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Cold dipolar heteromolecular collisions MARK YEO, BRIAN SAWYER, BENJAMIN STUHL, JILA / University of Colorado, TIMUR TSCHERBUL, Harvard University, MATTHEW HUMMON, XIA YONG, JILA / University of Colorado, JACEK KLOS, University of Maryland, DAVID PATTERSON, JOHN DOYLE, Harvard University, JUN YE, JILA / University of Colorado — Research into cold molecules has been progressing at a rapid pace with many exciting topics and techniques being developed. The long range dipole-dipole interaction between cold polar molecules allows us to exquisitely control their collisional dynamics using an external electric field. We combine Stark deceleration, magnetic trapping and buffer gas cooling to make the first experimental observation of cold collisions between two different neutral cold molecule species. The trapping of the collision target, OH, increases the interaction time by a factor of 10^5, enabling us to make an absolute measurement of the total trap loss cross section between OH and ND_3 at mean collision energy 3.6 cm^{-1} (5 K) . Due to the dipole-dipole interaction between the two species, the application of an external polarizing electric field increases the measured total trap loss cross section.

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