Abstract Submitted
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Enhanced optical cycling and slowing of YO through rotational state microwave mixing[1] BO YAN, MATTHEW HUMMON, MARK YEO, ALEJANDRA COLLOPY, JILA/University of Colorado, BOERGE HEMMERLING, EUNMI CHAE, LOIC ANDEREGG, AAKASH RAVI, JOHN DOYLE, Harvard University and Harvard-MIT Center for Ultracold Atoms, JUN YE, JILA/University of Colorado — In order to address rotational dark states in the molecule yttrium (II) monoxide (YO) and to enhance optical cycling, we demonstrate the remixing of ground electronic state rotational levels using microwave radiation. This mixing technique, in conjunction with a broadband modulated and frequency chirped laser, is used to decelerate a beam of YO from a cryogenic buffer gas cell. The result is a population of molecules with velocities less than 10 m/s, which are sufficiently slow to be loaded into a magneto-optical trap. With two vibrational repump lasers, the cycling transition is closed to the 10^{-6} level. Additionally, we present progress towards a three dimensional implementation of a magneto-optical trap for YO.

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