

Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres (C)

Advances in Equatorial, Low- and Mid-Latitude Thermosphere and Ionosphere Studies (C11)

Consider as poster only.

STUDY OF THE SOUTH AMERICA LOWER IONOSPHERE USING THE SARINET NETWORK

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The main objective of this work is to study the behavior of the Ionosphere in the central region of the South Atlantic Magnetic Anomaly – SAMA, in the south of Brazil and south cone of South America, analyzing data observed with a riometer network (riometer – radio ionosphere opacity meter). The SAMA is characterized as an area in which the geomagnetic field has its lowest intensity. This negative anomaly only happens in Southern Hemisphere and it extends longitudinally until the western coast of South America with its origin attributed to the anti-symmetrical distribution of the electric currents inside the Planet. One of the consequences of the low intensity of the geomagnetic field in this region is that the energetic particles trapped in the Van Allen's inner radiation belt can precipitate easily into the SAMA region then in other regions worldwide. To study the precipitation of the energy particles in the SAMA, a riometer network SARINET (South America Riometer Network) is been installed and is operating. These riometers detects the variation of the incidence of cosmic radiation in the ground, thus determining the electronic density of the lower ionosphere, layers D and E. The objective of SARINET is to have five Riometer operational in the SAMA region. Two of them were installed in the Southern Space Observatory - SSO/CRS/CIE/INPE - MCT, in São Martinho da Serra – South of Brazil (29.4°S, 53.8°W). The first consists of a one channel riometer while the second one is an image riometer, with a set of 16 antennas formed by a 4x4 matrix operating at 38.2 MHz. The SSO-Observatory is strategically located near SAMA central region, where the intensity of geomagnetic field is around 23000 nT. The third and fourth Riometers are also one channel Riometer and were installed in Chile, one in Punta Arenas (53.1 °S, 71.0 °W) and other in Concepcion (37.5 °S, 72.7 °W), respectively. The last one channel Riometer is at Trelew, Argentina, and it should be integrated to the SARINET by April 2008. These five Riometers permits to study and determine the spatial scale and the dynamics of the Ionospheric absorption events.