

Abstract Submitted to the
3rd Conference on Concepts in Electron Correlation
30 September - 5 October, 2005
Hvar, Croatia

Cooper Pairs in Flatland: Electrodynamics of the 2D Superconductor-Insulator Quantum Phase Transition

N. P. Armitage

*Département de Physique de la Matière Condensée, Université de Genève, quai
Ernest-Ansermet 24, CH1211 Genève 4, Switzerland*

Using microwave cavities and a novel cryogenic system we have probed the evolution of the low frequency electrodynamics of thin InO_x films across the nominal 2D field-tuned superconductor insulator quantum phase transition. Such a finite study allows us, at least in principle, to access the true phase coherent ($\hbar\omega > k_B T$) quantum critical behavior. A number of other interesting items are found including evidence for significant finite frequency superfluid density well into the "insulating" regime of the phase diagram. Various scenarios for frequency dependent scaling will be discussed.

Keywords : quantum criticality, frequency scaling, superconductors