

# A New Double Star from an Asteroidal Occultation: TYC 5186-00724-1

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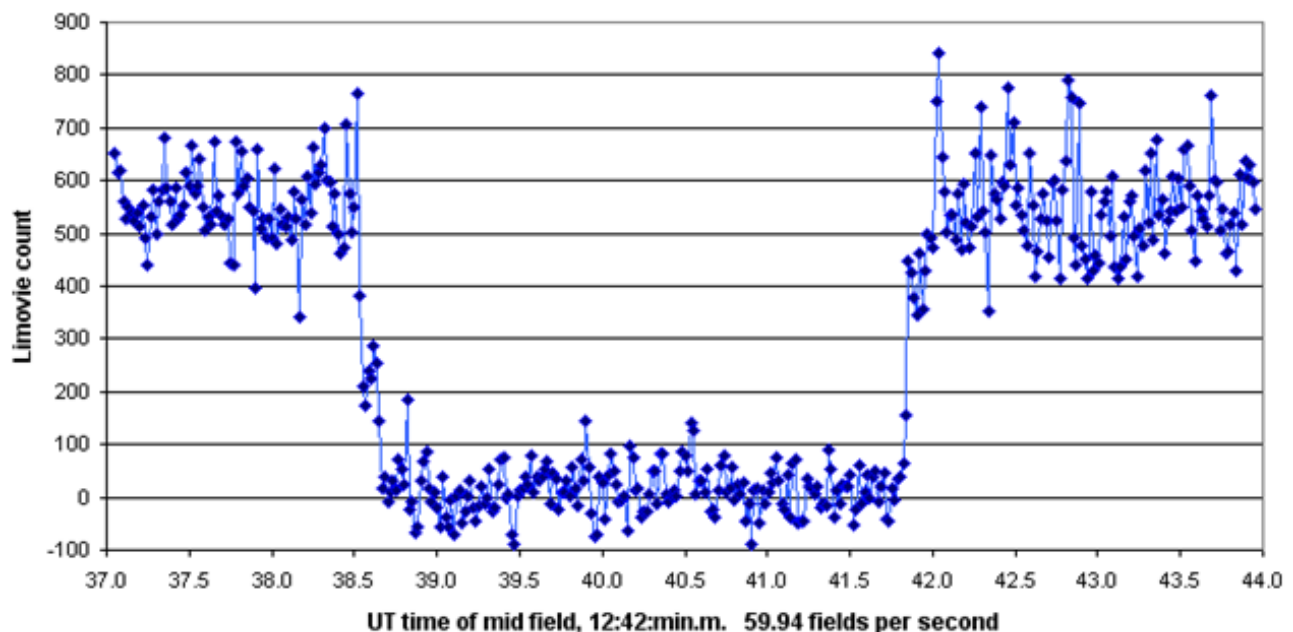
**Abstract:** An occultation of TYC 5186-00724-1 by the asteroid (732) Tjilaki on 2009 July 28 showed this star to be a double star with a separation of 1.7 mas.

## Observation

On 2009 July 28 Loader and Parker observed the asteroid (732) Tjilaki occult the star TYC 5186-00724-1 from two locations in New Zealand. The observations were made with 25 cm (Loader) and 35 cm (Parker) telescopes, using video with GPS-based time insertion to record the event. The star is of magnitude 9.21(V), 8.96(R), and has a corresponding expected

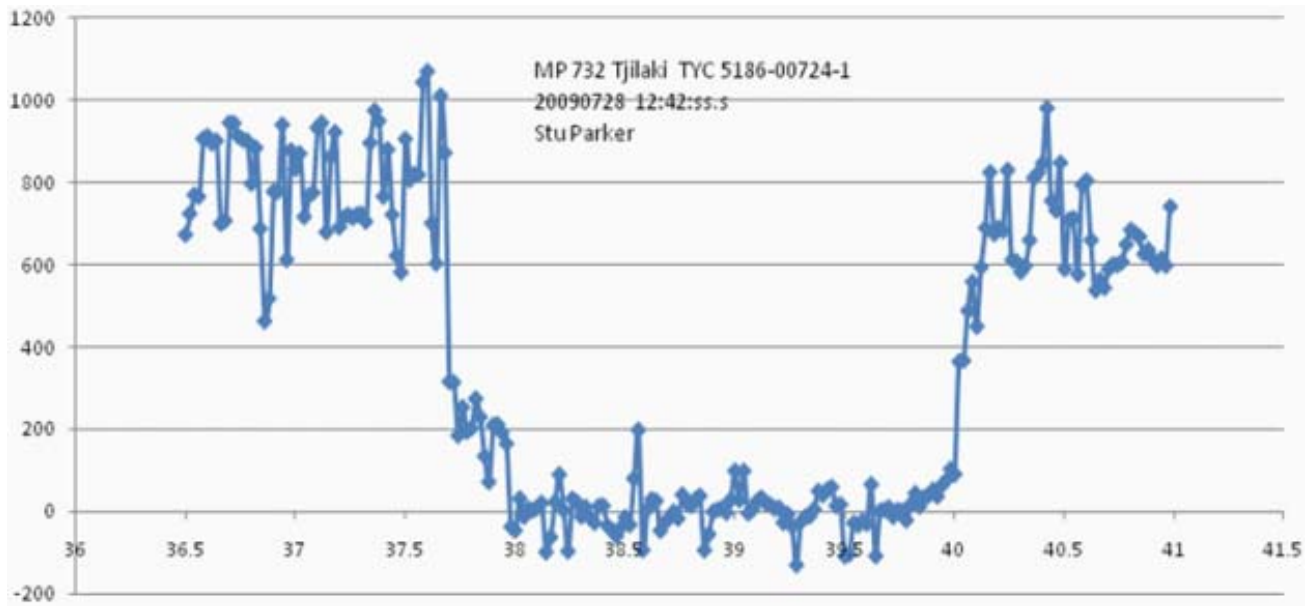
apparent diameter of 0.1 mas. The expected magnitude drop at occultation was 4.7 magnitudes. The star is not listed in the Fourth Interferometric Catalog, nor the Washington Double Star catalog.

The light curve obtained from the occultation shows clear step events, characteristic of a double star. The two light curves of the event (which lasted for about 3 seconds) are shown in Figures 1 and 2.



**Figure 1:** Light curve of TYC 5186-00724-1 obtained during the occultation obtained by Loader.

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**Figure 2:** Light curve of TYC 5186-00724-1 obtained during the occultation by Parker.

The companion can be seen in both light curves as a step near the bottom of the disappearance part of the light curve, and a corresponding step near the top of the reappearance part of the light curve.

The observations were analyzed in the standard manner described by Herald [Herald, 2009]. There is no ambiguity in the solution. Assuming the asteroid had a circular profile, the double star characteristics are:

The fact that the separation is only about 20 times the expected diameter of the star raises the possibility that this pair might be detectable as a spectroscopic binary.

### References

Herald, D., *et al.*, 2009, "New double stars from asteroidal occultations, 1971 – 2008", *JDSO*, **6**, 88-96.

<b>Star</b>	TYC 5186-00724-1 HD 197707 SAO 144774 BD-04° 5248
<b>Coordinates (J2000)</b>	20h 45m 33.77s, -04° 26' 19.5"
<b>Spectral type</b>	F5
<b>Mag A</b>	9.6 ± 0.1 (V)
<b>Mag B</b>	10.5 ± 0.1 (V)
<b>Separation</b>	1.7 mas ± 0.1 mas
<b>Position Angle</b>	273° ± 3°
<b>Epoch</b>	2009.573