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Mark A Hoefler* (mahoefer@ncsu.edu), Mathematics, North Carolina State University, Box 8205, Raleigh, NC 27607. *Perturbed Magnetic Droplet Solitons.*

The Landau-Lifshitz equation with uniaxial anisotropy in two spatial dimensions admits a two-parameter family of propagating, precessing solitary wave solutions called magnetic droplets. Physically relevant perturbations due to weak damping, a slowly varying external magnetic field, and spin torque are considered in the context of soliton perturbation theory. A dynamical systems analysis of the modulation system and direct numerical simulations of the governing PDE demonstrate the conditions under which physical droplets can be nucleated, sustained, accelerated, and controlled. Applications to recent experiments will be presented. (Received February 14, 2013)