

ARA-DAC Weekly Analysis Result: 2000 (GFA)

Technical Report

GPS Week: 2000 (GFA)

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

ARA-DAC details:

Contact person: J. Zurutuza

Contact mail: geodesia@aranzadi.eus

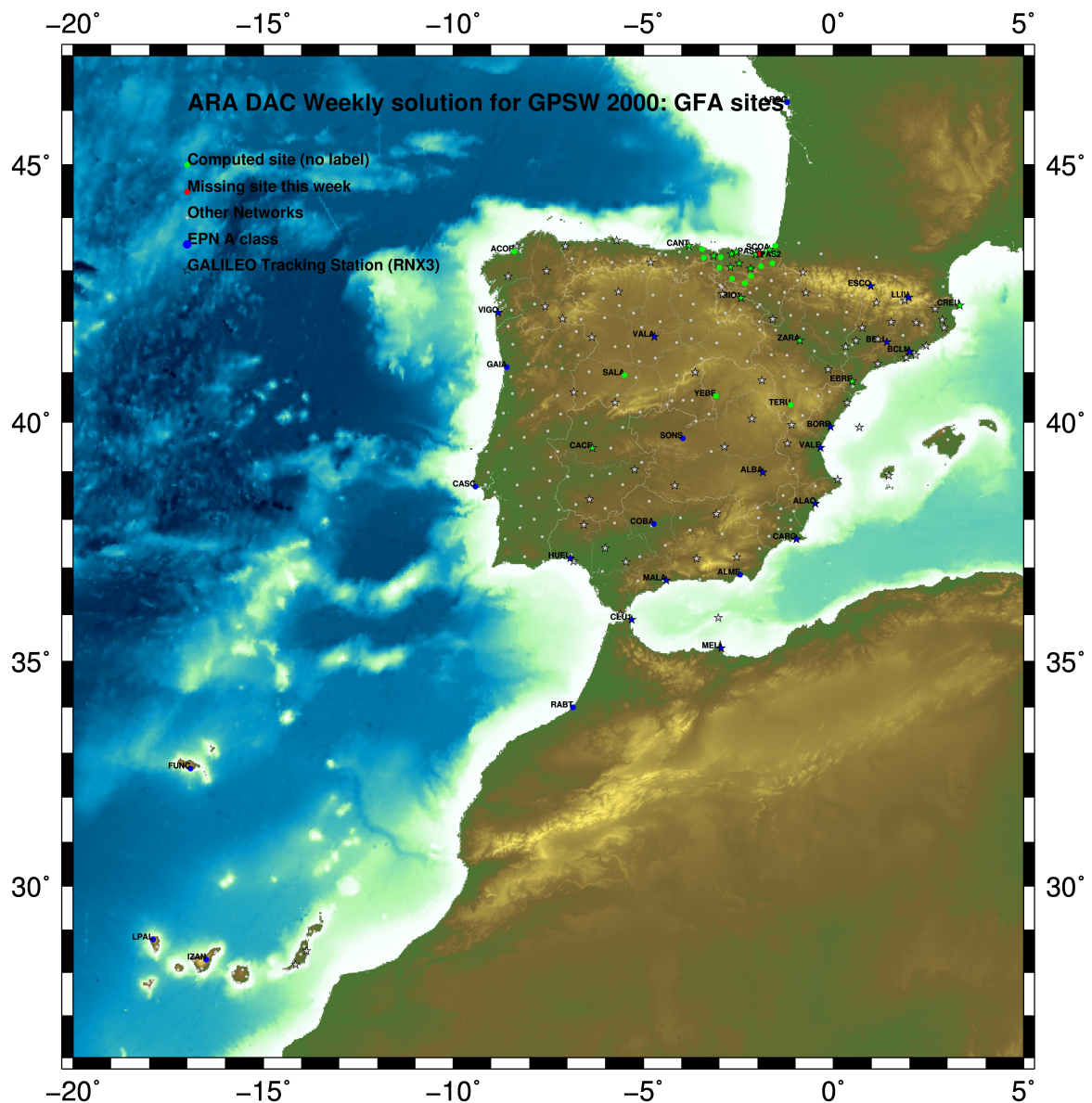
Report generated on 2018/05/28 at 03:30:07



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 28 03:29:54

Fig.1: Computed Sites for GPS Week2000 (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 2000 WEEK FINAL COMBINATION: PRECISE ORBITS                27-MAY-18 23:52
-----
LOCAL GEODETIC DATUM: IGS14                EPOCH: 2018-05-09 12:00:00
```

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	
1	ACOR	13434M001	4594489.56716	-678367.47234	4357066.27063	W
33	ALDA	19383M001	4687280.16622	-190876.58636	4308106.94870	A
42	ALSA	19419M001	4677250.84438	-176770.41776	4319079.86107	A
44	AMUR	19388M001	4661499.45581	-244591.28055	4332269.86995	A
77	BLAZ	10074M002	4634456.06223	-124344.99779	4365785.44635	A
78	BIDA	00000M000	4644177.83378	-145778.34470	4354832.47058	A
88	BRZR	19387M001	4662221.00085	-220769.92159	4333309.42708	A
9	CACE	13447M001	4899866.51225	-544567.05734	4033770.19202	W
10	CANT	13438M001	4625924.32113	-307096.25491	4365771.54218	W
112	CHER	00000M000	4645880.33019	-125721.94786	4353624.36003	A
15	CREU	13432M001	4715420.14217	273178.03741	4271946.82964	W
16	EBRE	13410M001	4833520.00351	41537.36792	4147461.70434	W
131	ELGE	19353S001	4657557.41319	-202241.49633	4338991.85682	A
133	EMAZ	17001M001	4645924.21781	-276949.88752	4347759.56657	A
153	GERN	19389M001	4642811.32002	-217222.95459	4353278.87041	A
173	IGEL	19352S001	4645951.43848	-165574.52477	4352550.40609	A
178	ISPS	19484M001	4640596.48959	-206963.79769	4356391.90122	A
182	KAST	19499M001	4646949.08810	-240747.29942	4348014.97807	A
185	LARE	19440M001	4632831.96083	-279026.15812	4360314.41549	A
186	LAZK	19354S001	4666098.35020	-178186.21254	4330463.65992	A
190	LEIT	19428M001	4663520.94917	-155858.73888	4334519.87231	A
242	ORND	19427M001	4659695.79934	-130864.75773	4338948.87635	A
31	PASA	19351S001	4644909.06738	-156645.08870	4353623.06428	W
34	R1D1	13448M002	4708446.83388	-199490.30494	4284089.72301	W
35	SALA	13469M001	4803054.49191	-462131.09200	4158379.06431	W
36	SCDA	10088M002	4639940.50828	-136224.96140	4359552.40383	W
298	SOPU	19386M001	4643997.92076	-255913.92820	4350063.13334	A
40	TERU	13487M001	4867391.33053	-95523.37562	4108341.67005	W
349	VITO	19385M001	4679397.70728	-218436.52753	4314898.35188	A
44	YEBE	13420M001	4848724.57649	-261631.95178	4123094.31640	W
45	ZARA	13462M001	4773803.17572	-73506.00529	4215454.08342	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 2000                27-MAY-18 23:52
-----
LOCAL GEODETIC DATUM: ETRF2000                EPOCH: 2018-05-09 12:00:00
```

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	
1	ACOR	13434M001	4594489.86489	-678367.98951	4357065.86730	W
33	ALDA	19383M001	4687280.51579	-190877.11182	4308106.54435	A
42	ALSA	19419M001	4677251.19627	-176770.94217	4319079.45762	A
44	AMUR	19388M001	4661499.80093	-244591.80356	4332269.46686	A
77	BLAZ	10074M002	4634456.42315	-124345.51774	4365785.04664	A
78	BIDA	00000M000	4644178.19155	-145778.86569	4354832.06991	A
88	BRZR	19387M001	4662221.34873	-220770.44462	4333309.02422	A
9	CACE	13447M001	4899866.80353	-544567.60476	4033769.76787	W
10	CANT	13438M001	4625924.66142	-307096.77450	4365771.14096	W
112	CHER	00000M000	4645880.69014	-125722.46896	4353623.95947	A
15	CREU	13432M001	4715420.54162	273177.51072	4271946.42856	W
16	EBRE	13410M001	4833520.36856	41536.82859	4147461.29195	W
131	ELGE	19353S001	4657557.76354	-202242.01883	4338991.45452	A
133	EMAZ	17001M001	4645924.56031	-276950.40906	4347759.16425	A
153	GERN	19389M001	4642811.66962	-217223.47565	4353278.46901	A
173	IGEL	19352S001	4645951.79387	-165575.04600	4352550.00506	A
178	ISPS	19484M001	4640596.84056	-206964.31850	4356391.50010	A
182	KAST	19499M001	4646949.43470	-240747.82096	4348014.57609	A
185	LARE	19440M001	4632832.30393	-279026.67834	4360314.01410	A
186	LAZK	19354S001	4666098.70269	-178186.73583	4330463.25727	A
190	LEIT	19428M001	4663521.30445	-155859.26185	4334519.47011	A
242	ORND	19427M001	4659696.15773	-130865.28024	4338948.47472	A
31	PASA	19351S001	4644909.42384	-156645.60980	4353622.66343	W
34	R1D1	13448M002	4708447.18087	-199490.83254	4284089.31701	W
35	SALA	13469M001	4803054.80085	-462131.62968	4158378.64827	W
36	SCDA	10088M002	4639940.86744	-136225.48194	4359552.00358	W
298	SOPU	19386M001	4643998.26578	-255914.44948	4350062.73140	A
40	TERU	13487M001	4867391.67751	-95523.91876	4108341.25359	W
349	VITO	19385M001	4679398.05419	-218437.05227	4314897.94779	A
44	YEBE	13420M001	4848724.90572	-261632.49354	4123093.89937	W
45	ZARA	13462M001	4773803.53234	-73506.53905	4215453.67409	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).

ETRF2014 FINAL COORD. wk 2000		27-MAY-18 23:52			
LOCAL GEODETIC DATUM: ETRF2014		EPOCH: 2018-05-09 12:00:00			
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
1	ACOR 13434M001	4594489.82208	-678368.02851	4357065.91523	W
33	ALDA 19383M001	4687280.47086	-190877.15210	4308106.59219	A
42	ALSA 19419M001	4677251.15139	-176770.98254	4319079.50548	A
44	AMUR 19388M001	4661499.75639	-244591.84376	4332269.51473	A
77	BIAZ 10074M002	4634456.37852	-124345.55844	4365785.09463	A
78	BIDA 00000M000	4644178.14689	-145778.90629	4354832.11787	A
88	BRZR 19387M001	4662221.30412	-220770.48489	4333309.07210	A
9	CACE 13447M001	4899866.75740	-544567.64306	4033769.81516	W
10	CANT 13438M001	4625924.61739	-307096.81463	4365771.18890	W
112	CHER 00000M000	4645880.64541	-125722.50962	4353624.00743	A
15	CREU 13432M001	4715420.49492	273177.46902	4271946.47661	W
16	EBRE 13410M001	4833520.32147	41536.78809	4147461.33959	W
131	ELGE 19353S001	4657557.71891	-202242.05919	4338991.50241	A
133	EMAZ 17001M001	4645924.51601	-276950.44921	4347759.21214	A
153	GERN 19389M001	4642811.62518	-217223.51601	4353278.51694	A
173	IGEL 19352S001	4645951.74925	-165575.08652	4352550.05300	A
178	ISPS 19484M001	4640596.79611	-206964.35890	4356391.54804	A
182	KAST 19499M001	4646949.39029	-240747.86123	4348014.62400	A
185	LARE 19440M001	4632832.25975	-279026.71853	4360314.06202	A
186	LAZK 19354S001	4666098.65792	-178186.77623	4330463.30516	A
190	LEIT 19428M001	4663521.25964	-155859.30234	4334519.51801	A
242	ORON 19427M001	4659696.11288	-130865.32083	4338948.52265	A
31	PASA 19351S001	4644909.37921	-156645.65035	4353622.71138	W
34	RI01 13448M002	4708447.13576	-199490.87271	4284089.36479	W
35	SALA 13469M001	4803054.75551	-462131.66862	4158378.69577	W
36	SOA 10088M002	4639940.82279	-136225.52258	4359552.05155	W
298	SOPU 19386M001	4643998.22144	-255914.48971	4350062.77931	A
40	TERU 13487M001	4867391.63052	-95523.95868	4108341.30108	W
349	VITO 19385M001	4679398.00941	-218437.09249	4314897.99563	A
44	YEBE 13420M001	4848724.85939	-261632.53298	4123093.94683	W
45	ZARA 13462M001	4773803.48622	-73506.57940	4215453.72179	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 2000 WEEK FINAL COMBINATION: PRECISE ORBITS 27-MAY-18 23:52

Station	#Days	Weekday 0123456	Repeatability (mm)		
			N	E	U
ACOR 13434M001	7	XXXXXX	0.84	0.79	3.80
ALDA 19383M001	7	XXXXXX	2.03	0.32	3.48
ALSA 19419M001	7	XXXXXX	1.18	0.53	3.16
AMUR 19388M001	7	XXXXXX	0.80	1.18	3.49
BIAZ 10074M002	6	XX XXX	0.66	1.04	2.95
BIDA 00000M000	7	XXXXXX	0.97	0.82	2.95
BRZR 19387M001	7	XXXXXX	1.12	0.43	3.54
CACE 13447M001	7	XXXXXX	0.52	0.96	3.44
CANT 13438M001	7	XXXXXX	0.54	0.36	4.24
CHER 00000M000	7	XXXXXX	0.62	0.80	3.90
CREU 13432M001	7	XXXXXX	0.90	0.66	2.98
EBRE 13410M001	7	XXXXXX	0.70	0.90	3.12
ELGE 19353S001	7	XXXXXX	0.79	0.85	2.64
EMAZ 17001M001	7	XXXXXX	1.56	1.09	4.68
GERN 19389M001	6	XX XXX	0.59	0.51	4.28
IGEL 19352S001	7	XXXXXX	0.79	0.53	3.04
ISPS 19484M001	7	XXXXXX	1.19	1.25	3.23
KAST 19499M001	7	XXXXXX	0.61	0.91	3.49
LARE 19440M001	7	XXXXXX	1.60	1.16	2.27
LAZK 19354S001	7	XXXXXX	0.56	0.55	3.34
LEIT 19428M001	7	XXXXXX	0.70	0.54	5.88
ORON 19427M001	7	XXXXXX	0.54	1.13	2.82
PASA 19351S001	7	XXXXXX	0.91	0.44	3.23
RI01 13448M002	7	XXXXXX	0.72	0.56	2.51
SALA 13469M001	7	XXXXXX	1.00	0.79	2.87
SCDA 10088M002	7	XXXXXX	0.42	0.54	4.78
SOPU 19386M001	7	XXXXXX	1.41	1.26	4.23
TERU 13487M001	7	XXXXXX	0.90	0.52	2.71
VITO 19385M001	7	XXXXXX	0.75	0.40	3.09
YEBE 13420M001	7	XXXXXX	0.88	0.73	2.28
ZARA 13462M001	7	XXXXXX	0.97	0.36	2.88

Comparison of individual solutions:

ACOR 13434M001	N	0.84	-0.98	-0.41	0.85	-0.90	-0.49	0.77	0.88
ACOR 13434M001	E	0.79	0.69	-0.45	-0.31	0.69	0.19	1.16	1.03
ACOR 13434M001	U	3.80	-2.65	-3.87	-3.12	0.64	3.83	6.00	1.94
ALDA 19383M001	N	2.03	1.20	1.71	3.00	2.60	0.08	-2.16	-0.66
ALDA 19383M001	E	0.32	0.10	0.12	-0.56	0.14	0.39	0.25	0.18
ALDA 19383M001	U	3.48	-0.98	2.99	-5.98	-1.74	-2.53	-0.92	-4.11
ALSA 19419M001	N	1.18	0.95	0.57	0.74	1.93	0.42	-1.37	-0.88
ALSA 19419M001	E	0.53	-0.94	0.20	0.16	0.77	0.24	0.27	0.10
ALSA 19419M001	U	3.16	3.97	-2.50	-1.47	1.42	-4.44	-0.29	-3.72
AMUR 19388M001	N	0.80	-0.75	0.13	-0.31	1.12	0.91	-0.55	0.90
AMUR 19388M001	E	1.18	-0.63	-1.94	0.84	1.23	1.11	0.25	0.84
AMUR 19388M001	U	3.49	-1.20	-0.07	-2.72	0.88	-7.39	0.52	-2.90
BIAZ 10074M002	N	0.66	0.21	0.19		0.50	1.01	-0.86	0.31
BIAZ 10074M002	E	1.04	-0.35	-0.72		-0.01	0.44	-1.41	1.62
BIAZ 10074M002	U	2.95	-3.62	-0.04		-1.70	-3.63	1.38	-3.54
BIDA 00000M000	N	0.97	0.17	-0.48	0.25	0.48	1.26	-1.63	0.93
BIDA 00000M000	E	0.82	-0.30	0.18	-0.43	0.52	1.14	-1.39	-0.46
BIDA 00000M000	U	2.95	-0.81	-4.74	0.80	-5.04	-0.72	-1.22	1.09
BRZR 19387M001	N	1.12	0.66	0.63	-1.32	-0.08	0.03	2.22	0.01
BRZR 19387M001	E	0.43	0.65	-0.09	-0.02	-0.55	-0.00	-0.08	0.62
BRZR 19387M001	U	3.54	2.18	4.90	-3.67	-0.27	-3.98	-1.57	-3.79
CACE 13447M001	N	0.52	0.65	-0.76	-0.05	-0.17	0.14	0.74	0.14
CACE 13447M001	E	0.96	0.20	1.44	-0.81	-1.21	-0.17	0.80	-0.77
CACE 13447M001	U	3.44	-2.53	-1.64	4.53	-4.67	0.42	0.45	-4.41
CANT 13438M001	N	0.54	-0.59	0.48	0.56	0.91	0.12	0.08	-0.19
CANT 13438M001	E	0.36	-0.07	-0.19	0.38	0.70	0.09	0.09	0.26
CANT 13438M001	U	4.24	-2.35	-2.38	-4.39	8.33	-2.28	0.88	1.42
CHER 00000M000	N	0.62	0.49	0.80	-0.81	0.57	0.25	0.23	-0.57
CHER 00000M000	E	0.80	0.63	0.31	0.43	-1.02	-0.28	-1.32	0.55
CHER 00000M000	U	3.90	-3.46	-1.83	4.45	-1.06	-6.56	1.61	-3.09
CREU 13432M001	N	0.90	0.89	-1.39	0.43	1.08	-0.81	-0.17	-0.21
CREU 13432M001	E	0.66	0.71	0.15	-0.61	0.20	-0.89	0.80	-0.46
CREU 13432M001	U	2.98	1.89	4.50	-3.17	0.60	-3.36	-2.78	0.41
EBRE 13410M001	N	0.70	0.63	-0.13	0.68	0.48	-0.26	0.76	-1.11
EBRE 13410M001	E	0.90	-0.58	-0.30	-1.14	-0.12	0.64	-0.26	1.63
EBRE 13410M001	U	3.12	-2.56	0.92	-1.32	-3.59	5.19	-0.30	3.08
ELGE 19353S001	N	0.79	0.59	1.01	-0.39	0.39	0.98	-1.01	0.36
ELGE 19353S001	E	0.85	0.55	0.31	-0.01	0.13	0.94	-1.71	0.31
ELGE 19353S001	U	2.64	0.07	0.04	-0.44	1.57	-6.15	-1.12	-0.25
EMAZ 17001M001	N	1.56	-0.42	1.07	0.77	-2.06	-2.25	0.42	-1.77
EMAZ 17001M001	E	1.09	0.10	0.43	1.75	1.24	-0.95	-0.74	-0.97
EMAZ 17001M001	U	4.68	-3.45	-0.23	0.66	2.60	7.19	-4.55	6.32
GERN 19389M001	N	0.59	-0.61	0.84	0.10		0.20	0.19	0.74
GERN 19389M001	E	0.51	0.57	-0.49	-0.20		0.81	0.14	-0.21
GERN 19389M001	U	4.28	3.89	2.47	-3.44		-2.43	0.86	-7.20
IGEL 19352S001	N	0.79	0.13	1.14	-0.11	1.15	-0.77	-0.62	0.35
IGEL 19352S001	E	0.53	-0.65	0.16	-0.29	0.64	-0.03	-0.84	0.16
IGEL 19352S001	U	3.04	-1.21	-1.24	2.26	-4.13	-3.63	1.19	-3.94
ISPS 19484M001	N	1.19	-0.93	1.29	0.50	0.99	1.17	-1.76	0.51
ISPS 19484M001	E	1.25	1.07	1.26	-0.31	0.37	0.97	-2.28	-0.49
ISPS 19484M001	U	3.23	0.10	-2.36	1.74	3.30	-6.20	-1.47	-1.57
KAST 19499M001	N	0.61	-1.05	0.72	0.30	0.43	0.48	0.13	0.35
KAST 19499M001	E	0.91	-0.35	-1.00	1.13	1.45	-0.01	-0.11	0.66
KAST 19499M001	U	3.49	1.64	-2.20	-2.89	-0.71	-3.13	-6.82	0.73
LARE 19440M001	N	1.60	1.93	0.04	-1.62	1.14	1.23	-2.29	-0.94
LARE 19440M001	E	1.16	-0.83	0.06	-0.31	-0.32	1.94	-1.77	0.51
LARE 19440M001	U	2.27	2.61	-0.58	-0.62	0.64	-4.78	-0.31	-0.04
LAZK 19354S001	N	0.56	-0.03	0.29	-0.30	0.20	0.88	0.02	0.95
LAZK 19354S001	E	0.55	-0.41	-0.07	0.54	1.11	-0.35	-0.09	-0.16
LAZK 19354S001	U	3.34	-1.56	-2.77	1.74	4.55	-5.16	-0.19	-2.54

LEIT 19428M001	N	0.70	0.75	-0.28	0.25	0.94	0.43	-1.08	0.13
LEIT 19428M001	E	0.54	0.16	0.01	-1.09	-0.30	0.02	-0.13	0.68
LEIT 19428M001	U	5.88	-4.03	-9.29	4.02	-5.93	0.65	-3.32	6.48
ORDN 19427M001	N	0.54	0.25	-0.55	-0.06	0.81	0.38	-0.39	0.67
ORDN 19427M001	E	1.13	0.25	0.60	-0.03	-0.69	0.08	-2.38	1.06
ORDN 19427M001	U	2.82	-2.20	2.09	-1.43	-0.03	-5.39	-1.09	-2.51
PASA 19351S001	N	0.91	-0.50	-0.60	-0.56	1.37	0.32	-0.04	1.42
PASA 19351S001	E	0.44	-0.53	-0.44	-0.14	-0.14	0.07	-0.36	0.73
PASA 19351S001	U	3.23	-2.09	-0.11	0.59	-5.00	-4.32	2.78	-2.57
RIO1 13448M002	N	0.72	0.01	-0.32	-0.02	0.98	0.82	-0.63	1.00
RIO1 13448M002	E	0.56	-0.52	0.12	0.06	1.15	0.02	-0.42	0.35
RIO1 13448M002	U	2.51	-0.52	1.85	-3.27	2.87	-3.06	-2.16	1.04
SALA 13469M001	N	1.00	-0.95	0.62	0.02	-1.76	-0.98	0.36	0.74
SALA 13469M001	E	0.79	0.72	-0.74	0.68	0.24	0.19	-1.12	0.96
SALA 13469M001	U	2.87	0.88	-1.72	3.07	0.27	3.02	4.97	1.57
SCDA 10088M002	N	0.42	0.39	0.35	-0.30	-0.17	0.13	0.78	-0.15
SCDA 10088M002	E	0.54	-0.32	0.11	-0.15	-0.43	-0.38	-0.51	1.02
SCDA 10088M002	U	4.78	-0.46	1.93	0.19	-2.22	-3.41	3.83	-10.09
SOPU 19386M001	N	1.41	1.49	2.15	-0.50	0.53	0.53	-0.03	-2.06
SOPU 19386M001	E	1.26	0.82	1.54	0.98	0.19	-0.47	-0.15	-2.29
SOPU 19386M001	U	4.23	-0.62	-3.06	1.34	0.65	-7.59	6.14	-0.15
TERU 13487M001	N	0.90	1.09	0.97	-0.26	0.19	0.87	-1.32	-0.31
TERU 13487M001	E	0.52	-0.17	-0.11	0.65	-0.39	0.66	-0.04	-0.77
TERU 13487M001	U	2.71	-1.39	1.15	-0.24	0.24	1.39	5.88	-2.03
VITO 19385M001	N	0.75	0.62	-0.04	0.16	1.27	0.74	-0.90	-0.01
VITO 19385M001	E	0.40	0.03	-0.03	-0.38	0.16	0.43	0.38	0.69
VITO 19385M001	U	3.09	1.76	-4.38	-1.16	2.29	-2.69	-4.44	-1.19
YEBE 13420M001	N	0.88	0.46	-1.02	-1.08	-0.25	0.58	1.34	-0.08
YEBE 13420M001	E	0.73	0.29	0.17	-0.14	-1.20	0.49	0.97	-0.69
YEBE 13420M001	U	2.28	-0.48	-2.25	-2.57	-1.02	2.92	-2.36	-2.00
ZARA 13462M001	N	0.97	0.93	-0.01	-0.10	1.95	-0.07	-0.92	0.33
ZARA 13462M001	E	0.36	0.44	-0.32	0.28	0.46	-0.10	-0.06	-0.40
ZARA 13462M001	U	2.88	0.07	3.53	0.86	-5.53	-1.26	-0.01	-2.11

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	-1.08	2.36	2.43
2	ALAC 13433M001	I W	-0.06	0.72	-3.26
3	ALBA 13452M001	I W	-0.09	-0.50	-1.13
4	ALME 13437M001	I W	-0.60	-0.14	1.26
5	BCLN 13412M001	I W	-1.03	0.62	-2.01
6	BELL 13431M001	I W	1.52	1.07	-2.31
7	BORR 13480M001	I W	-0.32	-1.43	-2.80
8	BRST 10004M004	I W	-1.35	-0.16	-2.64
9	CACE 13447M001	I W	0.05	0.49	-0.60
10	CANT 13438M001	I W	-0.36	-0.25	2.36
11	CARG 19412M001	I W	0.21	0.13	-1.27
12	CASC 13909S001	I W	-1.46	-1.26	3.32
13	CEU1 13449M002	I W	0.52	-0.09	1.80
14	COBA 13453M001	I W	0.36	0.32	-3.06
15	CREU 13432M001	I W	-0.86	1.02	-0.35
16	EBRE 13410M001	I W	1.31	0.96	-4.70
17	ESCO 13435M001	I W	-0.70	-3.61	4.60
18	FUNC 13911S001	I W	2.23	0.39	-1.39
19	GAIA 13902M001	I W	-0.20	-1.11	4.98
21	HUEL 13451M001	I W	-0.23	-0.50	4.35
22	IZAN 31309M002	I W	0.57	0.77	-0.42
24	LLIV 13436M001	I W	-0.93	0.84	3.83
25	LPAL 81701M001	I W	-1.40	1.66	-2.70
26	LROC 10023M001	I W	-0.26	-1.20	-0.98
27	MALA 13443M001	I W	-2.18	1.46	2.60
30	MELI 19379M001	I W	-0.19	0.02	2.49
31	PASA 19351S001	I W	-0.47	-1.10	3.29
32	PDEL 31906M004	I W	-0.26	0.75	-6.99
33	RABT 35001M002	I W	0.08	-0.57	-2.03
34	RID1 13448M002	I W	0.08	-0.89	0.86
35	SALA 13469M001	I W	0.23	0.79	-0.50
36	SCOA 10088M002	I W	-3.97	-1.83	-0.45
38	SONS 13446M001	I W	0.97	1.64	-0.53
39	TERC 31909M001	I W	7.43	-2.63	-9.69
40	TERU 13487M001	I W	1.40	0.80	-0.61
41	VALA 13463M002	I W	-0.68	-0.02	-0.67
42	VALE 13439M001	I W	-0.40	0.84	-3.31
43	VIGO 13450M001	I W	0.87	-0.47	5.15
44	YEBE 13420M001	I W	1.23	-0.37	2.95
45	ZARA 13462M001	I W	-0.57	0.38	1.98
46	ZIMM 14001M004	I W	0.59	0.05	6.17
RMS / COMPONENT			1.61	1.17	3.35
MEAN			0.00	0.00	0.00
MIN			-3.97	-3.61	-9.69
MAX			7.43	2.36	6.17

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 123
RMS OF TRANSFORMATION : 2.25 MM

BARYCENTER COORDINATES:

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

PARAMETERS:

TRANSLATION IN N : 0.00 +- 0.35 MM
TRANSLATION IN E : -0.00 +- 0.35 MM
TRANSLATION IN U : -0.00 +- 0.35 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                16658951
NUMBER OF UNKNOWN                    233241
NUMBER OF DEGREES OF FREEDOM          16425710
PHASE MEASUREMENTS SIGMA              0.00100
SAMPLING INTERVAL (SECONDS)           180
VARIANCE FACTOR                       2.368734732263197

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
 1  0.00187    -0.0050 -0.0136 -0.0038  0.0003 -0.0000 -0.0004  0.00075
 2  0.00223    0.0114 -0.0000 -0.0065  0.0001  0.0004  0.0001 -0.00062
 3  0.00225    0.0159 -0.0145 -0.0113  0.0003  0.0006 -0.0004 -0.00107
 4  0.00198   -0.0014  0.0140  0.0094 -0.0003 -0.0003  0.0004 -0.00070
 5  0.00231    0.0120  0.0200 -0.0113 -0.0003  0.0005  0.0006 -0.00014
 6  0.00192    0.0121  0.0145 -0.0177 -0.0001  0.0007  0.0005  0.00046
 7  0.00224    0.0106  0.0092 -0.0141 -0.0001  0.0006  0.0003  0.00008
    
```

```

Statistics of individual solutions:
-----
File  RMS (m)      DOF  Ch1**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
 1  0.00142    2299788    2.02          2333022          3          987    32250    0
 2  0.00145    2362451    2.09          2396746          3          1011   33287    0
 3  0.00154    2287797    2.37          2321387          3          984    32609    0
 4  0.00145    2331047    2.11          2365130          3          1014   33072    0
 5  0.00142    2394488    2.02          2429218          3          1026   33707    0
 6  0.00147    2372633    2.17          2407405          3          1023   33752    0
 7  0.00193    2371488    3.73          2406043          3          1026   33532    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 18:126:00000 18:132:86370 LEICA GRX1200PRO -----
ALDA  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
ALSA  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200GGPRO -----
AMUR  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
BIAZ  A  1 P 18:126:00000 18:132:86370 TRI SP90M -----
BIDA  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
BRZR  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
CACE  A  1 P 18:126:00000 18:132:86370 TRIMBLE NETR9 -----
CANT  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
CHER  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200+GNSS -----
CREU  A  1 P 18:126:00000 18:132:86370 LEICA GR50 -----
EBRE  A  1 P 18:126:00000 18:132:86370 LEICA GR50 -----
ELGE  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
EMAZ  A  1 P 18:126:00000 18:132:86370 LEICA GR30 -----
GERN  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
IGEL  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
ISPS  A  1 P 18:126:00000 18:132:86370 TRIMBLE NETR9 -----
KAST  A  1 P 18:126:00000 18:132:86370 LEICA GR30 -----
LARE  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200GGPRO -----
LAZK  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
LEIT  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200+GNSS -----
ORON  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200GGPRO -----
PASA  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
RIO1  A  1 P 18:126:00000 18:132:86370 LEICA GR25 -----
SALA  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200+GNSS -----
SCOA  A  1 P 18:126:00000 18:132:86370 LEICA GR25 -----
SOPU  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
TERU  A  1 P 18:126:00000 18:132:86370 LEICA GRX1200GGPRO -----
VITO  A  1 P 18:126:00000 18:132:86370 LEICA GR10 -----
YEBE  A  1 P 18:126:00000 18:132:86370 TRIMBLE NETR9 -----
ZARA  A  1 P 18:126:00000 18:132:86370 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 18:126:00000 18:132:86370 LEIAT504    LEIS -----
ALDA  A  1 P 18:126:00000 18:132:86370 LEIAS10    NONE -----
ALSA  A  1 P 18:126:00000 18:132:86370 LEIAX1202GG NONE -----
AMUR  A  1 P 18:126:00000 18:132:86370 LEIAS10    NONE -----
BIAZ  A  1 P 18:126:00000 18:132:86370 LEIAR25    LEIT -----
    
```

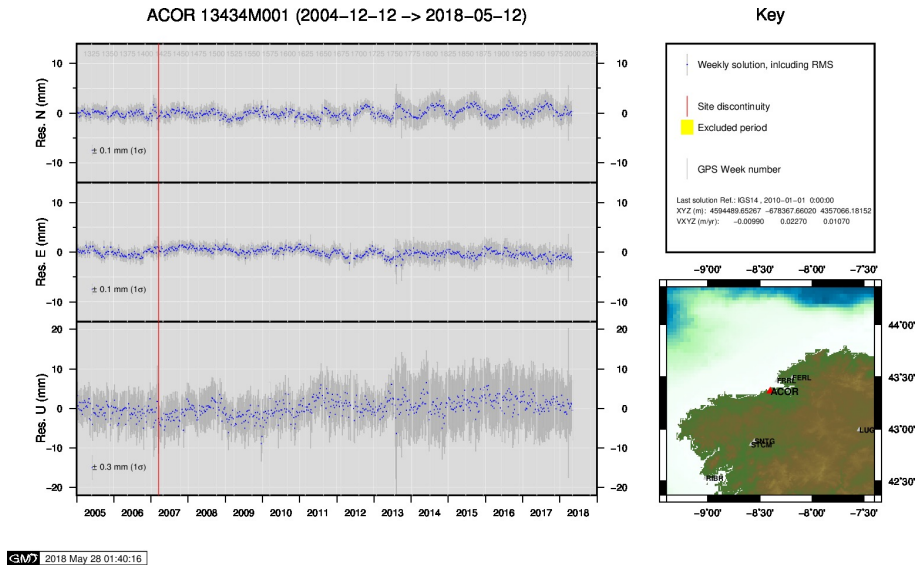
BIDA	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
BRZR	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
CACE	A	1 P	18:126:00000	18:132:86370	TRM29659.00	NONE	----
CANT	A	1 P	18:126:00000	18:132:86370	LEIAR25.R4	LEIT	25066
CHER	A	1 P	18:126:00000	18:132:86370	LEIAX1203+GNSS	NONE	----
CREU	A	1 P	18:126:00000	18:132:86370	LEIAR25.R4	NONE	26357
EBRE	A	1 P	18:126:00000	18:132:86370	LEIAR25.R4	NONE	26359
ELGE	A	1 P	18:126:00000	18:132:86370	LEIAR25.R4	LEIT	----
EMAZ	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
GERN	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
IGEL	A	1 P	18:126:00000	18:132:86370	LEIAR20	LEIM	----
ISPS	A	1 P	18:126:00000	18:132:86370	TRM59900.00	SCIS	----
KAST	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
LARE	A	1 P	18:126:00000	18:132:86370	LEIAT504	NONE	----
LAZK	A	1 P	18:126:00000	18:132:86370	LEIAR25.R4	LEIT	----
LEIT	A	1 P	18:126:00000	18:132:86370	LEIAX1203+GNSS	NONE	----
ORDN	A	1 P	18:126:00000	18:132:86370	LEIAX1202GG	NONE	----
PASA	A	1 P	18:126:00000	18:132:86370	LEIAR20	LEIM	73034
RIO1	A	1 P	18:126:00000	18:132:86370	LEIAR25.R4	LEIT	25138
SALA	A	1 P	18:126:00000	18:132:86370	LEIAR25	NONE	----
SCDA	A	1 P	18:126:00000	18:132:86370	TRM55971.00	NONE	----
SOPU	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
TERU	A	1 P	18:126:00000	18:132:86370	LEIAT504GG	LEIS	----
VITO	A	1 P	18:126:00000	18:132:86370	LEIAS10	NONE	----
YEBE	A	1 P	18:126:00000	18:132:86370	TRM29659.00	NONE	----
ZARA	A	1 P	18:126:00000	18:132:86370	TRM29659.00	NONE	----

7.3 Eccentricities

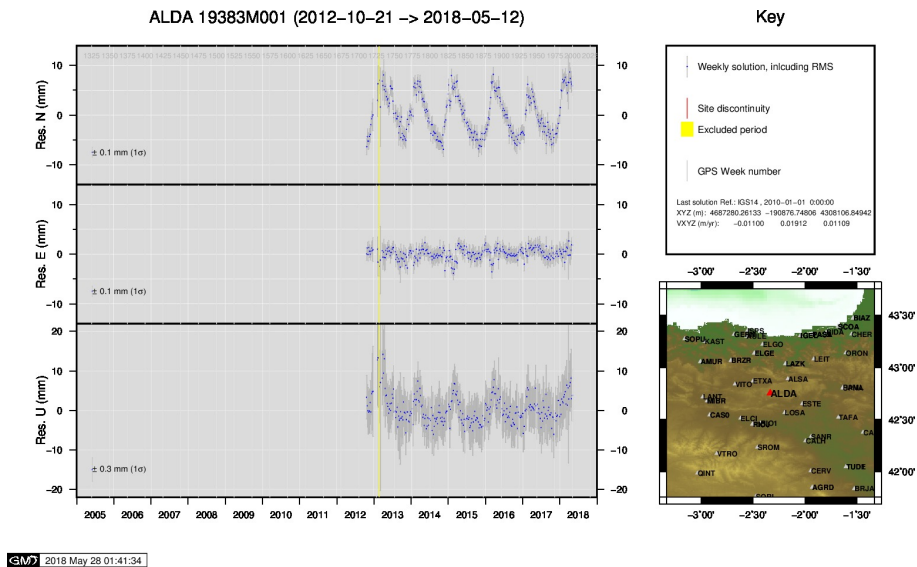
*SITE	PT	SOLN	T	DATA_START_	DATA_END_	AXE	ARP->BENCHMARK(M)	UP_	NORTH_	EAST_
ACOR	A	1 P	18:126:00000	18:132:86370	UNE	3.0460	0.0000	0.0000	0.0000	0.0000
ALDA	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ALSA	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
AMUR	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
BIAZ	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
BIDA	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
BRZR	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
CACE	A	1 P	18:126:00000	18:132:86370	UNE	0.0600	0.0000	0.0000	0.0000	0.0000
CANT	A	1 P	18:126:00000	18:132:86370	UNE	3.0490	0.0000	0.0000	0.0000	0.0000
CHER	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
CREU	A	1 P	18:126:00000	18:132:86370	UNE	0.0770	0.0000	0.0000	0.0000	0.0000
EBRE	A	1 P	18:126:00000	18:132:86370	UNE	0.0770	0.0000	0.0000	0.0000	0.0000
ELGE	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
EMAZ	A	1 P	18:126:00000	18:132:86370	UNE	0.0350	0.0000	0.0000	0.0000	0.0000
GERN	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
IGEL	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ISPS	A	1 P	18:126:00000	18:132:86370	UNE	0.0350	0.0000	0.0000	0.0000	0.0000
KAST	A	1 P	18:126:00000	18:132:86370	UNE	0.0350	0.0000	0.0000	0.0000	0.0000
LARE	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
LAZK	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
LEIT	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ORDN	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
PASA	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
RIO1	A	1 P	18:126:00000	18:132:86370	UNE	0.0606	0.0000	0.0000	0.0000	0.0000
SALA	A	1 P	18:126:00000	18:132:86370	UNE	0.0600	0.0000	0.0000	0.0000	0.0000
SCDA	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
SOPU	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
TERU	A	1 P	18:126:00000	18:132:86370	UNE	0.0600	0.0000	0.0000	0.0000	0.0000
VITO	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
YEBE	A	1 P	18:126:00000	18:132:86370	UNE	0.0000	0.0000	0.0000	0.0000	0.0000
ZARA	A	1 P	18:126:00000	18:132:86370	UNE	3.2590	0.0000	0.0000	0.0000	0.0000

8 Cumulative Time Series

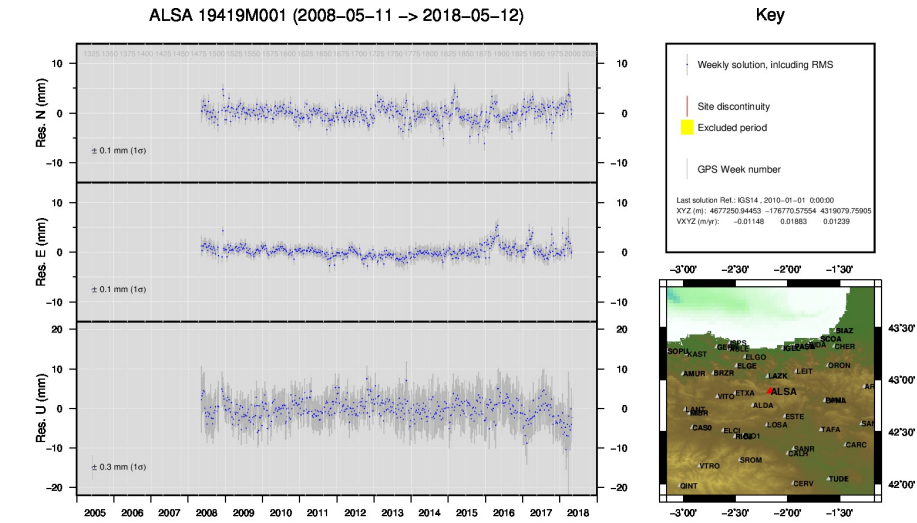
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

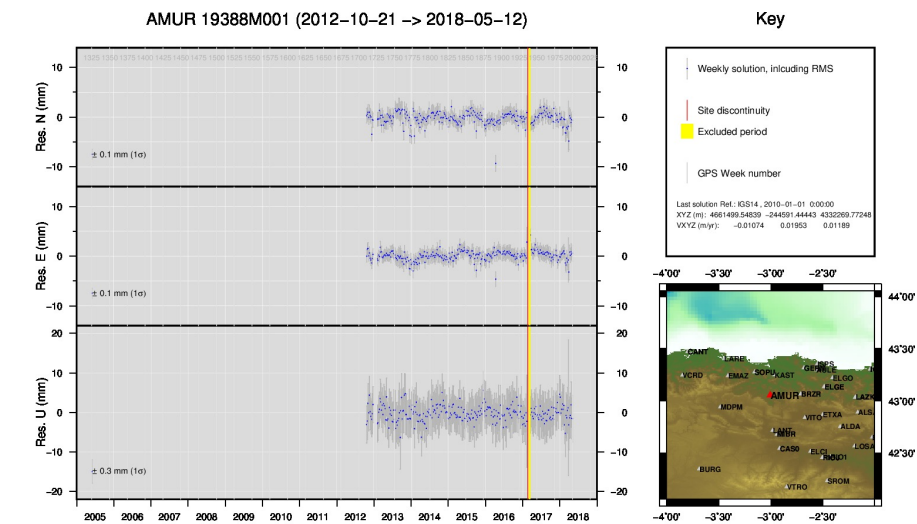


2) ALDA



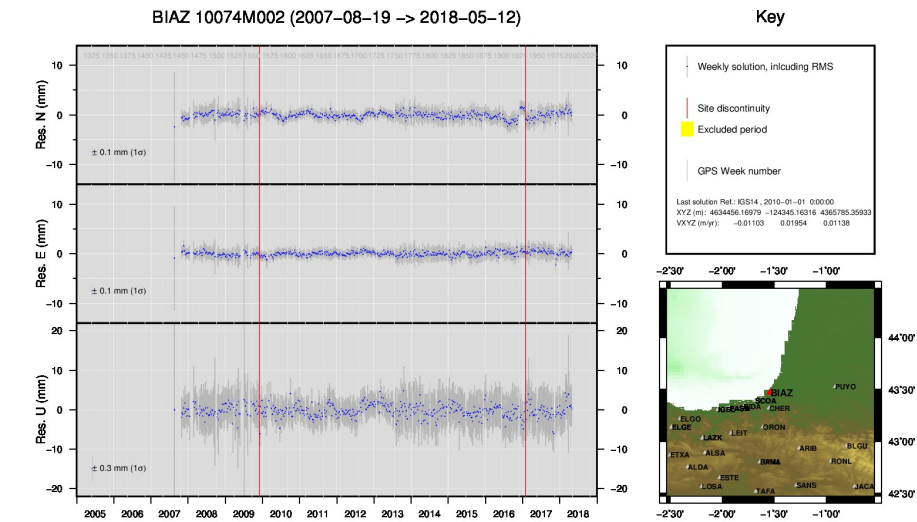
GMW 2018 May 28 01:42:29

3) ALSA



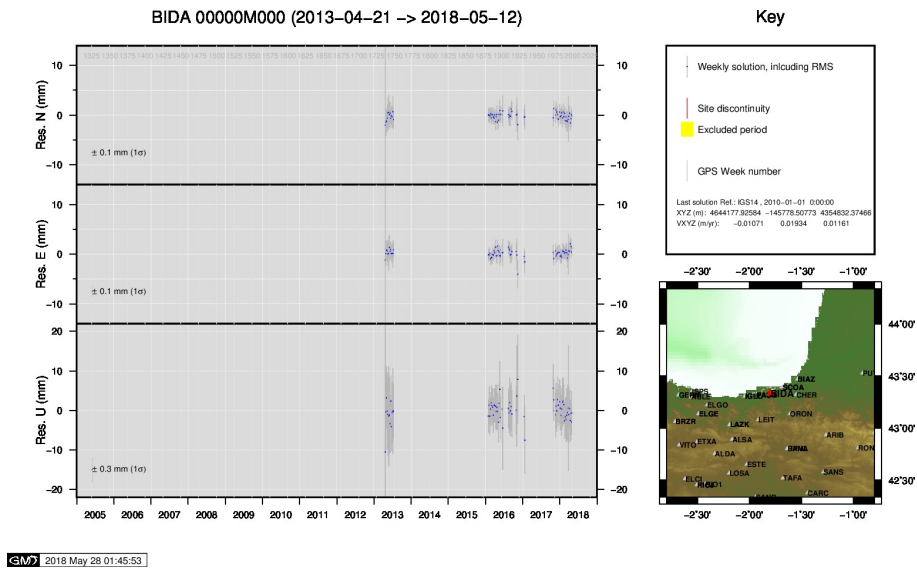
GMW 2018 May 28 01:42:40

4) AMUR



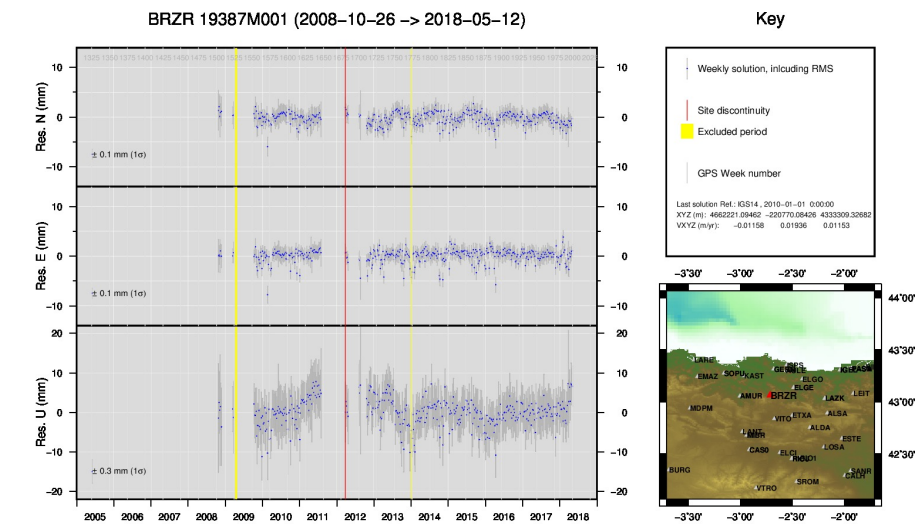
GMW 2018 May 28 01:45:47

5) BLAZ



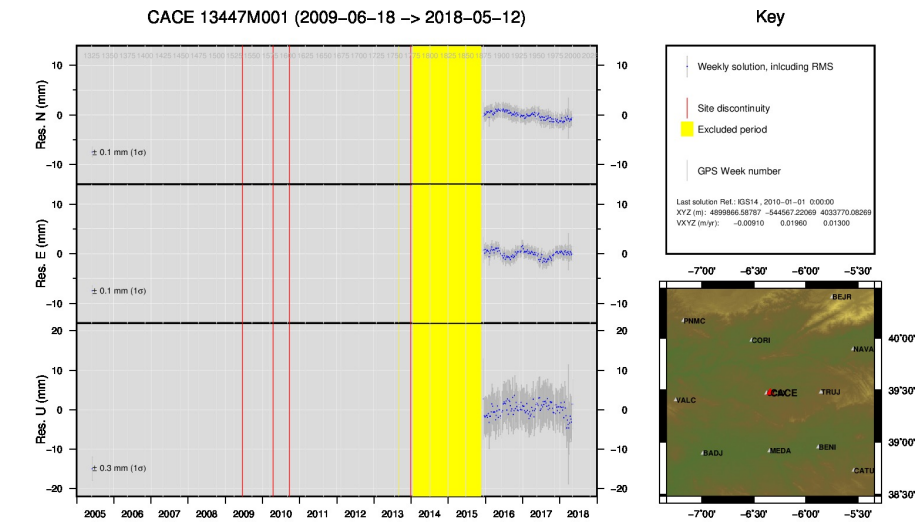
GMW 2018 May 28 01:45:53

6) BIDA



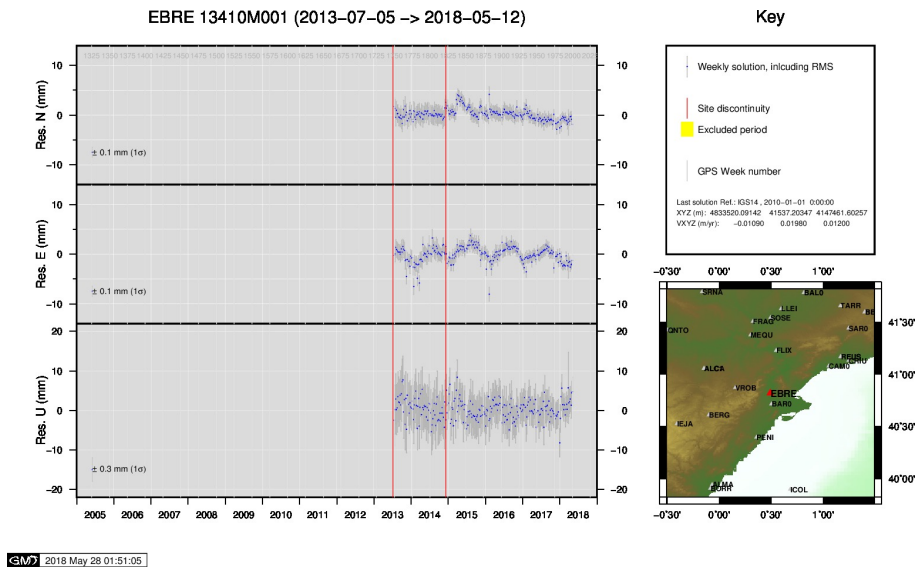
GMW 2018 May 28 01:46:59

7) BRZR

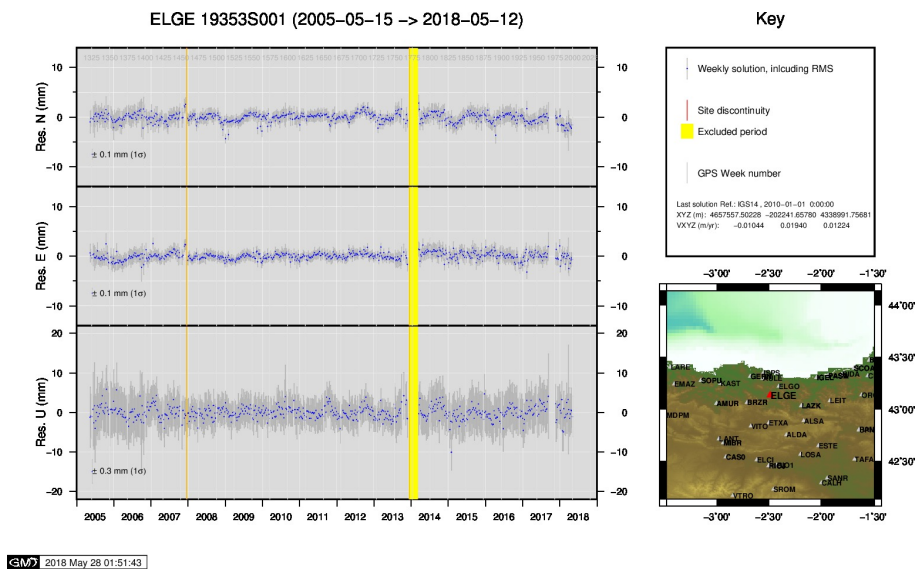


GMW 2018 May 28 01:47:33

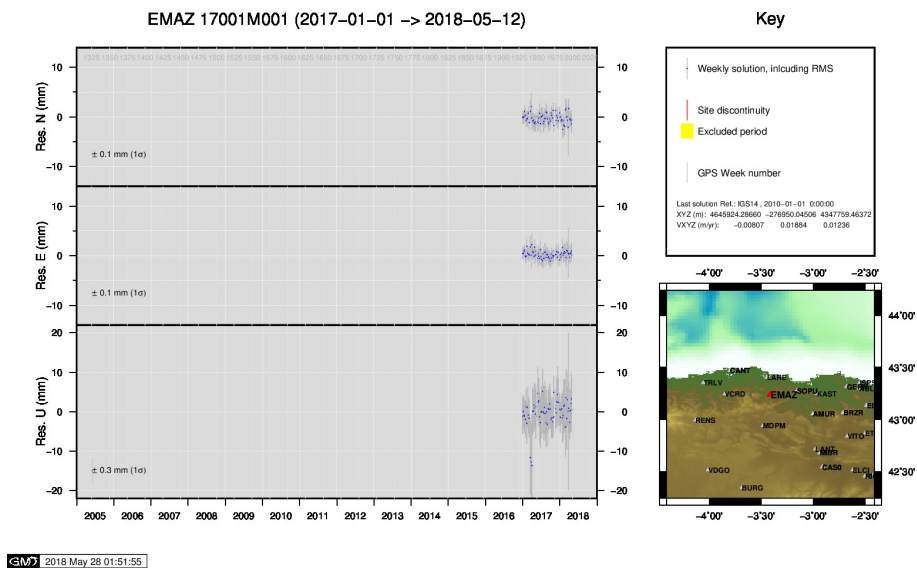
8) CACE



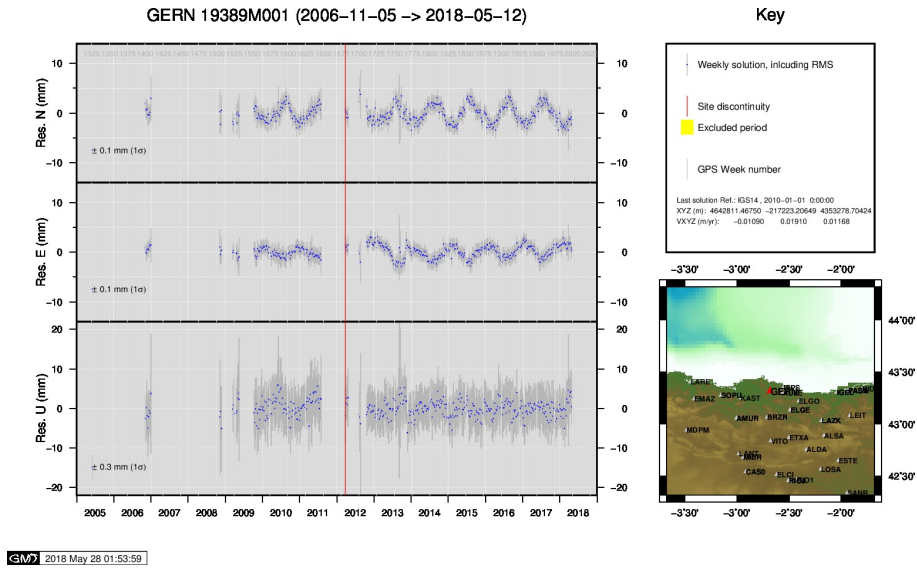
12) EBRE



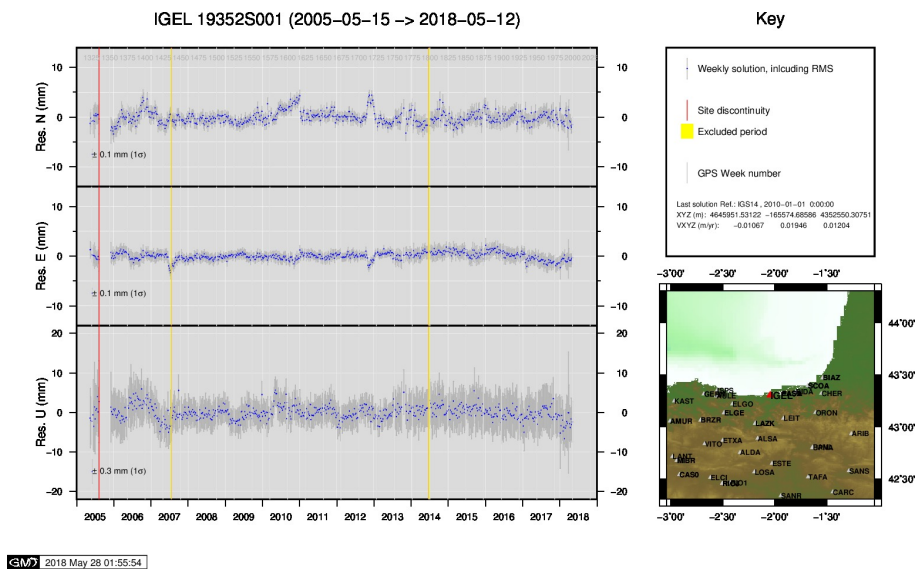
13) ELGE



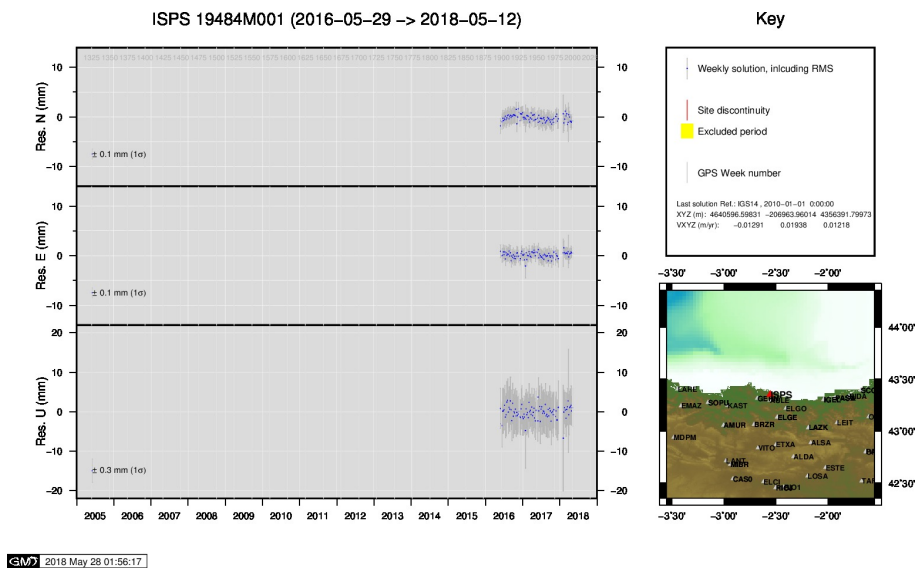
14) EMAZ



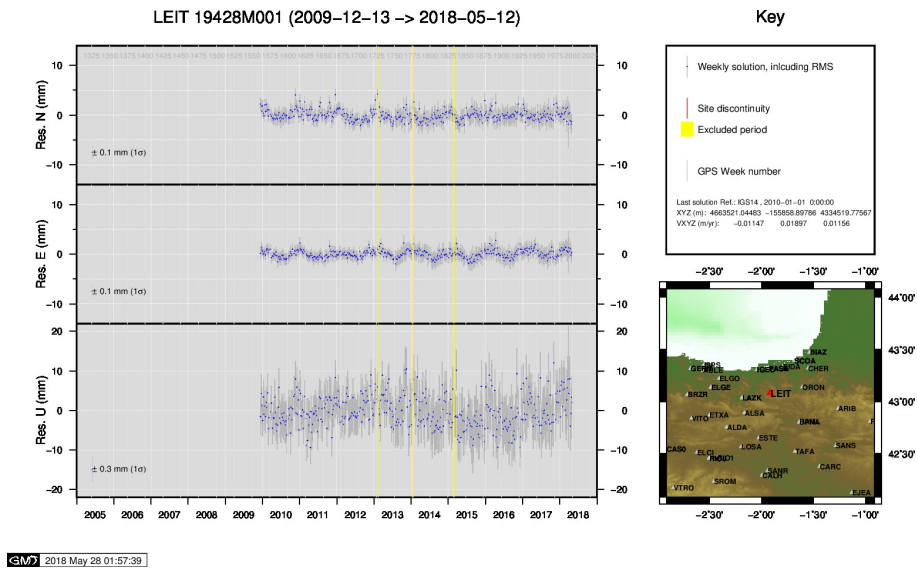
15) GERN



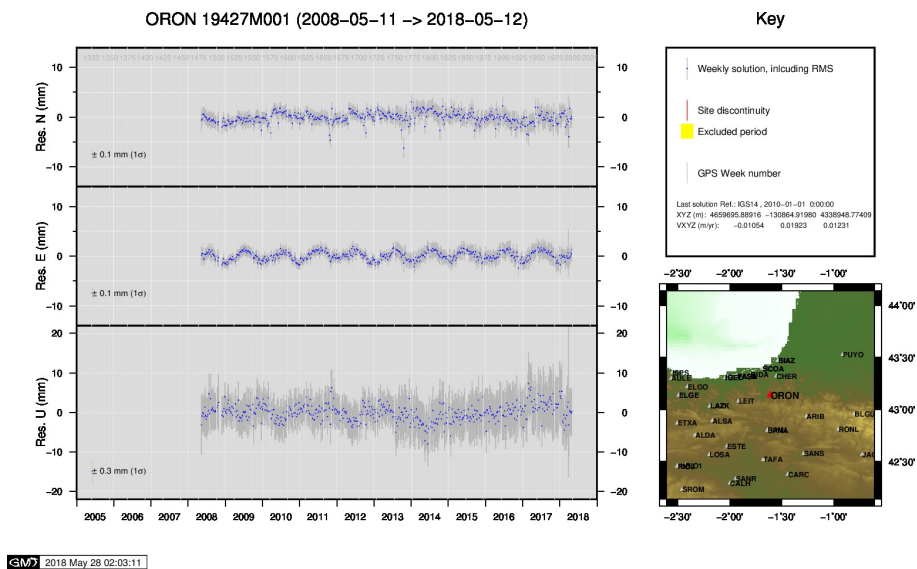
16) IGEL



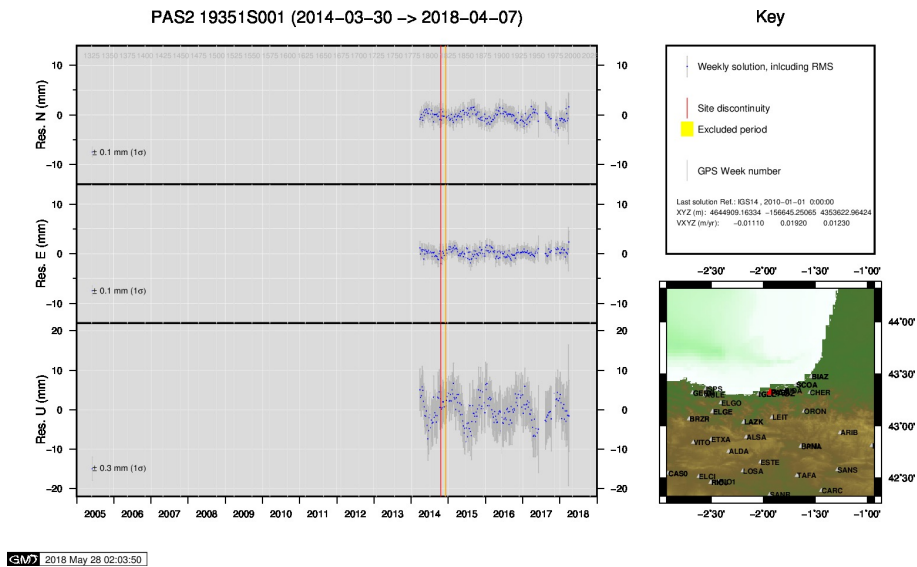
17) ISPS



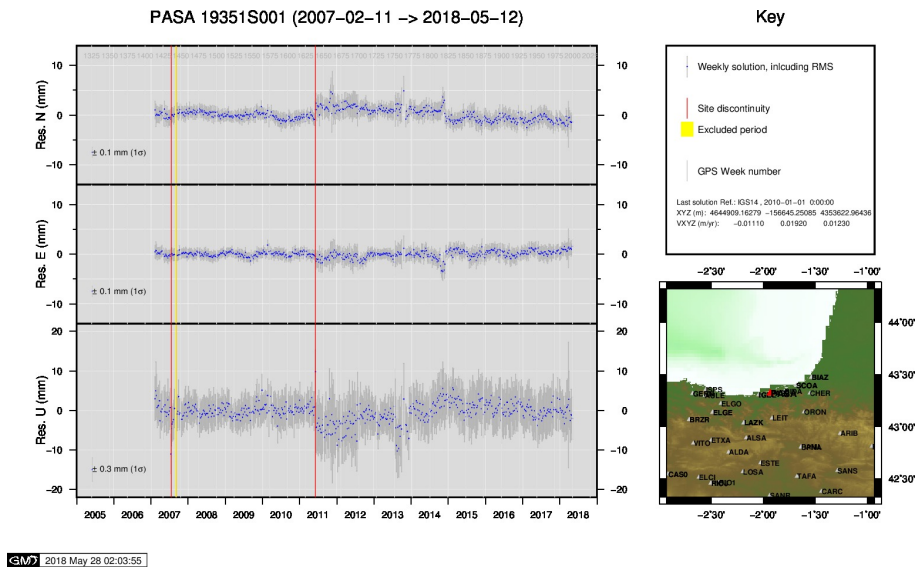
21) LEIT



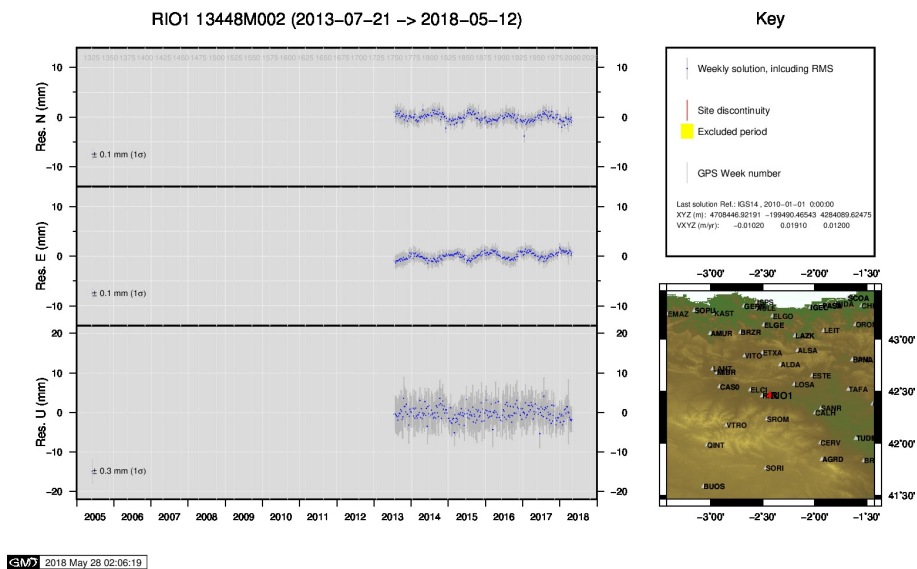
22) ORON



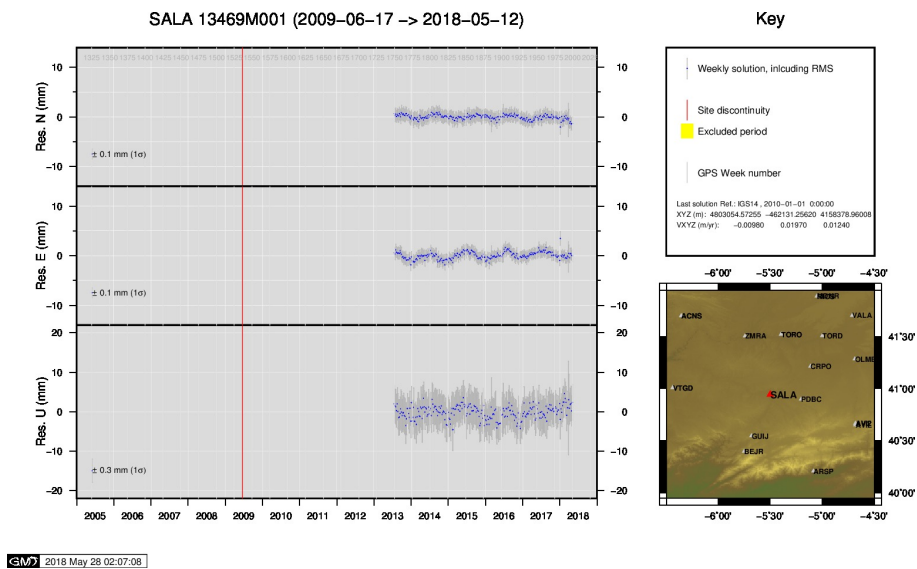
23) PAS2



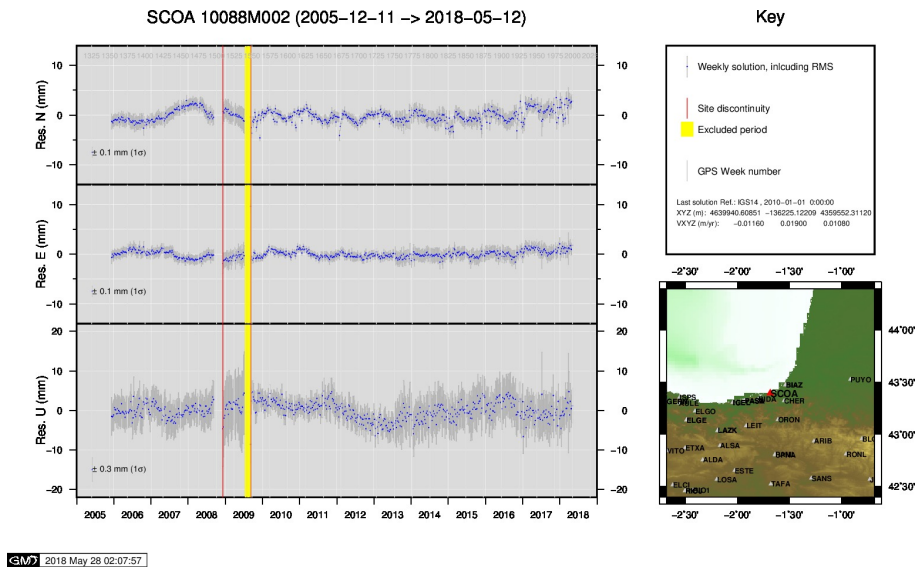
24) PASA



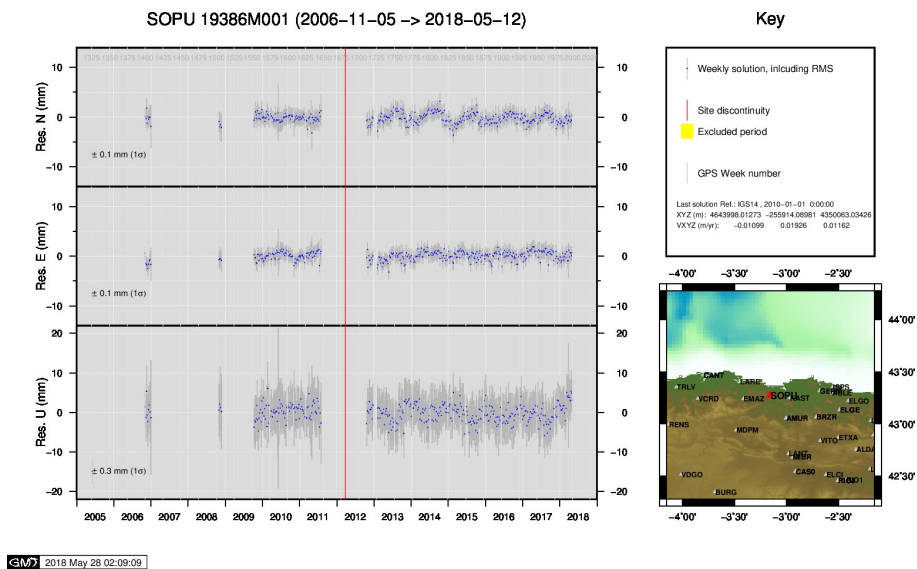
25) RIO1



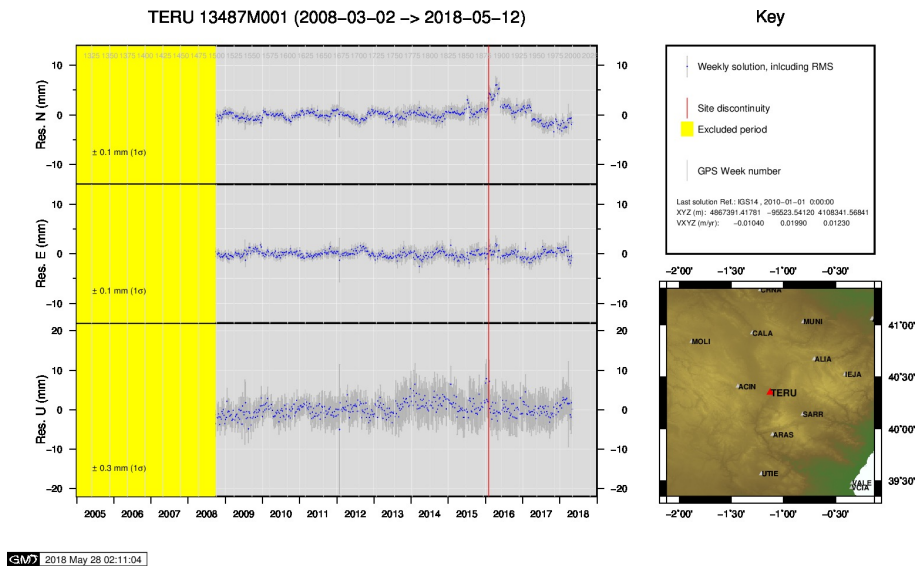
26) SALA



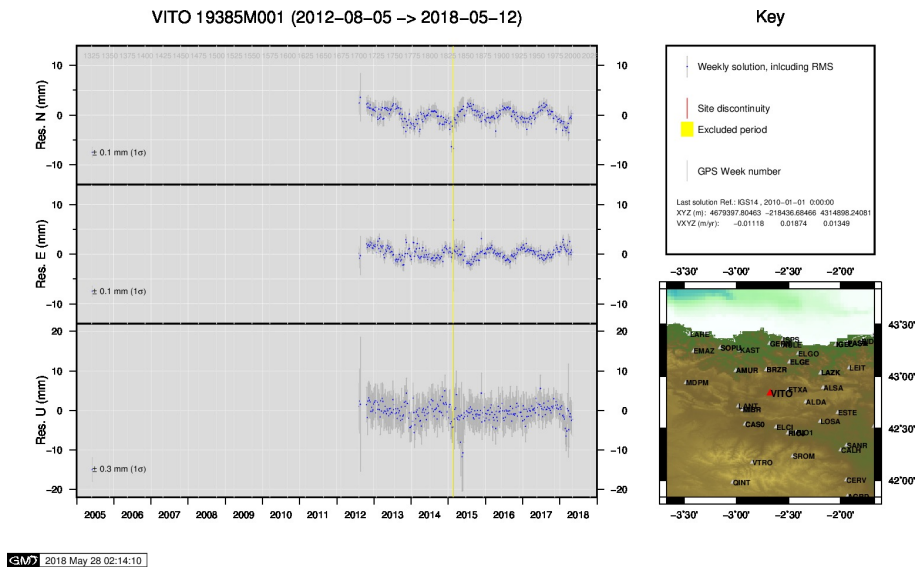
27) SCOA



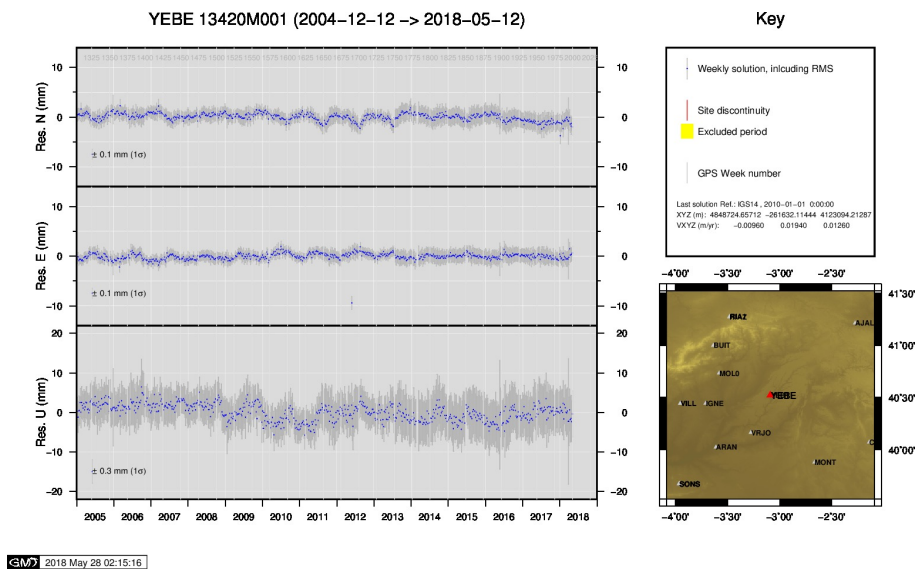
28) SOPU



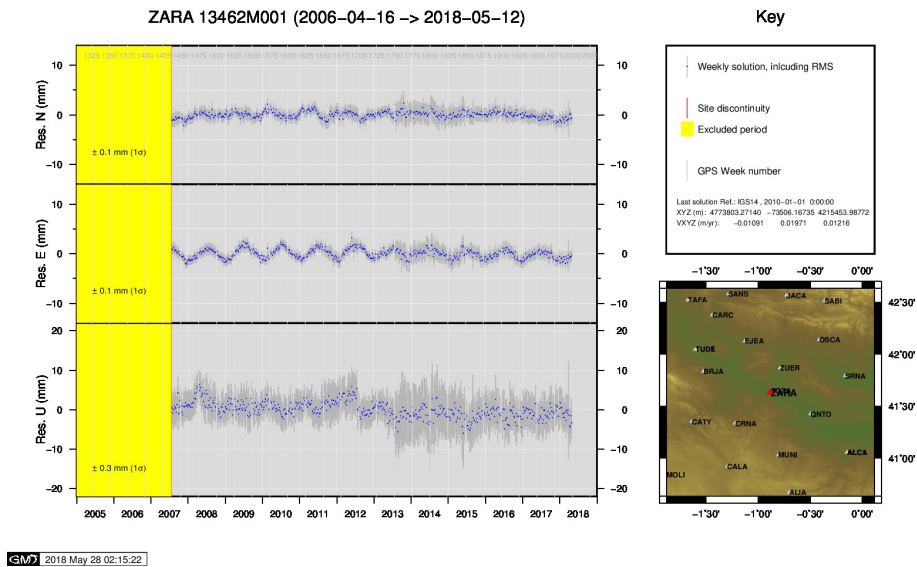
29) TERU



30) VITO



31) YEBE



32) ZARA

