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**Phenomenological study of switching in strongly coupled multiferroics** KUNTAL ROY, CRAIG J. FENNIE, School of Applied and Engineering Physics, Cornell University, Ithaca, NY 14853 — An ongoing challenge in the field of multiferroics is to understand new mechanisms and to realize new materials in which an electric field can deterministically switch the magnetization by  $180^\circ$  at room temperature. One mechanism that has recently become of renewed interests is that of ferroelectric-induced weak ferromagnetism, for which several new classes of materials have been proposed and found to be realizations of from first principles. An open and challenging question concerning these systems is that of polarization-magnetization dynamics such as switching. In this talk we will discuss our initial work addressing this question. We apply a phenomenological approach, e.g., the Landau-Lifshitz-Gilbert equation for magnetization dynamics and dynamical systems equations for polarization to study the switching dynamics in single-phase multiferroic materials with strongly coupled polarization and magnetization.

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