

Variations of geomagnetic cutoff rigidity in the southern hemisphere close to 70°W (South-Atlantic Anomaly and Antarctic zones) in the period 1975-2010

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© 2018 COSPAR We report the existence of rapid variations in (effective) geomagnetic cutoff rigidity (R_c) between the equatorial and Antarctic zones adjacent to the Andes Mountains, revealed by the variation rate of geomagnetic cutoff rigidity (VR_c) in the period 1975-2010. Our analysis is based on empirical records and theoretical models of the variations in cosmic rays and on the structure of geomagnetic fields. These have given us a different view of variations in R_c in time and space along the 70°W meridian, where secular variations in the geomagnetic field are strongly influenced by the proximity of the South Atlantic Magnetic Anomaly (SAMA), one of the most important characteristics of the terrestrial magnetic field that affects our planet, close from the equator to the 50°S parallel and from South America to South Africa. The VR_c presents rapid changes in mid-latitudes where SAMA exerts its influence despite the existence of smooth changes in the geomagnetic field. This shows tha