The EUREF BE/2011 campaign

Filip De Doncker & Pierre Voet Department of Geodesy National Geographical Institute



Outline

History

- Campaign configuration
- Processing strategy
- Results
- An alternative processing strategy
- Conclusions

NATIONAAL GEOGRAFISCH INSTITUUT

History / Motivation

EUREF LUXBD94 campaign

- 6 class B stations in Belgium
- 2 of them have disappeared meanwhile

2002: Startup of RTK networks

Results have not been submitted to EUREF for validation

2010-2011: Hardware upgrade in all RTK ref.stations

NATIONAAL GEOGRAFISCH INSTITUUT

Campaign configuration (1)



Campaign configuration (2)



Processing strategy

- Bernese software V5.0, release 11 May 2011
- Guidelines for EUREF densifications, V2 (4 May 2010)
- Reference frame coords: IGS08 ep. 2005-01-01
- Absolute (type) antenna calibrations applied
- Only GPS data used
- QIF ambiguity resolution
- 3 deg elevation cut-off (10 deg for ambiguity resolution)
- During the final combination, the option 'Minimum constraints conditions on translations only' was chosen
- Transformation of results to ETRS89 according to the memo of Altamimi & Boucher, V8

NATIONAAL GEOGRAFISCH INSTITUUT

Results (1)

Overall mean ambiguity resolution = 91.6 %



NATIONAAL GEOGRAFISCH INSTITUUT

Daily coordinate repeatibilities



Fiducial stations coordinate recoveries

Helmert transformation residuals for fiducials				
Station	N (mm)	E (mm)	U (mm)	
BRUS	4.2	-5.7	-2.3	
WSRT	-1.8	1.9	1.8	
ZIMM	-3.1	0.8	7.3	
GRAS	3.0	0.5	0.9	
LROC	0.8	1.6	-2.7	
ONSA	-1.0	0.9	-0.4	
HERT	-1.1	1.7	-6.0	
WTZR	-1.0	-1.7	1.3	
RMS	2.5	2.6	3.9	

NATIONAAL GEOGRAFISCH INSTITUUT



Comparison with the weekly EPN solution

Stations	N (mm)	E (mm)	U (mm)	Flag
BRUS	-0.1	-0.1	2.2	Fiducial
GRAS	0.3	-0.2	1.5	Fiducial
HERT	0.3	0.0	2.7	Fiducial
LROC	0.1	-0.2	1.4	Fiducial
ONSA	0.3	-0.2	1.2	Fiducial
WSRT	0.5	0.1	1.1	Fiducial
WTZR	-0.2	0.1	1.6	Fiducial
ZIMM	0.5	0.0	1.6	Fiducial
DENT	-0.1	-0.2	1.9	Control
DOUR	0.1	-0.2	2.6	Control
WARE	0.1	0.0	2.4	Control

NATIONAAL GEOGRAFISCH INSTITUUT

Comparison with previous campaigns

The EUREF LUXBD94 campaign No common points !

The 2002 campaign

Not the same processing strategy

- 1st order geodetic network was intermediate between EPN and RTK stations
- Observation period: 2 x 6 hours
- Baselines with Bernese, network with MOVE3
- Not minimum constraint

Differences between 2002 and 2011 solution					
N (mm)	E (mm)	U (mm)			
-0.5	-5.7	7.7			
5.9	9.2	10.8			
	N (mm) -0.5 5.9	N (mm) E (mm) -0.5 -5.7 5.9 9.2			

NATIONAAL GEOGRAFISCH INSTITUUT

An alternative strategy



Conclusions

- High internal consistency demonstrated by the daily repeatabilities
- Coordinate recoveries of the fiducials are on a acceptable level
- When comparing with the 2002 campaign the mean differences are within 1 cm
- An alternative strategy, with other software, leads to nearly the same results

