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GPS PHASE SCINTILLATIONS

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Abstract.

GPS TEC monitors with high sampling rates are now available providing amplitude and phase scintillation data in addition to other configurable parameters. While amplitude scintillation index can be directly derived, phase scintillation data requires preprocessing before obtaining the phase scintillation index and other related ionospheric parameters. The phase shift due to the Doppler effect and slowly changing position of the satellite have to be eliminated. The residue may be used for deriving the scintillation index and the power spectrum. The amplitude scintillation index is basically controlled by the first Fresnel dimension and the phase spectrum extends over a larger scale domain. The two combined together may provide idea about the hierarchy of the irregularities over extended scales. A high resolution GPS TEC monitor has been in operation at Kolkata, which is situated near the northern crest of the equatorial anomaly since 2005. Even during the solar minimum period, there are occasions when moderate scintillations were observed on L1. A few cases of such amplitude and phase scintillations will be presented and discussed. The constraints imposed by scintillations on systems are indicated.