The ILRS Analysis Standing Committee Contribution to ITRF2020

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Abstract. The ILRS contribution to ITRF2020 is a time series of weekly/bi-weekly SINEXs with station position estimates and EOP, from 7-day arcs (1993.0 – 2021.0) and 15-day arcs over 1983.0-1993.0. Each solution was obtained as the combination of loosely constrained individual solutions from the seven ILRS Analysis Centers: ASI, BKG, DGFI, ESA, GFZ, JCET and NSGF. Everyone followed strict standards agreed within the ILRS Analysis Standing Committee (ASC) and used SLR data from LAGEOS, LAGEOS-2, Etalon-1 and Etalon-2, (LAGEOS-only from 1983 to 1992). The ILRS ASC devised an innovative approach in handling systematic errors in the network, never before utilized. After a 5-year pilot-project documented in Luceri et al., (2019). The Station Systematic Error Monitoring PP (SSEM), delivered a series of long-term mean bias estimates for each station, the time intervals of applicability and their statistics. They were derived from freely adjusted station position and EOP solutions for the period 1993.0 to 2020.5, using the latest satellite CoG model. The simultaneous estimation of the station heights and measurement biases resulted in a self-consistent set of weekly bias estimates for each site. Breaks and "jumps" were used to define the periods of applicability and to calculate the mean bias and its standard deviation. The mean biases were pre-applied in the re-analysis, limiting the remaining jitter of the bias to negligible level. This approach strengthened the estimation process without a compromise of the final results' accuracy. As a result, the ILRS contribution to ITRF2020 minimized the scale difference between SLR and VLBI to below 2 mm (ITRF2014 ~9 mm). We present an overview of the procedures, models, and the improvement over previous ILRS products, focusing especially on the Core ILRS sites.