Abstract Submitted
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Landau Theory of the Magnetic Phases of Hexagonal Rare Earth Manganites[1] IRAM MUNAWAR, STEPHANIE CURNOE, Department of Physics and Physical Oceanography/Memorial University of Newfoundland — A group theoretical analysis is presented on the magnetic structure of rare earth atoms in the multiferroic hexagonal manganites $RMnO_3$ (R=Ho, Er, Tm, Yb, Sc, Y) which exhibit the coexistence of ferroelectricity (T_c ∼900 K) and antiferromagnetism (T_N ∼100 K). Using Landau theory, a phenomenological model of the free energy based on four one-dimensional magnetic order parameters has been developed. Coupling of the various order parameters leads to complex magnetic field – temperature phase diagrams in qualitative agreement with experimental data.

References:
[1] S. H. Curnoe and I. Munawar, Magnetic Phases of Rare Earth Hexagonal Manganites, Proceedings of The International Conference on Strongly Correlated Electron Systems SCES '05, July 26^{th} - 30^{th}, 2005, Vienna, Austria, (accepted on July 29, 2005 to be published in Physica B)
[2] Manfred Fiebig. (2005) Revival of the magnetoelectric effect, Journal of Physics D: Applied Physics, 38, R123-R152

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Iram Munawar
Department of Physics and Physical Oceanography/
Memorial University of Newfoundland

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