Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11085, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11085
EGU General Assembly 2008

Comparisons of precession-nutation models and interior of the Earth models

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In this presentation, we first recall the characteristics of the IAU 2000/2006 precession-nutation model, with particular emphasis on the Earth transfer function that expresses the ratio between rigid and non-rigid nutations. Then, we report on recent comparisons of those models with VLBI observations, with and without removal of an FCN model and with different strategies for the VLBI series construction. Residuals with respect to the IAU 2000/2006 nutation model corrected for atmospheric effects have been analyzed in order to retrieve Earth-interior parameters. Further corrections stemming from the second order terms in the action of the tidal potential on the tidal redistribution of matter inside the Earth are considered as well. With these corrections taken into account, new transfer function parameters can be obtained. In particular we have examined the value of the free outer core and inner core resonant periods and quality factors (FCN and FICN periods and quality factors) in terms of the physics of the Earth's interior and the accuracy with which the nutations are observed with VLBI. We finally discuss some aspects of the geophysics involved in the numerical ERA model in comparison with the semi-analytical IAU models, and present possible future improvements in the modeling of the interior of the Earth.