

The Bernese GPS Software in the Reprocessing Environment

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Reprocessing means going back in time...

- all input values/options need a history → time windows

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

TYPE 001: STATION COORDINATES

DEFAULT EPOCH: 2005 01 01 12 00 00

STATION NAME	VALIDITY INTERVAL (FROM -> TO)	FLAG	SYS	X (M)	Y (M)
*****	YYYY MM DD HH MM SS YYYY MM DD HH MM SS	*****	*****	*****.*****	*****.*...
ZIM2 14001M008		PPP	GR	4331299.8232	567537.3...
ZIMM 14001M004	2006 09 30 23 59 59	ITRFxx	G	4331297.0136	567555.9...
ZIMM 14001M004	2006 10 01 00 00 00	ITRFxx	G	4331297.0336	567555.9...
...					

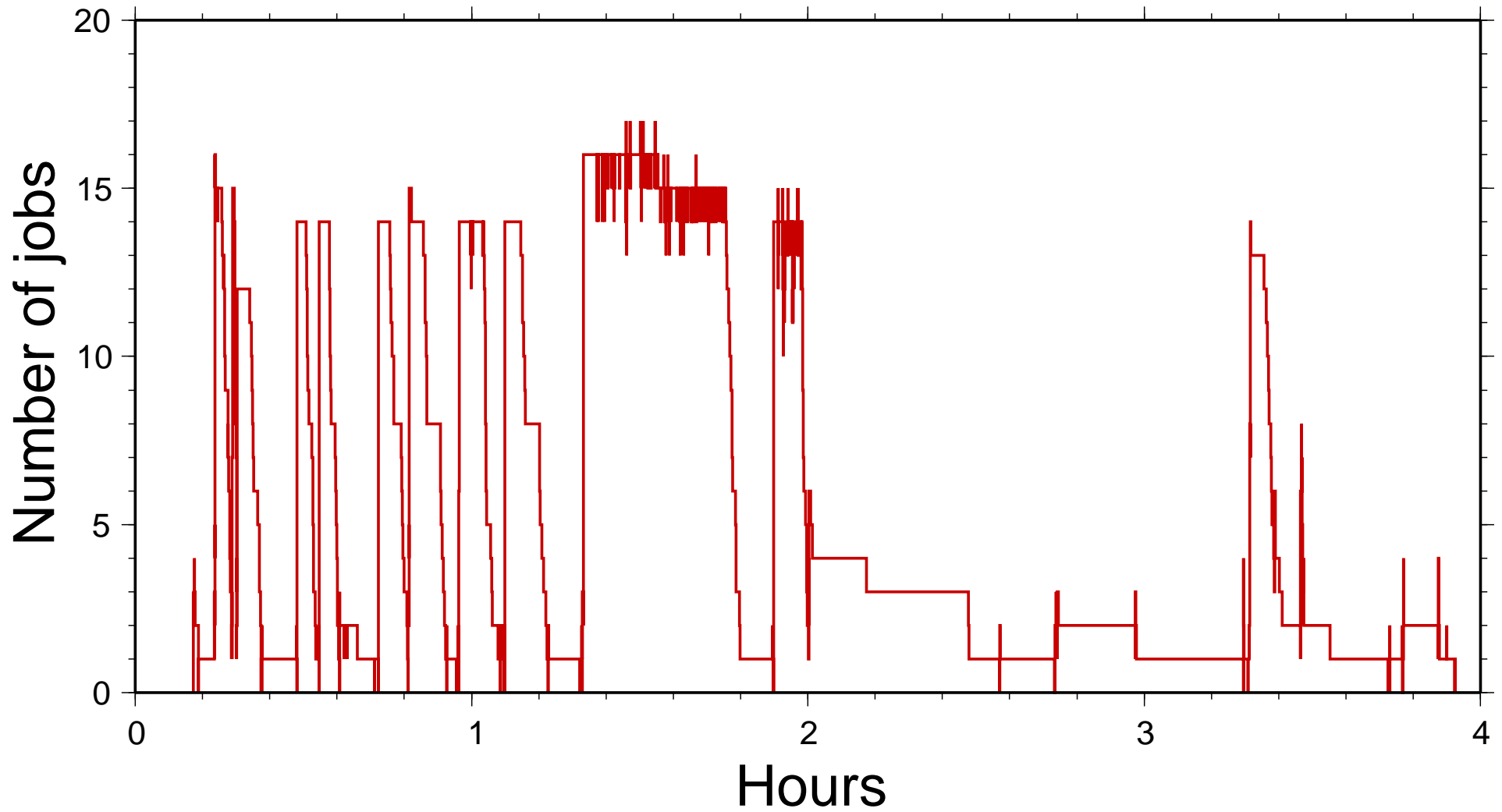
TYPE 002: STATION VELOCITIES

STATION NAME	VALIDITY INTERVAL (FROM -> TO)	FLAG	SYS	VX (M/Y)	VY (...)
*****	YYYY MM DD HH MM SS YYYY MM DD HH MM SS	*****	*****	*****.*****	*****.*...
ZIM2 14001M008		PPP	GR	-0.0126	0.0...
ZIMM 14001M004	2009 10 24 23 59 59	ITRFxx	G	-0.0126	0.0...
ZIMM 14001M004	2009 10 24 00 00 00	ITRFxx	G	-0.0138	0.0...
...					

Reprocessing means going back in time...

- all input values/options need a history → 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



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- 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

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- daily independent processing
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 - 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 GPS Software
 - automated analysis of time series (mainly station coordinates)
 - poster Ostini et al., panel 56

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■ **FODITS**: Find Outliers and Discontinuities in Time Series

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■ 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

```
-----  
STATION NAME          FLG           FROM                TO                MARKER TYPE          REMARK  
*****  
JAPA ERDBEBEN_       ERQ    2011 08 01 00 10 00  2011 08 01 00 20 00  KINEMATIC
```

TYPE 004: HANDLING OF STATION PROBLEMS

```
-----  
STATION NAME          FLG           FROM                TO                PARAM  ELIM          REMARK  
*****  
MDVJ 12309M005       RNX    2008 09 16 00 00 00  2008 09 24 00 00 00  CRD    ASAP          do not use this station  
ZIMJ 14001M006       IGS    2008 09 18 00 00 00  2008 09 19 00 00 00  CRD    NO_STACK     not in cumulative sol.  
ZIMJ 14001M006       SNX    2008 09 18 00 00 00  2008 09 19 00 00 00  TRP    A_STACK     problem with trop.model  
ZIMJ 14001M006       EPN    2008 09 18 00 00 00  2008 09 19 00 00 00  VEL    DATUM        do not use for datum def  
ZIMJ 14001M006       EPN    2008 09 18 00 00 00  2008 09 19 00 00 00  AMB    NO_RESOLVE   no ambiguity resolution
```

TYPE 005: STATION EVENTS

```
-----  
STATION NAME 1        FLG           EPOCH                PARAM  GRP          REMARK  
*****  
ZIM2 14001M008       NEQ    2008 01 01 00 00 00  VEL    002          diff. velocity as the group  
ZIM2 14001M008       NEQ    2010 06 30 00 00 00  VEL    001          now same vel. as the group
```

TYPE 006: STATION ECCENTRICITIES

```
-----  
STATION NAME 1        STATION NAME 2      FLG           EPOCH STA1          EPOCH STA2          PARAM  SYS          ...  
*****  
HELG 14264M001          1    2008 08 31 00 00 00  YYY Y MM DD HH MM SS  CRD    NEU          ...  
TERS 13534M001        TERS 13534M003      1    2008 09 18 00 00 00  2008 09 19 00 00 00  TRP    NEU          ...
```

What to do with a reprocessed set of solutions?

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

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

- higher order ionosphere corrections
- considering, investigating non-tidal loading effects
- spherical harmonics development for loading to assess the center of mass
- . . .

**PDR-group did a reasonable
part of the implementation**

