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Interaction between magnetism and superconductivity in $La_{0.7}Ca_{0.3}MnO_3/YBa_2Cu_3O_{7-\delta}$ multilayers¹ T. HU, H. XIAO, C. C. ALMASAN, Department of Physics, Kent State University, Kent, OH 44242, USA, C. VISANI, Z. SEFRIQUI, J. SANTAMARIA, GFMC, Departamento Fisica Aplicada III, Universidad Complutense de Madrid, 28040 Madrid, Spain — Angular dependent resistivity measurements were performed on $La_{0.7}Ca_{0.3}MnO_3/YBa_2Cu_3O_{7-\delta}$ (LCMO/YBCO) heterostructures below and above the superconducting transition temperature $T_c \approx 90$ K in different applied magnetic field. Besides the conventional intrinsic anisotropic magnetoresistance (AMR) present above T_c , we observe another anisotropic magnetoresistance, which only arises below T_c and increases significantly with decreasing temperature. Also, the proximity-induced resistance, which appears in the LCMO layer, displays a spectacular increase at T_c and then decreases significantly with decreasing temperature, persisting down to the lowest measured T of 72 K. This anomalous AMR and the proximity-induced resistance in the LCMO layer could be due to the triplet component of the superconducting condensation which penetrates into the ferromagnet over a long distance.

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