

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Angular and Linear Momentum of Excited Ferromagnets PENG YAN, AKASHDEEP KAMRA, YUNSHAN CAO, GERRIT BAUER, Kavli Institute of NanoScience, Delft University of Technology — The angular momentum vector of a Heisenberg ferromagnet with isotropic exchange interaction is conserved, while under uniaxial crystalline anisotropy the projection of the total spin along the easy axis is a constant of motion. Using Noether's theorem, we prove that these conservation laws persist in the presence of dipole-dipole interactions. However, spin and orbital angular momentum are not conserved separately anymore. We also define the linear momentum of ferromagnetic textures. We illustrate the general principles with special reference to spin transfer torques and identify the emergence of a non-adiabatic effective field acting on domain walls in ferromagnetic insulators

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Date submitted: 15 Nov 2013

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