

# EPN CB News

Carine Bruyninx  
Royal Observatory of Belgium  
EPN Central Bureau

# Content

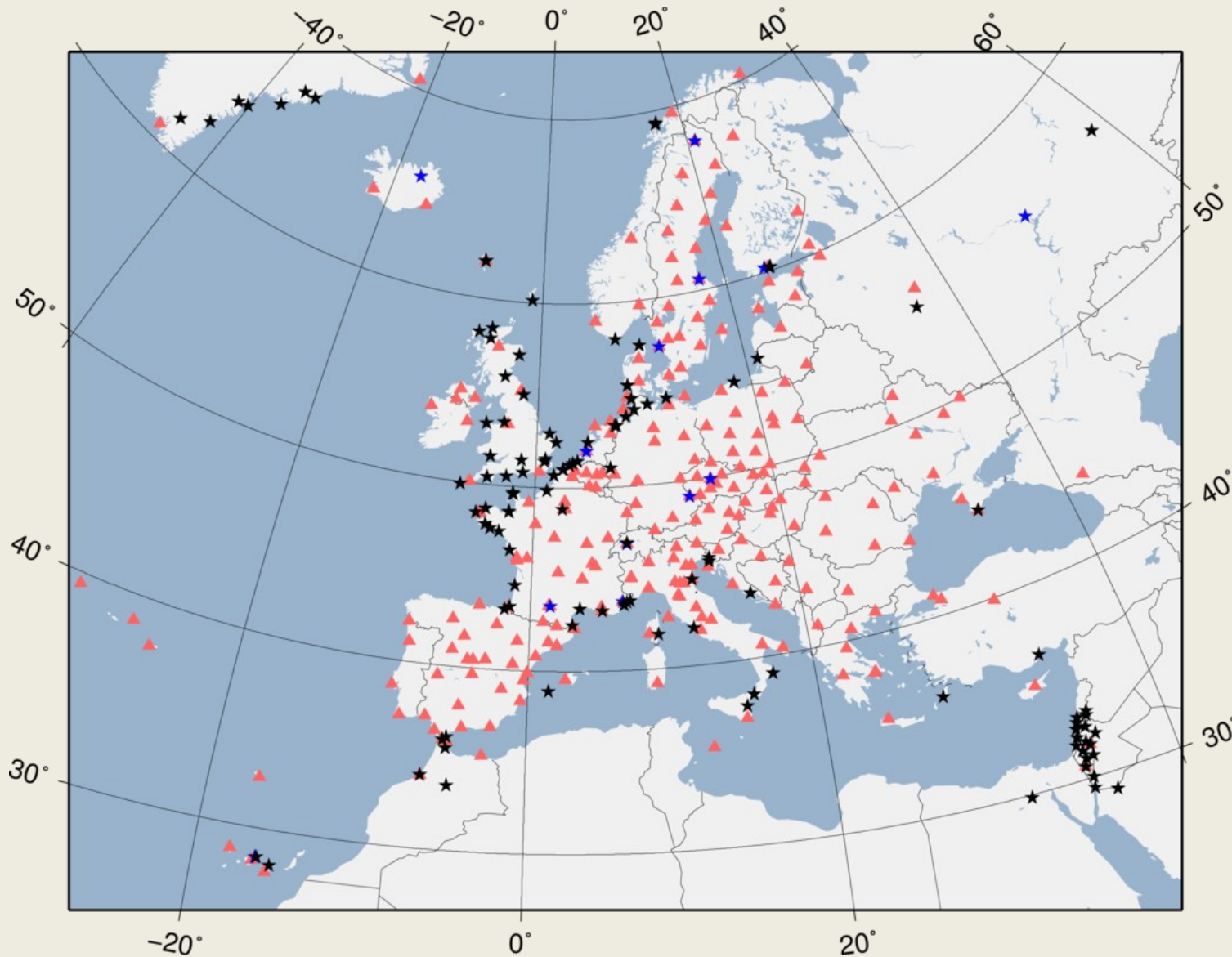
- **New and Proposed EPN stations**
- Station tracking problems
- Individual antenna calibrations: Full Serial numbers
- RINEX 3 preparations
- Site log exchange – meta data
- EPN densification

# Why add a station to the EPN?

Provide an added-value to the EPN,  
according to the objectives of EUREF

- Reference Frame
  - *ITRF station*
  - *Location: few EPN stations or border of Europe*
- Equipment capabilities
  - *Multi-GNSS, RINEX 3*
  - *Real-time*
- Co-locations
  - *Other space geodetic techniques*
  - *Tide gauge*
  - *Gravity measurements*

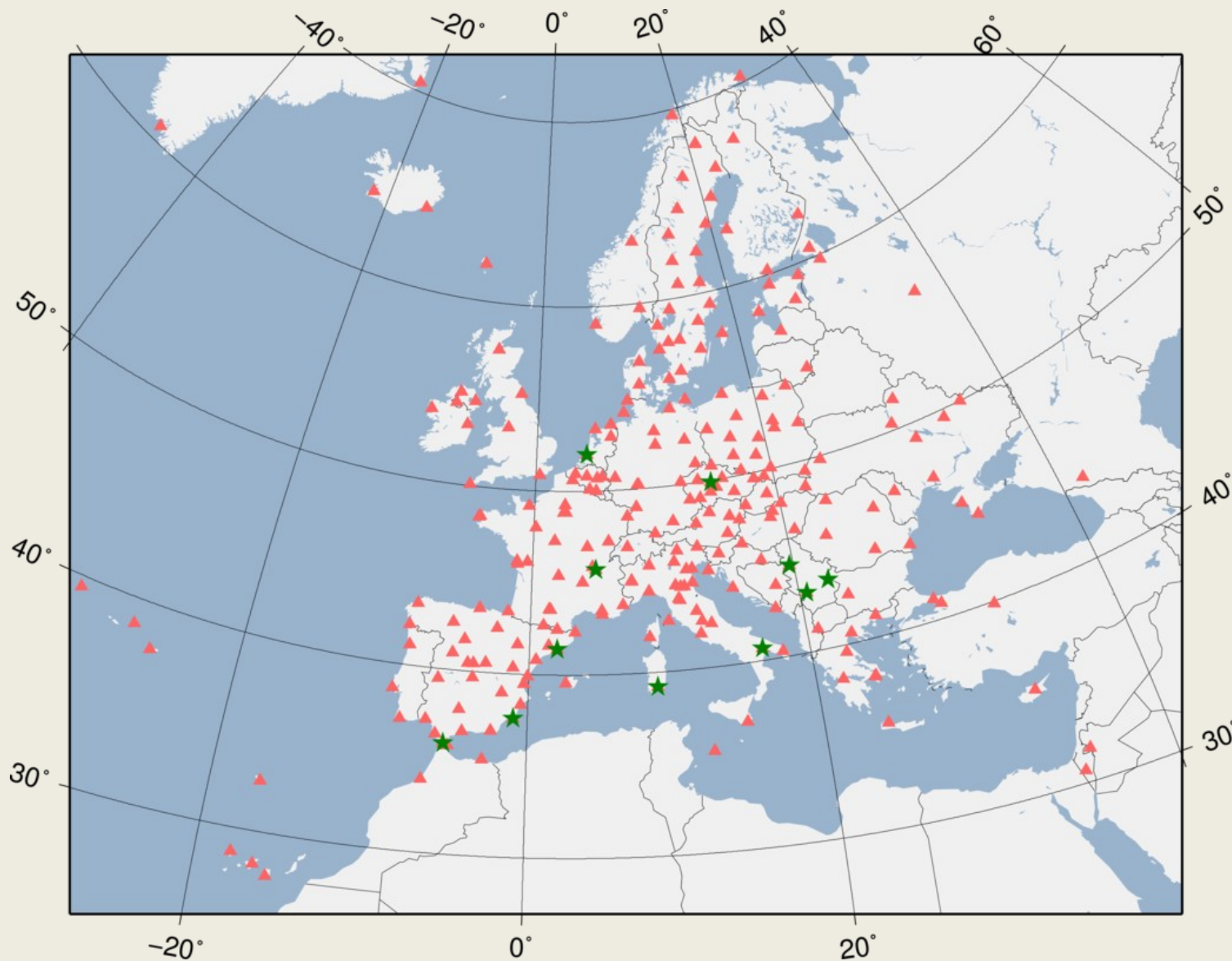
# EPN - ITRF2014 - MGEX



# New EPN Stations

4-ch ID	Location	MGE X ITRF	Capabilities	Calib	Inclusion	Hist. DC
BCLN	Barcelona, ESP		RT GLO+GA L	Indiv.	02/08/2015	07/02/2012
CAR G	Cartagena, ESP		RT GLO+GA L	Indiv.	27/09/2015	23/05/2014
TARI	Tarifa, ESP	ITRF	RT GLO+GA L	Indiv.	02/08/2015	15/05/2010
BRMF	Bron, FRA		RT GLO+GA L	Type	26/07/2015	25/02/2014
GOP6	Ondrejov, CZE	MGEX	GLO+GA L	Indiv.	05/07/2015	28/02/2012
MAT G	Matera, ITA	MGEX	RT GLO+GA L	Type	09/08/2015	01/02/2012
UCA G	Cagliari, ITA		RT GLO+GA L	Type	09/09/2015	16/04/2014
KNJA	Knjazevac, SRB		-	Type	27/09/2015	12/05/2012
NPAZ	Novi Pazar, SRB		GLO	Type	21/06/2015	17/12/2014

# New EPN Stations



# Proposed EPN Stations

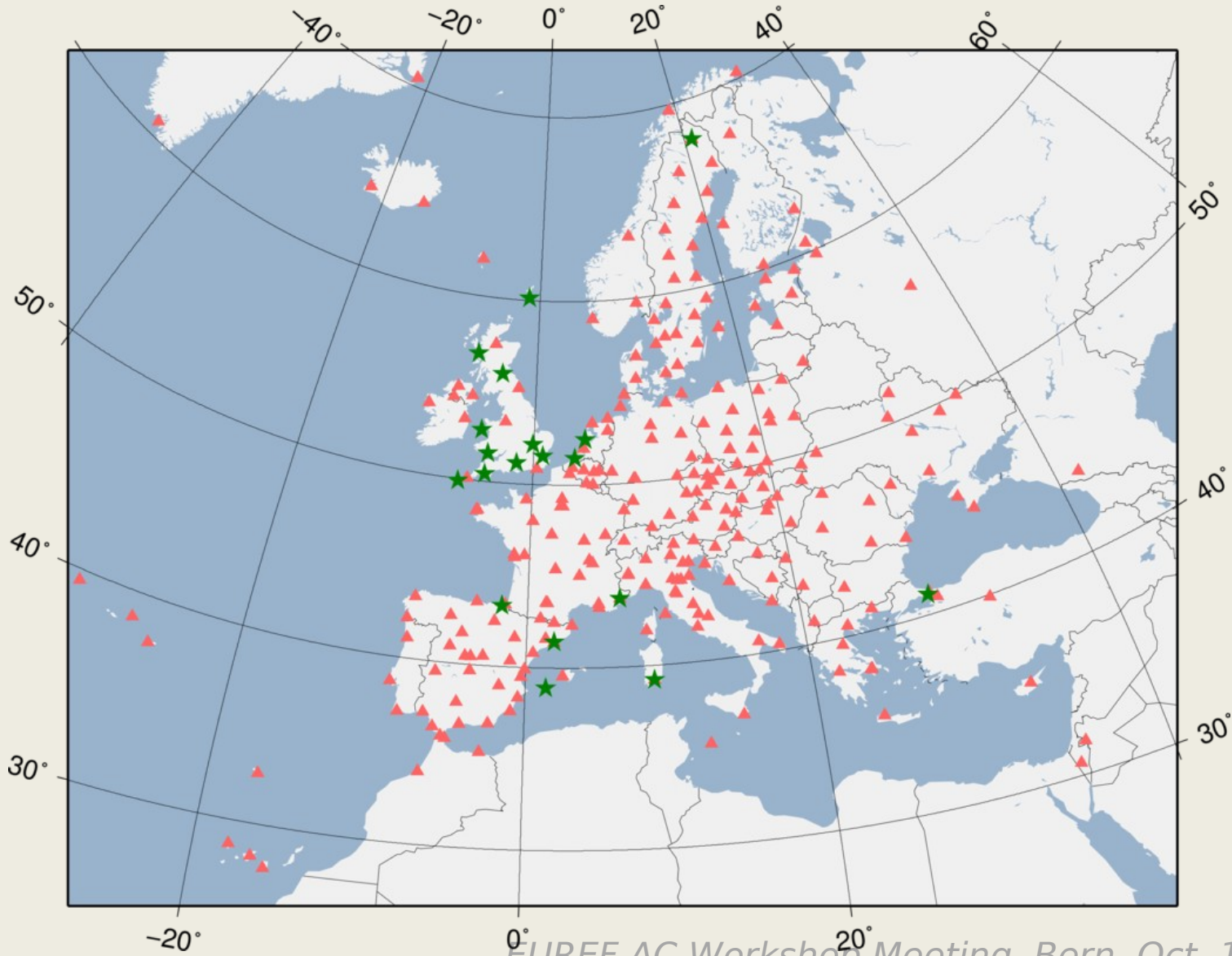
4- ch ID	Location	MGE X ITRF	Capabili ties	Cali b	Historic al	Twin	
GRA C	Grasse, FRA	MGEX	RT	GLO+G AL	Type	07/02/201 2	GRAS
CAG 1	Cagliary, ITA	(CAGL )	RT	GLO+G AL	Type	23/05/201 4	UCAG
VLIS	Vlissingen, NLD	ITRF	RT	GLO+G AL	Indiv .	15/05/201 0	
KOS1	Kootwijk, NLD	(KOSG )	RT	GLO+G AL	Indiv .	25/02/201 4	
IJMU	Ijmuiden, NLD	ITRF	RT	GLO+G AL	Indiv .	28/02/201 2	
NYA2	Ny Alesund, NOR	MGEX	RT	GLO+G AL	Indiv .		NYA1
PASA	Pasaia, ESP	ITRF	RT	GLO+G AL	Indiv .	01/02/201 2	
IBIZ	Ibiza, ESP	ITRF			Type	16/04/201 4	
PLAN	Palleja, ESP		RT	GLO+G AL	Type	12/05/201 2	

# Proposed EPN Stations

4-ch ID	Location	MGE X ITRF	Capabilities	Calib	Historical
YLDZ	Istanbul, TUR		GLO+GA L	Type	07/02/2012
ADAR	Aberdaron, GBR		GLO+GA L	Indiv.	04/03/2009
ARIS	Arisaig, GBR		GLO+GA L	Indiv.	02/06/2009
CHIO	Chilbolton, GBR		GLO+GA L	Indiv.	30/06/2009
EDIN	Edinburgh, GBR	ITRF	GLO+GA L	Type	16/03/2000
LERI	Lerwick, GBR		GLO+GA L	Indiv.	16/06/2009
PMT H	Plymouth, GBR	ITRF	GLO+GA L	Type	13/02/2004
SHOE	Shoeburyness, GBR	ITRF	GLO+GA L	Type	29/07/2005
SCIL	Scilly Isles, GBR	ITRF	GLO+GA L	Type	18/08/2010



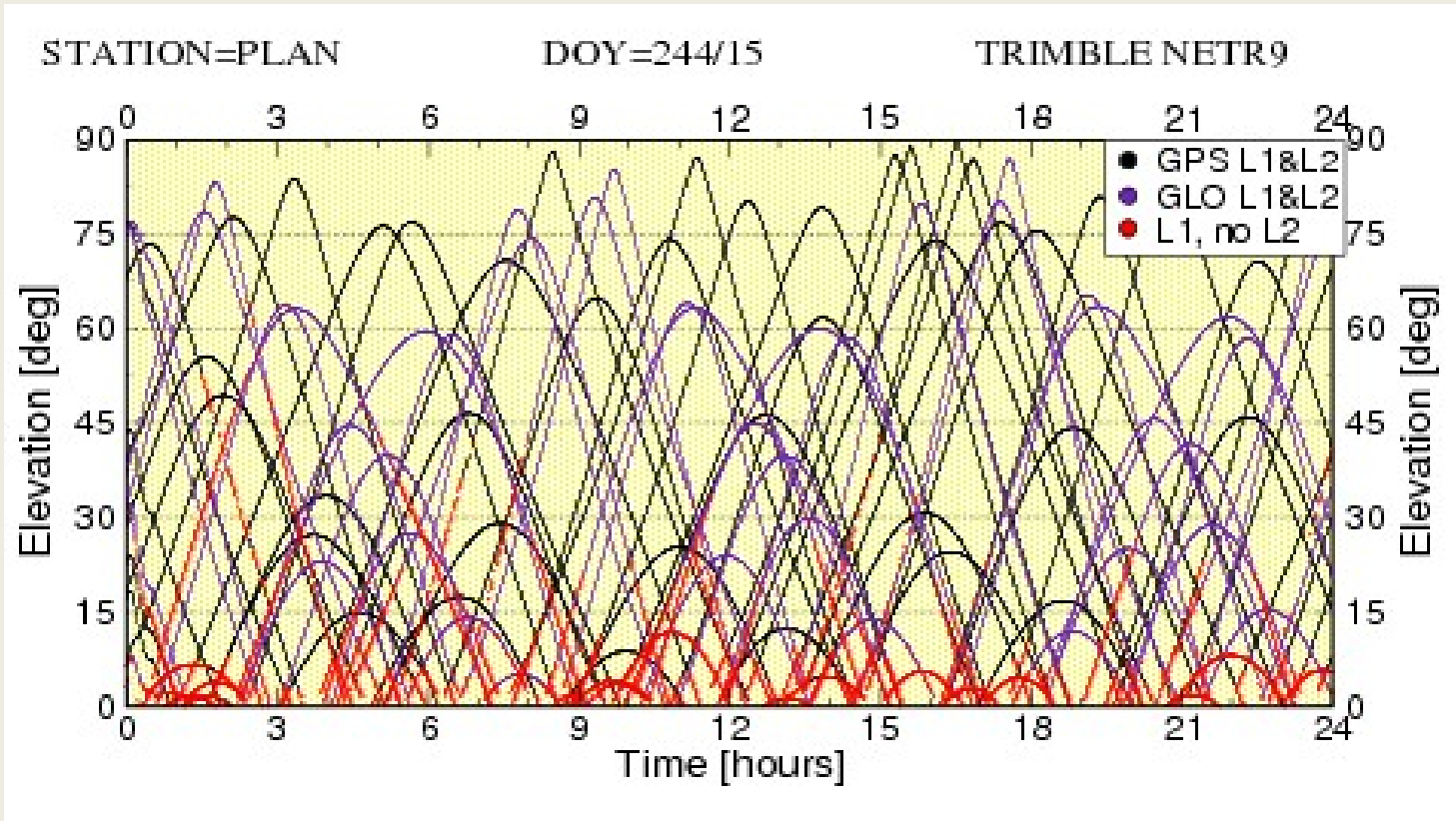
# Proposed EPN Stations



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- EPN densification

# Station tracking



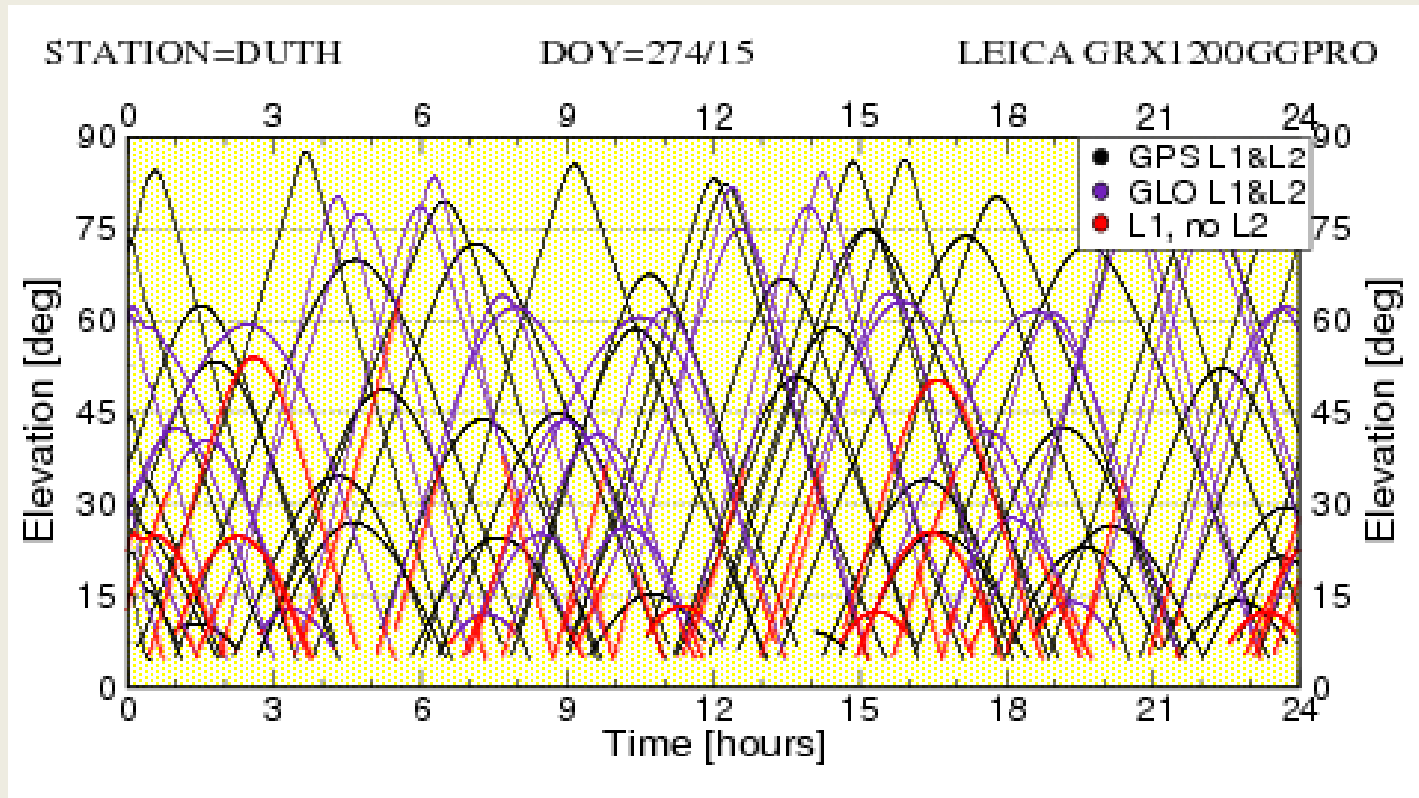
Station manager:

Tracking L2W and L2X

L2W  L2 in RINEX 2: degraded L2 tracking at low elevations

L2X  L2 in RINEX 2: OK

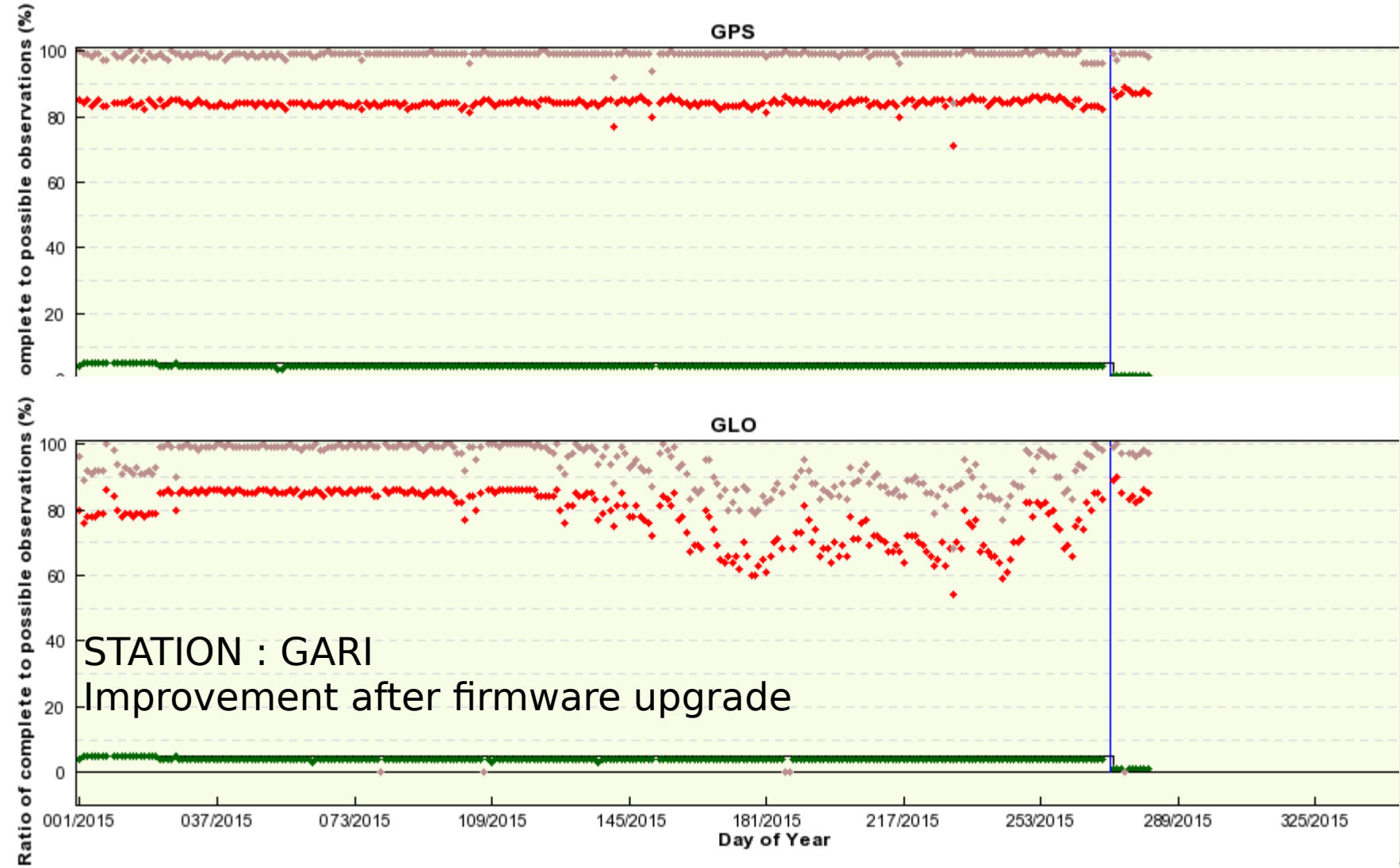
# Station tracking



L2 GLONASS tracking problem

Waiting for data to see improvement (hopefully) after firmware upgrade  
If not, Interference

# Station tracking



# Station tracking

- Missing firmware upgrades
  - *Missing L2 data at low elevations*
  - *GLONASS tracking starts at higher elevations*
- Daily RINEX generation procedure
  - *Missing data*

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# Change of epnc.atx

## EUREF mail 7222 : Nov. 2013

- epnc\_08.atx            □ last 5-char of antenna SN
- epnc\_08\_FULLSN.atx       □ full SN

Station	Antenna/Radome	Full SN	Part of SN used in atx	Indiv. Calib.
SUN6	LEIAR25.R3 LEIT	08490012	90012	YES
VALE	LEIAR25.R3 LEIT	10190012	90012	YES



# Change of epnc.atx

epnc\_08.atx

□ last 5-char of antenna SN

```

LEIAR25.R3      LEIT90012
ROBOT           Geo++ GmbH           1   2010-08-11
5.0
0.0  90.0   5.0
4
EPNC
INDIVIDUAL ANTENNA CALIBRATION
Miguel Angel Cano Villaverde
STATION: VALE
START OF ANTENNA
TYPE / SERIAL NO
METH / BY / # / DATE
DAZI
ZEN1 / ZEN2 / DZEN
# OF FREQUENCIES
SINEX CODE
COMMENT
COMMENT
COMMENT

```

epnc\_08\_FULLSN.atx

□ full SN

```

LEIAR25.R3      LEIT10190012
ROBOT           Geo++ GmbH           1   2010-08-11
5.0
0.0  90.0   5.0
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EPNC_VALE
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# RINEX 3 preparations

- 4-char  $\square$  9-char station name
  - *Done together with IGS*
  - *Web pages (in progress), internal DB (done)*
  - *Translation table:*  
ftp://epncb.oma.be/pub/station/general/stationname\_conversion.txt
  
- Latency/Availability checks of RNX 3 data
  - *Adapt to changes in Data Centers*
  - *RNX 3 in BKG, short+long filenames in V3 dir*
    - *long filenames to RNX 2 dir*
    - *RNX 3 short filenames renamed to long names and moved to RNX2 dir*
  - *RNX 3 long filenames at OLG mixed with RNX 2 files*
  
- Meta-data checks of RNX 3 data
  - *Done for all available RNX 3 data (similar to RNX 2)*
  - *Rigorous check of sat. system in site log and*

# RINEX 3 preparations

## RINEX 3 Quality Checks

- Run Anubis on EPN stations (RNX 2/3) with known problems (detected by present QC software used at EPN CB)
- Evaluate capability of Anubis to detect these problems
- Iterate with Jan
- Yes.... It takes time, but EPN CB wants to present ONE simple plot that gives a first indication of the health of a station.
- If no health problem, no need to check all plots.

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# Exchange of site logs

Jan. 2015:

IGS Data Centers WG : XML version of the IGS Site Log to facilitate machine-to-machine metadata exchange

- *Presently: Stations belonging to several networks have to submit the site log to each network □ Future: One site log submission*
- During XML discussion
  - Use of GeodesyML namespaces
  - Expand upon, and in some cases eliminate, some elements of the site log content
  - Will be reported to text version of site log
  - IGS DC WG proposals will be adopted by IGS CB
- Examples
  - Add Url to individual antenna calibration
  - Add station 9-char ID
  - Removal of antenna drawing

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- **EPN densification**



# EPN densifications

[http://www.epncb.oma.be/\\_densification](http://www.epncb.oma.be/_densification)

EPN CB  
HOME

EPN DENSIFICATION  
HOME

## EUREF PERMANENT NETWORK

### DENSIFICATION

ROB   
GNSS RESEARCH GROUP

EUREF 

ORGANISATION	NETWORK	DATA ANALYSIS	PRODUCTS
<a href="#">About</a>   <a href="#">How to Join</a>   <a href="#">Contributors</a>   <a href="#">Site Map</a>   <a href="#">FTP Server</a>	<a href="#">Station List</a>   <a href="#">Maps</a>   <a href="#">Operational Centres</a>   <a href="#">Station Log Submission</a>	<a href="#">Analysis Centres</a>	<a href="#">Coordinates &amp; Velocities</a>   <a href="#">Time Series</a>

## ORGANISATION > ABOUT

The primary goal of the EPN Densification is to realize a continental-scale (European), homogeneous, high quality position and velocity product in an homogeneous reference frame, for a very dense network of GNSS stations, and this with comparable quality from Greenland to Crete, from Svalbard to Gran Canaria.

Consequently, the EPN Densification is a joint venture of agencies and institutions from European countries which operate and/or analyse the data from dense national GNSS networks (in addition to their EPN stations) and are willing to submit the results of their data analysis (daily or weekly position SINEX files) routinely to EUREF.

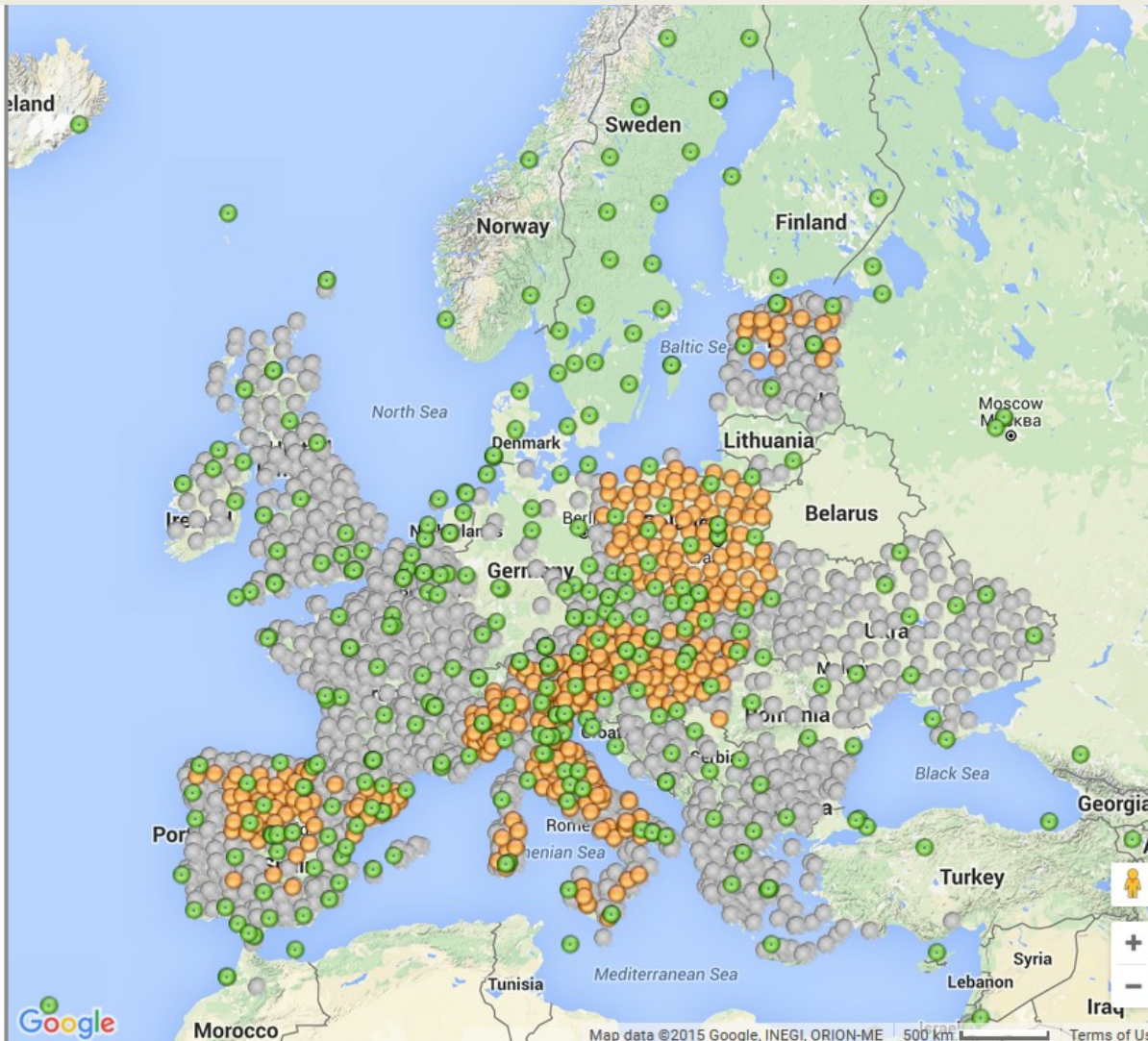
To achieve its goal, the EPN Densification combines the national GNSS networks on the product level (daily or weekly position SINEX files) with [the multi-year positions & velocities of the EPN stations](#) and express them homogeneously in the ITRS/ETRS89 with the EPN as the backbone. Additionally, to support the station managers and guarantee the reliability of the combination, the station metadata (station naming, site logs) of the participating densification stations will be maintained, cross-checked, harmonized and centrally managed by EUREF to avoid inconsistencies.

The EPN Densification products shall be used - in close cooperation with the [EUREF Deformation Models Working Group](#) - to support the ETRS89 realization not only over the stable part of Europe, but also over tectonically deforming areas like the Mediterranean region. The velocity product will be useful for general and specific tectonic studies, supporting the better understanding of the processes at deforming regions.

The EPN Densification will exploit the huge potential lying in these active GNSS networks both for geodesy and earth sciences. All the activities of the EPN densification require efficient cooperation between the data suppliers (e.g. NMCAs) and the geophysical community. Beside the well built structure and communication channels of the EPN, a close cooperation with other communities such as EPOS is foreseen.



# EPN densifications



**EPN station (276)**

**Densification stations with site log at EPN CB (413)**

**Densification stations without site log at EPN CB**

*Large networks:  
Working on easier  
(more automated)  
upload than site log  
submission form*

*Major problem: non  
validated site logs, 2015*

# EPN densifications - AC list

## ANALYSIS CENTRES

AGR (Kadaster)	The Netherlands	Lennard Huisman
ASG (Główny Urząd Geodezji i Kartografii)	Poland	Marcin Ryczywolski
BGF (NERC British Isles continuous GNSS Facility (BIGF))	United Kingdom	Dionne Hansen, Richard Bingley
BKG (Bundesamt fuer Kartographie und Geodesie)	Germany	Peter Franke, Dr. Axel Ruelke
BUL (National Institut of Geophysics, Geodesy and Geography BAS)	Bulgaria	Ivan Georgiev
CAT (ICGC: Institut Cartografic i Geologic de Catalunya)	Spain	Anna M. Baron, Joel Grau Bellet, Ernest Bosch Llopart
CZE (Research Institute of Geodesy, Topogr. and Cartogr.)	Czech Republic	Vratislav Filler, Jan Dousa
EST (Estonian Landboard AC)	Estonia	Priit Pihlak, Karin Kollo, Ahti Bloom
GGI (Institute of Geodesy and Geoinformation, University of Latvia)	Latvia	Katerina Morozova, Inese Janpaule, Diana Haritonova
GKU (Geodetický a Kartografický Ústav)	Slovakia	Branislav Droscak
IGE (Instituto Geografico Nacional)	Spain	Jose Antonio Sanchez Sobrino, Marcelino Valdés Pérez de Varga
IGN (Institut National de l'Information Géographique et Forestière)	France	Anne Duret, Bruno Garayt, Romain Fages
NGI (National Geographic Institute Belgium)	Belgium	Filip De Doncker, Pierre Voet
OLG (Austrian Academy of Sciences - Space Research Institute)	Austria	Guenter Stangl, Philipp Mitterschifthaler
SGO (FOMI Satellite Geodetic Observatory)	Hungary	Tivadar Horvath, Ambrus Kenyeres
UPA (University of Padova, Dipartimento di Geoscienze)	Italy	Alessandro Caporali, Joaquin Zurutuza, Mauro Bertocco



Thank you for your attention

[epncb@oma.be](mailto:epncb@oma.be)