Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

A cryogenic beam apparatus for laser cooling and ultracold fragmentation of BaH molecules GEOFFREY IWATA, MARCO G. TARALLO, Columbia University, FABIAN SOERENSEN, Darmstadt Technical University, TANYA ZELEVINSKY, Columbia University — Cold and ultracold molecules offer a wide array of possibilities for precision measurement, molecular quantum chemistry, and studies many-body physics. Recently, cold beams of many molecular species have been created via cryogenic buffer gas cooling. Paired with laser cooling, this method can yield a molecular magneto-optical trap (MOT). We report progress toward a barium monohydride (BaH) cold molecular beam and MOT, including identification of cooling transitions in the $B^2\Sigma \leftarrow X^2\Sigma$ manifold in laser ablated molecules and construction of the cryogenic beam apparatus. The large mass ratio of the constituent atoms makes this system attractive for studies of ultracold fragmentation via coherent transfer to weakly bound states and subsequent photo- or magneto-dissociation, resulting in ultracold hydrogen.

Geoffrey Iwata
Columbia University

Date submitted: 29 Jan 2015 Electronic form version 1.4