

Abstract Submitted  
for the DAMOP13 Meeting of  
The American Physical Society

**Bose-Einstein condensation of atoms in a uniform potential** ROBERT SMITH, ALEXANDER GAUNT, TOBIAS SCHMIDUTZ, IGOR GOTLIBOVYCH, ZORAN HADZIBABIC, University of Cambridge — We have observed Bose-Einstein condensation of an atomic gas in the (quasi-)uniform three-dimensional potential of an optical box trap. Condensation is seen in the bimodal momentum distribution and the anisotropic time-of-flight expansion of the condensate. The critical temperature agrees with the theoretical prediction for a uniform Bose gas. The momentum distribution of our non-condensed quantum-degenerate gas is also clearly distinct from the conventional case of a harmonically trapped sample and close to the expected distribution in a uniform system. We confirm the coherence of our condensate in a matter-wave interference experiment. Our experiments open many new possibilities for fundamental studies of many-body physics.

Robert Smith  
University of Cambridge

Date submitted: 25 Jan 2013

Electronic form version 1.4