Long-term monitoring of active stars. VII. UBV(RI)$_c$ photometry collected in March 1991

G. Cutispoto

Osservatorio Astrofisico di Catania, V.le A.Doria 6, I-95125 Catania, Italy;
e-mail: gcutispoto@alpha4.ct.astro.it

abstract

In the framework of an extensive program focusing on the global properties and evolution of active stars, high-precision *UBV(RI)$_c$* photometry of 19 selected stars, collected at the European Southern Observatory over the 15-31 March 1991 interval is presented. Significant evolution of the light curves, period variations and evidence for long-term variability of the global degree of spottedness are found. Most of the spectral classifications are discussed. A flare event was detected for the star HD 127535 = V 841 Cen. These observations contribute to the establishment of a time-extended photometric database which can give important clues on topics such as the stability of spotted areas, differential rotation, solar-like cycles and the correlation between inhomogeneities at different atmospheric levels.

Table 1: Comparison (c) and check (ck) stars for each program star (v) and standard deviations (σ) for the v-c and ck-c V-band differential magnitudes for each series of N nights

Program star (v)		(c)	(ck)	σ (v-c)	σ (ck-c)	N
HD 32918	= YY Men	HD 33763	HD 33747	54	4	13
HD 36705	= AB Dor	HD 35230	HD 36316	17	6	11
HD 37847	= TW Lep	HD 37653	SAO 170680	41	4	16
HD 39917	= SZ Pic	HD 39901	HD 39962	38	5	13
HD 61245	= V344 Pup	HD 61390	HD 61333	22	5	12
HD 81410	= IL Hya	HD 81904	HD 80991	46	4	14
HD 82558	= LQ Hya	HD 82508	HD 82447	25	4	12
HD 86005		HD 86034	HD 85849	4	2	10
HD 98712	= SZ Crt	HD 97977	HD 98251	20	4	11
HD 101309	= V829 Cen	HD 101679	HD 101215	50	4	13
HD 102077	= V838 Cen	HD 102076	HD 102202	16	4	13
HD 106225	= HU Vir	HD 106270	HD 105796	72	4	16
HD 119285	= V851 Cen	HD 119164	HD 119076	14	2	13
HD 127535	= V841 Cen	HD 128227	HD 128618	33	4	17
HD 136905	= GX Lib	HD 136480	HD 137241	49	4	14
HD 139084	= V343 Nor	HD 139070	HD 138363	60	4	13
HD 155555	= V824 Ara	HD 157427	HD 154775	25	7	16
HD 174429	= PZ Tel	HD 173560	HD 176557	21	5	17
HD 197481	= AU Mic	HD 197237	HD 197339	15	8	9

Table 2: Mean atmospheric extinction coefficients for La Silla site, obtained over the 15-31 Mar 1991 period

	U	B	V	R	I
Mag/airmass	.520	.274	.157	.107	.053

Table 3: V magnitude and colors for the c and ck stars derived from standard stars. Errors are of the order of 0.01 magnitudes. The symbol ":" denotes errors of the order of 0.02 magnitudes

c or ck	V	U-B	B-V	V-R_c	V-I_c
HD 33747	8.76	0.72	0.98	0.53	1.03
HD 33763	8.37	0.50	0.89	0.49	0.95
HD 35230	7.58	0.47	0.88	0.48	0.93
HD 36316	7.95	1.72	1.46	0.79	1.50
HD 37653	8.24	0.50	0.89	0.48	0.93
SAO 170680	8.97	0.91	1.04	0.54	1.01
HD 39901	6.54	1.63	1.37	0.71	1.32
HD 39962	7.97	-.06:	0.40	0.26	0.50
HD 61333	7.18	-.64:	-.11	-.05	-.09
HD 61390	7.92	0.70	1.01	0.52	1.03
HD 81904	8.02	0.72:	0.98	0.50	0.98
HD 80991	8.51	0.83:	1.04	0.52	1.02
HD 82477	6.11	1.18	1.18	0.61	1.17
HD 82508	7.58	0.35	0.71	0.40	0.80
HD 85849	8.52	1.07	1.14	0.58	1.12
HD 86034	7.89	1.32	1.26	0.63	1.20
HD 97977	8.85	1.66:	1.42	0.75	1.42
HD 98251	9.21	1.47:	1.31	0.69	1.28
HD 101215	7.79	0.07	0.15	0.10	0.20
HD 101679	8.12	0.79	1.09	0.59	1.15
HD 102076	7.10	0.75	1.00	0.51	0.98
HD 102202	8.86	0.19	0.67	0.38	0.73
HD 105796	8.06	0.93	1.06	0.55	1.04
HD 106270	7.58	0.29	0.72	0.40	0.77
HD 119076	6.87	0.88	1.15	0.60	1.15
HD 119164	7.20	1.14	1.29	0.64	1.22
HD 128227	8.33	0.82	1.07	0.57	1.10
HD 128618	8.03	1.63:	1.46	0.77	1.47
HD 136480	7.35	1.12:	1.16	0.60	1.15
HD 137241	7.36	1.10:	1.14	0.59	1.11
HD 138363	7.12	0.95	1.14	0.61	1.15
HD 139070	8.71	0.80	1.12	0.60	1.16
HD 154775	7.60	1.97	1.59	0.87	1.75
HD 157427	7.41	1.69	1.50	0.81	1.55
HD 173560	8.72	0.11:	0.64	0.36	0.70
HD 176557	7.19	1.76:	1.48	0.78	1.47
HD 197237	9.02	0.83:	0.98	0.51	0.96
HD 197339	7.39	1.44:	1.29:	0.66	1.23

Table 4: Maximum luminosity (V_{max}) and corresponding colors for the program stars and inferred spectral classification (Spectral Type)

Program Star		V_{max}	*U-B*	*B-V*	*V-R*$_c$	*V-I*$_c$	Spectral Type
HD 32918	= YY Men	7.98	0.67	1.04	0.59	1.14	K1 III
HD 36705	= AB Dor	6.89	0.37	0.83	0.49	0.97	K0 IV/V (PMS)
HD 37847	= TW Lep	7.35	0.76	1.09	0.60	1.16	K2/3 III + F6 IV
HD 39917	= SZ Pic	7.85	0.31	0.81	0.47	0.91	K0/1 IV + G5 IV
HD 61245	= V344 Pup	6.85	0.80	1.04	0.55	1.05	K1 III
HD 81410	= IL Hya	7.33	0.74	1.03	0.55	1.09	K2 IV
HD 82558	= LQ Hya	7.81	0.56	0.91	0.52	1.02	K2 V
HD 86005		7.18	1.01	1.31	0.69	1.34	K4 III + K1/2 III
HD 98712 AB	= SZ Crt	8.60	1.21	1.33	0.86	1.65	K7 V + M3 V
HD 98712 A		8.74		1.30	0.83	1.56	K7 V
HD 98712 B		11.25		1.6	1.1	2.4	M3 V
HD 101309	= V829 Cen	7.82	0.49	0.93	0.53	1.04	K1/2 IV + G5 V
HD 102077	= V838 Cen	8.92	0.53	0.91	0.54	1.08	K1/2 V + K2 V
HD 106225	= HU Vir	8.59	0.58	0.98	0.57	1.13	K1 IV/III
HD 119285	= V851 Cen	7.69	0.81	1.09	0.61	1.20	K2/3 IV
HD 127535	= V841 Cen	8.55	0.82	1.08	0.61	1.18	K2/3 IV
HD 136905	= GX Lib	7.30	0.73	1.03	0.57	1.10	K1 III + G5 IV
HD 139084	= V343 Nor	8.06	0.37	0.82	0.48	0.93	K0 IV/V (PMS)
HD 155555	= V825 Ara	6.87	0.38	0.82	0.49	0.93	G5 IV + K0 IV (PMS)
HD 174429	= PZ Tel	8.44	0.31	0.78	0.45	0.87	G9 IV/V (PMS)
HD 197481	= AU Mic	8.73	1.12	1.45	0.94	2.06	M1 V