Abstract Submitted
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Cold dipolar collisions between buffer gas cooled ND_3 and Stark decelerated OH molecules[1] BRIAN SAWYER, BENJAMIN STUHL, MARK YEO, JILA/University of Colorado, DAVID PATTERSON, JOHN DOYLE, Harvard University, JUN YE, NIST/JILA/University of Colorado — There is currently much theoretical and experimental interest in the collisions of neutral polar molecules at cold and ultracold temperatures. The long-range, anisotropic dipole-dipole interaction between such molecules may be exploited to control elastic, inelastic, or even reactive rates in a variable electric field. We employ two direct molecular cooling methods - Stark deceleration and buffer gas cooling - to collide a slow ($\sim$100 m/s) continuous beam of state-selected ND_3 molecules with a magnetically trapped sample of state-selected OH. The collisions between the two species occur within a permanent magnetic trap at the terminus of a Stark decelerator. The magnetic trap design allows for application of a variable electric field ($<$100 kV/cm) to the collision region to fully polarize both species. We report progress toward observation of electric field dependent elastic and inelastic collision rates at $\sim$1 K.

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