



**ANÁLISES E RESULTADOS DO
CENTRO DE PROCESSAMENTO
SIRGAS - IBGE**

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1. INTRODUÇÃO

Desde 2005, o Sistema de Referência Geocêntrico para as Américas – SIRGAS, na sua realização 2000, tornou-se oficialmente o novo sistema de referência geodésico para o Brasil, conforme publicado na Resolução do Presidente do IBGE, R.PR-1/2005. Por se tratar de um sistema de referência preciso e com origem no centro de massa da Terra, a componente temporal passou a ser um fator importante para a manutenção desse sistema. Fatores como, movimento de placas litosféricas, subsidência de solo, influenciam na posição de cada uma das estações que materializam esse sistema, e, portanto, devem ser monitoradas.

Define-se por redes ativas GNSS (*Global Navigation Satellite System*), o conjunto de estações geodésicas estabelecidas em locais estáveis da superfície terrestre ou litosfera, materializadas por uma estrutura rígida, nas quais são instalados receptores GNSS de dupla-frequência, os quais coletam dados continuamente. Com a implantação deste novo conceito de estações geodésicas, torna-se possível avaliar sistematicamente as variações ocorridas na realização de um sistema de referência geodésico ao longo do tempo, possibilitando assim, a determinação de novos parâmetros para esse sistema, assim como o aprimoramento dos modelos de velocidades.

Atualmente o SIRGAS é materializado por uma rede denominada SIRGAS-CON, com mais de 200 estações GNSS em operação contínua, distribuídas na América do Sul, Central e Caribe, conforme apresentada na Figura 1. Maiores informações podem ser encontradas em www.sirgas.org.

Os Centros de Processamento SIRGAS foram instituídos com a finalidade de determinar de forma sistemática, as coordenadas das estações pertencentes à rede SIRGAS-CON, assim como outras informações referente à rede, seguindo critérios pré-estabelecidos, a fim de dar suporte à manutenção do SIRGAS. Essas informações são utilizadas na avaliação do SIRGAS, e para uma futura realização desse sistema. Atualmente existem três centros de processamento SIRGAS oficiais: IBGE através da Coordenação de Geodésia; *Instituto Geográfico Agustín Codazzi* - IGAC (Colômbia), e *Instituto de Geodésia y Geodinâmica de la Universidad Nacional del Cuyo*, IGG-CIMA (Argentina). Além desses três, o *Deutsches Geodätisches Forschungsinstitut* – DGFI, instituto alemão responsável pelo processamento da rede regional IGS sul-americana, também processa os dados da rede SIRGAS-CON.

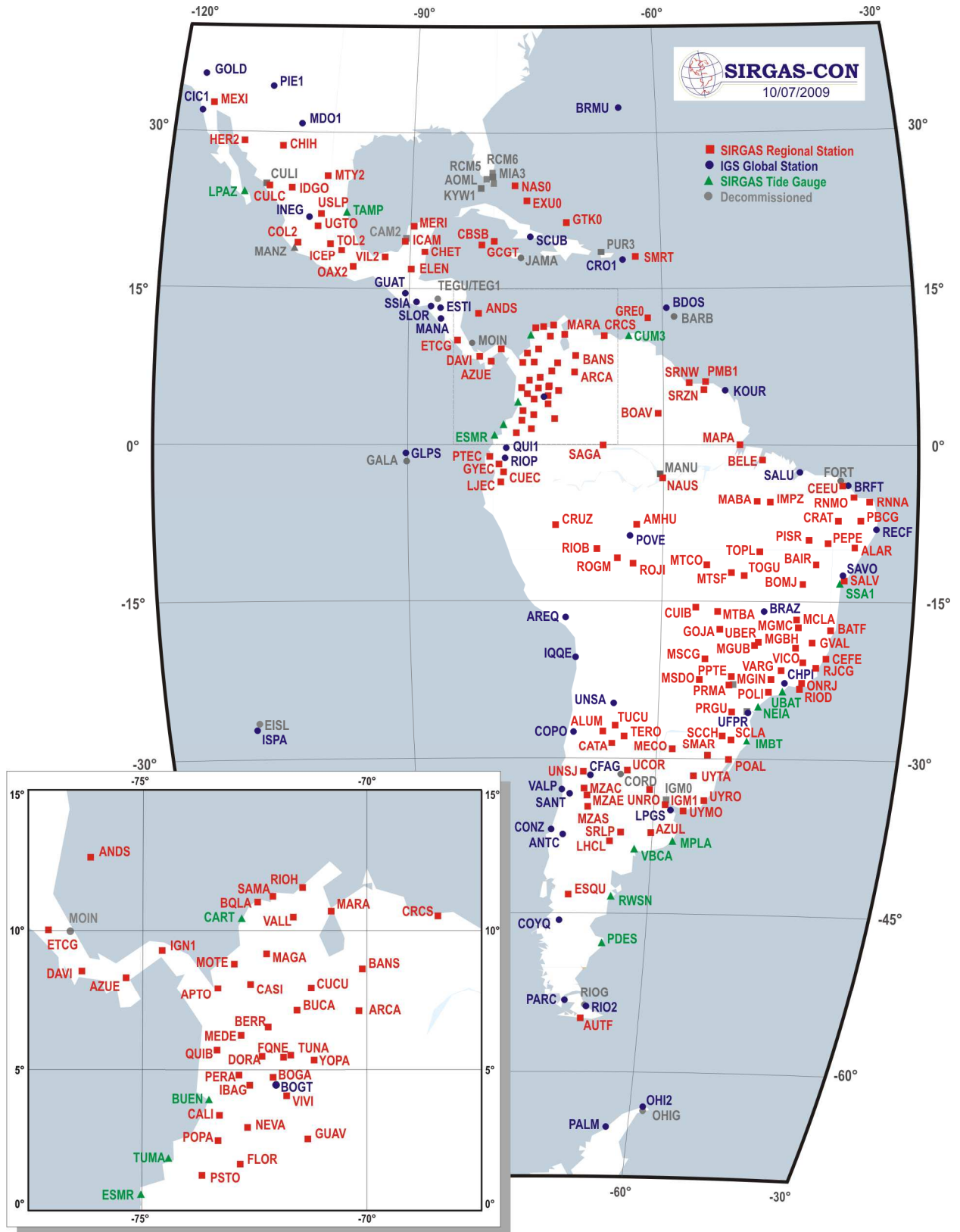


Figura 01: Rede SIRGAS-CON (www.sirgas.org)

2. REDE DE ESTAÇÕES GNSS/GPS CONTÍNUAS SIRGAS-CON

A cada ano o número de estações contínuas GNSS da Rede SIRGAS-CON vem aumentando significativamente. Em julho de 2009 o número já era superior à 200 estações. Esse aumento fez com que houvesse a necessidade de dividir a rede em sub-redes, para que os centros de processamentos não ficassem sobrecarregados com uma grande quantidade de estações a serem processadas. A partir daí, a rede SIRGAS-CON foi dividida em quatro sub-redes: SIRGAS-CON C e SIRGAS-CON D norte, central e sul, conforme apresentado na figura 2.

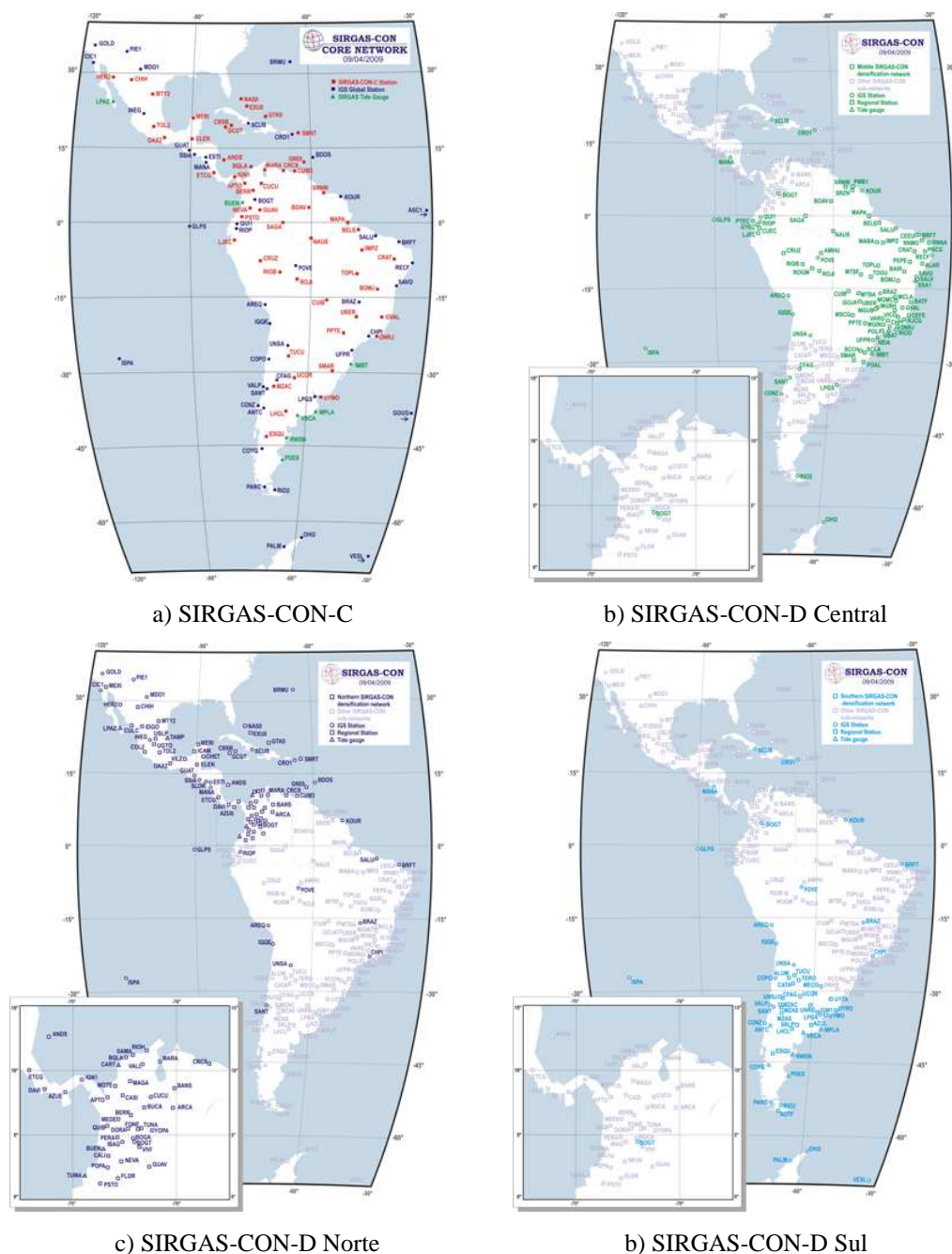


Figura 02 – Sub-redes SIRGAS-CON (www.sirgas.org)

Com essa nova configuração de sub-redes, ficou estabelecido que cada um dos centros de processamento ficasse responsável pelo processamento de uma determinada rede, e posteriormente os resultados de cada rede combinados pelos Centros de Combinação SIRGAS, tarefa realizada atualmente pelo DGFI e IBGE.

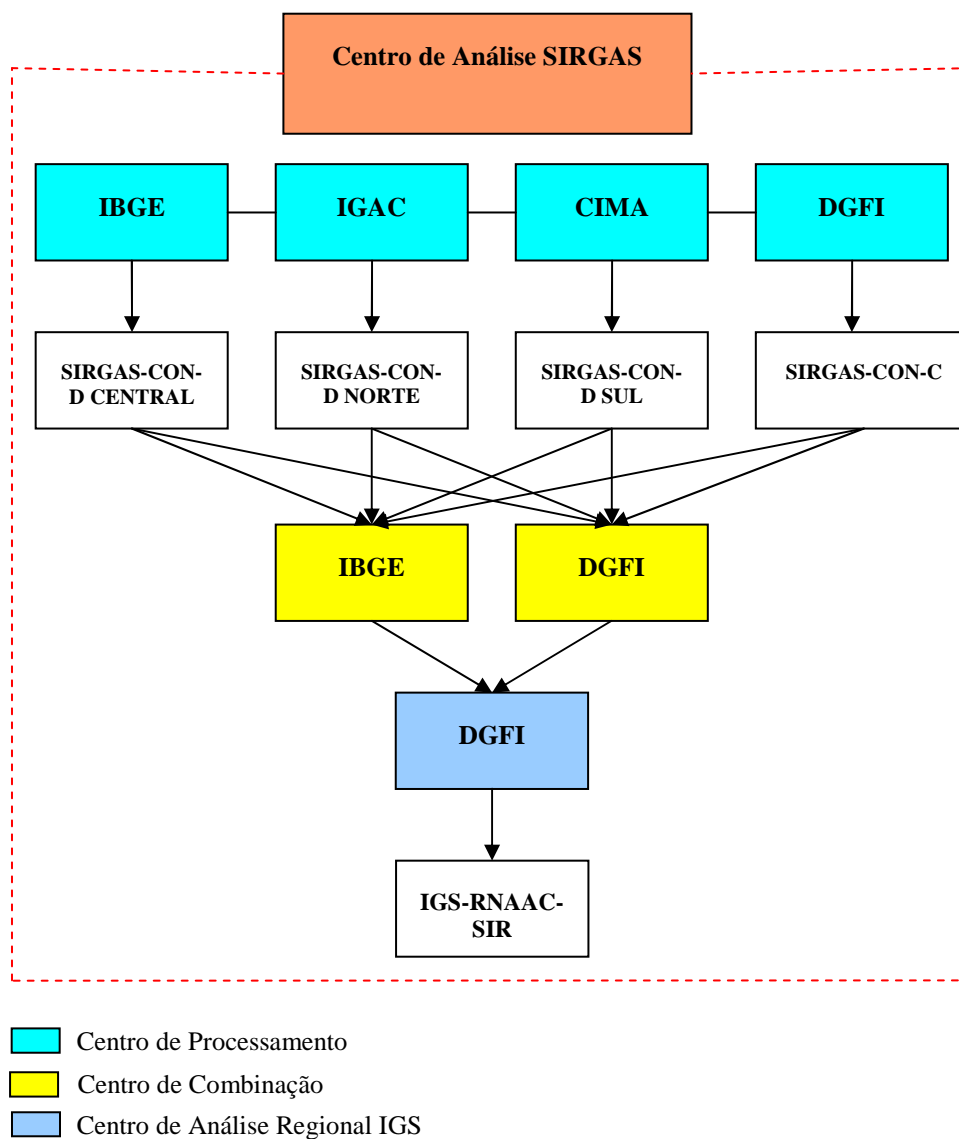


Figura 03: Organograma – Centro de Análise SIRGAS

3. CENTRO DE PROCESSAMENTO SIRGAS - IBGE

O centro de processamento SIRGAS – IBGE apesar de ter iniciado oficialmente suas atividades em 2008, tem resultados do processamento dos dados GNSS coletados desde janeiro de 2003 (semana GPS 1199). Responsável pelo processamento GNSS da rede SIRGAS-CON-D central, tem como finalidade determinar as coordenadas dessas estações, assim como informações referentes à precisão desse processamento, e enviá-las para os Centros de Combinações, responsável pela combinação dos resultados de todos os centros de processamentos.

Como o IBGE através de sua Coordenação de Geodésia já realizava o processamento de várias estações localizadas na América do Sul, antes mesmo de se tornar centro de processamento oficial, e como algumas destas estações não fazem parte da rede SIRGAS-CON-D central, a figura 4 apresenta a rede de estações GNSS atualmente processada pelo IBGE. Entretanto, os resultados enviados ao SIRGAS são somente correspondente àquelas estações que fazem parte da rede SIRGAS-CON-D central.

Desde o início das atividades de processamento realizadas pelo IBGE a partir de 2005, várias estações localizadas na América do Sul já foram desativadas, modificadas ou criadas. Alguns fenômenos naturais como terremotos, descargas elétricas, assim como problemas com o equipamento, contribuíram para que essas estações não permanecessem no processamento ao longo do tempo. Estações localizadas nas regiões andinas como Bogotá – BOGT, Arequipa – AREQ, são frequentemente afetadas por terremotos, o que ocasiona em muitos casos a desativação da estação. Em regiões Amazônicas estações sofrem muitas influências de descargas elétricas, danificando o receptor e a antena.



Figura 04 – Estações processadas pelo IBGE

4. CARACTERÍSTICAS DAS ESTAÇÕES SIRGAS

As estações pertencentes à rede SIRGAS-CON são materializadas em locais estáveis, dispostas com rede elétrica e lógica, e equipadas com receptores e antenas com ao menos duas frequências na banda L. A maioria dos equipamentos coletam dados GNSS (GPS e GLONASS), restando ainda alguns que coletam apenas dados GPS.



Figura 05 – Estações MZAS (Argentina) à esq. e BOMJ (Brasil) à dir.

O anexo 01 apresenta a relação das estações utilizadas atualmente pelo centro de processamento SIRGAS - IBGE, além das informações relativas ao receptor e antena, e o local onde elas se encontram.

5. METODOLOGIA APLICADA

O *software* de processamento GNSS utilizado pelo IBGE para a realização das atividades do Centro de Processamento SIRGAS é o Bernese 5.0, desenvolvido pela Universidade de Berne na Suíça (Hugentobler U. et al.,2006). Trata-se de um *software* científico, que tem como principal característica, o processamento de longas linhas de base (acima de 1000 km). Além disso, pode ser utilizado de forma automática através do módulo BPE.

As principais características do processamento realizado pelo IBGE com o Bernese 5.0 são apresentadas na tabela 01.

Tabela 01 – Características principais do processamento

Observações	Dupla Diferença
Software	Bernese 5.0 (BPE mode)
Taxa de coleta	30 sec
Ângulo de Elevação	03°
Estratégia de Linha de Base	SHORTEST
Órbita/EOP	IGS final - IGS05 EOP week
Modelo de Troposfera a priori	Niell dry component
Troposfera	Zenith delay estimated each 2 hours (12 daily corrections p/station) A priori sigmas applied with respect to prediction model Niell(wet component) -first parameter +/- 5 m absolute and +/- 5 cm relative
Ambiguidades	QIF strategy with GIM from CODE
Modelo de Carga Oceânica	FES2004
Variação de Centro de Fase	Absolute (IGS_05)
Coordenadas e Velocidades	IGS05_R
Soluções Diárias	All the constraint stations ($\sigma=\pm 1$ m) OUTPUT FILES: SINEX Troposphere maps
Soluções Semanais	All the constraint stations ($\sigma=\pm 1$ m) OUTPUT FILES: SINEX

O processamento das observações é realizado duas semanas após a sua coleta, isso porque as órbitas utilizadas são as órbitas precisas finais IGS que só ficam disponíveis 14 dias após a data correspondente. O resultado gerado por cada um dos centros de processamentos é

disponibilizado para o DGFI dentro de um intervalo de três semanas após as observações terem sido realizadas.

As informações das estações utilizadas no processamento tais como tipo de receptor e antena, *domes number*, altura da antena, entre outras, são obtidos através dos *logfile* disponíveis no site do DGFI e IGS:

<ftp://ftp.dgfi.badw-muenchen.de/pub/gps/DGF/station/log/>

<ftp://igscb.jpl.nasa.gov/pub/station/log/>

Cada centro de processamento gera resultados diários, e semanais. Esses resultados semanais são disponibilizados para os centros de combinações, e estes têm a tarefa de combinar as soluções de cada centro gerando resultado único para aquela semana, que serão utilizados posteriormente em um ajustamento global. Os resultados determinados pelo IBGE são disponibilizados no seguinte endereço: <ftp://geofp.ibge.gov.br/SIRGAS/>.

6. SERIE TEMPORAL DAS ESTAÇÕES

Com o processamento sistemático das estações pertencentes à rede SIRGAS-CON, séries temporais são geradas para cada uma das estações processadas. Com essas séries, é possível detectar problemas que possa haver ocorrido em alguma estação, avaliar o comportamento geodinâmico local, determinar a velocidade das estações devido ao movimento das placas litosféricas. As séries temporais de todas as estações da rede SIRGAS-CON processadas pelo IBGE são apresentadas no anexo 2.

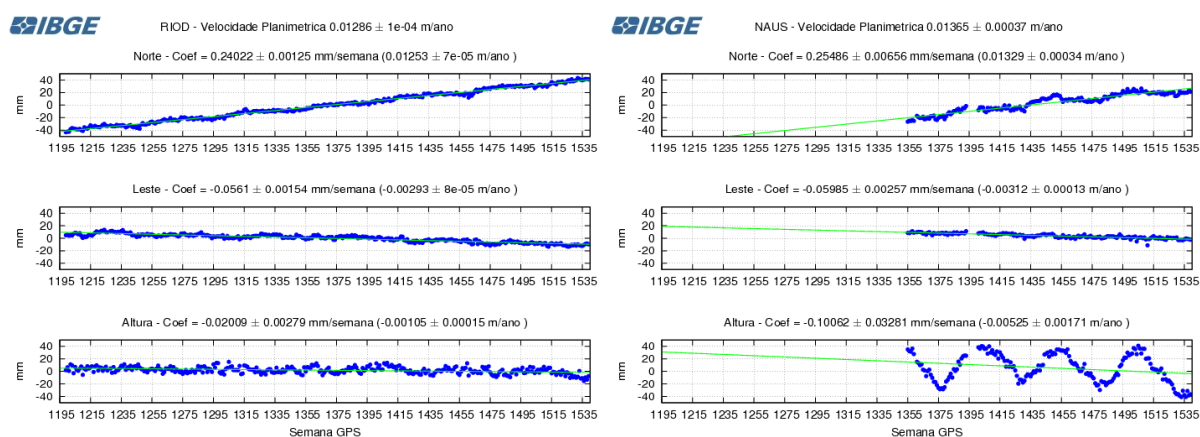


Figura 06 – Série temporal das estações RIOD (esq) e NAUS (dir)

A figura 06 apresenta o comportamento temporal das estações RIOD e NAUS localizadas no Rio de Janeiro e Manaus respectivamente. Observem que tanto a componente norte, quanto a leste apresentam o mesmo comportamento (direção) para ambas as estações. Esse movimento é em grande parte, devido ao deslocamento das placas litosféricas, sendo que ambas estão sobre a placa Sulamericana. Entretanto, a componente altimétrica por ser mais dependente do local, e não do movimento das placas litosféricas, apresentam comportamento variável. A componente altimétrica para a estação NAUS, vem se comportando de forma sazonal com um período anual oscilando aproximadamente 8 cm, e está diretamente relacionado com o período de cheia e vazante do Rio Negro. Isso é verificado quando comparamos o resultado determinado pela estação NAUS, com os resultados de linígrafos dispostos às margens do Rio Negro.

Com a determinação das séries temporais é possível calcular o vetor velocidade para as estações da rede SIRGAS-CON, conforme apresentado na figura 07. Nota-se que o comportamento para as estações localizadas no Brasil apresenta concordância entre si, o que não

ocorre com as estações localizadas nos Andes, e que sofrem grande influência da placa litosférica Nazca.

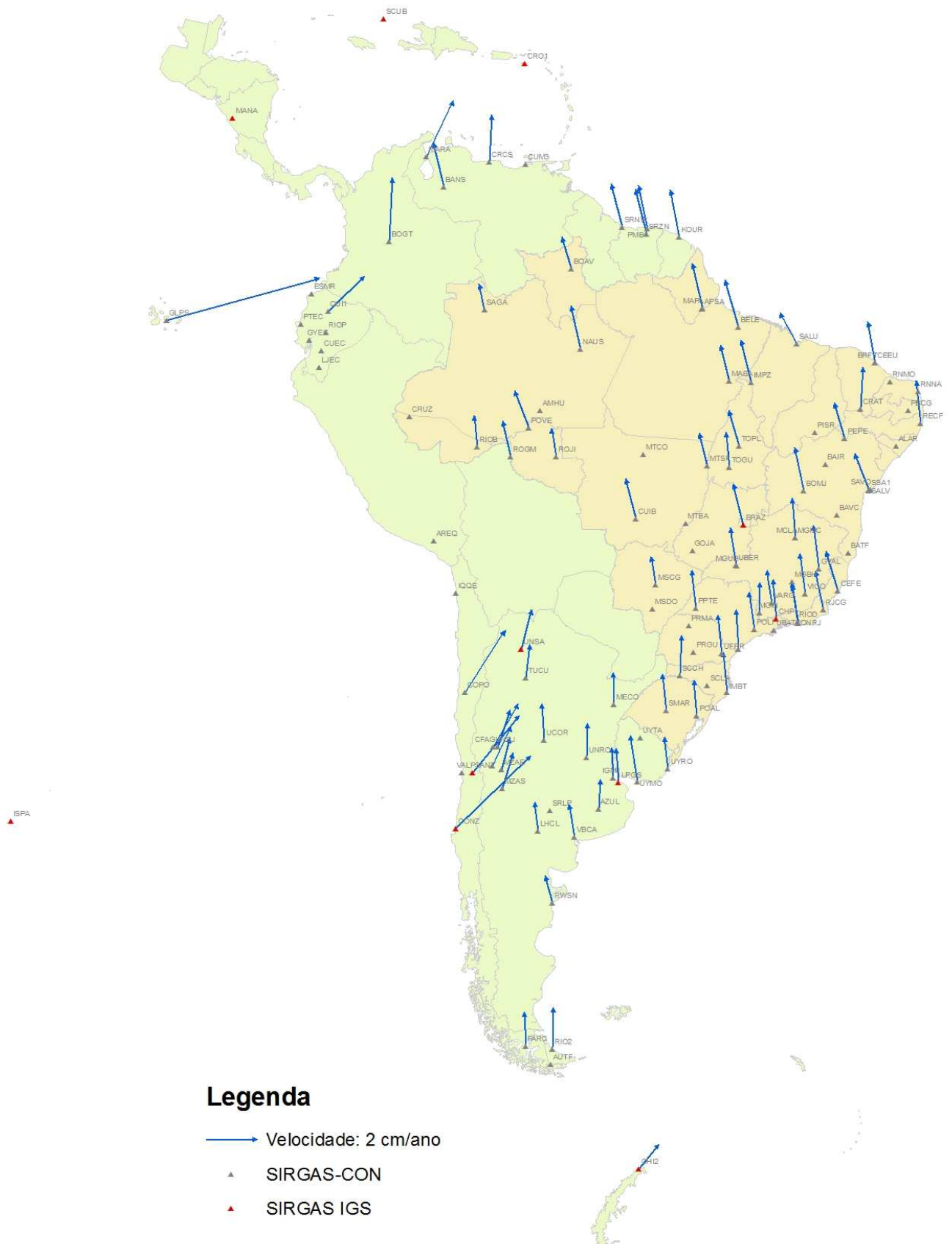


Figura 07 – Velocidade das estações determinadas pelo IBGE

7. ARQUIVOS UTILIZADOS NO PROCESSAMENTO EM 2008

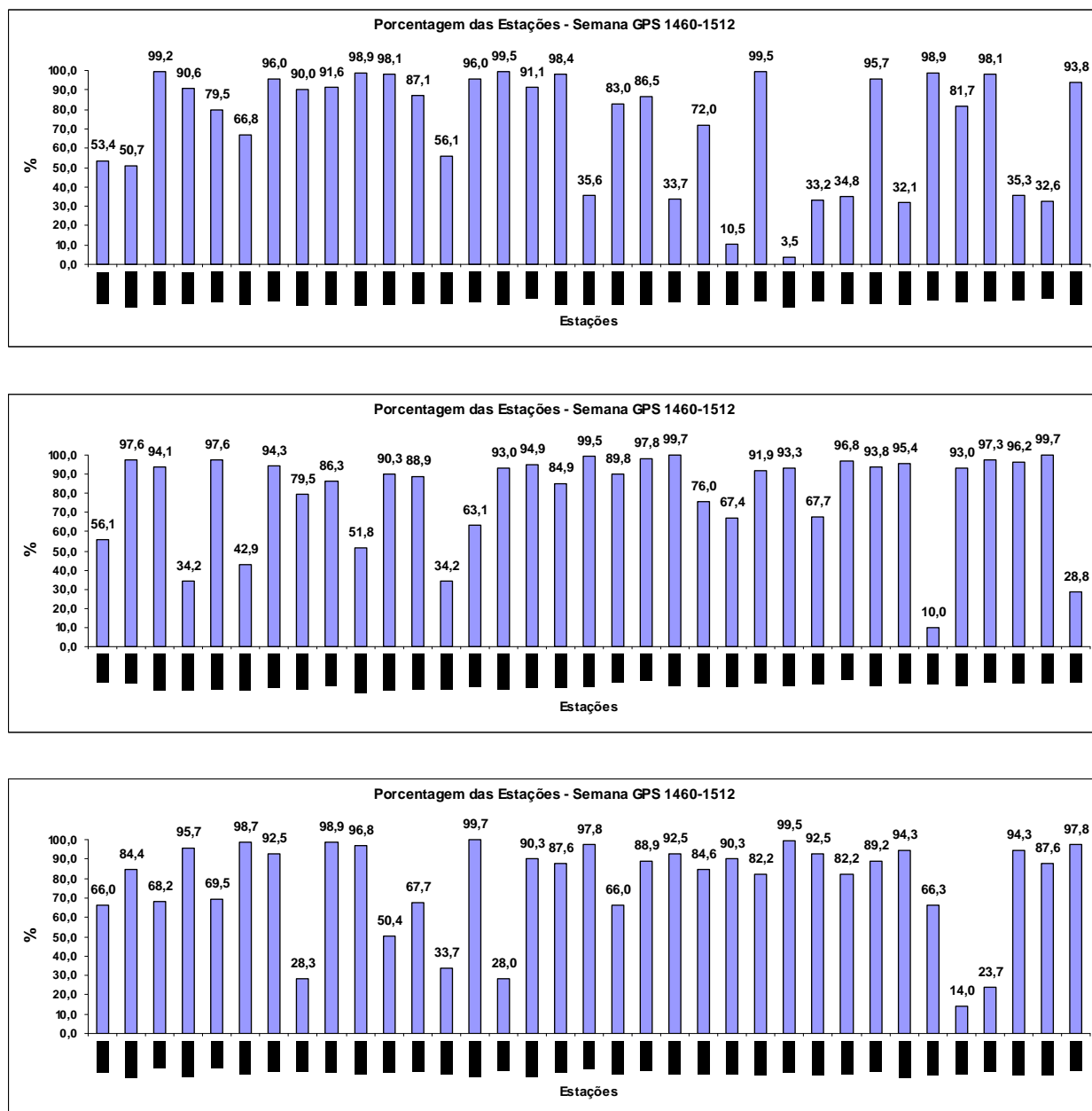
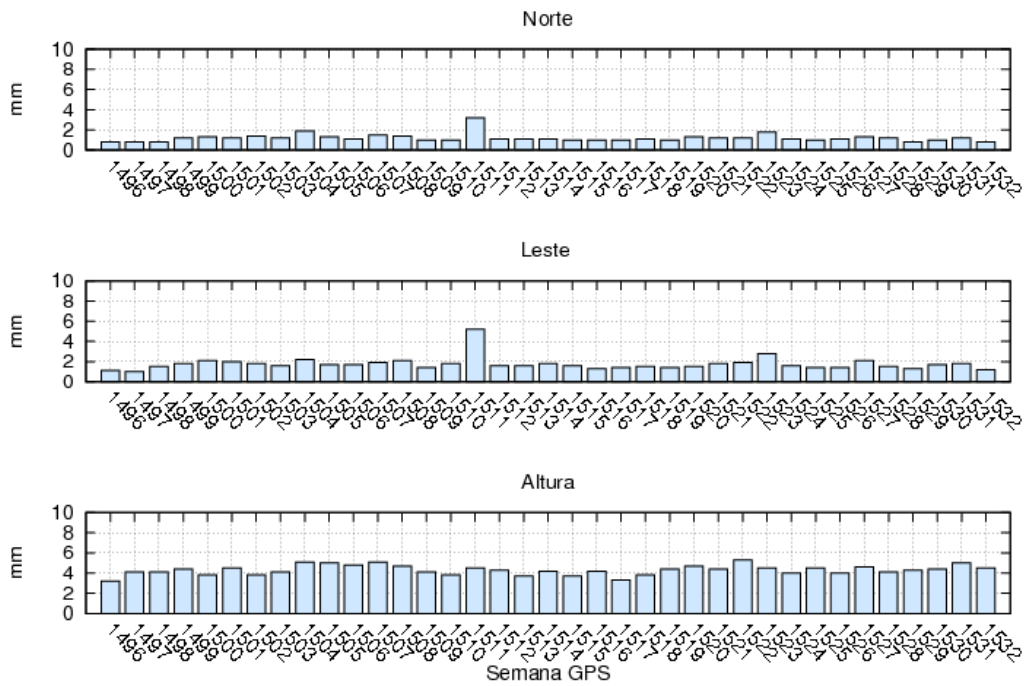


Figura 07 – Estações utilizadas no processamento em 2008

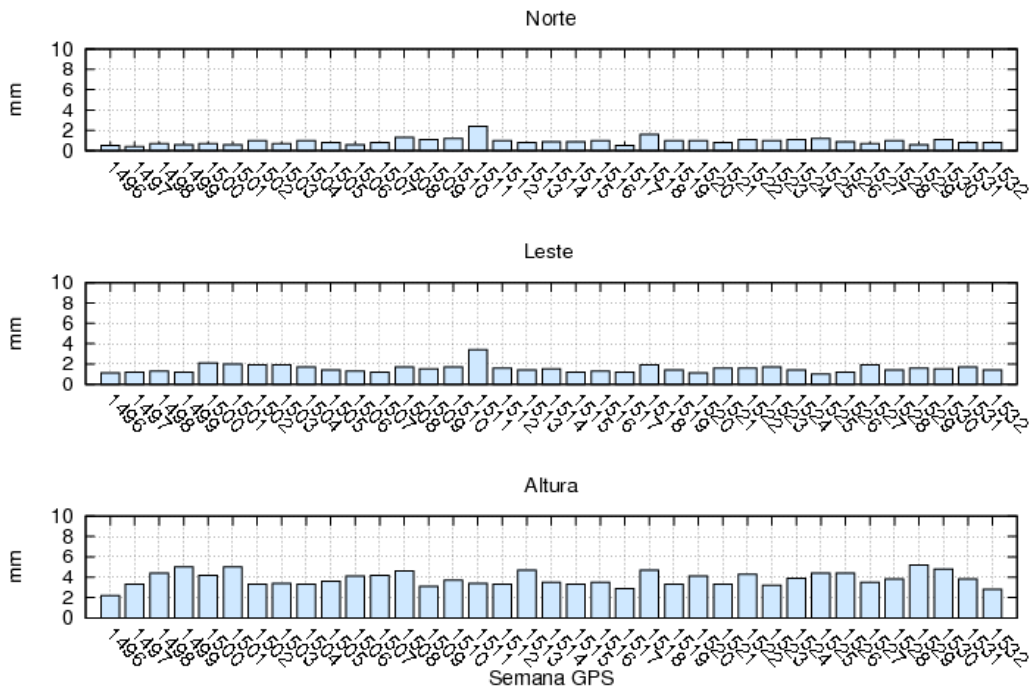
8. COMPARAÇÃO COM OUTROS CENTROS DE PROCESSAMENTO SIRGAS



Erro Medio Quadratico - IBGE - DGFI



Erro Medio Quadratico - IBGE - CIMA



ANEXO 01 – DESCRIÇÃO DAS ESTAÇÕES SIRGAS

Tabela 02 – Estações processadas pelo IBGE

EST	RECEPTOR	ANTENA		ALTURA (m)	CIDADE	PAÍS
ALAR	TRIMBLE NETR5	TRM55971.00	NONE	0.0010	Arapiraca	Brasil
AMHU	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Humaitá	Brasil
APSA	TRIMBLE 4000SSI	TRM29659.00	NONE	0.0080	Santana	Brasil
AREQ	ASHTECH UZ-12	AOAD/M_T	JPLA	0.0610	Arequipa	Peru
AUTF	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Ushuia	Argentina
AZUL	TRIMBLE NETR5	TRM55971.00	TZGD	0.0000	Azul	Argentina
BAIR	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Irecê	Brasil
BANS	TRIMBLE 5700	TRM29659.00	NONE	0.0000	Barinas	Venezuela
BATF	TRIMBLE NETR5	TRM55971.00	NONE	0.0100	Tefé	Brasil
BAVC	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Vitória da Conquista	Brasil
BELE	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Belem	Brasil
BOAV	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Boa Vista	Brasil
BOGT	ASHTECH UZ-12	ASH701945G_M	NONE	0.0610	Bogota	Colômbia
BOMJ	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Bom Jesus da Lapa	Brasil
BRAZ	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Brasilia	Brasil
BRFT	LEICA GRX1200PRO	LEIAT504	NONE	0.0083	Euzébio	Brasil
CEEU	TRIMBLE NETRS	TRM41249.00	NONE	0.0020	Euzébio	Brasil
CEFE	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Vitória	Brasil
CFAG	TRIMBLE NETRS	ASH700936D_M	NONE	0.0000	Caucete	Argentina
CHPI	ASHTECH UZ-12	ASH701945C_M	NONE	0.0792	Cachoeira	Brasil
CONZ	TPS E_GGD	TPSCR3_GGD	CONE	0.0574	Concepcion	Chile
COPO	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Copiapo	Chile
CRAT	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Crato	Brasil
CRCS	TRIMBLE 5700	TRM29659.00	NONE	0.0160	Caracas	Venezuela
CRO1	ASHTECH UZ-12	ASH701945G_M	JPLA	0.0814	Saint Croix	USA
CRUZ	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Cruzeiro do Sul	Brasil
CUEC	LEICA GRX1200GGPRO	LEIAT504GG	NONE	0.0080	Cuenca	Equador
CUIB	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Cuiabá	Brasil
CUM3	SOK GSR2700 RS	NOV533+CR	NOVC	0.1440	Cumana	Venezuela
ESMR	TRIMBLE NETRS	TRM41249.00	NONE	1.1840	Esmeraldas	Equador
GLPS	ASHTECH UZ-12	ASH701945B_M	SCIT	0.0083	Puerto Ayora	Equador
GOJA	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Jataí	Brasil
GVAL	ASHTECH UZ-12	ASH700700.B	NONE	0.0500	Gov. Valadares	Brasil
GYEC	LEICA GRX1200GGPRO	LEIAT504GG	NONE	0.0080	Guayaquil	Equador
IGM1	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Buenos Aires	Argentina

IMBT	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Imbitiba	Brasil
IMPZ	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Imperatriz	Brasil
IQQE	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Iquique	Chile
ISPA	ASHTECH UZ-12	ASH701945E_M	SCIT	0.0083	Easper Island	Chile
KOUR	JPS LEGACY	ASH701946.3	NONE	0.0450	Kourou	Guiana Francesa
LHCL	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Lihuel Calel	Argentina
LJEC	LEICA GRX1200GGPRO	LEIAT504GG	NONE	0.0080	Loja	Equador
LPGS	AOA BENCHMARK ACT	AOAD/M_T	NONE	0.0460	La Plata	Argentina
MABA	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Maraba	Brasil
MANA	TRIMBLE 4000SSI	TRM29659.00	UNAV	0.0000	Managua	Nicarágua
MAPA	TRIMBLE NETRS	TRM29659.00	NONE	0.0880	Macapá	Brasil
MARA	SOK GSR2700 RS	NOV533+CR	NOVC	0.0780	Maracaibo	Venezuela
MCLA	ASHTECH UZ-12	ASH700700.B	NONE	0.0600	Montes Claros	Brasil
MECO	TRIMBLE NETRS	TRM41249.00	TZGD	0.5350	Mercedes	Argentina
MGBH	TRIMBLE NETR5	TRM55971.00	NONE	0.0060	Belo Horizonte	Brasil
MGIN	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Inconfidente s	Brasil
MGMC	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Montes Claros	Brasil
MGUB	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Uberlandia	Brasil
MSCG	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Campo Grande	Brasil
MSDO	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Dourados	Brasil
MTBA	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Barra do Garça	Brasil
MTCO	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Colider	Brasil
MTSF	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	São Félix do Araguaia	Brasil
MZAC	ASHTECH Z-XII3	ASH701933C_M	SNOW	0.0000	Mendoza	Argentina
MZAE	TRIMBLE NETRS	TRM29659.00	UNAV	0.0000	Santa Rosa	Argentina
MZAS	TRIMBLE NETRS	TRM29659.00	UNAV	0.0000	San Rafael	Argentina
NAUS	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Manaus	Brasil
NEIA	TRIMBLE 4000SSI	TRM29659.00	NONE	0.0000	Cananéia	Brasil
OHI2	JPS E_GGD	AOAD/M_T	DOVE	0.0080	O'Higgins	Antártica
ONRJ	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Rio de Janeiro	Brasil
PARC	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Punta Arenas	Chile
PBCG	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Campina Grande	Paraíba
PEPE	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Petrolina	Brasil
PISR	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	São Raimundo Nonato	Brasil
PMB1	TRIMBLE R7	TRM55971.00	NONE	0.0000	Paramaribo	Suriname
POAL	TRIMBLE NETR5	TRM29659.00	NONE	0.0075	Porto Alegre	Brasil

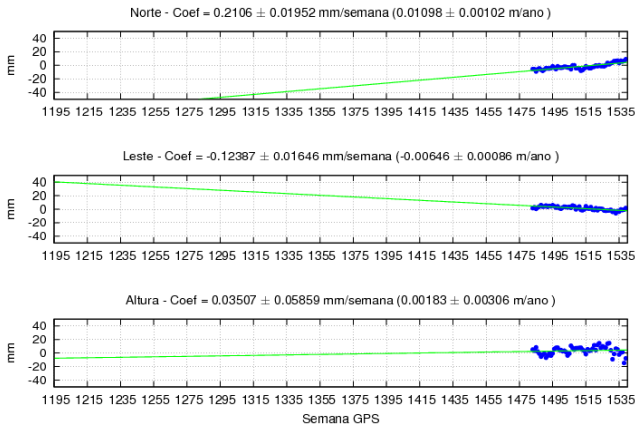
POLI	LEICA GRX1200 PRO	LEIAX1202	NONE	0.0500	São Paulo	Brasil
POVE	TRIMBLE NETR5	TRM29659.00	NONE	0.0075	Porto Velho	Brasil
PPTE	TRIMBLE NETRS	TRM41249.00	NONE	0.0025	Pres. Prudente	Brasil
PRGU	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Guarapuava	Brasil
PRMA	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Maringa	Brasil
PTEC	LEICA GRX1200GGPRO	LEIAT504GG	NONE	0.0080	Portoviejo	Equador
QUI1	ASHTECH Z-XII3	ASH700936B_M	SNOW	0.0000	Quito	Equador
RECF	TRIMBLE NETR5	TRM55971.00	NONE	0.0710	Recife	Brasil
RIO2	ASHTECH Z-XII3	ASH700936C_M	SNOW	0.0350	Rio Grande	Argentina
RIOB	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Rio Branco	Brasil
RIOD	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Rio de Janeiro	Brasil
RIOP	TRIMBLE 4000SSI	TRM29659.00	NONE	0.0729	Riobamba	Equador
RJCG	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Campos dos Goytacazes	Brasil
RNMO	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Mossoró	Brasil
RNNA	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Natal	Brasil
ROGM	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Guajará- Mirim	Brasil
ROJI	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Ji-Paraná	Brasil
RWSN	ASHTECH UZ-12	ASH700936D_M	NONE	0.0000	Rawson	Argentina
SAGA	TRIMBLE NETRS	TRM41249.00	NONE	0.0100	São Gabriel da Cachoeira	Brasil
SALU	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	São Luis	Brasil
SALV	TRIMBLE 4000SSI	TRM29659.00	NONE	0.1570	Salvador	Brasil
SANT	ASHTECH UZ-12	AOAD/M_T	JPLA	0.0614	Santiago	Chile
SAVO	TRIMBLE NETR5	TRM55971.00	NONE	0.0010	Salvador	Brasil
SCCH	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Chapecó	Brasil
SCLA	TRIMBLE NETR5	TRM55971.00	NONE	0.0000	Lages	Brasil
SCUB	ASHTECH Z-XII3	ASH700936C_M	SNOW	0.0460	Santiago de Cuba	Cuba
SMAR	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Santa Maria	Brasil
SRLP	NOV MILLEN-STD	AERAT2775_43	NONE	0.0000	Santa Rosa, La Pampa	Argentina
SRNW	TRIMBLE NETRS	TRM41249.00	NONE	0.0000	Nieuw Nickerie	Suriname
SRZN	TRIMBLE NETRS	TRM41249.00	NONE	0.0000	Paramatibo	Suriname
SSA1	TRIMBLE 4000SSI	TRM29659.00	NONE	0.0000	Salvador	Brasil
TOGU	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Gurupi	Brasil
TOPL	TRIMBLE NETRS	TRM41249.00	NONE	0.0080	Palmas	Brasil
TUCU	TRIMBLE NETRS	ASH700936C_M	SNOW	0.0000	Tucuman	Argentina
UBAT	TRIMBLE 4000SSI	TRM29659.00	NONE	0.0000	Ubatuba	Brasil
UBER	ASHTECH UZ-12	ASH700700.B	NONE	0.0400	Uberlândia	Brasil
UCOR	TRIMBLE 4000SSE	TRM14532.00	NONE	0.0000	Cordoba	Argentina
UFPR	TRIMBLE NETR5	TRM55971.00	NONE	0.1000	Curitiba	Brasil

UNRO	ASHTECH Z-XII3	TRM41249.00	NONE	0.0000	Rosario	Argentina
UNSA	SEPT POLARX2	TPSCR3_GGD	NONE	0.1300	Salta	Argentina
UNSJ	ASHTECH Z-XII3	TRM41249.00	NONE	0.0000	San Juan	Argentina
UYMO	LEICA GRX1200PRO	LEIAX1202GG	NONE	0.0000	Montevideo	Uruguai
UYRO	LEICA GRX1200PRO	LEIAX1202GG	NONE	0.0000	Santa Teresa	Uruguai
UYTA	TRIMBLE NETRS	TRM41249.00	NONE	0.0000	Tacuarembó	Uruguai
VALP	TRIMBLE NETRS	ASH700936D_M	SNOW	0.0000	Valparaiso	Chile
VARG	ASHTECH UZ-12	ASH700700.B	NONE	0.0650	Varginha	Brasil
VBCA	LEICA SR9500	LEIAT303	NONE	1.0707	Bahia Blanca	Argentina
VICO	TRIMBLE NETR5	TRM55971.00	NONE	0.0080	Viçosa	Brasil

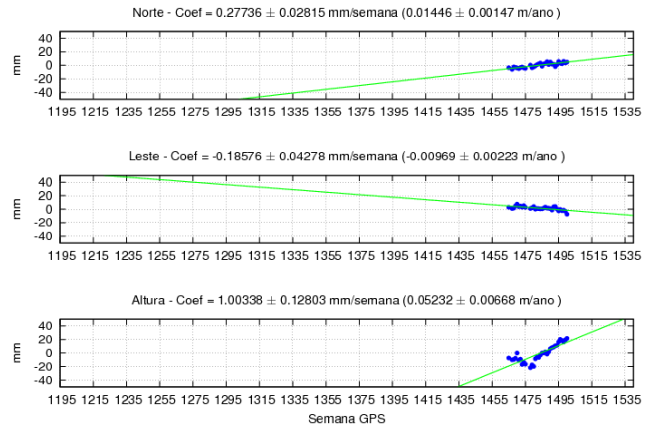
ANEXO 02 – SÉRIE TEMPORAL DAS ESTAÇÕES



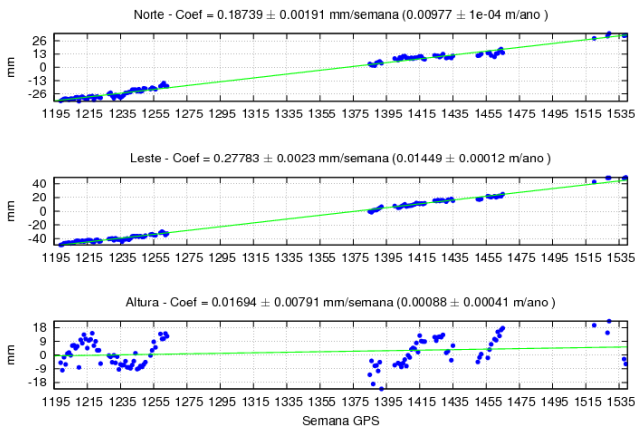
ALAR - Velocidade Planimetrica 0.01274 ± 0.00133 m/ano



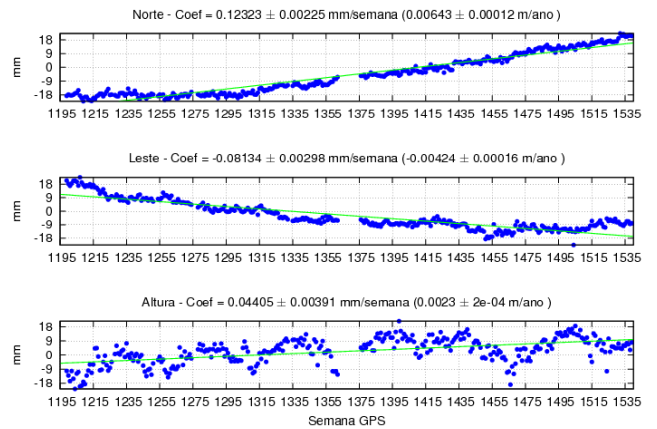
AMHU - Velocidade Planimetrica 0.01741 ± 0.00267 m/ano



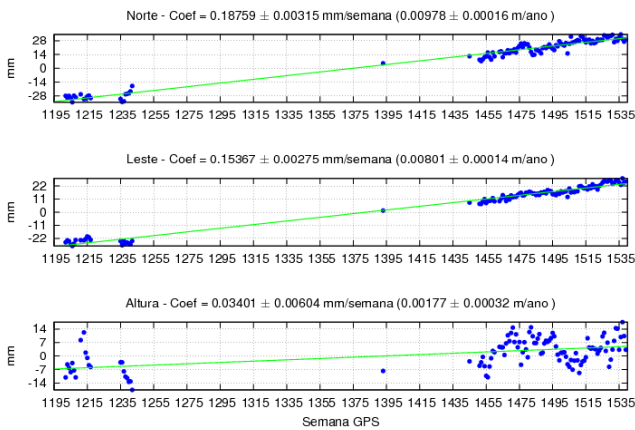
ANTC - Velocidade Planimetrica 0.01747 ± 0.00016 m/ano



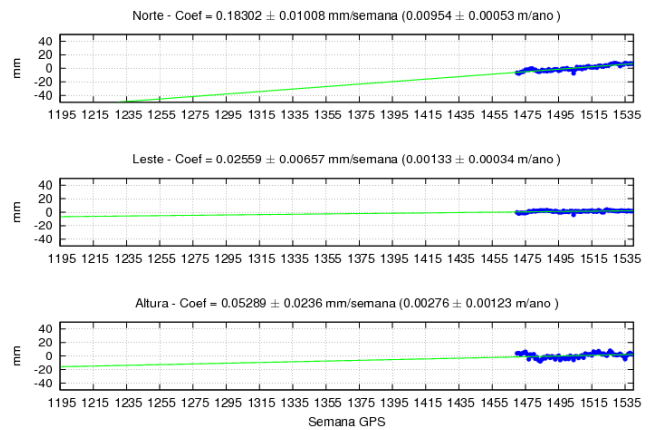
AREQ - Velocidade Planimetrica 0.0077 ± 0.00019 m/ano



AUTF - Velocidade Planimetrica 0.01264 ± 0.00022 m/ano



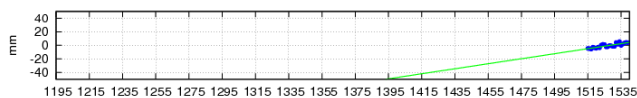
AZUL - Velocidade Planimetrica 0.00964 ± 0.00063 m/ano



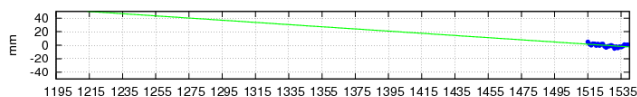


BAIR - Velocidade Planimetrica 0.02105 ± 0.00383 m/ano

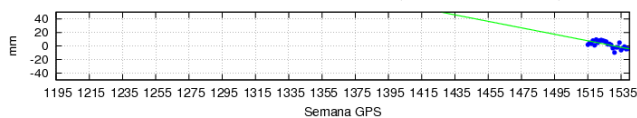
Norte - Coef = 0.37023 ± 0.04108 mm/semana (0.0193 ± 0.00214 m/ano)



Leste - Coef = -0.161 ± 0.06082 mm/semana (-0.0084 ± 0.00317 m/ano)

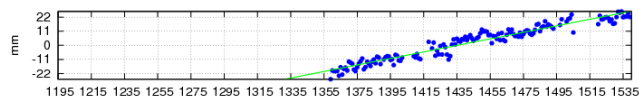


Altura - Coef = -0.47885 ± 0.10422 mm/semana (-0.02497 ± 0.00543 m/ano)

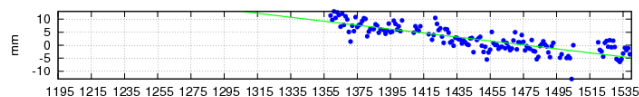


BANS - Velocidade Planimetrica 0.01382 ± 0.00036 m/ano

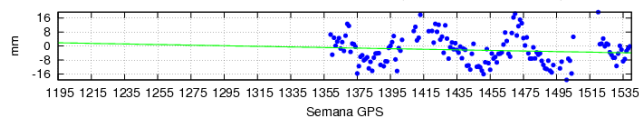
Norte - Coef = 0.25383 ± 0.00524 mm/semana (0.01324 ± 0.00027 m/ano)



Leste - Coef = -0.07595 ± 0.00453 mm/semana (-0.00396 ± 0.00024 m/ano)

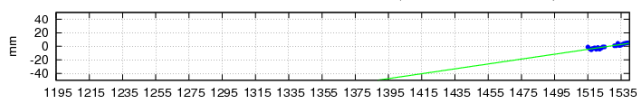


Altura - Coef = -0.01674 ± 0.01133 mm/semana (-0.00087 ± 0.00059 m/ano)

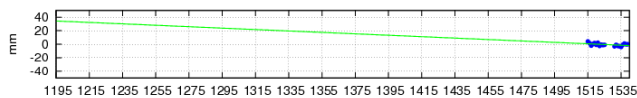


BATF - Velocidade Planimetrica 0.01957 ± 0.0037 m/ano

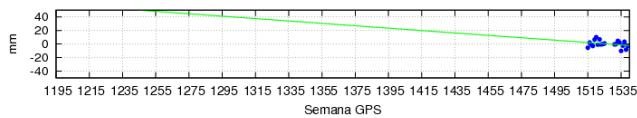
Norte - Coef = 0.36031 ± 0.04268 mm/semana (0.01879 ± 0.00223 m/ano)



Leste - Coef = -0.10536 ± 0.05662 mm/semana (-0.00549 ± 0.00295 m/ano)

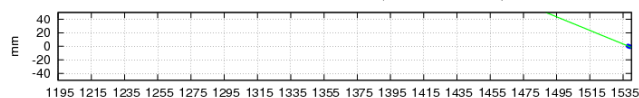


Altura - Coef = -0.17692 ± 0.14477 mm/semana (-0.00923 ± 0.00755 m/ano)

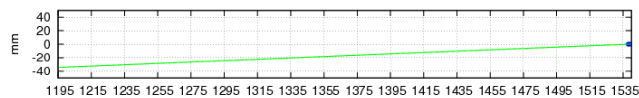


BAVC - Velocidade Planimetrica 0.0524 ± 0 m/ano

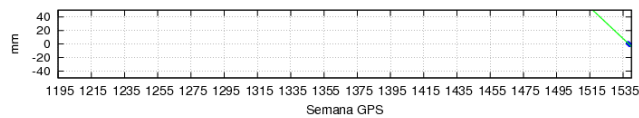
Norte - Coef = -1 ± 0 mm/semana (-0.05214 ± 0 m/ano)



Leste - Coef = 0.1 ± 0 mm/semana (0.00521 ± 0 m/ano)

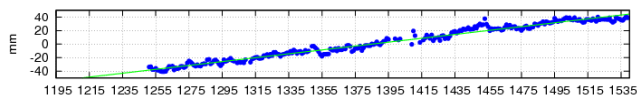


Altura - Coef = -2.3 ± 0 mm/semana (-0.11993 ± 0 m/ano)

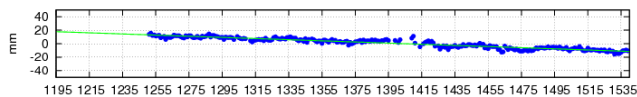


BELE - Velocidade Planimetrica 0.01561 ± 0.00017 m/ano

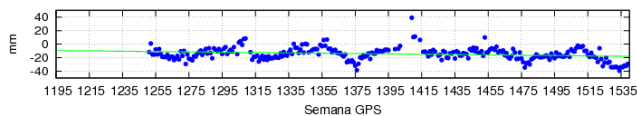
Norte - Coef = 0.28703 ± 0.00277 mm/semana (0.01497 ± 0.00014 m/ano)



Leste - Coef = -0.08485 ± 0.00153 mm/semana ($-0.00442 \pm 8e-05$ m/ano)

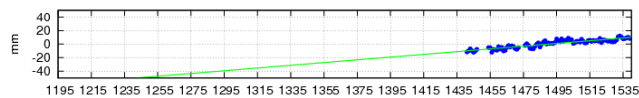


Altura - Coef = -0.02464 ± 0.0065 mm/semana (-0.00128 ± 0.00034 m/ano)

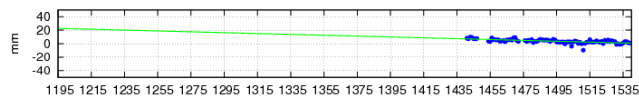


BOAV - Velocidade Planimetrica 0.01104 ± 0.00061 m/ano

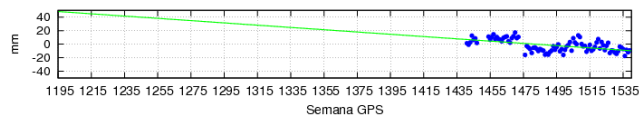
Norte - Coef = 0.20203 ± 0.00895 mm/semana (0.01053 ± 0.00047 m/ano)



Leste - Coef = -0.06353 ± 0.00761 mm/semana ($-0.00331 \pm 4e-04$ m/ano)

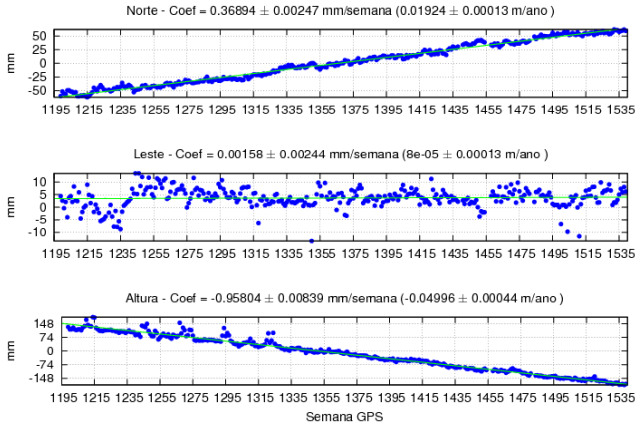


Altura - Coef = -0.16832 ± 0.02183 mm/semana (-0.00878 ± 0.00114 m/ano)

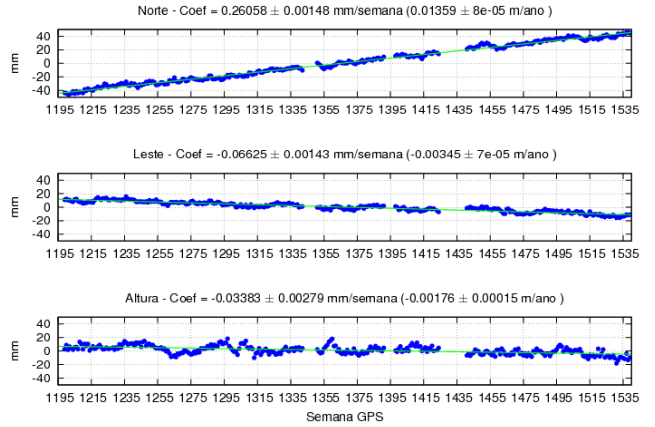




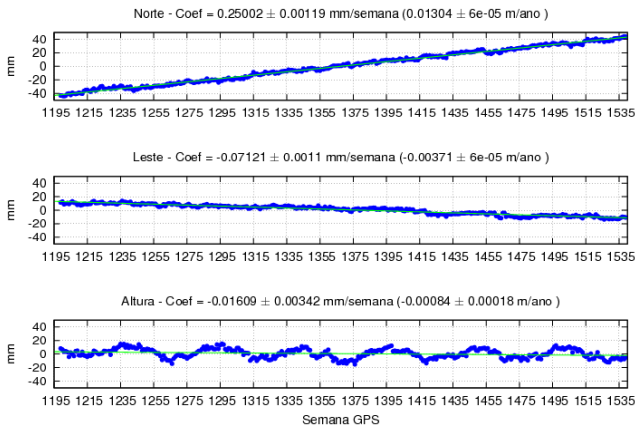
BOGT - Velocidade Planimétrica 0.01924 ± 0.00018 m/ano



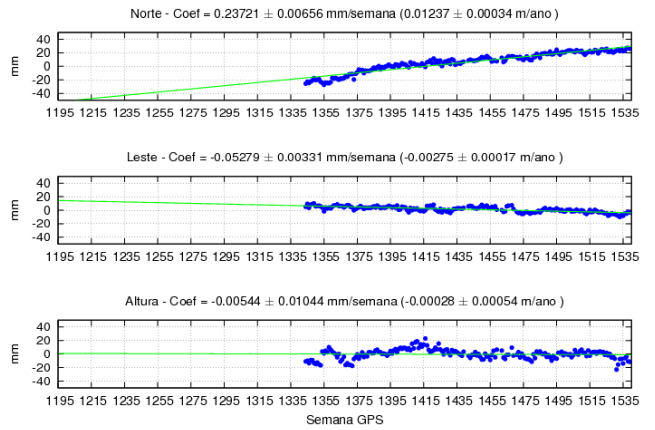
BOMJ - Velocidade Planimétrica 0.01402 ± 0.00011 m/ano



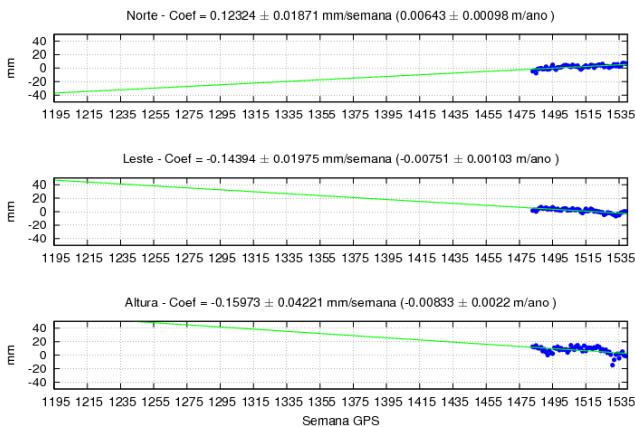
BRAZ - Velocidade Planimétrica $0.01356 \pm 8e-05$ m/ano



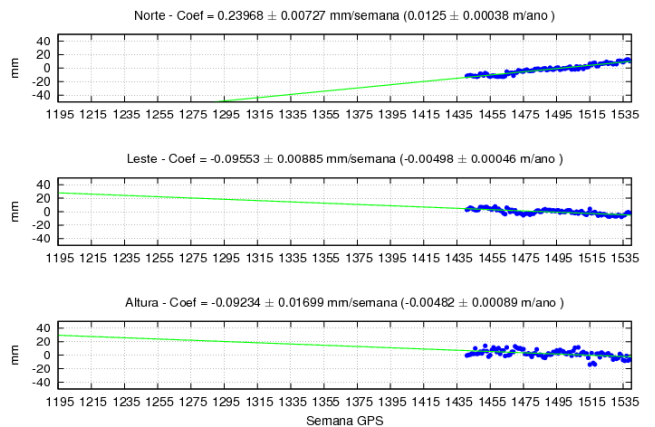
BRFT - Velocidade Planimétrica 0.01267 ± 0.00038 m/ano



CEEU - Velocidade Planimétrica 0.00988 ± 0.00142 m/ano



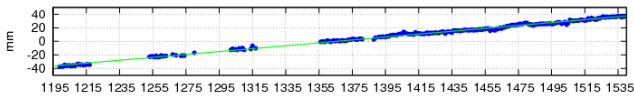
CEFE - Velocidade Planimétrica $0.01345 \pm 6e-04$ m/ano



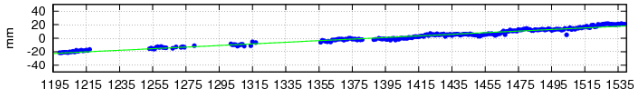


CFAG - Velocidade Planimetrica $0.01275 \pm 1e-04$ m/ano

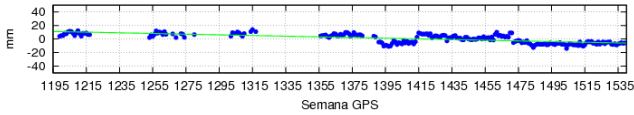
Norte - Coef = 0.21411 ± 0.00106 mm/semana ($0.01116 \pm 6e-05$ m/ano)



Leste - Coef = 0.11821 ± 0.00149 mm/semana ($0.00616 \pm 8e-05$ m/ano)

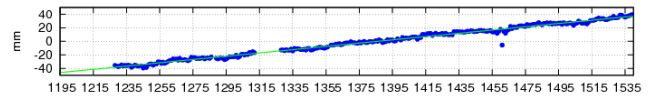


Altura - Coef = -0.04963 ± 0.00252 mm/semana (-0.00259 ± 0.00013 m/ano)

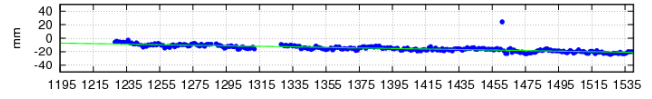


CHPI - Velocidade Planimetrica 0.01277 ± 0.00015 m/ano

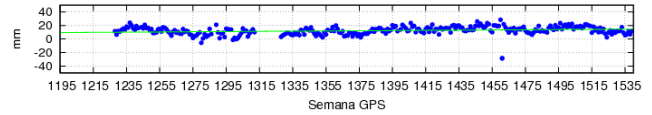
Norte - Coef = 0.24176 ± 0.00171 mm/semana ($0.01261 \pm 9e-05$ m/ano)



Leste - Coef = -0.03957 ± 0.00222 mm/semana (-0.00206 ± 0.00012 m/ano)

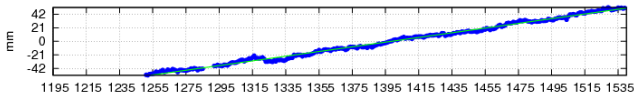


Altura - Coef = 0.01499 ± 0.00387 mm/semana ($0.00078 \pm 2e-04$ m/ano)

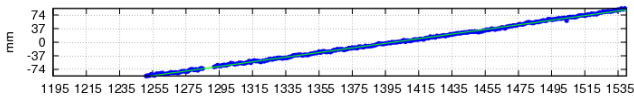


CONZ - Velocidade Planimetrica 0.03792 ± 0.00012 m/ano

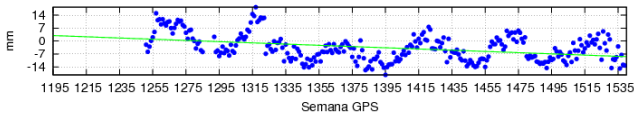
Norte - Coef = 0.36272 ± 0.0018 mm/semana ($0.01891 \pm 9e-05$ m/ano)



Leste - Coef = 0.63041 ± 0.00152 mm/semana ($0.03287 \pm 8e-05$ m/ano)

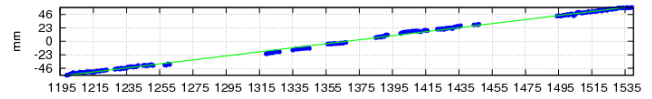


Altura - Coef = -0.03302 ± 0.00502 mm/semana (-0.00172 ± 0.00026 m/ano)

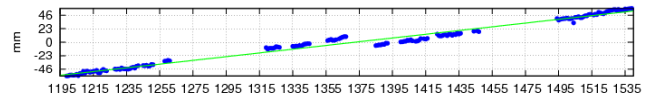


COPO - Velocidade Planimetrica 0.02441 ± 0.00012 m/ano

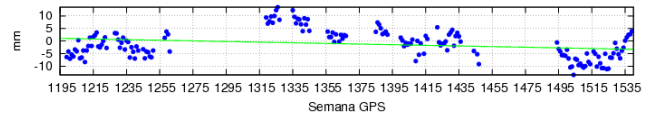
Norte - Coef = 0.34431 ± 0.00086 mm/semana ($0.01795 \pm 4e-05$ m/ano)



Leste - Coef = 0.31726 ± 0.00215 mm/semana (0.01654 ± 0.00011 m/ano)

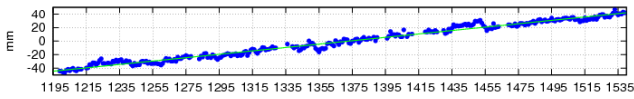


Altura - Coef = -0.01261 ± 0.00332 mm/semana (-0.00066 ± 0.00017 m/ano)

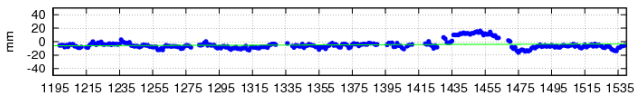


CRAT - Velocidade Planimetrica 0.01309 ± 0.00019 m/ano

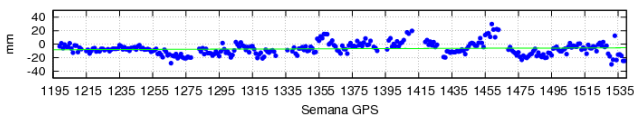
Norte - Coef = 0.25081 ± 0.00189 mm/semana ($0.01308 \pm 1e-04$ m/ano)



Leste - Coef = 0.00835 ± 0.00311 mm/semana (0.00044 ± 0.00016 m/ano)

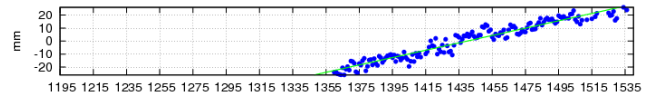


Altura - Coef = 0.00824 ± 0.00494 mm/semana (0.00043 ± 0.00026 m/ano)

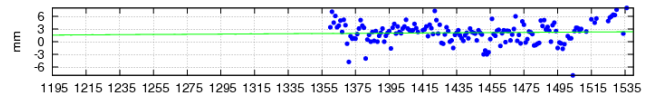


CRCS - Velocidade Planimetrica 0.01474 ± 0.00039 m/ano

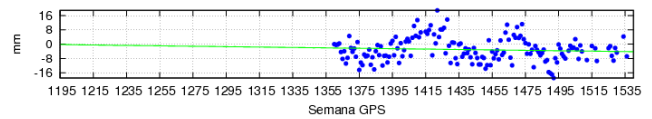
Norte - Coef = 0.28267 ± 0.00594 mm/semana (0.01474 ± 0.00031 m/ano)



Leste - Coef = 0.00226 ± 0.00467 mm/semana (0.00012 ± 0.00024 m/ano)

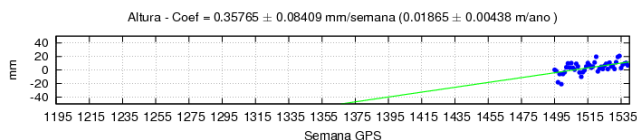
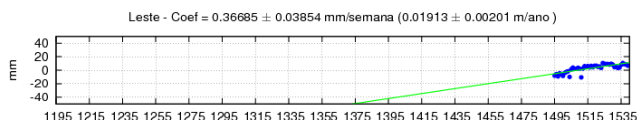
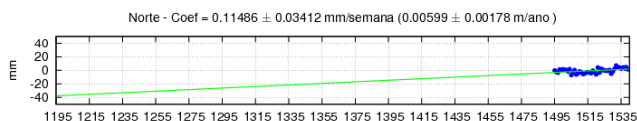


Altura - Coef = -0.01149 ± 0.00908 mm/semana ($-6e-04 \pm 0.00047$ m/ano)

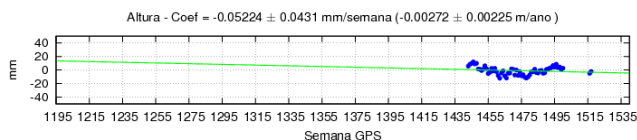
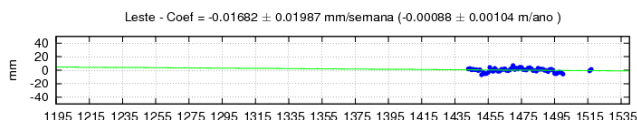
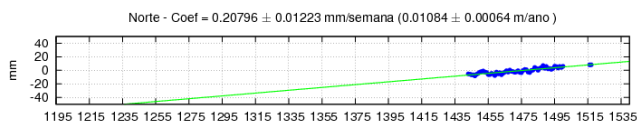




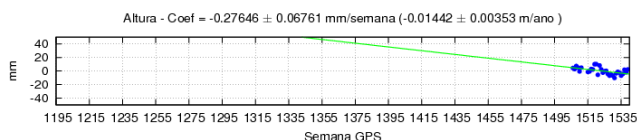
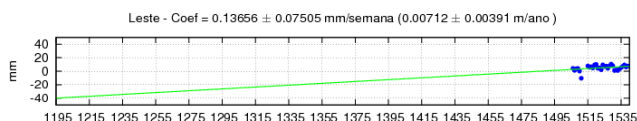
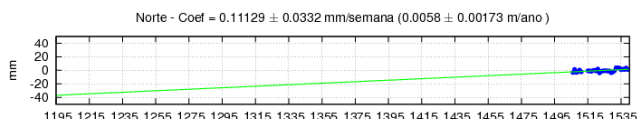
CRO1 - Velocidade Planimetrica 0.02004 ± 0.00268 m/ano



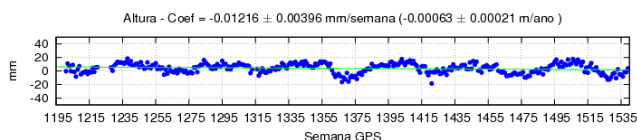
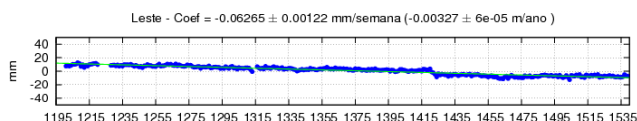
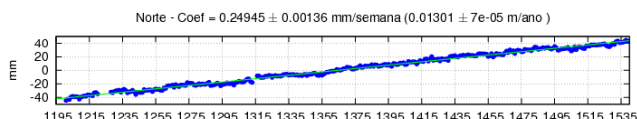
CRUZ - Velocidade Planimetrica 0.01088 ± 0.00122 m/ano



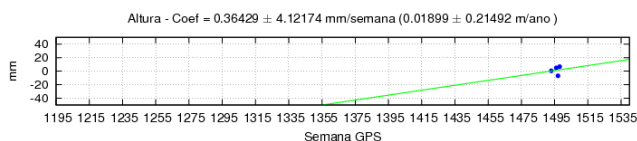
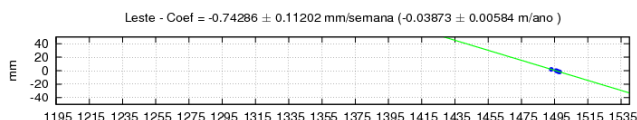
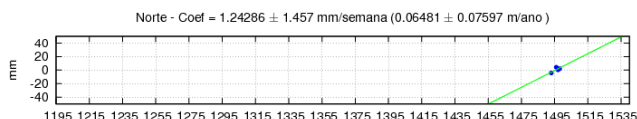
CUEC - Velocidade Planimetrica 0.00919 ± 0.00428 m/ano



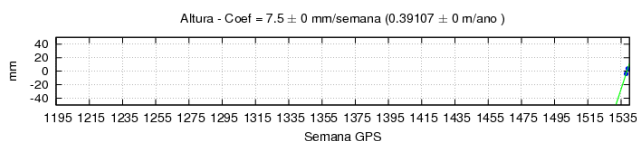
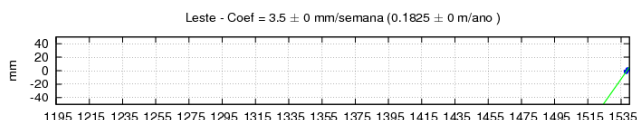
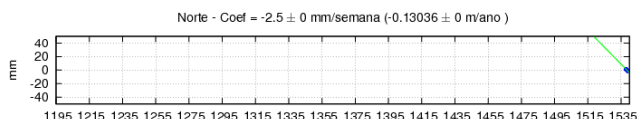
CUIB - Velocidade Planimetrica $0.01341 \pm 1e-04$ m/ano



CUM3 - Velocidade Planimetrica 0.0755 ± 0.0762 m/ano



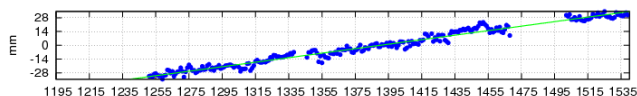
ESMR - Velocidade Planimetrica 0.22427 ± 0 m/ano



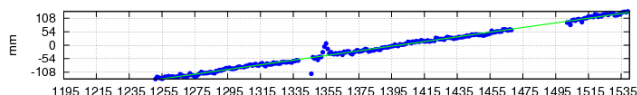


GLPS - Velocidade Planimetrica 0.0502 ± 0.00025 m/ano

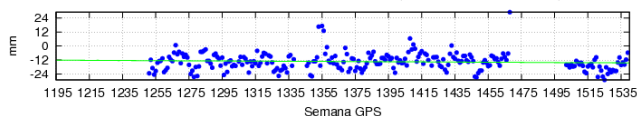
Norte - Coef = 0.22815 ± 0.00227 mm/semana (0.0119 ± 0.00012 m/ano)



Leste - Coef = 0.93524 ± 0.00413 mm/semana (0.04677 ± 0.00022 m/ano)

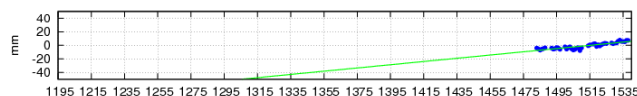


Altura - Coef = -0.00675 ± 0.00532 mm/semana (-0.00035 ± 0.00028 m/ano)

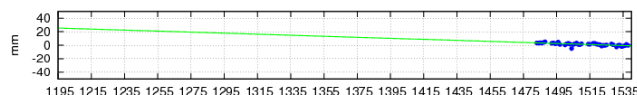


GOJA - Velocidade Planimetrica 0.01306 ± 0.00106 m/ano

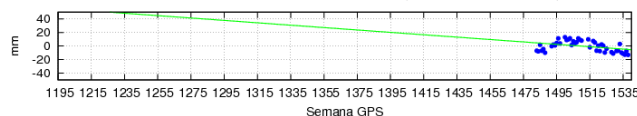
Norte - Coef = 0.23864 ± 0.01736 mm/semana (0.01244 ± 0.00091 m/ano)



Leste - Coef = -0.07611 ± 0.01072 mm/semana (-0.00397 ± 0.00056 m/ano)

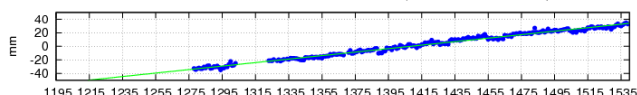


Altura - Coef = -0.17643 ± 0.07349 mm/semana (-0.0092 ± 0.00383 m/ano)

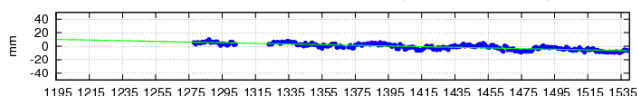


GVAL - Velocidade Planimetrica 0.01368 ± 0.00014 m/ano

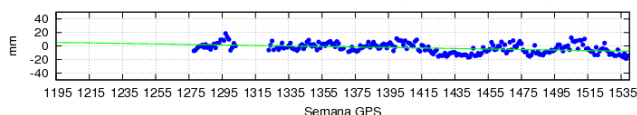
Norte - Coef = 0.25782 ± 0.00189 mm/semana ($0.01344 \pm 1e-04$ m/ano)



Leste - Coef = -0.0487 ± 0.00184 mm/semana ($-0.00254 \pm 1e-04$ m/ano)

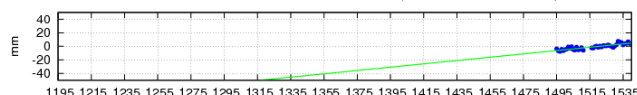


Altura - Coef = -0.03763 ± 0.0057 mm/semana ($-0.00196 \pm 3e-04$ m/ano)

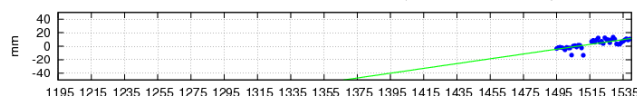


GYEC - Velocidade Planimetrica 0.02249 ± 0.00241 m/ano

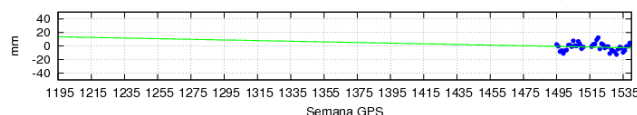
Norte - Coef = 0.24531 ± 0.02325 mm/semana (0.01279 ± 0.00121 m/ano)



Leste - Coef = 0.35479 ± 0.03985 mm/semana (0.0185 ± 0.00208 m/ano)

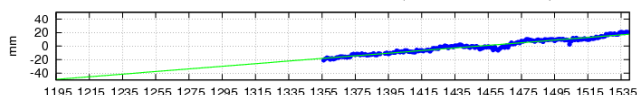


Altura - Coef = -0.04747 ± 0.06243 mm/semana (-0.00248 ± 0.00326 m/ano)

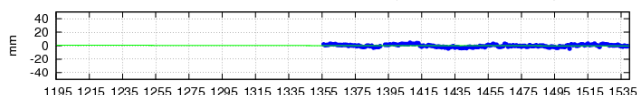


IGM1 - Velocidade Planimetrica 0.0101 ± 0.00019 m/ano

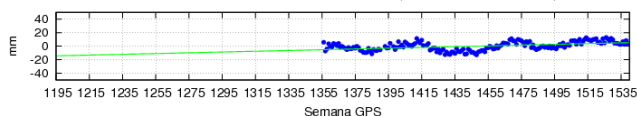
Norte - Coef = 0.19372 ± 0.00281 mm/semana (0.0101 ± 0.00015 m/ano)



Leste - Coef = -0.00288 ± 0.0023 mm/semana (-0.00015 ± 0.00012 m/ano)

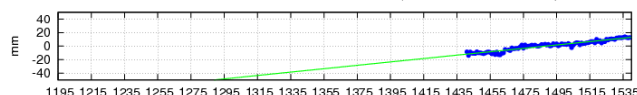


Altura - Coef = 0.05669 ± 0.00668 mm/semana (0.00296 ± 0.00035 m/ano)

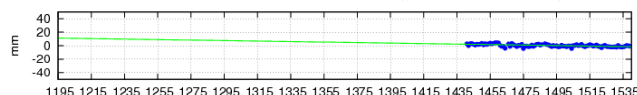


IMBT - Velocidade Planimetrica 0.01322 ± 0.00045 m/ano

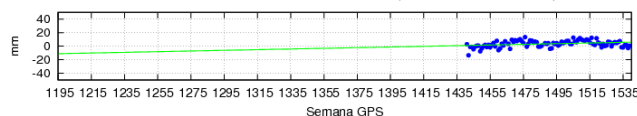
Norte - Coef = 0.25085 ± 0.00697 mm/semana (0.01308 ± 0.00036 m/ano)



Leste - Coef = -0.03695 ± 0.00503 mm/semana (-0.00193 ± 0.00026 m/ano)

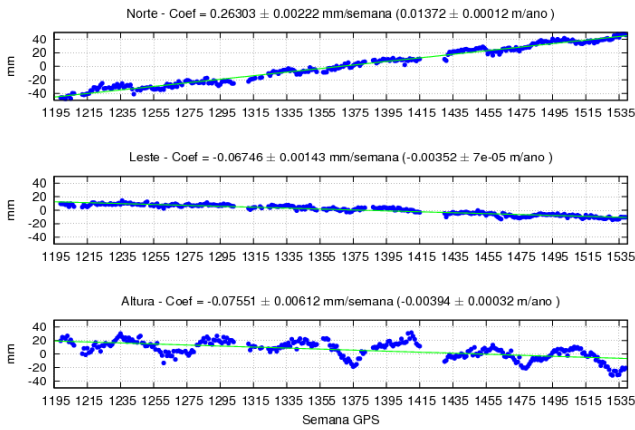


Altura - Coef = 0.0494 ± 0.01697 mm/semana (0.00258 ± 0.00088 m/ano)

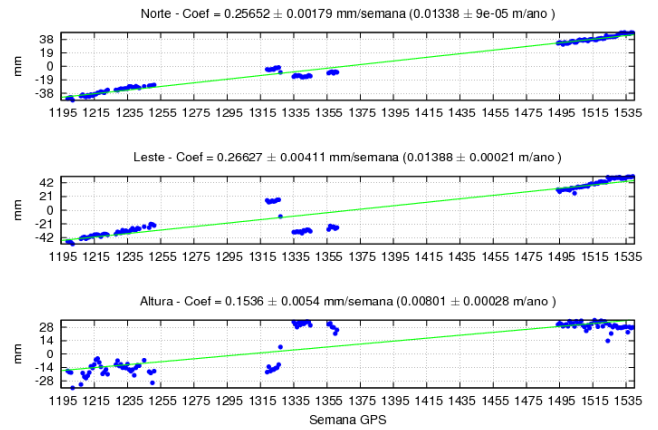




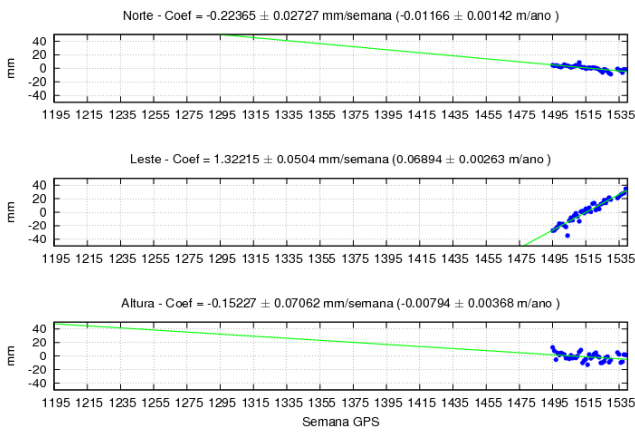
IMPZ - Velocidade Planimetrica 0.01416 ± 0.00014 m/ano



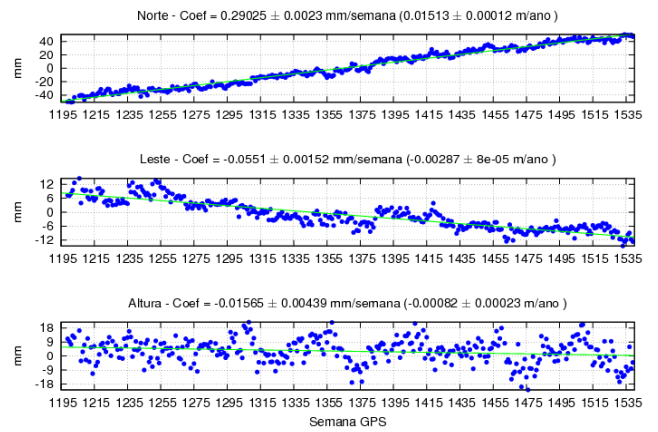
IQQE - Velocidade Planimetrica 0.01928 ± 0.00023 m/ano



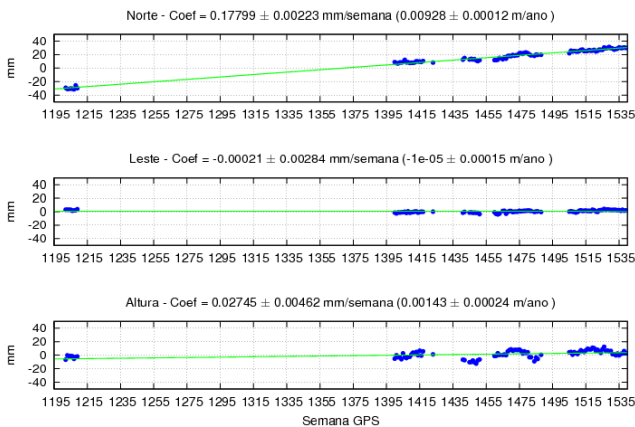
ISPA - Velocidade Planimetrica 0.06992 ± 0.00299 m/ano



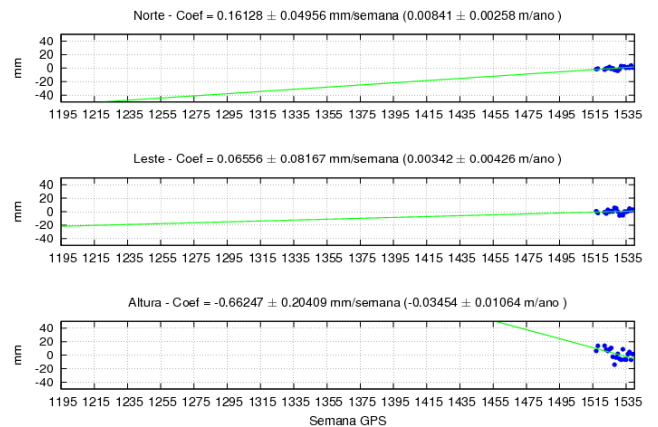
KOUR - Velocidade Planimetrica 0.0154 ± 0.00014 m/ano



LHCL - Velocidade Planimetrica 0.00928 ± 0.00019 m/ano



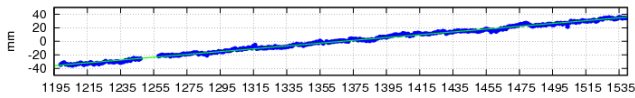
LJEC - Velocidade Planimetrica 0.00908 ± 0.00498 m/ano



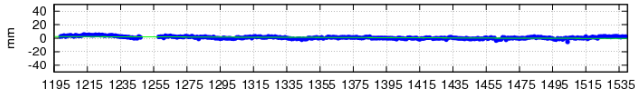


LPGS - Velocidade Planimetrica $0.01084 \pm 7e-05$ m/ano

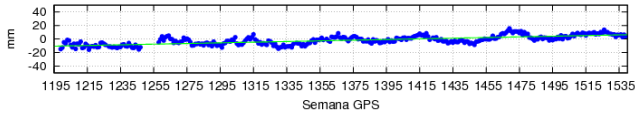
Norte - Coef = 0.20777 ± 0.00089 mm/semana ($0.01083 \pm 5e-05$ m/ano)



Leste - Coef = -0.00847 ± 0.001 mm/semana ($-0.00044 \pm 5e-05$ m/ano)

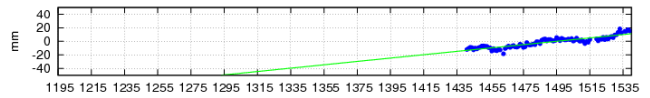


Altura - Coef = 0.04891 ± 0.00232 mm/semana (0.00255 ± 0.00012 m/ano)

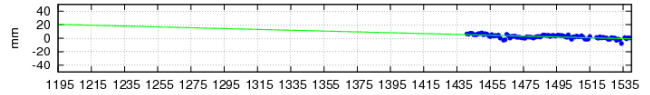


MABA - Velocidade Planimetrica 0.01333 ± 0.00081 m/ano

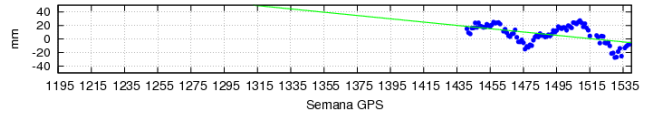
Norte - Coef = 0.24803 ± 0.01345 mm/semana ($0.01293 \pm 7e-04$ m/ano)



Leste - Coef = -0.06184 ± 0.00769 mm/semana ($-0.00322 \pm 4e-04$ m/ano)

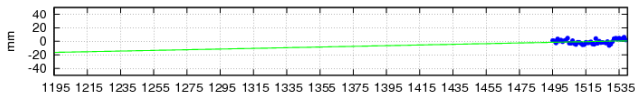


Altura - Coef = -0.24352 ± 0.03998 mm/semana (-0.0127 ± 0.00208 m/ano)

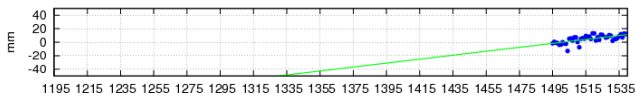


MANA - Velocidade Planimetrica 0.01542 ± 0.00299 m/ano

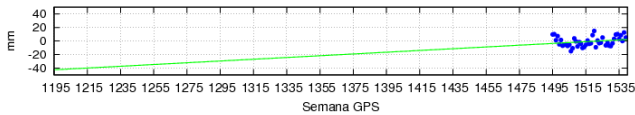
Norte - Coef = 0.04967 ± 0.03807 mm/semana (0.00259 ± 0.00199 m/ano)



Leste - Coef = 0.29152 ± 0.04292 mm/semana (0.0152 ± 0.00224 m/ano)

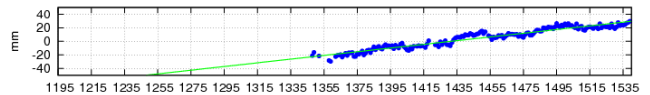


Altura - Coef = 0.12964 ± 0.09028 mm/semana (0.00676 ± 0.00471 m/ano)

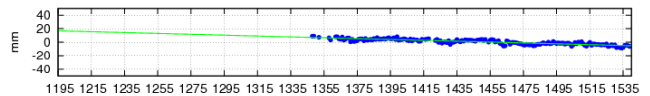


MAPA - Velocidade Planimetrica 0.01461 ± 0.00034 m/ano

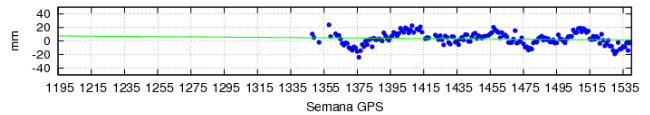
Norte - Coef = 0.27273 ± 0.00586 mm/semana (0.01422 ± 0.00031 m/ano)



Leste - Coef = -0.06403 ± 0.0027 mm/semana (-0.00334 ± 0.00014 m/ano)

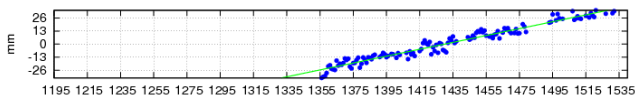


Altura - Coef = -0.01673 ± 0.01467 mm/semana (-0.00087 ± 0.00076 m/ano)

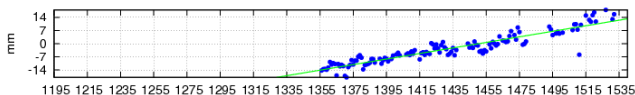


MARA - Velocidade Planimetrica 0.01939 ± 0.00047 m/ano

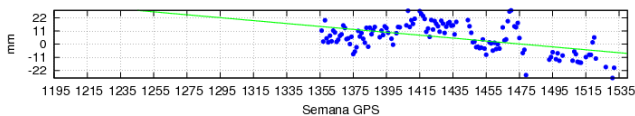
Norte - Coef = 0.34122 ± 0.00659 mm/semana (0.01779 ± 0.00034 m/ano)



Leste - Coef = 0.14759 ± 0.00608 mm/semana (0.0077 ± 0.00032 m/ano)

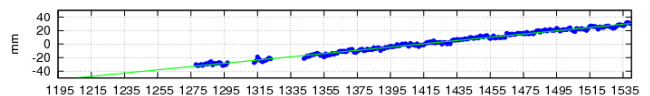


Altura - Coef = -0.1215 ± 0.01856 mm/semana (-0.00634 ± 0.00097 m/ano)

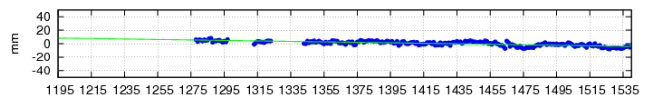


MCLA - Velocidade Planimetrica 0.01271 ± 0.00014 m/ano

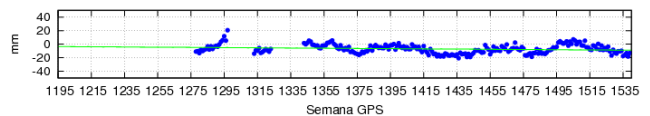
Norte - Coef = 0.24105 ± 0.00186 mm/semana ($0.01257 \pm 1e-04$ m/ano)



Leste - Coef = -0.0356 ± 0.00197 mm/semana ($-0.00186 \pm 1e-04$ m/ano)

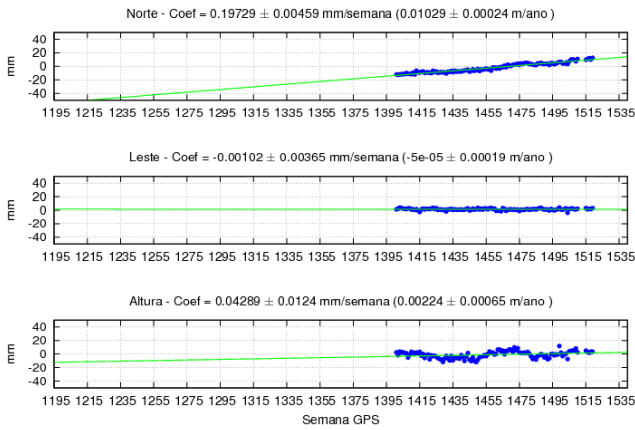


Altura - Coef = -0.01575 ± 0.00642 mm/semana (-0.00082 ± 0.00033 m/ano)

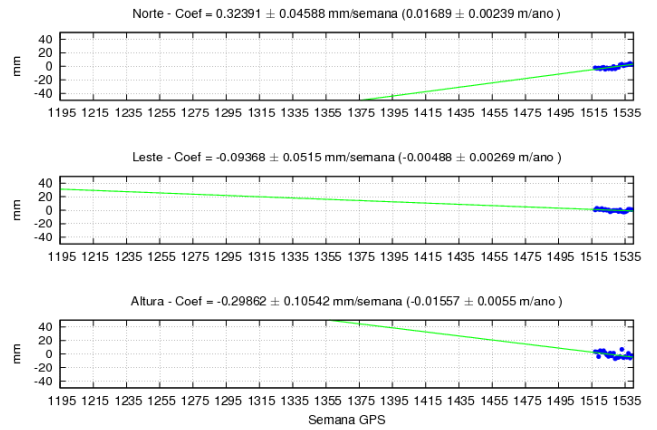




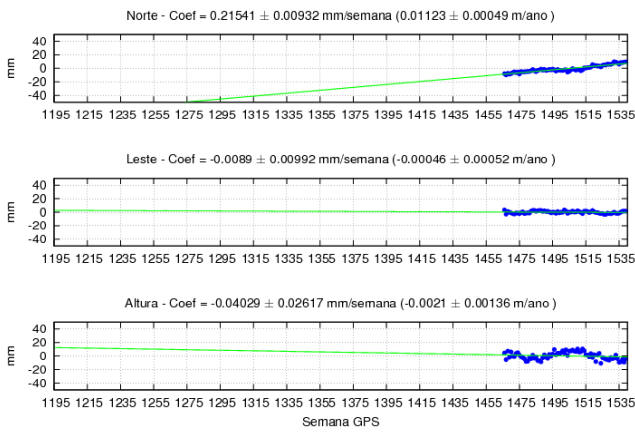
MECO - Velocidade Planimetrica 0.01029 ± 0.00031 m/ano



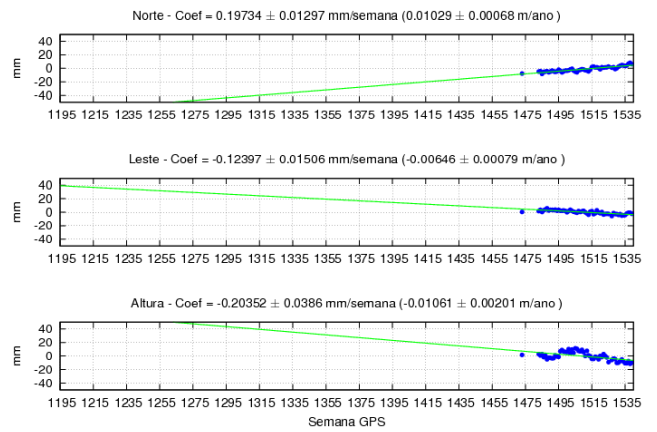
MGBH - Velocidade Planimetrica 0.01758 ± 0.0036 m/ano



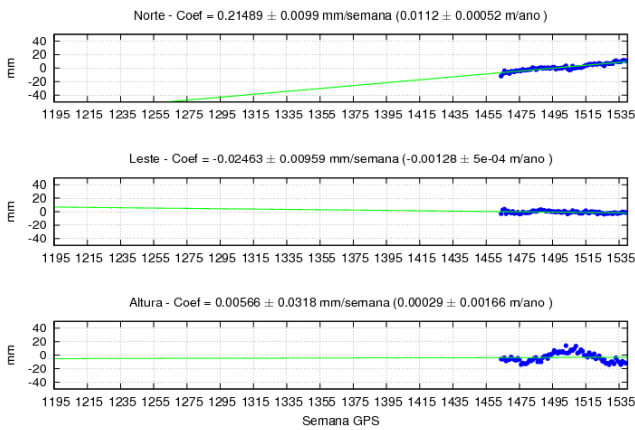
MGIN - Velocidade Planimetrica 0.01124 ± 0.00071 m/ano



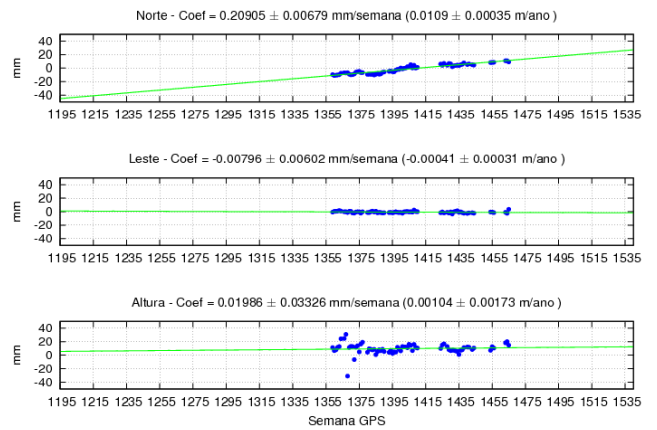
MGMC - Velocidade Planimetrica 0.01215 ± 0.00104 m/ano



MGUB - Velocidade Planimetrica 0.01128 ± 0.00072 m/ano

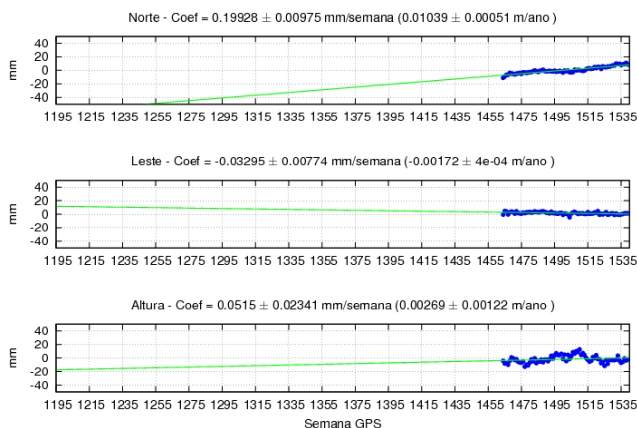


MPLA - Velocidade Planimetrica 0.01091 ± 0.00047 m/ano

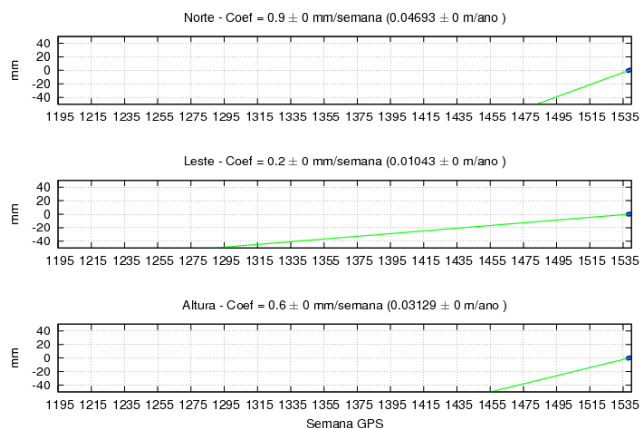




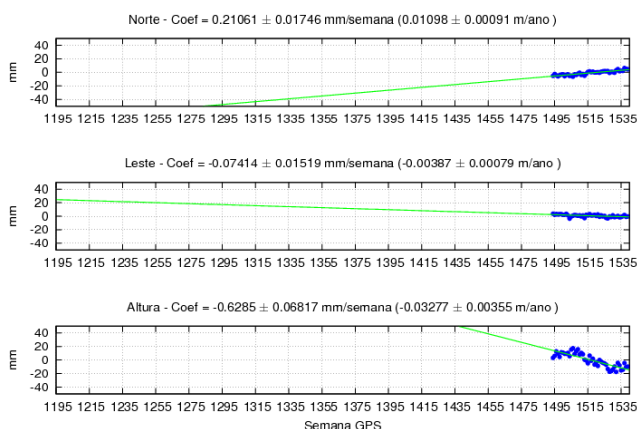
MSCG - Velocidade Planimetrica 0.01053 ± 0.00065 m/ano



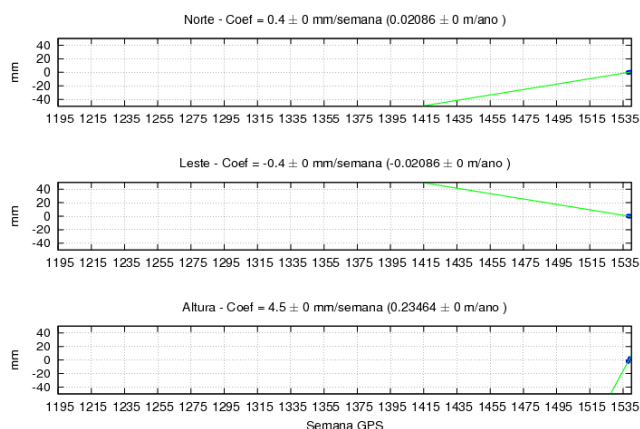
MSDO - Velocidade Planimetrica 0.04807 ± 0 m/ano



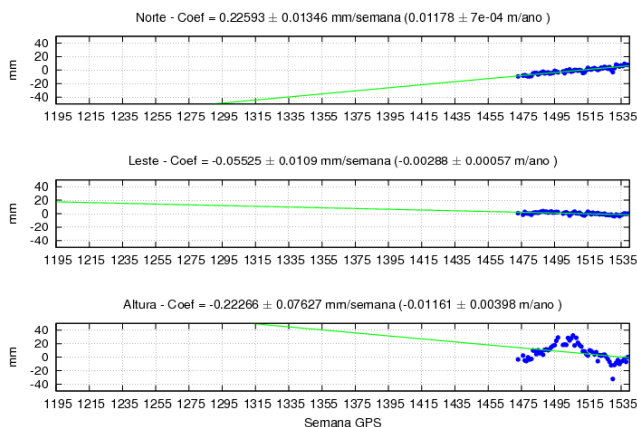
MTBA - Velocidade Planimetrica 0.01164 ± 0.00121 m/ano



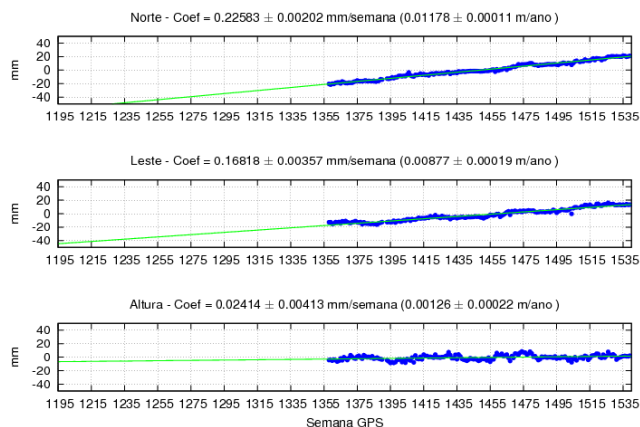
MTCO - Velocidade Planimetrica 0.0295 ± 0 m/ano



MTSF - Velocidade Planimetrica $0.01213 \pm 9e-04$ m/ano



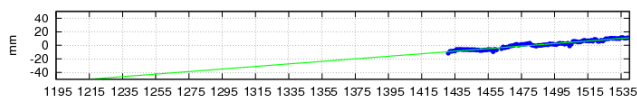
MZAC - Velocidade Planimetrica 0.01468 ± 0.00021 m/ano



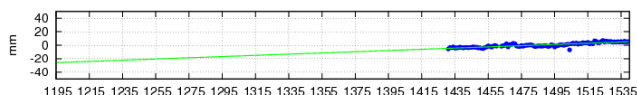


MZAE - Velocidade Planimetrica $0.01086 \pm 3e-04$ m/ano

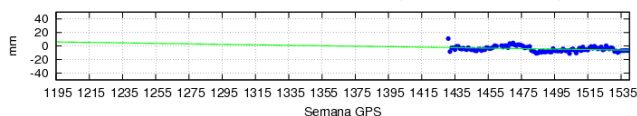
Norte - Coef = 0.18805 ± 0.00416 mm/sem (0.00981 ± 0.00022 m/ano)



Leste - Coef = 0.08963 ± 0.00393 mm/sem (0.00467 ± 0.00021 m/ano)

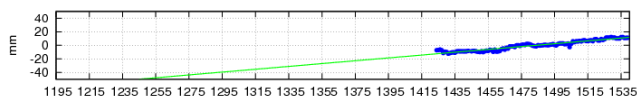


Altura - Coef = -0.03522 ± 0.01032 mm/sem (-0.00184 ± 0.00054 m/ano)

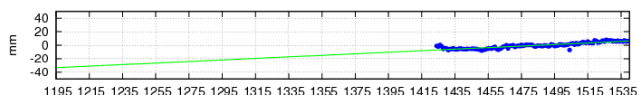


MZAS - Velocidade Planimetrica 0.01244 ± 0.00047 m/ano

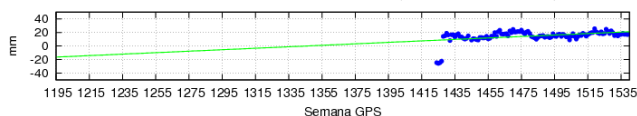
Norte - Coef = 0.20949 ± 0.00584 mm/sem ($0.01092 \pm 3e-04$ m/ano)



Leste - Coef = 0.11413 ± 0.0068 mm/sem (0.00595 ± 0.00035 m/ano)

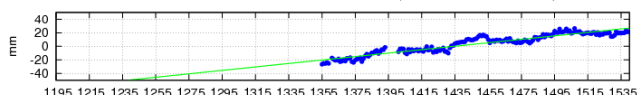


Altura - Coef = 0.10854 ± 0.03023 mm/sem (0.00566 ± 0.00158 m/ano)

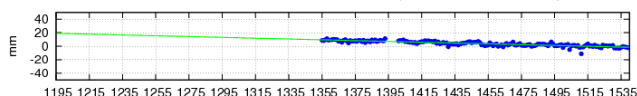


NAUS - Velocidade Planimetrica 0.01365 ± 0.00037 m/ano

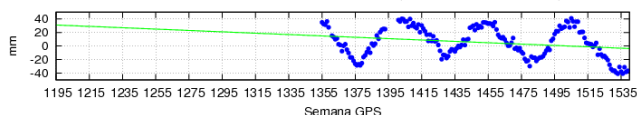
Norte - Coef = 0.25486 ± 0.00656 mm/sem (0.01329 ± 0.00034 m/ano)



Leste - Coef = -0.05985 ± 0.00257 mm/sem (-0.00312 ± 0.00013 m/ano)

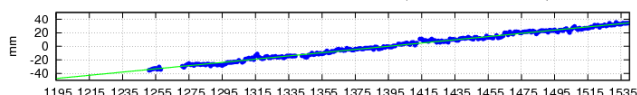


Altura - Coef = -0.10062 ± 0.03281 mm/sem (-0.00525 ± 0.00171 m/ano)

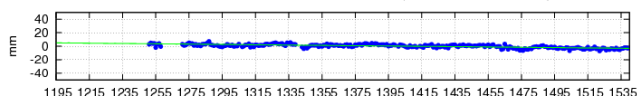


NEIA - Velocidade Planimetrica $0.01248 \pm 1e-04$ m/ano

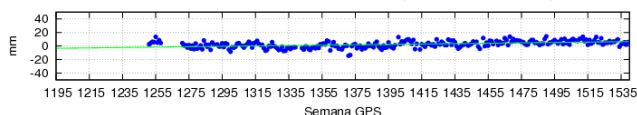
Norte - Coef = 0.23822 ± 0.00131 mm/sem ($0.01242 \pm 7e-05$ m/ano)



Leste - Coef = -0.02353 ± 0.0014 mm/sem ($-0.00123 \pm 7e-05$ m/ano)

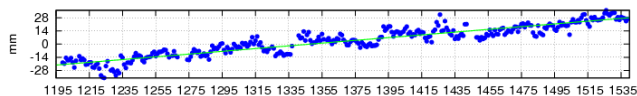


Altura - Coef = 0.02871 ± 0.00325 mm/sem (0.0015 ± 0.00017 m/ano)

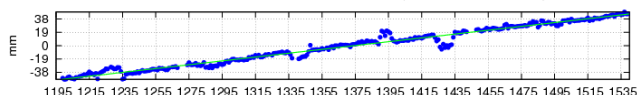


OH2 - Velocidade Planimetrica $0.01618 \pm 2e-04$ m/ano

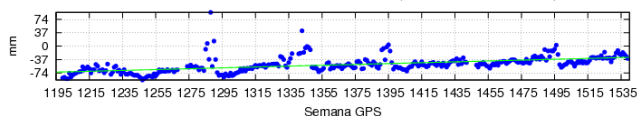
Norte - Coef = 0.14596 ± 0.00324 mm/sem (0.00761 ± 0.00017 m/ano)



Leste - Coef = 0.27392 ± 0.0019 mm/sem ($0.01428 \pm 1e-04$ m/ano)

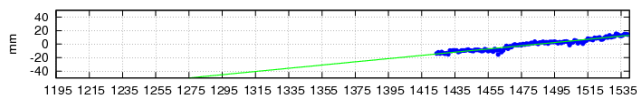


Altura - Coef = 0.11832 ± 0.00826 mm/sem (0.00617 ± 0.00043 m/ano)

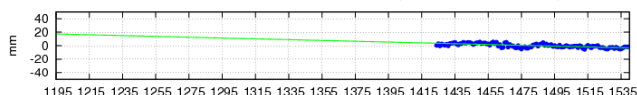


ONRJ - Velocidade Planimetrica 0.0128 ± 0.00039 m/ano

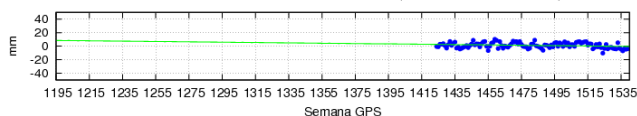
Norte - Coef = 0.23803 ± 0.00559 mm/sem (0.01241 ± 0.00029 m/ano)



Leste - Coef = -0.06005 ± 0.00496 mm/sem (-0.00313 ± 0.00026 m/ano)

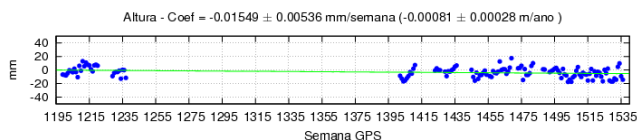
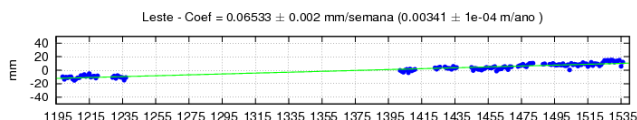
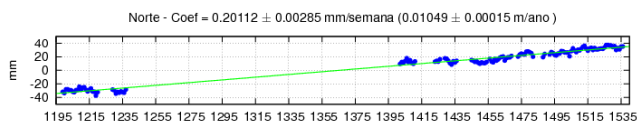


Altura - Coef = -0.02541 ± 0.00998 mm/sem (-0.00132 ± 0.00052 m/ano)

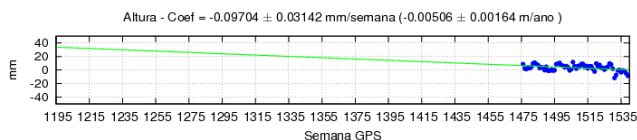
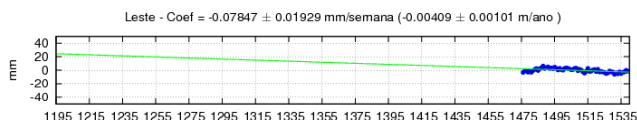
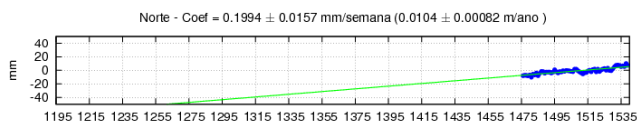




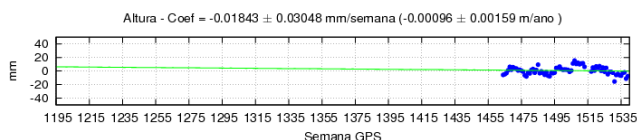
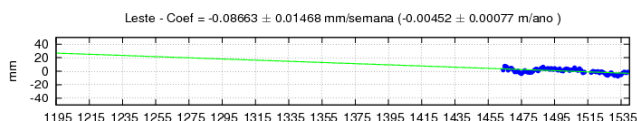
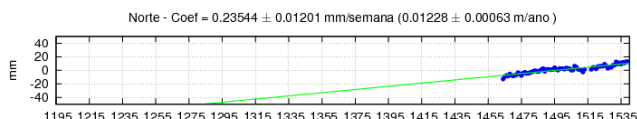
PARC - Velocidade Planimetrica 0.01103 ± 0.00018 m/ano



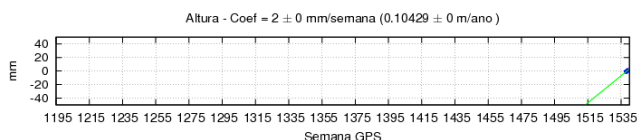
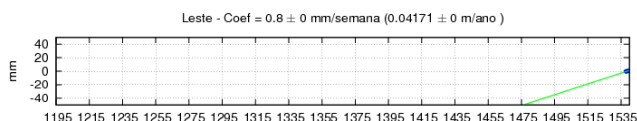
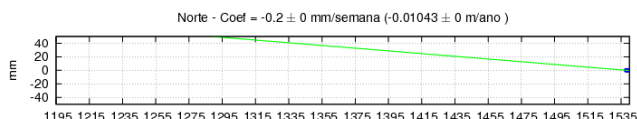
PBCG - Velocidade Planimetrica 0.01117 ± 0.0013 m/ano



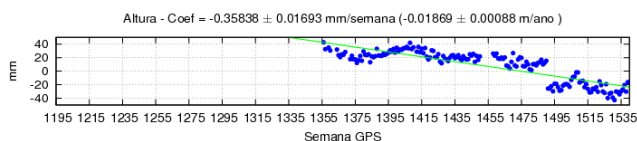
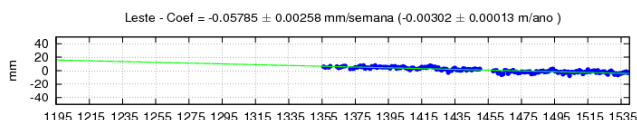
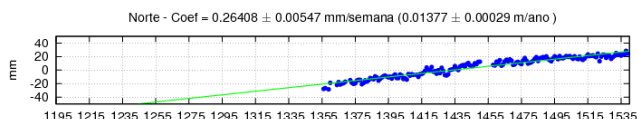
PEPE - Velocidade Planimetrica 0.01308 ± 0.00099 m/ano



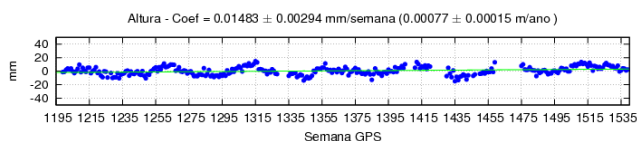
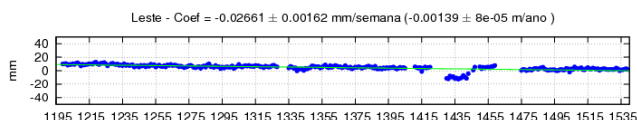
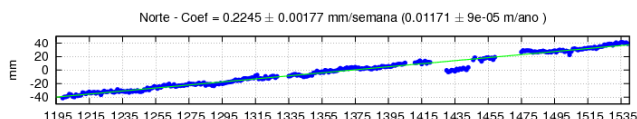
PISR - Velocidade Planimetrica 0.043 ± 0 m/ano



PMB1 - Velocidade Planimetrica 0.0141 ± 0.00032 m/ano



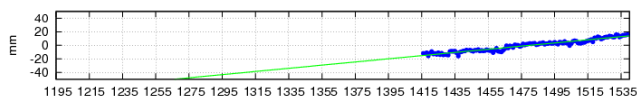
POAL - Velocidade Planimetrica 0.01179 ± 0.00013 m/ano



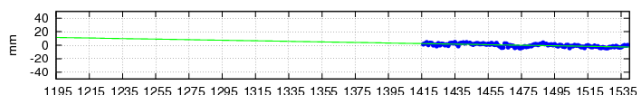


POLI - Velocidade Planimetrica 0.01238 ± 0.00036 m/ano

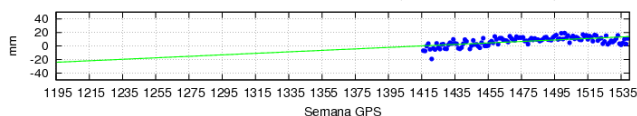
Norte - Coef = 0.23396 ± 0.00564 mm/semana (0.0122 ± 0.00029 m/ano)



Leste - Coef = -0.04078 ± 0.00392 mm/semana ($-0.00213 \pm 2e-04$ m/ano)

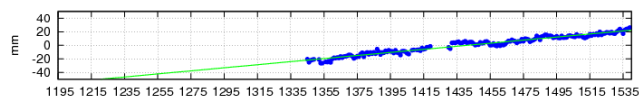


Altura - Coef = 0.10974 ± 0.01574 mm/semana (0.00572 ± 0.00082 m/ano)

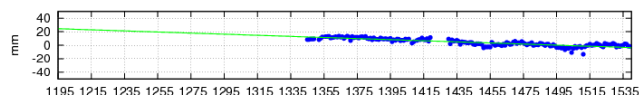


POVE - Velocidade Planimetrica 0.01256 ± 0.00027 m/ano

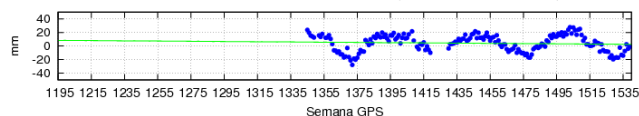
Norte - Coef = 0.22677 ± 0.00348 mm/semana (0.01182 ± 0.00018 m/ano)



Leste - Coef = -0.08099 ± 0.00384 mm/semana ($-0.00422 \pm 2e-04$ m/ano)

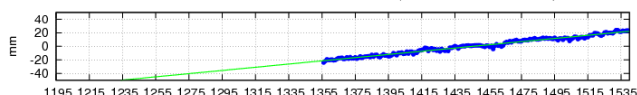


Altura - Coef = -0.0171 ± 0.01809 mm/semana (-0.00089 ± 0.00094 m/ano)

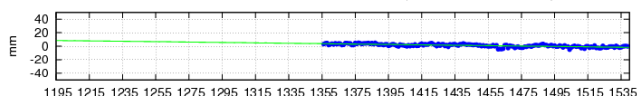


PPTE - Velocidade Planimetrica 0.01241 ± 0.00016 m/ano

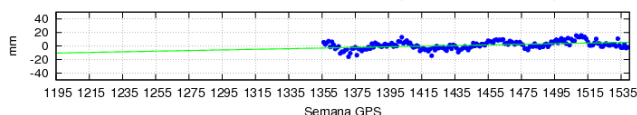
Norte - Coef = 0.23618 ± 0.00239 mm/semana (0.01232 ± 0.00012 m/ano)



Leste - Coef = -0.02937 ± 0.00187 mm/semana ($-0.00153 \pm 1e-04$ m/ano)

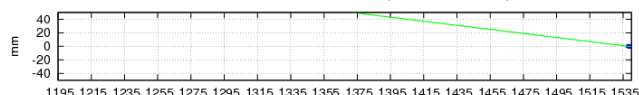


Altura - Coef = 0.04628 ± 0.00754 mm/semana (0.00241 ± 0.00039 m/ano)

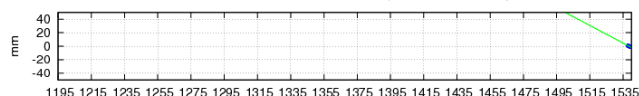


PRGU - Velocidade Planimetrica 0.06957 ± 0 m/ano

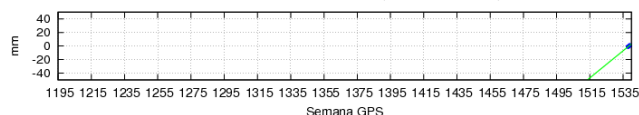
Norte - Coef = -0.3 ± 0 mm/semana (-0.01564 ± 0 m/ano)



Leste - Coef = -1.3 ± 0 mm/semana (-0.06779 ± 0 m/ano)

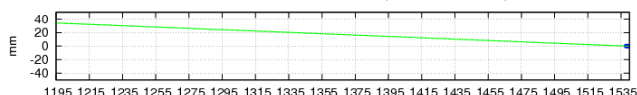


Altura - Coef = 2 ± 0 mm/semana (0.10429 ± 0 m/ano)

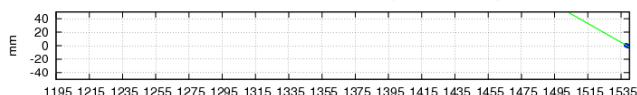


PRMA - Velocidade Planimetrica 0.07319 ± 0 m/ano

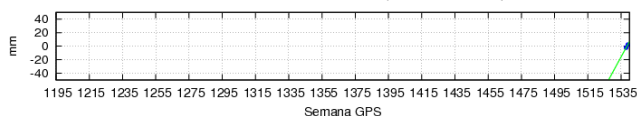
Norte - Coef = -0.1 ± 0 mm/semana (-0.00521 ± 0 m/ano)



Leste - Coef = -1.4 ± 0 mm/semana (-0.073 ± 0 m/ano)

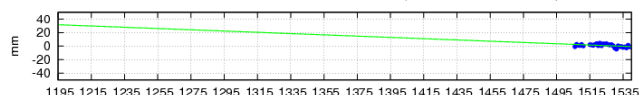


Altura - Coef = 4.5 ± 0 mm/semana (0.23464 ± 0 m/ano)

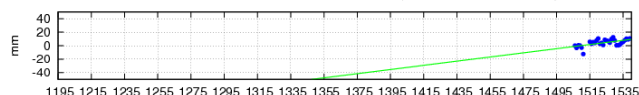


PTEC - Velocidade Planimetrica 0.01682 ± 0.00444 m/ano

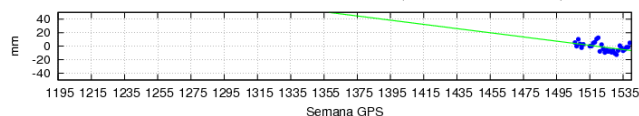
Norte - Coef = -0.09393 ± 0.03608 mm/semana (-0.0049 ± 0.00188 m/ano)



Leste - Coef = 0.30858 ± 0.07719 mm/semana (0.01609 ± 0.00403 m/ano)



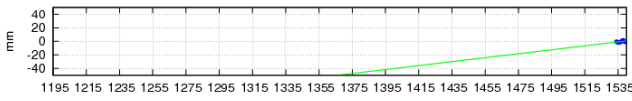
Altura - Coef = -0.31048 ± 0.09644 mm/semana (-0.01619 ± 0.00503 m/ano)



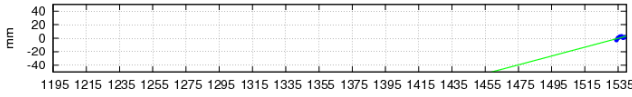


QUI1 - Velocidade Planimétrica 0.03735 ± 0.0355 m/ano

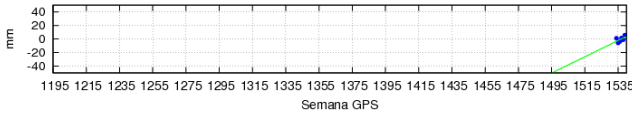
Norte - Coef = 0.29143 ± 0.34312 mm/semana (0.0152 ± 0.01789 m/ano)



Leste - Coef = 0.65429 ± 0.58797 mm/semana (0.03412 ± 0.03066 m/ano)

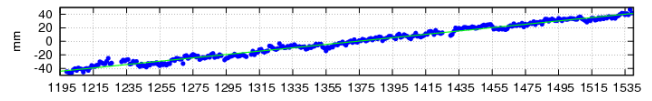


Altura - Coef = 1.20286 ± 1.18665 mm/semana (0.06272 ± 0.06188 m/ano)

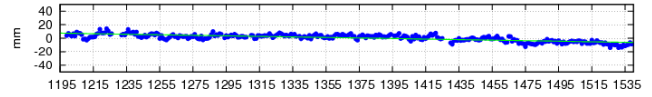


RECF - Velocidade Planimétrica 0.01309 ± 0.00015 m/ano

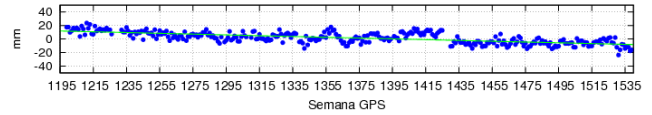
Norte - Coef = 0.2479 ± 0.00197 mm/semana ($0.01293 \pm 1e-04$ m/ano)



Leste - Coef = -0.03985 ± 0.00201 mm/semana ($-0.00208 \pm 1e-04$ m/ano)

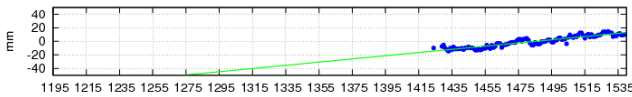


Altura - Coef = -0.05818 ± 0.00303 mm/semana (-0.00303 ± 0.00016 m/ano)

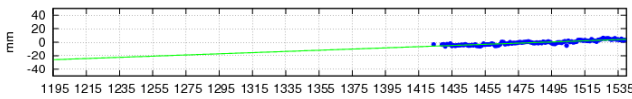


RIQ2 - Velocidade Planimétrica $0.01312 \pm 5e-04$ m/ano

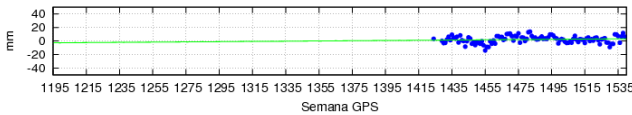
Norte - Coef = 0.23584 ± 0.00854 mm/semana (0.0123 ± 0.00045 m/ano)



Leste - Coef = 0.08749 ± 0.00423 mm/semana (0.00456 ± 0.00022 m/ano)

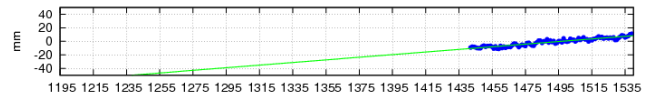


Altura - Coef = 0.01706 ± 0.01585 mm/semana (0.00089 ± 0.00083 m/ano)

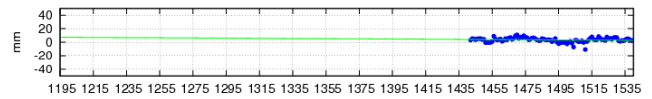


RIQB - Velocidade Planimétrica 0.01011 ± 0.00062 m/ano

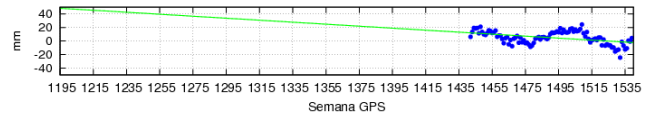
Norte - Coef = 0.19344 ± 0.00664 mm/semana (0.01009 ± 0.00035 m/ano)



Leste - Coef = -0.01303 ± 0.00989 mm/semana (-0.00068 ± 0.00052 m/ano)

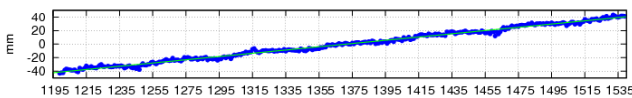


Altura - Coef = -0.14699 ± 0.02882 mm/semana (-0.00766 ± 0.0015 m/ano)

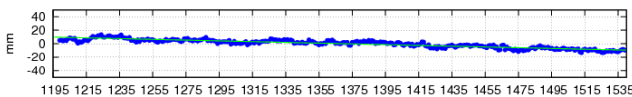


RIOD - Velocidade Planimétrica $0.01286 \pm 1e-04$ m/ano

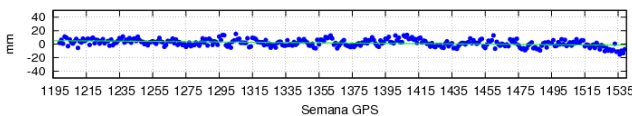
Norte - Coef = 0.24022 ± 0.00125 mm/semana ($0.01253 \pm 7e-05$ m/ano)



Leste - Coef = -0.0561 ± 0.00154 mm/semana ($-0.00293 \pm 8e-05$ m/ano)

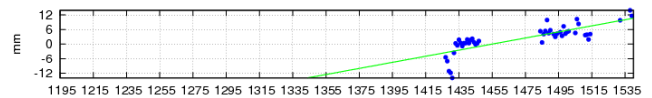


Altura - Coef = -0.02009 ± 0.00279 mm/semana (-0.00105 ± 0.00015 m/ano)

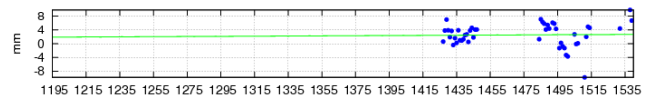


RIOP - Velocidade Planimétrica 0.00653 ± 0.0012 m/ano

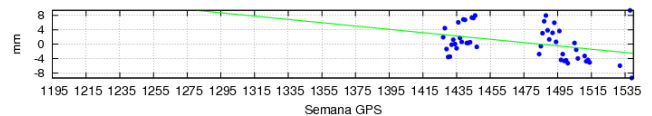
Norte - Coef = 0.12513 ± 0.01635 mm/semana (0.00652 ± 0.00085 m/ano)



Leste - Coef = 0.00234 ± 0.01606 mm/semana (0.00012 ± 0.00084 m/ano)



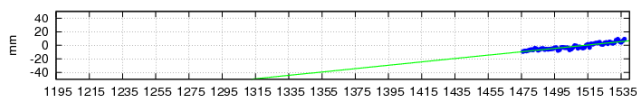
Altura - Coef = -0.04574 ± 0.02149 mm/semana (-0.00238 ± 0.00112 m/ano)



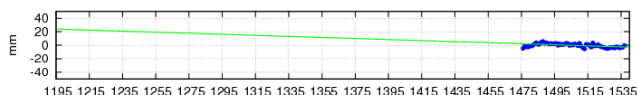


RJCG - Velocidade Planimetrica 0.0136 ± 0.0012 m/ano

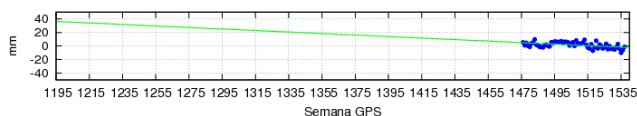
Norte - Coef = 0.24904 ± 0.0128 mm/semana (0.01299 ± 0.00067 m/ano)



Leste - Coef = -0.07756 ± 0.01916 mm/semana (-0.00404 ± 0.001 m/ano)

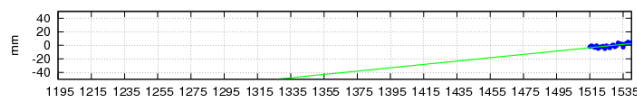


Altura - Coef = -0.11178 ± 0.02596 mm/semana (-0.00583 ± 0.00135 m/ano)

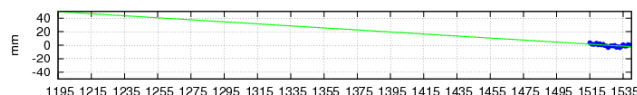


RNMO - Velocidade Planimetrica 0.01505 ± 0.00404 m/ano

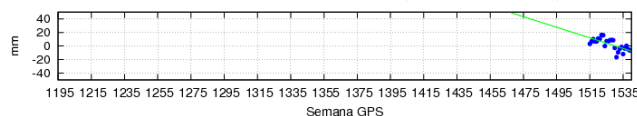
Norte - Coef = 0.24662 ± 0.05773 mm/semana (0.01286 ± 0.00301 m/ano)



Leste - Coef = -0.14985 ± 0.05158 mm/semana (-0.00781 ± 0.00269 m/ano)

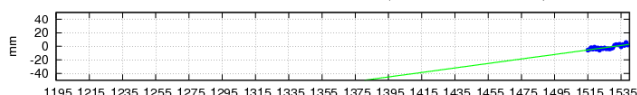


Altura - Coef = -0.78254 ± 0.15093 mm/semana (-0.0408 ± 0.00787 m/ano)

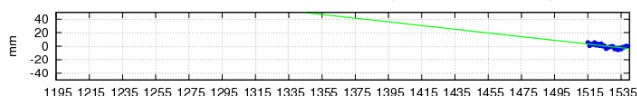


RNNA - Velocidade Planimetrica 0.02242 ± 0.00439 m/ano

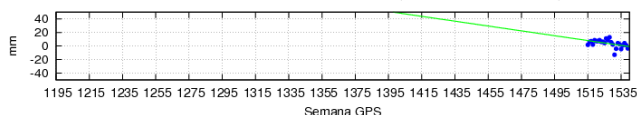
Norte - Coef = 0.33231 ± 0.05 mm/semana (0.01733 ± 0.00261 m/ano)



Leste - Coef = -0.273 ± 0.06786 mm/semana (-0.01424 ± 0.00354 m/ano)

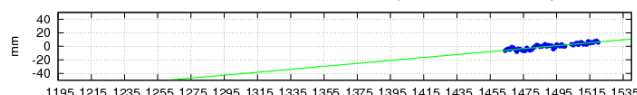


Altura - Coef = -0.35754 ± 0.11478 mm/semana (-0.01864 ± 0.00598 m/ano)

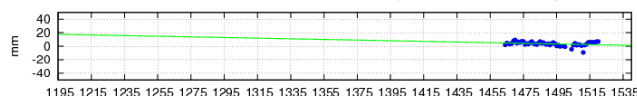


ROGM - Velocidade Planimetrica 0.01161 ± 0.00164 m/ano

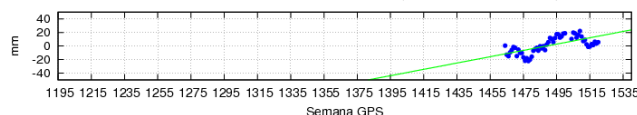
Norte - Coef = 0.21762 ± 0.0145 mm/semana (0.01135 ± 0.00076 m/ano)



Leste - Coef = -0.0474 ± 0.02794 mm/semana (-0.00247 ± 0.00146 m/ano)

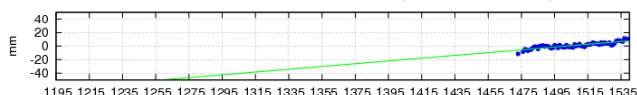


Altura - Coef = 0.46625 ± 0.07639 mm/semana (0.02431 ± 0.00398 m/ano)

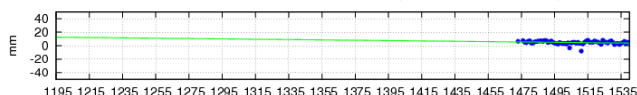


RQJI - Velocidade Planimetrica 0.01078 ± 0.00102 m/ano

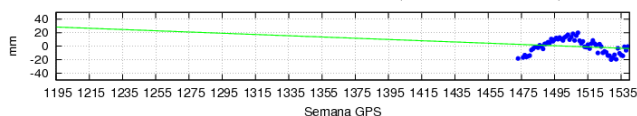
Norte - Coef = 0.20513 ± 0.01615 mm/semana (0.0107 ± 0.00084 m/ano)



Leste - Coef = -0.02562 ± 0.01109 mm/semana (-0.00134 ± 0.00058 m/ano)

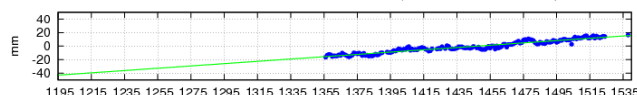


Altura - Coef = -0.09222 ± 0.07892 mm/semana (-0.00481 ± 0.00412 m/ano)

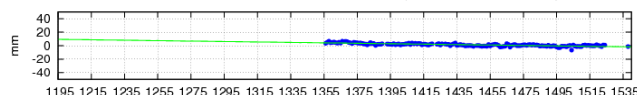


RWSN - Velocidade Planimetrica 0.00905 ± 0.00021 m/ano

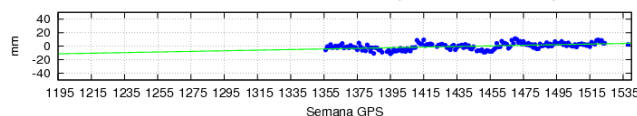
Norte - Coef = 0.17048 ± 0.00341 mm/semana (0.00889 ± 0.00018 m/ano)



Leste - Coef = -0.03251 ± 0.00214 mm/semana (-0.0017 ± 0.00011 m/ano)



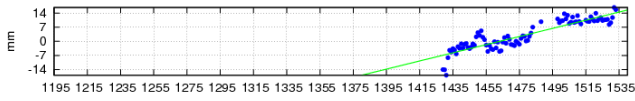
Altura - Coef = 0.04522 ± 0.0055 mm/semana (0.00236 ± 0.00029 m/ano)



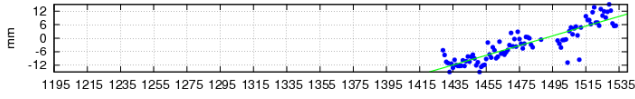


S061 - Velocidade Planimetrica 0.01546 ± 0.00091 m/ano

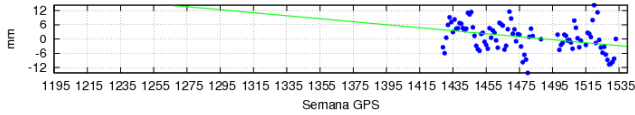
Norte - Coef = 0.20281 ± 0.01141 mm/semana ($0.01058 \pm 6e-04$ m/ano)



Leste - Coef = 0.21626 ± 0.01329 mm/semana (0.01128 ± 0.00069 m/ano)

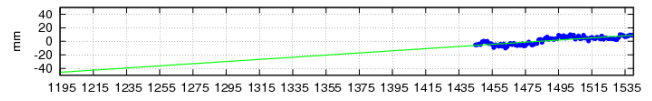


Altura - Coef = -0.06312 ± 0.01799 mm/semana (-0.00329 ± 0.00094 m/ano)

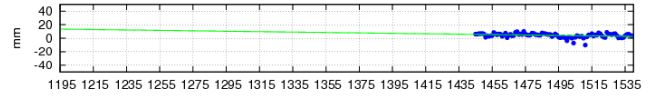


SAGA - Velocidade Planimetrica 0.00844 ± 0.00075 m/ano

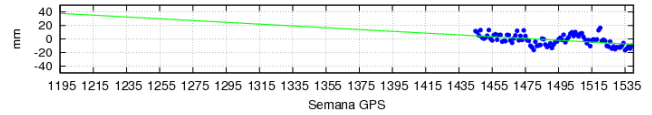
Norte - Coef = 0.15879 ± 0.01082 mm/semana (0.00828 ± 0.00056 m/ano)



Leste - Coef = -0.03107 ± 0.00943 mm/semana (-0.00162 ± 0.00049 m/ano)

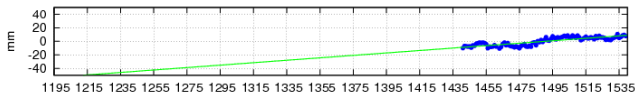


Altura - Coef = -0.13259 ± 0.02403 mm/semana (-0.00691 ± 0.00125 m/ano)

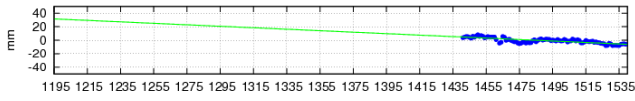


SALU - Velocidade Planimetrica 0.01097 ± 0.00063 m/ano

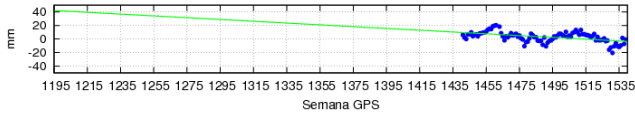
Norte - Coef = 0.17997 ± 0.00973 mm/semana (0.00938 ± 0.00051 m/ano)



Leste - Coef = -0.10892 ± 0.00707 mm/semana (-0.00568 ± 0.00037 m/ano)

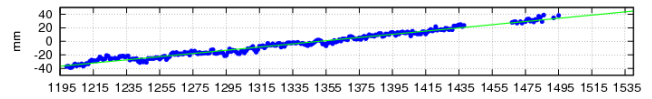


Altura - Coef = -0.13216 ± 0.02323 mm/semana (-0.00689 ± 0.00121 m/ano)

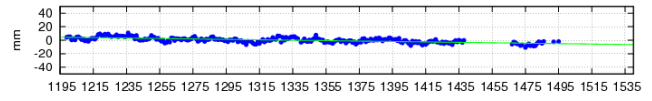


SALV - Velocidade Planimetrica 0.01241 ± 0.00018 m/ano

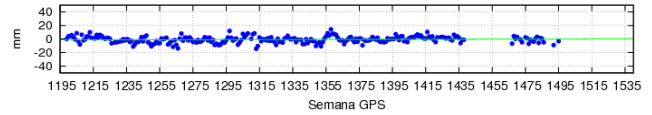
Norte - Coef = 0.23598 ± 0.00244 mm/semana (0.0123 ± 0.00013 m/ano)



Leste - Coef = -0.03152 ± 0.00234 mm/semana (-0.00164 ± 0.00012 m/ano)

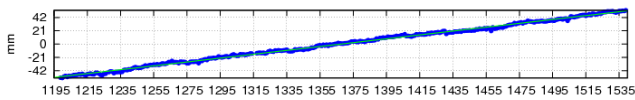


Altura - Coef = 0.00422 ± 0.00342 mm/semana (0.00022 ± 0.00018 m/ano)

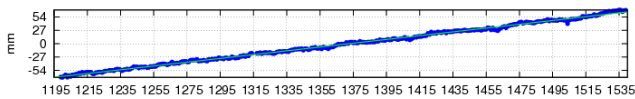


SANT - Velocidade Planimetrica $0.02546 \pm 9e-05$ m/ano

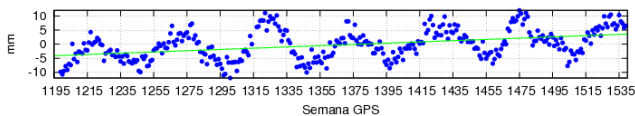
Norte - Coef = 0.30452 ± 0.00101 mm/semana ($0.01588 \pm 5e-05$ m/ano)



Leste - Coef = 0.38176 ± 0.00133 mm/semana ($0.01991 \pm 7e-05$ m/ano)

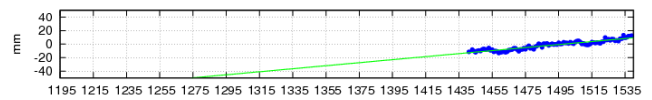


Altura - Coef = 0.02228 ± 0.00237 mm/semana (0.00116 ± 0.00012 m/ano)

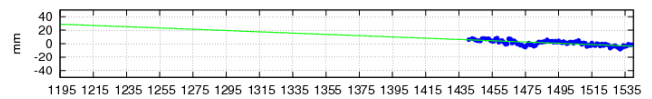


SAVO - Velocidade Planimetrica 0.01265 ± 0.00063 m/ano

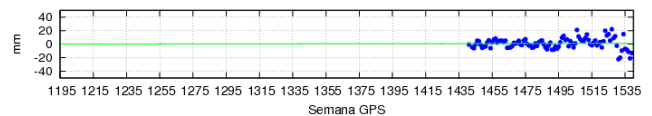
Norte - Coef = 0.22355 ± 0.00899 mm/semana (0.01166 ± 0.00047 m/ano)



Leste - Coef = -0.09448 ± 0.00821 mm/semana (-0.00493 ± 0.00043 m/ano)

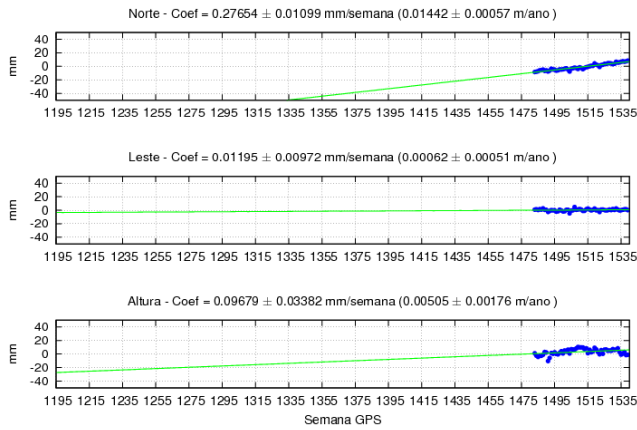


Altura - Coef = 0.00325 ± 0.03343 mm/semana (0.00017 ± 0.00174 m/ano)

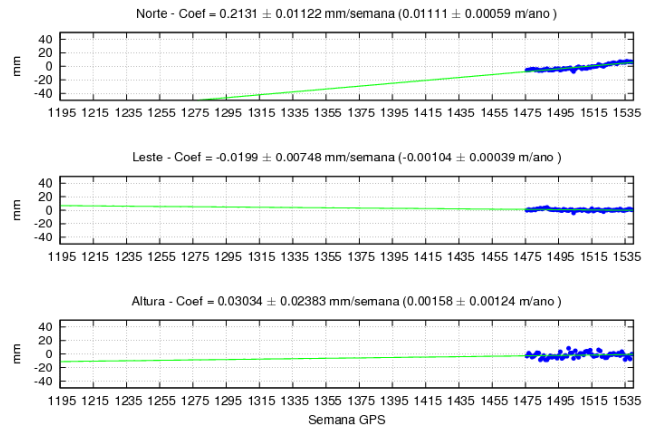




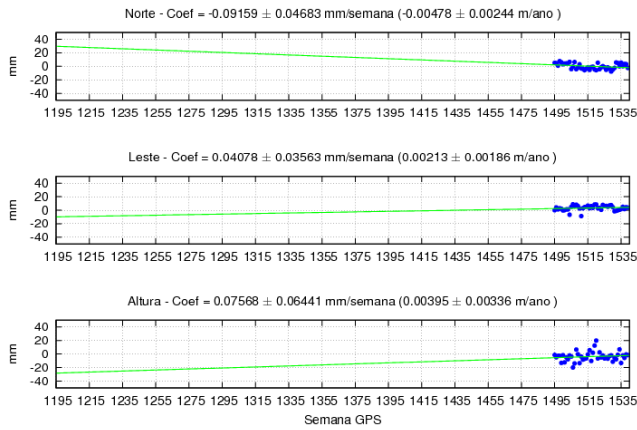
SCCH - Velocidade Planimetrica 0.01443 ± 0.00077 m/ano



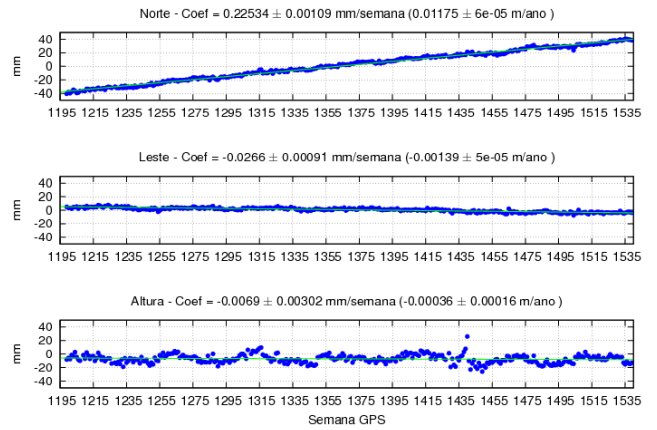
SCLA - Velocidade Planimetrica $0.01116 \pm 7e-04$ m/ano



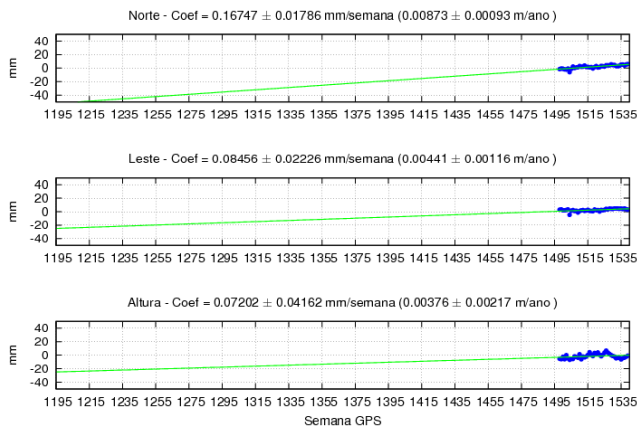
SCUB - Velocidade Planimetrica 0.00523 ± 0.00307 m/ano



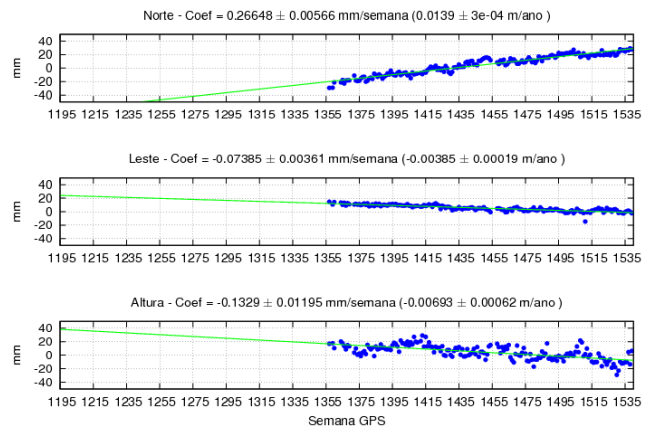
SMAR - Velocidade Planimetrica $0.01183 \pm 7e-05$ m/ano



SRLP - Velocidade Planimetrica 0.00978 ± 0.00149 m/ano



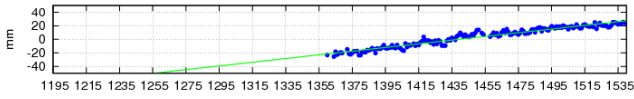
SRNW - Velocidade Planimetrica 0.01442 ± 0.00035 m/ano



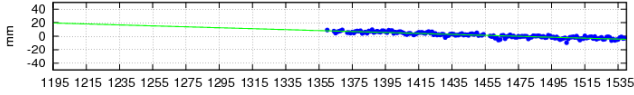


SRZN - Velocidade Planimetrica 0.01466 ± 0.00029 m/ano

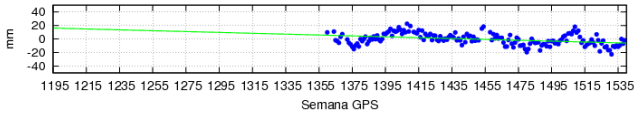
Norte - Coef = 0.27232 ± 0.00485 mm/semana (0.0142 ± 0.00025 m/ano)



Leste - Coef = -0.07006 ± 0.00278 mm/semana (-0.00365 ± 0.00014 m/ano)



Altura - Coef = -0.06415 ± 0.0127 mm/semana (-0.00334 ± 0.00066 m/ano)

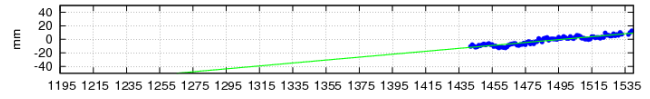


Semana GPS

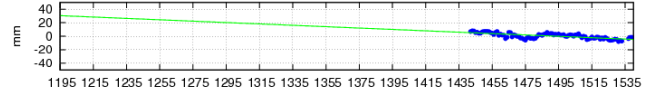


SSA1 - Velocidade Planimetrica 0.01245 ± 0.00067 m/ano

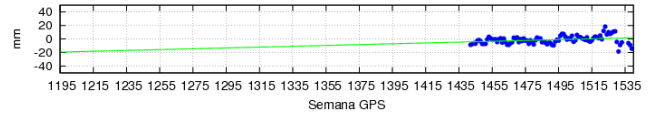
Norte - Coef = 0.21592 ± 0.00879 mm/semana (0.01126 ± 0.00046 m/ano)



Leste - Coef = -0.10195 ± 0.00931 mm/semana (-0.00532 ± 0.00049 m/ano)



Altura - Coef = 0.06139 ± 0.02565 mm/semana (0.0032 ± 0.00134 m/ano)

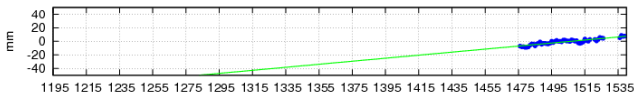


Semana GPS

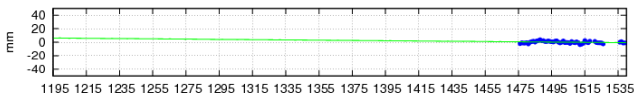


TOGU - Velocidade Planimetrica 0.01171 ± 0.00093 m/ano

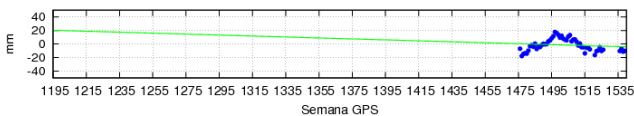
Norte - Coef = 0.22374 ± 0.01277 mm/semana (0.01167 ± 0.00067 m/ano)



Leste - Coef = -0.02003 ± 0.01245 mm/semana (-0.00104 ± 0.00065 m/ano)



Altura - Coef = -0.0708 ± 0.07167 mm/semana (-0.00369 ± 0.00374 m/ano)

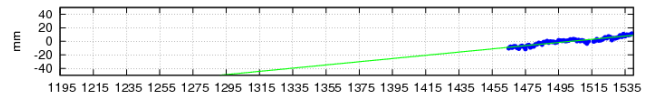


Semana GPS

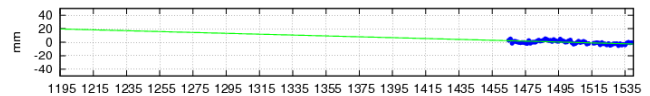


TOPL - Velocidade Planimetrica 0.01281 ± 0.00078 m/ano

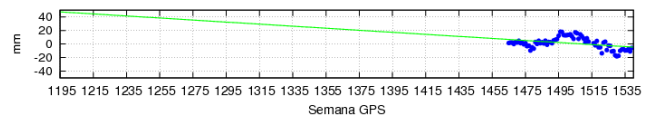
Norte - Coef = 0.23702 ± 0.01049 mm/semana (0.01236 ± 0.00055 m/ano)



Leste - Coef = -0.0643 ± 0.01072 mm/semana (-0.00335 ± 0.00056 m/ano)



Altura - Coef = -0.15081 ± 0.03504 mm/semana (-0.00786 ± 0.00183 m/ano)

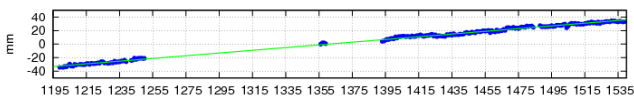


Semana GPS

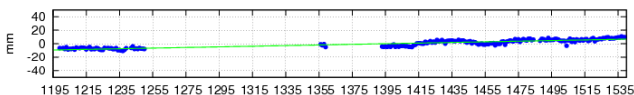


TUCU - Velocidade Planimetrica $0.01074 \pm 8e-05$ m/ano

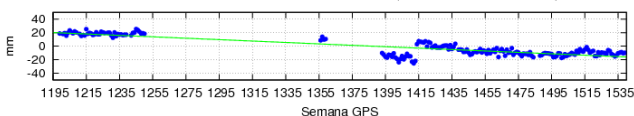
Norte - Coef = 0.20062 ± 0.00081 mm/semana ($0.01046 \pm 4e-05$ m/ano)



Leste - Coef = 0.04657 ± 0.00129 mm/semana ($0.00243 \pm 7e-05$ m/ano)



Altura - Coef = -0.10467 ± 0.00253 mm/semana (-0.00546 ± 0.00013 m/ano)

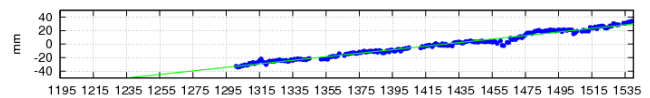


Semana GPS

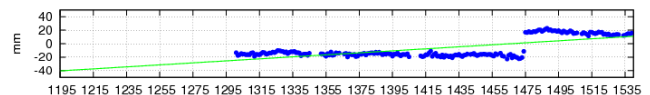


UBAT - Velocidade Planimetrica 0.01568 ± 0.00049 m/ano

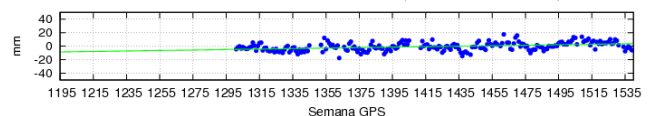
Norte - Coef = 0.26152 ± 0.0025 mm/semana (0.01364 ± 0.00013 m/ano)



Leste - Coef = 0.14862 ± 0.00913 mm/semana (0.00775 ± 0.00048 m/ano)



Altura - Coef = 0.03555 ± 0.00511 mm/semana (0.00185 ± 0.00027 m/ano)

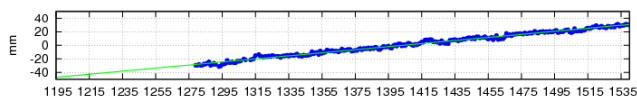


Semana GPS

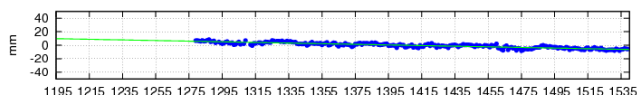


UBER - Velocidade Planimetrica 0.01205 ± 0.00011 m/ano

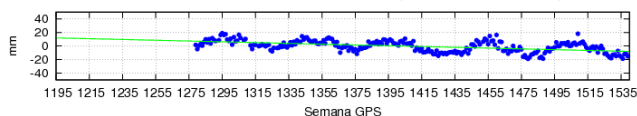
Norte - Coef = 0.22644 ± 0.00166 mm/semana ($0.01181 \pm 9e-05$ m/ano)



Leste - Coef = -0.04642 ± 0.00137 mm/semana ($-0.00242 \pm 7e-05$ m/ano)



Altura - Coef = -0.05782 ± 0.00599 mm/semana (-0.00302 ± 0.00031 m/ano)

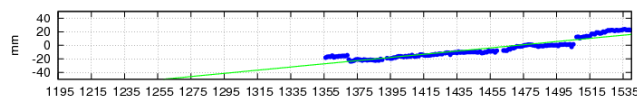


Semana GPS

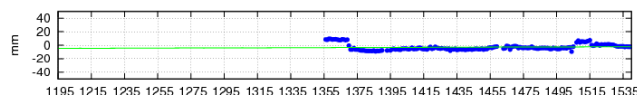


UCOR - Velocidade Planimetrica 0.01225 ± 0.00065 m/ano

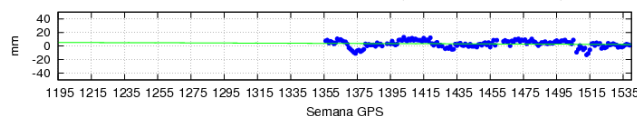
Norte - Coef = 0.2349 ± 0.00882 mm/semana (0.01225 ± 0.00046 m/ano)



Leste - Coef = 0.00708 ± 0.00888 mm/semana (0.00037 ± 0.00046 m/ano)



Altura - Coef = -0.00851 ± 0.00735 mm/semana (-0.00044 ± 0.00038 m/ano)

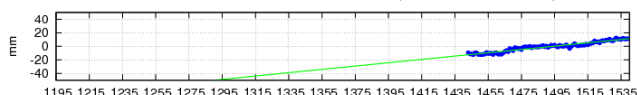


Semana GPS

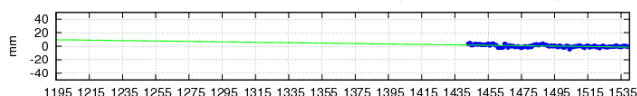


UFPR - Velocidade Planimetrica 0.01288 ± 0.00042 m/ano

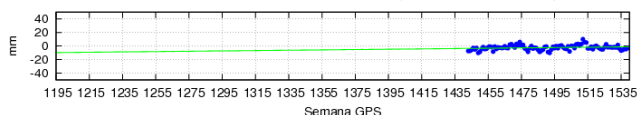
Norte - Coef = 0.24507 ± 0.00613 mm/semana (0.01278 ± 0.00032 m/ano)



Leste - Coef = -0.03142 ± 0.00513 mm/semana (-0.00164 ± 0.00027 m/ano)



Altura - Coef = 0.02474 ± 0.01113 mm/semana (0.00129 ± 0.00058 m/ano)

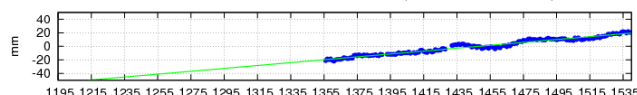


Semana GPS

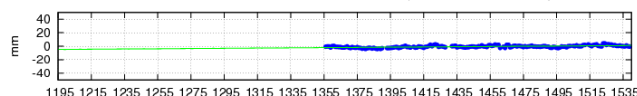


UNRO - Velocidade Planimetrica 0.01113 ± 0.00017 m/ano

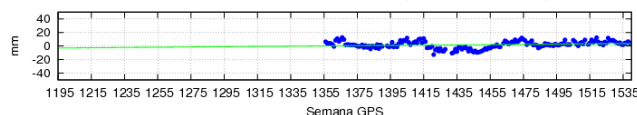
Norte - Coef = 0.21283 ± 0.00254 mm/semana (0.0111 ± 0.00013 m/ano)



Leste - Coef = 0.01683 ± 0.00191 mm/semana ($0.00088 \pm 1e-04$ m/ano)



Altura - Coef = 0.01919 ± 0.0061 mm/semana (0.001 ± 0.00032 m/ano)

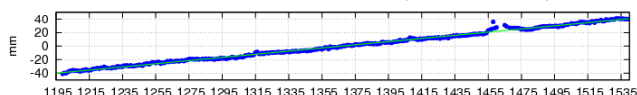


Semana GPS

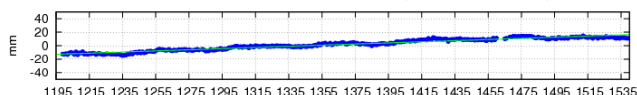


UNSA - Velocidade Planimetrica $0.01297 \pm 8e-05$ m/ano

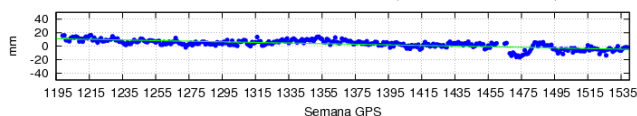
Norte - Coef = 0.23387 ± 0.00091 mm/semana ($0.01219 \pm 5e-05$ m/ano)



Leste - Coef = 0.08458 ± 0.00128 mm/semana ($0.00441 \pm 7e-05$ m/ano)



Altura - Coef = -0.04539 ± 0.0023 mm/semana (-0.00237 ± 0.00012 m/ano)

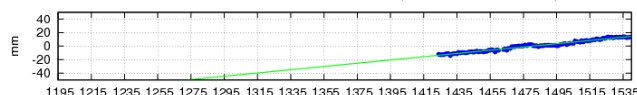


Semana GPS

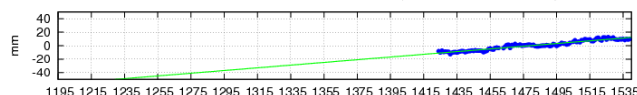


UNSJ - Velocidade Planimetrica 0.01631 ± 0.00029 m/ano

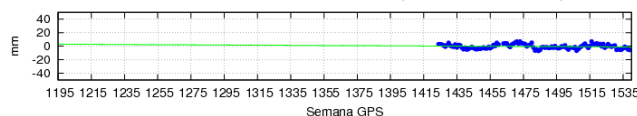
Norte - Coef = 0.24066 ± 0.00284 mm/semana (0.01255 ± 0.00015 m/ano)



Leste - Coef = 0.19996 ± 0.00476 mm/semana (0.01043 ± 0.00025 m/ano)



Altura - Coef = -0.01187 ± 0.00843 mm/semana (-0.00062 ± 0.00044 m/ano)

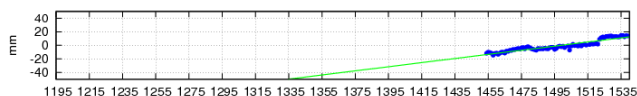


Semana GPS

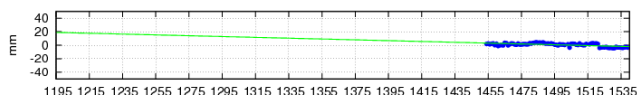


UYMO - Velocidade Planimetrica 0.01618 ± 8e-04 m/ano

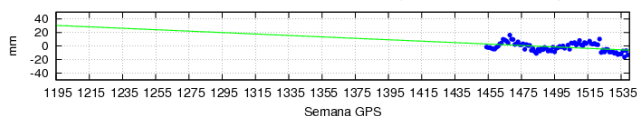
Norte - Coef = 0.30433 ± 0.01283 mm/semana (0.01587 ± 0.00067 m/ano)



Leste - Coef = -0.06076 ± 0.00839 mm/semana (-0.00317 ± 0.00044 m/ano)

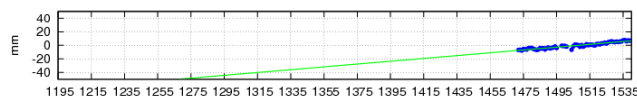


Altura - Coef = -0.10587 ± 0.02728 mm/semana (-0.00552 ± 0.00142 m/ano)

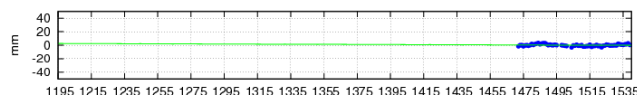


UYRO - Velocidade Planimetrica 0.01085 ± 0.00059 m/ano

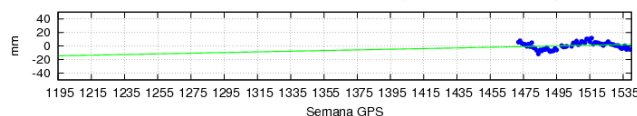
Norte - Coef = 0.20791 ± 0.00703 mm/semana (0.01084 ± 0.00037 m/ano)



Leste - Coef = -0.00781 ± 0.00881 mm/semana (-0.00041 ± 0.00046 m/ano)

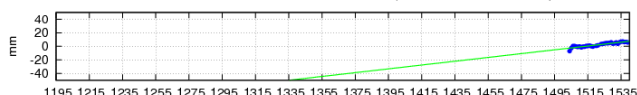


Altura - Coef = 0.04885 ± 0.03125 mm/semana (0.00255 ± 0.00163 m/ano)

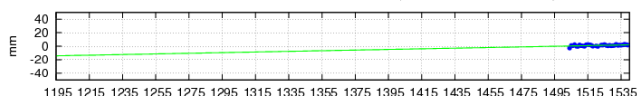


UYTA - Velocidade Planimetrica 0.01486 ± 0.0017 m/ano

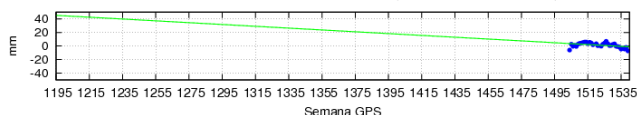
Norte - Coef = 0.2811 ± 0.02669 mm/semana (0.01466 ± 0.00139 m/ano)



Leste - Coef = 0.04698 ± 0.01878 mm/semana (0.00245 ± 0.00098 m/ano)

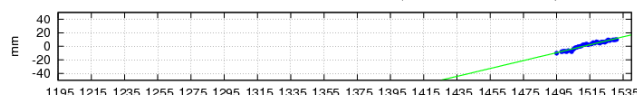


Altura - Coef = -0.1346 ± 0.06543 mm/semana (-0.00702 ± 0.00341 m/ano)

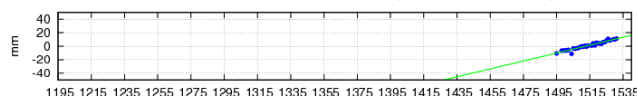


VALP - Velocidade Planimetrica 0.0431 ± 0.00189 m/ano

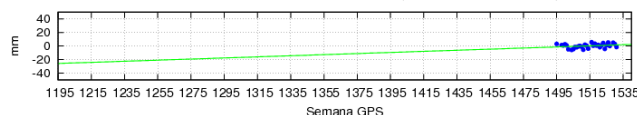
Norte - Coef = 0.58386 ± 0.02332 mm/semana (0.03044 ± 0.00122 m/ano)



Leste - Coef = 0.58506 ± 0.0278 mm/semana (0.03051 ± 0.00145 m/ano)

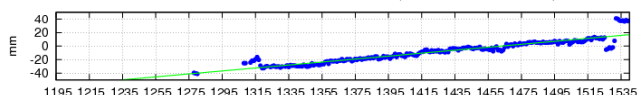


Altura - Coef = 0.08131 ± 0.05833 mm/semana (0.00424 ± 0.00304 m/ano)

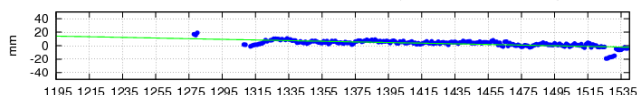


VARG - Velocidade Planimetrica 0.0117 ± 0.00052 m/ano

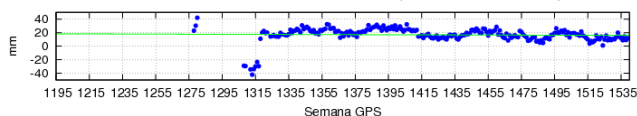
Norte - Coef = 0.21925 ± 0.00838 mm/semana (0.01143 ± 0.00044 m/ano)



Leste - Coef = -0.04775 ± 0.00528 mm/semana (-0.00249 ± 0.00028 m/ano)

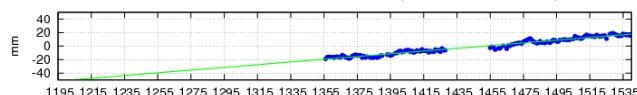


Altura - Coef = -0.00646 ± 0.01584 mm/semana (-0.00034 ± 0.00083 m/ano)

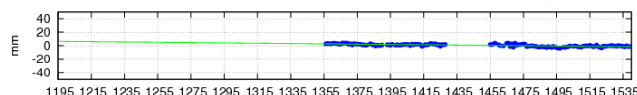


VBCA - Velocidade Planimetrica 0.01056 ± 0.00017 m/ano

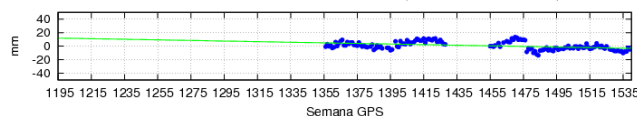
Norte - Coef = 0.20122 ± 0.00291 mm/semana (0.01049 ± 0.00015 m/ano)



Leste - Coef = -0.02308 ± 0.00154 mm/semana (-0.0012 ± 8e-05 m/ano)



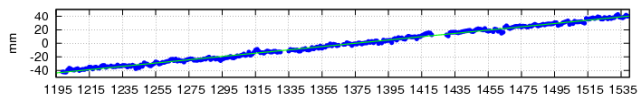
Altura - Coef = -0.04405 ± 0.00616 mm/semana (-0.0023 ± 0.00032 m/ano)



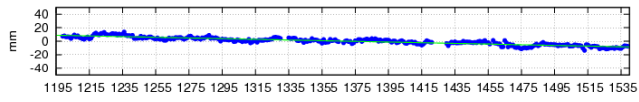


VICO - Velocidade Planimetrica $0.01296 \pm 1e-04$ m/ano

Norte - Coef = 0.24346 ± 0.00116 mm/semana ($0.01269 \pm 6e-05$ m/ano)



Leste - Coef = -0.05014 ± 0.00142 mm/semana ($-0.00261 \pm 7e-05$ m/ano)



Altura - Coef = -0.03058 ± 0.0029 mm/semana (-0.00159 ± 0.00015 m/ano)

