This result goes a long way towards confirming the physical association of the two stars, whose common proper motion and similar spectroscopic distance moduli already strongly indicated such an association. The velocity discrepancy of 1·4 km/s is not large enough to be worth worrying about. For one thing, it is hardly likely that the radial-velocity observations of the relatively faint secondary star are more accurate than those of the primary (s.e. 0·8 km/s), and their good interagreement is probably in part fortuitous: the discrepancy from the primary velocity is probably not unambiguously significant. For another, if the actual distance between the components is not much greater than the projected separation of 2200 AU implied by a distance modulus taken as 4 magnitudes, then on the assumption of a total mass of $4M_{\odot}$ in the system there could well be a relative motion of 1 km/s or so between the two visual components.

It should be pointed out that there can be no certainty that the velocity of HR 4249 B is constant on time scales longer than a few days. Although the similarity of its velocity, observed at a single epoch, to the γ-velocity of the primary is suggestive, there remains a finite possibility that the star is a spectroscopic binary, and it is still conceivable that it is not associated with HR 4249 at all.

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NOTES FROM OBSERVATORIES

Infrared Observations of UV Cas

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UV Cas is classified as an R CrB star in GCVS[1]. However, from the photometric behaviour, Zavatti[2] raised doubts about this classification. Recently, Nesci and Zavatti[3] observed the spectrum in the blue; it shows the typical characteristics of R CrB stars, namely, the absence of the Balmer lines of hydrogen and probable presence of C_2 bands. They also classified the spectral type of the star to be between F0 Ib and F5 Ib.

At my request, B. McNamara observed UV Cas in the K (2·2 μ) and L (3·5 μ) bands on 1973 November 17/18 (JD 2442004) using the Kitt Peak 50-inch telescope. The magnitude in K was 6·80 and that in L was 5·43. That these observations were obtained at maximum light is strongly suggested by observations made[2] in the V band two days later. UBV observations made at maximum light by Fernie *et al.*[4] show that $V = 10^{m}\cdot65$, $(B-V) = 1^{m}\cdot46$ and $(U-B) = 0^{m}\cdot87$ with a range of $0^{m}\cdot17$ in V and $(B-V)$ and $0^{m}\cdot4$ in $(U-B)$. With the spectral classification of F0–F5 Ib, the colours obtained by Fernie *et al.* show that UV Cas is highly reddened.

The amount of interstellar reddening for UV Cas is estimated from the work of Fitzgerald[5] on the distribution of interstellar reddening material in the Galactic plane: for distances greater than 1 kpc, the $E(B-V)$ value at galactic longitude $l = 108^{\circ}\cdot5$ is $0^{m}\cdot88$ and at $l = 111^{\circ}\cdot5$ it is $1^{m}\cdot1$ (see ref. 5, Fig. 3). The colour excess for UV Cas ($l = 109^{\circ}\cdot5$, $b = -0^{\circ}\cdot39$) can thus be estimated to be $E(B-V) = 1^{m}\cdot0$ on the assumption that UV Cas has the same absolute magnitude as the average for R CrB stars, *i.e.* -4^{m}. Support for this estimate comes from comparison with W Men, the F5 supergiant[6] R CrB star in the Large Magellanic Cloud, which has[7] $(B-V)_0 = 0^{m}\cdot40$. If the same $(B-V)_0$ is assumed for UV Cas, since UV Cas has roughly the same spectral type, then $E(B-V) = 1^{m}\cdot06$. Adopting $E(B-V) = 1^{m}\cdot0$ and using reddening relationships corresponding to Van de Hulst's curve No. 15 (ref. 8), the following intrinsic colours are obtained: $(U-B)_0 = 0^{m}\cdot16$, $(B-V)_0 = 0^{m}\cdot46$, $(V-K)_0 = 0^{m}\cdot97$, $(K-L)_0 = 1^{m}\cdot34$. Thus UV Cas shows a value of $(K-L)_0$ similar to that of other R CrB stars[9,10], and shares the general property of having an infrared excess.

Feast & Glass[9] and Glass[10] have shown that, in the $(J-K)$ (or $(H-K)$) versus $(K-L)$ diagram, most of the R CrB stars occupy the region between the lines defined by star-plus-circumstellar-shell combinations of 4000K (star)/900K (shell) and 6000K (star)/800K (shell), at the time of both light maximum and minimum. The $(V-K)_0$ obtained for UV Cas is close to the value for normal F5 supergiants[11] of $0^{m}\cdot93$ (which probably shows that there is not much dust emission at K). Thus it is justified to assume that the $(V-J)_0$ for UV Cas would also be similar to that of normal F5 supergiants of[11] $0^{m}\cdot67$. Then $(J-K)_0$ for UV Cas is obtained as $0^{m}\cdot30$. These colours place the star, in the $(J-K)$ versus $(K-L)$ diagram[9], below the black-body line for a 6000K (star)/800K (shell) combination, indicating a slightly hotter star and cooler shell.

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