

DETERMINATION OF THE DOMINANT FADING AND THE EFFECTIVE FADING FOR THE RAIN ZONES IN THE ITU-R P.838-3 RECOMMENDATION**Ononiwu, Gordon**Department of
Electrical/Electronic Engineering
Federal university Of Technology
Owerri, NIGERIA**Simeon Ozuomba**Department of Electrical/Electronic
and Computer Engineering
University of Uyo, Akwalbom
NIGERIA**Constance Kalu**Department of Electrical/Electronic
and Computer Engineering
University of Uyo, Akwalbom
NIGERIA**ABSTRACT**

The International Telecommunication Union (ITU) published well-tested models and data set for the prediction of fading (or attenuation) due to multipath and rain based on measurements on radio links across the globe. In respect of rain attenuation, ITU released ITU-R PN.837-1 recommendation in which ITU split the globe into 15 regions according to precipitation intensity. In this paper, a web application was developed to study the variation of rain attenuation, multipath attenuation, dominant attenuation and the effective fading experienced by terrestrial line of sight microwave links in any of the 15 ITU rain zones. The web application do generate tables and graph plots for the variation of the dominant fading and the effective fading with respect to frequency, link percentage availability, path inclination and point refractivity gradient. The web application was developed with PHP scripting language, MySQL database management system and then hosted online using apache web server. Sample computations were carried out for microwave frequencies in rain zone N which can be found in some parts of Nigeria. Rain and multipath attenuation data were obtained from ITU published data. In all, the result obtained in the paper showed that rain attenuation is the dominant fading for higher frequencies whereas, multipath fading do dominate at the lower frequencies. The frequency at which the transition from dominant multipath fading to dominant rain fading is not fixed. Rather, the turning point depends on different link parameter combinations. The results obtained in the paper showed how changes in link parameters like the link's percentage availability, the path's point refractivity index and the path inclination, can affect the frequency at which the dominant fading in a given rain zone transit from multipath fading to rain fading.

Keywords: Microwave Communication, Communication Link, Line Of Sight Microwave Communication, Rain Attenuation, Multipath Attenuation, Dominant Attenuation, Effective Attenuation. Web Application.