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Estimation of Satellite PCO Offsets for BeiDou based on MGEX Net Solution

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BeiDou Satellite Navigation System currently has a total 14 satellites including GEO/IGSO/MEO satellites and providing a regional PNT service. Due to a lack of publicly available antenna phase center offsets (PCO) for the BeiDou satellites, conventional values of (+0.6 m, 0.0 m, +1.1 m) are recommended for orbit and clock determination of the GEO/IGSO/MEO satellites, which needs to be further estimation and refinement.
In this paper, we propose a multi-GNSS network solution for the estimation of BeiDou satellite PCO. More than 35 ground stations of International GNSS MGEX tracking network are used to determine the BeiDou satellite PCO. In this strategy, the GPS and BeiDou satellite orbits and clocks are derived from IGS final products, and GPS satellite PCO and PCV are fixed according to igs08.atx. The BeiDou satellites PCO are estimated together with the station clock, troposphere delay and LC combination ambiguity parameter.
Result shows that the RMS of phase residuals for all stations is 1.8cm and is 1.6m for code residual, respectively. The estimated PCO is different for each satellite. Appling the new PCO for precise point positioning, we found that the positioning error improves from 6cm to 2cm in height.