Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

A relativistic treatment of electron ionization of xenon ALLAN STAUFFER, ALEXEY ILLARIONOV, York University, Toronto — Xenon is a heavy atom with a $5p^6$ valence shell. This outer shell is split into two subshells with an energy difference of 1.3 eV. Experimental measurements exist for the ionization of this atom which resolve these two subshells. Moreover, ionization experiments have been carried out with spin-polarized electrons. A relativistic treatment of these processes based on the Dirac equations has two particular advantages. By providing distinct orbitals for the two valence subshells with different ionization thresholds, we have a more realistic description of the target atom than is available in a standard Schroedinger approximation. Since the Dirac equations explicitly contain the spin of the electrons, we have a natural way of treating spin-polarized processes. We will present results based on a simple plane and coulomb representation of the scattered and ejected electron as well as a more elaborate distorted-wave approach.

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Date submitted: 12 Jul 2011 Electronic form version 1.4