



ILRS Activities Towards the Mitigation of Systematic Errors in SLR Products

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The International Laser Ranging Service (ILRS) contributes to ITRF development unique information that only Satellite Laser Ranging—SLR is sensitive to: the definition of the origin, and in equal parts with VLBI, the scale of the model. For the development of ITRF2014, the ILRS analysts adopted a revision of the internal standards and procedures in generating our contribution from the eight ILRS Analysis Centers. The improved results for the ILRS components were reflected in the resulting new time series of the ITRF origin and scale, showing insignificant trends and tighter scatter. This effort was further extended after the release of ITRF2014, with the execution of a Pilot Project (PP) over the past two years that demonstrated the robust estimation of persistent systematic errors at the millimeter level. The ILRS Analysis Standing Committee—ASC, is now turning this into an operational tool to monitor station performance and to generate a history of systematics at each station, to be used with each re-analysis for future ITRF model developments. This is part of a broader ILRS effort to improve the quality control of the data collection process as well as that of our products. To this end, the ILRS has established a “Quality Control Board—QCB” that comprises of members from the analysis and engineering groups, the Central Bureau, and even user groups with special interests. The QCB meets by telecon monthly and oversees the various ongoing projects, develops ideas for new tools and future products. The lessons learned from the PP were used in the reanalysis of the entire SLR data set of the LAGEOS and LAGEOS-2 era (1993 to present) to determine persistent systematic errors over time at each site. These are subsequently applied in a forward-modeling step during the reanalysis of the data for the development of a set of normal equations for the development of the next ITRF model and a consistent series of weekly TRF solutions. This presentation will discuss our new approach in handling systematics in SLR data, examine the time series of systematics at key-stations in comparison to what was previously modeled at these sites, and investigate the effect of the revised ILRS product on the ITRF attributes, more specifically on its origin and scale.