

Abstract Submitted
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A buffer gas cooled beam of barium monohydride GEOFFREY IWATA, MARCO TARALLO, TANYA ZELEVINSKY, Columbia University — Significant advances in direct laser cooling of diatomic molecules have opened up a wide array of molecular species to precision studies spanning many-body physics, quantum collisions and ultracold dissociation. We present a cryogenic beam source of barium monohydride (BaH), and study laser ablation of solid precursor targets as well as helium buffer gas cooling dynamics. Additionally, we cover progress towards a molecular magneto-optical trap, with spectroscopic studies of relevant cooling transitions in the $B^2\Sigma \leftarrow X^2\Sigma$ manifold in laser ablated molecules, including resolution of hyperfine structure and precision measurements of the vibrational Frank-Condon factors. Finally, we examine the feasibility of photo dissociation of trapped BaH molecules to yield optically accessible samples of ultracold hydrogen.

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