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Impact of geodetic satellite techniques on the CRS realization

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The Global Geodetic Observing System (GGOS) of International Association of Geodesy (IAG) aims at 1mm accuracy/precision by integrating the geodetic parameters from individual techniques. The Very Long Baseline Interferometry (VLBI), one of the major GGOS techniques, contributes to the realization of International Terrestrial Reference System (ITRS) and Earth Orientation Parameters (EOP) together with geodetic satellite techniques: Global Navigation Satellite Systems (GNSS), Satellite Laser Ranging (SLR), and Doppler Orbitography and Radiopositioning Integrated by Satellite (DORIS). The VLBI is also the unique technique which realizes the International Celestial Reference System (ICRS). Up to now, the VLBI-derived Celestial Reference Frame (CRF) is not estimated but fixed in the computation of the Terrestrial Reference Frame (TRF) and the corresponding EOP series. However, EOP are the linking parameters between CRF and TRF, and due to existing correlations between the parameters the EOP will have an impact on the CRF if they are adjusted through an inter-technique combination. The influence would be the contribution of the other techniques. In this work, we simultaneously estimate CRF, TRF, and EOP using the VLBI input data for ICRF3 (1979-2017), and the GNSS input data for ITRF2014 (1994-2014) extended for the period 2015-2017. In this presentation, we focus on the correlation between CRF parameters (right ascension and declination) and EOP. The impact of different combination strategies on various types of radio sources is also investigated. The results indicate that the improvement of the precision (standard deviation) of the source positions is about 10%.