Electron Momentum Distribution in Multiply-Ionized Atoms as a Function of Atomic Number and Degree of Ionization KHONDKAR KARIM, Illinois State University — We present momentum-space properties of multiply-ionized atoms as a function of atomic number Z and the degree of ionization of the atom. In particular, we have calculated the Compton profiles of all possible electronic configurations of He, Li, Be, B, and N atoms as they are progressively ionized with the outer-shell electrons being stripped off. The values of the Compton profiles presented here can be used to deduce doubly differential cross sections of variously ionized atoms colliding with other atoms and ions. The single-electron radial wave functions were obtained from the Hartree-Fock atomic model. Compton profiles of neutral atoms, available in the literature, are in excellent agreement with the present calculation.

Khondkar Karim
Illinois State University

Date submitted: 21 Jan 2005

Electronic form version 1.4