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Evidence for the coexistence of antiferromagnetism and superconductivity in the electron-doped infinite-layer cuprate $Sr_{1-x}La_xCuO_2$ from ARPES JOHN HARTER, DANIEL SHAI, ERIC MONKMAN, YUEFENG NIE, DARRELL SCHLOM, Cornell University, LUIGI MARITATO, University of Salerno, KYLE SHEN, Cornell University — The asymmetry between hole doping and electron doping of cuprates has major implications for theories of high-T_c superconductivity, yet the vast majority of our knowledge of electron-doped cuprates originates from the $Re_{2-x}Ce_xCuO_4$ (RCCO) materials. One salient feature of electron doping is the robustness of antiferromagnetism, but at present it has not been established whether this is intrinsic to the electron-doped CuO_2 plane or idiosyncratic to the RCCO family. Here we report high-resolution *in situ* angle-resolved photoemission spectroscopy measurements of superconducting $Sr_{1-x}La_xCuO_2$ (SLCO) thin films grown by molecular beam epitaxy. The observed electronic structure exhibits many features consistent with (π,π) scattering, and the clear observation of such scattering in this material demonstrates that strong antiferromagnetism is generic to the electron-doped CuO_2 plane. Furthermore, the (π,π) order in SLCO is sufficiently strong to fully gap the nodal portion of the Fermi surface, leaving only electron pockets at (π,0); these pockets are gapped by the coexisting (presumably d-wave) superconductivity. This offers a simple explanation for the many reports of s-wave superconductivity in this material.

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