Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Theory of spin-orbit enhanced electric-field control of magnetism in multiferroic $BiFeO_3$[1] ROGERIO DE SOUSA, MARC ALLEN, Department of Physics and Astronomy, University of Victoria, BC, Canada, MAXIMILIEN CAZAYOUS, Laboratoire Materiaux et Phenomenes Quantiques, Universite Paris Diderot-Paris 7, France — We present a microscopic theory that shows the importance of spin-orbit coupling in multiferroic compounds with heavy ions. In $BiFeO_3$ (BFO) the spin-orbit coupling at the bismuth ion sites results in a special kind of magnetic anisotropy that is linear in the applied E-field. We show how this interaction is capable of disrupting the magnetic cycloid state of bulk BFO, leading to a remarkable level of E-field control of magnetism. R. de Sousa, M. Allen, and M. Cazayous, arXiv:1209.6612.

[1]Our research was supported by the NSERC Discovery program.

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Date submitted: 25 Oct 2012 Electronic form version 1.4