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PHOTOVISUAL AND SPECTROPHOTOMETRIC OBSERVATIONS OF THE CARBON STAR HD 59643

Greene and Wing (1971) reported on unusual behaviour of the carbon star HD 59643 ($V=7^{m}.80$ - Blanco et al., 1968). They discovered an ultraviolet brightening of this star previously supposed to be constant and hydrogen emission lines in its spectra obtained in February 1970. Earlier studies of HD 59643 carried out by Yamashita (1967) and Utsumi (1970) indicated some peculiarities such as slight enhancement of the CH G-band, strong absorption lines of Ba II and Sr I and sudden appearance of the H_{β} absorption line on Utsumi's plates.

It seemed worth while to observe further this star exceptional among non-variable stars in showing ultraviolet brightening. Some observational material has been obtained for this star at the Toruń Observatory in 1964 - 1971 in the course of the photometric and spectrophotometric investigations of carbon stars. Photovisual measurements (m_{pv}) have been made on Kodak IIa-F plates with the aid of the 8" Draper astrograph and Ilford 108 filter. They are given in Table 1 and plotted in Fig.1.

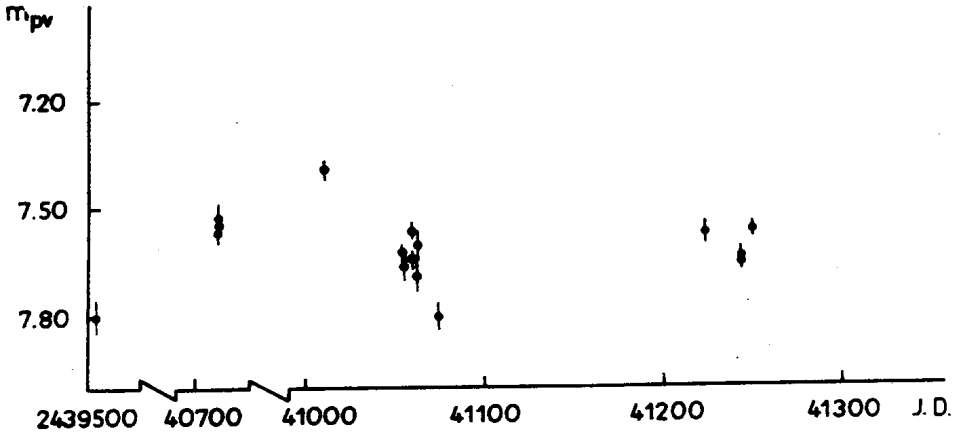

Table 1

Photovisual magnitudes of HD 59643

Date	Julian Days JD	Photovisual magnitude $m_{pv} \pm \varepsilon$
1967 Jan. 14	2439505.4	7.80 ± 0.05
1970 May 6	2440713.3	7.52 .03
1970 May 6	713.4	7.56 .04
1970 May 6	713.5	7.54 .03
1971 March 1	2441011.5	7.39 .03
1971 April 13	054.5	7.62 .02
1971 April 14	055.5	7.66 .04
1971 April 19	060.4	7.64 .02
1971 April 19	060.5	7.56 .02
1971 April 21	062.4	7.69 .04
1971 April 21	062.5	7.60 .04
1971 May 3	074.6	7.80 .04
1971 Sept. 29	223.6	7.57 .03
1971 Oct. 19	243.5	7.65 .02
1971 Oct. 19	243.7	7.64 .03
1971 Oct. 26	250.5	7.56 .02

It seems probable that in the examined period of time HD 59643 brightened by about $0^m.3$, but since JD 2441060 it dropped to its previous brightness.

Spectrophotometric observations were made on Kodak I-N, II a-F and II a-O plates using the 60/90/180 cm Schmidt telescope and on Ilford HP3 films with the aid of the 30/35/75 cm Schmidt camera both with objective prisms giving dispersions of 250 Å/mm and 320 Å/mm at $H\gamma$, respectively. They covered the periods before the brightening (1965) and after it (1971). The central depths of some characteristic bands and the "absolute" energy distribution have been determined for both periods. No changes exceeding the observational errors have been detected. It is not surprising that there are no remarkable differences in the central depths and energy distributions for such a small amplitude of brightness. Unfortunately, there were no photometric as well as spectrophotometric observations during the most interesting interval of time reported by

Greene and Wing (1971). The mean "absolute" energy distribution of HD 59643 compared with that of HD 137613 (R2)and HD 156074 (C1,2) given by Mendoza and Johnson (1965) are shown in Figure 2.

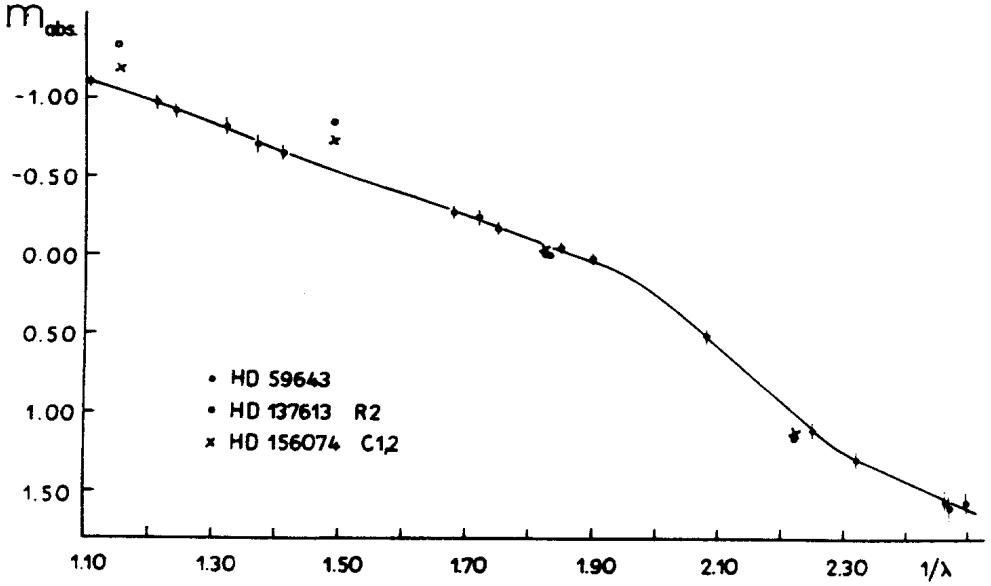

Fig.2 "Absolute" energy distribution of HD 59643 (dots), HD 137 613 (open circles) and HD 156074 (crosses) .

The spectral type estimated from this comparison about C1 or R2 is earlier than that one C6.5 received by Yamashita 1967 from lines and bands intensities.

STANISLAW KRAWCZYK
Astronomical Observatory
N. Copernicus University
Toruń, Poland

JANINA KREMPEĆ
Polish Academy of Sciences
Institute of Astronomy
Astrophysics Laboratory
Toruń, Poland

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