

Abstract Submitted  
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**Subshell-resolved photoionization in the reciprocal space: Metal and noble gas atoms in a fullerene cage**<sup>1</sup> MATT MCCUNE, Northwest Missouri State University, Maryville, MO 64468, MOHAMED MADJET, Free University, D-14195 Berlin, Germany, HIMADRI CHAKRABORTY, Northwest Missouri State University, Maryville, MO 64468 — Theory has predicted oscillations in the photoionization cross section of various atoms trapped in  $C_{60}$ . Most of the studies however modeled the confining shell by a simplistic one-active-electron potential. We recently established a method that treats the  $C_{60}$  electrons in a sophisticated multi-electron frame based on the density functional theory [1]. Using this method, we perform calculations for noble gas atoms in  $C_{60}$ . In the past, the free  $C_{60}$  photo cross section, which also shows oscillations, was analyzed by a Fourier-transform technique to determine the origin of the oscillation [2] and its dependence on the electron's rotational motion [3]. In the present work, we employ the Fourier analysis to unravel the interplay between specific ionization modes that induces oscillations in the cross section of a confined atom. The quality of oscillations is found to strongly differ from the outermost to an inner subshell. [1] Madjet et al., *J. Phys. B* **41**, 105101 (2008); [2] Ruedel et al., *Phys. Rev. Letts.* **89**, 125503 (2002); [3] McCune et al., *J. Phys. B* **41**, 201003 (2008).

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