diffuse, long wavelength, X-ray emission. A striated region of emission, seen surrounding a large quiescent filament (20E-45N to 15W, 25N) may indicate the passage of material into or out of the region. Weakly emitting loop structures, reaching high into the corona, are seen to extend over this feature and over a disjointed filament which runs diagonally across the S.E. quadrant of the disc. Estimates of the temperature and density of the surrounding structures enable upper limits to be set for the density of the northern cavity. Hence the amount of coronal material which may have condensed to form the filament may be evaluated. Physical dimensions of the filament, inferred from Hα photographs and from prominence observations, are used to estimate its total density. This is then compared with the computed coronal deficiency.

Methods for Measurement of High Fields. A. M. TITLIE, Lockheed Solar Observatory, Lockheed Missiles and Space Company, California. - The measurement of the magnetic field in sunspots and other high field regions often presents difficulties because of peculiarities of the line profile shape.

Two methods are suggested that yield the magnetic field strength and are independent, to a large extent, of the line profile shape. The first depends on the properties of the first three moments of a Zeeman profile; the second, on Fourier transform properties of the line profile.

Both of the methods have been tried on computer-generated line profiles with various amounts of random noise. Both yield good results on computer generated data. When used on real spectra the moment method sometimes exhibits unstable behavior. The Fourier Transform method does, however, yield consistent results for real data.

Movement of a Bright Source in the White-Light Corona. R. TOUSKY and M. KOCHEN, Naval Research Lab. - On 8 Feb. 1972 the NRL white-light coronagraph in NASA's OSO-7 recorded a large bright source which moved outward through the intermediate corona. When first recorded at 2111 UT this object appeared as a roughly circular sharpened edge, with a diameter ~1.5 Rₐ., and with its leading edge at a radius of ~3 Rₐ.

The position angle was at 58° eastward from solar north. Any connection between large sources and solar surface was not observable because of the instrument's occulting disk which eclipses the sun and inner corona to ~2.9 Rₐ.

The cloud's leading edge moved radially outward with a velocity ~200 km/sec, reaching 5.1 Rₐ. at 2146 UT, when observations were terminated by spacecraft sunset. By this time the cloud had developed a looped structure. Assuming constant velocity, coupled with the observed radial motion, the cloud left the solar limb at ~1946UT from the location of a limb prominence, which was centered approximately at a position angle of 35° at 1739UT. It is concluded that this prominence represents the source of the observed cloud, since the corona through which the cloud eventually passed did not show any streamer structure or enhancement prior to the event.

In spite of the obvious outward passage of a high-density cloud, we are not yet aware of any radio emissions which may be associated with it. The description above is in distinct contrast to that for an event recorded by the coronagraph on 14 Dec. 1971 when the disruption of a long bright streamer preceded the appearance of outward moving clouds, which were then connected with streamer emission and probably an energetic flare behind the limb. This work is supported by NASA funds.

The GSFC EUV and X-Ray Spectroheliograph on OSO-7. J. H. Underwood and W. M. Neupert, Solar Physics Branch, Goddard Space Flight Center, Greenbelt, Md. 20771. - This paper describes the instrumentation carried in the GSFC half of the OSO-7 pointed section. In the EUV spectral region (170-400 Å), a Wolter type 2 glancing incidence telescope forms a real image of the sun on an adjustable slit, which also serves as the entrance slit of a conventional glancing incidence grazing spectrometer. With this optical system it is possible to study the EUV spectrum of a section of solar disc as small as 10 by 20 arc seconds, with a spectral resolution of about 1 Å. Three detectors are mounted around the Rowland circle and, by using the spacecraft raster mode, it is possible to make spectroheliograms of all or part of the solar disc in 3 EUV lines and Hα simultaneously. For the x-ray region a mechanical multigridded collimator is used to define a section of disc 20 by 20 arc sec. Individual lines are isolated by the use of balanced (Ross) filters mounted in front of double chamber proportional counters.

A flare polarimeter for the 10-40 keV region is also included. Samples of data from each of these instruments will be shown.

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On the Difference between the Poles and Equator in the Region of Formation of the Lyman Continuum. J. E. Vernazza, Harvard Observatory, and R. W. Noyes, Smithsonian Observatory. From the analysis of Harvard OSO IV Lyman continuum spectroheliograms, differences in brightness and color temperature between polar and equatorial regions are found. These differences are interpreted as a result of a lower chromospheric density and a smaller temperature gradient at the poles, as compared with the equator. Two models, one for the poles and one for the equator, giving temperature and density as a function of height explain the Lyman continuum observations. At ~1250 Å the polar pressure is 0.10 dyne/cm² and the equatorial pressure 0.17 dyne/cm². The differences begin in the middle chromosphere around 1300 km above T = 1, and increase toward the transition zone.

Multiple Components in the Impulsive Phase of Solar Flares. V. V. KORPHAL, Guest Investigator, Hale Observatories. - Quasi-periodic impulsive x-ray bursts have been reported by Parks and Zinkler (Ap. J., 152, 1117, 1969) and by Prost (Ap. J. 4, 655, 1971). Here we discuss the Na, microwave and hard (> 10 keV) x-ray emission from more than 30 flares with multiple components in the impulsive phase. Ten percent of 1500 events occurring in 1965 contained a hard x-ray spike. Less than 1 percent of the 1500 had more than one peak in the x-radiation, with some having as many as four peaks. There is a definite tendency for the electron spectrum to soften from one spike to another in a multiple burst. Time between spikes maximally characteristically ranges from 15 to 45 seconds although time between peaks in the same event normally varies by 10 percent or less. In 22 of 25 multiple x-ray bursts the first, and often the second, microwave peak is not present at frequencies less than 2500 MHz. At most, the initial radio bursts at low frequencies increase and decrease gradually, i.e., are not impulsive. However in later peaks of the same event, the flux at these lower frequencies is higher and shows more structure thereby in-