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The new EIGEN-GRACE05S (RL04) Gravity Field Time Series

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At GFZ Potsdam the GRACE mission data have been reprocessed based on improved background models for e.g. the static gravity field, the non-tidal atmosphere and ocean mass variations, the ocean tides or the ocean pole tides, the inclusion of further secular trends in low degree and order harmonics and the application of the full IERS2003 conventions. These new release 04 (RL04) monthly gravity field solutions are called EIGEN-GRACE05S.

Compared to the precursor EIGEN-GRACE04S (RL03) time series several advantages and improvements have to be highlighted. For example, due to the mass conserving approach now applied to the OMCT model used to calculate non-tidal oceanic mass variations the re-adding of GAB products to avoid artificial slopes in land applications (as recommended in the SDS TN04) is no longer necessary. Additionally, the monthly mean of the 6-hourly OMCT ocean bottom pressure is now provided for more reliable oceanic applications (GAD product).

The quality of the RL04 gravity field time-series has been slightly improved resulting in a further reduced meridional striping over the oceans and better localization of hydrological signals. Thanks to the improved de-aliasing product, spurious signals over the Baltic Sea have disappeared. Ocean bottom pressure comparisons with the FESOM ocean model show an improved correlation especially in the tropical and Northern Atlantic Ocean. The variability of the C20 coefficient is in good agreement to SLR-derived values. However there remains a bias which is also visible in GRACE-derived time series of other centers and which needs further investigation.