

数学与系统科学研究院  
计算数学所系列学术报告

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报告题目及时间:

**Cloud Radio Access Networks Part I :  
System Model and Capacity Analysis**

*2015 年 8 月 18 日 (周二) 上午 10:00~11:00*

**Cloud Radio Access Networks Part  
II : Optimization Algorithms**

*2015 年 8 月 18 日 (周二) 上午 11:00~12:00*

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报告地点: 科技综合楼三层

311 报告厅

## **Abstract:**

Cloud radio access network (C-RAN) is an emerging wireless cellular architecture in which the base-stations (BSs) take advantage of high-capacity backhaul links to upload signal processing and computation to a cloud-computing based central processor. The C-RAN architecture offers an enabling platform for the centralized joint encoding and joint decoding of user messages and a capability for intercell interference mitigation across the BSs. In this talk, we address the capacity analysis and optimization technique for C-RAN while specifically taking into account the finite capacity constraint on the backhaul links. In the uplink, the C-RAN architecture can be modeled as a multiple-access relay channel. We show that a compress-and-forward scheme in which the BSs quantize the received signals and send the quantized signals to the central processor using Wyner–Ziv coding is sum-capacity achieving to within a constant gap. We also propose a successive convex optimization approach for optimizing the quantization noise covariance matrix. In the downlink, the C-RAN architecture can be modeled as a broadcast relay channel. We compare the message-sharing strategy versus compression-based strategy for this setting, and show how compressive sensing and weighted minimum mean-squared error (WMMSE) techniques can be used to solve a network utility maximization problem involving joint user scheduling, BS clustering and beamforming in a user-centric message-sharing C-RAN design.

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