

ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS E ESTIAGENS NA BACIA DO RIO GRAVATAÍ

Contrato nº 004/2015



ETAPA - ESTUDOS BÁSICOS

PRODUTO Nº 8 - RELATÓRIO DA AEROFOTOGRAMETRIA



CONTRATO N.º: 004/2015		ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS E ESTIAGEM NA BACIA DO RIO GRAVATAÍ			
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1 APRESENTAÇÃO

Este documento é parte integrante dos “Estudo de Alternativas e Projetos para Minimização do Efeito das Cheias e Estiagens na Bacia do Rio Gravataí”, e trata do PRODUTO 08 – RELATÓRIO DA AEROFOTOGRAMETRIA, conforme descrito no Edital CELIC-RS nº 010/14 na modalidade de Regime de Contratação Diferenciada (RDC).

O contrato supracitado é financiado através do Orçamento Geral da União, operacionalizado pelo Ministério das Cidades, no âmbito do Plano de Aceleração do Crescimento-2 (PAC 2). O contrato está inserido no Plano Nacional de Gestão de Riscos e Resposta a Desastres Naturais (PNGR), atendendo aos municípios da bacia hidrográfica do Rio Gravataí, na Região Metropolitana de Porto Alegre, no Estado do Rio Grande do Sul.

Quadro 1 - Dados do Contratante

DADOS DA CONTRATANTE	
Nome	Fundação Estadual de Planejamento Metropolitano e Regional - METROPLAN (citada daqui em diante como FISCALIZAÇÃO)
Endereço	Rua 24 de Outubro 388 - 4o andar - Bairro Moinhos de Vento, Porto Alegre - RS
Responsável pela Instituição	
Nome	Pedro Bisch Neto
Cargo	Diretor-Superintendente
Fiscal do Contrato	
Nome	Eng. ^a Paula Branco Pinto
Telefone	(51) 3288-6000
E-mail	paula-pinto@metroplan.rs.gov.br

(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)

Quadro 2 - Dados do Consórcio

DADOS DO CONSÓRCIO	
Nome Fantasia	Consórcio Metroplan Bacia Rio Gravataí
Empresas Componentes	
Razão social	Cohidro Consultoria, Estudos E Projetos Ltda.
Endereço	Rua 96, 585, loja comercial 7, Saquarema/RJ
Responsável	Eng.º Wellington Coimbra Lou
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(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)

Quadro 3 - Dados do Contrato

DADOS DO CONTRATO	
Termo de Compromisso do Estado do RS com União	0402.532-34/2012-RS
Edital CELIC	RDC 010/14
Número do contrato com a METROPLAN	004/2015
Objeto	Elaboração de estudos e projetos necessários para a gestão de inundações na bacia hidrográfica do Rio Gravataí
Ordem de início	16 de junho de 2015
Prazo	24 meses (contrato inicial mais primeiro termo aditivo)

(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)

2 INTRODUÇÃO

O presente relatório descreve o conteúdo referente ao "Produto 8 – Relatório da Aerofotogrametria", conforme solicitado no Termo de Referência:

Os produtos de aerofotogrametria fornecerão todos os elementos de planialtimetria e as imagens ortorretificadas para apropriação no projeto. Além das imagens, a informação cadastral e de altimetria servirá as etapas posteriores de anteprojeto, projeto básico e elaboração do plano diretor de drenagem, entre outros, bem como permitirá uma homogeneidade na base de informação geográfica entre os municípios da bacia para fins de planejamento urbano e territorial metropolitano.

Este documento oferece subsídios para a elaboração dos demais produtos do presente projeto, além de poder ser disponibilizado publicamente para reuso por interessados nos temas abrangidos. O Quadro 4 apresenta a relação de produtos previstos no presente projeto e a situação em que se encontrava o desenvolvimento de cada produto no momento do fechamento da presente edição.

Quadro 4 - Produtos previstos no contrato e status de execução

Número	Denominação do Produto	Status de Execução
1	Plano de Trabalho Consolidado	Executado
2	Consulta Pública - Relatório do Evento 1 - Plano de Trabalho	Executado
3	Consulta Pública - Relatório do Evento 2 - Diagnóstico	Não iniciado
4	Consulta Pública - Relatório do Evento 3 - Plano de Ação	Não iniciado
5	Base de Dados	Em revisão
6	Diagnóstico	Em revisão
7	Levantamento Topobatimétrico	Em execução
8	Levantamento Aerofotogramétrico	
9	Cadastro de Redes	Não iniciado
10	Relatório dos Estudos Hidrológicos	Em execução
11	Relatório Simulações Hidráulicas e Mapas de Inundações	Não iniciado
12	Projetos dos Cenários de Intervenção	Não iniciado
13	Análise de Viabilidade das Alternativas	Não iniciado
14	Consolidação do Conjunto de Intervenções	Não iniciado
15	Plano de capacitação e adequação dos serviço de gestão de águas pluviais	Não iniciado
16	Plano de Ação	Não iniciado
17	Resumo Executivo	Não iniciado
18	Relatório Final	Não iniciado

(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)

O relatório descreve as operações desenvolvidas, os produtos resultantes, bem como a metodologia e o instrumental empregado nos serviços de Recobrimento Aerofotogramétrico de diversas áreas urbanas e rurais, pertencentes à Bacia Hidrográfica do Rio Gravataí e localizadas nos municípios de Santo Antônio da Patrulha, Glorinha, Gravataí, Cachoeirinha, Alvorada e Viamão, estado do Rio Grande do Sul.

3 AEROFOTOGRAMETRIA

3.1 Planejamento geral

As atividades executadas foram divididas em 5 etapas, assim definidas:

- Recobrimento Aerofotogramétrico, conforme Relatórios de Andamento RA 03 e RA 04;
- Aerotriangulação, conforme Relatório de Andamento RA 05;
- Apoio de campo, conforme Relatório de Andamento RA 06;
- Geração de Ortofotos, conforme Relatórios de Andamento RA 07 e RA 08;
- Restituição Aerofotogramétrica, parte deste documento;

3.2 Recobrimento Aerofotogramétrico

3.2.1 Retificação do Termo de Referência

Conforme reunião realizada no dia 9 de março de 2016, com representantes da METROPLAN, ficou acordado a retificação do termo de referência em relação a resolução do recobrimento aerofotogramétrico.

A especificação de captura de imagens na escala 1:10.000 e geração de produtos na escala 1:2.000 é adequada às normas de aerofotogrametria, que permitem o uso de escala com proporção de 5 vezes nessas fases. A especificação da escala 1:2.000 para a geração de produtos finais é compatível com a grande maioria dos levantamentos aerofotogramétricos contratados por prefeituras para serem executados em áreas urbanas.

A configuração do tamanho do pixel em uma câmera digital é realizada conforme a altura de voo buscando-se uma equivalência com os parâmetros de câmeras analógicas.

Para uma altura de voo compatível com as escalas 1:10.000/1:8.000, o valor de resolução de uma câmera analógica com distância focal aproximada de 152 mm é de 20 a 25 cm por pixel.

No presente projeto, configurou-se até uma resolução superior, próxima aos 20 cm por pixel. Portanto a resolução apresentada no voo com escala 1:8.000 com GSD 20 cm é perfeitamente compatível para a obtenção de Restituição aerofotogramétrica na escala 1:2000 - PEC "A" - com curvas de nível a cada metro.

Desta forma, atendendo este quesito a cobertura aerofotogramétrica, digital e colorida, foi feita com resolução espacial de 20 centímetros por pixel. No ANEXO 16, estão mostradas as planilhas de cálculo de resolução.

As atividades realizadas nesta fase da cobertura aérea foram:

- Coleta de informações;
- Planejamento de voo;
- Aquisição das imagens aéreas;
- Etapa pós voo: controle de qualidade.

3.2.2 Coleta de Informações

Nesta fase foram coletadas todas as informações preliminares necessárias para o planejamento de voo utilizando como base o Google Earth e dentro de um polígono definido pelo TR e consolidado pela METROPLAN.

3.2.3 Planejamento de Voo

Para garantir a perfeita cobertura aerofotogramétrica foi feito um planejamento de voo adequado para o mapeamento das áreas.

No planejamento da cobertura aerofotogramétrica foi considerada uma série de aspectos técnicos dentro da área a fotografar; entre eles:

- Altitude média e variação do terreno;
- Definição das faixas de sobreposição das imagens.
- Condições naturais da região (relevo da área);

Para o início da cobertura aerofotogramétrica tornou-se necessário uma autorização junto ao Ministério da Defesa e a elaboração de planos de voos gráficos e analíticos para o recobrimento da área de interesse.

- Autorização de Voo

Após a realização do levantamento das informações da área a ser fotografada foi realizado o pedido de autorização de voo junto ao Ministério da Defesa.

Esta autorização tem como objetivo controlar a cobertura aerofotogramétrica dentro do território brasileiro, visando à segurança aérea e o controle de fluxo de aeronaves no espaço aéreo brasileiro.

Para este projeto, foi utilizado a autorização nº167/2015MD e AVOMD (Autorização de Voo do Ministério da Defesa), sob número 203/2015, com validade para o período de 09/10/2015 a 30/03/16. O ANEXO 1 apresenta uma cópia desta autorização.

- Planos de Voo

Os planos de voo foram gerados em software específico e após serem analisados, foram encaminhados à equipe de campo para a execução da atividade.

Foram gerados dois planos de voo:

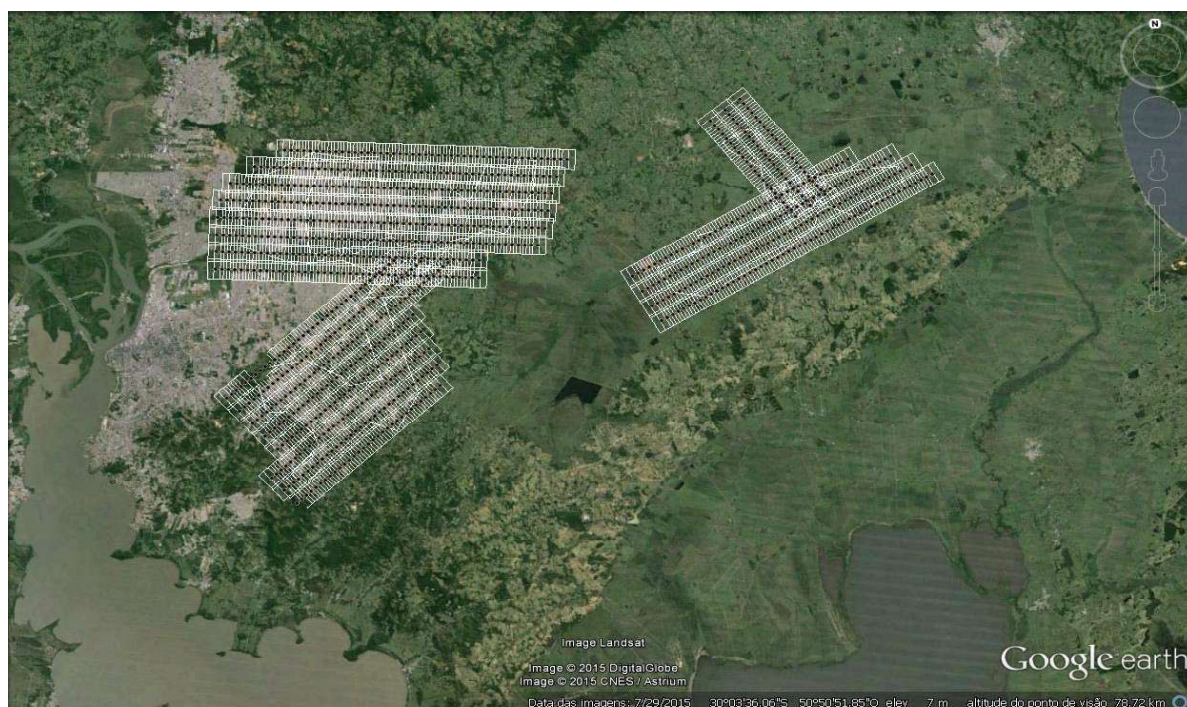
- gráfico;
- analítico.

O plano de voo gráfico apresenta as faixas de voo e o posicionamento das fotos que serão adquiridas. Isto possibilita verificar se a área será devidamente recoberta, além de orientar a equipe de campo durante a aquisição dos dados com a devida análise do posicionamento da aeronave, visando o atendimento das faixas de voo e o controle de qualidade em tempo real da atividade.

O sistema Phase One possui software de navegação que possibilita ao operador o controle total da tarefa e a possibilidade de tomada de decisões, caso o voo não esteja sendo feito conforme planejado.

A Figura 1 ilustra o plano de voo gráfico elaborado para as áreas de interesse.

Além do plano de voo gráfico elaborou-se o plano de voo analítico, que contém uma descrição detalhada dos dados técnicos do voo, tais como: informações técnicas dos sensores, dados da região, bem como outras instruções tipo: altura e altitude de voo, recobrimento lateral e longitudinal, GSD, tempo de exposição (necessário para evitar o arrastamento da imagem), quantidade aproximada de imagens que serão obtidas, coordenadas geográficas de entrada e saída das faixas, coordenadas geográficas do centro perspectivo de cada fotografia aérea e características da aeronave que será utilizada. As áreas sobrevoadas estão localizadas nos municípios de Santo Antônio da Patrulha, Glorinha, Gravataí, Cachoeirinha, Alvorada e Viamão, estado do Rio Grande do Sul.



*Figura 1 - Plano de voo
(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)*

3.2.4 Aquisição das Imagens Aéreas

A tomada das imagens obedeceu a um planejamento meticuloso. Uma série de condições foram observadas, visando assegurar a qualidade do voo e, consequentemente, a qualidade das imagens.

Neste sentido, fez-se necessária a consulta diária ao mapa climatológico, observações “in loco”, contato com as estações meteorológicas mais próximas do local do recobrimento e outros dispositivos que permitissem a constatação das condições climáticas.

É com este conjunto de informações que se decide pela decolagem ou não da aeronave.

A cobertura aerofotogramétrica corresponde ao imageamento do terreno através de imagens, expostas sucessivamente, ao longo de uma direção de voo. Essa sucessão foi realizada em intervalo de tempo tal forma a se obter uma superposição longitudinal entre duas fotografias de ao menos 60%; constituindo-se no final uma faixa de cobertura.

Nas faixas dispostas, paralelamente, para compor a cobertura de uma área, foi mantida uma distância entre os eixos de voo de forma que se conseguisse uma superposição lateral, seja de, no mínimo, 30% entre as faixas adjacentes.

O recobrimento de 60% tem como objetivo garantir a visão tridimensional do terreno, necessária às etapas posteriores de mapeamento, como a aerotriangulação, restituição aerofotogramétrica e geração das ortofotos. Ocasionalmente, esta sobreposição pode variar principalmente devido às oscilações da altura de voo e da deriva da aeronave decorrente da ação do vento.

Todos os cuidados foram tomados para que os trabalhos referentes à cobertura aerofotogramétrica digital fossem executados conforme o planejamento constante no plano de voo, entre eles:

- A aeronave utilizada (Figura 2) está devidamente homologada pela Agência Nacional de Aviação Civil (ANAC) para esse fim e dotada de equipamento GPS voltado para navegação, contendo os planos de voo de todas as diretrizes de faixas e centros das imagens.

Possui teto de serviço superior ao necessário para a obtenção de imagens, sendo especialmente adaptada para acoplar o equipamento aerofotogramétrico e acomodar a tripulação.
- A direção de voo foi realizada de forma a otimizar o aerolevanteamento e no sentido das pistas dos aeroportos, garantindo completa cobertura das áreas de interesse.
- Havendo interrupção na tomada das imagens em uma determinada faixa, o reinício das operações está condicionado à superposição dos três últimos pares estereoscópicos.



*Figura 2 - Aeronave Sêneca III (EMBRAER) - Prefixo PT-VBA utilizada no projeto.
(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)*

- O sistema de aerolevantamento utilizado no projeto possui sistema automático de disparo e sincronismo de dados, ângulo normal e capaz de registrar os menores detalhes sem distorções; resolução radiométrica de 8 a 16 bits; resolução geométrica de 80 megapixels e distância focal nominal de 50 mm. Também possui Unidade de Medida Inercial (IMU- Inertial Measurement Unit), que registra os ângulos de posicionamento do avião (Omega, Phi e Kappa) e GPS que registra as coordenadas com alta precisão (x, y, z), na tomada de cada imagem.

A partir dos dados definidos no planejamento de voo, foi realizada a aquisição das imagens coloridas digitais, utilizando o sistema Phase One (Figura 3).



*Figura 3 - Sistema Phase One, com a IMU do sistema de navegação
(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)*

3.2.5 Etapa pós voo

Após a atividade de campo os dados foram recebidos pela equipe técnica em escritório.

Inicialmente, foi realizado um controle de qualidade das informações e dos dados coletados nas missões de voo, analisando-se:

- O recobrimento total da área a ser sobrevoada;
- A qualidade das imagens;
- A interação das informações (imagens, dados de navegação GPS/INS, dados laser, arquivos técnicos do voo e demais dados);
- O atendimento do plano de voo planejado, comparando os fotoíndices e as trajetórias geradas pelo sistema de navegação.

Após a análise e armazenamento dos dados verificou-se que não houve problemas com o voo realizado e procedeu-se a geração e edição final dos fotoíndices.

- Dados GPS/inercial:

Os dados de navegação e georreferenciamento direto, coletados pelo sistema GPS/inercial, foram processados em software específico do fabricante dos sensores, para o cálculo das coordenadas precisas do centro óptico e dos ângulos de rotação da câmara em cada aquisição de dados.

Estas informações precisas foram usadas tanto para a etapa posterior de triangulação das imagens como para o processamento dos dados laser.

Este processamento foi feito no modo relativo, integrando os dados de uma estação base posicionada em solo, próxima ao local da atividade, aos dados coletados em voo.

No processamento dos dados GNSS e da IMU foram utilizadas técnicas de ajuste e integração dos dados (forte ou fracamente acoplados), com suavização e exportação da trajetória da aeronave para serem utilizados em processos posteriores.

3.3 Apoio de Campo

A seguir estão descritas as operações envolvidas, a metodologia e o instrumental empregado no processo do apoio de campo, necessários para o desenvolvimento dos serviços.

Inicialmente foram obtidas as coordenadas dos pontos de apoio suplementar, para posterior aerotriangulação da área de interesse. Os pontos de apoio suplementar foram distribuídos de forma regular em quantidade e qualidade suficientes a atender às exigências mínimas dos programas de aerotriangulação a serem utilizados na próxima etapa.

O desenvolvimento dos serviços deu-se de conformidade com as especificações técnicas para sua execução.

Dados do relatório:

- Apoio básico: 01 marco (Base 01)
- Identificação e levantamento de HV = 89 pontos

3.3.1 Objetivo da etapa

O apoio terrestre básico se constitui na determinação de coordenadas planialtimétricas, no sistema UTM, de pontos necessários às operações aerofotogramétricas.

O apoio terrestre bem como a determinação altimétrica, foram realizados a partir de determinações por rastreamento de satélites do sistema NAVSTAR GPS, pelo método da determinação relativa.

3.3.2 Planejamento

Os trabalhos do apoio terrestre iniciaram-se a partir da coleta de todas as informações cartográficas disponíveis na região dos trabalhos, tais como:

- Monografias dos vértices da Rede Geodésica e de referências de nível da Rede Geodésica de 1a. Ordem do IBGE.
- Mapas rodoviários do Estado;
- Fotografias aéreas da área;
- Fotoíndice da Cobertura Aerofotogramétrica.

Com base nos mapas das redes básicas existentes e nos mapas rodoviários foram planejados os desenhos de uma rede de densificação planimétrica.

Sobre as fotografias aéreas da cobertura devidamente justapostas e montadas e com o auxílio do fotoíndice correspondente, foram escolhidas as posições aproximadas para os pontos de apoio fotogramétrico (HHVV), com base nos seguintes critérios:

- Pontos ao longo de todos os bordos e ligações de faixas;
- Facilidade de acesso aos pontos;
- Presença de detalhes do terreno nas imagens que permitissem a perfeita identificação dos pontos;
- Condições de visibilidade para ocupação dos pontos com os receptores GPS.

As zonas assim escolhidas para a localização dos pontos foram marcadas sobre as fotografias e fotoíndice e em seguida numerados sequencialmente. Em função da quantidade de pontos e da distância da rede, foi definida a necessidade de equipamentos e pessoal.

Sobre fotografias, foram escolhidos os pontos de apoio suplementar, necessários ao processamento da aerotriangulação, os quais obedeceram a seguinte distribuição e densidade:

- Foram escolhidos um total de 89 pontos, como solução suficiente aos trabalhos de orientação da aerotriangulação da cobertura aérea.

Concluído o planejamento do apoio suplementar, partiu-se para o reconhecimento e identificação em campo.

Finda esta etapa, iniciaram-se os trabalhos de medição dos pontos de apoio suplementar.

3.3.3 Controle fotogramétrico

Tendo em vista a utilização de programa baseado em leituras de modelos independentes, a execução da restituição aerofotogramétrica da cobertura aérea e a utilização de aerotriangulação para densificação do controle fotogramétrico, foi feito um planejamento da distribuição de pontos de apoio terrestre em função da forma do bloco de fotografias e extensão das faixas. Optou-se por pontos de duplo apoio (HV), distribuídos em todas as faixas.

Os pontos de apoio fotogramétrico tiveram suas coordenadas e altitudes determinadas em campo por posicionamento de satélites do sistema NAVSTAR GPS, Método Diferencial Estático, a partir da base local amarrada à Rede Nacional e as referências de nível do apoio altimétrico.

3.3.4 Operações de Campo

- Posicionamento Tridimensional GPS:

As etapas do levantamento dos pontos de apoio foram conduzidas segundo o mesmo método de posicionamento, utilizando o sistema GPS.

Foi empregado o método de posicionamento estático, no modo relativo, isto é, foram utilizados dois, rastreando simultaneamente em duas estações distintas, uma das quais, pelo menos com coordenadas já conhecidas, e a outra que se pretende determinar.

Foram utilizados dois receptores geodésicos de dupla frequência, Topcon. Os dados armazenados nas memórias dos receptores foram descarregados em computador portátil e processados diariamente.

- Apoio Básico

Para o transporte de coordenadas foi utilizado um receptor Legacy da Topcon, de dupla frequência, operando no modo estático, com pelo menos 05 satélites.

Para o cálculo das coordenadas do marco base (Base-01) foi utilizado o processo Posicionamento por Ponto Preciso (PPP), que é um serviço on-line para o pós-processamento de dados GPS (Global Positioning System). Ele permite aos usuários de GPS, obterem coordenadas de boa precisão no Sistema de Referência Geocêntrico para as Américas (SIRGAS 2000) e no International Terrestrial Reference Frame (ITRF).

No posicionamento com GPS, o termo Posicionamento por Ponto Preciso normalmente refere-se à obtenção da posição de uma estação utilizando as observáveis fase da onda portadora coletadas por receptores de duas frequências e em conjunto com os produtos do IGS (International GNSS Service).

O resultado do IBGE-PPP independe de qualquer ajustamento de rede geodésica e não está associado às realizações ou ajustamentos de rede planimétrica. O IBGE-PPP processa dados GPS que foram coletados no modo estático ou cinemático de receptores de uma ou duas frequências.

- Apoio Suplementar

O levantamento dos pontos do apoio suplementar, foram conduzidas segundo o mesmo método de posicionamento, utilizando o sistema GPS.

Foi empregado o método de posicionamento estático, no modo relativo, isto é, foram utilizados dois, rastreando simultaneamente em duas estações distintas, uma das quais, pelo menos com coordenadas já conhecidas, e a outra que se pretende determinar.

Foram utilizados dois receptores geodésicos de dupla frequência, Topcon. Os dados armazenados nas memórias dos receptores foram descarregados em computador portátil e processados diariamente.

3.3.5 Controle de Ondulação do Geóide

A transformação de altitudes geométricas em ortométricas requer a aplicação dos valores de ondulação geoidal.

Esta ondulação “(N) pode ser definida como sendo a diferença, em metros, entre as superfícies do geóide e do elipsóide em um ponto considerado (Figura 4), e é calculada subtraindo o valor da altitude elipsoidal (h) pelo valor da altitude geoidal (H).

Os valores de ondulação geoidal deste trabalho foram calculadas através do software livre MAPGEO 2015, versão 1.0, disponibilizado pelo IBGE.

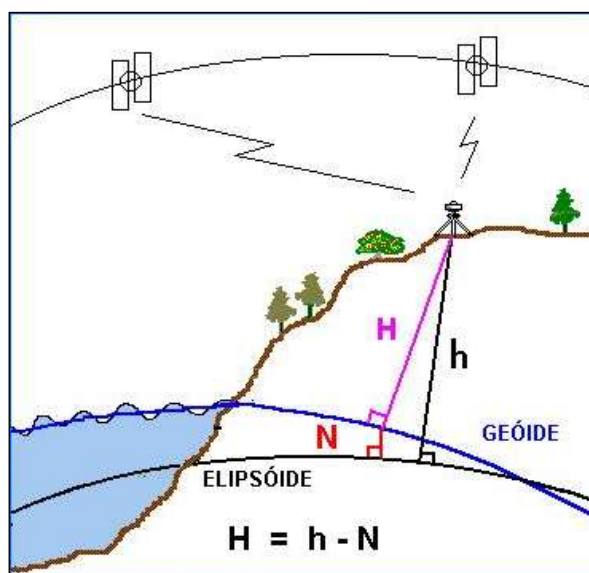


Figura 4 - Ondulação geoidal para um Ponto Considerado
(Fonte IBGE)

3.3.6 Datum

Foi adotado o sistema de projeção UTM, sendo que todos os pontos de apoio geodésico estão referenciados ao “DATUM” SIRGAS-2000 e todas as altitudes estão referenciadas ao Marégrafo de Imbituba-SC.

3.4 Aerotriangulação

A aerotriangulação é um processo que visa determinar as coordenadas em referencial terrestre através da medição de imagens aéreas, utilizando pontos esparsos determinados no terreno.

Após a coleta dos pontos HVs levantados em campo, os dados coletados foram utilizados no processo de aerotriangulação (este processo permite realizar a correção e visualização dos modelos estereoscópicos tridimensionais) com determinação simultânea das posições, altitudes de cada imagem e das coordenadas de pontos fotogramétricos (pontos de passagem).

Este processo foi realizado semi-automaticamente usando a estação fotogramétrica INPHO; neste software os pontos de apoio foram medidos interativamente e os pontos de passagem foram medidos automaticamente por correlação de imagens.

Após a medição dos pontos (fotogramétricos e de passagem) fez-se o ajuste em bloco dos feixes de raios, obtendo-se as coordenadas de terreno dos pontos fotogramétricos e os parâmetros de orientação exterior de cada imagem, com precisão da escala.

3.5 Restituição Aerofotogramétrica Planialtimétrica Digital

A restituição estereofotogramétrica é a fase do projeto que consiste na produção do mapa vetorial do projeto, correspondendo à restituição tridimensional das feições geográficas contidas no modelo estereoscópico, utilizando-se as estações fotogramétricas digitais.

Para a execução da etapa de restituição todos os modelos aerotriangulados foram repassados para a equipe de restituição que fez uma análise da qualidade da aerotriangulação, carregaram os modelos juntamente com as imagens e verificaram a inexistência de desníveis entre os modelos subsequentes e faixas adjacentes.

Assim, na captura de informações gráficas que ocorrem a partir dos elementos resultantes do apoio básico e da aerotriangulação possibilitaram a orientação das imagens que foram utilizadas em estações fotogramétricas. Todos os equipamentos que foram utilizados para restituição foram compatíveis com a precisão e acurácia do mapeamento solicitado.

De posse das fotografias aéreas devidamente processadas, dos pontos de apoio de campo, dos parâmetros referentes à aerotriangulação, foi realizada a restituição estereofotogramétrica digital dos elementos cartográficos, utilizando-se as estações fotogramétricas digitais.

Estes sistemas são soluções de restituição completas, que oferecem ao usuário uma riqueza de atributos e ferramentas que aumentam a produtividade sem a perda de qualidade.

A exibição de imagens digitais pode ser feita em telas com recurso de visualização estereoscópica.

Essa funcionalidade facilita a detecção de feições e alterações, principalmente na revisão de mapas, exibindo simultaneamente uma ortofoto e um estéreo-modelo.

3.6 Geração de Ortofotos Digitais

Após a etapa de aerotriangulação das procedeu-se a ortorretificação geométrica das fotografias aéreas.

A ortorretificação pode ser definida como uma transformação geométrica aplicada a imagens digitais onde o objetivo é a correção das distorções inerentes a câmara e as diferenças de relevo encontradas na superfície terrestre.

As ortofotos, com precisão na escala 1:2.000, foram obtidas após a etapa de aerotriangulação e a partir do processo de ortorretificação diferencial das imagens aéreas, através de técnicas de cartografia digital com o emprego de equipamentos e softwares específicos para tal fim.

A ortofoto digital pode ser entendida como um produto cartográfico que alia a riqueza de detalhes de uma fotografia com qualidade geométrica podendo ser utilizada tal qual uma planta, representando os diversos elementos do terreno como em uma planta convencional.

É importante ressaltar que uma fotografia aérea não pode ser utilizada como um documento cartográfico.

Ressalva-se que as principais diferenças entre uma ortofoto e uma imagem fotográfica comum estão na eliminação das distorções dos seguintes fatores inerentes ao processo fotográfico: projeção central do processo fotográfico, variação da topografia do terreno, distorção provocada pelo sistema de lentes da câmara fotográfica, variações na altitude de voo da aeronave e curvatura terrestre.

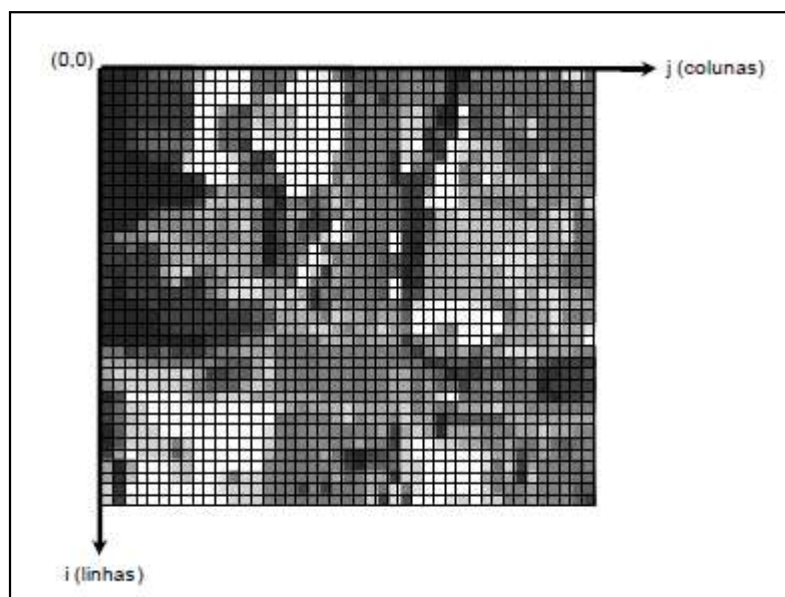
Assim, devido a não homogeneidade da escala que estas distorções provocam não se podem efetuar medidas de coordenadas, distâncias e áreas diretamente sobre uma fotografia.

Dessa forma, as correções desses fatores foram aplicadas de modo a tornar a escala homogênea até que as feições do terreno apareçam na sua correta posição.

Uma imagem digital constitui uma matriz bidimensional que define um conjunto de células ou pixels. Cada pixel é definido pelas coordenadas espaciais (x, y) que indicam sua localização na imagem, sendo que a cada posição (x, y) é atribuído um valor digital (nível de cinza) correspondente ao valor radiométrico registrado pela câmara aérea digital.

Desta forma, uma imagem digital pode ser entendida como uma matriz, cujas colunas e linhas identificam um ponto na imagem.

O elemento da matriz correspondente a este ponto identifica o valor de brilho ou nível de cinza. Os elementos dessa matriz foram denominados pixels. A Figura 5 ilustra esta definição.



*Figura 5 - Representação de uma imagem digital
(Fonte: Consórcio Metroplan Bacia do Rio Gravataí)*

Existem duas componentes principais que definem a qualidade de imagens digitais: a resolução espacial e a radiométrica.

A resolução espacial da imagem está relacionada às dimensões do pixel na imagem, enquanto que a resolução radiométrica da imagem depende dos níveis de quantização adotados. Se uma imagem é quantizada em n bits, ela possuirá 2^n valores de brilho.

Além destas duas resoluções, existem ainda a resolução temporal, que diz respeito à frequência com que imagens da mesma região foram obtidas e a resolução espectral, caracterizada pelo número de bandas espectrais em que a imagem é obtida. Estas duas últimas resoluções foram mais comuns quando se trata de sensores a bordo de satélites.

Para o início das atividades de produção das ortofotos digitais, foram necessários alguns dados de entrada, como: fotografias aéreas adquiridas. Também foram necessários pontos de checagem para aferição da qualidade dos produtos resultantes.

Este processamento tem o objetivo de manipular as imagens para que as mesmas se tornem um documento cartográfico confiável e passível de se executar medições precisas. Objetiva também corrigir distorções e melhorar a qualidade interpretativa dos dados originais.

As atividades foram desenvolvidas por uma equipe técnica qualificada em Processamento Digital de Imagens - PDI e especializada na manipulação de fotografias aéreas digitais.

Para a obtenção das ortofotos foram realizadas as seguintes etapas:

- Ortorretificação das fotografias;
- Ajuste radiométrico das imagens;
- Mosaicagem e georreferenciamento das imagens.

3.6.1 Mosaicagem e Georreferenciamento das Imagens

No processo de ortorretificação das imagens é realizado o georreferenciamento das mesmas.

O processo de mosaicagem visa à obtenção de um bloco contínuo de imagens com qualidade uniforme da área do projeto, a partir das fotografias ortorretificadas. Neste processo, foram criadas as linhas de corte entre as ortofotos adjacentes, objetivando a obtenção de um bloco contínuo da área do projeto, denominado mosaico.

Alguns cuidados devem ser tomados para a obtenção de ortofotos de boa qualidade, o principal cuidado está na etapa de mosaicagem.

No processo de mosaicagem foi utilizado o software INPHO, módulo OrthoVista. Para este projeto foi realizada a geração das ortofotos com GSD de 20 cm, referenciados ao datum planimétrico SIRGAS 2000 e projetados para UTM no fuso 22S.

Após a mosaicagem, as ortofotos foram recortadas de acordo com a articulação na escala 1:2.000.

3.7 Anexos

A seguir estão elencados todos arquivos anexos a este documento, tanto em forma gráfica, integrante do mesmo, como em mídia digital, conforme segue:

- Anexo 1 - Autorização do Ministério da Defesa;
- Anexo 2 - Certificado de Calibração da Câmera (Digital);
- Anexo 3 - Dados Técnicos do Recobrimento Aerofotogramétrico;
- Anexo 4 - Coordenadas do Marco Base;
- Anexo 5 - Localização do Marco – Base 01;
- Anexo 6 - Croqui do Apoio Suplementar;
- Anexo 7 - Coordenadas dos Pontos do Apoio Suplementar;
- Anexo 8 - Dados do Processamento GPS;
- Anexo 9 - Monografia dos Marcos;
- Anexo 10 - Dados de Aerotriangulação;
- Anexo 11 - Área da Bacia do Rio Gravataí;
- Anexo 12 - Mosaico (Digital);
- Anexo 13 - Ortofoto (Digital);
- Anexo 14 - Restituição Aerofotogramétrica (Digital);
- Anexo 15 - Foto Índice;
- Anexo 16 – Planilhas de Resolução.

ANEXO 1 - AUTORIZAÇÃO DO MINISTÉRIO DA DEFESA



MINISTÉRIO DA DEFESA
ESTADO-MAIOR CONJUNTO DAS FORÇAS ARMADAS
CHEFIA DE LOGÍSTICA
SUBCHEFIA DE APOIO A SISTEMAS DE CARTOGRAFIA LOGÍSTICA E MOBILIZAÇÃO
SEÇÃO DE CARTOGRAFIA, METEOROLOGIA E AEROLEVANTAMENTO
Esplanada dos Ministérios - Bloco "Q" - 3º Andar - Sala 348 - 70049-900 - Brasília - DF
Tel/Fax: (61) 3312-4161 / 3312-4261

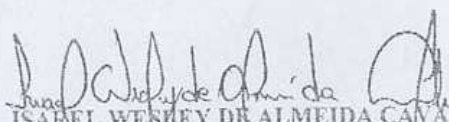
DESTINATÁRIO: Sr. **PETERSON MARTINSKI** – Diretor Técnico
AEROSAT – ENGENHARIA E AEROLEVANTAMENTOS LTDA.
Nº de fax: (41) 3016-9660. Data: 02/12/2015
REMETENTE: Seção de Cartografia, Meteorologia e Aerolevanteamento – SECMA.
Nº do fax: (61) 3312-4261
Nº do documento: 342/SEGMA Nº de páginas: 1
Observações:

ASSUNTO: Prorrogação de prazo.

Prezado Senhor,

1. Em referência ao Projeto nº 114/2015, informo que:
 - a) foi prorrogada a Autorização nº 167/2015/MD, expedida em 09/10/2015, à **AEROSAT – ENGENHARIA E AEROLEVANTAMENTOS LTDA.**, no período de 09/10/2015 a 30/03/2016;
 - b) foi mantida a AVOMD - 203/15, para o período de 09/10/2015 a 30/03/2016, que deverá constar no item 18 do plano de voo para as aeronaves PT-VBA e PT-EGT; e
 - c) está autorizado o voo na altitude compreendida entre 2.000 e 10.000 pés.
2. Por oportuno, solicito que qualquer necessidade de alteração no processo inicial seja encaminhada a esta Seção com a maior brevidade possível.

Atenciosamente,


ISRAEL WESLEY DE ALMEIDA CAVALCANTE
Capitão-de-Mar-e-Guerra (RM1-IM)
Coordenador da SECMA

Caso não sejam bem recebidas todas as páginas, favor contatar-nos.

ANEXO 2 - CERTIFICADO DE CALIBRAÇÃO DA CÂMERA

Este anexo está sendo apresentado somente em mídia digital.

ANEXO 3 - DADOS TÉCNICOS DO RECOBRIMENTO AEROFOTOGRAMÉTRICO

Anexo 3 - Dados Técnicos do Recobrimento Aerofotogramétrico

COTA 10 Media

Projeto:	
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Dados do Projeto	Dados Técnicos	Faixas e Blocos
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Dados do Projeto

Nome do Projeto:	PL_AR_URB_VOO_GRAVATAI_F22S_V1_COTA MEDIA 10		
Interessado:	PL_AR_URB_VOO_GRAVATAI_F22S_V1_COTA MEDIA 10		
Endereço:	PL_AR_URB_VOO_GRAVATAI_F22S_V1_COTA MEDIA 10		
Telefone:	PL_AR_URB_VOO_	E-mail:	PL_AR_URB_VOO_GRAVATAI_F22S_V1_COTA MEDIA 150
Site:	PL_AR_URB_VOO_GRAVATAI_F22S_V1_COTA MEDIA 10		
Data Inicial:		Data de Término:	
Descrição do Projeto:	PL_AR_URB_VOO_GRAVATAI_F22S_V1_COTA MEDIA 10		

Dados Técnicos

Aeronave				
Nome da Aeronave:	EMB 810 C- SENECA III			
Velocidade (Km/h):	220,000	Velocidade (m/s):	61,111	
Teto Operacional (pés):	20000,000	Teto Ideal (pés):	18000,000	
Peso Básico (Kg):	1500,000	Peso máximo Decolagem (Kg):	2100,000	
Consumo (l/h):	80,000	Capacidade (l):	450,000	
Autonomia (horas):	5,625			
Tipo do Motor:	0,000	Potência (HP):	400	
Observações:	PILOTO:			
Câmara				
Nome da Aeronave:	Sistema Phase One			
Descrição:		Focal (mm):	50,000	
Tamanho do pixel em X (mm):		Tamanho do pixel em Y (mm):		
Resolução em X (pixel):		Resolução em Y (pixel):		
Tempo de Inverso de Exposição (1/s):				

Dados Técnicos			
GSD (m):	0,2	Denominador da Escala da Carta:	
Altitude Média da Região (m):	10	Altura de Vôo (m):	
Altitude de Vôo (m):	2.173	Altitude de Vôo (pés):	7.079
Superposição Longitudinal (%):	60,000	Superposição Lateral (%):	40,000
Tamanho da imagem no Terreno X (m):	2.064	Tamanho da imagem no Terreno Y (m):	1.550
Arrastamento (Pixels):		Arrastamento (mm):	
Elipsóide de Referência:	WGS84 / SIRGAS 2000		

Faixas e Blocos

Faixas e Blocos Selecionados:														
Tipo	Nome da Faixa/Bloco	Sentido	Margem Lateral (modelos)	Margem Longitudinal (modelos)	Faixas Paralelas	Margem Piloto (Km)	Base Aérea (m)	Avanço Lateral (m)	Comprimento da Faixa (Km)	Total de Faixas	Fotos por Faixa	Total de Fotos	Posição do Quadro	Tempo Entre Tomadas(s)
Faixa	FX01 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	24,037	1	50	50	Inclinado	8,027345
Faixa	FX02 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	23,056	1	48	48	Inclinado	8,027345
Faixa	FX03 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	22,075	1	46	46	Inclinado	8,027345
Faixa	FX04 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	19,132	1	40	40	Inclinado	8,027345
Faixa	FX05 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	10,302	1	22	22	Inclinado	8,027345
Faixa	FX06 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	10,302	1	22	22	Inclinado	8,027345
Faixa	FX07 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	10,302	1	22	22	Inclinado	8,027345
Total Geral de Fotos:												250		

FX01_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
519320,406	6677750,920	540577,413	6688707,822	0,294336	1			24,037	0,000	6,556	0,000	6,556	6,556

Informações sobre os CPs						
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude
WPT-01 A	CPs Imagens	519320,406	6677750,920	22	J	-30° 01' 51,982060
WPT-01 B	CPs Imagens	540686,491	6688764,046	22	J	-29° 55' 52,302957

FX02_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
518658,448	6679035,155	539366,980	6689709,346	0,294336	1	48	48	23,056	0,000	6,288	0,000	6,288	6,288

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-02 A	CPs Imagens	518658,448	6679035,155	22	J	-30° 01' 10,296461	-050° 48' 23,420245
WPT-02 B	CPs Imagens	539152,448	6689598,766	22	J	-29° 55' 25,363989	-050° 35' 39,720095

FX03_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
517996,491	6680319,390	537728,120	6690490,037	0,294336	1	46	46	22,075	0,000	6,021	0,000	6,021	6,021

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-03 A	CPs Imagens	517996,491	6680319,390	22	J	-30° 00' 28,609465	-050° 48' 48,211221
WPT-03 B	CPs Imagens	537618,406	6690433,485	22	J	-29° 54' 58,417992	-050° 36' 37,040185

FX04_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
517334,533	6681603,625	534154,271	6690273,341	0,294336	1	40	40	19,132	0,000	5,218	0,000	5,218	5,218

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-04 A	CPs Imagens	517334,533	6681603,625	22	J	-29º 59' 46,921074	-050º 49' 12,996457
WPT-04 B	CPs Imagens	534340,192	6690369,174	22	J	-29º 55' 0,852901	-050º 38' 39,290039

FX05_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
524044,897	6694199,811	530098,118	6685763,948	0,294336	1	22	22	10,302	0,000	2,810	0,000	2,810	2,810

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-05 A	CPs Imagens	524044,897	6694199,811	22	J	-29º 52' 57,280696	-050º 45' 3,556657
WPT-05 B	CPs Imagens	530050,795	6685829,898	22	J	-29º 57' 28,731440	-050º 41' 18,800818

FX06_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
525218,759	6695042,126	531271,981	6686606,263	0,294336	1	22	22	10,302	0,000	2,810	0,000	2,810	2,810

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-06 A	CPs Imagens	525218,759	6695042,126	22	J	-29° 52' 29,830247	-050° 44' 19,864336
WPT-06 B	CPs Imagens	531224,658	6686672,213	22	J	-29° 57' 1,260496	-050° 40' 35,093038

FX07_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
526392,622	6695884,440	532445,843	6687448,577	0,294336	1	22	22	10,302	0,000	2,810	0,000	2,810	2,810

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-07 A	CPs Imagens	526392,622	6695884,440	22	J	-29º 52' 2,375821	-050º 43' 36,178639
WPT-07 B	CPs Imagens	532398,520	6687514,527	22	J	-29º 56' 33,785607	-050º 39' 51,391964

COTA 50 Media

Projeto:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 COTA MÉDIA 50 - Código Interno: 01
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Dados do Projeto	Dados Técnicos	Faixas e Blocos
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Dados do Projeto

Nome do Projeto:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 COTA MÉDIA 50		
Interessado:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 COT		
Endereço:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 COTA MÉDIA 50		
Telefone:	PL_AR_URB_VOO_	E-mail:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 Cota Média 50
Site:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 Cota Média 50		
Data Inicial:		Data de Término:	
Descrição do Projeto:	PL_AR_URB_VOO_GRAVATAI_WGS84_F22S_V1 COTA MÉDIA 50		

Dados Técnicos

Aeronave				
Nome da Aeronave:	EMB 810 C- SENECA III			
Velocidade (Km/h):	220,000	Velocidade (m/s):	61,111	
Teto Operacional (pés):	20000,000	Teto Ideal (pés):	18000,000	
Peso Básico (Kg):	1500,000	Peso máximo Decolagem (Kg):	2100,000	
Consumo (l/h):	80,000	Capacidade (l):	450,000	
Autonomia (horas):	5,625			
Tipo do Motor:	0,000	Potência (HP):	400	
Observações:	PILOTO:			
Câmara				
Nome da Aeronave:	Phase One			
Descrição:		Focal (mm):	50,000	
Tamanho do pixel em X (mm):		Tamanho do pixel em Y (mm):		
Resolução em X (pixel):		Resolução em Y (pixel):		
Tempo de Inverso de Exposição (1/s):	500			

Dados Técnicos			
GSD (m):	0,20	Denominador da Escala da Carta:	
Altitude Média da Região (m):	50	Altura de Vão (m):	2.113
Altitude de Vão (m):	2.163	Altitude de Vão (pés):	7.200
Superposição Longitudinal (%):	60,000	Superposição Lateral (%):	40,000
Tamanho da imagem no Terreno X (m):	2.054	Tamanho da imagem no Terreno Y (m):	1.550
Arrastamento (Pixels):		Arrastamento (mm):	
Elipsóide de Referência:	WGS84 / SIRGAS 2000		

Faixas e Blocos

Faixas e Blocos Selecionados:														
Tipo	Nome da Faixa/Bloco	Sentido	Margem Lateral (modelos)	Margem Longitudinal (modelos)	Faixas Paralelas	Margem Piloto (Km)	Base Aérea (m)	Avanço Lateral (m)	Comprimento da Faixa (Km)	Total de Faixas	Fotos por Faixa	Total de Fotos	Posição do Quadro	Tempo Entre Tomadas(s)
Faixa	FX08 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	14,717				Inclinado	8,027345
Faixa	FX09 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	15,698				Inclinado	8,027345
Faixa	FX10 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	16,188				Inclinado	8,027345
Faixa	FX11 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	14,717				Inclinado	8,027345
Faixa	FX12 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	15,207				Inclinado	8,027345
Faixa	FX13 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	20,113				Inclinado	8,027345
Faixa	FX14 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	18,641				Inclinado	8,027345
Faixa	FX15 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	17,170				Inclinado	8,027345
Faixa	FX16 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	20,113				Inclinado	8,027345
Faixa	FX17 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	20,113				Inclinado	8,027345
Faixa	FX18 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	24,528				Inclinado	8,027345
Faixa	FX19 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	25,019				Inclinado	8,027345
Faixa	FX20 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	25,019				Inclinado	8,027345
Faixa	FX21 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	24,528				Inclinado	8,027345
Faixa	FX22 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	23,056				Inclinado	8,027345
Faixa	FX23 LTGRAVATAI FOTO	L<->O	S/Margem	0	Nenhuma	0	490,560	981,120	21,585				Inclinado	8,027345
Total Geral de Fotos:														

FX08_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
490611,592	6664137,394	502227,430	6673434,659	0,294336	1			14,717	0,000	4,014	0,000	4,014	4,014

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-08 A	CPs Imagens	490611,592	6664137,394	22	J	-30° 09' 14,679186	-051° 05' 50,974464
WPT-08 B	CPs Imagens	502101,265	6673333,677	22	J	-30° 04' 16,033801	-050° 58' 41,512301

FX09_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
489708,760	6665265,376	501795,158	6674939,274	0,294336	1			15,698	0,000	4,281	0,000	4,281	4,281

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-09 A	CPs Imagens	489708,760	6665265,376	22	J	-30° 08' 38,007250	-051° 06' 24,686218
WPT-09 B	CPs Imagens	501964,412	6675074,744	22	J	-30° 03' 19,470346	-050° 58' 46,635713

FX10_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
488805,929	6666393,357	501362,886	6676443,890	0,294336	1			16,188	0,000	4,415	0,000	4,415	4,415

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-10 A	CPs Imagens	488805,929	6666393,357	22	J	-30° 08' 1,332902	-051° 06' 58,391014
WPT-10 B	CPs Imagens	501444,569	6676509,269	22	J	-30° 02' 32,867604	-050° 59' 6,057138

FX11_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
489421,438	6668736,612	500930,614	6677948,505	0,294336	1			14,717	0,000	4,014	0,000	4,014	4,014

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-11 A	CPs Imagens	489421,438	6668736,612	22	J	-30° 06' 45,225200	-051° 06' 35,301472
WPT-11 B	CPs Imagens	500911,111	6677932,895	22	J	-30° 01' 46,618086	-050° 59' 25,981827

FX12_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
488518,607	6669864,594	500498,342	6679453,121	0,294336	1			15,207	0,000	4,147	0,000	4,147	4,147

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-12 A	CPs Imagens	488518,607	6669864,594	22	J	-30° 06' 8,549918	-051° 07' 8,994577
WPT-12 B	CPs Imagens	500391,269	6679367,420	22	J	-30° 01' 0,013533	-050° 59' 45,393088

FX13_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
487615,775	6670992,575	503345,430	6683582,521	0,294336	1			20,113	0,000	5,485	0,000	5,485	5,485

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-13 A	CPs Imagens	487615,775	6670992,575	22	J	-30° 05' 31,872232	-051° 07' 42,680814
WPT-13 B	CPs Imagens	503318,328	6683560,829	22	J	-29° 58' 43,759573	-050° 57' 56,166603

FX14_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
486712,944	6672120,557	501211,186	6683724,886	0,294336	1			18,641	0,000	5,084	0,000	5,084	5,084

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-14 A	CPs Imagens	486712,944	6672120,557	22	J	-30° 04' 55,192077	-051° 08' 16,360112
WPT-14 B	CPs Imagens	501266,529	6683769,183	22	J	-29° 58' 37,004236	-050° 59' 12,736533

FX15_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
485810,112	6673248,538	499076,943	6683867,250	0,294336	1			17,170	0,000	4,683	0,000	4,683	4,683

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-15 A	CPs Imagens	485810,112	6673248,538	22	J	-30º 04' 18,509524	-051º 08' 50,032550
WPT-15 B	CPs Imagens	499214,731	6683977,535	22	J	-29º 58' 30,236596	-051º 00' 29,303594

FX16_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
485563,296	6684090,318	505430,486	6682178,598	0,294336	1			20,113	0,000	5,485	0,000	5,485	5,485

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-16 A	CPs Imagens	485563,296	6684090,318	22	J	-29º 58' 26,267297	-051º 08' 58,722583
WPT-16 B	CPs Imagens	505583,782	6682163,847	22	J	-29º 59' 29,116006	-050º 56' 31,598050

FX17_LTGRAVATAI_FOTO														
	E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
	485701,683	6685528,475	505568,872	6683616,755	0,294336	1			20,113	0,000	5,485	0,000	5,485	5,485
Tempo Total da Faixa/Bloco (horas):													0,091	
Consumo estimado de combustível para a Faixa/Bloco (litros):													7,314	

Informações sobre os CPs								
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude	
WPT-17 A	CPs Imagens	485701,683	6685528,475	22	J	-29° 57' 39,549355	-051° 08' 53,489190	
WPT-17 B	CPs Imagens	505722,169	6683602,004	22	J	-29° 58' 42,389922	-050° 56' 26,460845	

FX18_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
485840,070	6686966,633	510186,318	6684623,915	0,294336	1			24,528	0,000	6,689	0,000	6,689	6,689

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-18 A	CPs Imagens	485840,070	6686966,633	22	J	-29º 56' 52,831227	-051º 08' 48,257184
WPT-18 B	CPs Imagens	510255,297	6684617,277	22	J	-29º 58' 9,298671	-050º 53' 37,329488

FX19_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
485978,456	6688404,790	510702,272	6686025,741	0,294336	1			25,019	0,000	6,823	0,000	6,823	6,823

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-19 A	CPs Imagens	485978,456	6688404,790	22	J	-29º 56' 6,112976	-051º 08' 43,026599
WPT-19 B	CPs Imagens	510881,988	6686008,448	22	J	-29º 57' 24,081882	-050º 53' 13,995958

FX20_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
486299,988	6689825,324	511218,226	6687427,567	0,294336	1			25,019	0,000	6,823	0,000	6,823	6,823

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-20 A	CPs Imagens	486299,988	6689825,324	22	J	-29º 55' 19,974525	-051º 08' 30,967469
WPT-20 B	CPs Imagens	511203,520	6687428,982	22	J	-29º 56' 37,920041	-050º 53' 2,053319

FX21_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
487139,310	6691196,034	511734,181	668829,393	0,294336	1	51	51	24,528	0,000	6,689	0,000	6,689	6,689

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-21 A	CPs Imagens	487139,310	6691196,034	22	J	-29º 54' 35,474294	-051º 07' 59,604180
WPT-21 B	CPs Imagens	511554,537	6688846,679	22	J	-29º 55' 51,848997	-050º 52' 49,013805

FX22_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
489067,481	6692461,969	512250,135	6690231,218	0,294336	1			23,056	0,000	6,288	0,000	6,288	6,288

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-22 A	CPs Imagens	489067,481	6692461,969	22	J	-29º 53' 54,412507	-051º 06' 47,651939
WPT-22 B	CPs Imagens	512017,794	6690253,575	22	J	-29º 55' 6,124504	-050º 52' 31,791148

FX23_LTGRAVATAI_FOTO													
E0	N0	E1	N1	B/Z	Núm. Faixas	Fotos por Faixa	Total Fotos	Comprimento da Faixa (Km)	Comprimento do Alinhamento (Km)	Tempo por Faixa (minutos)	Tempo Por Alinhamento (minutos)	Total por Faixa (minutos)	Total por Bloco/Faixas Paralelas (minutos)
491439,841	6693685,162	512766,089	6691633,044	0,294336	1			21,585	0,000	5,887	0,000	5,887	5,887

Informações sobre os CPs							
Identificador	Tipo CP	Coordenada E	Coordenada N	Fuso	Zona UTM	Latitude	Longitude
WPT-23 A	CPs Imagens	491439,841	6693685,162	22	J	-29º 53' 14,739774	-051º 05' 19,156271
WPT-23 B	CPs Imagens	512925,241	6691617,730	22	J	-29º 54' 21,771402	-050º 51' 58,006901

ANEXO 4 - COORDENADAS DO MARCO BASE



**Instituto Brasileiro de Geografia e Estatística
Relatório do Posicionamento por Ponto Preciso (PPP)**

Sumário do Processamento do marco: BASE-01

Início: AAAA/MM/DD HH:MM:SS.SS	2016/01/13 09:30:20,00
Fim: AAAA/MM/DD HH:MM:SS.SS	2016/01/13 20:51:30,00
Modo de Operação do Usuário:	ESTÁTICO
Observação processada:	CÓDIGO & FASE
Modelo da Antena:	TPSHIPER_SR NONE
Órbitas dos satélites:¹	RÁPIDA
Frequência processada:	L3
Intervalo do processamento(s):	5,00
Sigma² da pseudodistância(m):	2,000
Sigma da portadora(m):	0,015
Altura da Antena³(m):	1,522
Ângulo de Elevação(graus):	10,000
Resíduos da pseudodistância(m):	1,70 GPS 2,58 GLONASS
Resíduos da fase da portadora(cm):	1,37 GPS 1,59 GLONASS

Coordenadas SIRGAS

	Latitude(gms)	Longitude(gms)	Alt. Geo.(m)	UTM N(m)	UTM E(m)	MC
Em 2000.4 (B a quo deve ser usada) ⁴	-29° 56' 23,8247"	-51° 00' 54,0532"	68,14	6687868.404	498550.988	-51
Na data do levantamento⁵	-29° 56' 23,8185"	-51° 00' 54,0541"	68,14	6687868.595	498550.964	-51
Sigma(95%)⁶ (m)	0,001	0,003	0,006			
Modelo Geoidal	MAPGEO2015					
Ondulação Geoidal (m)	4,62					
Altitude Ortométrica (m)	63,52					

Precisão esperada para um levantamento estático (metros)

Tipo de Receptor	Uma frequência		Duas frequências	
	Planimétrico	Altimétrico	Planimétrico	Altimétrico
Após 1 hora	0,450	1,000	0,030	0,050
Após 2 horas	0,300	0,800	0,015	0,025
Após 4 horas	0,200	0,500	0,006	0,015
Após 6 horas	0,180	0,400	0,004	0,010

¹ Órbitas obtidas do International GNSS Service (IGS) ou do Natural Resources of Canada (NRCAN).

² O termo "Sigma" é referente ao desvio-padrão.

³ Distância Vertical do Marco ao Plano de Referência da Antena (PRA).

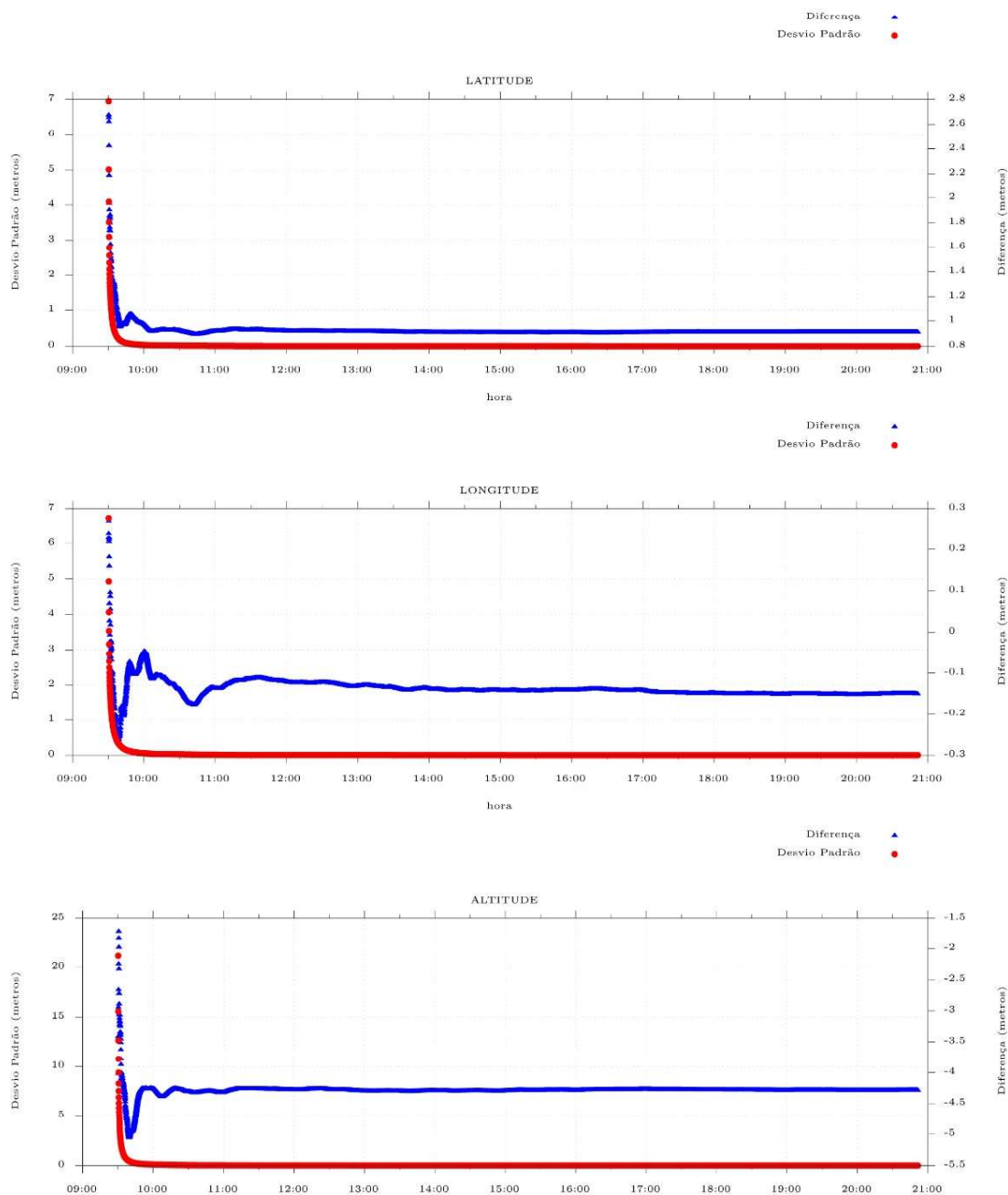
⁴ A coordenada oficial na data de referência do Sistema SIRGAS, ou seja, 2000.4. A redução de velocidade foi feita na data do levantamento, utilizando o modelo VEMOS em 2000.4.

⁵ A data de levantamento considerada é a data de início da sessão.

⁶ Este desvio-padrão representa a confiabilidade interna do processamento e não a exatidão da coordenada.

Os resultados apresentados neste relatório dependem da qualidade dos dados enviados e do correto preenchimento das informações por parte do usuário.
 Em caso de dúvidas, críticas ou sugestões contate: ibge@ibge.gov.br ou pelo telefone 0800-7218181.
 Este serviço de posicionamento faz uso do aplicativo de processamento CSRS-PPP desenvolvido pelo Geodetic Survey Division of Natural Resources of Canada (NRCAN)

Desvio Padrão e Diferença da Coordenada a Priori
BASE013j.16O



ANEXO 5 - LOCALIZAÇÃO DO MARCO – BASE 01



ANEXO 6 - CROQUI DO APOIO SUPLEMENTAR

ANEXO 7 - COORDENADAS DOS PONTOS DO APOIO SUPLEMENTAR

Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Ondulação Geoidal (N)	Alt Orto (m)
HV01-GRA	6.693.914,465	492.527,329	47,32	4,66	42,66
HV02-GRA	6.692.783,448	492.227,292	41,95	4,68	37,27
HV03-GRA	6.691.702,944	489.091,999	49,34	4,74	44,60
HV04-GRA	6.690.320,061	487.462,137	37,81	4,79	33,02
HV05-GRA	6.689.124,909	487.135,490	32,02	4,81	27,21
HV06-GRA	6.687.308,318	488.226,698	11,91	4,82	7,09
HV07-GRA	6.685.865,519	488.147,760	7,00	4,84	2,16
HV08-GRA	6.684.737,709	488.120,588	10,97	4,85	6,12
HV09-GRA	6.683.589,270	487.749,212	6,65	4,87	1,78
HV10-GRA	6.682.642,873	493.890,049	11,73	4,78	6,95
HV11-GRA	6.685.387,182	493.955,249	8,75	4,73	4,02
HV12-GRA	6.686.779,051	493.801,352	12,42	4,72	7,70
HV13-GRA	6.688.405,264	493.940,018	14,24	4,7	9,54
HV14-GRA	6.689.758,299	494.025,903	44,43	4,68	39,75
HV15-GRA	6.691.175,717	494.028,061	47,76	4,66	43,10
HV16-GRA	6.682.482,261	498.379,779	29,26	4,69	24,57
HV17-GRA	6.682.343,299	500.718,523	42,39	4,65	37,74
HV18-GRA	6.681.808,363	502.685,266	38,13	4,62	33,51
HV19-GRA	6.683.223,228	498.898,935	32,48	4,67	27,81
HV20-GRA	6.684.897,208	499.028,431	9,26	4,65	4,61
HV21-GRA	6.686.393,664	499.134,587	38,34	4,63	33,71
HV22-GRA	6.687.921,073	499.134,460	45,82	4,61	41,21
HV23-GRA	6.689.359,191	499.206,019	51,11	4,6	46,51
HV24-GRA	6.690.735,670	499.913,737	62,52	4,58	57,94
HV25-GRA	6.692.067,206	500.982,783	57,79	4,57	53,22
HV26-GRA	6.693.256,668	499.787,836	49,81	4,57	45,24
HV27-GRA	6.682.813,416	503.772,651	55,89	4,58	51,31
HV28-GRA	6.684.681,275	504.443,492	33,22	4,54	28,68
HV29-GRA	6.685.789,434	506.200,768	40,43	4,51	35,92
HV30-GRA	6.687.186,910	507.339,268	60,61	4,48	56,13
HV31-GRA	6.688.234,128	510.552,775	79,41	4,41	75,00

Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Ondulação Geoidal (N)	Alt Orto (m)
HV32-GRA	6.689.541,104	510.624,488	88,69	4,41	84,28
HV33-GRA	6.691.057,858	511.299,882	73,06	4,4	68,66
HV34-GRA	6.692.067,891	511.876,489	61,49	4,39	57,10
HV35-GRA	6.687.342,022	503.043,609	16,76	4,55	12,21
HV36-GRA	6.690.459,075	503.326,168	32,39	4,54	27,85
HV37-GRA	6.692.785,481	505.916,349	42,71	4,5	38,21
HV38-GRA	6.682.216,605	496.092,212	22,93	4,74	18,19
HV39-GRA	6.679.422,797	492.592,222	44,84	4,85	39,99
HV40-GRA	6.677.767,479	495.066,551	78,22	4,83	73,39
HV41-GRA	6.675.880,167	495.078,349	95,84	4,86	90,98
HV42-GRA	6.674.830,772	498.033,763	77,29	4,82	72,47
HV43-GRA	6.672.633,729	497.833,644	93,47	4,85	88,62
HV44-GRA	6.671.160,275	498.271,434	87,39	4,87	82,52
HV45-GRA	6.677.038,207	489.696,168	75,90	4,95	70,95
HV46-GRA	6.676.041,537	490.587,844	67,31	4,94	62,37
HV47-GRA	6.678.698,625	493.779,493	87,82	4,84	82,98
HV48-GRA	6.673.677,127	485.772,138	35,71	5,03	30,68
HV49-GRA	6.672.987,885	486.810,409	44,11	5,03	39,08
HV50-GRA	6.672.096,932	488.180,427	89,44	5,01	84,43
HV51-GRA	6.672.286,011	490.291,133	96,41	4,98	91,43
HV52-GRA	6.671.144,082	491.272,807	128,21	4,98	123,23
HV53-GRA	6.668.468,946	490.264,336	112,40	5,02	107,38
HV54-GRA	6.667.380,069	491.266,582	132,43	5,03	127,40
HV55-GRA	6.665.691,008	491.465,531	100,90	5,06	95,84
HV56-GRA	6.664.618,263	492.587,015	97,11	5,06	92,05
HV57-GRA	6.669.766,875	498.283,967	56,46	4,89	51,57
HV58-GRA	6.672.359,488	501.849,905	25,94	4,76	21,18
HV59-GRA	6.673.697,645	501.357,934	58,07	4,76	53,31
HV60-GRA	6.676.222,482	500.008,390	83,11	4,76	78,35
HV61-GRA	6.676.628,279	498.887,665	82,51	4,77	77,74
HV62-GRA	6.679.074,258	499.067,383	31,68	4,73	26,95
HV63-GRA	6.679.725,579	497.345,506	31,58	4,76	26,82

Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Ondulação Geoidal (N)	Alt Orto (m)
HV64-GRA	6.674.943,067	491.333,422	67,58	4,94	62,64
HV65-GRA	6.675.054,927	495.989,603	58,47	4,85	53,62
HV66-GRA	6.670.220,991	494.613,710	106,23	4,96	101,27
HV67-GRA	6.668.380,988	494.695,164	97,85	4,99	92,86
HV68-GRA	6.667.301,733	495.404,092	73,66	5,00	68,66
HV69-GRA	6.672.944,398	493.431,396	80,79	4,93	75,86
HV70-GRA	6.670.274,436	492.657,920	145,75	4,98	140,77
HV71-GRA	6.672.722,168	495.407,572	115,08	4,9	110,18
HV72-GRA	6.693.367,248	524.512,870	31,11	4,24	26,87
HV73-GRA	6.695.562,332	527.124,472	35,52	4,19	31,33
HV74-GRA	6.695.950,935	526.130,506	36,10	4,21	31,89
HV75-GRA	6.694.782,801	524.975,851	29,99	4,23	25,76
HV76-GRA	6.692.818,069	529.006,949	29,90	4,15	25,75
HV77-GRA	6.689.742,019	532.181,765	17,94	4,1	13,84
HV78-GRA	6.683.910,266	519.788,488	16,81	4,34	12,47
HV79-GRA	6.676.926,917	521.966,472	22,88	4,34	18,54
HV79A-GRA	6.677.906,535	521.480,739	17,07	4,34	12,73
HV80-GRA	6.682.316,926	527.730,624	17,36	4,2	13,16
HV81-GRA	6.683.514,001	531.288,803	25,27	4,13	21,14
HV82-GRA	6.686.900,269	538.695,138	23,04	3,96	19,08
HV83-GRA	6.689.192,241	538.141,392	18,15	3,97	14,18
HV84-GRA	6.689.715,800	537.595,442	18,12	3,98	14,14
HV85-GRA	6.690.382,672	535.658,865	18,64	4,03	14,61
HV86-GRA	6686734,725	526288,685	18,90	4,22	14,68
HV86A-GRA	6678145,647	521368,695	17,22	4,34	12,88
HV86B-GRA	6687943,584	538429,088	17,96	3,96	14,00

ANEXO 8 - DADOS DO PROCESSAMENTO GPS

PROJETO				
Project name: Gravatai_Sinos 11 01 2016.ttp				
Project folder: G:\Dados\Jobs				
Creation time: 30/7/2013 13:17:07				
Created by:				
Comment:				
Linear unit: Meters				
Angular unit: DMS				
Projection: UTMSouth-Zone_22 : 54W to 48W				
Datum: SIRGAS2000				
Geoid:				

AJUSTAMENTO				
COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
Base-01	6687868,404	498550,9884	68,14	
HV01-GRA	6693914,465	492527,329	47,3194	
HV02-GRA	6692783,448	492227,2917	41,9537	
HV03-GRA	6691702,944	489091,9985	49,3432	
HV04-GRA	6690320,061	487462,1371	37,8068	
HV05-GRA	6689124,909	487135,4903	32,0227	
HV06-GRA	6687308,318	488226,6983	11,9149	
HV07-GRA	6685865,519	488147,7604	7,0046	
HV08-GRA	6684737,709	488120,5877	10,9726	
HV09-GRA	6683589,27	487749,2119	6,6508	
HV10-GRA	6682642,873	493890,0492	11,7348	
HV12-GRA	6686779,051	493801,3516	12,4233	
HV13-GRA	6688405,264	493940,0184	14,2362	
HV14-GRA	6689758,299	494025,9033	44,4329	
HV15-GRA	6691175,717	494028,061	47,7554	
HV16-GRA	6682482,261	498379,7791	29,2622	
HV18-GRA	6681808,363	502685,266	38,1305	
HV19-GRA	6683223,228	498898,9349	32,4811	
HV20-GRA	6684897,208	499028,4309	9,2584	
HV21-GRA	6686393,664	499134,587	38,3436	
HV27-GRA	6682813,416	503772,6507	55,8913	
HV28-GRA	6684681,275	504443,4918	33,2152	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
Base-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV01-GRA	29°53'07,315442S	51°04'38,604735W	47,3194	
HV02-GRA	29°53'44,054482S	51°04'49,820590W	41,9537	
HV03-GRA	29°54'19,073280S	51°06'46,765555W	49,3432	
HV04-GRA	29°55'03,945730S	51°07'47,602186W	37,8068	
HV05-GRA	29°55'42,762742S	51°07'59,836244W	32,0227	
HV06-GRA	29°56'41,821066S	51°07'19,207114W	11,9149	
HV07-GRA	29°57'28,693111S	51°07'22,209525W	7,0046	
HV08-GRA	29°58'05,333247S	51°07'23,268506W	10,9726	
HV09-GRA	29°58'42,631314S	51°07'37,173448W	6,6508	
HV10-GRA	29°59'13,544071S	51°03'48,030104W	11,7348	
HV12-GRA	29°56'59,163269S	51°03'51,253943W	12,4233	
HV13-GRA	29°56'06,331949S	51°03'46,047493W	14,2362	
HV14-GRA	29°55'22,374817S	51°03'42,816644W	44,4329	
HV15-GRA	29°54'36,324356S	51°03'42,707700W	47,7554	
HV16-GRA	29°59'18,813109S	51°01'00,469326W	29,2622	
HV18-GRA	29°59'40,700423S	50°58'19,775325W	38,1305	
HV19-GRA	29°58'54,742177S	51°00'41,090816W	32,4811	
HV20-GRA	29°58'00,357090S	51°00'36,252652W	9,2584	
HV21-GRA	29°57'11,739297S	51°00'32,287231W	38,3436	
HV27-GRA	29°59'08,037296S	50°57'39,202666W	55,8913	
HV28-GRA	29°58'07,344867S	50°57'14,194523W	33,2152	

DESVIO PADRÃO					
Nome	n (m)	e (m)	Hz (m)	u (m)	Código
Base-01	0	0	0	0	
HV01-GRA	0,00556	0,00383	0,00675	0,0105	
HV02-GRA	0,00546	0,00325	0,00635	0,0114	
HV03-GRA	0,00452	0,00332	0,00561	0,0115	
HV04-GRA	0,00693	0,00544	0,00881	0,017	
HV05-GRA	0,0053	0,00607	0,00806	0,0135	
HV06-GRA	0,00536	0,00456	0,00704	0,014	
HV07-GRA	0,00563	0,00436	0,00712	0,0119	
HV08-GRA	0,00511	0,00462	0,00689	0,0342	
HV09-GRA	0,00852	0,00933	0,01264	0,0283	
HV10-GRA	0,00523	0,00435	0,0068	0,0103	
HV12-GRA	0,00251	0,00264	0,00365	0,0174	
HV13-GRA	0,00146	0,00114	0,00185	0,0053	
HV14-GRA	0,00225	0,00157	0,00274	0,0045	
HV15-GRA	0,00375	0,00184	0,00417	0,0052	
HV16-GRA	0,00852	0,0078	0,01155	0,0212	
HV18-GRA	0,00399	0,00464	0,00612	0,0114	
HV19-GRA	0,00317	0,00235	0,00395	0,0076	
HV20-GRA	0,00241	0,00188	0,00305	0,0053	
HV21-GRA	0,00252	0,00251	0,00356	0,0075	
HV27-GRA	0,00395	0,00389	0,00555	0,0119	
HV28-GRA	0,00934	0,00901	0,01297	0,0243	

FATOR DE ESCALA			
Nome	Fator de Escala Comb. Proj ao Terr	Convergência	Código
Base-01	1,000410834	0°00'26,9775	
HV01-GRA	1,000406901	0°02'18,8194	
HV02-GRA	1,000406002	0°02'24,4527	
HV03-GRA	1,000406439	0°03'22,8004	
HV04-GRA	1,000404156	0°03'53,2199	
HV05-GRA	1,000403145	0°03'59,4000	
HV06-GRA	1,00040032	0°03'39,2383	
HV07-GRA	1,000399525	0°03'40,8240	
HV08-GRA	1,000400141	0°03'41,4211	
HV09-GRA	1,000399351	0°03'48,4385	
HV10-GRA	1,000401542	0°01'53,9706	
HV12-GRA	1,000401636	0°01'55,4514	
HV13-GRA	1,000401942	0°01'52,8019	
HV14-GRA	1,000406696	0°01'51,1485	
HV15-GRA	1,000407218	0°01'51,0511	
HV16-GRA	1,000404723	0°00'30,2242	
HV18-GRA	1,000406058	-0°00'50,1042	
HV19-GRA	1,000405245	0°00'20,5341	
HV20-GRA	1,000401602	0°00'18,1081	
HV21-GRA	1,000406172	0°00'16,1208	
HV27-GRA	1,000408761	-0°01'10,3680	
HV28-GRA	1,000405132	-0°01'22,8243	

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
Base-01-HV01-GRA	6046,0604	-6023,6594	-20,8206	0,0067	0,0105
Base-01-HV02-GRA	4915,0434	-6323,6967	-26,1863	0,0064	0,0114
Base-01-HV03-GRA	3834,5168	-9458,9784	-18,8265	0,0056	0,0115
Base-01-HV04-GRA	2451,5013	-11088,8222	-30,5285	0,0088	0,017
Base-01-HV05-GRA	1256,5048	-11415,4981	-36,1173	0,0081	0,0135
Base-01-HV06-GRA	-560,0859	-10324,2901	-56,2251	0,007	0,014
Base-01-HV07-GRA	-2002,8857	-10403,228	-61,1354	0,0071	0,0119
Base-01-HV08-GRA	-3130,6891	-10430,4088	-57,071	0,0069	0,0342
Base-01-HV09-GRA	-4279,1341	-10801,7764	-61,4892	0,0126	0,0283
Base-01-HV10-GRA	-5225,5363	-4660,9122	-56,3816	0,0068	0,0103
Base-01-HV12-GRA	-1089,353	-4749,6368	-55,7167	0,0037	0,0174
Base-01-HV13-GRA	536,86	-4610,9699	-53,9038	0,0019	0,0053
Base-01-HV14-GRA	1889,8946	-4525,0851	-23,7071	0,0027	0,0045
Base-01-HV15-GRA	3307,3131	-4522,9274	-20,3846	0,0042	0,0052
Base-01-HV16-GRA	-5385,8931	-171,4139	-40,9191	0,0116	0,0212
Base-01-HV18-GRA	-6060,0416	4134,2776	-30,0095	0,0061	0,0114
Base-01-HV19-GRA	-4645,1767	347,9466	-35,6589	0,0039	0,0076
Base-01-HV20-GRA	-2971,1965	477,4425	-58,8816	0,0031	0,0053
Base-01-HV21-GRA	-1474,7397	583,5986	-29,7964	0,0036	0,0075
Base-01-HV27-GRA	-5055,0103	5221,664	-12,2333	0,0056	0,0119
Base-01-HV28-GRA	-3187,1289	5892,5034	-34,9248	0,013	0,0243
HV03-GRA-HV20-GRA	-6805,736	9936,4323	-40,0848	0,0085	0,0171
HV04-GRA-HV16-GRA	-7837,7998	10917,642	-8,5445	0,4328	0,3587
HV04-GRA-HV19-GRA	-7096,8336	11436,7978	-5,3257	0,0157	0,0282
HV05-GRA-HV16-GRA	-6642,4299	11244,0809	-4,7993	0,0296	0,0518
HV07-GRA-HV10-GRA	-3222,6456	5742,2888	4,7302	0,006	0,0099
HV08-GRA-HV12-GRA	2041,3425	5680,7639	1,4507	0,0037	0,0174
HV21-GRA-HV27-GRA	-3580,2487	4638,0637	17,5477	0,0066	0,0165

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
Base-01-HV01-GRA	8538,1103	2,128	1,13	1,804	PostProcessed
Base-01-HV02-GRA	8012,4832	3,98	2,082	3,392	PostProcessed
Base-01-HV03-GRA	10210,8431	2,398	1,116	2,122	PostProcessed
Base-01-HV04-GRA	11361,2466	2,308	1,137	2,009	PostProcessed
Base-01-HV05-GRA	11489,1739	1,968	0,97	1,712	PostProcessed
Base-01-HV06-GRA	10343,8184	2,931	1,467	2,537	PostProcessed
Base-01-HV07-GRA	10598,7469	2,697	1,502	2,239	PostProcessed
Base-01-HV08-GRA	10894,6831	2,256	0,79	2,113	PostProcessed
Base-01-HV09-GRA	11623,3626	1,597	0,792	1,387	PostProcessed
Base-01-HV10-GRA	7005,2373	1,74	0,9	1,489	PostProcessed
Base-01-HV12-GRA	4875,2581	4,823	0,991	4,721	PostProcessed
Base-01-HV13-GRA	4644,3177	2,571	0,938	2,394	PostProcessed
Base-01-HV14-GRA	4905,9477	1,78	0,935	1,515	PostProcessed
Base-01-HV15-GRA	5605,4702	2,759	1,655	2,207	PostProcessed
Base-01-HV16-GRA	5390,9719	1,551	0,76	1,353	PostProcessed
Base-01-HV18-GRA	7339,0208	1,839	0,7	1,7	PostProcessed
Base-01-HV19-GRA	4660,227	1,52	0,701	1,348	PostProcessed
Base-01-HV20-GRA	3011,1105	1,848	0,79	1,67	PostProcessed
Base-01-HV21-GRA	1586,943	3,184	1,324	2,896	PostProcessed
Base-01-HV27-GRA	7270,6501	1,603	0,688	1,448	PostProcessed
Base-01-HV28-GRA	6702,0322	1,356	0,617	1,207	PostProcessed
HV03-GRA-HV20-GRA	12048,6341	2,43	1,125	2,154	PostProcessed
HV04-GRA-HV16-GRA	13445,1568	2,285	1,229	1,927	PostProcessed
HV04-GRA-HV19-GRA	13465,2187	2,335	1,085	2,068	PostProcessed
HV05-GRA-HV16-GRA	13064,8014	1,886	0,9	1,657	PostProcessed
HV07-GRA-HV10-GRA	6587,4191	2,715	1,516	2,253	PostProcessed
HV08-GRA-HV12-GRA	6038,823	4,833	0,993	4,73	PostProcessed
HV21-GRA-HV27-GRA	5861,5789	3,393	1,4	3,091	PostProcessed

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
Base-01-HV01-GRA	11/01/2016 11:11	00:19:20	TPSHIPER_SR	1,522	Legant E	2
Base-01-HV02-GRA	11/01/2016 11:45	00:17:10	TPSHIPER_SR	1,522	Legant E	2,5
Base-01-HV03-GRA	11/01/2016 18:33	00:22:55	TPSHIPER_SR	1,522	Legant E	3,5
Base-01-HV04-GRA	11/01/2016 17:50	00:25:35	TPSHIPER_SR	1,522	Legant E	3,1
Base-01-HV05-GRA	11/01/2016 17:20	00:21:05	TPSHIPER_SR	1,522	Legant E	3,5
Base-01-HV06-GRA	11/01/2016 15:59	00:22:45	TPSHIPER_SR	1,522	Legant E	2,5
Base-01-HV07-GRA	11/01/2016 15:08	00:22:00	TPSHIPER_SR	1,522	Legant E	2
Base-01-HV08-GRA	11/01/2016 13:37	00:21:25	TPSHIPER_SR	1,522	HiPer+	2
Base-01-HV09-GRA	11/01/2016 14:17	00:21:05	TPSHIPER_SR	1,522	HiPer+	2
Base-01-HV10-GRA	11/01/2016 15:09	00:20:10	TPSHIPER_SR	1,522	HiPer+	2
Base-01-HV12-GRA	11/01/2016 13:41	00:17:50	TPSHIPER_SR	1,522	Legant E	2
Base-01-HV13-GRA	11/01/2016 13:15	00:17:00	TPSHIPER_SR	1,522	Legant E	3,5
Base-01-HV14-GRA	11/01/2016 12:46	00:17:40	TPSHIPER_SR	1,522	Legant E	2,4
Base-01-HV15-GRA	11/01/2016 12:19	00:18:35	TPSHIPER_SR	1,522	Legant E	3
Base-01-HV16-GRA	11/01/2016 17:34	00:17:40	TPSHIPER_SR	1,522	HiPer+	2
Base-01-HV18-GRA	11/01/2016 19:18	00:19:00	TPSHIPER_SR	1,522	HiPer+	2
Base-01-HV19-GRA	11/01/2016 18:04	00:17:50	TPSHIPER_SR	1,522	HiPer+	3
Base-01-HV20-GRA	11/01/2016 18:35	00:18:15	TPSHIPER_SR	1,522	HiPer+	2,3
Base-01-HV21-GRA	11/01/2016 19:39	00:18:35	TPSHIPER_SR	1,522	Legant E	3
Base-01-HV27-GRA	11/01/2016 19:49	00:18:40	TPSHIPER_SR	1,522	HiPer+	3
Base-01-HV28-GRA	11/01/2016 20:17	00:19:55	TPSHIPER_SR	1,522	HiPer+	1,3
HV03-GRA-HV20-GRA	11/01/2016 18:35	00:18:15	Legant E	3,5	HiPer+	2,3
HV04-GRA-HV16-GRA	11/01/2016 17:50	00:01:50	Legant E	3,1	HiPer+	2
HV04-GRA-HV19-GRA	11/01/2016 18:04	00:12:05	Legant E	3,1	HiPer+	3
HV05-GRA-HV16-GRA	11/01/2016 17:34	00:06:25	Legant E	3,5	HiPer+	2
HV07-GRA-HV10-GRA	11/01/2016 15:09	00:20:10	Legant E	2	HiPer+	2
HV08-GRA-HV12-GRA	11/01/2016 13:41	00:17:10	HiPer+	2	Legant E	2
HV21-GRA-HV27-GRA	11/01/2016 19:49	00:08:55	Legant E	3	HiPer+	3

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão u (m)
Base-01	29°56'23,824700S	51°00'54,053200W	68,14	0	0	0

PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

PROJETO				
Project name: Gravatai_Sinos 12 01 2016.ttp				
Project folder: G:\Dados\Jobs				
Creation time: 30/7/2013 13:17:07				
Created by:				
Comment:				
Linear unit: Meters				
Angular unit: DMS				
Projection: UTMSouth-Zone_22 : 54W to 48W				
Datum: SIRGAS2000				
Geoid:				
AJUSTAMENTO				

COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,14	
HV17-GRA	6682343,299	500718,5232	42,3864	
HV22-GRA	6687921,073	499134,4604	45,8206	
HV23-GRA	6689359,191	499206,019	51,1115	
HV24-GRA	6690735,67	499913,7371	62,5174	
HV25-GRA	6692067,206	500982,7826	57,7854	
HV26-GRA	6693256,668	499787,8364	49,8068	
HV29-GRA	6685789,434	506200,7681	40,4265	
HV30-GRA	6687186,91	507339,2685	60,6099	
HV31-GRA	6688234,128	510552,7751	79,4134	
HV33-GRA	6691057,858	511299,8824	73,0569	
HV34-GRA	6692067,891	511876,4885	61,4874	
HV35-GRA	6687342,022	503043,609	16,7612	
HV36-GRA	6690459,075	503326,1678	32,3888	
HV37-GRA	6692785,481	505916,3492	42,7104	
HV42-GRA	6674830,772	498033,7629	77,2911	
HV44-GRA	6671160,275	498271,4342	87,3854	
HV57-GRA	6669766,875	498283,9668	56,4556	
HV60-GRA	6676222,482	500008,3896	83,112	
HV61-GRA	6676628,279	498887,6649	82,5127	
HV62-GRA	6679074,258	499067,383	31,6785	
HV63-GRA	6679725,579	497345,506	31,5788	
HV67-GRA	6668380,988	494695,1638	97,8477	
HV70-GRA	6670274,436	492657,9201	145,7458	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV17-GRA	29°59'23,330907S	50°59'33,183188W	42,3864	
HV22-GRA	29°56'22,115517S	51°00'32,287500W	45,8206	
HV23-GRA	29°55'35,392780S	51°00'29,614283W	51,1115	
HV24-GRA	29°54'50,673291S	51°00'03,217076W	62,5174	
HV25-GRA	29°54'07,411554S	50°59'23,352655W	57,7854	
HV26-GRA	29°53'28,768328S	51°00'07,910599W	49,8068	
HV29-GRA	29°57'31,314715S	50°56'08,646303W	40,4265	
HV30-GRA	29°56'45,889758S	50°55'26,202880W	60,6099	
HV31-GRA	29°56'11,782544S	50°53'26,357881W	79,4134	
HV33-GRA	29°54'40,018705S	50°52'58,596502W	73,0569	
HV34-GRA	29°54'07,184210S	50°52'37,133648W	61,4874	
HV35-GRA	29°56'40,915773S	50°58'06,457355W	16,7612	
HV36-GRA	29°54'59,643388S	50°57'55,951317W	32,3888	
HV37-GRA	29°53'44,025627S	50°56'19,397382W	42,7104	
HV42-GRA	30°03'27,396578S	51°01'13,434091W	77,2911	
HV44-GRA	30°05'26,645803S	51°01'04,579163W	87,3854	
HV57-GRA	30°06'11,914812S	51°01'04,119059W	56,4556	
HV60-GRA	30°02'42,187907S	50°59'59,686710W	83,112	
HV61-GRA	30°02'29,002403S	51°00'41,536193W	82,5127	
HV62-GRA	30°01'09,536884S	51°00'34,817546W	31,6785	
HV63-GRA	30°00'48,367335S	51°01'39,094818W	31,5788	
HV67-GRA	30°06'56,902391S	51°03'18,238527W	97,8477	
HV70-GRA	30°05'55,349922S	51°04'34,321841W	145,7458	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01					
HV17-GRA	0,00382	0,00281	0,00474	0,009	
HV22-GRA	0,00099	0,00107	0,00146	0,0027	
HV23-GRA	0,00219	0,00184	0,00286	0,0057	
HV24-GRA	0,00137	0,00122	0,00184	0,003	
HV25-GRA	0,00228	0,00182	0,00292	0,0053	
HV26-GRA	0,00873	0,00421	0,00969	0,0145	
HV29-GRA	0,01507	0,01173	0,0191	0,0315	
HV30-GRA	0,01943	0,01431	0,02413	0,0418	
HV31-GRA	0,00716	0,00642	0,00962	0,0203	
HV33-GRA	0,00233	0,00287	0,0886	0,0052	
HV34-GRA	0,02619	0,0418	0,04933	0,1993	
HV35-GRA	0,04112	0,07071	0,0377	0,0886	
HV36-GRA	0,00339	0,00238	0,00414	0,0067	
HV37-GRA	0,00399	0,00418	0,00578	0,0234	
HV42-GRA	0,0494	0,05753	0,6044	1,381	
HV44-GRA	0,1924	0,1771	0,0615	0,0236	
HV57-GRA	0,0395	0,02708	0,04789	0,085	
HV60-GRA	0,01221	0,00611	0,01365	0,0197	
HV61-GRA	0,00797	0,00573	0,00982	0,0181	
HV62-GRA	0,01411	0,01077	0,01775	0,0312	
HV63-GRA	0,00603	0,00578	0,00836	0,0328	
HV67-GRA	0,01153	0,00664	0,01331	0,0267	
HV70-GRA	0,00963	0,00683	0,0118	0,0229	

FATOR DE ESCALA				
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código	
BASE-01	1,000410834	0°00'26,9775		
HV17-GRA	1,000406809	-0°00'13,4043		
HV22-GRA	1,000407346	0°00'16,1142		
HV23-GRA	1,000408178	0°00'14,7742		
HV24-GRA	1,000409977	0°00'01,6044		
HV25-GRA	1,000409222	-0°00'18,2694		
HV26-GRA	1,00040798	0°00'03,9423		
HV29-GRA	1,000406033	-0°01'55,5324		
HV30-GRA	1,000409012	-0°02'16,6754		
HV31-GRA	1,000411255	-0°03'16,4439		
HV33-GRA	1,000410055	-0°03'30,1356		
HV34-GRA	1,000408073	-0°03'40,7771		
HV35-GRA	1,000402678	-0°00'56,6764		
HV36-GRA	1,000405109	-0°01'01,8678		
HV37-GRA	1,000406434	-0°01'49,9529		
HV42-GRA	1,000412249	0°00'36,7810		
HV44-GRA	1,000413845	0°00'32,3781		
HV57-GRA	1,000408989	0°00'32,1596		
HV60-GRA	1,000413211	-0°00'00,1569		
HV61-GRA	1,000413101	0°00'20,7941		
HV62-GRA	1,000405124	0°00'17,4189		
HV63-GRA	1,000405032	0°00'49,5675		
HV67-GRA	1,000415177	0°01'39,4661		
HV70-GRA	1,00042238	0°02'17,5701		

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV17-GRA	-5525,1052	2167,5348	-25,7536	0,0047	0,009
BASE-01-HV22-GRA	52,6692	583,472	-22,3194	0,0015	0,0027
BASE-01-HV23-GRA	1490,7871	655,0306	-17,0285	0,0029	0,0057
BASE-01-HV24-GRA	2867,2656	1362,7487	-5,6226	0,0018	0,003
BASE-01-HV25-GRA	4198,8013	2431,7942	-10,3546	0,0029	0,0053
BASE-01-HV26-GRA	5388,2637	1236,848	-18,3332	0,0097	0,0145
BASE-01-HV29-GRA	-2078,9704	7649,7797	-27,7135	0,0191	0,0315
BASE-01-HV30-GRA	-681,494	8788,2801	-7,5301	0,0241	0,0418
BASE-01-HV31-GRA	365,724	12001,7867	11,2734	0,0096	0,0203
BASE-01-HV33-GRA	3189,4541	12748,8941	4,9169	0,7895	1,3748
BASE-01-HV34-GRA	4199,4864	13325,5002	-6,6526	0,0495	0,1993
BASE-01-HV35-GRA	-526,3825	4492,6206	-51,3788	0,5037	1,0887
BASE-01-HV36-GRA	2590,6708	4775,1794	-35,7512	0,0041	0,0067
BASE-01-HV37-GRA	4917,0764	7365,3608	-25,4296	0,0058	0,0234
BASE-01-HV42-GRA	-13037,6325	-517,2255	9,1511	0,6049	1,3808
BASE-01-HV44-GRA	-16708,1288	-279,5542	19,2454	0,2614	0,4237
BASE-01-HV57-GRA	-18101,5289	-267,0215	-11,6844	0,0479	0,085
BASE-01-HV60-GRA	-11645,9222	1457,4012	14,972	0,0136	0,0197
BASE-01-HV61-GRA	-11240,1254	336,6766	14,3727	0,0098	0,0181
BASE-01-HV62-GRA	-8794,1465	516,3946	-36,4615	0,0177	0,0312
BASE-01-HV63-GRA	-8142,8251	-1205,4823	-36,5612	0,0084	0,0328
BASE-01-HV67-GRA	-19487,4162	-3855,8246	29,7077	0,0133	0,0267
BASE-01-HV70-GRA	-17593,9679	-5893,0682	77,6058	0,0118	0,0229

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV17-GRA	5937,5471	1,972	0,75	1,824	PostProcessed
BASE-01-HV22-GRA	586,5089	2,235	1,028	1,985	PostProcessed
BASE-01-HV23-GRA	1629,102	2,515	1,071	2,276	PostProcessed
BASE-01-HV24-GRA	3175,9412	2,086	1,037	1,81	PostProcessed
BASE-01-HV25-GRA	4854,1708	3,023	1,518	2,614	PostProcessed
BASE-01-HV26-GRA	5530,6913	4	2,159	3,367	PostProcessed
BASE-01-HV29-GRA	7930,5337	2,199	1,07	1,921	PostProcessed
BASE-01-HV30-GRA	8818,2811	2,594	1,153	2,324	PostProcessed
BASE-01-HV31-GRA	12012,3	3,152	1,31	2,867	PostProcessed
BASE-01-HV33-GRA	13147,1971	3,039	1,519	2,631	PostProcessed
BASE-01-HV34-GRA	13977,2898	4,104	1,562	3,795	PostProcessed
BASE-01-HV35-GRA	4525,4842	2,795	0,973	2,62	PostProcessed
BASE-01-HV36-GRA	5435,005	1,818	0,933	1,56	PostProcessed
BASE-01-HV37-GRA	8859,5113	3,107	0,924	2,966	PostProcessed
BASE-01-HV42-GRA	13053,2592	2,327	0,793	2,188	PostProcessed
BASE-01-HV44-GRA	16717,3646	2,159	1,061	1,88	PostProcessed
BASE-01-HV57-GRA	18110,9172	2,535	1,071	2,297	PostProcessed
BASE-01-HV60-GRA	11741,6036	1,84	0,995	1,549	PostProcessed
BASE-01-HV61-GRA	11249,8073	1,609	0,789	1,402	PostProcessed
BASE-01-HV62-GRA	8812,9638	1,876	0,809	1,692	PostProcessed
BASE-01-HV63-GRA	8235,0114	2,588	0,793	2,463	PostProcessed
BASE-01-HV67-GRA	19873,435	2,165	0,983	1,93	PostProcessed
BASE-01-HV70-GRA	18562,5626	1,625	0,719	1,457	PostProcessed

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV17-GRA	12/01/2016 10:45	00:25:20	TPSHIPER_SR	1,522	HiPer+	2,3
BASE-01-HV22-GRA	12/01/2016 09:57	00:17:15	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV23-GRA	12/01/2016 10:25	00:16:25	TPSHIPER_SR	1,522	Legant E	2,5
BASE-01-HV24-GRA	12/01/2016 10:57	00:17:15	TPSHIPER_SR	1,522	Legant E	3,5
BASE-01-HV25-GRA	12/01/2016 11:28	00:16:35	TPSHIPER_SR	1,522	Legant E	2,2
BASE-01-HV26-GRA	12/01/2016 11:51	00:17:10	TPSHIPER_SR	1,522	Legant E	2,2
BASE-01-HV29-GRA	12/01/2016 17:41	00:20:10	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV30-GRA	12/01/2016 18:12	00:21:20	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV31-GRA	12/01/2016 16:54	00:21:55	TPSHIPER_SR	1,522	Legant E	3,5
BASE-01-HV33-GRA	12/01/2016 15:36	00:34:55	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV34-GRA	12/01/2016 16:17	00:23:05	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV35-GRA	12/01/2016 14:05	00:17:45	TPSHIPER_SR	1,522	Legant E	3
BASE-01-HV36-GRA	12/01/2016 12:45	00:18:40	TPSHIPER_SR	1,522	Legant E	3,5
BASE-01-HV37-GRA	12/01/2016 13:21	00:17:20	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV42-GRA	12/01/2016 13:52	00:23:05	TPSHIPER_SR	1,522	HiPer+	2,32
BASE-01-HV44-GRA	12/01/2016 15:34	00:17:55	TPSHIPER_SR	1,522	HiPer+	1,86
BASE-01-HV57-GRA	12/01/2016 16:09	00:19:15	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV60-GRA	12/01/2016 12:06	00:21:25	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV61-GRA	12/01/2016 12:50	00:17:20	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV62-GRA	12/01/2016 11:31	00:20:10	TPSHIPER_SR	1,522	HiPer+	3,17
BASE-01-HV63-GRA	12/01/2016 13:20	00:17:55	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV67-GRA	12/01/2016 16:49	00:18:50	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV70-GRA	12/01/2016 18:05	00:20:30	TPSHIPER_SR	1,522	HiPer+	2

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Código	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)
no data met						
PONTOS AJUSTADOS						
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)	
no data met						

PROJETO					
Project name: Gravatai_Sinos 12 01 2016 HV32.ttp					
Project folder: G:\Dados\Jobs					
Creation time: 30/7/2013 13:17:07					
Created by:					
Comment:					
Linear unit: Meters					
Angular unit: DMS					
Projection: UTMSouth-Zone_22 : 54W to 48W					
Datum: SIRGAS2000					
Geoid:					

AJUSTAMENTO					
COORDENADAS UTM					
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código	
BASE-01	6687868,404	498550,9884	68,14		
HV32-GRA	6689541,104	510624,4875	88,6872		

COORDENADAS GEOGRÁFICAS					
Nome	Latitude	Longitude	Alt Elip (m)	Código	
BASE-01	29°56'23,824700S	51°00'54,053200 W	68,14		
HV32-GRA	29°55'29,318125S	50°53'23,729584 W	88,6872		

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV32-GRA	0,00779	0,0053	0,00942	0,0181	

FATOR DE ESCALA					
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código		
BASE-01	1,000410834	0°00'26,9775			
HV32-GRA	1,000412692	-0°03'17,6849			

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV32-GRA	1672,7002	12073,4992	20,5472	0,0094	0,0181

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV32-GRA	12193,8567	2,852	1,612	2,353	PostProcessed

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV32-GRA	12/01/2016 15:04	00:20:35	TPSHIPER_SR	1,522	Legant E	3,55

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Código	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)
BASE-01	29°56'23,824700S	51°00'54,053200 W		68,14	0	0

PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

PROJETO					
Project name: Gravatai_Sinos 12 01 2016 B HV43.ttp					
Project folder: G:\Dados\Jobs					
Creation time: 30/7/2013 13:17:07					
Created by:					
Comment:					
Linear unit: Meters					
Angular unit: DMS					
Projection: UTMSouth-Zone_22 : 54W to 48W					
Datum: SIRGAS2000					
Geoid:					

AJUSTAMENTO				
COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,14	
HV43-GRA	6672633,729	497833,6443	93,4724	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV43-GRA	30°04'38,773449S	51°01'20,924152W	93,4724	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV43-GRA	0,00978	0,00947	0,01361	0,0281	

FATOR DE ESCALA			
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código
BASE-01	1,000410834	0°00'26,9775	
HV43-GRA	1,00041478	0°00'40,5568	

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV43-GRA	-15234,6748	-717,3441	25,3324	0,0136	0,0281

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV43-GRA	15257,8679	1,671	0,943	1,38	PostProcessed

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV43-GRA	12/01/2016 15:05	00:18:55	TPSHIPER_SR	1,522	HiPer+	2

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Código	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)
BASE-01	29°56'23,824700S	51°00'54,053200W		68,14	0	0

PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

PROJETO				
Project name: Gravatai_Sinos 12 01 2016 HV66.ttp				
Project folder: G:\Dados\Jobs				
Creation time: 30/7/2013 13:17:07				
Created by:				
Comment:				
Linear unit: Meters				
Angular unit: DMS				
Projection: UTMSouth-Zone_22 : 54W to 48W				
Datum: SIRGAS2000				
Geoid:				

AJUSTAMENTO				

COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,14	
HV66-GRA	6670220,991	494613,7101	106,2339	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV66-GRA	30°05'57,12300S	51°03'21,4875W	106,2339	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV66-GRA	0,00778	0,00947	0,02161	0,03	

FATOR DE ESCALA			
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código
BASE-01	1,000410834	0°00'26,9775	
HV66-GRA	1,000416449	0°01'40,9274	

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV66-GRA	-17647,6284	-3937,3516	37,8744	0,2455	0,232

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV66-GRA	18089,0385	1,455	0,729	1,259	PostProcessado

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV66-GRA	12/01/2016 17:24	00:24:10	TPSHIPER_SR	1,522	HiPer+	2,5

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão u (m)
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	0	0	0

PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

PROJETO					
Project name: Gravatai_Sinos 12 01 2016 B.ttp					
Project folder: G:\Dados\Jobs					
Creation time: 30/7/2013 13:17:07					
Created by:					
Comment:					
Linear unit: Meters					
Angular unit: DMS					
Projection: UTMSouth-Zone_22 : 54W to 48W					
Datum: SIRGAS2000					
Geoid:					

AJUSTAMENTO				
COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,14	
HV73-GRA	6695562,332	527124,4729	35,5184	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV73-GRA	29°52'12,78347S	50°43'08,86885W	35,5184	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV73-GRA	0,02064	0,04398	0,04859	0,0316	

FATOR DE ESCALA			
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código
BASE-01	1,000410834	0°00'26,9775	
HV73-GRA	1,000396653	-0°08'23,5854	

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV73-GRA	7693,8149	28573,5663	-32,6174	0,0486	0,0316

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV73-GRA	29603,2617	2,713	1,187	2,44	PostProcessd

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV73-GRA	12/01/2016 19:20	00:35:05	TPSHIPER_SR	1,522	Legant E	2

PONTO DE CONTROLE							
Nome	Latitude	Longitude	Código	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão u (m)
BASE-01	29°56'23.824700S	51°00'54.053200W		68,14	0	0	0

PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

PROJETO				
Project name: Gravatai_Sinos 13 01 2016.ttp				
Project folder: G:\Dados\Jobs				
Creation time: 30/7/2013 13:17:07				
Created by:				
Comment:				
Linear unit: Meters				
Angular unit: DMS				
Projection: UTMSouth-Zone_22 : 54W to 48W				
Datum: SIRGAS2000				
Geoid:				

AJUSTAMENTO				
COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,17	
HV48-GRA	6673677,127	485772,1379	35,7102	
HV49-GRA	6672987,885	486810,4088	44,1089	
HV50-GRA	6672096,932	488180,4274	89,4402	
HV51-GRA	6672286,011	490291,1334	96,4118	
HV53-GRA	6668468,946	490264,3358	112,3976	
HV54-GRA	6667380,069	491266,5823	132,4257	
HV55-GRA	6665691,008	491465,5313	100,9023	
HV56-GRA	6664618,263	492587,0145	97,1063	
HV58-GRA	6672359,488	501849,9054	25,9402	
HV59-GRA	6673697,645	501357,9345	58,0684	
HV68-GRA	6667301,733	495404,0918	73,6607	
HV72-GRA	6693367,248	524512,8697	31,1073	
HV74-GRA	6695950,935	526130,5056	36,1049	
HV75-GRA	6694782,801	524975,8506	29,9929	
HV76-GRA	6692818,069	529006,9494	29,9024	
HV77-GRA	6689742,019	532181,765	17,9373	
HV83-GRA	6689192,241	538141,3922	18,1474	
HV84-GRA	6689715,8	537595,4419	18,1193	
HV85-GRA	6690382,672	535658,8648	18,6374	
M31-2010	6665324,796	491781,6435	123,733	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,17	
HV48-GRA	30°04'04,583878S	51°08'51,430321W	35,7102	
HV49-GRA	30°04'27,018020S	51°08'12,680373W	44,1089	
HV50-GRA	30°04'56,013934S	51°07'21,540884W	89,4402	
HV51-GRA	30°04'49,938113S	51°06'02,685643W	96,4118	
HV53-GRA	30°06'53,946399S	51°06'03,812821W	112,3976	
HV54-GRA	30°07'29,349141S	51°05'26,392140W	132,4257	
HV55-GRA	30°08'24,228268S	51°05'19,005880W	100,9023	
HV56-GRA	30°08'59,105877S	51°04'37,113576W	97,1063	
HV58-GRA	30°04'47,684933S	50°58'50,895118W	25,9402	
HV59-GRA	30°04'04,212915S	50°59'09,279294W	58,0684	
HV68-GRA	30°07'31,975586S	51°02'51,763179W	73,6607	
HV72-GRA	29°53'24,296466S	50°44'46,041278W	31,1073	
HV74-GRA	29°52'00,235596S	50°43'45,955125W	36,1049	
HV75-GRA	29°52'38,273270S	50°44'28,897958W	29,9929	
HV76-GRA	29°53'41,786604S	50°41'58,428449W	29,9024	
HV77-GRA	29°55'21,438516S	50°39'59,719053W	17,9373	
HV83-GRA	29°55'38,685735S	50°36'17,376788W	18,1474	
HV84-GRA	29°55'21,736854S	50°36'37,805839W	18,1193	
HV85-GRA	29°55'00,279145S	50°37'50,112898W	18,6374	
M31-2010	30°08'36,133533S	51°05'07,200320W	123,733	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV48-GRA	0,08798	0,07765	0,11734	0,2216	
HV49-GRA	0,01608	0,00986	0,01886	0,0331	
HV50-GRA	0,01051	0,00965	0,01427	0,0233	
HV51-GRA	0,00871	0,00785	0,01172	0,0271	
HV53-GRA	0,01021	0,00863	0,01337	0,0247	
HV54-GRA	0,01258	0,01013	0,01615	0,0407	
HV55-GRA	0,01257	0,01371	0,0186	0,0447	
HV56-GRA	0,04758	0,04528	0,06569	0,3172	
HV58-GRA	0,01249	0,0065	0,01409	0,0235	
HV59-GRA	0,00963	0,0078	0,0124	0,02	
HV68-GRA	0,03094	0,02224	0,03811	0,0781	
HV72-GRA	0,00939	0,00553	0,0109	0,0204	
HV74-GRA	0,01289	0,00716	0,01475	0,02	
HV75-GRA	0,00877	0,00714	0,01131	0,0211	
HV76-GRA	0,02758	0,06747	0,07289	0,0387	
HV77-GRA	0,02278	0,04721	0,05241	0,0474	
HV83-GRA	0,01507	0,03541	0,03849	0,0246	
HV84-GRA	0,01047	0,00697	0,01258	0,0241	
HV85-GRA	0,02407	0,0511	0,05649	0,0307	
M31-2010	0,00919	0,00798	0,01218	0,0242	

FATOR DE ESCALA			
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código
BASE-01	1,000410838	0°00'26,9775	
HV48-GRA	1,000403268	0°04'26,2612	
HV49-GRA	1,000404938	0°04'06,8927	
HV50-GRA	1,000412479	0°03'41,3192	
HV51-GRA	1,000414135	0°03'01,7843	
HV53-GRA	1,000416639	0°03'02,5385	
HV54-GRA	1,000420012	0°02'43,8116	
HV55-GRA	1,000415105	0°02'40,1779	
HV56-GRA	1,00041473	0°02'19,1836	
HV58-GRA	1,000404191	-0°00'34,6359	
HV59-GRA	1,000409255	-0°00'25,4123	
HV68-GRA	1,000411466	0°01'26,2073	
HV72-GRA	1,000397625	-0°07'35,4623	
HV74-GRA	1,000397399	-0°08'05,0618	
HV75-GRA	1,000397167	-0°07'43,8255	
HV76-GRA	1,000394466	-0°08'59,0711	
HV77-GRA	1,000390189	-0°09'58,7413	
HV83-GRA	1,000385047	-0°11'49,7588	
HV84-GRA	1,000385554	-0°11'39,4665	
HV85-GRA	1,000387386	-0°11'03,2763	
M31-2010	1,000418755	0°02'34,2655	

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV48-GRA	-14191,2774	-12778,8505	-32,4598	0,1174	0,2216
BASE-01-HV49-GRA	-14880,519	-11740,5795	-24,0611	0,0189	0,0331
BASE-01-HV50-GRA	-15771,472	-10370,561	21,2702	0,0143	0,0233
BASE-01-HV51-GRA	-15582,393	-8259,855	28,2418	0,0117	0,0271
BASE-01-HV53-GRA	-19399,4579	-8286,6526	44,2276	0,0134	0,0247
BASE-01-HV54-GRA	-20488,3352	-7284,406	64,2557	0,0162	0,0407
BASE-01-HV55-GRA	-22177,3962	-7085,4571	32,7323	0,0186	0,0447
BASE-01-HV56-GRA	-23250,141	-5963,9739	28,9363	0,0659	0,3172
BASE-01-HV58-GRA	-15508,9162	3298,9171	-42,2298	0,0141	0,0235
BASE-01-HV59-GRA	-14170,7596	2806,9461	-10,1016	0,0124	0,02
BASE-01-HV68-GRA	-20566,6713	-3146,8966	5,4907	0,0381	0,0781
BASE-01-HV72-GRA	5498,8436	25961,8814	-37,0627	0,0109	0,0204
BASE-01-HV74-GRA	8082,5309	27579,5173	-32,0651	0,0147	0,02
BASE-01-HV75-GRA	6914,3963	26424,8622	-38,1771	0,0113	0,0211
BASE-01-HV76-GRA	4949,6647	30455,961	-38,2676	0,0729	0,0387
BASE-01-HV77-GRA	1873,615	33630,7766	-50,2327	0,0525	0,0473
BASE-01-HV83-GRA	1323,8371	39590,4039	-50,0226	0,0385	0,0246
BASE-01-HV84-GRA	1847,3955	39044,4535	-50,0507	0,0126	0,0241
BASE-01-HV85-GRA	2514,2681	37107,8764	-49,5326	0,0565	0,0307
BASE-01-M31-2010	-22543,608	-6769,3449	55,563	0,0122	0,0242

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV48-GRA	19104,6948	1,792	0,711	1,645	PostProcessed
BASE-01-HV49-GRA	18962,1919	1,838	0,782	1,664	PostProcessed
BASE-01-HV50-GRA	18883,369	1,418	0,704	1,231	PostProcessed
BASE-01-HV51-GRA	17643,5123	1,763	0,854	1,543	PostProcessed
BASE-01-HV53-GRA	21103,971	1,847	1,009	1,547	PostProcessed
BASE-01-HV54-GRA	21753,8777	1,915	0,909	1,685	PostProcessed
BASE-01-HV55-GRA	23291,3934	1,895	0,847	1,696	PostProcessed
BASE-01-HV56-GRA	24012,7894	2,343	0,796	2,204	PostProcessed
BASE-01-HV58-GRA	15862,4071	1,686	0,839	1,462	PostProcessed
BASE-01-HV59-GRA	14452,0097	1,712	0,748	1,539	PostProcessed
BASE-01-HV68-GRA	20814,578	1,601	0,759	1,41	PostProcessed
BASE-01-HV72-GRA	26548,6033	3,921	2,082	3,323	PostProcessed
BASE-01-HV74-GRA	28751,1213	1,956	1,105	1,615	PostProcessed
BASE-01-HV75-GRA	27325,5855	2,165	1,053	1,892	PostProcessed
BASE-01-HV76-GRA	30868,0225	4,375	0,974	4,265	PostProcessed
BASE-01-HV77-GRA	33696,4937	3,058	1,523	2,652	PostProcessed
BASE-01-HV83-GRA	39628,3898	2,322	1,054	2,069	PostProcessed
BASE-01-HV84-GRA	39103,7918	2,4	1,106	2,13	PostProcessed
BASE-01-HV85-GRA	37207,8862	3,05	1,279	2,769	PostProcessed
BASE-01-M31-2010	23547,8367	1,706	0,915	1,44	PostProcessed

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV48-GRA	13/01/2016 18:55	00:19:30	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV49-GRA	13/01/2016 18:14	00:20:35	TPSHIPER_SR	1,522	HiPer+	1,49
BASE-01-HV50-GRA	13/01/2016 17:26	00:20:55	TPSHIPER_SR	1,522	HiPer+	2,5
BASE-01-HV51-GRA	13/01/2016 16:55	00:18:30	TPSHIPER_SR	1,522	HiPer+	1,87
BASE-01-HV53-GRA	13/01/2016 15:42	00:23:00	TPSHIPER_SR	1,522	HiPer+	2,4
BASE-01-HV54-GRA	13/01/2016 16:18	00:16:55	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV55-GRA	13/01/2016 14:05	00:18:45	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV56-GRA	13/01/2016 13:37	00:19:45	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV58-GRA	13/01/2016 11:44	00:20:05	TPSHIPER_SR	1,522	HiPer+	1,35
BASE-01-HV59-GRA	13/01/2016 11:02	00:19:15	TPSHIPER_SR	1,522	HiPer+	2
BASE-01-HV68-GRA	13/01/2016 12:51	00:23:50	TPSHIPER_SR	1,522	HiPer+	1,78
BASE-01-HV72-GRA	13/01/2016 11:36	00:31:50	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV74-GRA	13/01/2016 12:23	00:31:15	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV75-GRA	13/01/2016 10:46	00:31:05	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV76-GRA	13/01/2016 13:07	00:42:30	TPSHIPER_SR	1,522	Legant E	2,4
BASE-01-HV77-GRA	13/01/2016 15:15	00:52:40	TPSHIPER_SR	1,522	Legant E	3,5
BASE-01-HV83-GRA	13/01/2016 18:49	01:00:30	TPSHIPER_SR	1,522	Legant E	3
BASE-01-HV84-GRA	13/01/2016 17:39	00:59:40	TPSHIPER_SR	1,522	Legant E	2,5
BASE-01-HV85-GRA	13/01/2016 16:28	00:57:25	TPSHIPER_SR	1,522	Legant E	4
BASE-01-M31-2010	13/01/2016 14:31	00:33:50	TPSHIPER_SR	1,522	HiPer+	0

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão u (m)
BASE-01	29°56'23,824700S	51°00'54,053200W	68,17	0	0	0

PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

PROJETO					
Project name: Gravatai_Sinos 14 01 2016.ttp					
Project folder: G:\Dados\Jobs					
Creation time: 30/7/2013 13:17:07					
Created by:					
Comment:					
Linear unit: Meters					
Angular unit: DMS					
Projection: UTMSouth-Zone_22 : 54W to 48W					
Datum: SIRGAS2000					
Geoid:					

AJUSTAMENTO				
COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,14	
HV11-GRA	6685387,182	493955,2494	8,7536	
HV39-GRA	6679422,797	492592,2222	44,8449	
HV40-GRA	6677767,479	495066,5507	78,2174	
HV41-GRA	6675880,167	495078,3486	95,8441	
HV45-GRA	6677038,207	489696,1684	75,9021	
HV46-GRA	6676041,537	490587,8435	67,3071	
HV47-GRA	6678698,625	493779,4933	87,8188	
HV52-GRA	6671144,082	491272,8074	128,2147	
HV64-GRA	6674943,067	491333,4223	67,5838	
HV69-GRA	6672944,398	493431,3962	80,7878	
HV71-GRA	6672722,168	495407,5716	115,0815	
HV79-GRA	6676926,917	521966,4721	22,8807	
HV80-GRA	6682316,926	527730,6236	17,3584	
HV81-GRA	6683514,001	531288,8029	25,2715	
HV82-GRA	6686900,269	538695,1377	23,0423	
HV86B-GRA	6687943,584	538429,0884	17,9635	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV11-GRA	29°57'44,386181S	51°03'45,540809W	8,7536	
HV39-GRA	30°00'58,133948S	51°04'36,546971W	44,8449	
HV40-GRA	30°01'51,957602S	51°03'04,203055W	78,2174	
HV41-GRA	30°02'53,273492S	51°03'03,793985W	95,8441	
HV45-GRA	30°02'15,530036S	51°06'24,745338W	75,9021	
HV46-GRA	30°02'47,936065S	51°05'51,481956W	67,3071	
HV47-GRA	30°01'21,684970S	51°03'52,239053W	87,8188	
HV52-GRA	30°05'27,063950S	51°05'26,047949W	128,2147	
HV64-GRA	30°03'23,643332S	51°05'23,671771W	67,5838	
HV69-GRA	30°04'28,623690S	51°04'05,363015W	80,7878	
HV71-GRA	30°04'35,876076S	51°02'51,548627W	115,0815	
HV79-GRA	30°02'18,591628S	50°46'19,765209W	22,8807	
HV80-GRA	29°59'23,058687S	50°42'45,037212W	17,3584	
HV81-GRA	29°58'43,859394S	50°40'32,366859W	25,2715	
HV82-GRA	29°56'53,085224S	50°35'56,424655W	23,0423	
HV86B-GRA	29°56'19,220013S	50°36'06,484808W	17,9635	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV11-GRA	0,00406	0,0044	0,00599	0,0118	
HV39-GRA	0,00859	0,006	0,01048	0,0203	
HV40-GRA	0,01929	0,0095	0,0215	0,0397	
HV41-GRA	0,00734	0,00598	0,00947	0,0167	
HV45-GRA	0,10686	0,09982	0,14623	0,7393	
HV46-GRA	0,00977	0,00739	0,01225	0,0211	
HV47-GRA	0,01543	0,00784	0,01731	0,0206	
HV52-GRA	0,01213	0,0087	0,01492	0,0393	
HV64-GRA	0,00922	0,00853	0,01256	0,0186	
HV69-GRA	0,00843	0,00829	0,01182	0,0283	
HV71-GRA	0,00863	0,0076	0,0115	0,0211	
HV79-GRA	0,01127	0,00871	0,01424	0,0275	
HV80-GRA	0,01705	0,01065	0,0201	0,033	
HV81-GRA	0,02433	0,05508	0,06021	0,0657	
HV82-GRA	0,00668	0,00602	0,00899	0,0281	
HV86B-GRA	0,00966	0,04308	0,04414	0,0349	

FATOR DE ESCALA			
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código
BASE-01	1,000410834	0°00'26,9775	
HV11-GRA	1,000401083	0°01'52,6420	
HV39-GRA	1,000406524	0°02'18,3410	
HV40-GRA	1,000412142	0°01'32,1881	
HV41-GRA	1,000414911	0°01'32,0307	
HV45-GRA	1,000410768	0°03'12,5917	
HV46-GRA	1,000409635	0°02'55,9889	
HV47-GRA	1,000413472	0°01'56,1992	
HV52-GRA	1,000419352	0°02'43,4716	
HV64-GRA	1,000409845	0°02'42,1127	
HV69-GRA	1,000412313	0°02'02,9582	
HV71-GRA	1,00041797	0°01'25,9730	
HV79-GRA	1,000397795	-0°06'50,5962	
HV80-GRA	1,000393391	-0°08'37,3242	
HV81-GRA	1,000392041	-0°09'43,4480	
HV82-GRA	1,000385291	-0°12'00,6635	
HV86B-GRA	1,000384747	-0°11'55,4371	

PRECIFORAM					
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)
BASE-01-HV11-GRA	-2481,222	-4595,739	-59,3864	0,006	0,0118
BASE-01-HV39-GRA	-8445,6076	-5958,7661	-23,2951	0,0105	0,0203
BASE-01-HV40-GRA	-10100,9255	-3484,4377	10,0774	0,0215	0,0398
BASE-01-HV41-GRA	-11988,2372	-3472,6398	27,7041	0,0095	0,0167
BASE-01-HV45-GRA	-10830,1974	-8854,82	7,7621	0,1465	0,7392
BASE-01-HV46-GRA	-11826,8672	-7963,1449	-0,8329	0,0122	0,0211
BASE-01-HV47-GRA	-9169,7789	-4771,4951	19,6788	0,0173	0,0206
BASE-01-HV52-GRA	-16724,3222	-7278,181	60,0747	0,015	0,0393
BASE-01-HV64-GRA	-12925,3369	-7217,566	-0,5562	0,0126	0,0186
BASE-01-HV69-GRA	-14924,0062	-5119,5922	12,6478	0,0118	0,0283
BASE-01-HV71-GRA	-15146,2367	-3143,4167	46,9415	0,0115	0,0211
BASE-01-HV79-GRA	-10941,4869	23415,4838	-45,2593	0,0142	0,0275
BASE-01-HV80-GRA	-5551,4779	29179,6352	-50,7816	0,0201	0,033
BASE-01-HV81-GRA	-4354,4027	32737,8145	-42,8685	0,0603	0,0656
BASE-01-HV82-GRA	-968,1352	40144,1493	-45,0977	0,009	0,0281
BASE-01-HV86B-GRA	75,1796	39878,1001	-50,1765	0,0441	0,035

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV11-GRA	5225,2233	2,575	1,147	2,306	PostProcessed
BASE-01-HV39-GRA	10340,3607	1,6	0,753	1,412	PostProcessed
BASE-01-HV40-GRA	10689,4372	1,606	0,829	1,375	PostProcessed
BASE-01-HV41-GRA	12486,2505	1,852	0,812	1,665	PostProcessed
BASE-01-HV45-GRA	13995,0664	2,145	0,763	2,004	PostProcessed
BASE-01-HV46-GRA	14263,7044	1,694	0,675	1,553	PostProcessed
BASE-01-HV47-GRA	10341,2033	1,432	0,752	1,219	PostProcessed
BASE-01-HV52-GRA	18247,0432	2,087	0,925	1,87	PostProcessed
BASE-01-HV64-GRA	14810,0454	1,617	0,878	1,357	PostProcessed
BASE-01-HV69-GRA	15784,2077	1,952	0,974	1,692	PostProcessed
BASE-01-HV71-GRA	15475,4656	1,922	0,761	1,765	PostProcessed
BASE-01-HV79-GRA	25856,2163	2,407	1,098	2,142	PostProcessed
BASE-01-HV80-GRA	29715,0426	3,592	1,427	3,296	PostProcessed
BASE-01-HV81-GRA	33039,4521	2,678	1,392	2,288	PostProcessed
BASE-01-HV82-GRA	40171,8978	3,517	0,955	3,385	PostProcessed
BASE-01-HV86B-GRA	39894,1307	2,952	1,638	2,456	PostProcessed

DURAÇÃO E INTERVALO							
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)	
BASE-01-HV11-GRA	14/01/2016 19:45	00:22:50	TPSHIPER_SR	1,522	Legant E	2,4	
BASE-01-HV39-GRA	14/01/2016 12:45	00:21:30	TPSHIPER_SR	1,522	HiPer+	1,64	
BASE-01-HV40-GRA	14/01/2016 11:43	00:20:15	TPSHIPER_SR	1,522	HiPer+	3,36	
BASE-01-HV41-GRA	14/01/2016 11:16	00:18:50	TPSHIPER_SR	1,522	HiPer+	2,3	
BASE-01-HV45-GRA	14/01/2016 13:28	00:22:15	TPSHIPER_SR	1,522	HiPer+	2,3	
BASE-01-HV46-GRA	14/01/2016 18:43	00:33:35	TPSHIPER_SR	1,522	HiPer+	3	
BASE-01-HV47-GRA	14/01/2016 12:14	00:20:15	TPSHIPER_SR	1,522	HiPer+	3,35	
BASE-01-HV52-GRA	14/01/2016 16:37	00:21:50	TPSHIPER_SR	1,522	HiPer+	2,02	
BASE-01-HV64-GRA	14/01/2016 14:56	00:19:05	TPSHIPER_SR	1,522	HiPer+	1,5	
BASE-01-HV69-GRA	14/01/2016 15:59	00:19:15	TPSHIPER_SR	1,522	HiPer+	2,12	
BASE-01-HV71-GRA	14/01/2016 10:45	00:18:35	TPSHIPER_SR	1,522	HiPer+	2,55	
BASE-01-HV79-GRA	14/01/2016 17:45	00:40:25	TPSHIPER_SR	1,522	Legant E	2	
BASE-01-HV80-GRA	14/01/2016 16:06	01:00:50	TPSHIPER_SR	1,522	Legant E	2	
BASE-01-HV81-GRA	14/01/2016 14:22	00:59:40	TPSHIPER_SR	1,522	Legant E	2	
BASE-01-HV82-GRA	14/01/2016 12:56	00:59:40	TPSHIPER_SR	1,522	Legant E	2	
BASE-01-HV86B-GRA	14/01/2016 11:35	01:14:45	TPSHIPER_SR	1,522	Legant E	2	
PONTO DE CONTROLE							
Nome	Latitude	Longitude	Código	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão u (m)
BASE-01	29°56'23,824700S	51°00'54,053200W		68,14	0	0	0
PONTOS AJUSTADOS							
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)		
no data met							

PROJETO				
Project name: Gravatai_Sinos 15 01 2016.ttp				
Project folder: G:\Dados\Jobs				
Creation time: 30/7/2013 13:17:07				
Created by:				
Comment:				
Linear unit: Meters				
Angular unit: DMS				
Projection: UTMSouth-Zone_22 : 54W to 48W				
Datum: SIRGAS2000				
Geoid:				

AJUSTAMENTO				
COORDENADAS UTM				
Nome	Malha Norte (m)	Malha Este (m)	Alt Elip (m)	Código
BASE-01	6687868,404	498550,9884	68,14	
HV65-GRA	6675054,927	495989,6029	58,4718	
HV78-GRA	6683910,266	519788,4877	16,8109	
HV86-GRA	6686734,725	526288,6846	18,8956	

COORDENADAS GEOGRÁFICAS				
Nome	Latitude	Longitude	Alt Elip (m)	Código
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	
HV65-GRA	30°03'20,096161S	51°02'29,775347W	58,4718	
HV78-GRA	29°58'31,847976S	50°47'41,558224W	16,8109	
HV86-GRA	29°56'59,645994S	50°43'39,244395W	18,8956	

DESVIO PADRÃO					
Nome	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão Hz (m)	Desv Padrão u (m)	Código
BASE-01	0	0	0	0	
HV65-GRA	0,01417	0,0071	0,01585	0,0202	
HV78-GRA	0,00823	0,0079	0,01141	0,0569	
HV86-GRA	0,0087	0,00619	0,01067	0,0176	

FATOR DE ESCALA			
Nome	Fator de Escala Combinado Proj ao Terr	Convergência	Código
BASE-01	1,000410834	0°00'26,9775	
HV65-GRA	1,000409143	0°01'15,0135	
HV78-GRA	1,000397965	-0°06'08,9487	
HV86-GRA	1,000394594	-0°08'09,6378	

PRECIFORAM						
Nome	dN (m)	dE (m)	dZ (m)	Preciforam Horizontal (m)	Preciforam Vertical (m)	
BASE-01-HV65-GRA	-12813,4775	-2561,3854	-9,6682	0,0158	0,0202	
BASE-01-HV78-GRA	-3958,1379	21237,4993	-51,3291	0,0114	0,0569	
BASE-01-HV86-GRA	-1133,6789	27737,6962	-49,2444	0,0107	0,0176	

DISTÂNCIA E PDOP					
Nome	Distancia (m)	PDOP	HDOP	VDOP	Status
BASE-01-HV65-GRA	13072,3366	1,487	0,75	1,284	PostProcessed
BASE-01-HV78-GRA	21612,0063	3,529	0,974	3,392	PostProcessed
BASE-01-HV86-GRA	27772,0991	2,004	1,068	1,695	PostProcessed

DURAÇÃO E INTERVALO						
Nome	Hora Início	Duração	Tipo antena Base	Alt Antena Base (m)	Tipo Antena Rover	Altura Antena Rover (m)
BASE-01-HV65-GRA	15/01/2016 12:02	00:20:55	TPSHIPER_SR	1,522	HiPer+	1,9
BASE-01-HV78-GRA	15/01/2016 13:34	00:41:10	TPSHIPER_SR	1,522	Legant E	2
BASE-01-HV86-GRA	15/01/2016 12:16	00:45:20	TPSHIPER_SR	1,522	Legant E	2

PONTO DE CONTROLE						
Nome	Latitude	Longitude	Alt Elip (m)	Desv Padrão n (m)	Desv Padrão e (m)	Desv Padrão u (m)
BASE-01	29°56'23,824700S	51°00'54,053200W	68,14	0	0	0

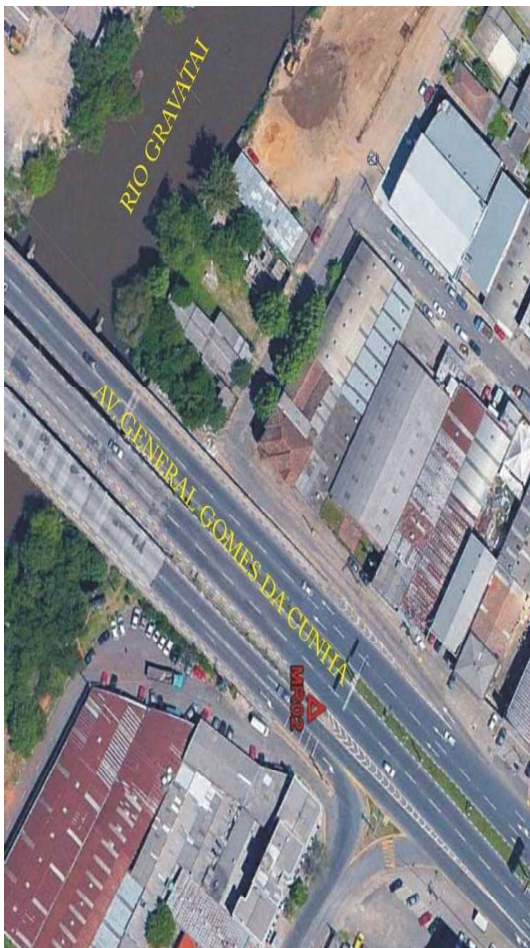
PONTOS AJUSTADOS					
Nome	Latitude	Longitude	Alt Elip (m)	Malha Norte (m)	Malha Este (m)
no data met					

ANEXO 9 - MONOGRAFIA DOS MARCOS

MONOGRAFIA – MR01

ESTAÇÃO: MR01	COORDENADAS NO DATUM SIRGAS 2000 MERIDIANO CENTRAL: 51° W. GR	
LOCALIZAÇÃO	COORDENADAS GEOGRÁFICAS	COORDENADAS UTM
Estado: Rio Grande do Sul	LAT: 29°56'48,789426S"S	N: 6.687.099,988 m
Município: Gravataí	LON: 50°59'03,781264"W	E: 501.506,958 m
Localidade:	Ondulação Geoidal (N): 4,58 m	H (ORTO): 10,01 m (*)
Data do rastreio: 16/01/2016	(*) Map Geo 2015	H (GEOM): 14,59 m
Descrição do Marco: Chapa de alumínio com as seguintes descrições: "PROTEGIDO POR LEI – AEROSAT – MR 01 "		
LOCALIZAÇÃO DO MARCO	MARCO	
		
	FOTO DA LOCALIZAÇÃO DO MARCO 	

MONOGRAFIA – MR02

ESTAÇÃO: MR02		COORDENADAS NO DATUM SIRGAS 2000 MERIDIANO CENTRAL: 51° W. GR	
LOCALIZAÇÃO		COORDENADAS GEOGRÁFICAS	COORDENADAS UTM
Estado: Rio Grande do Sul	LAT: 29°57'31,358094"S	N: 6.685.784,736 m	
Município: Gravataí	LON: 51°06'36,443280"W	E: 489.374,481m	
Localidade:	Ondulação Geoidal (N): 4,82 m	H (ORTO): 5,21 m (*)	
Data do rastreio: 16/01/2016	(*) Map Geo 2015	H (GEOM): 10,03 m	
Descrição do Marco: Chapa de alumínio com as seguintes descrições: "PROTEGIDO POR LEI – AEROSAT – MR 02"			
LOCALIZAÇÃO DO MARCO		MARCO	
			
		FOTO DA LOCALIZAÇÃO DO MARCO	
			

ANEXO 10 - DADOS DA AEROTRIANGULAÇÃO

DADOS AEROTRIANGULAÇÃO - BANHADO GRANDE

Active Block : complete Block

Number of photos : 291

Number of strips : 7

Photo scale : 1:39565

Mean terrain height [m] : 15

Automatic blunder detection : OFF

Use all adjusted points in project file
as control (absolute mode) : OFF

Control parameter for block adjustment :

Selfcalibration : ON

Number of selfcalibration parameters : 44

Write calibrated camera to project : OFF

GNSS-Mode : ON

Drift-Mode : ON

drift per strip : ON

drift for X,Y,Z : ON,ON,ON

enable shifts only : OFF

IMU-Mode : OFF

Earth's curvature correction : ON

Atmospheric correction : ON

Do not eliminate manual points : OFF

Do not eliminate GNSS : ON

Standard deviations (a-priori) :

Ground control (planimetry) [m]

Set	
0 (=default)	: 0.042
1	: 10000.000

Ground control (height) [m]

Set	
0 (=default)	: 0.141
1	: 10000.000

Automatic image points [mm]

Set	
0 (=default)	: 0.002

Image points of ground control and manual measurements [mm] : 0.002

GNSS X Y Z [m] : 0.100 0.100 0.100

Used Cameras in block:

1 PHASEONE_NEW_CALIBRATION	
Distortion	: Table

Tie Point Generator

created	107 observations for photo	51641
created	119 observations for photo	51642
created	119 observations for photo	51643
created	110 observations for photo	51644
created	122 observations for photo	51645
created	122 observations for photo	51646
created	168 observations for photo	51647
created	202 observations for photo	51648
created	234 observations for photo	51649
created	263 observations for photo	51650
created	260 observations for photo	51651
created	249 observations for photo	51652
created	237 observations for photo	51653
created	206 observations for photo	51654
created	187 observations for photo	51655
created	162 observations for photo	51656
created	195 observations for photo	51657
created	161 observations for photo	51658
created	227 observations for photo	51659
created	218 observations for photo	51660
created	231 observations for photo	51661
created	209 observations for photo	51662
created	178 observations for photo	51663
created	195 observations for photo	51664
created	131 observations for photo	51665
created	78 observations for photo	51666
created	57 observations for photo	51667
created	117 observations for photo	51668
created	172 observations for photo	51669
created	230 observations for photo	51670
created	179 observations for photo	51671
created	184 observations for photo	51672
created	165 observations for photo	51673

created	224 observations for photo	51674
created	212 observations for photo	51675
created	160 observations for photo	51676
created	160 observations for photo	51677
created	145 observations for photo	51678
created	192 observations for photo	51679
created	168 observations for photo	51680
created	193 observations for photo	51681
created	155 observations for photo	51682
created	192 observations for photo	51683
created	196 observations for photo	51684
created	266 observations for photo	51685
created	248 observations for photo	51686
created	229 observations for photo	51687
created	152 observations for photo	51688
created	129 observations for photo	51689
created	117 observations for photo	51690
created	116 observations for photo	51691
created	112 observations for photo	51692
created	89 observations for photo	51693
created	139 observations for photo	51696
created	145 observations for photo	51697
created	187 observations for photo	51698
created	157 observations for photo	51699
created	153 observations for photo	51700
created	139 observations for photo	51701
created	163 observations for photo	51702
created	251 observations for photo	51703
created	305 observations for photo	51704
created	368 observations for photo	51705
created	324 observations for photo	51706
created	289 observations for photo	51707
created	285 observations for photo	51708
created	296 observations for photo	51709
created	301 observations for photo	51710
created	240 observations for photo	51711
created	263 observations for photo	51712
created	205 observations for photo	51713
created	270 observations for photo	51714

created	279 observations for photo	51715
created	311 observations for photo	51716
created	255 observations for photo	51717
created	267 observations for photo	51718
created	279 observations for photo	51719
created	264 observations for photo	51720
created	182 observations for photo	51721
created	177 observations for photo	54310
created	219 observations for photo	54311
created	290 observations for photo	54312
created	301 observations for photo	54313
created	304 observations for photo	54314
created	348 observations for photo	54315
created	299 observations for photo	54316
created	347 observations for photo	54317
created	306 observations for photo	54318
created	309 observations for photo	54319
created	305 observations for photo	54320
created	302 observations for photo	54321
created	307 observations for photo	54322
created	314 observations for photo	54323
created	300 observations for photo	54324
created	278 observations for photo	54325
created	288 observations for photo	54326
created	263 observations for photo	54327
created	275 observations for photo	54328
created	287 observations for photo	54329
created	265 observations for photo	54330
created	263 observations for photo	54331
created	261 observations for photo	54332
created	288 observations for photo	54333
created	285 observations for photo	54334
created	321 observations for photo	54335
created	316 observations for photo	54336
created	344 observations for photo	54337
created	320 observations for photo	54338
created	297 observations for photo	54339
created	251 observations for photo	54340
created	251 observations for photo	54341

created	242 observations for photo	54342
created	220 observations for photo	54343
created	205 observations for photo	54344
created	165 observations for photo	54345
created	135 observations for photo	54346
created	150 observations for photo	54347
created	208 observations for photo	54348
created	245 observations for photo	54349
created	256 observations for photo	54350
created	242 observations for photo	54351
created	306 observations for photo	54352
created	297 observations for photo	54353
created	353 observations for photo	54354
created	398 observations for photo	54355
created	347 observations for photo	54356
created	344 observations for photo	54357
created	324 observations for photo	54358
created	294 observations for photo	54359
created	319 observations for photo	54360
created	273 observations for photo	54361
created	251 observations for photo	54362
created	198 observations for photo	54363
created	116 observations for photo	54364
created	128 observations for photo	54365
created	187 observations for photo	54366
created	230 observations for photo	54367
created	225 observations for photo	54368
created	188 observations for photo	54369
created	205 observations for photo	54370
created	216 observations for photo	54371
created	212 observations for photo	54372
created	180 observations for photo	54373
created	132 observations for photo	54374
created	120 observations for photo	54375
created	78 observations for photo	54376
created	80 observations for photo	54377
created	88 observations for photo	54378
created	124 observations for photo	54379
created	112 observations for photo	54380

created	159 observations for photo	54381
created	205 observations for photo	54382
created	235 observations for photo	54383
created	254 observations for photo	54384
created	229 observations for photo	54385
created	219 observations for photo	54386
created	192 observations for photo	54387
created	188 observations for photo	54388
created	199 observations for photo	54389
created	223 observations for photo	54390
created	233 observations for photo	54391
created	234 observations for photo	54392
created	225 observations for photo	54393
created	246 observations for photo	54394
created	269 observations for photo	54395
created	271 observations for photo	54396
created	264 observations for photo	54397
created	220 observations for photo	54398
created	229 observations for photo	54399
created	246 observations for photo	54400
created	228 observations for photo	54401
created	228 observations for photo	54402
created	224 observations for photo	54403
created	210 observations for photo	54404
created	172 observations for photo	54405
created	173 observations for photo	54406
created	184 observations for photo	54407
created	226 observations for photo	54408
created	211 observations for photo	54409
created	154 observations for photo	54410
created	111 observations for photo	54411
created	154 observations for photo	54412
created	188 observations for photo	54413
created	204 observations for photo	54414
created	208 observations for photo	54415
created	232 observations for photo	54416
created	229 observations for photo	54417
created	262 observations for photo	54418
created	260 observations for photo	54419

created	251 observations for photo	54420
created	286 observations for photo	54421
created	264 observations for photo	54422
created	249 observations for photo	54423
created	203 observations for photo	54424
created	240 observations for photo	54425
created	256 observations for photo	54426
created	240 observations for photo	54427
created	230 observations for photo	54428
created	213 observations for photo	54429
created	221 observations for photo	54430
created	214 observations for photo	54431
created	222 observations for photo	54432
created	239 observations for photo	54433
created	235 observations for photo	54434
created	225 observations for photo	54435
created	250 observations for photo	54436
created	210 observations for photo	54437
created	247 observations for photo	54438
created	213 observations for photo	54439
created	263 observations for photo	54440
created	242 observations for photo	54441
created	230 observations for photo	54442
created	199 observations for photo	54443
created	192 observations for photo	54444
created	195 observations for photo	54445
created	195 observations for photo	54446
created	196 observations for photo	54447
created	184 observations for photo	54448
created	197 observations for photo	54449
created	178 observations for photo	54450
created	202 observations for photo	54451
created	215 observations for photo	54452
created	204 observations for photo	54453
created	219 observations for photo	54454
created	195 observations for photo	54455
created	227 observations for photo	54456
created	261 observations for photo	54457
created	305 observations for photo	54458

created	298 observations for photo	54459
created	279 observations for photo	54460
created	283 observations for photo	54461
created	270 observations for photo	54462
created	248 observations for photo	54463
created	252 observations for photo	54464
created	222 observations for photo	54465
created	185 observations for photo	54466
created	132 observations for photo	54467
created	151 observations for photo	54468
created	211 observations for photo	54469
created	234 observations for photo	54470
created	238 observations for photo	54471
created	246 observations for photo	54472
created	259 observations for photo	54473
created	279 observations for photo	54474
created	309 observations for photo	54475
created	295 observations for photo	54476
created	299 observations for photo	54477
created	296 observations for photo	54478
created	296 observations for photo	54479
created	329 observations for photo	54480
created	292 observations for photo	54481
created	290 observations for photo	54482
created	226 observations for photo	54483
created	166 observations for photo	54484
created	141 observations for photo	54485
created	149 observations for photo	54486
created	166 observations for photo	54487
created	187 observations for photo	54488
created	185 observations for photo	54489
created	182 observations for photo	54490
created	215 observations for photo	54491
created	268 observations for photo	54492
created	304 observations for photo	54493
created	328 observations for photo	54494
created	370 observations for photo	54495
created	324 observations for photo	54496
created	297 observations for photo	54497

created	272 observations for photo	54498
created	297 observations for photo	54499
created	308 observations for photo	54500
created	325 observations for photo	54501
created	293 observations for photo	54502
created	269 observations for photo	54503
created	259 observations for photo	54504
created	300 observations for photo	54505
created	331 observations for photo	54506
created	343 observations for photo	54507
created	323 observations for photo	54508
created	292 observations for photo	54509
created	278 observations for photo	54510
created	293 observations for photo	54511
created	318 observations for photo	54512
created	332 observations for photo	54513
created	320 observations for photo	54514
created	316 observations for photo	54515
created	296 observations for photo	54516
created	259 observations for photo	54517
created	256 observations for photo	54518
created	259 observations for photo	54519
created	258 observations for photo	54520
created	183 observations for photo	54521

total of 67126 measurements in 291 photos are used for adjustment (total 291 photos)

sigma naught	0.8 micron (17:19:27)
sigma naught	0.8 micron (17:19:32)

found	613 points connecting	2 photos
found	3012 points connecting	3 photos
found	3063 points connecting	4 photos
found	1197 points connecting	5 photos
found	2614 points connecting	6 photos

found	2252 points connecting	7 photos
found	794 points connecting	8 photos
found	53 points connecting	9 photos
found	22 points connecting	10 photos
found	6 points connecting	11 photos
found	2 points connecting	12 photos
found	2 points connecting	13 photos
found	1 points connecting	14 photos

number of observations	135176
number of unknowns	42725
redundancy	92451

additional selfcalibration parameters - camera 1

parameter number	value	standardized residual	lower bound of determinability
1	-0.4	-14.6	0.1
2	-0.6	-25.1	0.1
3	-0.0	-2.7	0.1
4	0.1	9.1	0.1
5	-0.3	-16.7	0.1
6	-0.0	-0.1	0.1
7	0.4	23.5	0.1
8	-1.1	-64.2	0.1
9	0.8	42.9	0.1
10	0.0	2.2	0.0
11	0.0	1.9	0.1
12	-0.1	-4.2	0.1
13	-1.1	-54.4	0.1
14	0.4	42.8	0.0
15	-0.0	-0.8	0.1

16	-0.3	-17.4	0.1
17	0.0	1.1	0.1
18	-0.1	-12.1	0.0
19	-0.0	-0.8	0.1
20	0.1	7.8	0.1
21	0.0	0.7	0.1
22	-0.2	-7.3	0.1
23	-0.0	-2.6	0.0
24	-0.0	-3.0	0.1
25	0.0	3.1	0.1
26	0.6	35.6	0.1
27	0.0	3.2	0.0
28	0.3	22.6	0.1
29	0.4	22.8	0.1
30	0.0	1.2	0.1
31	0.2	12.2	0.1
32	0.0	2.0	0.1
33	-0.1	-6.0	0.1
34	0.0	4.9	0.0
35	-0.1	-3.8	0.1
36	0.1	4.0	0.1
37	-0.1	-5.1	0.0
38	0.0	0.9	0.1
39	-0.0	-0.2	0.0
40	0.1	8.4	0.1
41	0.2	21.2	0.0
42	-0.0	-1.8	0.1
43	-0.0	-1.1	0.1
44	0.0	0.7	0.1

corrections on 25 grid points in micron

-2.19	0.84	0.70	-0.31	-0.44
1.54	1.23	1.51	-0.35	-1.44
-0.06	0.21	0.30	-0.31	-1.60
-0.91	-0.04	0.24	-0.09	-0.55

0.68	0.18	-0.02	-0.47	-1.07
-0.88	-0.35	0.13	0.35	0.47
1.58	0.59	-0.41	-0.86	-0.07
0.19	0.20	0.37	0.33	0.30
0.27	1.01	-0.62	-0.84	2.90
0.52	0.73	-0.24	-0.86	-2.38

RMS automatic points in photo (number: 67063)

x	0.6 micron
y	0.7 micron

RMS control and manual points in photo (number: 63)

x	0.9 micron
y	0.8 micron

RMS control points with default standard deviation set (number: 17)

x	0.014 [meter]
y	0.017 [meter]

RMS control points with default standard deviation set (number: 17)

z	0.044 [meter]
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RMS GNSS observations (number: 291)

x	0.045 [meter]
y	0.036 [meter]
z	0.035 [meter]

sigma naught 0.8 micron (17:19:39)

standard deviations of exterior orientation parameters (px, py, pz in [meter] omega,phi,kappa in [deg/1000])

photo ID	px	py	pz	omega	phi	kappa
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51641	0.046	0.046	0.034	1.23451	1.17917	0.40558
51642	0.044	0.042	0.033	1.10086	1.15753	0.35436
51643	0.040	0.042	0.032	1.10149	1.04535	0.33789
51644	0.044	0.043	0.032	1.14120	1.16053	0.39007
51645	0.041	0.040	0.031	1.02315	1.13065	0.35334
51646	0.041	0.040	0.030	1.04728	1.09645	0.39195
51647	0.040	0.039	0.029	1.02769	1.07451	0.39406
51648	0.039	0.040	0.029	1.02783	1.06095	0.38949
51649	0.040	0.039	0.029	0.98950	1.09630	0.47357
51650	0.043	0.039	0.030	0.94574	1.20708	0.42197
51651	0.043	0.041	0.031	0.94719	1.22855	0.45641
51652	0.045	0.042	0.032	0.96549	1.28987	0.46308
51653	0.046	0.043	0.033	1.02003	1.34410	0.43641
51654	0.047	0.045	0.034	0.99585	1.42129	0.52514
51655	0.051	0.046	0.037	1.05726	1.54450	0.48282
51656	0.054	0.051	0.038	1.14661	1.65572	0.56406
51657	0.058	0.051	0.041	1.09317	1.78185	0.55505
51658	0.059	0.054	0.043	1.17427	1.86565	0.55799
51659	0.061	0.053	0.045	1.05081	1.93883	0.57771
51660	0.066	0.058	0.048	1.19627	2.07611	0.54444
51661	0.067	0.057	0.050	1.11094	2.13631	0.56338
51662	0.072	0.061	0.052	1.18948	2.29111	0.58965
51663	0.074	0.064	0.055	1.29977	2.36188	0.67270
51664	0.078	0.066	0.059	1.30742	2.48280	0.75236
51665	0.082	0.071	0.063	1.43320	2.60445	0.93444
51666	0.087	0.076	0.068	1.63202	2.71649	1.30786
51667	0.103	0.076	0.088	1.66731	2.97078	1.50569
51668	0.099	0.070	0.081	1.47019	2.84334	1.11540
51669	0.092	0.065	0.076	1.35039	2.65884	0.86043
51670	0.089	0.062	0.072	1.22523	2.59757	0.75027
51671	0.088	0.061	0.069	1.27268	2.55512	0.70279
51672	0.080	0.056	0.065	1.11080	2.35595	0.64848
51673	0.079	0.055	0.063	1.14867	2.30859	0.59622
51674	0.072	0.054	0.059	1.12434	2.13419	0.57049
51675	0.070	0.051	0.056	1.05484	2.04752	0.58461
51676	0.068	0.051	0.054	1.14715	1.98788	0.59043
51677	0.065	0.046	0.050	0.98886	1.85457	0.60339
51678	0.062	0.046	0.047	1.04390	1.76860	0.54042
51679	0.057	0.045	0.044	1.02056	1.61315	0.60473

51680	0.055	0.043	0.042	1.02774	1.55920	0.52988
51681	0.053	0.041	0.039	0.98704	1.45136	0.58231
51682	0.050	0.042	0.038	1.02296	1.38249	0.52616
51683	0.048	0.039	0.035	0.95800	1.29877	0.52676
51684	0.045	0.039	0.034	0.96662	1.21165	0.45113
51685	0.043	0.038	0.032	0.93845	1.15245	0.39038
51686	0.041	0.037	0.031	0.95132	1.08082	0.32557
51687	0.037	0.038	0.031	0.95712	0.98304	0.29068
51688	0.040	0.040	0.032	1.03588	1.02126	0.31073
51689	0.041	0.041	0.033	1.05894	1.05757	0.33214
51690	0.041	0.042	0.034	1.05372	1.07466	0.33699
51691	0.044	0.044	0.035	1.12858	1.13133	0.35539
51692	0.045	0.045	0.036	1.13908	1.18935	0.37360
51693	0.047	0.043	0.036	1.11562	1.19412	0.37663
51696	0.040	0.043	0.034	1.13319	1.04553	0.32900
51697	0.039	0.042	0.033	1.09647	1.01167	0.30981
photo ID	px	py	pz	omega	phi	kappa

51698	0.037	0.036	0.032	0.91075	0.96673	0.26119
51699	0.041	0.040	0.032	1.05277	1.04784	0.30182
51700	0.038	0.036	0.031	0.93436	0.97460	0.27867
51701	0.038	0.036	0.030	0.93739	0.98981	0.28451
51702	0.038	0.036	0.030	0.97038	0.99327	0.28859
51703	0.034	0.033	0.029	0.84451	0.91113	0.25764
51704	0.037	0.034	0.029	0.89921	0.97753	0.27010
51705	0.035	0.032	0.030	0.81442	0.95065	0.25763
51706	0.037	0.032	0.030	0.80035	0.99346	0.26832
51707	0.038	0.035	0.031	0.87047	1.03725	0.28207
51708	0.041	0.037	0.033	0.91279	1.14090	0.29633
51709	0.041	0.036	0.034	0.87812	1.15702	0.29781
51710	0.044	0.036	0.035	0.87172	1.23458	0.30389
51711	0.045	0.037	0.037	0.86817	1.28376	0.31604
51712	0.047	0.039	0.039	0.89492	1.35347	0.31117
51713	0.050	0.042	0.041	0.96203	1.44994	0.33739
51714	0.051	0.042	0.042	0.91902	1.51387	0.32022
51715	0.053	0.042	0.044	0.89342	1.58914	0.33197
51716	0.054	0.042	0.046	0.89303	1.62690	0.33882
51717	0.056	0.046	0.048	0.96896	1.69177	0.37569
51718	0.059	0.045	0.051	0.92843	1.76416	0.41451

51719	0.061	0.050	0.053	1.06908	1.83545	0.50682
51720	0.063	0.050	0.056	1.08439	1.87202	0.59819
51721	0.069	0.056	0.060	1.25242	2.02763	0.79991
54310	0.053	0.075	0.072	1.42277	1.95910	0.98024
54311	0.049	0.072	0.070	1.37019	1.78818	0.71601
54312	0.046	0.068	0.068	1.24418	1.66803	0.54139
54313	0.045	0.067	0.066	1.23502	1.61770	0.45651
54314	0.045	0.065	0.065	1.21491	1.57786	0.40466
54315	0.043	0.063	0.063	1.15723	1.53246	0.35036
54316	0.044	0.061	0.062	1.13014	1.52364	0.32689
54317	0.042	0.060	0.060	1.11444	1.46666	0.29772
54318	0.041	0.059	0.059	1.11579	1.45772	0.29436
54319	0.040	0.057	0.057	1.10103	1.40913	0.29324
54320	0.040	0.055	0.055	1.03777	1.37463	0.28405
54321	0.040	0.055	0.054	1.05964	1.37286	0.28909
54322	0.038	0.053	0.053	1.02288	1.31232	0.28664
54323	0.038	0.053	0.051	1.08114	1.28835	0.28779
54324	0.037	0.051	0.050	1.04253	1.23876	0.29125
54325	0.037	0.050	0.048	1.02048	1.24592	0.29794
54326	0.036	0.048	0.047	0.99303	1.18927	0.29349
54327	0.037	0.047	0.046	0.99358	1.20007	0.31007
54328	0.036	0.046	0.044	0.99309	1.16629	0.30702
54329	0.036	0.045	0.043	0.97344	1.15755	0.30665
54330	0.035	0.043	0.042	0.95459	1.13023	0.30582
54331	0.035	0.044	0.041	0.99468	1.10825	0.30161
54332	0.034	0.042	0.040	0.95431	1.07529	0.29467
54333	0.033	0.040	0.038	0.90145	1.04835	0.28329
54334	0.033	0.039	0.037	0.90571	1.01947	0.28084
54335	0.032	0.037	0.036	0.86117	1.00964	0.26822
54336	0.031	0.038	0.035	0.89310	0.96998	0.26541
54337	0.031	0.037	0.035	0.87081	0.97050	0.25946
54338	0.030	0.037	0.034	0.89128	0.93902	0.26424
54339	0.032	0.036	0.033	0.89366	0.96732	0.27096
54340	0.032	0.036	0.033	0.90037	0.96077	0.28190
54341	0.031	0.035	0.032	0.88430	0.95264	0.28242
54342	0.032	0.036	0.032	0.90331	0.95947	0.29251
54343	0.035	0.036	0.032	0.91465	1.05635	0.31111
54344	0.034	0.038	0.032	0.98695	1.00593	0.32107
54345	0.034	0.039	0.032	1.01694	1.03265	0.34414

54346	0.036	0.041	0.032	1.03176	1.12843	0.37393
54347	0.037	0.041	0.032	1.01119	1.15901	0.36298
54348	0.034	0.042	0.032	1.06297	1.09612	0.33811
54349	0.034	0.042	0.032	1.00419	1.13079	0.31521
54350	0.034	0.042	0.032	0.99529	1.13848	0.30797
54351	0.035	0.042	0.032	0.97467	1.16447	0.30831
54352	0.031	0.042	0.032	0.96505	1.09020	0.28597
54353	0.032	0.043	0.033	1.02674	1.11259	0.29308
54354	0.032	0.043	0.033	1.01168	1.11476	0.28691
54355	0.032	0.042	0.034	0.94454	1.12549	0.28191
54356	0.034	0.045	0.035	1.00398	1.21446	0.30667
54357	0.033	0.045	0.035	1.00911	1.19282	0.32452
54358	0.035	0.047	0.036	1.03170	1.27432	0.36903
54359	0.036	0.049	0.038	1.09082	1.28853	0.42805
54360	0.036	0.049	0.039	1.10507	1.29124	0.48006

photo ID	px	py	pz	omega	phi	kappa
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54361	0.037	0.052	0.041	1.18160	1.33510	0.56695
54362	0.038	0.054	0.043	1.24172	1.37043	0.66890
54363	0.042	0.056	0.045	1.32594	1.49537	0.81011
54364	0.046	0.060	0.049	1.48233	1.60786	1.01756
54365	0.044	0.060	0.042	1.50908	1.68963	1.01032
54366	0.040	0.057	0.039	1.38475	1.55772	0.75843
54367	0.038	0.053	0.037	1.24227	1.47776	0.62158
54368	0.038	0.053	0.035	1.23487	1.47123	0.58392
54369	0.038	0.051	0.034	1.22501	1.44596	0.58079
54370	0.036	0.051	0.033	1.23141	1.36174	0.56688
54371	0.035	0.048	0.031	1.20431	1.28271	0.53613
54372	0.036	0.046	0.031	1.19999	1.25999	0.50400
54373	0.038	0.045	0.030	1.17980	1.29552	0.48258
54374	0.040	0.044	0.030	1.16723	1.34326	0.50179
54375	0.039	0.046	0.031	1.24994	1.30019	0.51232
54376	0.041	0.048	0.032	1.30184	1.36744	0.60606
54377	0.040	0.046	0.032	1.28046	1.30606	0.59716
54378	0.040	0.044	0.032	1.24158	1.27047	0.55792
54379	0.039	0.045	0.032	1.26165	1.27979	0.49827
54380	0.039	0.045	0.032	1.22683	1.28030	0.51381
54381	0.038	0.041	0.032	1.16331	1.19787	0.46560
54382	0.038	0.041	0.032	1.11909	1.24435	0.45141

54383	0.037	0.042	0.033	1.09080	1.24976	0.46975
54384	0.036	0.042	0.034	1.06079	1.26126	0.47253
54385	0.036	0.044	0.035	1.08290	1.29241	0.49348
54386	0.037	0.045	0.036	1.09636	1.33615	0.52326
54387	0.036	0.047	0.038	1.14662	1.34099	0.56151
54388	0.038	0.048	0.039	1.14571	1.40034	0.57020
54389	0.039	0.050	0.041	1.16351	1.45811	0.61688
54390	0.040	0.050	0.043	1.11903	1.50029	0.58871
54391	0.040	0.052	0.045	1.17997	1.50345	0.63956
54392	0.041	0.053	0.047	1.18119	1.54658	0.60251
54393	0.041	0.055	0.049	1.18700	1.55873	0.59405
54394	0.041	0.057	0.050	1.21409	1.59582	0.57733
54395	0.041	0.059	0.052	1.22043	1.61125	0.56447
54396	0.042	0.060	0.054	1.22627	1.65476	0.54612
54397	0.043	0.061	0.056	1.19373	1.73501	0.54712
54398	0.045	0.063	0.058	1.24588	1.80431	0.57860
54399	0.044	0.065	0.059	1.25801	1.80925	0.58144
54400	0.046	0.067	0.061	1.28192	1.87723	0.55416
54401	0.047	0.070	0.063	1.36389	1.91717	0.55079
54402	0.047	0.071	0.065	1.30909	1.97688	0.57633
54403	0.047	0.073	0.066	1.38896	1.97435	0.59006
54404	0.051	0.076	0.069	1.40547	2.12285	0.64441
54405	0.053	0.079	0.071	1.44384	2.16867	0.71974
54406	0.055	0.080	0.074	1.41770	2.22519	0.78570
54407	0.055	0.082	0.076	1.46644	2.25627	0.82499
54408	0.056	0.084	0.078	1.51715	2.30116	0.88462
54409	0.056	0.087	0.080	1.61802	2.31508	0.98973
54410	0.060	0.091	0.083	1.76916	2.44492	1.23763
54411	0.063	0.097	0.073	2.00219	2.52390	1.54792
54412	0.062	0.094	0.070	1.88450	2.37991	1.21229
54413	0.058	0.091	0.067	1.77772	2.21775	0.97908
54414	0.056	0.089	0.065	1.69643	2.13729	0.85576
54415	0.055	0.087	0.064	1.69676	2.11304	0.73611
54416	0.052	0.085	0.061	1.63147	2.05579	0.69140
54417	0.051	0.083	0.060	1.59974	2.03516	0.61589
54418	0.051	0.080	0.058	1.52948	1.99964	0.53878
54419	0.050	0.080	0.056	1.53153	1.99700	0.51975
54420	0.049	0.078	0.055	1.48939	1.96292	0.50462
54421	0.048	0.077	0.054	1.49121	1.92551	0.50141

54422	0.046	0.075	0.053	1.45641	1.88249	0.49622
54423	0.047	0.075	0.051	1.46553	1.86993	0.54178
54424	0.046	0.073	0.050	1.46311	1.79846	0.53435
54425	0.046	0.070	0.049	1.38213	1.76994	0.49100
54426	0.045	0.069	0.047	1.37906	1.75651	0.50081
54427	0.045	0.069	0.046	1.38024	1.73117	0.52497
54428	0.044	0.066	0.045	1.34210	1.67835	0.51178
54429	0.044	0.066	0.044	1.33651	1.69107	0.52730
54430	0.045	0.064	0.042	1.30989	1.70779	0.52758
54431	0.043	0.063	0.041	1.31622	1.63490	0.53838
54432	0.042	0.062	0.040	1.28670	1.61958	0.50882
54433	0.043	0.060	0.039	1.25530	1.59635	0.52618
54434	0.041	0.060	0.038	1.28029	1.57803	0.48936
54435	0.043	0.060	0.037	1.30502	1.62860	0.50907

photo ID	px	py	pz	omega	phi	kappa
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54436	0.041	0.059	0.036	1.24639	1.55606	0.49923
54437	0.040	0.059	0.036	1.27069	1.53785	0.51123
54438	0.041	0.057	0.035	1.25070	1.51733	0.50271
54439	0.040	0.058	0.035	1.26480	1.53356	0.48418
54440	0.039	0.056	0.034	1.22066	1.50003	0.46534
54441	0.041	0.056	0.033	1.21058	1.55507	0.47235
54442	0.041	0.056	0.034	1.20273	1.55860	0.48223
54443	0.041	0.057	0.033	1.26342	1.55631	0.52846
54444	0.040	0.057	0.033	1.25824	1.53956	0.48824
54445	0.040	0.057	0.033	1.27081	1.53366	0.50525
54446	0.042	0.057	0.034	1.25223	1.58372	0.54949
54447	0.042	0.057	0.034	1.28232	1.57651	0.53708
54448	0.042	0.058	0.035	1.30884	1.58422	0.55958
54449	0.043	0.058	0.035	1.28368	1.61402	0.53243
54450	0.043	0.058	0.036	1.23522	1.63916	0.54868
54451	0.044	0.058	0.036	1.25207	1.65907	0.56470
54452	0.043	0.059	0.037	1.25358	1.65632	0.54149
54453	0.043	0.060	0.038	1.26681	1.66934	0.52690
54454	0.042	0.060	0.038	1.26481	1.64240	0.53585
54455	0.043	0.062	0.039	1.32328	1.67272	0.51735
54456	0.042	0.062	0.040	1.29995	1.66153	0.49056
54457	0.043	0.063	0.041	1.29384	1.71484	0.48242
54458	0.044	0.063	0.042	1.28353	1.75089	0.46591

54459	0.043	0.064	0.043	1.29467	1.73295	0.48303
54460	0.044	0.066	0.044	1.36516	1.78421	0.47801
54461	0.044	0.066	0.045	1.32585	1.79436	0.49050
54462	0.046	0.068	0.047	1.36248	1.85481	0.56705
54463	0.048	0.069	0.049	1.38501	1.90346	0.62189
54464	0.049	0.072	0.051	1.45003	1.95151	0.71748
54465	0.051	0.073	0.053	1.48953	2.02039	0.79293
54466	0.052	0.076	0.055	1.56866	2.06936	0.93043
54467	0.055	0.079	0.059	1.69115	2.14363	1.15407
54468	0.045	0.059	0.046	1.47260	1.70412	1.04277
54469	0.040	0.055	0.042	1.31309	1.56367	0.82274
54470	0.040	0.053	0.040	1.25373	1.53522	0.70561
54471	0.038	0.051	0.039	1.21370	1.45598	0.64228
54472	0.036	0.049	0.037	1.18514	1.36474	0.57566
54473	0.034	0.047	0.035	1.15077	1.26956	0.47361
54474	0.033	0.045	0.034	1.09974	1.22401	0.40421
54475	0.032	0.043	0.033	1.04861	1.17155	0.36136
54476	0.032	0.042	0.032	1.00854	1.16979	0.34404
54477	0.031	0.041	0.032	0.98958	1.15461	0.32473
54478	0.031	0.041	0.031	0.98335	1.10499	0.30785
54479	0.031	0.040	0.031	0.98072	1.11013	0.30185
54480	0.029	0.038	0.030	0.94886	1.01388	0.28938
54481	0.032	0.037	0.030	0.97366	1.05348	0.30793
54482	0.032	0.036	0.030	0.95068	1.02885	0.30416
54483	0.033	0.037	0.030	1.00500	1.04943	0.32886
54484	0.035	0.038	0.031	1.01134	1.11247	0.35952
54485	0.035	0.039	0.031	1.09586	1.06729	0.37828
54486	0.036	0.038	0.031	1.06408	1.13313	0.39859
54487	0.034	0.037	0.031	1.05448	1.05896	0.38614
54488	0.033	0.037	0.032	1.04193	1.01009	0.35845
54489	0.033	0.038	0.032	1.07149	1.01521	0.35272
54490	0.033	0.036	0.033	0.99930	1.03515	0.33745
54491	0.033	0.035	0.033	0.96557	1.01918	0.31627
54492	0.032	0.035	0.034	0.95575	1.00769	0.30271
54493	0.031	0.036	0.035	0.94530	0.99176	0.29573
54494	0.030	0.036	0.036	0.93283	0.97252	0.29034
54495	0.031	0.036	0.037	0.87557	1.01531	0.28289
54496	0.032	0.037	0.039	0.92054	1.05904	0.29839
54497	0.032	0.037	0.040	0.88442	1.05247	0.30172

54498	0.033	0.039	0.041	0.92818	1.08623	0.31709
54499	0.033	0.039	0.042	0.91107	1.10471	0.31524
54500	0.033	0.040	0.044	0.92675	1.09530	0.31695
54501	0.034	0.041	0.045	0.91596	1.13670	0.31931
54502	0.034	0.043	0.047	0.96127	1.16350	0.33361
54503	0.037	0.044	0.049	0.97542	1.23416	0.34082
54504	0.037	0.047	0.051	1.00894	1.27352	0.34259
54505	0.037	0.048	0.052	1.02710	1.27273	0.33979
54506	0.038	0.048	0.054	1.00872	1.30549	0.32627
54507	0.038	0.048	0.055	0.96479	1.33171	0.32019
54508	0.038	0.050	0.057	0.97226	1.34377	0.31790
54509	0.039	0.053	0.058	1.06104	1.39632	0.33006
54510	0.040	0.055	0.060	1.12802	1.41796	0.33334
photo ID	px	py	pz	omega	phi	kappa

54511	0.042	0.055	0.062	1.06534	1.50175	0.33130
54512	0.041	0.056	0.064	1.06541	1.47839	0.33177
54513	0.042	0.057	0.065	1.06080	1.50964	0.33452
54514	0.043	0.059	0.067	1.13085	1.53642	0.35403
54515	0.044	0.059	0.069	1.06756	1.58657	0.37330
54516	0.043	0.061	0.070	1.11421	1.57471	0.41201
54517	0.047	0.064	0.072	1.16994	1.71980	0.48795
54518	0.046	0.066	0.074	1.22339	1.73038	0.56971
54519	0.049	0.069	0.076	1.27237	1.84643	0.68465
54520	0.049	0.070	0.077	1.30669	1.88417	0.81971
54521	0.053	0.074	0.079	1.45596	1.98472	1.08435

mean standard deviations of rotations

omega	1.2 [deg/1000]
phi	1.5 [deg/1000]
kappa	0.5 [deg/1000]

max standard deviations of rotations

omega	2.0 [deg/1000] at photo	54411
phi	3.0 [deg/1000] at photo	51667

kappa 1.5 [deg/1000] at photo 54411

mean standard deviations of translations

x 0.044 [meter]
y 0.052 [meter]
z 0.044 [meter]

max standard deviations of translations

x 0.103 [meter] at photo 51667
y 0.097 [meter] at photo 54411
z 0.088 [meter] at photo 51667

residuals horizontal control points in [meter]

control point ID	rx	ry
HV72_GRA	-0.007	0.013
HV73_GRA	-0.005	-0.000
HV74_GRA	-0.023	-0.004
HV75_GRA	-0.000	-0.001
HV76_GRA	0.012	0.012
HV77_GRA	-0.034	0.001
HV78_GRA	0.025	-0.002
HV80_GRA	-0.006	0.019
HV81_GRA	0.012	-0.005
HV82_GRA	-0.003	-0.012
HV83_GRA	-0.013	0.035
HV84_GRA	0.013	-0.047
HV85_GRA	0.011	-0.007
HV86_GRA	0.008	0.018
HV79A_GRA	-0.001	-0.004
HV86A_GRA	-0.001	-0.007
HV86B_GRA	0.012	-0.009

residuals vertical control points in [meter]

control point ID	rz
HV72_GRA	0.038
HV73_GRA	0.023
HV74_GRA	-0.031
HV75_GRA	0.003
HV76_GRA	0.044
HV77_GRA	-0.062
HV78_GRA	-0.054
HV80_GRA	0.031
HV81_GRA	0.038
HV82_GRA	0.037
HV83_GRA	0.009
HV84_GRA	-0.089
HV85_GRA	0.077
HV86_GRA	-0.037
HV79A_GRA	0.008
HV86A_GRA	0.008
HV86B_GRA	-0.043

residuals GNSS observations in [meter]

photo ID	rx	ry	rz
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GNSS drift parameter for profile 1

constant part in [meter] X -1.008 Y -1.703 Z 4.865

linear part in [meter] X 0.044 Y -0.080 Z 0.049

54310	0.129	0.042	-0.004
54311	0.080	0.027	-0.026
54312	0.038	-0.003	-0.006

54313	-0.047	-0.006	0.029
54314	-0.004	0.037	-0.000
54315	0.012	-0.026	0.001
54316	0.014	-0.069	0.057
54317	0.014	0.010	-0.005
54318	0.006	0.045	-0.019
54319	0.022	-0.034	0.013
54320	-0.025	-0.015	-0.052
54321	-0.042	-0.036	-0.007
54322	0.097	0.025	0.019
54323	-0.073	0.054	0.005
54324	-0.133	0.082	-0.010
54325	-0.027	-0.022	0.050
54326	0.053	-0.044	0.074
54327	-0.006	-0.050	-0.006
54328	-0.080	0.059	0.023
54329	0.042	0.013	0.001
54330	-0.086	-0.076	-0.021
54331	-0.040	-0.034	0.039
54332	-0.021	-0.054	-0.010
54333	-0.014	-0.015	-0.035
54334	-0.061	-0.057	0.001
54335	-0.050	-0.052	-0.014
54336	-0.043	-0.035	-0.049
54337	0.017	0.000	-0.074
54338	-0.011	0.002	-0.038
54339	-0.027	0.030	-0.055
54340	-0.040	0.009	-0.004
54341	0.004	0.050	0.049
54342	0.080	0.071	0.037
54343	0.049	0.060	0.009
54344	0.000	0.009	0.064
54345	0.035	0.011	0.027
54346	-0.011	0.026	-0.029
54347	0.028	-0.027	-0.067
54348	0.003	0.030	-0.084
54349	-0.044	-0.009	-0.038
54350	0.025	-0.002	0.024
54351	0.062	-0.005	0.045

54352	0.024	0.018	-0.017
54353	0.041	0.003	0.037
54354	0.012	0.019	0.030
54355	-0.011	0.039	-0.048
54356	0.015	-0.039	0.022
54357	0.020	-0.030	0.007
54358	0.032	0.034	-0.003
54359	0.003	-0.003	0.063
54360	-0.023	0.039	-0.006
54361	-0.082	-0.036	0.039
54362	0.038	-0.007	-0.015
54363	0.016	-0.024	-0.018
54364	-0.008	-0.033	-0.003

GNSS drift parameter for profile 2

constant part in [meter] X 0.201 Y 2.286 Z 4.336

linear part in [meter] X -0.055 Y 0.096 Z -0.161

54365	0.017	-0.025	-0.047
54366	-0.033	-0.046	-0.014
54367	-0.011	0.016	0.031
54368	-0.023	-0.016	0.004
54369	0.006	0.002	0.009
54370	0.020	-0.008	0.030
54371	-0.014	-0.007	0.005
54372	0.035	0.073	0.021
54373	0.018	0.004	0.012
54374	0.063	-0.006	0.015
54375	0.039	-0.021	0.049
54376	0.012	-0.028	0.012
54377	-0.028	-0.016	0.014
54378	-0.057	0.027	-0.059
54379	0.047	0.046	-0.018
54380	0.080	-0.004	0.024
54381	-0.042	0.060	-0.019
54382	-0.042	0.027	-0.058
54383	-0.025	0.030	0.011
54384	-0.017	-0.019	0.014
54385	-0.037	0.005	-0.025

54386	-0.011	-0.046	0.021
54387	0.025	-0.006	-0.004
54388	-0.010	-0.019	-0.013
54389	-0.012	-0.005	-0.044
54390	0.017	-0.006	-0.021
54391	-0.018	-0.056	-0.011
54392	0.004	0.025	0.068
54393	-0.060	0.004	-0.019
54394	0.052	0.025	-0.018
54395	-0.045	0.047	0.015
54396	-0.001	-0.038	0.027
54397	-0.000	-0.007	-0.011
54398	0.006	0.008	-0.002
54399	-0.052	-0.012	-0.011
54400	0.002	0.001	-0.037
54401	-0.007	-0.021	-0.028
54402	0.047	0.018	-0.007
54403	-0.010	0.050	0.022
54404	-0.073	-0.017	0.006
54405	0.071	-0.033	0.009
54406	0.021	-0.004	-0.030
54407	0.031	-0.011	-0.016
54408	0.034	0.032	0.031
54409	-0.036	-0.017	0.022
54410	0.017	-0.005	0.040

GNSS drift parameter for profile 3

constant part in [meter] X -1.041 Y -1.466 Z 5.147

linear part in [meter] X 0.042 Y -0.065 Z -0.002

54411	0.012	0.014	-0.079
54412	0.006	0.046	-0.059
54413	-0.121	0.051	-0.033
54414	-0.008	-0.010	0.052
54415	-0.015	-0.044	0.042
54416	-0.007	-0.060	0.041
54417	0.003	-0.034	0.084
54418	-0.068	-0.077	0.066
54419	0.078	0.000	-0.003

54420	0.023	0.010	0.027
54421	-0.009	0.001	-0.025
54422	-0.036	-0.048	0.011
54423	0.016	-0.024	-0.044
54424	0.017	0.013	-0.029
54425	-0.053	-0.033	-0.027
54426	-0.007	0.049	-0.076
54427	0.100	0.052	-0.026
54428	0.018	0.018	0.019
54429	-0.031	0.038	-0.025
54430	-0.030	0.006	0.053
54431	-0.046	0.023	0.052
54432	0.009	0.027	-0.014
54433	-0.022	-0.026	-0.011
54434	0.065	-0.028	-0.011
54435	0.017	-0.005	-0.004
54436	-0.006	0.016	0.026
54437	0.129	0.010	-0.030
54438	0.034	0.002	0.042
54439	0.035	0.039	-0.045
54440	0.038	0.019	0.016
54441	-0.007	0.028	-0.010
54442	0.022	-0.037	0.036
54443	0.032	-0.029	0.006
54444	-0.010	0.020	0.028
54445	0.038	-0.014	0.013
54446	-0.023	-0.023	0.004
54447	0.023	-0.009	0.013
54448	0.012	0.011	0.007
54449	0.008	-0.008	-0.044
54450	-0.074	0.071	-0.048
54451	-0.049	0.004	-0.043
54452	0.005	0.049	-0.012
54453	-0.005	-0.021	0.018
54454	0.026	-0.020	-0.036
54455	-0.030	-0.004	-0.018
54456	-0.001	-0.008	0.029
54457	0.006	0.039	0.006
54458	-0.031	0.026	0.032

54459	-0.077	-0.014	0.016
54460	-0.006	-0.010	0.029
54461	-0.017	-0.001	0.004
54462	0.022	-0.009	-0.009
54463	-0.008	-0.032	0.025
54464	-0.017	-0.022	-0.025
54465	-0.020	-0.019	0.016
54466	0.017	-0.003	0.000
54467	0.025	-0.009	-0.030

GNSS drift parameter for profile 4

constant part in [meter] X 0.201 Y 2.561 Z 4.606

linear part in [meter] X -0.033 Y 0.067 Z -0.106

54468	0.024	-0.002	-0.021
54469	-0.001	0.034	-0.008
54470	-0.028	0.032	0.008
54471	0.026	-0.046	-0.044
54472	-0.012	-0.023	-0.008
54473	0.091	0.014	-0.018
54474	0.041	0.046	0.012
54475	-0.026	0.067	0.061
54476	-0.020	-0.025	0.002
54477	0.027	-0.082	0.042
54478	0.017	0.063	0.007
54479	0.021	0.035	-0.016
54480	0.002	0.002	-0.026
54481	-0.008	0.018	-0.088
54482	0.055	0.043	0.035
54483	-0.062	-0.048	-0.028
54484	-0.035	-0.075	-0.039
54485	0.005	0.032	0.032
54486	-0.043	-0.034	-0.025
54487	0.006	-0.016	0.045
54488	0.047	-0.119	0.023
54489	-0.071	-0.001	-0.001
54490	0.001	0.023	0.016
54491	-0.128	-0.047	-0.047
54492	-0.047	-0.031	-0.026

54493	-0.051	0.040	-0.053
54494	-0.017	0.029	-0.037
54495	0.035	0.067	0.042
54496	-0.064	-0.010	0.013
54497	-0.014	-0.004	0.054
54498	-0.048	-0.025	0.045
54499	0.030	0.005	0.034
54500	0.059	-0.090	0.023
54501	0.061	0.015	0.013
54502	0.006	-0.033	0.087
54503	-0.064	0.009	-0.001
54504	0.006	-0.002	0.043
54505	0.034	0.055	0.015
54506	0.040	0.029	0.019
54507	0.025	0.061	0.040
54508	-0.009	0.008	-0.024
54509	0.078	-0.003	-0.003
54510	0.030	0.015	-0.007
54511	0.030	-0.037	-0.045
54512	-0.007	0.022	0.014
54513	-0.002	0.000	-0.062
54514	0.092	-0.014	-0.038
54515	0.027	-0.011	-0.015
54516	-0.058	-0.000	0.021
54517	0.054	0.066	-0.012
54518	-0.069	0.016	-0.050
54519	-0.035	0.021	0.046
54520	-0.064	-0.063	-0.059
54521	0.016	-0.024	0.009

GNSS drift parameter for profile 5

constant part in [meter] X 2.227 Y 0.678 Z 4.493

linear part in [meter] X 0.087 Y 0.009 Z -0.129

51641	-0.002	-0.026	-0.032
51642	-0.120	0.026	0.023
51643	0.162	-0.058	-0.047
51644	-0.009	0.017	0.041
51645	0.015	0.055	0.010

51646	-0.045	-0.094	-0.001
51647	0.060	-0.034	-0.053
51648	-0.041	0.017	-0.065
51649	0.017	0.003	0.049
51650	0.001	0.006	0.069
51651	-0.022	-0.040	0.026
51652	-0.012	0.021	-0.043
51653	-0.009	0.096	0.018
51654	0.023	0.012	0.001
51655	0.011	0.058	0.007
51656	-0.048	0.016	-0.019
51657	-0.005	0.022	0.016
51658	-0.004	-0.003	0.053
51659	0.017	-0.008	0.009
51660	-0.027	0.012	-0.040
51661	0.005	-0.029	0.049
51662	0.005	-0.004	-0.014
51663	-0.000	0.008	0.017
51664	0.041	-0.032	-0.043
51665	-0.005	-0.020	0.001
51666	-0.007	-0.024	-0.033

GNSS drift parameter for profile 6

constant part in [meter] X -2.375 Y 0.389 Z 4.488

linear part in [meter] X -0.058 Y 0.017 Z 0.052

51667	-0.014	-0.002	0.029
51668	0.015	-0.033	-0.040
51669	-0.060	0.052	0.034
51670	0.018	-0.034	-0.007
51671	0.028	0.003	0.026
51672	0.026	-0.014	-0.026
51673	-0.010	0.009	0.019
51674	-0.043	0.019	-0.054
51675	0.001	0.004	-0.008
51676	0.021	0.055	-0.035
51677	-0.016	0.017	0.059
51678	0.033	-0.043	-0.011
51679	-0.007	-0.014	-0.040

51680	-0.017	0.001	-0.008
51681	-0.007	0.017	-0.012
51682	0.037	-0.042	0.042
51683	-0.037	-0.035	0.095
51684	0.079	-0.078	-0.045
51685	-0.024	0.044	0.010
51686	0.056	0.053	-0.017
51687	0.013	0.010	0.018
51688	0.081	0.099	0.033
51689	-0.161	-0.057	-0.058
51690	-0.006	-0.081	-0.024
51691	-0.036	0.051	0.013
51692	-0.048	0.037	0.003
51693	0.079	-0.038	0.003

GNSS drift parameter for profile 7

constant part in [meter] X 2.372 Y 0.678 Z 4.492

linear part in [meter] X 0.076 Y 0.015 Z -0.088

51696	-0.068	-0.098	0.056
51697	-0.128	0.025	0.112
51698	-0.059	0.091	-0.002
51699	-0.029	-0.007	-0.083
51700	0.041	-0.061	-0.077
51701	0.068	0.036	0.052
51702	0.076	0.028	-0.028
51703	0.052	0.015	0.042
51704	0.048	0.020	-0.026
51705	0.072	0.009	-0.011
51706	0.032	0.039	-0.015
51707	-0.003	-0.003	-0.069
51708	0.025	-0.018	-0.013
51709	-0.058	-0.033	-0.013
51710	0.033	-0.034	0.012
51711	-0.014	0.002	-0.033
51712	0.005	-0.010	0.048
51713	-0.056	0.001	-0.064
51714	0.043	-0.051	0.028
51715	0.003	-0.011	0.037

51716	0.035	0.009	0.029
51717	-0.009	-0.014	-0.017
51718	-0.002	0.017	-0.001
51719	-0.018	0.021	0.046
51720	-0.082	0.024	-0.048
51721	-0.007	0.003	0.038

max standard deviations of terrain points

x	0.101 [meter] at point	60001001
y	0.123 [meter] at point	70002094
z	0.264 [meter] at point	40000411

mean standard deviations of terrain points

x	0.023
y	0.024
z	0.079

exterior orientation parameters (px, py, pz in [meter] omega,phi,kappa in [deg])

rotations from terrain to photo (rotated axes)

photo ID	px	py	pz	omega	phi	kappa
51641	533126.439	6686600.419	2176.982	-0.73062	-1.56149	41.19244
51642	532808.864	6687030.045	2175.306	-0.85978	-0.83477	41.07530
51643	532491.764	6687458.982	2176.536	-0.01260	-1.36788	41.65186
51644	532171.561	6687883.606	2176.454	-0.92573	-1.16618	41.88303
51645	531858.976	6688296.407	2174.518	-0.30676	-0.99744	42.01004
51646	531543.360	6688710.263	2176.841	-0.52441	-0.91095	42.12791

51647	531226.422	6689125.312	2180.128	-0.63317	-0.88234	42.18771
51648	530913.032	6689535.413	2176.644	-1.09944	-1.59851	42.23573
51649	530601.080	6689947.397	2174.885	-0.90997	0.47787	41.34755
51650	530290.750	6690373.719	2176.946	-2.31696	0.63424	40.20707
51651	529994.982	6690799.967	2178.353	-0.62139	0.18640	39.07819
51652	529723.450	6691205.217	2182.994	-1.14072	-1.18679	38.34889
51653	529457.263	6691611.837	2179.880	-1.07637	-0.45451	37.68573
51654	529175.113	6692046.190	2179.755	-0.48961	-1.20870	38.55458
51655	528883.390	6692483.167	2177.037	-1.25838	-1.02037	39.56025
51656	528587.021	6692920.623	2174.528	-0.04335	-1.29461	39.59536
51657	528293.685	6693343.653	2178.673	-0.68943	-0.68198	40.35700
51658	527998.464	6693760.527	2177.997	-1.39648	-0.42690	41.11887
51659	527700.320	6694175.343	2180.511	-0.30696	-0.89977	41.58454
51660	527387.674	6694601.091	2181.293	-1.04642	-1.79536	41.86908
51661	527081.582	6695010.537	2177.121	-1.14519	-0.34704	42.23752
51662	526767.199	6695430.117	2178.750	-0.57969	-0.99899	42.32252
51663	526458.822	6695837.845	2176.054	-1.06116	-0.78387	42.24607
51664	526151.349	6696242.701	2175.805	-0.01439	-0.94662	42.71842
51665	525843.200	6696641.106	2178.478	-0.99807	-0.60726	43.12422
51666	525516.452	6697062.488	2179.111	-0.53098	-0.58978	42.95047
51667	522932.722	6695832.049	2183.555	0.95879	-0.23961	-148.62075
51668	523213.736	6695410.421	2179.905	0.64904	0.56512	-148.84918
51669	523476.574	6695017.836	2182.472	0.69852	-0.29947	-148.62193
51670	523744.531	6694614.522	2181.163	1.27993	0.85994	-148.94689
51671	523996.061	6694231.032	2181.726	0.19948	0.36498	-149.46792
51672	524270.843	6693813.397	2182.621	1.06278	1.49959	-148.88096
51673	524545.474	6693407.926	2178.796	0.54505	0.75225	-147.74632
51674	524827.309	6693002.302	2180.256	0.24587	1.85283	-147.28888
51675	525120.046	6692596.434	2179.510	0.85598	1.20140	-146.35291
51676	525414.224	6692200.284	2176.688	0.48246	1.45179	-145.57067
51677	525722.586	6691797.431	2178.167	1.02388	0.30015	-145.42322
51678	526027.157	6691398.675	2178.148	1.11863	1.01877	-145.72263
51679	526330.748	6690998.366	2177.166	0.33075	0.98152	-146.11041
51680	526635.991	6690592.772	2177.033	1.20769	0.70296	-146.57601
51681	526936.229	6690183.620	2180.397	0.63091	0.79638	-147.47233
51682	527223.575	6689782.097	2177.646	1.74830	0.50846	-148.42154
51683	527515.846	6689362.112	2177.449	0.87863	-0.54780	-148.73319
51684	527791.043	6688956.661	2179.630	1.19914	1.25036	-148.99127
51685	528066.630	6688548.925	2176.448	1.11591	0.72075	-148.43664

51686	528344.983	6688137.646	2175.181	0.09323	1.41737	-148.61734
51687	528605.999	6687760.681	2177.057	0.87008	0.78228	-147.91298
51688	528895.330	6687351.445	2175.335	0.84863	0.77182	-147.08084
51689	529181.171	6686952.409	2177.487	0.14432	1.26932	-146.91419
51690	529471.362	6686554.181	2177.046	1.19973	0.76336	-146.59519
51691	529763.164	6686154.599	2175.933	0.67042	0.19743	-146.57052
51692	530053.979	6685756.300	2179.344	0.90509	0.43466	-146.42075
photo ID	px	py	pz	omega	phi	kappa

51693	530344.033	6685357.426	2175.715	1.49054	0.12675	-146.87556
51696	531882.415	6685719.853	2174.841	-0.74170	-0.92555	39.12327
51697	531591.883	6686135.484	2178.840	-0.90310	0.08865	38.67361
51698	531307.310	6686550.349	2177.478	-1.21416	-0.49680	39.07247
51699	531017.704	6686977.185	2181.431	-0.00487	-1.21915	38.60260
51700	530734.391	6687395.476	2179.458	-0.82044	-1.99529	38.57818
51701	530443.518	6687817.148	2180.079	-1.03144	-0.31660	39.93503
51702	530168.067	6688210.250	2176.636	-0.95853	-1.54332	40.26679
51703	529868.798	6688631.374	2177.963	-0.95642	-0.18234	40.38462
51704	529567.846	6689055.649	2175.642	-1.55058	-1.05505	40.56656
51705	529272.401	6689473.074	2175.119	-0.51251	-0.35123	40.07180
51706	528974.380	6689896.198	2177.972	-1.50181	-0.66284	40.31369
51707	528679.077	6690318.135	2174.005	-0.65826	-1.43753	39.99819
51708	528377.284	6690744.837	2175.721	-0.44388	-0.66844	40.49155
51709	528079.465	6691161.604	2174.800	-0.54681	-1.15021	40.66222
51710	527789.253	6691562.411	2178.975	-0.76280	-0.41455	41.10549
51711	527495.502	6691967.178	2177.838	-0.68260	-1.38877	40.94683
51712	527201.283	6692370.564	2177.225	-0.71779	0.00699	41.04343
51713	526910.116	6692772.235	2178.044	-0.37206	-1.54305	41.03232
51714	526616.320	6693171.155	2176.873	-0.42674	-0.29226	41.42596
51715	526324.326	6693567.323	2179.159	-0.90927	-0.62026	41.24834
51716	526040.758	6693953.952	2178.975	-0.42512	-0.63409	41.06087
51717	525749.830	6694347.986	2181.210	-0.28909	-1.47721	41.38779
51718	525459.674	6694735.985	2177.279	-0.46639	-0.77480	41.43436
51719	525180.621	6695106.454	2179.578	-0.77238	-0.02259	41.68494
51720	524921.574	6695451.556	2178.167	-0.72099	-1.23359	41.40873
51721	524629.667	6695839.321	2177.786	-0.61332	0.16174	41.36805
54310	517893.380	6678788.539	2202.741	-3.26717	-0.00359	-63.56476
54311	518348.642	6678980.784	2200.496	-2.31223	-0.19602	-60.64598
54312	518816.362	6679199.676	2203.602	-1.34523	0.73575	-59.07087

54313	519240.861	6679406.383	2200.691	-0.36432	0.89836	-58.07424
54314	519626.799	6679596.409	2202.718	-0.98516	0.01940	-58.02854
54315	520043.898	6679803.082	2202.381	-0.67789	1.05970	-58.40036
54316	520473.731	6680014.449	2202.896	0.23831	0.12657	-58.31187
54317	520912.512	6680227.734	2205.181	-0.97291	0.74046	-58.80712
54318	521293.061	6680411.112	2202.632	-0.68585	0.01136	-59.13747
54319	521727.356	6680618.997	2206.566	-0.25086	0.79144	-59.63211
54320	522123.049	6680808.488	2203.548	-0.98181	0.48513	-58.26354
54321	522508.146	6680996.500	2205.616	-0.33556	0.06328	-58.41237
54322	522937.179	6681207.306	2205.813	-0.18015	1.49326	-58.17415
54323	523373.933	6681424.063	2203.076	-0.93001	-0.26745	-57.28283
54324	523795.310	6681639.509	2205.535	-1.79326	0.26156	-56.97951
54325	524247.042	6681874.764	2200.506	-0.07834	0.65784	-57.11650
54326	524619.302	6682069.072	2203.247	-0.00094	0.21737	-56.79049
54327	525057.414	6682298.069	2203.096	-0.86067	0.81460	-57.07154
54328	525500.665	6682531.195	2202.692	0.23526	0.23454	-56.95434
54329	525922.161	6682753.487	2204.810	-0.63795	0.58831	-56.48192
54330	526357.179	6682984.781	2202.521	-0.67916	0.38550	-56.53722
54331	526784.787	6683212.651	2205.478	0.41746	0.71821	-56.57866
54332	527198.960	6683432.079	2204.704	-0.45013	1.23320	-56.16855
54333	527614.275	6683651.449	2203.983	-0.44378	0.43897	-56.44664
54334	528007.384	6683858.170	2206.422	0.32906	1.28809	-56.39463
54335	528433.571	6684080.676	2203.247	-0.14343	1.53657	-56.36991
54336	528862.740	6684302.977	2203.228	-0.58874	0.30231	-57.05327
54337	529294.650	6684527.569	2203.377	-0.76831	0.98291	-56.78582
54338	529716.757	6684748.039	2200.341	0.05699	0.99101	-56.67297
54339	530159.414	6684976.285	2203.344	-0.27887	0.50876	-56.85984
54340	530581.912	6685192.782	2201.613	-0.29637	1.44678	-57.09563
54341	530965.450	6685386.973	2200.821	-0.05115	0.23195	-57.41662
54342	531369.709	6685590.692	2203.964	-0.70708	0.85993	-57.32494
54343	531746.386	6685781.999	2201.009	-0.74012	0.35473	-57.23677
54344	532177.146	6686002.494	2205.177	0.01888	0.71369	-57.50140
54345	532604.786	6686221.135	2203.485	-0.17344	1.53216	-57.20801
54346	533016.939	6686432.187	2203.571	-0.61883	-0.08576	-57.22626
54347	533380.916	6686619.881	2205.393	-0.44894	1.32646	-57.34550
54348	533811.728	6686842.476	2201.139	-0.55217	0.58809	-56.90123
54349	534236.182	6687062.767	2204.174	-0.95888	0.45824	-57.30049
54350	534668.436	6687287.662	2200.593	-0.01490	1.36282	-57.37652
54351	535028.887	6687473.662	2202.243	0.17914	0.44757	-57.36970

54352	535448.147	6687687.967	2204.229	-1.36031	0.87933	-57.56471
54353	535881.314	6687910.894	2202.034	-0.27719	0.91245	-57.28497
54354	536302.682	6688128.829	2204.553	-0.15101	1.08055	-57.03277
54355	536717.472	6688343.574	2202.043	-1.26566	1.05574	-56.91496
54356	537147.845	6688567.806	2200.988	-0.27054	0.58885	-57.17452
54357	537583.292	6688795.076	2203.988	-0.51036	1.14490	-56.66446

photo ID	px	py	pz	omega	phi	kappa
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54358	538010.554	6689018.298	2200.705	-0.92423	1.00396	-56.87445
54359	538434.144	6689240.069	2202.953	0.53418	0.94464	-56.67107
54360	538812.385	6689435.735	2202.744	-0.92365	1.33555	-56.93219
54361	539205.130	6689638.316	2201.254	0.19501	0.87793	-56.78755
54362	539612.867	6689845.369	2203.531	-0.26096	1.48914	-57.09472
54363	540004.144	6690041.653	2199.952	-0.47910	1.05512	-57.39303
54364	540424.414	6690252.305	2203.214	-0.38983	0.53149	-57.27868
54365	535258.179	6690843.992	2202.116	1.74266	-0.59316	113.01285
54366	534827.965	6690619.326	2199.869	0.92428	-0.55780	113.44598
54367	534405.786	6690394.965	2202.441	-0.18234	-0.67026	113.79783
54368	533984.127	6690173.071	2201.559	0.70138	-1.06332	113.34794
54369	533608.208	6689978.172	2199.802	0.40029	-0.38499	113.06714
54370	533176.832	6689755.530	2203.557	0.09088	-0.71768	113.25411
54371	532747.329	6689534.090	2201.567	0.91015	-0.55710	113.71613
54372	532353.041	6689328.457	2203.298	0.94917	0.10893	113.73860
54373	531930.986	6689104.958	2204.637	0.61012	-1.33383	114.15922
54374	531515.710	6688885.847	2202.019	0.73415	-0.29057	113.72560
54375	531082.435	6688657.726	2205.201	0.08950	-1.30810	113.54482
54376	530669.635	6688444.418	2201.707	0.36763	-0.52705	113.12231
54377	530247.768	6688228.871	2205.663	0.25969	-0.86480	112.81297
54378	529854.949	6688030.750	2201.876	0.72919	-1.01328	112.78072
54379	529438.652	6687821.645	2203.100	0.17195	-0.23406	112.83001
54380	529012.733	6687609.302	2203.874	0.32588	-1.24779	112.59238
54381	528587.995	6687399.509	2201.520	0.63486	-0.28301	112.73272
54382	528171.749	6687193.876	2205.651	0.78746	-0.62186	112.28980
54383	527772.660	6686997.219	2203.163	0.10847	-1.31788	112.29581
54384	527389.150	6686808.288	2204.320	0.78808	-0.02704	112.65628
54385	527025.485	6686627.829	2205.827	0.92351	-1.21844	112.43660
54386	526597.286	6686414.777	2202.118	0.16462	-0.82602	112.67238
54387	526181.779	6686209.644	2204.864	0.77263	-0.72212	112.28551
54388	525755.803	6685999.728	2202.354	1.02642	-1.00614	112.48824

54389	525382.629	6685814.022	2201.667	1.85259	-0.01420	112.74700
54390	524948.854	6685590.403	2205.730	1.60895	-0.37766	114.15472
54391	524524.067	6685365.325	2202.878	1.30594	-1.17920	114.15852
54392	524098.640	6685134.598	2203.896	-0.32686	-0.67883	114.63398
54393	523674.060	6684902.208	2204.244	1.07497	-1.43974	114.94887
54394	523236.603	6684662.420	2200.795	0.36238	-0.33878	114.93747
54395	522813.651	6684432.830	2204.725	-0.48244	-1.48531	115.07137
54396	522427.744	6684226.524	2202.836	-0.36516	-1.51868	114.97864
54397	522071.062	6684039.252	2205.264	0.21822	-0.44907	113.91904
54398	521665.559	6683827.684	2206.999	0.25997	-1.69444	113.49056
54399	521300.462	6683638.612	2202.905	0.34551	-1.14748	113.77396
54400	520901.753	6683432.420	2205.250	0.75053	-0.56021	113.51897
54401	520483.476	6683215.272	2203.830	0.14205	-1.96723	113.68544
54402	520108.143	6683023.276	2201.548	0.14118	-0.63773	113.30938
54403	519751.977	6682842.899	2204.335	-0.26212	-1.10599	113.43186
54404	519312.180	6682624.176	2202.595	0.57134	-1.23743	112.98586
54405	518856.659	6682398.578	2203.871	0.63348	-0.01512	113.36375
54406	518444.102	6682190.082	2206.432	1.05345	-1.17469	113.95561
54407	518078.141	6682001.614	2202.855	0.83625	-0.71912	114.28359
54408	517688.250	6681797.810	2204.973	-0.02284	-0.69740	114.35278
54409	517276.502	6681582.647	2203.355	0.90802	-1.08802	114.66138
54410	516859.981	6681363.343	2203.053	-0.29626	-0.64048	114.56914
54411	517650.096	6676850.766	2206.277	-2.90495	-1.24255	-58.67087
54412	518091.794	6677076.157	2206.660	-2.48772	1.02524	-56.08907
54413	518519.599	6677311.617	2202.019	-1.82986	-0.12712	-54.72646
54414	518901.639	6677530.218	2203.217	-0.08449	2.05466	-54.34976
54415	519321.520	6677767.098	2200.412	-0.19081	1.32493	-55.14940
54416	519754.914	6678004.145	2204.258	0.03933	1.00812	-56.40958
54417	520186.322	6678231.078	2203.148	0.56934	2.50816	-57.44913
54418	520637.307	6678459.194	2204.102	0.21299	0.50417	-57.65126
54419	521080.311	6678679.296	2204.492	-1.10684	1.65561	-58.02849
54420	521462.452	6678867.054	2201.665	-0.31666	0.52341	-58.33041
54421	521910.123	6679085.429	2204.804	-1.12161	1.21221	-58.40649
54422	522362.168	6679304.835	2199.748	-0.18867	1.23851	-58.85035
54423	522799.938	6679513.378	2202.824	-1.12651	0.31469	-59.26050
54424	523295.095	6679753.951	2201.012	-0.91971	1.37492	-58.48766
54425	523714.201	6679962.037	2201.454	-0.84255	0.32761	-57.46990
54426	524099.823	6680158.349	2203.367	-1.89447	0.37253	-57.00720
54427	524542.570	6680390.373	2199.646	-1.37520	0.61331	-56.45699

54428	524952.489	6680609.698	2201.119	0.28835	0.98433	-56.14161
54429	525375.794	6680835.446	2200.536	-0.93268	1.18635	-56.29407
54430	525809.602	6681066.572	2199.953	0.29828	0.75528	-56.67980
54431	526258.944	6681303.726	2203.527	-0.08241	0.98682	-56.11687
54432	526693.832	6681532.387	2201.222	-0.51514	1.06928	-56.57294
photo ID	px	py	pz	omega	phi	kappa
54433	527129.986	6681760.956	2203.773	-0.05532	0.51966	-56.61682
54434	527562.089	6681986.243	2204.009	-0.41955	1.59060	-56.77897
54435	527941.805	6682182.127	2202.252	-0.73924	0.40494	-57.03340
54436	528367.226	6682403.998	2205.930	-0.34578	1.05458	-56.58001
54437	528792.766	6682626.889	2202.244	-1.35604	1.00519	-56.54931
54438	529220.588	6682853.704	2203.692	0.25675	0.83913	-55.95721
54439	529623.769	6683066.153	2203.288	-0.88725	1.59904	-56.29191
54440	530057.027	6683293.443	2199.653	0.18727	0.85059	-56.29040
54441	530494.748	6683520.925	2203.135	-0.70382	1.01391	-56.52572
54442	530867.245	6683715.262	2198.825	0.20941	1.57571	-56.73785
54443	531304.669	6683941.032	2201.715	-0.45919	0.13600	-56.65979
54444	531736.086	6684165.032	2201.244	-0.34192	1.46169	-56.47916
54445	532098.582	6684351.142	2200.834	-0.16549	0.47117	-56.80138
54446	532486.098	6684549.422	2204.088	-0.61011	0.56402	-56.51916
54447	532867.267	6684745.668	2202.289	-0.42835	1.39818	-56.42067
54448	533302.724	6684968.242	2202.681	-0.32068	0.50362	-56.88913
54449	533726.437	6685184.110	2204.038	-0.78820	0.99431	-56.82339
54450	534150.582	6685402.164	2201.030	-0.66464	0.66830	-56.40754
54451	534569.981	6685619.530	2202.677	-0.43474	0.56915	-56.32562
54452	534988.640	6685837.706	2202.004	-0.30549	1.26632	-56.20967
54453	535410.743	6686055.489	2202.227	0.51784	0.91041	-56.56383
54454	535801.182	6686252.882	2203.730	-0.70370	1.02518	-57.11992
54455	536163.314	6686436.400	2201.721	-0.78734	0.59255	-56.81482
54456	536590.365	6686654.749	2204.570	-0.09724	0.87259	-56.73732
54457	537021.760	6686875.877	2201.796	-0.74709	1.09925	-56.54216
54458	537444.071	6687093.326	2202.750	-0.32895	0.44893	-56.66139
54459	537880.938	6687318.782	2203.311	-0.58171	1.15678	-56.58032
54460	538309.584	6687539.598	2200.348	-0.31731	0.76316	-56.69683
54461	538682.970	6687731.303	2202.950	-0.11057	0.58365	-56.69316
54462	539126.210	6687956.991	2202.927	-0.54249	1.41048	-57.18169
54463	539563.428	6688179.028	2202.331	0.10386	0.71158	-56.88188
54464	540000.826	6688400.978	2205.319	-1.11896	0.87028	-56.86070

54465	540427.438	6688618.413	2202.473	-0.01214	1.52165	-57.12105
54466	540804.421	6688808.314	2203.384	-0.80151	0.45180	-56.99268
54467	541236.301	6689027.329	2203.207	-0.74698	1.55163	-57.14318
54468	538668.135	6690885.900	2207.384	0.61290	-1.80512	112.24262
54469	538224.964	6690668.780	2202.827	0.94153	-0.60367	112.17414
54470	537796.742	6690457.444	2204.112	0.36444	-1.28052	112.08165
54471	537411.434	6690266.701	2199.337	1.29411	-0.74950	112.68488
54472	537016.486	6690067.238	2200.671	0.59941	-0.18940	112.85149
54473	536605.755	6689856.172	2200.324	1.06840	-0.88227	113.57444
54474	536200.187	6689643.539	2199.010	1.14883	0.18288	114.15640
54475	535807.883	6689434.122	2203.389	-0.31545	-0.89085	113.83444
54476	535454.814	6689247.844	2202.042	0.96138	-0.71009	113.75000
54477	535037.858	6689029.239	2204.225	-0.05143	-0.04128	112.98246
54478	534621.973	6688814.222	2205.972	0.42801	-1.10414	113.34145
54479	534200.897	6688597.876	2202.526	0.44171	-0.48129	113.16998
54480	533779.244	6688382.413	2206.585	0.56005	-0.64395	113.21606
54481	533358.568	6688168.151	2201.877	1.72328	-0.47806	112.94740
54482	532994.406	6687981.617	2203.950	-0.07386	-0.28360	112.77070
54483	532638.281	6687799.539	2204.956	0.90104	-1.06994	113.18772
54484	532214.149	6687581.675	2202.586	1.01693	-0.36579	113.13077
54485	531801.250	6687369.403	2205.541	-0.39144	-1.18899	112.85448
54486	531394.362	6687165.130	2202.460	0.99479	-1.14575	112.49262
54487	530978.171	6686958.129	2202.347	0.08812	-0.34801	112.01855
54488	530589.630	6686766.751	2205.621	1.19713	-0.86387	112.09750
54489	530181.805	6686564.178	2202.145	0.84067	-1.04942	112.19022
54490	529770.085	6686359.003	2203.546	0.32166	-0.54634	112.09833
54491	529350.047	6686150.906	2201.863	1.01281	-1.24470	111.80066
54492	528925.534	6685939.973	2200.464	0.78393	0.05658	112.25335
54493	528574.236	6685762.905	2203.446	0.61084	-0.83953	112.59060
54494	528163.320	6685556.459	2199.937	0.68708	-0.62785	112.28688
54495	527727.749	6685337.851	2204.551	0.09196	-0.35684	112.72673
54496	527299.550	6685124.361	2204.049	0.76667	-1.25853	112.41326
54497	526884.725	6684918.566	2204.402	0.29309	-0.07680	112.66860
54498	526535.582	6684745.370	2206.904	0.27158	-1.26901	112.40448
54499	526115.024	6684535.440	2202.845	0.58328	-0.46493	113.36065
54500	525698.988	6684321.581	2205.844	1.32052	-0.42335	113.97411
54501	525291.858	6684110.390	2202.791	1.35115	-0.87617	113.94429
54502	524859.176	6683885.536	2204.341	0.01448	-0.35460	114.00148
54503	524447.941	6683673.304	2205.385	1.13646	-1.01287	114.05541

54504	524015.190	6683449.651	2202.865	0.25508	-0.50242	113.93210
54505	523610.015	6683241.925	2205.276	0.63483	-0.89032	113.95235
54506	523255.852	6683060.420	2202.274	0.43908	-1.01330	113.99557
54507	522906.557	6682882.685	2204.232	0.14368	-0.17022	113.63217

photo ID	px	py	pz	omega	phi	kappa
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54508	522508.093	6682680.959	2205.543	0.83674	-1.15652	113.60287
54509	522098.432	6682473.527	2203.939	0.76574	-0.21391	113.52246
54510	521702.915	6682271.471	2207.411	1.14911	-0.70278	113.94663
54511	521289.213	6682055.898	2202.884	1.79945	-0.31158	114.53304
54512	520910.111	6681851.791	2206.552	0.63182	-0.50152	115.05169
54513	520499.434	6681628.447	2204.661	1.74139	-0.94048	115.49260
54514	520094.683	6681406.222	2204.726	0.83076	-0.15939	115.33956
54515	519693.278	6681186.754	2206.443	0.41385	-1.53648	115.57846
54516	519284.359	6680966.300	2202.606	-0.79291	-1.44779	115.20831
54517	518895.083	6680764.610	2205.428	0.11887	-0.64067	113.96568
54518	518482.391	6680558.598	2203.158	0.85803	-1.01141	112.91368
54519	518125.683	6680384.389	2204.605	-0.67295	-0.55290	112.42267
54520	517771.460	6680215.750	2205.761	1.08099	-1.14348	112.15980
54521	517339.051	6680010.797	2203.260	-0.61249	-0.76625	112.16334

Sigma naught : 0.8 [micron] = 0.2 [pixel in level 0]

DADOS AEROTRIANGULAÇÃO - GRAVATAÍ VIAMÃO

Active Block : complete Block

Number of photos : 758

Number of strips : 16

Photo scale : 1:39056

Mean terrain height [m] : 49

Automatic blunder detection : OFF

Use all adjusted points in project file
as control (absolute mode) : OFF

Control parameter for block adjustment :

Selfcalibration : ON

Number of selfcalibration parameters : 44

Write calibrated camera to project : OFF

GNSS-Mode : ON

Drift-Mode : ON

drift per strip : ON

drift for X,Y,Z : ON,ON,ON

enable shifts only : OFF

IMU-Mode : OFF

Earth's curvature correction : ON

Atmospheric correction : ON

Do not eliminate manual points : OFF

Do not eliminate GNSS : ON

Standard deviations (a-priori) :

Ground control (planimetry) [m]

Set	
0 (=default)	: 0.040
1	: 10000.000

Ground control (height) [m]

Set	
0 (=default)	: 0.138
1	: 10000.000

Automatic image points [mm]

Set	
0 (=default)	: 0.002

Image points of ground control and manual measurements [mm] : 0.002

GNSS X Y Z [m] : 0.100 0.100 0.100

Used Cameras in block:

1 PHASEONE_NEW_CALIBRATION
Distortion : Table

Tie Point Generator

created	79 observations for photo	51722
created	105 observations for photo	51723
created	129 observations for photo	51724
created	133 observations for photo	51725
created	145 observations for photo	51726
created	137 observations for photo	51727
created	130 observations for photo	51728
created	111 observations for photo	51729
created	145 observations for photo	51730
created	147 observations for photo	51731
created	143 observations for photo	51732
created	138 observations for photo	51733
created	151 observations for photo	51734
created	170 observations for photo	51735
created	173 observations for photo	51736
created	177 observations for photo	51737
created	127 observations for photo	51738
created	146 observations for photo	51739
created	120 observations for photo	51740
created	160 observations for photo	51741
created	180 observations for photo	51742
created	195 observations for photo	51743
created	173 observations for photo	51744
created	175 observations for photo	51745
created	175 observations for photo	51746
created	162 observations for photo	51747
created	146 observations for photo	51748
created	149 observations for photo	51749
created	145 observations for photo	51750
created	129 observations for photo	51751
created	147 observations for photo	51752
created	148 observations for photo	51753
created	167 observations for photo	51754

created	153 observations for photo	51755
created	123 observations for photo	51756
created	138 observations for photo	51757
created	143 observations for photo	51758
created	146 observations for photo	51759
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created	178 observations for photo	51762
created	152 observations for photo	51763
created	135 observations for photo	51764
created	155 observations for photo	51765
created	131 observations for photo	51766
created	153 observations for photo	51767
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created	161 observations for photo	51777
created	178 observations for photo	51778
created	185 observations for photo	51779
created	180 observations for photo	51780
created	145 observations for photo	51781
created	128 observations for photo	51782
created	135 observations for photo	51783
created	161 observations for photo	51784
created	170 observations for photo	51785
created	154 observations for photo	51786
created	157 observations for photo	51787
created	161 observations for photo	51788
created	201 observations for photo	51789
created	190 observations for photo	51790
created	202 observations for photo	51791
created	207 observations for photo	51792
created	205 observations for photo	51793

created	171 observations for photo	51794
created	163 observations for photo	51795
created	166 observations for photo	51796
created	194 observations for photo	51797
created	228 observations for photo	51798
created	227 observations for photo	51799
created	177 observations for photo	51800
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created	140 observations for photo	51803
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created	113 observations for photo	51819
created	163 observations for photo	51820
created	146 observations for photo	51821
created	145 observations for photo	51822
created	162 observations for photo	51823
created	198 observations for photo	51824
created	207 observations for photo	51825
created	195 observations for photo	51826
created	177 observations for photo	51827
created	161 observations for photo	51828
created	134 observations for photo	51829
created	77 observations for photo	51830
created	139 observations for photo	52765
created	186 observations for photo	52766

created	194 observations for photo	52767
created	189 observations for photo	52768
created	221 observations for photo	52769
created	227 observations for photo	52770
created	229 observations for photo	52771
created	243 observations for photo	52772
created	216 observations for photo	52773
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created	191 observations for photo	52778
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created	211 observations for photo	52787
created	206 observations for photo	52788
created	197 observations for photo	52789
created	167 observations for photo	52790
created	176 observations for photo	52791
created	183 observations for photo	52792
created	163 observations for photo	52793
created	177 observations for photo	52794
created	152 observations for photo	52795
created	146 observations for photo	52796
created	158 observations for photo	52797
created	159 observations for photo	52798
created	168 observations for photo	52799
created	149 observations for photo	52800
created	132 observations for photo	52801
created	73 observations for photo	52802
created	174 observations for photo	52804
created	231 observations for photo	52805
created	241 observations for photo	52806

created	217 observations for photo	52807
created	228 observations for photo	52808
created	211 observations for photo	52809
created	215 observations for photo	52810
created	194 observations for photo	52811
created	170 observations for photo	52812
created	184 observations for photo	52813
created	210 observations for photo	52814
created	248 observations for photo	52815
created	244 observations for photo	52816
created	223 observations for photo	52817
created	183 observations for photo	52818
created	202 observations for photo	52819
created	160 observations for photo	52820
created	168 observations for photo	52821
created	179 observations for photo	52822
created	179 observations for photo	52823
created	204 observations for photo	52824
created	227 observations for photo	52825
created	258 observations for photo	52826
created	243 observations for photo	52827
created	219 observations for photo	52828
created	212 observations for photo	52829
created	184 observations for photo	52830
created	227 observations for photo	52831
created	220 observations for photo	52832
created	242 observations for photo	52833
created	223 observations for photo	52834
created	222 observations for photo	52835
created	192 observations for photo	52836
created	214 observations for photo	52837
created	219 observations for photo	52838
created	178 observations for photo	52839
created	135 observations for photo	52840
created	163 observations for photo	52841
created	232 observations for photo	52842
created	282 observations for photo	52843
created	257 observations for photo	52844
created	303 observations for photo	52845

created	291 observations for photo	52846
created	259 observations for photo	52847
created	273 observations for photo	52848
created	257 observations for photo	52849
created	272 observations for photo	52850
created	267 observations for photo	52851
created	275 observations for photo	52852
created	231 observations for photo	52853
created	205 observations for photo	52854
created	197 observations for photo	52855
created	198 observations for photo	52856
created	208 observations for photo	52857
created	204 observations for photo	52858
created	190 observations for photo	52859
created	205 observations for photo	52860
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created	267 observations for photo	52862
created	276 observations for photo	52863
created	265 observations for photo	52864
created	271 observations for photo	52865
created	224 observations for photo	52866
created	215 observations for photo	52867
created	209 observations for photo	52868
created	238 observations for photo	52869
created	205 observations for photo	52870
created	174 observations for photo	52871
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created	100 observations for photo	52873
created	145 observations for photo	52874
created	188 observations for photo	52875
created	152 observations for photo	52876
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created	47 observations for photo	52878
created	4 observations for photo	52879
created	128 observations for photo	52880
created	170 observations for photo	52881
created	197 observations for photo	52882
created	187 observations for photo	52883
created	167 observations for photo	52884

created	154 observations for photo	52885
created	127 observations for photo	52886
created	128 observations for photo	52887
created	166 observations for photo	52888
created	179 observations for photo	52889
created	212 observations for photo	52890
created	223 observations for photo	52891
created	230 observations for photo	52892
created	229 observations for photo	52893
created	211 observations for photo	52894
created	200 observations for photo	52895
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created	242 observations for photo	52914
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created	207 observations for photo	52916
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created	182 observations for photo	52918
created	211 observations for photo	52919
created	233 observations for photo	52920
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created	231 observations for photo	52922
created	215 observations for photo	52923

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created	234 observations for photo	52926
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created	179 observations for photo	52932
created	170 observations for photo	52933
created	170 observations for photo	52934
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created	189 observations for photo	52936
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created	178 observations for photo	52938
created	189 observations for photo	52939
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created	186 observations for photo	52944
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created	223 observations for photo	52954
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created	99 observations for photo	52957
created	96 observations for photo	52958
created	174 observations for photo	52959
created	220 observations for photo	52960
created	212 observations for photo	52961
created	213 observations for photo	52962

created	209 observations for photo	52963
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created	185 observations for photo	52965
created	212 observations for photo	52966
created	224 observations for photo	52967
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created	244 observations for photo	52969
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created	255 observations for photo	52986
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created	241 observations for photo	52988
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created	229 observations for photo	52996
created	278 observations for photo	52997
created	292 observations for photo	52998
created	278 observations for photo	52999
created	259 observations for photo	53000
created	240 observations for photo	53001

created	274 observations for photo	53002
created	290 observations for photo	53003
created	311 observations for photo	53004
created	240 observations for photo	53005
created	289 observations for photo	53006
created	233 observations for photo	53007
created	229 observations for photo	53008
created	235 observations for photo	53009
created	231 observations for photo	53010
created	245 observations for photo	53011
created	294 observations for photo	53012
created	348 observations for photo	53013
created	363 observations for photo	53014
created	348 observations for photo	53015
created	296 observations for photo	53016
created	214 observations for photo	53017
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created	175 observations for photo	53035
created	165 observations for photo	53036
created	166 observations for photo	53037
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created	166 observations for photo	53039
created	134 observations for photo	53040

created	125 observations for photo	53041
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created	177 observations for photo	53043
created	187 observations for photo	53044
created	150 observations for photo	53045
created	124 observations for photo	53046
created	121 observations for photo	54149
created	214 observations for photo	54150
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created	254 observations for photo	54153
created	236 observations for photo	54154
created	253 observations for photo	54155
created	278 observations for photo	54156
created	271 observations for photo	54157
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created	308 observations for photo	54162
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created	275 observations for photo	54174
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created	250 observations for photo	54176
created	241 observations for photo	54177
created	236 observations for photo	54178
created	207 observations for photo	54179
created	198 observations for photo	54180
created	236 observations for photo	54181

created	252 observations for photo	54182
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created	270 observations for photo	54184
created	251 observations for photo	54185
created	203 observations for photo	54186
created	226 observations for photo	54187
created	290 observations for photo	54188
created	379 observations for photo	54189
created	376 observations for photo	54190
created	374 observations for photo	54191
created	293 observations for photo	54192
created	275 observations for photo	54193
created	232 observations for photo	54194
created	169 observations for photo	54195
created	108 observations for photo	54196
created	132 observations for photo	54197
created	145 observations for photo	54198
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created	191 observations for photo	54200
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created	212 observations for photo	54202
created	214 observations for photo	54203
created	241 observations for photo	54204
created	191 observations for photo	54205
created	233 observations for photo	54206
created	234 observations for photo	54207
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created	219 observations for photo	54210
created	193 observations for photo	54211
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created	220 observations for photo	54215
created	196 observations for photo	54216
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created	189 observations for photo	54219
created	170 observations for photo	54220

created	217 observations for photo	54221
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created	232 observations for photo	54223
created	183 observations for photo	54224
created	177 observations for photo	54225
created	163 observations for photo	54226
created	177 observations for photo	54227
created	174 observations for photo	54228
created	184 observations for photo	54229
created	197 observations for photo	54230
created	193 observations for photo	54231
created	196 observations for photo	54232
created	210 observations for photo	54233
created	233 observations for photo	54234
created	265 observations for photo	54235
created	249 observations for photo	54236
created	253 observations for photo	54237
created	236 observations for photo	54238
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created	218 observations for photo	54241
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created	213 observations for photo	54247
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created	182 observations for photo	54251
created	199 observations for photo	54252
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created	152 observations for photo	54254
created	164 observations for photo	53989
created	240 observations for photo	53990
created	250 observations for photo	53991
created	244 observations for photo	53992
created	251 observations for photo	53993

created	220 observations for photo	53994
created	191 observations for photo	53995
created	170 observations for photo	53996
created	190 observations for photo	53997
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created	234 observations for photo	53999
created	191 observations for photo	54000
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created	209 observations for photo	54004
created	208 observations for photo	54005
created	242 observations for photo	54006
created	218 observations for photo	54007
created	163 observations for photo	54008
created	184 observations for photo	54009
created	172 observations for photo	54010
created	214 observations for photo	54011
created	208 observations for photo	54012
created	248 observations for photo	54013
created	233 observations for photo	54014
created	255 observations for photo	54015
created	236 observations for photo	54016
created	223 observations for photo	54017
created	199 observations for photo	54018
created	200 observations for photo	54019
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created	227 observations for photo	54023
created	250 observations for photo	54024
created	218 observations for photo	54025
created	209 observations for photo	54026
created	177 observations for photo	54027
created	205 observations for photo	54028
created	209 observations for photo	54029
created	224 observations for photo	54030
created	215 observations for photo	54031
created	232 observations for photo	54032

created	191 observations for photo	54033
created	172 observations for photo	54034
created	185 observations for photo	54035
created	203 observations for photo	54036
created	244 observations for photo	54037
created	227 observations for photo	54038
created	197 observations for photo	54039
created	183 observations for photo	54040
created	166 observations for photo	54041
created	150 observations for photo	54042
created	110 observations for photo	54043
created	125 observations for photo	54044
created	108 observations for photo	54045
created	65 observations for photo	54046
created	107 observations for photo	54255
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created	283 observations for photo	54257
created	295 observations for photo	54258
created	290 observations for photo	54259
created	241 observations for photo	54260
created	237 observations for photo	54261
created	270 observations for photo	54262
created	313 observations for photo	54263
created	270 observations for photo	54264
created	285 observations for photo	54265
created	238 observations for photo	54266
created	265 observations for photo	54267
created	244 observations for photo	54268
created	230 observations for photo	54269
created	210 observations for photo	54270
created	210 observations for photo	54271
created	219 observations for photo	54272
created	278 observations for photo	54273
created	305 observations for photo	54274
created	301 observations for photo	54275
created	245 observations for photo	54276
created	227 observations for photo	54277
created	260 observations for photo	54278
created	266 observations for photo	54279

created	244 observations for photo	54280
created	258 observations for photo	54281
created	270 observations for photo	54282
created	260 observations for photo	54283
created	210 observations for photo	54284
created	214 observations for photo	54285
created	265 observations for photo	54286
created	287 observations for photo	54287
created	281 observations for photo	54288
created	271 observations for photo	54289
created	265 observations for photo	54290
created	268 observations for photo	54291
created	273 observations for photo	54292
created	294 observations for photo	54293
created	314 observations for photo	54294
created	285 observations for photo	54295
created	302 observations for photo	54296
created	255 observations for photo	54297
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created	222 observations for photo	54301
created	207 observations for photo	54302
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created	207 observations for photo	54304
created	231 observations for photo	54305
created	207 observations for photo	54306
created	220 observations for photo	54307
created	166 observations for photo	54308
created	108 observations for photo	54309
created	103 observations for photo	54047
created	152 observations for photo	54048
created	191 observations for photo	54049
created	177 observations for photo	54050
created	173 observations for photo	54051
created	202 observations for photo	54052
created	229 observations for photo	54053
created	236 observations for photo	54054
created	205 observations for photo	54055

created	199 observations for photo	54056
created	237 observations for photo	54057
created	217 observations for photo	54058
created	210 observations for photo	54059
created	219 observations for photo	54060
created	196 observations for photo	54061
created	244 observations for photo	54062
created	233 observations for photo	54063
created	225 observations for photo	54064
created	220 observations for photo	54065
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created	337 observations for photo	54074
created	317 observations for photo	54075
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created	172 observations for photo	54077
created	199 observations for photo	54078
created	168 observations for photo	54079
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created	216 observations for photo	54083
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created	270 observations for photo	54086
created	276 observations for photo	54087
created	273 observations for photo	54088
created	240 observations for photo	54089
created	248 observations for photo	54090
created	203 observations for photo	54091
created	191 observations for photo	54092
created	132 observations for photo	54093
created	111 observations for photo	54094

created	226 observations for photo	54095
created	242 observations for photo	54096
created	236 observations for photo	54097
created	208 observations for photo	54098
created	216 observations for photo	54099
created	206 observations for photo	54100
created	203 observations for photo	54101
created	183 observations for photo	54102
created	201 observations for photo	54103
created	191 observations for photo	54104
created	204 observations for photo	54105
created	189 observations for photo	54106
created	174 observations for photo	54107
created	161 observations for photo	54108
created	158 observations for photo	54109
created	181 observations for photo	54110
created	192 observations for photo	54111
created	190 observations for photo	54112
created	156 observations for photo	54113
created	159 observations for photo	54114
created	177 observations for photo	54115
created	179 observations for photo	54116
created	207 observations for photo	54117
created	190 observations for photo	54118
created	195 observations for photo	54119
created	215 observations for photo	54120
created	199 observations for photo	54121
created	164 observations for photo	54122
created	143 observations for photo	54123
created	139 observations for photo	54124
created	164 observations for photo	54125
created	147 observations for photo	54126
created	151 observations for photo	54127
created	138 observations for photo	54128
created	210 observations for photo	54129
created	226 observations for photo	54130
created	218 observations for photo	54131
created	179 observations for photo	54132
created	177 observations for photo	54133

created	177 observations for photo	54134
created	196 observations for photo	54135
created	171 observations for photo	54136
created	191 observations for photo	54137
created	175 observations for photo	54138
created	167 observations for photo	54139
created	177 observations for photo	54140
created	202 observations for photo	54141
created	219 observations for photo	54142
created	223 observations for photo	54143
created	228 observations for photo	54144
created	188 observations for photo	54145
created	164 observations for photo	54146
created	118 observations for photo	54147
created	77 observations for photo	54148
created	176 observations for photo	54522
created	153 observations for photo	54523
created	181 observations for photo	54524
created	192 observations for photo	54525
created	195 observations for photo	54526
created	211 observations for photo	54527
created	219 observations for photo	54528
created	228 observations for photo	54529
created	196 observations for photo	54530
created	194 observations for photo	54531
created	167 observations for photo	54532
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created	262 observations for photo	54536
created	233 observations for photo	54537
created	260 observations for photo	54538
created	240 observations for photo	54539
created	275 observations for photo	54540
created	267 observations for photo	54541
created	272 observations for photo	54542
created	254 observations for photo	54543
created	252 observations for photo	54544
created	236 observations for photo	54545

created	233 observations for photo	54546
created	236 observations for photo	54547
created	251 observations for photo	54548
created	267 observations for photo	54549
created	236 observations for photo	54550
created	253 observations for photo	54551
created	245 observations for photo	54552
created	258 observations for photo	54553
created	235 observations for photo	54554
created	193 observations for photo	54555
created	186 observations for photo	54556
created	203 observations for photo	54557
created	215 observations for photo	54558
created	211 observations for photo	54559
created	190 observations for photo	54560
created	177 observations for photo	54561
created	178 observations for photo	54562
created	186 observations for photo	54563
created	201 observations for photo	54564
created	176 observations for photo	54565
created	177 observations for photo	54566
created	140 observations for photo	54567
created	85 observations for photo	54568

total of 156159 measurements in 758 photos are used for adjustment (total 758 photos)

sigma naught	0.8 micron (17:22:38)
sigma naught	0.8 micron (17:22:47)

found	3623 points connecting	2 photos
found	10250 points connecting	3 photos
found	6874 points connecting	4 photos
found	2584 points connecting	5 photos
found	4696 points connecting	6 photos
found	4710 points connecting	7 photos

found	1324 points connecting	8 photos
found	274 points connecting	9 photos
found	185 points connecting	10 photos
found	100 points connecting	11 photos
found	26 points connecting	12 photos
found	15 points connecting	13 photos
found	4 points connecting	14 photos
found	2 points connecting	15 photos

number of observations	314799
number of unknowns	108689
redundancy	206110

additional selfcalibration parameters - camera 1

parameter number	value	standardized residual	lower bound of determinability
1	-0.3	-19.5	0.1
2	-1.1	-82.9	0.1
3	-0.1	-11.7	0.0
4	0.2	21.7	0.0
5	-0.3	-25.1	0.0
6	-0.0	-0.9	0.1
7	0.7	63.4	0.0
8	-1.3	-132.4	0.0
9	1.1	100.6	0.0
10	0.0	0.6	0.0
11	0.0	0.6	0.0
12	-0.0	-3.0	0.1
13	-1.3	-111.2	0.0
14	0.5	81.1	0.0
15	0.1	9.5	0.0

16	-0.5	-65.1	0.0
17	0.1	7.4	0.1
18	-0.2	-34.2	0.0
19	0.0	1.8	0.0
20	-0.0	-0.1	0.0
21	0.1	9.8	0.0
22	-0.3	-18.2	0.1
23	0.0	3.9	0.0
24	-0.1	-9.4	0.0
25	0.0	1.2	0.0
26	1.0	99.1	0.0
27	-0.0	-2.6	0.0
28	0.5	50.2	0.0
29	0.7	64.7	0.0
30	0.0	1.0	0.0
31	0.3	32.6	0.0
32	-0.0	-1.0	0.0
33	-0.1	-6.1	0.0
34	-0.0	-7.6	0.0
35	-0.0	-4.4	0.0
36	-0.0	-1.2	0.0
37	-0.0	-3.5	0.0
38	0.0	0.4	0.0
39	-0.0	-0.5	0.0
40	0.3	34.2	0.0
41	0.3	50.9	0.0
42	0.0	0.1	0.0
43	-0.0	-3.0	0.0
44	-0.0	-2.9	0.0

corrections on 25 grid points in micron

-3.16	0.80	0.70	-0.72	-0.48
2.15	1.49	1.55	-0.80	-1.84
-0.27	0.03	0.26	-0.49	-2.02
-0.75	-0.03	0.09	-0.35	-0.99

0.73	0.23	0.02	-0.61	-1.31
-0.67	-0.37	-0.10	0.14	0.33
1.94	0.79	-0.27	-0.97	-0.08
0.67	0.31	0.27	0.37	0.40
0.08	1.90	-0.46	-1.40	4.75
0.99	1.29	-0.35	-0.60	-3.22

RMS automatic points in photo (number: 155729)

x 0.6 micron
y 0.6 micron

RMS control and manual points in photo (number: 430)

x 1.0 micron
y 0.7 micron

RMS control points with default standard deviation set (number: 69)

x 0.009 [meter]
y 0.009 [meter]

RMS control points with default standard deviation set (number: 69)

z 0.042 [meter]

RMS GNSS observations (number: 758)

x 0.032 [meter]
y 0.031 [meter]
z 0.038 [meter]

sigma naught 0.8 micron (17:23:01)

standard deviations of exterior orientation parameters (px, py, pz in [meter] omega,phi,kappa in [deg/1000])

photo ID	px	py	pz	omega	phi	kappa
51722	0.047	0.137	0.069	3.45802	4.11367	3.10915
51723	0.045	0.134	0.065	3.32592	3.93668	2.54465
51724	0.043	0.131	0.062	3.22206	3.78738	2.04365
51725	0.041	0.127	0.059	3.07188	3.70378	1.82165
51726	0.041	0.124	0.057	2.98554	3.61834	1.55437
51727	0.040	0.120	0.055	2.90969	3.53724	1.36088
51728	0.039	0.118	0.054	2.84831	3.50211	1.27479
51729	0.040	0.116	0.052	2.86401	3.46021	1.19486
51730	0.037	0.113	0.051	2.79349	3.34356	1.12645
51731	0.038	0.111	0.049	2.75937	3.31335	1.12601
51732	0.039	0.108	0.048	2.70906	3.23438	1.07708
51733	0.037	0.105	0.047	2.65065	3.13629	1.08697
51734	0.038	0.103	0.046	2.60731	3.07292	1.05133
51735	0.037	0.100	0.045	2.51157	3.01589	1.01939
51736	0.037	0.099	0.044	2.47830	2.92992	0.96279
51737	0.037	0.097	0.043	2.45478	2.85302	0.99848
51738	0.037	0.095	0.042	2.38053	2.80410	1.14370
51739	0.038	0.093	0.041	2.32919	2.73956	1.02366
51740	0.038	0.092	0.041	2.34580	2.72859	0.99504
51741	0.036	0.090	0.039	2.26569	2.63039	0.97376
51742	0.035	0.088	0.038	2.24562	2.58203	0.93888
51743	0.035	0.087	0.037	2.23433	2.53022	0.95406
51744	0.035	0.086	0.037	2.23762	2.48405	0.94831
51745	0.034	0.084	0.036	2.25409	2.39995	0.95880
51746	0.034	0.083	0.036	2.19478	2.41703	0.99002
51747	0.035	0.083	0.036	2.16015	2.46149	0.99085
51748	0.035	0.082	0.036	2.12793	2.43413	1.03769
51749	0.035	0.082	0.036	2.14748	2.41018	0.97704
51750	0.035	0.082	0.036	2.16461	2.42428	1.02971
51751	0.036	0.083	0.036	2.21589	2.44795	1.11277
51752	0.035	0.083	0.035	2.20605	2.43071	1.07503
51753	0.035	0.083	0.036	2.20192	2.46229	1.05030
51754	0.035	0.083	0.036	2.20796	2.42703	0.98308
51755	0.035	0.084	0.037	2.30233	2.40575	1.05220

51756	0.036	0.085	0.038	2.34018	2.46607	1.03591
51757	0.036	0.086	0.039	2.33600	2.48871	1.16544
51758	0.035	0.087	0.040	2.33017	2.53508	1.02932
51759	0.037	0.089	0.041	2.40311	2.57368	1.09344
51760	0.034	0.089	0.041	2.39578	2.52286	0.95998
51761	0.033	0.090	0.042	2.37430	2.56575	1.01547
51762	0.036	0.092	0.043	2.43236	2.67891	0.97686
51763	0.035	0.094	0.044	2.41389	2.71338	0.96347
51764	0.036	0.097	0.046	2.57128	2.76401	1.06415
51765	0.036	0.100	0.047	2.60586	2.85835	1.03739
51766	0.037	0.101	0.048	2.68003	2.90717	1.09131
51767	0.036	0.103	0.049	2.68047	2.92534	1.02774
51768	0.038	0.107	0.050	2.78278	3.03881	1.07290
51769	0.037	0.109	0.051	2.85981	3.01168	0.94632
51770	0.037	0.111	0.053	2.88182	3.13023	1.01433
51771	0.038	0.114	0.054	2.98112	3.20273	1.07914
51772	0.038	0.116	0.056	3.00463	3.24673	1.17877
51773	0.040	0.120	0.058	3.15893	3.32550	1.52417
51774	0.043	0.124	0.061	3.24105	3.48009	2.02023
51775	0.042	0.076	0.044	2.24833	2.24090	2.78663
51776	0.040	0.073	0.040	2.04794	2.06309	2.00808
51777	0.038	0.071	0.037	1.96724	1.92073	1.43699
51778	0.036	0.068	0.035	1.84100	1.78496	0.99140
51779	0.035	0.066	0.033	1.79432	1.76130	0.77902
51780	0.036	0.065	0.032	1.74776	1.79187	0.66090
51781	0.034	0.063	0.031	1.72977	1.72884	0.61725
51782	0.035	0.062	0.031	1.68839	1.76221	0.56785
51783	0.036	0.061	0.031	1.68832	1.75108	0.54707
51784	0.033	0.059	0.029	1.60092	1.69735	0.49240
51785	0.034	0.058	0.029	1.59997	1.70322	0.49239
51786	0.033	0.056	0.028	1.55237	1.64391	0.48453
51787	0.033	0.055	0.027	1.46440	1.69079	0.47056
51788	0.034	0.054	0.027	1.51504	1.64978	0.49609
51789	0.032	0.052	0.026	1.49210	1.49891	0.43757
51790	0.033	0.053	0.025	1.52813	1.50118	0.44671
51791	0.033	0.049	0.024	1.44612	1.47837	0.44696
51792	0.032	0.048	0.024	1.39913	1.44310	0.42864
51793	0.031	0.047	0.023	1.35329	1.39430	0.39683
51794	0.032	0.048	0.023	1.36707	1.43763	0.42704

51795	0.032	0.048	0.023	1.40027	1.42710	0.46235
photo ID	px	py	pz	omega	phi	kappa
51796	0.032	0.047	0.022	1.31871	1.44298	0.45275
51797	0.033	0.047	0.022	1.36687	1.45725	0.46784
51798	0.032	0.046	0.022	1.38778	1.41575	0.46622
51799	0.031	0.045	0.022	1.34540	1.38051	0.44931
51800	0.033	0.046	0.022	1.39495	1.41355	0.51160
51801	0.033	0.045	0.022	1.38874	1.41235	0.49201
51802	0.031	0.045	0.021	1.38823	1.30891	0.45574
51803	0.033	0.045	0.021	1.40542	1.38619	0.48561
51804	0.033	0.046	0.022	1.36309	1.44462	0.47657
51805	0.033	0.045	0.022	1.31962	1.43156	0.46376
51806	0.032	0.047	0.022	1.37776	1.37513	0.48215
51807	0.033	0.047	0.023	1.41718	1.42285	0.48235
51808	0.035	0.049	0.023	1.49248	1.43772	0.52880
51809	0.033	0.047	0.023	1.35079	1.45279	0.47986
51810	0.033	0.048	0.024	1.39029	1.47111	0.47371
51811	0.034	0.050	0.024	1.45091	1.46644	0.49207
51812	0.033	0.050	0.024	1.44036	1.48223	0.49849
51813	0.033	0.050	0.025	1.44520	1.46669	0.47600
51814	0.034	0.052	0.026	1.52477	1.52377	0.51096
51815	0.032	0.053	0.026	1.50240	1.52122	0.50913
51816	0.034	0.054	0.027	1.55916	1.58124	0.53915
51817	0.034	0.057	0.028	1.66068	1.60845	0.61692
51818	0.034	0.057	0.029	1.62247	1.65402	0.65212
51819	0.035	0.059	0.030	1.64477	1.77659	0.63813
51820	0.034	0.059	0.030	1.64939	1.75896	0.57268
51821	0.035	0.062	0.030	1.77687	1.74326	0.59109
51822	0.033	0.063	0.031	1.74745	1.78620	0.57145
51823	0.035	0.064	0.032	1.73225	1.87911	0.58815
51824	0.035	0.065	0.033	1.79110	1.86831	0.57998
51825	0.034	0.066	0.033	1.80901	1.86939	0.59653
51826	0.033	0.068	0.034	1.83136	1.92880	0.62310
51827	0.035	0.070	0.035	1.85300	2.03604	0.76439
51828	0.037	0.072	0.036	1.99338	2.09861	0.95792
51829	0.038	0.074	0.039	2.03733	2.14596	1.23424
51830	0.041	0.077	0.042	2.14229	2.30206	1.65266
52765	0.069	0.074	0.057	1.53419	2.37997	1.16235

52766	0.066	0.069	0.054	1.37341	2.30275	0.94996
52767	0.063	0.068	0.051	1.32749	2.18495	0.79628
52768	0.061	0.065	0.049	1.27280	2.13817	0.70331
52769	0.058	0.064	0.047	1.22783	2.06863	0.62356
52770	0.057	0.061	0.045	1.19460	2.01218	0.56054
52771	0.054	0.060	0.043	1.20722	1.93018	0.53266
52772	0.052	0.059	0.042	1.17669	1.88501	0.50328
52773	0.051	0.056	0.040	1.13127	1.83478	0.47887
52774	0.051	0.056	0.038	1.14540	1.79920	0.46430
52775	0.048	0.053	0.037	1.09093	1.70818	0.44247
52776	0.049	0.052	0.036	1.07562	1.68877	0.44978
52777	0.048	0.051	0.034	1.08053	1.64597	0.46245
52778	0.047	0.049	0.033	1.02187	1.61290	0.47305
52779	0.047	0.048	0.032	1.01126	1.60617	0.49064
52780	0.045	0.049	0.031	1.05694	1.56455	0.46640
52781	0.045	0.050	0.031	1.08375	1.55850	0.45499
52782	0.044	0.048	0.030	1.08056	1.52456	0.47312
52783	0.045	0.047	0.029	1.04754	1.53647	0.48666
52784	0.044	0.048	0.029	1.04670	1.53516	0.49387
52785	0.044	0.050	0.029	1.12997	1.55458	0.47613
52786	0.043	0.049	0.028	1.08758	1.54786	0.49978
52787	0.044	0.049	0.028	1.06967	1.56364	0.50092
52788	0.044	0.049	0.028	1.06773	1.57392	0.48215
52789	0.044	0.050	0.028	1.09397	1.59055	0.46470
52790	0.045	0.053	0.029	1.18036	1.64450	0.46904
52791	0.045	0.053	0.030	1.16126	1.60552	0.46997
52792	0.045	0.054	0.031	1.20038	1.62745	0.48518
52793	0.047	0.055	0.033	1.21615	1.68993	0.51170
52794	0.049	0.056	0.033	1.22052	1.71881	0.56117
52795	0.052	0.058	0.035	1.23463	1.83638	0.56193
52796	0.052	0.060	0.036	1.25875	1.85698	0.59962
52797	0.054	0.062	0.037	1.28964	1.92481	0.56170
52798	0.053	0.064	0.038	1.34604	1.94282	0.60823
52799	0.053	0.066	0.040	1.39226	1.94810	0.66655
52800	0.056	0.070	0.043	1.48370	2.05574	0.81676
52801	0.059	0.071	0.046	1.51558	2.11367	1.01287
52802	0.062	0.074	0.050	1.65310	2.22524	1.39532
52804	0.051	0.054	0.038	1.25852	1.67652	0.73342
52805	0.045	0.049	0.035	1.08246	1.54114	0.51265

photo ID	px	py	pz	omega	phi	kappa
52806	0.043	0.050	0.034	1.11378	1.52757	0.40660
52807	0.042	0.047	0.032	1.04871	1.46033	0.33938
52808	0.041	0.045	0.030	0.99235	1.43151	0.30075
52809	0.040	0.043	0.029	0.96441	1.38672	0.28294
52810	0.040	0.042	0.028	0.97160	1.36121	0.27080
52811	0.039	0.042	0.027	0.98184	1.33207	0.26660
52812	0.039	0.040	0.026	0.93187	1.30954	0.25702
52813	0.037	0.040	0.025	0.95093	1.25731	0.25259
52814	0.036	0.039	0.024	0.93273	1.20319	0.23808
52815	0.034	0.039	0.023	0.94861	1.14618	0.22996
52816	0.035	0.039	0.023	0.98265	1.13712	0.23919
52817	0.036	0.037	0.023	0.91635	1.16390	0.24341
52818	0.037	0.037	0.022	0.94195	1.17311	0.26536
52819	0.035	0.038	0.022	0.96971	1.12266	0.25678
52820	0.035	0.038	0.022	0.98024	1.09651	0.25823
52821	0.037	0.036	0.022	0.91834	1.15086	0.26845
52822	0.035	0.036	0.022	0.91350	1.12570	0.25736
52823	0.037	0.037	0.022	0.94202	1.16425	0.26736
52824	0.037	0.036	0.022	0.88143	1.17275	0.24693
52825	0.035	0.036	0.022	0.87018	1.13284	0.23769
52826	0.036	0.037	0.023	0.89101	1.16444	0.23738
52827	0.036	0.039	0.024	0.92321	1.17549	0.25094
52828	0.036	0.040	0.025	0.97893	1.17810	0.26099
52829	0.037	0.040	0.025	0.92561	1.23072	0.24482
52830	0.039	0.042	0.027	0.97712	1.28946	0.25625
52831	0.039	0.039	0.027	0.88216	1.26310	0.22203
52832	0.039	0.041	0.028	0.93326	1.27086	0.23279
52833	0.041	0.042	0.029	0.93834	1.33673	0.23745
52834	0.039	0.044	0.030	0.96382	1.33596	0.24799
52835	0.042	0.045	0.031	0.96487	1.40459	0.27729
52836	0.045	0.047	0.033	1.01386	1.49400	0.32117
52837	0.046	0.048	0.034	1.00804	1.53920	0.36441
52838	0.046	0.047	0.036	0.98538	1.54863	0.44786
52839	0.050	0.052	0.038	1.13366	1.65764	0.64949
52840	0.053	0.055	0.041	1.22903	1.72483	0.87929
52841	0.053	0.057	0.044	1.26815	1.74172	0.86880
52842	0.049	0.052	0.041	1.09642	1.62659	0.62907

52843	0.046	0.050	0.039	1.03716	1.57838	0.49315
52844	0.045	0.051	0.038	1.09706	1.54963	0.41944
52845	0.043	0.047	0.036	0.97532	1.48679	0.35206
52846	0.042	0.047	0.035	0.98388	1.47269	0.31945
52847	0.041	0.047	0.033	1.03003	1.41681	0.30216
52848	0.039	0.046	0.032	1.01602	1.37968	0.28148
52849	0.039	0.044	0.031	0.96610	1.34038	0.26511
52850	0.038	0.042	0.029	0.90853	1.31826	0.25801
52851	0.037	0.042	0.028	0.96579	1.26026	0.26447
52852	0.036	0.041	0.027	0.92756	1.23465	0.25959
52853	0.037	0.041	0.026	0.93397	1.22903	0.26645
52854	0.037	0.039	0.025	0.89748	1.21199	0.26762
52855	0.036	0.038	0.024	0.90239	1.17133	0.27041
52856	0.036	0.038	0.023	0.91617	1.17045	0.27155
52857	0.034	0.039	0.023	0.94420	1.11254	0.26392
52858	0.035	0.039	0.022	0.94142	1.12290	0.26509
52859	0.034	0.038	0.022	0.93246	1.10454	0.26944
52860	0.033	0.037	0.022	0.89062	1.07931	0.25607
52861	0.035	0.036	0.021	0.85598	1.12169	0.24991
52862	0.033	0.036	0.021	0.86337	1.09579	0.25058
52863	0.032	0.037	0.021	0.87082	1.08979	0.24632
52864	0.033	0.038	0.022	0.90288	1.12290	0.25169
52865	0.033	0.037	0.022	0.88216	1.11933	0.24619
52866	0.035	0.038	0.023	0.91267	1.19861	0.26213
52867	0.036	0.041	0.024	1.00925	1.21448	0.27302
52868	0.038	0.042	0.025	0.98999	1.28192	0.28634
52869	0.039	0.042	0.026	0.97490	1.31654	0.27951
52870	0.039	0.045	0.027	1.08160	1.34774	0.31099
52871	0.042	0.045	0.029	1.04986	1.43368	0.34949
52872	0.046	0.049	0.030	1.15582	1.54472	0.38558
52873	0.045	0.049	0.031	1.11376	1.54476	0.38784
52874	0.044	0.052	0.033	1.23804	1.51267	0.41374
52875	0.044	0.052	0.034	1.19120	1.52785	0.45529
52876	0.047	0.054	0.036	1.25198	1.61251	0.59055
52877	0.048	0.058	0.039	1.38983	1.63992	0.74461
52878	0.054	0.061	0.043	1.46944	1.77525	1.04454
52879	0.057	0.065	0.053	1.61095	1.77226	1.52609
52880	0.049	0.057	0.038	1.34170	1.64236	0.89094

photo ID	px	py	pz	omega	phi	kappa
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52881	0.047	0.053	0.036	1.18210	1.59796	0.60815
52882	0.044	0.051	0.034	1.15348	1.52676	0.45911
52883	0.044	0.048	0.033	1.05739	1.51524	0.36611
52884	0.044	0.046	0.032	1.01129	1.50911	0.33161
52885	0.043	0.047	0.031	1.08017	1.47339	0.32398
52886	0.042	0.048	0.030	1.11648	1.44140	0.33287
52887	0.040	0.047	0.029	1.09441	1.37993	0.32031
52888	0.039	0.046	0.027	1.09038	1.35129	0.29257
52889	0.038	0.042	0.026	0.97579	1.31678	0.26871
52890	0.035	0.040	0.025	0.93321	1.20293	0.23744
52891	0.035	0.039	0.025	0.91339	1.17062	0.23242
52892	0.035	0.039	0.024	0.91737	1.15907	0.23691
52893	0.035	0.038	0.023	0.90743	1.13681	0.23185
52894	0.035	0.036	0.023	0.87296	1.11101	0.23866
52895	0.036	0.037	0.022	0.89244	1.14625	0.25151
52896	0.037	0.037	0.022	0.92361	1.15321	0.26692
52897	0.034	0.037	0.021	0.90575	1.07801	0.25339
52898	0.032	0.036	0.021	0.87759	1.03248	0.23548
52899	0.034	0.036	0.021	0.88988	1.08953	0.24370
52900	0.033	0.036	0.020	0.87634	1.05044	0.22813
52901	0.032	0.035	0.020	0.85469	1.03786	0.21893
52902	0.033	0.035	0.020	0.85745	1.06800	0.21495
52903	0.034	0.036	0.020	0.89585	1.08182	0.23128
52904	0.034	0.036	0.020	0.86923	1.09415	0.22467
52905	0.034	0.034	0.020	0.80794	1.09262	0.21233
52906	0.037	0.035	0.020	0.83275	1.16415	0.22662
52907	0.035	0.036	0.020	0.83092	1.13806	0.20518
52908	0.037	0.039	0.021	0.90172	1.18831	0.23413
52909	0.035	0.038	0.021	0.85910	1.14821	0.19915
52910	0.035	0.039	0.021	0.84576	1.18061	0.20568
52911	0.038	0.040	0.022	0.86554	1.25721	0.21372
52912	0.039	0.039	0.023	0.83109	1.30314	0.21843
52913	0.039	0.040	0.023	0.86857	1.30900	0.24474
52914	0.042	0.043	0.025	0.89741	1.40862	0.28382
52915	0.042	0.044	0.025	0.95726	1.42081	0.33292
52916	0.045	0.048	0.027	1.06205	1.50978	0.43502
52917	0.047	0.050	0.029	1.10301	1.55699	0.55220
52918	0.050	0.051	0.041	1.13678	1.63180	0.63387

52919	0.049	0.050	0.039	1.08661	1.63052	0.49125
52920	0.046	0.048	0.037	1.03776	1.54838	0.38308
52921	0.043	0.046	0.035	1.01037	1.48126	0.32544
52922	0.041	0.046	0.034	1.01147	1.43232	0.29664
52923	0.043	0.046	0.032	1.02720	1.46611	0.28412
52924	0.040	0.042	0.031	0.92548	1.38554	0.25033
52925	0.040	0.041	0.030	0.92417	1.35364	0.24639
52926	0.039	0.041	0.029	0.92467	1.29005	0.25246
52927	0.037	0.042	0.028	1.00111	1.25500	0.26180
52928	0.041	0.044	0.029	1.05135	1.37772	0.41285
52929	0.040	0.046	0.030	1.12488	1.33978	0.54974
52930	0.039	0.041	0.026	1.01672	1.24608	0.29473
52931	0.037	0.040	0.024	1.01284	1.19449	0.27283
52932	0.035	0.038	0.023	0.95400	1.12593	0.25766
52933	0.034	0.037	0.023	0.93253	1.07882	0.24561
52934	0.037	0.037	0.022	0.94339	1.14707	0.25751
52935	0.035	0.036	0.022	0.89928	1.09248	0.24238
52936	0.035	0.037	0.022	0.94623	1.10249	0.25854
52937	0.034	0.037	0.022	0.92089	1.08520	0.24918
52938	0.035	0.036	0.022	0.89741	1.13111	0.25970
52939	0.036	0.036	0.022	0.91026	1.18337	0.25985
52940	0.034	0.037	0.022	0.89077	1.15270	0.24940
52941	0.033	0.039	0.022	0.98029	1.11070	0.24946
52942	0.033	0.040	0.023	1.01619	1.12095	0.25748
52943	0.035	0.039	0.023	0.98712	1.15884	0.25778
52944	0.036	0.041	0.024	1.00080	1.19304	0.26541
52945	0.037	0.041	0.025	0.98789	1.23005	0.26158
52946	0.037	0.040	0.025	0.95715	1.25576	0.24521
52947	0.037	0.041	0.026	0.98609	1.26625	0.25446
52948	0.038	0.043	0.027	1.00420	1.28071	0.25160
52949	0.038	0.043	0.028	1.00463	1.30822	0.26283
52950	0.040	0.045	0.029	1.02875	1.41598	0.30059
52951	0.041	0.046	0.030	1.02120	1.46319	0.32530
52952	0.042	0.049	0.032	1.12325	1.45888	0.36623
52953	0.042	0.050	0.034	1.13086	1.47312	0.41630
52954	0.044	0.052	0.036	1.17191	1.50648	0.50369
52955	0.051	0.053	0.039	1.21237	1.69077	0.68404
photo ID	px	py	pz	omega	phi	kappa

52956	0.052	0.057	0.041	1.32364	1.74238	0.90036
52957	0.055	0.060	0.045	1.42194	1.83171	1.20294
52958	0.049	0.053	0.037	1.30922	1.65510	0.99750
52959	0.043	0.048	0.034	1.11620	1.46950	0.63495
52960	0.040	0.047	0.032	1.05510	1.41364	0.47594
52961	0.042	0.046	0.031	1.07948	1.45067	0.40476
52962	0.038	0.045	0.030	1.00509	1.36037	0.33794
52963	0.040	0.045	0.029	1.00561	1.41669	0.32055
52964	0.039	0.045	0.029	1.05344	1.35264	0.31130
52965	0.037	0.043	0.028	1.01166	1.29978	0.28689
52966	0.037	0.042	0.027	0.98615	1.26836	0.27542
52967	0.036	0.039	0.026	0.89731	1.22752	0.25213
52968	0.034	0.039	0.025	0.92014	1.17713	0.23722
52969	0.034	0.037	0.024	0.87779	1.12531	0.23361
52970	0.034	0.037	0.024	0.87251	1.11063	0.22194
52971	0.034	0.036	0.023	0.86636	1.09245	0.22349
52972	0.033	0.037	0.022	0.86431	1.07422	0.22847
52973	0.034	0.036	0.022	0.86693	1.08357	0.23411
52974	0.033	0.035	0.021	0.84902	1.03546	0.22018
52975	0.031	0.032	0.020	0.75831	0.97817	0.20041
52976	0.031	0.033	0.020	0.78869	0.96526	0.20048
52977	0.030	0.031	0.019	0.75500	0.94229	0.20156
52978	0.028	0.031	0.019	0.76945	0.88537	0.19572
52979	0.029	0.032	0.019	0.81917	0.92111	0.20994
52980	0.027	0.031	0.018	0.79629	0.86830	0.20877
52981	0.030	0.032	0.018	0.81201	0.92014	0.21839
52982	0.030	0.032	0.018	0.79639	0.92957	0.21916
52983	0.029	0.030	0.018	0.77610	0.87631	0.20556
52984	0.029	0.031	0.018	0.80394	0.85750	0.21159
52985	0.029	0.029	0.018	0.74465	0.85167	0.20187
52986	0.030	0.030	0.018	0.74652	0.88794	0.20612
52987	0.029	0.030	0.018	0.77263	0.84560	0.21282
52988	0.028	0.030	0.018	0.76989	0.83156	0.20583
52989	0.028	0.031	0.018	0.79077	0.81319	0.20525
52990	0.028	0.029	0.018	0.75002	0.80535	0.20255
52991	0.028	0.030	0.019	0.77358	0.82497	0.21140
52992	0.029	0.029	0.019	0.77899	0.85249	0.22311
52993	0.029	0.030	0.020	0.79465	0.84273	0.23632
52994	0.032	0.031	0.020	0.81363	0.91081	0.26097

52995	0.030	0.031	0.020	0.81435	0.87128	0.25468
52996	0.031	0.032	0.021	0.84542	0.86553	0.28445
52997	0.027	0.031	0.021	0.80078	0.76559	0.30343
52998	0.027	0.031	0.021	0.80187	0.77995	0.29390
52999	0.028	0.030	0.021	0.81296	0.79242	0.26741
53000	0.030	0.029	0.022	0.79177	0.81783	0.27446
53001	0.028	0.030	0.022	0.79094	0.77630	0.26985
53002	0.027	0.031	0.022	0.81227	0.75998	0.25952
53003	0.028	0.032	0.023	0.86094	0.76569	0.24571
53004	0.028	0.032	0.023	0.84430	0.79592	0.24104
53005	0.030	0.034	0.020	0.94036	0.79495	0.25104
53006	0.026	0.031	0.019	0.84283	0.70571	0.20757
53007	0.029	0.029	0.019	0.80033	0.76396	0.22418
53008	0.031	0.028	0.018	0.78243	0.81856	0.22107
53009	0.027	0.029	0.018	0.78580	0.73273	0.21359
53010	0.026	0.031	0.017	0.84612	0.70454	0.21694
53011	0.026	0.030	0.017	0.80274	0.71623	0.21696
53012	0.029	0.027	0.017	0.73162	0.79796	0.20756
53013	0.028	0.026	0.017	0.71033	0.78033	0.19718
53014	0.026	0.027	0.017	0.72051	0.73401	0.20276
53015	0.026	0.029	0.017	0.77365	0.74462	0.22787
53016	0.028	0.030	0.017	0.78705	0.80467	0.27276
53017	0.033	0.029	0.017	0.76411	0.93145	0.32118
53018	0.033	0.032	0.018	0.82875	0.95126	0.35334
53019	0.032	0.034	0.019	0.85525	0.98330	0.38718
53020	0.032	0.033	0.019	0.84949	0.98382	0.41586
53021	0.032	0.034	0.020	0.85378	1.00022	0.43255
53022	0.033	0.035	0.020	0.92247	1.00770	0.44693
53023	0.034	0.035	0.021	0.91141	1.04954	0.43519
53024	0.034	0.036	0.021	0.90808	1.04943	0.42728
53025	0.035	0.036	0.022	0.90994	1.12183	0.42498
53026	0.038	0.038	0.023	0.93283	1.23636	0.45962
53027	0.038	0.039	0.024	0.93705	1.22612	0.47084
53028	0.038	0.041	0.025	0.98894	1.24716	0.47856
53029	0.039	0.041	0.026	0.98043	1.26639	0.46895
53030	0.040	0.040	0.026	0.93277	1.29954	0.45457
photo ID	px	py	pz	omega	phi	kappa
53031	0.040	0.042	0.027	0.96597	1.31580	0.42693

53032	0.040	0.042	0.027	0.94203	1.33239	0.44121
53033	0.041	0.045	0.029	1.01157	1.39994	0.43774
53034	0.041	0.046	0.030	1.01566	1.43044	0.44206
53035	0.042	0.047	0.031	1.04300	1.43553	0.47879
53036	0.043	0.047	0.032	1.05120	1.50868	0.50530
53037	0.044	0.048	0.033	1.09279	1.55665	0.49882
53038	0.045	0.048	0.034	1.04717	1.60827	0.53142
53039	0.047	0.050	0.035	1.09684	1.70540	0.54038
53040	0.050	0.052	0.036	1.16645	1.77092	0.60102
53041	0.049	0.055	0.037	1.20571	1.77664	0.61801
53042	0.050	0.058	0.038	1.31480	1.80477	0.60262
53043	0.051	0.058	0.039	1.22298	1.83396	0.59422
53044	0.052	0.059	0.040	1.26726	1.84570	0.59626
53045	0.054	0.061	0.042	1.35498	1.91316	0.72605
53046	0.057	0.061	0.044	1.33754	1.99669	0.93103
53989	0.039	0.068	0.042	1.83757	1.69852	1.18620
53990	0.034	0.064	0.039	1.72478	1.59956	0.94507
53991	0.033	0.062	0.037	1.65908	1.64219	0.79606
53992	0.033	0.062	0.036	1.65953	1.70002	0.71069
53993	0.032	0.059	0.034	1.63603	1.64710	0.60281
53994	0.032	0.061	0.033	1.67797	1.62873	0.55402
53995	0.033	0.059	0.033	1.61359	1.64627	0.53113
53996	0.033	0.058	0.032	1.55375	1.61926	0.51933
53997	0.033	0.056	0.031	1.54323	1.56133	0.49065
53998	0.032	0.055	0.031	1.51245	1.49420	0.48291
53999	0.031	0.054	0.030	1.46414	1.47467	0.45252
54000	0.032	0.053	0.030	1.45576	1.47727	0.47025
54001	0.031	0.053	0.029	1.39652	1.45691	0.45542
54002	0.032	0.053	0.029	1.42795	1.46804	0.50784
54003	0.031	0.050	0.028	1.39107	1.39166	0.47355
54004	0.031	0.050	0.028	1.41145	1.37598	0.48186
54005	0.031	0.050	0.027	1.43319	1.36159	0.51369
54006	0.030	0.048	0.026	1.36257	1.31795	0.43196
54007	0.031	0.048	0.026	1.37561	1.35330	0.44757
54008	0.032	0.049	0.026	1.39513	1.39942	0.50784
54009	0.031	0.047	0.025	1.32818	1.34498	0.46785
54010	0.031	0.047	0.024	1.34854	1.29814	0.48776
54011	0.031	0.046	0.024	1.31931	1.30073	0.45050
54012	0.030	0.044	0.023	1.25767	1.28122	0.42494

54013	0.027	0.042	0.022	1.20023	1.18787	0.38515
54014	0.029	0.043	0.022	1.25493	1.19774	0.40429
54015	0.028	0.043	0.022	1.23574	1.17459	0.39977
54016	0.029	0.043	0.021	1.23902	1.20183	0.40704
54017	0.029	0.043	0.021	1.24269	1.20353	0.39979
54018	0.029	0.043	0.021	1.25644	1.21332	0.39759
54019	0.029	0.043	0.021	1.25661	1.22712	0.40949
54020	0.031	0.044	0.021	1.32463	1.25732	0.43877
54021	0.030	0.043	0.021	1.26365	1.26823	0.41853
54022	0.029	0.045	0.022	1.28273	1.28010	0.44007
54023	0.030	0.045	0.022	1.32086	1.27321	0.42828
54024	0.030	0.044	0.022	1.30093	1.23308	0.40783
54025	0.030	0.045	0.022	1.31794	1.24665	0.42636
54026	0.030	0.045	0.022	1.31249	1.27098	0.41370
54027	0.030	0.045	0.022	1.26771	1.31605	0.41541
54028	0.030	0.046	0.023	1.30093	1.33667	0.40718
54029	0.029	0.046	0.023	1.30972	1.30224	0.39071
54030	0.029	0.047	0.023	1.34173	1.30845	0.38260
54031	0.031	0.048	0.024	1.39858	1.33281	0.39521
54032	0.029	0.049	0.024	1.33015	1.36060	0.36759
54033	0.032	0.049	0.025	1.36557	1.41237	0.40047
54034	0.033	0.052	0.026	1.46174	1.45681	0.44676
54035	0.031	0.052	0.026	1.43704	1.41424	0.40771
54036	0.031	0.054	0.027	1.47530	1.46304	0.43663
54037	0.030	0.054	0.028	1.46570	1.44820	0.41732
54038	0.030	0.055	0.028	1.46531	1.51138	0.44348
54039	0.031	0.057	0.029	1.56786	1.55206	0.48757
54040	0.033	0.059	0.030	1.61944	1.61230	0.53096
54041	0.035	0.061	0.031	1.72854	1.67282	0.63558
54042	0.034	0.063	0.032	1.72531	1.72874	0.71876
54043	0.037	0.065	0.033	1.78786	1.85360	0.91777
54044	0.038	0.066	0.035	1.83356	1.87671	1.20058
54045	0.039	0.067	0.037	1.84229	1.94830	1.47872
54046	0.041	0.070	0.040	1.94649	2.07729	2.12763
54047	0.043	0.070	0.056	2.27443	1.93742	1.95220
photo ID	px	py	pz	omega	phi	kappa
54048	0.040	0.067	0.052	1.73250	2.17703	1.51736
54049	0.038	0.065	0.050	1.70037	2.01717	1.29364

54050	0.037	0.064	0.048	1.62942	1.95122	1.12939
54051	0.035	0.062	0.046	1.55286	1.83697	1.04677
54052	0.036	0.060	0.044	1.55341	1.79783	0.93243
54053	0.035	0.057	0.043	1.49207	1.73532	0.87269
54054	0.034	0.055	0.041	1.43217	1.71442	0.83436
54055	0.034	0.054	0.040	1.41813	1.70023	0.79388
54056	0.034	0.053	0.038	1.44998	1.64821	0.80803
54057	0.032	0.051	0.036	1.36338	1.60114	0.78635
54058	0.033	0.050	0.036	1.35274	1.59881	0.76045
54059	0.033	0.049	0.034	1.37314	1.54683	0.77053
54060	0.032	0.048	0.033	1.30843	1.48981	0.76208
54061	0.033	0.046	0.032	1.26174	1.50630	0.80179
54062	0.031	0.045	0.030	1.22171	1.45373	0.73781
54063	0.030	0.043	0.029	1.20337	1.36561	0.71651
54064	0.032	0.043	0.028	1.22386	1.36965	0.72141
54065	0.032	0.041	0.027	1.20401	1.33534	0.72622
54066	0.033	0.040	0.026	1.16000	1.31417	0.69737
54067	0.032	0.038	0.024	1.11859	1.25744	0.68783
54068	0.033	0.039	0.024	1.22297	1.23350	0.70294
54069	0.032	0.037	0.023	1.13422	1.24057	0.70360
54070	0.032	0.035	0.022	1.09944	1.24638	0.63756
54071	0.030	0.033	0.020	1.03638	1.19818	0.57452
54072	0.031	0.033	0.019	1.18856	1.03759	0.48827
54073	0.030	0.031	0.018	1.08338	1.06185	0.41859
54074	0.028	0.028	0.017	1.00867	0.93388	0.35119
54075	0.027	0.027	0.017	0.94946	0.92197	0.34468
54076	0.028	0.027	0.017	0.92792	0.96280	0.35512
54077	0.030	0.028	0.018	0.95207	1.00572	0.38066
54078	0.029	0.027	0.017	0.96029	0.91227	0.34380
54079	0.032	0.029	0.018	0.94204	1.07837	0.38941
54080	0.030	0.029	0.018	0.94203	1.00359	0.36205
54081	0.031	0.030	0.019	1.00059	1.06061	0.39420
54082	0.029	0.030	0.020	1.08688	0.91876	0.39496
54083	0.030	0.031	0.020	1.09458	1.01528	0.44071
54084	0.029	0.030	0.021	1.01478	1.02149	0.43244
54085	0.030	0.031	0.022	1.04307	1.07410	0.45241
54086	0.031	0.032	0.023	1.22362	0.94889	0.49898
54087	0.028	0.032	0.024	1.15402	0.92315	0.55707
54088	0.030	0.035	0.026	1.14784	1.10143	0.63501

54089	0.033	0.038	0.028	1.25702	1.18899	0.71521
54090	0.032	0.039	0.029	1.22076	1.19648	0.82090
54091	0.034	0.043	0.031	1.35113	1.27661	0.96309
54092	0.035	0.045	0.034	1.41219	1.32950	1.10975
54093	0.040	0.048	0.037	1.52011	1.46603	1.43454
54094	0.041	0.071	0.044	1.95761	1.96030	1.44992
54095	0.036	0.067	0.041	1.78885	1.86513	1.14221
54096	0.034	0.065	0.039	1.67932	1.75377	0.92089
54097	0.033	0.064	0.038	1.66763	1.69930	0.75034
54098	0.033	0.063	0.037	1.66714	1.68572	0.68346
54099	0.033	0.061	0.035	1.61548	1.68647	0.62666
54100	0.031	0.059	0.034	1.57382	1.61621	0.57300
54101	0.032	0.058	0.033	1.54929	1.62260	0.53626
54102	0.033	0.059	0.033	1.59199	1.59313	0.53482
54103	0.032	0.057	0.032	1.53159	1.53999	0.50828
54104	0.034	0.058	0.032	1.58089	1.59057	0.55387
54105	0.033	0.057	0.032	1.54693	1.54787	0.57740
54106	0.034	0.055	0.031	1.49174	1.54843	0.56209
54107	0.035	0.055	0.031	1.49005	1.58226	0.61683
54108	0.035	0.054	0.031	1.48993	1.56608	0.59194
54109	0.035	0.054	0.030	1.47999	1.59668	0.62349
54110	0.034	0.052	0.029	1.48355	1.51240	0.61323
54111	0.033	0.050	0.028	1.43375	1.43782	0.56600
54112	0.032	0.050	0.027	1.42335	1.42499	0.55834
54113	0.032	0.048	0.027	1.35209	1.42929	0.54398
54114	0.032	0.048	0.026	1.31010	1.45368	0.51728
54115	0.031	0.048	0.025	1.34468	1.38839	0.49891
54116	0.031	0.047	0.025	1.34578	1.38588	0.50492
54117	0.030	0.046	0.024	1.33361	1.28095	0.47645
54118	0.031	0.045	0.024	1.32668	1.31490	0.50015
54119	0.031	0.045	0.024	1.31029	1.33964	0.51186
54120	0.031	0.045	0.024	1.29124	1.35338	0.53413
54121	0.032	0.046	0.024	1.34992	1.37812	0.53749
54122	0.033	0.046	0.024	1.31138	1.43850	0.57766
photo ID	px	py	pz	omega	phi	kappa
54123	0.034	0.046	0.024	1.37516	1.40389	0.54568
54124	0.034	0.049	0.025	1.46388	1.45246	0.61588
54125	0.033	0.048	0.024	1.40767	1.41406	0.57475

54126	0.033	0.050	0.025	1.50674	1.36942	0.57754
54127	0.032	0.049	0.025	1.40280	1.38293	0.55594
54128	0.036	0.052	0.026	1.52660	1.48164	0.63237
54129	0.031	0.049	0.025	1.36452	1.37084	0.47715
54130	0.030	0.049	0.026	1.39149	1.33392	0.46054
54131	0.031	0.049	0.026	1.38097	1.35117	0.45634
54132	0.031	0.050	0.027	1.40702	1.35710	0.48652
54133	0.032	0.051	0.028	1.44722	1.39144	0.49122
54134	0.033	0.053	0.028	1.45489	1.52201	0.52314
54135	0.032	0.053	0.029	1.43785	1.49995	0.50182
54136	0.033	0.055	0.029	1.52113	1.54552	0.52770
54137	0.032	0.056	0.030	1.52418	1.51453	0.48728
54138	0.032	0.056	0.030	1.52809	1.55385	0.47118
54139	0.032	0.058	0.031	1.55240	1.58656	0.48566
54140	0.031	0.058	0.031	1.58357	1.55477	0.48814
54141	0.031	0.060	0.032	1.66986	1.53399	0.49322
54142	0.031	0.061	0.033	1.65506	1.58416	0.54254
54143	0.031	0.062	0.034	1.65136	1.60922	0.59772
54144	0.032	0.063	0.035	1.68822	1.66760	0.65416
54145	0.033	0.066	0.037	1.78150	1.71317	0.77428
54146	0.036	0.068	0.038	1.81518	1.83230	0.99474
54147	0.038	0.070	0.040	1.89223	1.94131	1.24033
54148	0.041	0.072	0.043	1.97736	1.99045	1.66231
54149	0.040	0.060	0.044	1.89670	1.76788	1.58485
54150	0.035	0.057	0.041	1.77399	1.55821	1.21315
54151	0.033	0.053	0.039	1.44295	1.63660	0.94509
54152	0.033	0.052	0.037	1.38104	1.63192	0.80200
54153	0.031	0.051	0.036	1.32183	1.58465	0.68942
54154	0.033	0.051	0.035	1.34820	1.57030	0.60516
54155	0.032	0.049	0.034	1.30895	1.52464	0.54870
54156	0.030	0.046	0.032	1.28025	1.42208	0.50287
54157	0.029	0.044	0.031	1.24022	1.35977	0.46031
54158	0.030	0.044	0.030	1.27443	1.36257	0.45103
54159	0.029	0.043	0.029	1.17878	1.34866	0.42113
54160	0.030	0.043	0.028	1.21535	1.34965	0.42023
54161	0.029	0.040	0.028	1.13335	1.29472	0.40068
54162	0.027	0.039	0.027	1.08788	1.24521	0.40344
54163	0.028	0.039	0.026	1.08933	1.26686	0.40992
54164	0.030	0.039	0.025	1.19163	1.23681	0.44115

54165	0.029	0.039	0.025	1.27209	1.12365	0.44775
54166	0.030	0.038	0.024	1.11462	1.25577	0.45067
54167	0.032	0.038	0.023	1.30355	1.14425	0.47082
54168	0.030	0.037	0.023	1.17425	1.18586	0.45148
54169	0.029	0.034	0.021	1.09283	1.12255	0.40441
54170	0.029	0.034	0.021	1.08586	1.11872	0.38978
54171	0.028	0.033	0.020	1.01377	1.11151	0.37327
54172	0.028	0.031	0.019	0.97128	1.06306	0.36136
54173	0.029	0.031	0.019	1.01344	1.05714	0.35896
54174	0.028	0.029	0.019	0.94862	1.00574	0.33070
54175	0.029	0.031	0.019	0.98453	1.06457	0.35142
54176	0.029	0.030	0.018	1.00499	1.00998	0.34743
54177	0.029	0.029	0.018	1.01419	0.99318	0.34731
54178	0.029	0.029	0.018	1.06285	0.91233	0.34326
54179	0.030	0.030	0.018	1.01619	1.05396	0.38013
54180	0.030	0.030	0.019	1.11025	0.98144	0.40491
54181	0.027	0.027	0.019	0.92896	0.94448	0.35723
54182	0.029	0.027	0.019	0.98492	0.96585	0.35312
54183	0.028	0.027	0.019	0.95237	0.98901	0.35466
54184	0.029	0.028	0.020	1.03804	0.95561	0.35584
54185	0.027	0.027	0.020	0.88708	0.99621	0.34975
54186	0.030	0.030	0.021	1.07988	1.00832	0.39394
54187	0.029	0.030	0.022	1.03709	0.97787	0.37830
54188	0.025	0.028	0.022	0.94557	0.90188	0.35155
54189	0.026	0.029	0.023	0.92875	0.96100	0.34610
54190	0.027	0.031	0.024	0.96064	1.01237	0.36799
54191	0.026	0.031	0.025	0.94942	0.98200	0.39761
54192	0.030	0.035	0.026	1.09512	1.12389	0.50818
54193	0.031	0.037	0.028	1.11735	1.19101	0.62054
54194	0.033	0.039	0.029	1.23636	1.26401	0.81839
54195	0.037	0.043	0.032	1.38646	1.40114	1.09954
54196	0.041	0.069	0.045	2.02515	1.98019	2.18984
54197	0.039	0.068	0.042	1.90547	1.87900	1.71196
photo ID	px	py	pz	omega	phi	kappa
54198	0.038	0.065	0.040	1.76503	1.80496	1.32438
54199	0.035	0.061	0.037	1.61727	1.61714	0.96605
54200	0.035	0.061	0.036	1.65919	1.60183	0.80628
54201	0.032	0.058	0.034	1.57193	1.51473	0.66719

54202	0.032	0.058	0.034	1.54981	1.51739	0.58969
54203	0.033	0.057	0.033	1.49854	1.56798	0.55838
54204	0.031	0.055	0.032	1.52194	1.46599	0.51419
54205	0.033	0.055	0.031	1.51307	1.52439	0.52500
54206	0.030	0.052	0.029	1.42398	1.43291	0.47043
54207	0.030	0.052	0.029	1.45056	1.39787	0.45353
54208	0.030	0.051	0.028	1.45105	1.35661	0.44015
54209	0.030	0.051	0.027	1.42712	1.37544	0.47719
54210	0.030	0.050	0.027	1.43134	1.31570	0.47016
54211	0.032	0.049	0.026	1.38449	1.38032	0.46793
54212	0.032	0.048	0.026	1.35283	1.37490	0.47708
54213	0.031	0.046	0.025	1.30500	1.32250	0.42143
54214	0.031	0.045	0.024	1.31177	1.28432	0.40166
54215	0.030	0.044	0.023	1.22491	1.26515	0.37825
54216	0.031	0.044	0.023	1.26411	1.26225	0.39936
54217	0.030	0.043	0.022	1.21808	1.22934	0.37164
54218	0.031	0.043	0.022	1.20164	1.25153	0.38900
54219	0.032	0.044	0.022	1.27621	1.23274	0.40563
54220	0.032	0.043	0.022	1.25002	1.24153	0.42000
54221	0.030	0.041	0.021	1.19856	1.19233	0.37111
54222	0.030	0.040	0.020	1.18121	1.18740	0.37339
54223	0.029	0.039	0.020	1.11784	1.22507	0.35447
54224	0.031	0.041	0.020	1.18020	1.25011	0.39750
54225	0.030	0.040	0.020	1.17119	1.22131	0.38388
54226	0.031	0.041	0.020	1.22020	1.26117	0.41681
54227	0.030	0.041	0.020	1.24199	1.20667	0.39517
54228	0.031	0.041	0.021	1.24587	1.25194	0.40795
54229	0.031	0.041	0.021	1.24538	1.23742	0.40299
54230	0.030	0.041	0.021	1.21860	1.20349	0.38315
54231	0.032	0.041	0.021	1.21893	1.25534	0.38983
54232	0.030	0.041	0.021	1.19521	1.23408	0.37970
54233	0.030	0.042	0.021	1.21494	1.24684	0.37740
54234	0.029	0.042	0.021	1.20509	1.19792	0.35954
54235	0.029	0.042	0.021	1.20685	1.20609	0.34940
54236	0.028	0.043	0.022	1.22136	1.19384	0.34773
54237	0.029	0.043	0.023	1.21462	1.21162	0.35052
54238	0.030	0.045	0.023	1.25455	1.25950	0.36541
54239	0.031	0.045	0.024	1.22687	1.30133	0.36415
54240	0.031	0.046	0.025	1.23271	1.33156	0.37319

54241	0.030	0.047	0.025	1.27790	1.32198	0.36330
54242	0.032	0.048	0.026	1.31774	1.37998	0.39267
54243	0.030	0.049	0.026	1.33091	1.32566	0.35845
54244	0.029	0.049	0.027	1.35327	1.33206	0.36428
54245	0.030	0.050	0.028	1.36926	1.35714	0.37057
54246	0.030	0.052	0.028	1.41230	1.40621	0.38562
54247	0.031	0.053	0.029	1.46299	1.43013	0.41695
54248	0.033	0.054	0.030	1.45953	1.51888	0.46131
54249	0.032	0.055	0.031	1.45136	1.52866	0.45922
54250	0.033	0.056	0.031	1.45055	1.58900	0.49073
54251	0.034	0.059	0.033	1.60150	1.59866	0.56448
54252	0.032	0.058	0.033	1.56116	1.59222	0.66024
54253	0.035	0.061	0.036	1.63316	1.71903	0.87075
54254	0.038	0.064	0.037	1.72375	1.76420	1.14332
54255	0.040	0.062	0.041	1.76400	1.85013	1.49406
54256	0.035	0.057	0.037	1.63177	1.59645	0.95351
54257	0.033	0.054	0.035	1.48415	1.55803	0.73439
54258	0.031	0.052	0.034	1.41960	1.49443	0.60053
54259	0.031	0.050	0.033	1.36404	1.49125	0.52002
54260	0.031	0.048	0.031	1.34317	1.48097	0.47416
54261	0.030	0.048	0.030	1.28642	1.50190	0.43844
54262	0.029	0.046	0.029	1.28903	1.41908	0.40220
54263	0.028	0.044	0.028	1.37882	1.22285	0.36783
54264	0.029	0.045	0.028	1.27777	1.38099	0.38499
54265	0.028	0.044	0.027	1.22226	1.36292	0.36695
54266	0.029	0.044	0.027	1.25803	1.35750	0.39844
54267	0.030	0.042	0.026	1.20811	1.37581	0.38575
54268	0.031	0.043	0.026	1.23729	1.36069	0.40275
54269	0.032	0.042	0.025	1.27285	1.31848	0.40655
54270	0.029	0.040	0.024	1.21346	1.22864	0.39806
54271	0.031	0.040	0.024	1.21282	1.26466	0.41317
54272	0.031	0.039	0.023	1.15755	1.29048	0.40371
photo ID	px	py	pz	omega	phi	kappa
54273	0.028	0.037	0.022	1.09370	1.19687	0.34516
54274	0.027	0.036	0.021	1.11685	1.10583	0.33422
54275	0.029	0.036	0.021	1.09976	1.20202	0.34858
54276	0.029	0.036	0.021	1.22624	1.10208	0.36896
54277	0.029	0.036	0.020	1.25041	1.05132	0.37201

54278	0.029	0.035	0.020	1.16682	1.08170	0.36372
54279	0.029	0.035	0.020	1.13894	1.07457	0.35079
54280	0.029	0.035	0.020	1.18208	1.04015	0.36007
54281	0.028	0.034	0.019	1.14301	1.02996	0.35344
54282	0.028	0.034	0.019	1.12003	1.03434	0.35062
54283	0.028	0.035	0.019	1.10883	1.11186	0.36736
54284	0.031	0.036	0.020	1.15954	1.18124	0.40521
54285	0.030	0.035	0.020	1.14788	1.14014	0.38819
54286	0.028	0.034	0.019	0.98634	1.16381	0.34130
54287	0.029	0.035	0.020	1.07184	1.15791	0.34363
54288	0.028	0.034	0.020	1.06049	1.09126	0.33498
54289	0.026	0.033	0.020	1.03363	1.02697	0.31703
54290	0.029	0.034	0.021	1.08028	1.08985	0.33444
54291	0.029	0.035	0.021	1.09830	1.08340	0.34426
54292	0.028	0.034	0.022	0.99691	1.14576	0.33127
54293	0.029	0.036	0.022	1.03323	1.22872	0.34208
54294	0.028	0.037	0.023	1.06712	1.22527	0.35940
54295	0.028	0.039	0.024	1.16557	1.23379	0.39648
54296	0.027	0.039	0.024	1.17859	1.16159	0.37526
54297	0.031	0.041	0.025	1.24205	1.30863	0.42321
54298	0.028	0.040	0.026	1.23335	1.18160	0.42184
54299	0.030	0.042	0.027	1.32839	1.19582	0.47120
54300	0.031	0.044	0.028	1.37435	1.29007	0.57050
54301	0.032	0.045	0.030	1.36186	1.36567	0.69571
54302	0.032	0.048	0.031	1.36632	1.41214	0.78428
54303	0.033	0.049	0.032	1.35744	1.50211	0.82678
54304	0.034	0.049	0.033	1.39978	1.50101	0.91456
54305	0.033	0.050	0.034	1.36820	1.51432	0.94372
54306	0.035	0.051	0.035	1.41472	1.57426	1.06631
54307	0.036	0.053	0.037	1.44209	1.72517	1.15711
54308	0.038	0.055	0.039	1.63760	1.81239	1.45141
54309	0.040	0.058	0.042	1.92885	1.81768	1.90078
54522	0.030	0.033	0.022	0.90820	0.83246	0.26489
54523	0.034	0.032	0.022	0.90253	0.94572	0.30295
54524	0.030	0.032	0.021	0.88756	0.86172	0.26887
54525	0.031	0.030	0.020	0.83421	0.86160	0.26177
54526	0.030	0.030	0.020	0.83379	0.86951	0.25950
54527	0.031	0.030	0.019	0.81830	0.88163	0.24928
54528	0.030	0.029	0.019	0.80528	0.81825	0.25215

54529	0.027	0.031	0.019	0.87616	0.76223	0.24973
54530	0.029	0.032	0.018	0.87743	0.82387	0.26116
54531	0.029	0.032	0.018	0.86505	0.82264	0.25664
54532	0.031	0.031	0.018	0.84786	0.89022	0.27267
54533	0.030	0.031	0.018	0.84378	0.85984	0.24244
54534	0.030	0.032	0.018	0.87507	0.87322	0.25308
54535	0.031	0.029	0.017	0.76856	0.92063	0.23659
54536	0.031	0.028	0.017	0.74134	0.90935	0.22280
54537	0.030	0.030	0.017	0.76419	0.88406	0.23008
54538	0.029	0.029	0.017	0.73812	0.86752	0.22297
54539	0.030	0.031	0.017	0.81029	0.89560	0.24514
54540	0.030	0.028	0.017	0.73158	0.88480	0.22790
54541	0.029	0.029	0.017	0.74485	0.87202	0.23291
54542	0.029	0.029	0.017	0.76688	0.88266	0.23523
54543	0.030	0.030	0.017	0.78683	0.92235	0.24700
54544	0.029	0.030	0.017	0.78164	0.91342	0.24454
54545	0.029	0.032	0.018	0.83225	0.94448	0.25125
54546	0.030	0.032	0.018	0.79700	0.97202	0.25243
54547	0.032	0.033	0.019	0.84410	1.01420	0.25831
54548	0.032	0.033	0.019	0.82976	1.02798	0.25384
54549	0.031	0.033	0.019	0.78566	1.01805	0.24854
54550	0.033	0.035	0.020	0.84476	1.07780	0.26523
54551	0.032	0.035	0.020	0.83699	1.05941	0.24877
54552	0.034	0.035	0.021	0.83724	1.09477	0.25418
54553	0.034	0.035	0.021	0.84576	1.07477	0.24979
54554	0.034	0.036	0.022	0.84346	1.11583	0.25740
54555	0.036	0.038	0.023	0.94756	1.15989	0.28337
54556	0.036	0.037	0.024	0.88103	1.16949	0.27836
54557	0.036	0.039	0.024	0.93426	1.19702	0.28409
54558	0.036	0.039	0.025	0.92721	1.23055	0.29204
54559	0.038	0.041	0.026	0.92564	1.32873	0.30740
photo ID	px	py	pz	omega	phi	kappa
54560	0.040	0.043	0.027	0.97506	1.40368	0.33879
54561	0.039	0.045	0.027	1.02547	1.37792	0.33811
54562	0.041	0.046	0.028	1.05304	1.44642	0.35621
54563	0.039	0.046	0.029	1.05744	1.42152	0.36629
54564	0.040	0.046	0.029	1.02120	1.42547	0.39724
54565	0.044	0.048	0.031	1.08336	1.55490	0.50084

54566	0.045	0.049	0.033	1.10524	1.57393	0.62535
54567	0.047	0.051	0.035	1.18789	1.62772	0.84880
54568	0.050	0.054	0.038	1.34877	1.75852	1.22406

mean standard deviations of rotations

omega	1.3 [deg/1000]
phi	1.5 [deg/1000]
kappa	0.5 [deg/1000]

max standard deviations of rotations

omega	3.5 [deg/1000] at photo	51722
phi	4.1 [deg/1000] at photo	51722
kappa	3.1 [deg/1000] at photo	51722

mean standard deviations of translations

x	0.035 [meter]
y	0.049 [meter]
z	0.029 [meter]

max standard deviations of translations

x	0.069 [meter] at photo	52765
y	0.137 [meter] at photo	51722
z	0.069 [meter] at photo	51722

residuals horizontal control points in [meter]

control point ID	rx	ry
HV01_GRA	0.010	-0.017
HV02_GRA	0.010	-0.012
HV03_GRA	0.000	0.008
HV04_GRA	0.006	-0.002
HV05_GRA	0.005	0.004
HV06_GRA	-0.004	-0.004
HV07_GRA	0.001	-0.013
HV08_GRA	-0.006	-0.011
HV09_GRA	0.014	-0.006
HV10_GRA	-0.003	-0.004
HV11_GRA	0.001	0.002
HV12_GRA	0.009	0.010
HV13_GRA	0.007	-0.001
HV14_GRA	0.002	-0.001
HV15_GRA	-0.001	-0.011
HV16_GRA	0.001	-0.005
HV17_GRA	-0.014	-0.004
HV18_GRA	0.005	0.004
HV19_GRA	-0.000	0.010
HV20_GRA	0.009	-0.000
HV22_GRA	-0.007	-0.001
HV23_GRA	0.004	0.005
HV24_GRA	-0.001	0.007
HV25_GRA	-0.009	0.009
HV26_GRA	0.000	0.007
HV27_GRA	0.006	0.032
HV28_GRA	-0.006	-0.001
HV29_GRA	-0.019	0.004
HV30_GRA	-0.007	-0.000
HV31_GRA	0.002	-0.015
HV32_GRA	-0.001	-0.003
HV33_GRA	0.006	-0.009
HV34_GRA	0.026	0.009

HV35_GRA	0.002	0.005	
HV36_GRA	-0.005	-0.003	
HV37_GRA	0.003	0.016	
HV38_GRA	-0.003	0.007	
HV39_GRA	-0.019	0.002	
HV40_GRA	-0.003	0.000	
HV41_GRA	0.001	0.005	
HV43_GRA	-0.026	-0.020	
HV44_GRA	-0.016	0.002	
HV45_GRA	-0.006	0.007	
HV46_GRA	-0.001	0.006	
HV47_GRA	-0.013	0.014	
HV48_GRA	0.000	-0.005	
HV49_GRA	0.008	0.002	
HV50_GRA	-0.006	-0.009	
HV51_GRA	0.001	0.002	
HV52_GRA	0.003	-0.001	
HV53_GRA	0.013	-0.004	
HV54_GRA	0.016	0.007	
HV55_GRA	0.009	-0.006	
HV56_GRA	0.014	0.007	
HV57_GRA	-0.007	-0.005	
control point ID	rx	ry	
	HV58_GRA	0.014	-0.017
HV59_GRA	-0.010	-0.011	
HV60_GRA	0.000	-0.005	
HV61_GRA	-0.007	-0.001	
HV62_GRA	0.003	0.010	
HV63_GRA	-0.007	0.005	
HV64_GRA	-0.003	-0.002	
HV65_GRA	0.002	-0.011	
HV66_GRA	-0.006	-0.007	
HV67_GRA	0.000	0.010	
HV68_GRA	-0.000	-0.003	
HV69_GRA	0.003	0.006	
HV70_GRA	-0.005	0.007	
HV71_GRA	0.003	0.001	

residuals vertical control points in [meter]

control point ID	rz
HV01_GRA	-0.034
HV02_GRA	-0.042
HV03_GRA	-0.028
HV04_GRA	0.042
HV05_GRA	0.053
HV06_GRA	-0.057
HV07_GRA	-0.031
HV08_GRA	-0.053
HV09_GRA	-0.063
HV10_GRA	0.041
HV11_GRA	-0.000
HV12_GRA	-0.063
HV13_GRA	0.063
HV14_GRA	0.022
HV15_GRA	-0.011
HV16_GRA	0.045
HV17_GRA	0.008
HV18_GRA	-0.009
HV19_GRA	-0.007
HV20_GRA	0.017
HV22_GRA	0.006
HV23_GRA	0.052
HV24_GRA	0.042
HV25_GRA	-0.006
HV26_GRA	0.013
HV27_GRA	-0.050
HV28_GRA	0.059
HV29_GRA	0.000
HV30_GRA	-0.021
HV31_GRA	-0.025
HV32_GRA	0.022
HV33_GRA	-0.035

HV34_GRA	0.014
HV35_GRA	-0.019
HV36_GRA	-0.018
HV37_GRA	0.052
HV38_GRA	0.014
control point ID	rz
HV39_GRA	0.042
HV40_GRA	0.028
HV41_GRA	-0.060
HV43_GRA	0.083
HV44_GRA	-0.010
HV45_GRA	0.045
HV46_GRA	0.024
HV47_GRA	0.026
HV48_GRA	0.006
HV49_GRA	0.054
HV50_GRA	0.051
HV51_GRA	0.026
HV52_GRA	-0.044
HV53_GRA	-0.015
HV54_GRA	-0.023
HV55_GRA	0.049
HV56_GRA	0.029
HV57_GRA	-0.003
HV58_GRA	0.092
HV59_GRA	-0.082
HV60_GRA	-0.085
HV61_GRA	-0.016
HV62_GRA	-0.039
HV63_GRA	0.023
HV64_GRA	0.020
HV65_GRA	-0.041
HV66_GRA	0.021
HV67_GRA	-0.017
HV68_GRA	0.019
HV69_GRA	-0.082
HV70_GRA	-0.099
HV71_GRA	-0.016

residuals GNSS observations in [meter]

photo ID	rx	ry	rz
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GNSS drift parameter for profile 1

constant part in [meter]	X	-0.295	Y	2.497	Z	5.159
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linear part in [meter]	X	0.040	Y	-0.029	Z	-0.048
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52841	0.035	0.032	-0.011
52842	0.027	-0.026	0.000
52843	0.032	-0.079	-0.022
52844	-0.010	0.025	0.026
52845	-0.025	0.010	0.018
52846	0.053	0.029	-0.015
52847	0.027	0.010	-0.034
52848	-0.061	-0.022	-0.049
52849	-0.060	0.003	-0.008
52850	-0.122	0.008	0.007
52851	0.019	-0.030	0.022
52852	0.027	0.009	-0.062
52853	-0.022	0.011	-0.025
52854	0.003	-0.030	-0.016
52855	0.067	0.002	0.032
52856	-0.008	-0.026	0.013
52857	0.016	-0.005	0.058
52858	0.016	0.021	0.030
52859	0.010	0.001	0.015
52860	-0.040	0.042	0.059
52861	-0.013	-0.016	0.050
52862	0.015	-0.027	0.024
52863	0.024	0.015	0.030
52864	-0.003	0.073	0.009
52865	-0.013	0.004	-0.023
52866	-0.036	0.041	0.016
52867	-0.008	0.022	-0.010
52868	0.027	-0.010	-0.038
52869	-0.028	-0.016	-0.067
52870	0.015	-0.038	0.010
52871	-0.017	0.013	0.036
52872	0.035	-0.001	-0.032

52873	0.054	0.021	-0.023
52874	-0.002	-0.005	-0.021
52875	-0.011	0.022	0.018
52876	-0.012	-0.042	-0.006
52877	0.013	-0.050	-0.007
52878	-0.021	0.012	-0.015
52879	-0.001	-0.003	0.012

GNSS drift parameter for profile 2

constant part in [meter] X -0.636 Y -1.816 Z 4.879

linear part in [meter] X -0.014 Y 0.004 Z -0.027

52880	-0.081	-0.004	0.028
52881	0.024	0.016	0.006
52882	0.022	0.015	0.004
52883	0.012	0.009	-0.033
52884	0.038	0.002	-0.013
52885	0.030	-0.045	0.083
52886	-0.010	0.008	-0.011
52887	0.048	0.006	0.009
52888	-0.035	-0.011	0.021
52889	-0.027	0.003	-0.020
52890	-0.022	-0.015	0.018
52891	-0.018	0.042	-0.058
52892	0.013	-0.052	-0.033

52893	0.001	0.044	-0.008
52894	0.051	-0.029	0.013
52895	0.029	0.037	0.015
52896	-0.043	-0.029	-0.012
52897	0.009	0.014	0.005
52898	0.004	-0.022	-0.006
52899	0.001	-0.015	-0.020
52900	0.052	0.005	0.013
52901	-0.015	-0.003	-0.062
52902	-0.085	0.000	0.016
52903	0.015	-0.027	0.023
52904	-0.016	-0.042	-0.011
52905	0.006	0.006	0.036
52906	-0.034	0.055	-0.003
52907	-0.021	0.059	-0.056
52908	-0.038	0.015	0.019
52909	-0.019	0.015	-0.001
52910	-0.006	-0.036	0.012
52911	0.009	-0.029	0.017
52912	0.076	0.039	-0.078
52913	0.031	-0.019	0.011
52914	0.028	-0.008	-0.009
52915	-0.011	0.040	0.002
52916	-0.038	-0.031	0.045
52917	0.020	-0.014	0.037

GNSS drift parameter for profile 3

constant part in [meter] X -0.204 Y 2.533 Z 5.112

linear part in [meter] X 0.048 Y -0.025 Z -0.023

52918	0.010	-0.093	-0.033
52919	0.013	0.032	0.006
52920	0.008	0.042	0.010
52921	0.052	0.077	0.036
52922	-0.048	-0.036	-0.067
52923	-0.023	-0.048	-0.075
52924	0.037	0.005	0.021
52925	-0.009	-0.004	0.028
52926	0.045	0.035	0.087
52927	-0.032	-0.010	0.033
52928	-0.016	-0.003	0.037
52929	-0.078	-0.029	-0.033
52930	-0.031	0.007	0.004
52931	-0.042	0.009	-0.016
52932	-0.006	-0.017	-0.011
52933	0.057	0.005	-0.025
52934	0.006	-0.050	0.030
52935	0.035	-0.010	0.003
52936	0.056	-0.043	-0.004
52937	0.011	0.005	-0.008
52938	-0.019	0.052	0.011
52939	-0.022	0.030	-0.027
52940	0.009	0.065	0.024
52941	-0.010	0.058	0.036
52942	-0.037	0.002	0.002
52943	0.012	-0.021	-0.018
52944	0.034	0.005	-0.020
52945	0.020	-0.011	-0.058
52946	0.059	-0.002	-0.021
52947	-0.004	-0.027	0.012

52948	-0.030	-0.010	0.031
52949	-0.074	-0.016	0.014
52950	-0.056	0.058	0.007
52951	-0.013	0.016	-0.006
52952	0.019	0.035	0.002
52953	0.064	0.003	-0.072
52954	-0.014	-0.057	-0.024
52955	0.002	-0.024	0.032
52956	0.013	-0.032	0.042
52957	0.002	0.005	0.011

GNSS drift parameter for profile 4

constant part in [meter] X -0.568 Y -1.883 Z 4.557

linear part in [meter] X 0.016 Y -0.036 Z -0.018

52958	0.003	0.009	0.021
52959	-0.010	-0.014	-0.000
52960	-0.007	0.013	-0.011
52961	0.022	0.013	0.012
52962	0.007	-0.041	0.003
52963	0.063	-0.040	0.019
52964	0.018	0.016	0.032
52965	-0.020	-0.002	0.031

52966	0.004	0.001	-0.017
52967	-0.029	0.027	0.044
52968	-0.027	-0.013	-0.015
52969	-0.017	-0.017	0.025
52970	0.017	-0.022	-0.038
52971	-0.040	0.016	-0.135
52972	-0.008	0.072	-0.016
52973	-0.016	0.033	-0.015
52974	-0.007	-0.012	-0.013
52975	-0.009	0.036	0.044
52976	-0.036	0.002	0.067
52977	-0.049	-0.015	0.099
52978	-0.006	-0.035	-0.007
52979	-0.002	-0.002	-0.069
52980	0.050	-0.005	-0.107
52981	-0.044	-0.030	-0.004
52982	0.016	0.003	-0.058
52983	-0.007	-0.063	0.003
52984	-0.014	0.058	0.034
52985	0.048	0.024	0.027
52986	0.006	0.060	-0.035
52987	0.009	0.017	-0.046
52988	0.042	-0.044	0.030
52989	0.047	0.016	-0.039
52990	0.051	-0.003	-0.021
52991	-0.030	-0.037	0.003
52992	0.035	-0.009	0.019
52993	-0.017	-0.028	0.061
52994	0.022	0.009	0.030
52995	0.079	-0.025	0.048
52996	0.042	0.034	-0.031
52997	-0.025	-0.014	0.017
52998	0.000	-0.025	0.035
52999	-0.031	-0.009	0.027
53000	-0.039	-0.009	0.031
53001	0.033	0.042	-0.032
53002	-0.040	-0.010	0.018
53003	-0.073	0.009	-0.022
53004	-0.005	0.013	-0.049

GNSS drift parameter for profile 5

constant part in [meter] X 0.125 Y 2.473 Z 4.381

linear part in [meter] X 0.013 Y 0.004 Z -0.006

53005	0.072	-0.035	-0.009
53006	0.023	-0.124	0.002
53007	0.035	0.012	-0.001
53008	0.011	0.029	0.022
53009	-0.038	0.026	0.008
53010	-0.021	-0.030	0.027
53011	-0.054	-0.004	0.035
53012	0.025	0.057	0.000
53013	-0.059	0.038	0.016
53014	-0.026	-0.010	-0.022
53015	-0.009	0.043	-0.029
53016	-0.017	0.028	-0.086
53017	0.050	0.034	-0.030
53018	-0.025	-0.054	0.004
53019	-0.012	-0.000	-0.024
53020	-0.034	0.035	0.005
53021	0.031	0.033	-0.011
53022	0.022	-0.033	-0.004
53023	0.000	-0.038	0.002
53024	0.012	0.039	0.089
53025	-0.021	0.102	0.100
53026	0.013	0.010	-0.077
53027	-0.029	-0.034	-0.045
53028	0.017	-0.046	-0.087
53029	0.041	-0.033	0.034

53030	-0.000	-0.037	0.045
53031	-0.037	-0.030	0.061
53032	0.012	0.015	0.020
53033	-0.028	0.040	0.046
53034	0.013	-0.001	-0.003
53035	0.052	0.018	-0.053
53036	-0.028	-0.013	-0.052
53037	-0.017	-0.031	-0.018
53038	0.021	-0.029	-0.053
53039	0.029	0.011	0.044
53040	-0.025	0.004	0.042
53041	-0.041	0.021	0.039
53042	0.005	-0.028	-0.007
53043	0.050	-0.028	-0.012
53044	0.034	-0.000	-0.008
53045	-0.026	0.044	0.023
53046	-0.019	-0.001	-0.036

GNSS drift parameter for profile 6

constant part in [meter] X 1.569 Y 1.280 Z 4.787

linear part in [meter] X -0.010 Y -0.006 Z -0.026

53989	0.013	0.118	0.122
53990	-0.031	-0.062	-0.128

53991	-0.038	-0.046	0.019
53992	-0.002	-0.032	0.011
53993	0.071	-0.116	0.010
53994	-0.020	0.000	0.026
53995	0.085	0.033	0.071
53996	-0.001	-0.021	-0.050
53997	0.043	0.080	-0.004
53998	0.013	-0.020	-0.044
53999	-0.021	0.002	0.012
54000	0.032	0.034	0.015
54001	0.007	-0.005	0.000
54002	-0.026	0.016	-0.001
54003	-0.048	0.002	-0.026
54004	-0.003	0.036	-0.070
54005	0.016	0.001	-0.011
54006	-0.011	-0.032	-0.003
54007	-0.052	-0.021	0.003
54008	0.003	0.036	-0.002
54009	0.024	-0.032	0.007
54010	-0.087	-0.023	0.047
54011	-0.000	0.056	-0.004
54012	0.024	0.019	0.016
54013	0.026	0.005	-0.034
54014	0.023	0.015	-0.037
54015	-0.012	-0.015	-0.056
54016	-0.024	-0.034	-0.054
54017	-0.021	0.012	-0.013
54018	-0.008	0.005	-0.022
54019	0.016	0.034	0.006
54020	0.002	0.015	0.001
54021	-0.032	-0.030	0.012
54022	-0.003	0.041	0.002
54023	0.029	-0.012	-0.005
54024	0.060	-0.012	0.021
54025	-0.028	-0.024	0.038
54026	-0.013	-0.014	0.005
54027	0.027	-0.007	0.002
54028	0.010	-0.019	0.014
54029	-0.006	-0.059	0.022

54030	-0.025	-0.008	0.006
54031	0.008	0.015	0.047
54032	-0.010	0.059	0.073
54033	-0.052	0.037	0.063
54034	-0.026	0.035	0.052
54035	-0.045	-0.012	0.004
54036	0.017	0.003	0.009
54037	-0.038	-0.053	-0.045
54038	0.019	0.018	0.014
54039	-0.028	-0.049	-0.003
54040	0.024	0.010	0.017
54041	0.017	0.024	-0.028
54042	0.025	0.028	-0.002
54043	0.036	0.012	-0.018
54044	0.018	-0.013	-0.006
54045	0.004	-0.013	-0.052
54046	0.024	-0.021	-0.053

GNSS drift parameter for profile 7

constant part in [meter] X -2.018 Y -1.434 Z 4.836

linear part in [meter] X 0.002 Y -0.014 Z 0.004

54047	-0.008	-0.008	0.029
54048	-0.017	0.005	0.030
54049	-0.017	-0.004	-0.005
54050	0.010	0.014	0.007
54051	-0.044	-0.009	-0.039
54052	0.009	-0.010	0.024
54053	-0.006	0.004	0.006
54054	0.026	0.019	-0.043
54055	0.001	0.001	-0.088
54056	0.010	0.009	-0.062
54057	-0.019	0.047	-0.050
54058	0.027	-0.020	-0.059
54059	0.049	-0.019	-0.048
54060	0.030	0.038	-0.007
54061	0.004	-0.009	0.062
54062	0.027	-0.036	0.107
54063	0.001	0.006	0.087

54064	0.047	-0.009	0.045
54065	-0.027	-0.039	0.065
54066	-0.018	-0.007	0.044
54067	0.009	-0.016	-0.037
54068	-0.013	0.010	0.028
54069	0.023	0.030	-0.105
54070	-0.026	0.020	-0.040
54071	0.013	0.009	-0.055
54072	-0.002	0.033	0.013
54073	-0.023	0.012	0.036
54074	-0.064	-0.033	0.050
54075	0.042	0.008	0.063
54076	0.016	-0.087	0.035
54077	-0.059	0.009	0.006
54078	0.002	-0.022	0.029
54079	0.015	0.028	0.032
54080	-0.044	-0.007	-0.056
54081	-0.021	0.006	0.009
54082	0.010	-0.042	0.010
54083	-0.072	0.025	-0.021
54084	-0.000	0.033	0.004
54085	0.009	-0.017	-0.050
54086	0.039	-0.005	-0.003
54087	-0.036	-0.003	0.013
54088	0.023	0.005	-0.004
54089	-0.005	0.032	-0.012
54090	0.032	-0.009	-0.036
54091	-0.003	-0.023	-0.047
54092	0.040	0.020	-0.014
54093	0.008	0.010	0.046

GNSS drift parameter for profile 8

constant part in [meter] X 1.566 Y 1.360 Z 5.048

linear part in [meter] X -0.008 Y -0.013 Z -0.014

54094	-0.042	-0.071	-0.151
54095	0.027	-0.013	0.001
54096	0.030	0.083	0.098
54097	0.037	0.064	0.015
54098	-0.015	-0.008	-0.124
54099	0.021	-0.060	-0.039
54100	-0.049	0.006	0.018
54101	0.022	0.035	0.097
54102	0.031	0.011	0.076
54103	-0.007	-0.015	-0.021
54104	0.009	0.026	0.006
54105	-0.036	-0.044	0.014
54106	0.009	-0.027	0.042
54107	-0.012	0.018	-0.013
54108	0.016	-0.024	-0.030
54109	0.044	0.003	-0.090
54110	0.037	-0.017	-0.036
54111	0.021	0.020	0.050
54112	-0.005	-0.013	0.066
54113	0.007	-0.003	0.016
54114	-0.042	0.024	0.036
54115	-0.094	-0.032	-0.029
54116	0.067	-0.007	-0.014
54117	0.013	-0.004	-0.013
54118	0.019	0.029	0.016
54119	0.044	0.018	0.034
54120	-0.016	-0.016	0.041
54121	0.012	-0.023	0.047
54122	-0.008	-0.017	0.038
54123	-0.019	0.065	-0.008
54124	-0.026	-0.003	-0.015
54125	-0.020	0.013	0.020
54126	-0.056	-0.034	0.024
54127	-0.048	-0.011	0.003
54128	-0.037	0.044	-0.008
54129	-0.054	0.038	-0.049
54130	-0.011	-0.000	-0.028

54131	-0.032	-0.027	-0.015
54132	-0.054	0.002	-0.063
54133	0.018	-0.006	-0.008
54134	0.021	-0.016	0.025
54135	-0.048	-0.012	-0.035
54136	0.037	0.029	0.022
54137	-0.031	-0.020	-0.016
54138	0.030	-0.028	0.009
54139	0.025	0.026	-0.049
54140	0.076	-0.006	-0.008
54141	0.035	0.047	0.040
54142	0.010	0.025	0.019
54143	0.005	-0.004	-0.008
54144	0.027	-0.039	-0.018
54145	-0.000	-0.029	-0.043
54146	-0.017	-0.032	-0.000
54147	0.029	0.031	0.026
54148	0.002	0.006	0.033

GNSS drift parameter for profile 9

constant part in [meter]	X	-1.884	Y	-1.466	Z	4.842
linear part in [meter]	X	-0.000	Y	-0.001	Z	0.003

54149	-0.040	-0.041	0.100
54150	-0.022	0.020	0.053
54151	-0.026	0.012	-0.004
54152	0.000	-0.012	-0.012
54153	0.013	-0.047	-0.013
54154	0.019	-0.034	-0.036
54155	-0.031	-0.002	-0.028
54156	0.049	0.064	-0.061
54157	0.012	0.028	-0.018
54158	0.046	-0.020	0.060
54159	0.026	0.002	0.027
54160	0.014	-0.027	-0.008
54161	0.005	-0.060	0.016
54162	0.023	0.037	-0.064
54163	0.054	-0.062	-0.006

54164	0.011	0.022	-0.065
54165	-0.030	-0.003	0.004
54166	-0.031	-0.007	-0.018
54167	-0.044	0.044	0.066
54168	-0.030	0.068	-0.038
54169	-0.047	0.010	-0.001
54170	0.031	-0.031	0.044
54171	-0.023	0.034	0.015
54172	-0.032	0.022	0.022
54173	-0.023	0.021	-0.041
54174	0.014	0.024	0.028
54175	0.049	-0.047	-0.011
54176	0.047	0.052	-0.021
54177	0.035	0.002	-0.044
54178	0.045	-0.013	-0.015
54179	-0.010	0.005	-0.033
54180	-0.036	-0.047	-0.023
54181	-0.047	0.050	0.011
54182	0.004	0.046	0.010
54183	-0.037	0.006	0.050
54184	-0.039	0.019	-0.020
54185	0.009	0.019	-0.045
54186	-0.057	-0.019	0.036
54187	0.008	0.006	0.022
54188	-0.026	-0.003	0.016
54189	0.008	-0.050	0.049
54190	0.086	-0.060	0.008
54191	0.006	-0.050	0.065
54192	0.031	-0.025	0.001
54193	0.017	-0.006	-0.002
54194	-0.005	0.052	-0.062
54195	-0.026	0.001	-0.012

GNSS drift parameter for profile 10

constant part in [meter] X 1.602 Y 1.356 Z 4.948
linear part in [meter] X -0.001 Y 0.047 Z -0.013

54196	-0.003	-0.018	0.028
54197	-0.004	0.011	-0.048
54198	0.010	0.007	-0.047
54199	0.024	-0.028	-0.004
54200	-0.031	0.002	-0.021
54201	0.049	0.031	-0.016
54202	0.009	0.038	-0.022
54203	0.028	-0.023	0.017
54204	0.024	-0.030	-0.020
54205	-0.046	-0.029	0.036
54206	-0.040	-0.030	-0.044
54207	-0.014	-0.010	-0.056
54208	-0.007	-0.044	-0.001
54209	0.025	-0.033	0.026
54210	0.006	0.017	0.031
54211	0.011	0.034	0.034
54212	-0.042	-0.017	0.004
54213	0.056	0.017	0.079
54214	-0.006	0.025	0.037
54215	0.039	0.059	0.059
54216	0.005	0.038	0.004
54217	-0.023	-0.024	0.025
54218	-0.066	0.023	0.002
54219	-0.043	0.040	-0.076
54220	-0.023	0.023	-0.006
54221	-0.064	-0.036	-0.080
54222	-0.009	-0.049	-0.031
54223	-0.012	-0.001	-0.029
54224	0.006	0.005	-0.009
54225	-0.018	0.004	0.035
54226	0.013	0.001	-0.045
54227	0.072	-0.007	0.038

54228	-0.021	0.013	0.031
54229	0.053	0.019	0.052
54230	-0.009	0.012	0.051
54231	-0.007	-0.034	0.034
54232	0.024	0.012	0.046
54233	0.004	-0.010	0.056
54234	0.039	-0.009	0.048
54235	-0.060	-0.019	-0.001
54236	-0.012	0.021	-0.029
54237	0.014	0.044	-0.018
54238	0.013	0.011	0.018
54239	0.013	-0.003	-0.020
54240	0.004	-0.043	-0.027
54241	0.007	0.039	-0.002
54242	0.038	-0.008	-0.025
54243	0.031	0.021	-0.031
54244	0.013	0.009	0.001
54245	-0.016	-0.014	-0.027
54246	0.033	0.004	-0.002
54247	-0.002	0.018	0.026
54248	0.011	-0.016	-0.008
54249	-0.014	-0.031	0.008
54250	0.011	0.051	-0.003
54251	0.009	-0.048	-0.023
54252	-0.076	-0.044	-0.083
54253	0.009	-0.005	0.006
54254	-0.032	0.013	0.025

GNSS drift parameter for profile 11

constant part in [meter] X -1.858 Y -1.495 Z 4.871

linear part in [meter] X 0.002 Y -0.011 Z -0.000

54255	0.013	0.006	-0.008
54256	-0.034	-0.046	0.024
54257	0.067	-0.061	-0.057
54258	-0.047	-0.021	0.032
54259	-0.002	-0.010	-0.029
54260	-0.020	0.106	0.025
54261	0.029	-0.028	-0.000

54262	0.038	0.011	0.048
54263	-0.018	0.033	-0.008
54264	0.035	-0.023	0.012
54265	-0.050	0.016	0.022
54266	0.003	-0.002	-0.021
54267	0.012	-0.024	-0.017
54268	-0.022	0.049	0.007
54269	0.004	-0.004	0.007
54270	-0.004	0.014	0.013
54271	0.026	-0.058	0.027
54272	0.032	-0.059	-0.006
54273	0.026	-0.002	-0.018
54274	0.024	0.016	0.017
54275	0.029	0.044	0.034
54276	-0.059	0.017	0.034
54277	-0.010	0.012	0.012
54278	-0.008	-0.003	0.008
54279	-0.052	0.031	0.003
54280	-0.084	0.037	-0.026
54281	-0.030	0.045	0.043
54282	-0.015	-0.003	0.047
54283	-0.063	-0.002	0.031
54284	-0.022	0.014	0.003
54285	0.068	-0.010	-0.038
54286	-0.026	-0.045	-0.044
54287	-0.009	-0.058	-0.058
54288	0.040	0.018	-0.075
54289	0.040	-0.008	-0.007
54290	0.066	-0.049	-0.048
54291	0.019	-0.017	-0.051
54292	0.040	-0.011	-0.027
54293	0.054	0.019	-0.042
54294	0.014	0.029	-0.009
54295	-0.046	0.037	-0.050
54296	0.014	0.013	-0.056
54297	-0.021	0.020	-0.021
54298	-0.024	0.095	-0.055
54299	-0.033	0.060	0.011
54300	-0.048	-0.023	0.089

54301	0.019	-0.074	-0.030
54302	0.003	-0.056	0.022
54303	0.020	-0.018	0.040
54304	0.034	0.025	0.007
54305	-0.008	-0.027	0.091
54306	0.002	-0.052	0.063
54307	0.019	-0.028	0.008
54308	-0.030	0.019	0.015
54309	-0.010	0.034	0.005

GNSS drift parameter for profile 12

constant part in [meter] X 0.183 Y 2.542 Z 4.969

linear part in [meter] X -0.003 Y 0.034 Z 0.001

54522	-0.030	-0.000	0.004
54523	0.028	0.049	0.022
54524	0.054	-0.040	-0.020
54525	-0.069	-0.035	0.036
54526	-0.032	-0.008	-0.017
54527	-0.003	-0.002	-0.061
54528	0.040	-0.009	0.014
54529	0.020	-0.031	-0.003
54530	-0.005	-0.002	0.031
54531	-0.063	-0.008	0.003
54532	0.030	0.008	-0.042
54533	0.014	-0.049	-0.016
54534	0.012	0.012	-0.021
54535	0.019	0.030	0.016
54536	-0.012	0.029	0.008
54537	-0.028	0.005	0.051
54538	0.058	0.023	0.014
54539	0.020	-0.001	-0.021
54540	0.004	0.025	-0.005
54541	0.032	-0.018	0.017
54542	-0.039	-0.037	0.002
54543	-0.021	0.026	-0.057
54544	0.039	-0.020	-0.031
54545	0.029	0.002	-0.034
54546	-0.064	0.019	-0.027

54547	-0.005	0.031	0.030
54548	-0.023	-0.012	-0.001
54549	-0.025	-0.024	0.029
54550	0.019	0.061	0.074
54551	-0.015	0.058	0.020
54552	-0.019	0.001	0.057
54553	0.019	-0.036	-0.039
54554	0.052	0.023	0.031
54555	-0.004	-0.004	-0.025
54556	0.002	-0.007	0.011
54557	-0.005	-0.033	-0.043
54558	0.013	0.037	0.001
54559	-0.033	0.039	0.014
54560	-0.047	-0.023	0.011
54561	-0.027	0.051	0.046
54562	0.029	-0.035	0.000
54563	-0.045	0.020	0.051
54564	-0.012	-0.067	-0.075
54565	0.006	-0.002	-0.018
54566	0.031	-0.011	0.002
54567	0.033	-0.026	-0.004
54568	0.021	-0.008	-0.035

GNSS drift parameter for profile 13

constant part in [meter] X 1.570 Y 2.693 Z 4.893

linear part in [meter] X -0.002 Y -0.050 Z 0.005

51722	0.009	0.009	0.049
51723	0.022	0.017	0.041
51724	0.016	0.028	0.064
51725	0.049	-0.033	0.026
51726	0.018	0.013	0.079

51727	-0.015	0.022	0.017
51728	0.084	-0.064	-0.059
51729	-0.004	-0.015	-0.045
51730	0.011	0.013	0.035
51731	0.021	0.000	-0.059
51732	-0.009	0.028	-0.031
51733	0.046	-0.031	-0.060
51734	-0.012	-0.064	-0.098
51735	-0.008	0.014	0.045
51736	-0.020	-0.019	-0.061
51737	0.012	0.044	0.037
51738	0.016	-0.010	-0.005
51739	-0.034	-0.008	-0.016
51740	-0.000	-0.015	-0.092
51741	-0.029	0.029	-0.049
51742	-0.066	-0.019	-0.007
51743	0.000	-0.026	0.035
51744	-0.054	-0.002	-0.044
51745	-0.022	0.017	0.017
51746	-0.007	0.015	0.005
51747	-0.034	0.013	-0.011
51748	-0.045	0.061	0.058
51749	-0.059	0.029	0.028
51750	-0.074	-0.014	-0.003
51751	-0.003	0.002	-0.047
51752	-0.009	-0.026	-0.003
51753	0.000	-0.029	0.038
51754	-0.016	0.016	-0.038
51755	-0.010	0.029	0.069
51756	-0.011	-0.013	-0.020
51757	0.027	-0.037	0.030
51758	0.015	-0.003	0.045
51759	0.000	0.017	0.010
51760	0.045	0.106	0.037
51761	-0.026	0.027	-0.018
51762	0.058	-0.055	0.024
51763	0.005	-0.007	0.020
51764	-0.018	-0.024	-0.031
51765	0.006	-0.028	-0.001

51766	-0.012	-0.005	0.013
51767	0.026	0.014	0.071
51768	0.027	-0.036	0.023
51769	0.015	0.048	0.037
51770	0.017	-0.005	0.016
51771	0.029	-0.016	-0.031
51772	0.012	-0.013	-0.087
51773	0.014	0.017	-0.007
51774	-0.004	-0.017	-0.046

GNSS drift parameter for profile 14

constant part in [meter] X -1.685 Y -1.769 Z 4.900

linear part in [meter] X 0.015 Y 0.000 Z 0.029

51775	-0.015	-0.010	0.018
51776	-0.010	0.024	0.005
51777	0.013	-0.013	-0.002
51778	-0.034	-0.026	0.004
51779	0.024	-0.016	-0.013
51780	0.027	0.023	-0.000
51781	0.012	-0.023	-0.012
51782	-0.018	-0.016	0.004
51783	-0.014	0.035	-0.033
51784	0.025	0.013	-0.023
51785	-0.019	-0.010	0.054
51786	-0.018	-0.016	0.061
51787	-0.038	-0.008	0.046
51788	-0.015	0.015	0.017
51789	0.035	0.030	-0.076
51790	-0.010	-0.010	0.053
51791	-0.003	0.008	0.006
51792	-0.008	0.009	0.010
51793	-0.024	0.012	0.013
51794	0.002	0.027	0.032
51795	0.011	-0.039	0.023
51796	-0.027	0.007	-0.039

51797	-0.030	0.002	-0.066
51798	-0.042	0.017	-0.133
51799	-0.036	-0.029	0.004
51800	0.004	-0.018	-0.002
51801	0.003	0.016	-0.018
51802	0.001	-0.013	-0.018
51803	-0.011	0.025	0.006
51804	-0.012	0.031	-0.023
51805	0.008	-0.034	-0.019
51806	0.030	-0.004	0.022
51807	0.048	0.011	-0.058
51808	-0.011	0.014	-0.011
51809	0.061	0.009	-0.048
51810	0.017	-0.040	0.064
51811	0.073	-0.033	0.019
51812	0.029	-0.021	0.018
51813	0.069	0.059	0.030
51814	0.018	-0.029	-0.011
51815	0.056	0.020	0.023
51816	-0.008	0.030	-0.020
51817	0.026	0.037	0.077
51818	0.056	-0.003	-0.012
51819	0.013	-0.046	0.031
51820	0.059	0.022	0.024
51821	-0.003	0.004	-0.036
51822	0.029	-0.062	0.049
51823	-0.013	-0.003	0.041
51824	-0.029	-0.012	-0.032
51825	-0.079	0.004	-0.011
51826	-0.079	0.021	0.031
51827	-0.070	-0.018	0.009
51828	-0.022	0.033	0.006
51829	-0.010	0.013	-0.019
51830	-0.039	-0.018	-0.068

GNSS drift parameter for profile 15

constant part in [meter] X -0.470 Y 2.445 Z 5.279

linear part in [meter] X 0.029 Y -0.033 Z -0.077

52765	-0.046	0.010	0.090
52766	0.043	-0.049	0.048
52767	0.060	-0.028	0.027
52768	-0.002	0.007	0.065
52769	-0.015	0.006	0.048
52770	0.015	0.004	-0.052
52771	-0.004	0.034	0.006
52772	-0.022	0.047	-0.066
52773	-0.001	0.072	-0.055
52774	-0.000	0.062	-0.044
52775	0.021	-0.036	-0.021
52776	0.067	-0.054	-0.087
52777	-0.016	0.013	0.003
52778	0.018	-0.057	-0.031
52779	-0.001	-0.034	0.004
52780	-0.018	-0.047	0.050
52781	-0.044	-0.039	0.016
52782	0.019	0.039	0.022
52783	-0.045	-0.011	0.011
52784	0.006	-0.002	-0.013
52785	-0.032	0.032	0.005
52786	-0.027	-0.006	-0.097
52787	-0.031	0.012	-0.013
52788	-0.017	-0.005	-0.029
52789	-0.021	0.027	-0.035
52790	0.007	-0.019	0.037
52791	-0.004	0.003	0.003
52792	-0.014	-0.000	-0.049
52793	0.015	0.029	0.002
52794	-0.009	0.011	0.004
52795	0.021	0.001	0.034
52796	0.015	-0.005	0.036
52797	0.008	-0.001	0.016
52798	-0.003	-0.000	-0.024
52799	0.028	0.020	0.018
52800	0.035	-0.006	0.024
52801	-0.019	-0.017	0.037
52802	0.018	-0.011	0.010

GNSS drift parameter for profile 16

constant part in [meter] X -0.631 Y -1.943 Z 5.082

linear part in [meter] X -0.037 Y 0.017 Z -0.006

52804	0.019	0.011	-0.048
52805	-0.001	-0.062	-0.063
52806	-0.032	-0.009	-0.026
52807	-0.007	-0.014	0.009
52808	0.020	-0.012	0.024
52809	0.048	0.043	0.015
52810	0.001	0.009	-0.003
52811	0.047	-0.005	0.015
52812	0.049	0.034	0.031
52813	-0.041	0.023	-0.052
52814	-0.064	-0.038	0.024
52815	0.017	0.018	0.040
52816	-0.006	-0.010	0.030
52817	-0.028	0.039	0.007
52818	0.001	0.034	0.004
52819	-0.059	-0.004	0.028
52820	0.040	-0.014	0.030
52821	0.004	0.004	0.020
52822	-0.017	-0.009	0.020
52823	0.038	-0.041	-0.017
52824	-0.019	-0.002	0.020
52825	0.015	0.026	0.019
52826	-0.012	0.000	0.045
52827	-0.036	-0.015	0.007
52828	0.055	-0.024	-0.019
52829	-0.029	0.029	-0.057
52830	-0.046	0.009	-0.044
52831	-0.024	0.036	-0.099
52832	-0.034	-0.040	-0.037
52833	0.047	-0.008	0.009
52834	-0.009	-0.008	0.025
52835	-0.021	-0.021	0.037
52836	0.005	-0.009	-0.019
52837	-0.001	0.015	0.004
52838	0.008	-0.003	0.032

52839	0.054	0.056	-0.001
52840	0.018	-0.038	-0.010

max standard deviations of terrain points

x	0.100 [meter] at point	40000022
y	0.119 [meter] at point	60002845
z	1.016 [meter] at point	60003453

mean standard deviations of terrain points

x	0.020
y	0.023
z	0.075

exterior orientation parameters (px, py, pz in [meter] omega,phi,kappa in [deg])

rotations from terrain to photo (rotated axes)

photo ID	px	py	pz	omega	phi	kappa
51722	515127.525	6691472.217	2178.570	1.05835	-0.82859	87.51613
51723	514651.842	6691519.780	2180.219	0.49629	-0.51418	87.25072
51724	514192.185	6691565.970	2183.338	-0.36926	-1.07375	87.38000
51725	513726.785	6691613.936	2180.479	0.68464	-1.07391	87.37528
51726	513264.761	6691660.859	2181.325	-0.25670	-0.85220	87.20784
51727	512796.730	6691710.201	2177.949	0.41458	-1.23470	87.44906
51728	512328.452	6691758.147	2177.337	1.96694	-0.39194	87.98010
51729	511891.384	6691798.060	2179.527	1.10776	-1.35229	88.23817
51730	511423.626	6691836.062	2178.115	0.12652	-0.79770	88.78190
51731	510962.030	6691870.469	2180.968	1.19911	-1.10960	89.07408
51732	510493.717	6691901.618	2177.004	0.18788	-1.26451	88.92503
51733	510017.629	6691932.371	2177.097	0.30444	-0.40891	89.29309
51734	509575.263	6691960.114	2176.826	0.79559	-1.15434	89.15900
51735	509140.680	6691985.990	2175.434	-1.27621	-0.32321	89.25054
51736	508708.605	6692017.756	2180.516	0.79486	-0.46253	87.93532

51737	508259.628	6692054.282	2179.246	-0.53273	-1.14345	87.88325
51738	507790.192	6692096.714	2178.946	0.19717	-0.28038	87.38829
51739	507357.697	6692137.875	2180.977	-0.05170	-1.02311	86.98730
51740	506917.278	6692181.470	2178.102	0.67653	-0.85812	87.19795
51741	506448.773	6692226.736	2181.067	0.24203	-0.81887	86.97944
photo ID	px	py	pz	omega	phi	kappa
51742	505981.555	6692271.883	2178.811	-0.69390	-1.19323	87.41785
51743	505501.536	6692319.842	2179.676	-0.38773	-0.46747	87.35841
51744	505033.976	6692368.684	2177.995	0.94216	-1.47525	86.86786
51745	504566.443	6692416.755	2176.425	0.41158	-0.29169	86.81266
51746	504130.180	6692461.240	2178.617	0.36414	-0.81070	87.26177
51747	503656.390	6692508.637	2176.428	0.87595	-0.67597	87.29420
51748	503174.241	6692555.341	2176.465	-0.01740	-0.49044	87.27211
51749	502712.584	6692602.010	2180.676	0.08504	-0.49865	86.76510
51750	502252.259	6692648.815	2179.677	0.12611	-1.16671	87.32638
51751	501789.770	6692694.356	2181.393	1.12550	-0.42834	87.58570
51752	501312.183	6692739.898	2180.796	-0.10181	-1.63858	87.63166
51753	500840.057	6692786.752	2180.107	-0.19019	-0.49155	87.60900
51754	500363.120	6692835.788	2177.865	1.08575	-1.70770	87.05444
51755	499889.441	6692881.903	2175.396	-0.05069	-0.32469	87.24308
51756	499424.416	6692926.664	2177.396	1.01491	-1.10008	87.59182
51757	498954.395	6692968.117	2175.754	0.24804	-0.57955	87.91219
51758	498500.623	6693008.244	2179.716	-0.12972	-0.54402	87.76694
51759	498021.393	6693053.548	2178.926	0.22816	-1.07348	87.61474
51760	497563.745	6693097.897	2180.327	0.17947	-0.31842	87.55581
51761	497090.116	6693144.976	2179.679	0.32428	-1.41810	87.34364
51762	496636.144	6693190.374	2178.096	0.21117	-0.25547	87.43498
51763	496166.217	6693238.600	2180.750	0.09713	-1.17670	87.11621
51764	495689.241	6693288.791	2178.002	0.80293	-0.77373	87.29490
51765	495220.683	6693335.255	2182.166	0.15513	-0.91805	87.81462
51766	494749.711	6693381.470	2179.935	-0.11154	-1.40624	88.07896
51767	494277.418	6693429.275	2181.127	-0.44668	-1.22809	87.43940
51768	493791.179	6693484.260	2177.854	0.37194	-1.37156	87.29062
51769	493314.487	6693538.820	2177.846	0.68780	-0.93884	86.84471
51770	492837.684	6693591.103	2174.085	0.39637	-1.05720	87.24416
51771	492405.827	6693636.000	2175.206	1.13791	-0.66008	87.51137
51772	491965.428	6693678.458	2174.053	1.30788	-1.14747	87.55825
51773	491489.128	6693720.400	2177.417	-0.24339	-0.23675	88.11390

51774	491021.187	6693761.235	2180.184	-0.66920	-1.46529	88.43970
51775	484842.322	6690004.387	2179.593	-0.15577	1.05781	-98.82571
51776	485357.766	6689949.642	2182.466	0.04180	0.59361	-99.47382
51777	485866.387	6689888.024	2181.482	0.46855	1.30268	-100.30191
51778	486373.866	6689816.000	2182.960	0.32112	0.32014	-101.73272
51779	486866.997	6689740.062	2181.833	0.35124	1.17878	-100.55892
51780	487369.063	6689667.740	2180.244	-0.05268	0.83789	-99.75033
51781	487854.902	6689603.857	2180.805	0.16063	1.00785	-98.32587
51782	488323.424	6689545.799	2179.950	0.28891	1.20183	-97.46722
51783	488836.623	6689484.328	2178.245	-0.23308	0.90145	-97.27014
51784	489336.669	6689430.762	2178.439	-0.03774	1.19259	-97.34172
51785	489855.699	6689378.676	2176.520	1.05736	0.96146	-96.01615
51786	490362.283	6689329.110	2178.143	0.98726	0.87477	-96.43512
51787	490834.584	6689282.580	2175.961	0.91523	1.03373	-95.89608
51788	491324.953	6689234.121	2176.310	0.43188	0.15086	-96.03713
51789	491826.260	6689185.673	2179.438	-0.25104	1.43565	-96.63476
51790	492342.025	6689134.756	2177.093	1.82780	0.60736	-97.18010
51791	492844.166	6689081.814	2179.337	1.06206	0.93855	-95.74882
51792	493344.667	6689030.138	2176.262	0.66047	0.89600	-96.42529
51793	493855.269	6688977.844	2178.975	0.69493	0.70449	-96.49417
51794	494360.203	6688926.806	2175.909	1.05573	1.02899	-96.72630
51795	494863.125	6688874.931	2177.715	0.84832	0.24241	-96.44722
51796	495365.986	6688821.924	2176.662	0.23992	1.22320	-96.61799
51797	495869.121	6688769.418	2177.760	-0.43445	0.48561	-95.60045
51798	496380.090	6688723.114	2177.848	-0.84386	1.35771	-95.01979
51799	496878.723	6688683.894	2177.353	1.19076	0.29858	-95.33279
51800	497343.928	6688649.758	2178.295	1.27527	1.12068	-94.46713
51801	497857.513	6688614.014	2174.293	0.66324	0.48298	-95.28017
51802	498357.756	6688578.782	2177.380	0.34518	0.68846	-95.43000
51803	498853.345	6688544.322	2176.213	0.22709	0.56988	-94.86805
51804	499348.287	6688509.277	2180.530	-0.10484	0.66691	-95.60515
51805	499812.532	6688472.097	2177.628	0.19957	1.26935	-96.54454
51806	500320.862	6688424.712	2180.150	0.31435	0.43955	-97.76491
51807	500794.044	6688375.773	2179.344	-0.28338	1.58643	-96.64362
51808	501291.437	6688323.314	2180.039	-0.18063	0.55658	-96.54951
51809	501783.330	6688270.706	2178.562	0.00498	2.03559	-96.77556
51810	502280.072	6688217.085	2175.691	0.75524	0.29884	-96.80956
51811	502782.109	6688160.974	2176.333	0.08019	1.52768	-97.08951
51812	503239.489	6688110.515	2172.920	0.00793	0.62905	-97.09285

51813	503742.525	6688057.519	2176.728	0.11641	0.70638	-97.07028
51814	504190.851	6688012.226	2174.433	-0.36941	1.00157	-96.77088
51815	504680.907	6687966.243	2177.293	0.27075	0.33080	-96.55325
51816	505182.151	6687920.706	2178.027	-0.30098	1.15405	-96.20061
photo ID	px	py	pz	omega	phi	kappa

51817	505677.942	6687878.315	2178.771	0.43661	0.45618	-96.35892
51818	506156.395	6687836.616	2179.857	-0.03919	1.18489	-95.94401
51819	506662.709	6687792.977	2179.857	0.73985	0.62871	-95.83770
51820	507157.509	6687747.535	2179.405	0.77732	1.36456	-95.76190
51821	507667.571	6687697.684	2174.087	-0.31460	1.10351	-96.32815
51822	508164.648	6687649.627	2177.037	0.81806	0.54557	-96.14572
51823	508659.728	6687602.287	2177.317	0.64029	1.22472	-95.61697
51824	509155.865	6687556.885	2177.815	-0.49002	0.54068	-95.56694
51825	509664.961	6687512.903	2176.949	0.25424	1.59721	-95.68676
51826	510164.519	6687470.854	2175.491	0.02884	0.24853	-95.09181
51827	510667.896	6687429.933	2174.756	0.32353	1.28302	-95.46289
51828	511126.442	6687393.050	2174.732	-0.29647	0.08275	-95.18700
51829	511620.417	6687355.589	2179.378	0.16792	0.97887	-95.23098
51830	512115.096	6687318.535	2177.887	-0.28008	0.81209	-94.83223
52765	504063.967	6674907.117	2207.331	0.97864	-1.44624	131.61309
52766	503724.968	6674620.764	2205.118	1.18936	-0.02732	132.40188
52767	503403.135	6674338.357	2205.858	1.06807	-0.85801	133.05646
52768	503038.907	6674012.401	2201.030	-0.57277	-1.76734	132.86648
52769	502711.505	6673729.264	2206.019	-0.95534	-1.67291	130.67807
52770	502358.903	6673438.642	2203.321	0.35295	-1.11148	129.72798
52771	502005.162	6673156.717	2206.463	-0.79141	-1.06359	128.73212
52772	501649.848	6672886.526	2205.416	0.69910	-0.96991	127.52655
52773	501261.978	6672596.993	2208.319	0.35564	-0.35626	127.40938
52774	500896.682	6672323.269	2210.412	1.15726	-0.95155	127.98153
52775	500516.468	6672034.243	2204.582	1.52097	0.00242	128.55774
52776	500167.211	6671761.124	2206.929	3.12856	0.95118	129.70967
52777	499802.905	6671458.969	2202.234	1.47853	-0.59224	130.81813
52778	499429.896	6671142.907	2201.906	1.92234	0.71569	131.09900
52779	499075.416	6670835.929	2201.136	1.71282	-0.30451	131.46062
52780	498722.182	6670530.875	2202.483	0.25353	0.18694	130.72988
52781	498380.393	6670241.712	2206.004	0.57909	-1.28042	129.83647
52782	498031.997	6669952.201	2204.217	-0.16884	-0.35260	130.44880
52783	497669.703	6669657.469	2208.831	-0.23519	-1.38214	129.20485

52784	497279.832	6669353.844	2206.108	0.13138	-1.72333	127.98460
52785	496901.765	6669071.985	2208.114	-0.43840	-1.20976	127.02217
52786	496518.485	6668796.734	2206.218	2.03162	-0.66882	126.17753
52787	496143.074	6668524.433	2204.240	0.23630	-0.62900	126.77582
52788	495764.321	6668247.640	2204.720	0.87875	-0.89976	127.41523
52789	495390.740	6667972.346	2202.380	1.42674	-0.53851	127.35160
52790	495010.240	6667686.460	2202.897	0.59844	-0.12089	127.89729
52791	494635.387	6667397.069	2206.583	1.26330	-0.55807	128.83770
52792	494263.658	6667101.652	2201.948	1.26402	-0.36732	130.00785
52793	493894.921	6666803.603	2203.538	0.51081	-0.23707	130.13575
52794	493529.222	6666505.844	2204.418	0.72505	-0.81393	130.74430
52795	493163.045	6666205.112	2207.923	0.46993	-0.15221	130.49160
52796	492821.270	6665921.794	2210.217	0.76133	-1.43531	130.62696
52797	492455.755	6665620.373	2205.519	0.56706	-0.91777	130.70127
52798	492100.005	6665328.960	2204.894	0.74235	-0.76177	130.57644
52799	491745.223	6665039.687	2202.087	0.32089	-1.26932	130.58306
52800	491382.337	6664747.854	2202.742	0.48757	0.01039	130.36650
52801	491016.083	6664452.607	2207.007	0.38355	-0.65844	130.50079
52802	490657.003	6664163.637	2206.097	0.82913	-0.49776	130.40640
52804	488474.593	6667882.936	2209.850	-0.07479	1.43464	-49.85138
52805	488869.940	6668207.113	2208.084	-0.50771	1.15669	-49.80878
52806	489255.358	6668521.026	2207.572	-0.46966	0.84838	-50.42221
52807	489646.483	6668837.549	2207.150	-0.57162	1.29984	-50.52177
52808	490032.574	6669147.793	2203.999	-0.63119	1.06969	-50.69105
52809	490392.217	6669435.213	2203.932	-0.73705	0.09253	-50.80312
52810	490779.952	6669747.281	2205.644	-0.83032	0.58840	-50.34045
52811	491129.101	6670029.265	2202.201	-0.25400	0.86666	-50.24336
52812	491494.995	6670322.561	2204.490	0.06640	0.68448	-50.16284
52813	491853.236	6670605.035	2206.348	-1.47159	-0.09687	-50.41103
52814	492215.842	6670892.258	2207.137	-0.50084	0.58367	-50.27973
52815	492590.697	6671193.938	2206.230	-0.63397	0.79086	-49.64113
52816	492973.009	6671505.180	2207.674	-0.55865	0.32800	-49.23040
52817	493322.045	6671792.952	2206.948	-0.98077	0.92209	-48.47444
52818	493714.604	6672117.882	2204.586	-0.35152	0.37053	-48.70957
52819	494102.825	6672438.325	2207.039	0.11145	1.16219	-48.94758
52820	494480.075	6672746.406	2205.044	-0.19834	1.22489	-49.41229
52821	494844.258	6673041.387	2205.625	0.23053	0.79302	-49.86232
52822	495235.344	6673354.948	2208.443	-0.05565	1.25689	-49.54624
52823	495620.083	6673659.872	2206.690	-0.58628	1.53070	-50.29738

52824	496012.390	6673968.230	2205.481	-0.04838	0.75151	-50.38097
52825	496409.463	6674279.013	2207.586	-0.55354	1.07508	-50.12331
52826	496810.500	6674591.529	2203.150	0.01849	1.66326	-50.22503
52827	497203.322	6674895.939	2204.676	-0.71505	-0.18945	-49.78055
52828	497585.628	6675197.143	2207.690	-1.29175	0.77161	-49.53218
52829	497946.142	6675486.283	2205.936	-1.80805	-0.16513	-48.78900
52830	498324.759	6675802.964	2209.186	-0.96368	0.54864	-47.27565
52831	498685.376	6676112.541	2205.028	-1.74056	0.76223	-46.91877
52832	499056.598	6676438.445	2205.645	-0.80457	0.02508	-46.29693
52833	499407.696	6676751.036	2206.686	-0.17393	2.46614	-46.91800
52834	499772.179	6677070.809	2202.340	0.45287	1.39028	-47.57773
52835	500151.535	6677399.279	2203.977	0.70453	2.00017	-47.48108
52836	500513.939	6677707.769	2201.580	-0.15594	0.81174	-47.84226
52837	500864.168	6678002.502	2204.000	0.18407	0.41461	-48.38556
52838	501237.144	6678312.469	2204.469	0.27150	1.54620	-48.28643
52839	501604.278	6678611.886	2205.989	0.24204	0.39253	-48.99649
52840	501973.509	6678909.615	2210.329	-0.06930	0.81692	-49.09802
52841	502956.726	6675779.081	2207.879	0.84830	0.18899	129.81352
52842	502613.265	6675497.669	2209.020	0.71801	-1.02344	130.19904
52843	502264.684	6675209.534	2206.026	1.24305	-0.55452	130.48662
52844	501920.412	6674923.807	2205.703	0.11349	-0.74668	129.92433
52845	501594.127	6674661.022	2204.852	-0.19204	-1.56463	128.60236
52846	501272.430	6674410.609	2203.171	0.41021	-0.55197	127.59585
52847	500932.215	6674152.071	2206.551	0.98922	0.05773	126.73499
52848	500599.839	6673901.728	2206.501	1.27747	-0.50416	126.91243
52849	500234.877	6673625.491	2204.457	0.46369	0.46903	128.19534
52850	499885.049	6673358.823	2205.658	-0.03366	-1.79886	128.22099
52851	499521.773	6673083.965	2205.590	0.05473	-0.20863	128.50375
52852	499168.259	6672815.300	2208.637	2.08608	-0.25511	128.99539
52853	498803.944	6672530.573	2206.349	1.75625	0.21737	129.67900
52854	498449.640	6672244.027	2205.503	1.48429	-0.61389	130.14062
52855	498095.281	6671950.104	2201.427	0.39693	-0.74563	130.95281
52856	497743.109	6671656.529	2205.380	0.86131	-0.20994	130.50895
52857	497392.455	6671364.367	2202.986	0.02918	-1.40538	130.56238
52858	497037.018	6671074.401	2203.200	0.42288	-0.30540	130.25657
52859	496683.857	6670787.329	2206.933	1.00063	-0.17079	129.80299
52860	496330.511	6670499.153	2206.264	0.22874	-1.43519	129.54911
52861	495972.267	6670213.039	2206.569	-0.09125	-0.86317	128.71335
52862	495600.080	6669924.759	2205.842	0.45657	-1.42082	127.67842

52863	495234.347	6669648.701	2201.711	0.29906	-0.56356	127.21459
52864	494861.431	6669370.500	2205.601	0.67527	-0.16089	126.60729
52865	494517.079	6669112.642	2205.729	1.15152	-0.65755	127.30839
52866	494170.112	6668851.155	2203.712	0.05092	-0.66246	126.95250
52867	493779.214	6668559.405	2204.229	0.60042	-0.48209	126.78014
52868	493408.999	6668282.814	2206.639	1.70929	0.86018	127.72941
52869	493062.260	6668013.054	2207.583	2.11288	0.09241	129.20293
52870	492675.671	6667702.671	2204.676	0.97171	0.08504	129.89979
52871	492319.963	6667414.403	2209.299	0.47980	-0.75524	129.27563
52872	491959.859	6667122.638	2208.099	1.58557	-0.61427	129.56278
52873	491600.927	6666827.184	2206.746	1.40868	0.07462	130.34804
52874	491236.848	6666526.645	2203.617	1.30254	-0.57125	130.47625
52875	490876.193	6666233.576	2204.956	0.37598	-0.16896	130.71718
52876	490531.301	6665958.064	2206.957	0.92378	-0.85845	129.67099
52877	490160.413	6665663.986	2207.543	0.88371	-0.29909	129.48443
52878	489779.690	6665362.654	2205.100	1.27712	-0.94645	129.47856
52879	489407.683	6665068.133	2202.353	1.24403	-5.08766	143.91134
52880	487427.410	6668974.727	2209.044	-0.55275	0.15409	-50.57921
52881	487834.910	6669311.300	2210.142	-0.70530	1.44585	-50.61845
52882	488214.910	6669621.939	2205.989	-0.36421	0.83640	-51.06547
52883	488610.426	6669941.605	2208.448	-0.80607	0.61826	-51.51649
52884	488970.020	6670229.459	2206.823	-0.40716	1.29369	-52.29270
52885	489352.789	6670531.479	2206.314	0.72889	1.59712	-52.90692
52886	489739.002	6670833.461	2207.108	-1.00809	0.75014	-52.42373
52887	490134.199	6671141.515	2203.196	-0.66823	0.54354	-52.54379
52888	490540.510	6671456.646	2206.165	-0.37023	0.57801	-51.92660
52889	490924.026	6671753.208	2204.041	-1.23243	0.25473	-51.99614
52890	491265.996	6672018.802	2208.057	-0.73363	-0.30288	-51.05132
52891	491665.582	6672331.180	2208.391	-1.93829	0.52493	-50.82113
52892	492033.231	6672625.345	2207.592	-1.63162	-0.74782	-49.99644
52893	492414.628	6672940.713	2208.501	-1.24589	0.94391	-49.18257
52894	492797.417	6673262.491	2203.997	-0.42972	1.10282	-49.13439
52895	493158.618	6673569.000	2203.811	-0.14983	0.71367	-48.53183
52896	493542.731	6673895.886	2205.238	-0.06577	0.93991	-48.44255
52897	493903.239	6674200.358	2206.836	0.51801	1.39630	-48.60845
52898	494247.992	6674486.833	2205.768	0.18640	1.72648	-48.49882
52899	494599.253	6674773.008	2206.808	0.23027	0.68266	-49.21299
52900	494991.693	6675086.479	2210.298	0.45766	2.27020	-49.90257
52901	495391.723	6675398.318	2205.016	-0.86673	0.67115	-50.43189

52902	495748.558	6675678.331	2206.192	-0.18005	0.78676	-50.02618
52903	496127.116	6675975.694	2202.729	-0.40300	1.29667	-50.03315
photo ID	px	py	pz	omega	phi	kappa

52904	496514.005	6676279.470	2202.990	-0.93678	-0.41211	-49.52229
52905	496908.164	6676596.289	2206.981	-0.00506	0.83398	-49.16029
52906	497276.737	6676895.839	2208.757	-0.49907	0.55922	-48.60604
52907	497651.322	6677204.643	2205.742	-1.19766	0.44343	-48.10073
52908	498026.076	6677519.005	2207.687	0.29777	0.94276	-47.13682
52909	498378.719	6677816.688	2206.904	-0.14069	1.76446	-46.73705
52910	498711.594	6678097.336	2204.283	0.36829	1.29754	-46.49293
52911	499099.202	6678418.875	2208.529	0.27232	1.48923	-48.06601
52912	499460.520	6678714.481	2205.669	-1.53240	0.65734	-49.23564
52913	499834.732	6679022.634	2207.858	-0.18580	0.62292	-48.98194
52914	500203.076	6679326.229	2205.335	-0.57220	1.43768	-48.54582
52915	500535.295	6679599.108	2202.298	-0.32134	0.83668	-48.53313
52916	500887.737	6679887.564	2204.885	0.07112	0.55332	-48.67182
52917	501241.571	6680176.529	2208.953	-0.14217	1.01647	-49.16742
52918	501823.968	6676734.994	2207.061	1.08229	0.27946	132.77537
52919	501491.704	6676444.650	2209.557	-0.33482	-1.16204	132.29291
52920	501166.264	6676169.377	2207.761	-0.48142	-1.53133	130.61379
52921	500827.061	6675894.574	2210.642	-0.60352	-0.93984	130.24518
52922	500490.397	6675629.458	2214.266	1.72006	-0.57835	127.94402
52923	500139.254	6675353.249	2206.740	1.84411	-0.39157	127.74498
52924	499773.815	6675060.777	2205.980	0.52840	-0.83523	128.36001
52925	499433.989	6674785.890	2200.557	0.23957	-0.87015	129.13058
52926	499084.330	6674502.334	2202.047	-0.84196	-1.09636	131.53157
52927	498778.077	6674257.622	2204.202	-0.21456	-1.19737	129.06165
52928	498419.660	6673981.626	2207.574	0.17758	-0.66159	127.66506
52929	498087.158	6673732.228	2205.904	0.95427	-0.41604	128.78069
52930	497731.462	6673469.036	2206.607	0.94907	0.12354	128.48573
52931	497373.558	6673207.715	2206.617	1.83262	-0.33707	127.96040
52932	497011.508	6672938.471	2205.819	1.80013	1.07405	128.68625
52933	496666.645	6672663.432	2203.171	1.99306	-0.32531	131.32415
52934	496325.187	6672379.672	2199.716	0.67574	0.89319	131.81475
52935	495992.859	6672098.819	2205.505	0.91002	-0.23643	132.52391
52936	495653.687	6671811.926	2208.050	0.53466	0.04142	131.27923
52937	495318.677	6671537.668	2206.679	0.33731	-1.24474	130.57378
52938	494999.252	6671290.391	2207.587	-0.04580	-0.52449	127.76294

52939	494656.957	6671040.623	2208.382	0.55430	-1.35302	127.46644
52940	494308.324	6670794.470	2207.334	0.07686	-0.78758	125.99814
52941	493951.097	6670546.116	2206.824	0.17913	-1.40605	126.81068
52942	493602.025	6670303.520	2204.954	0.87216	-0.40422	126.82259
52943	493245.441	6670048.421	2206.280	0.98193	-0.02785	130.06670
52944	492897.337	6669774.952	2207.572	1.10691	-0.50225	132.64428
52945	492594.235	6669519.070	2208.940	2.23685	0.40607	131.74478
52946	492286.485	6669251.223	2206.465	1.67892	-0.82307	131.28517
52947	491953.103	6668961.707	2205.231	0.89918	-0.56956	130.90039
52948	491606.943	6668663.688	2203.260	-0.11829	-1.63932	131.79619
52949	491260.318	6668377.432	2203.484	-0.21475	-1.38251	129.77878
52950	490894.894	6668092.380	2205.569	-0.03799	-1.12254	127.12146
52951	490545.066	6667830.249	2204.529	0.16571	-0.91280	127.92062
52952	490190.468	6667566.319	2208.304	0.72928	-0.32216	129.65127
52953	489845.368	6667296.324	2208.069	2.25078	0.12113	131.15423
52954	489501.780	6667011.300	2206.540	1.46321	-0.35776	131.61774
52955	489166.239	6666727.151	2202.391	0.80556	-0.82969	132.71084
52956	488828.342	6666443.831	2201.970	0.03711	-0.93692	132.18644
52957	488511.970	6666185.102	2203.504	-0.20335	-1.07043	132.27273
52958	486646.158	6670226.267	2206.129	-0.88313	1.20247	-51.20944
52959	487029.732	6670537.918	2205.947	-0.61378	-0.02597	-50.67380
52960	487402.001	6670845.326	2209.417	-0.47905	1.30278	-50.47947
52961	487758.162	6671136.795	2207.446	0.19974	1.57925	-51.69352
52962	488126.253	6671431.287	2208.812	0.00753	0.74816	-52.25840
52963	488501.549	6671727.544	2208.814	-0.07813	1.82132	-52.87615
52964	488842.756	6671991.357	2206.094	0.25438	1.39776	-53.39637
52965	489220.014	6672276.820	2208.729	0.06628	0.93981	-53.69090
52966	489610.435	6672567.311	2207.025	-1.05641	0.89563	-54.61181
52967	489959.296	6672826.299	2207.174	0.16197	0.66659	-53.71116
52968	490345.471	6673112.793	2206.209	-0.74080	1.23822	-52.55520
52969	490738.625	6673405.425	2203.233	0.09106	0.58092	-51.17833
52970	491122.080	6673695.955	2209.417	-1.03101	-0.04084	-50.85663
52971	491499.012	6673990.690	2209.638	-2.43401	0.21805	-50.69968
52972	491837.602	6674265.881	2207.009	-0.60493	0.91191	-50.01881
52973	492199.941	6674567.652	2206.768	-0.70228	1.07660	-49.36383
52974	492560.515	6674872.576	2204.700	-0.82608	1.12748	-49.59616
52975	492928.728	6675186.887	2206.033	0.17642	0.89418	-48.92359
52976	493266.063	6675476.072	2206.521	0.70214	2.42481	-48.30388
52977	493648.253	6675795.081	2204.975	1.58385	1.99860	-48.87557

52978	494030.153	6676098.839	2200.926	0.48561	1.06530	-50.37388
photo ID	px	py	pz	omega	phi	kappa
52979	494426.400	6676401.929	2211.538	-0.28134	0.17820	-52.89913
52980	494775.245	6676666.326	2213.111	-1.42823	1.58416	-52.83365
52981	495160.717	6676964.244	2207.806	0.11537	0.84880	-51.63985
52982	495502.875	6677232.810	2205.611	-1.66459	0.83319	-50.73800
52983	495898.093	6677548.821	2201.603	-0.71573	-0.15867	-50.36803
52984	496279.099	6677858.443	2204.470	-0.31730	1.15916	-48.96861
52985	496632.232	6678146.463	2204.028	-0.11195	0.92909	-48.24766
52986	496996.680	6678443.916	2207.322	-0.75763	0.59516	-49.04755
52987	497333.186	6678717.447	2207.650	-0.70365	1.01800	-49.32945
52988	497702.580	6679017.656	2205.998	0.62011	1.56092	-48.36765
52989	498076.506	6679321.689	2207.245	-0.79695	1.18673	-49.08020
52990	498448.273	6679623.175	2205.593	-0.44466	0.80344	-49.82437
52991	498791.340	6679901.872	2207.816	-0.39097	0.91116	-50.08382
52992	499164.557	6680205.273	2205.327	-0.33246	1.58238	-50.02542
52993	499507.732	6680484.753	2202.359	0.37808	0.97792	-49.22733
52994	499887.674	6680794.103	2204.392	0.19782	1.42291	-48.90559
52995	500258.922	6681096.230	2205.897	0.86106	1.47590	-50.56690
52996	500650.954	6681413.808	2206.111	-0.32286	1.60148	-49.32678
52997	501034.058	6681723.551	2204.710	0.68171	1.50349	-49.04261
52998	501419.704	6682034.250	2207.188	0.44413	1.64332	-48.90031
52999	501812.364	6682348.749	2203.944	-0.21198	1.31369	-49.15668
53000	502164.215	6682629.270	2206.283	0.01795	0.33484	-48.99343
53001	502551.162	6682937.071	2208.535	-0.87498	1.38642	-49.14716
53002	502908.719	6683220.899	2205.923	0.16065	1.43342	-49.39532
53003	503290.578	6683522.540	2206.698	-0.51698	0.92161	-49.06915
53004	503677.438	6683828.128	2202.989	-0.93547	0.80460	-49.29498
53005	500188.884	6684744.834	2205.340	0.92332	-0.07030	131.45549
53006	499824.750	6684434.459	2208.477	0.65870	-0.76665	131.04854
53007	499479.998	6684141.975	2205.398	0.32567	-1.02703	131.32218
53008	499136.321	6683852.962	2209.141	-0.13160	-1.19814	130.76260
53009	498785.866	6683560.599	2207.919	0.70023	-1.36091	130.49729
53010	498433.371	6683269.181	2207.752	0.37679	-0.74778	129.86748
53011	498103.693	6682999.049	2204.977	-0.20455	-1.89515	129.82494
53012	497766.612	6682726.504	2202.292	-0.03948	-0.77219	129.90849
53013	497414.401	6682443.311	2206.673	-0.34996	-1.40744	129.63666
53014	497058.034	6682159.322	2207.069	0.49844	-1.09631	129.57207

53015	496701.823	6681874.403	2207.242	0.52284	-0.66086	129.64369
53016	496339.245	6681582.756	2206.123	1.59346	-0.77615	130.08474
53017	495973.305	6681286.779	2203.719	0.60071	-0.44396	129.88677
53018	495607.905	6680991.023	2206.816	0.06098	-1.17645	129.10532
53019	495239.046	6680699.501	2206.925	0.33806	-1.49992	127.26103
53020	494869.642	6680412.043	2205.565	0.08438	-0.64507	127.28958
53021	494498.496	6680127.165	2207.341	0.52784	-0.95201	127.09510
53022	494161.510	6679871.143	2206.271	0.67299	-0.81035	127.37124
53023	493818.859	6679611.924	2207.520	0.71969	-0.61173	128.46211
53024	493445.453	6679333.725	2205.045	-0.75276	-2.14117	129.49666
53025	493066.405	6679061.732	2208.268	-0.77359	-1.69272	128.00246
53026	492683.078	6678797.828	2208.574	2.83383	0.13965	125.13043
53027	492298.645	6678525.756	2207.282	2.41406	-0.28515	126.81959
53028	491930.480	6678241.169	2202.576	2.84779	0.27428	129.34961
53029	491595.832	6677960.953	2204.170	0.95657	-0.72069	130.45709
53030	491272.623	6677682.333	2201.387	0.53662	-1.36858	130.85120
53031	490919.794	6677380.678	2200.273	-0.55644	-1.56359	131.74124
53032	490560.160	6677083.726	2200.329	-0.25746	-0.75049	132.34516
53033	490204.037	6676801.166	2207.539	-0.61285	-1.41251	129.66606
53034	489838.475	6676523.334	2208.452	0.48223	-0.84322	130.75429
53035	489474.125	6676243.296	2211.159	1.20262	-0.84461	132.94876
53036	489113.138	6675954.009	2210.876	1.58971	-2.14342	131.35493
53037	488764.811	6675666.851	2204.742	0.66165	-1.08250	131.58750
53038	488452.720	6675401.651	2202.611	0.91902	-0.98139	133.14408
53039	488093.724	6675092.324	2201.670	-0.15160	-2.11527	132.06734
53040	487774.958	6674824.754	2198.840	-0.57655	-1.59803	132.22707
53041	487456.431	6674566.864	2200.614	-0.27860	-0.64841	131.53282
53042	487091.968	6674279.501	2204.133	0.61347	-0.55167	131.42730
53043	486727.988	6673997.665	2203.963	0.77855	-0.03565	131.27739
53044	486365.165	6673720.735	2210.104	0.97299	-0.61764	130.33620
53045	486000.648	6673443.804	2211.232	0.57780	-1.11878	129.94389
53046	485638.631	6673164.336	2205.914	1.57421	-0.70118	131.00298
53989	513184.331	6688515.132	2208.966	0.55986	-0.88521	72.98177
53990	512694.003	6688651.061	2209.387	5.49118	-2.23290	76.08085
53991	512221.814	6688739.709	2215.786	2.11575	-1.21279	80.27056
53992	511744.798	6688800.315	2214.093	0.67307	-1.88793	83.09833
53993	511269.538	6688844.463	2215.613	0.30664	-0.83798	84.74849
53994	510798.409	6688879.870	2216.187	-0.69435	-1.59850	83.27582
53995	510373.591	6688913.476	2214.559	-2.46061	-0.69110	82.62283

photo ID	px	py	pz	omega	phi	kappa
53996	509889.471	6688962.265	2216.700	-0.42150	-1.47230	82.26575
53997	509433.351	6689010.623	2214.249	-0.49763	-1.30926	82.29767
53998	508976.440	6689061.752	2215.318	-0.09647	-0.87006	81.63025
53999	508513.673	6689116.985	2215.447	-1.11687	-1.33170	80.68511
54000	508040.362	6689177.361	2214.590	-0.19485	-0.69679	80.56772
54001	507629.072	6689230.094	2216.143	0.50367	-1.47859	80.66724
54002	507150.772	6689289.586	2212.476	-0.25708	-1.31783	80.66918
54003	506674.319	6689348.732	2214.953	1.65541	-1.36805	80.98487
54004	506212.725	6689399.436	2213.178	1.43034	-2.36366	81.74406
54005	505799.790	6689437.965	2210.662	0.82282	-1.04516	82.74309
54006	505379.716	6689471.461	2211.690	-0.18377	-1.65665	83.34297
54007	504896.973	6689509.287	2207.532	0.06755	-1.42339	83.23911
54008	504419.938	6689547.995	2210.041	0.38614	-0.88882	82.82459
54009	503962.438	6689586.698	2209.354	-0.34195	-1.56810	82.36974
54010	503484.157	6689630.390	2209.887	-0.18106	-0.51327	82.06826
54011	503038.117	6689672.521	2213.261	0.44636	-1.50500	82.04706
54012	502546.196	6689718.857	2209.082	-0.79624	-0.86754	81.58391
54013	502084.478	6689767.300	2212.377	-0.01026	-0.90453	81.24149
54014	501616.081	6689819.029	2209.208	-0.78448	-1.32539	80.73239
54015	501132.295	6689876.486	2210.157	0.99915	-0.61612	80.66667
54016	500675.351	6689927.945	2211.564	0.41284	-1.56078	81.03368
54017	500254.637	6689973.633	2209.037	-0.01182	-0.66005	81.08247
54018	499800.268	6690023.773	2211.847	-0.12900	-1.02225	80.65041
54019	499382.741	6690069.611	2210.462	0.06504	-0.91032	81.80374
54020	498918.289	6690115.301	2213.270	0.54470	-0.94973	82.27466
54021	498454.726	6690155.670	2212.089	0.22265	-1.26675	82.76754
54022	497988.533	6690192.795	2212.803	0.36175	-0.72887	83.01444
54023	497510.708	6690226.981	2213.887	0.27677	-1.37283	83.60433
54024	497003.575	6690261.647	2211.014	-0.34754	-0.56338	83.10288
54025	496559.568	6690294.296	2213.959	-0.89699	-0.97024	82.95536
54026	496084.997	6690332.211	2210.310	-0.65528	-1.10791	82.29574
54027	495598.643	6690373.366	2212.599	0.32238	-0.73729	82.38230
54028	495123.494	6690410.444	2211.918	-0.81510	-1.26898	82.83484
54029	494648.159	6690449.281	2212.200	-0.02355	-0.63177	82.50913
54030	494172.270	6690490.172	2213.746	-0.61635	-1.19855	81.77066
54031	493694.389	6690534.407	2210.868	-0.77908	-0.92192	81.74831
54032	493220.138	6690582.700	2212.721	-1.12850	-0.62663	80.97010

54033	492746.370	6690638.050	2211.971	-0.64196	-0.99372	80.35126
54034	492262.975	6690699.193	2213.799	-0.97756	-0.66753	80.03934
54035	491786.616	6690765.373	2213.518	-0.78460	-1.33848	79.60560
54036	491289.148	6690836.876	2212.727	-0.07896	-0.63769	80.13829
54037	490810.918	6690902.643	2213.516	0.96674	-1.76529	80.50752
54038	490394.607	6690955.301	2211.616	0.23514	-0.92773	81.09803
54039	489869.066	6691015.989	2213.675	1.31531	-1.65884	82.95779
54040	489378.693	6691064.474	2212.106	0.61604	-1.30594	83.15613
54041	488906.528	6691105.630	2214.079	0.67242	-1.46770	83.69920
54042	488468.859	6691138.536	2213.450	-0.87157	-1.42875	84.31875
54043	488001.708	6691172.436	2211.780	-2.49010	-1.46113	84.50561
54044	487493.674	6691213.791	2211.759	-1.74704	-0.61992	84.09229
54045	486988.338	6691260.076	2212.068	-0.62000	-1.69713	83.52015
54046	486491.752	6691307.054	2210.701	-1.07342	-0.67148	83.03228
54047	483874.196	6684211.646	2216.125	1.10658	1.29349	-89.91848
54048	484373.845	6684171.290	2215.736	0.77235	1.15916	-91.06189
54049	484796.392	6684133.589	2217.920	0.34617	0.72014	-91.77029
54050	485284.817	6684086.164	2217.654	0.94111	1.63676	-92.34160
54051	485766.738	6684033.513	2213.982	-0.22883	0.68447	-92.98714
54052	486222.566	6683980.758	2217.117	0.78221	0.96782	-92.72681
54053	486710.542	6683922.526	2215.396	0.29856	1.18385	-92.31453
54054	487171.244	6683870.761	2217.532	-0.67498	1.02439	-92.15509
54055	487667.541	6683820.815	2216.110	-0.15808	1.72771	-91.81959
54056	488159.293	6683775.887	2213.707	-0.42096	1.08905	-91.39295
54057	488586.282	6683740.031	2214.960	0.52859	1.82176	-91.09960
54058	489080.628	6683700.319	2209.213	0.08512	1.08206	-91.16357
54059	489535.013	6683665.450	2212.193	0.13670	0.95705	-91.30156
54060	490024.685	6683627.064	2208.966	0.45842	1.40401	-91.63522
54061	490469.173	6683589.624	2211.516	0.87638	0.45698	-91.64409
54062	490965.171	6683545.615	2213.014	1.65091	1.47916	-91.84757
54063	491460.550	6683497.624	2213.566	1.25365	0.47353	-92.27481
54064	491962.491	6683444.726	2215.761	0.88030	1.77413	-92.67007
54065	492410.522	6683393.599	2213.319	1.43699	0.97322	-93.72252
54066	492902.712	6683332.756	2216.731	1.19156	0.99536	-94.56087
54067	493397.859	6683270.891	2214.350	-0.19172	1.90800	-93.70496
54068	493841.520	6683219.075	2215.558	0.46153	0.99976	-93.52479
54069	494325.383	6683167.877	2214.302	-1.30185	2.23274	-92.40137
54070	494812.704	6683127.510	2211.813	-0.92222	1.10429	-91.11719
photo ID	px	py	pz	omega	phi	kappa

54071	495304.901	6683096.804	2211.914	-0.34123	2.11279	-90.05094
54072	495806.859	6683072.603	2208.036	0.52934	1.26379	-89.43213
54073	496252.699	6683053.906	2210.417	1.36753	1.04373	-90.06146
54074	496767.373	6683029.415	2209.116	1.88434	1.44605	-90.83718
54075	497276.065	6682995.794	2210.105	0.73530	0.46939	-91.68923
54076	497725.197	6682958.870	2214.193	1.38325	0.70843	-92.43469
54077	498212.437	6682909.360	2213.721	0.60163	1.04458	-93.81320
54078	498682.956	6682854.095	2216.253	1.20581	0.31172	-94.91640
54079	499115.970	6682796.827	2217.384	1.50539	1.18201	-95.77197
54080	499605.404	6682725.087	2213.793	-0.76223	1.23314	-96.43738
54081	500084.157	6682658.091	2216.029	-0.04165	0.72392	-94.36578
54082	500578.282	6682597.856	2216.068	0.11350	1.67040	-93.70799
54083	501079.295	6682548.151	2213.436	-0.87984	0.99349	-91.42868
54084	501547.663	6682515.443	2215.961	0.45716	1.68122	-90.00401
54085	501984.990	6682489.133	2211.566	-0.95388	1.93025	-90.89547
54086	502471.874	6682459.180	2213.116	-0.23539	0.84300	-91.26908
54087	502974.737	6682426.766	2213.546	0.82830	1.99644	-91.53538
54088	503495.058	6682389.460	2211.036	0.69740	0.94461	-91.53093
54089	503993.640	6682349.713	2213.922	1.21411	1.39877	-92.02474
54090	504490.430	6682302.952	2211.699	1.46887	1.64146	-93.10307
54091	504961.349	6682251.523	2210.067	0.37272	0.86660	-93.78679
54092	505501.687	6682186.626	2212.599	0.71537	1.22586	-94.63666
54093	505984.106	6682122.033	2209.672	1.58480	0.99713	-95.22407
54094	513938.980	6690008.928	2201.883	4.98726	-2.41228	80.91052
54095	513436.494	6690050.925	2195.937	0.13703	-1.72403	83.42155
54096	512993.204	6690085.293	2194.034	-2.56897	-0.87194	80.93606
54097	512544.270	6690138.171	2195.506	-0.65041	-0.77211	80.57900
54098	512132.470	6690191.682	2197.812	3.04969	-1.63601	80.62092
54099	511677.579	6690232.944	2202.026	1.56512	-0.11052	82.31654
54100	511254.575	6690264.859	2207.366	-0.89883	-1.34698	81.95093
54101	510807.368	6690304.933	2203.933	-2.64465	-0.62709	81.81548
54102	510409.771	6690349.887	2208.618	-1.83111	-0.43994	80.93111
54103	510003.261	6690400.891	2207.724	-0.41829	-2.06383	80.87697
54104	509581.342	6690454.259	2205.496	0.49114	-1.22643	80.89550
54105	509097.495	6690516.074	2204.871	-0.23170	-2.38510	80.61724
54106	508607.527	6690581.670	2197.573	-0.25180	-1.68187	80.44727
54107	508119.215	6690647.328	2198.275	0.43193	-1.41658	80.62636
54108	507622.149	6690712.064	2194.091	0.58798	-1.67707	80.17925
54109	507122.073	6690772.549	2196.668	3.20033	-1.16580	81.77752

54110	506622.379	6690818.185	2197.624	1.12192	-1.91753	83.03313
54111	506143.896	6690859.200	2197.751	0.40451	-0.73380	82.79170
54112	505638.962	6690903.827	2201.512	-0.69175	-1.47346	82.71435
54113	505152.873	6690949.656	2199.047	0.40929	-1.52808	82.62356
54114	504671.302	6690994.018	2202.451	-0.04168	-1.25958	82.41474
54115	504186.380	6691039.085	2201.140	0.33476	-2.07217	82.44207
54116	503693.671	6691082.851	2199.565	0.22251	-1.35500	82.80976
54117	503196.118	6691125.994	2200.813	-0.11766	-2.06321	82.49379
54118	502700.759	6691170.233	2194.998	-0.13398	-1.75459	82.46582
54119	502205.368	6691214.999	2197.568	0.43932	-1.32181	82.48198
54120	501716.404	6691257.275	2195.376	0.07743	-1.96357	82.51237
54121	501228.800	6691298.673	2195.401	0.18843	-0.97401	82.73902
54122	500755.744	6691339.296	2197.434	-0.53297	-1.54856	82.23197
54123	500205.032	6691389.382	2194.312	0.42751	-0.88268	81.72845
54124	499715.926	6691432.313	2198.974	0.49311	-1.09399	82.00346
54125	499287.819	6691469.280	2198.560	-0.32263	-1.78885	81.93986
54126	498871.375	6691507.715	2199.259	-0.14533	-0.89342	81.12908
54127	498379.237	6691556.203	2199.711	-0.40733	-1.60135	80.49988
54128	497893.063	6691606.213	2196.727	0.32597	-1.13113	80.15430
54129	497402.326	6691656.490	2198.258	0.33940	-1.31981	79.87555
54130	496917.932	6691704.974	2196.174	-0.00388	-1.10614	79.93763
54131	496431.247	6691753.330	2199.456	0.70714	-1.09745	80.09653
54132	495950.233	6691799.580	2198.535	0.54156	-1.82582	80.07816
54133	495468.505	6691845.784	2195.886	0.29241	-1.01435	79.97875
54134	494969.915	6691893.258	2198.845	-0.09594	-1.13606	80.61932
54135	494488.362	6691939.204	2196.373	0.19717	-1.57853	80.76942
54136	494009.708	6691985.643	2196.497	-0.10489	-0.55948	80.52355
54137	493527.152	6692034.625	2195.959	-0.01285	-1.28800	80.41061
54138	493096.654	6692079.455	2196.109	-0.21498	-0.46382	80.21174
54139	492677.274	6692124.481	2198.442	0.54750	-1.10088	80.78001
54140	492232.594	6692172.048	2198.234	0.32995	-0.99727	80.68002
54141	491804.696	6692218.196	2199.889	-0.32020	-0.65894	80.95353
54142	491325.322	6692271.939	2201.991	0.09877	-1.10659	80.52926
54143	490875.369	6692323.783	2201.211	-0.37302	-1.29302	80.40514
54144	490456.120	6692372.349	2201.079	0.39147	-0.82473	80.76045
54145	490006.515	6692420.632	2202.464	-0.49912	-1.46025	81.33057
54146	489521.833	6692471.717	2198.463	0.00776	-0.99928	81.23582
photo ID	px	py	pz	omega	phi	kappa
54147	489038.154	6692520.518	2201.521	-0.51139	-1.10806	81.09923

54148	488559.677	6692567.256	2199.175	-0.19815	-1.57077	81.27655
54149	484040.386	6685650.514	2205.490	3.19987	0.38322	-88.98239
54150	484534.957	6685616.269	2205.769	1.94735	0.72807	-89.91563
54151	485006.722	6685573.616	2208.167	0.36434	0.38948	-90.85633
54152	485478.470	6685526.264	2208.859	0.73445	0.85058	-90.88454
54153	485891.144	6685481.401	2205.891	0.57474	0.74364	-91.49231
54154	486364.640	6685426.054	2206.171	0.01111	0.46132	-92.00003
54155	486806.639	6685373.846	2206.800	0.05666	0.73084	-91.49953
54156	487265.268	6685322.301	2204.565	-0.93428	0.85384	-90.84737
54157	487760.454	6685270.138	2205.214	-1.02052	0.51018	-91.05829
54158	488212.805	6685224.432	2204.513	0.70267	1.10495	-91.03773
54159	488674.885	6685176.550	2202.633	0.36455	0.65042	-90.97110
54160	489111.461	6685130.176	2203.392	-0.38368	0.78009	-91.62498
54161	489600.951	6685077.401	2202.228	0.72272	1.09095	-91.95467
54162	490136.623	6685016.244	2200.724	-1.43096	0.72379	-91.48311
54163	490642.589	6684962.693	2204.963	0.27901	0.59293	-91.01340
54164	491146.179	6684912.883	2202.211	-1.23676	1.30085	-90.79122
54165	491619.548	6684871.268	2203.873	-0.24542	0.51965	-89.94994
54166	492129.194	6684829.132	2201.437	-0.32984	1.46830	-90.20831
54167	492583.072	6684793.242	2199.693	0.93550	0.43384	-89.92892
54168	493086.263	6684752.219	2202.322	-0.68434	0.87101	-90.29257
54169	493597.629	6684710.302	2200.079	0.32165	0.64425	-90.08847
54170	494088.254	6684669.842	2203.708	0.57852	0.48089	-90.49760
54171	494600.396	6684625.626	2201.232	0.46687	1.29312	-90.17557
54172	495112.378	6684580.310	2203.097	0.71165	0.28743	-90.65954
54173	495614.864	6684533.586	2203.025	0.35250	1.55635	-91.51175
54174	496131.130	6684484.173	2201.986	0.79483	0.31032	-92.02677
54175	496624.920	6684435.575	2203.852	0.82362	1.54157	-92.67955
54176	497135.387	6684385.108	2201.210	-0.07548	0.55773	-92.32612
54177	497629.622	6684336.744	2204.289	0.13527	1.39505	-92.31095
54178	498117.500	6684289.378	2199.215	0.44128	1.10084	-92.34886
54179	498548.226	6684247.135	2200.467	-0.07620	0.46457	-92.29758
54180	499057.618	6684201.442	2201.197	0.26842	1.31048	-91.12241
54181	499572.100	6684160.065	2199.128	-0.45053	0.68605	-90.94490
54182	500075.505	6684123.358	2202.203	-0.54217	0.88649	-90.84571
54183	500529.177	6684093.834	2200.089	1.08019	1.31276	-90.22053
54184	501046.258	6684060.761	2200.479	-0.03739	0.24105	-89.92666
54185	501523.565	6684030.841	2202.681	0.22068	1.33924	-90.28038
54186	502005.983	6683999.296	2199.895	1.24293	0.40757	-90.86589

54187	502485.908	6683963.057	2204.613	0.90990	1.04293	-91.24740
54188	502989.949	6683918.790	2200.843	0.81777	0.89259	-91.76264
54189	503489.442	6683867.362	2203.813	1.23075	0.73913	-91.90045
54190	504010.379	6683805.799	2200.160	0.77135	1.39862	-93.04686
54191	504504.010	6683740.568	2201.570	1.43634	0.44763	-93.94930
54192	504972.231	6683674.382	2198.817	0.05783	1.27356	-93.73972
54193	505421.766	6683612.919	2197.826	-0.65690	0.46217	-93.70066
54194	505913.685	6683549.800	2200.554	-1.47875	0.85806	-93.38094
54195	506356.630	6683497.782	2198.755	-0.35071	1.04947	-92.84003
54196	512427.851	6685816.257	2203.880	-0.24607	-0.03614	81.00359
54197	511952.808	6685864.916	2204.936	-0.37863	-0.86591	80.50104
54198	511523.629	6685912.215	2203.300	-0.24187	-0.54200	80.18684
54199	511035.153	6685968.812	2207.711	-0.15433	-0.70595	80.04980
54200	510573.056	6686024.710	2205.374	-0.40718	-1.32106	79.78782
54201	510138.403	6686078.693	2204.575	0.30095	-0.64186	79.86702
54202	509664.441	6686136.262	2204.456	0.30687	-1.79833	79.92230
54203	509186.698	6686190.991	2200.623	0.56182	-0.63334	80.57234
54204	508704.018	6686241.521	2200.422	0.92277	-1.52864	81.18284
54205	508212.201	6686286.563	2199.998	0.02717	-0.45202	82.01219
54206	507746.119	6686326.095	2202.447	0.62962	-1.09610	82.37419
54207	507277.808	6686364.096	2199.184	0.54767	-1.05052	81.97098
54208	506787.995	6686401.007	2201.061	-0.05752	-0.27237	82.50665
54209	506325.271	6686435.644	2202.034	-0.40419	-0.86420	82.08569
54210	505912.868	6686469.134	2202.269	0.29979	-0.65820	81.71941
54211	505437.946	6686507.704	2206.756	-0.17327	-0.62737	81.84406
54212	504963.471	6686546.535	2203.271	0.06490	-1.53631	82.13421
54213	504482.449	6686587.592	2203.269	-0.72566	-0.02102	81.81623
54214	504011.415	6686633.341	2202.852	-1.00938	-1.29342	81.90209
54215	503542.207	6686685.877	2202.249	-0.22694	0.04200	81.04783
54216	503073.728	6686742.875	2205.909	-0.24518	-0.92442	80.73909
54217	502611.352	6686801.028	2204.131	-0.15187	-0.79110	80.52811
54218	502131.155	6686864.371	2208.493	0.02464	-1.22982	80.01954
54219	501668.367	6686925.860	2203.965	0.53017	-1.60494	80.21636
54220	501199.202	6686982.881	2204.679	-0.29617	-0.66398	81.09160
54221	500729.184	6687037.229	2202.426	0.54284	-1.80031	82.20351
54222	500263.568	6687087.226	2201.614	0.50505	-0.60730	82.45967
photo ID	px	py	pz	omega	phi	kappa
54223	499797.655	6687134.334	2204.498	-0.88607	-1.47306	82.78152
54224	499332.481	6687181.953	2199.742	0.15188	-0.87512	82.75104

54225	498840.928	6687230.506	2203.915	-0.71105	-0.96524	82.76576
54226	498397.754	6687273.768	2200.309	0.31722	-1.25956	83.19489
54227	497941.987	6687314.105	2202.506	-0.24355	-0.35386	83.22108
54228	497453.250	6687356.831	2201.435	-0.41026	-1.42467	83.06566
54229	496980.355	6687397.340	2200.607	0.07640	-0.22752	83.32155
54230	496520.437	6687434.687	2203.254	-0.61480	-0.89992	83.28029
54231	496041.088	6687474.431	2200.368	-0.04580	-0.51108	83.09104
54232	495575.007	6687511.274	2202.994	-0.37693	-0.52933	83.36429
54233	495104.989	6687547.534	2199.495	-0.36271	-0.65834	83.12032
54234	494698.771	6687578.853	2202.537	-0.31341	-0.08343	82.59591
54235	494301.111	6687611.435	2202.647	-0.51979	-0.98787	82.25832
54236	493879.725	6687650.099	2201.886	0.18095	-0.30517	81.51303
54237	493423.004	6687695.171	2203.741	-0.49422	-0.67539	80.91217
54238	492954.403	6687745.223	2202.830	-1.01297	-0.50304	80.34497
54239	492509.913	6687796.522	2203.755	0.27061	-0.72974	80.06993
54240	492055.417	6687848.719	2201.866	0.79624	-1.01871	80.00325
54241	491591.680	6687901.917	2202.392	-0.14007	-0.32188	80.21444
54242	491138.599	6687953.381	2203.080	0.67268	-1.01948	80.67553
54243	490668.324	6688004.123	2201.728	0.23141	-0.59487	80.25536
54244	490240.248	6688049.237	2203.722	0.22184	-0.35114	80.77481
54245	489777.453	6688096.879	2202.970	0.08020	-1.23542	80.87908
54246	489333.467	6688143.024	2202.724	0.21906	-0.12077	80.82809
54247	488888.546	6688189.047	2204.538	-0.01408	-1.04345	81.24495
54248	488448.423	6688233.553	2202.742	1.05846	-0.44824	81.71992
54249	487979.119	6688277.066	2206.835	0.53716	-1.02043	81.99521
54250	487526.843	6688319.453	2203.776	-0.16289	-0.97667	81.98966
54251	487093.089	6688359.786	2206.070	0.35667	-0.89497	82.44722
54252	486575.323	6688404.668	2202.387	0.41189	-1.29403	82.87845
54253	486142.180	6688440.760	2204.687	-0.61284	-0.61119	82.76260
54254	485699.295	6688479.176	2202.628	-1.21124	-1.42384	82.36451
54255	484700.920	6687121.987	2205.971	1.18783	1.07058	-93.55466
54256	485256.698	6687042.098	2207.571	1.40568	0.49934	-93.91883
54257	485734.523	6686970.285	2202.821	-0.35954	1.26671	-93.68559
54258	486157.761	6686908.706	2202.867	0.25653	-0.02141	-93.45740
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54264	489100.595	6686587.714	2204.559	0.75119	1.17569	-90.24264
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54271	492443.755	6686247.764	2208.432	0.96202	0.56731	-92.08317
54272	492932.589	6686190.832	2205.099	0.01806	1.05594	-91.34991
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54277	495494.422	6685940.023	2204.116	0.71295	1.30157	-89.11269
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54279	496438.983	6685873.873	2205.150	0.26827	0.71093	-88.36552
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54291	502215.572	6685356.455	2199.304	-0.09122	0.74200	-92.87856
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54293	503229.236	6685225.511	2203.347	-0.63819	1.19355	-92.28686
54294	503745.133	6685166.810	2204.005	-0.70705	0.73300	-90.99642
54295	504246.405	6685118.781	2205.416	-1.25563	1.32251	-90.16993
54296	504709.825	6685082.622	2199.954	-0.57919	1.44697	-89.28583
54297	505182.478	6685052.507	2199.890	-0.37464	0.43303	-88.78976
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54523	502015.410	6684350.336	2205.682	-0.09210	-1.34520	126.20965
54524	501643.187	6684053.109	2202.720	0.93863	-1.34611	125.85112
54525	501288.213	6683772.656	2201.484	-0.41118	-0.96360	125.54813
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54547	493465.558	6677546.136	2203.384	-0.07078	-0.66141	125.78806
54548	493084.349	6677247.691	2204.531	0.79752	-0.91653	125.52402
54549	492714.105	6676958.560	2204.339	-0.00040	-0.89079	125.95889
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54552	491591.381	6676070.975	2208.226	-0.13657	-1.40631	126.84049

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54554	490881.302	6675497.881	2205.739	0.19778	-0.68373	128.15621
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54567	486045.990	6671602.914	2202.439	0.81392	-0.40774	126.83294
54568	485666.323	6671297.019	2203.792	0.93058	-1.03779	126.71163

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WARNING: Less than 11 measured points in following photo(s):

52879: 4 points

WARNING: Suspect orientation angle(s) (> 4.50000 [deg]) in following photo(s):

photo	omega	phi	kappa
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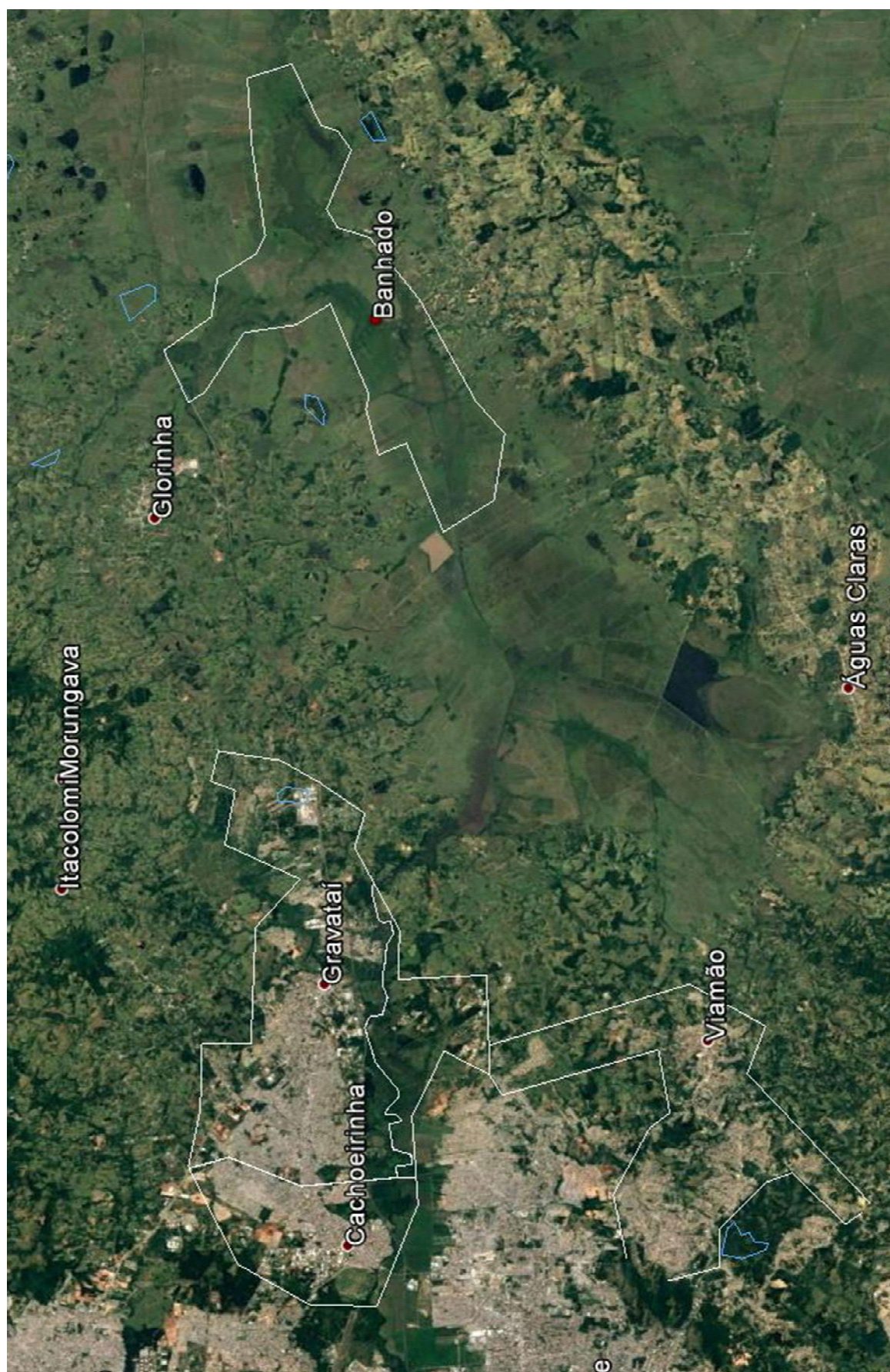
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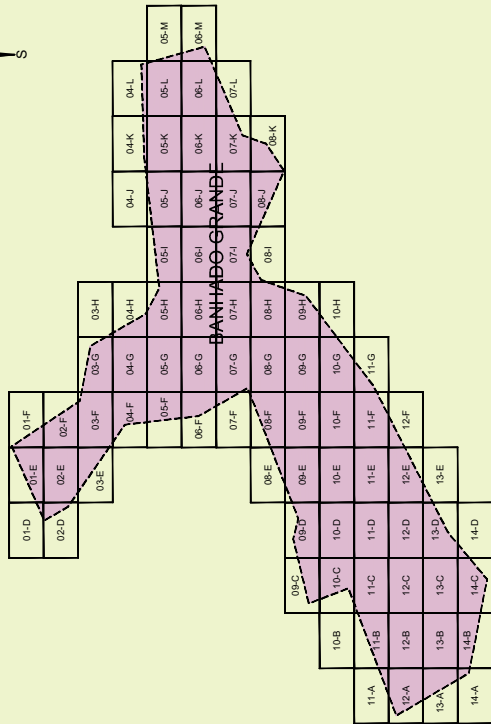
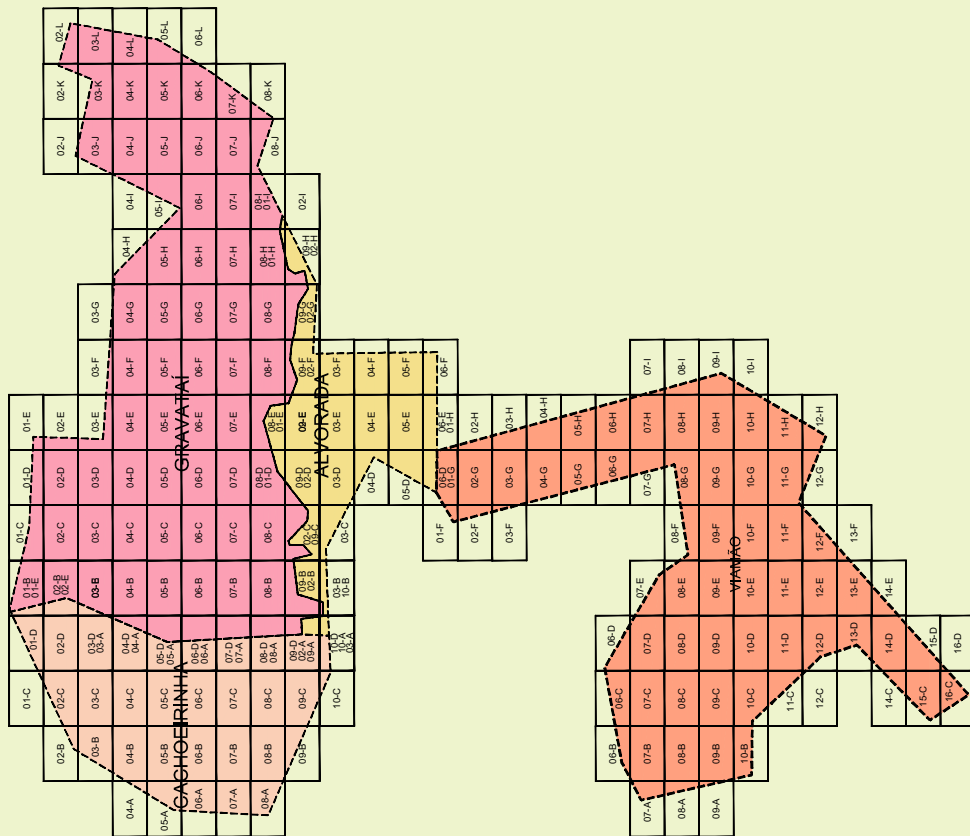
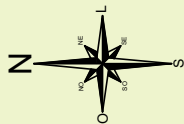
Sigma naught : 0.8 [micron] = 0.1 [pixel in level 0]

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ANEXO 11 - ÁREA DA BACIA DO RIO GRAVATAÍ



ANEXO 12 - MOSAICO



LEGENDA

PROPOSTA DE PROJETO

ENF. JOSÉ CARVALHO FILHO
CREA RJ 98.724

ENF. LUIZIANO BEZERRA
CREA RJ 65.554

ENF. HELMONTON CORREIA LOPES
CREA RJ 224.142



ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS NA BACIA DO RIO GRAVATAÍ

MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

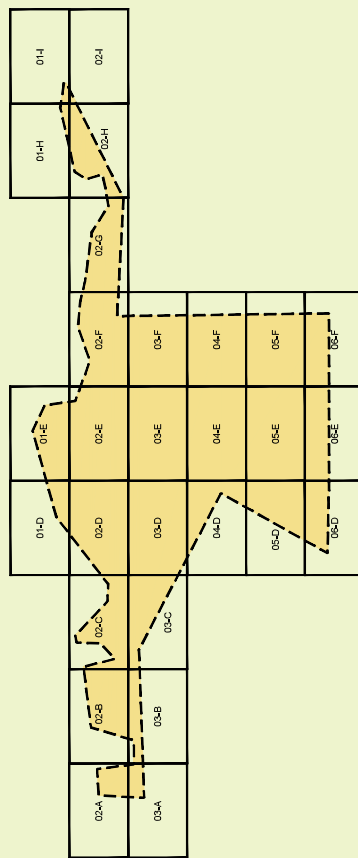
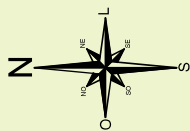
REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO

REVISÃO PROJETO
MOSAICO ALVORADA, BANHADO GRANDE, CACHOEIRINHA, GRAVATAÍ E VIAMÃO



LEONARD

PERSONNEL AVE) TECHN

ENGº ORGEL CARVALHO FILHO
CREA RS 087284

ENG³ LUCIANO BEZERRA
CREA RS 065454

ENGEUSEE | BOSTON COLLEGE | 011

[illegible]

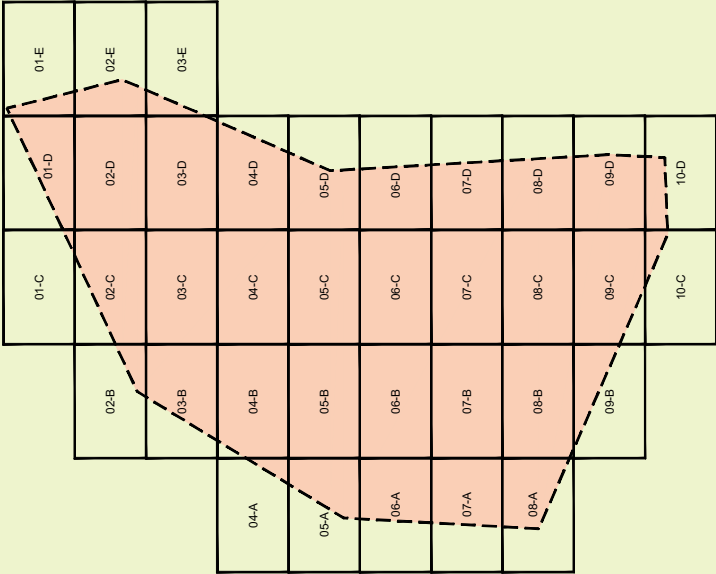
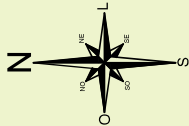
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No

713

MOSAICO ALVORADA

ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS NA BACIA DO RIO GRAVATAÍ





GOVERNO DO ESTADO
RIO GRANDE DO SUL



COHIDRO
CORPORAÇÃO DE PARTICIPAÇÃO



ENCOPI
ENGENHARIA

RESPONSÁVEL TÉCNICO

ENF. ORIEL CARVALHO
CREA: RS 65644

ENF. LUCIANO BEZERRA
CREA: RS 65644

ENF. WILLINGTON CORREIA
CREA: RS 65644

REVISÃO	DESCRIÇÃO	DESENHO	VERIFICAÇÃO	THIAGO	DATA
0	EMISSÃO INICIAL				



METROPLAN
Engenharia e Planejamento

ESCALA
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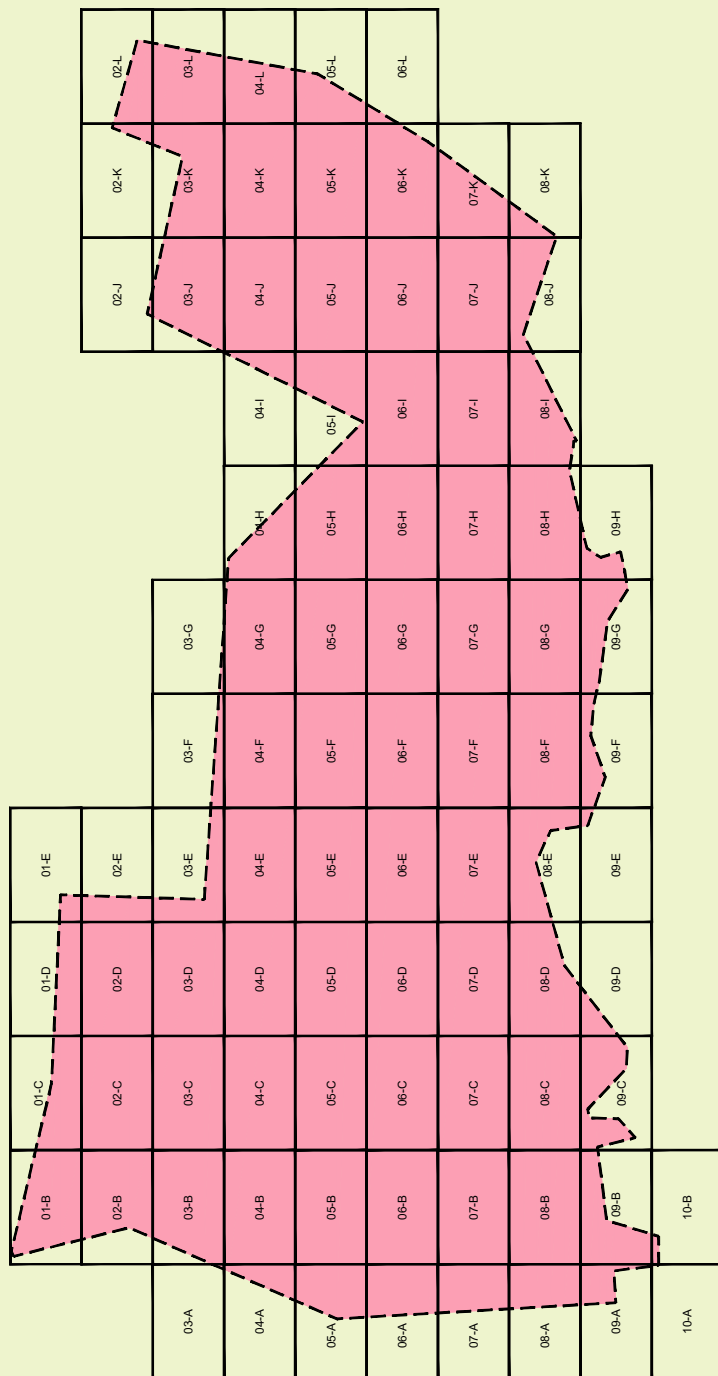
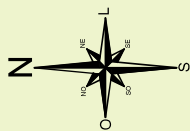
TIPO DE PROJETO
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ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS NA BACIA DO RIO GRAVATAI

MOSAICO CACHOEIRINHA

COBRAS
16881-LA-CP-01-02-00

1/1



LEGENDA:

RESPONSE 84VEB TECHNICOS

ENGº ORGEL CARVALHO FILHO
CREA RS 087284

ENG³ LUCIANO BEZERRA
CREA RS 066454

ENG^o WELLINGTON COIMBRA LOU

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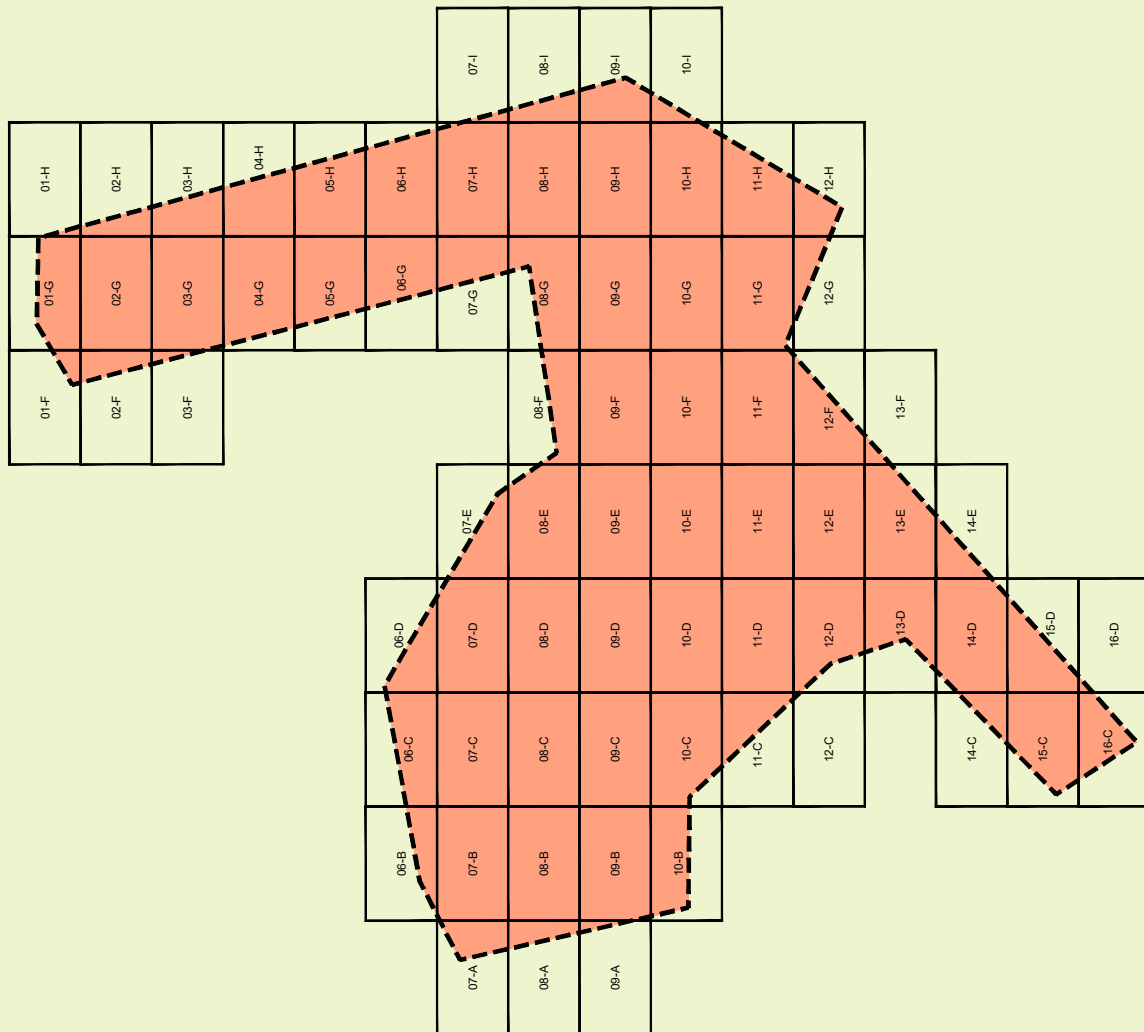
ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS NA BACIA DO RIO GRAVATAÍ

MOSAICO GRAVATAÍ

OME DO ARQUIVO

16001-D-TOE-01-02-00

FOLHA
1/1



RESPONSE-DRIVEN TECHNOLOGIES

ING^a WELLINGTON COIMBRA LOU

0	EMIÇÃO INICIAL
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L. FILIPE	L. FILIPE	THIAGO	11/11/16
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ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DAS CHEIAS NA BACIA DO RIO GRAVATAÍ

MOSAICO VIAMÃO

16001-D-TOP-01-02-00	1/1
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ANEXO 13 - ORTOFOTOS

Este anexo está sendo apresentado somente em mídia digital.

ANEXO 14 - RESTITUIÇÃO AEROFOTOGRAMÉTRICA

Este anexo está sendo apresentado somente em mídia digital.

ANEXO 15 - FOTO INDICE





ESTUDO DE ALTERNATIVAS E PROJETOS PARA MINIMIZAÇÃO DO EFEITO DE CHUVA E ESTAGENS NA BACIA DO RIO GRAVATAÍ

Mapa

Fotointerpretação da Bacia do Rio Gravataí

Data: Dezembro 2015

ANEXO 16 - PLANILHAS DE RESOLUÇÃO

Este anexo está sendo apresentado somente em mídia digital.