

Abstract Submitted
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Correlation Effects in the Photoionization of Confined Calcium and Zinc R. HARI VARMA, P. C. DESHMUKH, Indian Institute of Technology-Madras, S. T. MANSON, Georgia State University — Studies of atoms confined in an endohedral environment have aroused significant recent interest [1]. In this work, the photoionization @Ca and @Zn have been studied using the Relativistic-Random-Phase Approximation, modified to include the confinement potential. Photoionization of the $4s$ and $3p$ subshells of free and confined atomic calcium, along with the $4s$, $3d$, $3p$ and $3s$ subshells of free and confined atomic zinc, have been studied. The photoionization parameters of confined atoms differ significantly from those of their “free” counterparts. The dipole cross sections and angular distribution asymmetry parameters exhibit oscillations with energy arising from the back scattering of the escaping electron by the confining potential, i.e., “confinement resonances” [2]. These oscillations persist when nondipole matrix elements are also included as is reflected in the nondipole cross section and angular distribution asymmetry parameters [3]; the relative strengths of the oscillations due to back-scattering in the E1 and E2 photoionization parameters have qualitatively different profiles as a function of photon energy. [1] V. K. Dolmatov, A. S. Baltenkov, J.-P. Connerade and S. T. Manson, *Radiation Phys. Chem.* **70**, 417 (2004). [2] M. Ya. Amusia, A. S. Baltenkov, V. K. Dolmatov, S. T. Manson and A. Z. Msezane, *Phys. Rev. A* **70**, 023201 (2004). [3] P.C. Deshmukh, Tanima Banerjee, K. P. Sunanda and R. Hari Varma, *Radiation Phys. and Chem* (submitted).

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