

Gracing incidence small angle neutron scattering of incommensurate magnetic structures in MnSi thin films

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The topological stability of skyrmions in bulk samples of MnSi and the observation of spin transfer torque effects at ultra-low current densities have generated great interest in skyrmions in chiral magnets as a new route towards next generation spintronics devices. Yet, the formation of skyrmions in MBE grown thin films of MnSi reported in the literature is highly controversial. We report gracing incidence small angle neutron scattering (GISANS) of the magnetic order in selected thin films of MnSi grown by state of the art MBE techniques. In combination with polarised neutron reflectometry (PNR) and magnetisation measurements of the same samples our data provide direct reciprocal space information of the incommensurate magnetic order, clarifying the nature of magnetic phase diagram.

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