

COMMISSION 27 OF THE I. A. U.
 INFORMATION BULLETIN ON VARIABLE STARS
 Number 2607

Konkoly Observatory
 Budapest
 18 October 1984
 HU ISSN 0374 - 0676

A SEARCH FOR LOW-HARMONIC PULSATION IN THE Ap STAR HD 184 905

The Ap star HD 184905 (SAO 48604, $m_v=6.48$, sp=A0p SiCrSrEu) was reported by Panov (1981) to show short-period light variations with a period of about 25-30 minutes and an amplitude of about ± 0.001 in U,B,V on several nights. Consequently, this star has been included in an observing program by the author to investigate the presence of short-period variations in Ap stars over long periods of time.

Differential photometry was obtained using HD 184875 (HR 7444, SAO 48601, $m_v=5.35$, sp=A2V) as a comparison star on the Lowell 1.1-m telescope. A dual-channel photometer utilizing cooled S-11 tubes and B and V filters was employed. Alternating sets of three 10-second integrations were obtained on HD 184905 and HD 184875. The observations are summarized in Table I. The differential magnitudes, normalized to zero, are plotted in Fig. 1.

Table I. Journal of observations of HD 184905 (V) and HD 184875 (C).

Date 1984	t (hours)	σ_B	σ_V	HJD (at start) 2,445,900+	$\Delta m(V-C)$ (at start) B	V
Aug 30/31	0.52	0.00021	0.00037	43.7074	1.195	1.288
Sep 27/28	2.86	0.0014	0.0024	71.6662	1.205	1.300
Sep 28/29	2.93	0.0014	0.0024	72.6659	1.180	1.266

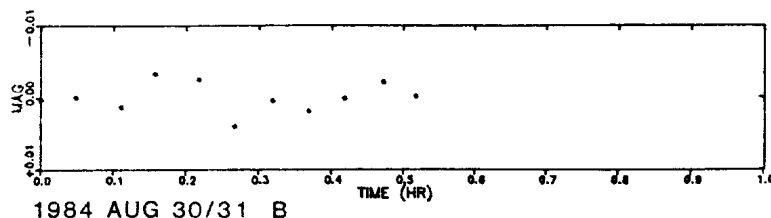
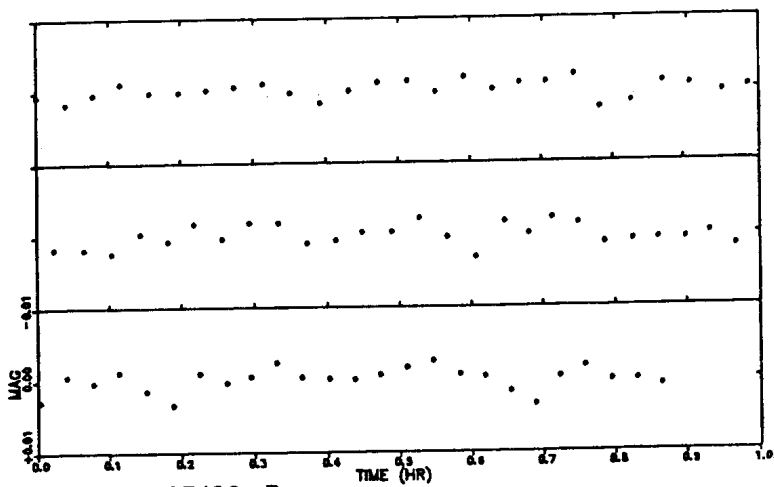
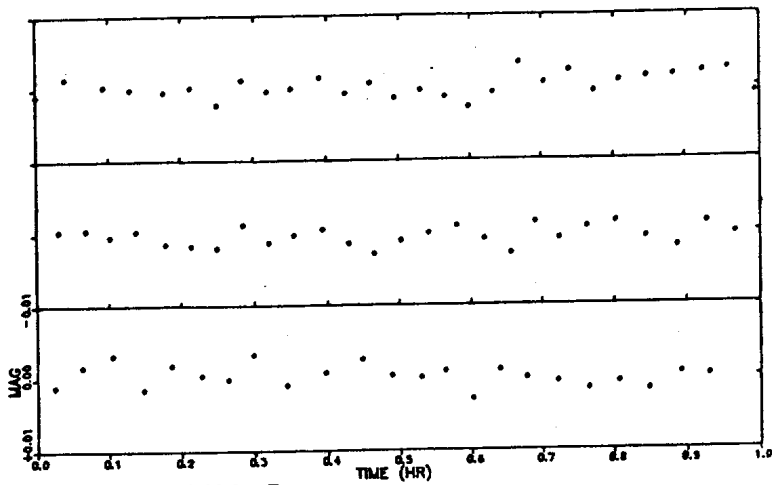


Figure 1. The differential data (HD 184905 - HD 184875), normalized to $\Delta m=0.0$. Each panel is one hour wide; the time series progresses left-to-right and top-down. The height of each vertical division is 0.001 .

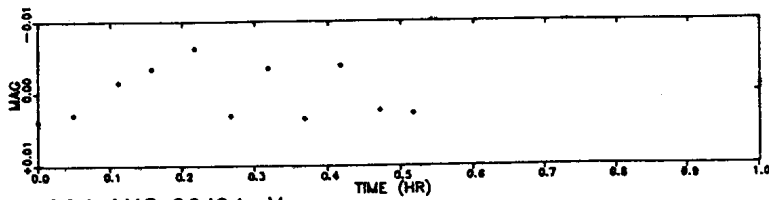
Fig. 1 (cont.)



1984 SEP 27/28 B

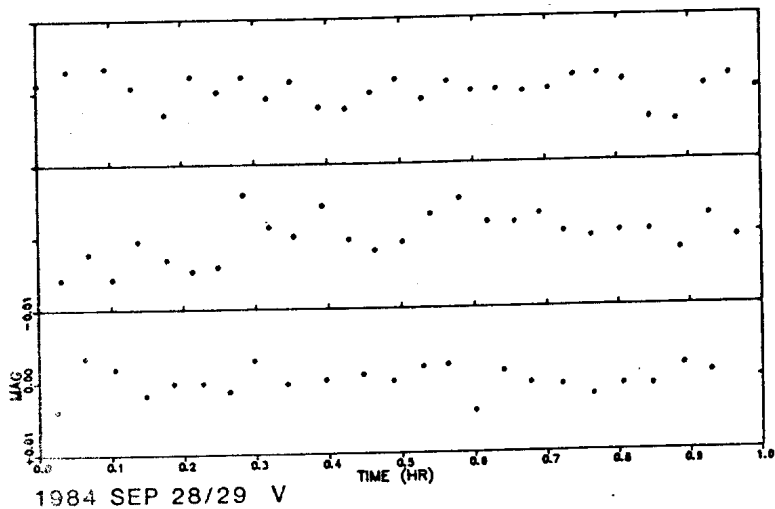
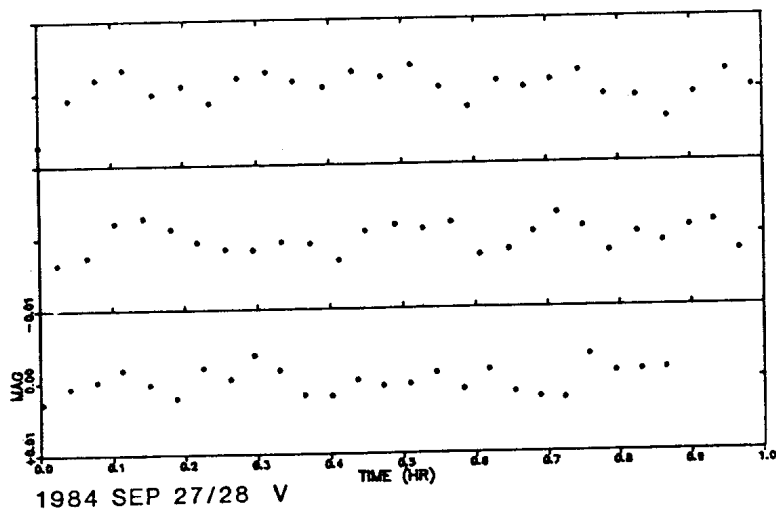


1984 SEP 28/29 B



1984 AUG 30/31 V

Fig. 1 (cont.)



No evidence is present for low-harmonic pulsation in the period range 25-30 minutes, nor in the valid range of periods being investigated (approx. 6 to 90 minutes), as demonstrated in Fig. 2. The maximum semi-amplitude is 0.56 mmag in B and 1.02 mmag in V at the period ~12 minutes; the average power lies at about half of these values. While there is a peak in the power spectra at the frequency corresponding to a period of about 12 minutes, it is probably not significant. Rapid oscillations leading to such a period would yield a larger amplitude in B than in V, which is not the case with these data. Consequently,

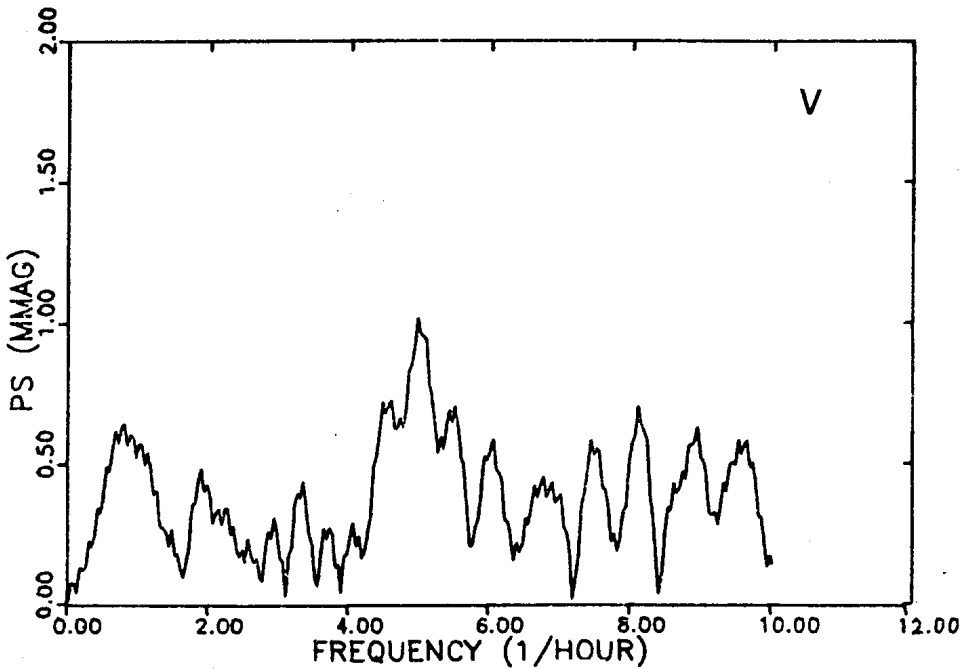
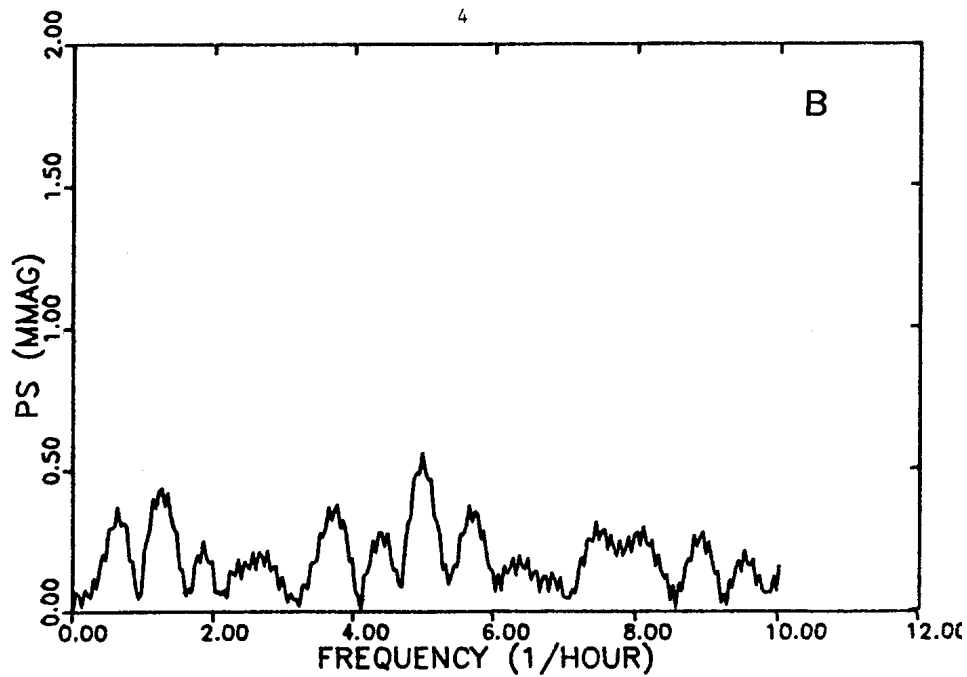


Figure 2. Power spectra for the B and V data presented in Fig. 1.

we are most likely dealing with an artifact. A much higher sampling rate (e.g., 20 seconds) would be required to accurately search for such short periods, since the mean sampling rate here is about 2.5 to 3 minutes.

Investigations by the author have failed to detect any of the reported rapid light variations in the stars HD 10088 (Kreidl 1984a, 1984c), HD 32633 (Kreidl 1984b), HD 125248 (Kreidl 1984d), and HD 184905 (this paper). As in the other cases, HD 184905 appears to be too hot to lie in the instability strip.

TOBIAS J. KREIDL
Lowell Observatory
P.O. Box 1269
Flagstaff, AZ 86002

References:

- Panov, K. (1981) *Comm. Spec. Astrophys. Obs.*, No. 32, 73.
Kreidl, T.J. (1984a) *Inf. Bull. Var. Stars*, No. 2460.
Kreidl, T.J. (1984b) *Inf. Bull. Var. Stars*, No. 2472.
Kreidl, T.J. (1984c) *Inf. Bull. Var. Stars*, No. 2602.
Kreidl, T.J. (1984d) *Mon. Not. R. astr. Soc.*, (in press).