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Suprathermal electron acceleration during reconnection onset in magnetotail

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We study in detail an event of reconnection onset in the Earth magnetotail during 27 September 2006 observed by Cluster spacecraft that were at large separation of about 10,000 km. We focus on the energetic electron acceleration during different stages of the reconnection associated to a small substorm. We show that several distinct stages of particle energization can be observed during the time of the substorm. 1) Reconnection of pre-existing plasma sheet associated with a moderate energetic particle production. 2) Reconnection of the lobe plasma associated with increased energetic particle production. 3) Formation of dipolarization front or magnetic pile-up boundary associated to the production of most energetic electrons. Very strong localized Ey are observed in the association with the localized magnetic pile-up regions. In addition strong wave activity in lower hybrid frequency range is observed. Most probably electrons at the magnetic pile-up boundary are accelerated due to the strong electric fields.