Speaker: **Tim Haurin, University of Freiburg**

Title: **Probing Wigner time delay in perturbed atomic potential**

Date: **Tuesday, August 26th, 11:00 am (s.t.).**

Place: **Seminar room 915**

Title: **Probing Wigner time delay in perturbed atomic potential**

This thesis investigates the influence of static, short-range Gaussian potentials on the measurement of the Wigner time-delay in photoionization processes. A one-dimensional numerical simulation, that models the time-dependent Schrödinger-equation, is implemented using the finite difference method and the Crank-Nicolson scheme. It is build to model electron dynamics from the ionization process to free propagation. Both Time-of-Flight (ToF)-, and RABBIT measurements (Reconstruction of Attosecond Beating By Interference of Two-photon transitions) are used to quantify the Wigner time delay. Our simulations reveal that the perturbing Gaussian potentials introduce additional time delays, scaling linearly with their spacial width and non-linearly with the distance from the atomic center due to the Coulomb tail of the binding potential.
A scaling model is proposed that enables the extraction of the perturbing potential's position from the measured time delay alone. Further, the data shows that the RABBIT measurement is unaffected by distant perturbations, but captures perturbations if they are within probing range, i.e. close to the atomic potential's center. However, discrepancy between the results of ToF and RABBIT measurements remain.