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VARIABILITY AMONG STARS OF SPECTRAL CLASS S !

Stephenson's (1976) "A Catalogue of S Stars" includes 24 that have been classified as S! by either Stephenson (21 stars) or Sanduleak (3 stars). The comment was made that probably all stars so classified are variable. Among the 24, eight had already been confirmed as variable: 4 Mira, 3Lb and one SRa. Two others are contained in the Catalogue of Suspected Variables, CSV1356 and CSV1482. For the regions of two of those not previously suspected of variability, Nos. 557 and 566 in Stephenson's Catalogue, plates are available at the Maria Mitchell Observatory. Both stars prove to be typical Mira type variables.

For 557 at $18^{\text{h}}21^{\text{m}}17^{\text{s}} -14^{\circ}45'17''$, 110 plates spanned the interval JD 26889 - 43697, while the only earlier plate on the region, taken JD 22611, showed the star at maximum. The range of magnitude is provisionally 13.0 to 15.0 pg. The observations are satisfied by

$$\text{Max} = \text{JD}2442940 + 398\text{E}.$$

Star 566 at $18^{\text{h}}29^{\text{m}}21^{\text{s}} -22^{\circ}42'51''$ I had some difficulty in identifying in the crowded Sagittarius field. Dr. Stephenson therefore kindly supplied me with a finder chart. The star marked a in Figure 1 appeared to vary slightly but this could have been

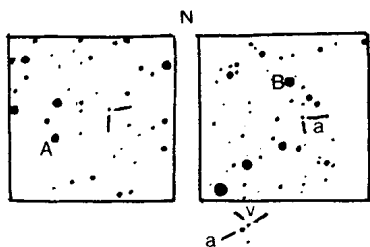


Figure 1. Finder charts, approximately $10' \times 10'$, for Stephenson's S!-stars, Nos. 557 (left) and 566 (right). The variable star 566 is a companion about 0.3 north preceding star a. A is BD-14^o5054, and B is BD-22^o4793.

a deceptive effect of the overlapping of adjacent images. The better of the available plates revealed a companion about 0.3 N which was intermittently as bright as a. This normally faint com-

panion is presumably the star with the S-type spectrum. Its magnitude appears to vary from 14.3 to 15.5 pg. The average color index for those S! stars for which Stephenson listed both photographic and visual magnitudes is 2.7. Hence the difference between my photographic magnitude and his visual is reasonable. Among the 600 plates of the region, only 90 showed unblended images. These observations are represented by

$$\text{Max} = \text{JD } 2443000 + 369\text{E}.$$

Table I lists the other S! stars which remain to be discovered as variable. The visual magnitudes listed are from Stephenson's Catalogue.

Table I
Stars with S!-Type Spectra to be Investigated for Variability.

Stephenson Cat. No.	R.A. (1900)	Dec.	m_{vis}
10	0 ^h 38 ^m 44 ^s	+ 63°13'6"	12.0
123	5 52 43	+ 35 07.5	9.9:
139	6 08 02	+ 28 09.6	10.7
223	7 15 57	- 7 37.2	11.3
297	8 08 13	- 30 56.3	11.8
359	9 18 27	- 42 13.0	12.4
397	10 22 18	- 51 59.2	12.6
408	10 35 58	- 52 41.1	11.6
489	14 50 53	- 63 00.9	11.0
519	17 13 44	- 24 49.0	11.8
687	21 28 04	+ 61 07.0	11.8:
727	23 10 48	+ 49 46.2	10.6:

Another star, No. 576 with spectral class S4,2 and identified as CoD -23°14695, 11.0 m_{v} (CoD mag. 9.6) has been examined on Nantucket plates without success. The star I have taken to be CoD -23°14695 is photographically bright, about 11.5 pg. Plates of better resolving power are required to detect if this star has a red companion possibly fainter than 13 pg.

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DORRIT HOFFLEIT
Maria Mitchell Observatory
Nantucket, Mass. 02554 U.S.A.

Reference:

Stephenson, C.B. 1976, Pub. Warner and Swasey Obs. Vol. 2 No. 2