A SLR Pre-Processing Algorithm Based on Satellite Signature Effect

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Satellite signature effect is the one of major SLR error sources. The reflected signal is deformed and spread with a long tail in temporal distribution due to Satellite signature effect. To reduce the satellite signature effect on the SLR precision, we recently simulated the satellite signature effect removal process for normal point algorithm. The simulation is conducted based on a revised model of satellite response, which fully considering the structural and distribution characteristics of retroreflectors. In order to eliminate both long-term and short-term satellite signature effect, a clipping method for SLR data processing is proposed by defining the clipping location as 5.6mm away from the mean value of the long-term fit residuals to select effective returns for normal points. We applied the clipping method for SLR data processing of Changchun station. The results indicate that compared to normal points algorithm, the stability of RMS is improved 53% and both the stability of skew ness and Kurtosisfor LAGEOS-1 also improved. The new method has stronger robustness and applicability, which can further minimize the influence of satellite signature effect on the SLR production. The results have been published in Appl. Sci.