Abstract Submitted
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**Resonance in Magnetostatically Coupled Transverse Domain Walls**[1] ANDREW GALKIEWICZ, LIAM O'BRIEN, University of Minnesota, PAUL KEATLEY, University of Exeter, RUSSEL COWBURN, University of Cambridge, PAUL CROWELL, University of Minnesota — In a system of adjacent ferromagnetic nanowires, stray magnetic fields from a transverse domain wall (TDW) in one wire can give rise to an attractive interaction with a TDW in a separate wire. This has previously been shown to lead to an increase in the depinning fields for TDW propagation, and has also been predicted to lead to oscillatory motion should the two TDWs be separated laterally from equilibrium. Using time-resolved Kerr microscopy, we have observed the resonance associated with the TDW interaction. In addition, another resonance has been observed that we find is due to the pinning of the TDWs by the intrinsic edge roughness of the nanowires. The overall system dynamics are well described by a 1-D analytical model that incorporates both effects. Micromagnetics show that the energy scales of the intrinsic pinning and the inter-TDW coupling are similar and suggest that roughness should be accounted for in future dynamical investigations.

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