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Unconventional proximity effect and inverse spin-switch behavior in a model manganite/cuprate/manganite trilayer system
JUAN SALAFRANCA, Universidad Complutense de Madrid, Spain., SATOSHI OKAMOTO, Oak Ridge National Laboratory — The proximity effect in a model manganite/cuprate system is investigated theoretically. We consider a situation in which spin-polarized electrons in manganite layers antiferromagnetically couple with electrons in cuprate layers as observed experimentally. The effect of the interfacial magnetic coupling is found to be much stronger than the injection of spin-polarized electrons into the cuprate region. As a result, the superconducting transition temperature depends on the thickness of cuprate layer significantly. Since the magnetic coupling creates *anti*-spin-polarization, an applied magnetic field and the *anti*-polarization compete resulting in the inverse spin-switch behavior where superconducting transition temperature is increased by applying a magnetic field. This work was supported by the NSF Grant DMR-0706020 (J.S.) and by the Materials Sciences and Engineering Division, Office of Basic Energy Sciences, the US DOE (S.O.).

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