

Abstract Submitted
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Fully consistent theory of response functions in the cuprate pseudogap phase: Implementing the Ward Takahashi identity¹ CHIEN-TE WU, RUFUS BOYACK, PETER SCHERPELZ, KATHRYN LEVIN, James Franck Institute, University of Chicago — There is a multiplicity of pairing-based theories of the cuprate pseudogap associated with Fermi surface reconstruction or charge ordering, which have a simple mean-field-like self energy. These include the scenario of Yang, Rice and Zhang and the recent Amperean pairing scenario of Lee. We demonstrate here how to arrive at precise response functions for this class of theories which include vertex corrections, where necessary. Thus one can address two body physics experiments at the same level of accuracy that one addresses the one body physics of photoemission spectroscopy. We do so by exploiting the Ward Takahashi identity. As an illustration, we present the spin dynamical response functions of neutron scattering for three different scenarios, finding that a recently proposed pair Amperean pairing scheme is readily distinguishable from other related scenarios.

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