Abstract Submitted
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Magnetic excitations in the high-T_c superconductor $HgBa_2CuO_{4+d}$ at low doping[1] CHELSEY DOROW, M.K. CHAN, Y. TANG, G. YU, University of Minnesota, YUAN LI, Max Planck Institute for Solid State Research, Germany, N. BARISIC, University of Minnesota, J. PARK, O. SOBOLEV, A. TEICHERT, Forschungsneutronenquelle Heinz Maier-Leibnitz, Germany, Y. SIDIS, Laboratoire Leon Brillouin, France, P. STEFFENS, Institut Laue Langevin, France, D. ABERNATHY, Oak Ridge National Lab, X. ZHAO, University of Minnesota, Jilin University, China, P. BOURGES, Laboratoire Leon Brillouin, France, M. GREVEN, University of Minnesota — We report on the observation of magnetic excitations in the very underdoped regime of the high-T_c superconductor $HgBa_2CuO_{4+d}$ (Hg1201). Our previous inelastic neutron scattering measurements of optimally doped ($T_c \approx 95$ K) and moderately underdoped ($T_c \approx 65$ K) samples revealed two novel, weakly-dispersive magnetic excitation branches below the pseudogap temperature T* [Y. Li et al., Nature 468, 283 (2010); Y. Li et al., Nature Phys. 8, 404 (2012)]. These excitations are associated with the translational symmetry preserving magnetic order previously established to be a universal property of the pseudogap phase [B. Fauqué et al., Phys. Rev. Lett. 96, 197001 (2006); Y. Li et al., Nature 455, 372 (2008); Y. Li et al. Phys. Rev. B 84, 224508 (2011)]. In $YBa_2Cu_3O_{6+d}$, the strength of this order was found to decrease in very underdoped samples [V. Balédent et al. Phys. Rev. B 83, 104504 (2011)]. Indeed, we find no evidence of pseudogap excitations in very underdoped Hg1201 ($T_c = 45$ K), and instead we observe strong antiferromagnetic fluctuations over a large energy range (10 -150 meV).

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