ABSTRACTS


As the gradual phase of a flare is traced by the time evolution of the intensity of the soft X-ray emission, the impulsive phase can be identified by studying the line profile characteristics of the Ca XIX and Fe XXV resonance lines and associated satellites, as observed by the Bent Crystal Spectrometer. A large broadening and a blue wing of the soft X-ray lines is typically associated with hard X-ray bursts (NRBS experiment). The line broadenings indicate turbulent velocities of the order of 100 km/sec or higher, and reach a maximum value in coincidence with the peak of the hard X-ray burst, while the blue shifted component of the Ca XIX and Fe XXV spectra indicates the presence of plasma emitted with a line of sight velocity of the order of 300 km/sec. The soft X-ray spectra, characteristic of the impulsive phase of a flare, can be interpreted in terms of a multi-component plasma. An appropriate data analysis technique allows one to compare the observed and theoretical spectra and deduce the changes of temperature, ionization conditions, and emission measure, as well as of the kinetic properties of the plasma in response to the energy release associated with the hard X-ray bursts. The 10 May event will be presented as a typical case for describing the impulsive phase soft X-ray emission.


Several observations have been made with the SMM Coronagraph/Polarimeter of H-alpha ejecta associated with coronal transients. These unique observations of H-alpha in the outer corona are possible with this instrument, the space-borne coronagraph capable of multicolor photometry/polarimetry. One of the 6 filters in the instrument is a 42A bandwidth H-alpha filter. Of the H-alpha ejecta observed, some have been followed to the limit of the field of view of the coronagraph, 5.5 R\(_S\) thus requiring they maintain their intensity for at least a few hours. In order to understand the lifetime of the cool prominence material in the hot outer corona, the physics of the H-alpha emitting ejecta is discussed both from a thermodynamic and dynamical point of view. Attempts are made to establish the thermodynamic energy balance of the prominence material in the presence of the coexisting magnetic fields. Comparisons will also be made with a dynamical model of transient associated cool ejecta matter.

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D.8 Radio and Visible Light Observations of a Coronal Transient Associated with a Prominence Eruption. T.E. GERGELY, M.R. KINDBU, P.T. ERSKINE, U OF WA, C. SAWYER, W.J. WAGNER, R. ILLING, L.L. HOUSE, NAO/NCAR, M.K. McCABE, U OF HAWAI, R.T. STEWART and C.J. NELSON, CSLIO - A transient event in the corona was recorded on 9 April 1980 by the C/1 experiment aboard the Solar Maximum Mission satellite and by ground-based radio and optical telescopes. The event started at 2112 UT with a prominence eruption at PA 258°–264° observed in H\(_\alpha\) at the U of Hawaii's Haleakula Observatory. Most of the ejecta fell back towards the chromosphere but a few blobs were observed to accelerate even at \(\approx 1.25 \text{ R}_S\) from disk center. Two type II radio bursts and a moving type IV burst were associated with the transient. The bursts were observed with the U of Maryland Clark Lake Radio Observatory's swept-frequency interferometer and the Culgoora radio heliograph and spectograph. The type II bursts started at 2237 and 2238 UT. They were observed in the 65 to 30 MHz band and at heights ranging from 1.2 \text{ R}_S\) to 2.0 \text{ R}_S\). The weak moving type IV burst was observed from 2235 to 2315 UT over the height range 2.8 to 3.5 \text{ R}_S at 80 MHz by Culgoora and from 2303 to 2309 UT at 40 MHz by the S-arm of the CLIO array. Coronagraph/Polarimeter visible-light observations of the expanding transient commenced at 2316 UT and continued for about 2 hours, following the transient in the height range 1.5 to 5 \text{ R}_S\. We analyze the relationships of the eruptive prominence and the meter-wave radio sources to the transient, and discuss possible physical mechanisms responsible for the mass ejection.

D.9 Large-Scale Evolution of Solar Activity Related to Selected SMM Flaring Regions. PATRICK S. MCINTOSH, NOAA Space Environ. Lab.

Solar activity as displayed on H-alpha synoptic charts.

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