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GPS Scintillation Effects as Observed from a Location Beyond the Anomaly Crest in the Indian Longitude Sector

Abstract:
Extensive measurements of GPS amplitude scintillations have been performed all over India for the past decade especially under the GAGAN program from stations near the magnetic equator, in between the equator and the anomaly crest, and near the anomaly crest. Scintillation observations from a station beyond the anomaly crest is rare. A dual frequency GPS receiver is being operated by the University of Calcutta at Palampur (32.11 deg.N, 76.53 deg.E geographic; 30.25 deg.N magnetic latitude) since April 2014. An estimate of the northern limit of the equatorial irregularity belt at 77 deg.E has been obtained from GPS amplitude scintillation measurements at Palampur over the equinoctial months of February through April and August through October in the high sunspot number year 2014. Intense scintillations (S4_0.6) have been observed upto a latitude of 26 deg.N geographic (21deg.N magnetic) from Palampur. Scintillations with intensity S4 _ 0.6 corresponds to an SI _15dB which corresponds to a receiver fade depth _ 12 dB. These measurements have been combined with that obtained from GAGAN reference stations to obtain the northern limit of the equatorial irregularity belt over the Indian longitude sector.