NOTES FROM OBSERVATORIES

THE ABSOLUTE MAGNITUDE OF GAMMA VELORUM

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The distance modulus for the γ Velorum system has been a subject of controversy for some time in the recent past. Different investigators find that it is either about $8^{m}\cdot3$ or $7^{m}\cdot5$. Baschek[1] derived $M_v\,(\gamma^1\,\text{Vel}) = -3\cdot2$ from a spectroscopic comparison of γ^1 Velorum with other B stars. The distance modulus, therefore, is 7·5 magnitudes. Hanbury Brown *et al.*[2] combining their interferometric measures with the orbital elements of γ^2 Velorum published by Ganesh and Bappu[3] derive a distance modulus of 7·7 magnitudes. Graham[4] determined $M_v = -4\cdot0$ for γ^1 Velorum from $H\beta$ photoelectric measurements and hence a distance modulus of 8·3 magnitudes. Brandt *et al.*[5] derived a distance modulus of 8·3 magnitudes from $H\beta$ measurements of nine B stars surrounding γ Velorum. γ^1 Velorum is classified as B1IV by Hiltner *et al.*[6] and by Baschek[1], while Smith[7] classified it as B2IV.

I have derived the equivalent width of $H\gamma$ in a number of standard stars at 45 A/mm reciprocal dispersion with the 51 cm reflector at Kodaikanal. The relationship between line intensities measured at this observatory and at Victoria was found to be one to one. From the measured equivalent width (4·7 A) of γ^1 Velorum and using Petrie's revised calibration curve[8], I find that $M_v\,(\gamma^1\,\text{Vel}) = -3\cdot1$. Since γ^2 Velorum is 2·44 magnitudes brighter than γ^1, $M_v\,(\text{WC8}+\text{O}) = -5\cdot5$. This leads to a distance modulus of 7·4 magnitudes for the γ Velorum system, in agreement with the Baschek value.

The absorption line intensities derived from a single high-dispersion (6 A/mm) plate obtained by Dr. Bappu at Mount Stromlo were used to derive the magnitude difference between the two components of γ^2 Velorum. The lines used were $\lambda\lambda$ 4101, 3970, 3835, and 3797 A. They give $\Delta m = 0\cdot6$ when I use a spectral class of O7·5 found by Ganesh and Bappu[3] and the equivalent-width values of these lines for similar spectra from Buscombe[9]. A recent classification of the O star by Conti and Smith[10] is O9I. Assuming this classification to be correct, the value of Δm derived will be 0·7. Low dispersion (250 A/mm) infra-red spectra[11] were used to derive the emission-line intensities of $\lambda\lambda$ 7065, 7233 and 7726. These were compared with the intensities of the WC8 star, HD 192103. They give $\Delta m = 1\cdot4$. In both instances the O star turns out to be the brighter component. Conti and Smith[10] find $\Delta m = 1\cdot4$ from emission-line intensities in the visual region and Hanbury Brown *et al.*[2] derived $\Delta m = 1\cdot2 \pm 0\cdot6$ from interferometric measurements.

There is little doubt at present that the O component is brighter than its WR counterpart by about one magnitude. There is still doubt as to whether the distance modulus of γ Velorum is 8·3 or 7·5 magnitudes. Our work supports the latter value. In taking sides in this issue one has to examine the possibilities that (i) emission in the core of $H\beta$ in these early-type stars surrounding γ Velorum can yield $H\beta$ measurements that give a higher distance modulus, (ii) γ^1 Velorum being a spectroscopic binary, the secondary component (though not visible in our spectrograms) may be contributing enough to the measured line intensities to upset the derived absolute magnitude. Baschek's study seems to rule out such a possibility.

I wish to express my indebtedness to Dr. Bappu for his valuable suggestions during the course of this work.

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A Search for Optical Pulses from the Galactic Centre

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Following the arguments put forward[1] as to the possibility of detecting single radio pulses from Weber-type events, it has been suggested that a search be made for pulses at optical frequencies. Despite the serious questions as to the effect of absorption and scattering by dust which are involved in an optical experiment[2], it was thought worth-while to undertake a preliminary optical experiment, using the A.E.R.E.–U.C.D. Cerenkov system[3], at the same time as the Galactic centre radio survey[4].

The light receiver consisted of a 3-foot $f/2$ mirror with a RCA 8575 photomultiplier at the focus, giving a 1° full field of view. A second photomultiplier–mirror system was offset by 3° to act as an anti-coincidence system for local sky variations. The electronics were arranged to observe pulses with a 1-second integration time in each channel at a threshold light level of 100 photons/cm^2 sec. The output was recorded on charts.

Ideally, the output noise should be shot noise and the records uncorrelated, but it was found that in general the noise was well correlated between the two channels (owing to scattered street lighting), and analysis could only be

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