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Laser Cooling of Buffer Gas Beams JULIA RASMUSSEN, HSIN-I LU, DAVE PATTERSON, JOHN DOYLE, Harvard University — We realize a continuous, collimated and cold atomic beam with buffer gas and laser cooling. Atoms from an oven (450K) are mixed with cold neon buffer gas (15K) and emitted in a cold, high flux beam. Further collimation produces a cold rubidium beam with a flux of 3×10^{10} atoms per second and a longitudinal temperature of 1.5 K. We demonstrate transverse laser cooling and spatial separation of rubidium from buffer gas by laser deflection. An intrinsically low longitudinal temperature makes such a continuous beam source ideal for cold collision studies. An atomic beam with low background buffer gas is also suitable for trap loading. We believe this source may be generalized to other atoms and molecules with a significant vapor pressure below 1000 K.

Hsin-I Lu
Membership Pending

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