

Abstract Submitted
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Two-dimensional harmonically trapped fermionic atomic gases¹

DANIEL E. SHEEHY, QIN-QIN LU, Louisiana State University — Recent experiments [1,2] have probed superfluidity of two-dimensional fermionic atomic gases confined to a harmonic trapping potential. While theoretical studies of such systems often incorporate the presence of the trap using the local density approximation, here we present a different approach based on a Bardeen-Cooper-Schrieffer-type variational wavefunction in which the single-particle states undergoing pairing are the exact eigenfunctions of the single-particle problem (i.e., harmonic oscillator wavefunctions). Our approach, following earlier work in the 1D case[3], allows the calculation of several experimentally-relevant observables, such as the local densities and noise correlations. [1] A.T. Sommer, L.W. Cheuk, M.J.H. Ku, W.S. Bakr, and M.W. Zwierlein, Phys. Rev. Lett. **108**, 045302 (2012). [2] Y. Zhang, W. Ong, I. Arakelyan, and J.E. Thomas, Phys. Rev. Lett. **108**, 235302 (2012). [3] S. Kudla, D.M. Gautreau, and D.E. Sheehy, <http://arxiv.org/abs/1404.4081>

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