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MeV electrons observed at near-Earth plasma sheet boundary

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We have reported that energetic electron bursts over 300 keV up to MeV occur at the plasma sheet boundary. In this study, using an 8-year dataset of Arase (ERG) observations of electron burst events, we try to address where the energetic electron bursts at higher latitudes come from and their acceleration process. The pitch angle distribution of 100-200 keV electrons typically shows an enhancement in parallel flux, which is consistent with common observations in the plasma sheet boundary layer. However, the higher energy portion of the energetic electron bursts exhibits a perpendicular flux enhancement, resembling typical dispersion-less injection events. The magnetic field line model suggests that the Arase satellite was located in a transition region between dipole-like and tail-like fields. This leads to the interpretation that the higher-energy electron bursts may result from electron acceleration in the downstream region of the magnetotail reconnection site. We will present the statistical features of these electron burst events in the near-Earth plasma sheet boundary layer, discuss the origin of MeV electrons based on particle dynamics, and compare their distribution functions with those observed in the magnetotail.