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Author: Mr. Dongjun Li
China Academy of Space Technology (CAST), China, lidj@spacestar.com.cn

REAL-TIME PRECISE ORBIT DETERMINATION OF LEO SATELLITES BASED ON GNSS PRECISE
POINT POSITION TECHNOLOGY

Abstract

Spaceborne Global Navigation Satellite System (GNSS) receivers are widely used for orbit determination of low-Earth-orbiting (LEO) satellites. In this paper, a real-time precise orbit determination method of LEO satellite based on GNSS precise point position (PPP) technology is proposed, which is different from the traditional ones based on GNSS observations and isn't sensitive to the satellite orbit maneuver and attitude change. Different methods of PPP for orbit determination are designed and compared, which can make the accuracy of real-time orbit determination for LEO satellite is up to the centimeter level. The scheme to broadcast GNSS precision correction product by GSMC(Global Short Message Communication) service of BDS(Beidou satellite navigation System) is also proposed, which will apply to fast or near real-time precise orbit determination for LEO satellite and provide a method with high precision and high reliability for orbit determination of LEO satellites in the future.