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Title: Stability of the recovery map and the quantum quasi relative entropy

Abstract: Quantum relative entropy can be viewed as a kind of a measure of a distance between two quantum states. The larger it gets, the easier it is to distinguish two states. One of the most fundamental quantum information inequality is the data processing inequality, which states that the relative entropy can not increase after states pass through a quantum channel. In 1986 Petz showed that there is no decrease in the relative entropy, if and only if, it is possible to perfectly recover both states with which is now known, as the Petz recovery map. The standing goal in this area is to provide a universal and easily computable quantitative bound in data processing inequality. Based on the joint work with E. A. Carlen, I will provide the most elegant sharpening of the data processing inequality so far. It is evident that if the change in relative entropy between two states after passing through a quantum channel is small, the original Petz recovery map recovers one state perfectly, and the other approximately well. I will also provide related results for various quasi-relative entropies.