CFEL SCIENCE

SEMINAR

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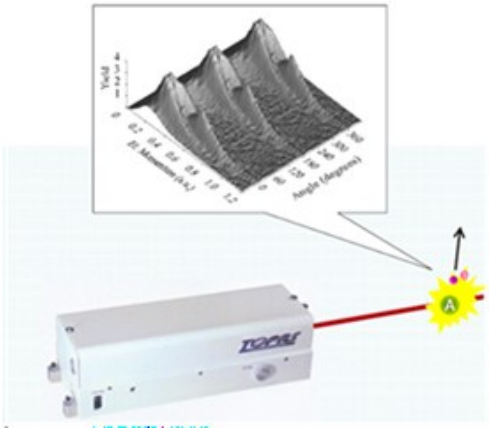
Photoelectric effect in negative ions exposed to a strong laser field



Light intensity is a critical parameter that governs electron emission from atoms and atomic ions. In a strong electromagnetic field, the emitted electron can absorb considerably more photons than needed to overcome the threshold associated with its initial binding energy. Mechanisms of such a highly nonlinear process will be discussed in this talk. In particular, we will address the role of quantum interference of electron paths in the continuum and will consider the re-scattering mechanism, where the liberated electron, driven by the laser field, revisits the parent core. In the discussion we will refer to the experimental results on strong-field photo detachment of negatively charged ions. Due to the short-range character of binding forces, negative ions represent a suitable system for developing analytical theories, combining the power of prediction and simplicity, for the description of the photoelectric effect. Predictions by the theory based on the strong-field approximation will be used for the interpretation.

Host: Jochen Küpper – CFEL CMI Group