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Electronic competing phases and their magnetic field dependence in electron-doped nonsuperconducting and superconducting $\mathbf{Pr_{0.88}LaCe_{0.12}CuO_4}$ STEPHEN D. WILSON, The University of Tennessee, Knoxville, Tennessee 37996-1200, PENGCHENG DAI, The University of Tennessee, Knoxville, Tennessee 37996-1200 / Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831-6393 , WEI BAO, Los Alamos National Laboratory, Los Alamos, NM 87545, SEUNG-HUN LEE, National Institute of Standards and Technology, Gaithersburg, MD 20899-3460, Y. KURITA, SEIKI KOMIYA, YOICHI ANDO, Central Research Institute of Electric Power Industry, Komae, Tokyo — We present inelastic neutron scattering studies of electron- doped $Pr_{0.88}LaCe_{0.12}CuO_4$ (PLCCO). Previous elastic neutron scattering results have shown when superconductivity is first induced by annealing in PLCCO, a quasi-two-dimensional spin density wave also appears and coexists with three- dimensional (3D) antiferromagnetic order. As a function of increasing T_c, the Neel temperature of the 3D order decreases and vanishes when optimal superconductivity is achieved, suggesting the potential presence of a quantum critical point at zero temperature. We have performed careful inelastic neutron scattering experiments on a $T_c = 21$ K and $T_N = 40$ K sample of PLCCO. We find that magnetic excitations in this material scale according to the proximity of a quantum critical regime. We compare the results with hole-doped La_2CuO_4.

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