

Quantum Screening Effects on the Entanglement Fidelity for Elastic Collisions in Electron-Ion Quantum Plasmas

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The quantum screening effects on the entanglement fidelity for the elastic collision are investigated in electron-ion quantum plasmas. The partial wave analysis and modified Debye-Hückel interaction potential are employed to obtain the entanglement fidelity function in electron-ion quantum plasmas as a function of the collision energy, charge of the ion, and quantum wave number. It is found that the quantum screening effects significantly enhance the entanglement fidelity in electron-ion quantum plasmas. It is also found that the entanglement fidelity increases with an increase of the ion charge. The quantum screening effects on the entanglement fidelity is also found to be increased with increasing plasma density. In addition, it is found that the quantum screening effects decreases with an increase of the collision energy.

Key words: Quantum Screening; Entanglement Fidelity; Electron-Ion Quantum Plasmas.