The Bernese Software in the Reprocessing Environment

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2010 IGS Workshop, Newcastle, U.K.
Reprocessing means going back in time...

- all input values/options need a history ➞ time windows
Reprocessing means going back in time...

- all input values/options need a history $\rightarrow$ time windows

```plaintext
FORMAT: 1
MODELS: 2
DATUM : IGS05
ALOAD : LPRESS PRESS0815.GRD COEFF0815.

TYPE 001: STATION COORDINATES

---

DEFAULT EPOCH: 2005 01 01 12 00 00

<table>
<thead>
<tr>
<th>STATION NAME</th>
<th>VALIDITY INTERVAL (FROM -&gt; TO)</th>
<th>FLAG</th>
<th>SYS</th>
<th>X (M)</th>
<th>Y (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZIM2 14001M008</td>
<td>2006 09 30 23 59 59</td>
<td>PPP</td>
<td>GR</td>
<td>4331299.8232</td>
<td>567537.3...</td>
</tr>
<tr>
<td>ZIMM 14001M004</td>
<td>2006 10 01 00 00 00</td>
<td>ITRFxx</td>
<td>G</td>
<td>4331297.0136</td>
<td>567555.9...</td>
</tr>
</tbody>
</table>

TYPE 002: STATION VELOCITIES

---

| STATION NAME | VALIDITY INTERVAL (FROM -> TO) | FLAG | SYS | VX (M/Y) | VY (...)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ZIM2 14001M008</td>
<td>2009 10 24 23 59 59</td>
<td>PPP</td>
<td>GR</td>
<td>-0.0126</td>
<td>0.0...</td>
</tr>
<tr>
<td>ZIMM 14001M004</td>
<td>2009 10 24 00 00 00</td>
<td>ITRFxx</td>
<td>G</td>
<td>-0.0138</td>
<td>0.0...</td>
</tr>
</tbody>
</table>
```
Reprocessing means going back in time.

- All input values/options need a history $\rightarrow$ time windows

- "Déjà-vu" with old known problems:
  - L2 data gaps during the period with high activity of the ionosphere
  - AS-off period: need to be considered in DCB handling
  - Receivers with squaring technique to recover L2 phase measurements
Reprocessing technical aspects
Reprocessing technical aspects

- daily independent processing
  - no dependency in the processing from other days
  - redesign of the quality control of the results
Reprocessing technical aspects

■ daily independent processing
  – no dependency in the processing from other days
  – redesign of the quality control of the results

■ job and control system need to be extended
  – new features for the Bernese Processing Engine required
  – version control to recover a certain status of the processing configuration
Reprocessing technical aspects

- daily independent processing
  - no dependency in the processing from other days
  - redesign of the quality control of the results

- job and control system need to be extended
  - new features for the Bernese Processing Engine required
  - version control to recover a certain status of the processing configuration

- preparation of different levels for a repetition of the reprocessing effort
Looking into the results... 

- **FODITS**: Find Outliers and Discontinuities in Time Series
  - new component of the Bernese Software
  - automated analysis of time series (mainly station coordinates)
  - poster Ostini et al., panel 56
Looking into the results... 

- **FODITS**: Find Outliers and Discontinuities in Time Series
  - new component of the Bernese Software
  - automated analysis of time series (mainly station coordinates)
  - poster Ostini et al., panel 56

- Review of the generation of cumulative solutions
  - a reasonable default behavior of the station is assumed
  - only the exceptions from the defaults shall need an interaction by the operator (Event handling)
Looking into the results...

TYPE 003: HANDLING STATION TYPES

<table>
<thead>
<tr>
<th>STATION NAME</th>
<th>FLG</th>
<th>FROM</th>
<th>TO</th>
<th>MARKER</th>
<th>TYPE</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAPA ERDBEBEN_</td>
<td>ERQ</td>
<td>2011 08 01 00 10 00</td>
<td>2011 08 01 00 20 00</td>
<td>KINEMATIC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TYPE 004: HANDLING OF STATION PROBLEMS

<table>
<thead>
<tr>
<th>STATION NAME</th>
<th>FLG</th>
<th>FROM</th>
<th>TO</th>
<th>PARAM</th>
<th>ELIM</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDVJ 12309M005</td>
<td>RNX</td>
<td>2008 09 16 00 00 00</td>
<td>2008 09 24 00 00 00</td>
<td>CRD</td>
<td>ASAP</td>
<td>do not use this station</td>
</tr>
<tr>
<td>ZIMJ 14001M006</td>
<td>IGS</td>
<td>2008 09 18 00 00 00</td>
<td>2008 09 19 00 00 00</td>
<td>CRD</td>
<td>NO_STACK</td>
<td>not in cumulative sol.</td>
</tr>
<tr>
<td>ZIMJ 14001M006</td>
<td>SNX</td>
<td>2008 09 18 00 00 00</td>
<td>2008 09 19 00 00 00</td>
<td>TRP</td>
<td>A_STACK</td>
<td>problem with trop.modell</td>
</tr>
<tr>
<td>ZIMJ 14001M006</td>
<td>EPN</td>
<td>2008 09 18 00 00 00</td>
<td>2008 09 19 00 00 00</td>
<td>VEL</td>
<td>DATUM</td>
<td>do not use for datum def</td>
</tr>
<tr>
<td>ZIMJ 14001M006</td>
<td>EPN</td>
<td>2008 09 18 00 00 00</td>
<td>2008 09 19 00 00 00</td>
<td>AMB</td>
<td>NO_RESOLVE</td>
<td>no ambiguity resolution</td>
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</tbody>
</table>

TYPE 005: STATION EVENTS

<table>
<thead>
<tr>
<th>STATION NAME 1</th>
<th>FLG</th>
<th>EPOCH</th>
<th>PARAM</th>
<th>GRP</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZIM2 14001M008</td>
<td>NEQ</td>
<td>2008 01 01 00 00 00</td>
<td>VEL</td>
<td>002</td>
<td>diff. velocity as the group</td>
</tr>
<tr>
<td>ZIM2 14001M008</td>
<td>NEQ</td>
<td>2010 06 30 00 00 00</td>
<td>VEL</td>
<td>001</td>
<td>now same vel. as the group</td>
</tr>
</tbody>
</table>

TYPE 006: STATION ECCENTRICITIES

<table>
<thead>
<tr>
<th>STATION NAME 1</th>
<th>STATION NAME 2</th>
<th>FLG</th>
<th>EPOCH STA1</th>
<th>EPOCH STA2</th>
<th>PARAM</th>
<th>SYS</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELG 14264M001</td>
<td>********************</td>
<td>1</td>
<td>2008 08 31 00 00 00</td>
<td>2008 09 19 00 00 00</td>
<td>CRD</td>
<td>NEU</td>
<td>...</td>
</tr>
<tr>
<td>TERS 13534M001</td>
<td>TERS 13534M003</td>
<td>1</td>
<td>2008 09 18 00 00 00 00</td>
<td>2008 09 19 00 00 00</td>
<td>TRP</td>
<td>NEU</td>
<td>...</td>
</tr>
</tbody>
</table>
What to do with a reprocessed set of solutions?

More implementations were motivated due to the availability of the reprocessed time series solution:
What to do with a reprocessed set of solutions?

More implementations were motivated due to the availability of the reprocessed time series solution:

- higher order ionosphere corrections
- considering, investigating non-tidal loading effects
- spherical harmonics development for loading and CM realization issue
- ...
PDR–group did a reasonable part of the implementation