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GOCE USER TOOLBOX and TUTORIAL FOR SOLID EARTH PHYSICS

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The Gravity and Ocean Circulation Experiment - GOCE satellite mission is a new type of Earth observation satellite that measures the Earth gravity with an unprecedented accuracy at intermediate wavelengths. These wavelengths are perfectly suited to study the inner upper Earth at a regional scale. Indeed, the primary requirement of Solid Earth physicists is to have access to the Earth gravity field and its error covariance at the highest spatial resolution and accuracy possible, although required resolution depends on application. Solid Earth physicists are also eager to take advantage of the gravity gradients that are measured by GOCE. Combined with topographic/bathymetric information as wither other ones coming from geophysics, geology or geochemistry, detailed crustal and lithospheric models can be established, especially in areas of geodynamic interest previously poorly surveyed by ground or airborne means. Another objective of the Earth Science community is to analyze possible time variations of the gravity gradients linked with mass redistributions due to earthquakes of large magnitudes. Within the ESA supported GUTS project, the user requirements for GOCE User Toolbox associated with geodetic, oceanographic and solid earth applications were consolidated and subsequently the toolbox was designed and implemented. Here, we present the Toolbox functionality and didactic uses cases in Solid Earth physics.