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First Period Determination of V1899 Sgr

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Abstract

We studied the ASAS-3 V-band observations of the supposed RV Tau star V1899 Sgr. We obtained the likely period of 105.2 d. The observed characteristics are not inconsistent with the RV Tau-type classification.

V1899 Sgr (=CoD −26°13240) is registered in General Catalogue of Variable Stars (Kholopov et al. 1985) as an RV Tau star with a photographic range of 12.1–14.5. Neither period information was given in the catalogue, nor subsequent study has been published in spite of its brightness. The object is one of the brightest objects in V band suspected of RV Tau-type variability.

We studied the variability of this object using the ASAS-3 survey data (Pojmanski 2002), and confirmed its variability. The V-band light curve constructed from the ASAS-3 public data is presented in Figure 1. The recorded range of variability in V was 11.6–13.6.

The light curve indicates the presence of $\gtrsim$50 d quasi-periodicity. This period is a typical one for an RV Tau-type variable star. Figure 2 shows the Phase Dispersion Minimization (PDM: Stellingwerf 1978) analysis of the data. There are clear periodicity around $P \gtrsim 50$ d. There are indications of a double periodicity ($2P$), which is consistent with the RV Tau-type variation. By adopting two strongest period candidates ($P = 48.4$ d and $P = 52.6$ d) and folding with the double period, we obtained the folded light curves in Figure 3.

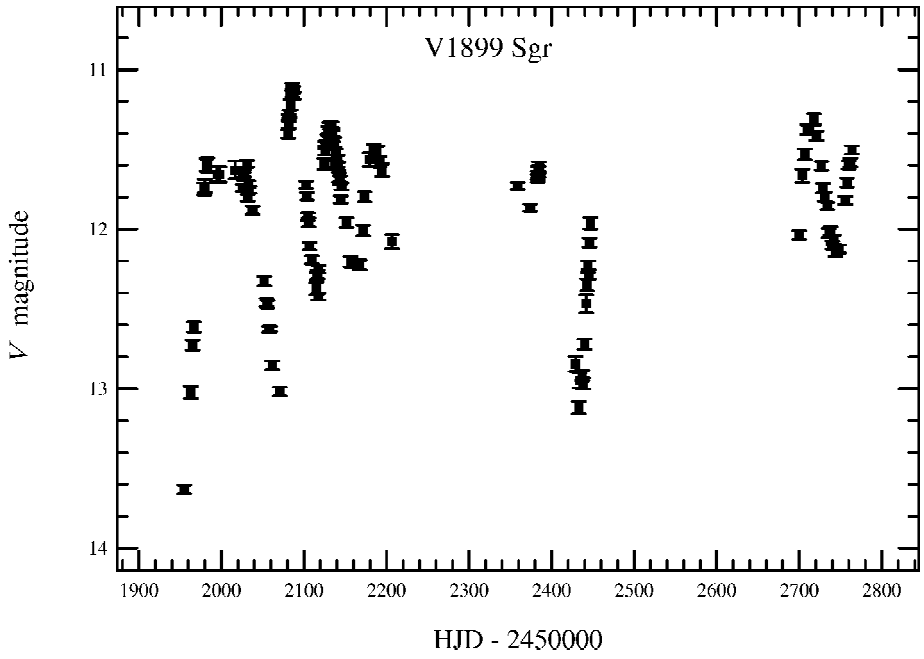

Fig.1 V -band light curve of V1899 Sgr drawn from the ASAS-3 public data.

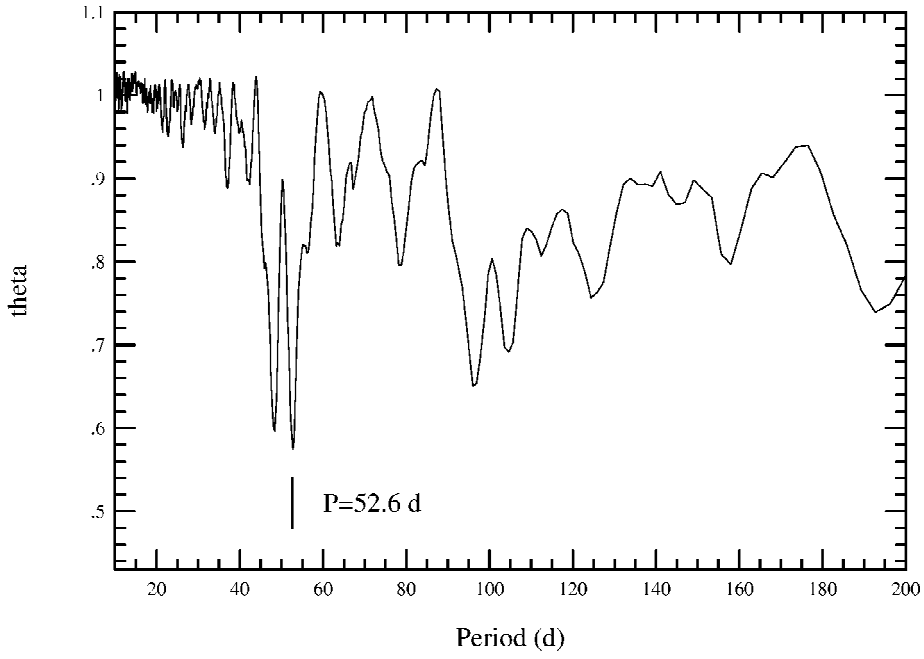

Fig.2 Period analysis of V1899 Sgr. The strongest signal P = 52:6 d is marked.

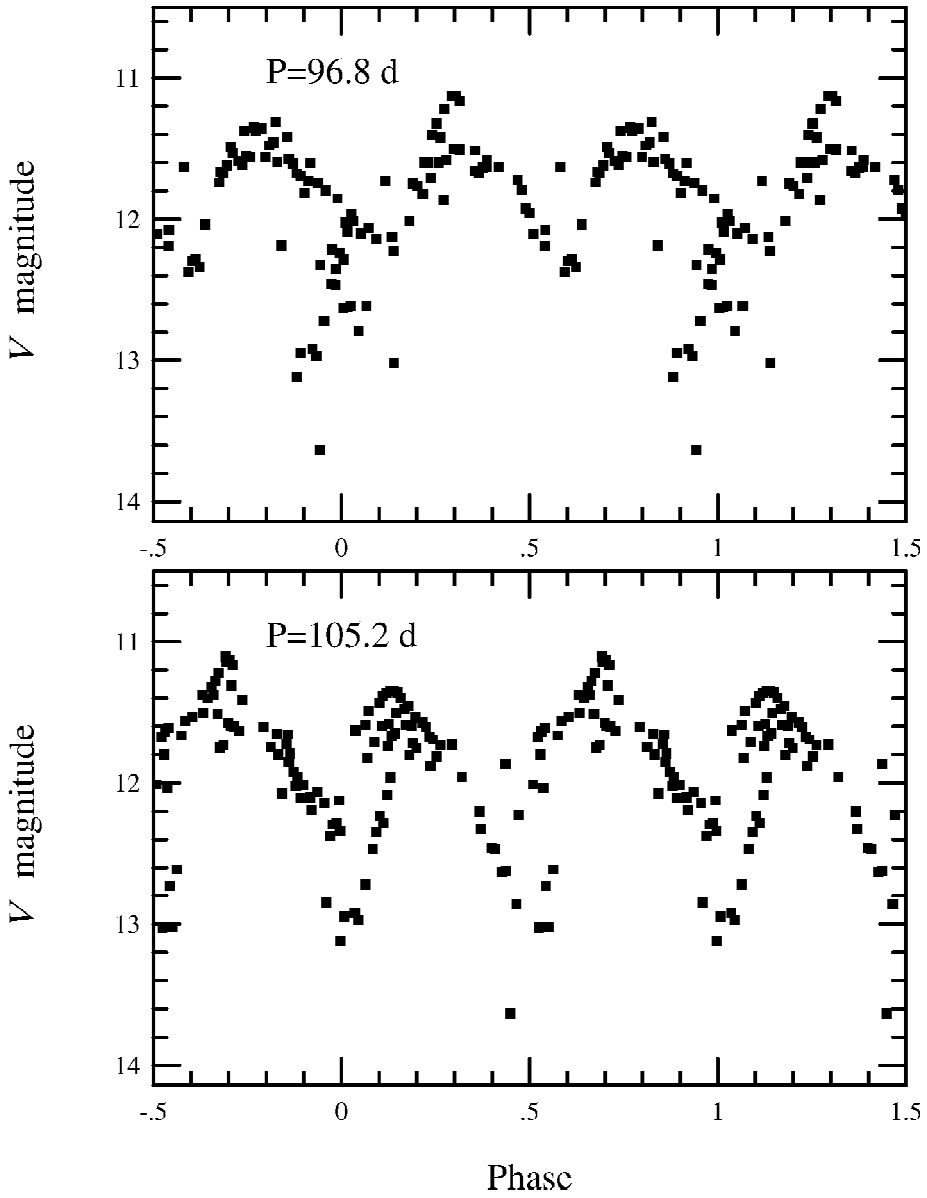

Fig.3 Folded light curves of V1899 Sgr.

Neither of the candidate periods strictly represented the light variation, which indicates that the variation of V1899 Sgr intrinsically contains some degree of irregularity. While the assumed period 2P = 96:8 d yielded a scattered low-brightness points over a wide range of phases, the assumed period of 2P = 105:2 d gives a better and reasonable concentration of these low-brightness points. This trend re°ects that the ¯rst recorded pulsation (Figure 1) had a larger amplitude than in the later ones. Since some RV Tau stars are known to show occasional deep primary minima,[1] this deep minimum in conjunction with the minimum phase is in reasonable agreement with the RV Tau-type behavior.

Since the star is recorded conspicuously bright neither in IRAS PSC nor 2MASS public images. This absence of strong infrared excess likely rules out the possibility of a very cool pulsator or an post-AGB object experiencing a heavy mass-loss.

We are grateful to G. Pojmanski for making the ASAS-3 survey data pub-

[1] See e.g. R Sct: http://www.kusastro.kyoto-u.ac.jp/vsnet/gcvs/SCTR.html

licly available, and generously allowing us for unlimited usage. This work is partly supported by a grant-in-aid (13640239, 15037205) from the Japanese Ministry of Education, Culture, Sports, Science and Technology.

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[1] Kholopov, P. N., Samus', N. N., Frolov, M. S., Goranskij, V. P., Gorynya, N. A., Kireeva, N. N., Kukarkina, N. P., Kurochkin, N. E. et al., 1985, General Catalogue of Variable Stars, fourth edition (Moscow: Nauka Publishing House)

[2] Pojmanski, G. 2002, Acta Astronomica, 52, 397

[3] Stellingwerf, R. F., 1978, ApJ, 224, 953

UW Aqr is a Variable Star

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Abstract

We studied the ASAS-3 V-band observations of the CST star UW Aqr. The object is confirmed to be a variable star, likely a semiregular variable with a period about 220 d.

UW Aqr was reported to be L? type variable star (SVS 2633, 12.0–13.6p) by Kurochkin (1986). Although Kurochkin (1986) presented a finding chart, no detailed observations nor description of its variability was reported. The object has been registered as "constant" (CST) in the General Catalogue of Variable Stars (Kholopov et al. 1985).

However, we noticed that the object is identified with a very red star DO 7714 = IRAS 22040−0040 = TMSS 00514 = RAFGL 5666S. The IRAS colors places the object a location where variable stars with young oxygen-rich circumstellar shells are populous. We studied variability of this object using the ASAS-3 survey data (Pojmanski 2002), and confirmed that the object is indeed variable (Figure 1).

The extreme range of variability was $V = 10.8$–11.8. From the continuously observed segment of the data, we can put a safer variability range of $V = 11.3$–11.7. In any case, the variability of the object is confirmed. From the observed light curve, the object is more likely a semiregular variable with a period about 220 d, rather than an irregular variable as originally proposed by Kurochkin (1986).

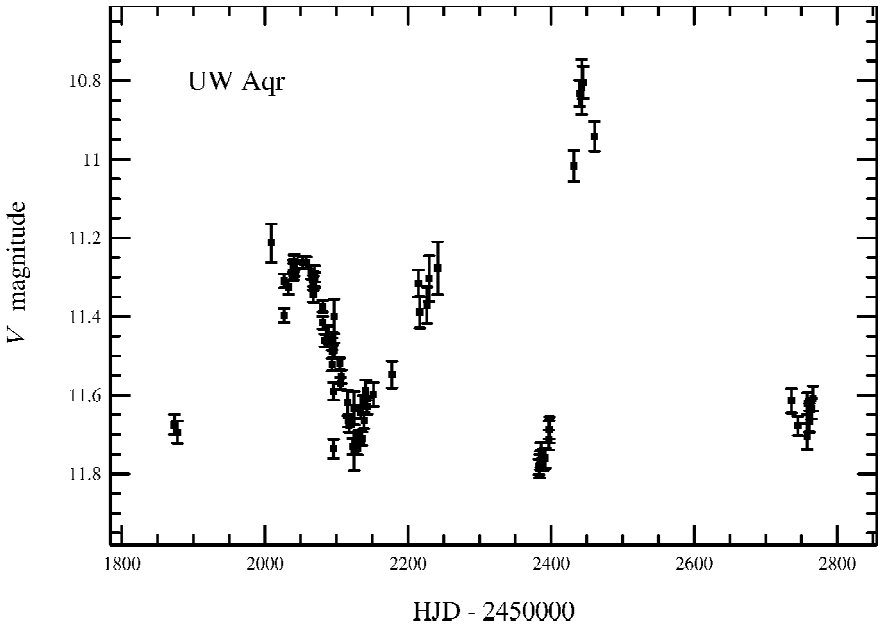

Fig.1 V-band light curve of UW Aqr drawn fromthe ASAS-3 public data.

We are grateful to G. Pojmanski for making the ASAS-3 survey data publicly available, and generously allowing us for unlimited usage. This work is partly supported by a grant-in-aid (13640239, 15037205) from the Japanese Ministry of Education, Culture, Sports, Science and Technology.

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[1] Kholopov, P. N., Samus', N. N., Frolov, M. S., Goranskij, V. P., Gorynya, N. A., Kireeva, N. N., Kukarkina, N. P., Kurochkin, N. E. et al., 1985, General Catalogue of Variable Stars, fourth edition (Moscow: Nauka Publishing House)

[2] Kurochkin, N. E., 1986, Perem. Zvezdy, 22, 327

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ZZ Aqr is a Semiregular Variable Resembling Z UMa

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Abstract

We studied the ASAS-3 V-band observations of the poorly known variable star ZZ Aqr. We report that ZZ Aqr is likely an SRB-type variable resembling Z UMa.

ZZ Aqr was originally discovered as a variable star by Beljawsky (1928). The object was rediscovered by Kurochkin (1986); the reported elements were: L? type, range 12.8{14.1p. Kurochkin (1986) reported that the maxima could be explained by a period of 168 d, although the period analysis yieled period candidates of 177 and 72 d. The object has been registered as unclassi¯ed in the General Catalogue of Variable Stars (Kholopov et al. 1985).

We studied variability of this object using the ASAS-3 survey data (Pojmanski 2002), and con¯rmed that the object is indeed variable (Figure 1).

The range of variability was $V = 11.2\{12.3$. We could con¯rm the 170-d periodicity, which corresponds to the longer period reported by Kurochkin (1986). From the observed light curve, the object probably showed alternating deep and shallow minima (or bright and faint maxima), which was probably the cause of double periodicity inferred by Kurochkin (1986). Among pulsating variables with alternating minima, the SRD and RV types would be safely excluded based on the red color of ZZ Aqr (Tycho-2 $B - V = +1.7$). The light behavior resembles that of a rather regular SRB-type variable Z UMa[2] with a mean period of 195.5 d.

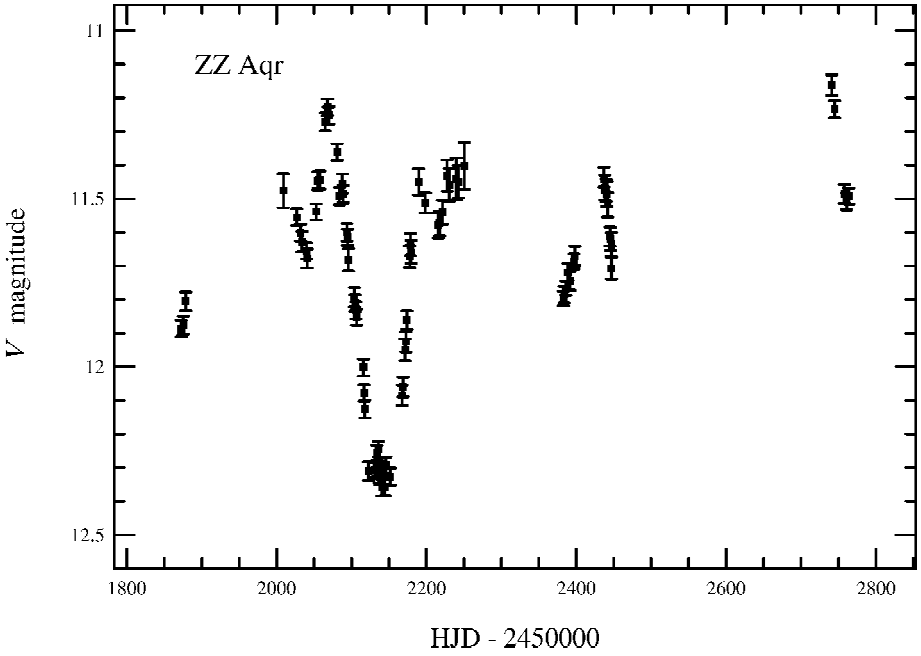

Fig.1 V-band light curve of ZZ Aqr drawn from the ASAS-3 public data.

We are grateful to G. Pojmanski for making the ASAS-3 survey data publicly available, and generously allowing us for unlimited usage. This work is partly supported by a grant-in-aid (13640239, 15037205) from the Japanese Ministry of Education, Culture, Sports, Science and Technology.

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[2] e.g. http://www.kusastro.kyoto-u.ac.jp/vsnet/gcvs/UMAZ.html

[3] Kurochkin, N. E., 1986, Perem. Zvezdy, 22, 327

[4] Pojmanski, G. 2002, Acta Astronomica, 52, 397

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