



Ground truth for satellite-derived gravity variations from superconducting and absolute gravimeters

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The network of superconducting gravimeters (SG) of the 'Global Geodynamics Project' (GGP) in combination with repeated absolute gravity (AG) measurements offers the unique opportunity to supplement and validate the gravity field variations derived from the GRACE satellite mission. Because of the different spatial and temporal resolution of the gravity data a combination of all data sets can be considered as the most straight forward approach to retrieve a maximum of information regarding mass transfers on different time and spatial scales esp. related to hydrology. For a consistent combination of the data sets this gap between gravity variations from terrestrial point data and from satellite data has to be bridged. Presently, the study is focused on Europe where a dense and long-term observation network is available, which covers the period of the GRACE mission. A first task is a uniform reprocessing of the SG data according to agreed-upon criteria. A successful combination of SG and AG data could be obtained for the stations Bad Homburg, Wettzell, and Medicina up to now. In parallel, work is done to improve reductions of environmental influences such as barometric pressure and local hydrology. Concerning the latter it can be shown that for stations with a hydrologically challenging situation such as Moxa/Germany local hydrology-induced effects on gravity can be successfully removed, thus data from these stations can also be used to provide ground truth. From a first comparison between SG residuals, GRACE-derived gravity field changes, and the variations computed on basis of hydrological models a principal good agreement emerges, but also certain differences

become visible between model- and observation-based gravity variations.