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4 Jovian extrasolar planets detected with CORALIE

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Abstract. We present radial-velocity data measurements for 4 solar-type stars (HD 6434, HD 19994, HD 92788 and HD 121504) harboring new detected planetary companions. The measurements were obtained with the CORALIE echelle spectrograph mounted on the 1.2–m "Leonard Euler" Swiss telescope at ESO–La Silla Observatory (Chile). The minimum masses inferred for the planets are $m_2 \sin i = 0.48$, 2.0, 3.81 and 0.89 $M_{\rm Jup}$, respectively.

1. Introduction

A systematic radial-velocity survey of about 1650 dwarfs of the solar vicinity with the CORALIE echelle spectrograph mounted on the 1.2–m "Leonard Euler" Swiss telescope at ESO-La Silla Observatory (Chile) started 2 years ago (Udry et al. 2000a, 2000b). The main goal of this survey is the detection of planetary companions to solar-type stars. To date, the number of detections reaches 19 (companions with minimum masses smaller than 15 $M_{\rm Jup}$) including a 2-Saturnian planet system around HD 83443 (Udry et al., Mayor et al., this volume). We report here the results for the 4 latest candidates.

Table 1. Best Keplerian orbital solutions and inferred parameters

Parameter		HD 6434	HD 19994	HD 92788[†]	HD 121504
P	days	22.09 ± 0.03	454 ± 19	340 ± 5	64.6 ± 0.7
T	JD[‡]	$51\,688.9 \pm 0.7$	$51\,335 \pm 79$	$51\,064 \pm 13$	$51\,563 \pm 3.5$
e		0.30 ± 0.05	0.2	0.36 ± 0.07	0.13 ± 0.06
V	$\mathrm{km\,s^{-1}}$	22.962 ± 0.002	19.331 ± 0.008	-4.546 ± 0.005	19.548 ± 0.002
ω	$^\circ$	144 ± 13	282 ± 47	283 ± 10	199 ± 20
K_1	$\mathrm{m\,s^{-1}}$	37 ± 3	45 ± 19	123 ± 14	45 ± 3
$f_1(m)$	$10^{-11}\,M_\odot$	9.9 ± 2.8	410	5300 ± 1900	61 ± 13
a_1 sini	10^{-5} AU	7.1 ± 0.7	180 ± 0.8	360 ± 40	27 ± 2
N		61	33	40	49
(O−C)	$\mathrm{m\,s^{-1}}$	13.9	10.3	11.6	9.4
$m_2 \sin i$	$M_{\rm Jup}$	0.48	2.0	3.81	0.89
a	AU	0.15	1.3	0.94	0.32

[†] independently announced by Butler et al. (this volume) , [‡] JD = HJD − 2 400 000

Table 2. Stellar characteristics of the stars hosting the new planets.

Parameter		HD 6434	HD 19994	HD 92788	HD 121504
$Sp.Type$		G3IV	F8V	G5	G2V
π	mas	24.80	44.69	30.94	22.54
d	pc	40.32	22.38	32.32	44.37
$m_{\rm V}$		7.72	5.07	7.31	7.54
$(B-V)$		0.613	0.575	0.694	0.593
$T_{\rm eff}$	K	5845	6160	5577	6080
$M_{\rm V}$		4.69	3.32	4.76	4.30
L	$L_{\odot}$	1.12	3.87	1.10	1.58
$\log(g)$	cgs	-	4.25	-	4.79
M	$M_{\odot}$	1.0	1.35	0.95	1.0
$\log(R^{'}_{\rm HK})$		-4.89	-4.84	-	-4.81
$P_{\rm rot}$	days	18.5	13.7	-	14.8
$v \sin i$	km s^{-1}	2.3	8.5	1.9	3.7
Age $_{\rm HK}$	Gyr	3.7	3.1	-	2.8
Age $_{\rm Photom}$	Gyr	-	3	-	-
$[Fe/H]$		-	0.23	0.25	0.16

2. Stellar characteristics and orbital solutions

Table 1 lists the orbital elements fitted to the radial-velocity measurements of HD 6434, HD 19994, HD 92788 and HD 121504. Table 2 summarizes the stellar characteristics of the four primary stars. The spectral types, apparent magnitudes, colour indexes and parallaxes are from HIPPARCOS (ESA 1997). The effective temperature, gravity and metallicity for HD 19994 and HD 121504 are derived using a high signal-to noise CORALIE spectrum (Santos et al., this volume). The activity indicators are from Henry et al. (1996) for HD 6434 and from CORALIE (method described in Santos et al. 2000) for HD 19994 and HD 121504. The CORALIE velocities are displayed in Fig. 1.

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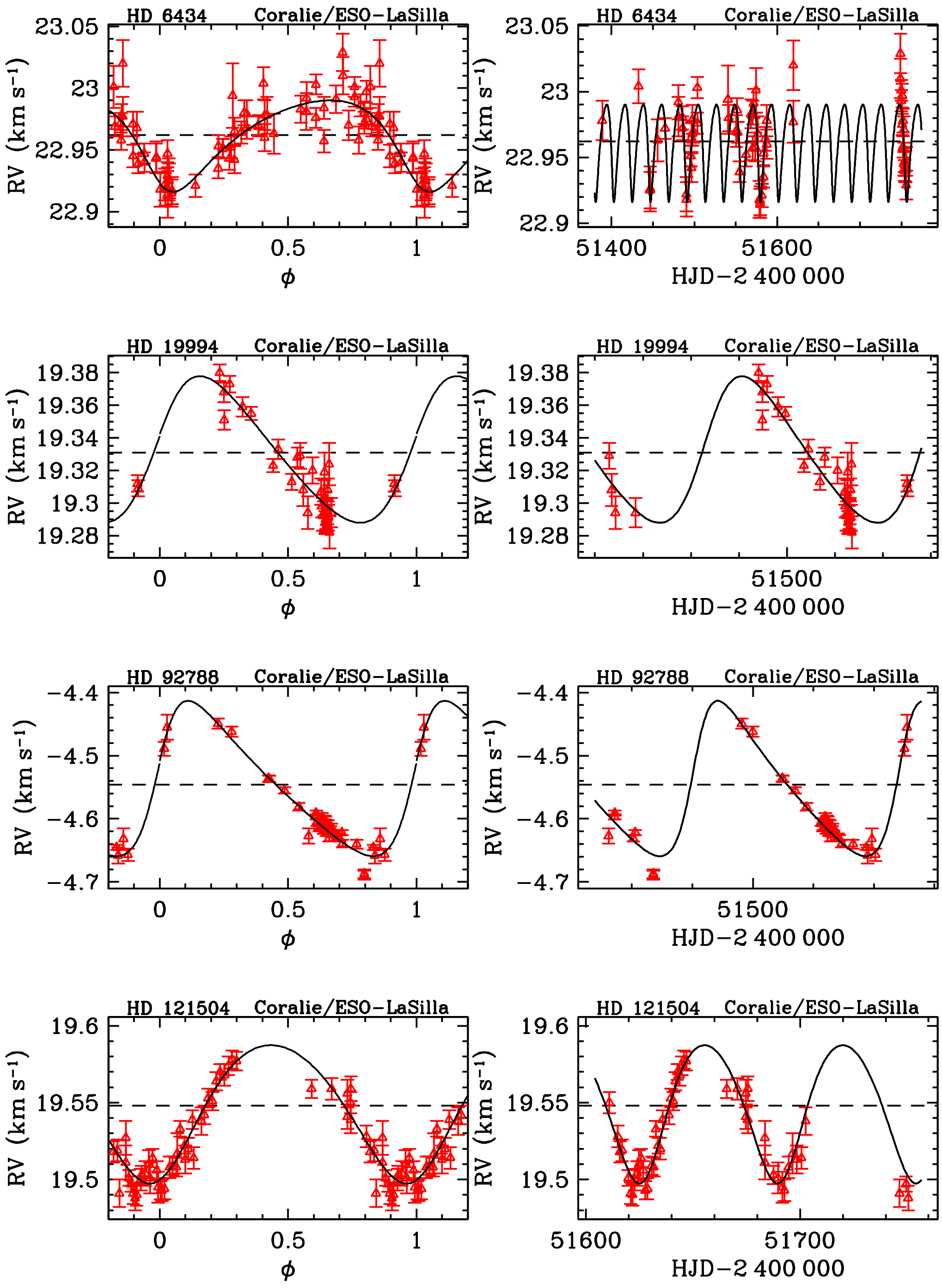

Figure 1. Phase-folded curve and temporal radial velocities of HD 6434, HD 19994, HD 92788 and HD 121504