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：

Signal Processing Techniques for Massive IoT Connectivity

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报告时间：**2017** 年 **12** 月 **30** 日（周六）

上午 **11:00--12:00**

报告地点：　数学院科技综合楼

三层 **311** 报告厅

报告摘要：

This talk considers an uplink massive device communication scenario in which a large number of devices are connected to

a base-station (BS), but user traffic is sporadic so that in any given coherence interval, only a subset of users are active. The objective is to quantify the cost of active user detection and channel estimation and to characterize the overall achievable rate of a grant-free two-phase access scheme in which device activity detection and channel estimation are performed jointly using pilot sequences in the first phase and data is transmitted in the second phase. In order to accommodate a large number of simultaneously transmitting devices, this talk studies an asymptotic regime where the BS is equipped with a massive number of antennas. We show that in the asymptotic massive multiple-input multiple-output (MIMO) regime, although non-orthogonal pilot sequences are used due to the large number of devices and limited coherence time, both the missed device detection and the false alarm probabilities for activity detection can always be made to go to zero by utilizing approximate message passing (AMP) algorithm that exploits sparsity in the user activity pattern. We also characterize the achievable rates using the proposed scheme and quantify the cost of using non-orthogonal pilot sequences for channel estimation in achievable rates.