

Renormalization screening effects on the electron-impact ionization process in dense plasmas

Myoung-Jae LEE ¹ and Young-Dae JUNG ²

1) *Department of Physics, Hanyang University, Seoul 04763, South Korea and Research
Institute for Natural Sciences, Hanyang University, Seoul 04763, South Korea*

E-mail: mjlee@hanyang.ac.kr

2) *Department of Applied Physics and Department of Bionanotechnology
Hanyang University, Ansan, Kyunggi-Do 15588, South Korea*

E-mail: ydjung@hanyang.ac.kr

The influence of renormalization screening on the electron-impact ionization process is investigated in dense plasmas. The effective projectile-target interaction Hamiltonian and the semiclassical trajectory method are employed to obtain the transition amplitude as well as the ionization probability as functions of the impact parameter, the collision energy, and the renormalization parameter. It is found that the renormalization screening effect suppresses the transition amplitude for the electron-impact ionization process in dense plasmas. It is also found that the renormalization screening effect suppresses the differential ionization cross section in the peak impact parameter region. In addition, it is found that the influence of renormalization screening on the ionization cross section decreases with an increase of the collision energy. The variations of the renormalization screening effects on the electron-impact ionization cross section are also discussed.