

Abstract Submitted
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Superconductivity induced by non-local electron-phonon interaction KA-MING TAM, University of Waterloo — The effects from commensurate filling, typically in the one-dimensional half-filled systems, often lead to finite charge gap and instability of long wavelength density wave ordering. Various proposals have been suggested recently that some of the one-dimensional electron-phonon coupled systems can be metallic with zero charge gap. However, subsequent studies of these proposals have obtained divergent results. We study an electron-phonon model with non-local electron-phonon interaction, its low energy effective theory unambiguously possess dominant charge gapless superconducting phase at half filling. In this model, the spin-charge coupling at high energy is weakened by the non-local electron-phonon interaction and the charge gap can be destroyed by the suppression of the umklapp process. The existence of the dominant pairing instability in the half-filled system may have an implication on the role plays by the phonon modes in the cuprate superconductor, suggesting that non-local or long range electron-phonon interactions may favor the formation of pairing.

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