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Probing the homogeneous spectral function of a trapped atomic Fermi gas using momentum resolved rf spectroscopy[1] QIJIN CHEN, Zhejiang University — Radio refequency spectroscopy is arguably the most direct probe for measuring the excitation gap in atomic Fermi gases. Recently, the Jin group developed momentum resolved rf spectroscopy, which has been demonstrated to be able to probe the averaged spectral function in a Fermi gas. However, the usefulness of this technique was limited by the inhomogeneity over the entire trap. On the other hand, the tomography technique developed by the Kettele group provides spatial resolution but not spectral information. Here we propose that using highly population imbalances, one can essentially measure the spectral function of a homogeneous Fermi gas using momentum resolved rf spectroscopy. We will present theoretically calculated spectral functions and spectral intensity maps for various cases over the entire BCS-BEC crossover. References: Q.J. Chen and K. Levin, Phys. Rev. Lett. 102, 190402 (2009). Y. He, C.-C. Chien, Q.J. Chen, and K. Levin, Phys. Rev. A 77, 011602(R) (2008). Y. He, Q.J. Chen, and K. Levin, Phys. Rev. A 72, 011602(R) (2005).

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