

A Brief Report on the Activities of the BEK Local Analysis Centre

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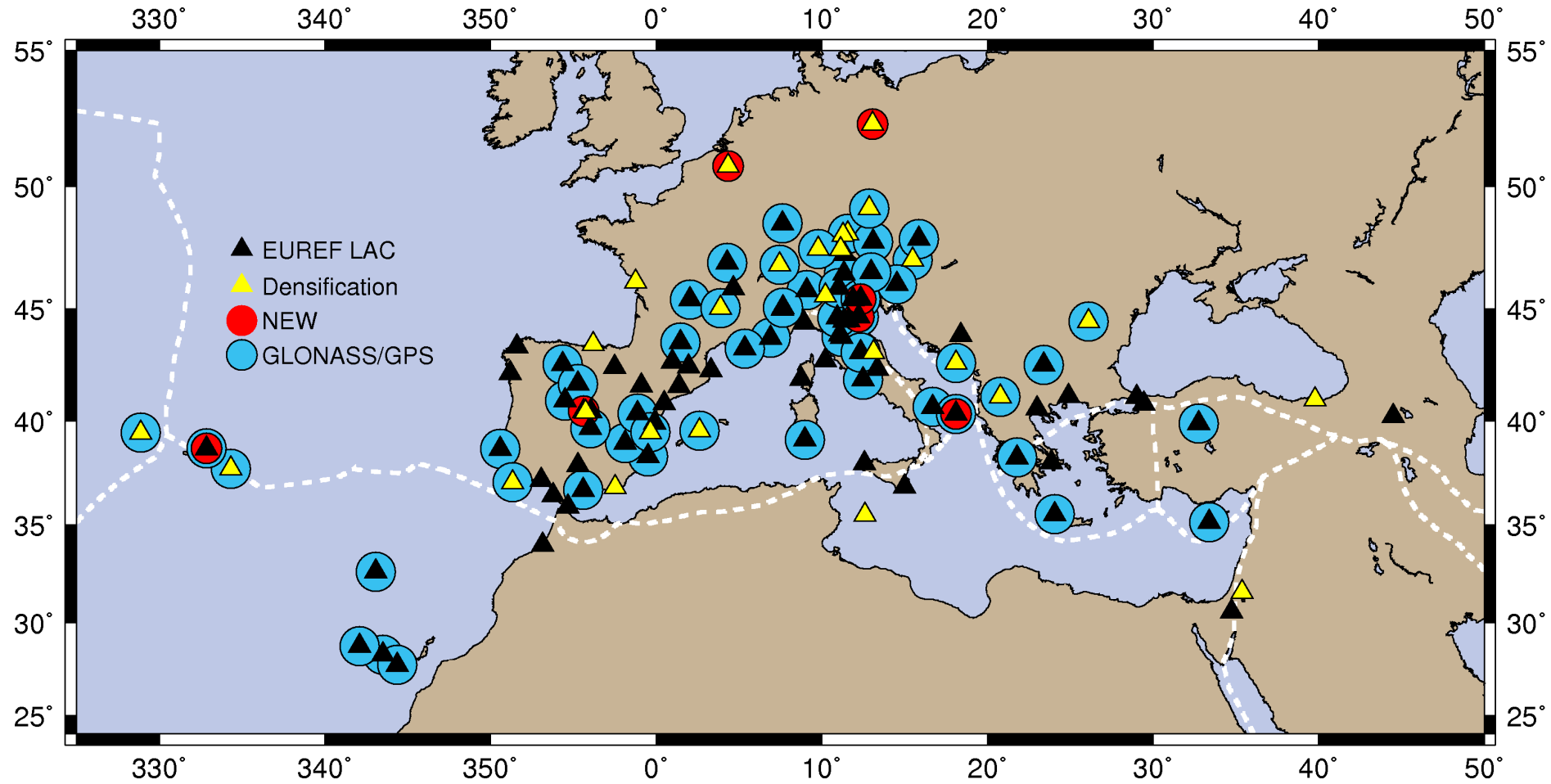
Bayerische Kommission
für die
Internationale Erdmessung (BEK)

Bavarian Akademie of Sciences and Humanities (BADW)

Overview

- Establishment of the facilities for the EPN analysis in 1996
- Focus was set on the southern part of EUROPE
- GNSS analysis software is still Bernese 5.0
- Analysis of GPS and GLONASS data since 2007
- Rapid processing has recently been added in 2010

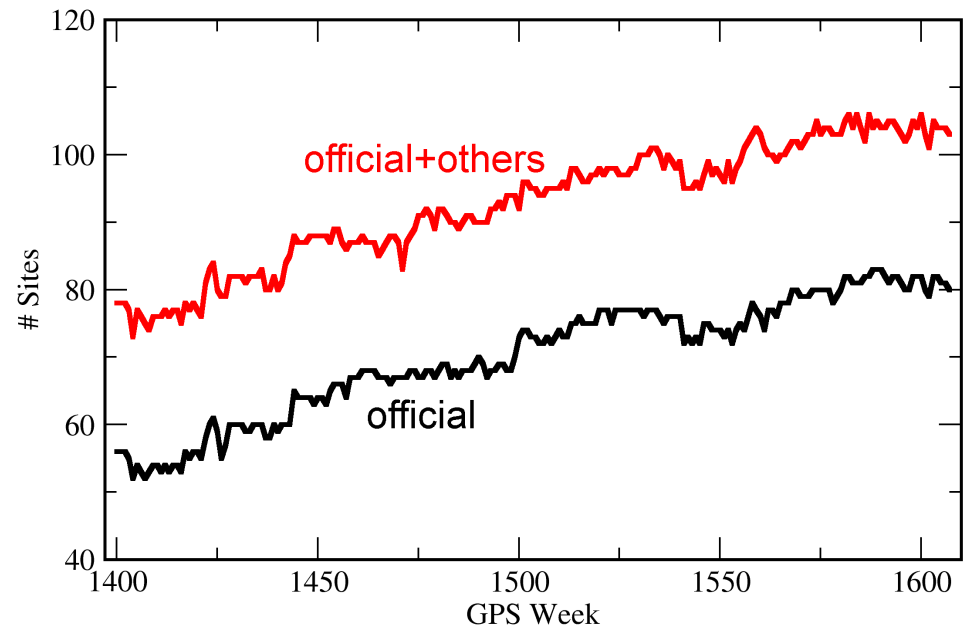
Current Network



Some Network Details

Total Number of Sites	110
Official Sites	83
Densification	27
GNSS	56
GPS	54
New in 2009	4
New in 2010	2

Development of sites processed



Potsdam and Brussels were added for reference frame improvements!

Analysis with Final Products

- Most of the processing is automated (BERNESE)
- Products used are final orbits, ERP and ION-files from **CODE** (Center for Orbit Determination in Europe)
- RINEX observation files are retrieved automatically
- Check for missing observation files / manual retrieval
- Processing time 4.5 h
 - Dell 6400 workstation (QuadCore), Debian "Lenny", G95, Qt 3.4
 - Processing of two sessions in parallel
- Check for outliers, re-computation, delivery to BKG

Processing Options

Analysis Software	BERNESE 5.0
Orbit and Clock Products	CODE
Reference Frame	IGS05_A
Normal Equations	Normal Equation Vector
Absolute PCV	epr05_www.atx
Troposphere	Saastamoinen: Dry Niell mapping function/Wet Niell Mapping Function + one daily gradient
Ionosphere	CODE ION Files
Elevation Cut off	3°
Ambiguity Fixing	QIF Strategy
Reference Points	MATE, NOT1, RABT, RAMO, VILL, ZIMM, (BRUS, POTS, WTZR, [CAGL, CASC, MAS1, PDEL, TORI])

RMS of weekly combination:

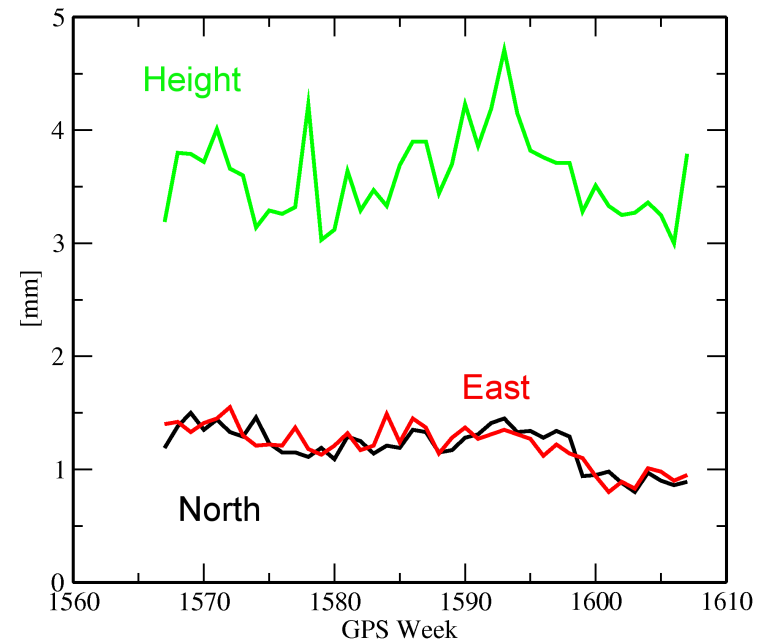
horizontal: ~1-1.5 mm

vertical: ~3-4.5 mm

Significant improvement since week 1600
for still unknown reasons!

RMS Weekly Combination

(North, East, Up)



Rapid Daily Processing

- Rapid Processing started in 2010 (1579, 11/04/2010)
- Same strategy as for daily solutions with final products
- Processing is strictly automated
 - RINEX data are downloaded automatically 3 am, 6am and 11 am
 - No manual download of missing RINEX files
- Products used:
 - Rapid CODE products
 - SP3-orbits, ERP-files, ION-files
- Solution uploaded to BKG as it is!

Results Daily Rapid

Comparison of daily rapid coordinates with weekly final solutions (Week: 1606).

- Final weekly solutions do not contain outliers
- Rapid daily solutions are yet not quality checked!
- Final computations are checked for missing data (manual retrieval)

DOY	RMS [mm]			Outlier [mm]			# Sites	
	North	East	Up	North	East	Up	Rapid	Final
290	1.0	0.9	3.8	-3.3	-2.1	10.5	99	102
291	1.3	1.0	4.7	-4.3	-3.2	32.3	100	103
292	0.9	1.7	2.7	-2.8	-12.5	10.6	102	103
293	1.2	1.0	3.2	-4.7	3.4	12.4	102	103
294	0.9	1.0	3.6	2.4	-2.8	13.3	97	103
295	0.8	1.2	3.6	-3.7	4.1	11.4	94	99
296	0.9	0.7	2.4	3.0	-2.0	6.4	100	102

Outlook

- **BERNESE**
 - New mapping functions for the troposphere are required
 - Implementation of a new reference frame realization
 - GLONASS ambiguity fixing
- **Rapid Processing**
 - Automated quality check should be implemented
- **Combination Center**
 - Reports on rapid processing would be nice!
- **AFREF**
 - EPN should included some sites in North

Future of the BEK

„Centrum für Geodätische Erdsystemforschung (CGE)“

(Center for Geodetic Earth System Research)

