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Future of IERS Conventions models

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The IERS main products are the celestial and terrestrial reference frames (ICRF and ITRF) and the set of Earth orientation parameters to transform between them. The IERS Conventions should provide the definitions and a complete set of models and procedures allowing realization of these products. Models are meant either to represent exactly a physical phenomenon, or to provide a convenient (conventional) way of specifying the products to be exchanged. In the first category, "exactly" means that the uncertainty from the model should not significantly affect the final uncertainty of the products. Although models representing physical phenomena which are not understood well enough could be introduced as conventional in the second category, this view is not retained in the Conventions.

For the ITRF, the current realization expressed in the Conventions (2003) is that the instantaneous position of a terrestrial point can be represented as a function of time t as X(t) = X_o + V*(t - t_o) + SUM_i{dX_i(t)} where X_o and V are regularized coordinates and velocities at reference epoch t_o and the summation covers "high-frequency time variations (mainly geophysical ones) using conventional corrections dX_i(t)". The summation should explicitly include effects for solid Earth tides, ocean loading, pole tide, atmospheric loading, and geocenter motion. However, the actual frequency range is not specified and models for atmospheric loading and geocenter motion are not provided in the Conventions (2003). We review recent work and propose directions to cover these points.

Applicability of the IERS Conventions is a prerequisite to their complete use in the analysis of space geodetic techniques: It is expected that the Conventions provide a consistent set of models and procedures, and the complete information on what is needed to implement them (either by explicit information or by providing the source of such information e.g. other IERS centers). First updates of the IERS Conventions take steps in this direction and some examples will be given. Updates are published

as they become available after proper approval and can be found on the web site (http://tai.bipm.org/iers/convupdt/convupdt.html).