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Spin chirality is flipped in transition-metal monogermanides

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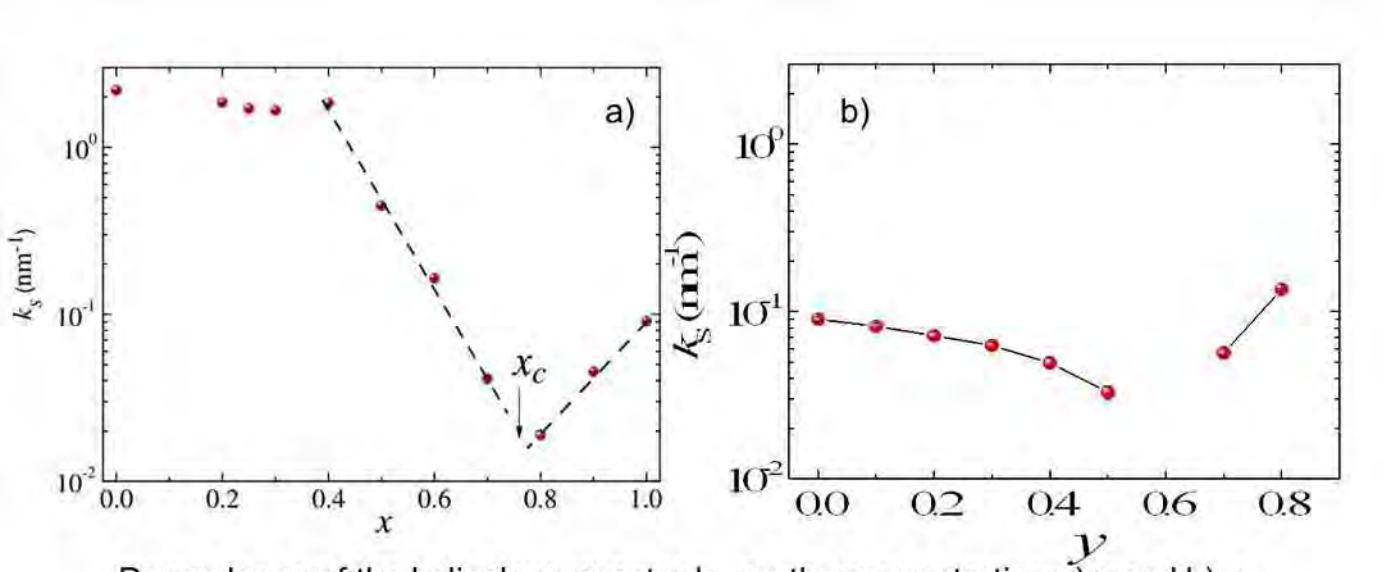
Using high pressure method polycrystalline powder samples of Mn1-xFexGe and Fe1-yCoyGe have been synthesized with x/y running from 0.0 to 1.0. The crystallite size for these compounds is in the order of 10 microns. SQUID magnetization and small angle neutron scattering (using SANS-1 at the MLZ, Garching) have revealed the helical magnetic ordering of the samples within the concentration range of x = [0.0 – 1.0] and y = [0.0 – 0.8]. The values of the helical wavevector k have been taken from the SANS pattern. As it could be seen in Fig.1 a) for Mn1-xFexGe the wavevector k remains roughly constant around 2 nm^-1 for x ≤ 0.4, while going down to a minimum for (|k| -> 0) at xc ≈ 0.75 and increases again to a value of 0.09 nm^-1 for pure FeGe. For Fe1-yCoyGe the k value smoothly decreases from 0.09 nm-1 for pure FeGe to its minimum at yc ≈ 0.6 and increase again for y = 0.8 to its maximum of 0.14 nm^-1 (Fig.1 b). For x/y -> xc/yc we observe a transformation of the helical magnetic structure to a ferromagnetic-like one at the critical concentrations. The change of the magnetic structure from helimagnetic to ferromagnetic-like goes along with a different sign of the magnetic chirality for x/y < xc/yc and x/y > xc/yc [1,2].

[1] *S. V. Grigoriev, N. M. Potapova, S.-A. Siegfried, et al., PRL 110, 207201 (2013).,* ***[2]*** *S. V. Grigoriev, S.-A. Siegfried, E. V. Altynbayev, to be submitted.*



Dependence of the helical wavevector k_S on the concentration a) x and b) y.

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