



July 2004: an extreme event from the radiation belts point of view

Remi Benacquista (1), Sandrine Rochel (1), and Guy Rolland (2)

(1) ONERA, DESP, France (remi.benacquista@onera.fr), (2) CNES, France

During July 2004, at least three ICMEs impact successively the magnetosphere. Within a few days, the flux of relativistic electrons increases leading to a filling of the the radiation belts.

We investigate particles data from the NOAA-15 spacecraft over the 1998-2015 time range, and focus on the events able to fulfill the radiation belts with relativistic electrons. It is notably found that individual events usually fulfill the radiation belts in a limited range of L^* . From this standpoint, July 2004 is an exception since it leads to a complete fulfill of the radiation belts. In addition, the related magnetic storm is not exceptionally strong ($Dst \approx -170nT$), so it is usually not considered as a potential extreme event. After presenting some statistical results, we spotlight the exceptional case of July 2004 and we focus on this particular event. Notably, we propose an explanation to understand how this filling can be observed on such a large range of L^* .