CFEL SCIENCE

SEMINAR

10th December 2014 - 2:00 p.m.

CFEL-bldg. 99, seminar room IV

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Feynman path integral approach to tunnelling time

The tunnelling time problem is almost as old as quantum mechanics itself and is a highly debated subject. Time is not a quantum observable, and therefore many conflicting theories have been developed over the decades. Here we present the Feynman path integral (FPI) approach to tunnelling time, and show how it can be used to calculate tunnelling time probability amplitudes. The FPI approach also sheds new light on four best-known definitions of tunnelling times (Buttiker-Landauer, Pollack-Miller, Eisenbud-Wigner, and Larmor), which although derived using very different physical models, can also be represented as different averages using FPI tunnelling time probability amplitudes. Relation between the FPI approach, other tunnelling time definitions and the theory of weak measurement is also reviewed.

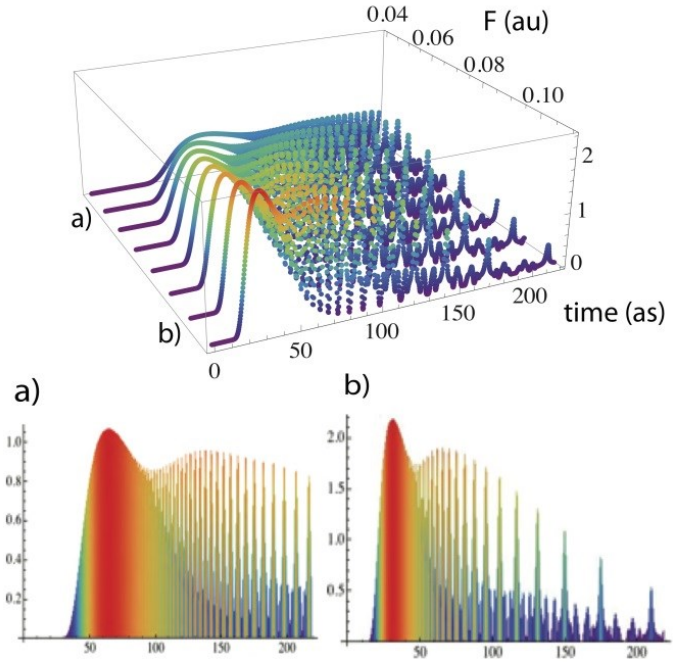

Figure description: Tunneling time probability distribution calculated in the context of strong field ionisation using the path integral approach. Top: distribution at different field strengths, Panel a: F=0.04 au; Panel b: F=0.1 au

Host: Robin Santra – Theory Division