

The role of magnetic islands in electron acceleration during magnetic reconnection

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Magnetic reconnection converts magnetic energy rapidly into plasma kinetic energy, at the same time, the topology of magnetic field lines also changes. During such a process, magnetic islands can be generally generated due to the tearing mode instability, and they are considered to play an important role in electron acceleration. With particle-in-cell simulations combined with satellite observations, we investigate mechanisms of electron acceleration during the evolution of magnetic islands, including the contract and coalescence of magnetic islands, and evaluate the roles of the mechanism of parallel electric field, betatron and Fermi acceleration.