
Skyrmion-Based Quantum Computing: Challenges For Future Applications

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Résumé

Magnetic nano-skyrmions develop quantized helicity excitations, and the quantum tunneling between nano-skyrmions possessing distinct helicities is indicative of the quantum nature of these particles. Experimental methods capable of non-destructively resolving the quantum aspects of topological spin textures, their local dynamical response, and their functionality now promise practical device architectures for quantum operations. With abilities to measure, engineer, and control matter at the atomic level, nano-skyrmions present opportunities to translate ideas into solid-state technologies. This talk aims to discuss the basic concept of a magnetic skyrmion qubit, its advantages, and challenges in this new research avenue in quantum magnetism and quantum information.

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