## Abstract Submitted for the MAR15 Meeting of The American Physical Society

Electric-field manipulation of magnetization rotation and tunneling magnetoresistance of magnetic tunnel junctions at room temperature AITIAN CHEN, PEISEN LI, Department of Physics, Tsinghua University, DALAI LI, Institute of Physics, Chinese Academy of Sciences, YONGGANG ZHAO, Department of Physics, Tsinghua University, SEN ZHANG, College of Science, National University of Defense Technology, LIFENG YANG, YAN LIU, MEIHONG ZHU, HUIYUN ZHANG, Department of Physics, Tsinghua University, XIUFENG HAN, Institute of Physics, Chinese Academy of Sciences — Recent studies on the electricfield control of tunneling magnetoresistance (TMR) have attracted considerable attention for low power consumption. So far two methods have been demonstrated for electric-field control of TMR. One method uses ferroelectric or multiferroic barriers, which is limited by low temperature. The other is nanoscale thin film magnetic tunnel junction (MTJ), but the assistance of a magnetic field is required. Therefore, electric-field control of TMR at room temperature without a magnetic field is highly desired. One promising way is to employ strain-mediated coupling in ferromagnetic/piezoelectric structure. Though MTJs/piezoelectric has been predicted by theory, experiment work is still lacking. We deposited CoFeB/AlOx/CoFeB on Pb(Mg1/3Nb2/3)0.7Ti0.3O3 (PMN-PT) ferroelectric single crystal. Under external electric fields, PMN-PT will produce a piezostrain due to piezoelectric effect, and the piezostrain transfers to ferromagnetic film to change the magnetic anisotropy. We demonstrate a reversible, continuous magnetization rotation and manipulation of TMR at room temperature by electric fields without the assistance of a magnetic field.

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Date submitted: 14 Nov 2014

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