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DISCOVERY THAT HR 454 IS A VARIABLE STAR

HR 454 was included in a list of twenty bright suspected variables (Hall 1983) after Bidelman (1983) reported observing strong Ca II emission and therefore suspecting it may be an RS CVn-type variable. According to the Yale Bright Star Catalogue the spectral type is gK1 and the apparent magnitude is $V = 5^m.92$.

Altogether eight different observatories made photoelectric observations, mostly in V, on 107 nights between October 20-21, 1983 and March 23-24, 1984. The comparison star was 51 Andromedae, which is less than 20 arc-minutes from HR 454 and differs less than $0^m.1$ in B-V color index. The nightly mean differential magnitudes, corrected for differential atmospheric extinction and transformed differentially to the UBV system, have been sent to the I.A.U. Commission 27 Archive for Unpublished Observations of Variable Stars (Breger 1982), where they are available as file no. 136 (Boyd) and file no. 54 (the others).

The data in file no.136 were not corrected for dead time, because the dead time parameter had not yet been determined accurately. That may be a problem in this particular case because the comparison star is so bright ($V = 3^m.6$) and the magnitude difference between it and HR 454 is so large ($\Delta V = 2^m.4$).

The nightly means in V are plotted in Figure 1. The magnitudes in file no. 136 appeared systematically $0^m.05$ brighter than the magnitudes in file no. 54 at corresponding times, we presume because of the above-mentioned dead-time problem. Therefore they have been plotted $0^m.05$ fainter.

In Figure 1 we see immediately that HR 454 is variable, with a total range of $0^m.09$, but the character of the variation is difficult to describe. Four minima are apparent (at JD 2445640, at 2445706, at 2445742, and at 2445782 or later) but the intervals between are definitely not equal. Moreover, there appears to be a secular brightening, at a rate of approximately $0^m.045 / 100$ days.

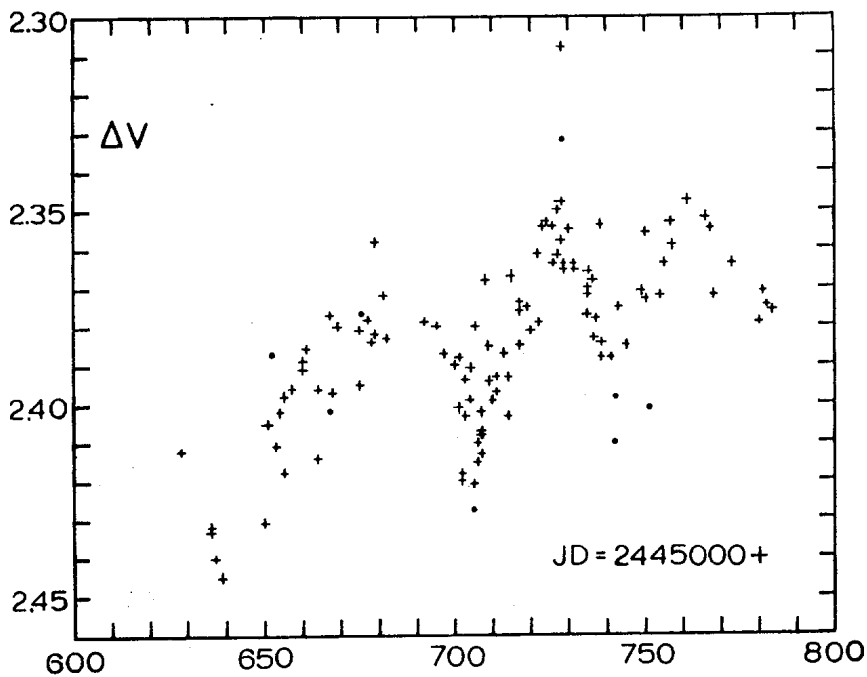


Figure 1

Our light curve of HR 454 in V, with 51 And as the comparison star. The total range seen in 0.09^m , but no simple periodicity is evident. Each symbol is a nightly mean, with a distinction made if the uncertainty is less than (+) or greater than (\bullet) $\pm 0.010^m$.

Table I

Observers Providing Photometry of HR 454

Observer	Observatory	Aperture	Nights
Barksdale	Barksdale	14-inch	18
Boyd	Fairborn West	10-inch	38
Chang	Riverdale	10-inch	3
Ingvarsson	Tjorn Island	14-inch	28
Persinger	E.T.S.U.	8-inch	6
Stelzer	Stelzer	14-inch	1
Wasson	Sunset Hills	8-inch	11
Ziegler	Gila	11-inch	2

We plan to continue photometry of this interesting bright variable, to see if there is a periodicity in the variation and to see if the secular brightening continues.

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