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TWO - COLOUR - LIGHTCURVE AND PRELIMINARY ELEMENTS
FOR AL Leo

[BAV-Mitteilung Nr.53]

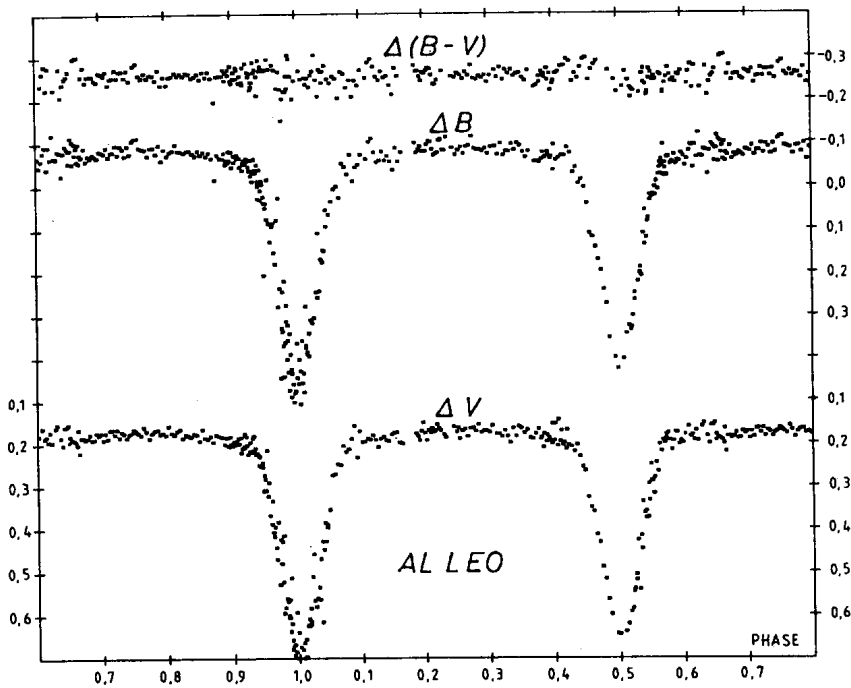
AL Leo = SAO 098873 = BD+18°2297 [9.1] = 354.1934 = CSU 1536 = P 3369 was discovered by Hoffmeister (1934) as probably rapidly changing eclipsing binary star. Sandig (1947) reported, that on 80 plates he inspected, only two minima were found. The variable was also investigated by Kurochkin (1948), who reported 14 photographic brightness measurements and derived from them first elements with a period of 4^d.1444 and a range of brightness between 10^m.1 and 10^m.5. These elements were confirmed by Vasilyanovskaya (1955), who corrected the epoch by -0^p.185 and the limits of lightchange to 10^m.28 - 10^m.70. The small extent of the observational material made us put AL Leo on our program.

AL Leo was observed during 15 nights in spring and autumn 1989 in B and V magnitudes with a single-channel photometer (which utilizes an uncooled EMI 9781 B photomultiplier tube). The telescope used was a 0.35 m Schmidt-Cassegrain at the private Observatory of one of us, which operates fully automatically. For a description see Agerer (1988). SAO 098898 = BD+18°2306 was chosen as a comparison star and SAO 098890 = BD+18°2302 was used

Table 1. Observed times of minima for AL Leo, epochs and residuals computed with respect to the ephemeris derived in this paper

No.	JD helioc.	Min	Type	Epoch	(O-C)	Source
1	2419829.36	I	p::	-17437	+0.092	Kurochkin (1948)
2	20894.47	II	p	-16773.5	-0.057	
3	26116.39	I	p	-13521	-0.071	
4	2447609.473	I	E:	-134	+0.0041	Agerer
5	47613.4941	II	E	-131.5	+0.0032	
6	47654.429	I	E	-106	-0.0025	
7	47824.619	I	E	0	+0.0030	

p denotes pg plate min. (weight 2), E photoelectrical min. (weight 100 or 25). The minimum marked ":" received reduced weight, while those marked "::" were discarded.



Differential B and V light and B-V colour curves of AL Leo.

to check its constancy. Measurements showed that the differences in magnitude between comparison and check star were constant at

$$\begin{aligned} (\text{comparison} - \text{check}) \Delta V &= 0^m.135 \pm 0^m.046 \\ \Delta(B-V) &= -0^m.395 \pm 0^m.041 \end{aligned}$$

Instrumental magnitude differences were converted to the international UB_V-System by observations of 27 LMi and 28 LMi. Our observations showed AL Leo to be a short-period Algol-type eclipsing variable (EA). The depth of the secondary minimum differs only marginally from that of the primary. Moreover, many measurements were made at large zenith distances and under not always satisfying atmospheric conditions. Therefore the variations between observations where the light ought to be constant are of the same order as the difference between primary and secondary eclipse brightness. Further observations are recommended and planned in order to confirm the relation of primary to secondary minimum and to improve the ephemeris. Little or no colour change could be detected during all phases. From our observations we derive the following preliminary elements:

$$\text{Min I} = 2447824.616 \pm 1 + 1^d.605514 \pm 1 * E$$

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