

# ARA-DAC Weekly Analysis Result: 1985 (GFA)

## Technical Report

**GPS Week: 1985 (GFA)**

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

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### 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
- 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 1985 WEEK FINAL COMBINATION: PRECISE ORBITS 04-FEB-18 12:19

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LOCAL GEODETIC DATUM: IGS14 EPOCH: 2018-01-24 12:00:00

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
3	ACOR 13434M001	4594489.57423	-678367.47835	4357066.26947	W
24	ALDA 19383M001	4687280.17053	-190876.59358	4308106.94401	A
30	ALSA 19419M001	4677250.84615	-176770.42335	4319079.85662	A
54	BLAZ 10074M002	4634456.06580	-124345.00318	4365785.44196	A
55	BIDA 00000M000	4644177.83851	-145778.35205	4354832.46838	A
58	BRZR 19387M001	4662221.00157	-220769.92769	4333309.41919	A
95	CACE 13447M001	4899866.51459	-544567.06214	4033770.18731	W
106	CANT 13438M001	4625924.32604	-307096.25982	4365771.53874	W
150	CREU 13432M001	4715420.14846	273178.03233	4271946.82492	W
186	EBRE 13410M001	4833520.00760	41537.36144	4147461.70222	W
85	ELGE 19353S001	4657557.42063	-202241.50115	4338991.85619	A
98	GERN 19389M001	4642811.32270	-217222.95880	4353278.86414	A
115	IGEL 19352S001	4645951.44383	-165574.53060	4352550.40393	A
126	LAZK 19354S001	4666098.35379	-178186.21846	4330463.65616	A
129	LEIT 19428M001	4663520.95663	-155858.74347	4334519.87375	A
158	ORON 19427M001	4659695.80664	-130864.76428	4338948.87707	A
165	PAS2 19351S001	4644909.07175	-156645.09463	4353623.06092	A
173	PASA 19351S001	4644909.07314	-156645.09464	4353623.06151	A
491	RI01 13448M002	4708446.83979	-199490.31015	4284089.71925	W
496	SALA 13469M001	4803054.49251	-462131.09725	4158379.05984	W
200	SOPU 19386M001	4643997.92426	-255913.93518	4350063.12717	A
569	TERU 13487M001	4867391.33568	-95523.38036	4108341.66518	W
232	VITO 19385M001	4679397.71534	-218436.53195	4314898.34906	A
671	YEBE 13420M001	4848724.58023	-261631.95822	4123094.31353	W
674	ZARA 13462M001	4773803.18330	-73506.01160	4215454.08175	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 1985 04-FEB-18 12:19

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LOCAL GEODETIC DATUM: ETRF2000 EPOCH: 2018-01-24 12:00:00

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
3	ACOR 13434M001	4594489.86955	-678367.98996	4357065.86975	W
24	ALDA 19383M001	4687280.51718	-190877.11340	4308106.54328	A
30	ALSA 19419M001	4677251.19510	-176770.94213	4319079.45678	A
54	BLAZ 10074M002	4634456.42368	-124345.51755	4365785.04583	A
55	BIDA 00000M000	4644178.19328	-145778.86745	4354832.07130	A
58	BRZR 19387M001	4662221.34654	-220770.44510	4333309.01993	A
95	CACE 13447M001	4899866.80351	-544567.60371	4033769.76697	W
106	CANT 13438M001	4625924.66350	-307096.77383	4365771.14111	W
150	CREU 13432M001	4715420.54150	273177.51129	4271946.42743	W
186	EBRE 13410M001	4833520.36957	41536.82789	4147461.29353	W
85	ELGE 19353S001	4657557.76805	-202242.01804	4338991.45749	A
98	GERN 19389M001	4642811.66938	-217223.47426	4353278.46633	A
115	IGEL 19352S001	4645951.79624	-165575.04623	4352550.00649	A
126	LAZK 19354S001	4666098.70333	-178186.73613	4330463.25711	A
129	LEIT 19428M001	4663521.30893	-155859.26083	4334519.47515	A
158	ORON 19427M001	4659696.16203	-130865.28118	4338948.47903	A
165	PAS2 19351S001	4644909.42522	-156645.61013	4353622.66366	A
173	PASA 19351S001	4644909.42661	-156645.61014	4353622.66425	A
491	RI01 13448M002	4708447.18389	-199490.83209	4284089.31689	W
496	SALA 13469M001	4803054.79892	-462131.62917	4158378.64754	W
200	SOPU 19386M001	4643998.26641	-255914.45086	4350062.72883	A
569	TERU 13487M001	4867391.67976	-95523.91769	4108341.25245	W
232	VITO 19385M001	4679398.05936	-218437.05106	4314897.94859	A
671	YEBE 13420M001	4848724.90673	-261632.49418	4123093.90025	W
674	ZARA 13462M001	4773803.53693	-73506.53964	4215453.67609	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 1985 04-FEB-18 12:19

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LOCAL GEODETIC DATUM: ETRF2014 EPOCH: 2018-01-24 12:00:00

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
3	ACDR 13434M001	4594489.82665	-678368.02907	4357065.91755	W
24	ALDA 19383M001	4687280.47218	-190877.15378	4308106.59099	A
30	ALSA 19419M001	4677251.15015	-176770.98260	4319079.50452	A
54	BIAZ 10074M002	4634456.37899	-124345.55834	4365785.09369	A
55	BIDA 00000M000	4644178.14855	-145778.90814	4354832.11912	A
58	BRZR 19387M001	4662221.30187	-220770.48548	4333309.06768	A
95	CACE 13447M001	4899866.75734	-544567.64213	4033769.81414	W
106	CANT 13438M001	4625924.61940	-307096.81406	4365771.18892	W
150	CREU 13432M001	4715420.49476	273177.46951	4271946.47535	W
186	EBRE 13410M001	4833520.32245	41536.78729	4147461.34104	W
85	ELGE 19353S001	4657557.72336	-202242.05850	4338991.50525	A
98	GERN 19389M001	4642811.62487	-217223.51472	4353278.51413	A
115	IGEL 19352S001	4645951.75155	-165575.08685	4352550.05430	A
126	LAZK 19354S001	4666098.65849	-178186.77663	4330463.30487	A
129	LEIT 19428M001	4663521.26406	-155859.30141	4334519.52292	A
158	ORON 19427M001	4659696.11711	-130865.32186	4338948.52683	A
165	PAS2 19351S001	4644909.38052	-156645.65078	4353622.71148	A
173	PASA 19351S001	4644909.38191	-156645.65079	4353622.71207	A
491	RI01 13448M002	4708447.13871	-199490.87236	4284089.36454	W
496	SALA 13469M001	4803054.75353	-462131.66822	4158378.69490	W
200	SOPU 19386M001	4643998.22200	-255914.49119	4350062.77661	A
569	TERU 13487M001	4867391.63273	-95523.95771	4108341.29982	W
232	VITO 19385M001	4679398.01451	-218437.09138	4314897.99630	A
671	YEBE 13420M001	4848724.86036	-261632.53373	4123093.94758	W
674	ZARA 13462M001	4773803.49076	-73506.58008	4215453.72366	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 1985 WEEK FINAL COMBINATION: PRECISE ORBITS 04-FEB-18 12:19

Station	#Days	Weekday 0123456	Repeatability (mm)		
			N	E	U
ACOR 13434M001	7	XXXXXX	0.78	0.53	2.15
ALDA 19383M001	7	XXXXXX	0.78	1.08	3.10
ALSA 19419M001	7	XXXXXX	2.63	1.06	3.07
BIAZ 10074M002	7	XXXXXX	0.65	0.59	1.52
BIDA 00000M000	7	XXXXXX	0.90	1.68	2.55
BRZR 19387M001	7	XXXXXX	1.44	1.04	2.75
CACE 13447M001	7	XXXXXX	0.67	0.43	2.28
CANT 13438M001	7	XXXXXX	1.12	1.35	2.69
CREU 13432M001	7	XXXXXX	1.77	1.00	5.36
EBRE 13410M001	7	XXXXXX	2.53	1.21	4.01
ELGE 19353S001	7	XXXXXX	1.19	0.89	3.45
GERN 19389M001	7	XXXXXX	0.99	0.55	3.47
IGEL 19352S001	6	X XXXX	1.07	1.24	1.83
LAZK 19354S001	7	XXXXXX	0.93	2.27	2.67
LEIT 19428M001	7	XXXXXX	1.21	1.07	8.94
ORON 19427M001	7	XXXXXX	2.20	1.13	3.91
PAS2 19351S001	5	X XI XX	1.48	0.68	5.12
PASA 19351S001	7	XXXXXX	0.94	0.72	2.77
RIO1 13448M002	7	XXXXXX	1.75	0.54	2.61
SALA 13469M001	7	XXXXXX	0.41	0.43	3.07
SOPU 19386M001	7	XXXXXX	1.46	1.17	2.09
TERU 13487M001	7	XXXXXX	0.85	0.42	3.01
VITO 19385M001	7	XXXXXX	0.79	0.92	3.35
YEBE 13420M001	7	XXXXXX	1.60	0.75	0.97
ZARA 13462M001	7	XXXXXX	1.00	0.63	1.71

Comparison of individual solutions:

ACOR 13434M001	N	0.78	0.11	0.70	0.01	1.37	-0.22	-0.93	-0.60
ACOR 13434M001	E	0.53	0.58	0.89	0.51	-0.19	-0.37	-0.28	-0.24
ACOR 13434M001	U	2.15	-1.86	2.93	0.49	-0.32	-2.14	2.53	2.11
ALDA 19383M001	N	0.78	1.03	0.30	0.81	-0.85	0.88	0.58	-0.04
ALDA 19383M001	E	1.08	-0.89	0.06	-1.53	-0.10	-0.92	-0.12	-1.72
ALDA 19383M001	U	3.10	2.90	4.06	-3.96	-0.98	1.99	1.81	-2.99
ALSA 19419M001	N	2.63	0.82	1.37	1.18	-4.55	-2.40	2.88	1.70
ALSA 19419M001	E	1.06	-0.33	0.87	1.05	-1.10	-1.45	-0.55	-1.09
ALSA 19419M001	U	3.07	-1.34	1.92	2.70	-0.99	2.02	-6.14	-1.03
BIAZ 10074M002	N	0.65	-0.59	-0.50	-0.62	0.69	-1.03	0.20	-0.34
BIAZ 10074M002	E	0.59	0.94	0.20	-0.50	-0.59	-0.09	0.32	-0.66
BIAZ 10074M002	U	1.52	0.82	0.87	2.72	-1.39	0.12	1.57	0.81
BIDA 00000M000	N	0.90	0.09	0.80	0.12	-1.50	-0.39	-0.48	-1.23
BIDA 00000M000	E	1.68	-0.72	-1.59	0.63	2.68	-1.84	-0.77	1.54
BIDA 00000M000	U	2.55	2.87	3.53	0.31	-3.53	-0.15	2.33	0.66
BRZR 19387M001	N	1.44	-0.13	1.73	1.08	-0.78	-2.53	-1.10	0.16
BRZR 19387M001	E	1.04	0.93	1.47	0.70	-0.00	-1.65	-0.47	-0.02
BRZR 19387M001	U	2.75	0.40	-0.12	-2.48	-3.20	-1.90	4.37	2.46
CACE 13447M001	N	0.67	-0.58	-0.93	0.03	0.67	-0.02	1.00	-0.16
CACE 13447M001	E	0.43	0.10	0.29	0.11	0.65	-0.27	-0.03	0.69
CACE 13447M001	U	2.28	-1.78	0.83	-0.47	1.99	-0.52	3.83	-2.84
CANT 13438M001	N	1.12	-1.81	1.35	-0.01	1.19	0.83	0.07	-0.57
CANT 13438M001	E	1.35	3.20	-0.01	0.06	-0.20	0.03	-0.76	-0.26
CANT 13438M001	U	2.69	3.49	4.53	1.78	1.16	1.52	-1.95	0.18
CREU 13432M001	N	1.77	-2.73	0.51	1.08	0.28	2.27	-0.27	-2.14
CREU 13432M001	E	1.00	-0.77	-1.70	0.92	-0.34	1.18	0.29	-0.09
CREU 13432M001	U	5.36	9.49	0.25	1.74	-1.93	-8.61	0.92	0.49
EBRE 13410M001	N	2.53	-0.34	5.53	-2.05	-0.63	-0.98	-1.28	-0.73
EBRE 13410M001	E	1.21	0.62	-2.63	0.36	1.00	0.30	-0.53	0.01
EBRE 13410M001	U	4.01	0.39	5.28	4.86	-4.56	-4.54	0.01	-1.84
ELGE 19353S001	N	1.19	-2.14	0.30	-0.04	0.11	1.61	-0.35	-1.03
ELGE 19353S001	E	0.89	0.64	0.62	0.15	-1.48	1.01	0.59	-0.64
ELGE 19353S001	U	3.45	4.20	-1.04	-2.93	0.08	3.82	1.01	-5.35
GERN 19389M001	N	0.99	-0.41	-0.81	-1.40	0.99	1.20	-0.34	-0.77
GERN 19389M001	E	0.55	0.36	-0.86	0.23	0.17	0.89	0.02	0.28
GERN 19389M001	U	3.47	5.04	-4.65	-0.87	-1.58	3.87	0.17	-2.65
IGEL 19352S001	N	1.07	-0.79		0.59	0.12	0.75	-1.41	-1.47
IGEL 19352S001	E	1.24	1.04		0.87	-1.77	-1.27	0.20	1.01
IGEL 19352S001	U	1.83	1.88		-1.51	2.57	1.61	0.89	-0.93
LAZK 19354S001	N	0.93	-0.33	0.54	-0.69	-0.39	-0.33	1.98	0.33
LAZK 19354S001	E	2.27	-0.73	-0.31	0.54	3.51	-0.12	-4.00	-1.26
LAZK 19354S001	U	2.67	1.89	1.31	1.87	-1.66	-0.96	-5.46	-0.60
LEIT 19428M001	N	1.21	1.49	0.65	-0.45	-1.85	-0.30	-0.83	-1.31
LEIT 19428M001	E	1.07	-0.94	-0.02	-1.31	1.97	-0.31	0.11	0.54
LEIT 19428M001	U	8.94	5.87	-3.21	0.56	-15.61	1.72	13.68	0.99
ORON 19427M001	N	2.20	0.17	-1.02	-0.92	-4.60	1.87	0.79	1.32
ORON 19427M001	E	1.13	1.21	0.69	0.01	-1.69	-1.48	0.83	0.24
ORON 19427M001	U	3.91	1.91	0.97	-1.05	5.00	4.71	-6.23	0.09
PAS2 19351S001	N	1.48	-0.01		-0.36	-2.20		-1.36	1.40
PAS2 19351S001	E	0.68	0.71		-0.33	-0.92		0.18	0.58
PAS2 19351S001	U	5.12	3.02		2.02	5.78		0.47	-7.62
PASA 19351S001	N	0.94	-0.05	0.08	0.45	-1.24	0.39	-1.79	-0.43
PASA 19351S001	E	0.72	0.95	-0.50	-0.29	-1.31	0.18	0.21	0.36
PASA 19351S001	U	2.77	3.70	5.23	-0.92	1.16	-1.66	-0.33	0.24
RIO1 13448M002	N	1.75	1.62	0.48	1.66	1.16	1.62	-0.07	-2.98
RIO1 13448M002	E	0.54	0.58	-0.60	0.06	-0.25	-0.28	-0.64	-0.69
RIO1 13448M002	U	2.61	3.13	-3.26	0.36	-2.13	1.08	1.82	-3.35
SALA 13469M001	N	0.41	-0.07	0.47	-0.04	0.65	-0.26	0.27	-0.47
SALA 13469M001	E	0.43	0.32	0.51	0.17	-0.80	0.23	-0.01	0.12
SALA 13469M001	U	3.07	0.85	5.32	-0.67	-1.98	-3.39	-0.98	3.24
SOPU 19386M001	N	1.46	1.81	-0.04	0.47	0.59	-1.60	-2.52	-0.01
SOPU 19386M001	E	1.17	-0.61	1.38	1.67	-0.22	-0.47	-1.42	0.92
SOPU 19386M001	U	2.09	-2.35	0.06	0.09	1.26	-2.99	3.20	0.08
TERU 13487M001	N	0.85	-0.26	0.39	0.74	-0.19	1.12	-1.22	-0.87
TERU 13487M001	E	0.42	-0.44	0.05	0.47	0.17	0.60	-0.38	0.31
TERU 13487M001	U	3.01	1.53	-4.15	-2.37	1.69	1.46	-2.88	3.98

VITO 19385M001	N	0.79	-1.61	-0.09	0.07	0.59	0.37	0.77	-0.17
VITO 19385M001	E	0.92	1.59	0.62	-0.72	-0.93	-0.02	-0.23	-0.88
VITO 19385M001	U	3.35	0.88	-4.51	-4.79	-0.52	1.51	1.78	4.22
YEBE 13420M001	N	1.60	0.04	0.11	0.93	1.26	1.25	-3.38	-0.04
YEBE 13420M001	E	0.75	0.43	0.15	0.09	0.71	-0.09	0.63	-1.49
YEBE 13420M001	U	0.97	0.22	0.08	0.09	0.65	1.18	-1.92	-0.27
ZARA 13462M001	N	1.00	-1.69	0.27	0.55	0.28	1.63	-0.18	-0.19
ZARA 13462M001	E	0.63	0.19	0.58	-0.08	-1.25	-0.39	0.48	-0.17
ZARA 13462M001	U	1.71	0.75	-0.64	-1.01	0.76	2.59	-2.37	-1.61



## 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	-0.76	1.29	-2.20
10	ALAC 13433M001	I W	0.22	0.59	-3.63
13	ALBA 13452M001	I W	-0.11	0.20	1.20
18	ALME 13437M001	I W	-1.81	0.30	2.93
43	BELL 13431M001	I W	0.38	-1.27	0.03
61	BORR 13480M001	I W	0.34	-2.36	-2.80
65	BRST 10004M004	I W	1.06	-0.41	-0.64
95	CACE 13447M001	I W	0.40	0.20	0.34
106	CANT 13438M001	I W	0.14	-1.25	1.45
110	CASC 13909S001	I W	-1.88	-0.58	3.47
117	CEU1 13449M002	I W	0.99	0.26	4.33
131	COBA 13453M001	I W	-0.14	0.67	-3.59
150	CREU 13432M001	I W	-0.50	-0.97	0.97
186	EBRE 13410M001	I W	0.98	1.66	-6.59
203	ESCO 13435M001	I W	-0.91	-0.35	2.75
213	FUNC 13911S001	I W	2.19	0.32	-0.72
215	GAIA 13902M001	I W	-0.44	-0.43	2.19
271	HUEL 13451M001	I W	-1.08	2.19	1.08
282	IZAN 31309M002	I W	-1.13	0.96	0.77
317	LAGO 13903M001	I W	-2.67	-2.78	0.53
337	LLIV 13436M001	I W	-2.22	3.45	2.73
341	LPAL 81701M001	I W	-2.16	1.90	-1.19
344	LROC 10023M001	I W	0.61	-0.76	-1.54
353	MALA 13443M001	I W	-3.20	1.05	0.43
371	MAS1 31303M002	I W	-0.60	-0.36	2.78
442	PDEL 31906M004	I W	-0.10	0.94	-3.75
475	RABT 35001M002	I W	0.73	0.53	0.18
491	RID1 13448M002	I W	1.13	-1.24	-1.82
496	SALA 13469M001	I W	-0.85	-0.54	1.27
504	SCOA 10088M002	I W	-2.59	-1.16	0.59
532	SONS 13446M001	I W	1.64	0.66	0.86
562	TERC 31909M001	I W	2.75	-5.15	3.08
569	TERU 13487M001	I W	5.07	-0.61	-1.40
629	VALA 13463M002	I W	-0.93	0.11	-1.11
633	VALE 13439M001	I W	0.66	0.99	-3.62
643	VIGO 13450M001	I W	0.19	-0.27	-1.93
671	YEBE 13420M001	I W	1.47	1.50	1.48
674	ZARA 13462M001	I W	1.52	0.73	-2.76
683	ZIMM 14001M004	I W	1.59	-0.01	3.83
	RMS / COMPONENT		1.63	1.47	2.48
	MEAN		-0.00	-0.00	0.00
	MIN		-3.20	-5.15	-6.59
	MAX		5.07	3.45	4.33

NUMBER OF PARAMETERS : 3  
NUMBER OF COORDINATES : 117  
RMS OF TRANSFORMATION : 1.91 MM

BARYCENTER COORDINATES:

LATITUDE : 39 38 22.11  
LONGITUDE : - 5 53 51.37  
HEIGHT : -50.253 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          15227593
NUMBER OF UNKNOWN               210502
NUMBER OF DEGREES OF FREEDOM    15017091
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)     180
VARIANCE FACTOR                  1.760747904509742

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")
      X          Y          Z          X          Y          Z      Scale (ppm)
-----
  1  0.00203    -0.0023 -0.0241  0.0041  0.0005 -0.0002 -0.0006  -0.00035
  2  0.00182    -0.0019 -0.0085  0.0006  0.0002 -0.0000 -0.0002   0.00004
  3  0.00152     0.0031  0.0100 -0.0051 -0.0002  0.0002  0.0003   0.00030
  4  0.00168     0.0022  0.0140 -0.0068 -0.0003  0.0002  0.0004   0.00063
  5  0.00200     0.0086  0.0032 -0.0093 -0.0001  0.0004  0.0001  -0.00013
  6  0.00244    -0.0014  0.0073  0.0052 -0.0001 -0.0002  0.0002  -0.00024
  7  0.00222     0.0004  0.0230 -0.0013 -0.0004  0.0000  0.0006   0.00025
```

```
Statistics of individual solutions:
-----
File  RMS (m)      DOF  Chi**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
  1  0.00134    2150041    1.80          2180273      3          942      29293      0
  2  0.00129    2142835    1.66          2172658      3          948      28878      0
  3  0.00123    2168674    1.52          2200601      3          954      30976      0
  4  0.00125    2138196    1.55          2168386      3          957      29236      0
  5  0.00136    2135089    1.86          2166284      3          957      30241      0
  6  0.00143    2138048    2.04          2169840      3          957      30838      0
  7  0.00135    2138517    1.82          2169551      3          960      30077      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 18:021:00000 18:027:86370 LEICA GRX1200PRO  -----
ALDA  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
ALSA  A   1 P 18:021:00000 18:027:86370 LEICA GRX1200GGPRO -----
BIAZ  A   1 P 18:021:00000 18:027:86370 TRI SP90M      -----
BIDA  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
BRZR  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
CACE  A   1 P 18:021:00000 18:027:86370 TRIMBLE NETR9  -----
CANT  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
CREU  A   1 P 18:021:00000 18:027:86370 LEICA GR50      -----
EBRE  A   1 P 18:021:00000 18:027:86370 LEICA GR50      -----
ELGE  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
GERN  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
IGEL  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
LAZK  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
LEIT  A   1 P 18:021:00000 18:027:86370 LEICA GRX1200+GNSS -----
ORON  A   1 P 18:021:00000 18:027:86370 LEICA GRX1200GGPRO -----
PAS2  A   1 P 18:021:00000 18:027:86370 TPS NET-G3A    -----
PASA  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
RIO1  A   1 P 18:021:00000 18:027:86370 LEICA GR25      -----
SALA  A   1 P 18:021:00000 18:027:86370 LEICA GRX1200+GNSS -----
SOPU  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
TERU  A   1 P 18:021:00000 18:027:86370 LEICA GRX1200GGPRO -----
VITO  A   1 P 18:021:00000 18:027:86370 LEICA GR10      -----
YEBE  A   1 P 18:021:00000 18:027:86370 TRIMBLE NETR5  -----
ZARA  A   1 P 18:021:00000 18:027:86370 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 18:021:00000 18:027:86370 LEIAT504      LEIS  -----
ALDA  A   1 P 18:021:00000 18:027:86370 LEIAS10      NONE  -----
ALSA  A   1 P 18:021:00000 18:027:86370 LEIAX1202GG  NONE  -----
BIAZ  A   1 P 18:021:00000 18:027:86370 LEIAR25     LEIT  -----
BIDA  A   1 P 18:021:00000 18:027:86370 LEIAS10      NONE  -----
BRZR  A   1 P 18:021:00000 18:027:86370 LEIAS10      NONE  -----
CACE  A   1 P 18:021:00000 18:027:86370 TRM29659.00 NONE  -----
CANT  A   1 P 18:021:00000 18:027:86370 LEIAR25.R4  LEIT  25066
CREU  A   1 P 18:021:00000 18:027:86370 LEIAR25.R4  NONE  26357
EBRE  A   1 P 18:021:00000 18:027:86370 LEIAR25.R4  NONE  26359
ELGE  A   1 P 18:021:00000 18:027:86370 LEIAR25.R4  LEIT  -----
```

```

GERN A 1 P 18:021:00000 18:027:86370 LELIAS10 NONE -----
IGEL A 1 P 18:021:00000 18:027:86370 LELIAR20 LEIM -----
LAZK A 1 P 18:021:00000 18:027:86370 LELIAR25.R4 LEIT -----
LEIT A 1 P 18:021:00000 18:027:86370 LELAX1203+GNSS NONE -----
ORON A 1 P 18:021:00000 18:027:86370 LELAX1202GG NONE -----
PAS2 A 1 P 18:021:00000 18:027:86370 LELIAR20 LEIM 73034
PASA A 1 P 18:021:00000 18:027:86370 LELIAR20 LEIM 73034
RIO1 A 1 P 18:021:00000 18:027:86370 LELIAR25.R4 LEIT 25138
SALA A 1 P 18:021:00000 18:027:86370 LELIAR25 NONE -----
SOPU A 1 P 18:021:00000 18:027:86370 LELIAS10 NONE -----
TERU A 1 P 18:021:00000 18:027:86370 LELAT504GG LEIS -----
VITO A 1 P 18:021:00000 18:027:86370 LELIAS10 NONE -----
YEBE A 1 P 18:021:00000 18:027:86370 TRM29659.00 NONE -----
ZARA A 1 P 18:021:00000 18:027:86370 TRM29659.00 NONE -----

```

### 7.3 Eccentricities

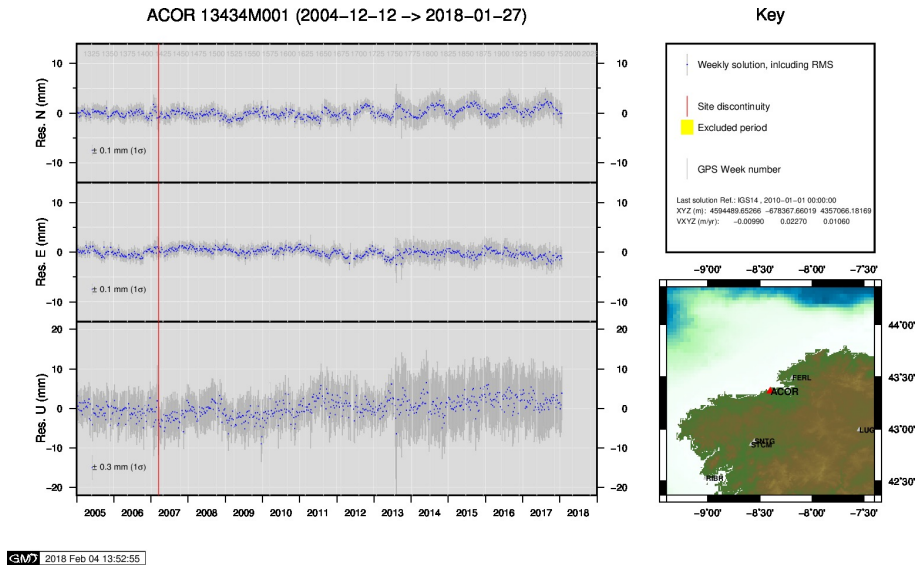
```

*
*SITE PT SOLN T DATA_START_ DATA_END_ AXE ARP->BENCHMARK(M) UP_ NORTH_ EAST_
ACOR A 1 P 18:021:00000 18:027:86370 UNE 3.0460 0.0000 0.0000
ALDA A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
ALSA A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
BIAZ A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
BIDA A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
BRZR A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
CACE A 1 P 18:021:00000 18:027:86370 UNE 0.0600 0.0000 0.0000
CANT A 1 P 18:021:00000 18:027:86370 UNE 3.0490 0.0000 0.0000
CREU A 1 P 18:021:00000 18:027:86370 UNE 0.0770 0.0000 0.0000
EBRE A 1 P 18:021:00000 18:027:86370 UNE 0.0770 0.0000 0.0000
ELGE A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
GERN A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
IGEL A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
LAZK A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
LEIT A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
ORON A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
PAS2 A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
PASA A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
RIO1 A 1 P 18:021:00000 18:027:86370 UNE 0.0606 0.0000 0.0000
SALA A 1 P 18:021:00000 18:027:86370 UNE 0.0600 0.0000 0.0000
SOPU A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
TERU A 1 P 18:021:00000 18:027:86370 UNE 0.0600 0.0000 0.0000
VITO A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
YEBE A 1 P 18:021:00000 18:027:86370 UNE 0.0000 0.0000 0.0000
ZARA A 1 P 18:021:00000 18:027:86370 UNE 3.2590 0.0000 0.0000

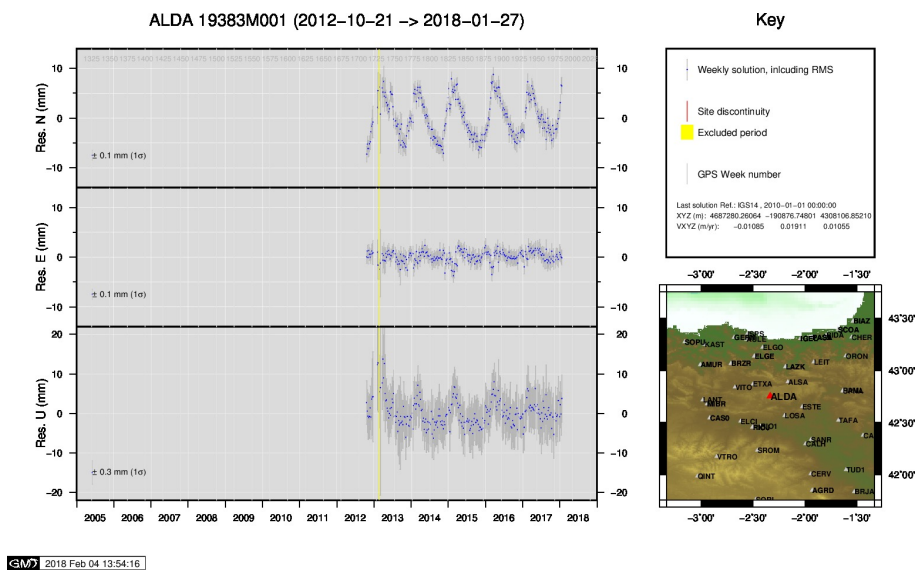
```

## 8 Cumulative Time Series

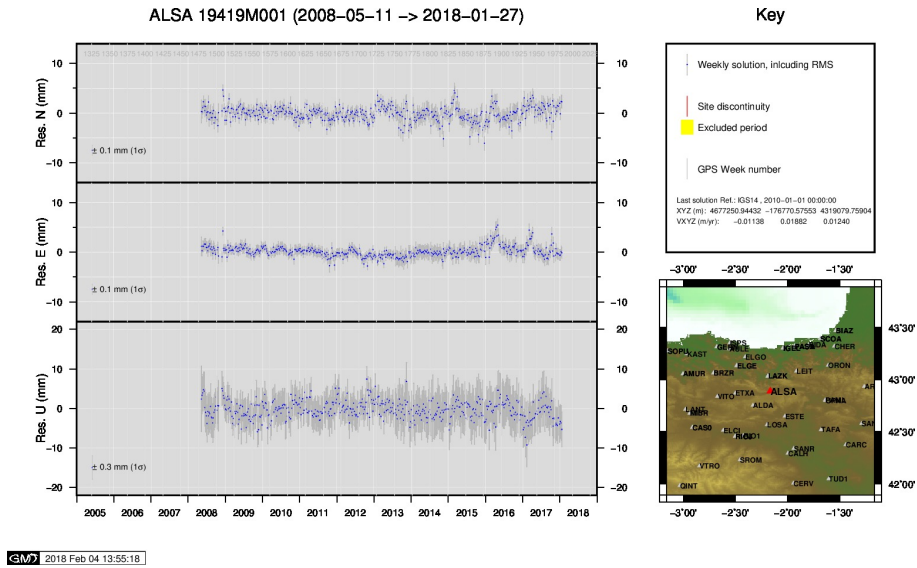
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



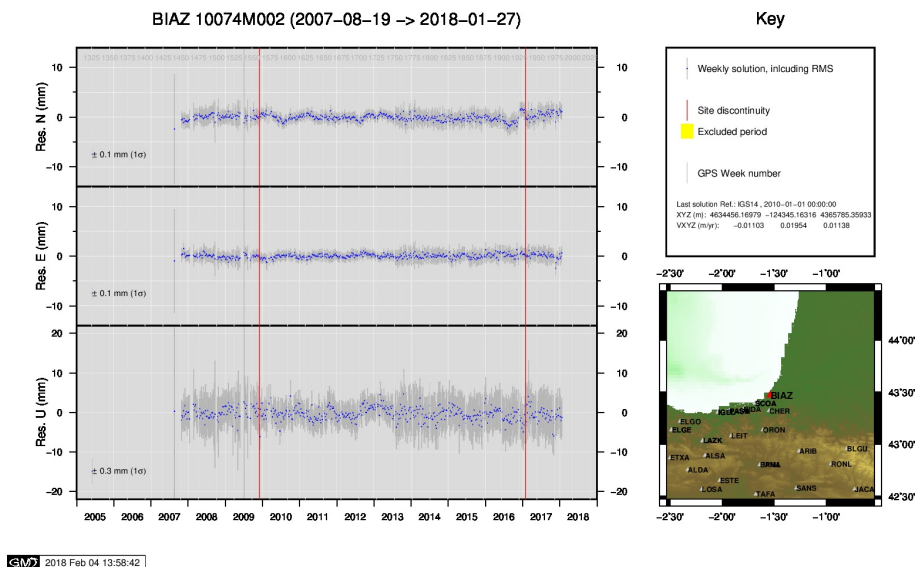
1 ) ACOR



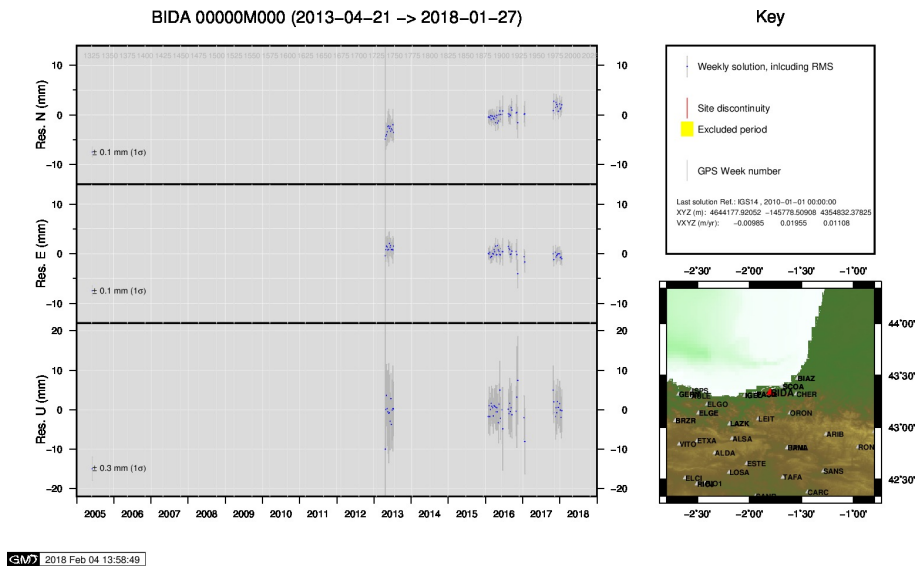
2 ) ALDA



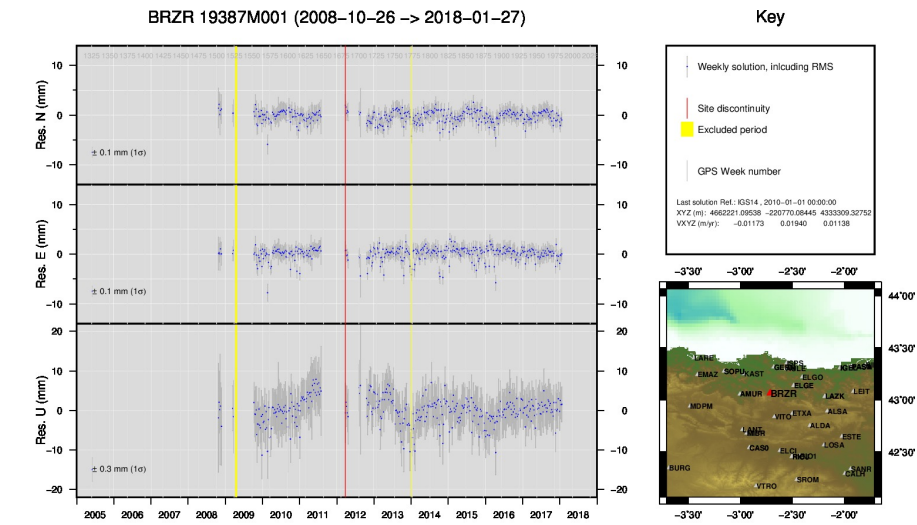
3 ) ALSA



4 ) BIAZ

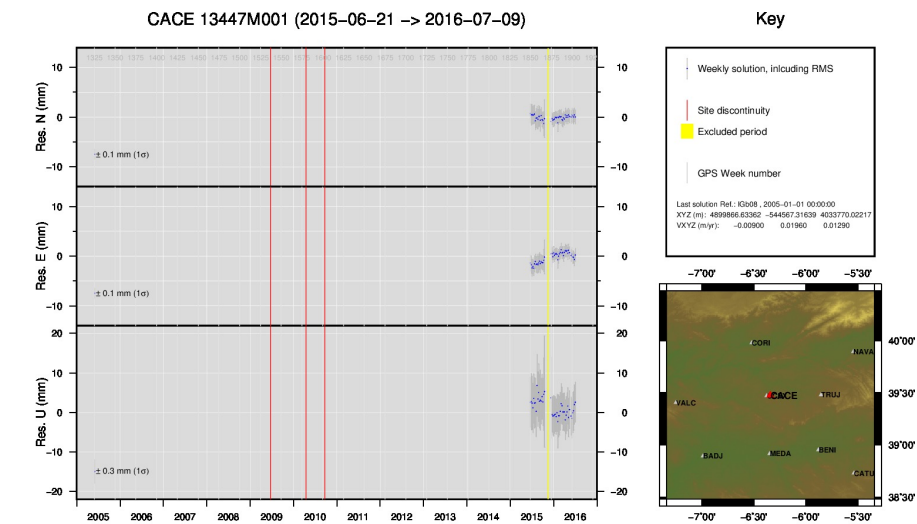


5 ) BIDA



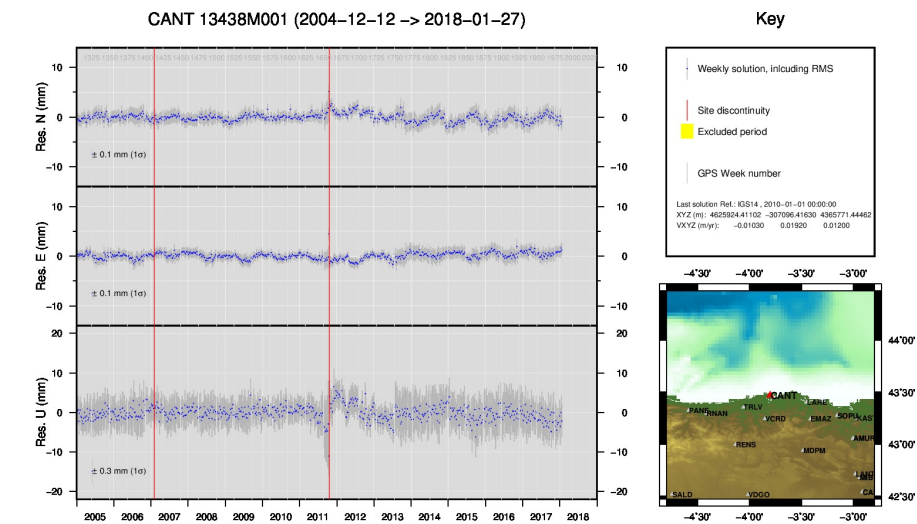
GMW 2018 Feb 04 14:00:01

6 ) BRZR



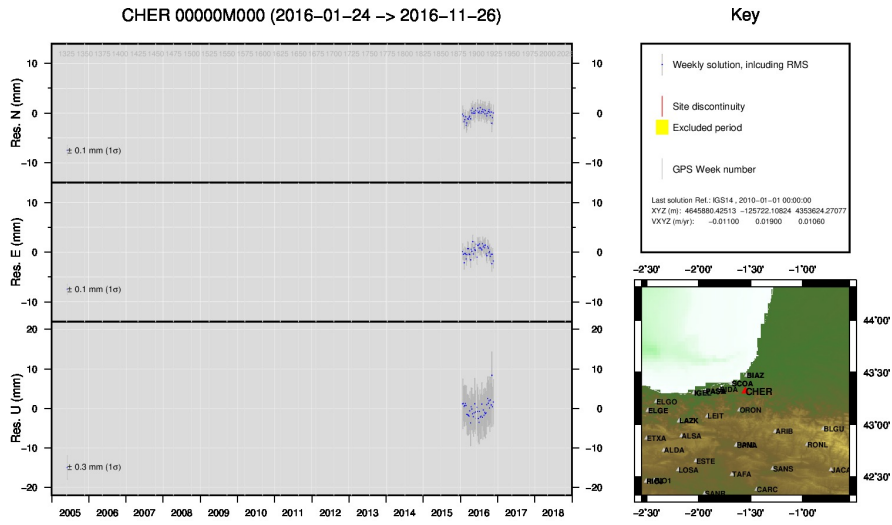
GMW 2016 Jul 18 03:58:15

7 ) CACE



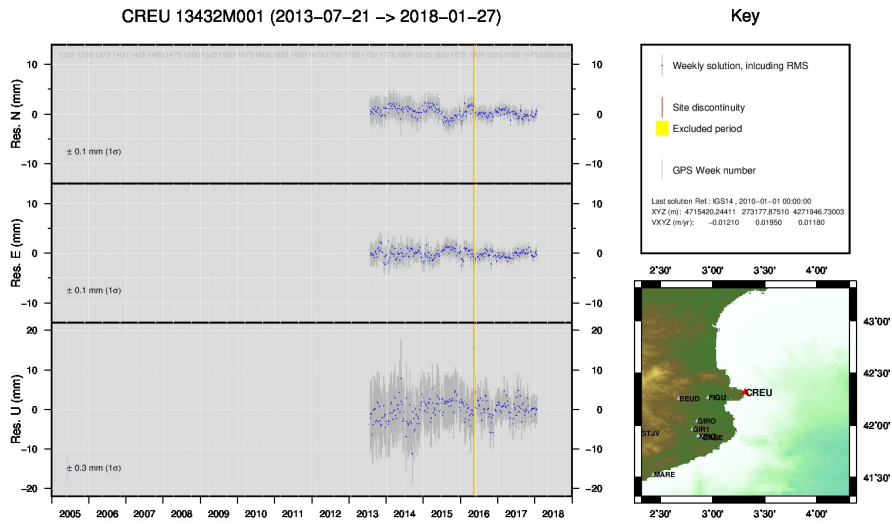
GMW 2018 Feb 04 14:00:57

8 ) CANT



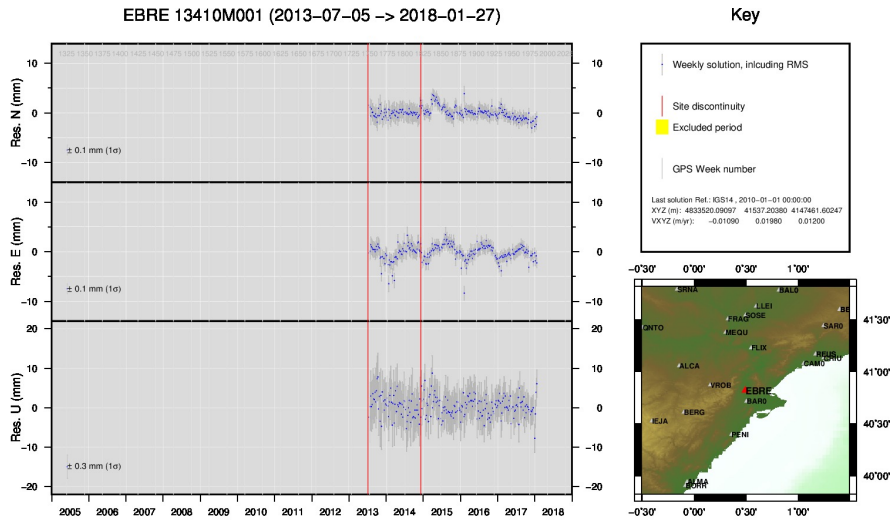
GMW 2018 Feb 04 14:02:50

9 ) CHER



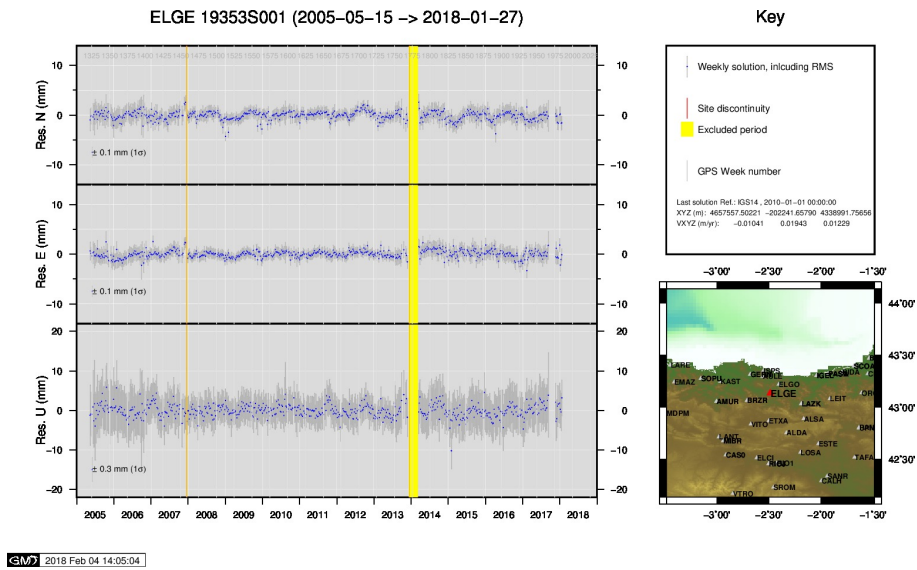
GMW 2018 Feb 04 14:03:27

10 ) CREU

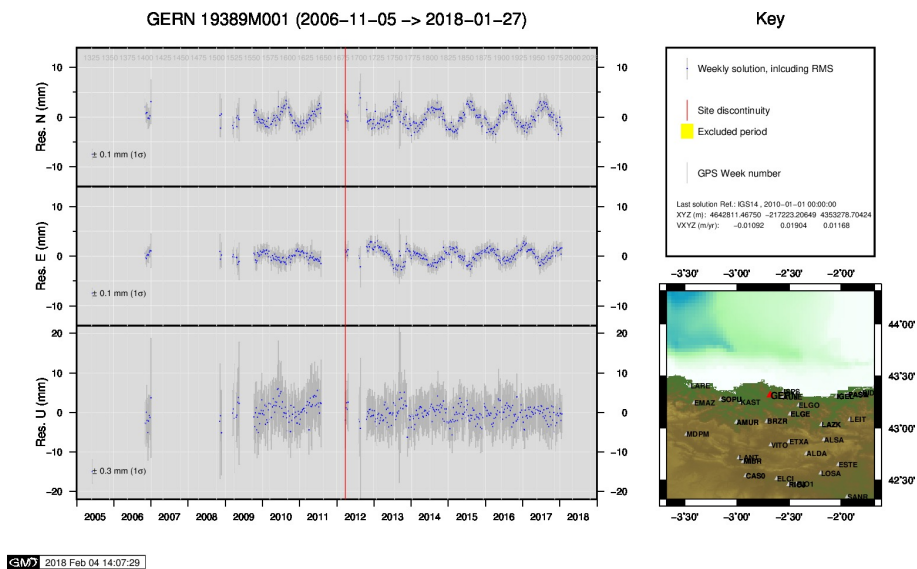


GMW 2018 Feb 04 14:04:21

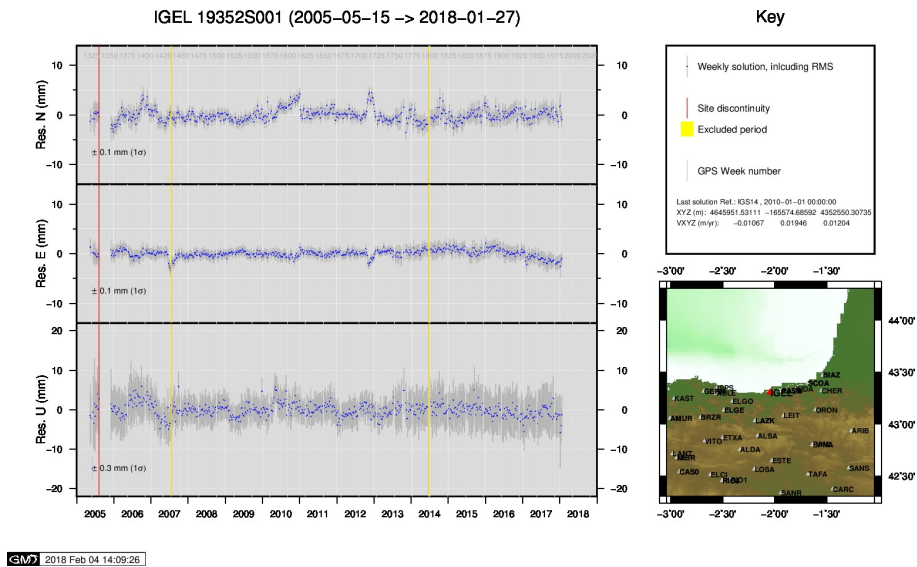
11 ) EBRE



12 ) ELGE

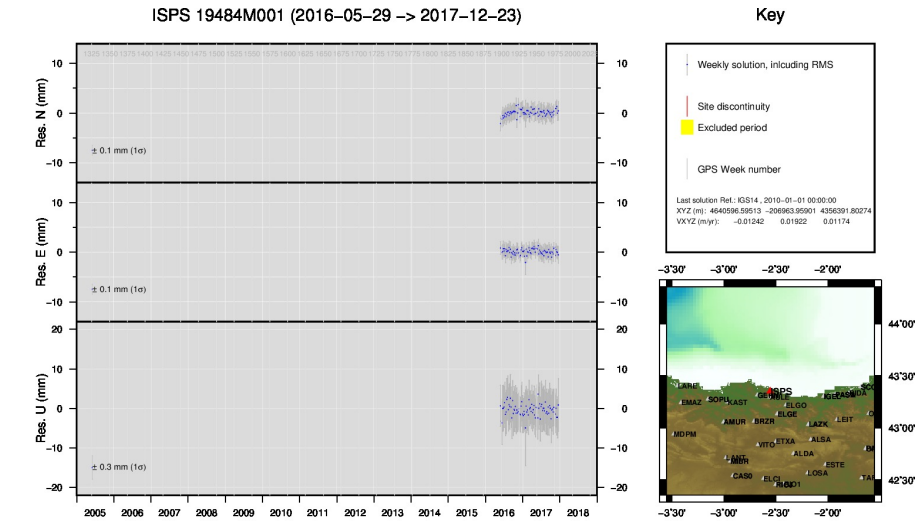


13 ) GERN

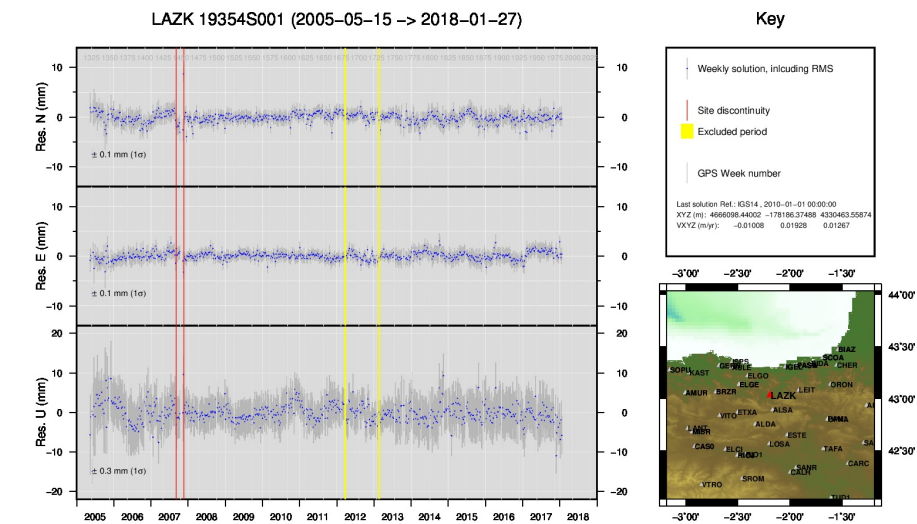


14 ) IGEL

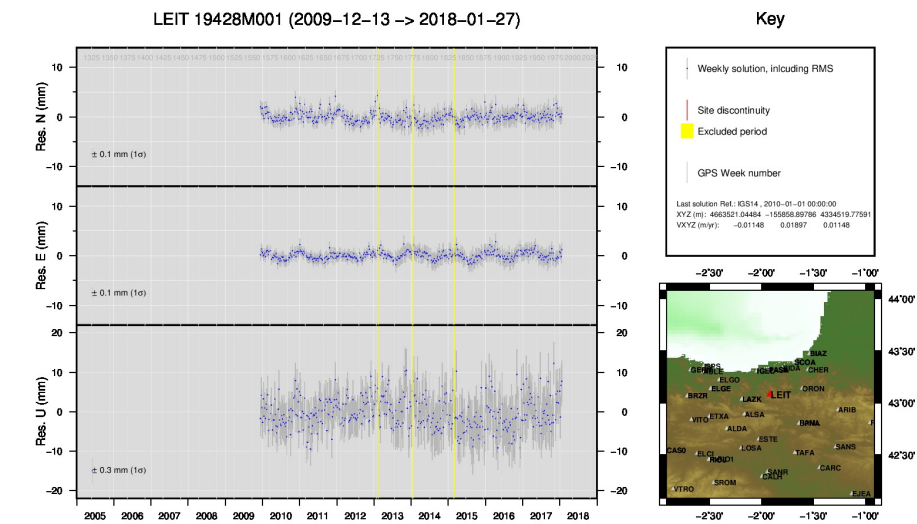




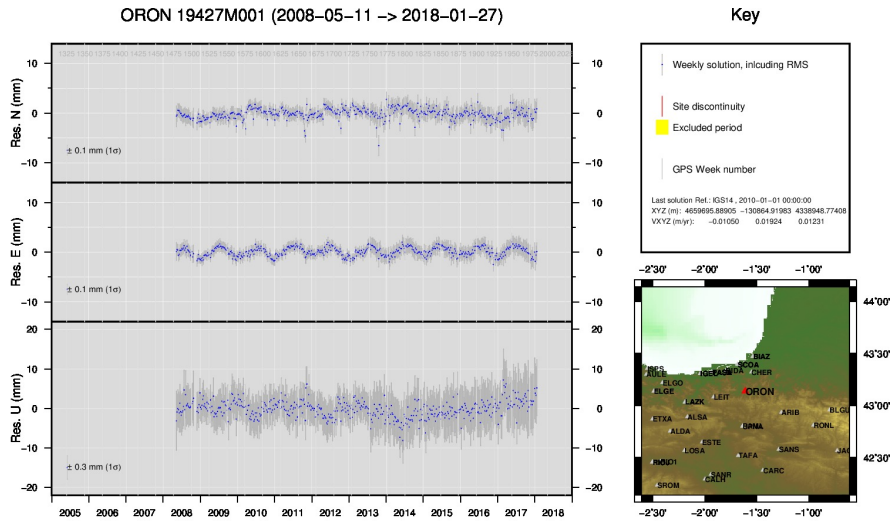
15 ) ISPS



16 ) LAZK

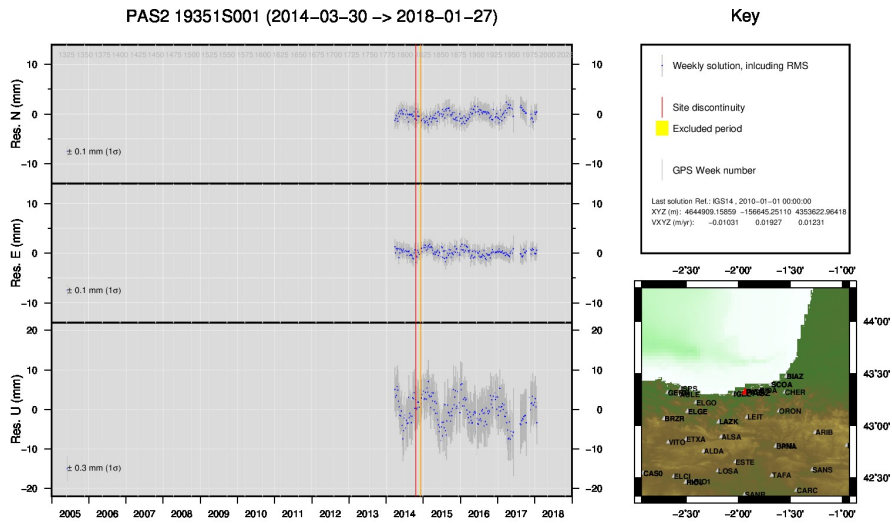


17 ) LEIT



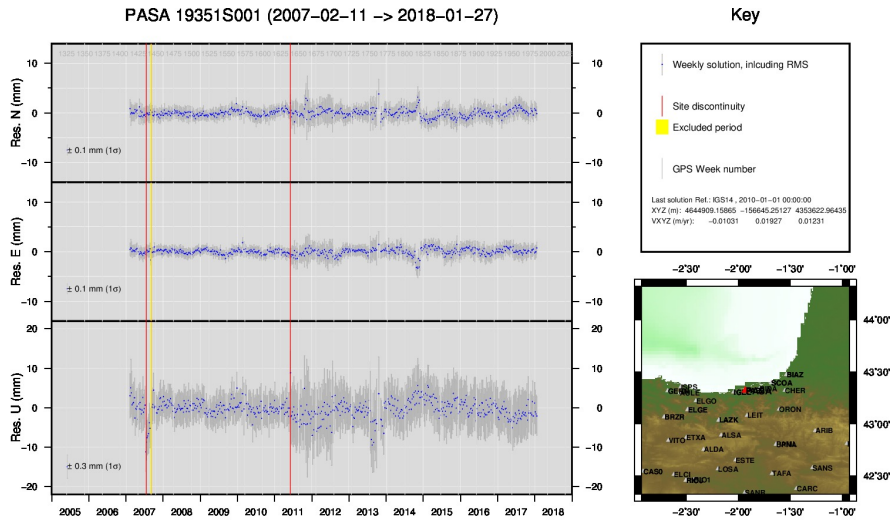
GMW 2018 Feb 04 14:17:09

18 ) ORON



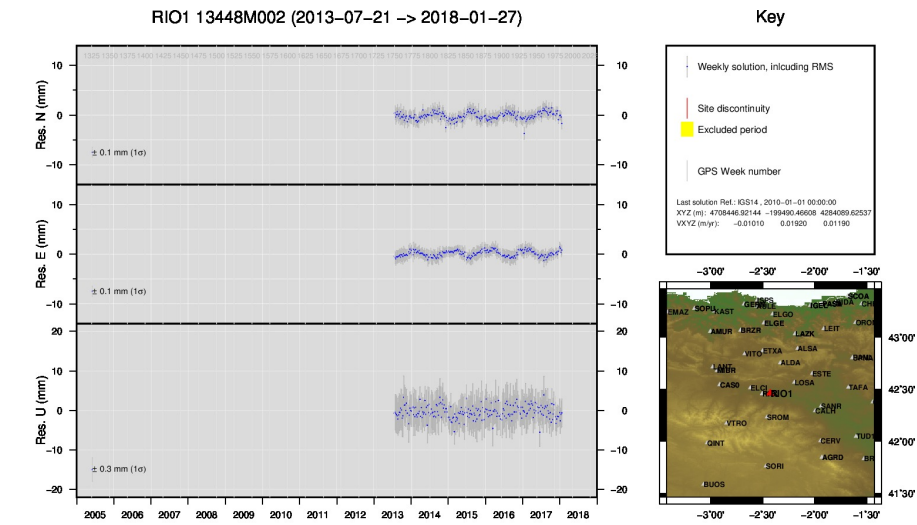
GMW 2018 Feb 04 14:17:53

19 ) PAS2



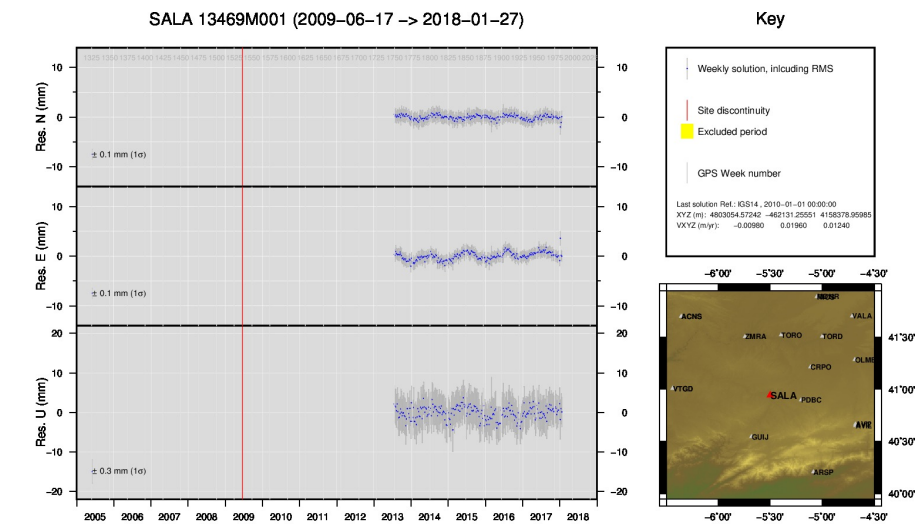
GMW 2018 Feb 04 14:18:00

20 ) PASA



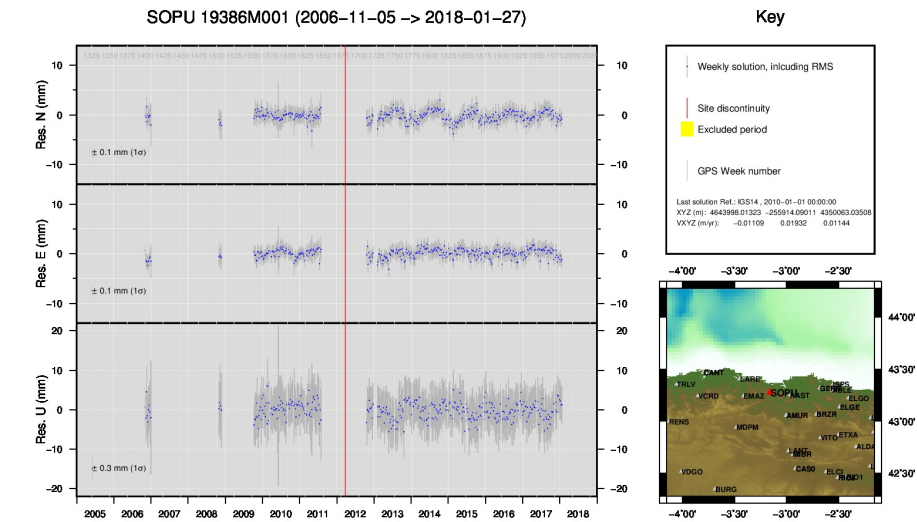
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21 ) RIO1



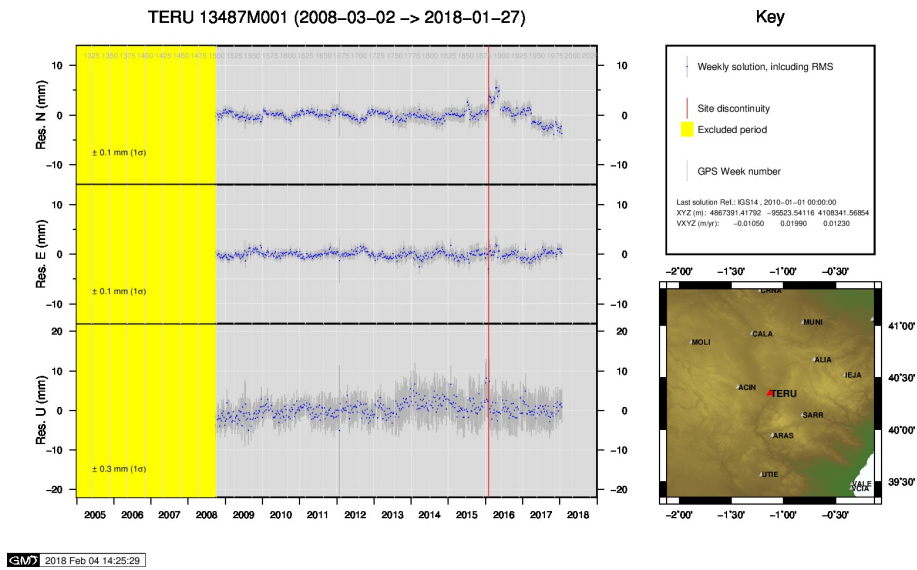
GMW 2018 Feb 04 14:21:17

22 ) SALA

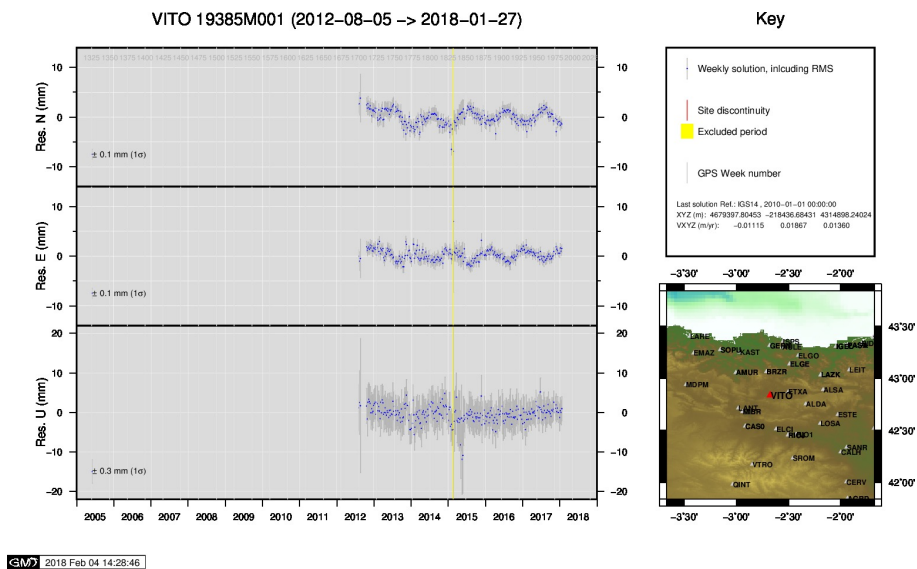


GMW 2018 Feb 04 14:23:26

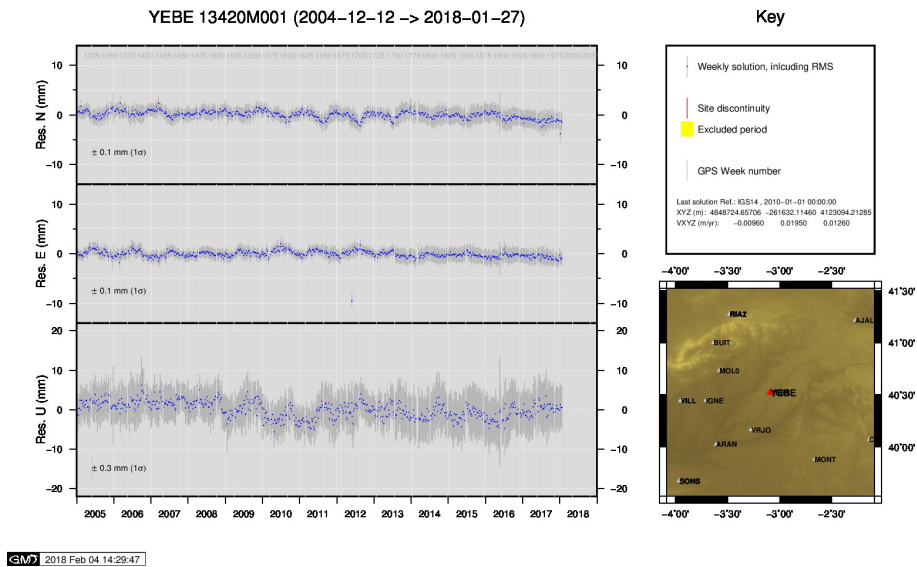
23 ) SOPU



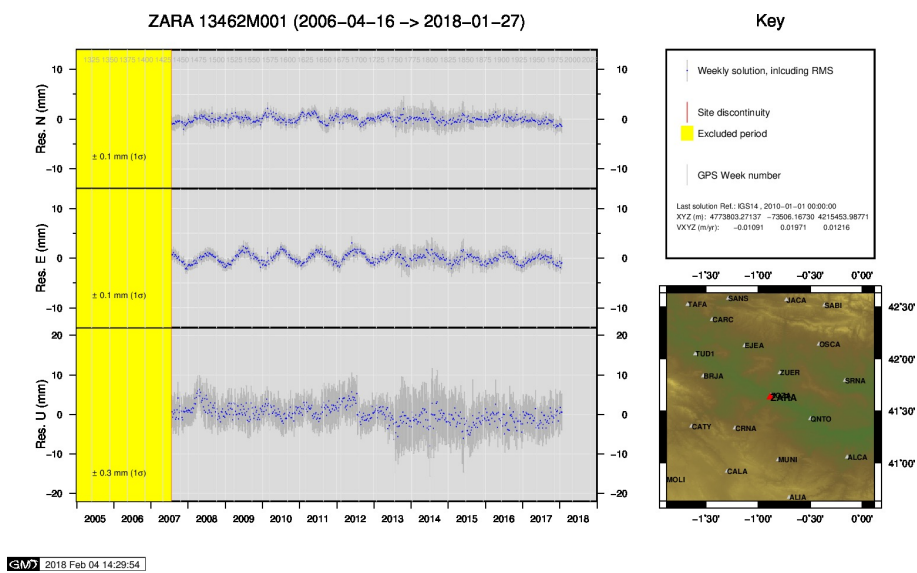
24 ) TERU



25 ) VITO



26 ) YEBE



27 ) ZARA