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# Impact of the stochastic model of the ocean tides on GRACE monthly gravity field solutions

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In GRACE data processing the geophysical background models, which are needed to compute the monthly gravity field solutions, usually enter as error-free. This means that model errors could influence and distort the gravity field solution.

The geophysical models which influence the solution the most are the atmosphere and ocean dealiasing product (AOD1B) and the ocean tide model. In this presentation we focus on the ocean tide model and on incorporating its stochastic information in data processing.

We use the FES2014 ocean tide model presented as a spherical harmonic expansion till degree and order 180. The information about its uncertainties and the correlations between different spherical harmonics is provided by the research unit NEROGRAV (New Refined Observations of Climate Change from Spaceborne Gravity Missions). In a first step, the stochastic properties of the tide model are considered to be static and are expressed as variance-covariance matrices (VCM) of the spherical harmonics of the 8 main tidal waves till degree and order 30. The incorporation of this stochastic information is done by setting up the respective ocean tide harmonics as parameters to be solved for. Since ocean tides cannot be freely estimated within monthly GRACE solutions, the provided VCMs for the 8 tidal waves are used for constraining the tidal parameters.

This procedure was used to compute monthly gravity field solutions for the year 2007. For a comparison, we computed also monthly gravity fields without taking into account the stochastic information on ocean tides. In this contibution we present and discuss the first results of this comparison.