



Improved elements of Fr327 Cyg = UCAC3 249-201293

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Abstract: *Fr327 Cyg = UCAC3 249-201293 was discovered by Peter Frank in the year 2018 and classified as EW eclipsing binary. The authors present a phased light curve, a list of primary and secondary minima, O-C diagrams and improved elements of the star.*

Observations

400 mm ASA Astrograph f/3.7 - f = 1471 mm,
FLI Proline 16803 CCD-Camera - V-filter - t = 120 sec.
Wolfgang Moschner, Astrocamp/Nerpio, Spain

102mm f/5.0 TeleVue Refractor - f = 510 mm - SIGMA 1603 CCD-Camera - -I-U-filter - t = 90 sec.
Peter Frank, Velden, Germany

Data analysis

Muniwin [1] and self-written programs by Franz Agerer and Lienhard Pagel [2] were used for the analysis of the frames, after bias, dark and flatfield correction of the exposures. The weighted average of 5 comparison stars was used.

Explanations:

HJD = heliocentric UTC timings (JD) of the observed minima
mag = (raw instrumental) magnitude

G-band mean magnitude	= 350-1000 nm
Integrated BP mean magnitude	= 330- 680 nm
Integrated RP mean magnitude	= 640-1000 nm

Explanations to the light curve:

The colors of the symbols denote different nights.

All coordinates are taken from the Gaia DR2 catalogue [3].

The coordinates (epoch J2000) are computed by VizieR, and are not part of the original data from Gaia (note that the computed coordinates are computed from the positions and the proper motions).

Fr327 Cyg

Cross-ID's

= ZTF J195629.11+341410.7

= Gaia DR2 2035260658012712576

= UCAC3 249-201293

= ATOID J299.1213+34.2363

Gaia DR2 Catalog:

Right ascension: 19h56m29.1211s at Epoch=J2000

Declination: +34° 14' 10.770" at Epoch=J2000

15.4554 mag G-band mean magnitude

15.9949 mag Integrated BP mean magnitude

14.7563 mag Integrated RP mean magnitude

1.2386 mag BP-RP

Periods known so far:

VSX (AAVSO) [4] 0.2968380 d (ZTF)

ASAS-SN [5] no information

ATLAS 0.2968400 d

ZTF 0.2968380 d

Results

Fr327 Cyg was discovered by Peter Frank in the year 2018 and classified as EW eclipsing binary. The amplitude is given as 0.29 mag (15.16-15.45 mag). The star was also recently processed by the ATLAS project [6] and the ZTF project [7].

With our observations obtained with the 400 mm ASA astrograph in Nerpio we have created a phased light curve. The presented elements were calculated by the method of least squares, taking into account all our minima (see table below).

Our ephemeris represents improved elements for this star.

Fr327 Cyg Improved elements

Amplitude: Min I: 0.29 mag (instr.) Min II: 0.22 mag (instr.)

Type: EW type eclipsing binary

Min I = HJD 2459066.54010 + 0.29683910*E
±0.00056 ±0.00000012

Observer	HJD-Date		Epoch	O-C (d)
	Minimum	Type		
P. Frank	2455067.3734	II	-13472.5	-0.0020
P. Frank	2455067.5198	I	-13472	-0.0040
P. Frank	2455833.3691	I	-10892	0.0004
P. Frank	2456152.4704	I	-9817	-0.0003
W. Moschner	2457617.3719	I	-4882	0.0002
W. Moschner	2457617.5168	II	-4881.5	-0.0033
P. Frank	2457678.3774	II	-4676.5	0.0053
W. Moschner	2457897.5869	I	-3938	-0.0008
P. Frank	2457924.4481	II	-3847.5	-0.0035
W. Moschner	2457943.4516	II	-3783.5	0.0022
W. Moschner	2457943.5953	I	-3783	-0.0025
W. Moschner	2457977.4360	I	-3669	-0.0014
W. Moschner	2457977.5860	II	-3668.5	0.0001
W. Moschner	2458013.3559	I	-3548	0.0010
W. Moschner	2458013.5044	II	-3547.5	0.0010

W. Moschner	2458036.3605	II	-3470.5	0.0005
W. Moschner	2458037.3988	I	-3467	-0.0002
W. Moschner	2458041.4085	II	-3453.5	0.0022
W. Moschner	2458050.3115	II	-3423.5	0.0001
W. Moschner	2458074.3585	II	-3342.5	0.0031
W. Moschner	2458076.2866	I	-3336	0.0018
W. Moschner	2458322.5174	II	-2506.5	0.0045
P. Frank	2458324.4433	I	-2500	0.0009
W. Moschner	2458328.4515	II	-2486.5	0.0018
W. Moschner	2458328.5967	I	-2486	-0.0014
P. Frank	2458342.4072	II	-2439.5	0.0060
W. Moschner	2458353.3845	II	-2402.5	0.0003
W. Moschner	2458353.5344	I	-2402	0.0018
W. Moschner	2458390.3394	I	-2278	-0.0012
W. Moschner	2458390.4896	II	-2277.5	0.0006
W. Moschner	2458641.6132	II	-1431.5	-0.0017
W. Moschner	2458706.4737	I	-1213	-0.0006
W. Moschner	2458706.6210	II	-1212.5	-0.0017
W. Moschner	2458759.3102	I	-1035	-0.0015
W. Moschner	2458759.4612	II	-1034.5	0.0011
W. Moschner	2459043.5354	II	-77.5	0.0003
W. Moschner	2459066.3884	II	-0.5	-0.0033
W. Moschner	2459066.5385	I	0	-0.0016
W. Moschner	2459084.3480	I	60	-0.0025
W. Moschner	2459084.4956	II	60.5	-0.0032

Table 1: Minima Fr327 Cyg = UCAC3 249-201293, O-C using the ephemeris given above.

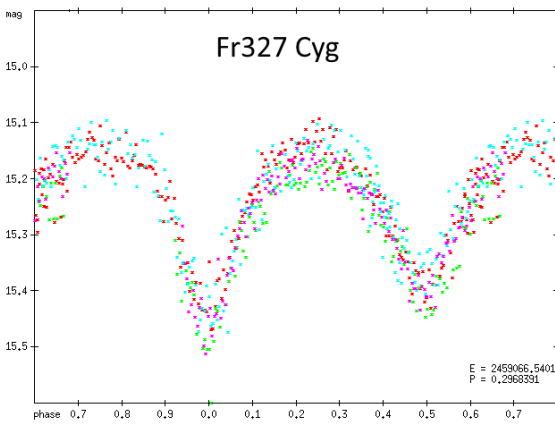


Figure 1

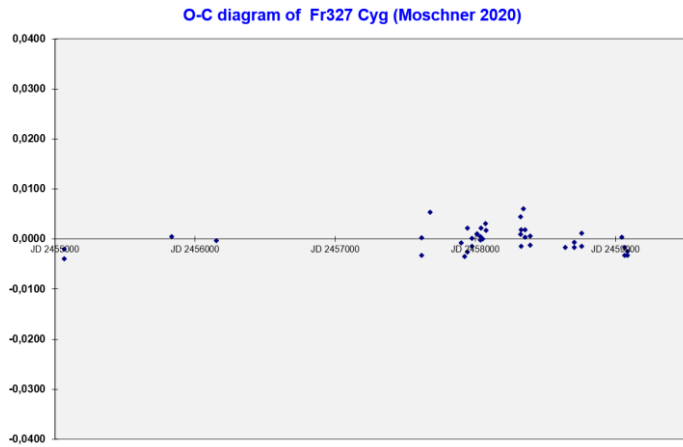


Figure 2

Figure 1: Phased light curve of Fr327 Cyg = UCAC3 249-201293 Cyg using the ephemeris given by the authors. The vertical axis shows raw instrumental magnitudes. Different colors denote different observing nights. Only the data points from the better nights were used to display the light curve. An FLI Proline 16803 camera + a V-filter (2019-2020) was used. Presented elements were calculated by taking into account all minima (see Table 1) with the method of least squares.

Figure 2: O-C-diagram from Fr327 Cyg = UCAC3 249-201293 Cyg using the improved elements.

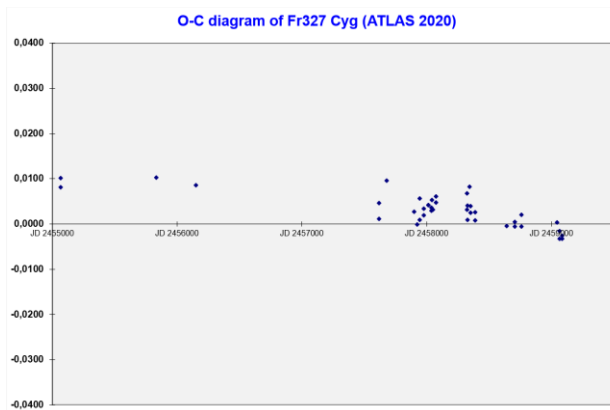


Figure 3

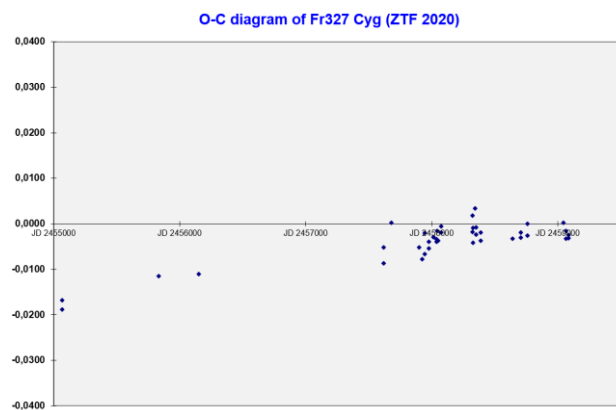


Figure 4

Figure 3: O-C-diagram from Fr327 Cyg = UCAC3 249-201293 using the period from ATLAS (0.296840 d).

Figure 4: O-C-diagram from Fr327 Cyg = UCAC3 249-201293 using the period from ZTF (0.2968380 d).

Acknowledgements

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