

Abstract Submitted
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Robust gray molasses cooling of YO to 4 μ K for optical dipole trap¹ YEWEI WU, University of Colorado, Boulder, SHIQIAN DING, IAN A. FINNERAN, JUSTIN J. BURAU, University of Colorado Boulder, JUN YE, University of Colorado Boulder, JILA — We report robust sub-Doppler cooling of YO and progress towards loading into an optical dipole trap. YO molecules are first trapped in a DC magneto-optical trap (MOT), followed with cooling in gray molasses (GM). One of the hyperfine ground states has a vanishing Landé g-factor, which makes cooling of YO at 4 μ K robust over a wide range of magnetic field, laser intensity, and detunings (one and two-photon). The magnetic insensitivity enables further spatial compression of the molecular cloud by alternating GM and MOT under continuous operation of the quadrupole magnetic field. This scheme creates the highest phase space density of 3.3×10^{-8} for laser cooled molecules in free space.

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