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NON-CEPHEID CHARACTER OF V588 Cas

V588 Cas (RA= $1^{\text{h}}19^{\text{m}}12^{\text{s}}$ , Dec= $+54^{\circ}6'$ , 1950.0) is listed in the 4th Edition of the GCVS as "DCEP:" with no period or epoch given. The magnitude range is listed as  $12^{\text{m}}2$ - $13^{\text{m}}6$  (photographic). We observed V588 Cas during January-March in 1992 and 1993, included in our list of Cepheids thought to have few or no recent observations. We found no indication of a Cepheid light curve.

The GCVS lists a reference for a finder chart (Hoffmeister, 1957), which has been reproduced in Figure 1. Although no chart on the No. 291 page is labelled as V588 Cas, we recognize the field, in comparison with our CCD images (our telescopes point to  $30''$  or better). The MVS chart is labelled "S3880 Cas".

A printout of one of our R-bandpass CCD images is shown in Figure 2, for comparison with Figure 1. Our field of view in this image is about 5 arc minutes. We have assigned arbitrary star numbers and the variable marked in the MVS is #1 on our diagram. Agreement of our field with this MVS chart is not in doubt.

We obtained CCD observations during the 1992 and 1993 observing seasons to check the light curve of this star. We used two similar telescopes and CCD equipment, at two sites. RHB obtained observations with the U.S. Air Force Academy's 0.4 m DFM Engineering reflector, and a 14-bit Photometrics (LN<sub>2</sub>-cooled) CCD system. DLD obtained observations with Virginia Military Institute's 0.5 m DFM Engineering reflector, and a 14-bit Photometrics (Peltier-cooled) CCD system.

Observations were obtained in the Johnson V and R bandpasses, with a field of view of  $12'$ , and  $5'$ , respectively, for the two systems. Standard flat field corrections were applied to all V588 Cas images. We obtained images of the standard field in M67 (Schild, 1983), to insure that our detector/filter system was close to the standard Johnson system. We

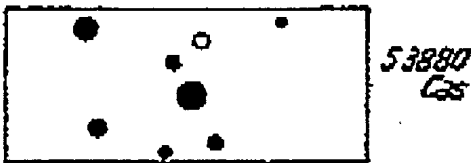


Figure 1

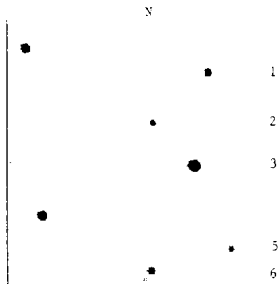


Figure 2

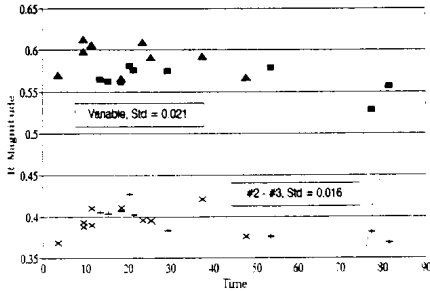


Figure 3. Light curve of V588 Cas (1993 data)

used DAOPHOT (VMI) or rectangular aperture photometry (USFA) to obtain magnitudes from the corrected CCD images. Observations were entered into a spreadsheet, with comparison star differences tabulated to help insure that any errors would be noticed.

Unlike the other Cepheids observed, we found that V588 Cas does not show any indication of a Cepheid light curve. In Figure 3 is shown our differential R bandpass CCD observations of V588 Cas, referenced to the average magnitude of comparison stars #2 and #3 (squares=VMI data, triangles=USFA data). In the bottom half of the graph is shown magnitude differences of comparison stars #2 and #3 (with an offset to place the difference conveniently on the graph), as an indication of the variability and observational noise in these comparison stars. We found that the average of our comparison star differences (VMI–USFA) showed an  $0^m031$  difference, and we added that amount to one set to insure no systematic differences; that difference might be attributed to the different manner of obtaining magnitudes.

The standard deviation of the differences (shown on the graph) of the comparison stars (#2 minus #3) is  $0^m016$ . For the variable minus the average of the two comparison stars, the standard deviation is  $0^m021$ . The variation in the variable star is comparable to that in the comparison stars. Although only our 1993 results are shown, we obtained similar results with the 1992 data.

We examined the surrounding stars out to about  $4'$  (radius) for variability above the  $0^m1$  level, and found none. The CCD photometry, using images, greatly reduces the risk of misidentification. We conclude that the star denoted as V588 Cas is not a Cepheid.

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