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UBV PHOTOMETRY OF THE R CORONAE BOREALIS STAR GU Sgr – 1986/87

Photoelectric observations of the R Coronae Borealis (RCB) star, GU Sgr, were obtained at Mount John University Observatory (MJUO) during 1986 and 1987 as part of an ongoing survey of southern RCB stars. The 1986 observations were obtained with the 0.6-m photometric reflector; the 1987 observations with the 1-m reflector. The measurements were made with the MJUO No.1 photometer equipped with an EMI 6094B photomultiplier tube (S11 photocathode) and UBV filters as described by Bessell (1976).

The magnitude and colours of the comparison star HD 169441 ($V = 9.87$, $B-V = 0.24$, $U-B = -0.01$) were standardised after the derivation of the photoelectric constants from observations of E-region standards at MJUO. The magnitude and colours of the check star HD 168990 ($V = 9.30$, $B-V = 0.49$, $U-B = 0.36$), determined differentially, remained constant to within 0.01 magnitudes in V and $B-V$ and 0.02 magnitudes in $U-B$. The UBV observations of GU Sgr are listed in Table I. The light and colour curves for the observations obtained in 1986 and 1987 are reproduced in Figures 1(a) and 1(b) respectively.

A linear solution to the times of maxima on the light curve gives a value for the average period of 37.0 ± 0.3 day. This value is very similar to the period of 37–38 day determined from visual estimates of GU Sgr obtained between 1956 and 1969 by Bateson and Jones (1972). We note that although the average period of GU Sgr is similar to the average pulsation period of RY Sgr (Lawson and Cottrell 1988), the amplitude of the light and colour curves of GU Sgr are lower and less regular than those of RY Sgr (see e.g. Lawson et al 1987).

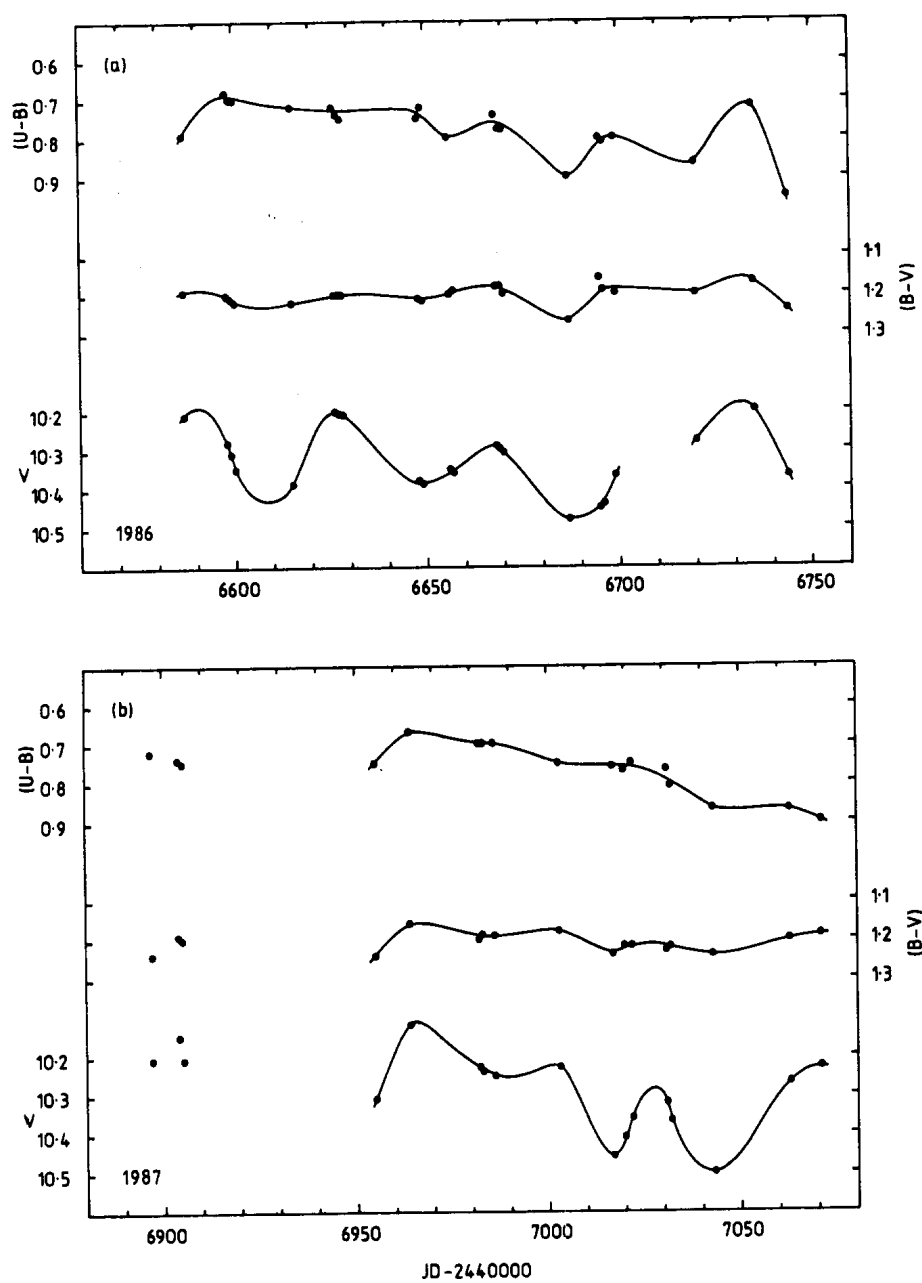


Figure 1. Light and colour curves of GU Sgr during (a) 1986 and (b) 1987.

Table I. Photoelectric observations of GU Sgr

| | JD-2440000 | V | B-V | U-B | JD-2440000 | V | B-V | U-B | |
|---------|------------|---------|-------|------|------------|---------|-------|------|------|
| 1986 | 6586.88 | 10.21 | 1.19 | 0.79 | 6656.97 | 10.36 | 1.19 | - | |
| | 6597.99 | 10.28 | 1.20 | 0.68 | 6667.96 | 10.29 | 1.18 | 0.74 | |
| | 6599.06 | 10.31 | 1.21 | 0.70 | 6669.07 | 10.30 | 1.18 | 0.78 | |
| | 6600.01 | 10.35 | 1.22 | 0.70 | 6669.97 | 10.31 | 1.20 | 0.78 | |
| | 6615.02 | 10.39 | 1.22 | 0.72 | 6686.94 | 10.48 | 1.27 | 0.90 | |
| | 6626.05 | 10.20 | 1.20 | 0.72 | 6694.93 | 10.45 | 1.16 | 0.80 | |
| | 6627.00 | 10.21 | 1.20 | 0.74 | 6696.01 | 10.44 | 1.19 | 0.81 | |
| | 6628.06 | 10.21 | 1.20 | 0.75 | 6698.95 | 10.37 | 1.20 | 0.80 | |
| | 6648.06 | 10.38 | 1.21 | 0.75 | 6719.94 | 10.28 | 1.20 | 0.87 | |
| | 6649.02 | 10.39 | 1.22 | 0.72 | 6734.87 | 10.20 | 1.17 | 0.72 | |
| | 6656.09 | 10.35 | 1.20 | 0.80 | 6743.89 | 10.37 | 1.24 | 0.95 | |
| | 1987 | 6897.20 | 10.21 | 1.24 | 0.72 | 7071.06 | 10.46 | 1.24 | 0.76 |
| | | 6904.13 | 10.15 | 1.19 | 0.74 | 7020.04 | 10.41 | 1.22 | 0.77 |
| 6905.13 | | 10.21 | 1.20 | 0.75 | 7021.99 | 10.36 | 1.22 | 0.75 | |
| 6955.00 | | 10.31 | 1.24 | 0.75 | 7030.97 | 10.32 | 1.23 | 0.77 | |
| 6964.02 | | 10.12 | 1.16 | 0.67 | 7031.92 | 10.37 | 1.22 | 0.81 | |
| 6981.90 | | 10.23 | 1.20 | 0.70 | 7042.93 | 10.50 | 1.24 | 0.87 | |
| 6982.99 | | 10.24 | 1.19 | 0.70 | 7062.95 | 10.27 | 1.20 | 0.87 | |
| 6986.00 | | 10.25 | 1.19 | 0.70 | 7070.98 | 10.23 | 1.19 | 0.90 | |
| 7003.10 | | 10.23 | 1.18 | 0.75 | | | | | |

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