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Improved DORIS Reference Frame Solutions from NASA GSFC

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At GSFC, since 2008, we have been routinely processing data to DORIS and SLR satellites from 1993. A SINEX time series, based on processing of DORIS data from 1993 to 2008 (designated wd10) was included in the IDS combination for ITRF2008 (Le Bail et al., 2010; Valette et al., 2010). We have updated this series with the addition of new satellites – Cryosat2 and Jason-2, and the new series (designated wd12) is routinely submitted to the IDS combination center for inclusion in the DORIS operational combination.

In preparation for an eventual reprocessing of all the DORIS data for eventual inclusion in a new ITRF we are now updating our processing standards. As a first step, we update to the ITRF2008 reference frame as expressed through DPOD2008. In addition, we apply the GMF and GPT models for the troposphere, and we update the modeling for the change in pitch of SPOT-5 solar arrays after January 2008. Finally, we consider updated standards for static and time-variable gravity modeling.

With this base series, we compute cumulative solution, expressed in ITRF2008, and examine the week-by-week station solution parameters, in particular scale, WRMS and Helmert transformation parameters. Finally we consider a joint solution with SLR, where the DORIS system is tied to SLR in two ways, first through the orbit computations using satellites tracked by both SLR and DORIS (e.g. TOPEX, Envisat, Jason-2, Cryosat2), and second through explicit ties at collocated sites. As one of the means of testing of these DORIS-only and SLR+DORIS solutions, we examine the vertical rates at sites in the vicinity of tide gauges.