

Abstract Submitted  
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**Correlations of the metastable branch of harmonically-trapped one-dimensional two-component Fermi gases**<sup>1</sup> SEYED EBRAHIM GHARASHI, Washington State University, D. BLUME, Washington State University and ITAMP — We present highly-accurate energy spectra and eigen functions of small harmonically-trapped one-dimensional two-component Fermi gases with interspecies  $\delta$ -function interactions, and analyze the correlations of the metastable crossover branch with effectively repulsive and attractive interactions. Structural expectation values are presented as a function of the interspecies coupling strength and related to cold atom tunneling experiments. Moreover, we show that the eigenstate  $\psi_{adia}$  of the infinitely strongly-interacting system with  $n_1 + n_2 > 2$  and  $|n_1 - n_2| < n$  ( $n_1$  and  $n_2$  denote the number of fermions of components 1 and 2, respectively, and  $n_1 + n_2 = n$ ), which is reached experimentally by adiabatically changing the system parameters, does not, as previously proposed, coincide with the wave function  $\psi_G$  obtained by applying a generalized Fermi-Fermi mapping function to the eigen function of the non-interacting single-component Fermi gas.

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