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PHOTOMETRY OF THE NEW ECLIPSING BINARY DHK 16 = SAO 80992

Kaiser (1990) discovered that the 9th-magnitude star SAO 80992 = BD $+26^{\circ}1996$ is an eclipsing binary, which he designated DHK 16 in his discovery list. The spectral type is G0, the position RA $9^{h}\ 41^{m}\ 22^{s}$, Dec $+25^{\circ}\ 35.1'$ (1950).

Regular visual monitoring by Baldwin soon detected additional minima. A discrete Fourier transform analysis of these visual observations by Kaiser produced several possible periods, the most promising being 0.69 day.

Williams observed the star photoelectrically with an Optec SSP-3 photometer and 28-cm Schmidt-Cassegrain. Most observations were made in the R band because of the variable's faintness with a 28-cm aperture and the photodiode's greater sensitivity at longer wavelengths. These observations (Figure 1) show that the 0.69-day DFT period is the half-period of an Algol-type eclipsing binary with nearly equal minima. A least-squares period solution using the discovery photo (HJD 2447968.691), one photoelectric minimum (the initial epoch of Equation 1), and six times of minima estimated from visual observations results in the preliminary light elements:

$$\text{Min. I} = \text{HJD } 2447999.617 + 1^{d}.3742\ E \qquad (1)$$
$$\pm.002 \quad \pm.0002$$

The comparison star was SAO 80978 (7.26 V, +1.10 B-V, K1III). Williams measured the comparison star and the variable at maximum in the V and R bands relative to several nearby stars from the Arizona-Tonantzintla Catalogue (Iriarte et al. 1965) and obtained the following results:

Comparison = SAO 80978 = 7.26 V, +0.80 V-R
Var (max) = SAO 80992 = 9.22 V, +0.54 V-R

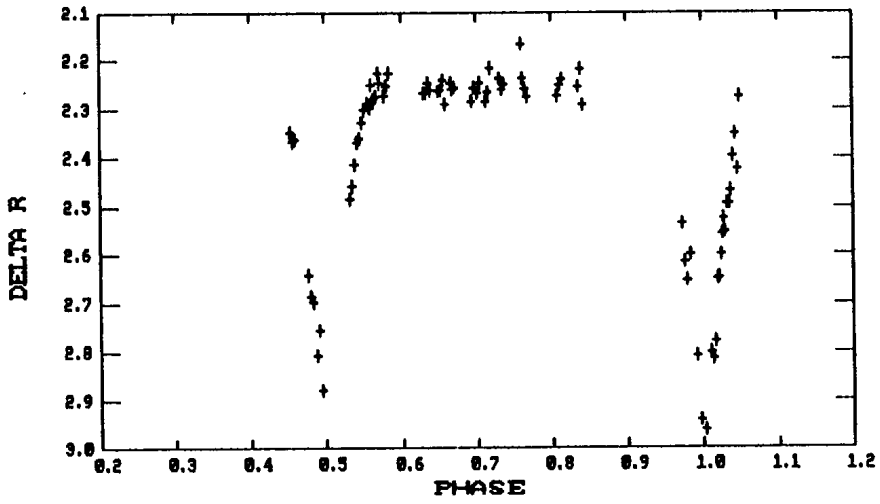

Figure 1. R-band differential photometry of DHK 16 = SAO 80992 phased according to Equation (1).

The eclipses appear to be partial, with duration of eclipse close to 0.10 P = 3.3 hours. Due to incomplete phase coverage and increased scatter when the variable was faint, the amplitudes of the two minima remain somewhat uncertain. However, available observations indicate that the primary minimum is $0^{m}.70$ R deep and the secondary minimum is within $0^{m}.1$ of the primary.

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