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The apparent diurnal motion of the instantaneous rotation axis from Very Long Baseline Interferometry and the Wettzell G-Ringlaser

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On the one hand, space geodesy, especially Very Long Baseline Interferometry (VLBI), determines the position of the celestial intermediate pole (CIP) w.r.t. both a conventional celestial reference frame and a conventional terrestrial reference frame (CTRF). Time series of reported nutation offsets related to a specific precession-nutation model can be used to compute the apparent motion of the instantaneous rotation pole (IRP) w.r.t. a CTRF. On the other hand, ringlasers are in principle sensitive to the apparent motion of the IRP w.r.t. the CTRF. The retrograde diurnal polar motion of the IRP, arising from both the luni-solar torques and geophysical forcing, is calculated from current precession-nutation models (e.g. MHB2000) and related offsets determined from VLBI. The sampling interval is three hours over the period 1984-2007. Next, we add the prograde component of diurnal polar motion excited by ocean tides and by the influence of tidal gravitation upon the triaxial structure of the Earth, estimated from the conventional models. All time series describing the motion of the IRP are transformed to a relative Sagnac frequency variation for comparison purposes with recent Wettzell G-ringlaser observations.