The EPN Reprocessing Project: Mission, Plans and Problems

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Coordinates and velocities of global and regional GNSS networks are affected by

- the reference frame (ITRFXX), correction models, analysis strategies, and software packages

Time series of coordinates reflect these changes!

Consistent coordinates can only be generated by a ***reprocessing*** using identical standards for the entire period of time.

MISSION: Compute consistent precise coordinates, velocities and by-products (e.g. trop. param.) based on the EPN in support of the ETRS.

GOAL: EPN-Repro1

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Project Development

Date	Items
October 2008	LAC-Workshop in Frankfurt actuated a plan for the EPN working group on "reprocessing".
February 2009	Charter for the working group on reprocessing has been developed and has been accepted by the EUREF Technical Working Group (TWG).
June 2009	First schedule for the reprocessing has been developed.
May 2010	Time schedule for the reprocessing of the EPN has been drafted and revised. Wiki has been established.
Summer-Autumn 2010	LACs conducted reprocessing their EPN subnetworks for the year 2006 (daily and/or weekly solutions).
November 2010	Most LACs provided reprocessing solutions for 2006.
Today	Finalize a plan for the first EPN-Repro1 campaign

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Pilot Phase

The pilot phase was thought as an initial step in order to:

- – Setup facilities (computers, data, software) for the reprocessing.
- – Redistribute sites within the group of participating partners.
- – Initial analysis of the GNSS data of the year 2006
- – Test of different analysis strategies and evaluation.
- – Recommendations for a common analysis strategy and products to be used

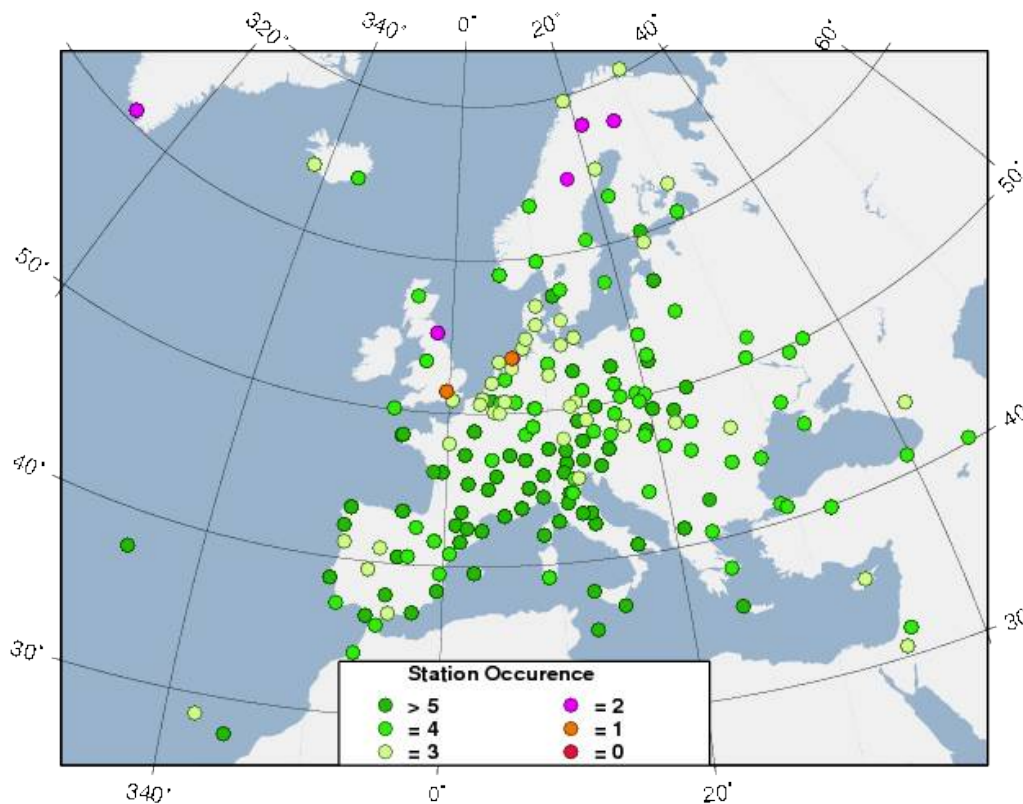The pilot phase serves as a "proof of concept" for the LACs, data centers and combination center.

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Contributions within Pilot Phase

LAC	BERNESE	GAMIT	GIPSY	(MicroCosm)	Products used
ASI	-	-	as_	*as0* *)	JPL/ IGS reprocessed
BEK	be0	-	-	-	PDR05
DEO	-	-	de0 **)	-	Transf. ITRF08
GOP	go0	-	-	-	
IGE	ig0	-	-	-	IGS repro1
IGN	in0	-	-	-	IGS repro1?
LPT	lp0	-	-	-	CODE regular
MUT	mu0	mu1	-	-	IGS repro1/ IGS repro1
NKG	nk0	(nk?)	-	-	IGS repro1
OLG	ol0	-	-	-	IGS repro1
ROB	ro0	-	-	-	CODE reprocessed
SGO	sg0	-	-	-	IGS final
SUT	su0	-	-	-	IGS repro1
UPA	up0	-	-	-	PDR05
WUT	wu0	-	-	-	IGS repro1

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*) not yet provided
**) two weeks were uploaded (1356/1357)

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Network with site distribution

Status: 2006

Northern part is not as well covered as the rest of Europe.

Separation of the network by software seems possible:
- BERNESE - Network
- GAMIT – Network
- GIPSY – Network

"Redistribution of Sites?"
or
"Get started!"

Combination of Subnetworks

No decision has been taken concerning the combination of the individual contribution of the participating Local Analysis Centers!

Combination methods of the different contributions:
– Weekly combinations of available solutions (like standard EPN weekly).
– Daily combinations of available solutions.
– By software (type networks)
  • BERNESE - Network
  • GAMIT – Network
  • GIPSY – Network

=> then combine the type networks

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Orbit, ERP and Clocks

- Available products (~ITRF05/IGS05)
  - Potsdam-Dresden-Reprocessing (PDR 05: 1995 – 2006)
  - Repro1 (ITRF05: 1994-2007)
    - **IGS**: CODE, EMR, ESA, GFZ, PDR, JPL, NGS, SIO
      - GLONASS is not yet available
    - **Details**: http://acc.igs.org/reprocess.html

- New products to be expected:
  - Repro2 of the IGS (realized in the ITRF2008), but time schedule unknown!
    - Will GLONASS be included?

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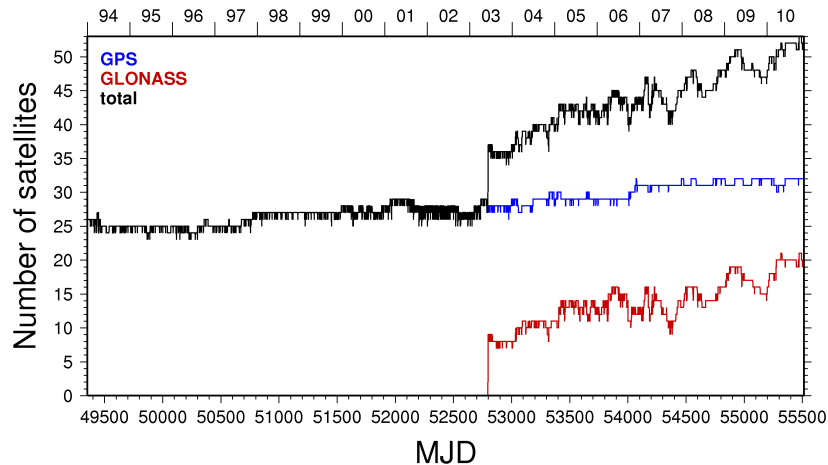Akademie der Wissenschaften

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Reference Frame

- Products for the reprocessing of the EPN are currently available in IGS05 as the standard EPN analysis.
- Within a few month the ITRF2008/IGS08 will be adopted by the IGS introducing a new inconsistency.
- New PCV model will be made available igs08.atx.
  - Shall we introduce this already for or EPN-REPRO1
- Reprocessing of the IGS network (repro2) based on the ITRF2008 is to be expected.
  - How does the EPN respond? => **EPN-Repro2**

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Software for EPN-Repro1

Software	BERNESE 5.0	GAMIT 10.35	GIPSY 5.0	(MicroCosm)
GPS	Fix	Fix	PPP-Float/ Net Fix	FIX
GLONASS	Float	-	-	Float
Global Mapping Function	-	Yes	Yes	yes
Vienna Mapping Function	-	Yes	Yes	Yes
2nd Order Ionosphere	-	Yes	Yes	?
Atmospheric Loading	-	-	-	-

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Impact of GLONASS on the Reprocessing

- The EPN has included GLONASS/GPS sites for many years.

- Almost 40% of the EPN sites today track both systems.

- Today GLONASS can have a significant contribution. What about the past? Shall we postpone GLONASS integration for EPN-Repro1?

Wiki

- Media-Wiki installed under
  - http://www.epn-repro.org

  - Can be maintained by each partner! But ....

- Not too much use has been made recently.

- Wiki is currently restricted to and only visible for partners
  - therefore it could be a perfect platform for discussions, descriptions of your achievements or problems

- Please, be more active!

- Also as platform to report problems.

Pushing our activities!

Alternative 1:

• Decide on the processing options today!

• Set a deadline for the contributions of each LAC.

   – Upload until March 31, 2011; Do not wait for missing contributions!

   – Presentation as **EPN-Repro1** on the next EUREF Symposium.

Alternative 2:

• Use the processing option to your best knowledge and upload your solutions.

• Missing contributions will be ignored.

• Compute every three months a new version of EPN-Repro1.x until IGS-Repro2 is available. => EPN-Repro2

Alternative 3:

• Continue with the reprocessing of the years 2005, 2004,...

• By March 31, 2011 use the available data for a **EPN-Repro1** combination.

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9⁰⁰-11⁰⁰ **Session I: Reports from the pilot re-processing**
Chairman: Christof Völksen

09⁰⁰ -09²⁰   The EPN Reprocessing Project: Mission, Plans and Problems – *C. Völksen*

09²⁰-09³⁰   OLG LAC Reprocessing EPN 2006 – *G. Stangl, C. Aichhorn, S. Krauss*

09³⁰-09⁴⁰   Reprocessing Activities at ASI-CGS – *R. Pacione, B. Pace, G.Bianco*

09⁴⁰-09⁵⁰   Results from the Test Reprocessing made in MUT LAC – *K. Szafranek, M. Figurski*

09⁵⁰-10⁰⁰   GNSS Reprocessing Activities at Swisstopo (LPT) – *S. Schaer, E. Brockmann, D. Ineichen*

10¹⁰-10²⁰   GOP LAC Reprocessing - Status Report – *J. Dousa*

10²⁰-10⁴⁰   EPN Re-Processing1 - Combination of Pilot Solutions – *H. Habrich*

10⁴⁰-11⁰⁰   Quality of the Troposphere Reprocessing - First Results – *W. Soehne*

11⁰⁰-11³⁰ **Coffee break**

11³⁰-16⁰⁰ **Session II: Other re-processing issues**
Chairman: Wolfgang Söhne

11³⁰-11⁴⁵   Support from the Bernese Software for the EUREF-Reprocessing – *R. Dach*

11⁴⁵-12⁰⁰   Report from the Pilot Reprocessing in GAMIT/GLOBK – *A. Araszkiewicz, M. Lidberg*

12⁰⁰-12¹⁵   New approach for the ITRF2008 densification: Global EPN – *A. Kenyeres, K. Szafranek*

12¹⁵-12³⁰   Should reprocessing of the CEPER contribute to EPN reprocessing activities? –
M. Igondova, J. Hefty

12³⁰-14⁰⁰ **Lunch**

14⁰⁰-16⁰⁰ **Proposal, plans for future, discussion**
Chairmen: Heinz Habrich and Christof Völksen

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