



## **Analysis of the Second Degree Stokes Coefficients of Geopotential and Earth Rotation Trends**

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We use changes of second degree Stokes coefficients,  $C_{20}$ ,  $C_{21}$ ,  $S_{21}$ , of geopotential estimated from GRACE mission and Satellite Laser Ranging (SLR) to calculate excitations of the Earth rotation. From their comparison with the trends in the Earth pole, it can be concluded, that the drift of the pole is more or less consistent with the climate driven mass redistribution, at least for the GRACE data span 2002-2017. The analysis of  $J_2 = -\sqrt{5}C_{20}$  variations contributing to LOD during the last 4 decades since 1976 shows trend and acceleration reversal during  $\sim 2005$ , when LOD trend also changed. However,  $J_2$  trend can only explain  $\sim 5\%$  of the long-term LOD changes. The remaining decadal signal in LOD, usually accounted to the angular momentum exchange at the core-mantle boundary, is anticorrelated with Earth surface temperature anomaly, which needs explanation.