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CCD Photometry of the Cataclysmic Variable HV Virginis

HV Virginis was originally thought to be a classical nova (Duerbeck 1987) until the recent outburst first detected by Schmeer (1992). The original outburst of this system occurred in 1929 when Schneller (1931) reported that the system had reached a *V* magnitude of 11 on 1929 Feb 1. In addition, Schneller reported a magnitude of 12.5 on 1929 Feb 3 and then noted that by 1929 Feb 9, the system was no longer observable. The normal quiescent magnitude of the system is 19.1 (Howell, et al 1992). The current outburst also shows a rise in magnitude up to an observed maximum of about 11.5 on 1992 April 21. The outburst light curve compiled from IAU circulars, Bruch (1992), and our own observations is presented in Figure 1.

Using the High Resolution Imaging CCD camera on the 1.8 meter ARC telescope, we observed HV Vir on April 30 and May 1 with 20 second integrations in the *V* band (Figure 2). Unfortunately, no other stars were visible in the CCD frame to enable differential photometry. The light curves were corrected for extinction and calibrated with the standard star G 21-15. The extinction coefficient was obtained by matching the magnitudes of the three minima seen on May 1 (on each night, the raw light curve showed a clear linear relationship to the airmass over time). Our observations indicate the presence of superhumps of 0.2 mag amplitude in the *V* band and a superhump period of 84.1 ± 0.4 minutes.

The arrows in Figure 2 indicate timings of the measured superhump maxima, which were measured by bisecting the full width at half maximum. The superhump timings are given in Table 1. Except for the

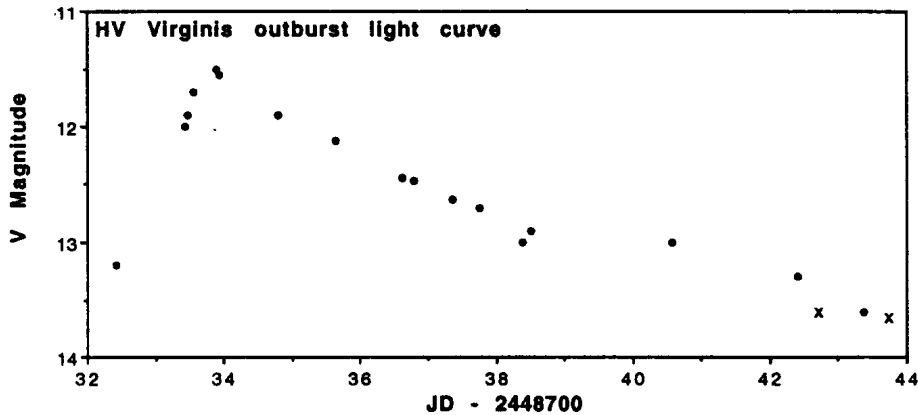


Figure 1 - The outburst light curve for HV Vir compiled from IAU circulars, Bruch (1992) and our data. Our observations are indicated with an "x."

maximum at the end of the 1st half of the May 1 data (which appears to be undergoing a second peak), all of the superhumps appear to be the same amplitude and width.

Table 1: Photometric data on HV Vir

Date (1992)	Time of Maximum(UT)	H.J.D. (2448700+)	V Mag (at half max)
April 30	8:49 ± 0:05	42.8728 ± .0033	13.60 ± 0.10
May 1	5:45 ± 0:03	43.7448 ± .0021	13.62 ± 0.10
May 1	8:38 ± 0:02	43.8653 ± .0013	13.65 ± 0.10
May 1	9:57 ± 0:05	43.9198 ± .0033	13.65 ± 0.10

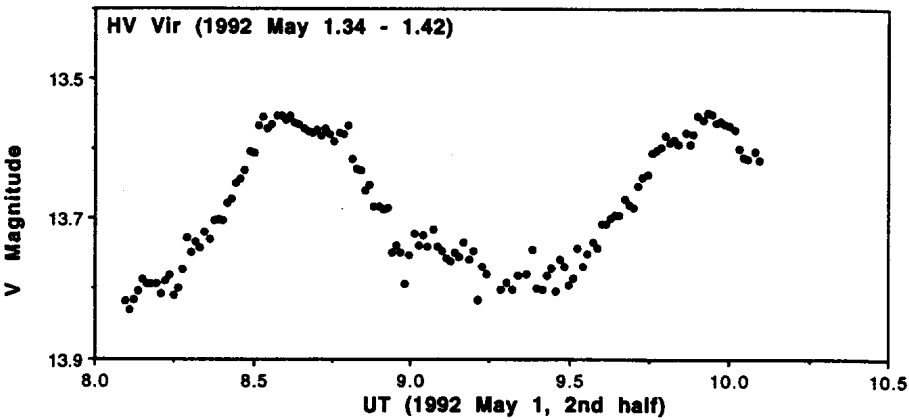
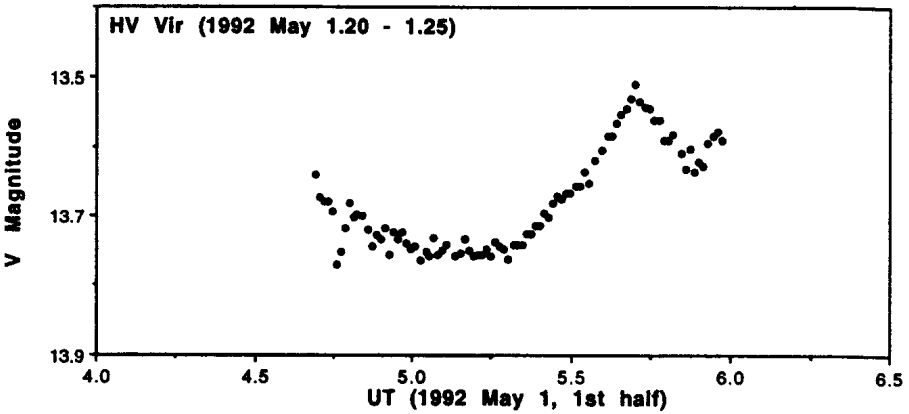
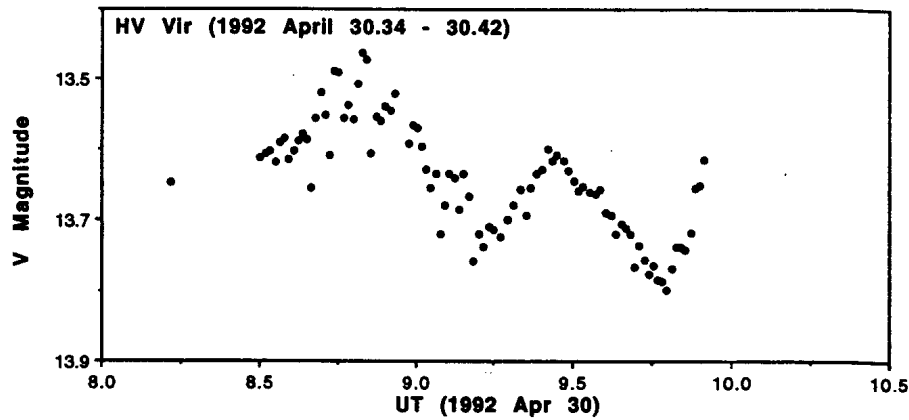


Figure 2 - Light curves from the two nights of CCD photometry.

The smaller hump feature apparent in the April 30 observations may be a manifestation of a beat phenomenon between the orbital and superhump periods reported by Mantel, et al (1992), but the evidence for a similar feature is not apparent in the May 1 data. The small upturn at the end of the first half of the May 1 observations does not match up with an extrapolation of the orbital period from the April 30 "beat hump."

The very large outburst amplitude (8 magnitudes) of HV Vir and its high galactic latitude (65°) are of note. Howell and Szkody (1990) are finding a large number of large amplitude (> 6 mag) dwarf novae out of the galactic plane, as compared to those in the plane, and most of the large amplitude systems have orbital periods below the period gap.

HV Vir adds to this correlation; 11 of the 12 known high galactic latitude, large outburst amplitude dwarf novae now have orbital periods below the gap.

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D. INGRAM and P. SZKODY
Department of Astronomy, FM-20
University of Washington
Seattle, WA 98103

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