

ARA-DAC Weekly Analysis Result: 1921 (GFA)

Technical Report

GPS Week: 1921 (GFA)

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

ARA-DAC details:

Contact person: J. Zurutuza

Contact mail: geodesia@aranzadi.eus

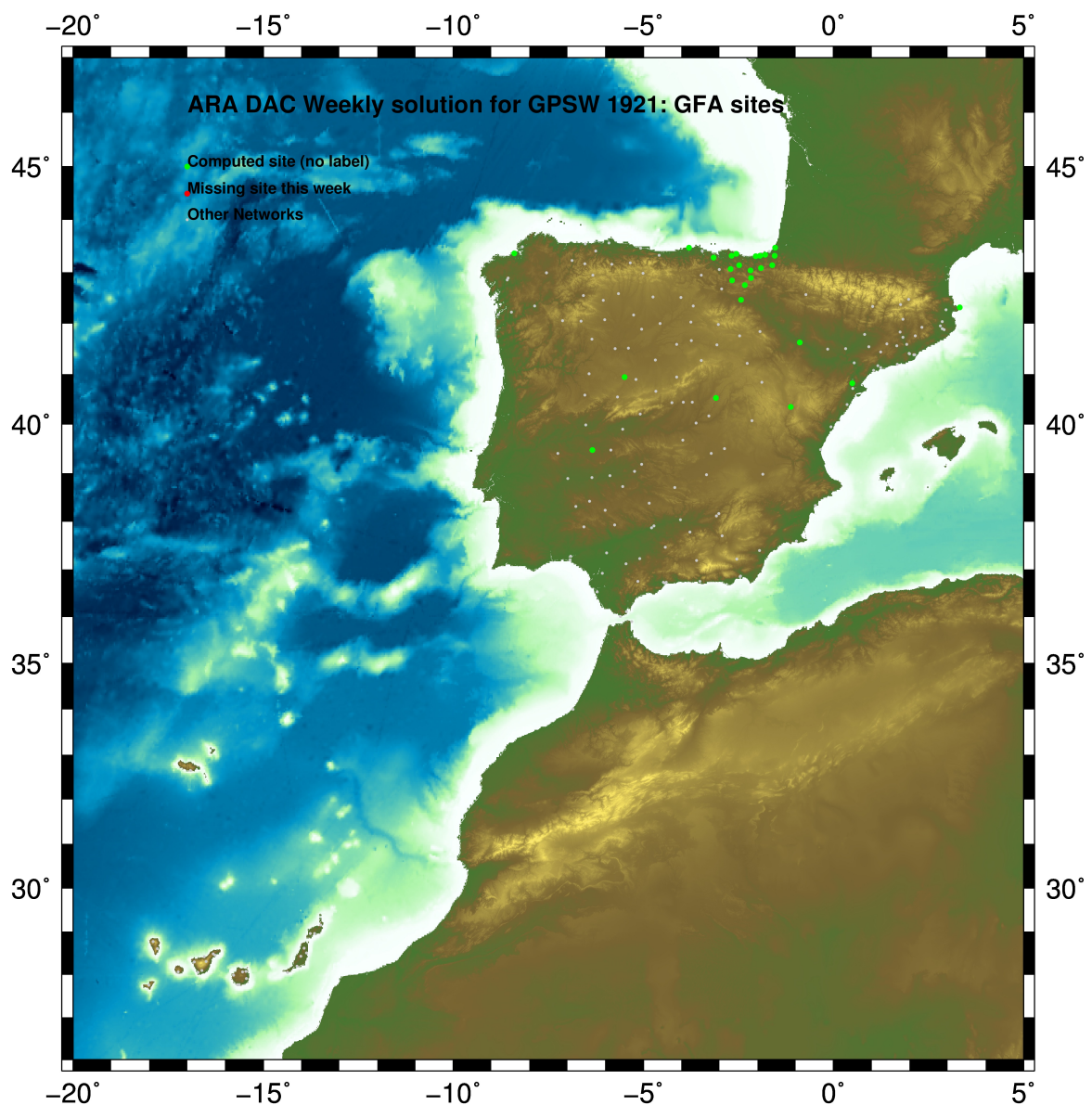
Report generated on 2016/11/13 at 16:59:12



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 Nov 13 16:59:04

Fig.1: Computed Sites for GPS Week1921 (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.

ARA LAC 1921 WEEK COMBINATION: PRECISE ORBITS 13-NOV-16 15:23

LOCAL GEODETIC DATUM: IGB08 EPOCH: 2016-11-02 12:00:00

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
1	ACDR 13434M001	4594489.58961	-678367.50309	4357066.26050	W
22	ALDA 19383M001	4687280.19235	-190876.61575	4308106.92528	A
28	ALSA 19419M001	4677250.86897	-176770.44659	4319079.84644	A
51	BLAZ 10074M002	4634456.09453	-124345.02880	4365785.43651	A
55	BIDA 00000M000	4644177.85661	-145778.37296	4354832.45778	A
54	BRZR 19387M001	4662221.01807	-220769.95077	4333309.40858	A
7	CACE 13447M001	4899866.52965	-544567.08491	4033770.17573	W
8	CANT 13438M001	4625924.34322	-307096.28245	4365771.52920	W
69	CHER 00000M000	4645880.35434	-125721.97682	4353624.34777	A
11	CREU 13432M001	4715420.16460	273178.00765	4271946.81164	A
12	EBRE 13410M001	4833520.01918	41537.34112	4147461.68697	W
77	ELGE 19353S001	4657557.43385	-202241.52336	4338991.84469	A
87	GERN 19389M001	4642811.33741	-217222.98147	4353278.85503	A
101	IGEL 19352S001	4645951.46090	-165574.55166	4352550.39576	A
105	ISPS 19484M001	4640596.51203	-206963.82570	4356391.88700	A
109	LAKZ 19354S001	4666098.37340	-178186.24172	4330463.64756	A
112	LEIT 19428M001	4633520.96959	-155859.76623	4334519.85675	A
141	ORON 19427M001	4659695.81989	-130864.70645	4338948.86027	A
146	PAS2 19351S001	4644909.09321	-156645.11751	4353623.05271	A
147	PASA 19351S001	4644909.09161	-156645.11776	4353623.05193	A
27	RI01 13448M002	4708446.85597	-199490.33304	4284089.70991	W
28	SALA 13469M001	4803054.50702	-462131.11922	4158379.04749	W
172	SOPU 19386M001	4643997.94186	-255913.95580	4350063.11862	A
31	TERU 13487M001	4867391.35023	-95523.40363	4108341.65686	W
204	VITO 19385M001	4679397.73211	-218436.55464	4314898.33755	A
35	YEBE 13420M001	4848724.59446	-261631.97938	4123094.30151	W
36	ZARA 13462M001	4773803.19928	-73506.03406	4215454.07144	W

5.2 ETRS89 Coordinates

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

ETRF2000 COORD. wk 1921 13-NOV-16 15:23

LOCAL GEODETIC DATUM: ETRF2000 EPOCH: 2016-11-02 12:00:00

NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG
1	ACDR 13434M001	4594489.87128	-678367.99310	4357065.87211	W
22	ALDA 19383M001	4687280.52315	-190877.11384	4308106.53595	A
28	ALSA 19419M001	4677251.20197	-176770.94269	4319079.45796	A
51	BLAZ 10074M002	4634456.43611	-124345.52169	4365785.05056	A
55	BIDA 00000M000	4644178.19520	-145778.86683	4354832.07192	A
54	BRZR 19387M001	4662221.34727	-220770.44653	4333309.02065	A
7	CACE 13447M001	4899866.80507	-544567.60367	4033769.76774	W
8	CANT 13438M001	4625924.66524	-307096.77492	4365771.14282	W
69	CHER 00000M000	4645880.69500	-125722.47080	4353623.96202	A
11	CREU 13432M001	4715420.54269	273177.50820	4271946.42543	A
12	EBRE 13410M001	4833520.36459	41536.82978	4147461.29008	W
77	ELGE 19353S001	4657557.76540	-202242.01864	4338991.45729	A
87	GERN 19389M001	4642811.66826	-217223.47537	4353278.46848	A
101	IGEL 19352S001	4645951.79723	-165575.04575	4352550.00956	A
105	ISPS 19484M001	4640596.84418	-206964.31937	4356391.50072	A
109	LAKZ 19354S001	4666098.70698	-178186.73775	4330463.25983	A
112	LEIT 19428M001	4633521.30581	-155859.26197	4334519.46945	A
141	ORON 19427M001	4659696.15907	-130865.28176	4338948.47351	A
146	PAS2 19351S001	4644909.43056	-156645.61147	4353622.66668	A
147	PASA 19351S001	4644909.42896	-156645.61172	4353622.66590	A
27	RI01 13448M002	4708447.18431	-199490.83315	4284089.31903	W
28	SALA 13469M001	4803054.79923	-462131.62877	4158378.64714	W
172	SOPU 19386M001	4643998.26836	-255914.44989	4350062.73156	A
31	TERU 13487M001	4867391.67849	-95523.91853	4108341.25613	W
204	VITO 19385M001	4679398.06039	-218437.05203	4314897.94846	A
35	YEBE 13420M001	4848724.90589	-261632.49289	4123093.90024	W
36	ZARA 13462M001	4773803.53673	-73506.54007	4215453.67743	W

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).

ARA LAC 1921 WEEK COMBINATION: PRECISE ORBITS 13-NOV-16 15:23

Station	#Days	Weekday 0123456	Repeatability (mm)		
			N	E	U

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	-0.84	0.31	-3.09
2	ALAC 13433M001	I W	1.26	0.82	-1.08
3	ALBA 13452M001	I W	-0.15	1.36	-0.48
4	ALME 13437M001	I W	0.03	1.40	5.55
6	BRST 10004M004	I W	0.47	-0.02	1.69
7	CACE 13447M001	I W	1.50	-0.04	-1.08
8	CANT 13436M001	I W	-0.04	-1.12	-1.98
9	CEU1 13449M002	I W	1.79	4.13	7.90
10	COBA 13453M001	I W	1.37	-0.11	-4.58
12	EBRE 13410M001	I W	2.46	-0.04	0.69
14	FUNC 13911S001	I W	-0.55	-0.85	4.80
16	HUEL 13451M001	I W	-0.02	1.50	1.01
17	IZAN 31309M002	I W	-4.21	-0.20	2.15
18	LLIV 13436M001	I W	5.68	-2.58	-8.46
19	LPAL 81701M001	I W	-5.17	-1.06	3.45
20	LRDC 10023M001	I W	1.09	-0.89	-2.82
21	MALA 13443M001	I W	-3.38	1.89	-2.25
22	MALL 13444M001	I W	0.31	0.11	2.34
24	MELI 13379M001	I W	-1.38	0.44	-1.45
25	FDEL 31906M004	I W	-9.41	-10.70	16.18
26	RABT 35001M002	I W	-0.30	1.18	-0.27
27	RID1 13448M002	I W	0.91	0.65	-4.33
28	SALA 13469M001	I W	-0.23	0.06	1.96
29	SCDA 10088M002	I W	-0.82	-0.23	-1.76
30	SDNS 13446M001	I W	0.31	-0.63	-3.28
31	TERU 13487M001	I W	4.02	1.10	-2.43
32	VALE 13439M001	I W	0.00	1.07	-2.04
33	VIGO 13450M001	I W	-0.48	0.16	-0.43
34	VILL 13406M001	I W	0.73	1.38	-3.52
35	YEBE 13420M001	I W	1.68	0.21	1.50
36	ZARA 13462M001	I W	0.79	0.37	-2.91
37	ZIMM 14001M004	I W	2.56	0.33	-0.99
RMS / COMPONENT			2.69	2.27	4.40
MEAN			-0.00	0.00	0.00
MIN			-9.41	-10.70	-8.46
MAX			5.68	4.13	16.18

NUMBER OF PARAMETERS : 3
NUMBER OF COORDINATES : 96
RMS OF TRANSFORMATION : 3.25 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          7692831
NUMBER OF UNKNOWN               112464
NUMBER OF DEGREES OF FREEDOM    7580367
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)     180
VARIANCE FACTOR                  1.948202655284387

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
 1  0.00153    -0.0183 -0.0076  0.0147  0.0002 -0.0007 -0.0002  0.00065
 2  0.00167    -0.0141  0.0247  0.0276 -0.0006 -0.0010  0.0006 -0.00067
 3  0.00162     0.0012  0.0263  0.0026 -0.0005 -0.0000  0.0007 -0.00033
 4  0.00175     0.0105  0.0131 -0.0180 -0.0002  0.0007  0.0003  0.00054
 5  0.00197    -0.0038  0.0003  0.0024 -0.0001 -0.0001 -0.0001  0.00040
 6  0.00269     0.0109 -0.0110 -0.0117  0.0003  0.0005 -0.0002 -0.00036
 7  0.02871    -0.0234 -0.0066  0.0383  0.0000 -0.0015 -0.0002 -0.00058
```

```
Statistics of individual solutions:
-----
File  RMS (m)      DOF  Chi**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
 1  0.00131    1114047    1.70          1130673      3          471    16158    0
 2  0.00133    1113848    1.76          1130496      3          474    16177    0
 3  0.00138    1097602    1.90          1114027      3          474    15954    0
 4  0.00137    1061400    1.87          1078023      3          471    16155    0
 5  0.00139    1061011    1.93          1077121      3          468    15645    0
 6  0.00143    1062840    2.04          1079111      3          468    15806    0
 7  0.00154    1066820    2.37          1083380      3          471    16092    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 16:304:00000 16:310:86370 LEICA GRX1200PRO -----
ALDA A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
ALSA A 1 P 16:304:00000 16:310:86370 LEICA GRX1200GGPRO -----
BIAZ A 1 P 16:304:00000 16:310:86370 LEICA GRX1200GGPRO -----
BIDA A 1 P 16:305:24960 16:310:21720 LEICA GR10 -----
BRZR A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
CACE A 1 P 16:304:00000 16:310:86370 TRIMBLE NETR9 -----
CANT A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
CHER A 1 P 16:304:00000 16:310:86370 LEICA GRX1200+GNSS -----
CREU A 1 P 16:304:00000 16:310:86370 LEICA GR50 -----
EBRE A 1 P 16:304:00000 16:310:86370 TRIMBLE NETR9 -----
ELGE A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
GERN A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
IGEL A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
ISPS A 1 P 16:304:00000 16:310:86370 TRIMBLE NETR9 -----
LAZK A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
LEIT A 1 P 16:304:00000 16:310:86370 LEICA GRX1200+GNSS -----
ORON A 1 P 16:304:00000 16:310:86370 LEICA GRX1200GGPRO -----
PAS2 A 1 P 16:304:00000 16:310:86370 TPS NET-G3A -----
PASA A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
RIO1 A 1 P 16:304:00000 16:310:86370 LEICA GR25 -----
SALA A 1 P 16:304:00000 16:310:86370 LEICA GRX1200+GNSS -----
SOPU A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
TERU A 1 P 16:304:00000 16:310:86370 LEICA GRX1200GGPRO -----
VITO A 1 P 16:304:00000 16:310:86370 LEICA GR10 -----
YEBE A 1 P 16:304:00030 16:310:86370 TRIMBLE NETR5 -----
ZARA A 1 P 16:304:00000 16:310:86370 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 16:304:00000 16:310:86370 LEIAT504 LEIS -----
ALDA A 1 P 16:304:00000 16:310:86370 LEIAS10 NONE -----
ALSA A 1 P 16:304:00000 16:310:86370 LEIAX1202GG NONE -----
BIAZ A 1 P 16:304:00000 16:310:86370 LEIAR25 LEIT -----
BIDA A 1 P 16:305:24960 16:310:21720 LEIAS10 NONE -----
BRZR A 1 P 16:304:00000 16:310:86370 LEIAS10 NONE -----
CACE A 1 P 16:304:00000 16:310:86370 TRM29659.00 NONE -----
CANT A 1 P 16:304:00000 16:310:86370 LEIAR25.R4 LEIT 25066
CHER A 1 P 16:304:00000 16:310:86370 LEIAX1203+GNSS NONE -----
```



```

CREU A 1 P 16:304:00000 16:310:86370 LEIAR25.R4 NONE 26357
EBRE A 1 P 16:304:00000 16:310:86370 TRM57971.00 NONE 25603
ELGE A 1 P 16:304:00000 16:310:86370 LEIAR25.R4 LEIT -----
GERN A 1 P 16:304:00000 16:310:86370 LEIAS10 NONE -----
IGEL A 1 P 16:304:00000 16:310:86370 LEIAR20 LEIM -----
ISPS A 1 P 16:304:00000 16:310:86370 TRM59900.00 SCIS -----
LAZK A 1 P 16:304:00000 16:310:86370 LEIAR25.R4 LEIT -----
LEIT A 1 P 16:304:00000 16:310:86370 LELAX1203+GNSS NONE -----
ORON A 1 P 16:304:00000 16:310:86370 LELAX1202GG NONE -----
PAS2 A 1 P 16:304:00000 16:310:86370 LEIAR20 LEIM 73034
PASA A 1 P 16:304:00000 16:310:86370 LEIAR20 LEIM 73034
RIO1 A 1 P 16:304:00000 16:310:86370 LEIAR25.R4 LEIT 25138
SALA A 1 P 16:304:00000 16:310:86370 LEIAR25 NONE -----
SOPU A 1 P 16:304:00000 16:310:86370 LEIAS10 NONE -----
TERU A 1 P 16:304:00000 16:310:86370 LELAT504GG LEIS -----
VITO A 1 P 16:304:00000 16:310:86370 LEIAS10 NONE -----
YEBE A 1 P 16:304:00030 16:310:86370 TRM29659.00 NONE -----
ZARA A 1 P 16:304:00000 16:310:86370 TRM29659.00 NONE -----

```

6.3 Eccentricities

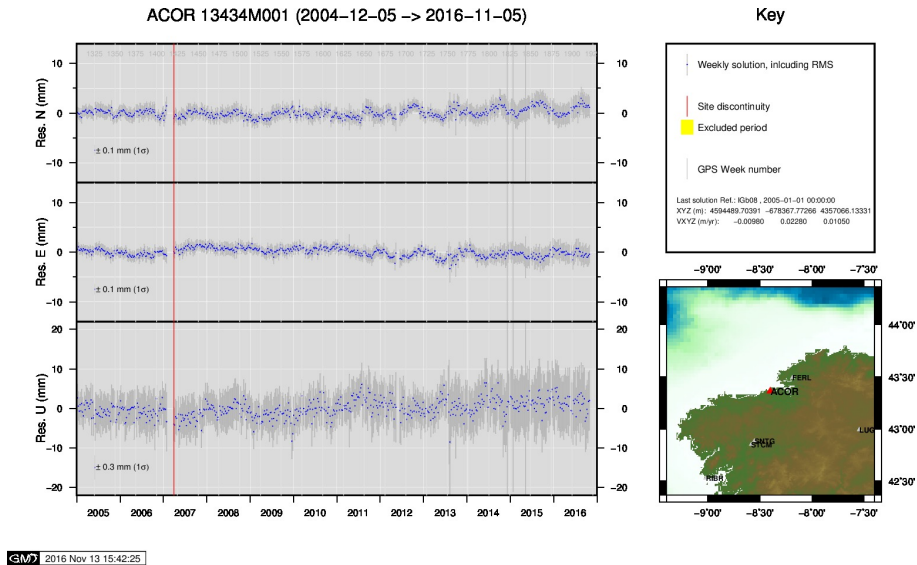
```

*
*SITE PT SOLN T DATA_START__ DATA_END_____ AXE ARP->BENCHMARK(M)-----
ACOR A 1 P 16:304:00000 16:310:86370 UNE 3.0460 0.0000 0.0000
ALDA A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
ALSA A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
BIAZ A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
BIDA A 1 P 16:305:24960 16:310:21720 UNE 0.0000 0.0000 0.0000
BRZR A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
CACE A 1 P 16:304:00000 16:310:86370 UNE 0.0600 0.0000 0.0000
CANT A 1 P 16:304:00000 16:310:86370 UNE 3.0490 0.0000 0.0000
CHER A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
CREU A 1 P 16:304:00000 16:310:86370 UNE 0.0770 0.0000 0.0000
EBRE A 1 P 16:304:00000 16:310:86370 UNE 0.0770 0.0000 0.0000
ELGE A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
GERN A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
IGEL A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
ISPS A 1 P 16:304:00000 16:310:86370 UNE 0.0350 0.0000 0.0000
LAZK A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
LEIT A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
ORON A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
PAS2 A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
PASA A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
RIO1 A 1 P 16:304:00000 16:310:86370 UNE 0.0606 0.0000 0.0000
SALA A 1 P 16:304:00000 16:310:86370 UNE 0.0600 0.0000 0.0000
SOPU A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
TERU A 1 P 16:304:00000 16:310:86370 UNE 0.0600 0.0000 0.0000
VITO A 1 P 16:304:00000 16:310:86370 UNE 0.0000 0.0000 0.0000
YEBE A 1 P 16:304:00030 16:310:86370 UNE 0.0000 0.0000 0.0000
ZARA A 1 P 16:304:00000 16:310:86370 UNE 3.2590 0.0000 0.0000

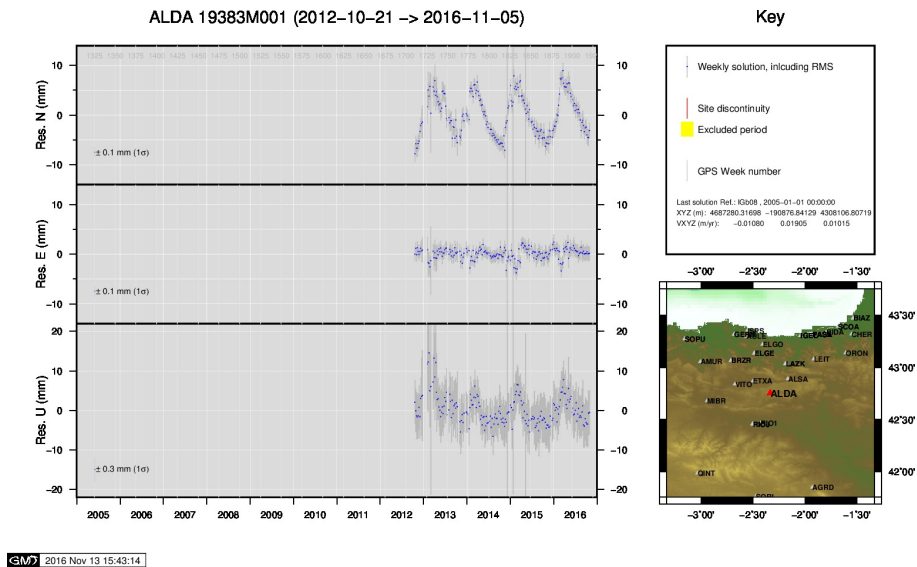
```

7 Cumulative Time Series

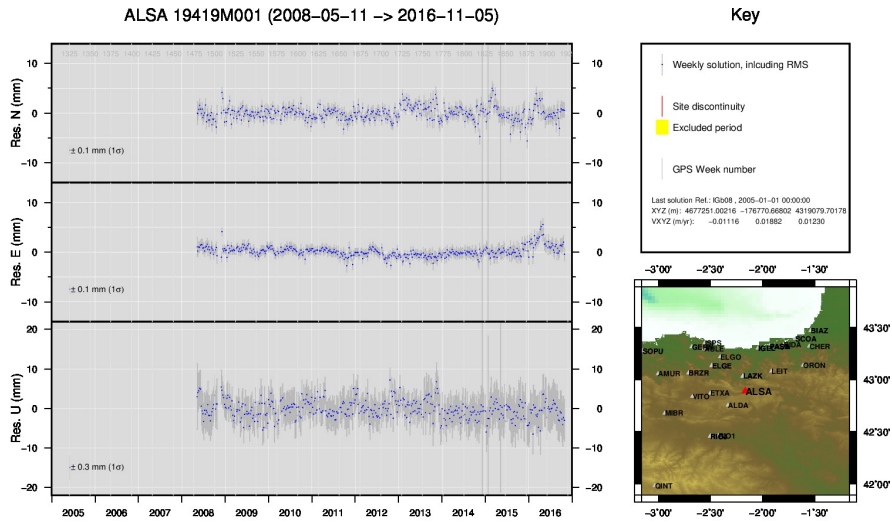
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1) ACOR

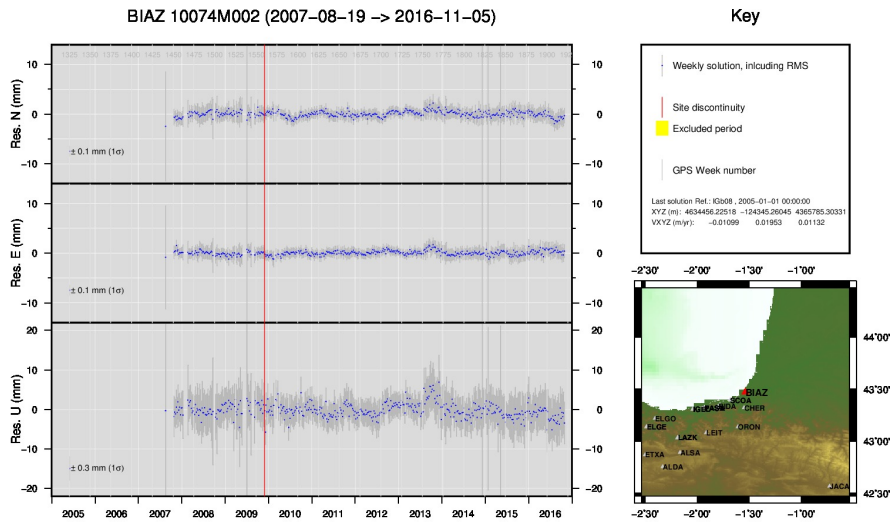


2) ALDA



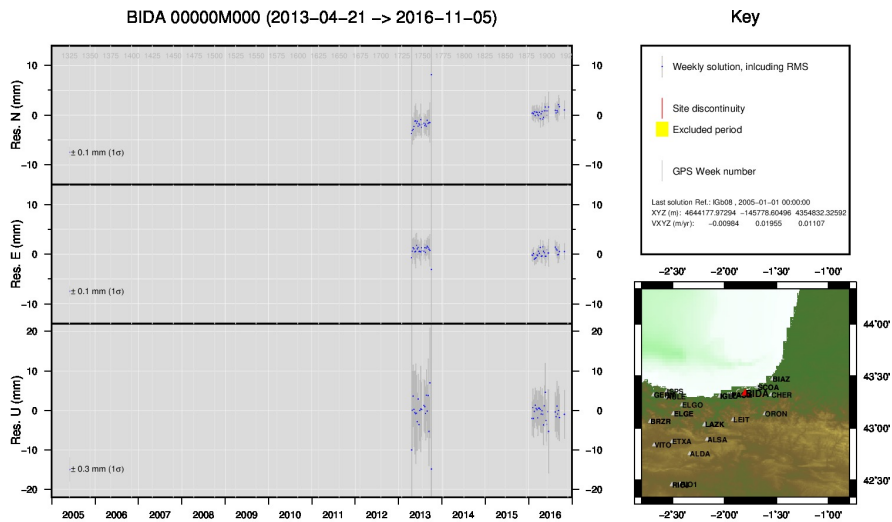
GMW 2016 Nov 13 15:43:54

3) ALSA



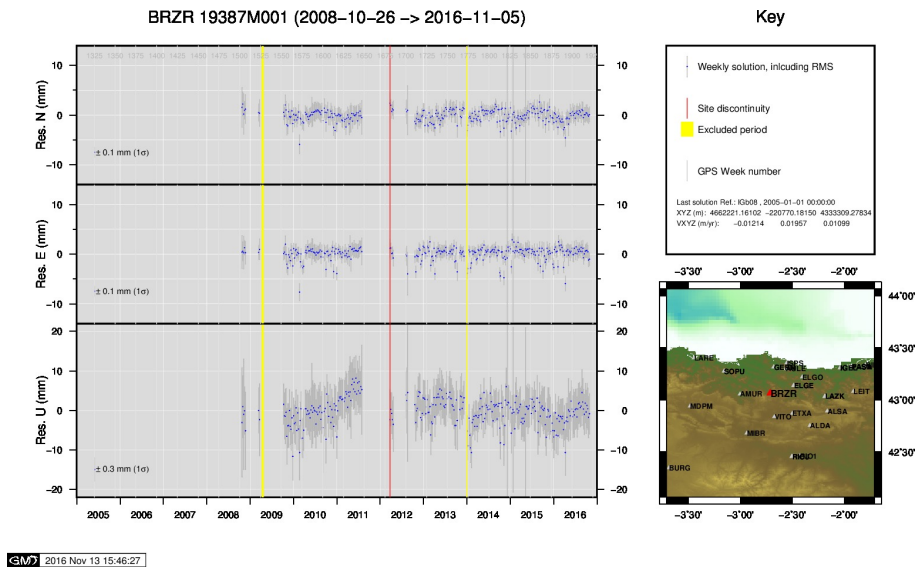
GMW 2016 Nov 13 15:46:03

4) BLAZ

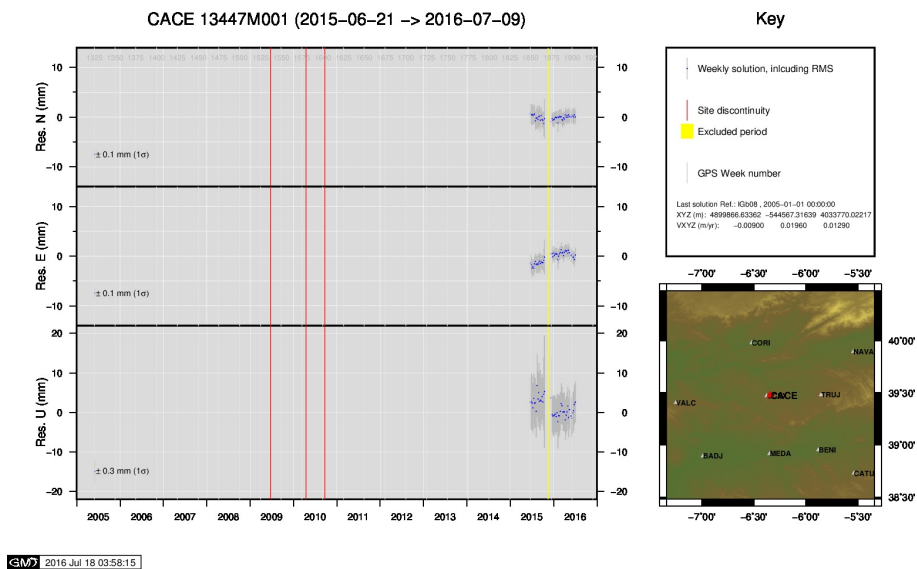


GMW 2016 Nov 13 15:46:09

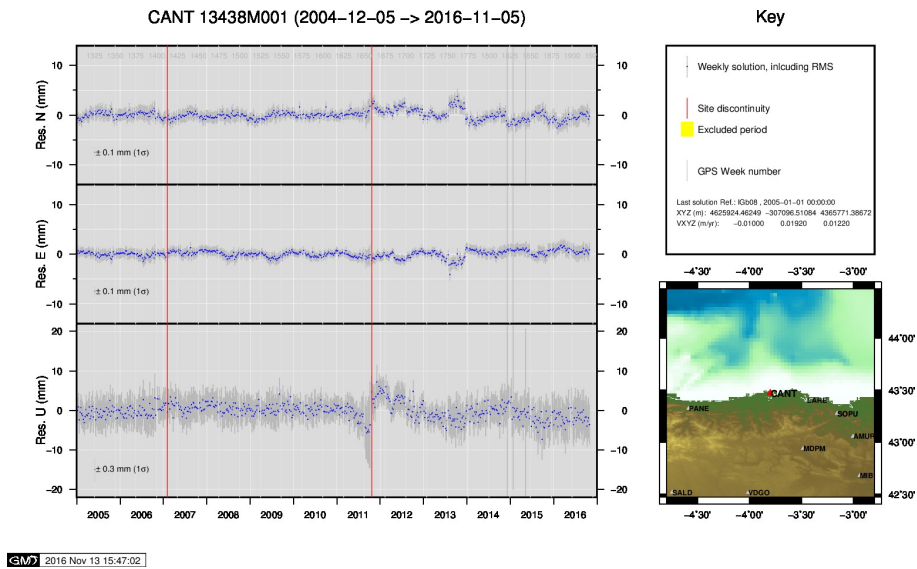
5) BIDA



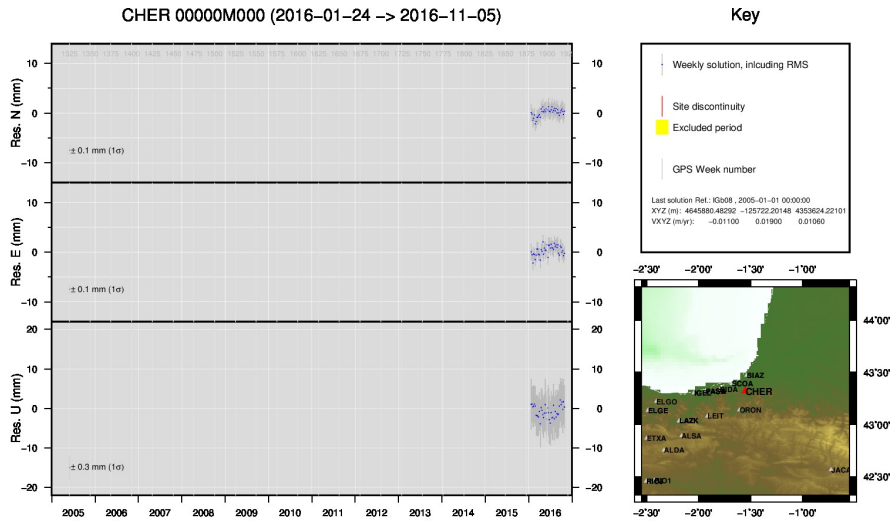
6) BRZR



7) CACE

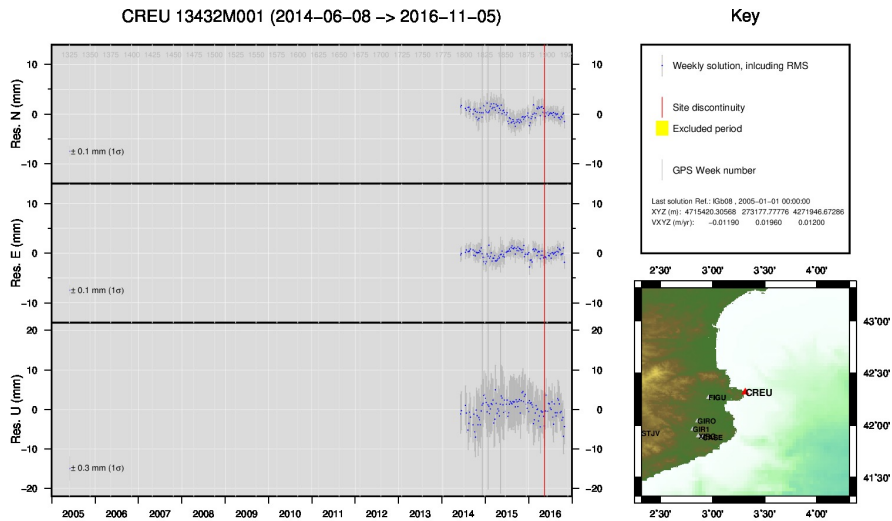


8) CANT



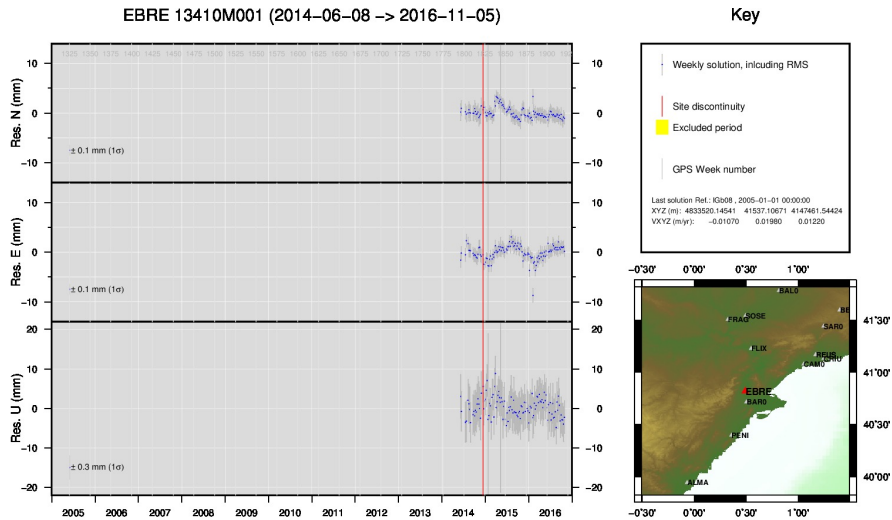
GMW 2016 Nov 13 15:48:01

9) CHER



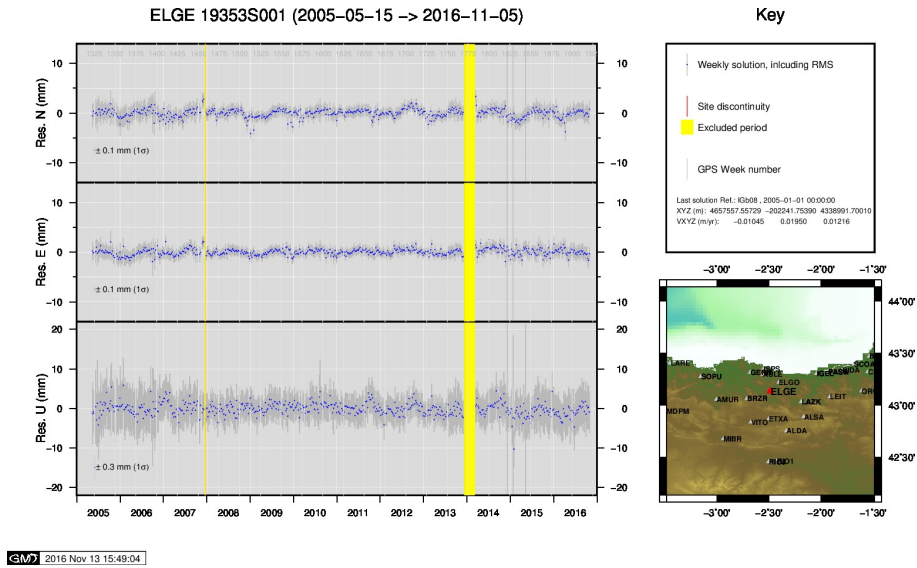
GMW 2016 Nov 13 15:48:30

10) CREU

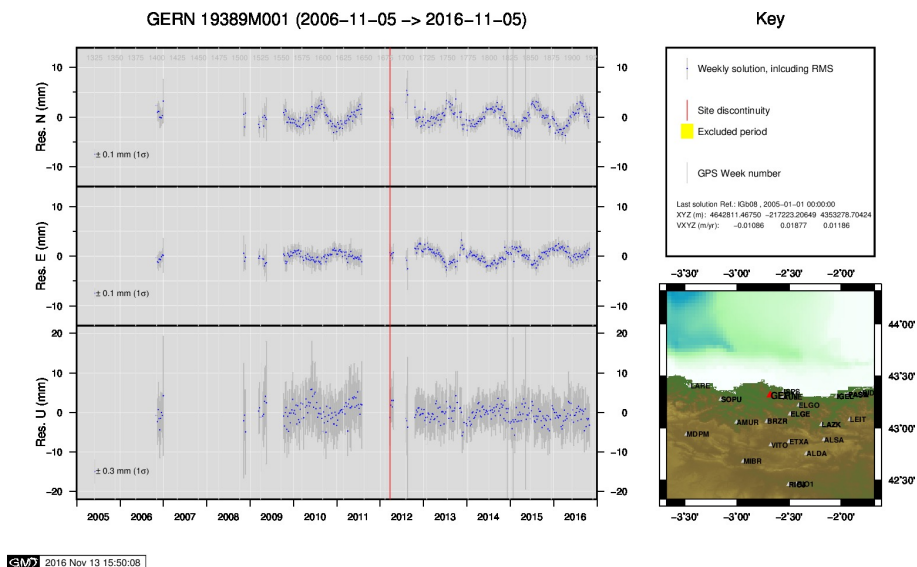


GMW 2016 Nov 13 15:48:53

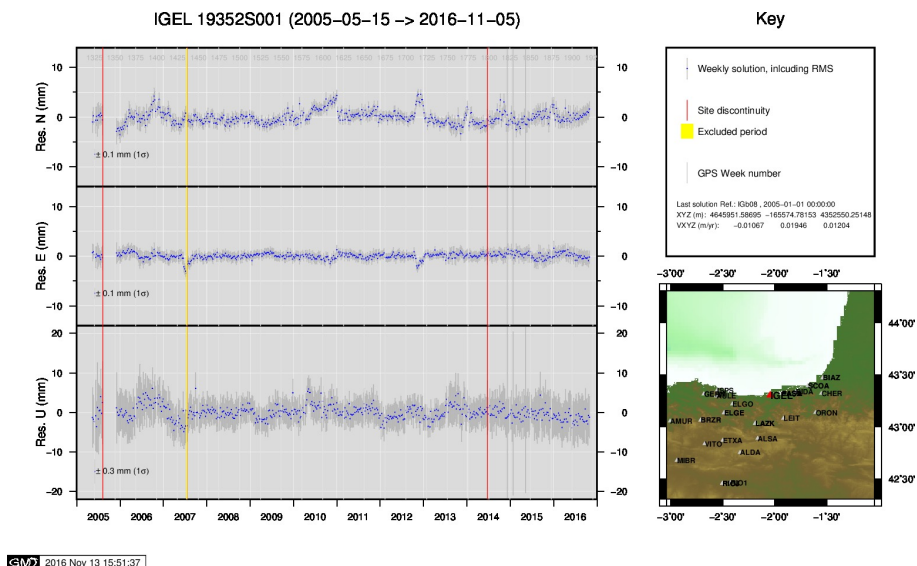
11) EBRE



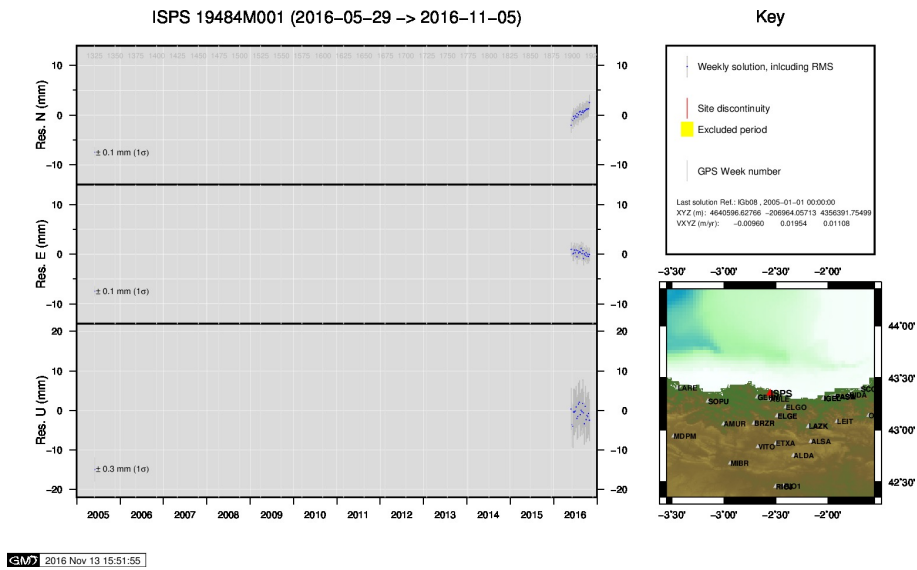
12) ELGE



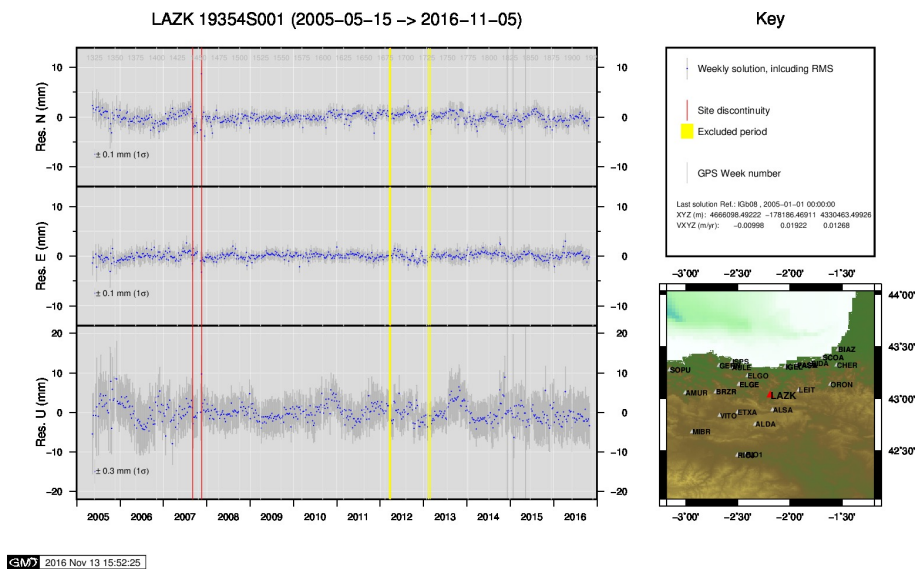
13) GERN



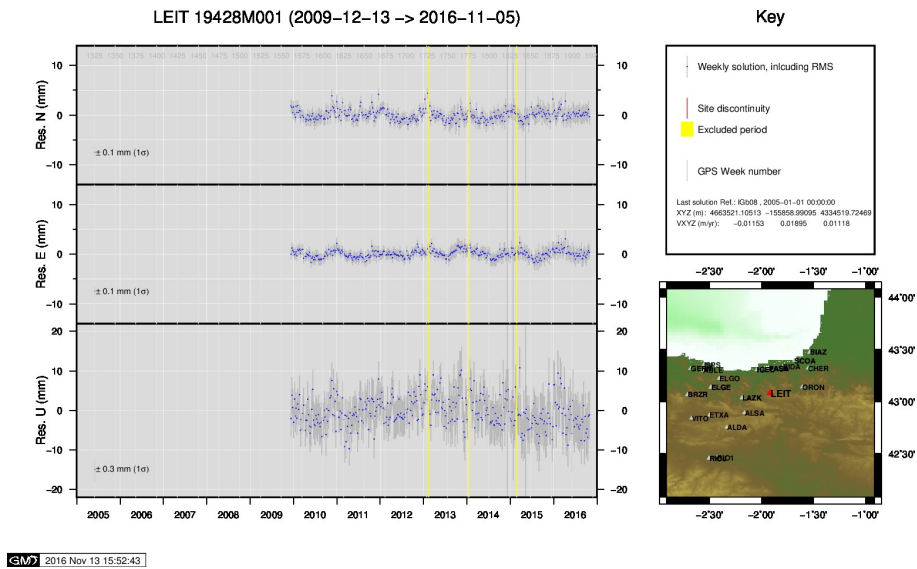
14) IGEL



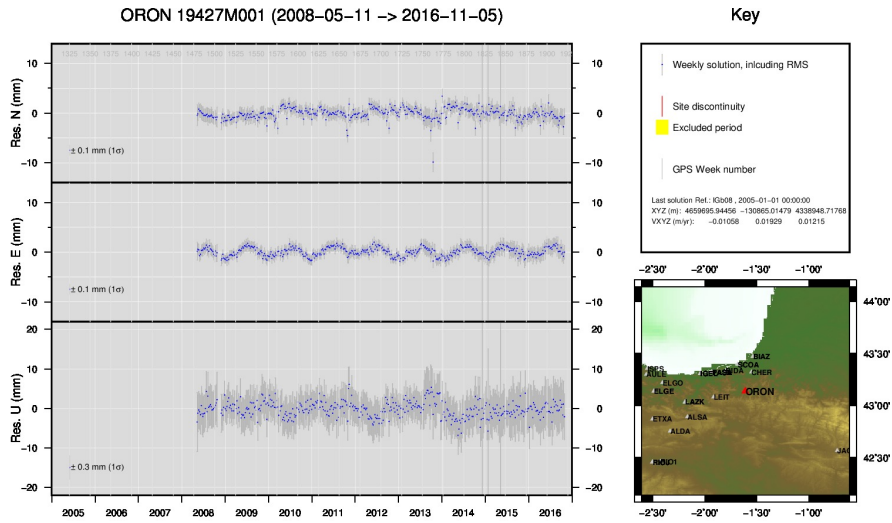
15) ISPS



16) LAZK

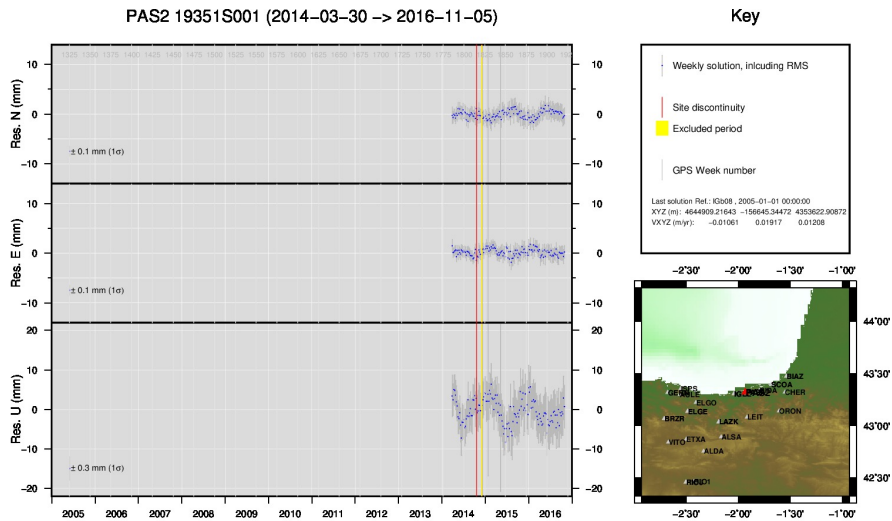


17) LEIT



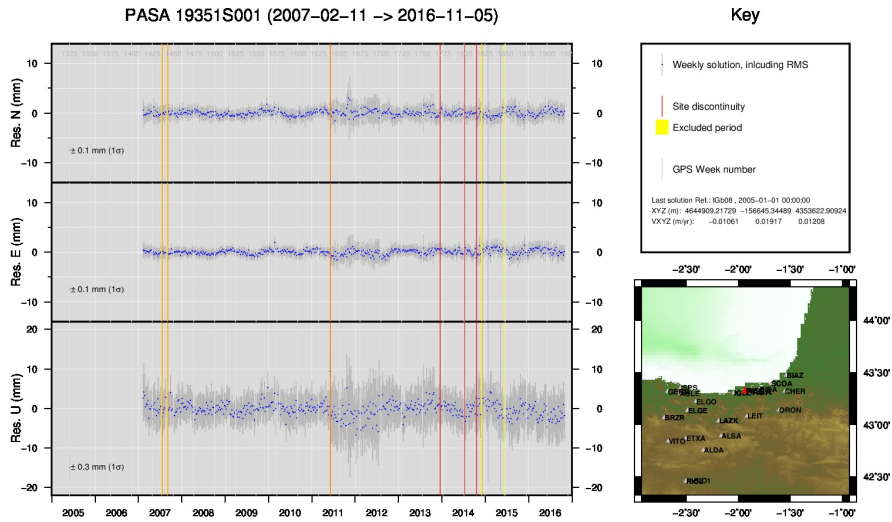
GMW 2016 Nov 13 15:56:22

18) ORON



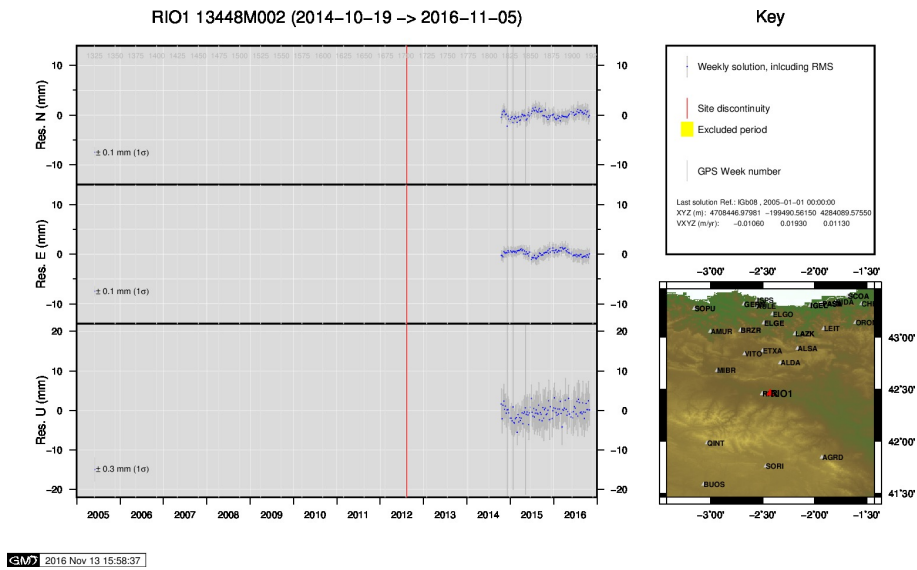
GMW 2016 Nov 13 15:56:51

19) PAS2

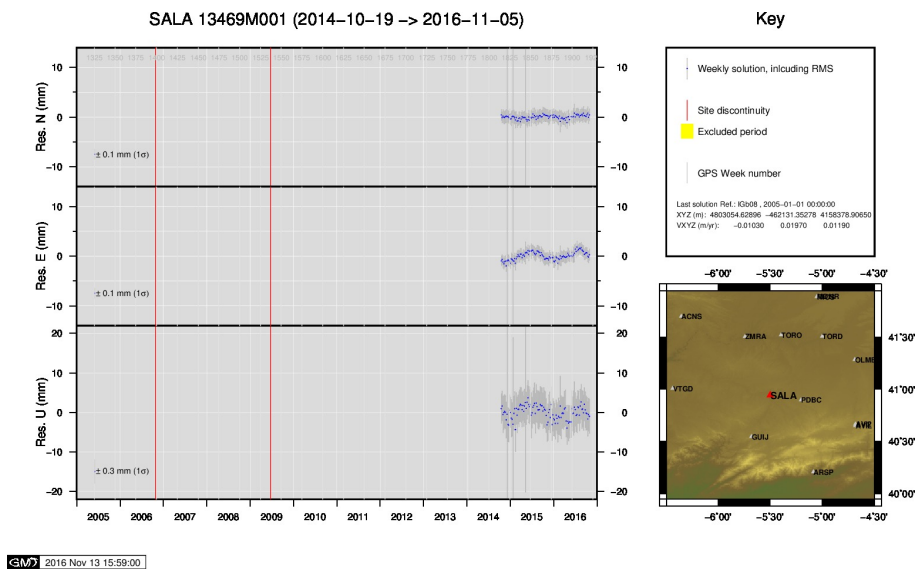


GMW 2016 Nov 13 15:56:57

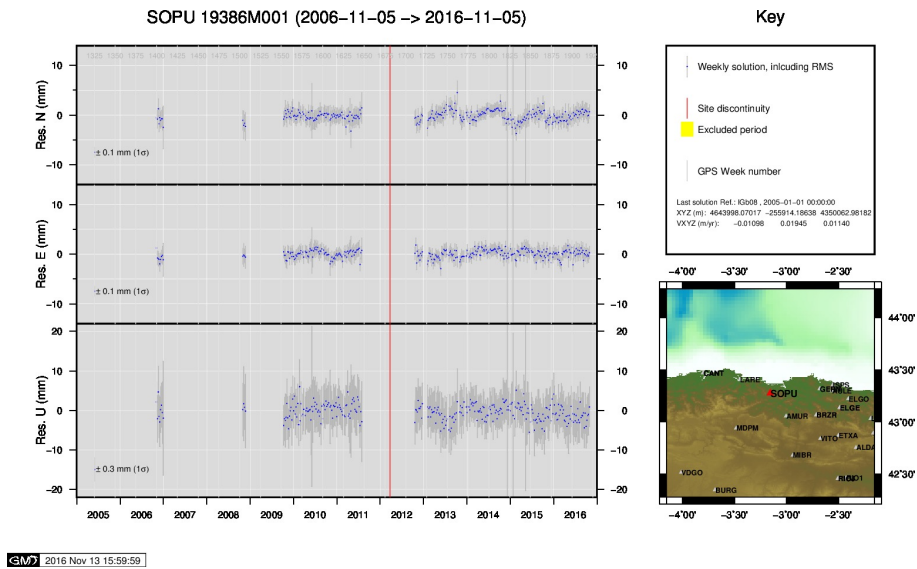
20) PASA



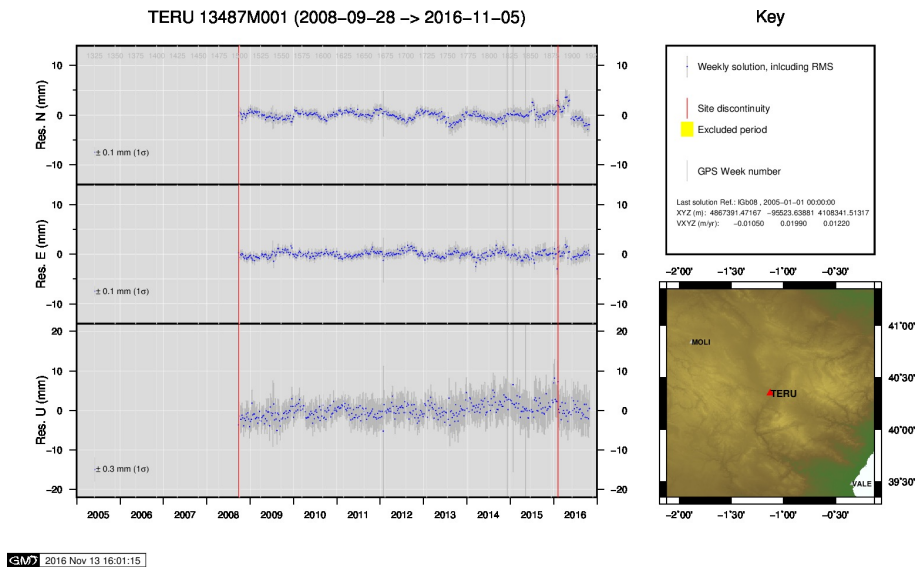
21) RIO1



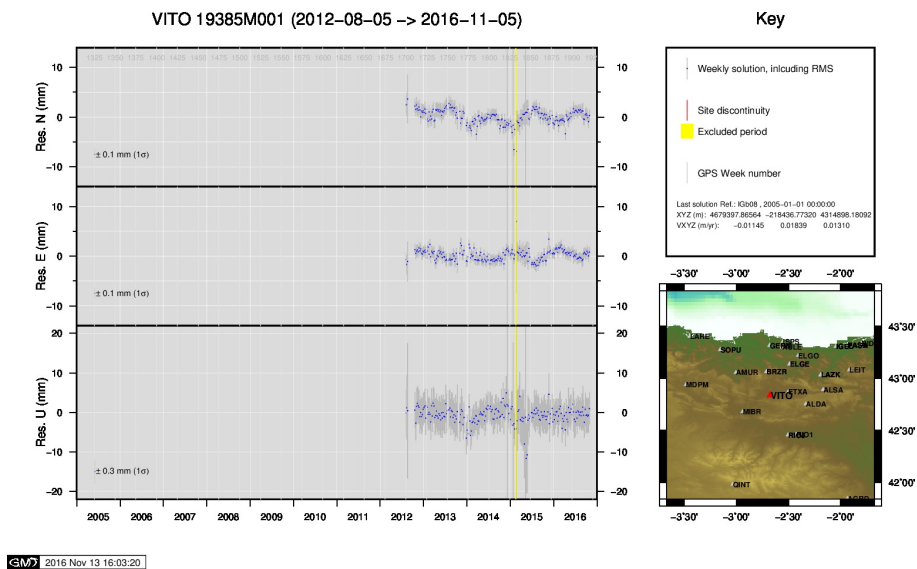
22) SALA



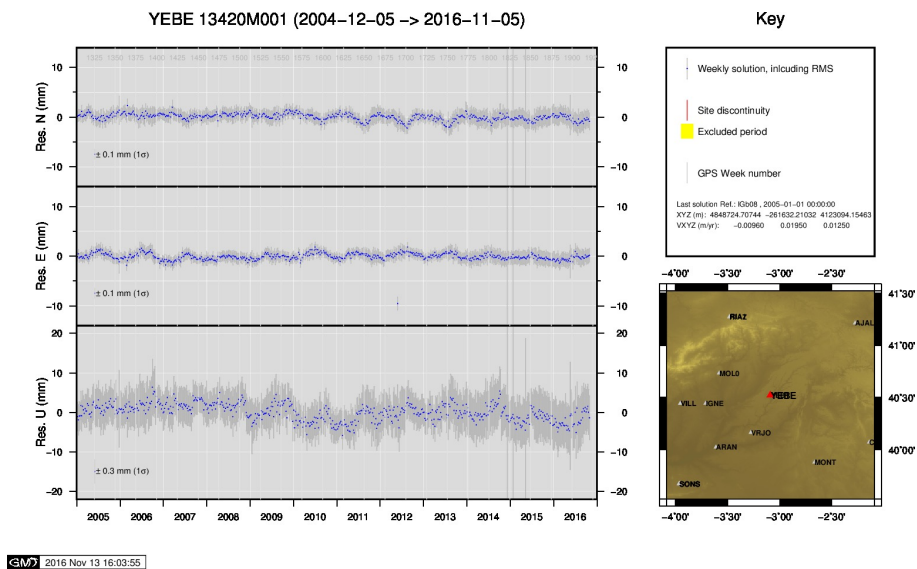
23) SOPU



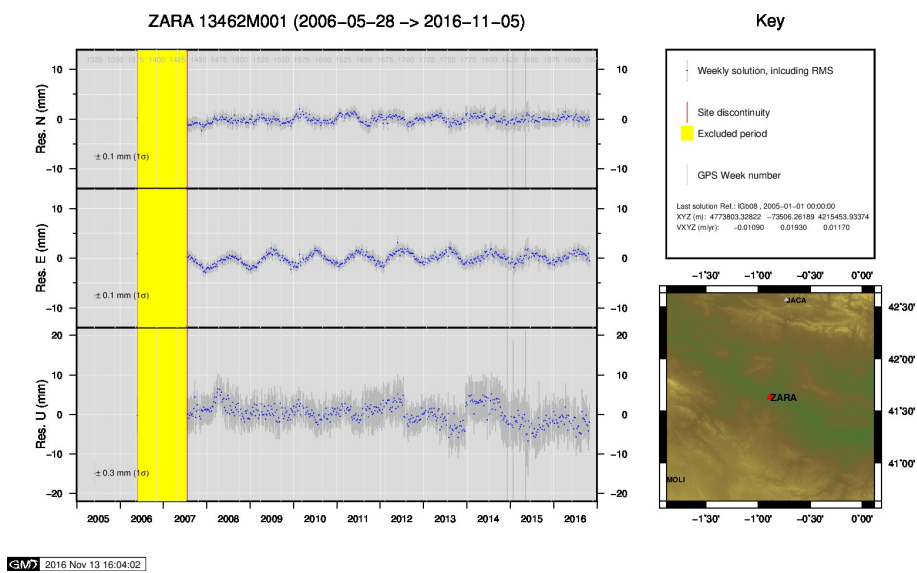
24) TERU



25) VITO



26) YEBE



27) ZARA