

Precise positioning of a moving object in urban area

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The goal of this presentation is to investigate the performance of current GNSS precise positioning of a moving object in difficult environment (urban area). The test setup consisted of a moving vehicle equipped with a Topcon's GR-3 receiver. The test track was chosen to pass differently obstructed areas in downtown Vienna (heavily obstructed areas due to high buildings) but also roads without signal masking which allows to analyze for example the ratio of signal losses to periods with fixed phase solutions. The measurements taken at rover site were raw GPS and GLONASS observations and, via GPRS, 10Hz RTK corrections obtained from the nationwide implemented Austrian GNSS correction provider EPOSA (Echtzeit Positionierung Austria). From the test drive lasting about 2-hours 6750 RTK positions as well as raw data files for post processing were gained.

In general the data was analyzed to detect multipath effects in the raw observations and the impact of multipath to harm RTK positioning. Furthermore the presentation discusses other environmental effects like the impact of the vehicle's speed on ambiguity resolution and the gain in the number of fixed positions due to the inclusion of GLONASS data.

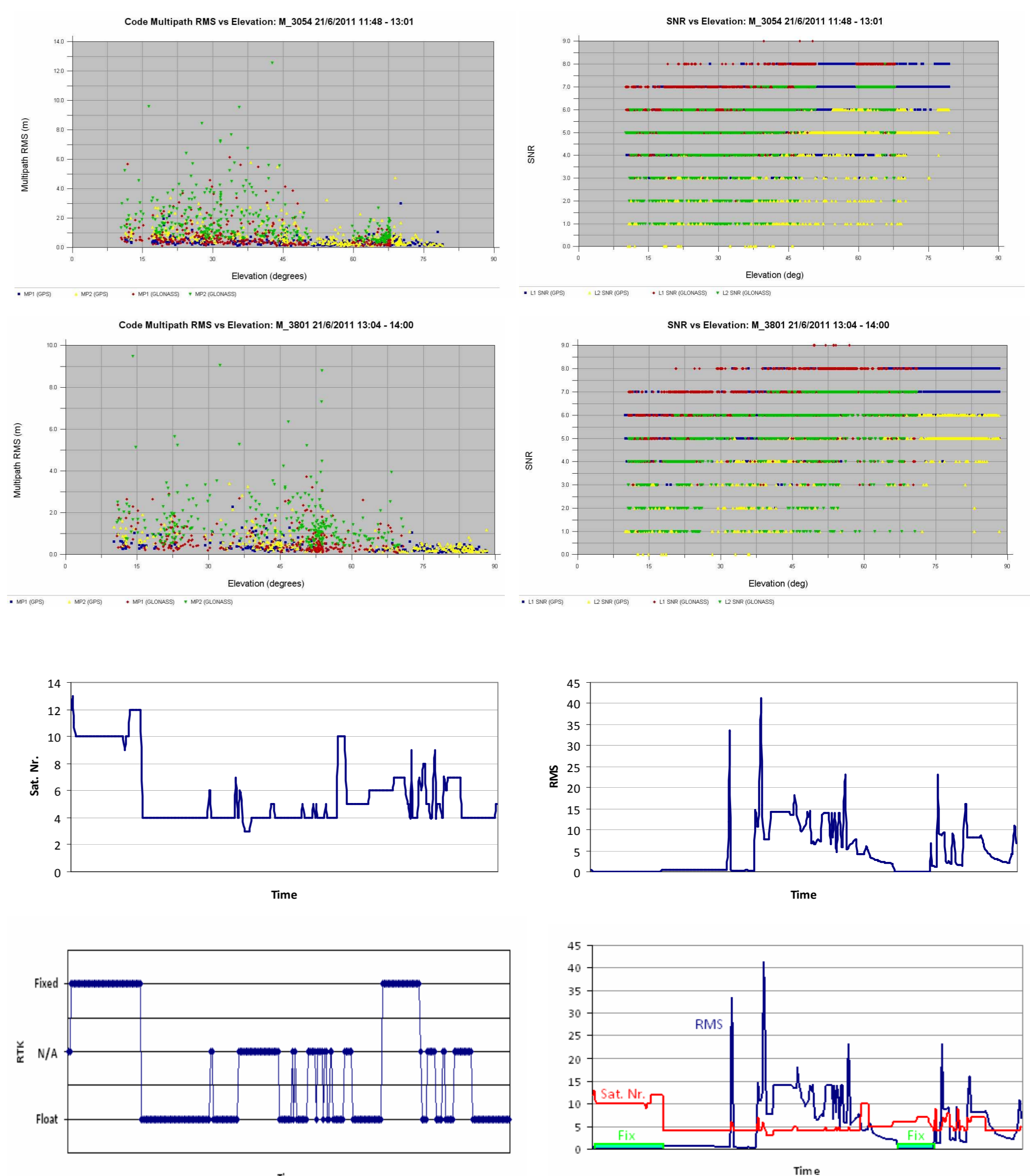
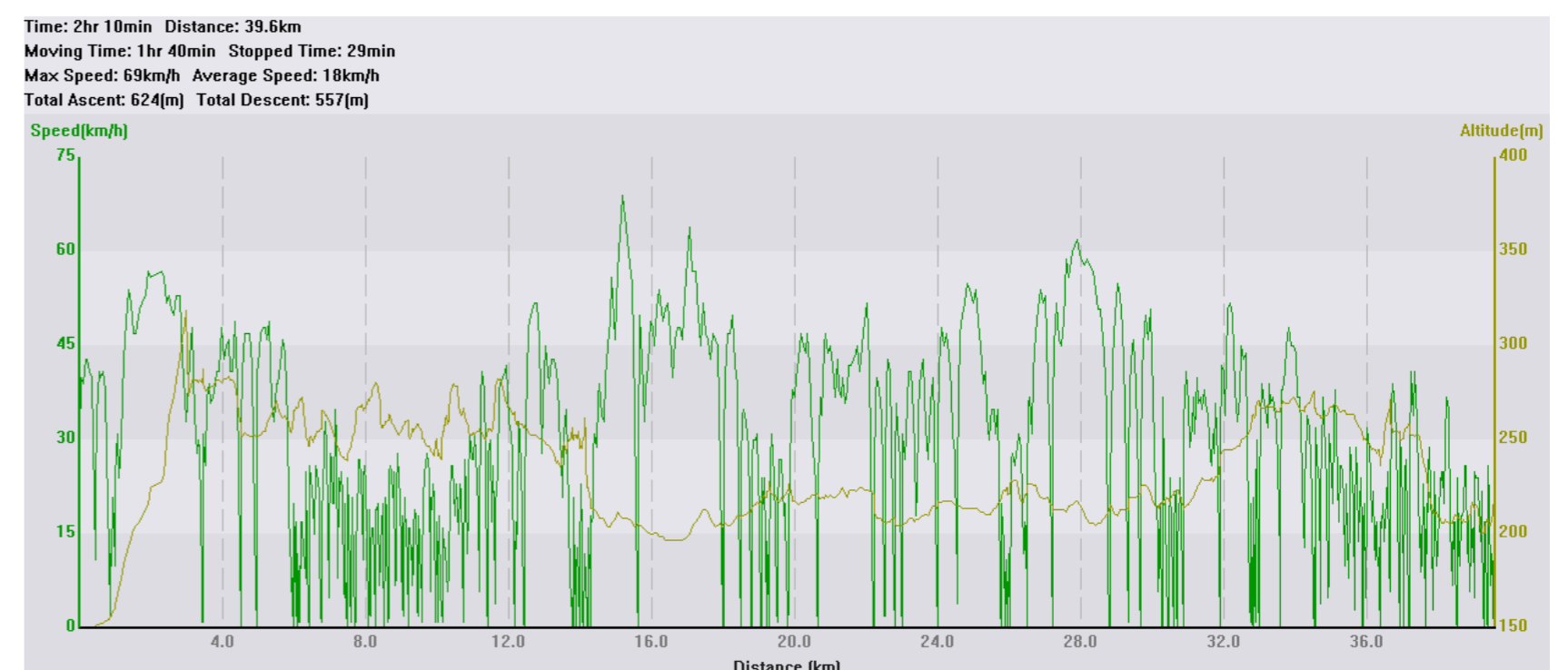


Fig. 1: Measurement system consisting from Topcon GR-3 receiver [1], FC-250 field controller [2] and moving vehicle

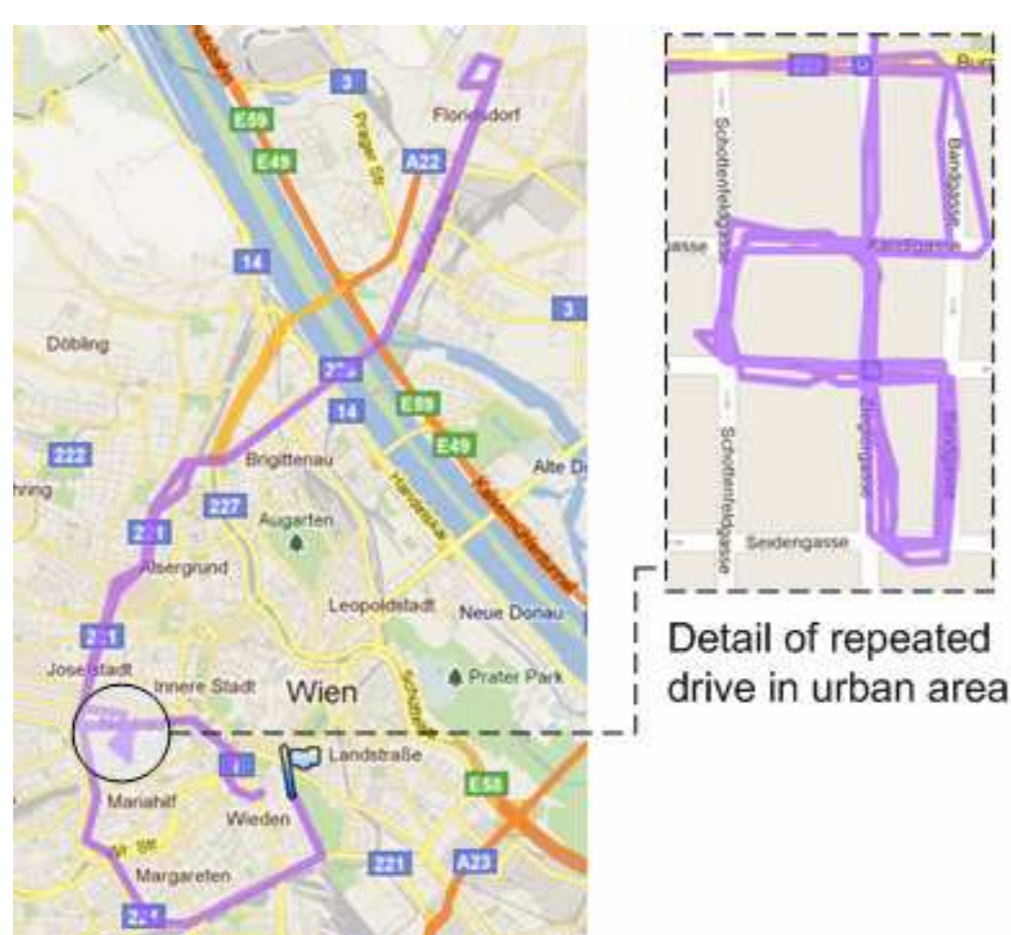


Fig. 2: Tested track in Vienna

RTK Fixed solution were during test drive acquired only two times. Correlations between vehicle's speed and RTK solution acquiring were not found, however strong difficulties of fixed solution for a moving object in urban area getting were observed.

References

- <http://www.topconpositioning.com/sites/default/files/literature/GR-3Brochure.pdf>
- http://www.topconpositioning.com/sites/default/files/literature/FC250_Broch_7010_2036_RevA.pdf