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AN EXTREME REDDENING OF THE CARBON STAR RW LMi=CIT 6

The photographic observations of RW LMi=CIT 6 made at the Radioastrophysical Observatory at the end of the last October, J.D. 2443073 to 2443080, show that since the end of the previous observing season, J.D. 2442873 to 2887, the colour index B-V of this infrared carbon star has increased from the value $B-V=1^m.5$ to $B-V=2^m.5$, while at only a little earlier time interval, J.D. 2442760 to 2868, the mean of the colour index values for 10 nights was $B-V=1^m.0$.

The blue-red ($\lambda_{\text{eff.}}=0.63\mu$) colour index at the same time has increased from $B-R=2^m.6$ to $B-R=4^m.2$, while at the interval J.D. 2442760 to 2868 it was $B-R=2^m.2$.

The range of the B-V variations according to our observations made in B and V magnitudes since J.D. 2441060 as well as others published and made in B and V since J.D. 2439889 by Kruszewski (1971, 1973) is $B-V=0^m.9$ to $B-V=1^m.6$. The observations in B and G filters by Kruszewski and Coyne (1976) show that sometimes the colour index of CIT 6 was even smaller.

The usual range of colour index B-R variations was $1^m.9$ - $2^m.9$.

Only the first ever made (probably in May, 1966) and published observations of B and V magnitudes by Wisniewski et al., (1967) also show similar colour index: $B-V=2^m.47$ extremely large for this star (but still very small to compare with other infrared carbon stars).

The other, third, occasion when CIT 6 is known to be unusually red was in April-May 1970, J.D. 2440677 to 0713, when our blue-red observations indicated the value of the colour index $B-R=4^m.1$ (Alksnis and Eglitis, 1973).

On all three occasions of extreme reddening the star was

near its maximum phase according to the elements $\text{Max.} = \text{J.D. } 2441880 + 640 \cdot E$ (Alksnis and Khozov, 1975), the epochs and phases being 5.9 (?), 2.16 and 1.87. In the latest reddening, however, the star is more than 1 magnitude fainter than in the other two previous cases, B magnitude being at its faintest value, $17^m.4$.

The B and R (0.63) magnitude long period variations for RW LMi based on our observations are shown in Fig.1 where dots represent the mean values for time intervals $0.1 P$; period $P = 640^d$.

Polarization measurements of CIT 6 (Khozov, unpubl., Kruszewski 1971, 1973, Kruszewski and Coyne, 1976) have never been made at the intervals of extreme redness of the star, although they might be of great importance for studying the processes taking place in the object. Thus polarization measurements in blue, visual and red are now urgently needed.

It is difficult to tell how long this state of extreme redness will last; the observations of the last two cycles of long period variations of the star, however, give evidence, that after the calculated phase of maximum brightness, colour indices of the star decrease (Fig.2). But the next predicted maximum time is at the middle of January 1977.

Finding chart of RW LMi=CIT 6 can be found in our previous paper (Alksnis and Eglitis, 1975).

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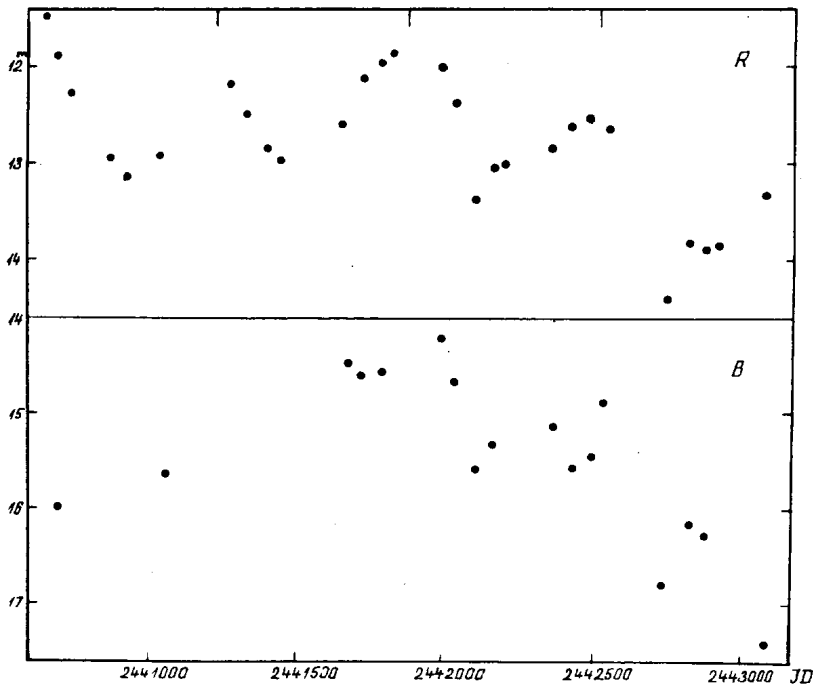


Fig.1. Long period variations of RW LMi according to the mean values of the magnitude $R(0.63)$ and B for time intervals $0.1 P = 64$ days. Calculated times of maxima are indicated at the top.

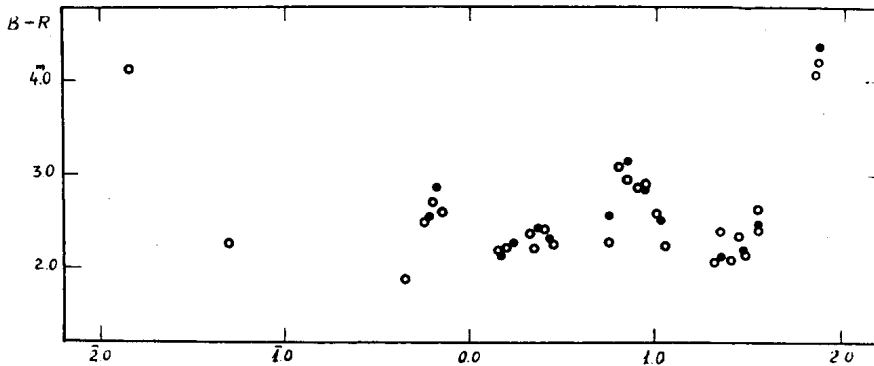


Fig.2. Colour index $B-R(0.63)$ variations. Dots - one day mean values of $B-R(0.63)$ averaged over time intervals $0.1 P$; circles - differences between B - and $R(0.63)$ -magnitude 64-day-means or sum of $B-V$ and $V-R(0.63)$ 64-day-means. Abscissa - time in periods.

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