Support from the Bernese Software for the EUREF–Reprocessing


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Recent model updates in CODE–EPN solution (since week 1600):

- Use of VMF1 (instead of GMF) as troposphere mapping model.
- Consideration of three higher-order ionosphere correction terms:
  - second order term,
  - third order term,
  - ray bending/curvature term (according to IERS Conventions 2010).
- Refined GNSS orbit representation
  (by setting up stochastic pulses at noon).
- Applied OTL CMC correction.
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<th>Version at AIUB</th>
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<tr>
<td>Troposphere modelling</td>
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**Note:**
- GMF/GPT: Global Mapping Functions/Generalized Polar Tropospheric Model
- VMF1: Vertical Mapping Function
- HOI: Hotening Outer Ionosphere
- PCV: Parametric Correction for Velocity
- GLONASS: Global Navigation Satellite System
<table>
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<th>Feature</th>
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<td>Troposphere modelling</td>
<td>GMF/GPT, VMF1, Gradient: TAN(z)</td>
<td>NMF</td>
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<td>Ionosphere modelling</td>
<td>HOI with scaling factor, only first order</td>
<td>only antenna-dependent</td>
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<td>possible, but without any check</td>
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<td>baselines</td>
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Implemented features relevant for an (EPN-)reprocessing

- FODITS: Find Outliers and Discontinuities in Time Series
- create a campaign for each session in case of a multi-session BPE
- flexible selection of files of an interval in the menu
- update to IERS2010 conventions
  DE405, OTL-CMC, mean pole, S1/S2 ATL, and others
- handling of equipment changes when generating weekly solutions
- ADDNEQ2 repeatability computation for regional networks
- review ADDNEQ2 station pre-elimination procedure
- optimize the memory consumption for GPSEST and ADDNEQ2
What options for developments do we have?

1. Continue working on the full multi–GNSS version.
   - expected time frame: two to three years
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   - preparation to release a version 5.2
   - still without multi–GNSS and without the redesigned coordinate and station information file formats
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other potential interesting features

- GLONASS clock estimation (including PPP)
- Geophysical (deformation) models can be introduced as grids and validated by estimating scaling factors
- Receiver antenna parameters in ADDNEQ2 flexible multi–year GNSS–Satellite antenna offset estimation
- Adapt SINEX import program for ITRF2008 (also to extract coordinates/velocities for a given epoch)
- Processing SLR–Range data, not only to GNSS-Sat. but also LAGEOS (Bernese Software has passed the ILRS benchmark)
- Menu program goes QT4; it can also be used in a remote mode on slow data connections.
Planned updates of the processing examples:

- update the existing three examples to the latest models
- add more ambiguity resolution strategies
- extension by hourly processing and re-processing aspects
- prepare for a bigger number of stations
- new examples for LEO-processing and SLR-analysis
New file types

- grid files for VMF1 and geophysical models
- atmospheric tidal loading
- event list file, Earthquake file (used by FODITS)
- SLR corrections
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- SLR corrections

File types not supported anymore

- file formats prior version 5.0: NEQ, STN, HTR, TRN etc.
- ELE-file from version 5.0 cannot be integrated with version 5.2
Changed with converter

- station information file (conversion program: STA2STA)
- antenna phase center correction file (ATX2PCV generates the new format)
- satellite information file (download new version)
Bernese Software: file formats

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Changed but compatible
- normal equation
- standard orbit
- DCB-file (new types)
Milestones to prepare version 5.2 for delivery?

1. finish the software developments Jan. 2011
2. review and update all program input files and Apr. 2011
   the corresponding help files
3. update and extent the processing examples Jul. 2011
4. update and review all readme files Aug. 2011
5. develop the installation procedure Aug. 2011
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Announcement of the preparation of the distribution of a Bernese Software, Version 5.2 to the users is today.

Update fee same as for version 5.0:
Research site license CHF 1 500
Commercial site license CHF 4 500
dual workstation CHF 4 000
single workstation CHF 3 000

All users who have purchased a new license of version 5.0 or ordered an update to version 5.0 after November 1st, 2010 will get the update to version 5.2 for free.

Single and dual workstation licenses will not only offered for windows but also for UNIX/LINUX systems.
THANK YOU!