

Quantum gas in a box

Z.Hadzibabic^{*1}

1. Cavendish Laboratory, University of Cambridge, JJ Thomson Avenue, Cambridge, CB3 0HE, United Kingdom

For the past two decades ultracold Bose and Fermi atomic gases have been used with great success to study fundamental many-body physics. While traditionally they were produced in harmonic electromagnetic traps, it recently also became possible to create them in the uniform potential of an optical box trap. This has opened even more possibilities for fundamental studies, allowing closer connections with other many-body systems and the theories that rely on the translational symmetry of the system. Research topics for which the homogeneous, box-trapped quantum gases offer distinct advantages include critical phenomena near phase transitions, quantum turbulence, and searches for exotic states of matter in strongly interacting (unitary) gases. I will give an overview of our recent progress in this growing field.

*Corresponding author: zh10001@cam.ac.uk