



Research Article



Multuser Detection over Generalized-K Fading Channels with MRC Receive Diversity in Presence of Impulsive Noise

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ABSTRACT

In direct sequence-code division multiple accesses systems (DS-CDMA), the signals are transmitted over multipath channels that introduce fading and

shadowing. Multipath fading and shadowing along with multiple access interference and inter-symbol interference degrades the system performance. Further, experimental results have confirmed the presence of impulsive noise in wireless mobile communication channels. Hence, this paper presents a technique for multuser detection in DS-CDMA systems over generalized-K (GK) fading channels in presence of impulsive noise. An approximate closed-form expression for average probability of error of an M-decorrelator is derived, for the demodulation of binary phase shift keying (BPSK) signals transmitted over the channels with simultaneous presence of fading and shadowing. Maximal ratio combining (MRC) receive diversity is also incorporated to mitigate the effects of fading and shadowing. Performance of a new M-estimator based detector is also studied by evaluating error rate with the derived expression. Simulation results reveal that the proposed M-estimator based detector performs better in the presence of fading, shadowing and heavy-tailed impulsive noise.

Keywords: Diversity combining, fading channel; GK distribution; impulsive noise; multuser detection; probability of error, shadowing.

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