The IUE Spectral Image System, IUESIPS
KLINGLESMITH, D. A., NASA, Goddard Space Flight Center - The details of the data reduction that is routinely done to the spectral images obtained by IUESIPS will be presented. The complexity of images obtained - high and low resolution, point source or extended object, single or multiple exposures, celestial object of on-board calibration source, long or short wavelength spectra - require a highly complex and flexible data reduction system. However, in order to achieve the desired turn-around time of 24 hours, it is necessary to have a fixed scheme of reduction with only a few options available. The major steps in the data reduction include geometrical correction, photometric correction, data extraction, background removal, wavelength identification, system sensitivity correction and radial velocity corrections.

Photometric Performance of the IUE, BOHLIN, R. C., NASA, Goddard Space Flight Center, SAVAGE, B. D., University of Wisconsin - During the scientific commissioning phase of IUE in March 1978, a set of spectra of standard stars was obtained for the purpose of defining the photometric and instrumental properties of the IUE. In the high dispersion echelle observing mode spectra of η UMa, C Lyr, τ Sco, and ω Col were obtained, while at low dispersion spectra of ω Col and HD 60753 were acquired. These data were used to assess the following aspects of the IUE instrumental performance: (1) noise in the extracted spectra, (2) photometric repeatability over short and long time intervals, and (3) absolute spectral sensitivity. Detailed results will be presented in all these areas and a comparison between IUE and Copernicus data will be shown for the narrow line star τ Sco.

Ultraviolet Spectroscopy of Hg-Ne Stars with IUE, LECKrone, D. S. and HEACOCK, W. D., NASA, Goddard Space Flight Center - We have obtained IUE spectra of the 8p stars HR 4072, t Crh, 46 Dra, χ Lpe, κ Cnc and μ Lep. Exposure times were selected to provide useful data over the ranges 1300-1950 Å and 2400-2900 Å. These stars possess very low v sin i values. Their observed UV spectra are exceedingly line-rich, but many individual absorption lines are clearly resolved and uniquely identifiable. Four of the stars are cool Hg stars, which show evidence of isotope shifts in their Hg II λ3984 lines (White, el al. 1976, Ap. J. 204, 131). The remaining two, μ Lep and κ Cnc, have a normal Hg isotope mix. We will discuss the search for ultraviolet lines of Hg III and any systematic trends in Hg III/Hg II line strength ratio as evidence for or against an explanation of isotope shifts based on the diffusion hypothesis (Michaud, el al. 1974, Astr. and Astrophys.

37, 313). The systematics of ultraviolet lines of other ions important to the physics of Bp stars will also be discussed.

♦NAS-NRC Postdoctoral Fellow

IUE Observations of F, G, and K Stars and Preliminary Models for Upper Chromospheres based on C II, Si II, and Si III, KELCH, W. L. and LINSKY, J. L.*, JILA, Univ. of Colo. & NBS - We discuss spectra of C II, Si II, and Si III seen in IUE observations of a CNI (55 IV-V), a Aur (G5 III + G0 III), λ And (G8 III-IV), HR 1099 (dG9), ε Eri (K2 V), and a Boo (K2 III). The IUE observations were obtained mainly in the low dispersion mode, 6 Å resolution, with the short wavelength camera. Our data include C II λ1334 + 1335; Si II λ1808, λ1816 + 1817, and in some cases λ1260, λ1264 + 1265, λ1527, and λ1533; and Si III λ1206 and λ1892. In the Sun Si II is formed in the middle chromosphere at 5-9000 K and Si III and C II are formed in the 20,000 K plateau in the upper chromosphere. To model the middle and upper chromospheres of F-K stars, we have developed multilevel, nonLTE codes for Si II + III (13 levels, 8 transitions), and C II (10 levels, 4 transitions). This work is not completed, but we discuss preliminary models for several of the stars under study. In particular, we consider whether the data imply plateaus in these stars similar to the 20,000 K plateau in the Sun. This work is supported by NASA under grants NAS5-23274 and NGL-06-003-057 to the University of Colorado.

♦Staff Member, Quantum Physics Division, National Bureau of Standards.

A First Look at IUE Far Ultraviolet Spectra of K and M Stars - α Ori, α Boo, and ε Eri, BASRI, G. S. and LINSKY, J. L.*, JILA, Univ. of Colo. & NBS - We present and discuss IUE spectra covering the spectral range 1175-2100 Å for the stars α Ori (M2 lab), α Boo (K2 IIIP), and ε Eri (K2 V). These spectra were obtained in the low dispersion mode (resolution ~6 Å), and exhibit mainly emission lines originating in the outer atmospheres of these stars. The spectra of α Ori and α Boo contain lines of relatively cool material including H I, O I, C I, and Si II. In addition, a Boo clearly shows He II λ1660 and may also show C II and Si III emission. α Ori apparently also shows He II and a number of broad emission features that may be molecular in origin. Comparison, the spectrum of ε Eri is rather similar to the Sun, containing emission due to C II, C IV, Si III-IV, and N V in addition to the other species seen in α Ori and α Boo. We discuss the differences between these spectra qualitatively in terms of the different chromospheres, transition regions, and circumstellar envelopes of these stars. This work is supported by NASA under grant NAS5-23274 to the University of Colorado.

♦Staff Member, Quantum Physics Division, National Bureau of Standards.

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