

AERONOMY SCIENCE PROJECTS AT SOUTH OF BRAZIL

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The main objective of this work is to present an overview of Aeronomy projects with results from the central region of the South Atlantic Magnetic Anomaly – (SAMA), in the south of Brazil and south cone of South America.

The investigation of the behavior of the low terrestrial ionosphere has been achieved through the South America VLF NETwork – SAVNET, which has a operational station at the Southern Space Observatory - SSO/CRS/INPE–MCT, (29.4°S, 53.8°W, São Martinho da Serra, Brazil, strategically located near of the SAMA center, around 23000 nT), by analyzing the VLF (Very Low Frequency: 3 - 30 kHz) waves propagation over long distances within the Earth-ionosphere waveguide, since these characteristics transmit information about the electrical properties of the waveguide's boundaries. For the study of the SAMA the South America Riometer Network - SARINET (an International Scientific Cooperation between Japan, Brazil, Argentina and Chile) is been used. The first riometer was installed in 1999 in the SSO. Three other have been installed under and close to the SAMA region, as part of the SARINET, at the Magallanes University, in Punta Arenas, Chile (53.1°S, 71.0°W); at Concepcion University, in Concepcion, Chile (37.5°S, 72.7°W), and at the Observatório Magnético de TERLEW – INTERMAGNET, (43° 14'7S, 65° 18'9W), at Trelew, Argentina.

A Skymet meteor radar to study the atmospheric dynamics, was installed at the Santa Maria, RS, South of Brazil, which is an active systems site, which makes use of the ionized trails left by meteors when entering the terrestrial atmosphere. This ionization is the result of attrition between the surface of the meteor and atmospheric molecules. Measurements of echo delay, Doppler shift and angle of arrival are used to determine the location and motion of meteor trails. The INPE'S SKIYMET METEOR RADARS are now operating at three locations in Brazil: São João do Cariri (37 W, 7 S), Cachoeira Paulista (45 W, 23 S) and Santa Maria (54 W, 30 S). These radars provide 24-hour data on upper atmosphere winds between 80 and 100 km, with a time resolution of about 1 hour. Although this radar can be used for meteor studies, the main research interest is to the study of atmospheric dynamics.

Low terrestrial ionosphere, SAMA, VLF, waves propagation, Earth-ionosphere waveguide, meteor radar, mesosphere and atmospheric dynamics

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