

Variations of the Earth's gravity field for 1980-1992 from LAGEOS

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Thirteen years of satellite laser ranging (SLR) measurements to LAGEOS (1980-1992) have been analyzed to investigate the variations of the Earth's gravity field, in particular of C_{20} . We use monthly LAGEOS arcs to estimate C_{20} , C_{30} , C_{21} , S_{21} coefficients together with orbital state vectors and along-track accelerations. After removing the dominant annual and semiannual harmonics in C_{20} , the residuals show significant interannual variations. To explore the geophysical sources to account for the interannual gravity variations, we use the surface atmospheric pressure estimates from the European Center for Medium Range Weather Forecasts (ECMWF) and the National Meteorological Center (NMC) to calculate their corresponding variations in C_{20} coefficient. Both inverted barometer (IB) model and non-IB model for the oceanic response to the atmospheric loading are tested. Results from these analysis will be presented.

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