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Pair-Density-Wave Superconducting Order in Two-Leg Ladders AKBAR JAEFARI, EDUARDO FRADKIN, University of Illinois at Urbana-Champaign — We show, using bosonization and Renormalization Group methods, that Pair Density Wave (PDW) state happens in the system of two extended Hubbard-Heisenberg models on two leg ladders. Two different models are discussed in detail. In even legged ladder system we find that PDW state is the dominant instability for certain filling factors and some range of parameters. We show that phase diagram of the spin gap regime is composed of two dual phases: PDW and uniform Superconducting (SC) states. The phase transition between uniform SC and PDW in this model is shown to be in the Ising universality class. The idea has been generalize to the case of other commensurate fillings where we find higher order commensurate PDW states. Then we consider a two leg ladder system with nonzero flux Φ per plaquette. This system is commensurate for wide range of the electron fillings when $\Phi = \pi$. We show that commensurate PDW and incommensurate CDW are some of the phases present in the phase diagram of this model. We show how formation of PDW order in the ladder embodies the notion of intertwined orders.

[X] Prefer Oral Session
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