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Linear magnetoelectricity at room temperature in perovskite artificial superlattices SAURABH GHOSH, HENA DAS, CRAIG J. FENNIE, School of Applied and Engineering Physics, Cornell University — The primary challenge in the field of multiferroics remains to identify materials that have a functional coupling between an electrical polarization and a magnetization, i.e., a magnetoelectric effect, at room temperature. Such materials may, for example, facilitate technologically important devices based on the electric field control of magnetism. Atomic scale heterostructures of transition metal ABO_3 perovskites are an ideal platform to realize designer properties and functionalities that don't exist in the bulk phase diagrams of the constituent materials. Here we take advantage of a recent direction in functional perovskites (where the combination of heterointerfaces with rotations/tilts of the BO_6 octahedra facilitate ferroelectric order) to create a new class of room temperature multiferroics in which ferroelectricity induces linear magnetoelectricity. We consider heterostructures of rare-earth orthoferrites of *Pnma* perovskites, $(LnFeO_3)_1/(Ln'FeO_3)_1$. Computed values of linear ME coefficients are found to be comparable to the prototype ME compound Cr_2O_3. Finally, we discuss the role of the Ln f-states in the ME response.

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