

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:

**Interference Mitigation using
Device-to-Device Link**

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311 报告厅

Abstract:

In this talk, we consider the use of device-to-device link for cooperative communication in a cellular environment, where a nearby user terminal acts as a relay in enabling both signal enhancement and common interference rejection at the destination. Assuming Gaussian transmission and Gaussian test-channel in the compress-and-forward relaying strategy for a multiple-input multiple-output (MIMO) relay channel with a finite-capacity out-of-band relay-destination link and with arbitrarily correlated noises, we suggest an algorithm for joint optimization of the transmission strategy at the source and compression strategy at the relay. A coordinate ascent approach is employed to iteratively optimize the transmit covariance matrix for reception at both relay and destination, and for optimizing the quantization noise covariance matrix using a simultaneous diagonalization approach. Assuming uniqueness of the optimal solution in iterations, the algorithm converges to a stationary point of the overall problem. We further introduce the concept of antenna pooling, and illustrate that the optimized use of the device-to-device relay link is capable of significantly improving the user throughput in an interfering cellular environment. The relay link can enhance the overall transmission degree-of-freedom by enabling not only joint reception but also interference rejection across the user terminals.

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