

MAR13-2012-020314

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Modeling polycrystalline multiferroics materials

KEN ELDER, Oakland University

Multiferroics are materials that involve the coupling of elasticity, magnetization and polarization. The ability to turn mechanical energy into electric or magnetic energy has been exploited for many years in device applications. More recently there has been a great deal of interest in systems that contain all three properties so that the elastic coupling can be used to control polarization with magnetic fields or magnetization with electric fields. In this talk I would like to discuss the development of a phase field crystal model that incorporates all of the rich physics contained in polycrystalline multiferroic materials. To extend the use of this model to larger length scales an amplitude description will be presented. This description also provides a natural link to traditional continuum field theories of multiferroic materials.