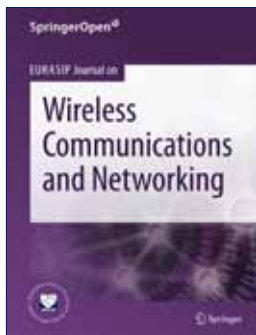


EURASIP Journal on Wireless Communications and Networking

Special Issue on
MIMO Relays for Cooperative Wireless
Networks

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In recent years, the demand for high speed data rates over wireless networks has significantly increased. New technologies must be developed to increase the network-wise spectral efficiency and one of the most promising approaches is to employ wireless relays. As shown by research, relay deployment in wireless networks can improve the error performance and cell-edge capacity. Recent standards such as LTE-Advanced Release 10 and IEEE 802.16j have embraced relaying that operate with limited capability. However, adoption of new promising relay solutions such as network coding, joint source-channel coding, full-duplex relaying and multi-antenna deployment with advanced signal processing can further reap great performance gains for both civilian and military communication applications.

Although the use of MIMO techniques in point-to-point systems has reached maturity, their application and utility in relay networks remains largely to be explored. While some fundamental results on MIMO relay transmission have already been laid out, theories related to non-ideal practical conditions have not been forthcoming. There is also a lack of solid understanding on where theory meets practice. MIMO techniques can be used in relay networks to improve the diversity, multiplexing gains and for interference cancellation. Additionally, advanced signal processing techniques capable of delivering a superior performance must be deployed to justify the use of MIMO in practical relays. Theory, PHY layer aspects and signal processing related to MIMO relays are of interest to this call and include:

- ▶ Theories for MIMO relays
- ▶ Diversity-Multiplexing trade-off
- ▶ Relay selection methods
- ▶ Signal processing for non-ideal world (imperfect CSI, synchronization errors etc.)
- ▶ Interference channel with relays, interference alignment and cancellation
- ▶ Half-duplex, full-duplex based MIMO relay design
- ▶ MIMO OFDM relays
- ▶ Communication with limited feedback and feedback delay
- ▶ Advanced coding techniques (Quantize-and-Forward, joint source-channel coding, network coding etc.)
- ▶ Multi-user MIMO relay networks
- ▶ Optimization of MIMO relay networks
- ▶ Game theoretic solutions for design of MIMO relay networks
- ▶ Application of MIMO relaying to physical layer security
- ▶ Practical test-bed and prototype design
- ▶ Closed-loop MIMO relay systems (architectures, communication with limited feedback and feedback delay etc.)

Submission Schedule

- ▶ **Manuscript due:**
April 2, 2012
- ▶ **First round of reviews:**
July 1, 2012
- ▶ **Publication date:**
September 15, 2012

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