



Consistency of Earth orientation parameters, second degree gravity field coefficients and geophysical excitation functions

Andrea Heiker and Hansjoerg Kutterer

Leibniz Universitaet Hannover, Geodaetisches Institut, Hannover, Germany (heiker@gih.uni-hannover.de)

The Earth orientation parameters (EOP) and the time variable gravity field coefficients of degree 2 (GFC2) vary due to mass redistribution of the Earth's subsystems caused by, e.g., atmosphere, oceans, hydrology, cryosphere. The influence of the major subsystems (atmosphere, oceans and hydrology) is quantified by models and expressed in terms of the geophysical excitation functions (CHI). All parameters are functionally related to the unknown tensor of inertia of the Earth leading to a redundant determination of some elements of the tensor of inertia.

Our study is based on advanced least squares estimation method for combining the EOP, GFC2 and the CHI rigorously leading to consistent time series for all relevant observation and model data. The residuals allow to quantify inconsistencies between the data. We present and discuss the results obtained from different time series (EOP 05 C04 time series, different consistent combinations of excitation functions for atmosphere, oceans and hydrosphere, GRACE and SLR gravity field coefficients) and identify the best fitting combination of the time series.