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Evolution of the spin dynamics in electron-doped high-transition temperature superconductor $Pr_{0.88}LaCe_{0.12}CuO_{4-\delta}$(Tc=24K, 27K) JUN ZHAO, Department of Physics, University of Tennessee, Knoxville, TN, PENGCHENG DAI, Department of Physics, University of Tennessee, Oak Ridge National Lab, SHILIANG LI, Department of Physics, University of Tennessee, Knoxville, TN, HYE JUNG KANG, Center for Neutron Research, National Institute of Standards and Technology,Gaithersburg, MD, LOUIS-PIERRE REGNAULT, Laboratoire de Magnétisme et Diffraction Neutronique, Service de Physique Statistique, Magnétisme et Supraconductivité, PAUL STEPPENS, Institut Laue-Langevin, Grenoble, France, ARNO HIESS, nstitut Laue-Langevin, Grenoble, France, STEPHEN WILSON, Department of Physics, University of Tennessee, Knoxville, TN — We use both polarized and unpolarized neutron scattering to study spin excitations in electron doped cuprates $Pr_{0.88}LaCe_{0.12}CuO_{4-\delta}$(Tc=24K, 27K). We determine the dynamic susceptibility and its temperature dependence for energes between 0.5meV to 30meV in these samples. Our results show that the spectral weight of optimal doped PLCCO (27K) around resonance energy region ($\sim$10meV) is much stronger than that of the slightly underdoped 24K PLCCO. We also demonstrate that using polarized neutrons are necessary to isolate magnetic scattering from nonmagnetic processes. A determination of the evolution of spin excitations in PLCCO as the system is tuned from nonsuperconducting to superconducting states is important to our understanding of the role of magnetism in high-Tc superconductivity.

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