Mean Frequency Shift and Finite Width of RF Spectrum of Paired Fermions ZHENHUA YU, Department of Physics, University of Illinois, 1110 W. Green Street, Urbana, IL 61801 — Using sum rules we derived the mean frequency shift of the rf spectrum of paired fermions in terms of the derivative of free energy, and explained many features of experiments done at the unitarity point between the lowest hyperfine states of ^{6}Li.[1] The calculated mean shifts are however some three times larger than the peak shift observed at the center of the trapped atomic cloud, a discrepency due to the long tail of the spectrum. Generating the rf spectrum function self-consistently within BCS-Hartree-Fock, we have determined the characteristic frequency where the behavior of the spectrum transits from $\omega^{-3/2}$ to $\omega^{-5/2}$ at large frequency. We discuss how to subtract out the long tail from the spectrum and give an improved estimate for the peak frequency shift from the sum rules.

[1]G. Baym, C. J. Pethick, Z. Yu, and M. W. Zwierlein, Phys. Rev. Lett. 99, 190407 (2007).

Zhenhua Yu
Department of Physics, University of Illinois,
1110 W. Green Street, Urbana, IL 61801

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