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Electron-impact double ionization of helium at low incident energy[1] JAMES COLGAN, Los Alamos National Laboratory, Los Alamos, NM 87545, M. S. PINDZOLA, Auburn University, Auburn, AL 36849 — Electron-impact double ionization of helium is an example of the Coulomb four-body problem - that is, three electrons moving in the field of a charged nucleus. At low incident electron energy, ionization results in all three electrons move relatively slowly away from the nucleus, so that the electron-electron interactions between all three electrons can be expected to govern the fragmentation process. Measurements of this ionization process at such energies are exceedingly difficult due to the very low count rates (cross sections) at such energies. However, measurements of the fully differential cross sections for electron-impact double ionization of helium for an excess electron energy of 5 eV have been reported [1], and show that a 'triangle' break up is produced at low energies. We present time-dependent close-coupling calculations of this process. Such calculations are extremely time consuming due to the requirement of large box sizes and long propagation times for such low-energy ionization processes. However, we find good agreement with the reported measurements and are able to confirm the triangle break up pattern. We present results of our calculations at the conference and compare and contrast our results with the related process of triple photoionization of lithium.

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