UM Physics Department

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Name: Simon Hands

Title: Quantum Criticality in the Single Flavor Thirring Model in 2+1d

Abstract:

The Thirring model describes N flavors of relativistic fermion interacting via a contact between conserved currents. In 2+1d the U(2N) global symmetry may break spontaneously at strong coupling to U(N)xU(N) via the formation of a bilinear condensate. The resulting quantum critical point depends sensitively on the number of flavors N. I will present results from lattice field theory simulations of the Thirring model using domain wall fermions, which preserve the U(2N) symmetry in the limit of wall separation L_s->infinity. The results suggest symmetry is broken for N<N_c with 1<N_c<2. Equation of state fits to the order parameter data on lattices with L_s <= 48 suggest the transition at N=1 is second order and described by exponents which depart significantly from mean field theory.