Quantum Physics

Classical capacity of a qubit depolarizing channel with memory

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The classical product state capacity of a noisy quantum channel with memory is investigated. A forgetful noise-memory channel is constructed by Markov switching between two depolarizing channels which introduces non-Markovian noise correlations between successive channel uses. The computation of the capacity is reduced to an entropy computation for a function of a Markov process. A reformulation in terms of algebraic measures then enables its calculation. The effects of the hidden-Markovian memory on the capacity are explored. An increase in noise-correlations is found to increase the capacity.

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