EPN-Repro2

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EPN-Repro 2

- Response to the planned IGS repro2 campaign
- Is a continuation of the EPN-Repro1 campaign
- Aim will be the estimation of consistent coordinates, velocities and ZTD for the EPN in one reference frame
  - Based on a regional network analysis
- Will support the densification of the new ITRF 2014
- Products will be made available for the IAG Working Group "Regional Dense Velocity Fields"

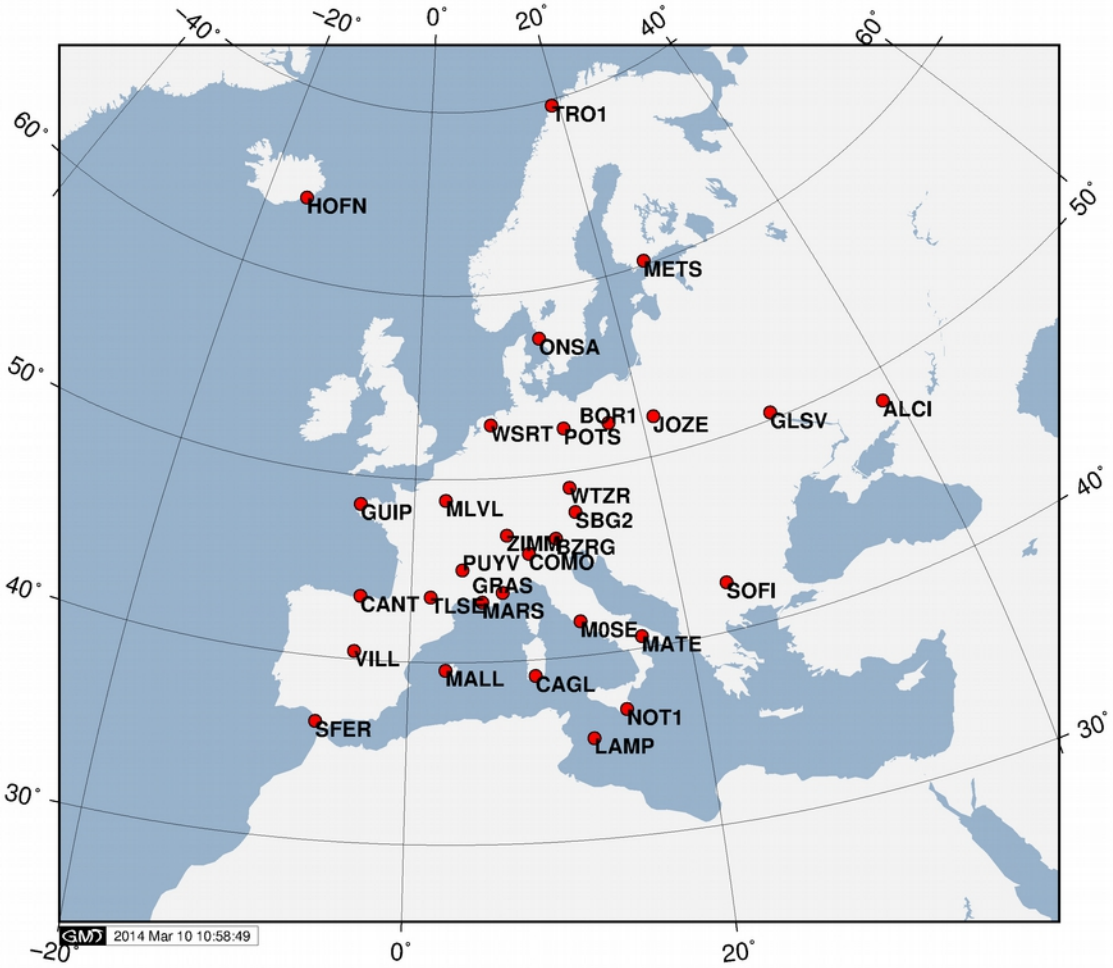
Contributors

- GNSS Analysis
  - Centro di Geodesia Spaziale, Italy (ASI)
  - Geodetic Observatory Pecny, Czech Republic (GOP)
  - Instituto Geografico National, Spain (IGE)
  - Swisstopo, Switzerland (LPT)
  - Military University of Technology, Poland (MUT)
- Combination of daily Normal Equations (NEQ):
  - Military University of Technology, Poland (MUT)
- Combination of Troposphere Parameters:
  - Centro di Geodesia Spaziale, Italy (ASI)
- Coordination:
  - Commission for Geodesy and Glaciology, Munich (BEK)

Specifications

- Naming conventions for the files to be delivered:
  - 2-Char for the AC, followed by the different solution types (starting with 0) AC: AS, GO, IG, LP & MU
  - „WWWW“ for the GPS-Week and „D“ for the day of the week
    → e.g. **AS013451.SNX**
- Each LAC provides at least one solution
- Orbits to be used are CODE Repro2 products
  - ASI will apply JPL “preliminary” products (version 2.0), the JPL “final” reprocessed products (version 2.1) released Nov 7, 2014
    → too late for ASI’s analysis
- PCV with individual calibration (IGS+EPN) are recommended
- Follow the guidelines for the EPN Analysis Centres

Benchmark: Test of the strategies (4 weeks of Data)



GNSS	#
GPS	32
GLONASS	21
Galileo	19

- Performed Spring 2014
- IGE Autumn 2014

Planed Contributions I:

- ASI:

SOL	PCV	Tropo	Atm. Load.	Progress
AS0	IGS	VMF1	No	Finished

- IGE:

SOL	PCV	Tropo	Atm. Load.	Progress
IG0	IGS+EPN	GMF	No	Finished

- LPT:

SOL	PCV	Tropo	Atm. Load.	Progress	$S_{N\ [mm]}$	S_E [mm]	S_h [mm]
LP0	IGS	GMF	No	Finished	1.49	1.46	4.70
LP1	IGS+EPN	VMF1	Yes	Finished	1.44	1.42	4.13

Planed Contributions II:

- MUT:

SOL	PCV	Tropo	Atm. Load.	Progress
MU0	**IGS**	**VMF1**	**Yes**	**Finished**
MU1	IGS + EPN	VMF1	Yes	In Progress
MU2	IGS+EPN	VMF1	No	Not started

- GOP (all finished):

SOL	Tropo	Elev.	ZTD	GRD	S_N [mm]	S_E [mm]	S_h [mm]
GO0	GMF	3	1h	6	1.47	1.61	4.87
GO1	VMF1	3	1h	6	1.46	1.61	4.75
GO2	**VMF1**	**7**	**1h**	**6**	**1.45**	**1.60**	**4.73**
GO3	VMF1	10	1h	-	1.47	1.61	4.78

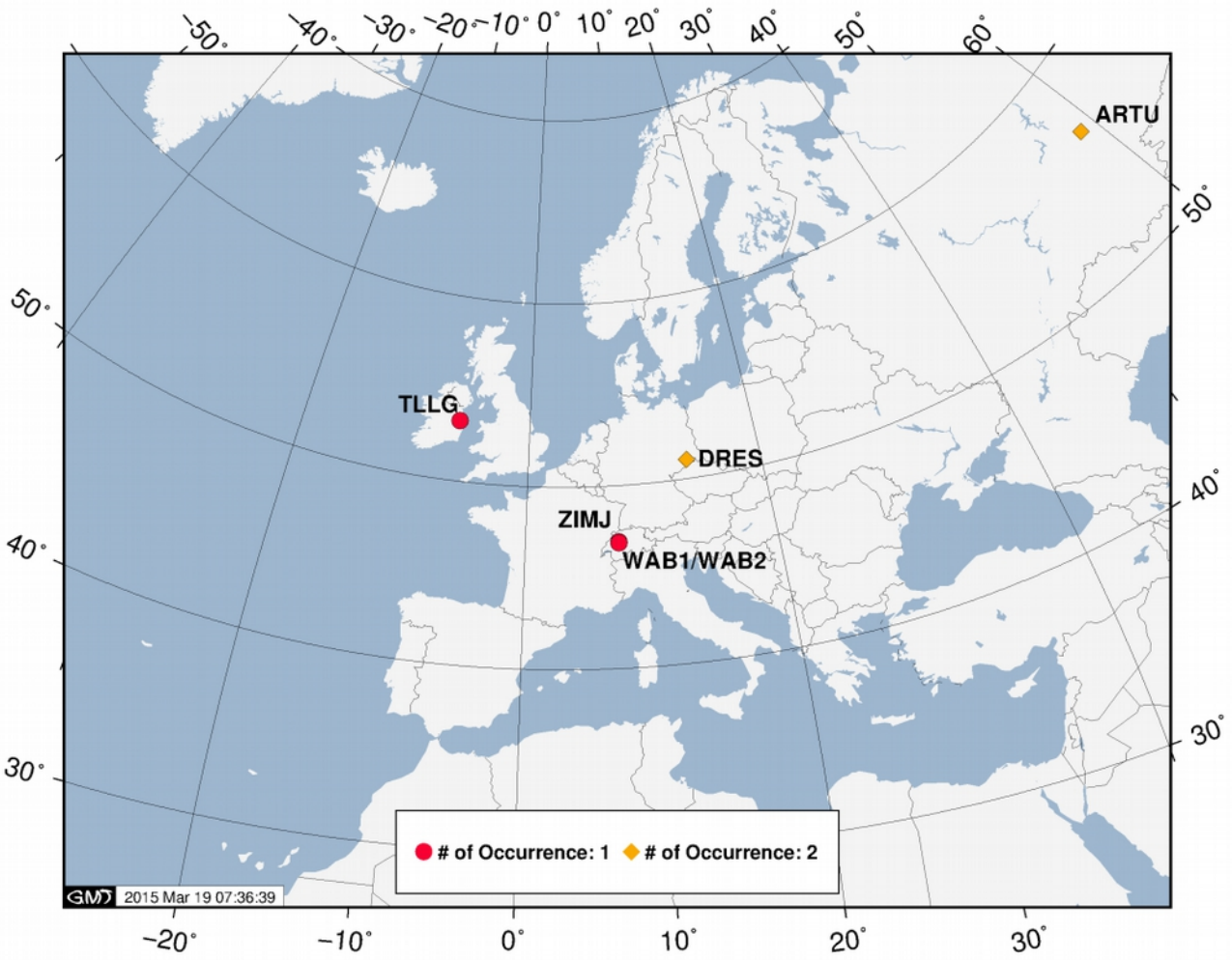
Uploaded Contributions (BKG)

	AS0	GO2	IG0	LP0/LP1	MU0
SW	GIPSY 6.2	BSW 5.2	BSW 5.2	BSW 5.2	GAMIT 10.5
GNSS	**G**	**G**	**G + R**	**G + R**	**G**
SOLUTION TYPE	PPP	NET	NET	NET	NET
STATIONS	**ALL EPN+ IGS CORE**	**ALL EPN**	**PART EPN**	**PART EPN + IGS**	**ALL EPN**
ORBITS	**JPL R2 (prelim.)**	**CODE R2**	**CODE R2**	**CODE R2**	**CODE R2**
ANTENNAS	**IGS08**	**IGS08 + IND.**	**IGS08 + IND.**	**IGS08 / IGS08+ IND**	**IGS08**
IERS	2010	2010	2010	2010	2010
GRAVITY	EGM0	EGM08	EGM08	EGM08	EGM08
TROPOSPHERE Estimated Param	ZTD (5min) GRAD (5min)	ZTD (1h) GRAD (6h)	ZTD (1h) GRAD (6h)	ZTD (1h) GRAD (24h)	ZTD (1h) GRAD (24h)
MAPPING FUNCTION	VMF1	VMF1	GMF	GMF /VMF1	VMF1
ZTD/GRAD time stamp	hh:30 24 estimates/day	hh:30 24 estimates/day	hh:30 24 estimates/day	hh:00 (and hh:30) **24**(+24) estimates/day	hh:30 24 estimates/day
IONOSPHERE	(HOI included)	CODE (HOI included)	CODE (HOI included)	CODE (HOI included)	CODE IONEX + IGRF11 (HOI included)
REF. FRAME	IGb08	IGb08	IGb08	IGb08	IGb08
OCEAN TIDES	FES2004	FES2004	FES2004	FES2004	FES2004
ATM. TID. LOAD.	NO	NO	YES	YES/No	YES
ATM. NONTID. LOAD.	NO	NO	NO	NO/Yes	YES
ELEV. CUTOFF	**3**	**7**	**3**	**3**	**5**
Delivered SNX/TRO Files [from week to week]	**0835-1772**	**836-1771**	**835-1816**	**835-1772**	**835-1771**

Features of the solutions

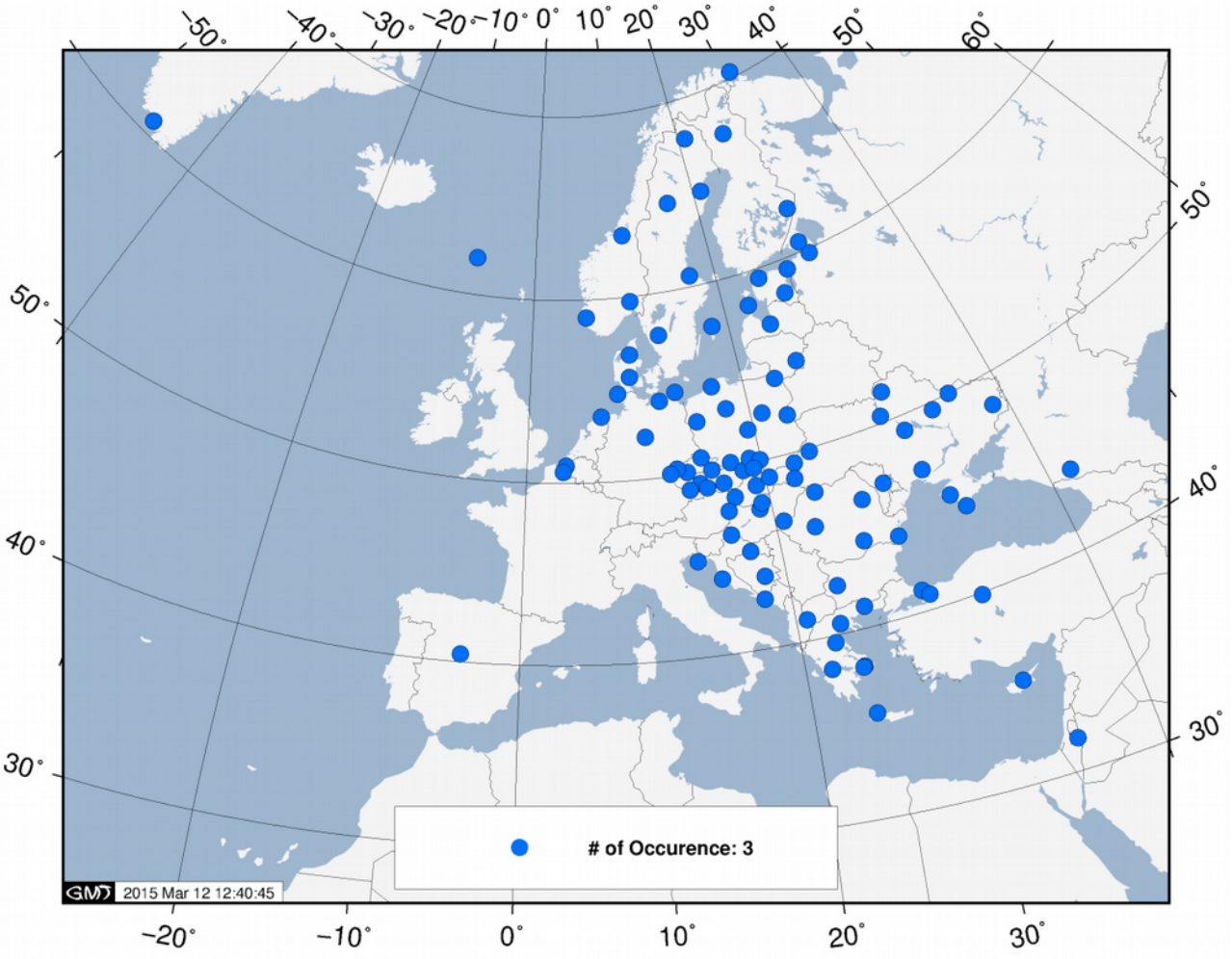
- GLONASS
  - available since 2003, very few stations in the beginning
  - only used in solutions by LPT and IGE
- Different PCV corrections used in the uploaded solutions („type mean“ and „type mean + individual)
  - Available solutions offer the possibility to elaborate the difference and generate corrections
- Orbits are mostly homogeneous (CODE Repro 2) with exception of ASI
- More solutions can be expected

Sites Represented in only one or two Solutions

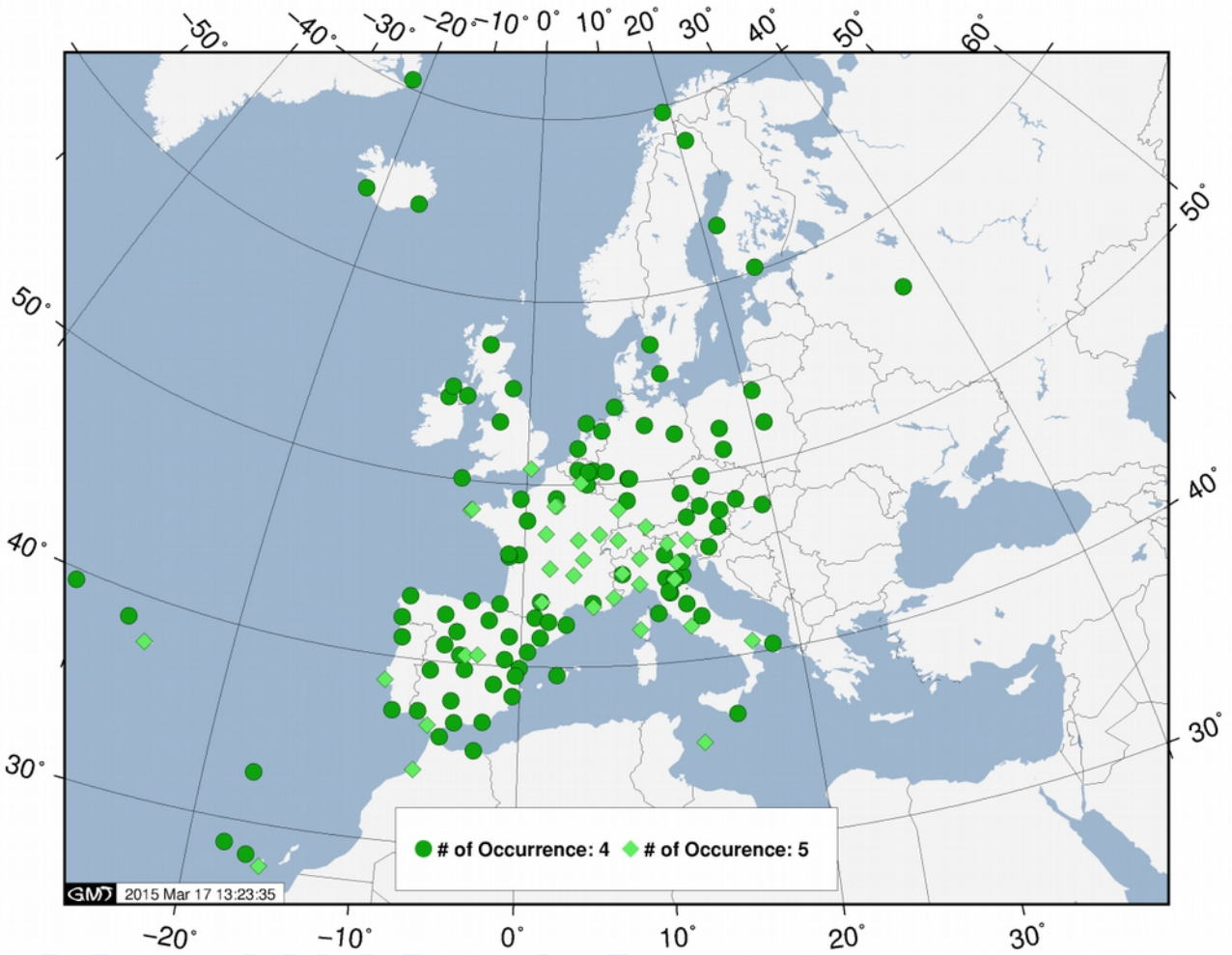


Not on map: STJO (2), NYAL (2)

Sites Represented in three Solutions



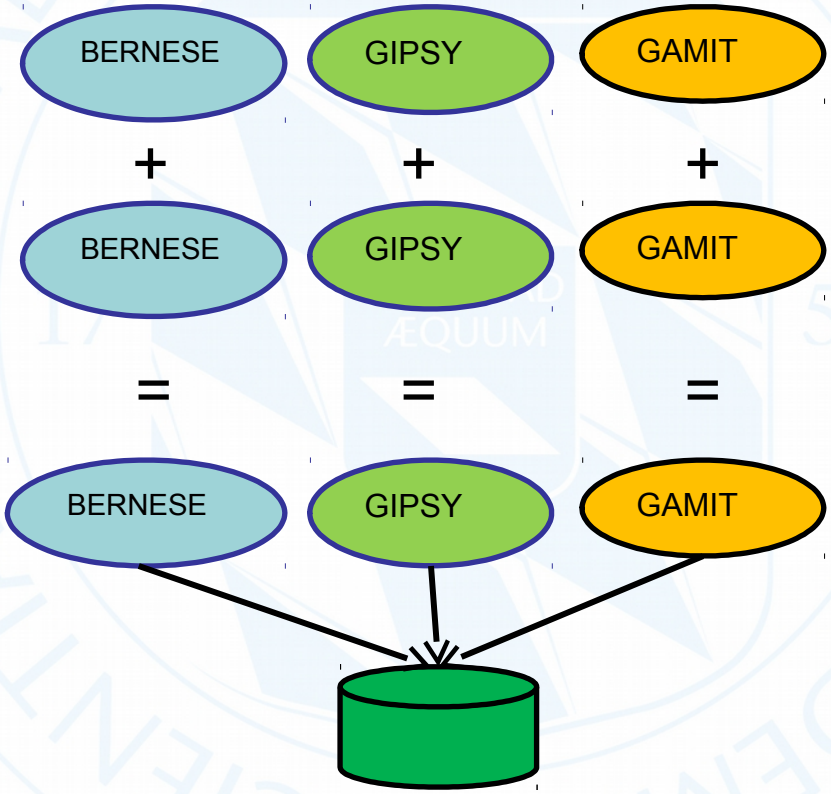
Sites Represented in four or five Solutions



Not on map: NYA1 (4), SCOR (5)

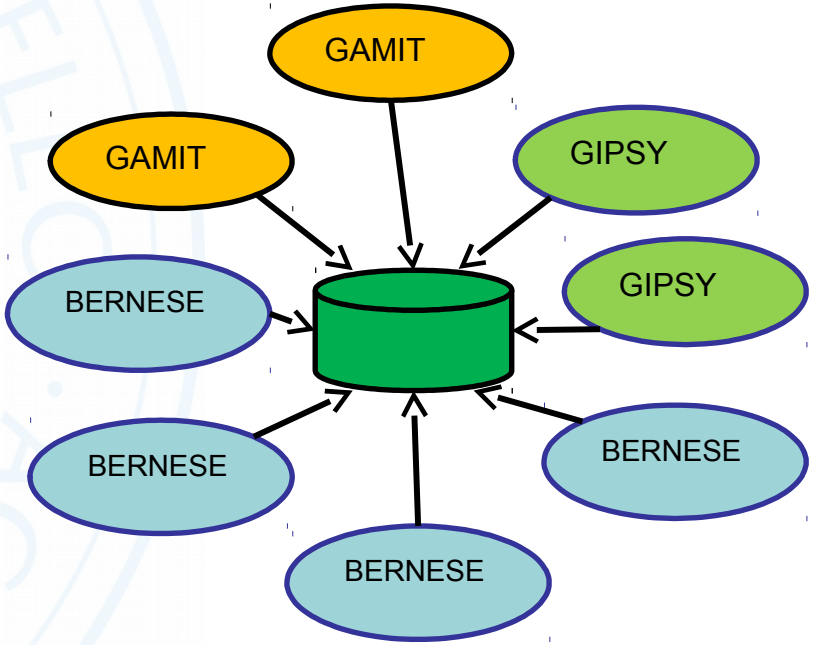
Combination of daily solutions?

By software packages



Equivalent impact by Bernese, GIPSY & GAMIT

Any daily solution



Dominated by BERNESE

EPN-Repro2 - Status

- Combination of the coordinate solutions has already been started (MUT) - > remarks by Andrzej (MUT)
- Troposphere parameter combination is in progress (ASI) -> remarks by Rosa (ASI)
- Extension of the EPN-Repro2 activities for 2014 is likely (GPS Weeks: 1773-1825)
- Presentation of available results is planed for the next EUREF symposium in Leipzig
- A large amount of data to be analyzed
- Multi Year combination is still to be performed