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THE PERIOD OF ECLIPSING BINARY DHK 40

Eclipses of the F8 type star SAO 46698 = BD +49°2630 were reported by Kaiser (1994), who gave it the designation DHK 40 in his discovery list. We have observed this variable during the past two seasons with photoelectric and CCD photometry. DHK utilized a 35-cm Schmidt-Cassegrain telescope, Optec SSP-5 photometer, and SBIG ST-6 CCD camera, and GL used a 28-cm Schmidt-Cassegrain and SBIG ST-6 CCD camera. A light curve compiled from DHK's photoelectric observations (Figure 1) shows variations of Beta Lyr type with a range of 9.41 - 9.87 V.

Table 1. Minima of DHK 40= SAO 46698

HJD 2400000+	Obs.	Min.	E	O-C
43759.582	H ptg	I	-11640.0	+0.002
43777.558	H ptg	I	-11606.0	-0.025
44512.510	H ptg	I	-10218.0	+0.012
44733.813	H ptg	I	- 9800.0	-0.007
45161.657	H ptg	I	- 8992.0	+0.018
46590.700	H ptg	I	- 6293.0	+0.001
46669.598	H ptg	I	- 6144.0	+0.005
46757.468	H ptg	I	- 5978.0	-0.018
46879.815	H ptg	I	- 5747.0	+0.019
47466.464	H ptg	I	- 4639.0	+0.006
49637.5821 ±.0009	K pep	II	- 538.5	-0.0011
49917.6769 ±.0001	K ccd	II	- 9.5	-0.0003
49922.7073 ±.0002	L ccd	I	0.0	+0.0001
49927.7383 ±.0006	L ccd	II	+ 9.5	+0.0011
49983.5979 ±.0002	K ccd	I	+ 115.0	+0.0007
50001.5979 ±0002	L ccd	I	+ 149.0	-0.0016

H = Harvard plate, K = Kaiser, L = Lubcke

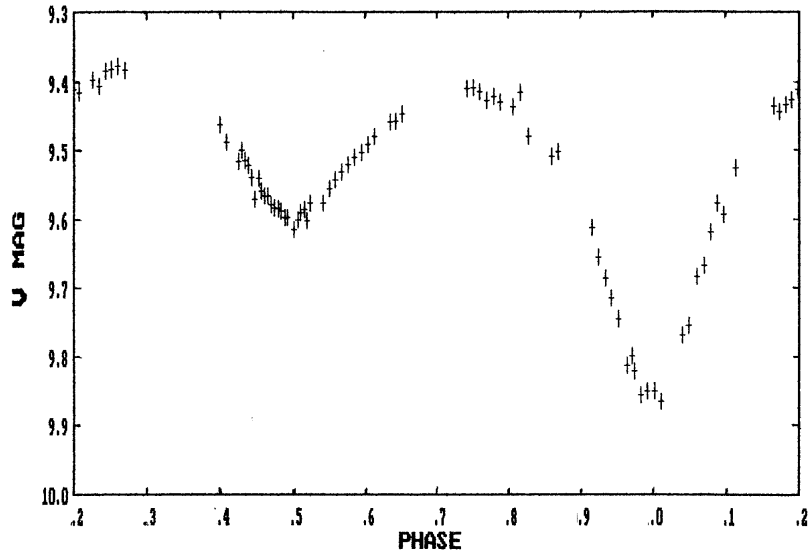


Figure 1. Photoelectric V observations of DHK 40 by Kaiser, 1994 season.

DBW examined 175 Harvard College Observatory patrol plates for the interval 1976-1989 to obtain additional times of minima. Table 1 lists 10 Harvard plate minima and 6 high-precision PEP/CCD minima. The PEP/CCD minima were reduced by the Kwee-Van Woerden method, and the internal error of each timing is listed. These times were introduced into a least-squares solution, with weight 1 for the photographic data and weight 10 for the PEP/CCD data, to derive the following light elements:

$$\text{Min. I} = \text{HJD } 2\,449\,922.7072 + 0^{\text{d}}52947826 \times E \quad (1)$$

$$\pm 7 \qquad \qquad \qquad \pm 11$$

The light curve shows strong proximity effects, and Maximum I (Phase 0.25) is slightly brighter than Maximum II. DHK 40 appears to be a thermally decoupled binary of W UMa or “near contact” type. The reported spectral type is rather late for a binary with such unequal minima and needs to be confirmed. We are continuing observations to obtain a complete light curve for solution. We wish to thank Dr. Martha Hazen for the opportunity to examine the Harvard plates.

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Reference:

Kaiser, D. H., 1994, *Inform. Bull. Var. Stars*, No. 4119