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(I) Soft X-Ray Scattering of Magnetic Skyrmions in Helimagnetic Lamella

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Skyrmions are a topologically non-trivial magnetic state that has been observed in several different magnetic materials, such as the chiral cubic magnets Cu₂OSeO₃, FeGe, and MnSi. In these non-centrosymmetric systems, competition between the symmetric exchange interaction and Dzyaloshinskii-Moriya interaction results in the formation of incommensurate spin textures, such as the vortex-like skyrmions. In metallic systems, such as FeGe, these skyrmions can be manipulated by small electrical currents, with motion occurring at very small current densities. This raises the possibility for them to be used in ultra-low energy electronic applications, such as memory devices or stochastic computing. In this talk, I will introduce general features of the skyrmion state, and present recent work on skyrmions in thin lamella of FeGe and Cu₂OSeO₃, investigated using soft X-ray scattering. In particular, I will discuss aspects of skyrmion metastability in these systems, as well as investigations of the current-induced motion of skyrmions in sample with variable thickness, and the prospects of this leading towards potential applications.

Keyword-1

Skyrmion

Keyword-2

Magnetism

Keyword-3

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