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Quantum entropy derived from first principles

The most fundamental properties of quantum entropy are derived by considering the union of two ensembles. We discuss the limits these properties put on an entropy measure and obtain that they uniquely determine the form of the entropy functional up to normalisation. In particular, the result implies that all other properties of quantum entropy may be derived from these first principles.

Quantum entropy derived from first principles. Journal of Statistical Physics (2016) 165(5):799-808. Doi 10.1007/s10955-016-1651-4.