



New ERP predictions based on (sub-)daily ocean tides from satellite altimetry data

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A new model for Earth rotation variations based on ocean tide models is highly desirable in order to close the gap between geophysical Earth rotation models and geodetic observations. We have started a project, SPOT (Short Period Ocean Tidal variations in Earth Rotation), with the goal to develop a new model of short period Earth rotation variations based on one of the best currently available empirical ocean tide models obtained from satellite altimetry. We employ the EOT11a model which is an upgrade of EOT08a, developed at DGFI, Munich. As EOT11a does not provide the tidal current velocities which are fundamental contributors to Earth rotation excitation, the calculation of current velocities from the tidal elevations is one of three main areas of research in project SPOT. The second key aspect is the conversion from ocean tidal angular momentum to the corresponding ERP variations using state-of-the-art transfer functions. A peculiar innovation at this step will be to consider the Earth's response to ocean tidal loading based on a realistic Earth model, including an anelastic mantle. The third part of the project deals with the introduction of the effect of minor tides. Ocean tide models usually only provide major semi-diurnal and diurnal tidal terms and the minor tides have to be inferred through admittance assumptions. Within the proposed project, selected minor tidal terms and the corresponding ERP variations shall be derived directly from satellite altimetry data.

We determine ocean tidal angular momentum of four diurnal and five sub-daily tides from EOT11a and apply the angular momentum approach to derive a new model of ocean tidal Earth rotation variations. This poster gives a detailed description of project SPOT as well as the status of work progress. First results are presented as well.