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Abstract
In the uplink channel of the third generation wireless system, there are two types of interferences. One is multiple access interference resulted from different users, and the other is inter-symbol interference caused by multiple radio paths between the transmitter and the receiver. Both effects can result in poor capacity of users in a cell. To improve communication performance in the mobile radio environment, and the simultaneous subscribers per cell, both techniques, smart antenna and Rake receiver, have been proposed respectively. In this thesis, by Matlab program, we present the performance evaluation of smart antennas combined with Rake receiver under multipath channel for DS-CDMA systems.

In the simulation, a two-path channel model of DS-CDMA system with Rake receiver is provided first. Then, the MMSE algorithm is selected to implement the smart antenna approach. By the BER calculation, we can predict the performance according to the different numbers of antennas and the different angles of multiple incident waves. Under the same conditions, we can also have the maximum capacity of users. These simulation results and Matlab programs are useful for communication engineers in cellular system design.
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