

COMMISSIONS 27 AND 42 OF THE IAU  
INFORMATION BULLETIN ON VARIABLE STARS

Number 5977

Konkoly Observatory  
Budapest  
18 March 2011

*HU ISSN 0374 – 0676*

**MAXIMA OF HIGH-AMPLITUDE DELTA SCUTI STARS**

WILS, PATRICK<sup>1</sup>; HAMBSCH, FRANZ-JOSEF<sup>1,2</sup>; ROBERTSON, C. W.<sup>3</sup>; LAMPENS, PATRICIA<sup>4,5</sup>;  
VAN CAUTEREN, PAUL<sup>1,5</sup>; HAUTECLER, HUBERT<sup>1</sup>; PANAGIOTOPOULOS, KOSTAS<sup>6,7</sup>; VAN  
WASSENHOVE, JEROEN<sup>1</sup>; STAEELS, BART<sup>1,8</sup>; VANLEENHOVE, MAARTEN<sup>1</sup>; HOSTE, SERGE<sup>1</sup>;  
PICKARD, ROGER D.<sup>9</sup>; KLEIDIS, STELIOS<sup>6,10</sup>; AYIOMAMITIS, ANTHONY<sup>6,11</sup>; NIEUWENHOUT,  
FRANS<sup>12</sup>; STRIGACHEV, ANTON<sup>13</sup>; BERNHARD, KLAUS<sup>2</sup>

<sup>1</sup> Vereniging Voor Sterrenkunde, Belgium; e-mail: [patrickwils@yahoo.com](mailto:patrickwils@yahoo.com)

<sup>2</sup> Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. Germany

<sup>3</sup> SETEC Observatory, Goddard, Kansas, USA

<sup>4</sup> Koninklijke Sterrenwacht van België (ROB), Brussel, Belgium

<sup>5</sup> Beersel Hills Observatory, Beersel, Belgium

<sup>6</sup> Helliniki Astronomiki Enosi, Greece

<sup>7</sup> Pouda Observatory, Diakopto, Greece

<sup>8</sup> Center for Backyard Astrophysics Flanders

<sup>9</sup> British Astronomical Association, UK

<sup>10</sup> Zagori Observatory, Epirus, Greece

<sup>11</sup> Perseus Observatory, Athens, Greece

<sup>12</sup> Werkgroep Veranderlijke Sterren, The Netherlands

<sup>13</sup> Institute of Astronomy and National Astronomical Observatory, Bulgarian Academy of Sciences, Sofia, Bulgaria

In this paper we report 337 further times of maximum for 60 High-Amplitude Delta Scuti Stars (HADS), following the reports of Wils et al. (2009, 2010). The majority of the data were obtained during 2010. Time series photometry was obtained for the first time for a number of recently discovered HADS, mainly by the ASAS-3 survey (Pojmański, 2002).

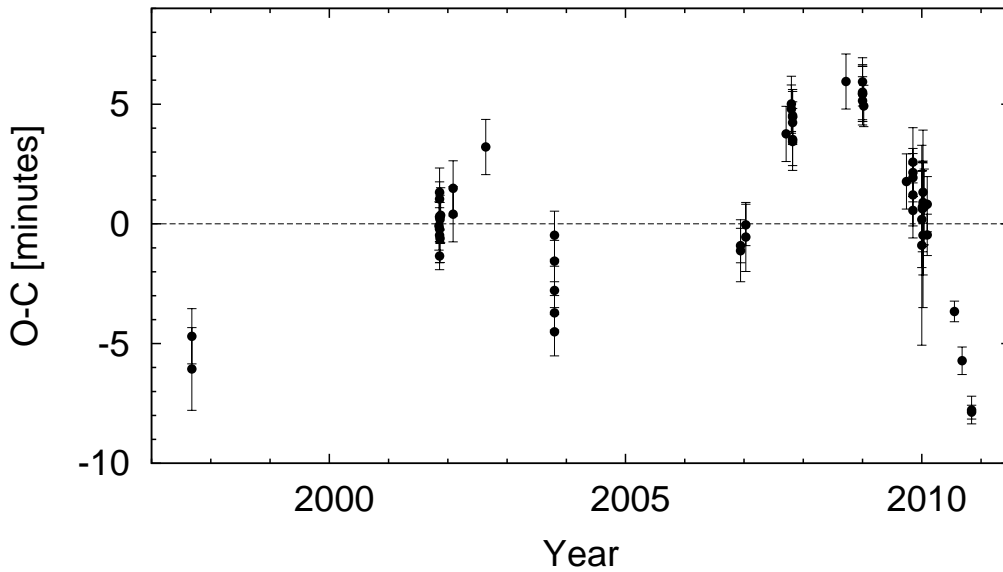
The observers and their instruments are given in Table 1. The times of maximum obtained are listed in Table 3. When the same maximum was observed in more than one filter, the table shows the average value of the times obtained in each filter individually. The method used to calculate the times of maximum is described in Wils et al. (2009).

The pulsation frequency of KZ Lac turned out to be 9.577 cycles per day instead of 8.577 as given by the GCVS (Samus et al., 2007). A new ephemeris is given in Table 2, together with elements for a number of other stars that have been observed in detail the past year, or for which the existing ephemeris deviates substantially from our recent observations. To get a better precision, use was made of data from the ASAS (Pojmański, 2002), NSVS (Woźniak et al., 2004) and SuperWASP surveys (Butters et al., 2010). Table 2 also contains the elements of the previously unknown HADS GSC 4464-0924 (J2000 position: 20 52 31.06 +70 54 40.3) that was observed in the course of this study. Its magnitude range is 12.2-12.6V.

The period of DW Psc was found to be highly variable over the last decade. A linear ephemeris obtained from all available timings given by Krugly (1999), Van Cauteren et al. (2002) and this paper, results in the following ephemeris:

$$\text{HJD Max} = 2452219.3647(5) + 0^{\text{d}}059648094(13) \times E \quad (1)$$

Since 2009 however the data are better represented by a period of 0.059647300(34) days, shorter by  $69 \pm 3$  milliseconds. An  $O - C$  graph with respect to the above ephemeris is given in Fig. 1. A cyclical change in period is not excluded, but this has to be confirmed with more data.



**Figure 1.**  $O - C$  graph of DW Psc with respect to the elements given in Eq. 1.

### Acknowledgements:

This work has made use of the SIMBAD database, operated at CDS, Strasbourg, France. PVC is grateful for support from Astrotechniek and Baader Planetarium. PL thanks the directors of the Royal Observatory of Belgium (ROB) for purchasing and operating an optical telescope at the radio-astronomy site of Humain under the project name *HOACS* (Humain Optical Observatory for Astrophysics of Coeval Stars). The BHO and *HOACS* data were acquired with equipment purchased thanks to a research fund financed by the Belgian National Lottery (1999). Part of the equipment used at SETEC Observatory was purchased with a grant from the American Astronomical Society. The Skinakas Observatory is a collaborative project of the University of Crete, the Foundation for Research and Technology – Hellas, and the Max-Planck-Institut für Extraterrestrische Physik. Part of the data were obtained through AAVSONet telescopes. HMB acknowledges cooperation with Tom Krajci.

Table 1: List of instruments used for the observations.

Code	Observer(s)	Telescope	Observatory	CCD
AA	AA	Refractor 16 cm	Perseus Observatory, Athens	SBIG ST-10XME
AS	AS	Modified Ritchey-Chrétien 129 cm	Skinakas Observatory, Crete	CH360
BHO1	PL+PVC	Refractor 18 cm	Beersel Hills Observatory	SBIG ST-10XME
BHO2	PL+PVC	Newton 40 cm	Beersel Hills Observatory	SBIG ST-10XME
BHO4	PL+PVC	Newton 25 cm	Beersel Hills Observatory	SBIG ST-10XME
FN	FN	Catadioptric 40 cm	Alkmaar, Nederland	SBIG ST-7ME
HHSX	HH	Catadioptric 20 cm	Roosbeek Lake Observatory	Starlight XPress MX-716
HHU	HH	Catadioptric 20 cm	Roosbeek Lake Observatory	SBIG ST-7XME
HMB4	FJH	Ritchey-Chrétien 35 cm	Mol, Belgium	SBIG ST-8
HMB8	FJH	Ritchey-Chrétien 20 cm	Mol, Belgium	SBIG ST-8XME
HMBC	FJH	Ritchey-Chrétien 28 cm	Mol, Belgium	SBIG ST-10XME
HMBH	FJH	Hypergraph 40 cm	Mol, Belgium	SBIG STL-11000XM
HMBN	FJH	Catadioptric 28 cm	Farm Hakos, Namibia	SBIG ST-8XME
HMBT	FJH	Refractor 14 cm	Mol, Belgium	SBIG STL11000XM
HMBW	FJH	Catadioptric 30 cm	Astrokolhoz, New Mexico	SBIG ST-9XE
HMBX	FJH	Ritchey-Chrétien 50 cm	New Mexico, USA	SBIG STL11000XM
HO18	PL+PVC	Refractor 18 cm	R.O.B.-Humain	SBIG ST-10XME, STL6303
HO40	PL+PVC	Newton 40 cm	R.O.B.-Humain	SBIG ST-10XME
KP	KP	Modified Cassegrain 26 cm	Pouda Observatory	SBIG ST-10XME
MAV	MV	Newton 25 cm	Leest Observatory ?	SBIG ST-10XME
RP	RDP	Catadioptric 36 cm	Shobdon, UK	Starlight XPress SXV-H9
RP30	RDP	Catadioptric 30 cm	Shobdon, UK	Starlight XPress SXV-H9
SBL	BS	Cassegrain 28 + 23.5 cm	Alan Guth Observatory	Starlight XPress MX-716
SH	SH	Catadioptric 25 cm	Merelbeke, Belgium	Meade DSI II pro
SK	SK	Catadioptric 30 cm	Zagori Observatory	SBIG ST-7XMEI
SO	CWR	Catadioptric 40 cm	SETEC Observatory	Apogee AP7B
SO30	CWR	Catadioptric 30 cm	SETEC Observatory	SBIG ST-8XME
SO40	CWR	Catadioptric 40 cm	SETEC Observatory	SBIG ST-8XME
VWS	JVW	Refractor 15.2 cm	Hooglede, Belgium	SBIG ST-7XME

Table 2: Updated elements of known HADS. Uncertainties are given in units of the last decimal.

Star	Max (HJD)	Period (d)
V524 And	2451505.703(1)	0.094491797(11)
V2455 Cyg	2452885.399(1)	0.094206008(7)
KZ Lac	2454075.578(1)	0.10441604(11)
GSC 1594-2234	2452713.245(1)	0.13668374(5)
GSC 2043-1201	2452701.105(2)	0.07793425(5)
GSC 2696-1396	2455378.441(1)	0.10307595(4)
GSC 2861-0970	2453987.695(1)	0.11010541(3)
GSC 3074-0114	2454138.969(1)	0.051296398(6)
GSC 3489-0868	2451311.722(2)	0.08664929(4)
GSC 4417-0394	2454835.182(1)	0.13224446(8)
GSC 4464-0924	2451342.906(3)	0.08063046(5)
GSC 4556-1113	2453813.331(1)	0.086343043(11)
GSC 4638-0455	2451511.601(1)	0.09661133(2)
NSVS 11672463	2451323.913(2)	0.10772127(4)

Table 3: Observed times of maximum (Epoch = HJD - 2400000).

Star	Epoch	Unc.	Obs.	Filter	Star	Epoch	Unc.	Obs.	Filter	
GP And	55473.6155	0.0007	SO30	V	LW Dra	55295.3705	0.0014	VWS	V	
	55473.6942	0.0004	SO30	V		55340.5057	0.0005	VWS	V	
	55473.7731	0.0007	SO30	V		55352.4392	0.0008	VWS	V	
	55473.8518	0.0006	SO30	V		55373.7057	0.0016	SO30	V	
	55473.9309	0.0010	SO30	V		55451.6896	0.0010	SO30	V	
	55479.5955	0.0005	SO30	V		55479.3358	0.0010	VWS	V	
	55479.6740	0.0003	SO30	V		55480.3989	0.0010	VWS	V	
	55479.7526	0.0005	SO30	V		DY Her	55322.4551	0.0009	BHO4	V
	55479.8313	0.0016	SO30	V			55335.5343	0.0007	HHU	C
	55479.9102	0.0004	SO30	V			55395.4324	0.0005	MAV	V
	55493.3654	0.0008	KP	V		55395.5805	0.0005	MAV	V	
	55493.4440	0.0009	KP	V		V1086 Her	55338.4849	0.0005	HO40	C
	55493.5230	0.0014	KP	V			V1116 Her	55303.5268	0.0006	HMBH
	55493.6017	0.0014	KP	V		55303.6220		0.0007	HMBH	V
	55525.3098	0.0006	RP	V		55340.4535		0.0005	HHU	C
55525.3895	0.0009	RP	V	55440.3423	0.0021	SH	V			
V460 And	55452.3457	0.0019	HMB8	V	KZ Lac	54075.5753	0.0008	HMBX	C	
	55452.4202	0.0011	HMB8	V		54075.6795	0.0010	HMBX	C	
	55452.4947	0.0008	HMB8	V		54076.6189	0.0009	HMBX	C	
	55452.5701	0.0007	HMB8	V		54077.6627	0.0014	HMBX	C	
V524 And	55430.4199	0.0003	HHU	C	54084.5556	0.0022	HMBX	C		
	55433.4441	0.0009	MAV	V	55427.5661	0.0025	SH	V		
V544 And	55481.4454	0.0004	HHU	C	55443.4380	0.0015	SH	V		
	55452.4119	0.0007	HMBC	V	EH Lib	55334.4172	0.0004	HHU	C	
	55452.5192	0.0006	HMBC	V		55334.5055	0.0003	HHU	C	
55452.6263	0.0005	HMBC	V	55367.6609		0.0004	SO40	V		
CY Aqr	55531.4399	0.0005	KP	V	55367.7496	0.0007	SO40	V		
	55434.3598	0.0006	AA	C	SZ Lyn	55304.5137	0.0004	VWS	V	
	55434.4205	0.0006	AA	C		55310.4195	0.0004	VWS	V	
55434.4816	0.0007	AA	C	55310.5398		0.0004	VWS	V		
YZ Boo	55481.3582	0.0003	HHU	C	55507.4890	0.0005	KP	V		
	55262.5192	0.0007	SBL	V	55507.6095	0.0005	KP	V		
	55262.6226	0.0007	SBL	V	V593 Lyr	55309.5118	0.0004	HO40	C	
	55311.4414	0.0004	VWS	V		55309.6136	0.0003	HO40	C	
	55321.4349	0.0002	HHU	C		55371.4152	0.0008	HHU	C	
55321.5391	0.0002	HHU	C	55371.5176	0.0006	HHU	C			
55367.6512	0.0011	SO30	V	55420.4485	0.0010	SH	V			
V376 Cam	55367.7549	0.0008	SO30	V	V337 Ori	55528.5845	0.0013	RP	V	
	55263.3286	0.0006	HMBT	V		V1162 Ori	55244.3083	0.0013	BHO4	V
	55263.6093	0.0013	HMBT	V	55254.2226		0.0020	SK	V	
	55486.4433	0.0004	VWS	V	55254.3020		0.0031	SK	V	
	55487.4255	0.0004	VWS	V	55254.3793		0.0014	SK	V	
	55520.5422	0.0004	KP	C	55257.2910	0.0026	BHO4	V		
55520.6826	0.0003	KP	C	55258.2358	0.0023	SK	V			
V792 Cep	55462.4542	0.0028	HMBC	V	55293.3302	0.0039	HO18	V		
XX Cyg	55341.4404	0.0003	HO18	C	DY Peg	55409.7914	0.0007	SO30	V	
	55352.4979	0.0003	HMBH	V		55409.8670	0.0013	SO30	V	
	55437.3291	0.0005	AA	C		55445.3798	0.0007	MAV	V	
	55437.4641	0.0004	AA	C		55445.4527	0.0003	MAV	V	
	55437.5989	0.0004	AA	C		55445.5260	0.0003	MAV	V	
	55494.2412	0.0004	KP	V		55459.6009	0.0010	SO30	V	
	55494.3760	0.0004	KP	V		55459.6738	0.0004	SO30	V	
	55495.3212	0.0007	HHU	C		55459.7464	0.0002	SO30	V	
	V2455 Cyg	55365.4676	0.0005	SBL		V	55459.8196	0.0003	SO30	V
		55365.5619	0.0011	SBL		V	55459.8924	0.0006	SO30	V
55373.4747		0.0013	SBL	V	55464.6327	0.0002	SO30	V		
55417.5631	0.0004	SH	V	55464.7053	0.0003	SO30	V			
LW Dra	55291.4726	0.0007	VWS	V	55464.7784	0.0002	SO30	V		

Table 3: Observed times of maximum (continued).

Star	Epoch	Unc.	Obs.	Filter	Star	Epoch	Unc.	Obs.	Filter	
DY Peg	55464.8514	0.0003	SO30	V	DW Psc	55396.5775	0.0003	HO40	C	
	55464.9245	0.0005	SO30	V		55445.4875	0.0004	HHU	C	
	55466.4561	0.0005	RP	C		55505.4920	0.0002	KP	C	
	55466.6018	0.0002	SO30	V		55505.5517	0.0004	KP	C	
	55466.6747	0.0002	SO30	V		CW Ser	55365.3304	0.0007	HMBN	V
	55466.7476	0.0006	SO30	V		GW UMa	55264.4392	0.0009	HMB4	V
	55466.8201	0.0004	SO30	V		55264.6425	0.0008	HMB4	V	
	55466.8937	0.0004	SO30	V		55521.6828	0.0013	KP	V	
	55468.6439	0.0003	SO30	V		GSC 0321-0314	55352.4908	0.0002	HHU	C
	55468.7165	0.0003	SO30	V		55362.2711	0.0004	HMBN	V	
	55468.7893	0.0002	SO30	V		55362.3496	0.0003	HMBN	V	
	55468.8627	0.0002	SO30	V		55362.4276	0.0004	HMBN	V	
	55468.9354	0.0007	SO30	V		GSC 0429-2098	55338.4200	0.0019	HO18	C
	55470.6126	0.0002	SO30	V		55350.7098	0.0013	HMBW	V	
	55470.6856	0.0002	SO30	V		55350.8555	0.0019	HMBW	V	
55470.7583	0.0004	SO30	V	55353.7820	0.0011	HMBW	V			
55470.8312	0.0003	SO30	V	55358.7564	0.0019	HMBW	V			
DW Psc	52508.4812	0.0008	AS	V	55358.9031	0.0011	HMBW	V		
	52931.6386	0.0007	SO	C	GSC 0612-0771	55443.4199	0.0006	HMBC	V	
	52931.6991	0.0006	SO	C	55443.4830	0.0005	HMBC	V		
	52931.7595	0.0007	SO	C	55443.5453	0.0005	HMBC	V		
	52931.8169	0.0005	SO	C	55443.6084	0.0005	HMBC	V		
	52931.8760	0.0007	SO	C	55444.4241	0.0005	HMBC	V		
	54077.7599	0.0009	HMBX	C	55444.4874	0.0004	HMBC	V		
	54077.8197	0.0005	HMBX	C	55444.5504	0.0007	HMBC	V		
	54110.5671	0.0006	HMBX	C	55445.4920	0.0007	HMB8	V		
	54110.6264	0.0010	HMBX	C	55445.5546	0.0006	HMB8	V		
	54360.5549	0.0008	BHO2	C	55445.6175	0.0006	HMB8	V		
	54392.4675	0.0008	SK	C	GSC 0628-0348	55461.4997	0.0007	HMB4	V	
	54392.5270	0.0007	SK	C	GSC 0933-0651	55338.4924	0.0005	HMBH	C	
	54400.6984	0.0006	SO30	C	GSC 1061-1651	55393.4367	0.0011	HMB8	V	
	54400.7575	0.0007	SO30	C	GSC 1076-0158	55365.4317	0.0007	HMBN	V	
	54400.8179	0.0007	SO30	C	55365.5186	0.0009	HMBN	V		
	54400.8775	0.0008	SO30	C	55365.6058	0.0009	HMBN	V		
	54400.9365	0.0009	SO30	C	55478.3546	0.0008	HHU	C		
	54730.4939	0.0008	BHO1	C	GSC 1158-0921	55439.4442	0.0004	HHU	C	
	54830.2252	0.0008	SBL	C	55445.3856	0.0004	HHU	C		
	54830.2848	0.0008	MAV	C	55445.4515	0.0006	SH	V		
	54830.2846	0.0007	SBL	C	55445.5160	0.0006	SH	V		
	54830.3448	0.0007	MAV	C	GSC 1220-1131	55443.4758	0.0008	HMB8	V	
	54830.4041	0.0008	MAV	C	55443.5574	0.0008	HMB8	V		
	54838.2773	0.0006	HO40	C	55443.6390	0.0007	HMB8	V		
	55101.4425	0.0008	HO40	C	55444.4524	0.0010	HMB8	V		
	55140.6912	0.0007	SO30	C	55444.5334	0.0008	HMB8	V		
	55140.7502	0.0009	SO30	C	55444.6146	0.0006	HMB8	V		
	55140.8094	0.0008	SO30	C	GSC 1594-2234	55340.4431	0.0006	HO18	V	
	55140.8700	0.0007	SO30	C	55340.5796	0.0002	HO18	V		
	55140.9301	0.0010	SO30	C	55374.4790	0.0005	HHU	C		
	55198.3099	0.0014	HMBH	V	55462.3647	0.0010	MAV	V		
	55198.3688	0.0029	HMBH	V	GSC 1621-1643	55365.5201	0.0049	HMBN	V	
	55200.2190	0.0013	HMBH	C	55365.6329	0.0033	HMBN	V		
	55200.2786	0.0011	HMBH	C	GSC 1750-1237	55445.3591	0.0006	HMBC	V	
55204.2752	0.0021	HMBH	C	55445.4476	0.0006	HMBC	V			
55204.3339	0.0021	HMBH	C	55445.5345	0.0007	HMBC	V			
55204.3948	0.0009	HMBH	C	55445.6211	0.0006	HMBC	V			
55211.2539	0.0011	HO40	C	GSC 2043-1201	55363.3402	0.0010	HMBN	V		
55229.2677	0.0008	SK	C	55363.4172	0.0006	HMBN	V			
55231.2352	0.0006	SK	C	GSC 2080-0986	55350.5293	0.0004	HHU	C		

Table 3: Observed times of maximum (continued).

Star	Epoch	Unc.	Obs.	Filter	Star	Epoch	Unc.	Obs.	Filter
GSC 2108-1564	55337.5449	0.0009	HO18	C	GSC 3832-0152	55301.5178	0.0005	HHSX	C
GSC 2566-1398	55304.5360	0.0010	HMBH	V		55308.3683	0.0005	HO18	V
	55308.3457	0.0020	HMBT	V	GSC 3863-0740	55264.3671	0.0024	HMBC	V
	55308.4366	0.0010	HMBT	V		55267.9247	0.0016	HMBW	V
	55308.5273	0.0007	HMBT	V	GSC 3934-1904	55339.5393	0.0003	HMBH	V
	55351.4324	0.0004	HHU	C		55364.4524	0.0008	SBL	V
	55351.5228	0.0003	HHU	C		55364.5617	0.0008	SBL	V
GSC 2696-1396	55378.4410	0.0011	HHU	C		55417.4471	0.0010	HHU	C
	55452.3469	0.0012	SH	V	GSC 4417-0394	55258.3647	0.0013	BHO4	V
GSC 2861-0970	55465.6402	0.0006	RP	C		55263.5219	0.0008	RP30	V
	55508.4706	0.0004	FN	V		55264.4476	0.0016	HMBT	V
	55508.5808	0.0003	FN	V		55264.5804	0.0026	HMBT	V
	55516.3976	0.0016	HMB4	V		55310.4680	0.0012	HHSX	C
GSC 2977-0238	55262.3263	0.0001	HMB4	VR		55552.4762	0.0008	KP	C
	55263.3896	0.0001	HMB4	VR		55552.6082	0.0008	KP	C
	55263.4654	0.0001	HMB4	VR	GSC 4464-0924	55304.5238	0.0007	HO18	C
	55263.5413	0.0001	HMB4	VR		55375.4772	0.0006	HHU	C
	55263.6181	0.0001	HMB4	VR		55452.3173	0.0004	HHU	C
	55309.3295	0.0005	HO40	V		55452.4000	0.0007	HHU	C
	55309.4051	0.0003	HO40	V	GSC 4500-0083	55365.4573	0.0013	HHU	C
	55536.4462	0.0002	KP	V		55479.2772	0.0016	HHU	C
	55536.5222	0.0002	KP	V		55479.3609	0.0009	HHU	C
	55536.5981	0.0003	KP	V	GSC 4552-1498	55257.3948	0.0015	BHO4	C
GSC 3074-0114	55310.3739	0.0006	HO18	C		55262.4737	0.0003	RP30	V
	55310.4252	0.0004	HO18	C		55262.5288	0.0003	RP30	V
	55310.4764	0.0005	HO18	C		55301.4297	0.0004	RP30	V
	55310.5275	0.0004	HO18	C		55301.4852	0.0003	RP30	V
	55386.4465	0.0004	HMB8	V		55480.3589	0.0003	HHU	C
	55386.4972	0.0006	HMB8	V		55480.4146	0.0003	HHU	C
	55386.5486	0.0010	HMB8	V		55537.4533	0.0005	KP	C
	55417.3779	0.0008	SH	V		55537.5094	0.0002	KP	C
	55433.3829	0.0007	SH	V		55537.5650	0.0002	KP	C
GSC 3483-0746	55266.5628	0.0008	HMBH	V	GSC 4556-1113	55262.3407	0.0009	BHO4	V
	55266.6748	0.0018	HMBH	V		55461.3606	0.0004	VWS	V
	55311.3810	0.0015	HO18	V		55478.3694	0.0007	VWS	V
	55311.4946	0.0008	HO18	V		55478.4564	0.0005	VWS	V
GSC 3489-0868	55334.4160	0.0015	BHO4	C		55478.5426	0.0006	VWS	V
	55334.5016	0.0010	BHO4	C		55521.3686	0.0004	VWS	V
GSC 3490-0814	55260.5677	0.0013	HO40	V		55521.4550	0.0003	VWS	V
	55308.5073	0.0016	HO18	C		55543.3012	0.0003	VWS	V
	55309.4001	0.0020	HO18	C		55543.3876	0.0003	VWS	V
	55396.4434	0.0008	MAV	V	GSC 4638-0455	55337.4089	0.0003	HMBH	C
	55396.5126	0.0009	MAV	V		55337.5059	0.0008	HMBH	C
GSC 3832-0152	55258.4054	0.0011	SBL	V	GSC 4923-0693	55297.3319	0.0008	HMBH	V
	55258.4960	0.0011	SBL	V		55297.3980	0.0009	HMBH	V
	55258.5861	0.0013	SBL	V		55303.3880	0.0006	HMBH	V
	55260.4138	0.0004	HO40	V		55303.4546	0.0006	HMBH	V
	55260.5051	0.0003	HO40	V	GSC 5018-1085	55337.4338	0.0003	HO18	C
	55260.5054	0.0005	SBL	V	NSVS 11672463	55445.4360	0.0005	SH	V
	55298.4128	0.0008	HHSX	C	NSVS 14243430	55365.4340	0.0008	HMBN	V
	55298.5030	0.0009	HHSX	C		55365.5199	0.0003	HMBN	V
	55301.4261	0.0009	HHSX	C		55365.6061	0.0003	HMBN	V

## References:

- Butters, O.W., West, R.G., Anderson, D.R. et al., 2010, *A&A*, **520**, L10
- Krugly, Y.N., 1999, *IBVS*, 4730
- Pojmański, G., 2002, *Acta Astron.*, **52**, 397
- Samus, N.N., Durlevich, O.V. et al., 2007-2011, *General Catalog of Variable Stars*, online edition
- Van Cauteren, P., Wils, P., Lampens, P., Strigachev, A., 2002, *IBVS*, 5248
- Wils, P., Kleidis, S., Hamsch, F.-J., Vidal-Sáinz, J., Vanleenhove, M., Lampens, P., Van Cauteren, P., Robertson, C.W., Staels, B., Pickard, R.D., Rozakis, I., Dufoer, S., Groenendaels, R., Gómez-Forrellad, J.M., García-Melendo, E., Hautecler, H., Van der Looy, J., 2009, *IBVS*, 5878
- Wils, P., Hamsch, F.-J., Lampens, P., Van Cauteren, P., Staels, B., Pickard, R.D., Kleidis, S., Van Wassenhove, J., Otero, S.A., Bellocchio, E., Thienpont, E., Vanleenhove, M., 2010, *IBVS*, 5928
- Woźniak, P.R., Vestrand, W.T., Akerlof, C.W. et al., 2004, *AJ*, **127**, 2436