Fermi Liquid Description of X-ray Absorption Spectra in Over-doped LSCO

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— 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 La$_{(2-x)}$Sr$_{(x)}$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.


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