The study on the coefficients of Earth's gravity using Scaled Sensitivity Matrix method

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Abstract

For a single satellite, the obtained low-degree zonal coefficients contain the lumped effects of the high-degree zonal coefficients of the Earth's gravity field. Thus, a method that uses multiple satellites at various altitudes and inclinations is particularly important for separating the low-degree spherical harmonics. The coefficients of the earth's gravitational field parameters from the used studies are obtained from the orbital node varia tion analysis to get the correlations. In this paper, the Satellite Laser Ranging (SLR)data from the Lageos1 and Lageos2 for the 10 years period(2003-2013) and Scaled Sensitivity Matrix（SSM）method are used to recovered monthly mean, uncorrelated gravitational field parameters(C_{20}, C_{30}, C_{21} and S_{21}) that represent linear combinations of the primarily spherical harmonic coefficients of the Earth's gravitational field.