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ON THE VARIABILITY OF THE OLD NOVA HR DELPHINI 1967

Photometry

Photoelectric observations of the old nova HR Del 1967 were carried out with the 61cm Bochum telescope at the European Southern Observatory in Chile on May 28 and 31, 1979.

The photometer was furnished with standard Johnson UBV filters. In order to improve the time resolution, the nearby field star HD 197397 (=BD+18^o4591 = SAO 106418; Sp=AO V) was used as comparison star. As the separation of both stars is less than eight arcminutes, no extinction correction was applied; the brightness of the postnova was determined by means of differential photometry. The individual measurements were obtained with an integration time of 20 seconds. Means of observations with the V, B, and U filters are presented in columns 2 to 4 of Table 1, respectively; the Julian dates corresponding to the times of mid-observation are given in the first column. The standard deviations from the mean value of n measurements, and the number n are given in the last two columns.

Continuous observations with the B filter conducted on May 28, 1979 revealed variations between $B=12^m.38$ and $12^m.51$, obviously covering a brightness minimum of the old nova. During the UBV measurements obtained on May 31, 1979 the B magnitude of the postnova was brighter by at least $0^m.20$; $B-V \approx -0^m.06$, and $U-B \approx -0^m.90$.

Table 1: UBV Photometry of HR Del

JD (mid-obs.) 244....	V	B	U	Error	n
4021.8028		12. ^m 383		0. ^m 019	6
.8045		12.406		.011	6
.8099		12.449		.017	6
.8116		12.436		.011	6
.8167		12.444		.014	6
.8184		12.481		.020	6
.8311		12.501		.015	6
.8327		12.515		.011	6
.8381		12.485		.018	6
.8397		12.515		.023	6
.8452		12.462		.008	6
.8469		12.460		.011	6
.8802		12.378		.005	4
.8815		12.397		.006	5
4024.8164	12. ^m 270	12.205	11. ^m 328	.011	2
.8259	12.209	12.166	11.268	.011	2
.8350	12.219	12.161	11.249	.008	2

Optical Spectroscopy

From optical spectroscopic data, Hutchings (1979) found evidence that HR Del is a close binary system with a $0.5 M_{\odot}$ main-sequence star and a $1.0 M_{\odot}$ white dwarf as probable components, and with a fairly high inclination close to $i \approx 45^{\circ}$. Thus, only slight photometric variability can be expected. Our observations might have covered a shallow eclipse; the combination with further photoelectric data is useful for an improvement of Hutchings' ephemeris. Light variations with an amplitude of 0.2^m are also reported by Tempesti (1979), but do not fit the spectroscopic period of 0.17 days.

UV Spectroscopy

Variations in the line intensities are noticeable in IUE satellite spectra of HR Del. A comparison of our low resolution short wavelength (1100-2000 Å) spectrum taken on July 10, 1979, with the one obtained by Hutchings (1979), shows a varying intensity ratio of the He II (1640 Å)

to C IV (1550 Å) emission lines, as well as variations in the Si III (1303 Å) absorption; the relative strengths of the Si III (1368 Å) line and Si IV doublet (1398 Å), however, appear to remain essentially constant.

Phase-dependent spectroscopic observations have recently been made by Hutchings (1980).

Simultaneous photometry and spectroscopy of the classical nova V 603 Aql (1918) with the FES-instrument and UV spectrometer aboard the IUE satellite, revealed correlated periodic variations in the optical light curve and the UV spectra (Boggess et al., 1980). Additional comprehensive photometry of HR Del might similarly yield new information on the binary nature of this system.

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References:

- Boggess, A., Drechsel, H., Holm, A., and Rahe, J, 1980, I.A.U. Circ. 3485.
Hutchings, J.B. 1979, Ap.J., 232, 176.
Hutchings, J.B. 1979, P.A.S.P., 91, 661.
Hutchings, J.B. 1980, preprint.
Tempesti, P. 1979, I.A.U. Circ. 3340.