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Scaling of hysteresis in phenomenological models of thin ferromagnetic films ESHEL FARAGGI, Physics Department, Florida International University, Miami, Florida 33199 — Explicit solutions are derived for several phenomenological models of magnetization reversal in thin ferromagnetic films driven by a saw-tooth magnetic field. For a domain wall velocity that is linear in the magnetic field it is found that the dynamic coercive field, and hence the scaling of hysteresis, follows a square-root power-law in the slope of the magnetic field, shifted by the depinning field. For a more general domain wall velocity different power-law exponents are found, yet the overall form for the scaling of the area of the hysteresis loop remains a power-law shifted by the depinning field. This shifted power-law could be interpreted to be a crossover between adiabatic and dynamic regimes.

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