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NSV 03199: AN ECLIPSING BINARY SYSTEM IN AURIGA

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Among the many detected variables recorded in the NSV catalogue (Kholopov, 1982), NSV 03199 (= HV 7661 = GSC 3394.1630 = CSV000851) was included as an RR Lyrae object with a photographic magnitude range between 13^m3 and 13^m8, after Shapley and Boyd (1937).

Due to the lack of additional light measurements, NSV 03199 was included in a collaborative observing program between the US Naval Observatory Flagstaff Station and Esteve Duran Observatory. The star was monitored in the BVRI bands with the 1.0-m Ritchey-Chretien telescope at the USNO Flagstaff Station, and in the V band with the 0.6-m telescope at Esteve Duran Observatory, between September 1996 and November 1997. Some stars in the field of NSV 03199 were placed on the standard system by using Landolt (1992) standards, and GSC 3394.1226 was used as the primary comparison star.

Figure 1 shows the field of NSV 03199, and Table 1 lists the standard V magnitudes and color indices of comparison stars near the variable.

Table 1

Star	GSC	V	B–V	V–R	R–I
A	3394-1226	12.987±0.005	0.632±0.003	0.378±0.004	0.365±0.005
B	3394-1430	14.839±0.017	0.736±0.002	0.404±0.018	0.417±0.012
C	3394-1468	10.880±0.020	1.444±0.017	0.803±0.006	0.673±0.013
D	3394-1696	13.695±0.004	0.658±0.002	0.395±0.008	0.389±0.008
E	3394-1783	10.708±0.005	1.785±0.000	0.866±0.000	0.465±0.005
F	3394-1845	14.685±0.002	0.653±0.003	0.389±0.006	0.368±0.027
G	3394-1875	12.632±0.003	1.182±0.004	0.632±0.003	0.596±0.005
H	3394-2071	15.063±0.005	1.041±0.010	0.598±0.006	0.549±0.017
I	3394-2075	13.845±0.003	0.591±0.003	0.360±0.002	0.381±0.009
J	3394-2200	11.574±0.003	1.300±0.002	0.720±0.002	0.630±0.005
K	3394-2249	12.145±0.005	0.850±0.004	0.491±0.000	0.411±0.006
L	3394-2292	15.022±0.005	0.607±0.009	0.385±0.010	0.392±0.035
M	3394-2448	13.374±0.004	0.583±0.002	0.356±0.002	0.370±0.006

Photometric observations show that NSV 03199 is an eclipsing binary system and not an RR Lyrae star (Figure 2), with a period close to one day. At maximum light this object has a V magnitude of 12.72, and an average $(B-V)$ color index of $0^m340 \pm 0^m010$, fading 0.53 magnitudes at primary minimum and 0^m10 at minimum II. Photometric data also suggest that the $B-V$ color remains almost unchanged at minimum I. The following ephemeris was derived:

$$\begin{aligned} \text{Min. I} = & \text{HJD } 2450510.46542 + 1^d04640 \times E \\ & \pm 0.00060 \pm 0.00013 \end{aligned}$$

Table 2 lists the two observed primary minima and their O–C residuals:

Table 2

HJD	Epoch	O–C
2450510.46542	0.0	0.0000
2450511.51370	1.0	+0.0019

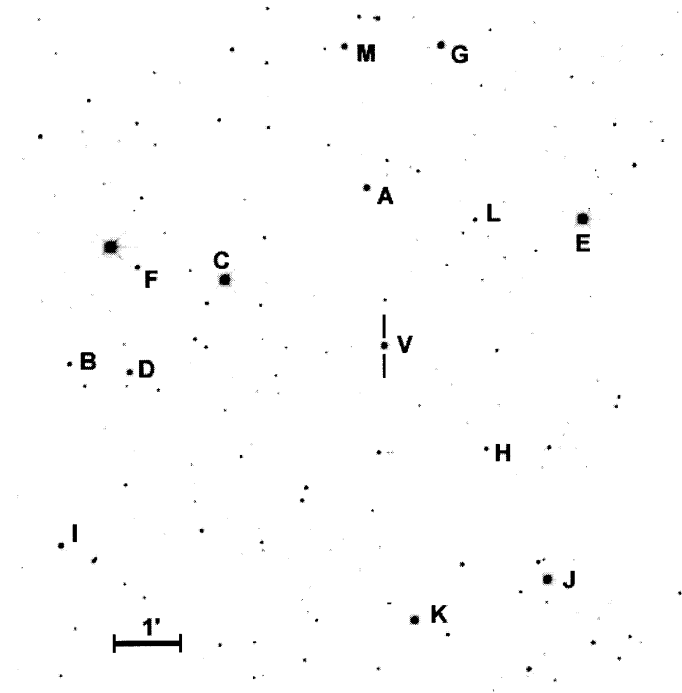


Figure 1. Finding chart for the variable. V = NSV 03199. North is on top

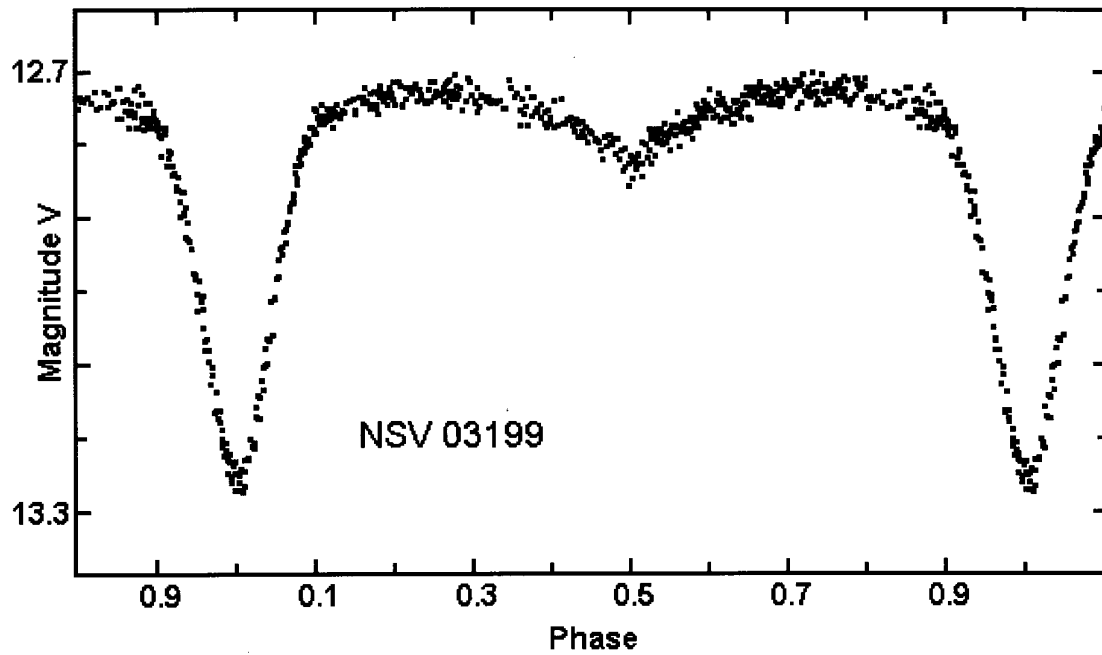


Figure 2. Light curve of the variable phased according to the given ephemeris

References:

- Kholopov, P. N., editor, 1982, New Catalogue of Suspected Variable Stars, Moscow
Landolt, A.U., 1992, *AJ*, **104**, 340
Shapley H., Boyd C.D., 1937, *HB*, **905**