ENTROPIES OF STATES IN VON NEUMANN ALGEBRAS

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The talk will be devoted to various kinds of entropy of states in a rather general setting. The underlying object will be a von Neumann algebra and the states will be positive normal functionals on this algebra. As an introduction, we shall consider the algebra of all bounded linear operators on a Hilbert space together with the von Neumann entropy defined by means of the canonical trace. Then the Segal entropy, a family of Rényi's entropies and the Tsallis entropy on a semifinite von Neumann algebra will be presented. Next, various notions of relative entropy for two states will be introduced: first the Umegaki entropy on a semifinite von Neumann algebra, and further, general Araki's entropy on an arbitrary von Neumann algebra. As an interesting complement, various quasi-entropies will appear. Finally, we shall discuss the notion of measured entropy in arbitrary as well as semifinite von Neumann algebras.

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