

Abstract for an Invited Paper
for the GEC10 Meeting of
The American Physical Society

Differential cross sections for ion-impact ionization of helium

JAMES COLGAN, LANL

An overview is given of the recent progress made in applying the time-dependent close-coupling (TDCC) approach to the treatment of ion-impact collisions with small atoms and molecules. In the last several years, the TDCC method has been used to compute cross sections for the single and double ionization of helium by alpha particles, protons, and anti-protons. We have also recently extended our approach to examine proton-impact single and double ionization of the hydrogen molecule. Recent work has also examined the differential cross sections arising from the single and double ionization of helium by protons and fully stripped carbon ions. Although the TDCC approach assumes a straight-line trajectory (impact-parameter method) for the incoming projectile, it is possible to extract cross sections differential in projectile scattering angle from such an approach. These calculations are made to compare with the recent intense experimental efforts in this area. We will report on our progress, including detailed comparisons with the C^{6+} single ionization of helium measurements, at the conference.