Abstract Submitted
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A Compact, Transportable, Microchip-Based System for High Repetition Rate Production of Bose-Einstein Condensates[1] DANIEL FARKAS, KAI HUDEK, EVAN SALIM, STEPHEN SEGAL, DANA ANDERSON, JILA/University of Colorado — We present a compact, transportable system that produces Bose-Einstein condensates (BECs) near the surface of an integrated atom microchip. Occupying a volume of 0.4 m^3 and consuming an average power of 525 W, the system contains all of the components needed to produce and image BECs, including an ultra-high vacuum system, lasers, data acquisition hardware, electronics, and imaging equipment. RF evaporative cooling forms nearly-pure condensates containing 1.9×10^4 ^{87}Rb atoms in the $|F=2,m_F=+2\rangle$ ground hyperfine state. With trap frequencies of several kHz, evaporative cooling times as short as 1.5 s have been used to create BECs, resulting in production repetition rates as high as 0.3 Hz. The system can be easily reconfigured for use with atom chips having wire patterns designed for different applications. As such, it can serve as a standardized platform for a variety of portable experiments that utilize ultracold matter.

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