Comparison of Rainfall Rate and Attenuation Models for Tropical Region in Southwestern, Nigeria

E. O. Olurotimi*[1], J. S. Ojo*[2], M. O. Ajewole*[3]

*Department of Physics, The Federal University of Technology,
P. M. B. 704, Akure, Ondo State, Nigeria
[1]elisayrot@yahoo.com
[2]ojojs_74@futa.edu.ng
[3]oludare.ajewole@futa.edu.ng

Abstract- One minute average rainfall rates data were compiled for two years of observation over two tropical stations using Nigeria Environmental Climatic Observatory Program (NECOP). The scenario at the tropical and the equatorial locations is of concern due to the nature of the climate which is characterized by high rainfall intensity, enhanced frequencies of rain occurrence and the increase presence of large raindrops when compare with the temperate climates. In this work, four different rainfall rate distribution models were compared to find the best cumulative model over the tropical stations observed. Also, three different rain-induced attenuation prediction models proposed by different authors on terrestrial paths not exceeding 20 km, and the rain attenuation exceeded for 0.01% of time over the stations were studied.

Keyword- Rainfall rate, rain-induced attenuation, ITU-R model, radiowave propagation, tropical region, and NECOP.