

MeV electrons observed at the plasma sheet boundary in the inner magnetosphere

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We report energetic electron bursts up to 1 MeV at the plasma sheet boundary observed by the Arase (ERG) satellite. Such higher energy electron bursts in the plasma sheet boundary layer have been rarely reported before. These events occur associated with substorm onsets, and they are observed when Arase enter the plasma sheet from the lobe region. The purpose of this study is to address where do the energetic electron bursts at higher latitude come from and what is the contribution of magnetotail reconnection and its associated acceleration process to the generation of the energetic electron bursts. The observed energetic electron bursts are different component from electron counter streams of 10-100 keV, which are usually observed in the plasma sheet boundary layer, and they look like substorm injections. If the observed electron bursts are due to the substorm injection, the observation cannot be explained by the standard understanding of the injection because (1) The injection occurs in downstream of the magnetotail reconnection jets (in deep inside of the plasma sheet), and (2) energetic electrons observed at the plasma sheet boundary are thought to be directly accelerated from magnetotail reconnection sites. In this presentation, we will present results of detailed analysis on the structure of the lobe-plasma sheet boundary and discuss the possible scenario of the MeV electron appearance in the plasma sheet boundary layer.