

Abstract Submitted
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Magnetoelectric coupling at the EuO/BaTiO₃ interface SHI CAO, Dept. of Physics and Astronomy, Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, Nebraska 68588, USA, PAN LIU, JINKE TANG, Dept. of Physics & Astronomy, University of Wyoming, Laramie, Wyoming 82071 USA, CHUNG WUNG BARK, SANGWOO RYU, CHANG BEOM EOM, Dept. of Materials Science and Engineering, University of Wisconsin-Madison, Wisconsin 53706, USA, PETER DOWBEN, ALEXEI GRUVERMAN, Dept. of Physics and Astronomy, Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, Nebraska 68588, USA — Magnetization modulation by ferroelectric polarization pinning is reported for the ferromagnetic-ferroelectric EuO/BaTiO₃ (EuO/BTO) heterostructures. Away from T_c , the critical exponent β indicates that the magnetization of EuO is consistent with mean field theory despite suggestions that EuO is a typical Heisenberg ferromagnetic semiconductor. The Heisenberg model is also inconsistent with the significant band dispersion seen in EuO thin films. The possible mechanisms include extrinsic doping and/or pinning of interface states at the EuO/BTO interface. The results are discussed in the context of data also obtained for La_{0.67}Sr_{0.33}MnO₃/BaTiO₃ heterostructures, where the critical exponent β is also close to the predictions of mean field theory, suggesting a similarity in the importance of the magnetic interface with a ferroelectric and the possible importance of ferroelectric polarization reversal.

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