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Buffer-gas loaded MOTs for Ho, Yb, Tm, and Er EUNMI CHAE, GARRETT DRAYNA, BOERGE HEMMERLING, NICK HUTZLER, AAKASH RAVI, Harvard-MIT Center for Ultracold Atoms, Cambridge, MA 02138, ALEJANDRA COLLOPY, MATTHEW HUMMON, BENJAMIN STUHL, MARK YEO, JUN YE, JILA, National Institute of Standards and Technology and the University of Colorado, Boulder, CO 80309, JOHN DOYLE, Harvard-MIT Center for Ultracold Atoms, Cambridge, MA 02138 — We report on direct loading of lanthanide atoms into MOTs from a two-stage slow buffer-gas beam source, which has a peak forward velocity of $\sim 30 - 60$ m/s [1], considerably lower than other beam implementations. The low velocity combined with species generality makes this source useful for loading magneto-optical traps (MOTs), especially for species that are not well suited to the traditional approach of oven plus Zeeman slower. We report loading MOTs with Yb, Tm, Er, and Ho, without any additional slowing stages. Application of a single frequency slowing laser to the buffer-gas beam of Yb results in an unprecedentedly high loading rate of $2.0(1.0) \times 10^{10}$ Yb atoms/s and $1.3(0.7) \times 10^8$ Yb atoms in the MOT [2]. We plan to use this versatile source to load a MOT with CaF, following the same general approach to that used with YO and SrF [3, 4].

[1] N. R. Hutzler, et al., Chem. Rev. 112, 4803 (2012).

[2] B. Hemmerling, et al., arXiv:1310.3239.

[3] M. T. Hummon, et al., Phys. Rev. Lett. 110, 143001 (2013).

[4] E. F. Shuman, et al., Nature 467, 820 (2010).

Eunmi Chae
Harvard-MIT Center for Ultracold Atoms, Cambridge, MA 02138

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