



Reference frame-induced errors in VLBI Earth rotation determinations

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Earth Rotation is defined as the transformation between the Geocentric Celestial Reference System (GCRS) and the International Terrestrial Reference System (ITRS). It is a three-dimensional rotation which is described by the precession/nutation Q , the Earth rotation R , and the polar motion W matrices (IERS Conventions 2010):

$$x_{GCRS} = QRWx_{ITRS}.$$

The actual determination of Earth Rotation by Very Long Baseline Interferometry (VLBI) is based on the reference frames involved in the VLBI analysis. VLBI is the only space-geodetic technique used for the realization of the International Celestial Reference System (ICRS), which is the geocentric celestial reference system (GCRS) practically realized to evaluate the above equation. Since the Earth Orientation Parameters (EOP) are obtained as 'session-wise parameters', they can suffer from any inconsistencies between session-wise TRF and CRF realizations. In this paper we assess the session-wise TRF and CRF differences by determining the respective transformation parameters of the adjusted terrestrial and celestial positions on a session basis to the catalogue coordinates, given by the International Terrestrial Reference Frame 2008 (ITRF2008) and the Second International Celestial Reference Frame (ICRF2).