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Effects of retardation on a system of polarized fermions LING YANG, University of California, Riverside, FILIPPOS KLIRONOMOS, ENS, Lyon, France, SHAN-WEN TSAI, University of California, Riverside — When fermion-fermion interactions are frequency dependent, retardation effects may play an important role in determining the phase diagram and critical energy scales of the system. These effects are particularly significant when there is competition between two or more instabilities of the Fermi liquid state. In order to elucidate these effects, we study a simple model of spinless fermions on a square lattice. We employ a functional renormalization-group method to obtain the flows of vertices and correlation functions of this system. The phase diagram, critical scales and sub-dominant types of order can be obtained this way for various types of interactions. We discuss an analytical understanding for simple cases, and possible ways to observe these effects in fermion-boson cold-atom mixtures on optical lattices.

Shan-Wen Tsai
University of California, Riverside

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