
Quantum gas in a box

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Abstract

For the past two decades harmonically trapped ultracold atomic gases have been used with great success to study fundamental many-body physics in a flexible experimental setting. In 2013 we created the first atomic Bose-Einstein condensate (BEC) in an essentially uniform potential of an optical box trap [1]. Compared to the traditional setting of a harmonic trap, this has opened new possibilities for closer connections with other many-body systems and the theories that rely on the translational symmetry of the system. I will give an overview of our recent experiments on this system, including studies of the (Kibble-Zurek) dynamics of spontaneous symmetry breaking [2] and the emergence of turbulence in a periodically driven gas [3].

A. L. Gaunt et al., PRL 110, 200406 (2013)

N. Navon et al., Science 347, 167 (2015)

N. Navon et al., Nature 539, 72 (2016)

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