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TWO PHOTOELECTRIC TIMES OF MINIMUM OF 44 i Boo

44 i Boo is a fascinating eclipsing variable due to its dramatically short period of 0.26781 day. The Yale Bright Star Catalogue suggests that this system may experience unusual variations in its light curve shape and its orbital period, perhaps as a result of mass transfer between its two components.

Photometry of this variable was obtained with the 24-inch Seyfert reflector at the A. J. Dyer Observatory in Nashville, Tennessee, on the nights of 1988 June 6-7 and 9-10. The detector was a 1P21 photomultiplier tube, cooled with dry ice and employing pulse-counting electronics. Filters to match the U, B, and V bandpasses were used on the first night of observation, while just the B and V filters were used on the second night, increasing the number of measurements possible. As a comparison star, nearby 47 Boo was used. The differential magnitudes were corrected for atmospheric extinction and transformed to the UBV system. Figure 1 shows the B and V light curves resulting from the second night.

We calculated the times of minimum with a novel approach which made use of the data at all phases of the light curve. Our differential magnitudes were fitted with the equation

$$I = A_0 + A_1 \cos \theta + A_2 \cos 2\theta, \quad (1)$$

where θ is phase computed using a period of 0.26781 day. The above equation was solved successively by least squares with different assumed initial epochs to find the Julian date which gave the best fit, i.e., the smallest sum of the squares of the residuals. The results are given in Table 1, and refer to the primary minimum.

The uncertainties in Table 1 are the formal errors resulting from chi-squared analysis. They might underestimate the actual uncertainties because our fit with equation (1) assumes a shape to the entire light curve which is only an approximation.

Table 1. Times of primary minimum for 44 i Boo.

Filter	J.D. (hel.)
U	2447319.7446 ± 0.0040
B	2447319.7495 ± 0.0038
V	2447319.7491 ± 0.0025
B	2447322.7008 ± 0.0012
V	2447322.6999 ± 0.0013

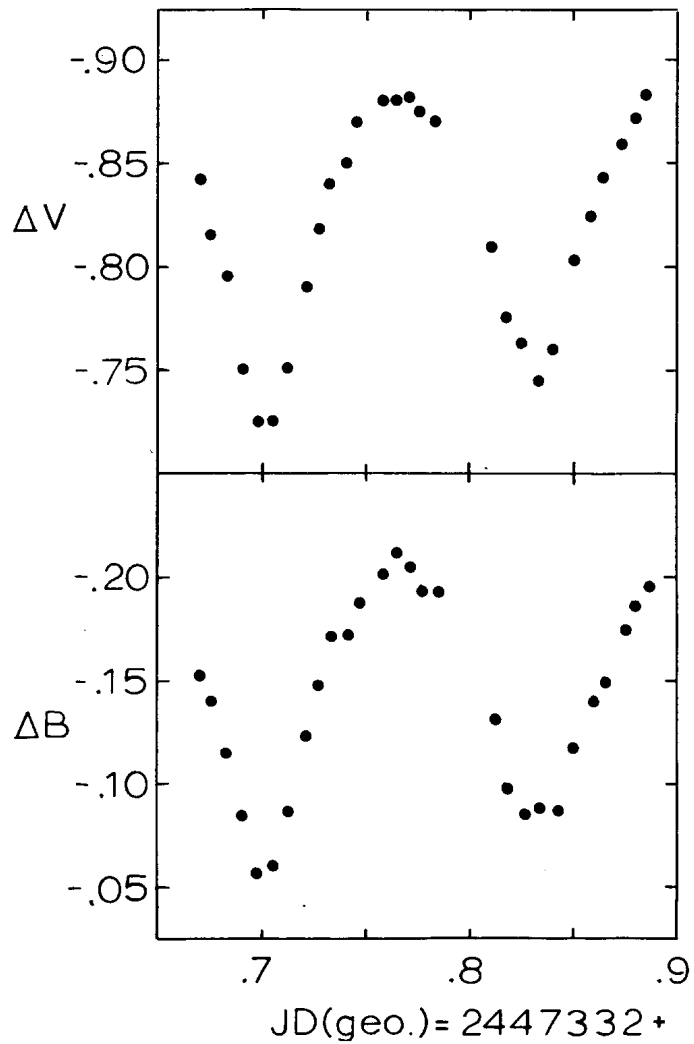


Figure 1. The B and V light curves from the night of June 9-10, 1988.

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