X RAY FLUXES AT BALLOON ALTITUDES IN THE SOUTH ATLANTIC MAGNETIC ANOMALY

O. Pinto Jr., W.D. Gonzalez
and A.L.C. Gonzalez
Ministério da Ciência e Tecnologia - MCT
Instituto de Pesquisas Espaciais - INPE
São José dos Campos - SP

A review of the status of the knowledge concerning X-ray measurements at balloon altitudes of the South Atlantic Magnetic Anomaly (SAMA) is presented, including a detailed description of the data obtained in two balloon-borne experiments using omnidirectional scintillation detectors in 1981. The results are also compared to similar ones obtained in the past (Ghielmetti et al, 1964). The main conclusions achieved are: (1) During magnetically quiet periods, the principal X-ray components at balloon altitudes in the SAMA region are the diffuse extragalactic component and the atmospheric component, namely, X-rays secondary of cosmic rays. The X-ray flux associated with electron precipitation in the SAMA region at these times is, at least, one order of magnitude less than these components (Pinto and Gonzalez, 1986a). (2) During magnetically disturbed periods, such as those related to strong geomagnetic storms ($|Dst|_{max} > 100nT$), the X-ray component produced by electron precipitation in the SAMA region is dominant. This component is mainly related to electrons with energies between 100 kev and 1 MeV that, by turn, may be the dominante source of pair production at altitudes around 60 km (Pinto and Gonzalez, 1986b). (3) The time-variations of the X-ray fluxes measured on April 14, 1981, in association with a strong geomagnetic storm ($|Dst|_{max} = 291nT$), show evidences of a periodicity with a period around 108 sec, suggesting that ressonant wave-particle or wave-wave-particle interactions take place at the SAMA region (Pinto et al., 1987).

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