14th November, 2016 – 11:00 am
CFEL-bldg. 99, seminar room I (EG.076)

P. Donnie Keathley

Massachusetts Institute of Technology, Cambr., USA.

Volkov transform generalized projection algorithm: a new approach for attosecond pulse characterization

Attosecond pulse characterization has developed rapidly in the last decade. Algorithms for extracting the temporal profile of attosecond pulses from photoelectron streaking data can be divided into two camps: interferometric methods and generalized projection algorithms (GPA). Interferometric methods do not suffer from the central momentum approximation and account for some of the amplitude and phase accrued by the electron packet during ionization, both limitations of currently used GPAs. However, interferometric methods place restrictions on the long-wavelength streaking pulse that can be used as they require well defined photon transitions. In this talk, we present a new approach to attosecond pulse characterization called Volkov Transform Generalized Projection Algorithm.

By solving directly in the frequency domain, it does not suffer from the central momentum approximation, and allows one to include a dipole transition matrix element to account for amplitude and phase reshaping of the electron pulse during ionization. Furthermore, it does not place any fundamental restrictions on the streaking pulse that can be used, meaning both the attosecond pulse and complex streaking fields can be solved for simultaneously, a key reason GPAs have remained prevalent.

Host: Franz Kärtner, CFEL UX Seminar