

MIMO Truncated Shannon bound for system level capacity evaluation of MIMO wireless networks

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Abstract:

Evaluation of overall system capacity (rather than the capacity of individual links) must take account of interference from neighbouring cells. To avoid the need for full simulation of every link in the network, in SISO systems we commonly define the capacity of a link as a deterministic function of the signal to noise-plus-interference ratio (SINR) experienced by that link. In MIMO systems, however, the capacity is a random function of SINR, depending both on the random channel matrix and on the directions of interference, as well as its total power. In this paper we outline a general method for modelling this effect, assuming that capacity of a link is a random function of SNR and signal to interference ratio (SIR). A look-up table for the CDF of this random function can then be obtained by link-level simulation in the presence of interference having the same characteristics as the interference found in the target network. We also exploit the Truncated Shannon Bound (TSB) to estimate the resulting capacity obtained in practice in a system using adaptive modulation and coding on the link level.