

Substorm injection like signatures observed at the plasma sheet boundary

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The Arase (ERG) satellite is possible to observe higher L-value plasma sheet close to the plasma sheet boundary because of its characteristic orbit, and, actually, Arase has observed several lobe entry events just outside of the outer radiation belt. In some of these events, we found that energetic electron bursts up to 500 keV appear at the plasma sheet boundary. Since the GOES satellites also observed rapid increases of energetic electrons at the same timing, the observed energetic electron bursts look quite similar to typical dispersionless substorm injection events. If the observed electron bursts are due to the substorm injection, the observation cannot be explained by the standard understanding of the injection since the injection is thought to occur associated with local magnetic field dipolarizations in downstream of the magnetotail reconnection jets in deep inside of the plasma sheet. In this paper, we will discuss the observed electrons are really the same phenomena as the substorm injections. The discussion is important to address the relationship between magnetotail reconnection and injections.