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ABSTRACTS

Alta Res. Lab. - Observations of X-ray emission from the decaying phase of a small (importance -7) solar flare were obtained from a rocket borne proportional counter spectrometer. The spectra span the 0.1 to 0.3 um region and have been fitted with a spectrum characterized by an isothermal continuum plus one line whose wavelength and intensity are parameters of the fit. The best fitted wavelength (0.19 um) corresponds to the group of lines produced by helium-like iron. The observed intensity of these lines has been compared to the intensity expected from a thermal plasma on the basis of the temperature and emission measure derived from the best fitted continuum spectrum. The computed line emission is based on the work of Gabriel (MNRAS, 160, 99, 1978) and Eballe, Gabriel and Presnaykov (MNRAS, 172, 359, 1975) and the ionization balance calculations of Jordan (MNRAS, 160, 99, 1978). During the course of the event, the observed intensity of these He-like lines systematically exceeds the expected value by factors of up to 100. We interpret this discrepancy as being due, at least in part, to errors in the ionization balance calculations at temperatures far from the peak ionic abundance for Fe XXV. This research has been supported by NASA Contracts NASw-1398 and NASw-2516 and the Lockheed Independent Research Program.

FRIDAY, 25 JUNE

Special Solar Physics Division Mini Symposium:

Robert's Hall, 0900-1200

Invited Papers

SD.OA.03 Recent Progress in Soft X-Ray Solar Observations. A. KRIEGER, ASU.

SD.09.03 Recent Progress in the Study of Coronal Holes. J. B. ZIKER, High Alt. Obs. & U. HI - Coronal holes are being studied intensively by over 50 scientists during a nine-month Skylab Workshop. Data obtained by the AFR experiments, by Interplanetary probes and by ground-based observatories have been analyzed and compared with theoretical models. This report presents some of the conclusions that are emerging from the study. Coronal holes, particularly the polar holes, are almost invariably sources of high speed solar wind streams. The large energy fluxes observed in such streams raise severe theoretical difficulties. Extended heating or modified heat conduction in the wind seems necessary to account for the energy fluxes. Large scale magnetic fields in coronal holes control the geometry and, indirectly, the mass and energy flux of solar wind streams. The apparent "rigid" rotation of holes may result from continuous magnetic field reconnections between differentially-rotating structures.

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SD.OC.03 Interpretation of EUV Flare Observations. F. Q. O'BALL, LASP, U. Colo. - Solar flares evidently both produce a hot rapidly evolving coronal plasma and profoundly modify the solar atmosphere that surrounds and underlies the primary flare event. Both the hot plasma and the disturbed atmosphere emit a strong time dependent EUV spectrum that provides a diagnostic probe of almost all stages of the flare. This paper will briefly review existing EUV observations of the pre-flare phase, the impulsive phase, and the main phase of the flare event, and summarize current progress in their interpretation. In recent years, much evidence has accumulated that a large part of the total energy of many flares is generated during the flash or impulsive phase in the form of energetic subrelativistic electrons. Emphasis in this review will be given to the response of the transition region and chromosphere to the impact and subsequent thermalization of such energetic plasma, and to the impulsive EUV spectrum that is a consequence of it.

SD.OD.03 A Summary of New Observations of the Chromospheric-Coronal Transition Region from OSO-8. O.R. WHITE, High Altitude Observatory* and U. Colo. - The first year of the OSO-8 experience is reviewed with emphasis on new transition region measurements from both the CNRS and LASP experiments. The rastering and spectral scanning capabilities of these two spectrometers have allowed collection of both spectroheliograms and line profiles for lines of Hi, CIV, SiIIII, SiIV, CII, MgII, OVI, and CaII that span the height range from the photosphere to the transition region at about 2500 K. Solar oscillations of line positions and strengths have been observed in several of the strong lines, and the periods of these motions range from 10 min to 35 sec. Such measurements in active regions show infrequent impulsive brightenings, suggestive of shock phenomena. Persistent flows have also been observed to show a correlation of downflow with bright network. Observations in OVI map the magnetic field structure in both sunspot regions and the quiet chromosphere. Measurements of line shifts at the solar limb show a systematic blue displacement of CIV and SiIV lines relative to spectra made on the disk. Both experimental groups plan to continue measurements into the next year of operation, but the emphasis of the research programs is shifting to in-depth analyses of line profiles, their variation with time, their variation in quiet and active regions, and the general morphology of line emission from the transition regions as exhibited by various ions available in the spectra.

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