# Near real-time GRACE gravity field solutions for hydrological monitoring applications

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Within the EGSIEM (European Gravity Service for Improved Emergency Management) project, a demonstrator for a near real-time (NRT) gravity field service which provides daily GRACE gravity field solutions will be established. Compared to the official GRACE gravity products, these NRT solutions will increase the temporal resolution from one month to one day and reduce the latency from currently two months to five days. This fast availability allows the monitoring of total water storage variations and of hydrological extreme events as they occur, in contrast to a 'confirmation after occurrence' as is the situation today. The service will be jointly run by GFZ (German Research Centre for Geosciences) and Graz University of Technology, with each analysis center providing an independent solution. A Kalman filter framework, in which GRACE data is combined with prior information, serves as basis for the gravity field recovery in order to increase the redundancy of the gravity field estimates. The on-line nature of the NRT service necessitates a tailored smoothing algorithm as opposed to post-processing applications, where forward-backward smoothing can be applied.

This contribution gives an overview on the near real-time processing chain and highlights differences between the computed NRT solutions and the standard GRACE products. We discuss the special characteristics of the Kalman filtered gravity field models as well as derived products and give an estimate of the expected error levels. Additionally, we show the added value of the NRT solutions through comparison of the first results of the pre-operational phase with in-situ data and monthly GRACE gravity field models.