Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Measurement of bulk viscosity of ultracold Fermi gas in the unitary regime TAKAHIRO TSUMORI, MUNEKAZU HORIKOSHI, University of Tokyo, KEISUKE FUJII, YUSUKE NISHIDA, Tokyo Institute of Technology, JUNJI YUMOTO, MAKOTO KUWATA-GONOKAMI, University of Tokyo — To understand the transport properties of a strongly correlated Fermi gas, it is important to measure the transport coefficient of ultracold Fermi gas in the unitary regime. In this study, we measure the bulk viscosity of ultracold Fermi gas in a wide range of temperatures. We apply a new theory which pays attention to the effects of the spacetime-dependent scattering length by employing a hydrodynamic description, and show that the spacetime-dependence of the scattering length is reflected as a correction term in the divergence of the velocity. This suggests that the bulk viscosity coefficient can be measured by applying a time modulation to the scattering length. The entropy of the system increases from the bulk viscosity, and so, the bulk viscosity coefficient can be measured as an energy increase. Through experiment, we measure the bulk viscosity coefficient of ultracold Li^6, and compare results with that predicted in the literature.

Takahiro Tsumori
University of Tokyo

Date submitted: 06 Feb 2019 Electronic form version 1.4