

IONOSPHERE EFFECT ON GLOBAL NAVIGATION SATELLITE SYSTEM PERFORMANCE – A REVIEW

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Abstract

Satellite-based Communications, Navigation, Surveillance and Air Traffic Management (CNS/ATM) systems have been adopted by the international aviation community to meet the challenges of continuously rising global air traffic. Global Navigation Satellite System (GNSS) has been prescribed for the provision of navigation services to the air traffic. Performance of GNSS depends upon many factors including refraction and scintillation effects of ionosphere on the satellite signal. Severity of this effect depends largely upon the geographical location of the navigation receiver, the time of the day, the month of the year and the year on the 11-year solar cycle. This paper studies ionosphere mechanism and discusses its effect on the performance of GNSS. The paper also predicts the performance during solar cycle maximum expected in 2013-2014 [Jensen, Anna B.O., Mitchell, Cathryn 2011]. It touches upon the preparations going on to face the adverse effects of increased solar activity during the cycle maximum and recommends coordination/cooperation between various relevant organizations/institutions in the processes of data collection and development of a model

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