



On the effect of atmospheric loading and mass variations on a geocenter time series from 30 years of LAGEOS SLR data

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With the dynamical approach for determining orbits of artificial satellites around Earth and concurrently parameters of the system Earth which are of geophysical interest, the geocenter in our focus here can conveniently be inferred by evaluating Satellite Laser Ranging (SLR) observations. The geocenter can either geometrically be derived as center of the coordinates of the SLR ground stations forming a polyhedron of the Earth's figure, or by solving explicitly for a global translation vector of the Earth's figure, or dynamically by estimating the degree 1 coefficients of a spherical harmonic expansion of the Earth's gravity field. In order to do so SLR observations of the two LAGEOS satellites since 1983 are examined according to recent standards. The geometrical and dynamical solutions are compared. Atmospheric loading and mass variations are added to the model space and the effect on the geocenter time series is investigated.