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Abstract
In the uplink channel of a Direct Sequence Code Division Multiple Access (DS-CDMA) system, there are two types of interferences. One is multiple access interference resulted from the different users, and the other is inter-symbol interference caused by multiple radio paths between the transmitter and the receiver. Both effects will increase bit error rate and result in poor communication performance. In this thesis, we propose a modified Direction-of-Arrival (DOA) estimation method combined with smart antennas technique to decrease the above two effects and then improve communication performance.
In the conventional methods for DOA estimation of radiation signal, the simplest technique is Delay-and-Sum method, also called Classical beamformer. However, when the number of users more than one, the Delay-and-Sum method will fail. To this question, we propose an improved approach, called Modified Delay-and-Sum (MODAS) and by Matlab program, we present the performance evaluation of the MODAS method in the reverse channel of DS-CDMA system, in which, the multipath is set as a simple Two-path model.
Finally, we discuss the communication performance of the smart antennas combined with MODAS method, and separately compare with Modified MUSIC、MMSE algorithms under the same channel environment. These simulation results and Matlab programs are useful for communication engineers in cellular system design.
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