Interaction between magnetism and superconductivity in $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3/\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ multilayers$^1$ T. HU, H. XIAO, C. C. ALMASAN, Department of Physics, Kent State University, Kent, OH 44242, USA, C. VISANI, Z. SEFRIOU, J. SANTAMARIA, GFMC, Departamento Física Aplicada III, Universidad Complutense de Madrid, 28040 Madrid, Spain — Angular dependent resistivity measurements were performed on $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3/\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (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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