Influence of the fermionic exchange symmetry in the 1-particle picture

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In a recent breakthrough, a complete set of constraints on fermionic occupation numbers, extending Pauli's original exclusion principle, has been found. We provide an introduction into this new research field. In particular, we show that those *generalized Pauli constraints* are approximately saturated in various few-fermion systems, i.e. the vector of occupation numbers lies close to the boundary of the allowed region. Striking implications of this quasipinning phenomenon are revealed and discussed: These are the concept of robust quantum information, a hierarchy of natural extensions of the Hartree-Fock ansatz and the existence of an exchange force emerging from the fermionic exchange symmetry. Finally, we explain how these novel research concepts offer a universal perspective on fermionic quantum systems.