

Abstract for an Invited Paper
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Two-electron atomic response on the attosecond time-scale¹

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Over the past decade or so we have developed methods [1] that now allow accurate two-electron solutions of the full-dimensionality Time-dependent Schroedinger equation to be constructed and temporally followed as they evolve on the attosecond time-scale. A survey of the achievements of this work will be presented. These range from the prediction of Double Above Threshold Ionisation [2] brought about by intense light in the EUV; through the prediction of uni-lateral double ionization by longer wavelength light [3] to the prediction of a surprising energy-partition between the two electrons ionizing as a result of a recollision process at Ti:sapphire wavelengths [4]. The talk will go on to describe new theoretical investigations pertinent to the imminently-available XFEL sources and also to FEL and IR lasers in combination.

References:

- [1] Smyth ES, Parker JS and Taylor KT *Comput Phys Commun* 114 1 (1998)
- [2] Parker JS, Moore LR, Meharg KJ, Dundas D and Taylor KT. *J Phys B: Atom Molec Opt Phys* 34 L69 (2001)
- [3] Taylor KT, Parker JS, Dundas D, Smyth ES and Vivirito S *Laser Physics* 9 98 (1999)
- [4] Parker JS, Doherty BJS, Taylor KT, Schultz KD, Blaga CI and DiMauro LF *Phys Rev Lett* 96 133001 (2006)

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