COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS

Number 6123

Konkoly Observatory
Budapest
12 December 2014

HU ISSN 0374 – 0676

INVESTIGATION OF THE ECLIPSING BINARY SYSTEM OT Lyr

BAV MITTEILUNGEN NR. 237

AGERER, F.

Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV), Munsterdamm 90, D-12169 Berlin, Germany, email: agerer.zweik@t-online.de

This star (AN 61.1930 = USNO-B1.0 1192-0326799 = 2MASS J19081152+2913576) was discovered to be a variable of Algol type by Hoffmeister (1930). A range from 14 to 15 mag was given. The same author gave this variable the 1855.0 coordinates RA = $19^{\rm h}02^{\rm m}28^{\rm s}$, Dec = $+29°0\'.1$. Richter (1961) determined the first ephemeris as

$$\text{Min I} = \text{JD } 2425303.646 + 0\overset{\rm d}{.}471095 \times E \tag{1}$$

and a magnitude range between $13\overset{\rm m}{.}9$ and $14\overset{\rm m}{.}9$.

OT Lyr is listed in the GCVS with these information (Samus et al. 2014). OT Lyr has been included in 'A Catalogue of Eclipsing Variables'(Malkov et al. 2006). In 2007 a minimum of OT Lyr was observed by the author (Hübscher 2007). Further observations of this variable showed only small amplitude variation of DSCT-type.

Extensive photoelectric monitoring (C14, -IR and -UV-filter, KAF 1603 CCD) has confirmed the Algol type of variability and revealed a period of approximately 8.3 days (Figure 1). TYC 2135-2336 ($12\overset{\rm m}{.}597$) and GSC 2135-1552 ($12\overset{\rm m}{.}5$) has been used as comparison star and check star, respectively.

Observed minima

Number	HJD hel.	Weight	Epoch	$(O-C)$	Source
1	2425303.646	0	−3692.0	−1.346	[1]
2	2454222.4568	1	−222.0	+0.001	[2]
3	2456072.5023	1	0.0	−0.004	[3]
4	2456897.5191	1	99.0	−0.010	[3]
5	2456918.360	0	101.5	−0.003	[3]
6	2456964.210	1	107.0	+0.012	[3]

Sources: [1] Richter (1961), [2] Hübscher (2007), [3] Agerer (this paper).

Using only CCD-measured primary minimum timings the following first ephemeris could be derived:

$$\begin{array}{l} \text{Min I} = \text{HJD } 2456072.5063 + 8\overset{\rm d}{.}333563 \times E \\ \qquad\qquad\qquad\qquad \pm 13 \qquad\qquad \pm 10 \end{array} \tag{2}$$

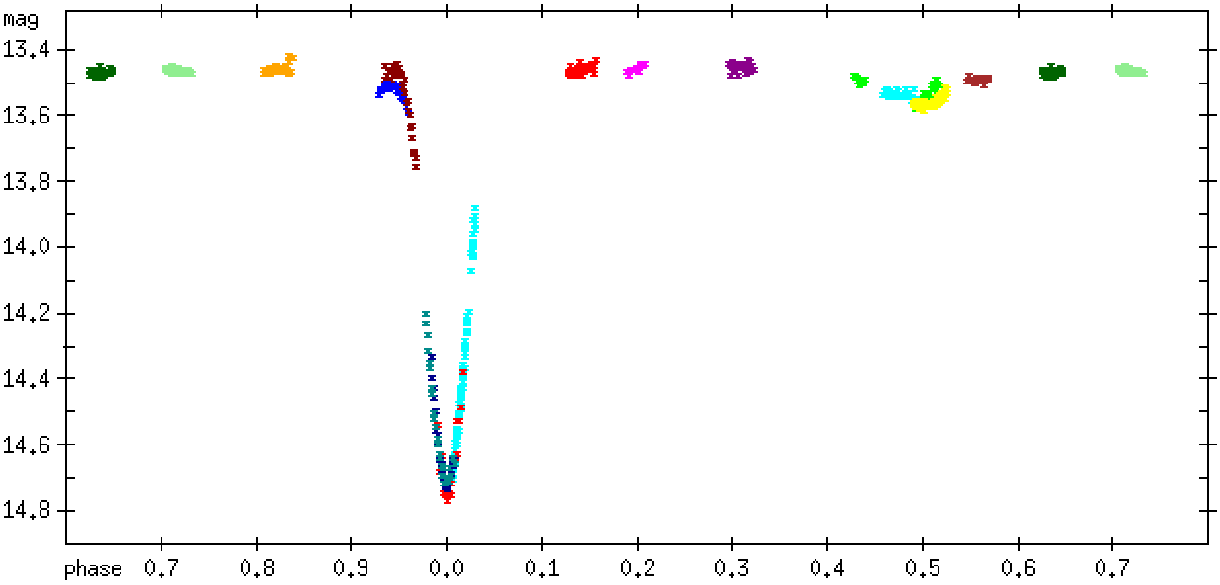

Figure 1. Photoelectric observations folded with the ephemeris (2), after removing the variations caused by the DSCT component.

In the instrumental system, OT Lyr is $13^{m}.45$ out of eclipse and $14^{m}.75$ in primary minimum. The secondary minimum seems to be somewhat displaced at a phase about 0.48 and is about $0^{m}.07$ deep.

A closer view to the data made clear, that the δ Scuti variations can be followed through the whole period of the eclipsing binary. During primary minima the amplitude of the light variation is reduced to about $\pm 0^{m}.2$ (Figure 2), whereas in normal light and in times of secondary eclipses the amplitude is about $\pm 0^{m}.4$ (Figure 3).

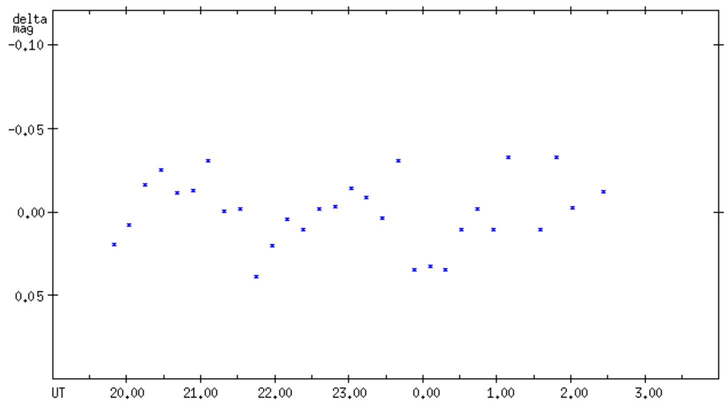

Figure 2. The δ Scuti variations in primary eclipse, after removing the variation caused by the eclipse.

From this it is obvious that the hotter component of the binary is the pulsating one and that the eclipse is not total.

The following first elements for the δ Scuti component could be derived:

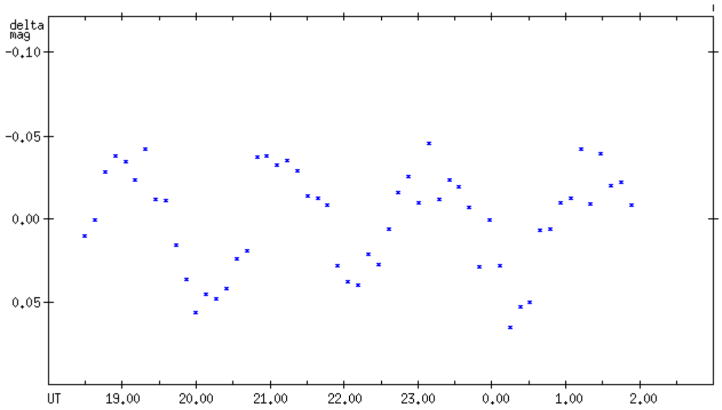

Figure 3. DSCT component in secondary eclipse, after removing the variation caused by the eclipse.

$$\text{Max} = \text{HJD } 2455451.3375 + 0\overset{\text{d}}{.}086495 \times E. \quad (3)$$

Figure 4 shows the corresponding phased light curve.

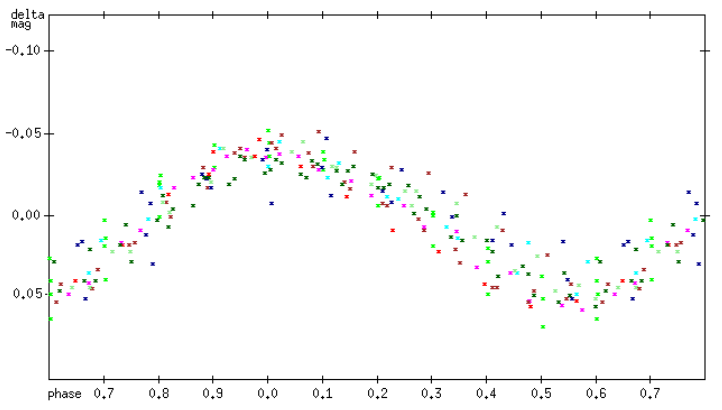

Figure 4. The δ Scuti component out of eclipse, folded with the ephemeris (3), and displayed with respect to the constant brightness level.

Acknowledgements: This research made use of the SIMBAD data base, operated by the CDS at Strasbourg, France.

References:

Hoffmeister, C., 1930, *AN*, **238**, 189
Hoffmeister, C., 1933, *Sonn. Mitt.*, **N22**, 191
Hübscher, J., 2007, *IBVS*, **5802**
Malkov O.Y., et al., 2006, *A&A*, **446**, 785
Richter, G., 1961, *MVS*, **565**
Samus, N. N. et al., 2014, *General Catalogue of Variable Stars*, Moscow

*This version of the paper contains corrections, and differs from the one appeared on-line originally. Date of last modification: Thu Dec 18 13:34:50 CET 2014