

Abstract Submitted
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Exploring SAMO states of fullerenes with angle-resolved fs photoelectron spectroscopy¹ ELEANOR CAMPBELL, ELVIRA BOHL, OLOF JOHANSSON, University of Edinburgh, BENOIT MIGNOLET, Stanford University, FRANCOIS REMACLE, University of Liege — Femtosecond photoelectron spectroscopy of fullerenes provides a powerful means to study excited Rydberg-like states that cannot be probed via conventional spectroscopy. The photoelectron spectra (PES) show a thermal electron background with a superimposed peak structure for photoelectron kinetic energies that lie below the laser photon energy. The peak structure has been assigned to one-photon ionisation of diffuse low-angular momenta states, so-called superatom molecular orbitals (SAMOs) centred on the hollow fullerene core, based on photoelectron angular distributions (PADs) and TD-DFT calculations. The relative photoionisation probabilities of the s-SAMO to p-SAMO were analysed for photon energies from 2-3.5 eV and showed good agreement with theoretical calculations. Here we look at the photoionisation probabilities and photoelectron angular distributions as a function of laser wavelength and, in particular directly probe the influence of an endohedrally-trapped atom on the photoelectron spectra by directly comparing C60 and Li@C60. We also provide preliminary measurements to probe the timescale for thermal emission prior to coupling to vibrational degrees of freedom.

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Eleanor Campbell
University of Edinburgh

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