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Theory of Electromotive Force Induced by Domain Wall Motion
SHENGYUAN YANG, DI XIAO, QIAN NIU, Department of Physics, The University of Texas at Austin — We formulate a theory on the dynamics of conduction electrons in the presence of moving magnetic textures in ferromagnetic materials. We show that the variation of local magnetization in both space and time gives rise to topological fields, which induce electromotive forces on the electrons. Universal results are obtained for the emf induced by both transverse and vortex domain walls traveling in a magnetic film strip, and their measurement may provide clear characterization on the motion of such walls.

Shengyuan Yang
Department of Physics, The University of Texas at Austin

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