

R008-13

C 会場 : 9/25 PM2 (15:45-18:15)

17:00~17:15

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Energy Partitioning of Thermal and Nonthermal Plasmas in 3D Magnetic Reconnection

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In our space and astrophysical collisionless plasmas, nonthermal particles whose energies are much higher than the thermal temperature are often observed, yet our understanding of the energy partitioning between thermal and nonthermal particles remains to be elucidated. In this presentation, we discuss the energy partitioning during magnetic reconnection by using PIC simulations. We have investigated the energy partitioning for hot plasmas in plasma sheet as a function of plasma sheet temperature from nonrelativistic to relativistic reconnection. For simplicity, we have assumed a pair plasma, and analyzed the hot plasmas heated by reconnection by fitting a model function composing of Maxwellian and kappa distributions. It was found that the nonthermal energy density can occupy more than 90% of the total kinetic plasma energy density in relativistic reconnection, and furthermore the efficiency of the nonthermal particle acceleration can be enhanced for three-dimensional system. However, the nonthermal particle acceleration efficiency decreases with decreasing the plasma sheet temperature.