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HR8768 - AN ULTRA SHORT PERIOD VARIABLE?

An earlier investigation (by Balona 1982) of three of Jakate's (1979) proposed early-type ultra-short-period variables cast doubt on the existence of this group of variables. Balona saw no variation over a few thousandths of a magnitude for HR3467, HR3582 and HR5294. This led us to reinvestigate the remaining northerly member of the group HR8768 (=HD217811=SAO 52626=BD +43°4378). Percy (1980) has reobserved this star, but in light of Balona's findings we decided to look one more time.

The variable was measured using SAO 52551 as a comparison and SAO 52599 as a check. Delta magnitude, in the sense HR8768-minus comparison, is plotted versus heliocentric Julian Date in Figure 1. There seems to

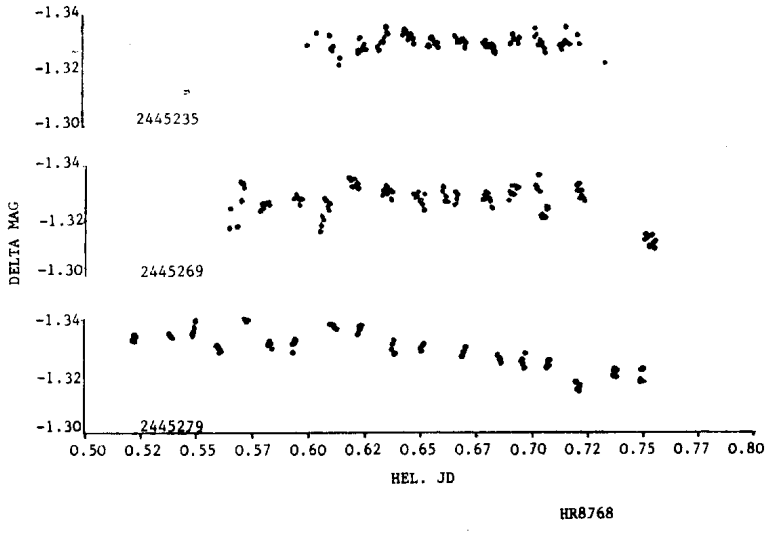

Figure 1

be no significant variation in HR8768 on JD 2445235 and JD 2445269. However, a gradual decline of approximately .02 magnitudes is present from JD2445279.62-.75. Since the check star also drops in this time period it is uncertain whether this can definitely be attributed to HR8768. In any case, no ultra-short period variation such as that found by Jakate ($P=0^{d}.02$, $\Delta m \approx 0^{m}.025$) was found. To confirm this, we conducted a periodogram analysis on our data for frequencies up to 100 cycles/day. None were found with amplitude greater than $0^{m}.003$, which is below the estimated measurement error.

The delta magnitude in B of SAO 52599 minus SAO 52551 is plotted in Figure 2. SAO 52599 seems to have more variation than HR8768,

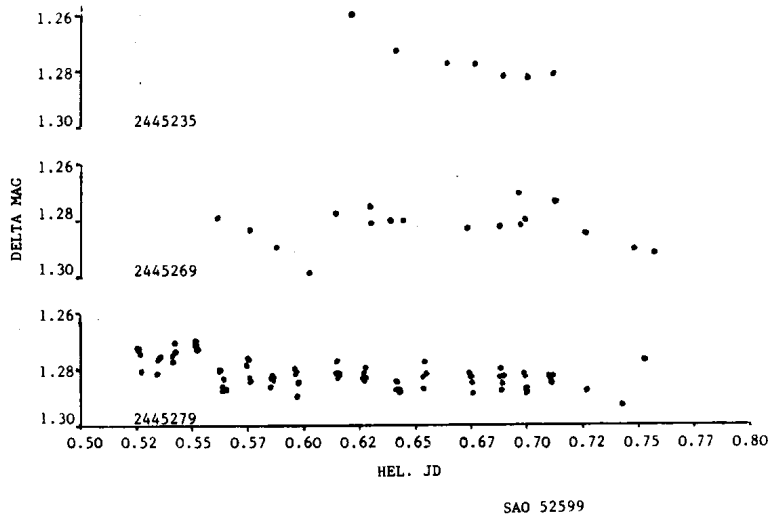

Figure 2

dropping $0^{m}.02$ on both JD 2445235 and JD 2445279. There may even be some variation on JD 2445269 but this night was not as good as the other two. Careful scrutiny of the data indicates the variation can be attributed to SAO 52599 and not the comparison star SAO 52551. SAO 52599's spectral type, A3, the magnitude of the variation ($0^{m}.02$), and the time-scale (2-5 hours) suggest that it might be a delta-Scuti variable but additional data is needed to confirm its type of variability.

In conclusion, it is always difficult to prove the photometric constancy of a star, particularly a low amplitude variable, with only a few nights data. However, on the basis of our observations of HR8768 we must support Balona's conclusion that Jakate's four stars are not members of a new group of early-type ultra-short-period variables. It will require further observations to determine if HR8768 has a low amplitude variation that is either aperiodic or of long period.

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