

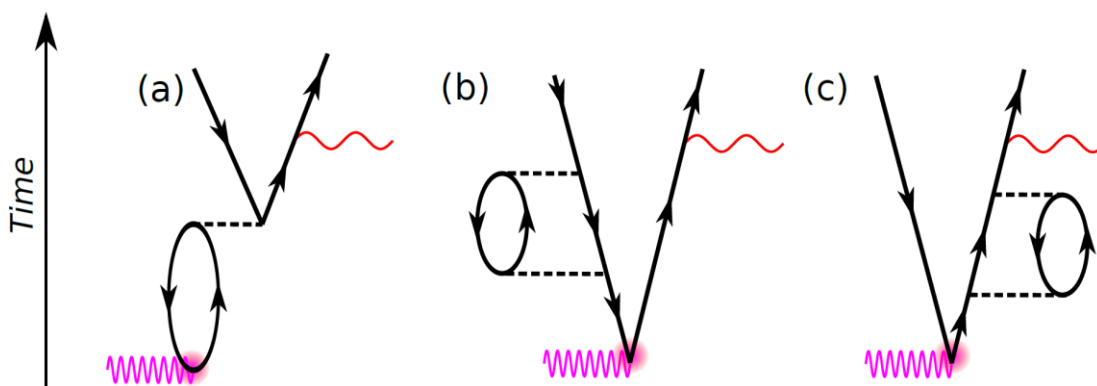
4th September 2013 - 4:00 p.m.
CFEL-bldg. 99, seminar room I

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Attosecond delay in photoionization

In attosecond science, the aim is to probe and control electrons in atoms and molecules at their natural time scale. Recently there have been intense theoretical discussions concerning the possibilities of measuring the time it takes for an atom to be photoionized, c.f. Ref. [1]. During this talk, we will discuss many-body effects in laser-assisted photoionization by attosecond pulses from noble gas atoms. We have implemented diagrammatic perturbation theory for a versatile description of multi-photon processes [2]. Time-delays have been determined for various methods from attosecond metrology, including both “streaking” and “rabbit” schemes. In order to understand correlated processes, e.g. the ionization of an inner atomic orbital, it is essential to account for many-body screening effects such as inter-shell correlation. This class of correlation is accounted for using the Random-Phase Approximation (RPAE). Further, by extending our diagrammatic approach, we will examine processes that include excitations to additional virtual electron-hole pairs, e.g. Fano-like structures.



[1] J M Dahlström, A L'Huillier and A Maquet "Introduction to attosecond delays in photoionization", J. Phys. B: At. Mol. Opt. Phys. 45 183001 (2012)

[2] J M Dahlström, T Carette and E Lindroth "Diagrammatic approach to Attosecond Delays in Photoionization", Phys. Rev. A 86, 061402(R) (2012)