Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Theoretical visualization of charge order in cuprates PEAYUSH CHOUBEY, University of Florida, WEI-LIN TU, National Taiwan University, TING-KUO LEE, Institute of Physics, Academia Sinica, Taiwan., PETER HIRSCHFELD, University of Florida — The anti-phase charge density wave (AP-CDW) state obtained in [1] by solving the renormalized mean-field theory of the t-J model was shown to have a dominant d-form factor for the bond order. However, the local density of states (LDOS) is only defined at the Cu lattice site. In order to compare with scanning tunneling microscopy (STM) experiments [2] in detail, we compute the continuum LDOS in the AP-CDW state at typical STM tip heights using $Bi_2Sr_2Ca_2CuO_2$ Wannier functions obtained from first principles [3]. The resulting spatial patterns compare very well with experimental results, and show the important role of the planar O2p states filtered through the BiO and SrO layers. In addition, we compute the Cu and O sublattice LDOS and Fourier transform it to obtain the amplitudes of s, s' and d-form factors actually reported in an STM experiment [4]. References:

1. Wei-Lin Tu and Ting-Kuo Lee, arXiv: 1505.07728.
2. Kazuhiro Fujita *et al.*, Proc. Natl. Acad. Sci. 111 30 (2014).
3. A. Kreisel *et al.*, Phys. Rev. Lett. 114, 217002 (2015).
4. M. H. Hamidian *et al.*, arXiv: 1507.07865.

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Date submitted: 06 Nov 2015 Electronic form version 1.4