National Report of Switzerland

E. Brockmann et al.

wissen wohin
savoir où
sapere dove
knowing where

swisstopo

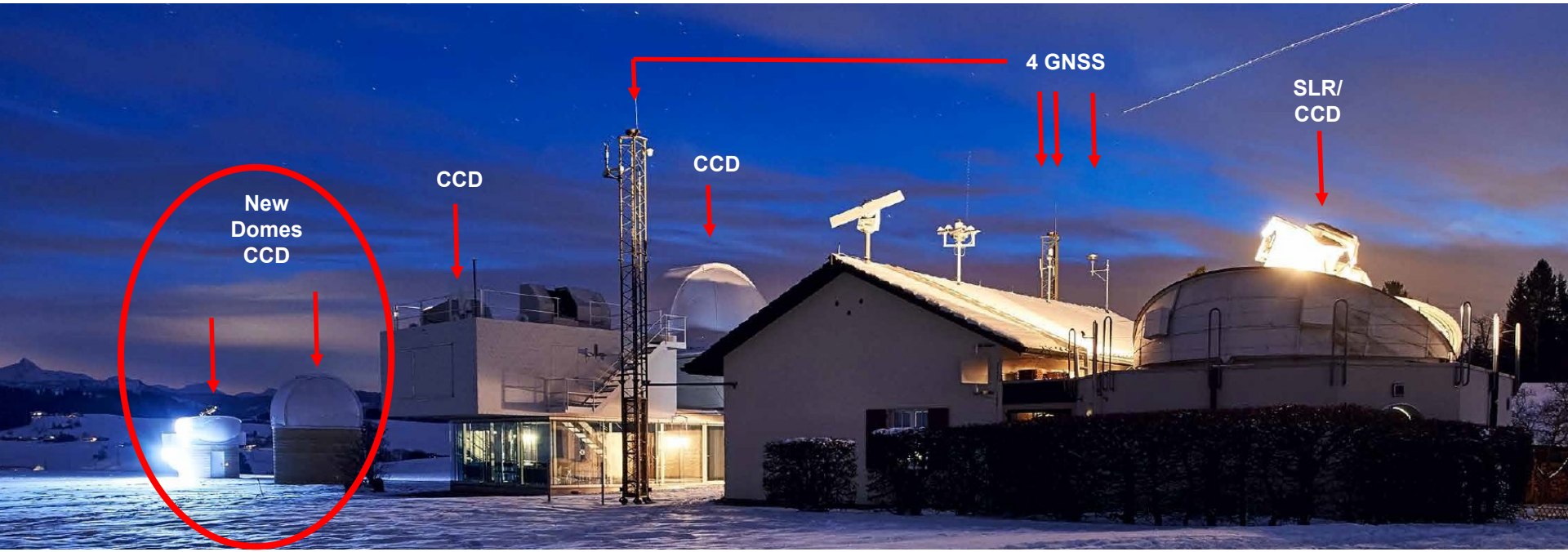
«Repère Pierre du Niton» (Geneva)
as **reference point** of the Swiss height system **LN02**

«Aarburg»
Zero velocity for height system **LHN95**

Reference point for height system **LHN95**

Zimmerwald

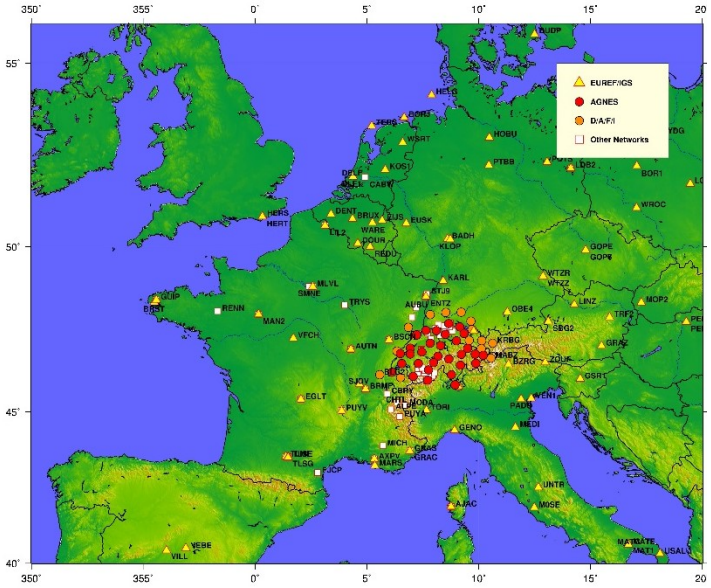
- 4 GNSS stations (ZIMM, ZIM2, ZIM3, ZIMJ) actively delivering data to IGS/EPN
- SLR stable since March 2017
- 2 new domes (for space debris / CCD) – inaugurated to public THIS week

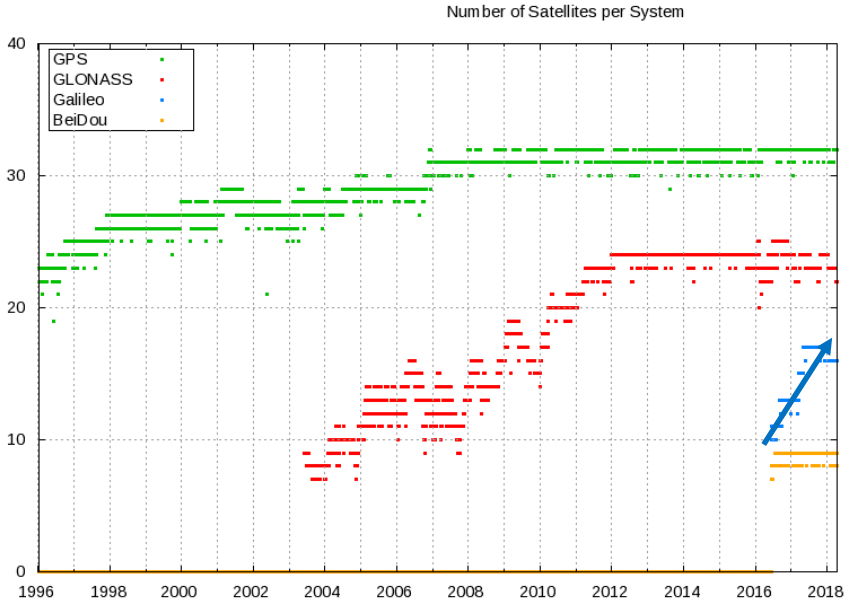


Analysis Center

http://pnac.swisstopo.admin.ch

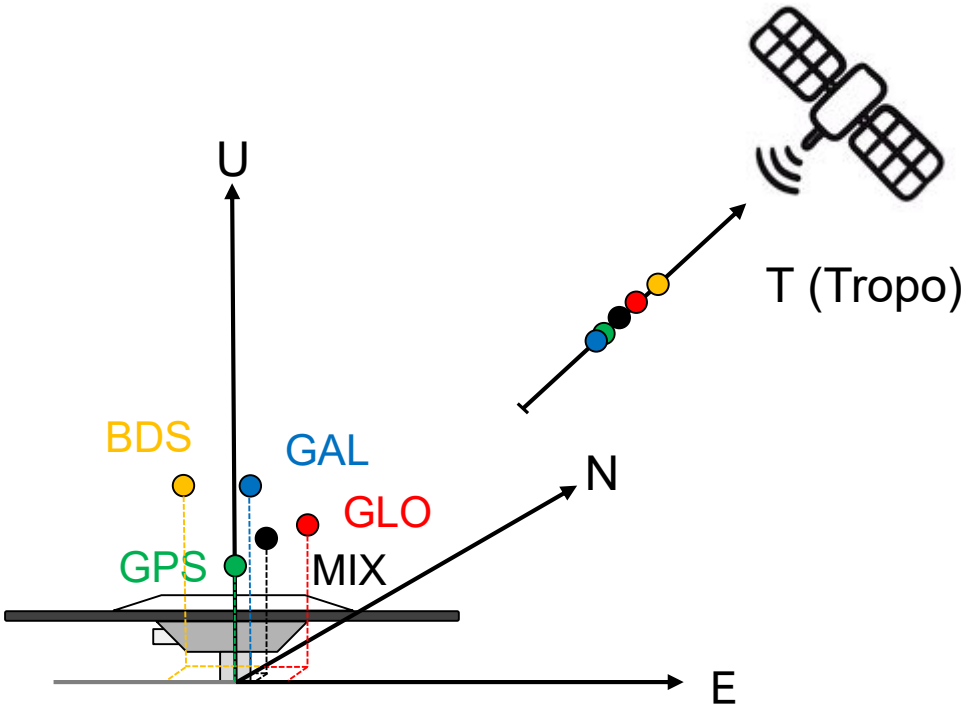
- Multi-GNSS processing established (based on BSW53; GPS+GLO+GAL+BDS) since Mid 2016
  - Campaign (200 passive stations observed + analysed)
  - Permanent network AGNES + EPN
  - May 2018: >80 GNSS satellites in daily processing



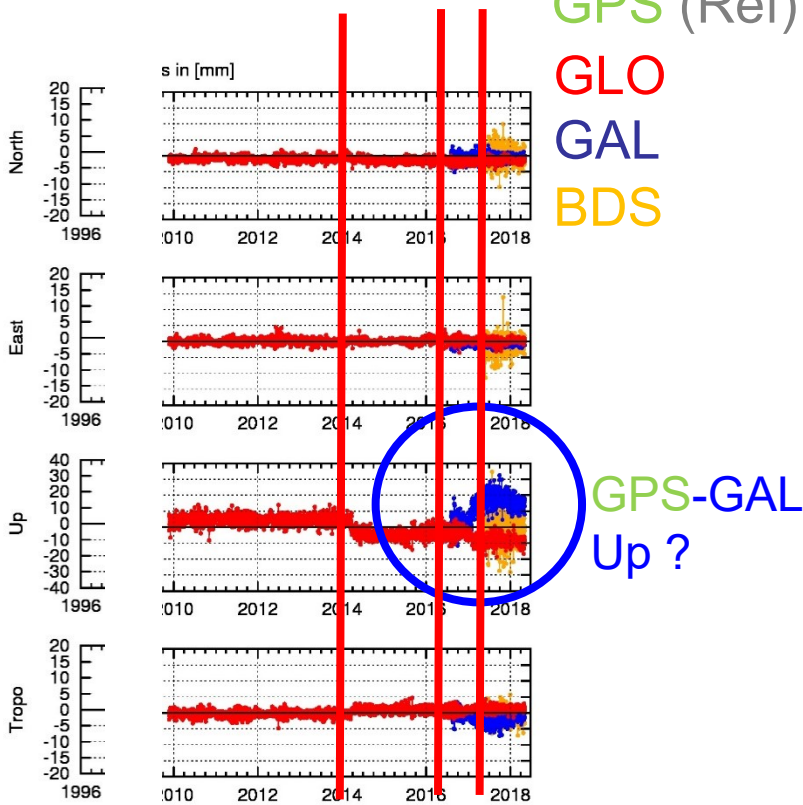


Analysis Center (2)

- Multi-GNSS: **I**nter **S**ystem **T**ranslation **P**arameter Monitoring

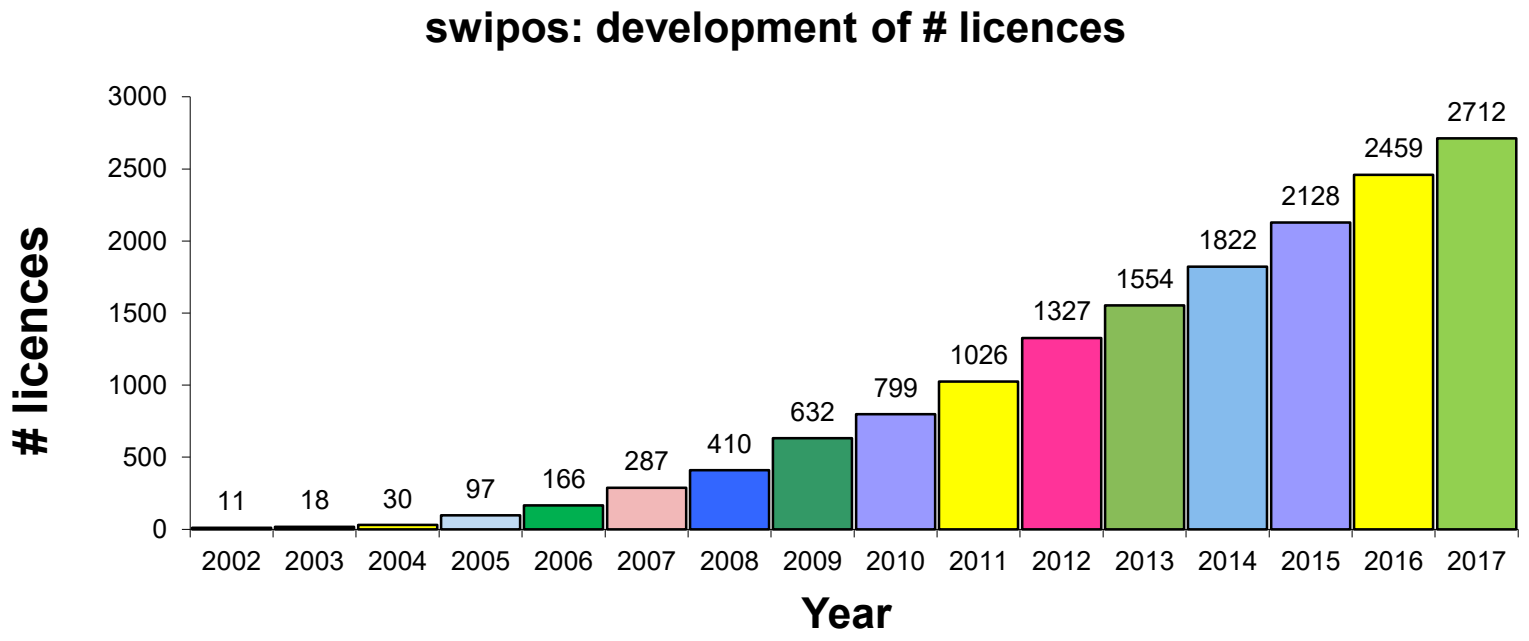


Example: ISTPs EUSK

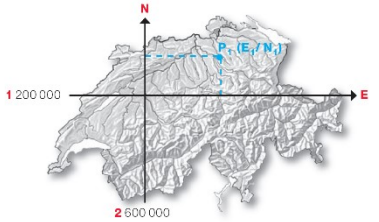


Swiss Positioning Service swipos

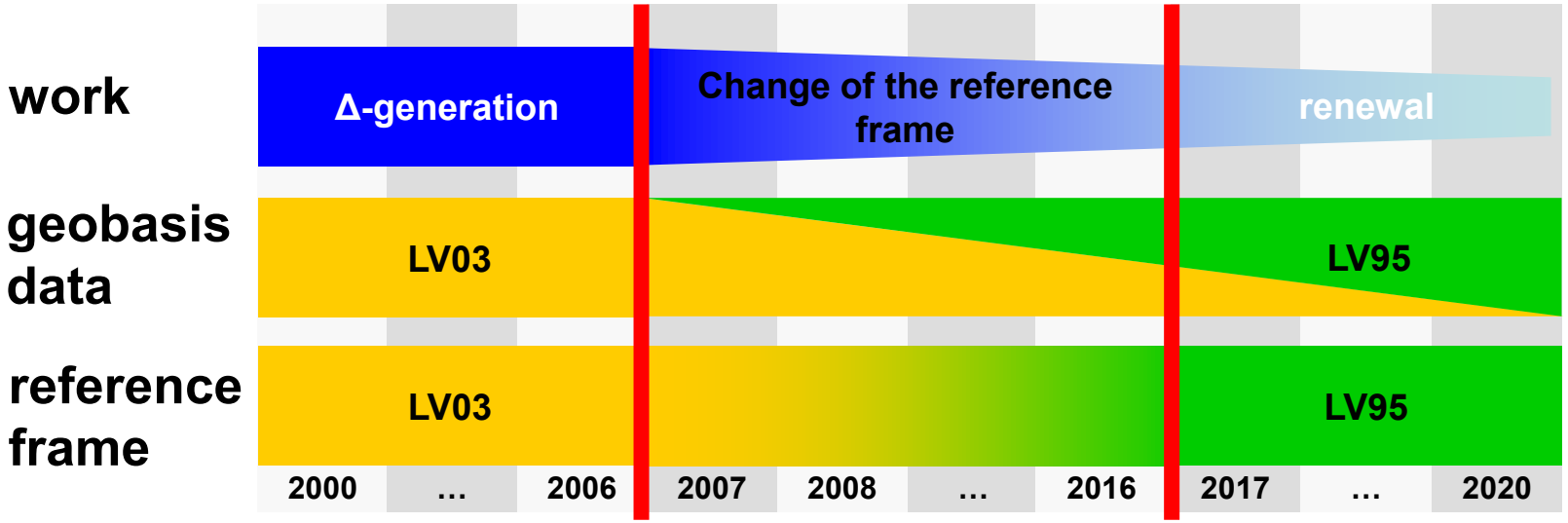
- Integration of BeiDou and Galileo in the Trimble Pivot Platform – Software (TPP 3.10) in June 2017; Trimble RTXNet – Processor Trimble RTX Real-time Orbits
- New RTCM 3.2 MSM mountpoints (GPS/GLO/BDS/GAL) are used by 10% users, GPS/GLO only mountpoints used by 90% of users



Swiss Reference Frame CHTRF95/LV95



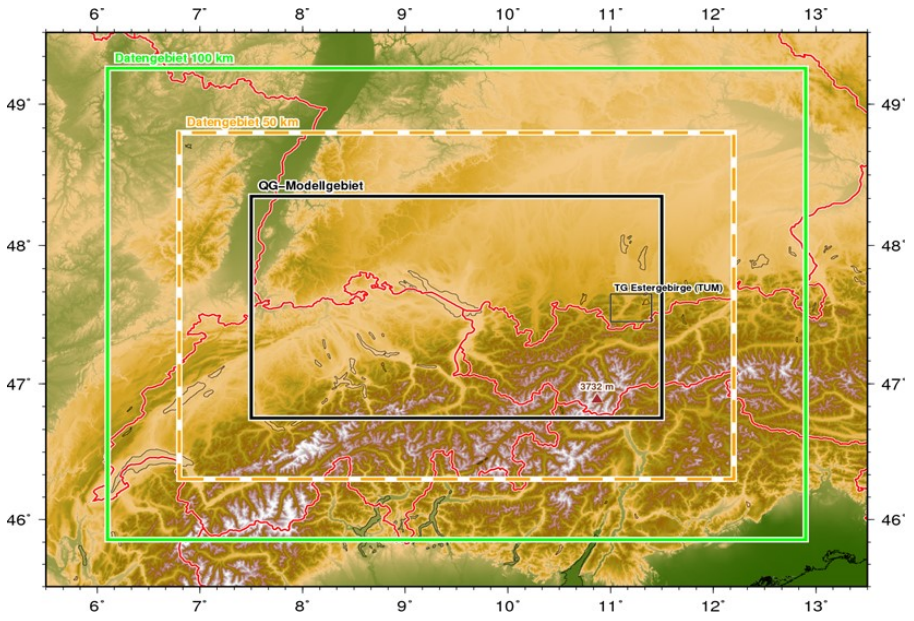
- LV95 reference system defined 1995 (ETRS93)
- Geographic information law coming into force 5 Oct 2007
- Transitions phase for LV95: 2016 for geobasis data regulated by federal law; 2020 for all geobasis data



25 years implementation time

D-A-CH Geoid

- Common geoid determination of Germany, Austria and Switzerland (Lake Constance)
- Partners: BKG, BEV and swisstopo with the participation of TU Graz and the states of Baden-Württemberg and Bavaria
- Free data exchange of gravity, DEMs and GPS/Levelling
- Each institution calculates its own solution with their own method and software with the same data set
- Possibility to extend the project to an “Alpine geoid determination” with further partners (France, Italy, Slovenia, ...)



New Base Data Set “Deformation” based on Space-borne SAR Interferometry for entire Switzerland

- Determination of a new base data set for the early detection of mass movements / landslides in entire Switzerland
- A comparison of GNSS- and DInSAR data sets in a land slide area above the new Gotthard base tunnel for the last 20 years showed the potential of this remote sensing technology
- A feasibility study was compiled by the Earth Observation and Remote Sensing Group of ETH Zürich end of 2017
- In April 2018, the Swiss government gave the financial and personal resources free for the realisation of a national platform natural dangers
- Next steps:
  - Realisation of a market analysis with the stake holders
  - Establishing of a realisation concept
  - Equipment of some CORS stations with reflectors / transponders
  - Start of a test project in a mountainous area