

ARA-DAC Weekly Analysis Result: 1904 (GFA)

Technical Report

GPS Week: 1904 (GFA)

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

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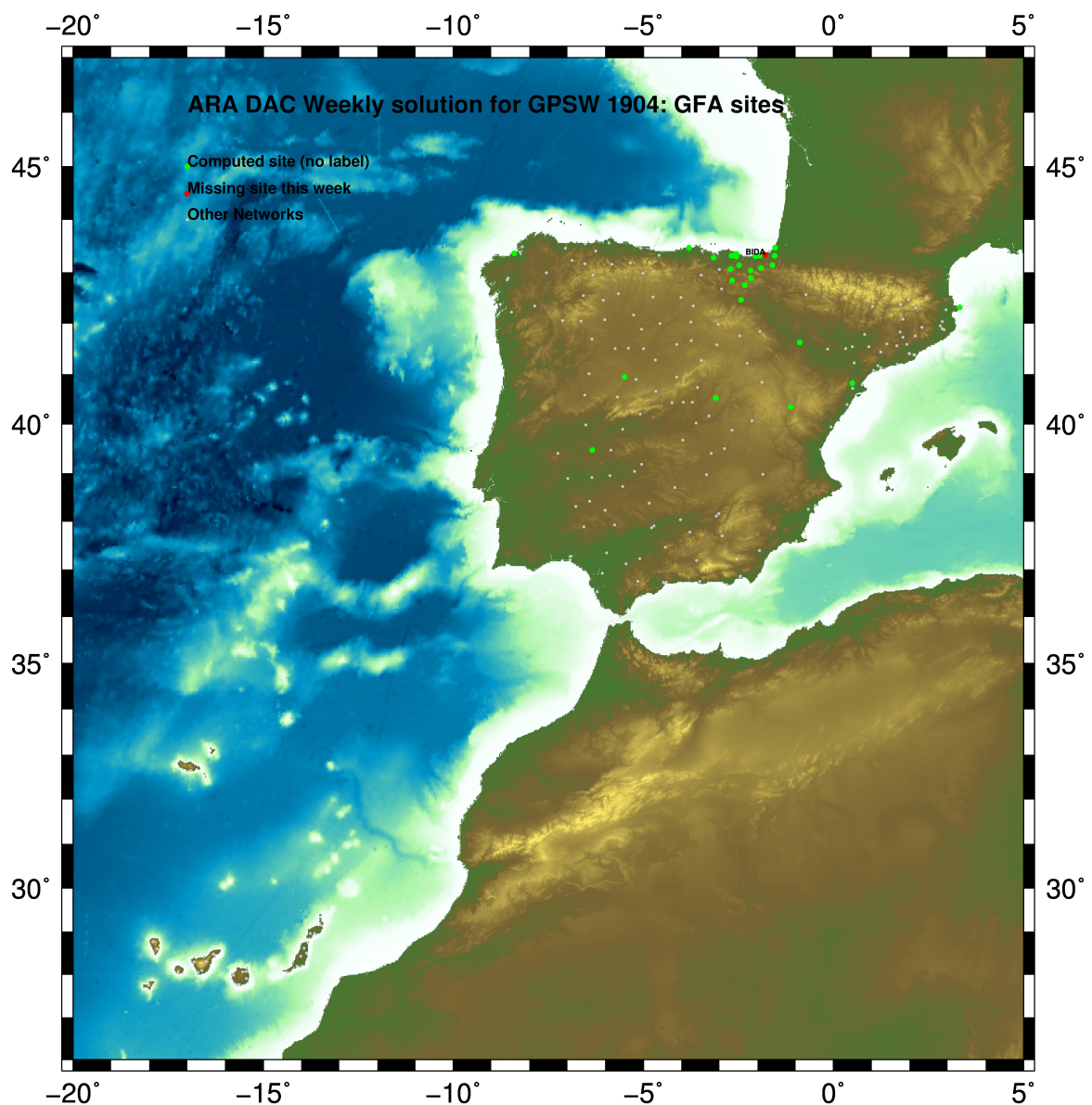
Report generated on 2016/07/17 at 13:07:58



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 2016 Jul 17 13:07:49

Fig.1: Computed Sites for GPS Week1904 (GFA)

3 Main Computation Parameters

The main parameters considered in the ARA analysis follow strictly the EPN recommendations.

- Reprocessing: 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 in QIF or L_3 combinations (respectively for ambiguity resolution in baseline mode, and final network solution). In the final network solution the double differenced data are sampled at 180 sec. intervals.
- Ground antenna phase center calibrations: Group APCV used from the PCV_COD.I08 file and individual calibrations from EPNC_08.ATX. EPN_A class sites (CRD + VEL) IGB08 used to define the reference frame. If individual calibrations, other from these, are available, they are also included in the analysis.
- Troposphere:
 - 3 deg elev. cutoff; elevation dependent weighting
 - VMF1_DRY mapping function. ZPD parameters are estimated using WET 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: 3σ 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 IGB08

The Reference Frame considered in this section is IGB08, release C1890.

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ARA LAC 1904 WEEK COMBINATION: PRECISE ORBITS                                17-JUL-16 12:05
-----
LOCAL GEODETIC DATUM: IGB08                                EPOCH: 2016-07-06 12:00:00
-----
NUM STATION NAME          X (M)          Y (M)          Z (M)          FLAG
-----
 1 ACRD 13434M001         4594489.58962        -678367.51037        4357066.26516        W
 22 ALDA 19383M001         4687280.19107        -190876.62083        4308106.92379        A
 28 ALSA 19419M001         4677250.87247        -176770.45015        4319079.84140        A
 40 AULE 00000M000         4644762.15659        -207777.70803        4351758.45040        A
 51 BIAZ 10074M002         4634456.09577        -124345.03506        4365785.43056        A
 54 BRZR 19387M001         4662221.02062        -220769.95667        4333309.40357        A
 7 CACE 13447M001         4899866.53135        -544567.09130        4033770.17177        W
 8 CANT 13438M001         4625924.34656        -307096.28930        4365771.52605        W
 69 CHER 00000M000         4645880.35223        -125721.98135        4353624.33972        A
 11 CREU 13432M001         4715420.16877        273178.00426        4271946.81104        A
 12 EBRE 13410M001         4833520.02339        41537.33559        4147461.68571        W
 77 ELGE 19353S001         4657557.43466        -202241.52940        4338991.83786        A
 87 GERN 19389M001         4642811.33970        -217222.98906        4353278.85130        A
 101 IGEL 19352S001         4645951.46178        -165574.55817        4352550.38871        A
 105 ISPS 19484M001         4640596.51581        -206963.83145        4356391.88129        A
 109 LAZK 19354S001         4666098.37432        -178186.24734        4330463.64273        A
 112 LEIT 19428M001         4663520.96995        -155859.77332        4334519.85105        A
 141 ORDN 19427M001         4659696.82104        -130864.79143        4338948.85579        A
 146 PAS2 19351S001         4644909.09000        -156645.12383        4353623.04538        A
 147 PASA 19351S001         4644909.09139        -156645.12375        4353623.04624        A
 27 RID1 13448M002         4708446.85719        -199490.33924        4284089.70527        W
 28 SALA 13469M001         4803054.51036        -462131.12468        4158379.04320        W
 172 SOPU 19386M001         4643997.94025        -255913.96231        4350063.11035        A
 31 TERU 13487M001         4867391.35244        -95523.40985        4108341.65404        W
 204 VITO 19385M001         4679397.73013        -218436.56095        4314898.33018        A
 35 YEBE 13420M001         4848724.59744        -261631.98478        4123094.29742        W
 36 ZARA 13462M001         4773803.20145        -73506.03766        4215454.06786        W
    
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5.2 ETRS89 Coordinates

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

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ETRF2000 COORD. wk 1904                                                    17-JUL-16 12:05
-----
LOCAL GEODETIC DATUM: ETRF2000                                EPOCH: 2016-07-06 12:00:00
-----
NUM STATION NAME          X (M)          Y (M)          Z (M)          FLAG
-----
 1 ACRD 13434M001         4594489.86862        -678367.99409        4357065.87089        W
 22 ALDA 19383M001         4687280.51862        -190877.11253        4308106.53859        A
 28 ALSA 19419M001         4677251.20220        -176770.94087        4319079.45704        A
 40 AULE 00000M000         4644762.48509        -207778.19575        4351758.06791        A
 51 BIAZ 10074M002         4634456.43398        -124345.52162        4365785.04969        A
 54 BRZR 19387M001         4662221.34659        -220770.44507        4333309.01975        A
 7 CACE 13447M001         4899866.80417        -544567.60343        4033769.76812        W
 8 CANT 13438M001         4625924.66543        -307096.77545        4365771.14376        W
 69 CHER 00000M000         4645880.68953        -125722.46899        4353623.95805        A
 11 CREU 13432M001         4715420.54305        273177.51121        4271946.42892        A
 12 EBRE 13410M001         4833520.36538        41536.83080        4147461.29304        W
 77 ELGE 19353S001         4657557.76295        -202242.01832        4338991.45456        A
 87 GERN 19389M001         4642811.66730        -217223.47662        4353278.46884        A
 101 IGEL 19352S001         4645951.79479        -165575.04592        4352550.00660        A
 105 ISPS 19484M001         4640596.84469        -206964.31878        4356391.49910        A
 109 LAZK 19354S001         4666098.70461        -178186.73701        4330463.25911        A
 112 LEIT 19428M001         4663521.30286        -155859.26270        4334519.46785        A
 141 ORDN 19427M001         4659696.15687        -130865.28039        4338948.47312        A
 146 PAS2 19351S001         4644909.42403        -156645.61145        4353622.66344        A
 147 PASA 19351S001         4644909.42542        -156645.61137        4353622.66430        A
 27 RID1 13448M002         4708447.18231        -199490.83294        4284089.31853        W
 28 SALA 13469M001         4803054.79977        -462131.62771        4158378.64710        W
 172 SOPU 19386M001         4643998.26355        -255914.45006        4350062.72739        A
 31 TERU 13487M001         4867391.67748        -95523.91816        4108341.25757        W
 204 VITO 19385M001         4679398.05519        -218437.05196        4314897.94522        A
 35 YEBE 13420M001         4848724.90585        -261632.49172        4123093.90041        W
 36 ZARA 13462M001         4773803.53557        -73506.53719        4215453.67803        W
    
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5.3 Mean and Daily Repeatabilities

In this section, the mean and daily repeatabilities of the sites are shown. Repeatabilities refer to the IGB08 solution and are given with respect the Local fram (North-East-Up).

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ARA LAC 1904 WEEK COMBINATION: PRECISE ORBITS                                17-JUL-16 12:05
-----
Station      #Days      Weekday      Repeatability (mm)
              0123456      N      E      U
    
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ACDR 13434M001	7	XXXXXX	0.52	1.03	4.07
ALDA 19383M001	7	XXXXXX	1.35	1.03	2.11
ALSA 19419M001	7	XXXXXX	1.26	0.88	2.30
AULE 00000M000	7	XXXXXX	0.84	0.79	1.75
BIAZ 10074M002	7	XXXXXX	1.02	0.62	2.13
BRZR 19387M001	7	XXXXXX	1.32	0.87	2.57
CACE 13447M001	7	XXXXXX	1.34	0.98	2.35
CANT 13438M001	7	XXXXXX	0.59	0.67	1.88
CHER 00000M000	7	XXXXXX	1.39	1.01	2.74
CREU 13432M001	7	XXXXXX	1.26	1.43	2.58
EBRE 13410M001	7	XXXXXX	0.60	0.80	2.92
ELGE 19353S001	7	XXXXXX	0.69	0.67	2.16
GERN 19389M001	7	XXXXXX	0.60	1.00	2.15
IGEL 19352S001	7	XXXXXX	0.95	0.68	2.54
ISPS 19484M001	7	XXXXXX	0.96	1.14	2.97
LAZK 19354S001	7	XXXXXX	0.96	1.04	1.92
LEIT 19428M001	7	XXXXXX	1.23	0.72	1.31
ORDN 19427M001	7	XXXXXX	1.00	1.03	1.51
PAS2 19351S001	7	XXXXXX	1.14	0.72	1.64
PASA 19351S001	7	XXXXXX	0.87	0.65	1.45
RID1 13448M002	7	XXXXXX	0.55	0.91	4.41
SALA 13469M001	7	XXXXXX	1.16	0.67	3.15
SOPU 19386M001	7	XXXXXX	0.87	1.47	5.21
TERU 13487M001	7	XXXXXX	0.66	0.84	4.46
VITO 19385M001	7	XXXXXX	1.01	0.43	3.51
YEBE 13420M001	7	XXXXXX	0.98	1.37	3.32
ZARA 13462M001	7	XXXXXX	1.15	0.85	3.49

Comparison of individual solutions:

ACDR 13434M001	N	0.52	-0.47	1.03	0.26	0.30	-0.10	-0.01	0.39
ACDR 13434M001	E	1.03	-0.03	-0.76	-1.45	-0.77	0.73	-1.57	0.31
ACDR 13434M001	U	4.07	0.76	-5.89	-2.47	2.99	-4.94	-4.99	0.04
ALDA 19383M001	N	1.35	1.45	0.16	0.59	-0.42	-0.77	-2.63	-0.90
ALDA 19383M001	E	1.03	-0.13	1.21	0.54	-1.22	1.71	0.35	0.16
ALDA 19383M001	U	2.11	-1.86	0.67	-0.45	1.40	3.06	-3.20	-0.95
ALSA 19419M001	N	1.26	0.67	-0.30	-0.23	-0.05	-0.71	-2.78	0.85
ALSA 19419M001	E	0.88	-0.69	0.78	0.85	-0.24	1.64	0.31	-0.09
ALSA 19419M001	U	2.30	-2.13	3.15	-2.53	2.30	-0.66	0.89	-2.08
AULE 00000M000	N	0.84	0.74	-0.63	0.53	0.72	-0.76	-1.33	-0.35
AULE 00000M000	E	0.79	-0.50	1.13	0.01	0.15	1.38	0.13	0.50
AULE 00000M000	U	1.75	1.25	0.55	0.68	0.48	-2.73	-2.85	0.51
BIAZ 10074M002	N	1.02	0.81	0.04	-0.79	-1.31	0.00	-1.75	0.34
BIAZ 10074M002	E	0.62	0.68	0.41	0.58	-0.65	0.27	0.29	0.89
BIAZ 10074M002	U	2.13	0.68	2.20	0.94	-2.11	1.57	-3.77	0.19
BRZR 19387M001	N	1.32	1.45	0.98	-1.89	-0.53	-0.80	-1.69	0.02
BRZR 19387M001	E	0.87	0.33	1.11	-0.59	-0.09	0.89	-0.32	1.40
BRZR 19387M001	U	2.57	1.16	0.40	0.57	3.98	-3.75	-2.49	-1.28
CACE 13447M001	N	1.34	-0.33	-1.06	-0.77	2.56	-0.30	-0.80	1.29
CACE 13447M001	E	0.98	1.12	-1.01	0.64	-0.99	0.80	0.95	-0.74
CACE 13447M001	U	2.35	0.11	1.57	1.65	-2.43	-0.40	4.67	-0.23
CANT 13438M001	N	0.59	-0.70	0.39	0.28	-0.29	-0.16	-1.10	0.12
CANT 13438M001	E	0.67	0.11	1.09	0.38	-0.90	-0.15	0.26	-0.69
CANT 13438M001	U	1.88	3.39	-1.63	-1.17	-0.79	-0.03	2.23	0.16
CHER 00000M000	N	1.39	1.28	-1.15	0.85	-0.95	-0.33	-2.60	0.47
CHER 00000M000	E	1.01	0.57	1.82	-0.60	-0.79	0.79	-0.12	0.94
CHER 00000M000	U	2.74	-0.60	2.76	0.17	-2.56	-2.88	-1.60	4.43
CREU 13432M001	N	1.26	-1.09	0.50	0.17	-0.78	1.60	1.88	-1.19
CREU 13432M001	E	1.43	-0.52	-0.96	-0.04	-2.57	0.36	-0.57	2.00
CREU 13432M001	U	2.58	-2.13	-3.26	2.29	-2.49	-0.89	-1.44	3.24
EBRE 13410M001	N	0.60	0.83	0.29	-0.72	0.20	-0.14	0.90	-0.09
EBRE 13410M001	E	0.80	-0.07	-0.69	0.53	-0.90	-0.76	-1.15	0.61
EBRE 13410M001	U	2.92	-1.68	-0.59	-1.96	4.14	-3.70	-1.09	-3.47
ELGE 19353S001	N	0.69	0.20	-0.56	0.48	-0.48	-0.21	-1.23	-0.68
ELGE 19353S001	E	0.67	0.47	0.08	0.03	-0.49	1.05	0.58	0.88
ELGE 19353S001	U	2.16	0.35	1.26	1.13	3.33	-2.84	-2.31	-1.35
GERN 19389M001	N	0.60	0.14	-0.51	-0.35	0.92	-0.91	-0.29	-0.01
GERN 19389M001	E	1.00	0.14	1.21	0.72	-0.16	1.72	-1.03	0.16
GERN 19389M001	U	2.15	1.35	0.40	-0.02	0.11	-0.16	-4.90	1.28
IGEL 19352S001	N	0.95	0.47	-0.74	0.22	-0.89	0.44	-1.88	-0.23
IGEL 19352S001	E	0.68	0.51	1.07	0.03	-0.52	0.98	0.22	0.30
IGEL 19352S001	U	2.54	1.76	2.57	-0.84	-0.61	-0.43	-5.05	1.52
ISPS 19484M001	N	0.96	-0.49	-0.11	0.48	1.62	-0.93	-1.18	-0.41
ISPS 19484M001	E	1.14	0.86	1.52	-0.23	-0.25	1.85	-1.12	0.11
ISPS 19484M001	U	2.97	2.25	0.87	-4.68	-1.46	0.11	-2.68	3.97
LAZK 19354S001	N	0.96	0.05	-0.68	0.54	-0.63	0.20	-2.08	0.13
LAZK 19354S001	E	1.04	-0.12	1.69	0.61	-0.60	1.51	-0.70	0.23
LAZK 19354S001	U	1.92	-0.93	1.10	-0.10	2.19	-3.78	-0.52	0.81
LEIT 19428M001	N	1.23	1.40	-1.68	-0.41	-0.79	0.38	-1.82	0.25
LEIT 19428M001	E	0.72	0.03	1.08	0.80	-0.53	0.98	0.05	0.10
LEIT 19428M001	U	1.31	0.85	-1.52	0.12	1.46	-0.09	-2.26	0.07
ORON 19427M001	N	1.00	0.83	-1.58	0.62	-0.65	-0.60	-1.27	0.18
ORON 19427M001	E	1.03	-0.23	0.97	-0.53	-1.06	1.06	1.11	1.25
ORON 19427M001	U	1.51	-0.68	2.61	-1.29	0.80	-1.98	-0.40	0.07
PAS2 19351S001	N	1.14	0.03	-0.73	-0.34	-0.53	1.21	-2.33	0.09
PAS2 19351S001	E	0.72	-0.36	1.44	0.35	-0.16	0.32	0.77	0.23
PAS2 19351S001	U	1.64	-2.06	2.00	1.41	-1.84	-1.40	0.17	0.78
PASA 19351S001	N	0.87	-0.00	-0.88	0.07	-0.66	0.67	-1.72	-0.03
PASA 19351S001	E	0.65	0.54	1.39	0.08	-0.25	0.36	0.25	0.25
PASA 19351S001	U	1.45	0.02	2.43	0.04	-1.27	-0.96	-1.96	0.62
RID1 13448M002	N	0.55	-0.05	-0.69	0.12	-0.38	-0.65	-0.85	-0.17
RID1 13448M002	E	0.91	-0.13	1.23	0.75	-0.01	1.16	1.24	-0.05
RID1 13448M002	U	4.41	-2.88	4.37	2.49	-4.57	4.45	-6.41	-1.19
SALA 13469M001	N	1.16	0.04	-1.35	-1.32	-0.44	0.37	1.78	0.98
SALA 13469M001	E	0.67	-0.54	0.48	0.80	0.18	-0.45	-1.03	-0.47
SALA 13469M001	U	3.15	-1.75	6.76	0.53	-3.06	-0.22	-0.95	0.15
SOPU 19386M001	N	0.87	-0.01	-0.91	-0.40	-1.42	-1.10	0.42	0.43
SOPU 19386M001	E	1.47	0.28	3.22	0.01	-0.49	-0.94	-1.14	0.29
SOPU 19386M001	U	5.21	1.57	1.82	-0.43	1.09	8.34	-9.27	0.24
TERU 13487M001	N	0.66	-0.50	1.01	0.25	-0.74	0.01	0.79	0.34
TERU 13487M001	E	0.84	-0.47	-1.12	0.20	-0.34	-1.32	0.91	-0.25
TERU 13487M001	U	4.46	-1.15	-1.93	7.10	1.20	-1.62	-5.96	-4.91
VITO 19385M001	N	1.01	-0.36	-0.62	1.33	-1.09	-0.26	-1.50	0.56
VITO 19385M001	E	0.43	0.08	0.10	0.14	0.57	0.56	-0.29	-0.58
VITO 19385M001	U	3.51	1.38	4.68	-4.52	2.43	-4.49	0.25	1.89
YEBE 13420M001	N	0.98	0.06	1.33	-0.09	-0.48	0.52	0.75	-1.72
YEBE 13420M001	E	1.37	-1.21	0.74	-0.46	1.97	-1.43	-0.22	1.73
YEBE 13420M001	U	3.32	-1.38	1.54	-3.95	5.18	2.20	3.44	1.66
ZARA 13462M001	N	1.15	0.01	2.20	-0.90	-1.22	0.27	0.85	-0.06
ZARA 13462M001	E	0.85	0.86	-0.38	-0.07	-0.92	-1.51	-0.60	-0.02
ZARA 13462M001	U	3.49	-3.71	-5.56	2.00	-2.43	2.24	1.99	-3.09

5.4 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: IGb08
RESIDUALS IN LOCAL SYSTEM (NORTH, EAST, UP)

NUM	NAME	FLG	RESIDUALS IN MILLIMETERS		
1	ACDR 13434M001	I W	-1.38	0.45	0.59
2	ALAC 13433M001	I W	0.35	0.50	0.67
3	ALBA 13452M001	I W	-0.65	1.30	-0.44
4	ALME 13437M001	I W	-0.04	1.29	3.90
6	BRST 10004M004	I W	1.00	-2.17	1.38
7	CACE 13447M001	I W	0.53	0.07	-0.29
8	CANT 13436M001	I W	-0.59	-0.53	-2.60
9	CEU1 13449M002	I W	0.85	3.07	12.15
10	COBA 13453M001	I W	0.89	0.21	0.93
12	EBRE 13410M001	I W	0.78	-1.02	-1.53
14	FUNC 13911S001	I W	0.77	1.05	-2.45
16	HUEL 13451M001	I W	-0.19	1.64	-1.13
17	IZAN 31309M002	I W	-1.55	2.21	-1.26
18	LLIV 13436M001	I W	2.47	-2.55	-3.70
19	LPAL 81701M001	I W	-1.28	0.78	-0.67
20	LRDC 10023M001	I W	1.80	-2.90	1.31
21	MALA 13443M001	I W	-4.26	3.17	3.12
22	MALL 13444M001	I W	0.16	-2.15	-2.93
24	MELI 13379M001	I W	-1.70	-1.15	-3.52
25	PDEL 31906M004	I W	-0.90	-0.97	1.00
26	RABT 35001M002	I W	-0.16	1.15	-1.84
27	RID1 13448M002	I W	0.23	0.76	-2.00
28	SALA 13469M001	I W	0.02	-0.89	2.30
29	SCDA 10088M002	I W	0.28	-0.59	-3.03
30	SDNS 13446M001	I W	-1.99	-0.12	-1.04
31	TERU 13487M001	I W	2.35	0.95	-2.22
32	VALE 13439M001	I W	-0.64	0.84	-0.09
33	VIGO 13450M001	I W	0.24	-1.47	2.44
34	VILL 13406M001	I W	-0.20	0.59	-1.96
35	YEBE 13420M001	I W	1.55	-0.72	1.69
36	ZARA 13462M001	I W	-0.42	-2.18	-1.82
37	ZIMM 14001M004	I W	1.69	-0.60	3.02
RMS / COMPONENT			1.36	1.54	3.03
MEAN			0.00	-0.00	0.00
MIN			-4.26	-2.90	-3.70
MAX			2.47	3.17	12.15

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 96
RMS OF TRANSFORMATION : 2.11 MM

5.5 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          8858694
NUMBER OF UNKNOWN               135495
NUMBER OF DEGREES OF FREEDOM    8723199
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)     180
VARIANCE FACTOR                  2.383530949326111

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
 1  0.00214    -0.0080 -0.0171  0.0103  0.0004 -0.0004 -0.0004  -0.00019
 2  0.00269    0.0261  0.0390 -0.0297 -0.0007  0.0013  0.0011  -0.00001
 3  0.00232    -0.0089  0.0044  0.0165  -0.0002 -0.0006  0.0000  -0.00040
 4  0.01238    -0.0010  0.0221  0.0236 -0.0005 -0.0006  0.0005  -0.00224
 5  0.00240    -0.0105  0.0169  0.0153  -0.0004 -0.0006  0.0004  -0.00006
 6  0.00228    -0.0098 -0.0070 -0.0016  0.0002 -0.0002 -0.0002   0.00108
 7  0.00289    -0.0038 -0.0047  0.0021  0.0000 -0.0001 -0.0002   0.00014
```

```
Statistics of individual solutions:
-----
File  RMS (m)      DOF  Chi**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
 1  0.00146    1260191    2.14    1279588    3    582    18818    0
 2  0.00156    1223576    2.42    1242937    3    579    18785    0
 3  0.00153    1239995    2.35    1259986    3    582    19412    0
 4  0.00159    1232697    2.53    1253093    3    582    19817    0
 5  0.00162    1242077    2.62    1262445    3    585    19786    0
 6  0.00156    1247803    2.44    1267521    3    576    19145    0
 7  0.00146    1273395    2.14    1293124    3    585    19147    0
```

6 Equipment

6.1 Receiver List

Serial numbers not shown.

```
*SITE PT SOLN T DATA_START__ DATA_END_____ DESCRIPTION_____ S/N__ FIRMWARE___
ACOR A 1 P 16:185:00000 16:191:86370 LEICA GRX1200PRO -----
ALDA A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
ALSA A 1 P 16:185:00000 16:191:86370 LEICA GRX1200GGPRO -----
AULE A 1 P 16:185:00000 16:191:86370 LEICA GRX1200+GNSS -----
BIAZ A 1 P 16:185:00000 16:191:86370 LEICA GRX1200GGPRO -----
BRZR A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
CACE A 1 P 16:185:00000 16:191:86370 TRIMBLE NETR9 -----
CANT A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
CHER A 1 P 16:185:00000 16:191:86370 LEICA GRX1200+GNSS -----
CREU A 1 P 16:185:00000 16:191:86370 LEICA GR25 -----
EBRE A 1 P 16:185:00000 16:191:86370 TRIMBLE NETR9 -----
ELGE A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
GERN A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
IGEL A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
ISPS A 1 P 16:185:00000 16:191:86370 TRIMBLE NETR9 -----
LAZK A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
LEIT A 1 P 16:185:00000 16:191:86370 LEICA GRX1200+GNSS -----
ORON A 1 P 16:185:00000 16:191:86370 LEICA GRX1200GGPRO -----
PAS2 A 1 P 16:185:00000 16:191:86370 TPS NET-G3A -----
PASA A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
RIO1 A 1 P 16:185:00000 16:191:86370 LEICA GR25 -----
SALA A 1 P 16:185:00000 16:191:86370 LEICA GRX1200+GNSS -----
SOPU A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
TERU A 1 P 16:185:00000 16:191:86370 LEICA GRX1200GGPRO -----
VITO A 1 P 16:185:00000 16:191:86370 LEICA GR10 -----
YEBE A 1 P 16:185:00000 16:191:86370 TRIMBLE NETR9 -----
ZARA A 1 P 16:185:00000 16:191:86370 TRIMBLE NETR9 -----
```

6.2 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 16:185:00000 16:191:86370 LEIAT504 LEIS -----
ALDA A 1 P 16:185:00000 16:191:86370 LEIAS10 NONE -----
ALSA A 1 P 16:185:00000 16:191:86370 LEIAX1202GG NONE -----
AULE A 1 P 16:185:00000 16:191:86370 LEIAS10 NONE -----
BIAZ A 1 P 16:185:00000 16:191:86370 LEIAR25 LEIT -----
BRZR A 1 P 16:185:00000 16:191:86370 LEIAS10 NONE -----
CACE A 1 P 16:185:00000 16:191:86370 TRM29659.00 NONE -----
CANT A 1 P 16:185:00000 16:191:86370 LEIAR25.R4 LEIT 25066
CHER A 1 P 16:185:00000 16:191:86370 LEIAX1203+GNSS NONE -----
```



```

CREU A 1 P 16:185:00000 16:191:86370 LELAR25.R4 NONE 26357
EBRE A 1 P 16:185:00000 16:191:86370 TRM57971.00 NONE 25503
ELGE A 1 P 16:185:00000 16:191:86370 LELAR25.R4 LEIT -----
GERN A 1 P 16:185:00000 16:191:86370 LELAS10 NONE -----
IGEL A 1 P 16:185:00000 16:191:86370 LELAR20 LEIM -----
ISPS A 1 P 16:185:00000 16:191:86370 TRM59900.00 SCIS -----
LAZK A 1 P 16:185:00000 16:191:86370 LELAR25.R4 LEIT -----
LEIT A 1 P 16:185:00000 16:191:86370 LELAX1203+GNSS NONE -----
ORON A 1 P 16:185:00000 16:191:86370 LELAX1202GG NONE -----
PAS2 A 1 P 16:185:00000 16:191:86370 LELAR20 LEIM 73034
PASA A 1 P 16:185:00000 16:191:86370 LELAR20 LEIM 73034
RIO1 A 1 P 16:185:00000 16:191:86370 LELAR25.R4 LEIT 25138
SALA A 1 P 16:185:00000 16:191:86370 LELAR25 NONE -----
SOPU A 1 P 16:185:00000 16:191:86370 LELAS10 NONE -----
TERU A 1 P 16:185:00000 16:191:86370 LELAT504GG LEIS -----
VITO A 1 P 16:185:00000 16:191:86370 LELAS10 NONE -----
YEBE A 1 P 16:185:00000 16:191:86370 TRM29659.00 NONE -----
ZARA A 1 P 16:185:00000 16:191:86370 TRM29659.00 NONE -----

```

6.3 Eccentricities

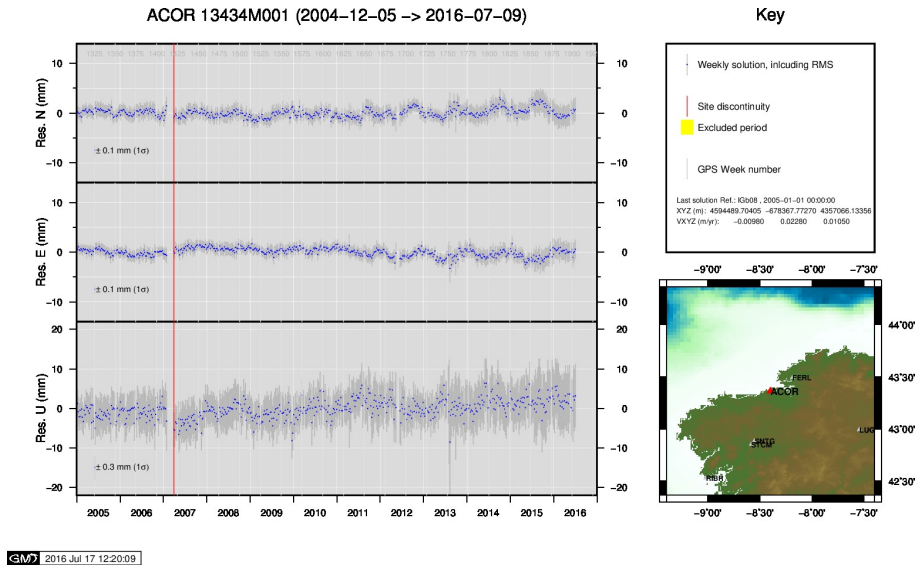
```

*
*SITE PT SOLN T DATA_START_ DATA_END_ AXE ARP->BENCHMARK(M) UP_ NORTH_ EAST_
ACOR A 1 P 16:185:00000 16:191:86370 UNE 3.0460 0.0000 0.0000
ALDA A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
ALSA A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
AULE A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
BIAZ A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
BRZR A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
CACE A 1 P 16:185:00000 16:191:86370 UNE 0.0600 0.0000 0.0000
CANT A 1 P 16:185:00000 16:191:86370 UNE 3.0490 0.0000 0.0000
CHER A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
CREU A 1 P 16:185:00000 16:191:86370 UNE 0.0770 0.0000 0.0000
EBRE A 1 P 16:185:00000 16:191:86370 UNE 0.0770 0.0000 0.0000
ELGE A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
GERN A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
IGEL A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
ISPS A 1 P 16:185:00000 16:191:86370 UNE 0.0350 0.0000 0.0000
LAZK A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
LEIT A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
ORON A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
PAS2 A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
PASA A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
RIO1 A 1 P 16:185:00000 16:191:86370 UNE 0.0606 0.0000 0.0000
SALA A 1 P 16:185:00000 16:191:86370 UNE 0.0600 0.0000 0.0000
SOPU A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
TERU A 1 P 16:185:00000 16:191:86370 UNE 0.0600 0.0000 0.0000
VITO A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
YEBE A 1 P 16:185:00000 16:191:86370 UNE 0.0000 0.0000 0.0000
ZARA A 1 P 16:185:00000 16:191:86370 UNE 3.2590 0.0000 0.0000

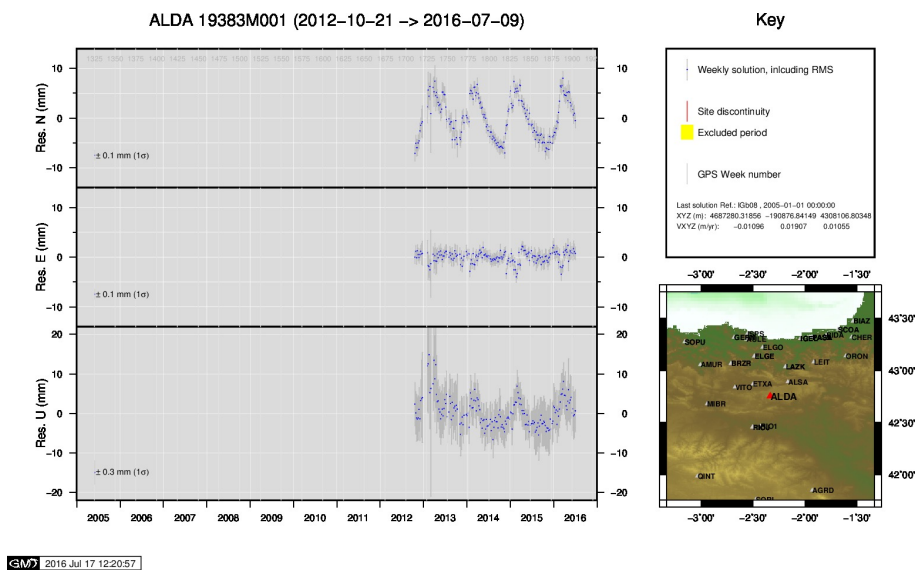
```

7 Cumulative Time Series

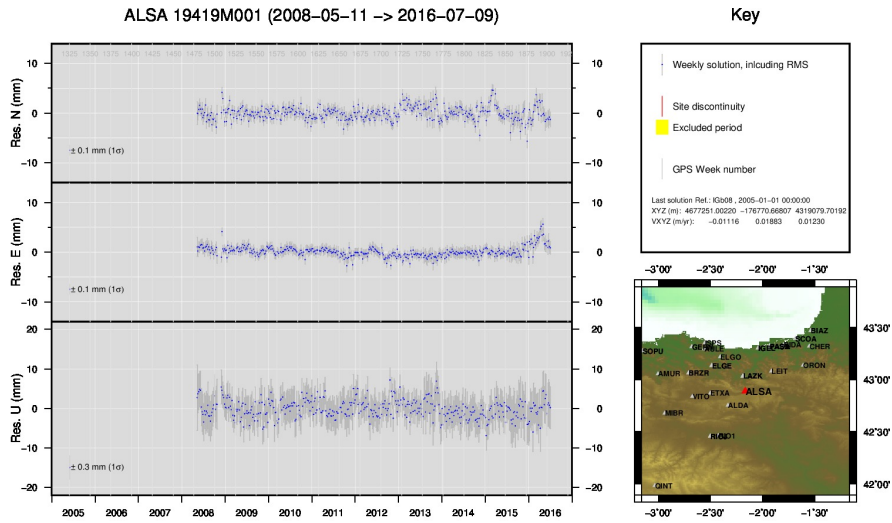
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

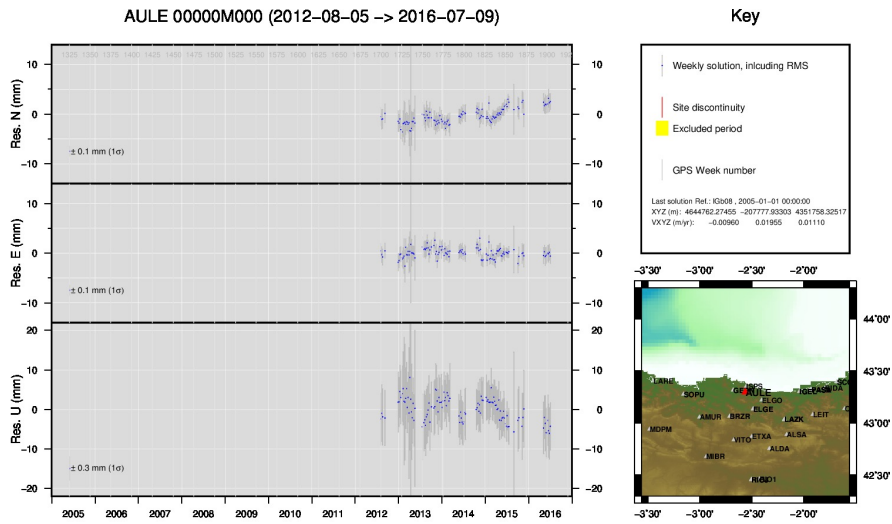


2) ALDA



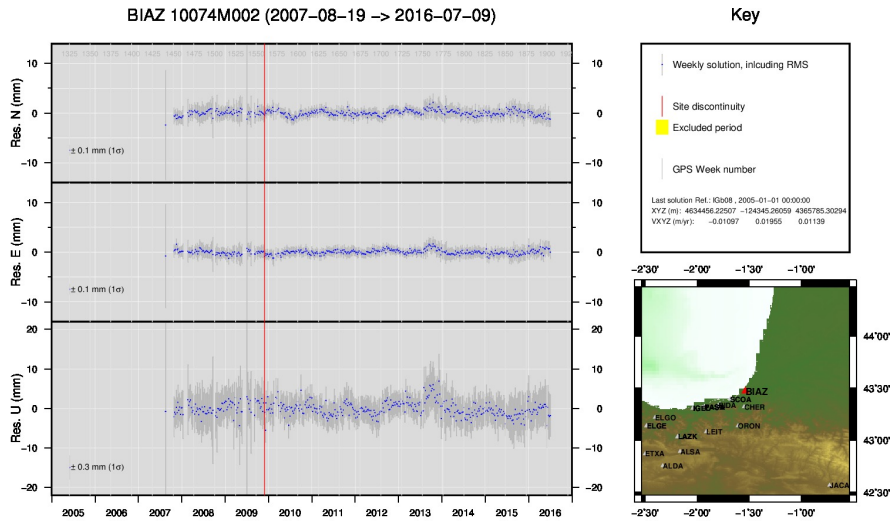
GMW 2016 Jul 17 12:21:39

3) ALSA



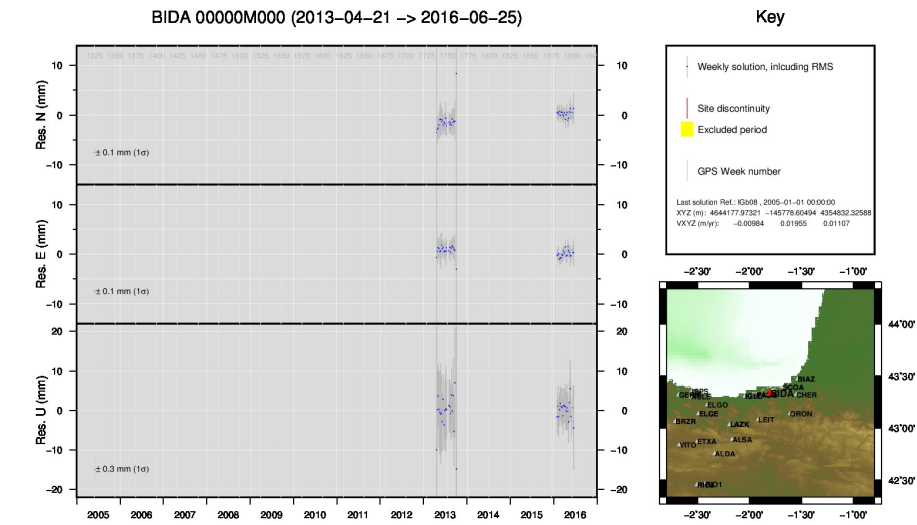
GMW 2016 Jul 17 12:22:45

4) AULE



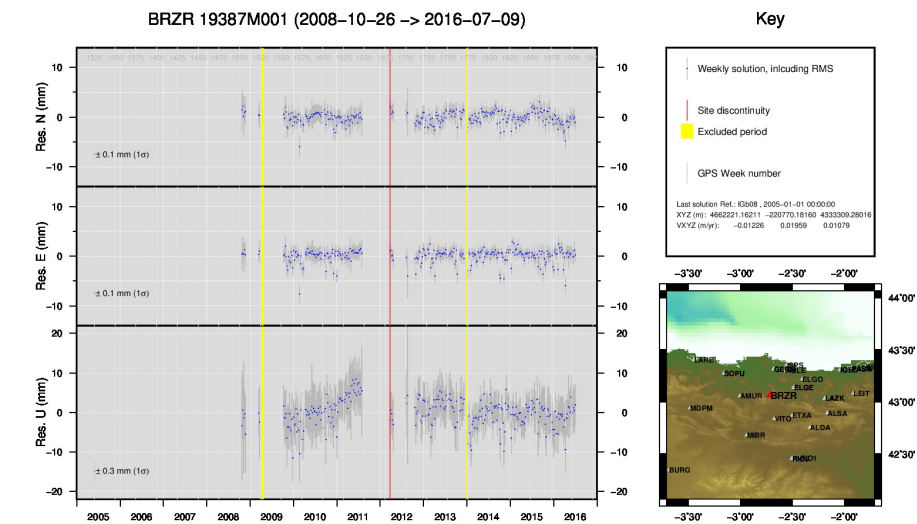
GMW 2016 Jul 17 12:23:50

5) BLAZ



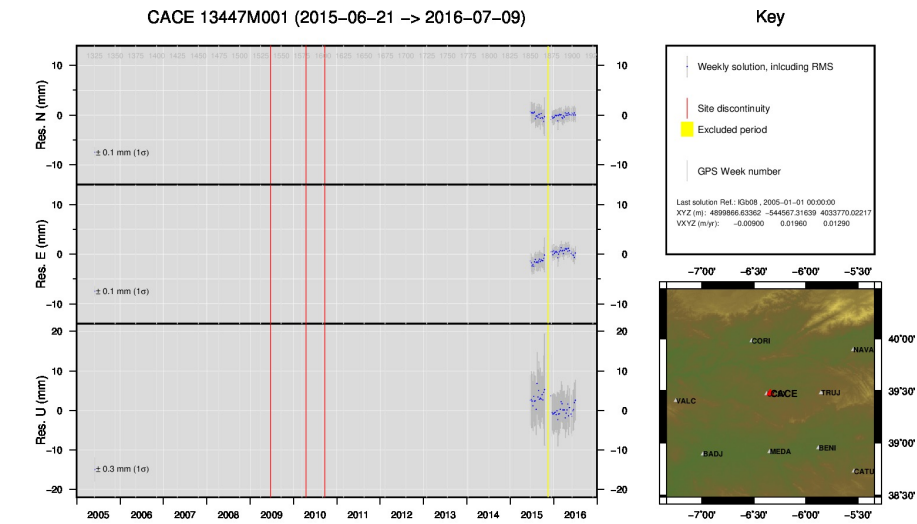
GMW 2016 Jul 17 12:23:56

6) BIDA



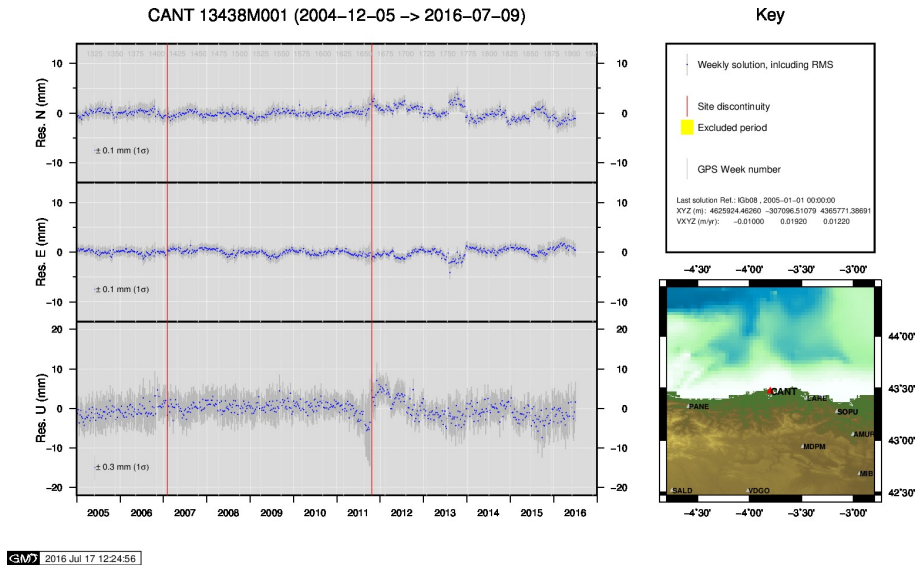
GMW 2016 Jul 17 12:24:15

7) BRZR

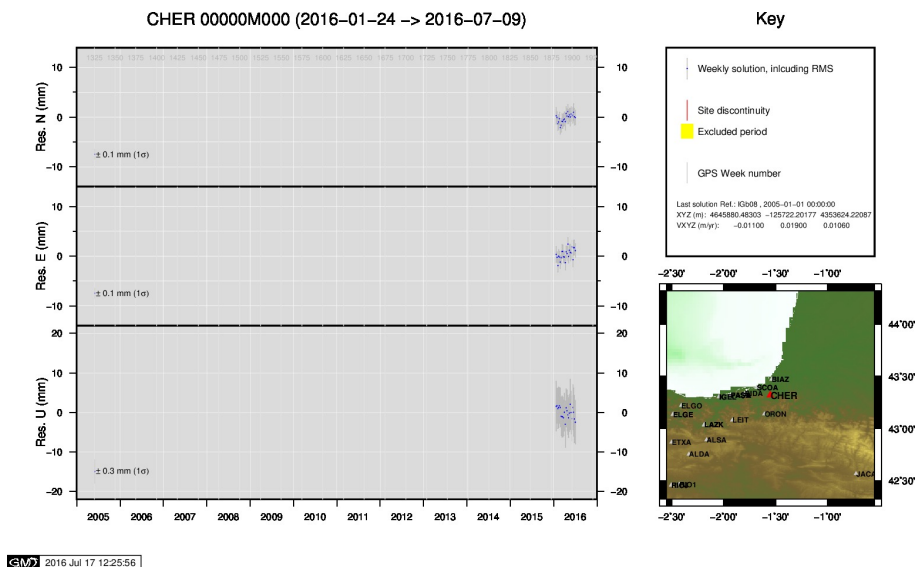


GMW 2016 Jul 17 12:24:45

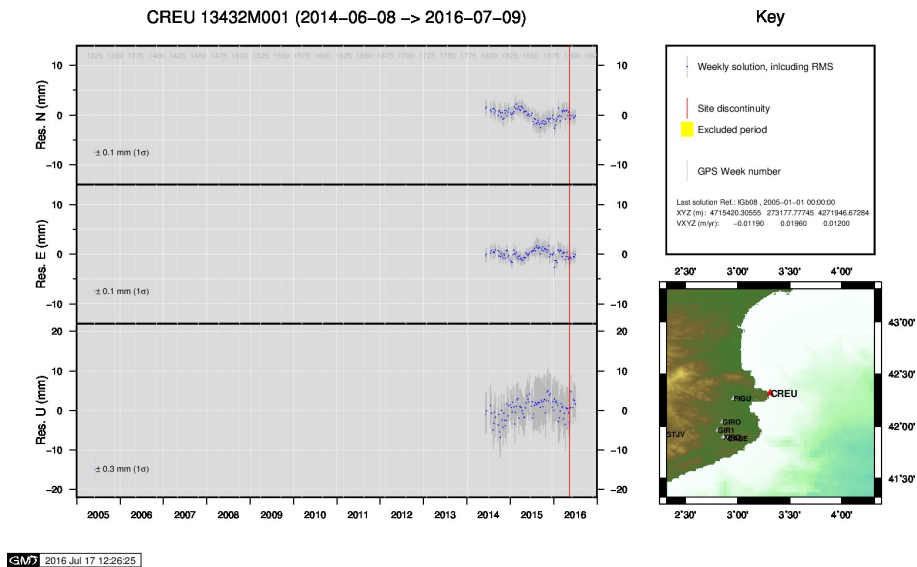
8) CACE



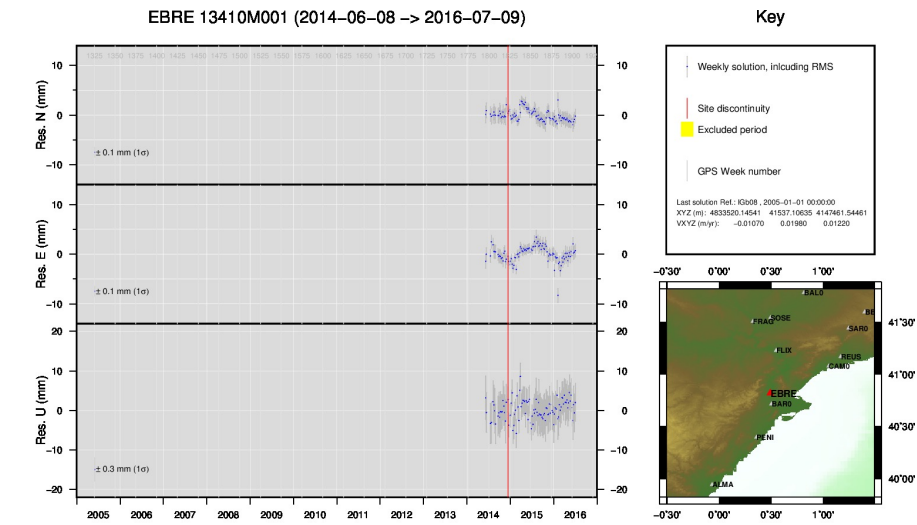
9) CANT



10) CHER

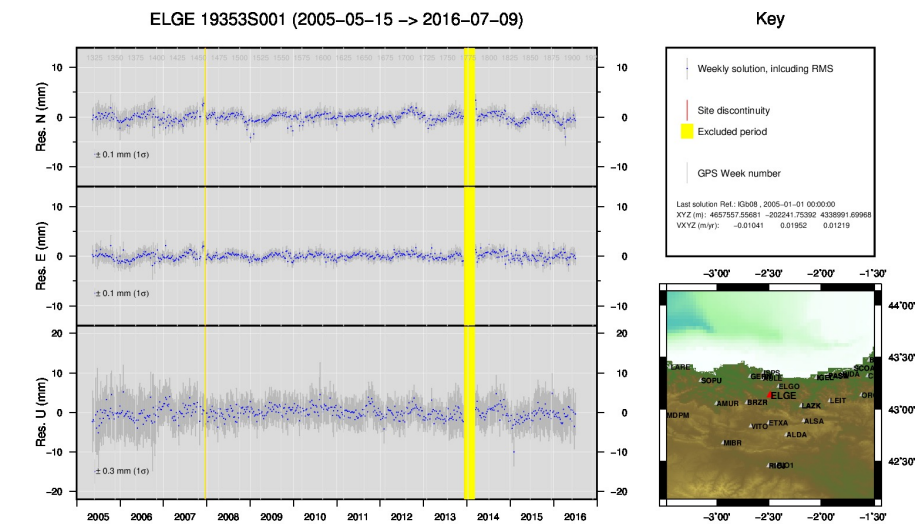


11) CREU



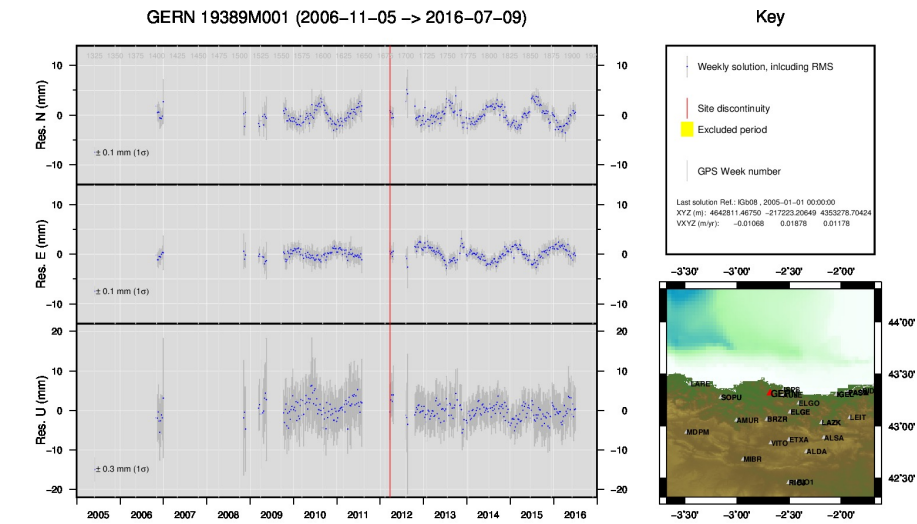
GMW 2016 Jul 17 12:26:43

12) EBRE



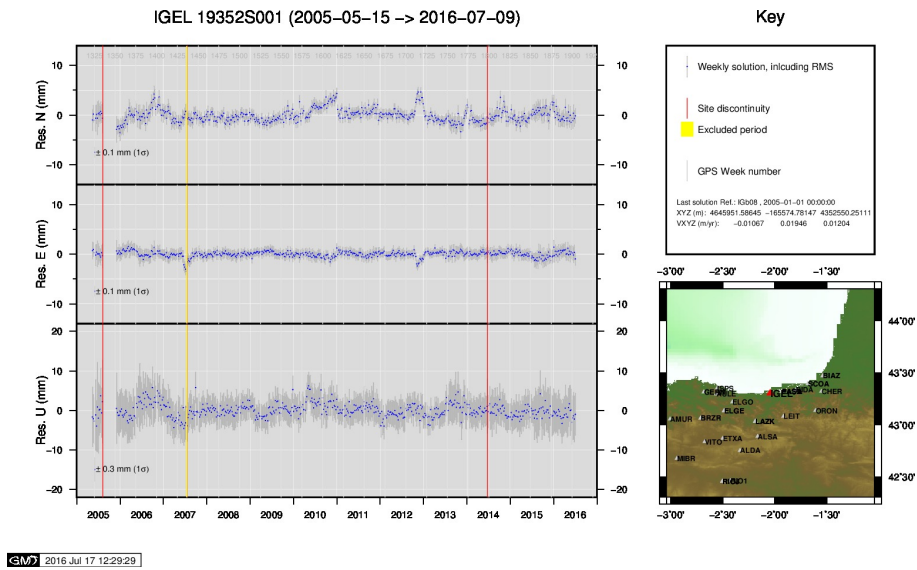
GMW 2016 Jul 17 12:26:55

13) ELGE

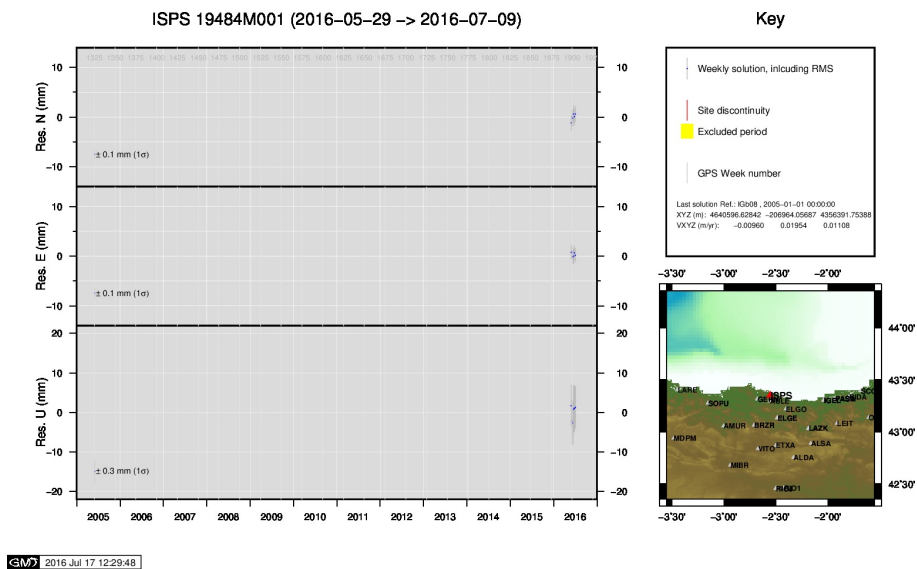


GMW 2016 Jul 17 12:28:00

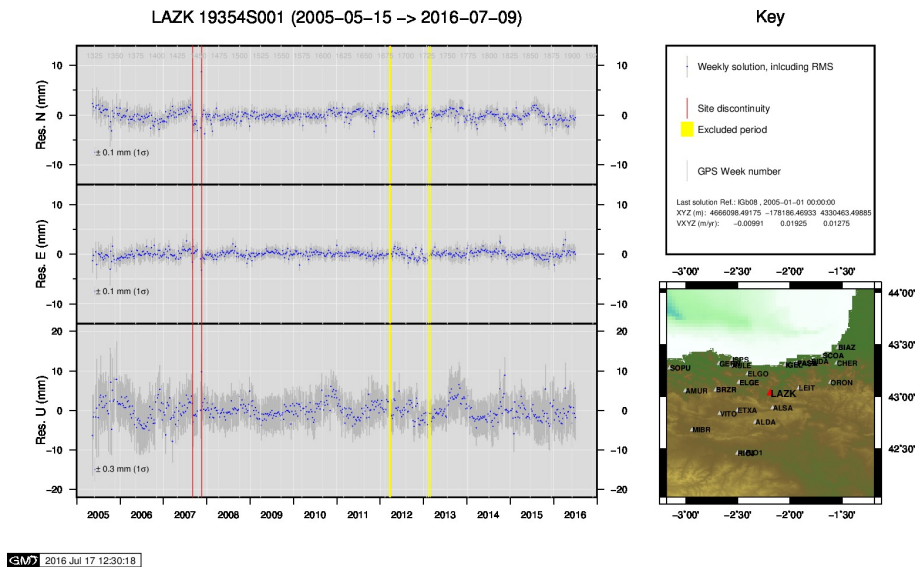
14) GERN



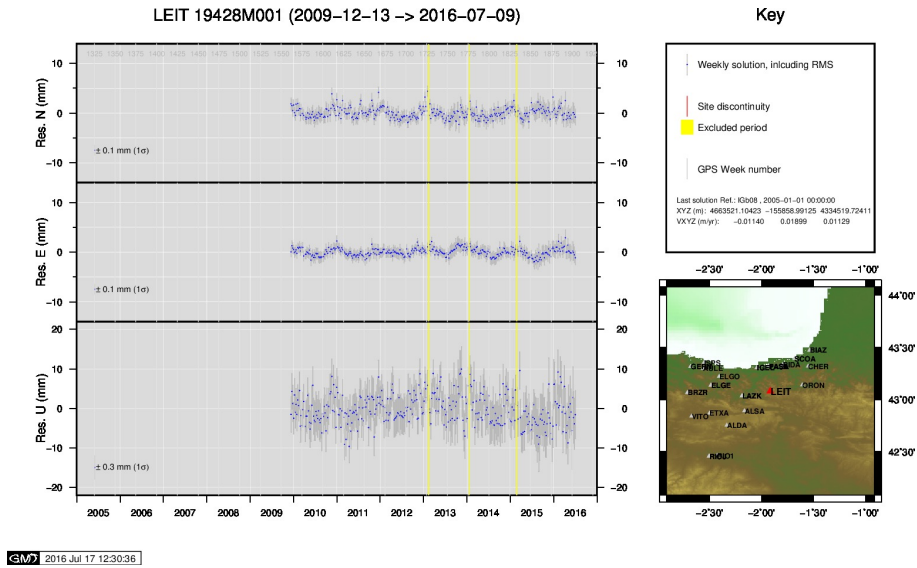
15) IGEL



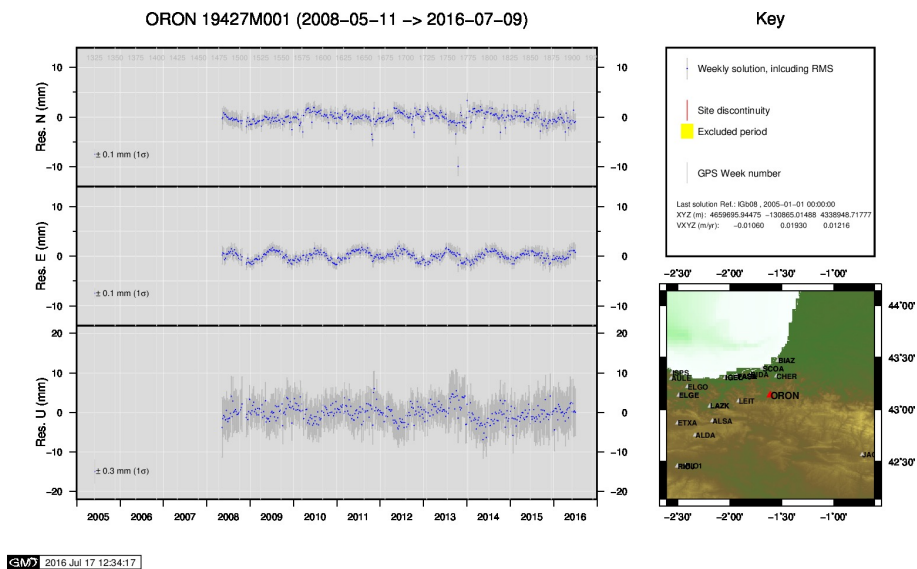
16) ISPS



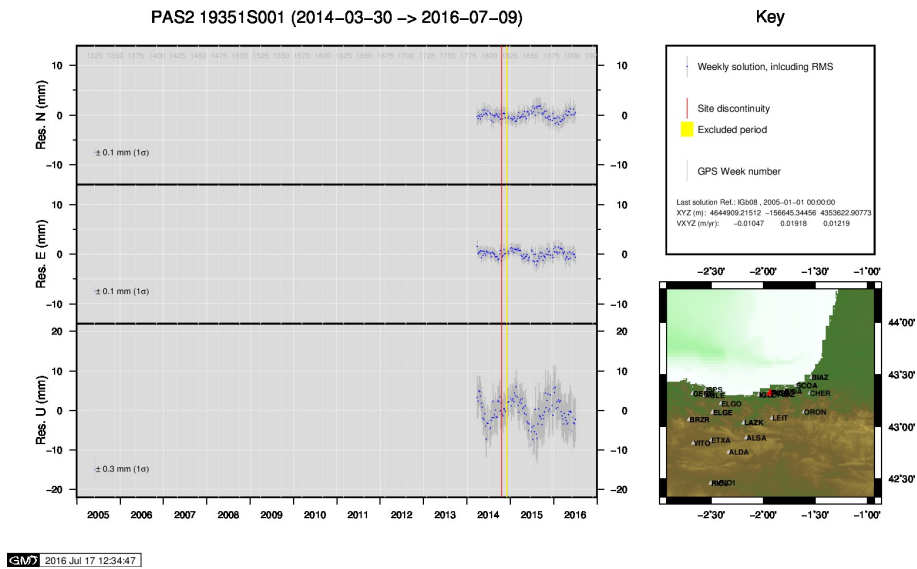
17) LAZK



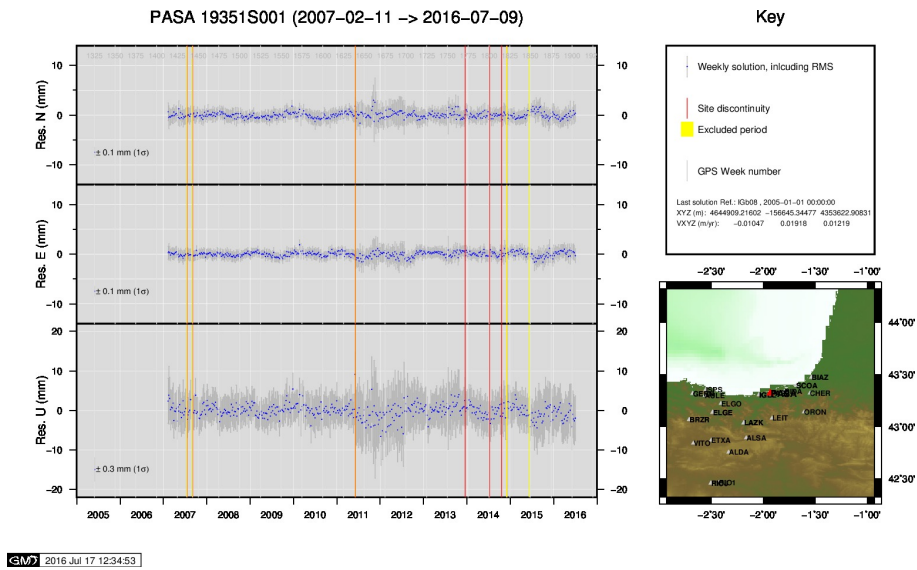
18) LEIT



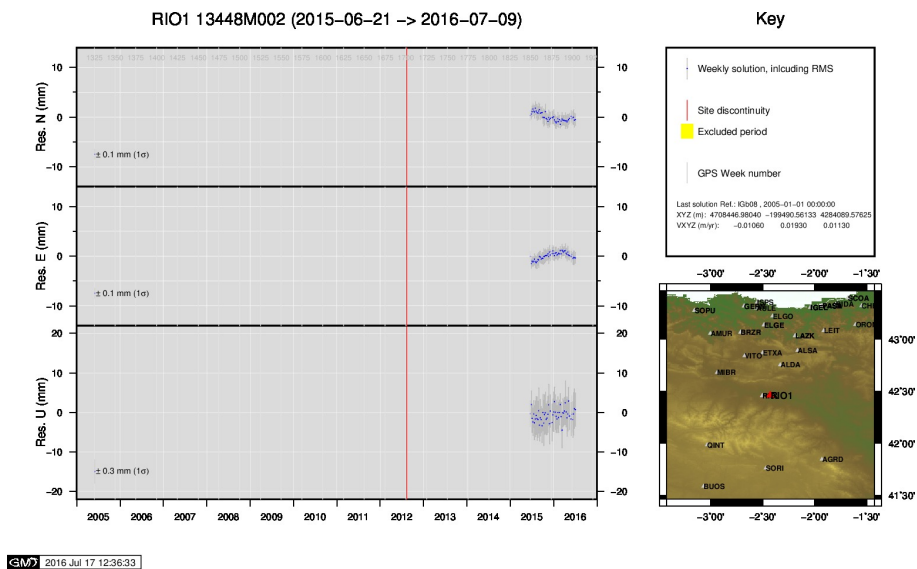
19) ORON



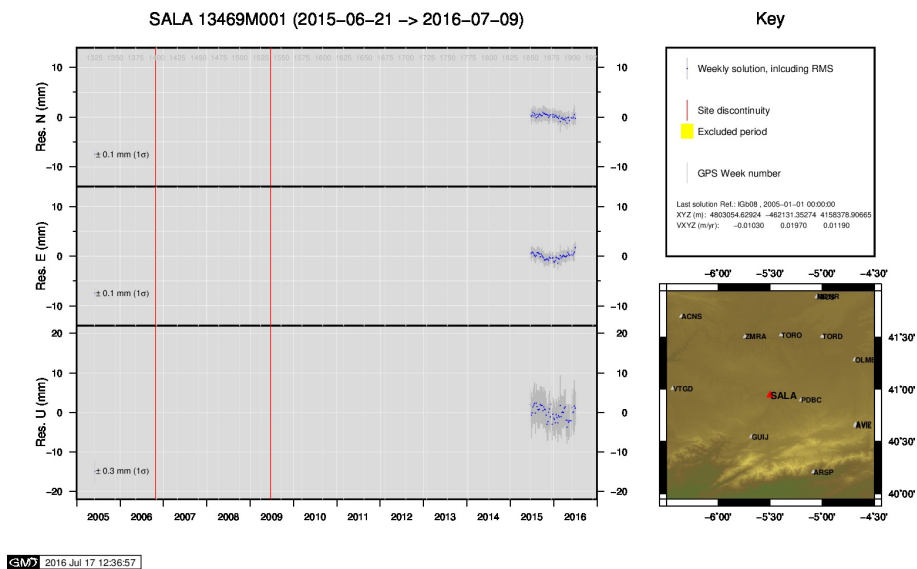
20) PAS2



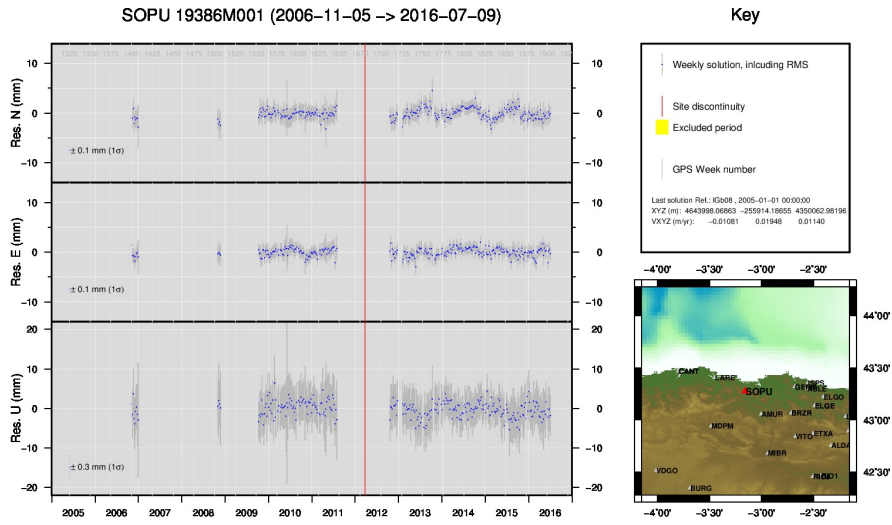
21) PASA



22) RIO1

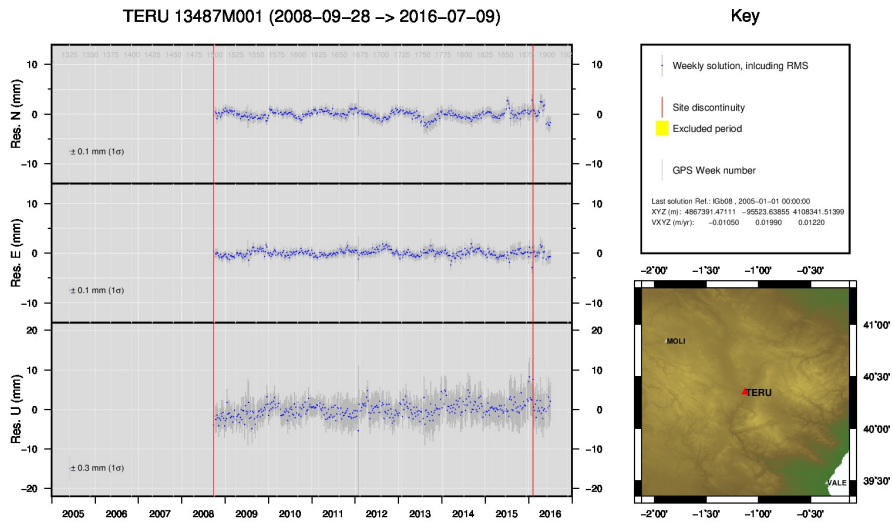


23) SALA



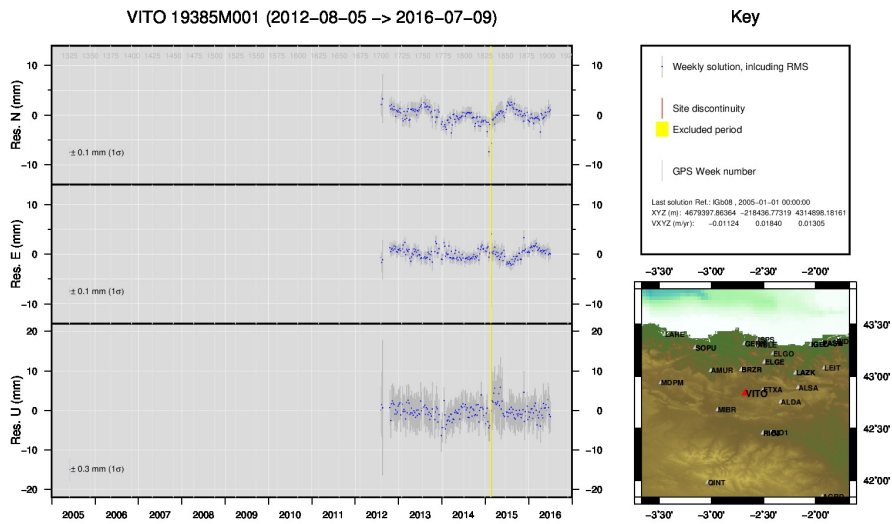
GMW 2016 Jul 17 12:37:57

24) SOPU



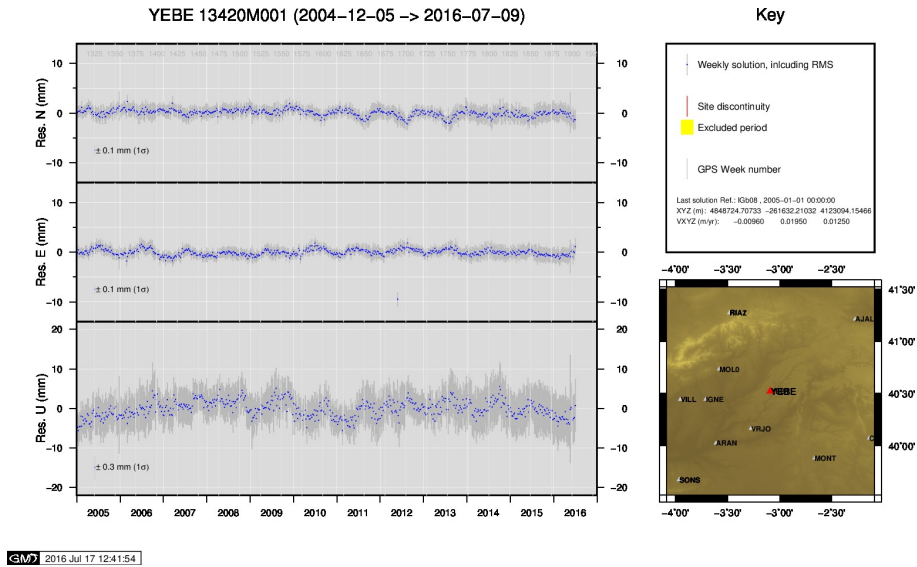
GMW 2016 Jul 17 12:39:14

25) TERU

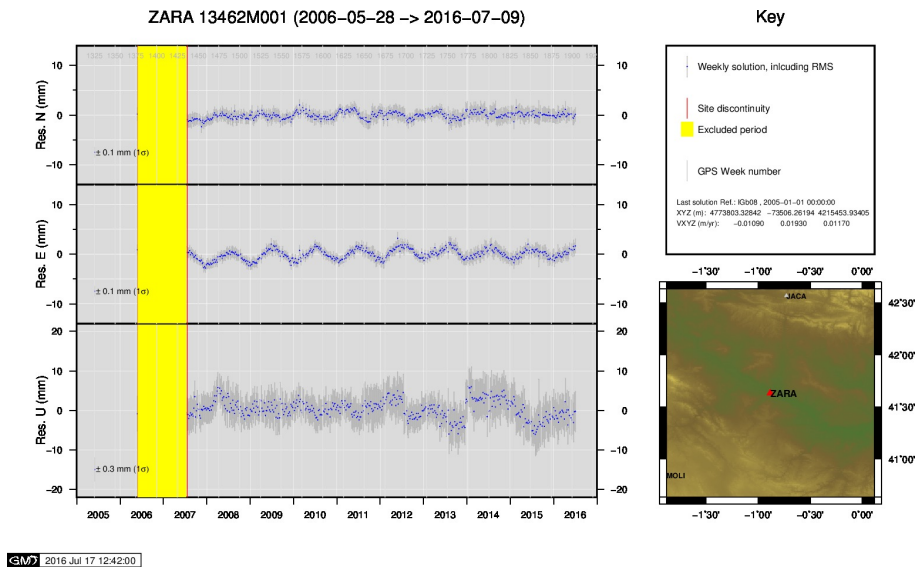


GMW 2016 Jul 17 12:41:18

26) VITO



27) YEBE



28) ZARA