

Mount Stromlo Gravity Station

Background

In February 1996 absolute gravity determinations were made simultaneously over five days by three FG5 absolute gravimeters, two from Japan and one from the CSIRO Division of Exploration and Mining. These observations were organised and supported by AUSLIG with additional financial support from the National Tidal Facility and AGSO.



The Superconducting Gravimeter

In January 1997 a highly sensitive Superconducting Gravimeter (SG) was installed in a basement lab adjacent to the Absolute benchmarks and has been operating continuously since then. The SG is the most sensitive gravimeter ever operated in Australia, and is capable of detecting variations in the strength of earth's surface gravity at the order of one part in 10^{12} . The installation is a collaboration between the Geodynamics group in the Research School of Earth Sciences at ANU and the Japanese National Astronomical Observatory, Mizusawa.



The Mount Stromlo gravimeter is a GWR Instruments manufactured Compact Tidal Superconducting Gravimeter designated CT031. Operating at liquid helium temperatures, the instrument is built around a superconducting niobium sphere levitated in a magnetic field in an evacuated chamber. Gravity fluctuations are determined from changes in the feedback coil current required to precisely centre the sphere in its chamber. The SG is extremely stable over long periods, and therefore ideal for normal mode, tidal and longer period observations.

Role

SG-CT031 is now part of a world-wide array, the Global Geodynamics Project, making precise observations of global gravity signals. The data is used to study the dynamics of the earth's deep interior and infer details of earth's internal structure, and may help distinguish the mechanisms causing changes in relative sea-level around Australia.

