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Magnetoelectric effects induced by domain walls ANDREA SCARAMUCCI, University of Groningen, THOMAS KAPLAN, Michigan State University, MAXIM MOSTOVOY, University of Groningen — We explore the possibility to observe high-temperature multiferroic behavior in thin films of ordinary ferrimagnets. In thin films magnetostatic interactions induce periodic stripe domain patterns. We show that stripe domain patterns, stabilized by magneto-dipolar interactions, have ferroelectric properties similar to those of magnetic spirals in bulk materials. We studied behavior of domain patterns and the induced electric polarization in applied magnetic and electric fields using mean field approximation and Monte Carlo simulations. We find a sharp anomaly in dielectric constant close to polarization-flip transition, induced by an external electric field. We also studied the domain walls in conical spiral multiferroics, where magnetization \mathbf{M} coexists with the electric polarization \mathbf{P} induced by the cycloidal spiral. The structure of these domain walls explains the conservation of $\mathbf{P} \times \mathbf{M}$ recently observed in CoCr_2O_4 as well as the magnetic field dependence of the polarization vector \mathbf{P} in ZnCr_2Se_4 .

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