

EUREF CAMPAIGNS

1. EUREF CAMPAIGN is a set of operations consisting in
 - a. the collection of GNSS observations at selected stations during a limited period of time in the EUREF geographical area of interest, and
 - b. the computation of the stations coordinates in the European Terrestrial Reference System (ETRS89) in compliance with the technical specifications adopted by the EUREF Governing Board (GB), formerly designated by Technical Working Group (TWG).

Furthermore, to be considered officially as an improvement and extension of ETRS89,

- c. the results of the campaign and respective report must be approved by the GB, and
 - d. the GB approval must be confirmed by the EUREF Plenary by a resolution at a EUREF Symposium.
2. The main purpose of a EUREF CAMPAIGN is the densification of the network of stations with high quality ETRS89 coordinates within a region covering one country or a group of countries, to be used as a frame of the official national geodetic reference system.

However, other situations may occur:

- a. the campaign is adopted by EUREF and the resulting coordinates are used internally and officially by the country to upgrade the results of previous campaigns, or
 - b. the campaign is adopted by EUREF but the resulting coordinates are not used internally and officially by the country, or
 - c. the country may adopt internally and officially coordinates coming from computations that have not been submitted to the GB; consequently, they cannot be considered officially by EUREF as an improvement and extension of ETRS89.

The results of repeated campaigns (campaigns over a network whose sites are totally or partially included in several campaigns) may be used, under some strict circumstances, to derive the velocities of the sites, besides the coordinates.

3. Historically, the ETRS89 was first realized by the European sub-set of sites included in the ITRF89 (SLR and VLBI sites), and named European Terrestrial Reference Frame 1989 (ETRF89).

Since the number of SLR and VLBI sites was not satisfactory, the densification of the network was achieved at that time by the organization of the GPS campaign EUREF89, covering 92 sites distributed all over Europe.

To allow a better access to ETRS89 by the users, there was a need to further densify and extend the network as much as possible using homogeneous procedures.

This was achieved with the adoption by the EUREF TWG of the document “Memo: Specifications for reference frame fixing in the analysis of a EUREF GPS campaign”, by Claude Boucher and Zuheir Altamimi.

The first version was published in 1993 and the last one in 2011; it was commonly known as the “*Memo of Boucher and Altamimi*”.

For quality assessment purposes, the sites were classified as follows:

- Class A stations with 1 cm precision independent of epoch (permanent GNSS observations);
- Class B stations with 1 cm precision at a specific epoch (GNSS campaigns since 1993);
- Class C stations with 5 cm precision at a specific epoch (EUREF89 campaign).

4. Presently, and as far as EUREF CAMPAIGNS is concerned, there are two reference documents:
- a. *“EUREF Technical Note 1: Relationship and Transformation between the International and the European Terrestrial Reference Systems”*, by Zuheir Altamimi, first version published in November 16, 2017.

This Technical Note summarizes and replaces the Memo of Boucher and Altamimi. It recalls the mathematical relationship linking ETRS89 to the ITRS, provides the users with all the necessary information allowing to transform station positions and velocities from any ITRS realization to any ETRS89 realization, and recommends a procedure to follow when realizing the ETRS89 at the national or regional level using GNSS data and the International GNSS Service (IGS) products.

- b. *“Guidelines for EUREF Densifications”*, by C. Bruyninx, Z. Altamimi, A. Caporali, A. Kenyeres, J. Legrand and M. Lidberg.

This document outlines the procedure for computing station coordinates (and velocities) in the ETRS89, in particular in the framework of national densifications of the ETRS89. The document also describes how to proceed to request a EUREF validation of the densification.

For quality assessment purposes, the sites are classified in this document as follows:

- Class A stations with coordinates at the 1 cm precision and velocities at the 1mm/yr precision at all epochs;
- Class B stations with coordinates at the 1 cm precision at the epoch of minimal position variance of each station.

5. The following table lists the official EUREF CAMPAIGNS by chronological order. The columns content is as follows:

EUREF CAMPAIGN - The official designation of the campaign;

ADOPTION - The number of the resolution, the place and year of the EUREF Symposium;

REMARKS - Particularities of the campaign; it is also indicated the classification of points, if different from Class B (the majority of campaigns);

PRESENTATION - Hyperlink to the presentation of the campaign at the EUREF Symposium, if it is available;

REPORT - Hyperlink to the report of the campaign, if it is available, otherwise reference.

EUREF CAMPAIGN	ADOPTION	REMARKS	PRESENTATION	REPORT
EUREF 89	R1 - Berne 1992	All points Class C		
EUREF 1992 Baltic States	R2 - Budapest 1993	Estonian points replaced by EUREF-Estonia-1997		
EUREF-CS/H 91	R1 - Warsaw 1994	Some H points replaced by EUREF-Hungary-2002 CS points replaced by EUREF-Slovakia-2001		
EUREF-POL 92	R1 - Warsaw 1994	Replaced by EUREF-POL-2001		
EUREF-D/NL 93	R1 - Warsaw 1994			
EUREF-GB92	R1 - Helsinki 1995	Replaced by EUREF GB2001		
EUREF-Cyprus93	R1 - Helsinki 1995			
EUREF-LUXBD94	R1 - Helsinki 1995			
EUREF-CRO/SLO94	R1 - Helsinki 1995	Croatian points replaced by EUREF-CRO-94/95/96		
EUREF-DK94	R1 - Helsinki 1995			
CH92/93	R1 - Ankara 1996			
EUREF-BG92/93	R1 - Ankara 1996			
EUREF-Iceland93	R1 - Ankara 1996			
EUREF-A94/95	R1 - Ankara 1996	Some points replaced by EUREF-Austria-2002		
EUREF-EIR/GB95	R1 - Ankara 1996	GB points replaced by EUREF GB2001		
Iberia 95	R1 - Bad Neuenahr – Ahrweiler 1998			
FYROM 96	R1 - Bad Neuenahr – Ahrweiler 1998			EUREF Publication No. 7/I Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 6, pp. 59-78
Malta 96	R1 - Bad Neuenahr – Ahrweiler 1998			EUREF Publication No. 7/I Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 6, pp. 89-103
EUREF-NOR94/NOR95	R2 - Bad Neuenahr – Ahrweiler 1998	Subset of points		
EUVN97	R1 - Prague 1999			
EUREF-FIN-96/97	R2 - Prague 1999	Subset of points		

EUREF-Estonia-1997	R2 - Prague 1999	Subset of points (EUREF 1992 no longer acceptable)		
EUREF-Balkan-98	R3 - Prague 1999	Wait for publication due to political reasons		

EUREF CAMPAIGN	ADOPTION	REMARKS	PRESENTATION	REPORT
Moldavia-99	R1 - Tromsoe 2000	3 points in Ukraine not included (bad quality)		http://www.euref.eu/symposia/book2000/P_160_166.pdf
EUREF-SWeref-99	R1 - Tromsoe 2000	Old points deleted from the database		http://www.euref.eu/symposia/book2000/P_167_175.pdf
EUREF-Balear-98	R1 - Tromsoe 2000			http://www.euref.eu/symposia/book2000/P_176_186.pdf
EUREF-CRO-94/95/96	R1 - Dubrovnik 2001	Old points deleted from the database		http://www.euref.eu/symposia/book2001/4_3.pdf ; EUREF Publication No. 10 Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 23, pp. 171-188
EUREF GB2001	R1 - Ponta Delgada 2002	Old points deleted from the database / Re-processing in 2004		http://www.euref.eu/symposia/book2002/168-184.pdf ; EUREF Publication No. 12 Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 29, pp. 168-184
EUREF-Slovakia-2001	R1 - Toledo 2003	Old points deleted from the database		http://www.euref.eu/symposia/book2003/4-03-Klobusiak.pdf ; EUREF Publication No. 13 Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 33, pp. 154-168
EUREF-POL-2001	R1 - Toledo 2003	Old points deleted from the database		http://www.euref.eu/symposia/book2002/185-198.pdf ; EUREF Publication No. 12 Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 29, pp. 185-198

EUREF-Austria-2002	R1 - Toledo 2003	Old points deleted from the database		http://www.euref.eu/symposia/book2003/4-05-Stangl.pdf ; EUREF Publication No. 13 Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 33, pp. 169-175
EUREF-Hungary-2002	R1 - Toledo 2003	Old points deleted from the database		http://www.euref.eu/symposia/book2003/4-01-Kenyeres.pdf ; EUREF Publication No. 13 Mitteilungen des Bundesamtes für Kartographie und Geodäsie Band 33, pp. 128-131
EUREF-Armenia-2002	R1 - Bratislava 2004		http://www.euref.eu/symposia/book2004/4-2-Norin.pdf	
EUREF-GB-2001	R1 - Bratislava 2004	Re-processing; previously accepted in 2002	http://www.euref.eu/symposia/book2004/4-1-greaves.pdf	
EUREF-BG-2004	R1 - Riga 2006	Combined with the EUREF-BG92/93, previously accepted in 1996	http://www.euref.eu/symposia/2006Riga/06-01.pdf	
EUREF-NKG-2003	R1 - Riga 2006	Only points from Latvia and Lithuania included in the data base	http://www.euref.eu/symposia/2006Riga/06-02.pdf ; http://www.euref.eu/symposia/2005Vienna/4-02.pdf	
Rete Dinamica Nazionale (RDN)	R1 - Florence 2009		http://www.euref.eu/symposia/2009Florence/06-01-farolfi.pdf	http://www.euref.eu/symposia/2009Florence/06-01-p-Farolfi.pdf
EUREF Czech 2009	R1 - Gävle 2010		http://www.euref.eu/symposia/2010Gavle/06-03-Dousa.pdf	http://www.euref.eu/symposia/2010Gavle/06-03-p-Dousa.pdf
EUREF EIR/UK 2009	R1 - Gävle 2010		http://www.euref.eu/symposia/2010Gavle/06-01-Bell.pdf	http://www.euref.eu/symposia/2010Gavle/06-01-p-Bell.pdf

EUREF GR 2007	R1 - Gävle 2010		http://www.euref.eu/symposia/2010Gavle/06-02-Gianniou.pdf	http://www.euref.eu/symposia/2010Gavle/06-02-p-Gianniou.pdf
EUREF Serbia 2010	R1 - Chisinau 2011		http://www.euref.eu/symposia/2011Chisinau/06-01-Veljkovic.pdf	http://www.euref.eu/symposia/2011Chisinau/06-01-p-Veljkovic.pdf
EUREF MAKPOS 2010	R1 - Chisinau 2011		http://www.euref.eu/symposia/2011Chisinau/06-02-Dimeski.pdf	http://www.euref.eu/symposia/2011Chisinau/06-02-p-Dimeski.pdf
EUREF Faroe Islands 2007	R1 - Chisinau 2011		http://www.euref.eu/symposia/2011Chisinau/06-03-Khan.pdf	http://www.euref.eu/symposia/2011Chisinau/06-03-p-Khan.pdf
EUREF BE 2011	R1 - Saint-Mandé 2012		http://www.euref.eu/symposia/2012Paris/04-04-Voet.pdf	http://www.euref.eu/symposia/2012Paris/04-04-p-Voet.pdf
EUREF Poland 2015	R2 - Leipzig 2015	All points Class A	http://www.euref.eu/symposia/2015Leipzig/01-07-Ryczywolski.pdf	http://www.euref.eu/symposia/2015Leipzig/01-07-p-Ryczywolski.pdf
CEGRN	R2 - Leipzig 2015	55 points Class A and 80 points Class B	http://www.euref.eu/symposia/2015Leipzig/02-05-Caporali.pdf	http://www.euref.eu/symposia/2015Leipzig/02-05-p-Caporali.pdf
Slovenia GNSS 2016	R3 - Amsterdam 2018		http://www.euref.eu/symposia/2018Amsterdam/01-03-Berk.pdf	http://www.euref.eu/symposia/2018Amsterdam/01-03-p-Berk.pdf