Photographic observations of the light-variation of Eros, made on 12—13 January 1931

(Obserwacje fotograficzne zmiany blasku Erosa, dokonane 12—13 stycznia 1931 r.)

by

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Three plates (Eastman 40, 9 × 12 cm), containing 28 exposures of Eros, were recorded by the writer during the night of 12—13 January 1931 with the aid of 12 cm Astropetzval of Zeiss (F = 60 cm) mounted on the 162 cm Heyde refractor. The duration of each exposure was 7 min., the interval between two exposures on the same plate being 1 min.

The plates were measured in the Schilt thermopile microphotometer made by W. C. 't Hart in Rotterdam in 1930 and recently installed in the Warsaw Observatory.

The following comparison-stars were used:

$a = B.D. + 16^{\circ}2150 (8^{m}\cdot 2)$; $b = B.D. + 16^{\circ}2146 (8^{m}\cdot 1)$; $c = B.D. + 16^{\circ}2139 (8^{m}\cdot 5)$.

The magnitudes of comparison-stars were deduced from the special plate taken with the grating placed in front of the objective and without it. The grating, made by H. Zunderman in Leiden Observatory, consists of parallel wires 0·450 mm thick separated by free spaces 0·448 mm wide. The difference between the central image and the diffraction images of the first order is $0^{m}\cdot 984$, and the difference between the image obtained without grating and the diffraction images of the first order is $2^{m}\cdot 486$, when the same exposure-time is used.

The plate, containing the comparison-stars of Eros, was taken on 9. Febr. 1931. One exposure was made with the grating placed in front of the objective and two exposures without the grating the duration of each exposure

being 10 min. The plate was measured in Schilt microphotometer giving the following differences of magnitudes of the comparison-stars:

$$b - a = +0^{m}{\cdot}30; \quad c - a = +1^{m}{\cdot}30.$$

The stars b and c are found in the A. Kopff's (A. N. 5403) list and are indicated there by the numbers 817 and 790 respectively. Their photographic magnitudes, according to F. E. Ross and R. S. Zug (A. N. 5728), are: $b = 9^{m}{\cdot}08$ and $c = 10^{m}{\cdot}15$. Taking thus $\frac{1}{2}(b + c) = 9^{m}{\cdot}62$, the following magnitudes of the comparison-stars were adopted:

*	*B.D.*	mg
a	+16°2150	8·87
b	+16°2146	9·17
c	+16°2139	10·07

Table given below contains the planetocentric J. D. (M. Astr. T. Greenw.) of the middle of each exposure and the corresponding magnitudes of Eros. Reduction to planetocentric time was effected by subtracting 1 min. 36 sec. from the moments of exposures.

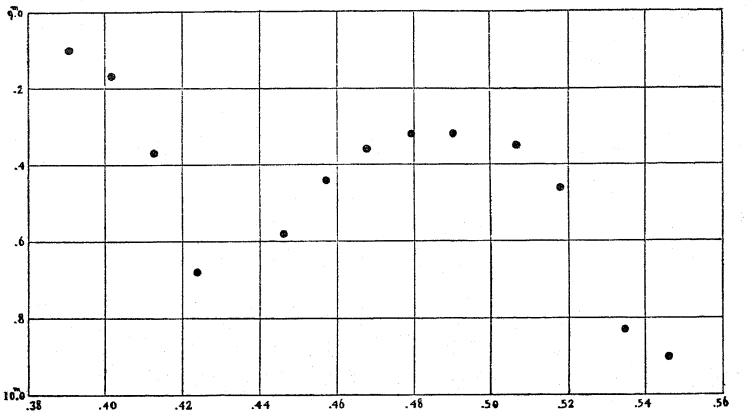
Table 1.

Observations.

Plate 17.			Plate 18.			Plate 19.		
N.	J. D.	mg.	N.	J. D.	mg.	N.	J. D.	mg.
	2426354			2426354			2426354	
1	·3877	9·07	10	·4432	9·68	20	·5041	9·29
2	·3933	9·12	11	·4487	9·47	21	·5096	9·41
3	·3988	9·11	12	·4542	9·41	22	·5152	9·38
4	·4044	9·23	13	·4598	9·46	23	·5207	9·55
5	·4099	9·27	14	·4653	9·34	24	·5262	—
6	·4154	9·47	15	·4701	9·39	25	·5318	9·82
7	·4210	9·64	16	·4764	9·30	26	·5373	9·84
8	·4265	9·72	17	·4819	9·33	27	·5429	9·91
9	·4320	—	18	·4874	9·22	28	·5484	9·89
			19	·4930	9·43			

The last exposure was probably taken partly through clouds, which stopped the observations. Two observations (Nr. 9 and 24) were rejected on account of the overlapping of the images on the plates.

Means from two consecutive exposures were formed and the resulting points were plotted on the accompanying diagram. The moment of the secon-



The light variation of Eros on 12—13 January 1931; the abscissas are fractions of J. D.

dary minimum computed graphically by Pogson's method is as follows:

J. D. Planetoc. M. Astr. T. Greenw. 2426354ᵈ·4318.

The comparison with the R. Müller's elements (A. N. 5768) gives the difference $O - C = -0^{d}{\cdot}0010$. Owing to incomplete lightcurve the range and the extreme magnitudes of Eros were not ascertained. It is seen however, from the diagram that the photographic amplitude of Eros was of the order of $0^{m}{\cdot}8$. In the secondary maximum Eros reached $9^{m}{\cdot}32$. The light curve seems to be quite regular without the secondary waves.

Owing to very unfavourable atmospheric conditions no further plates containing Eros were recorded during January and February 1931.

Warsaw, Astronomical Observatory of the University
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Streszczenie.

Obserwacje fotograficzne zmiany blasku Erosa, dokonane 12—13 stycznia 1931 r.

W nocy z 12-go na 13-ty stycznia 1931 r. autor uzyskał zapomocą 12-cm astrokamery Zeiss'a 3 klisze z 28 ekspozycjami Erosa. Klisze zostały zmie-

rzone mikrofotometrem termoelektrycznym Schilta, wykonanym w 1930 r. przez firmę W. C. 't Hart w Rotterdamie.

Podane niżej wielkości gwiazd porównania wyprowadzono z pomiarów specjalnej kliszy, uzyskanej 9 lutego 1931 r. przy użyciu siatki dyfrakcyjnej przed objektywem:

*	*B.D.*	mg
a	+16°2150	8·87
b	+16°2146	9·17
c	+16°2139	10·07

W tablicy podano planetocentryczne momenty środka każdej ekspozycji oraz odpowiadające im wielkości Erosa. Na wykresie umieszczono punkty, będące średnią arytmetyczną z dwóch kolejnych obserwacyj. Moment wtórnego minimum, uzyskany metodą graficzną, wypadł:

J. D. 2426354·^{d}4318 czas śr. planetoc. astr. w Greenwich.

Porównanie z elementami R. Müllera (A. N. 5768) daje różnicę O — C = —0^{d}·0010. We wtórnem maximum jasność Erosa wynosiła 9^{m}·32.

Sur l'unicité des solutions des équations aux dérivées partielles du premier ordre

(O jedyności całek równań różniczkowych cząstkowych rzędu pierwszego)

par

A. Rosenblatt

1. Dans une Note des Comptes Rendus [1]) j'ai démontré le théorème suivant: „L'équation

$$\frac{\partial z}{\partial x} = \varphi\left(x, y, z, \frac{\partial z}{\partial y}\right) \tag{1}$$

dans laquelle φ est continu dans le rectangle R

$$0 \leqq x \leqq a, \qquad |y| \leqq b \tag{R}$$

et pour z, $\frac{\partial z}{\partial y}$ quelconques possède au plus une intégrale $z = f(x, y)$ continue à dérivées continues dans le trapèze T

$$0 \leqq x = \alpha = \min\left(a, \frac{b}{M}\right), \qquad |y| \leqq b - Mx_r \tag{T}$$

et s'annullant sur l'axe des y entre $-b$ et $+b$, pourvu que la condition suivante soit remplie:

$$\varphi\left(x, y, z_2, \frac{\partial z_2}{\partial y}\right) - \varphi\left(x, y, z_1, \frac{\partial z_1}{\partial y}\right) = X_1(x,y)(z_2 - z_1) + X_2(x,y)\left(\frac{\partial z_2}{\partial y} - \frac{\partial z_1}{\partial y}\right), \tag{3}$$

où z_1, z_2 sont deux fonctions quelconques continues à dérivées continues, et où l'on a

$$|X_2| = M, \qquad X_2 \text{ continu dans } R, \tag{3}$$

[1]) Sur l'unicité des solutions des équations aux dérivées partielles du premier ordre. 13/10 1930.