



## **Analysis of Polar Motion Series Differences Between VLBI, GNSS, and SLR**

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We have compared polar motion series from VLBI, GNSS, and SLR generated with a reference frame aligned to ITRF2008. Three objectives of the comparisons are 1) to determine biases between the techniques, 2) to determine the precision of each technique via a 3-corner hat analysis after removing the relative biases, and 3) to evaluate the long-term stability of polar motion series. Between VLBI, GNSS, and SLR, there are clear variations ranging from 20 to 60  $\mu\text{as}$  in peak-to-peak amplitude. We investigate the possible causes of these variations. In addition, there are other apparent systematic biases and rate differences. There are VLBI network dependent effects that appear in the VLBI-GNSS and VLBI-SLR differences, specifically between the operational R1 and R4 weekly 24-hour sessions. We investigate the origins of these differences including network station changes in these networks over the period from 2002-present. The polar motion biases and precisions of the five IVS VLBI continuous observing CONT campaigns (since 2002) are also analyzed since these 2-week campaigns were each designed to provide the highest quality results that could be produced at the time. A possible source of bias between the three techniques is the underlying chosen sub-network used by each technique to realize the adopted reference frame. We also consider the technique differences when ITRF2014 is used instead of ITRF2008