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Abstract Submission

Development of Real-time PPP Client for Precise Satellite Orbit and Clock Corrections via NTRIP

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PPP (precise point positioning) is a precise positioning technique which does not need any reference station and baseline. PPP has been usually utilized for GNSS data post-processing analysis which necessarily requires precise satellite orbits and clocks. Recently, IGS (international GNSS service) started to distribute real-time precise satellite orbits and clocks. They are provided as the streams of NTRIP (networked transport of RTCM via internet protocol). The format of the correction data currently adopts to the draft proposal for RTCM SSR (state space representation) messages. The corrections for broadcast satellite ephemerides are generated in real-time at the IGS server by using worldwide IGS stations network. Users in the service area of mobile internet access can access the IGS NTRIP server and receive such correction data via a NTRIP stream. We implemented a client software for real-time PPP by using the correction stream. The software inputs raw measurement data from a GNSS receiver and processes carrier phase observables for real-time PPP. It uses an open source positioning library RTKLIB, which was also developed by the authors and has already supported standard RTCM messages and NTRIP. The extension for handling of RTCM message type 1057 to 1068 and algorithms for PPP including earth tide model, antenna phase center correction and phase wind-up effects. The libraries and applications for the real-time PPP are planned to be incorporated in the next version RTKLIB as open source. We also conducted some experiments to evaluate the performance of real-time PPP with the IGS satellite orbit and clock correction stream. The paper will contain the results of the experiments.