GEC06-2006-000103

Abstract for an Invited Paper
for the GEC06 Meeting of
the American Physical Society

Electron-atom collision theory and applications[1]

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During the last decade computational methods for electron-atom collisions have undergone major advances. In developing the convergent close-coupling (CCC) method the fundamental goal has been to have a theory which was valid at all projectile energies and for all atomic transitions of interest. Currently the CCC method has been shown to be particularly successful in reproducing experimental data for atomic transitions that are dominated by one-electron processes. This is the case for the lighter atoms such as H, He, He^+, Li, and Na. Much of our effort in recent years has gone towards generalising the possible targets to incorporate heavier and more complex atoms which are important in various applications. In particular, we have considered Zn, Ba, and Hg for the lighting industry. Currently we are extending the method to inert gases such as Ne and Ar. In the talk we will review the CCC method and its applications, and also discuss the possible future directions.

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