

DISCOVERY OF δ SCUTI PULSATIONS IN HD 98851

JOSHI, S.¹; GIRISH, V.²; MARTINEZ, P.³; SAGAR, R.¹; ASHOKA, B.N.²; GUPTA, S.K.¹;
 SEETHA, S.²; KURTZ, D.W.⁴; CHAUBEY, U.S.¹

¹ Uttar Pradesh State Observatory, Manora Peak-263 129, Naini Tal, India, santosh@upso.ernet.in

² ISRO Satellite Centre, Airport Road, Bangalore-560 034, India, girishv@isac.ernet.in

³ South African Astronomical Observatory, P. O. Box 9, South Africa, peter@sao.ac.za

⁴ Department of Astronomy, University of Cape Town, South Africa, dkurtz@sao.ac.za

We report a new pulsating δ Scuti variable, HD 98851, discovered during the “Naini Tal-Cape Survey for Pulsations in Chemically Peculiar Stars”. The main aim of the survey is to search for rapidly oscillating Ap (roAp) stars in the northern hemisphere. Therefore, the candidates are selected on the basis of Ap and Am spectral classifications and/or peculiar photometric colours. HD 98851 has Strömgren indices corresponding to high metallicity found in the Am and Ap stars, *viz.* $b - y = 0.199$, $m_1 = 0.222$, and $c_1 = 0.766$ (Olsen, 1983). The Johnson colour indices for HD 98851 are $V = 7.41$, $B - V = 0.33$ and $U - B = 0.12$ (Oja, 1985). Abt (1984) classified HD 98851 as ‘Am(F1/F1 IV/F3)’ on the basis of its Ca K, hydrogen and metallic lines. Although the Ca and metallic line types do not differ by more than 5 subtypes as required by the classical Am definition, the spectrum has several other indicators of Am character.

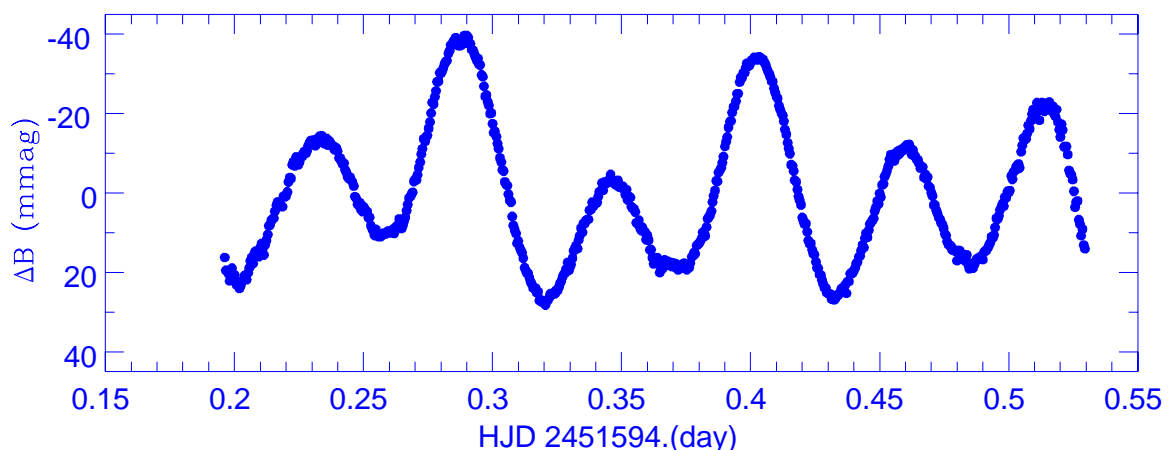


Figure 1. Light curve of HD 98851 on HJD 2451594.

On the basis of these peculiar colours we decided to search for rapid oscillations in HD 98851 on the night of 28 January 2000, JD 2451572. The data were acquired as

continuous 10-s integrations in Johnson *B* light using a high-speed photometer attached to the 104-cm Sampurnanand telescope of Uttar Pradesh State Observatory (UPSO), Naini Tal.

These observations revealed a peak-to-peak variation of 0.04 mag on a time-scale of about 80 min. Subsequent observations were made on nights HJD 2451594, 2451596, 2451623 and 2451627 to confirm the presence of these pulsations and to define better the period. Figure 1 shows the light curve obtained on night HJD 2451594. The data shown here have been corrected for coincidence counting losses, sky background and atmospheric extinction, and then binned to 40-s integrations.

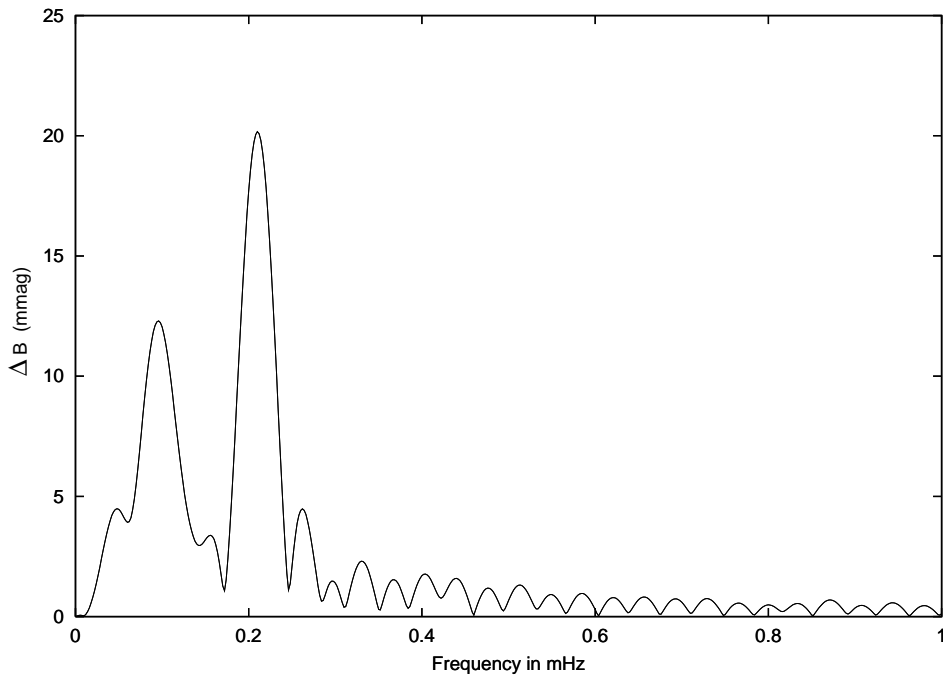


Figure 2. The amplitude spectrum of HD 98851 on HJD 2451594.

The reduced data were then Fourier analysed to identify the component frequencies using Deeming's (1975) discrete Fourier transform. Fig. 2 shows the amplitude spectrum of the HJD 2451594 data. The amplitude spectrum peaks strongly at 0.21 ± 0.02 mHz (79.4 minutes) and 0.10 ± 0.03 mHz (167 minutes). The peak at 0.10 mHz appears in the other light curves also, but we caution that contamination at low frequencies by sky transparency variations is significant in these single-channel measurements. In order to confirm this frequency additional two-channel data or differential data are required. A detailed analysis of the pulsations in this star will be published elsewhere.

References:

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