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Performance Analysis of Mobile WiMAX Communication using Directional Antenna over Fading channel

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Abstract: Worldwide interoperability for microwave access (WiMAX) is an IEEE802.16 standard that provides low cost, high-speed and long-range wireless communications, where the 802.16m is the latest version of WiMAX standard fully optimized for fixed and pedestrian speeds. Due to dynamic multipath fading and high Doppler shift, there is service degradation on quality of service (QoS) and data rate. In this paper, an outage probability expression is derived based on analytical model for WiMAX communications at high vehicular speeds over Nakagami $m < 1$ fading channel. Moreover, the new derived outage probably and an existing BER are analytically evaluated using a directional antenna on mobile receiver instead of Omni-directional antenna that shows significant enhancement on performance.