A BALLOON-BORNE IMAGING TELESCOPE FOR HIGH ENERGY ASTROPHYSICS

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A new balloon-borne imaging telescope for observations of southern hemisphere celestial sources in the energy range from 50 keV to 5 MeV is described. The detector is a 41-cm diameter, 5-cm thick NAI(T1) crystal coupled to 19 photomultipliers in an Anger camera configuration, with a spatial resolution of about 10 mm at 100 keV. It is surrounded by a well-type plastic scintillator shield 15-cm thick on the sides and 200-cm thick at the bottom, which also defines the field of view of the instrument. The imaging capability is provided by a coded-mask based on a 19 × 19 MURA (Modified Uniformly Redundant Array) pattern, mounted in an one-piece mask-antimask configuration. The angular resolution is of the order of 15 arcmin over a field of view of approximately 15° (FWHM). The expected 3σ sensitivity is $\sim 1 \times 10^{-5}$ photons cm^{-2} s^{-1} keV^{-1} at 100 keV and $\sim 1 \times 10^{-6}$ photons cm^{-2} s^{-1} keV^{-1} at 1 MeV for an 8 hour observation time. The platform where the instrument will be mounted has pointing and stabilization capabilities within an accuracy of 5 arcmin in both azimuth and elevation. It employs a 2-axis gyroscope, a reaction wheel, a solar sensor, a CCD camera and magnetometers.

MULTIWAVELENGTH OBSERVATIONS AND MAGNETIC FIELD MODELLING OF A SOLAR FLARE

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Recent ultraviolet and X-ray observations have shown the fundamental role of interacting magnetic structures in the development of a solar flare. The November 12, 1980 flare has been previously studied by De Jager & Boelee (1984, Solar Phys., 92, 227) and by Cheng et al. (1985, ApJ., 298, 887). These authors present different points of view concerning the structures involved during this event. We analyze the Ultraviolet Spectrometer and Polarimeter (UVSP) and the Hard X-Ray Imaging Spectrometer (HXIS) data and compare the location of flare brightenings at different heights in the solar atmosphere with the topology of the magnetic field. The 3D topology is computed using the numerical code described by Démoulin, Hénoux, & Mandrini (1992, Solar Phys., 139, 105) using a discrete number of sources, and the magnetic data have been obtained by the Marshall Space Flight Center vector magnetograph.

Concerning our study of the magnetic field topology, our results show that the number of sources, used in modelling the field, does not affect neither the shape of the surfaces which separate regions of different connectivities (separatrices), nor the intersection of these surfaces (separator).

From our analysis of *UV* and X-ray data we observe four kernels, indicating the presence of three magnetic structures involved in the flare. The flare brightenings at different wavelengths are located on the separatrices at photospheric level and can be linked by field lines passing close to the separator. We conclude that this event was the result of large scale magnetic interaction, through reconnection, taking place at the separator region.

LA CAPTURA DE COMETAS DE LA FAMILIA DE JUPITER. ESTUDIOS NUMERICOS

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Se estudia numéricamente el proceso de captura de cometas desde órbitas originales parabólicas a órbitas finales de corto período (períodos orbitales P < 20 años). Estos cometas son los que se denominan usualmente de la familia de Júpiter. Para este estudio numérico se utilizan dos aproximaciones diferentes: 1) Para la etapa de tránsito en que mantienen órbitas muy excéntricas (P > 200 años), se suman aleatoriamente a los parámetros orbitales más característicos: energía orbital E, distancia del perihelio q e inclinación i, los respectivos incrementos ΔE, Δq y Δi, que corresponden a cada pasaje por la región planetaria.

Esta aproximación se basa en la premisa de que, debido a los largos períodos orbitales, el cometa encontrará en el siguiente pasaje por la región planetaria, una configuración planetaria completamente diferente de la anterior.

Los incrementos (ΔE, Δq, Δi) se toman de una base de datos construída previamente a partir de la integración de una muestra de cometas ficticios. 2) Para la evolución posterior de los cometas (P < 200 años), se utiliza el método de Opik que computa las perturbaciones orbitales en encuentros próximos, bajo la asunción simplificadora de que la perturbación se puede tratar como un problema de dos cuerpos.

Se encuentra que una fracción significativa de

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