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Spin Dynamics in the electron-doped high- T_c superconductors $\text{Pr}_{0.88}\text{LaCe}_{0.12}\text{CuO}_{4-\delta}$ ¹

PENGCHENG DAI, The University of Tennessee

We briefly review results of recent neutron scattering experiments designed to probe the evolution of antiferromagnetic (AF) order and spin dynamics in the electron-doped $\text{Pr}_{0.88}\text{LaCe}_{0.12}\text{CuO}_{4-\delta}$ (PLCCO) as the system is tuned from its as-grown non-superconducting AF state into an optimally doped superconductor ($T_c = 27.5$ K) without static AF order [1-3]. For under doped materials, a quasi-two-dimensional spin-density wave was found to coexist with three-dimensional AF order and superconductivity. In addition, the low-energy spin excitations follow Bose statistics. In the case of optimally doped material, we have discovered a magnetic resonance intimately related to superconductivity analogous to the resonance in hole-doped materials. On the other hand, the low energy spin excitations have very weak temperature dependence and do not follow Bose statistics, in sharp contrast to the as-grown nonsuperconducting materials. 1 Stephen D. Wilson, Pengcheng Dai, Shiliang Li, Songxue Chi, H. J. Kang, and J. W. Lynn, *Nature (London)* **442**, 59 (2006). 2 Stephen D. Wilson, Shiliang Li, Hyungje Woo, Pengcheng Dai, H. A. Mook, C. D. Frost, S. Komiyama, and Y. Ando, *Phys. Rev. Lett.* **96**, 157001 (2006). 3. Stephen D. Wilson, Shiliang Li, Pengcheng Dai, Wei Bao, J. H. Chung, H. J. Kang, S.-H. Lee, S. Komiyama, and Y. Ando, *Phys. Rev. B* **74**, 144514 (2006).

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