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# Earth rotation parameters from satellite techniques

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It has been demonstrated since several years that satellite techniques are capable of determining Earth Rotation Parameters (ERPs) with a daily or even sub-daily resolution. Especially Global Navigation Satellite Systems (GNSS) with their huge amount of observations can determine time series of polar motion (PM) and length of day (LOD) rather well. But also SLR with its spherical satellites whose orbital motions are easy to model and that allow long orbital arc lengths can deliver valuable contributions to Earth rotation.
We analyze GNSS solutions (using GPS and GLONASS) and SLR solutions (using LAGEOS) regarding their potential of estimating polar motion and LOD with daily and subdaily temporal resolution.
A steadily improving modeling applied in the analysis of space-geodetic data aims at improved time series of geodetic parameters, e.g., the ERPs. The Earth's gravity field and especially its temporal variations are one point of interest for an improved modeling for satellite techniques. For modeling the short-periodic gravity field variations induced by mass variations in the atmosphere and the oceans the GRACE science team provides the Atmosphere and Ocean Dealiasing (AOD) products. They contain 6-hourly gravity fields of the atmosphere and the oceans. We apply these corrections in the analysis of satellite-geodetic data and show the impact on the estimated ERPs.
It is well known that the degree-2 coefficients of the Earth's gravity field are correlated with polar motion and LOD. We show to what extent temporal variations in the degree-2 coefficients are influencing the ERP estimates.