following results. In the disk, the rotation of the gas and stellar components are similar. In the bulge, stellar rotational velocities are only about half of the rotation of the disk. The velocity dispersion curves exhibit a decline with radius, with the small bulge systems showing the steepest decline. A reevaluation of the Vr vs. ellipticity for spiral bulges shows that models of rotationally flattened oblate spheroids do not fully explain the observations.

As part of the analysis, we have performed numerical experiments to determine values of the intrinsic rotation of the bulge in regions where significant fractions of the light come from both the bulge and the disk. These mixing experiments show that differences in both line strengths and in velocity dispersions play major roles in producing the observed velocities.

Session 43

43.01
Effect of Scattered Radiation on the Instability of Hot Star Winds

G. B. Rybicki (CPA) and S. P. Owocki (UCSD)

The driving of a stellar wind by line-extinction of the star's photospheric radiation is unstable to short-wavelength, optically-thin velocity perturbations (e.g., Owocki and Rybicki 1984, Ap. J., in press). Recently, Lucy (1984, Ap. J., submitted) has argued that driving by pure scattering lines does not contribute to this instability because the drag force exerted by the mean scattered radiation field on the velocity perturbations exactly cancels the perturbed force associated with the direct extinction of photospheric radiation. From this he concludes that hot-star winds are much less unstable than the pure extinction analysis implies.

We have also examined this drag effect and have found that it does not eliminate the instability of the wind of the wind. Instead, our analysis shows that, although the instability growth rate is indeed nearly zero close to the stellar surface, it quickly increases outward from the star, reaching a value more than 50% that implied by the pure-extinction analysis within a stellar radius from the surface, and eventually approaching 80% of the extinction value far from the star. Since, even with these reductions, the growth rate remains very high, the basic conclusion that the wind is very unstable remains unchanged by inclusion of scattering effects.

43.02
A New Maser Receiver for 36 to 50 GHz

S. H. Zisk (MIT/Haystack Observatory)

A new maser of a particularly simple design has been built for the 36-m telescope at Haystack Observatory. There are no frequency-limiting elements in the amplifier, and so the tuning bandwidth is approximately as wide as the waveguides will propagate. No slow-wave structure is used other than the dielectric constant of the ruby. The signal propagates through a ruby-filled waveguide, with a resonant isolator cemented on one side of the ruby. Pump power is introduced via a tee junction in the middle of the ruby.

A prototype has been operating successfully on the telescope since December, with encouraging results.

43.03
Possible Detection of an Old Supernova Remnant Associated with HD 50896

J. N. Heckathom (CSO), R.A. Feen (U. Colorado)

Using high-dispersion IUE spectra, we have detected a very large interstellar structure in the line-of-sight to the Wolf-Rayet star HD 50896. Blue-shifted interstellar absorption lines indicative of this high-velocity gas are present in the spectra of four B stars located up to 2° away from HD 50896 and at a distance of 1000-1400 parsecs, suggesting a linear diameter for the structure of at least 40 parsecs. These high-velocity components, present only in the low ionization lines and exhibiting nearly cosmic abundances, can be interpreted as a heretofore unknown, extremely old supernova remnant. The existence of such a supernova remnant potentially associated with HD 50896, a runaway Wolf-Rayet star believed to have a compact companion, implies HD 50896 may be a binary in the second Wolf-Rayet phase of evolution.

43.04
Discovery of a New, High Field, Magnetic White Dwarf, KUV813-14


We report the discovery of a new magnetic white dwarf, KUV813-14, during a spectroscopic survey of faint KISO blue candidates, (Kondo, M. et al., 1982, Publ. Astr. Soc. Japan, 34, 541), with the 3.6m Steward Observatory reflector. Our blue PC reticon spectra reveal the presence of numerous ul and s Zeman sub-components of Hγ, Hδ, and Hα. The Zeman pattern yields, by comparison with the Kemei (1979) tables, a mean field strength of 25-30 mega-gauss. Broadband photometric observations have been obtained along with optical continuum polarization observations which reveal 0.5 percent circular polarization. A high resolution reticon observation in the Hδ region rules out the presence of helium and, therefore, a mixed atmosphere such as that found in Feige 7. The low resolution IUE energy distribution (SNP + LWP), when compared with cool DA model atmosphere fluxes provided by H. L. Shipman, yields Te = 11,520 ± 500 K, log g = 8. This new high field, DAP4 degenerate brings the number of known magnetic white dwarfs to eighteen.

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43.05
The USNO Pole-to-pole Astrometric Program

T.J. Raftery, J.A. Hughes (US Naval Observatory)

The US Naval Observatory will conduct a pole-to-pole absolute observing program during the next ten years. The Observatory's seven-inch transit circles is currently being set up at Black Birch Astrometric observatory, located in the northern part of the south island of New Zealand. This instrument is equipped with an image dissector and will observe in an automatic mode. The six-inch transit circle, located in Washington, DC, has made fundamental observations for over 80 years, and will continue to observe in a visual mode. The location of the two instruments allow a 50 degree overlap, from which comparisons of instrumental results can be made. The observing list will include some 5,000 FK5 and 40,000 International Reference Stars, major and minor planets, the Moon, the Sun and the Northern hemisphere, and the instrument will be sent to New Zealand to complete a photographic pole-to-pole program. The plates will be reduced using the transit circles' results, producing a catalog containing more than a million star positions.