

## The Photographic Light Curve of the Supergiant Eclipsing Variable BL Telescopii

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The photometric elements and whole light curve of the unusual variable BL Telescopii are presented, based on observations taken from 1891 to 1953.

**T**HIS unusual star combines the peculiarities of  $\epsilon$  Aurigae and Algol. Its period of  $778^d.210$  and other physical characteristics were published previously (Gaposhkin 1969) but this is the first publication of the whole light curve. The tabulated photographic magnitudes (Table I) and the curve (Fig. 1) are based on 2079 observations made by the author from patrol plates of the Harvard collection of stellar photographs, taken with several small cameras over an interval of more than 60 years (1891–1953). This peculiar system

provides a unique opportunity for spectroscopic and photometric study, because its physical dimensions are so precisely known and the stars are so sharply defined. The photometric elements are as follows:

Epoch:

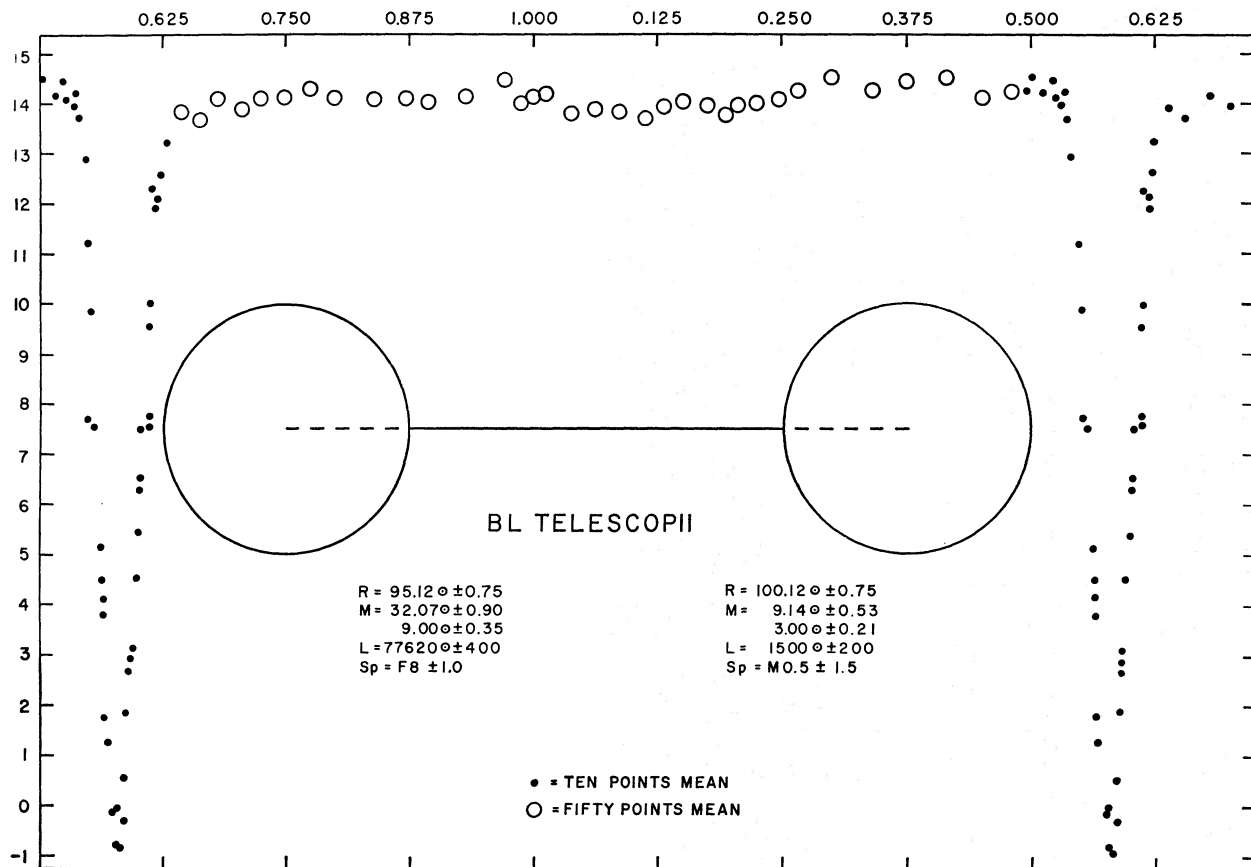
Min. (observed) = J.D. 2430023.70 +  $778^d.210$ ,Max. =  $7^m.54$ ,  $m_1 = 9^m.61$ ,  $m_2 = 7^m.65$ ,  $D_1 = 0^{\circ}.100$  (asymmetrical),  $D_2 > 0^{\circ}.100$ .

FIG. 1. Photographic light curve and bodily scheme of the eclipsing system BL Telescopii: *Abcissa*, phase of the period; *ordinate*, the scale brightness. The small dots represent an average of ten observations and the small circles 50 observations, except the last one which is based on 19. The transformation of the scale brightness ( $s$ ) into the international magnitude is performed with the formula  $m = 9^m.61 - 0.137(s + 0.80)$ . The two stars forming the system are represented by two circles in the figure at elongation with an inclination of  $90^\circ$ , i.e., their orbital plane lies exactly in the line of sight. The radius ( $R$ ), mass ( $M$ ), luminosity ( $L$ ), and spectrum ( $Sp$ ) are given in the area of the circles. The unlabeled numbers under  $M$  are the theoretical masses with the polytropic index  $n = 1.0$ .

TABLE I. The photographic light curve of BL Telescopii (2079 observations).

Phase	Bright- ness	Phase	Bright- ness	Phase	Bright- ness	Phase	Bright- ness	Phase	Bright- ness	Phase	Bright- ness
0F0123	14.2	0F2990	14.5	0F5341	14.2	0F5738	-0.1	0F6026	6.6	0F6829	14.2
0.0372	13.9	0.3387	14.2	0.5384	13.6	0.5763	-0.0	0.6038	7.5	0.7024	14.0
0.0606	13.8	0.3791	14.3	0.5437	12.9	0.5792	-0.7	0.6053	7.5	0.7235	14.1
0.0869	13.8	0.4197	14.6	0.5493	11.2	0.5802	-0.8	0.6071	7.6	0.7492	14.1
0.1100	13.7	0.4548	14.1	0.5537	9.9	0.5842	-0.3	0.6100	9.5	0.7772	14.3
0.1322	13.9	0.4829	14.2	0.5571	7.6	0.5858	0.5	0.6119	9.9	0.8063	14.1
0.1527	14.0	0.4948	14.2	0.5593	7.6	0.5882	1.8	0.6149	12.2	0.8399	14.0
0.1764	13.9	0.5027	14.5	0.5624	5.1	0.5908	2.6	0.6177	11.8	0.8729	14.0
0.1899	13.7	0.5105	14.5	0.5647	4.5	0.5926	2.8	0.6199	12.0	0.9084	14.0
0.2047	13.9	0.5175	14.1	0.5660	4.1	0.5938	3.0	0.6223	12.5	0.9444	14.1
0.2252	14.0	0.5224	14.4	0.5678	3.8	0.5955	4.5	0.6290	13.2	0.9736	14.4
0.2467	14.1	0.5283	14.0	0.5693	1.8	0.5977	5.4	0.6437	13.9	0.9907	14.0
0.2671	14.2	0.5308	13.9	0.5720	1.3	0.6007	6.2	0.6620	13.6	0.9953	14.1

## REFERENCES

Gaposhkin, S. 1969, *Bull. Am. Astron. Soc.* **1**, 189.