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Dynamic Response Functions from Angle Resolved Photoemission Spectra UTPAL CHATTERJEE, DIRK MORR, University of Illinois at Chicago, MIKE NORMAN, Argonne National Laboratory, MOHIT RANDEIRA, Ohio State University, JUAN CARLOS CAMPUZANO, University Of Illinois at Chicago — The linear response to an external probe as a function of energy and momentum is of great importance in elucidating the properties of complex materials. We introduce a formalism in the framework of diagrammatic k space approach with Random Phase Approximation (RPA), for calculating dynamic response functions using experimental single particle Green's function derived from ARPES spectra. Specifically we focus on using the single particle Green's function obtained from superconducting state of ARPES data in the High T_c cuprates to compute the dynamic spin susceptibility. We find good agreement between our results and the superconducting state neutron results, in particular the resonance at antiferromagnetic ordering wave vector, with its unusual 'reverse magnon' dispersion. We anticipate, our formalism will also be useful in interpreting results from other spectroscopies such as optical and Raman responses.

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