Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Towards Direct Laser Cooling of Barium Monofluoride RALF ALBRECHT, MARIAN ROCKENHAEUSER, TIM LANGEN, 5. Physikalisches Institut and Center for Integrated Science and Technology IQST, University of Stuttgart — We report on the progress of our experiment for the direct laser cooling and trapping of barium monofluoride molecules. Laser cooling of molecules had long been considered impossible due to their complex vibrational and rotational level structure. However, beneficial Franck-Condon factors and selection rules allow for optical cycling in many molecular species, including barium monofluoride. Hot molecules are generated through laser ablation of a pressed pellet inside a cold cell and precooled by collisions with a cold buffer gas of helium atoms. The thermalized gas mixture exits the cell through a few-millimeter-sized aperture and enters a high vacuum region as a cold and intense beam. A careful characterization of this beam and demonstration of optical cycling is presented in [1], which paves the way for the implementation of transversal laser cooling of the beam. The current status of this effort will be presented.
[1] R. Albrecht et. al., Phys. Rev. A 101, 013413 (2020)

Ralf Albrecht
University of Stuttgart

Date submitted: 15 Jan 2020 Electronic form version 1.4