

Abstract Submitted
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**New resonances from the coherence of Auger and intercoulo-
bic (ICD) processes in the photoionization of endohedral fullerenes¹** HIMADRI CHAKRABORTY, JACOB WISE, RUMA DE, Northwest Missouri State University, MOHAMMAD JAVANI, STEVE MANSON, Georgia State University, MOHAMED MADJET, QEERI, Doha, Qatar — Considering the photoionization of Ar@C₆₀, we predict resonant femtosecond decays of both Ar and C₆₀ vacancies through the continua of atom-fullerene hybrid final states. The resulting resonances emerge from the interference between simultaneous autoionizing and intercoulo-
bic decay (ICD) processes [1]. For Ar 3s→np excitations, these resonances are far stronger than the Ar-to-C₆₀ resonant ICDs, while for C₆₀ excitations they are strikingly larger than the corresponding Auger features. The results indicate the power of hybridization to enhance decay rates, and modify lifetimes and line profiles. These decays are also likely to exist generally in the ionization of molecules, nano-dimers and -polymers, and fullerene anions that support hybridized electrons as well. A jellium based time-dependent local density approximation (TDLDA) [2], with the Leeuwen and Baerends exchange-correlation functional to produce accurate asymptotic behavior, is employed to calculate the dynamical response of the system to the photon field. [1] M.H. Javani, J.B. Wise, R. De, M.E. Madjet, S.T. Manson, and H.S. Chakraborty, [arXiv:1312.2144](https://arxiv.org/abs/1312.2144) [physics.atm-clus]; [2] M.E. Madjet, T. Renger, D.E. Hopper, M.A. McCune, H.S. Chakraborty, J.-M. Rost, and S.T. Manson, *Phys. Rev. A* 81, 013202 (2010).

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