

STUDY AND SIMULATION OF OUTDOOR PROPAGATION MODELS IN WIRELESS COMMUNICATIONS SYSTEM

This Project Report is presented in partial of fulfillment for the award of Bachelor in
Electrical Engineering (Honours)

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ABSTRACT

Propagation loss prediction models play a very important role in the design of cellular mobile radio communication systems [2]. Radio transmission in a mobile communications system often takes place over irregular terrain [1]. Therefore, outdoor propagation models are important to predict the path (signal) loss. These models can be classified into theoretical and experimental models. The main experimental models are the Hata-Okumura, and COST231-Hata model. The problem of these models is that these prediction expressions are based on the qualitative propagation environments such as urban, suburban, and open (rural) areas [11]. The performance and applicability in those environments were investigated and discussed. The COST231-Walfisch-Ikegami model (COST231-WI) is a result of the effort to use a quantitative description of the propagation environments [11]. In addition to the height of transmitter and receiver antennas, the building's profile and street width are considered in this model [6]. For the more quantitative understanding of the propagation environment, the path losses of Hata-Okumura and COST231-Hata are compared with those of COST231-WI based on the same frequency, base station (BS) and mobile station (MS) antenna heights, but changing building height and street width. The impact of these parameters is presented. Simulations by MATLAB version 7.0 software has been carried out.

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