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Effect of Wind and Humidity on Microwave Links in Al-Khoms City-Libya

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Abstract : The propagation of electromagnetic waves in millimeter band is severely affected by rain, and dust particles in terms of attenuation and de-polarization. The computations of dust and/or sand storms require knowledge of electrical properties of the scattering particles and climate conditions at the studied region in the west north region of Libya. (Al -Khoms) To compute the effect of dust and sand particles on the propagation of electromagnetic waves, it is required to collect the sand particles carried out by the wind, measure the particles size distribution (PSD), calculate the concentration, and carry chemical analysis of the contents, then the dielectric constant can be calculated. The main object of this paper is to study the effect of sand and dust storms on wireless communication, such as microwave links, in the north region of Libya (Al -Khoms) of Libya (Nagaza stations, Al-khoms center stations, Al-khoms gateway stations) by determining of the attenuation loss per unit length and cross-polarization discrimination (XPD) change due to the effect of sand and dust storms on wireless communication systems (GSM signal). The result showed that there is some consideration that has to be taken into account in the communication power budget .

Keywords : attenuation, scattering, transmission loss, electromagnetic waves
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