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Self-Imaging of aligned molecules from the diffraction spectra by laser-induced rescattering electrons[1] JUNLIANG XU, ZHANGJIN CHEN, ANH-THU LE, CHII-DONG LIN, Kansas State University — According to the quantitative rescattering (QRS) theory, the high-energy Above-threshold-ionization (HATI) electron spectra from a molecule M can be used to extract the differential cross section (DCS) at large scattering angles for e- + M+ collisions. Using mid-infrared (MIR) lasers the rescattering electrons can reach energies from 50 eV to a few hundred eV's where the independent atom model (IAM) is accurate enough to describe the DCS for large scattering angles. Within this model, we show that the interatomic separations can be accurately retrieved from the DCS, thus paving the way for using HATI spectra for time-dependent gaseous electron diffraction (TDGED) of transient molecules.

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