

Empirical Prediction of the Effect of Rain Drops on Dbs System Operating in Ku-Band (Case Study of Abuja)

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Abstract : Recent advancement in microwave communications technologies especially in telecommunications and broadcasting have resulted in congestion on the frequencies below 10GHz. This has forced microwave designers to look for high frequencies. Unfortunately for frequencies greater than 10GHz rain becomes one of the main factors of attenuation in signal strength. At frequencies from 10GHz upwards, rain drop sizes leads to outages that compromises the availability and quality of service this making it a critical factor in satellite link budget design. Rain rate and rain attenuation predictions are vital steps to be considered when designing microwave satellite communication link operating at Ku-band frequencies (112-18GHz). Unreliable rain rates data in the tropical regions of the world like Nigeria from radio communication group of the international Telecommunication Union (ITU-R) makes it difficult for microwave engineers to determine a realistic rain margin that needs to be accommodated in satellite link budget design in such region. This work presents an empirical tool for predicting the amount of signal due to rain on DBS signal operating at the Ku-band.

Keywords : attenuation, Ku-Band, microwave communication, rain rates

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