

Skyrmionic Textures in Chiral Magnets

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Vortices are most commonly observed in fluids and in superfluids but they are also present in a variety of physical systems. In magnetic films, swirling magnetization configurations are observed that bare formal similarities to ordinary fluid vortices. These are nanoscopic axially-symmetric configurations called *chiral skyrmions* [1]. They arise spontaneously in materials whose crystal structure allows for a chiral magnetic interaction first discussed by Dzyaloshinskii and Moriya about 60 years ago. The chiral Dzyaloshinskii-Moriya (DM) interaction is responsible for stabilizing a variety of skyrmionic textures beyond the standard (axially-symmetric) skyrmion [2,3]. Skyrmionic textures are classified as topological solitons since they are localized and they carry a topological charge. Their topological complexity makes them robust under perturbations. Furthermore, their dynamical behavior is linked to their topology. In chiral magnets, we have the rare opportunity to study soliton dynamics for a series of skyrmions with various topological structures that co-exist within the same model [4].

References

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