

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 3312

Konkoly Observatory
Budapest
30 March 1989
HU ISSN 0374 - 0676

V LIGHT CURVE AND ELEMENTS OF THE BINARY SYSTEM AH CEPHEI

The binary system AH Cephei was discovered and first studied as a spectroscopic binary system by Pearce (1925). Photoelectric light curves were obtained and the system was further studied by Zverev (1933), Stebbins (1934), Huffer and Eggen (1947), Whitney (1956), Nekrasova (1960), Guarnieri et al. (1975), Cester et al. (1978), Eaton (1979), Mayer (1980), Schaefer (1981), Raefert (1982), and Mayer and Tremko (1983).

AH Cephei was observed at Bucharest in 1985-1986. The observations were made with the 50 cm telescope and a photoelectric photometer housing an EMI photomultiplier. The observational points in V filter are indicated by dots in Figure 1. The star GC 31719 was used as the comparison star.

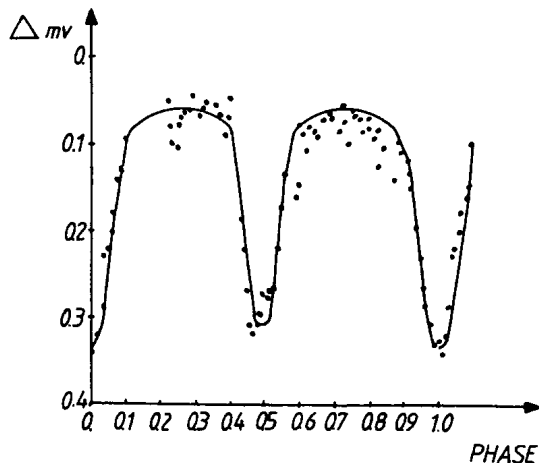


Figure 1

Table I

Year of observations	Source	Spectral region	amplitude	
			primary min.	secondary min.
1930	Huffer and Eggen	B	0 ^m .217	0 ^m .192
1930	Zverev	V	0.230	0.160
1954	Nekrasova	B	0.223	0.178
		V	0.233	0.193
1970	Guarnieri	B		0.230
		V		0.236
1978	Mayer	B	0.270	
		V	0.267	
1985-1986	Bucharest	B	0.290	0.260
		V	0.308	0.260

We used a sphere-sphere model for the first calculation of the elements of the system. The elements were obtained simultaneously for the two minima using Horak's minimization method. The solution was improved using a Wood model after this first approximation.

The calculated elements of the system are:

$$\begin{aligned}
 i &= 69^{\circ}3 & r_A &= 0.388 & q &= 0.86 & u &= 0.38 & \beta &= 0.08 \\
 e &= 0 & r_B &= 0.289 & a_A &= 0.415 & a_B &= 0.300 & L_A &= 0.686 \\
 \omega &= 0 & T_A &= 25000 \text{ K} & b_A &= 0.385 & b_B &= 0.287 & L_B &= 0.313 \\
 k &= 0.723 & T_B &= 22174 \text{ K} & c_A &= 0.364 & c_B &= 0.280
 \end{aligned}$$

The curve in Figure 1 has been calculated with these elements. Mayer (1980) observed that the amplitudes of the minima are increasing in time. The Bucharest observations confirm this conclusion (see Table I). The depth of the minima probably fluctuate due to the variable amount of circumstellar matter in the system. Variability of the comparison star can be ruled out.

GABRIELA OPRESCU
 MARIAN DORU SURAN
 NEDELIA POPESCU
 Center for Astronomy and Space Sciences
 5 rue Cutitul de Argint, 7000 Bucharest
 Romania

References:

- Cester, B., Fedel, B., Giuricin, G., Mardirossian, F., Mezzetti, M. 1978, Astron. Astrophys. Suppl., 33, 91.
- Eaton, J.A. 1979, Inf. Bull. Var. Stars, No. 1614.
- Guarnieri, A., Bonifazi, A., Battistini, P. 1975, Astron. Astrophys. Suppl., 20, 199.
- Huffer, C.M., Eggen, O.J. 1947, Astrophys. J., 106, 313.
- Mayer, P. 1980, Bull. Astron. Inst. Czechosl., 31, 292.
- Mayer, P., Tremko, J. 1983, Inf. Bull. Var. Stars, No. 2407.
- Nekrasova, S.V. 1960, Perem. Zvezdy, 13, 157.
- Pearce, J.A. 1925, Publ. DAO Canada, 3, 171.
- Raefert, J.B. 1982, PASP, 94, 485.
- Schaefer, B.E. 1981, PASP, 93, 225.
- Stebbins, J. 1934, Publ. Washburn Obs., 15, 237.
- Whitney, B.S. 1956, PASP, 68, 253.
- Zverev, M. 1933, Perem. Zvezdy, 4, 177.