

We study strategies for enhanced secrecy using cooperative jamming in secure communication systems with limited rate feedback. A Gaussian multiple-input multiple-output (MIMO) wiretap channel with a jamming helper is considered. The transmitter and helper both require channel state information (CSI), which is quantized at the receiver and fed back through two sum-rate-limited feedback channels. The quantization errors result in reduced beamforming gain from the transmitter, as well as interference leakage from the helper. First, under the assumption that the eavesdropper's CSI is completely unknown, we derive a lower bound on the average main channel rate and find the feedback bit allocation that maximizes the jamming power under a constraint on the bound. For the case where statistical CSI for the eavesdropper's channel is available, we derive a lower bound on the average secrecy rate, and we optimize the bound to find a suitable bit allocation and the transmit powers allocated to the transmitter and helper. For the case where the transmitter and helper have the same number of antennas, we obtain a closed-form solution for the optimal bit allocation. Simulations verify the theoretical analysis and demonstrate the significant performance gain that results with intelligent feedback bit allocation and power control.