

ARA-DAC Weekly Analysis Result: 2421 (GFA)

Technical Report

GPS Week: 2421 (GFA)

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

ARA-DAC details:

Contact person: J. Zurutuza

Contact mail: geodesia@aranzadi.eus

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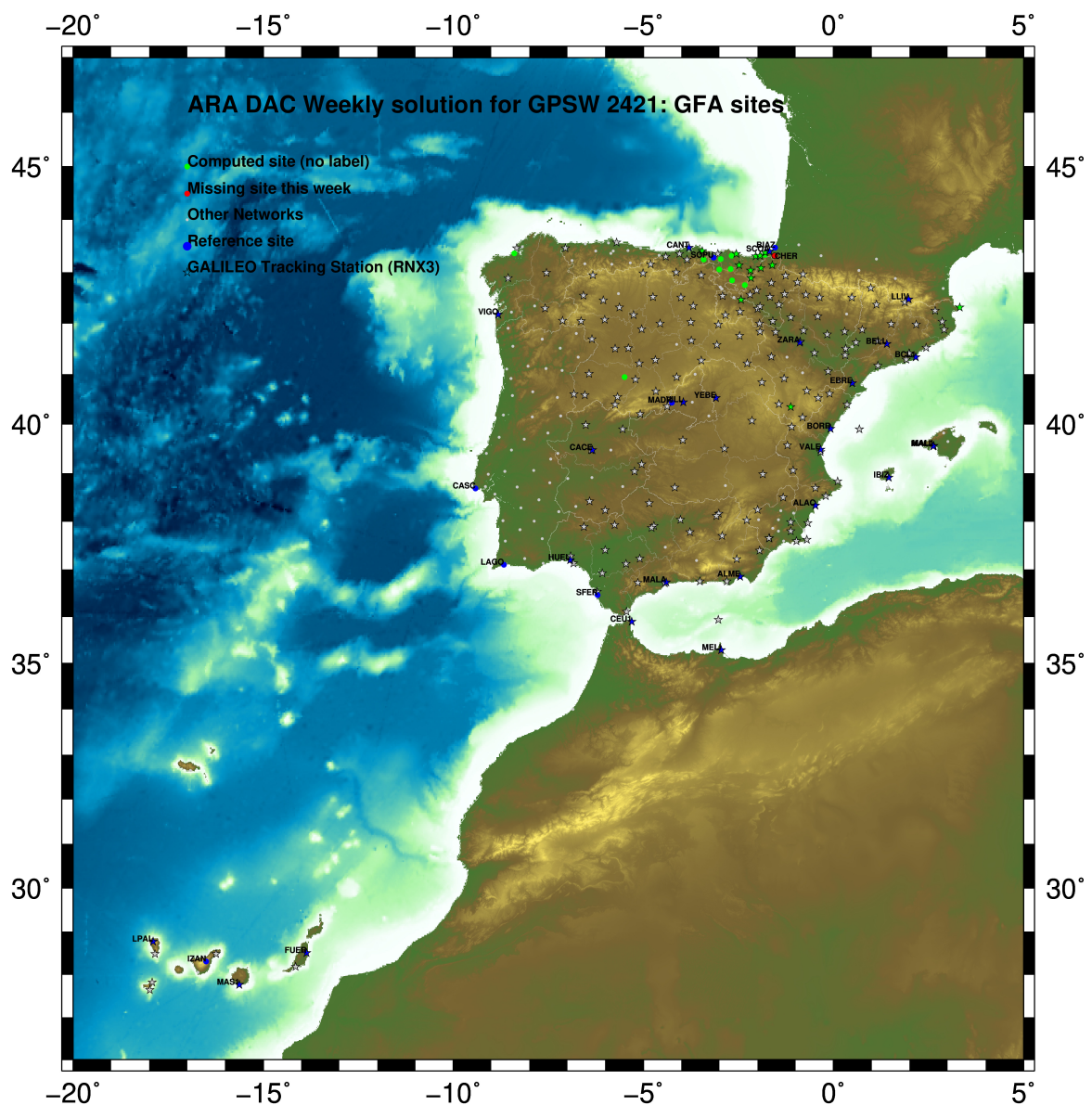
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1 Introduction

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



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Fig.1: Computed Sites for GPS Week2421 (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 is used if available starting GPS week 1986)
- 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.I20 file and individual calibrations from EPNC_20.ATX. In case no calibration values of an antenna/radome pairs are not available for a certain GNSS system at some station, the observation of this/these GNSS/GNSSs are excluded from the analysis of that station.
- Reference sites: the latest IGS cumulative solution is used to align our solution to the latest IGS20 release, regularly updated and available at: IGS0OPSSNX_1994002_00U_00U_CRD.SNX.gz. Following the EUREF guidelines, no other individual calibrations are included in the analysis starting GPSW 2238 (IGS20); also applies to repro3 solutions, which are based on IGS20 standards.
- Troposphere:
 - minimum elevation is 3 deg.; elevation dependent weighting.
 - VMF3 mapping function. ZPD parameters are estimated using the VMF3 mapping function.
 - CHENHER gradient estimation model.
- Ionosphere: no a priori model, ionospheric effect almost removed by iono free combination.
- Ocean Loading: FES2014b (Scherneck).
- Atmospheric loading: not corrected, following the latest recommendations for IGS20 products.
- Tidal displacements:
 - Mean pole model : IERS2010_v1.2.0
 - Subdaily pole model: DESAI2016
 - Nutation model : IAU2000R06

4 Estimated Parameters

- Adjustment: Least Squares
- Rejection Criteria: $3 \times \text{rms}$ of single differences, in the weekly combination of daily normal equations (ADDNEQ)
- Station coordinates: minimum constraints (MC) to IGS 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. DE421 planetary ephemeris and JGM3 Earth geopotential model is used.
- Ambiguity: an advanced ambiguity resolution (AR) scheme is included:
 - Code-Based Widelane (WL) and Narrow Line (NR) 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 (IGS cumulative solution) are the ones used in the Minimal Constraints condition.

5.1 IGS20

The Reference Frame considered in this section is the IGS20 (IGS cumulative solution), mapped from 2015.0 to the observation epoch.

ARA FINAL WEEKLY COMBINATION: FINAL ORBITS						21-JUN-26 23:05
LOCAL GEODETIC DATUM: IGS20						EPOCH: 2026-06-03 11:59:45
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	SYSTEM
111	ACOR 13434M001	4594489.46573	-678367.22684	4357066.33899	A	G
39	ALDA 19383M001	4687280.08477	-190876.43095	4308107.04174	A	GR
50	ALSA 19419M001	4677250.75919	-176770.26008	4319079.95977	A	GRE
53	AMUR 19388M001	4661499.37737	-244591.12186	4332269.96605	A	GR
384	BIAZ 10074M002	4634455.97189	-124344.84079	4365785.53671	W	GR
101	BIDA 15018M001	4644177.74522	-145778.18764	4354832.56429	A	GR
113	BRZR 19387M001	4662220.91859	-220769.76413	4333309.52200	A	GR
573	CACE 13447M001	4899866.44524	-544566.90131	4033770.29476	W	GRE
592	CANT 13438M001	4625924.24688	-307096.10268	4365771.64515	W	GRE
908	CREU 13432M001	4715420.05256	273178.19605	4271946.92589	A	GRE
135	EBRE 13410M001	4833519.91724	41537.53016	4147461.80676	W	GRE
180	ELGE 19353S001	4657557.32299	-202241.33603	4338991.97297	A	GRE
182	ENAZ 17001M001	4645924.13926	-276949.73639	4347759.65322	A	GR
209	GERN 19389M001	4642811.24769	-217222.79260	4353278.96273	A	GR
257	HOND 15012M002	4640529.24364	-145675.85120	4358781.84001	A	GRE
235	IGEL 19352S001	4645951.34943	-165574.36874	4352550.50603	A	GRE
240	ISPS 19484M001	4640596.40815	-206963.64447	4356392.00293	A	GRE
245	KAST 19499M001	4646949.00079	-240747.13180	4348015.07452	A	GR
252	LARE 19440M001	4632831.88637	-279026.01265	4360314.51068	A	GRE
256	LAZK 19354S001	4666098.26607	-178186.05746	4330463.75339	A	GRE
261	LEIT 19428M001	4663520.86504	-155858.58599	4334519.97274	A	GRE
334	ORON 19427M001	4659695.70409	-130864.60141	4338948.96788	A	GRE
345	PAS2 19351S001	4644908.98547	-156644.93535	4353623.16025	A	GRE
493	PASA 19351S001	4644908.98506	-156644.93571	4353623.15995	A	GRE
553	RIO1 13448M002	4708446.75539	-199490.14843	4284089.81805	A	GRE
558	SALA 13469M001	4803054.41980	-462130.93477	4158379.16314	A	GR
526	SCDA 10088M002	4639940.43130	-136224.80929	4359552.50700	W	GRE
715	SOPU 19386M001	4643997.83324	-255913.77436	4350063.22244	W	GR
443	TERU 13487M001	4867391.24734	-95523.20829	4108341.76701	A	GR
493	VITO 19385M001	4679397.62786	-218436.37069	4314898.45521	A	GR
616	YEBE 13420M001	4848724.50007	-261631.79190	4123094.41401	W	GRE
655	ZARA 13462M001	4773803.09600	-73505.84965	4215454.18039	W	GRE

5.2 ETRF2000 (ETRS89) Coordinates

European Terrestrial Reference System, 1989 (ETRS89) is realized by ETRF2000 (Boucher and Altamimi, 2011) and (Altamimi, 2017).

CONVERT TO ETRF2000						21-JUN-26 23:05
LOCAL GEODETIC DATUM: ETRF2000						EPOCH: 2026-06-03 11:59:45
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	SYSTEM
111	ACOR 13434M001	4594489.82665	-678367.90164	4357065.83423	A	
39	ALDA 19383M001	4687280.51171	-190877.11665	4308106.53572	A	
50	ALSA 19419M001	4677251.18910	-176770.94445	4319079.45489	A	
53	AMUR 19388M001	4661499.79865	-244591.80440	4332269.46162	A	
384	BIAZ 10074M002	4634456.41333	-124345.51952	4365785.03657	W	
101	BIDA 15018M001	4644178.18265	-145778.86768	4354832.06293	A	
113	BRZR 19387M001	4662221.34339	-220770.44671	4333309.01786	A	
573	CACE 13447M001	4899866.79772	-544567.61477	4033769.76368	W	
592	CANT 13438M001	4625924.66203	-307096.78082	4365771.14308	W	
908	CREU 13432M001	4715420.54307	273177.50846	4271946.42406	A	
135	EBRE 13410M001	4833520.36381	41536.82662	4147461.29059	W	
180	ELGE 19353S001	4657557.75094	-202242.01795	4338991.46954	A	
182	ENAZ 17001M001	4645924.55721	-276950.41703	4347759.14975	A	
209	GERN 19389M001	4642811.67471	-217223.47267	4353278.46044	A	
257	HOND 15012M002	4640529.68142	-145676.53077	4358781.33899	A	
235	IGEL 19352S001	4645951.78381	-165575.04907	4352550.00421	A	
240	ISPS 19484M001	4640596.83691	-206964.32423	4356391.50100	A	
245	KAST 19499M001	4646949.42397	-240747.81247	4348014.57149	A	
252	LARE 19440M001	4632832.30510	-279026.69160	4360314.00839	A	
256	LAZK 19354S001	4666098.69675	-178186.74040	4330463.24952	A	
261	LEIT 19428M001	4663521.29928	-155859.26854	4334519.46944	A	
334	ORON 19427M001	4659696.14230	-130865.28339	4338948.46530	A	
345	PAS2 19351S001	4644909.42123	-156645.61551	4353622.65866	A	
493	PASA 19351S001	4644909.42082	-156645.61587	4353622.65836	A	
553	RIO1 13448M002	4708447.17903	-199490.83685	4284089.30994	A	
558	SALA 13469M001	4803054.79486	-462131.63586	4158378.64232	A	
526	SCDA 10088M002	4639940.87050	-136225.48875	4359552.00617	W	
715	SOPU 19386M001	4643998.25441	-255914.45469	4350062.71946	W	
443	TERU 13487M001	4867391.67086	-95523.91660	4108341.24568	A	
493	VITO 19385M001	4679398.05142	-218437.05546	4314897.94951	A	
616	YEBE 13420M001	4848724.90096	-261632.49833	4123093.89195	W	
655	ZARA 13462M001	4773803.53187	-73506.54601	4215453.66808	W	

5.3 ETRF2014 (ETRS89) Coordinates

European Terrestrial Reference System, 1989 (ETRS89) is realized by ETRF2014 (Boucher and Altamimi, 2011) and (Altamimi, 2017).

CONVERT TO ETRF2014						21-JUN-26 23:05
LOCAL GEODETIC DATUM: ETRF2014						EPOCH: 2026-06-03 11:59:45
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	SYSTEM
111	ACOR 13434M001	4594489.78739	-678367.93764	4357065.88776	A	
39	ALDA 19383M001	4687280.46977	-190877.15416	4308106.58911	A	
50	ALSA 19419M001	4677251.14722	-176770.98207	4319079.50832	A	
53	AMUR 19388M001	4661499.75721	-244591.84182	4332269.51506	A	
384	BIAZ 10074M002	4634456.37177	-124345.55754	4365785.09017	W	
101	BIDA 15018M001	4644178.14104	-145778.90557	4354832.11648	A	
113	BRZR 19387M001	4662221.30186	-220770.48422	4333309.07131	A	
573	CACE 13447M001	4899866.75431	-544567.64984	4033769.81631	W	
592	CANT 13438M001	4625924.62123	-307096.81816	4365771.19661	W	
908	CREU 13432M001	4715420.49890	273177.46927	4271946.47772	A	
135	EBRE 13410M001	4833520.31917	41536.78890	4147461.34369	W	
180	ELGE 19353S001	4657557.70939	-202242.05556	4338991.52301	A	
182	EMAZ 17001M001	4645924.51608	-276950.45440	4347759.20323	A	
209	GERN 19389M001	4642811.63338	-217223.51029	4353278.51395	A	
257	HOND 15012M002	4640529.63986	-145676.56868	4358781.39256	A	
235	IGEL 19352S001	4645951.74227	-165575.08687	4352550.05775	A	
240	ISPS 19484M001	4640596.79558	-206964.36190	4356391.55453	A	
245	KAST 19499M001	4646949.38269	-240747.84997	4348014.62499	A	
252	LARE 19440M001	4632832.26411	-279026.72902	4360314.06191	A	
256	LAZK 19354S001	4666098.65501	-178186.77806	4330463.30298	A	
261	LEIT 19428M001	4663521.25749	-155859.30630	4334519.52292	A	
334	ORON 19427M001	4659696.10046	-130865.32127	4338948.51882	A	
345	PAS2 19351S001	4644909.37966	-156645.65336	4353622.71221	A	
493	PASA 19351S001	4644909.37925	-156645.65372	4353622.71191	A	
553	RI01 13448M002	4708447.13687	-199490.87423	4284089.36325	A	
558	SALA 13469M001	4803054.75244	-462131.67173	4158378.69523	A	
526	SCOA 10088M002	4639940.82891	-136225.52671	4359552.05975	W	
715	SOPU 19386M001	4643998.21322	-255914.49215	4350062.77296	W	
443	TERU 13487M001	4867391.62634	-95523.95362	4108341.29858	A	
493	VITO 19385M001	4679398.00967	-218437.09289	4314898.00291	A	
616	YEBE 13420M001	4848724.85730	-261632.53478	4123093.94481	W	
655	ZARA 13462M001	4773803.48844	-73506.58357	4215453.72127	W	

5.4 ETRF2020 (ETRS89) Coordinates

European Terrestrial Reference System, 1989 (ETRS89) is realized by ETRF2020 (Boucher and Altamimi, 2011) and (Altamimi, 2017).

CONVERT TO ETRF2020						21-JUN-26 23:05
LOCAL GEODETIC DATUM: ETRF2020						EPOCH: 2026-06-03 11:59:45
NUM	STATION NAME	X (M)	Y (M)	Z (M)	FLAG	SYSTEM
111	ACOR 13434M001	4594489.78332	-678367.92250	4357065.89578	A	
39	ALDA 19383M001	4687280.46435	-190877.13852	4308106.59740	A	
50	ALSA 19419M001	4677251.14173	-176770.96646	4319079.51660	A	
53	AMUR 19388M001	4661499.75189	-244591.82629	4332269.52330	A	
384	BIAZ 10074M002	4634456.36599	-124345.54205	4365785.09838	W	
101	BIDA 15018M001	4644178.13536	-145778.89006	4354832.12471	A	
113	BRZR 19387M001	4662221.29646	-220770.46867	4333309.07955	A	
573	CACE 13447M001	4899866.75067	-544567.63365	4033769.82488	W	
592	CANT 13438M001	4625924.61601	-307096.80277	4365771.20477	W	
908	CREU 13432M001	4715420.49213	273177.48520	4271946.48614	A	
135	EBRE 13410M001	4833520.31345	41536.80511	4147461.35228	W	
180	ELGE 19353S001	4657557.70393	-202242.04003	4338991.53125	A	
182	EMAZ 17001M001	4645924.51082	-276950.43893	4347759.21143	A	
209	GERN 19389M001	4642811.62792	-217223.49480	4353278.52217	A	
257	HOND 15012M002	4640529.63417	-145676.55318	4358781.40078	A	
235	IGEL 19352S001	4645951.73665	-165575.07136	4352550.06598	A	
240	ISPS 19484M001	4640596.79008	-206964.34642	4356391.56274	A	
245	KAST 19499M001	4646949.37732	-240747.83449	4348014.63320	A	
252	LARE 19440M001	4632832.25882	-279026.71360	4360314.07009	A	
256	LAZK 19354S001	4666098.64949	-178186.76249	4330463.31124	A	
261	LEIT 19428M001	4663521.25189	-155859.29073	4334519.53118	A	
334	ORON 19427M001	4659696.09477	-130865.30570	4338948.52707	A	
345	PAS2 19351S001	4644909.37401	-156645.63785	4353622.72043	A	
493	PASA 19351S001	4644909.37360	-156645.63821	4353622.72013	A	
553	RI01 13448M002	4708447.13153	-199490.85852	4284089.37158	A	
558	SALA 13469M001	4803054.74822	-462131.65582	4158378.70367	A	
526	SCOA 10088M002	4639940.82319	-136225.51120	4359552.06797	W	
715	SOPU 19386M001	4643998.20789	-255914.47668	4350062.78116	W	
443	TERU 13487M001	4867391.62114	-95523.93735	4108341.30720	A	
493	VITO 19385M001	4679398.00432	-218437.07729	4314898.01118	A	
616	YEBE 13420M001	4848724.85256	-261632.51864	4123093.95337	W	
655	ZARA 13462M001	4773803.48289	-73506.56760	4215453.72974	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 IGS20 solution and are given with respect to the Local frame (North-East-Up).

GFA FINAL WEEKLY COMBINATION: FINAL ORBITS									
21-JUN-26 23:05									
Station	#Days	Weekday 0123456	Repeatability (mm)						
			N	E	U				
ACDR 13434M001	6	XXXXXX	2.03	3.81	6.24				
ALDA 19383M001	7	XXXXXXX	1.73	1.27	2.68				
ALSA 19419M001	7	XXXXXXX	0.97	0.80	4.09				
AMUR 19388M001	7	XXXXXXX	0.74	0.88	4.67				
BIAZ 10074M002	7	XXXXXXX	0.80	0.83	3.33				
BIDA 15018M001	7	XXXXXXX	0.76	1.14	2.67				
BRZR 19387M001	7	XXXXXXX	0.79	1.68	4.31				
CACE 13447M001	5	XX XX	0.84	0.39	3.38				
CANT 13438M001	7	XXXXXXX	1.18	0.99	3.20				
CREU 13432M001	7	XXXXXXX	1.93	1.03	3.09				
EBRE 13410M001	7	XXXXXXX	1.07	1.24	3.95				
ELGE 19353S001	7	XXXXXXX	1.30	0.89	4.69				
EMAZ 17001M001	7	XXXXXXX	1.29	0.66	4.42				
GERN 19389M001	7	XXXXXXX	1.01	1.11	6.06				
HOND 15012M002	7	XXXXXXX	0.73	0.83	1.95				
IGEL 19352S001	7	XXXXXXX	0.93	0.84	3.19				
ISPS 19484M001	7	XXXXXXX	0.98	0.89	2.09				
KAST 19499M001	6	XXXX XX	0.53	1.13	4.20				
LARE 19440M001	7	XXXXXX	0.61	0.86	3.92				
LAZK 19354S001	7	XXXXXXX	0.69	1.03	4.27				
LEIT 19428M001	7	XXXXXXX	0.83	0.50	3.33				
ORON 19427M001	7	XXXXXXX	0.66	0.68	3.18				
PAS2 19351S001	2	XX	0.81	0.66	1.02				
PASA 19351S001	5	XX XX	1.44	0.51	2.02				
RI01 13448M002	5	XX XX	0.36	0.91	2.75				
SALA 13469M001	6	XX XXXX	1.03	0.88	3.62				
SCOA 10088M002	7	XXXXXXX	1.97	1.20	2.97				
SOPU 19386M001	7	XXXXXXX	0.79	2.73	5.47				
TERU 13487M001	7	XXXXXXX	0.82	1.32	2.84				
VITO 19385M001	7	XXXXXXX	0.62	0.87	3.38				
YEBE 13420M001	5	XX XX	0.75	0.84	3.88				
ZARA 13462M001	5	XX XX	1.00	0.38	3.10				
Comparison of individual solutions:									
ACDR 13434M001	N	2.03		2.80	0.84	-2.70	-0.51	2.08	-0.39
ACOR 13434M001	E	3.81		-7.22	0.17	2.76	1.28	-1.59	2.94
ACOR 13434M001	U	6.24		-7.58	5.99	7.03	-6.88	-0.85	1.93
ALDA 19383M001	N	1.73	0.22	0.21	2.83	-1.47	-1.51	-2.20	-0.73
ALDA 19383M001	E	1.27	1.12	-0.33	-2.12	-1.01	-1.57	-0.47	0.33
ALDA 19383M001	U	2.68	5.34	-0.96	-1.61	1.58	-2.90	0.55	0.05
ALSA 19419M001	N	0.97	0.85	0.18	1.55	-0.61	-1.27	-0.54	-0.43
ALSA 19419M001	E	0.80	1.27	-0.52	-0.69	-0.94	-0.61	0.08	0.47
ALSA 19419M001	U	4.09	-0.06	-6.19	1.95	-1.55	3.24	-3.74	5.58
AMUR 19388M001	N	0.74	1.31	0.08	0.15	-0.94	0.17	0.72	-0.29
AMUR 19388M001	E	0.88	0.74	-0.69	0.11	-1.31	0.29	-1.28	-0.39
AMUR 19388M001	U	4.67	-3.19	-3.69	-0.14	-4.56	8.88	-2.61	0.62
BIAZ 10074M002	N	0.80	1.72	-0.02	-0.66	-0.36	-0.25	0.50	0.01
BIAZ 10074M002	E	0.83	0.94	-0.50	-0.15	-1.53	0.28	-0.75	-0.19
BIAZ 10074M002	U	3.33	-0.82	-4.51	4.28	-3.27	-1.40	-1.07	3.64
BIDA 15018M001	N	0.76	0.91	-0.83	0.35	-0.76	0.93	0.46	-0.47
BIDA 15018M001	E	1.14	1.10	0.08	-2.03	-0.55	-1.40	0.34	0.21
BIDA 15018M001	U	2.67	-1.32	1.46	-0.01	-5.65	1.26	-0.69	2.25
BRZR 19387M001	N	0.79	1.01	0.24	-1.08	-0.49	-0.42	1.02	0.13
BRZR 19387M001	E	1.68	0.09	-1.15	3.06	-1.47	-1.72	-1.09	-0.14
BRZR 19387M001	U	4.31	-2.69	-3.65	0.46	-2.76	8.77	-2.52	-0.29
CACE 13447M001	N	0.84	0.63	-0.17	1.37		0.48	-0.52	
CACE 13447M001	E	0.39	0.20	-0.14	0.14		0.19	-0.70	
CACE 13447M001	U	3.38	-2.83	1.81	2.11		-5.02	2.16	
CANT 13438M001	N	1.18	0.82	1.42	-1.47	-1.35	-0.51	1.11	-0.43
CANT 13438M001	E	0.99	0.02	-1.81	0.90	-1.16	-0.04	-0.61	0.30
CANT 13438M001	U	3.20	0.54	-3.76	5.01	-0.96	-2.43	-3.88	-0.42
CREU 13432M001	N	1.93	-0.11	-1.52	2.87	1.85	-2.76	0.16	-0.77
CREU 13432M001	E	1.03	-1.34	-1.05	-0.13	-1.73	0.31	0.53	0.26
CREU 13432M001	U	3.09	1.10	1.88	3.71	-3.73	-2.68	0.19	4.18
EBRE 13410M001	N	1.07	0.17	-0.40	-1.37	1.95	-0.82	0.10	-0.52
EBRE 13410M001	E	1.24	0.13	-0.89	-2.41	1.39	-0.11	-0.66	-0.41
EBRE 13410M001	U	3.95	1.82	-2.80	5.82	-2.66	5.78	0.35	-2.80
ELGE 19353S001	N	1.30	2.43	-0.55	-1.21	-0.49	0.67	0.80	-1.07
ELGE 19353S001	E	0.89	0.23	-0.84	1.27	-0.96	-0.38	-0.95	-0.65
ELGE 19353S001	U	4.69	-6.74	-6.26	4.26	-0.01	5.06	-0.66	1.74
EMAZ 17001M001	N	1.29	1.01	0.88	0.43	-0.89	-1.33	1.64	-1.65
EMAZ 17001M001	E	0.66	0.74	-0.99	0.19	-0.26	-0.82	0.46	-0.37
EMAZ 17001M001	U	4.42	-4.38	-5.95	0.01	-3.49	5.60	-3.71	2.34
GERN 19389M001	N	1.01	1.69	0.04	0.79	-0.34	-1.56	-0.00	-0.06
GERN 19389M001	E	1.11	1.41	0.06	-1.92	-1.13	0.01	-0.48	-0.44
GERN 19389M001	U	6.06	-7.15	-2.37	5.87	-4.89	9.77	-0.95	-3.03
HOND 15012M002	N	0.73	-0.43	-0.24	-1.14	0.83	0.19	0.87	0.45
HOND 15012M002	E	0.83	0.67	-0.57	-0.08	-0.71	-1.64	-0.30	0.34
HOND 15012M002	U	1.95	-0.29	1.10	1.87	-4.09	-0.06	0.40	-1.11
IGEL 19352S001	N	0.93	0.04	-0.94	-1.01	0.79	0.09	1.64	0.15
IGEL 19352S001	E	0.84	0.54	-0.58	0.79	-1.29	-1.11	-0.19	0.18
IGEL 19352S001	U	3.19	-2.28	-0.20	5.10	-2.74	1.44	-3.33	3.02
ISPS 19484M001	N	0.98	0.97	-0.09	-1.15	0.12	-1.15	1.40	0.43
ISPS 19484M001	E	0.89	-0.05	-0.54	0.91	-1.70	-0.75	-0.33	0.11
ISPS 19484M001	U	2.09	-3.74	-0.51	2.40	-2.06	-0.12	0.28	1.40
KAST 19499M001	N	0.53	0.74	0.28	-0.12	-0.33		0.70	-0.41
KAST 19499M001	E	1.13	-0.56	-0.59	1.91	-0.95		-0.80	-0.73
KAST 19499M001	U	4.20	-8.22	-2.09	3.83	0.56		-0.14	1.14
LARE 19440M001	N	0.61	0.25	0.39	-0.65	0.35	-1.07	0.15	-0.57
LARE 19440M001	E	0.86	0.85	0.25	0.51	-1.56	-0.43	-0.87	0.05
LARE 19440M001	U	3.92	-3.90	3.43	2.29	-2.45	-4.78	-4.46	3.32
LAZK 19354S001	N	0.69	0.90	-1.01	0.10	-0.02	-0.91	0.34	0.30
LAZK 19354S001	E	1.03	2.07	-0.35	-1.05	-0.25	-0.33	-0.71	-0.42

LAZK 19354S001	U	4.27	9.12	-0.57	-1.34	-2.62	-0.16	-4.14	-0.06
LEIT 19428M001	N	0.83	1.24	-1.04	-0.72	0.01	-0.51	0.73	0.44
LEIT 19428M001	E	0.50	0.03	0.11	-0.55	-0.53	-0.57	-0.75	-0.14
LEIT 19428M001	U	3.33	3.58	-6.01	2.51	0.01	-0.49	-3.32	-0.02
ORON 19427M001	N	0.66	0.87	-1.02	0.27	0.38	-0.68	0.32	0.22
ORON 19427M001	E	0.68	0.51	-0.19	-1.35	-0.74	0.14	-0.33	0.14
ORON 19427M001	U	3.18	-1.43	-0.43	5.55	-2.86	0.19	-4.23	1.26
PAS2 19351S001	N	0.81						0.77	-0.27
PAS2 19351S001	E	0.66						0.01	-0.66
PAS2 19351S001	U	1.02						-0.85	0.55
PASA 19351S001	N	1.44	2.47	-0.06	-1.40			0.29	-0.35
PASA 19351S001	E	0.51	0.52	-0.86	-0.13			-0.09	-0.05
PASA 19351S001	U	2.02	-1.95	-0.60	2.94			-1.82	0.51
RI01 13448M002	N	0.36	0.08	0.04	-0.34			0.58	-0.22
RI01 13448M002	E	0.91	1.38	-0.25	-0.98			-0.57	0.30
RI01 13448M002	U	2.75	3.27	-3.21	1.57			-0.32	2.61
SALA 13469M001	N	1.03	-0.18	-0.18		-1.51	-0.78	1.29	0.84
SALA 13469M001	E	0.88	-0.26	-0.25		-1.39	-1.13	0.05	0.72
SALA 13469M001	U	3.62	-3.18	-4.96		-1.29	-5.38	0.12	0.47
SCDA 10088M002	N	1.97	0.63	2.11	-1.37	2.95	-2.39	-1.40	0.53
SCDA 10088M002	E	1.20	0.30	1.32	-2.07	0.64	-0.83	-1.15	-0.38
SCDA 10088M002	U	2.97	-1.56	-1.27	2.11	-6.06	0.87	1.67	2.01
SOPU 19386M001	N	0.79	-0.21	0.82	1.50	-0.42	-0.53	-0.51	-0.20
SOPU 19386M001	E	2.73	1.48	-0.22	-6.09	-0.17	-0.15	0.67	2.20
SOPU 19386M001	U	5.47	-6.97	2.16	-9.33	0.81	5.03	2.37	2.73
TERU 13487M001	N	0.82	0.10	-0.10	0.96	-1.28	-0.29	-0.58	-1.02
TERU 13487M001	E	1.32	-0.31	-1.78	0.34	-0.47	-1.86	1.82	0.27
TERU 13487M001	U	2.84	1.44	-0.06	-1.73	-0.36	-3.81	3.90	-3.65
VITO 19385M001	N	0.62	-0.34	-0.33	0.02	-0.03	-1.04	0.98	0.03
VITO 19385M001	E	0.87	-0.32	-0.63	0.35	-1.87	-0.56	-0.34	0.02
VITO 19385M001	U	3.38	4.79	-2.75	2.83	-3.54	1.77	-3.78	-0.40
YEBE 13420M001	N	0.75	-0.76	0.58	0.09			0.95	0.66
YEBE 13420M001	E	0.84	1.55	-0.53	-0.04			-0.40	-0.07
YEBE 13420M001	U	3.88	-6.45	-2.36	2.74			-1.75	1.54
ZARA 13462M001	N	1.00	-1.86	0.29	0.38			0.31	0.51
ZARA 13462M001	E	0.38	0.02	0.20	-0.41			-0.60	-0.03
ZARA 13462M001	U	3.10	5.86	0.38	-1.36			1.31	0.61

6.2 Datum verification

In this section, the datum verification is shown. A 3 parameter Helmert 3D (3 translations) is computed to the minimally constrained sites.

TRANSFORMATION IN EQUATORIAL SYSTEM (X, Y, Z):
RESIDUALS IN LOCAL SYSTEM (NORTH, EAST, UP)

LIST OF REMOVED STATIONS:

OUTLIER CRITERIA: 15.00 15.00 20.00
ITERATION 1: FLRS 31907M001 1.76 20.11 20.61

NUM	NAME	FLG	RESIDUALS IN MILLIMETERS			
2	ALAC 13433M001	I W	1.94	-2.11	0.43	
3	ALME 13437M001	I W	-0.59	0.93	1.46	
4	BCL1 19482M001	I W	1.38	-2.89	5.97	
5	BELL 13431M001	I W	0.13	-0.98	0.55	
6	BIAZ 10074M002	I W	2.19	0.98	-5.03	
7	BORR 13480M001	I W	-6.05	-1.73	-1.78	
8	BRST 10004M004	I W	-0.39	-0.96	-0.53	
9	CACE 13447M001	I W	1.51	1.85	-1.01	
10	CANT 13438M001	I W	0.59	1.14	-5.73	
11	CASC 13909S001	I W	2.31	-0.04	3.88	
12	CEU1 13449M002	I W	0.88	0.68	0.57	
14	EBRE 13410M001	I W	-3.17	0.27	-5.79	
16	FLRS 31907M001	I W	1.81	20.69	21.20	*
17	FUER 31330M001	I W	0.98	-0.91	-1.34	
19	HUEL 13451M001	I W	2.56	2.37	-3.76	
20	IBIZ 13454S001	I W	-0.43	0.79	1.85	
21	IZAN 31309M002	I W	-0.61	-1.21	-2.01	
22	LAGO 13903M001	I W	2.17	0.55	3.47	
23	LLIV 13436M001	I W	-2.51	2.06	4.37	
24	LPAL 81701M001	I W	1.99	2.10	-1.63	
25	MADR 13407S012	I W	-0.19	2.86	1.23	
26	MAL1 13444M002	I W	3.32	-2.87	-5.16	
27	MALA 13443M001	I W	1.98	1.19	16.59	
28	MALL 13444M001	I W	-0.53	-0.65	0.49	
29	MAS1 31303M002	I W	-1.52	-1.11	2.13	
30	MELI 19379M001	I W	0.76	-0.44	3.31	
31	PDEL 31906M004	I W	-4.10	-2.06	0.83	
32	SCOA 10088M002	I W	-1.81	0.01	-15.53	
33	SFER 13402M004	I W	-1.11	-4.33	3.76	
34	SOPU 19386M001	I W	-0.70	2.33	0.97	
35	VALE 13439M001	I W	0.70	2.22	-4.17	
36	VIGO 13450M001	I W	2.17	1.41	-2.07	
37	VILL 13406M001	I W	-0.89	-0.43	-0.20	
38	YEBE 13420M001	I W	0.35	-0.23	3.41	
39	ZARA 13462M001	I W	-0.43	0.10	-4.17	
40	ZIMM 14001M004	I W	-0.91	-0.82	4.11	
	RMS / COMPONENT		2.00	1.70	5.00	
	IQR		2.83	2.17	5.37	
	MEAN		0.06	0.00	-0.02	
	MEDIAN		0.13	0.01	0.49	
	MIN		-6.05	-4.33	-15.53	
	MAX		3.32	2.86	16.59	
OVERALL RMS/IQR/MAX(3D)			3.26	2.95	16.75	MALA 13443M001 #SUM
ALL	RMS / COMPONENT		2.00	3.88	6.09	
ALL	IQR		2.67	2.27	5.39	
ALL	MEAN		0.10	0.58	0.57	
ALL	MEDIAN		0.24	0.06	0.52	
ALL	MIN		-6.05	-4.33	-15.53	
ALL	MAX		3.32	20.69	21.20	
ALL	OVERALL RMS/IQR/MAX(3D)		4.33	3.00	29.67	FLRS 31907M001 #SUM_ALL

NUMBER OF PARAMETERS : 3
NUMBER OF STATIONS : 35
NUMBER OF COORDINATES : 105
RMS OF TRANSFORMATION : 3.26 MM

PARAMETERS:

TRANSLATION IN X : -0.66 +- 0.55 MM
TRANSLATION IN Y : -0.27 +- 0.55 MM
TRANSLATION IN Z : -0.41 +- 0.55 MM

NUMBER OF ITERATIONS : 3

ACCEPTED STATIONS : 35 97.22 %
VERIFIED STATIONS : 0 0.00 %
REJECTED STATIONS : 1 2.78 %

LIST OF VERIFIED/REJECTED STATIONS

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 to the daily solutions are shown.

```
*. STATISTICAL PARAMETER----- VALUE(S)-----
NUMBER OF OBSERVATIONS              16977499
NUMBER OF UNKNOWN                   175128
NUMBER OF DEGREES OF FREEDOM        16802371
PHASE MEASUREMENTS SIGMA             0.00100
SAMPLING INTERVAL (SECONDS)          180
VARIANCE FACTOR                      2.324453059829910
```

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 26:152:00000 26:157:86370 LEICA GR50 -----
ALDA A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
ALSA A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
AMUR A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
BIAZ A 1 P 26:151:00000 26:157:86370 SPECTRA SP90M -----
BIDA A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
BRZR A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
CACE A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
CANT A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
CREU A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
EBRE A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
ELGE A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
EMAZ A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
GERN A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
HOND A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
IGEL A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
ISPS A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
KAST A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
LARE A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
LAZK A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
LEIT A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
ORON A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
PAS2 A 1 P 26:156:00000 26:157:86370 STUNEX SC2200 -----
PASA A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
RIO1 A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
SALA A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
SCOA A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
SOPU A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
TERU A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
VITO A 1 P 26:151:00000 26:157:86370 LEICA GR30 -----
YEBE A 1 P 26:151:00000 26:157:86370 LEICA GR50 -----
ZARA A 1 P 26:151:00000 26:157:86370 TRIMBLE NETR9 -----
```

7.2 Antennas

Serial number ONLY provided in case individual calibrations are used.

```
*SITE PT SOLN T DATA_START_ DATA_END_ DESCRIPTION----- S/N_ DAZI
ACOR A 1 P 26:152:00000 26:157:86370 LEIAT504 LEIS -----
ALDA A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
ALSA A 1 P 26:151:00000 26:157:86370 LEIAR10 NONE -----
AMUR A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
BIAZ A 1 P 26:151:00000 26:157:86370 LEIAR25 LEIT -----
BIDA A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
BRZR A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
CACE A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
CANT A 1 P 26:151:00000 26:157:86370 LEIAR25.R4 LEIT -----
CREU A 1 P 26:151:00000 26:157:86370 LEIAR25.R4 NONE -----
EBRE A 1 P 26:151:00000 26:157:86370 LEIAR25.R4 NONE -----
ELGE A 1 P 26:151:00000 26:157:86370 LEIAR25.R4 LEIT -----
EMAZ A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
GERN A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
HOND A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
IGEL A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
ISPS A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
KAST A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
LARE A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
LAZK A 1 P 26:151:00000 26:157:86370 LEIAR25.R4 LEIT -----
LEIT A 1 P 26:151:00000 26:157:86370 LEIAR10 NONE -----
ORON A 1 P 26:151:00000 26:157:86370 LEIAR10 NONE -----
PAS2 A 1 P 26:156:00000 26:157:86370 LEIAR20 LEIM -----
PASA A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
RIO1 A 1 P 26:151:00000 26:157:86370 LEIAR25.R4 LEIT -----
SALA A 1 P 26:151:00000 26:157:86370 LEIAR25 NONE -----
SCOA A 1 P 26:151:00000 26:157:86370 TRM55971.00 NONE -----
SOPU A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
TERU A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
VITO A 1 P 26:151:00000 26:157:86370 LEIAS10 NONE -----
YEBE A 1 P 26:151:00000 26:157:86370 LEIAR20 LEIM -----
ZARA A 1 P 26:151:00000 26:157:86370 TRM29659.00 NONE -----
```

7.3 Eccentricities

```

*
*SITE PT SOLN T DATA_START__ DATA_END_____ AXE ARP-->BENCHMARK(M)-----
ACOR A 1 P 26:152:00000 26:157:86370 UNE 3.0460 0.0000 0.0000
ALDA A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
ALSA A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
AMUR A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
BIAZ A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
BIDA A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
BRZR A 1 P 26:151:00000 26:157:86370 UNE 0.0771 0.0000 0.0000
CACE A 1 P 26:151:00000 26:157:86370 UNE 0.0600 0.0000 0.0000
CANT A 1 P 26:151:00000 26:157:86370 UNE 3.0490 0.0000 0.0000
CREU A 1 P 26:151:00000 26:157:86370 UNE 0.0770 0.0000 0.0000
EBRE A 1 P 26:151:00000 26:157:86370 UNE 0.0770 0.0000 0.0000
ELGE A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
EMAZ A 1 P 26:151:00000 26:157:86370 UNE 0.0350 0.0000 0.0000
GERN A 1 P 26:151:00000 26:157:86370 UNE 0.0771 0.0000 0.0000
HOND A 1 P 26:151:00000 26:157:86370 UNE 0.0771 0.0000 0.0000
IGEL A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
ISPS A 1 P 26:151:00000 26:157:86370 UNE 0.0350 0.0000 0.0000
KAST A 1 P 26:151:00000 26:157:86370 UNE 0.0350 0.0000 0.0000
LARE A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
LAZK A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
LEIT A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
ORDN A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
PAS2 A 1 P 26:156:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
PASA A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
RI01 A 1 P 26:151:00000 26:157:86370 UNE 0.0606 0.0000 0.0000
SALA A 1 P 26:151:00000 26:157:86370 UNE 0.0600 0.0000 0.0000
SCOA A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
SOPU A 1 P 26:151:00000 26:157:86370 UNE 0.0771 0.0000 0.0000
TERU A 1 P 26:151:00000 26:157:86370 UNE 0.0600 0.0000 0.0000
VITO A 1 P 26:151:00000 26:157:86370 UNE 0.0000 0.0000 0.0000
YEBE A 1 P 26:151:00000 26:157:86370 UNE 0.0600 0.0000 0.0000
ZARA A 1 P 26:151:00000 26:157:86370 UNE 3.2590 0.0000 0.0000

```

8 Inconsistencies (logsheets-RINEX metadata)

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

```

2026-06-21 05:54 UTC | ALDA1510.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 08:38 UTC | ALDA1520.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 11:22 UTC | ALDA1530.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 13:55 UTC | ALDA1540.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 16:30 UTC | ALDA1550.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 19:18 UTC | ALDA1560.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 23:02 UTC | ALDA1570.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: alda00esp_20241008.log
2026-06-21 05:54 UTC | AMUR1510.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 08:38 UTC | AMUR1520.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 11:22 UTC | AMUR1530.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 13:55 UTC | AMUR1540.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 16:30 UTC | AMUR1550.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 19:18 UTC | AMUR1560.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 23:02 UTC | AMUR1570.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amur00esp_20241008.log
2026-06-21 05:54 UTC | BRZR1510.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
2026-06-21 08:38 UTC | BRZR1520.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
2026-06-21 11:22 UTC | BRZR1530.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
2026-06-21 13:55 UTC | BRZR1540.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
2026-06-21 16:30 UTC | BRZR1550.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
2026-06-21 19:18 UTC | BRZR1560.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
2026-06-21 23:02 UTC | BRZR1570.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: brzr00esp_20240315.log
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2026-06-21 23:02 UTC | EMAZ1570.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: amaz00esp_20241008.log
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2026-06-21 05:54 UTC | KAST1510.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: kast00esp_20241008.log
2026-06-21 08:38 UTC | KAST1520.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: kast00esp_20241008.log
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2026-06-21 05:54 UTC | VITO1510.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: vito00esp_20241008.log
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2026-06-21 13:55 UTC | VITO1540.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: vito00esp_20241008.log
2026-06-21 16:30 UTC | VITO1550.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: vito00esp_20241008.log
2026-06-21 19:18 UTC | VITO1560.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: vito00esp_20241008.log
2026-06-21 23:02 UTC | VITO1570.260 | RECEIVER FIRM. VERS. | 4.83/7.900 -> 4.80/7.900 (source: vito00esp_20241008.log

```

9 References

C. Boucher and Z. Altamimi (2011): *Specifications for reference frame fixing in the analysis of a EUREF GPS campaign*. etrs89.ensg.ign.fr/memo-V8.pdf

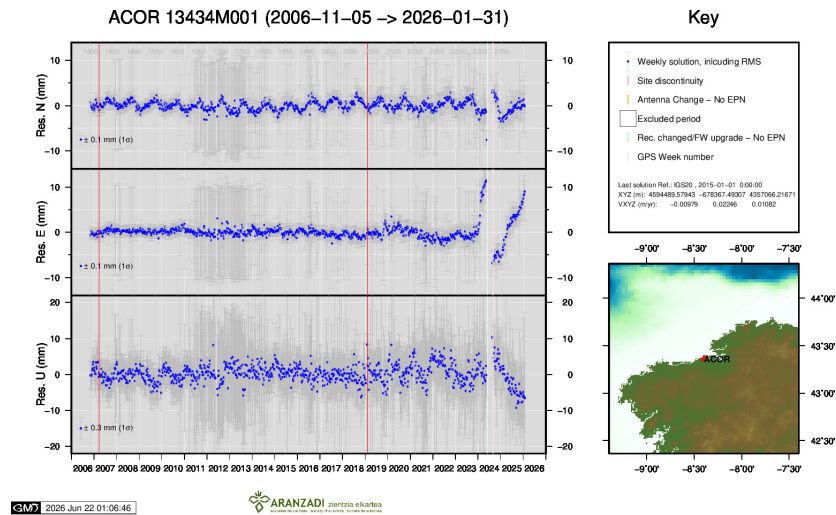
EPN Coordination Group and the EPN Central Bureau (2018): *Guidelines for the EPN Analysis Centres*. epncb.oma.be/documentation/guidelines/guidelines_analysis_centres.pdf

Johnston, G., Riddell, A., Hausler, G. (2017). The International GNSS Service. Teunissen, Peter J.G., Montenbruck, O. (Eds.), Springer Handbook of Global Navigation Satellite Systems (1st ed., pp. 967-982). Cham, Switzerland: Springer International Publishing. DOI: 10.1007/978-3-319-42928-1

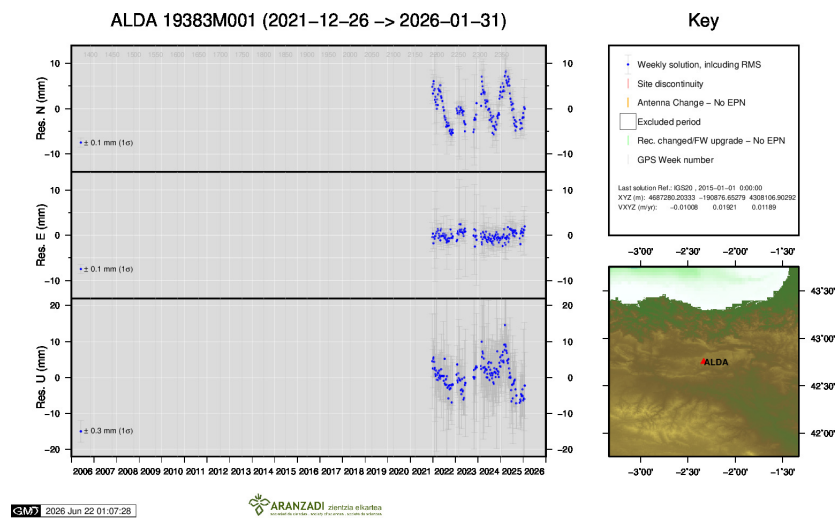
Z. Altamimi (2018): *EUREF Technical Note 1: Relationship and Transformation between the International and the European Terrestrial Reference Systems*. etrs89.ensg.ign.fr/pub/EUREF-TN-1.pdf

10 Cumulative Time Series

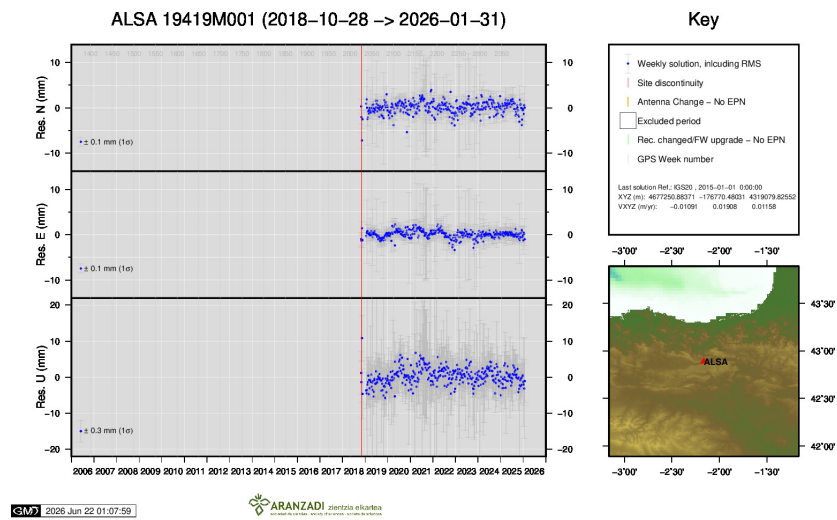
Time series of stations. Latest plots at: <http://geolabpasaia.org/gnss/ARA-net/TSeries/>, or click on the caption of each image.



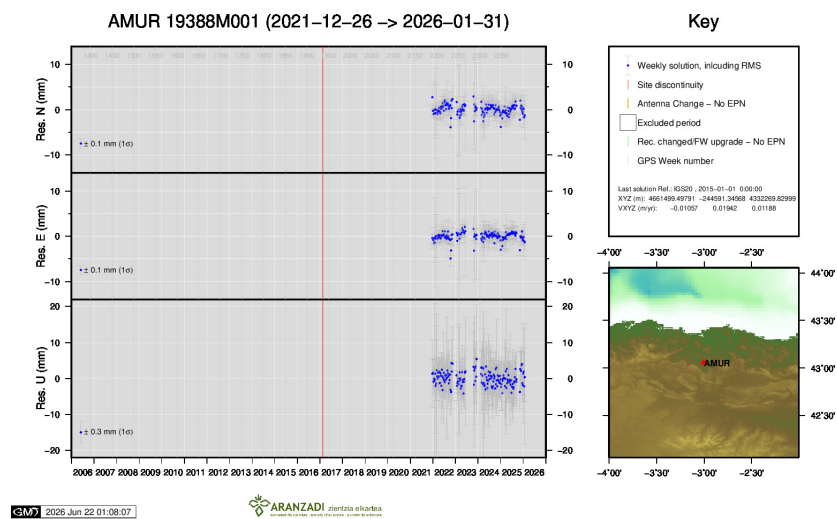
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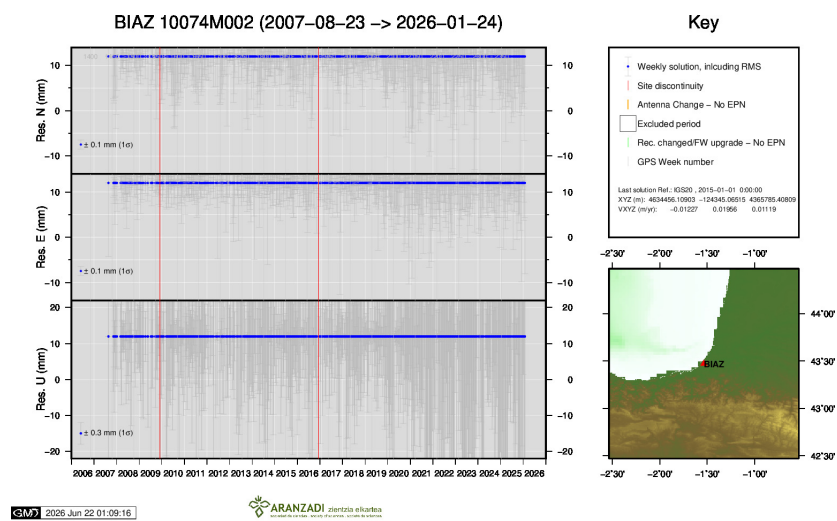
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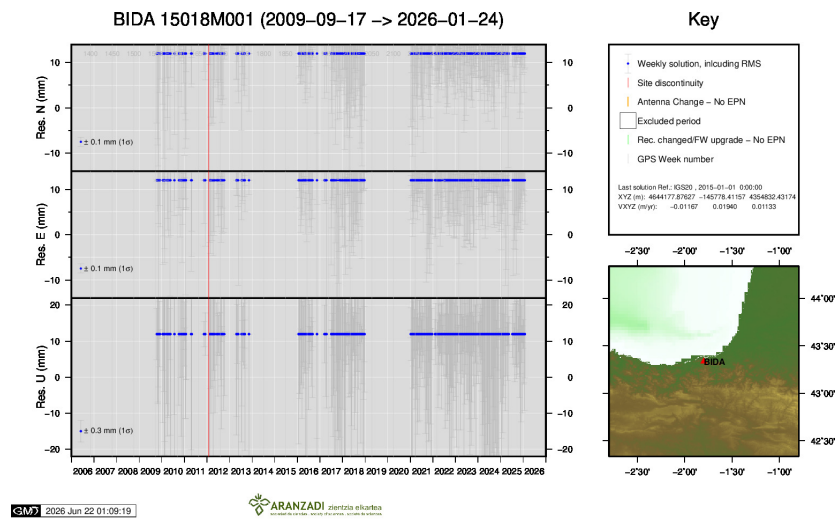
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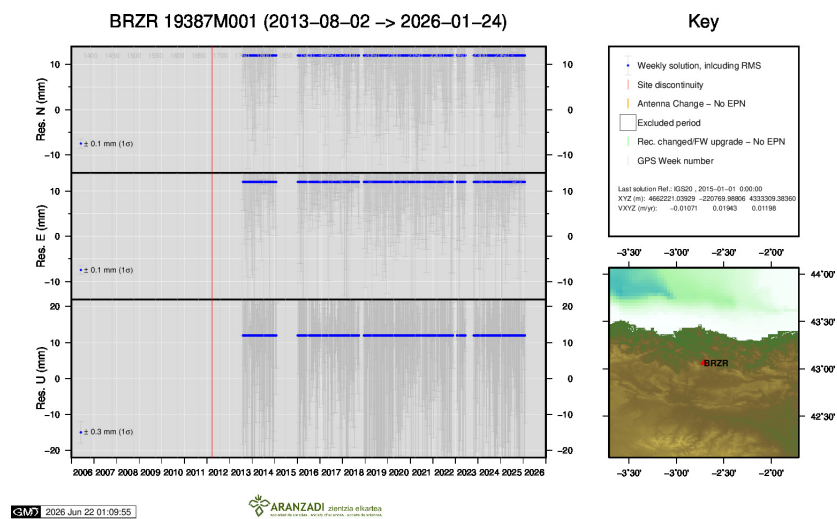
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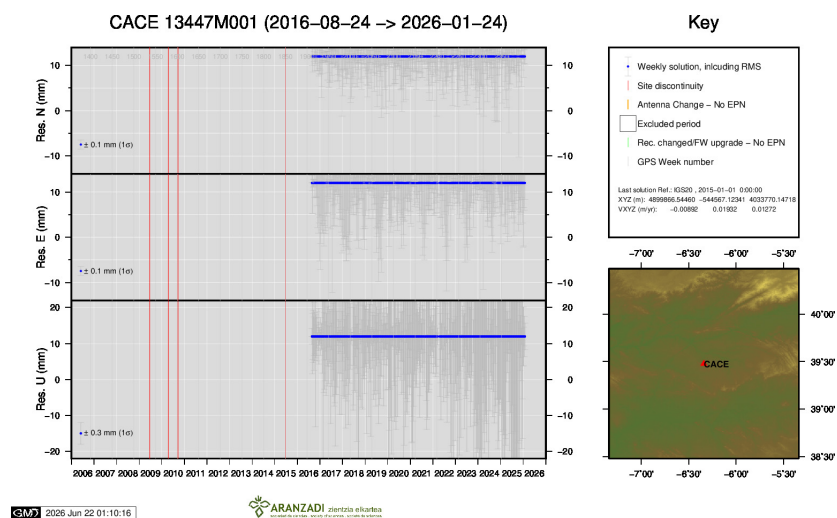
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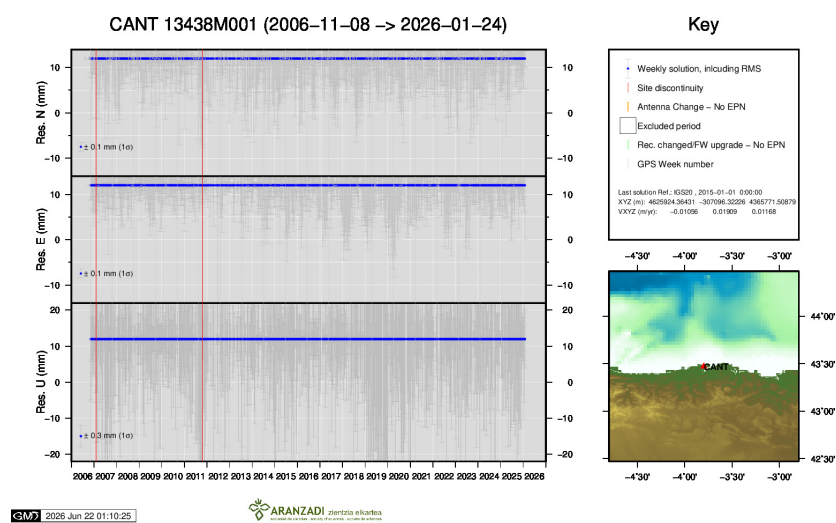
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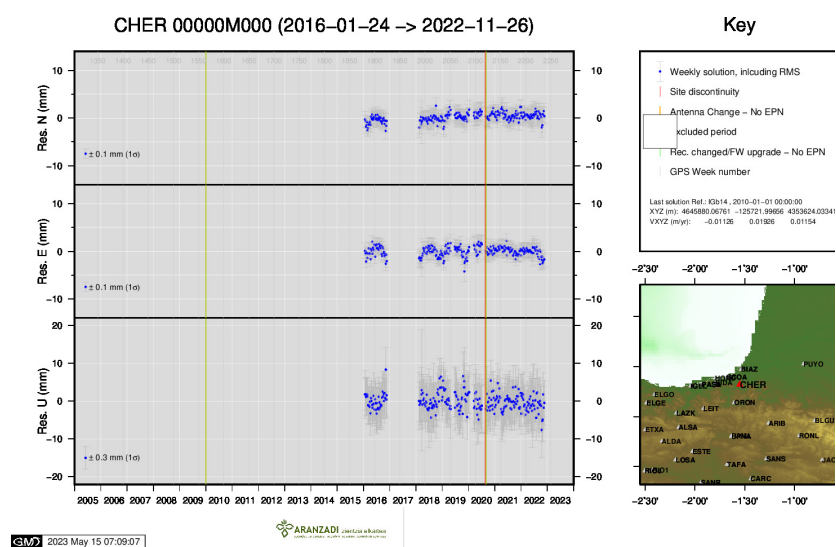
7) BRZR



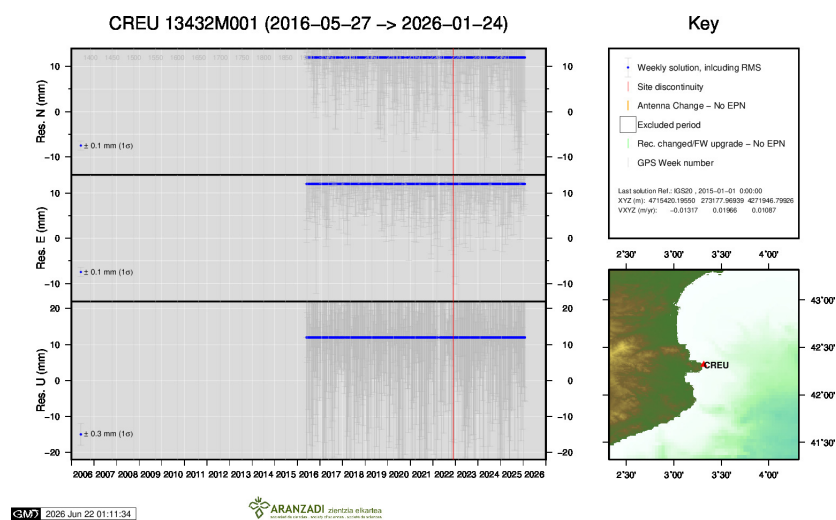
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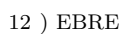
9) CANT

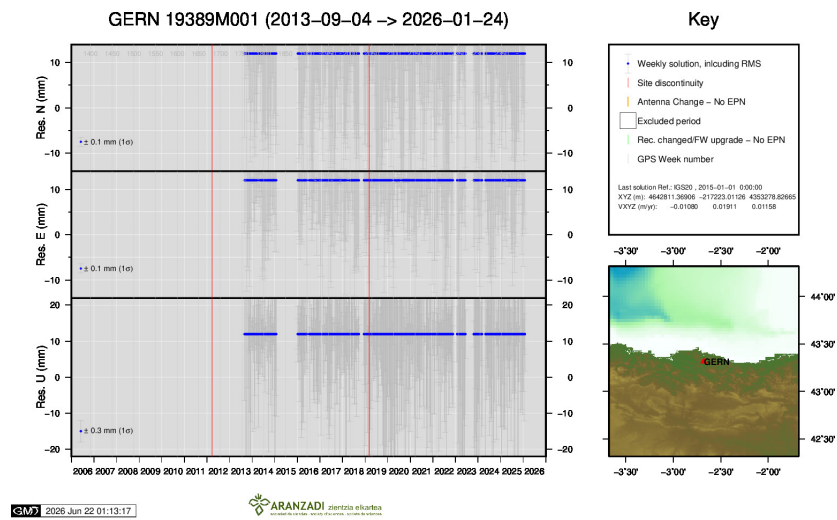


10) CHER

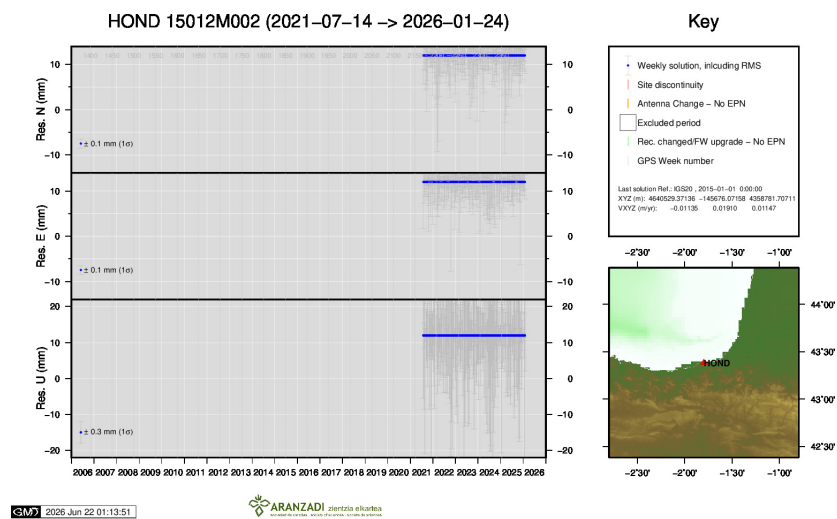


11) CREU

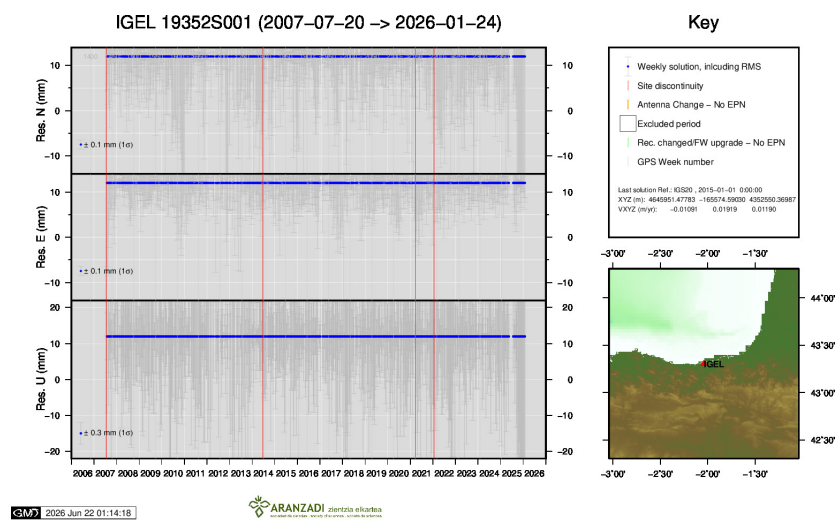




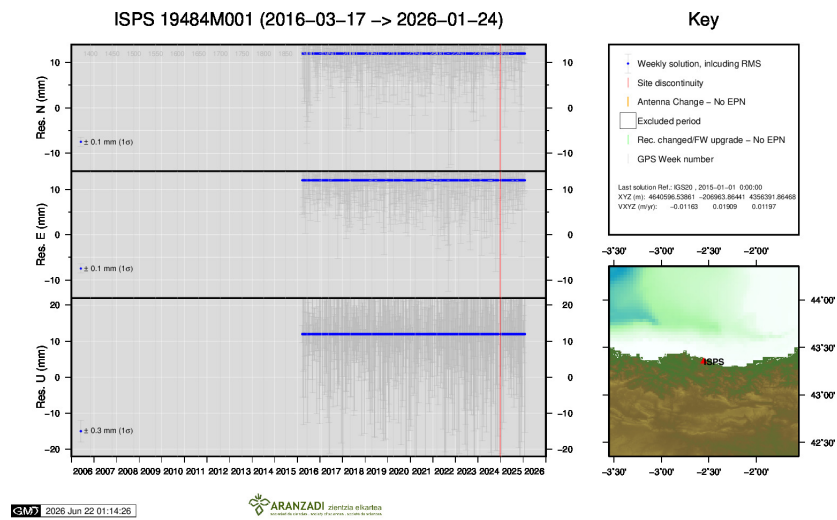
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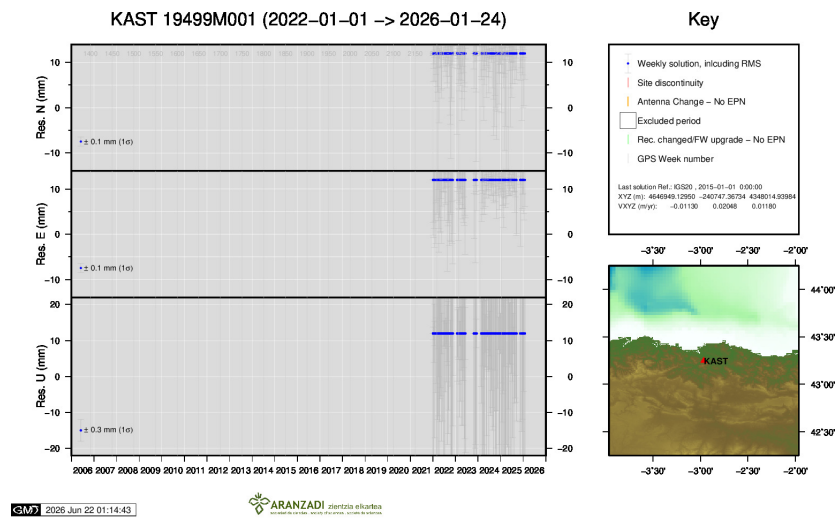
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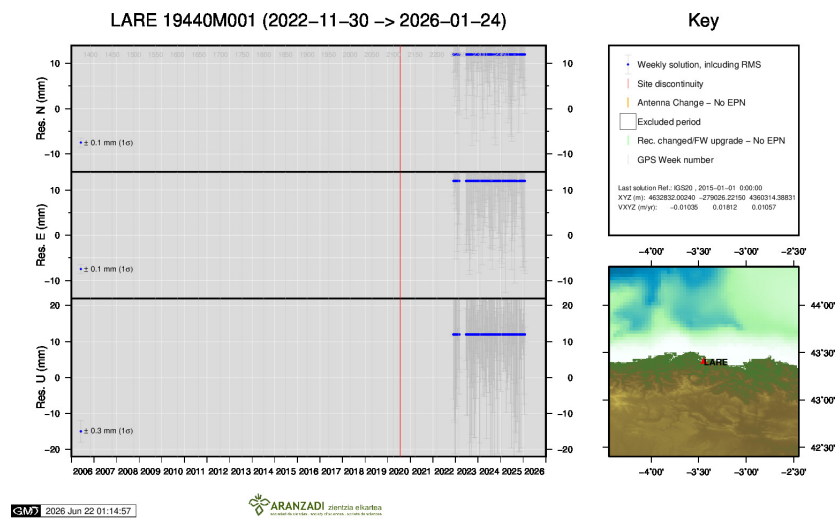
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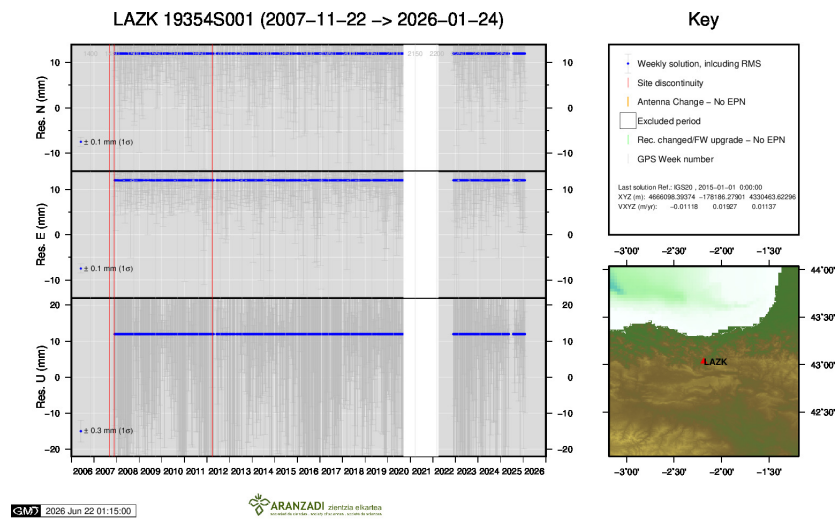
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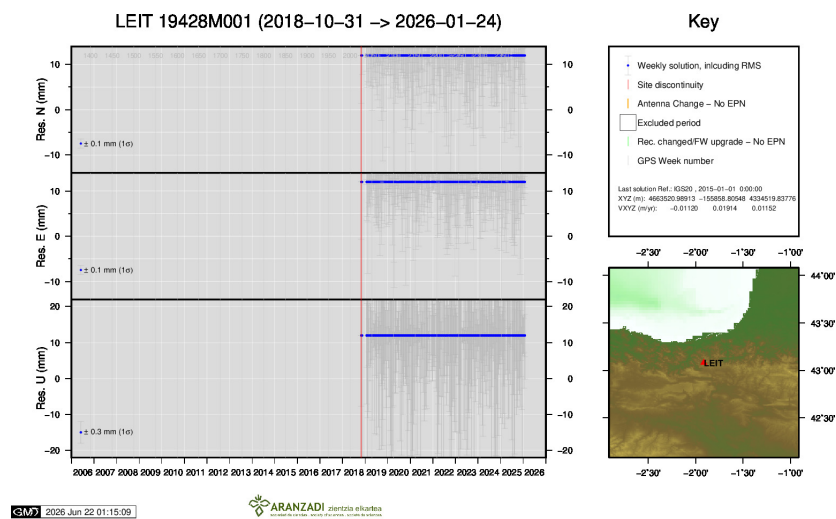
19) KAST



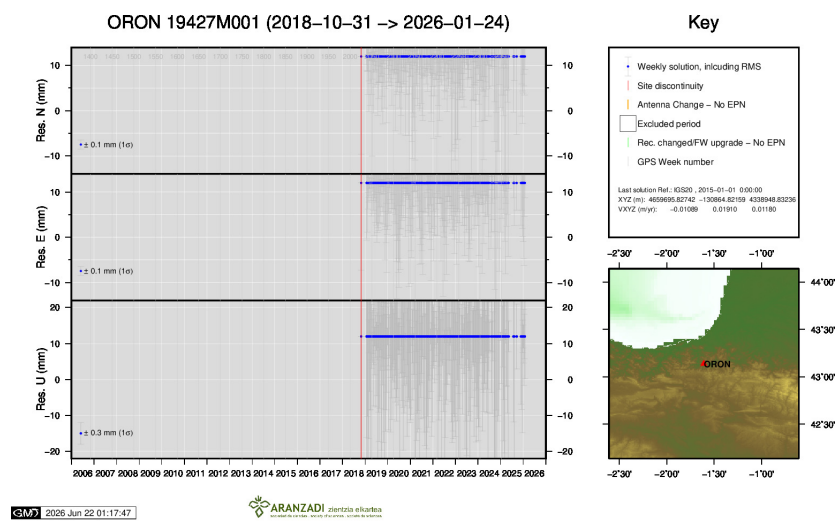
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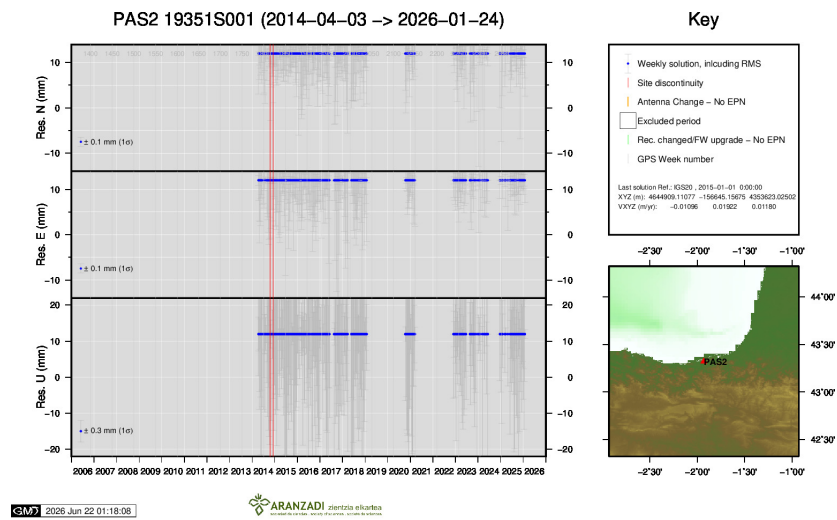
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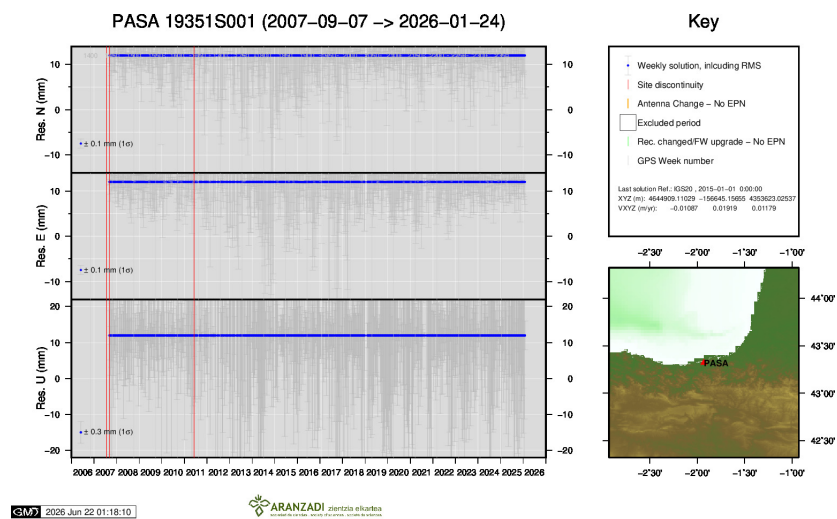
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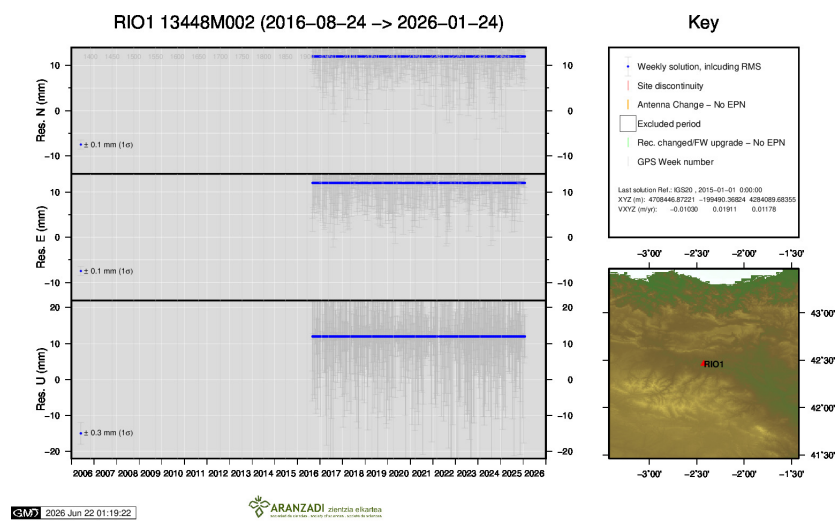
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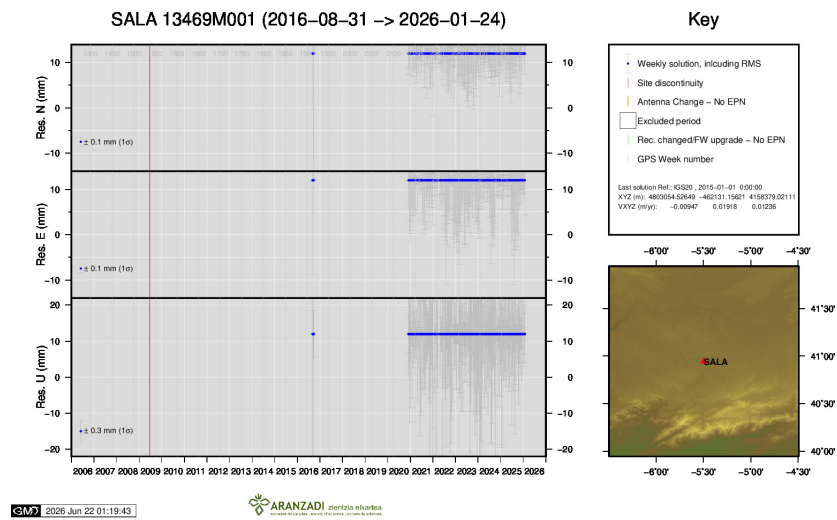
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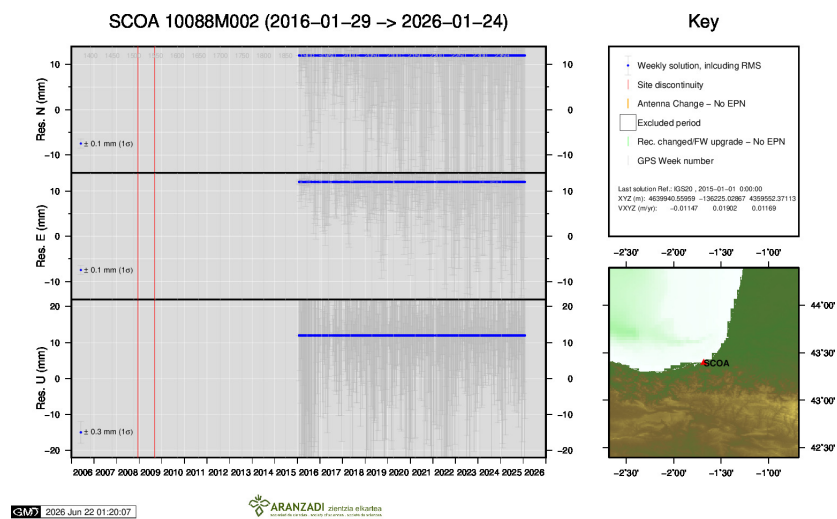
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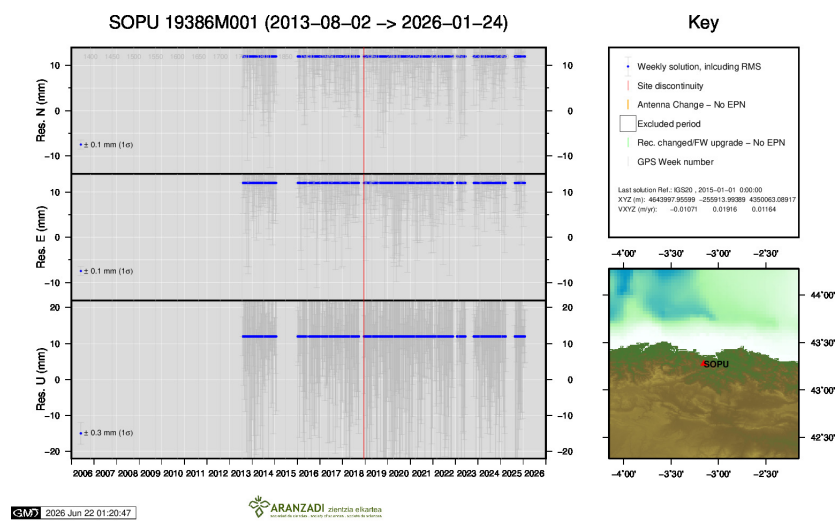
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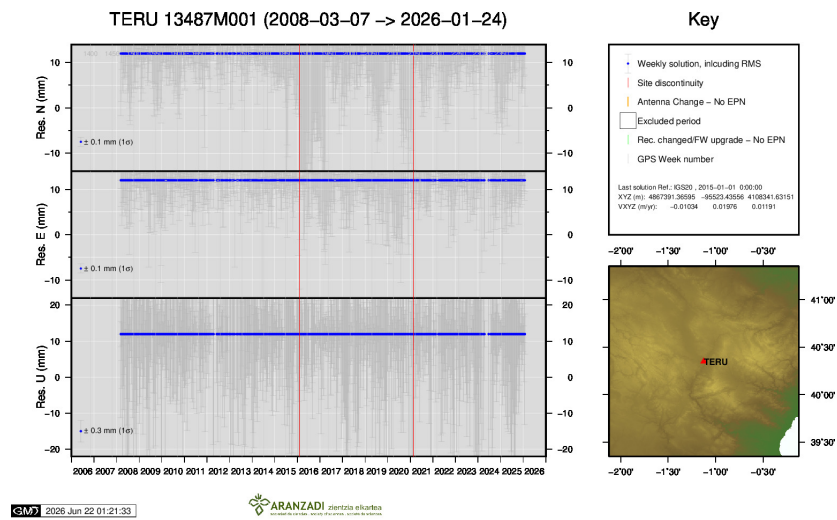
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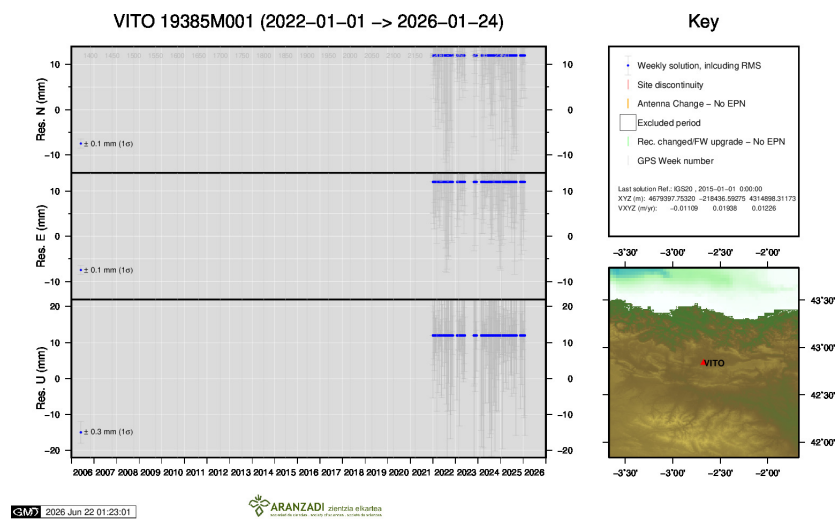
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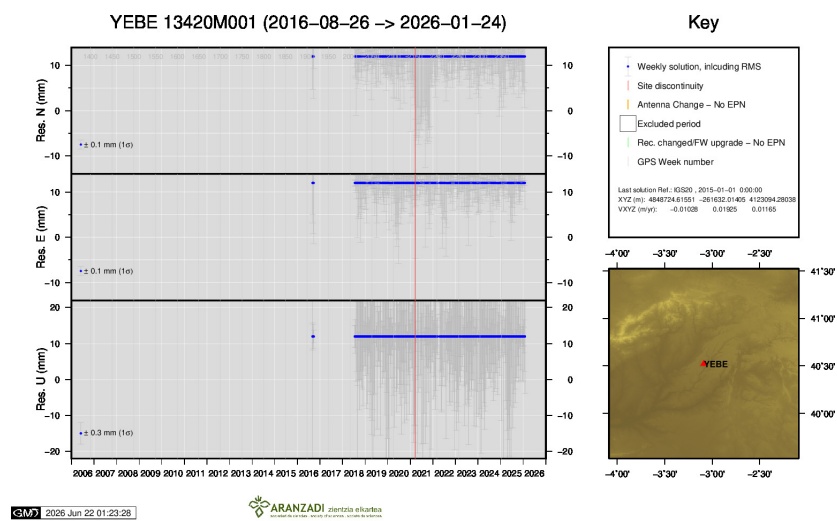
29) SOPU



30) TERU



31) VITO



32) YEBE

