Caltech videomagnetograph at the Big Bear Solar Observatory. We obtained a magnetic movie of a young sunspot group on 15 March 1972 which covered a period of 6½ hours. Small points of both polarities are seen streaming away from the large spot with velocities between 0.6 and 1.0 km/sec. More than a dozen other magnetic features are seen to move with velocities from 0.3 to 0.7 km/sec. At least three bipolar patches appear during the course of the movie; these are assumed to be new EFR's. One of these pairs separates rapidly (0.7 km/sec), while another pair is observed to rotate through 180°.

The Photospheric Velocity Field in and Around Sunspots N. R. SHEELEY, JR., Kitt Peak National Observatory. - Observation of the horizontal velocity field in and around sunspots have been made to see whether material motions can account for the observed - 1 km/sec transport of small-scale magnetic fields outwards from sunspots. Outside of the penumbra the 0.5 - 1.0 km/sec horizontal flow is indistinguishable from the supergranulation with the direction of motion tending to be outward from well-developed or decaying sunspots. The ever-shed velocity has a completely different character and is confined to the penumbra itself. Although these observations suggest that the supergranulation may be responsible for the horizontal outflow of small-scale magnetic fields, the detailed origin of these magnetic fields at the boundary of a sunspot remains a mystery.

The Coronal Transient of 1970 March 21. Kevin Sheridan, CSIRO, Australia, Charles Garcia and Richard Hansen, High Altitude Observatory - A moving Type IV disturbance was observed to 5 R with the 80 MHz Culloara radiotelegraph on 1970 March 21. Concurrent white-light coronal measurements at Mauna Loa showed a sudden decrease in brightness at heights 1.1 - 2 R, as the disturbance moved outward. Generalizing from this and several other events during the past couple of years we find that coronal features may be abruptly expelled at the time of solar flares but that -- surprisingly -- the coronal structure is restored within hours.

On the Source of the Slowly Varying Component at Centimeter and Millimeter Wavelengths - F. I. Shimabukuro, Aerospace Corp., G. A. Chapman (Guest Investigator, Kitt Peak National Observatory), Aerospace Corp., S. Bitelson (Guest Investigator, National Radio Astronomy Observatory), NASA, Ames Research Center and B. R. Mayfield, Aerospace Corp. - Measurements of the random and polarized radio emission at centimeter and millimeter wavelengths provide much information on physical conditions in the chromosphere, chromosphere-corona transition region and the corona. Using concurrent observations of magnetic fields, random and polarized radio emission, and relativistic data obtained in October, 1971, an investigation was made to determine the origin of the slowly varying component. Recent models of the temperature and electron density profiles in these regions by the Harvard group, based on extreme ultra-violet data, are characterized by an extremely thin transition region in which there is a temperature rise of 5 x 10⁶K and an electron density decrease of an order of magnitude in less than 500 km. A current magnetic field model obtained from a scalar potential developed by Schmidt. An investigation is made to see whether a continuum model, based on the recent EUV measurements and on current free magnetic fields, is consistent with the measurements of the slowly varying component of random and polarized emission at centimeter and millimeter wavelengths.

Photoelectric Ca II Line Profiles in Solar Plages and a Sunspot and Their Preliminary Interpretation. - RICHARD A. SHINE and JEFFREY L. LINSKY, Joint Institute for Laboratory Astrophysics, Boulder, Colo. - We have obtained photoelectric double pass profiles of the Ca II lines 3933, 3968, 8498, 8542, and 8662 Ǻ in the quiet chromosphere, a number of plages of a range of emission strength, and a sunspot. The profiles were obtained sequentially but in a short amount of time, are well-calibrated, and refer to relatively homogeneous regions on the disk. In bright plages the infrared triplet lines all show double reversal features, but only the least opaque line (8498Å) exhibits a double reversal feature in weak plages. We will present a preliminary analysis of the data assuming a 5-level representation of Ca II and hydrostatic equilibrium.

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Correlation between the Intensity Fields of the Chromospheric and Coronal Networks. G. W. SIMON, Sacramento Peak Observatory, APO, and D. K. LYNCH, University of Texas. - Observations of quiet regions were obtained simultaneously in the Ca K line (Mt. Wilson Observatory) and in a number of chromospheric, transition zone, and coronal EUV lines (Harvard experiment on the OSO-VI satellite). We have measured cross-correlation coefficients of 0.5 - 0.9 between various pairs of these observations, which indicate that the network structure seen in Ca K extends upward into the high transition zone, although it becomes more diffuse with increasing height, and probably only the brightest points of the network extend into the low corona.

Rotation of Active Regions in the Corona. G. W. SIMON, Sacramento Peak Observatory, APO. - Further analysis of data from the Harvard experiment on the OSO-VI satellite indicates that the rotational sidereal rotation velocity of active regions is the same whether measured in the Lyman continuum (2000 km above the photosphere), or in Mg X (11000 km). For the period of observation (27 Oct 67 to 29 Nov 67) this velocity is measured to be 14.7 ± 0.2° per day. Thus, within the accuracy of our measurements, there appears to be no differential rotation with height in active regions, although we did observe differential rotation with latitude.

On the Quantitative Description of the Fluctuating Solar Atmosphere. 1. Regression Analysis and Calibration of Multi-channel Observations. A. Skumanich, C. Smythe, HIGH ALTITUDE OBS., NOAA, and E. N. Frazier, Aerosp. Corp. Recent multi-channel observations (E. N. Frazier, 1970 Solar Phys. 24, 89) of the quiet-sun sunspot number to yield explicit linear regression relations between vertical magnetic field and vertical velocities and between magnetic field and Ca II-core brightness for a variety of supergranulation (SG) features (downdrafts). The average network field in "unipolar" regions (UPR) was found to be 27 G (2.4 arcseconds resolution) irrespective of the sign of the UPR. A remaining area (call) contained a gaussian distributed field with standard deviation of 3.4 G and 1 G aver-