Preliminary results of UIT galaxy studies.
S. G. Neff (NASA/GSFC) and the UIT Science Team

The Ultraviolet Imaging Telescope (UIT) plans an ambitious program of ultraviolet galaxy observations, ranging from studies of the LMC to deep surveys of clusters around high redshift quasars. Most galaxy observations are planned for orbital night and are therefore expected to go as deep as 29th magnitude per square arcsecond in some cases. All galaxies will be checked for previously undetected very faint surrounding material. Nearby galaxies will be subjects of studies on star formation rates and locations, gas and dust distributions, population studies, and will be searched for "hidden" nuclear starbursts. Active galaxies such as M87 and Centaurus A will be prime targets; studies will be made of the effects of the galaxies' activity on their evolution and vice versa. Searches will be made of clusters around distant quasars to determine properties of these high redshift galaxies. Very deep exposures will be made of S87 and other "blank" fields for comparison with deep studies at other wavelengths.

Very preliminary results will be presented on the above studies.

All UIT data will be archived at the NSSDC and will be available for public access 12 months after the mission is demilitarized. Data will be available at the AAS meeting on successful observations that may be requested, on dates that specific images will be available and/or on relevant contact persons.

Session 47: Solar Corona
Oral Session, 10:00–11:30 am
Acoma

47.01
Preliminary Results from Modeling the White-Light Corona at 5:35
A. G. Nash and Y.-H. Wang (NRL)

Selected synoptic maps of K-coronal intensity from the 6.5 year SOLWIND experiment are modeled. Some of the coronal features seen on the synoptic maps can be explained by particular electron density distributions. Previously, we used an empirical expression related to the neutral line of the extrapolated coronal magnetic field for the electron density distribution. This was able to produce coronal intensity patterns similar to the observations only for certain years.

Recently, Wang and Sheeley (1990, Ap. J., in press) found an empirical relationship between the solar wind speed from coronal holes and the flux-tube expansion rate, computed from the photospheric magnetic field. Since the electron density is low inside coronal holes, the electron density may be related to the flux-tube expansion rate. Using this results in a better correspondence between simulated coronal intensity features and the observations, and shows some promise in helping us to understand the origin of white-light coronal intensity features.

47.02
Modeling the Solar Corona at Solar Minimum
F. Bagenal and S. Gibson (Astrophysical, Planetary and Atmospheric Sciences, U. of Coloradso, Boulder)

The aim of this study is to derive a fully 3-d description of both the magnetic field and the distribution of plasma in the lower corona constrained by measurements of the white light solar corona and the photospheric magnetic field. To model the large-scale structures which do not change substantially over a solar rotation, we take the magnetostatic model of Bogdan and Low (Ap. J., 306, 271, 1976) and data from a full rotation at solar minimum. We then adopt standard inversion techniques to solve for model parameters that best fit the data. The results are compared with the work of Withbroe (Ap. J., 325, 442, 1988) and Saito et al. (Solar Physics, 55, 121, 1977).

This work is supported by NSF (Grant ATM-8912797).

47.03
The Structure and Dynamics of Solar Coronal Magnetic Fields
S. K. Antihochos, R. B. Dahlburg (NRL), T. Zang (NASA/Langley)

Many aspects of solar activity are believed to be due to the stressing of the coronal magnetic field by footpoint motions at the photosphere. We present the results of a numerical simulation which, to our knowledge, is the first 3-d time dependent simulation of footpoint stressing in an open geometry appropriate for the corona. We consider an arcade that is initially current-free and impose a smooth footpoint motion that produces a twist in the field of approximately 11. We then fix the footpoints and follow the evolution until the field relaxes, primarily by resistive diffusion, to another current-free state.

We see no evidence for any instability, either ideal or resistive, during the complete simulation. The most striking feature of the evolution is that in response to photospheric motions, the field expands rapidly upward to minimize the stress. We conclude that the expansion has two important effects. First, it suppresses the development of 'dips' in the field that would be capable of supporting dense, cool material. At least for the motions that we assume, the magnetic field does not develop a geometry suitable for explaining prominence formation. Second, the expansion inhibits ideal instabilities such as kinking. Although we have twisted the field through only one revolution, it is clear that further rotations will only lead to more upward expansion so that we see no reason for kinking to develop. Our results indicate that simple shearing of a single arcade is unlikely to lead to any significant manifestation of solar activity such as flares or prominences. Details of the simulation results and the numerical code are presented in the poster paper by Dahlburg, Antihochos and Zang. This work was supported by NASA and ONR.

47.04
The Formation of Current Sheets in the Solar Corona: Asymmetric Shears
J.T. Karpin, S.K. Antihochos, and C.R. DeVore (NRL)

A major issue in coronal-heating research is whether or not current sheets can occur without a null point being present in the initial, potential magnetic field. Several analytic studies contend that current sheets form along separatrices between magnetic flux systems whenever the footpoint of the configuration are moved continuously. Both symmetric and asymmetric systems have been investigated (e.g., Low and Wolfson 1988; Vekstein and Priest 1990), all with the assumption...