

COLD Cs RYDBERG GAS COLLISIONS STUDIED USING PHOTOFRAGMENT
KINETIC ENERGY DISTRIBUTIONS

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Studies of inelastic cold Cs Rydberg atom collisions using photo-fragment kinetic energy distributions will be presented. Our work focuses on resonances associated with the Cs $89D+89D \rightarrow 89D+90P$ collision channel. The mechanism for the inelastic collision is shown to be dipole-dipole interactions. Long-range potential energy calculations have been performed to support the conclusion. Experiments will also be presented on elastic collisions that show many body effects due to dipole-dipole interactions. The many body interactions are investigated by observing spectral line broadening and shifts. Progress on using three-dimensional imaging of collision products to further discriminate inelastic collision dynamics and future directions will be discussed.