British Astronomical Association

VARIABLE STAR SECTION CIRCULAR

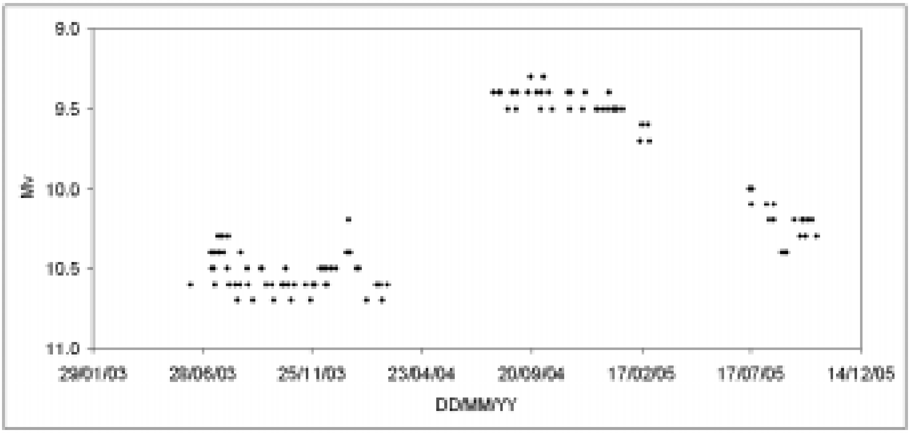
No 126, December 2005

Contents

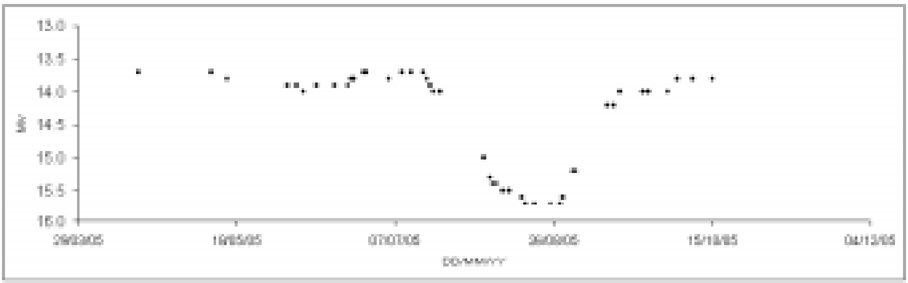
Light Curves .... inside front cover
From the Director 1
Recurrent Objects Programme News.. 6
CG Draconis, a Particularly Active Dwarf Nova................................. 8
Hidden Magnetic Accretors in V426 Ophiuchi and LS Pegasi 10
BAAVSS OJ+287 Observing Campaign 13
Chart News 14
A New Eclipsing Variable in Lyra 16
A Stroke of Luck.. 19
Some Observations of RR Lyrae in August/September, 2005 21
Binocular Priority List 29
Eclipsing Binary Predictions 29
Light Curves .... inside back cover

ISSN 0267-9272

Office: Burlington House, Piccadilly, London, W1V 9AG



Cover Figure 1, Observations of Z And by Gary Poyner 2003-2005



Cover Figure 2, Observations of an eclipse of V1413 Aql, made by Gary Poyner

FROM THE DIRECTOR

ROGER PICKARD

Changes to the Programmes

At a recent Officers Meeting it was agreed that we should make some amendments to the list of programme stars. Although some stars have been deleted, observers are still advised to monitor them occasionally, to check for possible outbursts or other unusual behaviour.

The following Novae have all been deleted from the Telescopic Programme:

V1493 Aql	N1999
V705 Cas	N1993
V1819 Cyg	N1986
V2275 Cyg	N2001
PW Vul	N1984
QU Vul	N1984
QV Vul	N1987

Charts

I'm pleased to advise that many more charts are now available on the VSS website at **http://www.britastro.com/vss/chartcat/wfb.php**. Hopefully, by the time you read this, the charts that John Toone mentions in this Circular will also be on the web.

All reasonably well-drawn, and specifically, all charts that are numbered xxx.xx, are now available on-line. They have been listed by constellation, and the following information may assist in deciphering the particular chart reference.

Where a chart is named UU Aql 9d 002.02.gif, for example, the star designation is followed by the constellation (except in the case of objects such as Markarian509). Where applicable, the chart size is then shown. In this case it is a 9 degree chart, but other examples might be 20m for a 20 minute chart. Where there is only one chart for a particular variable, the size is not given. Next comes the standard notation adopted for more modern VSS charts i.e. xxx.xx. If this notation is not given and the chart only has a date, then this is not given. It will be necessary to look at the chart itself, to see the date. In addition, where a chart has more than one Section variable on it, each chart is now listed separately. This has also been done to keep the chart name to a manageable length.

I hope this will enable observers to keep up-to-date more easily with the latest version of Section charts, which will continue to be announced via the Circulars and electronically via BAAVSS-alert. To minimise the download time, charts have only been scanned at a low resolution, but this should suffice. However, if observers wish to obtain high quality paper charts they can do so by applying to the Chart Secretary in the usual way (preferably enclosing a large sae).

Star	Const	Chart Size	Chart Ref
EG	And		072.01.gif
LS	And		116.02.gif
R	And	10m	053.01.gif
R	And	1d	053.01.gif
R	And	3d	053.01.gif
R	And	9d	053.01.gif
R	And	Seq	053.01.gif
RW	And	1d	022.01.gif
RW	And	3d	022.01.gif
RW	And	9d	022.01.gif
RX	And	1d	001.03.gif
RX	And	20m	001.03.gif
RX	And	9d	001.03.gif
V402	And		239.02.gif
W	And	1d	035.01.gif
W	And	20m	035.01.gif
W	And	3d	035.01.gif
W	And	9d	035.01.gif
Z	And		095.01.gif
CI	Aql		260.01.gif
R	Aql	1d	030.02.gif
R	Aql	9d	030.02.gif
UU	Aql	1d	002.02.gif
UU	Aql	20m	002.02.gif
UU	Aql	5m	002.02.gif
UU	Aql	9d	002.02.gif
UW	Aql	2d	028.01.gif
UW	Aql	9d	028.01.gif
V	Aql		026.03.gif
V1293	Aql		070.01.gif
V1294	Aql		070.01.gif
V450	Aql		070.01.gif
Markarian509Aqr			Mark509 Aqr.gif
R	Aqr	1d	096.01.gif
R	Aqr	9d	096.01.gif
AR	Aur		283.01.gif
EO	Aur		283.01.gif
LY	Aur		283.01.gif
SS	Aur	20m	003.03.gif
SS	Aur	3d	003.03.gif
UU	Aur		230.01.gif
UV	Aur	1d	074.02.gif
UV	Aur	3d	074.02.gif

Star	Const	Chart Size	Chart Ref
RV	Boo		104.01.gif
RW	Boo		104.01.gif
RX	Boo		219.01.gif
U	Boo	1d	036.02.gif
U	Boo	5d	036.02.gif
V	Boo	3d	037.01.gif
V	Boo	9d	037.01.gif
ZZ	Boo		252.01.gif
ST	Cam		111.01.gif
U	Cam		100.01.gif
V	Cam	1d	027.01.gif
V	Cam	20m	027.01.gif
V	Cam	3d	027.01.gif
V	Cam	9d	027.01.gif
X	Cam	1d	038.02.gif
X	Cam	20m	038.02.gif
X	Cam	3d	038.02.gif
XX	Cam		068.01.gif
Z	Cam	30m	004.03.gif
Z	Cam	3d	004.03.gif
DK	Cas		257.01.gif
Gam	Cas		064.01.gif
Rho	Cas		064.01.gif
RZ	Cas		236.01.gif
S	Cas	10m	054.01.gif
S	Cas	1d	054.01.gif
S	Cas	3d	054.01.gif
S	Cas	9d	054.01.gif
T	Cas	1d	067.01.gif
T	Cas	3d	067.01.gif
UV	Cas	25m	061.01.gif
UV	Cas	3d	061.01.gif
V452	Cas		118.03.gif
V465	Cas		233.01.gif
V630	Cas		185.02.gif
WZ	Cas		WZ Cas.gif
TW	Cas		273.01.gif
AR	Cep		AR Cep.gif
MisV1147Cep			272.01.gif
RU	Cep		RU Cep.gif
U	Cep		279.01.gif
Omi	Cet	60d	039.02.gif
Omi	Cet	9d	039.02.gif
SS	Cet		SS Cet.gif

Star	Const	Chart Size	Chart Ref
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W	CMa		213.02.gif
GY	Cnc		268.01.gif
OJ287	Cnc		251.01.gif
RS	Cnc		269.01.gif
X	Cnc		231.01.gif
R	Com	1d	212.01.gif
R	Com	9d	212.01.gif
W	Com		148.03.gif
R	Crb	18d	041.03.gif
R	CrB	1d	041.03.gif
R	CrB	20m	041.03.gif
R	Crb	9d	041.03.gif
RR	CrB		220.01.gif
S	CrB	1d	043.01.gif
S	CrB	9d	043.01.gif
SW	CrB		220.01.gif
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T	CrB	50d	025.02.gif
T	CrB	9d	025.02.gif
U	CrB	5d	254.01.gif
V	CrB	1d	057.01.gif
V	CrB	3d	057.01.gif
W	CrB	1d	044.01.gif
W	CrB	20m	044.01.gif
W	CrB	3d	044.01.gif
TT	Crt	1d	191.02.gif
TT	Crt	20m	191.02.gif
NGC4151CVn			NGC4151.gif
RS	CVn		253.01.gif
TU	CVn		215.01.gif
TX	CVn		078.01.gif
V	CVn		214.02.gif
Y	CVn		215.01.gif
BC	Cyg	1d	065.01.gif
BC	Cyg	6d	065.01.gif
BF	Cyg		088.03.gif
BI	Cyg	1d	065.01.gif
BI	Cyg	6d	065.01.gif

Star	Const	Chart Size	Chart Ref
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CH	Cyg	9d	089.02.gif
Chi	Cyg	1d	045.01.gif
Chi	Cyg	20m	045.01.gif
Chi	Cyg	3d	045.01.gif
Chi	Cyg	9d	045.01.gif
Chi	Cyg	Seq	045.01.gif
CI	Cyg	30m	006.01.gif
CI	Cyg	3d	006.01.gif
EM	Cyg		216.02.gif
R	Cyg	1d	031.01.gif
R	Cyg	20m	031.01.gif
R	Cyg	3d	031.01.gif
R	Cyg	9d	031.01.gif
S	Cyg	1d	032.01.gif
S	Cyg	20m	032.01.gif
S	Cyg	3d	032.01.gif
SS	Cyg	1d	005.03.gif
SS	Cyg	5d	005.03.gif
TT	Cyg		227.01.gif
V	Cyg	1d	034.01.gif
V	Cyg	20m	034.01.gif
V1016	Cyg		092.01.gif
V1316	Cyg		249.01.gif
V1329	Cyg		093.01.gif
V1363	Cyg		176.02.gif
V2176	Cyg		241.01.gif
V973	Cyg		232.01.gif
W	Cyg		062.03.gif
EU	Del		228.01.gif
U	Del		228.01.gif
AB	Dra	20m	007.04.gif
AB	Dra	3d	007.04.gif
AG	Dra		080.02.gif
AH	Dra		106.01.gif
AI	Dra		284.01.gif
AT	Dra		106.01.gif
BH	Dra		285.01.gif
CG	Dra		262.01.gif
CP	Dra		258.01.gif
DV	Dra		263.01.gif
KV	Dra		264.01.gif
RY	Dra		225.01.gif
T	Dra	1d	046.01.gif

Star	Const	Chart Size	Chart Ref
T	Dra	3d	046.01.gif
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Z	Dra		Z Dra.gif
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IR	Gem	10m	042.02.gif
IR	Gem	20m	042.02.gif
IR	Gem	3d	042.02.gif
NQ	Gem		077.01.gif
RW	Gem		RW Gem.gif
U	Gem	1d	008.03.gif
U	Gem	20m	008.03.gif
U	Gem	3d	008.03.gif
U	Gem	9d	008.03.gif
AC	Her		048.03.gif
AH	Her	1d	009.04.gif
AH	Her	20m	009.04.gif
g (30)	Her		224.02.gif
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RU	Her	3d	060.01.gif
SS	Her	1d	047.01.gif
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SS	Her	3d	047.01.gif
SS	Her	9d	047.01.gif
ST	Her		223.01.gif
SX	Her		113.01.gif
UW	Her		107.01.gif
V1008	Her		238.01.gif
V443	Her		086.01.gif
V478	Her		259.01.gif
V589	Her		266.01.gif
V660	Her		237.01.gif
YY	Her		084.01.gif
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U	Hya		109.01.gif
BL	Lac		242.01.gif
SU	Lac	20m	069.01.gif
SU	Lac	3d	069.01.gif
SX	Lac		235.01.gif
RY	Leo	1d	222.01.gif
RY	Leo	9d	222.01.gif

Star	Const	Chart Size	Chart Ref
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NSV4031	Lyn		275.01.gif
SV	Lyn		108.01.gif
Y	Lyn		229.01.gif
AY	Lyr	15m	011.02.gif
AY	Lyr	1d	011.02.gif
Beta	Lyr		Beta Lyr.gif
V358	Lyr		240.01.gif
BX	Mon		076.01.gif
U	Mon		029.03.gif
RS	Oph	1d	024.02.gif
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X	Oph		099.01.gif
BL	Ori		211.01.gif
CK	Ori		221.01.gif
CN	Ori	20m	012.03.gif
CN	Ori	3d	012.03.gif
CZ	Ori	15m	013.03.gif
CZ	Ori	3d	013.03.gif
U	Ori	15m	059.02.gif
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U	Ori	5d	059.02.gif
V650	Ori		256.01.gif
W	Ori		105.01.gif
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EE	Peg		245.01.gif
GO	Peg		103.01.gif
IP	Peg	10m	186.03.gif
IP	Peg	30m	186.03.gif
IP	Peg	9d	186.03.gif
RU	Peg	1d	014.02.gif
RU	Peg	20m	014.02.gif
RU	Peg	9d	014.02.gif

Star	Const	Chart Size	Chart Ref	Star	Const	Chart Size	Chart Ref
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BU	Per		063.01.gif	RV	Tau	3d	056.01.gif
GK	Per		30m.gif	RV	Tau	9d	056.01.gif
GK	Per		3d.gif	RW	Tau		RW Tau.gif
GK	Per		seq.gif	SU	Tau	10m	017.03.gif
IQ	Per		246.01.gif	SU	Tau	1deg	017.03.gif
S	Per	1d	050.01.gif	CE	Tau		CE Tau.gif
S	Per	3d	050.01.gif				
ST	Per		ST Per.gif	W	Tri		114.01.gif
TZ	Per	10m	015.03.gif	X	Tri		X Tri.gif
TZ	Per	1d	015.03.gif				
UV	Per	20m	016.04.gif	CH	UMa	1d	020.02.gif
UV	Per	5m	016.04.gif	CH	UMa	20m	020.02.gif
V336	Per		267.01.gif	CH	UMa	9d	020.02.gif
X	Per		277.01.gif	Mark421	UMa		243.01.gif
Z	Per		Z Per.gif	RY	UMa		217.01.gif
				ST	UMa		102.01.gif
TX	Psc		276.01.gif	SU	UMa	20m	018.03.gif
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				SW	UMa	20m	019.02.gif
Lan17	Sct	20m	234.01.gif	SW	UMa	9d	019.02.gif
Lan17	Sct	3d	234.01.gif	T	UMa	1d	066.01.gif
R	Sct		026.03.gif	T	UMa	9d	066.01.gif
S	Sct		026.03.gif	TV	UMa		271.01.gif
				TX	UMa		288.01.gif
FG	Ser	1d	085.03.gif	VW	UMa		226.01.gif
FG	Ser	20m	085.03.gif	VY	UMa		226.01.gif
R	Ser	1d	033.01.gif	W	UMa		248.01.gif
R	Ser	9d	033.01.gif	Z	UMa		217.01.gif
R	Ser	seq	033.01.gif				
Tau4	Ser		209.01.gif	V	UMi		101.01.gif
				Z	UMi	10m	250.01.gif
FG	Sge	15m	203.02.gif	Z	UMi	1d	250.01.gif
FG	Sge	1d	203.02.gif				
HM	Sge		090.01.gif	3C273	Vir		244.01.gif
QW	Sge		091.01.gif	3C279	Vir	15m	151.02.gif
SV	Sge	10m	071.02.gif	3C279	Vir	1d	151.02.gif
SV	Sge	30m	071.02.gif	BK	Vir		270.01.gif
U	Sge		287.01.gif	SS	Vir		097.01.gif
WZ	Sge	1d	023.01.gif	SW	Vir		098.01.gif
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WZ	Sge	3d	023.01.gif	PU	Vul	30m	052.01.gif
WZ	Sge	9d	023.01.gif	PU	Vul	9d	052.01.gif
				V	Vul	3d	058.01.gif
HU	Tau		247.01.gif	V	Vul	9d	058.01.gif
Lam	Tau		Lam Tau.gif	Z	Vul		255.01.gif

RECURRENT OBJECTS PROGRAMME NEWS

Gary Poyner

Changes to the Programme

Due to an extended campaign to monitor the Dwarf Nova CG Dra during 2005, and the discovery that this object is a frequent faint outbursting DN, it has been decided to drop CG dra from the ROP forethwith. See elsewhere in this Circular for details on CG Dra's activity during 2005.

The complete ROP can be seen on the web at...
http://www.garypoyner.pwp.blueyonder.co.uk/rop.html

ROP Highlights

V452 Cas

A rare outburst of the UGSU star V452 Cas was detected by CCD on September 23.915 UT by Jeremy Shears at magnitude 15.8C as shown in the image in figure 1 below, and

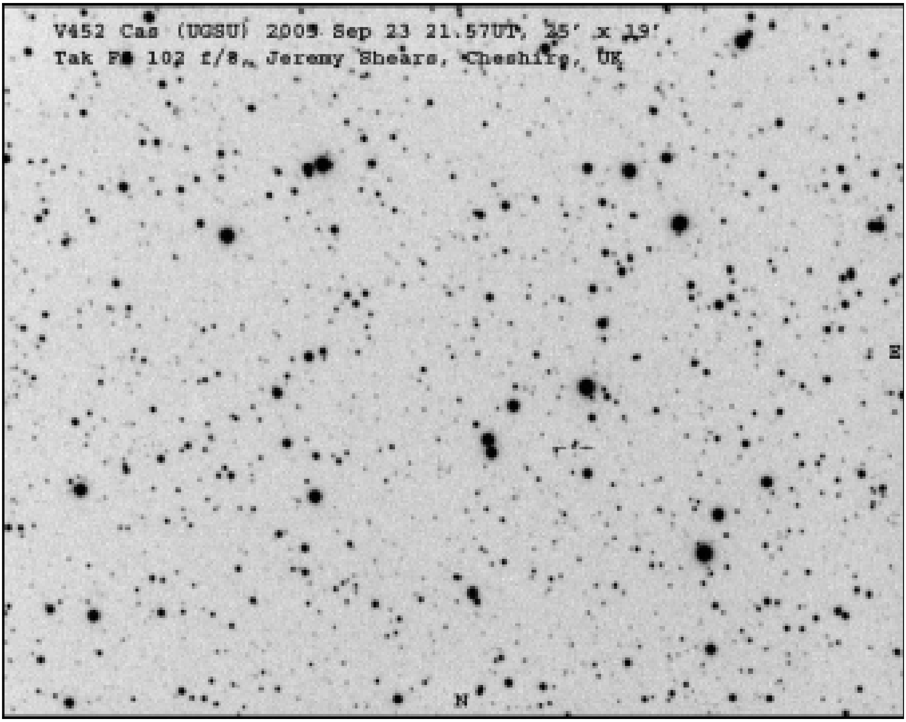

Figure 1, Image taken of V452 Cas by Jeremy Shears

was confirmed by G. Poyner on September 23.988 UT at 15.5 visual. This was the first recorded outburst detected since September 2000. Unfortunately, CCD photometry was not forthcoming, but comparing the duration and magnitudes of this outburst to the 1999 superoutburst, it would appear that this was probably a normal outburst. The star had risen to 15.3 visual by September 28.07, and had faded to 16.0C by Sep 30.93.

V402 And (formerly known as var62 And)

A rare outburst of the UGSU star V402 And was detected by CCD on October 25.889 UT again by Jeremy Shears at magnitude 16.6C (see Figure 2 below). This was the first outburst recorded and confirmed since September 2000 (we did have an unconfirmed observation during October 2003). At the time of writing (October 30) the outburst is still ongoing. The magnitude peaked at 15.2V on October 29/30.

The UGSU status was confirmed during the 2000 outburst when combined data from Jochen Pietz and the Kyoto team determined the superhump period as 0.06336d [vsnet-campaign-dn 164]

A complete list of outbursts during 2005 will appear in the March 2006 VSSC.

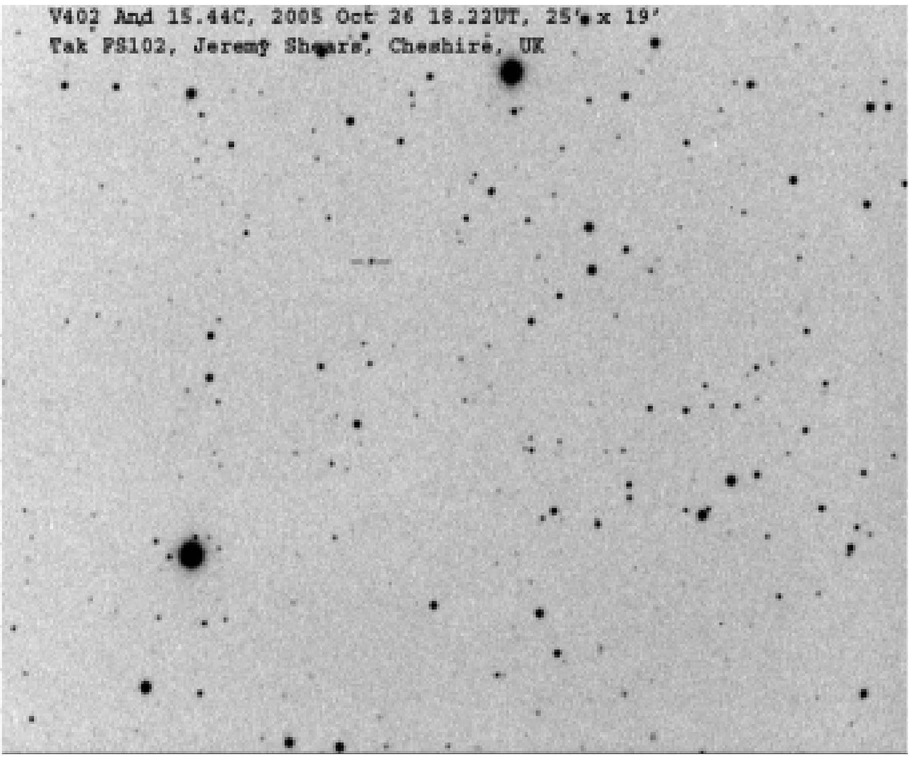

Figure 2, Image taken by Jeremy Shears of V402 And in outburst

CG DRACONIS – A PARTICULARLY ACTIVE DWARF NOVA

JEREMY SHEARS

CG Dra is believed to be a U Gem type Dwarf Nova, whose discovery was announced by Hofmeister in 1965. In a later paper, Hofmeister suggested that CG Dra may be a member of the CN Ori group: this group comprises dwarf novae which exhibit rapid sequences of outbursts without well defined quiescent states in between the outbursts. However, very few observations of this star existed , so that the outburst behaviour was poorly characterised. A report in IBVS 5124 by astronomers at Kyoto University, which was based on a campaign in 1996, suggested an outburst frequency of less than 82 days. This was based on two observed outbursts, although the observational data was limited, and each outburst was only caught during the declining phase.

CG Dra was added to the ROP by Gary Poyner in 200; it is also on the VSS CCD observing programme, whose aim is to encourage people to take up CCD photometry.

CG Dra was detected in outburst by Jeremy Shears on 2005 April 9 at 16.09C, as shown in Figure 1 below. Subsequently, an intensive observing campaign has been

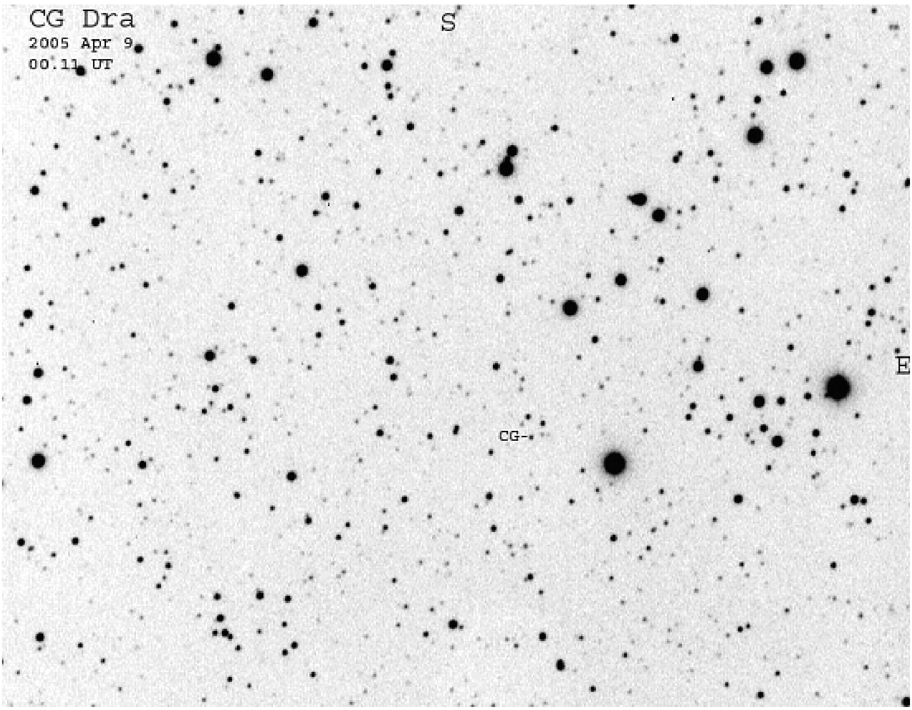

Figure 1, CG Dra in outburst, Jeremy Shears, 2005 April 9, 00.11UT. Takahashi FS102, 0.1 mm refractor, unfiltered CCD. Field 25’ x 19’

mounted by several observers, including David Boyd, Roger Pickard, Gary Poyner (visual) and Jeremy Shears. The lightcurve in Figure 2 below, shows that several outbursts have been detected during the period April 9th to October 21st. In the second half of the observing period, there is the suggestion of an outburst period of 10 to 15 days. It is not clear whether there were less frequent outbursts in the first half, or whether outbursts were missed due to incomplete coverage. The fact that CG Dra is particularly active, and seems to spend little time in quiescence supports Hofmeister's idea that this may be a CN Ori star.

Time-resolved CCD photometry conducted by Boyd, Pickard, Shears and Vanmunster (CBA Belgium) has shown small-amplitude flickering. However, there is an intriguing hint of a 0.1 magnitude dip of 20 to 30 minutes duration in some of the data. Whilst there are many possible explanations, one is that the dip might be caused by (partial) eclipses. This needs to be investigated by further photometric runs covering multiple orbital periods; the orbital period is currently uncertain, however. One source [1] reports possible periods of 4h 32m or 5h 32m, although even these are unreliable; hence long photometric runs may be required to confirm or refute this hypothesis.

In view of the high frequency of outbursts, CG Dra will be dropped from the ROP (which is meant for stars having outburst periods of more than a year). However, CG Dra remains an intriguing star and fully warrants further attention from both visual and CCD observers.

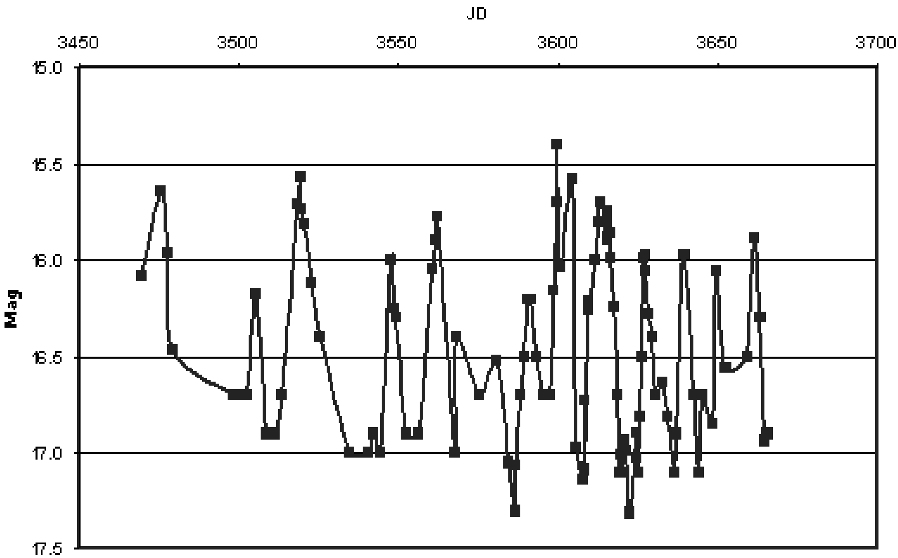

Figure 2. Light curve of CG Dra: Combined CCD and visual data from VSS and AAVSO QL. 2005 Apr 9 to Oct 21

References

[1] Bruch et al, Astron. Astrophys. 325, 601,1997

HIDDEN MAGNETIC ACCRETORS IN V426 OPHIUCHI AND LS PEGASI

DARREN BASKILL

Here I present an update to my article in the June 2005 BAA-VSS Circular (no. 124). I will discuss both the results of the XMM-Newton observation of LS Pegasi, and ask observers to monitor V426 Ophiuchi throughout the upcoming spring. This article is also a brief summary of the talk I presented at the August VSS meeting, held at the University of Sussex.

To summarise my previous article, after looking through a sample of 30 cataclysmic variables where the white dwarf has essentially no magnetic field, we discovered two unusual objects, LS Peg and V426 Oph. Their X-ray spectra implied that the white dwarves in these two systems were magnetic, but the expected strong periodic modulation was not observed, and this is currently the only accepted method of verifying a magnetic white dwarf in a cataclysmic variable.

Results from the XMM-Newton Observation of LS Pegasi

LS Peg was observed by XMM-Newton for 12 hours on the 8th of June, 2005. Unfortunately, the first half of the observations suffered greatly from solar activity.

Just prior to the beginning of the XMM-Newton observation, a solar storm started around the Earth, caused by a coronal mass ejection from a lone sunspot complex the previous day. Unfortunately, observing with space telescopes cannot be a guarantee of good (space) weather! The solar-storm caused the X-ray cameras to detect many false X-ray events, up to 100 times the number we would otherwise have expected.

However, not all is lost. If the increase in false X-ray detections is uniform across the camera, we can measure this increase from a blank patch of sky (within the 30 arc-minute field of view of the camera), and then subtract that from the X-rays emitted from the direction of LS Peg. Of course, this is still not an ideal situation - instead of looking for one real X-ray every second, with a low background, we are now searching for one real X-ray above the 100 background X-rays caused by the solar activity. However, this still allows us to carry out both spectral and temporal analysis, with fascinating results.

The weakly periodic modulation that was detected in the 1998 observation of LS Peg with the Japanese X-ray observatory ASCA, cannot be seen in this (improved) XMM-Newton observation. However, the X-ray spectrum of LS Peg looks like that of other magnetic systems, where periodic modulations have also been observed.

Recall that we were expecting to confirm the magnetic nature of LS Peg by detecting a much stronger periodic signal with XMM-Newton than we did with ASCA; instead, we have a much more interesting situation, in which XMM-Newton has discovered an apparent contradiction: a spectrum that looks like it is from gas falling onto a magnetic white dwarf, but a temporal signal that appears to originate from a non-magnetic white dwarf. How can we resolve this apparent contradiction?

Such a result could be explained by the geometry of the white dwarf with respect to the surrounding accretion disc. When the magnetic axis of the white dwarf is inclined to the plane of the accretion disc, the accretion flow naturally causes a modulation at the rotational frequency of the white dwarf - a modulation between geometry (a) and (b) shown in Figure 1 on the next page. However, if the magnetic field axis is aligned close to perpendicular to the accretion disc plane, no such modulation would be observed (c).

Looking forward to Observing V426 Ophiuchi

V426 Ophiuchi was some 15 times brighter than LS Pegasi at X-raywavelengths, during the ASCA observations. Our XMM-Newton observation ofV426 Oph will allow us to carry out phase-resolved spectrometry; that is, we will be able to compare the X-ray spectra of the numerous viewing angles that we naturally have as the two stars orbit each other. This, along with V426 Ophiuchi's relatively high inclination of 60 degrees, will allow us to search for vertical structure above and around the accretion disc. But the primary question is this: will we clearly see the periodic modulation that was hinted at in the ASCA observation? If we do, it could settle the published claims and counter-claims that this system is indeed an intermediate polar.

V426 Ophiuchi is currently due to be observed in late February, 2006; see the XMM-Newton Science Operations Centre (SOC) webpage for the latest timetables at:
http://xmm.vilspa.esa.es/external/xmm_sched/index.shtml

Unfortunately, V426 Oph does not rise in late February until midnight, and so it is best observed during the early mornings. I would appreciate optical observations at least a few weeks either side of the XMM-Newton observation, in order to appreciate the behaviour of the star around the observations. More intense optical observations on the day leading up to, and during, the X-ray observations may allow me to correlate any optical variations with (later) X-ray variations (as the gas falls through the disc, it changes colour from optical through to the X-ray). Your help is greatly appreciated!

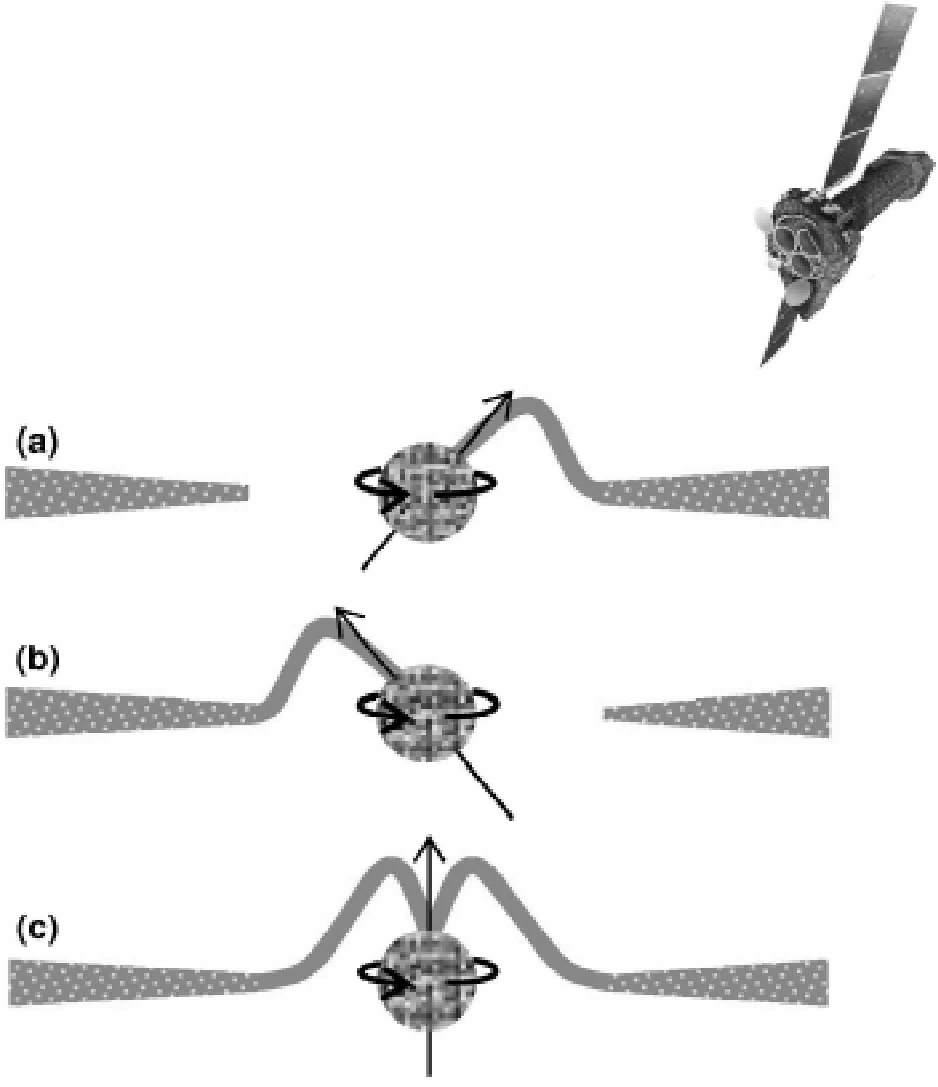

Figure 1, Possibile geometries for the system

BAAVSS OJ+287 OBSERVING CAMPAIGN

GARY POYNER

At *The Astronomer* AGM held on Saturday October 22nd, I had the opportunity to chat with Dr. Mark Kidger (Instituto de Astrofisica de Canarias) about the predicted 2006 outburst of the Blazar OJ+287.

Mark is keen to see a visual/CCD observing campaign start as soon as possible on this object, and comments...

I think that it would be useful to have weekly reports initially. I'll set up a web page for this and for the light curves. That way we can see trends. If the outburst is like the last three, the quasar will be rising for several weeks, and possibly months before peaking, so it will be the trend in the data that is important. This object is well-known for its fast flares, going up as much as a magnitude in a few days, and then fading again. These flares typically last 7-10 days, and are easy to confuse with the real thing without looking at the overall light curve. Before the last outburst, we also had a precursor where the object varied by a magnitude in about an hour at maximum.

The BAAVSS will therefore be starting an immediate observing campaign on OJ287 with myself coordinating and reporting observations to Mark's database. The observing campaign will last until the end of 2006 at least!

Observations can be sent either nightly or weekly to my e-mail address, and in the following simple format:

2005					
Dec 31.999	10(2)v(2)11	14.8	35cm SCT	visual	G. Poyner
Dec 31.999		14.79	30cm SCT	CCD+V	R. Pickard

Please send OJ287 observations separately to any observations you may submit to the TA Variable Star pages.

BAAVSS charts are available in both normal inverted view and reversed view for SCT users. BAAVSS-ALERT group members can download (21k) gif charts from the files section on the Yahoo groups web pages. For those who are not members of the group and would like a chart, let me know and I'll get one to you either by e-mail or post if preferred. Please only use the BAAVSS charts for this observing campaign.

CCD observers may also be interested in details of a c multi-wavelength campaign which is currently active:

http://www.astro.utu.fi/OJ287MMVI/XMMcampaign.html

CHART NEWS

JOHN TOONE

The following new charts are now available from the Chart and Eclipsing Binary Secretaries:

Telescopic Stars

281.01 NSV24897 Aql
No BAAVSS chart previously existed for this variable star, discovered by Mike Collins in 1989, which was provisionally identified as TASV1946+00. A 30' field chart has been drawn, and includes a V sequence using Tycho 2, Boyd and Pickard photometry.

191.02 TT Crt
This was formerly chart 191.01. New 1 degree and 20' field charts have been drawn. The sequence has been revised to adopt Henden V magnitudes. Comparison stars C and D have been dropped, and comparisons K, L, M, N and P have been added.

282.01 V2303 Oph
No BAAVSS chart previously existed for this variable star, discovered by Mike Collins in 1993, which was provisionally identified as TAV1836+11. A 30' field chart has been drawn which includes a V sequence photometry from Boyd and Pickard.

071.02 SV Sge
This was formerly 071.01. New 30' and 10' field charts have been drawn. The sequence has been revised and extended at the faint end to adopt ASAS-3 and Henden V magnitudes. Comparisons A, B and M have been dropped, and comparisons W, X, Y, Z, P, R, S and T have been added.

280.01 V335 Vul
No BAAVSS chart previously existed for this variable star, discovered by Mike Collins in 1990, which was provisionally identified as TAV1921+24. A 30' field chart has been drawn which includes a V sequence using Tycho 2, Boyd and Pickard photometry.

Binocular Stars

214.02 V CVn
This was formerly 214.01. A new 9 degree field chart has been drawn. The sequence remains unchanged, but is adjusted to adopt Hipparcos Vj magnitudes.

224.02 g Her
This was formerly 224.01. A new 18 degree field chart has been drawn. The sequence remains unchanged, but is adjusted to adopt Hipparcos Vj magnitudes. FL30 has been dropped as the primary designation for this variable star.

Eclipsing Binary Stars

283.01 AR, EO and LY Aur
This was formerly 1984 Dec 24. A new 5 degree field chart has been drawn and Tycho

2 Vj has been adopted for the sequence. Comparisons E (double star), H (high B-V) and M (MZ Aur) have been dropped. Comparisons R (SAO58076), S (SAO58165) and (SAO57878) have been added.

273.01 TW Cas
This was formerly 1985 Jun 8. A new 9 degree field chart has been drawn. Comparisons A(SAO12338) and D (SAO12435) have been added. The sequence is now Tycho 2 Vj with the exception of B, where Hipparcos Vj gives a better fit visually according to the Eclipsing Binary Secretary.

279.01 U Cep
This was formerly 1994 Mar 13. A new 5 degree field chart has been drawn and Tycho 2 Vj has been adopted for the sequence. Comparisons H (high B-V) and I (NSV330) have been dropped. Comparisons K (SAO225) and L (SAO136) have been added.

274.01 TW Dra
This was formerly 1993 Oct 23. A new 9 degree field chart has been drawn and Tycho 2 Vj has been adopted for the sequence. Comparison G (SAO16720) has been added.

284.01 AI Dra
This was formerly 1971 Jul 17. A new 5 degree field chart has been drawn and Tycho 2 Vj has been adopted for the sequence. Comparison A has been replaced with W (SAO30112) to give a consistently coloured sequence.

285.01 BH Dra
This was formerly 1972 Jun 10. A new 3 degree field chart has been drawn. The sequence remains unchanged but is adjusted to adopt Tycho 2 Vj magnitudes.

286.01 S Equ
This was formerly 1972 Jun 10. A new 3 degree field chart has been drawn and Tycho 2 Vj has been adopted for the sequence. Comparisons A (double star) and C (high B-V) have been dropped. Comparison N (SAO126450) has been added.

275.01 NSV4031 Lyn
This was formerly 1987 Nov. A new 9 degree field chart has been drawn and Tycho 2 Vj has been adopted for the sequence. Comparison B (high B-V) has been dropped. Comparisons D (SAO42316) and F (SAO42333) have been added.

287.01 U Sge
This was formerly 1993 Jan 24. A new 4 degree field chart has been drawn. The sequence remains unchanged but is adjusted to adopt Tycho 2 Vj magnitudes.

288.01 TX UMa
This was formerly 1993 Jan 10. A new 6 degree field chart has been drawn and Tycho 2 Vj has been adopted for the sequence. Comparisons A (too bright), D (too close to A) and G (high B-V) have been dropped. Comparisons N (SAO43572) and H (GSC 3011 1164) have been added.

Thanks are due to Chris Jones who drew the charts for NSV24897 Aql, TW Cas, TW Dra, NSV4031 Lyn, V2303 Oph and V335 Vul.

A NEW ECLIPSING VARIABLE IN LYRA

David Boyd

Whilst carrying out V-filtered CCD photometry on MV Lyrae in July 2005, I noticed that one of the comparison stars on the AAVSO chart for MV Lyrae (dated 031019) appeared to be varying. This star is marked 131 on the chart, and is catalogued as GSC 3132 1448. Its position is RA 19h 06m 46.6s, Dec 44d 01m 46.3s (2000). Figure 1, below, shows the field near MV Lyrae with the star in question marked.

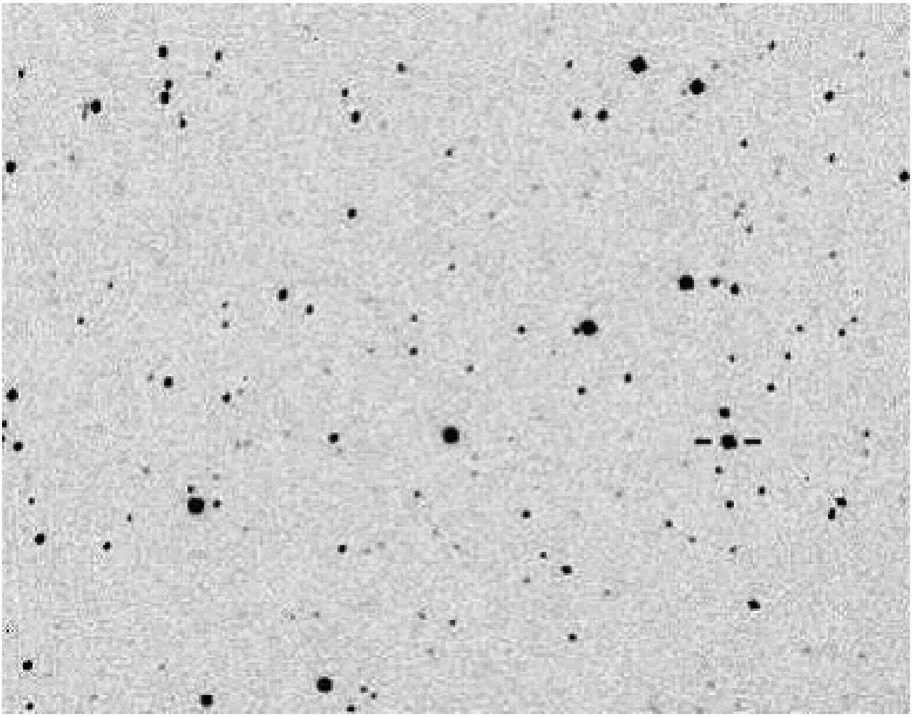

Figure 1, The star field surrounding MV Lyrae, with the suspected variable marked

The star's variability showed up because I was using an ensemble of stars as the comparison to MV Lyrae, and this particular star had a different magnitude within the ensemble each night. One night it changed noticeably over a period of 1.5 hours.

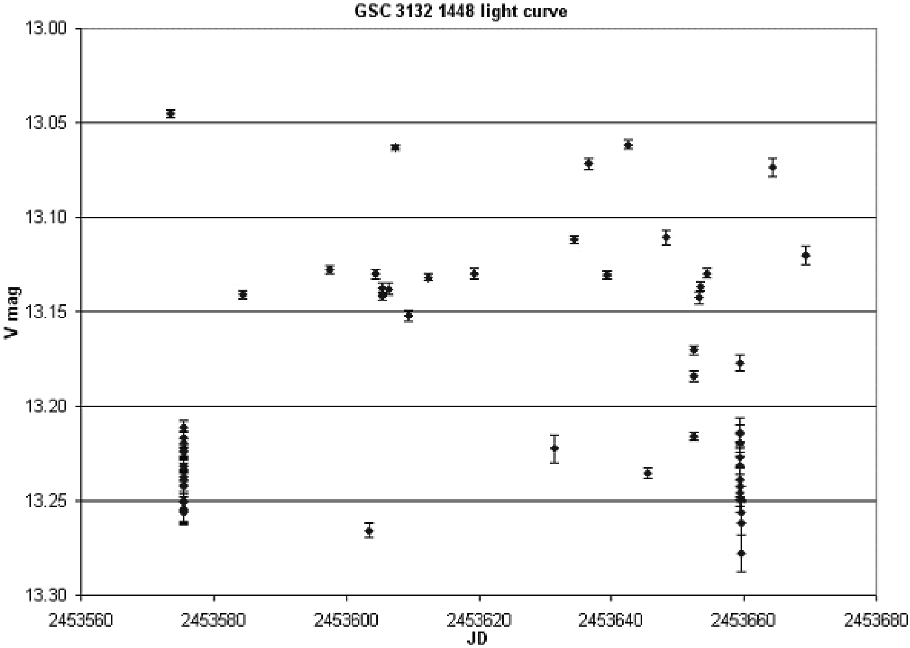

Figure 2, The light curve for the new suspected variable star

Since then I have measured this star as often as possible using the stars 126, 129 and 133 on the MV Lyrae chart as comparisons. Figure 2, above, shows the results. Each datapoint is the mean of usually at least 5 individual measurements so the uncertainties are quite small.

If you can imagine this light "curve" being revealed as time progressed, it looked initially like random variation. Eventually, I noticed that the excursions to fainter magnitudes appeared to be happening at regular intervals, although it was some time before the likely period emerged. The final confirmation that this was most likely an eclipsing system was the observation on JD 2453659, when I recorded the ingress to an eclipse, but unfortunately I could not measure the egress as it disappeared behind a tree at the crucial time.

Using these eclipses as a guide, I experimented with folding the light curve at various periods until I came to the conclusion that the most likely period was just over 7 days, 7.0008 days to be precise, although periods which are integer divisions of this could still be possible. The phase diagram obtained by folding the light curve with this period is shown in Figure 3. The eclipse is now quite clear but, if this is an eclipsing binary, the shape of the light curve is unusual.

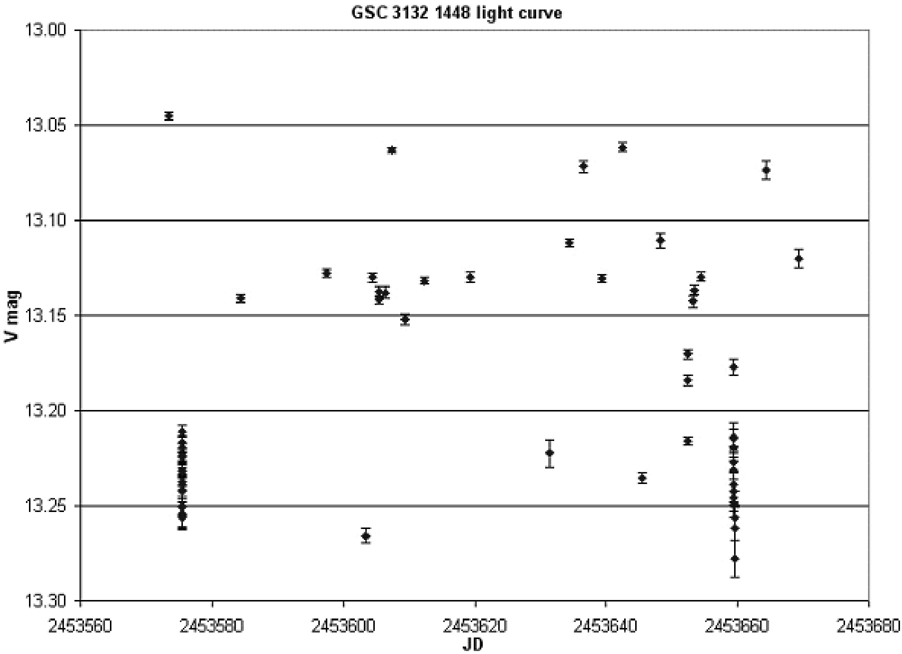

Figure 3, The phase diagram obtained by folding the light curve with the most likely period

The best working ephemeris for the primary minimum based on the available data and assuming the 7 day period is JD = 2453659.49 + 7.0008 * E.

Chris Lloyd at the Rutherford Appleton Laboratory has looked at ROTSE data for the star and finds support for a period of 7 hours although the eclipses are not resolved in that data and the data is noisy.

With a period of 7 days and 1 minute it is only possible to observe small segments of the light curve from a single longitude. Further observations at other longitudes are needed to clarify the nature of this object and determine a reliable period.

Acknowledgements
I would like to thank Chris Lloyd for his help in interpreting this data.

A STROKE OF LUCK

MARTIN CROW

Back at the Winchester weekend earlier this year, Roger Dymock mentioned during his talk, that if any body was interested, asteroid 218 Bianca, which was currently in Leo, was well placed for observing. I was interested and had previously done some observations of 656 Beagle in conjunction with Richard Miles. So, on the first available clear night I started making my observations.

The observation method I am talking about here is *time-series photometry*. Centre the target on the CCD and then set it to take continuous images with a timed pause between shots, if necessary. One has to make sure that the exposure time does not allow the target's saturation to exceed approx. 2/3 of the pixel's full-well capacity, otherwise non-linear results can follow. I find this type of observing relatively family-friendly as once it's set up I just need to check occasionally that everything is running ok. Having acquired a sessions' worth of images, I then use AIP4win to process them. This includes setting the darks and flats for calibration, and locating the target and check stars. Now, this is where it gets interesting. Normally with differential photometry there is a chart, so that everybody uses the same check stars. With asteroids, because they are never in the same CCD field for more than a few days, you have to pick your own. The way I do it is to look at the field in SkyMap Pro (other planetarium programmes will serve the same purpose), and pick at least two stars that are coloured yellow, and if possible, are also of a similar magnitude to the target. All stars that are displayed with a colour are Tycho 2 stars. These two stars will have a similar colour and therefore a similar response on the CCD, plus they should not be variable.

When I started reducing the data for 218 Bianca it became immediately obvious that something odd was going on with one of the check stars. The long and the short of it was that it appeared that the check star TYC 848-966 was varying. At first I thought it might be an error that I had introduced somehow, but observations on subsequent nights seemed to indicate a cyclical variation. What I needed was some independent confirmation. It occurred to me that maybe Roger Dymock might have been observing on the nights when the suspect would have been in his field of view. Unfortunately, he hadn't, but asked if I could forward my Bianca observations to him, which I was pleased to do. (I digress here slightly but it is all part of the tale.) Using his Canopus software Roger assembled all of my Bianca observations into this brilliant phase curve (Figure 1) giving a rotation period of 6.33 hours, which is in excellent agreement with previously published measurements. This data Roger has forwarded to Helsinki University, which, combined with data obtained last year and earlier, means they now have enough to model its shape.

Now, being able to take separate sets of observations and combine them into a single plot was just what was needed for the suspect variable. I asked Roger if he would mind having a look for me, which he agreed to do. The plot shown in Figure 2 is the final one containing all of my observations, two sets of Roger Dymock's and one of Roger Pickard's. It shows a star varying with a period of 6.202 hours and an amplitude of approx 0.17 mag, possibly an RRC Lyrae type variable.

When TYC 848-966 becomes favourably positioned again later this year follow up observations should allow the period to be further refined. All this begs the question, how many other unlooked for variables are just sitting in archived sets of CCD images sitting on peoples hard drives? I for one will be setting some time aside to do a bit of trawling.

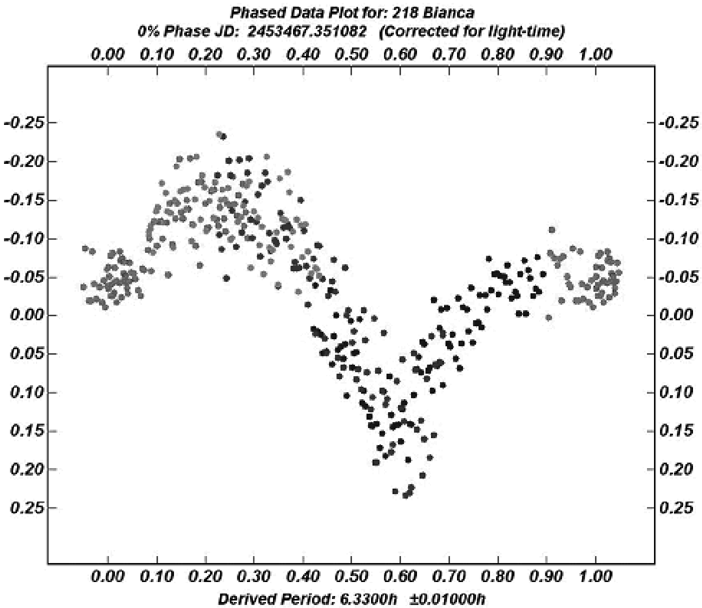

Figure 1, the phase curve

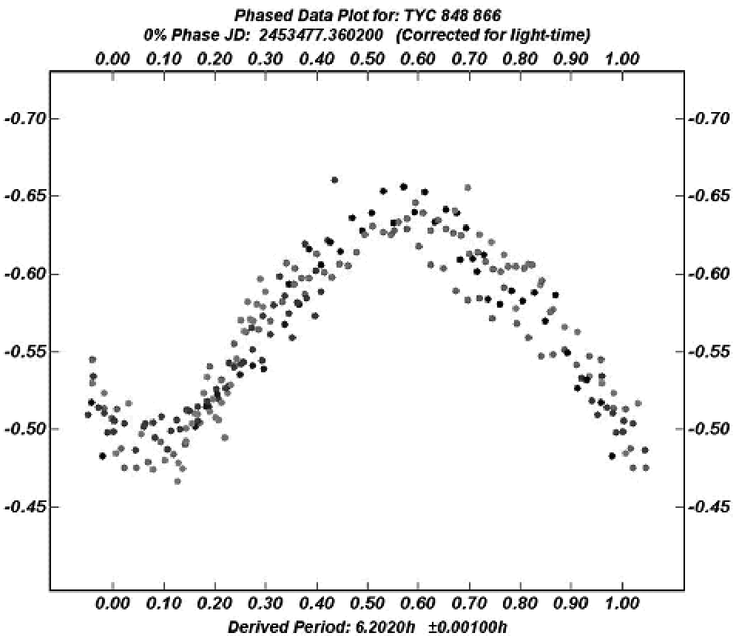

Figure 2, the final plot containg the observations of several observers

SOME OBSERVATIONS OF RR LYRAE IN AUGUST/ SEPTEMBER 2005

DES LOUGHNEY

Introduction

The Horace A. Smith book on ‘RR Lyrae Stars’ [1] inspired me to have a close look at this class of variable stars.

As Smith states (p 1):
- *RR Lyrae stars have been tracers of the chemical and dynamical properties of old stellar populations within our own and nearby galaxies*
- *RR Lyrae stars have served as standard candles, indicating the distances to globular clusters, to the centre of the galaxy, and to neighbouring Local Group systems*
- *RR Lyrae stars have served as test objects for theories of the evolution of low mass stars and for theories of stellar pulsation.*

The book asserts that visual observers can still make a contribution to the study of these stars, in a number of ways: visual observers can determine the shape of the light curve of the three classes of RR Lyrae stars (RRab,RRc,RRd); we can determine, with reasonable accuracy, the pulsation period, which is less than a day; and we can help to construct OC diagrams that contain clues to the evolution of these stars and to their internal dynamics. Smith estimates (p6) that more than 20% of all variable stars are of the RR Lyrae class.

An opportunity arose to study the prototype, RR Lyrae itself, which is the brightest of its class. It has a period of 0.56686 days [2], varies between magnitude 7.1 and 8.1, and has a characteristic light curve of the type RRab (see Figure 4).

I observed this star visually from a site on La Palma, the Canary Islands, on 84 occasions between the 12th August 2005 and the 25th August 2005. The site was located at 28 46 N and 17 56 W. The altitude of the site was about 1300 metres above sea level and therefore above the trade winds and the usual layer of clouds. When the moon and cloud were absent, observations took place in class one conditions; there was no light pollution whatsoever, and the atmosphere was stable and dry.

The star was also observed from Edinburgh, in class two conditions, on the evening of 25th September 2005, when 13 observations were made.

The instrument used for these observations was 11x80 binoculars mounted on a tripod. The moon interfered with some observations, and some of the observation runs were cut short by the appearance of clouds. The guidelines that I referred to whilst making the observations was the BAA publication *Observing Guide to Variable Stars* [3].

I used the chart AAVSO 1925+43 (b), which is entitled V1504 Cygni. The comparison stars were those marked 70, 75 and 78, and RR Lyrae and the comparison stars were all in the same binocular field of view. There were some doubts about the accuracy of the magnitude of two of the comparison stars: the gap between 75 and 78 seems to be 0.4

magnitude rather than 0.3.

On La Palma it turned out to be possible to observe seven maxima of RR Lyrae within the period 12/8/05 to 25/8/05. A further maximum was observed in Edinburgh on the evening of 25/9/05.

The Maxima

The seven maxima observed in La Palma were determined to occur at the following times, where HJD means Heliocentric Julian Date.

4.5UT	on 12/8/05	(HJD 2453594.6900)
23.75UT	on 14/8/05	(HJD 2453597.4921)
2.85UT	on 16/8/05	(HJD 2453598.6212)
4.75UT	on 21/8/05	(HJD 2453603.7003)
21.45UT	on 22/8/05	(HJD 2453605.3961)
0.5UT	on 24/8/05	(HJD 2453606.5232)
3.85UT	on 25/8/05	(HJD 2453607.6627).

The Edinburgh maximum occurred at:

22.15UT	on 25/9/05	(HJD 2453639.4244)

These maxima were determined by actual observation. The times of the maxima are taken to be the times of the brightest observation. The observations were timed to coincide with either a tenth or a twentieth of an hour, and this means that the time of maximum was accurate to plus or minus 6 minutes.

The Heliocentric JD was calculated using coordinnates for RR Lyrae of RA 19.25.27 and Dec. 42.47.04, which were taken from *http://webast.ast.obs-mip.fr/people/leborgne/dbRR/*.

Light Curves

The three best (most complete) light curves around the maxima are plotted in Figure 1 (14/8/05), Figure 2 (22/8/05) and Figure 3 (24/8/05). The horizontal axis is the Julian date. The light curves show the characteristic shape of RRab variables, with a steep rise to maximum and a less steep decline.

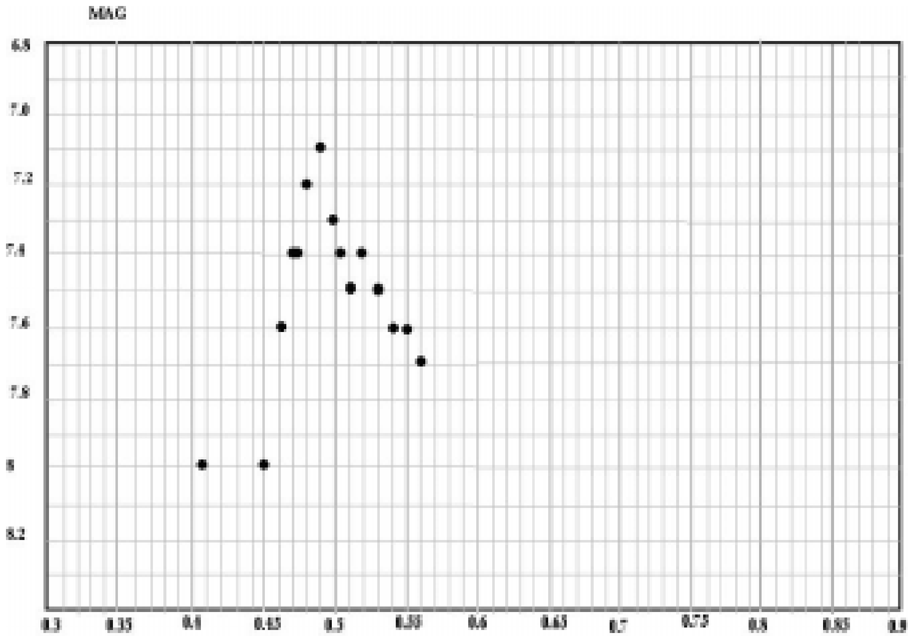

Figure 1.

14th August 2003 JD 3597 Maximum at HJD 3597.4921

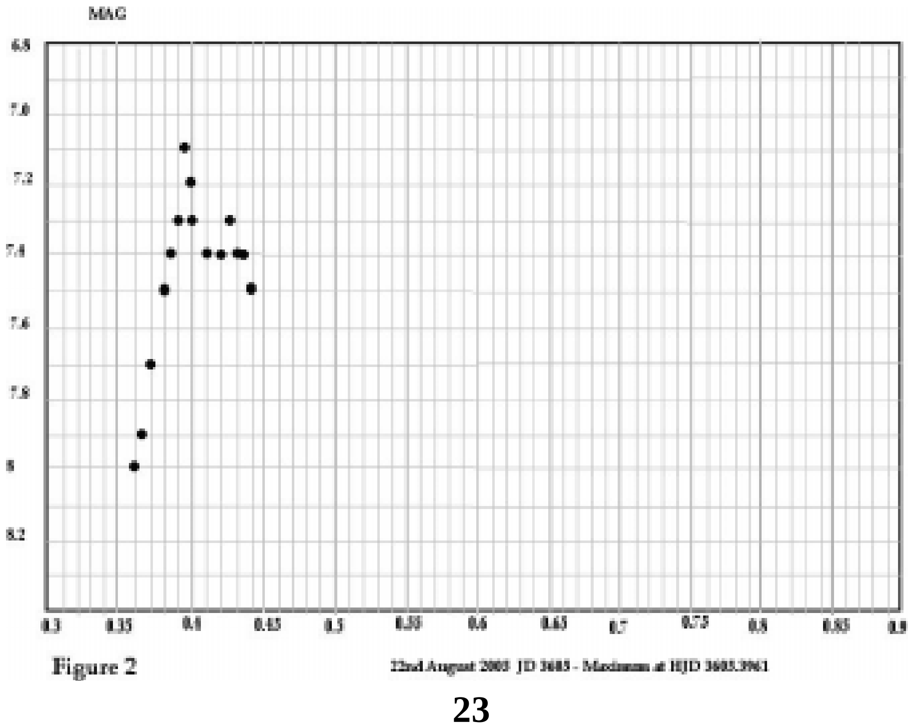

Figure 2

22nd August 2003 JD 3605 - Maximum at HJD 3605.3961

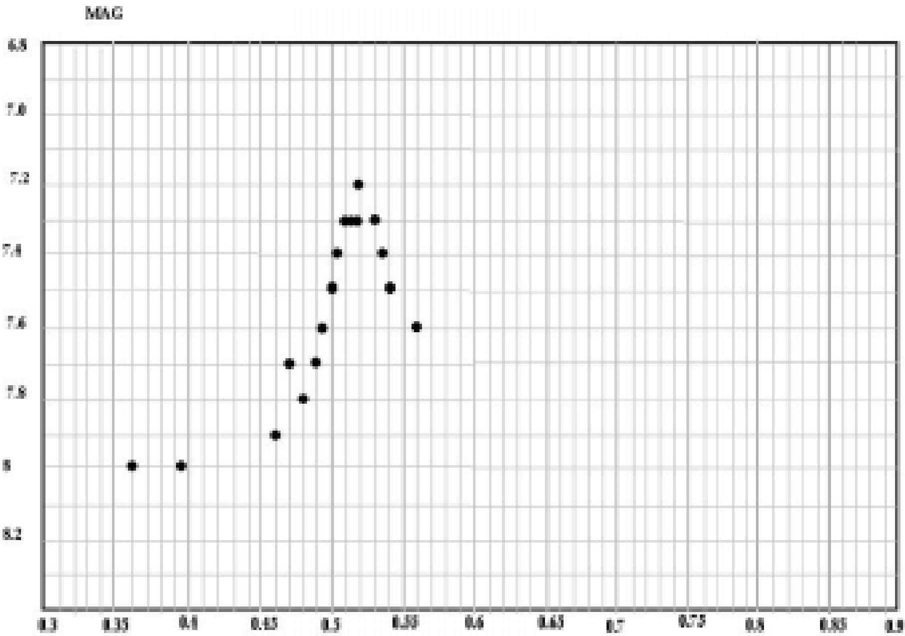

Figure 3. 28th August 2005 JD 3606 - Maximum at HJD 3606.5232

Shock Wave Phenomena

Smith (p82 - 88) describes shock wave phenomena which are part of the pulsation process of RR Lyrae stars. The shock waves are manifested by subtle features of the light curve, as seen in the characteristic light curve in Figure 4. Near minimum there is a *bump*, and on the rise to maximum there is a *hump*. The hump coincides with the maximum acceleration of the photosphere and emission of ultraviolet light.

It is considered that there may be a suggestion of a subtle *hump* on the rising light curve of the maxima of the 25/9/05 which is figure 5.

Period

The period (from *http://www.astro.uni-bonn.de/~gmaintz/3230tab1.dat*) is 0.56686, and the epoch of maximum is HJD 2452901.4020.

Within the time interval observed in August, 23 maxima occurred. If the time between the first and the seventh maxima observed (2453607.6627-2453594.6900) is divided by 23, then the average period comes to 0.5640. The difference between this period and the predicted period is 4.12 minutes.

The observation in September allowed the estimation of the average period over a much longer time span. Between the first observation on La Palma and the September

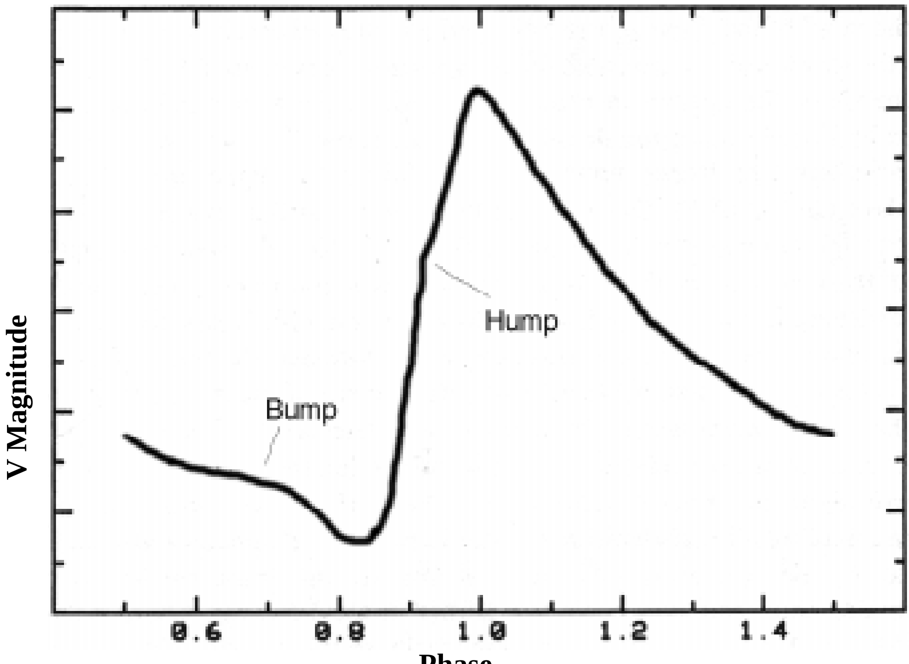

Figure 4: A Typical Light Curve

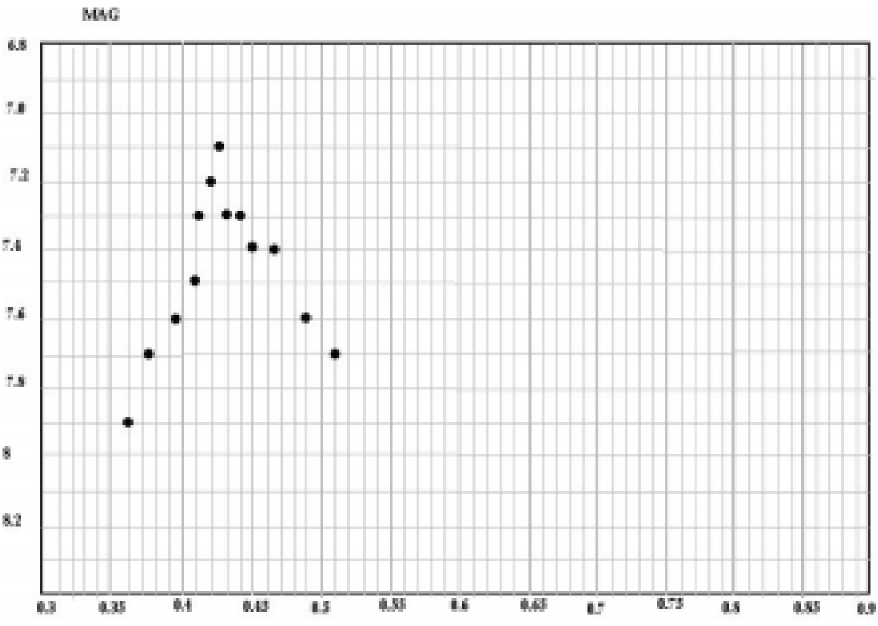

Figure 5.

25-26/9/85 JD 3639 - Maximum at HJD 3639.4244 observation there were 79 pulsations. When the time span is divided by 79 the average period comes to 0.56626, which is a difference of 0.87 of a minute compared with the official period. Between the last observation in La Palma and the September observation there were 56 pulsations. When this time span is divided by 56 the average period comes to 0.56720, which is a difference of 0.4896 of a minute compared with the official period.

These results illustrate that over long enough time spans visual observations can be accurate enough to alert CCD observers to significant changes.

Observed/Calculated Maxima

Figure 6 shows an OC graph which is generated from these observations. The horizontal axis is the pulsation number counted from the first one observed on La Palma. The horizontal axis could, however, be defined in HJDs. The horizontal zero line is where predicted maxima should occur. The vertical axis represents the difference between the predicted maximum and the actual maximum defined as a decimal fraction of a day.

The plots of the eight actual maxima are removed from the zero line. The 22nd maximum is significantly removed by about 0.05 of a day or 1.2 hours. This time is well beyond any possible error arising from careful visual observations in good conditions. This diagram illustrates how the period can vary. Smith outlines the explanation for this type of period/cycle variation which is deemed to be *noise*. In other words, the short term variation in cycle period is not related to the long term evolution of the star, but is related to semi-convection events in the outer atmospheres of these large red stars. Despite being labelled as noise there is a glimpse into the dynamics of these low mass stars.

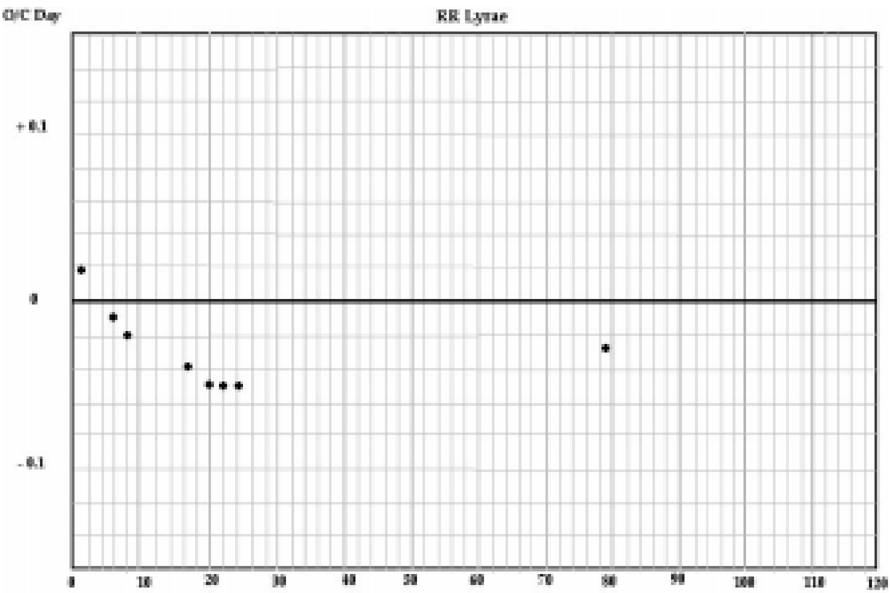

Figure 6.

The web site *http://webast.ast.obs-mip.fr/people/leborgne/dbRR/maxRR.htm* presents information about RR Lyrae stars, and, in particular, about RR Lyrae itself. The site displays an OC diagram covering a lengthy period, which is here reproduced as Figure 7. This shows how the period can vary around the standard period.

It can be readily appreciated that the scale of the *noise* variation in period is one that can be picked up by visual observers.

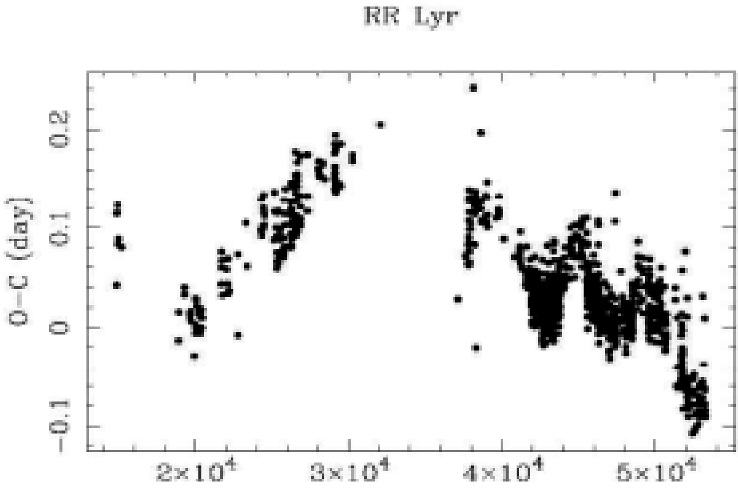

Figure 7

2004 Blazhko Effect Campaign

Professionals carried out a year long campaign to observe the Blazhko Effect in a number of RR Lyrae stars. The observations are reported on *http://www.astro.univie.ac.at/~blazhko/RRLyrae2004.html#Figures.* The Blazhko Effect is a secondary pulsation that occurs in some RR Lyrae stars.

Among the stars studied was RR Lyrae itself which has a secondary period of 40.8 days, and the light curves and OC diagrams that are published on the above web pages show that the amplitude of the maximum, the position of maximum and the shape of the light curve vary over the Blazhko period. The maximum, within the 40.8 day period, appears to vary over about 0.1 of the phase which is equal to 0.0567 days or 1.36 hours. This variation may explain the results of my OC diagram of the maxima observed in August/September 2005.
The results of this campaign suggest that it may not be correct, in the short term, to estimate the period as the time between two maxima. The results suggest that the time of maximum can vary within a cycle without the period of the cycle being affected.

The website also reports that RR Lyrae shows a cycle in its Blazhko Effect of about 4 years, at the end of which the strength of the modulation suddenly decreases, and a phase shift of about 10 days occurs in the Blazhko cycle. This phenomenon is still unexplained, though it has been used as an argument for the magnetic models of the Blazhko Effect..

Conclusion

The observations in August/ September 2005 illustrate the useful work that can still be done by visual observers. Good estimates of the mean period can be made, and reasonable OC diagrams can be constructed from these. It also appears that some monitoring of the Blazhko Effect can be attempted, and that the results can be significantly refined if the observing campaign can be carried out over a longer period by a team of observers [4].

The argument for ongoing observations is well put by Horace Smith in the AAVSO RR Lyrae Bulletin Number 2 of March 2002 [5]. He states that long terms changes in the primary periods of these stars can give clues about the ways in which all stars age.

A good summary of the RR Lyrae class of stars and the observational challenges can be found in the *AAVSO Variable Star of the Month for August 2002* which was an RR Lyrae star called XZ Cygni [6].

Monitoring such stars is a challenge for visual observers. To get a good light curve of a maximum one has to carry out observations over a period of at least three hours, with one before maximum and two hours after. Before devoting such time one has to work out when the maximum may actually occur, and bear in mind that the time of maximum may be substantially different from the predicted time. On La Palma, once I became aware of the vagaries of the maxima, I made a check on the magnitude two hours before the predicted maximum and at quarter of an hour intervals thereafter, until I could pick up the upward movement when the star brightened to 7.8. Thereafter the star was estimated at ten/ twelve minute intervals until an hour after maximum, when an estimation every fifteen minutes became sufficient.

References

1 RR Lyrae Stars, Horace A Smith, 1995, Cambridge University Press
2 http://www.astro.uni-bonn.de/~gmaintz/3230tab1.dat
3 Observing Guide to Variable Stars, BAA, 2005
4 The AAVSO Observing Program on RR Lyrae Stars http:// www.aavso.org/ observing/ programs/rrlyrae/
5 AAVSO RR Lyrae Bulletin N0 2 March 2002.
6 AAVSO Variable Star of the Month, August 2002 - XZ Cygni.

BINOCULAR PRIORITY LIST

Melvyn Taylor

Variable	Range	Type	Period	Chart	Variable	Range	Type	Period	Chart
AQ And	8.0-8.9	SRC	346d	82/08/16	***AH Dra***	7.1-7.9	SRB	158d?	106.01
EG And	7.1-7.8	ZA		072.01	***NQ Gem***	7.4-8.0	SR+ZA	70d?	077.01
V Aql	6.6-8.4	SRB	353d	026.03	***X Her***	6.3-7.4	SRB	95d?	223.01
UU Aur	5.1-6.8	SRB	234d	230.01.	***SX Her***	8.0-9.2	SRD	103d	113.01
AB Aur	7.2-8.4	INA		83/10/01	***UW Her***	7.8-8.7	SRB	104d	107.01
V Boo	7-12	SRA	258d	037.01	***AC Her***	6.8-9.0	RVA	75d	048.03
RW Boo	6.4-7.9	SRB	209d	104.01	***IQ Her***	7.0-7.5	SRB	75d	048.03
RX Boo	6.9-9.1	SRB	160d	219.01	***OP Her***	5.9-6.7	SRB	120d	84/04/12
ST Cam	6.0-8.0	SRB	300d?	111.01	***R Hya***	3.5-10.9	M	389d	049.01
XX Cam	7.3-9.7?	RCB?		068.01	***RX Lep***	5.0-7.4	SRB	60d?	110.01
X Cnc	5.6-7.5	SRB	195d	231.01	***SS Lep***	4.8-5.1	ZA		075.01
RS Cnc	5.1-7.0	SRC	120d?	84/04/12	***Y Lyn***	6.9-8.0	SRC	110d	229.01
V CVn	6.5-8.6	SRA	192d	214.01	***SV Lyn***	6.6-7.5	SRB	70d?	108.01
WZ Cas	6.9-8.5	SRB	186d	82/08/16	***U Mon***	5.9-7.8	RVB	91d	029.03
V465 Cas	6.2-7.2	SRB	60d	233.01	***X Oph***	5.9-9.2	M	328d	099.01
g Cas	1.6-3.0	GC		064.01	***BQ Ori***	6.9-8.9	SR	110d	84/04/12
rho Cas	4.1-6.2	SRD	320d	064.01	***AG Peg***	6.0-9.4	NC		094.01.
W Cep	7.0-9.2	SRC		83/10/01	***X Per***	6.0-7.0	GC+XP		84/04/08
AR Cep	7.0-7.9	SRB		85/05/06	***R Sct***	4.2-8.6	RVA	146d	026.03
mu Cep	3.4-5.1	SRC	730d	112.01	***Y Tau***	6.5-9.2	SRB	242d	84/04/12
O Cet	2.0-10.1	M	332d	039.02	***W Tri***	7.5-8.8	SRC	108d	114.01
R CrB	5.7-14.8	RCB		041.02	***Z UMa***	6.2-9.4	SRB	196d	217.01
W Cyg	5.0-7.6	SRB	131d	062.1	***ST UMa***	6.0-7.6	SRB	110d?	102.01
AF Cyg	6.4-8.4	SRB	92d	232.01	***VY UMa***	5.9-7.0	LB		226.01
CH Cyg	5.6-10.0	ZA+SR		089.02	***V UMi***	7.2-9.1	SRB	72d	101.01
U Del	5.6-7.5	SRB	110d?	228.01	***SS Vir***	6.9-9.6	SRA	364d	097.01
EU Del	5.8-6.9	SRB	60d?	228.01	***SW Vir***	6.4-7.9	SRB	150d?	098.01
TX Dra	6.8-8.3	SRB	78d?	106.01					

ECLIPSING BINARY PREDICTIONS

Tony Markham

The following predictions, based on the latest Krakow elements, should be usable for observers throughout the British Isles. The times of mid-eclipse appear in parentheses, with the start and end times of visibility on either side. The times are hours UT, with a value greater than 24 indicating a time after midnight. D indicates that the eclipse starts/end in daylight; L indicates low altitude at the start/end of the visibility; and << indicates that mid-eclipse occurred on an earlier date.

Thus, for example, on Jan 7, TV Cas D17(21)25 indicates that TV Cas will be in mid-eclipse at approx 21h UT. The start of the eclipse occurs during Daylight, but the eclipse will be observable from approx 17h UT. The eclipse ends at “25h” UT (i.e. 01h UT on Jan 8). Please contact the EB secretary if you require any further explanation of the format.

The variables covered by these predictions are:

RS CVn	7.9-9.1V	Z Dra	10.8-14.1p	U Sge	6.45-9.28V
TV Cas	7.2-8.2V	TW Dra	7.3-8.9v	RW Tau	7.98-11.59V
U Cep	6.75-9.24V	S Equ	8.0-10.08V	HU Tau	5.92-6.70V
SS Cet	9.4-13.0v	delta Lib	4.9-5.9V	X Tri	8.88-11.27V
U CrB	7.7-8.8V	Z Per	9.7-12.4p	TX UMa	7.06-8.80V
SW Cyg	9.24-11.83V	Y Psc	9.44-12.23V	Z Vul	7.25-8.90V

Note that predictions for RZ Cas, Beta Per and Lambda Tau can be found in the BAA Handbook.

Three long period eclipsing variables have eclipses due during this interval. These are mu Sgr (mid eclipse Feb 06), BM Cas (mid eclipse Feb 18) and V748 Cen (mid eclipse Mar 18). For further details, see VSSC 114.

In addition, a primary eclipse of NN Del (SAO 126201) is predicted to be centred on approx 18h UT on Mar 6, with a secondary eclipse predicted for approx 11h UT on Mar 25. Outside of eclipses, NN Del is of mag 8.4. Both eclipses are approx 0.5 mag deep, with the primary eclipse lasting approx 17 hours, compared with approx 21 hours for the secondary eclipse. NN Del was discovered via the Hipparcos data and has a period of approx 99.2684 days and a highly eccentric orbit. More observations are required to define the elements more accurately. Nearby comparison stars include SAO 126209 (V= 8.38, F2) and SAO 126185 (V = 8.92, K0).

2006 Jan 1 Sun
Z Vul L05(10)07D
SS Cet 21(26)25L
Z Dra 22(24)26
X Tri 22(24)27L
2006 Jan 2 Mon
TX UMa 01(06)07D
RW Tau 20(25)29L
TW Dra 20(25)30
X Tri 21(23)26
U Cep 22(26)31D
RS CVn L22(19)25
HU Tau 22(26)28L
2006 Jan 3 Tue
U CrB L00(<<)03
del Lib L04(05)07D
U Sge D17(15)19L
Y Psc D17(16)20
Z Vul D17(21)20L
SW Cyg D17(22)24L
X Tri 20(23)25
2006 Jan 4 Wed
TV Cas 02(06)07D
SW Cyg L02(<<)04
S Equ D17(14)19L
Z Dra D17(17)20
X Tri 20(22)25
SS Cet 20(25)25L
HU Tau 23(27)28L
2006 Jan 5 Thu
TX UMa 03(07)07D
U Cep D17(14)19
RW Tau D17(19)24
TW Dra D17(21)26
X Tri 19(21)24
TV Cas 21(25)29
Z Dra 23(26)28
2006 Jan 6 Fri
U CrB 02(08)07D
Z Vul L05(08)07D
X Tri 18(21)23
U Sge 18(24)19L
2006 Jan 7 Sat
HU Tau 00(04)04L
U Sge L05(00)06
TV Cas D17(21)25
X Tri 17(20)22
SS Cet 20(24)25L
U Cep 21(26)31D
2006 Jan 8 Sun
TX UMa 04(09)07D
RW Tau D17(14)19
TW Dra D17(16)21
Z Vul D17(18)19L
Z Dra D17(19)21
X Tri D17(19)22
2006 Jan 9 Mon
HU Tau 02(06)04L
TV Cas D17(16)20
X Tri D17(19)21
U CrB L24(19)25
2006 Jan 10 Tue
Z Dra 01(03)06
del Lib L04(05)07D
U Sge L05(09)07D
Z Per D17(14)18
U Cep D17(14)19
X Tri D17(18)20
SS Cet 19(24)24L
2006 Jan 11 Wed
HU Tau 03(07)04L
Z Vul L05(05)07D
X Tri D17(17)20
2006 Jan 12 Thu
RS CVn 03(09)07D
X Tri D17(17)19
Z Dra 18(21)23
SW Cyg 20(26)24L
U Cep 21(26)31
2006 Jan 13 Fri
U CrB 00(06)07D
SW Cyg L01(02)07D
TV Cas 03(07)07D
Z Per D17(15)20
X Tri D17(16)18
Z Vul D17(16)19L
U Sge D17(18)18L
SS Cet 18(23)24L
RW Tau 22(27)28L
2006 Jan 14 Sat
TW Dra 02(07)07D
Z Dra 03(05)07D
X Tri D17(15)18
S Equ D17(22)19L
Y Psc 19(23)21L
TV Cas 23(27)31D
2006 Jan 16 Mon
Z Vul L04(03)07D
Z Per D17(16)21
RW Tau D17(21)26

SS Cet 18(23)24L
TV Cas 18(22)26
Z Dra 20(22)25
TW Dra 21(26)31D
RS CVn 22(29)31D
2006 Jan 17 Tue
del Lib L03(05)07D
U Sge L05(04)07D
SW Cyg D17(16)22
U Cep 21(25)30
2006 Jan 18 Wed
Z Dra 05(07)07D
Z Vul D17(14)19L
Y Psc D17(17)21L
TV Cas D17(18)22
2006 Jan 19 Thu
RW Tau D17(16)20
Z Per D17(18)22
TW Dra D17(21)26
SS Cet D17(22)24L
U CrB L23(28)31D
2006 Jan 20 Fri
TX UMa D17(15)20
Z Dra 22(24)26
2006 Jan 21 Sat
Z Vul L04(01)06
S Equ D17(19)18L
RS CVn L20(24)30
2006 Jan 22 Sun
SW Cyg L01(05)07D
TV Cas 05(09)07D
TW Dra D17(17)22
Z Per D17(19)24
SS Cet D17(21)24L
U Cep 20(25)30
2006 Jan 23 Mon
HU Tau D17(15)19
TX UMa D17(17)21
Z Dra D17(17)20
U Sge D17(22)18L
2006 Jan 24 Tue
TV Cas 00(04)07D
del Lib L03(04)07D
Z Dra 23(26)28
RW Tau 24(28)27L
2006 Jan 25 Wed
HU Tau D17(16)20
Z Per D17(20)25
SS Cet D17(21)23L
TV Cas 20(24)28
2006 Jan 26 Thu
TX UMa D18(18)23
SW Cyg D18(19)23L
RS CVn L20(19)25
U CrB L23(25)31D
2006 Jan 27 Fri
U Sge L04(07)07D
HU Tau D18(18)22
Z Dra D18(19)21
TV Cas D18(19)23
RW Tau 18(23)27L
U Cep 20(25)30
2006 Jan 28 Sat
TW Dra 02(08)07D
Z Vul 04(10)07D
SS Cet D18(20)23L
Z Per D18(22)26
2006 Jan 29 Sun
Z Dra 01(04)06
TV Cas D18(15)19
HU Tau D18(19)23
TX UMa D18(20)24
Y Psc 20(25)20L
2006 Jan 30 Mon
RW Tau D18(17)22
TW Dra 22(27)31D
2006 Jan 31 Tue
del Lib L02(04)07D
SW Cyg 03(09)07D
SS Cet D18(19)23L
HU Tau D18(21)24
Z Per 18(23)27L
Z Dra 18(21)23
2006 Feb 1 Wed
X Tri 00(03)01L
TX UMa D18(21)26
U Cep 20(24)29
X Tri 24(26)25L
2006 Feb 2 Thu
TV Cas 02(06)07D
Z Dra 03(05)07D
Z Vul L03(08)07D
del Lib 05(12)07D
Y Psc D18(19)20L
TW Dra D18(22)27
HU Tau 18(22)26
U CrB L22(23)29
X Tri 23(26)24L
2006 Feb 3 Fri
U Sge L04(01)06D
SS Cet D18(19)23L
Z Per 20(24)27L
TV Cas 21(25)29
X Tri 22(25)24L
2006 Feb 4 Sat
SW Cyg D18(23)22L
TX UMa 18(23)27
HU Tau 19(23)26L
Z Dra 20(22)25
X Tri 22(24)24L
SW Cyg L24(23)29
2006 Feb 5 Sun
RS CVn 03(09)06D
TW Dra D18(18)23
TV Cas D18(21)25
X Tri 21(23)24L
2006 Feb 6 Mon
U CrB 04(10)06D
Z Dra 05(07)06D
SS Cet D18(18)23L
U Cep 19(24)29
X Tri 20(23)24L
HU Tau 21(25)26L
Z Per 21(26)27L
2006 Feb 7 Tue
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Z Vul L03(05)06D
TV Cas D18(16)20
TX UMa 19(24)29
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RW Tau 20(25)26L
2006 Feb 8 Wed
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RS CVn 22(28)30D
Z Per 22(27)27L
2006 Feb 10 Fri
RW Tau D18(19)24
X Tri D18(20)23
TX UMa 21(26)30D
HU Tau 23(27)26L
2006 Feb 11 Sat
TV Cas 03(07)06D
TW Dra 03(08)06D
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U Cep 19(24)29
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X Tri D18(19)21
TV Cas 23(27)30D
Z Dra 23(26)28
Z Per 24(28)27L
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HU Tau 01(05)02L
U CrB 02(08)06D
U Sge L03(05)06D
X Tri D18(18)21
SW Cyg 20(26)21L
TX UMa 22(27)30D
TW Dra 23(28)30D
SW Cyg L23(26)30D
2006 Feb 14 Tue
del Lib L01(03)06D
X Tri D18(17)20
TV Cas 18(22)26
RS CVn L19(23)30
2006 Feb 15 Wed
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X Tri D18(17)19
Z Dra D18(19)21
2006 Feb 16 Thu
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U CrB L21(19)24
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2006 Feb 17 Fri
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Z Vul L02(01)06D
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2006 Feb 18 Sat
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SW Cyg D18(16)21L
RW Tau 22(27)25L
2006 Feb 19 Sun
TW Dra D18(18)23
Z Dra 18(21)23
RS CVn L19(19)25
U CrB 24(29)30D

2006 Feb 20 Mon
TX UMa 02(06)06D
U Sge L03(<<)05
2006 Feb 21 Tue
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Z Dra 03(05)06D
Y Psc D18(15)19L
SS Cet D18(15)20
RW Tau D18(21)25L
U Cep 18(23)28
2006 Feb 22 Wed
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Z Vul L02(<<)04
SW Cyg 24(30)30D
2006 Feb 23 Thu
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TX UMa 03(08)06D
del Lib 04(10)06D
TV Cas 20(24)28
Z Dra 20(23)25
U CrB L21(16)22
2006 Feb 24 Fri
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RW Tau D18(15)20
2006 Feb 25 Sat
TW Dra 04(09)06D
Z Dra 05(07)06D
S Equ L05(03)06D
TV Cas D18(19)23
2006 Feb 26 Sun
U Cep D18(23)28
U CrB 21(27)30D
2006 Feb 27 Mon
SW Cyg D18(19)21L
Z Dra 22(24)27
SW Cyg L22(19)25
TW Dra 23(29)30D
2006 Feb 28 Tue
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2006 Mar 1 Wed
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RS CVn 03(09)06D
RW Tau 24(28)25L
2006 Mar 2 Thu
U Sge L02(02)06D
del Lib 03(10)06D
Z Dra D19(17)20
TW Dra 19(24)29
2006 Mar 3 Fri
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HU Tau D19(17)21
U Cep D19(22)27
Z Dra 24(26)28
2006 Mar 4 Sat
SW Cyg 03(09)06D
RW Tau D19(23)25L
TV Cas 21(25)29
2006 Mar 5 Sun
HU Tau D19(18)22
TW Dra D19(19)24
U CrB L20(25)29D
RS CVn 22(28)29D
2006 Mar 6 Mon
Z Vul L01(06)05D
Z Dra D19(19)22
TV Cas D19(21)25
del Lib L24(26)29D
2006 Mar 7 Tue
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HU Tau D19(20)23
2006 Mar 8 Wed
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U Cep D19(22)27
SW Cyg D19(23)20L
SW Cyg L22(23)29
2006 Mar 9 Thu
U Sge L01(<<)02
del Lib 03(09)05D
HU Tau D19(21)24L
2006 Mar 10 Fri
Z Dra D19(21)23
RS CVn D19(23)29D
X Tri 22(24)22L
2006 Mar 11 Sat
Z Vul L01(03)05D
HU Tau D19(22)24L
X Tri 21(24)22L
2006 Mar 12 Sun
U Sge L01(06)05D
Z Dra 03(05)05D
TV Cas 03(07)05D
Z Per D19(17)21
U CrB L20(22)28
X Tri 20(23)22L
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U Cep D19(22)27
X Tri 20(22)22L
HU Tau 20(24)24L
TV Cas 23(27)29D
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2006 Mar 14 Tue
TW Dra 00(05)05D
S Equ L04(08)05D
X Tri 19(22)22L
Z Dra 20(23)25
2006 Mar 15 Wed
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RS CVn D19(18)25
X Tri D19(21)22L
TV Cas D19(22)26
RW Tau 20(25)24L
HU Tau 21(25)24L
2006 Mar 16 Thu
Z Vul L00(01)05D
del Lib 03(09)05D
U CrB 04(09)05D
TX UMa D19(18)23
X Tri D19(20)22L
TW Dra 20(25)29D
2006 Mar 17 Fri
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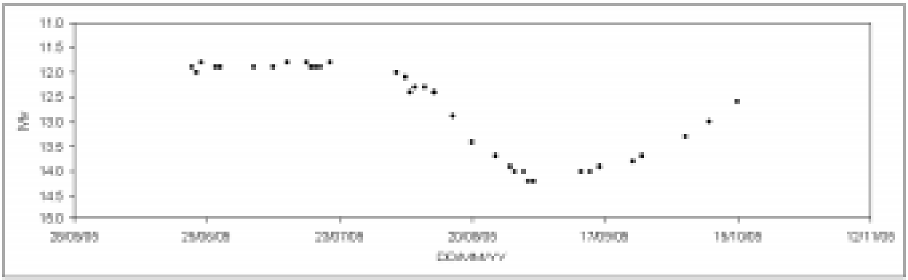
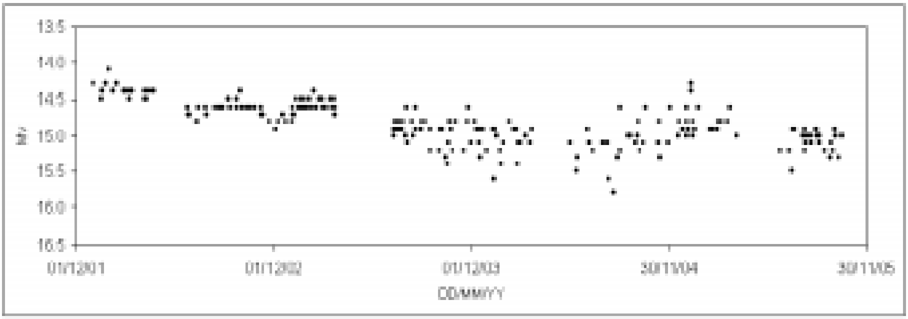
X Tri D19(19)22L
SW Cyg L21(26)29D
HU Tau 22(26)24L
2006 Mar 18 Sat
X Tri D19(19)21
RW Tau D19(19)24L
Z Per D19(19)24
U Cep D19(21)26
Z Dra 22(24)27
2006 Mar 19 Sun
U Sge L01(00)05D
X Tri D19(18)21
TX UMa D19(20)25
TW Dra D19(20)25
U CrB L19(20)26
2006 Mar 20 Mon
X Tri D19(17)20
del Lib L23(25)29D
2006 Mar 21 Tue
Z Vul L00(<<)04
S Equ L04(04)05D
Z Dra D19(17)20
Z Per D19(21)24L
2006 Mar 22 Wed
U Sge 03(09)05D
TX UMa D19(21)26
Z Dra 24(26)28
2006 Mar 23 Thu
TV Cas 00(04)05D
U CrB 01(07)05D
del Lib 02(09)05D
U Cep D19(21)26
2006 Mar 24 Fri
Z Per D19(22)24L
TV Cas 20(24)28
2006 Mar 25 Sat
RS CVn 02(09)05D
Z Dra D19(19)22
TX UMa D19(23)28
Z Vul L24(21)26
2006 Mar 26 Sun
U CrB D19(18)24
TV Cas D19(19)23
RW Tau 22(26)23L
SW Cyg 24(30)29D
2006 Mar 27 Mon
Z Dra 01(04)05D
Z Per D19(23)24L
del Lib L22(24)29D
2006 Mar 28 Tue
TW Dra 01(06)05D
Z Vul 02(08)05D
S Equ L03(01)05D
U Cep D19(21)26
TX UMa 20(24)29D
2006 Mar 29 Wed
U Sge L00(03)05D
RW Tau D19(21)23L
Z Dra D19(21)23
RS CVn 21(28)29D
U CrB 23(29)29D
2006 Mar 30 Thu
del Lib 02(08)05D
Z Per 20(25)24L
TW Dra 20(26)28D
Z Vul L23(19)24
2006 Mar 31 Fri
Z Dra 03(06)04D
U Cep 04(09)04D
SW Cyg L20(20)26
TX UMa 21(26)28D



Cover Figure 3, Observations of a fade of ES Aql, made by Gary Poyner



Cover Figure 4, Observations of V723 Cas showing activity, made by Gary Poyner

The deadline for contributions to the issue of VSSC 127 will be 7th February,

Whilst every effort is made to ensure that information in this circular is correct, the Editor and Officers of the BAA cannot be held responsible for errors that may occur.

Printed by RAMPrint 01604 233677

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Nova and Supernova discoveries

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Variable Star Alerts Telephone Gary Poyner (see above for number)

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