

Abstract Submitted
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Fermi Liquid Description of X-ray Absorption Spectra in Over-doped LSCO¹ TOWFIQ AHMED, JOHN J. REHR, JOSHUA J. KAS, University of Washington, TANMOY DAS, HSIN LIN, ROBERT S. MARKIEWICZ, BERNARDO BARBIELLINI-AMIDEI, ARUN BANSIL, Northeastern University — We show that a paramagnetic self-energy correction [1] to the real-space Green's function code FEFF9 [2] can provide a good description of the x-ray absorption spectra (XAS) of cuprate system such as $\text{La}_{(2-x)}\text{Sr}_x\text{CuO}_4$ (LSCO). This self energy includes coupling to both charge and magnetic excitations. We also find good agreement with recent XAS results of Peet et al. [3] in the over-doped regime of LSCO. We have also investigated various prescriptions for including core-hole effects. We infer that at low doping, the system behaves as an anti-ferromagnetic insulator, while Fermi liquid physics is recovered at high doping.

[1] Tanmoy Das, R.S. Markiewicz, and A. Bansil, Phys.Rev. B **77**, 134516 (2008).

[2] J. J. Rehr et al., Comptes Rendus Physique **10**, 548 (2009).

[3] D.C. Peets *et al.*, Phys. Rev. Lett. **103**, 087402 (2009).

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Towfiq Ahmed
University of Washington

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