



## **Using tesseroid mascons to improve the estimations of water-mass variations with GRACE**

Vagner Fereria (1), Bernhard Heck (2), Kurt Seitz (2), and Thomas Grombein (2)

(1) School of Earth Sciences and Engineering, Hohai University, Nanjing, China (vagnergf@hhu.edu.cn), (2) Geodetic Institute of Karlsruhe, Karlsruhe Institute of Technology, Karlsruhe, Germany

Observing and monitoring the different components of the hydrological cycle and their dynamics are essential steps to understand and predict natural disasters like floods and droughts, all of which periodically occur worldwide. Nevertheless, in the absence of ground-based measurements as, for example, in Africa and South America, space-borne geodetic sensors offers an opportunity for monitoring the temporal variations of the terrestrial water storage (TWS). However, the TWS fields - inverted from the temporal variations of the gravity field - are generally computed based on a global solution, which has not exploited the fundamental resolution of the satellite gravimetry observations. Thus, in order to overcome the deficiencies of global solutions based on spherical harmonic coefficients, results of TWS can be inverted from a regional recovery approach considering the in-situ measurements of Gravity Recovery and Climate Experiment (GRACE) mission. To this end, an approach based on the tesseroids is proposed to compute the TWS, expressed as equivalent water heights, from the gravitational potential at the altitude of the spacecraft.