1078-35-57 **Mark A. Hoefer*** (mahoefer@ncsu.edu), Department of Mathematics, North Carolina State University, Box 8205, Raleigh, NC 27695, and **Matteo Sommacal**, School of Computing, Engineering, Info. Sci., Northumbria University, Newcastle, England. *Perturbed magnetic droplet solitons.*

The (1+1)-dimensional Landau-Lifshitz equation with uniaxial anisotropy admits a two-parameter family of soliton solutions called magnetic droplets. Recent work demonstrates the physical relevance of these coherent structures when perturbed by weak damping, a slowly varying external magnetic field, and spin torque. Perturbed droplet dynamics encompassing these physical effects are studied in the context of soliton perturbation theory, made particularly explicit by the integrability of the unperturbed problem. The resulting finite dimensional modulation system describes the slow evolution of the perturbed soliton's speed and frequency. A detailed dynamical systems analysis yields a number of interesting physical effects. Asymptotic results are corroborated by direct numerical simulations of the full partial differential equation. (Received November 16, 2011)