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Bias and temperature dependence on junction magnetoresistance in manganite/magnetite based magnetic tunnel junctions RAJESH CHOPDEKAR[1], School of Applied Physics, Cornell Univ., GUOHAN HU, Hitachi Global Storage Technologies, YURI SUZUKI, Dept. of Materials Science and Engineering, UC Berkeley — Studies of the bias and temperature dependence of junction magnetoresistance (JMR) in manganite/magnetite trilayer junctions have revealed non-monotonic dependence on both quantities. Such junctions were constructed to probe the spin-polarization of magnetite using the well-established majority spin-polarized oxide (La,Sr)MnO_3 as a counter-electrode. We have found that using an isostructural oxide cobalt chromite tunnel barrier reduces disorder at the chromite-magnetite interface as compared to junctions with a rocksalt structure MgO barrier. An order of magnitude increase in JMR for these junctions is strongly peaked as a function of bias magnitude and sign, but has weak temperature dependence. The Verwey transition in magnetite, the paramagnetic-ferrimagnetic transition in cobalt chromite, and the interface roughness in the junctions all play a role in determining the temperature and bias dependence of the measured magnetoresistance.

[1]membership pending

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