

Abstract Submitted
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Thermodynamics and Dynamics of Bose condensation in a quasi-homogeneous gas NIR NAVON, TOBIAS SCHMIDUTZ, IGOR GOTLIBOVYCH, ALEXANDER GAUNT, MARTIN ROBERT-DE-SAINT-VINCENT, ROBERT SMITH, ZORAN HADZIBABIC, University of Cambridge — We present an experimental study of the thermodynamics and dynamics of Bose-Einstein condensation (BEC) in an optical-box trap. We first characterize the critical point for BEC, and observe saturation of the thermal component in a partially condensed cloud, in agreement with Einstein's textbook picture of a purely statistical phase transition. We also observed the quantum Joule-Thomson effect, namely isenthalpic cooling of a non-interacting gas [1]. We then investigate the dynamics of Bose condensation in the box potential following a rapid temperature quench through the phase transition, and focus on the time-evolution of the condensed fraction, the coherence length and the mean-field shift, that we probe via Bragg spectroscopy.

[1] T.F. Schmidutz, I. Gotlibovych, A.L. Gaunt, R.P. Smith, N. Navon, Z. Hadzibabic, Phys. Rev. Lett. 112, 040403 (2014)

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