

Attosecond control of electron acceleration in cluster Coulomb explosions

Josef Tiggesbäumker¹

Institute of Physics, University of Rostock, Albert-Einstein Strasse 230, Rostock, Germany

Strong field driven electron recollision is the key to conduct high-harmonic spectroscopy experiments, laser-induced electron diffraction, and allows to generate attosecond pulses. In atoms, molecules, and surfaces elastic backscattering produces the most energetic electrons and enables for an precise spectral, directional, and temporal control of the acceleration process through the sub-cycle waveform of the driving laser field. With metal clusters we reveal a so far unexplored route for waveform controlled electron acceleration emerging from the extreme enhancement of forward rescattering in plasmonic systems [1]. In the experiments we studied the plasmon-

enhanced photoemission from silver clusters and find that the directional electron acceleration can be controlled up to keV energies through the relative phase of a two-color laser light field.

References

- [1] Nanoplasmonic electron acceleration by attosecond-controlled forward rescattering, J. Passig and S. Zherebtsov and R. Irsig and M. Arbeiter and Ch. Peltz and S. Gode and S. Skruszewicz and K.-H. Meiwes-Broer. and J. Tiggesbäumker and M.F. Kling and T. Fennel, Nature Comm., in revision

¹E-mail: josef.tiggesbaeumker@uni-rostock.de