Plasmon and Screening Effects on the Occurrence Scattering Time Advance in Hot Quantum Plasmas

Sang-Chul Na[a] and Young-Dae Jung[a,b]

[a] Department of Applied Physics, Hanyang University, Ansan, Kyunggi-Do 426-791, South Korea
[b] Atomic and Molecular Data Research Center, National Institute for Fusion Science, Toki, Gifu, 509-5292, Japan

Reprint requests to Prof. Y.-D. J.; E-mail: ydjung@hanyang.ac.kr

Z. Naturforsch. **63a,** 791 – 796 (2008); received June 3, 2008

The plasmon and screening effects on the occurrence scattering time advance for elastic electron-ion collisions are investigated in hot quantum plasmas. The effective screening model taking into account the plasmon and screening effects is employed to represent the electron-ion interactions in hot quantum plasmas. The Glauber method is applied to obtain the occurrence scattering time as a function of the scattering angle, impact parameter, plasmon parameter, collision energy, and Debye length. It is shown that the occurrence scattering time advance is enhanced with increasing the plasmon effect and scattering angle. In addition, it is shown that the occurrence scattering time advance decreases with increasing the collision energy. It is also found that the plasmon effect is dominant for the forward scattering domain and, however, the screening effect is getting important with an increase of the scattering angle.

Key word: Occurrence Scattering Time.