

Measuring Earth gravitational effects at the Conrad Observatory

Continuously measuring the gravity field of the Earth is one geophysical goal of the Conrad Observatory. Complimentary methods are used to determine gravitational variations with high accuracy and high temporal resolution.

Gravity monitoring is an important tool for investigating geodynamical phenomena. Among them are earth tides, seismic normal modes, translational modes of the inner core, crustal motion, interaction of solid Earth - ocean and solid Earth - atmosphere, hydrology and Earths' rotation.

For continuously observing temporal gravity variations a superconducting gravimeter (SG) GWR SG CT-025 is established since November 2007 at the Conrad Observatory. The instrument is operated in close cooperation with the University of Vienna. The SG Conrad Observatory is part of the Global Geodynamics Project (Crossley et al. 1999).

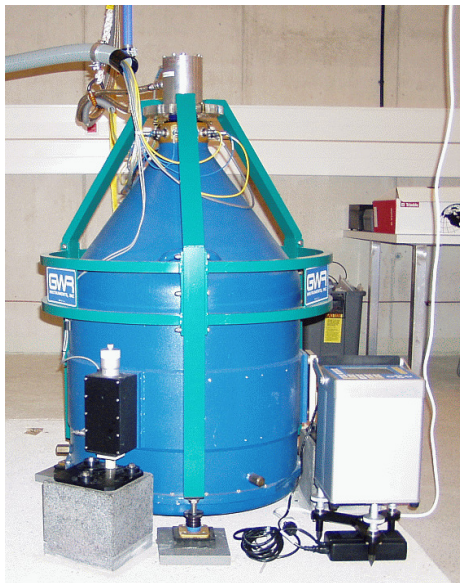


Figure 1: GWR SG CT-025 and Scintrex CG-5 at the Conrad Observatory

In addition to continuous monitoring of relative gravity variations, absolute measurements are necessary for calibration.

Starting in June 2008 several absolute gravity measurement (AG) campaigns are undertaken at the Observatory in cooperation with the Austrian Bundesamt für Eich- und Ver-

messungswesen (BEV) and other international institutions for calibrating the SG and for determining the SG instrumental drift. A mobile Scintrex relative gravimeter CG-5 is used to tie the different AG sites at the base.

These measurements underlined an exceptional low instrumental drift of the SG gravimeter at the Conrad Observatory.



Figure 2: Absolute gravity measurement survey for SG calibration (FG5, front: JILAG-6)

References:

Crossley, D., Hinderer, J., Casula, G., Francis, O., Hsu, H.T., Imanishi, Y., Jentzsch, G., Kääriäinen, J., Merriam, J., Meurers, B., Neumeyer, J., Richter, B., Shibuya, K., Sato, T., van Dam, T., 1999: Network of Superconducting Gravimeters Benefits a Number of Disciplines. *EOS, Transactions, AGU*, 80, No. 11, 125-126.

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