

Skyrmions and their dynamics in helical magnets

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We discuss the phase diagram of two-dimensional DM helical magnet under magnetic field. It is shown that SkX state is stable in a wide range of the T-H phase diagram. This is confirmed experimentally by Lorentz microscope recently. The coupled dynamics of the conduction electrons and SkX will be also discussed: (i) The topological Hall effect is induced by the spin chirality, (ii) The Skyrmion trajectories bend away from the direction of the electric current (the Skyrmion Hall effect), (iii) A new dissipation mechanism in non-collinear spin textures can lead to a much faster spin relaxation than Gilbert damping, (iv) The dispersion of phonons in the SkX are k^2 , and (v) the pinning effects of SkX by impurities is very weak, and it can move with very small current density.

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