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Anti-chiral order and damped spin waves in the topological semi-metal Mn₃Ge

Monday, June 3, 2019 2:00 PM (30 minutes)

The recent discovery of Anomalous Hall Effect in Mn₃X (X=Sn,Ge) suggests the existence of Weyl nodes in the electronic band structure of these non-collinear antiferromagnets [1]. The resulting coupling of electronic transport and magnetism in Mn₃X presents important technological opportunities. The magnetic properties of Mn₃X are crucial to Weyl physics and to its implementation in devices but are still under debate due to the lack of experimental studies. In this talk, I will present polarized neutron diffraction and inelastic neutron scattering measurements performed on Mn₃Ge to gain insight into its magnetism. I will show Mn₃Ge has an anti-chiral spin structure with a peculiar field dependence. I will also propose a spin Hamiltonian for this material that can explain its magnetic ground state selection and can also parametrize its spin wave excitations. [1] Nakatsuji S. et al., Nature 527.7577 (2015).

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