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A miniaturized, high flux BEC source for precision atom interferometry WALDEMAR HERR, JAN RUDOLPH, MANUEL POPP, ERNST M. RASEL, Institute of Quantum Optics, Leibniz University of Hanover, QUANTUS COLLABORATION[1] — Atom chips have proven to be excellent sources for the fast production of ultra-cold gases due to their outstanding performance in evaporative cooling. However, the total number of atoms has previously been limited by the small volume of their magnetic traps. To overcome this restriction, we have developed a novel loading scheme that allows us to produce Bose-Einstein condensates of a few 10^5 ^{87}Rb atoms every two seconds. The apparatus is designed to be operated in microgravity at the drop tower in Bremen, where even higher numbers of atoms can be achieved in the absence of any gravitational sag. Using the drop tower's catapult mode, our setup will perform atom interferometry during nine seconds in free fall. Thus, the fast loading scheme allows for interferometer sequences of up to seven seconds – interrogation times which are inaccessible for ground based devices. The QUANTUS project is supported by the German Space Agency DLR with funds provided by the Federal Ministry of Economics and Technology (BMWi) under grant number DLR 50WM1131.

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