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Radial Velocities and Atmospheric Parameters of Field Stars Suitable for RAVE Tests

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Abstract. With the Asiago 1.82m telescope + Echelle spectrograph we have obtained high resolution spectra of 25 RAVE targets well distributed in atmospheric parameters. From them we have derived radial velocities and $T_{\rm eff}$, $\log g$, [M/H], $V_{\rm rot} \sin i$ to the aim of serving as an external test for corresponding values derived from RAVE spectra.

RAVE is a spectroscopic survey of high galactic latitude field stars aiming to investigate galactic kinematics and chemistry. Spectra at a resolving power 7 500 are collected over the range 8400-8800 Å with the 6dF multi-fiber spectrograph operating on the UK Schmidt telescope at AAO (Australia). At the time of writing, RAVE has already secured 175 000 spectra. Steinmetz et al. (2006) described the project and the first data release. The second one (Zwitter et al., in preparation) is planned to deliver also atmospheric parameters $T_{\rm eff}$, $\log g$ and [M/H] in addition to radial velocities. At the faint RAVE magnitudes there are very few targets for which radial velocities and atmospheric parameters have been derived in literature by means of high resolution spectroscopy. Such stars would be quite useful to serve as an external test of the accuracy of RAVE results.

To fill the gap, we have observed with the Asiago 1.82m telescope and Echelle spectrograph (resolving power $R_{\rm P}$=20 000 and wavelength range 5100-6000 Å) a sample of 25 RAVE targets selected from those to be included in the second data release, aiming to span a wide range in $T_{\rm eff}$, $\log g$, [M/H] and $V_{\rm rot} \sin i$. In addition, some of the targets have been selected because they show emission line cores (marked by a bullet in Table 1). As expected, all fast rotating cool stars also have active chromoespheres traced by emission line cores. Radial velocity and atmospheric parameters have been obtained via χ^2 fitting to $R_{\rm P}$=20 000 version of the synthetic spectral library of Munari et al. (2005). They are listed in Table 1. Five of program stars have been observed twice at different dates to evaluate internal consistency of the derived results, which turned out to be appreciably high: the mean differences between the two observations for the five repeated stars is ΔRad.Vel.=0.4 km/s, $\Delta T_{\rm eff}$=67°K, $\Delta \log g$=0.32, Δ[M/H]=0.13.

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References

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	TYC	B_T	V_T	I_D	date	RV (km/s)	T_{eff} (°K)	log g (cgs)	[M/H]	V_{rot} (km/s)	<S/N>
•	T4678_00087_1	11.695	10.612	9.495	2006-10-10.94	0.8 ±0.2	3918 ±39	3.08 ±0.23	−1.02 ±0.11	95	38
					2006-12-11.83	0.8 ±0.4	3998 ±67	2.91 ±0.25	−1.11 ±0.25	114	51
	T4679_00388_1	11.221	10.823	9.963	2006-10-10.96	18.4 ±0.7	6291 ±41	4.00 ±0.10	−0.88 ±0.07	74	24
	T4701_00802_1	11.262	10.267	9.209	2006-10-11.04	−41.2 ±0.3	4865 ±72	2.19 ±0.18	−1.28 ±0.22		47
	T4702_00944_1	11.322	10.569	9.663	2006-10-10.78	29.1 ±0.4	5851 ±51	4.10 ±0.30	−0.38 ±0.12		13
•	T4704_00341_1	10.921	10.336	9.686	2006-10-11.06	−19.6 ±0.6	5724 ±63	4.25 ±0.18	−0.51 ±0.10	144	23
					2006-12-10.95	−19.7 ±0.3	5801 ±72	4.08 ±0.29	−0.42 ±0.07	162	36
	T4749_00016_1	11.218	10.165	9.133	2006-10-11.02	−27.9 ±0.3	5178 ±78	3.06 ±0.32	−0.65 ±0.33		40
	T4749_00085_1	12.204	10.812	9.904	2006-10-12.71	62.8 ±0.9					11
					2006-11-02.08	63.0 ±0.8					13
	T4749_00143_1	10.038	9.688	9.428	2006-10-13.09	18.3 ±0.6	6955 ±55	4.03 ±0.15	−0.29 ±0.13	44	56
					2006-12-04.02	18.0 ±0.5	6887 ±68	3.88 ±0.19	−0.31 ±0.18	52	17
	T4763_01210_1	11.895	10.568	9.248	2006-11-03.07	1.2 ±0.3	4451 ±49	2.01 ±0.34	−0.51 ±0.08		27
	T5178_01006_1	12.092	10.569	9.393	2006-11-03.74	−37.4 ±0.3	4498 ±38	2.23 ±0.09	−0.53 ±0.11		20
	T5186_01028_1	12.671	11.091	9.965	2006-10-11.79	−7.7 ±0.5	4777 ±81	2.88 ±0.17	0.22 ±0.18	46	27
	T5198_00021_1	11.369	10.358	9.191	2006-11-03.86	−33.3 ±0.8	4898 ±63	3.15 ±0.22	0.10 ±0.14		21
	T5198_00784_1	9.845	9.530	9.217	2006-10-10.94	−54.0 ±0.7	7426 ±55	3.78 ±0.23	−0.44 ±0.14	58	43
	T5199_00143_1	9.670	9.358	9.082	2006-11-03.83	26.7 ±0.9	7102 ±81	4.24 ±0.11	−0.21 ±0.09	120	40
	T5201_01410_1	12.417	10.822	9.395	2006-11-02.83	0.0 ±0.9	4901 ±76	2.98 ±0.32	0.30 ±0.23		20
	T5207_00294_1	11.933	11.018	9.529	2006-11-03.77	24.6 ±0.6	4105 ±78	1.33 ±0.19	−0.59 ±0.26		21
	T5225_01299_1	11.804	10.436	9.412	2006-10-12.82	−9.6 ±0.3	4241 ±59	1.97 ±0.43	−0.60 ±0.34		31
	T5227_00846_1	11.493	10.612	9.585	2006-11-02.87	−10.2 ±0.8	5239 ±61	3.34 ±0.21	−0.88 ±0.08		35
	T5228_01074_1	11.454	10.502	9.713	2006-10-10.87	−7.5 ±0.3	5098 ±61	4.10 ±0.13	−0.41 ±0.09		23
	T5231_00546_1	10.651	10.219	9.844	2006-10-12.86	−28.2 ±0.7	7104 ±70	3.52 ±0.11	−0.46 ±0.09	116	32
	T5232_00783_1	11.778	10.787	9.742	2006-10-12.89	−20.1 ±0.4	4906 ±66	3.01 ±0.10	−0.12 ±0.12	42	38
•	T5242_00324_1	12.573	10.879	9.546	2006-10-10.94	−11.9 ±0.8	3915 ±79	3.37 ±0.41	−0.91 ±0.31	100	15
	T5244_00102_1	10.324	9.936	9.260	2006-10-10.89	−5.8 ±0.5	6523 ±55	3.28 ±0.16	−0.54 ±0.14	55	53
	T5246_00361_1	11.893	10.932	9.890	2006-10-11.91	11.5 ±0.5	4890 ±47	2.44 ±0.10	−0.89 ±0.09		32
	T5323_01037_1	12.039	10.839	9.651	2006-11-02.13	22.4 ±0.7	4897 ±44	2.26 ±0.14	−0.53 ±0.19		27
					2006-11-03.05	21.9 ±0.6	4845 ±63	2.74 ±0.15	−0.74 ±0.15		41

Table 1. Results from Asiago Echelle spectra on the 25 program stars. B_T, V_T are Tycho-2 magnitudes, I_D is from DENIS survey. Rotational velocities are given only for faster rotating stars. A • marks an object with emission line cores in the Balmer/CaII lines.