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HR 239 AND HR 8676 : TWO  $\delta$  Sct - TYPE VARIABLES

During an observing run at the 50 cm ESO-telescope at La Silla (Chile), HR 239 (HD 4849,  $-44^{\circ}216$ ) was observed as a program star and HR 8676 (HD 215874, 70 Aqr) as a comparison star. Both stars are classified as FO. For HR 239 this classification was verified in essence by a coudé-spectrogram obtained at the 1.5 m ESO telescope by Mr. F. Spite. The standard ESO photometer with an EMI 6256, cooled by Peltier elements to  $-20^{\circ}$  relative to ambient temperature, was used for the observations. Diaphragms of 21" and 30" were used. B and V colours have been measured for HR 239 in the night of Sept. 6/7, 1977 and UBV for HR 8676 in the night of Sept. 28/29, 1977. In addition, Mrs. B.E. Helt from Copenhagen University Observatory covered one cycle of HR 239 in the night of Sept. 24/25, 1977 with a simultaneous 4-colour photometer in the Strömberg system at the 50 cm Danish telescope at La Silla.

A sophisticated telescope control system and a convenient preliminary on-line reduction system, developed by J. Fluxá and D. Hofstadt enabled the writer to switch rapidly from one star to the other and check for constant brightness and colour. The latter was done by using mean extinction and a zero-point for the colour transformation which was determined at the beginning of every night. Both have proven to be sufficient for a preliminary check of the magnitudes on-line.

HR 239 as a program star was observed in the sequence: comparison 1 (HD 5042), program star, comparison 2 (HD 5062), comparison 1, program star, etc. The magnitude difference in V between the two comparison stars was constant to within  $\sigma=0.003^m$  for a total of 33 measurements. This value corresponds also to the internal accuracy with which the light curve for HR 239 has

been determined in V. The V light curve using extinction corrected and colour transformed magnitudes is shown in Figure 1. The colour difference (B-V) for the variable was constant during the nearly 3 hrs of observations to within 0.0034 mag. For the comparison star a  $\sigma$  of 0.0037 mag was determined, this being essentially the same as for the variable.

A raw estimate for the amplitude range of the V light curve is 0.015 mag with a period of about 80 min. The measurements in V obtained 18 days later by B.E. Helt confirmed the first results concerning the shape of the light curve, the amplitude and the period. However, the scatter of her measurements has been almost twice as much as for the Johnson colours.

HR 8676 was observed during a night of very poor seeing. The first 9 measurements have been obtained with a 21" diaphragm, but then it was necessary to change to a 30" diaphragm. The comparison stars have been HD 216494 (74 Aqr), originally a program star, and HD 215874 (75 Aqr). The correction for changing the diaphragm in V was obtained by averaging the first 9 measurements of 74 Aqr which resulted in  $V=5^m.80$  ( $\sigma=0.0044$  mag) and averaging the following 9 measurements, which have been obtained already with the 30" diaphragm. The latter observations gave a mean  $V=5^m.78$  ( $\sigma=0.0021$  mag). Thus, a correction of -0.020 mag was applied to the first 9 measurements of HR 8676 in V. The resulting light-curve using on-line reduced magnitudes can be seen in Figure 2. Although the seeing was poor during this night, the relative photometric accuracy was slightly better than in the night of Sept. 6/7 1977. A first inspection of the light curve results in an amplitude in V of 0.025 mag and a period of about 125 min.

Considering the rather late spectral type which is published for these stars and which is confirmed by their Strömrgren indices, one is tempted to classify HR 239 and HR 8676 as  $\delta$  Sct type variables. This might be less evident for HR 8676, if one uses the Period - Spectral type diagram for Dwarf Cepheids and  $\delta$  Sct type stars, as published by M.S. Frolov (1976). However, both stars are located in the  $M_V - Sp$  diagram very close to the ZAMS and the cool limit of the instability strip (Breger et al., 1975). Thus fundamental mode pulsation should be expected. It is evident, that more and better observations, especially spectra, are needed to clarify this point.

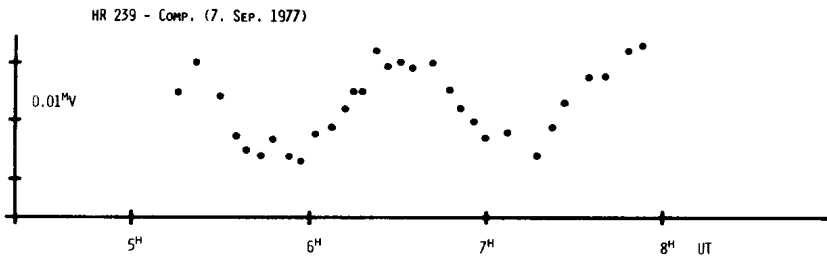


FIGURE 1. V-MAGNITUDES FOR HR 239 AND THE COMPARISON (HR 245).

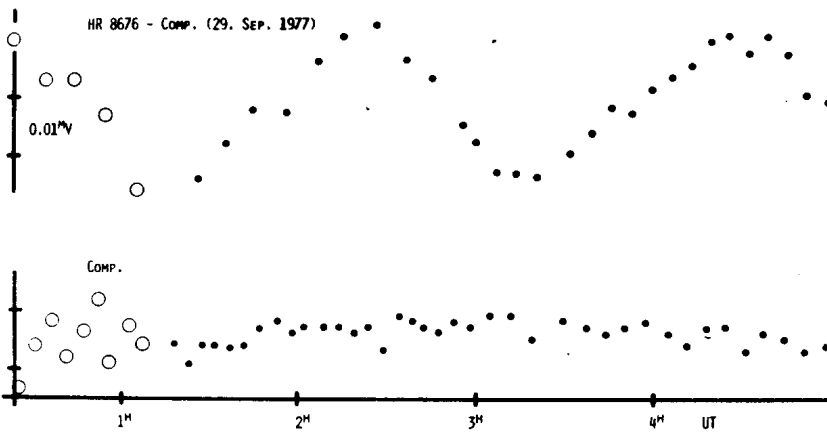


FIGURE 2. RAW V-MAGNITUDES FOR HR 8676 AND THE COMPARISON (74 AQR).

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