# LETTERS TO NATURE

## PHYSICAL SCIENCES

## Observed Energy Distribution of α Lyra and β Cen at 2000–3800 Å

THE space astrophysical observatory Orion, installed in the orbital station Salyut, has provided several slitless spectrograms of α Lyra and β Cen between wavelengths 2000 and 3800 Å. The spectrograms were obtained in June 1971 with the help of a mirror telescope of the Mersenn system and a spectrograph of the Wadsworth system using film sensitive in the far ultraviolet. The dispersion of the spectrograph is 32 Å/mm, while the resolution of the spectrograms derived is about 5 Å on 2600 Å. A detailed description of the Orion apparatus and the method of obtaining the spectrograms have been given elsewhere[1–3].

Before installation the telescope and spectrograph were calibrated using synchrotron radiation from an electron accelerator[3]. We also allowed for astigmatism to obtain the true energy distribution in the spectra of α Lyra (AO V) and β Cen (B1 II) in the region 3800 to 2000 Å (Figs. 1 and 2). Curves of theoretical distribution of continuous spectra corresponding to the various models of stellar photospheres are also plotted in Figs. 1 and 2. In the case of α Lyra the following calculated models have been used: by Schild *et al.*[4], $T_{eff}$ = 9,650 K, log $g$ = 4.05; by Mihalas[5], $T_{eff}$ = 10,080 K, log $g$ = 4; by Strom and Avrett[6], $T_{eff}$ = 10,000 K, log $g$ = 4, $x$ = 0.83. In the case of β Cen two models have been used: Mihalas[5], $T_{eff}$ = 24,000 K, log $g$ = 4; and Van Citters and Morton[7], $T_{eff}$ = 22,000 K, log $g$ = 4.

The observed distribution of energy in the spectrum of α Lyra (Vega) in the region 3800 to 2000 Å is in good accordance with theoretical models. Within the precision range of our measurements (0.15 mag) no priority should be given to any of the three models. In future α Lyra can be used as a convenient and reliable spectrophotometric standard in the region of wavelengths shorter than 3000 Å at least down to 2000 Å.

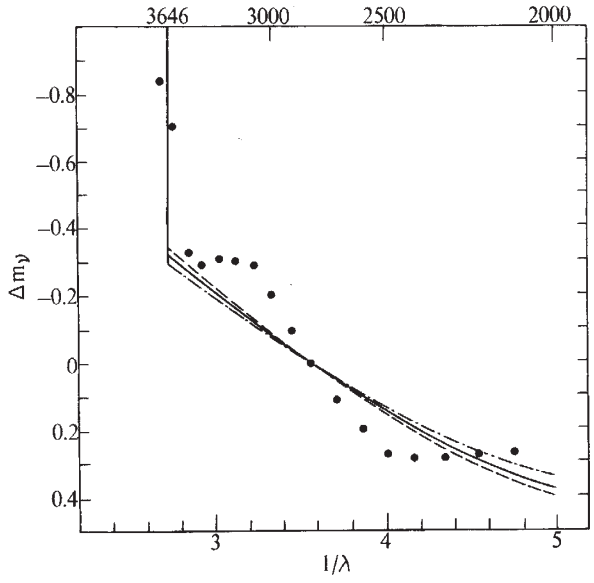


**Fig. 1** Energy distribution for α Lyra. Corrections for astigmatism have been applied. Data from Schild *et al.*[4] (— · —), Mihalas[5] (——) and Strom and Averett[6] (– – –). ● ● ●, Our observations.

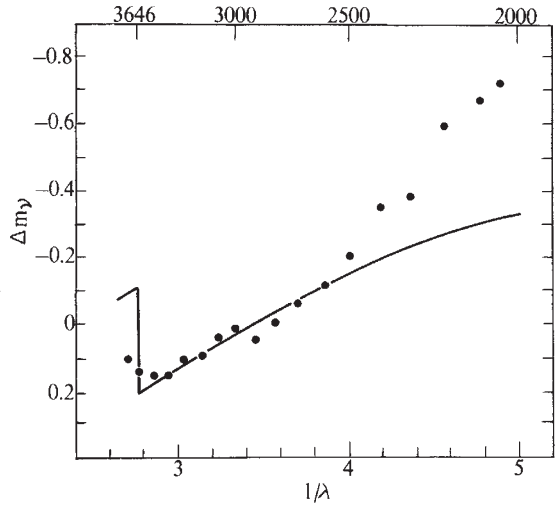


**Fig. 2** Energy distribution for β Cen, with astigmatism corrections. ——, Data from Van Citters and Morton[7], and Mihalas[5]. ● ● ●, Our observations.

In the case of Agena (β Cen) our observations confirm the occurrence of a jump in the continuous spectrum on the limit of the Balmer continuum. On the other hand, in the interval of wavelengths 3700–2400 Å we have a good accordance between observed and computed distributions of the energy in Agena. But in the region below 2400 Å a considerable difference has been found between observed and theoretical distributions, the observations giving greater energy as compared with theory. The difference increases in the direction of short waves and at 2000 Å it is roughly 0.4 mag, nearly 1.5 on the intensity scale. The probable error of the measurements does not exceed 0.2 mag. So this discrepancy may be real, the results of the lack of correspondence between the assumptions underlying the theoretical models and the state of the photosphere in β Cen, which is a bright giant endowed with a luminosity of the second class. But additional observations are required before a final conclusion is reached.

G. A. GURZADYAN
J. B. OHANESYAN

*Space Research Branch,*
*Burakan Astrophysical Observatory,*
*Armenian SSR, USSR*

Received February 28, 1972.

[1] Gurzadyan, G. A., and Ohanesyan, J. B., *Space Sci. Revs.* (1972, in the press).
[2] Patzaev, V. I., Ohnesyan, J. B., and Gurzadyan, G. A., *Commun. Burakan Observ.*, **45** (1972).
[3] Gurzadyan, G. A., Ohanesyan, J. B., and Efremyan, R. A., *Commun. Burakan Observ.*, **45** (1972).
[4] Schild, R., Peterson, D. M., and Oke, J. B., *Astrophys. J.*, **166**, 95 (1971).
[5] Mihalas, D., *Astrophys. J.*, Suppl., **9**, 321 (1965).
[6] Strom, S. E., and Avrett, E. H., *Astrophys. J.*, Suppl., **12**, 1 (1965).
[7] Van Citters, G. W., and Morton, D. C., *Astrophys. J.*, **161**, 695 (1970).

© 1972 Nature Publishing Group