In order to test this prediction, we conducted a 40-day flux monitoring program of 25 pulsars. Daily flux measurements were made at 310 MHz, 416 MHz, and 750 MHz with the NRAO 92-m telescope. Pulsars were chosen with a wide range of dispersion measure (3 < DM < 160); predicted time scales range from shorter than our sampling interval to longer than the duration of the observations.

We will compare the observed variability time scales with the dispersion measure and frequency scaling expected from refractive scintillation theory. Implications for low-frequency variability of extragalactic sources will be discussed.

56.01 New Insights into the Physical Properties and Evolution of Galaxies

Arthur F. Davidsen (Johns Hopkins U.)

Active galaxies and quasars are powerful emitters of far ultraviolet and extreme ultraviolet radiation which maintains the ionization of the gas responsible for their prominent optical and UV emission lines. In objects with substantial redshifts this radiation has been observed with IUE, but for low redshift galaxies, direct observations are needed in the 912-1200 Å region. For inactive galaxies, such as normal giant ellipticals, the observed long wavelength UV spectral upturns indicate the presence of a hot stellar population. Observations in the 912-1200 Å region, to be undertaken with the Hopkins Ultraviolet Telescope (HUT) beginning in 1986, and eventually with FUSE (Columbia), should be very sensitive diagnostic of the hottest stars present, as well as perhaps revealing any gas and non-thermal sources which occur in these galaxies.

This talk will emphasize the potential of HUT to contribute new insights concerning galaxies through observations below Lyman α.

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56.02 New Insights into the Solar-Stellar Connection

T.R. Ayres (LASP/UL, Colorado)

The Solar-Stellar Connection is a framework within which detailed measurements of phenomena in the atmosphere of the Sun can be combined in a synergistic way with lower quality, but extensive observations of stars.

Spectroscopy below Lyα will promote the solar-stellar connection in a number of ways, particularly in the exploration of "transition zones" of main-sequence stars. The transition zone is the critical interface between the hydrodynamically heated chromosphere and the magnetically heated corona, and provides an important laboratory in which to test hypotheses concerning the nature of energy transport, deposition, storage, and dissipation mechanisms. For example, high-dispersion spectra in the sub-Lyα band could be used to characterize mass motions in the stellar transition zone: Doppler shifts reveal the amplitudes of stochastic velocity fields, while systematic Doppler shifts indicate the existence of organized gas flows. The study of gas dynamics in the solar transition zone is a young, but rapidly growing field, that has experienced its fair share of controversy. Evidence for analogous flow systems in the transition zones of other late-type stars as yet are confined primarily to the luminous yellow giants like β Dra (G2 1b-II) and the secondary of Capella (a Aur AB: F9 III). However, first Space Telescope and then the Far Ultraviolet Spectroscopic Explorer will permit very sensitive measures of Doppler shifts of high-excitation emission lines of solar-type dwarfs covering a wide range of activity levels. FUSE in particular will extend the peak temperature regime to 300,000 K (O VI).

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56.03 New Insights into Degenerate Stars and Interacting Stellar Systems

J.C. Raymond (CFA)

Observations below 1200 Å can answer many questions pertaining to degenerate stars and the physics of accretion. They can tell us the elemental abundances of hot white dwarfs, permitting inferences regarding diffusion and white dwarf evolution. In binary systems having mass transfer onto a degenerate star, the EUV region is especially important. In many cases most of the accretion energy is liberated at these wavelengths. Among the mysteries to be studied are the prevalence of hot white dwarfs in cataclysmic variables, the outburst mechanism, and the formation of emission lines.

56.04 New Insights Into Interacting Stellar Systems

Yoji Kondo (NASA/GSFC)

Recent observational results, particularly those obtained from UV and X-ray satellites, show that the solar system is embedded in a warp (7-10^4 K), relatively low-density (0.1 atom cm^-3) cloud. This cloud extends a few parsecs in all directions. Beyond this cloud is a porous, hot (7-10^6 K) and raffled (0.01-0.001 atom cm^-3) plasma extending at least 50 parsecs in every direction examined. This hot plasma is practically transparent to the extreme UV radiation even shorward of Lyman continuum absorption head at 912 Å. This makes it possible to study several dozen binaries in the EUV wavelengths from EUV satellite observatories such as Columbus. Examples of such binaries will be given and the importance of EUV observations in understanding the nature of mass flow and the evolutionary processes in interacting binaries will be discussed.

56.05 New Insights into Solar System Objects

W. Moos (Johns Hopkins U.)

This talk will review the new information about solar system objects obtainable by using ultraviolet astronomy below Lyman-alpha. Some of the best guides are the results of the Voyager ultraviolet spectrometers. The toroidal plasma nebulae near the path of Io about Jupiter shows strong emissions in this spectral region due to S and O ions. Auroral processes on Jupiter and Saturn excite the intense Lyman bands of H2. The spectrum of Titan