

**The determination of mass transport processes in the Earth's system from satellite gravity missions**

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The analysis of the Earth's time variable gravity field plays an important role in the research of the Earth's system. The satellite gravity mission GRACE (Gravity Recovery And Climate Experiment) provides, for the first time, a direct measurement of the amount of mass that is redistributed at or near the surface of the Earth. These redistribution processes include, for example, the oceanic and atmospheric circulation, water fluxes between various terrestrial water storages, melting ice, river discharge, changing sea level and convective flows in the Earth's mantle. The satellite observations provide global data sets of unprecedented homogeneity and resolution and have significantly improved our understanding of the Earth's gravity field and the processes that lead to its temporal changes.

This talk will discuss the observables of satellite geodesy and their relation to potential change and mass change. Furthermore, a variety of examples from different geophysical applications will be shown to demonstrate how the interpretation of satellite gravity data can improve our knowledge of the mass transport phenomena.