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Characterizing Featureless Mott Insulating State by Quasiparticle Interferences - A DMFT Prospect[1] SHANTANU MUKHERJEE, WEI-CHENG LEE, State Univ of NY - Binghamton — In this talk we discuss the quasiparticle interferences (QPIs) of a Mott insulator using a T-matrix formalism implemented with the dynamical mean-field theory (T-DMFT). In the Mott insulating state, the DMFT predicts a singularity in the real part of electron self energy s (w) at low frequencies [1], which completely washes out the QPI at small bias voltage. However, the QPI patterns produced by the non-interacting Fermi surfaces can appear at a critical bias voltage in Mott insulating state. The existence of this non-zero critical bias voltage is a direct consequence of the singular behavior of Re[s (w)] /sim n/w with n behaving as the 'order parameter' of Mott insulating state. We propose that this reentry of non-interacting QPI patterns could serve as an experimental signature of Mott insulating state, and the 'order parameter' can be experimentally measured [2]. [1] A. Georges et al, Rev. Mod. Phys. 68, 13 (1996). [2] Shantanu Mukherjee, and Wei-Cheng Lee, Arxiv: 1504.05214 (2015).

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