

R010-04

Zoom meeting B : 11/3 AM2 (10:45-12:30)

11:30-11:45

Proton Flux Response in the South Atlantic Anomaly due to Inductive Electric Field

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The South Atlantic Anomaly (SAA) is considered as a harmful radiation source for the Low-Earth Orbit (LEO) missions because it involves high-energy charged particles precipitating from the inner trapped radiation belt. In this research, we studied the short-term response of the proton flux in the South Atlantic Anomaly (SAA) region during the geomagnetic storm event of 15 May 2015. We have developed a three-dimensional relativistic test particle simulation code by implementing Tao-Chan-Brizard guiding center model in order to calculate the trajectories of protons with energy range 140-400 MeV in a time-varying magnetic field, provided by Tsyganenko model TS05 as well as the corresponding inductive electric field solved by Biot-Savart law. In this study, we considered the following SAA variables: the maximum value of the proton flux and the area of the anomaly at given altitudes. Numerical results showed that the proton flux was enhanced during the main storm phase and totally decreased during the recovery phase. The previous results were compared with observations from satellites.