



Forthcoming Improvements in SLR Data Analysis for the Next ITRF

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Accuracy requirements for the International Terrestrial Reference Frame (ITRF) are becoming increasingly more stringent, especially with regards to its origin definition and its scale stability. The precise monitoring of the geocenter and its variations over increasingly shorter intervals is a priority goal in order to meet the requirements of the Global Geodetic Observing System (GGOS) for 1 mm in the definition of the TRF origin at epoch and a 0.1 mm/y stability. Satellite Laser Ranging (SLR) contributes unique information on the origin, and along with VLBI, for its absolute scale. Advances in our understanding of the coupling between the sub-components of system Earth require that we revisit our current modeling used in the reduction of SLR data. For example, GRACE monthly gravitational fields provide significant temporal variations not captured by classical static models, and global atmospheric and hydrological fields can be used to determine the equivalent gravitational variations due to mass redistribution down to as short periods as 3-6 hrs. The deduced variations can in turn be used to reduce more rigorously the precise SLR data from geodetic targets like the LAGEOS satellites for a higher accuracy definition of the ITRF. Over the past few years, the inclusion (or not) in our models of high frequency effects of the temporal gravity signals due to mass redistribution in the terrestrial system has been a topic of heated discussions within the space geodesy community. With the recent release of numerous products from global circulation models and, satellite and terrestrial observations, we are able now to examine the effect of such improved modeling in the analysis of several years of SLR data. We will present initial results from such analyses and compare them to our nominal products, based on the currently accepted IERS and ILRS standards. The improvements in the ILRS products should then be considered along with those from the other space geodetic techniques by the IERS, in order to formulate a proposal for modification of the analysis standards related to products contributing to the establishment of future ITRFs.