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REVERSIVE AND NON-REVERSIVE MAGNETIC CP STARS. I. CATALOG.

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ABSTRACT

An analysis of the distribution of signs of the longitudinal magnetic field component B_z is presented for a sample of 307 chemically peculiar (CP) stars with reliably measured magnetic fields. For each star, the root-mean-square field $B_{\rm rms}$ and the extreme values of B_z are used to classify the field configuration as either reversive or non-reversive. Among the 173 non-reversive stars, 100 exhibit a predominantly negative B_z sign, while only 73 display a positive sign, corresponding to an excess of negative polarities by a factor of about 1.37. A subsample of stars with at least five independent measurements (254 objects) yields a similar ratio of 1.38, confirming the robustness of the asymmetry. The observed predominance of negative B_z values among non-reversive CP stars in the solar neighbourhood is statistically significant. Possible origins of this asymmetry remain unclear and will be addressed in future studies.

Key words: stars: magnetic field — stars: chemically peculiar

1 INTRODUCTION

Magnetic fields are found in approximately 10% of OBA-type stars on the main sequence. In terms of effective temperature, mass, and luminosity, these objects do not differ from normal stars, but exhibit significant anomalies in the chemical composition of their atmospheres: the abundances of some elements, in particular rare-earth elements, exceeds the solar value by up to three orders of magnitude (see, e.g., Ghazaryan et al. 2018). In addition, the rotation velocities of magnetic stars are approximately in 3–4 times lower than those of normal stars (Netopil et al. 2017).

The first magnetic field in a star (78 Vir) was discovered by Babcock (1947). The technique he introduced allowed the measurement of only the longitudinal component B_z, under the assumption of a global, coherent field structure covering the entire stellar surface. To a first approximation, this configuration is dipolar. Although more complex geometries are possible, the dipole component remains dominant. The measured strengths of the large-scale magnetic fields in CP stars range from about 100 G (Aurière et al. 2007) up to 35 kG (Babcock 1960).

The longitudinal component reaches its maximum value at the magnetic poles, and at the magnetic equator it becomes zero. As the star rotates, the observer views different regions of the surface with varying B_z orientations, resulting in periodic changes of the measured field strength and polarity. This behaviour is naturally explained by the oblique rotator model (Stibbs 1950). The choice of sign (+ or −) is a matter of convention. Currently, researchers follow the system introduced by Babcock (1947). If during the rotation period the B_z curve changes sign, the field is called reversive, and if the sign remains constant, then it is called non-reversive.

Since the rotation period is unknown for most of the stars studied and, therefore, it is impossible to carry out detailed modeling of the magnetic field, to estimate it we use the value of the root-mean-square magnetic field $B_{\rm rms}$ and its error:

$$B_{\rm rms} = \sqrt{\frac{1}{n}\sum_{i=1}^{n} B_{zi}^2}; \qquad \sigma_{\rm rms} = \sqrt{\frac{1}{n}\sum_{i=1}^{n} \sigma_i^2}. \quad (1)$$

The purpose of this study is to search for a possible correlation between the strength and configuration of the magnetic field of individual stars and the parameters of the large-scale Galactic magnetic field in the solar neighbourhood.

The first attempt at such an analysis was made by Romanyuk (1994). Based on 64 non-reversible CP stars, it was found that in 36 objects the negative sign of the longitudinal field predominates, and in 28 it is positive. However, due to the small sample size, it was premature to conclude that a genuine asymmetry exists in the distribution of magnetic stars. A substantial increase in the number of studied objects was clearly required.

Over the next 30 years, our group conducted an active search for new magnetic stars in the northern hemisphere. In total, about 200 objects were discovered. In parallel with these efforts, large international collaborations have carried out a number of survey

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Table 1. Catalog of reversive and non-reversive magnetic CP stars. The stars are arranged in ascending order of their HD and BD catalog numbers. The table columns contain: star name, distance r, root-mean-square magnetic field and its error $B_{\rm rms} \pm \sigma$, minimum and maximum extremal values of the longitudinal field B_z, number of measurements n, and reversibility signature.

Star	r, pc	$B_{\rm rms} \pm \sigma$, G	B_z (min)/(max), G	n	Revers. type	Star	r, pc	$B_{\rm rms} \pm \sigma$, G	B_z (min)/(max), G	n	Revers. type
HD 315	219	1520 ± 680	-1600 / $+2000$	5	+/−	HD 34736	373	4000 ± 500	-6000 / $+5000$	100	+/−
HD 965	237	400 ± 50	-400 / $+600$	78	+/−	HD 34889	353	642 ± 134	-1000 / $+600$	6	+/−
HD 1048	139	136 ± 55	-70 / $+240$	4	+/−	HD 349321	460	2700 ± 300	-4400 / $+1900$	20	−
HD 2453	174	588 ± 202	-1030 / -520	28	−	HD 35177	347	940 ± 274	-400 / $+700$	4	+/−
HD 2887	331	436 ± 249	-700 / $+500$	6	+/−	HD 35298	358	2323 ± 330	-2810 / $+2920$	13	+/−
HD 2957	316	520 ± 120	-930 / $+670$	7	+/−	HD 35456	346	440 ± 80	$+200$ / $+500$	6	+
HD 3980	68	1200 ± 200	-1600 / $+2000$	11	+/−	HD 35502	363	1490 ± 140	-2250 / -100	25	−
HD 4478	575	990 ± 850	-1000 / $+1300$	3	+/−	HD 36313	386	1020 ± 450	-1500 / $+1100$	12	+/−
HD 4778	104	1026 ± 454	-1100 / $+1400$	30	+/−	HD 36429	338	425 ± 170	-840 / $+160$	5	−
HD 5441	385	409 ± 40	-440 / 0	6	−	HD 36485	382	3220 ± 318	-3700 / -1900	10	−
HD 5601	277	1190 ± 100	-2000 / -300	8	−	HD 36526	448	2130 ± 200	-980 / $+3480$	9	+
HD 5737	216	324 ± 142	-400 / $+500$	23	+/−	HD 36644	338	1992 ± 125	-2500 / $+2300$	9	+/−
HD 5797	565	669 ± 46	-100 / $+1000$	10	+	HD 36668	393	1875 ± 447	-2100 / $+2000$	10	+/−
HD 6757 A	298	2730 ± 160	$+2300$ / $+2900$	30	+	HD 36916	260	500 ± 125	-1000 / -200	8	−
HD 8855	485	354 ± 145	-600 / $+270$	6	+/−	HD 36955	448	843 ± 219	-1300 / 0	6	−
HD 9147	787	400 ± 150	-370 / $+600$	5	+/−	HD 36997	424	762 ± 73	-1600 / $+1100$	6	+/−
HD 9996	140	833 ± 174	-1700 / $+600$	20	−	HD 37017	360	1490 ± 338	-2600 / $+300$	44	−
HD 10783	169	1269 ± 260	-1200 / $+1800$	17	+/−	HD 37058	382	1090 ± 412	-1200 / $+900$	11	+/−
HD 11187	389	616 ± 239	-500 / $+400$	11	+/−	HD 37140	420	450 ± 210	-900 / $+500$	8	+/−
HD 11503	51	545 ± 344	-1100 / $+500$	18	−	HD 37333	335	869 ± 246	-1290 / $+560$	6	−
HD 11948	180	468 ± 39	-750 / $+330$	8	−	HD 37479	435	1980 ± 155	-1600 / $+3500$	15	+
HD 12288	251	1643 ± 150	-3100 / -200	42	−	HD 37633	417	520 ± 122	$+200$ / $+800$	6	+
HD 12447	50	365 ± 266	-510 / $+570$	22	+/−	HD 37642	369	2100 ± 180	-3000 / $+3000$	12	+/−
HD 12767	106	242 ± 94	-230 / $+290$	8	+/−	HD 37687	446	613 ± 195	$+500$ / $+700$	5	+
HD 13404	217	3680 ± 380	-4800 / -2100	20	−	HD 37776	394	1260 ± 385	-2000 / $+2000$	150	+/−
HD 14437	234	1829 ± 260	-2600 / -800	26	−	HD 37808	185	950 ± 172	$+300$ / $+1200$	5	+
HD 15089	41	303 ± 47	-300 / $+400$	16	+/−	HD 38129	178	438 ± 173	-600 / -200	3	−
HD 15144	79	802 ± 216	-1150 / -530	20	−	HD 38823	110	1510 ± 110	-2500 / $+1500$	12	+/−
HD 16145	249	725 ± 66	-820 / $+500$	3	+/−	HD 39082	166	1290 ± 330	-1100 / $+1600$	6	+/−
HD 16605	621	1627 ± 119	-2400 / -800	7	−	HD 39658	371	930 ± 190	-970 / $+1350$	7	+/−
HD 16705	487	524 ± 155	-400 / $+720$	4	+/−	HD 40142	308	700 ± 50	-780 / $+780$	4	+/−
HD 17330	427	415 ± 38	-500 / -300	30	−	HD 40146	474	595 ± 105	-650 / $+650$	3	+/−
HD 18078	388	800 ± 100	-850 / $+1200$	25	+/−	HD 40312	51	340 ± 60	-240 / $+360$	20	+/−
HD 18296	107	440 ± 216	-1000 / $+1350$	8	+/−	HD 40652	377	781 ± 61	-1200 / -270	6	−
HD 19712	166	2211 ± 232	-3800 / $+2000$	13	+/−	HD 40711	487	500 ± 180	-650 / $+320$	6	−
HD 21699	178	973 ± 247	-800 / $+1600$	8	+/−	HD 40759	411	1990 ± 240	$+600$ / $+2400$	30	+
HD 22316	137	1250 ± 348	-2200 / $+600$	19	−	HD 41403	283	330 ± 150	-500 / $+450$	12	+/−
HD 22470	117	733 ± 408	-1100 / $+1200$	12	+/−	HD 42605	283	270 ± 47	-480 / $+100$	9	−
HD 22920	191	307 ± 159	$+200$ / $+400$	4	+	HD 42616	231	620 ± 238	-840 / -440	4	−
HD 24155	161	803 ± 170	-440 / $+1660$	8	+	HD 43819	246	560 ± 100	-20 / $+740$	4	+
HD 24712	48	802 ± 171	$+300$ / $+1300$	30	+	HD 45107	492	300 ± 150	-140 / $+570$	8	+
HD 25267	100	241 ± 91	-345 / -15	7	−	HD 45530	273	590 ± 270	-650 / $+750$	5	+/−
HD 25823	124	668 ± 470	-100 / $+1200$	18	+	HD 45583	314	2880 ± 600	-2500 / $+3800$	30	+/−
HD 25999	158	1155 ± 233	-900 / $+1400$	6	+/−	HD 47103	360	3526 ± 365	-4000 / -2700	8	−
HD 27309	88	1755 ± 602	-4000 / -200	25	−	HD 47152	121	856 ± 207	-600 / $+1500$	4	+
HD 27404	165	1326 ± 174	-3100 / $+1400$	15	−	HD 47756	277	420 ± 120	-650 / $+150$	7	−
HD 279021	257	954 ± 151	-960 / $+1300$	5	+/−	HD 49223	714	390 ± 210	-120 / $+590$	6	+
HD 29009	239	480 ± 217	-600 / $+900$	10	+/−	HD 49333	216	618 ± 300	-800 / $+800$	8	+/−
HD 290665	392	2024 ± 53	-2900 / $+4000$	10	+/−	HD 49713	212	2560 ± 460	-2880 / $+2200$	9	+/−
HD 294046	355	495 ± 163	-900 / $+330$	4	−	HD 49976	102	1490 ± 360	-2000 / $+2200$	18	+/−
HD 29762	392	409 ± 50	$+150$ / $+560$	4	+	HD 50169	507	1220 ± 220	-1500 / $+2000$	30	+/−
HD 29925	365	1064 ± 170	-1400 / -200	10	−	HD 50403	305	663 ± 82	-330 / $+1100$	5	+
HD 30466	195	1464 ± 293	$+1000$ / $+2200$	14	+	HD 50461	257	1500 ± 700	-2800 / $+2200$	9	+/−
HD 32145	287	2000 ± 293	-2100 / $+2400$	7	+/−	HD 51418	178	401 ± 200	-460 / $+750$	15	+/−
HD 32633	217	2760 ± 263	-4100 / $+1700$	50	−	HD 51684	222	1410 ± 65	-1800 / -1100	5	−
HD 335238	385	1738 ± 247	-3040 / $+2260$	12	+/−	HD 52628	220	2000 ± 80	-2050 / $+2100$	10	+/−
HD 341037	333	1100 ± 48	-1400 / -840	6	−	HD 53081	770	450 ± 100	-600 / $+600$	5	+/−
HD 34162	363	440 ± 100	-750 / $+190$	6	−	HD 54118	96	1030 ± 256	-1600 / $+1600$	7	+/−
HD 343872	526	2930 ± 320	-700 / $+4500$	40	+	HD 54824	282	589 ± 153	-860 / $+480$	8	+/−
HD 34452	142	743 ± 434	-300 / $+1000$	13	+	HD 55522	278	505 ± 100	$+38$ / $+873$	3	+
HD 34719	160	930 ± 220	-1300 / $+1300$	9	+/−	HD 55755	555	2670 ± 150	-3280 / $+2180$	5	+/−

Table 1. (Contd.)

Star	r, pc	$B_{\rm rms} \pm \sigma$, G	B_z (min)/(max), G	n	Revers. type	Star	r, pc	$B_{\rm rms} \pm \sigma$, G	B_z (min)/(max), G	n	Revers. type
HD 58260	629	2290 ± 300	$+2000$ / $+2600$	10	+	HD 130559	73	1375 ± 100	-1300 / -200	12	−
HD 59435	518	800 ± 50	-1200 / $+900$	35	+/−	HD 133029	157	2420 ± 319	$+1300$ / $+3300$	16	+
HD 61045	488	680 ± 532	-160 / $+470$	5	+/−	HD 133652	122	1110 ± 200	-2100 / $+700$	9	−
HD 61468	515	1900 ± 51	-2500 / -1000	5	−	HD 134214	93	458 ± 150	-900 / -200	20	−
HD 62140	95	1336 ± 306	-2200 / $+3200$	30	+/−	HD 134793	180	770 ± 250	-800 / $+900$	6	+/−
HD 63347	175	831 ± 139	-1100 / $+1100$	11	+/−	HD 135679	265	1025 ± 43	$+200$ / $+1300$	6	+
HD 63401	185	400 ± 80	-650 / $+340$	4	+/−	HD 137193	264	680 ± 220	$+230$ / $+970$	4	+
HD 64486	104	855 ± 513	-1300 / $+600$	6	−	HD 137509	196	1020 ± 416	-1200 / $+2200$	8	+/−
HD 64740	245	565 ± 114	-870 / $+530$	15	+/−	HD 137909	35	750 ± 100	-900 / $+1000$	50	+/−
HD 65339	97	3200 ± 440	-5400 / $+4200$	100	+/−	HD 137949	79	1500 ± 120	$+980$ / $+1920$	20	+
HD 66350	472	480 ± 100	-660 / $+520$	5	+/−	HD 138633	302	277 ± 25	-300 / $+300$	5	+/−
HD 70331	467	2800 ± 184	-3000 / -2000	14	−	HD 138777	355	1870 ± 57	$+1700$ / $+2200$	9	+
HD 71866	130	1680 ± 236	-1600 / $+2000$	10	+/−	HD 140160	68	860 ± 712	-1840 / $+760$	4	+/−
HD 72295	370	200 ± 130	-360 / $+110$	8	−	HD 142070	180	400 ± 60	-700 / $+600$	20	+/−
HD 72968	104	480 ± 288	-700 / $+500$	20	+/−	HD 142301	144	2100 ± 420	-4100 / $+1600$	4	−
HD 73340	149	1644 ± 218	-2300 / -900	5	−	HD 142502	431	547 ± 36	-500 / $+660$	6	+/−
HD 74521	154	812 ± 141	-200 / $+1400$	10	+	HD 142554	448	1310 ± 290	-2250 / $+1740$	5	+/−
HD 78316	188	208 ± 205	-640 / $+460$	25	+/−	HD 142990	142	1304 ± 255	-2500 / $+600$	20	−
HD 79158	190	672 ± 226	-1500 / $+1000$	20	+/−	HD 143473	162	4292 ± 362	$+4200$ / $+5100$	6	+
HD 80316	135	410 ± 120	-590 / $+649$	5	+/−	HD 144334	136	783 ± 257	-1400 / $+500$	20	−
HD 81009	145	1430 ± 236	-100 / $+2500$	10	+	HD 147010	130	4032 ± 402	-5500 / -2500	20	−
HD 83368	71	576 ± 264	-800 / $+800$	12	+/−	HD 148199	167	900 ± 247	-900 / $+1700$	12	+/−
HD 86170	273	257 ± 88	-340 / -150	4	−	HD 149764	175	700 ± 65	-1213 / $+30$	3	−
HD 86592	153	1908 ± 115	-260 / $+2670$	10	+	HD 149822	146	450 ± 180	-690 / $+510$	7	+/−
HD 89069	314	434 ± 29	-700 / $+600$	13	+/−	HD 149911	119	580 ± 32	-700 / $+300$	5	−
HD 90044	106	740 ± 373	-800 / $+700$	6	+/−	HD 151199	103	280 ± 100	-400 / $+150$	5	−
HD 92499	269	1000 ± 140	-1255 / -964	3	−	HD 151965	175	2602 ± 282	-3700 / -550	8	−
HD 92664	153	803 ± 40	-1300 / -100	18	−	HD 152107	55	1487 ± 250	$+500$ / $+2000$	50	+
HD 93507	327	2164 ± 278	$+1600$ / $+2600$	12	+	HD 153882	161	1750 ± 462	-1800 / $+3100$	15	+
HD 93700	335	836 ± 50	-1170 / -490	9	−	HD 154708	148	6000 ± 50	$+5764$ / $+7530$	3	+
HD 94603	450	518 ± 69	-145 / $+900$	5	+	HD 158450	159	1570 ± 180	-4400 / $+800$	10	−
HD 94660	166	2352 ± 265	-3300 / -1800	6	−	HD 159545	408	613 ± 125	-360 / $+1100$	4	+
HD 96237	350	750 ± 83	-1000 / -700	4	−	HD 161321	140	573 ± 118	-600 / $+900$	6	+/−
HD 96446	465	1105 ± 248	-2100 / -1100	11	−	HD 164258	116	800 ± 300	-500 / $+1200$	6	+/−
HD 98088	127	802 ± 284	-1200 / $+1000$	10	+/−	HD 164827	324	1567 ± 615	-2300 / $+1600$	5	+/−
HD 99563	255	600 ± 80	-680 / $+670$	6	+/−	HD 165474	171	470 ± 100	-300 / $+600$	20	+/−
HD 101065	109	2241 ± 450	-2300 / -1040	3	−	HD 166473	140	2150 ± 220	-2200 / -600	3	−
HD 103192	95	204 ± 104	-250 / -100	4	−	HD 168733	198	815 ± 276	-800 / -400	4	−
HD 107000	277	200 ± 60	-240 / $+390$	15	+/−	HD 168796	215	610 ± 100	-900 / $+500$	7	+/−
HD 107612	176	320 ± 140	-440 / $+430$	7	+/−	HD 168856	204	657 ± 221	-1100 / $+360$	4	−
HD 108651	72	380 ± 240	-200 / $+560$	5	+	HD 169842	403	370 ± 180	-660 / $+380$	8	+/−
HD 108662	77	620 ± 200	-1150 / $+550$	50	−	HD 169887	376	680 ± 250	-2300 / $+2020$	9	+/−
HD 108945	82	537 ± 313	-347 / $+440$	15	+/−	HD 170000	93	350 ± 150	-180 / $+640$	15	+
HD 109026	116	342 ± 95	$+140$ / $+470$	5	+	HD 170397	113	615 ± 252	-650 / $+870$	10	+/−
HD 110066	137	204 ± 50	-370 / $+300$	15	+/−	HD 170565	235	1760 ± 170	$+40$ / $+1960$	6	+
HD 111133	192	806 ± 143	-1500 / -500	10	−	HD 170836	666	490 ± 140	-700 / $+300$	3	−
HD 112381	124	3400 ± 245	-3700 / -3100	5	−	HD 170973	251	530 ± 100	-600 / $+800$	8	+/−
HD 112413	30	1350 ± 200	-1400 / $+1600$	100	+/−	HD 173650	247	326 ± 275	-500 / $+700$	15	+/−
HD 112528	226	900 ± 100	-1000 / $+970$	8	+/−	HD 175362	146	3570 ± 448	-6500 / $+4000$	20	+/−
HD 113894	192	791 ± 40	-1200 / $+1000$	11	+/−	HD 178892	249	5410 ± 470	$+2100$ / $+8000$	32	+
HD 115605	181	620 ± 120	-750 / $+680$	7	+/−	HD 179761	210	480 ± 238	-590 / $+170$	4	−
HD 115708	128	927 ± 405	-1860 / $+1600$	11	+/−	HD 180058	641	277 ± 74	-390 / $+310$	4	+/−
HD 116114	138	1923 ± 113	-2200 / -1800	13	−	HD 182532	316	461 ± 108	-40 / $+620$	5	+
HD 116458	125	1925 ± 273	-2300 / -1500	10	−	HD 183339	322	1296 ± 465	-1600 / $+1800$	6	+/−
HD 118022	60	808 ± 225	-2800 / -200	80	−	HD 184471	460	350 ± 100	-20 / $+800$	15	+
HD 118054	148	575 ± 304	-1000 / $+200$	6	−	HD 184927	599	1465 ± 430	-1200 / $+3000$	15	+
HD 119213	91	1220 ± 440	-500 / $+1600$	13	+	HD 187128	336	400 ± 66	$+373$ / $+437$	3	+
HD 119419	134	1770 ± 455	-4200 / $+1800$	20	−	HD 187474	97	1488 ± 143	-1800 / $+1800$	10	+/−
HD 122532	153	665 ± 268	-900 / $+900$	9	+/−	HD 188041	85	1100 ± 200	-200 / $+1500$	10	+
HD 124224	75	570 ± 323	-437 / $+811$	14	+/−	HD 188501	462	1172 ± 72	-2200 / $+50$	11	−
HD 125248	87	1505 ± 295	-2500 / $+2800$	15	+/−	HD 189160	332	995 ± 197	-200 / $+1500$	4	+
HD 125823	120	470 ± 253	-440 / $+370$	9	+/−	HD 189775	248	1375 ± 540	-540 / $+2240$	3	+
HD 126515	131	1720 ± 373	-2000 / $+2000$	15	+/−	HD 189963	621	410 ± 130	-700 / $+300$	6	−

Table 1. (Contd.)

Star	r, pc	$B_{\rm rms} \pm \sigma$, G	B_z (min)/(max), G	n	Revers. type	Star	r, pc	$B_{\rm rms} \pm \sigma$, G	B_z (min)/(max), G	n	Revers. type
HD 191742	329	578 ± 43	-900 / -200	4	$-$	HD 225114	277	970 ± 220	-1450 / $+750$	20	$+/-$
HD 192224	440	480 ± 130	-680 / $+680$	8	$+/-$	HD 225627	393	204 ± 59	-50 / $+300$	5	$+$
HD 192678	220	1410 ± 160	$+1000$ / $+1800$	30	$+$	HD 231054	321	1650 ± 240	$+380$ / $+2500$	5	$+$
HD 192913	242	483 ± 221	-670 / $+380$	5	$+/-$	HD 258686	629	6000 ± 320	$+5100$ / $+7900$	17	$+$
HD 196178	168	973 ± 238	-1500 / -700	9	$-$	HD 260858	790	536 ± 76	$+300$ / $+700$	4	$+$
HD 196502	116	490 ± 200	-700 / -200	15	$-$	HD 279021	257	954 ± 151	-960 / $+1300$	5	$+/-$
HD 196606	251	1005 ± 192	-1565 / $+1040$	5	$+/-$	HD 290665	392	2024 ± 53	-2900 / $+4000$	10	$+/-$
HD 196655	323	400 ± 100	-530 / $+450$	4	$+/-$	HD 294046	355	495 ± 163	-900 / $+330$	4	$-$
HD 196691	371	1650 ± 250	-800 / $+2290$	5	$+$	HD 335238	385	1738 ± 247	-3040 / $+2260$	12	$+/-$
HD 199180	385	278 ± 45	-350 / -5	7	$-$	HD 338226	550	1080 ± 200	$+440$ / $+1490$	7	$+$
HD 199728	213	400 ± 200	-470 / $+1120$	6	$+$	HD 341037	333	1100 ± 48	-1400 / -840	6	$-$
HD 200177	156	1124 ± 433	-1900 / $+300$	4	$-$	HD 343872	526	2930 ± 320	-700 / $+4500$	40	$+$
HD 200311	330	1490 ± 427	-2600 / $+2600$	22	$+/-$	HD 349321	460	2700 ± 300	-4400 / $+1900$	20	$-$
HD 200405	370	194 ± 24	-265 / -50	4	$-$	HDE 293764	385	3760 ± 220	$+2700$ / $+4700$	16	$+$
HD 201174	305	1311 ± 75	$+500$ / $+2100$	40	$+$	BD +00 1659	862	288 ± 99	$+160$ / $+365$	6	$+$
HD 201601	35	600 ± 100	-1100 / $+600$	100	$+/-$	BD +00 4535	526	2157 ± 180	-2900 / $+2400$	6	$+/-$
HD 204815	512	390 ± 145	$+60$ / $+600$	5	$+$	BD +17 3622	315	1390 ± 180	$+900$ / $+1600$	4	$+$
HD 205198	304	1714 ± 557	-3700 / -222	5	$-$	BD +32 2827	568	524 ± 156	-770 / $+60$	3	$-$
HD 207188	293	1220 ± 310	-1510 / $+1000$	4	$+/-$	BD +35 3616	417	520 ± 160	-500 / $+540$	6	$+/-$
HD 208217	122	970 ± 45	-1800 / $+800$	6	$-$	BD +40 175A	300	2650 ± 178	-3400 / -2000	8	$-$
HD 209051	336	2225 ± 520	-3300 / -1040	7	$-$	BD +40 175B	300	1426 ± 148	$+780$ / $+2660$	6	$+$
HD 210432	232	1230 ± 190	-1810 / $+530$	4	$-$	BD +41 43	850	290 ± 150	-450 / $+100$	11	$-$
HD 213258	111	950 ± 49	-1200 / -400	26	$-$	BD +42 659	427	913 ± 68	-1000 / $+1300$	4	$+/-$
HD 215441	460	17500 ± 500	$+10000$ / $+20000$	50	$+$	BD +44 4130	540	2728 ± 132	-3094 / -2398	4	$-$
HD 216018	143	1200 ± 120	$+1000$ / $+1400$	12	$+$	BD +46 570	474	450 ± 68	$+260$ / $+570$	4	$+$
HD 217833	204	3000 ± 500	-6200 / -1500	12	$-$	BD +51 3356	507	3209 ± 598	-218 / $+4786$	3	$+$
HD 221006	119	600 ± 150	$+410$ / $+990$	3	$+$	BD +53 1183	595	703 ± 111	-810 / $+1030$	7	$+/-$
HD 221934	312	1100 ± 400	-1490 / -1130	4	$-$	BD +64 352	505	4240 ± 390	-5500 / -2700	17	$-$
HD 221936	444	2200 ± 300	-2500 / $+2900$	27	$+/-$	V1356 Ori	917	2282 ± 800	-3200 / -800	6	$-$
HD 223640	100	653 ± 218	-20 / $+820$	4	$+$			$\pm$	/		

projects, leading to the discovery of hundreds of new magnetic CP stars. Notable among these are the BinaMIcS (Binarity and Magnetic Interactions in various classes of Stars; Neiner et al. 2015), MiMeS (Magnetism in Massive Stars; Wade et al. 2016), and BOB (B-fields in OB stars; Schöller et al. 2017) projects. Thus, it became possible to perform analysis at a new level, using much more extensive observational material.

2 CATALOG AND SAMPLE ANALYSIS

Currently, magnetic fields have been detected in a significant number of CP stars. However, for many objects only a few measurements have been made, which does not allow constructing a phase magnetic curve and confidently classifying the field as reversible or non-reversible. For this reason, a list of stars was compiled for which there are at least three measurements of the longitudinal component of the magnetic field.

The primary data sources were the catalogs Romanyuk & Kudryavtsev (2008), Bychkov et al. (2009), together with the later compilation by Bychkov et al. (2021). Additionally, the database of our group was used. The final catalog includes only those objects for which the root-mean-square value $B_{\rm rms}$ confirms the presence of a magnetic field with high confidence.

The resulting sample of reversive and non-reversive magnetic CP stars is presented in Table 1. In addition to the magnetic field parameters, it contains distances to objects that were obtained from the parallaxes of the Gaia DR3 mission (Gaia Collaboration 2020). Almost all magnetic stars from catalog are nearby objects ($r \leqslant 1$ kpc). In a few cases where the Gaia parallaxes for binary systems are unreliable, distances determined from spectroscopic data. A star is classified as non-reversive if one of the extreme values of the longitudinal field exceeds the other by at least a factor of two or more times. For reversive fields in the table, $(+/-)$ is indicated in the corresponding column.

In total, the catalogue contains 307 magnetic CP stars. A reversive field is observed in 134 objects (44%), while the remaining 173 stars (56%) exhibit a non-reversive configuration. Among the latter, 73 objects have a positive field sign $(+)$ and 100 have a negative sign $(-)$. Thus, in the non-reversive subsample the ratio of negative to positive polarities is approximately 1.37. In the earlier study of Romanyuk (1994), based on a smaller sample, this ratio was about 1.28.

To classify a star as reversive or non-reversive, it is necessary to have a sufficient number of measurements of the longitudinal field. Obviously, three observations are not enough to confidently construct the B_z curve and determine the alternation of signs. In order to check the stability of the obtained conclusions, stars were selected from the catalog for which at least five magnetic field measurements were made. For the majority of these objects, even in the absence of a known rotation period, five measurements provide a reliable characterisation of the field behaviour, and the probability of misclassification is greatly reduced.

A separate issue concerns super-slowly rotating stars, for which all measurements can occur at the same rotation phase. However, statistical estimates indicate that such objects constitute only a few percent of the total CP star population (see, e.g., Mathys 2020), and therefore they cannot significantly affect the overall conclusions.

After applying the selection criterion ($n \geqslant 5$), a total of 254 magnetic CP stars remain. Among these, 77 are non-reversive stars with a negative sign $(-)$, 56 have a positive sign $(+)$, and 121 dis-

play reversive fields (+/−). The ratio of negative to positive polarities in this restricted subsample is 1.38, in excellent agreement with the value obtained from the full catalogue. Thus, in all the cases considered, the advantage of stars with a negative sign of the longitudinal field remains.

All stars are located within 1 kpc from the Sun, with the absolute majority (90%) located at a distance of less than 500 pc. The nearest object is HD 112413 at 30 pc, while the most distant is V1356 Ori at 917 pc. The mean distance of the sample is $\langle r \rangle = 275$ pc.

The root-mean-square magnetic field $B_{\rm rms}$ varies in a wide range, from 200 G (HD 72295 and HD 107000) to 17 500 G (HD 215441), with a mean value of $\langle B_{\rm rms} \rangle = 1290 \pm 220$ G. The $B_{\rm rms}$ distribution shows that the field strengths of most stars do not exceed a few kilogauss: only 15 objects (6%) have $B_{\rm rms} \geqslant 3$ kG.

3 CONCLUSIONS

This paper presents a catalogue of magnetic CP stars containing 307 objects with reliably measured values of the longitudinal magnetic field B_z. All stars lie relatively close to the Sun, with distances not exceeding 1 kpc. For each object, the catalogue lists the root-mean-square magnetic field $B_{\rm rms}$, the extreme values of B_z, the number of observations, and the classification of the field as reversive or non-reversive.

An analysis of the full sample of 307 stars reveals that among non-reversive objects, those with a negative longitudinal field sign are approximately 37% more common than those with a positive sign. This excess is larger than the value reported in the earlier study of Romanyuk (1994). A subsample restricted to 254 stars with five or more observations yields a similar predominance of the negative sign, confirming the robustness of the detected asymmetry.

On the basis of this statistically significant sample, it is concluded that non-reversive magnetic CP stars in the solar neighbourhood possess a predominantly negative longitudinal magnetic field. The physical origin of this asymmetry remains unclear. Possible explanations include a connection with the orientation of the large-scale Galactic magnetic field in the local region or evolutionary peculiarities of magnetic stars. A more detailed analysis, involving magnetic field modelling that incorporates rotation periods and comparisons with 3D-models of the Galaxy, will be the subject of future investigations.

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REFERENCES

Aurière M., Wade G. A., Silvester J., et al., 2007, A&A, **475**, 1053
Babcock H. W., 1947, ApJ, **105**, 105
Babcock H. W., 1960, ApJ, **132**, 521
Bychkov V. D., Bychkova L. V., Madej J., 2009, MNRAS, **394**, 1338
Bychkov V. D., Bychkova L. V., Madej J., 2021, A&A, **652**, A31
Gaia Collaboration, 2020, VizieR Online Data Catalog, I/350
Ghazaryan S., Alecian G., Hakobyan A. A., 2018, MNRAS, **480**, 2953
Mathys G., 2020, in Wade G., Alecian E., Bohlender D., Sigut A., eds, Stellar Magnetism: A Workshop in Honour of the Career and Contributions of John D. Landstreet, Vol. 11, p. 35
Neiner C., Morin J., Alecian E., 2015, in Martins F., Boissier S., Buat V., et al., eds, SF2A-2015: Proc. Annual Meeting of the French Society of Astronomy and Astrophysics, p. 213
Netopil M., Paunzen E., Hümmerich S., Bernhard K., 2017, MNRAS, **468**, 2745
Romanyuk I. I., 1994, Bull. Spec. Astrophys. Obs., **38**, 119
Romanyuk I. I., Kudryavtsev D. O., 2008, Astrophys. Bull., **63**, 139
Schöller M., Hubrig S., Fossati L., et al., 2017, A&A, **599**, A66
Stibbs D. W. N., 1950, MNRAS, **110**, 395
Wade G. A., Neiner C., Alecian E., et al., 2016, MNRAS, **456**, 2