

SLR monthly gravity solutions using the C5++ software

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This study presents monthly gravity solutions up to degree and order 4 for the period 1993-2015 derived by Satellite Laser Ranging (SLR) data using the C5++ software [Otsubo et al., 1994]. Here, we apply the following modifications to the previous solutions by Matsuo et al. (2013). First, Range bias is estimated for per station and per satellite. Secondly, station coordinates are solved for using no-net-rotation constraints. Thirdly, non-tidal effects for atmosphere, ocean, hydrology are corrected using geophysical fluid models. Last, one-per-rev empirical accelerations are estimated in along-track and cross-track. Consequently, our new SLR solutions exhibited better consistency with those from Gravity Recovery And Climate Experiment (GRACE) than the previous solutions in the degree 3 and 4 components. The improvements of SLR gravity solutions provides further insight into the mass variability of the earth prior to the launch of GRACE in 2002.

Keywords: Time-variable gravity, Satellite Laser Ranging, Space geodesy