Master's thesis project at the Department of Space, Earth and Environment

Measuring a local survey network with GNSS

Background

During 2015–2017 the Onsala twin telescopes (OTT) were installed. The new radio telescopes have been commissioned and taken into operation in 2018/2019. Together with the Onsala 20 m and 25 m antenna they now form the Onsala telescope cluster. To make optimum use of the Onsala telescope cluster and the other geodetic equipment, the so-called local ties between the reference points of the insturments need to be observed. Usually this involved classical geodetic surveys of the telescopes in a network of geodetic survey pillars. The latter were installed in 2018 and a first classical survey of the new pillars and their connection to the local survey network at the Onsala Space Observatory was done. Now it is time to additionally do GNSS measurements on the new pillars to dereive highy accurate and precise coordinates in the international terrestrial reference frame (ITRF).

Task description

You will take care of collecting GNSS data on the new survey pillars around the Onsala twin telescopes and analyse the recorded data together with data recorded with the other GNSS equipment at the observatory. The maingoal is to derive highly accurate and precise coordinates of the new pillars in the ITRF, so that a classical survey of the radio teleascope reference points can be performed as a next step. In parallel, you shall investigate the tropospheric parameters in the dense GNSS array at Onsala. The data analysis shall be performed with two software packages, namely GipsyX and c5++. Both software packages can analyse multi-GNSS data, and c5++ can combine data from several stations on the observation level.

Required education and potential course requirements

You should have interest and a solid background in GNSS and corresponding data analysis, as well in general signal processing and data analysis. Programming in MatLab and/or python and experience in Linux computer environment is of advantage.

Contact information of the supervisors

Rüdiger Haas: rudiger.haas@chalmers.se (031-772-5530)
Periklis-Konstantinos Diamantidis: periklis.diamtidis@chalmers.se (031-772-5575)

December 2019