

OLG LAC Reprocessing EPN 2006

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- Hardware
 - Server Intel Xeon E5520 Quadcore
 - 12 GB Memory
 - 1 TB Disk space
 - 6x 1 Gigabit LAN

- System Software
 - Xen Server
 - Virtual Workstation
 - Now: Linux Debian 5.0.3 (32bit)
 - Upcoming: CentOS 5.5 (64bit)
 - Qt 3.3.8 | C-Compiler v4.4
 - 2 GB Memory (variable)

- Bernese Software

- Bernese Software 5.0 release February 10
- Qt 3.3.8
- C-Compiler v4.4
- Now: Intel Fortran Compiler v8.1
- Future: g95-x86_64-32 Integer Fortran Compiler

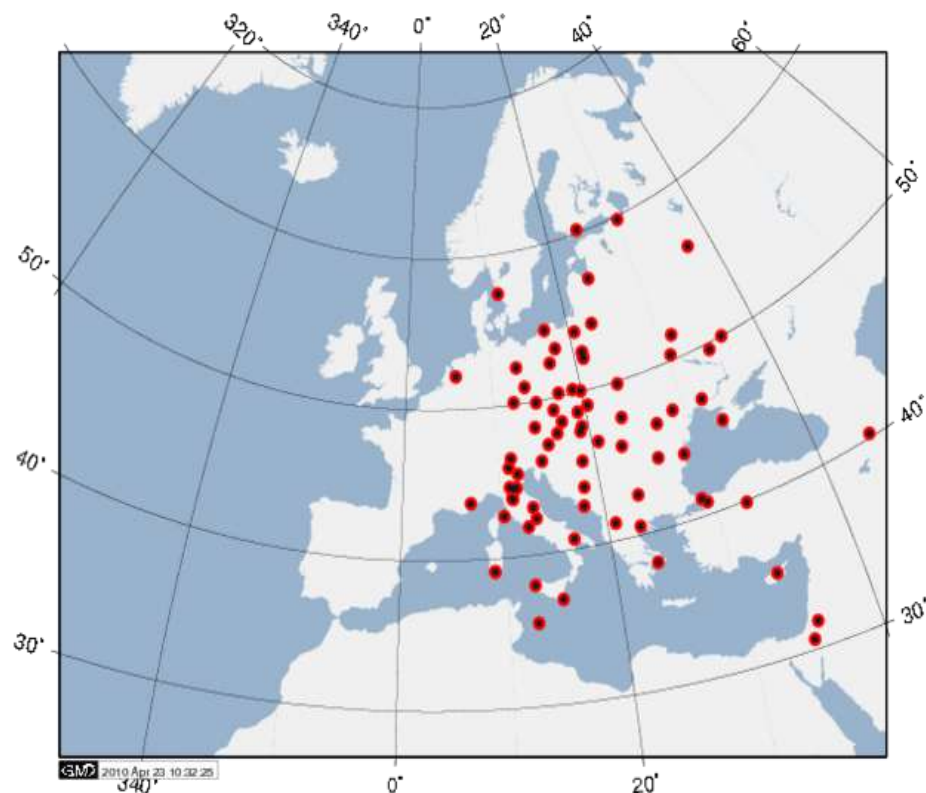
- Data

- IGP1 : IGS orbits + clocks + EOPs reprocessed
- RINEX daily files corrected by ROB DC
- ITRF2005 coordinates + velocities a priori for minimum constraint stations from EPN cumulated solution

OLG
LAC
EPN

Similar to OLG EPN sub-network
+20 stations from other OLG networks
+ 10 completely new stations

OLG LAC
Reprocessing



- Bernese Software
 - 3° minimum elevation
 - L5/L3 ambiguity resolution
 - Dry Niell a priori + Zenith delays + troposphere gradients wet Niell estimated
 - Minimum constraints to BOR1, BUCU, GOPE, GRAZ, PENC, SOFI, ZIMM
- Network design
 - Predefined baselines, mainly based on shortest distance strategy
 - Automation by Bernese Processing Engine, manual afterwork (e.g. exchange of bad baselines)
 - Every day Helmert 7 parameter transformation on all IGS stations with a priori coordinates (solution check)

- Preparation time without RINEX file check 20 minutes per week
- Computing time BPE 140 minutes per week
- Manual checking 10–60 minutes per week
- Manual problem solving + rerun 0–120 minutes per week

- Outlier = North/East component exceeds 10 mm, Up exceeds 20 mm
- Problem checking independently from existing OLG database of outliers
- Automatic exclusion of RINEX files less than 12 hours
- Baseline changes to improve results (most frequently VLNS–RIGA–METS to VLNS–METS–RIGA)
- If no improvement, outliers removed from weekly normal equation (still there in daily normal equation)
- 31 baseline exchanges (14 times VLNS–RIGA) ~0.1% of all processed ones, almost all improved the solution

- 88 Stations, 12 of them never processed by OLG LAC before
- 46 out of 76 common ones with documented outliers
- Number of stations with outliers remains approximately the same 39 → 36
- Total number of outliers reduced from 139 to 92
- Main characteristics of improvement:
 - Better estimation of troposphere
 - Minimum constraint more stable than constraint to one station
 - 3° degree elevation provides more data per station

- 200 hours processing for the whole year is affordable, but more speed is required (e.g. 4 years per year)
- Problems can be seen more clearly because of the reduction of processing noise (heights)
- All problems = outliers with physical, human and electronic background remain -> need for further analysis?
- Some network problems depend on network design (outliers are compensated by minimum constraint) -> re-reprocessing with improved station velocities and global station distribution?

Thank you