Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

A Pre-Formed Pair Approach to the Dynamical (THz) Complex Conductivity in the Cuprates DAN WULIN, VIVEK MISHRA, KATHRYN LEVIN, University of Chicago — In this talk we present a theory for $\sigma(\omega) = \sigma_1(\omega) + i\sigma_2(\omega)$ in the underdoped cuprates. Our work presumes that the pseudogap is associated with preformed pairs. We demonstrate how the puzzling extended range of finite $\sigma_2(\omega)$ above T_c (implying a "dynamical superfluid density") arises from a new form of pair breaking contribution to $\sigma_2(\omega)$. This is only present in these moderately clean superconductors because of stronger than BCS attraction (BCS-BEC). Sum rule compatibility and good semiquantitative agreement with experiment is found.

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Date submitted: 06 Dec 2011 Electronic form version 1.4