

Abstract Submitted  
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**Andreev Nanoprobe of Half-Metallic Oxides Using Superconducting Cuprate Tips** C.S. TUREL, T.L. WU, J.Y.T. WEI, University of Toronto, I.J. GUILARAN, P. XIONG, Florida State University — Andreev reflection has been extensively used to determine the spin polarization of various ferromagnetic materials, with conventional *s*-wave superconductors as a counterelectrode. In this work, we use the high- $T_c$  superconductor  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (YBCO) as point-contact tips to probe the half-metallic ferromagnets  $\text{CrO}_2$  and  $\text{La}_{0.66}\text{Ca}_{0.33}\text{MnO}_3$  (LCMO) in thin-film form. High-impedance point-contact junctions are made and their differential conductance spectra are measured at 4.2K. Strong suppression of the *d*-wave Andreev reflection characteristics is observed, in contrast to spectra taken on Au films, indicating strong spin polarization in the  $\text{CrO}_2$  and LCMO films. Our point contacts are estimated to range between several nanometers to tens of nanometers in size, attesting to their ballistic and microscopic nature. These results demonstrate the feasibility of using superconducting cuprate tips as spin-sensitive nanoprobe of itinerant ferromagnets.

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