

Transportation and acceleration of outer belt electrons in the slot region responsible for the formation of new radiation belt during big magnetic storm

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It was reported that relativistic electrons in the outer radiation belt have been transported into the slot region during big magnetic storms (Obara and Matsumoto, 2016 and references therein). Baker et al. (2013) further reported a new radiation belt has been made in some cases.

We have examined electron data in the radiation belt during magnetic storms paying a particular attention to the formation of new radiation belt. Issues, we like to clarify, will be followings: i.e. 1) electrons injected into the slot region will have additional (local) acceleration there? 2) what is the cause of electron acceleration? 3) how long electrons will feel acceleration? and 4) what mechanism will be essential for the formation of new radiation belt?

We have analyzed two events; one is March 24-th, 1991 event and the other is July 14-th, 2000 event. New radiation belt has been made at round $L \sim 3$ in both cases and it persisted for almost two weeks. In both cases, we have confirmed local acceleration. Intense very low frequency (VLF) plasma waves have been observed. We are considering additional acceleration has been made by these waves.

New point of our result will be the identification of local acceleration of electrons in very near Earth region; i.e. $L \sim 3$, and it also confirms the results by Baker et al. (2013).

Keywords: New radiation belt, Slot region, Electron acceleration