find that enhancements of emission lines formed at 2-3 x 10^6 K are consistent with the location of bright H alpha emission. However, the EUV radiation enhancements of higher temperature emission lines originate from a larger spatial area (≈ 45 arc sec) that extends eastward from the flare over a photospheric magnetic neutral line and an active filament. This high temperature component may be related to soft X-ray enhancements reported prior to some flares and may also be a counterpart of microwave emission of comparable size sometimes observed prior to an impulsive burst and attributed to heating of coronal loops. Coronal emission line blue shifts are generally no greater than 4 km s⁻¹ over the flare, implying little "chromospheric evaporation". Evolution of chromospheric features is observed during the interval of rocket observations and may have implications for energy release in the overlying corona. This research is supported under NASA RTP 879-11-38 and Grant No. NAGW-1972.

45.04

VLBI Angular Broadening Studies of Plasma Turbulence in The Solar Wind

Turbulence in the outer corona and the lower solar wind is of interest for at least two reasons. First, the solar wind is an ideal test environment for basic plasma physics, particularly turbulence in a collisionless plasma. Second, nonlinear plasma wave processes are believed to be responsible for heating and accelerating the solar wind. Despite such importance, plasma parameter data near the sun (< 0.3 AU) are scarce due to the lack of in situ measurements by spacecraft, and we do not have a clear understanding of MHD processes in the outer corona and the inner solar wind. One of the few ways of obtaining information on plasma characteristics in the solar corona and lower solar wind is via radio propagation experiments. Angular broadening of compact extragalactic radio sources is one such experiment, where the broadened angular size is attributed to diffractional scintillation in the solar wind. The amount of broadening is determined by the path integral of the normalisation constant of the electron density power spectrum. High quality angular broadening measurements are possible with current VLBI equipment and data reduction procedures. We report the results from two VLBI network experiments in which angular broadening measurements of ten extragalactic radio sources were made at 4.99 GHz using the Mk II recording system. The first experiment was conducted when the program sources were close to the sun with the solar elongation ranging from 18 to 243°. The second experiment was conducted 8 months later when all sources were very far from the sun. This was necessary to obtain the intrinsic structure of the program sources without the effect of solar wind turbulence so that the broadened angular sizes were unambiguously measured when the sources were near the sun. We detected angular broadening in two sources, 3C273 and 1148-001, with solar elongations of 180° and 300°, respectively. For the remaining eight sources, upper limits of order 0.6 milliarcseconds were obtained. The amount of scattering was much less than that predicted by the formula by Erickson (Ap. J., 139, 1290, 1964). Possibilities for this discrepancy will be discussed.

45.05

Near-Ultraviolet Spectroscopic Features in Comet Austin (1985k1)

We present the results of spectrophotometric observations of Comet Austin from 3000Å to 4000Å at a resolution of 1.8Å. The strongest features present are the OH A-X 0-0 and 1-1 bands, the NH A-X 0-0 band, and the CN B-X Û=0 band sequence. The (90.0-1 and CN Û=0 bands are well developed and clearly present. We see strong features associated with the CH B-X 0-0 band and several bands of C3. We see emission from the CO2+A-X Û=2, 1, 0, and -1 band sequences, and have identified the lines of this species in greater detail than has been accomplished before. We tentatively identify the OH 2-2 band and the CO2+B-X Û=0-0 band sequences, and present evidence for the presence of H2CO, OH+, NCN, N2+, and CN+. The OH band ratios agree with the theoretically predicted values. The CN Û=1 band sequence is stronger than expected, and the ratio of the CN 1-0 band to the 2-1 band is lower than the predicted value. We believe this discrepancy is caused by OH emission blended with the CN bands.

45.06

HUT Observations of Comet Levy (1990c)

Observations of comet Levy (1990c) were made with the Hopkins Ultraviolet Telescope during the Astro-1 Space Shuttle mission on 1990 December 10. The spectrum, covering the wavelength range 415-1850 Å at a spectral resolution of 3 Å (in first order), shows the presence of carbon monoxide and atomic hydrogen, carbon and sulfur in the coma. Aside from H Lyman-α, no cometary features are detected below 1200 Å, although cometary O I and OII would be masked by the same emissions present in the day airglow spectrum. The 9 x 116 arcsec aperture corresponds to 12000 x 148000 km at the comet. The derived production rate of CO relative to water, 0.13 ± 0.02, compared with the same ratio derived from IUE observations (made in September 1990) which sample a much smaller region of the coma, 0.04 ± 0.01, suggests the presence of an extended source of CO, as was found in comet Halley. Upper limits on Ne and Ar abundance are within an order of magnitude of solar abundances.

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45.07

The 16.0 March 1986 Disconnection Event in Comet Halley
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The most spectacular of all comet plasma (type I) tail phenomena is the disconnection event (DE), during which the plasma tail is severed from the cometary head. In order to more clearly understand the mechanism by which these DEs occur, we have analyzed a series of DEs which were observed during the Comet Halley 1985-1986 apparition. In this paper, we report the analysis of a DE which was observed from 16 March through 19 March 1986.

From kinematic extrapolation of tail/nucleus distance measurements on photographic images in the International Halley Watch (IHWW) archive, we calculated the disconnection time of the 16-19 March 1986 event to be 16.1 ±0.1 March. The solar wind conditions around Comet Halley at the time of DE, inferred by corotation of IMF-8 satellite data to the comet, were such that (1) Comet Halley had just crossed the interplanetary magnetic field (IMF) sector boundary; (2) the solar wind density was ~ 8 cm⁻³; (3) the solar wind speed was ~ 600 km/sec; (4) the IMF magnitude was ~ 8 nT. Given these conditions, we conclude that the most likely cause of the 16.0 March DE was front-side magnetic reconnection, as described in the model of Niedner and Brandt (1978).

While the calculated heliospheric neutral sheet has a complex shape which changes with the solar rotation, the gross, qualitative features remained relatively constant during the period from December, 1985 through May 1986, when the plasma tail of Comet Halley was visible. We show in this paper that Comet Halley crossed the same sector boundary on the heliospheric neutral sheet at the times of the 9.6 January, ~ 21 February, 16.0 March and 10.9 April DEs. This fact lends credence to our conclusion that the occurrence of DEs caused by front-side reconnection is a general phenomenon in cometary tail dynamics.