Belgian National Report

Royal Observatory of Belgium :

- contribution to the EUREF Permanent Network
- research field :
  - impact of Solar Radio Bursts (SRB)
  - analysis of the quality of GNSS Network-based Processing

National Geographical Institute :

- AGN (Active Geodetic Network)
- towards a new quasi-geoid and height-conversion model

Contribution to the EUREF Permanent Network

Manage the EUREF Permanent Network Central Bureau

Data analysis
- daily rapid
- final position
- tropospheric zenith path delay estimates

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Since August 2016
RINEX 3 (if available) instead of RINEX 2

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Since Jan. 2017, the new epn_14.atx antenna calibration model is used
Solutions are tied to the new IGS14 reference frame

Impact of Solar Radio Bursts (SRB)

Emitted close to the GNSS frequencies on GNSS receivers

Based on the Carrier to noise density (C/N_0) observations of each satellite-receiver pair from a regional network,

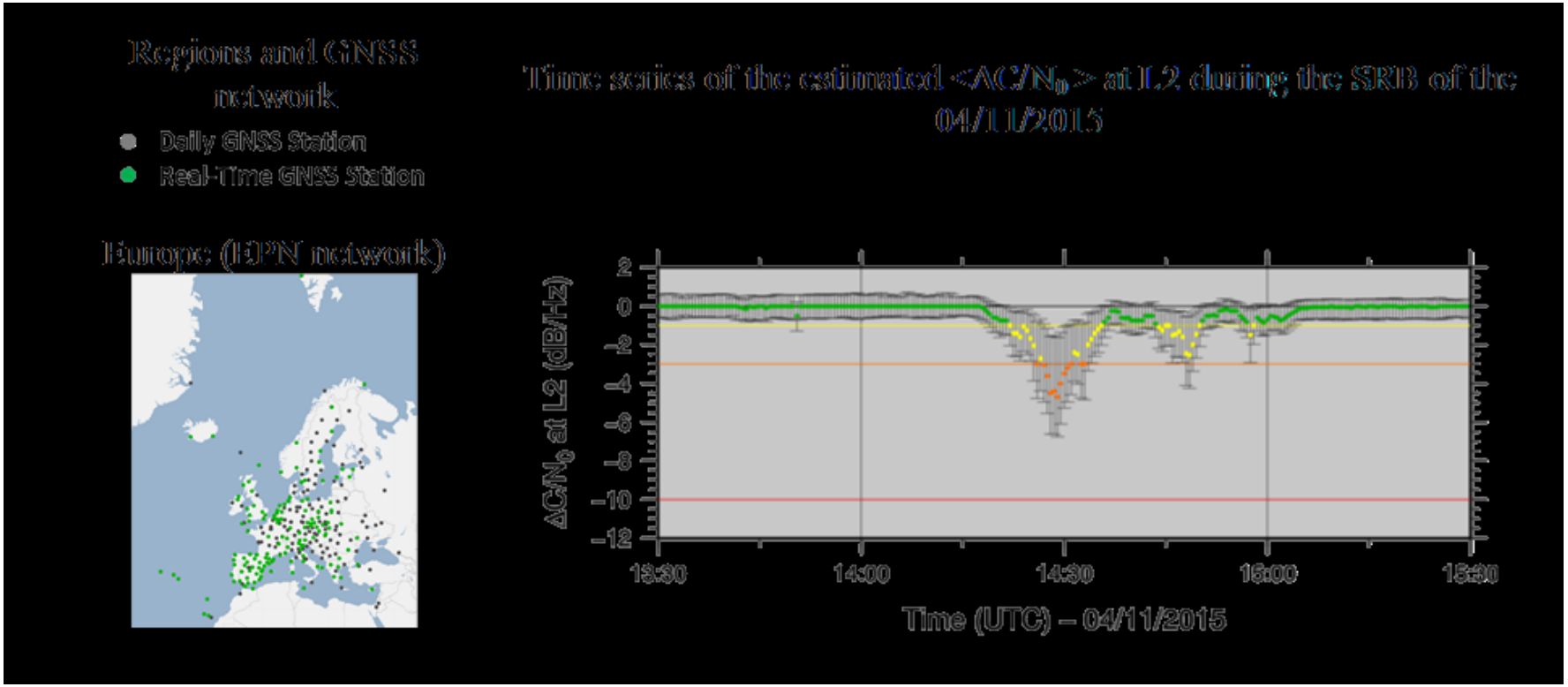
the median of abnormal C/N_0 fades ($<\Delta C/N_0>$ L1, L2) is estimated

Impact of Solar Radio Bursts (SRB)

Maintained a near-real time 4-level index alert

Level	GNSS ΔC/N0 Fade	Effect
Quiet	< 1 dB-Hz	None
Moderate	> 1 dB-Hz	SRB detected but should not impact GNSS applications
Strong	> 3 dB-Hz	Potential impact on GNSS applications
Severe	> 10 dB-Hz	Potential failure of the GNSS receivers

Impact of Solar Radio Bursts (SRB)



Analysis of the Quality of GNSS network-based processing

number of permanent GNSS stations increased significantly

need of a tool to handle and monitor the processing of big amount of data and meta-data by using Bernese V5.2

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"ROBER"

- extract significant "Key Performance Indicators" (KPI)

- store the metrics into database

- carry out statistical analysis, give reports, cross-check meta-data

- a number of decision models have been tested to identify and correct for situations of degradation of reliability and precision of the network

AGN (Active Geodetic Network)

Since 2002 daily and weekly solutions for the 67 permanent GNSS stations in Belgium

Results can be found on our website

Since the beginning of 2015, we are taking part in the EPN Densification project

1656 (2 October 2011) up to week 1932 (21 January 2017)

Towards a new quasi-geoid and height-conversion model

Height-conversion model in 2003
3000 GNSS-levelling points
Standard deviation of 2 cm

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Height-conversion model in 20??

3800 GNSS-levelling points

During first test doubts about homogeneity of our leveling netwerk

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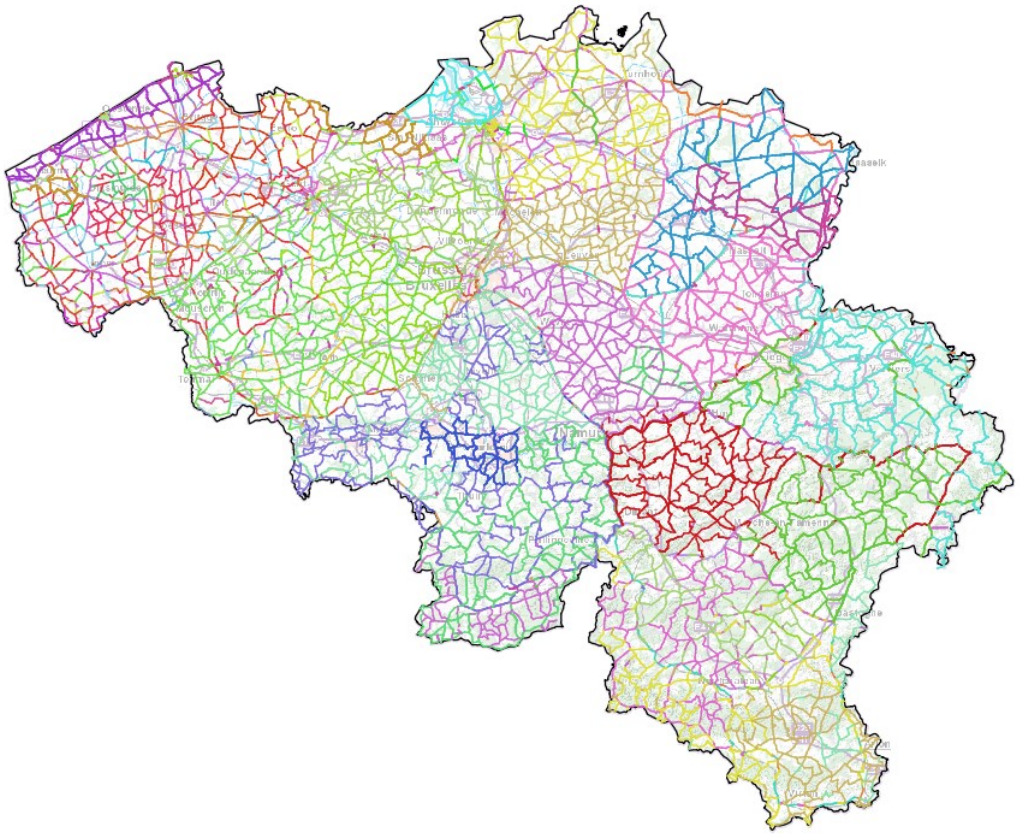

Observations between 1981 till 2000 (systematic)
Observations between 2001 and 2017 (problem areas)

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35891 observations
Fixing the fundamental point at the Royal Observatory of Belgium
Least squares method

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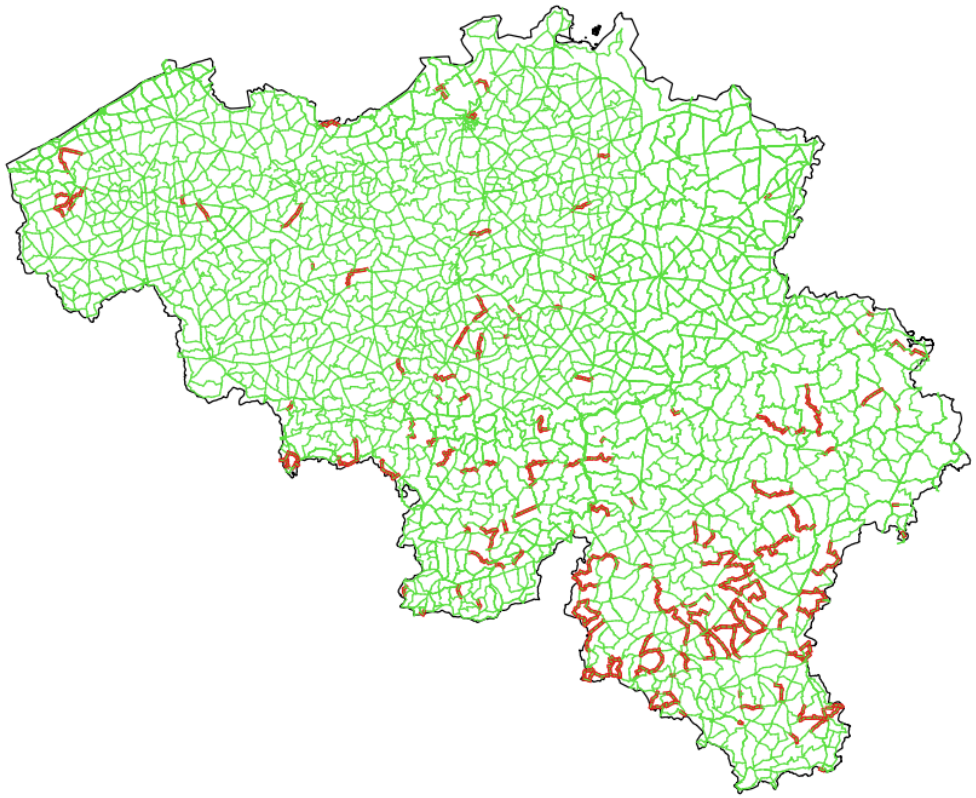

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Thank you