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Effect of interface states on spin-dependent tunneling in Fe/MgO/Fe tunnel junctions KIRILL BELASHCHENKO, JULIAN VELEV, EVGENY TSYMBAL, University of Nebraska-Lincoln — The electronic structure and spin-dependent tunneling in epitaxial Fe/MgO/Fe(001) tunnel junctions are studied using first-principles calculations.[1] For small MgO barrier thickness the minority-spin resonant bands at the two interfaces make a significant contribution to the tunneling conductance for the antiparallel magnetization, whereas these bands are, in practice, mismatched by disorder and/or small applied bias for the parallel magnetization. This explains the experimentally observed decrease in tunneling magnetoresistance (TMR) for thin MgO barriers. We predict that a monolayer of Ag epitaxially deposited at the interface between Fe and MgO suppresses tunneling through the interface band and may thus be used to enhance the TMR for thin barriers. [1] K. D. Belashchenko, J. Velev, and E. Y. Tsymbal, Phys. Rev. B **72**, 140404(R) (2005).

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