

BER of the Leaky Feeder under Rayleigh Fading Multichannel Reception with Imperfect Phase Estimation

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Abstract : Leaky Feeder (LF) has been a proven technology for many decades and its promises broadband wireless access in short range but being overlooked until now. The LF is a natural MIMO transceiver ideal for micro and pico cells. In this work, the LF is considered as a linear antenna array MultiInput-Single-Output (MISO) and derive the average bit error rate (BER) in Rayleigh fading channel considering ideal and independent paths (iid) which consider there is no correlation and mutual coupling between transmit antennas (slots) or receiver antenna considering QPSK modulation with imperfect phase estimation. We consider maximal ratio transmission (MRT) at the transmit end and maximal ratio combining (MRC) at the receiving end. Analytical expressions are derived for the BER with radiating cable transmitters. The effects of slot spacing and carrier frequency on the BER are also studied. Numerical evaluations show the radiating cable transmitter offer much lower BER than a single antenna transmitter with same SNR.

Keywords : leaky feeder, BER, QPSK, rayleigh fading, channel gain, phase mismatch

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