Attosecond Time-resolved Electron Dynamics in Molecules

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In the last few years, first experiments have been performed where attosecond laser pulses have been used to study time-resolved electron dynamics. So far, these experiments have been two-color XUV+IR experiments, where attosecond time-resolution was achieved by attosecond IR streaking (appropriate for continuum electron dynamics) and by use of the sub-cycle time-dependence of IR (multi-photon) ionization. We have recently introduced a new method that is particularly suitable for studies of attosecond dynamics in molecules, namely a measurement of an asymmetry in the ejection of charged fragments that is indicative of the localization of electrons in the molecule at the time of dissociation. The method was demonstrated in a pump-probe experiment on the H_2 molecule.