CFEL SCIENCE

SEMINAR

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Building 99, room IV – O1.111

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Probing and controlling electron dynamics of atoms and molecules with subcycle shaped laser fields

Electron dynamics is quite essential and very important to understand ultrafast phenomena of atoms and molecules. In the talk, recent work on probing and controlling electron dynamics of atoms and molecules with few cycle laser fields will be presented. First, the reconstruction of a valence electron wave packet with subcycle electron wave packet interferometry will be demonstrated. It was found that subcycle electron wave packet interferometry can serve as a tool to retrieve the structure and dynamics of the valence-electron cloud in atoms on a sub-10-as time scale. Secondly, double ionization dynamics of hydrocarbons in few-cycle laser fields will be discussed. We found that the molecular fragmentation and isomerization can be controlled by the carrier-envelope phase of few cycle laser pulses, and inner-valence orbital electrons play crucial role in the recollision-induced ionization process of hydrocarbons.

Host: Franz X. Kärtner, CFEL UX Seminar