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Using non-tidal atmospheric loading model in space geodetic data processing: Preliminary results of the IERS analysis campaign

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In 2012, the International Earth Rotation and Reference Systems Service (IERS) released a call for space geodetic solutions corrected for non-tidal atmospheric loading at the observation level. The main objective of this analysis campaign is to evaluate the impact of non-tidal atmospheric loading corrections on Terrestrial Reference Frame (TRF), geocenter motion and Earth Orientation Parameters (EOP) estimated from the four geodetic techniques. Compared to previously published studies, this call is an opportunity to assess the impact of non-tidal atmospheric loading corrections using the same loading model for all technique solutions.

Eleven Analysis Centers submitted solutions including six weekly Satellite Laser Ranging (SLR) solutions, one weekly solution from Doppler Orbitography and Radiopositioning Integrated by Satellite (DORIS), three session-wise Very Long Baseline Interferometry (VLBI) and one daily Global Navigation Satellite Systems (GNSS) solution. The submitted solutions will be described and compared. The differences between corrected and non-corrected solutions for every solution will be highlighted and quantified. The issue of applying mean daily or weekly non-tidal atmospheric loading corrections versus using the loading model a priori in the data processing will be also revisited for the four space geodetic techniques and presented for the first time fully consistently for SLR and DORIS. Finally, the impact of non-tidal atmospheric loading on the International Terrestrial Reference Frame (ITRF) will be carefully studied.