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Transverse domain walls in thin ferromagnetic strips

We present a characterization of the domain wall solutions arising as minimizers of an energy functional obtained in a suitable asymptotic regime of micromagnetics for infinitely long thin film ferromagnetic strips in which the magnetization is forced to lie in the film plane. For the considered energy, we provide existence, uniqueness, monotonicity, and symmetry of the magnetization profiles in the form of 180 and 360 degree walls. We also demonstrate how this energy arises as a Γ-limit of the reduced two-dimensional thin film micromagnetic energy that captures the non-local effects associated with the stray field.