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Characterization of Zn impurity resonances in strongly underdoped Bi-2212 JAMES A. SLEZAK, JINHO LEE, Cornell University, KYLE MCELROY, University of California, Berkeley, Cornell University, H. EISAKI, AIST-Tsukuba, S. UCHIDA, University of Tokyo, J. C. DAVIS, Cornell University
— Using atomically resolved scanning tunneling spectroscopy (STS), we investigate the local density of states (LDOS) in the vicinity of Zn impurity atoms in strongly underdoped $Bi_2Sr_2CaCu_2O_{8+x}$. Previous studies have shown a correlation between the local superconducting energy gap and the locations of these impurities (Lang *et al, Nature,* 415, 2002; McElroy *et al,* cond-mat/040620). Different classes of scattering resonance are observed, and we present the results of preliminary experiments to characterize them and determine their relationship to the local electronic structure found in the underdoped samples.

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