LABORATOIRE INTERACTIONS, DYNAMIQUES et LASERS
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SEMINAIRE LIDYL

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Orme des Merisiers, Bât.701, Pièce 17 (salle de séminaires)

Participer à la réunion Zoom
https://cnrs.zoom.us/j/93363122223?pwd=VTZIS1RIYk9pdUFkUkxadldKNHhhdz09

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Development of an ultrafast XUV spectroscopy beamline for the investigation of electron dynamics in semiconductors

High Harmonic Generation (HHG) arising from the interaction of intense laser pulses with noble gases led to the realization of table-top sources of coherent XUV and soft-X radiation. Consequently, ultrafast spectroscopy experiments in this spectral range can nowadays be performed with extreme temporal resolution, down to the attosecond regime, and chemical specificity. Flexible and user-friendly solutions for the generation and handling of the XUV radiation are key for the implementation of new ultrafast spectroscopy schemes. Moreover, the optimization of the source photon flux is extremely important, since HHG sources suffer from a low generation efficiency, especially when moving towards higher photon energies. In this talk I will present the development of a flexible XUV beamline for transient absorption spectroscopy in semiconductors aiming at achieving these goals.

HHG is performed inside a microfluidic device, granting high generation efficiency and fine control on the gas density in the interaction volume. This technology platform grants the possibility to engineer the generation process and to implement different functionalities on the same device (e.g. filtering of the co-propagating IR field). After interaction with the sample, the radiation is analysed by a flexible XUV spectrometer. This can be remotely controlled for operation in the 1-120 nm range, either in stigmatic or astigmatic configuration. Moreover, an XUV polarimeter can be inserted in the optical path for the full characterization of the Stokes parameters down to 12 nm. The spectrometer is designed to switch between various configurations without any need to realign optical elements or to break the vacuum, adapting to different experimental needs.