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Microwave Signal Attenuation in Harmattan Weather Along Calabar-Akampkpa Line-of-Sight Link

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Abstract: Line-of-sight (LOS) attenuation at 6.44GHz was measured at Calabar (4° 58' N, 8° 17' E) for ten months (Aug '93-May '94) using the Nigerian Telecommunications radio signal. The measurement was made with the intent of highlighting microwave signal attenuation in Harmattan weather conditions. The results are presented in terms of mean signal level and fog attenuation, fade rate distribution, fade depth distribution and scintillation index. The observed attenuation values due to Harmattan (fog) and the calculated (using Altshuler's model) are in fairly good agreement. Also, the statistics of fade distribution show fast fading of longer duration of the order of 15 to 38 fades per hour during this period (Harmattan). This shows that microwave LOS link in this region and regions with similar climatic characteristics are prone to signal degradation as well as fading in the Harmattan season.

Key Words: Harmattan, Radio signal, Fog attenuation, Statistics of fade, Calabar

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