MAR08-2007-004592

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Current-induced torques in magnetic textures and in antiferromagnets

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Current-induced torques on ferromagnetic nanoparticles and on domain walls in ferromagnetic nanowires are normally understood in terms of transfer of conserved spin angular momentum between spin-polarized currents and the magnetic condensate. Spin pumping is the opposite of spin transfer, namely the generation of spin currents by a time-dependent magnetization. In this talk I will discuss recent theoretical work aimed at understanding current-induced torques and spin pumping in situations that spin is not fully conserved, due to e.g., spin-orbit interactions, or when conservation of spin can not be used to infer order-parameter dynamics, as is the case in antiferromagnets.