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NEW VARIABLE STARS DISCOVERED AT THE OSSERVATORIO ASTRONOMICO

"NASTRO VERDE" (MPC C82), SORRENTO, ITALY

A Complete Catalogue of Variable Star Discoveries from the Osservatorio Astronomico "Nastro Verde", Sorrento (MPC C82)

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Abstract: I present a catalogue of 118 variable stars associated with the Osservatorio Astronomico "Nastro Verde" (MPC Code C82, Sorrento, Italy) and registered in the AAVSO International Variable Star Index (VSX). Of these, 117 were discovered solely by me, 4 in small collaborations, 8 as part of the Campanian Star Hunters (CSH) Project, 5 discovered and 1 revision contributed through the AstroCampania collaboration using the 0.5-m telescope at the Observatory "Salvatore Di Giacomo" in Agerola (Na), and 7 represent substantial revisions of previously known objects. The catalogue spans 13 constellations and includes eclipsing binaries, contact systems, RR Lyrae, Delta Scuti pulsators, and ellipsoidal variables, with magnitudes ranging from 11.45 V (HD 337811, Lyra) to 18.7 CV (2MASS J02314319+5314450, Perseus).

1 Introduction

Systematic photometric surveys for variable stars remain a fundamental tool for advancing our understanding of stellar structure and evolution. While large automated sky surveys such as ASAS-SN, ZTF, and ATLAS have revolutionised the discovery of variable stars at bright magnitudes, a complementary niche exists for pointed CCD observations from smaller observatories, which can reach deeper limiting magnitudes in selected fields.

The Osservatorio Astronomico "Nastro Verde" (MPC Code C82) is located at Sorrento (Naples), Italy, and has been conducting a systematic photometric survey for variable stars since 2011. In this paper I present a catalogue of 118 variable stars associated with this observatory and registered in VSX. Of these, 117 were discovered solely by me, 4 in small collaborations, 8 as part of the Campanian Star Hunters (CSH) Project, 5 through the AstroCampania collaboration, and 7 represent substantial revisions of previously known objects.

The stars span a wide range of variability types across 13 constellations. Magnitudes range from 11.45 *V* (HD 337811, a Delta Scuti star in Lyra) to 18.7 CV (2MASS J02314319+5314450 in Perseus), demonstrating the depth achievable with the observatory's instrumentation under good seeing conditions.

2 Instruments and Methods

2.1 Osservatorio Astronomico "Nastro Verde" (MPC C82)

The primary instrument at the Osservatorio Astronomico "Nastro Verde" (MPC C82) is a Schmidt-Cassegrain 0.25-m (10") *f*/10 telescope equipped with a focal reducer operating at *f*/6.3. I used two CCD cameras during the survey: an SBIG ST-7 and an SBIG ST-8. All photometric observations were obtained unfiltered (CV passband, calibrated to the *V*-band using APASS comparison stars), unless otherwise noted. I performed

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image acquisition and aperture photometry with MUNIWIN and MAXIM DL; period analysis and phase-folding with PERANSO.

I conducted observations between 2011 and 2019 in numerous targeted fields across the northern sky. A typical observing session consisted of several hundred images obtained over one to several hours, yielding light curves with photometric precision of 0.01-0.03 mag for stars in the range 12-16 *V*, degrading to 0.05-0.10 mag near the faint limit of 18 CV.

2.2 Campanian Star Hunters (CSH) Project

Eight variable stars (CSHP_V4 through CSHP_V11, all in Cygnus) were discovered in the framework of the Campanian Star Hunters (CSH) Project, a collaborative photometric survey involving multiple observatories in the Campania region of Italy, conducted in 2017.

2.3 AstroCampania / Observatory "Salvatore Di Giacomo", Agerola

Five variable stars (AC_V1 through AC_V5) and one revision (AC_V6, primary name PS1-3PI J070539.96+201702.4) were discovered or characterised in collaboration with the AstroCampania group using the 0.5-m *f*/8 Ritchey-Chretien telescope equipped with an FLI PL4240 CCD camera at the Observatory "Salvatore Di Giacomo" (OASDG) in Agerola (Na), operated remotely. For the three High Amplitude Delta Scuti stars (AC_V1, AC_V2, AC_V3), additional observations were obtained with the T25 iTelescope, a 431-mm PlaneWave CDK telescope equipped with an FLI PL6303E CCD camera located in New Mexico, USA. Image processing and aperture photometry were performed with MUNIWIN and MAXIM DL; period analysis with PERANSO.

The AstroCampania team members contributing to these discoveries include: L. D'Avino, L. Izzo, M. Mollica, L. Morrone, A. Noschese, N. Ruocco, and A. Vecchione (for AC_V1-V3); A. Catapano, A. Noschese, and N. Ruocco (for AC_V4-V6).

2.4 Discovery and Verification Method

I identified variable candidates by blink comparison of reference and target images, followed by differential photometry against comparison stars drawn from APASS, UCAC4, CMC14/15, or GSC2.3 catalogues. I constructed phase-folded light curves to confirm periodicity and determine preliminary orbital elements (epoch, period, amplitude). All new variables were submitted by me to and accepted by the AAVSO International Variable Star Index (VSX).

3 The Catalogue

Table 1 presents the complete catalogue of 118 variable stars. For each star I list a running number, the VSX name, the constellation, the variability type, the period in days, the mean *V* magnitude (or CV range), the amplitude, the discoverer code, and notes of interest. Equatorial coordinates (J2000.0) are retrievable from VSX using the listed names.

Discoverer codes: R = N. Ruocco; R+M = Ruocco & Mantero; R+N = Ruocco & Noschese; CSH = Campanian Star Hunters Project; AC = AstroCampania / OASDG; Rev = Revision of previously known variable; Rev-AC = Revision by AstroCampania.

Table 1. Catalogue of variable stars from MPC C82 (2011-2019).

#	Name	Con.	Type	Period (d)	Mag.	Ampl.	Disc.	Notes
1	2MASS J22313220-0235497	Aqr	RRC	0.30342	16.8 V	0.40	R+N	Period change: 0.30349 to 0.30342 d
2	V0847 Aur	Aur	EB	2.8622	12.9 V	0.63	R+M	GCVS; F0/2 (Qian 2020); Min II=12.95 V
3	2MASS J05444611+3127591	Aur	EW	0.31560	15.8 V	0.30	R+M	
4	2MASS J05451032+3128028	Aur	EA	1.3405	15.3 V	0.40	R+M	
5	2MASS J05511976+3130494	Aur	EW	0.29748	15.8 V	0.45	R	CzeV353
6	UCAC4 609-022916	Aur	EA	1.72714	14.9 V	0.55	R	Eccentric; Min II at phase 0.59
7	UCAC4 609-023099	Aur	EW	0.31842	15.1 V	0.35	R	CzeV1853
8	ATO J086.6285+31.1938	Aur	EW	0.31270	15.6 V	0.30	R	
9	2MASS J13565075+4058462	CVn	RRC	0.30342	15.7 V	0.35	R	Period changes documented
10	CSHP_V4	Cyg	EW	0.33	16.5 V	0.40	CSH	CSH Project 2017
11	CSHP_V5	Cyg	EW	0.31	16.8 V	0.45	CSH	CSH Project 2017
12	CSHP_V6	Cyg	EW	0.29	17.0 V	0.35	CSH	CSH Project 2017
13	CSHP_V7	Cyg	EW	0.35	16.6 V	0.40	CSH	CSH Project 2017
14	CSHP_V8	Cyg	EW	0.32	16.9 V	0.50	CSH	O'Connell effect
15	CSHP_V9	Cyg	EB	0.55	16.7 V	0.40	CSH	CSH Project 2017
16	CSHP_V10	Cyg	EW	0.28	17.1 V	0.55	CSH	CSH Project 2017
17	CSHP_V11	Cyg	EA	1.12	16.4 V	0.60	CSH	CSH Project 2017
18	OO Cyg	Cyg	EW	0.5068	11.8 V	0.55	Rev	Rev: epoch+phase plot, 8 nights, 675 obs
19	V1111 Cyg	Cyg	RRAB/BL	0.6280	15.1 V	0.95	Rev	Rev: type, period, epoch from C82 obs
20	V2875 Cyg	Cyg	EW	0.38	15.5 V	0.40	R	GCVS
21	V2876 Cyg	Cyg	EA	1.15	14.8 V	0.55	R	GCVS
22	V2877 Cyg	Cyg	DSCTC	0.0589	13.5 V	0.05	R	GCVS; KIC 2755973
23	V2884 Cyg	Cyg	EB	0.8812	14.3 V	0.60	Rev	Rev: type, period, epoch; CzeV126; 12 nights
24	V2887 Cyg	Cyg	DSCT:	0.0680	13.2 V	0.04	R	GCVS; KIC 3278643; VB at 4"
25	V2888 Cyg	Cyg	EW	0.31	15.1 V	0.35	R	GCVS
26	V2890 Cyg	Cyg	DSCTC	0.0548	12.90 V	0.06	R	GCVS; 12.90 V
27	2MASS J19524346+3710178	Cyg	EA	1.4428	12.37 V	0.50	R	12.37 V; companion SAO 69016 at 20"
28	2MASS J19572341+3850246	Cyg	DSCT	0.07986	14.6 V	0.08	R	P = 115 min
29	2MASS J19575567+3853354	Cyg	EW	0.34	15.8 V	0.40	R	
30	2MASS J19580410+3850289	Cyg	EW	0.29	16.2 V	0.35	R	
31	2MASS J19585960+3839076	Cyg	DSCT	0.0720	14.9 V	0.07	R	AllWISE W4 = 9.08
32	UCAC4 601-078444	Cyg	EW	0.30	15.9 V	0.75	R	Ampl. 0.75 mag

33	UCAC4 618-094244	Cyg	RRC	0.33	15.6 V	0.38	R	AllWISE W3-W4 = 2.28
34	UCAC4 674-108700	Cyg	EA	2.14	14.7 V	1.04	R	Ampl. 1.04 mag; companion at 8"
35	2MASS J06103575+2243300	Gem	EW	0.3012	15.9 V	0.35	R	F0 (Qian 2020)
36	2MASS J06440196+2329468	Gem	EW	0.2987	16.1 V	0.40	R	
37	AC_V4	Gem	EW	0.376400	15.79-16.30 CV	0.51	AC	Catapano, Noschese, Ruocco; OASDG 0.5-m RC
38	AC_V5	Gem	EW	0.262094	17.93-18.37 CV	0.44	AC	Catapano, Noschese, Ruocco; G3 (Qian 2020)
39	PS1-3PI J070539.96+201702.4	Gem	EW	0.30366	16.08-16.56 V	0.48	Rev-AC	Rev: disc. Pan-STARRS1 (Sesar 2017); AC_V6 as alias
40	GR Gem	Gem	EA	0.7180	13.5 V	0.45	Rev	Rev: epoch+range from C82+APASS data
41	UCAC4 525-032209	Gem	EA	1.1205	15.4 V	0.50	R	
42	UCAC4 525-032522	Gem	RRC	0.29881	14.8 V	0.42	R	169 AAVSO obs
43	UCAC4 526-032227	Gem	EW	0.3156	15.7 V	0.38	R	
44	V0661 Lac	Lac	EW	0.3782	13.9 V	0.45	Rev	Rev: type, period, epoch; ex CzeV158
45	V0688 Lac	Lac	EA	1.8740	14.2 V	0.70	R	GCVS; 2011 Nov 7
46	V0910 Lac	Lac	EA	1.07022	13.84-14.48 V	0.64	R	GCVS (name-list 85)
47	V0911 Lac	Lac	ELL	0.62014	13.39-13.50 V	0.11	R	GCVS; first ELL of catalogue
48	V0912 Lac	Lac	EB	1.15003	13.39-13.50 V	0.11	R	GCVS; possibly ELL
49	2MASS J22000388+4351113	Lac	DSCT:	0.16106	14.92 V	0.06	R	J-K = 0.57; uncertain classification
50	2MASS J22162837+4952131	Lac	EW	0.31914	17.13 V	0.26	R	
51	2MASS J22163381+4952290	Lac	EW	0.61075	16.49 V	0.81	R	
52	2MASS J22192946+4416566	Lac	EW	0.4338	16.22 V	0.30	R	
53	2MASS J22235378+5122249	Lac	EW	0.29116	17.6 V	0.85	R	Ampl. 0.85 mag
54	2MASS J22243032+5126076	Lac	EW	0.2995	16.8 V	0.57	R	Mag. from IPHAS2
55	2MASS J22253540+5118014	Lac	EA	0.86561	16.9 V	0.55	R	AllWISE W1-W2 = -0.33
56	2MASS J22282227+5228058	Lac	EW	0.36280	17.3 V	0.65	R	
57	2MASS J22293014+5231171	Lac	EW	0.3887	16.8 V	0.48	R	
58	2MASS J22331661+5038561	Lac	EW	0.3128	16.12 V	0.30	R	2011 Nov; PM RA +17.5 mas/yr
59	2MASS J22333278+5040263	Lac	EW	0.2509	17.7 V	1.0	R	Ampl. 1.0 mag (EW record); AllWISE W1-W2 = -0.63
60	2MASS J22335381+5043227	Lac	EW	0.4409	15.5 V	0.70	R	2011 Nov; ampl. 0.70 mag
61	2MASS J22422253+5057575	Lac	EW	0.4428	16.22 V	0.40	R	2011 Nov 7; same field as V0688 Lac
62	2MASS J22425519+5059043	Lac	EB	0.5228	14.96 V	0.30	R	2011 Nov 7
63	2MASS J22432320+5056006	Lac	EW	0.3252	16.56 V	0.60	R	2011 Nov 7; mag. from GSC2.3
64	GSC 03632-02808	Lac	EA	1.07022	14.06 V	0.64	R	PM Dec -19.9 mas/yr
65	UCAC4 689-111349	Lac	DSCT:	0.099548	14.9 V	0.10	R	P = 2.39 h; 11 AAVSO obs
66	UCAC4 700-108110	Lac	EW	0.47037	15.5 V	0.19	R	
67	UCAC4 700-108268	Lac	EW	0.30660	15.54 V	0.28	R	
68	UCAC4 705-104781	Lac	EW	0.67587	15.68 V	0.41	R	PM RA -14.6 mas/yr
69	UCAC4 705-104975	Lac	EA	0.91107	16.2 V	0.49	R	Companion at 3" SW (blend)
70	UCAC4 705-105013	Lac	EB	0.5350	15.94 V	0.59	R	
71	UCAC4 706-105719	Lac	EW	0.28407	16.6 V	0.42	R	
72	UCAC4 706-105733	Lac	EW	0.2800	15.9 V	0.65	R	Same night as UCAC4 706-105719
73	UCAC4 707-100174	Lac	EA	1.824987	14.81-15.24 V	0.43	R	ASAS-SN data
74	UCAC4 707-100327	Lac	EA	0.66609	15.67 V	0.85	R	Ampl. 0.85 mag (EA record)
75	UCAC4 707-100455	Lac	EB	0.47295	16.4 V	0.30	R	

76	UCAC4 707-100598	Lac	EA	1.958047	15.54-16.04 V	0.50	R	ASAS-SN contaminated; range corrected
77	UCAC4 708-103075	Lac	EW	0.7772	13.32 V	0.15	R	13.32 V; third brightest
78	UCAC4 712-099399	Lac	EW	0.31123	15.64 V	0.90	R	Ampl. 0.90 mag (second EW)
79	URAT1 705-478678	Lac	EW	0.383142	17.7-18.4 CV	0.70	R	Faintest of catalogue
80	V0859 Lyr	Lyr	EA	0.7434342	14.05-14.65 V	0.60	R	GCVS (name-list 82)
81	V0883 Lyr	Lyr	RRAB	0.6207	14.8-15.8 V	1.0	R	GCVS (name-list 82); rise 15%
82	V0885 Lyr	Lyr	RRAB	0.4410	14.8-15.9 V	1.1	R	GCVS (name-list 82); 8 AAVSO obs
83	2MASS J19074994+3040582	Lyr	EW	0.2623819	15.921 V	0.64	R	130 AAVSO obs; PM RA -48.4 mas/yr (record)
84	2MASS J19080979+3045476	Lyr	EW	0.4427	13.37 V	0.14	R	CzeV193; companion at 4.4" (blend)
85	2MASS J19105127+2704353	Lyr	EW	0.695568	14.10 V	0.32	R	2011 Aug
86	2MASS J19133166+3334489	Lyr	EW	0.2611616	17.651 g	0.669	R	Elements updated from ZTF (Chen 2020)
87	2MASS J19205082+3138451	Lyr	EW	0.374880	16.03 V	0.49	R	2011 Jul
88	2MASS J19212033+3143085	Lyr	EW	0.358070	16.37 V	0.58	R	2011 Jul 26; same night as J19205082
89	ATO J277.3559+31.0806	Lyr	EW	0.277904	14.27-14.57 r	0.30	Rev	Rev: disc. ATLAS (Heinze 2018); VSX subm. Ruocco
90	CMC15 J190604.0+343654	Lyr	EW	0.2452	17.29 V	0.45	R	KIC 63666
91	CzeV192	Lyr	HADS	0.0779	13.85 V	0.36	Rev	Rev: disc. Trnka 2010; type+elem. Ruocco 2013; 5608 AAVSO obs
92	HD 337811	Lyr	DSCT	0.094549	11.45 V	0.07	R	11.45 V: brightest; F5
93	UCAC4 585-076740	Lyr	EW	0.3735	15.57 V	0.20	R	F7 (Qian 2020); PM Dec -30.7 mas/yr
94	UCAC4 586-077397	Lyr	EA/KE	0.5912	14.77 V	0.27	R	Hybrid EA/KE type
95	UCAC4 587-077573	Lyr	EW	0.3283	15.83 V	0.15	R	
96	UCAC4 615-061694	Lyr	EW	0.3179	14.63 V	0.30	R	Lyr W, RA 18h27m
97	UCAC4 623-067322	Lyr	EW	0.3072	15.9 V	0.22	R	2017 May
98	UCAC4 624-065143	Lyr	EW	0.2669	15.7 V	0.81	R	KIC 63963; ampl. 0.81 mag; J-K = 0.75
99	UCAC4 625-070455	Lyr	EW	0.4470	15.0 V	0.13	R	Companion at 8" S (blend)
100	UCAC4 625-070678	Lyr	EW	0.3617	15.10 V	0.39	R	F5 (Qian 2020)
101	2MASS J07042350-0150225	Mon	DSCT	0.1178	14.91 V	0.10	R	2012 Feb
102	GSC 04818-04232	Mon	EW	0.468465	13.95 V	0.30	R	Blend with V0383 Mon at 22"
103	2MASS J02311956+5314124	Per	EW	0.39604	17.8-18.3 CV	0.50	R	2018 Dec
104	2MASS J02314319+5314450	Per	EW	0.338975	18.1-18.7 CV	0.60	R	Faintest of catalogue
105	2MASS J02322502+5309173	Per	EW	0.351083	18.0-18.3 CV	0.30	R	2018 Dec; 3 obs only
106	2MASS J02323196+5305219	Per	EA	0.65445	17.4-18.4 CV	1.0	R	2018 Dec; ampl. 1.0 mag
107	2MASS J02455063+4319161	Per	EW/ELL	0.3156	14.57 V	0.10	R	F6 (Qian 2020); hybrid EW/ELL
108	2MASS J02592105+404039	Per	EW	0.3280	15.71 V	0.48	R	2012 Dec
109	2MASS J03204524+4020351	Per	EW	0.2568	16.27 V	0.70	R	2014 Nov
110	2MASS J03441632+4000139	Per	EW	0.3566	16.10 V	0.60	R	G5/6 (Qian 2020)
111	2MASS J03501172+3355441	Per	EW	0.32864	13.66 V	0.18	R	PM RA -34.2 mas/yr; companion at 5"
112	UCAC4 620-012334	Per	EW	0.462171	16.15 V	0.17	R	F3 (Qian 2020); alias CSS
113	UCAC4 672-028159	Per	EW	0.316389	16.16-16.55 CV	0.39	R	2019 Jan
114	AC_V1	Ser	HADS	0.05797	18.06 G	0.45	AC	D'Avino et al.; OASDG+T25 NM; P=83.5 min
115	AC_V2	Ser	HADS	0.134508	15.7 V	0.41	AC	D'Avino et al.; OASDG+T25 NM; P=3.23 h
116	AC_V3	Sgr	HADS	0.046238	16.5 V	0.23	AC	D'Avino et al.; T25 NM; P=66.6 min (shortest)
117	2MASS J05530151+2426019	Tau	EW	0.2692	15.54 V	0.22	R	F9 (Qian 2020); PM RA +31.2 mas/yr
118	UCAC3 235-195327	Vul	EW	0.3803	16.2: V	0.60	R	2012 Aug; AllWISE W1-W2 = -0.47

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4 Discussion and Notable Objects

4.1 Range of Brightness

The catalogue spans more than seven magnitudes, from HD 337811 in Lyra (11.45 *V*, a Delta Scuti star of spectral type F5) at the bright end, to 2MASS J02314319+5314450 in Perseus (18.1-18.7 CV) at the faint end. Reaching the latter depth with a 0.25-m telescope requires exceptional seeing and long integration times.

4.2 Spectral Classifications

Ten stars in the catalogue received spectral type determinations from Qian et al. (2020): two G-type contact binaries (2MASS J03441632 in Perseus, G5/6; AC_V5 in Gemini, G3) are particularly noteworthy, as EW systems of spectral type G are physically interesting due to their cooler component temperatures. The remaining classified stars are of type F (F0, F0, F3, F5, F5, F6, F7, F9).

Fig. 1 shows a colour-magnitude diagram of the catalogue stars for which an effective temperature estimate is available (27 objects). The positions of the stars are broadly consistent with their assigned variability types. The RR Lyrae variables fall precisely on the horizontal branch at $M_V \sim +0.6$, within the instability strip, as expected. The Delta Scuti and HADS stars lie within the instability strip at the upper main sequence (T_{eff} = 7000-7500 K). The majority of the EW contact binaries cluster along the upper main sequence between spectral types F0 and G0, consistent with the known temperature distribution of W UMa systems. Two noteworthy exceptions are UCAC4 624-065143 (Lyr, J-K = 0.75, $T_{eff} \sim 4800$ K) and AC_V5 (Gem, G3), both at the cool end of the W UMa temperature distribution.

4.3 Large-Amplitude Objects

The largest amplitude among EW contact systems belongs to 2MASS J22333278+5040263 in Lacerta (1.0 mag), which also displays a highly anomalous AllWISE colour W1-W2 = -0.63, requiring further investigation. The largest amplitude among EA Algol-type systems belongs to UCAC4 674-108700 in Cygnus (1.04 mag), which has a visual companion 8" away.

4.4 High Proper Motion Stars

Several stars exhibit unusually high proper motions, suggesting nearby distances. The most extreme is 2MASS J19074994+3040582 in Lyra (PM: -48.4, +25.4 mas/yr; 130 AAVSO observations; revised period 0.2623819 d, amplitude 0.64 mag, Otero 2024), followed by 2MASS J03501172+3355441 in Perseus (-34.2, -11.5 mas/yr) and 2MASS J05530151+2426019 in Taurus (+31.2, -17.1 mas/yr).

4.5 Pulsating Stars

The catalogue includes four RR Lyrae variables (V0883 Lyr and V0885 Lyr as RRAB; 2MASS J22313220 in Aquarius and 2MASS J13565075 in Canes Venatici as RRC, both with documented period changes), five Delta Scuti stars, and four HADS. Among the latter, CzeV192 in Lyra - for which Ruocco revised the type and provided precise elements in 2013 - has accumulated 5608 AAVSO observations. The three AstroCampania HADS (AC_V1 to AC_V3) have periods ranging from 66.6 to 193 minutes.

4.6 Productive Fields

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On the night of 2011 November 7, I identified four variable stars in the same Lacerta field near RA 22h42m: V0688 Lac, 2MASS J22422253, 2MASS J22425519, and 2MASS J22432320. The field around RA 22h24m-26m in Lacerta (2016-2019) yielded nine variables. In Lyra, the area around RA 19h07m-08m, Dec +30-31 degrees was the source of 2MASS J19074994, 2MASS J19080979 (CzeV193), and the revised CzeV192.

5 Revisions of Known Variables

Seven previously known variable stars received substantial contributions from C82 survey observations (Table 2). These revisions involved new orbital elements, reclassification of variability type, correction of magnitude range, or documentation of period changes.

Table 2. Stars with substantial revisions from C82 observations.

Star	Type	Contribution from C82 observations
OO Cyg	EW	Epoch and phase plot from 8 nights of observation (675 data points).
V1111 Cyg	RRAB/BL	Variability type, period, and epoch first determined from C82 observations.
V2884 Cyg	EB	Type, period, and epoch from 12 nights; also listed as CzeV126.
GR Gem	EA	Epoch and magnitude range revised using C82 and APASS data.
V0661 Lac	EW	Type, period, and epoch revised; previously listed as CzeV158.
ATO J277.3559+31.0806	EW	Initial VSX submission by Ruocco; discoverer is ATLAS (Heinze 2018).
CzeV192 Lyr	HADS	Type revised to HADS; precise elements added (Ruocco 2013); 5608 AAVSO observations.
PS1-3PI J070539.96+201702.4	EW	Discovered by Pan-STARRS1 (Sesar 2017), not yet in VSX; AstroCampania provided EW classification and corrected range (AC_V6).

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