Using this, we have been able to set a firm lower limit to the chemical abundances and to find a somewhat less firm determination of the abundances themselves.

The Spectrum of the Chromosphere and Corona from 13000 to 17000 on March 7, 1970. J. T. JEFFRIES, P. Q. O'BRIEN, and J. B. ZIEKER, University of Hawaii. During the total Solar Eclipse of March 7, 1970, we obtained spectra of the inner corona simultaneously at all position angles around the limb from 13000 to 17000. We were in all respects fortunate since conditions at the site in Halema, Næsby were ideal and the spectra are well exposed, focused and standardized. Fifteen spectra were made at different exposure times to record the corona, prominences and chromosphere. The linear dispersion was 36 A/mm and 18 A/mm in the first and second orders, and the solar image size was 1 cm. The 8/4.8 spectrograph is the same one that we used in 1965 and 1966 and has been described by Dunn (1966, Trans. Inst. Soc. America 5, No. 2).

No strong coronal condensation was present on the limb at eclipse time, although the yellow line [Ca XI] was observed over a wide region on the west limb. Twenty-five emission lines are present on the spectrograms, particularly in the violet.

Estimates of the Role of Mechanical Heating in the Low Solar Chromosphere. STUART D. JORDAN, Laboratory for Solar Physics, NASA-Goddard Space Flight Center, Greenbelt, Maryland. Approximate calculations of the temperature distribution and departures from LTE in the H and H elements are made for different values of the mechanical energy in the low solar chromosphere. Estimates of the relative magnitudes of the inelastic collisional and non-coherent scattering of continuum radiation (Shamach, 1970 Astrophys. J., 159, 1077) terms are made, and their relationship to the mechanical heating is discussed. A notable result is that the amount of mechanical energy required to produce a given temperature above the radiative equilibrium value in the first few hundred kilometers is crucially dependent upon the location and values of the minimum temperature. Although this result is obtained without including line blanketing in the problem, the result should remain true when a proper non-LTE treatment of line blanketing is included (Athay, 1970 Astrophys. J., 161, 713). Finally, it is shown that the departure of the H line population from LTE, discussed by Gebbie and Thomas (1970 Astrophys. J., 163, 229) is critically dependent on the ratio (\(n_0/e_0\)) of neutral hydrogen to electron particle densities. Lower values of \(n_0/e_0\), given \(n_0\), reduce the line density, and the increase near the minimum of the reaction \(3H + e \rightarrow H_2 + H\) drives \(H_2\) toward its LTE value.

Characteristics of Energetic Electrons in the Source Region of Impulsive Solar Flare X-rays. S. R. KANE, Univ. of California, Berkeley. High time resolution measurements of impulsive solar flare x-rays \(\geq 10^7\) keV made with the GO-5 satellite are analyzed to determine the characteristics of energetic (\(\geq 10^7\) keV) electrons responsible for the impulsive hard x-ray emission. The findings are: (1) The spectrum of the energetic electrons is non-thermal. (2) The injection of energetic electrons into the x-ray source region occurs more or less continuously throughout the duration of the impulsive burst. (3) Escape of energetic electrons from the x-ray source region plays an important role in determining the time-intensity profile of the impulsive x-ray burst.

On the Interpretation of Coronal Properties from Type III Radio Burst Measurements. Roger A. Kopp and C. W. Penuma, High Altitude Observatory. A theoretical analysis is presented which incorporates observations of Type III radio bursts into solar wind theory. Under the assumption that the bursts are excited at the plasma frequency and collisionally damped, the equations for the conservation of momentum, mass, and energy yield a model of the ambient medium in which the bursts occur. The unusual properties of this model suggest that, either the bursts are not collisionally damped or that they must be produced in extremely thin dense regions of the corona plasma such as, for example, the neutral sheets associated with coronal streamers.

Spectral Hardening during X-Ray Bursts. W. E. KINZ, N. R. BLOM, W. H. CHAMBERS, P. E. PENN, J. C. PULFLE, and R. W. MIKEL, Los Alamos Scientific Laboratory. X-rays and VI satellites carry photomultiplier-scintillator detectors capable of five channel pulse height analysis. Data are obtained during a two-second counting period at intervals of 32 seconds when the satellite is in the real time mode of operation. Data from ion chambers covering the 2-12 keV and 1-6 keV regions are obtained at two second intervals. We shall show spectral data for typical flares. Laboratory studies of the scintillators indicate severe pulse pileup problems at very high count rates which produce instrumental hardening of the spectrum.

*This work was performed under the auspices of the U.S. Atomic Energy Commission.

The Intermediate Infrared Coronal Radiance. W. G. MANKIN, R. M. MACQUEEN, and R. J. LEE, High Altitude Observatory. An attempt to observe the thermal emission of the corona in the intermediate infrared (7-13\(\mu\)) at the eclipse of 7 March 1970 has resulted in an upper limit for the coronal radiance of approximately \(3 \times 10^{7}\) watts/cm²-ster-\(\mu\), to be compared with that predicted (Kaiser, C. B. 1970 Astrophys. J., 159, 77). The observations, which cover the range 3-12 \(\mu\), and the limitation due to fluctuating emission from the sky are discussed.

A Discussion of the 2 November 1969 Solar Cosmic Ray Event. A. J. MASSEY and P. R. SATTERBLOM, McDonnell Douglas Astronautics Company - West. The 2 November 1969 Event was one of the largest observed on 2 November 1960. The 30 MeV rimiter at McMurdo Sound measured a peak absorption of 14.5 dB. A flare occurred at 0943 on 2 November in a region one day behind the West limb. Shortly thereafter absorption due to solar particles began to increase in both the Northern and Southern Polar caps. Observations made by the polar rimiters and the polar orbiting GOO-6 experiment will be presented. Details of the intensity profile, energy spectrum as a function of time and related geophysical observations will be discussed.

High Resolution Solar Ultraviolet Spectrograms. H. C. McALLISTER, University of Hawaii. Six spectrograms of the solar spectrum have been obtained in the spectral region from 2700 to 7700 A at a resolution of approximately 2\(\AA\) during a rocket flight on September 23, 1969. The spectrograph uses an echelle (7525 A/m) crossed with a grating (1700 A/m) in an f/10 Cassegrain arrangement. A spatial resolution of approximately 3 arc minutes was achieved by means of a biaxial pointing control. All the well-known features of the solar spectrum,