

Abstract Submitted  
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**BCS Pairing Detection by Electromagnetically Induced Transparency**<sup>1</sup> LEI JIANG, HAN PU, Department of Physics and Astronomy, and Rice Quantum Institute, Rice University, Houston, TX 77251-1892, WEIPING ZHANG, State Key Laboratory of Precision Spectroscopy, Department of Physics, East China Normal University, Shanghai 200062, P. R. China, HONG LING, Department of Physics and Astronomy, Rowan University, Glassboro, New Jersey 08028-1700 — We seek a new application of electromagnetically induced transparency (EIT), a well-known phenomena in quantum optics; to detect the onset of the BCS transition to superfluidity in a degenerate atomic fermi gas involving a pump and a copropagating probe laser field. We show that when a BCS pairing emerges, the EIT spectrum makes a qualitative change, which can be traced to the two-photon resonance condition being momentum-independent for a normal gas but momentum-dependent for a BCS pairing phase. We will calculate and discuss the EIT spectrum under different situations including when the pseudo gap cannot be ignored.

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