On-line database of photometric observations of magnetic chemically peculiar stars

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Abstract. We present our extensive project of the *On-line database of photometric observations of magnetic CP stars* to collect published data of photometric observations of magnetic chemically peculiar (mCP) stars in the optical and near IR regions. The nascent database that contains now more than 107 thousand photometric measurements of the most important 102 mCP stars will be continuously supplemented with published or new photometric data on these and about 150 additional mCP stars. This poster describes the structure and organization of the database.

Key words: chemically peculiar stars – magnetic stars – photometry

1 Structure and content of the Database

Using the NASA ADS (http://adsabs.harvard.edu/abstractservice.html) and the SIMBAD (http://simbad.ustrasbg.fr/Simbad) services we collected photometric observations of magnetic CP variable stars now available and satisfying the requirement of the two sources. Also, we obtained some observations as private communications from authors. 102 of the listed mCP stars were observed in the Strömgren uvby photometric system (Strömgren, 1966) and the HIPPARCOS (ESA, 1997) system, observations were also performed in other systems, e.g., the Johnson international photometric system (Johnson and Morgan, 1951), Geneva (Golay, 1972), 10-colour photometry (Schöneich et al., 1976), Walraven (Walraven and Walraven, 1960) and Maitzen (Maitzen, 1976) systems. We expect the list to be extended to more than 250 stars with photometric observations.

The database consists of two parts, the Data and the References. In the References, one finds the sources of data, the bibcodes including links to corresponding papers, names of comparison and check stars (if available), number of observations in individual filters (see Fig. 1).

We calculated the mean values of magnitudes, the error of one measurement and the effective amplitudes in particular filters given in this part from all data sets of a given star. We define the effective amplitude A_{eff} as:

$$A_{\mathrm{eff}} = \sqrt{8 \int_0^1 (m(\varphi) - \overline{m})^2 d\varphi},$$

where φ is the phase, $m(\varphi)$ is a colour light curve and $\overline{m}$ is its mean value. The factor 8 is selected so that the effective amplitude of the sine light curve corresponds to the amplitude of the observed one.

When using data by means of this database, the original sources linked at the *References* should be cited.

The Data contains photometric observations and offers various possibilities for retrieval, e.g. photometric systems and epochs of observation. After submitting the selection a tabulated list of information on data available is displayed (see Fig. 2). Besides the HD, the filter number and the number of the records found, one can extract the data in ASCII format ('TXT'). The data are also plotted in two formats ('PNG' and 'EPS'). The data extracted contain the following columns: the HD number, the $HJD - 2400000$, the magnitude or magnitude difference, the error of the individual measurement when given (otherwise 0.0000 is shown), the filter number, and the reference code. The pilot Database of 102 CP stars, mostly magnetic ones listed in Tab. 1 is accessible at

http://dumbell.physics.muni.cz/pilot

A reader can visit it and kindly send us comments, suggestions or recommendations. They will help us to improve future versions of the Database.

Table 1: List of 102 mCP stars

HD	Name	Sp. & pec.	HD	Name	Sp. & pec.
2453	GR And	A1 SrEuCr	94660	HR 4263	A0 EuCrSi
3322	HR 149	B8 HgMn (!)	96616	46 Cen	A3 Sr
3980	ξ Phe	A7 SrEuCr	96707	HR 4330	A8 Sr?
4778	HR 234	A1 SrCrEu	98088	HR 4369	A8 SrCrEu
5737	α Scl	B6 He wk	103192	β Hya	B9 SiCrSr
5797	V551 Cas	A0 CrEuSr	111133	HR 4854	A1 SrCrEu
6178	σ Scl	A2V (p?)	114365	V824 Cen	A0 Si
6491	AS Scl	F2IV/V	115708	HH Com	A3 SrEu
6532	AP Scl	A3 SrCr	116458	67 Mus	A0 EuSiCr
7676	VV Scl	A5 SrCrEu	119213	HR 5153	A3 SrCr
11187	BD+54 393	A0p Si	120198	84 UMa	A0 EuCr
14392	63 And	B9 Si	125248	HR 5355	A1 EuCr
15144	BD+38 2827	A5 SrCrEu	125630	BS Cir	A2 SiCrSr
15980	BD+39 571	B9 Si	126515	FF Vir	A2 CrSr
19832	56 Ari	B8 Si	133029	HR 5597	B9 SiCrSr
22316	HR 1094	B9 CrHgSi	134214	HI Lib	F2 SrCrEu
22470	20 Eri	A0 Si	137909	β CrB	A9 SrEuCr
26571	V1137 Tau	B8 Si	142070	HIP 77752	A0 SrCrEu
27309	56 Tau	A0 SiCr	142990	HR 5942	B7 He wk
28843	HR 1441	Bp He wk	144667	HR 6000A	A0 He wk
29009	46 Eri	B8 Si	152308	49 Her	A0 CrEu
30849	SY Pic	A5 SrEuCr	159376	52 Oph	B9 Si
32633	HZ Aur	B9 SiCr	164429	HR 6718	B9 SiCrSr
32650	HR 1643	B9 Si	168733	HR 6870	B8 TiSr
32966	TU Lep	B9 Si	170973	HR 6958	A0 SiCrSr
34364	AR Aur	B9.5	171247	HR 6967	B8 Si
35298	V1156 Ori	B6 He wk	171782	QV Ser	B9 SiCrEu
36668	V1107 Ori	B7 He wk Si	177410	HR 7224	B9 Si
37210	V1133 Ori	B9 He wk Si	179527	19 Lyr	B9 Si
37776	V901 Ori	B1 He str	184905	V1264 Cyg	A0 SiCr
38823	V1054 Ori	A5 SrEu	187474	HR 7552	A0 EuCrSi
40312	θ Aur	A0 Si	188041	HR 7575	A6 SrCrEu
41089	TW Col	B9 SrEuCr	189832	V4133 Sgr	A6 SrCrEu
43819	V1155 Ori	B9 Si	192678	V1372 Cyg	A2 Cr
49333	12 CMa	B7 He wk Si	192913	NW Vul	A0 SiCr
49606	33 Gem	B8 He wk Si	193722	HR 7786	B9 Si
50169	BD-01 1414	A3 SrCrEu	197018	HR 7911	B7 Mn
51418	NY Aur	A0 HoDy	200311	V2200 Cyg	B9 SiCrHg
54118	HR 2683	A0 Si	201601	γ Equ	A9 SrEu
62140	49 Cam	A8 SrEu	203006	θ¹ Mic	A2 CrEuSr
66605	QQ Pup	A0 Si	204411	HR 8216	A6 Cr
71866	TZ Lyn	A1 EuSrSi	205087	HR 8240	B9 Si
72968	3 Hya	A2 SrCrEu	205637	ε CapA	B4Si
74196	HR 3448	B7 He wk	210071	HR 8434	B9 SiCrHg
74521	49 Cnc	A1 SiEuCr	215441	GL Lac	B9 Si
79158	36 Lyn	B9 He wk	217833	HR 8770	B8 He wk
81009	HR 3724	A3 CrSrEu	219749	HR 8861	B9 Si
83368	HR 3831	A8 SrCrEu	221394	HR 8933	A0 SiSrCr
86592	V359 Hya	A0 SrEu	221760	ι Phe	A2 SrCrEu
90044	25 Sex	B9 SiCrSr	223358	HR 9017A	B9 SiSrCr
90569	45 Leo	A0 SrCrSi	223640	108 Aqr	B9 SiSrCr

Database References

	ref. No.	star HD#	source	bibcode	comp HD#	dataset statistics	
☐	0000	37776	ESA 1997, The Tycho Catalogues	ESA, SP-1200 (link to ADS)		Get statistics	Hp(103)Bh(129)Vh(129)
☐	0006	37776	Groote, D.; Kaufmann, J. P.	1983A&AS...53...91G (link to ADS)		Get statistics	J(10)H(10)K(10)L(10)M(8)
☐	0026	37776	Pedersen, H.; Thomsen, B.	1977A&AS...30...11P (link to ADS)		Get statistics	u(54)v(54)b(54)y(54)
☐	0033	37776	Adelman, S. J.	1997A&AS..125...65A (link to ADS)	HD36591	Get statistics	u(42)v(42)b(42)y(42)
☐	0085	37776	Adelman, S. J.; Pyper, D. M.	1985A&AS...62..279A (link to ADS)	HD37744	Get statistics	u(18)v(18)b(18)y(18)hbeta(15)

JD (<-) [＿＿＿] (starting Julian Date 2400000+, without restriction left empty)

JD (->) [＿＿＿] (finishing Julian Date 2400000+, without restriction left empty)

[Submit query]

[Database Query Results for star 37776 (all filters)]

Figure 1: Response of *Database* in the *References* part.

Database Query Form

Star: HD [＿＿] (asterisk for all stars included in database)

JD (<-) [＿＿＿] (starting Julian Date 2400000+, without restriction left empty)

JD (->) [＿＿＿] (finishing Julian Date 2400000+, without restriction left empty)

Johnson	☐ U	☐ B	☐ V	☐ R	☐ R_C	☐ I	☐ J	☐ H	☐ K	☐ L	☐ M
Strömgren	☐ u	☐ v	☐ b	☐ y	☐ c_1	☐ m_1	☐	☐	☐ (b-y)	☐	
Hipparcos	☐ H_p	☐ B_h	☐ V_h								
Geneva	☐ U-B_1	☐ B_1-B_2	☐ B_2-V_1	☐ V_1-G	☐ U	☐ B	☐ V	☐ B_1	☐ B_2	☐ V_1	☐ G
10 colour photometry	☐ U	☐ P	☐ X	☐ Y	☐ Z	☐ V	☐ HR	☐ S	☐ MR	☐ DR	
Walraven	☐ V	☐ B	☐ L	☐ U	☐ W						
Maitzen and others	☐ g_1	☐ g_2	☐ Δa		☐ 4200Å	☐ 5360Å					

None filter selected means all filters selected.

[Submit query]

Figure 2: Query form for selecting filters/indices.

Table 2: Codes of filters and colour indices of photometric systems

Johnson	Strömgren	Hipparcos	Geneva	10-colour photom.	Walraven	Maitzen and other
$U = 1$	$u = 20$	$H_p = 30$	U-$B_1 = 36$	$U = 50$	$V = 60$	$g_1 = 70$
$B = 2$	$v = 21$	$B_h = 31$	B_1-$B_2 = 37$	$P = 51$	$B = 61$	$g_2 = 71$
$V = 3$	$b = 22$	$V_h = 32$	B_2-$V_1 = 38$	$X = 52$	$L = 62$	$\Delta a = 72$
$R = 4$	$y = 23$		V_1-$G = 39$	$Y = 53$	$U = 63$	
$R_C = 5$	$c_1 = 24$		$U = 40$	$Z = 54$	$W = 64$	4200Å$= 75$
$I = 6$	$m_1 = 25$		$B = 41$	$V = 55$		5360Å$= 76$
$J = 7$	$\beta = 26$		$V = 42$	$HR = 56$		
$H = 8$	$\alpha = 27$		$B_1 = 43$	$S = 57$		
$K = 9$	$(b$-$y) = 28$		$B_2 = 44$	$MR = 58$		
$L = 10$	$\gamma = 29$		$V_1 = 45$	$DR = 59$		
$M = 11$			$G = 46$			

References

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