

Modelling of raindrop size distribution in Nigeria for microwave and millimetre wave application.

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Abstract:

Raindrop size data collected using a distrometer measuring system at three geographical locations in Nigeria namely Calabar, Ile-Ife and Zaria have been analysed for the prediction of rainfall attenuation at centimeter and millimetre wave frequency bands. The modeling of the raindrop size distributions has been carried out using the lognormal and exponential distributions. Models for the three stations as well as a Southern, Northern and a general model for the country have been proposed for the prediction of the effect of tropical rainfall on electromagnetic propagation at microwave and higher frequencies. Rain induced specific attenuation values were computed for a frequency range of 1 to 400GHz using the models obtained for thunderstorm and shower which are very important for communication systems design.

Keywords: Distrometer/ Lognormal distribution/ Exponential distribution/ Attenuation

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