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The variable Earth annual retrograde nutation

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Very Long Baseline Interferometry is the only technique that can estimate Earth nutations with an accuracy under the milliarcsecond level. With 35 years of geodetic VLBI observations, the principal nutation terms caused by luni-solar tides and geophysical response have been estimated. We focuse on the variabity. Two of them present very significant amplitude and phase variations : the retrograde Free Core Nutation (FCN) at around 430 days period and the Annual Retrograde
Nutation (ARN). Despite progresses achievied in global circulation models, the atmospheric and ocean excitation cannot account for that. In particular the ARN shows an amplitude modulation of approximately 6 years, reminding the 6-year geomagnetc oscillation in Length of Day (LOD). Therefore we investigate possible correlation of this modulation with the 6-year wave observed in LOD. More generally, we suggest that the nutation term variability may have deep Earth causes, and cannot be integrally attributed to surface mass redistribution.

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