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COORDINATED ULTRAVIOLET, OPTICAL AND RADIO OBSERVATIONS OF RS CVn AND FLARE STARS

Time has been allocated on the International Ultraviolet Explorer (IUE) satellite to three groups based at Armagh Observatory (Northern Ireland), Catania Observatory (Italy) and JILA (Boulder, USA) by the British SERC, ESA and NASA Agencies, respectively, to observe RS CVn and BY Dra flare stars during the period 1-7 February 1983. The total time allocated (12 eight-hour shifts) is comparable to the period of RS CVn and BY Dra-type optical variability and many times the mean inter-arrival time between flares. As a result it is hoped to be able to monitor changes taking place in the star's UV spectrum along a complete cycle of spot-like slow variation and during any fast transient phenomenon, with particular reference to those lines indicative of physical conditions in the chromosphere, transition region and lower corona.

A similar coordinated program was carried out successfully in October 1981, and preliminary important results have been presented at several recent meetings: ADVANCES IN ULTRAVIOLET ASTRONOMY, Boulder, Colorado, NASA-CP 2238 (January 1982), THIRD EUROPEAN IUE CONFERENCE, Madrid, ESA-SP 176 (May 1982), ACTIVITY IN RED-DWARF STARS, IAU Colloquium 71, Catania (August 1982). A complete account of the 1981 collaborative program is in preparation.

We are planning to observe three RS CVn systems (RS CVn, V 711 Tau = HR 1099, II Peg = HD 224085) along a complete cycle of variability and one flare star (AD Leo or YZ CMi). Concurrent photoelectric, spectroscopic and radio observations of these stars would add considerably to the scientific program in the UV band.

Simultaneous observations are not essential for the RS CVn program, as we are mainly interested in detecting spot/plage modulation of the stellar emission vs rotation phase, which is normally a stable phenomenon over a few cycles. Nevertheless simultaneous coverage is highly desirable, whenever possible, as useful information can be obtained on any transient phenomenon that occur during the IUE exposure.

Of course, simultaneous observations of the selected flare star (YZ CMi and AD Leo) will be essential, as the study of UV-associated flare events is the principal aim of the flare star program.

Therefore we are appealing all photometric, spectroscopic and radio observers to cooperate in providing the necessary coverage. Photometric observations should consist of U, B, V preferably photoelectric measurements of RS CVn stars with respect to the indicated comparison stars (Table I).

Table I

IUE Program Stars and suggested comparison stars

Gliese	Name	HD/DM	SAO	(1950)	(1950)	V(max)	Sp	Period
501.1	RS CVn	114519	063382	$13^h08^m18^s$	+36°12'01"	7.9	F4V+KOIV	4.7979 d
	C 1	+35°2420	063401					
	C 2	+36°2347	063397					
-	V711Tau	22468	111291	03 34 13	+00 25 33	6.0	G5IV+K1IV	2.84
	C 1	22484	111292					
	C 2	22796	111334					
-	II Peg	224085	091578	23 52 29	+28 21 18	7.3	K2IVe+ ?	6.72
	C 1	+28°4667	091577					
	C 2	+28°4648	091593					
	C 3	224016	091568					
388	AD Leo	+20°2465	081292	10 16 54	+20 07 19	9.4	M4.5Ve	-
	C 1	+21°2175	081296					
	C 2	+20°2460	081274					
285	YZ CMi	-	-	07 42 04	+03 40 48	11.2	dM4.5e	2.78
	(a)	+03°1778	115869					
	(b)	-	-	(cf. finding chart by A.D.Andrews, IBVS 342,1969)				
	(e),	+04°1806	-					

Transformation to the standard UBV system is desirable. We urge photometric observes to start their observations before the actual period of IUE observations and, if necessary, to prosecute them in order to secure a good phase coverage of the light curves. Continuous photoelectric monitoring of the flare stars in the standard U or similar wave band, with integration times of between 1 to 10 seconds, during the IUE exposures is recommended. Comparison star measurements (cf. Table I) should be carried out before and after the IUE exposure /photoelectric monitoring of flare stars.

As soon as available, the final details of the observation schedule will be communicated directly to those who have shown their interest by contacting one of the undersigned at the address, or better at the telex indicated below.

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