

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Contact and sum-rules in a homogeneous Fermi gas at unitarity
CHRISTOPHER VALE, CECILE CARCY, SASCHA HOINKA, MARCUS LINGHAM, PAUL DYKE, CARLOS KUHN, HUI HU, Swinburne Univ of Tech — We present an experimental study of the high-energy excitations in a near-homogenous unitary Fermi gas. Using focussed beam Bragg spectroscopy, we measure the dynamic structure factor in the centre of a harmonically trapped cloud, where the density varies by less than ten percent. By employing sum-rules, we map the evolution of Tan's universal contact parameter across the superfluid to normal fluid transition. For Bragg frequencies higher than approximately twice the atomic recoil frequency, the dynamic structure factor approaches the limiting behavior predicted by theory. We also use the kinetic (second-moment) sum-rule to determine the internal energy at unitarity which is very sensitive to the high frequency tail.

Christopher Vale
Swinburne Univ of Tech

Date submitted: 25 Jan 2018

Electronic form version 1.4