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Nonlocal magnetization dynamics

YAROSLAV TSERKOVNYAK, University of California, Los Angeles

Recently, nonlocal properties of ferromagnetic dynamics in magnetic nanostructures, such as damping sensitive to the Ohmic environment and spin-wave transfer between exchange-decoupled ferromagnets, have attracted a considerable interest [1]. It is also becoming clear [2] that nonlocal dynamic effects are important for understanding intrinsic properties such as magnetic damping, noise, and spin-transfer torques in inhomogeneous ferromagnets, with consequences for phenomena ranging from spin-wave propagation and domain-wall motion to current-driven instabilities in the bulk. I will present a self-consistent mean-field approach for treating these properties in a unified and rather general fashion.

[1] Y. Tserkovnyak, A. Brataas, G. E. W. Bauer, and B. I. Halperin, *Rev. Mod. Phys.* 77, 1375 (2005)

[2] Y. Tserkovnyak, H. J. Skadsem, A. Brataas, and G. E. W. Bauer, *Phys. Rev. B* 74, 144405 (2006)