

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 2322

Konkoly Observatory
Budapest
25 April 1983
HU ISSN 0374 - 0676

COORDINATED ULTRAVIOLET, OPTICAL AND RADIO OBSERVATIONS
OF RS CVn AND FLARE STARS IN
OCTOBER 1983 AND MARCH 1984

Time has been allocated on the International Ultraviolet Explorer (IUE) satellite to four groups based at Armagh Observatory (N. Ireland), Catania University (Italy), JILA/NBS University of Colorado (Boulder, USA) and Lockheed Research Lab. (Palo Alto, USA) by ESA and NASA to observe RS CVn and flare stars during the periods October 3-7, 1983 and March 26-30, 1984. The total time allocated is 17 eight-hour shifts, split into 10 shifts in October and 7 in March. We hope to monitor changes in the stars' UV spectra during their spot cycles and, in addition, to derive spatial resolution of atmospheric structures using eclipses. In the case of the flare stars, time-resolved spectroscopy during flares will be attempted as in previous years.

Similar programs were successfully carried out in October 1981 and February 1983. Preliminary results from the October 1981 program will be found in ADVANCES IN ULTRAVIOLET ASTRONOMY (NASA CP-2238), THIRD EUROPEAN IUE CONFERENCE (ESA SP-176) and ACTIVITY IN RED DWARF STARS (IAU Colloquium No. 71, Reidel, in press).

In the coming year we are planning to observe the three RS CVn stars AR Lac, HD 5303 (October 1983) and RS CVn (March 1984). Flare stars will be chosen from among the following list: UV Cet, Gliese 867A, EQ Peg, EV Lac (October 1983) and Proxima Cen, YZ CMi, Gliese 182 and AD Leo (March 1984). Concurrent photoelectric, spectroscopic and radio observations of these stars would add considerably to the scientific results of the IUE data.

Simultaneous ground-based observations are highly desirable for the RS CVn program, in particular during the eclipses. One of the principal aims of these observations is the detection of surface inhomogeneities in the outer atmospheres of these stars using the occulting disk of the companion to scan the surface of the active star. Obviously it is crucial that we know of any temporal variations in either the optical or radio output of the star at these times. Moreover, it is important to obtain complete UBV (or at least V) light

curves for the purpose of establishing the shape and phase-shift of the migrating "photometric waves". Therefore, the photometric observations of RS CVn stars need to be carried on over a one-two month interval including the period of IUE observing.

In the case of flare stars, simultaneous ground-based observations are essential for a proper interpretation of the UV and radio data. Such observations should aim at covering the period of the IUE program as completely as possible. Specifically, we are seeking continuous monitoring of the flare stars photometrically, spectroscopically and with radio receivers. Photometric monitoring should be in the Johnson U or B-band, where signal levels permit, and with as short an integration time as possible. In addition we would ask that the program stars should be measured in the Johnson UBVR bands at least twice per night, i.e. before and after the times of continuous monitoring, in order to establish possible or known BY Draconis wave-like variability. Again, observations outside of period of IUE observing could be necessary to obtain as complete as possible light curves.

Transformation to the standard UBV system is important so that observations from different observers can be intercompared.

Spectroscopic observations should aim at obtaining time-resolved spectra in the region near H α , H β , H γ , H δ and/or Ca II H and K emission lines to monitor continuum and line profile variability, especially during the course of flare events. The best attainable time and spectral resolution should be sought.

Radio monitoring of program stars should be preferably carried out at several wavelengths simultaneously, including a cm-wavelength, if possible.

As soon as possible, the final scheduling details, as well as suggested comparison stars and, if required, finding charts will be communicated directly to those who indicate their interest by writing or telexing the undersigned.

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