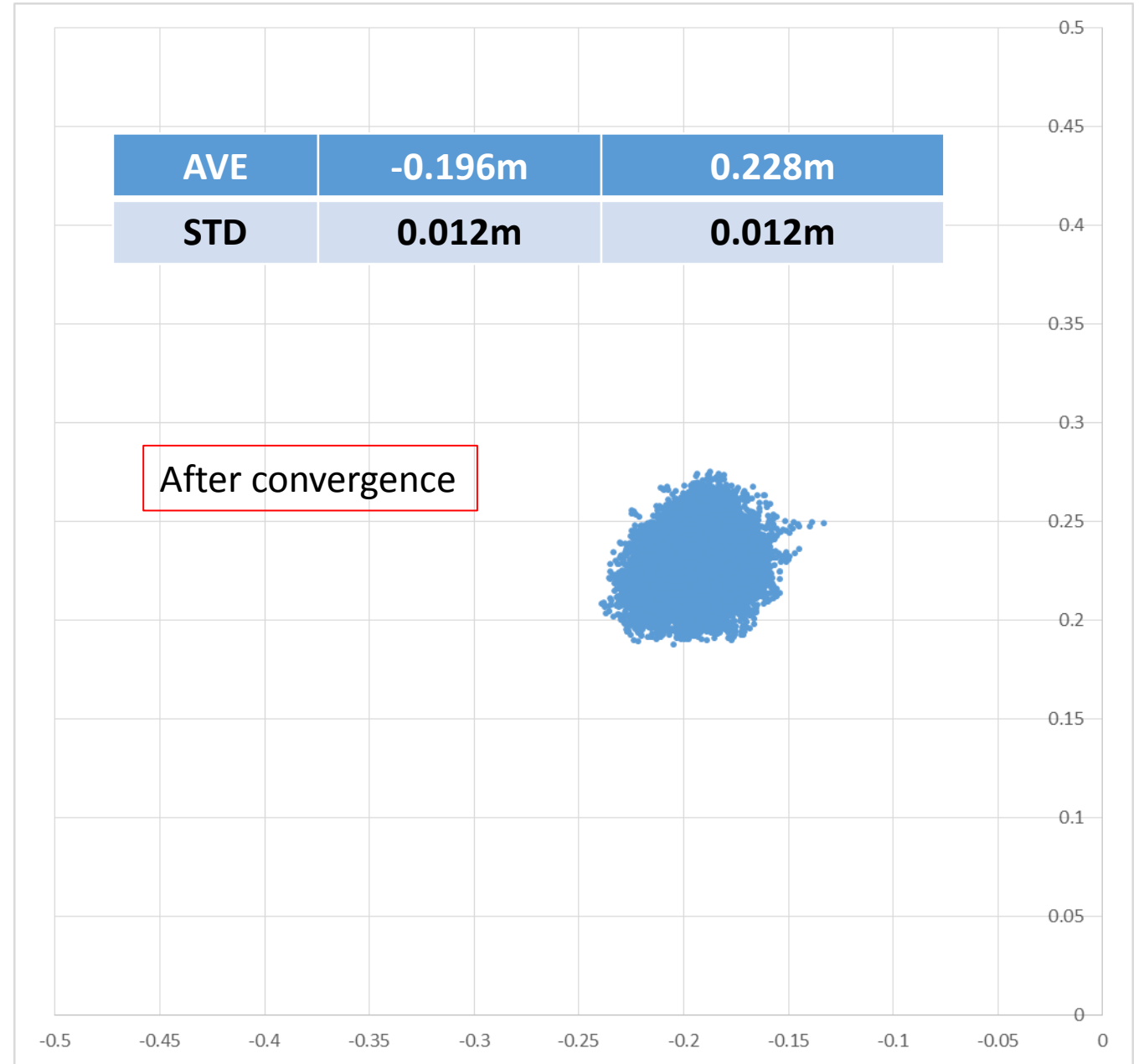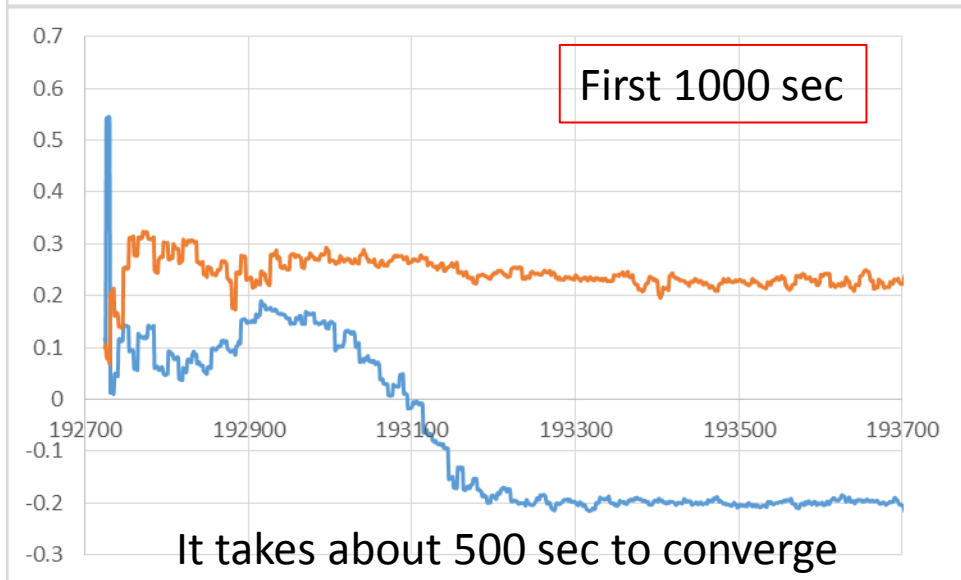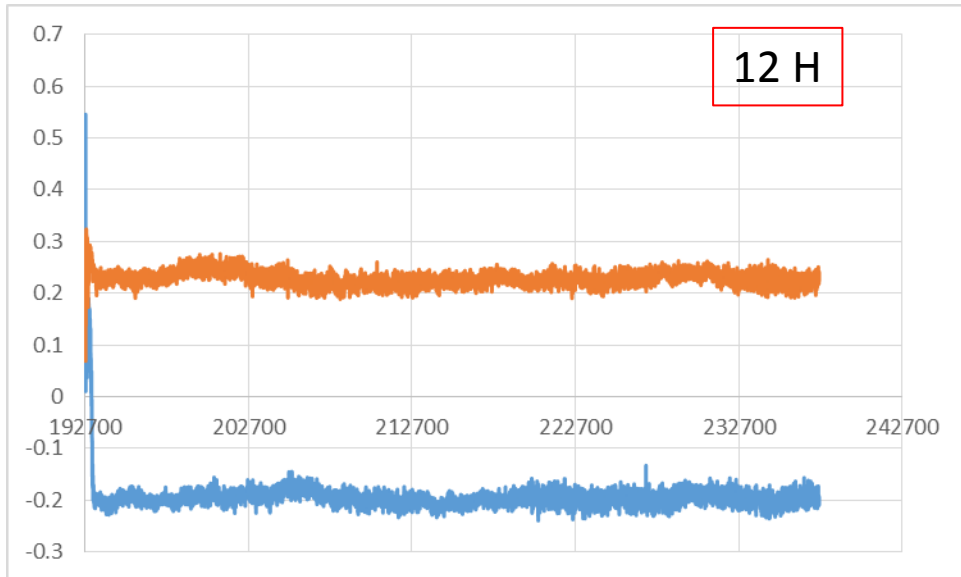# Comparison between 4 positioning methods

PPP / RTK / DGNSS / SPP

4 positioning methods

- PPP (Trimble RTX, real-time)
- RTK (RTKLIB, instantaneous and post-processed)
- Code-phase DGNSS (RTKLIB, instantaneous and post-processed)
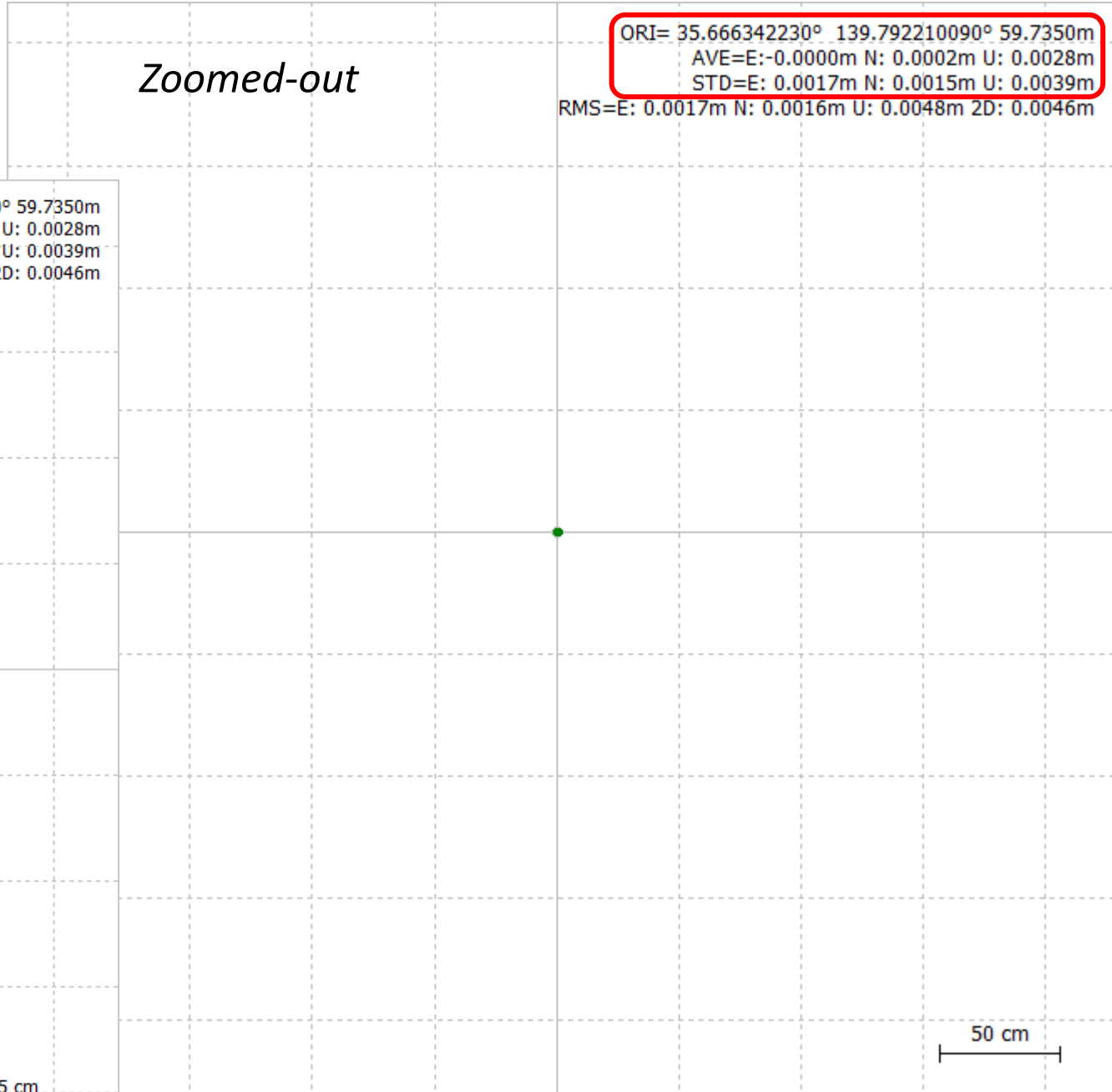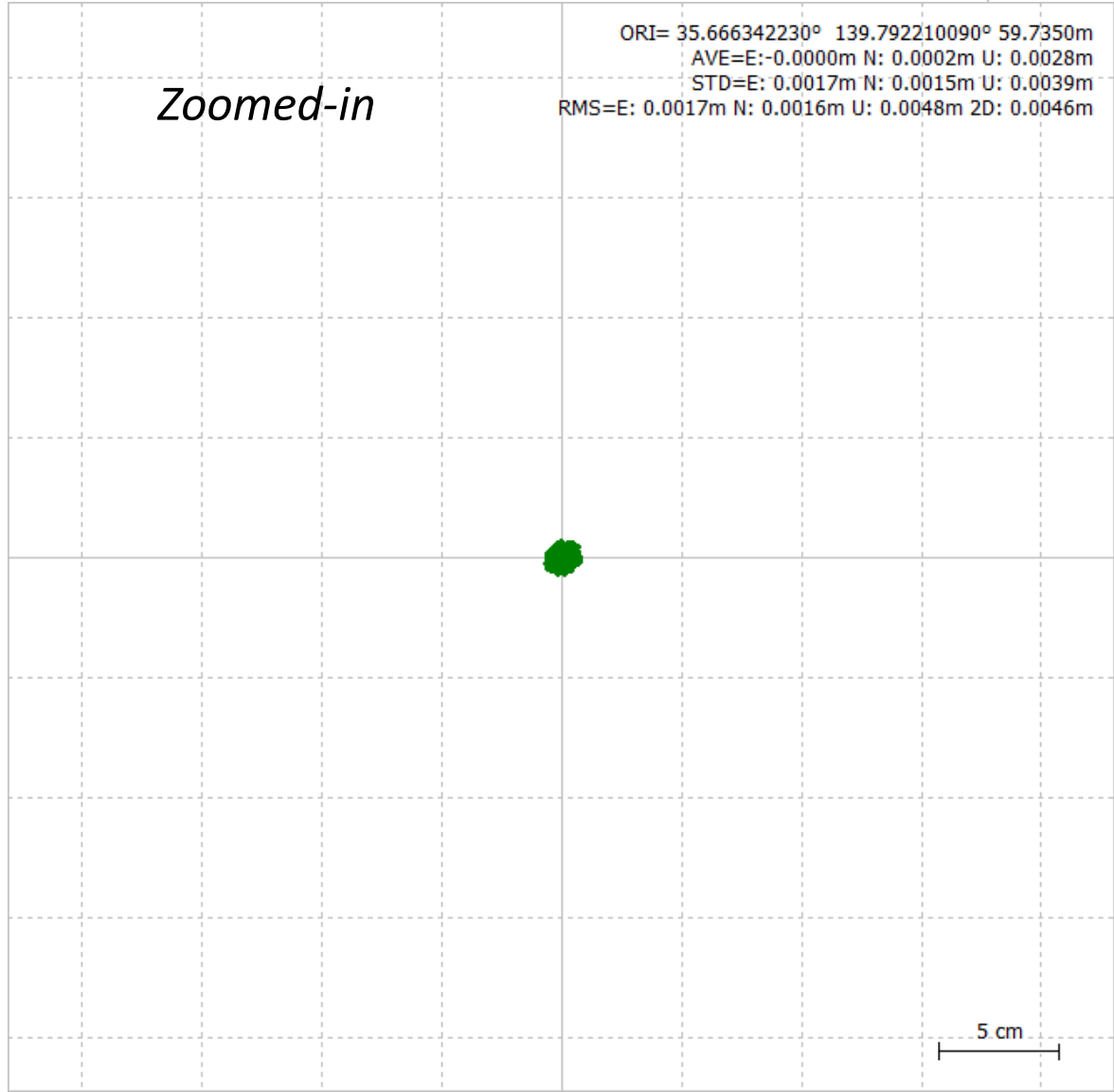- Single Point Positioning (RTKLIB, instantaneously processed)

PPP (Trimble RTX)

12 H

First 1000 sec

It takes about 500 sec to converge

	AVE	-0.196m	0.228m
	STD	0.012m	0.012m

After convergence

RTK/DGNSS/SPP Test configuration
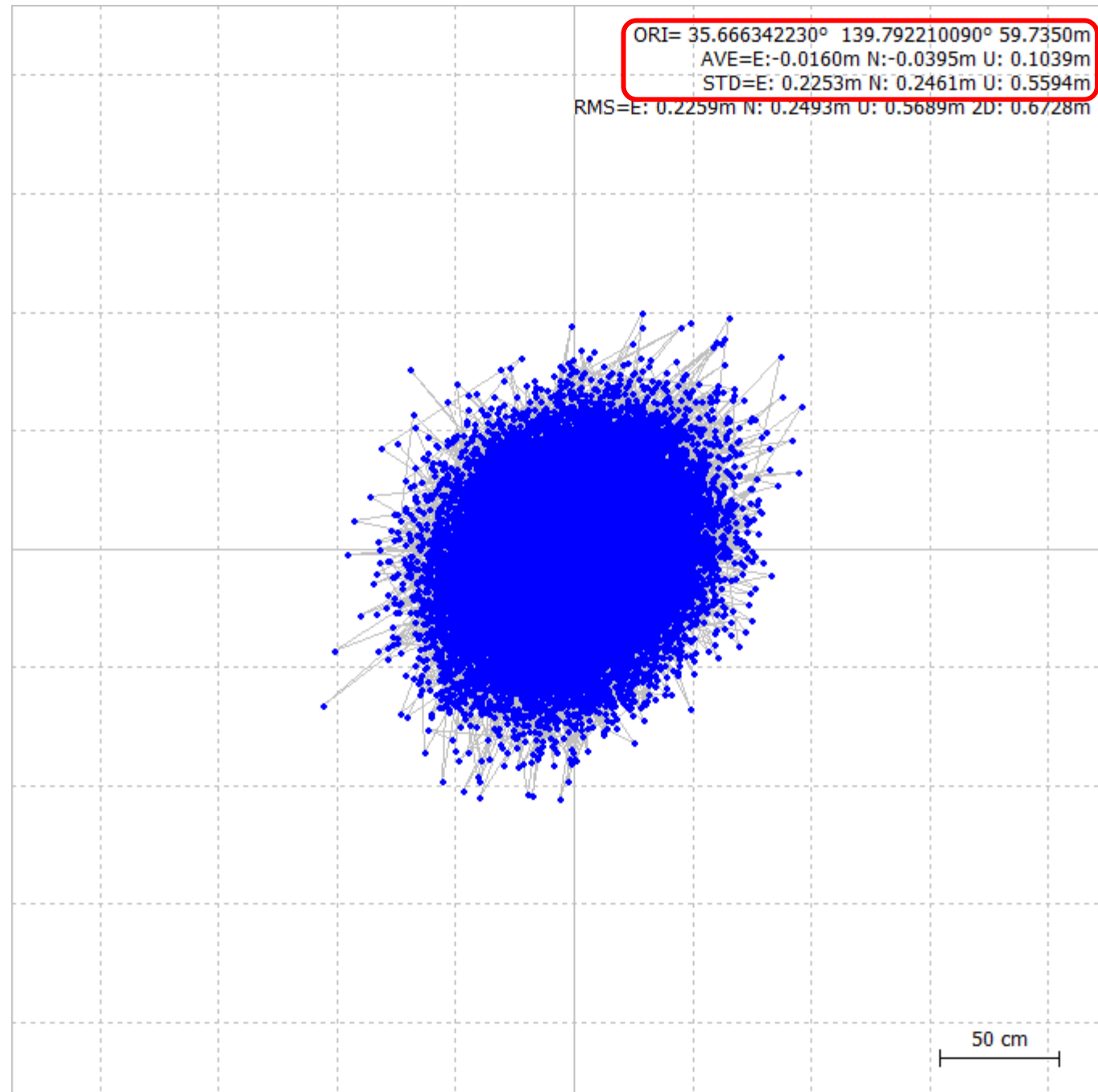
- Multi-GNSS raw data was obtained using a Trimble SPS855 receiver (rover). The reference station receiver was a Trimble NetR9. The baseline was approx. 1 meter.

- Trimble receiver engine and RTKLIB 2.4.2 p11 were used to analyze the raw data.

- GPS/QZS/GLO/BEI (mask angle 15 deg.)

- 2016/8/9 06:00:00 - 2016/8/09 17:59:59 (12H, UTC)

- Data collected on the rooftop of our building at TUMSAT

RTK

Zoomed-in

ORI= 35.666342230° 139.792210090° 59.7350m
AVE=E:-0.0000m N: 0.0002m U: 0.0028m
STD=E: 0.0017m N: 0.0015m U: 0.0039m
RMS=E: 0.0017m N: 0.0016m U: 0.0048m 2D: 0.0046m

5 cm

Zoomed-out

ORI= 35.666342230° 139.792210090° 59.7350m
AVE=E:-0.0000m N: 0.0002m U: 0.0028m
STD=E: 0.0017m N: 0.0015m U: 0.0039m
RMS=E: 0.0017m N: 0.0016m U: 0.0048m 2D: 0.0046m

50 cm

DGNSS

ORI= 35.666342230° 139.792210090° 59.7350m
AVE=E:-0.0160m N:-0.0395m U: 0.1039m
STD=E: 0.2253m N: 0.2461m U: 0.5594m
RMS=E: 0.2259m N: 0.2493m U: 0.5689m 2D: 0.6728m

50 cm

SPP

ORI= 35.666342230° 139.792210090° 59.7350m
AVE=E:-0.2368m N: 1.1001m U:-0.6957m
STD=E: 0.7813m N: 0.8869m U: 1.8977m
RMS=E: 0.8164m N: 1.4131m U: 2.0212m 2D: 3.2639m

50 cm