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Dissipative dynamics of composite domain walls in magnetic nanostrips[1] O. TRETIAKOV, Johns Hopkins University, YA. B. BAZALIY, Leiden University & University of South Carolina, O. TCHERNYSHYOV, Johns Hopkins University — We describe the dynamics of domain walls in thin magnetic nanostrips of submicron width under the action of magnetic field. Once the fast precession of magnetization is averaged out, the dynamics reduces to purely dissipative motion where the system follows the direction of the local energy gradient (Glauber's model A) [1]. We then apply the method of collective coordinates [2] to our variational model of the domain wall [3] reducing the dynamics to the evolution of two collective coordinates (the location of the vortex core). In weak magnetic fields the wall moves steadily. The calculated velocity is in good agreement with the results of numerical simulations (no adjustable parameters were used). In higher fields the steady motion breaks down and acquires an oscillatory character caused by periodic creation and annihilation of topological defects comprising the domain wall [3]. Numerical simulations uncover at least two different modes of oscillation. [1] C. J. García-Cervera and W. E, J. Appl. Phys. **90**, 370 (2001). [2] A. Sánchez and A. R. Bishop, SIAM Rev. **40**, 579 (1998). [3] Preceding talk by O. Tchernyshyov.

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