عنوان مقاله:

Assessing Potential Performance of GPS and Galileo in Context of Broadcast Precise Orbits and Clock Corrections

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خلاصه مقاله:

The global navigation satellite system (GNSS) is becoming a vital positioning technology across various services. The ephemeris quality is one of the factors that directly impact the user's position accuracy. Some applications, such as investigations into Earth's crustal dynamics, need more precise ephemeris data than broadcast ephemeris. Several institutions, such as the international GNSS service (IGS), have developed precise orbital services to enable these applications. Unfortunately, data rates for such precise orbits are often confined to ۱۵ minutes. In this paper, in order to generate precise ephemeris with the broadcast sampling period, the well-known Lagrange interpolation method is used. Furthermore, a comparative GPS and Galileo position analysis corresponding to the broadcast and precise ephemeris over a typical day in September ۲۰۲۱ is presented. To get insight into comparative positioning analysis over Hyderabad Station, the ENU (East-North-Up) directional errors, satellite visibility and horizontal accuracy parameters are considered. Based on the numerical analysis, standalone Galileo has similar capabilities to GPS, and it can be used in Multi-GNSS over India and its surrounding areas. This work may help in the development of single- or dual-frequency GNSS receivers for civilian navigation services.

کلمات کلیدی:

GPS, Galileo, Broadcast and Precise, Ephemerides, Satellite Visibility, Horizontal Accuracy

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