

ARA-DAC Weekly Analysis Result: 1989 (GFA)

Technical Report

GPS Week: 1989 (GFA)

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

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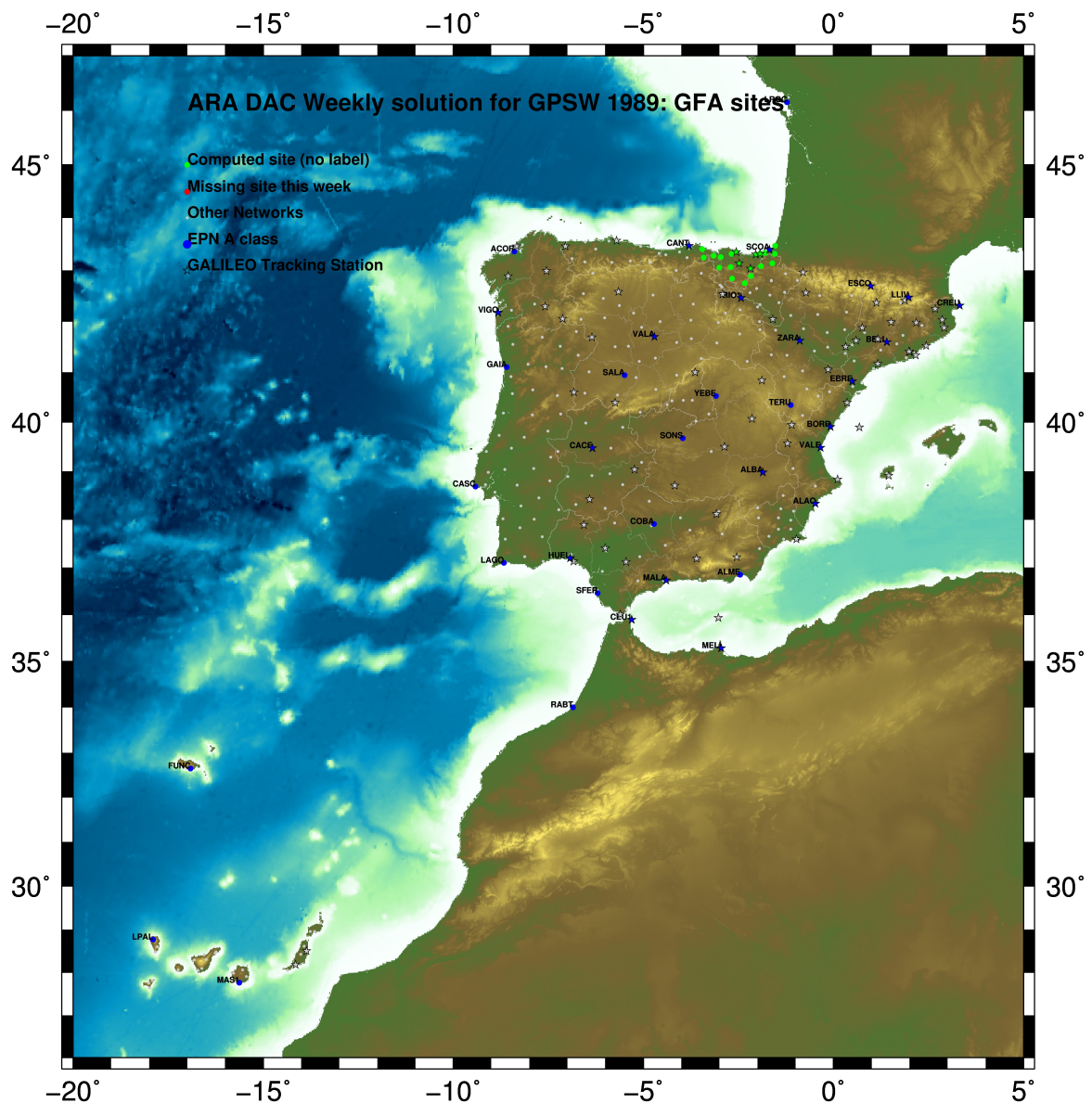
Report generated on 2018/03/08 at 01:42:04



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 Mar 08 01:41:48

Fig.1: Computed Sites for GPS Week1989 (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 Widelane (WL) AR for baselines shorter than 6000km, a Melbourne-Wuebbena wide-lane and narrow-lane AR is computed.
 - Phase-Based Widelane (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 C1950.

ARA LAC 1989 WEEK FINAL COMBINATION: PRECISE ORBITS						07-MAR-18 21:57
LOCAL GEODETIC DATUM: IGS14						EPOCH: 2018-02-21 12:00:00
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	
3	ACOR 13434M001	4594489.56887	-678367.47655	4357066.26807	W	
24	ALDA 19383M001	4687280.16813	-190876.59383	4308106.94730	A	
30	ALSA 19419M001	4677250.84396	-176770.42257	4319079.85628	A	
31	AMUR 19388M001	4661499.45717	-244591.28480	4332269.86639	A	
54	BLAZ 10074M002	4634456.06434	-124345.00236	4365785.44288	A	
55	BIDA 00000M000	4644177.83459	-145778.34976	4354832.46716	A	
58	BRZR 19387M001	4662220.99977	-220769.92536	4333309.42024	A	
95	CACE 13447M001	4899866.51543	-544567.06125	4033770.18875	W	
106	CANT 13438M001	4625924.32393	-307096.25877	4365771.53957	W	
75	CHER 00000M000	4645880.33391	-125721.95375	4353624.35636	A	
150	CREU 13432M001	4715420.14469	273178.03409	4271946.82646	W	
186	EBRE 13410M001	4833520.00314	41537.36277	4147461.70027	W	
85	ELGE 19353S001	4657557.41632	-202241.49924	4338991.85314	A	
300	EMAZ 17001M001	4645924.22165	-276949.89100	4347759.56374	A	
98	GERN 19389M001	4642811.31765	-217222.95685	4353278.86176	A	
115	IGEL 19352S001	4645951.43820	-165574.52824	4352550.40033	A	
119	ISPS 19484M001	4640596.49236	-206963.80164	4356391.89881	A	
301	KAST 19499M001	4646949.09578	-240747.30407	4348014.57920	A	
122	LARE 19440M001	4632831.96077	-279026.16058	4360314.41033	A	
126	LAZK 19354S001	4666098.35202	-178186.21731	4330463.65772	A	
129	LEIT 19428M001	4663520.95335	-155858.74243	4334519.87340	A	
158	ORDN 19427M001	4659695.79730	-130864.76315	4338948.87169	A	
165	PAS2 19351S001	4644909.06996	-156645.09334	4353623.06162	A	
173	PASA 19351S001	4644909.06934	-156645.09281	4353623.06042	A	
491	RID1 13448M002	4708446.83883	-199490.30904	4284089.72133	W	
496	SALA 13469M001	4803054.49601	-462131.09615	4158379.06404	W	
504	SCDA 10088M002	4639940.51006	-136224.96577	4359552.39955	W	
200	SOPU 19386M001	4643997.92201	-255913.93307	4350063.12741	A	
569	TERU 13487M001	4867391.33519	-95523.37865	4108341.66753	W	
232	VITO 19385M001	4679397.71192	-218436.53066	4314898.34706	A	
671	YEBE 13420M001	4848724.57976	-261631.95664	4123094.31615	W	
674	ZARA 13462M001	4773803.17995	-73506.01037	4215454.08106	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 1989						07-MAR-18 21:57
LOCAL GEODETIC DATUM: ETRF2000						EPOCH: 2018-02-21 12:00:00
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	
3	ACOR 13434M001	4594489.86483	-678367.98965	4357065.86738	W	
24	ALDA 19383M001	4687280.51566	-190877.11516	4308106.54561	A	
30	ALSA 19419M001	4677251.19369	-176770.94285	4319079.45548	A	
31	AMUR 19388M001	4661499.80018	-244591.80369	4332269.46595	A	
54	BLAZ 10074M002	4634456.42303	-124345.51822	4365785.04579	A	
55	BIDA 00000M000	4644178.19016	-145778.86665	4354832.06912	A	
58	BRZR 19387M001	4662221.34552	-220770.44427	4333309.02002	A	
95	CACE 13447M001	4899866.80498	-544567.60438	4033769.76740	W	
106	CANT 13438M001	4625924.66214	-307096.77427	4365771.14098	W	
75	CHER 00000M000	4645880.69164	-125722.47075	4353623.95843	A	
150	CREU 13432M001	4715420.54163	273177.51155	4271946.42801	W	
186	EBRE 13410M001	4833520.36593	41536.82768	4147461.29059	W	
85	ELGE 19353S001	4657557.76452	-202242.01763	4338991.45348	A	
300	EMAZ 17001M001	4645924.56206	-276950.40843	4347759.16406	A	
98	GERN 19389M001	4642811.66511	-217223.47380	4353278.46299	A	
115	IGEL 19352S001	4645951.79140	-165575.04537	4352550.00193	A	
119	ISPS 19484M001	4640596.84118	-206964.31835	4356391.50032	A	
301	KAST 19499M001	4646949.44026	-240747.82150	4348014.57986	A	
122	LARE 19440M001	4632832.30177	-279026.67670	4360314.01157	A	
126	LAZK 19354S001	4666098.70235	-178186.73648	4330463.25771	A	
129	LEIT 19428M001	4663521.30645	-155859.26129	4334519.47384	A	
158	ORDN 19427M001	4659696.15349	-130865.28155	4338948.47270	A	
165	PAS2 19351S001	4644909.42423	-156645.61033	4353622.66340	A	
173	PASA 19351S001	4644909.42361	-156645.60980	4353622.66220	A	
491	RID1 13448M002	4708447.18370	-199490.83249	4284089.31800	W	
496	SALA 13469M001	4803054.80210	-462131.62960	4158378.65074	W	
504	SCDA 10088M002	4639940.86701	-136225.48221	4359552.00193	W	
200	SOPU 19386M001	4643998.26492	-255914.45025	4350062.72811	A	
569	TERU 13487M001	4867391.68005	-95523.91753	4108341.25381	W	
232	VITO 19385M001	4679398.05671	-218437.05127	4314897.94562	A	
671	YEBE 13420M001	4848724.90699	-261632.49415	4123093.90187	W	
674	ZARA 13462M001	4773803.53438	-73506.53993	4215453.67442	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 1989		07-MAR-18 21:57			
LOCAL GEODETIC DATUM: ETRF2014		EPOCH: 2018-02-21 12:00:00			
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
3	ACDR 13434M001	4594489.82196	-678368.02872	4357065.91522	W
24	ALDA 19383M001	4687280.47058	-190877.15551	4308106.59335	A
30	ALSA 19419M001	4677251.14877	-176770.98329	4319079.50325	A
31	AMUR 19388M001	4661499.75559	-244591.84397	4332269.51372	A
54	BLAZ 10074M002	4634456.37835	-124345.55899	4365785.09369	A
55	BIDA 00000M000	4644178.14545	-145778.90731	4354832.11698	A
58	BRZR 19387M001	4662221.30086	-220770.48462	4333309.06781	A
95	CACE 13447M001	4899866.75882	-544567.64276	4033769.81460	W
106	CANT 13438M001	4625924.61806	-307096.81447	4365771.18882	W
75	CHER 00000M000	4645880.64686	-125722.51147	4353624.00629	A
150	CREU 13432M001	4715420.49491	273177.46978	4271946.47597	W
186	EBRE 13410M001	4833520.31882	41536.78711	4147461.33814	W
85	ELGE 19353S001	4657557.71985	-202242.05806	4338991.50128	A
300	EMAZ 17001M001	4645924.51771	-276950.44866	4347759.21185	A
98	GERN 19389M001	4642811.62062	-217223.51424	4353278.51083	A
115	IGEL 19352S001	4645951.74674	-165575.08596	4352550.04978	A
119	ISPS 19484M001	4640596.79668	-206964.35882	4356391.54816	A
301	KAST 19499M001	4646949.39580	-240747.86184	4348014.62767	A
122	LARE 19440M001	4632832.25755	-279026.71696	4360314.05940	A
126	LAZK 19354S001	4666098.65753	-178186.77696	4330463.30551	A
129	LEIT 19428M001	4663521.26159	-155859.30184	4334519.52165	A
158	ORON 19427M001	4659696.10859	-130865.32220	4338948.52053	A
165	PAS2 19351S001	4644909.37955	-156645.65096	4353622.71126	A
173	PASA 19351S001	4644909.37893	-156645.65043	4353622.71006	A
491	RI01 13448M002	4708447.13854	-199490.87274	4284089.36568	W
496	SALA 13469M001	4803054.75671	-462131.66863	4158378.69814	W
504	SOA 10088M002	4639940.82231	-136225.52292	4359552.04980	W
200	SOPU 19386M001	4643998.22053	-255914.49055	4350062.77592	A
569	TERU 13487M001	4867391.63302	-95523.95753	4108341.30121	W
232	VITO 19385M001	4679398.01188	-218437.09157	4314897.99337	A
671	YEBE 13420M001	4848724.86063	-261632.53366	4123093.94923	W
674	ZARA 13462M001	4773803.48822	-73506.58035	4215453.72202	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 1989 WEEK FINAL COMBINATION: PRECISE ORBITS 07-MAR-18 21:57

Station	#Days	Weekday 0123456	Repeatability (mm)		
			N	E	U
ACOR 13434M001	6	XXX XXX	0.84	0.74	3.87
ALDA 19383M001	7	XXXXXX	1.43	1.80	3.13
ALSA 19419M001	7	XXXXXX	1.92	1.05	4.17
AMUR 19388M001	7	XXXXXX	1.45	0.89	2.92
BIAZ 10074M002	7	XXXXXX	0.25	0.29	1.76
BIDA 00000M000	7	XXXXXX	1.04	0.59	3.70
BRZR 19387M001	7	XXXXXX	1.51	0.83	3.52
CACE 13447M001	7	XXXXXX	0.38	0.62	1.63
CANT 13438M001	7	XXXXXX	0.44	0.32	3.32
CHER 00000M000	7	XXXXXX	1.13	1.28	2.94
CREU 13432M001	7	XXXXXX	0.74	0.66	1.59
EBRE 13410M001	7	XXXXXX	1.08	1.06	1.88
ELGE 19353S001	7	XXXXXX	0.84	0.61	1.67
EMAZ 17001M001	7	XXXXXX	1.22	0.52	5.51
GERN 19389M001	7	XXXXXX	0.76	0.73	4.17
IGEL 19352S001	7	XXXXXX	0.84	0.21	2.33
ISPS 19484M001	7	XXXXXX	0.84	0.51	2.29
KAST 19499M001	7	XXXXXX	0.90	1.01	8.83
LARE 19440M001	7	XXXXXX	1.54	0.52	1.94
LAZK 19354S001	7	XXXXXX	1.28	0.39	2.36
LEIT 19428M001	7	XXXXXX	1.26	0.53	10.50
ORON 19427M001	7	XXXXXX	1.74	0.42	1.64
PAS2 19351S001	5	XXI XX	1.01	0.64	3.77
PASA 19351S001	7	XXXXXX	0.65	0.24	2.00
RI01 13448M002	7	XXXXXX	1.88	0.43	2.96
SALA 13469M001	7	XXXXXX	0.42	0.57	2.80
SCOA 10088M002	7	XXXXXX	1.06	0.37	3.21
SOPU 19386M001	7	XXXXXX	0.90	0.93	1.60
TERU 13487M001	7	XXXXXX	1.31	0.46	1.31
VITD 19385M001	7	XXXXXX	1.38	1.06	3.33
YEBE 13420M001	7	XXXXXX	0.36	0.62	1.27
ZARA 13462M001	7	XXXXXX	1.18	0.92	1.90

Comparison of individual solutions:

ACOR 13434M001	N	0.84	-0.22	-0.19	-0.42	1.68	0.04	0.66
ACOR 13434M001	E	0.74	0.66	0.16	-0.94	1.03	0.30	0.48
ACOR 13434M001	U	3.87	0.19	-4.54	6.25	1.01	2.89	-2.43
ALDA 19383M001	N	1.43	-0.97	-0.36	2.42	1.12	-1.12	1.34
ALDA 19383M001	E	1.80	1.37	1.99	-1.34	-0.17	-3.26	-0.06
ALDA 19383M001	U	3.13	2.93	-0.27	-6.39	-0.72	-0.43	2.06
ALSA 19419M001	N	1.92	-0.82	-0.10	3.70	2.43	0.33	-0.22
ALSA 19419M001	E	1.05	-0.00	0.37	-0.71	-1.47	-0.17	0.01
ALSA 19419M001	U	4.17	-1.83	-3.02	-3.44	-2.49	6.10	5.85
AMUR 19388M001	N	1.45	-1.16	1.43	2.55	1.43	-0.06	-0.55
AMUR 19388M001	E	0.89	0.73	1.28	0.13	0.41	-0.32	-1.14
AMUR 19388M001	U	2.92	1.02	4.16	-1.46	0.42	-5.21	-0.74
BIAZ 10074M002	N	0.25	-0.00	0.21	-0.05	-0.44	-0.25	-0.27
BIAZ 10074M002	E	0.29	-0.19	0.01	0.41	0.07	-0.41	-0.18
BIAZ 10074M002	U	1.76	0.14	2.23	1.83	-2.28	0.49	0.92
BIDA 00000M000	N	1.04	0.70	1.02	1.17	-0.96	-0.43	-1.30
BIDA 00000M000	E	0.59	0.99	-0.57	-0.11	-0.62	0.05	-0.54
BIDA 00000M000	U	3.70	3.45	6.85	1.52	-3.66	-1.95	0.75
BRZR 19387M001	N	1.51	-0.67	-1.76	-2.27	1.74	0.96	0.99
BRZR 19387M001	E	0.83	-0.76	-0.73	-1.10	1.25	0.23	0.43
BRZR 19387M001	U	3.52	0.29	8.18	-0.05	-1.94	0.66	-1.73
CACE 13447M001	N	0.38	-0.05	0.42	-0.17	-0.79	-0.03	-0.07
CACE 13447M001	E	0.62	0.36	0.59	0.74	-0.95	-0.35	0.40
CACE 13447M001	U	1.63	-2.64	0.94	1.75	-0.23	-0.79	1.88
CANT 13438M001	N	0.44	-0.27	0.09	-0.20	0.46	0.46	0.72
CANT 13438M001	E	0.32	0.19	-0.25	-0.43	-0.39	0.16	0.34
CANT 13438M001	U	3.32	4.68	3.26	4.15	-1.25	2.65	2.13
CHER 00000M000	N	1.13	-0.48	-0.95	-1.79	-0.45	0.97	0.40
CHER 00000M000	E	1.28	-1.01	-1.57	-1.65	0.53	1.11	0.53
CHER 00000M000	U	2.94	0.91	4.87	4.26	-0.82	-1.44	-2.50
CREU 13432M001	N	0.74	-1.36	-0.61	-0.41	-0.46	-0.03	0.20
CREU 13432M001	E	0.66	-1.05	0.12	0.91	0.17	0.04	-0.41
CREU 13432M001	U	1.59	1.51	2.70	-0.37	-0.61	0.52	-1.93
EBRE 13410M001	N	1.08	-1.06	-0.64	1.59	0.90	-1.24	-0.72
EBRE 13410M001	E	1.06	0.14	-0.34	-1.98	-0.84	0.84	0.93
EBRE 13410M001	U	1.88	1.35	0.88	2.29	1.55	-0.25	-2.83
ELGE 19353S001	N	0.84	0.07	0.22	-1.87	0.03	-0.34	0.64
ELGE 19353S001	E	0.61	-0.71	-0.34	1.05	-0.04	0.26	-0.51
ELGE 19353S001	U	1.67	-0.81	1.67	0.08	0.04	3.23	0.11
EMAZ 17001M001	N	1.22	-0.76	-1.34	0.68	0.92	0.28	1.24
EMAZ 17001M001	E	0.52	-0.72	0.18	-0.36	0.39	0.80	-0.21
EMAZ 17001M001	U	5.51	7.05	3.94	1.61	-7.40	-6.75	-3.44
GERN 19389M001	N	0.76	-1.18	0.41	-0.50	1.12	-0.51	-0.33
GERN 19389M001	E	0.73	-0.84	1.10	0.19	0.46	-1.00	0.22
GERN 19389M001	U	4.17	3.85	7.21	2.48	-5.18	-1.89	-0.75
IGEL 19352S001	N	0.84	-0.26	-1.14	-1.24	0.07	0.83	0.33
IGEL 19352S001	E	0.21	0.17	-0.24	-0.34	-0.00	0.08	-0.23
IGEL 19352S001	U	2.33	0.23	4.43	0.61	-0.36	1.51	-2.77
ISPS 19484M001	N	0.84	-0.04	-0.32	-0.30	-1.88	-0.16	-0.13
ISPS 19484M001	E	0.51	0.01	0.39	-0.44	-0.14	0.16	0.65
ISPS 19484M001	U	2.29	0.49	-0.47	2.43	4.45	1.58	-1.51
KAST 19499M001	N	0.90	0.06	1.77	-0.46	0.45	1.11	-0.14
KAST 19499M001	E	1.01	1.44	-0.10	-1.74	-0.70	0.15	0.52
KAST 19499M001	U	8.83	8.29	13.69	2.51	-4.69	-7.42	-8.38
LARE 19440M001	N	1.54	-1.37	-0.81	-0.38	0.28	1.30	2.63
LARE 19440M001	E	0.52	-0.55	-0.21	-0.89	-0.03	-0.11	0.06
LARE 19440M001	U	1.94	0.31	1.41	3.71	-1.17	-0.80	0.15
LAZK 19354S001	N	1.28	-0.83	-0.20	1.59	0.52	1.00	-1.49
LAZK 19354S001	E	0.39	0.17	-0.03	-0.16	-0.85	0.11	0.33

LAZK	19354S001	U	2.36	2.15	-0.93	-2.20	2.76	0.68	2.61	2.85
LEIT	19428M001	N	1.26	-0.25	1.80	1.49	-0.84	-0.80	-0.85	-1.38
LEIT	19428M001	E	0.53	-0.26	0.42	-0.27	0.63	-0.79	0.12	-0.58
LEIT	19428M001	U	10.50	6.41	13.98	12.57	-0.23	-11.75	-8.70	-7.26
ORDN	19427M001	N	1.74	-0.60	-0.86	2.87	1.37	0.30	-2.14	-1.48
ORDN	19427M001	E	0.42	-0.16	-0.31	-0.03	0.58	0.25	-0.66	-0.29
ORDN	19427M001	U	1.64	-1.07	-0.38	1.59	-0.68	2.16	1.88	1.92
PAS2	19351S001	N	1.01		-0.69	-1.15	-0.90		1.01	0.66
PAS2	19351S001	E	0.64		-0.98	-0.16	-0.14		0.10	0.78
PAS2	19351S001	U	3.77		7.14	-0.15	0.71		-2.21	-0.67
PASA	19351S001	N	0.65	0.54	0.08	-1.15	-0.80	-0.01	0.47	0.15
PASA	19351S001	E	0.24	0.29	-0.04	-0.25	0.03	-0.01	-0.32	-0.28
PASA	19351S001	U	2.00	0.46	3.88	1.96	-1.63	-0.92	0.68	0.99
RID1	13448M002	N	1.88	0.51	0.78	2.34	0.12	-3.56	0.89	1.22
RID1	13448M002	E	0.43	-0.82	-0.23	0.04	-0.23	-0.14	0.51	0.16
RID1	13448M002	U	2.96	-0.38	2.70	5.70	1.83	1.47	-1.00	-2.51
SALA	13469M001	N	0.42	-0.21	0.09	-0.58	0.58	0.07	0.06	0.59
SALA	13469M001	E	0.57	-0.19	0.13	0.77	0.60	-0.68	-0.35	-0.60
SALA	13469M001	U	2.80	0.88	-2.62	-4.94	1.98	-1.53	-2.29	1.89
SCDA	10088M002	N	1.06	-0.30	1.05	-0.11	0.44	0.84	-0.41	-2.12
SCDA	10088M002	E	0.37	0.07	0.44	-0.28	-0.33	-0.23	0.56	-0.25
SCDA	10088M002	U	3.21	-3.51	-1.01	2.13	-2.52	3.45	3.04	4.05
SOPU	19386M001	N	0.90	-0.29	-0.27	0.04	0.13	1.93	0.67	0.71
SOPU	19386M001	E	0.93	-0.35	-1.52	-0.77	-0.07	0.74	1.00	0.78
SOPU	19386M001	U	1.60	-1.14	1.41	1.13	1.27	-0.33	-2.58	-1.54
TERU	13487M001	N	1.31	0.58	-0.32	-2.94	-0.30	0.68	0.53	0.68
TERU	13487M001	E	0.46	0.09	-0.85	-0.29	0.30	-0.58	0.10	-0.11
TERU	13487M001	U	1.31	-1.34	1.08	-0.14	-2.16	1.59	0.27	0.11
VITO	19385M001	N	1.38	0.11	1.12	1.97	-1.72	-0.49	1.09	1.37
VITO	19385M001	E	1.06	0.04	0.90	1.40	0.18	-1.86	-0.45	-0.57
VITO	19385M001	U	3.33	-1.74	0.61	5.98	-1.57	-3.98	-2.34	-1.87
YEBE	13420M001	N	0.36	-0.14	-0.37	-0.03	0.73	-0.19	-0.19	-0.13
YEBE	13420M001	E	0.62	0.08	0.33	0.10	-0.89	1.00	-0.18	0.57
YEBE	13420M001	U	1.27	-1.29	1.28	-0.10	1.14	1.06	-1.86	-0.69
ZARA	13462M001	N	1.18	1.10	0.90	-1.94	0.48	1.19	0.47	0.85
ZARA	13462M001	E	0.92	-0.14	0.99	1.57	-0.44	-0.73	-0.71	-0.61
ZARA	13462M001	U	1.90	-1.78	2.41	2.00	-1.51	1.91	0.16	-1.62

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		
3	ACOR 13434M001	I W	-1.99	1.68	2.75
10	ALAC 13433M001	I W	-0.23	0.57	-0.16
13	ALBA 13452M001	I W	-0.69	-0.66	1.29
18	ALME 13437M001	I W	-1.15	-0.53	-0.40
43	BELL 13431M001	I W	0.68	0.67	1.71
61	BORR 13480M001	I W	0.25	-2.78	-1.96
65	BRST 10004M004	I W	-0.85	-0.51	3.33
95	CACE 13447M001	I W	1.08	0.66	-1.17
106	CANT 13438M001	I W	-0.60	-0.71	2.48
110	CASC 13909S001	I W	-0.42	0.80	2.20
117	CEU1 13449M002	I W	0.96	-0.41	-1.75
131	COBA 13453M001	I W	0.43	0.73	-6.13
150	CREU 13432M001	I W	-0.90	-1.26	0.46
186	EBRE 13410M001	I W	0.90	2.23	-1.99
203	ESCO 13435M001	I W	-0.50	-0.49	-0.60
213	FUNC 13911S001	I W	2.87	0.46	-0.32
215	GAIA 13902M001	I W	-1.21	0.84	2.19
271	HUEL 13451M001	I W	-0.19	1.08	0.90
317	LAGO 13903M001	I W	-3.93	-4.07	1.66
337	LLIV 13436M001	I W	-1.94	0.55	4.93
341	LPAL 81701M001	I W	-1.93	2.67	1.67
344	LROC 10023M001	I W	-0.54	-0.78	1.64
353	MALA 13443M001	I W	-1.18	1.42	-3.76
371	MAS1 31303M002	I W	0.96	1.29	2.32
381	MELI 19379M001	I W	-0.97	-0.55	2.38
442	PDEL 31906M004	I W	0.59	1.70	-2.94
475	RABT 35001M002	I W	1.16	1.30	-1.81
491	RID1 13448M002	I W	0.15	-0.85	-2.45
496	SALA 13469M001	I W	-1.26	-0.46	-3.33
504	SCOA 10088M002	I W	-2.94	-1.30	0.99
511	SFER 13402M004	I W	1.55	-5.17	-2.88
532	SONS 13446M001	I W	1.64	0.73	-1.49
562	TERC 31909M001	I W	4.89	-2.68	-1.06
569	TERU 13487M001	I W	4.18	-0.79	-2.53
629	VALA 13463M002	I W	-1.43	0.13	-0.88
633	VALE 13439M001	I W	-0.21	0.08	-3.84
643	VIGO 13450M001	I W	0.16	0.47	2.85
671	YEBE 13420M001	I W	0.36	1.39	0.24
674	ZARA 13462M001	I W	1.17	1.25	0.16
683	ZIMM 14001M004	I W	1.07	1.31	5.27
	RMS / COMPONENT		1.69	1.60	2.52
	MEAN		0.00	-0.00	0.00
	MIN		-3.93	-5.17	-6.13
	MAX		4.89	2.67	5.27

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 120
RMS OF TRANSFORMATION : 1.98 MM

BARYCENTER COORDINATES:

LATITUDE : 39 43 11.32
LONGITUDE : - 5 31 23.99
HEIGHT : -44.859 KM

PARAMETERS:

TRANSLATION IN N : 0.00 +- 0.31 MM
TRANSLATION IN E : 0.00 +- 0.31 MM
TRANSLATION IN U : 0.00 +- 0.31 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          16680940
NUMBER OF UNKNOWN               210462
NUMBER OF DEGREES OF FREEDOM    16470478
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)      180
VARIANCE FACTOR                  1.761242109073172

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
1  0.00159      0.0087  0.0179 -0.0119 -0.0002  0.0005  0.0006  0.00025
2  0.00207     -0.0008 -0.0082 -0.0028  0.0002  0.0000 -0.0002  0.00047
3  0.00229     -0.0085 -0.0144  0.0029  0.0002 -0.0002 -0.0005  0.00061
4  0.00203     -0.0019 -0.0067  0.0041  0.0001 -0.0001 -0.0002 -0.00031
5  0.00173      0.0048 -0.0019 -0.0045  0.0002  0.0002  0.0000 -0.00008
#PR_SBS 6 CRD  MUNI 19364M001      1 592  1  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  MUNI 19364M001      1 593  2  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  MUNI 19364M001      1 594  3  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  QNTD 19363M001      1 679  1  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  QNTD 19363M001      1 680  2  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  QNTD 19363M001      1 681  3  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  SRNA 19361M001      1 790  1  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  SRNA 19361M001      1 791  2  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
#PR_SBS 6 CRD  SRNA 19361M001      1 792  3  1  0  0  0  2018-02-23 00:00:00 2018-02-23 23:59:30
6  0.00151     -0.0004  0.0010  0.0036 -0.0000 -0.0001  0.0000 -0.00032
#PR_SBS 7 CRD  QNTD 19363M001      1 697  1  1  0  0  0  2018-02-24 00:00:00 2018-02-24 23:59:30
#PR_SBS 7 CRD  QNTD 19363M001      1 698  2  1  0  0  0  2018-02-24 00:00:00 2018-02-24 23:59:30
#PR_SBS 7 CRD  QNTD 19363M001      1 699  3  1  0  0  0  2018-02-24 00:00:00 2018-02-24 23:59:30
#PR_SBS 7 CRD  SRNA 19361M001      1 811  1  1  0  0  0  2018-02-24 00:00:00 2018-02-24 23:59:30
#PR_SBS 7 CRD  SRNA 19361M001      1 812  2  1  0  0  0  2018-02-24 00:00:00 2018-02-24 23:59:30
#PR_SBS 7 CRD  SRNA 19361M001      1 813  3  1  0  0  0  2018-02-24 00:00:00 2018-02-24 23:59:30
7  0.00152      0.0110  0.0158 -0.0086 -0.0003  0.0004  0.0004 -0.00034
    
```

Statistics of individual solutions:

File	RMS (m)	DOF	Chi**2/DOF	#Observations authentic / pseudo	#Parameters explicit / implicit / singular
1	0.00127	2400945	1.61	2431480 3	981 29567 0
2	0.00128	2410307	1.65	2441597 3	987 30306 0
3	0.00136	2385112	1.84	2417198 3	990 31099 0
4	0.00138	2324251	1.89	2356690 3	972 31470 0
5	0.00145	2269691	2.09	2299642 3	972 28982 0
6	0.00127	2316275	1.60	2345814 3	957 28585 0
7	0.00126	2358089	1.60	2388519 3	981 29452 0

7 Equipment

7.1 Receiver List

Serial numbers not shown.

```

*SITE PT SOLN T DATA_START__ DATA_END____ DESCRIPTION_____ S/N__ FIRMWARE____
ACDR A 1 P 18:049:00000 18:055:86370 LEICA GRX1200PRO -----
ALDA A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
ALSA A 1 P 18:049:00000 18:055:86370 LEICA GRX1200GGPRO -----
AMUR A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
BIAZ A 1 P 18:049:00000 18:055:86370 TRI SP90M -----
BIDA A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
BRZR A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
CACE A 1 P 18:049:00000 18:055:86370 TRIMBLE NETR9 -----
CANT A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
CHER A 1 P 18:049:00000 18:055:86370 LEICA GRX1200+GNSS -----
CREU A 1 P 18:049:00000 18:055:86370 LEICA GR50 -----
EBRE A 1 P 18:049:00000 18:055:86370 LEICA GR50 -----
ELGE A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
EMAZ A 1 P 18:049:00000 18:055:86370 LEICA GR30 -----
GERN A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
IGEL A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
ISPS A 1 P 18:049:00000 18:055:86370 TRIMBLE NETR9 -----
KAST A 1 P 18:049:00000 18:055:86370 LEICA GR30 -----
LARE A 1 P 18:049:00000 18:055:86370 LEICA GRX1200GGPRO -----
LAZK A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
LEIT A 1 P 18:049:00000 18:055:86370 LEICA GRX1200+GNSS -----
ORON A 1 P 18:049:00000 18:055:86370 LEICA GRX1200GGPRO -----
PAS2 A 1 P 18:050:00000 18:055:86370 TPS NET-G3A -----
PASA A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
RIO1 A 1 P 18:049:00000 18:055:86370 LEICA GR25 -----
SALA A 1 P 18:049:00000 18:055:86370 LEICA GRX1200+GNSS -----
SCOA A 1 P 18:049:00000 18:055:86370 LEICA GR25 -----
SOPU A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
TERU A 1 P 18:049:00000 18:055:86370 LEICA GRX1200GGPRO -----
VITO A 1 P 18:049:00000 18:055:86370 LEICA GR10 -----
YEBE A 1 P 18:049:00000 18:055:86370 TRIMBLE NETR5 -----
ZARA A 1 P 18:049:00000 18:055:86370 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__
ACDR	A	1	P	18:049:00000	18:055:86370	LEIAT504	LEIS -----
ALDA	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
ALSA	A	1	P	18:049:00000	18:055:86370	LEIAX1202GG	NONE -----
AMUR	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
BIAZ	A	1	P	18:049:00000	18:055:86370	LEIAR25	LEIT -----
BIDA	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
BRZR	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
CACE	A	1	P	18:049:00000	18:055:86370	TRM29659.00	NONE -----
CANT	A	1	P	18:049:00000	18:055:86370	LEIAR25_R4	LEIT 25066
CHER	A	1	P	18:049:00000	18:055:86370	LEIAX1203*GNSS	NONE -----
CREU	A	1	P	18:049:00000	18:055:86370	LEIAR25_R4	NONE 26357
EBRE	A	1	P	18:049:00000	18:055:86370	LEIAR25_R4	NONE 26359
ELGE	A	1	P	18:049:00000	18:055:86370	LEIAR25_R4	LEIT -----
EMAZ	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
GERN	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
IGEL	A	1	P	18:049:00000	18:055:86370	LEIAR20	LEIM -----
ISPS	A	1	P	18:049:00000	18:055:86370	TRM59900.00	SCIS -----
KAST	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
LARE	A	1	P	18:049:00000	18:055:86370	LEIAT504	NONE -----
LAZK	A	1	P	18:049:00000	18:055:86370	LEIAR25_R4	LEIT -----
LEIT	A	1	P	18:049:00000	18:055:86370	LEIAX1203*GNSS	NONE -----
ORDN	A	1	P	18:049:00000	18:055:86370	LEIAX1202GG	NONE -----
PAS2	A	1	P	18:050:00000	18:055:86370	LEIAR20	LEIM 73034
PASA	A	1	P	18:049:00000	18:055:86370	LEIAR20	LEIM 73034
RID1	A	1	P	18:049:00000	18:055:86370	LEIAR25_R4	LEIT 25138
SALA	A	1	P	18:049:00000	18:055:86370	LEIAR25	NONE -----
SCDA	A	1	P	18:049:00000	18:055:86370	TRM5991.00	NONE -----
SOPU	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
TERU	A	1	P	18:049:00000	18:055:86370	LEIAT504GG	LEIS -----
VITO	A	1	P	18:049:00000	18:055:86370	LEIAS10	NONE -----
YEBE	A	1	P	18:049:00000	18:055:86370	TRM29659.00	NONE -----
ZARA	A	1	P	18:049:00000	18:055:86370	TRM29659.00	NONE -----

7.3 Eccentricities

*SITE	PT	SOLN	T	DATA_START__	DATA_END_____	AXE	UP_____	NORTH_____	EAST_____
							ARP->	BENCHMARK(M)	
ACDR	A	1	P	18:049:00000	18:055:86370	UNE	3.0460	0.0000	0.0000
ALDA	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
ALSA	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
AMUR	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
BIAZ	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
BIDA	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
BRZR	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
CACE	A	1	P	18:049:00000	18:055:86370	UNE	0.0600	0.0000	0.0000
CANT	A	1	P	18:049:00000	18:055:86370	UNE	3.0490	0.0000	0.0000
CHER	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
CREU	A	1	P	18:049:00000	18:055:86370	UNE	0.0770	0.0000	0.0000
EBRE	A	1	P	18:049:00000	18:055:86370	UNE	0.0770	0.0000	0.0000
ELGE	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
EMAZ	A	1	P	18:049:00000	18:055:86370	UNE	0.0350	0.0000	0.0000
GERN	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
IGEL	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
ISPS	A	1	P	18:049:00000	18:055:86370	UNE	0.0350	0.0000	0.0000
KAST	A	1	P	18:049:00000	18:055:86370	UNE	0.0350	0.0000	0.0000
LARE	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
LAZK	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
LEIT	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
ORDN	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
PAS2	A	1	P	18:050:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
PASA	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
RID1	A	1	P	18:049:00000	18:055:86370	UNE	0.0606	0.0000	0.0000
SALA	A	1	P	18:049:00000	18:055:86370	UNE	0.0600	0.0000	0.0000
SCDA	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
SOPU	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
TERU	A	1	P	18:049:00000	18:055:86370	UNE	0.0600	0.0000	0.0000
VITO	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
YEBE	A	1	P	18:049:00000	18:055:86370	UNE	0.0000	0.0000	0.0000
ZARA	A	1	P	18:049:00000	18:055:86370	UNE	3.2590	0.0000	0.0000

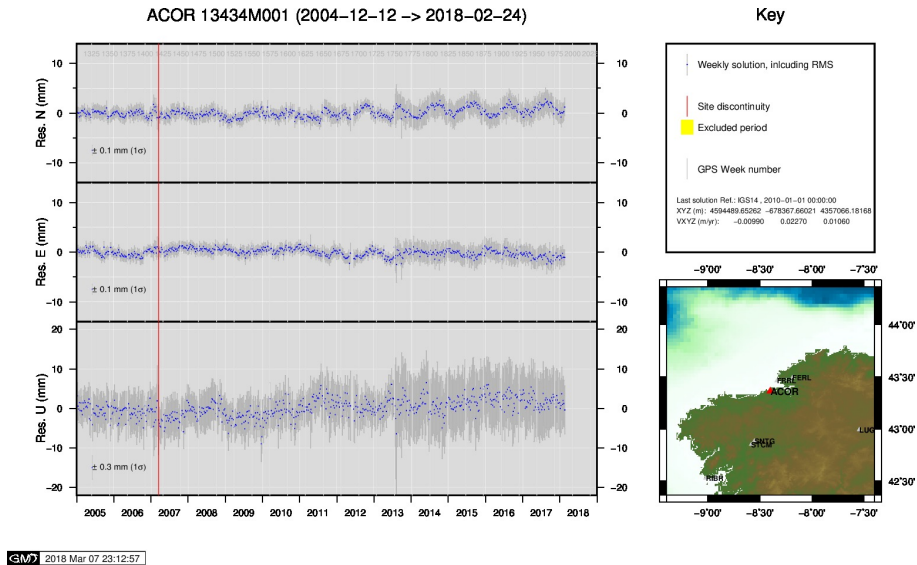
8 Inconsistencies (logsheet-RINEX metadata)

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

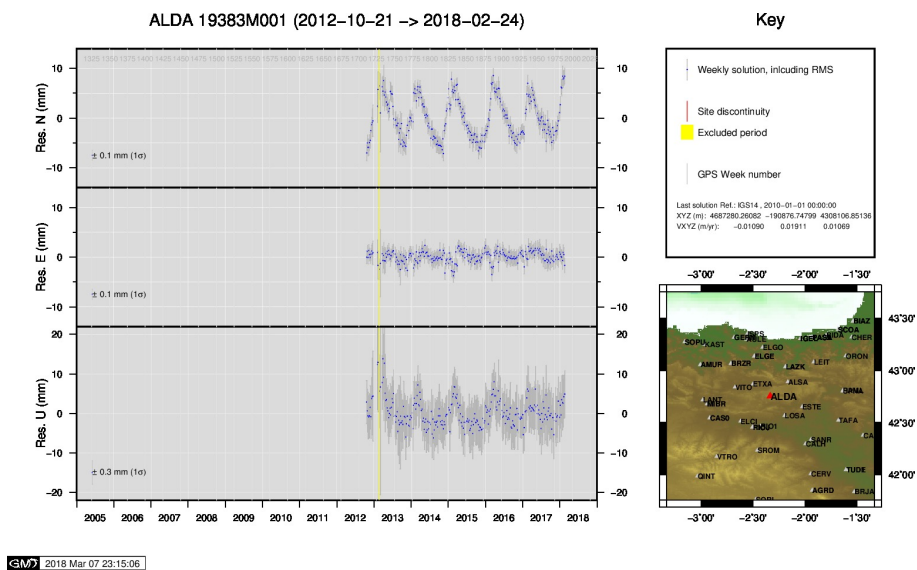
2018-03-04 11:05 UTC	BRZR0510.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-04 11:05 UTC	GERN0510.180	RECEIVER FIRM. VERS.	4.10 -> 4.10/6.523
2018-03-04 11:05 UTC	SOPU0510.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-04 17:26 UTC	BRZR0520.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-04 17:26 UTC	GERN0520.180	RECEIVER FIRM. VERS.	4.10 -> 4.10/6.523
2018-03-04 17:26 UTC	SOPU0520.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-04 22:30 UTC	BRZR0530.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-04 22:30 UTC	GERN0530.180	RECEIVER FIRM. VERS.	4.10 -> 4.10/6.523
2018-03-04 22:31 UTC	SOPU0530.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-05 06:00 UTC	BRZR0540.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-05 06:00 UTC	GERN0540.180	RECEIVER FIRM. VERS.	4.10 -> 4.10/6.523
2018-03-05 06:01 UTC	SOPU0540.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-05 12:13 UTC	BRZR0550.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522
2018-03-05 12:13 UTC	GERN0550.180	RECEIVER FIRM. VERS.	4.10 -> 4.10/6.523
2018-03-05 12:13 UTC	SOPU0550.180	RECEIVER FIRM. VERS.	4.02 -> 4.02/6.522

9 Cumulative Time Series

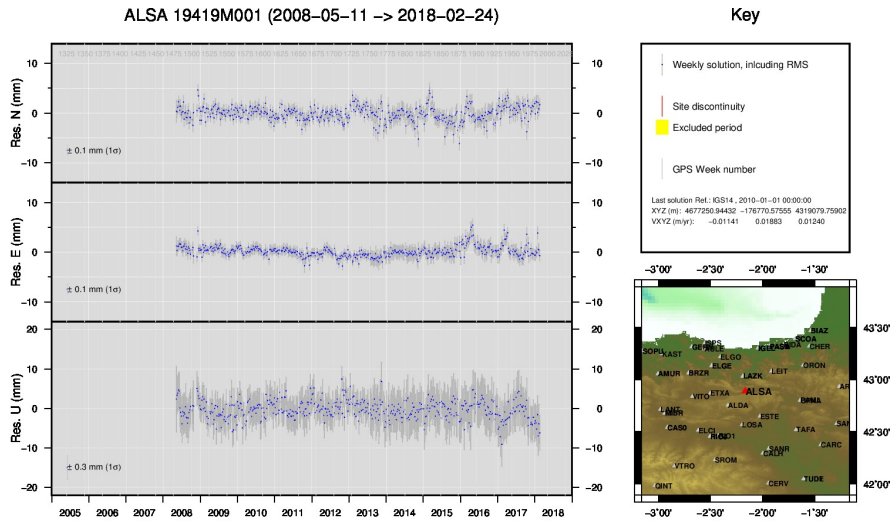
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

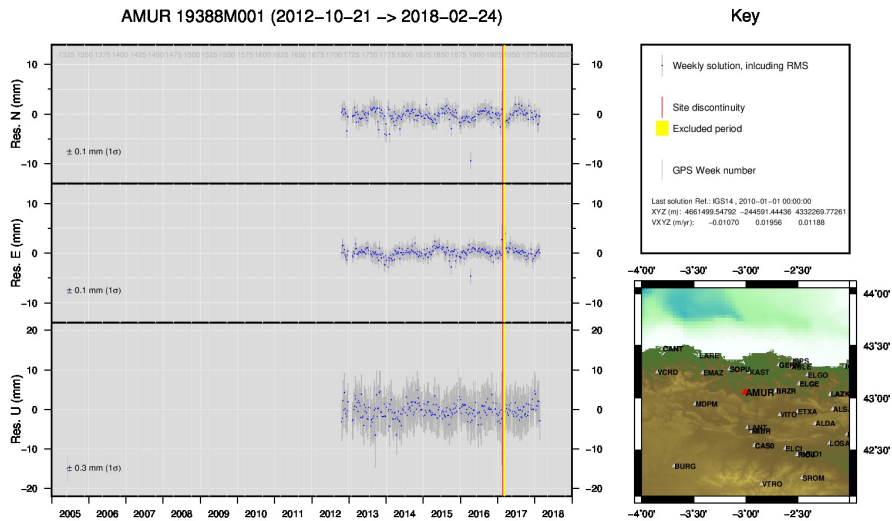


2) ALDA



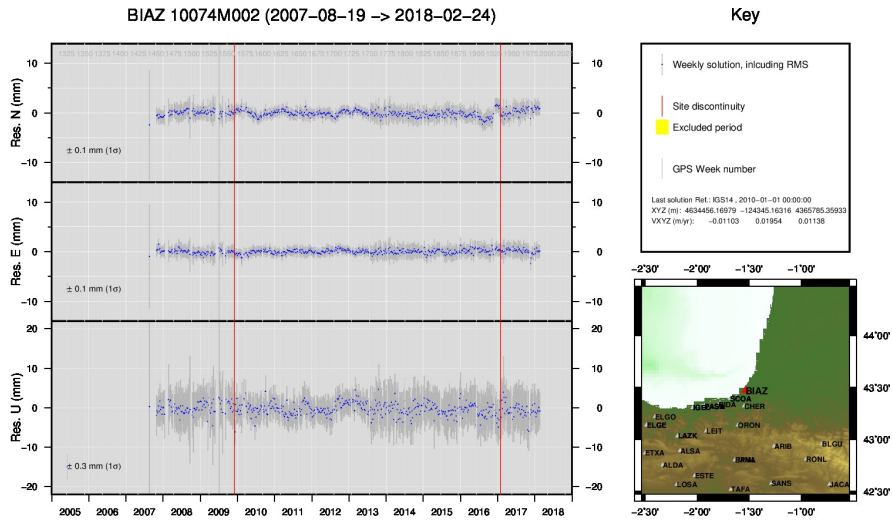
GMW 2018 Mar 07 23:16:38

3) ALSA



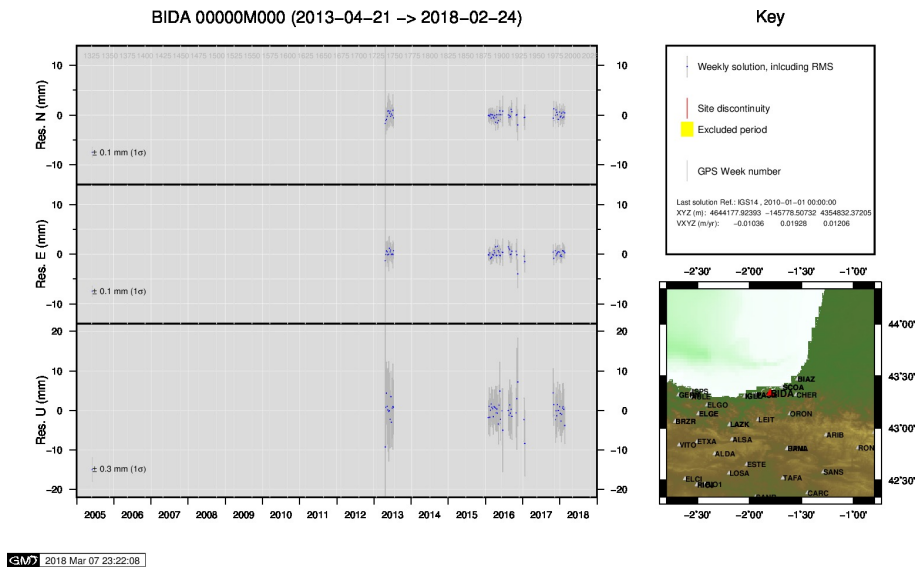
GMW 2018 Mar 07 23:16:57

4) AMUR

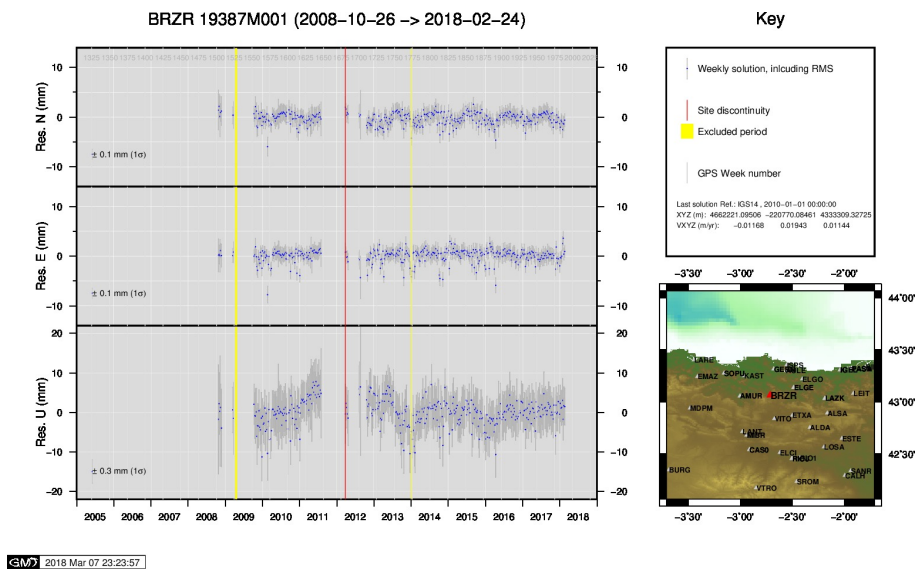


GMW 2018 Mar 07 23:21:58

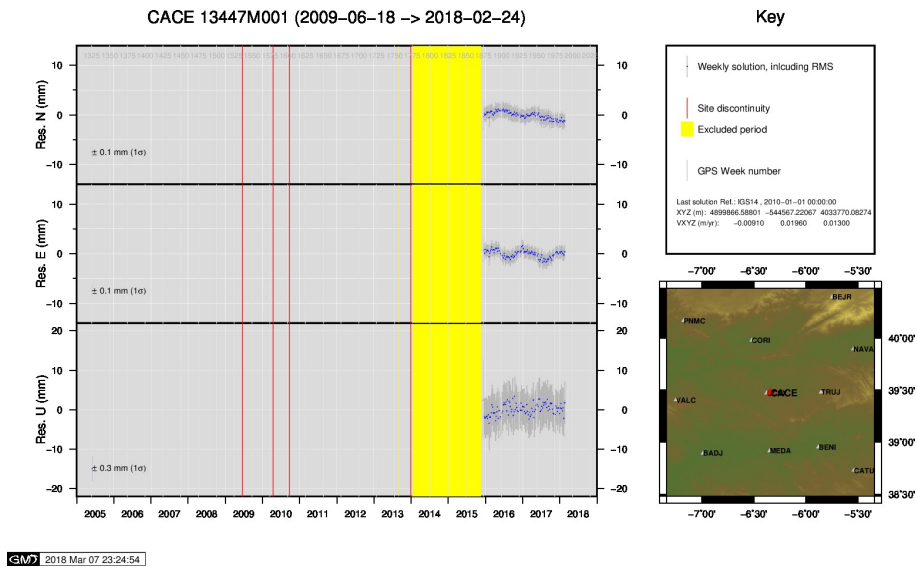
5) BIAZ



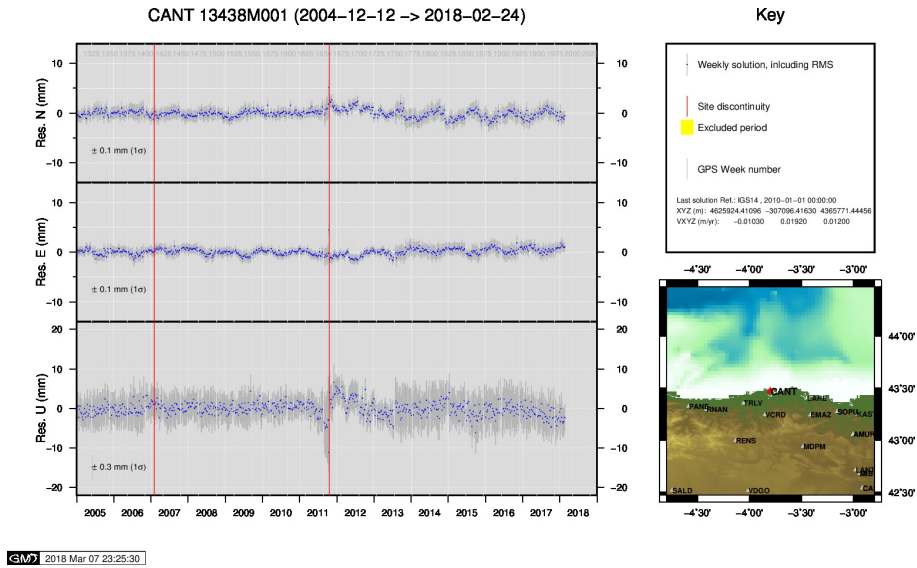
6) BIDA



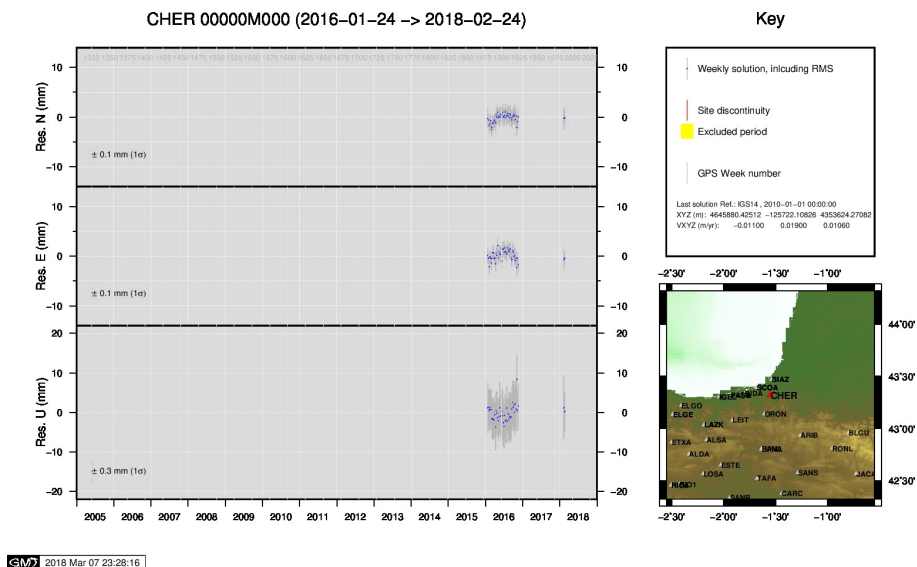
7) BRZR



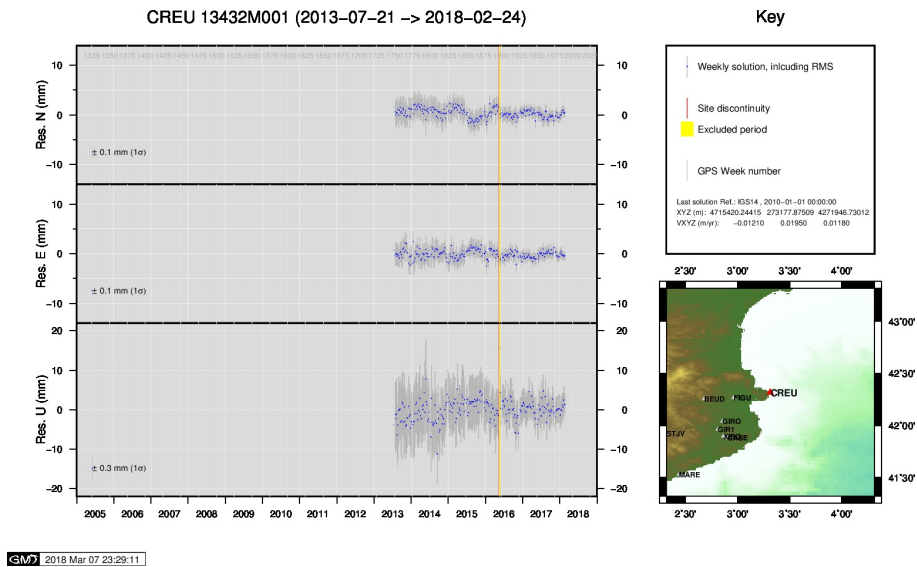
8) CACE



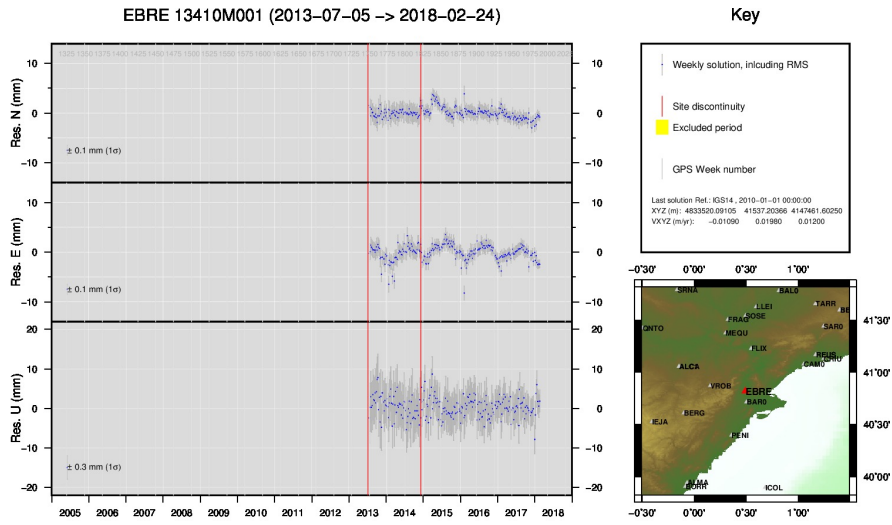
9) CANT



10) CHER

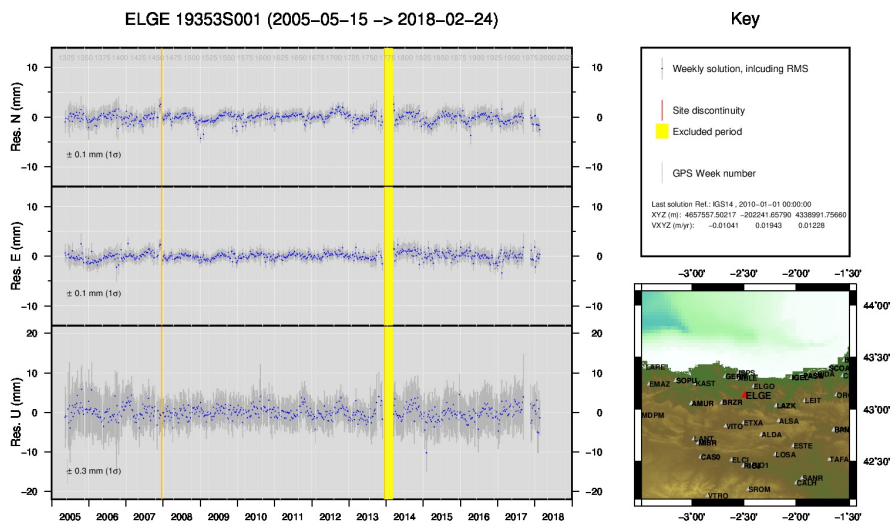


11) CREU



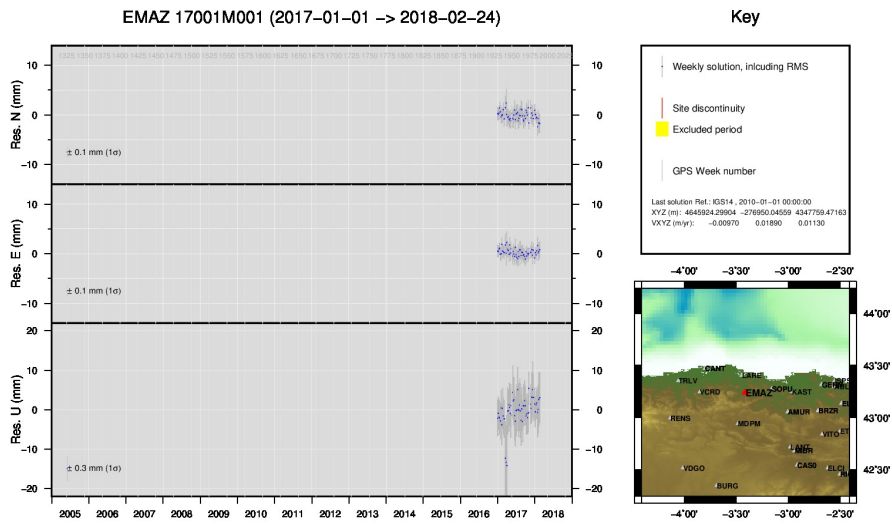
GMW 2018 Mar 07 23:30:33

12) EBRE



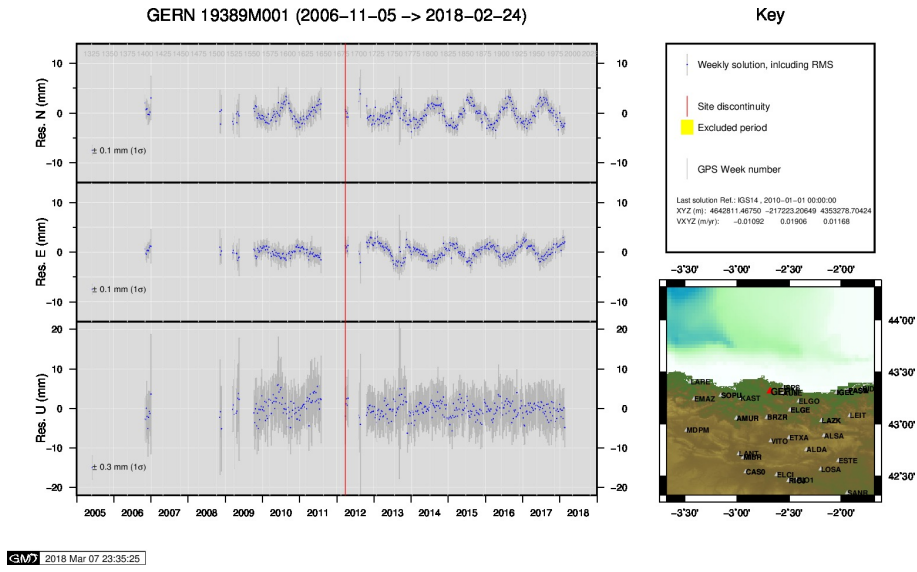
GMW 2018 Mar 07 23:31:37

13) ELGE

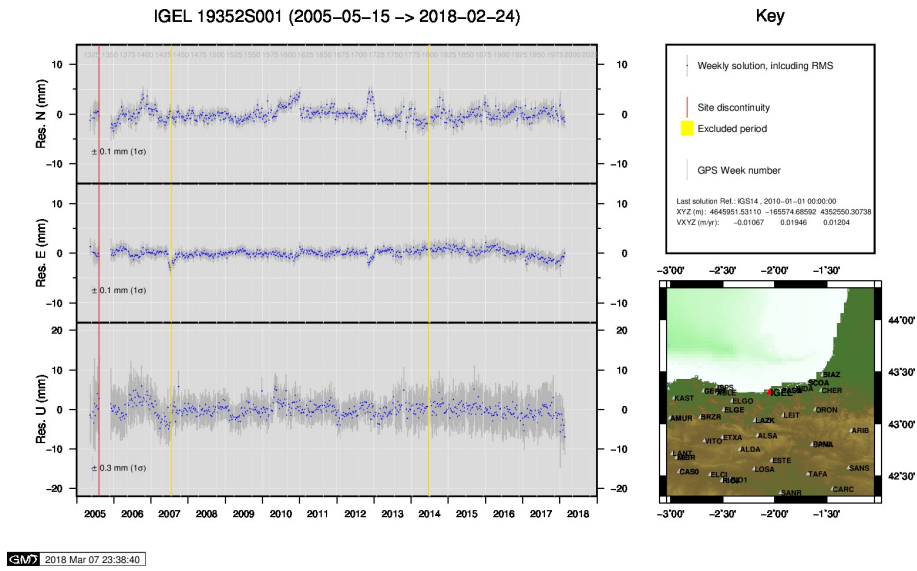


GMW 2018 Mar 07 23:31:56

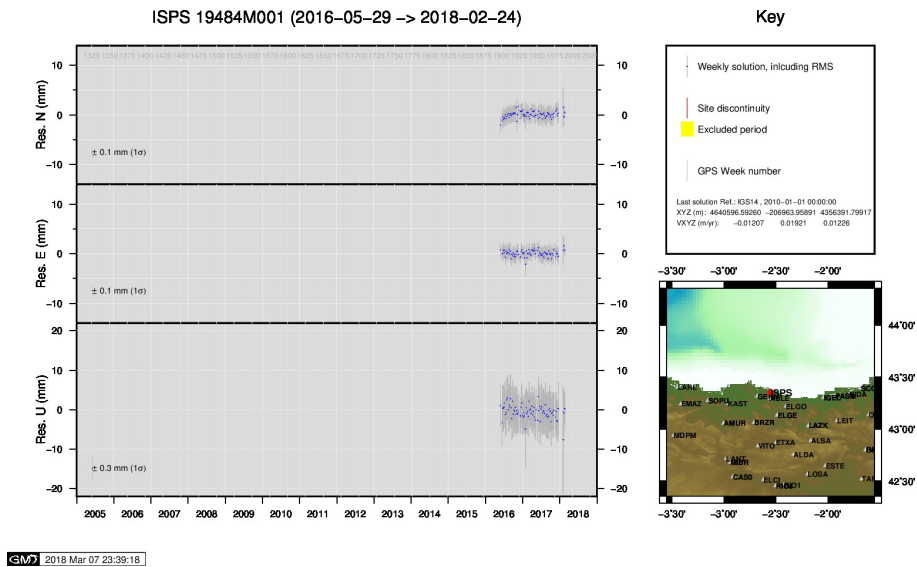
14) EMAZ



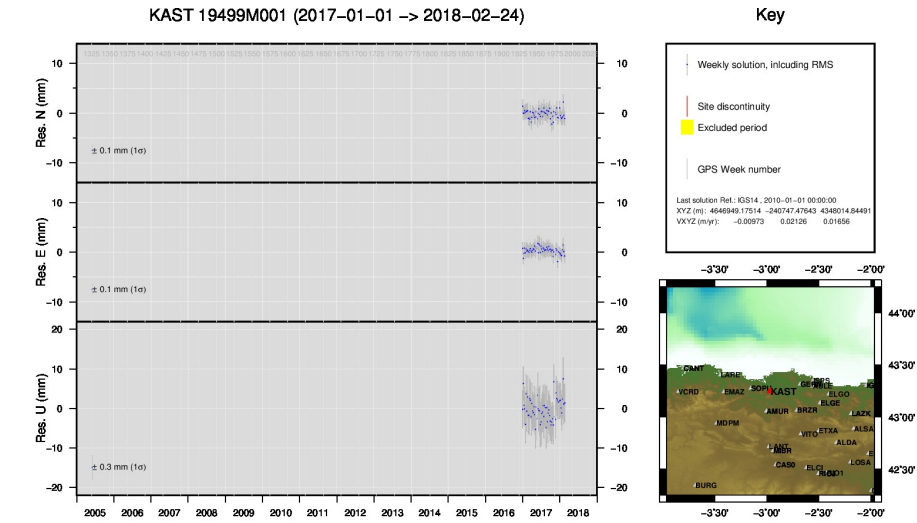
15) GERN



16) IGEL

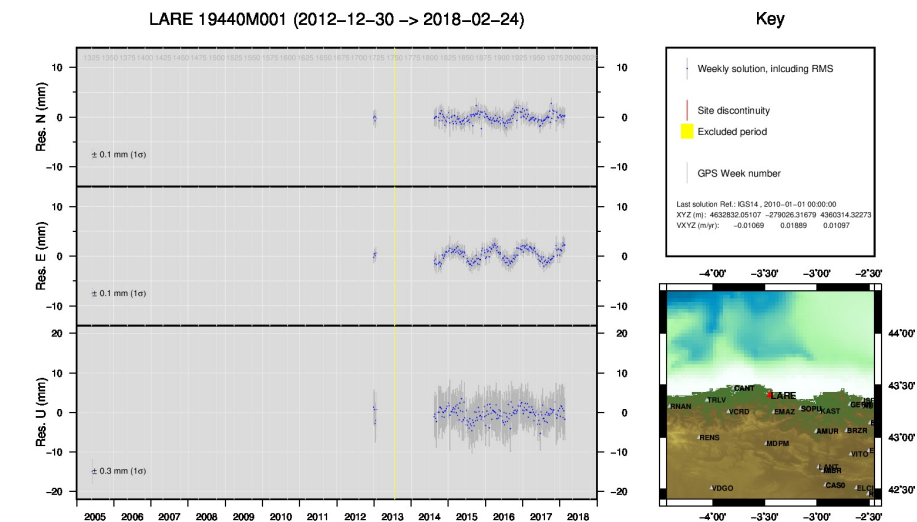


17) ISPS



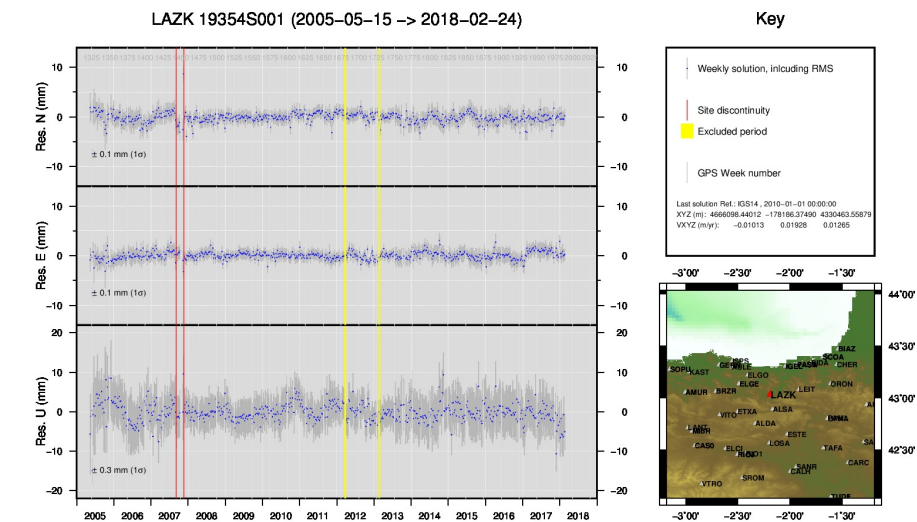
GMW 2018 Mar 07 23:40:04

18) KAST



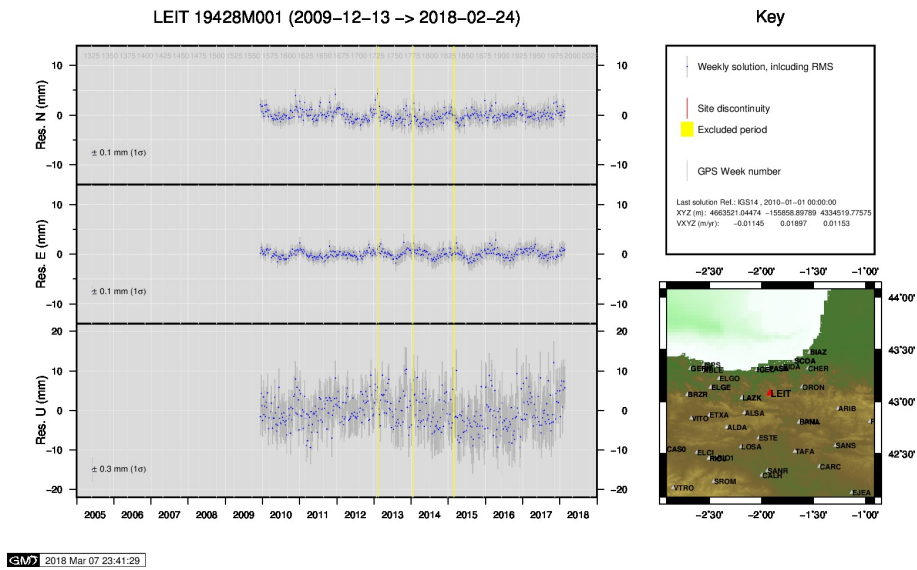
GMW 2018 Mar 07 23:40:40

19) LARE

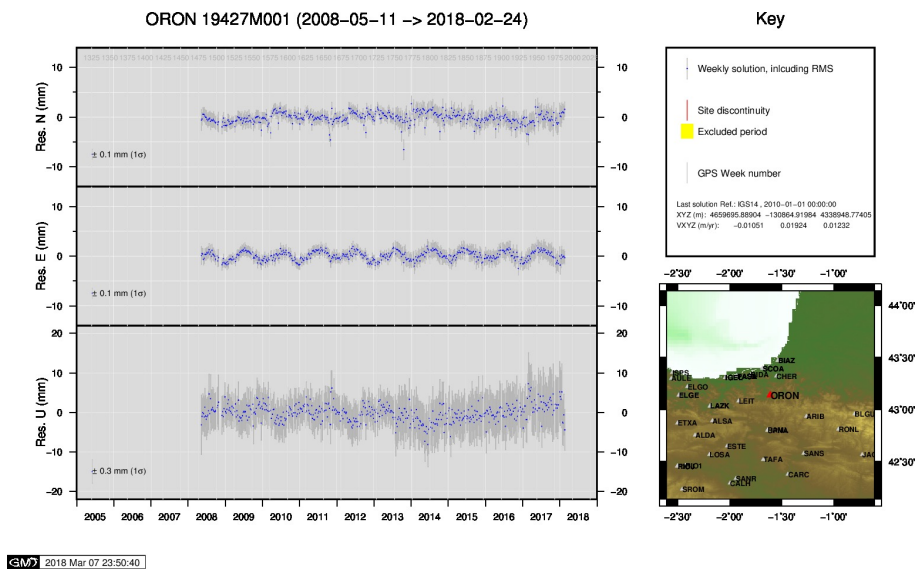


GMW 2018 Mar 07 23:40:50

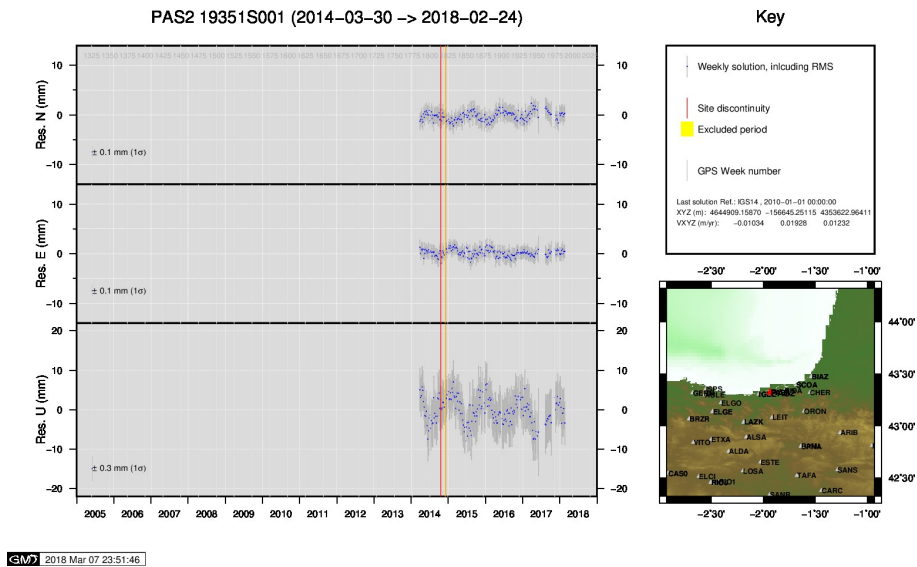
20) LAZK



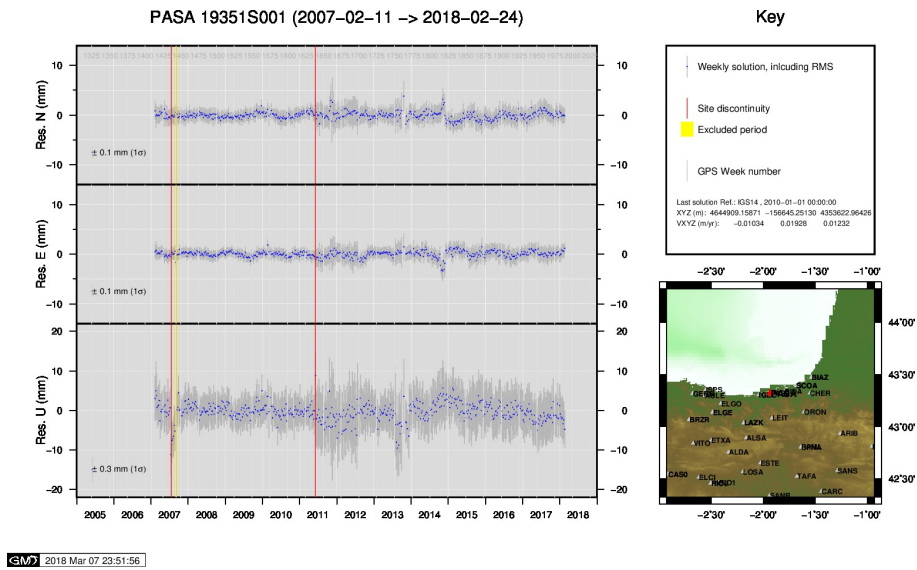
21) LEIT



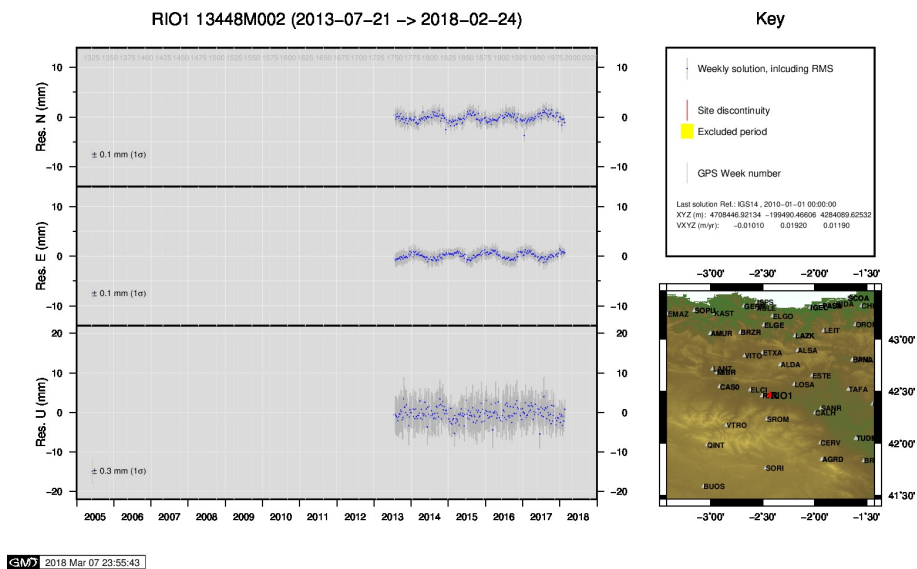
22) ORON



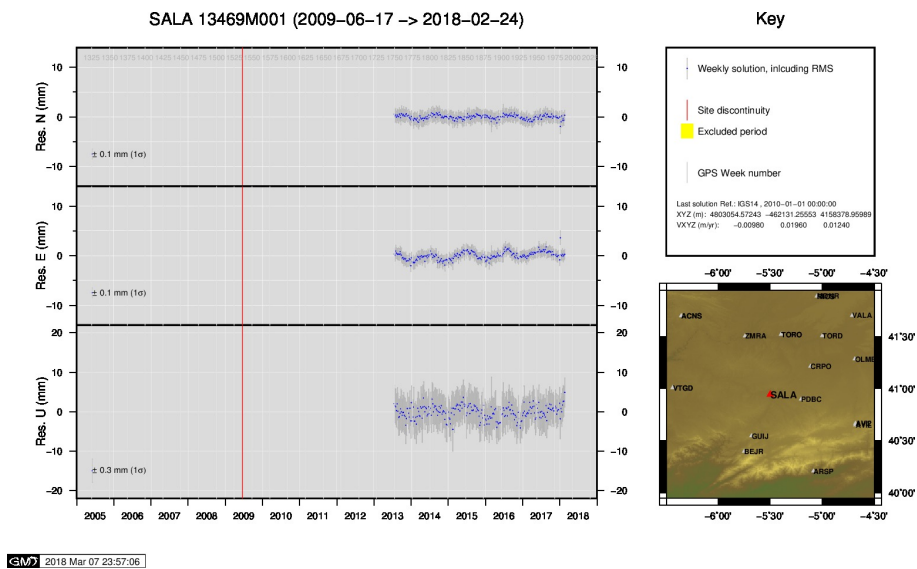
23) PAS2



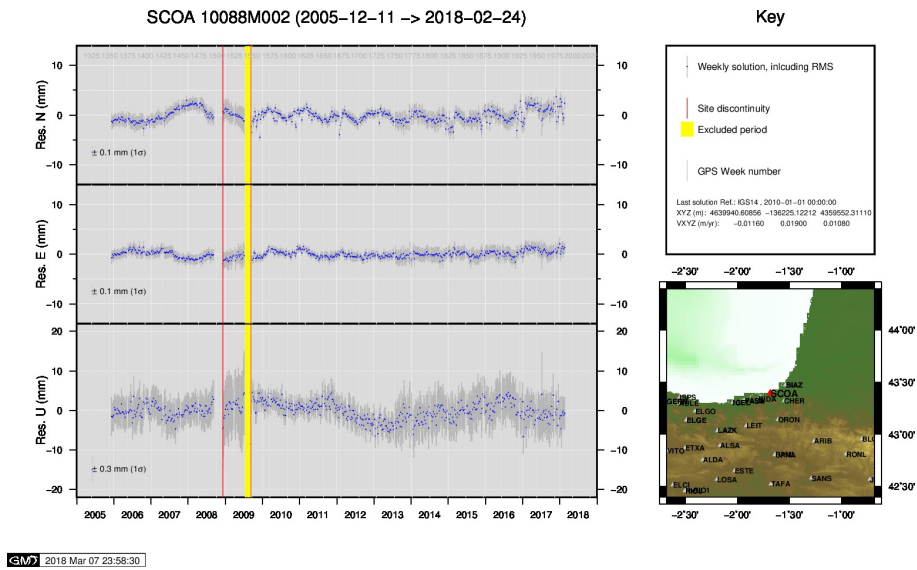
24) PASA



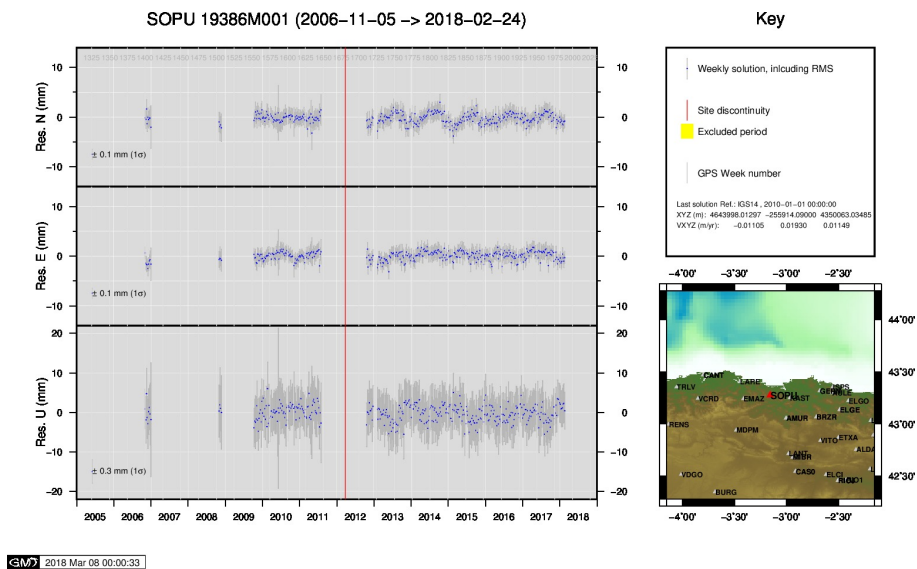
25) RIO1



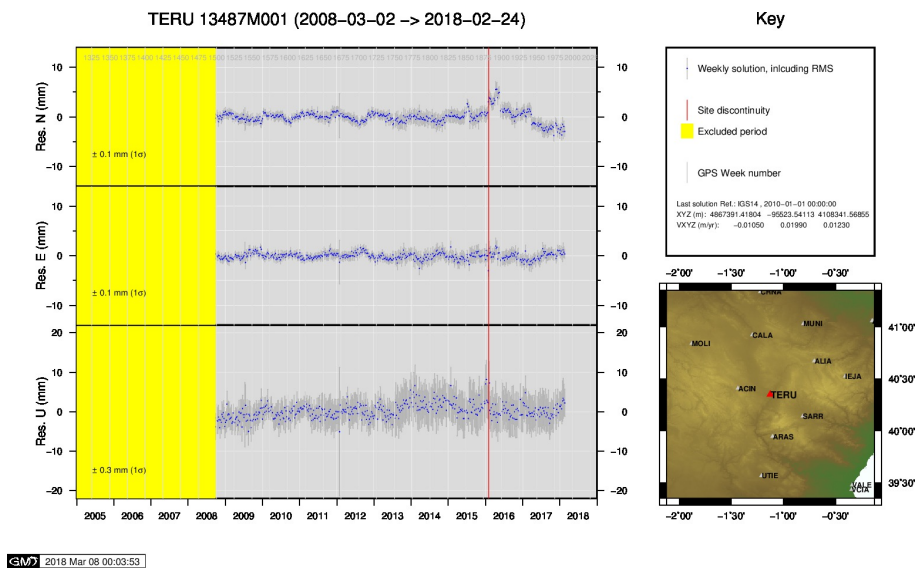
26) SALA



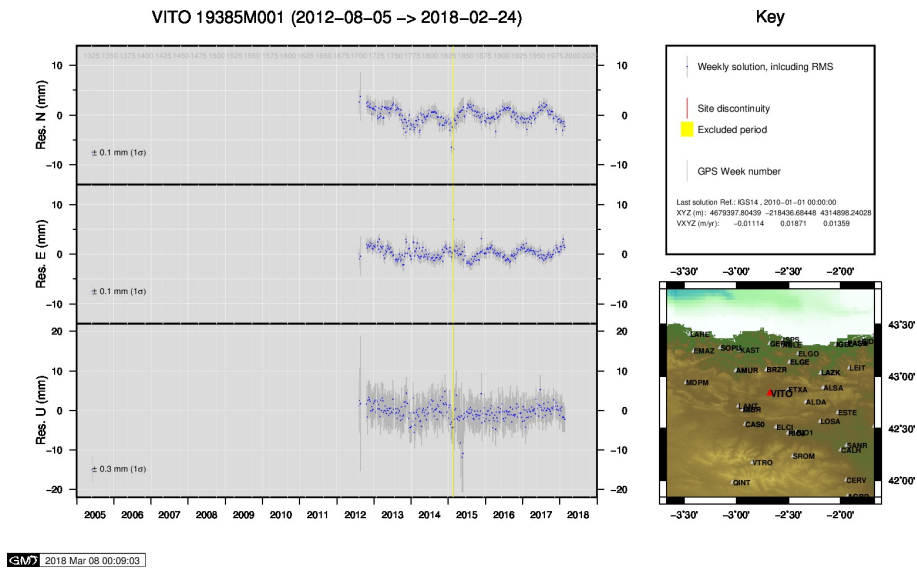
27) SCOA



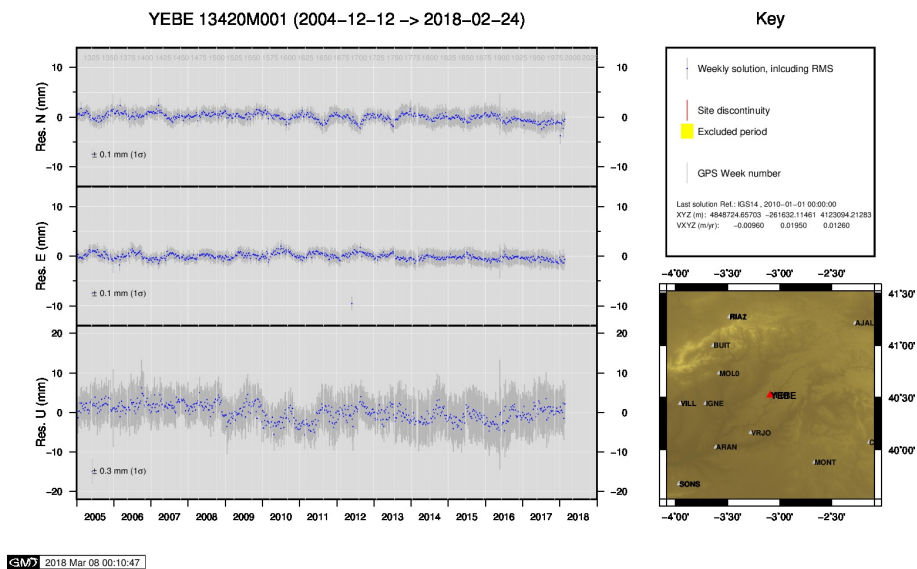
28) SOPU



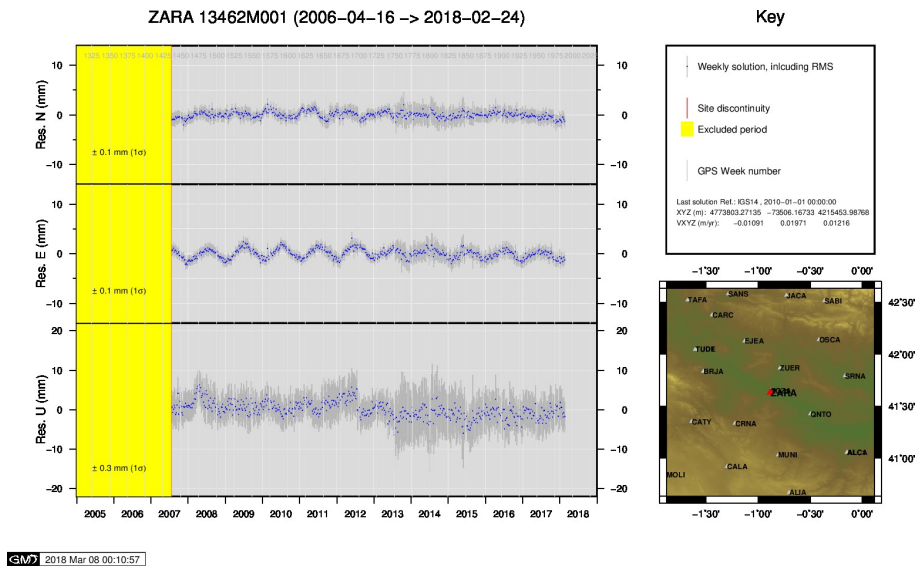
29) TERU



30) VITO



31) YEBE



32) ZARA

