PHOTOELECTRON IMAGING FROM NANOSECONDS TO FEMTOSECONDS

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Photoelectron imaging can reveal a wealth of information on the structural and dynamical properties of small molecules and their ions[a]. Using nanosecond lasers we distinguish direct and autoionization pathways in transient and reactive atoms and molecular radicals such as Fe from a discharge source or S atoms from OCS photodissociation. With picosecond lasers the rapid change in molecular geometry as methyl iodide dissociates is revealed in the photoelectron image as rich vibrational structure of excited CH_3I+. Trends from these simple systems are used to help interpret the complex time-dependent photoelectron images measured in femtosecond pump-probe studies of the molecule tetrakis, an amino-substituted ethylene. This overview describes work done in Nijmegen, at the FORTH facility in Crete with T. Kitsopoulos, and at the SLIC facility in Saclay with B. Soep and coworkers.

[a]D. H. Parker in "Photoionization and Photodetachment" C.Y. Ng, editor, Advanced Series in Physical Chemistry vol 10A, World Scientific (Singapore) 1999.