# Absolute Gravimetry in Austria

**A fundamental task of surveying is the determination of the gravity field of the earth which is of great importance for a series of subject fields such as geophysics, fundamental physics, geodesy and metrology. In Austria the BEV realizes the base of gravimetric measurements which is regularly validated and confirmed by means of international comparisons. Regular monitoring measurements using the absolute gravimeter are carried out at the stations of the Austrian Gravity Network (ÖSGN) and integrated into the European Combined Geodetic Network (ECGN).**

Absolute gravimetric measurements are taken by transportable gravimeters which measure the free fall of a testing mass in a vacuum chamber with high accuracy. The absolute determination of the gravity acceleration is derived from physical primary standards of highest accuracy: a Rubidium standard for time and a Iodine stabilized laser for distance.

The absolute gravity measurements have been performed for 23 years with the absolute gravimeter JILAg-6 and will be continued in 2010 with the latest series of absolute gravimeter FG5 (manufacturer Micro-g Solutions Inc., USA). The FG5 gravimeter was acquired in cooperation between BEV and ZAMG.

The gravimetric activities of BEV aim at realizing and maintaining a precise and coherent standard of gravity for Austria as well as to provide basic data for the calculation of gravity anomalies and models of geoids and metrology. Regular monitoring measurements with the absolute gravimeter are carried out at the stations of the Austrian Gravity Network (ÖSGN) and integrated into the European Combined Geodetic Network (ECGN) at Traflberg, Pfänder and Graz. The ECGN project is trying to use control points such as the Conrad Observatory which offer the opportunity to check the different heights by geometrical and physical methods in a very accurate way. Gravity changes are the result of the combined effect of elevation changes and density variations (mass shifts).
The gravity changes at the Conrad Observatory are measured permanently by the superconducting gravimeter GWR C025. Due to the fact that a superconducting gravimeter is not measuring absolute gravity and has a drift-rate, it has to be calibrated by an absolute gravimeter several times a year.

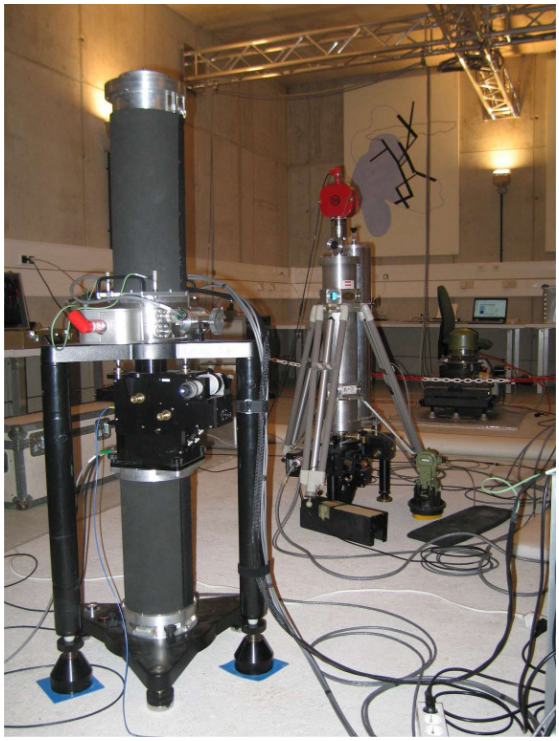

**Figure 1:** FG5 (in front) and JILAg-6 absolute gravimeter at Conrad Observatory Traflberg.

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