

Abstract Submitted  
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**Dynamics and Phase Transitions in Multiferroic Helimagnets**

HOSHO KATSURA, Department of Applied Physics, University of Tokyo, SHIGEKI ONODA, Condensed Matter Theory Laboratory, RIKEN, JUNG HOON HAN, Department of Physics and Institute for Basic Science Research, Sungkyunkwan University, NAOTO NAGAOSA, Department of Applied Physics, University of Tokyo, CERC, CREST — The strong coupling between magnetism and ferroelectricity in multiferroics has recently been attracting much attention due to the fundamental physics involved and promising applications. The representative materials are helical magnets  $RMnO_3$  ( $R = \text{Gd, Tb, Dy}$ ) and they have been extensively studied experimentally. We theoretically study the dynamics and phase transitions in cycloidal helical magnets showing the multiferroic behavior. Our approach reproduces several novel features such as the anomalous dielectric response revealed by recent experiments on  $RMnO_3$  [1,2]. We also study the nature of the phase transition from collinear to helical spin structure. [1]N. Kida, Y. Ikebe, Y. Takahashi, J. P. He, Y. Kaneko, Y. Yamasaki, R. Shimano, T. Arima, and Y. Tokura, [arXiv:0711.2733]. [2]A. Pimenov, A. Loidl, A. A. Mukhin, V. D. Travkin, V. Yu. Ivanov, and A. M. Balbashov, [arXiv:0707.3614].

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