



Validation of the EGSIM GRACE gravity fields using GNSS and OBP records

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During the 15 years of the GRACE mission, various different processing approaches have been developed to derive time-series of global gravity fields out of the sensor data acquired aboard of the two space-craft. For the majority of those approaches, different releases exist thanks to successive refinements of the methodology, re-processed Level-1 sensor data, or improved geophysical background models. In addition, a number of post-processing options were developed over the years that are necessary to transform gravity fields into global surface mass estimates. For geophysical applications of the GRACE results, it is important to obtain independent evidence about the quality of different GRACE products and their associated error estimates by means of independent validation.

We present comparisons of GRACE-based mass anomalies from various processing groups against both station coordinate time-series of GNSS permanent positions and in situ observations of ocean bottom pressure. Besides conventional GRACE solutions from the main processing centers, we focus particularly on gravity field combination solutions generated within the Horizon2020 project European Gravity Service for Improved Emergency Management (EGSIM). Although fully independent from each other, it will be demonstrated that both validation techniques confirm each other to a large extent, thereby allowing drawing robust conclusions on the noise level present in different GRACE series.