

ARA-DAC Weekly Analysis Result: 2014 (GFA)

Technical Report

GPS Week: 2014 (GFA)

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

ARA-DAC details:

Contact person: J. Zurutuza

Contact mail: geodesia@aranzadi.eus

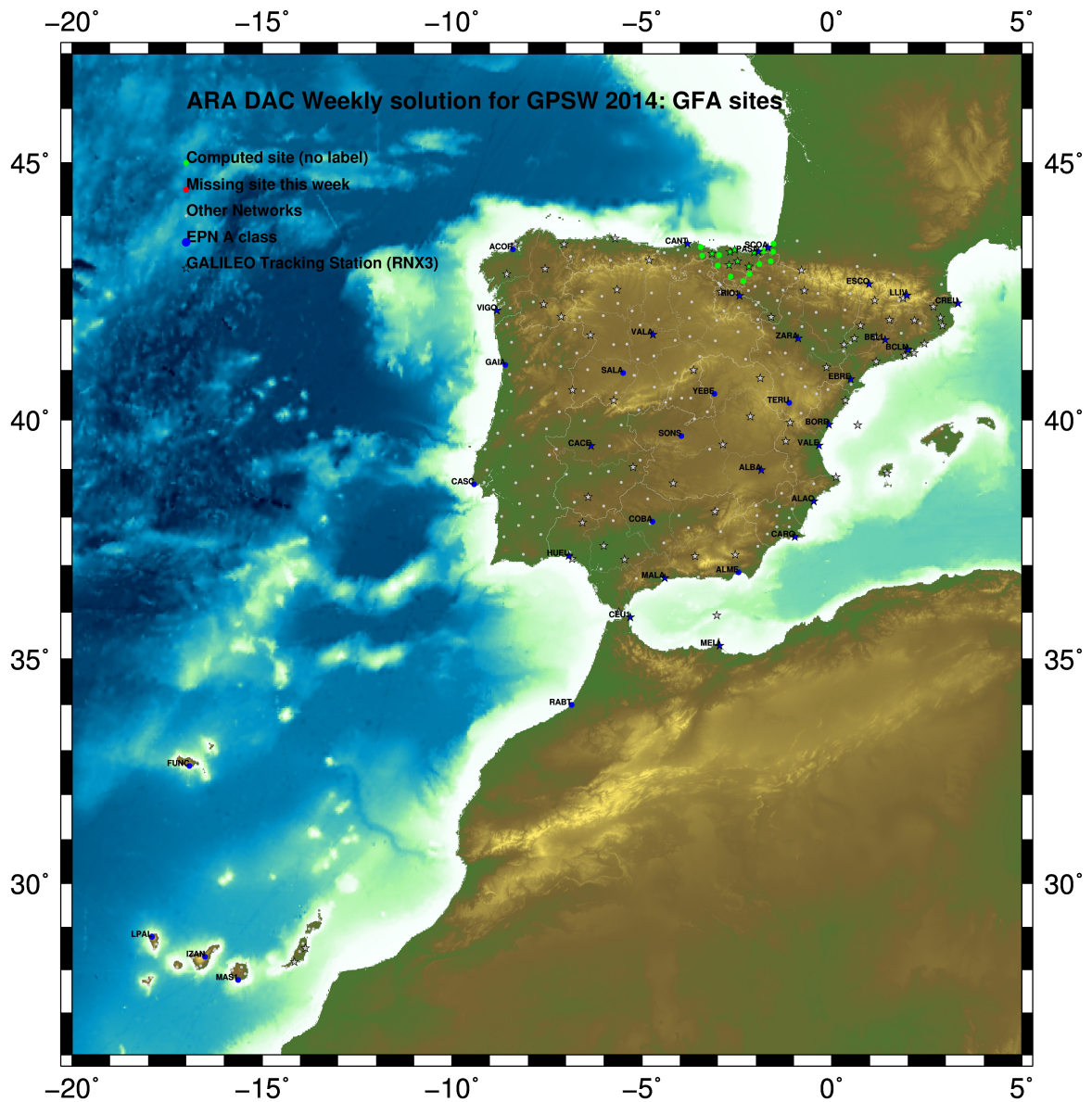
Report generated on 2018/09/04 at 12:25:32



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 Sep 04 12:25:20

Fig.1: Computed Sites for GPS Week2014 (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.

ARA LAC 2014 WEEK FINAL COMBINATION: PRECISE ORBITS					04-SEP-18 08:03
LOCAL GEODETIC DATUM: IGS14					EPOCH: 2018-08-15 12:00:00
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
1	ACOR 13434M001	4594489.56611	-678367.46626	4357066.27727	W
33	ALDA 19383M001	4687280.16479	-190876.58258	4308106.94587	A
42	ALSA 19419M001	4677250.84508	-176770.41360	4319079.86525	A
44	AMUR 19388M001	4661499.45525	-244591.27427	4332269.87449	A
77	BLAZ 10074M002	4634456.06098	-124344.99341	4365785.44922	A
78	BIDA 00000M000	4644177.83217	-145778.33911	4354832.47495	A
88	BRZR 19387M001	4662220.99660	-220769.91690	4333309.42951	A
9	CACE 13447M001	4899866.50797	-544567.05430	4033770.19398	W
10	CANT 13438M001	4625924.32127	-307096.25061	4365771.54925	W
112	CHER 00000M000	4645880.32800	-125721.94312	4353624.36296	A
15	CREU 13432M001	4715420.14062	273178.04385	4271946.83313	W
16	EBRE 13410M001	4833519.99615	41537.37527	4147461.70602	W
131	ELGE 19353S001	4657557.40978	-202241.49023	4338991.86016	A
133	EMAZ 17001M001	4645924.21415	-276949.88210	4347759.57081	A
153	GERN 19389M001	4642811.31673	-217222.95194	4353278.87566	A
173	IGEL 19352S001	4645951.43730	-165574.52006	4352550.40934	A
178	ISPS 19484M001	4640596.48725	-206963.79299	4356391.90413	A
182	KAST 19499M001	4646949.08930	-240747.29343	4348014.98424	A
185	LARE 19440M001	4632831.95878	-279026.15518	4360314.41805	A
186	LAZK 19354S001	4666098.34971	-178186.20748	4330463.66537	A
190	LEIT 19428M001	4663520.94239	-155858.73472	4334519.87234	A
242	ORON 19427M001	4659695.79610	-130864.75277	4338948.87847	A
249	PAS2 19351S001	4644909.06633	-156645.08506	4353623.06943	A
31	PASA 19351S001	4644909.06722	-156645.08497	4353623.06909	W
34	R101 13448M002	4708446.83326	-199490.30045	4284089.72869	W
35	SALA 13469M001	4803054.48859	-462131.08590	4158379.06787	W
36	SCDA 10088M002	4639940.50697	-136224.95784	4359552.40633	W
298	SOPU 19386M001	4643997.91604	-255913.92297	4350063.13482	A
40	TERU 13487M001	4867391.33043	-95523.36961	4108341.67383	W
349	VITO 19385M001	4679397.70724	-218436.52374	4314898.35773	A
44	YEBE 13420M001	4848724.57216	-261631.94676	4123094.31886	W
45	ZARA 13462M001	4773803.17293	-73505.99960	4215454.08596	W

5.2 ETRF2000 (ETRS89) Coordinates

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

ETRF2000 FINAL COORD. wk 2014					04-SEP-18 08:03
LOCAL GEODETIC DATUM: ETRF2000					EPOCH: 2018-08-15 12:00:00
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
1	ACOR 13434M001	4594489.86610	-678367.98862	4357065.87057	W
33	ALDA 19383M001	4687280.51709	-190877.11330	4308106.53814	A
42	ALSA 19419M001	4677251.19972	-176770.94326	4319079.45843	A
44	AMUR 19388M001	4661499.80305	-244591.80252	4332269.46803	A
77	BLAZ 10074M002	4634456.42473	-124345.51857	4365785.04618	A
78	BIDA 00000M000	4644178.19274	-145778.86532	4354832.07094	A
88	BRZR 19387M001	4662221.34719	-220770.44517	4333309.02328	A
9	CACE 13447M001	4899866.80144	-544567.60719	4033769.76627	W
10	CANT 13438M001	4625924.66420	-307096.77541	4365771.14468	W
112	CHER 00000M000	4645880.69077	-125722.46945	4353623.95906	A
15	CREU 13432M001	4715420.54325	273177.51189	4271946.42870	W
16	EBRE 13410M001	4833520.36406	41536.83056	4147461.29017	W
131	ELGE 19353S001	4657557.76286	-202242.01797	4338991.45450	A
133	EMAZ 17001M001	4645924.55931	-276950.40887	4347759.16513	A
153	GERN 19389M001	4642811.66906	-217223.47822	4353278.47091	A
173	IGEL 19352S001	4645951.79547	-165575.04651	4352550.00496	A
178	ISPS 19484M001	4640596.84096	-206964.31902	4356391.49966	A
182	KAST 19499M001	4646949.43860	-240747.82020	4348014.57891	A
185	LARE 19440M001	4632832.30454	-279026.68061	4360314.01330	A
186	LAZK 19354S001	4666098.70495	-178186.73601	4330463.25936	A
190	LEIT 19428M001	4663521.30045	-155859.26293	4334519.46678	A
242	ORON 19427M001	4659696.15730	-130865.28051	4338948.47349	A
249	PAS2 19351S001	4644909.42558	-156645.61138	4353622.66524	A
31	PASA 19351S001	4644909.42647	-156645.61129	4353622.66490	W
34	R101 13448M002	4708447.18296	-199490.83333	4284089.31929	W
35	SALA 13469M001	4803054.79988	-462131.62895	4158378.64834	W
36	SCDA 10088M002	4639940.86895	-136225.48360	4359552.00274	W
298	SOPU 19386M001	4643998.26375	-255914.44947	4350062.72952	A
40	TERU 13487M001	4867391.68011	-95523.91818	4108341.25387	W
349	VITO 19385M001	4679398.05685	-218437.05374	4314897.95026	A
44	YEBE 13420M001	4848724.90393	-261632.49393	4123093.89834	W
45	ZARA 13462M001	4773803.53235	-73506.53870	4215453.67320	W

5.3 ETRF2014 (ETRS89) Coordinates

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

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ETRF2014 FINAL COORD. wk 2014                                04-SEP-18 08:03
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LOCAL GEODETIC DATUM: ETRF2014                EPOCH: 2018-08-15 12:00:00
NUM STATION NAME          X (M)          Y (M)          Z (M)          FLAG
1  ACDR 13434M001        4594489.82336      -678368.02751    4357065.91862    W
33 ALDA 19383M001        4687280.47221      -190877.15350    4308106.58610    A
42 ALSA 19419M001        4677251.15490      -176770.98354    4319079.50641    A
44 AMUR 19388M001        4661499.75857      -244591.84263    4332269.51603    A
77 BIAZ 10074M002        4634456.38016      -124345.55919    4365785.09429    A
78 BIDA 00000M000        4644178.14814      -145778.90583    4354832.11901    A
88 BRZR 19387M001        4662221.30264      -220770.48535    4333309.07128    A
9  CACE 13447M001        4899866.75536      -544567.64538    4033769.81368    W
10 CANT 13438M001        4625924.62024      -307096.81544    4365771.19274    W
112 CHER 00000M000        4645880.64610      -125722.51001    4353624.00714    A
15 CREU 13432M001        4715420.49660      273177.47026    4271946.47688    W
16 EBRE 13410M001        4833520.31702      41536.79014    4147461.33793    W
131 ELGE 19353S001        4657557.71830      -202242.05824    4338991.50251    A
133 EMAZ 17001M001        4645924.51508      -276950.44893    4347759.21314    A
153 GERN 19389M001        4642811.62468      -217223.51849    4353278.51896    A
173 IGEL 19352S001        4645951.75091      -165575.08695    4352550.05303    A
178 ISPS 19484M001        4640596.79657      -206964.35933    4356391.54772    A
182 KAST 19499M001        4646949.39425      -240747.86037    4348014.62693    A
185 LARE 19440M001        4632832.26043      -279026.72071    4360314.06135    A
186 LAZK 19354S001        4666098.66024      -178186.77633    4330463.30737    A
190 LEIT 19428M001        4663521.25570      -155859.30333    4334519.51481    A
242 ORON 19427M001        4659696.11251      -130865.32101    4338948.52153    A
249 PAS2 19351S001        4644909.38101      -156645.65185    4353622.71331    A
31 PASA 19351S001        4644909.38190      -156645.65176    4353622.71297    W
34 RIO1 13448M002        4708447.13790      -199490.87341    4284089.36720    W
35 SALA 13469M001        4803054.75460      -462131.66779    4158378.69596    W
36 SOGA 10088M002        4639940.82436      -136225.52415    4359552.05083    W
298 SOPU 19386M001        4643998.21947      -255914.48961    4350062.77755    A
40 TERU 13487M001        4867391.63316      -95523.95800    4108341.30149    W
349 VITO 19385M001        4679398.01213      -218437.09387    4314897.99822    A
44 YEBE 13420M001        4848724.85765      -261632.53327    4123093.94591    W
45 ZARA 13462M001        4773803.48626      -73506.57895    4215453.72102    W

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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 2014 WEEK FINAL COMBINATION: PRECISE ORBITS 04-SEP-18 08:03

Station	#Days	Weekday 0123456	Repeatability (mm)		
			N	E	U
ACOR 13434M001	7	XXXXXX	0.90	1.02	5.35
ALDA 19383M001	7	XXXXXX	2.92	1.92	3.93
ALSA 19419M001	7	XXXXXX	2.46	0.69	2.21
AMUR 19388M001	7	XXXXXX	0.66	1.24	3.38
BLAZ 10074M002	7	XXXXXX	1.88	1.49	4.88
BIDA 00000M000	7	XXXXXX	1.08	1.44	4.46
BRZR 19387M001	7	XXXXXX	1.47	0.79	4.98
CACE 13447M001	7	XXXXXX	1.33	1.16	2.35
CANT 13438M001	7	XXXXXX	1.07	1.56	2.20
CHER 00000M000	7	XXXXXX	1.63	1.05	4.22
CREU 13432M001	7	XXXXXX	1.00	0.59	2.92
EBRE 13410M001	7	XXXXXX	0.88	0.49	5.69
ELGE 19353S001	7	XXXXXX	0.67	0.58	2.46
EMAZ 17001M001	7	XXXXXX	1.22	1.22	3.70
GERN 19389M001	7	XXXXXX	0.79	1.34	2.68
IGEL 19352S001	7	XXXXXX	1.27	1.17	4.51
ISPS 19484M001	7	XXXXXX	0.62	0.96	3.67
KAST 19499M001	7	XXXXXX	1.04	1.55	3.33
LARE 19440M001	7	XXXXXX	1.01	0.60	3.51
LAZK 19354S001	7	XXXXXX	1.17	0.79	2.72
LEIT 19428M001	7	XXXXXX	2.33	1.83	7.66
ORON 19427M001	7	XXXXXX	1.30	0.80	3.31
PAS2 19351S001	6	XXXXXX	1.25	1.46	4.15
PASA 19351S001	7	XXXXXX	1.53	1.68	4.51
RI01 13448M002	7	XXXXXX	2.12	1.32	4.54
SALA 13469M001	7	XXXXXX	0.76	0.68	3.51
SCOA 10088M002	7	XXXXXX	1.03	1.68	4.92
SOPU 19386M001	7	XXXXXX	1.05	1.01	3.22
TERU 13487M001	7	XXXXXX	2.00	1.40	4.48
VITD 19385M001	7	XXXXXX	1.67	1.60	3.46
YEBE 13420M001	7	XXXXXX	0.97	1.46	4.25
ZARA 13462M001	7	XXXXXX	0.85	1.35	4.52

Comparison of individual solutions:

ACOR 13434M001	N	0.90	0.74	-0.97	1.34	0.21	0.17	-0.82	0.88
ACOR 13434M001	E	1.02	-0.30	0.35	0.62	1.83	0.61	0.11	-1.36
ACOR 13434M001	U	5.35	2.43	4.81	-7.55	-5.28	2.47	6.82	2.23
ALDA 19383M001	N	2.92	-5.20	2.32	0.94	-1.36	-0.80	3.86	-0.62
ALDA 19383M001	E	1.92	2.94	-1.23	-0.70	1.76	0.30	-2.82	0.53
ALDA 19383M001	U	3.93	5.60	-2.33	-2.88	6.86	0.36	0.49	0.33
ALSA 19419M001	N	2.46	-4.72	1.19	-1.32	0.68	-0.75	2.73	1.49
ALSA 19419M001	E	0.69	0.58	-0.49	0.29	0.86	0.61	-0.50	-0.90
ALSA 19419M001	U	2.21	0.54	-0.42	3.88	-1.60	-0.88	2.36	2.22
AMUR 19388M001	N	0.66	0.14	-0.30	0.23	0.40	-1.04	-1.10	0.11
AMUR 19388M001	E	1.24	-0.89	0.25	1.26	-2.04	0.24	1.57	-0.29
AMUR 19388M001	U	3.38	2.38	3.35	3.78	-2.82	-3.80	-2.91	2.53
BLAZ 10074M002	N	1.88	3.82	0.84	-0.26	0.76	-1.22	-0.12	-1.91
BLAZ 10074M002	E	1.49	0.73	0.16	1.65	-2.62	-0.19	1.31	1.22
BLAZ 10074M002	U	4.88	-8.87	4.32	1.25	-0.30	-0.30	-6.06	-2.65
BIDA 00000M000	N	1.08	2.50	0.45	-0.38	-0.51	-0.42	0.05	0.14
BIDA 00000M000	E	1.44	1.74	0.63	1.01	-2.70	0.61	0.42	0.37
BIDA 00000M000	U	4.46	-8.34	-0.34	1.67	2.24	0.86	-5.51	-3.27
BRZR 19387M001	N	1.47	-2.09	0.13	-0.42	0.07	0.94	-2.17	1.68
BRZR 19387M001	E	0.79	1.32	0.89	0.81	-0.46	0.04	0.43	0.37
BRZR 19387M001	U	4.98	-0.48	-1.62	6.59	4.78	-7.29	1.66	4.88
CACE 13447M001	N	1.33	0.29	-1.18	2.64	1.03	-0.24	-1.06	-0.06
CACE 13447M001	E	1.16	-1.84	0.99	0.81	-0.08	0.95	-0.96	1.13
CACE 13447M001	U	2.35	-1.48	-2.42	2.18	-0.19	-4.08	-1.86	-0.33
CANT 13438M001	N	1.07	2.05	-0.62	-0.44	0.85	1.01	-0.38	-0.46
CANT 13438M001	E	1.56	1.87	-0.51	0.69	-3.09	0.93	-0.20	0.11
CANT 13438M001	U	2.20	-2.98	1.63	1.24	2.67	0.02	1.46	-2.59
CHER 00000M000	N	1.63	3.20	0.66	-0.51	1.21	-1.03	-1.50	-0.35
CHER 00000M000	E	1.05	1.01	-0.80	0.61	-1.25	0.70	0.34	1.56
CHER 00000M000	U	4.22	-7.37	-0.41	1.10	0.75	-0.27	0.88	-7.06
CREU 13432M001	N	1.00	-0.51	0.19	-1.11	-1.34	1.07	0.30	-1.19
CREU 13432M001	E	0.59	0.15	0.48	-0.48	0.48	0.05	-1.12	0.30
CREU 13432M001	U	2.92	2.44	1.73	-3.13	-3.67	-1.13	-2.12	3.65
EBRE 13410M001	N	0.88	-0.44	0.36	0.86	-1.14	-0.65	-1.36	0.13
EBRE 13410M001	E	0.49	0.53	-0.15	-0.25	-0.90	0.34	0.10	-0.35
EBRE 13410M001	U	5.69	5.52	-2.84	8.97	0.53	-7.38	-1.90	-4.11
ELGE 19353S001	N	0.67	-0.80	-0.42	-0.13	-1.02	0.73	-0.44	0.30
ELGE 19353S001	E	0.58	0.30	0.43	0.47	0.47	0.08	0.91	0.71
ELGE 19353S001	U	2.46	0.14	0.28	4.57	3.47	-0.87	1.09	1.13
EMAZ 17001M001	N	1.22	-0.04	-2.03	-0.48	-1.19	1.67	-0.14	-0.58
EMAZ 17001M001	E	1.22	-0.94	2.01	-0.40	0.47	-0.31	-1.00	-1.60
EMAZ 17001M001	U	3.70	-1.23	-3.92	0.91	-1.47	-5.30	5.32	2.40
GERN 19389M001	N	0.79	0.89	0.70	-0.74	-0.68	-0.45	-0.61	-0.93
GERN 19389M001	E	1.34	-0.20	0.12	0.94	0.00	0.54	3.06	-0.41
GERN 19389M001	U	2.68	2.18	2.29	3.24	1.86	-3.78	2.09	0.62
IGEL 19352S001	N	1.27	2.71	-0.54	-0.93	0.58	-0.28	-0.35	0.75
IGEL 19352S001	E	1.17	0.99	0.39	0.63	-2.18	0.82	1.07	0.37
IGEL 19352S001	U	4.51	-9.09	-1.99	2.51	1.69	1.24	-2.08	-4.55
ISPS 19484M001	N	0.62	0.36	-0.35	-1.12	-0.68	-0.26	-0.32	0.39
ISPS 19484M001	E	0.96	1.32	-0.46	-0.01	1.79	-0.13	0.16	0.60
ISPS 19484M001	U	3.67	-1.29	-2.77	5.84	1.37	-1.84	3.49	4.46
KAST 19499M001	N	1.04	-1.05	0.99	0.25	-0.29	-1.60	0.97	-0.84
KAST 19499M001	E	1.55	-2.01	0.54	0.85	-2.30	1.58	1.28	0.07
KAST 19499M001	U	3.33	-1.60	1.01	1.13	-2.89	-3.74	5.50	2.99
LARE 19440M001	N	1.01	0.72	-0.62	-1.43	-0.36	-1.28	-0.78	0.91
LARE 19440M001	E	0.60	-0.51	0.45	0.18	0.12	-0.87	-0.73	-0.61
LARE 19440M001	U	3.51	-0.72	-0.35	0.76	5.06	-6.26	-2.53	1.22
LAZK 19354S001	N	1.17	2.06	-0.97	-0.79	-1.15	-0.70	-0.69	0.20
LAZK 19354S001	E	0.79	-0.32	1.25	-0.25	0.24	0.48	0.94	0.93

LAZK	19354S001	U	2.72	4.31	3.47	2.21	0.98	2.01	-1.86	-0.77
LEIT	19428M001	N	2.33	4.67	1.78	-1.50	-1.35	-0.59	-1.68	0.55
LEIT	19428M001	E	1.83	2.77	0.31	-0.56	-3.02	0.03	0.95	1.45
LEIT	19428M001	U	7.66	-15.98	-0.98	6.37	2.88	3.29	-3.49	-4.91
ORDN	19427M001	N	1.30	2.66	0.51	0.16	-0.15	-0.58	-1.49	0.37
ORDN	19427M001	E	0.80	0.94	0.18	0.28	-0.92	-0.32	1.03	0.94
ORDN	19427M001	U	3.31	-3.72	-3.24	0.57	1.22	-0.24	0.04	-6.29
PAS2	19351S001	N	1.25		1.23	-2.06	0.63	-1.10	-0.44	0.42
PAS2	19351S001	E	1.46		0.17	1.48	-2.72	0.78	0.35	0.54
PAS2	19351S001	U	4.15		3.45	-0.11	2.00	0.54	-2.21	-8.07
PASA	19351S001	N	1.53	3.09	0.58	-1.50	0.77	-0.65	-0.89	0.35
PASA	19351S001	E	1.68	1.88	0.85	0.28	-3.27	0.67	1.08	0.58
PASA	19351S001	U	4.51	-9.33	-0.62	1.49	2.46	0.49	-2.71	-4.33
RID1	13448M002	N	2.12	4.44	-1.03	-0.16	1.49	-1.25	-1.46	-0.54
RID1	13448M002	E	1.32	0.57	-0.39	0.06	-2.83	0.59	0.52	1.12
RID1	13448M002	U	4.54	-9.07	1.31	4.81	2.84	2.68	0.99	-0.58
SALA	13469M001	N	0.76	0.69	0.25	-0.42	-0.55	-0.30	0.33	-1.51
SALA	13469M001	E	0.68	-1.11	0.72	-0.40	0.33	0.35	-0.17	-0.75
SALA	13469M001	U	3.51	6.16	1.59	-3.11	2.51	-1.27	-0.69	-3.91
SCDA	10088M002	N	1.03	1.85	-0.38	0.88	0.79	-1.18	-0.11	-0.15
SCDA	10088M002	E	1.68	2.27	0.45	0.23	-3.01	0.20	1.48	0.48
SCDA	10088M002	U	4.92	-7.62	-0.38	5.62	3.99	-1.89	-4.52	-3.93
SOPU	19386M001	N	1.05	1.76	-0.12	-0.44	-0.80	-0.60	-1.52	-0.17
SOPU	19386M001	E	1.01	-0.34	1.79	-0.13	0.17	0.17	0.06	1.66
SOPU	19386M001	U	3.22	-1.60	-1.88	6.18	2.49	0.28	1.06	3.22
TERU	13487M001	N	2.00	-2.32	3.84	0.34	-1.36	1.07	0.88	0.14
TERU	13487M001	E	1.40	0.63	-0.80	0.26	2.46	-1.99	-0.51	0.61
TERU	13487M001	U	4.48	3.29	1.62	-2.18	-6.03	4.82	-6.53	-0.06
VITO	19385M001	N	1.67	3.49	0.82	-0.01	0.78	-1.00	-0.76	-1.29
VITO	19385M001	E	1.60	0.45	-0.94	1.76	-2.89	0.11	0.91	1.38
VITO	19385M001	U	3.46	-3.68	0.82	3.74	-3.77	0.66	-2.82	4.58
YEBE	13420M001	N	0.97	-0.67	-0.47	0.60	1.38	0.65	-1.17	0.96
YEBE	13420M001	E	1.46	-1.42	0.48	-1.39	2.59	1.07	0.89	-0.25
YEBE	13420M001	U	4.25	5.47	-1.59	-1.65	-1.16	-7.72	-3.38	-0.93
ZARA	13462M001	N	0.85	1.19	-1.04	1.00	-0.71	0.53	-0.19	0.20
ZARA	13462M001	E	1.35	0.57	-0.56	-0.19	-0.00	2.61	-1.56	-1.03
ZARA	13462M001	U	4.52	-0.34	4.65	-4.05	3.63	6.02	-3.19	-5.02

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	-2.94	2.23	-1.20
2	ALAC 13433M001	I W	0.31	-0.32	-0.63
3	ALBA 13452M001	I W	0.44	-0.76	-3.10
4	ALME 13437M001	I W	-1.07	1.75	4.24
5	BCLN 13412M001	I W	-1.32	-0.85	-5.20
6	BELL 13431M001	I W	0.07	-0.12	-0.72
7	BORR 13480M001	I W	-0.12	-1.45	1.02
8	BRST 10004M004	I W	-2.19	1.70	-1.78
9	CACE 13447M001	I W	0.20	2.87	1.62
10	CANT 13438M001	I W	-1.41	0.33	-2.40
11	CARG 19412M001	I W	-0.52	0.94	-1.57
12	CASC 13909S001	I W	0.39	0.05	2.04
13	CEU1 13449M002	I W	0.53	0.05	0.73
14	COBA 13453M001	I W	0.31	0.57	-2.32
15	CREU 13432M001	I W	-0.11	-0.32	-1.77
16	EBRE 13410M001	I W	-0.47	-0.68	-0.18
17	ESCO 13435M001	I W	0.53	1.54	-8.24
18	FUNC 13911S001	I W	1.82	0.96	2.98
19	GAIA 13902M001	I W	0.18	1.12	6.45
21	HUEL 13451M001	I W	0.56	-1.39	0.76
22	IZAN 31309M002	I W	-0.41	0.84	3.35
24	LLIV 13436M001	I W	0.09	0.26	0.52
25	LPAL 81701M001	I W	-2.03	1.87	-0.39
27	MALA 13443M001	I W	-1.77	0.37	4.06
28	MAS1 31303M002	I W	0.68	1.85	4.73
30	MELI 19379M001	I W	1.10	-1.97	-1.15
31	PASA 19351S001	I W	0.25	0.06	0.07
32	PDEL 31906M004	I W	0.57	0.21	5.12
33	RABT 35001M002	I W	0.53	-0.08	0.05
34	RID1 13448M002	I W	-0.44	-0.46	-2.37
35	SALA 13469M001	I W	-0.44	0.04	-0.06
36	SCOA 10088M002	I W	-2.44	-0.45	-1.65
38	SONS 13446M001	I W	-0.02	-0.92	-1.33
39	TERC 31909M001	I W	7.98	-5.06	-4.96
40	TERU 13487M001	I W	2.69	-0.13	-2.95
41	VALA 13463M002	I W	-0.78	-1.52	0.94
42	VALE 13439M001	I W	-0.99	-1.01	-2.56
43	VIGO 13450M001	I W	-0.41	-0.85	3.96
44	YEBE 13420M001	I W	0.86	-0.01	4.86
45	ZARA 13462M001	I W	-0.00	-0.10	2.29
46	ZIMM 14001M004	I W	-0.21	-1.17	-3.24
	RMS / COMPONENT		1.68	1.37	3.12
	MEAN		0.00	0.00	0.00
	MIN		-2.94	-5.06	-8.24
	MAX		7.98	2.87	6.45

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 123
RMS OF TRANSFORMATION : 2.19 MM

BARYCENTER COORDINATES:

LATITUDE : 39 31 35.12
LONGITUDE : - 5 26 58.28
HEIGHT : -48.609 KM

PARAMETERS:

TRANSLATION IN N : 0.00 +- 0.34 MM
TRANSLATION IN E : 0.00 +- 0.34 MM
TRANSLATION IN U : -0.00 +- 0.34 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          16680025
NUMBER OF UNKNOWN              235011
NUMBER OF DEGREES OF FREEDOM    16445014
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)      180
VARIANCE FACTOR                  2.422428964205149
```

Helmert Transformation Parameters With Respect to Combined Solution:

Sol	Rms (m)	Translation (m)			Rotation (")			Scale (ppm)
		X	Y	Z	X	Y	Z	
1	0.00285	-0.0239	-0.0092	0.0357	0.0001	-0.0014	-0.0003	-0.00060
2	0.00240	0.0264	-0.0113	-0.0322	0.0003	0.0014	-0.0002	-0.00012
3	0.00248	0.0249	0.0065	-0.0338	0.0001	0.0014	0.0003	0.00033
4	0.00261	0.0120	0.0123	-0.0168	-0.0000	0.0007	0.0005	0.00030
5	0.00319	0.0225	-0.0094	-0.0285	0.0003	0.0012	-0.0002	-0.00001
6	0.00369	-0.0098	-0.0150	0.0134	0.0003	-0.0005	-0.0004	-0.00045
7	0.00267	0.0039	0.0070	-0.0142	0.0000	0.0004	0.0003	0.00093

Statistics of individual solutions:

File	RMS (m)	DOF	Chi**2/DOF	#Observations authentic / pseudo	#Parameters explicit / implicit / singular
1	0.00169	2338713	2.87	2374489	3 999 34780 0
2	0.00163	2359985	2.66	2395277	3 1002 34293 0
3	0.00147	2414439	2.17	2448916	3 1005 33475 0
4	0.00151	2419900	2.28	2454375	3 1002 33476 0
5	0.00156	2122109	2.42	2155744	3 990 32648 0
6	0.00153	2377030	2.33	2410824	3 996 32801 0
7	0.00147	2406880	2.17	2440400	3 996 32527 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 18:224:00000 18:230:86370 LEICA GRX1200PRO -----
ALDA A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
ALSA A 1 P 18:224:00000 18:230:86370 LEICA GRX1200GGPRO -----
AMUR A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
BIAZ A 1 P 18:224:00000 18:230:86370 TRI SP90M -----
BIDA A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
BRZR A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
CACE A 1 P 18:224:00000 18:230:86370 TRIMBLE NETR9 -----
CANT A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
CHER A 1 P 18:224:00000 18:230:86370 LEICA GRX1200+GNSS -----
CREU A 1 P 18:224:00000 18:230:86370 LEICA GR50 -----
EBRE A 1 P 18:224:00000 18:230:86370 LEICA GR50 -----
ELGE A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
EMAZ A 1 P 18:224:00000 18:230:86370 LEICA GR30 -----
GERN A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
IGEL A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
ISPS A 1 P 18:224:00000 18:230:86370 TRIMBLE NETR9 -----
KAST A 1 P 18:224:00000 18:230:86370 LEICA GR30 -----
LARE A 1 P 18:224:00000 18:230:86370 LEICA GRX1200GGPRO -----
LAZK A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
LEIT A 1 P 18:224:00000 18:230:86370 LEICA GRX1200+GNSS -----
ORON A 1 P 18:224:00000 18:230:86370 LEICA GRX1200GGPRO -----
PAS2 A 1 P 18:225:00000 18:230:86370 TPS NET-G3A -----
PASA A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
RIO1 A 1 P 18:224:00000 18:230:86370 LEICA GR25 -----
SALA A 1 P 18:224:00000 18:230:86370 LEICA GRX1200+GNSS -----
SCOA A 1 P 18:224:00000 18:230:86370 LEICA GR25 -----
SOPU A 1 P 18:224:00000 18:230:86370 LEICA GR10 -----
TERU A 1 P 18:224:00000 18:230:86370 LEICA GRX1200GGPRO -----
VITO A 1 P 18:224:03600 18:230:86370 LEICA GR10 -----
YEBE A 1 P 18:224:00000 18:230:86370 TRIMBLE NETR9 -----
ZARA A 1 P 18:224:00000 18:230:86370 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 18:224:00000 18:230:86370 LEIAT504 LEIS -----
ALDA A 1 P 18:224:00000 18:230:86370 LEIAS10 NONE -----
ALSA A 1 P 18:224:00000 18:230:86370 LEIAX1202GG NONE -----
AMUR A 1 P 18:224:00000 18:230:86370 LEIAS10 NONE -----
```

BLAZ	A	1	P	18:224:00000	18:230:86370	LEIAR25	LEIT	----
BIDA	A	1	P	18:224:00000	18:230:86370	LEIAS10	NONE	----
BRZR	A	1	P	18:224:00000	18:230:86370	LEIAS10	NONE	----
CACE	A	1	P	18:224:00000	18:230:86370	TRM29659.00	NONE	----
CANT	A	1	P	18:224:00000	18:230:86370	LEIAR25_R4	LEIT	25066
CHER	A	1	P	18:224:00000	18:230:86370	LEIAX1203+GNSS	NONE	----
CREU	A	1	P	18:224:00000	18:230:86370	LEIAR25_R4	NONE	26357
EBRE	A	1	P	18:224:00000	18:230:86370	LEIAR25_R4	NONE	26359
ELGE	A	1	P	18:224:00000	18:230:86370	LEIAR25_R4	LEIT	----
EMAZ	A	1	P	18:224:00000	18:230:86370	LEIAS10	NONE	----
GERN	A	1	P	18:224:00000	18:230:86370	LEIAS10	NONE	----
IGEL	A	1	P	18:224:00000	18:230:86370	LEIAR20	LEIM	----
ISPS	A	1	P	18:224:00000	18:230:86370	TRM59900.00	SCIS	----
KAST	A	1	P	18:224:00000	18:230:86370	LEIAS10	NONE	----
LARE	A	1	P	18:224:00000	18:230:86370	LEIAT504	NONE	----
LAZK	A	1	P	18:224:00000	18:230:86370	LEIAR25_R4	LEIT	----
LEIT	A	1	P	18:224:00000	18:230:86370	LEIAX1203+GNSS	NONE	----
ORDN	A	1	P	18:224:00000	18:230:86370	LEIAX1202GG	NONE	----
PAS2	A	1	P	18:225:00000	18:230:86370	LEIAR20	LEIM	73034
PASA	A	1	P	18:224:00000	18:230:86370	LEIAR20	LEIM	73034
RIO1	A	1	P	18:224:00000	18:230:86370	LEIAR25_R4	LEIT	25138
SALA	A	1	P	18:224:00000	18:230:86370	LEIAR25	NONE	----
SCOA	A	1	P	18:224:00000	18:230:86370	TRM55971.00	NONE	----
SOPU	A	1	P	18:224:00000	18:230:86370	LEIAS10	NONE	----
TERU	A	1	P	18:224:00000	18:230:86370	LEIAT504GG	LEIS	----
VITO	A	1	P	18:224:03600	18:230:86370	LEIAS10	NONE	----
YEBE	A	1	P	18:224:00000	18:230:86370	TRM29659.00	NONE	----
ZARA	A	1	P	18:224:00000	18:230:86370	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	18:224:00000	18:230:86370	UNE	3.0460	0.0000	0.0000	0.0000
ALDA	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
ALSA	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
AMUR	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
BLAZ	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
BIDA	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
BRZR	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
CACE	A	1	P	18:224:00000	18:230:86370	UNE	0.0600	0.0000	0.0000	0.0000
CANT	A	1	P	18:224:00000	18:230:86370	UNE	3.0490	0.0000	0.0000	0.0000
CHER	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
CREU	A	1	P	18:224:00000	18:230:86370	UNE	0.0770	0.0000	0.0000	0.0000
EBRE	A	1	P	18:224:00000	18:230:86370	UNE	0.0770	0.0000	0.0000	0.0000
ELGE	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
EMAZ	A	1	P	18:224:00000	18:230:86370	UNE	0.0350	0.0000	0.0000	0.0000
GERN	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
IGEL	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
ISPS	A	1	P	18:224:00000	18:230:86370	UNE	0.0350	0.0000	0.0000	0.0000
KAST	A	1	P	18:224:00000	18:230:86370	UNE	0.0350	0.0000	0.0000	0.0000
LARE	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
LAZK	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
LEIT	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
ORDN	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
PAS2	A	1	P	18:225:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
PASA	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
RIO1	A	1	P	18:224:00000	18:230:86370	UNE	0.0606	0.0000	0.0000	0.0000
SALA	A	1	P	18:224:00000	18:230:86370	UNE	0.0600	0.0000	0.0000	0.0000
SCOA	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
SOPU	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
TERU	A	1	P	18:224:00000	18:230:86370	UNE	0.0600	0.0000	0.0000	0.0000
VITO	A	1	P	18:224:03600	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
YEBE	A	1	P	18:224:00000	18:230:86370	UNE	0.0000	0.0000	0.0000	0.0000
ZARA	A	1	P	18:224:00000	18:230:86370	UNE	3.2590	0.0000	0.0000	0.0000

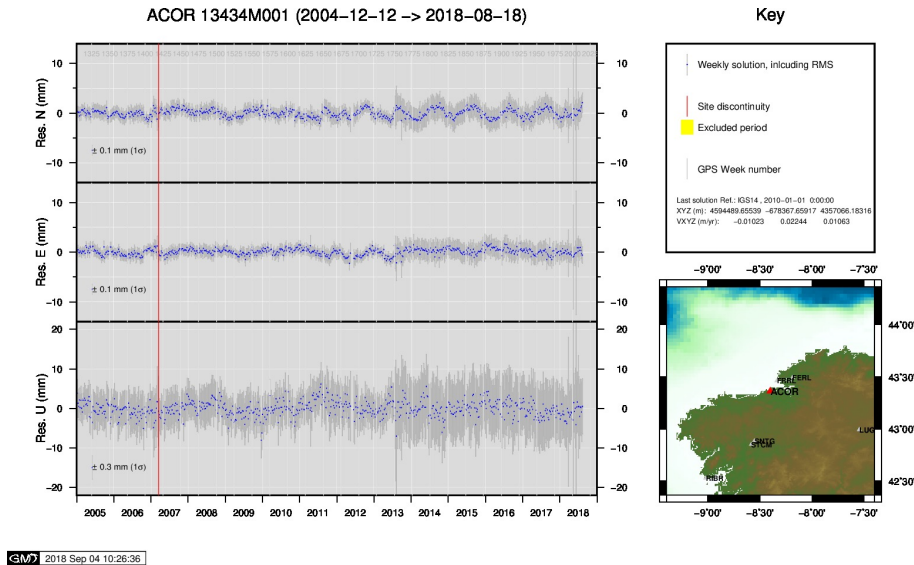
8 Inconsistencies (logsheet-RINEX metadata)

The following inconsistencies were found comparing the data available in the logsheets and the RINEX headers:

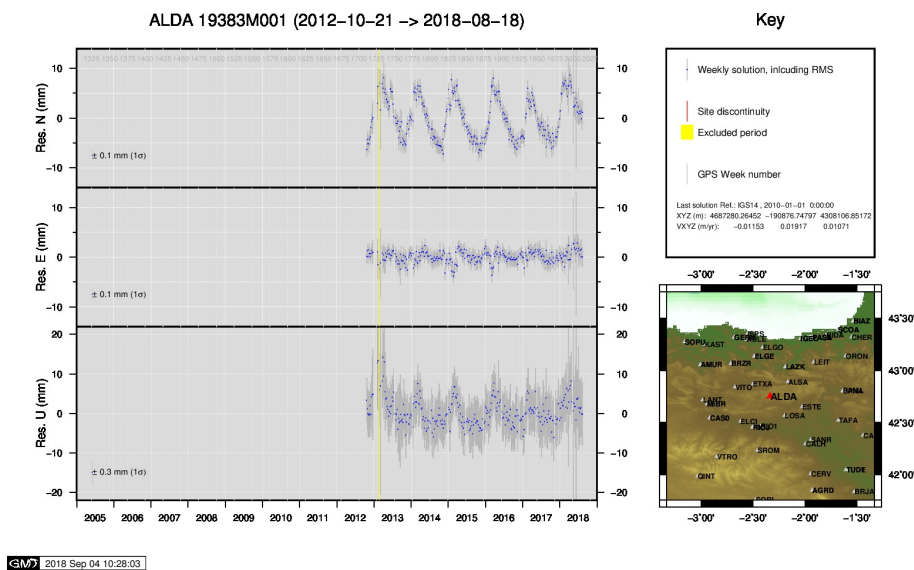
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2018-08-30	00:27	UTC		PAS22270.180		RECEIVER TYPE		NET-G3A	->	TPS NET-G3A
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9 Cumulative Time Series

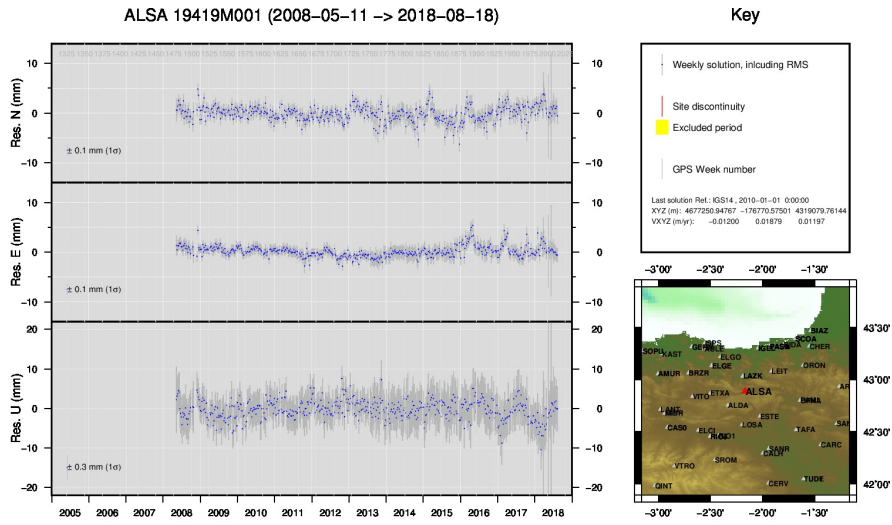
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

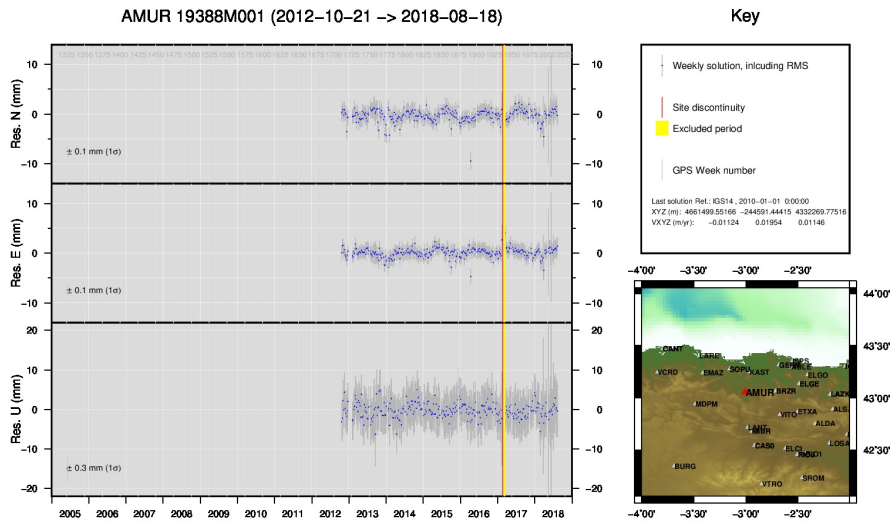


2) ALDA



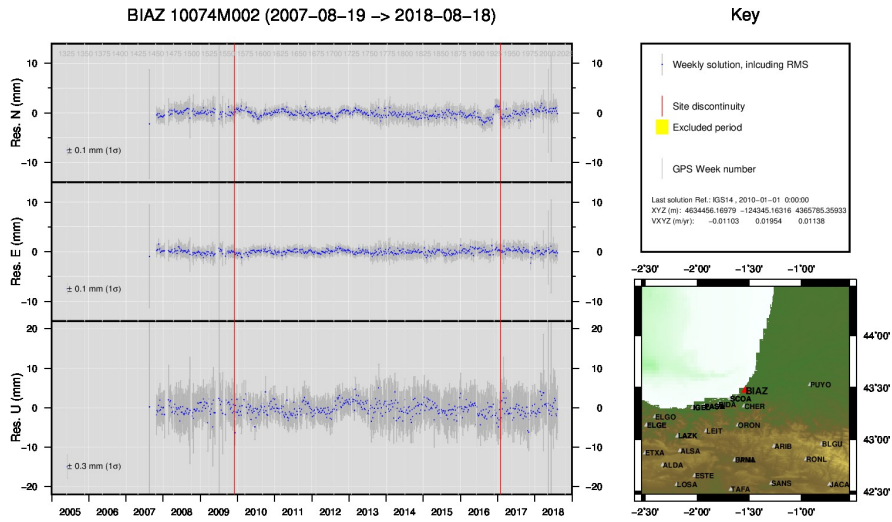
GMW 2018 Sep 04 10:29:04

3) ALSA



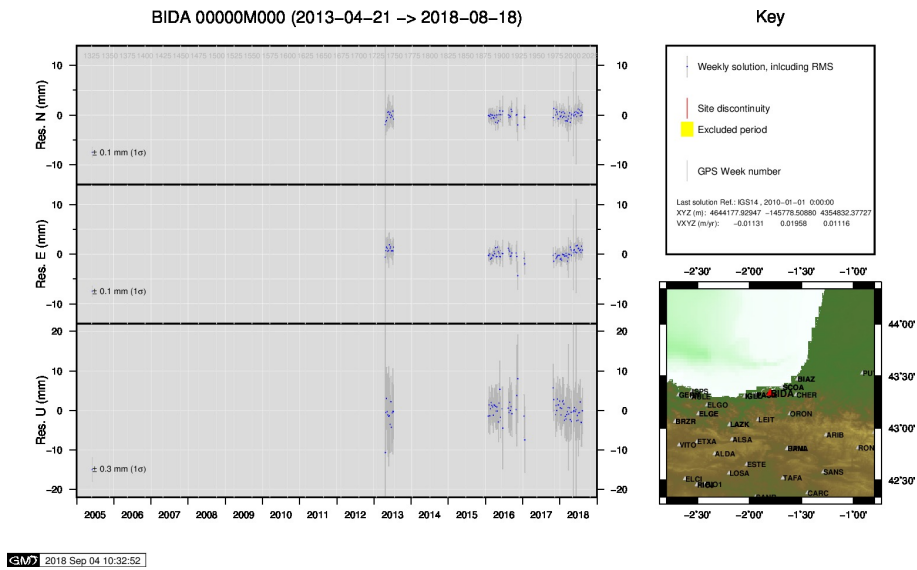
GMW 2018 Sep 04 10:29:17

4) AMUR

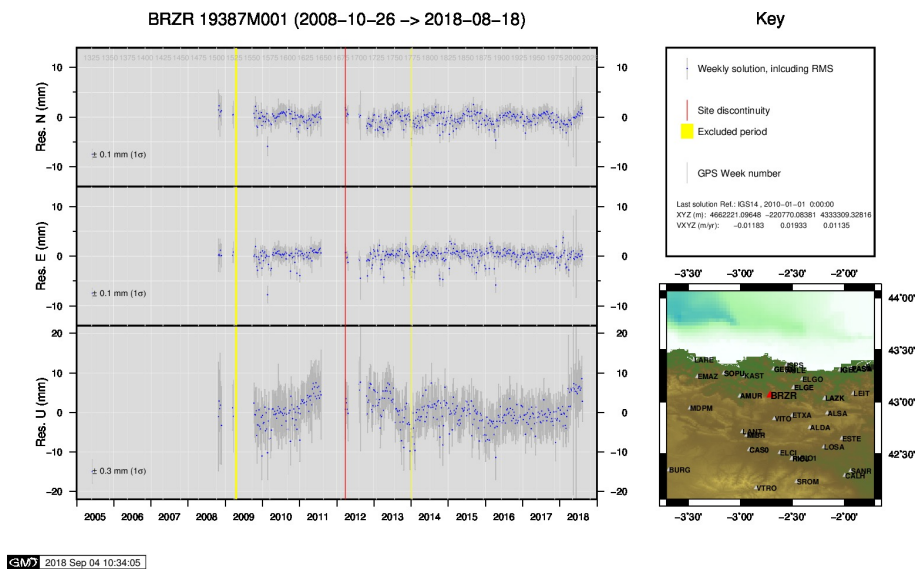


GMW 2018 Sep 04 10:32:45

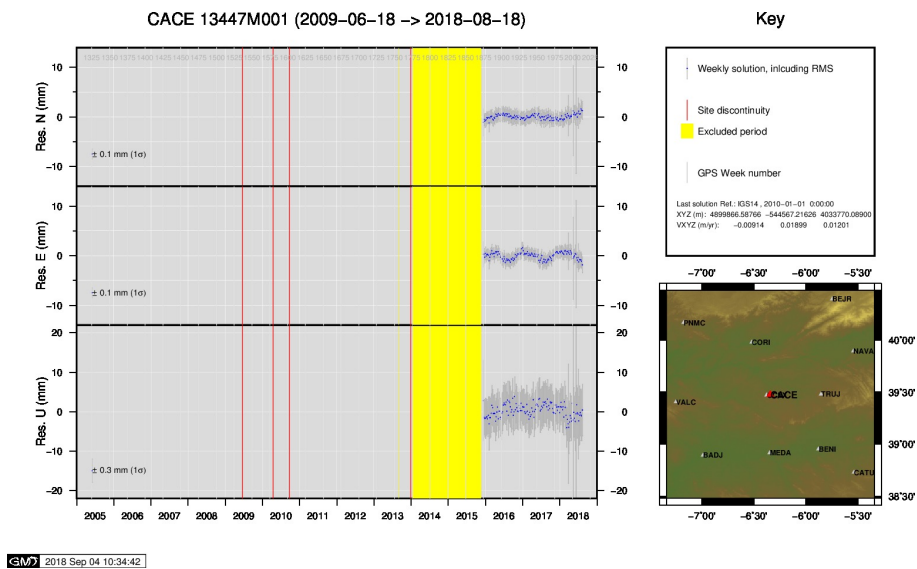
5) BIAZ



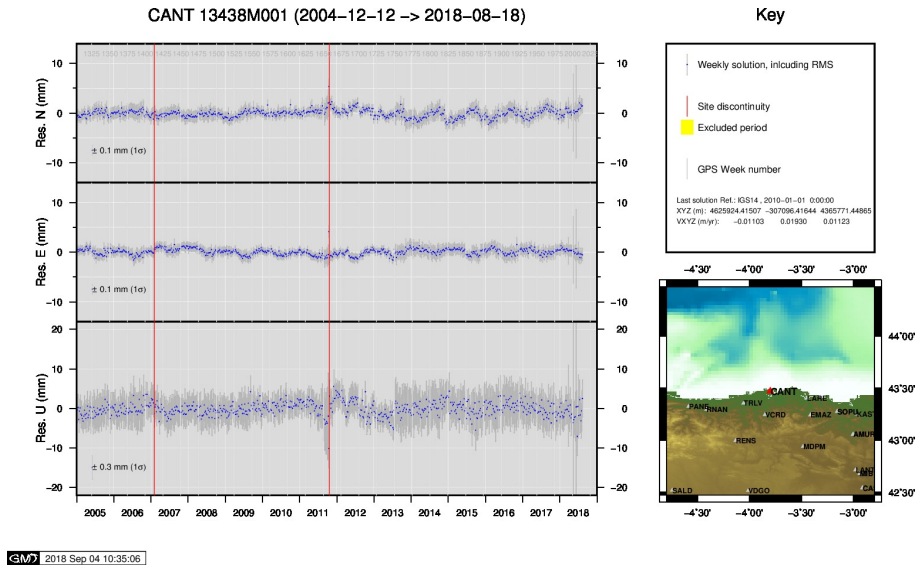
6) BIDA



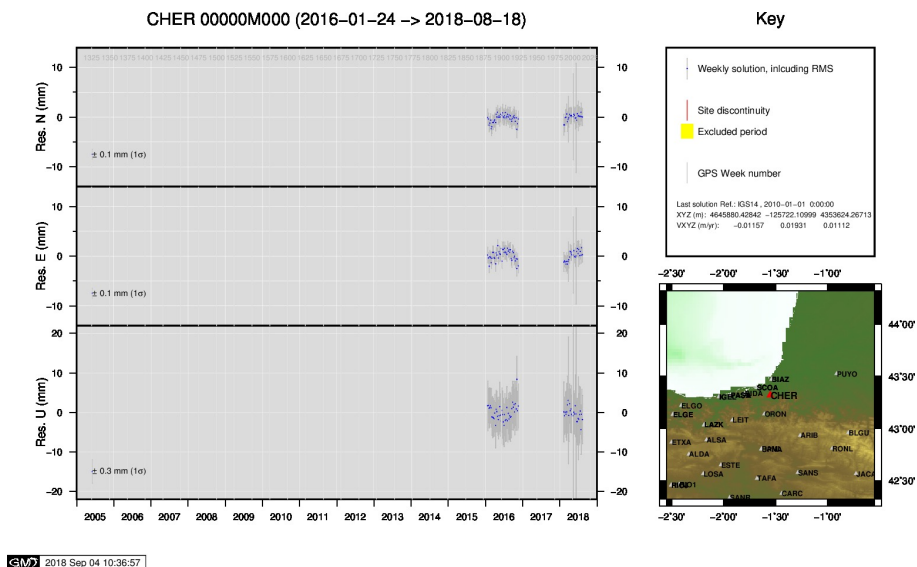
7) BRZR



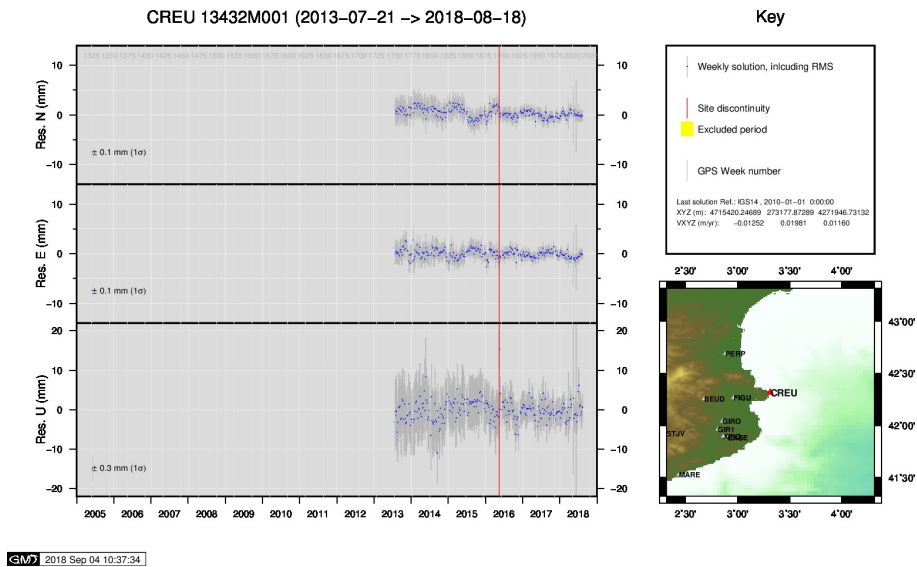
8) CACE



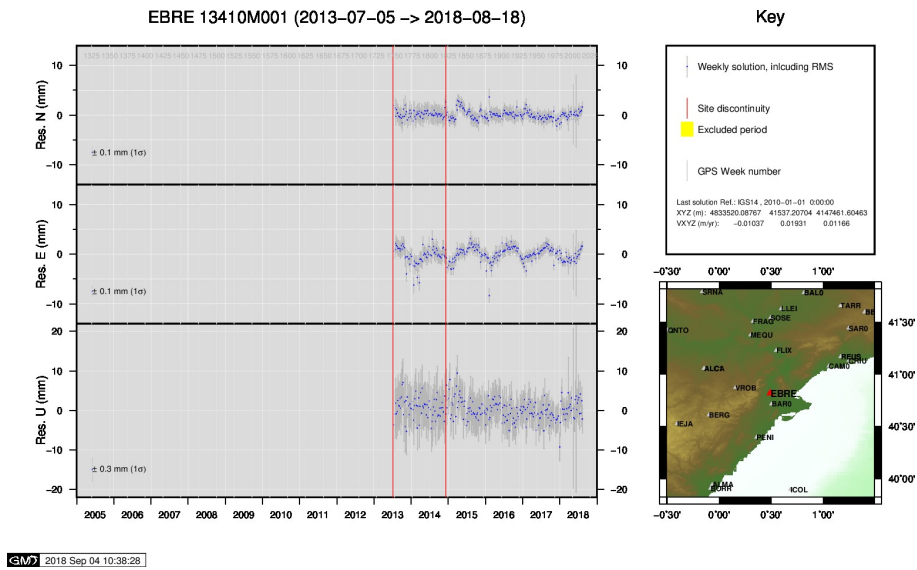
9) CANT



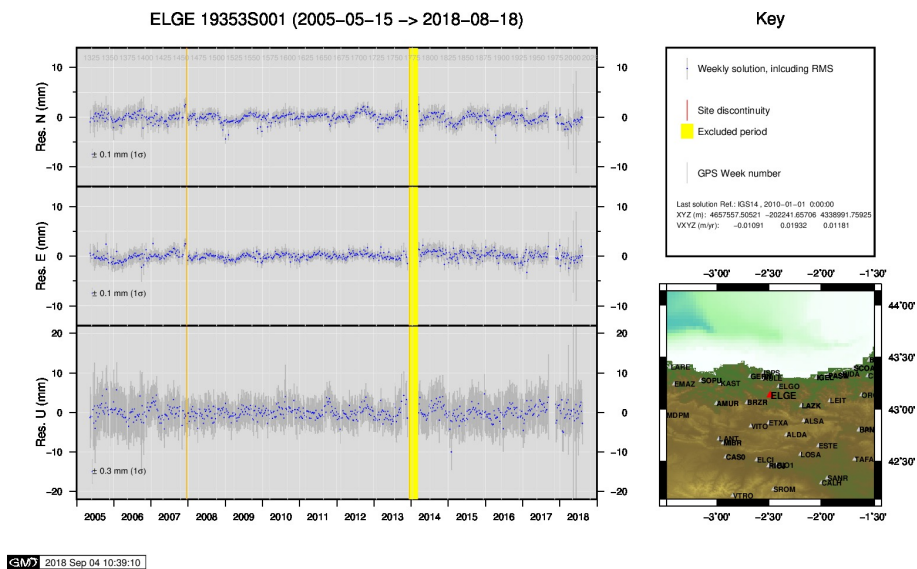
10) CHER



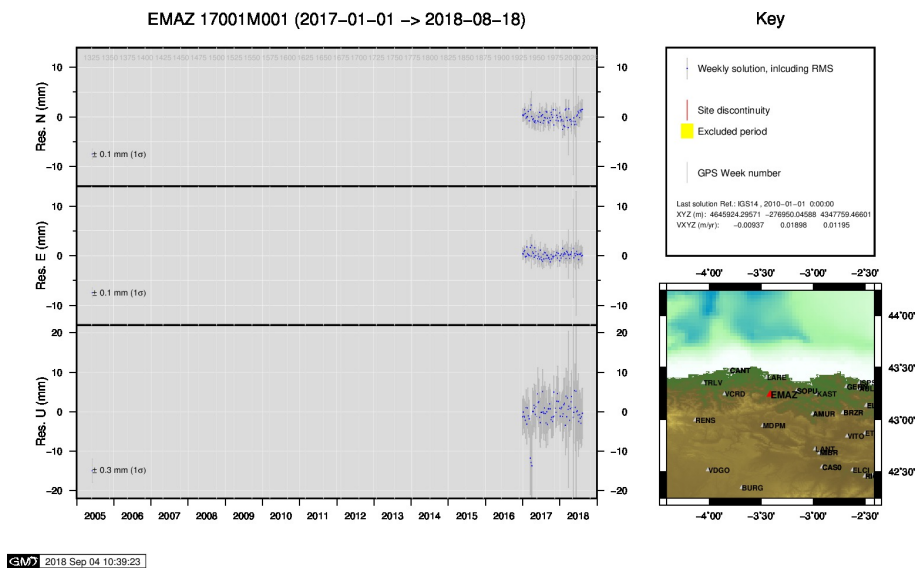
11) CREU



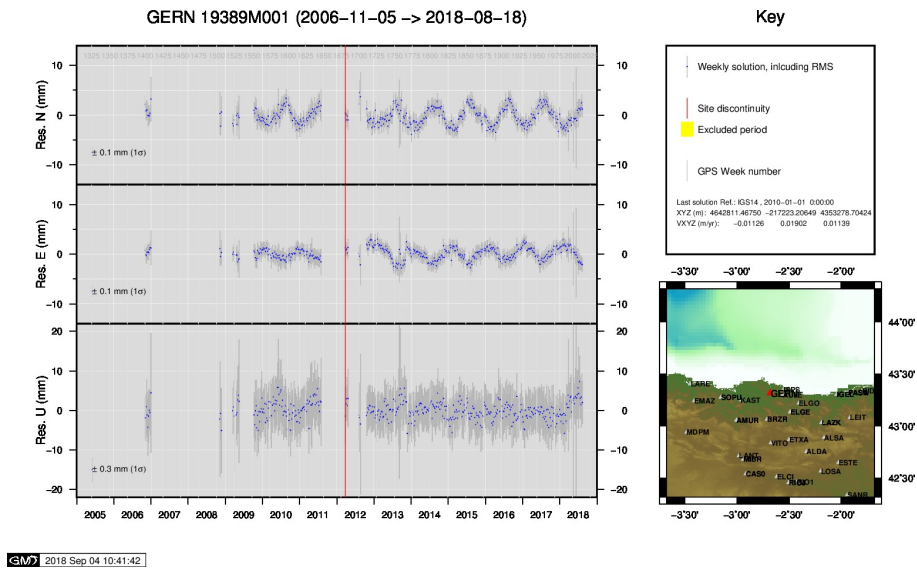
12) EBRE



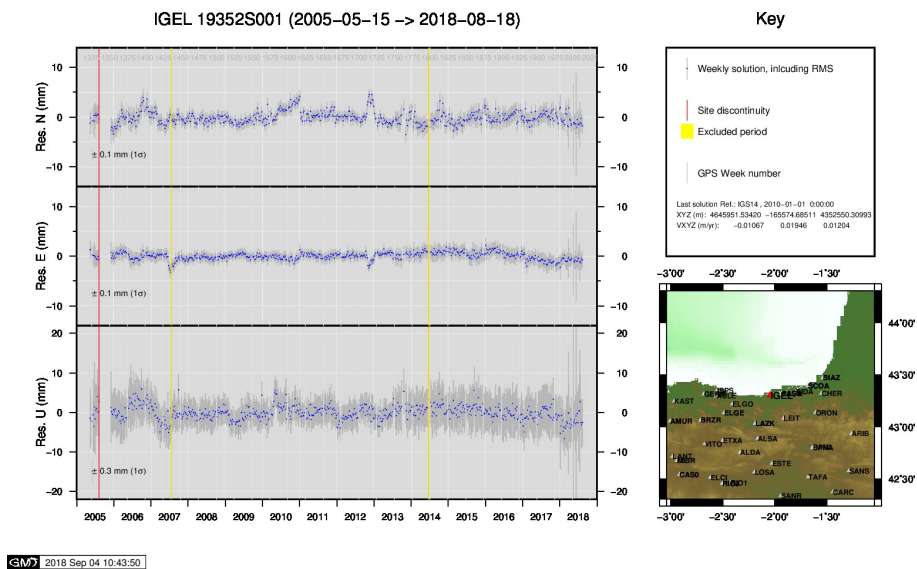
13) ELGE



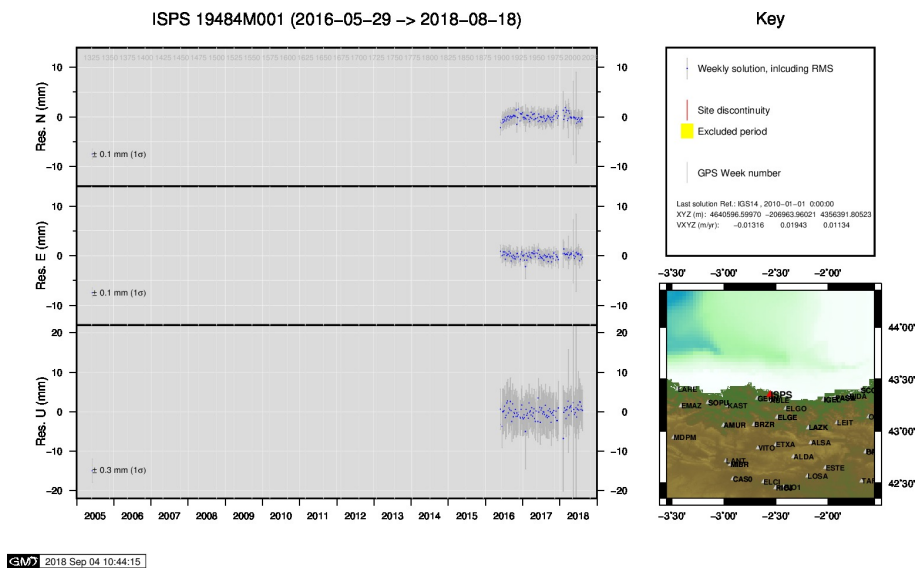
14) EMAZ



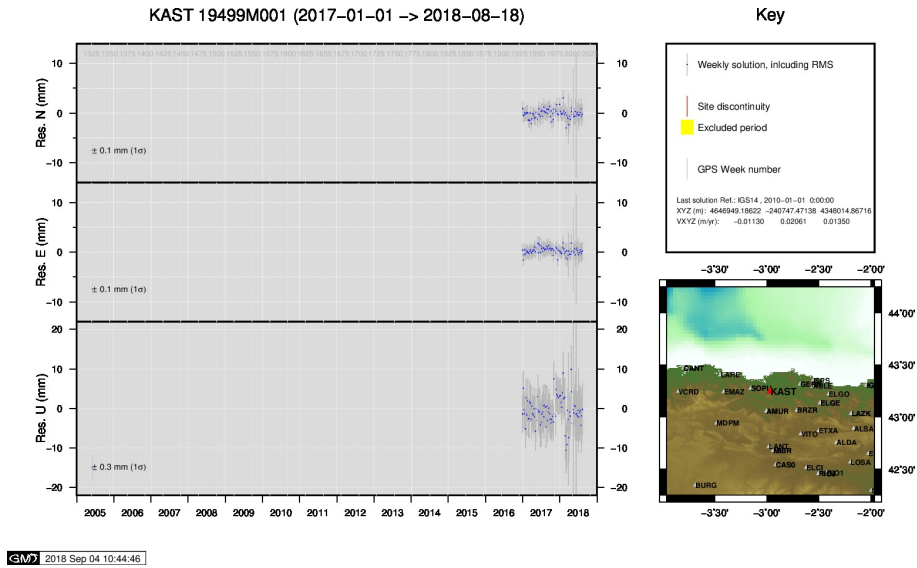
15) GERN



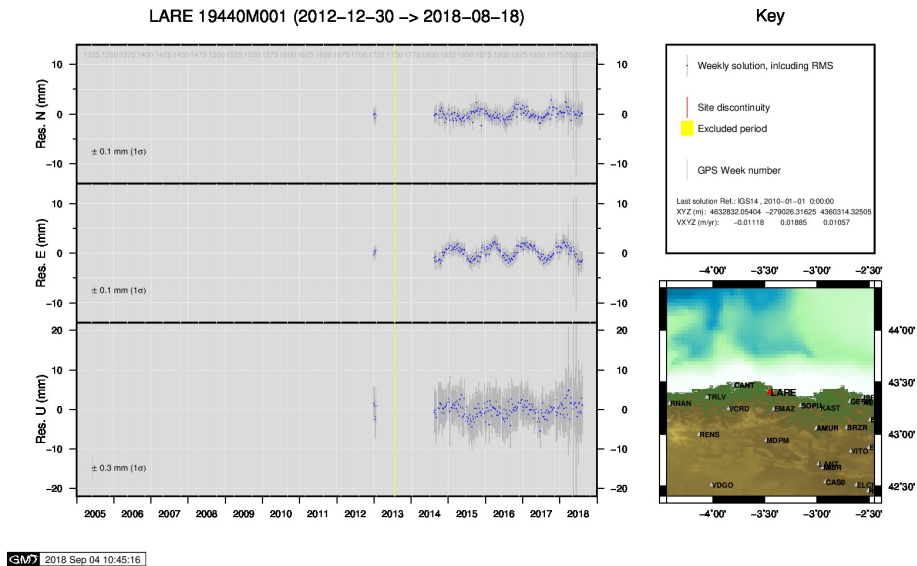
16) IGEL



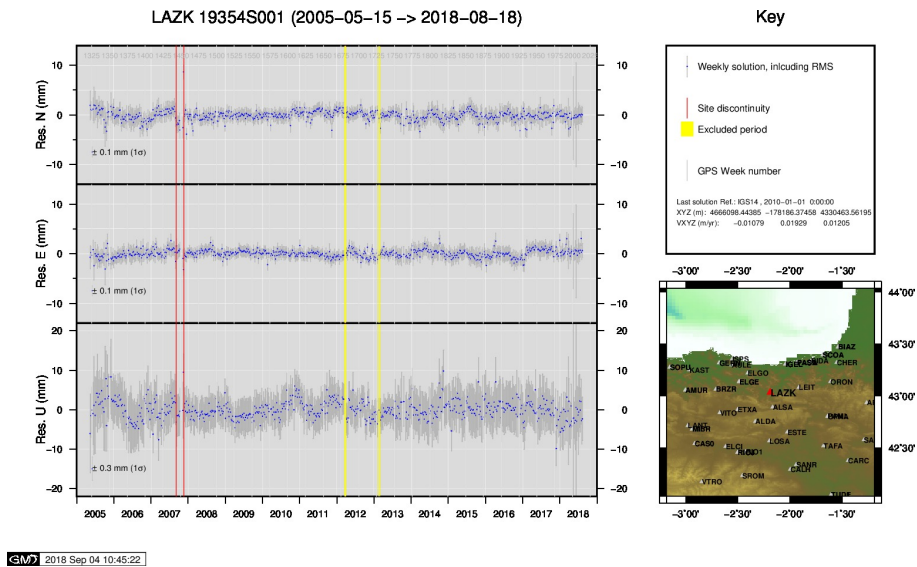
17) ISPS



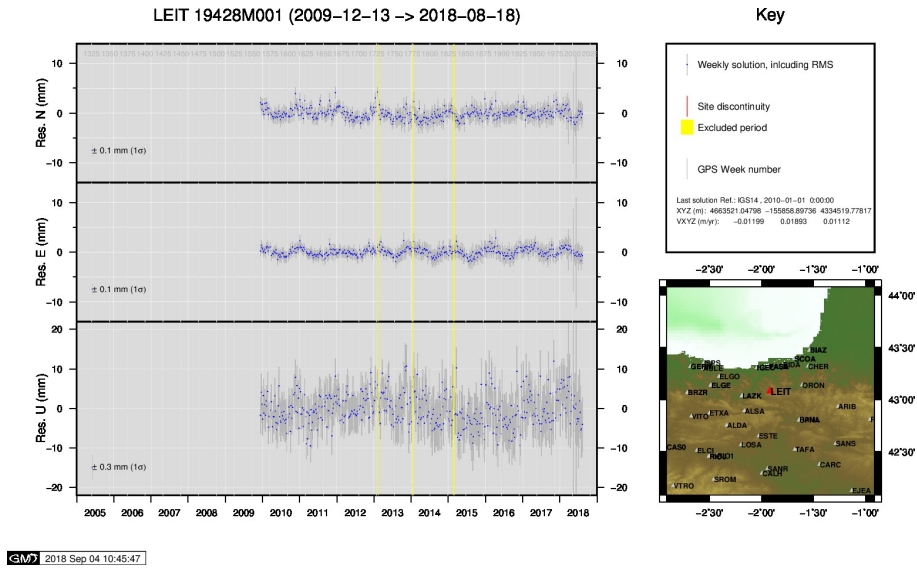
18) KAST



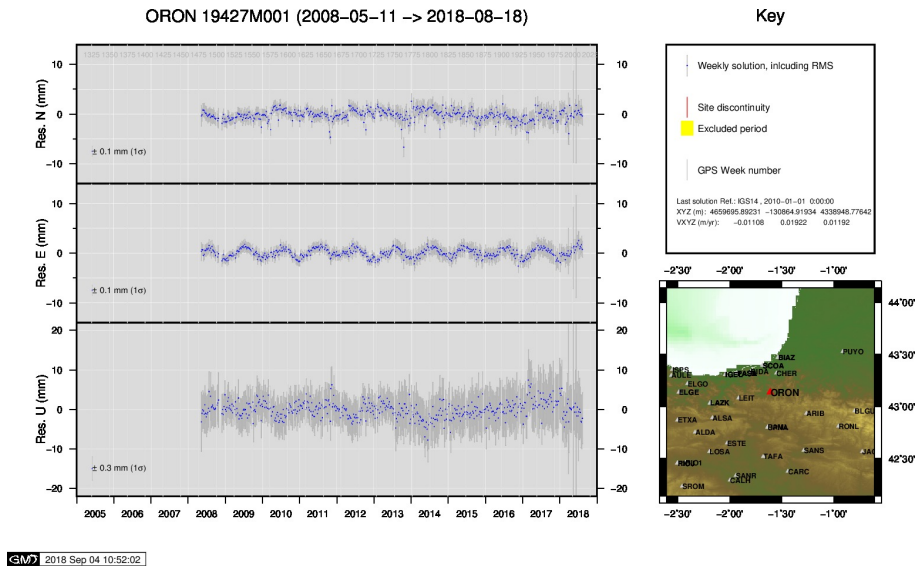
19) LARE



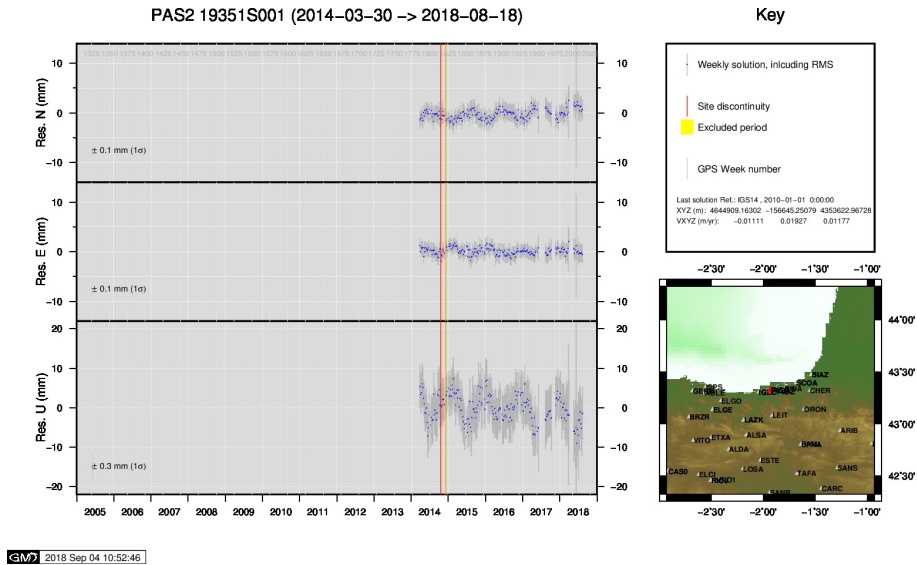
20) LAZK



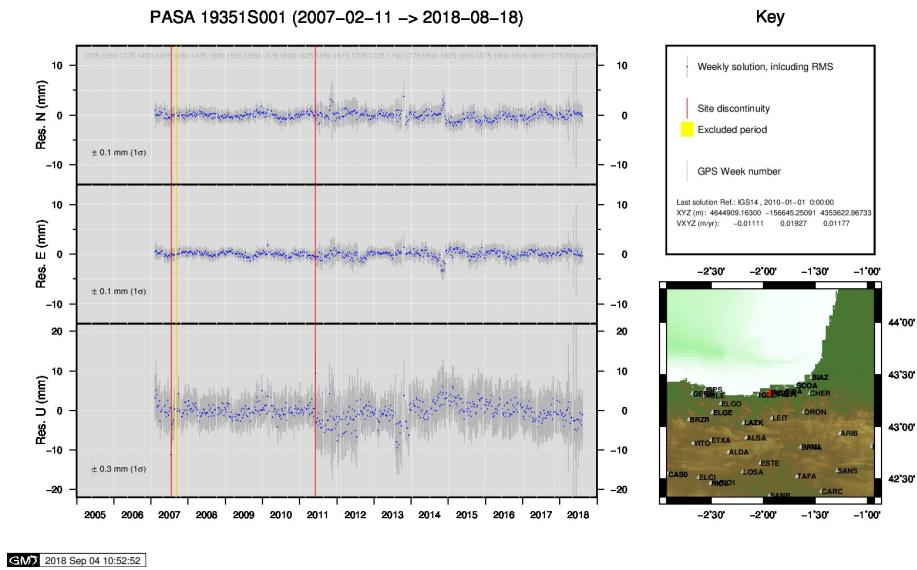
21) LEIT



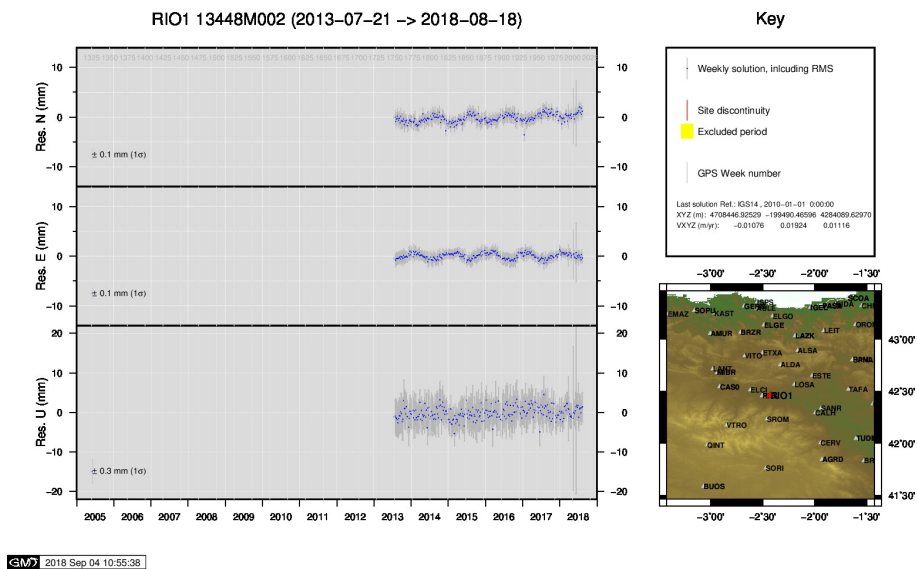
22) ORON



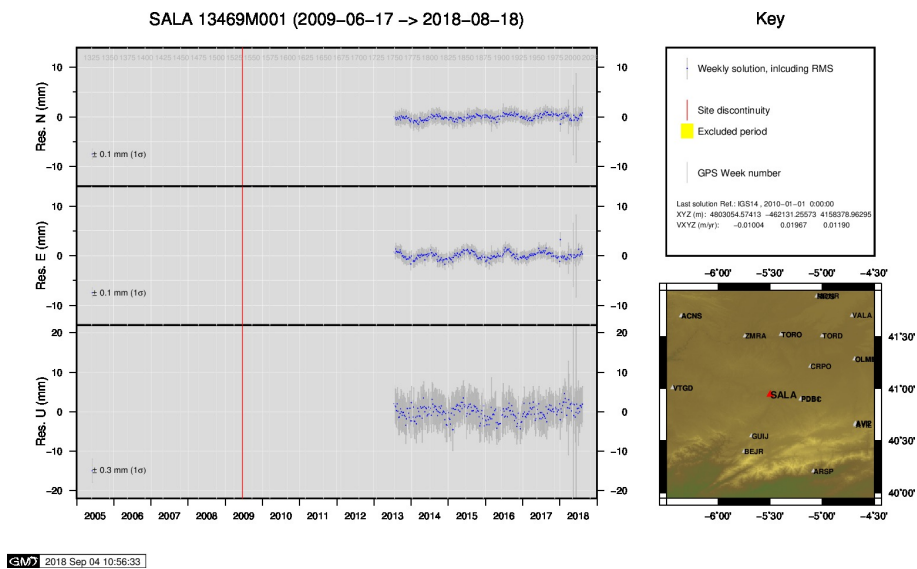
23) PAS2



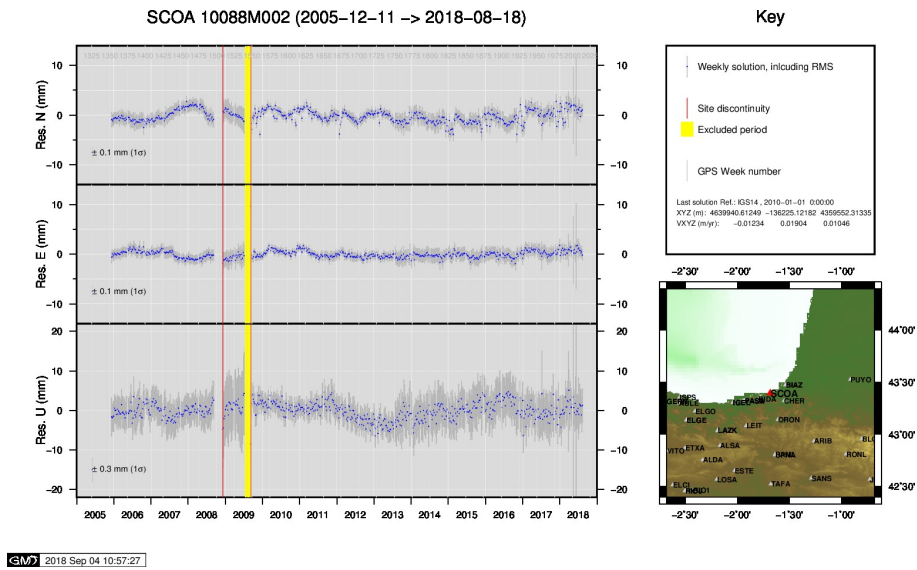
24) PASA



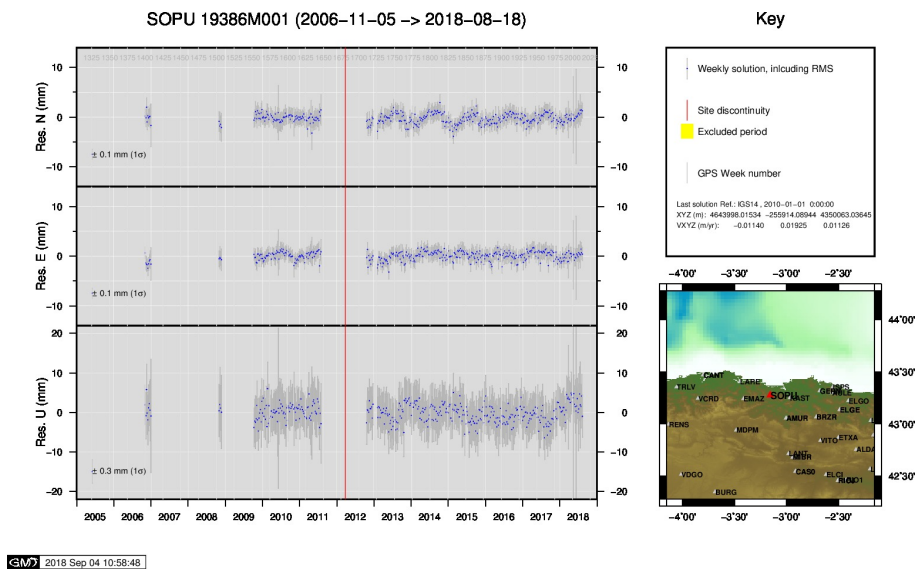
25) RIO1



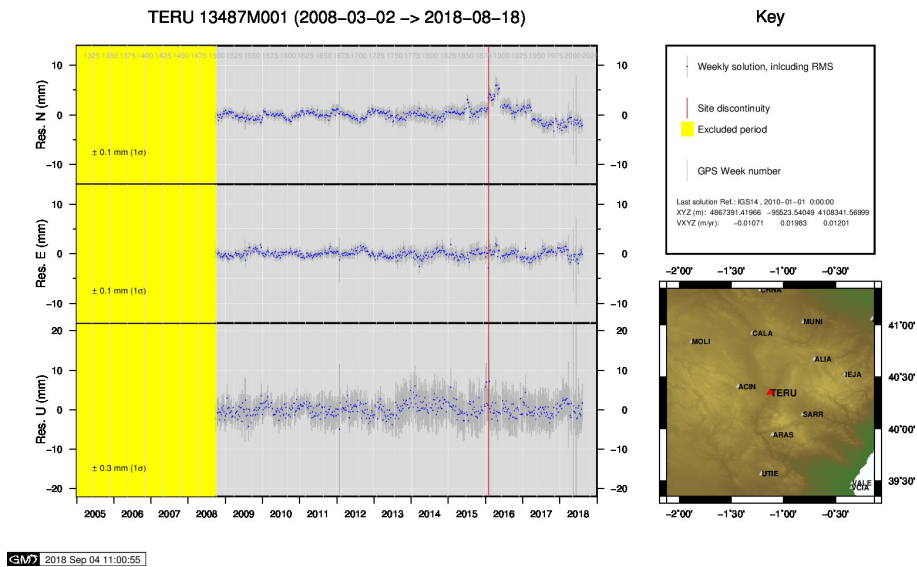
26) SALA



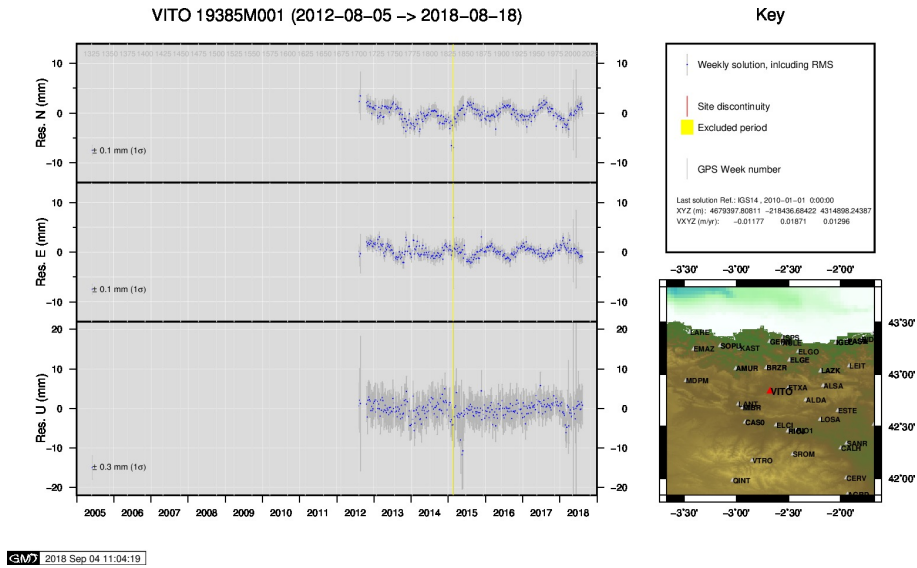
27) SCOA



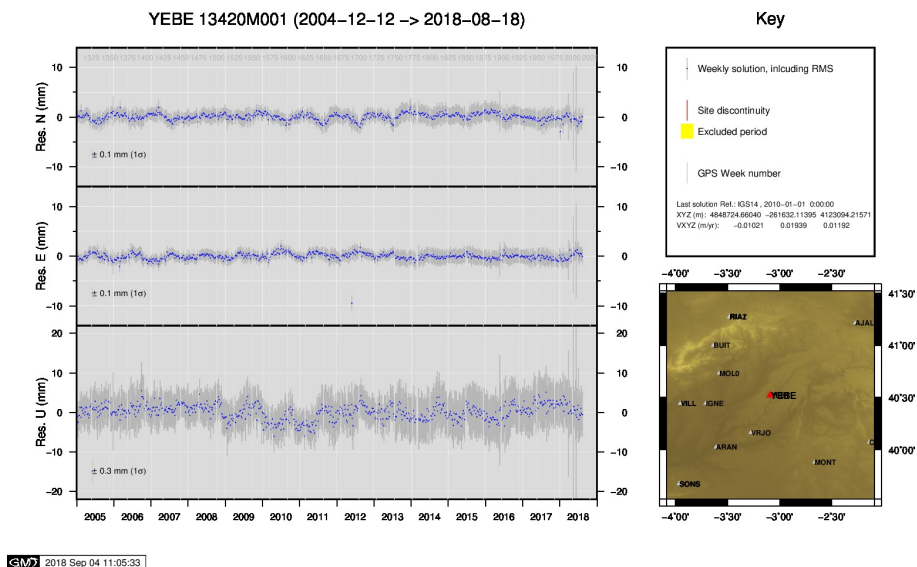
28) SOPU



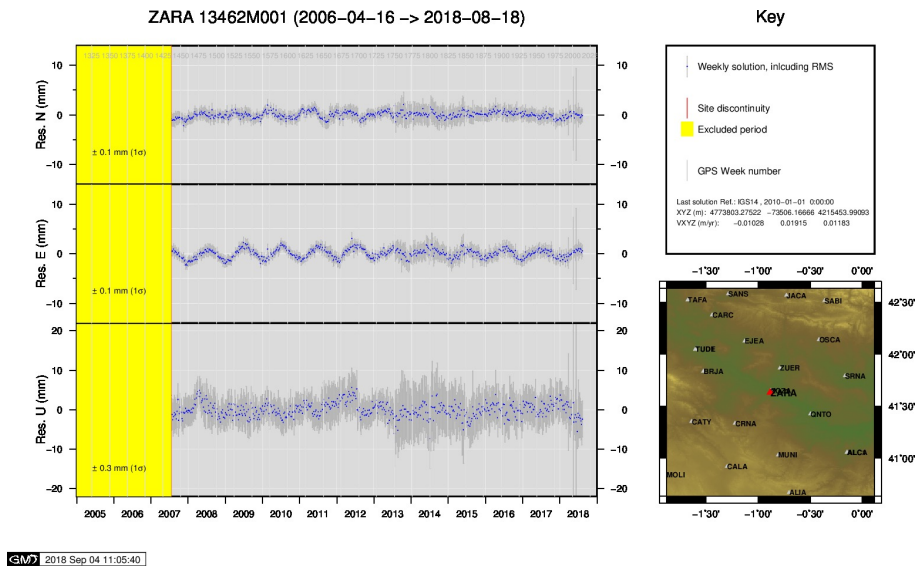
29) TERU



30) VITO



31) YEBE



32) ZARA

