

THE DETERMINATION OF PERIODS AND THE DEFINITION OF VARIABILITY TYPE OF NEW VARIABLE STAR IRAS 17583+5150

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ABSTRACT. The measurements of brightness of the star IRAS 17583+5150 discovered using the Odessa observatory negatives are discussed in the article. The proposed types of these stars are IRAS 17583+5150 – type SRB (SRC).

Key words: Variable Star, type SRB (SRC).

The history of research

The analysis of photo-electric measurements series of "HIPPARCOS" experiment allowed Roger W. Sinnott to state in the electronic version of "Sky & Telescope" magazine that the new variable star GV Dra is of EA type (Sinnott, 2000a; 2000b). The same assumption has also been made by Sergey E. Guryanov in the "Zvezdochet" magazine. While measuring the brightness of the star GV Dra Ivan S. Bryukhanov using the Odessa Photocollection negatives discovered optical variability of the star Tyc 2 3523 1519 1 or alternatively IRAS 17583+5150 or else IRC+50275 or HD 164645. Viewing in the Minsk Photocollection negatives (MPPLF) in V rays Alexander P. Solonovich confirmed the variability of the star IRAS 17583+5150.

IRAS 17583+5150

Ivan S. Bryukhanov has discovered optical variability of the star Tyc 2 3523 1519 1 (or alternatively IRAS 17583+5150 or else IRC+50275 or HD 164645, spectrum Mc) in the Odessa Photocollection negatives. The measurements were carried out using only the negatives of the Odessa observatory where the maximal amplitude of star brightness fluctuations is 7.4m–8.9m in V rays. The map and the stars for comparison in a visual range for IRAS 17583+5150 (fig. 1).

Ivan S. Bryukhanov's visual estimations of brightness of the star IRAS 17583+5150 were carried out using Neiland-Blazko method in 567 photographic plates.

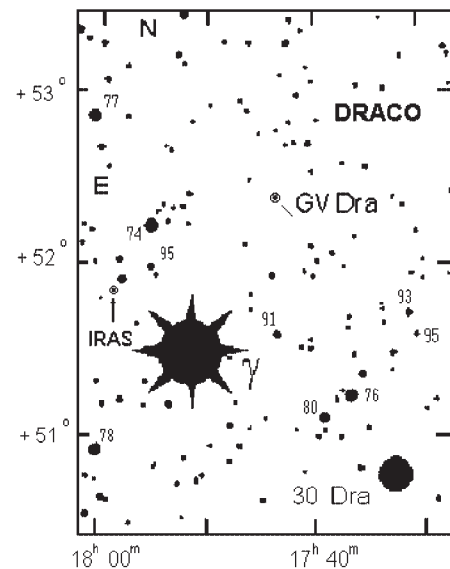


Figure 1: Map and stars of comparison IRAS 17583+5150 and GV Dra (Sinnott, 2000a; 2000b)

The determination of period or cycles of star brightness fluctuations was carried out by Ivan S. Bryukhanov using Lafler-Kinman method.

Taking into account the instability of star brightness fluctuations Ivan S. Bryukhanov applied the method of "cutting" the whole set of measurements into separate smaller intervals with the view of determining the brightness fluctuations periodicity.

The set of measurements of star brightness was divided by the researcher into 2 intervals: the early observations from 2436432 to 2441898 JD, the amplitude of fluctuations is from 8.m1 up to 8.m9 in V rays; the observations from 2442243 to 2449221 JD, the amplitude of fluctuations is from 7.m4 up to 8.m7 in V rays.

In the interval from 2436432 to 2441898 JD shorter intervals were taken for the determination of brightness

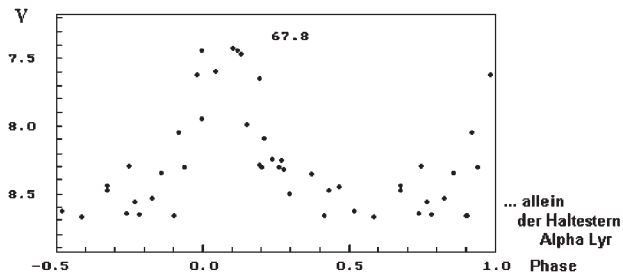


Figure 2: 2442573–2445879 J.D.

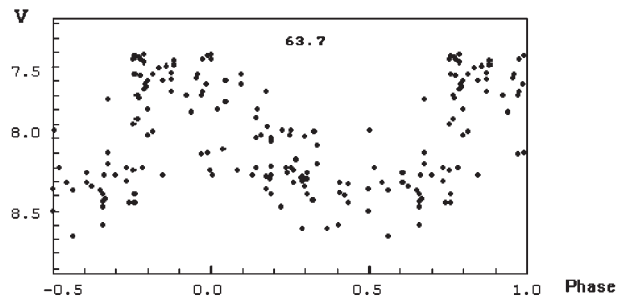


Figure 6: 2444694–2446655 J.D.

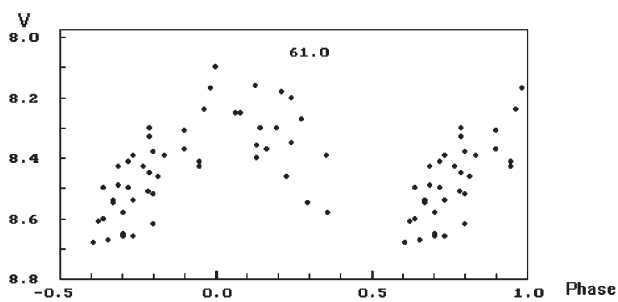


Figure 3: 2436779–2437173 J.D.

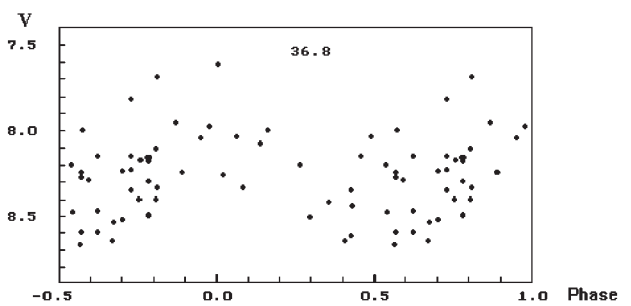


Figure 7: 2446936–2448036 J.D.

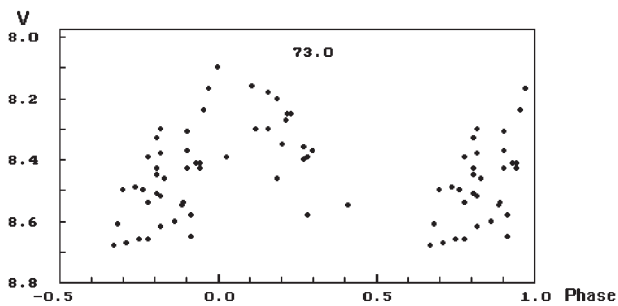


Figure 4: 2436779–2437173 J.D.

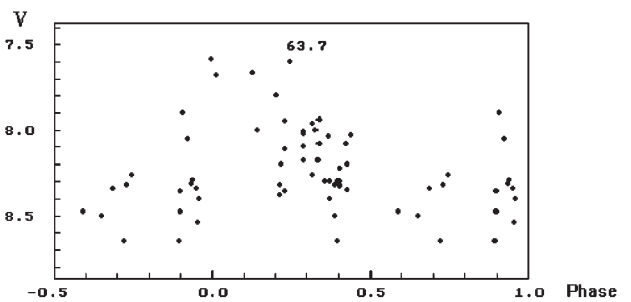


Figure 8: 2448061–2449221 J.D.

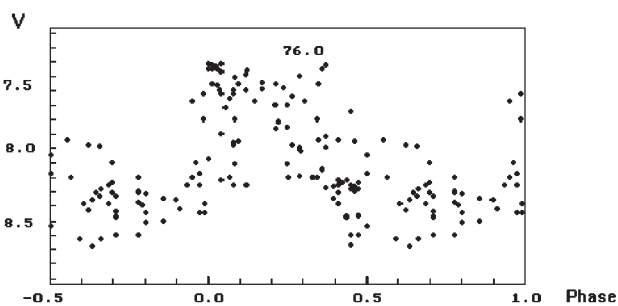


Figure 5: 2444694–2447022 J.D.

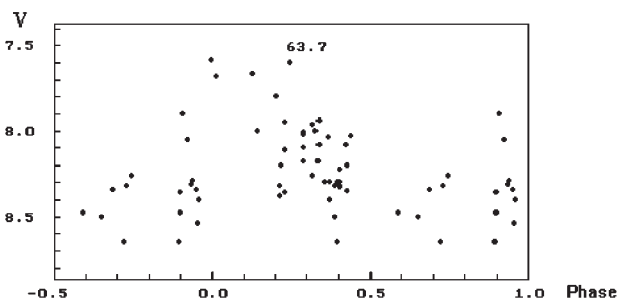


Figure 9: 2442573–2445879 J.D.

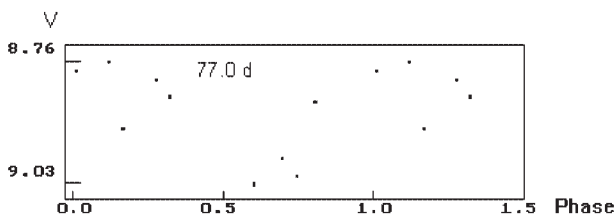


Figure 10: 2449840–2450201 J.D.

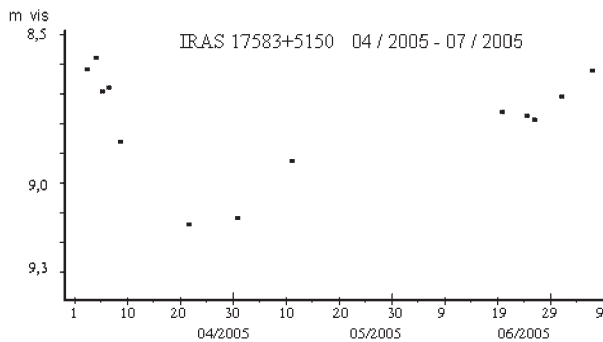


Figure 11: Observer Ivan S. Bryukhanov

fluctuations cycles of IRAS 17583+5150:

- 2436779–2437173 J.D. The cycle 61,0 d is clearly observed; possible cycles are 52,0 d and 73,0 d.
- 2437079–2437173 J.D. The cycle 65 - 66 d. is clearly observed.

In the interval from 2442243 to 2449221 JD shorter intervals were taken for the determination of brightness fluctuations cycles of IRAS 17583+5150:

- 2442243–2444052 J.D. Chaotic brightness fluctuations (?) or cycles 227 d (?) and 21.5 d (?) can be also observed.
- short interval 2444694–2446655 J.D. The cycles 63.7 d, 76.0 d are observed.
- 2446936–2448036 J.D. Chaotic brightness fluctuations (?) or cycle 36,8 d (?) are observed.
- 2448061–2449221 J.D. The cycle 63,7 or 66 d is clearly observed.

The conclusion is that the most clearly observed in different intervals of measurement series is the cycle 65 ± 10 days, and these cyclic fluctuations are sometimes interrupted by chaotic brightness fluctuations.

The 8 most successful diagrams of brightness fluctuations of IRAS 17583+5150 in V rays in different time intervals are given below (fig. 2, 3, 4, 5, 6, 7, 8, 9):

Visual estimations with the use of the Minsk Photocollection negatives (MPPLF) in V rays carried out by Alexander P. Solonovich resulted in his obtaining in the interval 2449840–2450201 J.D. the diagram of change in brightness fluctuations of IRAS 17583+5150 with the cycle 77 d. within 8.6–9.1 V limits (fig. 10). A visual patrol of IRAS 17583+5150 was carried out by Ivan S. Bryukhanov in April–July 2005 (fig. 11.)

Long and exact photo-electric and visual measurements of IRAS 17583+5150 brightness are required for confirmation or refutation of variability type.

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