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09.18
Large and small amplitude UV activity in cool giants
I. Ozonovich and D. M. Gibson (New Mexico Tech)

First results from an IUE archive search for variability in emission line fluxes in cool giants show large amplitude variations in more than a dozen stars.

More than 400 low resolution spectra of some 50 cool giants (Sp. Type F-H, Lmus, Class I-IV) from more than six years of IUE archive data-base were processed in a consistent procedure. A continuum fit for each image allowed evaluation of the integrated flux of all the available emission lines (peak flux > 3σ) for each star. We discuss the importance of measuring and comparing several emission lines in order to evaluate reasonably the behavior of a star's atmosphere in time.

The extent of the activity and its existence in a large fraction of the observed giants is surprising in light of the conventional rotation-activity wisdom. Since relatively small and large amplitude variations are observed in different stars, the physical phenomena expected to produce the variations in the UV line fluxes are rotational modulation (or formation and decay) of active regions and flares respectively.

09.19
Extreme Be Stars in the Small Magellanic Cloud
C. D. Garmady, P. S. Conti (JILA, Univ. of Colo. & NBS), P. Massey (KPNO/NOAO)

In 1966, Schield described a class of extreme Be stars in h and ε Per which lie about 1.5 mag above the main sequence (Ap. 2, 146, 142). We have evidence for the corresponding population of Be stars in the SMC, lying up to 2 mag above the main sequence. These objects have been uncovered in the course of a spectroscopic study of the O-star population in the SMC, as their colors are similar to those expected of a highly reddened O-star. However, their spectra show emission in Hβ and Hγ and weak absorption in the higher Balmer lines and the He I lines. There is no sign of forbidden oxygen lines. Although Be stars have been described in the SMC before (see, for example, Feast, 1972, MNRAS, 159, 113) none have been found so far from the main sequence. Their position in the B-K diagram raises some interesting questions about their evolutionary status.

09.20
A Corrected and Uniformly Formatted Edition of the Abt and Biggs (1972) Bibliography of Stellar Radial Velocities
W.H. Warren Jr. (NSSDC/ADC/SSFC)

An original magnetic tape version of the catalog, obtained from KPNO in print-type format (identical to the published version) has been modified to create a uniformly formatted machine version suitable for computer search and data processing applications. All published and privately transmitted error lists have been incorporated into the new machine catalog. The corrections were analyzed and checked prior to modifying the tape in order to assure that the changes were properly interpreted and effected. The completed catalog is available on tape with documentation (which contains a complete list of the changes made to produce this version) from the Astronomical Data Center. Appreciation is expressed to H. A. Abt and J. V. Barnes for supplying the original KPNO catalog on magnetic tape.

0.10.01
Atmospheric Structures in AR Lac. I. Mapping Quiescent Features by Occultations and Doppler Imaging
F.M. Walter (LASP, U. CO), D.M. Gibson (NMINT), A. Brown, K. Carpenter, J.L. Linsky (JILA, U. CO), M. Rodono (Catania), and C. Eyles (U. Birmingham)

We organized a coordinated set of observations at radio, optical, ultraviolet, and X-ray wavelengths over the 1984 Labor Day weekend to search for discrete structures in the atmosphere of the active stars of the eclipsing RS CVn binary AR Lacetae. By utilizing the eclipses, and with high time resolution photometry and spectroscopy, we plan to use Doppler imaging and occultation techniques to locate and map discrete features of contrasting surface flux (spots and plages). We obtained KPNO 4m echelle spectroscopy (15th time resolution) and Stromgren uvby photometry on 1-4 September UT (σ = 0.9 - 0.4, 0.4 - 0.6), VLA observations 31 August-3 September (σ = 0.0-0.1 and 0.5-0.6), and EXOSAT observations on 30 Aug (σ = 0.9-0.1) and 4 September (σ = 0.41-0.75). Despite a large flare on 31 August seen with the JUE, the system was very inactive, as we had hoped for. We shall present preliminary results from the optical, UV and X-ray observations. Accompanying posters will report on the radio observations (Gibson et al.) and the Mg II plages mapped with IUE in October 1983 (Neff et al.).

10.02
Atmospheric Structures in AR Lac. II. A Spatially Resolved Chromospheric Active Region
J. R. Neff, F. M. Walter, J. L. Linsky* (JILA/Univ. of Colo. & NBS), D. M. Gibson (New Mexico Tech.), M. Rodono (Catania)

We report on coordinated optical, UV, and radio observations of the RS CVn system AR Lacetae. The observations obtained during the period 3-5 October 1983 made use of the VLA (for monitoring flares), the IUE satellite (for high resolution spectroscopy in the ultraviolet), and a world-wide photometric network, necessitated by AR Lac's unfavorable (2 day) orbital period.

We have applied the technique of Doppler imaging, pioneered by Vogt and Penrod (1983, ApJ, 53, 569), to the analysis of the Mg II h and k emission lines at 2800 Å. Our preliminary results include: (1) the observation of a region of enhanced Mg II emission, centered on the equator of the K star, with a longitudinal extent of 70° centered at phase φ = 0.86 (σ = 0 = primary eclipse) and, (2) indications of a global enhancement of Mg II emission when φ = 0.19 which may be coincident with a radio flare.

This program represents the first successful application of the Doppler imaging technique to emission lines and provides valuable information about the chromospheric structure of AR Lac. We present full details of this work, discuss our analysis, and suggest ways in which this analysis may be applied to gain a better understanding of solar-like active regions on other stars. This work is supported by NASA through Grant NAGS-82 to the University of Colorado.

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