



BDS Clock Combination of iGMAS Analysis Centers and Its Performance Evaluation

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The international GNSS continuous Monitoring and Assessment System (iGMAS) is developed as a service platform for multi-GNSS by China at the beginning of 2011, which provides the orbit and clock products for BDS, GPS, GLONASS and Galileo. Product Integration and Service Center (ISC) of iGMAS is the reprocessing center of the precise products and the external service center. High precise satellite positioning could not be realized without precise clock correction, therefore the combination and assessment for clock products is one of the important tasks for ISC. First of all, this paper introduces the development and improvement of combination strategy for iGMAS BDS clock products, from classical the epoch-wise clock alignment to the proposed "three-step" alignment. The nonlinear systematic error processing, the alignment of clock reference and the compensation of systematic error are investigated. Furthermore, the BDS clock products of recent three years from iGMAS were compared and analyzed in details. In order to verify the accuracy and consistency of the combined clock products, PPP tests were implemented using BDS data from 5 IGS MGEX stations. The results show that the clock accuracy and quality of combined solutions is the best, which can be used as the reference to assess the clock quality of analysis centers (ACs). The accuracy of BDS static or kinematic PPP using the combined clock products is improved significantly, compared to those of PPP without using the proposed strategy. Finally, the combined BDS clock products of recent three years were evaluated from the aspects of accuracy, drift rate and stability respectively, which are very important for the performance evaluation of BDS spaceborne atomic clocks.

Keywords: iGMAS; GNSS; analysis center; systematic error; precise point positioning.

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