

Abstract Submitted
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Analytic Dirac Large and Small Component expressions for Compton Profiles LARRY LAJOHN, Univ of Pittsburgh — Expressions for relativistic Compton profiles (CP) were derived from Dirac large and small component hydrogen like wavefunctions. Such expressions are in the form of a rapidly converging infinite series and are functionally similar in form to the corresponding nonrelativistic (nr) expressions for CP. Such fully relativistic expressions can be used to greatly improve the accuracy of CP obtained from differential cross sections for collision processes such as photon-atom, electron-atom and proton-atom scattering processes. Such errors increase with increasing electron binding energies, as well as increasing angular momentum quantum number (l) and are spin orbit (j quantum number) dependent. Other applications for such expressions would be to model atomic processes that involve interactions with individual bound electrons such as for example positron-electron annihilation. For such applications there is a need for subshell (especially inner and middle shell) CP expressions.

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