Visual estimates of RZ Tauri

Rybka, E.

4. ROBINSON's period for the date J. D. 2419172 is 10^{d}·14489 ± $^{\mathrm{d}}$·00013 (m. e.), the difference from the period derived here being $^{\mathrm{d}}$·00092 ± $^{\mathrm{d}}$·00017 (m. e.) or $5^{1}/_{2}$ times its mean error. The corresponding coefficient of the term E^2 is

$$-{}^{\mathrm{d}}\cdot00092/2\times403 = -{}^{\mathrm{d}}\cdot00000114 \pm {}^{\mathrm{d}}\cdot00000021 \text{ (m.e.)},$$

while AXEL V. NIELSEN (*Meddelelser fra Ole Rømer-Observatoriet i Aarhus* N°. 5, 1930) found the same coefficient for ζ Geminorum to be

$$-{}^{\mathrm{d}}\cdot00000058 \pm {}^{\mathrm{d}}\cdot00000004 \text{ (m. e.)}.$$

The two coefficients found for the two similar variables SY Aur. and ζ Gem. have therefore the same sign and are of the same order of magnitude, but further observations are needed to settle the question in the case of SY Aurigae.

I want to thank Prof. E. HERTZSPRUNG for his advice and Mr. P. TH. OOSTERHOFF for putting the plates taken by him at my disposal.

Visual estimates of RZ Tauri, by *E. Rybka*.

From Febr. 10 to March 22, 1930 I made 163 visual estimates of RZ Tau, which is a variable of the W UMa-type. The visual 266-mm refractor of the Leiden Observatory was used with a magnifying power of 72.

As comparison stars were used b = BD + 18°658a (9^{m}·4) and a fainter star c at the distance, from the variable $\Delta\delta = +3'$·3 and $\Delta\alpha \cos\delta = +9'$·2. The results of my estimates are given in steps. Taking b as zero-point, c was found to be 7^{s}·2. From a comparison with the lightcurve of P. TH. OOSTERHOFF (*B. A. N.* 190) the value of my step is in this case found to be $^{\mathrm{m}}$·16.

Table 1 contains the results of the individual estimates. The phases were computed from the formula

phase $= 4^{\mathrm{d}\,-1}$·8115 (J. D. hel. M. astr. T. Grw. — 2426000)

TABLE 1. Estimates.

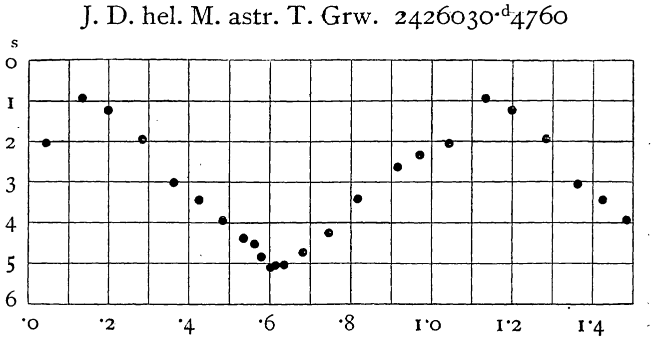
J. D. hel. M. astr. T. Grw.	Phase	steps	J. D. hel. M. astr. T. Grw.	Phase	steps	J. D. hel. M. astr. T. Grw.	Phase	steps
d 2426018	p	s	d 2426021	p	s	d 2426021	p	s
·2402	·763	4·8	·3003	·486	4·1	·3980	·956	1·2
·2519	·819	4·1	·3046	·507	3·6	·4013	·972	2·1
·4156	·607	4·8	·3072	·520	3·6	·4053	·992	1·2
·4171	·614	4·5	·3105	·536	3·6	·4077	·003	1·0
·4196	·626	4·1	·3145	·555	4·1			
·4219	·637	4·8	·3175	·569	5·1	2426022		
·4240	·647	4·5	·3212	·587	5·1	·2628	·118	— 1·0
·4267	·660	5·1	·3251	·606	5·1	·2654	·130	0·0
·4291	·672	4·8	·3288	·624	5·1	·2688	·146	— 1·0
			·3320	·639	5·4	·2713	·158	2·1
2426021			·3348	·652	5·1	·2734	·168	2·4
·2433	·212	2·4	·3385	·670	5·1	·3005	·299	2·7
·2480	·235	1·4	·3416	·685	4·8	·3036	·314	3·1
·2501	·245	2·1	·3452	·702	4·1	·3055	·323	3·6
·2529	·258	1·2	·3490	·721	4·1	·3080	·335	2·7
·2564	·275	0·0	·3524	·737	4·8	·3107	·348	3·1
·2608	·296	1·2	·3554	·752	3·6	·3133	·360	3·1
·2645	·314	2·4	·3595	·771	4·1	·3163	·375	2·7
·2666	·324	2·4	·3631	·789	4·1	·3193	·389	2·7
·2693	·337	2·8	·3672	·808	3·6	·3223	·404	3·1
·2793	·385	4·1	·3692	·818	3·1	·3249	·416	3·6
·2806	·392	3·6	·3744	·843	3·1	·3274	·428	2·7
·2830	·403	3·1	·3764	·852	2·4	·3302	·442	3·6
·2848	·412	3·6	·3805	·872	3·1	·3329	·455	3·6
·2869	·422	3·6	·3834	·886	2·4	·3349	·464	4·1
·2899	·436	4·1	·3876	·906	2·1	·3374	·476	4·1
·2940	·456	4·1	·3911	·923	2·7	·3402	·490	3·6
·2971	·471	3·6	·3942	·938	2·1	·3420	·498	4·1

TABLE 1. Estimates (*Continued*).

J. D. hel. M. astr. T. Grw.	Phase	steps	J. D. hel. M. astr. T. Grw.	Phase	steps	J. D. hel. M. astr. T. Grw.	Phase	steps
d			d			d		
2426022	P	s	**2426043**	P	s	**2426045**	P	s
·3445	·511	4·1	·3395	·528	4·5	·3162	·039	1·8
·3473	·524	4·1	·3430	·545	4·5	·3180	·048	1·8
·3514	·544	4·8	·3446	·552	4·5	·3207	·060	2·7
·3538	·555	4·8	·3462	·560	4·0	·3238	·076	1·8
·3566	·569	4·5	·3473	·566	4·5	·3263	·088	2·4
·3587	·579	5·1	·3492	·575	4·8	·3291	·101	1·6
·3618	·594	5·1	·3511	·584	4·5	·3325	·117	0·9
·3648	·608	5·1	·3527	·592	4·5	·3348	·128	2·4
			·3544	·600	5·1	·3377	·142	1·6
2426025			·3563	·609	5·4	·3408	·157	1·8
·2665	·570	5·1	·3578	·616	4·5	·3425	·165	1·8
·2680	·577	4·1	·3598	·626	4·8	·3459	·182	0·9
·2704	·588	5·1	·3620	·636	5·4	·3484	·194	0·0
·2720	·596	5·1				·3505	·204	1·8
·2737	·604	6·0	**2426045**			·3522	·212	0·0
·2748	·610	5·1	·2871	·899	3·1	·3544	·223	0·9
·2762	·616	6·2	·2894	·910	3·2	·3568	·234	1·0
·2771	·621	5·1	·2907	·916	2·7			
·2790	·630	5·1	·2918	·922	2·7	**2426058**		
·2822	·645	6·0	·2936	·930	2·7	·3031	·525	4·8
·2855	·661	4·8	·2954	·939	2·7	·3049	·534	4·8
·2891	·678	4·8	·2968	·946	2·7	·3069	·544	4·8
·2929	·697	5·1	·2982	·952	1·8	·3091	·554	5·1
·2949	·706	4·1	·3025	·973	3·2	·3112	·564	4·1
·2976	·719	4·8	·3041	·981	3·2	·3131	·574	4·8
·3009	·735	4·1	·3057	·988	2·9	·3154	·584	5·1
·3047	·754	4·1	·3077	·998	2·4	·3183	·598	5·1
·3070	·765	4·1	·3106	·012	1·8	·3205	·609	4·5
·3094	·776	3·6	·3129	·023	2·4	·3212	·612	5·1
·3124	·791	3·6	·3148	·032	2·7			

The estimates were then arranged according to phase and divided into 18 groups of 9 or 10 estimates each. The mean values of phase and brightness thus found are given in Table 2 and represented graphically in the accompanying figure. A smooth curve was drawn through the normal points thus obtained and the brightness read off on 50 places separated by ·02 of the period. From these values the phase of the minimum was derived in the way as described in *B. A. N.* 147 and 166, and found to be ^{P}·6352. The corresponding mean epoch of minimum is

J. D. hel. M. astr. T. Grw. 2426030·^{d}4760



in full agreement with the elements derived by P. TH. OOSTERHOFF (*B. A. N.* 190).

TABLE 2. Normal points.

Number of estimates	Mean Phase	steps
	P	s
9	·0423	2·0
9	·1332	0·9
9	·1994	1·2
9	·2844	2·0
9	·3606	3·0
9	·4242	3·4
9	·4845	3·9
9	·5332	4·4
9	·5605	4·5
9	·5797	4·9
9	6005	5·1
9	·6145	5·1
9	·6376	5·0
9	·6814	4·7
9	·7462	4·3
9	·8187	3·4
9	·9145	2·6
10	·9697	2·3