

Abstract Submitted
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Evidence for Local Moment Magnetism in Superconducting $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ ¹ JOHN TRANQUADA, G.Y. XU, G.D. GU, M. HUECKER, Brookhaven Natl. Lab., B. FAUQUE, LLB, T.G. PERRING, C. STOCK, ISIS, L.-P. REGNAULT, CEA-Grenoble — We have used inelastic neutron scattering to measure the dynamic spin susceptibility in optimally-doped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ ($T_c = 91$ K). Four crystals with a total mass of 19 g were measured on the MAPS spectrometer at ISIS for temperatures of 10 K and 100 K. We have been able to identify the magnetic excitations in the energy range 20-90 meV. The magnetic nature of the scattering has been confirmed with spin-polarization analysis on IN22 at the ILL. While we see temperature-dependent changes for energies around 40 meV that are consistent with earlier studies, we find that the Q-integrated signal shows a much weaker variation with temperature. The absolute magnetic cross section is quite comparable to that of spin fluctuations in stripe ordered $\text{La}_{1.875}\text{Ba}_{0.125}\text{CuO}_4$. As the magnetism in the latter system has been shown to have a dominant contribution from local moments [1], we argue that the same must be true for $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$. [1] M. Huecker et al., Phys. Rev. B (accepted); cond-mat/0503417v3.

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John Tranquada
Brookhaven National Lab

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