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# Site-dependent effects in GNSS-observations

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GNSS-observations are today used to investigate a variety of research topics in geosciences, including e.g. monitoring of crustal deformations and the amount of tropospheric water vapour. These applications require high accuracy for the results, e.g. millimeter-accuracy for positioning. During the last years so-called absolute antenna calibrations for GNSS-antennas on the satellites and on the ground have been implemented. These absolute antenna calibrations increase the accuracy of the GNSS-results. However, unmodeled error sources in the GNSS-results still remain due to the electromagnetic coupling of the GNSS-antennas with their surrounding. To further improve the accuracy of GNSS-results, these site-dependent effects and their dependency on the direction of the observation need to be identified and removed in the GNSS data analysis. We present a study of site-dependent error sources in GNSS-observations. This includes different antenna surroundings, multipath environment and of different type of monumentations. We also report on observations of reflected GNSS-signals.