

TROPOSPHERE DELAY MODELING WITH GRADIENTS FOR SLR: FIRST RESULTS

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Abstract

Satellite Laser Ranging (SLR) observation have a significant impact on the determination of precise satellite orbits, definition of the origin of the reference frame, the global scale and the gravitational constant. The present accuracy of SLR solutions is limited by deprivations in the background models which are applied when processing SLR data. One of the most important factors limiting the accuracy of SLR is the modelling of the troposphere delay, especially the modelling of the horizontal gradients of the troposphere delay. The limited number of laser observations disenables the determination of horizontal gradients with a sufficient accuracy. In this paper, we present a review of currently used models of the troposphere delay for SLR and provide an analysis of GNSS-derived horizontal gradients for SLR-GNSS co-located stations. Although the derived offsets are at submillimeter level in the zenith, after mapping to the elevation angles of 10° they achieve a value up to 20 mm.

Keywords

SLR, Troposphere delay modeling, mapping functions