

Abstract Submitted
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Plasmon-plasmon coupling in buckyonion fullerenes: Photoexcitation of interlayer plasmonic cross modes¹ MATT MCCUNE, University of Missouri, Columbia, RUMA DE, Northwest Missouri State University, MOHAMED MADJET, CFEL, DESY, Hamburg, Germany, HIMADRI CHAKRABORTY, Northwest Missouri State University, STEVE MANSON, Georgia State University — Considering the photoionization of a two-layer fullerene-onion system, $C_{60}@C_{240}$, strong plasmonic couplings between the nested fullerenes are predicted [1]. The resulting hybridization produces four cross-over plasmons generated from the bonding and antibonding mixing of excited charge clouds of individual fullerenes. The properties of these hybrid plasmons are also greatly different from the plasmons that exist in isolated C_{60} and C_{240} . This suggests the possibility of designing buckyonions exhibiting plasmon resonances with specified properties as candidates for nanomaterial plasmonics. The results can further motivate future research to modify the resonances by encaging atoms, molecules or clusters in multi-layered fullerenes.

[1] M.A. McCune, R. De, M.E. Madjet, H.S. Chakraborty, and S.T. Manson, *J. Phys. B Fast Track Comm.* **44**, 241002 (2011).

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