DH DRA: AN INTERESTING RED VARIABLE

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Abstract

The variable star DH Dra was observed on plates of the Sonneberg Sky Survey. It has a complex light curve and shows periods of approximately 225-240 and 550 days.

1. Observations

The variable DH Dra is 7' east of an 11th-magnitude spiral galaxy, NGC 3147. Figure 1 is a finder chart. The author observed this star on 307 plates of the Sonneberg Sky Survey made during the interval 1981-1990. DH Dra is a very red star with color index (mpg-mpv) = 4.0 magnitude (Kowal 1972). The *General Catalogue of Variable Stars* (GCVS)(Kholopov *et al.* 1985) says that DH Dra is a possible Mira star with spectrum class N and the following elements:

$$JD_{max} = 2442515 + 550\ E. \quad (1)$$

Table 1. Maxima and Minima of DH Dra

Epoch	*Event*	*Comp.*	*Obs. (JD 2440000+)*	*(O-C)*	*Phase*
	Min 1		4970		
5	Max	5265	5220	-45	
	Min 1		5490		0.47
	Min 2		5690		0.81
6	Max	5815	5800	-15	
	Min 1		6080		0.52
	Min 2		6220		0.80
7	Max	6365	6340	-25	
	Min 1		6520		0.31
	Min 2		6780		0.70
8	Max	6915	6950	35	
	Min 1		7120		0.35
	Min 2		7370		0.81
9	Max	7465	7470	5	
	Min 1		7690		0.35
	Min 2		7930		0.74
10	Max	8015	8090	75	

Table 1 lists data on DH Dra. Column 1 is the number of each maximum according to the GCVS elements; column 3 contains the computed times of maxima; column 4 contains the observed times of maxima and minima derived from the

Sonneberg plates; column 5 shows the differences (Observed - Computed); and column 6 shows the phases of the minima as fractions of the interval between the observed maxima.

2. Analysis

During the interval of observations there are 6 distinct maxima with a mean separation of 574 days. Pronounced minima are found around phase 0.3-0.5, and there is a secondary minimum around phase 0.75-0.80. Portions of the light curve (Figure 2) suggest an RV Tauri star. The depth of the secondary minimum is highly variable. Perhaps the real period of this star is only 225-240 days. From my observations of maxima, I derive a period of nearly 574 days, while the minima indicate a period half as long.

DH Dra is not a Mira star; it is a semiregular of type SRb. The magnitude varies in the range 10.6-12 mpv. The curious form of its light curve makes this star an interesting one for further research.

References

Kowal, C. T. 1972, *IAU Circ.*, No. 2394.

Kholopov, P. N., *et al.* 1985, *General Catalogue of Variable Stars,* Fourth Edition, Moscow.

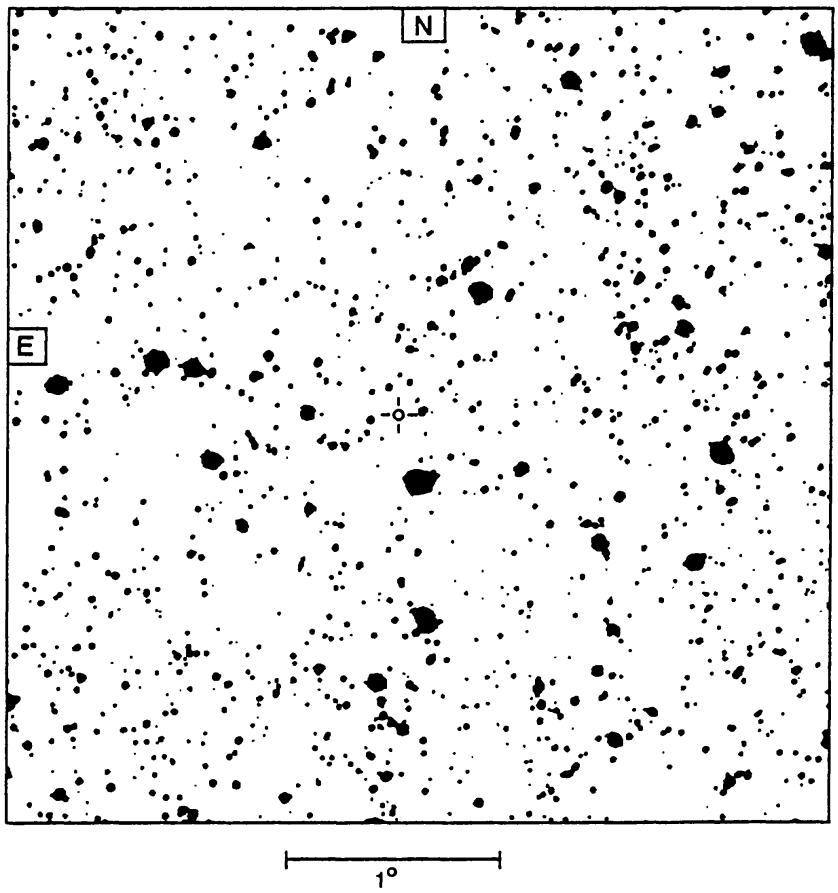

Figure 1. Finder chart for DH Dra (Falkauer Atlas by Vehrenberg).

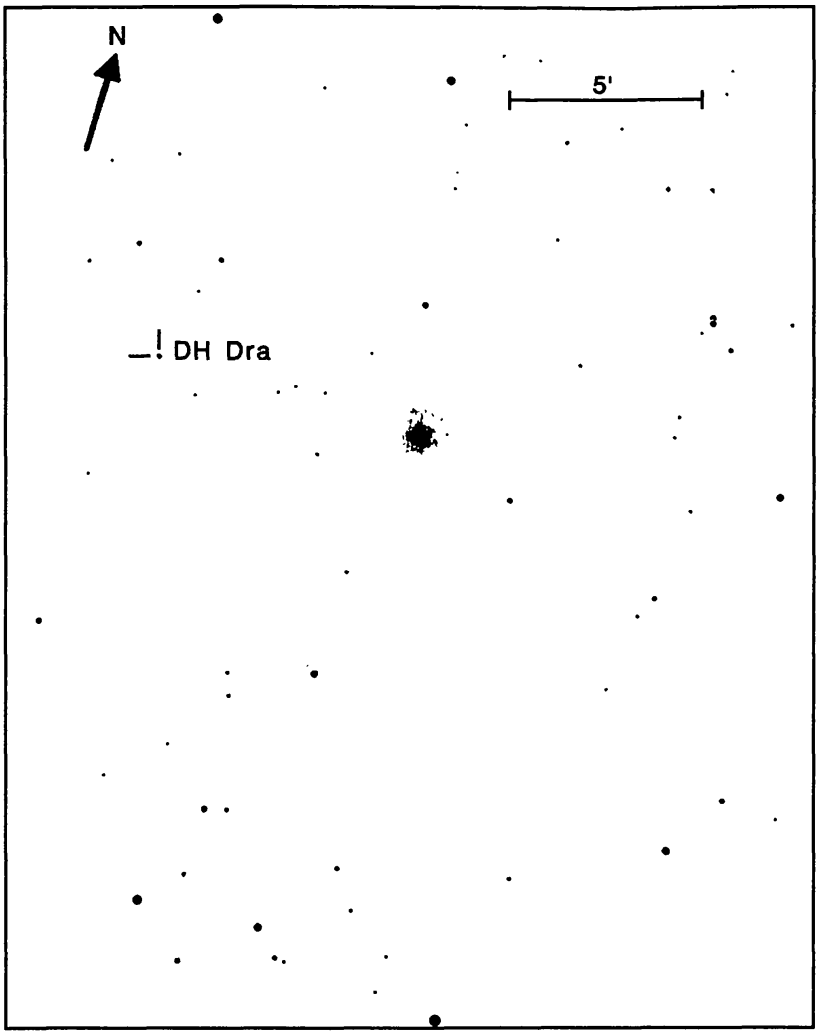

Figure 2. Photograph of DH Dra, located near the galaxy NGC 3147. Photograph taken by J. Salmi of Finland.

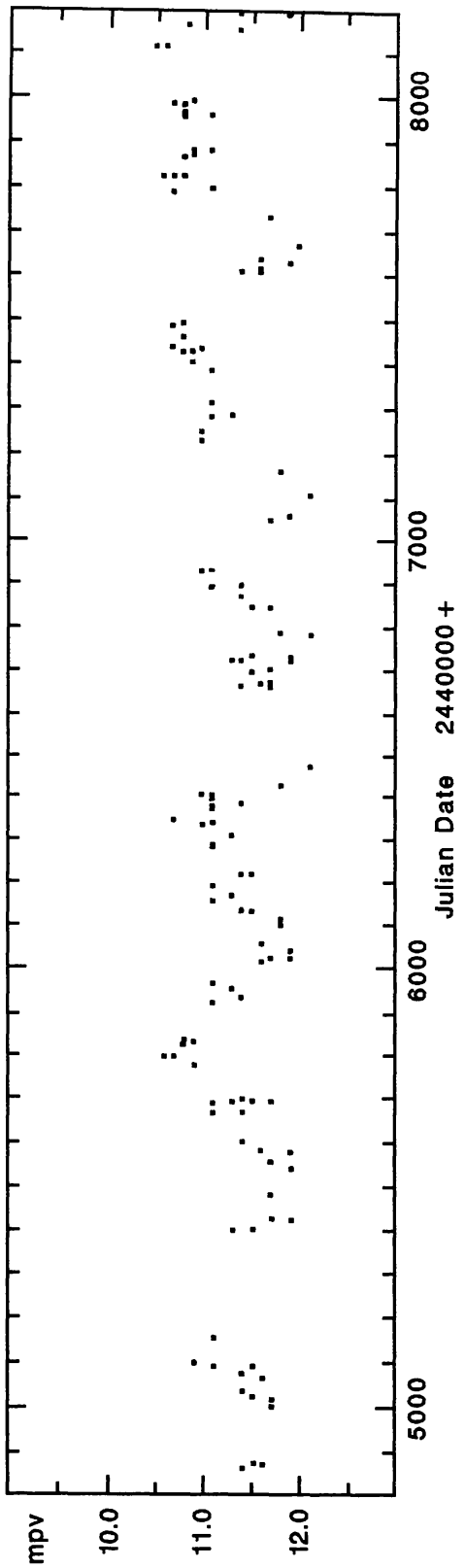

Figure 3. Photovisual lightcurve of DH Dra for the years 1981-90.