A Simulation Study of Electron Acceleration Mechanism in Magnetic Reconnection Regions

Teruya Yamamoto [1], Yoshiharu Omura [2], Takehiro Tominaga [1], Hideyuki Usui [1], Hiroshi Matsumoto [2]

[1] RASC, Kyoto Univ, [2] RASC, Kyoto Univ.

Electrostatic solitary waves and Langmuir waves have been observed by GEOTAIL spacecraft in plasma sheet boundary layer that is connected to the reconnection region of the magnetotail.These waves are assumed to be excited by electron beams generated near the neutral line. Most of the previous computational studies of the magnetic reconnecion process have been performed via MHD codes or hybrid codes. However, eloctrons are treated as a mssless fluid. The kinetic dynamics of electrons is theoretically important. In order to study electron dynamics in the region of magnetic reconnection, we use a two-dimensional electromagnetic particle code in which electorons are treated as particles. We study possible acceleration mechanism of electorns in magnetic reconnection regions.