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论文

MIMO系统中基于干扰子空间投影的盲空时多用户检测算法

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摘要
该文针对多天线码分多址系统，提出了一种盲空时多用户检测算法。该算法结合空域、时域二维信息，利用Alamouti空时分组码与MIMO信道的结构特征，通过跟踪干扰子空间对多天线信道进行估计。在此基础上，通过将接收信号投影到干扰子空间的正交补空间上，实现了抑制多址干扰的空时多用户检测。该算法不仅能够自适应地跟踪信道的变化，且具有较低的算法复杂度。仿真结果表明该算法能够有效地抑制多天线码分多址系统中的多址干扰，改善系统的性能。

关键词 空时处理 多用户检测 干扰子空间投影 多输入多输出 码分多址

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Blind Space-Time Multi-user Detection Based on Interfering Subspace Projection in MIMO-CDMA Systems

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Abstract
A blind space-time Multi-User Detection (MUD) algorithm is proposed for multi-antenna Code Division Multiple Access (CDMA) systems. The proposed algorithm exploits the signal structures in both time domain and spatial domain for interference rejection. Specifically, the proposed algorithm integrates Space-Time Coding (STC) with channel estimation by using the structural features of both Alamouti STC and the Multiple Input Multiple Output (MIMO) channel. The Multiple Access Interference (MAI) is suppressed by projecting the received signal onto the orthogonal complement of the estimated interference subspace. Furthermore, the proposed algorithm can adaptively trace the variation of the wireless channels with low complexity. Simulation results show that the algorithm can effectively suppress the MAI of space-time CDMA systems and significantly improve the system performance.

Key words Space-time processing MUD Interference subspace projection MIMO CDMA

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