

Contribution Title: ONE-SHOT QUANTUM CAPACITIES OF QUANTUM CHANNELS  
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We consider the protocol in which Alice sends one part of a maximally entangled state through a quantum channel to Bob, who then performs a quantum operation on the received state, with the final objective of obtaining a nearly maximally entangled state, shared with Alice. We find that the one-shot capacity of this protocol is characterized by appropriate smoothing of the 0-conditional Renyi entropy. This in turn provides a characterization of the one-shot quantum capacity of the channel. In the limit of asymptotically many uses of a memoryless channel, we recover the familiar expression of the quantum capacity given by the regularized coherent information. An important off-shoot of our result is that it also yields an expression for the asymptotic quantum capacity of an arbitrary sequence of channels, possibly with memory.