数学与系统科学研究院

计算数学所学术报告

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报告题目：

SINR-Constrained Beamforming for a MIMO Multi-User Downlink System: Algorithms And Convergence Analysis

邀请人： 刘亚锋 博士

报告时间：2015 年 12 月 20 日（周日）

上午 9:00~10:00

报告地点： 科技综合楼三层

311 报告厅

Abstract：

Consider a multi-input multi-output (MIMO) downlink multi-user channel. A well-studied problem in such system is the design of linear beamformers for power minimization with the quality of service (QoS) constraints. The most representative algorithms for solving this class of problems are the so-called MMSE-SOCP algorithm and the UDD algorithm. The former is based on alternating optimization of the transmit and receive beamformers; while the latter is based on the wellknown uplink-dowlink duality theory. Despite their wide applicability, the convergence (to KKT solutions) of both algorithms is still open in the literature. In this paper, we rigorously establish the convergence of these algorithms for QoS-constrained power minimization (QCPM) problem with both single stream and multiple streams per user cases. Key to our analysis is the development and analysis of a new MMSE-DUAL algorithm, which connects the MMSE-SOCP and the UDD algorithm. Our numerical experiments show that 1) all these algorithms can almost always reach points with the same objective value irrespective of initialization; 2) the MMSE-SOCP/MMSE-DUAL algorithm works well while the UDD algorithm may fail with an infeasible initialization.

报告信息以及个人简介：
史清江，浙江理工大学副教授，2011 年获得上海交通大学通信与信息系统专业博士学位，于 2009 年 9 月~2010 年 9 月在美国明尼苏达大学访问学习。曾获得 IEEE PIMRC 会议最佳论文奖(2009)，上海市优秀博士学位论文奖（2012），全国百篇优秀博士论文提名奖（2013）。史清江博士已在国际权威期刊及主流会议发表/录用 30 多篇 SCI/EI 收录论文，包括 IEEE 期刊论文 16 篇，其中以第一作者在国际信号处理领域顶级期刊 IEEE Trans. Signal Processing 上发表论文 6 篇。截至目前，已有两篇论文被 ESI 高被引论文收录，第一作者论文的总 SCI 他引为 170 余次。

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