

# ARA-DAC Weekly Analysis Result: 2027 (GFA)

## Technical Report

**GPS Week: 2027 (GFA)**

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

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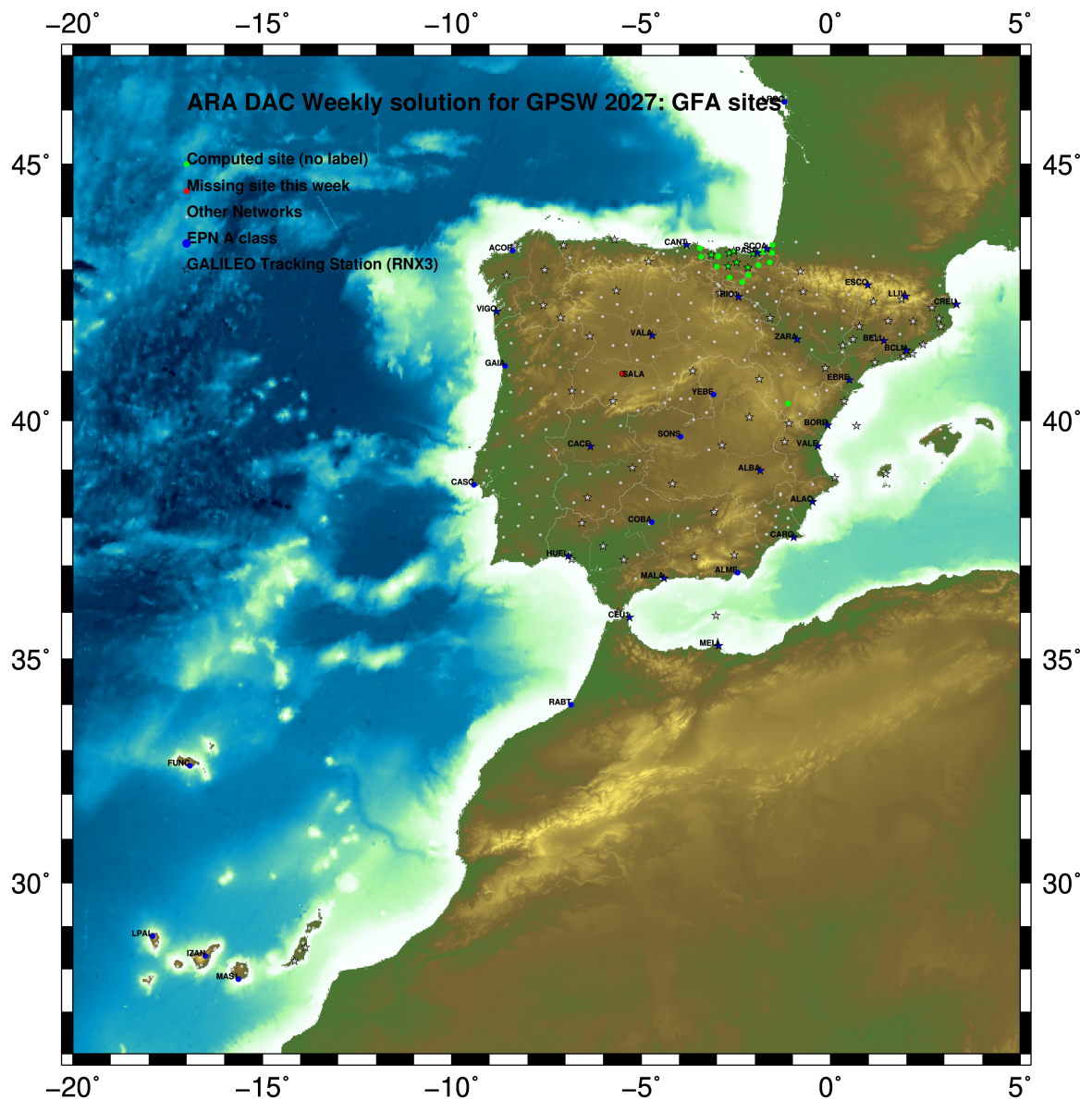
Report generated on 2018/12/09 at 21:10:06



# 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 Dec 09 21:09:58

Fig.1: Computed Sites for GPS Week2027 (GFA)

### 3 Main Computation Parameters

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

- Preprocessing: Independent baselines are defined by the criterion of maximum common observations. Cycle slips are fixed with the MAUPRP program, analysing triple phase differences for each independent baseline. If MAUPRP does not fix all slips for one station, that station is edited out.
- Basic Observable : Carrier phase,  $L_1$  and  $L_2$ ; a priori sigma of single differences:0.002 m.
  - sampling (for ambiguity resolution) : 30 s
  - sampling (for final processing) : 180 s
  - Systems: GPS+GLONASS observations are used (GALILEO also used if available from GPSW 1986 on)
- Modelled observable: Double differences of carrier phase using different combinations based on the distance.
- Ground antenna phase center calibrations: Group APCV used from the PCV\_COD.I14 file and individual calibrations from EPNC\_14.ATX. EPN\_A class sites (CRD + VEL) IGS14 used to define the reference frame (from GPSW 1934). If individual calibrations, other from these, are available, they are also included in the analysis.
- Troposphere:
  - 3 deg elev. cutoff; elevation dependent weighting
  - VMF1 mapping function. ZPD parameters are estimated using the VMF1 mapping function.
  - CHENHER gradient estimation model.
- Ionosphere: no a priori model, ionospheric effect almost removed by iono free combination.
- Ocean Loading: FES2004 (Scherneck).
- Atmosph. Loading: computed from a global grid using the GRDS1S2 program of Bernese 5.2.

### 4 Estimated Parameters

- Adjustment: Least Squares
- Rejection Criteria: 3\*rms of single differences, in the weekly combination of daily normal equations (ADDNEQ)
- Station coordinates: minimum constraints (MC) to EPN A class sites (only translations).
- Troposphere: 3 deg. After having obtained coordinates valid for the entire week, tropospheric zenith delay is solved at each site at intervals of 1 hour throughout the week, holding the coordinates constrained at the weekly values.
- Ionospheric: second and third "High Order Ionosphere (HOI)" corrections used, using CODE files, to improve Ambiguity Resolution.
- Satellite clock bias: not estimated because are eliminated by double differencing the phase data.
- Receiver clock bias: not estimated because are eliminated by double differencing the phase data.
- Orbits and ERPs: CODE's orbits and ERP for both rapid and final solutions. DE405 planetary ephemeris and JGM3 Earth geopotential model is used.
- Tidal displacements: according to IERS2010 Conventions. Atmospheric loading corrections used.

- Ambiguity: an advanced ambiguity resolution (AR) scheme is included:
  - Code-Based Widelane (WL) AR for baselines shorter than 6000km, a Melbourne-Wuebbena wide-lane and narrow-lane AR is computed.
  - Phase-Based Widelane ( $L_5$ ) AR for baselines shorter than 200km, the code-based wide-lane AR is replaced by a phase-only wide-lane with a subsequent narrow-lane AR.
  - Quasi-Ionosphere-Free (QIF)AR for the remaining real-valued ambiguities for baselines shorter than 2000km.
  - Direct  $L_1/L_2$  AR for baselines shorter than 20km
- AR Verification: Each baseline is processed by introducing the resolved integer ambiguities and checking the residuals. If there is any problem, the ambiguities are re-initialized.

## 5 Computed Coordinates

In this section the adjusted coordinates are summarized. Note that the sites with an A flag are the computed ones, whereas sites flagged as W are the ones used in the Minimal Constraints condition.

### 5.1 IGS14

The Reference Frame considered in this section is IGS14, release C2010.

ARA LAC 2027 WEEK FINAL COMBINATION: PRECISE ORBITS 09-DEC-18 17:36

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LOCAL GEODETIC DATUM: IGS14 EPOCH: 2018-11-14 12:00:00

| NUM | STATION NAME   | X (M)         | Y (M)         | Z (M)         | FLAG |
|-----|----------------|---------------|---------------|---------------|------|
| 1   | ACOR 13434M001 | 4594489.56345 | -678367.45866 | 4357066.27652 | W    |
| 33  | ALDA 19383M001 | 4687280.16524 | -190876.57662 | 4308106.94497 | A    |
| 42  | ALSA 19419M001 | 4677250.84805 | -176770.40436 | 4319079.86844 | A    |
| 44  | AMUR 19388M001 | 4661499.45406 | -244591.27351 | 4332269.87816 | A    |
| 78  | BLAZ 10074M002 | 4634456.05647 | -124344.98803 | 4365785.45360 | A    |
| 79  | BIDA 00000M000 | 4644177.83052 | -145778.33475 | 4354832.47914 | A    |
| 89  | BRZR 19387M001 | 4662220.99369 | -220769.91521 | 4333309.43156 | A    |
| 9   | CACE 13447M001 | 4899866.50627 | -544567.04759 | 4033770.19645 | W    |
| 10  | CANT 13438M001 | 4625924.31839 | -307096.24594 | 4365771.55098 | W    |
| 114 | CHER 00000M000 | 4645880.32737 | -125721.93958 | 4353624.36895 | A    |
| 15  | CREU 13432M001 | 4715420.13429 | 273178.04825  | 4271946.83310 | W    |
| 16  | EBRE 13410M001 | 4833519.99427 | 41537.37904   | 4147461.71078 | W    |
| 135 | ELGE 19353S001 | 4657557.41088 | -202241.48775 | 4338991.86678 | A    |
| 137 | EMAZ 17001M001 | 4645924.21273 | -276949.87731 | 4347759.57496 | A    |
| 157 | GERN 19389M001 | 4642811.31586 | -217222.94390 | 4353278.87800 | A    |
| 177 | IGEL 19352S001 | 4645951.43389 | -165574.51576 | 4352550.41621 | A    |
| 182 | ISPS 19484M001 | 4640596.48562 | -206963.78839 | 4356391.91063 | A    |
| 187 | KAST 19499M001 | 4646949.08679 | -240747.28842 | 4348014.99014 | A    |
| 192 | LARE 19440M001 | 4632831.95662 | -279026.14992 | 4360314.42448 | A    |
| 193 | LAZK 19354S001 | 4666098.35447 | -178186.20257 | 4330463.67205 | A    |
| 197 | LEIT 19428M001 | 4663520.93745 | -155858.72700 | 4334519.87668 | A    |
| 253 | ORON 19427M001 | 4659695.78361 | -130864.74728 | 4338948.87672 | A    |
| 260 | PAS2 19351S001 | 4644909.06811 | -156645.08012 | 4353623.07684 | A    |
| 30  | PASA 19351S001 | 4644909.06479 | -156645.08041 | 4353623.07436 | W    |
| 33  | RID1 13448M002 | 4708446.82929 | -199490.29534 | 4284089.73042 | W    |
| 35  | SCDA 10088M002 | 4639940.50512 | -136224.95273 | 4359552.41201 | W    |
| 313 | SOPU 19386M001 | 4643997.92111 | -255913.91921 | 4350063.14503 | A    |
| 333 | TERU 13487M001 | 4867391.32491 | -95523.36415  | 4108341.67626 | A    |
| 366 | VITO 19385M001 | 4679397.70420 | -218436.51855 | 4314898.35852 | A    |
| 43  | YEBE 13420M001 | 4848724.57014 | -261631.94130 | 4123094.32178 | W    |
| 44  | ZARA 13462M001 | 4773803.17204 | -73505.99661  | 4215454.08949 | 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 2027 09-DEC-18 17:36

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LOCAL GEODETIC DATUM: ETRF2000 EPOCH: 2018-11-14 12:00:00

| NUM | STATION NAME   | X (M)         | Y (M)         | Z (M)         | FLAG |
|-----|----------------|---------------|---------------|---------------|------|
| 1   | ACOR 13434M001 | 4594489.86553 | -678367.98584 | 4357065.86669 | W    |
| 33  | ALDA 19383M001 | 4687280.52007 | -190877.11223 | 4308106.53411 | A    |
| 42  | ALSA 19419M001 | 4677251.20224 | -176770.93890 | 4319079.45849 | A    |
| 44  | AMUR 19388M001 | 4661499.80436 | -244591.80663 | 4332269.46858 | A    |
| 78  | BLAZ 10074M002 | 4634456.42285 | -124345.51803 | 4365785.04746 | A    |
| 79  | BIDA 00000M000 | 4644178.19369 | -145778.86581 | 4354832.07202 | A    |
| 89  | BRZR 19387M001 | 4662221.34680 | -220770.44834 | 4333309.02221 | A    |
| 9   | CACE 13447M001 | 4899866.80178 | -544567.60555 | 4033769.76543 | W    |
| 10  | CANT 13438M001 | 4625924.66378 | -307096.77558 | 4365771.14330 | W    |
| 114 | CHER 00000M000 | 4645880.69276 | -125722.47076 | 4353623.96194 | A    |
| 15  | CREU 13432M001 | 4715420.53987 | 273177.51139  | 4271946.42556 | W    |
| 16  | EBRE 13410M001 | 4833520.36485 | 41536.82932   | 4147461.29173 | W    |
| 135 | ELGE 19353S001 | 4657557.76650 | -202242.02035 | 4338991.45800 | A    |
| 137 | EMAZ 17001M001 | 4645924.56036 | -276950.40893 | 4347759.16615 | A    |
| 157 | GERN 19389M001 | 4642811.67072 | -217223.47503 | 4353278.47013 | A    |
| 177 | IGEL 19352S001 | 4645951.79464 | -165575.04707 | 4352550.00873 | A    |
| 182 | ISPS 19484M001 | 4640596.84187 | -206964.31927 | 4356391.50305 | A    |
| 187 | KAST 19499M001 | 4646949.43860 | -240747.82004 | 4348014.58169 | A    |
| 192 | LARE 19440M001 | 4632832.30486 | -279026.68019 | 4360314.01662 | A    |
| 193 | LAZK 19354S001 | 4666098.71227 | -178186.73597 | 4330463.26291 | A    |
| 197 | LEIT 19428M001 | 4663521.29809 | -155859.26008 | 4334519.46800 | A    |
| 253 | ORON 19427M001 | 4659696.14742 | -130865.27989 | 4338948.46862 | A    |
| 260 | PAS2 19351S001 | 4644909.42995 | -156645.61129 | 4353622.66954 | A    |
| 30  | PASA 19351S001 | 4644909.42663 | -156645.61158 | 4353622.66706 | W    |
| 33  | RID1 13448M002 | 4708447.18150 | -199490.83312 | 4284089.31787 | W    |
| 35  | SCDA 10088M002 | 4639940.86971 | -136225.48333 | 4359552.00532 | W    |
| 313 | SOPU 19386M001 | 4643998.27131 | -255914.45057 | 4350062.73662 | A    |
| 333 | TERU 13487M001 | 4867391.67711 | -95523.91775  | 4108341.25306 | A    |
| 366 | VITO 19385M001 | 4679398.05632 | -218437.05343 | 4314897.94792 | A    |
| 43  | YEBE 13420M001 | 4848724.90427 | -261632.49349 | 4123093.89801 | W    |
| 44  | ZARA 13462M001 | 4773803.53405 | -73506.54066  | 4215453.67355 | 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 2027  |                | 09-DEC-18 17:36            |               |               |      |
|--------------------------------|----------------|----------------------------|---------------|---------------|------|
| LOCAL GEODETIC DATUM: ETRF2014 |                | EPOCH: 2018-11-14 12:00:00 |               |               |      |
| NUM                            | STATION NAME   | X (M)                      | Y (M)         | Z (M)         | FLAG |
| 1                              | ACDR 13434M001 | 4594489.82286              | -678368.02463 | 4357065.91486 | W    |
| 33                             | ALDA 19383M001 | 4687280.47525              | -190877.15234 | 4308106.58217 | A    |
| 42                             | ALSA 19419M001 | 4677251.15747              | -176770.97909 | 4319079.50659 | A    |
| 44                             | AMUR 19388M001 | 4661499.75993              | -244591.84665 | 4332269.51668 | A    |
| 78                             | BLAZ 10074M002 | 4634456.37833              | -124345.55857 | 4365785.09568 | A    |
| 79                             | BIDA 00000M000 | 4644178.14915              | -145778.90624 | 4354832.12021 | A    |
| 89                             | BRZR 19387M001 | 4662221.30230              | -220770.48844 | 4333309.07032 | A    |
| 9                              | CACE 13447M001 | 4899866.75574              | -544567.64364 | 4033769.81295 | W    |
| 10                             | CANT 13438M001 | 4625924.61987              | -307096.81553 | 4365771.19147 | W    |
| 114                            | CHER 00000M000 | 4645880.64814              | -125722.51124 | 4353624.01014 | A    |
| 15                             | CREU 13432M001 | 4715420.49326              | 273177.46984  | 4271946.47385 | W    |
| 16                             | EBRE 13410M001 | 4833520.31784              | 41536.78899   | 4147461.33960 | W    |
| 135                            | ELGE 19353S001 | 4657557.72199              | -202242.06053 | 4338991.50613 | A    |
| 137                            | EMAZ 17001M001 | 4645924.51619              | -276950.44890 | 4347759.21428 | A    |
| 157                            | GERN 19389M001 | 4642811.62640              | -217223.51521 | 4353278.51830 | A    |
| 177                            | IGEL 19352S001 | 4645951.75014              | -165575.08742 | 4352550.05690 | A    |
| 182                            | ISPS 19484M001 | 4640596.79755              | -206964.36950 | 4356391.55122 | A    |
| 187                            | KAST 19499M001 | 4646949.39430              | -240747.86013 | 4348014.62983 | A    |
| 192                            | LARE 19440M001 | 4632832.26081              | -279026.72021 | 4360314.06478 | A    |
| 193                            | LAZK 19354S001 | 4666098.66761              | -178186.77620 | 4330463.31104 | A    |
| 197                            | LEIT 19428M001 | 4663521.25339              | -155859.30039 | 4334519.51614 | A    |
| 253                            | ORON 19427M001 | 4659696.10268              | -130865.32030 | 4338948.51678 | A    |
| 260                            | PAS2 19351S001 | 4644909.38543              | -156645.65167 | 4353622.71772 | A    |
| 30                             | PASA 19351S001 | 4644909.38211              | -156645.65196 | 4353622.71524 | W    |
| 33                             | RI01 13448M002 | 4708447.13649              | -199490.87312 | 4284089.36589 | W    |
| 35                             | SOA 10088M002  | 4639940.82518              | -136225.52380 | 4359552.05352 | W    |
| 313                            | SOPU 19386M001 | 4643998.22709              | -255914.49062 | 4350062.78476 | A    |
| 333                            | TERU 13487M001 | 4867391.63019              | -95523.95749  | 4108341.30078 | A    |
| 366                            | VITO 19385M001 | 4679398.01166              | -218437.09347 | 4314897.99599 | A    |
| 43                             | YEBE 13420M001 | 4848724.85803              | -261632.53274 | 4123093.94569 | W    |
| 44                             | ZARA 13462M001 | 4773803.48801              | -73506.58084  | 4215453.72148 | 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 2027 WEEK FINAL COMBINATION: PRECISE ORBITS 09-DEC-18 17:36

| Station        | #Days | Weekday<br>0123456 | Repeatability (mm) |      |       |
|----------------|-------|--------------------|--------------------|------|-------|
|                |       |                    | N                  | E    | U     |
| ACOR 13434M001 | 7     | XXXXXX             | 1.13               | 0.75 | 6.09  |
| ALDA 19383M001 | 7     | XXXXXX             | 4.73               | 1.37 | 3.85  |
| ALSA 19419M001 | 7     | XXXXXX             | 6.28               | 1.54 | 11.00 |
| AMUR 19388M001 | 7     | XXXXXX             | 4.50               | 3.61 | 4.21  |
| BLAZ 10074M002 | 7     | XXXXXX             | 0.73               | 0.84 | 3.79  |
| BIDA 00000M000 | 7     | XXXXXX             | 1.02               | 0.94 | 5.16  |
| BRZR 19387M001 | 6     | XXXXX              | 3.08               | 3.84 | 6.98  |
| CACE 13447M001 | 7     | XXXXXX             | 0.83               | 0.86 | 2.05  |
| CANT 13438M001 | 7     | XXXXXX             | 0.56               | 0.92 | 4.54  |
| CHER 00000M000 | 7     | XXXXXX             | 1.98               | 3.11 | 3.60  |
| CREU 13432M001 | 7     | XXXXXX             | 0.85               | 1.05 | 4.38  |
| EBRE 13410M001 | 7     | XXXXXX             | 0.69               | 1.07 | 4.03  |
| ELGE 19353S001 | 7     | XXXXXX             | 2.79               | 0.78 | 3.70  |
| EMAZ 17001M001 | 7     | XXXXXX             | 0.71               | 0.98 | 2.71  |
| GERN 19389M001 | 5     | XXXX               | 1.87               | 1.26 | 3.21  |
| IGEL 19352S001 | 7     | XXXXXX             | 1.62               | 0.52 | 3.41  |
| ISPS 19484M001 | 7     | XXXXXX             | 1.43               | 1.18 | 3.56  |
| KAST 19499M001 | 7     | XXXXXX             | 3.34               | 1.09 | 11.66 |
| LARE 19440M001 | 7     | XXXXXX             | 2.00               | 0.45 | 3.72  |
| LAZK 19354S001 | 7     | XXXXXX             | 2.85               | 1.53 | 6.04  |
| LEIT 19428M001 | 7     | XXXXXX             | 1.07               | 1.60 | 8.78  |
| ORON 19427M001 | 6     | XX XXX             | 3.86               | 1.77 | 4.90  |
| PAS2 19351S001 | 7     | XXXXXX             | 1.65               | 1.25 | 3.05  |
| PASA 19351S001 | 7     | XXXXXX             | 1.26               | 1.07 | 3.31  |
| RIO1 13448M002 | 7     | XXXXXX             | 0.47               | 0.78 | 3.84  |
| SCOA 10088M002 | 7     | XXXXXX             | 0.89               | 1.22 | 3.67  |
| SOPU 19386M001 | 5     | XXXX               | 1.46               | 1.20 | 2.13  |
| TERU 13487M001 | 7     | XXXXXX             | 0.65               | 0.86 | 2.94  |
| VITO 19385M001 | 7     | XXXXXX             | 2.94               | 1.73 | 7.48  |
| YEBE 13420M001 | 7     | XXXXXX             | 0.41               | 0.81 | 2.58  |
| ZARA 13462M001 | 7     | XXXXXX             | 0.57               | 0.60 | 2.01  |

Comparison of individual solutions:

|                |   |       |        |       |       |       |        |       |        |
|----------------|---|-------|--------|-------|-------|-------|--------|-------|--------|
| ACOR 13434M001 | N | 1.13  | 0.35   | -0.37 | -0.99 | -0.96 | -0.68  | 2.25  | -0.14  |
| ACOR 13434M001 | E | 0.75  | 0.03   | -0.13 | -0.19 | 0.39  | -0.08  | 1.60  | -0.78  |
| ACOR 13434M001 | U | 6.09  | -8.44  | -2.15 | 0.39  | 2.60  | 10.46  | 2.17  | 5.13   |
| ALDA 19383M001 | N | 4.73  | 4.76   | 6.02  | -0.46 | -7.15 | 0.03   | -4.43 | 2.05   |
| ALDA 19383M001 | E | 1.37  | 1.50   | 0.22  | -1.87 | -0.13 | 1.48   | 1.33  | -1.23  |
| ALDA 19383M001 | U | 3.85  | -2.80  | 6.64  | 0.63  | 1.17  | -5.43  | 1.54  | -1.84  |
| ALSA 19419M001 | N | 6.28  | 7.63   | 7.88  | 0.85  | -9.05 | 0.99   | -5.70 | -0.50  |
| ALSA 19419M001 | E | 1.54  | -1.16  | -0.49 | -1.09 | 3.10  | -0.10  | 1.38  | 0.06   |
| ALSA 19419M001 | U | 11.00 | -18.43 | -2.83 | -3.49 | 16.00 | 2.63   | 7.18  | -7.18  |
| AMUR 19388M001 | N | 4.50  | -9.96  | 1.62  | 1.32  | 1.91  | 1.81   | 2.44  | 2.22   |
| AMUR 19388M001 | E | 3.61  | -7.68  | 2.45  | 1.98  | 1.03  | 0.70   | 1.74  | 2.15   |
| AMUR 19388M001 | U | 4.21  | -6.62  | 6.41  | -1.26 | -2.86 | -0.27  | -0.52 | -3.40  |
| BLAZ 10074M002 | N | 0.73  | 1.02   | 0.45  | -1.09 | -0.59 | -0.49  | -0.05 | 0.38   |
| BLAZ 10074M002 | E | 0.84  | -0.05  | -1.41 | 0.18  | 1.13  | -0.17  | 0.16  | 0.96   |
| BLAZ 10074M002 | U | 3.79  | 4.45   | -0.08 | -1.37 | -2.39 | -1.33  | -2.65 | -7.07  |
| BIDA 00000M000 | N | 1.02  | -0.86  | 1.19  | 0.41  | -0.78 | -1.25  | 1.33  | -0.09  |
| BIDA 00000M000 | E | 0.94  | 1.51   | -1.00 | -0.07 | 0.36  | -0.29  | -0.62 | 1.19   |
| BIDA 00000M000 | U | 5.16  | -6.10  | 5.67  | -0.29 | -0.39 | -6.36  | 3.03  | -6.38  |
| BRZR 19387M001 | N | 3.08  | -5.32  | 0.98  | 1.08  | 1.90  | -2.99  | 2.06  |        |
| BRZR 19387M001 | E | 3.84  | -7.60  | 1.92  | 2.96  | 1.05  | -0.83  | 1.32  |        |
| BRZR 19387M001 | U | 6.88  | -7.87  | 6.82  | 1.04  | -0.31 | -11.03 | -2.24 |        |
| CACE 13447M001 | N | 0.83  | 0.14   | 0.03  | 0.55  | 0.73  | 0.48   | 0.14  | -1.73  |
| CACE 13447M001 | E | 0.86  | -1.36  | 0.62  | 0.84  | 0.19  | 0.91   | 0.66  | -0.50  |
| CACE 13447M001 | U | 2.05  | -2.03  | 1.04  | 2.78  | 0.01  | 3.24   | 1.30  | -0.00  |
| CANT 13438M001 | N | 0.56  | -0.44  | 0.04  | -0.25 | 0.25  | 1.19   | 0.21  | 0.30   |
| CANT 13438M001 | E | 0.92  | 1.13   | 1.34  | 0.64  | 0.07  | -0.54  | 0.64  | 0.95   |
| CANT 13438M001 | U | 4.54  | -5.12  | 3.36  | -3.47 | -2.89 | 5.03   | 5.45  | -3.34  |
| CHER 00000M000 | N | 1.98  | -3.32  | 2.28  | -0.94 | -0.17 | 2.46   | -0.37 | -0.43  |
| CHER 00000M000 | E | 3.11  | -6.37  | -0.03 | 0.11  | 1.33  | 1.10   | 2.74  | 2.66   |
| CHER 00000M000 | U | 3.60  | -4.59  | 0.45  | -2.02 | 2.30  | -2.20  | 1.80  | -6.24  |
| CREU 13432M001 | N | 0.85  | 0.17   | -0.38 | 0.03  | 1.15  | -1.50  | -0.06 | 0.81   |
| CREU 13432M001 | E | 1.05  | 1.73   | 0.86  | 0.42  | 0.24  | -0.65  | -1.16 | -0.91  |
| CREU 13432M001 | U | 4.38  | -4.91  | -4.02 | 5.25  | -2.60 | -2.00  | 6.02  | -0.20  |
| EBRE 13410M001 | N | 0.69  | -0.42  | 0.20  | -0.19 | 0.75  | 0.88   | -1.10 | 0.27   |
| EBRE 13410M001 | E | 1.07  | 0.93   | -0.24 | -1.12 | -1.22 | 1.70   | 0.53  | -0.29  |
| EBRE 13410M001 | U | 4.03  | -4.11  | -2.21 | 0.59  | -2.06 | 2.93   | 6.85  | -3.96  |
| ELGE 19353S001 | N | 2.79  | -5.96  | 1.85  | -0.07 | 1.10  | -0.29  | 2.13  | 1.45   |
| ELGE 19353S001 | E | 0.78  | -1.24  | 0.28  | 0.73  | 0.40  | -0.68  | 0.06  | 0.95   |
| ELGE 19353S001 | U | 3.70  | -1.71  | 0.51  | -4.20 | -1.02 | 3.19   | -1.85 | -6.84  |
| EMAZ 17001M001 | N | 0.71  | 0.49   | -0.20 | -0.69 | 1.34  | -0.50  | 0.44  | -0.13  |
| EMAZ 17001M001 | E | 0.98  | -0.13  | -0.24 | 0.04  | -1.82 | -0.99  | 0.19  | 1.17   |
| EMAZ 17001M001 | U | 2.71  | 1.38   | 1.53  | 0.98  | -3.50 | -3.32  | 3.00  | 2.55   |
| GERN 19389M001 | N | 1.87  | -2.83  | 2.30  | -0.29 | 0.36  |        | 0.69  |        |
| GERN 19389M001 | E | 1.26  | -1.77  | 1.72  | -0.17 | 0.49  |        | -0.03 |        |
| GERN 19389M001 | U | 3.21  | -6.39  | 0.61  | -0.04 | -0.01 |        | 0.37  |        |
| IGEL 19352S001 | N | 1.62  | 2.74   | -0.77 | -1.97 | 0.92  | 0.91   | -0.80 | -1.24  |
| IGEL 19352S001 | E | 0.52  | 0.04   | -0.13 | 0.52  | 0.16  | -0.60  | 0.13  | 0.95   |
| IGEL 19352S001 | U | 3.41  | 2.50   | 1.32  | -4.57 | -1.88 | -1.68  | -0.30 | -5.87  |
| ISPS 19484M001 | N | 1.43  | 2.21   | 1.62  | -0.37 | -1.93 | -0.96  | 0.12  | -0.24  |
| ISPS 19484M001 | E | 1.18  | 1.61   | -0.94 | -0.35 | -0.44 | -0.90  | 0.65  | 1.84   |
| ISPS 19484M001 | U | 3.56  | -5.80  | -0.23 | -0.75 | -2.70 | -4.17  | 4.11  | -0.29  |
| KAST 19499M001 | N | 3.34  | -0.55  | 6.25  | 0.07  | -0.36 | -5.13  | 0.68  | 0.76   |
| KAST 19499M001 | E | 1.09  | -0.68  | 0.49  | 0.79  | 1.03  | 2.08   | -0.50 | 0.42   |
| KAST 19499M001 | U | 11.66 | -2.49  | 19.98 | 8.55  | -9.51 | -11.44 | -2.94 | -10.35 |
| LARE 19440M001 | N | 2.00  | -2.42  | -2.93 | 0.68  | 1.36  | 0.35   | 1.99  | 1.79   |
| LARE 19440M001 | E | 0.45  | -0.67  | -0.07 | -0.09 | -0.29 | -0.16  | -0.78 | 0.12   |
| LARE 19440M001 | U | 3.72  | 5.66   | -4.87 | 4.11  | -0.56 | -2.69  | 1.48  | -0.70  |
| LAZK 19354S001 | N | 2.85  | 0.54   | 2.98  | 2.46  | -1.08 | -5.41  | -0.83 | 1.60   |
| LAZK 19354S001 | E | 1.53  | 2.96   | -1.36 | -0.90 | -0.64 | -0.68  | 0.16  | 1.34   |
| LAZK 19354S001 | U | 6.04  | -2.64  | -3.63 | -6.94 | 5.39  | 4.47   | 1.62  | -9.93  |

|                |   |      |        |       |       |       |       |       |       |
|----------------|---|------|--------|-------|-------|-------|-------|-------|-------|
| LEIT 19428M001 | N | 1.07 | 1.00   | 0.12  | 0.56  | -0.03 | 0.98  | -1.87 | -1.03 |
| LEIT 19428M001 | E | 1.60 | 1.04   | -2.54 | -0.39 | 2.63  | -0.45 | 0.76  | -0.03 |
| LEIT 19428M001 | U | 8.78 | 2.90   | 15.99 | -4.99 | -9.20 | -7.54 | -2.68 | -4.96 |
| ORDN 19427M001 | N | 3.86 | -3.92  | -6.00 |       | 0.73  | 3.71  | 2.06  | 2.15  |
| ORDN 19427M001 | E | 1.77 | -1.65  | -2.87 |       | -0.17 | 0.56  | 1.03  | 1.80  |
| ORDN 19427M001 | U | 4.90 | -2.06  | 0.26  |       | 3.53  | 2.28  | -0.06 | -9.90 |
| PAS2 19351S001 | N | 1.65 | 0.62   | 1.05  | -1.67 | -0.80 | 2.95  | -1.31 | -1.03 |
| PAS2 19351S001 | E | 1.25 | -2.00  | -0.64 | 0.37  | -0.11 | 1.83  | 0.25  | 1.17  |
| PAS2 19351S001 | U | 3.05 | -3.26  | -3.27 | -0.81 | -1.74 | 1.98  | 1.15  | -5.07 |
| PASA 19351S001 | N | 1.26 | -0.06  | 0.77  | -1.16 | -0.97 | 2.47  | -0.53 | -0.50 |
| PASA 19351S001 | E | 1.07 | -1.77  | -0.77 | 0.82  | 0.54  | 0.59  | 0.36  | 1.29  |
| PASA 19351S001 | U | 3.31 | -3.64  | -2.70 | -3.65 | 1.41  | 2.52  | -0.20 | -4.82 |
| RID1 13448M002 | N | 0.47 | -0.46  | 0.67  | -0.18 | 0.45  | -0.20 | 0.52  | 0.38  |
| RID1 13448M002 | E | 0.78 | 1.06   | 0.12  | -0.23 | 0.94  | 0.59  | 0.59  | 0.93  |
| RID1 13448M002 | U | 3.84 | -2.32  | 7.07  | -2.61 | -3.52 | 0.92  | -0.65 | -3.57 |
| SCDA 10088M002 | N | 0.89 | 0.90   | 0.22  | -0.73 | -0.84 | -1.06 | 0.93  | 0.81  |
| SCDA 10088M002 | E | 1.22 | 2.04   | 0.61  | 0.76  | -0.24 | -1.84 | 0.32  | 0.49  |
| SCDA 10088M002 | U | 3.67 | -5.32  | -1.47 | -4.52 | -1.09 | 2.33  | 1.64  | -4.52 |
| SOPU 19386M001 | N | 1.46 | 0.22   | 0.55  | 0.47  | -2.48 |       | 1.33  |       |
| SOPU 19386M001 | E | 1.20 | -1.91  | -0.33 | 0.13  | 0.80  |       | 1.17  |       |
| SOPU 19386M001 | U | 2.13 | -1.15  | 0.20  | -1.60 | 1.01  |       | -3.64 |       |
| TERU 13487M001 | N | 0.65 | 0.58   | 0.23  | 0.03  | 0.61  | 1.00  | -0.78 | -0.44 |
| TERU 13487M001 | E | 0.86 | 1.76   | 0.33  | -0.44 | -0.50 | 0.01  | 0.91  | -0.00 |
| TERU 13487M001 | U | 2.94 | 4.42   | -1.61 | 0.22  | 0.91  | 3.90  | 3.42  | -1.42 |
| VITO 19385M001 | N | 2.94 | -6.39  | 0.78  | 1.36  | 1.06  | 1.99  | 1.59  | 0.96  |
| VITO 19385M001 | E | 1.73 | -2.91  | 1.63  | 0.68  | 0.36  | -0.08 | 0.83  | 2.35  |
| VITO 19385M001 | U | 7.48 | -13.22 | 9.20  | -4.26 | 3.52  | 2.34  | 0.93  | -6.26 |
| YEBE 13420M001 | N | 0.41 | 0.60   | 0.26  | 0.17  | 0.16  | 0.52  | 0.08  | -0.48 |
| YEBE 13420M001 | E | 0.81 | 1.17   | 0.15  | 0.13  | 0.07  | -1.34 | 0.42  | 0.72  |
| YEBE 13420M001 | U | 2.58 | 0.43   | -0.21 | 0.29  | 1.85  | -4.44 | 0.48  | 4.02  |
| ZARA 13462M001 | N | 0.57 | 0.18   | 1.16  | 0.21  | -0.30 | -0.53 | 0.44  | -0.02 |
| ZARA 13462M001 | E | 0.60 | 1.36   | -0.43 | -0.03 | 0.11  | 0.16  | 0.29  | 0.07  |
| ZARA 13462M001 | U | 2.01 | -0.67  | 3.34  | -1.45 | -2.51 | 0.76  | 1.55  | -1.05 |



## 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 |       |       |
|-----|-----------------|-----|--------------------------|-------|-------|
| 1   | ACOR 13434M001  | I W | -0.53                    | -0.67 | 1.39  |
| 2   | ALAC 13433M001  | I W | 0.40                     | -0.67 | -0.53 |
| 3   | ALBA 13452M001  | I W | -0.24                    | -0.71 | 1.19  |
| 4   | ALME 13437M001  | I W | -1.11                    | -0.72 | 0.25  |
| 5   | BCLN 13412M001  | I W | 0.37                     | 0.92  | -0.85 |
| 6   | BELL 13431M001  | I W | 2.01                     | 1.74  | 0.56  |
| 7   | BORR 13480M001  | I W | -1.08                    | -1.32 | 1.60  |
| 8   | BRST 10004M004  | I W | -1.88                    | 0.32  | -1.74 |
| 9   | CACE 13447M001  | I W | 0.82                     | 0.44  | 2.07  |
| 10  | CANT 13438M001  | I W | -0.58                    | 0.48  | -1.10 |
| 11  | CARG 19412M001  | I W | 1.06                     | -1.04 | 1.26  |
| 12  | CASC 13909S001  | I W | 0.39                     | -0.53 | 2.92  |
| 13  | CEU1 13449M002  | I W | -0.43                    | 0.05  | 0.41  |
| 14  | COBA 13453M001  | I W | 0.56                     | 0.13  | -1.57 |
| 15  | CREU 13432M001  | I W | 0.15                     | 0.35  | 2.42  |
| 16  | EBRE 13410M001  | I W | -1.46                    | 0.11  | -1.93 |
| 17  | ESCO 13435M001  | I W | 3.23                     | 0.21  | -3.32 |
| 18  | FUNC 13911S001  | I W | 0.34                     | -0.03 | 2.88  |
| 19  | GAIA 13902M001  | I W | -0.41                    | 0.21  | 0.83  |
| 21  | HUEL 13451M001  | I W | -1.40                    | 2.97  | 4.27  |
| 22  | IZAN 31309M002  | I W | 0.16                     | 0.34  | -2.78 |
| 23  | LLIV 13436M001  | I W | 0.68                     | -0.89 | 2.69  |
| 24  | LPAL 81701M001  | I W | -1.15                    | 0.70  | -3.14 |
| 25  | LROC 10023M001  | I W | -0.07                    | -0.59 | -0.73 |
| 26  | MALA 13443M001  | I W | -0.56                    | -0.79 | 1.23  |
| 27  | MAS1 31303M002  | I W | 1.53                     | 1.58  | -1.95 |
| 29  | MEL1 19379M001  | I W | 0.31                     | -0.13 | -2.33 |
| 30  | PASA 19351S001  | I W | -1.61                    | 0.70  | -2.45 |
| 31  | PDEL 31906M004  | I W | -1.13                    | 1.15  | -0.63 |
| 32  | RABT 35001M002  | I W | 0.67                     | -0.37 | -1.85 |
| 33  | RIO1 13448M002  | I W | -0.99                    | 0.14  | -0.65 |
| 35  | SCOA 10088M002  | I W | -3.61                    | -0.20 | -4.78 |
| 38  | SONS 13446M001  | I W | -0.58                    | 0.53  | -2.03 |
| 39  | TERC 31909M001  | I W | 3.57                     | -4.24 | -0.28 |
| 40  | VALA 13463M002  | I W | -0.46                    | -0.06 | 0.65  |
| 41  | VALE 13439M001  | I W | -0.14                    | -0.00 | -0.98 |
| 42  | VIGO 13450M001  | I W | 0.12                     | -0.56 | 3.53  |
| 43  | YEBE 13420M001  | I W | 1.19                     | -0.78 | 4.63  |
| 44  | ZARA 13462M001  | I W | 0.82                     | 1.55  | 0.36  |
| 45  | ZIMM 14001M004  | I W | 1.07                     | -0.35 | 0.50  |
|     |                 |     |                          |       |       |
|     | RMS / COMPONENT |     | 1.32                     | 1.10  | 2.18  |
|     | MEAN            |     | -0.00                    | 0.00  | -0.00 |
|     | MIN             |     | -3.61                    | -4.24 | -4.78 |
|     | MAX             |     | 3.57                     | 2.97  | 4.63  |

NUMBER OF PARAMETERS : 3  
NUMBER OF COORDINATES : 120  
RMS OF TRANSFORMATION : 1.60 MM

BARYCENTER COORDINATES:

LATITUDE : 39 38 11.41  
LONGITUDE : - 5 27 37.17  
HEIGHT : -50.822 KM

PARAMETERS:

TRANSLATION IN N : 0.00 +- 0.25 MM  
TRANSLATION IN E : 0.00 +- 0.25 MM  
TRANSLATION IN U : 0.00 +- 0.25 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          17837122
NUMBER OF UNKNOWN               225703
NUMBER OF DEGREES OF FREEDOM    17611419
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)      180
VARIANCE FACTOR                  1.874704450654574

Helmert Transformation Parameters With Respect to Combined Solution:
-----
Sol  Rms (m)      Translation (m)      Rotation (")      Scale (ppm)
      X          Y          Z          X          Y          Z
-----
 1  0.00277      0.0272  0.0005 -0.0277  0.0001  0.0013  0.0001  -0.00081
 2  0.00275     -0.0042 -0.0048  0.0072  0.0001 -0.0003 -0.0001  -0.00027
 3  0.00269      0.0108  0.0160 -0.0123 -0.0002  0.0005  0.0005   0.00012
 4  0.00214      0.0039 -0.0080 -0.0082  0.0002  0.0003 -0.0002  0.00028
 5  0.00252     -0.0179 -0.0269  0.0222  0.0005 -0.0009 -0.0007  -0.00017
 6  0.00196     -0.0083  0.0207  0.0173 -0.0004 -0.0006  0.0005  -0.00031
 7  0.00272     -0.0100 -0.0193  0.0113  0.0004 -0.0005 -0.0005  -0.00009
```

```
Statistics of individual solutions:
-----
File  RMS (m)      DOF  Chi**2/DOF  #Observations authentic / pseudo  #Parameters explicit / implicit / singular
-----
 1  0.00146      2538835  2.14          2574200          3          1014  34354  0
 2  0.00139      2532239  1.94          2565851          3          1020  32595  0
 3  0.00130      2541703  1.70          2573854          3          1014  31140  0
 4  0.00136      2524956  1.84          2558083          3          1008  32122  0
 5  0.00135      2473816  1.82          2507086          3          996  32277  0
 6  0.00133      2499669  1.77          2531717          3          999  31052  0
 7  0.00135      2494207  1.81          2526331          3          996  31131  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 18:315:00000 18:321:86370 LEICA GRX1200PRO -----
ALDA  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
ALSA  A  1 P 18:315:00000 18:321:86370 LEICA GR50 -----
AMUR  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
BIAZ  A  1 P 18:315:00000 18:321:86370 TRI SP90M -----
BIDA  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
BRZR  A  1 P 18:315:00000 18:320:86370 LEICA GR10 -----
CACE  A  1 P 18:315:00000 18:321:86370 TRIMBLE NETR9 -----
CANT  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
CHER  A  1 P 18:315:00000 18:321:86370 LEICA GRX1200+GNSS -----
CREU  A  1 P 18:315:00000 18:321:86370 LEICA GR50 -----
EBRE  A  1 P 18:315:00000 18:321:86370 LEICA GR50 -----
ELGE  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
EMAZ  A  1 P 18:315:00000 18:321:86370 LEICA GR30 -----
GERN  A  1 P 18:315:00000 18:320:86370 LEICA GR10 -----
IGEL  A  1 P 18:315:00000 18:321:86370 LEICA GR30 -----
ISPS  A  1 P 18:315:00000 18:321:86370 TRIMBLE NETR9 -----
KAST  A  1 P 18:315:00000 18:321:86370 LEICA GR30 -----
LARE  A  1 P 18:315:00000 18:321:86370 LEICA GRX1200GGPRO -----
LAZK  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
LEIT  A  1 P 18:315:00000 18:321:86370 LEICA GR50 -----
ORON  A  1 P 18:315:00000 18:321:86370 LEICA GR50 -----
PAS2  A  1 P 18:315:00000 18:321:86370 TPS NET-G3A -----
PASA  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
RIO1  A  1 P 18:315:00000 18:321:86370 LEICA GR25 -----
SCOA  A  1 P 18:315:00000 18:321:86370 LEICA GR25 -----
SOPU  A  1 P 18:315:00000 18:320:86370 LEICA GR10 -----
TERU  A  1 P 18:315:00000 18:321:86370 LEICA GRX1200GGPRO -----
VITO  A  1 P 18:315:00000 18:321:86370 LEICA GR10 -----
YEBE  A  1 P 18:315:00000 18:321:86370 TRIMBLE NETR9 -----
ZARA  A  1 P 18:315:00000 18:321:86370 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 18:315:00000 18:321:86370 LEIAT504  LEIS -----
ALDA  A  1 P 18:315:00000 18:321:86370 LEIAS10  NONE -----
ALSA  A  1 P 18:315:00000 18:321:86370 LEIAR10  NONE -----
AMUR  A  1 P 18:315:00000 18:321:86370 LEIAS10  NONE -----
BIAZ  A  1 P 18:315:00000 18:321:86370 LEIAR25  LEIT -----
```

```

BIDA A 1 P 18:315:00000 18:321:86370 LEIAS10 NONE -----
BRZR A 1 P 18:315:00000 18:320:86370 LEIAS10 NONE -----
CACE A 1 P 18:315:00000 18:321:86370 TRM29659.00 NONE -----
CANT A 1 P 18:315:00000 18:321:86370 LEIAR25_R4 LEIT 25066
CHER A 1 P 18:315:00000 18:321:86370 LEIAX1203+GNSS NONE -----
CREU A 1 P 18:315:00000 18:321:86370 LEIAR25_R4 NONE 26357
EBRE A 1 P 18:315:00000 18:321:86370 LEIAR25_R4 NONE 26359
ELGE A 1 P 18:315:00000 18:321:86370 LEIAR25_R4 LEIT -----
EMAZ A 1 P 18:315:00000 18:321:86370 LEIAS10 NONE -----
GERN A 1 P 18:315:00000 18:320:86370 LEIAS10 NONE -----
IGEL A 1 P 18:315:00000 18:321:86370 LEIAR20 LEIM -----
ISPS A 1 P 18:315:00000 18:321:86370 TRM59900.00 SCIS -----
KAST A 1 P 18:315:00000 18:321:86370 LEIAS10 NONE -----
LARE A 1 P 18:315:00000 18:321:86370 LEIAT504 NONE -----
LAZK A 1 P 18:315:00000 18:321:86370 LEIAR25_R4 LEIT -----
LEIT A 1 P 18:315:00000 18:321:86370 LEIAR10 NONE -----
ORDN A 1 P 18:315:00000 18:321:86370 LEIAR10 NONE -----
PAS2 A 1 P 18:315:00000 18:321:86370 LEIAR20 LEIM 73034
PASA A 1 P 18:315:00000 18:321:86370 LEIAR20 LEIM 73034
RID1 A 1 P 18:315:00000 18:321:86370 LEIAR25_R4 LEIT 25138
SCDA A 1 P 18:315:00000 18:321:86370 TRM55971.00 NONE -----
SOPU A 1 P 18:315:00000 18:320:86370 LEIAS10 NONE -----
TERU A 1 P 18:315:00000 18:321:86370 LEIAT504GG LEIS -----
VITO A 1 P 18:315:00000 18:321:86370 LEIAS10 NONE -----
YEBE A 1 P 18:315:00000 18:321:86370 TRM29659.00 NONE -----
ZARA A 1 P 18:315:00000 18:321:86370 TRM29659.00 NONE -----

```

### 7.3 Eccentricities

```

*
*SITE PT SOLN T DATA_START_ DATA_END_ AXE ARP->BENCHMARK(M)
ACOR A 1 P 18:315:00000 18:321:86370 UNE 3.0460 0.0000 0.0000
ALDA A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
ALSA A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
AMUR A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
BIAZ A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
BIDA A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
BRZR A 1 P 18:315:00000 18:320:86370 UNE 0.0000 0.0000 0.0000
CACE A 1 P 18:315:00000 18:321:86370 UNE 0.0600 0.0000 0.0000
CANT A 1 P 18:315:00000 18:321:86370 UNE 3.0490 0.0000 0.0000
CHER A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
CREU A 1 P 18:315:00000 18:321:86370 UNE 0.0770 0.0000 0.0000
EBRE A 1 P 18:315:00000 18:321:86370 UNE 0.0770 0.0000 0.0000
ELGE A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
EMAZ A 1 P 18:315:00000 18:321:86370 UNE 0.0350 0.0000 0.0000
GERN A 1 P 18:315:00000 18:320:86370 UNE 0.0000 0.0000 0.0000
IGEL A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
ISPS A 1 P 18:315:00000 18:321:86370 UNE 0.0350 0.0000 0.0000
KAST A 1 P 18:315:00000 18:321:86370 UNE 0.0350 0.0000 0.0000
LARE A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
LAZK A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
LEIT A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
ORDN A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
PAS2 A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
PASA A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
RID1 A 1 P 18:315:00000 18:321:86370 UNE 0.0606 0.0000 0.0000
SCDA A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
SOPU A 1 P 18:315:00000 18:320:86370 UNE 0.0000 0.0000 0.0000
TERU A 1 P 18:315:00000 18:321:86370 UNE 0.0600 0.0000 0.0000
VITO A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
YEBE A 1 P 18:315:00000 18:321:86370 UNE 0.0000 0.0000 0.0000
ZARA A 1 P 18:315:00000 18:321:86370 UNE 3.2590 0.0000 0.0000

```

## 8 Inconsistencies (logsheet-RINEX metadata)

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

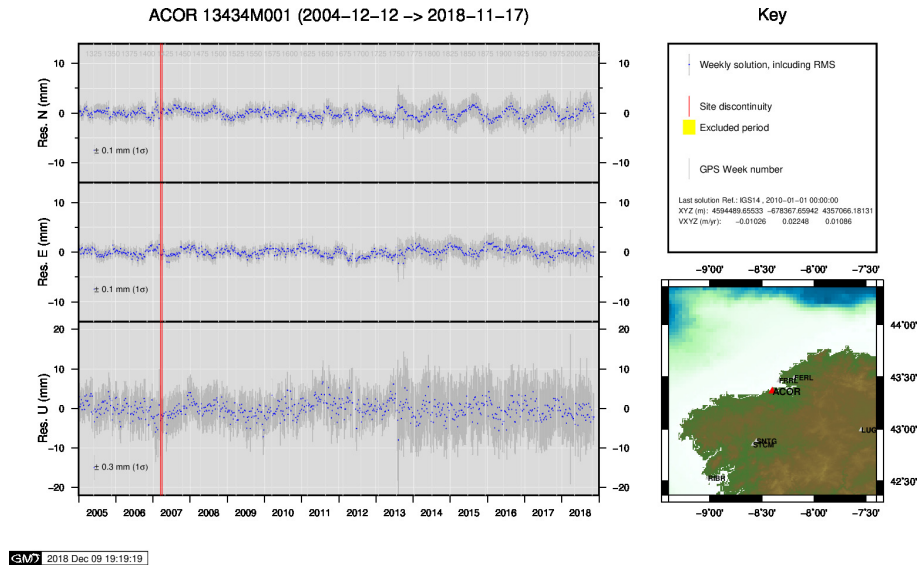
```

2018-11-29 07:51 UTC | ALSA3180.180 | RECEIVER FIRM. VERS. | 4.31/7.403 -> 4.31
2018-11-29 23:26 UTC | ALSA3190.180 | RECEIVER FIRM. VERS. | 4.31/7.403 -> 4.31
2018-11-30 23:32 UTC | ALSA3200.180 | RECEIVER FIRM. VERS. | 4.31/7.403 -> 4.31

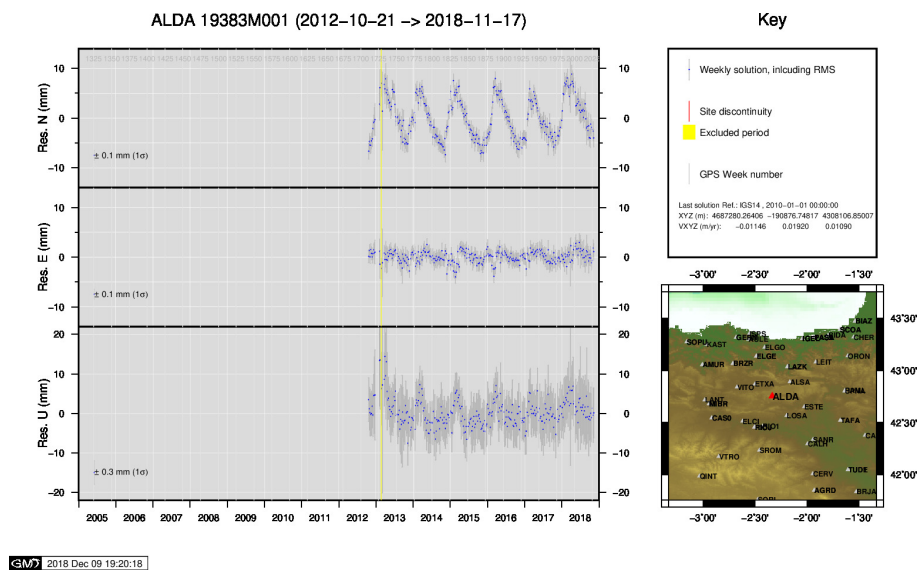
```

## 9 Cumulative Time Series

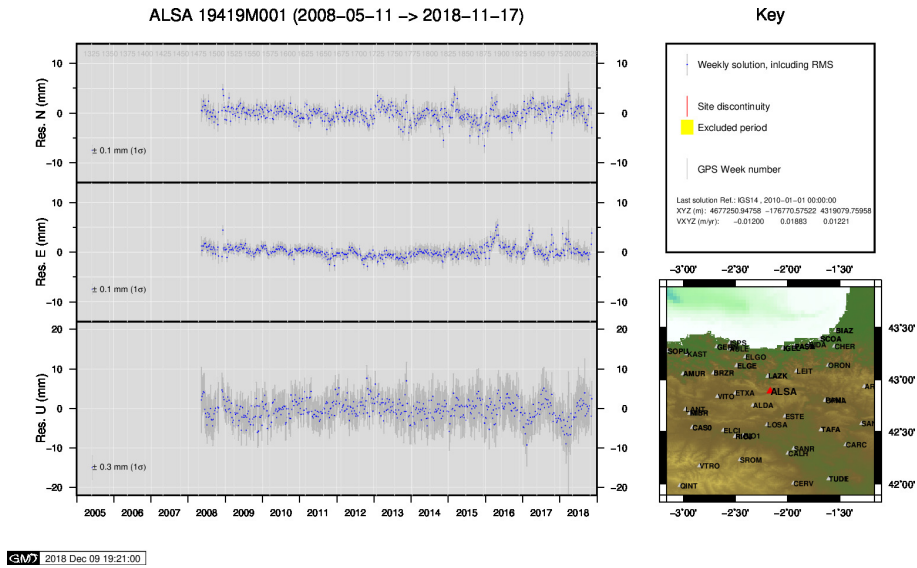
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



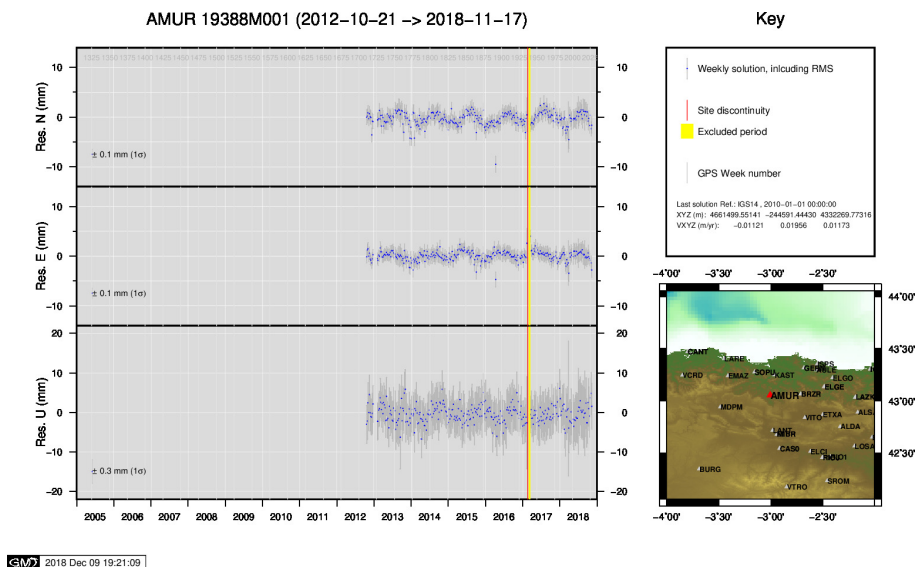
1 ) ACOR



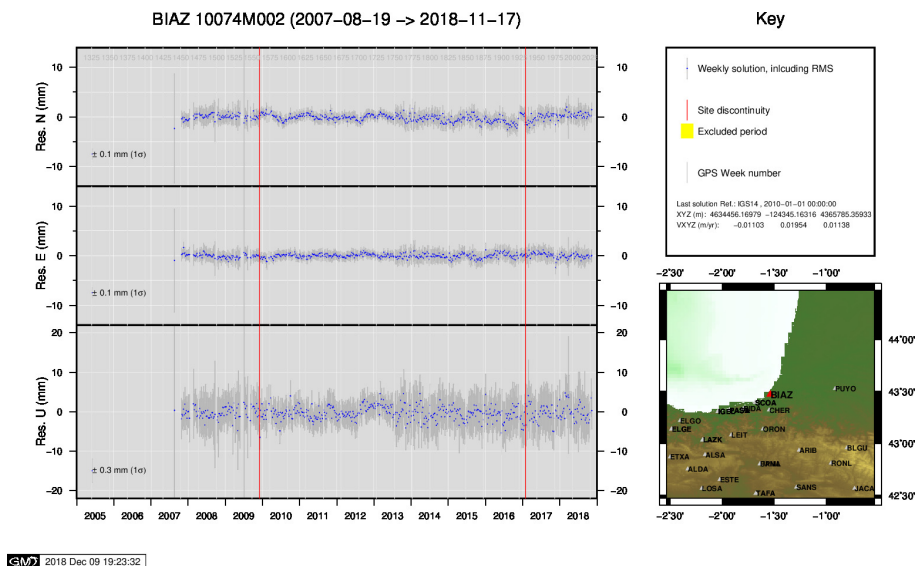
2 ) ALDA



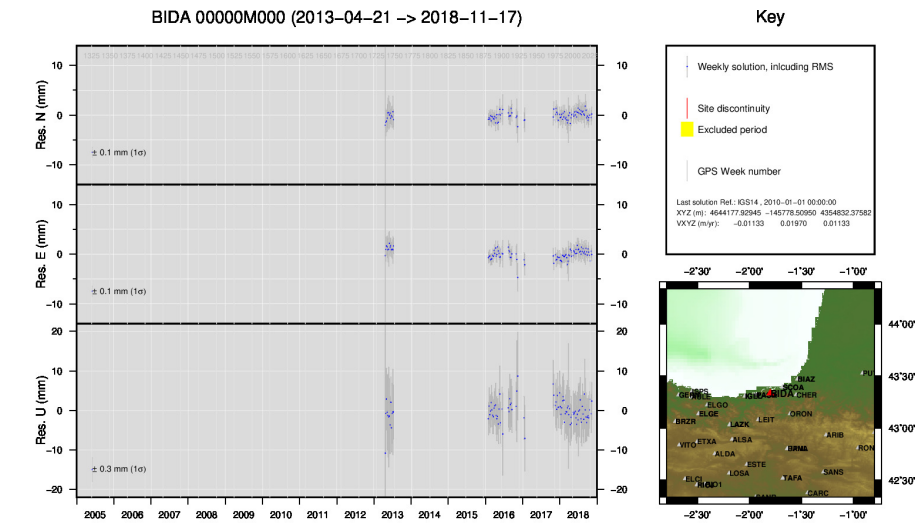
3 ) ALSA



4 ) AMUR

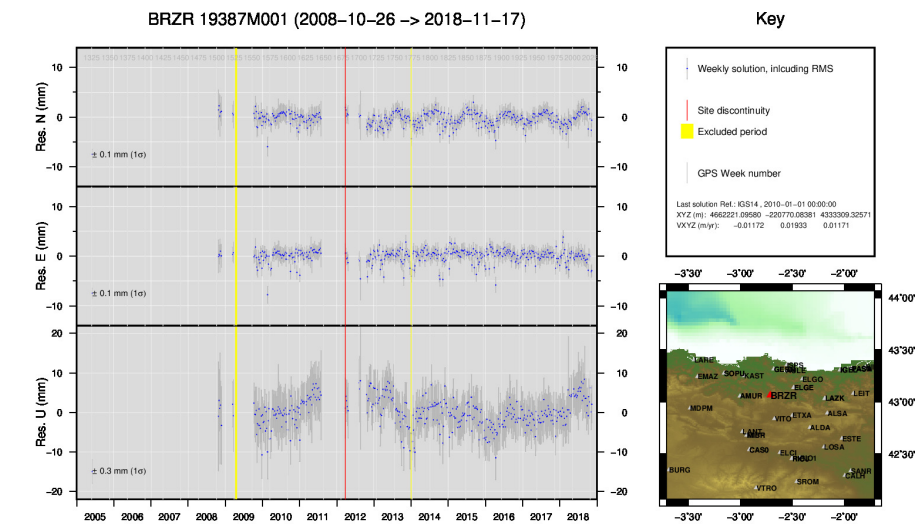


5 ) BIAZ



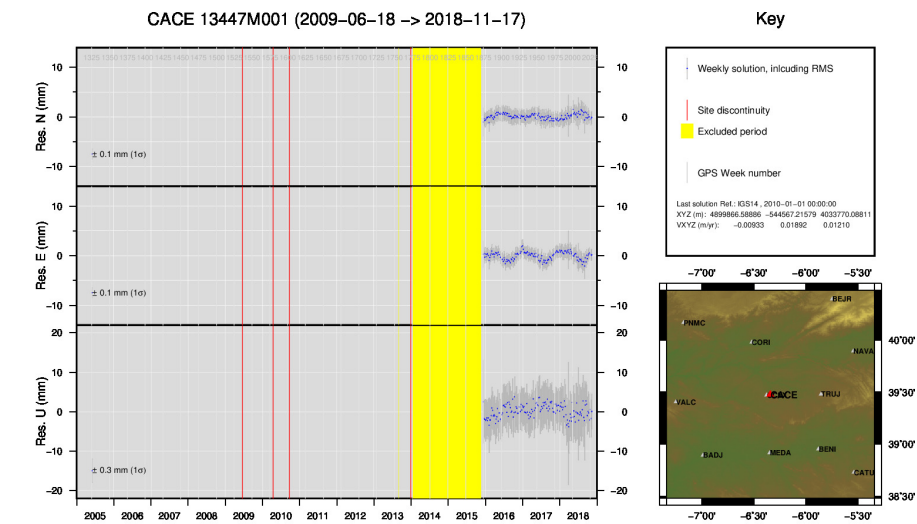
GMW 2018 Dec 09 19:23:36

6 ) BIDA



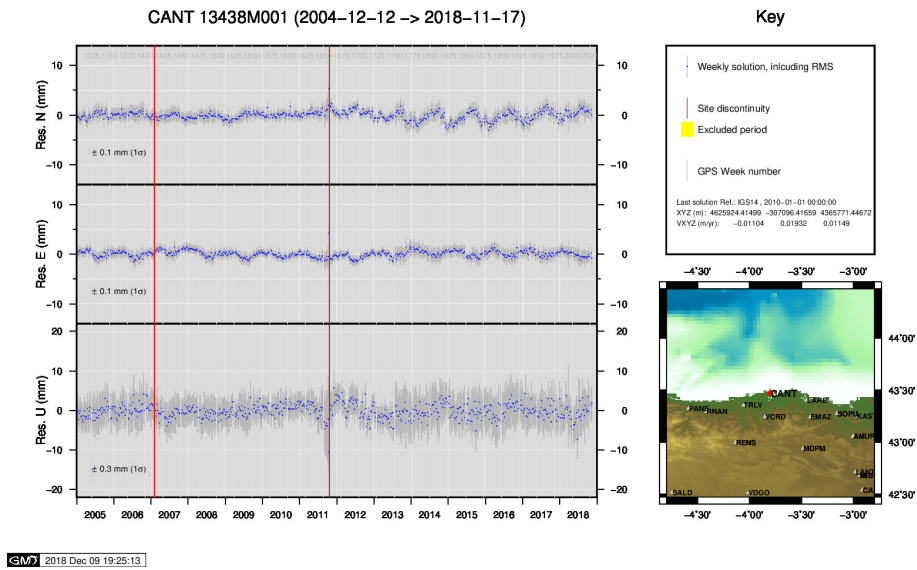
GMW 2018 Dec 09 19:24:26

7 ) BRZR

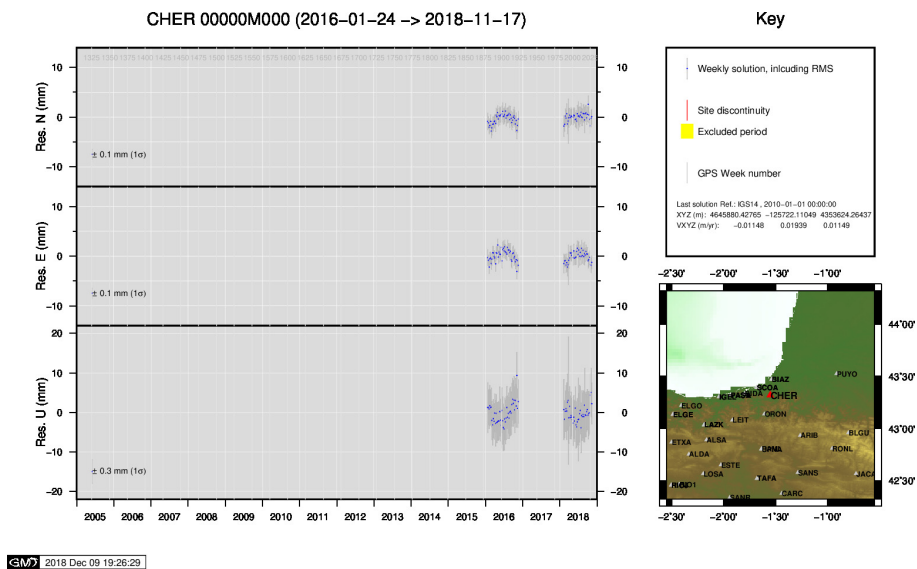


GMW 2018 Dec 09 19:24:56

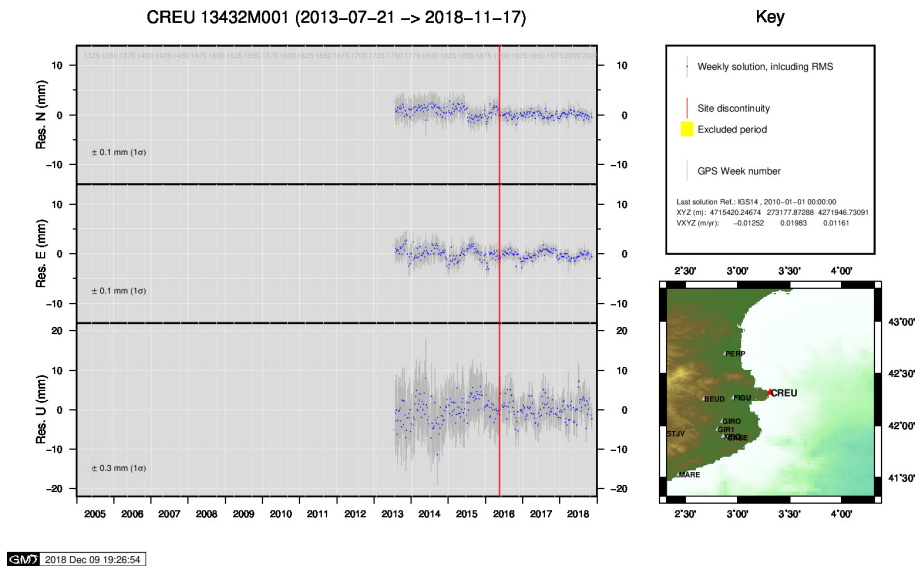
8 ) CACE



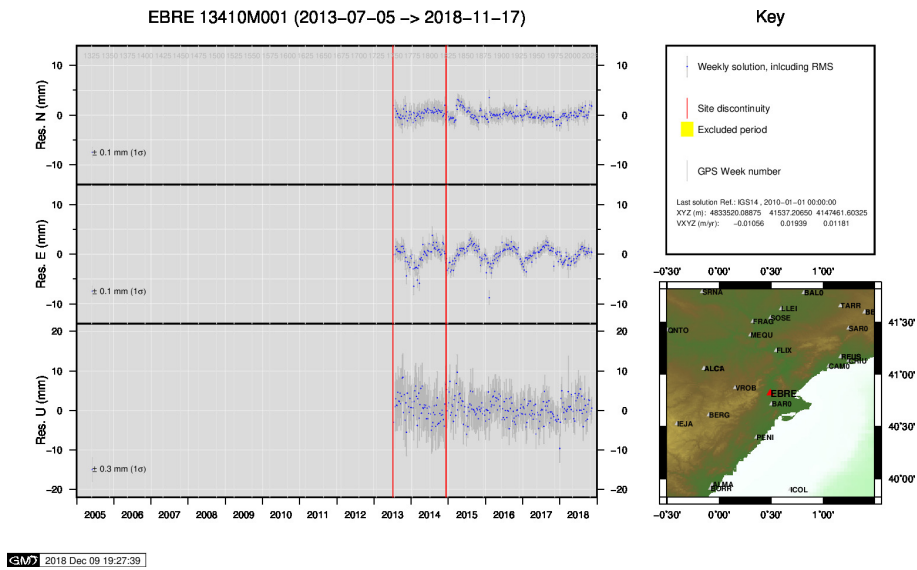
9 ) CANT



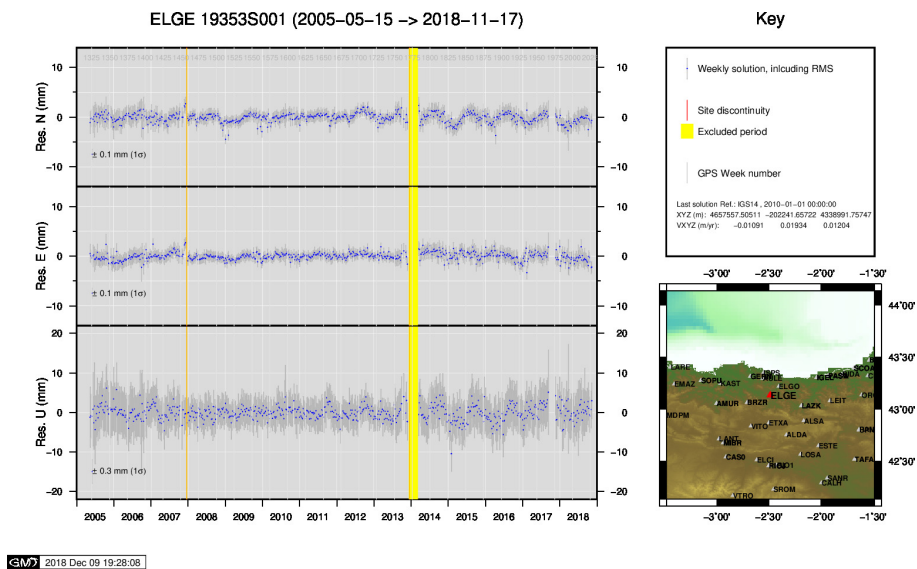
10 ) CHER



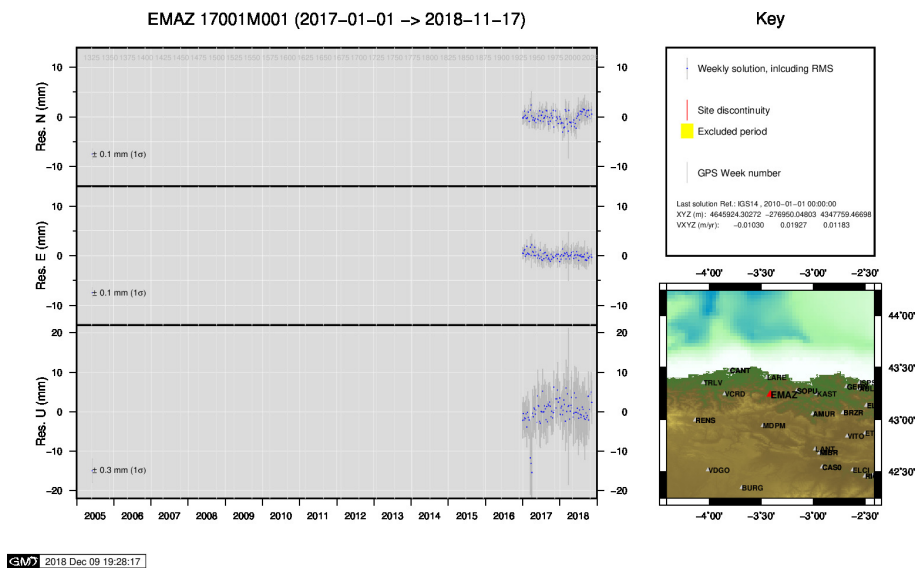
11 ) CREU



12 ) EBRE

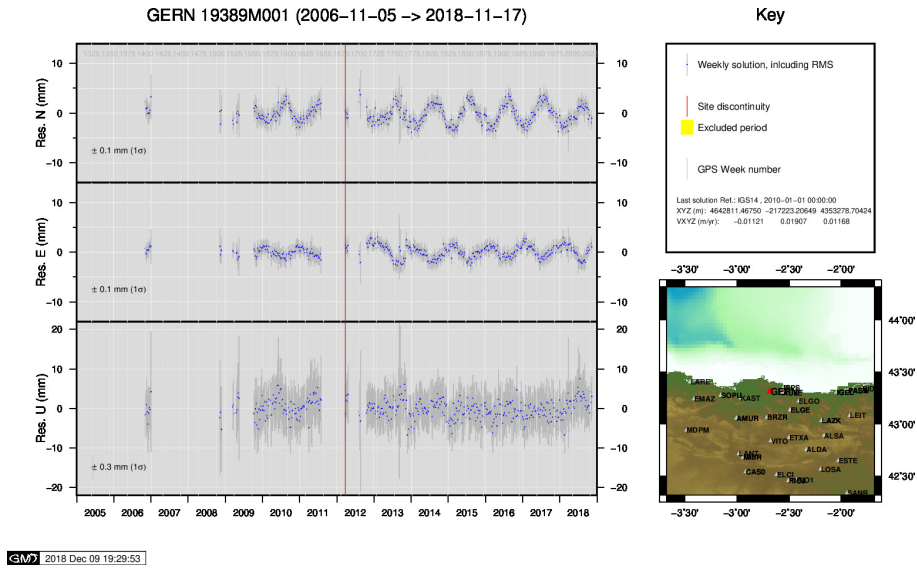


13 ) ELGE

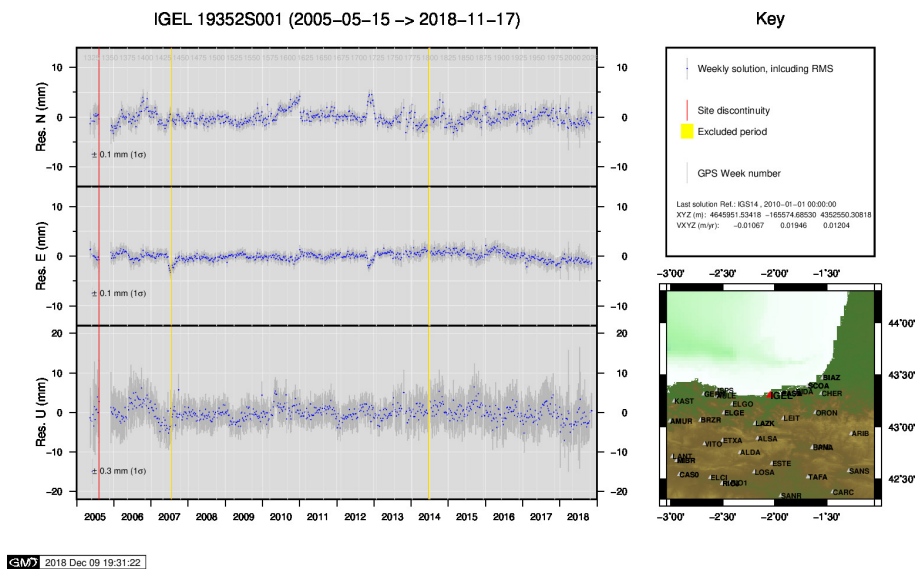


14 ) EMAZ

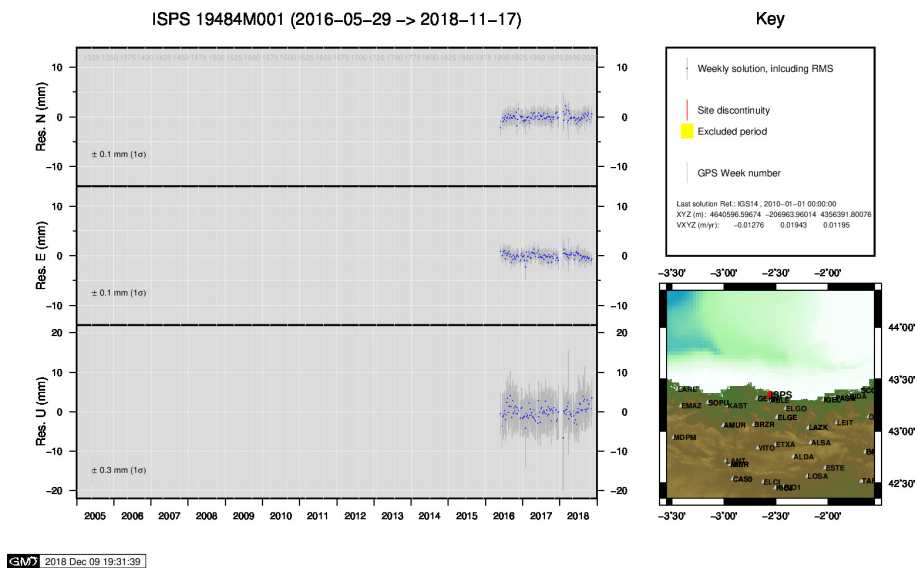




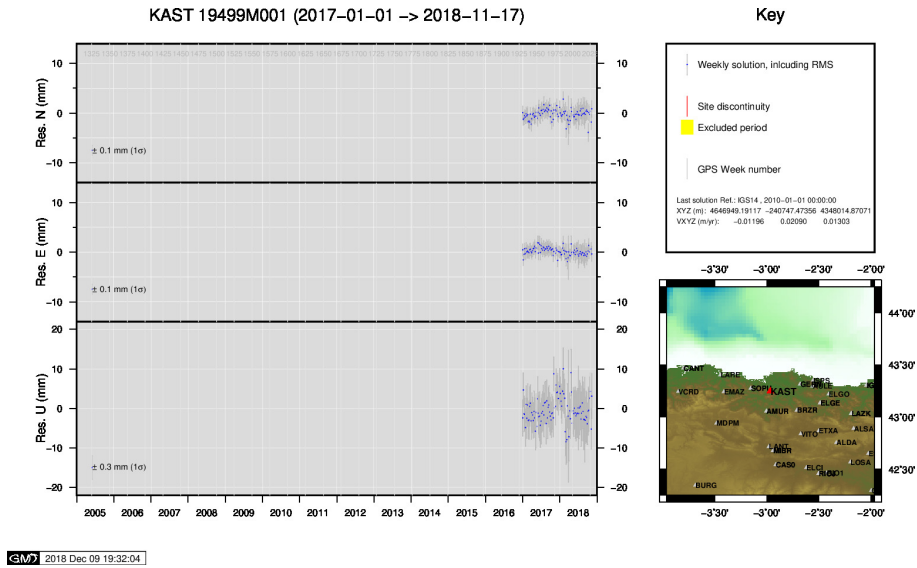
15 ) GERN



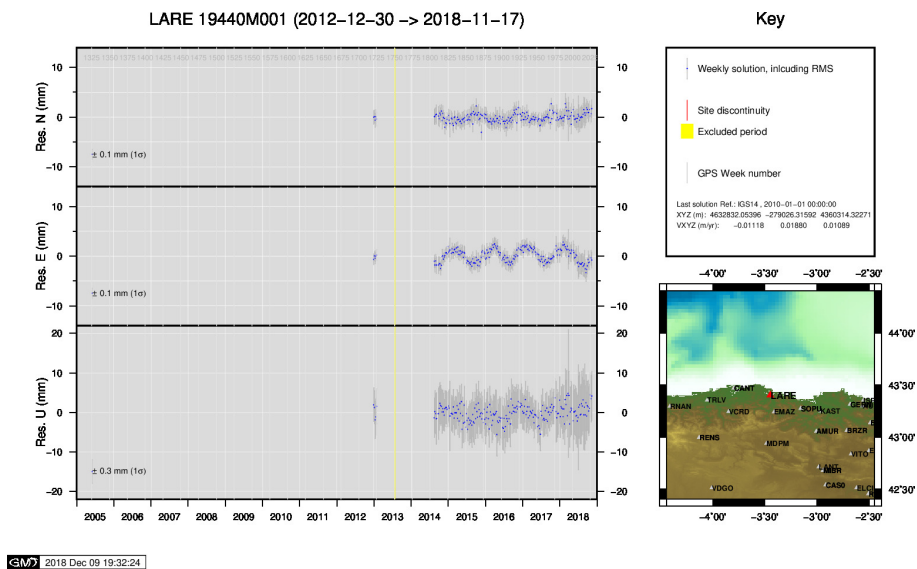
16 ) IGEL



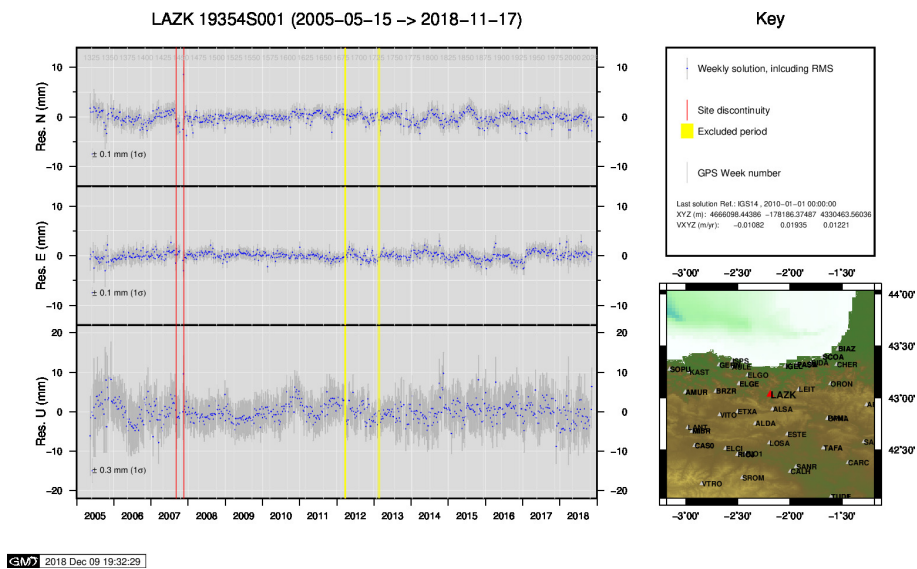
17 ) ISPS



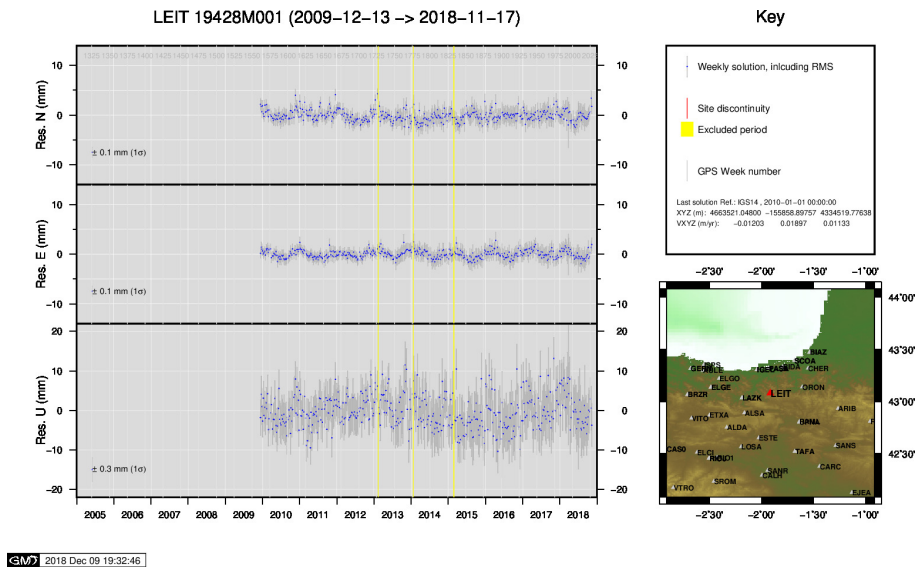
18 ) KAST



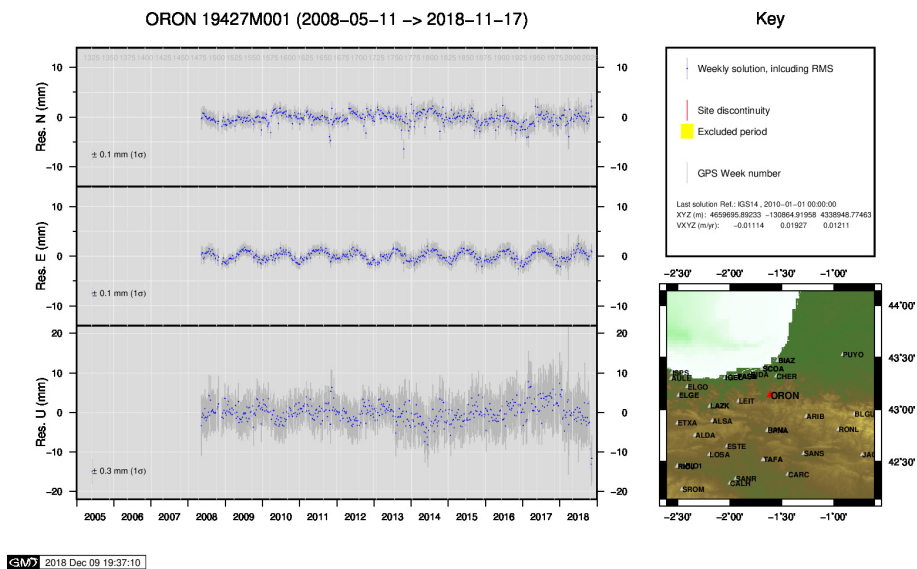
19 ) LARE



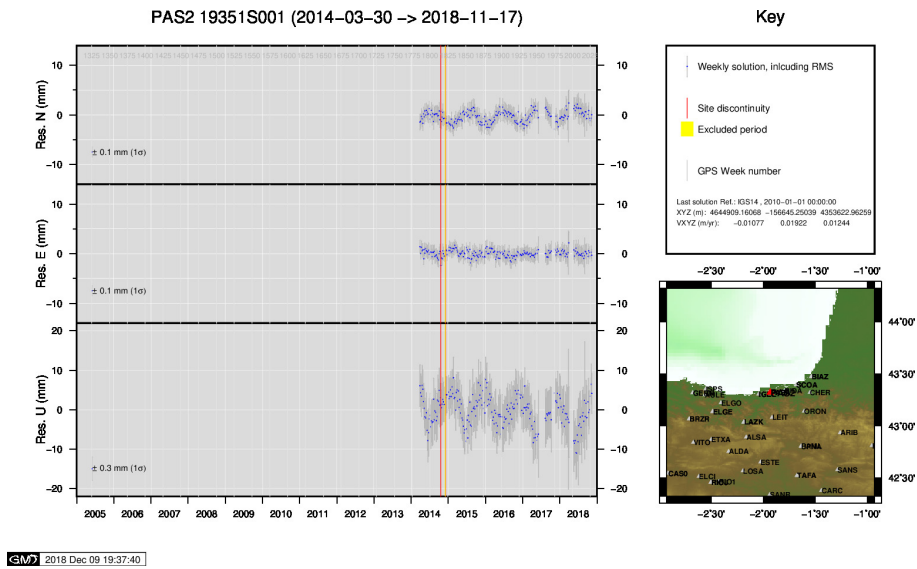
20 ) LAZK



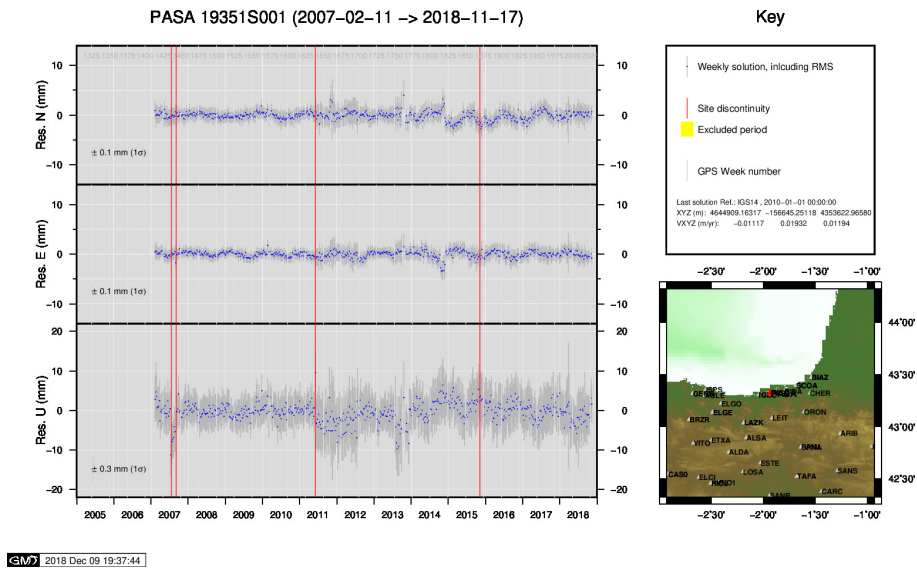
21 ) LEIT



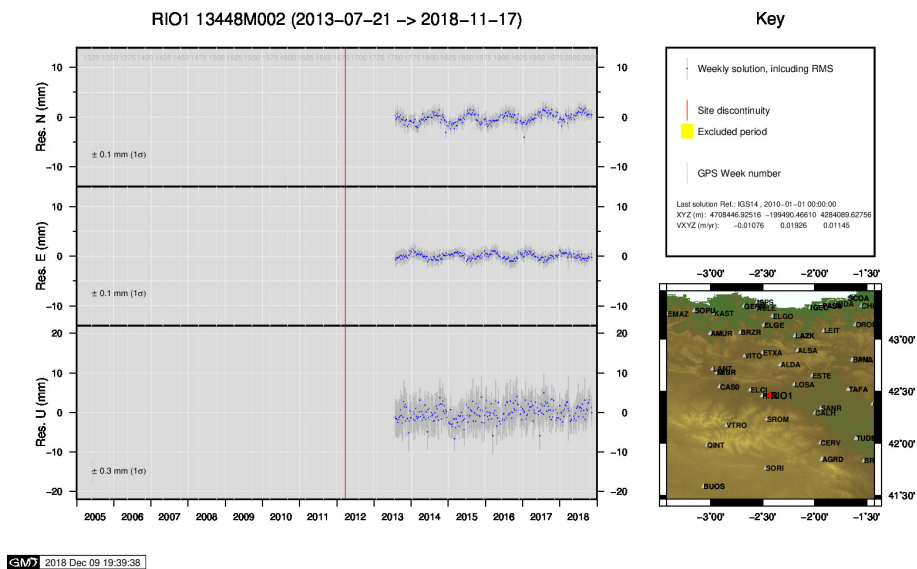
22 ) ORON



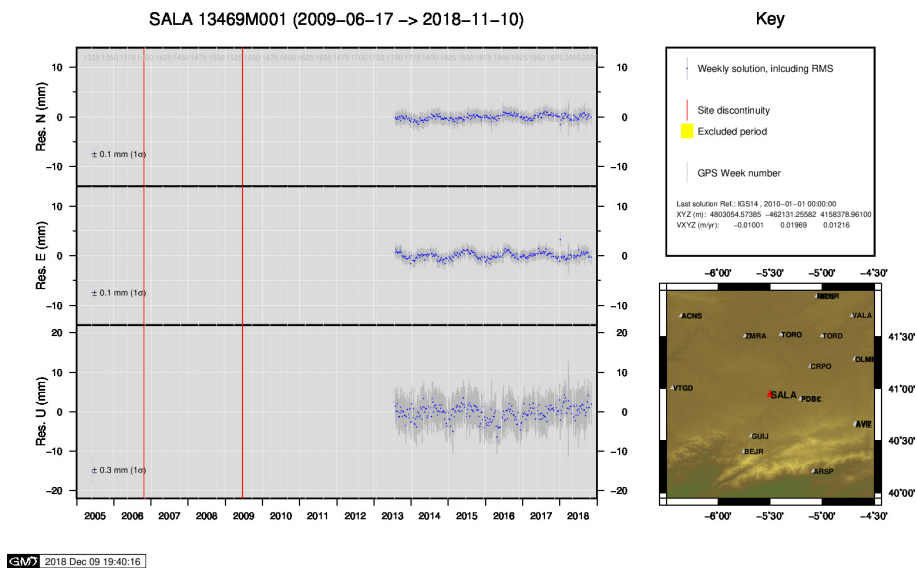
23 ) PAS2



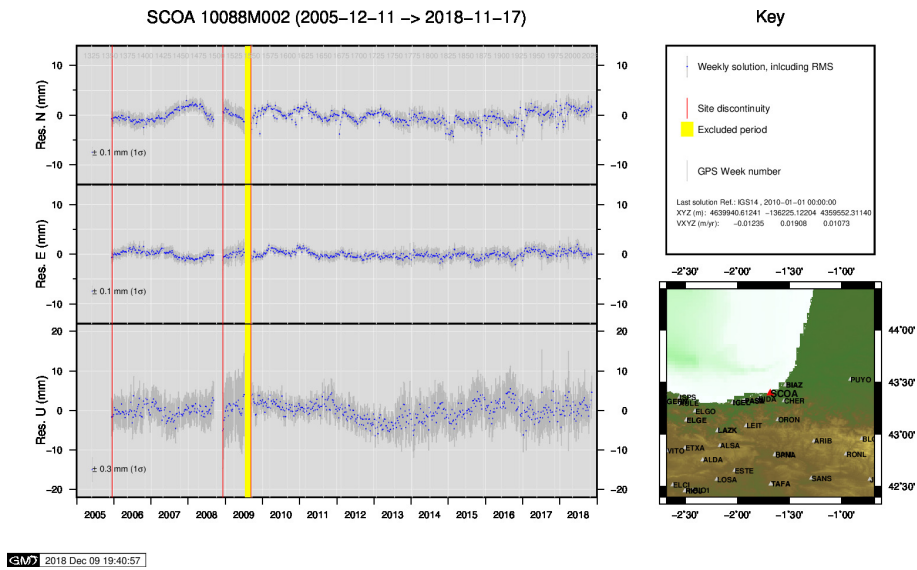
24 ) PASA



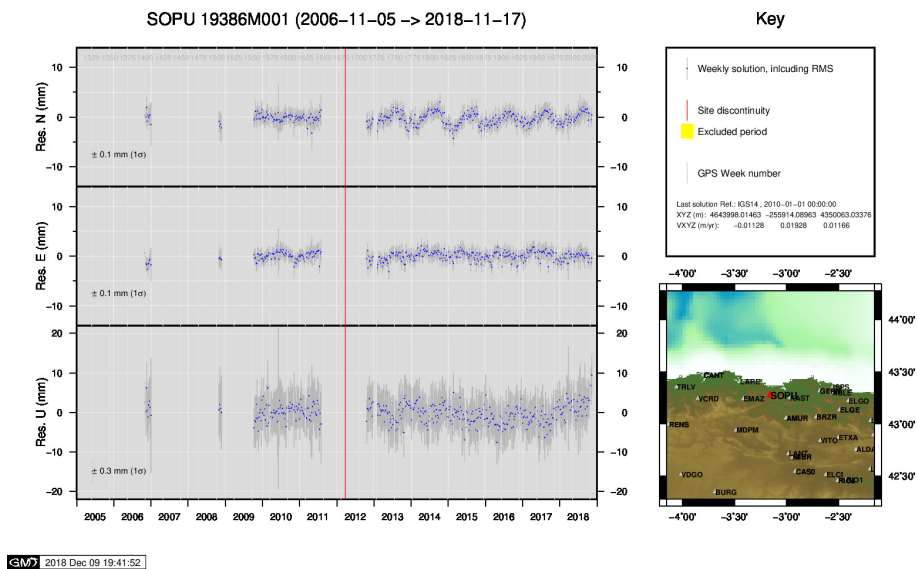
25 ) RIO1



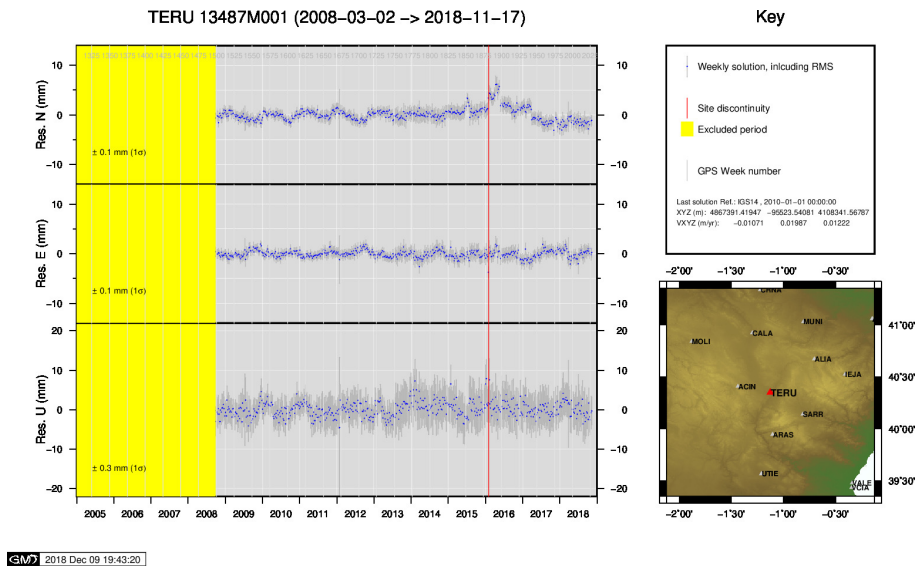
26 ) SALA



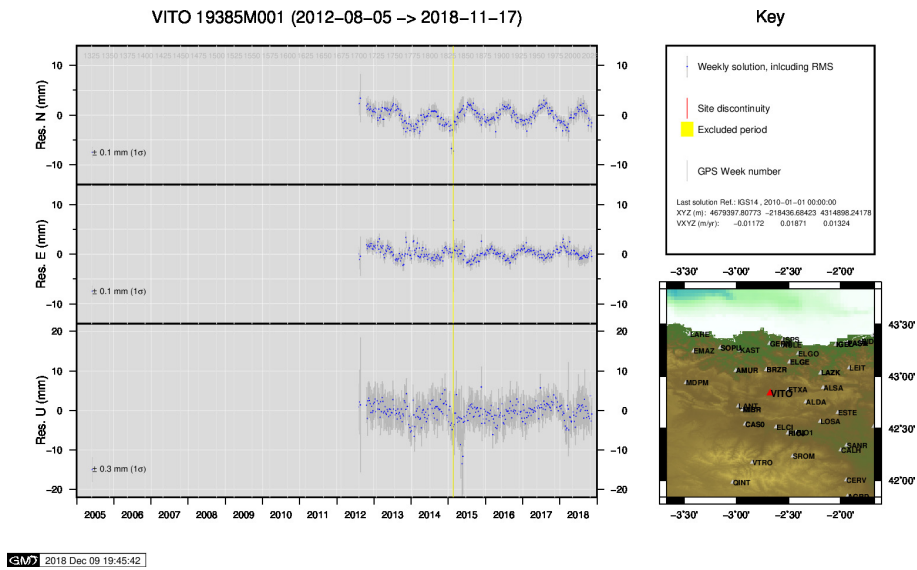
27 ) SCOA



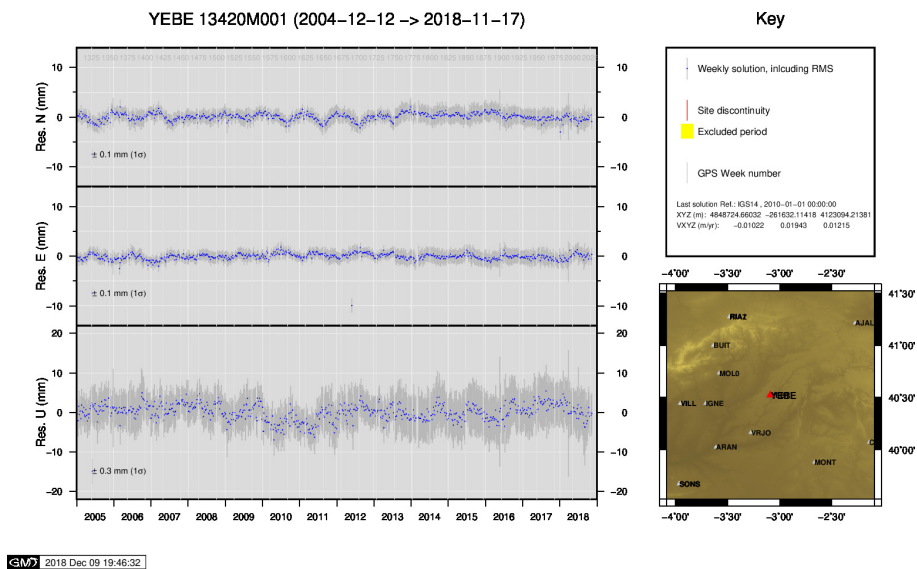
28 ) SOPU



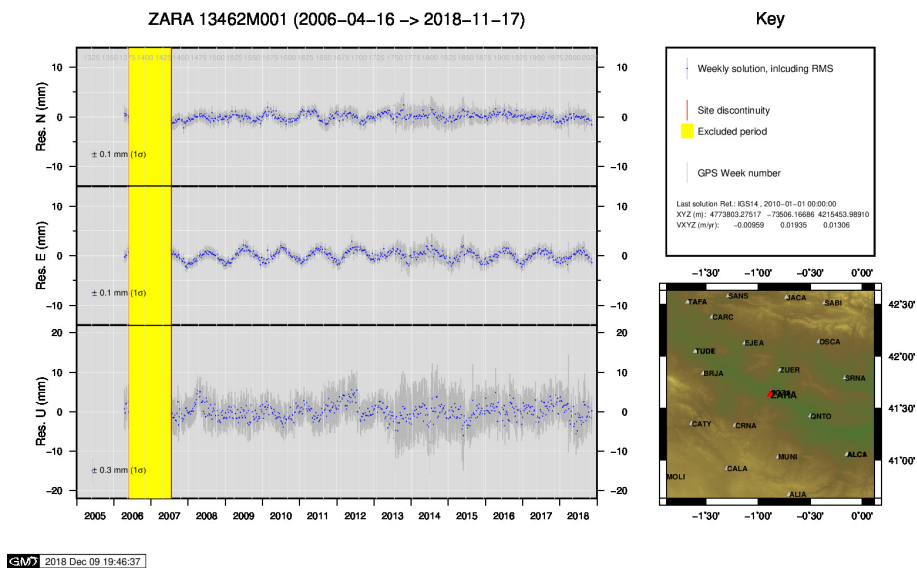
29 ) TERU



30 ) VITO



31 ) YEBE



32 ) ZARA

