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Study of tropospheric scintillation effects in Ku-band frequency for satellite communication system (Article) (Open Access)

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Abstract

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Scintillation is a rapid fluctuation of electromagnetic waves in terms of phase and amplitude due to a small-scale inconsistency in the transmission path (or paths) with time. Scintillation exists continuously throughout a day whether during raining or clear sky conditions. The raw signal data need to exclude other propagations factors that include signal fluctuations to further understand the scintillation studies. This paper presents the analysis of tropospheric scintillation data from January 2016 till December 2016 at Ku-band frequency of 12.202 GHz beacon signal. The experimental data from MEASAT 3B were collected and analyzed to see the effect of tropospheric scintillation . The elevation angle of the dish antenna is 77.45°. The highlighted objectives are to analyze the scintillation data at Ku-band, and to compare and validate the results with other scintillation models. The result shows that the stipulated scintillation analysis has higher amplitude, which is 0.73 dB compared to other scintillation analysis which has lower scintillation amplitude: 0.45 dB (Karasawa), 0.42 dB (ITU-R), 0.4 dB (Nadirah & Rafiqul), 0.42 dB (Van De Kamp), and 0.11 dB (Anthony & Mandeep).

SciVal Topic Prominence

Topic: Rain | Electromagnetic wave attenuation | ITU-R model

Prominence percentile: 89.600

Author keywords

CDF | Ku-band | Satellite communication system | Scintillation models | Tropospheric scintillation

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