

Abstract Submitted  
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**Influence of Interface on Conductance in  $\text{AlO}_x$  Based Magnetic Tunnel Junctions**<sup>1</sup> FENG GUO, E. DAN DAHLBERG, School of Physics and Astronomy, University of Minnesota — A surprising minimum in the differential conductance at nonzero bias is observed in some magnetic tunnel junctions consisting of  $\text{CoFe}/\text{AlO}_x/\text{CoFe}$ ; this pronounced conductance feature occurred for electrons tunneling from the bottom to top electrode. The presence of this conductance feature depends upon the oxidation time for creating the barrier from a thin Al layer; for short and moderate oxidation times the feature was present while for long oxidation times the conductance was found to be both symmetric about zero bias and monotonic with increasing bias voltage. To determine the origin of this feature samples were prepared where the oxidation states of the CoFe on each side of the barrier were studied by X-ray photoelectron spectroscopy: the conductance feature is observed only when the top CoFe layer is partially oxidized and it disappears when the CoFe on both sides of the junction has some oxidation present. More interestingly, the bias voltage of the conductance feature decreases with oxidation time. We attribute the differential conductance feature to the electronic structure and the chemical bonding at the bottom  $\text{CoFe}/\text{AlO}_x$  interface.

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