第 70 回トポロジカル物質科学セミナー
Topological Materials Science Seminar (70)

Turbulence in a quantum gas

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Place: **Room 447, Faculty of Science Bldg. #1, Hongo Campus, Univ. of Tokyo (東大本郷キャンパス理学部 1 号館 447 号室)**
Date: **Aug 3 (Friday), 2018**
Time: **13:00-14:30**

Abstract:

Many turbulent flows form so-called cascades, where excitations injected at large length scales, are transported to gradually smaller scales until they reach a dissipation scale. We initiate a turbulent cascade in a dilute Bose fluid by pumping energy at the container scale of an optical box trap using an oscillating magnetic force [1,2]. In contrast to classical fluids where the dissipation scale is set by the viscosity of the fluid, the turbulent cascade of our quantum gas finishes when the particles kinetic energy exceeds the laser-trap depth. This mechanism allows us to effectively tune the dissipation scale where particles (and energy) are lost, and measure the particle flux in the cascade at the dissipation scale. Our measurements are in very good agreement with simulations of the Gross-Pitaevskii equation including dissipation.

[1] A.L. Gaunt, T.F. Schmidutz, I. Gotlibovych, R.P. Smith, Z. Hadzibabic, Phys. Rev. Lett. 110, 200406 (2013).
[2] N. Navon, A.L. Gaunt, R.P. Smith, Z. Hadzibabic, Nature 539, 72 (2016) .

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