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Magnetoelectrostatic trapping of neutral OH molecules[1] BRIAN SAWYER, BENJAMIN STUHL, JILA/University of Colorado, BENJAMIN LEV, University of Illinois, Urbana-Champaign, MARK YEO, JILA/University of Colorado, DAJUN WANG, JUN YE, JILA/NIST/University of Colorado — 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 $>10^5$ cm^{-3} within a magnetic quadrupole whose center lies $\sim$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 cold collisions between samples of polar molecules.

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