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Reference Frames in Earth Rotation Theories

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Nowadays the determination of the Earth Orientation Parameters (EOP) and the different Terrestrial Reference Frames (TRF) are not independent. The available theories of Earth rotation aims at providing the orientation of a certain reference system linked somehow to the Earth with respect to a given celestial system, considered as inertial. In the past years a considerable effort has been dedicated to the improvement of the TRF realizations, following the lines set up in the 1980's. However, the reference systems used in the derivation of the theories have been rather considered as something fully established, not deserving a special attention. In this contribution we review the definitions of the frames used in the main theoretical approaches, focusing on those used in the construction of IAU2000, and the extent to which their underlying hypotheses hold. The results are useful to determine the level of consistency of the predicted and determined EOP.