NATIONAL REPORT OF POLAND TO EUREF 2008

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Symposium of the IAG Subcommission for Europe
European Reference Frame – **EUREF 2008**
Brussels, Belgium, 18-20 June 2008

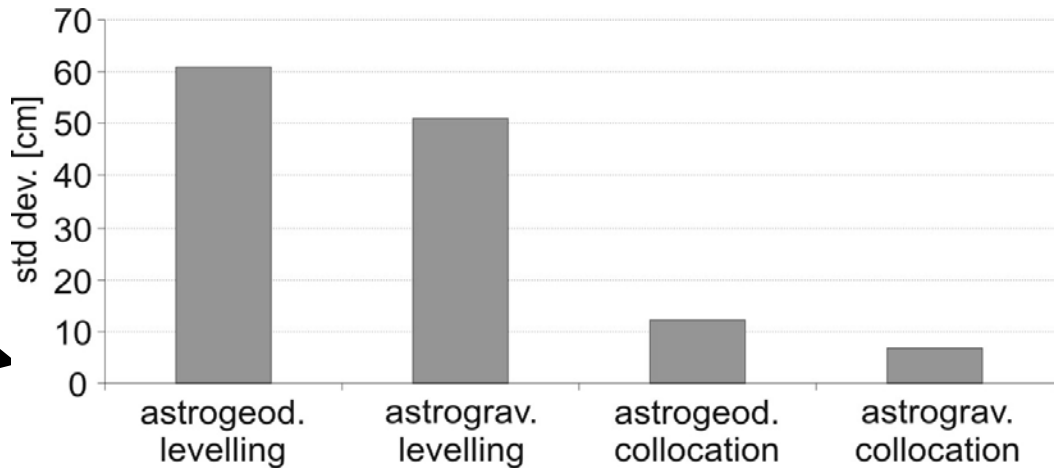
Outline

Main geodetic activities at the national level in Poland since 2006

- modelling a **cm geoid model** in Poland,
- maintenance of the national **gravity control**,
- operational work of **permanent IGS/EUREF stations**,
- data processing at **Local Analysis Centre at WUT**,
- activity within **EUREF-IP project**,
- GNSS **antenna calibration**,
- monitoring of **ionosphere** and ionospheric storms,
- GNSS for **meteorology**
- the **ASG-EUPOS** network in Poland,
- **Galileo** project,
- GNSS **applications**,
- activity in **SLR**.

Modelling a cm geoid for Poland

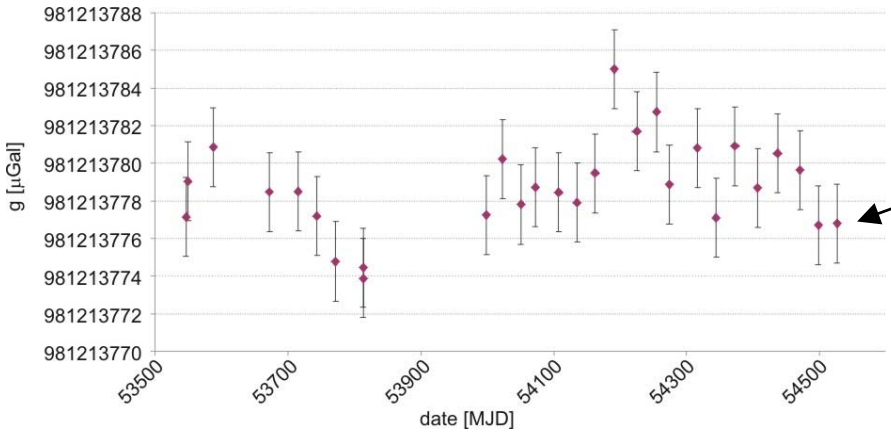
Re-visiting of
astro-geodetric geoid
and
astro-gravimetric geoid



Methodology
of quality assessment
of heights of gravity stations in Poland

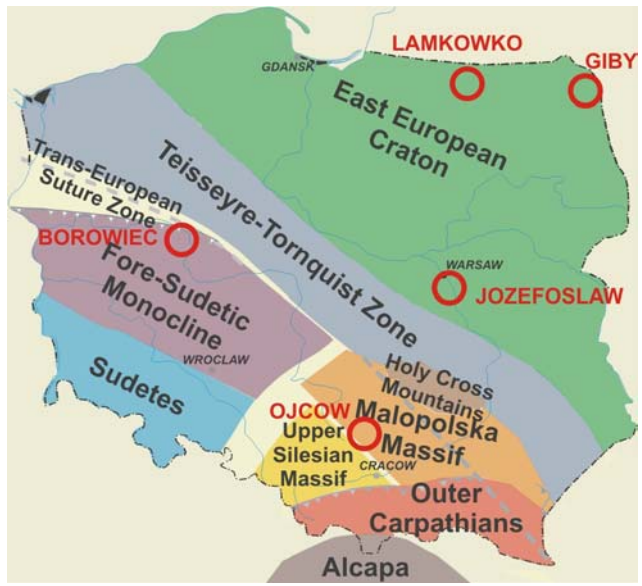
Optimisation
of the strategy
of the determination of terrain corrections in Poland

Maintenance of national gravity control (1)



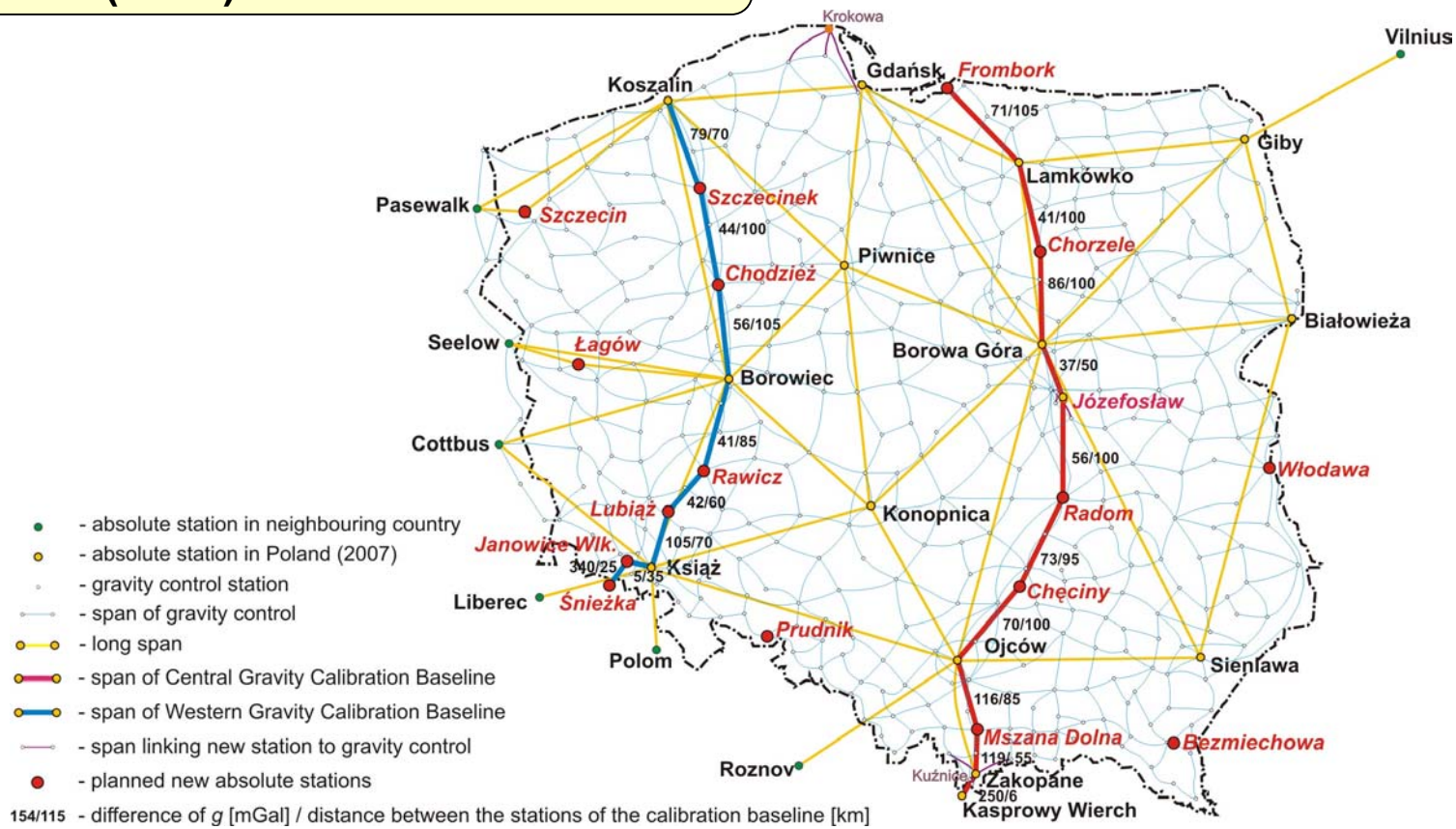
Absolute gravity measurements at Jozefoslaw

Absolute gravity stations in Poland included in the geodynamics research



Maintenance of national gravity control (2)

Modernised gravity calibration baseline in Poland (2007)



Operational work of permanent IGS/EUREF stations

EPN stations in Poland (2007):

- Borowa Gora (BOGI)
- Borowa Gora (BOGO)
- Borowiec (BOR1)
- Cracow (KRAW)
- Jozefoslaw (JOZE)
- Jozefoslaw (JOZ2)
- Katowice (KATO)
- Lamkowko (LAMA)
- Wroclaw (WROC)
- Zywiec (ZYWI)

Stations participating in EUREF-IP project:

- Borowa Gora (BOGI)
- Cracow (KRAW)
- Jozefoslaw (JOZ2)
- Wroclaw (WROC)

new EPN stations in Poland (2008):

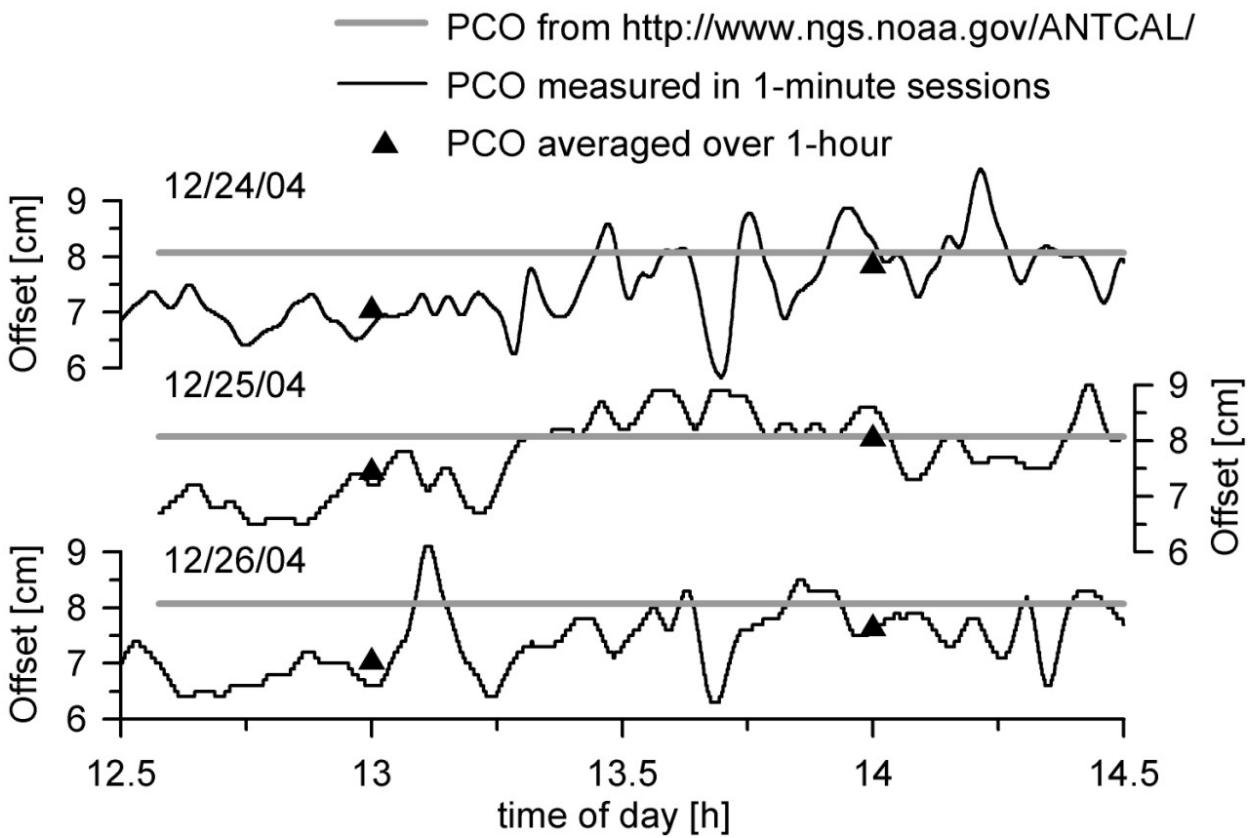
- Biala Podlaska (BPDL)
- Bydgoszcz (BYDG)
- Gorzow Wielkopolski (GWWL)
- Lodz (LODZ)
- Redzikowo (REDZ)
- Suwalki (SWKI)
- Ustrzyki Dolne (USDL)

Data processing at LAC at WUT

Data from 58 EPN stations - routinely processed

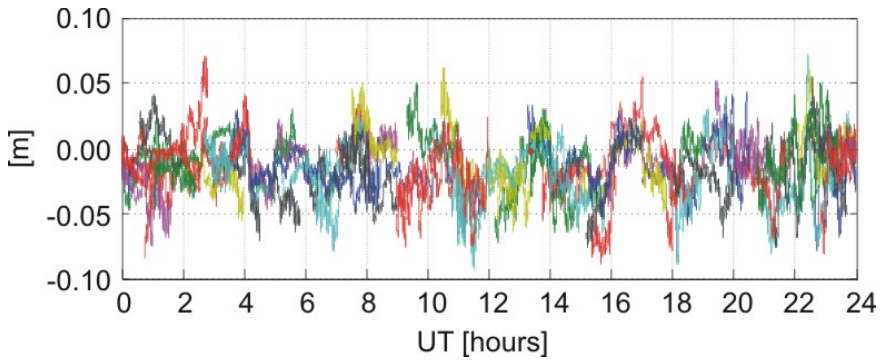
GNSS antenna calibration

The example of variations of phase centre offset averaged over observed satellites in one minute intervals
(*Institute of Geodesy and Cartography, Warsaw; Institute "Metrologia", Kharkiv***)**

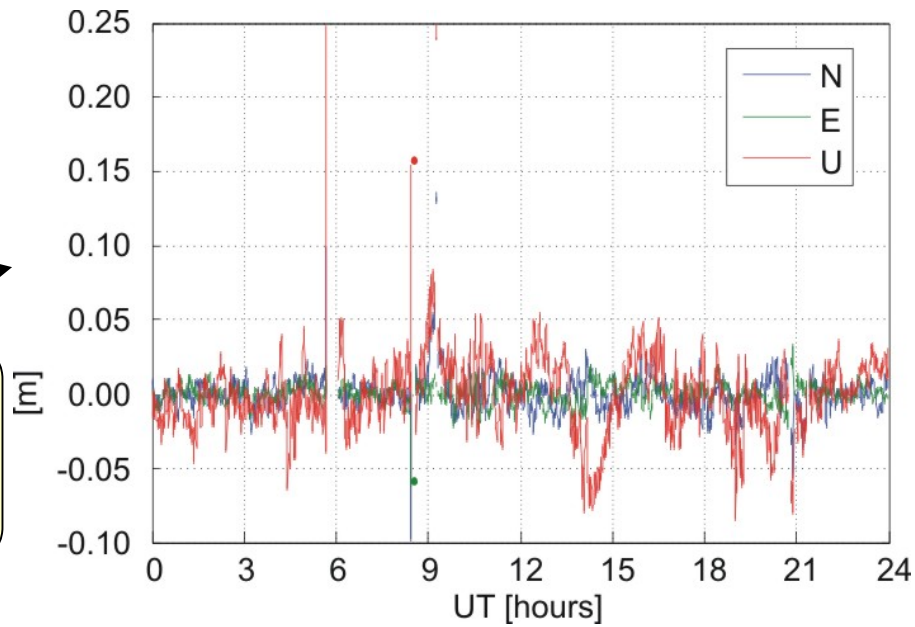


Monitoring ionosphere and ionospheric storms

Estimation of accuracy of the double difference ionospheric corrections from the predictive model UWM-IPM over 50 km baseline (*comparison with the true, observed DD ionospheric delays*)



Accuracy of the kinematic positioning with the application of the DD ionospheric corrections over 50 km baseline



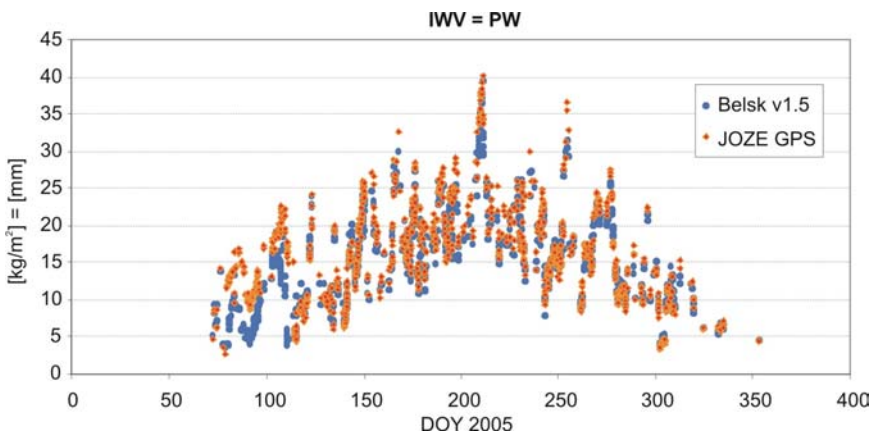
GPS for meteorology

Search for optimum solution for tropospheric tomography with the use of Zenith Tropospheric Delays estimated from the GPS network

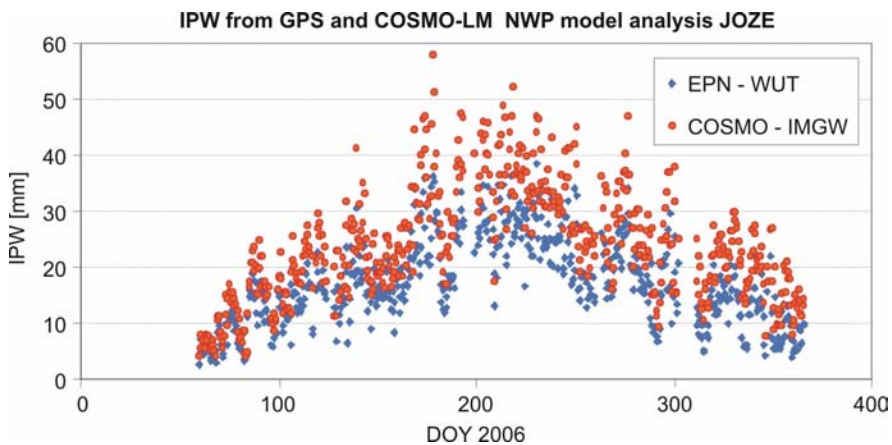
Determination GPS slant delay using data from mesoscale non-hydrostatic models of the atmosphere

Analysis of the of IPW time series obtained from different sources

Integrated Precipitable Water validated by sunphotometer data



Integrated Precipitable Water from EPN WUT LAC and from numerical weather prediction model COSMO-LM input data



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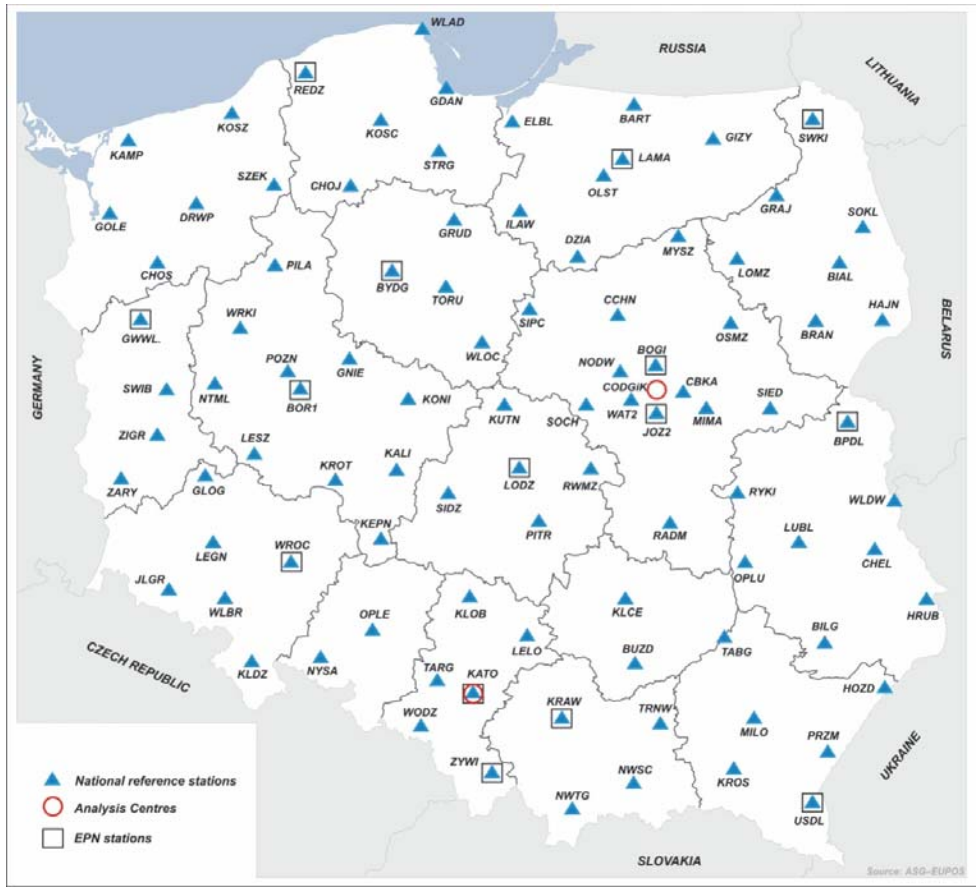
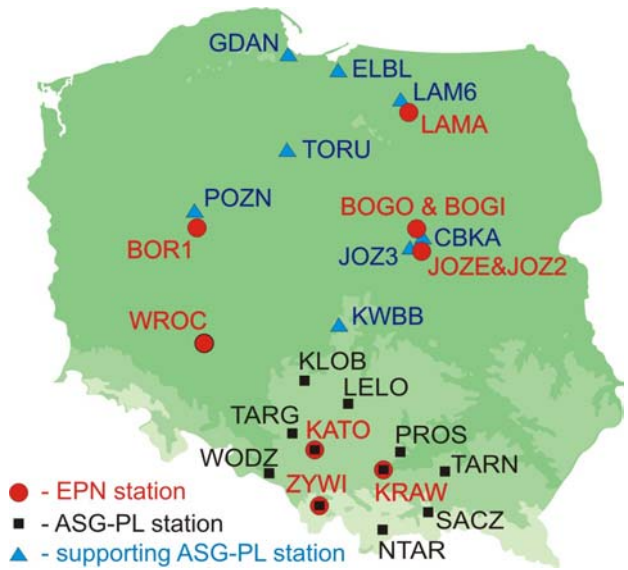
ASG-EUPOS network in Poland

Polish Active Control Network for Upper Silesia and Malopolska region operating in 2007

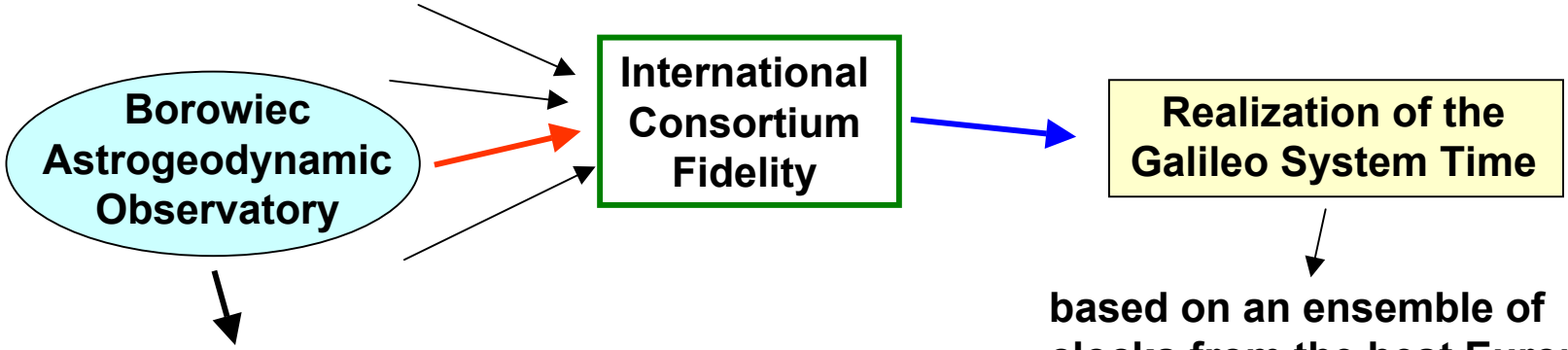
Reference stations (98) of the Polish part of the EUPOS network



ASG-PL stations and collaborating stations (end of 2006)



Galileo Project



Two methods of time transfer will be applied:

1. **GPS/Galileo P3 (iono-free) method according to the CGGTTS standards of Common View method (uncertainty: RMS<1.5 ns)**
2. **Two Way Satellite Time and Frequency Transfer (TWSTFT), the method using geostationary telecommunication satellite for time transfer (uncertainty: RMS<1 ns)**

Satellite Laser Ranging

Borowiec station operates within ILRS and EURULAS

in 2007:

- ~465 successful passes of 20 SLR satellites with the normal point precision of 3 mm and accuracy of 10 mm
- renovation of the laser building and significant modernization of the hardware and software of the SLR system
- determination of satellite spin parameters based on Graz kHz laser data
- determination of the positions and velocities of all SLR stations for 1999-2004 for Starlette, STELLA, and Ajisai
- determination of SLR station positions from 5 years of LAGEOS data
- fully automatic orbits calculation using GEODYN-II