

## Imaging riometer observation in South Atlantic Anomaly

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The total geomagnetic field intensity is especially weak around the southern part of Latin America. This region is called South Atlantic Anomaly (SAA). We named this singularity region as Geomagnetic Hole. Many high energetic particles are precipitating into Geomagnetic Hole from Radiation belt. Since the intensity of Geomagnetic Hole is sharply decreasing now, the quantity of particle precipitation in this region will become more large near future.

In order to examine Geomagnetic Hole phenomena, riometer, photometer and other instruments are installed at INPE southern space observatory (SSO:29.6S), Brazil and started observation since 1997. We also installed similar instruments and continue the observation at Concepcion(37.5 S), Punta Arenas(53.1S) in Chile and Kakioka (36.2N) in Japan.

We study Cosmic Noise Absorption (CNA) obtained by imaging riometer and their relationships to particle data by GOES Satellite. From our analysis results, typical CNA events are observed in associated with big geomagnetic storm period at SSO.GOES particle data shows sharp decrease of energetic particle in this time. It suggests that radiation belt particles are precipitating to Geomagnetic Hole during geomagnetic storm period. Sometimes, CNA events are also observed during big substorm period and during the X ray flare event. We also examined Punta Arenas, Concepcion and Kakioka imaging riometer data during geomagnetic storm time. However, typical CNA event corresponding to SSO data is not found in our analysis. Our preliminary result suggests that particle precipitation region is confined in a limited area around SSO, Brazil.

On the other hands, Traveling Ionosphere Disturbance (TID) events are also observed at Concepcion and Kakioka as well as SSO by imaging riometer. Generally, number density of ionosphere electron increases and electron density disturbance with stripe like structures are traveling during TID event. From imaging riometer observation, similar stripe-like CNA structure are also recognized during this TID event. It means that CNA occurs by not only energetic particle precipitation but also F layer electron density disturbance.

In order to examine the latitudinal and longitudinal width and its variation of particle precipitation from radiation belt in detail, two more imaging riometer are planning to install at Trelew Geomagnetic Observatory (43.1S) ,Argentina and University of Vale de Paraiba (23.2S),SP. Brazil.

Keywords: South Atlantic Anomaly, Radiation Belt particle, Geomagnetic Hole, Imaging Riometer, Cosmic Noise Absorption, Traveling Ionosphere Disturbance