

CURRENT-INDUCED MANIPULATION OF DOMAIN-WALLS IN SrRuO₃

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SrRuO₃ is a 4d itinerant ferromagnet with Curie temperature (for films) of ~ 150 K and large uniaxial magnetocrystalline anisotropy (anisotropy field of ~ 10 T). In epitaxially grown thin films, the easy axis is tilted out of the film plane inducing the formation of stripe domain structure with ultrathin domain walls (~ 3 nm). These features make domain walls in SrRuO₃ an excellent tool for studying spintronics phenomena, as we have shown by determining the domain wall interface resistance and its microscopic origins [1]. In my talk, I will present recent results demonstrating our ability to trap, manipulate and monitor a single domain wall. Based on this ability, we were able to determine the efficiency of current induced domain wall motion in SrRuO₃, defined by us as the ratio between depinning field and depinning current. I will show that the efficiency of current- induced domain wall motion in SrRuO₃ is orders of magnitude higher than in 3d ferromagnetic alloys and discuss possible theoretical explanations for this phenomenon.

[1] L. Klein *et al.*, Phys. Rev. Lett. **84**, 6090 (2000); M. Feigenson *et al.*, Phys. Rev. B **67**, 134436 (2003).

[2] M. Feigenson, J. W. Reiner and L. Klein, Phys. Rev. Lett. **98**, 247204 (2007).