

**EVALUATION OF RECEIVED SIGNAL STRENGTH  
INDICATOR (RSSI) FOR PROPAGATION PATH  
LOSS MODELS IN MOBILE WIMAX**

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## **ABSTRACT**

The coverage and performance of any wireless system is closely related to the propagation losses in wireless environment. This study presents an evaluation of Received Signal Strength Indication (RSSI) for mobile WiMAX (IEEE 802.16e-2005) in urban, suburban and rural terrain profiles. MATLAB R2008b is used to simulate the environment for different propagation path loss models which were Stanford University Interim (SUI), COST-231 Hata and Electronic Communication Committee (ECC-33). Results showed that SUI model and COST-231 Hata model gave better RSSI performance than ECC-33 model on all considered terrains.

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# CHAPTER 1

## INTRODUCTION

### 1.1 RESEARCH BACKGROUND

Highly usage of internet nowadays has led to the dramatic demand for a higher speed and larger coverage area of the service. Broadband is one of the technologies which is believed can give such an amazing offer to adapt for the situation. The current broadband options such as DSL, cable and WIFI have proved this. Now the latest broadband technology which is still on its deployment phase and that is the Worldwide Interoperability for Microwave Access or WiMAX. It is also known as broadband wireless access and essentially it was based on the IEEE 802.16 standards.

In 1998, a group was formed to develop an air-interface standard for wireless broadband, the IEEE 802.16. This group's preliminary focus was the development of a LOS-based point-to-multipoint wireless broadband system for the operation in the 10GHz to 66GHz millimeter wave band. As a result, the resulting standard, the original IEEE 802.16 standard was completed in December 2001 which is based on a single-carrier physical (PHY) layer with a burst time division multiplexed (TDM) MAC layer. The IEEE 802.16 group then produced 802.16a, an amendment to the standard, to include NLOS applications in the 2GHz to 11GHz band, using orthogonal frequency division multiplexing (OFDM) as the basic physical layer. For the MAC layer, as support for orthogonal frequency division multiple access (OFDMA) was also included. Further improvement resulted in a new standard in 2004, called IEEE 802.16-2004, which replaced all prior versions and formed the basis of the first WiMAX solution. These early WiMAX solutions were based on IEEE 802.16-2004 which targeted fixed applications. Until December 2005, the IEEE group completed and approved