IMPROVED ELEMENTS FOR THE W UMA-STAR EH CNC

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1) INTRODUCTION

The EW type eclipsing binary EH Cnc (= SVS 510 = P 3171 = CSV 1297 = NSV 4070) is located in the constellation Cancer with coordinates (1950.0): A.R. = 8h 23m 24s, Decl.= +21 02',7 and a range of variation 11.73 - 12.47: V (Kholopov et al.,1987). The spectral type is F0 (Kholopov et al.,1982).

It was discovered as variable in 1934 by P.G.Kulikovskj (Kulikovskj,1934) but, until the year 1983, only few observations on this object had been carried out. First photoelectric measures were performed by the GEOS members A.Figer, J.F.Le Borgne and M.Dumont (Figer et al.,1985) and they were able also to derive the following ephemerides:

$$\text{Min I} = \text{J.d. } 2445768.624 + 0.418034\ E \qquad (1)$$

2) OBSERVATIONS

I observed the star visually during four nights in 1994 with a 8.5 inch newtonian telescope using the GEOS chart No.105 in order to identify EH Cnc. The chart is presented here (fig.1), reproduced from the Vehrenberg's Atlas Stellarum 1950.0, with the comparison's stars I used and their steps sequence. The light curve (fig.2) shows a range of variation of 6.7 steps, between 2.2 9.7. There is also a strong scatter of points at the phase 0.5 due to the bad weather condition on the evening of February 10th, 1994, the only chance I had to see a secondary minimum of the variable.

3) DISCUSSION

With the SOP method (Gaspani, 1993) applied in order to find the extrema of the light curve, three times of minima have been calculated on the basis of 69 observations; these minima, together with other timings found in literature (tab.1), have been used to draw the O-C diagram (fig.3) and to derive the following new improved elements:

$$\text{Min I} = \text{J.d. } 2445768.625 + 0.4180358\ E \qquad (2)$$
$$\pm 1 \qquad \pm 5$$

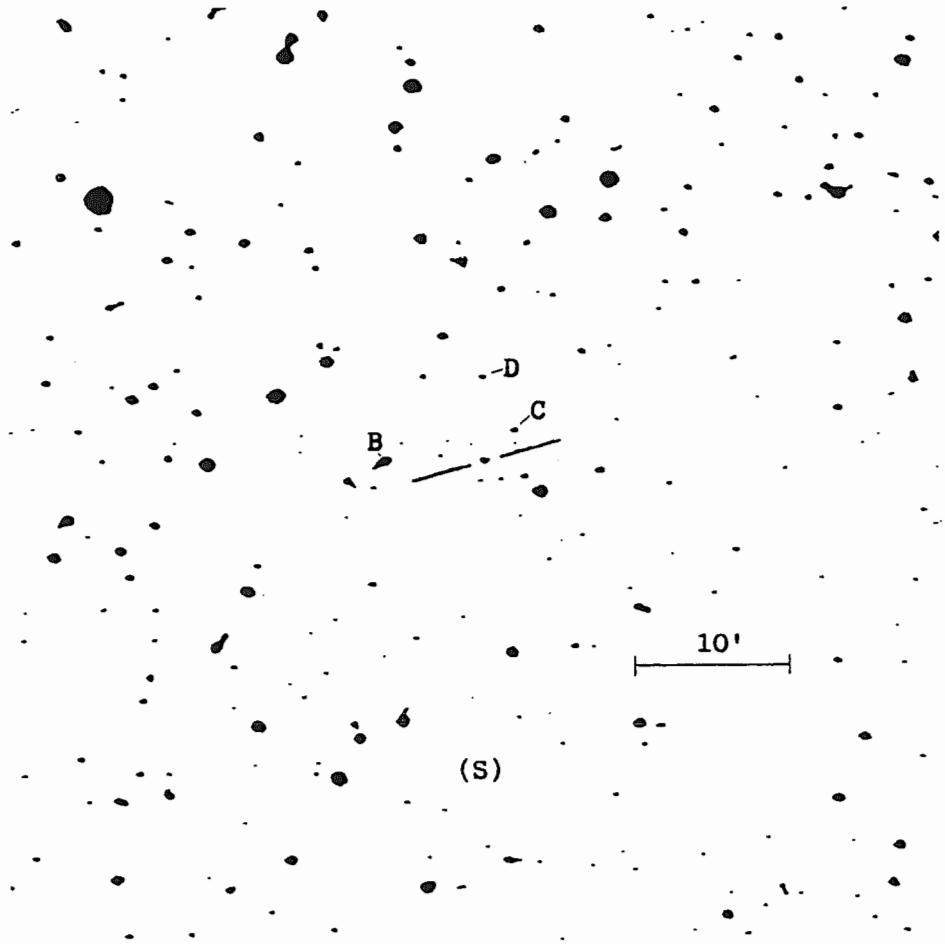
The method I used in the optimization of the ephemerides is a computer code, written by A.Gaspani (Gaspani, 1995), named NESTOR implementing a functional-link neural network. New elements seem to fit better the points in the above-mentioned diagram with smaller O-C values.

4) CONCLUSION

In the present work I give new ephemerides for the EW star EH·Cnc on the basis of my visual observations. The minima carried out by me are the only recent data found in variable star literature; moreover this star seem to be quite unknown out of the GEOS: for these reasons it would be interesting to have new observations in the future to confirm the ephemerides (2) or to update it.

5) REFERENCES

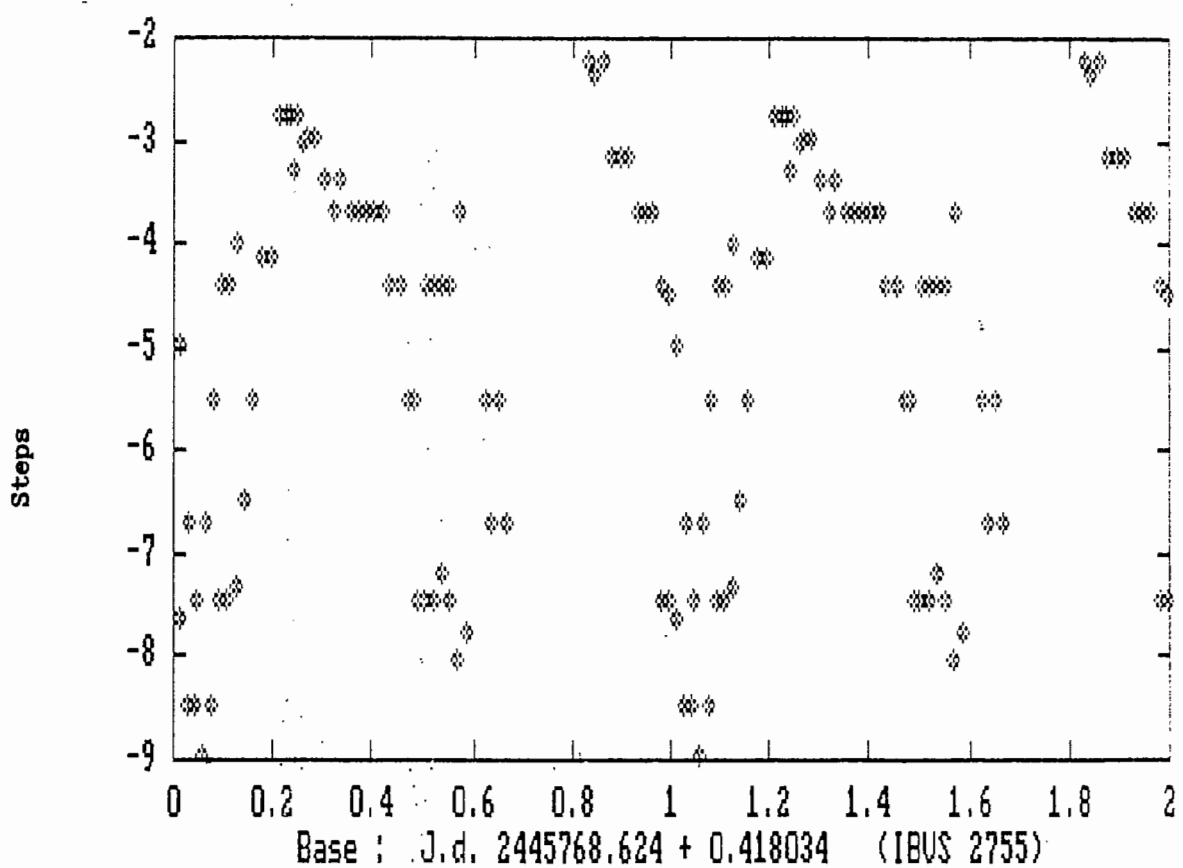
Figer A. et al.: 1985, Information Bulletin on Variable Stars No.2755;
Gaspani A.: 1993, "The Algorithms useful in finding the Extrema of the Light Curve", Proceedings of the Seventh Symposium GEOS-Italy, S.Pellegrino Terme (Italy);
Gaspani A.: 1995, "Neurocomputing Techniques in the Variable Stars Data Processing", paper presented at the Third GEOS Workshop on Variable Stars Data Acquisition and Processing Techniques, S.Pellegrino Terme (Italy);
Kholopov P.N. et al.: 1982, New Catalogue of Suspected Variable Stars, Nauka Publishing House, Moscow;
Kholopov P.N. et al.: 1987, "The 68th Name-List of Variable Stars", in Information Bulletin on Variable Stars No.3058;
Kulikovskj P.G.: 1934, Peremennye Zvezdy 4, 294.



Star		Steps
B	=	0
C	=	5.5
D	=	11.4

Fig.1: Chart of EH Cnc with comparison's stars.

Fig.2: Visual light curve phased on the basis of the period given by A.Figer.



J.d.	UBV	E (1)	O-C (1)	E (2)	O-C (2)	Observer(s)	Reference
2445385.502	v	-916.5	0.006	-916.5	0.006	A.Figer	GEOS NC 367
2445399.495	v	-883	-0.005	-883	-0.005	A.Figer	GEOS NC 367
2445402.429	v	-876	0.003	-876	0.003	A.Figer	GEOS NC 367
2445410.365	v	-857	-0.004	-857	-0.004	A.Figer	GEOS NC 367
2445438.382	v	-790	0.005	-790	0.005	A.Figer	GEOS NC 367
2445440.465	v	-785	-0.002	-785	-0.002	A.Figer	GEOS NC 367
2445672.6838	V	-229.5	-0.0014	-229.5	-0.0014	A.Figer et al.	IBVS 2755
2445672.6827	B	-229.5	-0.0025	-229.5	-0.0025	A.Figer et al.	IBVS 2755
2445675.6127	B	-222.5	0.0013	-222.5	0.0013	A.Figer et al.	IBVS 2755
2445675.6123	V	-222.5	0.0009	-222.5	0.0009	A.Figer et al.	IBVS 2755
2445676.6538	B	-220	-0.0027	-220	-0.0027	A.Figer et al.	IBVS 2755
2445676.6545	V	-220	-0.0020	-220	-0.0020	A.Figer et al.	IBVS 2755
2446800.342	v	2468	0.010	2468	0.010	A.Maraziti	BBSAG Bull 85
2449393.422	v	8671	0.025	8671	0.025	M.Martignoni	BBSAG Bull 107
2449394.441	v	8673.5	-0.001	8673.5	-0.001	M.Martignoni	BBSAG Bull 107
2449429.372	v	8757	0.024	8757	0.024	M.Martignoni	BBSAG Bull 107

Tab.1: Timings found in literature.

Fig.3: O-C diagram on the basis of the ephemerides (1).