Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Functional renormalization group analysis of the one-dimensional half-filled Holstein-Hubbard model SHAN-WEN TSAI, University of California, Riverside, KA-MING TAM, DAVID K. CAMPBELL, ANTONIO H. CASTRO NETO, Boston University — The one-dimensional half-filled Holstein-Hubbard model (HHM) is studied by the newly developed electron-phonon coupled functional renormalization group (ep-FRG) [1]. The ep-FRG enables us to study the electron-phonon coupled system in an unbiased manner by taking account of the scatterings at different energy scales and momenta systematically. Previous studies of the half-filled HHM showed that there is a direct transition between the charge-gapped spin-density wave (SDW) phase and the spin-charge-gapped charge-density wave (CDW) phase. Recently, it has been proposed that there is an intermediate spin-gapped metallic phase with dominant superconducting (SC) pairing correlation between SDW phase and CDW phase [2]. Our ep-FRG results show that the dominant correlation in this intermediate phase is not SC pairing.

[1] S.-W. Tsai, A. H. Castro Neto, R. Shankar, and D. K. Campbell, Phys. Rev. B 72, 054531 (2005).

[2] R. T. Clay and R. P. Hardikar, Phys. Rev. Lett. 95, 096401 (2005).

Shan-Wen Tsai
University of California, Riverside

Date submitted: 30 Nov 2005 Electronic form version 1.4