The BKG Reprocessing for the ILRS Pilot Project on Systematic Errors

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In the context of the ILRS Pilot Project (PP) on Systematic Errors a reprocessing has been carried out at BKG covering the years 2000-2017 yielding loose-constraints LAGEOS-only Terrestrial Reference Frame (TRF) solutions of weekly station positions as well as daily Earth Rotation Parameters. Following the specification of this PP range biases (RB) are estimated for each station for LAGEOS-1 and -2 separately in contrast to conventional ILRS analysis procedure in order to account for systematic errors in the normal point range data. Such a parameterization is expected to be beneficial for the TRF parameters estimated, and thus improving the quality of the ILRS contribution to the International Terrestrial Reference Frame in view of GGOS.

A closer look at the RB estimated reveals quite different structure of their time series among the contributing stations reflecting different levels of quality of measurement systems as well as of calibration efforts. The influence of these additional RB is studied through the effect on the TRF parameters as well as the satellite orbits. For that purpose, alternative solutions with different characteristics like the conventional RB parameterization, minimally constrained datum or constrained range biases are computed, and the time series of the TRF parameters obtained are analyzed in view of differences in statistical properties giving evidence of the influence of each RB parameter setup. Above all, a positive influence on global TRF scale is visible revealed by more stable long-term behavior.