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Photoionization of bilayer fullerene onions[1] RUMA DE, MATT MCCUNE, HIMADRI CHAKRABORTY, Northwest Missouri State, Maryville, MOHAMED MADJET, DESY, Germany, STEVE MANSON, Georgia State, Atlanta
— Density functional approaches are employed to calculate the photoionization cross sections of the $C_{60}@C_{240}$ system – a prototype bi-layer fullerene onion. The core of C^{4+} ions is smeared into a jellium-type double-shell structure before treating the correlated motion of all valence electrons in the standard Kohn-Sham framework [1]. In the low photon-energy regime dominated by the electronic collective motion, plasmon resonances appear whose character exhibits significant influence of the dynamical bilayer coupling. In the high energy region, on the other hand, the quantum interference effects induce oscillations far richer in frequency-structures than previously observed for monolayer fullerenes [2, 3]. The results indicate that hybridizations between near-degenerate pure orbitals of the constituent monolayers produce significant imprints on the overall ionization phenomenology.

[1] Madjet et al., *J. Phys.* B **41**, 105101 (2008);
[2] Ruedel et al., *Phys. Rev. Lett.* **89**, 125503 (2002);
[3] McCune et al., *J. Phys.* B **41**, 201003 (2008).

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Himadri Chakraborty
Northwest Missouri State, Maryville

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