CFEL SCIENCE

SEMINAR

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Building 49 - Seminar Room 108

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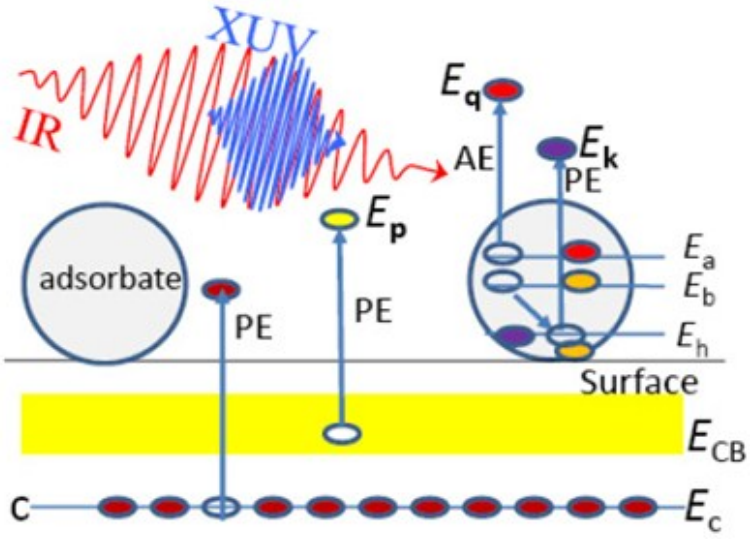
Time-resolved photoelectron emission from atoms and surfaces: the photoeffect revisited

State-of-the-art streaking spectroscopy experiments enable the resolution in time of photo-ionization processes at the natural time scale (tens of attoseconds, 1 as = 10^-18 seconds) of the motion of valence electrons in atoms and solids. The ultrahigh time resolution allows the unprecedented observation of a “delay time” between the primary absorption of extended ultra violet (XUV) photons and subsequent electron emission in atoms and solids. I will discuss different, currently debated, interpretations of photo-emission delay times based on the comparison of calculated time-resolved photo-electron spectra with recent experiments. For time-resolved photo-emission from metal surfaces, we find our calculated electron spectra to be very sensitive to details in the modeling of dielectric-response and electron-propagation effects during the laser-assisted XUV excitation and emission process, possibly offering a new way for time-resolved observation of collective (plasmon) excitations in large atoms, nano-particles, and solids.



Host: Robin Santra, CFEL Theory Group