Abstract

Wireless communication encountered lots of issues in the channel as the signal is being propagated from transmitter to the receiver. The mobile users continue increasing and the quality of service is very poor due to unreliable nature of the channel. There has been signaling fading, attenuation, calls drop, interference, network capacity and signal loss which may be traced to path propagation problems. The data was collected from MTN base station at four different locations in Owerri namely – Egbu road, Mbaise road, Chukwuoma road and Awaka road. The drive test equipment with Sony-Ericsson W995 hand phone was used to measure Received Signal Strength (RSS). The MATLAB R2014a software was used for the simulation of parameters of the existing model and optimized model. The Measured Received Signal Power (MRSP) compared with the corresponding results obtained from Okumura-Hata, COST 231-Hata and Egli models. The Root Mean Square Error (RMSE) and Mean Absolute Percentage Error (MAPE) is used to evaluate the deviation in terms of the amount of error in each model. The result showed that COST 213-Hata model has RMSE=9.75 dB and
MAPE=0.432 %. COST 231-Hata model was optimized using Least Square method (LSM) and optimized model showed better results with tuned COST 231-Hata model where RMSE=4.33 and MAPE=0.221 %. The optimized model is recommended for better deployment and would be more accurate to be applied for path loss prediction in the suburban area.

References


Index Terms

Computer Science  Wireless

Keywords

Received Signal Power, Least Square Method, COST 231-Hata, RMSE