bipolar active regions enhances the likelihood for collisions between growing sunspots in adjacent members of the same complex. We report the superposed growth in one great complex of 3 bipolar regions on 9 out of 10 successive days during their single transit across the disk. As each bipole spreads, head-on collisions occur between the two large p-polarity spots of the first and second regions (according to age), and between the f and p spots of, respectively, the second and third regions. The latter collision is significant for examining the role of magnetic reconnection in chromospheric heating and flare activity. The morphology of fine fibrils linking the f and p spots in Hα filtergrams (line-core and off-band) at high spatial resolution shows:

(a) in the early days of collision (judged by overlap of penumbras), a steady growth of each spot and a potential field configuration with no enhanced heating along the line of polarity inversion;
(b) initial flare activity, late on the second day of collision is only a subflare with tiny kernels brightening simultaneously over the colliding umbrae at each end of a short arc transverse to the inversion line;
(c) no major flare activity (≥class III) associated with the collision until 6 days after it began; by then, distorted fibrils link the colliding spots in a non-potential field configuration, the f spot fragments, and the direction of collision changes from head-on to a glancing sideswipe;
(d) only in this late shrinking and sheared stage of the collision does a filament form along the line of polarity inversion with signs of adjacent, sustained heating in the chromosphere.

brightness of the K-corona was analyzed with the aim of defining a mean distribution of streamer population per 10 degree latitude band for the entire period of observation. The data were collected over a 19-year period, beginning in 1965, using a series of K-coronameter instruments located at the Mauna Loa, Hawaii site. In order to be able to recognize streamers in the K-coronameter syoptic maps, both the collection of eclipse images from the HAO white light coronal camera and the ATM coronamographs were used to develop a detection scheme for streamers. Since the coronameter data are restricted to heights of 1.3 R_☉ and 1.5 R_☉ (depending upon the instrument system in use at a particular time), the results of this study refer to only the inner portion of the corona and to structure with longitudinal wavenumbers between 1 and 6.

The long-term averaged distribution of streamer number as a function of latitude indicates that streamers identified in this study tend to be located in two latitude bands on either side of the equator, N40 to N10 and S10 to N40. The yearly mean number of streamers detected per synodic rotation period varies by a factor of two, from 14 streamers per syoptic chart to a low of about 6, roughly in phase with the solar activity cycle. This variation is identified with the number of streamers observed at latitudes greater than N40 and less than S40. Within the sub-earth latitude band, N10 to S10, no significant fluctuation of the number streamers is detected over the activity cycle. This fact makes it extremely unlikely that the streamers in the observed latitude band are associated with the measured variation in He^++/H^+ abundance as detected at 1 A.U. in the solar wind.

22.07
Temporal and Spatial Variations of Solar Coronal Bright Points Observed with the VLA
S. R. Habbal, A. Cowell, R. Ronan, G. L. Withbroe (CFA), R. Shevgaonkar and K. Kundu (U. Maryland)

We report on radio observations at 6 and 20 cm of solar coronal bright points made using the VLA. Results of our analysis of the spatial and temporal variations of these 20° to 80° magnetic features will be discussed. The results indicate that significant fluctuations in the intensity and degree of polarization are present on temporal scales of a few minutes. Furthermore, the results show an anticorrelation in the variation of the intensity and degree of polarization. At both wavelengths, the brightness temperature of the bright points is in the range 3 to 5 x 10^7 K.

22.08
VLA Observations of Thermal and Non-thermal Emission From Coronal Loops

Very Large Array observations of coronal loops at 2.6 and 20 cm wavelength are compared with x-ray observations taken with the Solar Maximum Mission Satellite. The probable detection of thermal cyclotron lines from coronal loops is also discussed. Multiple-wavelength observations of the VLA and the RATAN-600 telescope are presented and used to argue for nonthermal emission from some parts of coronal loops. Finally, observations of a multiply-impulsive burst near 20 cm suggest electron-cyclotron maser emission.

22.09
On the Distribution and Variation of Streamers in the Lower Solar Corona
R. Fisher and D. G. Sime (High Altitude Observatory)

A series of observations of the distribution of polarized

22.10
Coronal Transient Apparent Morphology and the Associated Solar Activity
D. G. Sime (High Altitude Observatory)

The apparent morphology of coronal transients observed during the Skylab mission has been compared to the nature of the associated activity. It is found that loop-type transients identified in the Skylab observations occur preferentially in association with prominence eruptions as opposed to with flares. This is interpreted as indicating that an EPL may only be one aspect of a large scale structural change in the corona which is also shown in the transient, while flare associated events are a less organized response to mass ejection from a compact source. Such a view is supported when events are examined individually. The result appears to extend to observations made at solar maximum in spite of some difficulties of applying the technique at that time.

* The High Altitude Observatory is part of the National Center for Atmospheric Research, which is sponsored by the National Science Foundation.

22.11
The Onset of Coronal Mass Ejections
R. Wolfson and S. Gould (Middlebury College)

We have studied the nonlinear magnetostatic equilibria available to an axisymmetric corona as excess mass is added to a region confined in latitudinal extent at the coronal base. In contrast to the corresponding linear situation, we find that sequences of equilibrium solutions evolve discontinuously once a critical value is reached for the difference between plasma betas at the equator and poles. This discontinuity may represent the onset of rapid dynamical processes such as coronal transients and mass ejections. The excess mass required to reach this discontinuity is of the same order as the