

COMMISSIONS 27 AND 42 OF THE IAU  
INFORMATION BULLETIN ON VARIABLE STARS

Number 5551

Konkoly Observatory  
Budapest  
3 August 2004

*HU ISSN 0374 – 0676*

**HD 173844, A NEW  $\delta$  SCUTI STAR**

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A large fraction of low amplitude pulsators are discovered serendipitously when they are chosen as comparison stars for other programs. This is the case for HD 173844 (A2,  $V=8^m.70$ ), which was originally used as the comparison star of the ellipsoidal  $\delta$  Scuti star HD 173977 (Chapellier et al. 2004).

Photometric observations were obtained in August and September 2001 at the 0.9 photometric telescope of the Sierra Nevada Observatory (Spain) and at the 1.5 m telescope at San Pedro Martir Observatory (Mexico). Both sites have a 4-channel multicolor Strömgen spectro-photometer. HD 173633 (A2,  $V=8^m.43$ ) was used as comparison star. We obtained 69 measurements spread over 48 days in the four  $u$ ,  $v$ ,  $b$ ,  $y$  filters. Note that in the following, the data obtained in the  $u$ -filter have not been considered because of a too large dispersion.

We obtained another more homogeneous data set from San Pedro Martir in 2002, representing 156 measurements over 14 consecutive nights.

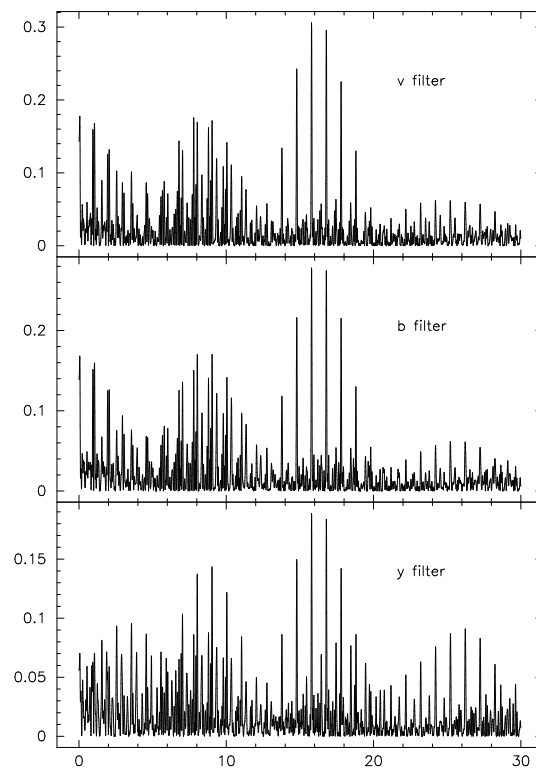
A Fourier analysis of the different filters lead to the detection of a clear signal for a frequency  $f = 15.79 \text{ d}^{-1}$  (Fig. 1).

A non-linear sine-fit provided the parameters given in Table 1.

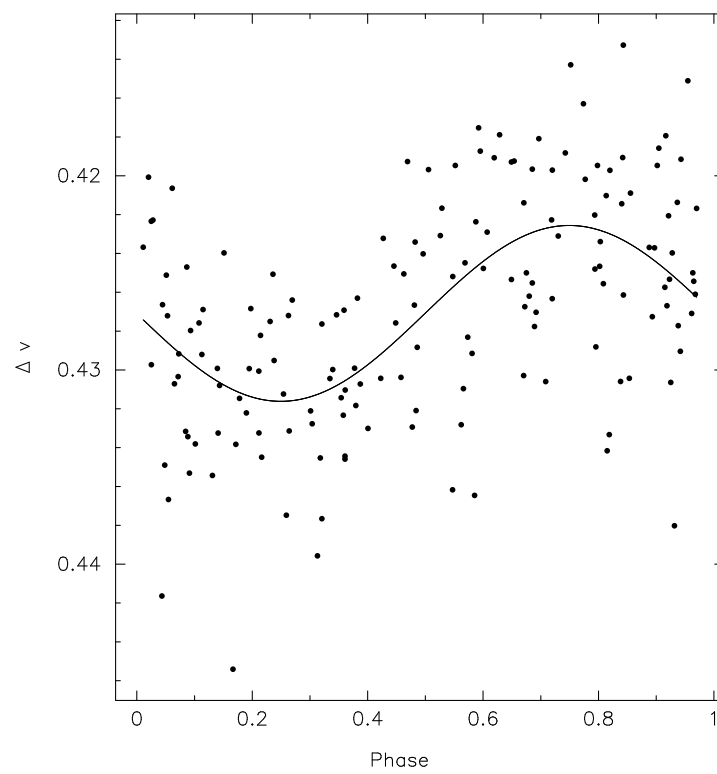
**Table 1.** Results of the sine-fit analysis performed to the Strömgen photometric data. For the different filters are given the dominant frequency  $f$  [ $\text{d}^{-1}$ ], the corresponding amplitudes  $A$  [mmag], residuals [mmag] and fraction of the variance [%].

filter	$f$	$A$	res	var
$v$	15.792	4.5	4.9	31
$b$	15.793	4.1	4.5	28
$y$	15.794	3.2	4.5	19

The light curve recorded in the  $v$ -filter is represented in Fig. 2.

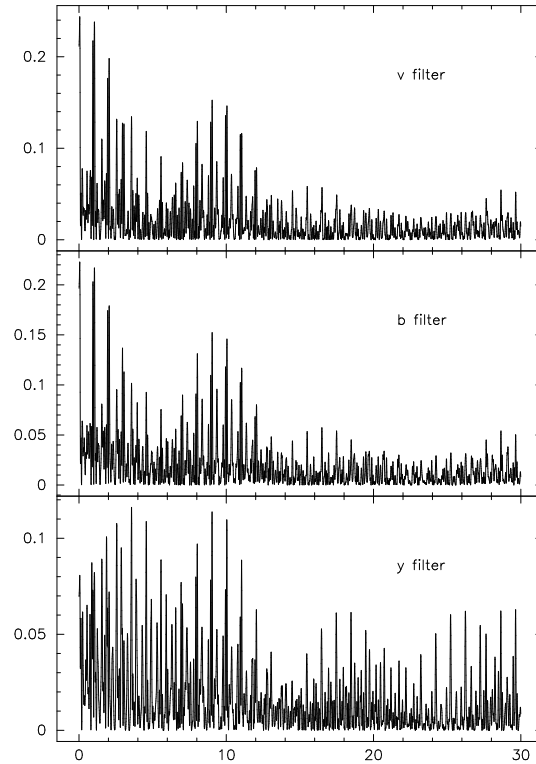


**Figure 1.** Amplitude spectra in the different filters.



**Figure 2.** *v*-filter photometric magnitudes data phased with the frequency  $f = 15.79 \text{ d}^{-1}$ .

The large dispersion of the curve, the relatively high residuals and low values of the fraction of the variance suggest that additional frequencies are present. A prewhitening of the data for the  $f$  frequency in the different filters data leads to periodograms where much of the amplitude is in the low frequency region, but also shows signal around a  $9.04^{-1}$  (Fig. 3).



**Figure 3.** Amplitude spectra in the different filters, once the  $f$  frequency has been prewhitened.

Considering only the  $v$ -filter, associated with the largest amplitude, shows that a sine-fit with the  $f$  and  $9.04^{-1}$  frequencies accounts for only 40 % of the fraction of the variance.

As a conclusion, HD 173844 should be considered as a new  $\delta$  Scuti star, a status compatible with both its A2 spectral type and variability timescale. New, extensive data are necessary to determine its complete variability properties.

Reference:

Chapellier, E., Mathias, P., Le Contel, J.-M., et al., 2004, A&A, in press