

Electron acceleration and heating associated with tearing island coalescence

Iku Shinohara[1]; Kentaro Tanaka[2]; Masaki Fujimoto[3]

[1] JAXA/ISAS; [2] Earth and Planetary Sci., TITECH; [3] DEPS, TITECH

Kinetic properties of magnetic island coalescence observed in the non-linear stage of the collisionless tearing instability have been studied. We have carried out a three-dimensional full kinetic simulation of the Harris current sheet with a large and long enough simulation run just for two islands coalescence. In the course of the coalescence, significant electron heating and acceleration is observed. The amount of electron energy in the subsequent island is found to be much larger than that observed in the single island case without coalescence. The simulation results suggest that the enhancement of the electron current in the coalescence island is responsible for the observed electron heating and acceleration. We will discuss the relation between the electron current

enhancement and the electron heating in detail.