研究论文

块对角化的最小均方误差几何均值分解矢量预编码

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摘要：

提出了对多用户多输入多输出下行链路信道进行块对角化处理后，使用最小均方误差准则推导结合几何均值分解的矢量预编码实现方法．首先使用块对角化方法将多用户多天线信道分解为等价的并行子信道，然后基于等价子信道获得收发信号的均方误差，通过最小均方误差准则推导结合几何均值分解的矢量预编码，其扰动矢量包括扩展星座图的扰动矢量和残余干扰矢量，最后根据推导结果给出了最小均方误差解的表达式，并总结出系统实现框图．仿真表明，提出的算法在误码率性能上优于传统的块对角化算法以及其扩展算法．

关键词： 多输入多输出系统 均方误差 矢量预编码 块对角化

Block diagonalized MMSE GMD vector precoding

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Abstract:

Based on the block diagonalization (BD) for the multiuser Multiple-input Multiple-output (MIMO) downlink channel, a vector precoding (VP) combined with geometric mean decomposition (GMD) based on the minimum mean square error (MMSE) criterion is proposed. The multiuser multi-antennas channel is decomposed into parallel effective sub-channels, and then the mean square error (MSE) of the transceiver signal is obtained based on the effective sub-channel. The VP combined with GMD is derived based on the MMSE criterion, and the perturbation vector contains the perturbation vector expanding constellation and residual interference vector. The MSE expression is then achieved based on the derivation results, and the realization block diagram is concluded finally. Simulation results show that the proposed algorithm outperforms the conventional BD method and its expanded method in bit error rate (BER).

Keywords: MIMO system   mean square error, vector precoding   block diagonalization

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