Extreme Photonics Seminar

No. 3

Language: English

Date : Oct.3rd(Fri), 2014, 11:15–12:00

Location : Cooperation Center, 5F Meeting Room, W524
(研究交流棟5階会議室W524)

Title : Probing Atomic Structure through Electron Rescattering in Optical Few-Cycle Pulses with Control over the Carrier-Envelope Phase

Speaker : **Dr. Henning Geiseler**

(The Institute for Solid State Physics, The University of Tokyo)

The rescattering of electrons during photoionization of atoms and molecules in the strong-field regime facilitates the efficient use of these electrons as probe, in order to study properties of their parent ions. We employ optical few-cycle pulses to drive rescattering, and focus specifically on the role of the carrier-envelope phase (CEP). Our infrared few-cycle pulse source uses a passive stabilization scheme for the CEP, and it is demonstrated that this concept provides full control over the CEP for extended periods of time, allowing to conduct sensitive experiments. From obtained photoelectron spectra using the CEP-stabilized pulses, the elastic scattering cross section involved in the rescattering event is extracted. By controlling the CEP, the spectral composition of the rescattering electron wave packet can be tuned, which allows to analyze the rescattering in broad energy ranges. By extension, this method may also allow sub-cycle temporal resolution of ultrafast elect ronic dynamics occurring on the attosecond time scale.

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