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Note on four southern double stars with large proper motion

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Citation

Plaut, L. (1939). Note on four southern double stars with large proper motion. *Bulletin Of The Astronomical Institutes Of The Netherlands*, 9, 36. Retrieved from <https://hdl.handle.net/1887/6142>

Version: Not Applicable (or Unknown)

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Note: To cite this publication please use the final published version (if applicable).

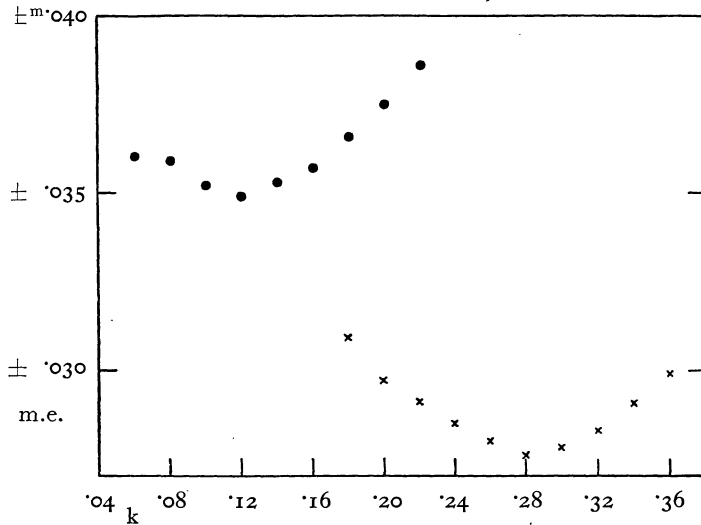


FIGURE 5.
Mean error of a single normal point for different theoretical light curves. • *U* hypothesis, × *D* hypothesis.

Suppose v = the true anomaly,
 r = the radius vector,
 $a = 1$ = the semi axis major of the orbit.
 If the rectification for $e = 0$ is used,

$$\delta^2 = (\cos^2 i + \sin^2 i \sin^2 v) r^2 = a_1^2 (1 - z \cos^2 \theta) \left(\frac{\delta}{a_1}\right)^2,$$

$$\left(\frac{\delta}{a_1}\right)^2 (1 - z \cos^2 \theta) \frac{1}{r^2} = \frac{1}{a_1^2} - \frac{1}{a_1^2} \sin^2 i \cos^2 v,$$

$$u' = A + B t'; u' = \frac{u}{r^2}; t' = -\cos^2 v.$$

Least squares solutions have been made in the same way as above. The resulting theoretical light curves scarcely differ from those computed with a circular orbit, though obviously a_1 and i have other values, viz. for $k = 0.12$:

periastron at primary minimum: $a_1 = 0.47$, $i = 63^\circ$,
 mean error of a single normal point = ± 0.0343 ;
 apastron at primary minimum: $a_1 = 0.34$, $i = 77^\circ$,
 mean error of a single normal point = ± 0.0357 .

Note on four southern double stars with large proper motion, by *L. Plaut*.

Following a suggestion of Prof. HERTZSPRUNG the lists of double stars found by ROSSITER, DONNER and JESSUP at the Lamont Hussey Observatory at Bloemfontein (*Mem. R.A.S.* 65, part II, III and 66, part I) have been examined for stars with proper motion exceeding $''5$ annually.

Four binaries of this kind have been found:

1. Rst 2280 = CPD $- 20^\circ 277$, $2^h 24^m 3$, $- 20^\circ 26'$ (1900). The data for this star have already been published by LUYTEN in *Harv. Bull.* No. 910.

2. Jsp 208 = CoD $- 59^\circ 1774$, $7^h 56^m 0$, $- 60^\circ 02'$ (1900); $9^m 7 - 13^m 7$, $d = 2'' 2$, $\mu = '' 52$. The star CoD $- 59^\circ 1773$ [$5^m 7$, $50''$ preceding; $\pi_{tr} = + '' 054$

$\pm '' 009$ (m.e.)] has the same proper motion.

3. Rst 2821 = BD $- 17^\circ 3723$, $12^h 47^m 9$, $- 17^\circ 57'$ (1900); $8^m 5 - 13^m 3$, $d = 1'' 7$, $\mu = '' 88$, $\pi_{tr} = + '' 013 \pm '' 019$ (m.e.).

4. Rst 3962 = BD $- 8^\circ 4352$, $16^h 50^m 2$, $- 8^\circ 09'$ (1900). This star is identical with Wolf 630, the visual binary with the shortest period known (KUIPER, *P. A. S. P.* 46, 235 and 48, 19).

The proper motions and trigonometric parallaxes have been taken from SCHLESINGER's *Catalogue of parallaxes* (Yale, 1935). The probable annual orbital motions according to HERTZSPRUNG (*B.A.N.* No. 208) are $'' 024$ for star 2 and $'' 061$ for star 3.