

The transnational geo-scientific initiative GURN (GNSS Upper Rhine Graben Network) - Recent results and future plans

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Continuation and extension of successful former projects

Main goal of GURN

First all-embracing and consistent scientific processing and analysis of data of permanent operating GNSS sites in the area of the Upper Rhine Graben

In addition: geodetic research playground

- Data processing
- GNSS modelling
- Fusion of sensors

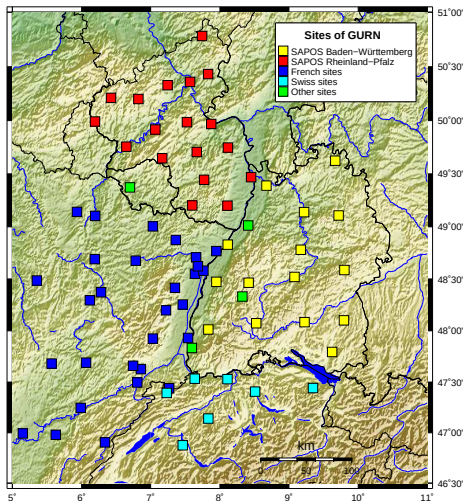
URG network: various data providers

24 h / 7 days, data resolution: 15-30s



- Germany
 - SAPOS® Baden-Württemberg
 - SAPOS® Rheinland-Pfalz
 - BFO, BKG
- France
 - RENAG
 - RGP
 - Teria
 - Orpheon
 - EOST
- Switzerland
 - swisstopo

$\Sigma \approx 75$ sites



Different monumentations: buildings ($\approx 75\%$)

⇒ Various heights above ground



Site BIBE



Site IFFE



Different monumentations: pillars ($\approx 25\%$)

$\Rightarrow$ 1-4 m above ground



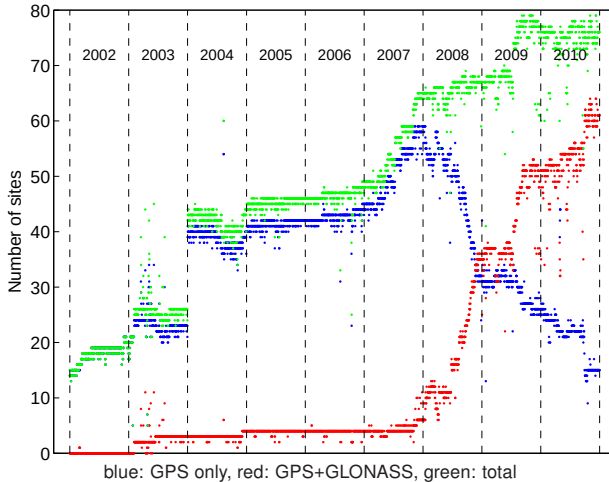
Site AUBU



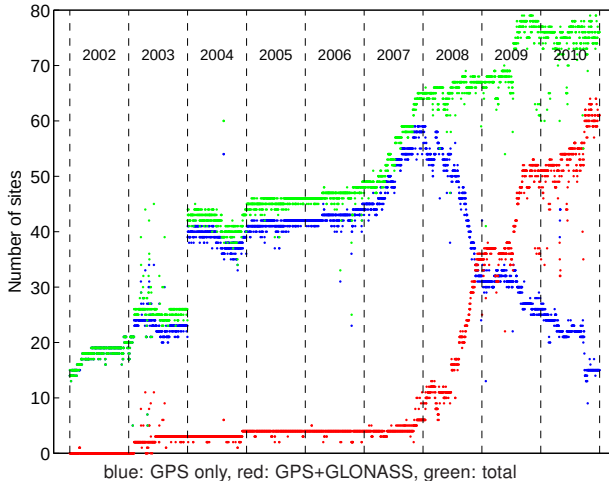
Site BFO1



Available GNSS data GURN



Available GNSS data GURN



Various consequences, esp. data processing, pseudo-deformation

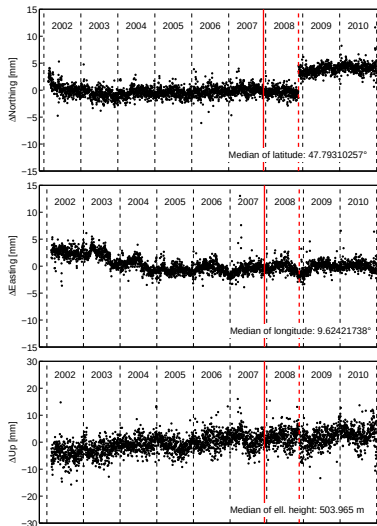
	EOST	GIK		LGL
Software	GAMIT/GLOBK Version 10.4	Bernese Version 5.0		Bernese Version 5.0
Strategy	differential	differential	PPP	differential
Orbits	IGS final	CODE Repro CODE final		IGS final
Antenna modelling	abs. ind. abs. IGS	abs. ind. abs. IGS		abs. ind. mean (Geo++)
Frame	ITRF2005	ITRF2005		IGS05/ITRF2005
Solutions	daily	daily weekly		weekly

Robust and accurate geodetic products:
e.g., coordinates, troposphere parameters (+ precision)

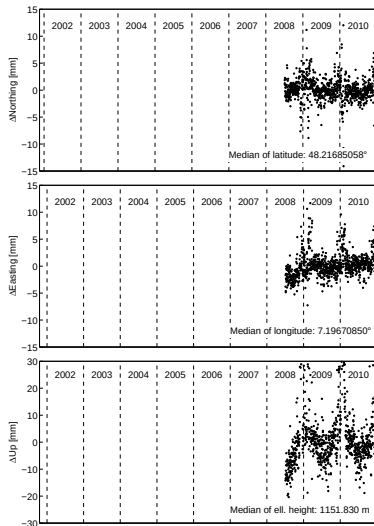
Examples for coordinate time series



Site RAVE



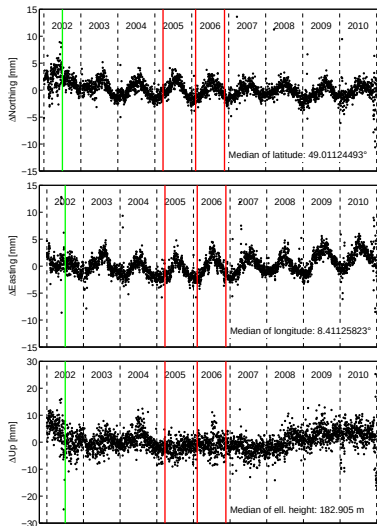
Site AUBU



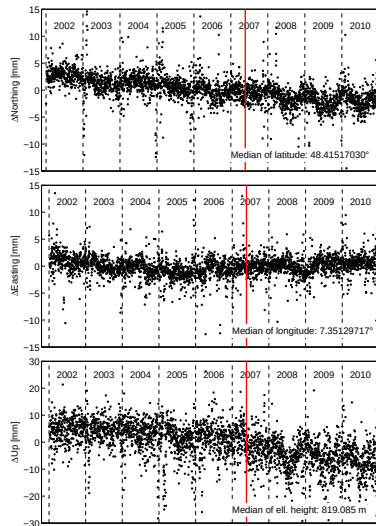
Examples for coordinate time series



Site KARL



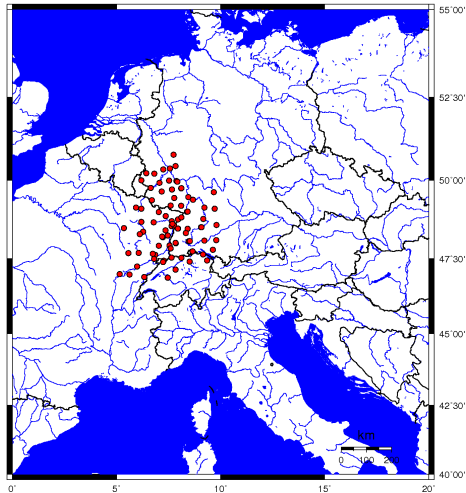
Site WLBH



BL definition: standard (OBS-MAX)



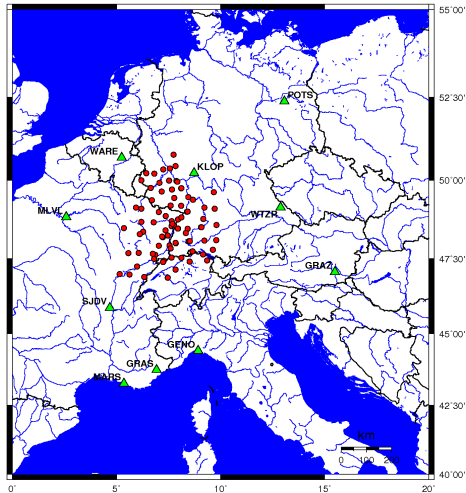
Sites of GURN



BL definition: standard (OBS-MAX)



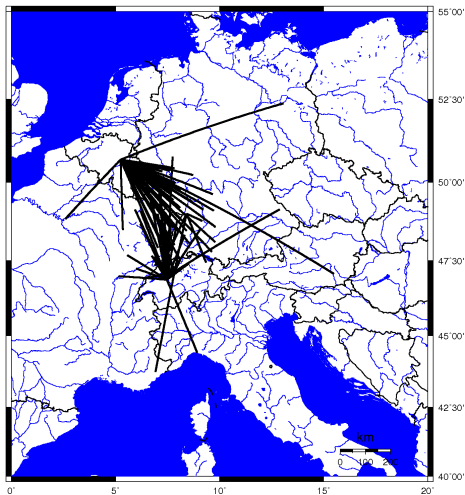
Sites of GURN and EPN



BL definition: standard (OBS-MAX)

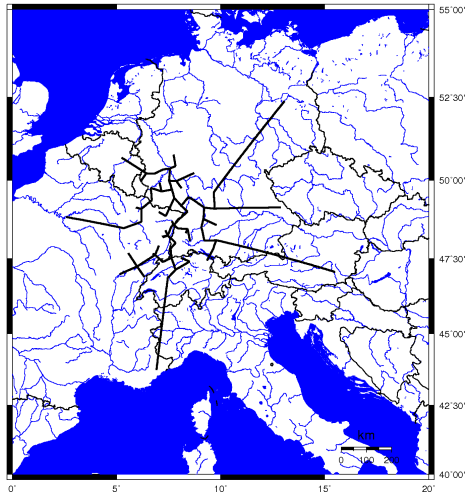


GURN: baselines 001 2010

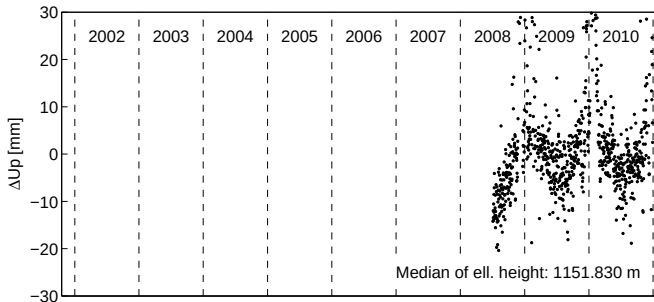


- 1 Extracting number of observations and separation
- 2 Forming baselines from EPN to GURN sites (shortest)
- 3 Forming baselines for "bad" GURN sites
- 4 Forming baselines for remaining GURN sites (shortest)
- 5 Combining all baselines sets

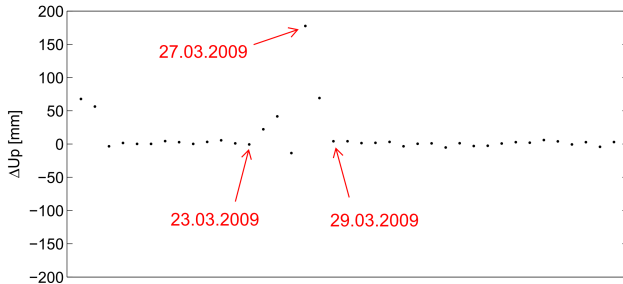
GURN: baselines 001 2010



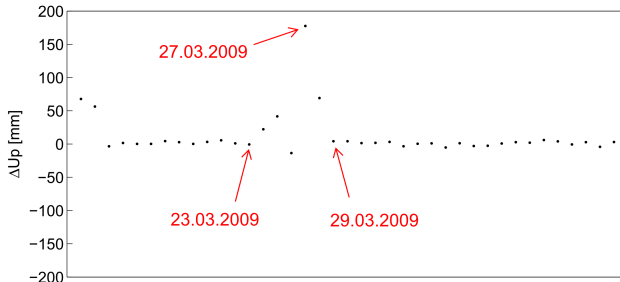
AUBU: Difference to median, GIK daily solutions



AUBU: Difference to median, GIK daily solutions, 10.03.-19.04.2009



AUBU: Difference to median, GIK daily solutions, 10.03.-19.04.2009



23.03.2009



26.03.2009



27.03.2009



29.03.2009

Derived high quality products



- Coordinate time series
- Troposphere estimates
- Residuals

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Further goals

- Integration of GLONASS
- Improved Residuals $\Rightarrow$ Stacking $\Rightarrow$ Water vapour
- Hybrid deformation analysis: GNSS + InSAR + Levelling

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