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Satellite Lines in High-Energy Atomic Photoionization C. YANG, A. M. SOSSAH, H.-L. ZHOU, S. T. MANSON, Georgia State University, M. YA AMUSIA, The Hebrew University — The recent discovery that interchannel coupling persists to high energy [1] has altered the viewpoint that the non-relativistic photoionization cross section for an *nl* atomic subshell at asymptotically high energies was essentially a single-electron process and depends upon energy E as $E^{-(l+7/2)}$ [2]. It was shown [3] that, owing to interchannel coupling, that this is correct only for photoionization *ns* and *np* states; for all *nl* states with greater l, the asymptotic energy dependence is $E^{-9/2}$, just as it is for *np* states. In the present work, implications of initial state correlation are explored. It is found that including initial state configuration interaction can have a profound effect upon the high-energy photoionization. For the photoionization of most *nl* subshells ($l \neq 0$) throughout the periodic system, the dominant transition is not the single-particle transition from the *nl* subshell but a satellite transition of *ns*→*kp* character. The cross section for the satellite transition exhibits the high-energy dependence characteristic of an *s*-state of $E^{-7/2}$, while the single-particle (main line) transition behaves as $E^{-9/2}$. Thus, in the nonrelativistic high-energy limit, most photoionization cross sections behave as $E^{-7/2}$, and satellite transitions dominate. Several examples are presented. This work was supported by DOE, NSF, and BSF. [1] E. W. B. Dias, *et al*, Phys. Rev. Lett. **78**, 4553 (1997). [2] U. Fano and A. R. P. Rau, Phys. Rev. **162**, 68 (1967). [3] M. Ya. Amusia, *et al*, Phys. Rev. Lett. **85**, 4703 (2000).

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