Strong-Laser-Field Control of Ultrafast Photochemistry

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Strong-laser-field control scenarios of ultrafast molecular photodissociation dynamics are presented. The control is exerted on different observables of the photochemical reaction, such as quantum yields and lifetimes or even on fragment kinetic energies. The control is achieved by opening new strong-field-induced reaction channels [1] or by creating light-induced-conical-intersections and modulating the potentials around them by light-induced potentials [2]. The case study involves photodissociation of the polyatomic molecule methyl iodide (CH_3I), whose ultrafast photodissociation dynamics has been studied in our laboratory for some years both in the first absorption *A*-band [3,4] and second *B*-band [5,6].

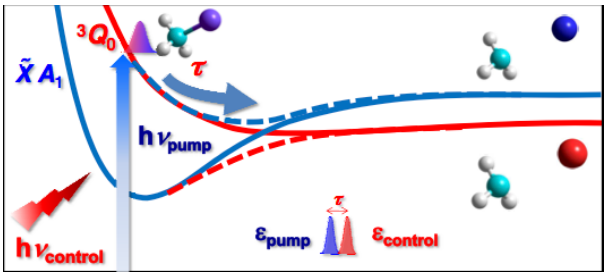

Figure 1. Shaping potential energy surfaces by tailored strong laser pulses is a powerful means for controlling product yields. Control over the velocity of the product fragments is achieved through the generation of light-induced conical intersections and modulating the potentials around them by creating light-induced potentials.

References

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