



## **Geophysical events as seen in the gravity field observed from space**

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Many geophysical events produce gravimetric signal with specific signatures. This has been, and will hopefully be in the future, the rationale for many space activities dedicated to the observation of the Earth gravity field, like CHAMP, GRACE and GOCE.

Earthquakes, like the Sumatra event of December 26<sup>th</sup> 2004, are one example of this kind. The modelled gravimetric signal shows an abrupt change when the earthquake occurs. The gravimetric effect of such an event has been simulated and it has been propagated in terms of observables at satellite altitude for different mission scenarios: GRACE, collecting low-low SST observations; the forthcoming GOCE mission, recovering a full gravity-gradient tensor; and a possible future gravimetric mission based on the low-low SST technique, but with an improved accuracy thanks to the use of laser doppler interferometry.

The results of the simulations show that the time-wise signal-to-noise ratio of GOCE observations (computed track by track) does not allow a direct identification of the event, while with GRACE there is such an opportunity. Even better, a laser doppler interferometry mission should be able to see the phenomenon in a quite detailed way.