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Projector Monte Carlo Study of a 2D Fermionic Ring Exchange Only Model KATHARINE HYATT, University of California, Santa Barbara, BRYAN CLARK, University of Illinois at Urbana-Champaign, MATTHEW FISHER, Kavli Institute for Theoretical Physics, University of California, Santa Barbara — There has been significant recent interest in understanding non-Fermi liquid phases and searching for candidate Hamiltonians which may support them. DMRG and variational Monte Carlo students on 2-leg ladders have suggested the presence of such a phase, the d-wave metal, in certain regime of the $t-J-K$ model on the 2D square lattice. K is a nearest neighbor ring exchange term. Non-variational quantum Monte Carlo studies of this model are hampered by the presence of a fermionic sign problem over most of the parameter space. However, in the $t = J = 0$ limit, where only ring exchange occurs, the Hamiltonian is sign problem free. Using Green's function Monte Carlo, we investigate the phase diagram of this ring exchange only fermionic model and report our results.

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