analysis. The microwave emission and the hard X rays are prompt signatures of the flares. The main concern for the microwave analysis is to know the magnetic field intensity and the viewing angle of the field lines. For this subject we developed a numerical code for the field lines extrapolation from the photosphere to the chromosphere and low corona using the force free theory. We present here a detailed analysis of the active region NOAA 10095 that produced an X1.5 flare on 30 August 2002 at 13:28 UT with the hard X rays emission peaking at 13:28 UT. The active region was observed by many imaging instruments on the East solar limb. The importance of the limb flare observation is the possibility to visualize the field lines from the side and possibly scale them better for the 3D topology. However, for field line extrapolation the central regions are in general preferable. The magnetic field (B) topology could not be extrapolated for this flare from the MDI magnetograms taken at limb due to line of sight component of B was mainly azimuthal at this longitude (N09 E70). The time sequence of the magnetic field flux showed a gradual evolution of the photospheric field for the time period of the burst but presented a small region associated to the flare position evolving fast. We succeeded to reconstruct most of the field lines presented on a TRACE image taken in EUV (195 Å) at the flare maximum using a magnetogram observed 36 hours later and rotated back to the time of the burst.

PAINEL 142

ANÁLISE DA EXPLOSÃO SOLAR DE 10 DE SETEMBRO DE 2002

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Apresentamos um estudo do evento do dia 10 de setembro de 2002 as 1450 (UT), sendo classificado como M 2.9 pelo satélite GOES, na faixa submilimétrica do espectro eletromagnético, através de dados nas freqüências de 212 e 405 GHz, observados por meio do Telescópio Solar Submilimétrico (SST), localizado nos Andes argentinos. Este evento foi observado simultaneamente em raios-X duros pelo Ramaty High Energy Solar Spectroscopic Imager (RHESSI). Calibramos em temperatura o sinal obtido pelo SST, corrigimos a absorção atmosférica e, por meio do método dos múltiplos feixes, determinamos o fluxo e as posições da fonte. Em seguida, utilizando dados de outros observatórios, estabelecemos o espectro da emissão rádio. Comparamos as posições obtidas em 212 GHz com imagens UV do instrumento EIT e TRACE e com raios-X duros do RHESSI. As principais conclusões de nosso trabalho são: atraso no máximo de emissão rádio 212 GHz de 20 segundos em relação ao máximo da emissão raios-X duros em 100 keV; coincidência da posição da fonte rádio com a posição da fonte raio-X; e o índice

espectral dos elétrons derivado das observações rádio em torno de 2.5, enquanto que nas de raios-X resultou-se um valor superior a 4.5. Concluímos então que a emissão rádio provém de elétrons com energia superior a 300 keV cuja emissão não foi observada pelo RHESSI.

PAINEL 143

X-RAY AND ASSOCIATED RADIO LIMB FLARE INVESTIGATIONS

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A total of 22 solar flares observed near the solar limb in X-ray by the "Ramaty High Energy Solar Spectroscopic Imager" (RHESSI), during the period of April/2002 to May/2003, was selected to investigation. Hard X-ray images were obtained during the impulsive phase of these flares and the location of the X-ray sources relative to the solar limb was obtained. The analysis of the X-ray spectra is in progress and the details of the spectral characteristics will be also presented. In particular, two of those flares were associated with radio bursts recorded in decimetric frequency range by the Brazilian Solar Spectroscope (BSS) and the Ondrejov Radio Telescopes (ORT), covering the frequency range of 800-4500 MHz. The 4th April, 2002 (? 15:24-15:38 UT) flare was observed in X-ray up to 50 KeV by RHESSI. The position of X-rays source in four X-ray energy bands were the same and it was located about 6 degree behind the east solar limb, implying an occultation height of about of 4000 km. Also, the presence of slowly drifting decimetric fine structures in radio spectrum, with negative rate, suggests the injection of energetic electrons into a plasmoid which is slowly drifting upwards in the solar corona. The 4th August, 2002 (? 09:23-10:23 UT) flare was also observed in X-ray up to 50 KeV by RHESSI. Single X-ray source located just above the limb was stable during the evolution of the flare. Associated radio emission over the band of 800-4000 MHz was observed by the ORT. In the initial phase, broadband radio pulsations covering entire frequency range were recorded and later on continuum was observed. Long duration (? 1 hour) of the X-ray flare and its association with radio pulsations followed by continuum suggest loop-like structures. Details of these observations and analysis will be presented.