

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 3526

Konkoly Observatory
Budapest
15 October 1990
HU ISSN 0374 - 0676

UX ANTLIAE, UW CENTAURI AND RZ NORMAE AT MINIMUM BRIGHTNESS

UX Ant was considered a suspected member of the R Coronae Borealis (R CrB) type of variable stars (Erro, 1940; Kholopov, 1985), but recently Kilkenny suggested that it is a true member of the class (Kilkenny and Westerhuys, 1990). UW Cen and RZ Nor are true members of the class. Identification charts as well as other data on these stars may be found elsewhere (Milone, 1990a and 1990b).

UX Ant was monitored visually (0.20 and 0.25 m reflectors) by one of us (E.R.M.) from 1980 to 1982, and lately (less regularly) from 1986 up to the present, but only minor brightness variations were detected, usually amounting to not more than 0.2, or 0.3, of a magnitude (exceptionally, 0.5). However, from June 9.0 UT, 1990 on, a larger brightness decline has been observed (Minniti, 1990; Milone, 1990c). Also, in June 1990 our monitoring on UW Cen and RZ Nor showed that they were much fainter than normal.

As it was advisable to determine magnitudes on a well established system (e.g., UBV), plates of all the three variable star zones were obtained at Córdoba with the 0.33 m "Carte du Ciel" astrograph (plate scale 1 mm = 1'); Kodak 103 a-0 plates were used. The reason is that in our experience the Córdoba Observatory Gauthier astrograph used with Kodak-0 plates reproduced accurately the B magnitudes of the UBV system. To tie as closely as possible our derived magnitudes to the standard system, plates of the globular cluster NGC 5139 (Omega Cen) were obtained with the same instrument, taking care of observing at similar zenith distance, exposing equal times and developing all the plates simultaneously. In NGC 5139 a BV sequence reaching faint magnitudes was measured by Arp (Arp, 1958; Pisani Belserene, 1959). Thus we found that the limiting B magnitude in our astrographic plates for a 25 minute exposure is 17.4.

Twenty two B plates were used in the following discussion: UX Ant 3, UW Cen 6, RZ Nor 6 and Omega Cen 7. They range in time from 1968 up to the present.

UX Ant was found at 16^m.9 on July 25.0 UT (JD 2448097.5), and fainter

than $17^m.4$ on July 27.0 (JD 2448099.5). Kholopov (1985) indicates $12^m.2$ and $15^m.8$, photographic, for the maximum and faintest brightness of this star; these values were traceable to the discoverer of the variable (Erro, 1940). From our plates we find: maximum, $12^m.6$ (May 7.1, 1975, JD 2442539.6), minimum, $< 17^m.4$ (B magnitudes). If we adopt $(B-V) = 0^m.6$ (Kilkenny and Westerhuys, 1990), the maximum V magnitude would be $V=12.0$, but as very probably $(B-V)$ would fluctuate (being as large as $0^m.8$, or $1^m.0$, for a giant star whose peculiar spectral type may be around G5 (Allen, 1976)), it is safer to say that at maximum UX Ant would have $11^m.5 \leq V \leq 12^m.0$. UX Ant shows a nearly constant maximum light only affected by small and irregular fluctuations, and sudden and irregular drops in brightness as large as, or larger than 4 magnitudes, this behaviour closely resembles that shown by other typical R CrB stars, and on this basis it can be suggested that it is a true R CrB star (for a description of the spectral characteristics also sustaining that it is a true R CrB star, see Kilkenny and Westerhuys, 1990). Finally, it is worth mentioning that a near-by star ($B=16^m.5$, 15 arc seconds to the NW of UX Ant) may be confused with the variable when it becomes fainter than $16^m.5$.

UW Cen has been fainter than normal since January 1988. A near-by star ($B=14^m.1$, 20 or 25 arc seconds to the NNW of the variable) has been frequently confused with it when it becomes fainter than $14^m.0$. UW Cen was found at $17^m.2$ on June 12.0, 1990 (JD 2448054.5) and $17^m.4$ on July 24.0 (B magnitudes). On June 21.0 and July 17.0, 1990, the star was invisible when observing visually its field with the 60 inch reflector of the Bosque Alegre Station (branch of the Córdoba Astronomical Observatory); according to Schaefer (1990), the limiting visual magnitude of such an instrument would be around $16^m.5$. If we accept for this star a $(B-V) \simeq 1^m.0$, it means that it was fainter than $B=17^m.5$ on June 21 and July 17, a value very near coincidental with that derived photographically. Kholopov (1985) indicates for the maximum and minimum brightness of this star $9^m.1$ and $< 14^m.5$, V; we found, maximum, $10^m.5$ (May 7.2, 1975, JD 2442539.7), minimum, $17^m.4$ (B magnitudes, from the previously adopted $(B-V) \simeq 1.0$ a maximum $V \simeq 9.5$ is derived). On plates taken in 1990, August 18.0 and 20.0 with the 60 inch reflector (Kodak 103 a-0 plates + GG 13 filter, processed as previously described) UW Cen was found at $B=16.4$ and 16.0 , respectively, so it seems that the star was recovering its brightness.

RZ Nor also has a close companion ($B=13.7$, 8 arc seconds to the NE of the variable; for details see Milone, 1990b) which may be confused with it when it becomes fainter than $13^m.5$. RZ Nor was found to be fainter than $17^m.4$

on June 17.1, 1990 (JD 2448059.6), and at 17^m.4 on July 24.1; it was invisible to the eye when observing its field with the 60 inch reflector on July 13.1, 1990 and was found recovering with magnitude B=15.2 on plates taken with the same instrument on August 18.1 and 20.1, 1990 (around magnitude 13, visual, on September 9.5). Kholopov (1985) indicates 10^m.6 and <13^m, V, for maximum and minimum brightness; we found, 11^m.5 (August 10.0, 1988, JD 2447383.5) and <17^m.4 (B magnitudes, for (B-V) \approx 1.0, a maximum light V \approx 10.5 is derived.

Many thanks to MM. Z. M. Pereyra and J.J. Rodriguez for kindly obtaining several plates for us with the 60 inch reflector of the Bosque Alegre Station and to Mr. R.H. Tschamler for idiomatic corrections. A grant from CONICOR, Córdoba, Argentina, partially supporting this research is acknowledged.

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