

THE RADIAL VELOCITY OF  $\iota$  CARINAE  
 B.Kucewicz and C.Jaschek  
 (Observatorio Astronómico, La Plata)

The object of this communication is to discuss the spectrograms of this star, obtained at Bosque Alegre (Córdoba Observatory) between 1955 and 1959. There are 27 measurable spectra available, well distributed over the different phases.

In each plate 28 lines were measured, selected from those recommended by the Victoria observers, for the 30 and 50 Å/mm dispersion, since our plate dispersion is 42 Å/mm. If instead of these lines one measures those used by Stibbs<sup>3)</sup>, one gets a systematic difference of + 1.2 km/sec. The mean probable error of our plates is of the order of 1.5 km/sec. The result of the measurements is given in table I.

Table I  
 Radial velocity observations

N	J.D.	$\phi$	V	N	J.D.	$\phi$	V
I 2273	2435172,57	0,35	- 0,3	2528	2435453,74	0,26	-14,6
2326	183,58	66	+11,4	2546	458,73	40	- 0,6
2327	183,60	66	+12,7	2572	497,81	50	+ 4,8
2339	187,64	78	+13,2	2615	509,76	84	+ 3,0
2340	187,65	78	+ 9,7	2622	510,73	86	+ 6,7
2349	190,60	86	+ 8,8	2885	36234,74	23	-17,6
2356	192,56	92	-25,4	2886	234,77	23	-16,9
2366	194,55	97	-24,5	2894	235,77	26	-17,8
2477	441,76	92	-23,0	2905	242,64	45	+ 5,1
2478	441,76	93	-26,2	2924	243,66	48	+ 6,0
2495	448,80	12	-24,8	2936	244,67	51	+ 1,3
2504	449,81	15	-14,4	2954	245,76	54	+11,2
2511	450,76	18	-20,8				

For the representation of our measurements (fig.1) we used the value of the period given in the 1958 edition of the GENERAL CATALOGUE OF VARIABLE STARS, namely  $35^d556$ . The general aspect of the curve is remarkably similar to the curve published by Jaschek and Jaschek<sup>2)</sup>, based on about half of these plates. In order to evaluate the systematic differences, we have formed the difference

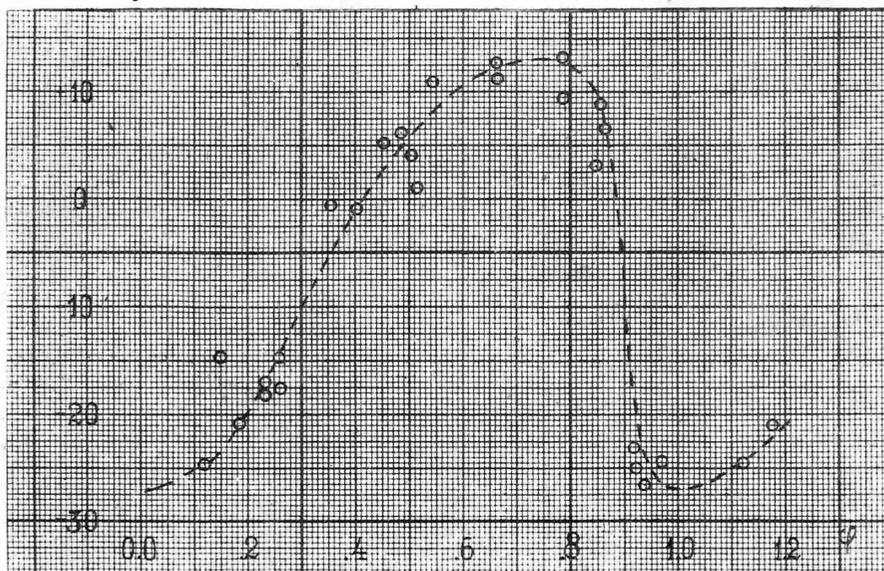
$$\text{"Kucewicz - Jaschek"}$$

for the eleven plates in common. Their mean difference is  $\pm 1.0$  km/sec.

We will now compare the present radial velocity curve with those published earlier. There are four: Wilson and Huffer<sup>4)</sup>, Jacobsen<sup>1)</sup>, Stibbs<sup>3)</sup> and Jaschek and Jaschek<sup>2)</sup>. Plotting the curves for different

epochs, namely Wilson and Huffer (1904-07); Jacobsen (1918), Jacobsen (1920); Stibbs (1952), and the present work, we get very similar curves, with the exception of the one by Stibbs, which is very different. In order to get a quantitative idea of the differences among the curves, we will assume that the radial velocity curve of this Cepheid is the one of a spectroscopic binary. This procedure is of course artificial, since no physical reality can be attached to the elements. The usefulness of the procedure consists in the fact that Huffer and Wilson and Jacobsen did published such elements. Computing elements for the later curves, by the usual procedure, we get the following data

Author	Wilson and Huffer	Jacobsen	Stibbs	Present
Mean epoch	1905	1919	1952	1956
$K$	19 km/sec	18	18,5	19
$e$	0.36	0.43	0.19	0.48
$\omega$	100	100	94	101
$V_0$	+4.1 km/sec	+2.5	+1.5	-5.3



It results that the amplitude of the curve is about constant, that the barycentral velocity ( $V_0$ ) is very different and that only in the case of Stibbs' curve the shape is essentially different. As far as to the barycentral velocity, it must be remembered that our value has not been reduced to the Lick system, so that we have still a systematic error in it, and therefore not too much weight should be attached to this. The different shape of the Stibbs curve is due mostly to two observations near the maximum. If these two were eliminated (which is of course not feasible) all the curves would be very much alike. From this evidence

alone one can therefore not conclude whether the radial velocity curve is variable or not.

We have however an additional element, namely the period. In the GENERAL CATALOGUE OF VARIABLE STARS (1958 ed.) it is mentioned that the period has been changed at least three times. The following values are quoted

Prager and Schneller (1934)	35 <sup>d</sup> 54
General Catalogue (1948)	35 5323
General Catalogue (1958)	35 556

A short analysis of the radial velocity curve reveals however the curious fact that none of these periods satisfies the radial velocity observations. From the observed maxima and minima, the period should be

$$35^d 5374$$

value which is irreconcilable with the light observations.

One is therefore forced to conclude that the period and perhaps also the shape of the radial velocity curve is variable. More observations are thus needed, which we hope to undertake at La Plata in 1960.

- 1) Jacobsen T.S., Publ. A.S.P. 46, 255 (1934)
- 2) Jaschek M. and Jaschek C. Publ. A.S.P. 69, 465 (1957)
- 3) Stibbs D.W.W., M.N. 115, 363 (1955)
- 4) Wilson E.R., and Huffer C.M., Pop.Astr. 29, 85 (1921)

#### Discusión:

GRATTON criticó el uso de elementos espectroscópicos orbitales para estrellas pulsantes.