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THREE-COLOUR PHOTOGRAPHIC PHOTOMETRY OF V 1057 CYGNI

According to a program of investigation of flare stars and other nonstable objects in the 16 square degrees region of Cygnus ($RA_{1950}=20^h52^m$; $D_{1950}=+42^{\circ}40'$) a great number of u, pg and some b, v patrol plates were taken between 1972 August 4 and 1974 August 30 (1121 days) with the 40 inch/50 inch and 21 inch/21 inch telescopes of the Byurakan Astrophysical Observatory.

On 89 of our plates we measured the magnitudes of V 1057 Cyg in u, b (pg) and v colours and compared them with the results of Gieseking (1) obtained for the period 1970-1975.

In order to obtain a good approximation to the UBV system we used the following telescope and plate-filter combinations:

- u - 40 in. telescope, Kodak 103a0 or ZU-2 + Schott UG2 or UG1
- b - 40 in. telescope, Kodak 103a0 or ZU-2 + Schott GG13
- pg - 21 in. telescope, Kodak 103a0 or ZU-2 without filter
- v - 40 in. telescope, Kodak 103aD + Schott GGII

Our investigation (2) shows that the used u,b,v system is a good approximation of Johnson's photographic system and that pg-magnitudes are equal to b.

The measurements were carried out with an "ASKANIA" irisphotometer. Characteristic curves were derived for each plate using a group of 5 stars of photoelectric UBV - standard of Bigay and Garnier (3) and 7 stars of our secondary UBV photographic standard in the region of IC 5070 according to (2).

As in this region the background is very inhomogenous the iris readings for V 1057 Cyg were corrected according to the method of Argue (4). The nebula around V 1057 Cyg influenced our measurements in the sense that our u,b (pg), v magnitudes of this star were systematically brighter.

The results of our three-colour photographic photometry are given in the Table.

In the Figure we present the light curve of V 1057 Cyg in three colours. With dots and solid lines are presented our u,b(pg),

| J.D.244... | v | b/pg | u | J.D.244... | v | b/pg | u |
|------------|-------|---------|-------|------------|-------|---------|-------|
| 1534,28 | | | 12,05 | 2251,42 | | 11,78 | |
| 1537,30 | | 10,90pg | | 2251,43 | | 11,60 | |
| 1538,43 | | | 12,03 | 2251,44 | | 11,67 | |
| 1547,42 | | | 11,98 | 2251,49 | | | 12,61 |
| 1550,46 | | 11,06pg | 12,07 | 2252,38 | | | 12,79 |
| 1567,24 | | | 11,95 | 2252,42 | | | 12,74 |
| 1597,30 | | 11,00pg | | 2254,37 | | | 12,73 |
| 1621,17 | | | 11,95 | 2254,40 | | | 12,76 |
| 1631,19 | | 11,01pg | | 2254,49 | | | 12,70 |
| 1810,46 | | 11,32pg | | 2255,30 | | | 12,68 |
| 1843,47 | | 11,46pg | | 2269,28 | | 11,80 | |
| 1860,40 | | | 12,67 | 2272,31 | 10,03 | | |
| 1866,43 | | 11,52 | | 2272,47 | | | 12,83 |
| 1868,41 | | | 12,62 | 2273,30 | | | 12,68 |
| 1888,30 | | 11,52 | | 2273,33 | | | 12,90 |
| 1889,42 | | | 12,42 | 2273,36 | | | 12,69 |
| 1891,26 | | | 12,70 | 2275,30 | | 11,68 | |
| 1891,31 | | | 12,55 | 2275,31 | 10,13 | | |
| 1893,50 | | | 12,66 | 2278,47 | | | 12,87 |
| 1914,29 | | | 12,39 | 2279,33 | | | 12,71 |
| 1919,34 | | | 12,65 | 2299,30 | | | 12,89 |
| 1920,33 | | | 12,40 | 2300,31 | | | 12,70 |
| 1921,29 | | | 12,32 | 2304,32 | | 11,70pg | |
| 1922,24 | | | 12,65 | 2312,40 | | 11,85pg | |
| 1923,32 | | 11,28 | | 2331,25 | | 11,88pg | |
| 1923,34 | | 11,30 | | 2337,21 | | 11,87pg | |
| 1923,42 | | | 12,55 | 2337,22 | | | 13,08 |
| 1925,31 | | | 12,45 | 2337,30 | | | 13,11 |
| 1927,48 | 9,90 | | | 2339,18 | | | 13,12 |
| 1946,26 | | 11,28 | | 2339,23 | | | 13,03 |
| 1946,30 | | | 12,59 | 2622,29 | 10,04 | | |
| 1947,41 | 9,80 | | | 2628,35 | | | 13,16 |
| 1949,29 | | 11,42pg | | 2628,38 | | 11,90 | |
| 2162,54 | 9,95 | | | 2628,39 | | 11,95 | |
| 2222,48 | | 11,61 | | 2628,40 | 10,15 | | |
| 2223,48 | | | 12,56 | 2631,30 | | | 13,08 |
| 2225,38 | | | 12,78 | 2631,40 | | 11,80 | |
| 2240,34 | | | 12,85 | 2631,41 | 10,05 | | |
| 2242,28 | | | 12,65 | 2652,22 | 10,22 | | |
| 2242,38 | | | 12,62 | 2652,23 | | 11,80 | |
| 2247,40 | 10,02 | | | 2652,25 | | | 13,20 |
| 2247,40 | 9,92 | | | 2655,34 | 10,21 | | |
| 2247,45 | 10,07 | | | 2655,35 | | 11,83 | |
| 2250,50 | | | 12,68 | 2655,36 | | | 13,12 |
| 2251,42 | | 11,53 | | | | | |

v measurements, with crosses and dashed lines - the data of Giesecking obtained in the period 1972-1973, according to (1).

The slopes of the brightness decrease per 100 days in the time interval 1973-1975 are:

$$\text{for } u - 0^m.080 \pm 0^m.009$$

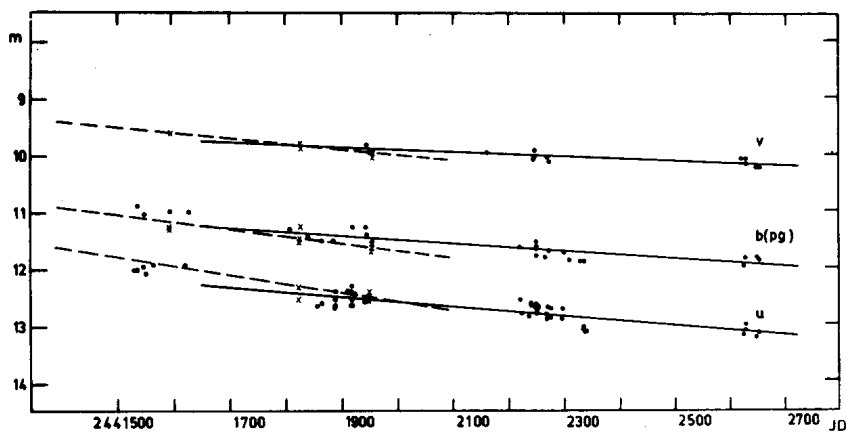
$$\text{for } b - 0^m.066 \pm 0^m.008$$

$$\text{for } v - 0^m.038 \pm 0^m.008$$

For the time interval of 750 days (from JD = 2441900 to JD = 2442650) we get the following changes of v and colours (u-b) and (b-v):

$$v = 0^m.3; \quad (b-v) = 0^m.2; \quad (u-b) = 0^m.1$$

From the Figure it can be seen that, starting from the summer 1973, the slope diminished approximately twice.



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