

A result of developing work for multi-SLR satellites orbit determination and earth orientation parameters solution at SHAO

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Abstract SLR (Satellite Laser Ranging) technique plays a key role in earth sciences. The global SLR network has evolved into a powerful source of data for studies of the solid Earth, and its ocean and atmospheric systems. It is the most accurate space geodetic technique currently available to determine the geocentric position of an Earth satellite. The SLR data processing work has been done in China since early 1980s, and contributed to the solution of the position and velocity of global station network and earth orientation parameters in the following years. Since 2004, GEODYN package has been introduced into Shanghai Astronomical Observatory (SHAO) of CAS for satellite POD data analysis. As a developing and initial work of using this powerful software at SHAO, in this paper the multi-SLR satellites observation data are processed simultaneously. The orbit determination and earth orientation parameters solution are done from tracking data of multi-satellites. Weighting methods are tested for the solution from each separate satellite. The obtained results computed from above procedure are compared with the result from IERS standard value for some time span. In addition, the result computed from single satellite tracking data is also given as an example to show the advantage of the technique of multi-satellites data processing. Additionally, the time variation of low degree coefficients of earth gravity field in several years span is estimated, the physical background of the result is analyzed and compared with the result of other literatures.