

昭和基地の超伝導重力計で観測された積雪による長周期重力変動

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Long period gravity change due to snow accumulation with superconducting gravimeter OSG#058 at Syowa Station, Antarctica

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Continuous gravity observation with a superconducting gravimeter (SG) has been performed over twenty years at Syowa Station, East Antarctica, and the observed data have been applied to various studies as the only precise and continuous gravity observation in the Antarctica. The first SG, TT-70#016 had been installed in Mar., 1993. At the end of 2003, it had been replaced by the second SG, CT#043. Its gravity data was contaminated by a large instrumental drift and noise. Then, the CT#043 was renewed to the third SG, OSG#058 in Jan. 2010. After the renewal, evaporation of liquid helium is less than 4% in three years and neither obvious instrumental drift and noise nor step-like change is observed.

During Jan. - Feb., 2010, the OSG#058 was calibrated by absolute gravimeter, FG-5#203 of Geospatial Information Authority of Japan. A determined scale factor is $-73.823 \pm 0.053 \mu\text{Gal/V}$. The OSG#058 three-year gravimetric data is decomposed into tidal components (M3 to SSA) and long-term trend by applying the tidal analysis software BAYTAP. The observed tidal parameters are accurate even for the long-period tides. Subtracting SA tide and gravity response to the polar motion from the long-term trend, the residual has correlation with seasonal variations of accumulated snow depth at Syowa Station measured by Japan Meteorological Agency. We expect that the gravimetric data obtained with OSG#058 would provide valuable information about the Earth's response to the long-period dynamical phenomena.