A New Eclipsing Binary for the BAAVSS
V1061 Tau

V1061 Tau

HIP23384 8.06V

HIP 23259 8.04V

V1061 Tau

HIP23333 7.78V

V1061 Tau

Discovered in 1990
Over contact EB system
Maximum magnitude= 8.03V
Period (latest Krakow)= 1.3852288 days
Primary eclipse depth= 0.4 magnitude
Secondary eclipse depth= 0.3 magnitude

Worth measuring at any time.

V1061 Tau

Equipment: Canon 550D DSLR
Canon 200mm lens plus remote switch and tripod.

Settings: Exposure 4 seconds, ISO 800 and f3.2.

Image Number - 20

Images are stacked with AIP4WIN. The resulting stacked image is analysed.

V1061 Tau

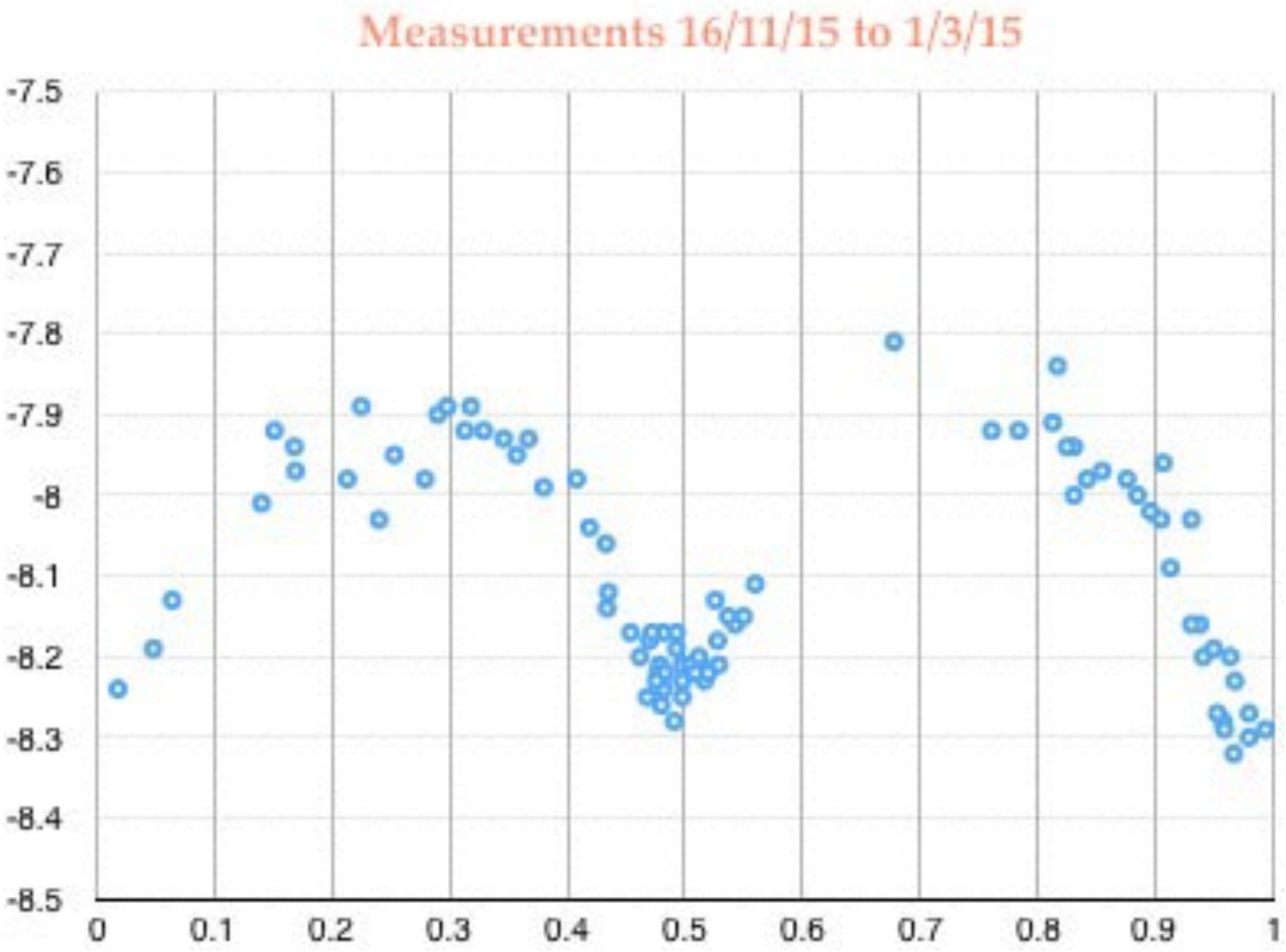
Transformation to Johnson V magnitude

The experimental determined transformation coefficient of the Canon 550D camera is 0.08. This is used, with the colour (B-V) of each comparison, to correct the instrumental magnitude to V magnitude.

The V magnitude that is determined for a particular time and date is the average of the three stacked images of the comparisons.

Errors

During the period of the measurements the biggest source of errors, in my view, were scintillation during windy nights, dispersing con trails and faint cirrus. The standard deviation on Rho Cas measurements during this period was, on average, 0.032 magnitude and varied from 0.007 to 0.065.



Measurements over a three month period as the weather in Edinburgh allowed. The phase diagram is based on the 'latest' Krakow elements which are over 13 years old.

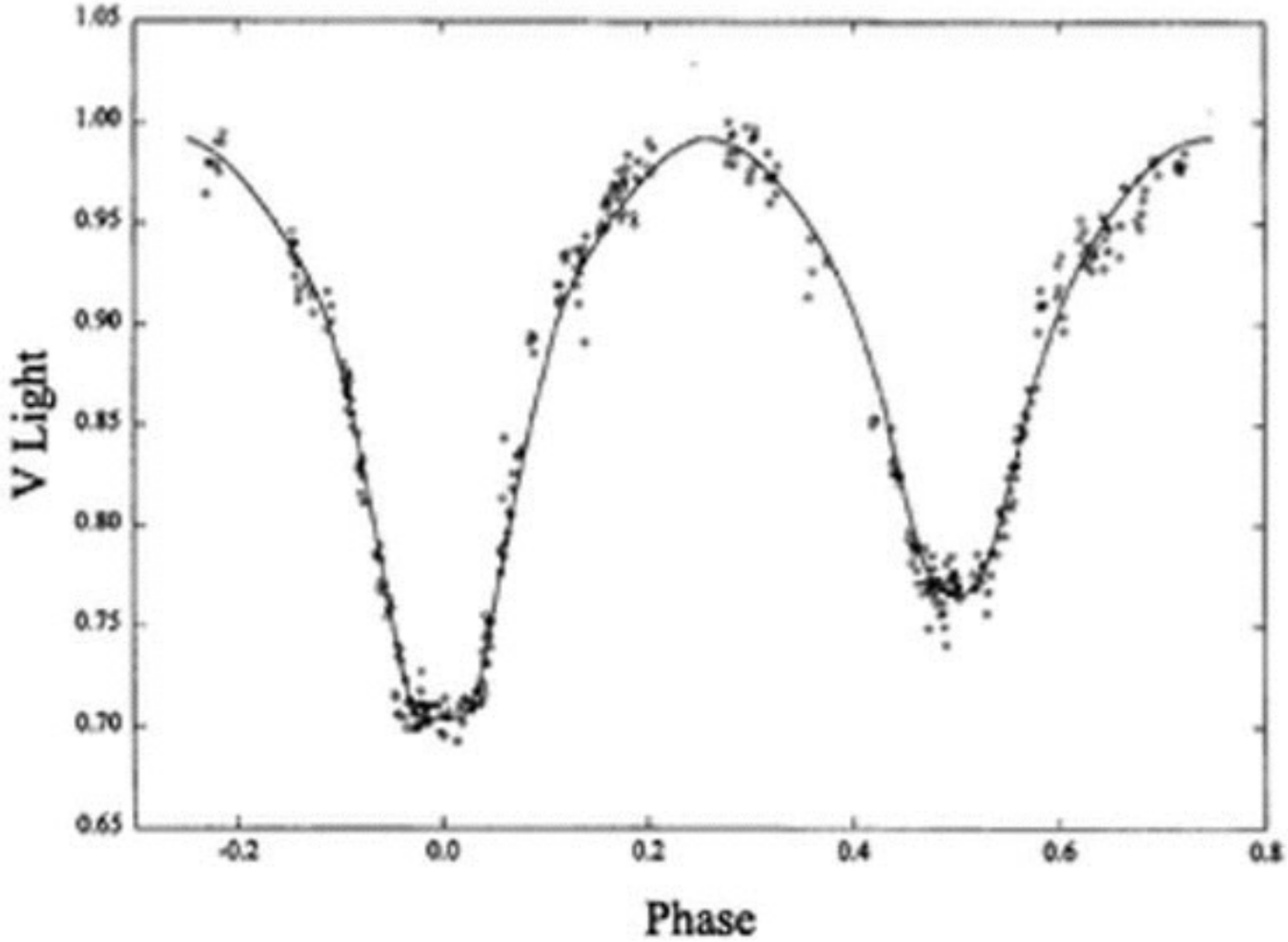
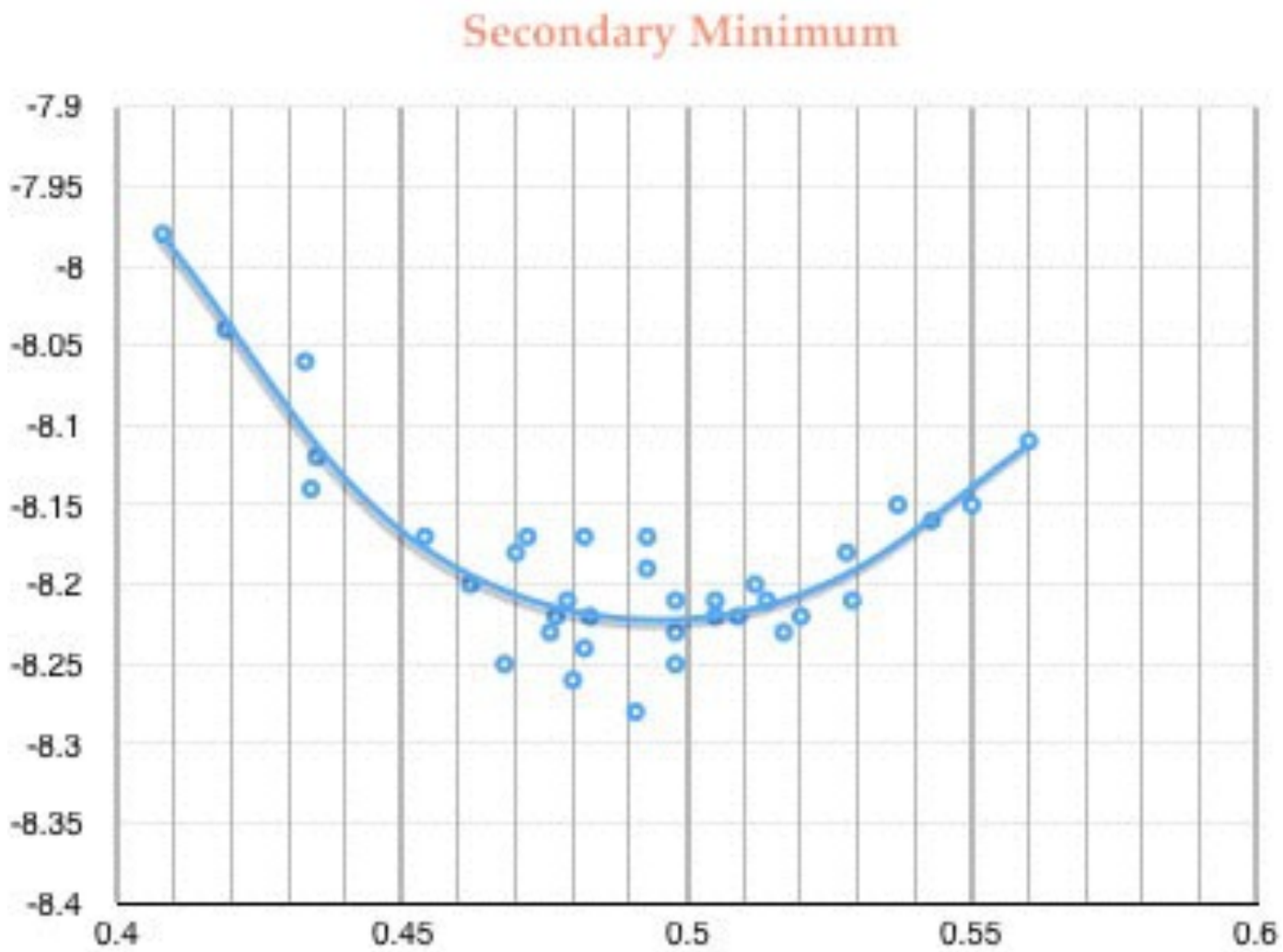
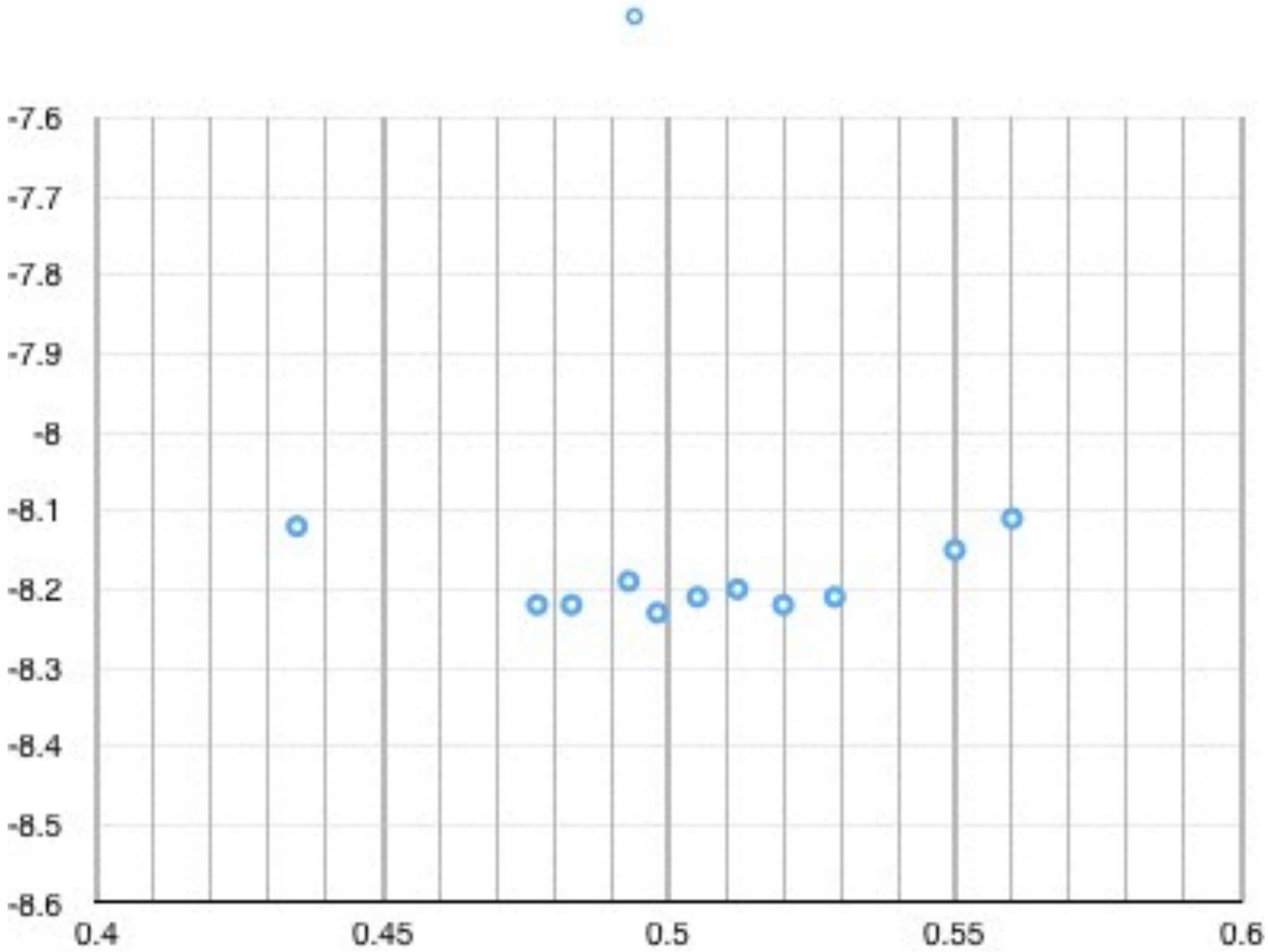


FIG. 2—*V* observations of V1061 Tauri with the computed curve from the elements of Table 4 (total eclipse).

'V1061 Tauri - Analysis of a Newly Discovered Eclipsing BInary'
Terrell, Williams & Kaiser PASP 107: 653=656, 1995 July.



Here are all my measurements around the secondary minimum between 0.4 and 0.6 on the phase diagram. These do not seem to conclusively indicate that the the eclipse is total.



Measurements across the secondary minimum on one night - 10th February 2016. These do seem to suggest that the eclipse is total for a period of about two hours.

In the AAVSO Eclipsing Binary Update No 8 of September 1999 there is a report by M E Baldwin on his measurements of V1061 Tau.

He reported that the eclipses were total for 2.3 hours. He then made these points:

"When all the observations were reduced and plotted to phase, the light curve showed two minima of similar depth, about 0.35 and 0.30 magnitudes, and a total eclipse at minimum. How could this be? The two minima of similar depth meant that the two binary components are of similar luminosity. But in such a system, when one star totally eclipses the other, the combined light should decrease by about 50 percent or 0.75 magnitude.

The answer became clear when astronomer Dirk Terrell performed a light-curve analysis (PASP 107,653, 1995). The only solution that would fit the observations outside of eclipse and allow a total eclipse at minimum included a large contribution of third light - about 44 percent of the total flux. If the light-curve analysis is correct, V1061 Tau has an unresolved third component."

Conclusions of the 1995 paper

4. CONCLUSIONS

VI061 Tauri appears to be a very interesting system since there are relatively few systems known to share a common radiative envelope. Although there may be contamination by third light, the totality of primary minimum, if confirmed by higher-precision observations, would strengthen the light- curve solution. A radial-velocity study of this system would be very useful even if the system is only single lined because we have a well-determined photometric mass ratio in the case of a total eclipse. And, of course, if the system is double lined, that will only strengthen the determination of the mass ratio and the resulting fundamental quantities like the individual masses and radii. Further photoelectric observations in several passbands would also facilitate a simultaneous light and velocity solution. The solution presented here should be judged preliminary until further observations are made. We hope that observers will consider this potentially important system for their radial-velocity and light-curve observing programs.