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Long-Term Evaluation of Precise Point Positioning with Single Receiver Phase Ambiguity Resolution using JPL's GPS products

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Precise knowledge of the orbits and clocks of the Global Positioning System (GPS) constellation is required to perform precise point positioning (PPP) of a single receiver. Significant improvement in the accuracy of these PPP solutions can be gained by resolving the integer carrier-phase ambiguities in the GPS data. Bertiger et al. [2010] presented an approach to perform ambiguity-resolved PPP of a single receiver also using the wide lane and phase bias estimates from the global network of sites that were used to determine the orbits and clocks of the GPS constellation. They showed that daily station repeatability improved by 10-30%, particularly in the east component, with results as good as or better than achieved with the classical double-difference approach to ambiguity resolution. In this paper, we present static and kinematic PPP results from a long-term (> 3 years) evaluation of this single receiver ambiguity resolution approach. We use GPS orbits, clocks, wide lane and phase bias estimates generated from the most recent reprocessing of historical GPS data by the Jet Propulsion Laboratory (JPL). These reprocessed GPS products with wide lane and phase bias estimates will span at least 1996-present, enabling bias-resolved single-receiver PPP solutions for these years in either the IGS08 or a fiducial-free reference frame.