Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

armasuisse
Swiss Federal Office of Topography swisstopo

National Report of Switzerland

E. Brockmann, D. Ineichen, M. Kistler, U. Marti,
S. Schaer, A. Schlatter, B. Vogel, A. Wiget, U. Wild

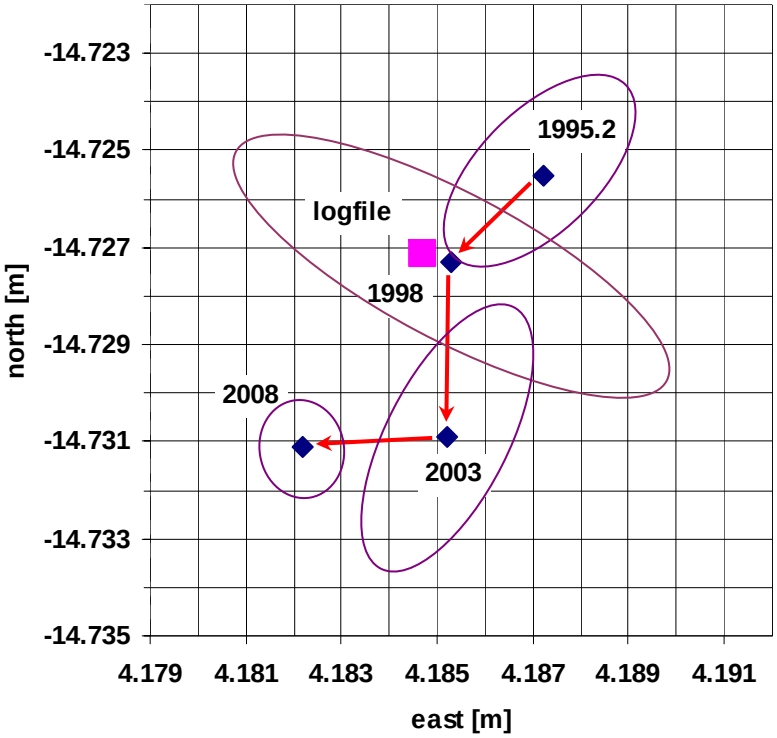
Geostation Zimmerwald

- New SLR system since more than 1 year in stable operation
  - more observations to the high satellites at day-time
  - improved precision of single shots by a factor of roughly two (from 80 ps / 12 mm to 40 ps / 6 mm)
  - improved stability of the system biases
- Local Tie (Sept. 2008): SLR – ZIMM – ZIM2

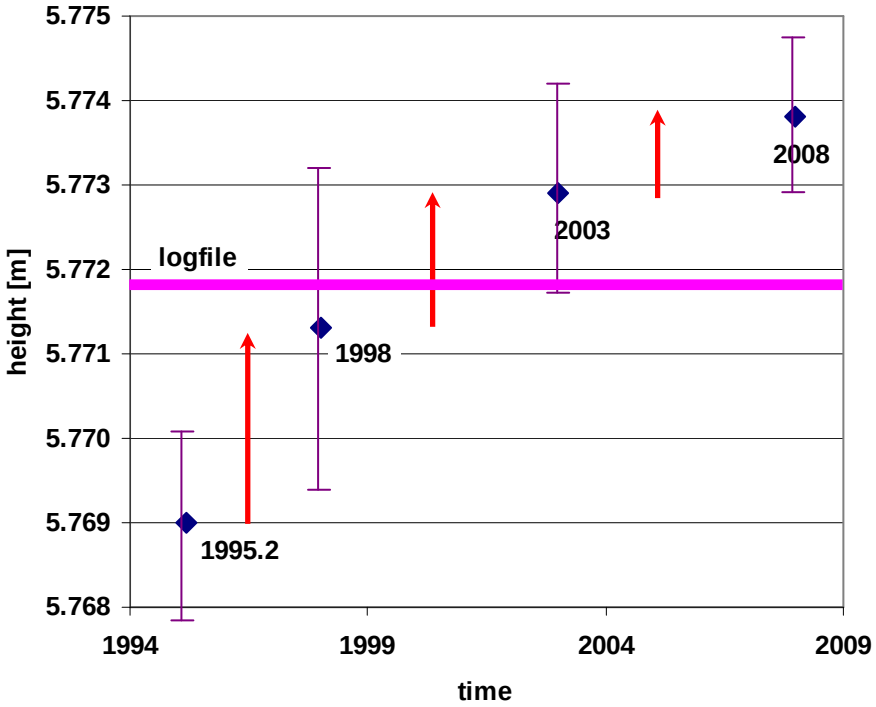
ZIM2 antenna and terrestrial target

Local tie results: ZIMM - SLR

horizontally



vertically

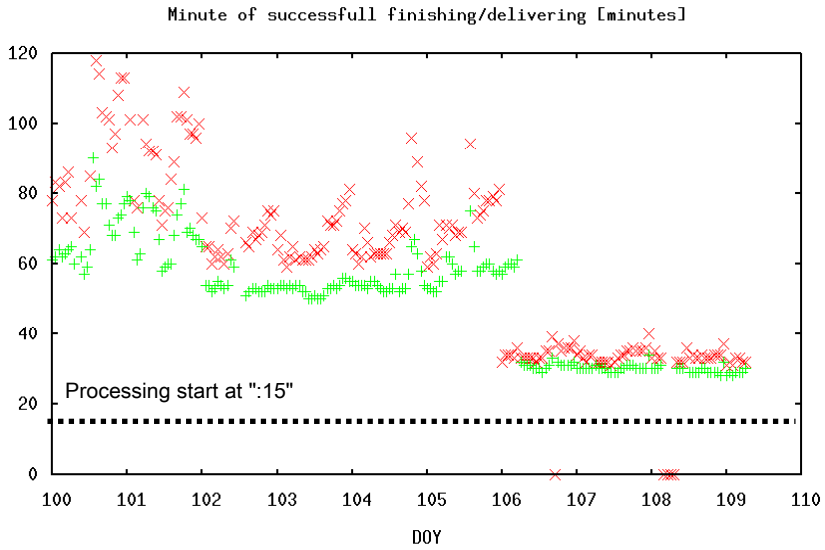


7 mm displacement (in 13 years) 5 mm rising of GPS

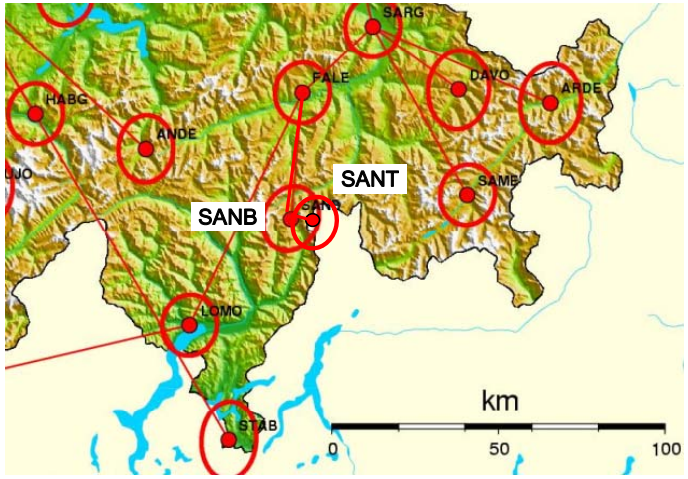
Conclusion from other points: Movement of top of the 9-meter mast

Permanent GNSS Network AGNES

- Faster CPUs for various processing chains: 3-10 times faster



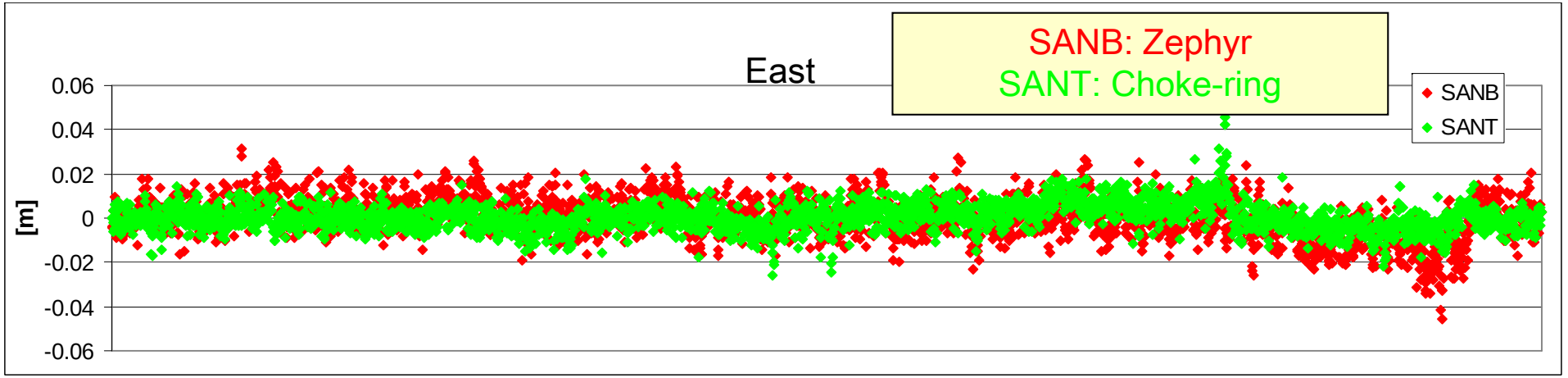
- Snow and antenna performance tests: Zephyr – Choke-ring



+3h

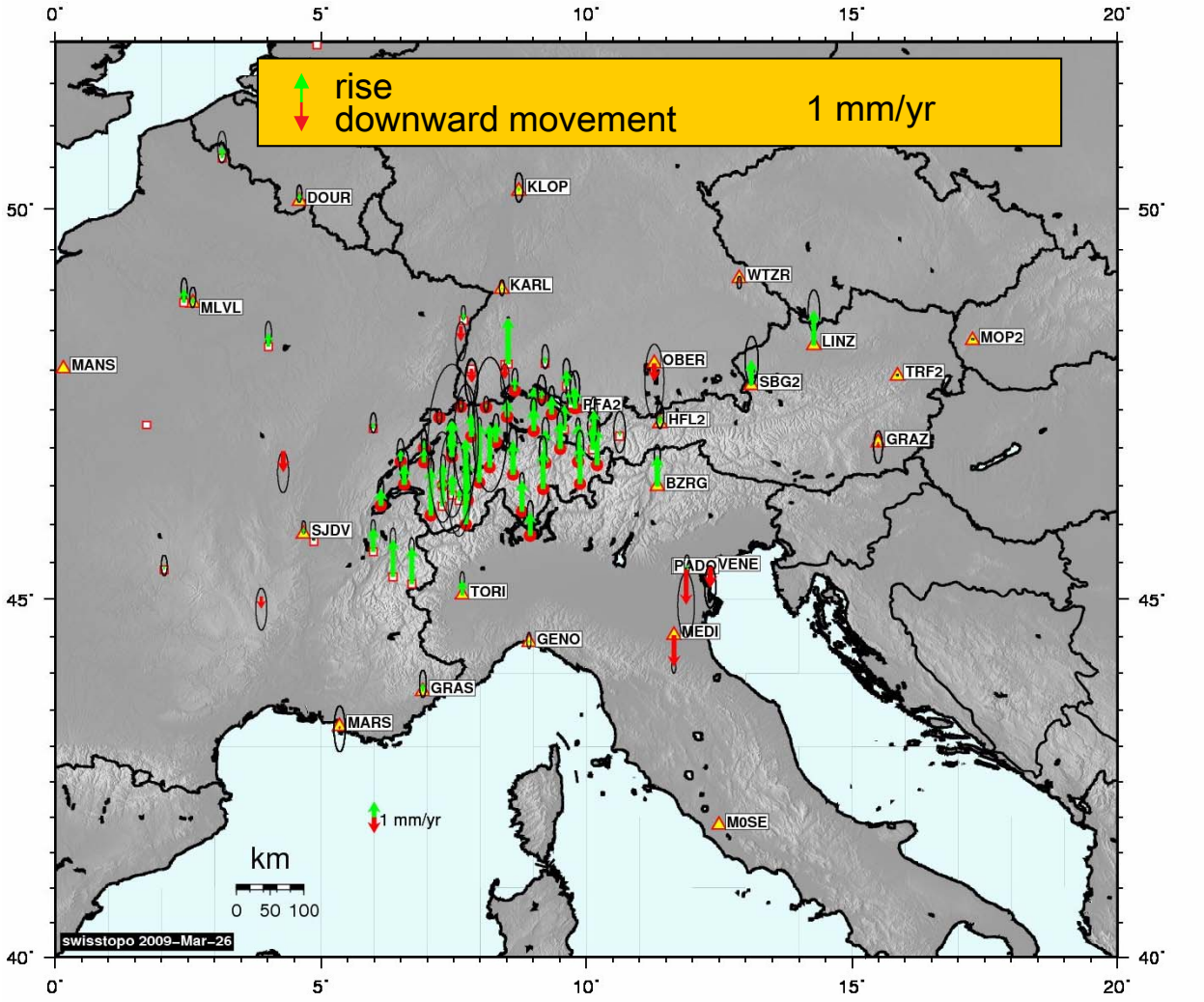
Permanent GNSS Network AGNES

- Kinematic GNSS coordinate estimation: gain of 30-40% in repeatability for GNSS choke-ring antenna
- 6 antennas purchased, calibrated and installed on most stable “class A” permanent stations May, 12-14 - e.g. ZIM2



7 days (4.1.-10.1.09)

Combined multi-annual solutions: vertical velocities



- 10 years normal equations
- Reference: min. constraint ITRF2005
- WTZR – ZIMM: 2.5 mm/yr
- +1.5 mm/yr Alpine rise from 100 years levelling
- STD to EUREF densification: 2 mm hor., 5 mm vertical

National ETRF coordinates for EPN stations

- ZIMM still has exactly the original ETRF93 coordinates which were used to define via campaigns the national reference frame CHTRF95

	CHTRF95 =ETRF93, epoch 1993.0		
Station	**X [m]**	**Y [m]**	**Z[m]**
ZIMM 14001M004	4331297.3388	567555.6380	4633133.7174

- Difference to EUREF densification solution

Station	**local difference [mm]**		
	dE	**dN**	**dU**
ZIMM 14001M004 310/98-365/05	0.4	0.2	12.
ZIMM 14001M004A 182/96-310/98	4.4	-0.2	-3.9

- “sequential datum definition process”: every site once used for datum definition in CHTRF95 is used reference station for the alignment additional stations using results of multi-annual solution