Electron-phonon-coupling-driven pairing symmetry transition in a ladder KA-MING TAM, ANTONIO H. CASTRO NETO, Boston University, SHAN-WEN TSAI, University of California, Riverside, DAVID K. CAMPBELL, Boston University — We address the effects of electron-phonon coupling in the electron-electron interacting ladder using the recently developed functional renormalization group method, in which the full retardation effects can be taken into account impartially[1]. We study the doped Holstein-Hubbard ladder as a typical example and show that there is a transition between s-wave and d-wave pairing as a function of electron-phonon coupling and doping level. This contrasts with recent results from a two-step renormalization group, which suggest that the electron-phonon coupling only contributes in a subdominant fashion and that the spin-gapped pairing phase always has d-wave symmetry, unchanged from the doped Hubbard ladder without electron-phonon interaction[2].

[1]S.-W. Tsai, A.H. Castro Neto, R. Shankar, D.K. Campbell, Phys. Rev. B 72, 054531 (2005)
[2]Alexander Seidel, Hsiu-Hau Lin, Dung-Hai Lee, Phys. Rev. B 71, 220501 (2005)

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