

ARA-DAC Weekly Analysis Result: 1988 (GFA)

Technical Report

GPS Week: 1988 (GFA)

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

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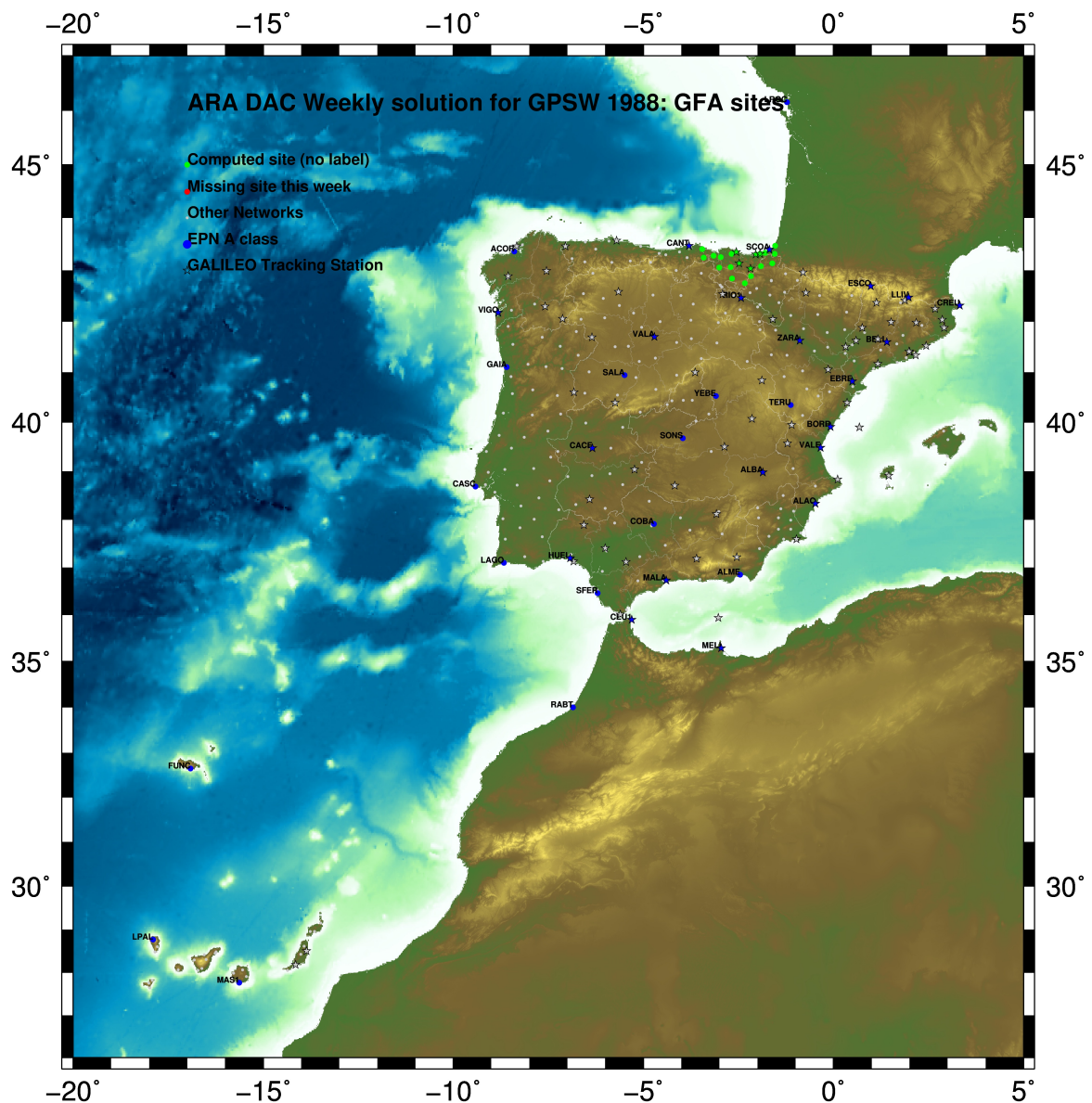
Report generated on 2018/02/26 at 02:20:34



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 Feb 26 02:20:19

Fig.1: Computed Sites for GPS Week1988 (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 C1950.

ARA LAC 1988 WEEK FINAL COMBINATION: PRECISE ORBITS						25-FEB-18 22:17
LOCAL GEODETIC DATUM: IGS14						EPOCH: 2018-02-14 12:00:00
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	
3	ACOR 13434M001	4594489.57291	-678367.47713	4357066.26996	W	
24	ALDA 19383M001	4687280.16976	-190876.59218	4308106.94772	A	
30	ALSA 19419M001	4677250.84815	-176770.42199	4319079.85840	A	
31	AMUR 19388M001	4661499.46270	-244591.28489	4332269.87097	A	
54	BIAZ 10074M002	4634456.06710	-124345.00303	4365785.44486	A	
55	BIDA 00000M000	4644177.84011	-145778.35020	4354832.47066	A	
58	BRZR 19387M001	4662221.00231	-220769.92643	4333309.42105	A	
95	CACE 13447M001	4899866.51298	-544567.06171	4033770.18656	W	
106	CANT 13438M001	4625924.32577	-307096.25933	4365771.53972	W	
75	CHER 00000M000	4645880.33657	-125721.95447	4353624.35831	A	
150	CREU 13432M001	4715420.14694	273178.03325	4271946.82843	W	
186	EBRE 13410M001	4833520.00289	41537.36223	4147461.70036	W	
85	ELGE 19353S001	4657557.41931	-202241.50051	4338991.85653	A	
300	EMAZ 17001M001	4645924.22326	-276949.89180	4347759.56481	A	
98	GERN 19389M001	4642811.32373	-217222.95790	4353278.86605	A	
115	IGEL 19352S001	4645951.44171	-165574.52958	4352550.40418	A	
119	ISPS 19484M001	4640596.49417	-206963.80115	4356391.89880	A	
301	KAST 19499M001	4646949.09712	-240747.30368	4348014.58065	A	
122	LARE 19440M001	4632831.96449	-279026.16117	4360314.41308	A	
126	LAZK 19354S001	4666098.35750	-178186.21817	4330463.66145	A	
129	LEIT 19428M001	4663520.95734	-155858.74320	4334519.87474	A	
158	ORON 19427M001	4659695.80251	-130864.76350	4338948.87502	A	
165	PAS2 19351S001	4644909.07481	-156645.09402	4353623.06525	A	
173	PASA 19351S001	4644909.07295	-156645.09406	4353623.06343	A	
491	RID1 13448M002	4708446.83786	-199490.30919	4284089.72089	W	
496	SALA 13469M001	4803054.49515	-462131.09654	4158379.06251	W	
504	SCDA 10088M002	4639940.51386	-136224.96670	4359552.39840	W	
200	SOPU 19386M001	4643997.92545	-255913.93438	4350063.12989	A	
569	TERU 13487M001	4867391.33590	-95523.37883	4108341.66928	W	
232	VITO 19385M001	4679397.71347	-218436.53071	4314898.34920	A	
671	YEBE 13420M001	4848724.57813	-261631.95756	4123094.31402	W	
674	ZARA 13462M001	4773803.18172	-73506.01040	4215454.08293	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 1988						25-FEB-18 22:17
LOCAL GEODETIC DATUM: ETRF2000						EPOCH: 2018-02-14 12:00:00
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	
3	ACOR 13434M001	4594489.86871	-678367.98986	4357065.86951	W	
24	ALDA 19383M001	4687280.51699	-190877.11313	4308106.54627	A	
30	ALSA 19419M001	4677251.19769	-176770.94190	4319079.45784	A	
31	AMUR 19388M001	4661499.80551	-244591.80341	4332269.47077	A	
54	BIAZ 10074M002	4634456.42559	-124345.51852	4365785.04801	A	
55	BIDA 00000M000	4644178.19548	-145778.86672	4354832.07286	A	
58	BRZR 19387M001	4662221.34786	-220770.44496	4333309.02107	A	
95	CACE 13447M001	4899866.80237	-544567.60445	4033769.76546	W	
106	CANT 13438M001	4625924.66380	-307096.77446	4365771.14137	W	
75	CHER 00000M000	4645880.69410	-125722.47110	4353623.96062	A	
150	CREU 13432M001	4715420.54366	273177.51108	4271946.43022	W	
186	EBRE 13410M001	4833520.36548	41536.82752	4147461.29093	W	
85	ELGE 19353S001	4657557.76731	-202242.01853	4338991.45711	A	
300	EMAZ 17001M001	4645924.56348	-276950.40886	4347759.16537	A	
98	GERN 19389M001	4642811.67100	-217223.47448	4353278.46752	A	
115	IGEL 19352S001	4645951.79471	-165575.04633	4352550.00602	A	
119	ISPS 19484M001	4640596.84279	-206964.31748	4356391.50055	A	
301	KAST 19499M001	4646949.44141	-240747.82074	4348014.58155	A	
122	LARE 19440M001	4632832.30530	-279026.67692	4360314.01456	A	
126	LAZK 19354S001	4666098.70763	-178186.73697	4330463.26168	A	
129	LEIT 19428M001	4663521.31024	-155859.26168	4334519.47542	A	
158	ORON 19427M001	4659696.15850	-130865.28152	4338948.47626	A	
165	PAS2 19351S001	4644909.42888	-156645.61064	4353622.66727	A	
173	PASA 19351S001	4644909.42702	-156645.61068	4353622.66545	A	
491	RID1 13448M002	4708447.18254	-199490.83226	4284089.31780	W	
496	SALA 13469M001	4803054.80207	-462131.62961	4158378.64946	W	
504	SCDA 10088M002	4639940.87061	-136225.48277	4359552.00102	W	
200	SOPU 19386M001	4643998.26817	-255914.45118	4350062.73083	A	
569	TERU 13487M001	4867391.68056	-95523.91733	4108341.25581	W	
232	VITO 19385M001	4679398.05807	-218437.05095	4314897.94800	A	
671	YEBE 13420M001	4848724.90518	-261632.49468	4123093.89999	W	
674	ZARA 13462M001	4773803.53595	-73506.53958	4215453.67653	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 1988		25-FEB-18 22:17			
LOCAL GEODETIC DATUM: ETRF2014		EPOCH: 2018-02-14 12:00:00			
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
3	ACDR 13434M001	4594489.82583	-678368.02894	4357065.91734	W
24	ALDA 19383M001	4687280.47201	-190877.15349	4308106.59400	A
30	ALSA 19419M001	4677251.15276	-176770.98234	4319079.50560	A
31	AMUR 19388M001	4661499.76092	-244591.84369	4332269.51854	A
54	BLAZ 10074M002	4634456.38091	-124345.55929	4365785.09590	A
55	BIDA 00000M000	4644178.15077	-145778.90739	4354832.12071	A
58	BRZR 19387M001	4662221.30320	-220770.48532	4333309.06885	A
95	CACE 13447M001	4899866.75621	-544567.64284	4033769.81265	W
106	CANT 13438M001	4625924.61971	-307096.81466	4365771.18920	W
75	CHER 00000M000	4645880.64932	-125722.51183	4353624.00847	A
150	CREU 13432M001	4715420.49693	273177.46931	4271946.47817	W
186	EBRE 13410M001	4833520.31836	41536.78695	4147461.33846	W
85	ELGE 19353S001	4657557.72264	-202242.05896	4338991.50490	A
300	EMAZ 17001M001	4645924.51912	-276950.44909	4347759.21316	A
98	GERN 19389M001	4642811.62650	-217223.51492	4353278.51535	A
115	IGEL 19352S001	4645951.75004	-165575.08693	4352550.05386	A
119	ISPS 19484M001	4640596.79829	-206964.35797	4356391.54839	A
301	KAST 19499M001	4646949.39694	-240747.86109	4348014.62935	A
122	LARE 19440M001	4632832.26107	-279026.71719	4360314.06238	A
126	LAZK 19354S001	4666098.66281	-178186.77745	4330463.30947	A
129	LEIT 19428M001	4663521.26538	-155859.30225	4334519.52322	A
158	ORON 19427M001	4659696.11360	-130865.32218	4338948.52409	A
165	PAS2 19351S001	4644909.38419	-156645.65127	4353622.71512	A
173	PASA 19351S001	4644909.38233	-156645.65131	4353622.71330	A
491	RI01 13448M002	4708447.13737	-199490.87252	4284089.36548	W
496	SALA 13469M001	4803054.75668	-462131.66864	4158378.69685	W
504	SOA 10088M002	4639940.82591	-136225.52348	4359552.04888	W
200	SOPU 19386M001	4643998.22377	-255914.49149	4350062.77863	A
569	TERU 13487M001	4867391.63354	-95523.95733	4108341.30320	W
232	VITO 19385M001	4679398.01323	-218437.09125	4314897.99574	A
671	YEBE 13420M001	4848724.85882	-261632.53420	4123093.94734	W
674	ZARA 13462M001	4773803.48978	-73506.58001	4215453.72413	W

LAZK	19354S001	U	2.31	0.99	-1.39	2.49	-2.08	0.53	2.83	-3.19
LEIT	19428M001	N	1.68	2.20	1.71	-0.29	-1.68	-1.39	-1.88	0.84
LEIT	19428M001	E	0.76	0.60	0.47	-0.74	-0.52	0.05	-1.01	1.03
LEIT	19428M001	U	6.02	8.43	-1.46	-2.91	3.77	-7.74	-6.73	4.08
ORDN	19427M001	N	0.70	1.07	-0.86	-0.47	-0.07	0.01	-0.33	-0.86
ORDN	19427M001	E	0.34	0.25	-0.06	-0.69	-0.19	-0.34	0.01	-0.05
ORDN	19427M001	U	4.25	-2.79	3.97	-1.63	-1.53	6.85	2.53	-5.12
PAS2	19351S001	N	0.61		0.08	0.08	-1.33	0.12	-0.09	0.26
PAS2	19351S001	E	0.97		0.95	1.12	-0.59	-1.33	-0.50	0.41
PAS2	19351S001	U	3.94		0.96	3.49	-2.69	-0.96	2.52	-7.06
PASA	19351S001	N	0.53	0.31	-0.37	0.32	-0.58	0.53	0.11	-0.84
PASA	19351S001	E	0.71	-0.28	0.02	1.40	0.37	-0.26	-0.44	-0.77
PASA	19351S001	U	2.61	2.08	-0.45	2.33	-4.59	-1.81	1.72	-1.87
RID1	13448M002	N	0.80	1.61	-0.05	-0.43	-0.04	-0.77	0.59	0.31
RID1	13448M002	E	0.51	-0.38	-0.55	-0.50	0.45	0.50	0.27	-0.55
RID1	13448M002	U	2.37	-3.19	2.87	-0.73	-0.07	1.62	-3.45	0.33
SALA	13469M001	N	0.39	0.50	-0.15	-0.53	-0.02	0.25	0.38	0.39
SALA	13469M001	E	0.46	-0.46	-0.13	-0.33	0.85	0.05	0.36	-0.26
SALA	13469M001	U	1.87	0.12	-2.62	0.01	2.32	-0.84	-2.12	-1.88
SCDA	10088M002	N	2.42	-0.88	-1.61	-1.87		0.08	3.66	3.01
SCDA	10088M002	E	0.59	0.15	-0.76	-0.36		0.02	0.94	0.35
SCDA	10088M002	U	3.34	-4.72	-0.50	2.41		1.39	4.87	-1.37
SOPU	19386M001	N	0.70	-1.08	0.28	0.41	0.25	0.55	0.79	0.76
SOPU	19386M001	E	1.49	-2.65	1.07	-0.24	0.24	0.98	0.99	-1.75
SOPU	19386M001	U	2.65	0.36	0.70	-1.00	-0.29	-2.93	-4.57	-3.32
TERU	13487M001	N	0.43	-0.05	0.22	0.35	-0.37	-0.01	-0.14	-0.87
TERU	13487M001	E	0.87	-0.72	-1.42	-0.07	0.91	-0.98	-0.10	0.43
TERU	13487M001	U	2.21	-1.26	-0.25	4.67	-0.42	0.23	-2.37	-0.07
VITO	19385M001	N	0.93	-0.37	-0.52	0.52	-1.38	0.76	1.21	0.73
VITO	19385M001	E	1.22	2.11	-0.29	-0.69	-0.82	-0.15	-1.73	-0.47
VITO	19385M001	U	3.12	0.94	1.13	-2.96	-6.65	-1.05	-1.31	0.55
YEBE	13420M001	N	0.57	0.36	-1.09	-0.22	0.69	-0.24	0.09	-0.23
YEBE	13420M001	E	0.85	0.34	-1.00	0.32	1.23	0.46	0.59	1.02
YEBE	13420M001	U	0.86	0.63	-0.77	0.83	1.38	-0.47	0.28	0.77
ZARA	13462M001	N	0.47	0.03	-0.34	0.18	-0.46	0.66	-0.03	-0.74
ZARA	13462M001	E	0.75	0.35	-0.38	-1.29	-0.55	-0.30	-0.43	-0.94
ZARA	13462M001	U	2.37	0.01	1.64	1.52	-0.48	0.00	3.10	-4.34

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	-1.15	1.45	-1.55
10	ALAC 13433M001	I W	0.11	1.03	-1.10
13	ALBA 13452M001	I W	-0.46	-0.32	1.51
18	ALME 13437M001	I W	-1.95	0.02	1.94
43	BELL 13431M001	I W	0.84	0.31	-0.77
61	BORR 13480M001	I W	0.10	-2.38	-1.37
65	BRST 10004M004	I W	-0.01	-0.26	-0.36
95	CACE 13447M001	I W	0.90	1.00	2.08
106	CANT 13438M001	I W	0.15	-0.68	0.97
110	CASC 13909S001	I W	-0.62	0.51	2.42
117	CEU1 13449M002	I W	0.50	0.18	0.14
131	COBA 13453M001	I W	0.17	1.34	-3.12
150	CREU 13432M001	I W	-1.28	-0.99	-2.52
186	EBRE 13410M001	I W	0.36	2.43	-1.85
203	ESCO 13435M001	I W	0.40	0.52	1.58
213	FUNC 13911S001	I W	3.71	-1.15	0.86
215	GAIA 13902M001	I W	-0.92	-0.05	-2.30
271	HUEL 13451M001	I W	-0.83	0.88	2.66
317	LAGO 13903M001	I W	-4.12	-3.92	1.44
337	LLIV 13436M001	I W	-1.50	1.05	1.93
341	LPAL 81701M001	I W	-3.13	1.77	2.11
344	LRDC 10023M001	I W	-0.14	-1.16	-1.70
353	MALA 13443M001	I W	-2.21	2.18	0.39
371	MAS1 31303M002	I W	-0.13	1.37	2.50
381	MELI 19379M001	I W	-1.19	0.94	9.27
442	PDEL 31906M004	I W	0.50	0.15	-4.91
475	RABT 35001M002	I W	0.85	1.20	1.09
491	RID1 13448M002	I W	-0.45	-0.96	-1.41
496	SALA 13469M001	I W	-0.30	-0.44	-2.47
504	SCDA 10088M002	I W	0.09	-1.09	-1.19
511	SFER 13402M004	I W	-0.73	-5.08	1.08
532	SONS 13446M001	I W	1.17	1.17	0.08
562	TERC 31909M001	I W	5.61	-3.89	-1.42
569	TERU 13487M001	I W	2.96	-1.05	-4.17
629	VALA 13463M002	I W	-0.82	0.41	-1.29
633	VALE 13439M001	I W	0.30	0.69	-3.34
643	VIGO 13450M001	I W	-0.23	0.03	-1.26
671	YEBE 13420M001	I W	0.69	2.10	2.79
674	ZARA 13462M001	I W	0.52	0.76	-2.35
683	ZIMM 14001M004	I W	2.22	-0.06	3.61
	RMS / COMPONENT		1.68	1.63	2.58
	MEAN		0.00	0.00	0.00
	MIN		-4.12	-5.08	-4.91
	MAX		5.61	2.43	9.27

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 120
RMS OF TRANSFORMATION : 2.01 MM

BARYCENTER COORDINATES:

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

PARAMETERS:

TRANSLATION IN N : 0.01 +- 0.32 MM
TRANSLATION IN E : 0.01 +- 0.32 MM
TRANSLATION IN U : 0.00 +- 0.32 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.

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* STATISTICAL PARAMETER-----VALUE(S)-----
NUMBER OF OBSERVATIONS          15577992
NUMBER OF UNKNOWN               203335
NUMBER OF DEGREES OF FREEDOM    15374647
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)      180
VARIANCE FACTOR                  1.933454519675721

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
  1  0.00240      0.0069 -0.0252 -0.0126  0.0007  0.0004 -0.0005 -0.00007
  2  0.00228     -0.0144 -0.0159  0.0180  0.0003 -0.0007 -0.0004 -0.00016
  3  0.00186     -0.0137 -0.0233  0.0125  0.0005 -0.0006 -0.0006  0.00014
  4  0.00213      0.0285  0.0182 -0.0313 -0.0003  0.0014  0.0005 -0.00020
  5  0.00207      0.0011  0.0082 -0.0062 -0.0001  0.0002  0.0002  0.00070
  6  0.00181     -0.0121  0.0088  0.0140 -0.0002 -0.0006  0.0002  0.00029
  7  0.00210     -0.0174  0.0033  0.0204 -0.0002 -0.0009 -0.0000  0.00015
```

```
Statistics of individual solutions:
-----
File  RMS (m)      DOF  Chi**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
  1  0.00137      2211121      1.89          2242594      3          960      30516      0
  2  0.00147      2283744      2.16          2314412      3          972      29699      0
  3  0.00134      2286308      1.81          2316907      3          969      29633      0
  4  0.00137      2131254      1.87          2160055      3          954      27850      0
  5  0.00133      2093951      1.78          2121715      3          873      26894      0
  6  0.00126      2188493      1.58          2218312      3          900      28922      0
  7  0.00153      2174283      2.35          2203987      3          897      28810      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 18:04:00000 18:04:86370 LEICA GRX1200PRO -----
ALDA  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
ALSA  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200GGPRO -----
AMUR  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
BIAZ  A   1 P 18:04:00000 18:04:86370 TRI SP90M -----
BIDA  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
BRZR  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
CACE  A   1 P 18:04:00000 18:04:86370 TRIMBLE NETR9 -----
CANT  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
CHER  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200+GNSS -----
CREU  A   1 P 18:04:00000 18:04:86370 LEICA GR50 -----
EBRE  A   1 P 18:04:00000 18:04:86370 LEICA GR50 -----
ELGE  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
EMAZ  A   1 P 18:04:00000 18:04:86370 LEICA GR30 -----
GERN  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
IGEL  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
ISPS  A   1 P 18:04:00000 18:04:86370 TRIMBLE NETR9 -----
KAST  A   1 P 18:04:00000 18:04:86370 LEICA GR30 -----
LARE  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200GGPRO -----
LAZK  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
LEIT  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200+GNSS -----
ORON  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200GGPRO -----
PAS2  A   1 P 18:04:00000 18:04:86370 TPS NET-G3A -----
PASA  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
RIO1  A   1 P 18:04:00000 18:04:86370 LEICA GR25 -----
SALA  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200+GNSS -----
SCOA  A   1 P 18:04:00000 18:04:86370 LEICA GR25 -----
SOPU  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
TERU  A   1 P 18:04:00000 18:04:86370 LEICA GRX1200GGPRO -----
VITO  A   1 P 18:04:00000 18:04:86370 LEICA GR10 -----
YEBE  A   1 P 18:04:00000 18:04:86370 TRIMBLE NETR9 -----
ZARA  A   1 P 18:04:00000 18:04:86370 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 18:04:00000 18:04:86370 LEIAT504      LEIS -----
ALDA  A   1 P 18:04:00000 18:04:86370 LEIAS10      NONE -----
ALSA  A   1 P 18:04:00000 18:04:86370 LEIAX1202GG  NONE -----
AMUR  A   1 P 18:04:00000 18:04:86370 LEIAS10      NONE -----
```

```

BIAZ A 1 P 18:042:00000 18:048:86370 LEIAR25 LEIT -----
BIDA A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
BRZR A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
CACE A 1 P 18:042:00000 18:048:86370 TRM29659.00 NONE -----
CANT A 1 P 18:042:00000 18:048:86370 LEIAR25.R4 LEIT 25066
CHER A 1 P 18:047:00000 18:048:86370 LEIAX1203+GNSS NONE -----
CREU A 1 P 18:042:00000 18:048:86370 LEIAR25.R4 NONE 26357
EBRE A 1 P 18:042:00000 18:048:86370 LEIAR25.R4 NONE 26359
ELGE A 1 P 18:042:00000 18:048:86370 LEIAR25.R4 LEIT -----
EMAZ A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
GERN A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
IGEL A 1 P 18:042:00000 18:048:86370 LEIAR20 LEIM -----
ISPS A 1 P 18:047:00000 18:048:86370 TRM59900.00 SCIS -----
KAST A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
LARE A 1 P 18:042:00000 18:048:86370 LEIAT504 NONE -----
LAZK A 1 P 18:042:00000 18:048:86370 LEIAR25.R4 LEIT -----
LEIT A 1 P 18:042:00000 18:048:86370 LEIAX1203+GNSS NONE -----
ORDN A 1 P 18:042:00000 18:048:86370 LEIAX1202GG NONE -----
PAS2 A 1 P 18:043:00000 18:048:86370 LEIAR20 LEIM 73034
PASA A 1 P 18:042:00000 18:048:86370 LEIAR20 LEIM 73034
RID1 A 1 P 18:042:00000 18:048:86370 LEIAR25.R4 LEIT 25138
SALA A 1 P 18:042:00000 18:048:86370 LEIAR25 NONE -----
SCOA A 1 P 18:042:00000 18:048:86370 TRM55971.00 NONE -----
SOPU A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
TERU A 1 P 18:042:00000 18:048:86370 LEIAT504GG LEIS -----
VITO A 1 P 18:042:00000 18:048:86370 LEIAS10 NONE -----
YEBE A 1 P 18:042:00000 18:048:86370 TRM29659.00 NONE -----
ZARA A 1 P 18:042:00000 18:048:86370 TRM29659.00 NONE -----

```

7.3 Eccentricities

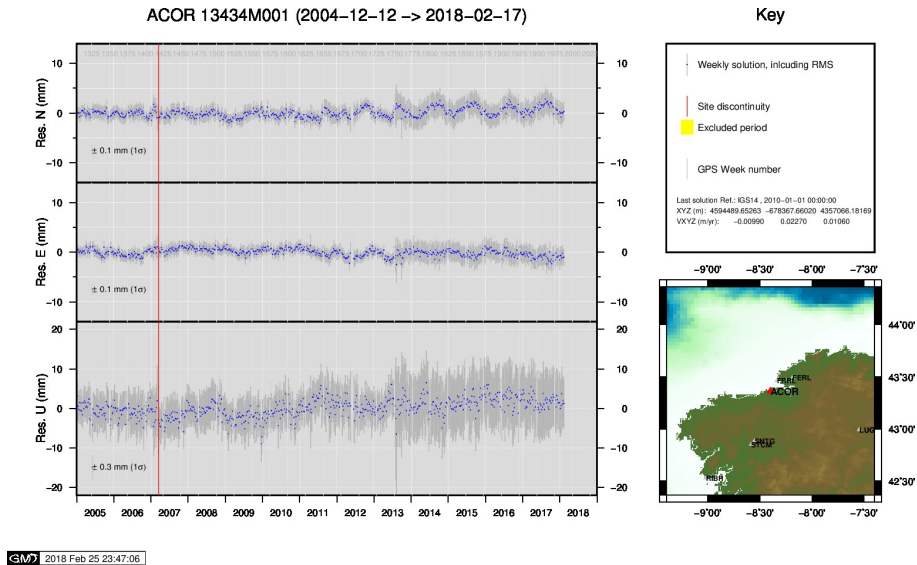
```

*
*SITE PT SOLN T DATA_START_ DATA_END_ AXE ARP->BENCHMARK(M) UP_----- NORTH_-- EAST_----
ACOR A 1 P 18:042:00000 18:048:86370 UNE 3.0460 0.0000 0.0000
ALDA A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
ALSA A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
AMUR A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
BIAZ A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
BIDA A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
BRZR A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
CACE A 1 P 18:042:00000 18:048:86370 UNE 0.0600 0.0000 0.0000
CANT A 1 P 18:042:00000 18:048:86370 UNE 3.0490 0.0000 0.0000
CHER A 1 P 18:047:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
CREU A 1 P 18:042:00000 18:048:86370 UNE 0.0770 0.0000 0.0000
EBRE A 1 P 18:042:00000 18:048:86370 UNE 0.0770 0.0000 0.0000
ELGE A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
EMAZ A 1 P 18:042:00000 18:048:86370 UNE 0.0350 0.0000 0.0000
GERN A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
IGEL A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
ISPS A 1 P 18:047:00000 18:048:86370 UNE 0.0350 0.0000 0.0000
KAST A 1 P 18:042:00000 18:048:86370 UNE 0.0350 0.0000 0.0000
LARE A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
LAZK A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
LEIT A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
ORDN A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
PAS2 A 1 P 18:043:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
PASA A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
RID1 A 1 P 18:042:00000 18:048:86370 UNE 0.0606 0.0000 0.0000
SALA A 1 P 18:042:00000 18:048:86370 UNE 0.0600 0.0000 0.0000
SCOA A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
SOPU A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
TERU A 1 P 18:042:00000 18:048:86370 UNE 0.0600 0.0000 0.0000
VITO A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
YEBE A 1 P 18:042:00000 18:048:86370 UNE 0.0000 0.0000 0.0000
ZARA A 1 P 18:042:00000 18:048:86370 UNE 3.2590 0.0000 0.0000

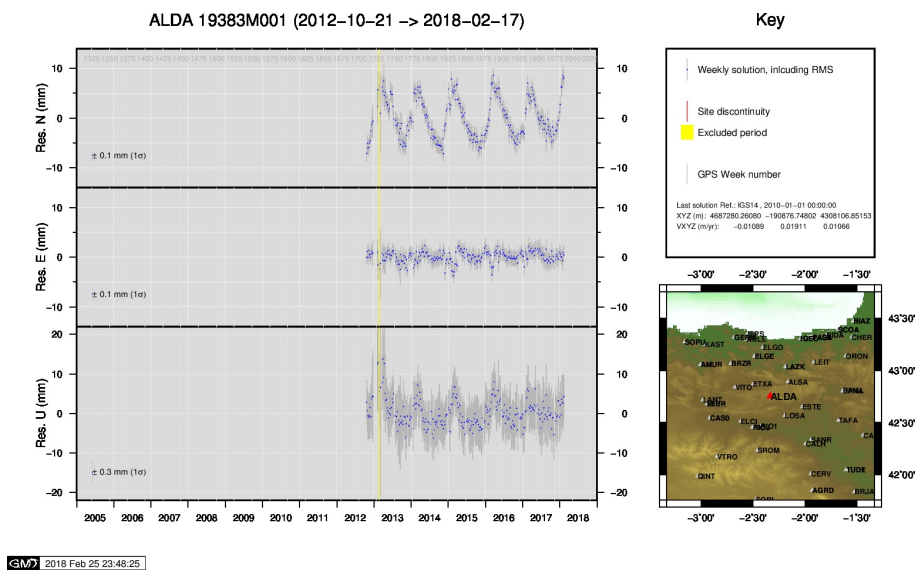
```

8 Cumulative Time Series

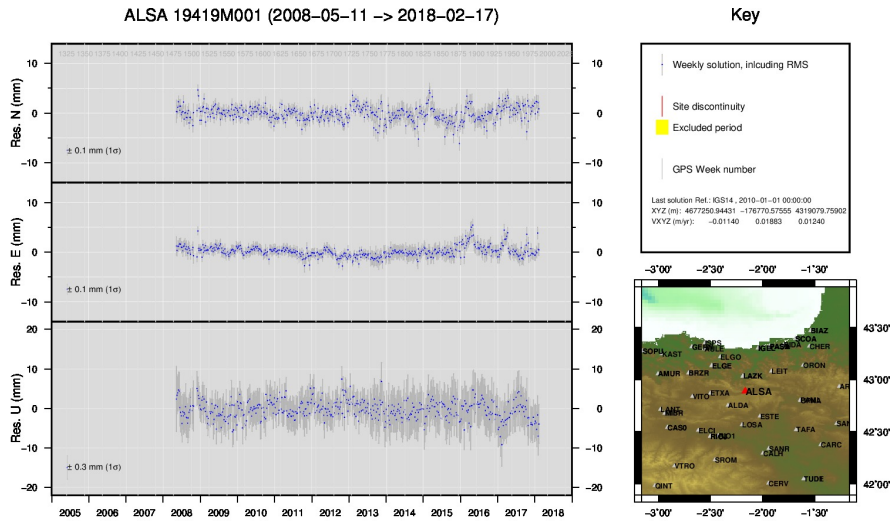
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

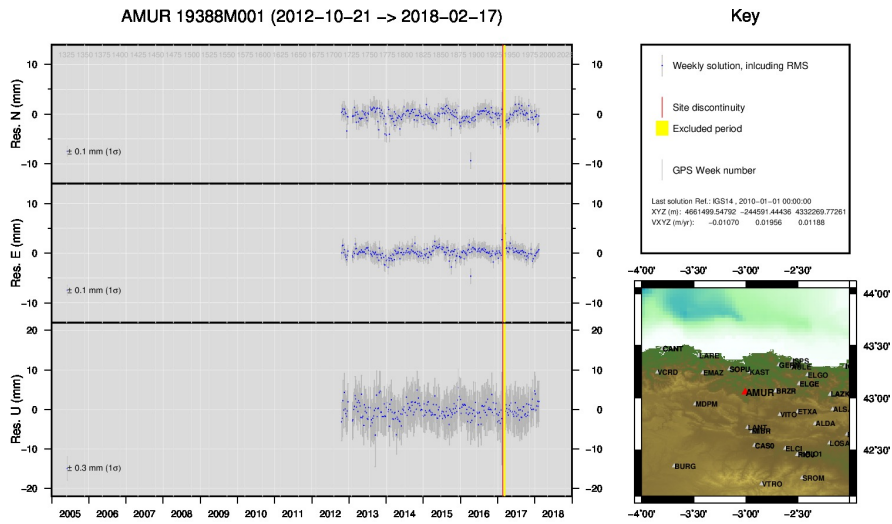


2) ALDA



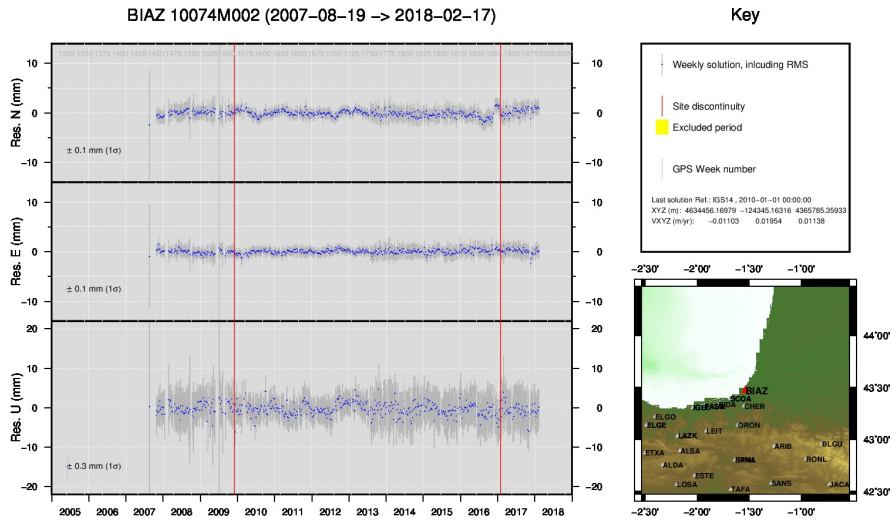
GMW 2018 Feb 25 23:49:21

3) ALSA



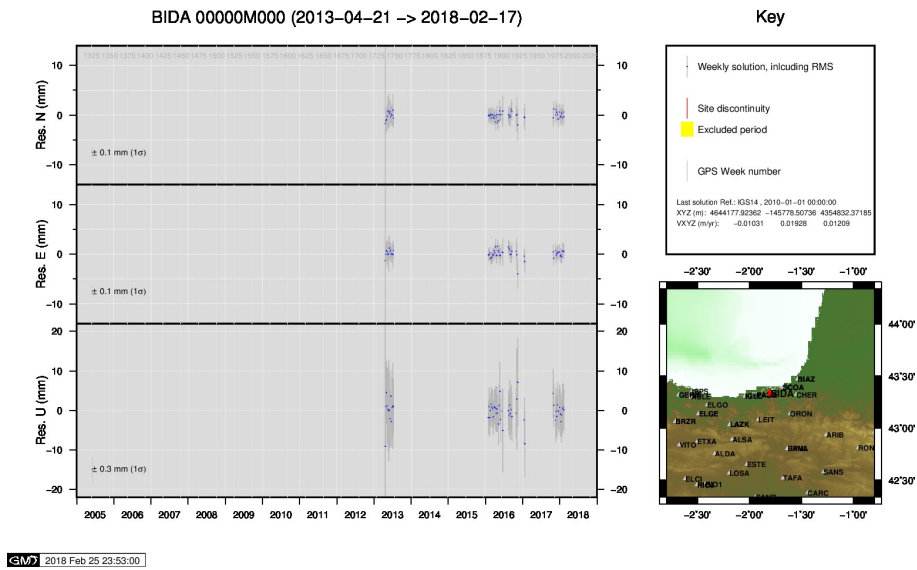
GMW 2018 Feb 25 23:49:34

4) AMUR

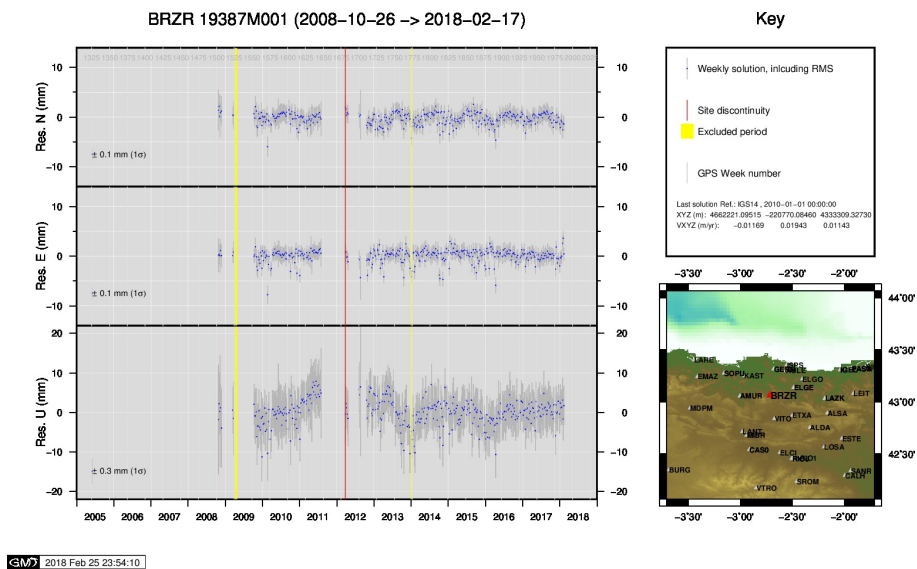


GMW 2018 Feb 25 23:52:54

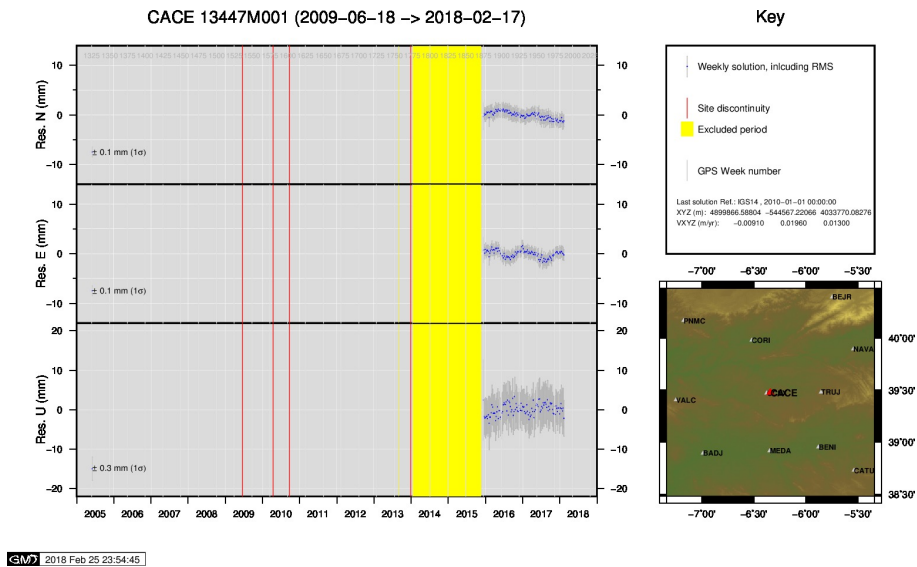
5) BIAZ



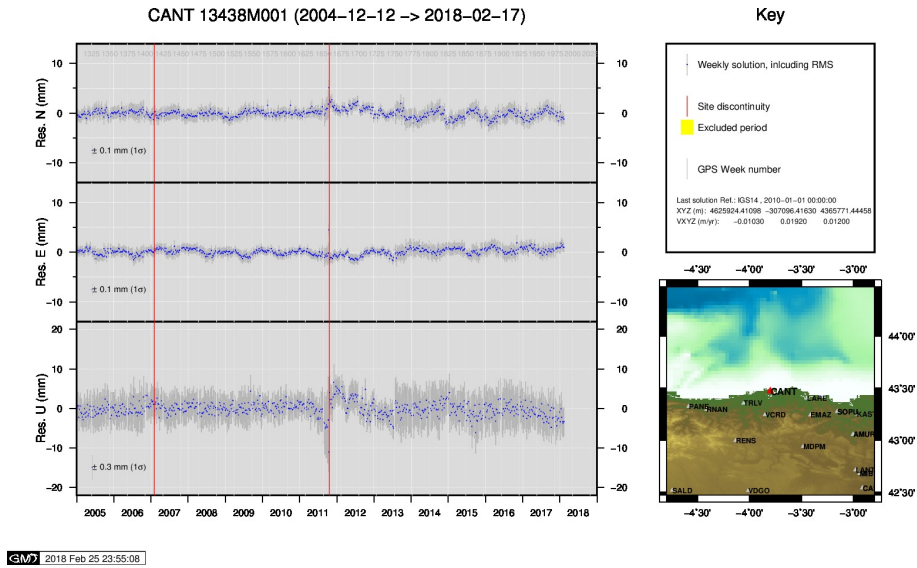
6) BIDA



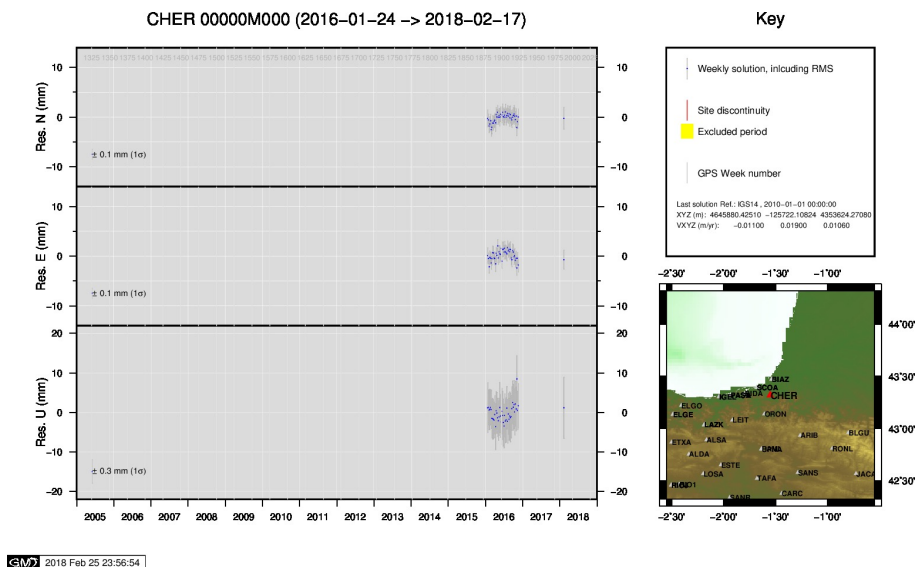
7) BRZR



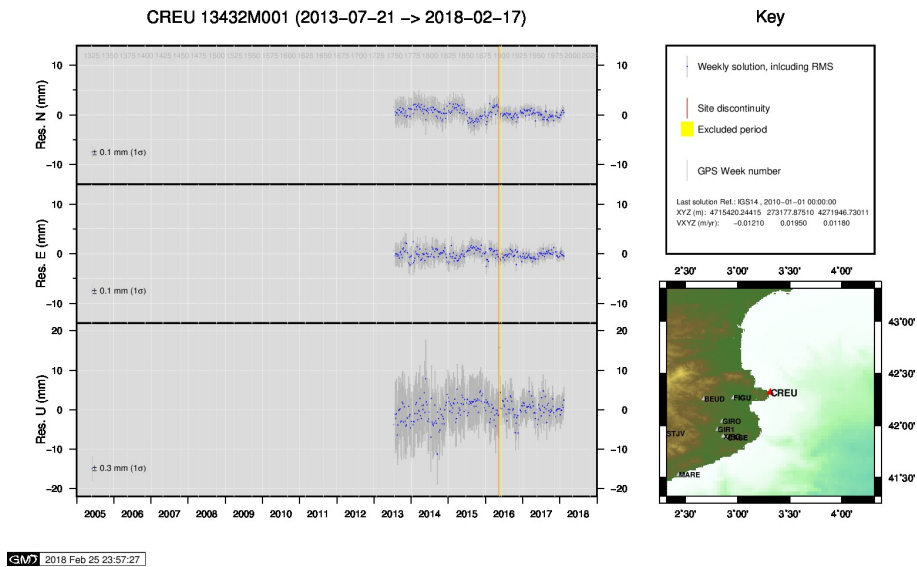
8) CACE



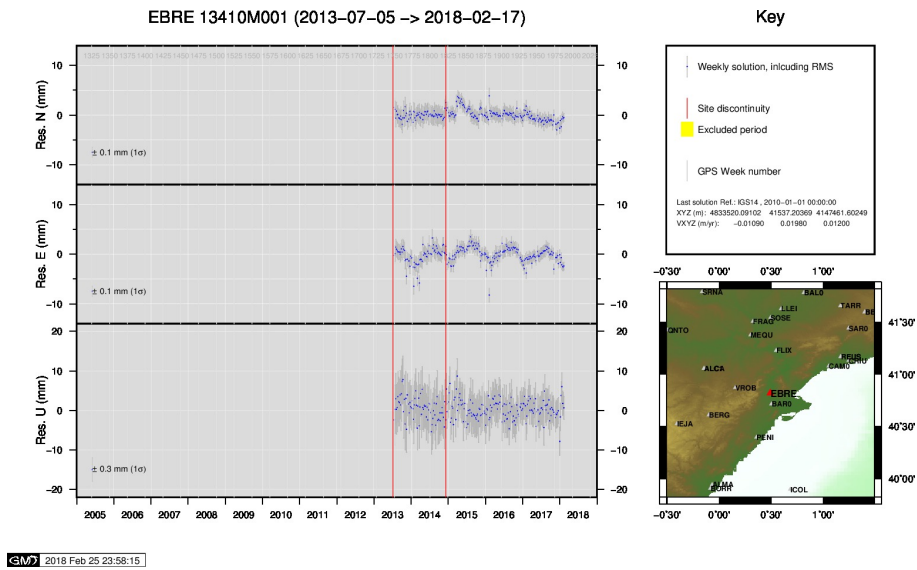
9) CANT



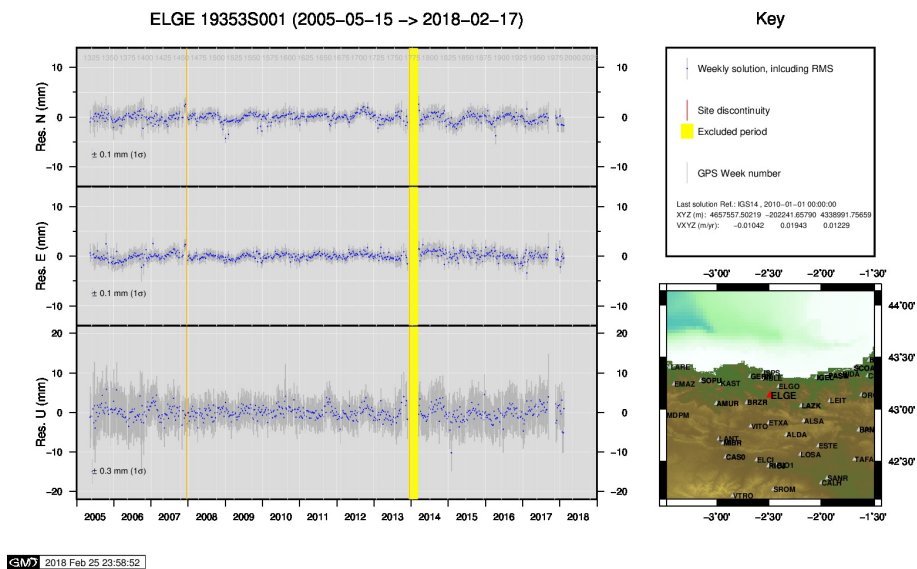
10) CHER



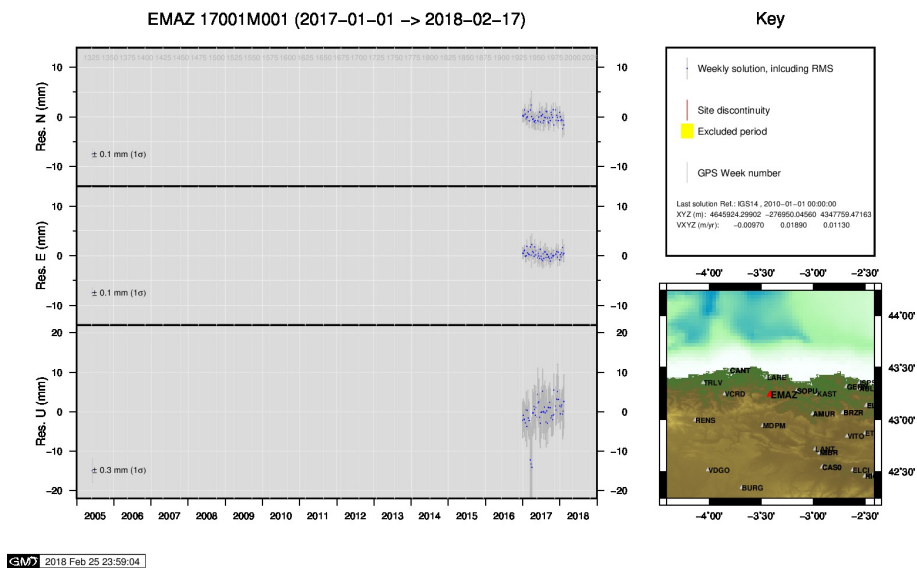
11) CREU



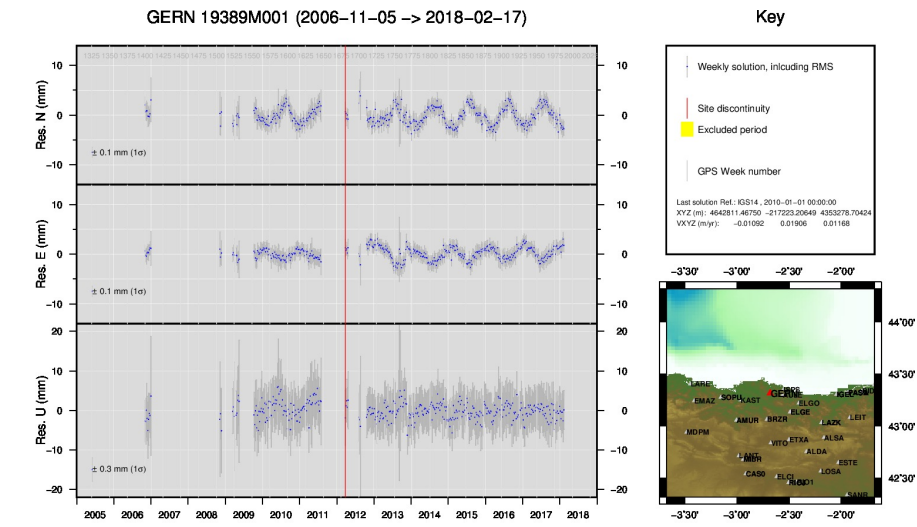
12) EBRE



13) ELGE

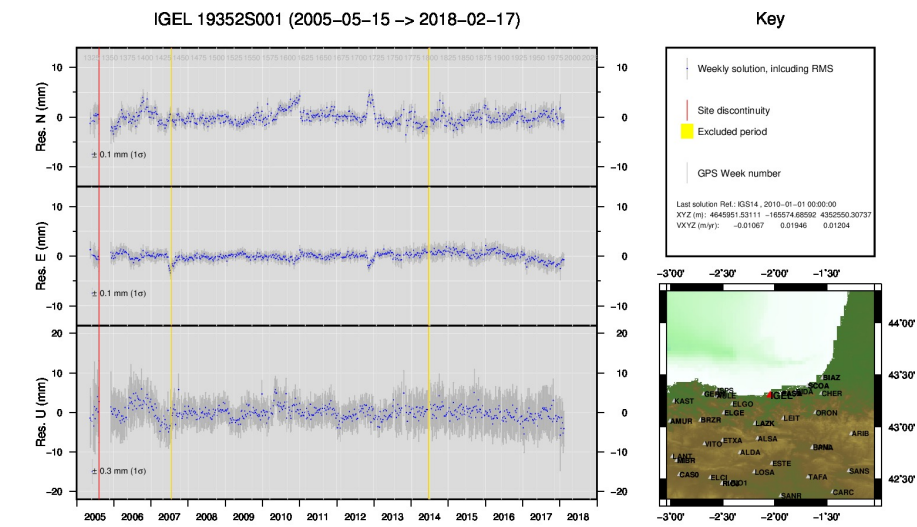


14) EMAZ



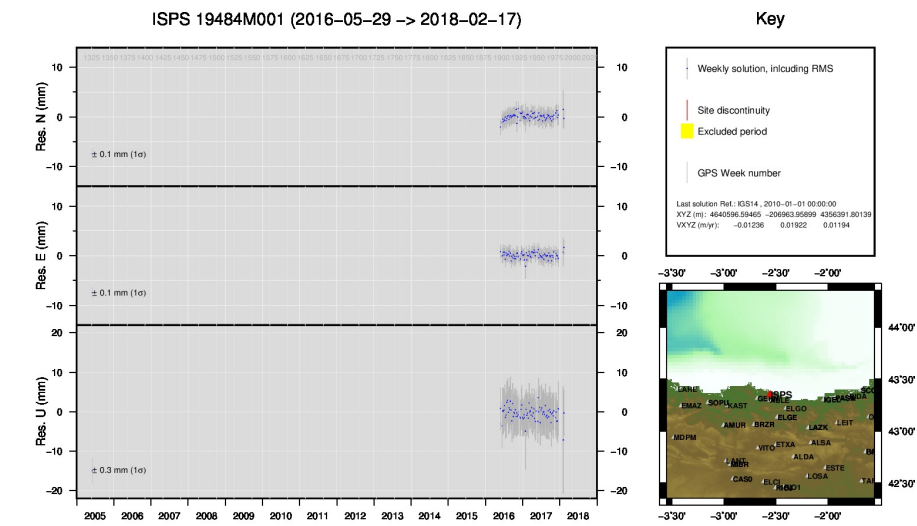
GMW 2018 Feb 26 00:01:08

15) GERN



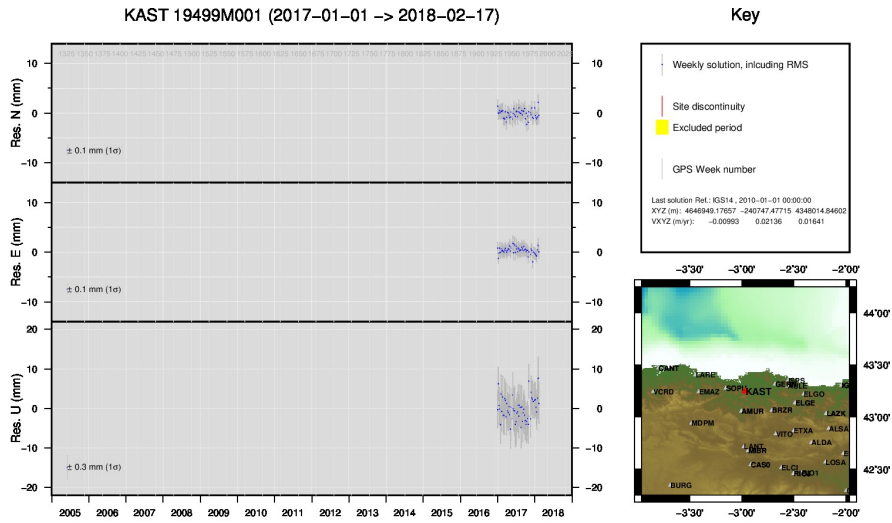
GMW 2018 Feb 26 00:03:19

16) IGEL



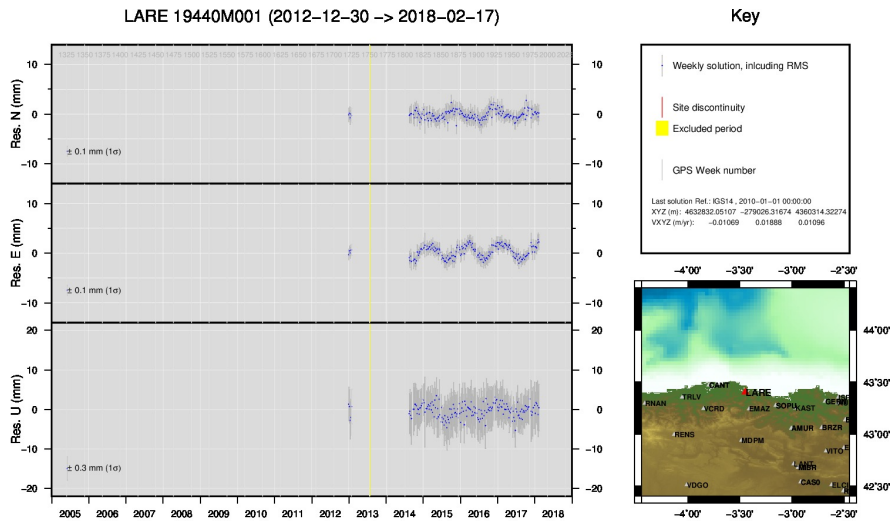
GMW 2018 Feb 26 00:03:42

17) ISPS



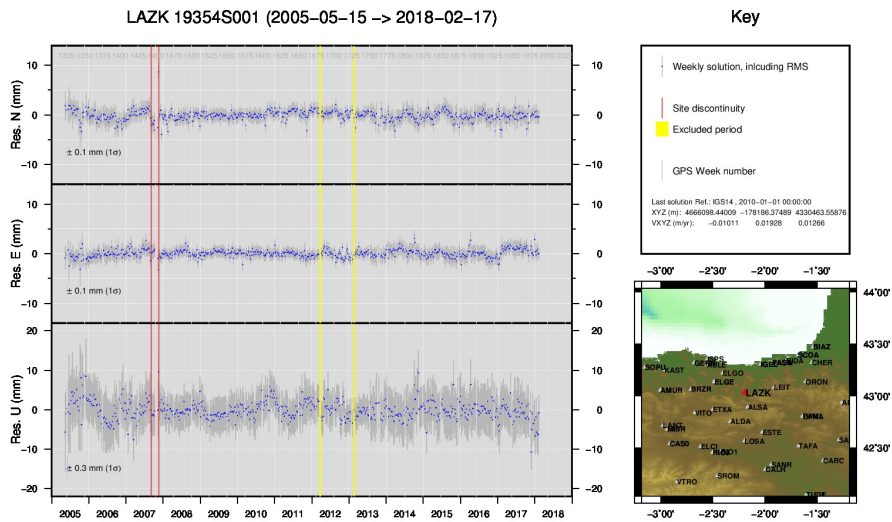
GMW 2018 Feb 26 00:04:10

18) KAST



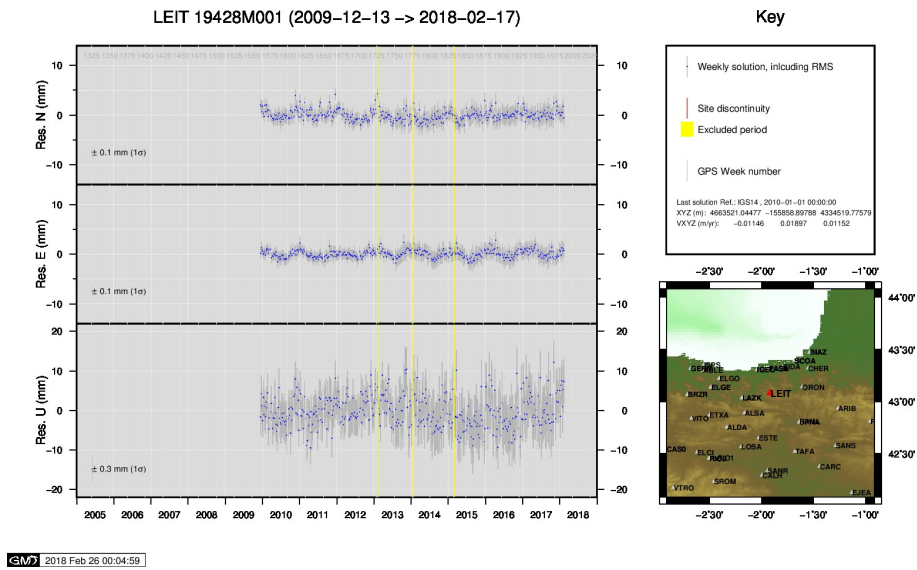
GMW 2018 Feb 26 00:04:31

19) LARE

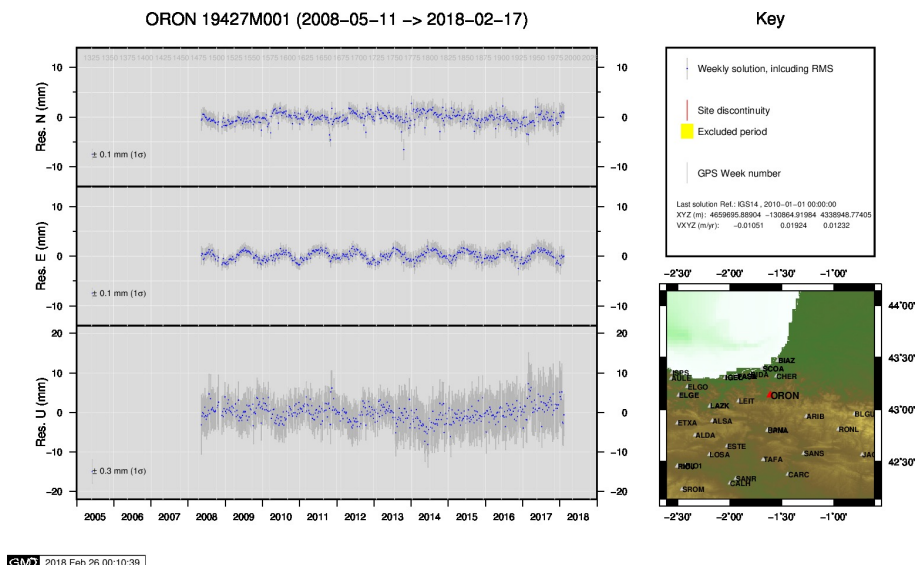


GMW 2018 Feb 26 00:04:37

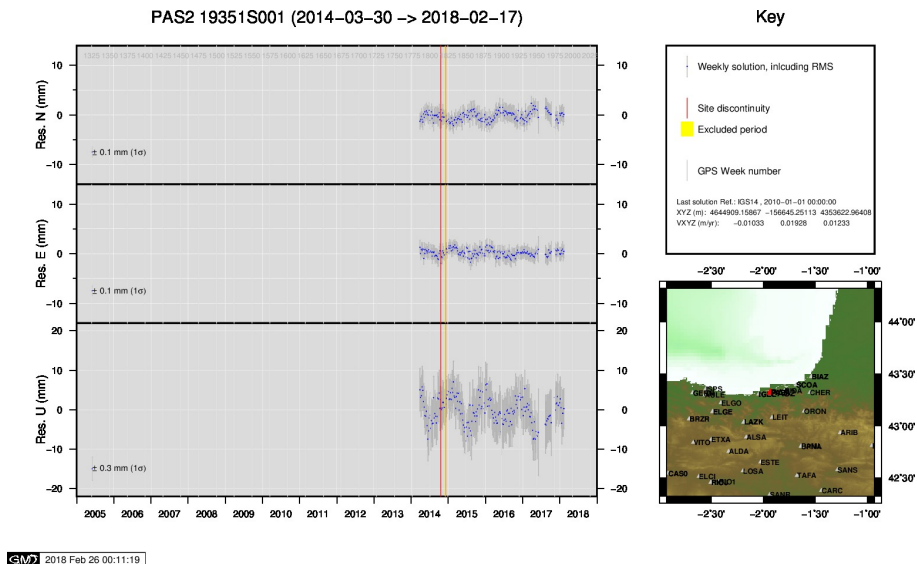
20) LAZK



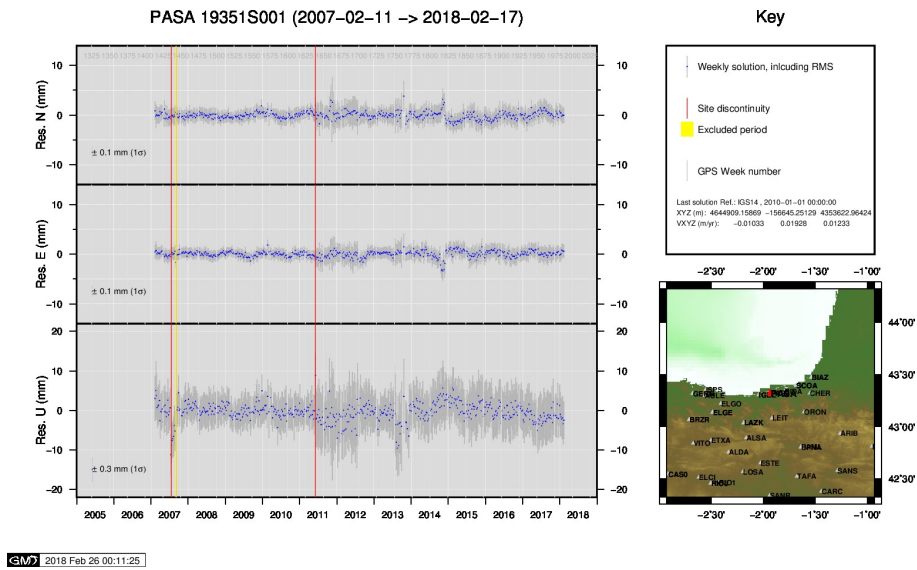
21) LEIT



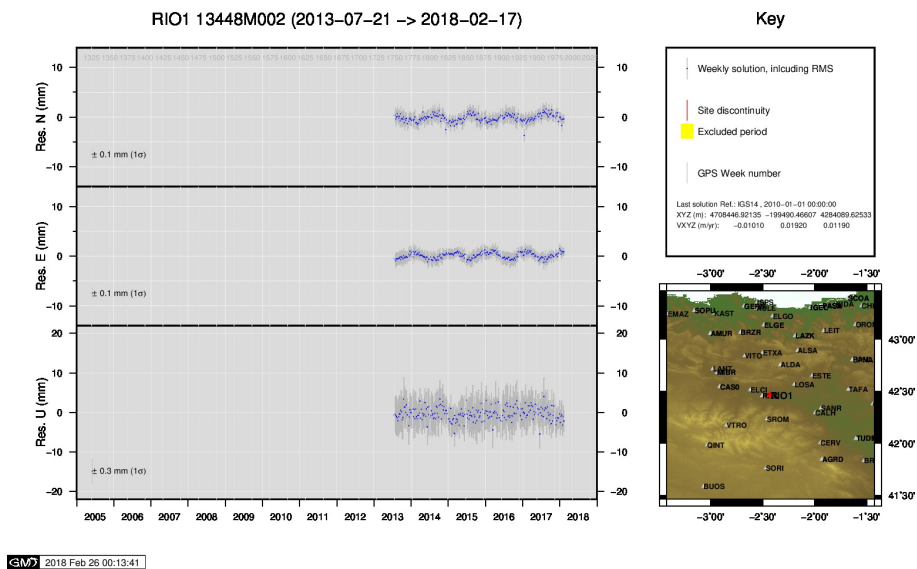
22) ORON



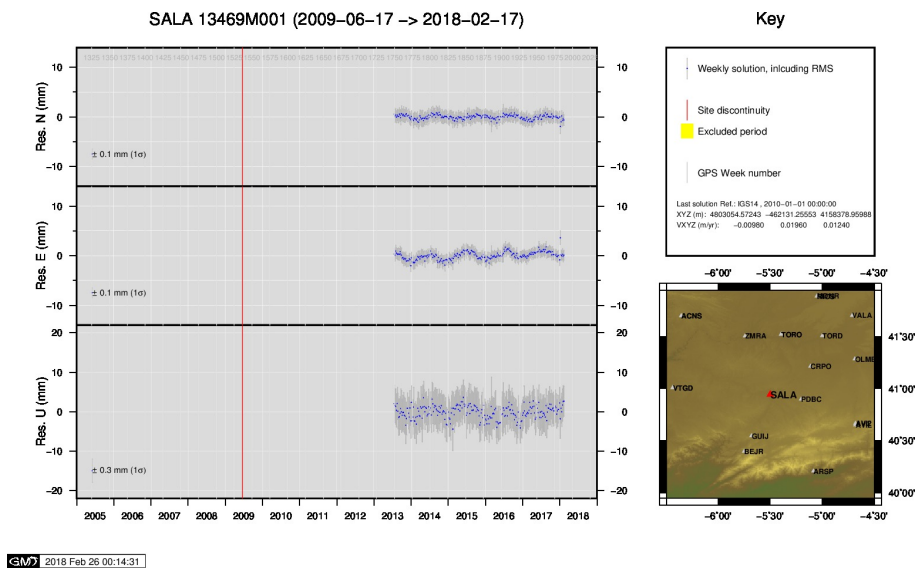
23) PAS2



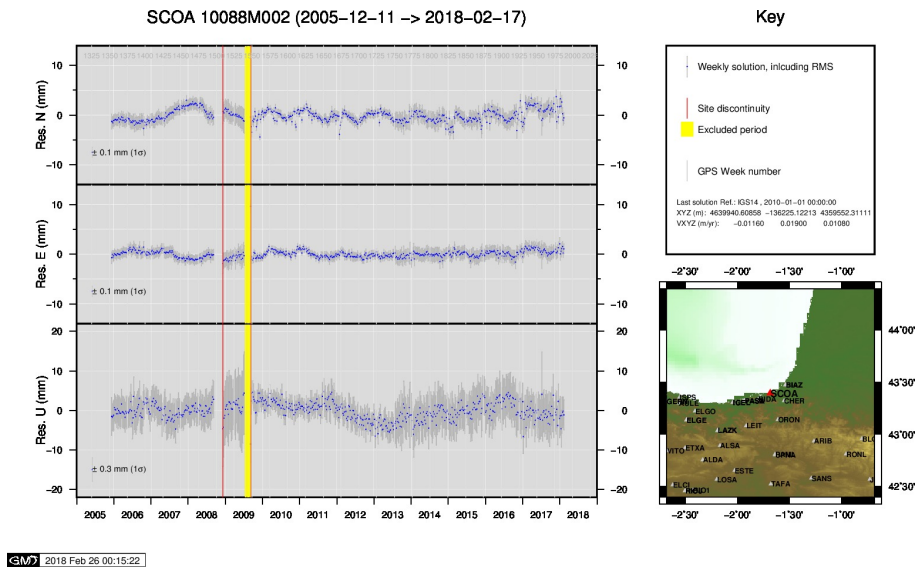
24) PASA



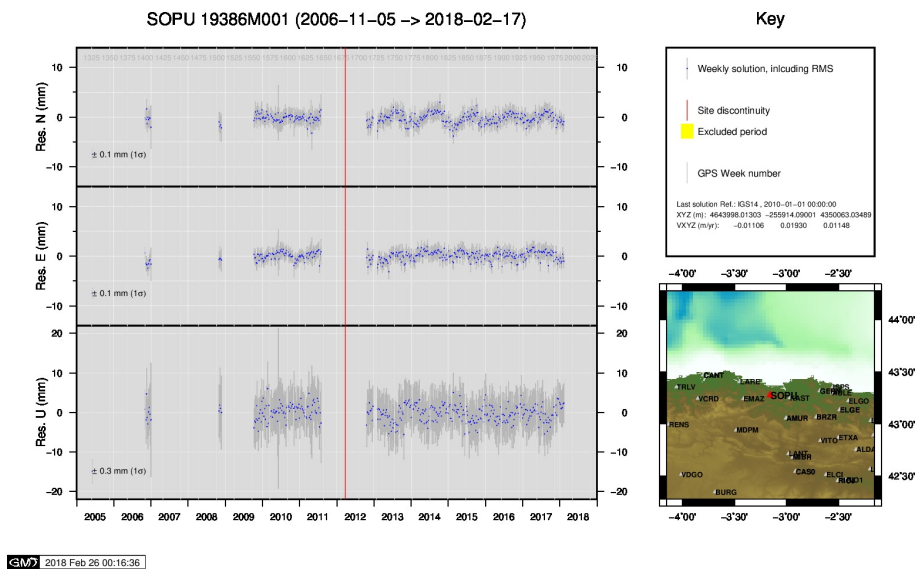
25) RIO1



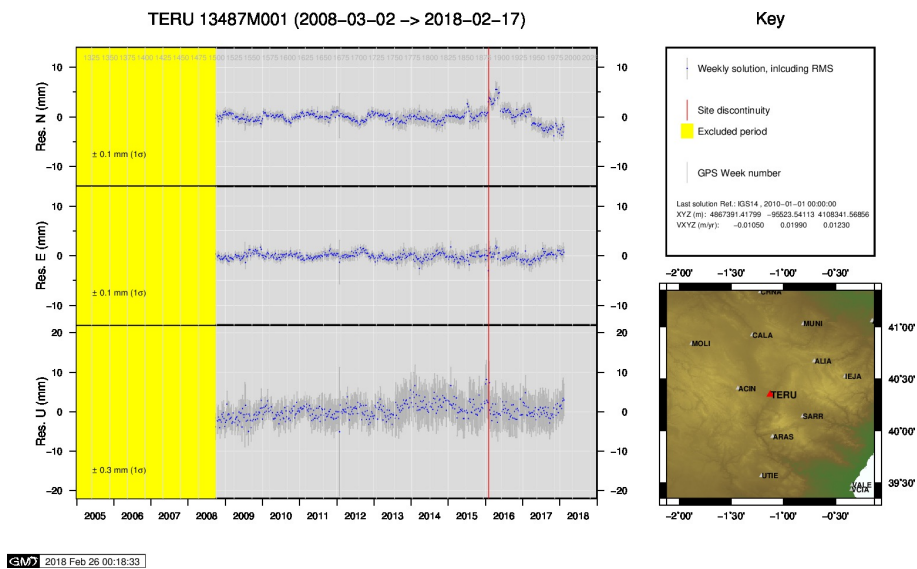
26) SALA



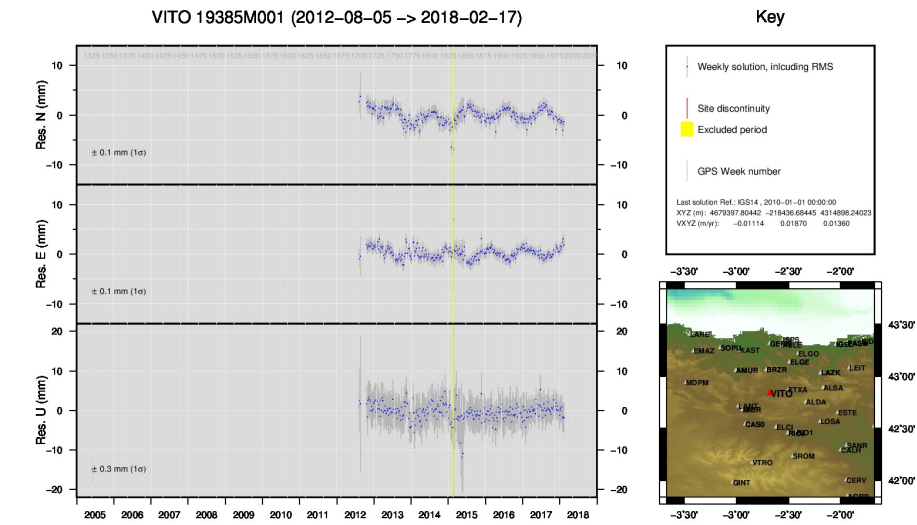
27) SCOA



28) SOPU

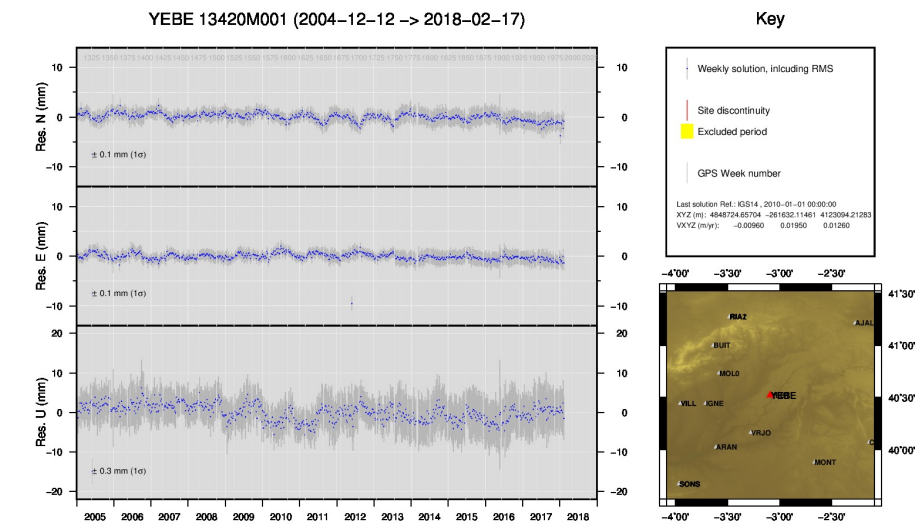


29) TERU



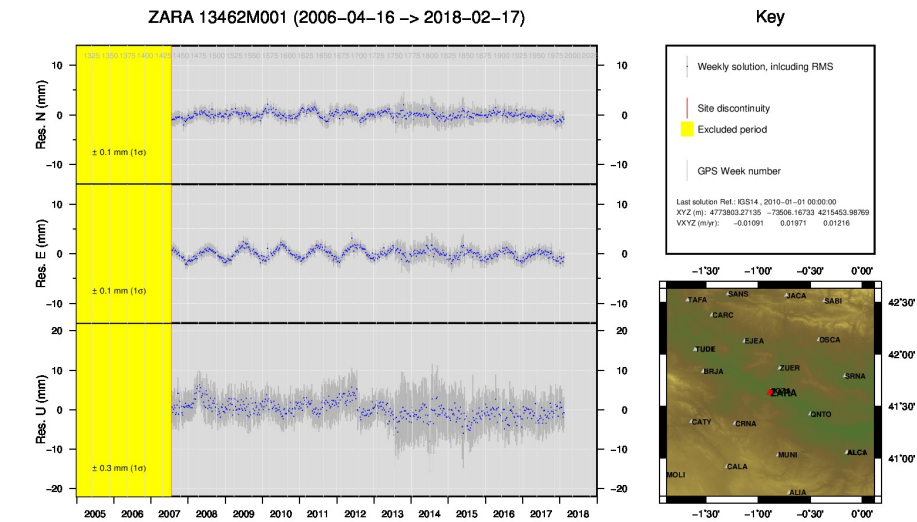
GMW 2018 Feb 26 00:21:39

30) VITO



GMW 2018 Feb 26 00:22:41

31) YEBE



GMW 2018 Feb 26 00:22:47

32) ZARA

