



# An Outer Bound for the Memoryless Two-user Interference Channel with General Cooperation

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The interference channel models a wireless network where several source-destination pairs compete for the same resources. When nodes transmit simultaneously the destinations experience interference. This paper considers a 4-node network, where two nodes are sources and the other two are destinations. All nodes are full-duplex and cooperate to mitigate interference. A sum-rate outer bound is derived, which is shown to unify a number of previously derived outer bounds for special cases of cooperation. The approach is shown to extend to cooperative interference networks with more than two source-destination pairs and for any partial sum-rate. How the derived bound relates to similar bounds for channel models including cognitive nodes, i.e., nodes that have non-causal knowledge of the messages of some other node, is also discussed. Finally, the bound is evaluated for the Gaussian noise channel and used to compare different modes of cooperation.

Comments: a shorter version of this paper has been submitted to ITW 2012

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