

Abstract Submitted  
for the DAMOP14 Meeting of  
The American Physical Society

**Relativistic Effects in the Photoionization of High-Z Confined**

**Atoms: Rn@C<sub>60</sub>** DAVID A. KEATING, STEVEN T. MANSON, Georgia State University, PRANAWA C. DESHMUKH, Indian Institute of Technology-Madras — At high enough Z relativistic effects become important contributors to even the qualitative nature of atomic properties. This is likely to be true for confined atoms as well. To explore extent of relativistic effects in the photoionization of a heavy confined atom, a theoretical study of inner shells of radon (Z=86) confined in a C<sub>60</sub> cage has been performed using the relativistic random phase approximation (RRPA) methodology [1]. The effects of the C<sub>60</sub> potential modeled by a static spherical well which is reasonable in the energy region well above the C<sub>60</sub> plasmons [2]. In order to determine which features in the photoionization cross section are due to relativistic effects, calculations using the (nonrelativistic) random phase approximation with exchange method (RPAE) [3] are performed for comparison. It is found that relativistic interactions shift and split the nonrelativistic thresholds very considerably, and these changes in thresholds translate into very significant alterations to the nonrelativistic cross section; the large splitting of the 5d thresholds particularly affects the interchannel coupling of 5d with the other channels dramatically.

- [1] W. R. Johnson and C. D. Lin, *Phys. Rev. A* **20**, 964 (1979);
- [2] V. K. Dolmatov, *Adv. Quantum. Chem.* **58**, 13 (2009);
- [3] M. Ya. Amusia, *Atomic Photoeffect* (Plenum, NY, 1990).

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Date submitted: 30 Jan 2014

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