



Radiation belt response to the March 7, 2012 eruptive solar event

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We study the response of the outer radiation belt due to an extreme eruptive solar event that took place on March 7, 2012, followed by two ultra-fast (>2000 km/s) CMEs and triggered an intense geomagnetic storm (minimum $Dst = -147$ nT) approximately two days later. To do that, we present direct observations of equatorial electron phase space density (PSD) by using differential flux data from the Solid State Telescope (SST) of THEMIS (A, D and E), the Radiation Environment Monitor (REM) of INTEGRAL, the Adaptive Particle Imaging Detectors (RAPID) of the 4 CLUSTER spacecrafts and the EPIC Radiation Monitor of XMM for the time period of March 5 – 12, 2012. Observations in the duskside magnetosphere show clear signatures of PSD enhancements while in the dawnside show PSD depletion. In addition, pronounced wave power enhancements at Pc4-5 frequencies are observed by CARISMA, THEMIS and IMAGE ground magnetometer arrays collocated with electron drift orbits, right after the Storm Sudden Commencement (SSC) in March 8. The study is complemented by in-situ and ground-based data of the solar wind parameters and the geomagnetic indices. This work has received support from the Hellenic National Space Weather Research Network and from the European Union's Seventh Framework Programme (FP7-SPACE-2011-1) under grant agreement no. 284520 for the MAARBLE (Monitoring, Analysing and Assessing Radiation Belt Energization and Loss) collaborative research project.