

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

Number 3467

Konkoly Observatory
Budapest
25 May 1990
HU ISSN 0374 - 0676

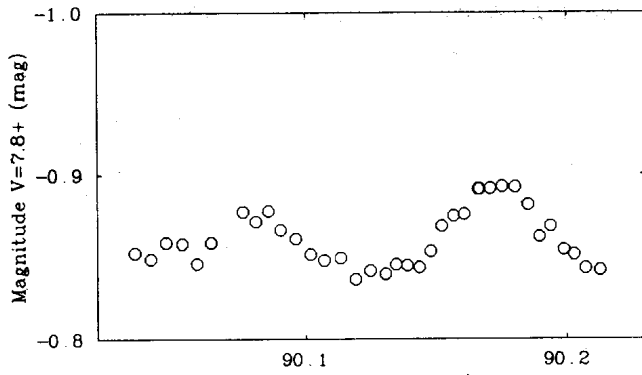
HD 93044: A NEW DELTA SCUTI VARIABLE?

This note announces a possible new delta Scuti variable discovered in a photometric survey near the declination 40° .

The Cassegrain focus of the 0.6-m reflector at Xinglong Station of Beijing Observatory was used for this survey. The star light passes through the Johnson's V filter which consists of BG12(1mm) + GG13(4mm) filters and enters a photoelectric photometer in DC mode (Shi et al., 1987). The signal is then real-time recorded by a micro-computer DATAMAX-8000, which can also display the observed light curve at any time and print out the observed data.

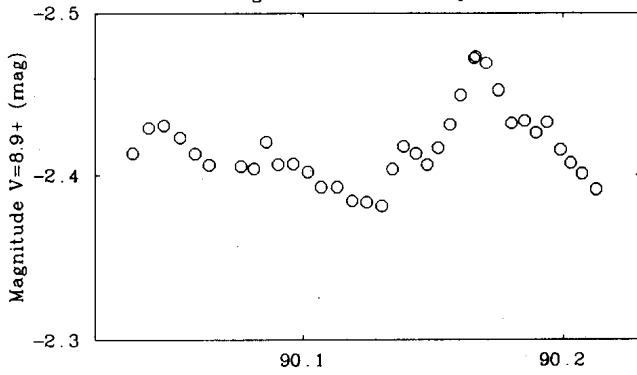
On the night of April 8, 1990, we observed HD 93044 (SAO 043461), HD 92370 (SAO 043428) and HD 92221 (SAO 043420). With the high voltage of photoelectric amplifier being 2.7 kV, and the step of preamplifier high resistance being $10^7 \Omega$, and the diaphragm aperture being 1 mm (23"), these stars were observed in the order of sky, HD 93044, HD 92370 and HD 92221 for five hours. The integration time was 20, 30, 40 and 60 seconds, respectively. From the differential light curves presented in Figures 1a-b, it can be seen that the variation in brightness of HD 93044 is obvious. Because the uncertainty in the magnitude differences of the other two stars was as large as $0^m.032$ (2σ), the observed variability needed to be confirmed.

We continued to observe these stars on April 9, 1990. But the reference star HD 92221 which is the faintest ($8^m.9$) in the group was abandoned and two other stars, HD 93457 (SAO 043475, $6^m.9$) and HD 93664 (SAO 043482, $7^m.8$) were added. The observing conditions were the same as those on the night of April 8. We performed six-hour differential observation in the order of sequence sky, HD 92370, HD 93044, HD 93664 and HD 93457, with the integration time of 20, 40, 30, 40 and 30 seconds, respectively. The light curves, no matter which of HD 93457 or HD 93664 was used as comparison, show the same periodic variations as presented in Figures 1c-d. The amplitude and period are about $0^m.09$ and $2^h.0$, respectively. The light curves of



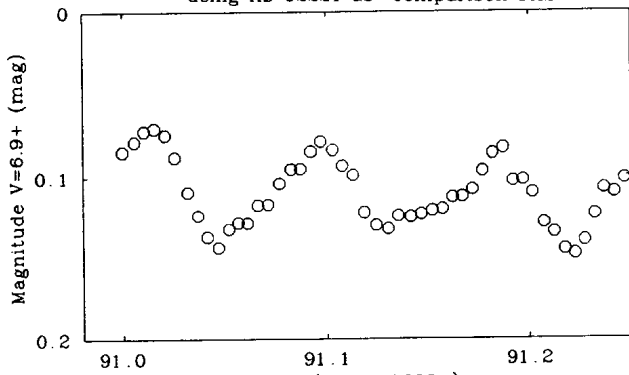
Epoch(HJD2447900+).
Fig 1:a The light curve of HD93044

using HD 92370 as comparison star.



Epoch(HJD2447900+).
Fig 1:b The light curve of HD93044

using HD 92221 as comparison star.



Epoch(HJD2447900+).
Fig 1:c The light curve of HD93044

using HD93457 as comparison star.

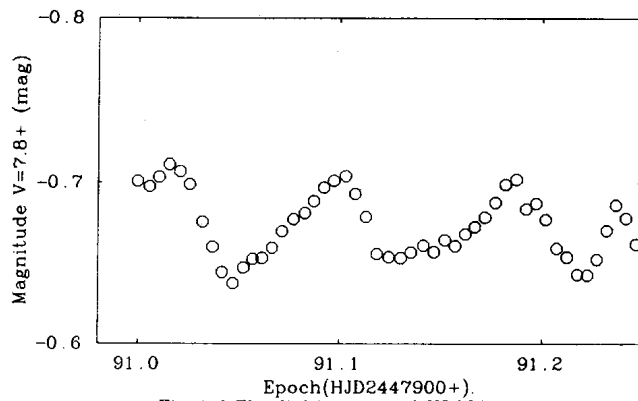


Fig 1:d The light curve of HD93044
using HD93664 as comparison star.

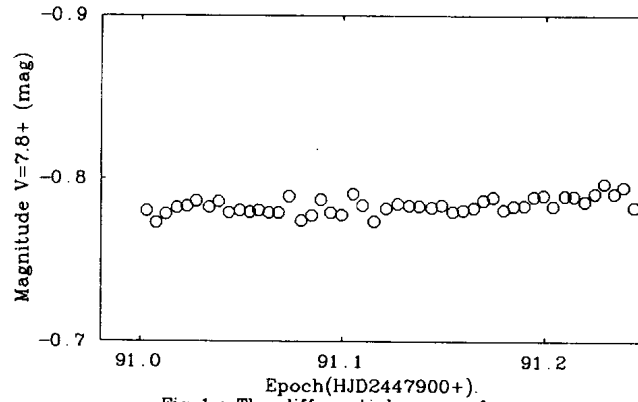


Fig 1:e The differential curve of
HD 93457-HD 93664

HD 93044 obtained on April 8 seem to have similar regularity. The observations of April 9 were of high quality. Figure 1e shows the magnitude difference HD 93457 - HD 93664 which is constant within $0^m.01$ and gives $\sigma = 0^m.0049$. So, using these two stars as comparisons did not affect the basic feature of the light variation in HD 93044.

In comparison with the eclipsing binaries, the light variation in HD 93044 is more complex. As the spectral class of HD 93044 is A7III, and its light variation is short-periodic and of low-amplitude, we classify it tentatively as a δ Scuti variable. In Figure 1, the m_v of the comparison stars, with some errors, are taken from the SAO Catalogue.

This work was directed by Jiang Shi-yang, professor of Beijing Observatory. In analyzing the nature of the variable, professors Huang Lin, Shen Liang-zao and Zhang Ron-xian gave much help. Here we gratefully acknowledge their kindness.

LI ZHI-PING

Beijing Astronomical Observatory
Academia Sinica
Beijing, China

TAN QING-QUAN

Sichuan Normal College

CAO MING

Shaanxi Astronomical Observatory

Reference:

Shi, C.M., Du, B.T. et al.: 1987, Acta Astrophysica Sinica, 7, 230.