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H β -PHOTOMETRY OF HR 8024 AND HR 8102

HR 8012 (1900 : $\alpha = 21^{\text{h}}6^{\text{m}}.2$; $\delta = -14^{\circ}53'$) was classified by Cowley et al. (1969) as a suspected δ Del-type variable. In order to investigate the possible variability of this star, it was observed extensively at the Mt. John University Observatory, Lake Tekapo, N.Z. in 1972 and at the Kitt Peak National Observatory in 1973 on the uvby system. Because of the close proximity of this star to HR 8024 ($\alpha = 20^{\text{h}}53^{\text{m}}.2$; $\delta = -14^{\circ}52'$; FO IV), the latter was also included on our observing program. Both stars are now identified as short period variables with amplitudes of the order of $0^{\text{m}}.1$ and periods less than 3 hours according to our preliminary reductions. Extensive uvby analyses of these stars are presently being pursued.

Photoelectric H β observations of these stars were collected on September 4, 1973 using the No. 4 40-cm telescope of Kitt Peak National Observatory. A 1P21 photomultiplier tube and H β filters nos. 493 and 494 were used in this investigation. SAO 164013 (1950: $\alpha = 20^{\text{h}}54^{\text{m}}.9$; $\delta = -16^{\circ}13'5$; A3) was used as a comparison star. The observations were obtained according to the following routine. Three 10-second integrations were obtained for each narrow- and wide-band filter and two 10-second integrations of background were recorded with each filter. The H β index thus obtained was put on the standard system using 10 A/F standards from Crawford and Mander (1966). For the variables the probable error for one β -index is $\pm 0^{\text{m}}.003$. The mean H β index computed for SAO 164013 is 2.855 ± 0.002 .

Table 1 gives the observational data on the standard H β system for both stars. The first column lists the U.T. of observation and columns 2 and 3 give the H β indices for HR 8024 and HR 8102, respectively. The H β indices show peak-to-peak scatters of

O^m.015 for HR 8024 and O^m.020 for HR 8102 and thus there are no H β index variations comparable to those observed in uvby photometry. No periodic variations were noticed during the whole observing run which lasted nearly two pulsation cycles. Average β - indices of 2.799 ± 0.003 and 2.757 ± 0.004 were derived for HR 8024 and HR 8102, respectively. For A/F stars the β index may be a more reliable and useful temperature indicator than is the (b-y) index. Our results suggest that there may be no large temperature variations for these stars during the pulsational cycles or that the stars could have been quiescent at the time of observation. At the present time, the former conclusion seems more likely. The absolute visual magnitudes of these stars were computed using the calibrations given by Crawford (1975) and have yielded $M_v = + 1.85$ for each of these stars. The absolute visual magnitudes thus derived and the preliminary periods identifies these stars as members of the normal δ -Scuti group according to the classification given by Dworak and Zieba (1975).

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Table I. H β OBSERVATIONS OF HR 8024 AND HR 8102

	U.T.(non-hel.)	HR 8024	HR 8102
1973 Sept. 4.	01 ^h 51 ^m	2.805	
	56		2.776
	02 08	2.814	
	12		2.760
	16	2.798	
	20		2.764
	28	2.800	
	30		2.747
	35	2.817	
	43		2.749
	52	2.816	
	57		2.775
	03 01	2.800	
	04		2.758
	14	2.804	
	18		2.776
	21	2.800	
	25		2.752
	34	2.801	
	37		2.771
	41	2.782	
	45		2.764
	57	2.809	
	04 01		2.754
	05	2.782	
	09		2.762
	17	2.800	
	21		2.752
	25	2.795	
	30		2.749
	37	2.803	
	41		2.753
	46	2.792	
	51		2.761
	05 00	2.815	
	03		2.743
	08	2.786	
	12		2.754
	19	2.797	
	23		2.751
	27	2.821	
	32		2.754
	44	2.787	
	49		2.752

Table 1 (cont.)

U.T.(non-hel.)	HR 8024	HR 8102
05 ^h 53 ^m	2.792	
56		2.746
06 04	2.801	
09		2.738
14	2.801	
18		2.754
25	2.796	
30		2.752
34	2.780	
38		2.752
49	2.788	
06 53		2.763