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THE NATURE OF THE COOL COMPONENT OF THE BX MONOCEROTIS
SYMBIOTIC SYSTEM

BX Mon (Mep) shows a combination spectrum (low temperature absorption features plus high temperature emission lines) with particularly strong HI emission lines (Merrill and Burwell 1950, Bidelman 1954). It is often classified among the symbiotic stars (e.g. Michalitsianos et al. 1982) and is distinguished in having a period of 1374 days (Mayall 1940). If its variability is due to Mira pulsations, as generally supposed, then it has the longest known period for this type of variable (although the OH/IR sources which are thought to be related to Miras do have periods of this order). This note describes some infrared observations which indicate that BX Mon is not a Mira variable.

JHKL (1.25; 1.65; 2.2; 3.5 μ m) photometry obtained with the SAAO MKII photometer on the 0.75m reflector in Sutherland on 1982, November 20 yield the following magnitudes:

$J = 6.96$; $H = 5.96$; $K = 5.63$ and $L = 5.40$ (± 0.05 JHK, ± 0.09 L).

These colours do not fall in the regions of the infrared two-colour diagrams occupied by Mira variables (Feast et al. 1982). Furthermore they do not indicate the presence of the dust excess typical of symbiotic systems containing Mira variables (Feast et al. 1983). When allowance is made for a very small amount of reddening ($E_{B-V} = 0.1 - 0.2$, Michalitsianos et al. 1982), these colours are appropriate to a normal M5III star (Lee 1970). This spectral type is in reasonable agreement with the M4 classification of the absorption spectrum by Bidelman (1954).

A low resolution infrared (1.2 - 2.5 μ m) spectrum of BX Mon was obtained with a filter wheel spectrometer on the 1.9m reflector at SAAO on 1983, January 28. Except for the presence of Paschen- β emission the spectrum is typical for a non-Mira M giant (M4-M6) in having moderately strong CO absorption at 2.3 μ m. There is no sign of the H₂O absorption features which are particularly strong in Mira variables. (see e.g., the symbiotic Mira R Aqr, Whitelock et al. 1983).

The strength of the Balmer emission lines is definitely abnormal for a Mira (Bidelman 1982, private communication). It would seem likely that these lines originate in the nebulosity surrounding the symbiotic system and are excited by the hot component. This would explain the Me classification of a star which is not a Mira.

The infrared observations described above are atypical for a long-period Mira. It is unlikely that the variation is due to a semi-regular variable given its large-amplitude (mpg \sim 3 mag.), long-period and its regularity. It is therefore possible that the variation is actually associated with the orbital motion in the symbiotic binary. If this is the case then BX Mon is clearly a system which merits further study.

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