

ARA-DAC Weekly Analysis Result: 1999 (GFA)

Technical Report

GPS Week: 1999 (GFA)

<http://geolabpasaia.org/gnss/ARA-euref/>

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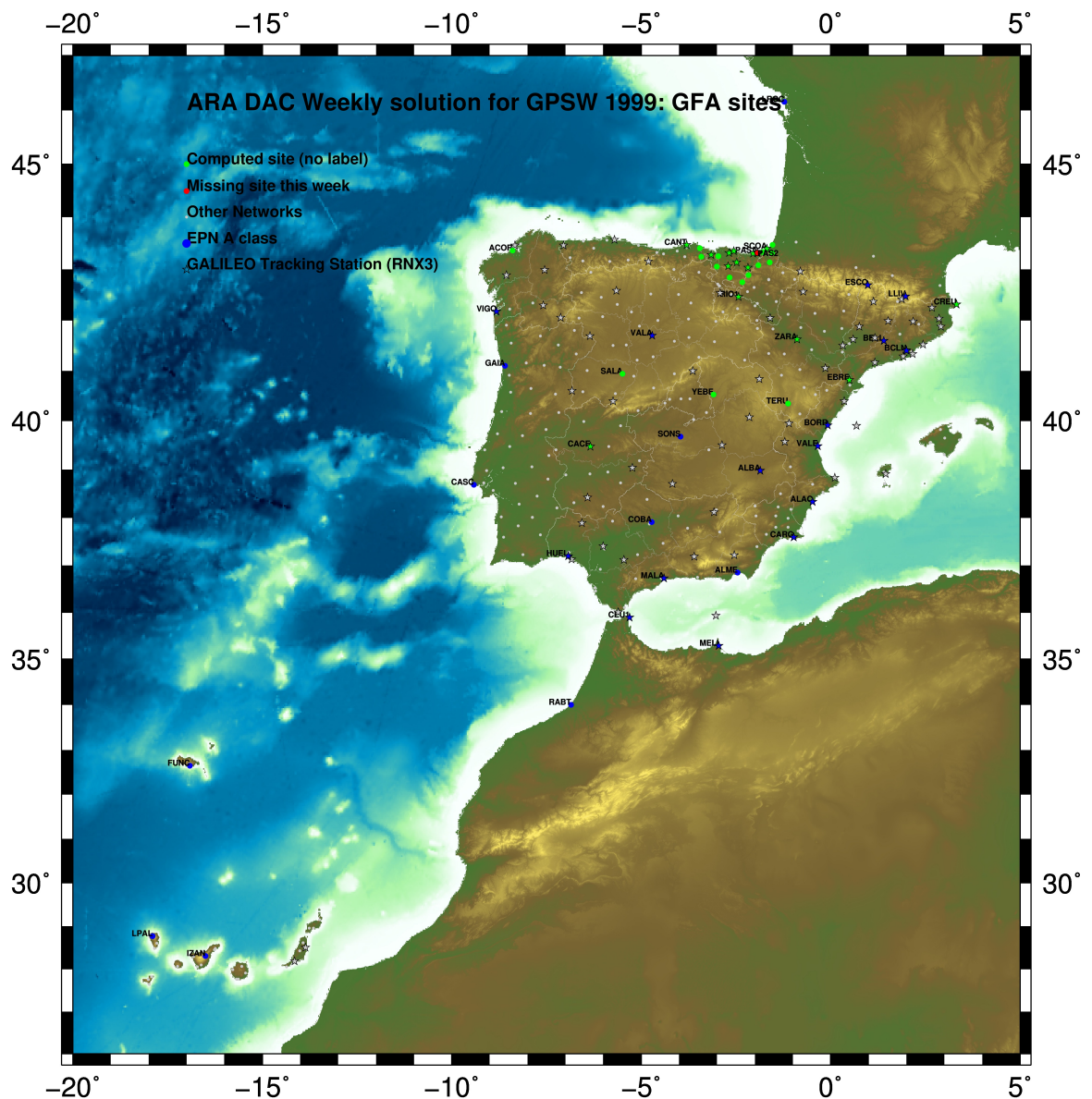
Report generated on 2018/05/22 at 21:23:17



1 Introduction

In may 2015 ARA (EUREF's acronym of the ARANZADI's Department of Applied Geodesy), kicks off as a EUREF's Operational Center. In July 2015, the Densification solutions ARA computes routinely in a weekly basis start being submitted to the EUREF's EPN Densification Project.

2 Map of Computed Sites



GM 2018 May 22 21:23:06

Fig.1: Computed Sites for GPS Week1999 (GFA)

3 Main Computation Parameters

The main parameters considered in the ARA analysis follow strictly the EPN recommendations.

- Preprocessing: Independent baselines are defined by the criterion of maximum common observations. Cycle slips are fixed with the MAUPRP program, analysing triple phase differences for each independent baseline. If MAUPRP does not fix all slips for one station, that station is edited out.
- Basic Observable : Carrier phase, L_1 and L_2 ; a priori sigma of single differences:0.002 m.
 - sampling (for ambiguity resolution) : 30 s
 - sampling (for final processing) : 180 s
 - Systems: GPS+GLONASS observations are used (GALILEO also used if available from GPSW 1986 on)
- Modelled observable: Double differences of carrier phase using different combinations based on the distance.
- Ground antenna phase center calibrations: Group APCV used from the PCV_COD.I14 file and individual calibrations from EPNC_14.ATX. EPN_A class sites (CRD + VEL) IGS14 used to define the reference frame (from GPSW 1934). If individual calibrations, other from these, are available, they are also included in the analysis.
- Troposphere:
 - 3 deg elev. cutoff; elevation dependent weighting
 - VMF1 mapping function. ZPD parameters are estimated using the VMF1 mapping function.
 - CHENHER gradient estimation model.
- Ionosphere: no a priori model, ionospheric effect almost removed by iono free combination.
- Ocean Loading: FES2004 (Scherneck).
- Atmosph. Loading: computed from a global grid using the GRDS1S2 program of Bernese 5.2.

4 Estimated Parameters

- Adjustment: Least Squares
- Rejection Criteria: 3*rms of single differences, in the weekly combination of daily normal equations (ADDNEQ)
- Station coordinates: minimum constraints (MC) to EPN A class sites (only translations).
- Troposphere: 3 deg. After having obtained coordinates valid for the entire week, tropospheric zenith delay is solved at each site at intervals of 1 hour throughout the week, holding the coordinates constrained at the weekly values.
- Ionospheric: second and third "High Order Ionosphere (HOI)" corrections used, using CODE files, to improve Ambiguity Resolution.
- Satellite clock bias: not estimated because are eliminated by double differencing the phase data.
- Receiver clock bias: not estimated because are eliminated by double differencing the phase data.
- Orbits and ERPs: CODE's orbits and ERP for both rapid and final solutions. DE405 planetary ephemeris and JGM3 Earth geopotential model is used.
- Tidal displacements: according to IERS2010 Conventions. Atmospheric loading corrections used.

- Ambiguity: an advanced ambiguity resolution (AR) scheme is included:
 - Code-Based Wideline (WL) AR for baselines shorter than 6000km, a Melbourne-Wuebbena wide-lane and narrow-lane AR is computed.
 - Phase-Based Wideline (L_5) AR for baselines shorter than 200km, the code-based wide-lane AR is replaced by a phase-only wide-lane with a subsequent narrow-lane AR.
 - Quasi-Ionosphere-Free (QIF)AR for the remaining real-valued ambiguities for baselines shorter than 2000km.
 - Direct L_1/L_2 AR for baselines shorter than 20km
- AR Verification: Each baseline is processed by introducing the resolved integer ambiguities and checking the residuals. If there is any problem, the ambiguities are re-initialized.

5 Computed Coordinates

In this section the adjusted coordinates are summarized. Note that the sites with an A flag are the computed ones, whereas sites flagged as W are the ones used in the Minimal Constraints condition.

5.1 IGS14

The Reference Frame considered in this section is IGS14, release C1980.

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ARA LAC 1999 WEEK FINAL COMBINATION: PRECISE ORBITS                22-MAY-18 17:36
-----
LOCAL GEODETIC DATUM: IGS14                EPOCH: 2018-05-02 12:00:00
-----
NUM STATION NAME          X (M)          Y (M)          Z (M)          FLAG
-----
 1 ACRD 13434M001         4594489.56852        -678367.47255        4357066.27047        W
 33 ALDA 19383M001         4687280.16607        -190876.58651        4308106.94838        A
 42 ALSA 19419M001         4677250.84436        -176770.41844        4319079.85922        A
 44 AMUR 19388M001         4661499.45631        -244591.28100        4332269.86995        A
 77 BIAZ 10074M002         4634456.06374        -124344.99863        4365785.44620        A
 78 BIDA 00000M000         4644177.83266        -145778.34574        4354832.46919        A
 88 BRZR 19387M001         4662221.00259        -220769.92208        4333309.42624        A
 9 CACE 13447M001         4899866.50923        -544567.05748        4033770.18865        W
 10 CANT 13438M001         4625924.32168        -307096.25507        4365771.54148        W
 112 CHER 00000M000         4645880.33104        -125721.94870        4353624.36047        A
 15 CREU 13432M001         4715420.14388        273178.03737        4271946.83045        W
 16 EBRE 13410M001         4833520.00385        41537.36672        4147461.70528        W
 131 ELGE 19353S001         4657557.41537        -202241.49630        4338991.85720        A
 133 EMAZ 17001M001         4645924.22087        -276949.88709        4347759.56770        A
 153 GERN 19389M001         4642811.31954        -217222.95443        4353278.86798        A
 173 IGEL 19352S001         4645951.43895        -165574.52527        4352550.40518        A
 178 ISPS 19484M001         4640596.48975        -206963.79788        4356391.90034        A
 182 KAST 19499M001         4646949.09434        -240747.29958        4348014.98345        A
 185 LARE 19440M001         4632831.96068        -279026.15803        4360314.41559        A
 186 LAZK 19354S001         4666098.35197        -178186.21320        4330463.66053        A
 190 LEIT 19428M001         4663520.95086        -155858.79440        4334519.87318        A
 242 ORDN 19427M001         4659695.79949        -130864.75890        4338948.87646        A
 31 PASA 19351S001         4644909.06865        -156645.08963        4353623.06477        W
 34 RIO1 13448M002         4708446.83454        -199490.30551        4284089.72251        W
 35 SALA 13469M001         4803054.49051        -462131.09206        4158379.06260        W
 36 SCDA 10088M002         4639940.50862        -136224.96250        4359552.40317        W
 298 SOPU 19386M001         4643997.92329        -255913.92921        4350063.13365        A
 40 TERU 13487M001         4867391.33303        -95523.37573        4108341.67110        W
 349 VITO 19385M001         4679397.70839        -218436.52743        4314898.35088        A
 44 YEBE 13420M001         4848724.57526        -261631.95224        4123094.31576        W
 45 ZARA 13462M001         4773803.17656        -73506.00593        4215454.08352        W

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5.2 ETRF2000 (ETRS89) Coordinates

European Terrestrial Reference System, 1989 (ETRS89) is realized by ETRF2000 (Boucher and Altamimi, 2011) and (Altamimi, 2017).

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ETRF2000 FINAL COORD. wk 1999                22-MAY-18 17:36
-----
LOCAL GEODETIC DATUM: ETRF2000            EPOCH: 2018-05-02 12:00:00
-----
NUM STATION NAME          X (M)          Y (M)          Z (M)          FLAG
-----
 1 ACRD 13434M001         4594489.86609        -678367.98935        4357065.86738        W
 33 ALDA 19383M001         4687280.51545        -190877.11159        4308106.54427        A
 42 ALSA 19419M001         4677251.19606        -176770.94248        4319079.45601        A
 44 AMUR 19388M001         4661499.80123        -244591.80364        4332269.46710        A
 77 BIAZ 10074M002         4634456.42446        -124345.51821        4365785.04673        A
 78 BIDA 00000M000         4644178.19023        -145778.86636        4354832.06876        A
 88 BRZR 19387M001         4662221.35027        -220770.44473        4333309.02362        A
 9 CACE 13447M001         4899866.80035        -544567.60451        4033769.76475        W
 10 CANT 13438M001         4625924.66178        -307096.77429        4365771.14050        W
 112 CHER 00000M000         4645880.69079        -125722.46943        4353623.96015        A
 15 CREU 13432M001         4715420.54310        273177.51106        4271946.42961        W
 16 EBRE 13410M001         4833520.36869        41536.82778        4147461.29313        W
 131 ELGE 19353S001         4657557.76552        -202242.01843        4338991.45514        A
 133 EMAZ 17001M001         4645924.56318        -276950.40826        4347759.16562        A
 153 GERN 19389M001         4642811.66895        -217223.47511        4353278.46682        A
 173 IGEL 19352S001         4645951.79414        -165575.04613        4352550.00439        A
 178 ISPS 19484M001         4640596.84053        -206964.31832        4356391.49946        A
 182 KAST 19499M001         4646949.44075        -240747.82075        4348014.58171        A
 185 LARE 19440M001         4632832.30359        -279026.67787        4360314.01444        A
 186 LAZK 19354S001         4666098.70426        -178186.73611        4330463.25812        A
 190 LEIT 19428M001         4663521.30594        -155859.26200        4334519.47122        A
 242 ORDN 19427M001         4659696.15768        -130865.28104        4338948.47507        A
 31 PASA 19351S001         4644909.42491        -156645.61035        4353622.66416        W
 34 RIO1 13448M002         4708447.18134        -199490.83273        4284089.31675        W
 35 SALA 13469M001         4803054.79928        -462131.62935        4158378.64681        W
 36 SCDA 10088M002         4639940.86758        -136225.48267        4359552.00316        W
 298 SOPU 19386M001         4643998.26812        -255914.45012        4350062.73195        A
 40 TERU 13487M001         4867391.67982        -95523.91849        4108341.25488        W
 349 VITO 19385M001         4679398.05511        -218437.05180        4314897.94703        A
 44 YEBE 13420M001         4848724.90430        -261632.49361        4123093.89898        W
 45 ZARA 13462M001         4773803.53298        -73506.53931        4215453.67443        W

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5.3 ETRF2014 (ETRS89) Coordinates

European Terrestrial Reference System, 1989 (ETRS89) is realized by ETRF2014 (Boucher and Altamimi, 2011) and (Altamimi, 2017) (Altamimi, 2017).

ETRF2014 FINAL COORD. wk 1999		22-MAY-18 17:36			
LOCAL GEODETIC DATUM: ETRF2014		EPOCH: 2018-05-02 12:00:00			
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
1	ACOR 13434M001	4594489.82327	-678368.02836	4357065.91530	W
33	ALDA 19383M001	4687280.47051	-190877.15189	4308106.59210	A
42	ALSA 19419M001	4677251.15117	-176770.98285	4319079.50387	A
44	AMUR 19388M001	4661499.75669	-244591.84384	4332269.51497	A
77	BIAZ 10074M002	4634456.37982	-124345.55892	4365785.09471	A
78	BIDA 00000M000	4644178.14556	-145778.90696	4354832.11671	A
88	BRZR 19387M001	4662221.30566	-220770.48502	4333309.07149	A
9	CACE 13447M001	4899866.75422	-544567.64282	4033769.81204	W
10	CANT 13438M001	4625924.61775	-307096.81442	4365771.18843	W
112	CHER 00000M000	4645880.64605	-125722.51009	4353624.00810	A
15	CREU 13432M001	4715420.49640	273177.46935	4271946.47765	W
16	EBRE 13410M001	4833520.32161	41536.78727	4147461.34076	W
131	ELGE 19353S001	4657557.72090	-202242.05879	4338991.50303	A
133	EMAZ 17001M001	4645924.51888	-276950.44842	4347759.21350	A
153	GERN 19389M001	4642811.62450	-217223.51548	4353278.51474	A
173	IGEL 19352S001	4645951.74951	-165575.08666	4352550.05232	A
178	ISPS 19484M001	4640596.79608	-206964.35873	4356391.54739	A
182	KAST 19499M001	4646949.39633	-240747.86102	4348014.62961	A
185	LARE 19440M001	4632832.25941	-279026.71807	4360314.06235	A
186	LAZK 19354S001	4666098.65949	-178186.77653	4330463.30600	A
190	LEIT 19428M001	4663521.26113	-155859.30249	4334519.51912	A
242	ORON 19427M001	4659696.11283	-130865.32163	4338948.52299	A
31	PASA 19351S001	4644909.38027	-156645.65092	4353622.71210	W
34	RI01 13448M002	4708447.13622	-199490.87291	4284089.36453	W
35	SALA 13469M001	4803054.75394	-462131.66830	4158378.69430	W
36	SOA 10088M002	4639940.82293	-136225.52331	4359552.05112	W
298	SOPU 19386M001	4643998.22377	-255914.49035	4350062.77985	A
40	TERU 13487M001	4867391.63282	-95523.95841	4108341.30237	W
349	VITO 19385M001	4679398.01032	-218437.09202	4314897.99486	A
44	YEBE 13420M001	4848724.85798	-261632.53306	4123093.94643	W
45	ZARA 13462M001	4773803.48685	-73506.57966	4215453.72212	W

6 Quality Control

6.1 Mean and Daily Repeatabilities

In this section, the mean and daily repeatabilities of the sites are shown. Repeatabilities refer to the IGS14 solution and are given with respect the Local frame (North-East-Up).

ARA LAC 1999 WEEK FINAL COMBINATION: PRECISE ORBITS 22-MAY-18 17:36

Station	#Days	Weekday 0123456	Repeatability (mm)		
			N	E	U
ACOR 13434M001	7	XXXXXX	1.67	1.85	3.97
ALDA 19383M001	7	XXXXXX	0.63	0.70	2.32
ALSA 19419M001	7	XXXXXX	1.19	0.62	2.97
AMUR 19388M001	7	XXXXXX	0.73	0.81	4.07
BLAZ 10074M002	7	XXXXXX	0.56	0.64	3.36
BIDA 00000M000	7	XXXXXX	0.98	1.13	4.87
BRZR 19387M001	7	XXXXXX	1.59	1.05	3.95
CACE 13447M001	7	XXXXXX	0.98	0.58	2.87
CANT 13438M001	7	XXXXXX	0.70	0.68	3.61
CHER 00000M000	7	XXXXXX	1.11	0.85	3.51
CREU 13432M001	7	XXXXXX	1.11	1.12	2.15
EBRE 13410M001	7	XXXXXX	0.49	1.19	2.18
ELGE 19353S001	7	XXXXXX	0.86	0.80	2.20
EMAZ 17001M001	7	XXXXXX	1.06	1.05	6.28
GERN 19389M001	7	XXXXXX	0.90	0.94	2.36
IGEL 19352S001	7	XXXXXX	0.80	0.71	2.23
ISPS 19484M001	7	XXXXXX	1.37	0.93	2.83
KAST 19499M001	7	XXXXXX	0.95	0.83	6.70
LARE 19440M001	7	XXXXXX	1.31	1.03	3.42
LAZK 19354S001	7	XXXXXX	0.56	0.62	2.93
LEIT 19428M001	7	XXXXXX	1.18	0.94	5.20
ORON 19427M001	7	XXXXXX	0.93	1.10	2.71
PASA 19351S001	7	XXXXXX	0.73	0.62	3.80
RI01 13448M002	7	XXXXXX	0.52	0.52	2.87
SALA 13469M001	7	XXXXXX	0.98	0.69	2.72
SCOA 10088M002	7	XXXXXX	0.74	0.75	3.49
SOPU 19386M001	7	XXXXXX	1.15	1.87	3.34
TERU 13487M001	7	XXXXXX	0.57	0.53	0.99
VITO 19385M001	7	XXXXXX	0.44	0.75	2.15
YEBE 13420M001	7	XXXXXX	0.57	0.42	2.02
ZARA 13462M001	7	XXXXXX	0.50	1.00	2.34

Comparison of individual solutions:

ACOR 13434M001	N	1.67	1.50	0.83	1.97	-0.33	-1.61	0.33	-2.65
ACOR 13434M001	E	1.85	0.15	1.05	-0.26	0.08	1.08	-4.11	-1.18
ACOR 13434M001	U	3.97	0.02	-3.78	-4.35	-0.86	-1.32	7.52	1.58
ALDA 19383M001	N	0.63	0.88	0.70	0.12	0.08	-1.03	0.16	0.18
ALDA 19383M001	E	0.70	-0.05	-0.91	-0.74	0.69	-0.92	-0.50	0.07
ALDA 19383M001	U	2.32	2.31	-0.01	0.02	-0.77	-4.35	-2.64	-0.80
ALSA 19419M001	N	1.19	0.00	0.44	0.83	1.32	-1.94	0.98	-1.07
ALSA 19419M001	E	0.62	0.44	-0.97	0.17	-0.04	-1.02	-0.30	0.20
ALSA 19419M001	U	2.97	0.45	-1.17	0.75	-4.49	-3.91	3.58	1.63
AMUR 19388M001	N	0.73	0.46	1.39	-0.62	-0.23	-0.57	-0.46	-0.19
AMUR 19388M001	E	0.81	-0.27	-0.02	0.87	0.17	-1.25	-0.96	-0.78
AMUR 19388M001	U	4.07	1.37	3.10	-0.11	0.56	-7.35	-4.65	-3.44
BLAZ 10074M002	N	0.56	-0.64	0.58	-0.11	0.40	-0.31	-0.73	0.58
BLAZ 10074M002	E	0.64	0.14	-1.30	0.21	-0.16	0.16	-0.79	0.14
BLAZ 10074M002	U	3.36	2.22	0.12	-3.34	0.08	-5.23	3.27	-3.69
BIDA 00000M000	N	0.98	0.39	1.01	0.23	-1.40	0.53	-1.47	0.39
BIDA 00000M000	E	1.13	-1.71	-1.11	0.36	0.77	1.39	-0.37	-0.86
BIDA 00000M000	U	4.87	-8.64	-0.32	1.53	7.07	-0.96	-0.48	-3.75
BRZR 19387M001	N	1.59	-0.99	-0.15	1.27	-0.83	-1.40	0.84	3.02
BRZR 19387M001	E	1.05	-1.48	-0.76	-0.73	0.19	-0.69	0.64	1.54
BRZR 19387M001	U	3.95	1.60	0.73	-2.53	4.88	-4.51	-5.15	3.68
CACE 13447M001	N	0.98	-1.63	-1.21	-0.28	-0.08	-1.24	-0.17	-0.01
CACE 13447M001	E	0.58	-0.60	0.26	0.72	0.57	0.24	-0.15	0.82
CACE 13447M001	U	2.87	2.30	-1.83	2.29	0.53	0.46	-0.86	5.86
CANT 13438M001	N	0.70	0.72	0.62	-0.05	0.16	-1.33	-0.23	0.41
CANT 13438M001	E	0.68	0.62	-1.42	-0.42	0.15	0.16	-0.26	-0.35
CANT 13438M001	U	3.81	-0.29	2.53	7.21	-0.39	-2.65	2.64	-3.81
CHER 00000M000	N	1.11	0.81	0.95	-0.16	-1.87	-0.36	-0.88	1.17
CHER 00000M000	E	0.85	-0.10	-1.55	0.02	1.12	-0.09	-0.71	-0.34
CHER 00000M000	U	3.51	0.49	-3.05	-4.08	4.34	-1.94	2.39	-4.39
CREU 13432M001	N	1.11	1.83	0.67	-0.30	-0.16	-1.24	-1.35	-0.28
CREU 13432M001	E	1.12	-2.07	-0.14	-0.25	1.65	0.55	-0.23	0.28
CREU 13432M001	U	2.15	-1.80	-2.34	0.08	-2.22	3.14	1.94	-0.59
EBRE 13410M001	N	0.49	-0.37	-0.59	-0.05	0.61	-0.21	-0.41	0.58
EBRE 13410M001	E	1.19	1.89	0.67	-0.11	-1.93	-0.51	-0.71	-0.02
EBRE 13410M001	U	2.18	2.30	1.61	-1.38	-2.49	-0.49	0.67	-3.44
ELGE 19353S001	N	0.86	-0.59	1.23	0.68	-0.50	0.36	-0.71	1.13
ELGE 19353S001	E	0.80	-0.94	-1.52	0.46	-0.18	0.03	0.45	0.44
ELGE 19353S001	U	2.20	0.35	-2.53	-2.16	2.02	-2.38	2.73	0.75
EMAZ 17001M001	N	1.06	1.32	1.05	-0.08	0.47	-1.66	0.63	0.71
EMAZ 17001M001	E	1.05	-0.02	0.91	-0.41	-0.35	-0.12	2.23	0.69
EMAZ 17001M001	U	6.28	-0.57	10.05	3.47	3.05	0.57	-10.36	-2.51
GERN 19389M001	N	0.90	0.98	0.42	1.13	-0.78	-0.49	-0.74	1.04
GERN 19389M001	E	0.94	-0.73	-1.73	-0.04	-0.11	0.63	-0.34	1.12
GERN 19389M001	U	2.36	-2.31	3.82	-0.50	2.21	-1.04	-1.23	-2.40
IGEL 19352S001	N	0.80	0.59	0.94	0.21	-0.53	-1.05	-0.94	0.60
IGEL 19352S001	E	0.71	-0.04	-1.67	0.43	-0.06	-0.15	-0.02	-0.21
IGEL 19352S001	U	2.23	-1.97	-1.72	-2.09	1.73	-1.22	2.08	-3.14
ISPS 19484M001	N	1.37	-1.36	-0.65	0.72	0.88	-1.42	1.43	1.89
ISPS 19484M001	E	0.93	-0.67	-1.49	0.71	0.07	0.79	-1.16	-0.03
ISPS 19484M001	U	2.83	1.47	-4.74	2.92	-2.56	-0.08	1.46	-2.49
KAST 19499M001	N	0.95	-0.66	1.14	0.86	0.93	-0.72	-1.06	-0.62
KAST 19499M001	E	0.83	-0.38	-1.28	0.75	0.17	-0.01	-1.27	-0.40
KAST 19499M001	U	6.70	-1.05	7.65	3.82	5.25	-7.07	-7.90	-7.46
LARE 19440M001	N	1.31	-0.12	-1.05	0.55	-0.63	0.83	0.36	2.77
LARE 19440M001	E	1.03	-0.25	-0.94	0.87	-0.56	-0.56	-0.54	1.94
LARE 19440M001	U	3.42	-2.17	-0.42	-2.80	6.34	1.57	-3.78	-0.80
LAZK 19354S001	N	0.56	0.09	0.64	-0.38	0.28	0.20	-0.31	1.05
LAZK 19354S001	E	0.62	-0.82	-1.07	0.29	-0.14	0.22	-0.27	0.54
LAZK 19354S001	U	2.93	-0.76	-2.57	1.21	5.20	-3.98	-0.31	0.21

LEIT 19428M001	N	1.18	-0.83	-0.52	0.55	2.28	0.28	-0.89	-1.01
LEIT 19428M001	E	0.94	0.29	-1.47	-0.33	0.05	1.00	-1.41	0.06
LEIT 19428M001	U	5.20	-1.41	-1.77	-1.17	6.82	2.04	0.27	-10.24
ORDN 19427M001	N	0.93	-0.00	1.37	-0.54	-0.87	0.73	-1.31	-0.01
ORDN 19427M001	E	1.10	0.27	-2.14	-0.15	1.18	0.10	-1.11	-0.09
ORDN 19427M001	U	2.71	-2.65	-1.24	-0.62	1.35	-4.54	3.43	-0.99
PASA 19351S001	N	0.73	-0.10	0.84	0.65	-0.02	-0.21	-1.43	0.07
PASA 19351S001	E	0.62	-0.28	-1.41	0.43	-0.16	-0.19	0.05	-0.18
PASA 19351S001	U	3.80	0.58	-0.89	-4.85	2.67	-1.16	3.54	-6.39
RIO1 13448M002	N	0.52	0.71	0.06	0.49	-0.48	0.65	-0.42	-0.21
RIO1 13448M002	E	0.52	0.06	-1.02	0.25	0.19	-0.14	-0.68	-0.11
RIO1 13448M002	U	2.87	-3.84	0.96	1.43	-0.24	-2.34	5.04	-0.94
SALA 13469M001	N	0.98	1.21	1.85	0.47	0.08	0.29	0.06	-0.73
SALA 13469M001	E	0.69	-0.44	0.62	-0.03	0.07	0.08	1.04	1.08
SALA 13469M001	U	2.72	-0.96	-1.88	-0.69	5.45	2.08	-0.57	2.29
SCDA 10088M002	N	0.74	0.23	1.22	-0.02	0.03	-0.59	-1.15	-0.22
SCDA 10088M002	E	0.75	-1.03	-0.89	0.38	0.22	0.92	-0.29	-0.60
SCDA 10088M002	U	3.49	-1.93	-1.08	-4.52	3.96	-4.69	3.03	-1.02
SOPU 19386M001	N	1.15	0.62	-1.15	-0.78	-0.23	0.78	0.94	2.02
SOPU 19386M001	E	1.87	-0.63	-3.04	-0.13	-1.10	-0.47	2.22	2.24
SOPU 19386M001	U	3.34	2.69	2.45	-0.02	2.55	-2.32	-6.47	0.30
TERU 13487M001	N	0.57	-0.87	-0.48	-0.40	-0.11	-0.04	0.64	0.64
TERU 13487M001	E	0.53	0.37	0.27	-0.37	0.23	-0.19	-0.35	-1.07
TERU 13487M001	U	0.99	1.13	-0.69	0.69	-0.74	-1.19	-1.04	-0.75
VITO 19385M001	N	0.44	0.17	-0.01	-0.37	0.32	-0.35	-0.17	0.88
VITO 19385M001	E	0.75	0.14	-1.13	0.13	0.30	0.58	-1.12	-0.61
VITO 19385M001	U	2.15	-0.15	-2.46	-0.70	2.50	-1.82	-0.86	-3.29
YEBE 13420M001	N	0.57	-0.46	-0.29	-0.60	0.35	-0.72	-0.12	0.78
YEBE 13420M001	E	0.42	0.27	0.31	-0.37	0.23	-0.45	0.28	-0.65
YEBE 13420M001	U	2.02	-0.19	-0.45	2.83	-3.68	-0.18	1.05	-1.21
ZARA 13462M001	N	0.50	0.70	-0.22	-0.55	0.11	-0.16	0.74	0.22
ZARA 13462M001	E	1.00	-0.32	-1.95	0.56	0.46	0.28	0.60	-1.08
ZARA 13462M001	U	2.34	0.86	2.82	-2.11	2.14	-3.33	-0.70	-1.86

6.2 Datum verification

In this section, the datum verification is shown. A 3 parameter Helmert 3D (3 translations) is computed to the minimally constrained sites.

LOCAL GEODETIC DATUM: IGS14
RESIDUALS IN LOCAL SYSTEM (NORTH, EAST, UP)

NUM	NAME	FLG	RESIDUALS IN MILLIMETERS		
1	ACOR 13434M001	I W	-0.38	2.03	1.53
2	ALAC 13433M001	I W	0.21	0.39	-3.38
3	ALBA 13452M001	I W	-0.05	-1.10	-0.92
4	ALME 13437M001	I W	-1.91	1.35	0.73
5	BCLN 13412M001	I W	-1.88	-0.94	-3.79
6	BELL 13431M001	I W	1.20	1.14	-2.39
7	BORR 13480M001	I W	-0.80	-1.77	-5.84
8	BRST 10004M004	I W	-1.12	-0.63	-1.67
9	CACE 13447M001	I W	0.39	0.54	3.86
10	CANT 13438M001	I W	0.21	-0.49	2.41
11	CARG 19412M001	I W	0.67	-0.46	0.43
12	CASC 13909S001	I W	-0.94	-1.44	3.31
13	CEU1 13449M002	I W	-0.55	0.70	0.38
14	COBA 13453M001	I W	0.14	0.85	-0.99
15	CREU 13432M001	I W	-0.73	0.55	-2.12
16	EBRE 13410M001	I W	0.54	1.76	-5.61
17	ESCO 13435M001	I W	-1.51	-3.20	4.79
18	FUNC 13911S001	I W	2.30	0.73	-1.37
19	GAIA 13902M001	I W	0.01	-1.67	7.22
21	HUEL 13451M001	I W	-0.88	0.38	3.13
22	IZAN 31309M002	I W	0.49	0.57	-1.35
24	LLIV 13436M001	I W	-1.16	0.25	1.80
25	LPAL 81701M001	I W	-1.14	2.19	-3.88
26	LRDC 10023M001	I W	-0.27	-1.00	0.03
27	MALA 13443M001	I W	-2.72	1.80	2.04
30	MELI 19379M001	I W	-0.81	1.46	1.91
31	PASA 19351S001	I W	-0.32	-0.63	1.97
32	PDEL 31906M004	I W	0.52	0.34	-1.17
33	RABT 35001M002	I W	0.25	-0.10	-3.43
34	RID1 13448M002	I W	0.59	-0.73	0.67
35	SALA 13469M001	I W	0.32	0.61	1.68
36	SCOA 10088M002	I W	-3.51	-1.10	-0.30
38	SONS 13446M001	I W	1.34	1.61	-0.33
39	TERC 31909M001	I W	8.36	-3.48	-2.55
40	TERU 13487M001	I W	1.87	0.33	-3.18
41	VALA 13463M002	I W	0.23	-0.14	1.69
42	VALE 13439M001	I W	-0.32	0.57	-5.14
43	VIGO 13450M001	I W	0.45	-1.11	3.06
44	YEBE 13420M001	I W	0.63	-0.15	4.28
45	ZARA 13462M001	I W	-0.41	0.60	1.27
46	ZIMM 14001M004	I W	0.68	-0.60	1.22
RMS / COMPONENT			1.75	1.28	2.97
MEAN			0.00	-0.00	-0.00
MIN			-3.51	-3.48	-5.84
MAX			8.36	2.19	7.22

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 123
RMS OF TRANSFORMATION : 2.12 MM

BARYCENTER COORDINATES:

LATITUDE : 39 57 51.24
LONGITUDE : - 5 4 6.90
HEIGHT : -44.684 KM

PARAMETERS:

TRANSLATION IN N : 0.00 +- 0.33 MM
TRANSLATION IN E : -0.00 +- 0.33 MM
TRANSLATION IN U : 0.00 +- 0.33 MM

6.3 Adjustment Statistics

In this section, the summary of the global adjustment and not subnetworks are shown. Also, the Helmert parameters of the combined solution with respect the daily solutions are shown.

```
* STATISTICAL PARAMETER-----VALUE(S)-----
NUMBER OF OBSERVATIONS          16177305
NUMBER OF UNKNOWN(S)            221902
NUMBER OF DEGREES OF FREEDOM    15955403
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)      180
VARIANCE FACTOR                  1.931206754947018

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
  1  0.00227    -0.0038 -0.0002  0.0078    -0.0000 -0.0003 -0.0000    -0.00030
  2  0.00190    -0.0063  0.0036  0.0099    -0.0001 -0.0004  0.0001    -0.00017
  3  0.00157    -0.0093  0.0016  0.0078    -0.0001 -0.0004 -0.0000     0.00033
  4  0.00187     0.0346  0.0026 -0.0414     0.0001  0.0017  0.0002    -0.00000
  5  0.00223     0.0042 -0.0004 -0.0005     0.0001  0.0001  0.0000    -0.00047
  6  0.00190    -0.0020  0.0035 -0.0004    -0.0001 -0.0000  0.0001     0.00036
  7  0.00205     0.0087  0.0135 -0.0128    -0.0002  0.0005  0.0004     0.00028
```

```
Statistics of individual solutions:
-----
File  RMS (m)      DOF  Ch1**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
  1  0.00150      2117860    2.25          2149626      3          951      30818      0
  2  0.00133      2267669    1.78          2299606      3          996      30944      0
  3  0.00133      2357957    1.77          2388859      3          1005     29900      0
  4  0.00130      2321443    1.69          2354236      3          1017     31779      0
  5  0.00155      2313806    2.41          2348172      3          1011     33358      0
  6  0.00138      2283414    1.92          2316620      3          990      32219      0
  7  0.00130      2287338    1.68          2320186      3          990      31861      0
```

7 Equipment

7.1 Receiver List

Serial numbers not shown.

```
*SITE PT SOLN T DATA_START__ DATA_END____ DESCRIPTION_____ S/N__ FIRMWARE____
ACOR  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200PRO  -----
ALDA  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
ALSA  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200GGPRO -----
AMUR  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
BIAZ  A   1 P 18:119:00000 18:125:86370 TRI SP90M      -----
BIDA  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
BRZR  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
CACE  A   1 P 18:119:00000 18:125:86370 TRIMBLE NETR9  -----
CANT  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
CHER  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200+GNSS -----
CREU  A   1 P 18:119:00000 18:125:86370 LEICA GR50      -----
EBRE  A   1 P 18:119:00000 18:125:86370 LEICA GR50      -----
ELGE  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
EMAZ  A   1 P 18:119:00000 18:125:86370 LEICA GR30      -----
GERN  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
IGEL  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
ISPS  A   1 P 18:119:00000 18:125:86370 TRIMBLE NETR9  -----
KAST  A   1 P 18:119:00000 18:125:86370 LEICA GR30      -----
LARE  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200GGPRO -----
LAZK  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
LEIT  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200+GNSS -----
ORON  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200GGPRO -----
PASA  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
RIO1  A   1 P 18:119:00000 18:125:86370 LEICA GR25      -----
SALA  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200+GNSS -----
SCOA  A   1 P 18:119:00000 18:125:86370 LEICA GR25      -----
SOPU  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
TERU  A   1 P 18:119:00000 18:125:86370 LEICA GRX1200GGPRO -----
VITO  A   1 P 18:119:00000 18:125:86370 LEICA GR10      -----
YEBE  A   1 P 18:119:00000 18:125:86370 TRIMBLE NETR9  -----
ZARA  A   1 P 18:119:00000 18:125:86370 TRIMBLE NETR9  -----
```

7.2 Antennas

Serial number ONLY provided in case individual calibrations are available.

```
*SITE PT SOLN T DATA_START__ DATA_END____ DESCRIPTION_____ S/N__
ACOR  A   1 P 18:119:00000 18:125:86370 LEIAT504      LEIS  -----
ALDA  A   1 P 18:119:00000 18:125:86370 LEIAS10      NONE  -----
ALSA  A   1 P 18:119:00000 18:125:86370 LEIAX1202GG  NONE  -----
AMUR  A   1 P 18:119:00000 18:125:86370 LEIAS10      NONE  -----
BIAZ  A   1 P 18:119:00000 18:125:86370 LEIAR25      LEIT  -----
```

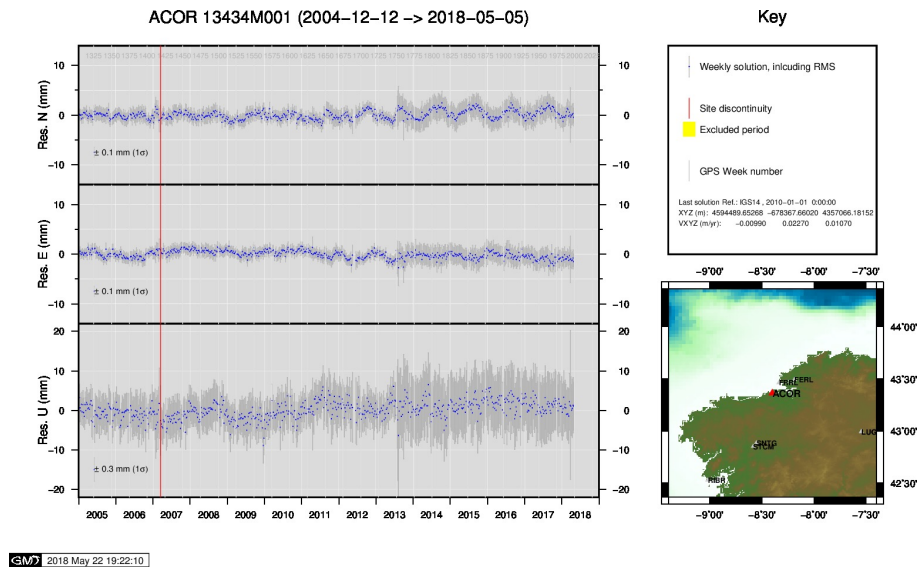
BIDA	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
BRZR	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
CACE	A	1 P	18:119:00000	18:125:86370	TRM29659.00	NONE	----
CANT	A	1 P	18:119:00000	18:125:86370	LEIAR25.R4	LEIT	25066
CHER	A	1 P	18:119:00000	18:125:86370	LEIAX1203+GNSS	NONE	----
CREU	A	1 P	18:119:00000	18:125:86370	LEIAR25.R4	NONE	26357
EBRE	A	1 P	18:119:00000	18:125:86370	LEIAR25.R4	NONE	26359
ELGE	A	1 P	18:119:00000	18:125:86370	LEIAR25.R4	LEIT	----
EMAZ	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
GERN	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
IGEL	A	1 P	18:119:00000	18:125:86370	LEIAR20	LEIM	----
ISPS	A	1 P	18:119:00000	18:125:86370	TRM59900.00	SCIS	----
KAST	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
LARE	A	1 P	18:119:00000	18:125:86370	LEIAT504	NONE	----
LAZK	A	1 P	18:119:00000	18:125:86370	LEIAR25.R4	LEIT	----
LEIT	A	1 P	18:119:00000	18:125:86370	LEIAX1203+GNSS	NONE	----
ORDN	A	1 P	18:119:00000	18:125:86370	LEIAX1202GG	NONE	----
PASA	A	1 P	18:119:00000	18:125:86370	LEIAR20	LEIM	73034
RIO1	A	1 P	18:119:00000	18:125:86370	LEIAR25.R4	LEIT	25138
SALA	A	1 P	18:119:00000	18:125:86370	LEIAR25	NONE	----
SCDA	A	1 P	18:119:00000	18:125:86370	TRM55971.00	NONE	----
SOPU	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
TERU	A	1 P	18:119:00000	18:125:86370	LEIAT504GG	LEIS	----
VITO	A	1 P	18:119:00000	18:125:86370	LEIAS10	NONE	----
YEBE	A	1 P	18:119:00000	18:125:86370	TRM29659.00	NONE	----
ZARA	A	1 P	18:119:00000	18:125:86370	TRM29659.00	NONE	----

7.3 Eccentricities

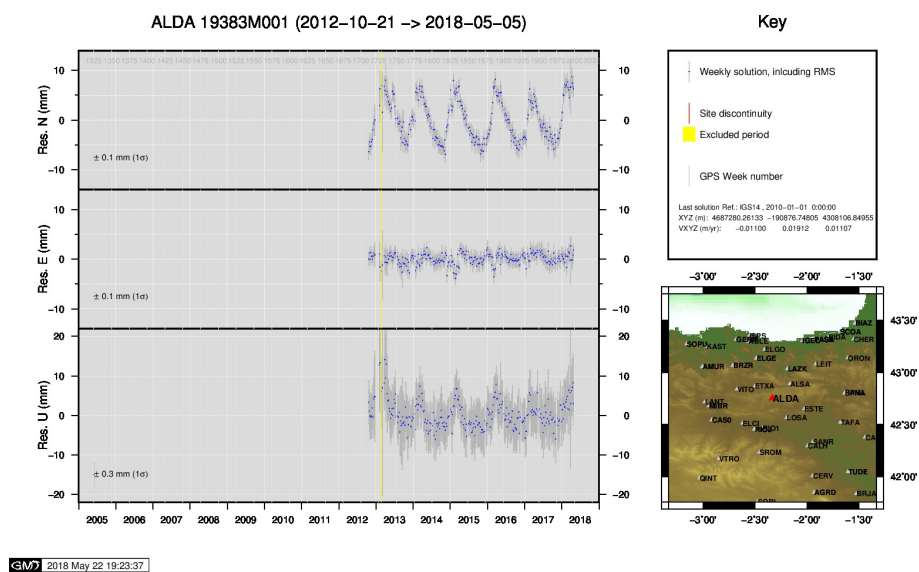
*SITE	PT	SOLN	T	DATA_START_	DATA_END_	AXE	ARP->BENCHMARK(M)	UP_	NORTH_	EAST_
ACOR	A	1 P	18:119:00000	18:125:86370	UNE	3.0460	0.0000	0.0000	0.0000	0.0000
ALDA	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ALSA	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
AMUR	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
BIAZ	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
BIDA	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
BRZR	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
CACE	A	1 P	18:119:00000	18:125:86370	UNE	0.0600	0.0000	0.0000	0.0000	0.0000
CANT	A	1 P	18:119:00000	18:125:86370	UNE	3.0490	0.0000	0.0000	0.0000	0.0000
CHER	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
CREU	A	1 P	18:119:00000	18:125:86370	UNE	0.0770	0.0000	0.0000	0.0000	0.0000
EBRE	A	1 P	18:119:00000	18:125:86370	UNE	0.0770	0.0000	0.0000	0.0000	0.0000
ELGE	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
EMAZ	A	1 P	18:119:00000	18:125:86370	UNE	0.0350	0.0000	0.0000	0.0000	0.0000
GERN	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
IGEL	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ISPS	A	1 P	18:119:00000	18:125:86370	UNE	0.0350	0.0000	0.0000	0.0000	0.0000
KAST	A	1 P	18:119:00000	18:125:86370	UNE	0.0350	0.0000	0.0000	0.0000	0.0000
LARE	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
LAZK	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
LEIT	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ORDN	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
PASA	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
RIO1	A	1 P	18:119:00000	18:125:86370	UNE	0.0606	0.0000	0.0000	0.0000	0.0000
SALA	A	1 P	18:119:00000	18:125:86370	UNE	0.0600	0.0000	0.0000	0.0000	0.0000
SCDA	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
SOPU	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
TERU	A	1 P	18:119:00000	18:125:86370	UNE	0.0600	0.0000	0.0000	0.0000	0.0000
VITO	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
YEBE	A	1 P	18:119:00000	18:125:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ZARA	A	1 P	18:119:00000	18:125:86370	UNE	3.2590	0.0000	0.0000	0.0000	0.0000

8 Cumulative Time Series

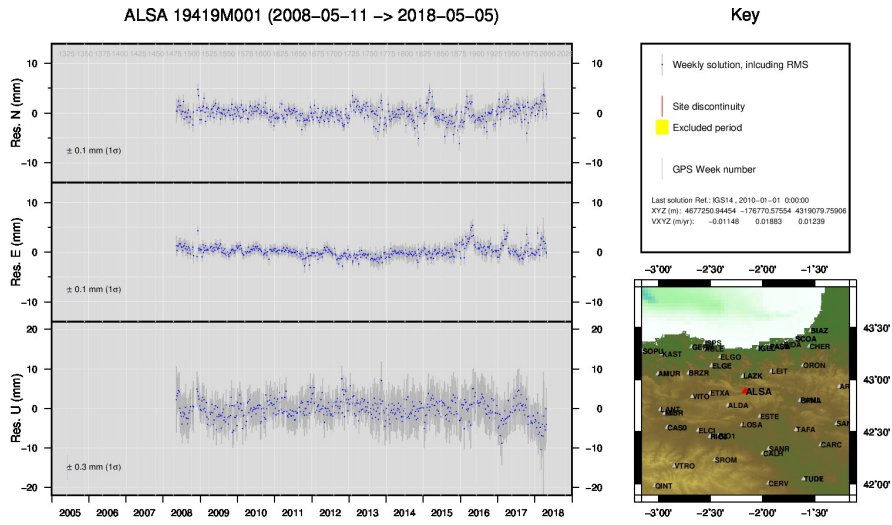
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

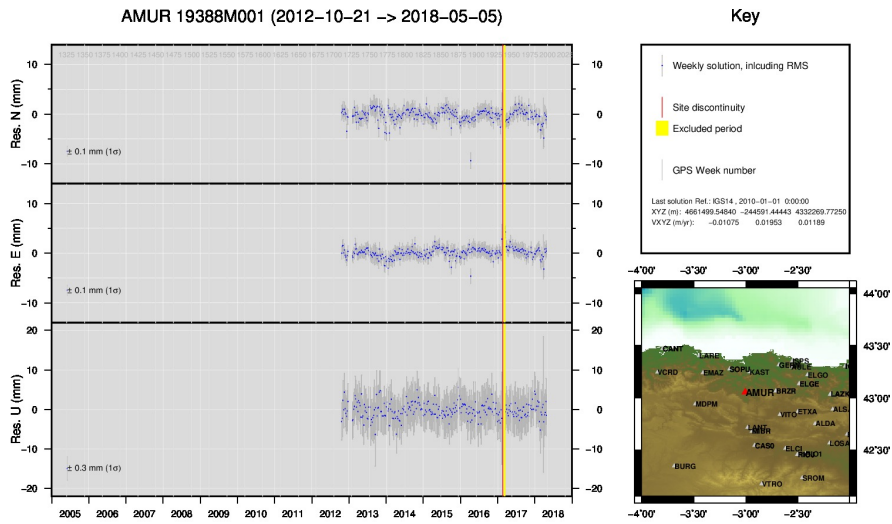


2) ALDA



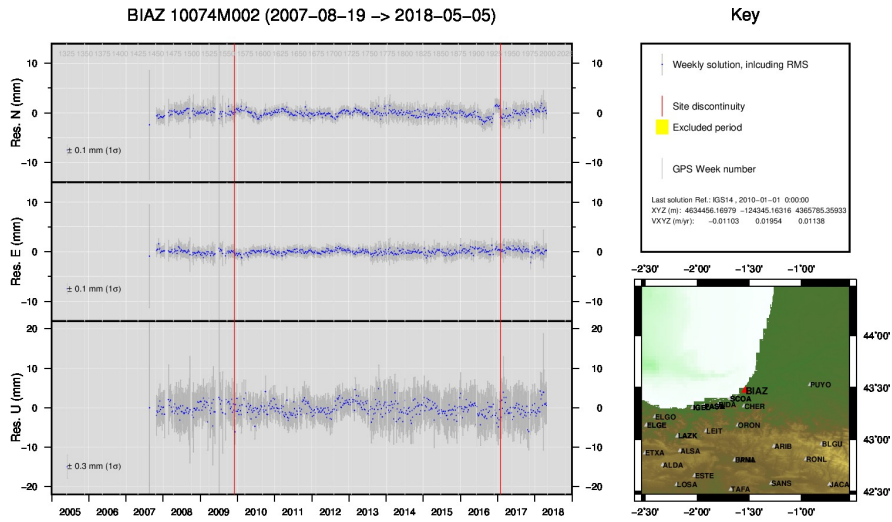
GMW 2018 May 22 19:24:38

3) ALSA



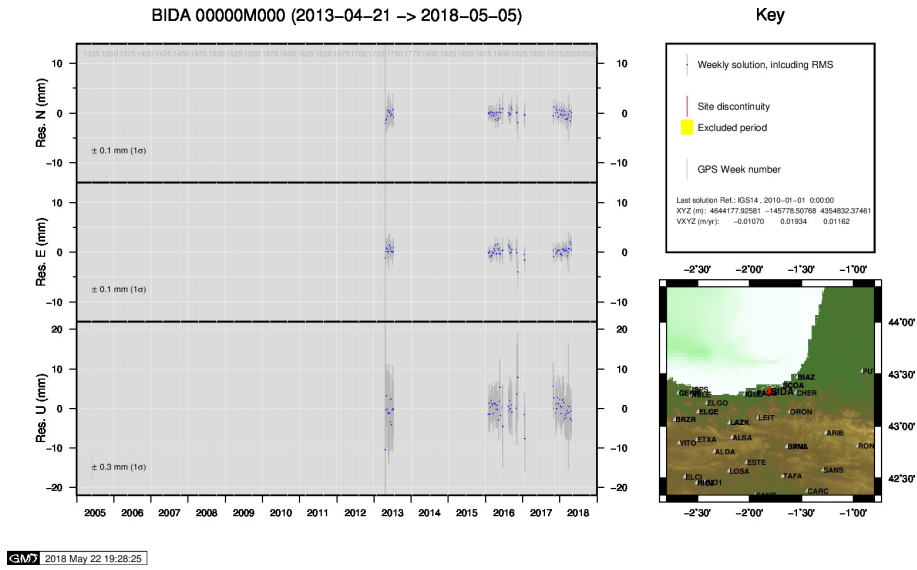
GMW 2018 May 22 19:24:51

4) AMUR

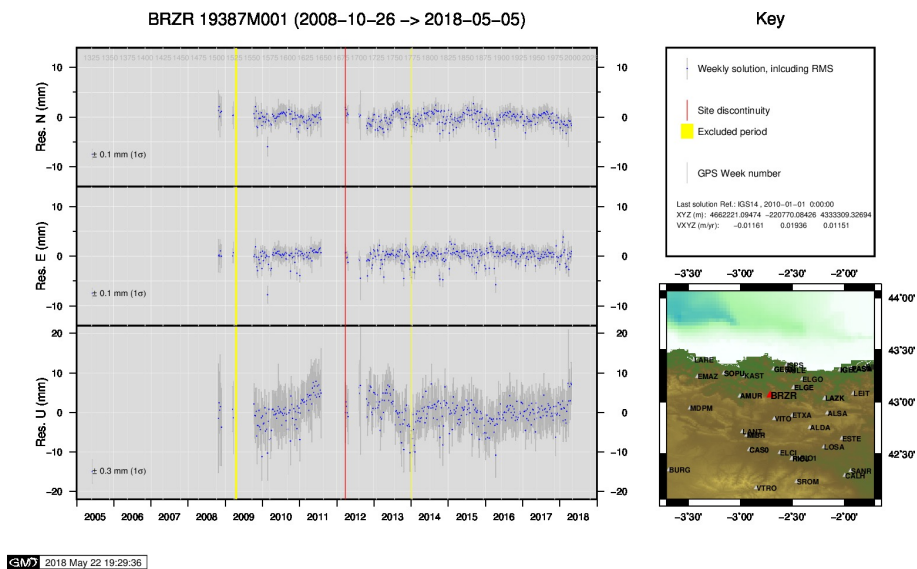


GMW 2018 May 22 19:28:18

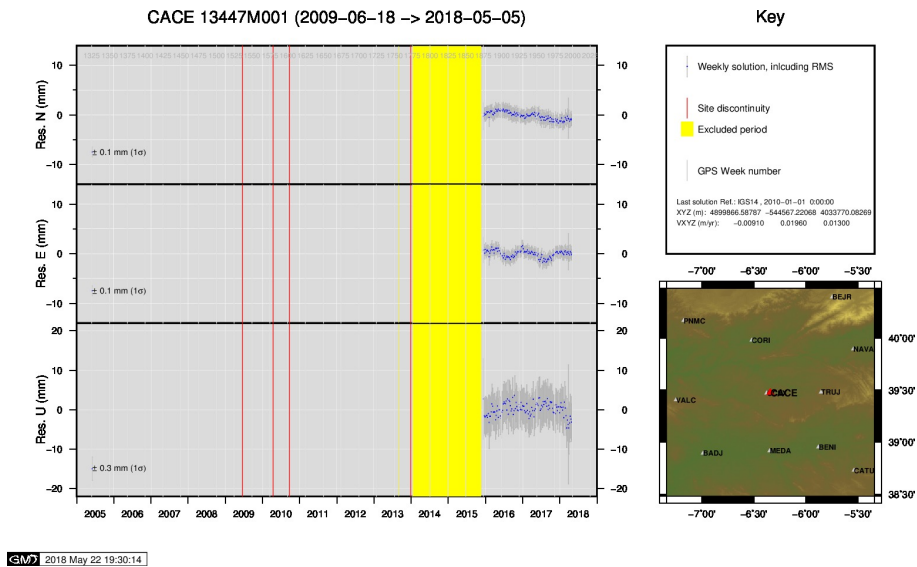
5) BIAZ



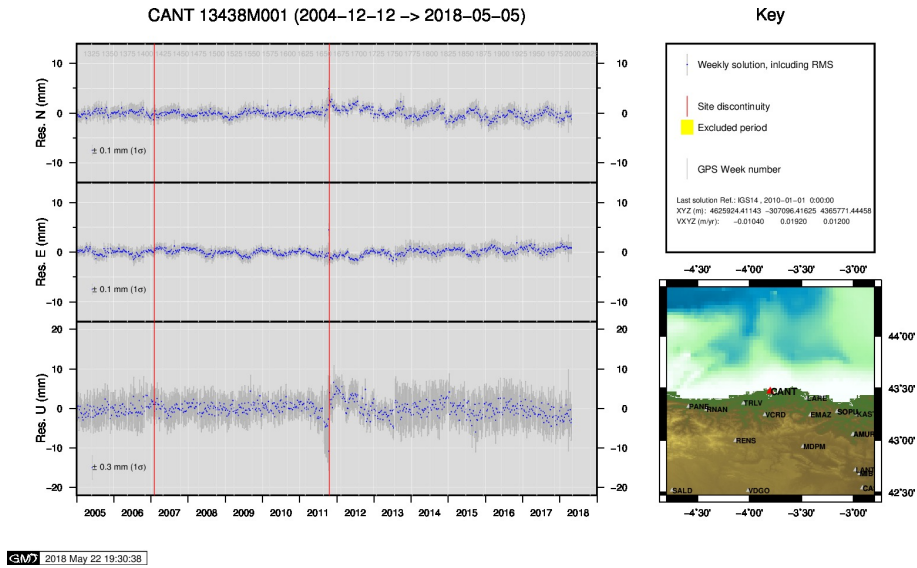
6) BIDA



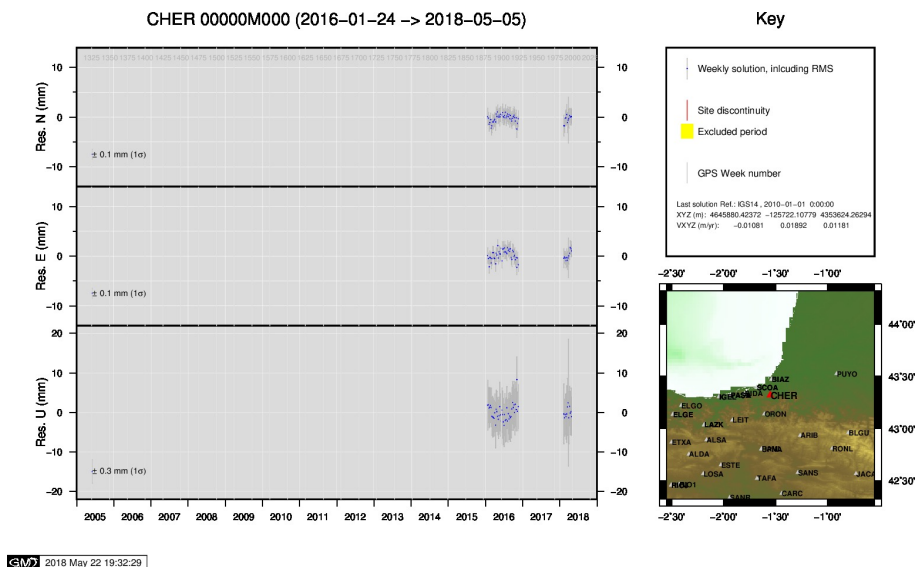
7) BRZR



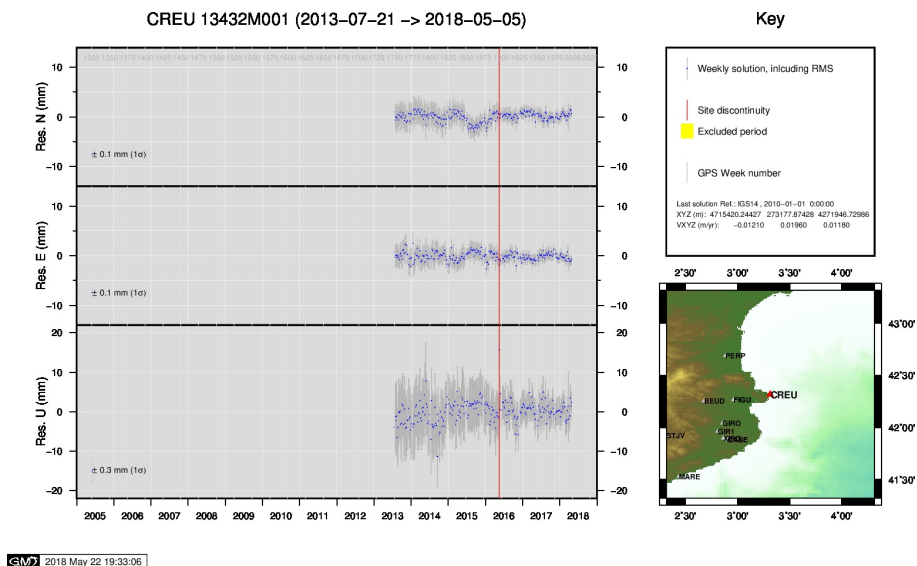
8) CACE



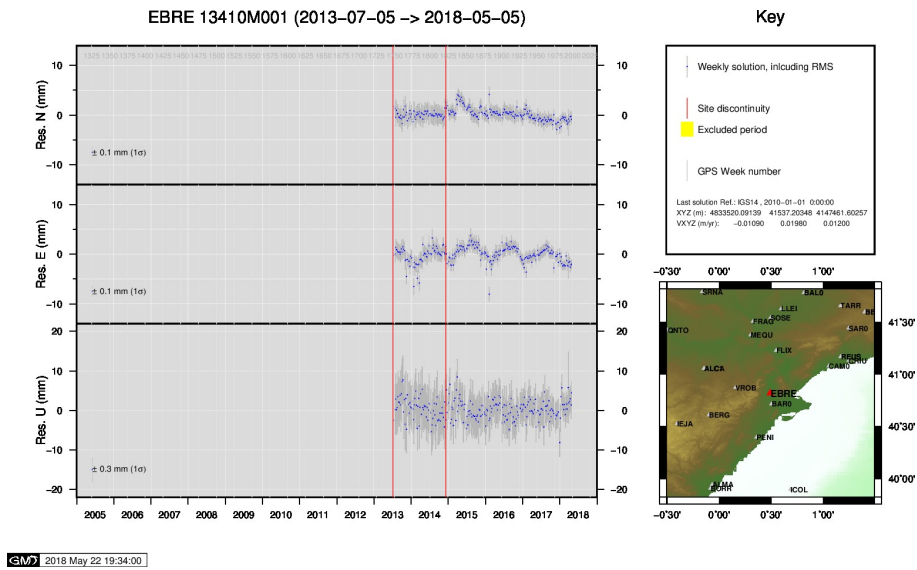
9) CANT



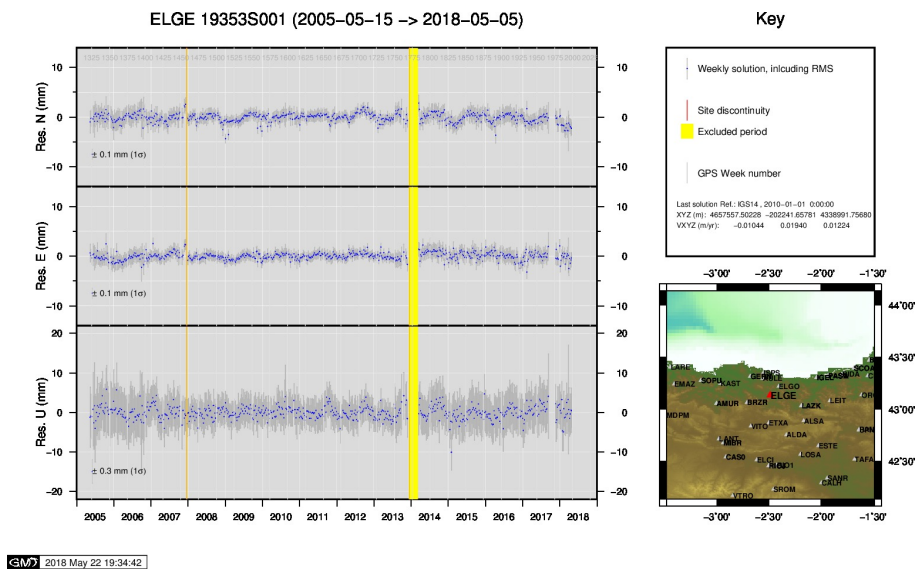
10) CHER



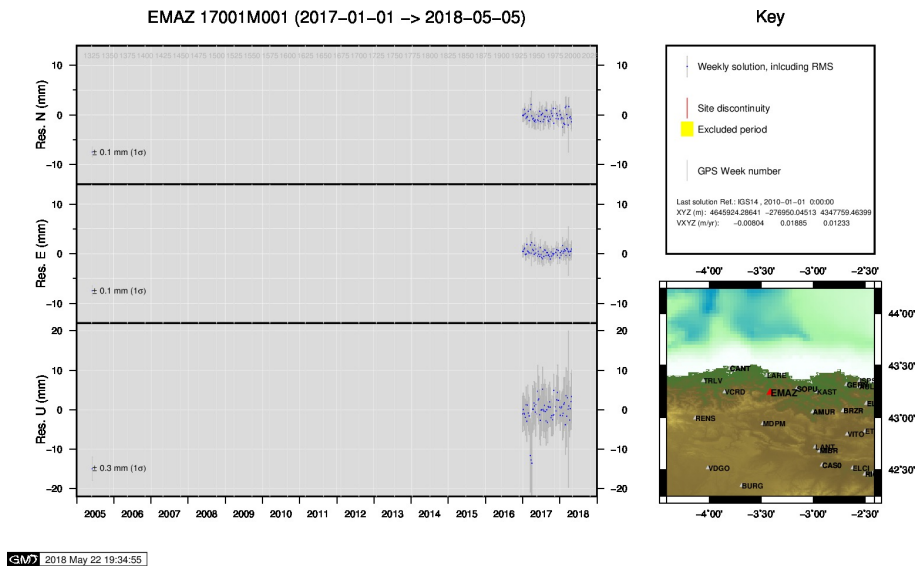
11) CREU



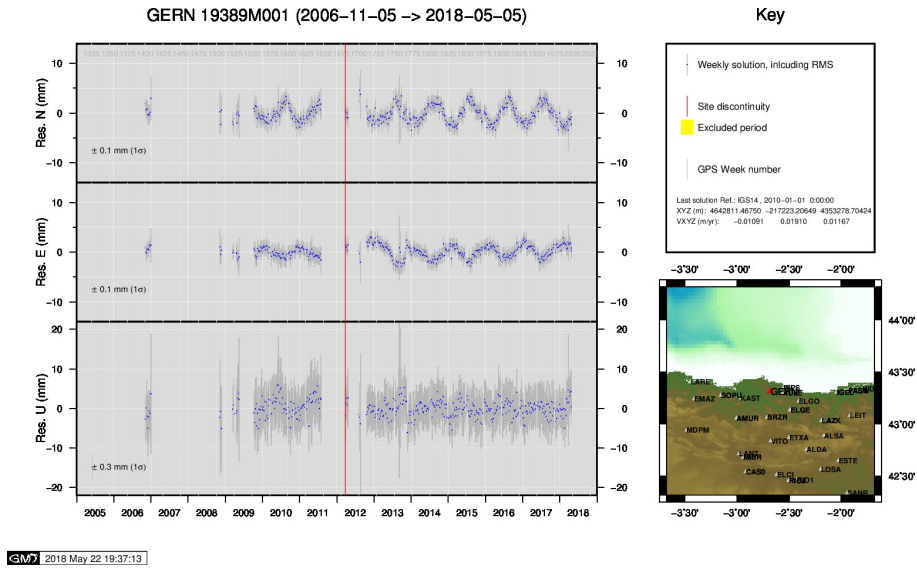
12) EBRE



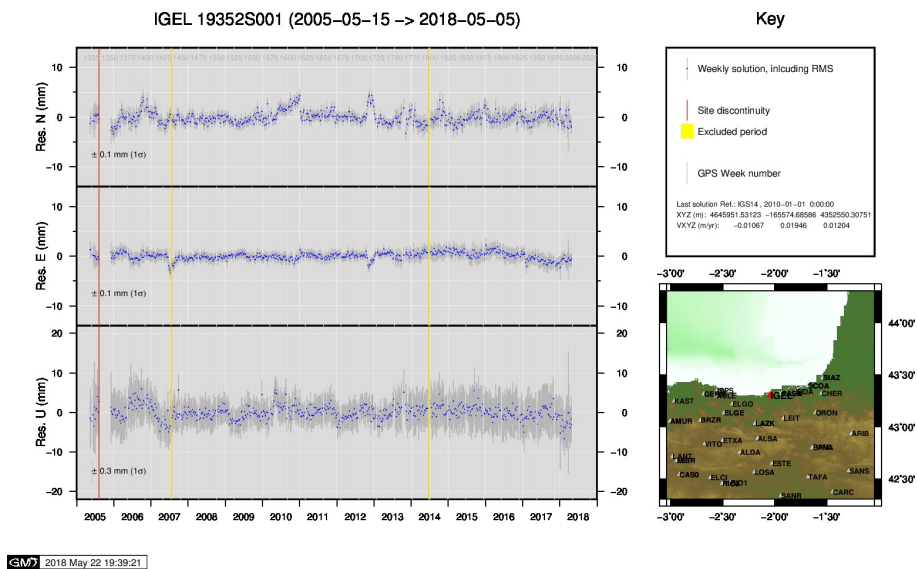
13) ELGE



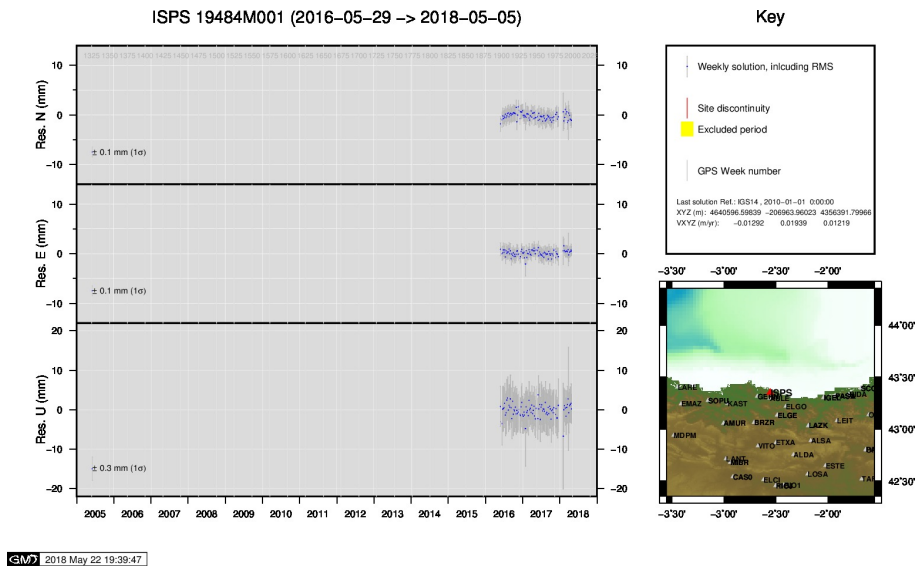
14) EMAZ



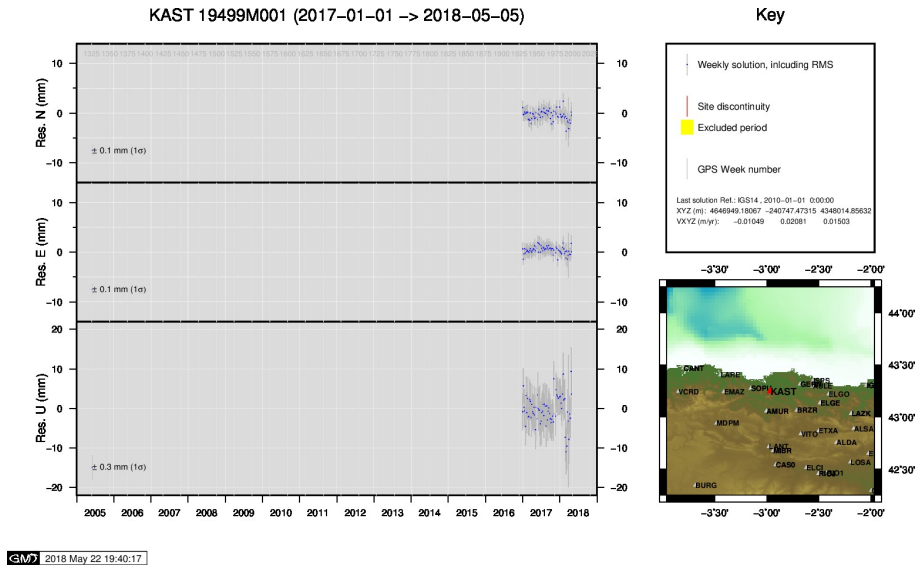
15) GERN



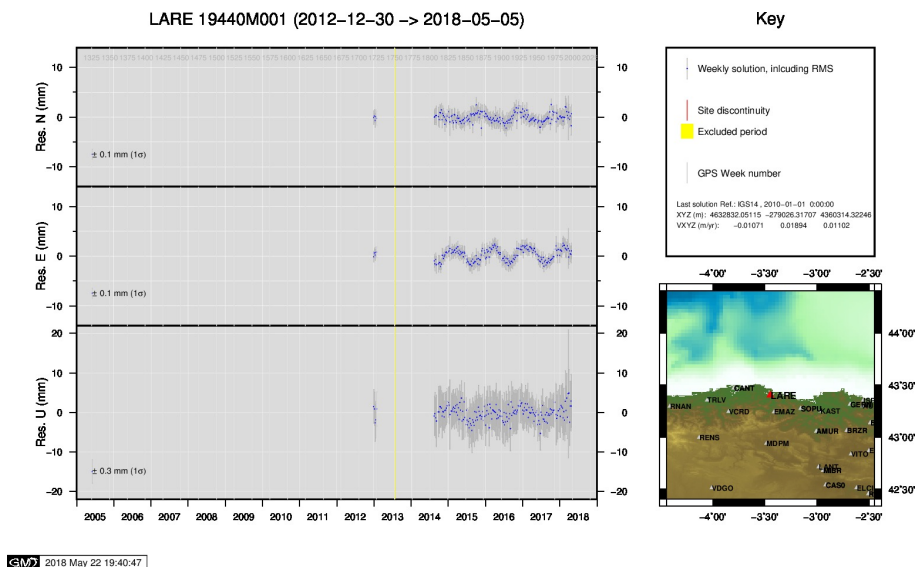
16) IGEL



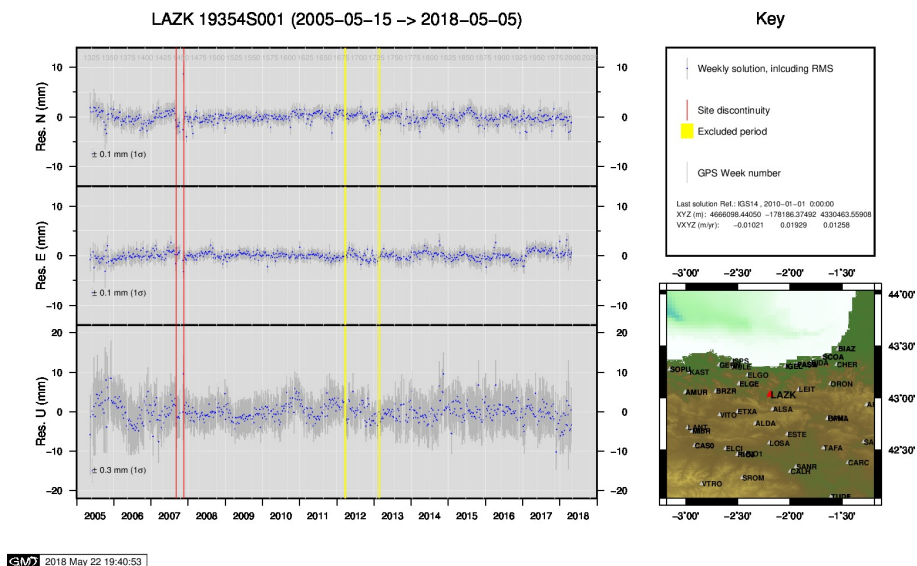
17) ISPS



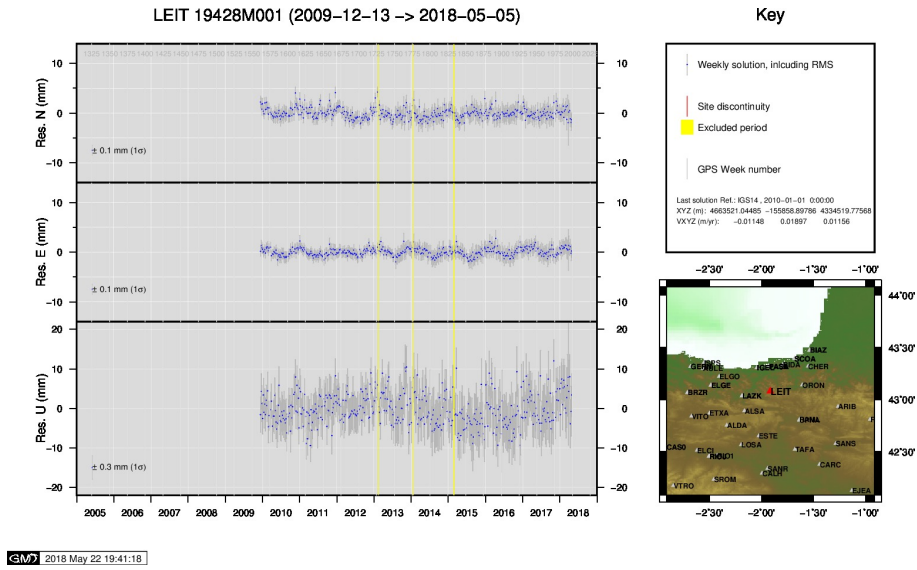
18) KAST



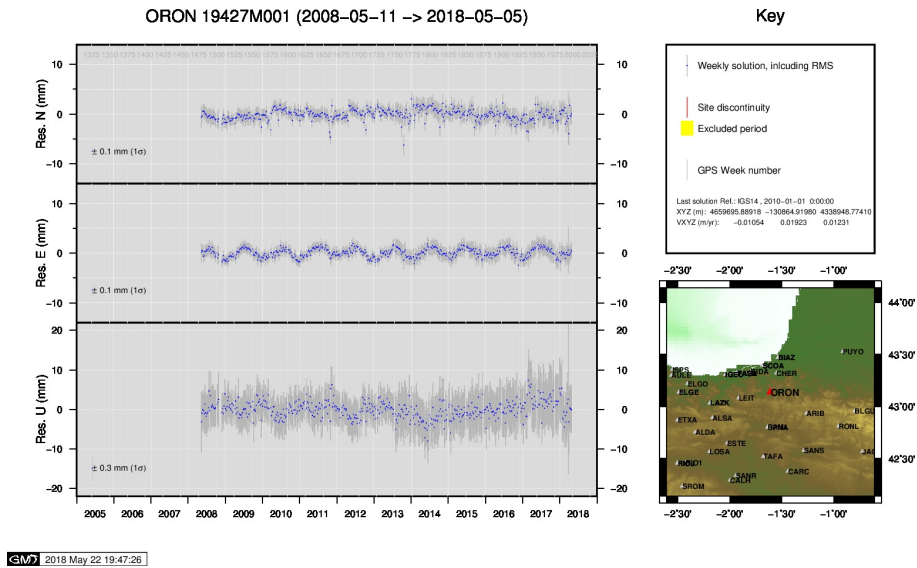
19) LARE



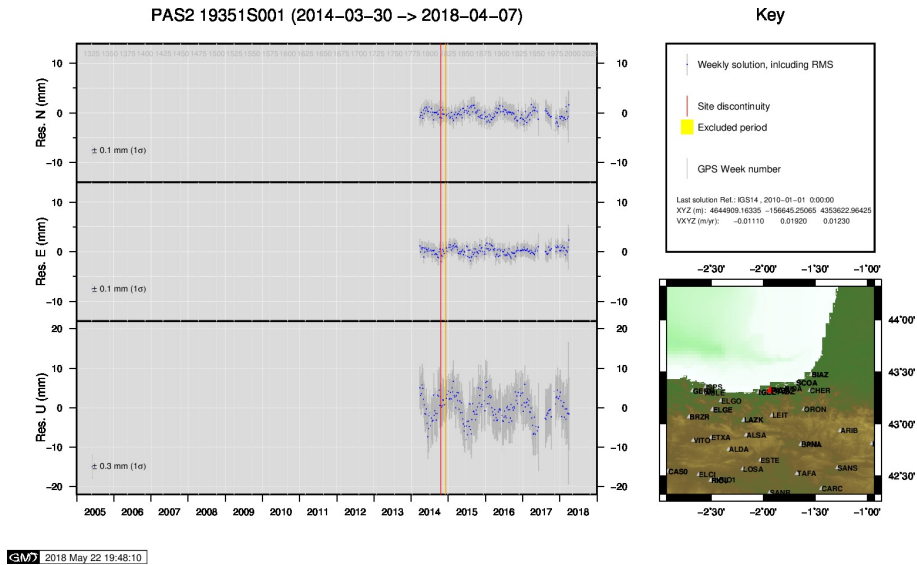
20) LAZK



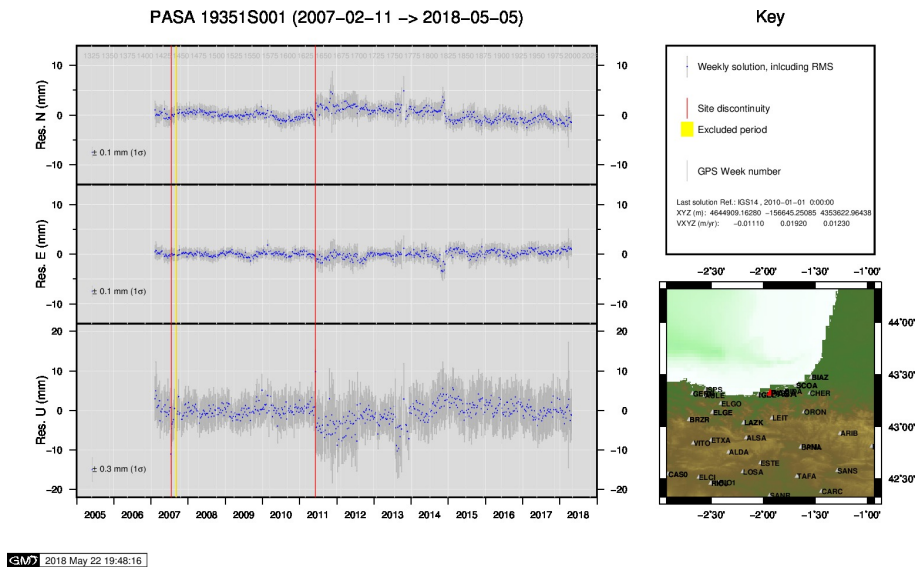
21) LEIT



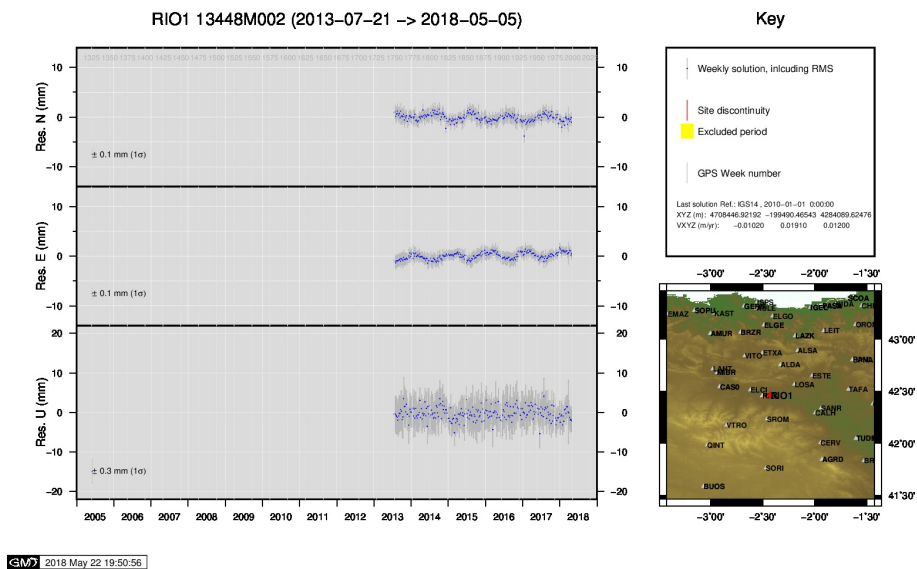
22) ORON



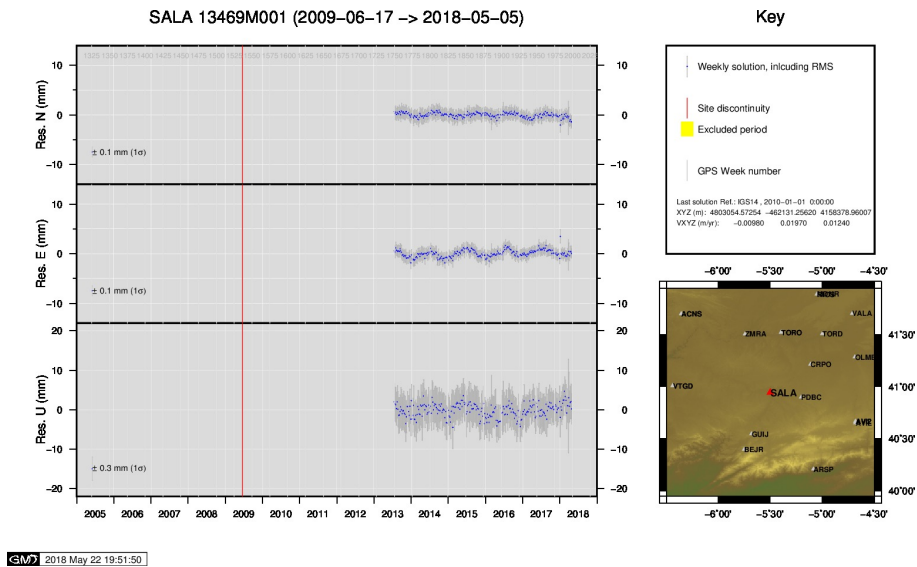
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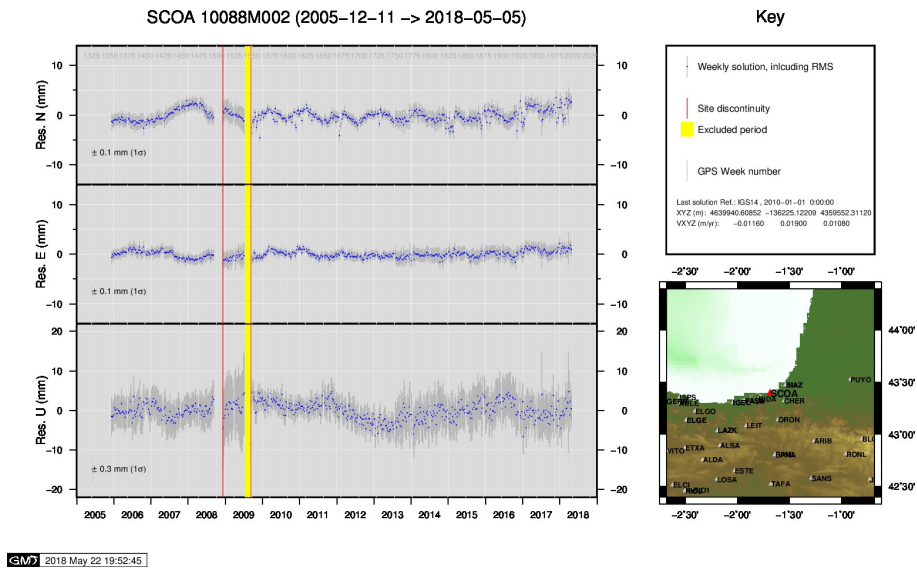
24) PASA



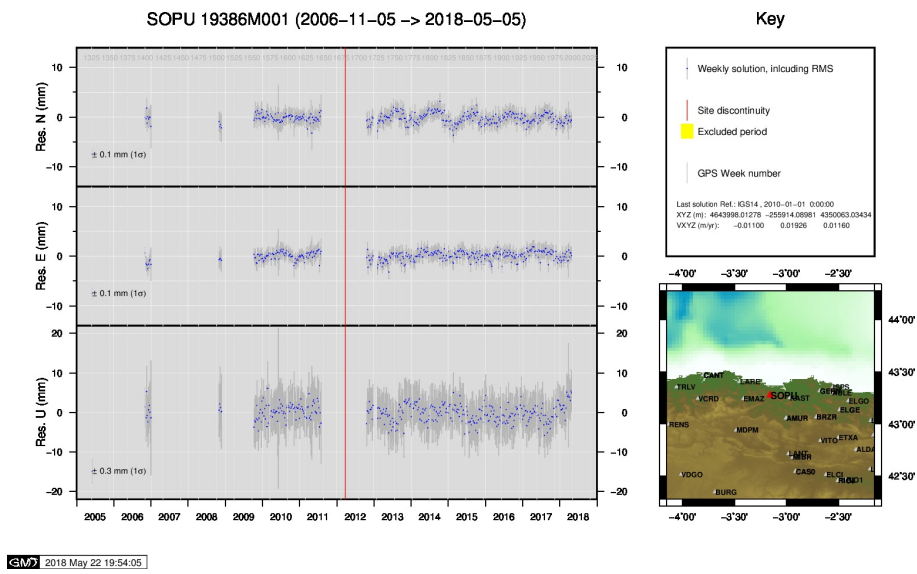
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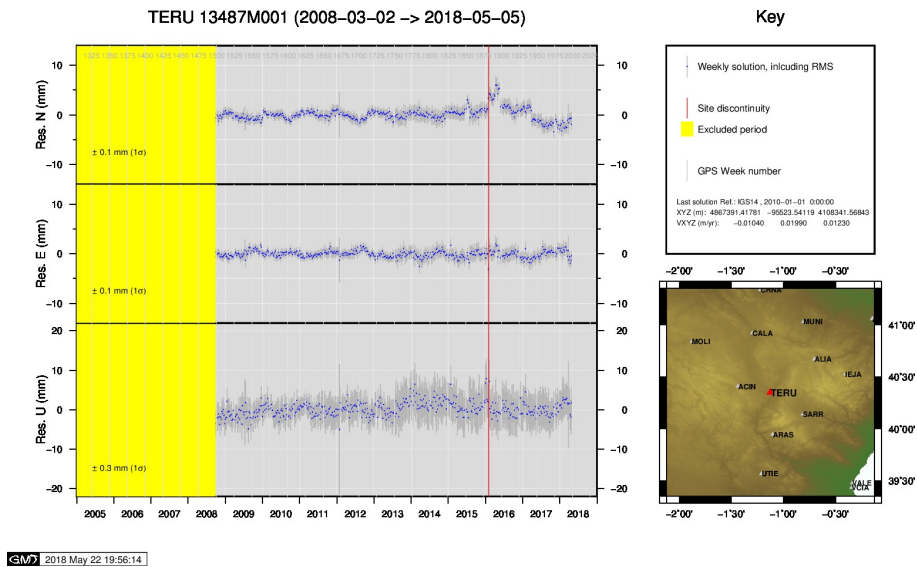
26) SALA



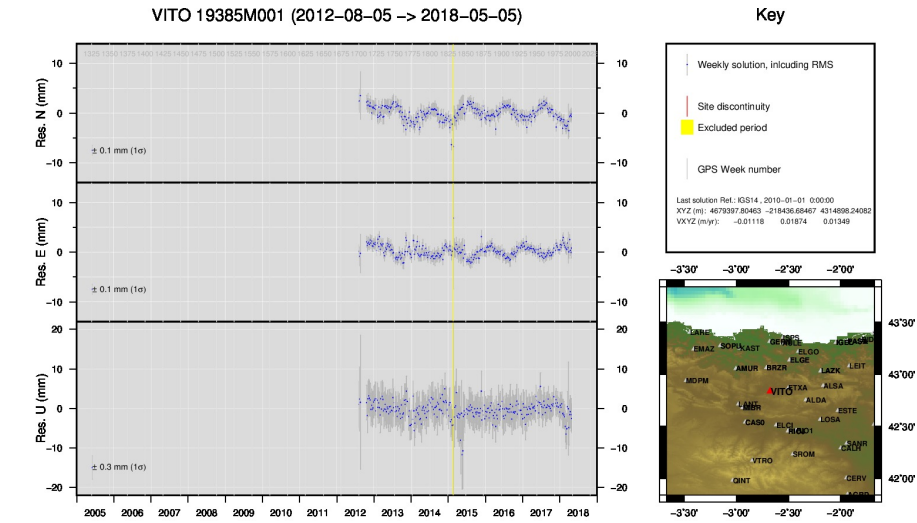
27) SCOA



28) SOPU

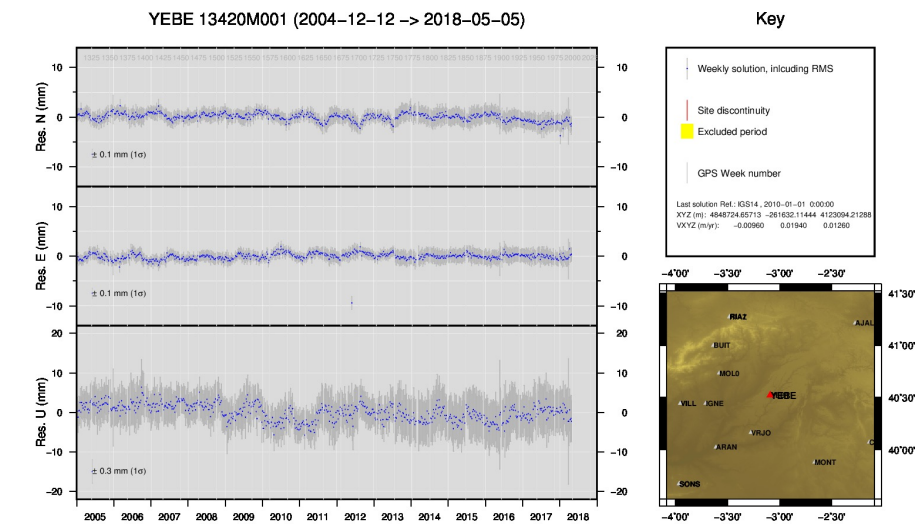


29) TERU



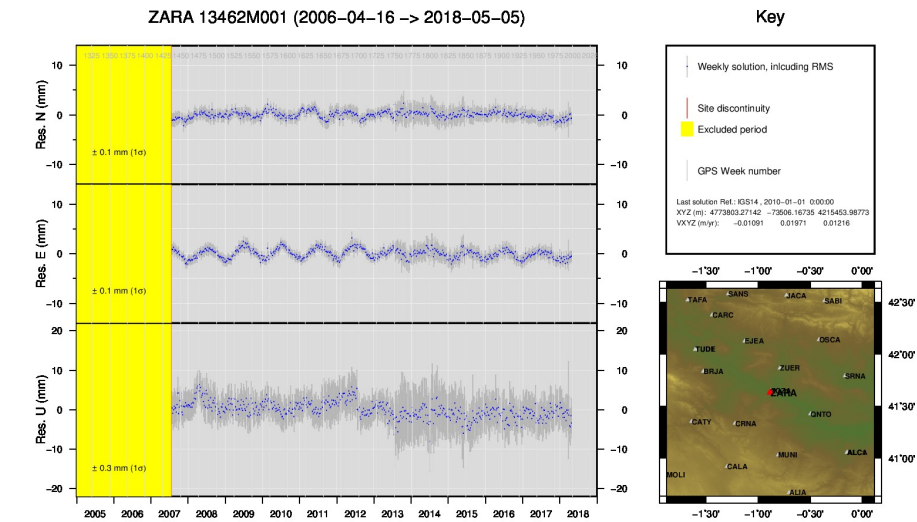
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30) VITO



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31) YEBE



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32) ZARA

