CFEL SCIENCE

# SEMINAR

***05th February 2020 - 2:00 p.m.***

CFEL-bldg. 99, seminar room IV

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## Theoretical study of attosecond transient absorption spectrum of perturbatively dressed Xe atom


We present a theoretical description of attosecond transient absorption spectroscopy for temporally and spatially overlapping XUV and optical pulses, developed to explain the signals one can obtain in such an experiment. To this end, we employ a two-stage approach based on perturbation theory, which allows us to give an analytical expression for the transient absorption signal. We focus on the situation in which the attosecond XUV pulse is used to create a coherent superposition of electronic states. As we explain, the resulting dynamics can be detected in the spectrum of the transmitted XUV pulse by manipulating the electronic wave packet using a carrier-envelope-phase-stabilized optical dressing pulse. In addition to coherent electron dynamics triggered by the attosecond pulse, the transmitted XUV spectrum encodes information on electronic states made accessible by the optical dressing pulse. We illustrate these concepts through calculations performed for a Xe atom.


Host: Robin Santra – CFEL-DESY Theory Division