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Fermiology of the undoped cuprate superconductor Pr_2CuO_4 ROSS MCDONALD, Los ALamos National Laboratory, NICHOLAS BREZNAY, NITYAN NAIR, JAMES ANALYTIS, UC Berkeley, ZENGWEI ZHU, KIMBER-LEY MODIC, Los ALamos National Laboratory, YOSHIHARU KROCKEN-BERGER, NTT Basic Research Laboratories, LANL COLLABORATION, UC BERKELEY COLLABORATION, NTT COLLABORATION — Recent advances in molecular beam epitaxy growth and preparation of cuprate thin films indicate that annealing can be employed to minimize apical oxygen defects. For Pr_2CuO_4 the resulting square planar coordinated structure exhibits a 25 K superconducting transition in the absence of doping. This calls into question whether a Mott insulating groundstate is the relevant description of the square-planar parent phase of the electron-doped cuprate superconductors. We present high field (>90 T) measurements of magnetic quantum oscillations – the first observation of it's kind for a cuprate thin film. The oscillation frequency and effective mass are consistent with the reconstructed Fermi surface of the electron-doped cuprate $\mathrm{Nd}_{2-x}\mathrm{Ce}_{x}\mathrm{CuO}_{4}$. The combination of a reconstructed bandstructure and the occurrence of metalicity at zero doping is consistent with a Slater picture of band magnetism, indicating that the "doped Mott insulator" paradigm may not apply in this system.

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