

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Single-Particle Spectral Density of a Bose-Condensed Gas in the Two-Fluid Hydrodynamic Regime EMIKO ARAHATA, NIKUNI TETSURO, Tokyo University of Science, ALLAN GRIFFIN, University of Toronto — In Bose superfluids, the single-particle Green's function can be directly related to the superfluid velocity-velocity correlation function in the hydrodynamic regime. An explicit expression for the single-particle spectral density was originally written down by Hohenberg and Martin in 1965, starting from the two-fluid equations for a superfluid. We give a new simple derivation of their results. Using these results, we calculate the relative weights of first and second sound modes in the single-particle spectral density as a function of temperature in a uniform Bose gas. We show that the second sound mode makes a dominant contribution to the single-particle spectrum in relatively high temperature region. We also discuss the possibility of experimental observation of the second sound mode in a Bose gas by photoemission spectroscopy.

Emiko Arahata
Tokyo University of Science

Date submitted: 18 Nov 2010

Electronic form version 1.4