

Abstract Submitted
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Towards cold collisions between dipolar OH and ND₃ molecules within a permanent magnetic trap¹ BRIAN SAWYER, BENJAMIN STUHL, MARK YEO, DAJUN WANG, JUN YE, JILA/University of Colorado — Progress in the field of cold molecules promises many new and exciting applications. The long range dipole-dipole interactions between cold polar molecules may be exploited to control intermolecular elastic/inelastic scattering processes with external electric fields. This same interaction could also be used to study long-range dynamics in condensed matter physics. Our group has successfully trapped Stark-decelerated OH molecules within a permanent magnetic trap at a temperature of 70 mK and density of 10^6 cm^{-3} . The trapped molecules were used in collision studies with external He and D₂ supersonic beams at temperatures of $\sim 80 \text{ K}$, yielding evidence of quantum threshold scattering and resonant energy transfer between colliding particles. We will report progress towards observation of cold collisions ($\sim 1 \text{ K}$) between magnetically trapped OH and buffer-gas cooled, electrostatically-guided ND₃ molecules. Collision cross sections between OH and ND₃ will be investigated within a variable external electric field superimposed on the OH magnetic trap.

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