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Entropic entanglement criteria for fermion systems

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Abstract content **
** (Max 300 words)

The entanglement features exhibited by systems consisting of identical fermions are important for the study of different physical systems and they also have implications for the development of quantum information technology. If the concept of entanglement in systems of indistinguishable particles is compared to the corresponding concept for systems consisting of distinguishable subsystems, some differences are observed.

The aim of this contribution is to investigate entanglement criteria in the case of general (pure or mixed) states of systems consisting of two identical fermions and to extend these criteria to systems of N identical fermions [1].

The criteria introduced are based on appropriate inequalities involving the entropy of the global density matrix describing the total system and the entropy of the one-particle reduced density matrix. A majorization-related relation between these two density matrices is obtained, leading to a family of entanglement criteria based on Renyi's entropic measure. These criteria are applied to various illustrative examples of parameterized families of mixed states.

[1] C. Zander, A.R. Plastino, M. Casas and A. Plastino, *Eur. Phys. J. D*, (2012) 14

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