EUREF‘s Reprocessing Initiative EPN-Repro 2

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EUREF‘s Reprocessing Initiative EPN-Repro 2

- Initiative is still under discussion, no final decision yet
- Response to the planned ***IGS repro2*** campaign
- Will be a continuation of the EPN-Repro1 campaign
- Aim will be the estimation of consistent coordinates, velocities and other products for the EPN in one reference frame
- Will support the densification of the ITRF2013
- Products will also be used by the IAG Working Group "Regional Dense Velocity Fields"

IGS repro2

- Start was proposed for the end of 2012 (Status?)
- Daily GPS & GLONASS orbits & GPS satellite clocks
- Daily Earth rotation parameters (ERPs)
- Terrestrial coordinate frames with ERPs (weekly -> daily?)
- **IERS Conventions (2010)** — to be implemented
- IGS08 reference frame (aligned to ITRF2008)
- igs08.atx "absolute" antenna calibrations (type mean!)
- Time schedule: deliveries by the end of 2013 => Release of ITRF2013 by early 2014

more Details under: http://acc.igs.org/reprocess2.html

Analysis Tools (EPN-Repro2)

Software (Release)	BERNESE 5.2 (Dec. 2012)	GAMIT 10.40 (Nov. 2010)	GIPSY 6.2 (March 2013)
GPS	Fix	Fix	PPP-Fix/ Net Fix
GLONASS	Fix	-	-
Global Mapping Function	Yes	Yes	Yes
Vienna Mapping Function	Yes	Yes	Yes
2nd Order Ionosphere	Yes+more	Yes	Yes
IERS	IERS2010	IERS2003/ IERS2010	IERS2010

Available Products (Orbits+Clocks)

Available Products (IGS08+IERS2010):

- Reprocessed CODE products (ftp.unibe.ch/aiub/REPRO_2011/CODE [1996-2011]+ regular CODE products)
- Reprocessed JPL products PPP (1992-2011 + continuation)

BERNESE+GIPSY o.k.

Products to be expected:

- IGS repro2 (end of 2013, early 2014?)
- Further individual solutions of the ACs (e.g. ESA, GFZ, NGS etc.- status unknown)

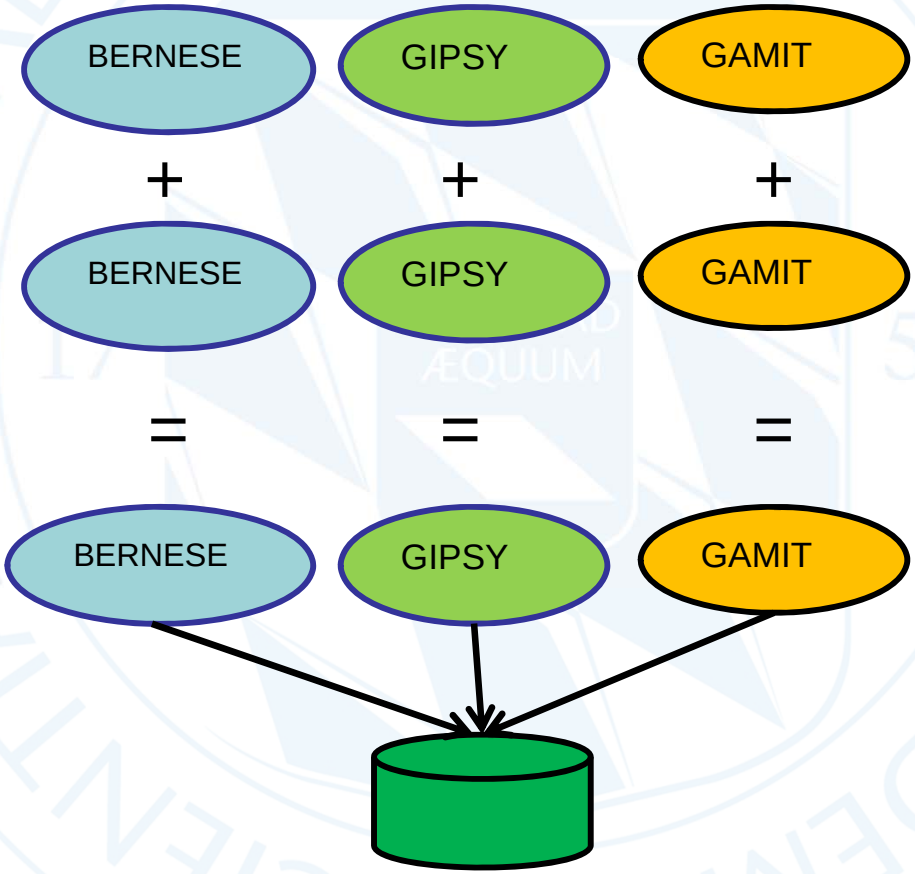
MIT products are still in IERS 2003?

Combination of the solutions

- LACs provide daily or weekly solutions in different Formats (observe META data [actice/inactive]):
  - BERNESE/GAMIT: Normal Equation Level
  - GIPSY: only coordinates and the full covariance information. Correlations between troposphere and coordinates cannot be reconstructed
- Combination of the daily/weekly solutions (LACs) into one set of coordinates/NEQ by the Analysis Coordinator
- Troposphere ZTD‘s Time Series (BKG?)
- Multi year solution processed by the coordinator of the EPN Time Series Analysis

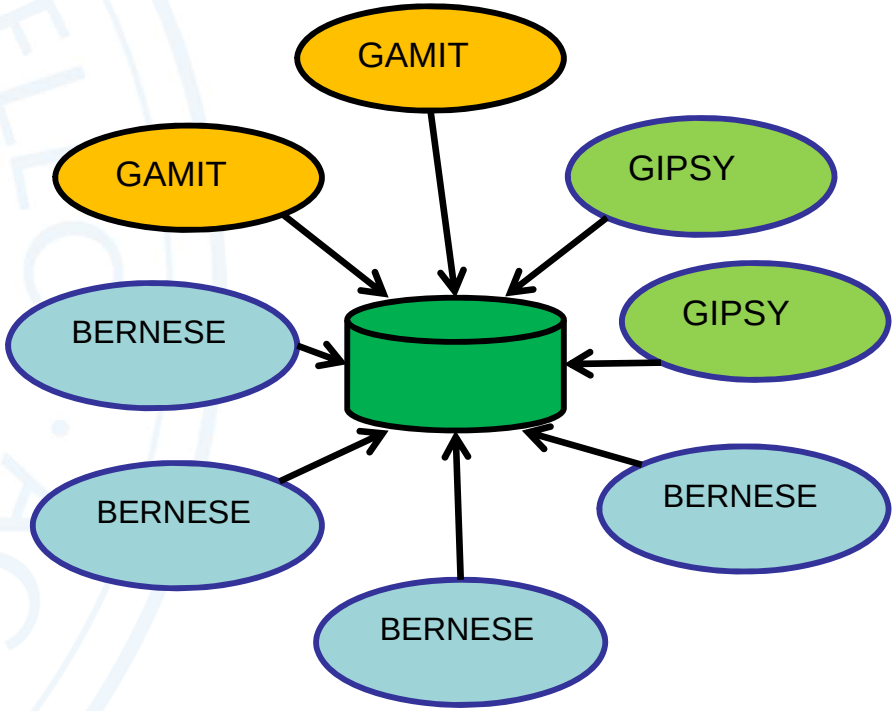
Combination of daily solutions?

By software packages



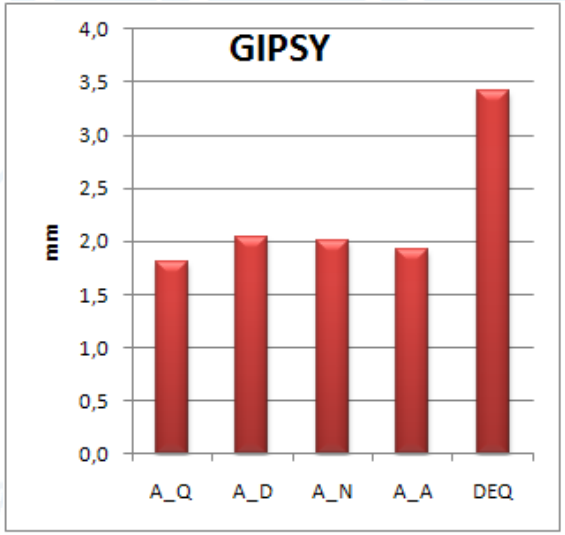
Stronger impact by GIPSY&GAMIT

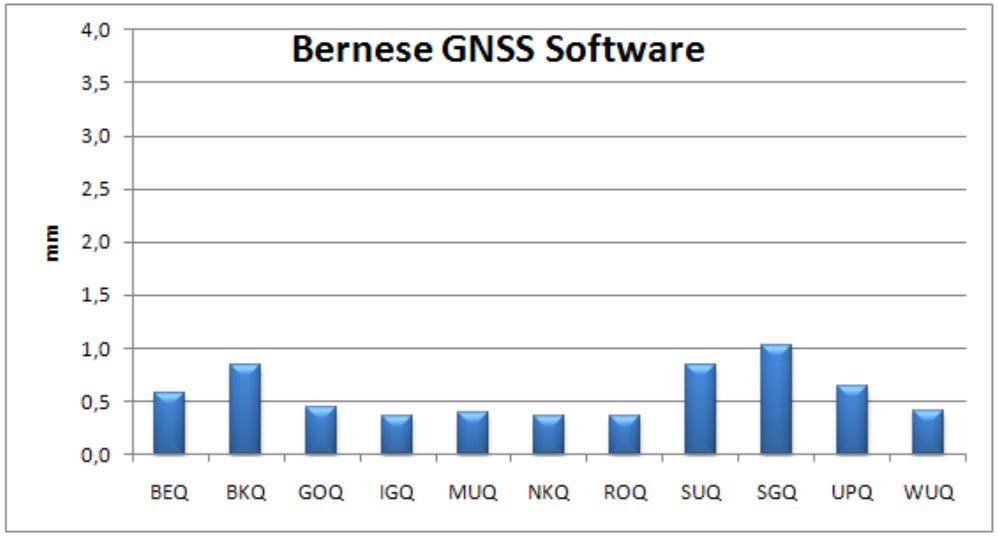
Any daily solution

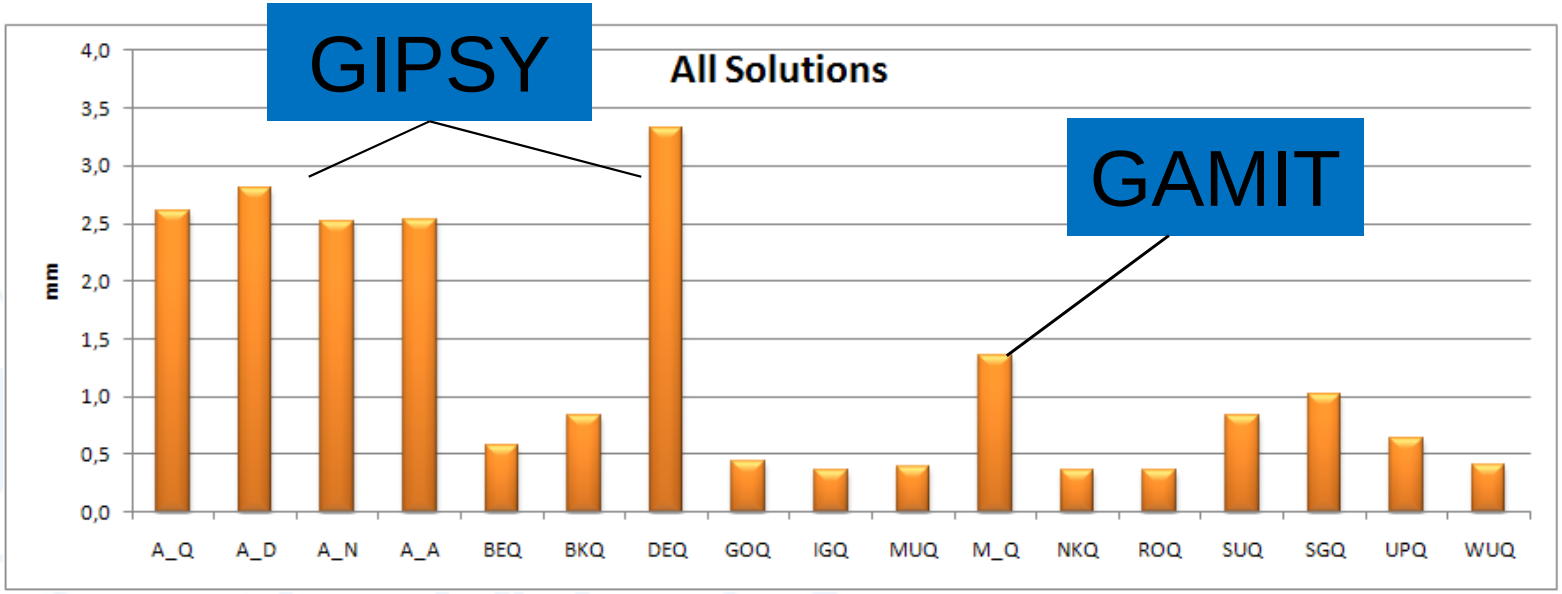


Dominated by BERNESE

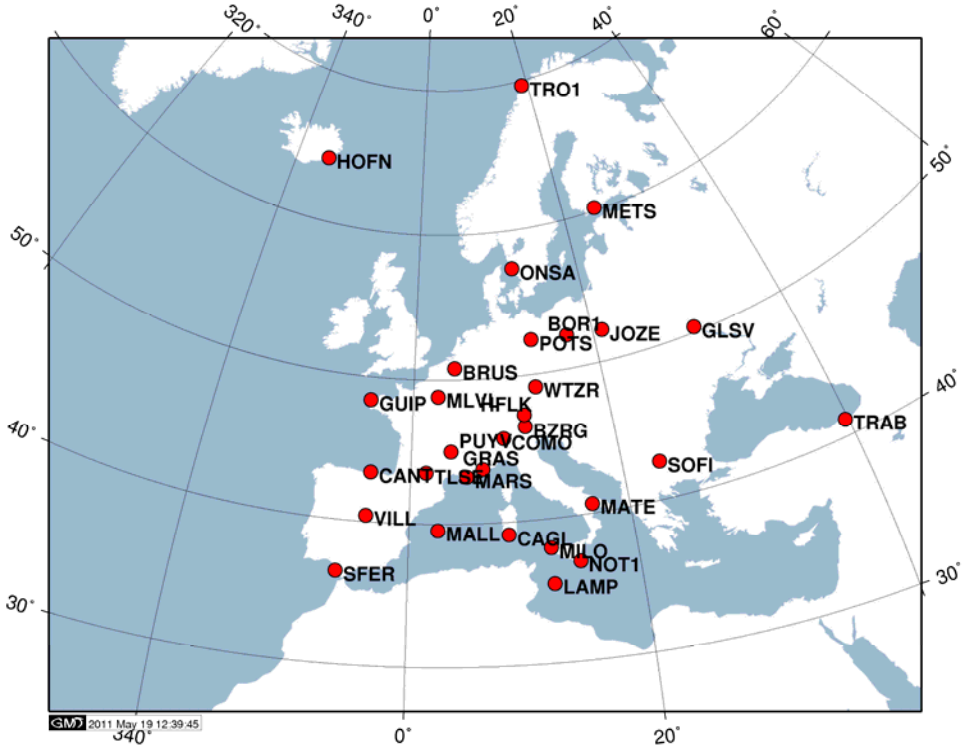
EPN Repro1: Benchmark Test (RMS Helmert Transformation)







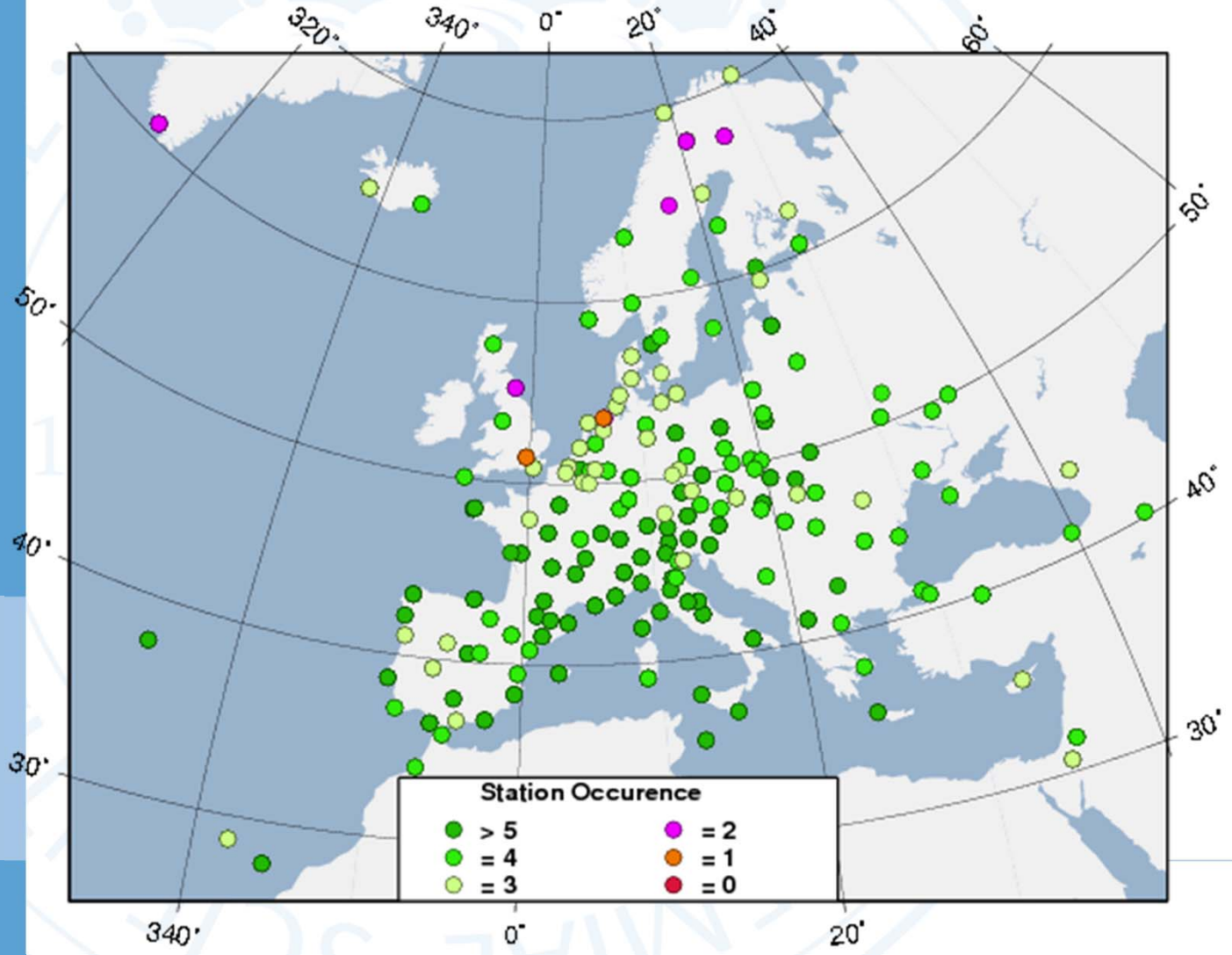
Benchmark Test (repeat it?)



- Network of 30 sites.
- Identify a set of identical data (EPN-Repro1: GW 1381).
- Apply the same PCV model: epn_08.atx?
- Follow the IGS repro2 recommendation?

According to the analysis of the results decide on the best strategies for EPN-Repro2

Network (Site distribution)



Commonness	#
1	2
2	6
3	42
4	72
5	45
6	19
7	6
8	2

Feasibility of a Proposed Time Schedule

Status of the data centres:

- Ready!

Benchmark Test:

- Mid-Summer?

Network analysis by participating LACs:

- Late autumn?

Combination of daily solutions:

- Winter

Multi-Year-Analysis:

- Early Spring

Assumption:

EPN-Repro2 will rely on JPL and CODE orbits and clocks only

Discussion

EPN-Repro2:

- Shall EPN-Repro2 be implemented? TBD

Participants:

- All volunteering LACs or
- Reduce the daily analysis to a smaller number of LAC

Strategy:

- IERS 2010 convention shall be realized + indiv. PCV
- One solution for the entire EPN by each software package?

Time Schedule:

- as soon as possible or
- wait for more IGS products

Time to cover:

- 1996-2013

Discussion: Analysis strategy

- Reprocessed orbits and clocks in the IGS08 (until week 1631) (connecting to the recent analysis)
- EPN_08.ATX satellite and **individual** receiver correction models; **observe common sites of IGS and EPN**
- Mapping function and troposphere modelling (GMF, VIENNA or ?)
- Reprocessing of the EPN with the core network of the IGS (global?) TIGA? **Who will do it?**
- Precise Point Positioning (GIPSY&Bernese), network analysis (Bernese & GAMIT)
- GPS only (GAMIT & GIPSY), GNSS analysis (Bernese only), other analysis tools e.g. NAPEOS (GNSS)
- BERNESE USERS: 5.2 is mandatory

Responsibilities for EPN-Repro2

Daily Network analysis by participating LACs:

- All volunteering LACs **or**
- Selected LACs

Data centres

- BKG, OLG, ROB or ROB is mandatory?

Combination of daily solutions and troposphere (ZTD):

- Analysis Coordinator (currently at BKG)
- EPN troposphere coordinator

Multi-Year-Analysis:

- SGO

Coordination

- KEG