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A planetary companion to HD 190228

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Abstract. We present our radial-velocity data for HD 190228. The measurements were obtained with the ELODIE echelle spectrograph mounted on the 1.93-m telescope at Observatoire de Haute-Provence. A 1100-day periodic low-amplitude radial-velocity signal is detected revealing the presence of a planetary companion with a minimum mass of $5\,M_{\rm Jup}$.

1. Introduction

A radial-velocity survey of 142 solar-type stars (Mayor & Queloz 1996) has been initiated in 1994 using the ELODIE echelle spectrograph (Baranne et al. 1996) mounted on the 1.93-m telescope at Observatoire de Haute-Provence (CNRS, France). In 1996, we have increased our sample size up to about 350 stars. The typical ELODIE precision with the "Simultaneous Thorium referencing technique" (see Baranne et al. 1996 for details) is of the order of $10\,{\rm m\,s^{-1}}$ over more than 5 years. Up to now, 5 planetary candidates have been detected with this instrument: the first extrasolar planet orbiting the star 51 Peg (Mayor & Queloz 1995), the planetary companion around 14 Her (Mayor et al. 1998, Protostars and Planets IV, oral presentation; Udry et al., this volume), the planet orbiting the M4 dwarf GL 876 (Delfosse et al. 1998; Marcy et al. 1998), the planetary companion around HD 209458 (Mazeh et al. 2000, Henry et al. 2000) and the planetary companion to HD 190228 (this contribution). Some low-mass sub-stellar/stellar companions have also been detected with ELODIE around HD 110833 ($m_2 \sin i = 19\,M_{\rm Jup}$, Mayor et al. 1997), HD 127506 ($m_2 \sin i = 33\,M_{\rm Jup}$, Halbwachs et al. 2000, Naef et al., this volume), HD 174457 and HD 185414 ($m_2 \sin i = 60$ and $53\,M_{\rm Jup}$ respectively, Naef et al., this volume).

2. HD 190228: stellar characteristics and orbital solution

Table 1 summarizes the main stellar characteristics of HD 190228. The orbital solution fitted to the radial-velocity measurements in presented in Table 2. The radial-velocity measurements are displayed in Fig. 1. The distance of the star from the Sun ($d = 62$ pc) prevents the Hipparcos astrometric data from providing a definitive constraints on the planet real mass.

Table 1. Basic stellar characteristics of HD 190228

Parameter		Value	Reference
Sp. Type		G5IV	ESA 1997
π	mas	16.10	ESA 1997
d	pc	62.11	ESA 1997
$m_{\rm V}$		7.30	ESA 1997
$(B-V)$		0.793	ESA 1997
$T_{\rm eff}$	K	5300	Flower 1996
$M_{\rm V}$		3.33	-
L	$L_\odot$	4.38	-
M_1	$M_\odot$	1.30 †	-
$v \sin i$	$\rm km\,s^{-1}$	< 2	CORAVEL ‡

† From spectral type, ‡ calibration by Benz & Mayor (1984)

Table 2. Orbital elements derived from the best Keplerian fit to the radial-velocity data of HD 190228

Parameter		Fit Value
P	days	1161 ± 45
T	HJD	$2\,451\,235 \pm 61$
e		0.5 ± 0.01
γ	$\rm km\,s^{-1}$	-50.218 ± 0.012
ω	$^\circ$	107 ± 6
K_1	$\rm m\,s^{-1}$	95 ± 17
$f_1(m)$	$10^{-8} M_\odot$	6.8 ± 3.9
$a_1 \sin i$	10^{-3} AU	8.8 ± 1.7
N		27
$\sigma(O-C)$	$\rm m\,s^{-1}$	12.3
$m_2 \sin i$	$M_{\rm Jup}$	5 ± 1
a	AU	2.4

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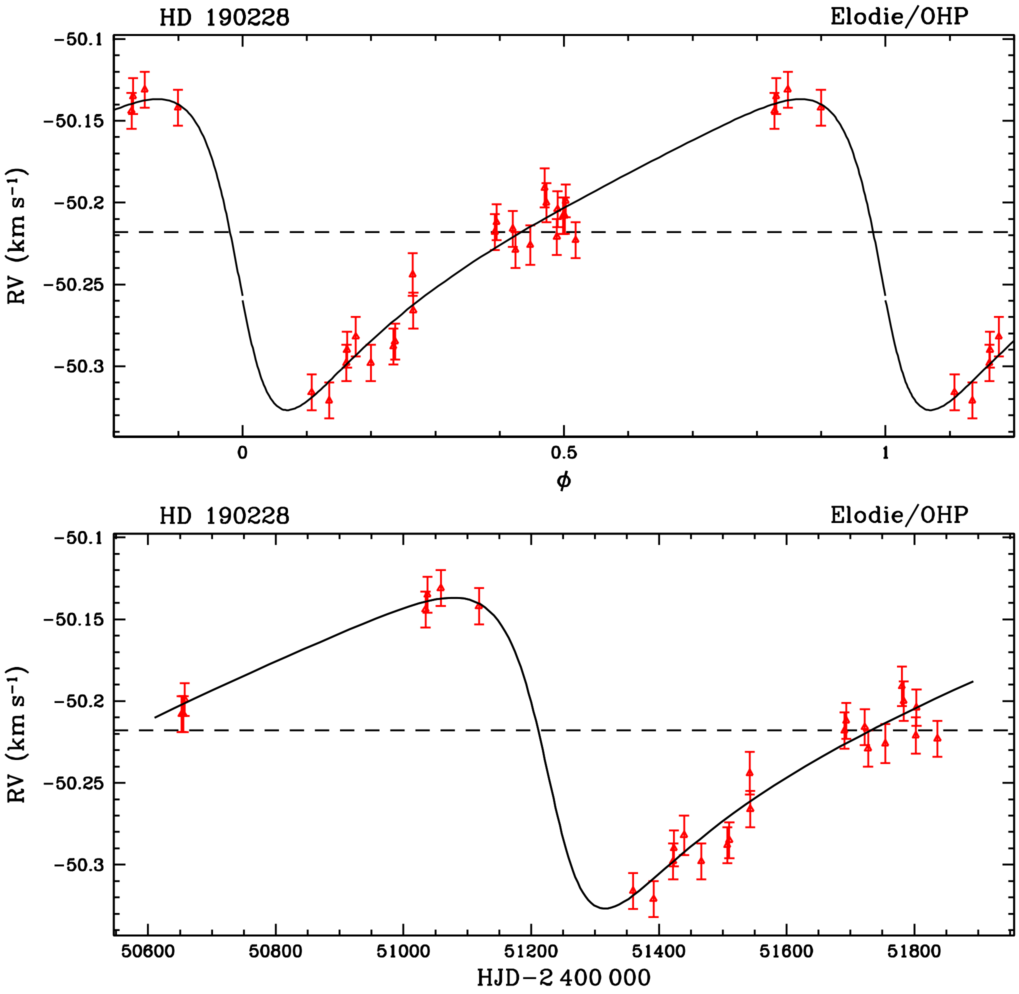

Figure 1. Phase-folded curve and temporal radial velocities for HD 190228

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