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$H_{\alpha}$  EMISSION IN RS CVn STARS: HD 8357, HD 175 742 AND HR 7428

Recently Hall et al. (1984) edited the "Hall Catalogue of RS CVn Binary Systems", in which twenty stars with  $H_{\alpha}$  emission were reported. We observed 33 RS CVn stars in the  $H_{\alpha}$  region using the coudé Reticon system of the McDonald Observatory 2.1 m telescope. The dispersion is 9.5 Å/mm and the resolution is 0.29 Å. Three of these stars (HD 8357, HD 175 742 and HR 7428) showed conspicuous  $H_{\alpha}$  emission. Physical data and observational details are listed in Table I. The individual systems are reported separately below.

Table I

star	sp	mag.	period	obs. J.D.(H)	phase
HD 8357	G5 composite	7.28	-	2445957.8848	-
				57.9428	-
				58.8243	-
				58.9799	-
				59.8129	-
HD 175 742	K0V K5 - M2V	8.4	-	2445958.6146	-
				58.6764	-
				59.6153	-
				60.5845	-
HR 7428	A? K2 IIII-II	6.36	108.6	2445957.6288	0.4835
				58.5794	0.4922
				59.5774	0.5014
				59.6711	0.5023
				60.5669	0.5106

HD 8357:

The  $H_{\alpha}$  profile changed significantly in both emission and absorption components as shown in Figure 1. The peak of emission fluctuated somewhat but was systematically shifted to the blue from the expected photospheric velocity by 0.6 Å. The intensity of the strongest emission is 1.29 times of that of the continuum. The profile is similar to that of UX Ari. (Nations and Ramsey, 1980).

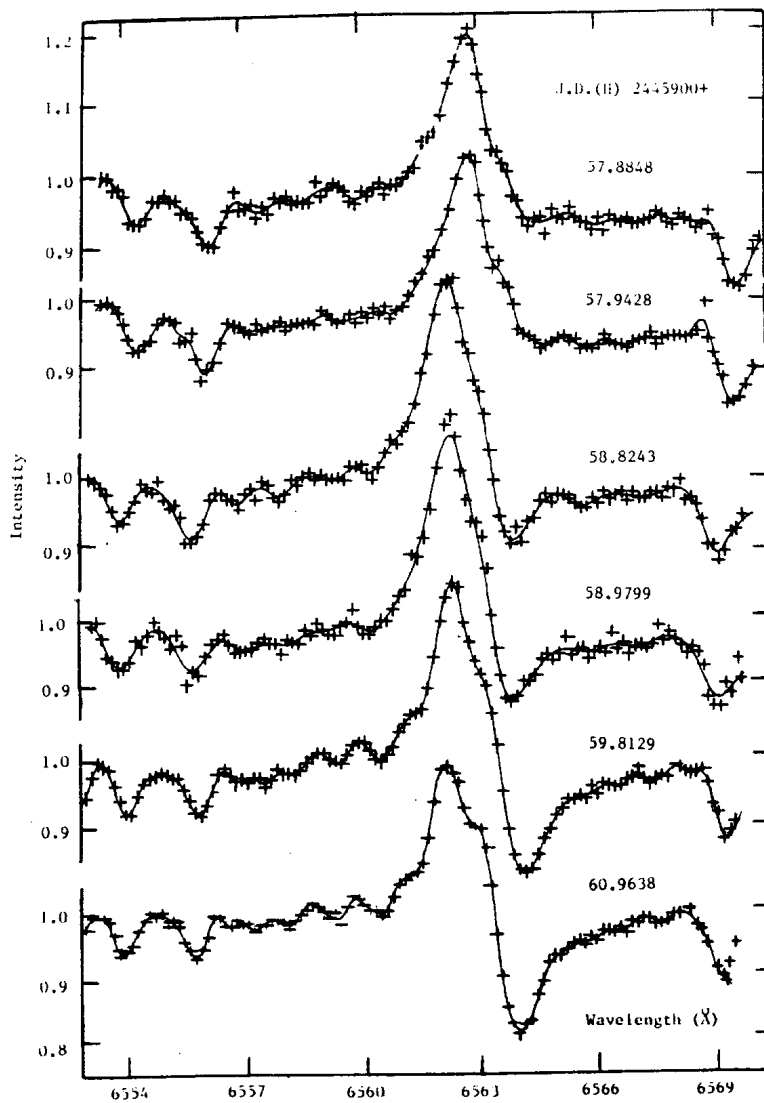


Figure 1. Variation of the  $H_{\alpha}$  emission feature of HD 8357

HD 175 742:

These  $H_{\alpha}$  profiles are bizarre, and show extreme changes over three nights (Figure 2). The interval between the two observations on Sep. 15 was only 1.5 hours, but the two profiles are radically different, and the emission peak shifted from red to blue. The period of variation will be very short if the change is periodic.

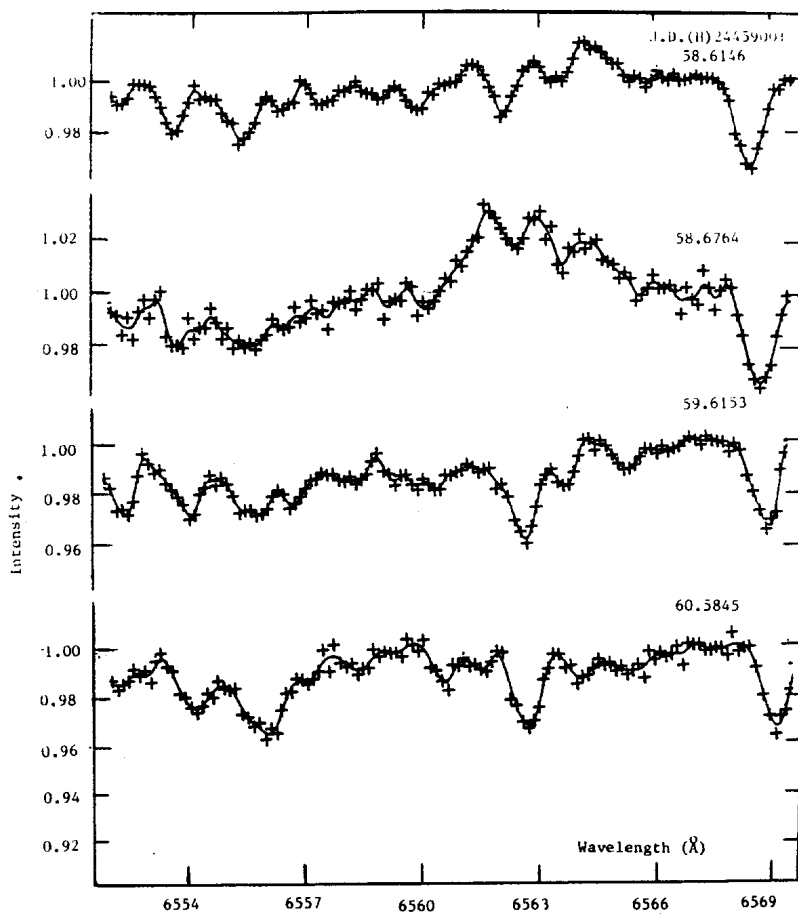


Figure 2. Variation of the  $H_{\alpha}$  emission of HD 175 742

HR 7428 :

HR 7428 shows double emission, the red element being stronger than the blue one as shown in Figure 3, in which we only drew one plot since the profiles show little change in blue emission. This star was observed by Bopp et al. (1978), but they did not find  $H_{\alpha}$  emission from two plates. Our observations were near phase 0.5. The  $H_{\alpha}$  emission may be related to the phase, so more observations are needed.

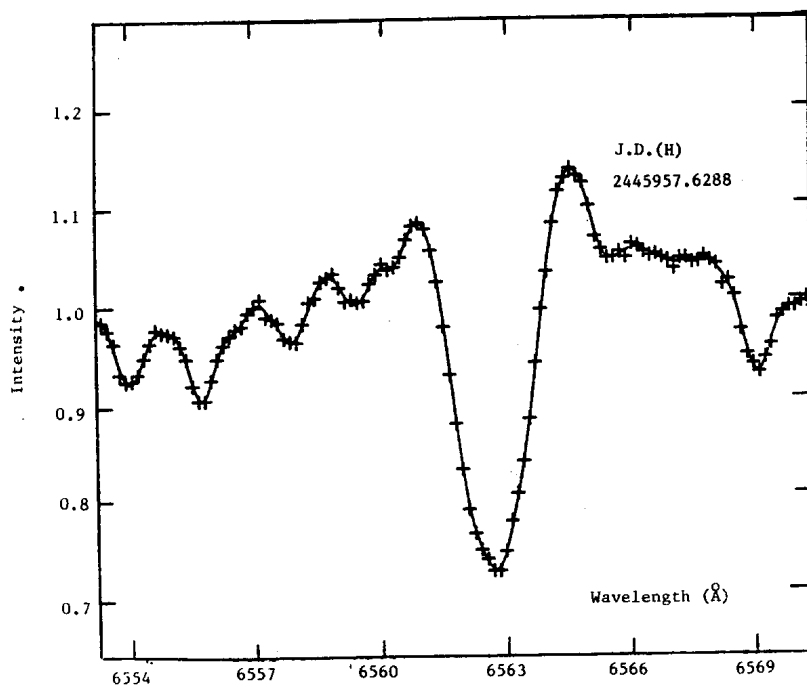


Figure 3.  $H_{\alpha}$  emission feature of HR 7428

We are especially grateful to Dr. H. Smith for scheduling the telescope time.

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 McDonald Observatory  
 The University of Texas  
 (two visiting scholars from China)

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