



Issues of GOCE SSTI processing

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ESA's first Earth Explorer Core Mission GOCE is equipped with a Satellite-to-Satellite Tracking Instrument (SSTI) consisting of a 12-channel dual-frequency Lagrange GPS receiver connected to a helix antenna. The GPS data are primarily used for precise orbit determination of the satellite and the derivation of the long wavelength part of the Earth's gravity field. The Precise Science Orbits derived from the almost continuous 1 Hz GPS data series meet the mission accuracy requirement of 2 cm and reflect the good quality of the GOCE GPS data.

The GOCE orbits are, however, of slightly reduced quality over the polar regions. This is particularly important and evident for kinematic positions, where an inferior quality directly maps into subsequent gravity field solutions. The root-cause for the degradation is still not yet fully understood, a correlation with more frequent L2 tracking losses occurring near the geomagnetic poles is suspected, but difficult to be demonstrated.

The worse observation geometry near the poles, the ionosphere which is coupled with solar activity, and the magnetic field of the Earth may contribute to the observed degradation. We investigate correlations with possible contributors and present the state of our findings.