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Laser cooled and trapped Dy: MOT dynamics, collisions, and progress toward narrow-line cooling SEO HO YOUN, MINGWU LU, BENJAMIN LEV, University of Illinois at Urbana-Champaign — We present details of the Dy laser cooling and trapping apparatus that has recently produced a magneto-optically (MOT) and magnetostatically (MT) trapped gas of dysprosium, a lanthanide (rare-earth) atom with an unsurpassed magnetic moment of 10 Bohr magnetons, in the 10–100 μK regime. We present details of the Dy MOT dynamics, MT inelastic collisional studies, and progress toward narrow-line cooling to the 1 μK regime. The laser cooling and trapping of highly magnetic atoms with complex level structure opens a new frontier for ultracold dipolar physics, atom chip microscopy, and quantum information processing.

Benjamin Lev
University of Illinois at Urbana-Champaign

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