Attosecond Molecular Physics

The Next Frontier

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The recent announcement of the generation of an isolated single attosecond cycle pulse, a "spin-off" of strong-field physics, (1), opens the way to a new regime in ultrafast physics. We will illustrate from numerical solutions of the TDSE (Time Dependent Schroedinger Equation) attosecond electron response in Enhanced Ionization, EI, of H2+ thus elucidating a recent experimental mystery in the Coulomb Explosion of this system (2), Carrier Envelope Phase, CEP, control of electron transfer in H3++, (3), where electron trajectories separated by a few hundreds of attoseconds interfere. Finally, we will discuss the usefulness of photoelectron interferometry with broadbands inherent with attosecond pulses (4).

(1) G Sansone et al, Science, 314,443(2006)

(2) A Staudte et al, Phys Rev Lett 98,073003(2007)

(3) A D Bandrauk et al, Phys Rev Lett 98,013001(2007)

(4) G L Yudin et al, Phys Rev Lett 96,063002(2006)