Studying Structure and Dynamics of Polyatomic Molecules by Coulomb Explosion Imaging

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Coulomb Explosion Imaging induced by either XUV pulses or strong laser fields is a powerful tool to image the structure of gas-phase molecules and to investigate photo-induced reaction dynamics. Here we show that this method can be used to distinguish molecular isomers such as cis/trans dibromoethene [1] as well as different structural isomers of difluoroiodobenzene [2]. This paves the way for time-resolved studies of isomerization and dissociation reactions on various halogenated hydrocarbon molecules that we have performed with free-electron lasers [3] and ultrafast optical lasers. In particular, I will focus on recent results on the UV-induced dissociation of halomethanes and of isomerization reactions in halogenated aromatic molecules.

References

