

A Broadcast Approach for a Single User¹

Slowly Fading MIMO Channel[†]

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Abstract

A broadcast transmission strategy for the slowly fading Gaussian multiple input multiple output (MIMO) channel is introduced. This broadcast strategy is an extension of the single input single output (SISO) broadcast approach. Perfect channel state information (CSI) is assumed known at the receiver end only. This strategy facilitates to adapt the reliably decoded rate to the actual channel state without having any feedback link to the transmitter. Transmission of layered coded information is motivated by the theory of majorization. We derive the basic equations characterizing achievable rates of the strategy. Several ad-hoc approximations to the achievable region are considered and their performance is compared with the SISO setting and the ergodic capacity. It has been demonstrated that a single layer outage approach is reasonably efficient in the MIMO setting in terms of the average reliably decoded rate. A multiple-access (MAC) broadcast approach is also applied for the MIMO case, and demonstrated to be relatively efficient.