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SPECTRAL CLASS AND METAL-ABUNDANCE INDEX DETERMINATION FOR 20 RR LYRAE STARS AT LIGHT MAXIMUM

The spectral classes of 20 RR Lyrae type stars determined according to hydrogen as well as K(Ca II) lines are given in the Table. The observations were performed with the 70 cm meniscus telescope (dispersion 166 A/mm near H_γ) of the Abastumani observatory. The stars were photographed on A-500 film with the aid of a special camera. The classification was made visually, using the MK standards for $A\underline{V}$ and $F\underline{V}$ stars. When classifying, much attention was given to the identity of blackening and quality of the spectra of the stars in question and the standards. The determination of the spectra of the variables was made at their light maxima, since in other phases and especially at minima they were not within the reach of our devices. The analysis of our data shows that during 1 hour near light maximum the change of the spectra is almost unnoticable. Since, our data are reliable in the sense of coverage of the light curve peaks. These conditions are not kept only for TW Lyn. The phases are computed relative to the elements, given in (1), involving refinements on some occasions. Except BB Vir, we have had several negatives for each star. Only the best negatives were used for classification. For SZ Lyn we give the determinations of the spectra not only for the maxima, but also for other phases, in order to state the constancy of the index ΔS within the accuracy of the spectral type estimation. We also give extreme values of RR Lyrae spectra obtained in the course of the same night. In this case the variation of ΔS was observed. In terms of the present and our earlier papers (2,3) we can state that when ΔS varies with the phase it is always less near to maximum and attains the highest value at light minimum. Therefore in such cases the use of mean values of ΔS, which are met in references, seems to be incorrect.

Star	Hel. J.D.	Phase	Exp.	Spectrum H	Spectrum CaII	ΔS
RZ CVn	2441392.387	0.872	20^m	A8	A1	7
	404	0.902	20	A9	A1	8
	459	0.999	15	A9	A2	7
	41396.392	0.930	15	A9	A1	8
	41421.346	0.908	15	A8	A2	6
	357	0.928	15	A8	A1	7
	369	0.949	15	A9	A2	7
AA CMi	41007.198	0.012	10	A7	A1	6
	207	0.030	15	A7	AO	7
RV CrB	41134.455	0.958	15	FO	A2	8
	467	0.989	15	FO	A2	8
	478	0.023	15	FO	A2	8
	41157.341	0.965	15	A9	A1	8
	41485.398	0.203	20	FO	A2	8
TV CrB	41418.421	0.062	26	A8	A1	7
	41473.377	0.067	26	A9	A1	8
BK Dra	41187.418	0.008	15	A8	AO	8
	430	0.028	15	A8	AO	8
BT Dra	41418.360	0.042	30	A8	A1	7
	41421.407	0.009	25	A8	A1	7
	422	0.038	12	A8	A1	7
SZ Gem	41007.355	0.991	10	A5	AO	5
	372	0.025	10	A5	AO	5
DL Her	41187.248	0.000	20	A6	AO	6
	263	0.025	20	A7	AO	7
SZ Hya	41412.261	0.007	20	A7	A1	6
V LMi	41396.431	0.696	20	A8	A1	7
	439	0.710	20	A8	A2	6
SZ Lyn	41009.250	0.845	10	F1	A9	2
	258	0.911	10	A8	A7	1
	266	0.978	10	A8	A7	1
	274	0.044	10	A9	A9	0
	282	0.110	10	F1	FO	1
	289	0.168	10	F1	FO	1
	41061.230	0.090	10	A7	A7	0
	308	0.737	10	A9	A9	0
TV Lyn	41007.232	0.952	10	A7	A3	4
	239	0.981	10	A7	A3	4
	247	0.014	9	A7	A3	4
	256	0.051	15	A8	A4	4
TW Lyn	41417.229	0.202	30	F6	A6	10
RR Lyr	41213.216	0.801	6.2	F7	A7	10
	224	0.815	6.2	F7	A7	10
	329	0.000	2.5	A8	A2	6

Star	Hel. J.D.	Phase	Exp.	Spectrum H	Spectrum CaII	ΔS
VY Ser	41425.430	0.996	10^m	F1	A3	8
	448	0.007	10	F0	A3	7
	457	0.020	13	F1	A4	7
AV Ser	41159.272	0.024	20	F0	A2	8
	287	0.055	20	F1	A1	10
ST Vir	41061.354	0.047	10	A6	A1	5
	362	0.066	10	A7	A2	5
				A8	A2	6
AF Vir	41418.393	0.018	16	A7	A0	7
AT Vir	41412.309	0.932	20	A8	A1	7
	323	0.959	20	A8	A1	7
	338	0.988	20	A8	A0	8
	351	0.012	20	A9	A2	7
	41442.308	0.981	15	A7	A0	7
	320	0.010	20	A8	A2	6
BD Vir	41412.388	0.009	15	A8	A1	7

References

(1.) Roczn.astr.obs.Krakow, 1970, N42.

(2.) Alania I.F.,Abastumansk.astrofiz.obs.Bjull.1968,36,17.

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