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Reanalysis and extension of the ILRS weekly products

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Satellite Laser Ranging (SLR) contributes to the realization of the International Terrestrial Reference Frame (ITRF) for over two decades. The origin of the ITRF is realized through the estimated coordinates of its defining set of positions and velocities at epoch. Driven by numerous geophysical processes, continuous mass redistribution within the Earth system causes concomitant changes in the long-wavelength terrestrial gravity field that result in geometric changes in the figure described by the tracking station network. The newly adopted ITRF approach allows the simultaneous estimation of these variations at weekly intervals, either through a geometric approach during the stacking step or a dynamic approach during the data reduction step. To complement these improvements at the ITRF production level, the ILRS Analysis Working Group has adopted some additional improvements in the data reduction of the future as well as the historical SLR data, with interim results presented here. At a first step, the newly adopted atmospheric refraction model of Mendes-Pavlis [2004] has been utilized throughout the reanalysis. This results in a more consistent scale definition and allows the proper utilization of all SLR data at any wavelength, without the need for additional bias adjustments that weaken the final result. In a parallel second step, we have extended our analysis to include past data since the early days of the SLR network, thus allowing the simultaneous estimation of accurate and consistent positions and velocities for tens of sites that are presently unavailable from the official ITRF2005 results. This extension of the spatiotemporal span of SLR data used in the new product will have beneficial implications for the final result, since it takes advantage of the long and uninterrupted operation of some key core sites with high quality data and the coverage of very tectonically complex areas that are presently void of SLR tracking sites. This new revision of the weekly products is a first step towards the official ILRS contribution for the next ITRF release. We will also present a brief list of additional improvements we envision for this next release.