

算法研究

多天线系统中多中继传输的时间分配和功率分配优化方法

陈遥, 邱玲

中国科学技术大学 电子工程与信息科学系, 合肥

摘要:

本文考虑单小区内的两个中继使用解码转发的方法为两个用户提供下行数据的场景, 基站和中继配置多根天线, 用户配置单天线。两中继使用相同的频率资源同时为两个用户提供服务。为减小两中继同时向两用户传输时产生的干扰, 中继到用户的传输采用协作干扰避免的策略; 相应的基站到中继的传输采用多用户空分复用的传输策略。本文在时间分配和功率分配两个方面对上述两跳传输过程进行了优化, 提出了两跳传输最优的时间分配策略。由于功率分配最优化问题难以求解, 本文提出了一种匹配链路容量的次优功率分配方法, 并对其进行简化以降低复杂度。通过仿真可以看出, 简化的功率分配方法与匹配链路容量的功率分配性能很接近; 所提出的时间分配和功率分配方案可以获得有效的性能提升。

关键词: 协作多中继 多天线技术 时间分配优化 功率分配优化

Time and Power Allocation Optimization for Multiple Relay Transmission in MIMO System

CHEN Yao, QIU Ling

Department of Electronic Engineering and Information Science, University of Science and Technology of China, Hefei

Abstract:

The scenario that base station (BS) transmits downlink data to two users with the assistance of two relays is considered in this paper. BS and relays have multiple antennas. The relays transmit to the users using the same frequency and time resources. Multi-user SDMA scheme and cooperative interference avoidance scheme are adopted in the first hop and the second hop, respectively, to reduce the interference generated when transmitting to or from the two relays simultaneously. Time allocation optimization and power allocation optimization are studied based on the joint usage of the two schemes. The optimal time allocation for the two hops is derived. The power allocation scheme at the base station is studied. Because it is difficult to solve the power allocation optimization problem directly, a suboptimal power allocation solution is proposed, which matches the two-hop transmission capacities of both the two relay links. The suboptimal power allocation solution can be realized by numerical iteration, and its simplified method is proposed to reduce complexity. Simulation results show that the performance of the simplified method is very close to the suboptimal power allocation solution, and the proposed time and power allocation methods effectively enhance the system throughput.

Keywords: cooperative multi-relay MIMO time allocation optimization power allocation optimization

收稿日期 2010-11-29 修回日期 2919-12-21 网络版发布日期 2011-03-25

DOI:

基金项目:

国家科技重大专项基金(No.2008ZX03003-004); 国家科技支撑计划基金(No.2008BAH30B09)资助

通讯作者:

作者简介:

作者Email: chen04@mail.ustc.edu.cn

参考文献:

本刊中的类似文章

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(731KB)
- ▶ [HTML全文]
- ▶ 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
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 协作多中继
- ▶ 多天线技术
- ▶ 时间分配优化
- ▶ 功率分配优化

本文作者相关文章

- ▶ 陈遥
- ▶ 邱玲

PubMed

- ▶ Article by Chen, Y.
- ▶ Article by Qiu, L.

反馈人	<input type="text"/>	邮箱地址	<input type="text"/>
反馈标题	<input type="text"/>	验证码	<input type="text"/> 5987