

Abstract Submitted
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Fullerene valence photoemission time delay near ionization cavity minima¹ MAIA MAGRAKVELIDZE, DYLAN ANSTINE, Northwest Missouri State University, GOPAL DIXIT, MBI, Berlin, Germany, MOHAMED MADJET, QEERI, Doha, Qatar, HIMADRI CHAKRABORTY, Northwest Missouri State University — We investigate photoemission quantum phases and associated Wigner-Smith time delays for HOMO and HOMO-1 electrons of a C₆₀ molecule [1] using time-dependent local density approximation (TDLDA) [2]. The interference oscillations in C₆₀ valence emissions produce series of minima whose energy separation depends on the molecular size. We show that the quantum phase associated with these minima exhibits rapid variations due to electron correlations, causing rich structures in the photoemission time delay. Besides fullerenes, the detection of photoemission minima in metal clusters [3] suggests a possible universality of the phenomenon in cluster systems, or even quantum dots [4], that confine finite-sized electron gas. The work predicts a new research direction to apply attosecond metrology, such as RABITT, in the world of nanosystems.

[1] Magrakvelidze et al., arXiv:1409.2910 [physics.atm-clus]

[2] Madjet et al., PRA 81, 013202 (2010);

[3] Jaenkaelae et al., PRL 107, 183401 (2011);

[4] Chakraborty et al., arXiv:cond-mat/0111383.

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