



## **Extraction of Tidal Signals from Magnetic Field Measurements with Tailored Trial Functions**

Roger Telschow and Christian Gerhards

University of Vienna, Computational Science Center, Vienna, Austria (roger.telschow@univie.ac.at)

Generated by the solar and lunar gravity fields, the oceanic tides cause a periodic motion of conducting sea water. By virtue of the ambient main magnetic field, these tidal water movements eventually generate an additional contribution to the geomagnetic field, which can be observed by recent satellite missions. The periodicity of the tidal constituents is very well known such that one is able to distinguish them from other contributions of the overall magnetic field.

We use the Regularized Orthogonal Functional Matching Pursuit to extract the dominant semi-diurnal lunar  $M_2$  tidal signal from a set of satellite measurements. Instead of relying on global functions which merely exhibit the corresponding  $M_2$  frequency, we use tailored time-periodic trial functions which are additionally spatially localized and satisfy the underlying Maxwell equations. Numerical examples are shown.