Efficiency of electron acceleration associated with tearing island coalescence

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Kinetic properties of magnetic island calescence 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. Due to the strong inductive electric field associated with the coalescence process, electrons are significantly accelerated at around the subsequent X-line. During the strong acceleration stage, the average reconnection rate is up to 40%, which is much larger rate observed in previous simulation studies including driven-reconnection cases. In this presentation, we will show the results of the detailed analysis on the acceleration process and will discuss the efficiency of the electron acceleration in the case of multi-islands coalescence.