Coherent Control of Bound and Free Electron Dynamics

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In this talk, after an introduction, I will concentrate on our current experiments devoted to direct control of bound and free electron dynamics [1]: First I will discuss the creation and tomographic reconstruction of 3D designer electron wave packets in the continuum with the help of polarization shaped laser pulses and the electronic structure of atoms. As an application I will present the current status of our approaches to chiral recognition in the gas phase. Finally I will highlight our experiments devoted to charge oscillation controlled molecular excitation.

1. Wollenhaupt,M. & Baumert,T. Ultrafast laser control of electron dynamics in atoms, molecules and solids. *Faraday Discuss.* **153**, 9-26 (2011).