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Theoretical Study of the Photoionization of small fullerenes C_n(n=28, 32, 40, 44, 50) using the Time-Dependent-Local-Density Approximation (TDLDA)[1] MOHAMMAD H. JAVANI, Georgia State University, HIMADRI S. CHAKRABORTY, Northwest Missouri State University, STEVEN T. MANSON, Georgia State University — The Time-Dependent-Local-Density Approximation (TDLDA) is used to calculate total and subshell photoionization cross section of small fullerene C_n, (n=28, 32, 40, 44, 50). For the various C_n, which are taken to be spherical, the core of n C^{4+} ions are smeared out on the sphere with known radius to form a classical jellium shell, and the resulting potential is used to treat the dynamics of the motion of the 4n delocalized valance electrons quantum mechanically. The theoretical methodology has been described in detail elsewhere [1]. For all cases, it is found that there are two plasmon resonances in the total cross section due to phase-coherent superposition of amplitudes that causes the enhancements in the ionization from different C_n subshells in two distinct energy regions, just as in the case of C_{60} [1]. In addition, each of the two plasmons, for each fullerene, is quite close in energy to each other and to the C_{60} case.

[1] M. E. Madjet, H. S. Chakraborty, J. M. Rost and S. T. Manson, J. Phys. B **41**, 105101 (2008).

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Steven T. Manson
Georgia State University

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