

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Magnetic impurities in spin-spiral multiferroic materials TRINAN-
JAN DATTA, Augusta State University — We investigate the effect of magnetic
impurities in the magnetic-spiral-induced multiferroic phases using an effective mul-
tiferroic Hamiltonian. We model the impurities as a two- level system and consider
the regimes when the impurity spins relax both slowly and fast. Using realistic
material parameters we study the effect of impurities on ferroelectricity for varying
impurity strength. We find that when the impurity strength is weak the electric
polarization is not affected. However as the impurity strength is increased the am-
plitude of the host spin components is reduced and the ferroelectricity suppressed.
We also discuss the role of impurities on a realistic multiferroic spin Hamiltonian
for the rare-earth- metal Mn perovskites.

Trinajan Datta
Augusta State University

Date submitted: 17 Nov 2010

Electronic form version 1.4