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论文

多用户MIMO系统上行检测算法

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摘要：

针对多用户MIMO上行传输系统提出了两种新型的多用户检测算法．利用块对角化技术将多用户MIMO系统并行或者串行地分解为多个单用户MIMO系统，从而使得适用于单用户MIMO系统的算法可以直接应用，极大地降低了系统的复杂度．仿真结果表明，该算法能够达到与相应单用户MIMO系统相同的性能，而与传统的迫零算法相比，性能有很大的提高．此外，理论分析与实验结果表明，串行多用户检测算法性能优于并行多用户检测算法．

关键词： 块对角化 并行多用户检测 串行多用户检测 多用户MIMO 单用户MIMO 迫零

Uplink detection algorithms in multiuser MIMO systems

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Abstract:

We propose two novel uplink multiuser detection (MUD) algorithms for Multi-User Multiple Input Multiple Output (MU-MIMO) systems. Based on block diagonalization (BD) technique the proposed parallel and successive MUD algorithms can decompose the MU-MIMO system into parallel single user MIMO (SU-MIMO) systems, which enables the SU-MIMO based algorithms to be directly applied and significantly reduces complexity. Simulation results show that the proposed algorithms are capable of achieving the same performance as the corresponding SU-MIMO system and have a substantial performance gain against the traditional zero-forcing (ZF) based algorithm. Furthermore, theoretical analysis and simulation results demonstrate that the successive BD algorithm significantly outperforms the parallel one.

Keywords: block diagonalization parallel multiuser detection successive mutiuser detection multi-user MIMO single-user MIMO zero-forcing

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