

## Variations of South Atlantic Anomaly due to Space Weather Conditions

# KIROLOSSE M. GIRGIS[1]; Tohru Hada[2]; Shuichi Matsukiyo[3]  
[1] IGSES, Kyushu Univ.; [2] IGSES, Kyushu Univ; [3] ESST Kyushu Univ.

[http://www.esst.kyushu-u.ac.jp/~space/index\\_e.html](http://www.esst.kyushu-u.ac.jp/~space/index_e.html)

South Atlantic Anomaly (SAA) is considered as a source of hazardousness for Low-Earth Orbit (LEO) satellites. This region involves high-energetic charged particles, emerging from the trapped radiation belts. The reason behind this precipitation is the anomaly in the Earth's magnetic field itself; the weakness of the magnetic field strength at this region, attracts those energetic particles to inhabit it. Few studies had been carried out to investigate SAA's behavior, with respect to space weather conditions. In this research, we consider the variations of the anomaly, from the point of view of magnetic field and charged particles population, by adopting Tsyganenko models and test particle simulations, respectively, corresponding to the solar wind ram pressure, Interplanetary Magnetic Field (IMF) and geodipole tilting angle. Those SAA variations are described by several variables such as: height, area, minimum magnetic field value and maximum charged particle density (SAA's center), movement of SAA's center (latitude and longitude) and charged particle penetration depth. Results revealed quantitatively, the correlation between the variation of each SAA's parameters, related to the space weather conditions.