

Error Probability of Multi-User Detection Techniques

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Abstract : Multiuser Detection is the intelligent estimation/demodulation of transmitted bits in the presence of Multiple Access Interference. The authors have presented the Bit-error rate (BER) achieved by linear multi-user detectors: Matched filter (which treats the MAI as AWGN), Decorrelating and MMSE. In this work, authors investigate the bit error probability analysis for Matched filter, decorrelating, and MMSE. This problem arises in several practical CDMA applications where the receiver may not have full knowledge of the number of active users and their signature sequences. In particular, the behavior of MAI at the output of the Multi-user detectors (MUD) is examined under various asymptotic conditions including large signal to noise ratio; large near-far ratios; and a large number of users. In the last section Authors also shows Matlab Simulation results for Multiuser detection techniques i.e., Matched filter, Decorrelating, MMSE for 2 users and 10 users.

Keywords : code division multiple access, decorrelating, matched filter, minimum mean square detection (MMSE) detection, multiple access interference (MAI), multiuser detection (MUD)

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