



ITAMP Special Seminar

Tuesday, June 5, 12:00 pm

CfA, 60 Garden Street, B-105

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“Electron dynamics induced by light pulse derivatives”

Attosecond physics with frequencies in the XUV range can achieve pulse durations which are comparable with the time scale of the bound orbital the light pulse couples to.

This will give rise to non-adiabatic ionization in which the electron is sensitive to light pulse derivatives. Hence, a simple Gaussian pulse acts like a double pulse and leads to a natural pump probe scenario as well as Stueckelberg oscillations. How large the non-adiabatic effects are depends on the AC Stark shift of the bound orbital.

We will illustrate these effects with a simple model of a negative ion.

The phenomena discussed link the intrinsic time-scale of the particle coupled to an external oscillating field to its frequency and envelope where the envelope can vary at any time scale provided that the particle's time scale is comparable or slower.

To demonstrate how general these links are we conclude by re-interpreting Fermi's golden rule in the light of the non-adiabatic ionization perspective.

Literature: Ning, Saalman and Rost, PRL 120, 033203 (2018)