

# ARA-DAC Weekly Analysis Result: 2020 (GFA)

## Technical Report

**GPS Week: 2020 (GFA)**

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

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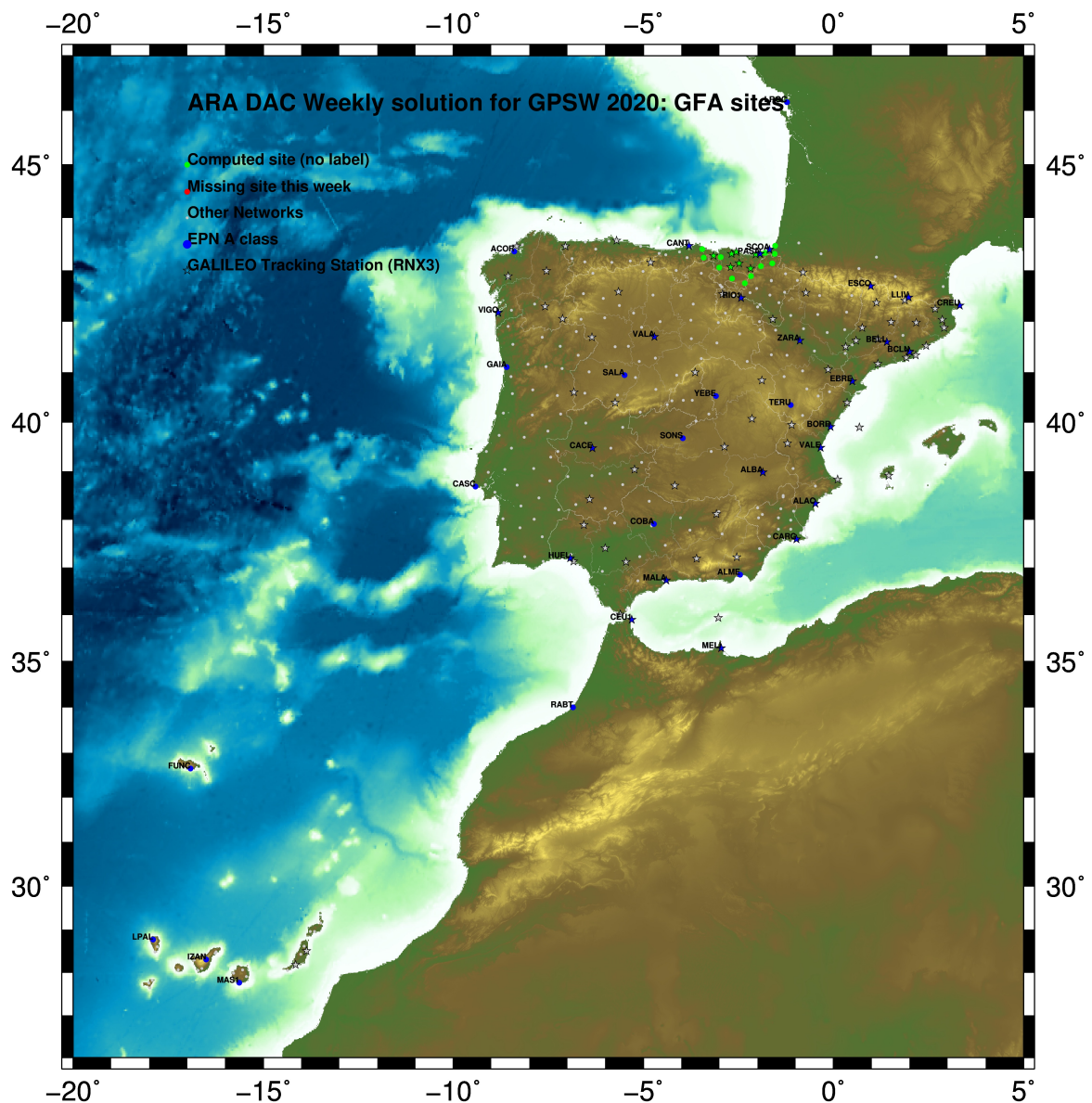
Report generated on 2018/10/14 at 16:13:37



# 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 Oct 14 16:13:24

Fig.1: Computed Sites for GPS Week2020 (GFA)

### 3 Main Computation Parameters

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

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

### 4 Estimated Parameters

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

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

## 5 Computed Coordinates

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

### 5.1 IGS14

The Reference Frame considered in this section is IGS14, release C1980.

| ARA LAC 2020 WEEK FINAL COMBINATION: PRECISE ORBITS |                |               |               |               | 14-OCT-18 11:41            |
|---|----------------|---------------|---------------|---------------|----------------------------|
| LOCAL GEODETIC DATUM: IGS14                         |                |               |               |               | EPOCH: 2018-09-26 12:00:00 |
| NUM   | STATION NAME   | X (M)         | Y (M)         | Z (M)         | FLAG                       |
| 1   | ACOR 13434M001 | 4594489.56635 | -678367.46316 | 4357066.27886 | W                          |
| 33  | ALDA 19383M001 | 4687280.16449 | -190876.58132 | 4308106.94419 | A                          |
| 42  | ALSA 19419M001 | 4677250.84322 | -176770.41115 | 4319079.86531 | A                          |
| 44  | AMUR 19388M001 | 4661499.45201 | -244591.27380 | 4332269.87498 | A                          |
| 77  | BLAZ 10074M002 | 4634456.05763 | -124344.99086 | 4365785.44861 | A                          |
| 78  | BIDA 00000M000 | 4644177.82922 | -145778.33699 | 4354832.47326 | A                          |
| 88  | BRZR 19387M001 | 4662220.99345 | -220769.91634 | 4333309.42945 | A                          |
| 9   | CACE 13447M001 | 4899866.50899 | -544567.05061 | 4033770.19665 | W                          |
| 10  | CANT 13438M001 | 4625924.31820 | -307096.24864 | 4365771.54831 | W                          |
| 112   | CHER 00000M000 | 4645880.32822 | -125721.94073 | 4353624.36581 | A                          |
| 15  | CREU 13432M001 | 4715420.14002 | 273178.04588  | 4271946.83439 | W                          |
| 16  | EBRE 13410M001 | 4833519.99683 | 41537.37631   | 4147461.70706 | W                          |
| 131   | ELGE 19353S001 | 4657557.41020 | -202241.48929 | 4338991.86317 | A                          |
| 133   | EMAZ 17001M001 | 4645924.21134 | -276949.88066 | 4347759.57111 | A                          |
| 153   | GERN 19389M001 | 4642811.31407 | -217222.94729 | 4353278.87563 | A                          |
| 173   | IGEL 19352S001 | 4645951.43435 | -165574.51795 | 4352550.41034 | A                          |
| 178   | ISPS 19484M001 | 4640596.48673 | -206963.79106 | 4356391.90603 | A                          |
| 182   | KAST 19499M001 | 4646949.08518 | -240747.29185 | 4348014.98441 | A                          |
| 185   | LARE 19440M001 | 4632831.95474 | -279026.15440 | 4360314.41958 | A                          |
| 186   | LAZK 19354S001 | 4666098.34758 | -178186.20511 | 4330463.66423 | A                          |
| 190   | LEIT 19428M001 | 4663520.93979 | -155858.73224 | 4334519.87168 | A                          |
| 242   | ORON 19427M001 | 4659695.79400 | -130864.75111 | 4338948.87855 | A                          |
| 249   | PAS2 19351S001 | 4644909.06630 | -156645.08267 | 4353623.07024 | A                          |
| 31  | PASA 19351S001 | 4644909.06332 | -156645.08292 | 4353623.06814 | W                          |
| 34  | RID1 13448M002 | 4708446.83209 | -199490.29892 | 4284089.72949 | W                          |
| 35  | SALA 13469M001 | 4803054.48813 | -462131.08351 | 4158379.06851 | W                          |
| 36  | SCDA 10088M002 | 4639940.50563 | -136224.95534 | 4359552.40752 | W                          |
| 298   | SOPU 19386M001 | 4643997.91548 | -255913.92056 | 4350063.13671 | A                          |
| 40  | TERU 13487M001 | 4867391.32720 | -95523.36719  | 4108341.67398 | W                          |
| 349   | VITO 19385M001 | 4679397.70440 | -218436.52106 | 4314898.35748 | A                          |
| 44  | YEBE 13420M001 | 4848724.56970 | -261631.94441 | 4123094.31884 | W                          |
| 45  | ZARA 13462M001 | 4773803.17226 | -73505.99803  | 4215454.08759 | 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 2020  |                |               |               |               | 14-OCT-18 11:41            |
|--------------------------------|----------------|---------------|---------------|---------------|----------------------------|
| LOCAL GEODETIC DATUM: ETRF2000 |                |               |               |               | EPOCH: 2018-09-26 12:00:00 |
| NUM                            | STATION NAME   | X (M)         | Y (M)         | Z (M)         | FLAG                       |
| 1                              | ACOR 13434M001 | 4594489.86730 | -678367.98774 | 4357065.87071 | W                          |
| 33                             | ALDA 19383M001 | 4687280.51796 | -190877.11430 | 4308106.53502 | A                          |
| 42                             | ALSA 19419M001 | 4677251.19904 | -176770.94306 | 4319079.45705 | A                          |
| 44                             | AMUR 19388M001 | 4661499.80096 | -244591.80430 | 4332269.46708 | A                          |
| 77                             | BLAZ 10074M002 | 4634456.42259 | -124345.51826 | 4365785.04414 | A                          |
| 78                             | BIDA 00000M000 | 4644178.19099 | -145778.86544 | 4354832.06781 | A                          |
| 88                             | BRZR 19387M001 | 4662221.34520 | -220770.44685 | 4333309.02178 | A                          |
| 9                              | CACE 13447M001 | 4899866.80340 | -544567.60584 | 4033769.76741 | W                          |
| 10                             | CANT 13438M001 | 4625924.66226 | -307096.77567 | 4365771.14231 | W                          |
| 112                            | CHER 00000M000 | 4645880.69220 | -125722.46929 | 4353623.96047 | A                          |
| 15                             | CREU 13432M001 | 4715420.54401 | 273177.51166  | 4271946.42853 | W                          |
| 16                             | EBRE 13410M001 | 4833520.36597 | 41536.82929   | 4147461.28973 | W                          |
| 131                            | ELGE 19353S001 | 4657557.76445 | -202242.01927 | 4338991.45607 | A                          |
| 133                            | EMAZ 17001M001 | 4645924.55764 | -276950.40967 | 4347759.16399 | A                          |
| 153                            | GERN 19389M001 | 4642811.66757 | -217223.47581 | 4353278.46944 | A                          |
| 173                            | IGEL 19352S001 | 4645951.79371 | -165575.04664 | 4352550.00453 | A                          |
| 178                            | ISPS 19484M001 | 4640596.84161 | -206964.31933 | 4356391.50013 | A                          |
| 182                            | KAST 19499M001 | 4646949.43564 | -240747.82086 | 4348014.57764 | A                          |
| 185                            | LARE 19440M001 | 4632832.30165 | -279026.68206 | 4360314.01340 | A                          |
| 186                            | LAZK 19354S001 | 4666098.70400 | -178186.73589 | 4330463.25678 | A                          |
| 190                            | LEIT 19428M001 | 4663521.29904 | -155859.26270 | 4334519.46468 | A                          |
| 242                            | ORON 19427M001 | 4659696.15641 | -130865.28110 | 4338948.47213 | A                          |
| 249                            | PAS2 19351S001 | 4644909.42675 | -156645.61123 | 4353622.66461 | A                          |
| 31                             | PASA 19351S001 | 4644909.42377 | -156645.61148 | 4353622.66251 | W                          |
| 34                             | RID1 13448M002 | 4708447.18295 | -199490.83406 | 4284089.31864 | W                          |
| 35                             | SALA 13469M001 | 4803054.80043 | -462131.62886 | 4158378.64749 | W                          |
| 36                             | SCDA 10088M002 | 4639940.86881 | -136225.48333 | 4359552.00250 | W                          |
| 298                            | SOPU 19386M001 | 4643998.26434 | -255914.44930 | 4350062.72997 | W                          |
| 40                             | TERU 13487M001 | 4867391.67804 | -95523.91808  | 4108341.25253 | A                          |
| 349                            | VITO 19385M001 | 4679398.05517 | -218437.05331 | 4314897.94856 | A                          |
| 44                             | YEBE 13420M001 | 4848724.90256 | -261632.49390 | 4123093.89682 | W                          |
| 45                             | ZARA 13462M001 | 4773803.53287 | -73506.53941  | 4215453.67337 | 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).

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ETRF2014 FINAL COORD. wk 2020                                14-OCT-18 11:41
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LOCAL GEODETIC DATUM: ETRF2014          EPOCH: 2018-09-26 12:00:00
NUM STATION NAME          X (M)          Y (M)          Z (M)          FLAG
1  ACDR 13434M001        4594489.82460    -678368.02659   4357065.91882   W
33 ALDA 19383M001        4687280.47310    -190877.15445   4308106.58302   A
42 ALSA 19419M001        4677251.15424    -176770.98330   4319079.50508   A
44 AMUR 19388M001        4661499.75651    -244591.84437   4332269.51513   A
77 BIAZ 10074M002        4634456.37805    -124345.55883   4365785.09230   A
78 BIDA 00000M000        4644178.14642    -145778.90591   4354832.11594   A
88 BRZR 19387M001        4662221.30068    -220770.48700   4333309.06983   A
9  CACE 13447M001        4899866.75734    -544567.64398   4033769.81487   W
10 CANT 13438M001        4625924.61833    -307096.81567   4365771.19041   W
112 CHER 00000M000        4645880.64755    -125722.50982   4353624.00861   A
15 CREU 13432M001        4715420.49738    273177.47007   4271946.47675   W
16 EBRE 13410M001        4833520.31895    41536.78891   4147461.33754   W
131 ELGE 19353S001        4657557.71992    -202242.05950   4338991.50414   A
133 EMAZ 17001M001        4645924.51343    -276950.44969   4347759.21205   A
153 GERN 19389M001        4642811.62322    -217223.51604   4353278.51754   A
173 IGEL 19352S001        4645951.74918    -165575.08704   4352550.05264   A
178 ISPS 19484M001        4640596.79725    -206964.35960   4356391.54824   A
182 KAST 19499M001        4646949.39131    -240747.86099   4348014.62572   A
185 LARE 19440M001        4632832.25757    -279026.72213   4360314.06150   A
186 LAZK 19354S001        4666098.65931    -178186.77616   4330463.30484   A
190 LEIT 19428M001        4663521.25431    -155859.30306   4334519.51276   A
242 ORON 19427M001        4659696.11644    -130865.32156   4338948.52023   A
249 PAS2 19351S001        4644909.38220    -156645.65166   4353622.71273   A
31 PASA 19351S001        4644909.37922    -156645.65191   4353622.71063   W
34 RIO1 13448M002        4708447.13791    -199490.87411   4284089.36659   W
35 SALA 13469M001        4803054.75517    -462131.66766   4158378.69515   W
36 SOGA 10088M002        4639940.82425    -136225.52385   4359552.05064   W
298 SOPU 19386M001        4643998.22009    -255914.48940   4350062.77806   A
40 TERU 13487M001        4867391.63111    -95523.95787   4108341.30019   W
349 VITO 19385M001        4679398.01047    -218437.09340   4314897.99658   A
44 YEBE 13420M001        4848724.85630    -261632.53320   4123093.94444   W
45 ZARA 13462M001        4773803.48681    -73506.57963   4215453.72123   W

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## 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 2020 WEEK FINAL COMBINATION: PRECISE ORBITS 14-OCT-18 11:41

| Station        | #Days | Weekday<br>0123456 | Repeatability (mm) |      |      |
|----------------|-------|--------------------|--------------------|------|------|
|                |       |                    | N                  | E    | U    |
| ACOR 13434M001 | 7     | XXXXXX             | 0.40               | 1.49 | 3.48 |
| ALDA 19383M001 | 4     | XXX X              | 2.70               | 1.36 | 1.97 |
| ALSA 19419M001 | 7     | XXXXXX             | 2.75               | 1.13 | 2.94 |
| AMUR 19388M001 | 5     | XXX X              | 0.89               | 1.31 | 1.38 |
| BIAZ 10074M002 | 7     | XXXXXX             | 0.74               | 0.88 | 3.77 |
| BIDA 00000M000 | 7     | XXXXXX             | 1.11               | 0.63 | 3.35 |
| BRZR 19387M001 | 7     | XXXXXX             | 1.43               | 2.24 | 5.70 |
| CACE 13447M001 | 7     | XXXXXX             | 0.74               | 0.73 | 2.68 |
| CANT 13438M001 | 7     | XXXXXX             | 1.01               | 0.95 | 3.56 |
| CHER 00000M000 | 7     | XXXXXX             | 0.97               | 1.28 | 3.68 |
| CREU 13432M001 | 7     | XXXXXX             | 1.48               | 1.20 | 4.80 |
| EBRE 13410M001 | 7     | XXXXXX             | 1.02               | 1.07 | 4.26 |
| ELGE 19353S001 | 7     | XXXXXX             | 1.44               | 1.57 | 2.40 |
| EMAZ 17001M001 | 5     | XX XX              | 2.01               | 1.63 | 5.45 |
| GERN 19389M001 | 7     | XXXXXX             | 0.86               | 1.76 | 3.53 |
| IGEL 19352S001 | 7     | XXXXXX             | 1.45               | 0.80 | 3.42 |
| ISPS 19484M001 | 7     | XXXXXX             | 1.10               | 1.40 | 3.24 |
| KAST 19499M001 | 5     | XXX X              | 2.01               | 0.94 | 7.19 |
| LARE 19440M001 | 7     | XXXXXX             | 2.00               | 1.11 | 4.34 |
| LAZK 19354S001 | 7     | XXXXXX             | 1.77               | 0.73 | 4.13 |
| LEIT 19428M001 | 7     | XXXXXX             | 1.13               | 1.56 | 6.90 |
| ORON 19427M001 | 7     | XXXXXX             | 1.66               | 1.30 | 4.08 |
| PAS2 19351S001 | 2     | X X                | 0.51               | 1.60 | 2.90 |
| PASA 19351S001 | 7     | XXXXXX             | 0.89               | 0.82 | 3.92 |
| RI01 13448M002 | 7     | XXXXXX             | 0.82               | 0.90 | 4.06 |
| SALA 13469M001 | 7     | XXXXXX             | 0.75               | 0.75 | 3.21 |
| SCDA 10088M002 | 7     | XXXXXX             | 0.64               | 0.68 | 3.13 |
| SOPU 19386M001 | 7     | XXXXXX             | 1.29               | 1.54 | 3.69 |
| TERU 13487M001 | 7     | XXXXXX             | 0.62               | 0.37 | 3.36 |
| VITD 19385M001 | 5     | XX XX              | 0.24               | 1.34 | 2.62 |
| YEBE 13420M001 | 7     | XXXXXX             | 0.76               | 1.02 | 3.12 |
| ZARA 13462M001 | 7     | XXXXXX             | 0.61               | 1.12 | 3.68 |

Comparison of individual solutions:

|                |   |      |       |       |       |        |       |       |       |
|----------------|---|------|-------|-------|-------|--------|-------|-------|-------|
| ACOR 13434M001 | N | 0.40 | -0.12 | -0.34 | 0.22  | -0.31  | 0.64  | -0.01 | 0.52  |
| ACOR 13434M001 | E | 1.49 | 0.45  | -1.33 | 0.57  | -0.16  | -1.64 | 2.81  | 0.61  |
| ACOR 13434M001 | U | 3.48 | 4.96  | -2.90 | -4.10 | -2.93  | 1.57  | 1.87  | -2.88 |
| ALDA 19383M001 | N | 2.70 | -1.24 | 3.76  | -0.64 |        |       |       | -2.40 |
| ALDA 19383M001 | E | 1.36 | 1.75  | -1.09 | 0.37  |        |       |       | 1.08  |
| ALDA 19383M001 | U | 1.97 | -0.24 | -0.95 | -2.22 |        |       |       | -2.40 |
| ALSA 19419M001 | N | 2.75 | 0.66  | 2.62  | 0.67  | -5.58  | -0.69 | -1.15 | 2.21  |
| ALSA 19419M001 | E | 1.13 | -0.69 | -1.09 | 0.89  | 1.37   | -0.97 | 1.39  | 0.69  |
| ALSA 19419M001 | U | 2.94 | -3.20 | 1.91  | -0.35 | -3.89  | 4.05  | 2.46  | -0.54 |
| AMUR 19388M001 | N | 0.89 | 0.54  | -1.25 | 0.32  | 0.99   |       |       | -0.46 |
| AMUR 19388M001 | E | 1.31 | 1.64  | 1.03  | 0.98  | 0.46   |       |       | -1.39 |
| AMUR 19388M001 | U | 1.38 | -1.65 | 1.15  | -1.47 | 0.39   |       |       | -1.10 |
| BIAZ 10074M002 | N | 0.74 | -0.31 | -0.78 | 0.77  | 0.29   | -1.01 | 0.34  | 0.86  |
| BIAZ 10074M002 | E | 0.88 | 0.55  | -1.24 | 1.41  | 0.83   | -0.29 | 0.20  | 0.19  |
| BIAZ 10074M002 | U | 3.77 | -1.78 | 1.51  | -2.45 | 3.67   | 5.49  | -0.95 | -5.42 |
| BIDA 00000M000 | N | 1.11 | -0.00 | 1.29  | -0.92 | -1.58  | -0.04 | -0.10 | 1.52  |
| BIDA 00000M000 | E | 0.63 | 1.10  | 0.07  | 0.51  | -0.47  | 0.17  | 0.80  | -0.09 |
| BIDA 00000M000 | U | 3.35 | -3.80 | 2.74  | 1.65  | -2.13  | 5.95  | -1.19 | -1.08 |
| BRZR 19387M001 | N | 1.43 | -0.07 | 0.34  | 1.84  | -2.29  | -0.73 | 1.74  | -0.14 |
| BRZR 19387M001 | E | 2.24 | 2.96  | -2.34 | 2.00  | -3.05  | 0.07  | 0.53  | 1.47  |
| BRZR 19387M001 | U | 5.70 | 4.93  | 7.06  | 2.16  | -10.33 | 2.34  | -1.03 | -1.70 |
| CACE 13447M001 | N | 0.74 | 0.06  | -0.14 | 0.74  | -0.23  | 0.29  | -1.49 | 0.59  |
| CACE 13447M001 | E | 0.73 | -0.25 | 1.23  | -0.06 | -0.94  | 0.72  | 0.22  | -0.39 |
| CACE 13447M001 | U | 2.68 | -1.62 | -0.42 | -4.13 | 0.82   | -3.81 | 0.03  | -2.85 |
| CANT 13438M001 | N | 1.01 | -1.41 | -1.23 | -0.14 | -1.44  | -0.40 | 0.60  | -0.15 |
| CANT 13438M001 | E | 0.95 | 1.10  | 0.97  | 1.11  | 0.49   | -0.21 | 1.34  | -0.13 |
| CANT 13438M001 | U | 3.56 | 0.11  | 1.78  | 0.13  | 4.08   | 4.44  | 3.82  | -4.67 |
| CHER 00000M000 | N | 0.97 | -1.35 | -0.59 | 0.82  | 1.60   | 0.04  | 0.17  | -0.43 |
| CHER 00000M000 | E | 1.28 | 2.05  | -0.83 | 2.05  | -0.66  | -0.38 | -0.19 | -0.26 |
| CHER 00000M000 | U | 3.68 | -4.62 | 0.32  | 4.06  | 5.50   | 0.71  | -2.45 | -2.51 |
| CREU 13432M001 | N | 1.48 | -0.62 | 1.05  | -0.39 | 0.85   | 0.72  | 0.87  | -3.10 |
| CREU 13432M001 | E | 1.20 | -0.84 | -2.04 | -1.20 | 0.77   | -0.20 | 0.50  | 1.20  |
| CREU 13432M001 | U | 4.80 | 4.55  | -7.76 | 2.30  | -5.31  | -1.49 | 0.44  | 4.59  |
| EBRE 13410M001 | N | 1.02 | -0.24 | -2.24 | 0.24  | 0.50   | 0.34  | 0.53  | 0.67  |
| EBRE 13410M001 | E | 1.07 | -1.06 | 1.75  | -0.98 | 0.74   | -0.51 | -0.85 | -0.49 |
| EBRE 13410M001 | U | 4.26 | -1.68 | 9.60  | 1.53  | -0.87  | 0.16  | -2.97 | -1.34 |
| ELGE 19353S001 | N | 1.44 | -0.27 | -1.48 | -0.35 | 2.69   | -1.45 | 0.83  | 0.30  |
| ELGE 19353S001 | E | 1.57 | 2.04  | 2.12  | 0.97  | 0.39   | -1.50 | -0.22 | -1.68 |
| ELGE 19353S001 | U | 2.40 | 2.42  | 1.76  | 0.42  | -0.30  | 2.30  | -0.14 | -4.48 |
| EMAZ 17001M001 | N | 2.01 | -1.31 | -0.66 | 0.83  |        |       |       | -3.34 |
| EMAZ 17001M001 | E | 1.63 | 0.07  | -0.06 | 1.14  |        |       |       | 1.76  |
| EMAZ 17001M001 | U | 5.45 | -4.82 | 1.66  | -2.88 |        |       |       | 8.88  |
| GERN 19389M001 | N | 0.86 | -0.10 | -0.63 | -0.57 | 1.76   | -0.46 | 0.61  | 0.11  |
| GERN 19389M001 | E | 1.76 | -1.16 | 0.80  | 0.18  | 3.67   | -1.34 | -0.82 | 0.76  |
| GERN 19389M001 | U | 3.53 | -1.97 | 6.83  | -2.66 | 3.29   | -1.39 | -2.14 | -0.06 |
| IGEL 19352S001 | N | 1.45 | -0.61 | -2.28 | -0.21 | 2.53   | -0.03 | 0.43  | 0.72  |
| IGEL 19352S001 | E | 0.80 | 1.48  | -0.39 | 1.12  | 0.26   | -0.30 | 0.16  | -0.27 |
| IGEL 19352S001 | U | 3.42 | -3.29 | 5.65  | 1.82  | -0.66  | 2.80  | -0.68 | -3.91 |
| ISPS 19484M001 | N | 1.10 | 0.30  | 0.45  | -0.05 | -1.96  | -0.55 | 0.91  | 1.42  |
| ISPS 19484M001 | E | 1.40 | 0.38  | -0.53 | 2.75  | -1.35  | -0.86 | 0.98  | 0.42  |
| ISPS 19484M001 | U | 3.24 | -2.64 | 4.67  | -0.82 | -0.85  | 4.90  | -1.16 | -2.74 |
| KAST 19499M001 | N | 2.01 | -1.03 | 1.50  | -1.37 | 2.85   |       |       | -1.70 |
| KAST 19499M001 | E | 0.94 | 0.67  | 0.60  | 1.60  | -0.01  |       |       | 0.37  |
| KAST 19499M001 | U | 7.19 | -4.80 | 10.82 | -7.95 | 0.30   |       |       | -1.82 |
| LARE 19440M001 | N | 2.00 | -1.34 | -1.86 | 0.21  | 0.18   | -0.72 | 4.06  | 1.31  |
| LARE 19440M001 | E | 1.11 | -0.06 | 1.29  | 1.91  | -0.04  | 0.21  | -0.17 | -1.42 |
| LARE 19440M001 | U | 4.34 | 0.37  | 0.46  | -0.65 | -4.91  | 7.64  | -2.36 | -4.90 |
| LAZK 19354S001 | N | 1.77 | 1.17  | -1.07 | 0.72  | -3.19  | -0.66 | 1.04  | 2.01  |
| LAZK 19354S001 | E | 0.73 | 0.44  | 1.21  | 0.21  | 0.85   | 0.13  | -0.09 | -0.85 |

|      |           |   |      |       |       |       |        |       |       |       |
|------|-----------|---|------|-------|-------|-------|--------|-------|-------|-------|
| LAZK | 19354S001 | U | 4.13 | 1.39  | 5.18  | -0.04 | 4.16   | 1.90  | -5.00 | -5.28 |
| LEIT | 19428M001 | N | 1.13 | 0.53  | -0.43 | 0.64  | -1.06  | -1.57 | 1.74  | 0.39  |
| LEIT | 19428M001 | E | 1.56 | 0.79  | -0.33 | -0.26 | 3.26   | 0.46  | -0.26 | -1.72 |
| LEIT | 19428M001 | U | 6.90 | 3.63  | 8.81  | 2.30  | -11.71 | 5.70  | -4.16 | -1.62 |
| ORDN | 19427M001 | N | 1.66 | 1.45  | 1.58  | 0.12  | -3.31  | -0.71 | 0.62  | 0.13  |
| ORDN | 19427M001 | E | 1.30 | 1.82  | 0.27  | 0.93  | -1.84  | 1.39  | 0.36  | -0.67 |
| ORDN | 19427M001 | U | 4.08 | -5.46 | 3.30  | 0.57  | 5.14   | 4.55  | -2.49 | -2.34 |
| PAS2 | 19351S001 | N | 0.51 | 0.44  |       |       |        |       |       |       |
| PAS2 | 19351S001 | E | 1.60 | 1.32  |       |       |        |       |       |       |
| PAS2 | 19351S001 | U | 2.90 | -2.67 |       |       |        |       |       |       |
| PASA | 19351S001 | N | 0.89 | 0.00  | -0.11 | -0.09 | -0.01  | -1.55 | 0.74  | 1.31  |
| PASA | 19351S001 | E | 0.82 | 1.38  | 0.89  | 0.89  | -0.65  | -0.35 | -0.03 | -0.04 |
| PASA | 19351S001 | U | 3.92 | -3.15 | 5.51  | 1.06  | -2.91  | 5.79  | -1.98 | -2.17 |
| RID1 | 13448M002 | N | 0.82 | -0.89 | -0.81 | 0.14  | -1.49  | -0.03 | 0.63  | -0.07 |
| RID1 | 13448M002 | E | 0.90 | 1.43  | 0.17  | 1.07  | -0.83  | -0.16 | 0.94  | -0.23 |
| RID1 | 13448M002 | U | 4.06 | 0.42  | 5.93  | -6.63 | 2.26   | 2.41  | 2.74  | -1.14 |
| SALA | 13469M001 | N | 0.75 | -0.45 | 0.93  | 1.16  | -0.40  | 0.54  | 0.54  | -0.47 |
| SALA | 13469M001 | E | 0.75 | -0.21 | 0.24  | -0.43 | -0.96  | -0.79 | -0.20 | 1.24  |
| SALA | 13469M001 | U | 3.21 | 4.29  | 1.95  | 2.02  | 1.76   | -3.22 | -1.10 | -4.58 |
| SCDA | 10088M002 | N | 0.64 | -0.73 | -0.47 | 0.51  | 1.03   | 0.22  | 0.57  | 0.04  |
| SCDA | 10088M002 | E | 0.68 | 0.35  | -0.07 | 1.50  | -0.38  | 0.31  | 0.07  | -0.34 |
| SCDA | 10088M002 | U | 3.13 | -2.25 | 4.94  | 0.90  | 1.89   | 3.55  | -2.82 | -2.10 |
| SOPU | 19386M001 | N | 1.29 | -0.38 | -2.05 | 0.48  | 1.75   | -0.55 | 1.28  | 0.66  |
| SOPU | 19386M001 | E | 1.54 | 0.69  | -0.75 | 2.69  | 1.38   | -1.60 | -0.63 | -1.03 |
| SOPU | 19386M001 | U | 3.69 | -0.69 | 3.74  | -2.87 | -5.70  | 2.87  | 3.49  | -2.51 |
| TERU | 13487M001 | N | 0.62 | 0.01  | 0.02  | 0.66  | 0.12   | -0.29 | 0.17  | 1.32  |
| TERU | 13487M001 | E | 0.37 | -0.15 | -0.01 | 0.22  | -0.38  | 0.78  | -0.01 | 0.06  |
| TERU | 13487M001 | U | 3.36 | 3.14  | -6.38 | 2.12  | -1.75  | -2.61 | -0.49 | -1.62 |
| VITO | 19385M001 | N | 0.24 | 0.26  | -0.31 | -0.23 |        |       | -0.04 | 0.12  |
| VITO | 19385M001 | E | 1.34 | 1.26  | -0.33 | 1.48  |        |       | 1.61  | -0.86 |
| VITO | 19385M001 | U | 2.62 | 2.04  | 0.95  | -2.72 |        |       | -0.25 | -3.85 |
| YEBE | 13420M001 | N | 0.76 | -0.99 | 1.01  | 0.69  | 0.16   | 0.54  | -0.78 | 0.14  |
| YEBE | 13420M001 | E | 1.02 | -0.59 | -0.31 | -0.18 | 1.08   | 0.77  | 1.44  | -1.37 |
| YEBE | 13420M001 | U | 3.12 | -3.58 | -3.60 | -0.48 | -1.29  | -5.08 | -0.57 | 2.13  |
| ZARA | 13462M001 | N | 0.61 | -0.06 | -0.45 | -0.86 | -0.71  | -0.27 | -0.05 | 0.85  |
| ZARA | 13462M001 | E | 1.12 | 1.46  | 1.29  | 0.08  | -1.71  | -0.27 | -0.29 | 0.80  |
| ZARA | 13462M001 | U | 3.68 | 3.41  | 3.27  | -4.28 | 2.54   | 1.21  | 1.30  | 5.58  |



## 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 | -2.37                    | 1.62  | -2.46 |
| 2   | ALAC 13433M001  | I W | -0.31                    | 0.46  | -0.98 |
| 3   | ALBA 13452M001  | I W | -0.47                    | -0.52 | 2.32  |
| 4   | ALME 13437M001  | I W | -2.32                    | 1.44  | 2.15  |
| 5   | BCLN 13412M001  | I W | -0.22                    | 0.23  | -3.81 |
| 6   | BELL 13431M001  | I W | 0.05                     | 0.32  | 1.72  |
| 7   | BORR 13480M001  | I W | -0.32                    | -0.86 | 0.40  |
| 8   | BRST 10004M004  | I W | -1.24                    | 0.71  | -2.65 |
| 9   | CACE 13447M001  | I W | 0.51                     | 1.25  | -0.61 |
| 10  | CANT 13438M001  | I W | -0.79                    | 0.74  | 0.50  |
| 11  | CARG 19412M001  | I W | -1.06                    | 0.61  | 1.39  |
| 12  | CASC 13909S001  | I W | 0.07                     | 0.30  | 2.10  |
| 13  | CEU1 13449M002  | I W | -0.95                    | 0.48  | 1.12  |
| 14  | COBA 13453M001  | I W | 0.52                     | -0.25 | -2.01 |
| 15  | CREU 13432M001  | I W | 0.49                     | -0.17 | -2.34 |
| 16  | EBRE 13410M001  | I W | 1.10                     | 0.37  | -1.54 |
| 17  | ESCO 13435M001  | I W | 1.72                     | 0.01  | -5.68 |
| 18  | FUNC 13911S001  | I W | 1.68                     | 0.77  | -0.27 |
| 19  | GAIA 13902M001  | I W | 0.91                     | 0.95  | 4.14  |
| 21  | HUEL 13451M001  | I W | 0.69                     | -2.47 | 1.95  |
| 22  | IZAN 13109M002  | I W | -0.32                    | -1.19 | 3.17  |
| 24  | LLIV 13436M001  | I W | 0.61                     | 0.35  | 0.86  |
| 25  | LPAL 81701M001  | I W | -3.43                    | 1.86  | -1.30 |
| 26  | LR0C 10023M001  | I W | 0.01                     | -0.66 | -3.16 |
| 27  | MALA 13443M001  | I W | -1.88                    | -0.06 | 1.62  |
| 28  | MAS1 31303M002  | I W | -0.46                    | 0.46  | 4.82  |
| 30  | MELI 19379M001  | I W | 0.38                     | -1.15 | -0.58 |
| 31  | PASA 19351S001  | I W | 0.41                     | 0.47  | 3.57  |
| 32  | PDEL 31906M004  | I W | -0.35                    | 1.94  | -2.03 |
| 33  | RABT 35001M002  | I W | 0.03                     | -0.37 | -1.71 |
| 34  | RID1 13448M002  | I W | 0.05                     | 0.21  | -2.05 |
| 35  | SALA 13469M001  | I W | 0.58                     | -0.15 | -0.07 |
| 36  | SCOA 10088M002  | I W | -2.42                    | -0.77 | -1.60 |
| 38  | SONS 13446M001  | I W | -0.67                    | -0.39 | 1.15  |
| 39  | TERC 131909M001 | I W | 8.01                     | -6.27 | -5.94 |
| 40  | TERU 13487M001  | I W | 2.37                     | -0.06 | -0.57 |
| 41  | VALA 13463M002  | I W | -0.59                    | -1.25 | 1.22  |
| 42  | VALE 13439M001  | I W | -0.81                    | 0.50  | -0.63 |
| 43  | VIGO 13450M001  | I W | -0.31                    | -0.47 | 1.04  |
| 44  | YEBE 13420M001  | I W | 1.10                     | -0.00 | 6.85  |
| 45  | ZARA 13462M001  | I W | 0.20                     | 0.50  | 1.61  |
| 46  | ZIMM 14001M004  | I W | -0.21                    | 0.53  | -1.72 |
|     |                 |     |                          |       |       |
|     | RMS / COMPONENT |     | 1.71                     | 1.32  | 2.63  |
|     | MEAN            |     | 0.00                     | -0.00 | -0.00 |
|     | MIN             |     | -3.43                    | -6.27 | -5.94 |
|     | MAX             |     | 8.01                     | 1.94  | 6.85  |

NUMBER OF PARAMETERS : 3  
NUMBER OF COORDINATES : 126  
RMS OF TRANSFORMATION : 1.96 MM

BARYCENTER COORDINATES:

LATITUDE : 39 41 12.90  
LONGITUDE : - 5 21 29.58  
HEIGHT : -48.657 KM

PARAMETERS:

TRANSLATION IN N : 0.00 +- 0.30 MM  
TRANSLATION IN E : 0.00 +- 0.30 MM  
TRANSLATION IN U : 0.00 +- 0.30 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          17187718
NUMBER OF UNKNOWN               234506
NUMBER OF DEGREES OF FREEDOM    16953212
PHASE MEASUREMENTS SIGMA        0.00100
SAMPLING INTERVAL (SECONDS)      180
VARIANCE FACTOR                  2.112869366566617
```

Helmert Transformation Parameters With Respect to Combined Solution:

| Sol | Rms (m) | Translation (m) |         |         | Rotation (") |         |         | Scale (ppm) |
|-----|---------|-----------------|---------|---------|--------------|---------|---------|-------------|
|     |         | X               | Y       | Z       | X            | Y       | Z       |             |
| 1   | 0.00207 | 0.0139          | -0.0140 | -0.0107 | 0.0003       | 0.0006  | -0.0003 | -0.00071    |
| 2   | 0.00232 | 0.0039          | 0.0015  | 0.0013  | -0.0001      | 0.0000  | 0.0000  | -0.00057    |
| 3   | 0.00204 | 0.0159          | 0.0023  | -0.0115 | -0.0000      | 0.0006  | 0.0001  | -0.00067    |
| 4   | 0.00276 | 0.0443          | 0.0056  | -0.0590 | 0.0002       | 0.0024  | 0.0004  | 0.00056     |
| 5   | 0.00234 | -0.0011         | 0.0126  | 0.0020  | -0.0002      | -0.0001 | 0.0004  | 0.00006     |
| 6   | 0.00232 | 0.0171          | -0.0012 | -0.0192 | 0.0002       | 0.0008  | 0.0001  | -0.00028    |
| 7   | 0.00220 | 0.0180          | 0.0121  | -0.0165 | -0.0001      | 0.0008  | 0.0005  | -0.00048    |

Statistics of individual solutions:

| File | RMS (m) | DOF     | Chi**2/DOF | #Observations authentic / pseudo | #Parameters explicit / implicit / singular |
|------|---------|---------|------------|----------------------------------|--|
| 1    | 0.00145 | 2441705 | 2.09       | 2476785                          | 3 1029 34054 0                             |
| 2    | 0.00149 | 2323224 | 2.21       | 2358234                          | 3 1014 33999 0                             |
| 3    | 0.00141 | 2402814 | 1.98       | 2438743                          | 3 1014 34918 0                             |
| 4    | 0.00150 | 2440871 | 2.25       | 2474460                          | 3 1011 32581 0                             |
| 5    | 0.00143 | 2423890 | 2.06       | 2457760                          | 3 1008 32865 0                             |
| 6    | 0.00143 | 2476657 | 2.05       | 2510778                          | 3 1026 33098 0                             |
| 7    | 0.00145 | 2437997 | 2.10       | 2470958                          | 3 1011 31953 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 18:266:00000 18:272:86370 LEICA GRX1200PRO -----
ALDA A 1 P 18:266:00000 18:271:46440 LEICA GR10 -----
ALSA A 1 P 18:266:00000 18:272:86370 LEICA GRX1200GGPRO -----
AMUR A 1 P 18:266:00000 18:271:57270 LEICA GR10 -----
BIAZ A 1 P 18:266:00000 18:272:86370 TRI SP90M -----
BIDA A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
BRZR A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
CACE A 1 P 18:266:00000 18:272:86370 TRIMBLE NETR9 -----
CANT A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
CHER A 1 P 18:266:00000 18:272:86370 LEICA GRX1200+GNSS -----
CREU A 1 P 18:266:00000 18:272:86370 LEICA GR50 -----
EBRE A 1 P 18:266:00000 18:272:86370 LEICA GR50 -----
ELGE A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
EMAZ A 1 P 18:266:00000 18:272:36870 LEICA GR30 -----
GERN A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
IGEL A 1 P 18:266:00000 18:272:86370 LEICA GR30 -----
ISPS A 1 P 18:266:00000 18:272:86370 TRIMBLE NETR9 -----
KAST A 1 P 18:266:00000 18:271:46950 LEICA GR30 -----
LARE A 1 P 18:266:00000 18:272:86370 LEICA GRX1200GGPRO -----
LAZK A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
LEIT A 1 P 18:266:00000 18:272:86370 LEICA GRX1200+GNSS -----
ORON A 1 P 18:266:00000 18:272:86370 LEICA GRX1200GGPRO -----
PAS2 A 1 P 18:266:00000 18:268:86370 TPS NET-G3A -----
PASA A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
RIO1 A 1 P 18:266:00000 18:272:86370 LEICA GR25 -----
SALA A 1 P 18:266:00000 18:272:86370 LEICA GRX1200+GNSS -----
SCOA A 1 P 18:266:00000 18:272:86370 LEICA GR25 -----
SOPU A 1 P 18:266:00000 18:272:86370 LEICA GR10 -----
TERU A 1 P 18:266:00000 18:272:86370 LEICA GRX1200GGPRO -----
VITO A 1 P 18:266:00000 18:272:37020 LEICA GR10 -----
YEBE A 1 P 18:266:00000 18:272:86370 TRIMBLE NETR9 -----
ZARA A 1 P 18:266:00000 18:272:86370 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 18:266:00000 18:272:86370 LEIAT504 LEIS -----
ALDA A 1 P 18:266:00000 18:271:46440 LEIAS10 NONE -----
ALSA A 1 P 18:266:00000 18:272:86370 LEIAX1202GG NONE -----
AMUR A 1 P 18:266:00000 18:271:57270 LEIAS10 NONE -----
```

|      |   |   |   |              |              |                |      |       |
|------|---|---|---|--------------|--------------|----------------|------|-------|
| BLAZ | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25        | LEIT | ----  |
| BIDA | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAS10        | NONE | ----  |
| BRZR | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAS10        | NONE | ----  |
| CACE | A | 1 | P | 18:266:00000 | 18:272:86370 | TRM29659.00    | NONE | ----  |
| CANT | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25.R4     | LEIT | 25066 |
| CHER | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAX1203+GNSS | NONE | ----  |
| CREU | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25.R4     | NONE | 26357 |
| EBRE | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25.R4     | NONE | 26359 |
| ELGE | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25.R4     | LEIT | ----  |
| EMAZ | A | 1 | P | 18:266:00000 | 18:272:36870 | LEIAS10        | NONE | ----  |
| GERN | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAS10        | NONE | ----  |
| IGEL | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR20        | LEIM | ----  |
| ISPS | A | 1 | P | 18:266:00000 | 18:272:86370 | TRM59900.00    | SCIS | ----  |
| KAST | A | 1 | P | 18:266:00000 | 18:271:46950 | LEIAS10        | NONE | ----  |
| LARE | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAT504       | NONE | ----  |
| LAZK | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25.R4     | LEIT | ----  |
| LEIT | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAX1203+GNSS | NONE | ----  |
| ORDN | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAX1202GG    | NONE | ----  |
| PAS2 | A | 1 | P | 18:266:00000 | 18:268:86370 | LEIAR20        | LEIM | 73034 |
| PASA | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR20        | LEIM | 73034 |
| RIO1 | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25.R4     | LEIT | 25138 |
| SALA | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAR25        | NONE | ----  |
| SCDA | A | 1 | P | 18:266:00000 | 18:272:86370 | TRM55971.00    | NONE | ----  |
| SOPU | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAS10        | NONE | ----  |
| TERU | A | 1 | P | 18:266:00000 | 18:272:86370 | LEIAT504GG     | LEIS | ----  |
| VITO | A | 1 | P | 18:266:00000 | 18:272:37020 | LEIAS10        | NONE | ----  |
| YEBE | A | 1 | P | 18:266:00000 | 18:272:86370 | TRM29659.00    | NONE | ----  |
| ZARA | A | 1 | P | 18:266:00000 | 18:272:86370 | TRM29659.00    | NONE | ----  |

### 7.3 Eccentricities

| *S   | PT | SOLN | T | DATA_START_  | DATA_END_    | AXE | ARP->BENCHMARK(M) | UP_    | NORTH_ | EAST_  |
|------|----|------|---|--------------|--------------|-----|-------------------|--------|--------|--------|
| ACOR | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 3.0460            | 0.0000 | 0.0000 | 0.0000 |
| ALDA | A  | 1    | P | 18:266:00000 | 18:271:46440 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| ALSA | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| AMUR | A  | 1    | P | 18:266:00000 | 18:271:57270 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| BLAZ | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| BIDA | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| BRZR | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| CACE | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0600            | 0.0000 | 0.0000 | 0.0000 |
| CANT | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 3.0490            | 0.0000 | 0.0000 | 0.0000 |
| CHER | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| CREU | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0770            | 0.0000 | 0.0000 | 0.0000 |
| EBRE | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0770            | 0.0000 | 0.0000 | 0.0000 |
| ELGE | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| EMAZ | A  | 1    | P | 18:266:00000 | 18:272:36870 | UNE | 0.0350            | 0.0000 | 0.0000 | 0.0000 |
| GERN | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| IGEL | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| ISPS | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0350            | 0.0000 | 0.0000 | 0.0000 |
| KAST | A  | 1    | P | 18:266:00000 | 18:271:46950 | UNE | 0.0350            | 0.0000 | 0.0000 | 0.0000 |
| LARE | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| LAZK | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| LEIT | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| ORDN | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| PAS2 | A  | 1    | P | 18:266:00000 | 18:268:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| PASA | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| RIO1 | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0606            | 0.0000 | 0.0000 | 0.0000 |
| SALA | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0600            | 0.0000 | 0.0000 | 0.0000 |
| SCDA | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| SOPU | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| TERU | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0600            | 0.0000 | 0.0000 | 0.0000 |
| VITO | A  | 1    | P | 18:266:00000 | 18:272:37020 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| YEBE | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 0.0000            | 0.0000 | 0.0000 | 0.0000 |
| ZARA | A  | 1    | P | 18:266:00000 | 18:272:86370 | UNE | 3.2590            | 0.0000 | 0.0000 | 0.0000 |

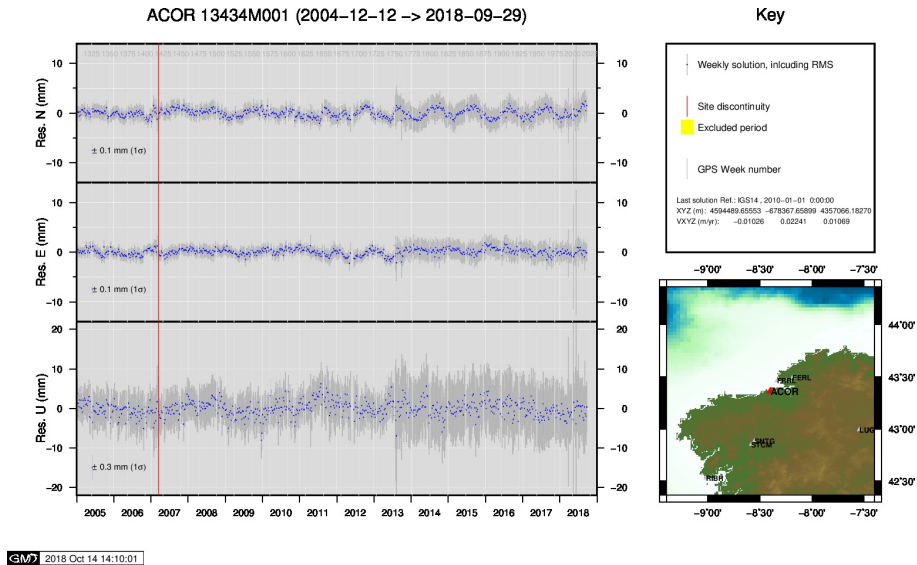
## 8 Inconsistencies (logsheet-RINEX metadata)

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

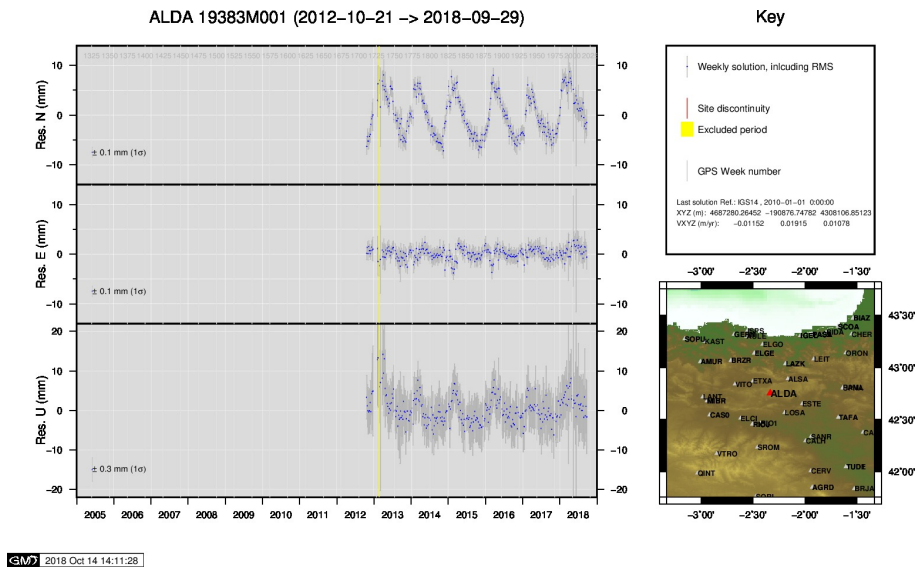
|            |       |     |  |              |  |               |  |         |    |             |
|------------|-------|-----|--|--------------|--|---------------|--|---------|----|-------------|
| 2018-10-08 | 00:28 | UTC |  | PAS22660.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |
| 2018-10-09 | 01:32 | UTC |  | PAS22670.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |
| 2018-10-10 | 00:26 | UTC |  | PAS22680.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |
| 2018-10-10 | 21:45 | UTC |  | PAS22690.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |
| 2018-10-12 | 00:32 | UTC |  | PAS22700.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |
| 2018-10-13 | 00:36 | UTC |  | PAS22710.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |
| 2018-10-14 | 00:32 | UTC |  | PAS22720.180 |  | RECEIVER TYPE |  | NET-G3A | -> | TPS NET-G3A |

## 9 Cumulative Time Series

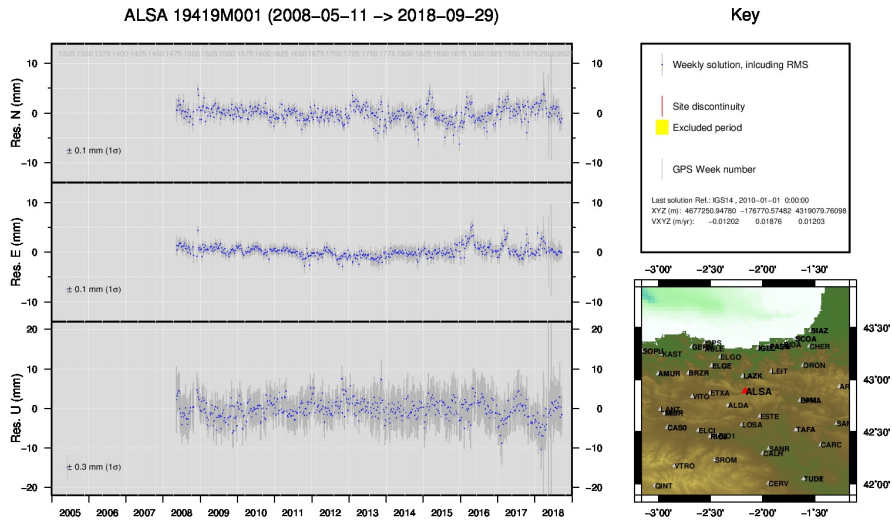
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



1 ) ACOR

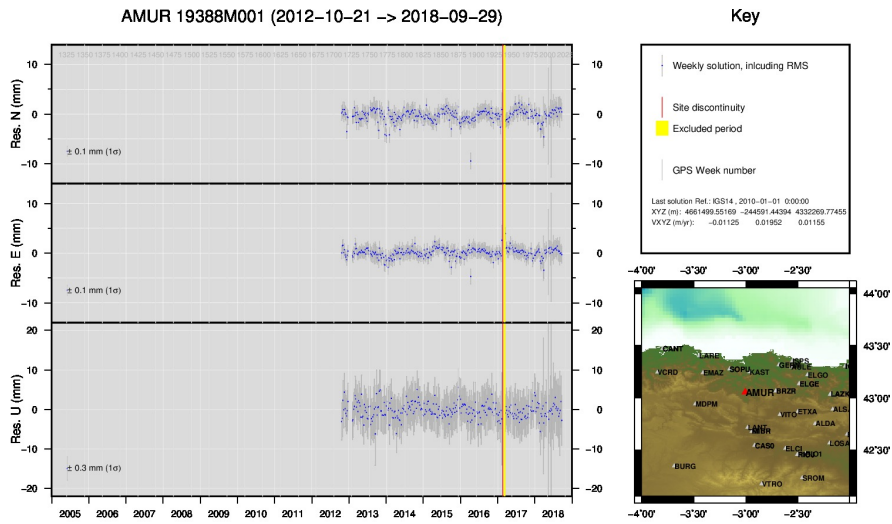


2 ) ALDA



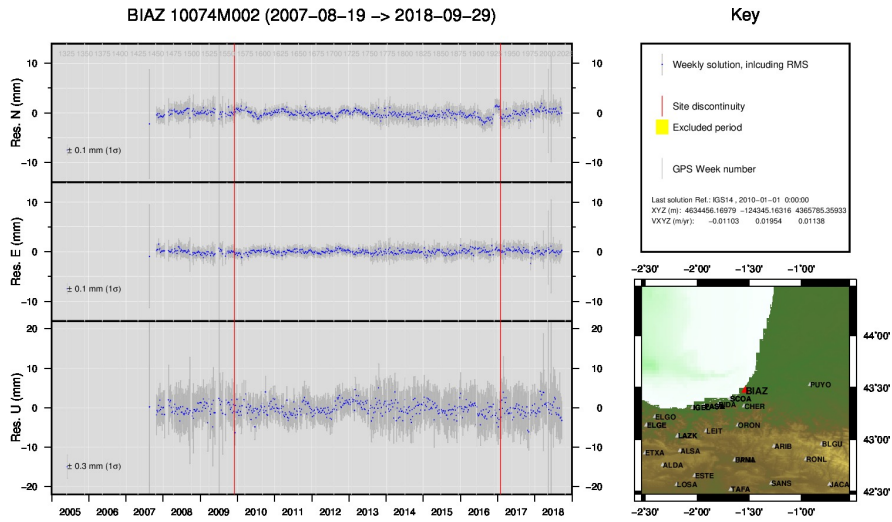
GMW 2018 Oct 14 14:12:28

3 ) ALSA



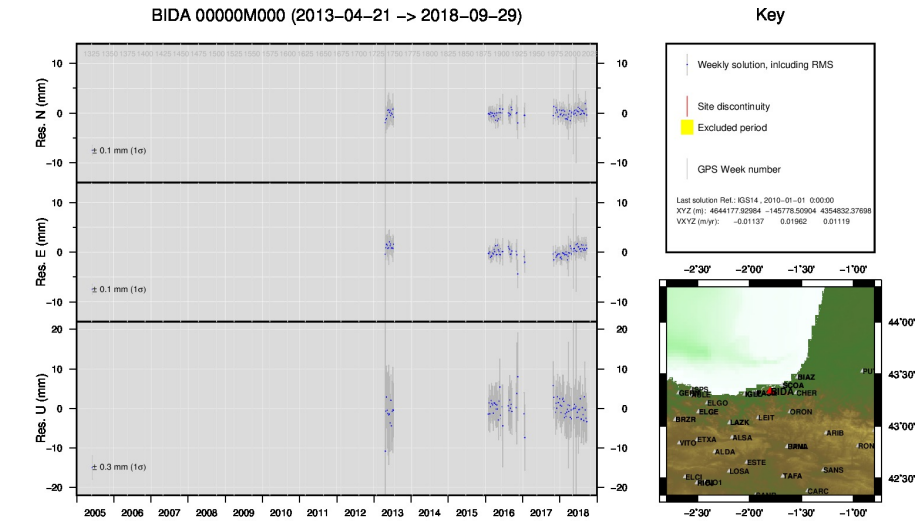
GMW 2018 Oct 14 14:12:41

4 ) AMUR



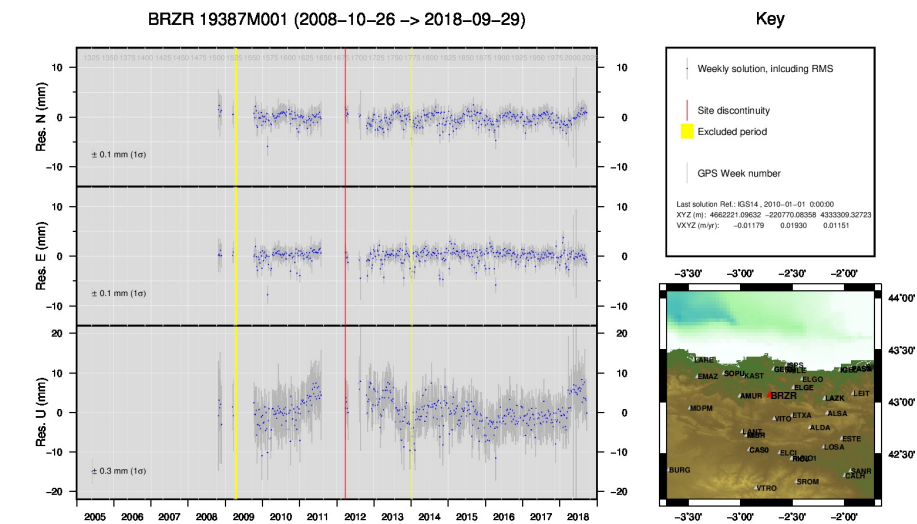
GMW 2018 Oct 14 14:16:09

5 ) BIAZ



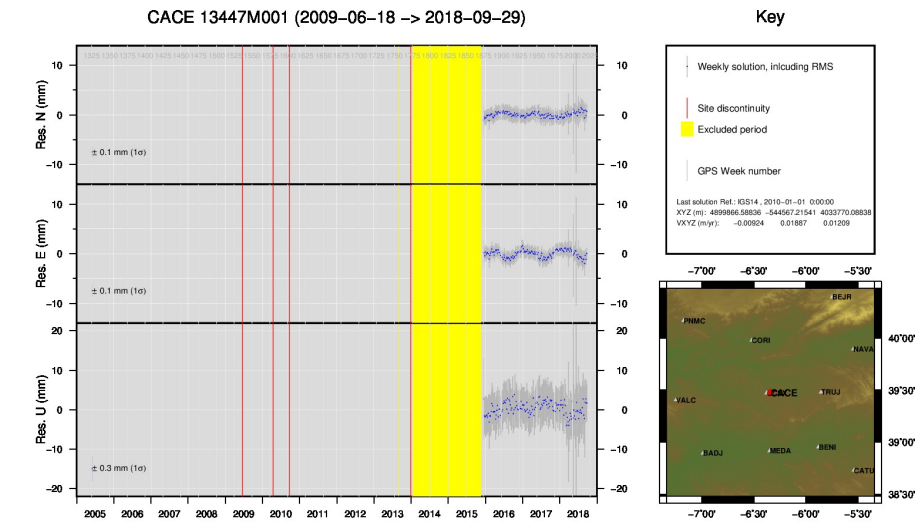
GMW 2018 Oct 14 14:16:16

6 ) BIDA



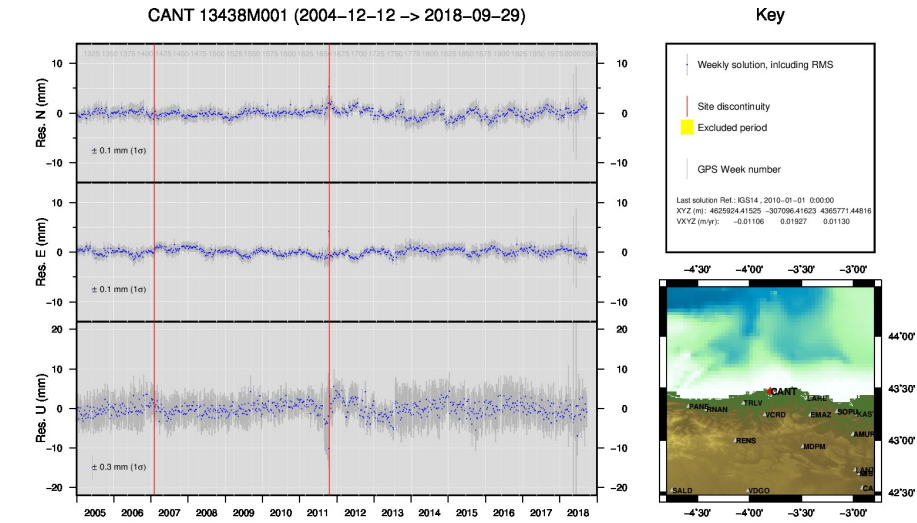
GMW 2018 Oct 14 14:17:28

7 ) BRZR



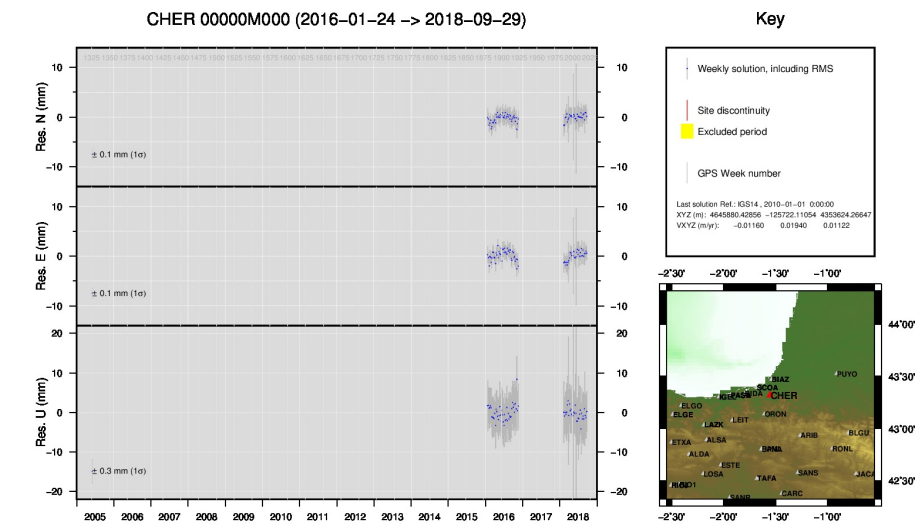
GMW 2018 Oct 14 14:18:11

8 ) CACE



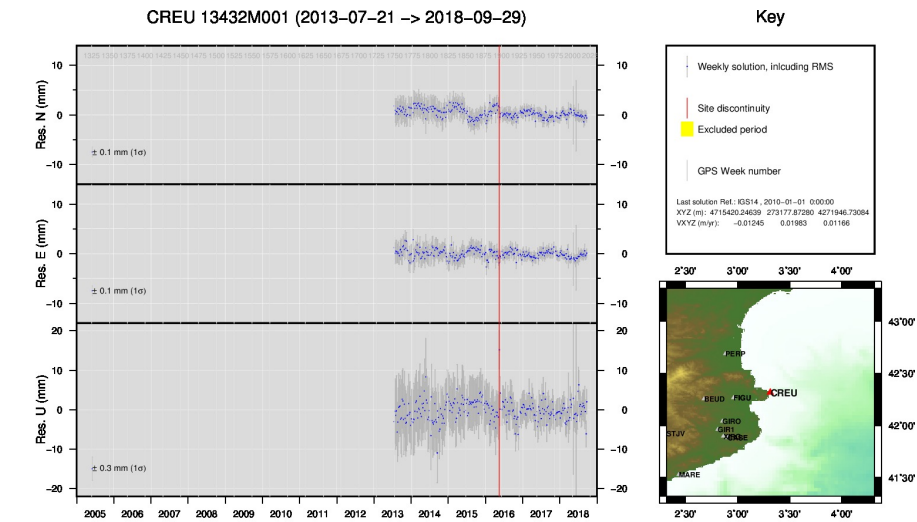
GMW 2018 Oct 14 14:18:36

9 ) CANT



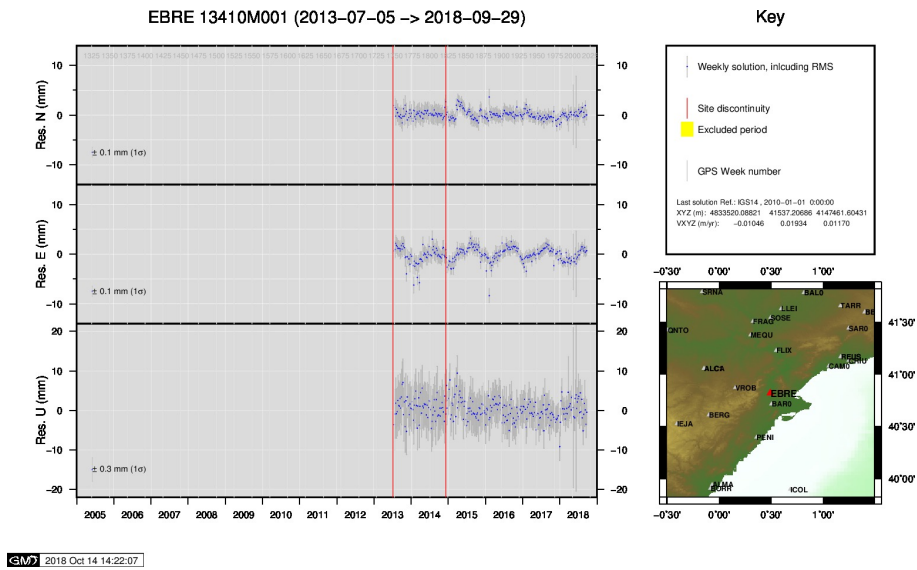
GMW 2018 Oct 14 14:20:26

10 ) CHER

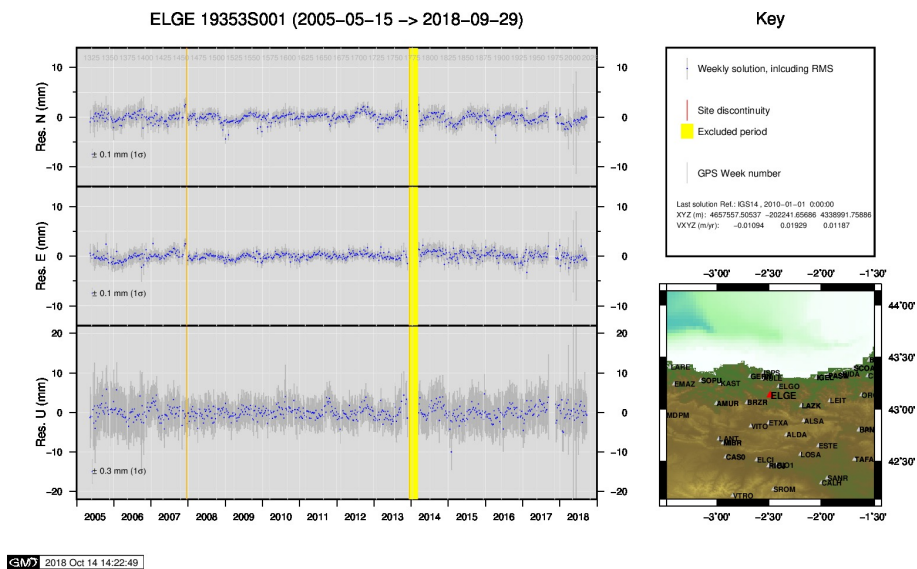


GMW 2018 Oct 14 14:21:02

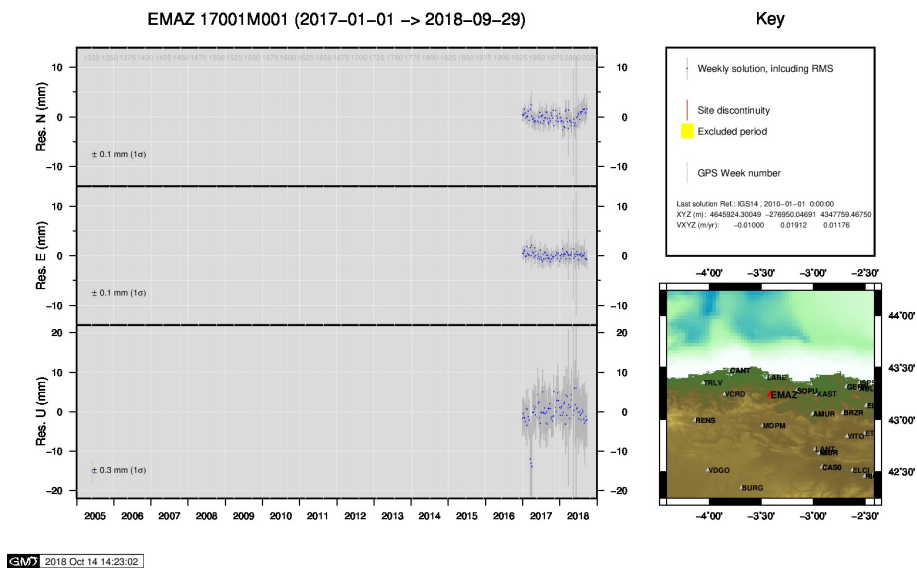
11 ) CREU



12 ) EBRE

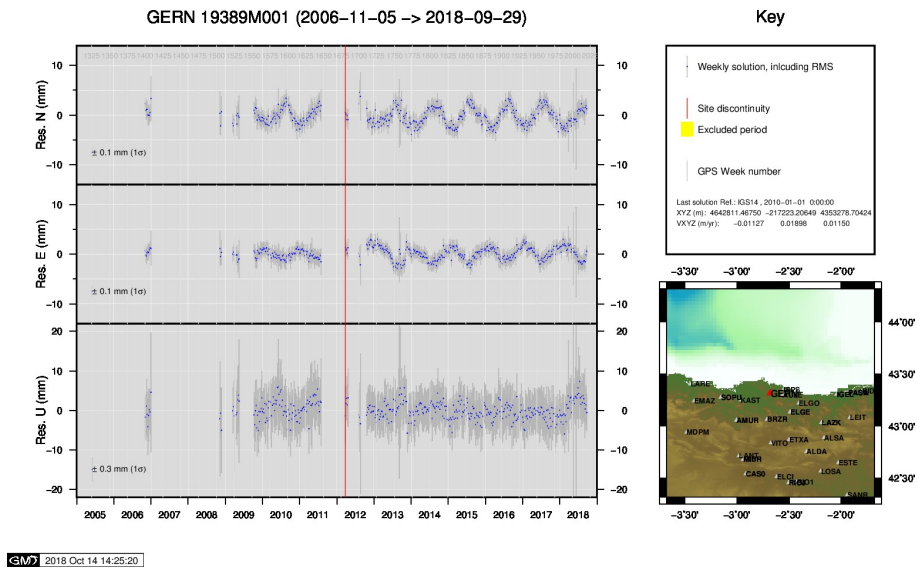


13 ) ELGE

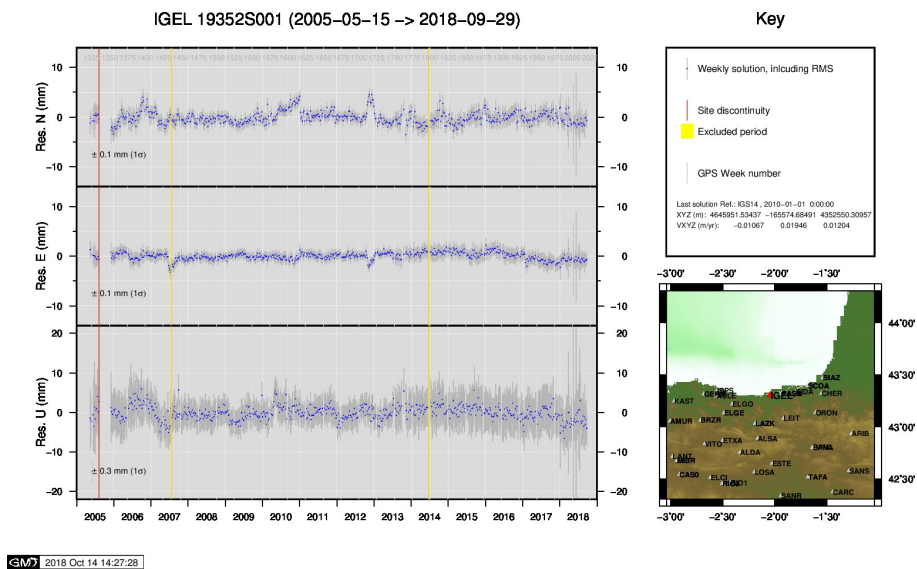


14 ) EMAZ

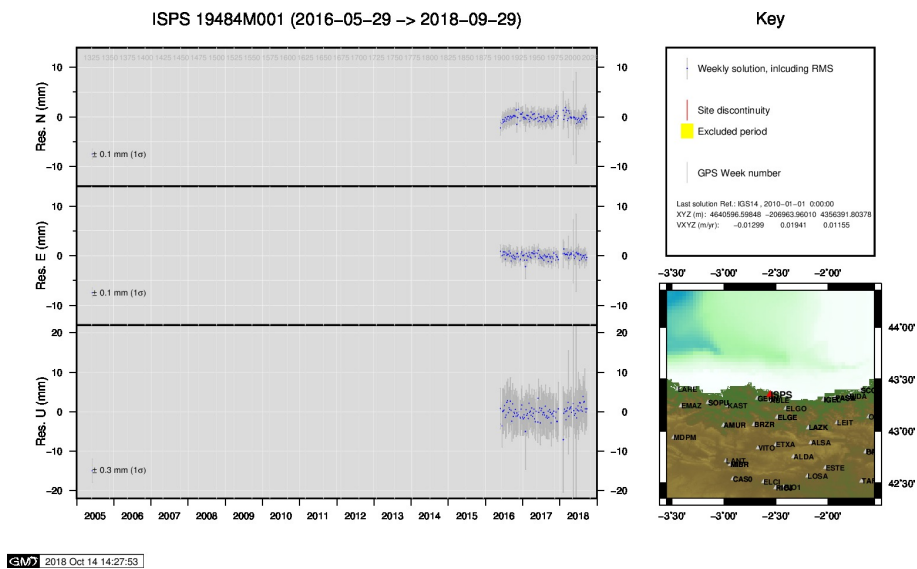




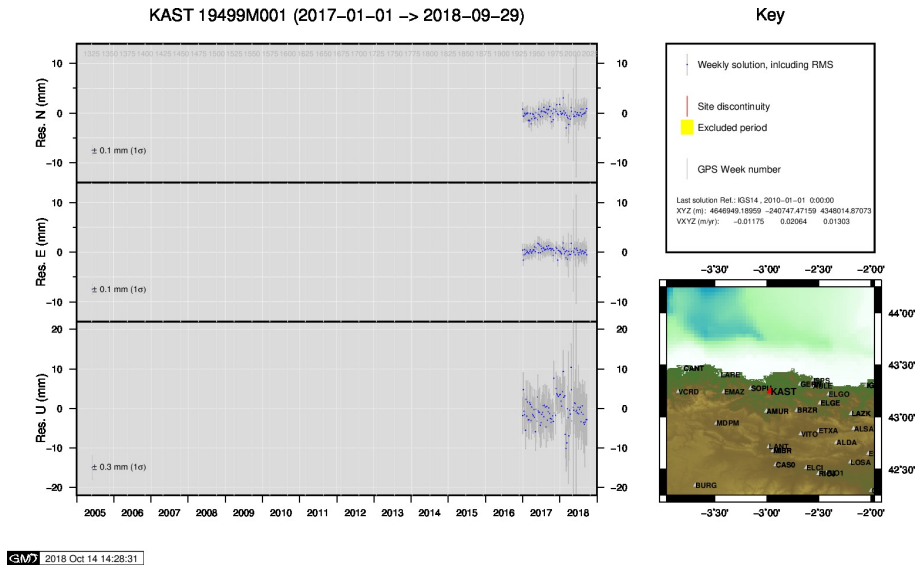
15 ) GERN



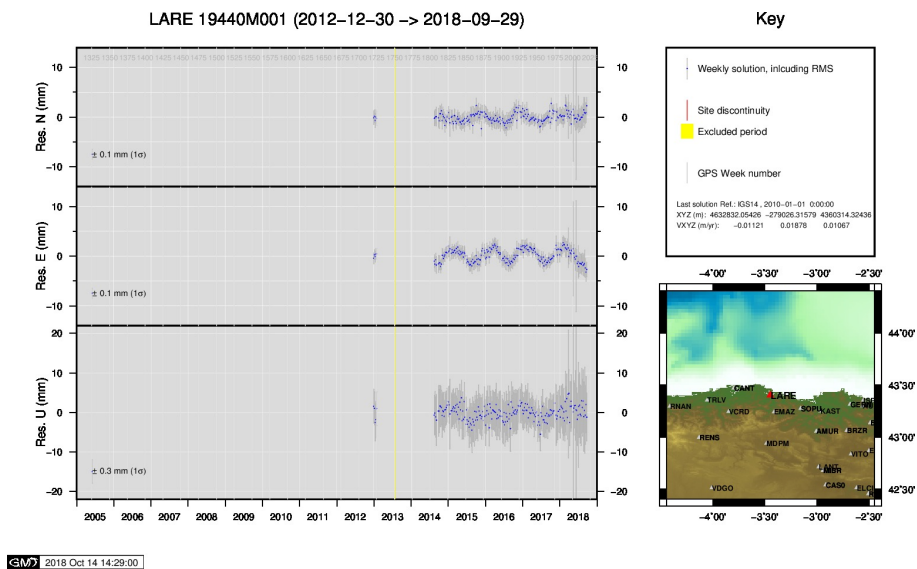
16 ) IGEL



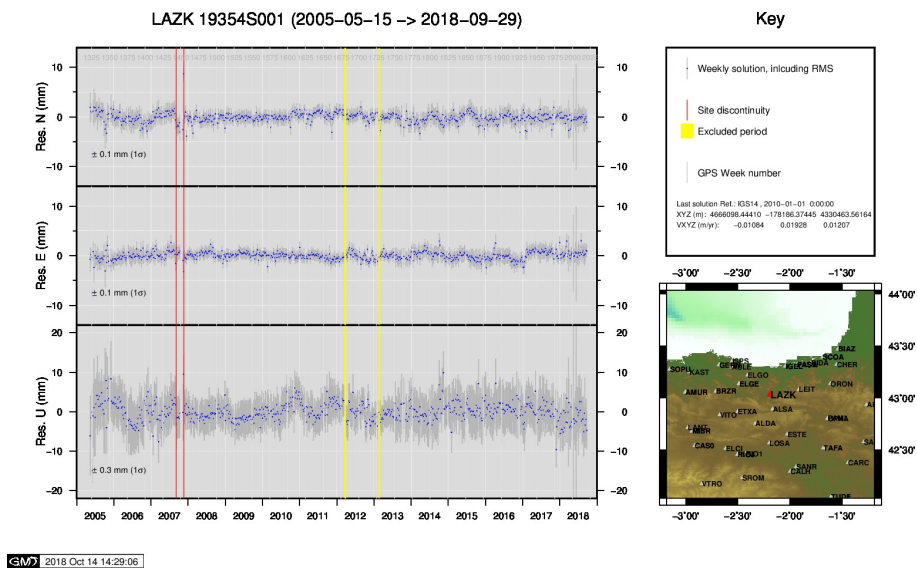
17 ) ISPS



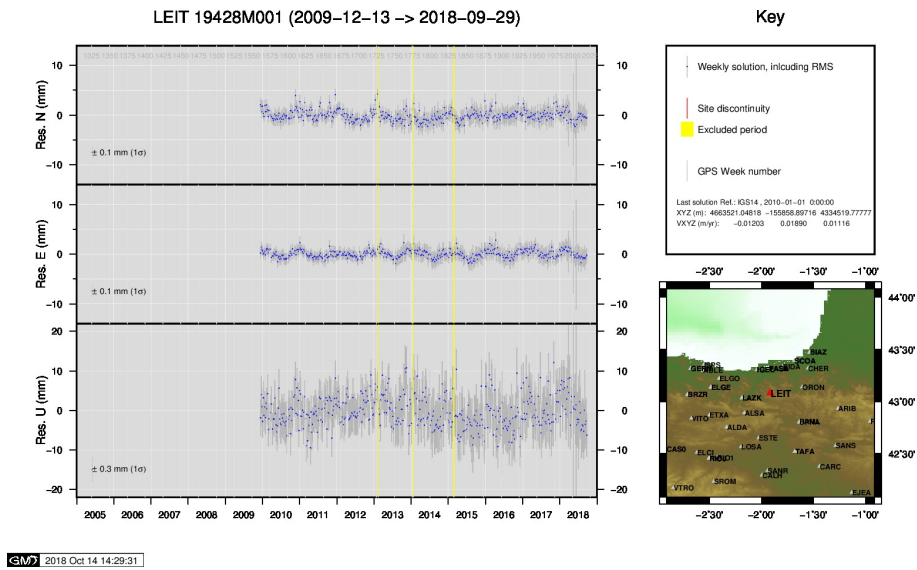
18 ) KAST



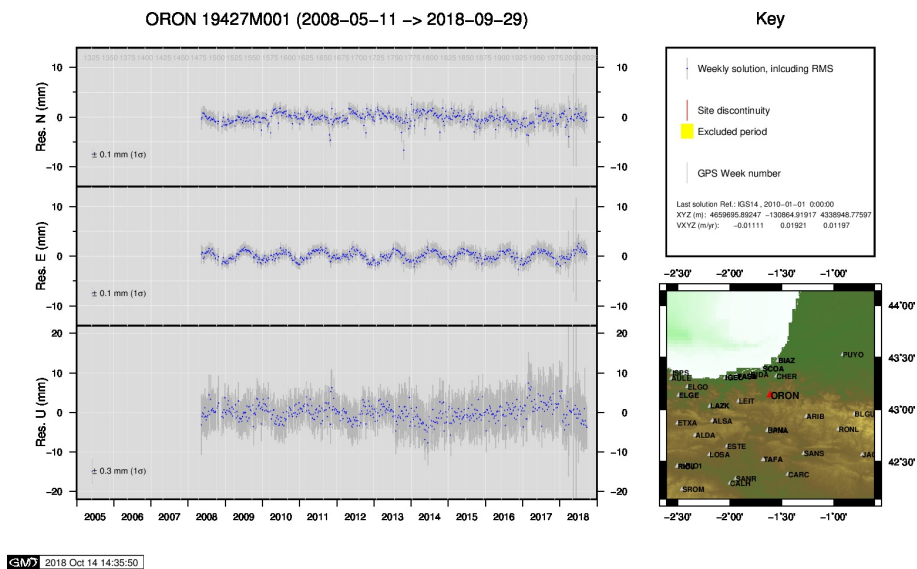
19 ) LARE



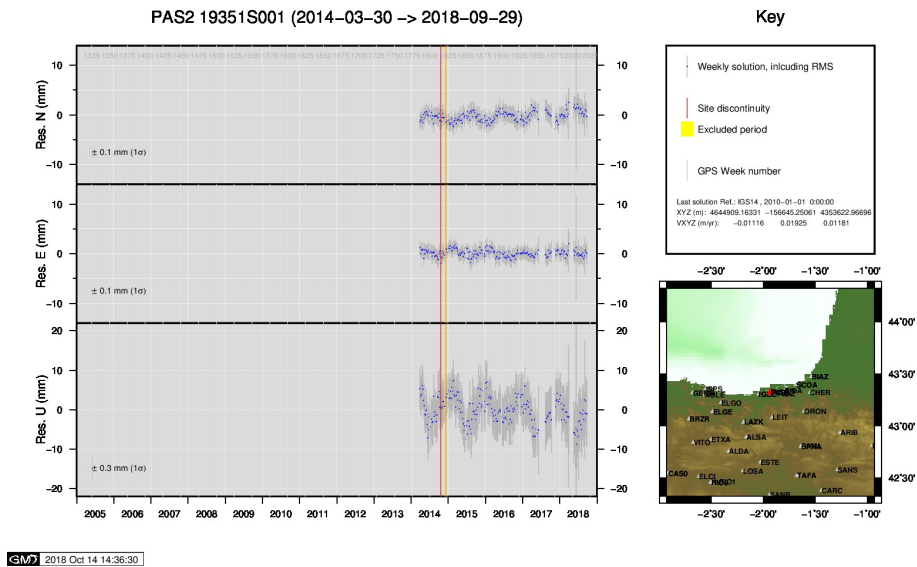
20 ) LAZK



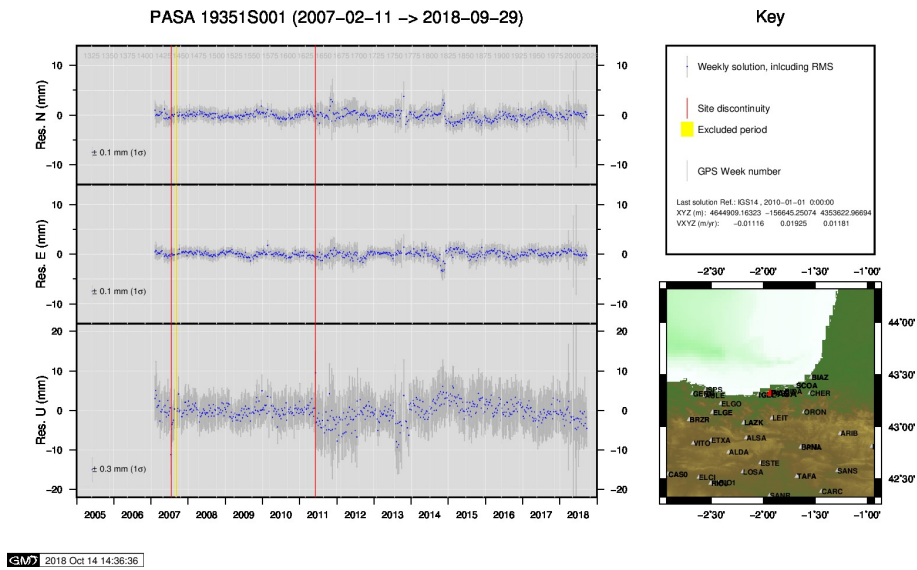
21 ) LEIT



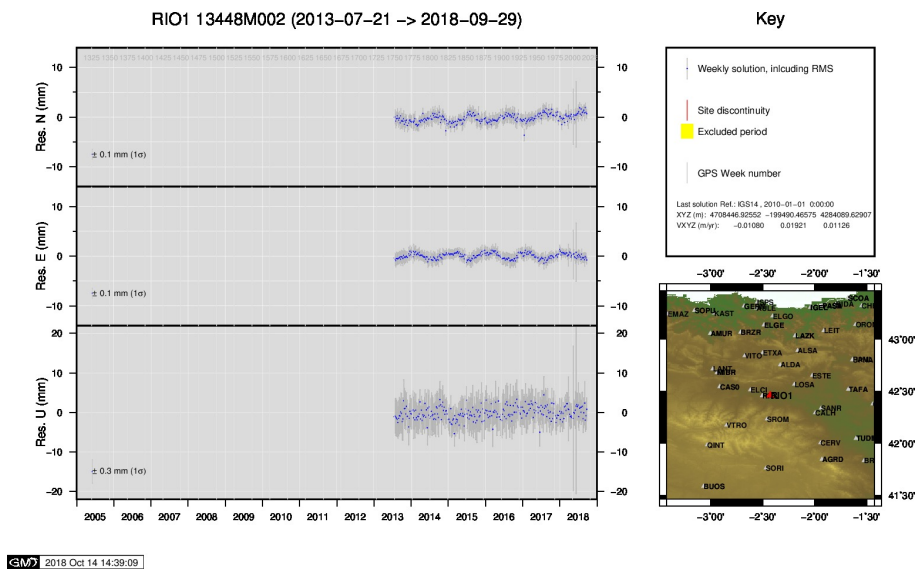
22 ) ORON



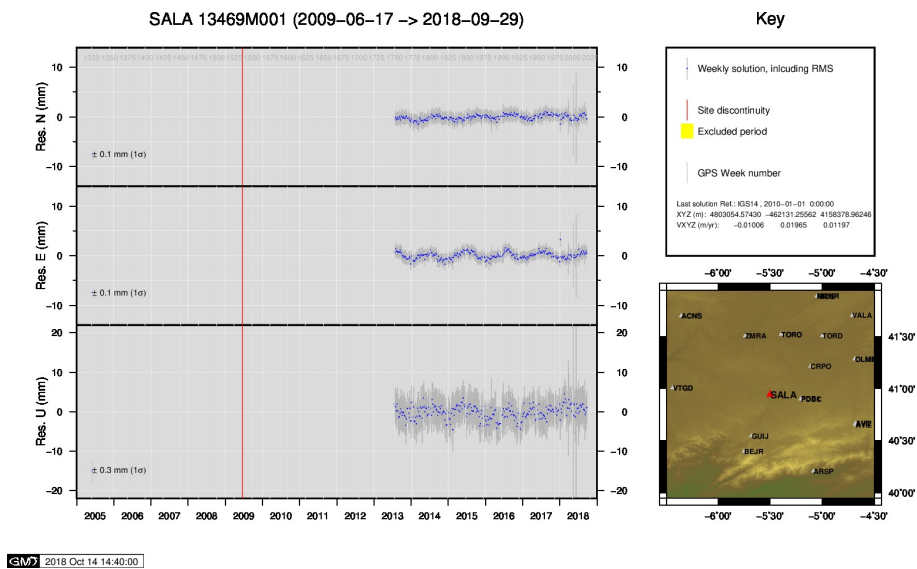
23 ) PAS2



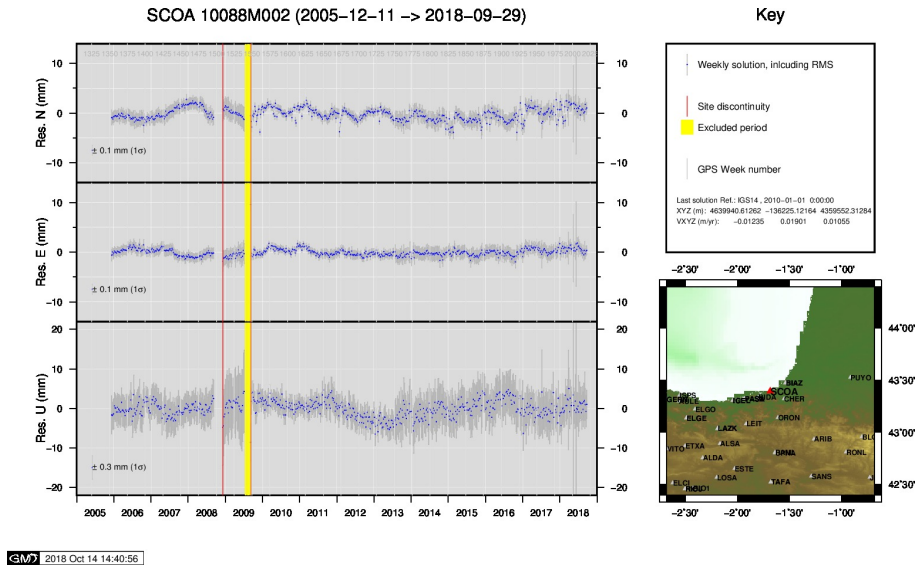
24 ) PASA



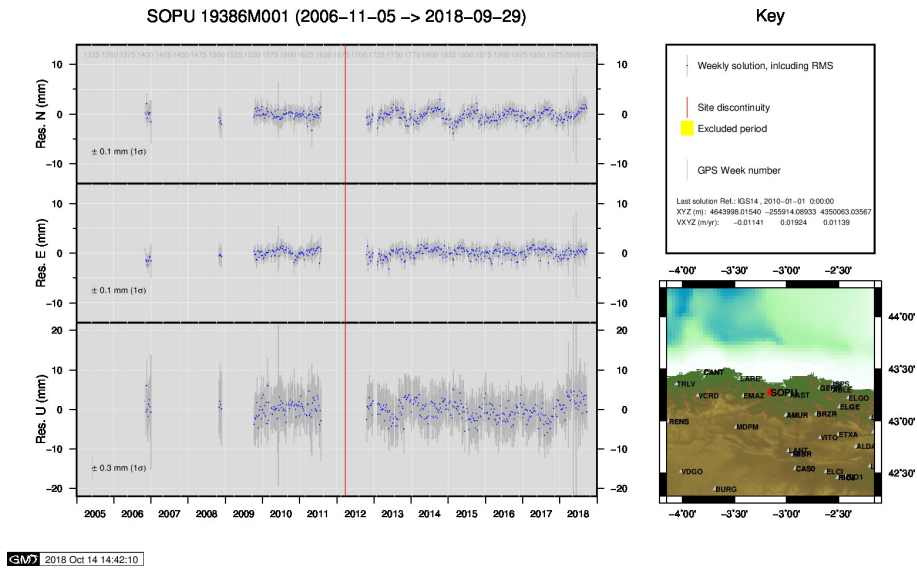
25 ) RIO1



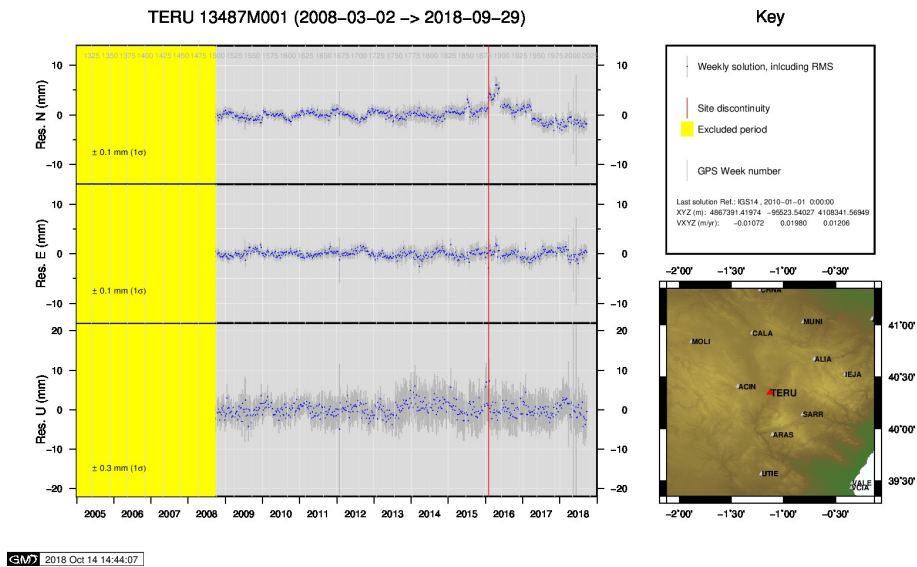
26 ) SALA



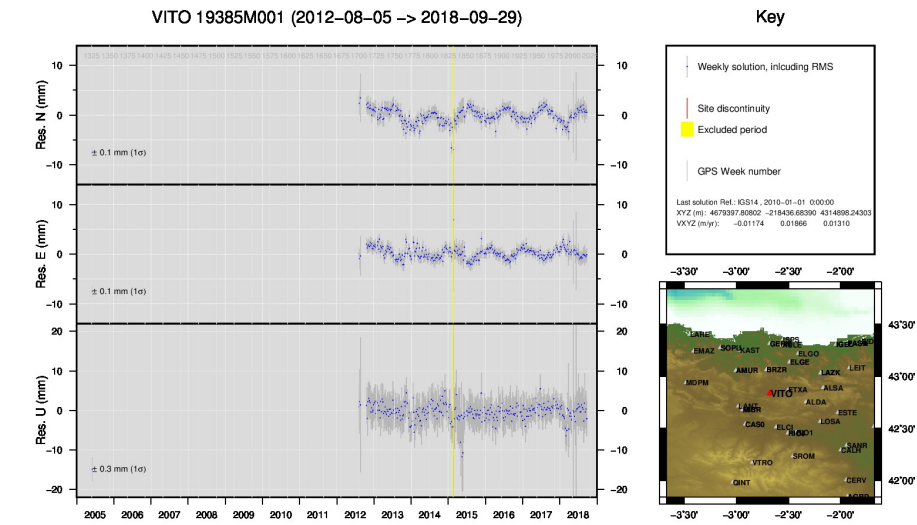
27 ) SCOA



28 ) SOPU

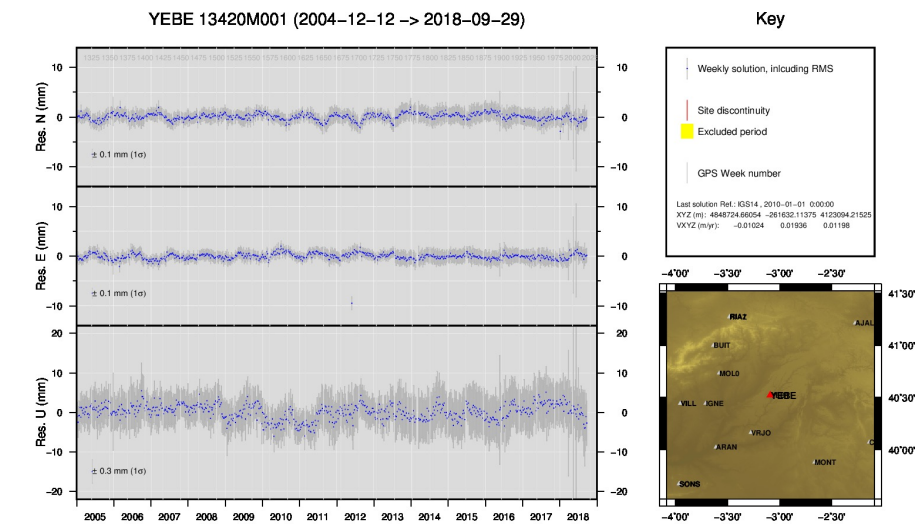


29 ) TERU



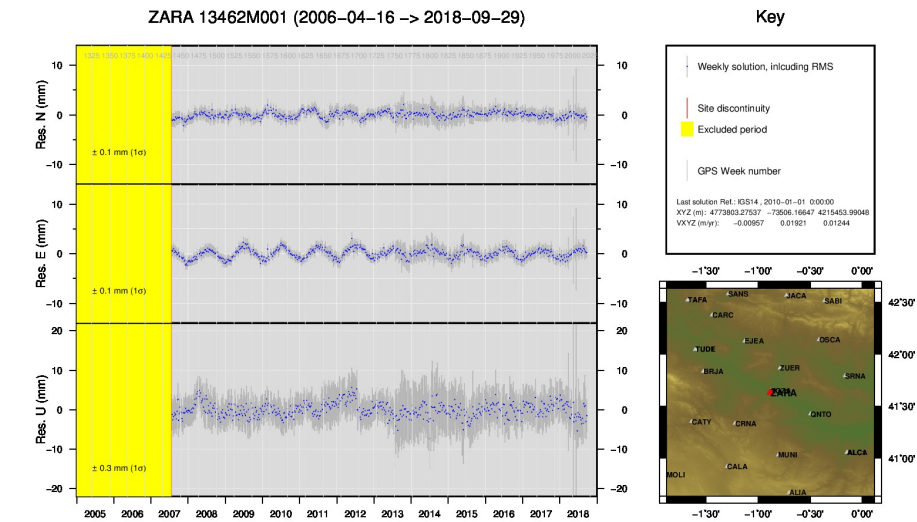
GMW 2018 Oct 14 14:47:17

30 ) VITO



GMW 2018 Oct 14 14:48:25

31 ) YEBE



GMW 2018 Oct 14 14:48:32

32 ) ZARA



