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Intense-Field Photoionization of Molecules using Ultrashort Radiation Pulses: Carbon Disulfide and Carbon Dioxide[1] JOSHUA BECK, CORNELIS UITERWAAL, Univ of Nebraska - Lincoln — We experimentally investigate the photoionization and photofragmentation of molecules using intense fields from an 800 nm, femtosecond laser source and an experimental method that eliminates the focal volume effect without the need for data deconvolution [*Phys. Rev. Lett.* **100,** 023002 (2008)]. Targets include carbon disulfide and carbon dioxide. We show that ionization is insignificant for intensities that maximize alignment of carbon disulfide, which validates ultrafast electron diffraction experiments from aligned carbon disulfide [*Nature Comm.* **6,** 8172 (2015)]. For comparison, we also investigate the analogous molecule carbon dioxide. In this molecule the molecular bonding orbitals include the $n = 2$ atomic orbitals of the oxygen atom, while in carbon disulfide the $n = 3$ orbitals of the sulfur atom contribute to the bonding. Recent work will be presented.

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Joshua Beck
Univ of Nebraska - Lincoln

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