Screened Collision-Induced Quantum Interference in Collisional 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 Y.-D. J.; E-mail: ydjung@hanyang.ac.kr

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The effects of neutral particle collisions on the quantum interference in electron-electron collisions are investigated in collisional plasmas. The effective potential model taking into account the electron-neutral particle collision effects is employed in order to obtain the electron-electron collision cross section including the total spin states of the collision system. It is found that the collision effects significantly enhance the cross section. In addition, the collision-induced quantum interference effects are found to be significant in the singlet spin state. It is shown that the quantum interference effects decrease with increasing the thermal energy of the plasma. It is also shown that the quantum interference effects increase with an increase of the collision energy.

Key words: Quantum Interference; Collisional Plasmas.