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Generation of large clouds of ultracold metastable helium S. CHARLES DORET, Dept. of Physics, Harvard University, SCOTT V. NGUYEN, COLIN B. CONNOLLY, ROBERT A. MICHNIAK, Dept. of Physics, Harvard University, WOLFGANG KETTERLE, Dept. of Physics, MIT, JOHN M. DOYLE, Dept. of Physics, Harvard University — Metastable helium is buffer-gas cooled, magnetically trapped and evaporatively cooled in large numbers. 10^{11} $^4He^*$ atoms are trapped at an initial temperature of 400 mK and evaporatively cooled into the ultracold regime, resulting in a cloud of $2x10^9$ atoms at 1.4 mK. Efficient evaporation indicates low collisional loss for $^4He^*$ in both the ultracold and multi-partial-wave regime, in agreement with theory. Further evaporative cooling to quantum degeneracy should be attainable after transfering the cloud to an Ioffe-Pritchard trap and implementing RF evaporation.

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