1148-35-209 **Cyrill Muratov*** (muratov@njit.edu), Department of Mathematical Sciences, New Jersey Institute of Technology, University Heights, Newark, NJ 07102, and **Valeriy V. Slastikov** and **Ross G. Lund**. *Edge Domain Walls in Ultrathin Ferromagnetic Films.*

We study existence and properties of one-dimensional edge domain walls in ultrathin ferromagnetic films with either uniaxial in-plane magnetic anisotropy or exchange bias. In these materials, the magnetization vector is constrained to lie entirely in the film plane, with the preferred directions dictated by the magnetocrystalline easy axis. We consider magnetization profiles in the vicinity of a straight film edge. To minimize the micromagnetic energy, these profiles form transition layers in which the magnetization vector rotates away from the direction of the easy axis to align with the film edge. For uniaxial films, we prove existence of edge domain walls as minimizers of the appropriate one-dimensional micromagnetic energy functional and show that they are classical solutions of the associated Euler-Lagrange equation with Dirichlet boundary condition at the edge. For exchange-biased films, we also prove that minimizers are always one-dimensional within a two-dimensional periodic setting and recover explicit one-dimensional wall profiles via Γ-convergence in an appropriate thin film limit. (Received February 03, 2019)