9.7 cm

POSSIBILITY OF HELICAL RKKY INTERACTION IN THE MAGNETIC MULTILAYERS

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Direct observation of the helical, nocollinear spin density waves /SDW/ in the Fe/Cr multilayers raised the question of noncollinear interlayer coupling in theses systems [1]. We assume that the SDW polarization within the spacer layer varies as:

$$\vec{m}_{\pm} = \mu_o \left[\vec{x} \cdot cos\left(\frac{2\pi}{a}z\right) \pm \vec{y} sin\left(\frac{2\pi}{a}z\right)\right] \tag{1}$$

where $\vec{x}$ and $\vec{y}$ are the unit cectors along the x, and y axis respectively, while a is the lattice constant. Taking into account the SDW pinning at the interfaces and coupling between correlated spin polarizability oscillations [2,]as well as the lock-in effects, we show that the resulting interlayer coupling can induce perpendicular ordering of the magnetizations of the adjacent layers.

[1] R.S.Fishman:J.Phys. (Cond. Matt.)**13**, (2001) R235-R269.
[2] Z. Bąk, W. Gruhn : J. Mag. Mag. Mater. **135** (1994) L7.

13.4 cm

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