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No. 20

The short period Cepheid RU Piscium

By *L. Dezső*

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Az RU Piscium rövid periódusú Cephei csillag

Irta *Dezső Loránt*

(Az angol nyelvű dolgozat kivonata)

1936-tól 1942-ig bezárólag 759 fotográfiai-fotometriai megfigyelést végeztem az RU Piscium rövid periódusú δ Cephei típusú változó csillagra vonatkozólag. A felvételek a Budapest-Svábhegyi Csillagvizsgáló Intézet (1 : 14) 16 cm-es asztrográfjával, míg a fényességmérések a Rosenberg-féle elektromikrofométerrel történtek. Az I. táblázat az összehasonlító csillagok, a II. táblázat a változó csillagra vonatkozó (magnitudokban megadott) mért fényességeket tartalmazza; a II. táblázat első oszlopában vannak Julian napokban megadva a Napra redukált greenwichi meridiánra vonatkozó észlelési idők. Megfigyeléseim célja a fotografikus fénygörbe meghatározása és annak az eldöntése volt, hogy változik-e a periódus vagy nem. A fotografikus fénygörbét az 1. és 2. ábrán adom meg. (Az 1. ábra pontjai az egyes észlelések eredményét tünteti fel, a fénygörbe feletti vízszintes vonalak mutatják, hogy a különböző észlelési napokon a fénygörbe milyen fázisban mennyi ideig állt megfigyelés alatt.) A fotografikus középgörbe szerint (2. ábra), amelynek a normál pontjaihoz tartozó és a minimumtól számított fázis-értékeit a III. táblázat tartalmazza, a csillag fotografikus minimális és maximális fényessége: $10^m,51$ ill. $9^m,83$; minimumtól maximumig szükséges idő 0,18 nap. A fényesség-változás periódusát illetőleg már első megfigyeléseim után valószínűnek látszott, hogy az nem állandó és az is, hogy a periódus változása lassú. Ezért a periódusváltozás törvényszerűségének meghatározása, amihez felhasználtam Detre régebbi vizuális fotometriai észleléseit is, csakis évekre kiterjedő rendszeres megfigyeléssel volt lehetséges. A periódus változására vonatkozó eredményemet az V. táblázatban ill. a 3. ábrán közlöm. A táblázat utolsó oszlopában adom meg, hogy a második oszlopban feltüntetett időpontban mekkora volt a periódus hossza, a harmadik oszlop azt a napokban kifejezett időintervallumot mutatja, amelybe eső észlelési adatokból lettek a periódusok számítva és amelyeken belül a számítás szempontjából a periódus állandónak volt tekinthető. Ezt az időintervallumot jelölik az ábrában az abszcissza tengellyel párhuzamos vonaldarabok, a táblázat hat értékét pontok tüntetik fel, míg a kihúzott görbe vonal és a dolgozat végén megadott formula a periódus valószínű változásának menetét mutatja. A fényesség-változás periódusa 0,3902 és 0,3906 napos határok között közel 3 éves periódussal maga is periódikusan változik. A IV. táblázatban van a periódus változásának tanulmányozására felhasznált 17 észlelt időpont, ezek a fotografikus fénygörbe felszálló ága $10^m,06$ pontjának megfelelő helyére vonatkoznak. A táblázat negyedik oszlopa a felszálló ágak észlelési pontosságára vonatkozó súlyokat, az ötödik pedig a 2429290,8 Julian nap óta eltelt periódusok számát adja meg.

Csillagvizsgáló Intézet, Budapest-Szabadsághegy (Svábhegy)
és
Kolozsvári Bolyai Tudományegyetem Csillagászati Intézete

The short period Cepheid RU Piscium

By *L. Dezső*

1. The variability of BD + 23°159 = H 3666 = RU Piscium was discovered by LEAVITT.[1] ZESSEWITSCH[2] found from 220 estimates that the variation is of the RR Lyrae type, the period being 0,3898 day. A visual light curve of this variable based on 472 observations made with a wedge photometer has been published by DETRE.[3] The classification adopted by him was the Bailey's RRb-type and the period the constant value of 0,390398 day.

RU Piscium has an A_3 spectrum[4] and the normal radial velocity[5] —115 km/sec.

2. I have made my photografic observations with the 16 cm. (1 : 14) astrograph of the Budapest-Svábhegy Observatory. The plates were exposed 3 minutes in the focal plane. A series of sets of images were photographed on a plate by moving it in declination. Eastman 40 plates were used through the entire series of observations. The photometric measures were secured by means a Rosenberg electromicrophotometer. Distance correction, and correction concerning atmospheric extinction were not introduced. The positions of the stars as to the optical axe always remained the same.

The magnitudes of the comparison stars are given in TABLE I; they were determined on three plates from the North Polar Sequence. At the exposure of these three plates the differences between the zenit distance of the pole and the zenit distance of the variable were about 16°—17°.

4 or 5 comparison stars were used at each single magnitude determination.

TABLE I.

Comparison Stars

	Star	m_{pg}
a	BD + 24° 190	8,99
b	BD + 24° 191	9,88
c	BD + 23° 157	10,10
d	BD + 23° 163	10,36
e	BD + 24° 192	10,62

[1] Harv. Bull. 790, 1923.
[2] A. N. **223**, 154, 1924.
[3] A. N. **251**, 28—32, 1934 (Nr. 6002).
[4] CANNON, Harv. Bull. 897, 1934.
[5] JOY, Publ. A. S. P. **50**, 303, 1938 (Nr. 297).

TABLE II.

The Observations

J. D.	m
2428426,598	10,01
,600	9,95
,602	9,93
,604	9,97
,606	10,01
,608	9,95
,610	9,98
,612	10,02
,614	9,94
,617	9,92
,619	10,05
,621	10,06
,623	9,99
,625	10,04
,627	9,92
,629	9,92
,631	9,93
,633	9,88
,636	9,99
2428430,570	9,93
,572	9,95
,574	9,88
,576	9,86
,578	9,88
,580	10,01
,582	10,00
,584	9,88
,586	9,98
,588	9,99
,591	9,97
,593	9,99
,595	10,00
,597	10,00
,599	9,97
,602	9,81
,604	9,96
,606	9,79
,608	9,92
,610	9,93
,612	9,99
,614	9,95
,616	9,92
,618	9,97
,620	10,02
,623	10,08
,625	10,06
,627	10,00
,629	10,03
,632	10,09
,634	9,98
,636	10,06
2428432,494	9,85
,496	9,80
,498	9,88

J. D.	m
2428432,500	9,96
,502	9,76
,505	9,85
,507	9,88
,509	9,98
,511	9,85
,513	9,85
,515	9,79
,517	9,74
,519	9,78
,521	9,77
,523	9,84
,525	9,77
,527	9,90
,530	9,80
,532	9,68
,534	9,85
,540	9,88
,542	9,84
2428433,371	10,05
,373	10,11
,375	9,76
,377	9,90
,379	10,09
,381	9,95
,383	9,80
,385	10,02
,387	9,79
,389	9,91
,391	9,94
,394	9,95
,396	9,94
,398	10,11
,400	10,06
,402	9,79
,404	10,07
,406	9,84
,408	9,84
,410	9,87
,412	9,93
,415	9,91
,416	10,13
,423	10,07
,425	9,97
,429	10,06
,431	10,11
,433	10,16
,437	10,23
,439	10,20
,441	9,98
,444	10,01
,446	10,05
,448	10,15
,450	10,10
,452	10,20

J. D.	m
2428433,457	10,36
,459	10,44
,461	10,40
,463	10,31
,465	10,39
,467	10,49
,469	10,54
,471	10,32
,473	10,30
,475	10,34
,478	10,39
,480	10,40
,482	10,38
,485	10,24
,487	10,40
,489	10,25
,491	10,24
,494	10,48
,496	10,44
,498	10,41
,500	10,36
,505	10,54
,507	10,43
,509	10,46
,511	10,33
,513	10,58
,515	10,51
,517	10,43
,519	10,42
,521	10,34
,523	10,48
,525	10,52
,528	10,36
,530	10,33
,534	10,40
,536	10,60
,545	10,31
,547	10,24
,560	10,18
,562	10,50
,564	10,46
,566	10,40
,569	10,36
,571	10,36
,577	10,20
,579	10,12
,581	10,00
,585	10,17
,587	10,14
,589	10,36
,591	10,28
,594	10,16
,596	10,27
,598	10,08
,600	10,17
,604	10,08

180.

J. D.	m
2428433,606	10,06
,608	9,99
,610	9,96
,614	10,05
,616	9,80
,619	10,08
2428545,214	10,41
,216	10,41
,218	10,37
,220	10,36
,222	10,35
,236	10,51
,239	10,51
,241	10,40
,243	10,49
,245	10,45
,247	10,44
,249	10,37
,251	10,39
,254	10,41
,255	10,51
,257	10,36
,259	10,47
,261	10,35
,264	10,45
,266	10,35
,268	10,30
,270	10,33
,272	10,36
,274	10,33
,276	10,40
,278	10,25
,280	10,31
,282	10,30
,284	10,28
,290	10,29
,293	10,21
,295	10,20
,299	10,16
,303	10,06
,305	10,11
,307	10,05
,309	9,92
,311	10,08
,314	10,08
,316	9,90
,318	10,05
,320	9,98
,322	10,00
,324	9,84
,326	10,00
,328	10,06
,331	9,98
,333	10,05
,335	9,95
,337	9,91
,339	10,05
,341	10,05
,346	10,04

J. D.	m
2428545,348	9,98
,350	10,03
,352	9,98
,355	9,88
,357	9,96
,361	9,90
,364	9,85
,370	9,82
,373	9,91
,375	9,84
,377	9,83
,380	9,89
,382	9,96
,384	9,78
,386	9,83
,388	9,97
,390	9,92
,392	9,83
,394	9,77
,396	9,93
2429222,238	10,06
,240	10,01
,242	10,17
,244	10,01
,246	10,07
,248	10,21
,250	10,16
,252	10,06
,254	10,07
,256	10,10
,258	10,01
,260	10,15
,262	10,21
,264	10,10
,266	10,27
,268	10,20
,270	10,21
,272	10,14
,274	10,22
,276	10,36
,279	10,17
,281	10,16
,282	10,35
,284	10,41
,285	10,20
,290	10,20
,292	10,31
,294	10,34
,299	10,29
,310	10,32
,312	10,33
,314	10,33
,316	10,29
,318	10,44
,320	10,36
,322	10,55
,324	10,47
,326	10,41
,329	10,42

J. D.	m
2429222,331	10,49
,333	10,35
,335	10,44
,337	10,43
,339	10,48
,341	10,37
,343	10,41
,345	10,38
,347	10,42
,349	10,40
,351	10,50
,354	10,57
,356	10,42
,358	10,62
,360	10,48
,362	10,53
,364	10,47
,366	10,34
,368	10,49
,371	10,44
,374	10,44
,376	10,45
,378	10,60
,380	10,47
,400	10,45
,402	10,45
,404	10,37
,406	10,38
,408	10,49
,410	10,41
,413	10,43
,415	10,33
,417	10,36
,419	10,31
,421	10,35
,423	10,35
,425	10,46
,427	10,37
,430	10,29
,432	10,36
,434	10,27
,437	10,28
2429226,346	10,04
,348	10,10
,350	10,08
,353	10,10
,355	10,08
,356	10,05
,359	10,10
,361	9,91
,364	9,99
,366	9,90
,368	9,88
,370	9,96
,372	10,03
,374	10,06
,376	9,98
,378	10,00
,380	9,97

J. D.	m
2429226,382	9,97
,385	9,92
,387	9,92
,389	9,94
,392	10,08
,394	9,88
,396	9,77
,398	9,94
,400	9,84
,402	9,96
,404	9,93
,406	9,80
,408	9,80
,410	9,83
,412	9,88
,414	9,83
,420	9,81
,422	9,80
,425	9,91
,427	9,79
,431	9,94
,433	9,93
,435	9,83
,437	9,94
,439	9,77
,442	9,80
,444	9,74
,446	9,75
,448	9,84
,450	9,87
,452	9,84
,454	9,80
2429227,266	9,82
,268	9,73
,270	9,86
,272	9,71
,274	9,78
,276	9,84
,280	9,88
,282	9,80
,284	9,90
,289	9,94
,291	9,90
,293	9,81
,295	9,86
,297	9,84
,299	9,95
,301	9,99
,303	9,99
,305	9,98
,307	10,08
,312	10,02
,314	9,99
.316	10,19
,318	10,12
,320	10,15
,322	10,09
,324	10,10
,326	10,06

J. D.	m
2429274,231	10,36
,233	10,38
,235	10,48
,238	10,54
,240	10,62
,242	10,38
,244	10,46
,246	10,36
,248	10,43
,250	10,49
,252	10,47
,254	10,40
,256	10,46
,258	10,52
,260	10,48
,263	10,49
,265	10,43
,267	10,66
,269	10,53
,271	10,40
,273	10,30
,275	10,56
,277	10,52
,285	10,45
,287	10,46
,290	10,54
,292	10,47
,294	10,53
,296	10,59
,298	10,59
,300	10,34
,302	10,52
,304	10,57
,306	10,53
,308	10,57
,310	10,38
,312	10,47
,315	10,36
,317	10,60
,319	10,49
,321	10,38
,323	10,36
,325	10,53
,327	10,28
,329	10,29
,331	10,36
,340	10,22
,342	10,12
,344	10,11
,346	10,07
,348	10,10
,350	10,20
,352	10,10
,354	10,06
,356	10,08
,358	10,07
,360	10,01
,362	10,09
,365	9,99
,367	10,03

J. D.	m
2429274,369	10,05
,371	9,98
,373	10,00
,375	9,90
,377	9,94
,379	9,96
,387	9,93
,390	9,90
,392	9,88
,394	9,96
,396	9,91
,398	9,88
,400	9,96
,402	9,85
,404	9,92
,406	9,92
,408	9,80
,410	9,83
,412	9,98
,415	9,91
,419	9,86
,421	9,85
,423	9,88
,427	9,86
,429	9,88
2429276,203	10,53
,205	10,62
,207	10,45
,209	10,65
,211	10,56
,213	10,56
,216	10,70
,219	10,60
,222	10,60
,224	10,45
,226	10,55
,228	10,48
,230	10,61
,232	10,43
,234	10,59
,237	10,63
,238	10,59
,241	10,56
,243	10,52
,245	10,64
,247	10,35
,252	10,46
,254	10,55
,256	10,41
,258	10,48
,261	10,40
,263	10,40
,265	10,55
2429301,264	10,20
,266	10,08
,269	10,11
,271	10,23
,273	10,06

J. D.	m
2429301,275	10,14
,277	10,08
,279	9,98
,281	10,06
,283	10,01
,286	10,18
,288	10,20
,293	10,07
,295	10,05
,297	10,00
,299	10,00
,303	9,96
,305	9,88
,307	9,95
,309	9,93
,312	10,01
,321	10,04
,323	9,94
,325	10,00
,328	9,98
,331	9,99
2429310,228	10,42
,230	10,19
,233	10,24
,235	10,36
,238	10,28
,240	10,18
,242	10,25
,246	10,17
,248	10,17
,252	10,16
,262	10,04
,264	9,98
,267	10,06
,269	9,98
,271	9,96
,273	10,01
,275	9,92
,277	9,97
2429497,526	10,30
,528	10,23
,530	10,34
,532	10,24
,535	10,36
,537	10,14
,539	10,21
,541	10,26
,543	10,20
,545	10,26
,547	10,12
,549	10,28
,551	10,34
,553	10,36
,555	10,35
,557	10,26
,559	10,49
,562	10,51
,566	10,36

J. D.	m
2429497,569	10,35
,571	10,31
,573	10,40
,575	10,29
,578	10,33
,580	10,47
,582	10,47
,584	10,49
,586	10,50
,588	10,56
,591	10,58
,597	10,42
,599	10,45
,601	10,54
,605	10,60
2429530,450	10,62
,452	10,55
,454	10,58
,456	10,59
,459	10,47
,461	10,56
,465	10,38
,467	10,46
,469	10,35
,471	10.41
,473	10,44
,475	10,42
,478	10,48
,480	10,40
,485	10,40
,487	10,26
,489	10,38
,491	10,42
,493	10,45
,495	10,16
,497	10,27
,499	10,24
,501	10,32
,505	10,20
,508	10,13
,510	10,20
,513	10,31
,515	10,07
,517	10,16
,519	10,18
,521	10,28
,524	10,15
,528	10,17
,530	10,17
,532	10,20
,534	9,98
2429553,539	10,50
,541	10,36
,543	10,31
,545	10,40
,549	10,40
,551	10,36
,553	10,18

J. D.	m
2429553,556	10,28
,558	10,36
,560	10,24
2429576,573	10,60
,575	10,57
,582	10,50
,584	10,49
,586	10,42
,588	10,61
,591	10,40
,601	10,36
,604	10,35
,607	10,33
,609	10,27
,611	10,29
,613	10,34
,618	10,36
,622	10,28
,624	10,10
,626	10,27
,629	10,03
,631	10,07
,633	10,15
,635	10,10
,637	10,07
,639	10,19
2429584,430	10,23
,432	10,13
,434	10,10
,436	10,15
,438	10,00
,441	10,06
,443	10,04
,445	10,04
,447	9,98
,451	9,90
,453	9,84
,455	9,76
,457	9,82
,460	9,85
,464	10,03
,470	9,83
2429984,349	9,93
,353	9,97
,356	9,99
,361	10,03
,366	10,03
,370	10,05
,374	10,04
,378	10,03
,382	10,09
,386	10,12
,391	10,09
,395	10,11
,400	10,12

J. D.	m	J. D.	m	J. D.	m
2430053,237	10,23	2430053,287	10,00	2430328,300	10,56
,239	10,13	,289	9,99	,304	10,46
,241	10,20	,291	10,07	,309	10,28
,243	10,10			,313	10,34
,245	10,07			,317	10,36
,247	10,07			,322	10,32
,249	10,06	2430325,479	10,24	,326	10,34
,251	10,05	,481	10,25	,330	10,20
,253	10,15	,483	10,23	,334	10,22
,255	10,15	,485	10,20	,338	10,16
,257	10,07	,487	10,15	,343	10,06
,260	10,04	,490	10,30	,347	10,14
,262	10,10	,492	10,34	,351	9,98
,264	10,21	,496	10,35	,361	10,02
,266	10,15	,498	10,26	,366	9,99
,268	10,00	,530	10,36	,370	9,98
,270	10,07	,533	10,38	,375	9,92
,272	10,01	,535	10,33	,378	9,99
,275	10,04	,537	10,36	,382	10,00
,277	10,07	,539	10,38	,386	9,98
,279	10,02	,543	10,36	,391	9,94
,281	9,95	,545	10,40	,395	9,99
,283	9,96	,547	10,33	,399	9,94
,285	9,94	,549	10,40	,403	9,94

TABLE III.

Normal points

p = phase, d = fraction of the day, (zero point at minimum,) m = photographic magnitudes, means of ten observations

p	d	m	p	d	m	p	d	m
0,000	0,000	10,52	0,228	0,089	10,12	0,567	0,221	9,90
0,010	0,004	10,46	0,233	0,091	10,09	0,595	0,232	9,89
0,018	0,007	10,45	0,241	0,094	10,09	0,626	0,244	9,95
0,031	0,012	10,44	0,249	0.097	10,06	0,646	0,252	9,96
0,041	0,016	10,45	0,259	0,101	10,02	0,667	0,260	10,00
0,051	0,020	10,47	0,264	0,103	9,98	0,687	0,268	10,01
0,067	0,026	10,45	0,272	0,106	9,99	0,703	0,274	9,95
0,074	0,029	10,48	0,279	0,109	9,95	0,715	0,279	10,13
0,087	0,034	10,46	0,287	0,112	9,97	0,728	0,284	10,10
0,100	0,039	10,44	0,292	0,114	9,95	0,744	0,290	10,08
0,105	0,041	10,44	0.308	0,120	10,00	0,761	0,297	10,09
0,113	0,044	10,40	0,318	0,124	9,97	0,777	0,303	10,24
0,120	0,047	10,43	0,328	0,128	9,96	0,797	0,311	10,25
0,128	0,050	10,41	0,338	0,132	9,94	0,818	0,319	10,28
0,138	0,054	10,31	0,349	0,136	9,95	0,836	0,326	10,23
0,149	0,058	10,34	0,359	0,140	9,93	0,861	0,336	10,38
0,156	0,061	10,33	0,371	0,145	9,90	0,885	0,345	10,35
0,164	0,064	10,32	0,387	0,151	9,93	0,900	0,351	10,42
0,172	0,067	10,29	0,405	0,158	9,87	0,913	0,356	10,36
0,182	0,071	10,25	0,418	0,163	9,88	0,928	0,362	10,44
0,187	0,073	10,19	0,433	0,169	9,84	0,946	0,369	10,38
0,195	0,076	10,15	0,451	0,176	9,85	0,961	0,375	10,43
0,205	0,080	10,16	0,472	0,184	9,82	0,977	0,381	10,50
0,213	0,083	10,14	0,492	0,192	9,86	0,987	0,385	10,51
0,220	0,086	10,14	0,523	0,204	9,93			

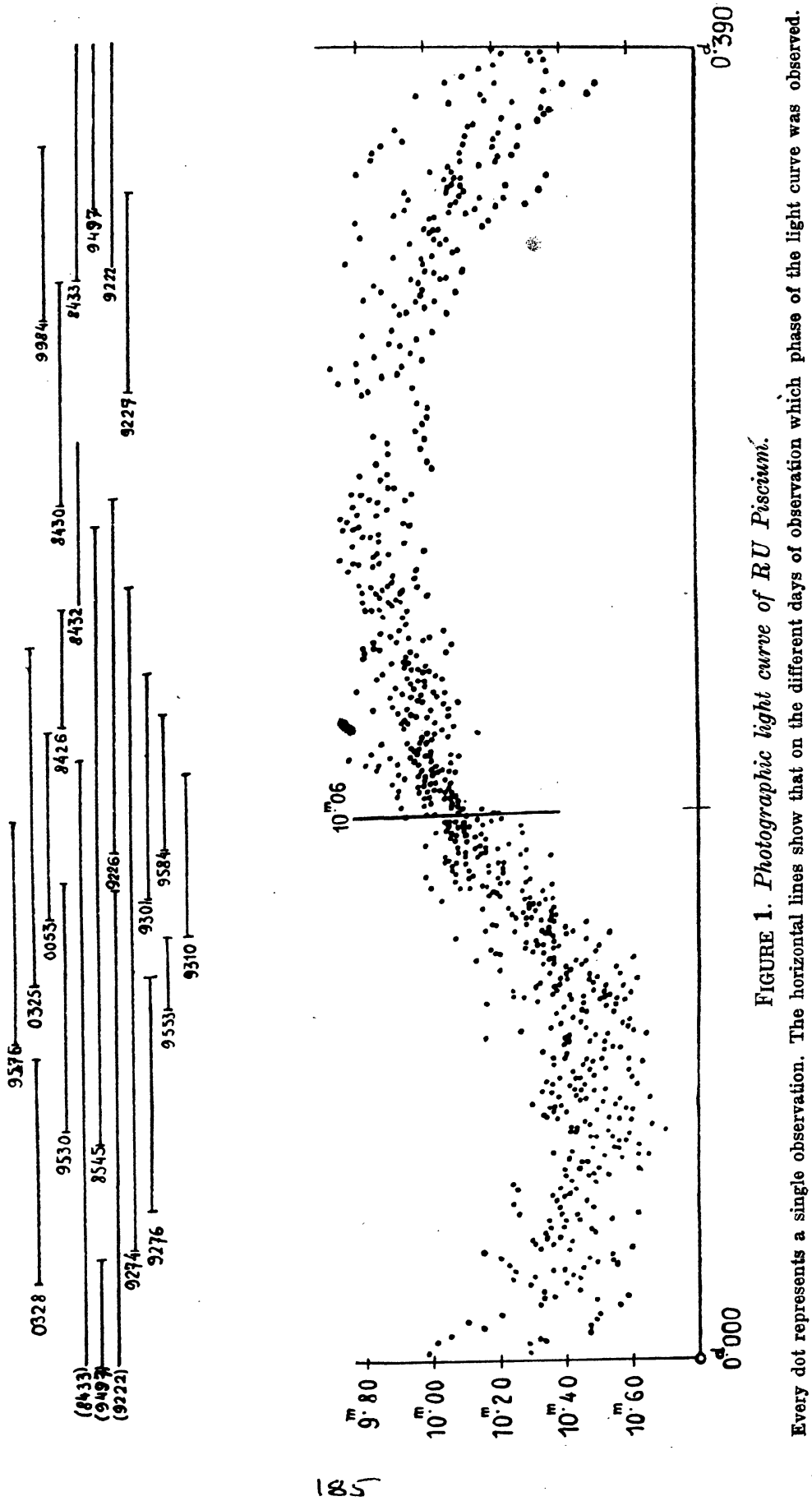

FIGURE 1. *Photographic light curve of RU Piscium.*

Every dot represents a single observation. The horizontal lines show that on the different days of observation which phase of the light curve was observed.

826 photograps were taken on RU Piscium. From about 8% of these available result could not be taken. Some images could not be measured at all partly because of uncertain stellar images caused principaly by defect of the emulsion and partly because the observations had to be stopped on account of claudy weather. Some other measurments had to be left out because it was difficult to draw a well defined characteristic curve (density vs. magnitude curve). Thus remain 759 observations as available, which are tabulated in TABLE II. The times of the observations (Heliocentric Greenwich Mean Time) are given in Julian Days.

With my observations I aimed to publish the photographic light curve and to determine whether the period is constant or whether there is some change in the period.

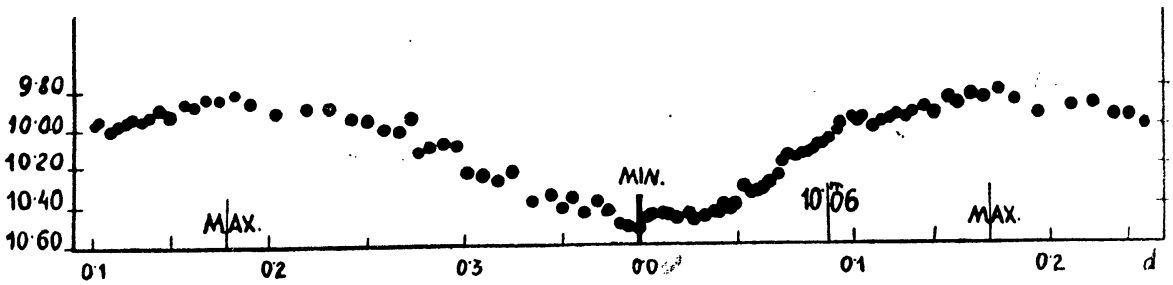

FIGURE 2. *The mean photographic light curve of RU Piscium.*
Every dot represents means of ten observations.

3. Determining the photographic light curve I have been using 740 of my observations. In FIGURE 1. all these observations are drawn in the right phase and containing the photographic light curve. The final mean photographic light curve (FIGURE 2.) has been derived from the single observations, grouped into means of ten observations in order of phase. The normal points obtained in this way are contained in TABLE III. The light curve is not typical of the Cepheids type. From the mean photographic light curve we find the photographical brightness in maximum $9^m,83$, in minimum $10^m,51$, the photographic amplitude $0^m,68$, and the time from minimum to maximum 0 ,18. The minimum was difficult to define. Therefore the location of the minimum is subject to some error, much more than that of the maximum. As seen from the light curve the rise is steeper than the fall in brightness, and the maximum is broader than the minimum. The three numerical parameter (for their definition see PAYNE and GAPOSCHKIN, Variable Stars) to describe the light curve are $a/b = 0{,}83$, $c/d = 1{,}5$, $e/f = 1{,}3$. I should like to remark that it seems to me that there are some changes in the shape of the light curve.

TABLE IV.

The Observational Material for the determination of the period change

	Date	J. D.	W	E
I	1931 Sept. 29	2426614,404	9	— 6856
	Oct. 1	6616,375	10	— 6851
	Oct. 19	6634,339	2	— 6805
II	1932 Sept. 19	6970,450	4	— 5944
	Oct. 22	7003,251	7	— 5860
	1933 Aug. 31	7316,350	9	— 5058
III	1936 Sept. 22	8433,604	8	— 2196
	1937 Ian. 11	8545,312	9	— 1910
IV	1938 Nov. 23	9226,356	9	— 165
	1939 Ian. 10	9274,358	10	— 42
	Febr. 6	9301,284	8	+ 27
	Febr. 15	9310,261	10	+ 50
V	Sept. 24	9530,535	2	+ 614
	Nov. 9	9576,637	4	+ 732
	Nov. 16	9584,440	9	+ 752
VI	1941 Febr. 27	2430053,267	10	+ 1953
	1942 Nov. 29	0328,351	8	+ 2658

TABLE V.

The Change of the Period

	J. D.	Δ d	P d
I	2426624	20	0,39056
II	2427138	336	0,39040
III	2428489	112	0,39059
IV	2429288	83	0,39025
V	2429540	87	0,39056
VI	2430190	275	0,39019

187

4. At the beginning of my observations I soon observed that there was a change in the period. But the real character of the period change could be made clear only after observations in a course of several years. In determining the change of the period I have been using, besides my own observations[6] also the early observations of DETRE.[7]

Beacause an accurate determination of the individual maximum epoch seemed the difficulty to me I used for the determination of the period change the epochs of the 10,06 photographic magnitude, on the rise of the light curve. From an inspection of the mean photographic light curve is seen that the epoch of the $10^m,06$ deviate from the following maximum epoch by $0^d,086$. This $10^m,06$ place of the photographic light curve corresponds to the $10^m,22$ point of DETRE's visual light curve. The observed epochs available for the study of the period change are in TABLE IV. There are 17 observed epochs between 1931—1942, the first 6 are DETRE's visual observations. These 17 epochs are not distributed well enough, so that their numeration (E) is not easy. There are six intervals of time (Δ in TABLE V and horizontal lines in FIGURE 3,) in every one of which the observations could be represented by linear elements. The different calculated periods are contained in TABLE V and indicated by the dots in FIGURE 3. (Calculating the fifth [V] period I had also to take into account the observed decline part of the light curve on J. D. 2429497). The fourth (IV.) group of observations gave the best result, wherefrom I calculated the epochs of a normal maximum = J. D. 2429290,8340. The numeration of the epochs in TABLE IV are counted from this normal maximum. The differences between the observations and the calculations, at the fourth (IV.) group of observations, concerning the epochs of the 10,06 magnitude are tabulated in TABLE VI.

TABLE VI.

	J. D.	O.—C.
	d	d
IV.	2429226,356	0,000
	9274,358	+ 0,001
	9301,284	— 0,001
	9310,261	0,000

[6] Unfortunately war time hindered me in making more observations.
[7] Loc. cit.

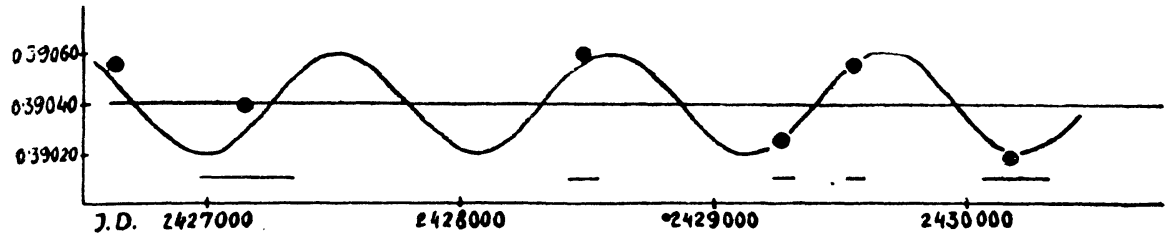

FIGURE 3. *The Period Change of RU Piscium.*

The probable approximative change of the period can be represented by a sine line, as is to be seen from FIGURE 3., the period of the period change being 1080^d. In first approximation we can calculate the actual period at any time by the formula:

$$P = 0^d,39040 + 0^d,0002 \sin \frac{2\pi}{1080} (t - 2429410),$$

where the time (t) shoud be expressed in Julian Days.

*

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Observatory (of the Pázmány University),
BUDAPEST-Szabadsághegy (Svábhegy)
and
Astronomical Inst. of the Bolyai University,
CLUJ-KOLOZSVÁR.

Felelős kiadó: Dr. Dezső Loránt

Minerva rt. Cluj-Kolozsvár. 8780. No. 99. Fsoc. jud. Cluj. Felelős vez.: Kiss Márton igazgató