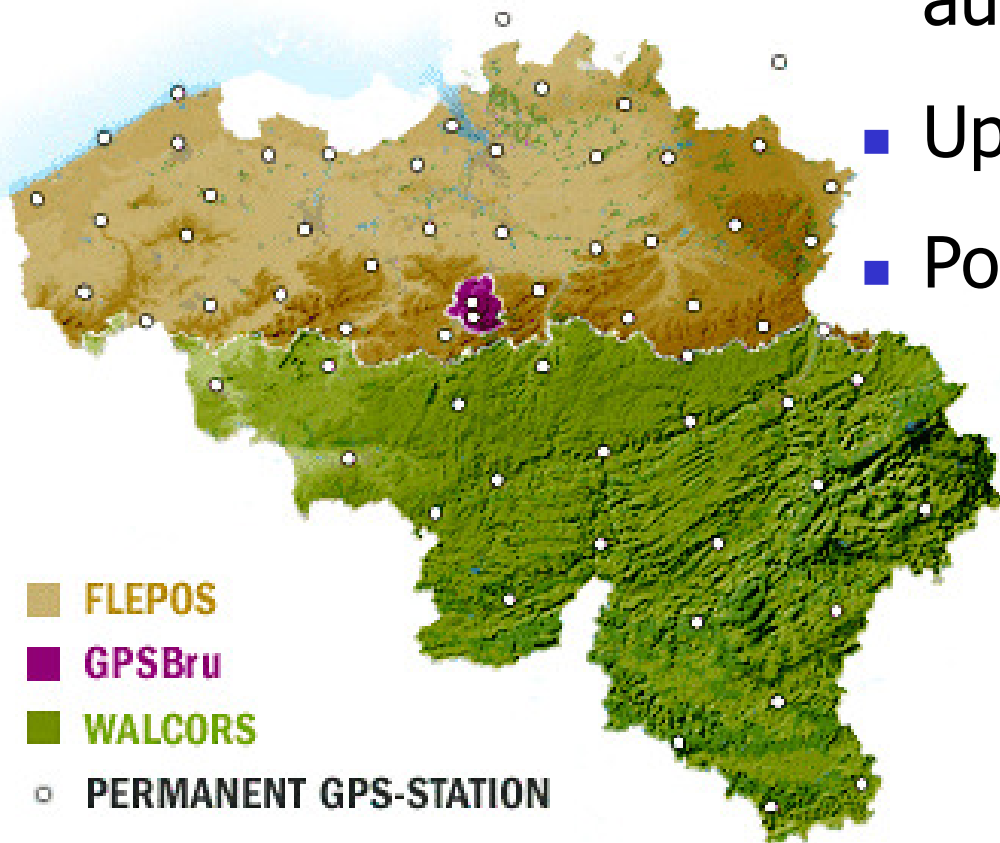# Belgian National Report

EUREF related activities of:

- National Geographical Institute

- Royal Observatory of Belgium

RTK Networks upgraded

- Since 2002 three regional networks, all managed by governmental authorities

- Upgrading from GPS to GNSS

- Policy remains the same: users can obtain RTK and Rinex data for free

FLEPOS

GPSBru

WALCORS

○ **PERMANENT GPS-STATION**

Atomium software upgraded (1)

- Developed by ROB for GNSS-based time transfer using zero-diff (PPP) or single-diff approach.

- New:
  - Glonass data can be treated (combined with GPS)
  - Tropospheric wet delay estimation was modified, which also improves the clock estimation

- Some results:
  - First step: Daily PPP solutions from data of IGS and EPN stations for the period 2007 – 2009
  - Second step: Helmert transformation to express them in IGS05

Atomium software upgraded (2)

Repeatability of Atomium PPP after Helmert Transformation
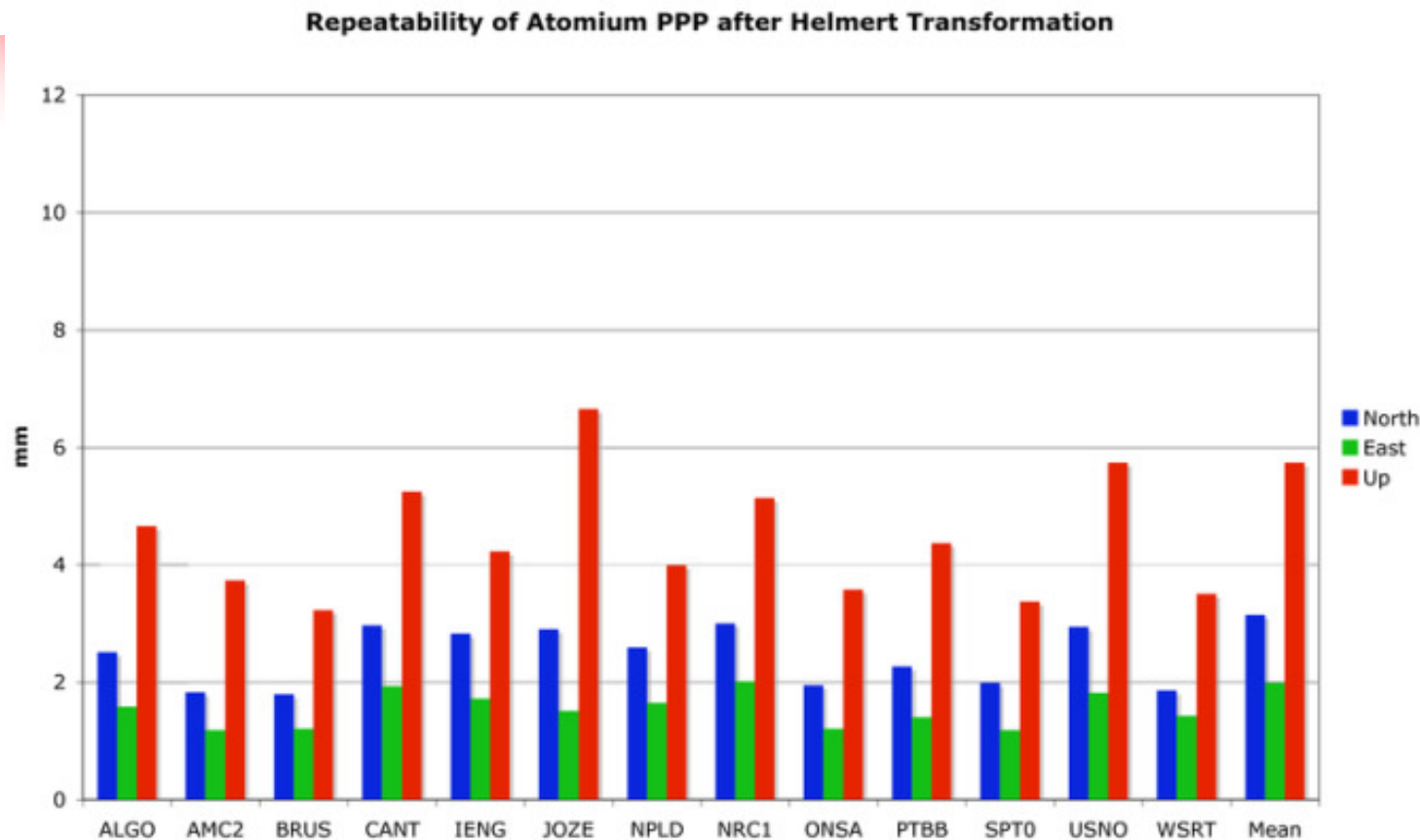
Mean repeatability's

North: 3.1 mm

East: 1.9 mm

Up: 5.7 mm

Conclusion: results are promising for the use of ATOMIUM, in an operational mode, for station monitoring

Recent activities at ROB

- EPN vs. Global network analysis
  Report by J. Legrand

- Study on the potential of the EPN for atmospheric tomographic applications over Europe by investigating the geometry of the satellite-receiver GNSS ray distribution traversing the atmosphere.
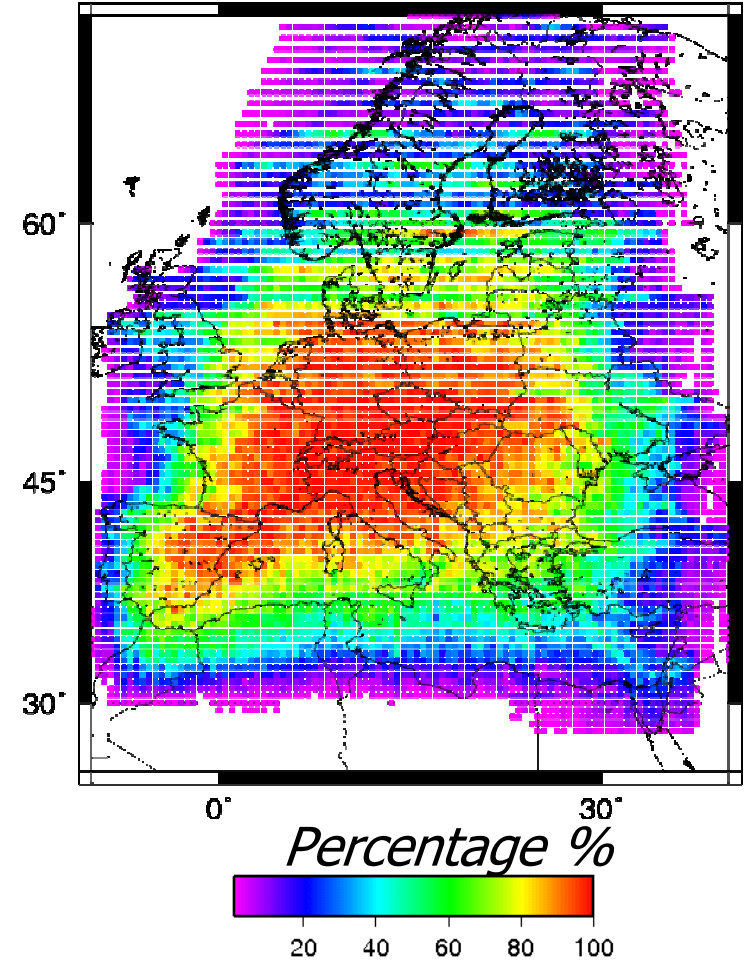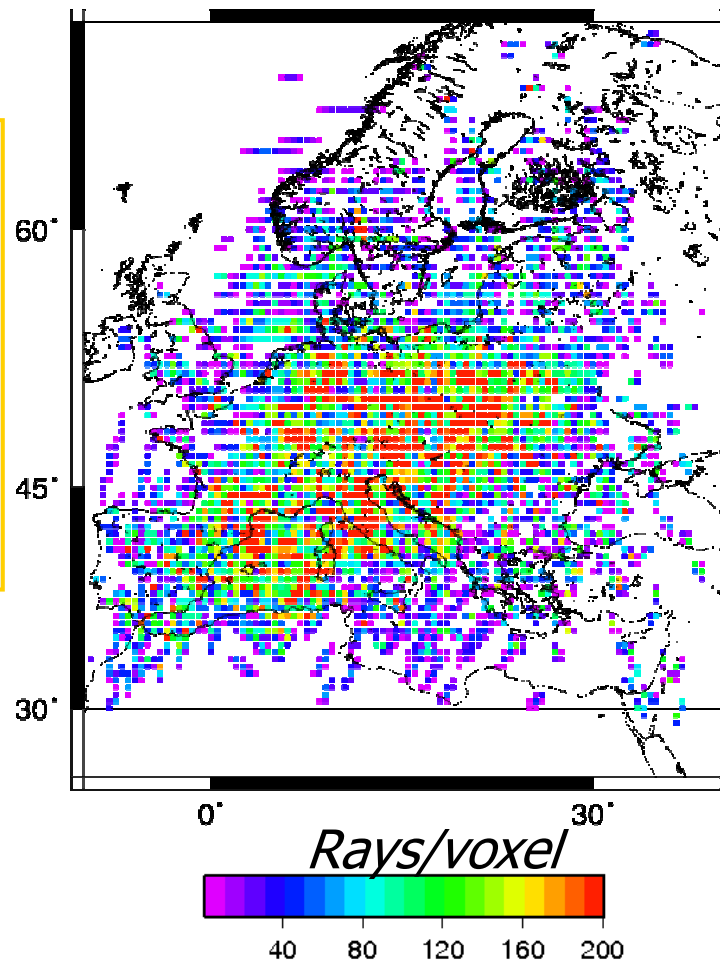
Present GPS signal distribution within the ionosphere above Europe using the EPN

In a grid of 0.5° x 0.5° x 30 km, at 300km height

For a given time span of 20 min (10h00 - 10h20)

% of epochs over a day for which the voxel is traversed by >5 rays

Central Europe is well covered at the peak electron concentration height (300 km) where most plasma disturbances occur.

Rays/voxel

Percentage %

Future multi-GNSS signal distribution within the ionosphere above Europe using the EPN

In a grid of 0.5° x 0.5° x 30 km, at 300km height

Compared to GPS-only observations:
• The mean number of rays increases by a factor of **2.5**.
• The number of voxels traversed by more than 5 rays over the whole day is increased by a factor of **13.2**.

For a given time span of 20 min (10h00 - 10h20)

% of epochs over a day for which the voxel is traversed by >5 rays

Rays/voxel

Percentage %