

## Recent advances in cooperative techniques for wireless transmission

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### Abstract.

When different devices or terminals cannot accommodate multiple antennas, they can decide to form a coalition of single antenna devices, in order to mimic MIMO and capture the degrees of freedom of multiple antennas communications.

The goal of this talk is to review recent advances in the field of distributed MIMO or communication links with a relay.

For frequency non selective channels, distributed turbo coding has been introduced some time ago.

An alternative to this setup is to let the relay forward soft information so that the destination be informed about the S-R link. While optimum this strategy turns out to be complex. An attractive alternative is to have a relay always decoding and forwarding to the destination, and to have the destination know about the S-R CSI. Based on that the decoding strategy at the destination can be revisited to account for the S-R reliability. The improvement will be illustrated by simulations.

For frequency selective channels, OFDM is an attractive technique. Moreover, assuming channel state information is available, the power can be optimally allocated to the different tones at the source and at the relay, in order to maximize the rate of the system. Assuming perfect decode and forward at the relay(s) the allocation problem will be discussed for the case of a single relay and of multiple relays. Results will be discussed.