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Collision experiments utilizing trapped neutral OH molecules[1]
BRIAN SAWYER, JILA / University of Colorado, BENJAMIN STUHL, MARK YEO, DAJUN WANG, BENJAMIN LEV, JUN YE — Advances in cold molecule production promise to profoundly impact research on precision measurement, quantum information, and controlled chemistry. To this end, we employ a Stark decelerator to remove 99.5% of the center-of-mass kinetic energy of a supersonic beam of ground-state OH molecules. We subsequently trap a 70 mK sample of the decelerated molecules at a density of 10^6 cm^{-3} within a magnetic quadrupole whose center lies 1cm from the decelerator exit. Our magnetoelectrostatic trap (MET) design allows for the addition of an electric field of variable magnitude to the trapped sample to facilitate polar-molecule collision studies. We report progress toward observation of collisions between trapped OH and different atomic and molecular beams.

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