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PHOTOGRAPHIC OBSERVATIONS OF THE CATAclySMIC VARIABLE CANDIDATES

PG 1445+584 AND PG 1524+622

The objects PG 1445+584 and PG 1524+622 from the Palomar-Green Survey were suspected to be Cataclysmic Variables (CVs) by Green et al. (1986). However, no information about the detailed classification or at least the possible variability was published. For this purpose, we studied the objects on 57 archival plates obtained at the 40-cm astrograph of the Crimean Laboratory of the Sternberg State Astronomical Institute. All the plates were measured by using the iris-photometer to obtain the brightness of comparison stars and to avoid possible variables among them. The instrumental system is close to B.

The standard stars in SA 15 were used from the list of Brun (1957). The finding charts are shown in Figure 1 and the comparison stars are listed in Table I. The value of σ_m corresponds to the mean-squared deviation from the mean value to estimate the scatter, but not to the standard error of the mean.

The object PG 1524+622 showed distinct variability, as one may see from Table II. The brightening up to $13^m.9$ was detected on one plate obtained at HJD 2433762.464. The deviation from the mean value, $14^m.8$ is only $0^m.9$. The temporal distribution of the observations does not allow us to study the structure of the brightening and thus additional observations are needed. Four plates showed the brightness decrease with an amplitude up to $1^m.5$, similar to the eclipsing variables, particularly to BH Lyn = PG 0818+513 (Andronov et al., 1989). For the period search, we used the "method of characteristic times" (Andronov, 1991) and the corresponding FORTRAN routine. Because the number of points is very low ($n=4$), the periodogram is very noisy. For 57 values of the trial period, the maximum deviation of the phase from zero $|\varphi_{\max}| \leq 0.01$, and thus the period determination is impossible from the present observations.

To search for the possible orbital brightness variations, series of observations were obtained during three subsequent nights. The most prominent (but weak) peaks in the periodogram occurred at periods 1.07 ± 0.08 , 0.53 ± 0.03

and 0.125 ± 0.003 days.

However, the shape of the light curve of PG 1524+622 changes from night to night, thus these periods seem to be unreal, despite the brightness variations at least up to $0^m.4$ occurred with characteristic times $0^d.10$ - $0^d.13$. For the precise classification, additional observations are needed.

A weak argument pro long period ($P > 0^d.3$) may be that the narrow ($d < .05$) deep eclipse may not be observed at short periods due to the exposure time of 30 min. However, the "minima" may be due to the "short-time excursions" to the "low state" like that observed in MV Lyrae (Andronov et al., 1988). It may be noted that IW And showed time intervals with nearly constant brightness, interrupted by rapid "switches" from high to low state (Meinunger and Andronov, 1987). In this case, high states must be observed more frequently, as compared with PG 1524+622.

Table I

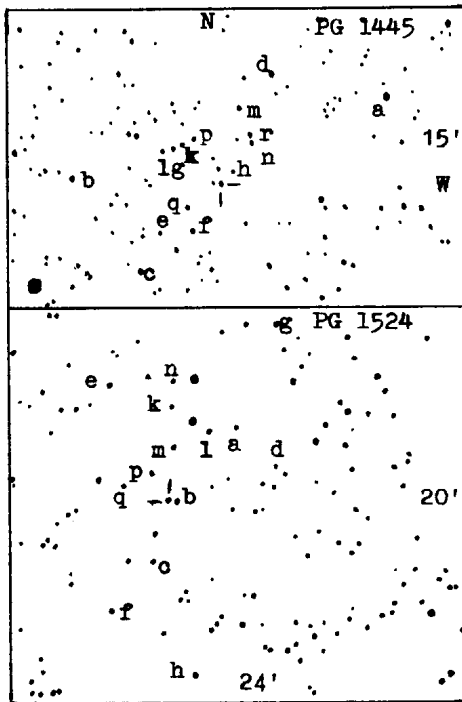


Figure 1

Comparison stars for PG 1445+584 and 1524+622				
*	PG 1445		PG 1524	
	m_{pg}	σ_m	m_{pg}	σ_m
a	12.74	.02	13.86	.07
b	13.16	.04	13.95	.05
c	13.67	.04	14.22	.07
d	14.07	.09	14.45	.08
e	14.64	.08	14.86	.11
f	14.84	.09	15.02	.10
g	15.04	.08	15.13	.11
h	15.57	.10	15.26	.11
k	15.82	.11	15.36	.09
l	15.84	.09	15.67	.10
m	16.08	.11	15.99	.10
n	16.13	.11	16.04	.11
p	16.18	.13	16.48	.13
q	16.63	.07	16.48	.09
r	16.70	.15		
s	17.09	.34		
Var	15.66	.10	14.84	.39

Table II

The photographic observations of PG 1445+584 and PG 1524+622

HJD 24...	PG 1445	PG 1524	HJD 24...	PG 1445	PG 1524
33057.409	15.84	16.32m	47302.398	15.63	14.82
33762.464	-	13.92!	47302.430	15.53	14.85
34480.526	15.70:	14.99	47302.462	15.57	14.73
35598.400	15.64	14.83	47302.496	15.70	14.57
47207.569	15.57	14.82	47304.450	15.70	15.93m
47264.495	15.68	15.13	47305.415	15.57	14.68
47265.553	15.64	15.25	47324.418	15.75	14.63
47266.420	15.68	15.12	47351.408	15.66	14.65
47268.480	15.77	15.12	47355.408	15.68	14.84
47294.512	15.66	14.72	47615.457	15.57	14.41
47295.517	15.66	14.65	47616.539	15.57	14.60
47296.368	15.57	14.77	47619.468	15.66	14.55
47300.341	15.64	14.65	47619.534	15.57	14.88
47300.374	15.84	14.57	47620.485	15.73	14.69
47300.407	15.68	14.69	47622.538	15.84	14.71
47300.440	15.68	14.87	47647.484	15.57	14.85
47300.473	15.80	14.69	47649.498	15.57	14.63
47300.509	15.73	14.49	47650.396	15.70	14.62
47301.303	15.77	14.83	47651.414	15.73	14.68
47301.336	15.57	14.86	47657.495	15.73	14.64
47301.368	15.75	14.76	47658.426	15.70	14.72
47301.399	15.72	14.79	47678.412	15.57	14.92
47301.429	15.51	14.68	47679.316	15.75	14.59
47301.460	15.55	14.75	47734.321	15.72	14.82
47301.491	15.57	14.83	47736.337	15.41	14.70
47301.514	15.69	14.60	47739.306	15.79	15.08
47302.303	15.58	14.83	47973.524	15.55	15.95m
47302.334	15.65	14.92	47984.527	15.84	15.54m
47302.365	15.54	14.81			

Remarks: the symbol ! marks the brightening of PG 1524+622, and the symbol m - the "minima".

The brightness of PG 1445+584 changed from 15^m.51 to 15^m.84 on our plates. Such low amplitude may be due to the scatter of the photographic observations. This behaviour is similar to that exhibited by other PG-objects - 0834+488 and 1639+338, but the "missed" larger variations may not be excluded.

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