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lower ionosphere cosmic noise absorption responses to the interplanetary magnetic field behavior in the south atlantic magnetic anomaly and sub-auroral regions

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The interplanetary magnetic field (IMF) plays an important role in the cosmic ray flux modulation that reaches the lower ionosphere, which is one of the main sources of the ionization in these regions. In this work, it is presented data analysis results obtained from riometers operating at 30 MHz over Cachoeira Paulista (located at South Atlantic Magnetic Anomaly (SAMA) - connected to an antenna pointed to the zenith direction, 22.50°S; 45.00°W) and the Brazilian Antarctic Station - EACF (connected to an antenna pointed to the zenith and geomagnetic west directions, 62.56°S; 58.39°W) during almost one complete solar cycle (1989-1996). Previous results have shown that there is a strong correlation between the cosmic noise absorption (CNA) behavior and the IMF. Basically, the sub-auroral region presents a decrease in the CNA with the increase of the IMF intensity, while in the SAMA region, for the same IMF conditions, it was registered an increase. Related to the IMF direction, the greater values of CNA are present when the IMF is pointed to the south and to the east for EACF and AMAS regions, respectively. The results of these data analysis are discussed and the galactic cosmic noise absorption is computed by using the geomagnetic activity (geomagnetic field values) to show the relationship between CNA and IMF behavior.

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