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## Towards Inter-Technique Co-Location of GNSS and VLBI Observations

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The current realisation of the ITRF2014, features the estimation of polar motion (x-pole and y-pole) based on the combination of the four space geodetic techniques, whereas polar motion rates are based on two techniques, and UT1-UTC and LOD are taken only from the solution of a single technique (VLBI). Moreover, the combination of troposphere parameters (from VLBI and GNSS) with tropospheric ties and the combination of common clocks at the fundamental sites are not yet exploited in this combination strategy. Therefore, a rigorous combination of all common parameter types, with consistent Earth Orientation Parameters (EOPs) and with appropriate inter-technique tropospheric and clock ties, is still a considerable way to go.

The guiding principle for a rigorous combination is that all parameter types common to more than one space geodetic observation technique should be combined, including their full variance-covariance information as well as the corresponding ties. Based on this fact, and keeping in mind that both, GNSS and geodetic VLBI are based on microwave frequencies, and that their physical models and their parameter types (site coordinates and velocities, troposphere estimates, EOPs and -possibly- clock estimates) are closely related, we used data from the CONT17 campaign to study the benefits to be expected from a more rigorous combination approach, and we developed a processing scheme, based on a tailored version of the Bernese V5.2 software, for the consistent estimation of all EOPs, with daily and sub-daily resolution of polar motion and UT1-UTC, and for realising inter-technique tropospheric ties. We discuss the challenges and results of this rigorous inter-technique combination of VLBI and GNSS observations, and provide evidence of the need of such an approach.