

# **Intra-technique Combination and Its Precision Evaluation based on SHAO SLR SINEX solutions**

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**ABSTRACT** Based on the weekly SINEX solutions provided by ILRS SLR analysis centers, another SLR Intra-technique combination solutions named ILRSC solutions were derived. The ILRSC combination method was a little different from that of ILRSA and ILRSB. We evaluated the three combined solutions. The results showed that the relative weight factors of each analysis center based on ILRSC were comparable to those provided by ILRSA and ILRSB. The precision of station coordinates and EOPs of the combined solution were better than that of each single analysis center. With the terrestrial reference frame SLRF2008 as a reference, the obtained translation parameters and scale parameters during 1993 to 2004 were consistent with the results derive from ILRSA, and the results during 2005 to 2017 were consistent with those of ILRSB. The translation parameters of the combined solution respect to SLRF2008 showed an annual character which amplitudes were 2.596mm, 2.550mm, and 3.480mm in the three directions of X, Y and Z respectively, and the rates of the linear term were 0.0398mm/year, 0.101mm/year and 0.3359mm/year respectively. The scale parameter had a linear term with rates of 0.0438 ppb/year. These linear rates were generally greater than 0.0411 mm/year, 0.0422 mm/year, 0.0657 mm/year, and 0.0106 ppb/year respect to the SLRF2014. It means that the terrestrial reference frame SLRF2014 is more stable

than SLRF2008. Moreover, the weekly SINEX solutions during 2013 to 2017 were calculated at SHAO and also were integrated with the SINEX solutions provided by other ILRS analysis centers. The results showed that the SHAO SLR 3D WRMS values of all stations and the core stations with respect to SLRF2014 were 15.66mm and 9.86mm respectively. The SHAO SINEX solutions' weight factor was equivalent to that of other analysis centers. The translation parameters and scale parameters with respect to SLRF2014 also showed the same trend with those of other analysis centers.

**Key words:** SLR; SINEX; Intra-technique Combination; Terrestrial Reference Frame; EOP