

Abstract Submitted
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Correlation and relaxation effects near threshold in photoabsorption of the Ar isoelectronic series¹ JOBIN JOSE, GAGAN B. PRADHAN, VOJISLAV RADOJEVIC', PRANAWA C. DESHMUKH, IIT-Madras, STEVEN T. MANSON, Georgia State University — The photoabsorption cross sections of the the 3s subshell of isoelectronic Cl⁻, Ar and K⁺ have been calculated at various levels of approximation to understand how correlation and relaxation effects behave with increasing nuclear charge using the Relativistic Random Phase Approximation (RRPA) [1] and its modification, the RRPA-with- Relaxation (RRPA-R) [2]. To study the correlation in the form of interchannel coupling, RRPA was employed with and without coupling between the 3d and 3p photoabsorption channels. Interchannel coupling is found to dominate the 3s cross section for Cl⁻, and become less and less important with increasing Z as discovered earlier for the Ne sequence [3]. Core-relaxation effects, of great importance for Cl⁻, diminish with increasing Z. Thus, both interchannel coupling and core-relaxation must be included for even qualitative accuracy for negative ions, but these effects diminish with increasing Z. [1]. W. R. Johnson, C. D. Lin, Phys. Rev. A 20 964 (1979). [2]. V. Radojevic', M. Kutzner and H. P. Kelly, Phys. Rev. A 40, 727 (1989). [3]. H. S. Chakraborty, P. C. Deshmukh and S. T. Manson, Ap. J. 595, 1312 (2003)

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