

# **Reprocessing activities @ ASI/CGS**

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ASI/CGS joined the EPN Reprocessing Working Group processing the complete EPN network for the test year 2006.

The Precise Point Positioning approach has been applied using different parameterizations.

The obtained results, in terms of site coordinates and tropospheric delays, are validated to evaluate the strategy to use for reprocessing the entire EPN data-set.

## Reprocessing resources

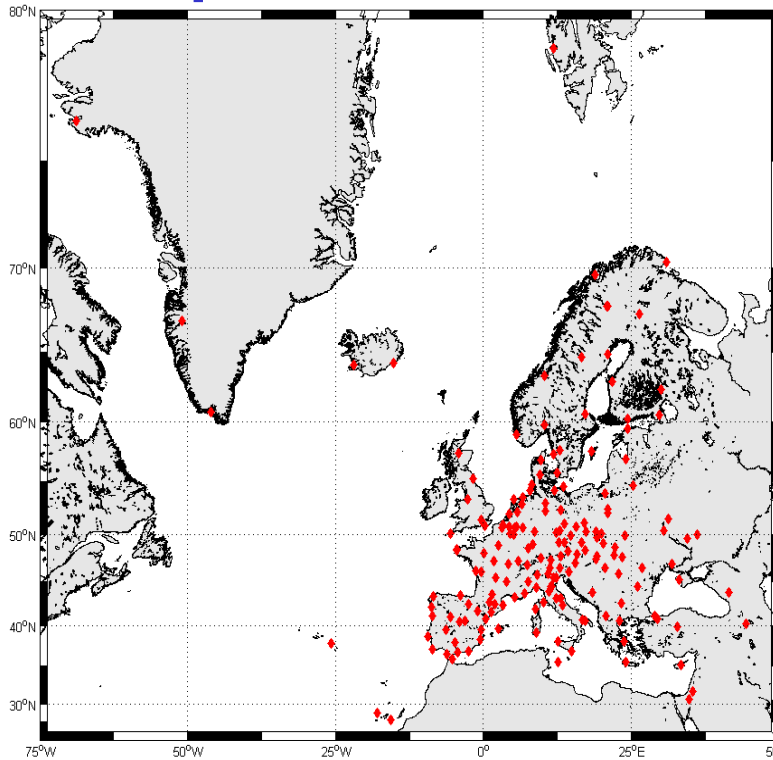
- HW: 1 Linux WKS Intel Core 2 Duo E8300/ 4GB RAM.
- SW: GIPSY-OASIS II 5.0.
- GIPSY sta\_info database (from 1994 till today) completed.

# Reprocessed Network

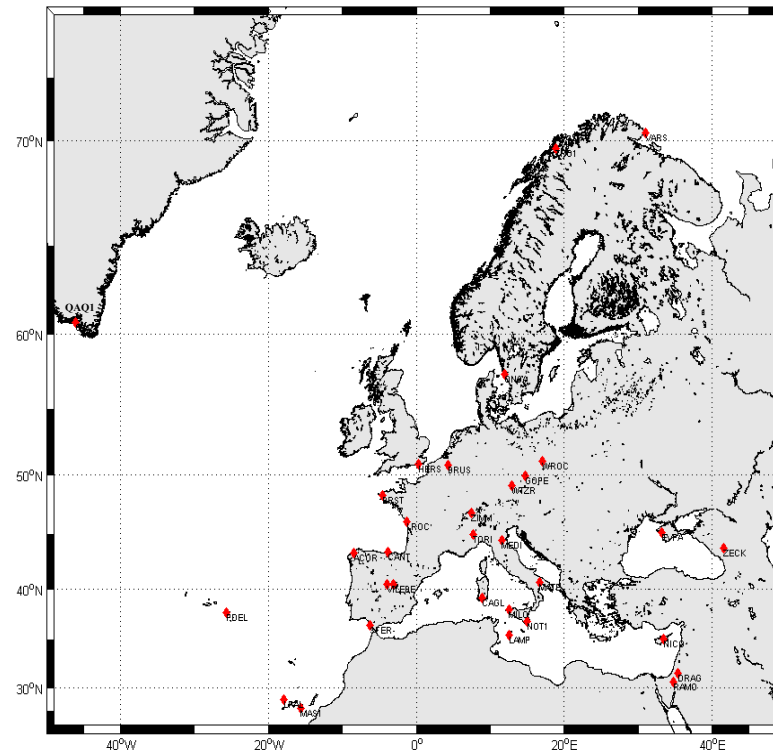
We have reprocessed the complete EPN network for the test year 2006 (approx. 180 rnx/day).

For the validation of the results a sub-network of 32 stations has been considered.

## Complete EPN Network



## Sub-Network



Site name

ACOR
BRST
BRUS
CAGL
CANT
DRAG
EVPA
GOPE
HERS
LAMP
LPAL
LROC
MAS1
MATE
MEDI
MIL0
NICO
NOT1
ONSA
PDEL
QAQ1
RAM0
SFER
TORI
TRO1
VARS
VILL
WROC
WTZR
YEBE
ZECK
ZIMM

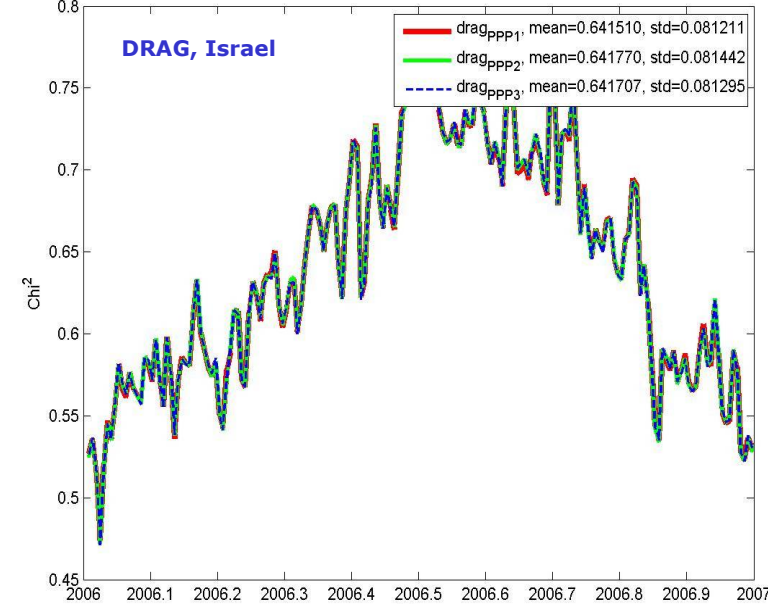
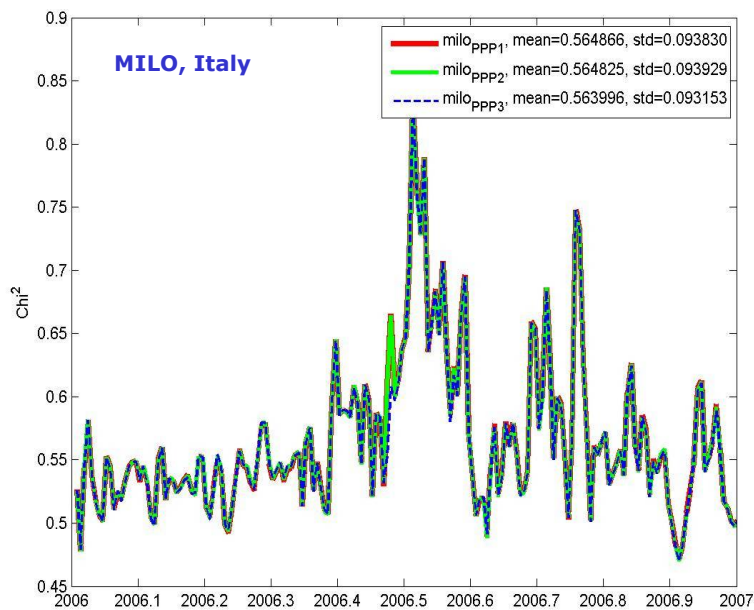
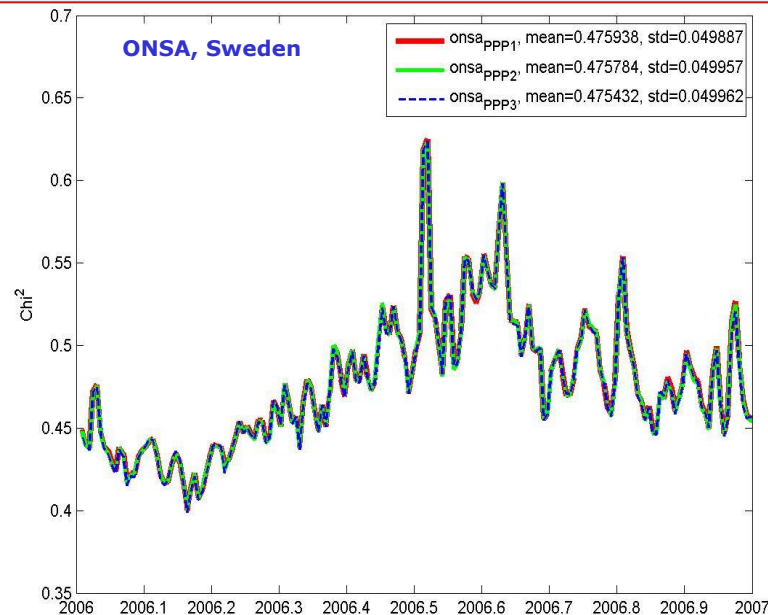
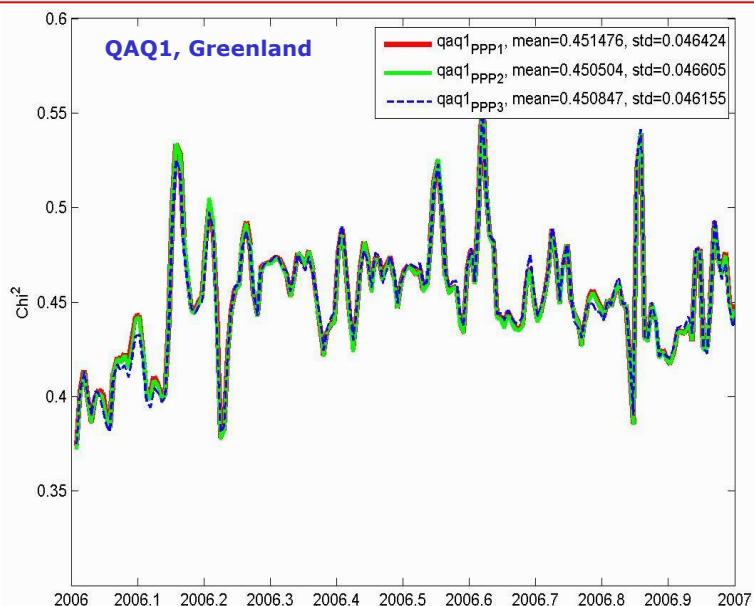
	PPPRepro1	PPPRepro2	PPPRepro3
<b>SW</b>	GIPSY-OASIS 5.0	GIPSY-OASIS 5.0	GIPSY-OASIS 5.0
<b>Strategy</b>	PPP	PPP	PPP
<b>Orbits</b>	JPL reprocessed	JPL reprocessed	JPL reprocessed
<b>Ref. Frame</b>	IGS05	IGS05	IGS05
<b>Ambiguities</b>	Real	Real	Real
<b>Mapping Function</b>	Niell	Niell	VMF1
<b>ZHD</b>	Height-scale	Height-scale	Height-scale
<b>Elevation angle cut-off</b>	7deg	7deg	7deg
<b>Ocean Loading</b>	FES 2004	FES 2004	FES 2004
<b>Atmo. Loading</b>	Not Applied	Not Applied	Not Applied
<b>Rec/Sat. Phase Center Maps</b>	IGS standards	IGS standards	IGS standards
<b>2nd Ionospheric Correction</b>	Not Applied	Applied	Applied
<b>Data Arc</b>	24 h	24 h	24 h
<b>Data Rate</b>	5 min	5 min	5 min
<b>Time Span</b>	2006	2006	2006



A priori delay (m): hydrostatic= $1.013 * 2.27 * e^{-0.116 * ht}$ , wet=0.1

Estimated Parameters: station clock, site position, wet zenith delay, delay gradients, phase biases.

# Chi<sup>2</sup> Running Average



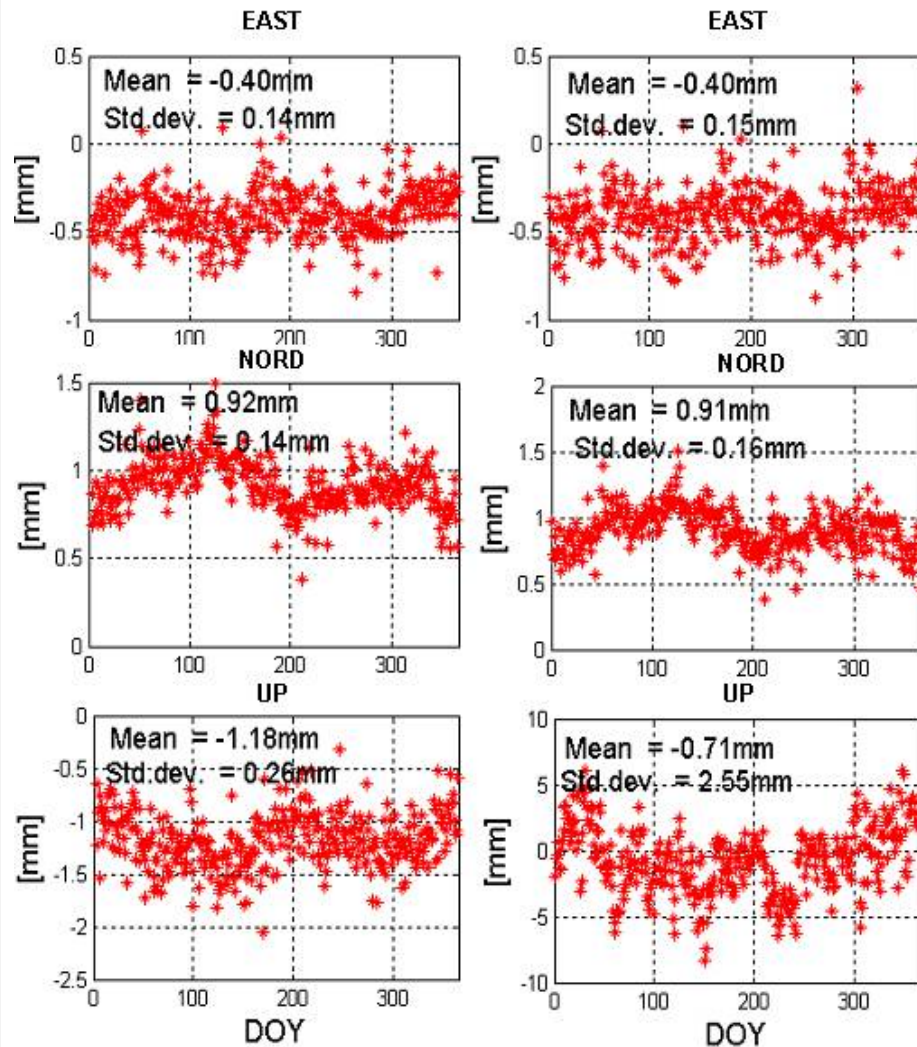
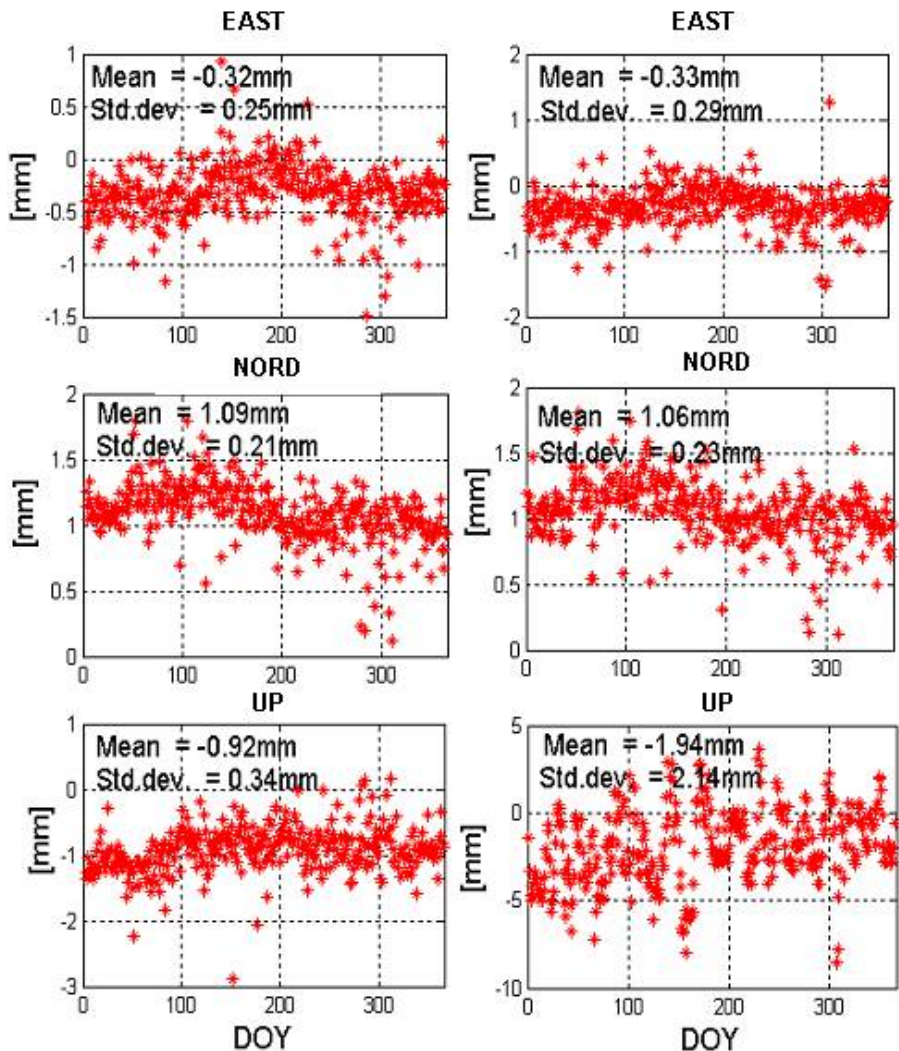


# PPPRepro1 vs PPPRepro2 & PPPRepro3



## MATE

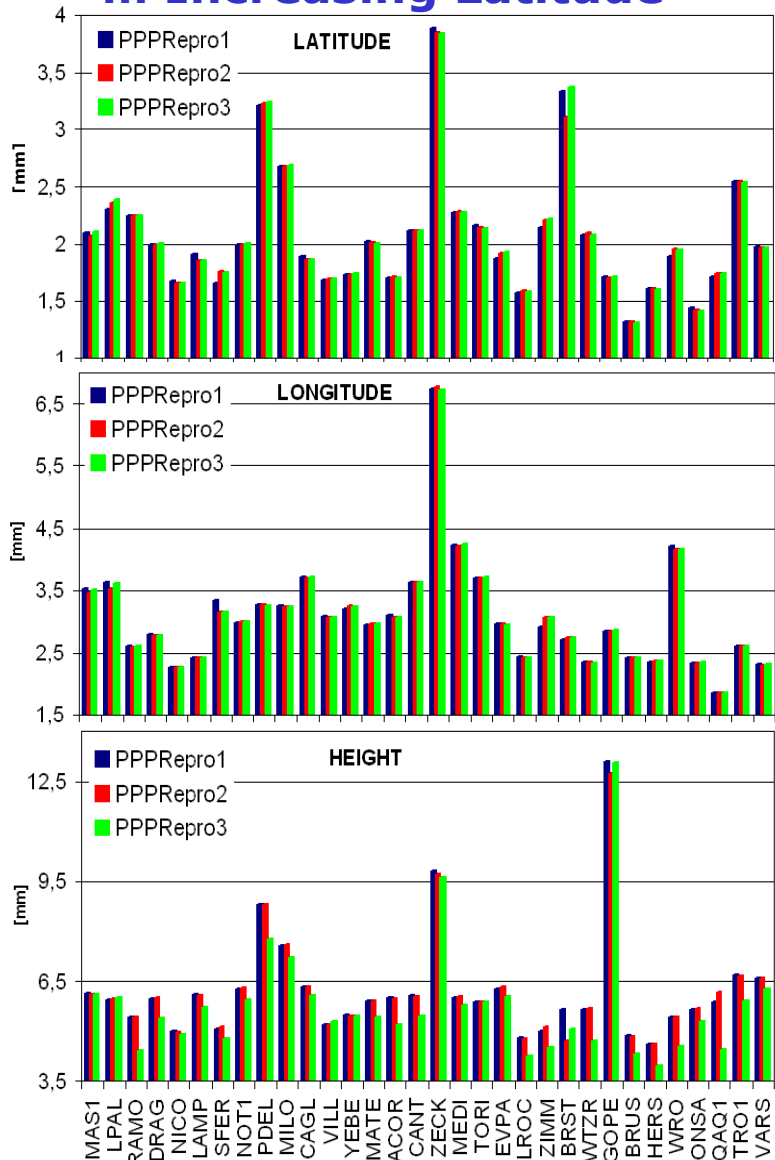
## BRUS



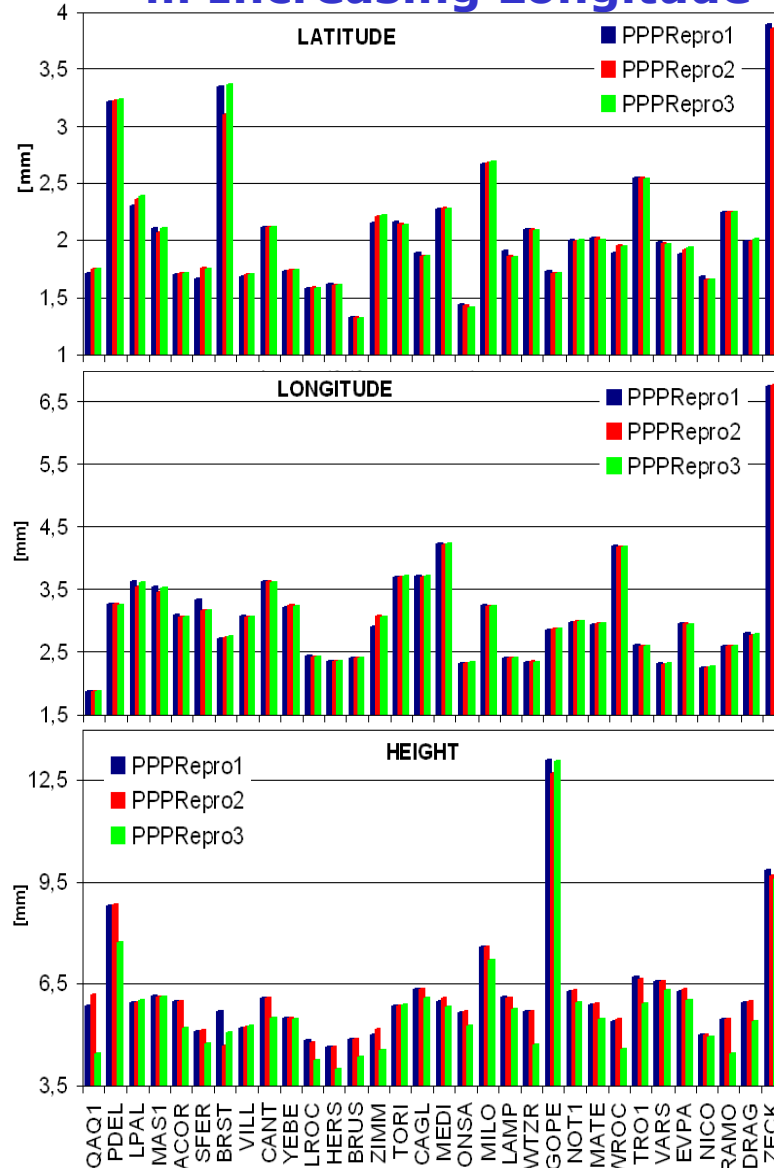
# Site Coordinate Mean Repeatability (1/2)



## ... Increasing Latitude



## ... Increasing Longitude

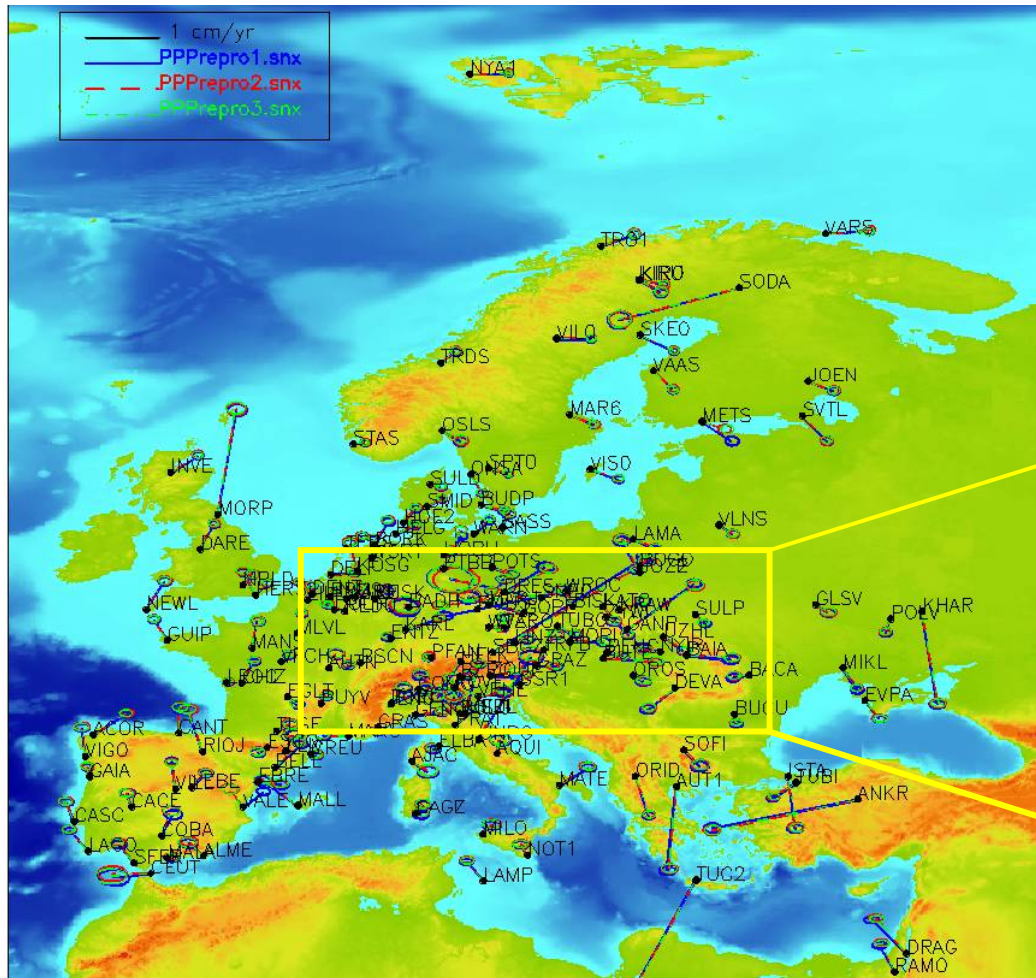


Repeatability table (all sites considered)

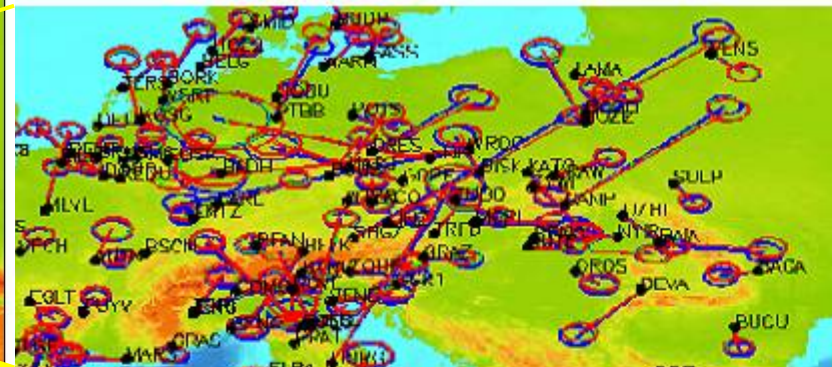
	PPPRepro1		PPPRepro2		PPPRepro3	
	MEAN [mm]	STD [mm]	MEAN [mm]	STD [mm]	MEAN [mm]	STD [mm]
LAT	1,99	0,78	1,99	0,76	1,99	0,77
LON	2,88	0,94	2,88	0,92	2,88	0,92
H	6,34	2,47	6,30	2,24	5,79	2,41



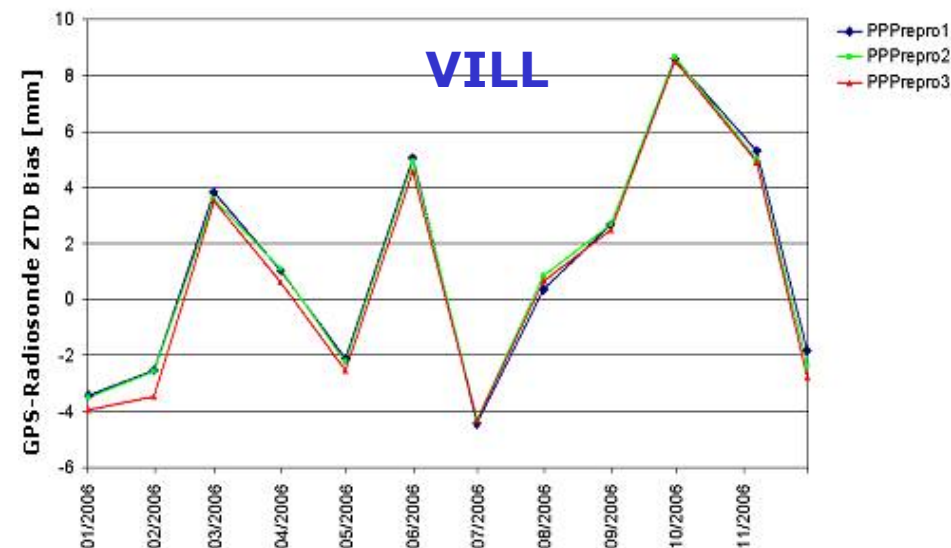
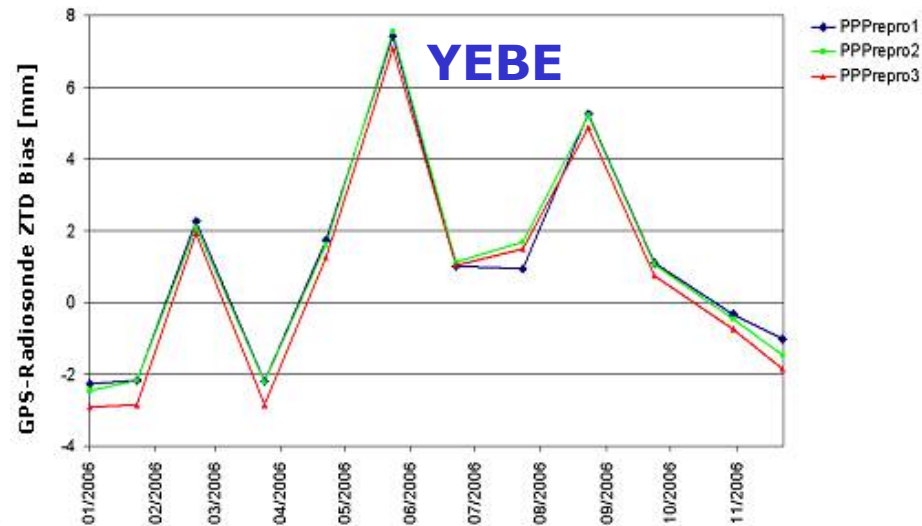
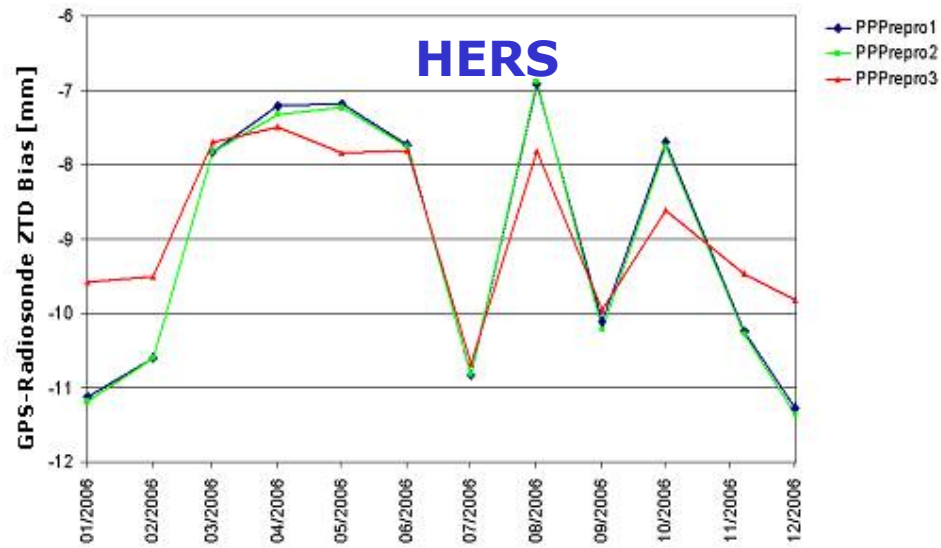
## Residual Velocity Field w.r.t. Eurasian Plate



### Zoom on Central Europe



	PPPRepro1			PPPRepro2			PPPRepro3		
	vel_x [mm/yr]	vel_y [mm/yr]	vel_z [mm/yr]	vel_x [mm/yr]	vel_y [mm/yr]	vel_z [mm/yr]	vel_x [mm/yr]	vel_y [mm/yr]	vel_z [mm/yr]
<b>BIAS</b>	<b>2,20</b>	<b>2,07</b>	<b>4,54</b>	<b>1,80</b>	<b>1,98</b>	<b>4,40</b>	<b>0,60</b>	<b>1,65</b>	<b>2,92</b>
<b>STD</b>	<b>5,25</b>	<b>4,17</b>	<b>4,64</b>	<b>5,18</b>	<b>4,39</b>	<b>4,79</b>	<b>4,98</b>	<b>4,32</b>	<b>4,64</b>



## GPS vs Radiosonde Comparison Table [mm]

	PPPPrepro1		PPPPrepro2		PPPPrepro3	
	BIAS	STD	BIAS	STD	BIAS	STD
HERS	-9,04	7,59	-9,08	7,59	-8,80	7,29
VILL	0,61	9,31	0,57	9,29	0,29	9,38
YEBE	1,04	8,12	1,03	8,24	0,68	8,35

## Status

- 2006 PPPRepro1, PPPRepro2, PPPRepro3 daily\_snx files are available.
- Reprocessing capabilities have been set-up.
- PPPRepro3 has an improved the Geodetic Accuracy.

## Plan

- Install GIPSY 6.0.
- Ambizap test.
- Reprocess the entire EPN data-set (from 1994 till today).