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Ferroelectricity in a Collinear Magnetic Phase of Orthorhombic Perovskites IVAN SERGIENKO, Oak Ridge National Laboratory, CENGIZ SEN, National High Magnetic Field Laboratory, ELBIO DAGOTTO, University of Tennessee and Oak Ridge National Laboratory — Below $T_c = 30$ K, a number of perovskite manganites (such as $HoMnO_3$) and nickelates order magnetically in the so-called E-type phase with zigzag chains of parallel spins. We demonstrate that this magnetic phase is also ferroelectric. We discuss the magnetoelectric coupling based on the symmetry arguments of the Landau theory of phase transitions. We also explore a microscopic mechanism of ferroelectricity induced by the collinear spin arrangement and address the order of magnitude of the ferroelectric polarization.

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