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Cold collisions between NH molecules and Rubidium atoms L. PAUL PARAZZOLI, JOHN OBRECHT, NOAH FITCH, DANIEL LOBSER, CARRIE WEIDNER, HEATHER LEWANDOWSKI, University of Colorado — In the past decade, cooling and trapping of atoms has allowed physicists to probe the nature of quantum mechanics on a macroscopic scale. Recently, ground state molecules have been cooled into the milli-Kelvin regime using a variety of techniques. However, these methods do not produce molecular samples with the required densities and temperatures to see quantum statistical effects. One method that may make this possible is sympathetically cooling the molecules through collisions with laser-cooled atoms. To this end, we are investigating the interactions of cold NH ($^1\Delta$) radicals with laser-cooled rubidium. A beam of cold NH radicals is created by supersonic expansion and decelerated using time varying inhomogeneous electric fields. The cold NH is then loaded into an electrostatic trap, which is overlaid spatially with a magnetic trap containing cold rubidium atoms for subsequent collision studies.

Lambert Parazzoli
University of Colorado

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