

EGU2020-10097

<https://doi.org/10.5194/egusphere-egu2020-10097>

EGU General Assembly 2020

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



Geocenter motion determination and analysis from SLR observations to Lageos1/2

Hongjuan Yu¹, Krzysztof Sośnica², and Yunzhong Shen¹

¹College of Surveying and Geo-informatics, Tongji University, Shanghai 200092, China (1610957@tongji.edu.cn)

²Institute of Geodesy and Geoinformatics, Wrocław University of Environmental and Life Sciences, Grunwaldzka 53, 50-357, Wrocław, Poland (krzysztof.sosnica@igig.up.wroc.pl)

Accurate quantification and analysis of geocenter motion are of great significance to the construction and maintenance of the international terrestrial reference frame and its geodetic and geophysical applications. Here, the time series of 13-year geocenter motion coordinates (from 2006 to 2019) is determined by using the network shift approach from Satellite Laser Ranging (SLR) observations to Lageos1 / 2. Then, the geocenter motion time series is analyzed by using singular spectrum analysis. The principal components of geocenter motion are determined with the w-correlation criterion and two principal components with large w-correlation are regarded as the periodic signals. The results show that the annual periodic terms are clearly detectable in all out of three coordinate components, whereas the semi-annual term is only detected in the X-component. Moreover, weak periodic oscillations of 3 to 4 months exist in the X- and Y-components. Besides weak periodic signals with periods of about 8 months and 1 month for the X- and Y-components, respectively, a significant periodic signal of about 2.8 years exists in the Z-component. Compared to the geocenter motion signals derived by the Center for Space Research (CSR) and Wrocław University of Environmental and Life Sciences (WUELS), both amplitude and phase agree well, with a better consistency with those from CSR, especially for the X- and Y-components.