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Photoionization of atoms confined in C_{60} versus C_{240} : Giant enhancement and attosecond delay¹ MAIA MAGRAKVELIDZE, KELE SHI, DYLAN ANSTINE, HIMADRI CHAKRABORTY, Northwest Missouri State University — We investigate the effects of confinement and electron correlation on the photoemissions of noble gas atoms sequestered endohedrally in C_{60} versus C_{240} . The time-dependent local density approximation (TDLDA) method [1] with Leeuwen and Baerends (LB94) exchange-correlation functional is employed. We study the moduli and phases of the photoionization dipole matrix elements involving atomic-type as well as atom-fullerene hybrid-type levels of the molecules and extract associated cross sections and angle-integrated Wigner-Smith time-delays [2]. We examine the size effects of the molecular cage on the plasmonically enhanced strength of the atomic ionization [3]. Furthermore, the behavior of emission time delays in attoseconds, induced by this enhancement as well as by the confinement-modified atomic Cooper minima, as a function of fullerene size is scrutinized in detailed.

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

[2] Dixit et al., PRL 111, 203003 (2013);

[3] Madjet et al., PRL 99, 243003 (2007).

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