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Temperature Dependent Magnetization Reversal of [Co/Pt]/Ru Multilayers OLAV HELLWIG, BESSY GmbH, Germany, JOSEPH E. DAVIES, KAI LIU, Physics Department - UC Davis, ERIC E. FULLERTON, Hitachi Global Storage Technologies — Magnetization reversal in antiferromagetically coupled [Co/Pt]/Ru multilayers have been shown to be either laterally or vertically correlated, depending on the layer thicknesses.[1] Here we report on our investigation of the magnetization reversal as a function of temperature using the First Order Reversal Curve (FORC) method.[2] At high temperatures the vertically correlated reversal dominates, and we observe the reversal behavior similar to that of just a Co/Pt multilayer.[2] At low temperatures the effect of antiferromagnetic interlayer coupling, and consequently laterally correlated reversal, becomes more prominent. At intermediate temperatures the two modes coexist and can be tuned by the applied magnetic field, leading to exotic reversal behavior where the FORCs could exist outside of the major hysteresis loop. This is due to the delicate balance among the magnetostatic, domain wall, and interlayer exchange coupling energies.

[1]O. Hellwig, et al., Nature Mat. **2**, 112 (2003).
[2] J. E. Davies, et al., Phys. Rev. B **70**, (22), Dec. 1^{st} (2004).

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