

A Review of the ILRS Station Validation Procedures and Recent Performance

FrankLemoine

The ILRS implements a procedure to verify the performance of new stations or stations that have undergone significant changes or repairs. With these procedures, the station data are withheld from public dissemination and analyzed by the Analysis Standing Committee (ASC) prior to release to the community and use in operational solutions for the International Terrestrial Reference Frame (ITRF). As currently formulated, the procedure requires that the stations to obtain 20 acceptable passes per satellite for LAGEOS-1, LAGEOS-2, LARES-2 and LARES, with a minimum of five normal points per satellite pass. The rationale for selecting these geodetic satellites as validation targets is first that this provides direct information on how the station will perform in its primary ILRS function, to contribute to the ITRF. The second indirect advantage is the validation procedure is simplified since these are passive spherical satellites that are straightforward to model. With certain exceptions for weather or other local considerations, the geodetic satellites passes should be obtained within a 60-day sliding window. The quarantined data are analyzed to determine the station precision and the magnitude of the biases that might be present in the ranging system. Since the amended procedures were implemented earlier this year (2024), they have been applied to the new stations of Tsukuba (7306), Yebes (7217), and to Mt. Stromlo (7825) which underwent a major system repair and upgrade. We describe the quarantine procedure, and report the results obtained in the primary ranging channels for these stations (532 nm for Tsukuba and Mt. Stromlo; 1064 nm for Yebes). We review the stations' performance in the ITRF SINEX solutions since the station data were released to the ASC and the scientific community by the ILRS data centers, in comparison to the other stations of the ILRS present in these routine solutions.