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A compact single-chamber apparatus for Bose-Einstein condensation of ^{87}Rb TOBIAS SCHMIDUTZ, IGOR GOTLIBOVYCH, STUART MOULDER, ROBERT CAMPBELL, NAAMAN TAMMUZ, RICHARD FLETCHER, ALEXANDER GAUNT, SCOTT BEATTIE, ROBERT SMITH, ZORAN HADZIBABIC, University of Cambridge,UK — We describe a simple and compact single-chamber apparatus for robust production of ^{87}Rb Bose-Einstein condensates. The apparatus is built from off-the-shelf components and allows production of quasi-pure condensates of $> 3 \times 10^5$ atoms in < 30 s. This is achieved using a hybrid trap created by a quadrupole magnetic field and a single red-detuned laser beam [Y.-J. Lin et al., Phys. Rev. A 79, 063631 (2009)]. In the same apparatus we also achieve condensation in an optically plugged quadrupole trap [K. B. Davis et al., Phys. Rev. Lett. 75, 3969 (1995)] and show that as little as 70 mW of plug-laser power is sufficient for condensation, making it viable to pursue this approach using inexpensive diode lasers. While very compact, our apparatus features sufficient optical access for complex experiments.

Tob Schmidutz
University of Cambridge,UK

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