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In search for the superconducting spin-switch: Magnetization induced resistance switching effects in $La_{0.67}Sr_{0.33}MnO_3/Yba_2Cu_3O_{7-\delta}$ bi- and trilayers MENNO VELDHORST, MAARTEN VAN ZALK, ALEXANDER BRINKMAN, HANS HILGENKAMP, MESA+ Institute for Nanotechnology and Faculty of Science and Technology, University of Twente, The Netherlands, JAN AARTS, Kamerlingh Onnes Laboratory, Leiden University, The Netherlands — The influence of the magnetization on the superconducting T_c in bi- and trilayers consisting of the half-metallic ferromagnet $La_{0.67}Sr_{0.33}MnO_3$ and the high-temperature superconductor $YBa_2Cu_3O_{7-\delta}$ is studied. Interfaces that are partly oriented within the crystallographic ab-plane are achieved by tilted epitaxial growth on $SrTiO_3$ (305) substrates. Sharp magnetization switching behavior is observed in the (305) oriented structures, due to the uniaxial magnetic anisotropy. At temperatures close to T_c, resistance jumps are induced by magnetization switching. Our results indicate that the switching behavior arises from magnetic stray fields from the ferromagnetic layers that penetrate into the superconductor, rather than spin-switch or spin-accumulation effects.

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