Large amplitude electric field observations by Geotail

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Large amplitude electric field has been observed by Geotail spacecraft in various regions of space plasma around the Earth. This paper summarize those event and origins based on electric fields, magnetic fields, plasma waves, and plasma particles observed from 1992 to 2006. In the near tail regions, large amplitude electric fields are found in the plasma sheet and its boundary region at radial distance ~ 15 Re, and are associated with the largest changes in the magnetic field and the intense substorm activities. Bow shock and other boundary layers also has such events. The results are described and compared with various possible generation mechanisms.