



Contributions of the Onsala Space Observatory to the GGOS

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The Onsala Space Observatory on the Swedish west coast is the fundamental geodetic station of Sweden and operates several geodetic and geophysical infrastructures that contribute to the GGOS. Onsala is the European observatory with the longest history in Very Long Baseline Interferometry (VLBI). Already 1968 Onsala was involved in geodetic/astrometric VLBI observations, at that time with the 25 m telescope. Since 1979 the 20 m telescope is used for geodetic/astrometric VLBI, and currently about 40–50 sessions per year are observed in the programs of the International VLBI Service for Geodesy and Astrometry (IVS). Onsala also participated in all continuous (CONT) campaigns of the IVS. In 2011 we received funding for twin telescopes at Onsala, to be part of the VLBI2010 Global Observing System (VGOS) network. The project has been delayed due to difficulties to get the necessary building permits, but finally a contract to purchase the new telescopes has been signed in late 2014. We expect that the Onsala Twin Telescopes will become operational in 2016/2017.

In parallel to the VLBI activities, the observatory operates other instrumentation for geosciences, in particular receivers for Global Navigation Satellite Systems (GNSS), and ground-based microwave radiometers. There are several monuments used for GNSS measurements, and Onsala is actively contributing to the International GNSS Service (IGS). Recently a GNSS array consisting of six new GNSS monuments, in the area around the Onsala Twin Telescopes, has been installed. Also several microwave radiometers are operated for tropospheric measurements.

A superconducting gravimeter is operated at the observatory since 2009 in a dedicated gravity laboratory which is also hosting visiting absolute gravimeters, and in 2011 a seismometer station has been installed that is part of the Swedish National Seismic Network (SNSN).

Since 2010 we operate a so-called GNSS-R tide gauge, based on the principle of reflectometry. Additional equipment comprises several pressure-sensor based tide gauges, and since the autumn of 2013 a pneumatic tide gauge that is operated together with the Swedish Hydrological and Meteorological Institute (SMHI). In cooperation with SMHI, a multi-sensor installation, including also a radar-based tide-gauge, has been installed during 2014.

With its large number of instruments, addressing reference frames, earth rotation, geo-kinematics, gravimetry, the Earth's atmosphere, and sea level, the Onsala Space Observatory contributes significantly to GGOS, and provides important data for a unification of geodesy.