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SU UMa-TYPE DWARF NOVA V369 Peg

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V369 Peg = NSV 26006 = KUV 23012+1702 was originally discovered as a variable, ultraviolet-excess object (Kondo et al. 1984). Wegner and Dupuis (1993) took a low-resolution spectrum of this object and described that "Hα and Hβ look as if they have emission cores", and gave a spectroscopic classification of sdBe. The variability of KUV 23012+1702 was studied on Moscow plates by Antipin (1998). Antipin (1998) discovered that the star is a dwarf nova with a variability range of 15.8–< 18.0 p. Antipin (1998) also noted the presence of two kinds of outbursts, bright ones lasting more than 8 days and faint ones lasting less than 5 days. KUV 23012+1702 was thus considered as a very good candidate for an SU UMa-type dwarf nova. This object received a GCVS designation of V369 Peg (Kazarovets et al. 2000).

J. Pietz detected an outburst on 1999 November 3, and detected hump features with an amplitude of $0^{\rm m}.35$ from his November 4 CCD observations (Pietz 1999). We started time-series CCD observations during this apparent superoutburst.

The CCD observations were done using an unfiltered ST-7 camera attached to the Meade 25-cm Schmidt–Cassegrain telescope. The exposure time was 30 s. The images were dark-subtracted, flat-fielded, and analyzed using the Java$^{\rm TM}$-based PSF photometry package developed by one of the authors (TK). The magnitudes were determined relative to GSC 1711.839 (Tycho-2 magnitude: $V = 11.44 \pm 0.12$, $B - V = +0.87 \pm 0.26$), whose constancy during the run was confirmed using GSC 1711.2320. Table 1 summarizes the log of observations. Barycentric corrections to the observed times were applied before the following analysis.

Figure 1 presents the overall light curve. The figure shows a long outburst (superoutburst) and following two short (normal) outbursts occurring on JD 2451509 and JD 2451522. The initial superoutburst detected by Pietz lasted until November 18, followed by a rapid decline. The duration of superoutburst was thus 15 days. The interval of two subsequent normal outbursts was 13 days, which can be regarded as the typical recurrence time of this dwarf nova. The short recurrence time and the small outburst amplitude suggests that the object is a rather active dwarf nova.

The data between JD 2451488 and 2451497 (superoutburst plateau), after subtracting the linear trend of decline, were analyzed using the Phase Dispersion Minimization (PDM) method (Stellingwerf 1978). The resultant theta diagram is shown in Figure 2. The best superhump period is 0.08484 ± 0.00010 d. The other one-day aliases were excluded by independent detections of the same signal by Pietz (1999) and Vanmunster (1999a, 1999b).

Table 1: Nightly averaged magnitudes of V369 Peg

JD start[a]	JD end[a]	mean mag[b]	error[c]	N[d]
51488.982	51489.125	4.294	0.045	160
51489.994	51490.207	4.329	0.038	249
51490.959	51491.206	4.486	0.043	164
51492.020	51492.192	4.593	0.019	418
51493.029	51493.181	4.586	0.022	378
51496.031	51496.184	4.945	0.029	365
51497.027	51497.156	4.987	0.042	265
51499.031	51499.034	-[e]	-	4
51500.028	51500.133	5.336	0.531	52
51501.028	51501.173	7.032	0.327	302
51502.033	51502.064	8.818	1.611	80
51503.135	51503.143	7.122	1.589	20
51504.056	51504.061	9.8:	3.0	14
51505.059	51505.163	6.736	1.205	9
51507.003	51507.003	-[e]	-	1
51509.002	51509.005	5.955	0.276	10
51510.996	51511.001	-[e]	-	10
51512.051	51512.055	9.120	2.081	11
51513.038	51513.042	6.954	0.784	10
51520.005	51520.009	8.084	1.083	10
51521.001	51521.004	-[e]	-	10
51521.905	51521.994	5.112	0.092	17
51522.968	51522.971	6.022	0.309	10
51523.970	51523.974	7.211	0.699	11

[a] JD − 2400000
[b] Magnitude relative to GSC 1711.839
[c] Standard error of nightly average
[d] Number of frames
[e] Object below detection limit (typically below 17^{m})

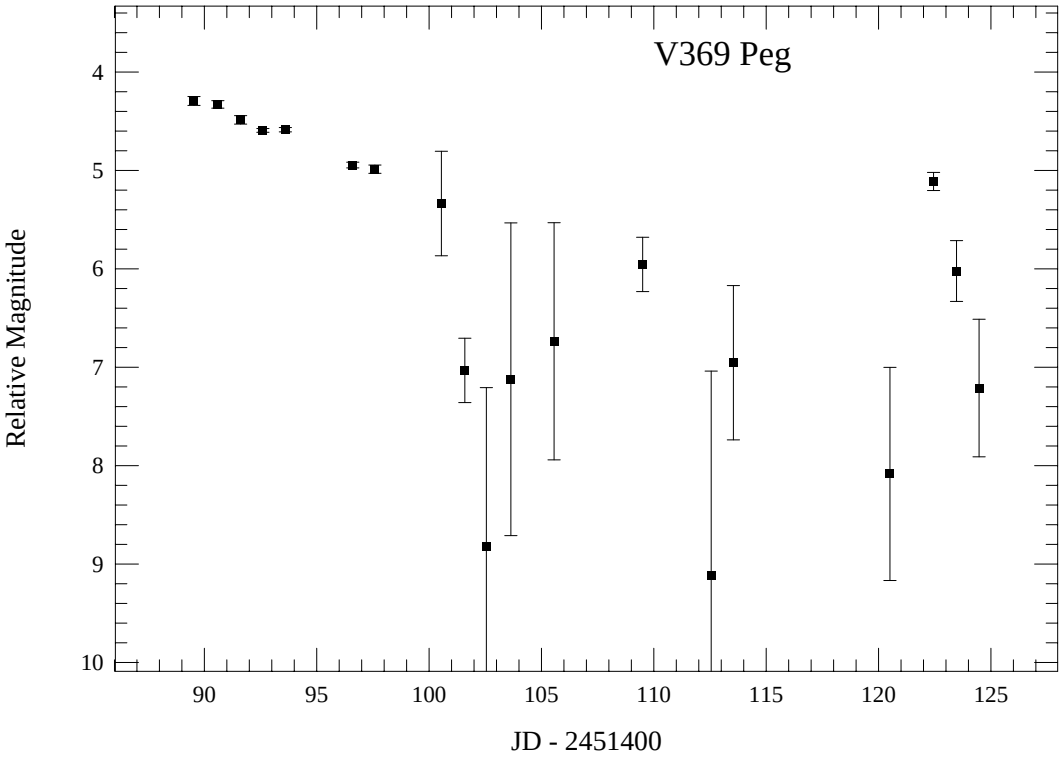

Figure 1. Light curve of V369 Peg. Relatively large errors were caused by the faintness of the object

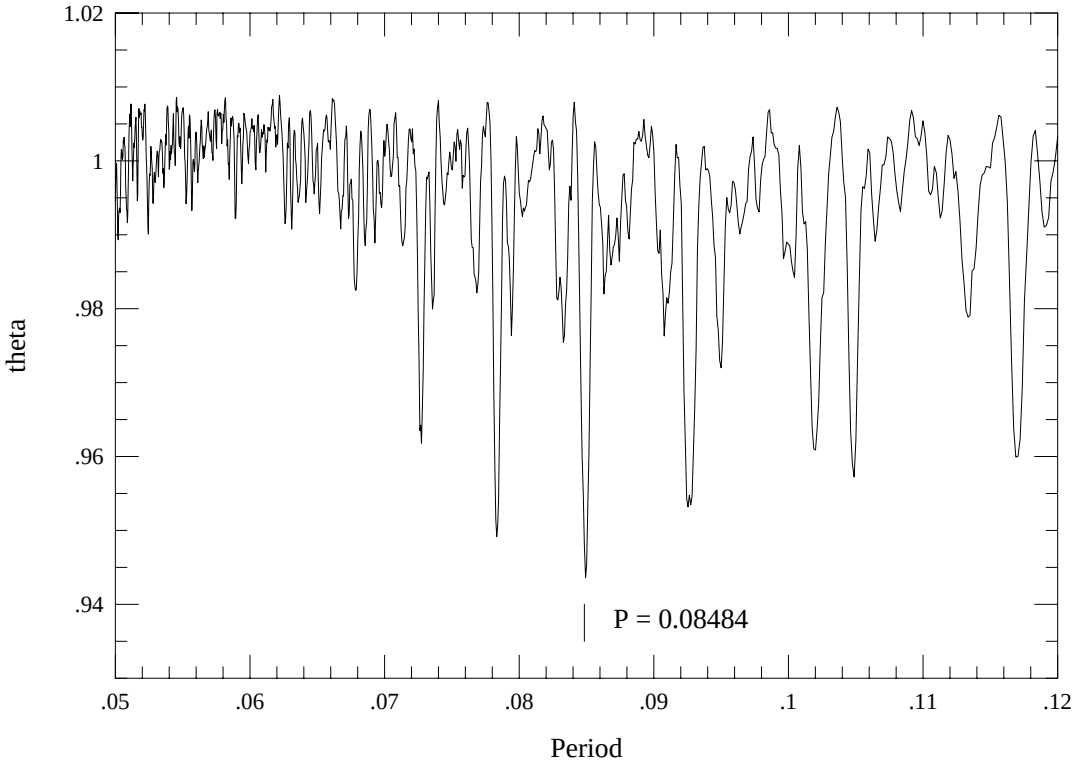

Figure 2. Periodogram of V369 Peg

Figure 3 shows the phase-averaged light curve of superhumps. The superhumps had a large amplitude of $\sim 0\overset{m}{.}3$. The superhump period of $0\overset{d}{.}0848$ makes V369 Peg as one of SU UMa-type dwarf novae with long orbital periods. The overall pattern of outbursts looks similar to the long-period system YZ Cnc. Further detailed observations are encouraged to precisely determine the system parameters.

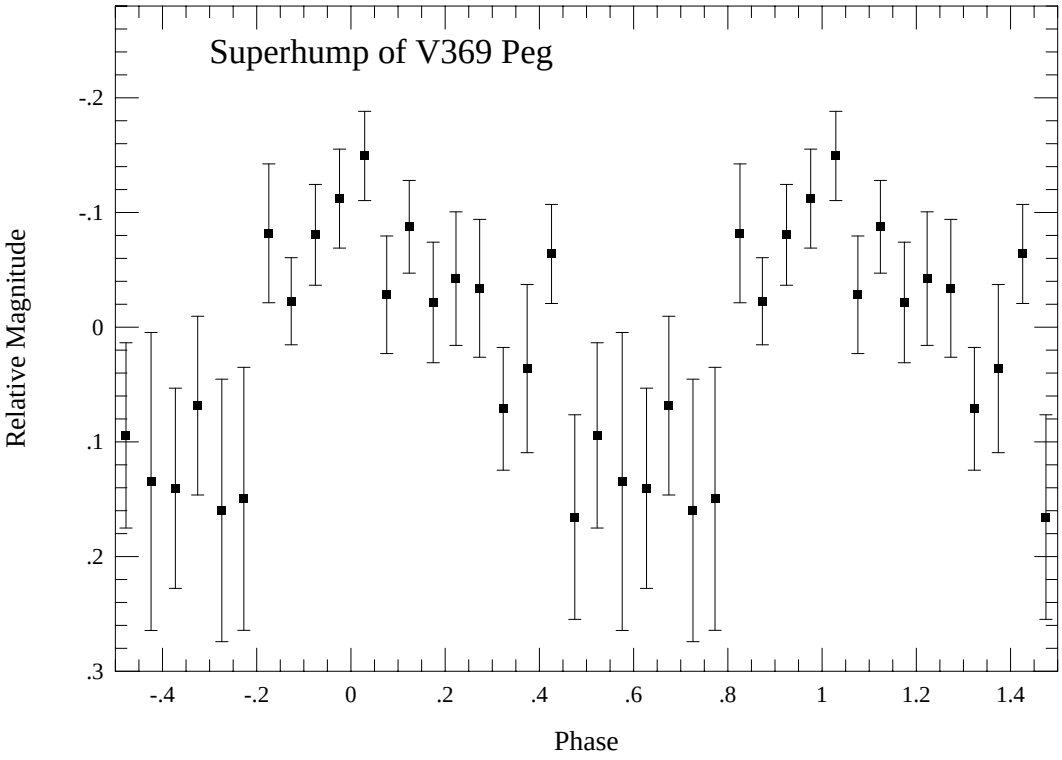

Figure 3. Superhump profile of V369 Peg

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