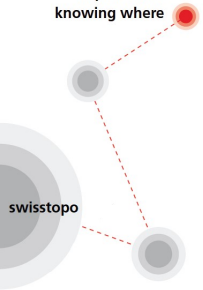




Schweizerische Eidgenossenschaft
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Federal Office of Topography swisstopo

wissen wohin
savoir où
sapere dove
knowing where



National Report of Switzerland EUREF 2019 Symposium

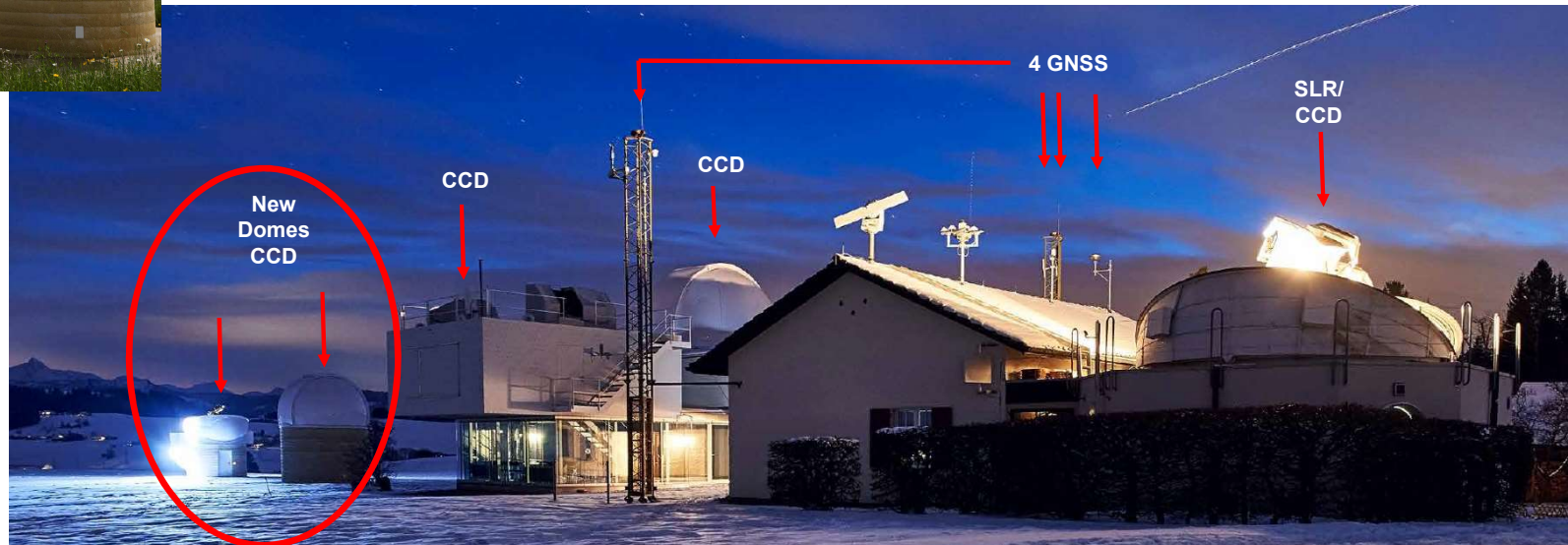
E. Brockmann et al.



Zimmerwald



- 4 GNSS stations (ZIMM, ZIM2, ZIM3, ZIMJ) actively delivering data to IGS/EPN
- SLR stable operation (laser replacement planning)
- 2 new domes (for space debris / CCD) – inaugurated to public a year ago

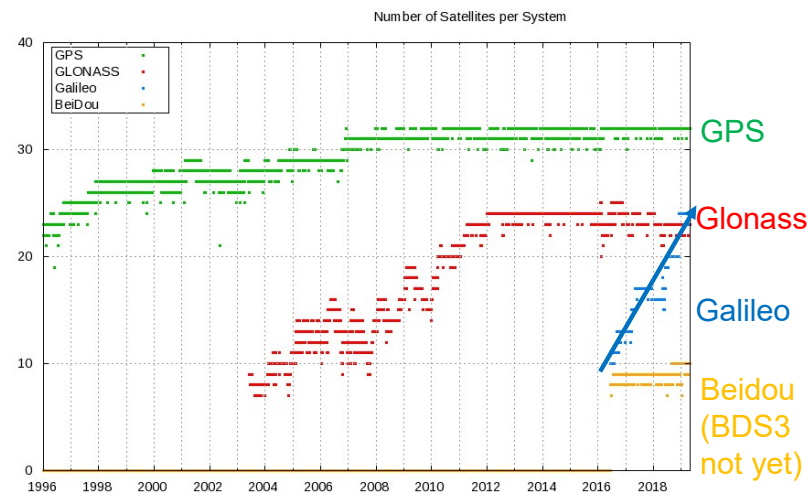
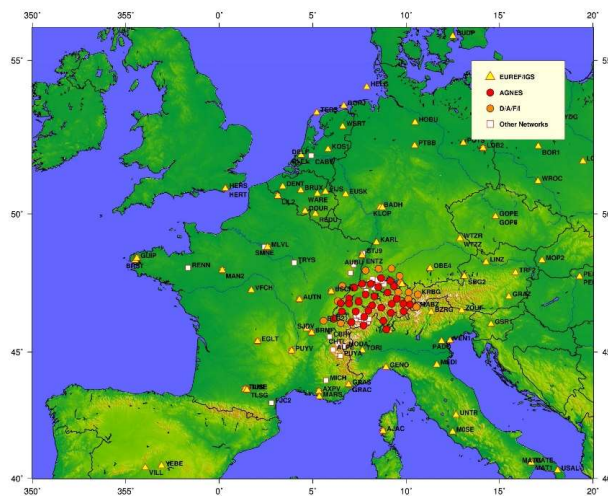




Analysis Center

<http://pnac.swisstopo.admin.ch>

- Multi-GNSS processing established (based on BSW53; GPS+GLO+GAL+BDS) since Mid 2016
- Passive sites (200): CHTRF2016 solution published
- Permanent network AGNES + EPN + IGS: hourly and daily products -> EUREF, EUMETNET





Publication CHTRF2016 on pnac web

<http://pnac.swisstopo.admin.ch/pages/en/chtfr.html>

Federal Administration > Department: VBS
Schweizerische Eidgenossenschaft
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Federal Office of Topography swisstopo
Eidgenössisches Amt für
Permanente Netzwerke Analysis Center

CHTRF95

The reference frame CHTRF95 is realized by about 200 points which were selected in order to guarantee a stable location. All points are suited for GNSS measurements. This passive network defines the Automated GNSS Network for Switzerland (AGNES).

Goals

The main goals are:

- The LV95 network realizes the Swiss reference frame CHTRF95. It serves as the basis for cantonal authorities and for municipalities for further densifications.
- Every 6 years, the network is re-measured in order to validate the stability of the reference points.
- CHTRF95 is currently defined as a static reference frame. Beside official LV95 coordinates also scientific CHTRF coordinates are computed which take into account possible movements of points. Also velocities for each point are computed and published.

Map with details:

Object-Information

CHTRF2016 stations and velocities (1234.100)

Point number: 1234.100
Point name: Zervvellaase
Point cat.: LV95 Hauptpunkt
Point info: [fpds-protocol](#)
Geographic coordinates: (WGS84)
Latitude: 46.571266 °
Longitude: 9.112159 °
Height: 2035.141 m
Geocentric coordinates: (CHTRF95/ETRF93)
X: 4338372.775 m
Y: 695839.015 m
Z: 4610607.984 m
Swiss coordinates: (CH1903+)
N: 1159144.214 m
E: 2728289.747 m
H: 1984.279 m
Geoid (CHGeo04): G: 1.932 m
Swiss velocities: (CH1903+)
vE: -0.8 mm/yr
vN: 0.1 mm/yr
vH: 1.6 mm/yr
dt: 25.0 years
Skyspot: [skyspot](#)
Repeatability: [repslot](#)
2728289.810, 1159144.263, 2035.1

Numerical values (coordinates at epoch 2018.0, horizontal velocities w.r.t. ZIMM, vertical velocities w.r.t. Europe, coordinates of AGNES sites available on individual station web page, are permanently updated and may change with changing instrumentation on the site)
published on July 9, 2018:

Number	Name	Swiss coordinates E, N, H, Geoid in m	Swiss Vel in mm/yr	ETRS fpds-protocol	Skyspot skyspot	Rep. repslot	Map
1811.826	Wälsch	E: 269508.556 N: 1254377.753 H: 704.856 G: 2.342	vE: 0.1 vN: -0.1 vH: -0.2	fpds-protocol	skyspot	repslot	Map
1812.698	Hahnenkai	E: 2702439.298 N: 1291348.751 H: 694.987 G: 1.176	vE: 0.0 vN: -0.2 vH: 0.0	fpds-protocol	skyspot	repslot	Map

10 km CH1903+ / LV95 Koordinaten (m): 2738700.0, 1163800.0

Ort suchen oder Karte hinzufügen:
Q z.B. Bundesplatz 1 Bern, 46.7 7.5, Lärmkarte ...

Vollbild Problem melden Hilfe Mobile Version DE FR IT EN RM

Object-Information

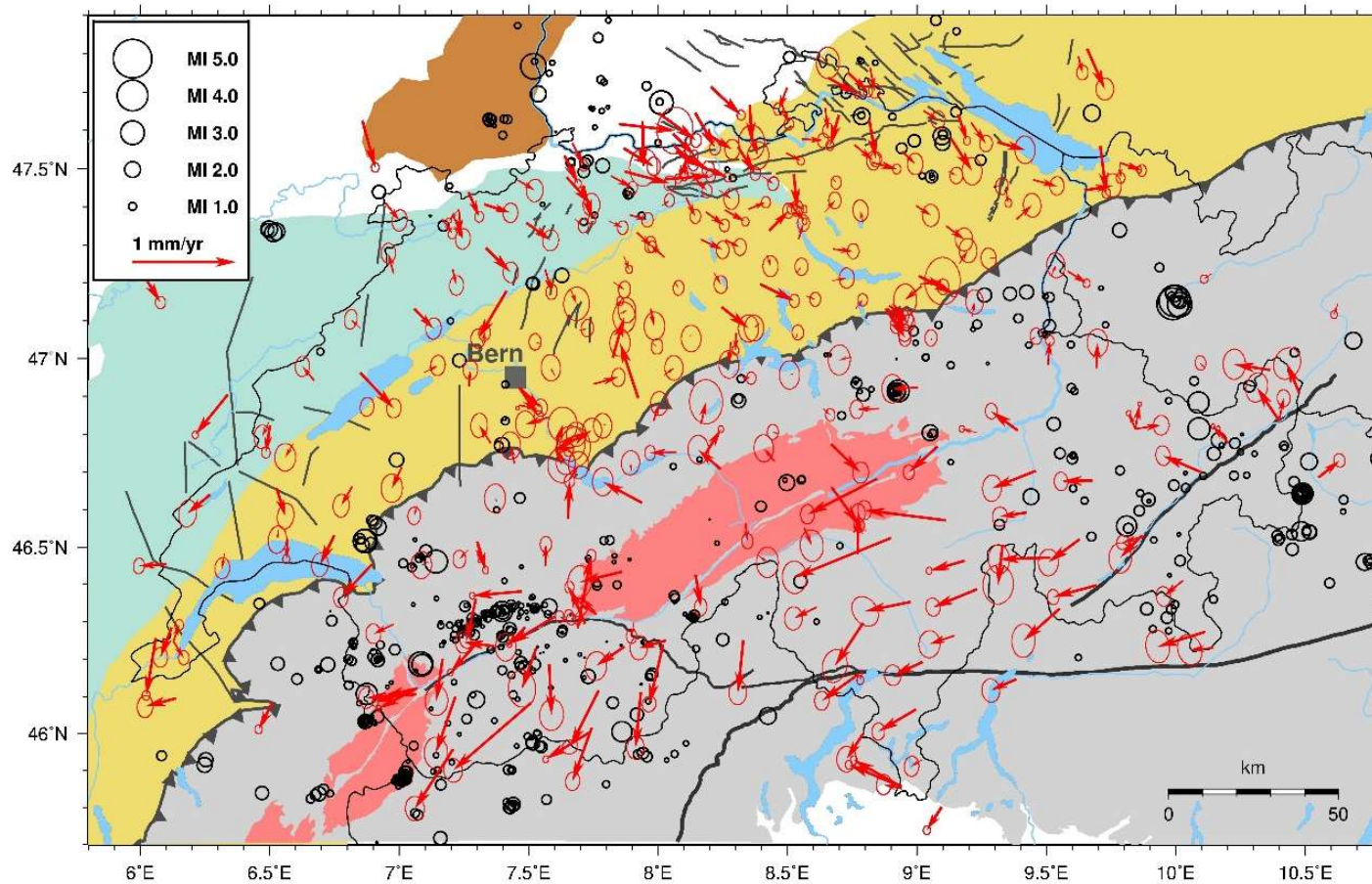
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Skyspot: [skyspot](#)
Repeatability: [repslot](#)
2728289.810, 1159144.263, 2035.1

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geo.admin.ch Copyright & Datenschutzerklärung



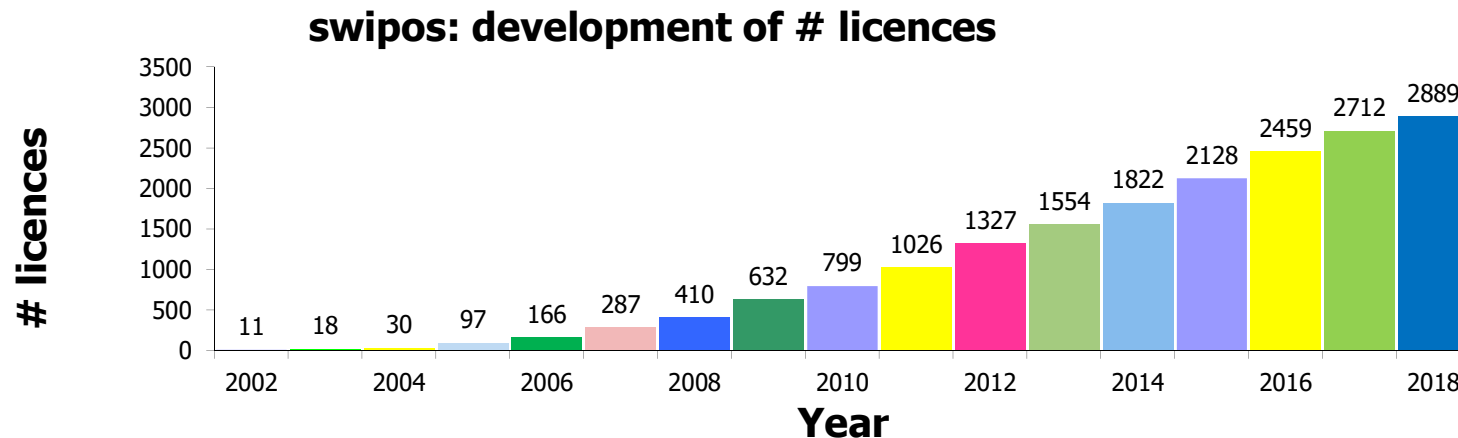
Correlation with Geology / Seismology





Swiss Positioning Service swipos

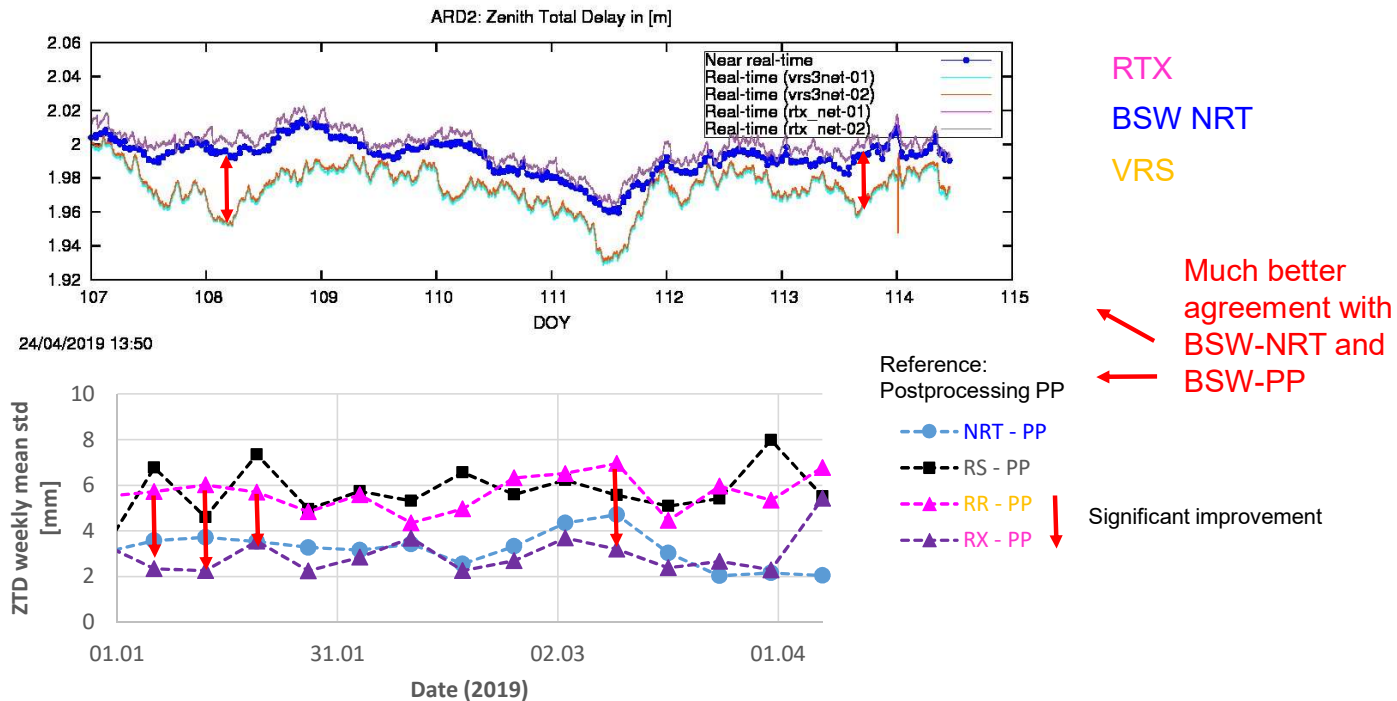
- Integration of BeiDou and Galileo in the Trimble Pivot Platform – Software (TPP 3.10) in June 2017; Trimble RTXNet – Processor Trimble RTX Real-time Orbits
- New RTCM 3.2 MSM mountpoints (GPS/GLO/BDS/GAL) are used by 10% users, GPS/GLO only mountpoints used by 90% of users





Benefit of real-time Multi-GNSS for GNSS-Meteorology

- Real real-time contribution to EUMETNET switched to Trimble from VRS3 (differential, GPS+GLO) to RTX (PPP, Multi-GNSS)





Multi-GNSS antenna calibrations

- Collaboration with ETHZ (phd D. Willi)
- Validation campaign with 2 swisstopo field antennas 518, 519 using 3 PCV mod.
 - ground truth comparison
 - Intersystem parameter checks

