Effect of Physical Layer Limitations on the MAC Layer Capacity of Mobile WiMAX System, Analysis and Simulation

Abstract

In this paper, the effect of physical layer limitations on the MAC layer capacity of mobile WiMAX system is analyzed mathematically. The downlink physical layer simulation results show the best burst profiles for a mobile WiMAX system working in a multipath fading channel under the Quality of Service (QoS) requirements for video streaming applications. The capacity mathematical results are obtained based on the physical layer constraints after discarding the MAC layer overheads. Then, a complete simulation model for physical and MAC layers are built to validate the capacity analytical results. The simulation results show a good degree of convergence between the analytical and simulation capacity results. Also, the results show that the maximum number of users that can be served instantaneously by the BS are different depends on the used distributed subcarrier permutation mode.

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**Index Terms**

Computer Science  
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**Keywords**  
Mobile WiMAX  physical layer  MAC layer  PUSC  FUSC  ITU-R mixed users  QoS  
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