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THE ECLIPSING BINARY HD 124195

The runaway star HD 124195 was observed in 1975 with the Dutch satellite ANS in the ultraviolet. The star has $V = 6.11$, $B - V = +0.05$, MK type: B5V. It has a variable radial velocity. The pointing direction of ANS was: $Ra(1950) = 14h 10m 15s$, $D(1950) = -54d 23.5m$. ANS has a field of view of 2.5×2.5 arc minutes.

In two consecutive half years 13 observations were obtained (see Table I). Observations 6 and 7 are about 0.5 magnitudes fainter than the remaining 11 observations. On the basis of the groundbased colours and spectral type, and unreddened colours in the visual of Fitzgerald (1970), and in the ultraviolet of Wesselius et al. (1980) I have predicted the ultraviolet magnitudes of HD 124195. The result is shown in the last line of Table I. It is apparent that the 11 bright observations agree quite well with this expectation.

While encountering this object in an earlier stage of the ANS data reduction I thought it was due to an—as yet unknown—observational problem. After many studies based on ANS material, and an extensive comparison with other ultraviolet data (Gilra et al., 1982) I had become reasonably convinced that the observed depression was real, i.e. we are observing an eclipse of HD 124195.

Indeed I found that the star is listed as a variable in Kukarkin's catalogue under the name: V716 Cen. Schoeffel and Koehler (1965) published a lightcurve showing a primary minimum of about 0.6 magnitudes and a secondary one of 0.3 magnitudes. The next year Popper described 6 spectrograms of this star: he

found only single lines. Hube (1970) published three radial velocities of HD 124195: +92, +95, +10 km/s, on average "+65.9 var".

Table I
ANS Observations on HD 124195

No.	Date	m1550N	m1550W	m1800	m2200	m2500	m3300
1	1975.10873	4.743	4.729	4.921	5.665	5.530	5.624
2	1975.11043	4.754	4.729	4.896	5.660	5.532	5.631
3	1975.11044	4.746	4.728	4.898	5.655	5.530	5.632
4	1975.11268		4.722	4.894	5.643	5.529	5.606
5	1975.11269		4.728	4.895	5.640	5.526	5.604
6	1975.11378	5.296		5.439	6.179	6.048	6.129
7	1975.11378	5.295		5.430	6.178	6.056	6.123
8	1975.61623		4.715	4.889	5.640	5.524	5.625
9	1975.61623	4.735		4.887	5.638	5.528	5.625
10	1975.61881		4.718	4.895	5.640	5.520	5.624
11	1975.61882	4.733		4.893	5.646	5.531	5.624
12	1975.61900		4.752	4.930	5.671	5.560	5.654
13	1975.61900	4.756		4.923	5.679	5.555	5.660
14	prediction		4.76	4.92	5.61	5.46	5.61
15	average	4.745		4.902	5.652	5.533	5.628
16	rms error	.009		.015	.014	.013	.017
17	eclipse	0.551		0.533	0.527	0.519	0.498

On the basis of Hube's result, and apparently unaware of the previous studies establishing the star as an eclipsing binary, Bekenstein and Bowers (1974) included it in a list of potential runaway stars on the basis of the high peculiar velocity derived from Hube's +65.9. This large peculiar velocity is due to the binary nature, and consequently the star is not a runaway star.

Each of the observations consists typically of 10 samples on the star, preceded and/or followed by 6 samples dark current of the photomultipliers; each sample lasts 8 seconds. The data reduction on an observation results in five net fluxes, one for each photometric channel (they are registered simultaneously). The internal error in each of these net fluxes is smaller than 0.5%. During the observations in the eclipse phase (lasting 208 seconds) the flux did not vary too.

HD 124195 has a period of $\text{Min} = \text{JD } 2438524.410 + 1.49008$ days. The ANS observation has been done 2638.044 periods later,

i.e. 1.6 hours after minimum. Judging from Schoeffel and Koehler's lightcurve I predict a depression in the visible of 0.47 mag and an increase in intensity in 208 seconds of 0.004 mag. Row 15 and 16 of Table I present the average of the 11 ANS observations apparently done outside of both eclipse phases, and row 17 presents the difference between this average and the eclipse observations. We see that there is a small color effect: the depression is 0.55 mag at 1550 Å to 0.50 mag at 3300 Å. The predicted depression at V of 0.47 mag seems perfectly in agreement with the UV depressions, and the ANS observations are apparently on the rising part of the primary minimum.

It might be possible to derive some properties of the secondary, but I will leave that to more experienced binary star specialists. It might be worthwhile to obtain more observations on this star in order to establish its properties.

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References:

- Bekenstein, J.D., Bowers, R.L.: 1974, *Astrophys. J.* 190,653.
 Fitzgerald, M.P.: 1970, *Astron.Astrophys.* 4,234.
 Gilra, D.P., Jamar, C., Koornneef, J., Meade, M.R., Wesselius, P.R.: 1982, in preparation.
 Hube, D.P.: 1970, *Mem. R.A.S.* 72,233.
 Popper, D.M.: 1966, *Astron. J.* 71,175.
 Schoeffel, E., Koehler, U.: 1965, *IAU Inf.Bull. on Variable Stars* No. 77.
 Wesselius, P.R., v.Duinen, R.J., Aalders, J.W.G., Kester, D.: 1980, *Astron. Astrophys.* 85,221.