

Abstract Submitted
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Relativistic Effects in the Photoionization of Very Heavy Atoms DAVID A. KEATING, STEVEN T. MANSON, Georgia State University, PRANAWA C. DESHMUKH, Indian Institute of Technology-Madras — At very high Z relativistic interactions become important contributors to even the qualitative nature of atomic properties. To explore the extent of relativistic interactions in the photoionization of a very heavy atom, a theoretical study of nobelium ($Z=102$) has been performed using the relativistic random phase approximation (RRPA) methodology [1]. In order to determine which features in the photoionization cross section are due to relativity, calculations using the (nonrelativistic) random phase approximation with exchange method (RPAE) [2] are performed for comparison. With the inclusion of inter-channel coupling some relativistic effects are amplified or diminished. To distinguish which relativistic effects are native to the orbital of interest or a product of inter-channel coupling, calculations have been performed with and without coupling for comparison. Aside from significant splitting and shifts of threshold, induced effects on subshells not strongly affected by relativity directly, e.g. outer shells, by inner subshells that are strongly affected, occur via changes in screening and inter-channel coupling.

[1] W. R. Johnson and C. D. Lin, *Phys. Rev. A* 20, 964 (1979)

[2] M. Ya. Amusia, *Atomic Photoeffect* (Plenum, NY, 1990).

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