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Pulsed Ring Stark Deceleration and OH Molecules in External Fields for Co-Trapping Experiments[1] JASON BOSSERT, YOMAY SHYUR, JOHN GRAY, HEATHER LEWANDOWSKI, JILA, Univ of Colorado - Boulder — Co-trapped collision experiments offer one of the best windows into how atoms and molecules interact at cold temperatures. However, one limitation of co-trapped collision experiments is the molecular density within the trap. First, we present an experimental realization of a ring-geometry Stark decelerator using both continuous and discrete electric fields. New ring-geometry Stark decelerators with continuously varying electric fields produce a more intense molecular source than conventional crossed-pin geometry decelerators. However, the electronic requirements to produce a continuously varying electric field are substantial. We show that operating a ring-geometry Stark decelerator with discretely varying electric fields not only eliminates the need for complicated analog electronics, but also opens a new, low velocity, higher-density regime for moderate peak electric fields. Second, we present a study on the effects of external electric and magnetic fields on Stark decelerated cold OH molecules. Our study of OH in external fields lays the foundation for future co-trapped collision studies.

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