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Effect of epitaxial strain on tunneling electroresistance in ferroelectric tunnel junctions[1] ANDREI SOKOLOV, OHHEUM BAK, HAIDONG LU, EVGENY TSYMBAL, ALEXEI GRUVERMAN, University of Nebraska at Lincoln — We present the effect of compressive strain on the tunneling electroresistance (TER) effect in BaTiO3/SrRuO3 (BTO/SRO) heterostructures. The films were prepared using PLD technique and characterized by XRD and RHEED methods. We performed comprehensive study of ferroelectric and transport properties of obtained structure and find that epitaxial strain imposed by the mismatch of NdGaO3 and SrTiO3 lattice parameters with the BTO and SRO layers improves ferroelectric polarization of BTO and concurrently promotes the metallicity of the SRO films. While the enhanced polarization is beneficial for the TER magnitude, the reduced asymmetry in the tunneling barrier due to the shortened screening length of SRO is detrimental for the effect. Thus, a combined effect of strain on the polarization of the ferroelectric barrier and the screening properties of the electrodes needs to be taken into account when considering and predicting the TER effect in ferroelectric tunnel junctions

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