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Determination of geocenter motion with satellite laser ranging data: methods, models and results

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Mass redistribution within the Earth affects the position of its center of mass whose translation, relative to the International Terrestrial Reference Frame (ITRF), ranges from a few millimetres to centimetres. Satellite space geodetic techniques are able to detect such geocenter motion, Satellite Laser Ranging (SLR) being the most accurate in this respect, since it has produced a long history of valuable observations which are particularly sensitive to the origin of the reference frame. The most recent and updated ASI/CGS analyses of Lageos-1 and Lageos-2 SLR data span two decades and provide time series of fortnightly geocenter offsets with respect to the ITRF. Two different methods have been applied to retrieve the time series: a direct estimation of the degree one geopotential harmonics and a computation of Cartesian coordinate offsets from ITRF. Models and results, together with accuracies and spectral content, will be shown and discussed.