Plenary Talk PV VII Wed 9:15 Audimax

Resolving and manipulating attosecond processes via strong-field light-matter interactions — •Nirit Dudovich — Weizmann Institute of Science, Departement of Physics of Complex Systems, Rehovot, 76100, Israel

The interaction of intense light with atoms or molecules can lead to the generation of extreme ultraviolet (XUV) pulses and energetic electron pulses of attosecond (10-18) duration. The advent of attosecond technology opens up new fields of time-resolved studies in which transient electronic dynamics can be studied with a temporal resolution that was previously unattainable. I will review the main challenges and goals in the field of attosecond science. As an example, I will focus on recent experiments where the dynamics of tunnel ionization, one of the most fundamental strong-field phenomena, were studied. Specifically, we were able to measure the times when different electron trajectories exit from under the tunneling barrier created by a laser field and the atomic binding potential. In the following stage, subtle delays in ionization times from two orbitals in a molecular system were resolved. These experiments provide an additional, important step towards achieving the ability to resolve multielectron phenomena – a long-term goal of attosecond studies.