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Comparison of two different ocean tide models for the GRACE satellite mission

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The GRACE dual satellite mission (launched in March, 2002) offers the possibility of computing monthly highly accurate mean gravity fields over an expected lifetime of five years. Incomplete subtraction (de-aliasing) of ocean tides (among other things) may cause corruption of the monthly GRACE gravity fields. Short-period tides may be partially aliased into the monthly mean fields. The differences between two ocean tide models (CSR 4.0 and FES2004) are used as a measure of tide model errors.

We have computed: a) straightforward monthly means of tidal elevation differences; b) orbital simulations for the footpoint of GRACE A. The results of b) show that for the S_2 and K_2 tidal constituents, aliasing causes effects which cannot be neglected with respect to the presently achievable GRACE measurement accuracy for spherical harmonic degrees $n \leq 7$ (S_2) and $n \leq 8$ (K_2).