

Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Detection of Fermi Pairing by Electromagnetically Induced Transparency¹ LEI JIANG, HAN PU, Rice University, WEIPING ZHANG, East China Normal University, HONG LING, Rowan University — Fermi pairing in the strongly interacting degenerate Fermi gas of two hyperfine spin states lies at the heart of many exotic phases that may shed light on long-standing problems in many branches of physics. The probe spectroscopy in an electromagnetically induced transparency, where one of the spin states is coupled to the ground state via an excited state by a pair of Raman laser fields, is proposed as quite a genetic tool in providing valuable insights into the nature of Fermi pairing. This technique has the capability of allowing the local spectroscopic response to be determined in a nondestructive manner. EIT spectra in the presence of both BCS and pseudo gaps are presented. A dressed state picture is constructed to facilitate a simple physical explanation, based on quantum interference, to the Fermi pairing signature in these EIT spectra.

¹Acknowledge: The support from US NSF, US ARO, Robert A. Welch, W. M. Keck, and Chinese NSF is acknowledged.

Lei Jiang
Rice University

Date submitted: 23 Jan 2009

Electronic form version 1.4