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GGOS Products from Multiple Mission SLR Data Analysis

Erricos C. Pavlis, Magdalena Kuzmicz-Cieslak, and Peter M. Hinkey
GEST/UMBC and NASA Goddard/698, Baltimore, USA (epavlis@umbc.edu/Fax: +1-410-455-5868)

The Global Geodetic Observing System (GGOS) is entering a new, pre-operational phase with an increased demand for multiple products to address several and diverse scientific investigations of the Earth System. All of the geodetic techniques are attempting to extract as much information from their current operations as possible, as a prelude to the upcoming improved infrastructure network, when these products should be available routinely and with a much higher accuracy and temporal resolution. The International Laser Ranging Service (ILRS) is considering the expansion of the satellite targets used for the generation of its official products for the International Terrestrial Reference Frame (ITRF) in order to address the development of additional or more robust products that are of interest to the broader community. This effort will have a minimal impact on the ILRS network operations since the data to be used are already collected and available for several satellite missions. The reasons these missions have not been considered up to now in the generation of the official products are the low altitude of most of these missions (hence increased drag forces and higher sensitivity to gravitational perturbations) and the limited accuracy for some of the spacecraft parameters that are crucial for high accuracy products. The advent of increasingly more accurate and detailed gravitational models and the availability of global fields describing the effects of atmospheric, oceanic and hydrology-induced perturbations, offer increased accuracy orbital modeling even for some of the very low altitude missions. At the same time, the use of SLR targets at a variety of altitudes provides increased geometric strength for all of the estimated parameters and offers more frequent tracking opportunities which in turn allow for increased resolution of the estimated parameters. We will present initial results from preliminary analyses and compare them to our nominal products, based on the currently accepted IERS and ILRS standards. We will highlight the issues that need more attention for future improvement of the operational products and the areas where the new targets' data are making the most important contributions. Depending on the outcome of these and future tests, we anticipate that in the near future, the ILRS will formulate a proposal to IERS for a modification of the analysis standards related to contributions to the establishment of future IERS/ITRF products.