

## 20 years GWR tide gravimeter ZAMG 1995-2015

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**With the purchase of the superconducting gravimeter GWR SG CT025 in 1995, the Central Institute for Meteorology and Geodynamics (ZAMG), together with its partner the University of Vienna (Prof. B. Meurers, IMG), opened the door for top research on the change in the Earth's gravitational field. At that time, only very few research institutions were able to obtain such a new high-sensitive geophysical instrument along with its long-term operation.**

The GRW SG CT025 gravimeter with serial number 25 was originally obtained for the Conrad Observatory. As this observatory was yet to be build when the instrument was purchased, the gravimeter was initially installed in the seismic basement of the ZAMG at the Hohe Warte in Vienna. The "Blues Baby", as the gravimeter was nicknamed by the technical crew, commenced operations in July 1995. With the station name "VIE", the ZAMG joined the "Global Geodynamics Project" GGP, which comprises joint data collection and research of globally distributed superconducting gravimeters. The Vienna station delivered data for 12 years.



Figure 1: First Installation in Vienna

After the opening of the first part of Conrad Observatory in 2002, the relocation of the gravimeter became the next challenge. At the Hohe Warte in Vienna evaluations of the gravimeter data could be connected with the meteorological measurements of nearby meteorological TAWES station of the ZAMG. The necessary sensors for meteorological parameters at the Conrad Observatory, however, had to be installed first. In 2007 the "Blues Baby" finally moved to its new site at the Conrad Observatory, with the station name "CO". It represents the only superconducting gravimeter in the Eastern Alpine

region. Although the noise level of the instruments was significantly lower at the new site, the complex meteorological and hydrological conditions on the Trafelberg required detailed research in this context. Among others, studies were performed with three subsequent ZAMG projects (EMGISCO I - III). The project resources were made available by the Ministry of Science (BMWFW). The cooperation between the ZAMG/Uni Wien team along with colleagues from the Federal Office of Metrology and Surveying (BEV) and recognized specialists of absolute gravity research in Belgium and the Czech Republic facilitated the calibration and drift determination of the gravimeter. Unfortunately, in 2013, the gravimeter suffered from malfunctions, forcing us to perform extended maintenance in several steps, which led to 13 month of data loss. The instrument was repaired in 2015 and put into operation again running smoothly since. Up to now 21 peer-reviewed articles have been published on data acquisition and interpretation documenting the success story of the "Blues Baby".



Figure 2: The gravimeter at the Conrad Observatory

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