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Magnetization dynamics in cold-atom ferromagnets[1] INTI SODEMANN, DMYTRO PESIN, ALLAN MACDONALD, University of Texas at Austin
— Recent experiments appear to demonstrate the realization of the ferromagnetic state in ultracold two-component Fermi gases with repulsive interactions [Gyu-Boong Jo et al., Science **325**, 1521 (2009)], providing a new arena for the study of ferromagnetism distinct from that of the solid state. We address the question of the magnetization dynamics at large length scales in the framework of Landau-Liftshitz equations modifed to account for some features of cold-atom ferromagnetism. In particular, the role of an external magnetic field is played by the hyperfine splitting along the trap, and randomness in the latter induces an effective magnetic damping in the plane perpendicular to this field. We study the preparation of non-uniform magnetic textures using intentionally applied non-uniform energy splittings, and their decay processes into the uniform magnetization state. In particular, we compare the decay process of magnetic spiral textures with the decay of supercurrent due to phase slips.

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