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Electronic competing phases and their magnetic field dependence in electron-doped nonsuperconducting and superconducting $\text{Pr}_{1.88}\text{LaCe}_{0.12}\text{CuO}_4$ H.J. KANG, University of Tennessee, PENGCHENG DAI, University of Tennessee/ORNL, H.A. MOOK, ORNL, D.N. ARGYRIOU, V. SIKOLENKO, Hahn-Meitner-Institut, J.W. LYNN, NIST, Y. KURITA, SEIKI KOMIYA, YOICHI ANDO, CRIEP — We use neutron scattering to study the evolution of the static antiferromagnetic order of electron-doped $\text{Pr}_{0.88}\text{LaCe}_{0.12}\text{CuO}_4$ (PLCCO) from an antiferromagnet to superconductors. When the superconductivity appears in PLCCO, a quasi-two-dimensional (2D) spin-density-wave (SDW) order is also induced, and both superconductivity and SDW coexist with the residual 3D antiferromagnetic (AF) phase. The SDW and 3D AF orders disappear when PLCCO becomes optimal doping with highest T_c . A c -axis aligned magnetic field enhances the quasi-2D SDW order at (0.5,0.5,0) in underdoped PLCCO, but has no effect on the 3D AF order in nonsuperconducting and superconducting samples. Since the same field along the ab -plane has no field effect on (0.5,0.5,0) and impurity positions, we conclude that the c -axis field-induced effect is intrinsic to PLCCO and arises from the suppression of superconductivity.

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