BEYOND LINEAR RESPONSE SPECTROSCOPY OF ULTRACOLD FERMI GASES

J. Kinnunen and P. Törmä

NanoScience Center, P.O.Box 35, FIN-40014 University of Jyväskylä, Finland
e-mail: jjkinnun@phys.jyu.fi

We study RF-spectroscopy of ultracold Fermi gas by going beyond the linear response in
the field-matter interaction [1]. Higher order perturbation theory allows virtual processes
and energy conservation beyond the single particle level. We formulate an effective higher
order theory which agrees quantitatively with experiments on the pairing gap [2], and is
consistent with the absence of the mean-field shift in the spin-flip experiment [3].

In addition, we study polarized Fermi gases and discuss the possibility of detecting FFLO-
type (Fulde-Ferrel-Larkin-Ovchinnikov) states by using RF-spectroscopy [4].

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