

论文

一种动态子信道分配MIMO-OFDM波束成形系统的信号检测算法

王 军, 刘 宁, 李少谦

电子科技大学通信抗干扰技术国家级重点实验室 成都 610054

收稿日期 2008-11-27 修回日期 2009-8-24 网络版发布日期 2010-1-12 接受日期

摘要

基于动态子信道分配的MIMO-OFDM波束成形系统可以获得比传统系统更好的误码率性能。但由于处理或者反馈时延的影响,会使得发射机利用不准确的信道状态信息发射数据,从而在数据流之间引入干扰,导致系统性能下降。通过分析时延对系统的影响,该文提出了一种改进的检测算法:通过构建等效MIMO系统模型,采用最小均方误差MIMO检测算法抑制数据流之间的干扰,并利用等效MIMO信道矩阵的特征值分解白化噪声获得等效高斯信道模型,计算编码比特的对数似然比。仿真表明,该算法相对于现有算法有2.5~4 dB的性能增益。

关键词 [MIMO](#) [OFDM](#) [波束成形](#) [检测算法](#) [时延](#)

分类号 [TN92](#)

An Improved Detection Algorithm for MIMO-OFDM Beamforming System with Dynamic Subchannel Allocation

Wang Jun, Liu Ning, Li Shao-qian

National Key Laboratory of Communication, University of Electronic Science and Technology of China, Chengdu 610054, China

Abstract

Dynamic subchannel allocation based MIMO-OFDM beamforming system outperforms conventional MIMO-OFDM beamforming system with considerable gain. Unfortunately, the imperfect channel state information, which is due to processing or feedback time delay, will be used by the transmitter to transmit data symbols. The resulted inter-streams interference will degrade the system performance significantly. In this paper, an improved detection scheme is proposed to combat effectively with this interference according to the analysis of the effect due to delay. By constructing equivalent MIMO system model, the inter-streams interference is suppressed though MIMO detection algorithms. Furthermore, eigenvalue decomposition of equivalent MIMO channel is applied to whiten the noise so that equivalent Gaussian channel model can be obtained to compute the log-likelihood ratio of coded bits. Simulation results show the proposed detection scheme outperforms conventional scheme with a gain of 2.5~4 dB.

Key words [MIMO](#) [OFDM](#) [Beamforming](#) [Detection algorithm](#) [Time delay](#)

DOI: 10.3724/SP.J.1146.2008.01576

通讯作者 王 军 junwang@uestc.edu.cn

作者个人主页 王 军; 刘 宁; 李少谦

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(294KB\)](#)

▶ [\[HTML全文\]\(OKB\)](#)

▶ [参考文献\[PDF\]](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“MIMO”的 相关文章](#)

▶ 本文作者相关文章

· [王 军](#)

· [刘 宁](#)

· [李少谦](#)