

## **Spin Chirality in Non-centrosymmetric MnSi as Probed by Polarised Neutrons**

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MnSi is a prototype of a weak itinerant ferromagnet that orders below  $T=29$  K in a left-handed helical spin structure. Because MnSi crystallises in the non-centrosymmetric space group P213 that lacks a center of symmetry the Dzyaloshinski-Moriya interaction (DM) is allowed in this compound. The antisymmetric DM stabilises the spin helix along the  $[1\ 1\ 1]$  crystallographic axis. Here we will present results of elastic and inelastic neutron scattering experiments performed both below and above the ordering temperature. We will show that because the chemical structure of MnSi is non-centrosymmetric the neutron cross section depends upon the polarisation of the neutron beam. This allows to separate the symmetric from the antisymmetric part of the dynamical susceptibility unambiguously. Consequently it was possible to show that 1) there is only one type of magnetic helix in MnSi in the magnetically ordered state [1], 2) the critical fluctuations in the vicinity of the magnetic phase transition as measured by triple-axis spectroscopy [2] and small-angle scattering [3] have a chiral character. In addition measurements of the dependence of the spin structure under applied magnetic field will be presented.

[1] Shirane G. et al., *Phys. Rev. B*, 1983, **28**, 6251. [2] Roessli B. et al., 2002, **88**, 237204. [3] Okorokov A.I. et al., *Physica B*, 2004, **350**, e323 [4] Georgii R. et al., *Physica B*, 2004, **350**, 47.

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