

Effect of Wind and Humidity on Microwave Links in North West Libya

Authors : M. S. Agha, A. M. Eshahiry, S. A. Aldabbar, Z. M. Alshahri

Abstract : The propagation of microwave is affected by rain and dust particles causing signal attenuation and de-polarization. Computations of these effects require knowledge of the propagation characteristics of microwave and millimeter wave energy in the climate conditions of the studied region. This paper presents effect of wind and humidity on wireless communication such as microwave links in the North West region of Libya (Al-Khoms). The experimental procedure is done on three selected antennae towers (Nagaza station, Al-Khoms center station, Al-Khoms gateway station) for determining the attenuation loss per unit length and cross-polarization discrimination (XPD) change. Dust particles are collected along the region of the study, to measure the particle size distribution (PSD), calculate the concentration, and chemically analyze the contents, then the dielectric constant can be calculated. The results show that humidity and dust, antenna height and the visibility affect both attenuation and phase shift; in which, a few considerations must be taken into account in the communication power budget.

Keywords : : Attenuation, scattering, transmission loss.

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