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Electrical Transport Measurements of a Manganite Multiferroic Field Effect Device¹ JAMES PARKER, SHANE CYBART, STEPHEN WU, PU YU, R. RAMESH, R.C. DYNES, Materials Sciences Division, Lawrence Berkeley National Laboratory — We report electrical transport measurements of multiferroic/ferromagnet, BiFeO₃ (BFO) / La_{0.7}Sr_{0.3}MnO₃ (LSMO), electric field effect devices. The antiferromagnetic (AFM) ordering of the BFO dielectric layer is coupled to the ferromagnetic (FM) ordering of the LSMO channel layer and is observed as exchange bias—a shift of the LSMO magnetic hysteresis curve along the applied field axis. We will present the temperature dependence of this exchange bias between 2K and 100K. Furthermore, we also investigate the exchange bias with respect to multiple gating variables, including channel current and gate pulsing patterns. We have observed that the current in the channel during gating plays an important role in setting the exchange bias.

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