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87

- Apr. 23 Coma fans out in 170° . Total 11 mag.
 May 21 Diffuse nucleus $20''$ in diameter surrounded by a very faint coma extending mostly in 130° . Total 15 mag.
 June 10 Very diffuse 16.5 mag.
 June 18-24 Diffuse nucleus some $15''$ in diameter in a hardly noticeable coma. Total 17 mag.
 Comet 1952 b (Periodic Grigg-Skjellerup)
 1952
 Apr. 20-21 Fuzzy nucleus $10''$ in diameter eccentrically placed in a coma extending to $1'$ mainly in the first quadrant. Total 13.5 mag.
 Apr. 24 Same appearance. Total 14 mag.
 May 31 Comet no longer found (17 mag.) on a 10-minute exposure with the 24-inch reflector.
 Comet 1952 c (Mrkos)
 May 17-19 Coma $2'$ in diameter with central condensation. Sky hazy. 10 mag.
 June 1 Round coma $2\frac{1}{2}'$ in diameter. Diffuse central condensation. Nebulosity a little brighter in 160° from the nucleus but no tail. Total 10 mag.
 June 18-26 Diffuse central condensation. 10 mag.
 June 29 Coma nearly $5'$ in diameter. 10 mag.
 July 2 Round coma $5'$ in diameter centrally condensed in a diffuse nucleus. Total 9.9 mag.
 July 13 Round coma $6'$ in diameter. Well-defined 12 mag. central nucleus. Total $\approx -0^\circ 43' 01''$. Hence 9.3 mag.
 July 17 Coma $5'$ in diameter. A 10 min. exposure guided for the motion shows no tail. Sharp nucleus 13 mag.
 June 20 Coma $8'$ in diameter. Stellar nucleus 12 mag. Total 9.5 mag.
 July 24-25 Faint at low altitude.
 Comet 1952 d (Peltier)
 June 23-26 Nearly round coma $4'$ in diameter centrally condensed into a diffuse nucleus. 10 mag.
 July 13 Nucleus 13 mag. Total $\approx 72^\circ 69'$. Hence 10.3 mag.
 July 17-25 Diameter still $4'$. Nucleus 12 mag. Total 10 mag.
 Oct. 18 Round coma $20''$ in diameter with diffuse central condensation. 16 mag.
 Nov. 6 $15''$ in diameter. 17 mag.
 Nov. 11 Very diffuse condensation in a $15''$ round coma. 17.5 mag.

- Nov. 13 Unchanged. 18 mag.
 Nov. 22 Faint trace too uncertain for measurement.
 Periodic Comet Schwassmann-Wachmann 1925 II
 1951
 Jan. 5-12 Central condensed coma $8''$ in diameter. Diffuse extension $12''$ in 90° . Total 18 mag.
 Feb. 4 Sharp nucleus in $20''$ coma with fan-shaped extension toward 130° . 17 mag.
 Feb. 7 Fuzzy nucleus with faint coma extending mostly in 140° . 16.5 mag.
 Mar. 5-7 Small round coma 17 mag.
 1952
 Apr. 23-24 The Astrographic Catalogue of this section is not yet published. There are no other suitable comparison stars. Nearly stellar nucleus 17 mag. in a faint coma $2'$ in diameter. Total 15 mag.
 Periodic Comet Oterma 1942 VII
 1950
 Mar. 14-15 Small coma $4''$ in diameter with a short tail $10''$ in 110° . Total 15 mag.
 Apr. 15-17 Small nucleus in a faint coma $30''$ in diameter and a tail-like extension in 280° . Total 15 mag.
 1951
 Jan. 5-12 Coma $8''$ in diameter slightly elongated in right-ascension. Tail extends $1\frac{1}{2}$ in 290° . Total 15 mag.
 1951
 Feb. 5 Total 14.5 mag.
 May 3-5 Tail $1'$ in 280° . Total 15 mag.
 1952
 Apr. 21-24 Round coma $6''$ in diameter. 16.5 mag.
 June 20 Nearly starlike round coma. 17 mag.

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Editor's note: A revision for Comet 1951f received after the table had been printed gives positions as follows:

Date	R. A.	Decl.
May 8.13750	$9^h 38^m 6^s.93$	$+33^\circ 49' 31''.7$
May 8.16528	$9\ 38\ 14.95$	$+33\ 49\ 46.9$

Williams Bay, Wis.,
1952 December.

THE RELATIVITY SHIFT AT THE 1952 FEBRUARY 25 ECLIPSE OF THE SUN

By G. VAN BIESBROECK

The National Geographic Society jointly with the Naval Research Laboratory sponsored an expedition to Khartoum, Sudan, to make a new test of the star shift as predicted by the theory of relativity at the February 25, 1952 eclipse of the sun. The same equipment used at the 1947 eclipse in Brazil was utilized.¹ The mounting of the 20-foot telescope had only to be changed for the new latitude. But this time a K2 yellow glass filter was used in front of the objective. The glass was obtained through the Bureau of Standards and carefully ground in the optical shop of

the Yerkes Observatory. The 45° plane-parallel plate left in the open in front of the lens was kept well shielded from the sun and vigorously ventilated by the strong breeze as well as by an electric fan so as to insure equal distribution of temperature in this delicate piece of optics. The lateral images were not distorted this time, but the direct as well as the lateral images were affected by the vibrations of the telescope due to a gusty NE wind. A canvas screen erected on that side did not suffice to prevent these vibrations. As a result the images in both fields are very diffuse.

TABLE I. ECLIPSE FIELD

Star	BD	Mag.	Sp.	D	A	Ea1 with		Ea2 with		Eb1 with		Eb2 with	
						Ca1	Ca2	Ca1	Ca2	Cb1	Cb2	Cb1	Cb2
1	-10° 5925	7.6	Go	4.37	229.0	+ 7.2	+ 4.0	+10.6	+17.5	+18.8	+13.7	+14.1	+16.8
2	- 8 5888	7.3	Fo	4.34	333.6					+19.3	- 8.7	+19.2	+16.5
3	-11 5850	4.9	Ao	5.91	198.3	- 4.1	+ 7.1	- 1.8	+ 8.1	+ 4.8	+16.7	+20.0	+26.3
4	-11 5851	8.6	K2	5.68	196.8	+ 2.2	+ 8.2	+10.9	+10.7	+15.2	+23.3	+10.1	+12.4
5	-11 5855	6.4	Fo	6.52	188.1	- 3.8	- 3.7	- 6.9	+21.5	+11.2	+15.3	+10.6	+26.0
6	-10 5947	6.8	Ko	2.12	141.3	+ 9.2	+ 3.6	+23.4	+24.8	+13.9	+ 0.8	+22.2	+28.1
7	- 8 5905	7.1	Fo	6.47	31.0	+11.4	+ 1.4	+16.2	- 1.2	+ 8.6	+10.3	- 8.6	+ 8.7
8	- 8 5907	7.7	Fo	7.14	34.0					- 2.5	- 9.6	+ 7.5	- 9.1
9	- 8 5912	6.4	Go	7.02	48.3	+23.2	- 5.0	+ 7.0	+ 3.3	+13.0	+ 4.6	- 2.7	-16.5
10	-10 5961	8.1	Go	6.73	121.3	+15.6	+ 2.3	+12.0	+12.4	-15.2	+21.8	+ 2.6	+12.2
11	- 8 5918	8.1	Ko	8.93	47.5	+18.1	+ 3.8	+ 6.3	+ 2.1	- 8.8	+13.3	- 6.0	-11.8
E (mm)						+49.2	+40.4	+44.0	+41.1	+57.8	+42.0	+59.0	+53.6
E						+ 1".68	+ 1".38	+ 1".50	+ 1".40	+ 1".97	+ 1".43	+ 2".01	+ 1".83

Many of the star images that were faintly visible had to be omitted on account of the uncertainty of the settings. Two plates were exposed: the first eclipse plate was exposed for 60 seconds; it shows 9 well measurable stars in the eclipse field and 8 in the auxiliary field. The second exposure which lasted 90 seconds, had 11 measurable stars in the eclipse field and also 8 in the auxiliary field. The telescope installed on the grounds of the shop of the Sudanese Geodetical Service some 4 kilometers southeast of Khartoum was left undisturbed on the site and on Aug. 29 the two corresponding check-plates were taken at night at the same hour-angle. On these the images are better than on the eclipse plates mainly on account of the absence of wind. The stars measured are given in Table I: under *D* and *A* are indicated the distance of the star to the center of the sun expressed in solar radii and the position-angle. Temperature readings at the lens and barometer data were obtained through the efficient help of the Sudanese Meteorological Service and were used to apply the small differential corrections in refraction between the two epochs. Also the differential corrections for aberration had to be applied. The measures were obtained through the courtesy of the Yale Observatory, New Haven, Conn., where I was permitted to use the large measuring machine for the 17 × 17 inch plates. The two eclipse-plates Ea and Eb as well as the two check-plates Ca and Cb were measured twice. The small differences in scale indicated by the stars in the auxiliary field (Table II) were each time applied to the measures in the

eclipse-field. The residual differences eclipse-plate minus check-plate projected on the radius vector can now be expressed by:

$$\Delta = \frac{E}{D} + a \cos A + b \sin A,$$

in which *a* and *b* are the *x* and *y* coordinates of the difference between the two zero points, and *E* the relativity constant to be determined by a least-squares solution. The first and second measures were discussed in the eight combinations for which the residuals are given in Table I. The large scattering of these figures shows how uncertain the final result remains on account of the poor quality and the small number of measurable star-images. Giving half weight to the shorter first exposure which shows the poorer images and the smaller number of stars the average of $1''.70 \pm .10$ (m.e.) comes out close to the theoretical prediction $1''.75$.

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TABLE II. AUXILIARY FIELD

B.D.	Mag.	Sp.	B.D.	Mag.	Sp.	REFERENCE
+57° 1785	6.5	A2	+57° 1780	6.2	F2	
+60 1754	5.7	A2	+57 1790	7.7	K2	1. <i>A. J.</i> 55, 49, 1950.
+58 1731	6.5	A2	+56 2007	7.5	K2	
+57 1774	6.5	K2	+57 1791	6.8	Ko	

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