Contribution ID: **47** Type: **Talk (20 min + 5 min discussion)**

Non-collinear long-range coupling in modulated manganites.

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Non-volatile and tunable non-collinear magnetic structures in thin films are gaining increasing importance for several spintronics applications, such as triplet spin-valves, or devices based on the topological Hall effect. Non-volatile non-collinearity can be tailored in heterostructures that exhibit exchange bias or long-range couplings, as the RKKY. We report on the experimental observation of a novel, complex non-collinear structure based on the imprinting of canted antiferromagnetism of the spacer to the neighboring ferromagnetic layers [1]. We studied superlattices composed of optimally doped (x=0.4) ferromagnetic $La_{1-x}Sr_xMnO_3$ of fixed thickness and overdoped (x=0.8) spacer of variable thickness. High hole diffusion over several unit cells creates depth-modulated manganite homojunctions, with an overall complex magnetism that differs from that of its singular components. In particular, at intermediate spacer thickness, we obtained a non-collinear synthetic antiferromagnet, which we investigated by means of polarized neutron reflectometry and diffraction. The novel long-range non-collinear structure is a non-volatile phase which is easily tuned with application of small magnetic fields (H<100 mT).

[1]. Guasco, L., Khaydukov, Y., Kim, G., et al., Emergent Magnetic Fan Structures in Manganite Homojunction Arrays. Adv. Mater. 2022, 34, 2202971. https://doi.org/10.1002/adma.202202971

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