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HD 111828: a new small amplitude variable star[∞]

We adopted HD 111828 as a comparison star for the observations of the variable star ET Mus performed at La Silla Observatory with the ESO 1m telescope on March 1987. The observations were performed with a single channel photometer and an EMI 9789QB photomultiplier in the V and B colours. Since we observed in the same cycle and with the same frequency a third star as a reference (HD 111658), we discovered that one of the two comparison stars showed light variations of a few hundredths of a magnitude. By comparing the differences of magnitudes between each comparison stars and ET Mus it was apparent that the variable object was HD 111828.

From the observations of some standard stars we obtained the transformation from the instrumental to the standard UBV system, deriving for HD 111658 $V = 9.05$, $B - V = 0.09$ and $U - B = 0.06$, and the following mean values for HD 111828: $V = 9.60$, $B - V = 0.29$.

In Table 1 the standard V magnitudes and the $B - V$ colour indices of HD 111828 are reported grouped into normal points. Each normal point is the average of six individual measurements, and has an internal standard error of 2-3 mmag.

In order to confirm this result new observations were planned, taking care of introducing a third comparison star, HD 111687 ($V = 9.19$, $B - V = 0.06$, $U - B = -0.31$, Nicolet, 1978). New measurements were obtained with the same instrumentation mounted at the ESO 50 cm telescope from January 29 to February 5, 1991. HD 111828 has been observed differentially with respect to HD 111658 and HD 111687 and a total of 9 normal points have been gathered, each one consisting of 4 individual cycles of measurements on these three stars. The typical internal standard error of these normal points is of about 2 mmag.

In Table 2 we have reported in the second column the V magnitudes of HD 111828 and in the third one those of HD 111658 for comparison purposes. We see that this last star is constant within the observational error: the data standard deviation is 3.8 mmag.

On the contrary we can see from both the tables that the data of HD 111828 show a light variation with a V amplitude of about 0.04 mag. The datapoints are insufficient to allow a careful analysis of the light variations, but some preliminary considerations can be made. The data from 1 m telescope (Table 1), obtained observing the star consecutively for more than 3 hours in each night, and the data obtained at the 0.5 m in the two nights with two normal points at a distance of about 3.5 hours, show that the light variations during a few hours are at most of the order of a few thousandths

[∞] Based on observations made at the European Southern Observatory, (ESO), La Silla, Chile

Table 1.

<i>Hel.JD</i>	<i>V</i>	<i>B - V</i>
2447200+		
42.595	9.465	0.287
42.609	9.458	0.287
42.624	9.467	0.282
42.644	9.467	0.285
42.670	9.466	0.286
43.529	9.481	0.279
43.556	9.478	0.280
43.583	9.475	0.281
43.605	9.477	0.281
43.627	9.476	0.283
43.653	9.475	0.283
44.568	9.440	0.291
44.594	9.441	0.292
44.619	9.438	0.294
44.645	9.435	0.298
44.673	9.440	0.290

Table 2.

<i>Hel.JD</i>	<i>V</i>	
2448200+	HD 111828	HD 111658
86.858	9.445	9.057
87.858	9.453	9.052
88.858	9.472	9.048
89.701	9.441	9.045
89.862	9.438	9.050
90.722	9.460	9.047
90.863	9.455	9.045
91.865	9.436	9.052
92.872	9.478	9.053

of a magnitude, and they exclude the possibility of short period variations. On the other hand an examination of all the data in Table 2 could suggest a characteristic time scale of the order of 1.8 d or perhaps of about 4 d if the light curve has a double-wave shape; however the light curve does not seem strictly periodic. From Table 1 we have an indication that the variations of the $B - V$ index are at most of about 0.01 mag. If the reddening is negligible, from the $B - V$ index we can estimate an F0 spectral type, thus HD 111828 could belong to the group of early F-type stars showing small amplitude light variations with characteristic timescales of the order of the day which are being discovered with increasing frequency in the recent years (Abt et al. 1983, Antonello & Mantegazza 1986, Krisciunas & Guinan 1990). The nature of the light variations of these objects is still unclear.

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