

Path Loss Propagation Model Prediction for GSM Mobile Networks in Nigeria

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AbstractThis research is aimed at predicting propagation path loss model which can be helpful in planning the best Global System for Mobile Communication (GSM) networks in Dutse town, Jigawa state Nigeria. The methodology employed is measurement and instrumentation method. Digital wheel meter and handheld Spectrum analyzer (AAronia AG HF 2025E spectran) were used to measure signal path loss at Garu, Fagoji, and Takur and Gida dubu sites in Dutse town respectively. The outdoor fields' measurements were carried for the GSM services provided by Airtel, MTN, Glo and Etisalat communication companies in the state. The average measured path losses were compared with the predicted and result were presented in tabular and graphical forms. The result presented that the variance of the average values lies between 2 to 7dB which is within the acceptable range. This shows a significant correlation between the measured and predicted models. Therefore the empirical model developed from Log-Normal shadowing concept can work for GSM network service providers for planning and optimization their services in Dutse, Nigeria.

Keywords: GSM Network Service Providers, Path loss Measurement, Propagation Model, Planning and Implementation.