

Space Weather Effects on Energetic Proton Flux Response in South Atlantic Anomaly

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In this research, energetic proton flux in the inner radiation belt, is studied inside the South Atlantic Anomaly (SAA) by performing test particle simulations, where the background time-varying magnetic field is provided by Tsyganenko model, according to *Dst* index and altitudes. The objective of this investigation, is to estimate and forecast the additional radiation dose, occurring on spacecraft and human bodies, due to their passage inside the anomaly, and precisely, during intense solar storms. It was found that within minutes, proton flux in the SAA, penetrated deeper downward by about 200 km, when the *Dst* index is decreased (< -210 nT), and a after few more minutes, it was significantly reduced at all the altitudes; the last conclusion was confirmed by satellite observations.

Keywords: South Atlantic Anomaly, Space Weather, *Dst* Index, Radiation Dose, Proton Flux