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Global combination of station coordinates and Earth rotation parameters

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A rigorous approach to simultaneously determine both a terrestrial reference frame (TRF) materialized by station coordinates and Earth Orientation Parameters (EOP) is now currently applied on a routine basis in a coordinated project of the Groupe de Recherches de Géodésie Spatiale (GRGS). Observations of the different astro-geodetic techniques are separately processed at different analysis centres using unique software package GINS DYNAMO, developed and maintained at GRGS. The strength of the method is the use of a set of identical up-to-date models and standards in unique software. In addition the solution benefits from mutual constraints brought by the various techniques. In the procedure, the datum-free normal equation matrices weekly derived from the analyses of the different techniques are stacked to derive solutions of station coordinates and Earth Orientation Parameters (EOP). The analyses we have performed over a three year time span (2005-2007) show that the accuracy and stability of the EOP solution and stations coordinates are very sensitive to a number of parameters in the application of minimum constraints, quality of local ties as well as continuity constraints on Earth rotation parameters and the weighting of the different techniques