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SWEET-Cat update and MOOGme

A new minimization procedure for high quality spectra

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ABSTRACT

Aims.
Methods.
Results.

Key words. data reduction: high resolution spectra – stars individual: Arcturus – stars individual: HD010853

1. Introduction

The study of extrasolar planetary systems is an established field of research. To date, over 3200 extrasolar planets have been discovered around solar-type stars[1]. Most of these have been found thanks to the incredible precision achieved in photometric transit and radial velocity. Especially the latest announcement from the *Kepler* space mission with 1284 confirmed exoplanets (Morton et al. 2016). The increasing number of exoplanets allow us to do statistical studies of the newfound worlds by analyzing their internal structure, atmospheric composition, with more.

A key aspect to this progress is the characterization of the planet host stars. For instance, precise and accurate stellar radii are critical if we want to measure oresice values of the radius of a transiting planet (see e.g. Torres et al. 2012). The determination of the stellar radius is in turn dependent on the quality of the derived stellar parameters such as the effective temperature.

2. MOOGme

MOOGme (acronym for MOOG made easy) is a new tool for analyzing spectra. MOOGme is written in Python and works as a wrapper around MOOG (Sneden 1973), and ARES (Sousa et al. 2015) for an all-in-one tool. MOOG is a radiative transfer code under the assumption of local thermodynamic equilibrium (LTE). And ARES is a tool to measure equivalent widths (EW) automatically from a spectrum given a line list. MOOGme has four different functions: Measure EWs with ARES, synthetic fitting, EW method, and abundances, all described below.

2.1. EW measurements

EW measurements are important for the EW method and to obtain abundances. This can be done manually using a tool like IRAF, but often when dealing with a large sample of stars this is not a suitable way to deal with the problem. Therefore tools like ARES exists which can measure the EW of spectral lines automatically.

[1] For an updated table we refer to http://ww.exoplanet.eu

3. New spectroscopic parameters for 65 planet hosts

Here we present the sample of 66 stars. We were unable to derive parameters for HD77065. This is a spectroscopic binary according to Pourbaix et al. (2004).

The remaining 65 stars are presented in Table 1

4. Conclusion

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Appendix A: An appendix

Table 1. The derived parameters for the 65 stars in our sample.

Star	$T_{\rm eff}$ (K)	$\log g$ (dex)	[Fe/H] (dex)	$\xi_{\rm micro}$ (km/s)	$\xi_{\rm micro}$ fixed?
WASP-762	6347 ± 52	4.29 ± 0.08	0.36 ± 0.04	1.73 ± 0.06	no
WASP-822	6563 ± 55	4.29 ± 0.10	0.18 ± 0.04	1.93 ± 0.08	no
WASP-882	6450 ± 61	4.24 ± 0.06	0.03 ± 0.04	1.79 ± 0.09	no
WASP-952	5799 ± 31	4.29 ± 0.05	0.22 ± 0.03	1.18 ± 0.04	no
WASP-972	5723 ± 52	4.37 ± 0.07	0.31 ± 0.04	1.03 ± 0.08	no
WASP-992	6324 ± 89	4.70 ± 0.11	0.27 ± 0.06	1.83 ± 0.12	no
HATS-12	5969 ± 46	4.61 ± 0.06	−0.04 ± 0.04	1.06 ± 0.08	no
Qatar-22	4637 ± 316	4.23 ± 0.61	0.09 ± 0.17	0.63 ± 0.83	no
WASP-442	5612 ± 80	4.47 ± 0.30	0.17 ± 0.06	1.32 ± 0.13	no
HAT-P-462	6421 ± 121	4.53 ± 0.14	0.16 ± 0.09	1.67 ± 0.18	no
WASP-522	5197 ± 83	4.47 ± 0.30	0.15 ± 0.05	1.16 ± 0.14	no
WASP-722	6570 ± 85	4.71 ± 0.13	0.15 ± 0.06	2.30 ± 0.15	no
WASP-752	6203 ± 46	4.42 ± 0.22	0.24 ± 0.03	1.45 ± 0.06	no
HAT-P-422	5903 ± 66	4.29 ± 0.10	0.34 ± 0.05	1.19 ± 0.08	no
HATS-52	5383 ± 91	4.40 ± 0.22	0.08 ± 0.06	0.91 ± 0.14	no
HD2855072	4620 ± 126	4.42 ± 0.61	0.04 ± 0.06	0.74 ± 0.43	no
HR2282	5042 ± 42	3.30 ± 0.09	0.07 ± 0.03	1.14 ± 0.04	no
SAND3642	4457 ± 104	2.26 ± 0.20	−0.04 ± 0.06	1.60 ± 0.11	no
Aldebaran	5279 ± 223	4.53 ± 0.40	0.14 ± 0.12	3.05 ± 0.41	no
Gl785	5087 ± 48	4.30 ± 0.10	−0.01 ± 0.03	0.69 ± 0.10	no
HD120084	4969 ± 40	2.94 ± 0.14	0.12 ± 0.03	1.41 ± 0.04	no
HD192263	4946 ± 46	4.43 ± 0.14	−0.05 ± 0.02	0.66 ± 0.12	no
HD207229	4957 ± 49	2.83 ± 0.09	0.04 ± 0.04	1.49 ± 0.05	no
HD219134	4767 ± 70	4.32 ± 0.17	−0.00 ± 0.04	0.59 ± 0.24	no
HD81688	4870 ± 30	2.50 ± 0.14	−0.26 ± 0.03	1.50 ± 0.03	no
HD82886	5124 ± 22	3.30 ± 0.05	−0.25 ± 0.02	1.15 ± 0.03	no
HD85503	4605 ± 94	2.61 ± 0.26	0.25 ± 0.06	1.64 ± 0.11	no
HD87883	4917 ± 68	4.34 ± 0.19	0.02 ± 0.03	0.46 ± 0.21	no
HIP11915	5770 ± 14	4.47 ± 0.03	−0.06 ± 0.01	0.95 ± 0.02	no
omiUma	5499 ± 52	3.36 ± 0.07	−0.01 ± 0.05	1.98 ± 0.06	no
11Com	4911 ± 38	2.68 ± 0.08	−0.20 ± 0.03	1.56 ± 0.04	no
HD102272	5351 ± 135	3.92 ± 0.33	−0.34 ± 0.11	1.16 ± 0.20	no
HD104985	4809 ± 48	2.73 ± 0.08	−0.26 ± 0.04	1.65 ± 0.05	no
HD114762	6058 ± 83	4.71 ± 0.09	−0.78 ± 0.05	0.00 ± 0.23	no
HD114762	6061 ± 83	4.70 ± 0.08	−0.78 ± 0.05	0.02 ± 0.26	no
HD136512	4915 ± 33	2.74 ± 0.08	−0.14 ± 0.03	1.57 ± 0.04	no
HD152581	5355 ± 82	3.65 ± 0.18	−0.39 ± 0.07	0.60 ± 0.15	no
HD155358	5917 ± 51	4.12 ± 0.08	−0.55 ± 0.04	1.06 ± 0.08	no
HD170693	4547 ± 55	2.23 ± 0.10	−0.31 ± 0.03	1.54 ± 0.05	no
HD220842	6027 ± 30	4.35 ± 0.05	−0.08 ± 0.03	1.19 ± 0.04	no
HD221345	4797 ± 44	2.58 ± 0.11	−0.23 ± 0.03	1.58 ± 0.04	no
HD233604	4925 ± 44	2.79 ± 0.11	−0.15 ± 0.03	1.62 ± 0.05	no
HD37124	5468 ± 32	4.28 ± 0.04	−0.43 ± 0.03	0.67 ± 0.07	no
HD81688a	4906 ± 29	2.69 ± 0.06	−0.21 ± 0.02	1.60 ± 0.03	no
HD82886	5252 ± 66	3.67 ± 0.13	−0.41 ± 0.06	0.06 ± 0.10	no
HD97658	5182 ± 43	4.50 ± 0.12	−0.29 ± 0.03	0.77 ± 0.11	no
Kepler-444	5163 ± 40	4.41 ± 0.11	−0.50 ± 0.03	0.78 ± 0.10	no
WASP-100	6853 ± 209	4.15 ± 0.26	−0.30 ± 0.12	1.87 ± 0.02	yes
HAT-P-242	6470 ± 181	4.75 ± 0.26	−0.41 ± 0.10	1.40 ± 0.03	yes
HAT-P-392	6745 ± 236	4.91 ± 0.46	−0.21 ± 0.12	1.53 ± 0.04	yes
WASP-612	6265 ± 168	4.21 ± 0.21	−0.38 ± 0.11	1.44 ± 0.02	yes
HD70573	5889 ± 186	4.32 ± 0.27	−0.42 ± 0.13	1.14 ± 0.01	yes