

Abstract Submitted  
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**Matter wave probe for detecting Fermi superfluidity in trapped ultra-cold atom experiments**<sup>1</sup> SATYAN BHONGALE, HAN PU, Rice University  
— We propose a robust matter wave probe for detecting Bardeen-Cooper-Schrieffer (BCS) superfluidity in a trapped two-component Fermi gas. In here the matter wave corresponds to a Bose condensed state (BEC) of some third species of atoms- ‘probe-atoms’. This detection scheme is based on the extreme control of atom-atom interactions that is made available by techniques based on scattering resonances such as a magnetic/optical Feshbach. We show that when the experimental parameters are fine tuned within a certain region of parameter space, the density of the bosonic atoms give a direct measure of the BCS gap associated with the fermions.

<sup>1</sup>W. M. Keck Program in Quantum Materials, Rice University.

Satyan Bhongale  
Rice University

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