

## Assessment of geodetic products from 24 h VGOS sessions using ITRF2020

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**Abstract.** The VLBI Global Observing System (VGOS) is a new network of antennas that are deployed for use in geodetic Very Long Baseline Interferometry (VLBI). It utilizes broadband receivers in the 2-14 GHz frequency range, and modern antennas that enable short integration times, and rapid and precise pointing. The result is that more observations with a diverse geometric coverage are obtained for the same time-window compared to legacy S/X systems.

Until recently the evaluation of geodetic products from sessions that are carried out using VGOS was challenging due to the fact that these new stations were not part of combined solutions for the determination of a reference frame. Their a priori coordinates had to be extracted either by short-baseline measurements to legacy S/X telescopes (Varenius et al., 2021), or by unconstrained estimation of their coordinates using known stations to fix the geodetic datum (Mikschi et al., 2021). The new iteration of the International Terrestrial Reference Frame (ITRF), the ITRF2020, was recently published in April 2022, and it is the first combined catalogue of well-defined stations that includes VGOS. The International Earth Rotation and Reference Systems Service (IERS) has also aligned its IERS-C04 earth orientation parameter (EOP) series to ITRF2020.

We assess the geodetic products of VGOS using 24 hr long observation sessions, spanning 2019 to 2021 by utilizing ITRF2020, and the corresponding EOP a priori series. A kalman filter and a least-squares estimator are deployed and we evaluate the accuracy and precision of station positions and EOP that are obtained. The tropospheric parameters are compared to those obtained from Water Vapor Radiometers (WVR) at co-location sites. The differences between the two estimators are also discussed.