



Benefits of double stations in permanent GNSS networks

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In mid-2007, the Swiss Permanent Network AGNES was enhanced from GPS to GPS/GLONASS. In order to guarantee continuous reference frame maintenance and for scientific purposes, 8 from 31 sites were designed as double stations. This means that the GPS receiver continued its operation and that a new GPS-GLONASS receiver started operation on a new marker.

In the continuous analysis of the permanent AGNES network on a daily and hourly basis, the short baselines between the double stations can be analysed using the L1 observations instead of using the ionosphere-free linear combination. The results are furthermore improved, because the estimation of troposphere parameters is not necessary. Finally, kinematic solutions between the stations allow the determination of possible instable monumentations of a reference station.

The benefits achieved from analysing short baselines between the double stations will be quantified in terms of the improvement in repeatability but also in terms of a comparison to the ground truth. In the years 2008 and 2009, local tie surveys were carried out at the double stations. The paper presents comparisons between GNSS-derived coordinates and the local ties allowing detailed conclusions concerning the quality of antenna calibrations and possible biases when using different processing options in the GNSS analysis.