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# Plasma neutrino energy loss due to the axial-vector current at the late stages of stellar evolution

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摘要

Based on the Weinberg-Salam theory, the plasma neutrino energy loss rates of vector and axial-vector contributions are studied. A ratable factor of the rates from the axial-vector current relative to those of the total neutrino energy loss rates is accurately calculated. The results show that the ratable factor will reach a maximum of 0.95 or even more at relatively higher temperature and lower density (such as $\rho\mu_e < 10^7$ g/cm$^3$). Thus the rates of the axial-vector contribution cannot be neglected. On the other hand, the rates of the axial-vector contribution are on the order of ~0.01% of the total vector contribution, which is in good agreement with Itoh's at relatively high density (such as $\rho\mu_e > 10^7$ g/cm$^3$) and a temperature of $T \leq 10^{11}$ K.

关键词

Weinberg-Salam theory, plasma neutrino energy loss, stellar evolution