

Abstract Submitted  
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**Effect of Surface Engineering on Tunneling Across Ferroelectric Thin Films**<sup>1</sup> LE ZHANG, SHIJIE LI, HAIDONG LU, ALEXEI GRUVERMAN, ANDREI SOKOLOV, Department of Physics and Astronomy, University of Nebraska - Lincoln — For a practical implementation of ferroelectric based devices, it is indispensable to obtain reliable switching characteristic of ME/FE/ME heterostructures. Electrostatic force microscopy shows that polar surfaces are achievable without top ME electrode and ionic adsorbates delivers enough screening ions, it is intriguing enough that top metal electrode appears to be less effective than such screening by adsorbates. This observation emphasizes the importance of surface engineering [1] heterojunctions in order to retain or enhance ferroelectric response. We report on our study of the role of top electrodes in ferroelectric stability and tunneling properties of heterojunctions containing BaTiO<sub>3</sub> thin film, grown epitaxially on Ti-terminated SrTiO<sub>3</sub> substrate with LaSrMnO<sub>3</sub> and SrRuO<sub>3</sub> as bottom electrodes by pulsed laser deposition. Epitaxial top electrodes are formed by the same method. Alternatively, Pt and Ni-based metallic films are deposited by electron beam evaporation. PFM response and HRTEM analysis of obtained interface are presented. Transport and magneto-transport measurement are discussed in the frame of ferroelectric polarization induced effects.

[1] H. Lu et al, Adv. Mater., 24, 1209 (2012).

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