THE ORBIT OF 103 TAURI

By S. N. Hill

The star mentioned above, 1900 α 5^h 02.0^m, $\delta = +24°08'$, visual magnitude 5.50 and type B3, was announced as a spectroscopic binary by Adams, Joy and Sanford,[1] with a range of –26 to +50 km. from 18 plates. Three observations of the star made at the Yerkes Observatory were published by Struve.[2] A number of spectra of this star were secured during the investigation of B-type stars at Victoria. The second and third plates showed a range from –11.9 to +60.9 km., and further spectra were obtained with a view of determining the orbit.

The spectra were secured with the single prism spectrograph whose dispersion at Hγ is 29 Angstroms per millimetre. On the average 8 lines were measured on each plate of this rather diffuse line star.

From Victoria observations, the writer obtained a period of 58.4 days which was communicated to Dr. Sanford of Mt. Wilson, who very kindly furnished the velocities of 59 observations and suggested that the Mt. Wilson and Victoria observations be combined in a single least-squares solution. From the first two observations of Mt. Wilson, taken about eleven years prior to the first Victoria, the period was corrected to 58.31 days, which was considered definite.

The fifty-nine Mt. Wilson and thirty-six Victoria observations were combined in one least-squares solution, which gave the following final elements:
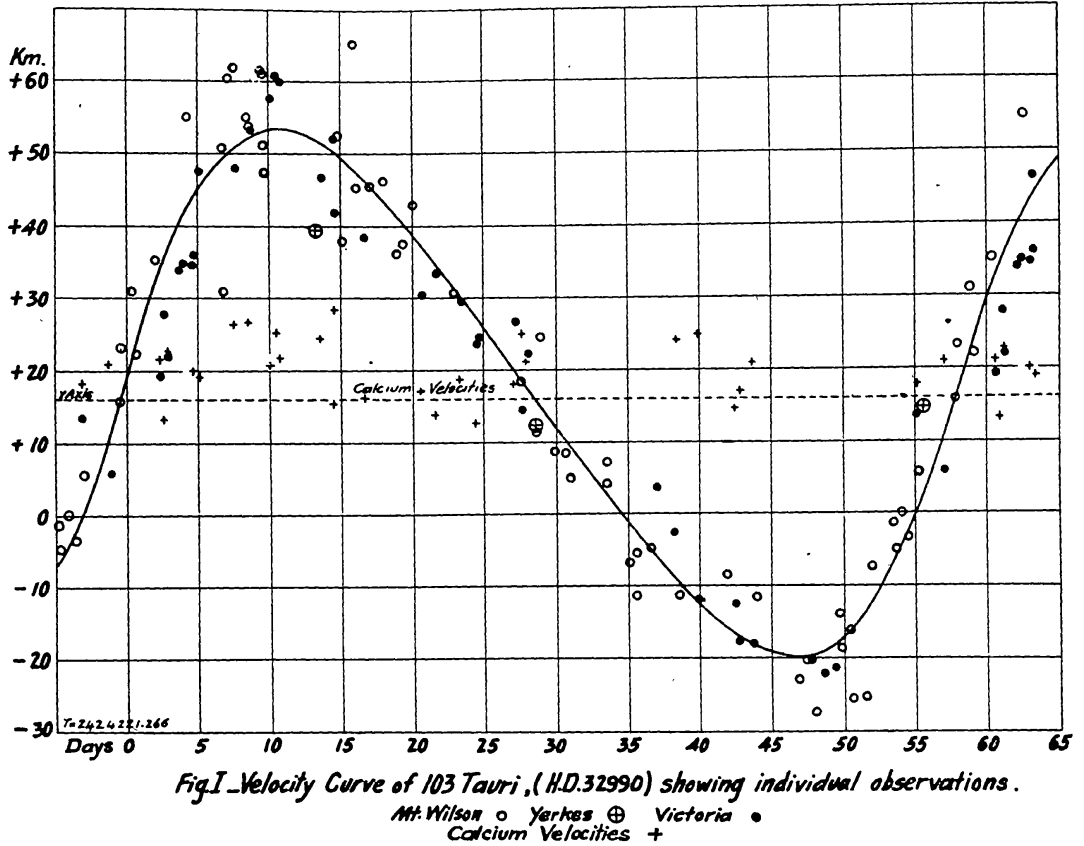
$$P = 58.31 \text{ days}$$
$$e = 0.189 \pm 0.017$$
$$K = 36.73 \pm 0.66 \text{ km.}$$
$$\gamma = +16.22 \pm 0.48 \text{ km.}$$
$$\omega = 273°.88 \pm 5°.31$$
$$T = 2424221.266 \pm 0.780 \text{ days}$$
$$\text{Mass function } 0.28 \odot$$
$$\alpha \sin i \ 28,900,000 \text{ km.}$$

The Yerkes observations were not included in the solution for

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[1] Pub. A.S.P. 36, 137, 1924.

[2] Ap. J. 64, 12, 1926.

the sake of homogeneity; however, they are shown on the graph,
Fig. I following.

Fig. I—*Velocity Curve of 103 Tauri ,(H.D.32990) showing individual observations.*
Mt. Wilson o   Yerkes ⊕   Victoria •
Calcium Velocities +

The mean calcium velocity is +20.1±0.6 km./sec., and of this
+11.6 km./sec. can be attributed to solar motion. This leaves a
residual of +8.5 km./sec., which must be due to the peculiar motion
of the calcium cloud, since the effect of "galactic rotation" in this
position of the sky is very small.

On averaging the residuals separately for each Observatory, a
mean residual difference, (Mt. Wilson minus Victoria), of +0.2
km./sec. was obtained. From this it will be seen that there is very
little if any systematic difference between the two observatories in
the measure of this B-type star. The probable error of a plate is
±4.46 km. per second.

A more detailed account of this binary, which is now with the
printer, will appear as a Publication, Vol. IV, No. 16, of the Vic-
toria Observatory.

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