GRACE gravity field solutions using alternative de-aliasing models

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Short-term atmospheric and oceanic mass variations have to be taken into account when generating monthly GRACE gravity fields. Till now GRACE SDS level-2 processing centers have used the AOD1B product which is routinely generated by GFZ Potsdam. This model is using multi-layer 6-hourly ECMWF meteorological fields, which are integrated vertically to represent the 3D atmospheric mass distribution at each epoch. The ocean´s response to wind and pressure is derived from a barotropic ocean model provided by JPL (PPHA v1.1) which has several disadvantages which might influence the quality of the GRACE gravity field solutions (polar gaps or less variance in bottom pressure than other comparable models).

To investigate this influence dedicated experiments have been performed in which the only difference in calculation of GRACE gravity field solutions was the exchange of the PPHA model by an alternative barotropic model MOG2D and a baroclinic model provided by GRGS and the Technical University of Dresden, respectively. Additionally the handling of atmospheric tides in forcing the PPHA ocean model and used as background model within GRACE gravity field determination has been studied.

The presentation will shortly focus on the differences between these ocean models and will show results (measurement data residuals, spatial and spectral gravity field differences or comparisons with hydrological models) obtained for different monthly and daily gravity field solutions.