

Abstract Submitted  
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**A Model of Magnetic Phase Diagrams of Monoclinic Multiferroics CuO and MnWO<sub>4</sub>** GUY QUIRION, Memorial University, R. VILLARREAL, University of Geneva, M.L. PLUMER, Memorial University, M. POIRIER, University of Sherbrooke, T. USUI, T. KIMURA, Osaka University — A mean-field Landau-type free energy model developed using symmetry arguments is used to investigate the magnetic field - temperature phase diagrams of monoclinic multiferroics such as CuO and MnWO<sub>4</sub>. Our analysis supports the necessity of having an intermediate collinear phase between the paramagnetic and magnetoelectric spin spiral phases. The numerical predictions agree well with the experimental phase diagram of CuO ( $\mathbf{H}\parallel\mathbf{b}$ ) determined recently by high resolution ultrasonic velocity measurements [1] which reveal a new transition at  $T_{N3} = 230.0$  K associated with collinear ordering, just above the spiral phase at  $T_{N2} = 229.5$  K. The model also reproduces the magnetic phase diagrams reported for MnWO<sub>4</sub> with the applied field along the three principal axes [2] and elucidates the nature of newly identified high-field phases.

[1] R. Villarreal et al., PRL **109**, 167206 (2012).

[2] H. Mitamura et al., J. Phys. Soc. Japan **81**, 054705 (2012).

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