



Detection of surface water mass redistributions using GRACE satellite gravimetry

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Since its launch in March 2002, the Gravity Recovery and Climate Experiment (GRACE) mission has provided, for the first time, a global mapping of the variations of the Earth's gravity field, at an unprecedented accuracy. A 1-cm geoid level precision enables now detection of tiny changes in gravity related to redistributions of fluid mass inside the surface terrestrial envelope (i.e., atmosphere, oceans, continental water storage) from monthly to decades time scales. Global monthly solutions with a spatial resolution of about 400 km have been used to study continental hydrology, ocean/continent exchanges and variations in polar mass balance, in particular for Greenland and Antarctica ice sheets. Even elastic deformation of the Earth due to storm rainfall can be derived from GRACE observations. Recent advances on the development of an alternative regional approach will be presented, showing the promise of greater temporal and spatial resolution.