Turbulence in a Quantum Gas

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The recent production of box-trapped Bose gases has offered new exciting possibilities to study turbulence in simple, uniform quantum fluids. We observe the emergence of a turbulent cascade in a homogeneous Bose fluid forced on a large scale using a spatially-uniform force. In contrast to classical fluids where the dissipation scale is set by the viscosity of the fluid, the turbulent cascade of our quantum gas stops 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 good agreement with simulations of the Gross-Pitaevskii equation that include dissipation.

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[1] N. Navon et. al. *Nature* **539**, 72 (2016)