Observation of intensity of cosmic rays and daily magnetic shifts near meridian 70° in the South America

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In analysis of experiments carried during September 2008 using secondary cosmic ray detectors located in Chacaltaya (Bolivia) and Niteroi (Brazil), Augusto et al. (2010) showed an increase in the intensity of charged particles which takes place 3 h after sunrise and lasts until 1 h after sunset, furthermore they said that during this period the solar magnetic field lines overtake the Earth's surface. These stations are located within the South Atlantic Magnetic Anomaly (SAMA), having both different magnetic rigidities. To reproduce data from the Niteroi and Chacaltaya stations, we record data during the same hours and days using our neutron monitors, muon telescopes and magnetometers within the stations Putre and Los Cerrillos. Our observation stations in Putre and Cerrillos are located at 18°11?47.8?S, 69°33?10.9?W at an altitude of 3600 m and 33°29?42.3?S, 70°42?59.81?W with 570 m height above sea level, respectively. These stations are located within the South Atlantic Anomaly (SAMA) and are separated approximately 1700 km from each other and 1700 km from the center of the anomaly. Our network is composed furthermore by two auxiliary Cosmic Ray and/or Geomagnetic stations located at different latitudes along 70°W meridian, LARC and O'Higgins stations, which are located within Antarctic territory, covering a broad part of the Southern Hemisphere. Our magnetometer data shows that for each of the components, shifts in the magnetic field intensity for every station (even for those out of the SAMA) lasted between 3 and 4 h after sunrise and 1 and 2 h past sunset, which are the periods when the geomagnetic field is modulated by the transit of the dayside to nightside and nightside to dayside. We believe that, although the magnetometric data indicates the magnetic reconnection for the Chilean region, there is no direct influence from the SAMA other than the lower rigidity cut-off that leads to an increased count rate. Other details about the magnetic field components such as muon and neutron count

rate, diurnal variation and''sunset enhancement' are reported in this work.

Cosmic rays

He neutron monitor

Magnetic reconnection

Sunset enhancement

Charged particles

Cosmic ray detectors

Cosmology

Geomagnetism

Magnetic fields

Magnetism

Magnetometers

Neutron detectors

Neutrons

Rigidity

Sea level

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South Atlantic magnetic anomaly

Southern Hemisphere

Cosmic rays