

Abstract Submitted
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Full control of magnetism in a manganite bilayer by ferroelectric polarization SHUAI DONG, Southeast University, ELBIO DAGOTTO, University of Tennessee, Knoxville — An oxide heterostructure made of manganite bilayers and ferroelectric perovskites is predicted to lead to the full control of magnetism when switching the ferroelectric polarizations. By using asymmetric polar interfaces in the superlattices, more electrons occupy the Mn layer at the *n*-type interface side than at the *p*-type side. This charge disproportionation can be enhanced or suppressed by the ferroelectric polarization. Quantum model and density functional theory calculations reach the same conclusion: a ferromagnetic-ferrimagnetic phase transition with maximal change $> 90\%$ of the total magnetization can be achieved by switching the polarization's direction. This function is robust and provides full control of the magnetization's magnitude, not only its direction, via electrical methods. Reference: S. Dong and E. Dagotto, Phys. Rev. B 88, 140404(R) (2013).

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