

Exploring Warm Jupiter Migration Pathways with Eccentricities. I. Catalog of Uniform Keplerian Fits to Radial Velocities of 200 Warm Jupiters

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ABSTRACT

Giant planets are expected to predominantly form beyond the water ice line and occasionally undergo inward migration. Unlike hot Jupiters, which can result from high-eccentricity tidal migration, warm Jupiters between 0.1-1 AU (≈ 10 –365 d) are in many ways more challenging to explain because they reside outside the tidal influence of their host stars. Warm Jupiters should therefore preserve traces of their origins as their eccentricities are directly related to their past interactions. We analyze the eccentricities of 200 warm Jupiters orbiting 194 Sun-like host stars (with FGKM spectral types) using 18,587 RV measurements across 40 high-resolution spectrographs. RVs are compiled from the literature and are supplemented with 540 new observations from MINERVA-Australis at Mt. Kent Observatory and the Habitable-zone Planet Finder spectrograph at McDonald Observatory’s Hobby-Eberly Telescope, which are timed to improve eccentricity constraints by sampling orbits near periastron passage. The overarching goal of this program is to establish the relative importance of giant planet migration channels through the largest homogeneous analysis of warm Jupiter orbital properties to date. In particular, we evaluate and compare the impact of different system architectures and host star characteristics on the population-level eccentricity distributions of warm Jupiters. Here, we present the target sample, observations, orbit fitting procedure, and parameter summary statistics of our survey. All orbit fit solutions, parameter posterior chains, and merged RV tables for each system are made publicly available.

Keywords: Exoplanet Formation – Exoplanet evolution – Exoplanet migration

1. INTRODUCTION

Early radial velocity observations of old Sun-like stars revealed a population of Jovian planets with orbital separations that deviate from the giant planets found in our own solar system (Campbell et al. 1988; Marcy & Benitz 1989; Walker et al. 1992; Mayor & Queloz 1995; Santos et al. 2003; Udry et al. 2003). Since then, the past 30 years of planet discoveries has shown that the giant planet occurrence rate peaks between about 1–10 AU and decreases interior and exterior to this range (Cumming et al. 2008; Bowler 2016; Fernandes et al. 2019; Nielsen et al. 2019a; Wittenmyer et al. 2020; Ful-

ton et al. 2021). Jovian-mass planets are expected to form in this region where disk conditions are conducive to giant planet core assembly and gas accretion before the dispersal of the protoplanetary gas disk around 5–10 Myr (Pollack 1996; Lecar et al. 2006; Kennedy & Kenyon 2008).

This poses a challenge to explain the origin of giant planets found on close-in orbits. As opposed to hot Jupiters ($P \lesssim 10$ d), which may arrive on short periods in part through high-eccentricity migration followed by tidal circularization (Dawson & Johnson 2018; Fortney et al. 2021), warm Jupiters with orbital periods ranging from ≈ 10 –365 d are a population of giant planets that are situated within the water ice line yet beyond the region of tidal influence from their host star (Marcy & Butler 1996a; Wittenmyer et al. 2010; Santerne et al. 2016).

The formation and evolution of warm Jupiters remains elusive (see Dawson & Johnson 2018 and references therein). They may have migrated to their present-day locations through long-range disk migration (Goldreich & Tremaine 1980; Lin et al. 1996; Kley & Nelson 2012), gravitational interactions such as planet-planet scattering (Rasio & Ford 1996; Ida & Lin 2004; Chatterjee et al. 2008; Beaugé & Nesvorný 2012; Petrovich et al. 2014), or secular interactions (Kozai 1962; Lidov 1962; Wu & Murray 2003; Wu & Lithwick 2011; Dawson & Chiang 2014; Petrovich 2015; Naoz 2016; Petrovich & Tremaine 2016). Under the right conditions, in situ formation is also possible (Batygin et al. 2016; Boley et al. 2016).

These processes, in principal, should imprint distinct features on the obliquities (Albrecht et al. 2012; Li & Winn 2016; Albrecht et al. 2022; Rice et al. 2022; Morgan et al. 2024) and eccentricities (Dong et al. 2021a; Kane & Wittenmyer 2024) of warm Jupiters. Eccentricities should therefore play a pivotal role in disentangling the relative significance of these migration mechanisms. A comprehensive census of warm Jupiter orbital properties may help unravel the intricacies of giant planet formation, migration, and evolution. Substantial effort has been devoted to discovering and characterizing this population of giant planets (e.g. Fischer & Valenti 2005; Johnson et al. 2010a; Dawson & Murray-Clay 2013), however, a comprehensive analysis of their eccentricities as a population has not been carried out. In particular, because eccentricity distributions can be asymmetric, multi-modal, and pile up against 0, compiling heterogeneously reported constraints from previously published orbit fits will not correctly capture the true individual constraints and population-level behavior of warm Jupiters; instead, a systematic reanalysis of orbit constraints is needed. In this work we aim to establish the relative importance of warm Jupiter migration channels through the largest homogeneous analysis of warm Jupiter orbital properties to date.

The paper is structured as follows. In Section 2 we discuss our warm Jupiter target selection and properties of their host stars. In Section 3 we present new spectroscopic observations from our multi-hemisphere campaign to improve eccentricity measurements for systems with the poorest constraints in our sample. Next, we describe our orbit refitting and model selection framework in Section 4. In Section 5 we contextualize our results and evaluate the impact of the new RV measurements from our observational campaign. Finally, we discuss implications and outline forthcoming future studies that will make use of these results in Section 6.

2. TARGET SAMPLE

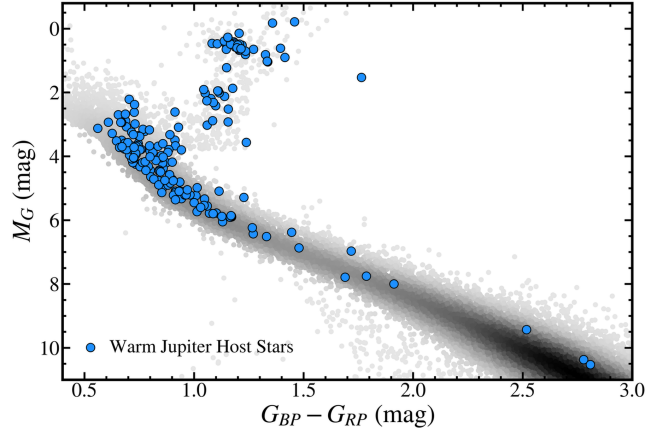


Figure 1. Warm Jupiter host stars in our sample plotted on a Gaia M_G vs $G_{BP} - G_{RP}$ color-magnitude diagram. Our analysis is comprised of both main-sequence and post-main-sequence FGKM stars.

Our sample of warm Jupiters originates from the NASA Exoplanet Archive (Akeson et al. 2013) as of May 2022. We first selected all planets confirmed by radial velocity measurements in order to homogeneously refit the orbits. We then selected planets with orbital periods between 10–365 days (≈ 0.1 –1 AU), and a measured minimum mass of $m_p \sin i = 0.3$ –13 M_{Jup} , or a radius $> 8 R_{\oplus}$, ensuring that low mass brown dwarfs and sub-Jovian size planets are excluded. Although transit ingress/egress durations can provide information about orbital eccentricities (Mandel & Agol 2002; Holman & Murray 2005), these constraints are generally quite broad so we do not consider transiting planets that have not also been recovered with RVs.

Hot Jupiters are also removed because their orbits have been shaped by tidal circularization. Warm Jupiters, on the other hand, are expected to be largely undisturbed by tidal forces. For a main-sequence Sun-like star, a separation $\gtrsim 0.1$ AU corresponds to a circularization timescale of > 1 Gyr (Rasio et al. 1996; Lubow et al. 1997). P-type circumbinary planets (planets orbiting around more than one host star) are removed to avoid the potential impact of a second central body on the planetary system’s formation and evolution.

Two planets, HD 102272 b (Niedzielski et al. 2009a) and HD 17092 b (Niedzielski et al. 2007), were excluded from the analysis due to the absence of reported radial velocity measurements, resulting in 206 planets. HD 114762, originally thought to be a Jovian planet (Latham et al. 1989; Cochran et al. 1991), has since been identified as a binary star (Kiefer 2019; Winn 2022; Holl et al. 2023) and was subsequently removed from our analysis. Furthermore, five planets (Kepler-418 b, KOI-12 b, Kepler-9 b, Kepler-9 c, and Kepler-539 b)

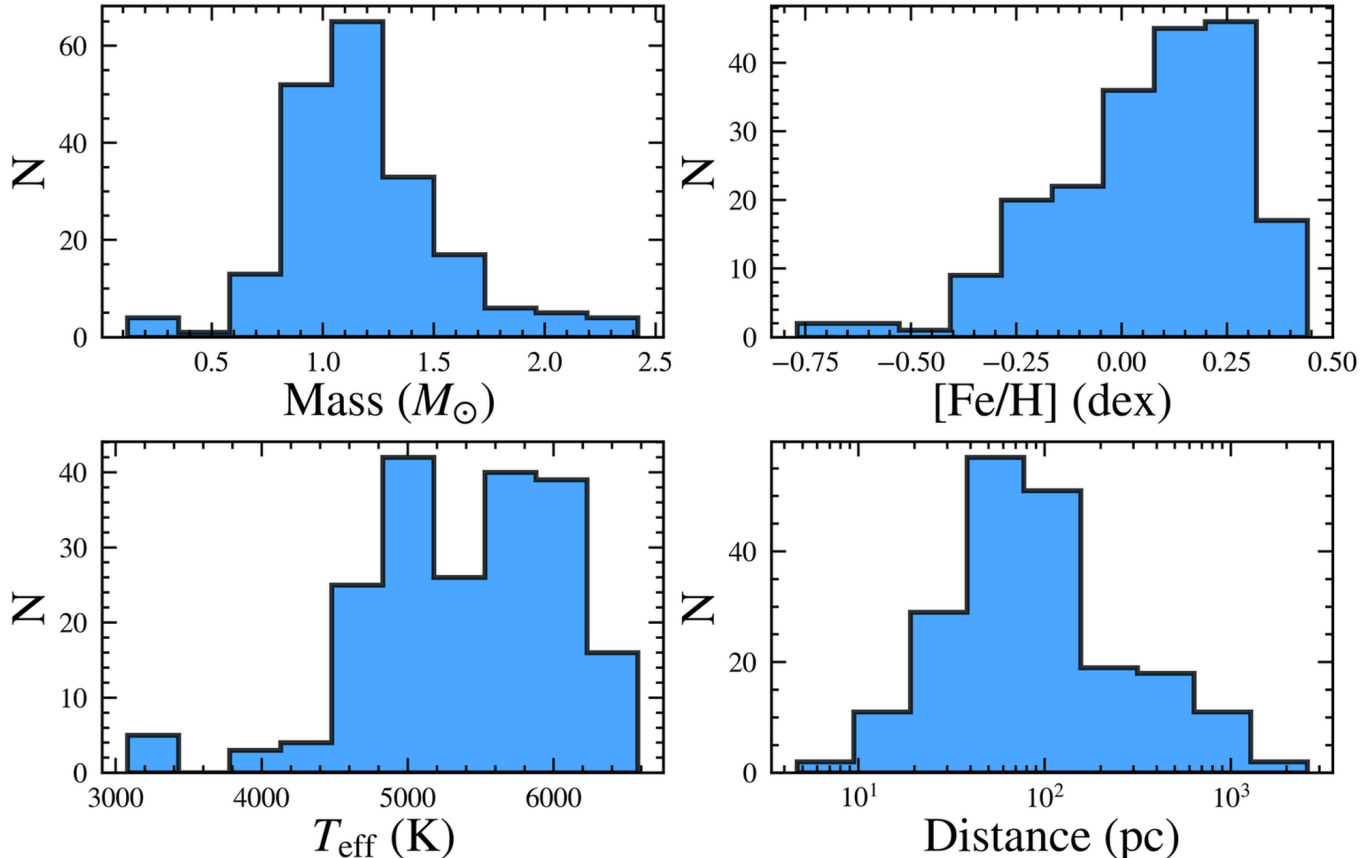


Figure 2. Distribution of stellar host masses, metallicities, effective temperatures, and distances for 194 host stars of warm Jupiters in our sample.

were ultimately removed due to unconstrained fits in this study. Kepler-418 b (Tingley et al. 2014) has an insufficient number of RV measurements needed to independently converge on a unique orbit fit without the transit information which was used in the original fit. Similarly, the orbits of Kepler-9 b (Holman et al. 2010; Borso et al. 2019), Kepler-9 c, and Kepler-539 b (Mancini et al. 2016) could not be reproduced without transit information as well. In particular, the period, P_0 , and time of inferior conjunction, T_C , for these planets are tightly constrained from transit light curves but are not used in this study in order to maintain uniformity of the refitting methodology. Most of KOI-12 b’s (Bourrier et al. 2015) radial velocity data set are dominated by Rossiter-McLaughlin measurements, which are used to measure the sky-projected spin-orbit angle between a planet’s orbital plane and its host stars equatorial plane. Altogether, this yields a sample of 200 warm Jupiters orbiting 194 host stars. 132 of these warm Jovian planets are in apparently single-planet systems based on the available observations, and 68 reside in known multi-planet systems.

2.1. Host Stars

One of the overarching goals of this effort is to examine how planet eccentricities track with properties of the host star. We have therefore assembled information about stellar metallicity, mass, evolutionary stage, age, and multiplicity. Host star properties in this study are compiled from a multitude of sources and are usually from detailed characterization as part of radial velocity and transit surveys (See Figure 1). Each campaign has its own specific focus, depending on the nature of the science goals (see Gaudi et al. 2005; Fischer et al. 2016; Perryman 2018). For instance, while some programs focus on identifying planets around Sun-like main sequence stars, others are designed to study the impact of planet formation and migration around stars of varying metallicities, or as a function of evolutionary stage, or are dedicated to the discovery of Jupiter analogs.

Figure 2 shows the distribution of stellar masses, metallicities, effective temperatures, and distances compiled from the Strasbourg astronomical Data Center’s VizieR catalog access tool (Ochsenbein et al. 2000), the NASA Exoplanet Archive (Akeson et al. 2013), and

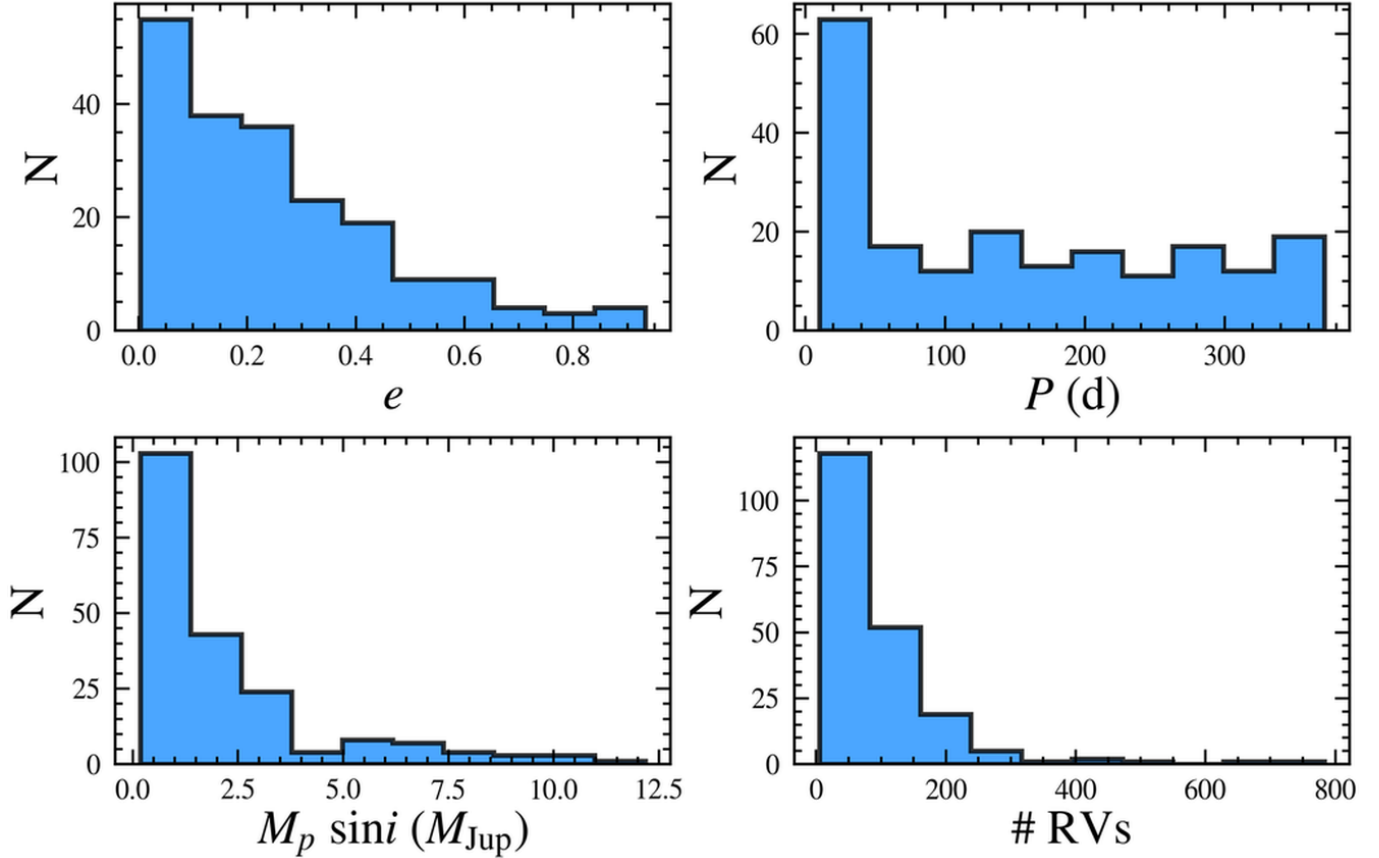


Figure 3. Distribution of eccentricities, orbital periods, minimum masses, and number of radial velocities per target for all planets in our analysis. Eccentricities, orbital periods, and minimum masses are derived from the final fits using *RadVel*1.

Gaia (Gaia Collaboration et al. 2023; Bailer-Jones et al. 2021). Most masses range from about $0.5\text{--}2\ M_{\odot}$, metallicities from -0.50 to $+0.5$ [Fe/H], effective temperatures from $\approx 4000\text{--}6500$ K, and distances out to ~ 500 parsecs (most being within 100 pc).

Stars in this sample were observed with various spectral resolving power and wavelength coverage in the optical and near infrared. These are summarized in Table 1. Each individual instrument in the uniform Keplerian fit has its own jitter values to reduce inhomogeneity in the analysis. Treating jitter as a free parameter for each instrument is intended to mitigate potential differences in both measurement and astrophysical uncertainties. For instance, a more active star may exhibit larger uncertainties in the optical compared to the near-infrared, and the jitter term absorbs this wavelength-dependent variability. Additionally, differences in instrumental precision or stability stemming from varying spectral resolutions ($\approx 40,000 < R < 100,000$) or environmental control are also accounted for with this prescription.

3. OBSERVATIONS

Here we describe new RV observations obtained as part of this program from December 2021 to July 2023 with the Habitable-zone Planet Finder spectrograph (Section 3.1) and MINERVA-Australis (Section 3.2).

Among the full sample of warm Jupiters available for this experiment, the precision of existing eccentricity constraints varies with reported uncertainties extending to as high as $\sigma_e \sim 0.2$. All targets have existing RV detections of warm Jupiters, but the lack of sufficient phase coverage, modest number of RVs, or moderate stellar jitter in some cases resulted in a poor constraint on the eccentricity. To make optimal use of all systems for our population-level eccentricity analysis, we launched a multi-hemisphere survey partitioned between the Hobby-Eberly Telescope’s (HET) Habitable-zone Planet Finder spectrograph (HPF) in the north and MINERVA-Australis for southern targets to improve the eccentricities of the least-constrained $\sim 10\%$ of the sample. This resulted in 20 targets altogether, 10 observed with HPF and 10 with MINERVA-Australis. We focused increased cadence near periastron, where the acceleration is greatest and the maximum information content

about the orbital eccentricity is located (e.g. [Endl et al. 2006](#); [Blunt et al. 2019](#); [Bergmann et al. 2021](#)). We add a total of 540 new radial velocity measurements which are presented below.

3.1. Habitable-zone Planet Finder Spectrograph

Northern targets in our sample were observed with HPF on the 10-m Hobby Eberly Telescope at McDonald Observatory ([Ramsey et al. 1998](#)). HPF is a near-infrared ($\lambda = 810\text{--}1270$ nm) high-resolution spectrograph ($R \equiv \lambda/\Delta\lambda \approx 50,000$) calibrated with a laser frequency comb, with on-sky RV precisions at the ~ 1 m/s level ([Mahadevan et al. 2012](#); [Metcalf et al. 2019](#); [Tran et al. 2021](#)). The brightest ($J < 8$ mag) 10 northern targets with reasonable $v \sin i$ values (generally $\lesssim 5\text{--}10$ km/s) were prioritized. Observations were carried out using the Hobby-Eberly Telescope’s queue scheduling mode ([Shetrone et al. 2007](#)). 180 radial velocity measurements were collected from December 2021 to July 2023.

Relative HPF RVs are measured with a least-squares matching algorithm based on the **SERVAL** ([Zechmeister et al. 2018](#)) package following the procedures described in [Tran et al. \(2021\)](#). All 1D spectra are first corrected for barycentric motion with the **barycorrpy** ([Kanodia & Wright 2018](#)). Then, high frequency pixel-to-pixel variations are removed with a median master flat spectrum. A master science template is created by scaling all spectra to the highest-S/N spectrum with multiplicative third-order polynomials and applying a uniform cubic basic (B -spline) regression. κ -sigma clipping is applied to the template spectrum to remove large outliers and data points near the spectrum edge. Telluric and sky emission features are masked during this process.

Using this master science template, we simultaneously fit for the RV shifts and polynomial coefficients. The template is Doppler shifted in steps of 50 m s^{-1} from -5 km s^{-1} to 5 km s^{-1} and the χ^2 residuals between the shifted template and science spectrum are calculated. The RV shift and variance for each spectral order are estimated from this χ^2 parabola. The final relative RV value for each spectrum is the weighted mean and standard error among the eight échelle orders detailed in [Tran et al. \(2021\)](#). For the RV of a single epoch, three contiguous exposures are obtained and binned together using a weighted average.

3.2. MINERVA-Australis

We obtained new observations from MINERVA-Australis to improve the eccentricities of warm Jupiter targets in the southern hemisphere. MINERVA-Australis is comprised of four 0.7m CDK700 telescopes

that feed light into an optical high-resolution spectrograph ($\lambda = 500\text{--}630\text{nm}$) with ~ 1 m/s precision radial velocity capabilities ([Wittenmyer et al. 2018](#); [Addison et al. 2019](#)). The brightest ($G < 10$ mag) 10 southern targets with reasonable $v \sin i$ values (generally $\lesssim 5\text{--}10$ km/s) were selected for further observations. 360 radial velocity measurements were taken from January 2022 to July 2023.

RVs are derived through a cross correlation function, where the matched template is the mean spectrum of each telescope. Each fiber is treated as an independent instrument and the spectra are analyzed individually. Radial velocity measurements with deviations greater than 3σ from the mean are clipped from each individual fiber for all systems.

3.3. Instrument Offsets

Several instruments listed in Table 1 have undergone upgrades to improve precision and efficiency. In cases where a significant offset (as documented in the literature) is mentioned, we divide the RVs for those spectrographs into two distinct datasets with an unknown velocity break to accurately model the radial velocity measurements both before and after the upgrade.

For instance, HPF underwent a vacuum warm-up and cool-down cycle for maintenance in May 2022, resulting in a division of the radial velocity measurements during our observational campaign into pre- and post-warmup periods. In addition, CORALIE underwent an upgrade in June 2007 to increase the efficiency of the instrument on bright targets and to improve RV accuracy on fainter targets ([Ségransan et al. 2010](#)). This upgrade led to RV offsets that could reach up to $\simeq 20 \text{ m s}^{-1}$ prompting the designation of RVs before and after the upgrade as CORALIE-98 and CORALIE-07, respectively. During the summer and winter of 2020, CHIRON underwent a multi-month shutdown and a statistically significant offset was observed ([Rodríguez et al. 2021](#)). Therefore, for TOI-1478 b we treat the CHIRON observations as two different instruments, CHIRON1 and CHIRON2.

HIRES was upgraded in August 2004 which helped increase the precision of typical observations from $\sim 3 \text{ m s}^{-1}$ to $\sim 1 \text{ m s}^{-1}$ ([Butler et al. 2006](#)). We opted not to include this offset in our analysis as the HIRES break has been shown to be comparable to the RV precision (see further details outlined in [Rosenthal et al. 2021](#)). In the case of HD 130322 ([Hinkel et al. 2015a](#)), the HIRES data is modeled separately for the pre- and post-upgrade periods, which prompted us to follow a similar approach. To ensure convergence with two unique systems, HD 224693 and HIP 14810, we treated the HIRES instrument as two independent instruments. For HD 224693,

Table 1. Spectrographs used to collect RV data for warm Jupiters

Telescope	Instrument	# RVs	λ (nm)	Reference
Whipple 1.5-m	AFOE	78	450–700	1
Lick/Levy 2.4-m	APF	444	374–970	2
Fairborn AST 2-m	AST	136	492–710	3
BOAO 1.8-m	BOES	165	350–1050	4,5
Calar Alto 2.2-m	CAFE	28	365–980	6
Calar Alto/CAHA 3.5-m	CARMENES	368	550–1700	7,8
ESO CAT 1.4-M	CES	95	360–1100	9,10
CTIO 1.5-m	CHIRON	262	410–870	11,12
ESO Euler 1.2-m	CORALIE	1817	381–681	13
Tautenburg 2-m	COUDE	212	463–737	14
ESO Paranal VLT 8-m	CRILES	4	1000–5000	15,16
OHP 1.9-m	ELODIE	396	390–681	17,18
CFHT 3.6-m	ESPaDOs	29	370–1050	19
MPG 2.2-m	FEROS	438	360–920	20,21
ESO LA Silla 1-m	FIDEOS	34	400–680	22,23
NOT 2.5-m	FIES	52	370–730	24
TNG 3.6-m	GIANO	7	950–2500	25,26
Lick/Shane 3-m	HAMILTON	1620	340–1100	27,28
ESO LA Silla 3.6-m	HARPS	1261	380–690	29,30
TNG 3.6-m	HARPS-N	301	378–691	31
Subaru 8.2-m	HDS	35	300–1000	32
OA0 1.9-m	HIDES	1690	500–620	33
Keck-I 10-m	HIRES	4547	300–1100	34,35
McDonald HET 9.2-m	HPF	195	810–1270	36,37
McDonald HET 9.2-m	HRS	1134	390–1100	38
Sloan 2.5-m	KeckET	16	500–590	39
KPNO 2.1-m	KPNO ET	40	500–564	40,41,42
Sloan 2.5-m	MARVELS	25	500–570	43,44,45
Magellan II 6.5-m	MIKE	48	320–1000	46,47,48
Mount Kent Obs./ 4×0.7-m	MINERVA-Australis	539	500–630	49,50
LCOGT/ 6 × 1-m	NRES	33	390–860	51
Magellan II 6.5-m	PFS	48	390–620	52,53
TNG 3.6-m	SARG	29	370–1000	54,55
SONG 1-m	SONG	40	440–690	56
OHP 1.9-m	SOPHIE/SOPHIE+	1460	387–694	57,58
Tillinghast 1.5-m	TRES	106	385–910	59
McDonald 2.7-m	Tull	313	387–1045	60,61
AAT 3.9-m	UCLES	451	300–1100	62,63,64
Xinglong 2.2-m	XSCES	31	330–1100	65,66
Xinglong 2.2-m	XSHRS	60	330–1100	66

NOTE—Telescopes and instruments used to discover and characterize warm Jupiters in our sample. Listings are ordered by instrument name.

References—(1) Brown et al. (1994); (2) Vogt et al. (2014a); (3) Eaton & Williamson (2004); (4) Izumiura (2005); (5) Kim et al. (2007); (6) Aceituno et al. (2013); (7) Quirrenbach et al. (2012); (8) Reiniers et al. (2018); (9) Hatzes et al. (1996); (10) Kürster et al. (1999); (11) Schwab et al. (2010); (12) Tokovinin et al. (2013); (13) Queloz et al. (2000); (14) Hatzes et al. (2003); (15) Kaeufl et al. (2004); (16) Bean et al. (2010); (17) Mayor & Queloz (1995); (18) Baranne et al. (1996); (19) Donati et al. (2006); (20) Kaufer et al. (1999); (21) Setiawan et al. (2008); (22) Tala et al. (2014); (23) Vanzì et al. (2018); (24) Telting et al. (2014); (25) Oliva et al. (2012b); (26) Oliva et al. (2012a); (27) Vogt (1987); (28) Cumming et al. (1999); (29) Mayor et al. (2003); (30) Mayor et al. (2009); (31) Cosentino et al. (2012); (32) Noguchi et al. (2002); (33) Sato et al. (2005); (34) Vogt et al. (1994); (35) Vogt et al. (2000a); (36) Mahadevan et al. (2012); (37) Metcalf et al. (2019); (38) Tull (1998); (39) Ge et al. (2006a); (40) Ge et al. (2003); (41) Ge et al. (2006b); (42) Mahadevan et al. (2008); (43) Ge et al. (2008); (44) Ge & Eisenstein (2009); (45) Ge et al. (2009); (46) Bernstein et al. (2003); (47) López-Morales et al. (2008a); (48) Minniti et al. (2009); (49) Wittenmyer et al. (2018); (50) Addison et al. (2019); (51) Eastman et al. (2014); (52) Crane et al. (2008); (53) Crane et al. (2010); (54) Gratton et al. (2001); (55) Gratton et al. (2004); (56) Andersen et al. (2014); (57) Perruchot et al. (2008); (58) Bouchy et al. (2013); (59) Fűrész et al. (2008); (60) Tull et al. (1995); (61) Cochran & Hatzes (1994); (62) Diego et al. (1990); (63) Tinney et al. (2001); (64) Horton et al. (2012); (65) Zhao & Li (2001); (66) Fan et al. (2016).

Table 2. Parameter priors for MCMC analysis.

Parameter	Prior	Description
P	$\mathcal{U}[1, 400]$	Period (d)
e	$\mathcal{U}[0, 1]$	Eccentricity
ω	$\mathcal{U}[0, 2\pi]$	Argument of Periastron (rad)
T_C	$\mathcal{U}[\tau - \frac{1}{2}P_0, \tau + \frac{1}{2}P_0]$	Time of Conjunction (BJD)
K	$\mathcal{J}[1, 1000]$	RV Semi-Amplitude (m s ⁻¹)
dv/dt	$\mathcal{U}[-2.75, 2.75]$	Linear Trend (m s ⁻¹ d ⁻¹)
d^2v/dt^2	$\mathcal{U}[-0.0075, 0.0075]$	Curvature (m s ⁻¹ d ⁻²)
σ_{jitter}	$\mathcal{U}[0, 100]$	Jitter (m s ⁻¹)

^a τ refers to an arbitrary reference time.

^b $\mathcal{U}$ and $\mathcal{J}$ represent uniform and Jeffreys priors, respectively. $\mathcal{U}(a, b) = 1/(b - a)$ between a and b , and 0 elsewhere. $\mathcal{J}(a, b) \propto 1/x$ between a and b .

RV measurements collected from [Ment et al. \(2018a\)](#) are referred to as HIRES1 and those collected from [Johnson et al. \(2006a\)](#) are referred to as HIRES. Similarly, for HIP 14810, RV measurements collected from [Ment et al. \(2018a\)](#) are referred to as HIRES1 and those collected from [Wright et al. \(2009b\)](#) are referred to as HIRES.

4. ORBIT RE-FITTING

We compile literature measurements from discovery papers and follow-up surveys to generate the most complete and up-to-date compilation of radial velocity measurements for warm Jupiters in our sample, as of May 2022. Including our new observations with HPF and MINERVA-Australis, this amounts to 18,587 RV measurements from 40 spectrographs acquired over the past 35 years. The median number of RV measurements per star is 70 with a range of 5–783 and the median baseline is 7 years with a range of 30 days to 30 years.

We use the **RadVel** package to model the radial velocity time series data and re-fit Keplerian orbits ([Fulton et al. 2018](#)). **RadVel** implements an affine-invariant Markov chain Monte Carlo (MCMC) posterior sampling routine, **emcee** ([Foreman-Mackey et al. 2013](#)), which generates the parameter posterior distributions for individual systems. The eccentricity distribution functions are then used for our broader population-level statistical analysis. The derived eccentricity posterior distributions for each system will be used in forthcoming papers in this series to analyze the underlying eccentricity distribution of warm Jupiters as a population.

We utilize a standard framework for orbit fitting and posterior sampling in our analysis by fitting for orbital period (P), time of inferior conjunction (T_C), velocity semi-amplitude (K), and parameterized forms of eccentricity (e) and argument of periastron (ω), $\sqrt{e} \cos \omega$ and $\sqrt{e} \sin \omega$. Through binary star observations, [Lucy &](#)

[Sweeney \(1971\)](#) found that the eccentricity posterior is not well sampled for orbits with small eccentricities. To avoid this bias, $\sqrt{e} \cos \omega$ and $\sqrt{e} \sin \omega$ are used to aid with convergence when e is small and ω is uncertain ([Ford 2006](#); [Anderson et al. 2011](#)). Uniform priors in $\sqrt{e} \cos \omega$ and $\sqrt{e} \sin \omega$ impose a uniform prior for e and a non-uniform (but weakly constrained) prior in ω . Initial parameter guesses use results of orbit fits from individual discovery and follow-up papers.

Equation 2 from [Rosenthal et al. \(2021\)](#) summarizes the Keplerian model used to fit the RV data,

$$m(t) = \sum_{n=1}^N K(t|P_n, T_{C,n}, e_n, \omega_n, K_n) + \gamma + \dot{\gamma}(t - t_0) + \ddot{\gamma}(t - t_0)^2 \quad (1)$$

where n is the number of planets, P_n is the orbital period for planet n , $T_{C,n}$ is the time of inferior conjunction, e_n is the eccentricity, ω_n is the argument of periastron, K_n is the radial velocity semi-amplitude, γ is the instrumental offset, $\dot{\gamma}$ is a linear acceleration term, $\ddot{\gamma}$ is a quadratic acceleration term, and t_0 is an arbitrary reference epoch, chosen here to be the first radial velocity measurement in each system. t_0 is important because it defines the reference time for calculating the inferior conjunction and any radial acceleration terms. **RadVel** also fits for “jitter” (unaccounted for astrophysical and instrumental noise) which is added in quadrature with the measurement uncertainties ([Fulton et al. 2018](#)). Indeed, some systems do not have reported time of inferior conjunction ($T_{C,n}$) values, but rather, they have reported time of periastron (T_P) values. In such cases, we transform the reported T_P to T_C and allow for the prior to freely fit for T_C . We note that a small number of RV measurements relative to the number of free parameters could lead to overfitting, but all but two systems have at least 10 RV measurements, with a median of 70 RVs per target. Due to the limited RV coverage for K2-114 and K2-115, both of which have fewer than 10 measurements, we adopt single Keplerian fits to minimize the risk of overfitting. Additionally, for the sake of model simplicity, orbit fits from the literature for some systems are reported with fixed eccentricities of 0. In our analysis, we incorporate greater flexibility by allowing eccentricity to vary in each system.

We use a **HardBounds** prior—a linearly uniform distribution bounded between two values—for the period, time of conjunction, jitter, linear acceleration, and quadratic acceleration to constrain the parameter values within a physically meaningful range while maintaining equal probability density across the specified bounds. A Jeffreys prior with upper and lower bounds is used for the RV semi-amplitude to ensure positive values and

prevent bias toward small values of K . To aid with convergence, we adopt a uniform prior on the eccentricity from 0–1, following the standard basis parameterization using $\sqrt{e} \cos \omega$ and $\sqrt{e} \sin \omega$. These weakly informative priors are listed in Table 2.

4.1. Model Selection

Combining radial velocity datasets allows for a longer baseline of observations, ultimately facilitating the discovery of long-term RV trends that are caused by distant giant planets, brown dwarfs, and low-mass stars (e.g., [Crepp et al. 2014](#); [Lagrange et al. 2019](#); [Bowler et al. 2021a](#); [Bowler et al. 2021b](#); [Dalal et al. 2021](#); [Barbato et al. 2023](#); [Matthews et al. 2024](#)). To generate a consistent comparison among each of the orbit fits in systems with signals of only a single giant planet, we re-fit each dataset three times: with a single-planet Keplerian orbit and no RV trend in the model, a single planet plus a linear trend (a radial acceleration), and a single planet with both linear and curvature terms (changes in radial acceleration). Each MCMC run contains at least 30 walkers and 2×10^4 steps. We utilize the built-in Gelman-Rubin ([Gelman & Rubin 1992](#); GR) statistic in RadVel (which imposes a minimum GR value of 1.03) coupled with trace and corner plots to assess convergence ([Foreman-Mackey 2016](#); [Hogg & Foreman-Mackey 2018](#)).

We then test the goodness of the fit among the three models using the Bayesian Information Criterion (BIC):

$$BIC = -2 \cdot \ln(\mathcal{L}) + k \cdot \ln(n) \quad (2)$$

where $\ln(\mathcal{L})$ is the log-likelihood, k is the number of free parameters in the model, and n is the number of data points. The BIC value takes into account the complexity of the model and the goodness of fit through the χ^2 value. We compare the Keplerian model against the linear trend and curvature (quadratic) models. Following the interpretation of ΔBIC values from [Trotta \(2007\)](#), we then select the statistically favored fit if the ΔBIC is > 10 from the next-best fit and more complex model. For instance, a Keplerian fit is preferred over a Keplerian-plus-linear trend model if the ΔBIC value between these two is less than 10, even if the model with the trend produces a slightly better χ^2 value.

Orbits of all warm Jupiters that reside in previously known multi-planet systems are fit by summing the Keplerian orbit of each planet. For the specific cases of HD 11506 ([Giguere et al. 2015](#)), HD 163607 ([Giguere et al. 2012a](#); [Luhn et al. 2019a](#)), HD 168443 ([Wittenmyer et al. 2007a](#); [Pilyavsky et al. 2011](#)), HD 191939 ([Lubin et al. 2022a](#); [Orell-Miquel et al. 2023](#)), and HD 38529 ([Fischer et al. 2001](#); [Wittenmyer et al. 2009](#); [Wright et al. 2009a](#);

[Luhn et al. 2019a](#)) we include linear trends to best fit the data following the setup outlined in previous studies.

The distribution of eccentricities, orbital periods, and minimum masses from the final RadVel fits can be found in Figure 3. We find that warm Jupiters exhibit a wide range of eccentricities spanning 0–0.93, with a preference for low- to moderate values below 0.4. The behavior of warm Jupiter eccentricities as a function of their orbital properties and host star characteristics is explored in more detail in companion papers in this series (Morgan et al., in press). The average $m_p \sin i$ is $\sim 1 M_{\text{Jup}}$, with minimum masses extending to $12.17 M_{\text{Jup}}$. The orbital period distribution peaks between 10–40 days and remains nearly uniform at longer periods. This is likely due to detection biases favoring transiting planets (which make up 22% of the sample) and the relative ease of discovering and following up warm Jupiters at smaller separations from their host stars.

5. RESULTS

5.1. General properties of Warm Jupiters and Host Stars

Here, we present results from the best-fit orbital solutions obtained for all 200 planets listed in Table 3. The Maximum a Posteriori (MAP) value¹, and 68% highest density interval about the median for each fitted parameters posterior probability distribution are reported in Table 3. A comparison of literature values and those obtained in our orbit refits can be found in Figure 4. Stellar properties for all 194 hosts are reported in Table 4. Mass (M_*), metallicity ($[\text{Fe}/\text{H}]$), and distances (pc) are collected from discovery papers, VizieR ([Ochsenbein et al. 2000](#)), the NASA Exoplanet Archive ([Akeson et al. 2013](#)), and Gaia DR3 ([Gaia Collaboration et al. 2023](#); [Bailer-Jones et al. 2021](#)).

Linear accelerations ($\dot{\gamma}$) and, when relevant, second-order quadratic terms ($\ddot{\gamma}$) are reported in Table 5. There are 132 single-planet warm Jupiters orbiting 132 individual host stars. Additionally, 68 warm Jupiters in multi-planet systems orbit a total of 62 host stars, with 6 of these stars hosting two warm Jupiters. Of the 62 host stars with warm Jupiters in multi-planet systems, 51 host at least two giant planets. The number of planets, the total number of radial velocity measurements, the mean error on those measurements, the observational baseline, and the BIC values are provided in Table 5.

5.2. RV Trends and Distant Companions

¹ Note that we report the global MAP value, which differs from the marginalized mean, median, and mode for each parameter. ([Hogg & Foreman-Mackey 2018](#)).

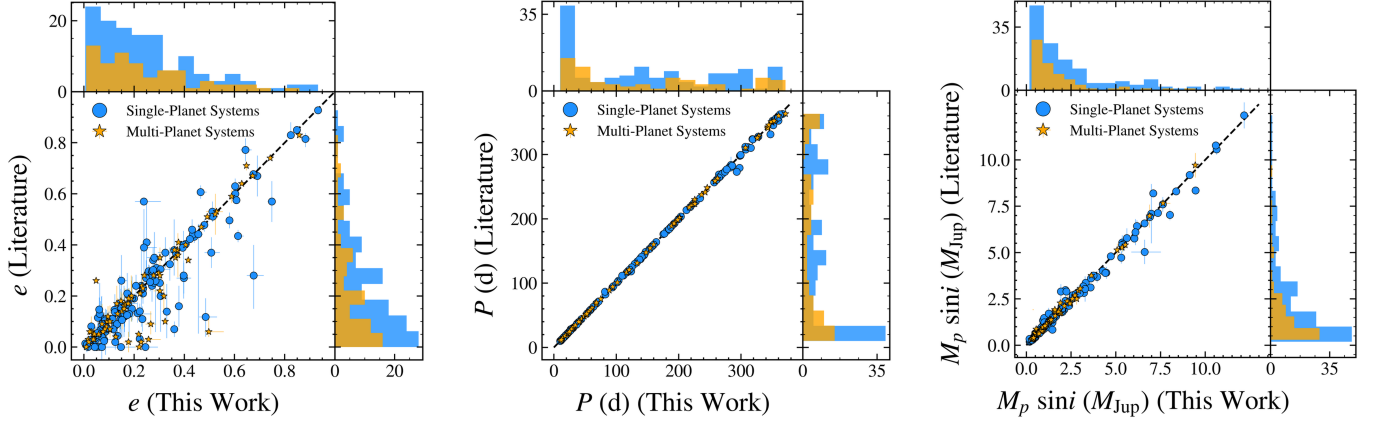


Figure 4. Comparison of eccentricity, orbital period, and minimum mass measurements from the literature and those from our orbit refits. Warm Jupiters in single planet systems are denoted by blue circles and those in multi-planet systems are represented by orange stars. Literature solutions were selected from the original fits in the discovery papers, with updated fits from follow-up papers utilized when available. References to earlier work used in this figure are reported in Table 3.

Many systems in this sample are expected to have wide stellar, substellar, and planetary companions. Multiplicity surveys of solar-type stars have found that almost half are in binary or higher-order systems with a period distribution peaking at ~ 50 AU (Raghavan et al. 2010; Duchêne & Kraus 2013). The distant companion rate for systems hosting warm Jupiters is unconstrained. However, for the similar population of hot Jupiter systems, the occurrence rate of distant planetary companions to stars harboring hot Jupiters from long-term RV surveys is $\approx 70\% \pm 8\%$ with masses between $1\text{--}13 M_{\text{Jup}}$ and orbital semi-major axes between $1\text{--}20$ AU (Knutson et al. 2014a; Bryan et al. 2016a). AO Imaging surveys have found that $47\% \pm 7\%$ of hot Jupiters have stellar companions with semimajor axes between 50 and 2000 AU (Ngo et al. 2016).

Among our best-fit models, 5 multi-planet and 54 single-planet systems show either a long-term linear $\dot{\gamma}$ (25 systems) or quadratic $\ddot{\gamma}$ (34 systems) acceleration, suggesting the presence of a distant companion. Close-in orbiting giant planets and wide stellar companions can produce degeneracies in mass and orbital separation that produce the measured reflex motion. These radial accelerations will be explored in greater detail in a future study in this series.

5.3. Systems with New RVs

Here, we discuss updated orbital parameters from our uniform fits with a focus on planetary mass, orbital separation, and eccentricity results for individual planets in our observational campaign with HPF and MINERVA-Australis (see Table 3 for additional details).

5.3.1. Apparently Single Planet Systems

1. BD+15 2940 is a K0 giant hosting a warm Jupiter with an eccentricity of $0.26^{+0.10}_{-0.10}$ and a mini-

um mass of $1.1 M_{\text{Jup}}$ on a 137.48 ± 0.34 day orbit (Nowak et al. 2013a). It is one of the closest-orbiting planets around an evolved giant and could potentially be an engulfment candidate. The initial RV measurements were acquired using HET/HRS by the Penn State-Torun Planet Search, extending until 2011. We revisited this system over a decade later using HPF with new measurements spanning from January 2022 to May 2022. We obtain an improved constraint on the eccentricity, $0.15^{+0.02}_{-0.02}$, and derive a minimum mass of $1.05 \pm 0.02 M_{\text{Jup}}$ and period of $138.87^{+0.02}_{-0.02}$ days.

2. BD+55 362, a K3 star, harbors a $0.72 \pm 0.08 M_{\text{Jup}}$ companion on a 265 ± 1 day orbit with an eccentricity of $0.27^{+0.06}_{-0.06}$. Dalal et al. (2021) adopted a model that incorporates a linear drift and quadratic trend for their SOPHIE+ measurements with reported values of $1.76 \pm 0.04 \text{ m s}^{-1} \text{ yr}^{-1}$ and $1.4365 \pm 0.0005 \text{ m s}^{-1} \text{ yr}^{-2}$, respectively. We obtain new RV measurements from August 2022 to November 2022 using HPF. The new orbit fit yields an eccentricity of $0.40^{+0.03}_{-0.03}$, minimum mass of $0.63 \pm 0.03 M_{\text{Jup}}$, and orbital period of $266.18^{+0.70}_{-0.70}$ days. The BIC analysis favors the model with a linear trend and curvature, with values of $-15.25^{+0.99}_{-0.95} \text{ m s}^{-1} \text{ yr}^{-1}$ and $1.36^{+0.11}_{-0.11} \text{ m s}^{-1} \text{ yr}^{-2}$, respectively.
3. HD 128356 b is a $0.89 \pm 0.07 M_{\text{Jup}}$ giant planet around a K3V star orbiting every 298.2 ± 1.6 days with an eccentricity of $0.57^{+0.08}_{-0.08}$ (Jenkins et al. 2017a). CORALIE and HARPS measurements were acquired up until 2014 to confirm this warm Jupiter. With our additional added RVs collected

- by MINERVA-Australis from February 2022 to May 2023, we find a somewhat higher eccentricity of $0.75^{+0.01}_{-0.01}$ along with a consistent period of $298.19^{+0.08}_{-0.07}$ days and minimum mass of $0.99^{+0.04}_{-0.03} M_{\text{Jup}}$.
4. The K0 subgiant HD 148427 hosts a $0.96 \pm 0.10 M_{\text{Jup}}$ warm Jupiter with a period of 331 ± 3 days and eccentricity of $0.16^{+0.08}_{-0.08}$ (Fischer et al. 2009a). HAMILTON RV measurements were obtained until 2009 to confirm the presence of this long-period planetary companion. Together with these published RVs, our additional observations collected over a decade later with MINERVA-Australis spanning February 2022 to May 2023 reveal an eccentricity of $0.38^{+0.01}_{-0.01}$, orbital period of $347.14^{+0.23}_{-0.22}$ days, and minimum mass of $1.27 \pm 0.02 M_{\text{Jup}}$. Our BIC analysis favors the model with a linear trend of $-5.07 \pm 0.09 \text{ m s}^{-1} \text{ yr}^{-1}$.
 5. The G2 star HD 164509 harbors a $0.48 \pm 0.09 M_{\text{Jup}}$ companion with an eccentricity of $0.26^{+0.14}_{-0.14}$ and orbits its host every 282.4 ± 3.8 days (Giguere et al. 2012a). Initial and follow-up RV measurements from Ment et al. (2018a) were taken with HIRES and show a linear trend of $-5.1 \pm 0.7 \text{ m s}^{-1} \text{ yr}^{-1}$. More recently, we obtained 15 new RVs with HPF from March 2022 to May 2022 and the combined orbit fit yields an eccentricity of $0.27^{+0.01}_{-0.01}$, a period of $281.29^{+0.12}_{-0.11}$ days, and minimum mass of $0.46^{+0.004}_{-0.004} M_{\text{Jup}}$. In addition we recover a linear trend of $-3.52^{+0.03}_{-0.04} \text{ m s}^{-1} \text{ yr}^{-1}$, a result similar to the trend identified by Giguere et al. (2012a).
 6. López-Morales et al. (2008b) discovered HD 205739 b, a $1.37^{+0.07}_{-0.09} M_{\text{Jup}}$ companion on a 279.8 ± 0.1 day orbit with an eccentricity of $0.27^{+0.07}_{-0.07}$ around an F-type star. MIKE RV measurements taken from 2004 to 2007 show a linear trend of $23.70 \pm 0.07 \text{ m s}^{-1} \text{ yr}^{-1}$ indicating the presence of another outer body in the system. Our additional RV measurements taken with MINERVA-Australis fifteen years later, from May 2022 to May 2023, recover a linear trend of $21.92^{+0.36}_{-0.34} \text{ m s}^{-1} \text{ yr}^{-1}$, broadly similar to results from López-Morales et al. (2008b). We find an eccentricity of $0.25^{+0.01}_{-0.01}$, an orbital period of $282.67^{+0.27}_{-0.29}$ days, and a minimum mass of $1.44 \pm 0.03 M_{\text{Jup}}$ for the warm Jupiter.
 7. HD 208487 b is a $0.45 \pm 0.05 M_{\text{Jup}}$ warm Jupiter orbiting a G-type star every 130 ± 1 days with an eccentricity of $0.32^{+0.10}_{-0.10}$ (Tinney et al. 2005). We re-observed this system from April 2022 to April 2023 with MINERVA-Australis, generating a 25 year baseline when combined with the initial UCLES RVs that were obtained from 1998–2004. We derive an eccentricity of $0.23^{+0.02}_{-0.02}$, along with a minimum mass and orbital period of $0.48 \pm 0.01 M_{\text{Jup}}$ and 129 ± 0.05 days, respectively.
 8. HD 211403 is an F-type star hosting a $5.54^{+0.39}_{-0.38} M_{\text{Jup}}$ companion with a period and eccentricity of 223.80 ± 0.41 days and $0.08^{+0.06}_{-0.04}$, respectively (Demangeon et al. 2021). ELODIE, SOPHIE, and SOPHIE+ RV measurements were obtained until 2018. We acquired new HPF measurements from December 2021 to September 2022. Our combined fit resulted in an eccentricity of $0.13^{+0.01}_{-0.01}$, an orbital period of $223.62^{+0.10}_{-0.09}$ days, and minimum mass of $5.36 \pm 0.05 M_{\text{Jup}}$. Our BIC analysis favors the accelerating model with linear and curvature terms of $-81.46^{+8.97}_{-10.08} \text{ m s}^{-1} \text{ yr}^{-1}$, and $3.96^{+0.49}_{-0.43} \text{ m s}^{-1} \text{ yr}^{-2}$, respectively.
 9. Niedzielski et al. (2015a) discovered a warm Jupiter with a mass of $1.47^{+0.20}_{-0.12} M_{\text{Jup}}$, period of 148.6 ± 0.7 , and eccentricity of $0.38^{+0.12}_{-0.10}$ around the K0 giant HD 216536. Our recently acquired HPF RVs (December 2021 to November 2022) combined with the original HRS RV measurements collected between 2005 and 2013 establish a seventeen-year baseline. We calculate that the companion has an eccentricity of $0.36^{+0.02}_{-0.02}$, orbital period of $147.01^{+0.08}_{-0.07}$ days, and a minimum mass of $0.99 \pm 0.02 M_{\text{Jup}}$.
 10. HD 216770 harbors a $0.65 M_{\text{Jup}}$ companion orbiting every 118.45 ± 0.55 days with an eccentricity of $0.37^{+0.06}_{-0.06}$ (Mayor et al. 2004). We combine CORALIE RVs taken from 2000 to 2002 with MINERVA-Australis RVs obtained two decades later from June 2022 to September 2022. The combined orbit fit yields a solution with an eccentricity of $0.51^{+0.03}_{-0.03}$, period of 123.58 ± 0.03 days, and minimum mass of $0.49 \pm 0.02 M_{\text{Jup}}$.
 11. HD 219139 b is a $0.78^{+0.05}_{-0.20} M_{\text{Jup}}$ companion with a period of $275.5^{+2.3}_{-1.0}$ days and eccentricity of $0.11^{+0.09}_{-0.08}$ (Teng et al. 2022a). Our orbit fit combines the original RV measurements taken with HIDES with new HPF RVs, yielding an eccentricity of $0.07^{+0.01}_{-0.01}$, orbital period of 275.60 ± 0.13 days, and a minimum mass of $0.76 \pm 0.01 M_{\text{Jup}}$.
 12. Johnson et al. (2006a) detected a warm Jupiter with a mass of $0.33 M_{\text{Jup}}$ and eccentricity of $0.48^{+0.05}_{-0.05}$ orbiting HD 33283 once every $18.179 \pm$

0.007 days. We combine the original HIRES RVs with updated HIRES RVs (Ment et al. 2018a) and our recently acquired MINERVA-Australis RVs. Our orbit fit finds an eccentricity of $0.40^{+0.01}_{-0.01}$, period of 18.1993 ± 0.0002 days, and a minimum mass of $0.325 \pm 0.003 M_{\text{Jup}}$.

13. HD 38283, a F-type star, hosts a $0.34 \pm 0.02 M_{\text{Jup}}$ warm Jupiter on a 363.2 ± 1.6 day orbit with an eccentricity $= 0.41^{+0.16}_{-0.16}$ (Tinney et al. 2011a). We combined the initial UCLES RVs, which were obtained from 1998 to 2010, with our new MINERVA-Australis RVs acquired from February 2022 to September 2022. The combined data resulted in an eccentricity of $0.25^{+0.01}_{-0.01}$, period of 365.70 ± 0.15 , and minimum mass $= 0.386 \pm 0.006 M_{\text{Jup}}$.
14. HR 810, also known as ι Horologii and HD 17051, harbors a $2.26 \pm 0.18 M_{\text{Jup}}$ companion with a period of 320.1 ± 2.1 days and eccentricity $= 0.161^{+0.069}_{-0.069}$ (Kürster et al. 2000; Butler et al. 2001a; Naef et al. 2001). Our RV analysis amounts to a 30 year baseline by combining measurements taken with the UCLES, COUDE, and CORALIE instruments from 1992–2001 together with new MINERVA-Australis RVs (February 2022 to September 2022). We calculate an eccentricity of $0.252^{+0.006}_{-0.006}$, orbital period of 311.95 ± 0.11 days, and minimum mass $= 2.62 \pm 0.02 M_{\text{Jup}}$.
15. NGC 2682 Sand 364, also known as BD+12 1917, is a K-type star hosting a $1.54 \pm 0.24 M_{\text{Jup}}$ warm Jupiter orbiting once every 121.71 ± 0.31 days with an eccentricity of $0.35^{+0.08}_{-0.08}$ (Brucalassi et al. 2014; Brucalassi et al. 2017). We combine RV measurements acquired between 2003 and 2014 by the CORALIE, HARPS, SOPHIE, AND HRS instruments with new HPF measurements collected from December 2021 to March 2023. This establishes a baseline of measurements spanning approximately twenty years. We derive an eccentricity of $0.28^{+0.02}_{-0.02}$, period of $121.31^{+0.07}_{-0.07}$ days, and minimum mass $= 1.66 \pm 0.04 M_{\text{Jup}}$. The BIC analysis favors the model with a linear trend of $2.75^{+0.67}_{-0.65} \text{ m s}^{-1} \text{ yr}^{-1}$.

5.3.2. Two Planet Systems

16. HD 207832 hosts two giant planets, one of which, HD 207832 b, is a warm Jupiter with period of $161.97^{+0.97}_{-0.78}$ days, minimum mass $= 0.56^{+0.06}_{-0.03} M_{\text{Jup}}$, and eccentricity $= 0.13^{+0.18}_{-0.05}$ (Haghighipour

et al. 2012a). The initial HIRES RVs in combination with updated RVs from HIRES (2004–2016; Ment et al. 2018a) and MINERVA-Australis RVs (February 2022 to September 2022) creates a baseline of eighteen years with 176 measurements. The combined orbit fit yields an eccentricity of $0.32^{+0.01}_{-0.01}$, period of 160.06 ± 0.02 days, and minimum mass $= 0.546 \pm 0.004 M_{\text{Jup}}$.

17. HD 67087, an F-type star, harbors two giant planets, where HD 67087 b is classified as a warm Jupiter with eccentricity $= 0.17^{+0.07}_{-0.07}$, period of $352.2^{+1.7}_{-1.6}$ days, and a minimum mass $= 3.06^{+0.22}_{-0.20} M_{\text{Jup}}$. The outer giant planet, HD 67087 c, is an eccentric cold Jupiter with $e = 0.76^{+0.17}_{-0.24}$, a period of 2374^{+193}_{-156} days, and a minimum mass $= 4.85^{+10.0}_{-3.61} M_{\text{Jup}}$ (Harakawa et al. 2015a). The warm Jovian was detected using the HDS and HIDES instruments from 2004 to 2014. We combined these measurements with new HPF RVs from December 2021 to March 2023 and derive an eccentricity of $0.13^{+0.01}_{-0.01}$, orbital period of $352.96^{+0.07}_{-0.08}$ days, and minimum mass $= 3.02 \pm 0.02 M_{\text{Jup}}$. The outer giant planet, HD 67087 c, yields an $e = 0.711^{+0.010}_{-0.010}$, period of $2375.52^{+18.76}_{-15.09}$ days, and minimum mass of $5.85^{+0.14}_{-0.15} M_{\text{Jup}}$.
18. HD 75784 b is a warm Jupiter in a system hosting two giant planets, with an eccentricity of $0.09^{+0.06}_{-0.06}$, period of 341.2 ± 1.1 days, and a minimum mass of $1.00 \pm 0.14 M_{\text{Jup}}$. The outer giant planet, HD 75784 c, is a cold Jupiter with $e = 0.49 \pm 0.09$, a period of 7900 ± 2000 days, and a minimum mass of $5.64 \pm 0.72 M_{\text{Jup}}$ (Giguere et al. 2015; Luhm et al. 2019a). We combined HIRES RVs from 2004 to 2014 with new HPF RVs acquired from December 2021 to March 2023. For the inner warm Jupiter we derive an eccentricity of $0.10^{+0.01}_{-0.01}$, period of $342.66^{+0.03}_{-0.04}$ days, and a minimum mass of $1.05^{+0.01}_{-0.01} M_{\text{Jup}}$. For HD 75784 c we derive an $e = 0.489^{+0.004}_{-0.004}$, orbital period of $8205.22^{+19.30}_{-26.30}$ days, and minimum mass of $6.02^{+0.05}_{-0.07} M_{\text{Jup}}$.
19. Lo Curto et al. (2010) discovered HIP 5158 b, a warm Jupiter orbiting its K-type host star once every $345.72^{+5.37}_{-5.37}$ days with a minimum mass of $1.42 M_{\text{Jup}}$ and eccentricity of $0.52^{+0.08}_{-0.08}$. A second giant planet was later discovered in the system with an eccentricity of 0.14 ± 0.10 , a period of 9017 ± 3180 days, and a minimum mass $= 15.04 \pm 10.55 M_{\text{Jup}}$ (Feroz et al. 2011). HARPS (2004 – 2009) and new MINERVA-Australis RVs obtained from August 2022 to September 2022 are combined and yield an eccentricity of $0.5231^{+0.0044}_{-0.0046}$, period of $344.57^{+0.23}_{-0.22}$

days, and a minimum mass of $1.37 \pm 0.01 M_{\text{Jup}}$. To aid with convergence we modeled HIP 5158 as a single-planet Keplerian with a quadratic trend, following the setup outlined in the discovery paper.

20. The K-type star HIP 65407 is the host star to two warm Jupiters that orbit just outside the 12:5 resonance, making it one of the six known systems with two confirmed warm Jupiters through RV observations as of May 2022 (Hébrard et al. 2016). The inner companion, HIP 65407 b, orbits its host every 28.13 ± 0.02 days with a minimum mass of $0.43 \pm 0.03 M_{\text{Jup}}$ and eccentricity of $0.14^{+0.07}_{-0.07}$. HIP 65407 c has a minimum mass of $0.78 \pm 0.05 M_{\text{Jup}}$, an eccentricity of $0.12^{+0.04}_{-0.04}$, and orbital period = 67.30 ± 0.08 days (Hébrard et al. 2016). We combine HPF RVs obtained in May 2022 with SOPHIE and SOPHIE+ RVs acquired from 2011 to 2015 for a total of 71 measurements. We find an eccentricity of $0.15^{+0.01}_{-0.01}$, period of 28.13 ± 0.003 days, and a minimum mass of $0.42 \pm 0.003 M_{\text{Jup}}$ for HIP 65407 b. For HIP 65407 c, we infer an eccentricity of $0.10^{+0.01}_{-0.01}$, period of 67.30 ± 0.01 days, and a minimum mass of $0.78 \pm 0.005 M_{\text{Jup}}$.

5.4. Systems with Poor Convergence

Here, we discuss systems that required additional attention for convergence (see solutions in Table 3).

21. HD 191939 is a G9V star hosting six planets. Notably for this analysis, HD 191939 e is identified with a mass of $0.340 \pm 0.009 M_{\text{Jup}}$, an eccentricity fixed at 0, and orbits at a distance of 0.397 ± 0.005 AU (Lubin et al. 2022a). While there are four other planets within the system, they are not giant planets and, consequently, have relatively low semi-amplitude signals ($K \approx 1\text{--}3 \text{ m s}^{-1}$) compared to HD 191939 e ($K = 17.73 \text{ m s}^{-1}$). Therefore, in our modeling of the RVs, we exclusively focus on the warm Jupiter. The RV measurements from the APF and HIRES instruments indicate a preference for a model that incorporates a linear trend and curvature. The long-term trend showed by the RVs is associated with HD 191939 f, a high-mass planet with an unconstrained period (Orell-Miquel et al. 2023). While fitting the orbit of the warm Jupiter, we allowed the model to also fit for changing acceleration terms. Lubin et al. (2022a) find a linear trend of $41.64^{+2.19}_{-2.19} \text{ m s}^{-1} \text{ yr}^{-1}$, accompanied by a curvature value of $-7.99^{+2.66}_{-2.66} \text{ m}$

$\text{s}^{-1} \text{ yr}^{-2}$. Orell-Miquel et al. (2023) find a linear trend of $69.47^{+0.77}_{-0.77} \text{ m s}^{-1} \text{ yr}^{-1}$, accompanied by a curvature value of $-3.03^{+0.09}_{-0.09} \text{ m s}^{-1} \text{ yr}^{-2}$. In our analysis, we derive an eccentricity of $0.04^{+0.003}_{-0.003}$, semi-major axis of $0.40^{+0.0001}_{-0.0001} \text{ AU}$ and a mass of $0.360 \pm 0.001 M_{\text{Jup}}$. In addition we find a linear trend of $44.96^{+1.14}_{-0.70} \text{ m s}^{-1} \text{ yr}^{-1}$, and a quadratic drift of $-7.77^{+0.04}_{-0.63} \text{ m s}^{-1} \text{ yr}^{-2}$, respectively.

22. HD 59686 A is a K III giant hosting the warm Jupiter HD 59686 Ab ($P = 299.36^{+0.26}_{-0.31}$ days; $e = 0.05^{+0.03}_{-0.02}$; $M_{\text{p}} \sin i = 6.92^{+0.18}_{-0.24} M_{\text{Jup}}$) in a tight eccentric binary system (Ortiz et al. 2016). The orbit fit of the HD 59686 system is dominated by the stellar companion HD 59686 B ($a_{\text{B}} = 13.56^{+0.18}_{-0.14} \text{ AU}$; $e = 0.73$; $M_{\text{p}} \sin i = 554.9^{+1.2}_{-0.9} M_{\text{Jup}}$). Consequently, we model this complex system as a two-planet system treating HD 59686 Ab as the inner companion and HD 59686 B as the outer companion. We derive an eccentricity of $e = 0.048^{+0.002}_{-0.002}$, orbital period of $299.36^{+0.028}_{-0.029}$ days, and $M_{\text{p}} \sin i = 6.92^{+0.01}_{-0.02} M_{\text{Jup}}$ for HD 59686 Ab.
23. The warm Jupiter host star HD 87646 A is a part of a close binary system, with the two stars separated by $\sim 22 \text{ AU}$ (Ma et al. 2016a). The primary star, HD 87646 A, harbors both a warm Jupiter HD 87646 b ($P = 13.481 \pm 0.001 \text{ d}$; $e = 0.05 \pm 0.02$; $M_{\text{p}} \sin i = 12.4 \pm 0.7 M_{\text{Jup}}$) and brown dwarf HD 87646 c ($P = 674 \pm 4 \text{ d}$; $e = 0.50$; $M_{\text{p}} \sin i = 57.0 \pm 3.7 M_{\text{Jup}}$). We utilize a two-planet Keplerian model for the orbit fit of this unique warm Jupiter-brown dwarf-binary star system. Our analysis of HD 87646 b finds an eccentricity of $e = 0.057^{+0.002}_{-0.002}$, orbital period of $13.48167 \pm 0.00007 \text{ d}$, and $M_{\text{p}} \sin i = 12.17^{+0.02}_{-0.03} M_{\text{Jup}}$.
24. 55 Cancri (55 Cnc) is a five-planet system with over twenty years of combined spectroscopic monitoring from the Tull (2.7m) and HRS spectrographs at McDonald Observatory, HIRES, HAMILTON, HARPS, HARPS-N, and SOPHIE (Bourrier et al. 2018). 55 Cnc b is a $0.8 M_{\text{Jup}}$ warm Jupiter with an eccentricity typically fixed at 0, and orbits its host star every 14.6516 ± 0.0001 days. We modeled this complex system using the two largest planets, b and d, as the other three planets induce small semi-amplitudes compared to these two giant planets. Our two-planet Keplerian model yields an eccentricity of $0.009^{+0.001}_{-0.001}$, orbital period of 14.65218 ± 0.00001 days, and $M_{\text{p}} \sin i = 0.8015^{+0.0005}_{-0.0005} M_{\text{Jup}}$ for 55 Cnc b.

25. Kepler-65 hosts three compact transiting sub-Neptunes (Kepler-65 b, c, and d with respective periods of ≈ 2 , 6 and 8 days), along with a long-period warm Jupiter (≈ 259 days), Kepler-65 e (Mills et al. 2019a). The three sub-Neptunes in the Kepler-65 system induce insignificant semi-amplitudes compared to planet e, leading us to concentrate our modeling efforts primarily on the warm Jupiter, which dominates the orbit fit. Our one-planet Keplerian model with Kepler-65 e produces an eccentricity of $e = 0.303^{+0.006}_{-0.008}$ and $M_p \sin i = 0.662^{+0.006}_{-0.008} M_{\text{Jup}}$.
26. Gliese 876 (GJ 876), an M dwarf with ≈ 20 years of spectroscopic monitoring from the HIRES, CARMENES, ELODIE, HAMILTON, HARPS, and CORALIE spectrographs hosts four planets (Marcy et al. 2001a; Rivera et al. 2005a; Correia et al. 2010a; Rivera et al. 2010a; Nelson et al. 2016; Trifonov et al. 2018). Two of the four planets, GJ 876 c and b, are coplanar warm Jupiters in a 2:1 mean-motion resonance. They have masses of 0.86 and 2.64 M_{Jup} , eccentricities of 0.265 ± 0.002 and 0.031 ± 0.001 , and periods of approximately 30.259 ± 0.010 and 61.065 ± 0.012 days, respectively. The inner and outermost planets in the system, GJ 876 d and e, induce small semi-amplitudes on the host star, leading us to concentrate our modeling efforts on the two warm Jupiters that dominate the orbit fit. Our two-planet Keplerian model with GJ 876 c and b yields eccentricities of $0.049^{+0.002}_{-0.001}$ and $0.018^{+0.001}_{-0.001}$, and minimum masses $= 0.610^{+0.001}_{-0.001}$ and $1.902^{+0.001}_{-0.002} M_{\text{Jup}}$, respectively.
27. Kepler-419 hosts two giant planets, one of which, Kepler-419 b, is a warm Jupiter with a period of $69.7546^{+0.0007}_{-0.0009}$ days, mass of $2.5^{+0.3}_{-0.3} M_{\text{Jup}}$, and eccentricity of $0.833^{+0.013}_{-0.013}$ (Dawson et al. 2014). The outer giant planet, Kepler-419 c, is a cold Jupiter with $e = 0.184 \pm 0.002$, a period of 675.47 ± 0.11 days, and a minimum mass of $7.3 \pm 0.4 M_{\text{Jup}}$. To aid with convergence, we modeled Kepler-419 as a single-planet Keplerian with a quadratic trend, following the setup outlined in the discovery paper (Dawson et al. 2014). Our analysis of Kepler-419 b finds an eccentricity of $e = 0.858^{+0.007}_{-0.006}$, orbital period of 68.14 ± 0.03 d, and $M_p \sin i = 2.81^{+0.07}_{-0.07} M_{\text{Jup}}$.
28. For the warm Jupiter-hosting systems BD-08 2823, K2-290, Kepler-117, Kepler-1514, KOI-94, and TOI-1670 we opted to model only the giant planets to aid with convergence. Specifically, we excluded the following companions: the inner Uranus-mass planet orbiting BD-08 2823 (Hébrard et al. 2010a), the inner mini-Neptune in the K2-290 system (Hjorth et al. 2019), the inner Neptune-mass planet orbiting Kepler-117 (Bruno et al. 2015), the inner Earth-sized planet in the Kepler-1514 system (Dalba et al. 2021), the two super-Earth's and Neptune-size planets orbiting KOI-94 (Weiss et al. 2013), and the inner sub-Neptune in the TOI-1670 system (Tran et al. 2022). The smaller planets in these systems are either tightly constrained from transit light curves or induce small semi-amplitudes on the host star, leading us to concentrate our modeling efforts on the warm Jupiter in the system.
29. The G-type star KOI-142 (Kepler-88) is the host to three planets including the warm Jupiter KOI-142 c which has an orbital period of $22.26492^{+0.00067}_{-0.00067}$ days, minimum mass of $0.674^{+0.016}_{-0.016} M_{\text{Jup}}$, and eccentricity of $0.05724^{+0.00045}_{-0.00045}$ (Nesvorný et al. 2013; Weiss et al. 2020). The orbit of the inner-most planet, the transiting sub-Neptune sized planet KOI-142 b, proved to be challenging to constrain with only RVs. Our two-planet Keplerian model with KOI-142 c produces an eccentricity of $e = 0.023^{+0.005}_{-0.005}$, period $= 22.2693^{+0.0006}_{-0.0006}$ days, and $M_p \sin i = 0.642^{+0.003}_{-0.003} M_{\text{Jup}}$.
30. HD 160691, also known as μ Arae, hosts four planets, one of which is the warm Jupiter HD 160691 e with an orbital period of $310.55^{+0.83}_{-0.83}$ days, mass of $0.52 M_{\text{Jup}}$, and eccentricity of $0.0666^{+0.0122}_{-0.0122}$ (Pepe et al. 2007). The inner Neptune-mass planet (≈ 10 days), HD 160691 d, induces a negligible semi-amplitude compared to the three outer giant planets in the system causing us to concentrate our modeling efforts on the three larger Jupiter-mass planets. The three planet Keplerian model with HD 160691 e yields an eccentricity of $0.124^{+0.004}_{-0.004}$, $M_p \sin i = 0.480^{+0.006}_{-0.007} M_{\text{Jup}}$, and orbital period of $308.904^{+0.158}_{-0.157}$ days.
31. We opted to only use the CORALIE RV data when modeling the orbit of HD 72892 b (Jenkins et al. 2017a) due to challenges in achieving convergence with the complete dataset. The additional 8 HARPS RVs, collected over a ≈ 21 day period, were excluded from the orbital fit. The orbit fit yields an eccentricity of $0.422^{+0.003}_{-0.004}$, minimum mass of $5.41^{+0.04}_{-0.05} M_{\text{Jup}}$, and orbital period of $39.469^{+0.005}_{-0.005}$ days, consistent with the values reported in Jenkins et al. (2017a).

32. In the case of KOI-1257 b and HD 113337 b, the Keplerian model without any acceleration terms is statistically favored. Although the curvature models are disfavored, they represent a more realistic scenario consistent with the findings in the discovery papers. The Keplerian model without acceleration terms may be favored due to the penalization of model complexity with the BIC and the additional parameters required by a more complex model. [Santerne et al. \(2014\)](#) and [Borgniet et al. \(2014\)](#) find significant linear and quadratic accelerations in both systems. [Santerne et al. 2014](#) report a trend of $135 \pm 80 \text{ m s}^{-1} \text{ yr}^{-1}$, and $-283 \pm 75 \text{ m s}^{-1} \text{ yr}^{-2}$ revealing the presence of an outer companion. Our solution yields a trend of $493.09^{+1.05}_{-0.71} \text{ m s}^{-1} \text{ yr}^{-1}$, and $-109.85^{+3.72}_{-4.09} \text{ m s}^{-1} \text{ yr}^{-2}$. [Borgniet et al. 2014](#) find a trend of $-41.2 \pm 3.6 \text{ m s}^{-1} \text{ yr}^{-1}$ and $-15.9 \pm 0.6 \text{ m s}^{-1} \text{ yr}^{-2}$. We infer a trend of $-61.25^{+0.27}_{-0.17} \text{ m s}^{-1} \text{ yr}^{-1}$, and $-16.58^{+0.09}_{-0.08} \text{ m s}^{-1} \text{ yr}^{-2}$.

6. CONCLUSION

In this uniform analysis of warm Jupiter orbits, we have presented Keplerian orbital fits of 200 planets orbiting 194 stars based on 18,587 radial velocity (RV) measurements acquired from 40 spectrographs over the course of the past 35 years. Eccentricity posterior distributions for individual systems will be used for population-level statistical analyses in future studies. As part of this, we have also presented our targeted spectroscopic observations from a multi-hemisphere campaign with HPF and MINERVA-Australis to refine the eccentricities of a subset of giant planets in our analysis.

Future papers in the Exploring Warm Jupiter Migration Pathways With Eccentricities series will examine how eccentricities depend on properties of their host stars and environmental context, such as planet multiplicity and stellar multiplicity. Together these will rely on warm Jupiter eccentricities as a tracer of how and when they form, migrate, and dynamically interact on Gyr timescales.

Table 3. Best-fitted solutions for warm Jupiters

Planet Name	e	a (AU)	T_c (BJD - 2450000)	P (days)	ω ($^\circ$)	K (m s $^{-1}$)	$M_p \sin i$ (M_{Jup})	Ref
14 And b	0.023 (0.010, 0.010)	0.82987 (0.00032, 0.00034)	2904.943 (0.894, 0.871)	186.168 (0.108, 0.113)	29.51 (16.07, 31.63)	99.94 (0.83, 0.79)	4.748 (0.037, 0.040)	1
24 Boo b	0.0545 (0.0072, 0.0068)	0.190865 (0.00004, 0.00004)	-6.387 (0.214, 0.222)	30.61056 (0.00100, 0.00094)	307.094 (8.744, 8.769)	51.834 (0.414, 0.402)	0.7913 (0.0063, 0.0062)	2
4 UMa b	0.040 (0.003, 0.003)	0.87189 (0.00059, 0.00062)	3009.49 (0.57, 0.59)	186.123 (0.273, 0.287)	22.99 (0.64, 0.65)	213.36 (0.90, 0.96)	6.980 (0.031, 0.030)	3
55 Cnc b	0.009 (0.001, 0.001)	0.1135577 (0.0000004, 0.0000001)	5803.337 (0.003, 0.003)	14.65218 (0.00001, 0.00001)	57.82 (3.69, 3.59)	70.89 (0.04, 0.04)	0.8015 (0.0005, 0.0005)	4, 5, 6
70 Vir b	0.3978 (0.0002, 0.0002)	0.4809564 (0.0000004, 0.0000003)	5306.62 (0.01, 0.01)	116.6927 (0.00001, 0.00001)	358.55 (0.03, 0.03)	314.70 (0.07, 0.07)	7.352 (0.002, 0.002)	7, 8, 9, 10
8 UMi b	0.049 (0.024, 0.025)	0.45564 (0.00020, 0.00019)	4148.00 (1.69, 1.79)	93.617 (0.063, 0.060)	10.20 (264.84, 49.62)	50.12 (1.07, 1.15)	1.413 (0.032, 0.033)	11
91 Aqr b	0.232 (0.002, 0.002)	0.70093 (0.00003, 0.00003)	3429.03 (0.86, 0.88)	181.152 (0.013, 0.013)	151.35 (3.28, 3.18)	92.86 (0.18, 0.19)	3.234 (0.006, 0.006)	12
BD+14 4559 b	0.022 (0.007, 0.007)	0.64321 (0.00038, 0.00035)	3294.70 (0.15, 0.11)	269.172 (0.239, 0.222)	91.14 (1.65, 1.68)	55.07 (0.39, 0.41)	1.060 (0.008, 0.008)	13
BD+15 2375 b	0.063 (0.022, 0.022)	0.57492 (0.00023, 0.00023)	7696.78 (1.50, 1.69)	153.212 (0.092, 0.094)	125.15 (28.33, 32.57)	33.21 (0.85, 0.82)	0.919 (0.023, 0.023)	14
BD+15 2940 b	0.149 (0.019, 0.021)	0.53846 (0.00006, 0.00006)	3363.19 (0.94, 0.87)	138.873 (0.023, 0.024)	23.31 (8.16, 7.20)	39.52 (0.75, 0.73)	1.048 (0.020, 0.019)	15
BD+45 564 b	0.066 (0.009, 0.010)	0.83136 (0.00039, 0.00040)	7734.50 (1.05, 0.99)	307.638 (0.214, 0.223)	83.52 (10.46, 9.34)	46.86 (0.39, 0.41)	1.350 (0.011, 0.012)	16
BD+55 362 b	0.398 (0.029, 0.029)	0.75488 (0.00129, 0.00132)	8131.57 (2.62, 2.97)	266.179 (0.682, 0.695)	181.03 (4.16, 4.14)	24.88 (1.15, 1.33)	0.628 (0.029, 0.033)	16
BD-08 2823 c	0.188 (0.009, 0.009)	0.67738 (0.00028, 0.00031)	4176.50 (0.48, 0.50)	236.718 (0.148, 0.163)	129.24 (2.37, 2.56)	13.42 (0.11, 0.11)	0.328 (0.003, 0.003)	17
CoRoT-10 b	0.511 (0.007, 0.007)	0.105362 (0.000004, 0.000004)	4273.15 (0.35, 0.07)	13.241 (0.001, 0.001)	220.13 (0.92, 0.92)	293.79 (2.49, 2.57)	2.719 (0.023, 0.024)	18
CoRoT-9 b	0.214 (0.011, 0.010)	0.40276 (0.00010, 0.00010)	5362.33 (0.31, 0.34)	95.285 (0.036, 0.036)	21.83 (2.93, 2.88)	39.59 (0.41, 0.43)	0.846 (0.009, 0.009)	19
GJ 1148 b	0.372 (0.001, 0.001)	0.163409 (0.00001, 0.00001)	4797.98 (0.06, 0.05)	41.378 (0.001, 0.001)	257.48 (0.27, 0.27)	38.02 (0.06, 0.07)	0.2926 (0.0005, 0.0005)	20, 21
GJ 3021 b	0.513 (0.002, 0.002)	0.49388 (0.00008, 0.00009)	1597.87 (0.01, 0.42)	133.630 (0.034, 0.037)	284.47 (0.65, 0.67)	164.70 (0.58, 0.54)	3.314 (0.011, 0.011)	22
GJ 3512 b	0.4339 (0.0002, 0.0002)	0.33396 (0.00001, 0.00001)	7738.48 (0.02, 0.02)	203.492 (0.008, 0.007)	125.80 (0.04, 0.04)	71.49 (0.02, 0.02)	0.4535 (0.0001, 0.0001)	23
GJ 86 b	0.0515 (0.0004, 0.0004)	0.1201035 (0.0000001, 0.0000001)	823.520 (0.003, 0.003)	15.76488 (0.00002, 0.00002)	270.77 (0.41, 0.43)	379.94 (0.13, 0.13)	4.460 (0.002, 0.002)	24, 25
GJ 876 b	0.018 (0.001, 0.001)	0.207504 (0.0000005, 0.0000005)	3055.87 (0.01, 0.01)	61.0326 (0.0002, 0.0002)	54.12 (2.03, 1.92)	209.94 (0.13, 0.13)	1.902 (0.001, 0.001)	20, 26, 27, 28, 29, 30
GJ 876 c	0.049 (0.001, 0.001)	0.129889 (0.0000004, 0.0000004)	3029.09 (0.01, 0.01)	30.2260 (0.0001, 0.0001)	340.22 (1.68, 1.68)	85.19 (0.12, 0.12)	0.610 (0.001, 0.001)	20, 26, 27, 28, 29, 30
HAT-P-15 b	0.200 (0.003, 0.003)	0.095099 (0.000001, 0.000001)	4638.67 (0.01, 0.01)	10.8643 (0.0002, 0.0002)	257.55 (0.76, 0.76)	181.71 (0.47, 0.50)	1.940 (0.005, 0.005)	31
HAT-P-17 b	0.416 (0.004, 0.004)	0.092553 (0.000001, 0.000001)	4801.65 (0.01, 0.01)	10.3365 (0.0002, 0.0002)	199.90 (0.54, 0.50)	58.57 (0.27, 0.28)	0.567 (0.003, 0.003)	32, 33, 34
HATS-17 b	0.119 (0.031, 0.026)	0.13027 (0.00022, 0.00028)	7138.94 (0.16, 0.18)	16.156 (0.042, 0.052)	273.36 (6.32, 6.09)	95.10 (1.32, 1.50)	1.274 (0.019, 0.020)	35
HD 100655 b	0.083 (0.009, 0.010)	0.75115 (0.00040, 0.00037)	3057.49 (1.36, 1.54)	157.477 (0.126, 0.117)	126.08 (8.36, 8.43)	34.40 (0.37, 0.37)	1.578 (0.017, 0.017)	36
HD 124330 b	0.076 (0.005, 0.006)	0.85666 (0.00038, 0.00036)	8481.57 (0.47, 0.41)	270.060 (0.178, 0.171)	302.15 (2.73, 2.55)	53.91 (0.20, 0.21)	1.474 (0.006, 0.006)	43
HD 104985 b	0.162 (0.008, 0.007)	0.88224 (0.00013, 0.00013)	1868.34 (0.36, 0.52)	199.578 (0.045, 0.045)	13.06 (1.52, 1.68)	22.84 (0.16, 0.16)	0.766 (0.005, 0.005)	16
HD 109246 b	0.34721 (0.0007, 0.0007)	0.34721 (0.0007, 0.0007)	4865.27 (0.22, 0.23)	68.217 (0.021, 0.022)	271.13 (2.57, 2.62)	167.68 (0.73, 0.69)	8.374 (0.037, 0.034)	37, 38
HD 10975 b	0.456 (0.017, 0.018)	0.94772 (0.00020, 0.00020)	5437.61 (0.90, 0.72)	283.798 (0.088, 0.092)	134.24 (1.71, 1.71)	12.63 (0.23, 0.23)	0.859 (0.006, 0.006)	39
HD 113337 b	0.431 (0.002, 0.002)	1.02056 (0.00018, 0.00018)	6001.501 (0.004, 0.006)	318.265 (0.083, 0.087)	219.61 (0.30, 0.28)	84.77 (0.36, 0.33)	0.457 (0.008, 0.008)	40
HD 11506 c	0.232 (0.006, 0.006)	0.77161 (0.00011, 0.00012)	3350.97 (0.33, 0.95)	222.332 (0.047, 0.050)	284.58 (1.62, 1.69)	12.08 (0.08, 0.08)	3.216 (0.013, 0.012)	41
HD 121504 b	0.055 (0.003, 0.003)	0.36535 (0.00002, 0.00002)	1481.66 (0.01, 0.01)	63.373 (0.005, 0.006)	302.15 (2.73, 2.55)	53.91 (0.20, 0.21)	0.404 (0.003, 0.003)	42
HD 124330 b	0.076 (0.005, 0.006)	0.85666 (0.00038, 0.00036)	8481.57 (0.47, 0.41)	270.060 (0.178, 0.171)	302.15 (2.73, 2.55)	53.91 (0.20, 0.21)	1.474 (0.006, 0.006)	43
HD 12484 b	0.359 (0.014, 0.013)	0.29740 (0.00008, 0.00008)	6706.41 (0.49, 0.47)	58.945 (0.024, 0.024)	258.91 (2.22, 2.30)	121.23 (1.98, 1.95)	2.181 (0.035, 0.035)	44
HD 12648 b	0.071 (0.016, 0.016)	0.44770 (0.00019, 0.00019)	2317.74 (3.73, 2.15)	133.673 (0.084, 0.087)	289.59 (16.24, 15.71)	100.28 (1.69, 1.69)	1.927 (0.032, 0.033)	11
HD 12661 b	0.361 (0.001, 0.001)	0.85243 (0.00001, 0.00001)	308.03 (0.13, 0.13)	262.420 (0.005, 0.005)	298.00 (0.12, 0.12)	73.73 (0.05, 0.05)	2.445 (0.002, 0.002)	45, 46, 47
HD 128556 b	0.749 (0.014, 0.012)	0.75666 (0.00013, 0.00012)	4610.10 (1.01, 1.31)	298.191 (0.077, 0.069)	94.24 (1.76, 1.57)	60.59 (2.20, 2.04)	0.991 (0.036, 0.034)	48
HD 130322 b	0.023 (0.003, 0.003)	0.09247 (0.00000, 0.00000)	6745.35 (0.01, 0.01)	10.709 (0.000, 0.000)	331.55 (8.88, 8.52)	106.15 (0.37, 0.37)	1.089 (0.004, 0.004)	49, 50, 51
HD 134987 b	0.235 (0.001, 0.001)	0.81920 (0.00002, 0.00002)	121.21 (0.14, 0.14)	258.219 (0.008, 0.008)	354.36 (0.26, 0.25)	49.68 (0.05, 0.05)	1.612 (0.002, 0.002)	52, 53
HD 13908 b	0.053 (0.004, 0.004)	0.15372 (0.00001, 0.00001)	5756.11 (0.02, 0.02)	19.381 (0.001, 0.001)	195.54 (4.76, 4.81)	55.21 (0.20, 0.19)	0.864 (0.003, 0.003)	54
HD 1397 b	0.299 (0.005, 0.005)	0.10980 (0.00004, 0.00004)	8331.82 (0.04, 0.04)	11.566 (0.006, 0.006)	16.13 (1.08, 1.09)	31.67 (0.20, 0.19)	0.405 (0.003, 0.003)	55, 56
HD 141309 b	0.034 (0.004, 0.005)	0.41494 (0.00004, 0.00004)	6998.03 (0.20, 0.22)	94.381 (0.012, 0.015)	175.59 (8.37, 10.11)	19.00 (0.08, 0.10)	0.445 (0.002, 0.002)	44, 57
HD 141399 c	0.059 (0.002, 0.002)	0.68873 (0.00009, 0.00007)	6837.49 (0.22, 0.25)	201.826 (0.041, 0.031)	211.40 (2.09, 1.91)	43.87 (0.09, 0.09)	1.322 (0.003, 0.003)	44, 57
HD 142 b	0.163 (0.006, 0.006)	1.04117 (0.00026, 0.00025)	2787.45 (1.13, 1.15)	349.890 (0.124, 0.124)	318.60 (3.35, 3.26)	32.50 (0.26, 0.25)	1.276 (0.010, 0.010)	58, 59
HD 145377 b	0.296 (0.001, 0.001)	0.45900 (0.00003, 0.00003)	4627.62 (0.05, 0.05)	103.687 (0.010, 0.010)	150.08 (0.29, 0.27)	245.69 (0.46, 0.43)	6.126 (0.011, 0.011)	60
HD 145457 b	0.121 (0.009, 0.009)	0.65895 (0.00077, 0.00064)	3588.79 (1.63, 1.91)	176.167 (0.310, 0.256)	298.16 (5.27, 5.33)	71.60 (0.66, 0.64)	2.251 (0.021, 0.020)	61
HD 147018 b	0.468 (0.001, 0.001)	0.238925 (0.000003, 0.000003)	4466.73 (0.01, 0.01)	44.233 (0.001, 0.001)	336.10 (0.11, 0.13)	145.45 (0.15, 0.16)	2.131 (0.002, 0.002)	62
HD 147873 b	0.225 (0.003, 0.003)	0.52001 (0.00002, 0.00002)	5279.15 (0.05, 0.05)	116.594 (0.007, 0.007)	79.84 (0.50, 0.51)	174.86 (0.32, 0.29)	5.077 (0.009, 0.009)	48
HD 148164 b	0.588 (0.006, 0.007)	0.99285 (0.00021, 0.00020)	13317.02 (2.13, 2.11)	328.496 (0.106, 0.100)	141.16 (0.68, 0.65)	39.70 (0.41, 0.43)	1.237 (0.013, 0.013)	63
HD 148427 b	0.378 (0.013, 0.014)	1.13996 (0.00050, 0.00049)	4088.79 (1.72, 2.61)	347.143 (0.227, 0.224)	331.41 (1.95, 1.98)	28.56 (0.48, 0.50)	1.272 (0.022, 0.022)	64
HD 154672 b	0.603 (0.001, 0.001)	0.61955 (0.00001, 0.00001)	4444.55 (0.19, 0.17)	163.974 (0.002, 0.002)	266.32 (0.14, 0.14)	221.05 (0.29, 0.30)	5.302 (0.007, 0.007)	48
HD 155193 b	0.172 (0.007, 0.007)	1.03967 (0.00049, 0.00053)	7590.53 (0.57, 0.85)	350.561 (0.248, 0.267)	173.04 (3.05, 2.86)	21.20 (0.18, 0.17)	0.827 (0.007, 0.006)	16
HD 155358 b	0.176 (0.003, 0.002)	0.68786 (0.00005, 0.00005)	1294.35 (0.42, 0.39)	194.310 (0.023, 0.023)	142.60 (1.33, 1.12)	231.67 (0.24, 0.25)	0.975 (0.007, 0.008)	65, 66
HD 156279 b	0.6477 (0.0001, 0.0001)	0.502259 (0.000003, 0.000002)	5598.36 (0.01, 0.02)	133.392 (0.001, 0.001)	265.68 (0.01, 0.01)	510.27 (0.06, 0.07)	9.445 (0.001, 0.001)	67, 68
HD 156846 b	0.8484 (0.0001, 0.0001)	1.101721 (0.000003, 0.000003)	3999.80 (0.00, 0.01)	359.556 (0.002, 0.002)	51.45 (0.02, 0.02)	463.37 (0.15, 0.15)	10.639 (0.003, 0.003)	69, 70
HD 159243 b	0.020 (0.005, 0.005)	0.110165 (0.000005, 0.000005)	6416.69 (0.04, 0.04)	12.620 (0.001, 0.001)	258.78 (15.96, 16.53)	91.15 (0.39, 0.39)	1.126 (0.005, 0.005)	54
HD 159243 c	0.089 (0.008, 0.009)	0.79751 (0.00217, 0.00230)	6332.52 (2.99, 2.98)	245.807 (1.004, 1.062)	55.81 (0.89, 7.23)	56.02 (0.55, 0.57)	1.855 (0.019, 0.019)	54
HD 159868 c	0.148 (0.003, 0.003)	1.02702 (0.00015, 0.00015)	3400.49 (0.09, 0.06)	348.492 (0.075, 0.075)	298.66 (0.72, 0.77)	21.14 (0.09, 0.09)	0.813 (0.003, 0.003)	8, 58
HD 160691 e	0.124 (0.004, 0.004)	0.93149 (0.00032, 0.00032)	2329.91 (0.66, 0.62)	308.904 (0.158, 0.157)	166.56 (1.97, 1.96)	13.41 (0.17, 0.17)	0.480 (0.006, 0.007)	71, 72
HD 161178 b	0.147 (0.007, 0.007)	0.88848 (0.00012, 0.00013)	5016.70 (0.02, 0.04)	297.112 (0.062, 0.065)	38.73 (3.22, 3.13)	16.23 (0.16, 0.15)	0.548 (0.005, 0.005)	40

Table 3 continued

Table 3 (*continued*)

Planet Name	e	a (AU)	T_c (BJD - 2450000)	P (days)	ω ($^\circ$)	K (m s^{-1})	$M_p \sin i$ (M_{Jup})	Ref
HD 163607 b	0.7425 (0.0004, 0.0004)	0.358954 (0.000002, 0.000002)	4185.80 (0.01, 0.01)	75.239 (0.001, 0.001)	78.13 (0.07, 0.07)	53.74 (0.04, 0.04)	0.792 (0.001, 0.001)	8, 73
HD 164509 b	0.271 (0.007, 0.006)	0.87251 (0.00024, 0.00024)	5500.57 (0.79, 0.79)	281.286 (0.118, 0.117)	320.69 (1.24, 1.23)	13.76 (0.11, 0.11)	0.460 (0.004, 0.004)	63, 73
HD 164666 b	0.602 (0.004, 0.004)	0.93536 (0.00028, 0.00028)	3614.99 (1.60, 1.26)	269.787 (0.119, 0.120)	290.80 (0.50, 0.49)	185.90 (1.11, 1.16)	6.183 (0.037, 0.039)	74
HD 168443 b	0.5288 (0.0001, 0.0001)	0.2926347 (0.0000001, 0.0000001)	5621.636 (0.002, 0.002)	58.11249 (0.00003, 0.00003)	172.92 (0.01, 0.01)	475.14 (0.09, 0.09)	7.634 (0.001, 0.001)	75, 76
HD 169830 b	0.289 (0.001, 0.001)	0.81124 (0.00001, 0.00001)	1904.14 (0.08, 0.08)	225.560 (0.006, 0.006)	152.02 (0.28, 0.27)	80.44 (0.12, 0.11)	2.887 (0.004, 0.004)	22, 87, 200
HD 17156 b	0.691 (0.001, 0.001)	0.168194 (0.00002, 0.00002)	4884.08 (0.01, 0.01)	21.2180 (0.0004, 0.0004)	123.11 (0.26, 0.25)	290.06 (1.26, 1.26)	3.591 (0.016, 0.016)	77, 78
HD 173416 b	0.216 (0.011, 0.011)	1.15621 (0.00159, 0.00165)	3957.09 (2.71, 2.69)	321.097 (0.662, 0.667)	249.09 (3.25, 3.22)	51.67 (0.55, 0.55)	2.698 (0.028, 0.030)	79
HD 175541 b	0.243 (0.012, 0.012)	0.98743 (0.00014, 0.00015)	139.96 (1.54, 1.55)	298.659 (0.065, 0.066)	214.05 (1.69, 1.62)	13.58 (0.11, 0.11)	0.552 (0.004, 0.004)	8
HD 178911 B b	0.1138 (0.0004, 0.0004)	0.3621398 (0.000006, 0.000006)	3866.56 (0.01, 0.01)	71.4829 (0.0002, 0.0002)	167.55 (0.18, 0.20)	342.69 (0.12, 0.12)	8.024 (0.003, 0.003)	45, 80
HD 180053 b	0.029 (0.003, 0.003)	0.83972 (0.00014, 0.00014)	5203.12 (0.22, 0.31)	212.462 (0.051, 0.053)	58.91 (7.51, 7.12)	49.89 (0.17, 0.17)	2.126 (0.008, 0.007)	8
HD 191939 e	0.042 (0.003, 0.003)	0.39772 (0.00012, 0.00012)	1790.52 (0.09, 0.10)	101.794 (0.047, 0.048)	194.68 (4.12, 4.44)	18.00 (0.05, 0.05)	0.359 (0.001, 0.001)	81
HD 192263 b	0.008 (0.002, 0.002)	0.143159 (0.00001, 0.00001)	9745.32 (0.02, 0.01)	24.3533 (0.0003, 0.0003)	293.00 (13.04, 11.65)	60.40 (0.10, 0.10)	0.653 (0.001, 0.001)	82, 83
HD 192699 b	0.150 (0.009, 0.009)	1.08523 (0.00175, 0.00178)	4074.49 (1.00, 0.90)	351.515 (0.849, 0.865)	54.59 (4.37, 4.19)	51.29 (0.70, 0.75)	2.183 (0.030, 0.033)	84, 85
HD 195019 b	0.0053 (0.0007, 0.0007)	0.144300 (0.000003, 0.000003)	1008.38 (0.01, 0.01)	18.20142 (0.00005, 0.00005)	243.96 (8.44, 8.28)	268.79 (0.21, 0.19)	3.950 (0.003, 0.003)	45, 75, 86, 87
HD 205739 b	0.248 (0.014, 0.015)	0.90069 (0.00056, 0.00063)	3204.63 (1.96, 1.89)	282.670 (0.265, 0.295)	307.23 (4.40, 4.88)	40.36 (0.79, 0.79)	1.441 (0.028, 0.028)	88
HD 207832 b	0.318 (0.008, 0.007)	0.58639 (0.00005, 0.00005)	3233.84 (0.35, 0.37)	160.059 (0.021, 0.020)	352.50 (0.97, 1.11)	20.88 (0.17, 0.15)	0.546 (0.004, 0.004)	63, 89
HD 208487 b	0.228 (0.018, 0.019)	0.52158 (0.00013, 0.00014)	1004.76 (0.63, 1.45)	129.431 (0.050, 0.053)	138.68 (5.08, 5.43)	18.61 (0.33, 0.34)	0.482 (0.009, 0.009)	45
HD 208897 b	0.085 (0.006, 0.006)	1.06627 (0.00053, 0.00057)	4934.95 (2.66, 2.64)	359.705 (0.268, 0.287)	279.60 (5.51, 5.70)	28.30 (0.19, 0.19)	1.145 (0.007, 0.008)	90
HD 210702 b	0.047 (0.006, 0.007)	1.14897 (0.00026, 0.00025)	3946.72 (0.73, 0.61)	354.524 (0.120, 0.113)	129.04 (6.28, 6.55)	39.13 (0.28, 0.29)	1.870 (0.014, 0.013)	8, 84, 85
HD 211403 b	0.125 (0.010, 0.010)	0.76620 (0.00022, 0.00020)	5882.19 (0.83, 0.85)	223.624 (0.095, 0.089)	181.47 (3.87, 4.14)	160.18 (1.36, 1.36)	5.360 (0.046, 0.045)	91
HD 216536 b	0.359 (0.018, 0.019)	0.50817 (0.00018, 0.00017)	3673.80 (2.06, 2.67)	147.018 (0.079, 0.073)	286.14 (3.90, 3.56)	46.95 (0.75, 0.79)	0.989 (0.016, 0.017)	92
HD 216770 b	0.507 (0.031, 0.030)	0.43919 (0.00007, 0.00008)	2634.56 (2.67, 3.69)	123.582 (0.030, 0.035)	262.01 (3.98, 4.25)	28.52 (1.15, 1.14)	0.493 (0.020, 0.020)	43
HD 219139 b	0.070 (0.011, 0.011)	0.94024 (0.00030, 0.00030)	5060.48 (1.15, 1.55)	275.600 (0.131, 0.134)	301.16 (10.37, 10.06)	18.41 (0.21, 0.20)	0.757 (0.008, 0.008)	37
HD 220842 b	0.405 (0.001, 0.001)	0.73936 (0.00007, 0.00007)	6567.77 (0.55, 0.26)	218.446 (0.032, 0.030)	224.99 (0.28, 0.30)	108.16 (0.22, 0.21)	3.178 (0.006, 0.006)	44
HD 221416 b	0.068 (0.013, 0.013)	0.12238 (0.00015, 0.00016)	8357.14 (0.21, 0.21)	14.217 (0.027, 0.029)	238.62 (12.66, 11.75)	13.45 (0.24, 0.24)	0.182 (0.003, 0.003)	93
HD 224693 b	0.084 (0.007, 0.007)	0.19125 (0.00001, 0.00001)	3199.76 (0.10, 0.05)	26.690 (0.001, 0.001)	346.75 (4.80, 4.89)	38.94 (0.28, 0.29)	0.683 (0.005, 0.005)	63, 94
HD 231701 b	0.063 (0.012, 0.011)	0.56674 (0.00007, 0.00007)	3336.67 (0.45, 0.47)	141.669 (0.028, 0.027)	63.31 (11.02, 10.38)	36.89 (0.42, 0.42)	1.072 (0.012, 0.012)	63, 78
HD 233604 b	0.053 (0.005, 0.005)	0.74554 (0.00010, 0.00011)	3111.45 (0.45, 0.61)	191.981 (0.038, 0.039)	279.91 (5.04, 5.18)	177.84 (0.83, 0.77)	6.605 (0.031, 0.029)	16
HD 27894 b	0.041 (0.002, 0.002)	0.1254064 (0.000008, 0.000006)	3290.63 (0.03, 0.03)	18.0233 (0.0002, 0.0001)	255.96 (3.15, 2.42)	65.98 (0.30, 0.25)	0.738 (0.003, 0.003)	95, 96
HD 2952 b	0.117 (0.012, 0.012)	1.12693 (0.00047, 0.00048)	131.09 (3.71, 3.49)	311.322 (0.193, 0.199)	57.06 (5.06, 5.22)	27.76 (0.41, 0.46)	1.439 (0.022, 0.023)	97
HD 32518 b	0.012 (0.005, 0.005)	0.59457 (0.00013, 0.00012)	3012.51 (0.42, 0.19)	157.532 (0.050, 0.046)	7.69 (287.61, 38.59)	113.77 (0.56, 0.56)	3.280 (0.016, 0.016)	98
HD 33142 b	0.084 (0.004, 0.004)	1.04052 (0.00018, 0.00018)	5612.02 (0.45, 0.46)	326.486 (0.084, 0.086)	170.88 (2.57, 2.57)	30.67 (0.12, 0.13)	1.302 (0.005, 0.005)	8, 99
HD 332231 b	0.222 (0.013, 0.013)	0.14258 (0.00006, 0.00006)	8731.63 (0.08, 0.08)	18.499 (0.011, 0.011)	127.12 (2.37, 2.37)	19.04 (0.24, 0.25)	0.262 (0.003, 0.003)	100
HD 33283 b	0.396 (0.006, 0.006)	0.150752 (0.00001, 0.00001)	13025.41 (0.10, 0.07)	18.1993 (0.0002, 0.0002)	156.38 (0.78, 0.77)	22.08 (0.18, 0.17)	0.325 (0.003, 0.003)	63, 95
HD 35299 b	0.328 (0.017, 0.018)	0.38852 (0.00001, 0.00001)	6517.71 (2.22, 1.95)	82.486 (0.002, 0.002)	256.08 (0.13, 0.13)	173.54 (0.13, 0.13)	3.751 (0.003, 0.003)	40
HD 360 b	0.393 (0.001, 0.001)	0.98368 (0.00021, 0.00022)	5451.19 (0.33, 0.05)	274.117 (0.088, 0.094)	216.77 (2.28, 2.36)	18.25 (0.28, 0.27)	0.783 (0.011, 0.012)	44
HD 37124 b	0.041 (0.005, 0.005)	0.53325 (0.00002, 0.00002)	4919.01 (0.22, 0.22)	154.270 (0.010, 0.011)	86.62 (5.84, 5.64)	28.40 (0.12, 0.12)	0.672 (0.003, 0.003)	101, 102
HD 37605 b	0.672 (0.004, 0.004)	0.277290 (0.000004, 0.000004)	3370.75 (0.01, 0.02)	55.0119 (0.0001, 0.0001)	220.29 (0.06, 0.06)	204.40 (0.20, 0.20)	2.717 (0.003, 0.003)	63, 103, 104
HD 38283 b	0.247 (0.012, 0.012)	1.11154 (0.00030, 0.00031)	983.60 (0.18, 0.12)	365.701 (0.146, 0.152)	301.11 (2.20, 2.44)	9.17 (0.14, 0.15)	0.386 (0.006, 0.006)	105
HD 38529 b	0.241 (0.002, 0.002)	0.13293 (0.00000, 0.00000)	4384.84 (0.01, 0.01)	14.311 (0.000, 0.000)	98.43 (0.60, 0.56)	58.34 (0.14, 0.13)	0.898 (0.002, 0.002)	8, 45, 46
HD 40979 b	0.277 (0.003, 0.003)	0.91231 (0.00011, 0.00011)	3993.90 (0.39, 0.39)	264.318 (0.046, 0.047)	317.30 (0.66, 0.65)	110.60 (0.37, 0.36)	4.299 (0.015, 0.014)	45, 80, 88, 106
HD 4313 b	0.053 (0.004, 0.004)	1.17724 (0.00027, 0.00026)	4810.06 (0.40, 0.40)	355.740 (0.124, 0.118)	91.85 (4.07, 3.60)	44.25 (0.17, 0.16)	2.211 (0.008, 0.008)	8
HD 43197 b	0.823 (0.006, 0.006)	0.91747 (0.00066, 0.00060)	4955.32 (6.11, 6.55)	327.607 (0.354, 0.323)	253.65 (1.45, 1.39)	30.25 (0.83, 0.90)	0.568 (0.016, 0.017)	107
HD 43691 b	0.082 (0.002, 0.002)	0.241929 (0.00002, 0.00001)	13016.47 (0.06, 0.06)	36.9989 (0.0003, 0.0003)	294.03 (1.34, 1.29)	131.31 (0.21, 0.24)	2.659 (0.004, 0.005)	63, 108
HD 45364 c	0.093 (0.004, 0.004)	0.89809 (0.00018, 0.00018)	3319.81 (0.45, 0.43)	343.298 (0.100, 0.101)	8.72 (1.64, 1.60)	21.58 (0.13, 0.13)	0.648 (0.004, 0.004)	109
HD 45652 b	0.405 (0.016, 0.016)	0.23749 (0.00001, 0.00001)	13712.95 (0.95, 1.02)	44.073 (0.004, 0.004)	236.62 (2.29, 2.14)	33.89 (0.61, 0.59)	0.493 (0.009, 0.009)	63, 110
HD 4732 b	0.134 (0.010, 0.010)	1.19190 (0.00046, 0.00047)	4974.91 (1.23, 1.18)	360.315 (0.210, 0.213)	101.10 (3.19, 3.55)	45.41 (0.54, 0.61)	2.279 (0.027, 0.030)	111
HD 47366 b	0.072 (0.009, 0.010)	1.31279 (0.00088, 0.00086)	-3.07 (5.63, 5.30)	371.252 (0.375, 0.366)	109.28 (14.64, 15.08)	32.63 (0.32, 0.35)	1.941 (0.019, 0.020)	112
HD 52265 b	0.042 (0.004, 0.004)	0.50398 (0.00006, 0.00006)	798.11 (0.20, 0.32)	119.297 (0.022, 0.022)	213.93 (0.90, 0.89)	41.93 (0.19, 0.19)	1.078 (0.005, 0.005)	22, 45, 87
HD 5583 b	0.091 (0.013, 0.012)	0.52771 (0.00015, 0.00015)	6047.43 (0.56, 0.53)	139.325 (0.058, 0.059)	64.98 (8.38, 7.89)	224.74 (2.81, 2.83)	5.746 (0.070, 0.075)	113
HD 5891 b	0.065 (0.004, 0.005)	0.76843 (0.00020, 0.00020)	5475.32 (0.30, 0.26)	177.105 (0.070, 0.070)	353.82 (5.71, 3.23)	178.52 (0.91, 0.91)	7.630 (0.038, 0.040)	99
HD 59686 A b	0.048 (0.002, 0.002)	1.08471 (0.00007, 0.00007)	1507.96 (0.30, 0.29)	299.360 (0.028, 0.029)	322.84 (2.79, 2.75)	136.98 (0.33, 0.33)	6.908 (0.016, 0.017)	114
HD 60532 b	0.278 (0.002, 0.002)	0.76942 (0.00012, 0.00012)	4024.23 (0.13, 0.13)	201.279 (0.047, 0.046)	352.80 (0.41, 0.41)	29.18 (0.11, 0.11)	1.059 (0.004, 0.004)	115
HD 63765 b	0.208 (0.006, 0.006)	0.85601 (0.00027, 0.00025)	4381.87 (0.48, 0.70)	358.807 (0.167, 0.157)	118.53 (1.88, 1.89)	20.77 (0.18, 0.17)	0.533 (0.005, 0.005)	116
HD 6434 b	0.122 (0.003, 0.003)	0.1586968 (0.000006, 0.000006)	1905.61 (0.03, 0.02)	22.0168 (0.0001, 0.0001)	161.60 (0.01, 0.01)	35.06 (0.12, 0.12)	0.511 (0.002, 0.002)	117, 118
HD 67087 b	0.131 (0.009, 0.010)	1.08293 (0.00015, 0.00016)	303.08 (0.32, 0.22)	352.961 (0.074, 0.078)	279.45 (5.40, 5.24)	71.28 (0.57, 0.56)	3.016 (0.024, 0.024)	74
HD 72892 b	0.422 (0.003, 0.004)	0.22837 (0.00002, 0.00002)	6457.55 (0.05, 0.05)	39.469 (0.005, 0.005)	345.29 (0.58, 0.63)	351.62 (2.90, 3.07)	5.411 (0.044, 0.047)	48
HD 73526 b	0.299 (0.005, 0.005)	0.67302 (0.00003, 0.00003)	2819.03 (0.27, 0.26)	188.882 (0.014, 0.014)	194.72 (0.83, 0.83)	82.95 (0.43, 0.40)	2.438 (0.013, 0.012)	119, 120
HD 74156 b	0.629 (0.001, 0.001)	0.291563 (0.00001, 0.00001)	790.35 (0.02, 0.02)	51.6399 (0.0003, 0.0003)	174.82 (0.12, 0.13)	108.47 (0.26, 0.26)	1.784 (0.004, 0.004)	121, 122
HD 75784 b	0.104 (0.008, 0.008)	1.07460 (0.00007, 0.00009)	9940.61 (1.39, 0.90)	342.658 (0.032, 0.041)	352.12 (6.31, 3.87)	24.36 (0.34, 0.34)	1.049 (0.014, 0.015)	8, 42
HD 79181 b	0.284 (0.007, 0.007)	0.93748 (0.00010, 0.00010)	5068.28 (0.79, 0.86)	321.97 (0.046, 0.046)	321.97 (1.46, 1.52)	19.66 (0.14, 0.14)	0.726 (0.005, 0.005)	40
HD 80606 b	0.93155 (0.00008, 0.00007)	0.4748083 (0.0000001, 0.0000001)	3427.865 (0.013, 0.014)	111.43636 (0.00				

Table 3 (continued)

Planet Name	e	a (AU)	T _c (BJD - 2450000)	P (days)	ω (°)	K (m s ⁻¹)	M _p sin i (M _{Jup})	Ref
HD 82943 c	0.377 (0.001, 0.001)	0.73156 (0.00001, 0.00001)	2276.59 (0.05, 0.05)	219.919 (0.006, 0.006)	121.83 (0.32, 0.32)	64.90 (0.19, 0.18)	1.879 (0.006, 0.006)	43, 124, 125
HD 8574 a	0.257 (0.004, 0.004)	0.80384 (0.00006, 0.00006)	4006.78 (0.25, 0.37)	227.407 (0.027, 0.026)	24.81 (1.03, 0.99)	57.49 (0.28, 0.30)	2.028 (0.010, 0.011)	45, 123, 126
HD 87646 b	0.057 (0.002, 0.002)	0.1151250 (0.0000004, 0.0000004)	4093.73 (0.01, 0.01)	13.48167 (0.00007, 0.00007)	319.67 (1.70, 1.60)	965.35 (1.78, 1.74)	12.172 (0.022, 0.022)	127
HD 89744 a	0.6751 (0.0005, 0.0004)	0.97229 (0.00001, 0.00001)	1487.19 (0.05, 0.04)	256.764 (0.002, 0.002)	194.03 (0.06, 0.06)	271.13 (0.28, 0.27)	9.460 (0.010, 0.009)	128, 129, 130
HD 92788 b	0.365 (0.001, 0.001)	0.97132 (0.00002, 0.00002)	5484.10 (0.004, 0.006)	326.058 (0.010, 0.009)	267.84 (0.06, 0.05)	105.15 (0.17, 0.15)	3.639 (0.006, 0.005)	87, 129, 131
HD 93083 b	0.222 (0.015, 0.016)	0.47815 (0.00055, 0.00051)	3227.65 (1.23, 0.62)	144.343 (0.248, 0.232)	289.59 (3.75, 3.59)	17.21 (0.21, 0.20)	0.341 (0.004, 0.004)	132
HD 9446 c	0.190 (0.006, 0.006)	0.18920 (0.00001, 0.00001)	4845.41 (0.08, 0.08)	30.059 (0.003, 0.003)	217.63 (0.027, 2.06)	46.05 (0.30, 0.31)	0.692 (0.005, 0.005)	133
HD 9446 c	0.65288 (0.00019, 0.00020)	0.85288 (0.00001, 0.00001)	4501.74 (0.31, 0.31)	192.684 (0.085, 0.088)	166.94 (10.67, 11.46)	63.07 (0.34, 0.35)	1.792 (0.010, 0.010)	133
HD 96063 b	0.134 (0.004, 0.037)	1.10501 (0.00102, 0.00120)	5342.05 (4.34, 1.13)	362.481 (0.500, 0.589)	276.09 (12.00, 15.80)	28.74 (1.43, 1.44)	1.231 (0.062, 0.061)	8, 99
HD 99283 b	0.160 (0.018, 0.018)	1.08271 (0.00041, 0.00043)	5424.75 (2.14, 2.14)	310.178 (0.175, 0.184)	286.87 (4.52, 4.73)	17.67 (0.26, 0.25)	0.847 (0.012, 0.012)	40
HIP 105854 b	0.125 (0.006, 0.005)	0.81268 (0.00019, 0.00020)	5311.55 (0.46, 0.50)	184.658 (0.066, 0.074)	298.11 (1.87, 1.89)	155.49 (0.88, 0.93)	7.089 (0.040, 0.042)	134
HIP 107773 b	0.132 (0.012, 0.012)	0.72375 (0.00021, 0.00021)	6177.36 (0.39, 0.83)	144.569 (0.064, 0.063)	171.13 (3.71, 3.75)	43.68 (0.42, 0.43)	2.015 (0.019, 0.021)	135
HIP 109600 b	0.166 (0.004, 0.004)	0.70535 (0.00024, 0.00025)	5936.99 (0.47, 0.50)	231.980 (0.118, 0.123)	227.20 (1.31, 1.34)	98.78 (0.41, 0.38)	2.684 (0.011, 0.011)	44
HIP 12961 b	0.175 (0.005, 0.005)	0.25745 (0.00002, 0.00002)	4456.43 (0.14, 0.15)	57.441 (0.006, 0.006)	274.79 (1.83, 1.81)	24.98 (0.12, 0.13)	1.365 (0.002, 0.002)	136
HIP 14810 c	0.134 (0.004, 0.003)	0.54519 (0.00002, 0.00002)	3829.28 (0.17, 0.19)	147.777 (0.009, 0.009)	325.63 (1.05, 1.19)	49.51 (0.14, 0.16)	1.268 (0.004, 0.004)	63, 137, 138
HIP 34222 b	0.305 (0.035, 0.033)	0.49187 (0.00127, 0.00128)	8037.26 (4.52, 2.45)	160.020 (0.610, 0.631)	31.01 (9.50, 9.10)	44.85 (1.74, 1.82)	0.829 (0.033, 0.033)	49
HIP 5158 b	0.523 (0.004, 0.005)	0.88543 (0.00040, 0.00038)	4792.72 (1.93, 1.94)	344.575 (0.236, 0.224)	252.44 (0.41, 0.38)	55.33 (0.55, 0.61)	1.378 (0.014, 0.015)	139
HIP 57274 c	0.039 (0.002, 0.002)	0.177285 (0.00004, 0.00004)	5792.29 (0.03, 0.03)	31.911 (0.001, 0.001)	331.01 (4.38, 4.10)	33.36 (0.12, 0.12)	0.422 (0.021, 0.018)	87, 140
HIP 5763 b	0.053 (0.016, 0.043)	0.16940 (0.00007, 0.00008)	8071.67 (0.47, 0.47)	30.012 (0.020, 0.021)	273.43 (51.96, 40.54)	40.95 (1.15, 1.13)	0.502 (0.014, 0.014)	39
HIP 63242 b	0.236 (0.008, 0.008)	0.56389 (0.00026, 0.00029)	5354.00 (0.51, 0.41)	124.631 (0.085, 0.096)	122.18 (2.63, 2.88)	286.69 (2.36, 2.21)	9.130 (0.074, 0.071)	141
HIP 65407 c	0.152 (0.009, 0.009)	0.17669 (0.00001, 0.00001)	6991.05 (0.10, 0.10)	28.131 (0.003, 0.003)	175.95 (2.82, 2.56)	29.92 (0.22, 0.22)	0.422 (0.003, 0.003)	44
HIP 65407 c	0.096 (0.005, 0.006)	0.31605 (0.00003, 0.00004)	7047.87 (0.17, 0.18)	67.297 (0.010, 0.011)	349.52 (3.60, 3.30)	41.02 (0.26, 0.26)	0.779 (0.005, 0.005)	44
HIP 67851 b	0.042 (0.006, 0.006)	0.45859 (0.00007, 0.00007)	2987.62 (0.78, 0.81)	88.848 (0.021, 0.020)	154.80 (8.02, 7.92)	45.80 (0.22, 0.21)	1.391 (0.007, 0.006)	136, 142
HIP 79431 b	0.270 (0.006, 0.006)	0.35293 (0.00014, 0.00013)	5025.94 (0.42, 0.40)	109.406 (0.064, 0.062)	289.61 (1.49, 1.56)	139.23 (0.88, 0.88)	1.961 (0.012, 0.012)	87, 143
HIP 810 b	0.252 (0.006, 0.006)	0.99241 (0.00024, 0.00023)	1625.06 (0.56, 0.56)	311.947 (0.111, 0.111)	50.56 (1.18, 1.27)	66.78 (0.38, 0.38)	2.621 (0.015, 0.015)	22, 24, 144
K2-114 b	0.032 (0.032, 0.055)	0.09431 (0.00013, 0.00016)	7173.74 (2.18, 0.81)	11.407 (0.023, 0.029)	331.59 (59.34, 19.48)	212.54 (5.19, 6.75)	2.128 (0.051, 0.067)	145
K2-115 b	0.123 (0.037, 0.038)	0.14263 (0.00004, 0.00004)	7158.44 (0.34, 0.29)	20.187 (0.008, 0.009)	307.47 (13.84, 11.93)	113.14 (6.32, 8.07)	1.454 (0.081, 0.104)	145
K2-139 b	0.160 (0.044, 0.046)	0.17327 (0.00035, 0.00049)	7339.14 (0.05, 0.14)	26.887 (0.082, 0.113)	75.99 (15.36, 16.12)	31.01 (1.73, 1.80)	0.439 (0.024, 0.026)	146
K2-232 b	0.277 (0.014, 0.014)	0.10344 (0.00006, 0.00006)	7826.07 (0.27, 0.28)	11.139 (0.009, 0.010)	179.00 (4.30, 4.71)	36.11 (0.94, 0.90)	0.428 (0.011, 0.011)	147, 148
K2-261 b	0.239 (0.032, 0.032)	0.10320 (0.00017, 0.00018)	7908.11 (0.31, 1.10)	11.598 (0.029, 0.031)	160.55 (8.60, 8.26)	16.70 (1.02, 1.09)	0.191 (0.012, 0.013)	149
K2-287 b	0.450 (0.010, 0.009)	0.12113 (0.00002, 0.00002)	8000.85 (0.08, 0.09)	14.957 (0.005, 0.004)	9.67 (1.19, 1.26)	29.17 (0.38, 0.40)	0.328 (0.004, 0.005)	150
K2-290 c	0.221 (0.019, 0.020)	0.27674 (0.00041, 0.00040)	8017.59 (0.74, 0.75)	48.746 (0.107, 0.106)	72.38 (2.76, 2.77)	43.24 (0.65, 0.70)	0.851 (0.013, 0.013)	151
K2-329 b	0.108 (0.026, 0.029)	0.10149 (0.00003, 0.00003)	7773.32 (0.27, 0.29)	12.448 (0.006, 0.006)	113.66 (7.49, 7.72)	24.24 (0.48, 0.49)	0.254 (0.005, 0.005)	152
KOI-1257 b	0.643 (0.021, 0.022)	0.159684 (0.00005, 0.00005)	8183.08 (0.04, 0.04)	18.256 (0.001, 0.001)	330.70 (1.28, 1.32)	54.15 (0.23, 0.22)	0.956 (0.004, 0.004)	153, 154
KOI-142 c	0.023 (0.005, 0.005)	0.36814 (0.00016, 0.00017)	5089.66 (0.90, 0.83)	81.998 (0.053, 0.056)	141.12 (4.87, 5.28)	94.63 (5.24, 6.34)	1.538 (0.086, 0.102)	155
KOI-3680 b	0.580 (0.011, 0.010)	0.154389 (0.00003, 0.00003)	4960.78 (0.08, 0.08)	22.269 (0.001, 0.001)	55.82 (13.33, 15.73)	46.71 (0.24, 0.25)	0.642 (0.003, 0.003)	156, 157
KOI-94 d	0.178 (0.018, 0.017)	0.53132 (0.00031, 0.00032)	5944.23 (1.06, 1.37)	140.757 (0.124, 0.129)	155.09 (1.44, 1.49)	91.51 (1.30, 1.33)	1.921 (0.027, 0.028)	158
Kepler-117 c	0.258 (0.041, 0.044)	0.17322 (0.00004, 0.00004)	4961.14 (0.43, 0.40)	23.275 (0.008, 0.008)	1.78 (340.73, 11.13)	19.85 (0.44, 0.43)	0.323 (0.007, 0.007)	159
Kepler-1514 b	0.405 (0.006, 0.006)	0.28245 (0.00051, 0.00050)	4946.42 (3.21, 3.27)	51.579 (0.141, 0.138)	297.88 (18.32, 20.44)	83.45 (4.79, 4.93)	1.602 (0.094, 0.094)	160
Kepler-1514 b	0.858 (0.007, 0.006)	0.75070 (0.00068, 0.00069)	5084.78 (5.10, 4.93)	216.874 (0.295, 0.301)	289.07 (1.09, 1.12)	175.67 (1.73, 1.87)	5.361 (0.055, 0.056)	161
Kepler-424 c	0.324 (0.010, 0.009)	0.36436 (0.00011, 0.00012)	5804.12 (0.17, 0.14)	68.137 (0.031, 0.033)	86.67 (2.09, 2.07)	219.00 (5.30, 5.59)	2.811 (0.068, 0.072)	162
Kepler-427 b	0.325 (0.050, 0.050)	0.72842 (0.00119, 0.00124)	5404.08 (0.39, 0.40)	225.950 (0.554, 0.576)	93.06 (1.73, 1.78)	241.29 (3.46, 3.60)	6.887 (0.109, 0.108)	163
Kepler-432 b	0.492 (0.002, 0.002)	0.09343 (0.00001, 0.00002)	5013.13 (0.39, 0.26)	10.647 (0.002, 0.003)	47.64 (10.81, 10.49)	30.30 (1.55, 1.64)	0.302 (0.015, 0.016)	164
Kepler-434 b	0.161 (0.038, 0.041)	0.30136 (0.00001, 0.00001)	5949.09 (0.02, 0.02)	52.595 (0.001, 0.001)	71.27 (0.35, 0.35)	286.19 (0.85, 0.85)	5.528 (0.016, 0.017)	165, 166
Kepler-643 b	0.324 (0.036, 0.034)	0.11445 (0.00020, 0.00015)	4999.67 (2.38, 3.19)	12.910 (0.034, 0.025)	48.02 (14.58, 17.88)	224.74 (6.44, 6.72)	2.891 (0.082, 0.087)	167
Kepler-65 e	0.303 (0.007, 0.007)	0.12814 (0.00001, 0.00002)	5019.33 (0.01, 0.78)	16.755 (0.002, 0.004)	74.19 (9.48, 10.83)	84.52 (4.79, 5.15)	1.007 (0.057, 0.061)	168
Sand 364 b	0.280 (0.020, 0.019)	0.85548 (0.00032, 0.00033)	5944.71 (0.81, 0.79)	258.499 (0.144, 0.147)	20.94 (1.52, 1.47)	19.10 (0.19, 0.20)	0.662 (0.007, 0.007)	169
NGTS-11 b	0.180 (0.049, 0.058)	0.53005 (0.00019, 0.00019)	4966.66 (1.42, 1.54)	121.312 (0.067, 0.065)	263.22 (5.25, 5.11)	58.11 (1.48, 1.53)	1.659 (0.042, 0.044)	170
PH2 b	0.676 (0.033, 0.034)	0.20324 (0.00023, 0.00032)	6256.78 (0.94, 8.75)	36.089 (0.060, 0.085)	142.76 (23.50, 19.22)	22.45 (1.31, 1.53)	0.325 (0.019, 0.022)	171
TAP 26 b	0.072 (0.028, 0.047)	0.83156 (0.00158, 0.00142)	5162.08 (4.52, 5.11)	285.679 (0.814, 0.732)	41.50 (3.80, 3.66)	7.73 (0.45, 0.48)	0.177 (0.010, 0.011)	172, 173, 174
TOI-2179 b	0.607 (0.004, 0.005)	0.09984 (0.00001, 0.00001)	5201.39 (0.00, 0.30)	11.299 (0.001, 0.001)	29.25 (28.44, 49.58)	110.62 (3.91, 3.84)	1.250 (0.044, 0.043)	175
TOI-1478 b	0.080 (0.014, 0.013)	0.12105 (0.00002, 0.00002)	8319.43 (0.09, 0.11)	15.157 (0.003, 0.003)	22.92 (0.45, 0.44)	200.70 (1.83, 1.86)	0.928 (0.018, 0.018)	176
TOI-1670 c	0.266 (0.021, 0.021)	0.11951 (0.00003, 0.00003)	8608.29 (0.13, 0.13)	10.173 (0.004, 0.004)	107.60 (9.82, 10.18)	80.24 (1.00, 0.94)	1.820 (0.010, 0.010)	177
TOI-1899 b	0.485 (0.038, 0.033)	0.25022 (0.00016, 0.00016)	8741.14 (0.50, 0.48)	41.561 (0.040, 0.040)	65.95 (6.03, 6.28)	38.22 (0.98, 0.95)	0.713 (0.018, 0.018)	178
TOI-201 b	0.399 (0.015, 0.015)	0.15607 (0.00073, 0.00072)	8709.43 (0.68, 0.75)	28.372 (0.199, 0.195)	356.94 (7.31, 6.45)	61.85 (2.25, 2.18)	0.596 (0.022, 0.021)	179, 180
TOI-2180 b	0.367 (0.001, 0.001)	0.30362 (0.00011, 0.00012)	8375.91 (0.21, 0.20)	53.187 (0.028, 0.030)	104.57 (3.09, 2.97)	21.92 (0.48, 0.48)	0.448 (0.010, 0.010)	181
TOI-2202 b	0.127 (0.010, 0.010)	0.82703 (0.00015, 0.00015)	8830.53 (0.20, 0.15)	260.748 (0.073, 0.069)	317.01 (0.22, 0.21)	88.03 (0.11, 0.11)	2.760 (0.003, 0.003)	182
TOI-2202 b	0.437 (0.037, 0.039)	0.09575 (0.00002, 0.00001)	8540.71 (0.10, 0.10)	11.951 (0.003, 0.003)	265.07 (6.12, 6.02)	94.87 (0.95, 0.95)	0.927 (0.010, 0.009)	183
TOI-3362 b	0.883 (0.018, 0.013)	0.15714 (0.00012, 0.00011)	8542.68 (0.41, 0.40)	25.125 (0.028, 0.025)	222.51 (4.22, 4.39)	34.40 (1.51, 1.57)	0.377 (0.019, 0.020)	183
TOI-481 b	0.149 (0.004, 0.004)	0.15331 (0.00015, 0.00013)	8524.14 (1.24, 1.04)	18.209 (0.028, 0.023)	38.10 (3.41, 4.51)	848.80 (96.95, 115.07)	6.610 (0.746, 0.906)	184
TOI-558 b	0.271 (0.006, 0.006)	0.09673 (0.00004, 0.00004)	8511.85 (0.03, 0.03)	10.291 (0.006, 0.006)	66.24 (1.61, 1.58)	130.87 (0.51, 0.47)	1.512 (0.006, 0.006)	185
TOI-677 b	0.614 (0.018, 0.019)	0.12929 (0.00037, 0.00041)	8871.95 (1.75, 1.56)	14.614 (0.063, 0.070)	130.67 (2.30, 2.27)	255.03 (1.23, 1.23)	3.607 (0.021, 0.020)	186
TOI-677 b	0.614 (0.018, 0.019)	0.10360 (0.00011, 0.00011)	8547.61 (0.10, 0.14)	11.21				

Table 3 (*continued*)

Planet Name	e	a (AU)	T_c (BJD - 2450000)	P (days)	ω ($^\circ$)	K (m s^{-1})	$M_p \sin i$ (M_{Jup})	Ref
TOI-892 b	0.172 (0.036, 0.038)	0.10276 (0.00009, 0.00010)	8474.77 (0.64, 0.68)	10.635 (0.014, 0.016)	25.02 (6.88, 6.70)	75.05 (1.45, 1.52)	0.943 (0.018, 0.019)	186
TYC 0434 b	0.073 (0.009, 0.009)	0.66292 (0.00020, 0.00019)	4775.17 (0.81, 1.36)	193.317 (0.087, 0.085)	211.16 (7.45, 7.00)	209.34 (1.99, 2.04)	0.6097 (0.058, 0.060)	188
TYC 1422 b	0.077 (0.005, 0.005)	0.69788 (0.00009, 0.00009)	3253.62 (0.53, 0.53)	198.572 (0.039, 0.040)	71.50 (3.33, 3.75)	81.97 (0.42, 0.42)	2.575 (0.013, 0.013)	189
TYC 3667 b	0.045 (0.006, 0.006)	0.21401 (0.00002, 0.00002)	6309.25 (0.12, 0.11)	26.443 (0.003, 0.003)	216.01 (7.58, 7.80)	240.49 (1.54, 1.63)	5.345 (0.035, 0.035)	190
TYC 4282 b	0.273 (0.001, 0.001)	0.42220 (0.00002, 0.00002)	6520.29 (0.07, 0.07)	101.739 (0.008, 0.009)	293.02 (0.30, 0.31)	489.09 (0.63, 0.63)	10.589 (0.014, 0.013)	191
WASP-117 b	0.276 (0.005, 0.005)	0.090015 (0.00004, 0.00004)	6533.62 (0.02, 0.03)	10.020 (0.001, 0.001)	244.03 (0.96, 0.99)	25.70 (0.15, 0.14)	0.310 (0.002, 0.002)	192
WASP-130 b	0.043 (0.012, 0.013)	0.10134 (0.00001, 0.00001)	6921.04 (0.06, 0.05)	11.554 (0.001, 0.001)	320.56 (12.17, 13.69)	107.80 (1.03, 1.06)	1.230 (0.012, 0.012)	193
WASP-148 c	0.374 (0.007, 0.008)	0.20748 (0.00001, 0.00001)	7935.19 (0.12, 0.11)	34.520 (0.003, 0.003)	7.83 (1.49, 1.49)	27.34 (0.25, 0.25)	0.406 (0.004, 0.004)	194
XO-2 S c	0.160 (0.001, 0.001)	0.47456 (0.00013, 0.00012)	6471.86 (0.12, 0.12)	120.623 (0.048, 0.046)	258.83 (0.60, 0.63)	58.71 (0.10, 0.10)	1.390 (0.002, 0.002)	195
mu Leo b	0.073 (0.009, 0.009)	1.13335 (0.00021, 0.00002)	2772.77 (1.43, 0.81)	359.833 (0.099, 0.105)	277.26 (4.41, 4.75)	47.82 (0.55, 0.57)	2.187 (0.025, 0.025)	196
ome Ser b	0.151 (0.007, 0.006)	1.07649 (0.00011, 0.00012)	-3.54 (2.78, 2.78)	276.938 (0.042, 0.045)	117.52 (3.05, 2.93)	32.12 (0.23, 0.23)	1.707 (0.012, 0.013)	197
omi CrB b	0.192 (0.008, 0.008)	0.82589 (0.00017, 0.00017)	2214.23 (0.82, 0.51)	187.843 (0.059, 0.057)	79.26 (3.17, 3.19)	32.25 (0.28, 0.27)	1.476 (0.013, 0.012)	197
rho CrB b	0.0379 (0.001, 0.0001)	0.2196064 (0.0000002, 0.0000002)	6516.14 (0.002, 0.002)	39.84474 (0.00006, 0.00006)	272.32 (0.20, 0.21)	67.19 (0.01, 0.01)	1.0441 (0.0001, 0.0001)	198
ups And c	0.243 (0.001, 0.001)	0.82762 (0.00002, 0.00002)	4164.68 (0.18, 0.19)	241.200 (0.010, 0.009)	358.49 (0.34, 0.31)	53.78 (0.08, 0.08)	1.903 (0.003, 0.003)	46, 75, 122, 199
xi Aql b	0.245 (0.018, 0.017)	0.67640 (0.00055, 0.00055)	3025.37 (1.32, 1.13)	136.992 (0.167, 0.167)	248.73 (5.96, 348.82)	71.63 (1.12, 1.22)	2.980 (0.047, 0.051)	37

NOTE.—Best fit orbital parameters for warm Jupiters in our sample. The MAP value is reported along with the upper and lower bounds of the 68.3% highest density interval regions of the posterior probability distributions about the median. We note that the argument of periastron (ω) reported is the argument of periastron of the star's orbit around the barycenter. In addition, T_c is the time of inferior conjunction of the orbit. Below we report references for discovery and follow-up papers.

- 1 NGC 2682 Sand 364 b is labeled as Sand 364 b.
- 2 TIC 237913194 b is labeled as TOI-2179 b.
- 3 TYC 0434-04538-1 b is labeled as TYC 0434 b.
- 4 TYC 1422-614-1 b is labeled as TYC 1422 b.
- 5 TYC 3667-1280-1 b is labeled as TYC 3667 b.
- 6 TYC 4282-00605-1 b is labeled as TYC 4282 b.

References—(1) Sato et al. (2008a); (2) Takanada et al. (2018); (3) Döllinger et al. (2007); (4) Bourrier et al. (2018); (5) Marcy & Butler (1998); (6) Fischer et al. (2008); (7) Kane et al. (2015); (8) Luhn et al. (2019b); (9) Naef et al. (2019a); (10) Nowak et al. (2019b); (11) Lee et al. (2015); (12) Mitchell et al. (2013); (13) Niedzielski et al. (2009b); (14) Niedzielski et al. (2016a); (15) Nowak et al. (2019a); (16) Datal et al. (2021); (17) Hebrard et al. (2016); (18) Bonomo et al. (2010); (19) Bonomo et al. (2017); (20) Trifonov et al. (2018); (21) Haghighipour et al. (2010); (22) Naef et al. (2019); (23) Morales et al. (2019); (24) Butler et al. (2015); (25) Queloz et al. (2010); (26) Nelson et al. (2012); (27) Rivera et al. (2009b); (28) Correia et al. (2013); (29) Rivera et al. (2016); (30) Marcy et al. (2005); (31) Kovács et al. (2010); (32) Howard et al. (2012); (33) Knutson et al. (2014b); (34) Fulton et al. (2013); (35) Brahm et al. (2015); (36) Omiya et al. (2015); (37) Sato et al. (2008b); (38) Sato et al. (2009); (39) Boisse et al. (2010); (40) Feng et al. (2019a); (41) Borgniet et al. (2011); (42) Jenkins et al. (2017b); (43) Mayor et al. (2004); (44) Hebrard et al. (2016); (45) Butler et al. (2006); (46) Wright et al. (2009); (47) Fischer et al. (2001); (48) Jenkins et al. (2017b); (49) Nayor et al. (2004); (50) Hinkel et al. (2013a); (51) Lamy et al. (2000); (52) Jones et al. (2012); (53) Vogt et al. (2009); (54) Moutou et al. (2012); (55) Nielsen et al. (2009); (56) Brahm et al. (2015); (57) Vogt et al. (2014b); (58) Wittenmyer et al. (2009b); (59) Triney et al. (2012); (60) Moutou et al. (2012); (61) Sato et al. (2017); (62) Segransan et al. (2010); (63) Ment et al. (2015b); (64) Fischer et al. (2009b); (65) Robert et al. (2012); (66) Gagliardini et al. (2012); (67) Sato et al. (2017); (68) Bryan (2016); (69) Kane et al. (2011); (70) Pinuz et al. (2008); (71) McCarthy et al. (2004); (72) Pepe et al. (2007); (73) Gagliardini et al. (2012); (74) Haraoka et al. (2015b); (75) Wittenmyer et al. (2007a); (76) Pinuz et al. (2011); (77) Barbieri et al. (2019); (78) Fischer et al. (2007); (79) Liu et al. (2009); (80) Zucker et al. (2002); (81) Luhn et al. (2022b); (82) Dragomir et al. (2012); (83) Santos et al. (2009); (84) Borra et al. (2010); (85) Johnson et al. (2010); (86) Fischer et al. (1999); (87) Butler et al. (2001); (88) Lemos-Morales et al. (2008); (89) Haghighipour et al. (2010); (90) Ylinen et al. (2005); (91) Demangeon et al. (2011); (92) Niedzielski et al. (2015b); (93) Huber et al. (2010); (94) Johnson et al. (2009); (95) Trifonov et al. (2018); (96) Moutou et al. (2003); (103) Ment et al. (2015b); (104) Cochran et al. (2009); (105) Johnson et al. (2011b); (106) Fisha et al. (2003); (107) Naef et al. (2016); (108) Butler et al. (2007); (109) Correia et al. (2009); (110) Santos et al. (2008); (111) Sato et al. (2013b); (112) Sato et al. (2016); (113) Niedzielski et al. (2016b); (114) Ortiz et al. (2016); (115) Dorn et al. (2019); (116) Segransan et al. (2011); (117) Hinkel et al. (2015b); (118) Sato et al. (2013); (119) Niedzielski et al. (2016a); (120) Triney et al. (2012); (121) Peng et al. (2015); (122) Segransan et al. (2011); (123) Wittenmyer et al. (2009); (124) Tan et al. (2013); (125) Bahar & Beauge (2014); (126) Poutier et al. (2003); (127) M. (2013); (128) Wittenmyer et al. (2007b); (129) Fischer et al. (2009); (130) Korzennik et al. (2006); (131) Rickman et al. (2019); (132) Loria et al. (2005); (133) Hagard et al. (2010); (134) Jones et al. (2012); (135) Jones et al. (2015); (136) Wozniak et al. (2011); (137) Wright et al. (2009c); (138) Wright et al. (2007); (139) Lo Curcio et al. (2017); (140) Fischer et al. (2012); (141) Jones et al. (2013); (142) Wittenmyer et al. (2015); (143) Appert et al. (2010); (144) Küster et al. (2009); (145) Shporer et al. (2017); (146) Bascigán et al. (2018); (147) Yu et al. (2018); (148) Braham et al. (2018); (149) Johnson et al. (2018); (150) Jorjón et al. (2019); (151) Hogg et al. (2019); (152) Sh et al. (2021); (153) Smith et al. (2017); (154) Smith et al. (2022); (155) Salmeron et al. (2014); (156) Weiss et al. (2020); (157) Nascimben et al. (2013); (158) Hagard et al. (2014); (159) Weiss et al. (2013); (160) Bruno et al. (2015); (161) Daiba et al. (2021); (162) Dawson et al. (2014); (163) End et al. (2014); (164) Hagard et al. (2014); (165) Cret et al. (2015); (166) Quinn et al. (2015); (167) Alomar et al. (2015); (168) Crumblatt et al. (2018); (169) Mills et al. (2019); (170) Bascigán et al. (2019); (171) Gill et al. (2020); (172) Wang et al. (2021); (173) Alomar et al. (2016); (174) Dubber et al. (2019); (175) Yu et al. (2021); (176) Schlecker et al. (2020); (177) Rodriguez et al. (2021); (178) Traa et al. (2022); (179) Caffau et al. (2020); (180) Lin et al. (2023); (181) Hobson et al. (2021); (182) Daiba et al. (2022); (183) Trifonov et al. (2021); (184) D. et al. (2021b); (185) Brabin et al. (2020); (186) Ikuta-Ikawa et al. (2022a); (187) Jordán et al. (2020); (188) Niedzielski et al. (2021); (189) Niedzielski et al. (2015a); (190) Niedzielski et al. (2016a); (191) González-Alvarez et al. (2017); (192) Lendl et al. (2014); (193) Haller et al. (2017); (194) Haraoka et al. (2020); (195) Desidera et al. (2014); (196) Lee et al. (2014); (197) Sato et al. (2012); (198) Fulton et al. (2010); (199) Wright et al. (2009a); (200) Rosenthal et al. (2021).

Table 4. Host star properties.

Hoststar	SpT	T_{eff} (K)	$M_{\star}$ ($M_{\odot}$)	[Fe/H] (dex)	Distance (pc)	Ref.
14 And	K0 III	4813^{+20}_{-20}	$2.20^{+0.10}_{-0.20}$	$-0.24^{+0.03}_{-0.03}$	$75.85^{+0.42}_{-0.44}$	1
24 Boo	G3 IV	4893^{+15}_{-15}	$0.99^{+0.19}_{-0.13}$	$-0.77^{+0.03}_{-0.03}$	$94.18^{+0.34}_{-0.40}$	2
4 UMa	K1 III	4415^{+70}_{-70}	$1.23^{+0.15}_{-0.15}$	$-0.25^{+0.04}_{-0.04}$	$75.63^{+0.62}_{-0.60}$	3
55 Cnc	K0 IV	5172^{+18}_{-18}	$0.91^{+0.01}_{-0.01}$	$0.35^{+0.10}_{-0.10}$	$12.58^{+0.01}_{-0.01}$	4
70 Vir	G4 V	5481^{+100}_{-100}	$1.06^{+0.03}_{-0.03}$	$-0.06^{+0.01}_{-0.01}$	$18.09^{+0.03}_{-0.03}$	5,6,7
8 UMi	K0	4847^{+7}_{-7}	$1.44^{+0.19}_{-0.19}$	$-0.03^{+0.02}_{-0.02}$	$162.68^{+0.42}_{-0.30}$	8,9
91 Aqr	K0 III	4665^{+18}_{-18}	$1.40^{+0.10}_{-0.10}$	$-0.03^{+0.10}_{-0.10}$	$45.28^{+0.28}_{-0.24}$	10
BD-08 2823	K3 V	4746^{+63}_{-63}	$0.74^{+0.07}_{-0.07}$	$-0.07^{+0.03}_{-0.03}$	$41.30^{+0.02}_{-0.02}$	11
BD+14 4559	K5	4864^{+101}_{-101}	$0.84^{+0.10}_{-0.10}$	$0.17^{+0.06}_{-0.06}$	$49.23^{+0.04}_{-0.04}$	8,9
BD+15 2375	G5	4649^{+30}_{-30}	$1.08^{+0.14}_{-0.14}$	$-0.22^{+0.08}_{-0.08}$	$671.55^{+9.96}_{-8.85}$	12
BD+15 2940	K0	4796^{+117}_{-117}	$1.10^{+0.20}_{-0.20}$	$0.28^{+0.07}_{-0.07}$	$402.55^{+2.60}_{-2.72}$	13
BD+45 564	K1	5004^{+50}_{-50}	$0.81^{+0.07}_{-0.07}$	$-0.09^{+0.03}_{-0.03}$	$53.27^{+0.04}_{-0.05}$	14
BD+55 362	K3	5012^{+78}_{-78}	$0.91^{+0.10}_{-0.10}$	$0.18^{+0.05}_{-0.05}$	$52.48^{+0.04}_{-0.03}$	14
CoRoT-10	K1 V	5075^{+75}_{-75}	$0.89^{+0.05}_{-0.05}$	$0.26^{+0.07}_{-0.07}$	$337.55^{+3.41}_{-2.33}$	15
CoRoT-9	G3 V	5625^{+80}_{-80}	$0.96^{+0.04}_{-0.04}$	$-0.01^{+0.06}_{-0.06}$	$420.03^{+2.92}_{-2.64}$	16
GJ 1148	M4.0 V	3287^{+157}_{-157}	$0.34^{+0.02}_{-0.02}$	$0.09^{+0.01}_{-0.01}$	$11.02^{+0.003}_{-0.003}$	17,18
GJ 3021	G6 V	5540^{+75}_{-75}	$0.97^{+0.14}_{-0.10}$	$0.10^{+0.08}_{-0.08}$	$17.55^{+0.01}_{-0.01}$	18,19
GJ 3512	M5.5 V	3081^{+51}_{-51}	$0.12^{+0.01}_{-0.01}$	$-0.07^{+0.16}_{-0.16}$	$9.49^{+0.003}_{-0.002}$	20
GJ 86	K1.5 V	5182^{+11}_{-11}	$0.93^{+0.06}_{-0.06}$	$-0.26^{+0.02}_{-0.02}$	$10.76^{+0.01}_{-0.01}$	9,21
GJ 876	M3.5 V	3293^{+48}_{-48}	$0.32^{+0.03}_{-0.03}$	$0.17^{+0.08}_{-0.08}$	$4.67^{+0.0008}_{-0.0008}$	5,22,23
HAT-P-15	G5	5568^{+90}_{-90}	$1.00^{+0.23}_{-0.23}$	$0.31^{+0.08}_{-0.08}$	$191.46^{+0.62}_{-0.68}$	9,24
HAT-P-17	G0	5846^{+78}_{-78}	$0.99^{+0.15}_{-0.15}$	$0.05^{+0.03}_{-0.03}$	$92.16^{+0.18}_{-0.20}$	8,9
HATS-17	G V	5846^{+78}_{-78}	$1.13^{+0.03}_{-0.03}$	$0.30^{+0.03}_{-0.03}$	$395.71^{+1.80}_{-2.01}$	25
HD 100655	G9 III	4891^{+46}_{-46}	$2.28^{+0.69}_{-0.69}$	$0.07^{+0.03}_{-0.03}$	$137.73^{+0.55}_{-0.54}$	8,9
HD 104985	G9 III	4679^{+14}_{-14}	$1.22^{+0.29}_{-0.23}$	$-0.38^{+0.03}_{-0.03}$	$100.50^{+0.42}_{-0.40}$	8,18,26,27
HD 109246	G0 V	5844^{+21}_{-21}	$1.20^{+0.53}_{-0.53}$	$0.10^{+0.05}_{-0.05}$	$67.84^{+0.07}_{-0.07}$	9,28
HD 10975	K0 III	4885^{+5}_{-5}	$1.41^{+0.34}_{-0.35}$	$-0.21^{+0.10}_{-0.08}$	$115.65^{+0.33}_{-0.39}$	18,29
HD 113337	F6 V	6576^{+153}_{-149}	$1.40^{+0.14}_{-0.14}$	$0.25^{+0.03}_{-0.03}$	$36.16^{+0.03}_{-0.04}$	8,30
HD 11506	G0 V	6055^{+44}_{-44}	$1.24^{+0.18}_{-0.18}$	$0.21^{+0.08}_{-0.08}$	$51.12^{+0.06}_{-0.06}$	6,31,32
HD 121504	G2 V	6027^{+24}_{-24}	$1.62^{+0.21}_{-0.21}$	$0.14^{+0.01}_{-0.01}$	$41.52^{+0.05}_{-0.04}$	8,9
HD 124330	G4 IV	5873^{+19}_{-19}	$1.15^{+0.08}_{-0.08}$	$0.22^{+0.01}_{-0.01}$	$60.05^{+0.07}_{-0.07}$	14
HD 12484	F8	5920^{+30}_{-30}	$1.01^{+0.03}_{-0.03}$	$0.05^{+0.02}_{-0.02}$	$48.03^{+0.07}_{-0.08}$	33
HD 12648	G5	4835^{+7}_{-7}	$0.67^{+0.07}_{-0.07}$	$-0.57^{+0.02}_{-0.02}$	$177.84^{+0.37}_{-0.39}$	8,9
HD 12661	K0 V	5645^{+31}_{-31}	$1.20^{+0.10}_{-0.10}$	$0.35^{+0.02}_{-0.02}$	$37.74^{+0.04}_{-0.04}$	9,34
HD 128356	K3 V	4875^{+100}_{-100}	$0.65^{+0.05}_{-0.05}$	$0.17^{+0.10}_{-0.10}$	$26.03^{+0.02}_{-0.02}$	35
HD 130322	K0 V	5387^{+44}_{-44}	$0.92^{+0.03}_{-0.03}$	$0.12^{+0.04}_{-0.04}$	$31.87^{+0.03}_{-0.03}$	36,37
HD 134987	G6 IV	5736^{+17}_{-17}	$1.10^{+0.07}_{-0.07}$	$0.31^{+0.08}_{-0.08}$	$26.16^{+0.02}_{-0.03}$	9,38
HD 13908	F8 V	6255^{+66}_{-66}	$1.29^{+0.04}_{-0.04}$	$0.01^{+0.04}_{-0.04}$	$79.68^{+0.13}_{-0.12}$	39
HD 1397	G5 III	5521^{+60}_{-60}	$1.32^{+0.04}_{-0.05}$	$0.29^{+0.09}_{-0.09}$	$79.98^{+0.12}_{-0.08}$	40
HD 141399	K0	5600^{+40}_{-40}	$1.07^{+0.08}_{-0.08}$	$0.35^{+0.03}_{-0.03}$	$37.02^{+0.02}_{-0.02}$	33
HD 142	F7 V	6245^{+48}_{-48}	$1.23^{+0.22}_{-0.16}$	$0.09^{+0.05}_{-0.05}$	$26.17^{+0.03}_{-0.03}$	41
HD 145377	G3 V	6014^{+20}_{-20}	$1.20^{+0.14}_{-0.14}$	$0.09^{+0.04}_{-0.04}$	$53.73^{+0.07}_{-0.06}$	9,42
HD 145457	K0 III	4769^{+27}_{-27}	$1.23^{+0.34}_{-0.34}$	$-0.16^{+0.01}_{-0.01}$	$134.86^{+0.25}_{-0.26}$	9,43
HD 147018	G9 V	5441^{+55}_{-55}	$0.93^{+0.03}_{-0.03}$	$0.10^{+0.05}_{-0.05}$	$40.32^{+0.03}_{-0.04}$	44

Table 4 *continued*

Table 4 (continued)

Hoststar	SpT	T_{eff} (K)	$M_{\star}$ ($M_{\odot}$)	[Fe/H] (dex)	Distance (pc)	Ref.
HD 147873	G1 V	5972^{+100}_{-100}	$1.38^{+0.05}_{-0.05}$	$0.03^{+0.10}_{-0.10}$	$109.71^{+0.40}_{-0.28}$	35
HD 148164	F8	6032^{+100}_{-112}	$1.21^{+0.24}_{-0.24}$	$0.19^{+0.06}_{-0.06}$	$76.77^{+0.19}_{-0.18}$	18,32,42
HD 148427	K0 III	5025^{+4}_{-4}	$1.64^{+0.27}_{-0.27}$	$0.17^{+0.03}_{-0.03}$	$70.21^{+0.12}_{-0.10}$	9,42
HD 154672	G3 IV	5743^{+23}_{-23}	$1.18^{+0.12}_{-0.12}$	$0.25^{+0.02}_{-0.02}$	$63.11^{+0.10}_{-0.10}$	8,9
HD 155193	F8 IV	6239^{+20}_{-20}	$1.22^{+0.08}_{-0.08}$	$0.05^{+0.01}_{-0.01}$	$57.59^{+0.08}_{-0.07}$	14
HD 155358	G0	5905^{+13}_{-13}	$1.15^{+0.08}_{-0.08}$	$-0.65^{+0.05}_{-0.05}$	$43.58^{+0.02}_{-0.02}$	9,34
HD 156279	K0	5453^{+40}_{-40}	$0.95^{+0.08}_{-0.08}$	$0.14^{+0.01}_{-0.01}$	$36.11^{+0.03}_{-0.02}$	8,9
HD 156846	G1 V	6090^{+31}_{-31}	$1.38^{+0.14}_{-0.14}$	$0.15^{+0.04}_{-0.04}$	$47.60^{+0.05}_{-0.05}$	9,34
HD 159243	G0 V	6123^{+65}_{-65}	$1.12^{+0.03}_{-0.03}$	$0.05^{+0.04}_{-0.04}$	$73.14^{+0.12}_{-0.10}$	39
HD 159868	G5 V	5558^{+15}_{-15}	$1.09^{+0.03}_{-0.03}$	$-0.08^{+0.01}_{-0.01}$	$55.86^{+0.06}_{-0.07}$	7,8,41
HD 160691	G3 IV	5807^{+30}_{-30}	$1.13^{+0.02}_{-0.02}$	$0.33^{+0.03}_{-0.03}$	$15.60^{+0.03}_{-0.02}$	38,44
HD 161178	G9 III	4793^{+6}_{-6}	$1.06^{+0.25}_{-0.17}$	$0.16^{+0.07}_{-0.07}$	$107.33^{+0.40}_{-0.61}$	18,29,42
HD 163607	G5 IV	5543^{+44}_{-44}	$1.09^{+0.02}_{-0.02}$	$0.20^{+0.06}_{-0.06}$	$67.69^{+0.09}_{-0.09}$	7,42,46
HD 164509	G5	5922^{+44}_{-44}	$1.12^{+0.19}_{-0.19}$	$0.20^{+0.06}_{-0.06}$	$53.63^{+0.06}_{-0.08}$	32,42,46
HD 1666	F7 V	6317^{+44}_{-44}	$1.50^{+0.07}_{-0.07}$	$0.37^{+0.04}_{-0.04}$	$117.86^{+0.31}_{-0.31}$	47
HD 168443	G5	5491^{+44}_{-44}	$0.99^{+0.02}_{-0.02}$	$0.04^{+0.03}_{-0.03}$	$39.03^{+0.06}_{-0.08}$	48
HD 169830	F8 V	6179^{+98}_{-98}	$1.40^{+0.04}_{-0.04}$	$0.11^{+0.05}_{-0.05}$	$36.80^{+0.19}_{-0.23}$	5,49,50
HD 17156	F9 V	6040^{+24}_{-24}	$1.41^{+0.12}_{-0.12}$	$0.23^{+0.04}_{-0.04}$	$77.31^{+0.10}_{-0.08}$	8,9
HD 173416	G8	4683^{+100}_{-100}	$2.00^{+0.30}_{-0.30}$	$-0.22^{+0.09}_{-0.09}$	$132.27^{+0.44}_{-0.46}$	51
HD 175541	G6 IV	4970^{+60}_{-60}	$1.44^{+0.14}_{-0.14}$	$-0.11^{+0.03}_{-0.03}$	$130.06^{+0.38}_{-0.26}$	5,7,8
HD 178911 B	G5	5588^{+115}_{-115}	$1.24^{+0.58}_{-0.58}$	$0.27^{+0.04}_{-0.04}$	$40.93^{+0.02}_{-0.02}$	9,38
HD 180053	K0	5131^{+25}_{-25}	$1.72^{+0.06}_{-0.06}$	$0.14^{+0.02}_{-0.02}$	$137.19^{+0.30}_{-0.30}$	7,18,52
HD 191939	G9 V	5348^{+100}_{-100}	$0.81^{+0.04}_{-0.04}$	$-0.15^{+0.06}_{-0.06}$	$53.44^{+0.04}_{-0.04}$	53
HD 192263	K1 V	4976^{+18}_{-18}	$0.66^{+0.08}_{-0.08}$	$0.05^{+0.03}_{-0.03}$	$19.62^{+0.01}_{-0.01}$	9,54
HD 192699	G8 IV	5220^{+44}_{-44}	$1.68^{+0.12}_{-0.12}$	$-0.19^{+0.01}_{-0.01}$	$72.65^{+0.18}_{-0.15}$	7,52,55
HD 195019	G1 V	5751^{+21}_{-21}	$1.21^{+0.08}_{-0.08}$	$0.03^{+0.01}_{-0.01}$	$37.49^{+0.03}_{-0.02}$	9,56
HD 205739	F7 V	6176^{+30}_{-30}	$1.22^{+0.08}_{-0.06}$	$0.19^{+0.04}_{-0.04}$	$92.64^{+0.15}_{-0.17}$	57
HD 207832	G5 V	5710^{+81}_{-81}	$1.05^{+0.17}_{-0.17}$	$0.15^{+0.04}_{-0.04}$	$59.07^{+0.05}_{-0.05}$	32,42,58
HD 208487	G1 V	6105^{+31}_{-31}	$1.10^{+0.10}_{-0.10}$	$0.07^{+0.01}_{-0.01}$	$44.84^{+0.05}_{-0.07}$	42,54,56
HD 208897	K0	4860^{+100}_{-100}	$1.25^{+0.11}_{-0.11}$	$0.21^{+0.15}_{-0.15}$	$66.70^{+0.12}_{-0.09}$	59
HD 210702	K0 III	4967^{+25}_{-25}	$1.68^{+0.18}_{-0.18}$	$0.07^{+0.01}_{-0.01}$	$54.04^{+0.14}_{-0.10}$	7,52,60
HD 211403	F7 V	6273^{+44}_{-44}	$1.20^{+0.06}_{-0.06}$	$0.18^{+0.04}_{-0.04}$	$82.65^{+0.09}_{-0.12}$	61
HD 216536	K0	4639^{+45}_{-45}	$0.81^{+0.44}_{-0.44}$	$-0.17^{+0.01}_{-0.01}$	$367.96^{+1.61}_{-1.89}$	9
HD 216770	G9 V	5399^{+18}_{-18}	$0.74^{+0.07}_{-0.07}$	$0.21^{+0.02}_{-0.02}$	$36.60^{+0.04}_{-0.03}$	6,9
HD 219139	G5 III	4902^{+123}_{-123}	$1.46^{+0.31}_{-0.29}$	$-0.17^{+0.02}_{-0.02}$	$105.37^{+0.59}_{-0.62}$	18,29
HD 220842	F8	5960^{+20}_{-20}	$1.13^{+0.06}_{-0.06}$	$-0.17^{+0.02}_{-0.02}$	$64.84^{+0.08}_{-0.08}$	33
HD 221416	K0 IV	5080^{+90}_{-90}	$1.21^{+0.07}_{-0.07}$	$-0.08^{+0.08}_{-0.08}$	$95.06^{+0.32}_{-0.29}$	62
HD 224693	G2 V	6037^{+50}_{-50}	$1.31^{+0.29}_{-0.29}$	$0.28^{+0.07}_{-0.07}$	$94.29^{+0.23}_{-0.23}$	32,38,63
HD 231701	F8 V	6208^{+44}_{-44}	$1.21^{+0.34}_{-0.34}$	$0.04^{+0.02}_{-0.02}$	$108.15^{+0.14}_{-0.17}$	8,32,64
HD 233604	K5	4791^{+45}_{-45}	$1.50^{+0.30}_{-0.30}$	$-0.36^{+0.04}_{-0.04}$	$848.48^{+14.27}_{-14.08}$	13
HD 27894	K2 V	4894^{+25}_{-25}	$0.81^{+0.10}_{-0.10}$	$0.30^{+0.07}_{-0.07}$	$43.67^{+0.02}_{-0.02}$	65,66,67
HD 2952	K0 III	4844^{+20}_{-20}	$1.97^{+0.38}_{-0.38}$	$0.00^{+0.04}_{-0.04}$	$109.31^{+0.44}_{-0.43}$	8,9
HD 32518	K1 III	4580^{+70}_{-70}	$1.13^{+0.18}_{-0.18}$	$-0.15^{+0.04}_{-0.04}$	$121.26^{+0.29}_{-0.28}$	68
HD 33142	K0 III	5025^{+24}_{-16}	$1.52^{+0.03}_{-0.03}$	$0.06^{+0.01}_{-0.01}$	$120.59^{+0.25}_{-0.25}$	7,52,69
HD 332231	F8	6089^{+97}_{-96}	$1.13^{+0.08}_{-0.08}$	$0.04^{+0.06}_{-0.06}$	$80.47^{+0.08}_{-0.09}$	70
HD 33283	G3/G5 V	5995^{+50}_{-50}	$1.38^{+0.24}_{-0.24}$	$0.34^{+0.02}_{-0.02}$	$89.47^{+0.14}_{-0.13}$	8,32,63
HD 35759	G0	6060^{+30}_{-30}	$1.15^{+0.08}_{-0.08}$	$0.04^{+0.02}_{-0.02}$	$70.87^{+0.10}_{-0.11}$	33

Table 4 continued

Table 4 (continued)

Hoststar	SpT	T_{eff}	$M_{\star}$	[Fe/H]	Distance	Ref.
		(K)	($M_{\odot}$)	(dex)	(pc)	
HD 360	G8 III	4741^{+100}_{-100}	$1.69^{+0.15}_{-0.53}$	$-0.06^{+0.17}_{-0.10}$	$110.67^{+0.49}_{-0.50}$	18,29
HD 37124	G4 V	5698^{+48}_{-48}	$0.81^{+0.01}_{-0.01}$	$-0.38^{+0.01}_{-0.01}$	$31.60^{+0.03}_{-0.03}$	5,6,71
HD 37605	K0	5448^{+44}_{-44}	$1.00^{+0.05}_{-0.05}$	$0.26^{+0.03}_{-0.03}$	$46.59^{+0.04}_{-0.05}$	32,72,73
HD 38283	F9 V	5981^{+12}_{-12}	$1.37^{+0.07}_{-0.07}$	$-0.29^{+0.03}_{-0.03}$	$38.04^{+0.02}_{-0.02}$	9,56
HD 38529	F3 III	5624^{+116}_{-116}	$1.53^{+0.01}_{-0.01}$	$0.37^{+0.02}_{-0.02}$	$42.35^{+0.08}_{-0.08}$	5,7,8
HD 40979	F8	6165^{+25}_{-25}	$1.45^{+0.15}_{-0.15}$	$0.21^{+0.05}_{-0.05}$	$33.94^{+0.03}_{-0.02}$	8,9
HD 4313	G5	5035^{+44}_{-44}	$1.72^{+0.12}_{-0.12}$	$0.13^{+0.01}_{-0.01}$	$133.64^{+0.48}_{-0.56}$	7,74,75
HD 43197	G8 V	5508^{+46}_{-46}	$0.96^{+0.16}_{-0.07}$	$0.40^{+0.04}_{-0.04}$	$62.37^{+0.04}_{-0.05}$	18,76
HD 43691	G0	6200^{+40}_{-40}	$1.38^{+0.05}_{-0.05}$	$0.23^{+0.06}_{-0.06}$	$85.39^{+0.23}_{-0.27}$	32,42,77
HD 45364	K0 V	5434^{+20}_{-20}	$0.82^{+0.05}_{-0.05}$	$-0.17^{+0.01}_{-0.01}$	$34.31^{+0.02}_{-0.02}$	78
HD 45652	G8	5312^{+68}_{-68}	$0.83^{+0.05}_{-0.05}$	$0.26^{+0.04}_{-0.04}$	$34.87^{+0.03}_{-0.03}$	32,34,79
HD 4732	K0 IV	4959^{+25}_{-25}	$1.74^{+0.20}_{-0.14}$	$0.01^{+0.04}_{-0.04}$	$55.03^{+0.13}_{-0.13}$	80
HD 47366	K1 III	4914^{+100}_{-100}	$2.19^{+0.25}_{-0.25}$	$-0.07^{+0.10}_{-0.10}$	$83.74^{+0.11}_{-0.19}$	81
HD 52265	G0 V	6057^{+97}_{-97}	$1.22^{+0.04}_{-0.04}$	$0.16^{+0.01}_{-0.01}$	$29.89^{+0.02}_{-0.02}$	5,6,82
HD 5583	K0	4830^{+45}_{-45}	$1.01^{+0.10}_{-0.10}$	$-0.50^{+0.18}_{-0.18}$	$214.68^{+0.95}_{-0.77}$	12
HD 5891	G5	4673^{+123}_{-123}	$1.93^{+0.54}_{-0.54}$	$-0.38^{+0.04}_{-0.04}$	$276.14^{+2.19}_{-2.82}$	8,9
HD 59686 A	K2 III	4658^{+24}_{-24}	$1.90^{+0.20}_{-0.20}$	$0.15^{+0.10}_{-0.10}$	$88.15^{+0.57}_{-0.69}$	83
HD 60532	F6 V	6245^{+80}_{-80}	$1.50^{+0.09}_{-0.09}$	$-0.13^{+0.02}_{-0.02}$	$26.21^{+0.08}_{-0.05}$	6,84
HD 63765	G9 V	5449^{+11}_{-11}	$0.65^{+0.01}_{-0.01}$	$-0.15^{+0.01}_{-0.01}$	$32.51^{+0.02}_{-0.02}$	8,9
HD 6434	G2 V	5769^{+14}_{-14}	$1.10^{+0.13}_{-0.13}$	$-0.53^{+0.04}_{-0.04}$	$42.21^{+0.04}_{-0.04}$	8,9
HD 67087	F8 V	6330^{+47}_{-47}	$1.36^{+0.04}_{-0.04}$	$0.25^{+0.04}_{-0.04}$	$76.27^{+0.17}_{-0.17}$	47
HD 72892	G5 V	5688^{+100}_{-100}	$1.02^{+0.05}_{-0.05}$	$0.25^{+0.10}_{-0.10}$	$69.82^{+0.06}_{-0.08}$	35
HD 73526	G6 V	5601^{+24}_{-24}	$1.14^{+0.15}_{-0.15}$	$0.22^{+0.02}_{-0.02}$	$96.64^{+0.15}_{-0.13}$	6,9
HD 74156	G0	6068^{+44}_{-44}	$1.24^{+0.04}_{-0.04}$	$0.11^{+0.03}_{-0.03}$	$57.28^{+0.09}_{-0.10}$	85
HD 75784	G5	4917^{+44}_{-44}	$1.41^{+0.08}_{-0.08}$	$0.25^{+0.03}_{-0.03}$	$84.87^{+0.17}_{-0.19}$	7,31
HD 79181	G8 III	4877^{+9}_{-9}	$1.28^{+0.32}_{-0.28}$	$-0.28^{+0.08}_{-0.09}$	$103.04^{+0.61}_{-0.52}$	18,29
HD 80606	G8 V	5561^{+24}_{-24}	$1.15^{+0.27}_{-0.27}$	$0.35^{+0.05}_{-0.05}$	$65.90^{+0.07}_{-0.07}$	9
HD 81688	K0 III	4753^{+15}_{-15}	$1.07^{+0.27}_{-0.16}$	$-0.36^{+0.02}_{-0.02}$	$84.35^{+0.42}_{-0.40}$	27,86
HD 82943	F9 V	5935^{+124}_{-144}	$1.08^{+0.12}_{-0.15}$	$0.26^{+0.10}_{-0.10}$	$27.67^{+0.02}_{-0.02}$	18
HD 8574	F8	6064^{+14}_{-14}	$1.34^{+0.12}_{-0.12}$	$0.35^{+0.05}_{-0.05}$	$44.76^{+0.04}_{-0.04}$	5,9
HD 87646	G	5770^{+80}_{-80}	$1.12^{+0.09}_{-0.09}$	$-0.17^{+0.08}_{-0.08}$	$93.12^{+4.37}_{-4.80}$	87
HD 89744	F7 V	6291^{+44}_{-44}	$1.56^{+0.05}_{-0.05}$	$0.30^{+0.03}_{-0.03}$	$38.50^{+0.06}_{-0.07}$	8,85,88
HD 92788	G6 V	5744^{+24}_{-24}	$1.15^{+0.07}_{-0.07}$	$0.27^{+0.02}_{-0.02}$	$34.51^{+0.04}_{-0.03}$	89
HD 93083	K3 V	4995^{+50}_{-50}	$0.70^{+0.04}_{-0.04}$	$0.15^{+0.06}_{-0.06}$	$28.47^{+0.02}_{-0.01}$	90
HD 9446	G5 V	5793^{+22}_{-22}	$1.00^{+0.10}_{-0.10}$	$0.09^{+0.05}_{-0.05}$	$50.11^{+0.09}_{-0.09}$	91
HD 96063	G6 V	5125^{+15}_{-15}	$1.41^{+0.09}_{-0.09}$	$-0.20^{+0.02}_{-0.02}$	$138.41^{+0.50}_{-0.48}$	7,92,93
HD 99283	K0 III	4932^{+122}_{-122}	$1.76^{+0.31}_{-0.30}$	$-0.16^{+0.06}_{-0.10}$	$108.48^{+0.43}_{-0.41}$	18,29
HIP 105854	K2 III	4780^{+100}_{-100}	$2.10^{+0.10}_{-0.10}$	$0.31^{+0.18}_{-0.18}$	$78.80^{+0.34}_{-0.44}$	94
HIP 107773	K1 III	4945^{+100}_{-100}	$2.42^{+0.27}_{-0.27}$	$0.03^{+0.10}_{-0.10}$	$104.10^{+0.40}_{-0.49}$	95
HIP 109600	G5	5530^{+35}_{-35}	$0.87^{+0.06}_{-0.06}$	$-0.12^{+0.02}_{-0.02}$	$66.23^{+0.09}_{-0.07}$	33
HIP 12961	K5 V	3901^{+175}_{-175}	$0.69^{+0.19}_{-0.19}$	$0.10^{+0.06}_{-0.06}$	$23.41^{+0.01}_{-0.01}$	9
HIP 14810	G5	5485^{+44}_{-44}	$0.99^{+0.04}_{-0.04}$	$0.26^{+0.03}_{-0.03}$	$50.12^{+0.06}_{-0.05}$	32,96
HIP 34222	K7 V	4050^{+93}_{-145}	$0.63^{+0.06}_{-0.10}$	-0.04	$22.81^{+0.01}_{-0.01}$	18,97
HIP 5158	K5	4962^{+89}_{-89}	$0.78^{+0.02}_{-0.02}$	$0.00^{+0.10}_{-0.10}$	$51.67^{+0.05}_{-0.05}$	98
HIP 57274	K4 V	4640^{+100}_{-100}	$0.73^{+0.05}_{-0.05}$	$0.09^{+0.05}_{-0.05}$	$25.83^{+0.02}_{-0.01}$	99
HIP 5763	K6 V	4352^{+147}_{-109}	$0.68^{+0.07}_{-0.08}$	0.01	$31.97^{+0.03}_{-0.03}$	18,97
HIP 63242	G8	4830^{+100}_{-100}	$1.54^{+0.05}_{-0.05}$	$-0.31^{+0.09}_{-0.09}$	$156.17^{+0.40}_{-0.39}$	100

Table 4 continued

Table 4 (continued)

Hoststar	SpT	T_{eff}	$M_{\star}$	[Fe/H]	Distance	Ref.
		(K)	($M_{\odot}$)	(dex)	(pc)	
HIP 65407	K0	5460^{+50}_{-50}	$0.93^{+0.07}_{-0.07}$	$0.25^{+0.04}_{-0.04}$	$61.39^{+0.05}_{-0.05}$	33
HIP 67851	K0 III	4890^{+100}_{-100}	$1.63^{+0.22}_{-0.22}$	$0.00^{+0.10}_{-0.10}$	$63.86^{+0.17}_{-0.18}$	95
HIP 79431	M3 V	3191^{+1000}_{-1000}	$0.49^{+0.05}_{-0.05}$	$0.40^{+0.10}_{-0.10}$	$14.56^{+0.01}_{-0.01}$	101
HR 810	F8 V	6167^{+24}_{-24}	$1.34^{+0.13}_{-0.13}$	$0.16^{+0.04}_{-0.04}$	$17.36^{+0.01}_{-0.01}$	9,102
K2-114	...	4920^{+68}_{-69}	$0.86^{+0.04}_{-0.03}$	$0.41^{+0.04}_{-0.04}$	$469.66^{+4.67}_{-4.46}$	103
K2-115	G4	5657^{+60}_{-60}	$0.95^{+0.02}_{-0.02}$	$-0.10^{+0.05}_{-0.05}$	$400.70^{+3.92}_{-2.45}$	104
K2-139	K0 V	5370^{+68}_{-68}	$0.96^{+0.02}_{-0.02}$	$0.24^{+0.05}_{-0.05}$	$152.09^{+0.31}_{-0.28}$	104
K2-232	G0	6154^{+60}_{-60}	$1.19^{+0.03}_{-0.03}$	$0.10^{+0.04}_{-0.04}$	$129.22^{+0.29}_{-0.30}$	105
K2-261	G7 V	5445^{+77}_{-76}	$1.09^{+0.05}_{-0.05}$	$0.36^{+0.06}_{-0.06}$	$213.21^{+0.94}_{-0.75}$	103
K2-287	...	5695^{+58}_{-58}	$1.06^{+0.02}_{-0.02}$	$0.20^{+0.04}_{-0.04}$	$155.85^{+0.49}_{-0.62}$	106
K2-290	...	6302^{+120}_{-120}	$1.19^{+0.07}_{-0.08}$	$-0.06^{+0.10}_{-0.10}$	$267.11^{+1.60}_{-1.48}$	107
K2-329	...	5282^{+40}_{-39}	$0.90^{+0.05}_{-0.05}$	$0.10^{+0.07}_{-0.07}$	$231.89^{+0.60}_{-0.55}$	108
K2-99	F7	6217^{+78}_{-78}	$1.63^{+0.04}_{-0.04}$	$0.21^{+0.06}_{-0.06}$	$508.41^{+4.50}_{-4.90}$	104
Kepler-117	F8 V	6150^{+110}_{-110}	$1.13^{+0.13}_{-0.02}$	$-0.04^{+0.10}_{-0.10}$	$1430.42^{+22.74}_{-27.46}$	109
Kepler-1514	F7 V	6145^{+99}_{-80}	$1.20^{+0.07}_{-0.06}$	$0.12^{+0.08}_{-0.07}$	$396.49^{+1.53}_{-1.52}$	110
Kepler-419	...	6430^{+79}_{-79}	$1.39^{+0.08}_{-0.07}$	$0.18^{+0.07}_{-0.07}$	$988.18^{+11.79}_{-12.34}$	111
Kepler-424	...	5460^{+81}_{-81}	$1.01^{+0.05}_{-0.05}$	$0.44^{+0.14}_{-0.14}$	$690.75^{+7.60}_{-6.14}$	112
Kepler-427	G2 V	5800^{+70}_{-70}	$0.96^{+0.06}_{-0.06}$	$-0.19^{+0.07}_{-0.07}$	$1000.94^{+10.14}_{-12.63}$	113
Kepler-432	G5	4995^{+78}_{-78}	$1.32^{+0.10}_{-0.07}$	$-0.03^{+0.01}_{-0.01}$	$847.04^{+5.49}_{-7.69}$	114
Kepler-434	F9	5977^{+95}_{-95}	$1.20^{+0.09}_{-0.09}$	$0.25^{+0.14}_{-0.14}$	$1199.59^{+28.40}_{-22.11}$	115
Kepler-643	K1 IV	4908^{+45}_{-47}	$1.00^{+0.07}_{-0.04}$	$0.13^{+0.08}_{-0.11}$	$1059.24^{+12.62}_{-11.42}$	116
Kepler-65	F6 IV	6220^{+44}_{-43}	$1.25^{+0.02}_{-0.02}$	$0.17^{+0.06}_{-0.06}$	$298.75^{+1.07}_{-1.23}$	117,118
KOI-1257	G5 V	5520^{+80}_{-80}	$0.99^{+0.05}_{-0.05}$	$0.27^{+0.09}_{-0.09}$	$2579.25^{+1496.57}_{-834.32}$	119
KOI-142	G8 IV	5466^{+60}_{-60}	$0.99^{+0.02}_{-0.02}$	$0.27^{+0.06}_{-0.06}$	$373.71^{+1.74}_{-1.45}$	120
KOI-3680	...	5830^{+100}_{-100}	$1.01^{+0.07}_{-0.16}$	$0.16^{+0.07}_{-0.07}$	$939.69^{+14.07}_{-16.06}$	121
KOI-94	...	6182^{+58}_{-58}	$1.28^{+0.05}_{-0.05}$	$0.02^{+0.00}_{-0.00}$	$471.03^{+1.79}_{-1.87}$	122
mu Leo	K2 III	4538^{+28}_{-28}	$1.50^{+0.10}_{-0.10}$	$0.36^{+0.05}_{-0.05}$	$38.27^{+0.23}_{-0.26}$	123
NGC 2682 Sand 364	K3 III	4284^{+9}_{-9}	$1.35^{+0.05}_{-0.05}$	$-0.02^{+0.04}_{-0.04}$	$814.52^{+13.25}_{-11.58}$	9,124,125
NGTS-11	K	5050^{+80}_{-80}	$0.86^{+0.03}_{-0.03}$	$0.22^{+0.08}_{-0.08}$	$188.26^{+0.68}_{-0.61}$	126
ome Ser	G8 III	4770^{+10}_{-10}	$2.17^{+0.21}_{-0.29}$	$-0.24^{+0.02}_{-0.02}$	$76.15^{+0.42}_{-0.38}$	127
omi CrB	K0 III	4749^{+20}_{-20}	$2.13^{+0.23}_{-0.23}$	$-0.23^{+0.03}_{-0.03}$	$83.75^{+0.43}_{-0.37}$	60
PH2	F9	5629^{+42}_{-45}	$0.94^{+0.02}_{-0.02}$	$-0.08^{+0.03}_{-0.03}$	$341.30^{+1.48}_{-1.15}$	128
rho CrB	G0 V	5627^{+54}_{-54}	$0.89^{+0.03}_{-0.03}$	$-0.31^{+0.05}_{-0.05}$	$17.50^{+0.01}_{-0.01}$	129
TAP 26	K7	4620^{+50}_{-50}	$1.04^{+0.10}_{-0.10}$	$-0.18^{+0.03}_{-0.03}$	$121.14^{+0.29}_{-0.20}$	130,131
TIC 237913194	G3	5788^{+80}_{-80}	$1.03^{+0.06}_{-0.06}$	$0.14^{+0.05}_{-0.05}$	$305.29^{+0.99}_{-0.85}$	132
TOI-1478	...	5597^{+83}_{-82}	$0.95^{+0.06}_{-0.04}$	$0.08^{+0.07}_{-0.07}$	$151.79^{+0.43}_{-0.30}$	133
TOI-1670	F7 V	6170^{+61}_{-61}	$1.21^{+0.02}_{-0.02}$	$0.09^{+0.07}_{-0.07}$	$165.72^{+0.32}_{-0.38}$	134
TOI-1899	M0	3841^{+54}_{-45}	$0.63^{+0.03}_{-0.03}$	$0.31^{+0.11}_{-0.12}$	$127.95^{+0.19}_{-0.15}$	135
TOI-201	F6 V	6394^{+75}_{-75}	$1.32^{+0.03}_{-0.03}$	$0.24^{+0.04}_{-0.04}$	$112.08^{+0.17}_{-0.20}$	136
TOI-2180	G5	5695^{+58}_{-60}	$1.11^{+0.05}_{-0.05}$	$0.25^{+0.06}_{-0.06}$	$116.34^{+0.14}_{-0.17}$	137
TOI-2202	K8 V	5144^{+50}_{-50}	$0.82^{+0.03}_{-0.02}$	$0.04^{+0.05}_{-0.05}$	$235.89^{+0.98}_{-0.83}$	138
TOI-3362	G5	6532^{+88}_{-86}	$1.45^{+0.07}_{-0.07}$	$0.02^{+0.06}_{-0.05}$	$356.95^{+1.78}_{-1.53}$	139
TOI-481	G	5735^{+72}_{-72}	$1.14^{+0.02}_{-0.01}$	$0.26^{+0.05}_{-0.05}$	$177.41^{+0.34}_{-0.35}$	140
TOI-558	F V	6466^{+95}_{-93}	$1.35^{+0.06}_{-0.07}$	$-0.00^{+0.06}_{-0.06}$	$401.43^{+1.99}_{-2.01}$	141
TOI-677	F8	6295^{+77}_{-77}	$1.18^{+0.06}_{-0.06}$	$0.00^{+0.05}_{-0.05}$	$141.66^{+0.26}_{-0.27}$	142
TOI-892	F	6261^{+80}_{-80}	$1.28^{+0.03}_{-0.02}$	$0.24^{+0.05}_{-0.05}$	$330.94^{+2.27}_{-1.99}$	140
TYC 0434-04538-1	...	4679^{+10}_{-10}	$1.04^{+0.15}_{-0.15}$	$-0.38^{+0.06}_{-0.06}$	$624.16^{+6.20}_{-6.55}$	143

Table 4 continued

Table 4 (continued)

Hoststar	SpT	T_{eff}	$M_{\star}$	[Fe/H]	Distance	Ref.
		(K)	($M_{\odot}$)	(dex)	(pc)	
TYC 1422-614-1	G5	4806 $^{+45}_{-45}$	1.15 $^{+0.18}_{-0.18}$	-0.20 $^{+0.08}_{-0.08}$	728.38 $^{+11.00}_{-11.42}$	144
TYC 3667-1280-1	...	5130 $^{+24}_{-24}$	1.87 $^{+0.17}_{-0.17}$	-0.08 $^{+0.05}_{-0.05}$	475.44 $^{+2.69}_{-2.41}$	145
TYC 4282-00605-1	K	4300 $^{+50}_{-50}$	0.97 $^{+0.03}_{-0.03}$	-0.07 $^{+0.16}_{-0.16}$	469.04 $^{+2.59}_{-2.19}$	146
ups And	F8 V	6156 $^{+112}_{-112}$	1.30 $^{+0.04}_{-0.04}$	0.11 $^{+0.02}_{-0.02}$	13.47 $^{+0.04}_{-0.04}$	5,43,147
WASP-117	F9	6040 $^{+90}_{-90}$	1.29 $^{+0.30}_{-0.30}$	-0.11 $^{+0.14}_{-0.14}$	157.48 $^{+0.35}_{-0.35}$	9,148
WASP-130	G6	5625 $^{+90}_{-90}$	1.04 $^{+0.04}_{-0.04}$	0.26 $^{+0.10}_{-0.10}$	173.79 $^{+0.49}_{-0.60}$	149
WASP-148	G	5460 $^{+130}_{-130}$	1.00 $^{+0.08}_{-0.08}$	0.11 $^{+0.08}_{-0.08}$	247.71 $^{+0.56}_{-0.55}$	150
xi Aql	G9.5 III	4780 $^{+30}_{-30}$	1.74 $^{+0.21}_{-0.28}$	-0.20 $^{+0.04}_{-0.04}$	57.02 $^{+0.27}_{-0.30}$	26,27
XO-2 S	G9 V	5399 $^{+55}_{-55}$	0.98 $^{+0.05}_{-0.05}$	0.39 $^{+0.05}_{-0.05}$	149.07 $^{+0.34}_{-0.29}$	151

NOTE—In the event where a value is not reported in a discovery paper or the NASA Exoplanet Archive, we use an updated value and report the reference. We note that all reported distance measurements are trigonometric distances generated from Gaia EDR3 parallaxes (Bailer-Jones et al. 2021).

¹We adopt [Fe/H] values from Gaia DR3 for HIP 34222 and HIP 5763.

²The bulk metallicity value (M/H) is adopted for TOI-3362.

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Table 5. Additional details of each planetary system including signals from long-term companions.

Planet	# Planets	N_{data}	$\bar{\sigma}_{RV}$	Δt	N_{inst}	χ^2_ν	ΔBIC_K	ΔBIC_{L-K}	ΔBIC_{Q-K}	$\dot{\gamma}$	$\ddot{\gamma}$
			(m s ⁻¹)	(years)						(m s ⁻¹ yr ⁻¹)	(m s ⁻¹ yr ⁻²)
14 And b	1	34	5.86	4.07	1	0.96	0.00	-8.41	-8.33	...	...
24 Boo b	1	149	6.70	13.15	1	0.98	0.00	8329.69	8150.76	...	...
4 UMa b	1	60	6.80	2.43	1	0.98	0.00	-205.76	-197.83	-11.89 (0.83, 0.75)	...
55 Cnc b	5	783	1.67	25.33	7	1.00	...	...	...	...	...
70 Vir b	1	345	4.36	29.05	3	0.95	0.00	-83.94	-36.84	-0.42 (0.01, 0.01)	...
8 UMi b	1	21	13.76	5.17	1	1.04	0.00	4.97	-48.32	12.05 (1.69, 1.68)	-2.51 (0.31, 0.33)
91 Aqr b	1	160	6.05	12.31	2	0.99	0.00	61.50	249.36	...	...
BD+14 4559 b	1	43	8.33	5.04	1	1.02	0.00	-1304.77	-1397.08	-24.25 (1.31, 1.26)	3.49 (0.35, 0.33)
BD+15 2375 b	1	47	4.64	3.46	2	0.96	0.00	-102.98	-50.17	-1.04 (0.37, 0.39)	...
BD+15 2940 b	1	66	6.90	11.23	2	0.95	0.00	565.06	697.43	...	...
BD+45 564 b	1	16	2.85	17.15	1	0.93	0.00	1787.89	1646.38	...	...
BD+55 362 b	1	45	3.99	8.36	2	0.86	0.00	-12190.20	-14307.43	-15.25 (0.99, 0.95)	1.36 (0.11, 0.11)
BD-08 2823 c	2	83	1.54	11.08	1	0.99	...	...	...	...	...
CoRoT-10 b	1	19	28.89	1.20	1	0.97	0.00	3.28	9.30	...	...
CoRoT-9 b	1	28	9.25	4.89	1	0.70	0.00	-1.28	5.56	...	...
GJ 1148 b	2	89	2.04	17.28	2	1.04	...	...	...	...	...
GJ 3021 b	1	49	10.84	1.20	1	1.00	0.00	4.93	-113.60	-88.81 (8.48, 8.18)	73.43 (6.49, 6.61)
GJ 3512 b	1	288	5.71	2.37	1	1.11	0.00	-70666.93	-105497.95	-6.87 (0.08, 0.09)	7.99 (0.03, 0.04)
GJ 86 b	1	109	4.44	7.66	2	1.04	0.00	-9639.72	-11832.81	-113.77 (0.23, 0.22)	2.33 (0.02, 0.03)
GJ 876 b	4	439	7.82	21.99	6	0.98	...	...	...	...	...
GJ 876 c	4	439	7.82	21.99	6	0.98	...	...	...	...	...
HAT-P-15 b	1	23	2.70	2.35	1	0.96	0.00	162.85	240.15	...	...
HAT-P-17 b	2	52	1.83	5.85	1	0.97	...	...	...	...	...
HATS-17 b	1	21	10.90	0.32	3	0.78	0.00	37187.29	26499.33	...	...
HD 100655 b	1	45	6.72	4.38	2	1.08	0.00	15.52	14.29	...	...
HD 104985 b	1	52	6.59	6.12	1	0.98	0.00	-31.60	3.16	-1.60 (0.29, 0.28)	...
HD 109246 b	1	58	5.98	3.06	1	0.98	0.00	886.50	-0.46	...	...
HD 10975 b	1	98	4.03	13.91	1	0.98	0.00	95.87	169.47	...	...
HD 113337 b	1	266	11.16	6.00	2	50.71	0.00	304.05	1632.25	-61.25 (0.27, 0.17)	-16.58 (0.09, 0.08)
HD 11506 c	2	113	1.69	9.79	1	11.67	...	...	...	-4.44 (0.15, 0.16)	-0.27 (0.02, 0.02)
HD 121504 b	1	100	6.45	4.10	1	1.01	0.00	-375.23	-416.83	5.46 (0.50, 0.51)	-0.72 (0.12, 0.12)
HD 124330 b	1	60	2.34	3.95	1	1.00	0.00	559.99	457.90	...	...
HD 12484 b	1	65	9.51	2.36	1	0.99	0.00	-556.82	-586.40	75.53 (5.77, 5.47)	-12.69 (2.31, 2.26)
HD 12648 b	1	28	14.90	4.63	1	0.94	0.00	4635.30	1530.65	...	...
HD 12661 b	2	242	3.53	15.90	2	0.99	...	...	...	...	...
HD 128356 b	1	96	9.05	15.93	3	0.92	0.00	3679.55	3438.57	...	...
HD 130322 b	1	205	9.24	18.38	5	0.98	0.00	104.23	126.99	...	...
HD 134987 b	2	138	1.26	13.24	2	1.02	...	...	...	...	...
HD 13908 b	2	75	6.25	4.10	2	0.94	...	...	...	...	...
HD 1397 b	1	151	5.06	0.29	5	0.97	0.00	743.00	701.00	...	...
HD 141399 b	4	230	3.61	11.72	4	0.99	...	...	...	...	...
HD 141399 c	4	230	3.61	11.72	4	0.99	...	...	...	...	...
HD 142 b	2	82	3.22	13.87	1	1.00	...	...	...	...	...
HD 145377 b	1	64	2.31	3.03	1	0.98	0.00	-8.19	-1318.19	-27.18 (0.72, 0.73)	9.36 (0.24, 0.23)
HD 145457 b	1	26	6.27	3.80	2	0.92	0.00	66.98	65.65	...	...
HD 147018 b	2	101	4.01	6.37	1	0.98	...	...	...	...	...
HD 147873 b	2	75	7.58	10.94	3	1.04	...	...	...	...	...
HD 148164 b	2	46	1.84	12.20	1	1.06	...	...	...	...	...
HD 148427 b	1	102	8.13	21.78	2	0.93	0.00	-165.17	1212.28	-5.07 (0.09, 0.09)	...
HD 154672 b	1	71	6.02	10.11	3	0.96	0.00	-320.40	-319.58	-0.60 (0.07, 0.08)	...
HD 155193 b	1	78	2.88	7.71	1	1.01	0.00	-465.91	-532.48	-0.17 (0.18, 0.19)	0.19 (0.02, 0.02)
HD 155358 b	2	122	5.32	10.19	1	1.01	...	...	...	...	...
HD 156279 b	2	88	1.55	11.57	2	0.97	...	...	...	...	...
HD 156846 b	1	95	3.93	7.45	3	1.07	0.00	516.90	449.68	...	...
HD 159243 b	2	51	6.08	1.58	2	0.95	...	...	...	...	...
HD 159243 c	2	51	6.08	1.58	2	0.95	...	...	...	...	...
HD 159868 c	2	181	1.08	14.41	2	0.99	...	...	...	...	...

Table 5 *continued*

Table 5 (continued)

Planet	# Planets	N_{data}	$\bar{\sigma}_{RV}$	Δt	N_{inst}	χ^2_ν	ΔBIC_K	ΔBIC_{L-K}	ΔBIC_{Q-K}	$\dot{\gamma}$	$\ddot{\gamma}$
			(m s ⁻¹)	(years)						(m s ⁻¹ yr ⁻¹)	(m s ⁻¹ yr ⁻²)
HD 160691 e	4	171	2.06	8.14	3	0.98	...	...	...	...	...
HD 161178 b	1	154	4.03	16.76	1	0.99	0.00	-8.17	-2.16	...	...
HD 163607 b	2	222	1.16	13.21	1	3.76	...	...	...	2.79 (0.01, 0.01)	...
HD 164509 b	1	123	2.74	16.83	2	0.98	0.00	-3031.54	1831.90	-3.52 (0.03, 0.04)	...
HD 1666 b	1	99	9.65	8.66	3	1.01	0.00	1793.33	1872.63	...	...
HD 168443 b	2	152	1.97	14.67	2	11.22	...	...	...	-3.16 (0.01, 0.01)	...
HD 169830 b	2	228	5.05	15.37	2	1.24	...	...	...	...	...
HD 17156 b	1	62	3.49	1.89	3	0.94	0.00	-471.34	-779.97	2.50 (1.37, 1.41)	-5.64 (1.31, 1.30)
HD 173416 b	1	52	15.12	3.50	2	0.90	0.00	86.61	12.51	...	...
HD 175541 b	1	85	1.42	20.02	1	1.00	0.00	11.59	-9.49	...	...
HD 178911 B b	1	125	6.49	14.89	3	0.92	0.00	0.41	69.26	...	...
HD 180053 b	1	109	1.32	8.19	1	0.99	0.00	156.47	475.49	...	...
HD 191939 e	5	182	2.70	1.25	2	5.45	...	...	...	44.96 (1.14, 0.70)	-7.77 (0.04, 0.63)
HD 192263 b	1	217	6.58	13.14	2	3.54	0.00	299.70	170.52	...	...
HD 192699 b	1	34	5.15	2.78	1	0.94	0.00	706.19	671.33	...	...
HD 195019 b	1	191	8.06	15.42	3	1.18	0.00	-2786.24	21775.70	3.95 (0.07, 0.07)	...
HD 205739 b	1	68	17.53	18.84	2	0.90	0.00	-2212.20	-1948.77	21.92 (0.36, 0.34)	...
HD 207832 b	2	176	4.50	18.80	2	1.00	...	...	...	...	...
HD 208487 b	1	55	11.09	24.67	2	0.98	0.00	332.66	1473.83	...	...
HD 208897 b	1	106	12.83	7.59	2	1.00	0.00	-1985.30	-1831.30	5.28 (0.11, 0.11)	...
HD 210702 b	1	80	3.55	12.40	3	0.96	0.00	156.59	36.75	...	...
HD 211403 b	1	68	32.67	18.14	5	0.97	0.00	-93.02	-1064.67	-81.46 (8.97, 10.08)	3.96 (0.49, 0.43)
HD 216536 b	1	62	19.27	17.38	3	0.96	0.00	420.61	113.35	...	...
HD 216770 b	1	57	8.40	22.05	2	0.81	0.00	43.31	1414.57	...	...
HD 219139 b	1	126	4.76	18.80	2	0.99	0.00	549.36	428.78	...	...
HD 220842 b	1	42	5.31	2.73	1	0.76	0.00	-9675.81	-9835.45	-34.38 (0.52, 0.53)	-0.43 (0.18, 0.19)
HD 221416 b	1	107	4.05	0.16	5	0.83	0.00	-1.95	-0.71	...	...
HD 224693 b	1	40	1.54	12.07	2	1.00	0.00	15.16	-75.09	-3.11 (0.48, 0.47)	0.22 (0.03, 0.04)
HD 231701 b	1	29	2.46	11.00	1	1.06	0.00	56.27	80.56	...	...
HD 233604 b	1	33	9.03	8.09	1	0.95	0.00	367.68	62.25	...	...
HD 27894 b	3	55	1.19	13.00	1	0.96	...	...	...	...	...
HD 2952 b	1	63	3.92	8.92	1	0.97	0.00	150.09	313.87	...	...
HD 32518 b	1	58	9.50	3.33	1	1.03	0.00	761.44	618.73	...	...
HD 33142 b	2	82	1.44	8.25	1	1.02	...	...	...	...	...
HD 332231 b	1	94	4.61	0.40	3	1.01	0.00	-1060.04	57.55	3.71 (1.12, 1.12)	...
HD 33283 b	1	74	10.00	19.31	2	1.04	0.00	74.25	76.73	...	...
HD 35759 b	1	71	5.04	3.45	1	0.98	0.00	-189.20	-774.90	-4.51 (0.41, 0.40)	2.02 (0.12, 0.12)
HD 360 b	1	102	4.08	13.91	1	0.99	0.00	-2735.10	-3377.92	8.55 (0.22, 0.23)	-0.39 (0.02, 0.01)
HD 37124 b	3	66	1.50	13.17	1	0.99	...	...	...	...	...
HD 37605 b	2	141	4.46	12.87	2	1.02	...	...	...	...	...
HD 38283 b	1	89	9.91	24.70	2	0.95	0.00	905.45	875.95	...	...
HD 38529 b	2	291	3.73	19.86	4	1.05	...	...	...	1.82 (0.09, 0.10)	...
HD 40979 b	1	167	11.16	15.90	3	0.97	0.00	-3.98	-4.60	...	...
HD 4313 b	1	46	1.70	9.41	1	0.98	0.00	335.24	961.20	...	...
HD 43197 b	1	33	1.53	5.32	1	0.97	0.00	-2.24	-41.08	1.43 (0.22, 0.22)	-0.20 (0.03, 0.03)
HD 43691 b	1	59	6.90	13.01	3	0.96	0.00	9.39	-3.31	...	...
HD 45364 c	2	58	0.68	4.33	1	1.09	...	...	...	...	...
HD 45652 b	1	58	6.01	9.87	4	1.21	0.00	-68.59	-53.00	3.07 (0.27, 0.27)	...
HD 4732 b	2	67	4.50	7.78	2	0.96	...	...	...	...	...
HD 47366 b	2	161	9.87	7.31	3	0.96	...	...	...	...	...
HD 52265 b	1	137	5.46	15.98	2	0.71	0.00	1023.81	321.80	...	...
HD 5583 b	1	36	3.76	8.83	2	0.94	0.00	-8.26	67.69	...	...
HD 5891 b	1	54	1.37	3.81	1	0.98	0.00	-702.00	-470.42	-8.07 (0.75, 0.76)	...
HD 59686 A b	1	88	5.81	12.08	1	1.01	...	...	...	...	...
HD 60532 b	2	147	1.07	2.36	1	0.99	...	...	...	...	...
HD 63765 b	1	100	2.48	10.06	3	0.96	0.00	21.54	11.02	...	...
HD 6434 b	1	137	7.62	14.91	2	0.98	0.00	52.92	51.08	...	...
HD 67087 b	2	78	16.23	18.26	4	0.73	...	...	...	...	...
HD 72892 b	1	31	10.39	4.07	1	0.67	0.00	1948.17	1924.32	...	...
HD 73526 b	2	56	3.08	14.31	2	1.06	...	...	...	...	...

Table 5 continued

Table 5 (continued)

Planet	# Planets	N_{data}	$\bar{\sigma}_{RV}$	Δt	N_{inst}	χ^2_{ν}	ΔBIC_K	ΔBIC_{L-K}	ΔBIC_{Q-K}	$\dot{\gamma}$	$\ddot{\gamma}$
				(m s ⁻¹) (years)						(m s ⁻¹ yr ⁻¹)	(m s ⁻¹ yr ⁻²)
HD 74156 b	2	229	8.08	15.92	4	0.94	...	...	...	...	...
HD 75784 b	2	62	2.02	19.21	3	0.95	...	...	...	...	...
HD 79181 b	1	164	5.27	16.72	1	0.98	0.00	1.84	90.58	...	...
HD 80606 b	1	182	7.15	14.15	3	0.98	0.00	-2.52	937.71	...	...
HD 81688 b	1	81	6.12	5.32	1	0.99	0.00	-2.50	-5.21	...	...
HD 82943 c	2	209	2.98	12.36	2	1.00	...	...	...	...	...
HD 8574 b	1	101	9.54	9.88	3	0.87	0.00	-183.23	-43.06	4.02 (0.19, 0.18)	...
HD 87646 b	1	246	102.82	6.75	5	2.79	...	...	...	...	...
HD 89744 b	1	237	8.60	14.20	4	0.99	0.00	5.11	-1493.79	16.32 (0.18, 0.18)	-0.72 (0.01, 0.01)
HD 92788 b	2	224	3.30	21.09	4	1.03	...	...	...	...	...
HD 93083 b	1	16	1.10	1.05	1	0.67	0.00	-334.00	-1618.13	7.51 (1.93, 1.83)	-14.39 (2.00, 2.13)
HD 9446 b	2	79	6.57	2.33	1	0.98	...	...	...	...	...
HD 9446 c	2	79	6.57	2.33	1	0.98	...	...	...	...	...
HD 96063 b	1	22	1.41	6.63	1	0.96	0.00	34.01	67.31	...	...
HD 99283 b	1	82	3.76	13.82	1	0.98	0.00	-0.45	-9.57	...	...
HIP 105854 b	1	49	7.30	3.50	2	0.93	0.00	-18334.78	-18182.05	17.04 (0.55, 0.54)	...
HIP 107773 b	1	63	6.02	4.58	2	0.94	0.00	-836.32	-812.79	13.49 (0.35, 0.36)	...
HIP 109600 b	1	34	6.03	6.83	2	0.66	0.00	11.13	4.42	...	...
HIP 12961 b	1	46	2.97	6.09	1	1.06	0.00	-267.95	-3493.26	-4.02 (0.30, 0.32)	0.55 (0.05, 0.04)
HIP 14810 c	3	85	0.82	11.15	1	0.99	...	...	...	...	...
HIP 34222 b	1	19	16.61	2.01	1	0.64	0.00	8394.34	10146.56	...	...
HIP 5158 b	2	85	8.16	18.20	2	0.96	...	...	...	-14.34 (0.15, 0.16)	4.46 (0.03, 0.03)
HIP 57274 c	3	110	1.32	5.54	1	1.00	...	...	...	...	...
HIP 5763 b	1	19	12.38	2.07	1	0.99	0.00	1956.30	7478.21	...	...
HIP 63242 b	1	15	7.56	2.81	1	0.95	0.00	1058.80	2403.79	...	...
HIP 65407 b	2	71	4.80	11.27	3	0.97	...	...	...	...	...
HIP 65407 c	2	71	4.80	11.27	3	0.97	...	...	...	...	...
HIP 67851 b	2	94	5.46	10.99	3	0.98	...	...	...	...	...
HIP 79431 b	1	27	2.01	4.24	1	0.97	0.00	-4389.08	4869.03	13.67 (0.89, 0.91)	...
HR 810 b	1	157	16.10	29.89	4	0.91	0.00	459.31	159.31	...	...
K2-114 b	1	5	6.50	1.27	1	0.62	0.00	3.23	6.44	...	...
K2-115 b	1	7	7.19	1.18	1	0.38	0.00	613309.93	2708.80	...	...
K2-139 b	1	19	9.18	0.15	3	0.61	0.00	-52.23	-61.14	-233.00 (16.29, 16.96)	...
K2-232 b	1	42	6.27	0.31	4	1.07	0.00	-2.12	49.03	...	...
K2-261 b	1	29	4.57	0.38	3	0.71	0.00	3230.27	387.01	...	...
K2-287 b	1	77	6.53	0.45	2	0.98	0.00	2.44	2.95	...	...
K2-290 c	2	33	6.66	0.52	2	17.54	...	...	...	...	...
K2-329 b	1	49	7.47	0.97	3	0.86	0.00	7.09	5.47	...	...
K2-99 b	2	93	7.74	3.14	5	0.87	...	...	...	...	...
KOI-1257 b	1	41	22.74	1.29	2	0.84	0.00	18723.07	3022.96	493.09 (1.05, 0.71)	-109.85 (3.72, 4.09)
KOI-142 c	3	55	4.39	6.68	2	0.97	...	...	...	...	...
KOI-3680 b	1	25	21.84	2.08	1	0.99	0.00	3069.51	4536.58	...	...
KOI-94 d	4	26	4.99	2.74	1	0.97	...	...	...	...	...
Kepler-117 c	2	14	38.29	1.36	1	0.44	...	...	...	...	...
Kepler-1514 b	2	11	4.15	1.53	1	0.67	...	...	...	...	...
Kepler-419 b	2	20	11.59	1.38	1	0.97	...	...	...	-349.88 (30.53, 29.63)	269.02 (20.40, 19.46)
Kepler-424 c	2	27	36.26	1.79	1	0.30	...	...	...	...	...
Kepler-427 b	1	11	13.09	2.03	2	0.05	0.00	-4.87	4.50	...	...
Kepler-432 b	2	117	39.94	4.97	3	1.08	...	...	...	...	...
Kepler-434 b	1	11	49.55	0.91	1	0.05	0.00	1225.77	-5406.46	-87.39 (72.02, 73.87)	187.63 (61.66, 60.46)
Kepler-643 b	1	12	4.62	0.28	1	0.92	0.00	156.88	73473.96	...	...
Kepler-65 e	4	70	3.38	6.10	1	0.99	...	...	...	...	...
NGC 2682 Sand 364 b	1	50	7.54	20.21	6	0.88	0.00	-17305.41	10229.20	2.75 (0.67, 0.65)	...
NGTS-11 b	1	18	14.06	0.31	3	0.93	0.00	1989.01	2079.83	...	...
PH2 b	1	40	6.01	2.96	3	0.92	0.00	1672.21	-284.39	-16.73 (1.21, 1.25)	3.70 (0.39, 0.38)
TAP 26 b	1	29	76.86	0.20	1	0.98	0.00	615.90	1638.71	...	...
TIC 237913194 b	1	25	8.36	0.68	1	0.97	0.00	15948.73	10945.51	...	...
TOI-1478 b	1	66	20.35	1.04	5	0.84	0.00	-0.28	44.19	...	...
TOI-1670 c	2	56	21.54	1.26	2	1.01	...	...	...	...	...
TOI-1899 b	1	15	20.06	0.16	1	0.39	0.00	-3093.93	-1538.16	19.03 (34.62, 35.93)	...

Table 5 continued

Table 5 (continued)

Planet	# Planets	N_{data}	$\bar{\sigma}_{RV}$	Δt	N_{inst}	χ^2_{ν}	ΔBIC_K	ΔBIC_{L-K}	ΔBIC_{Q-K}	$\dot{\gamma}$	$\ddot{\gamma}$
			(m s ⁻¹)	(years)						(m s ⁻¹ yr ⁻¹)	(m s ⁻¹ yr ⁻²)
TOI-201 b	1	163	11.29	1.28	4	0.97	0.00	-2985.43	-3371.48	-1.05 (0.79, 2.75)	43.86 (2.20, 2.34)
TOI-2180 b	1	99	3.62	1.48	2	0.99	0.00	-4426.42	-5706.74	-87.13 (0.86, 0.84)	29.19 (0.55, 0.59)
TOI-2202 b	2	49	9.79	0.98	3	0.97	...	...	...	...	...
TOI-2202 c	2	49	9.79	0.98	3	0.97	...	...	...	...	...
TOI-3362 b	1	30	172.22	0.12	2	0.74	0.00	306294.88	276011.67	...	...
TOI-481 b	1	113	29.79	0.11	4	0.81	0.00	5231.30	172.95	...	...
TOI-558 b	1	14	5.19	0.08	1	0.95	0.00	60616.94	13928.19	...	...
TOI-677 b	1	87	15.10	0.17	5	0.96	0.00	12748.83	13687.41	...	...
TOI-892 b	1	29	25.47	0.43	2	0.83	0.00	-1183.71	22606.99	-42.54 (10.23, 10.95)	...
TYC 0434-04538-1 b	1	29	5.99	9.72	2	0.92	0.00	-3919.75	-6194.30	11.59 (2.58, 2.54)	-1.59 (0.21, 0.20)
TYC 1422-614-1 b	2	86	6.50	10.00	2	0.97	...	...	...	...	...
TYC 3667-1280-1 b	1	35	5.03	7.79	2	0.95	0.00	18128.41	105186.30	...	...
TYC 4282-00605-1 b	1	54	3.81	3.29	2	0.98	0.00	714.82	-16629.04	61.04 (2.01, 1.99)	-19.29 (0.63, 0.64)
WASP-117 b	1	118	4.64	1.86	2	0.98	0.00	16.29	-453.96	-14.15 (2.22, 2.11)	6.91 (0.85, 0.89)
WASP-130 b	1	27	8.49	2.02	1	0.95	0.00	9333.80	497.72	...	...
WASP-148 c	2	116	9.77	4.14	1	1.00	...	...	...	...	...
XO-2 S c	2	63	2.70	1.05	1	1.00	...	...	...	...	...
mu Leo b	1	103	6.09	9.48	1	1.00	0.00	559.48	-1801.60	8.02 (0.17, 0.18)	-0.85 (0.02, 0.02)
ome Ser b	1	123	3.88	11.90	1	0.99	0.00	-17.12	284.44	-0.51 (0.03, 0.03)	...
omi CrB b	1	85	4.77	9.59	1	0.98	0.00	53.25	8.50	...	...
rho CrB b	2	675	1.73	9.21	2	1.00	...	...	...	...	...
ups And c	3	475	7.70	13.66	4	0.98	...	...	...	...	...
xi Aql b	1	26	6.53	3.15	1	0.94	0.00	1.43	14.58	...	...

NOTE—The number of planets in column 2 details the number of planets in the system not the number of planets fit. For single planet systems we present BIC values for all 3 models (Keplerian (ΔBIC_K), Keplerian+Linear (ΔBIC_{L-K}), or Keplerian+Quadratic (ΔBIC_{Q-K})). Reduced χ^2 values are reported for every system. The number of parameters for each system can be computed as $(5 \times N_P) + (2 \times N_i) + \text{acceleration terms}$, where N_P is the number of planets and N_i is the number of instruments in the model. The mean error on the RV's ($\bar{\sigma}_{RV}$), time baseline of the RVs (Δt), and number of RVs (N_{data}) are also presented. For systems where an acceleration is favored, the MAP value is reported along with the upper and lower bounds of the 68.3% highest density interval regions of the posterior probability distribution.

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This research has made use of the VizieR catalog access tool, CDS, Strasbourg, France ([doi:10.26093/cds/vizieR](https://cds.u-strasbourg.fr/vizieR)). The original description of

the VizieR service was published in 2000, A&AS 143, 23. This work has made use of data from the European Space Agency (ESA) mission *Gaia* (<https://www.cosmos.esa.int/gaia>), processed by the *Gaia* Data Processing and Analysis Consortium (DPAC, <https://www.cosmos.esa.int/web/gaia/dpac/consortium>). Funding for the DPAC has been provided by national institutions, in particular the institutions participating in the *Gaia* Multilateral Agreement.

Facility: HET (HPF) and MINERVA-Australis

Software: `radvel` (Fulton et al. 2018), `numpy` (Harris et al. 2020), `matplotlib` (Hunter 2007), `corner` (Foreman-Mackey 2016), `emcee` (Foreman-Mackey et al. 2013), `ArviZ` (Kumar et al. 2019), and `pandas` (pandas development team 2020)

APPENDIX

A. NEW RADIAL VELOCITY OBSERVATIONS OF WARM JUPITER HOSTS

Here we report the relative radial velocity observations of the warm Jupiter host stars observed with HPF and MINERVA-Australis. All RV tables for targets observed with HPF and MINERVA-Australis can be found in machine-readable format (see Table 6).

Table 6. New Relative Radial Velocities of BD+15 2940

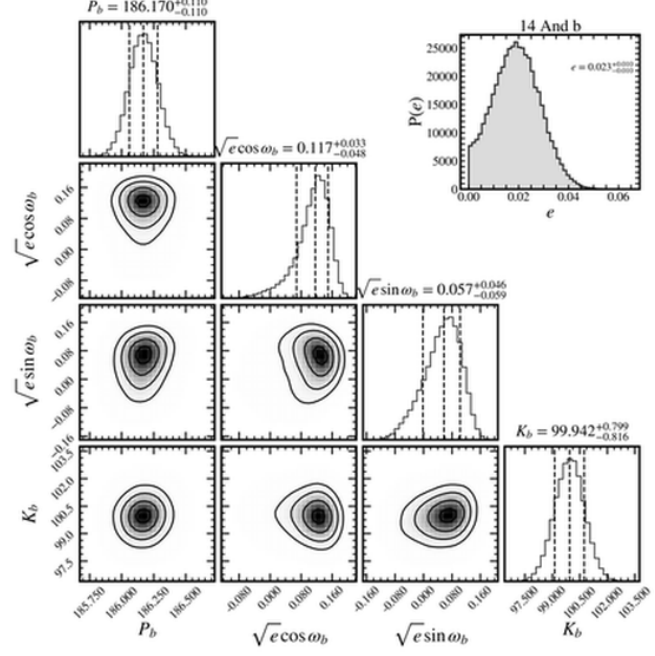
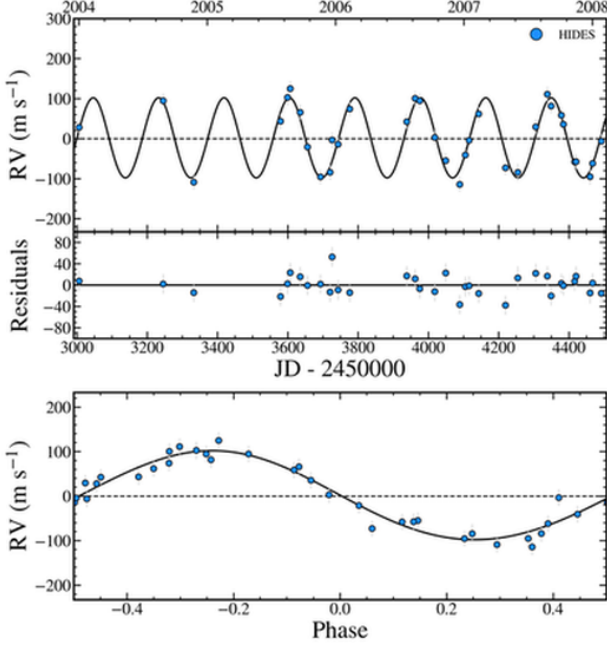
System	BJD	RV (m s ⁻¹)	σ_{RV} (m s ⁻¹)	Instrument
BD+15 2940	2459604.01778	18.74	6.06	HPF1
BD+15 2940	2459625.96012	-22.48	9.67	HPF1
BD+15 2940	2459626.94975	-16.96	14.77	HPF1
BD+15 2940	2459629.94852	-45.17	7.51	HPF1
BD+15 2940	2459631.94374	-27.85	6.35	HPF1
BD+15 2940	2459632.94328	-33.31	10.62	HPF1
BD+15 2940	2459635.93873	-22.14	17.21	HPF1
BD+15 2940	2459680.81257	-2.99	8.96	HPF1
BD+15 2940	2459683.98918	9.76	3.61	HPF1
BD+15 2940	2459685.79253	-24.85	3.38	HPF1
BD+15 2940	2459686.98267	0.76	4.87	HPF1
BD+15 2940	2459687.98372	-42.39	1.72	HPF1
BD+15 2940	2459690.78599	-45.37	5.09	HPF1
BD+15 2940	2459691.96513	-50.92	2.79	HPF1
BD+15 2940	2459693.96830	-13.20	7.92	HPF1
BD+15 2940	2459697.96413	-15.55	4.66	HPF1
BD+15 2940	2459705.73549	29.58	2.95	HPF1
BD+15 2940	2459706.74279	32.60	7.93	HPF1
BD+15 2940	2459709.73420	51.63	15.31	HPF1
BD+15 2940	2459710.73096	34.36	8.43	HPF1
BD+15 2940	2459712.72906	35.92	5.47	HPF1
BD+15 2940	2459712.93233	29.67	10.07	HPF1
BD+15 2940	2459713.72432	30.22	7.38	HPF1
BD+15 2940	2459713.93013	26.62	2.99	HPF1
BD+15 2940	2459714.72178	36.20	8.06	HPF1
BD+15 2940	2459714.91427	17.74	4.27	HPF1
BD+15 2940	2459715.91303	0.76	0.52	HPF1
BD+15 2940	2459717.90645	9.43	1.93	HPF1

NOTE—Relative radial velocities for BD+15 2940 are displayed here.

B. ORBIT FITS

Results of our uniform refitting for all 200 warm Jupiters. When an RV trend or change in radial acceleration is preferred, this best-fit model is shown. Figures 5–104 show the best fit model compared to the time-series RVs and phase-folded light curve, along with corner plots for P , $\sqrt{e} \cos \omega$, $\sqrt{e} \sin \omega$, and K . A histogram of the eccentricity “ e ” posterior distribution is also shown. We provide the posterior chains used in the Exploring Warm Jupiter Migration Pathways With Eccentricities series on Zenodo for public access (DOI: 10.5281/zenodo.17161693).

14 And b



24 Boo b

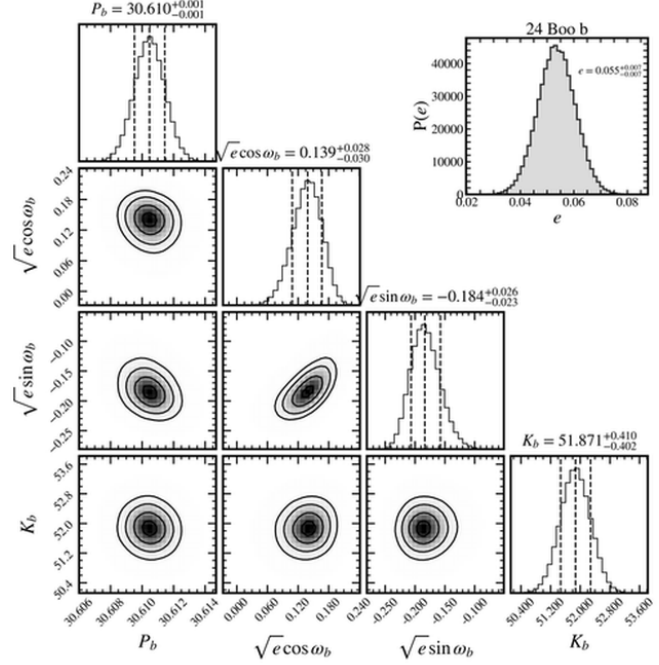
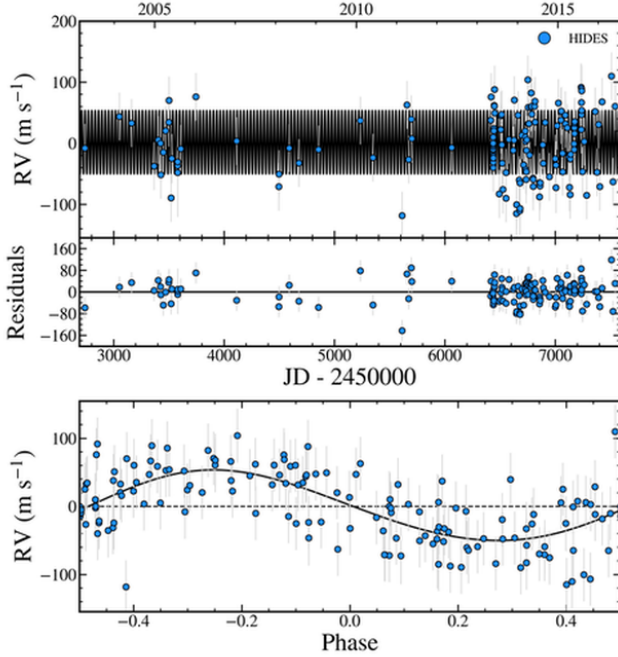
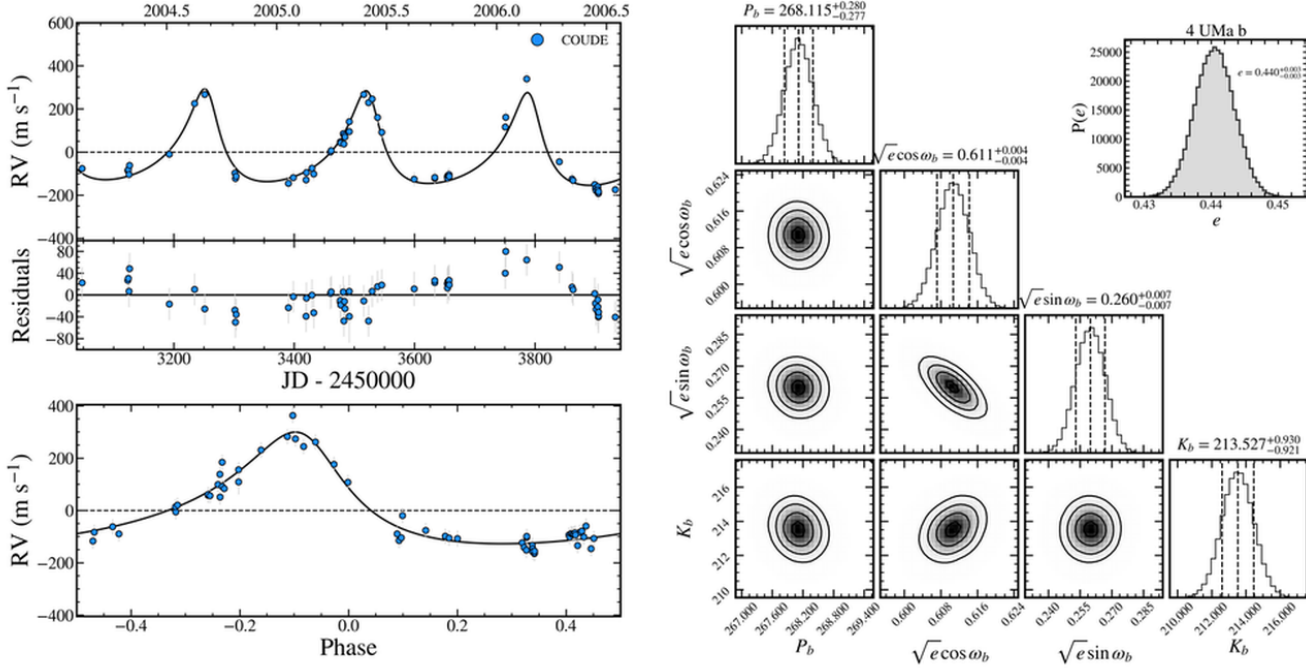


Figure 5. Example summary plot of the known warm Jupiters 14 And b and 24 Boo b using RadVel. Left: Panel showing the RV timeseries plot combined with the residuals to the model and the phase folded orbit of the planet. Right: Corner plot with the joint posterior distributions and a histogram of the eccentricity posterior distribution of the planet.

4 UMa b



55 Cnc b

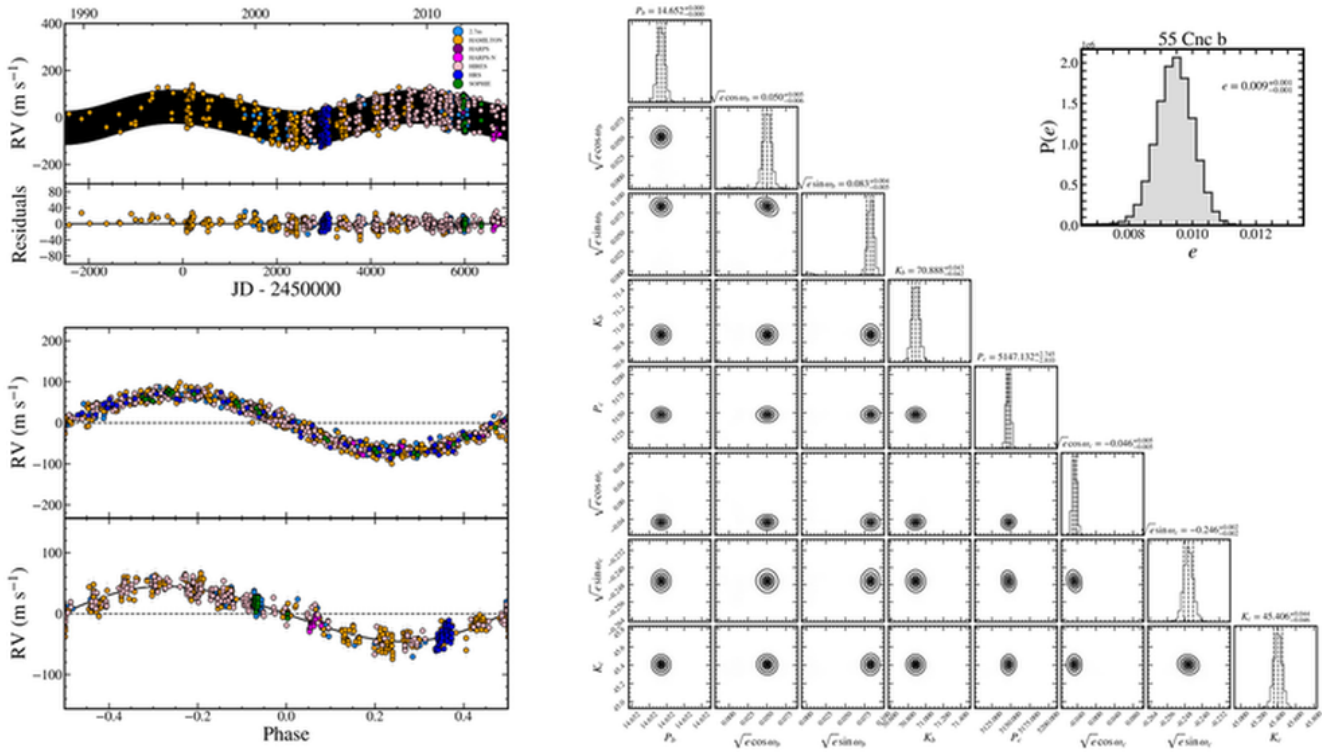
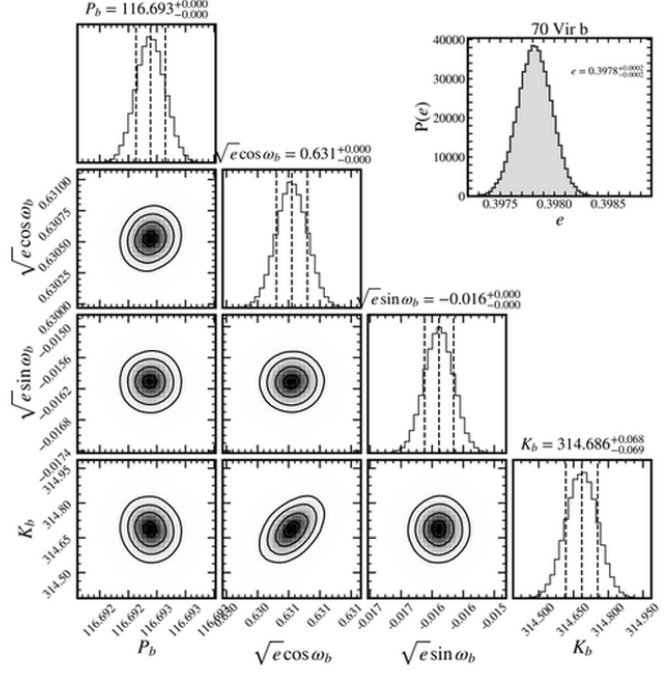
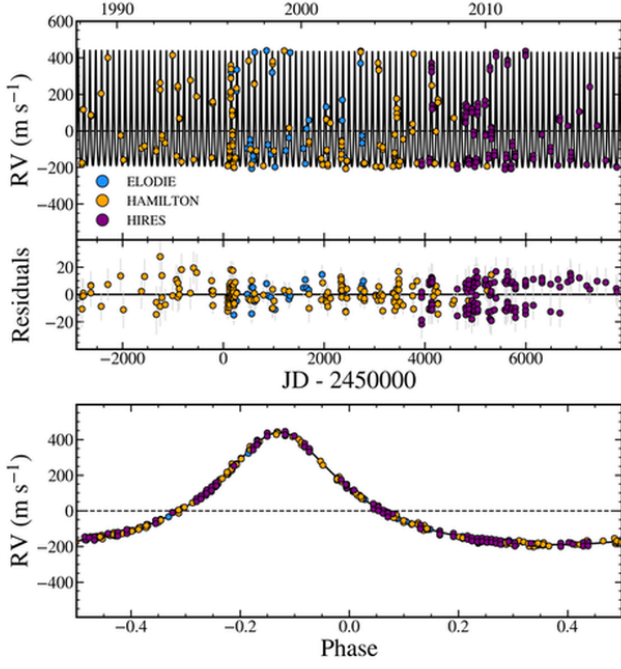


Figure 6. Summary of results for the warm Jupiters 4 UMa b and 55 Cnc b.

70 Vir b



8 UMi b

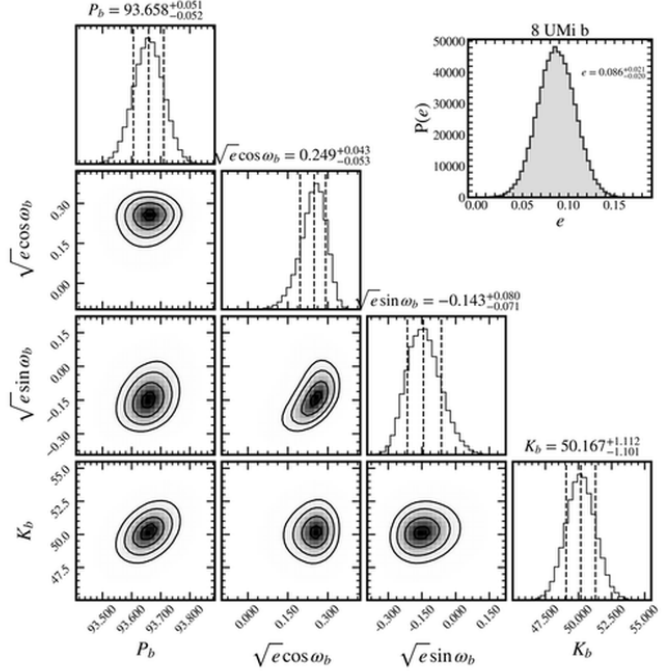
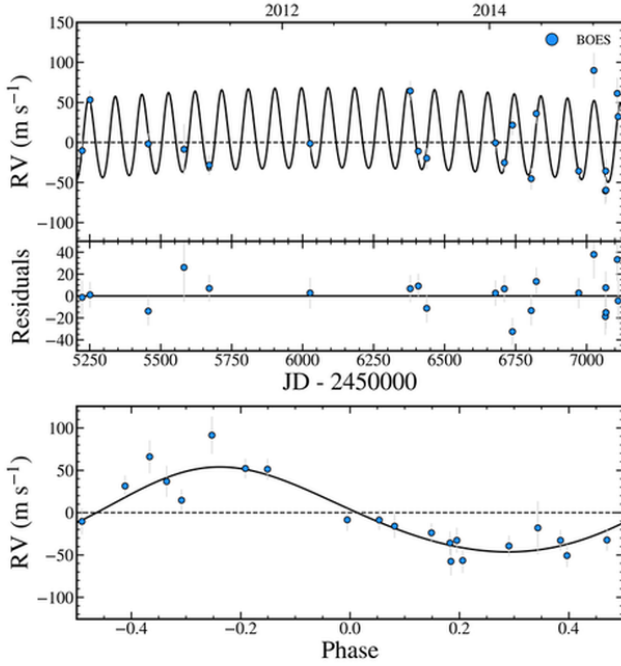
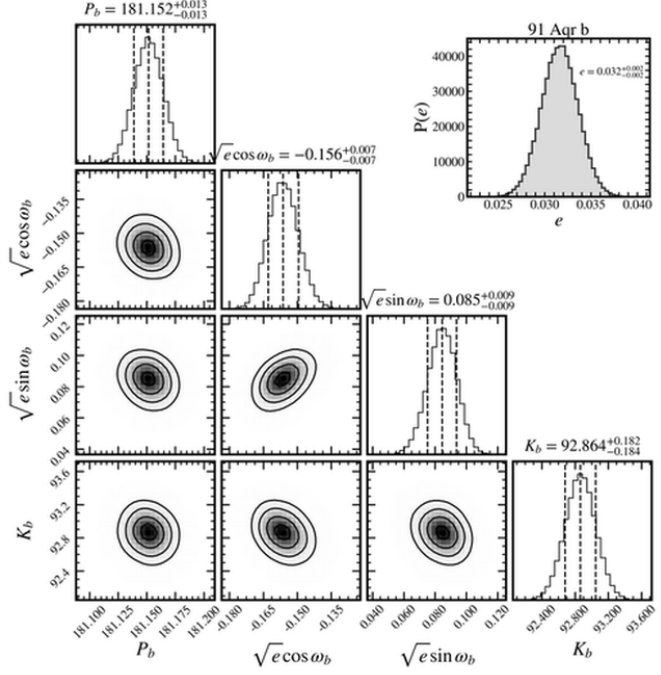
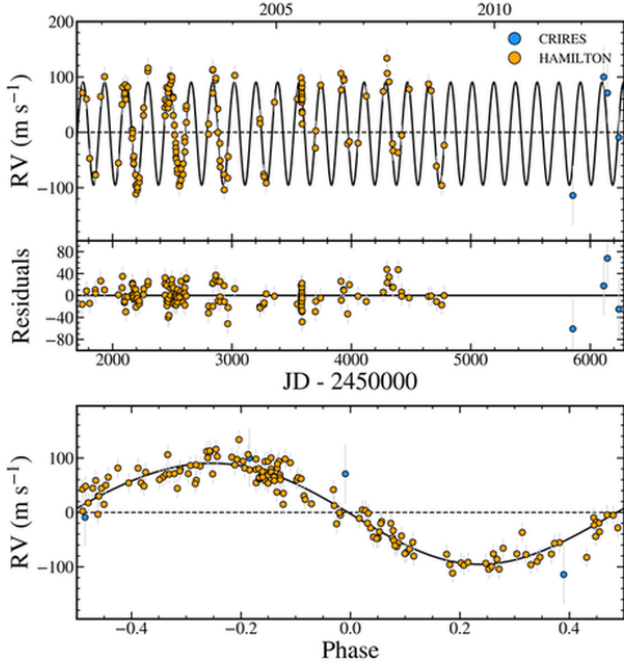


Figure 7. Summary of results for the warm Jupiters 70 Vir b and 8 UMi b.

91 Aqr b



BD+14 4559 b

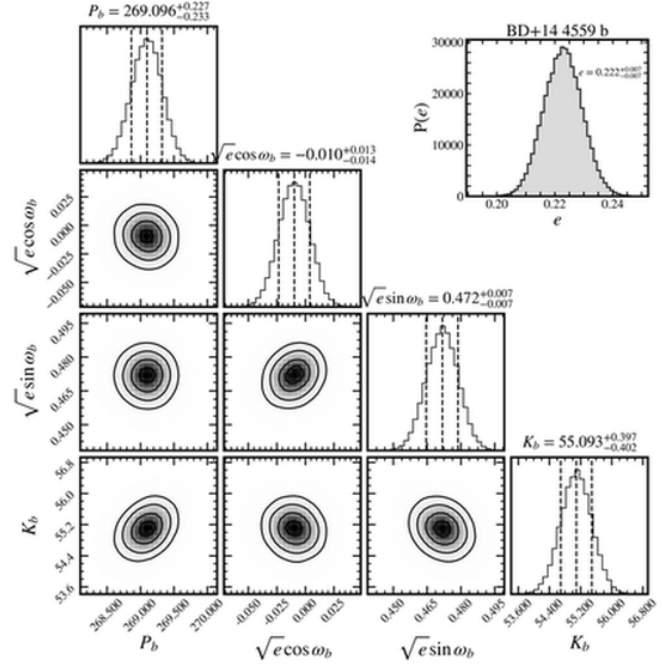
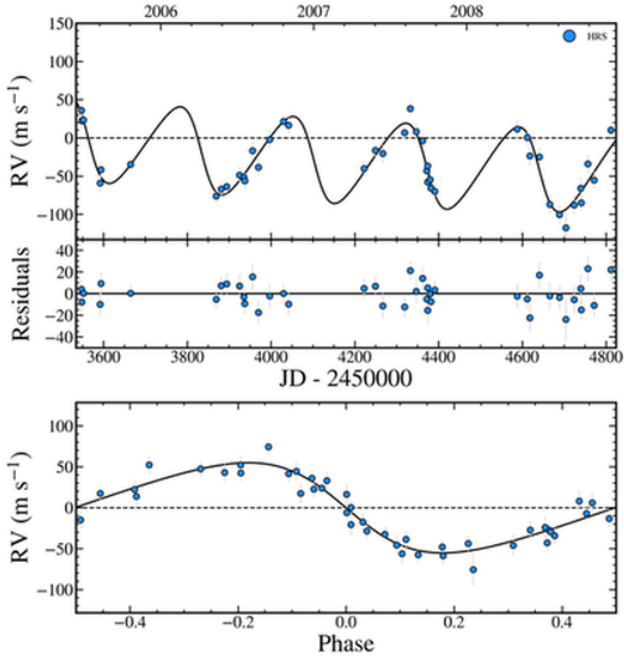
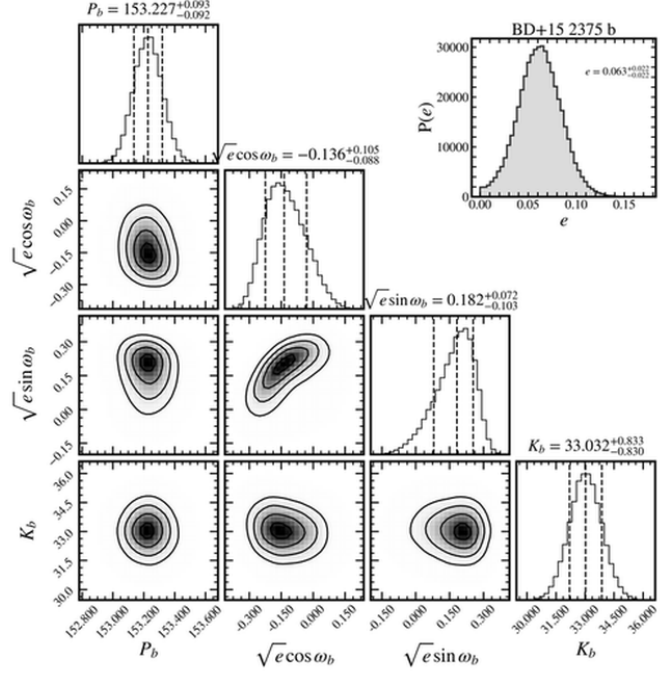
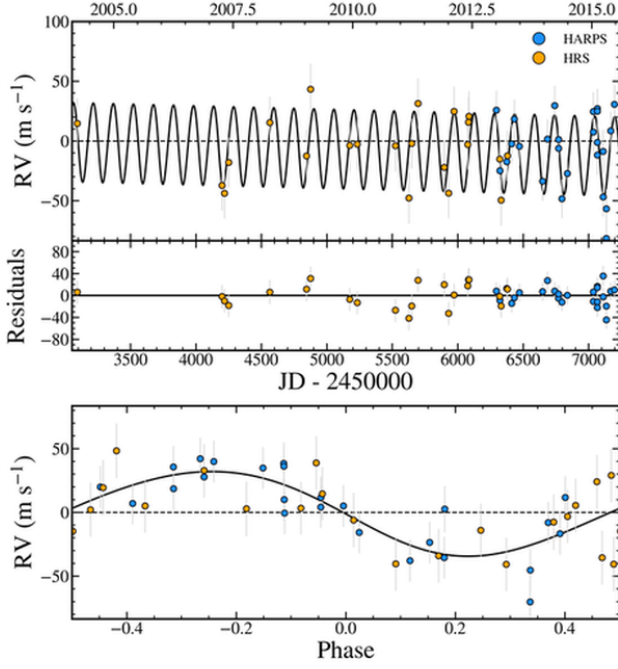


Figure 8. Summary of results for the warm Jupiters 91 Aqr b and BD+14 4559 b.

BD+15 2375 b



BD+15 2940 b

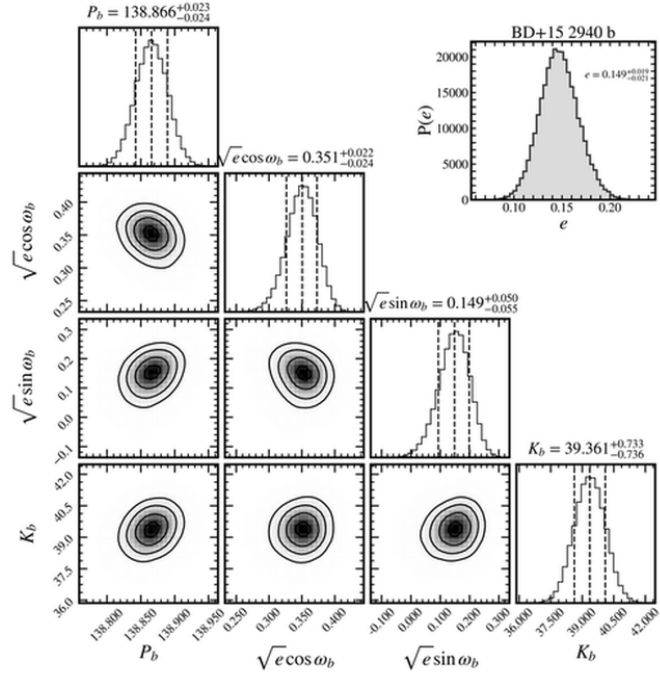
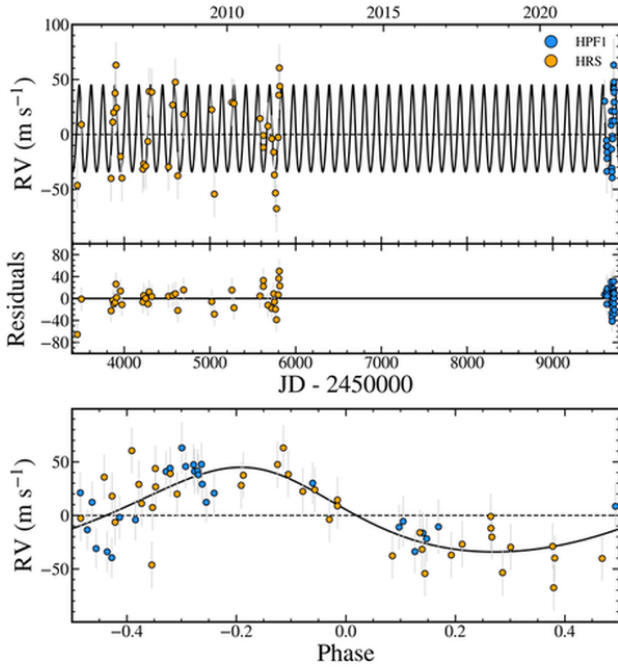
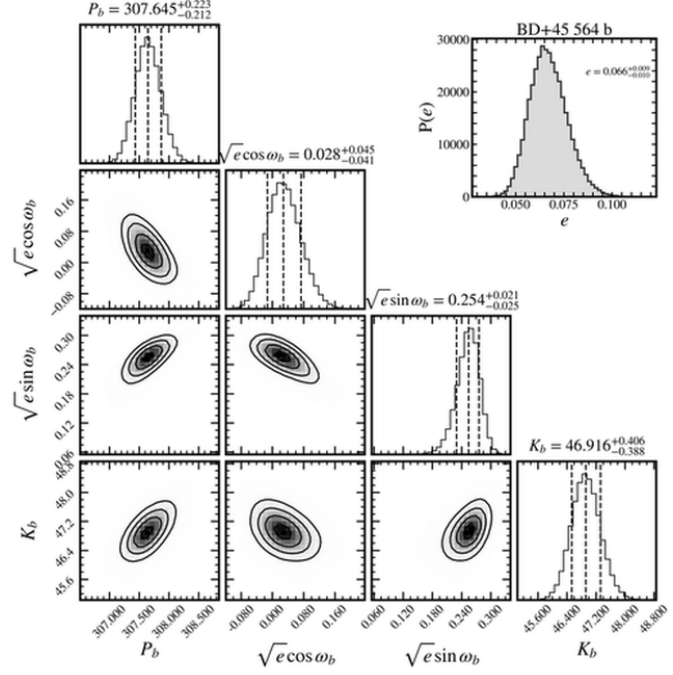
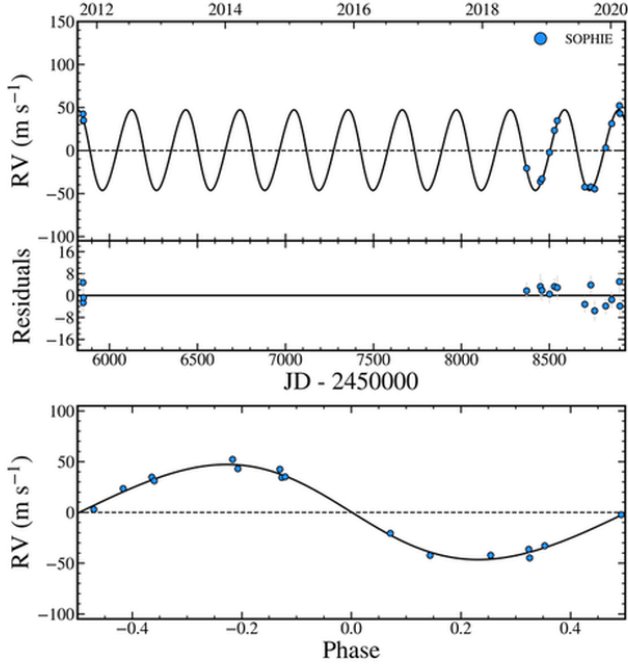


Figure 9. Summary of results for the warm Jupiters BD+15 2375 b and BD+15 2940 b.

BD+45 564 b



BD+55 362 b

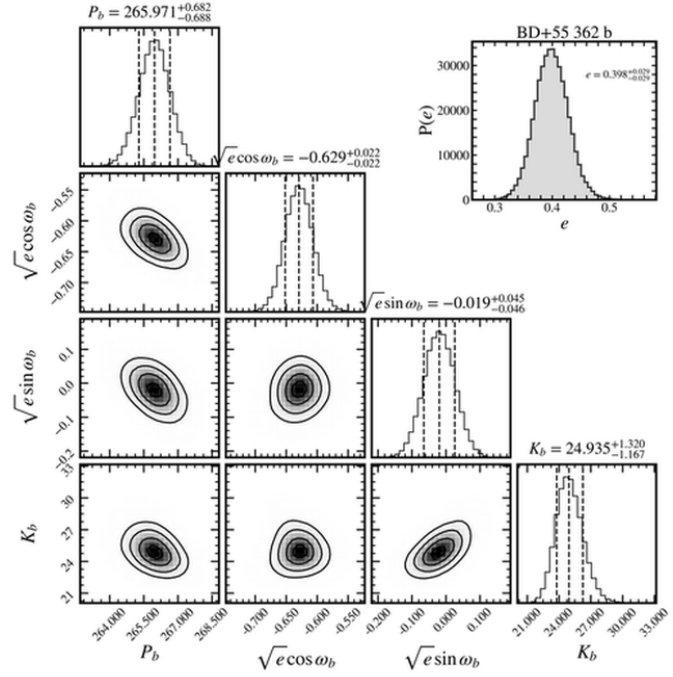
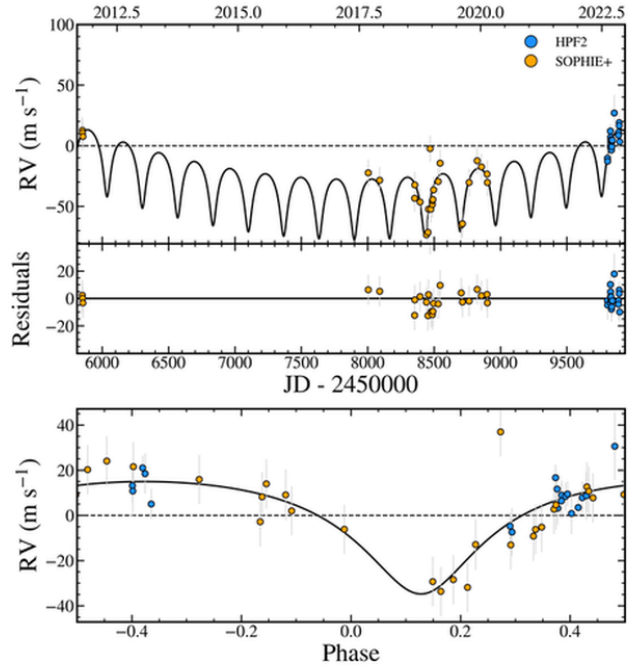
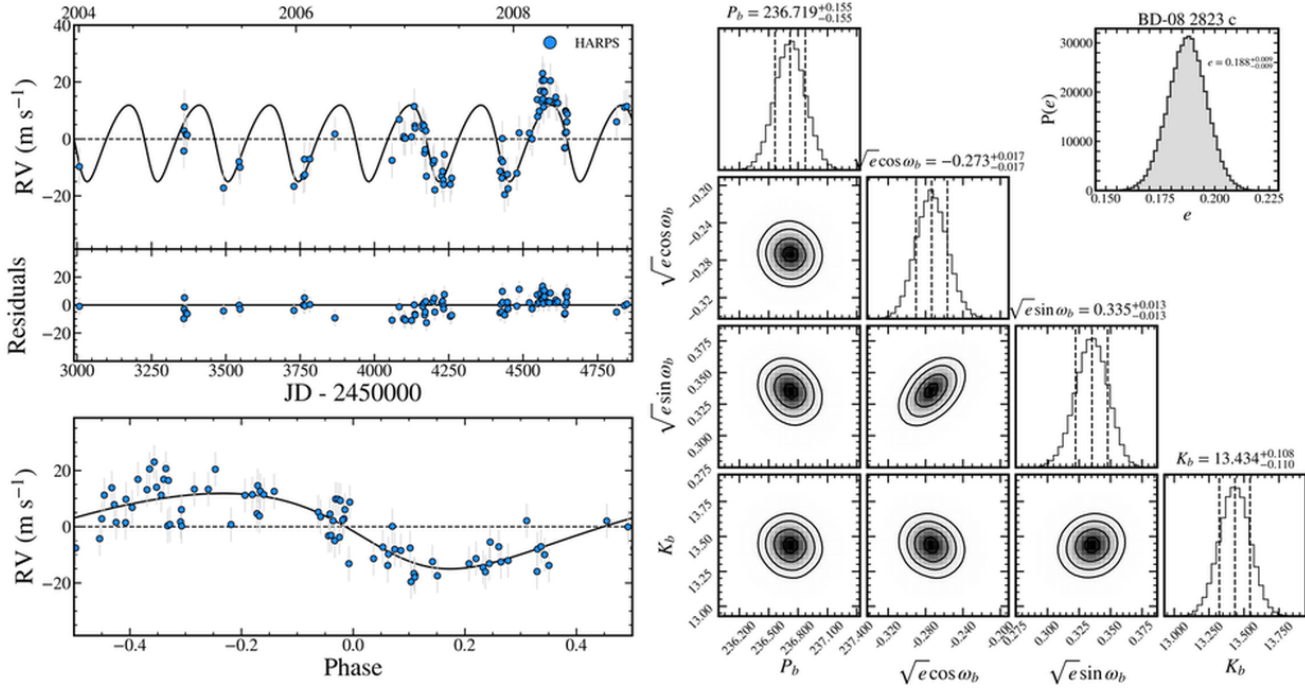


Figure 10. Summary of results for the warm Jupiters BD+45 564 b and BD+55 362 b.

BD-08 2823 c



CoRoT-10 b

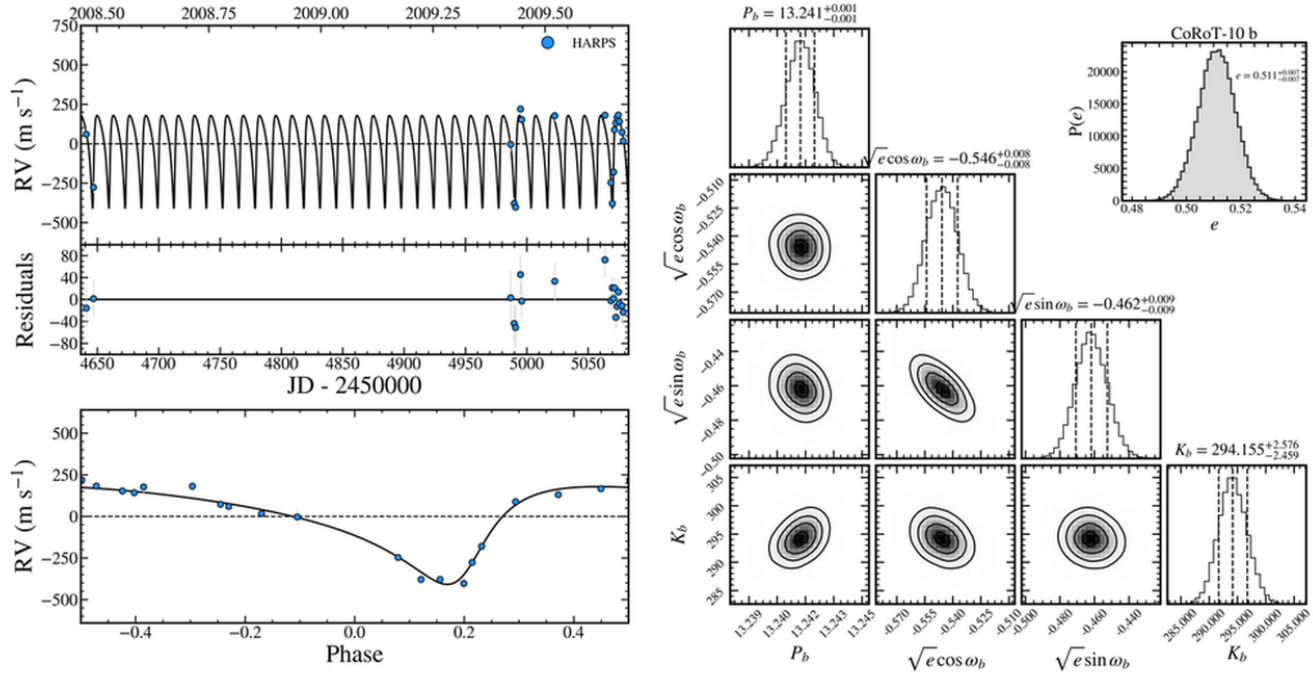
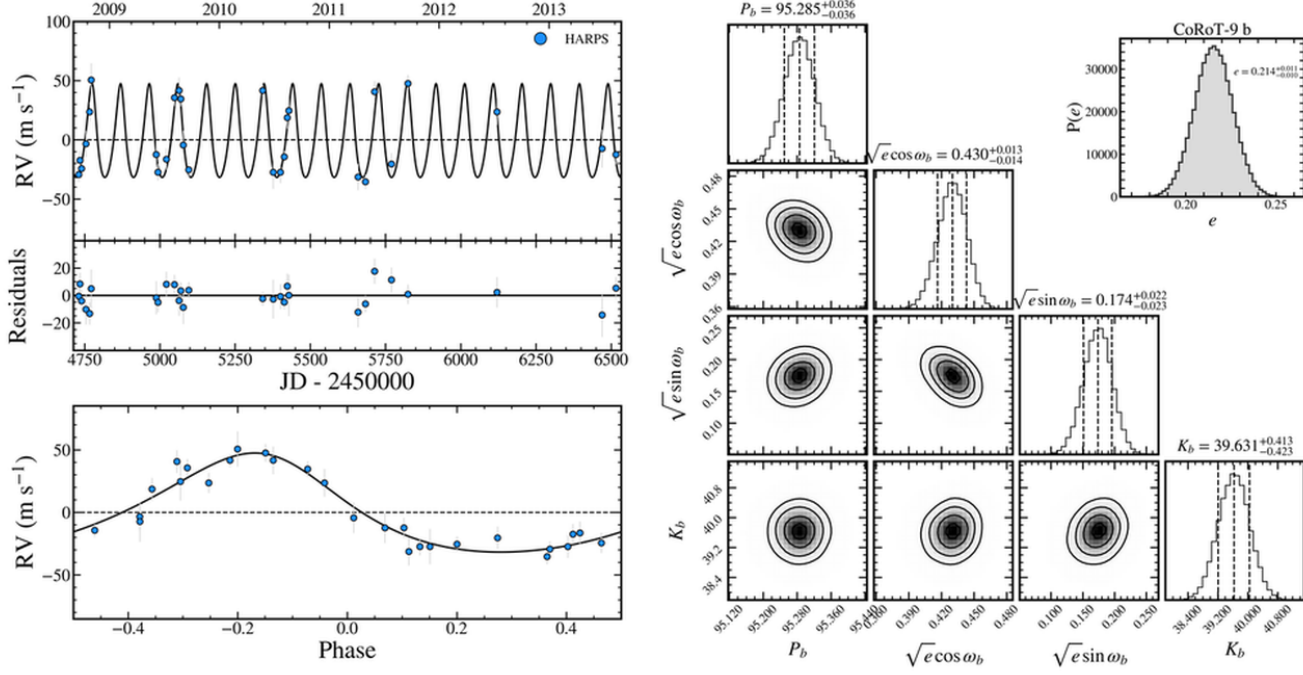


Figure 11. Summary of results for the warm Jupiters BD-08 2823 c and CoRoT-10 b.

CoRoT-9 b



GJ 1148 b

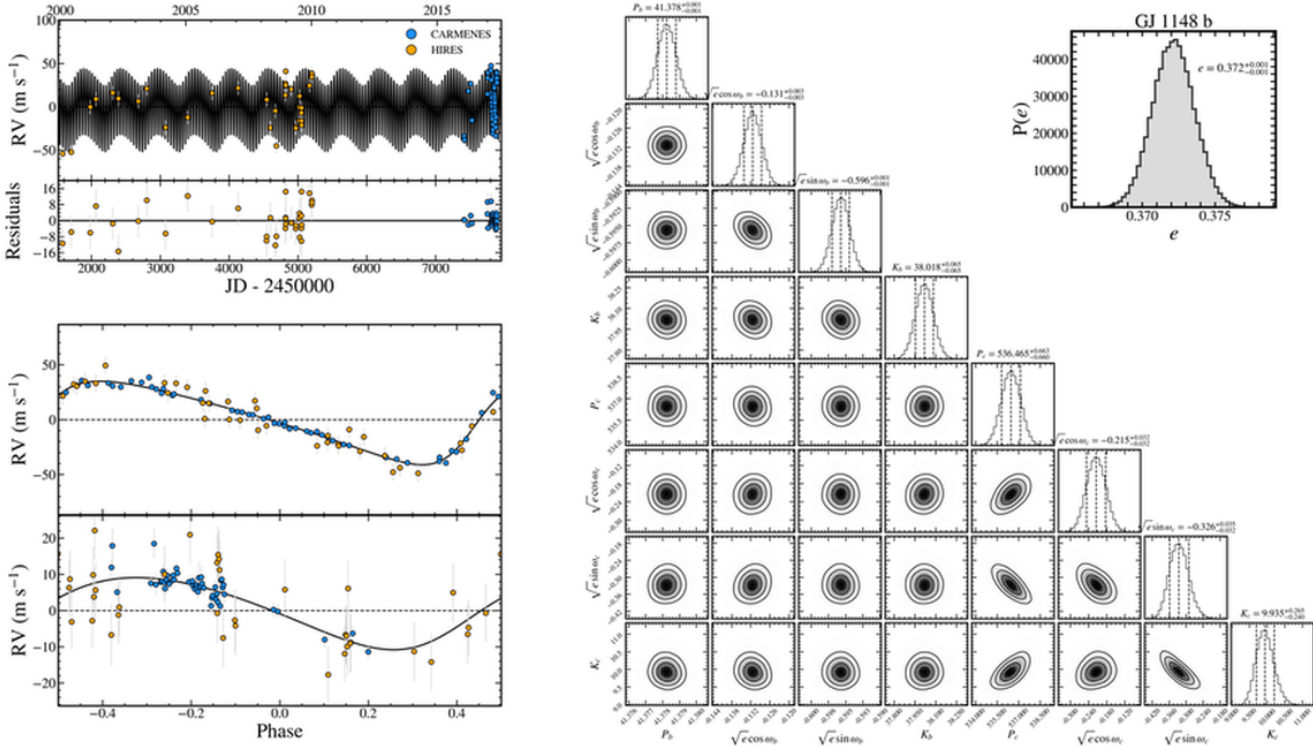
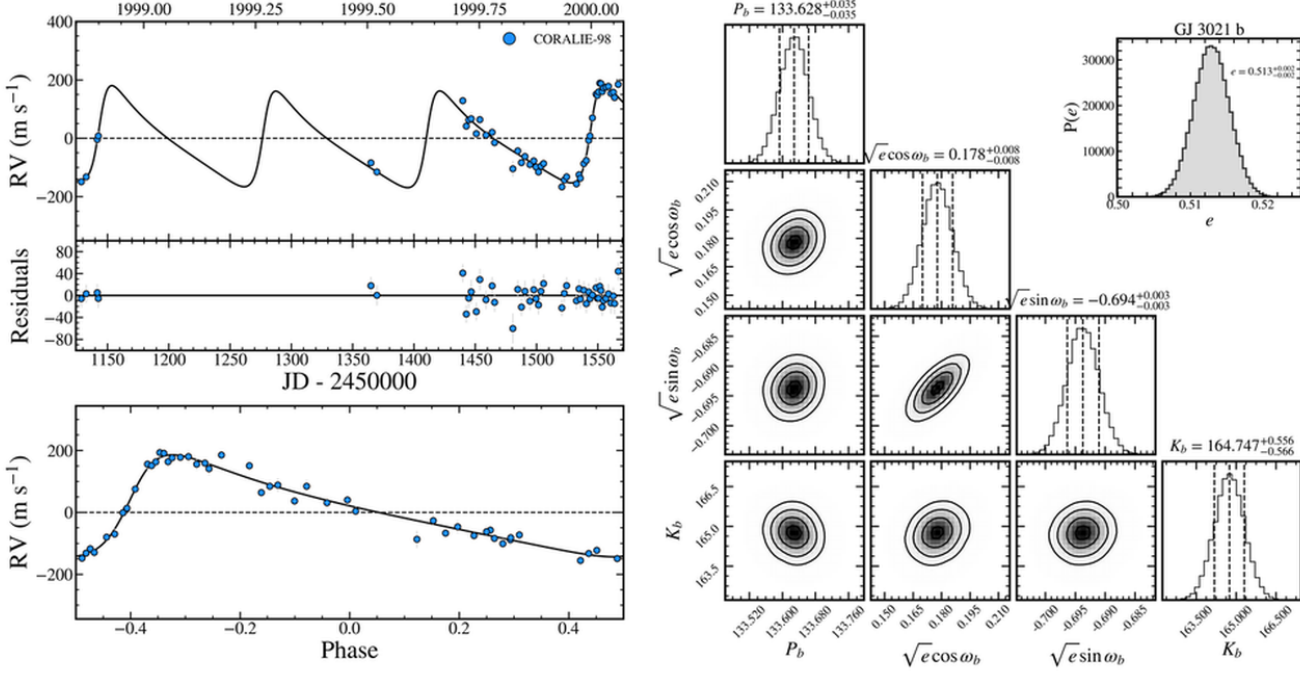


Figure 12. Summary of results for the warm Jupiters CoRoT-9 b and GJ 1148 b.

GJ 3021 b



GJ 3512 b

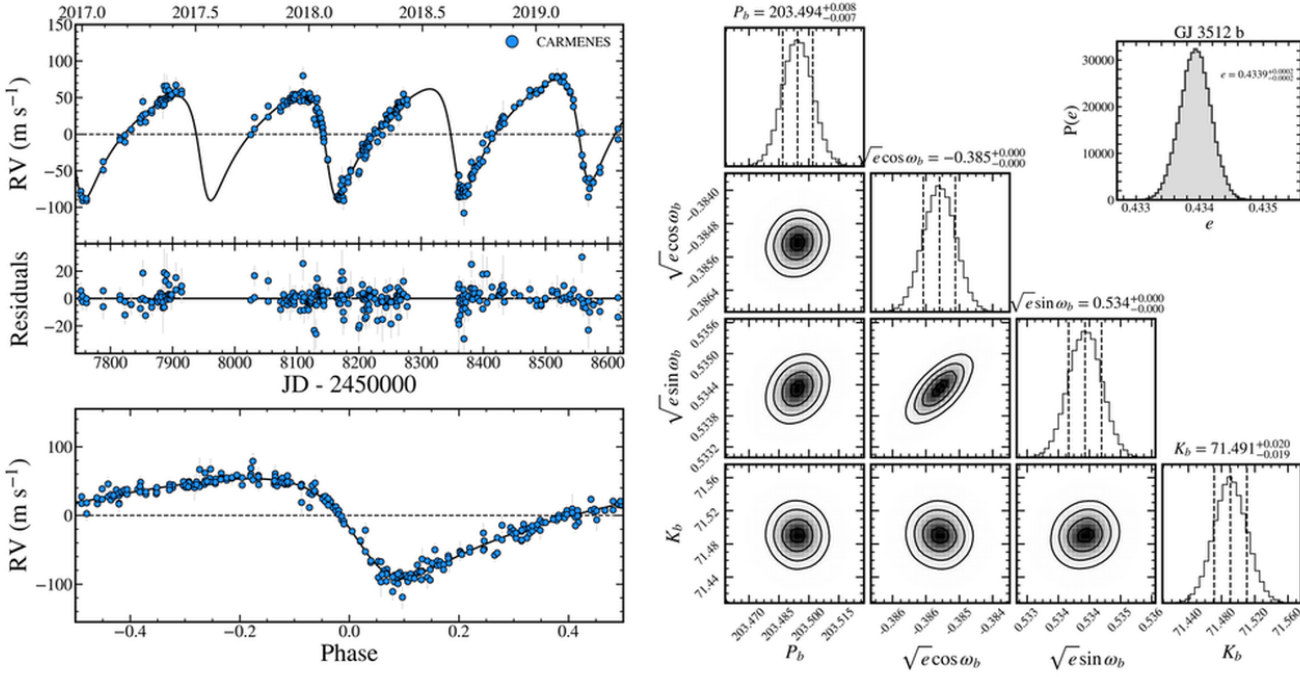
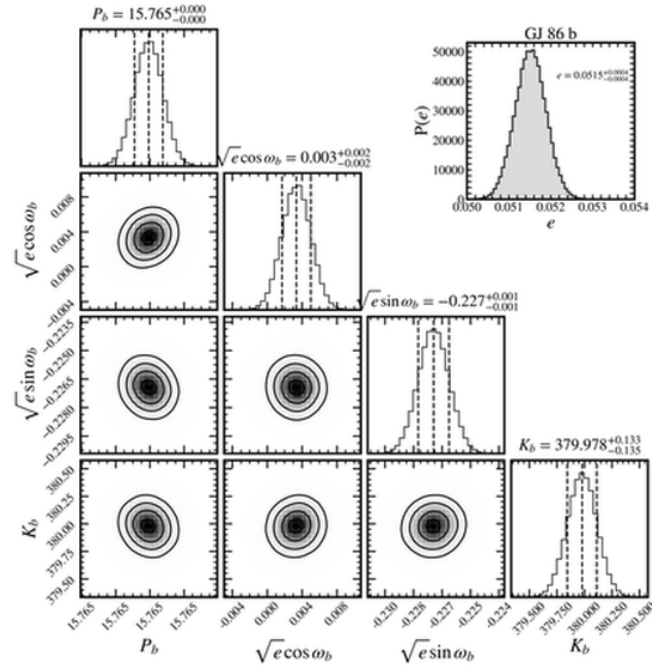
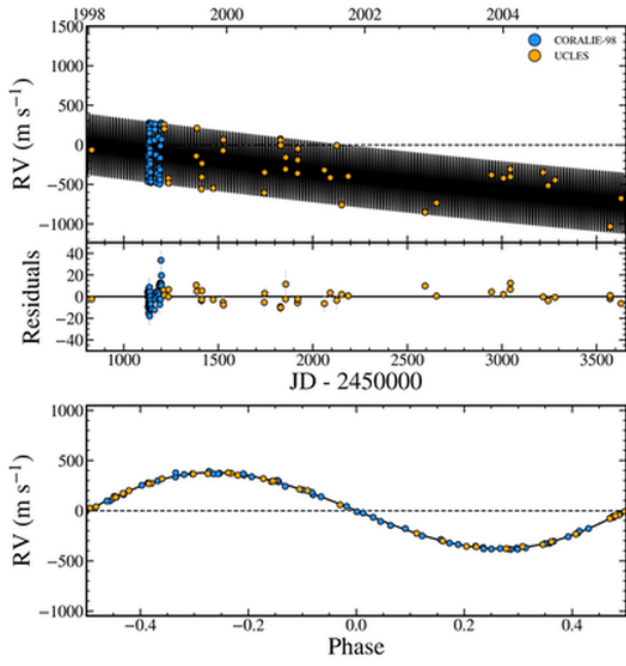


Figure 13. Summary of results for the warm Jupiters GJ 3021 b and GJ 3512 b.

GJ 86 b



GJ 876 b

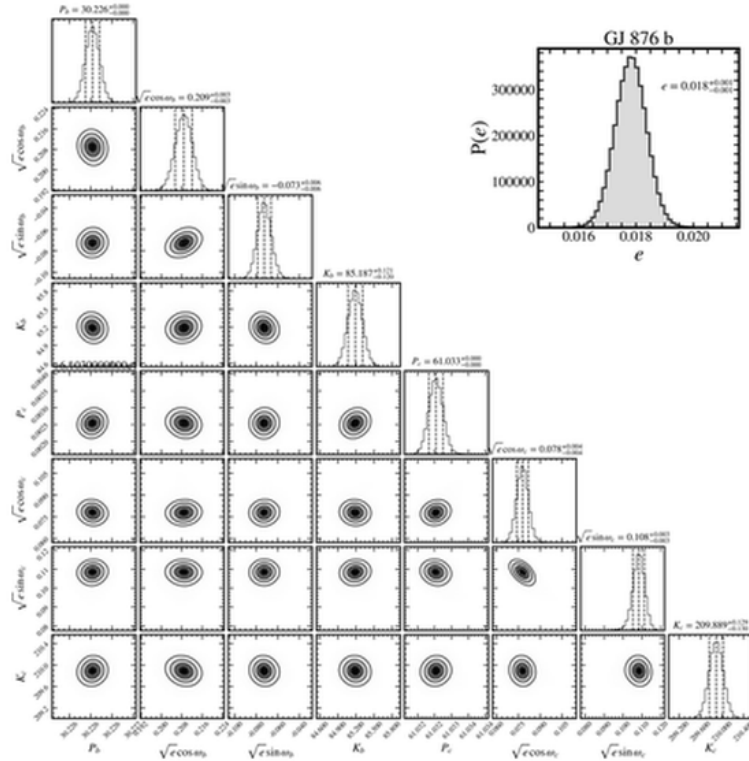
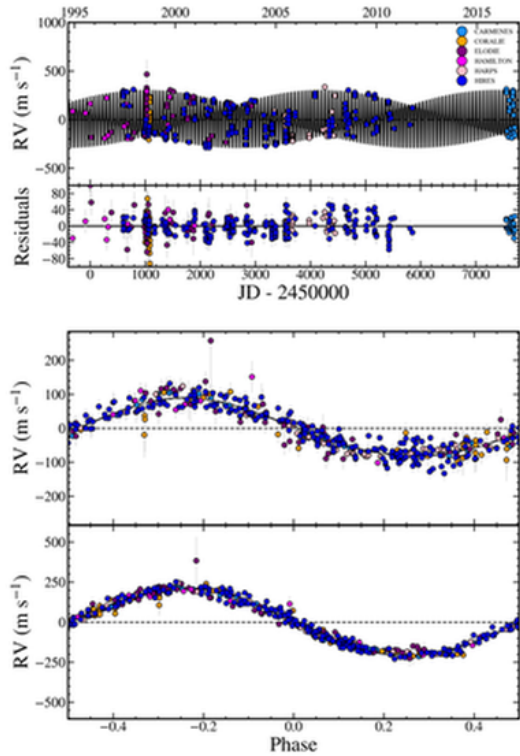
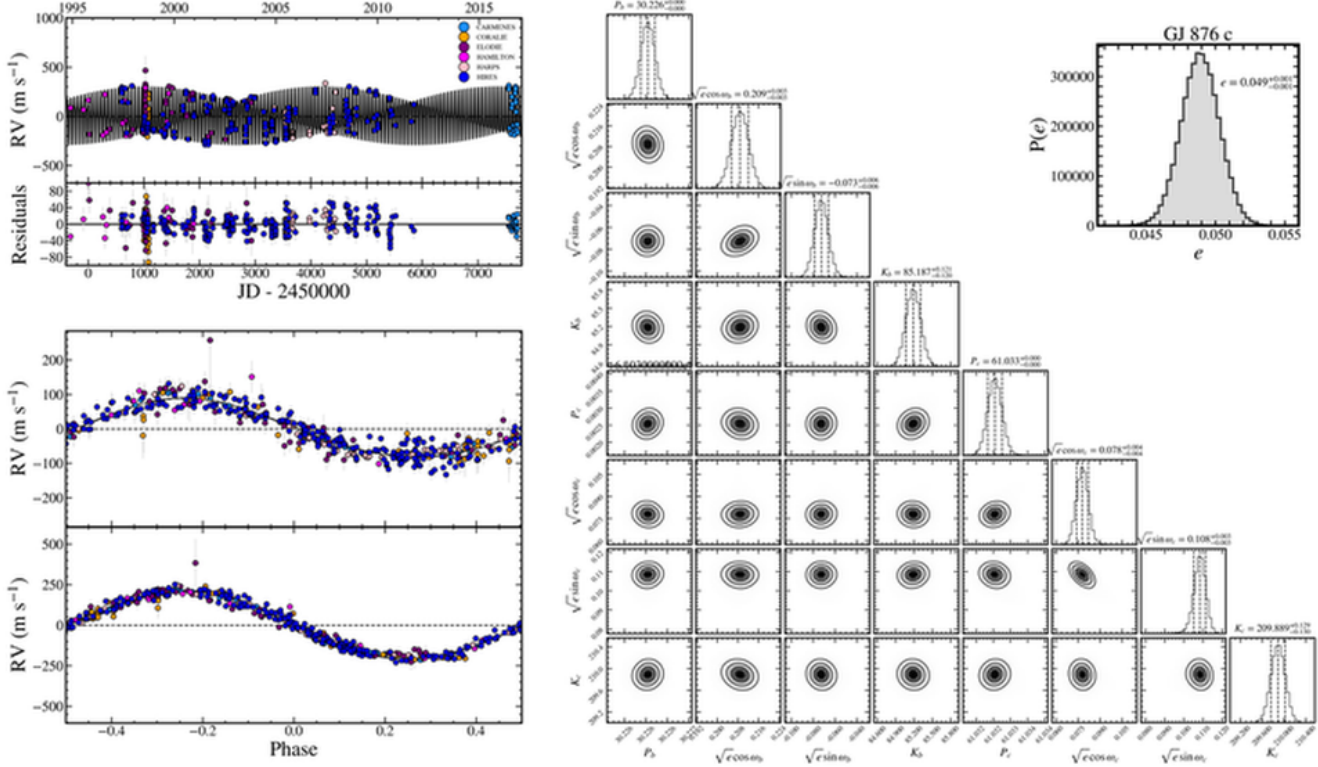


Figure 14. Summary of results for the warm Jupiters GJ 86 b and GJ 876 b.

GJ 876 c



HAT-P-15 b

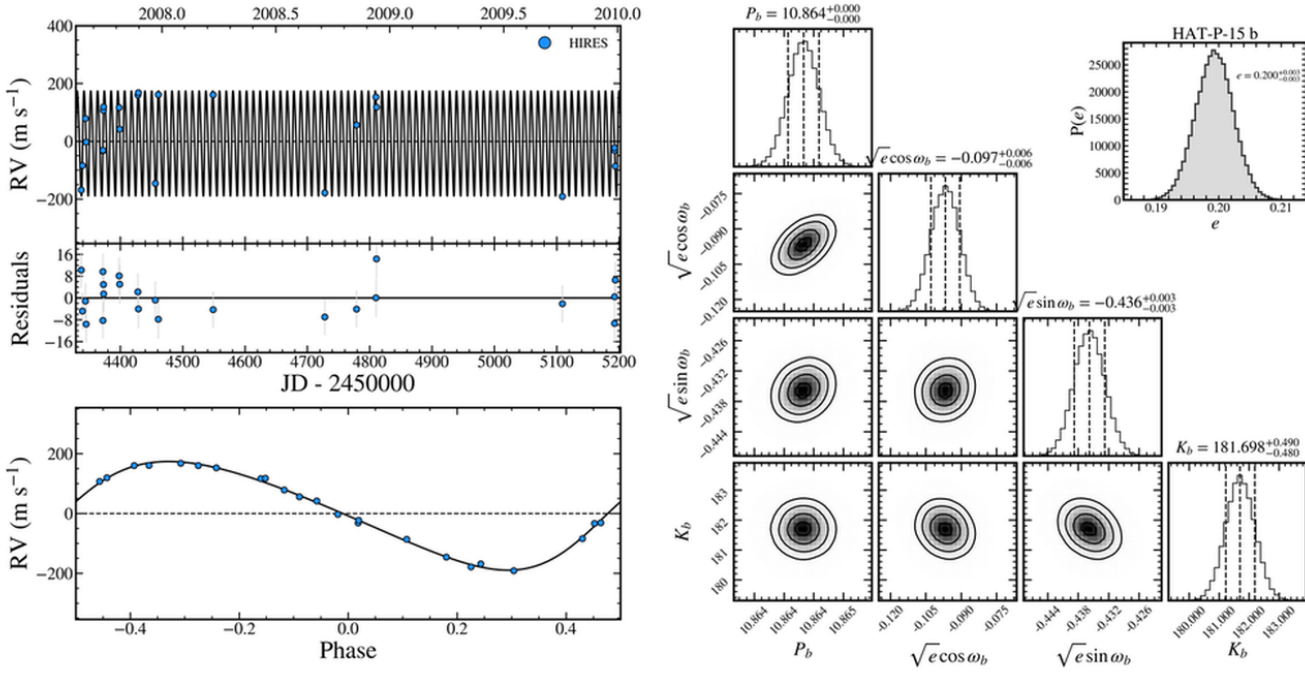
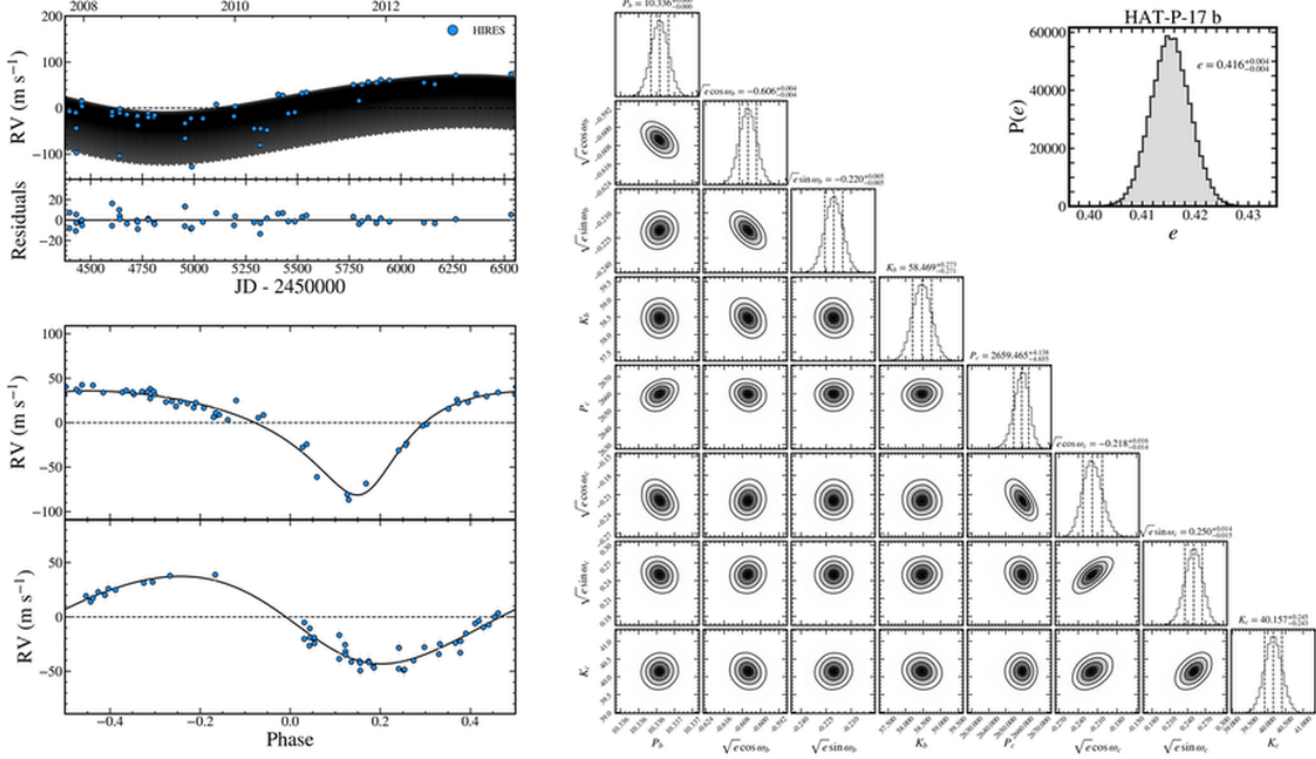


Figure 15. Summary of results for the warm Jupiters GJ 876 c and HAT-P-15 b.

HAT-P-17 b



HATS-17 b

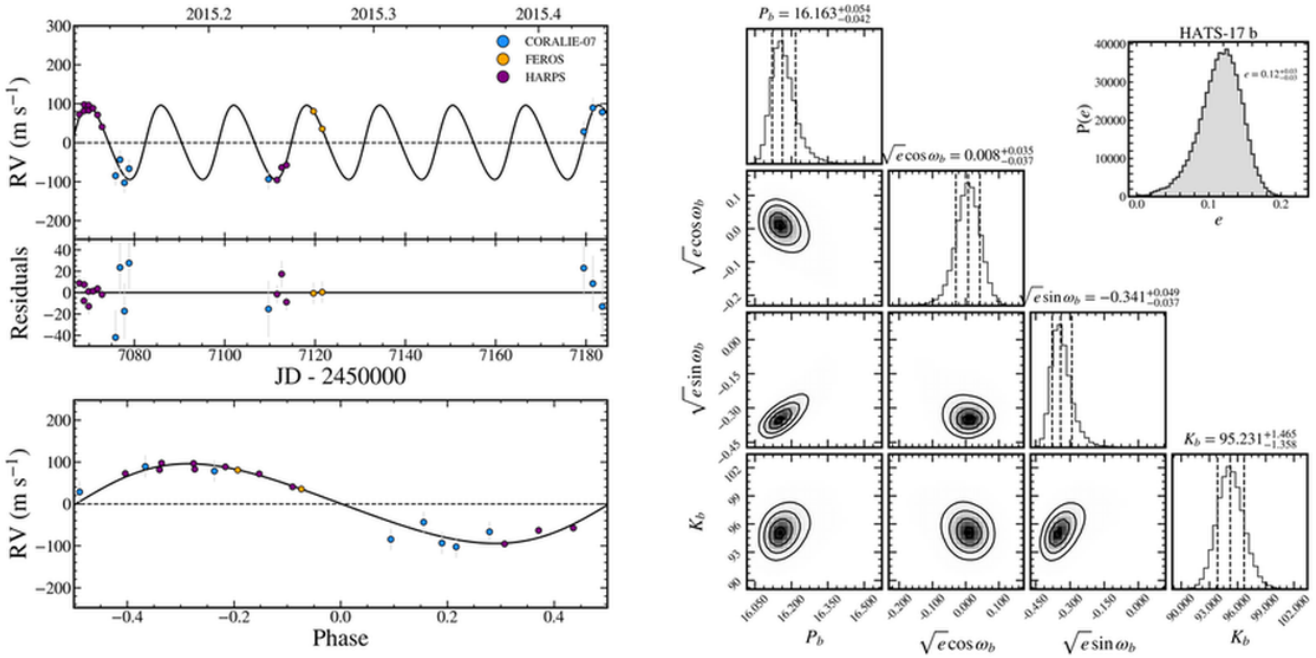
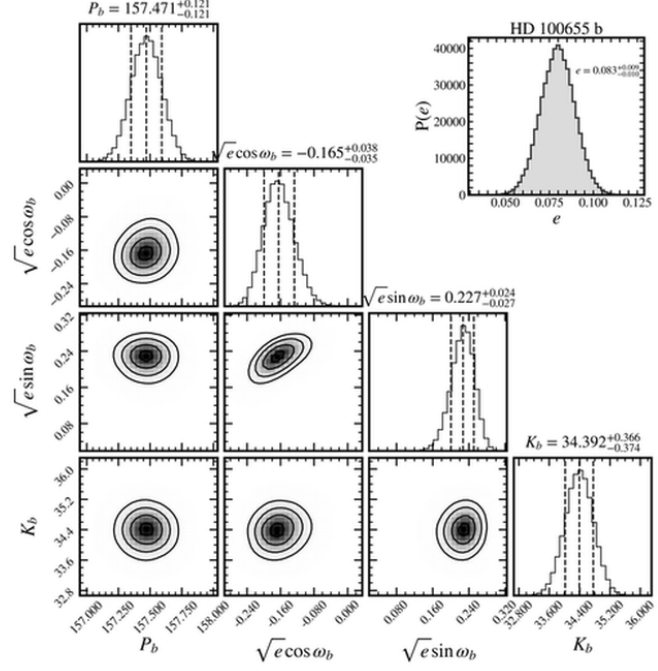
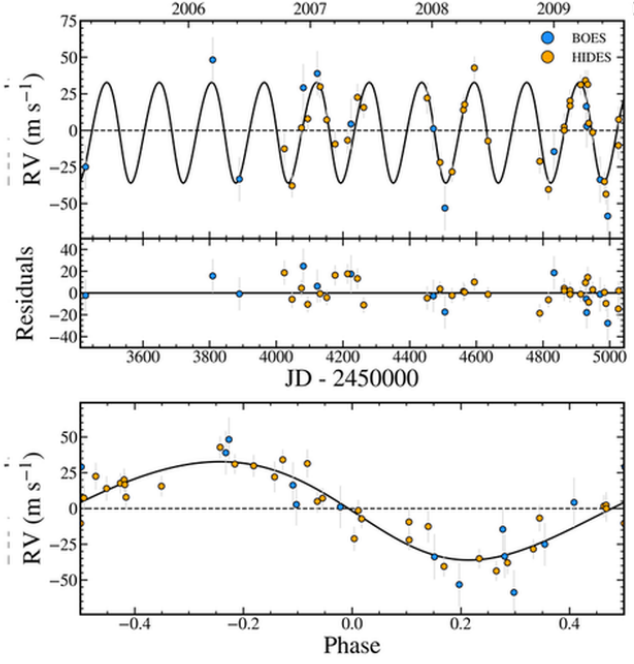


Figure 16. Summary of results for the warm Jupiters HAT-P-17 b and HATS-17 b.

HD 100655 b



HD 104985 b

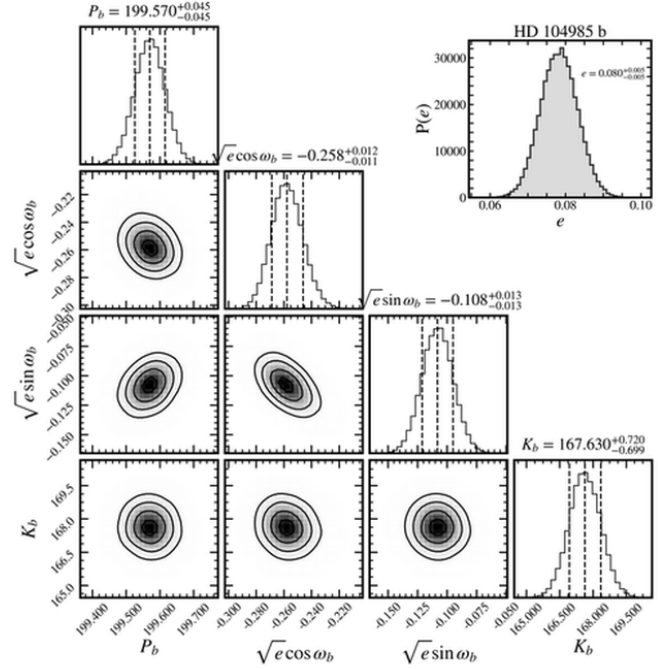
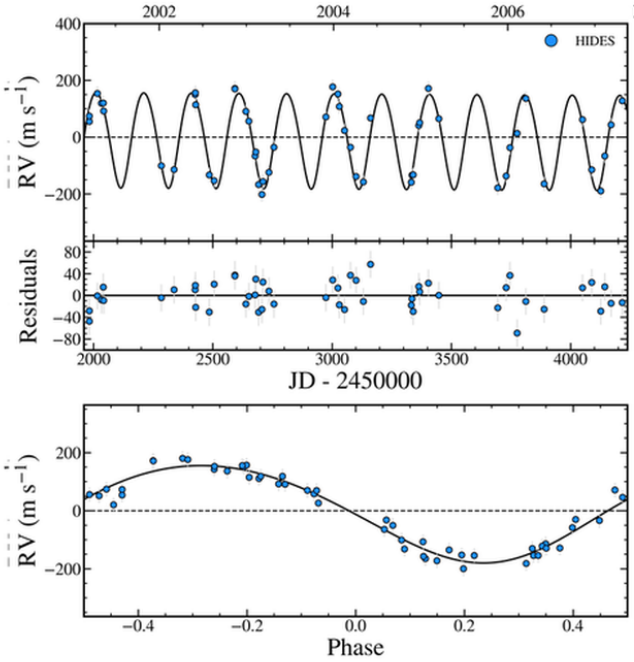
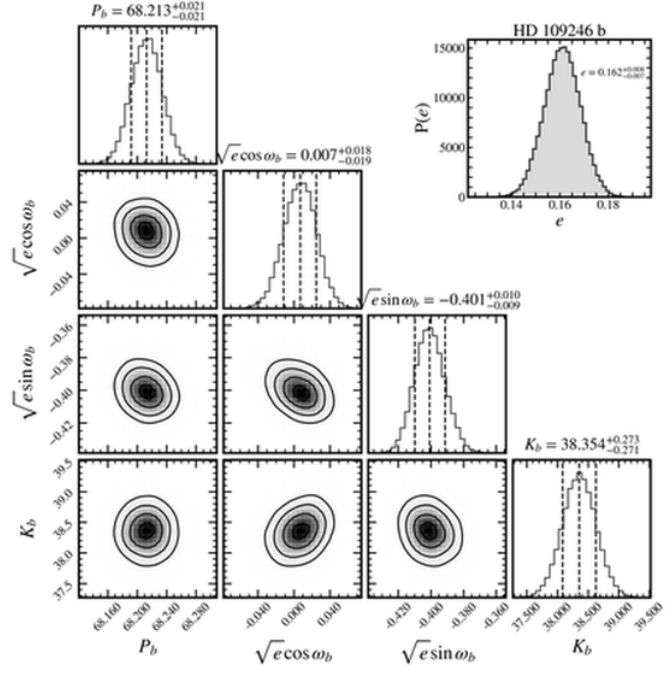
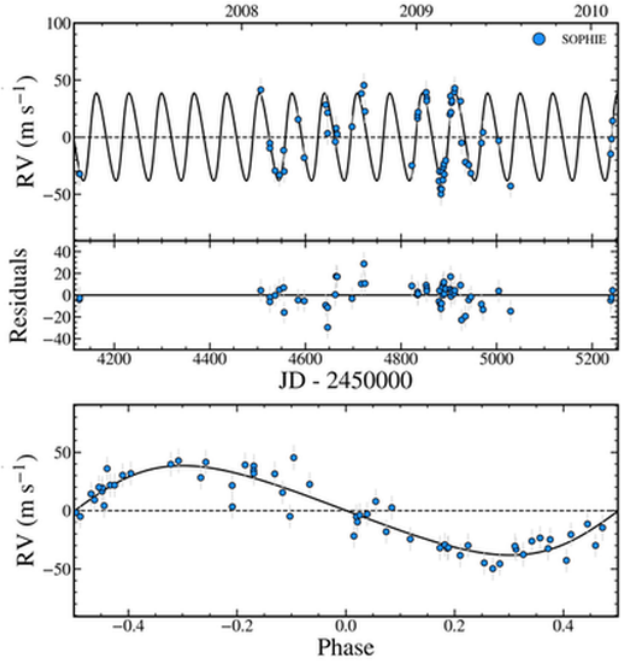


Figure 17. Summary of results for the warm Jupiters HD 100655 b and HD 104985 b.

HD 109246 b



HD 10975 b

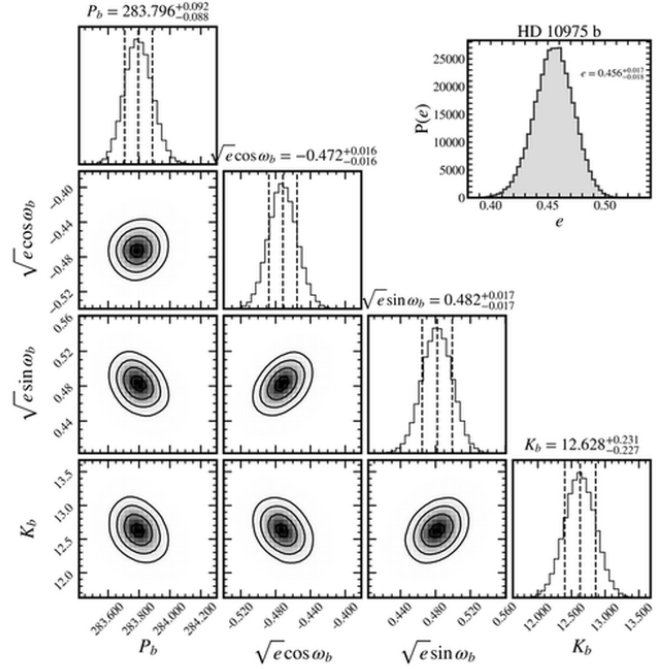
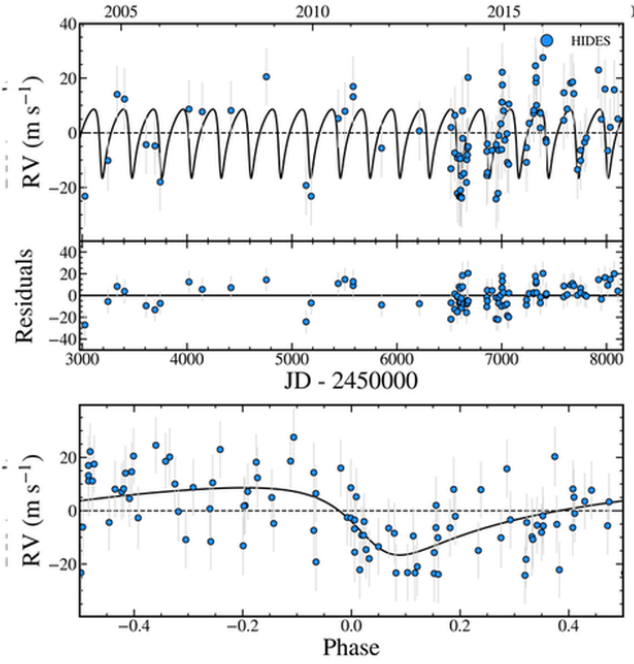
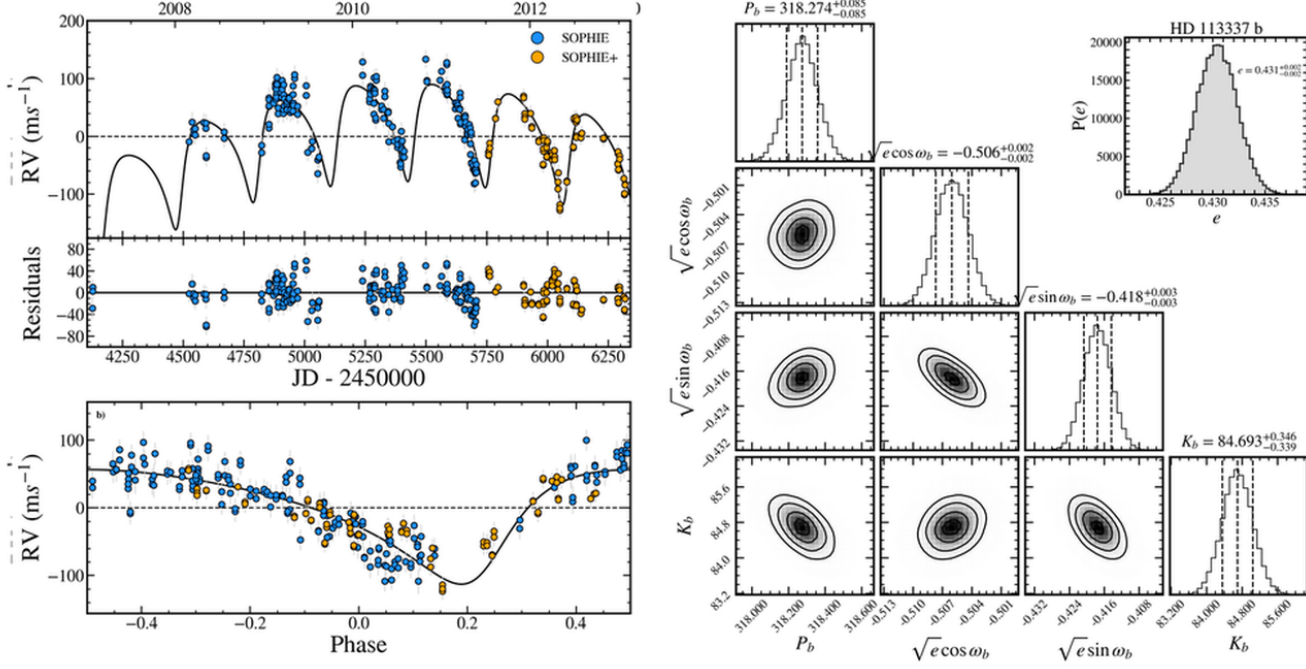


Figure 18. Summary of results for the warm Jupiters HD 109246 b and HD 10975 b.

HD 113337 b



HD 11506 c

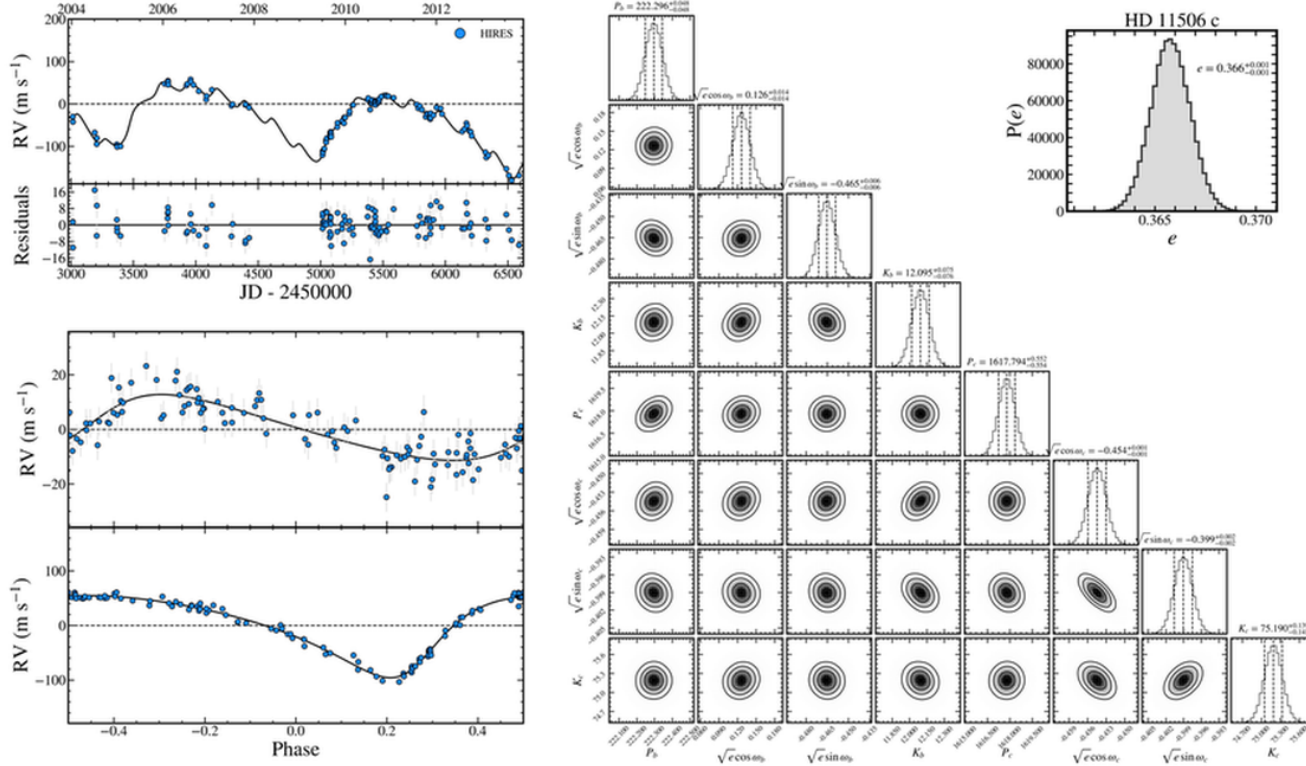
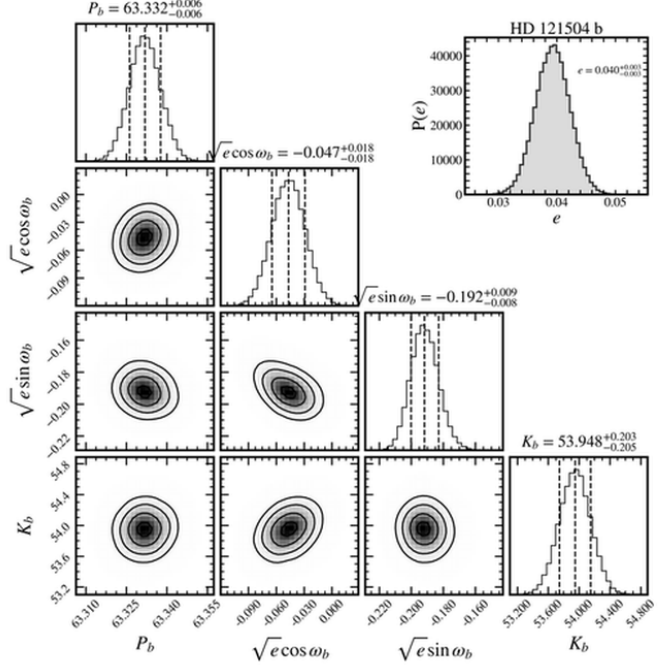
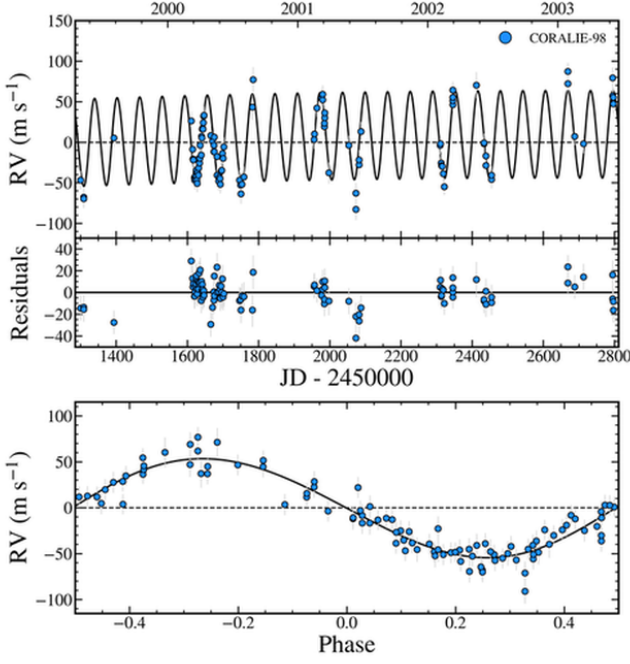


Figure 19. Summary of results for the warm Jupiters HD 113337 b and HD 11506 c.

HD 121504 b



HD 124330 b

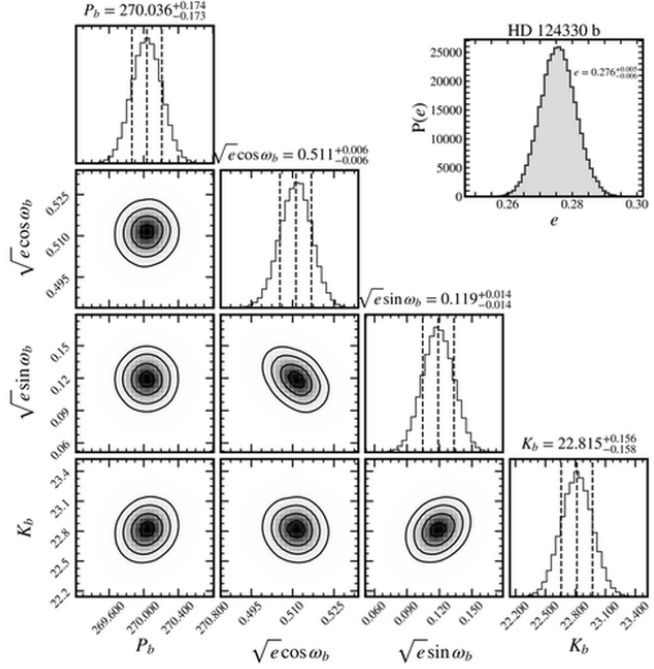
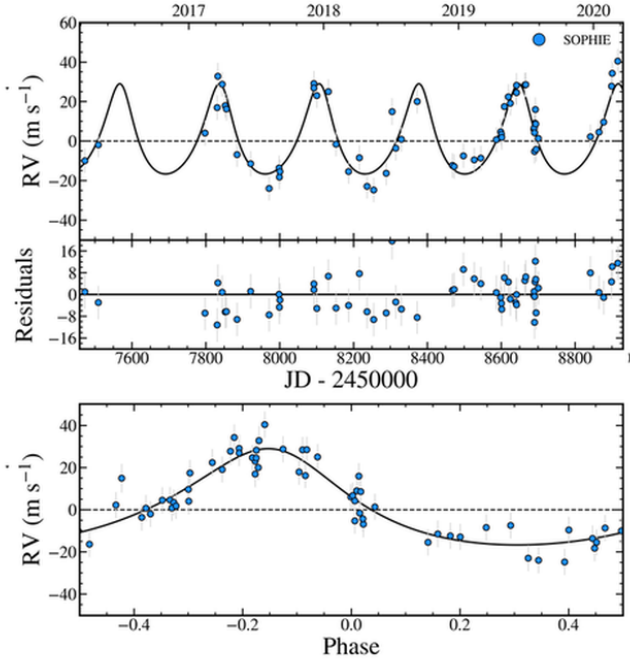
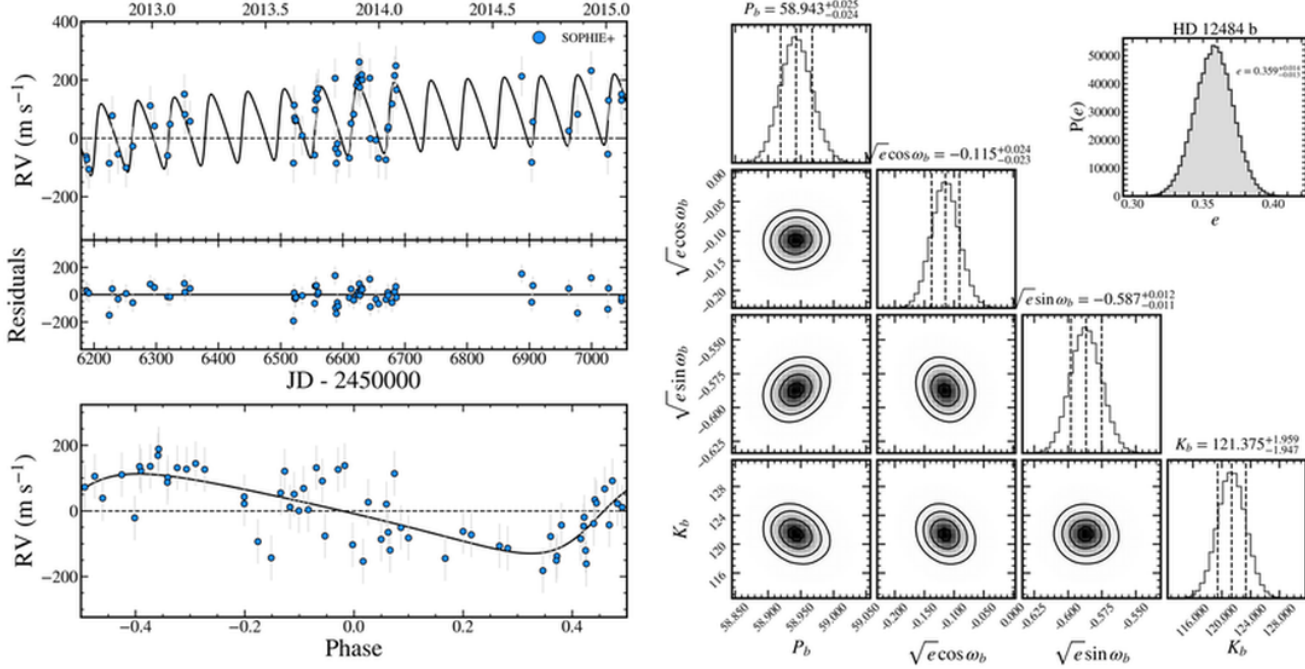


Figure 20. Summary of results for the warm Jupiters HD 121504 b and HD 124330 b.

HD 12484 b



HD 12648 b

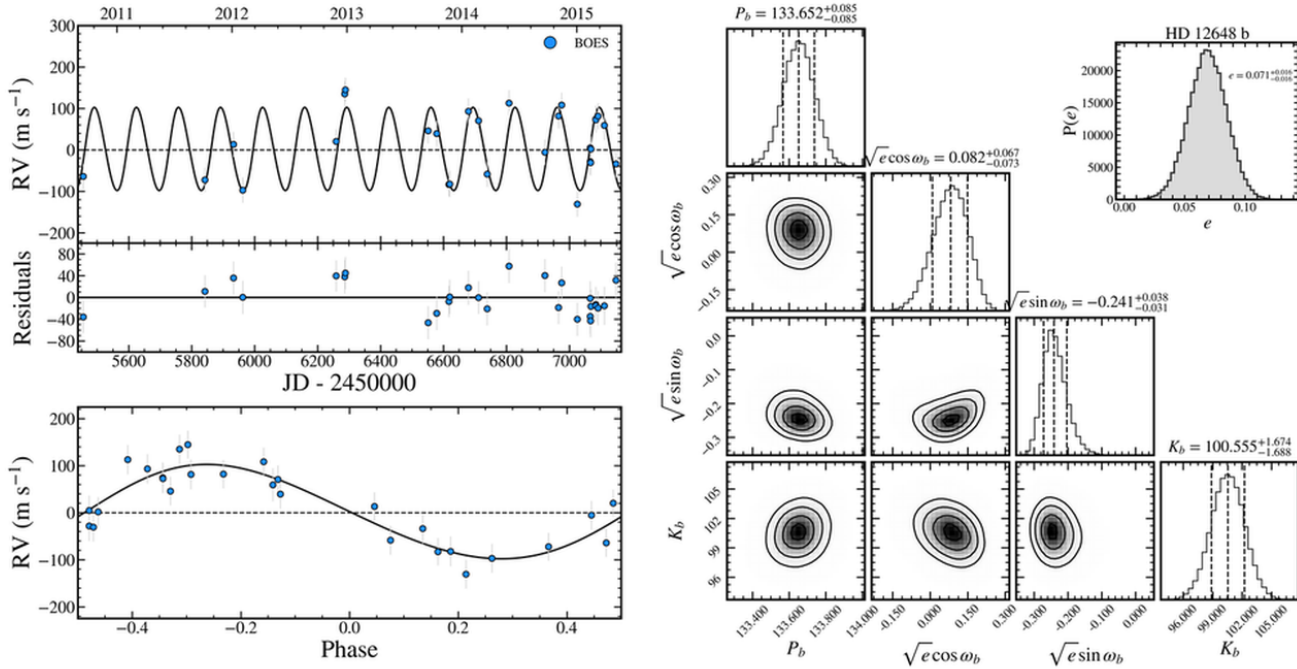
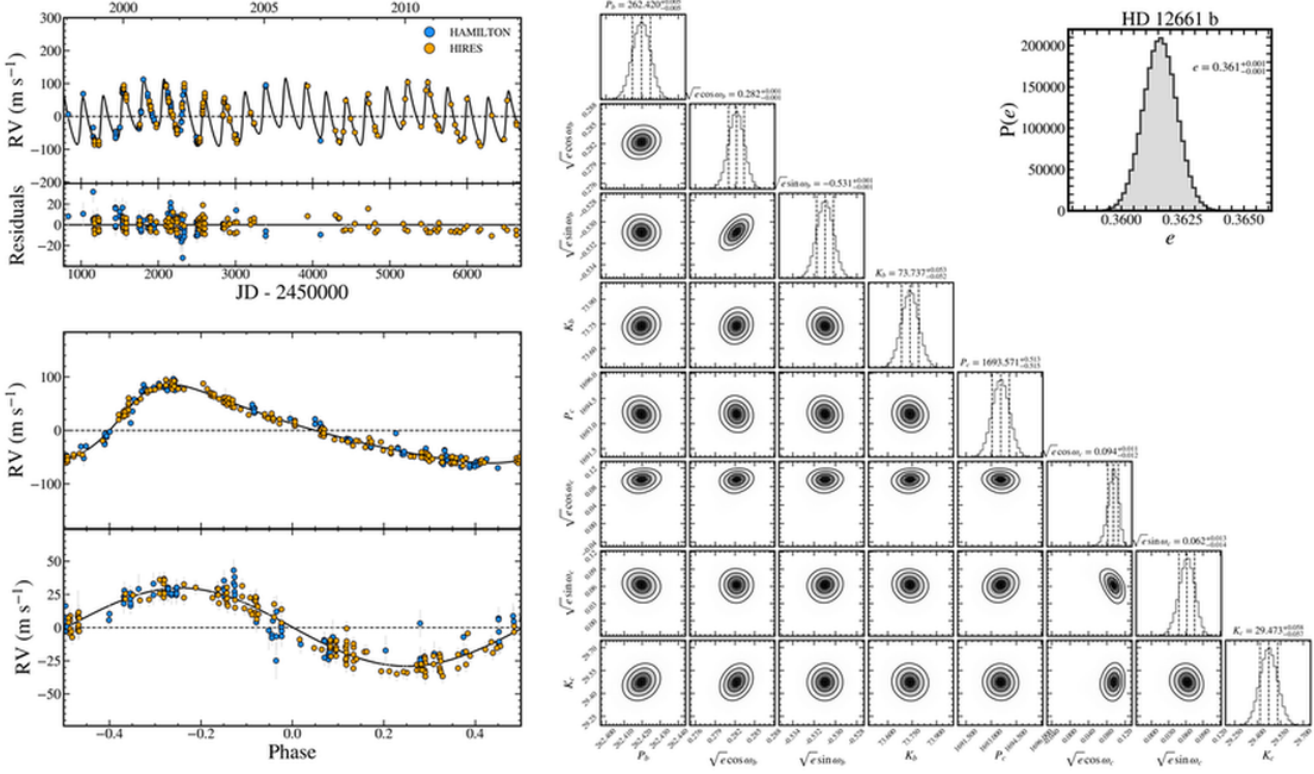


Figure 21. Summary of results for the warm Jupiters HD 12484 b and HD 12648 b.

HD 12661 b



HD 128356 b

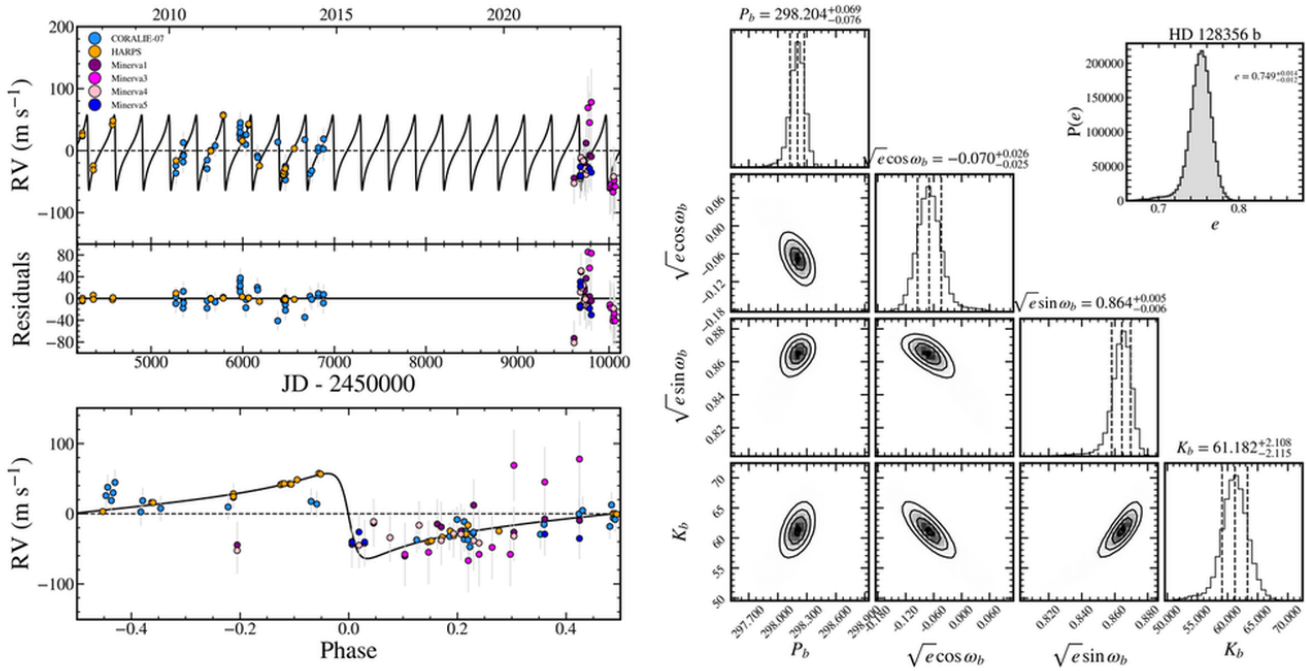
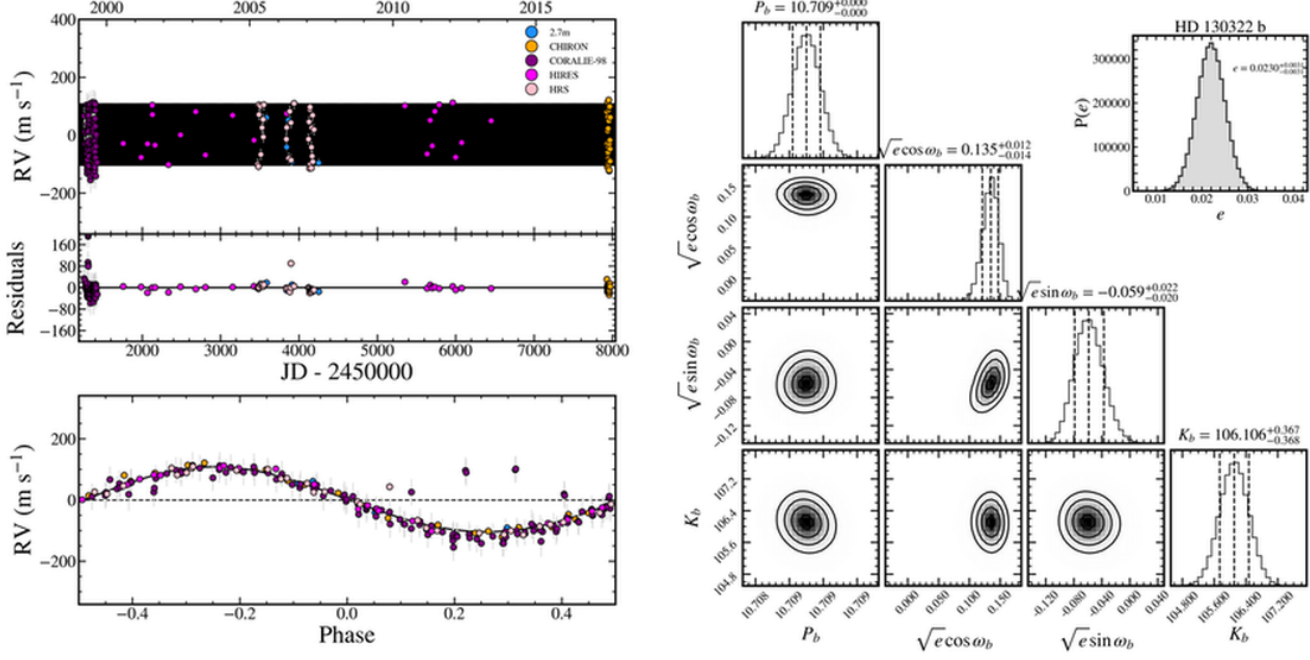


Figure 22. Summary of results for the warm Jupiters HD 12661 b and HD 128356 b.

HD 130322 b



HD 134987 b

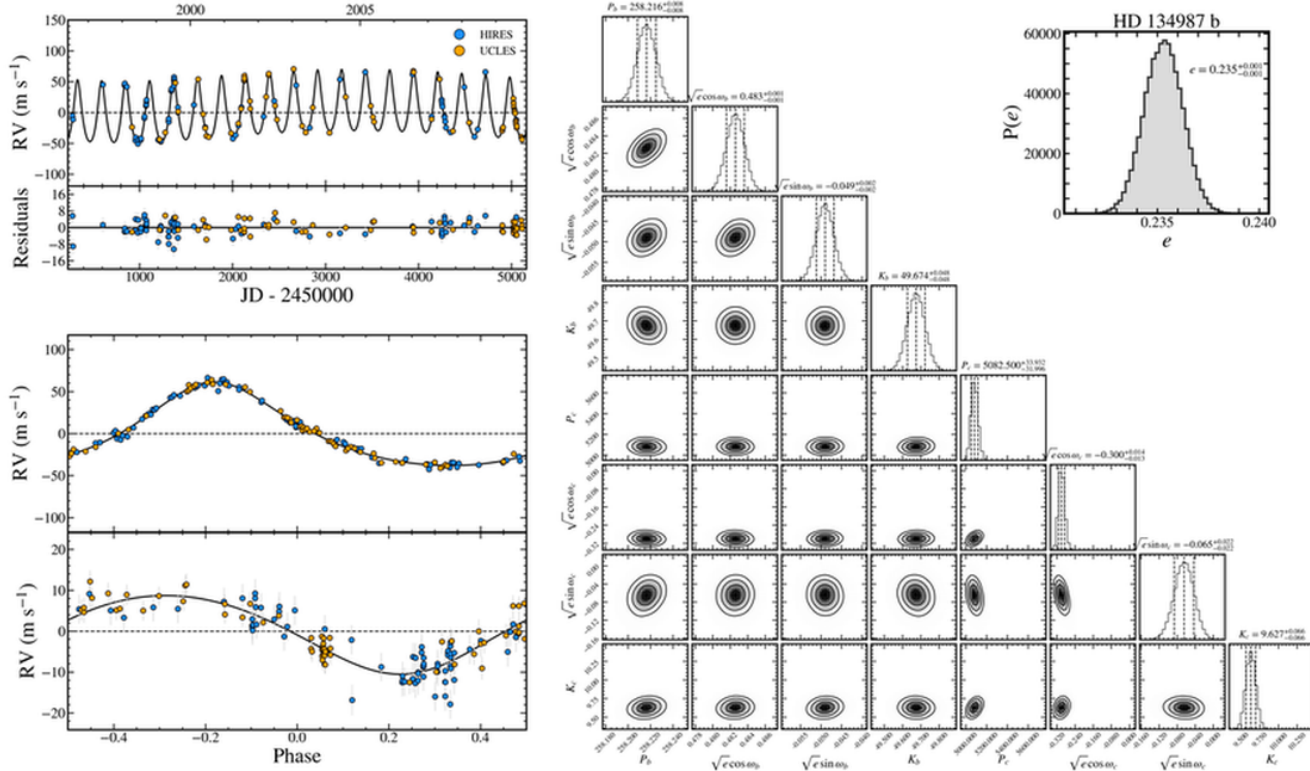
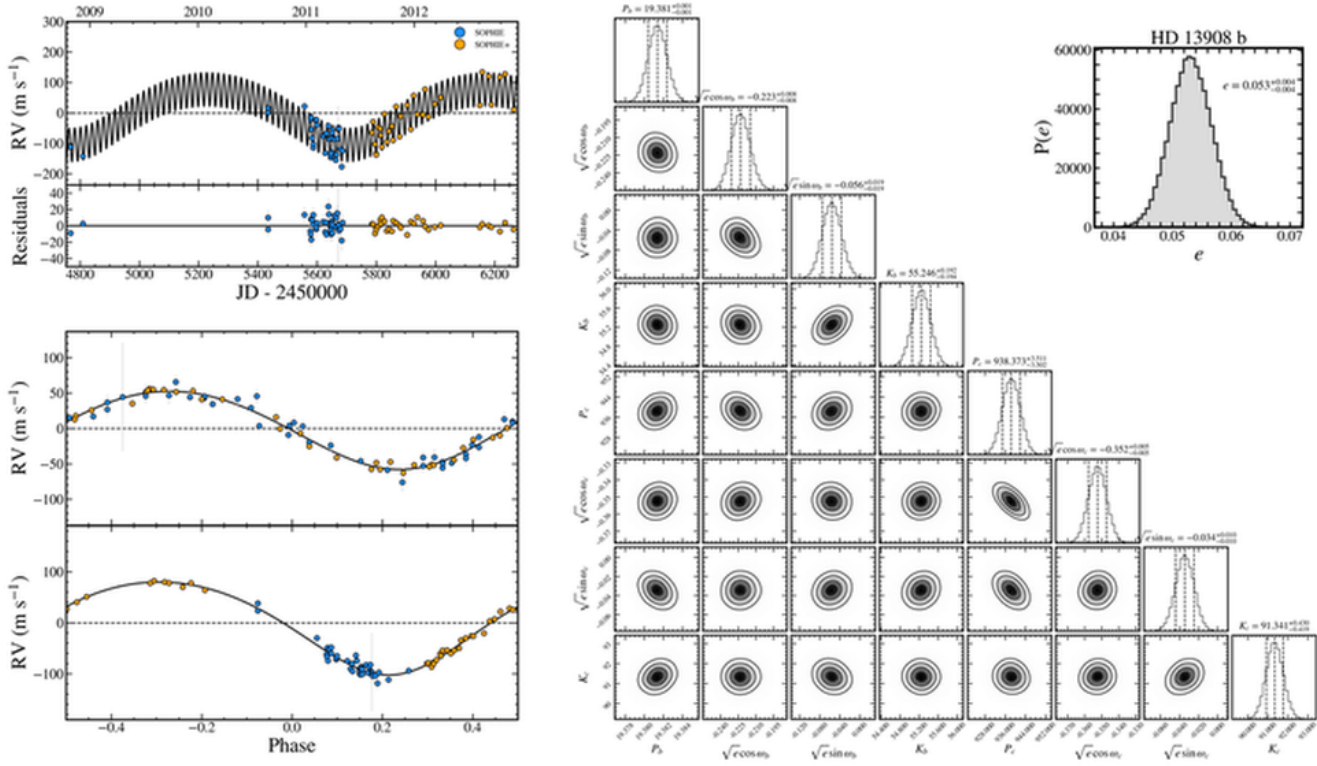


Figure 23. Summary of results for the warm Jupiters HD 130322 b and HD 134987 b.

HD 13908 b



HD 1397 b

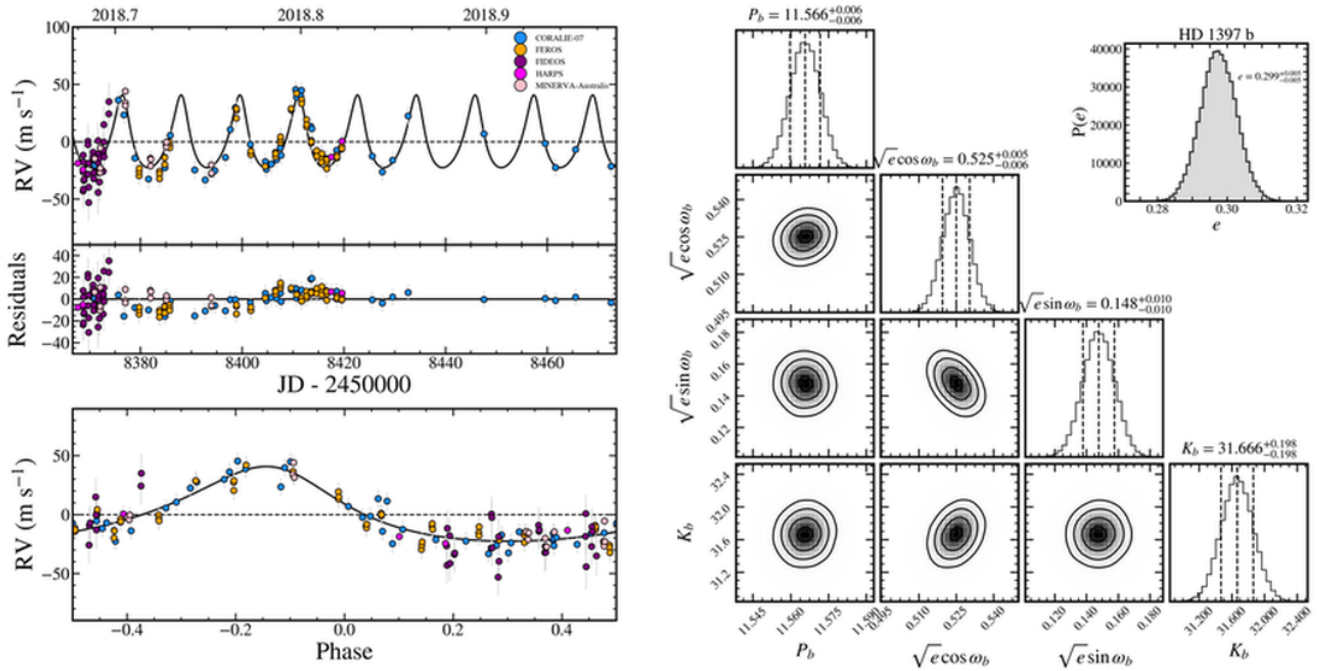
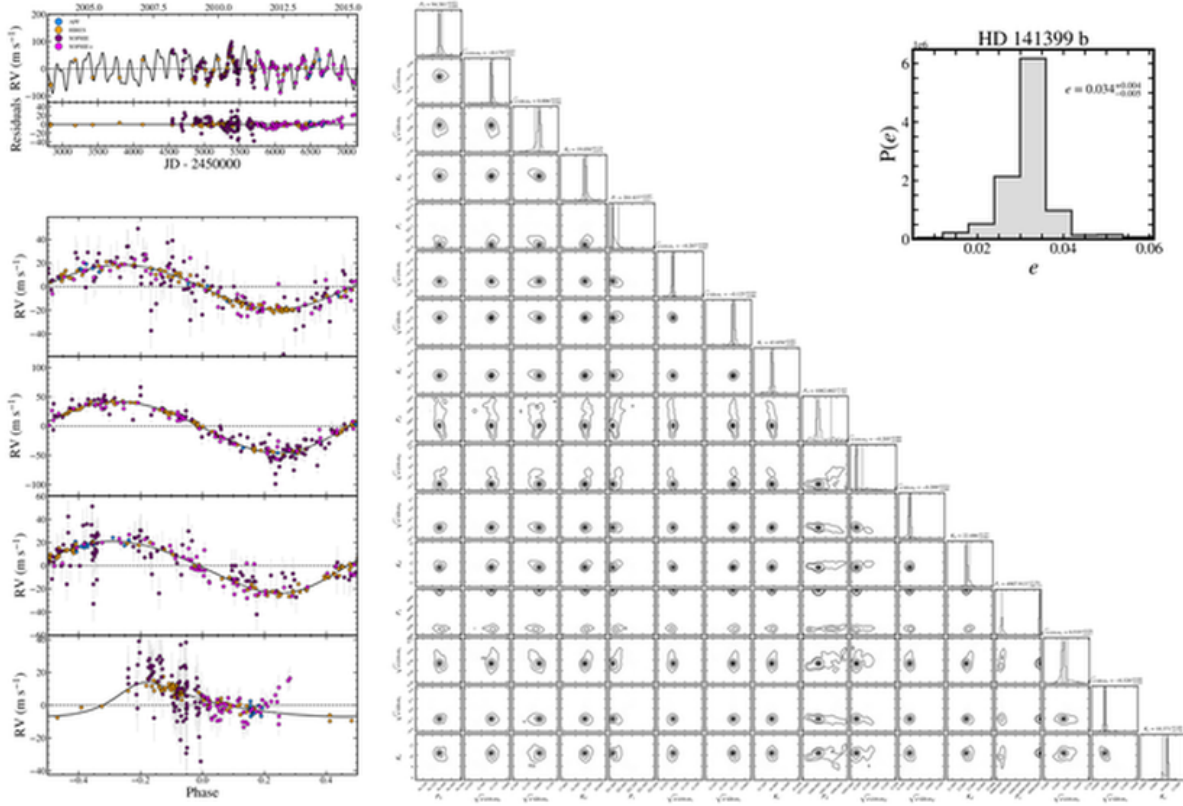


Figure 24. Summary of results for the warm Jupiters HD 13908 b and HD 1397 b.

HD 141399 b



HD 141399 c

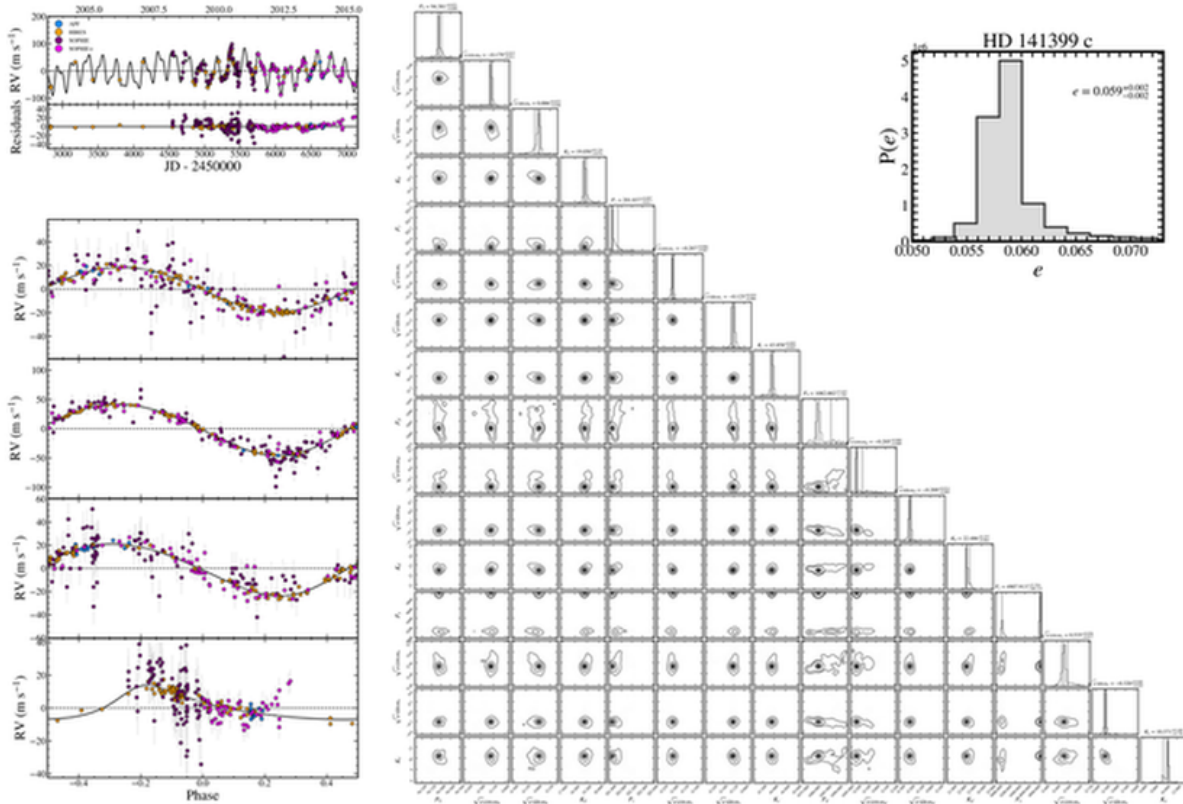
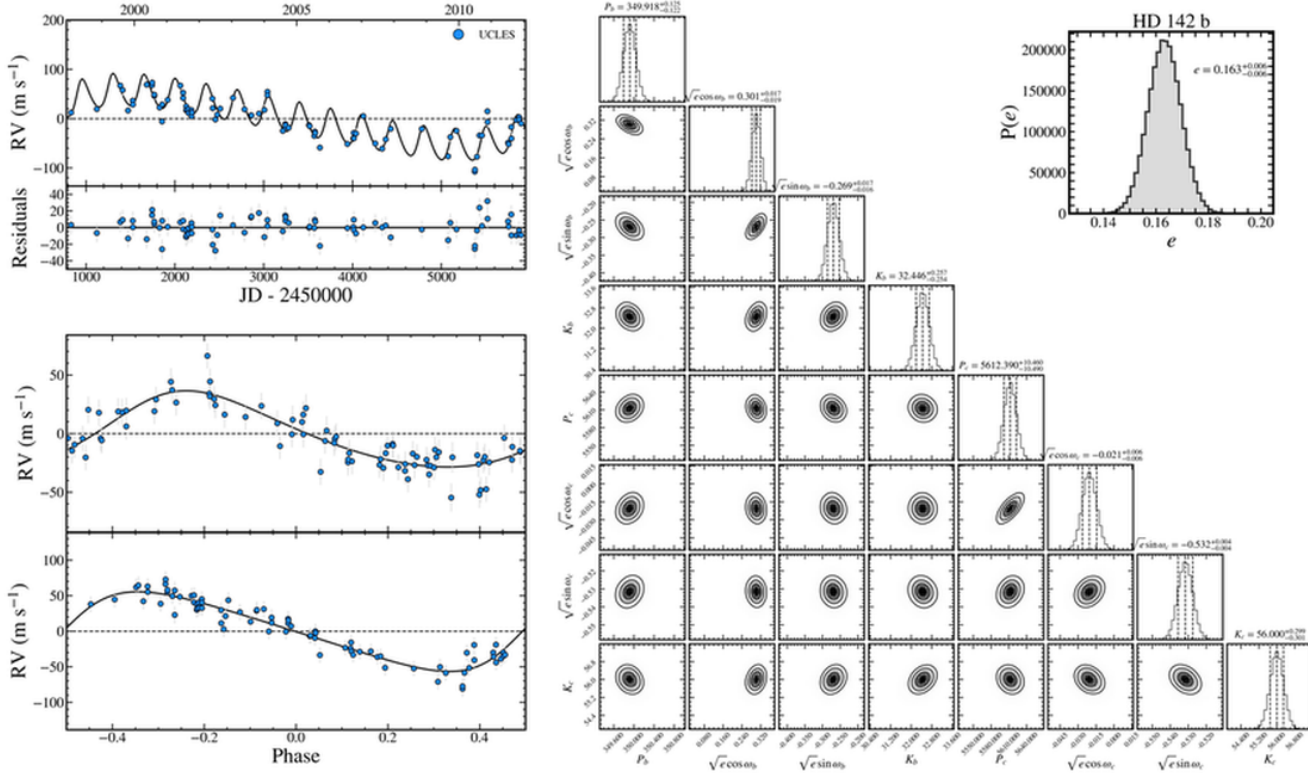


Figure 25. Summary of results for the warm Jupiters HD 141399 b and HD 141399 c.

HD 142 b



HD 145377 b

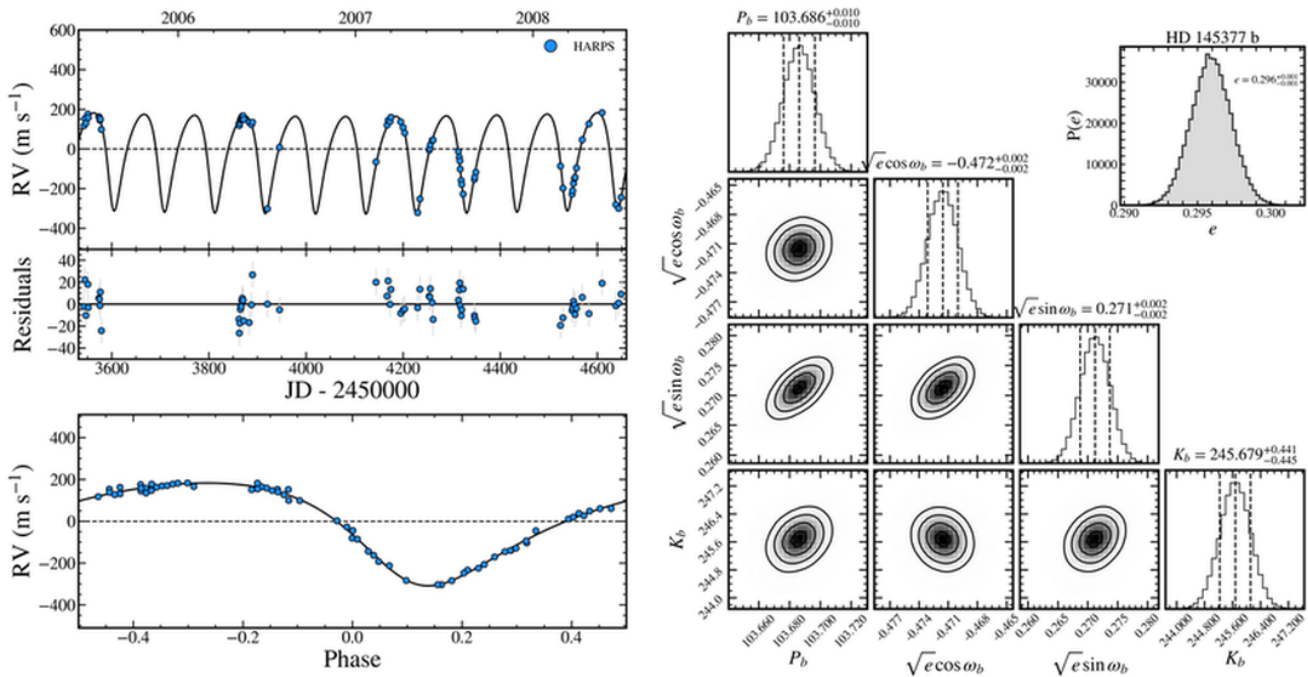
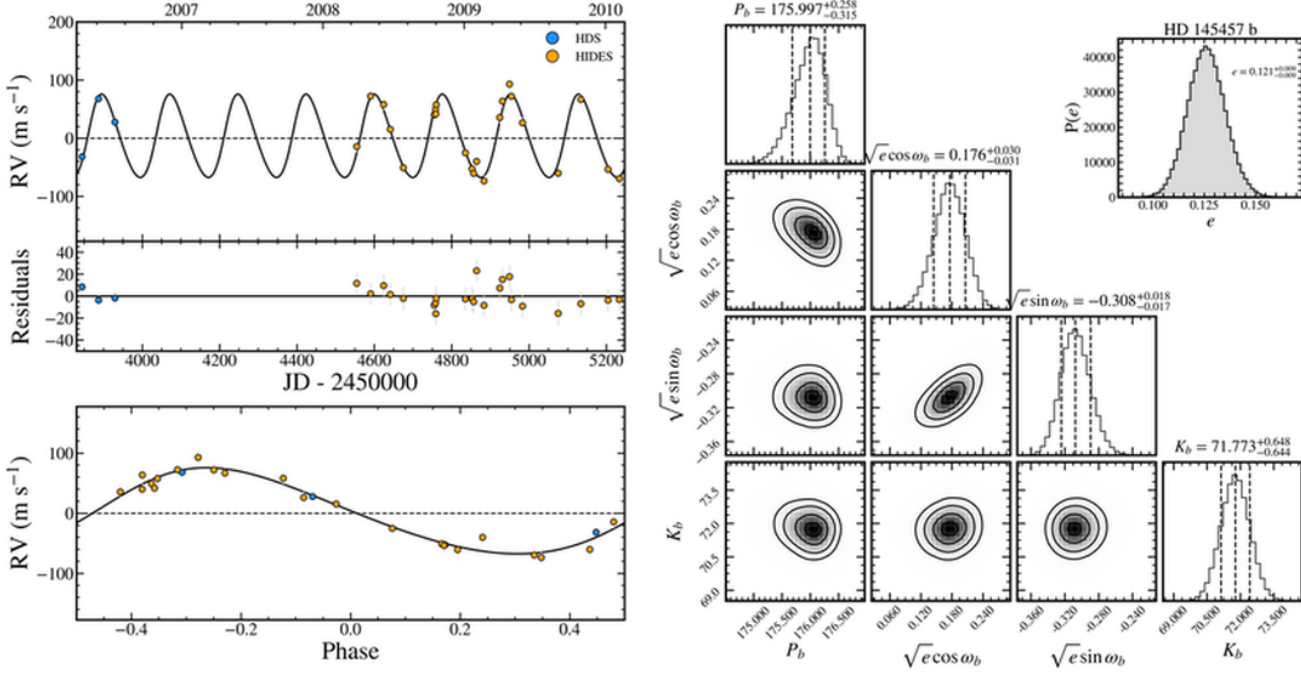


Figure 26. Summary of results for the warm Jupiters HD 142 b and HD 145377 b.

HD 145457 b



HD 147018 b

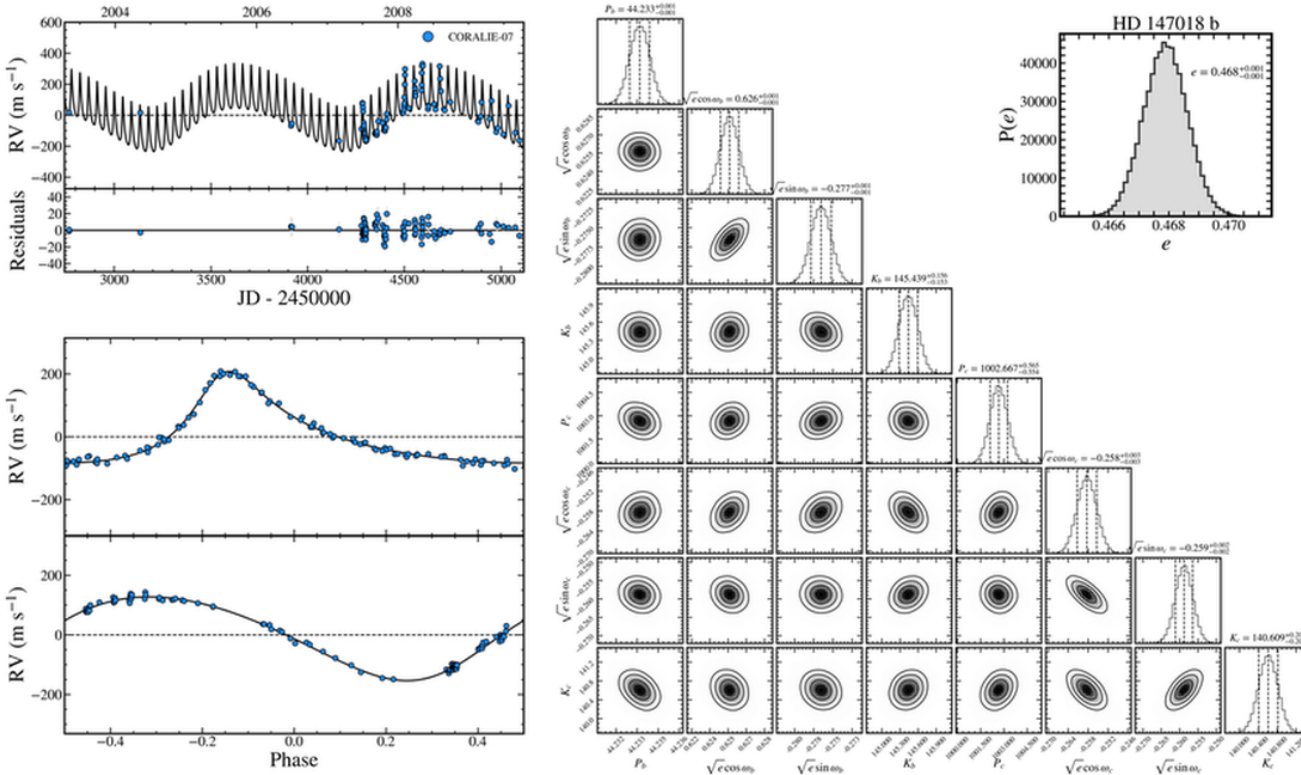
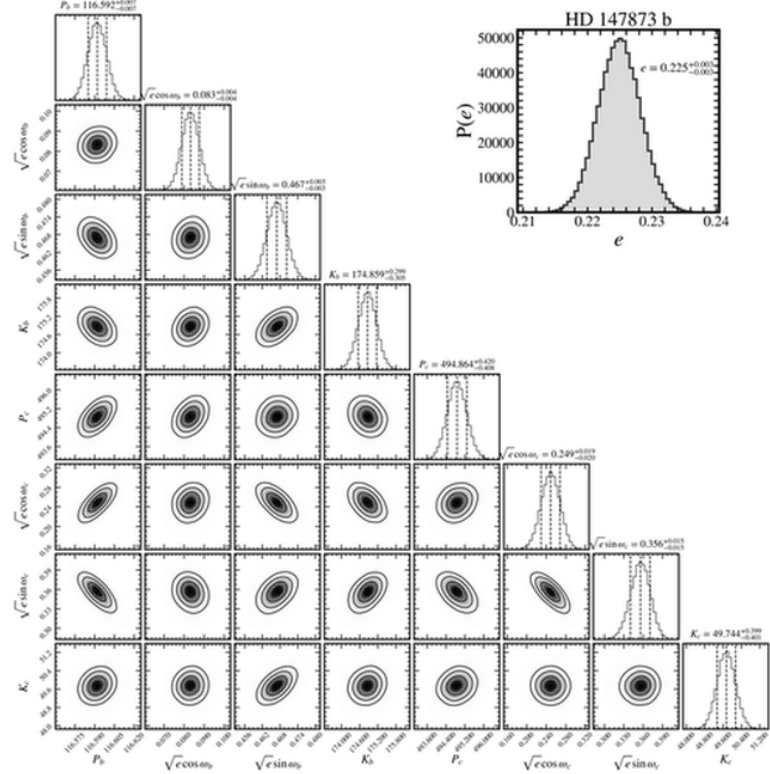
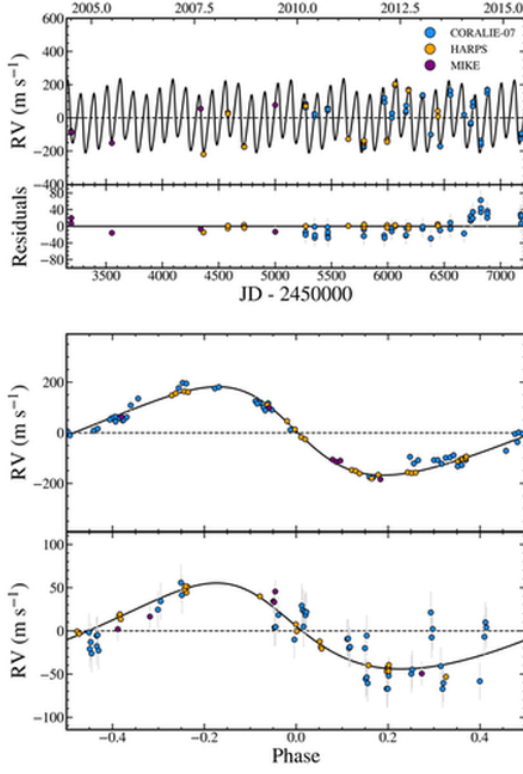


Figure 27. Summary of results for the warm Jupiters HD 145457 b and HD 147018 b.

HD 147873 b



HD 148164 b

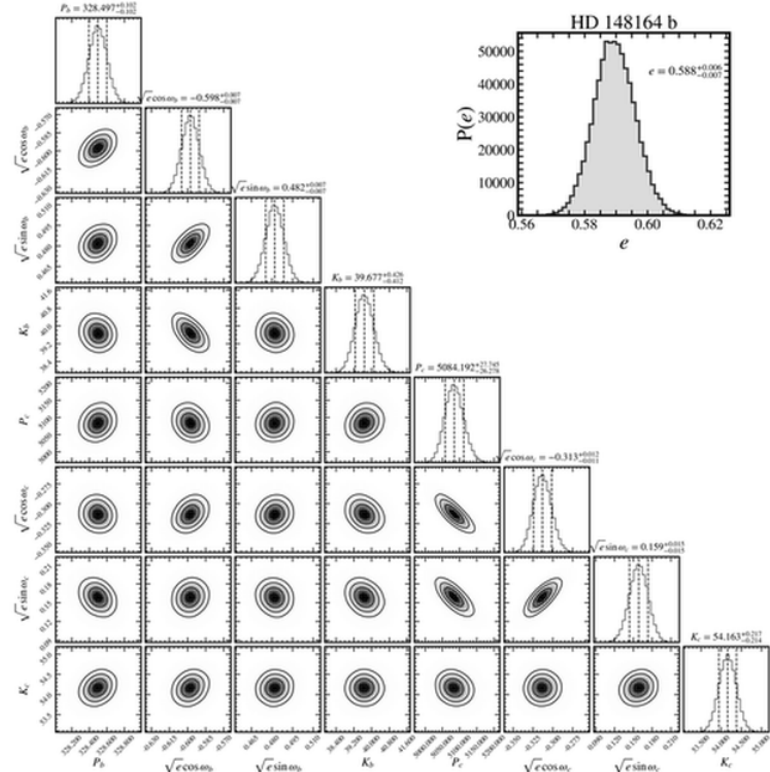
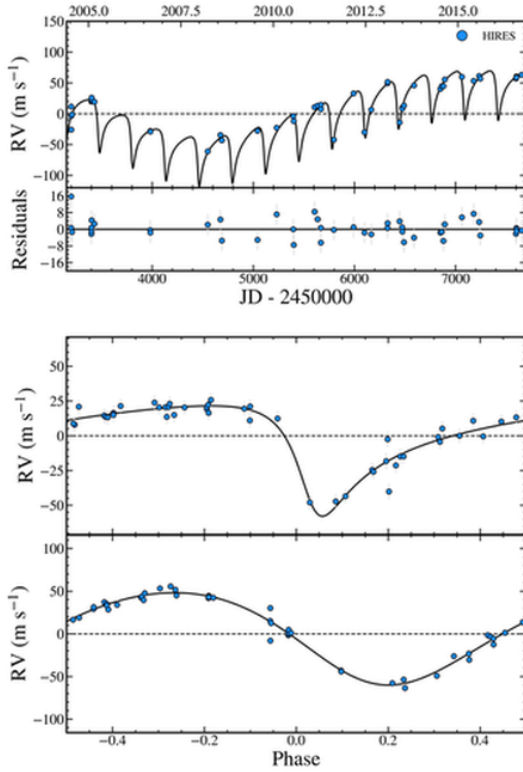
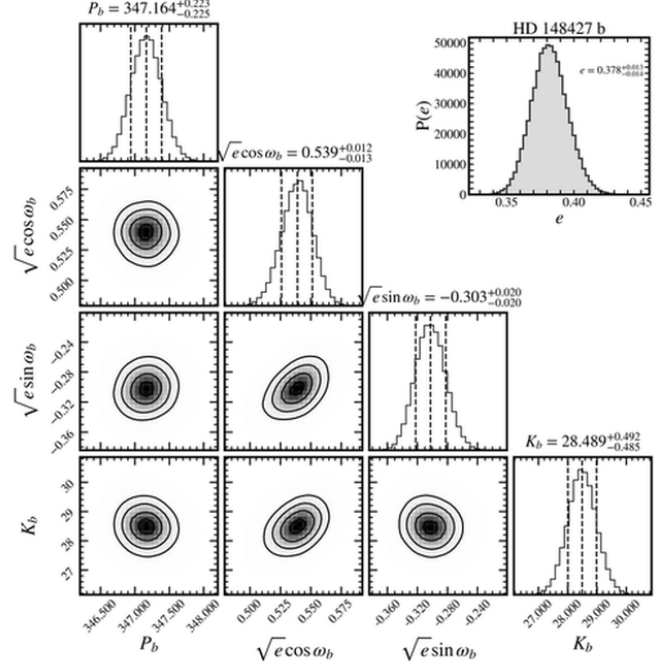
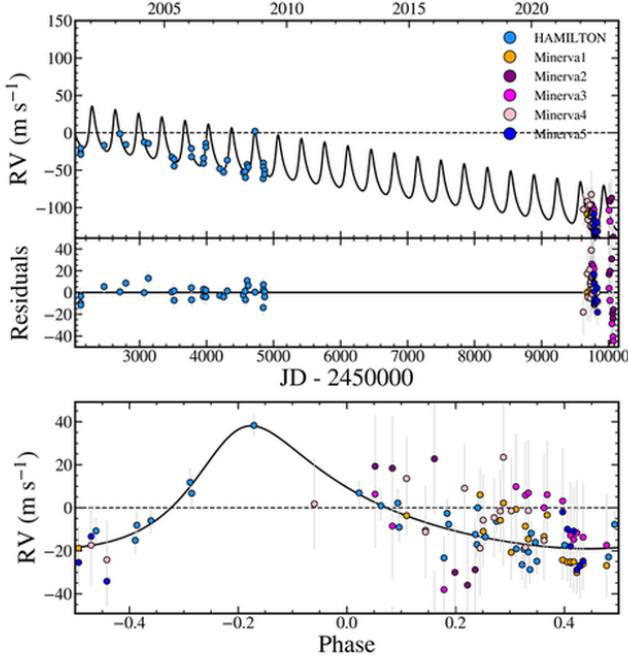


Figure 28. Summary of results for the warm Jupiters HD 147873 b and HD 148164 b.

HD 148427 b



HD 154672 b

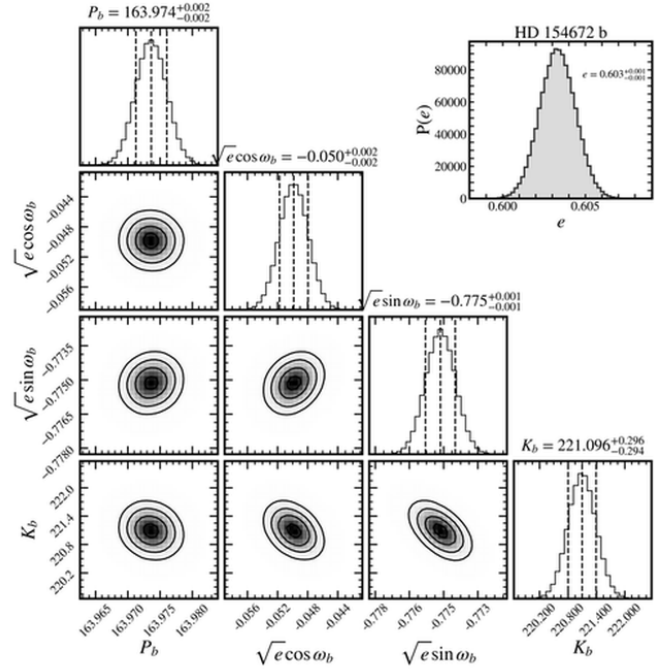
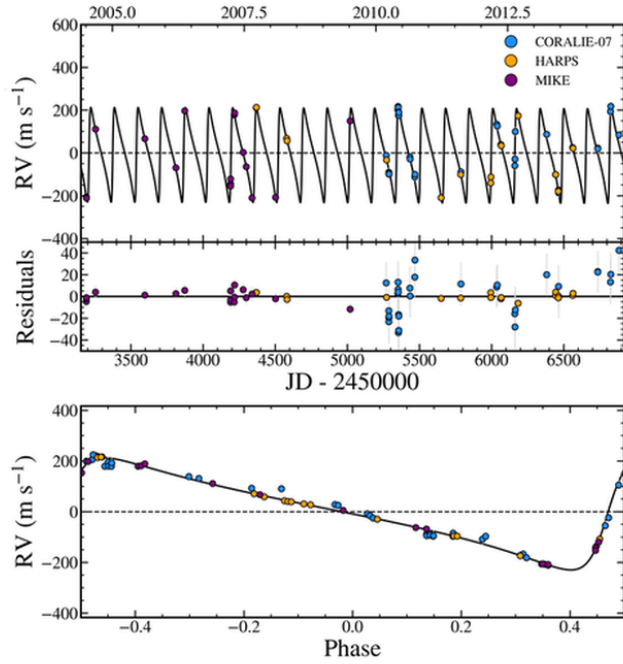
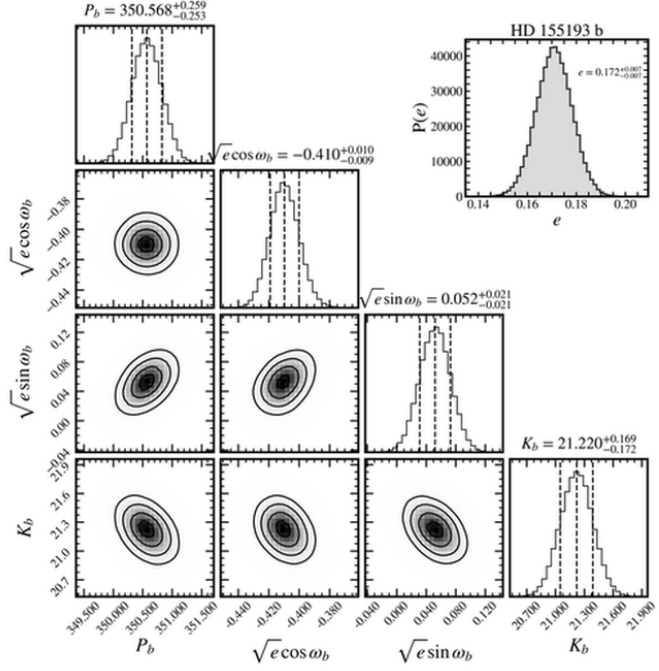
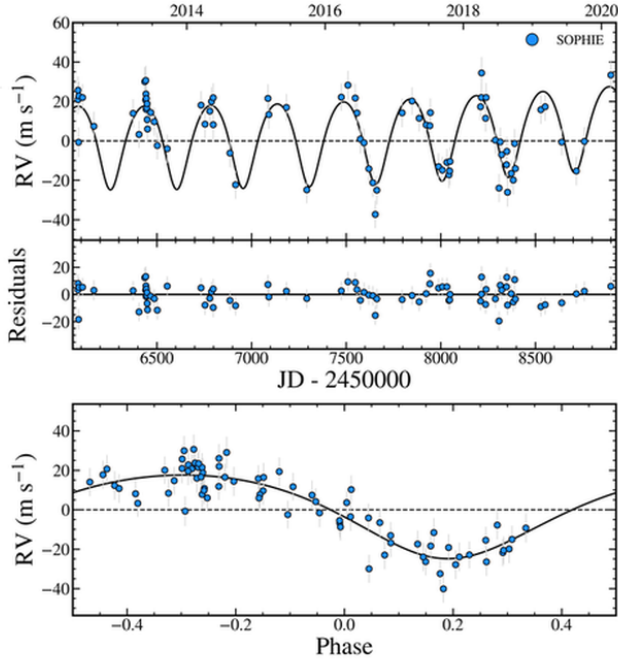


Figure 29. Summary of results for the warm Jupiters HD 148427 b and HD 154672 b.

HD 155193 b



HD 155358 b

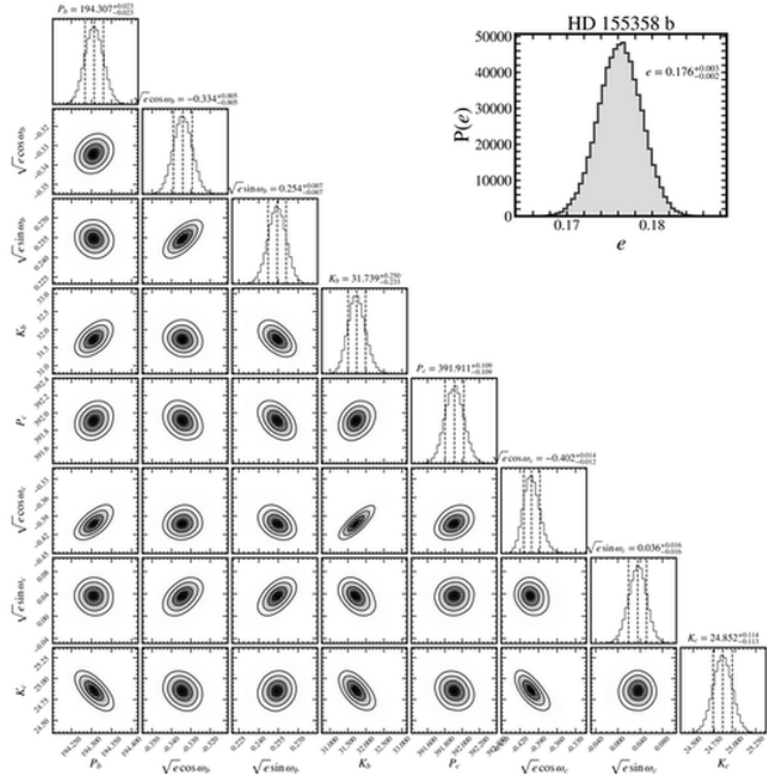
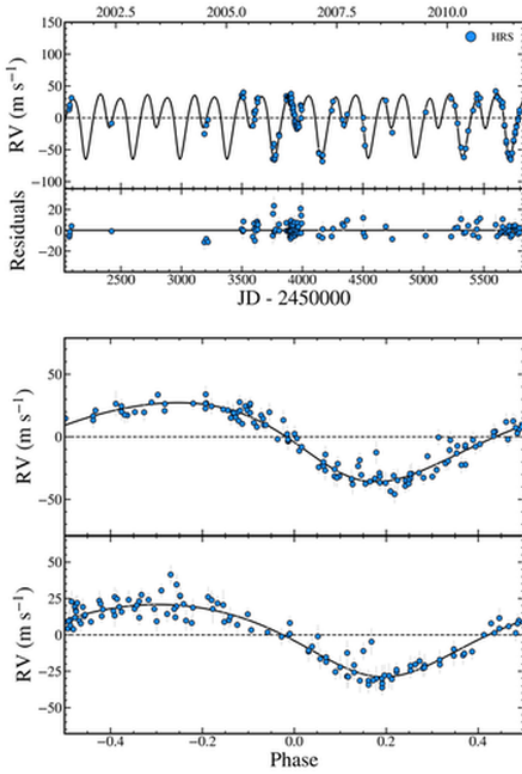
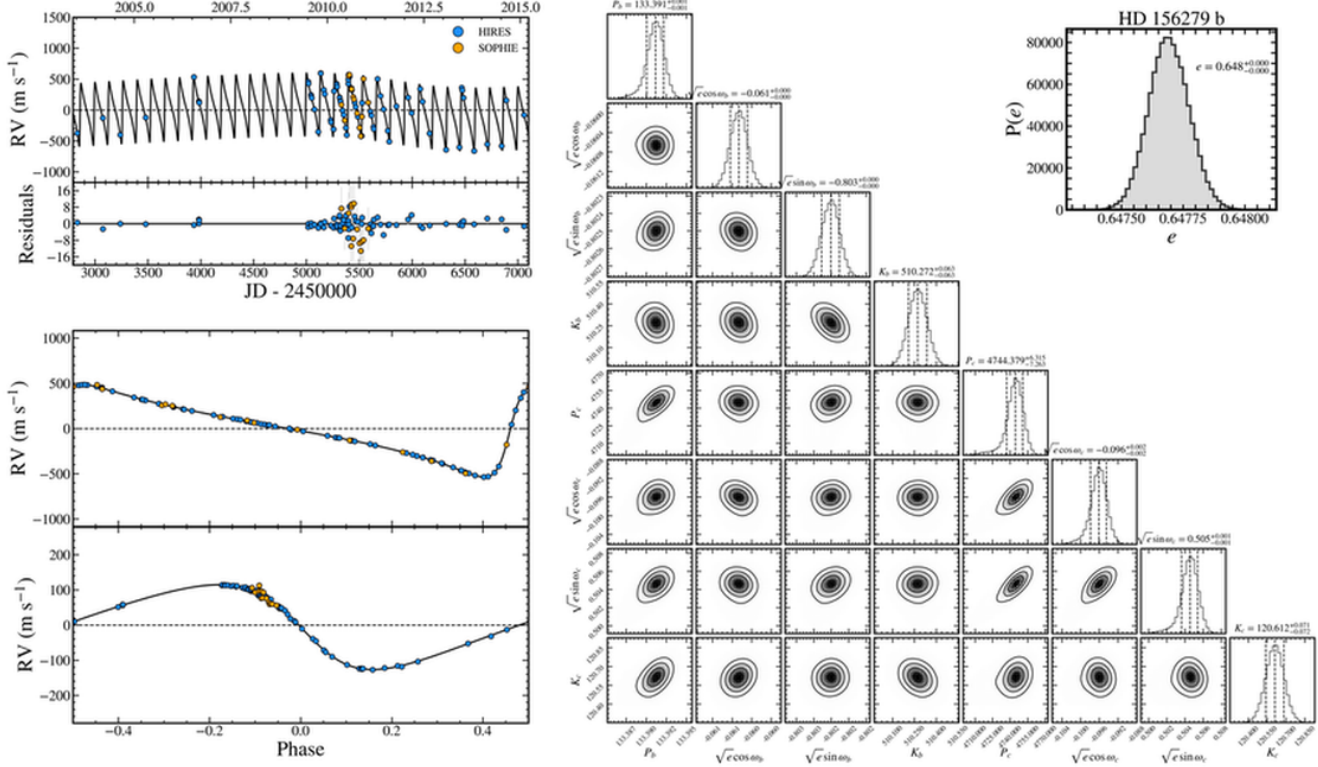


Figure 30. Summary of results for the warm Jupiters HD 155193 b and HD 155358 b.

HD 156279 b



HD 156846 b

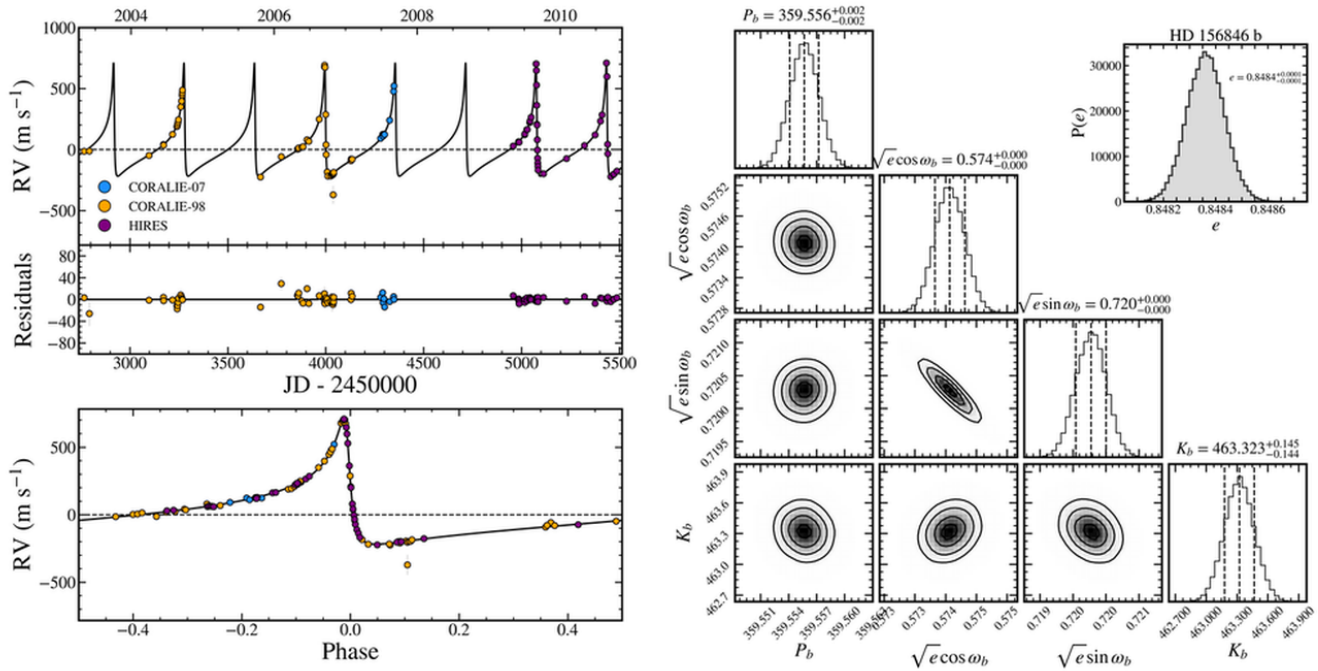
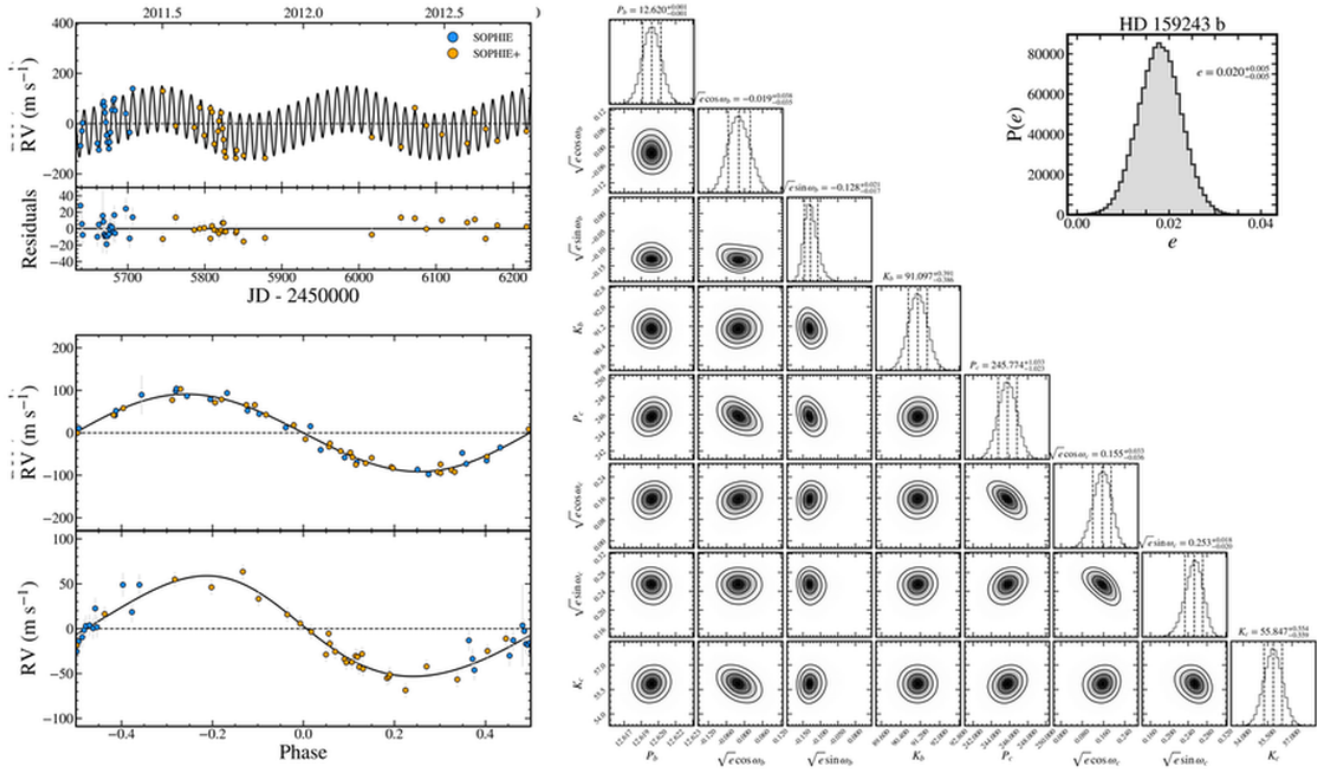


Figure 31. Summary of results for the warm Jupiters HD 156279 b and HD 156846 b.

HD 159243 b



HD 159243 c

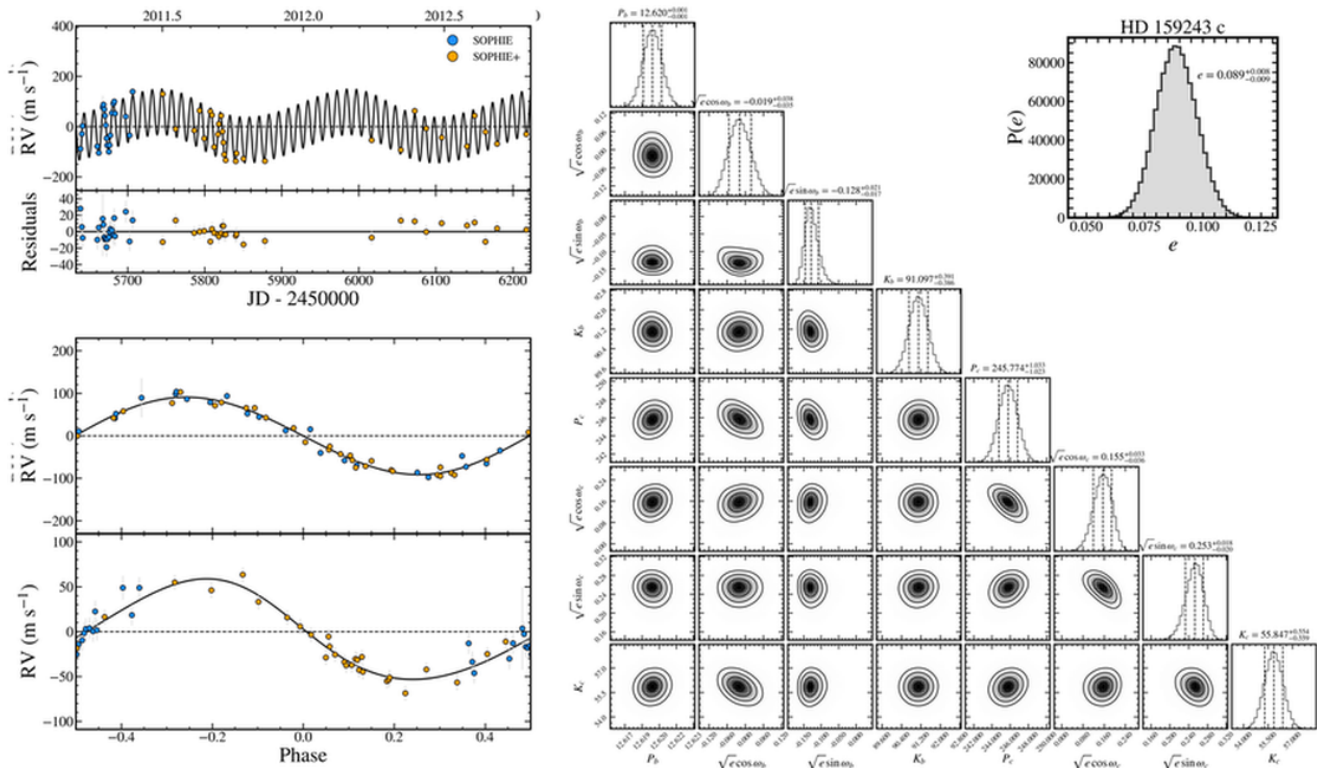
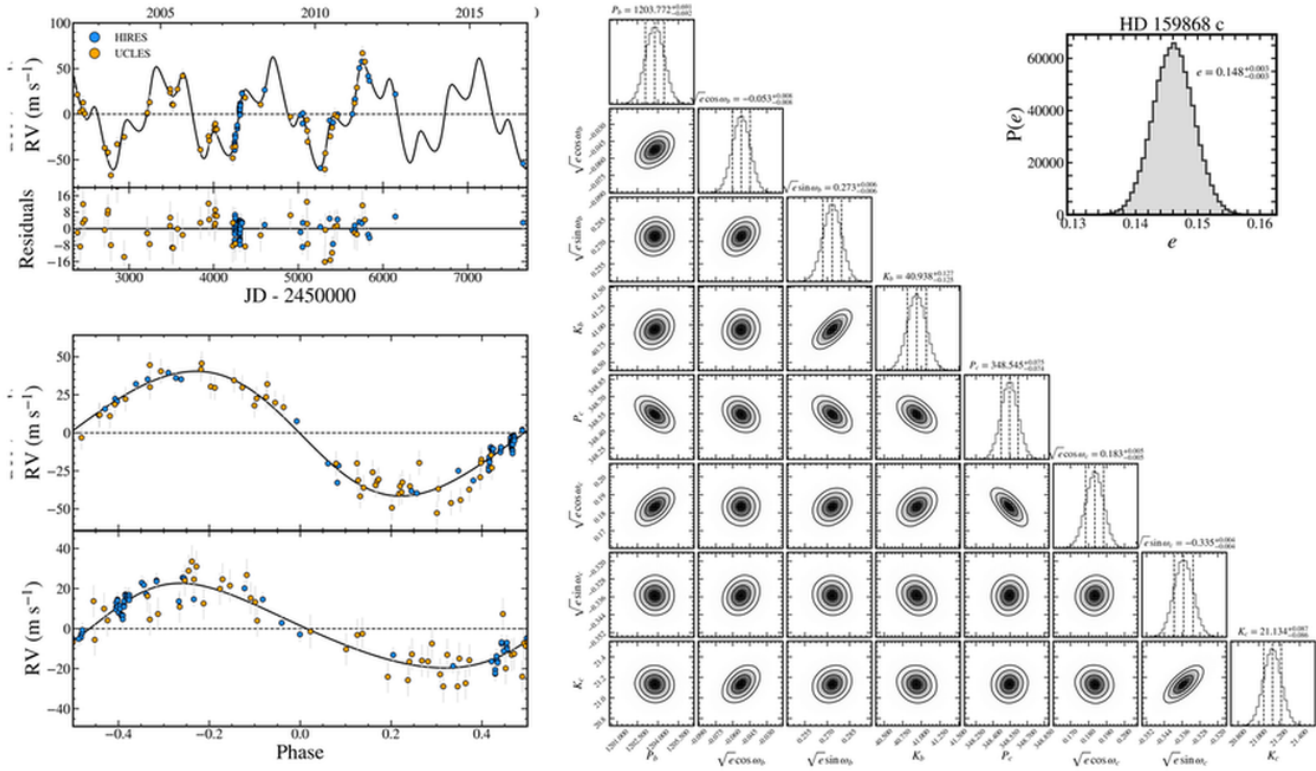


Figure 32. Summary of results for the warm Jupiters HD 159243 b and HD 159243 c.

HD 159868 c



HD 160691 e

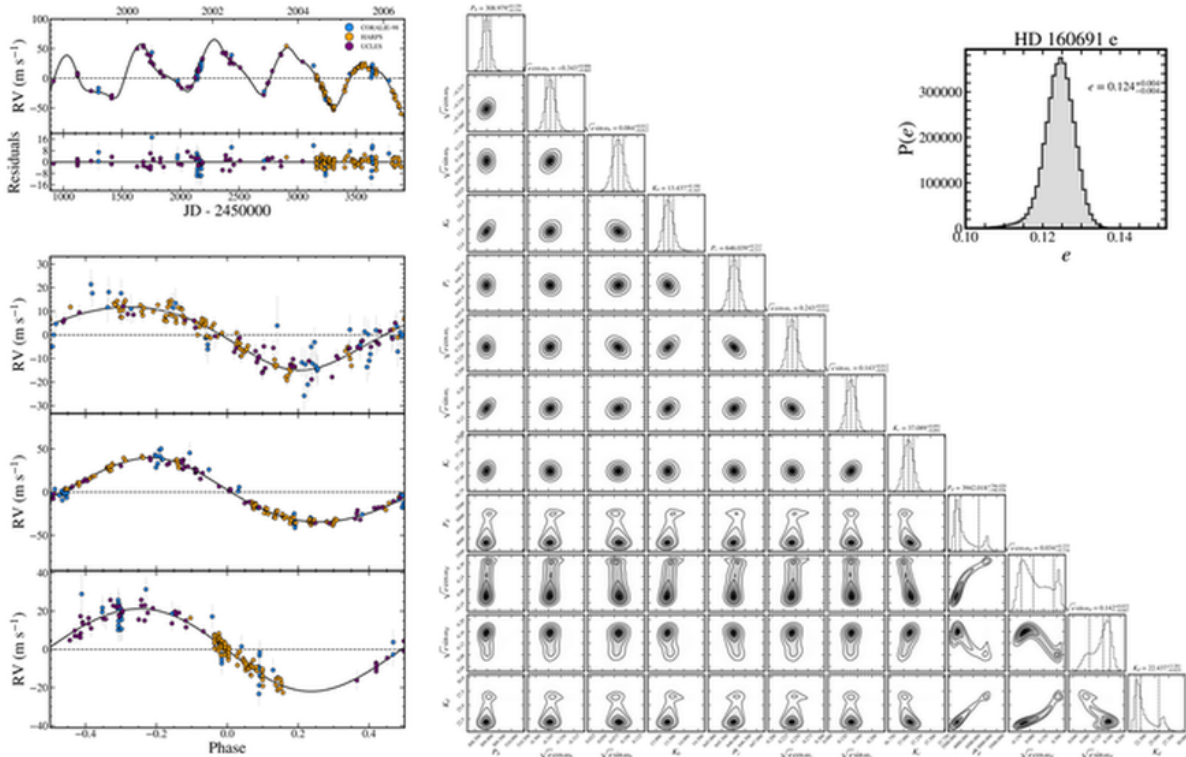
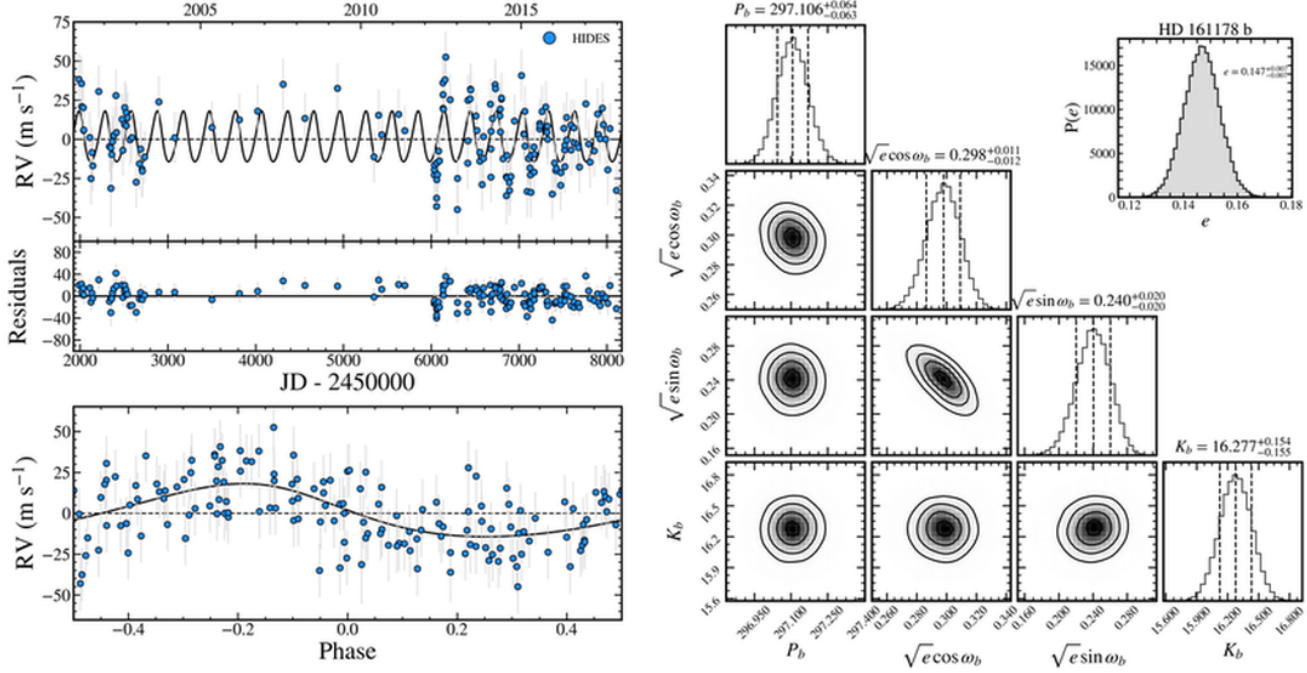


Figure 33. Summary of results for the warm Jupiters HD 159868 c and HD 160691 e.

HD 161178 b



HD 163607 b

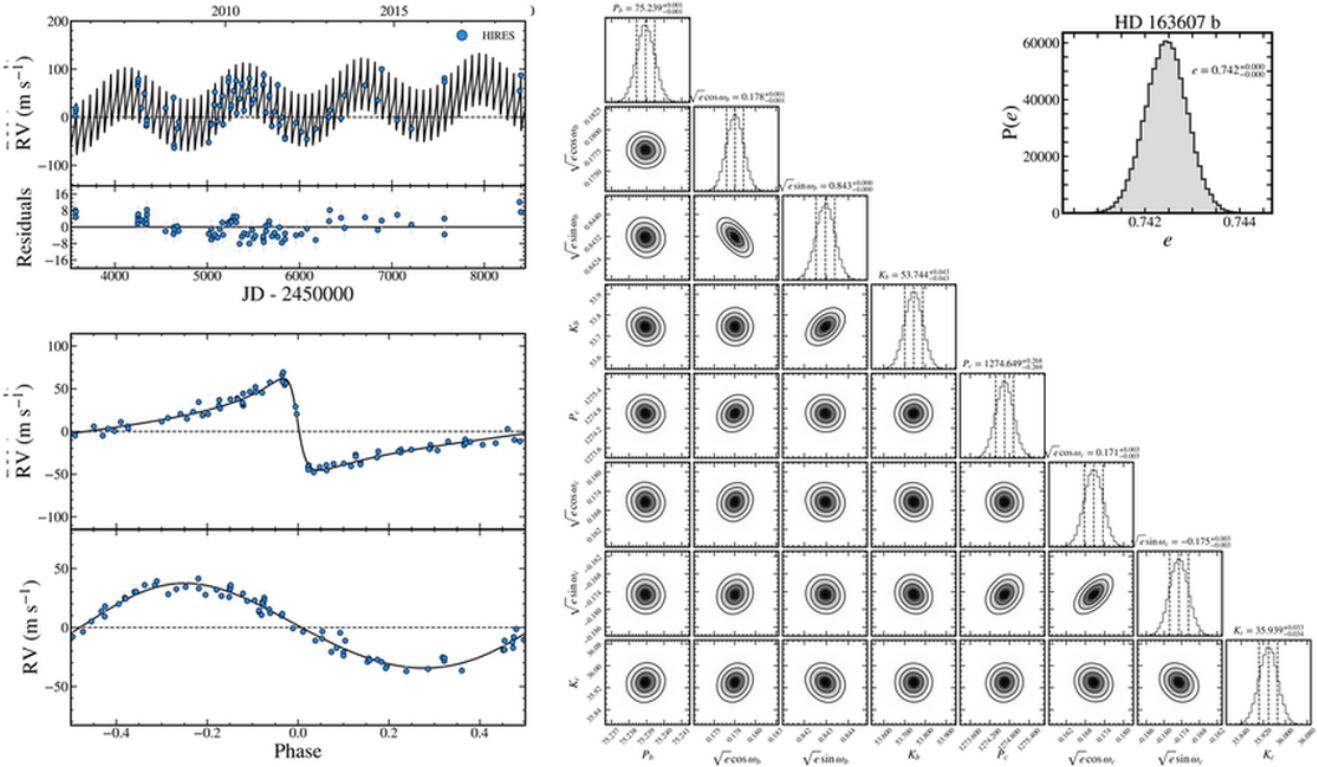
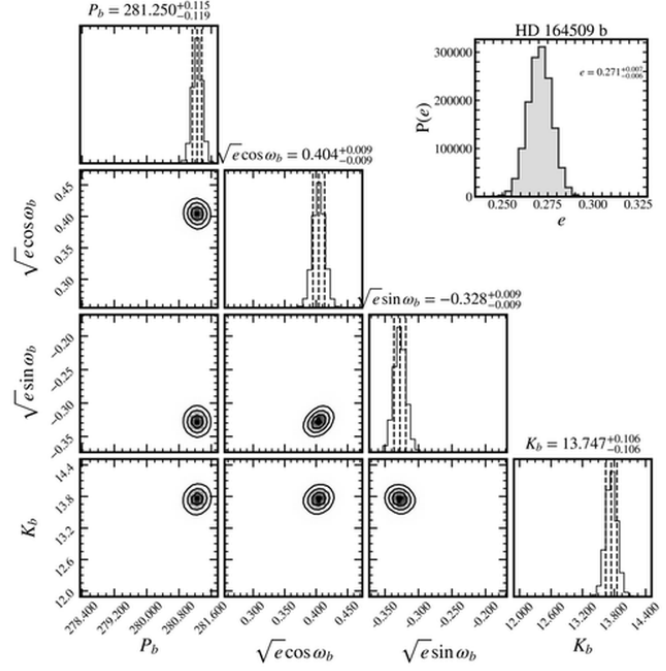
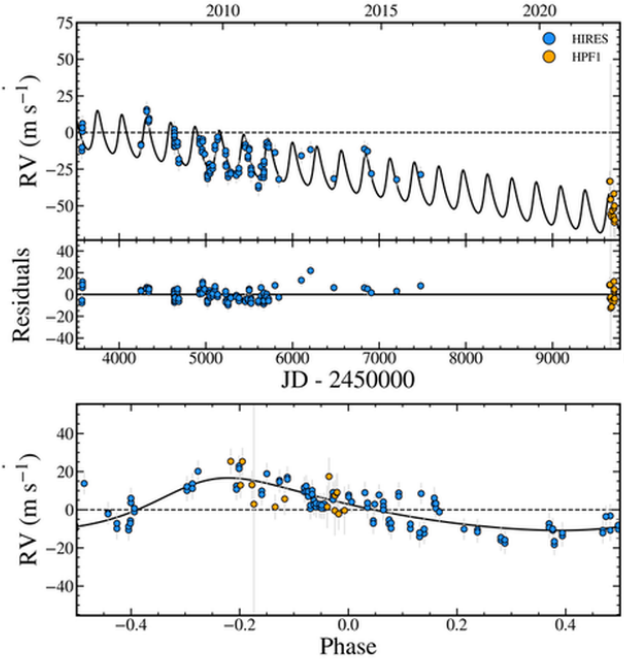


Figure 34. Summary of results for the warm Jupiters HD 161178 b and HD 163607 b.

HD 164509 b



HD 1666 b

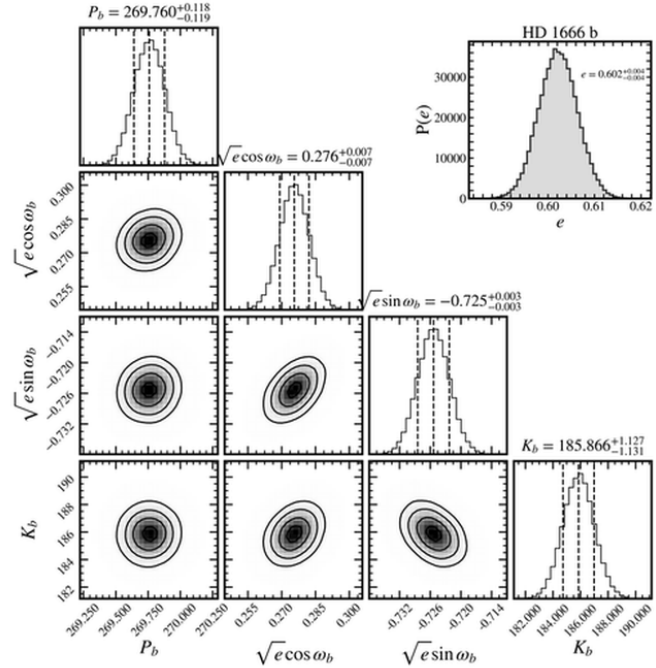
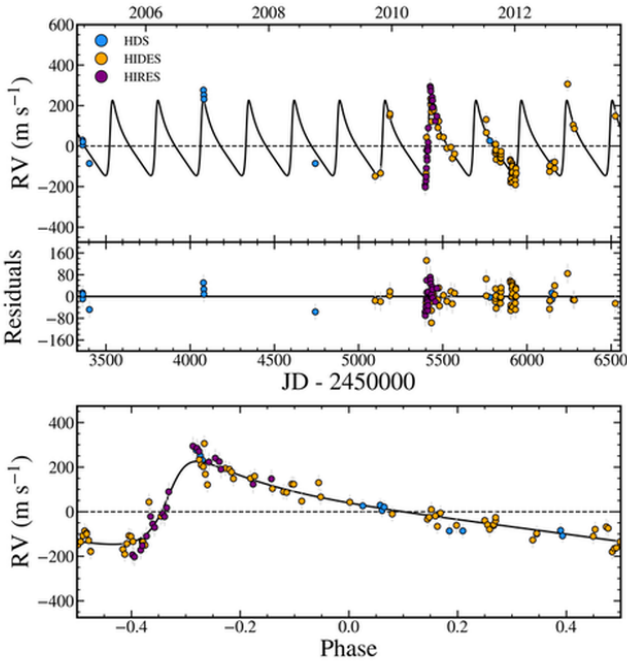
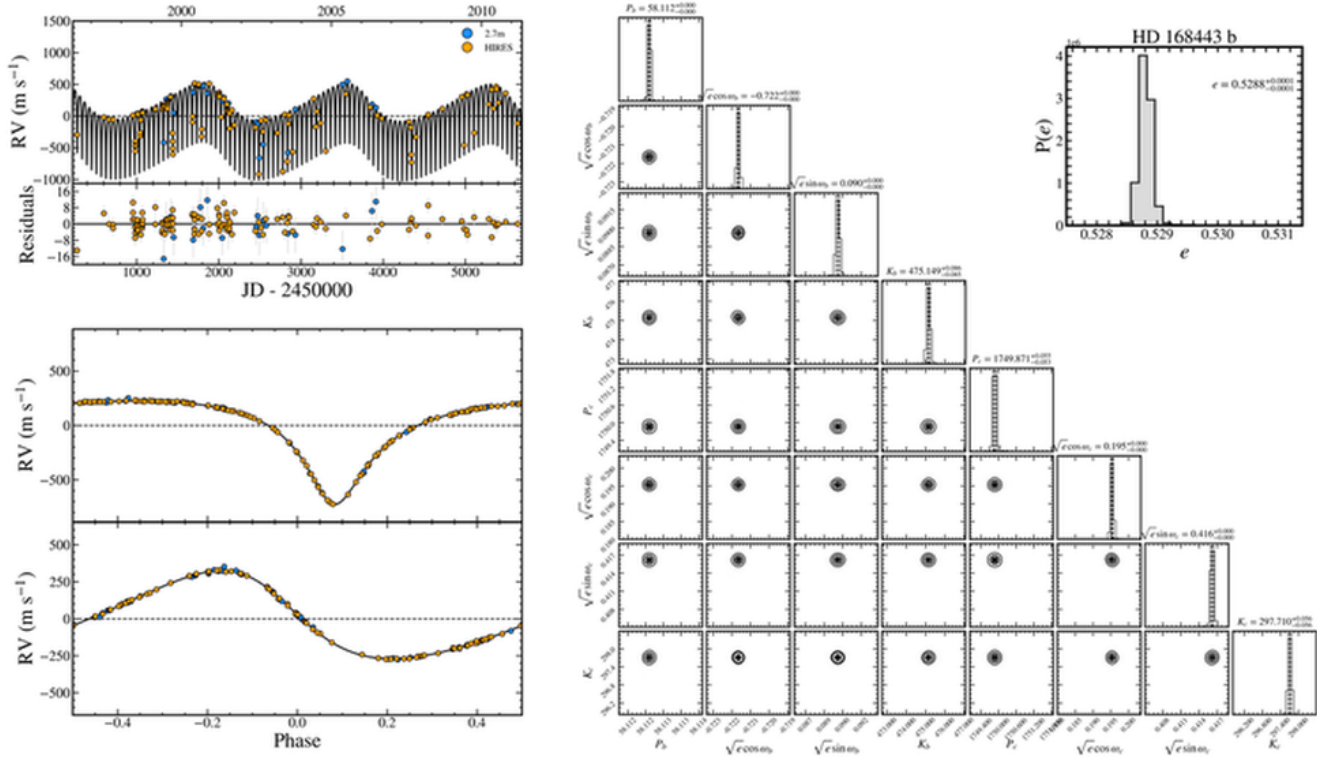


Figure 35. Summary of results for the warm Jupiters HD 164509 b and HD 1666 b.

HD 168443 b



HD 169830 b

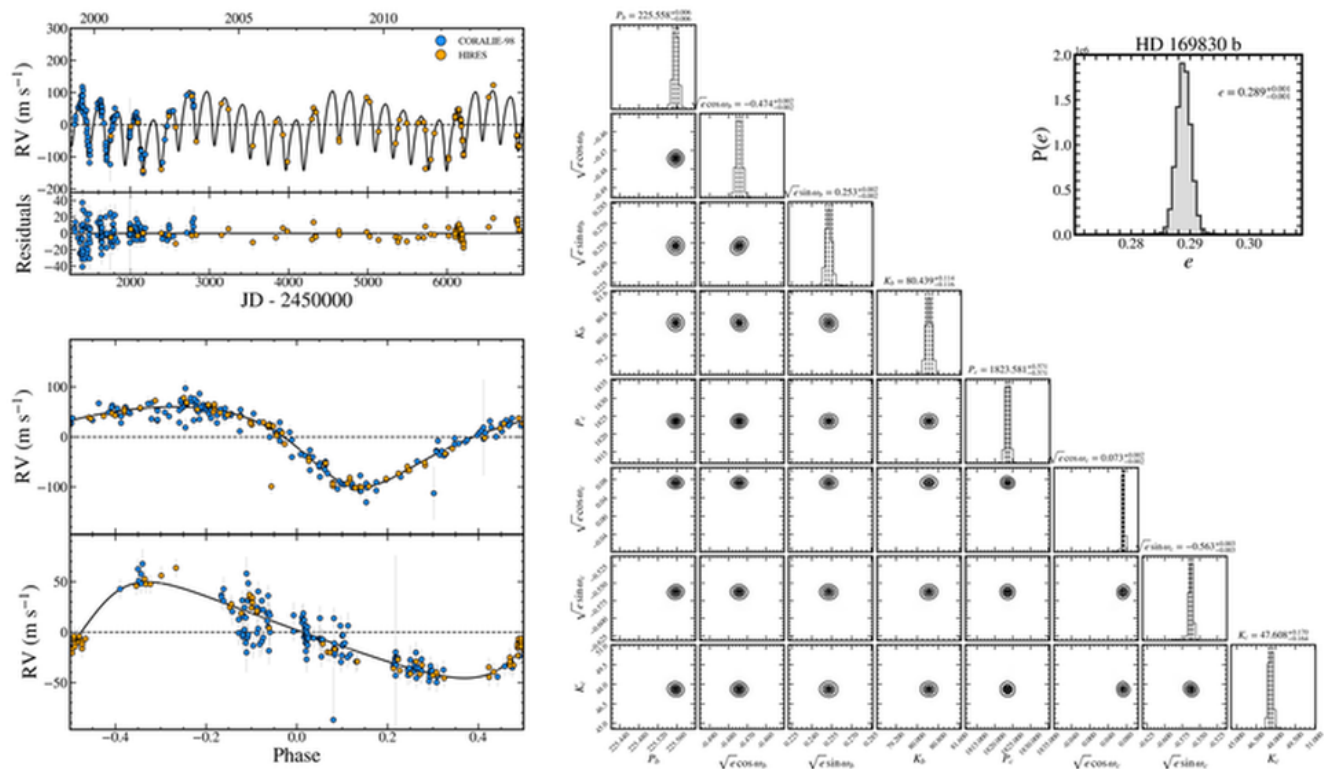
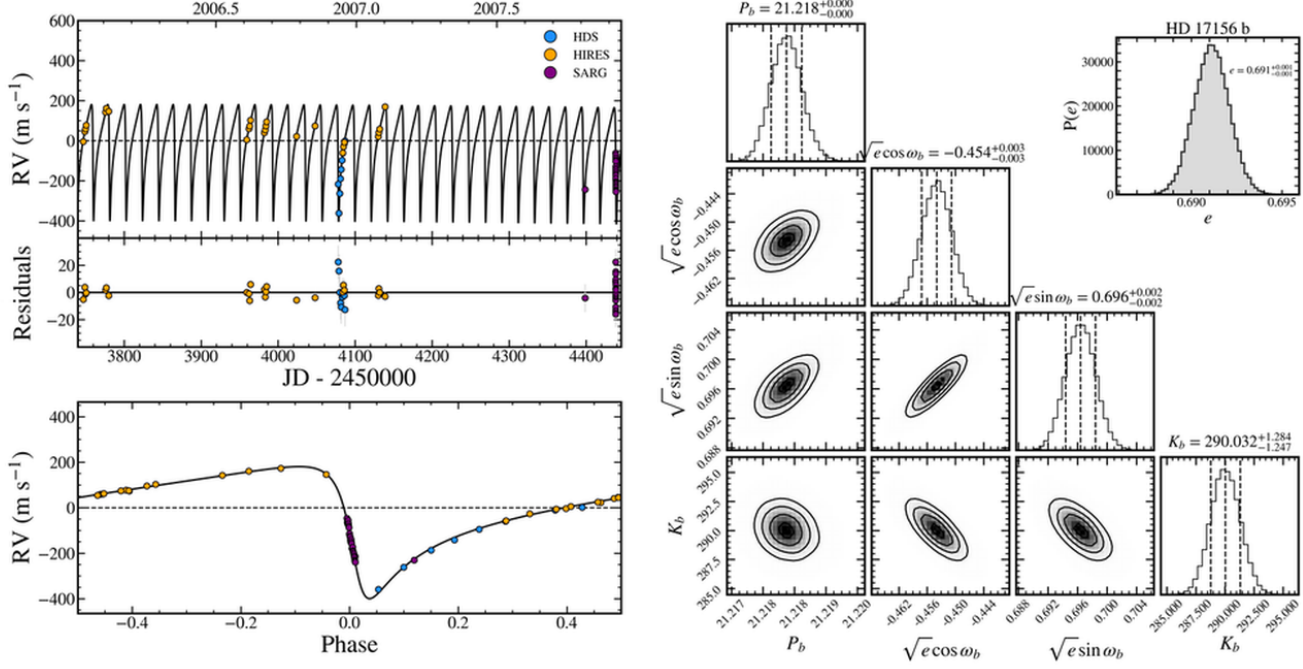


Figure 36. Summary of results for the warm Jupiters HD 168443 b and HD 169830 b.

HD 17156 b



HD 173416 b

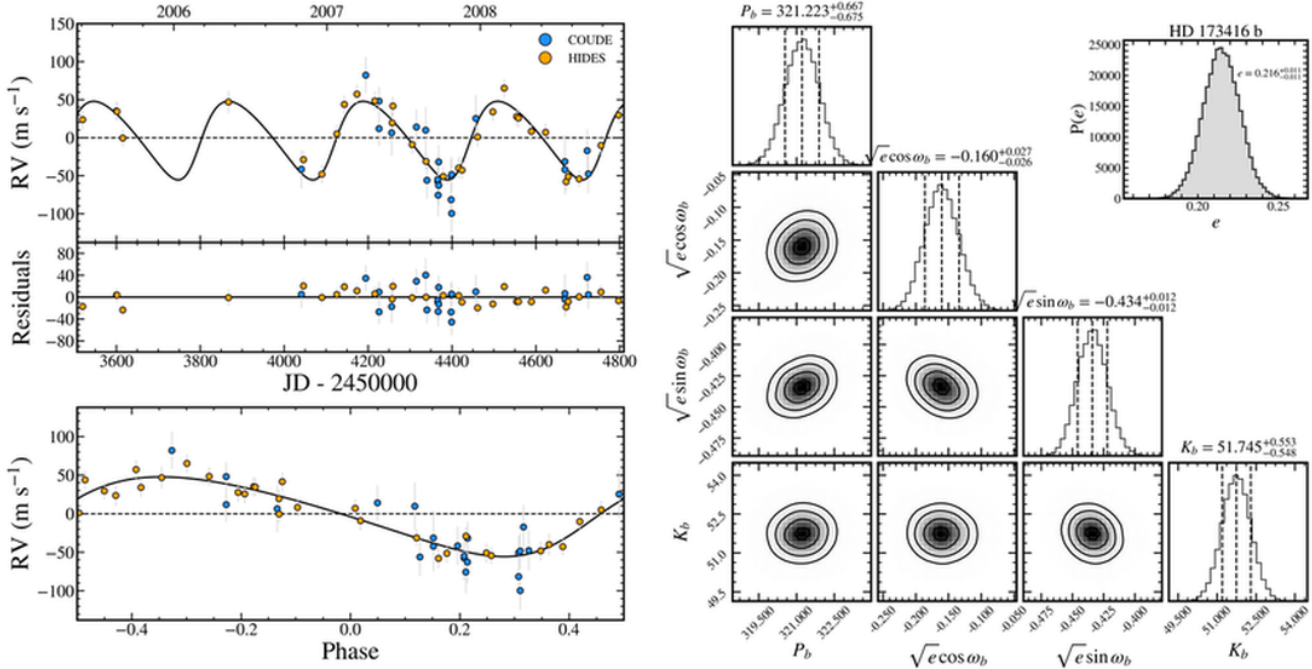
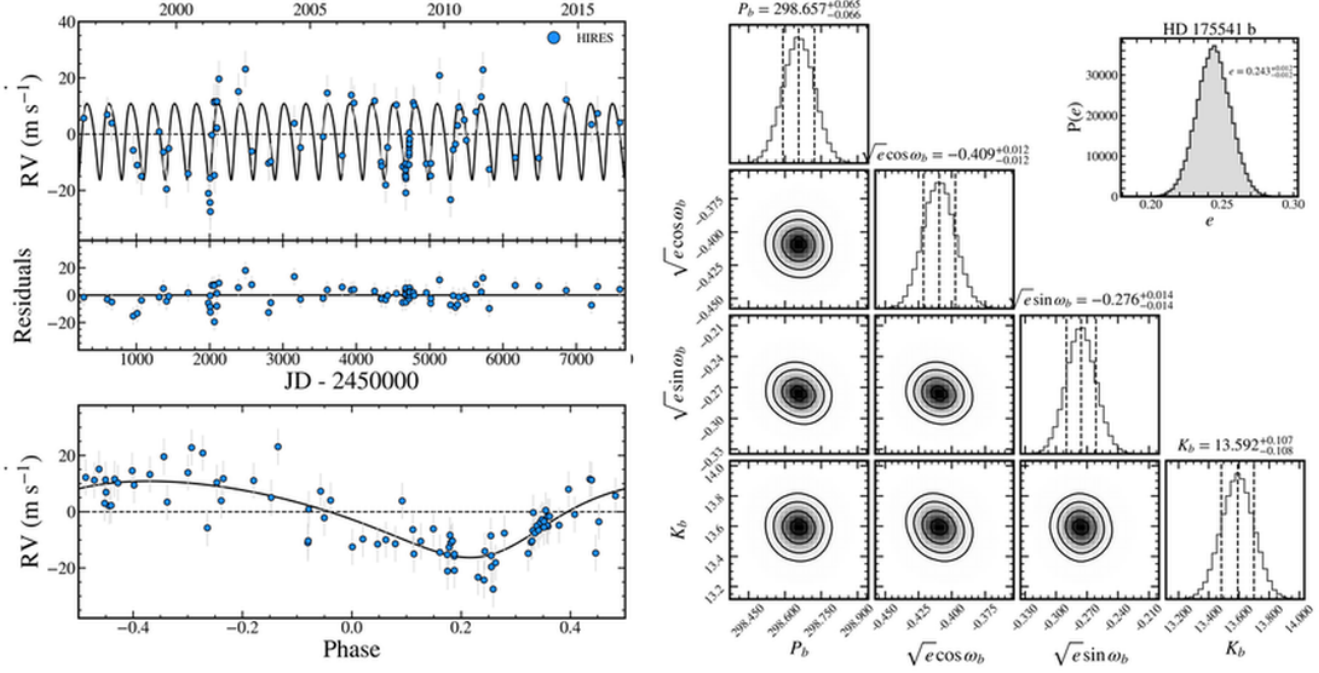


Figure 37. Summary of results for the warm Jupiters HD 17156 b and HD 173416 b.

HD 175541 b



HD 178911 B b

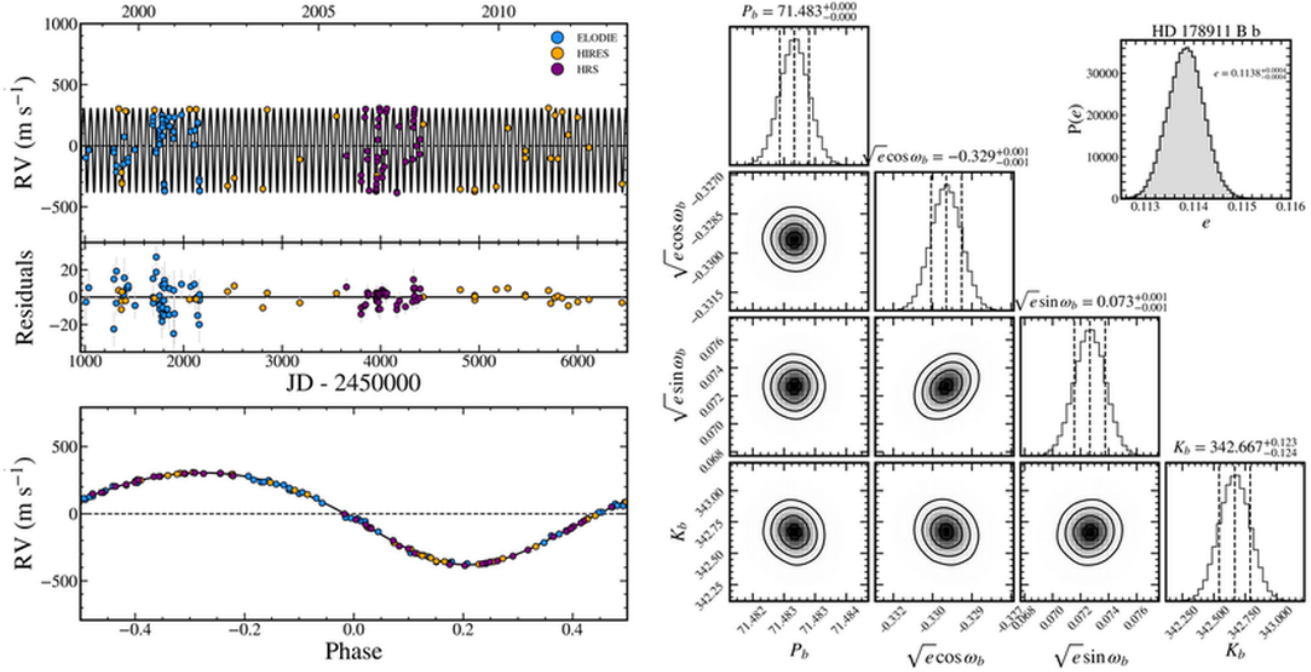
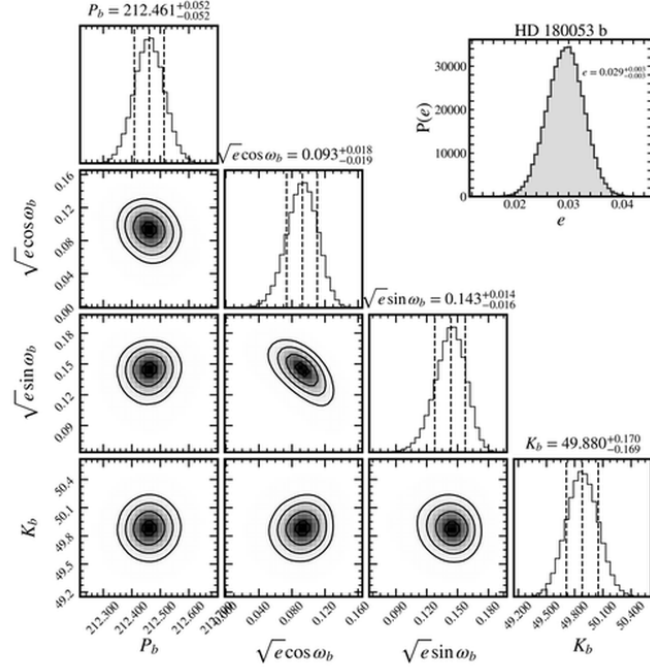
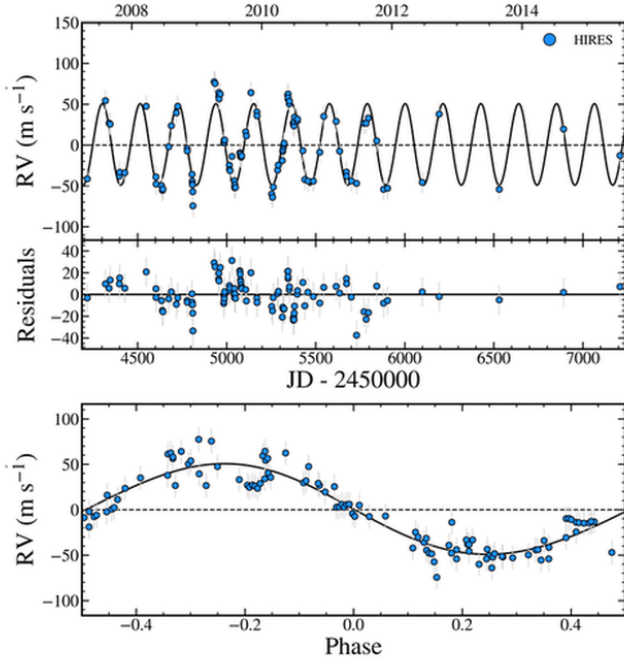


Figure 38. Summary of results for the warm Jupiters HD 175541 b and HD 178911 B b.

HD 180053 b



HD 191939 e

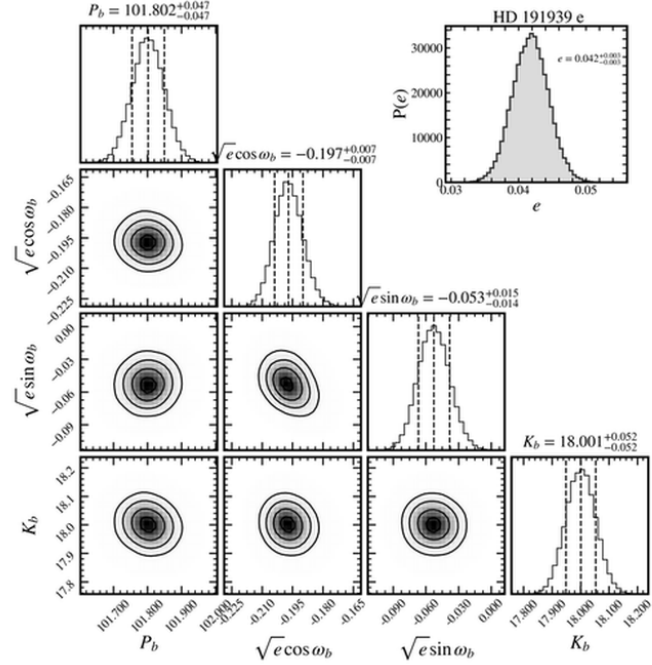
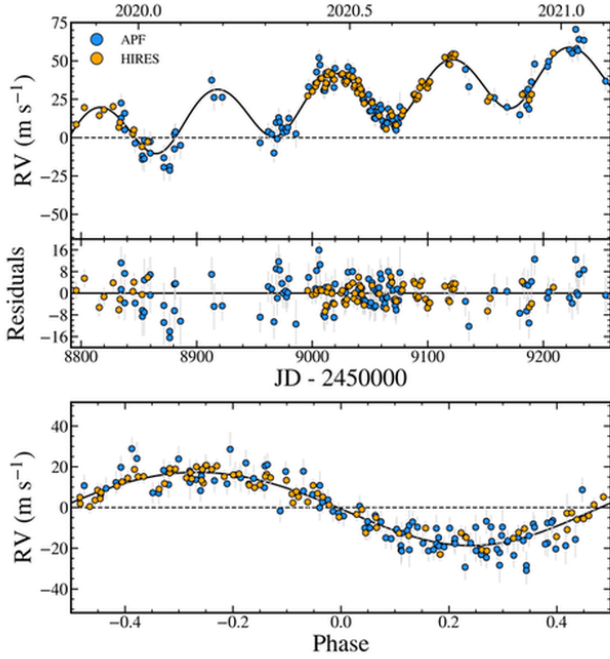
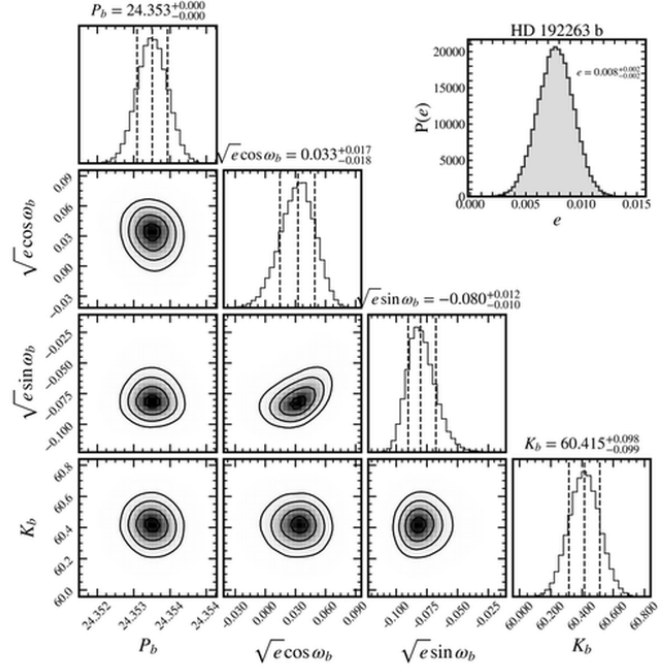
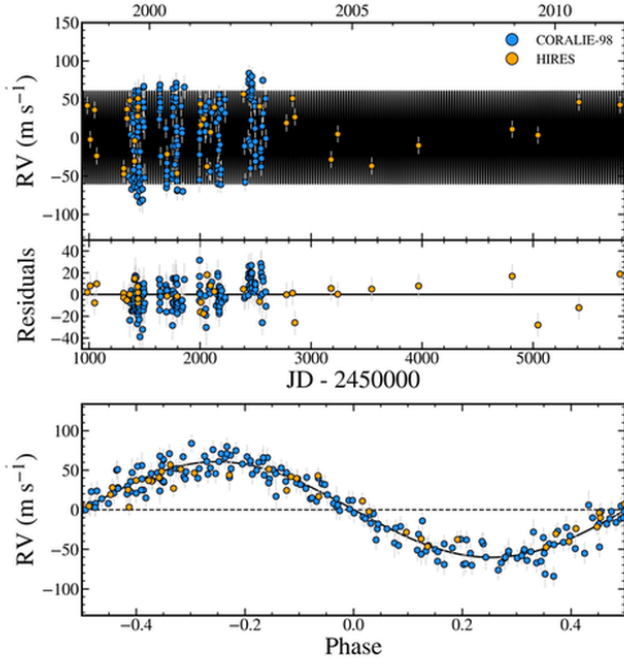


Figure 39. Summary of results for the warm Jupiters HD 180053 b and HD 191939 e.

HD 192263 b



HD 192699 b

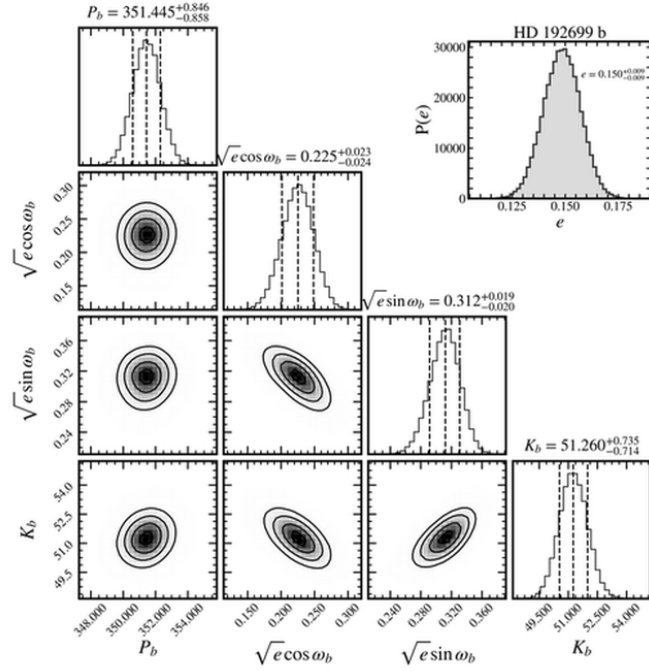
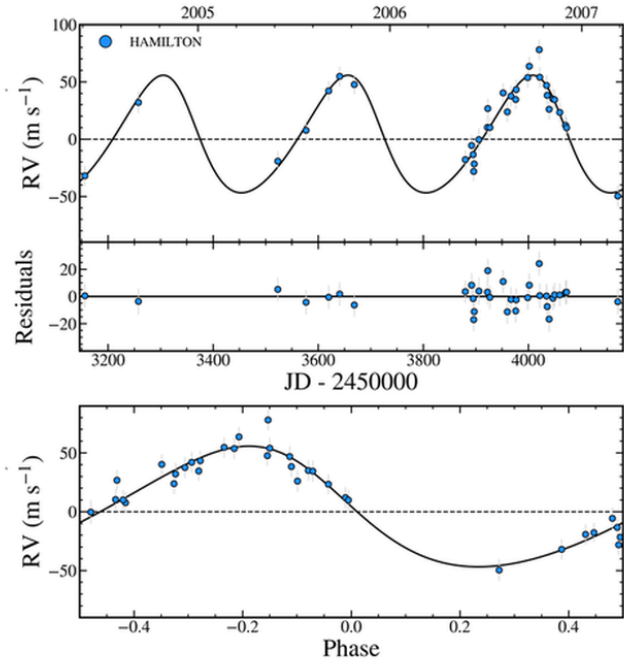
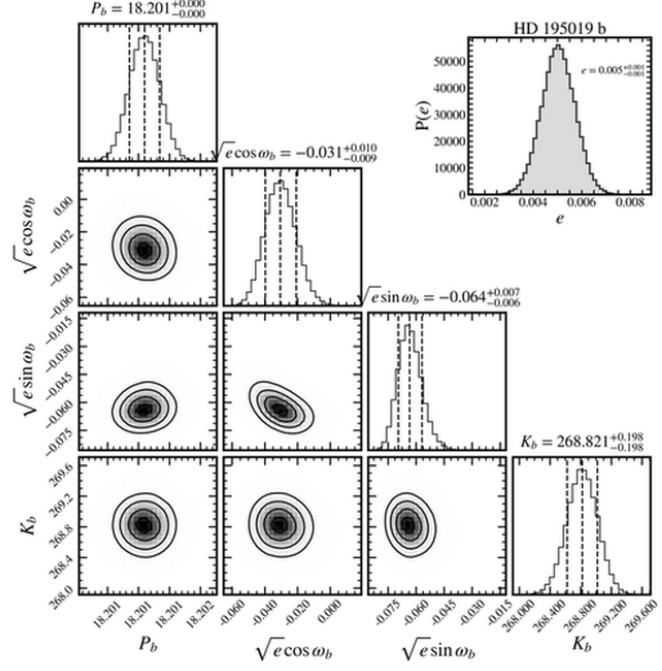
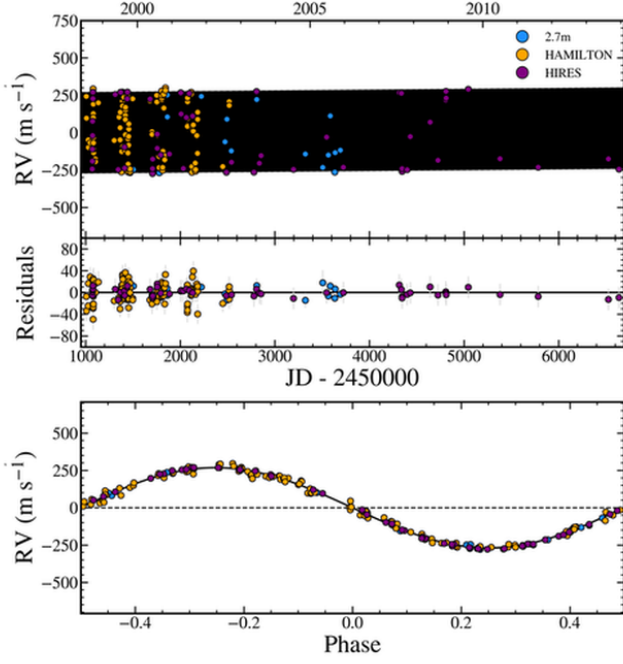


Figure 40. Summary of results for the warm Jupiters HD 192263 b and HD 192699 b.

HD 195019 b



HD 205739 b

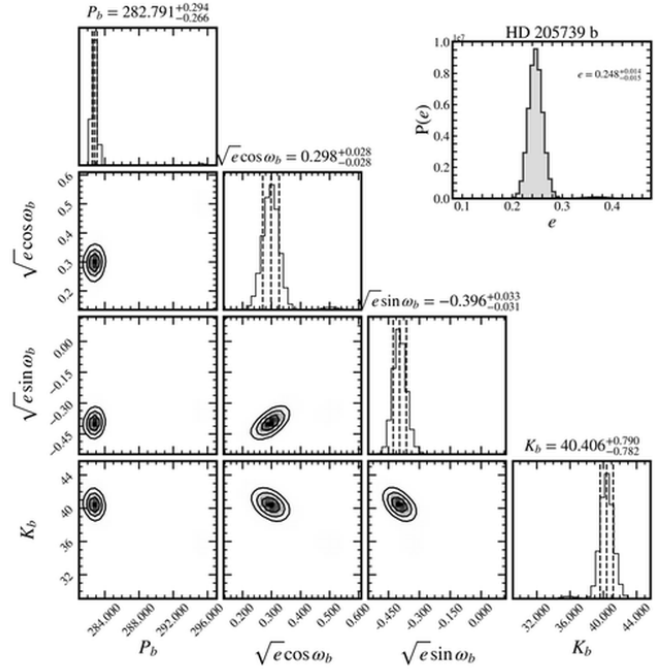
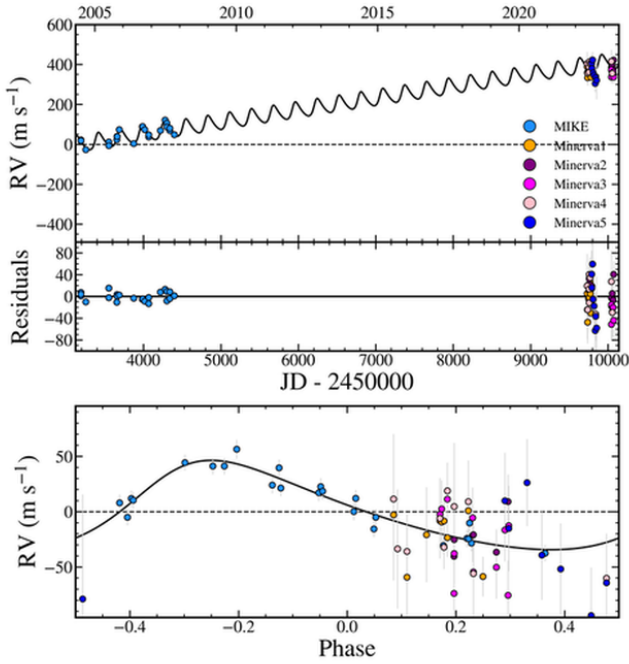
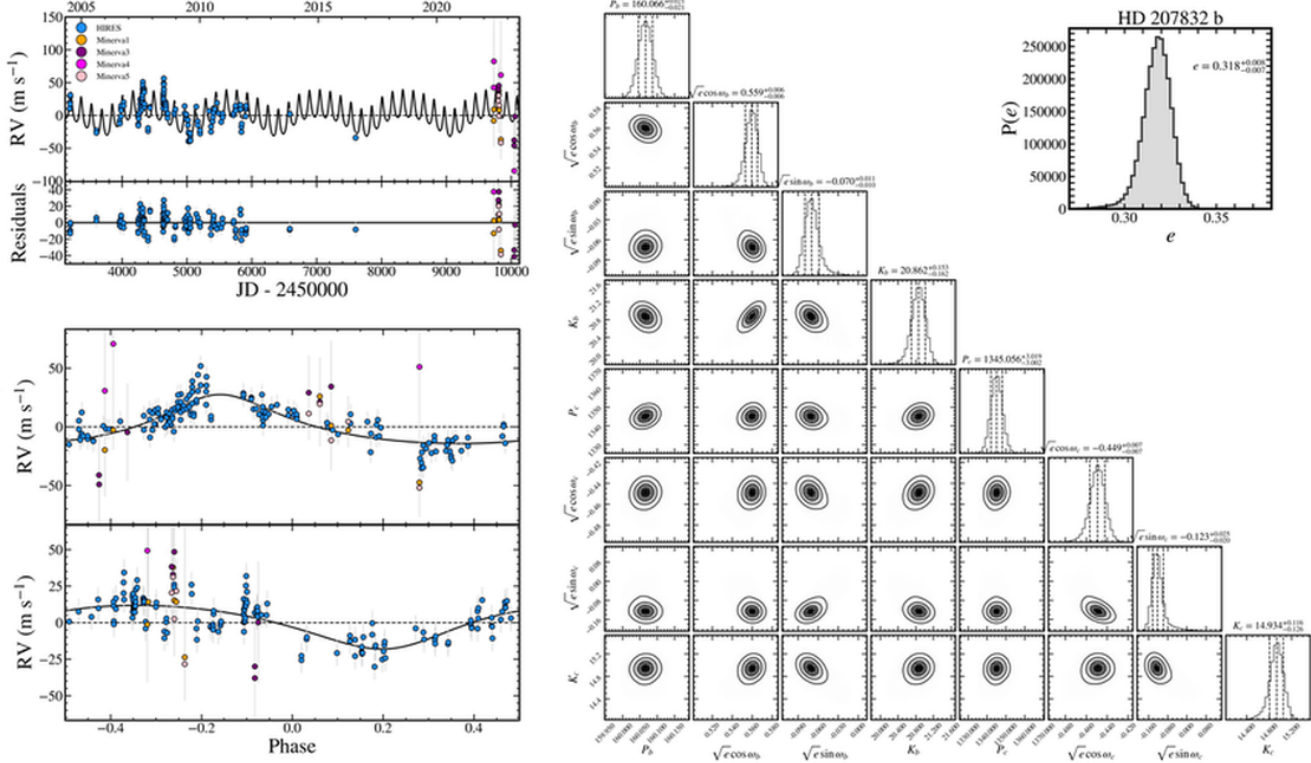


Figure 41. Summary of results for the warm Jupiters HD 195019 b and HD 205739 b.

HD 207832 b



HD 208487 b

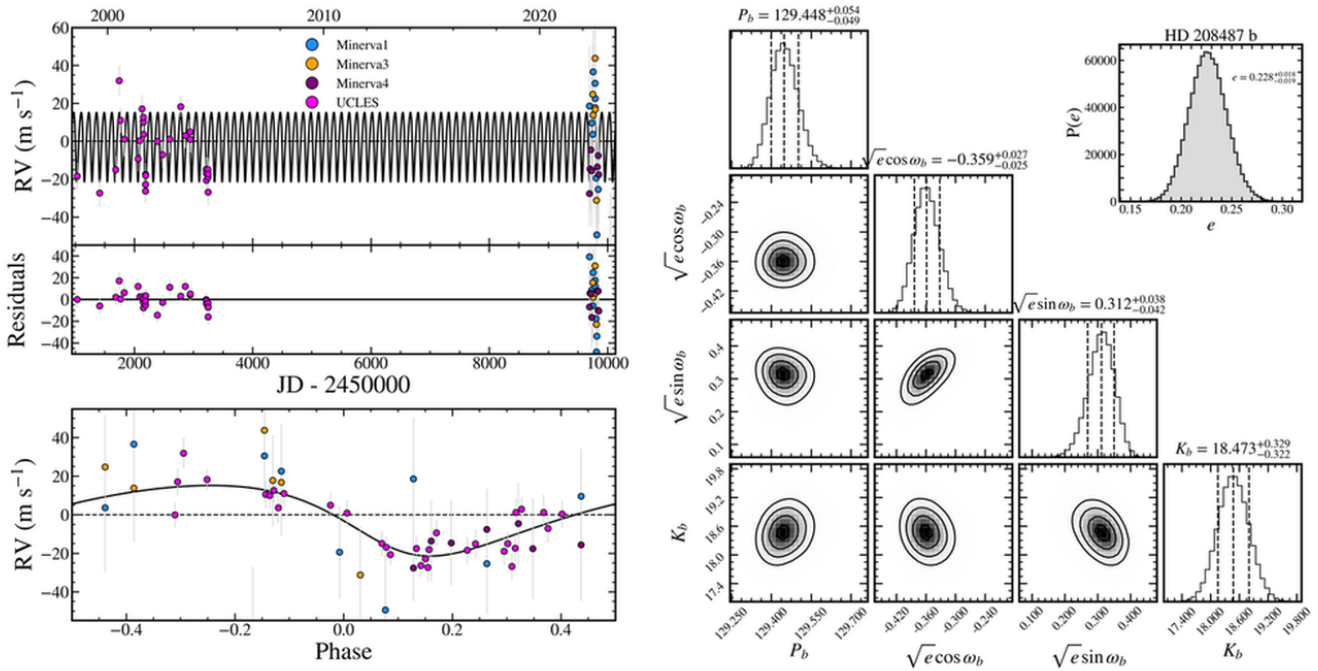
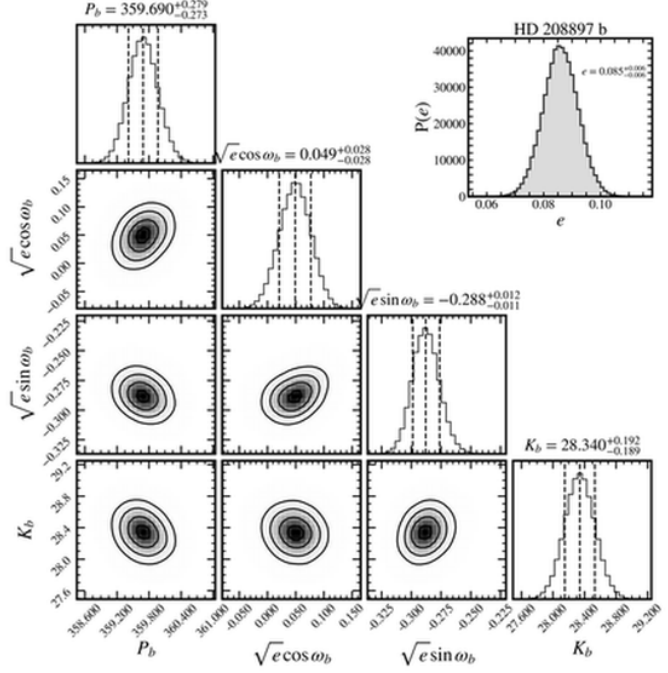
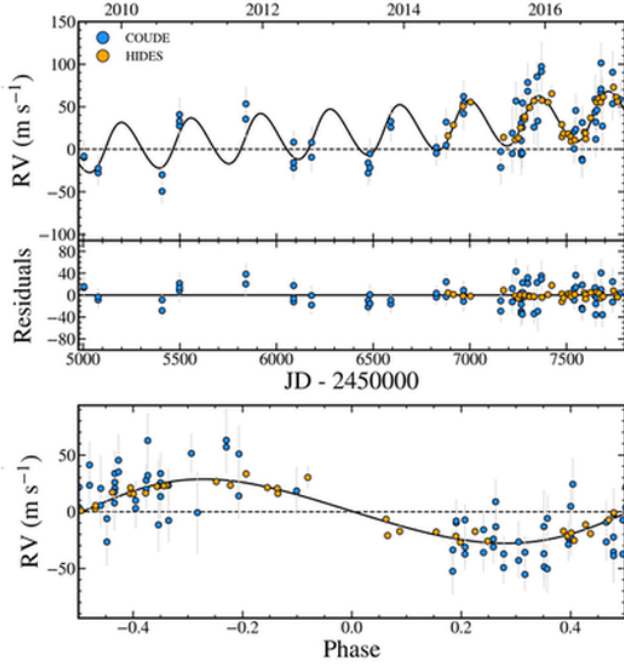


Figure 42. Summary of results for the warm Jupiters HD 207832 b and HD 208487 b.

HD 208897 b



HD 210702 b

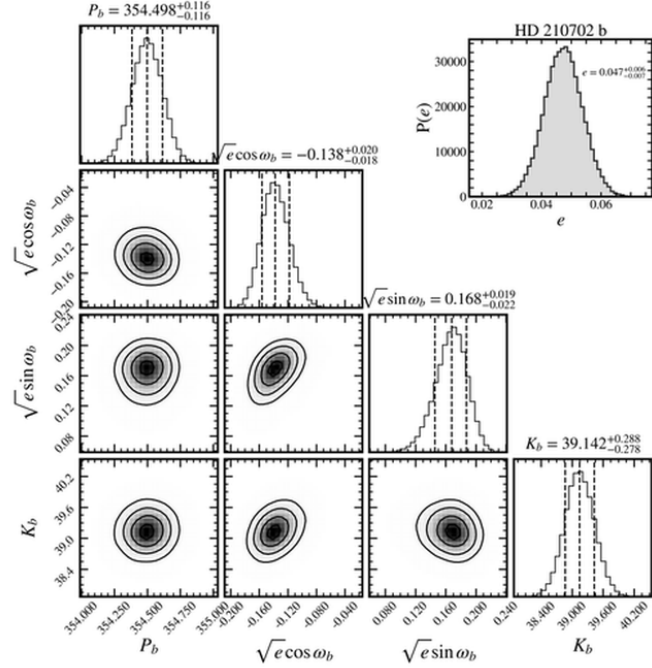
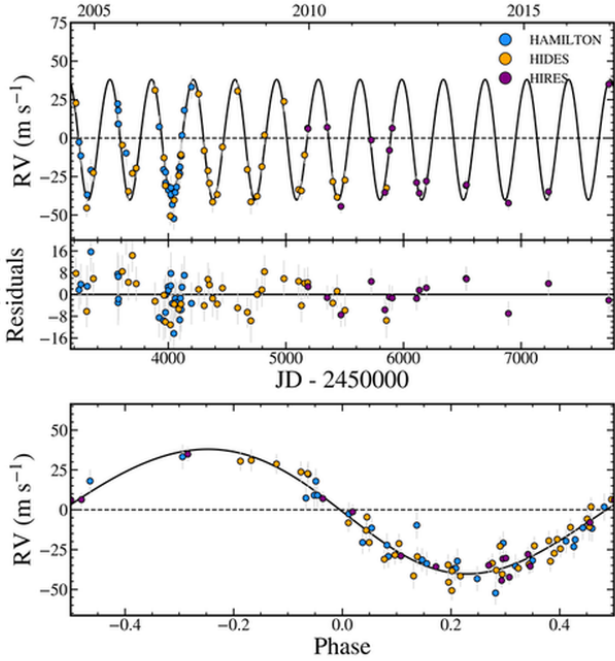
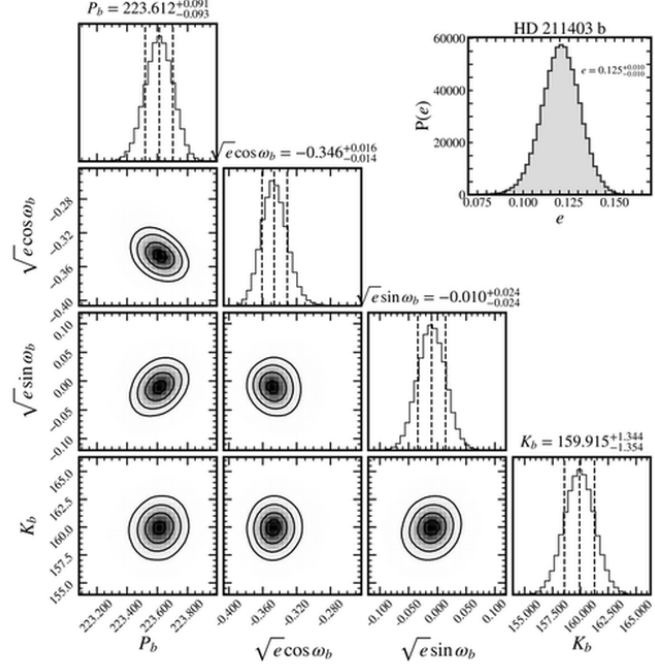
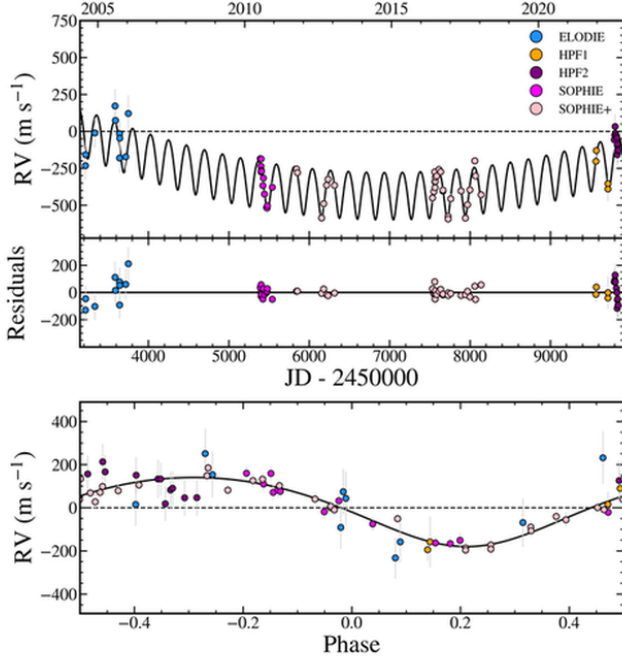


Figure 43. Summary of results for the warm Jupiters HD 208897 b and HD 210702 b.

HD 211403 b



HD 216536 b

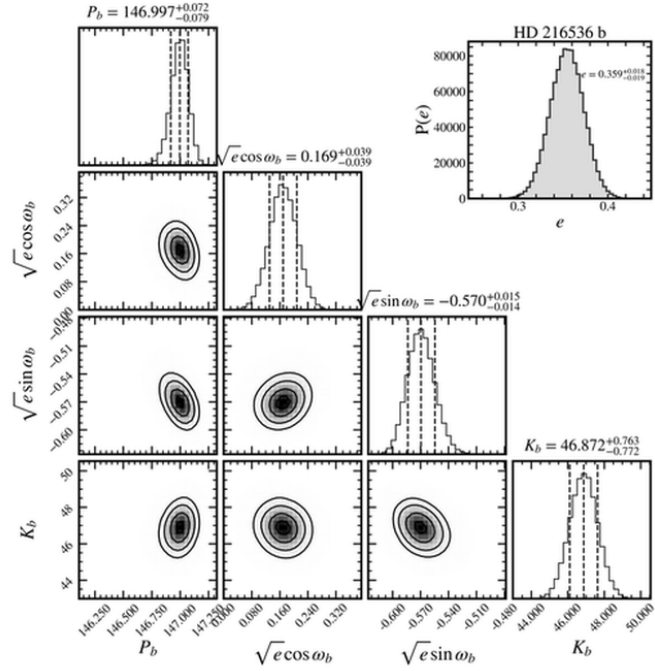
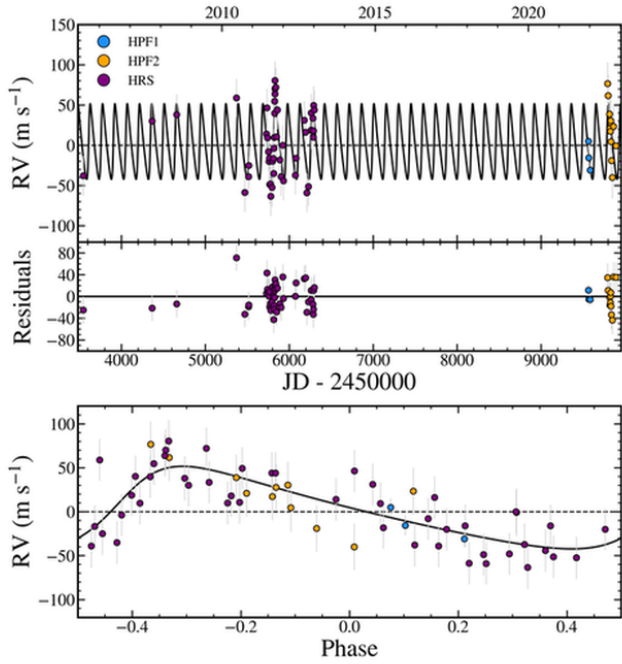
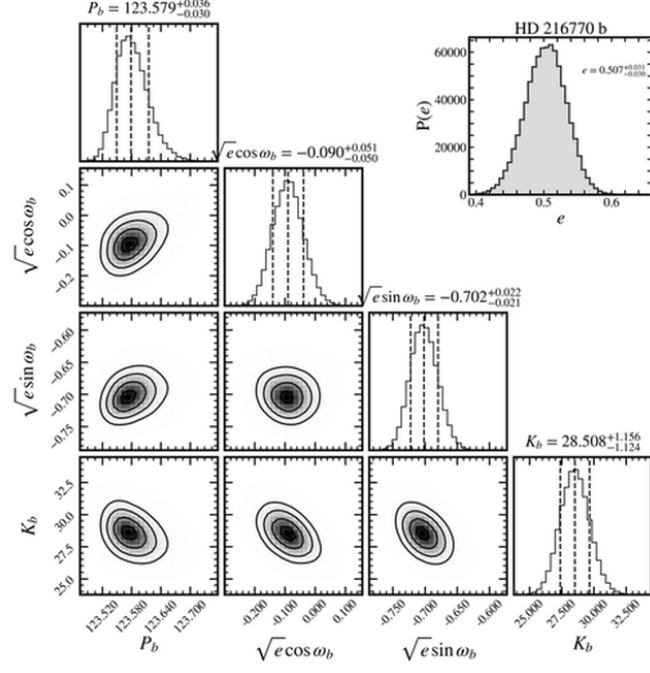
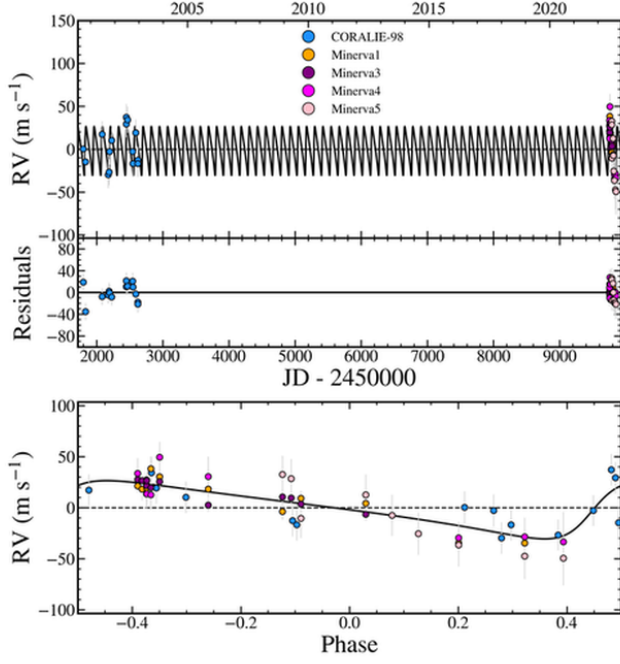


Figure 44. Summary of results for the warm Jupiters HD 211403 b and HD 216536 b.

HD 216770 b



HD 219139 b

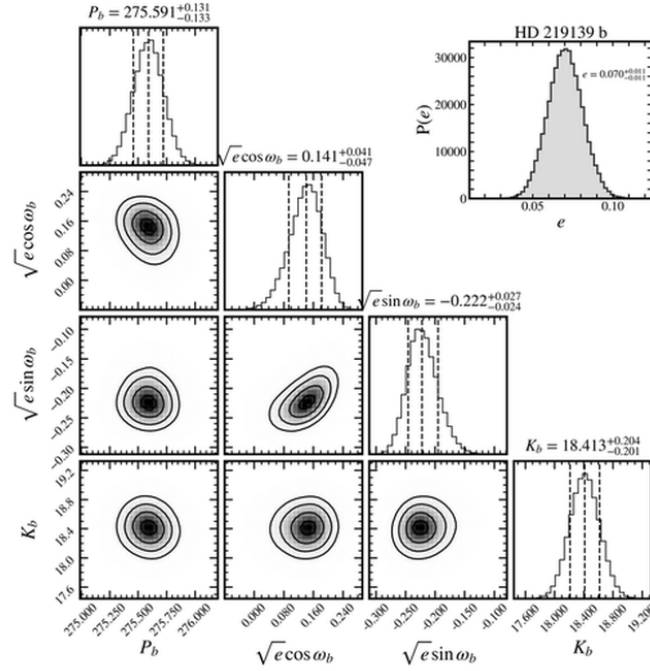
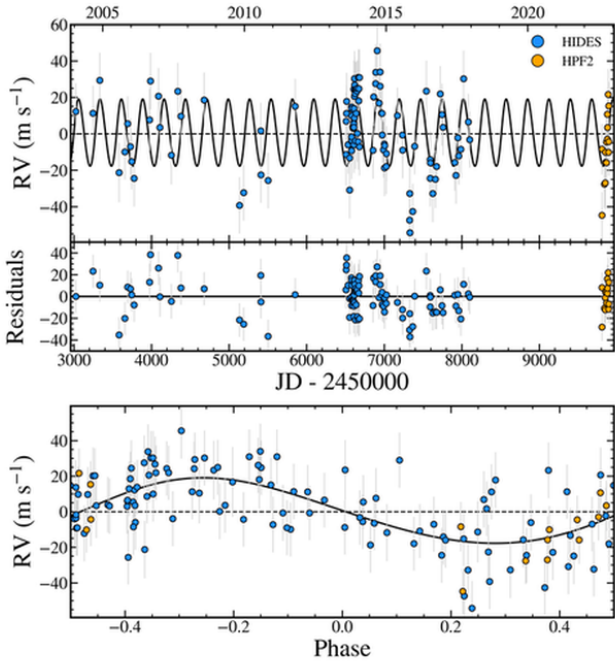
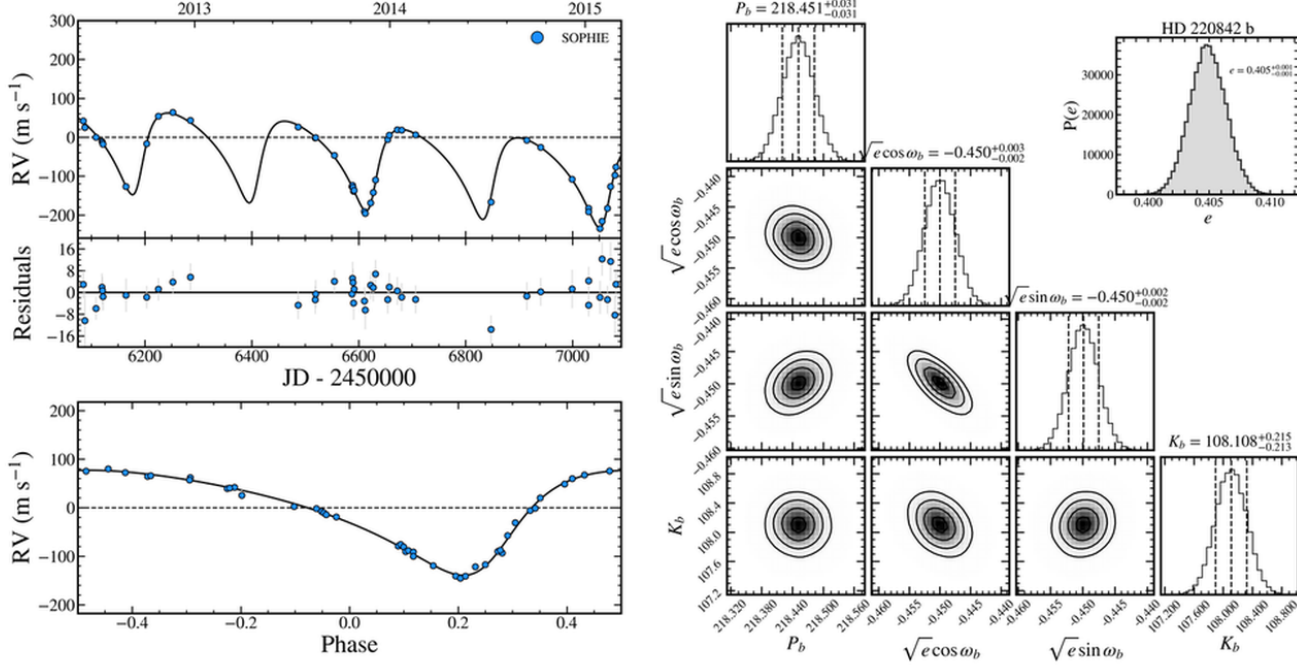


Figure 45. Summary of results for the warm Jupiters HD 216770 b and HD 219139 b.

HD 220842 b



HD 221416 b

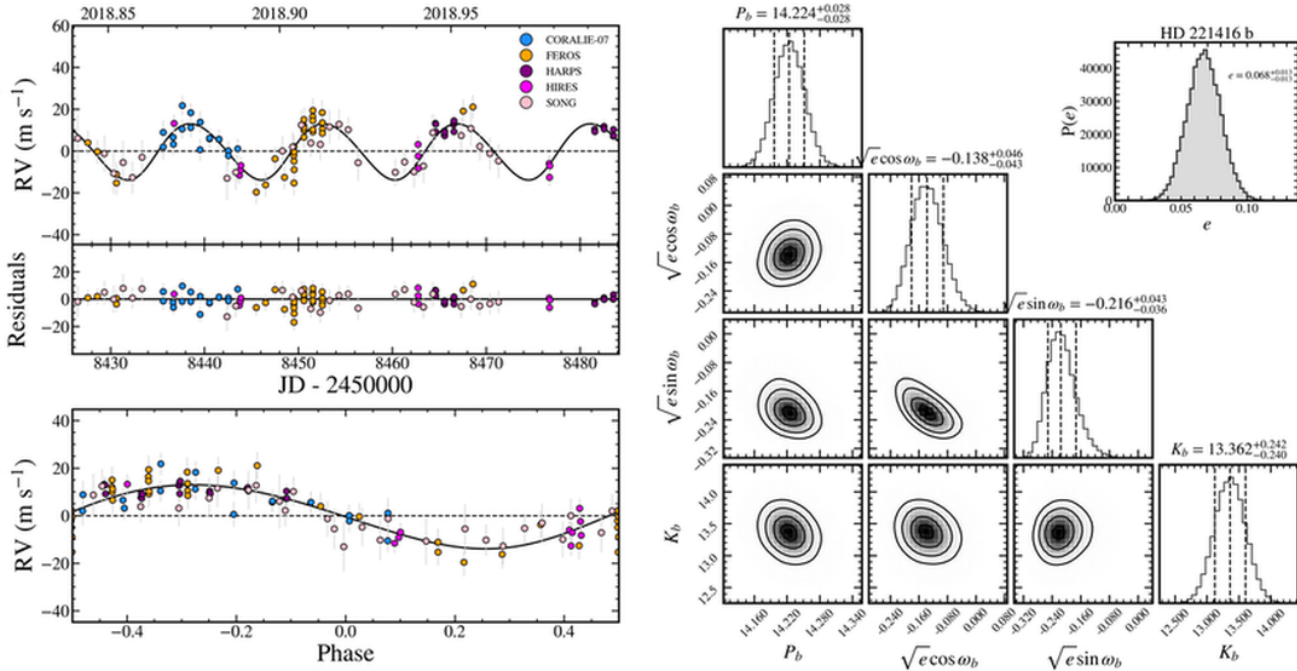
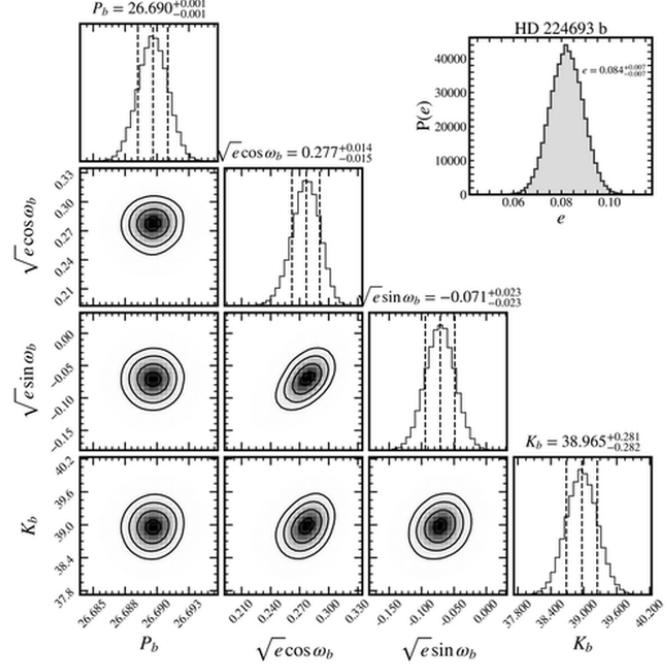
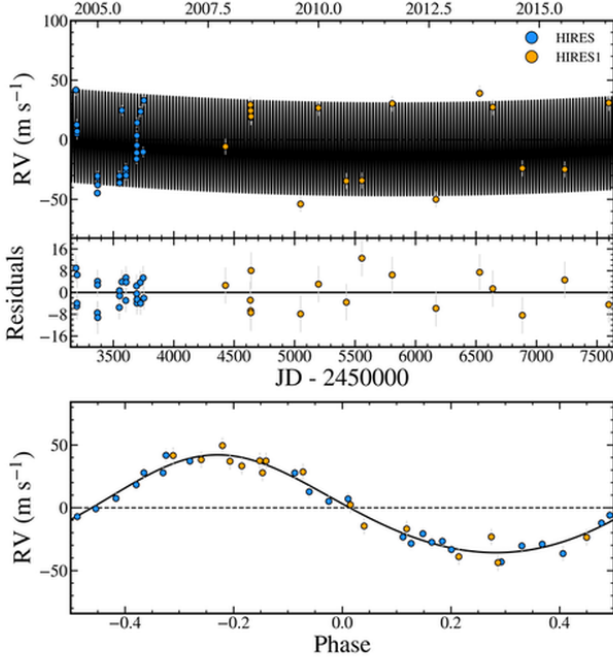


Figure 46. Summary of results for the warm Jupiters HD 220842 b and HD 221416 b.

HD 224693 b



HD 231701 b

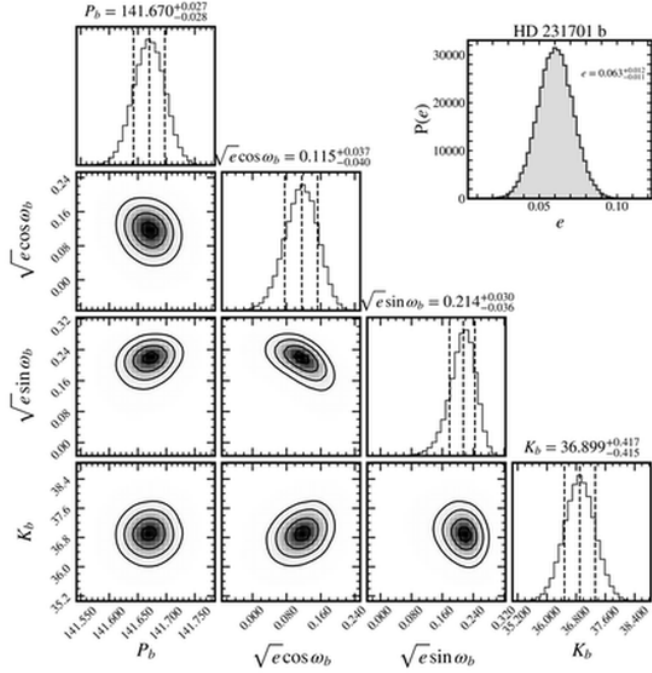
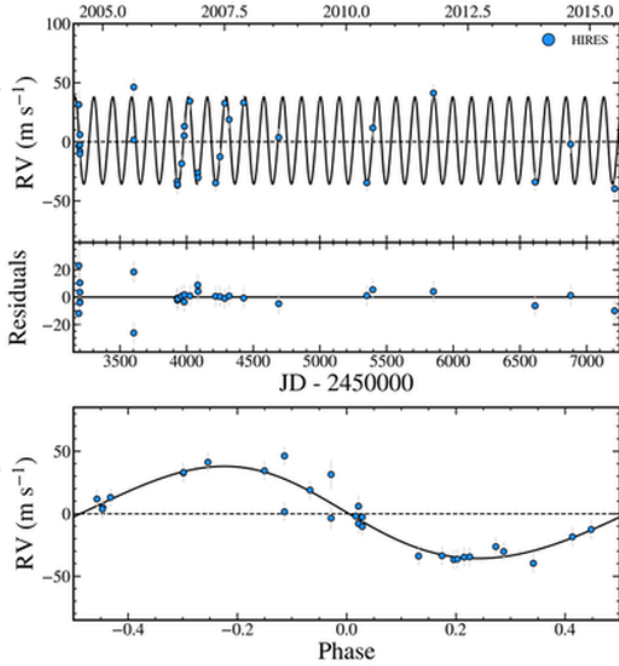
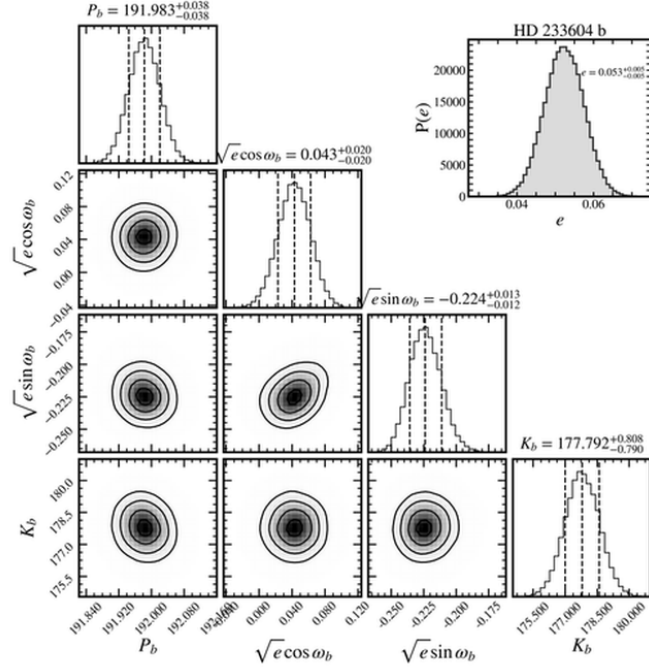
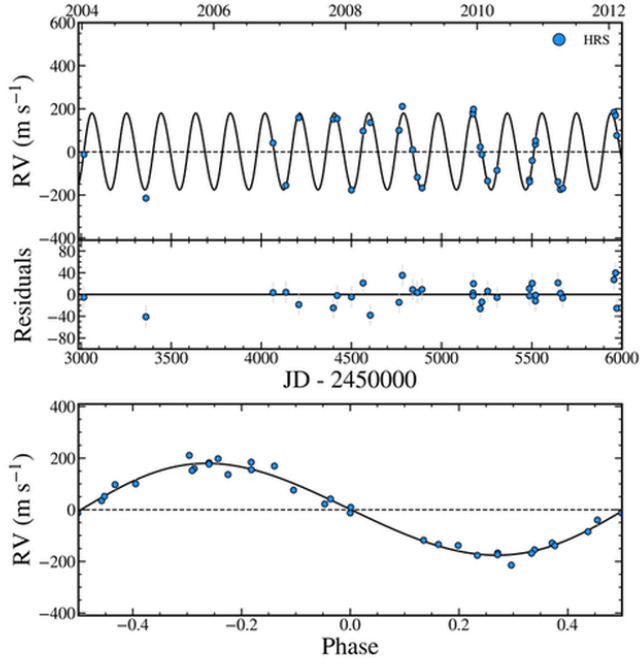


Figure 47. Summary of results for the warm Jupiters HD 224693 b and HD 231701 b.

HD 233604 b



HD 27894 b

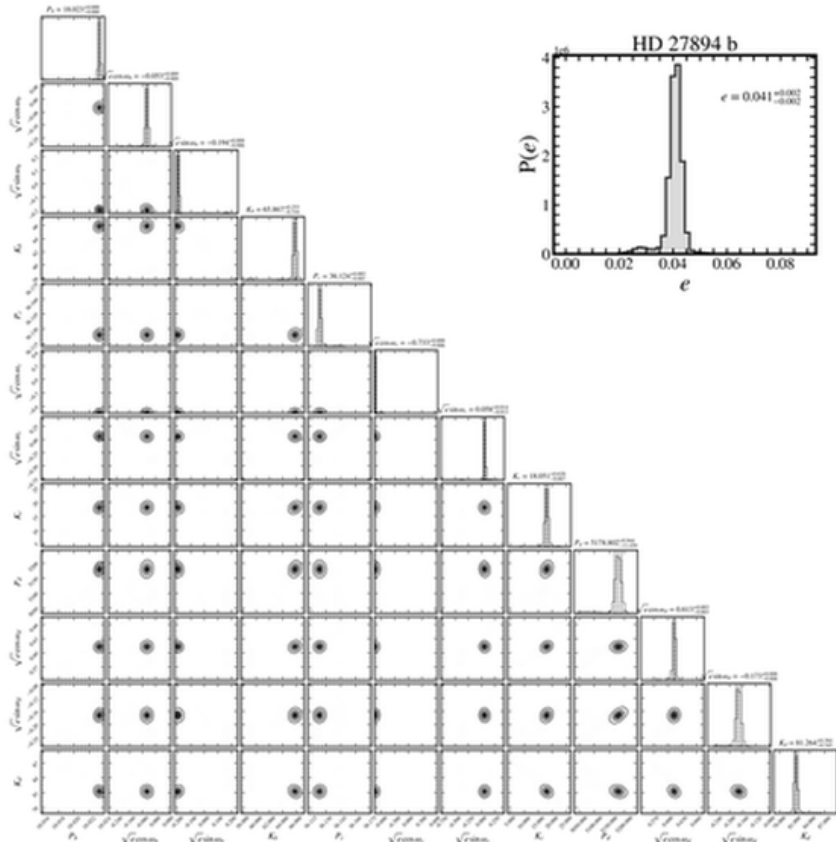
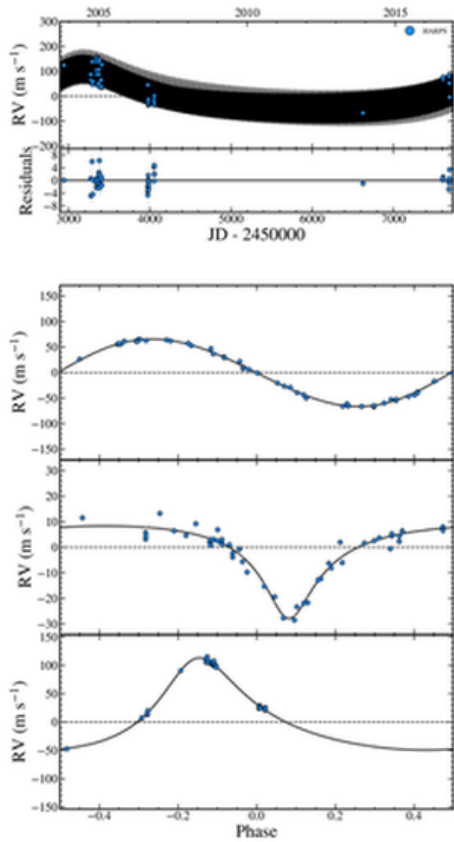
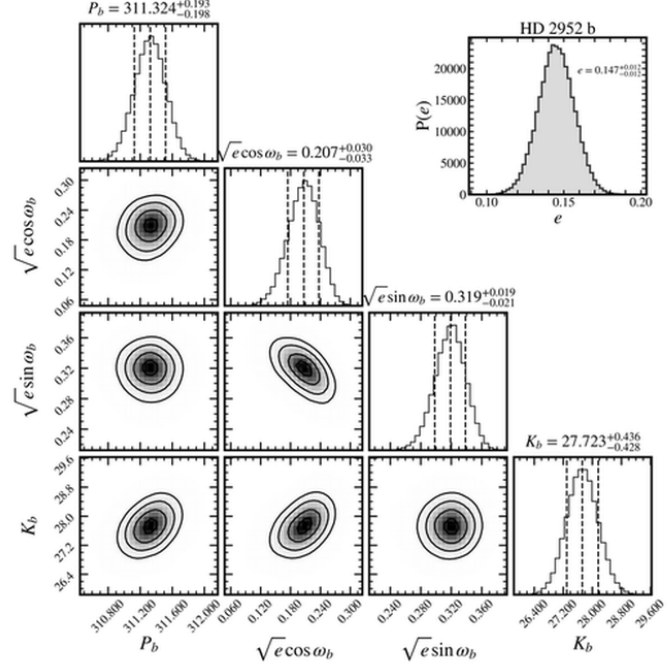
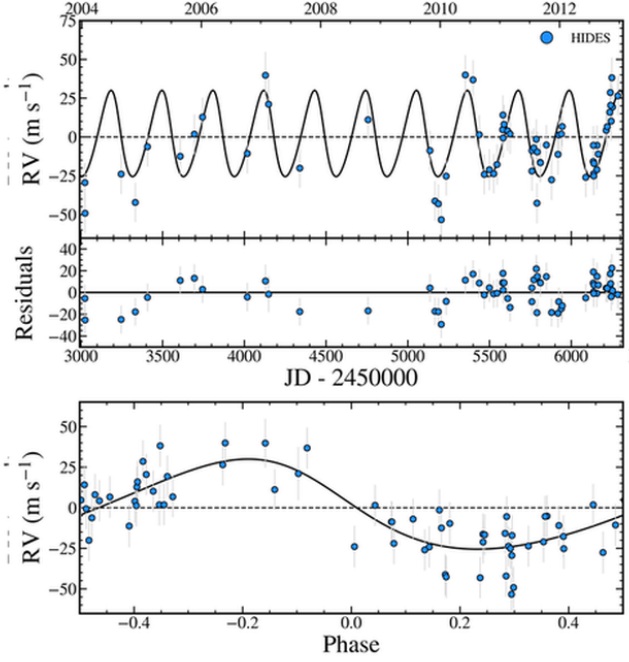


Figure 48. Summary of results for the warm Jupiters HD 233604 b and HD 27894 b.

HD 2952 b



HD 32518 b

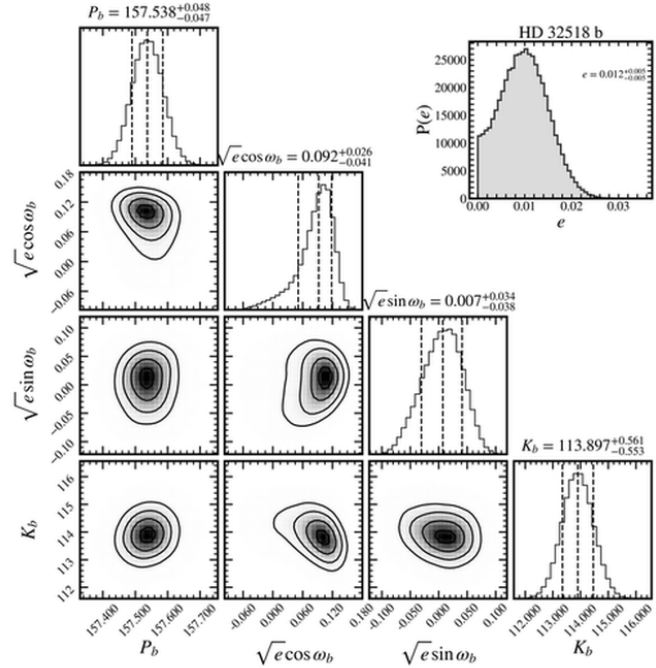
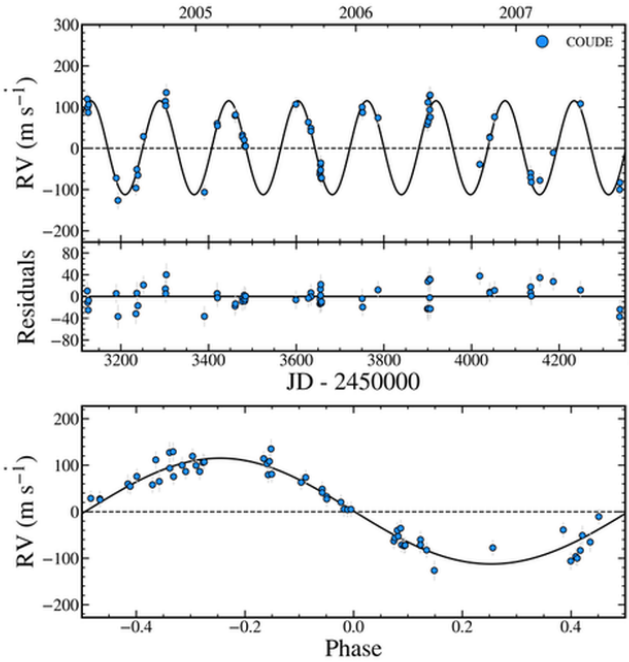
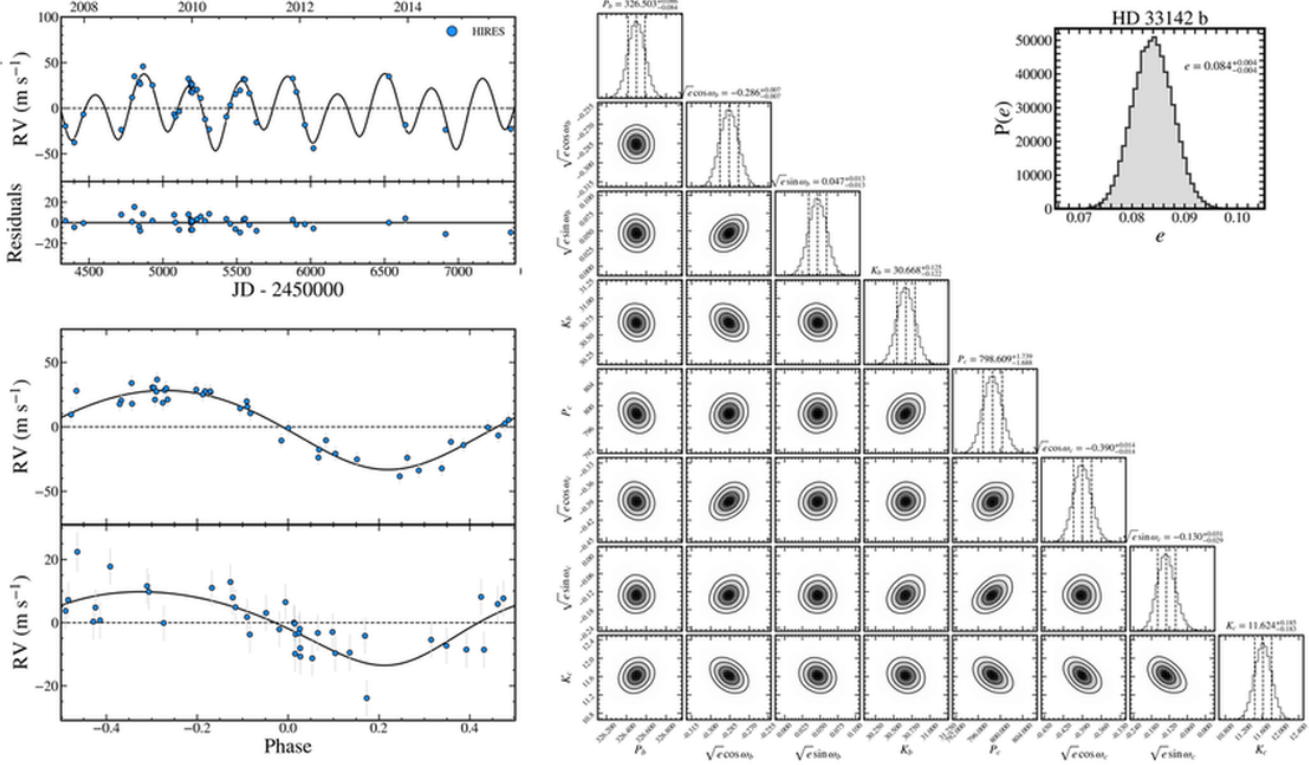


Figure 49. Summary of results for the warm Jupiters HD 2952 b and HD 32518 b.

HD 33142 b



HD 332231 b

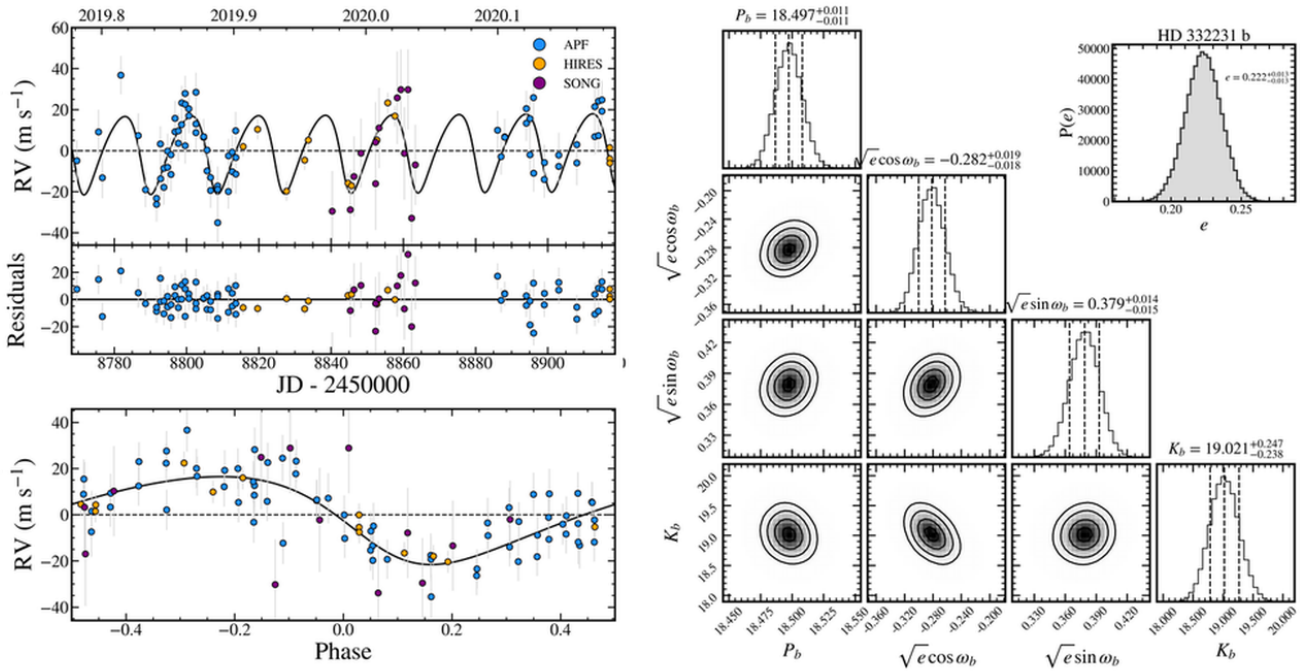
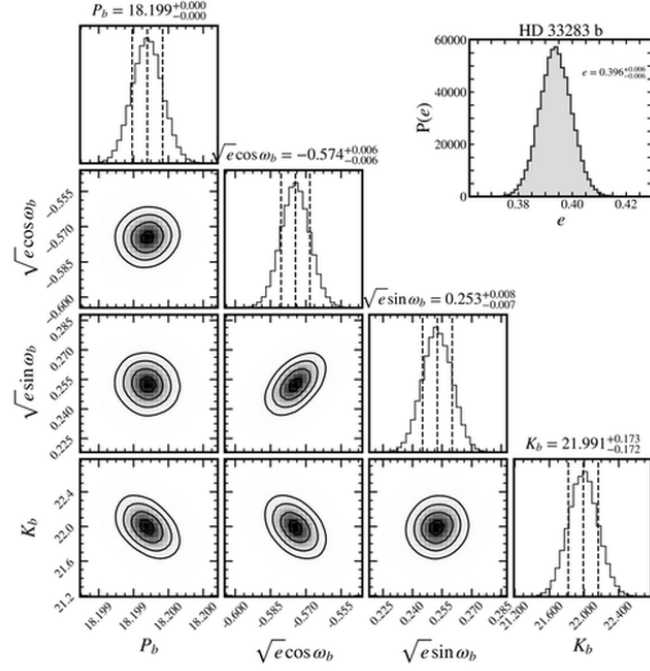
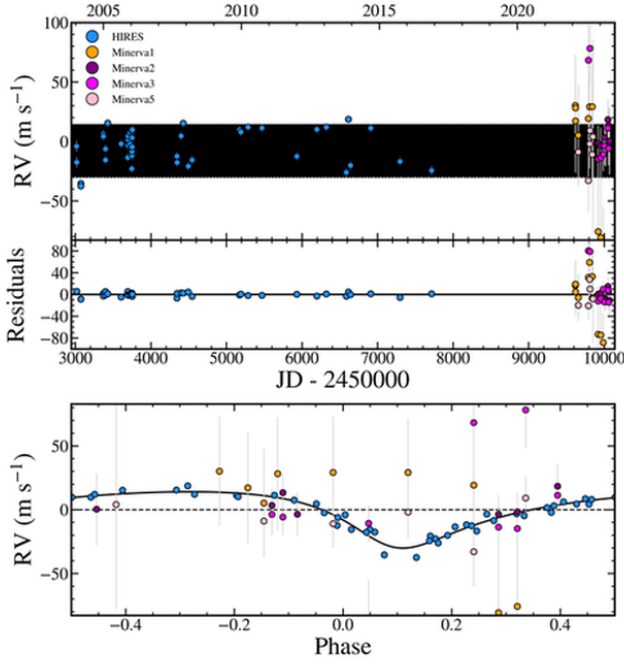


Figure 50. Summary of results for the warm Jupiters HD 33142 b and HD 332231 b.

HD 33283 b



HD 35759 b

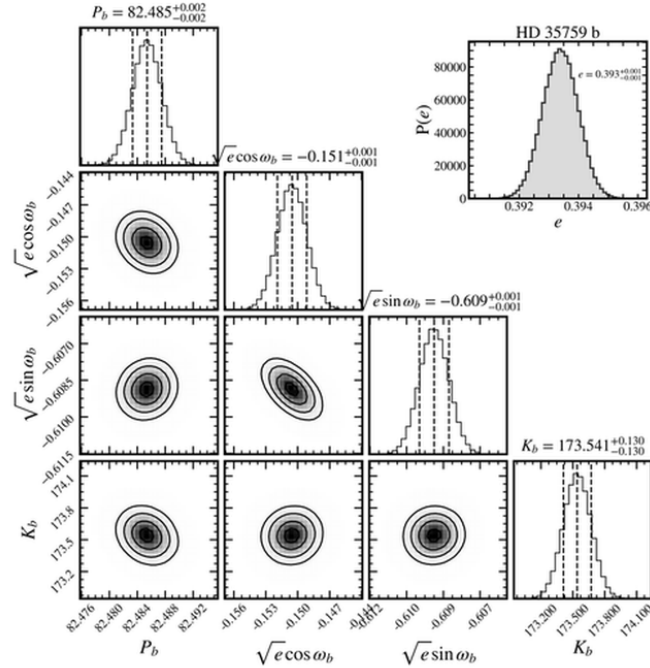
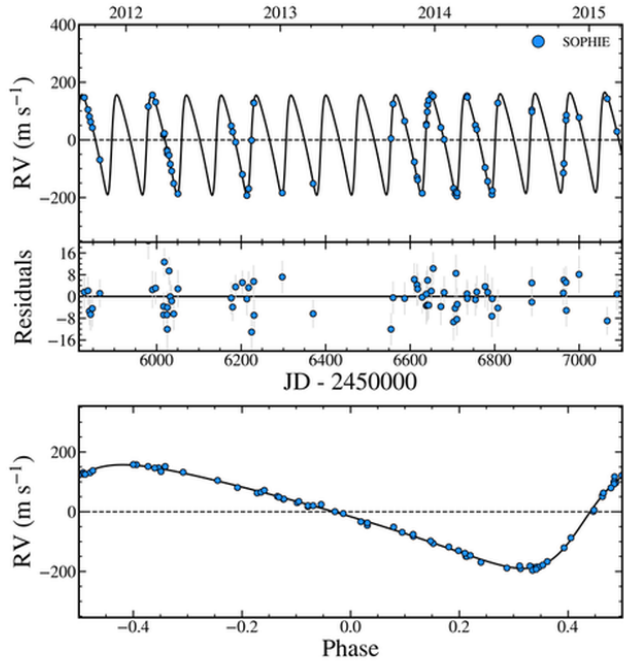
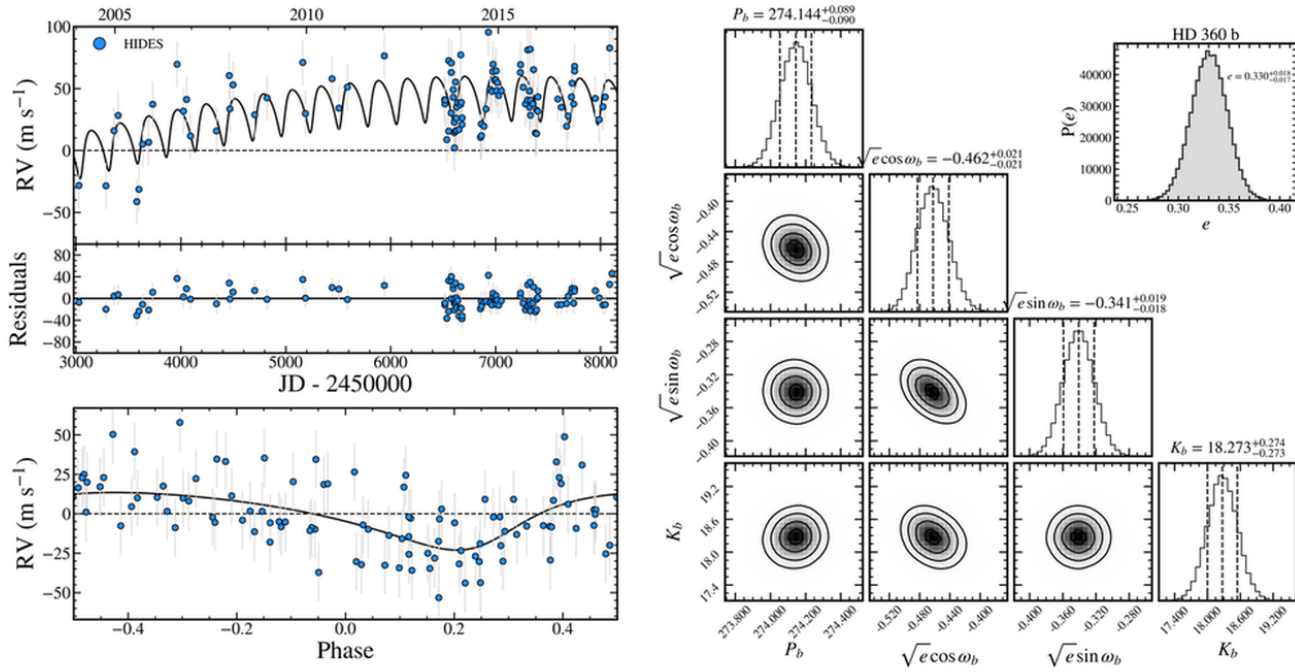


Figure 51. Summary of results for the warm Jupiters HD 33283 b and HD 35759 b.

HD 360 b



HD 37124 b

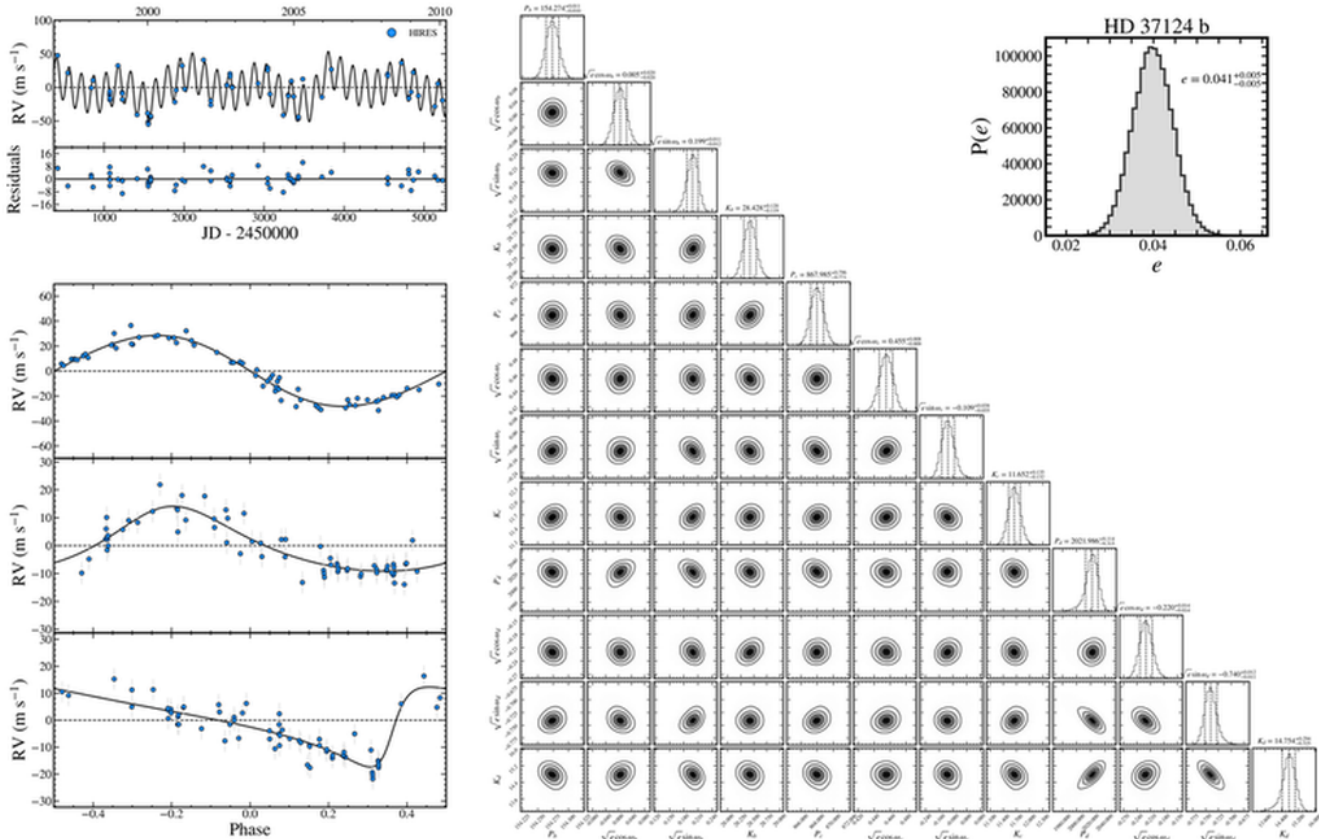
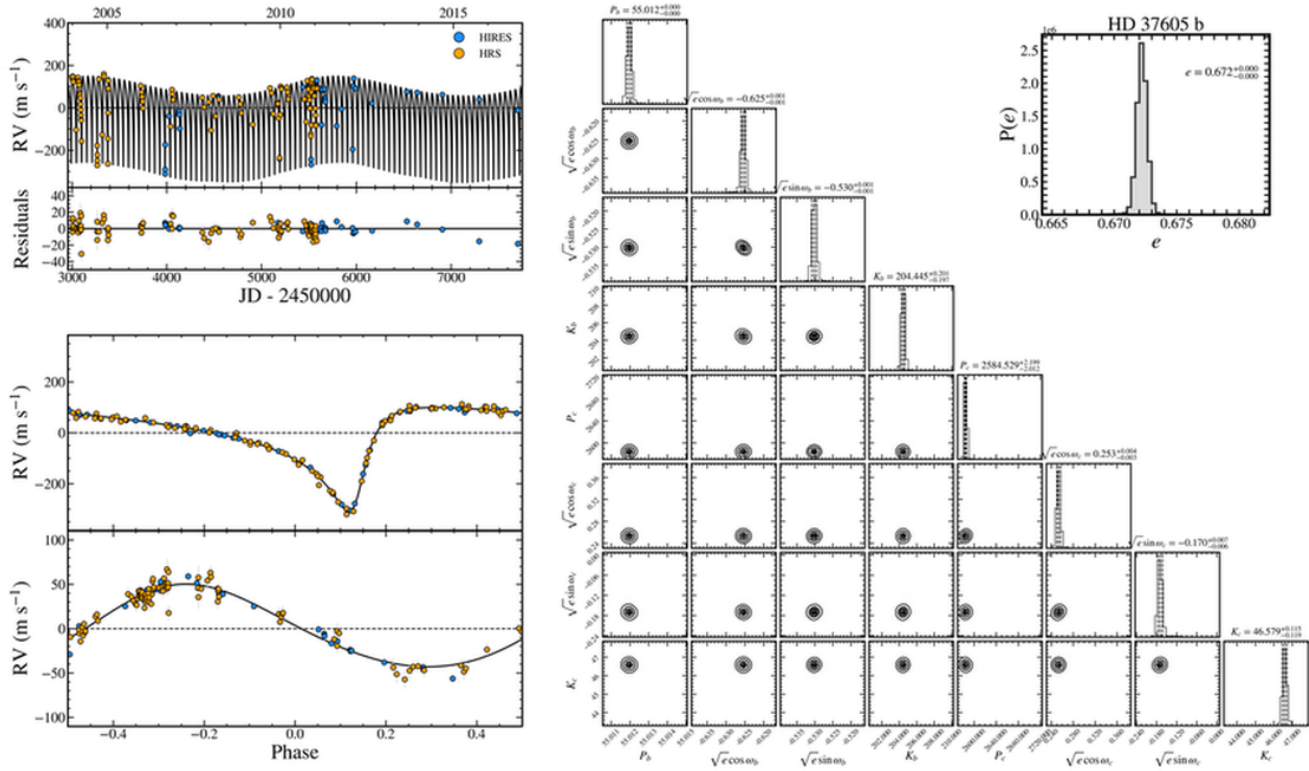


Figure 52. Summary of results for the warm Jupiters HD 360 b and HD 37124 b.

HD 37605 b



HD 38283 b

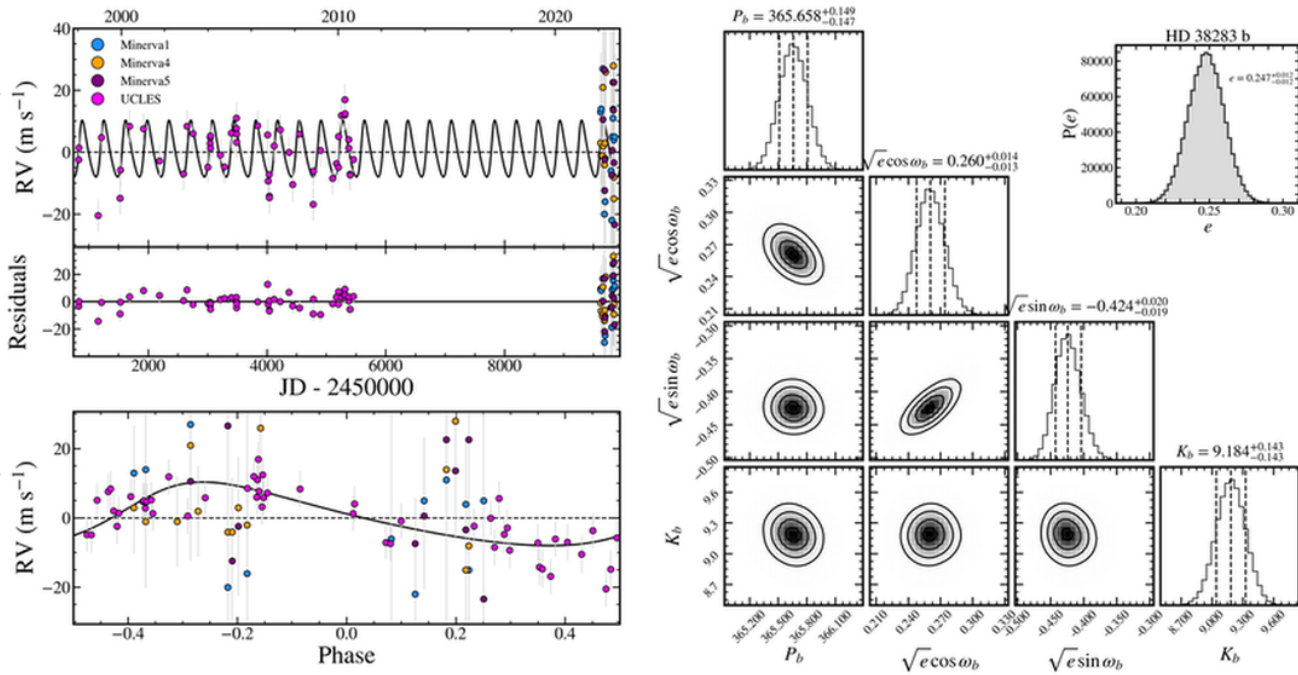
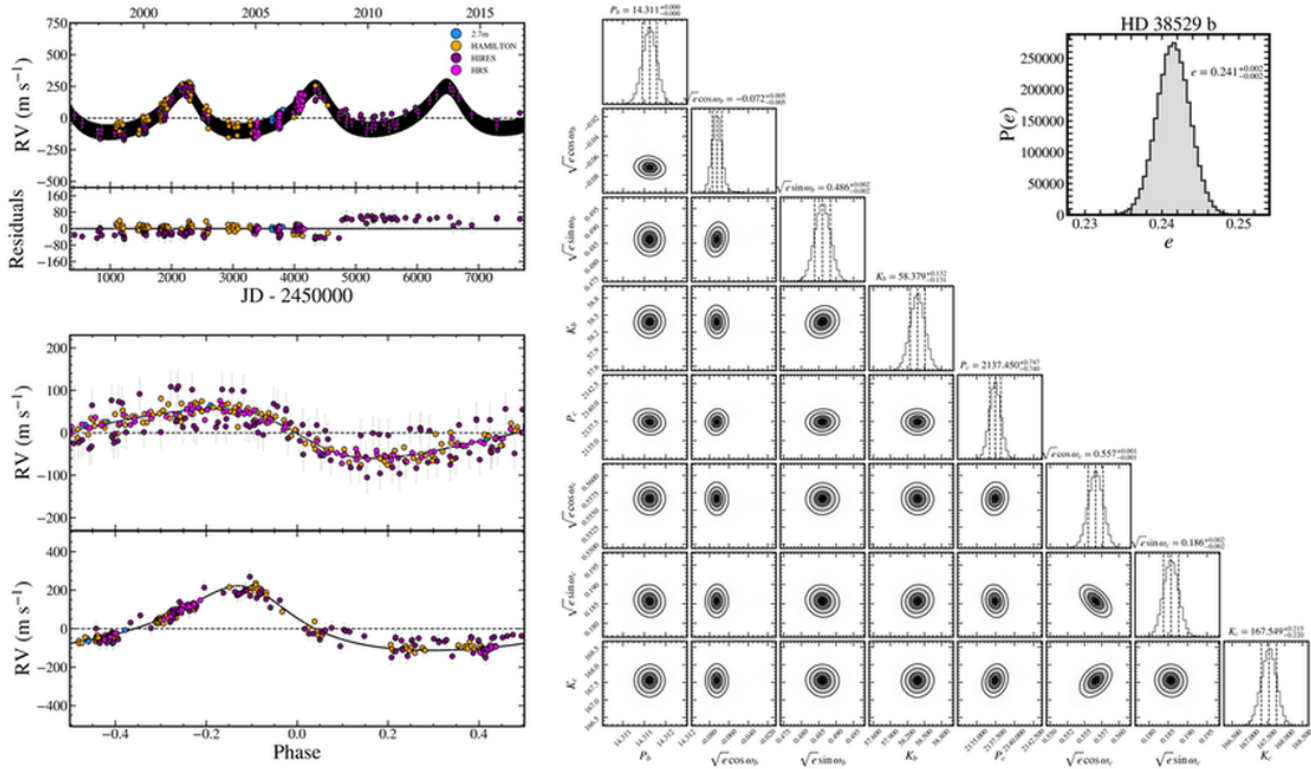


Figure 53. Summary of results for the warm Jupiters HD 37605 b and HD 38283 b.

HD 38529 b



HD 40979 b

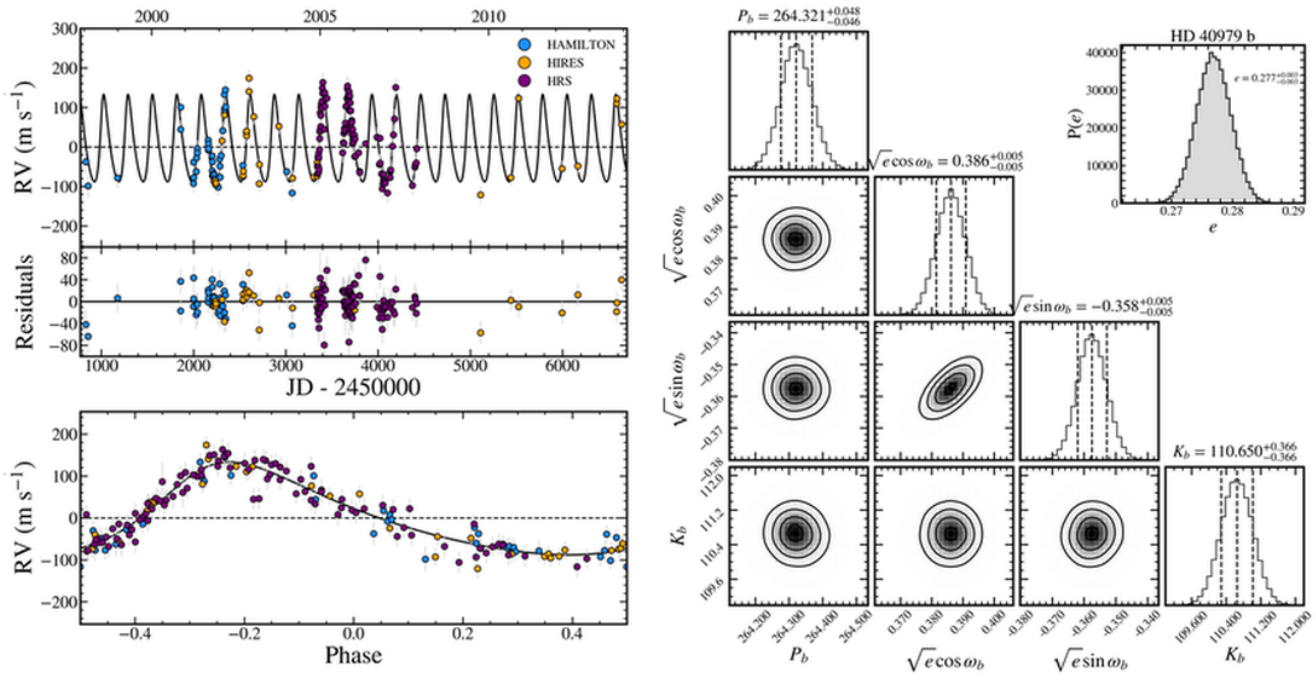
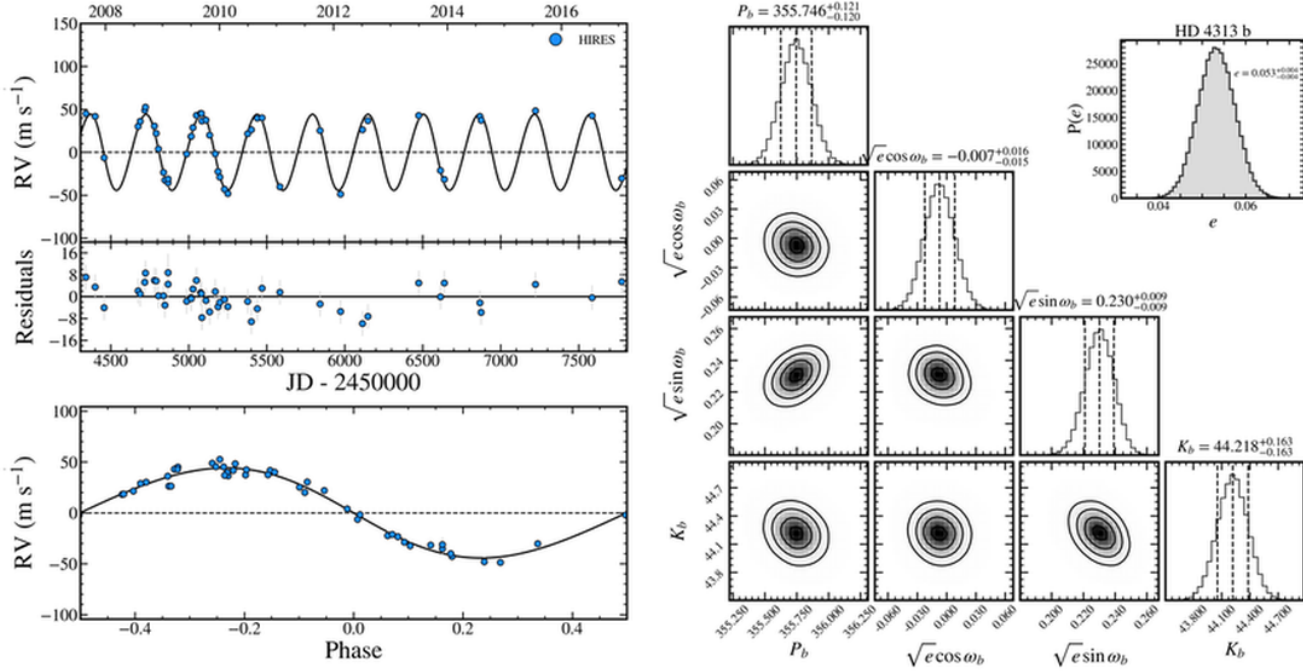


Figure 54. Summary of results for the warm Jupiters HD 38529 b and HD 40979 b.

HD 4313 b



HD 43197 b

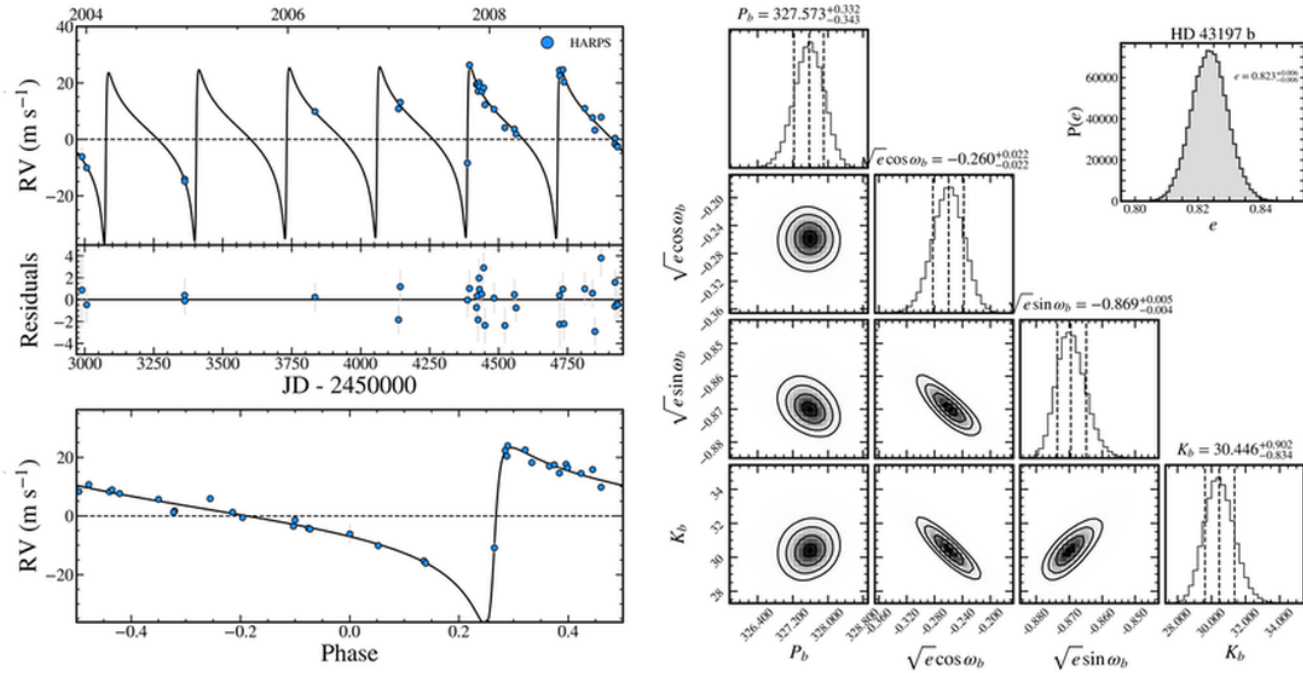
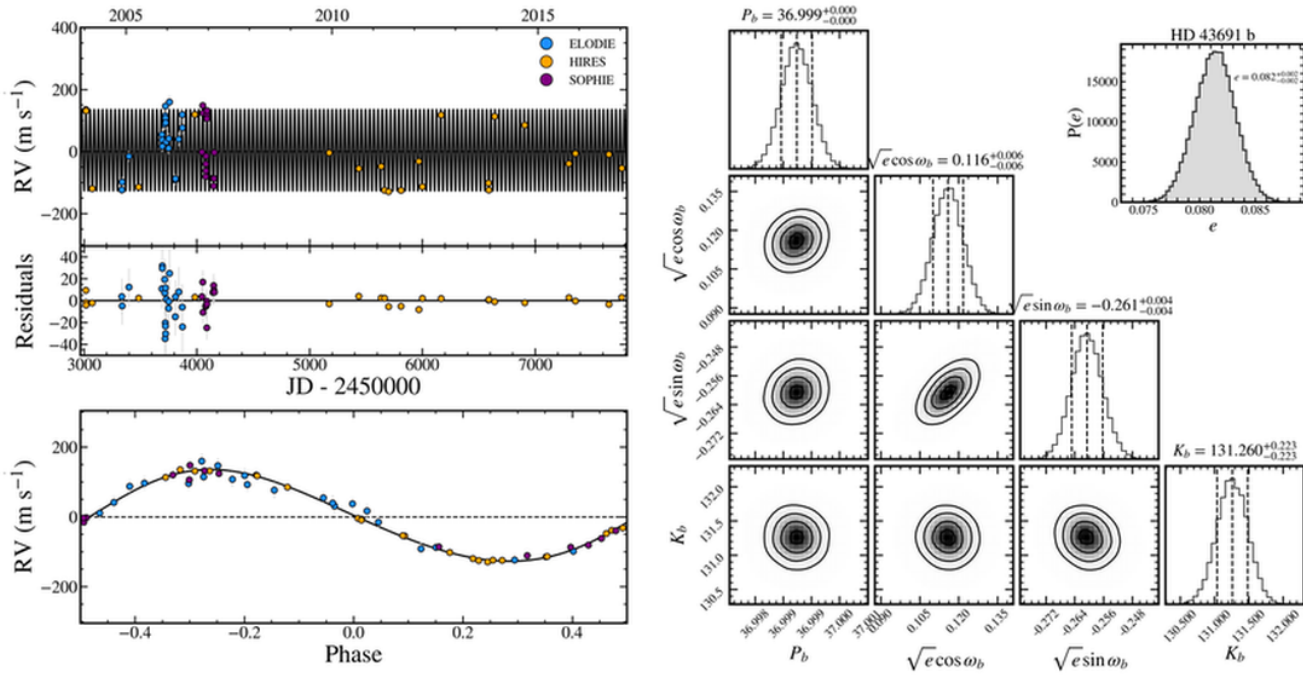


Figure 55. Summary of results for the warm Jupiters HD 4313 b and HD 43197 b.

HD 43691 b



HD 45364 c

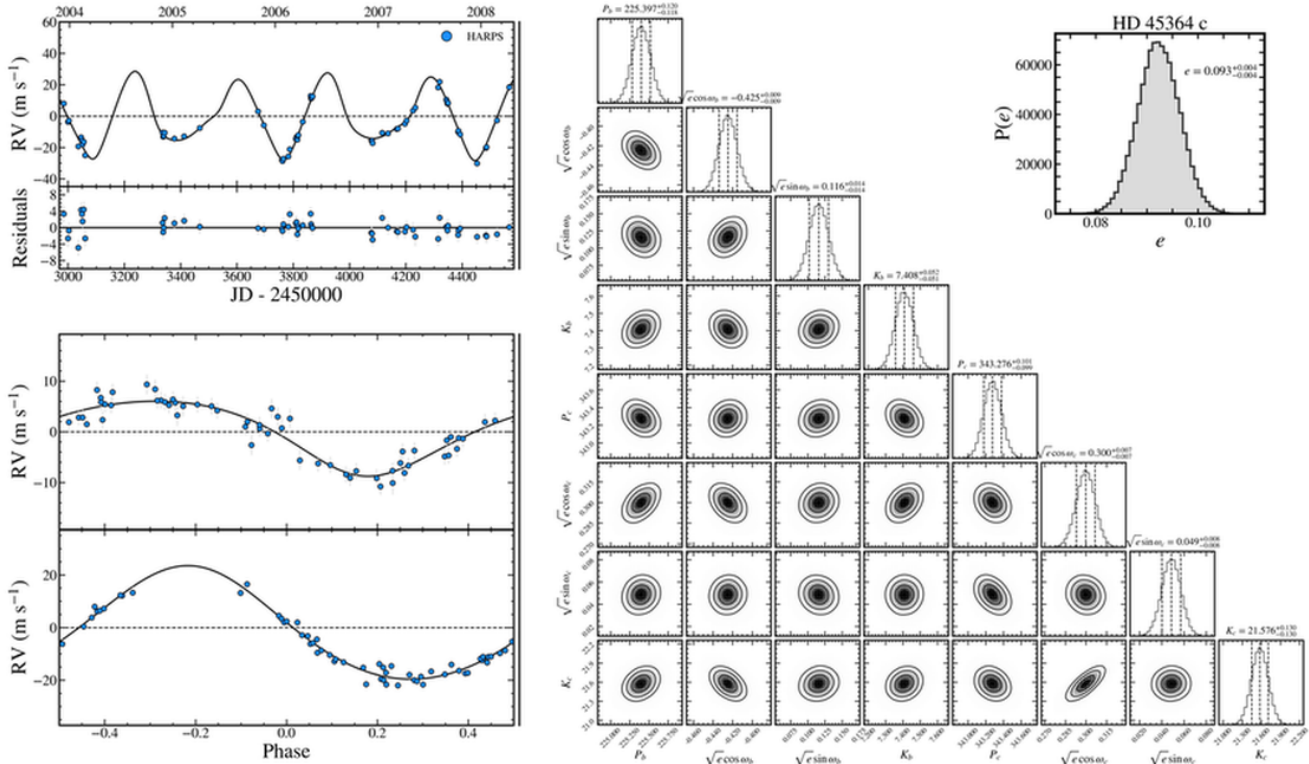
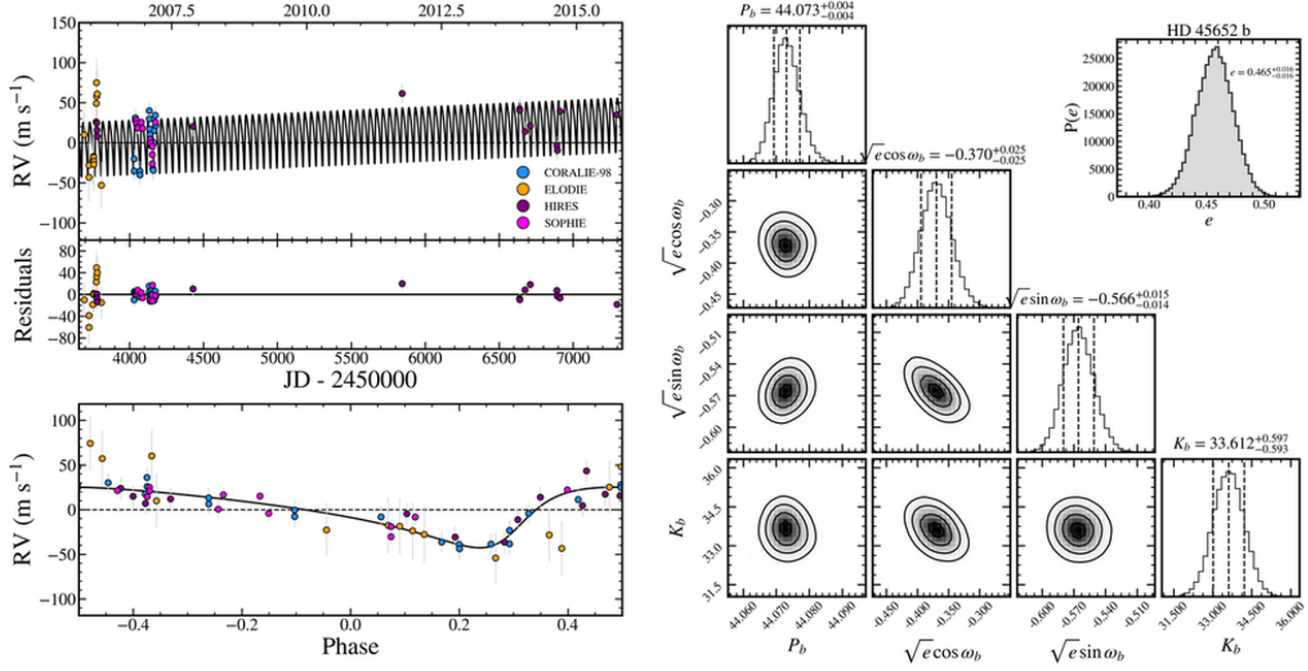


Figure 56. Summary of results for the warm Jupiters HD 43691 b and HD 45364 c.

HD 45652 b



HD 4732 b

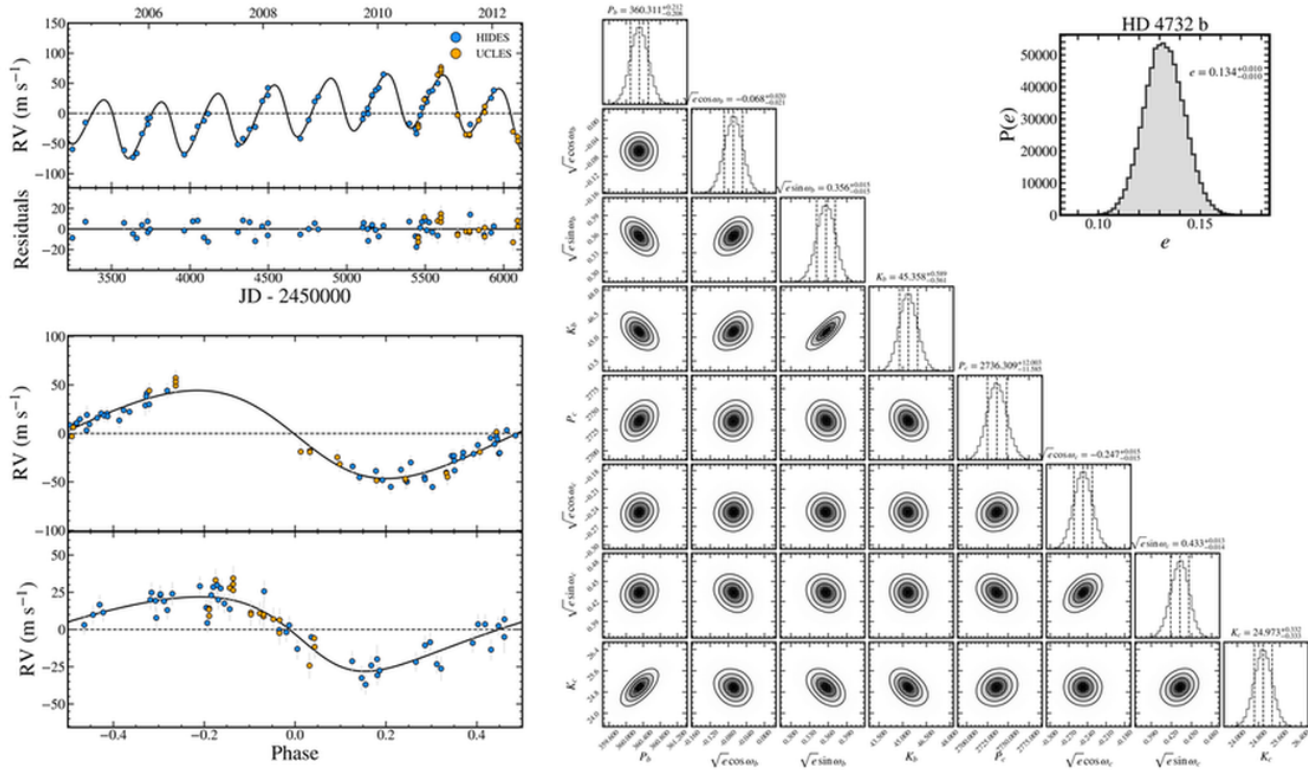
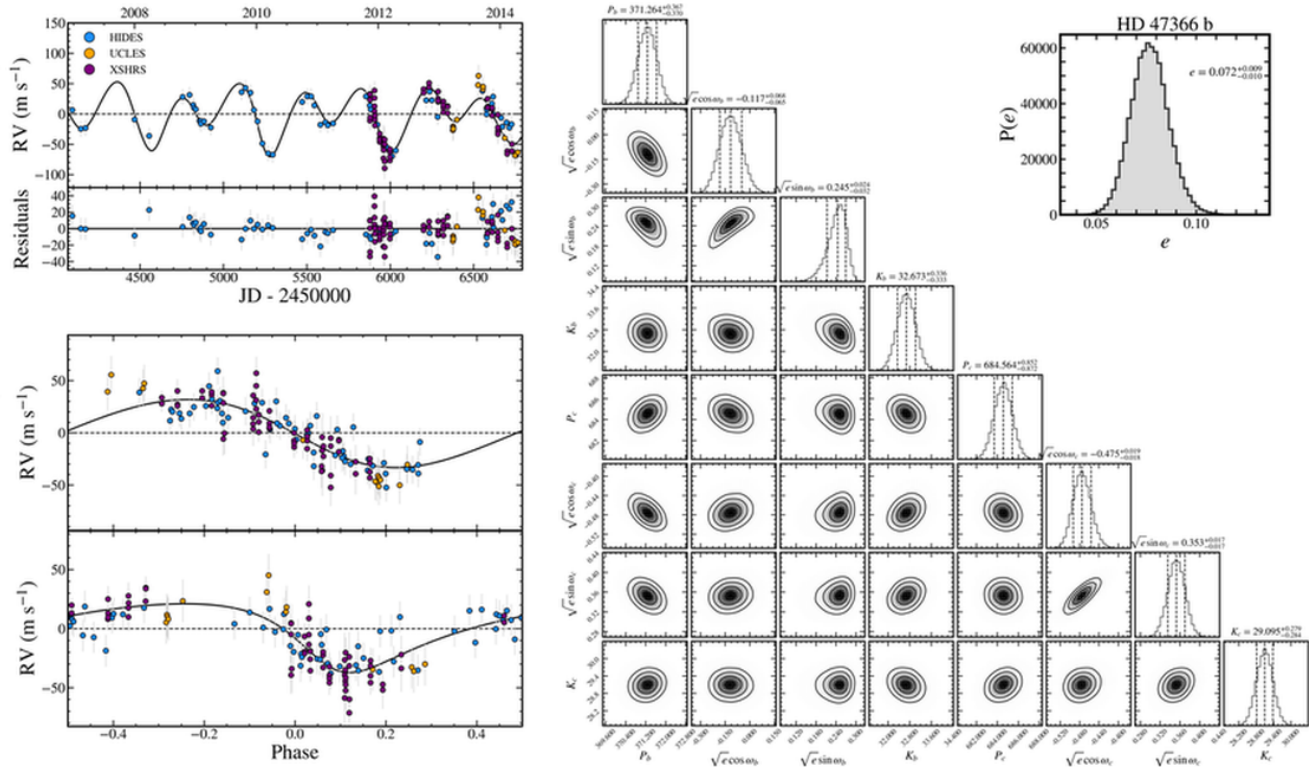


Figure 57. Summary of results for the warm Jupiters HD 45652 b and HD 4732 b.

HD 47366 b



HD 52265 b

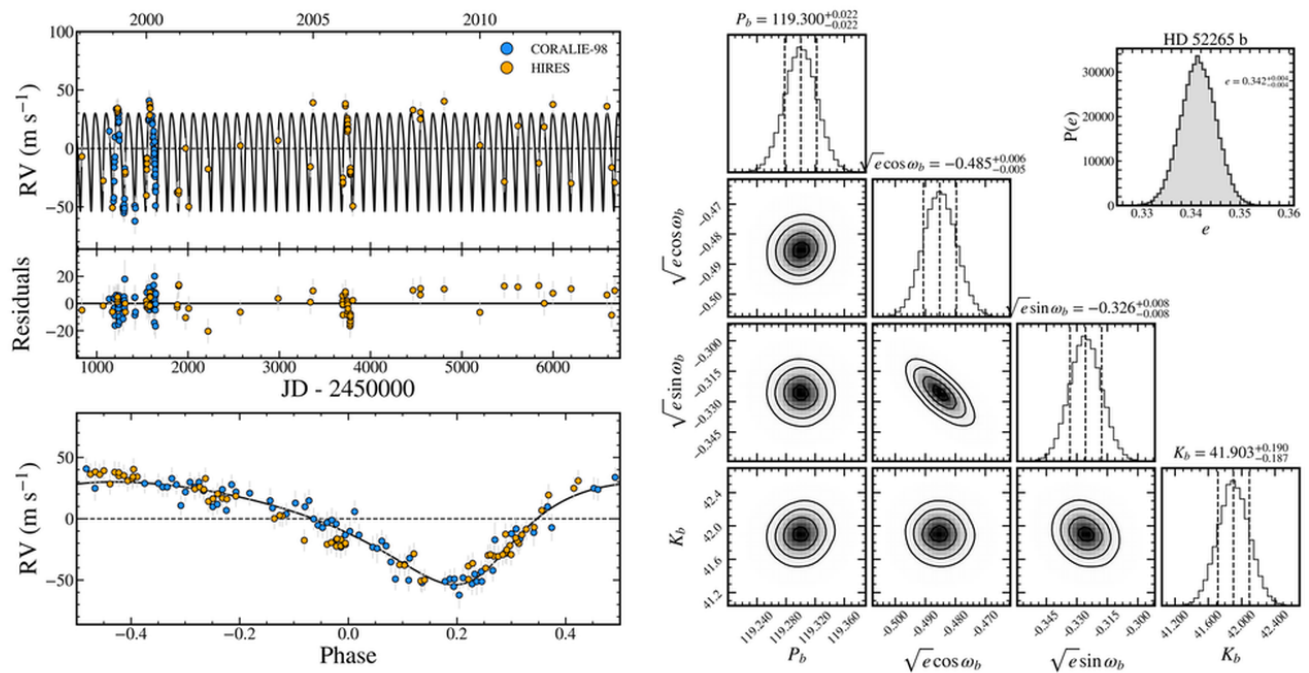
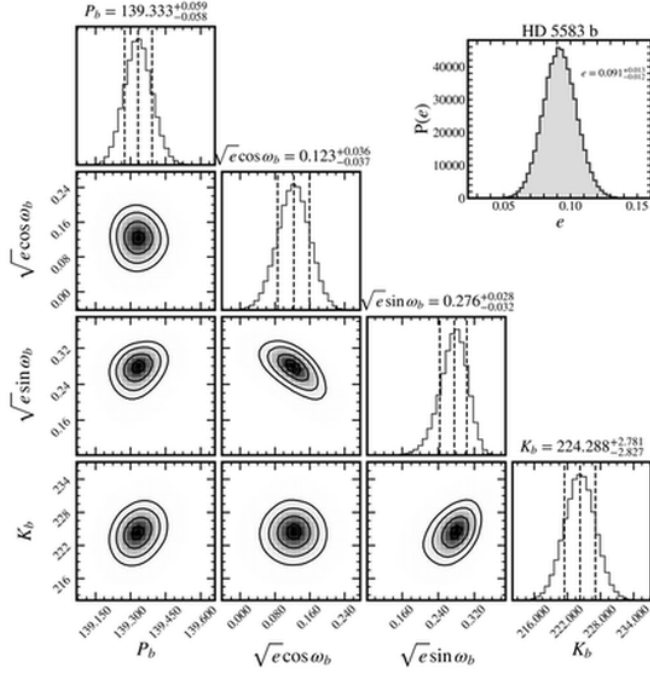
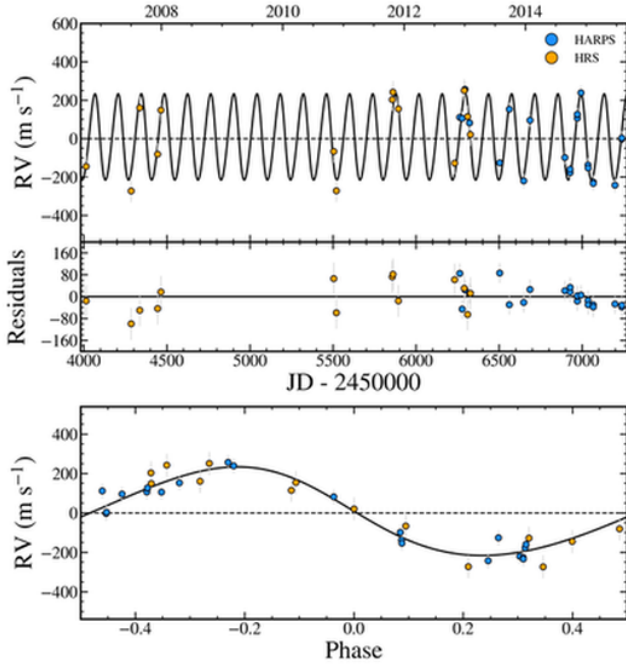


Figure 58. Summary of results for the warm Jupiters HD 47366 b and HD 52265 b.

HD 5583 b



HD 5891 b

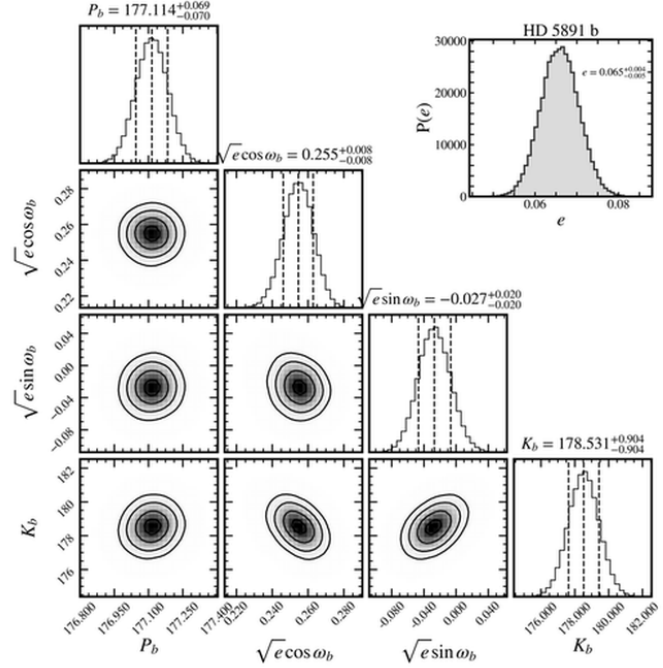
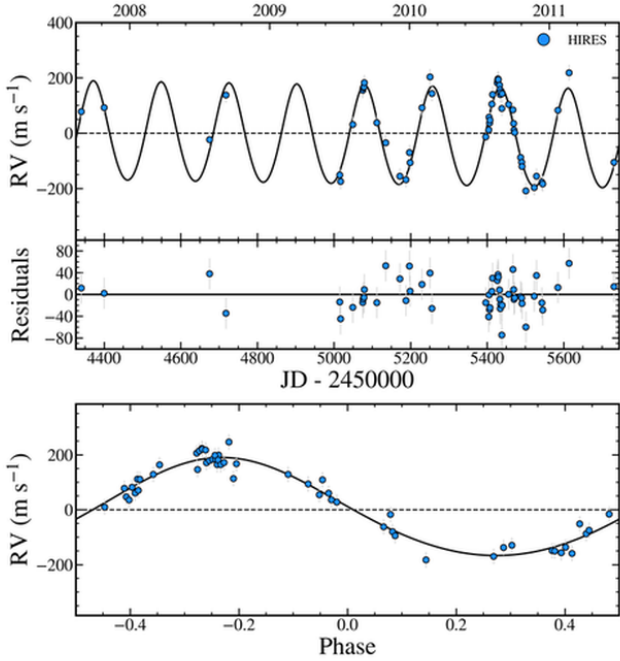
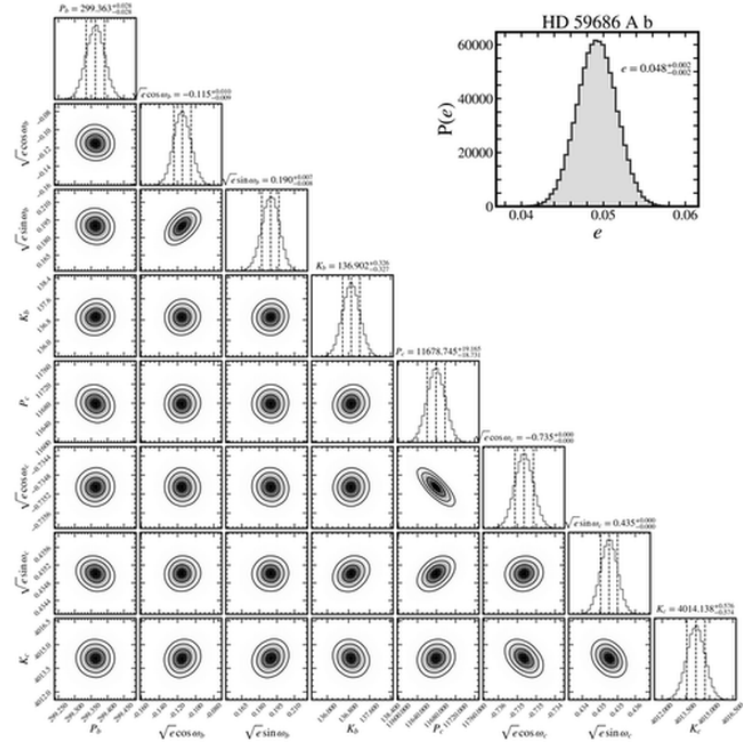
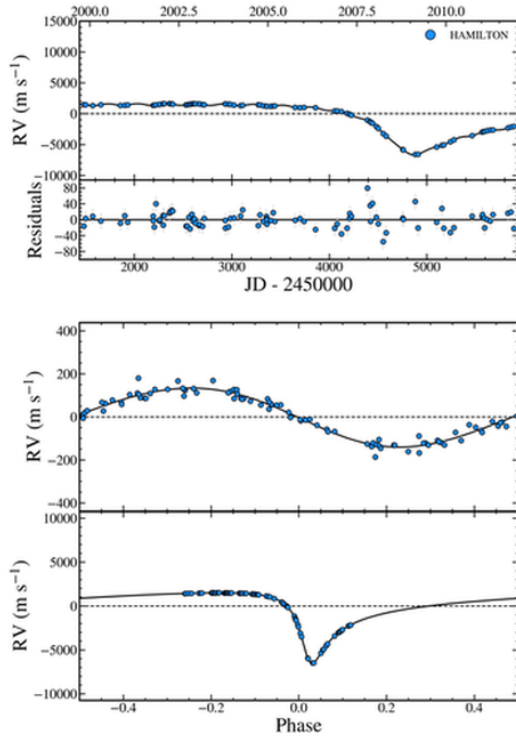


Figure 59. Summary of results for the warm Jupiters HD 5583 b and HD 5891 b.

HD 59686 A b



HD 60532 b

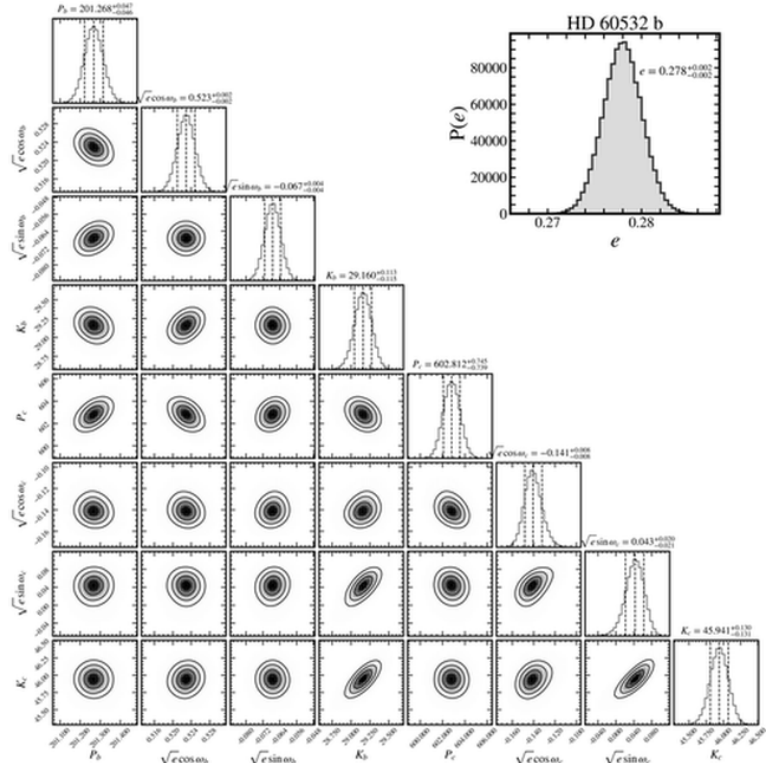
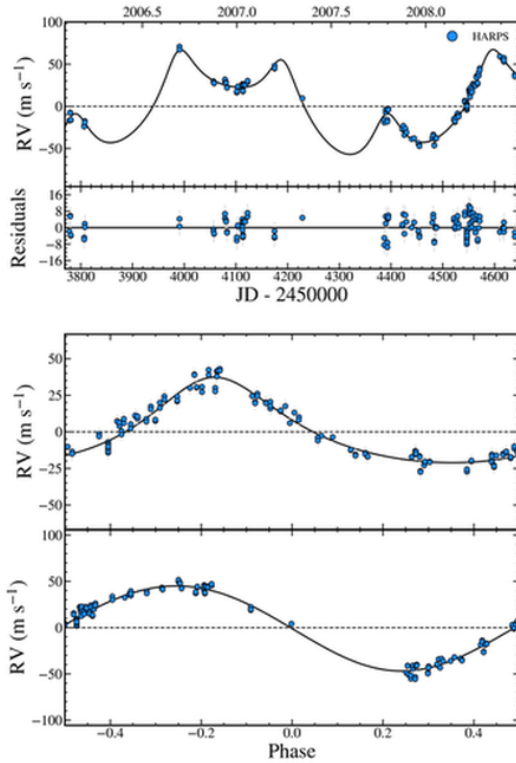
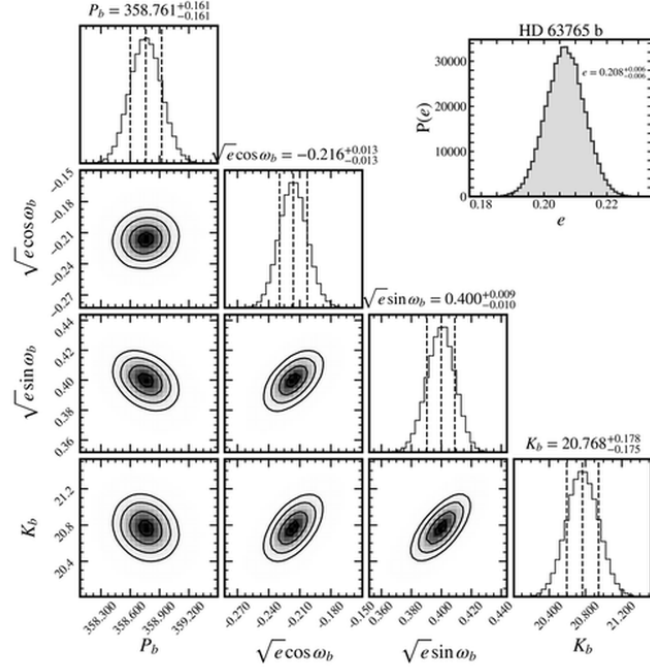
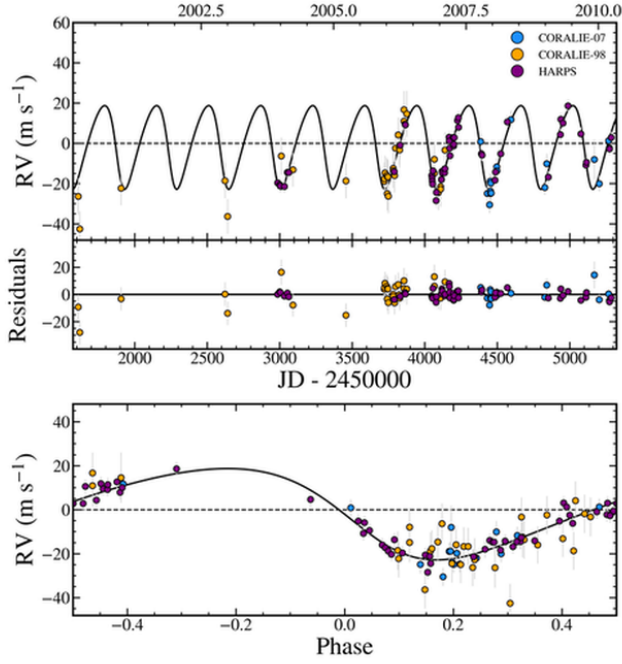


Figure 60. Summary of results for the warm Jupiters HD 59686 A b and HD 60532 b.

HD 63765 b



HD 6434 b

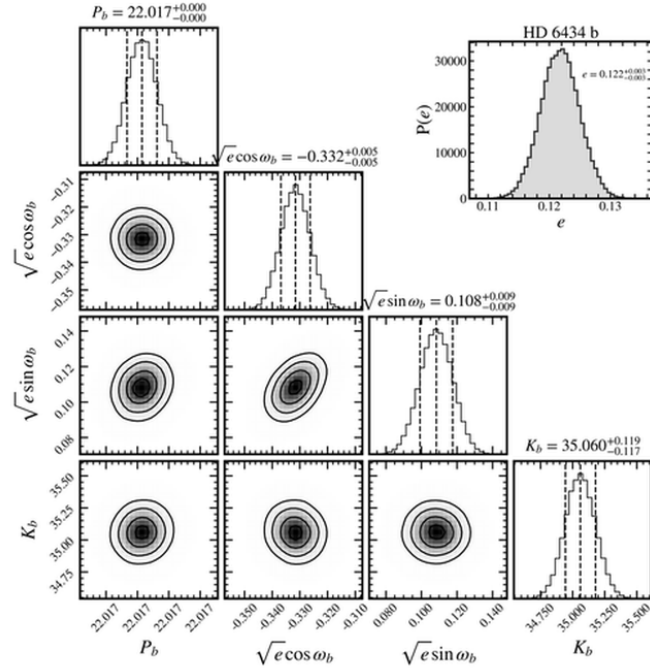
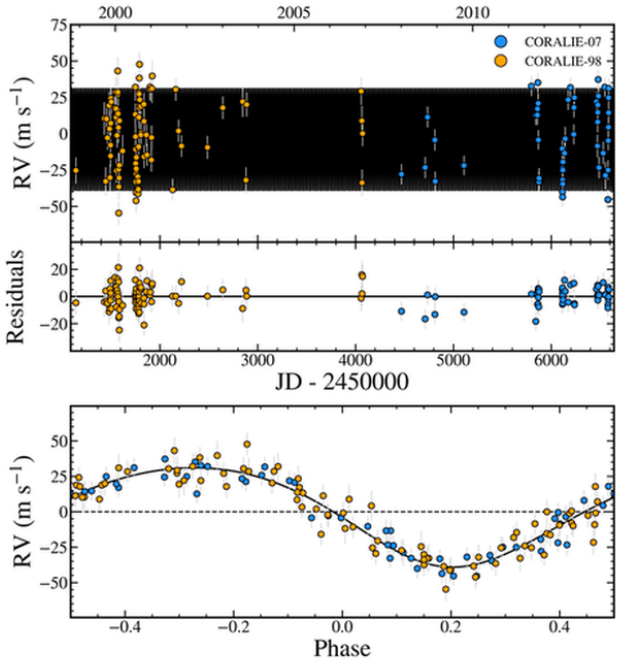
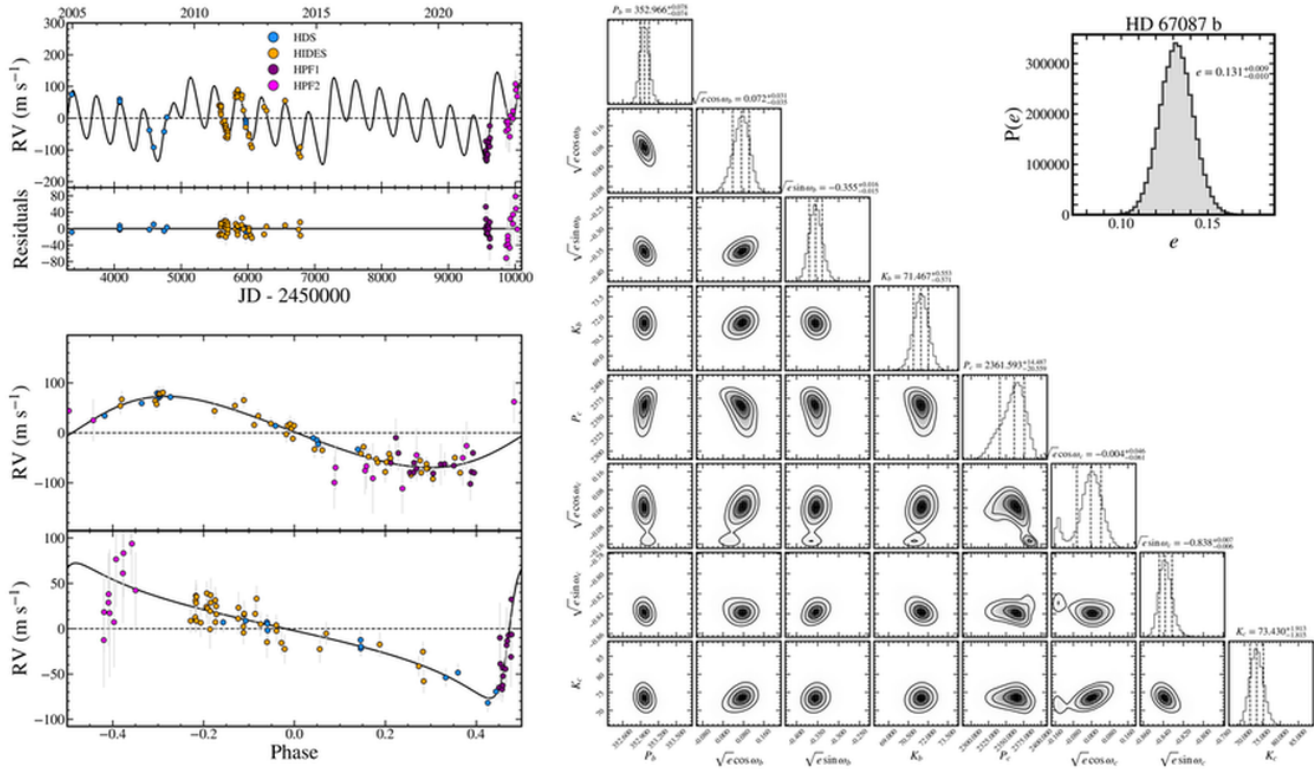


Figure 61. Summary of results for the warm Jupiters HD 63765 b and HD 6434 b.

HD 67087 b



HD 72892 b

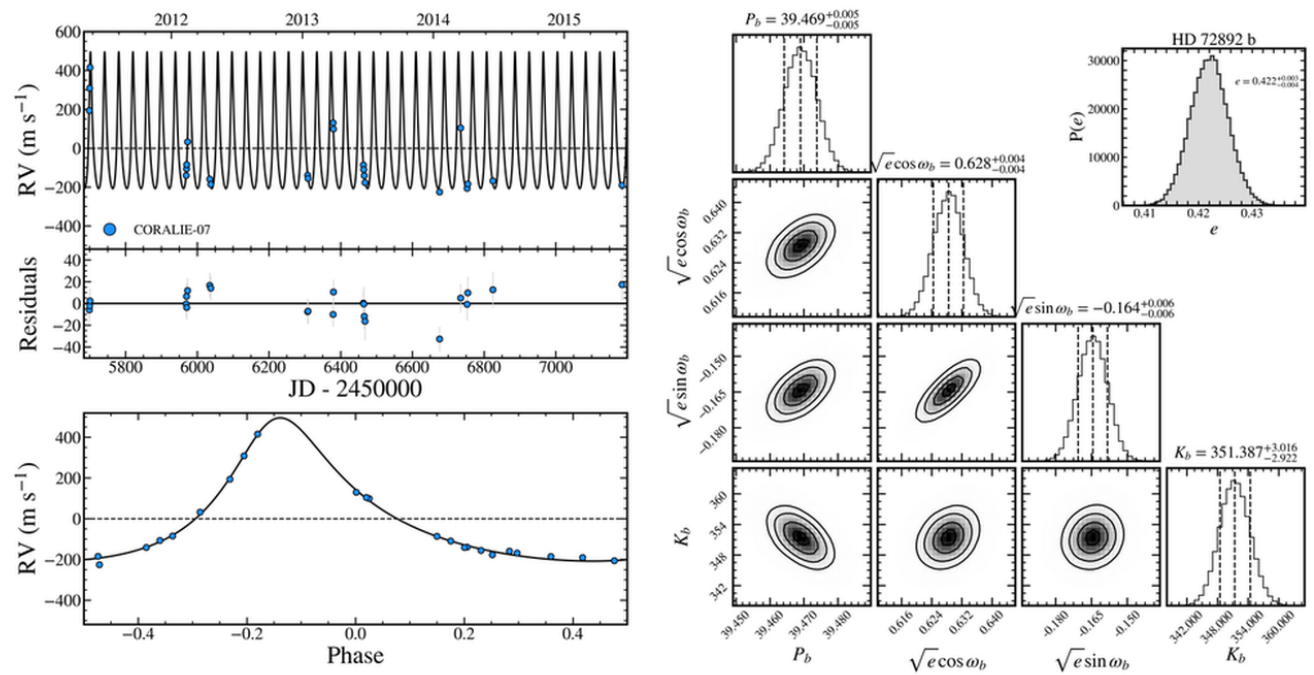


Figure 62. Summary of results for the warm Jupiters HD 67087 b and HD 72892 b.

HD 73526 b

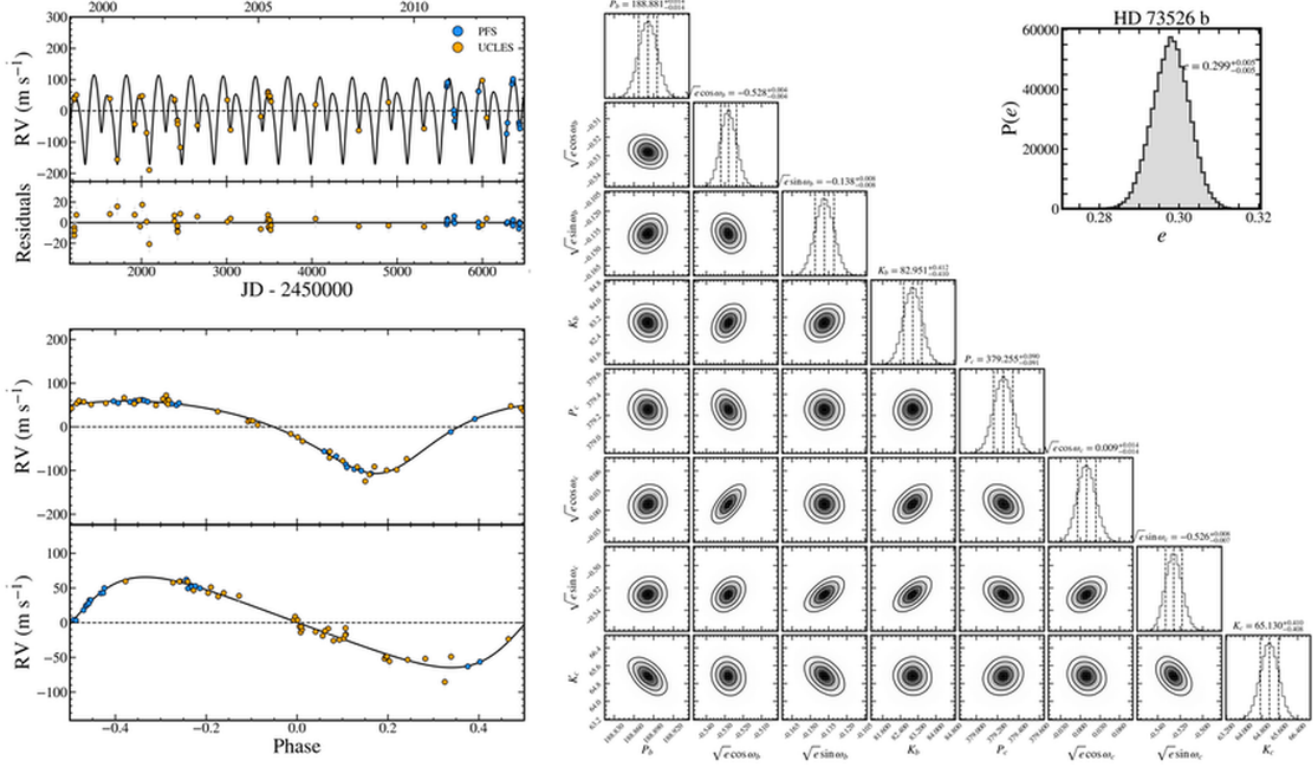
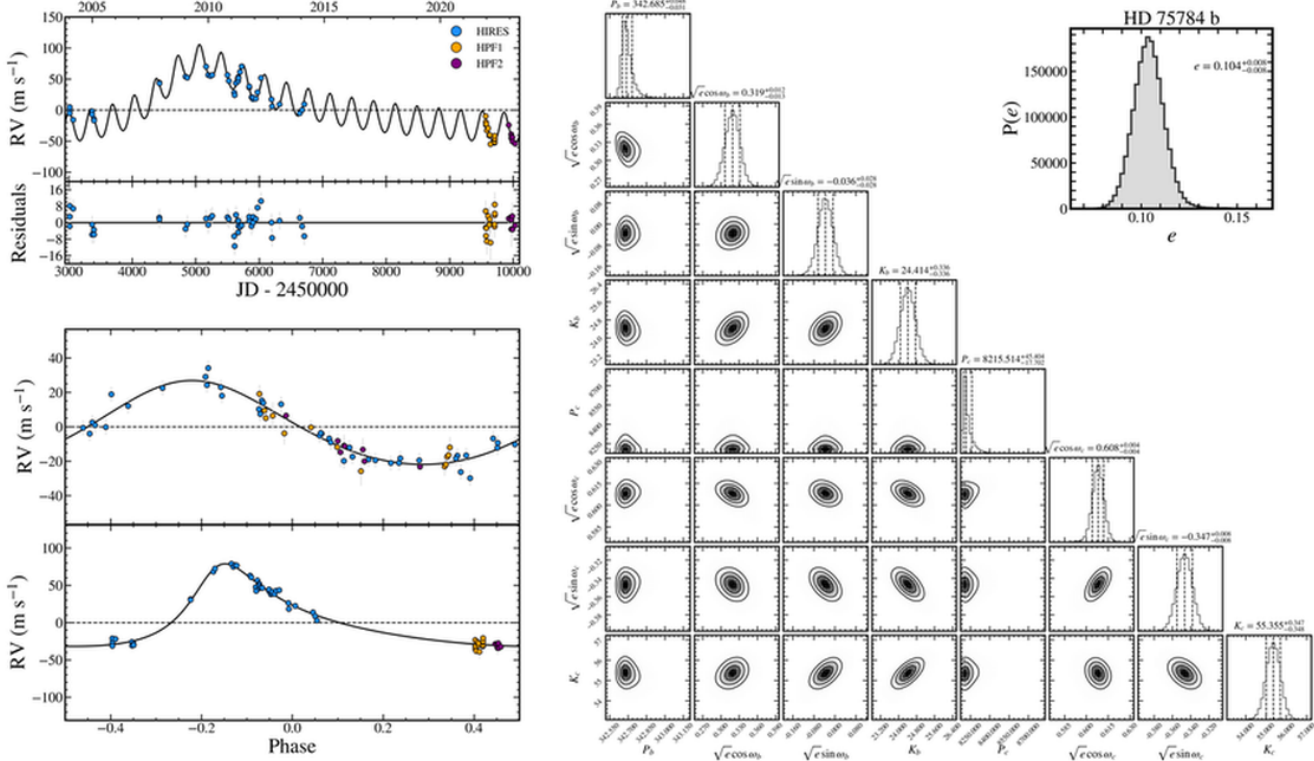


Figure 63. Summary of results for the warm Jupiters HD 73526 b and HD 74156 b.

HD 75784 b



HD 79181 b

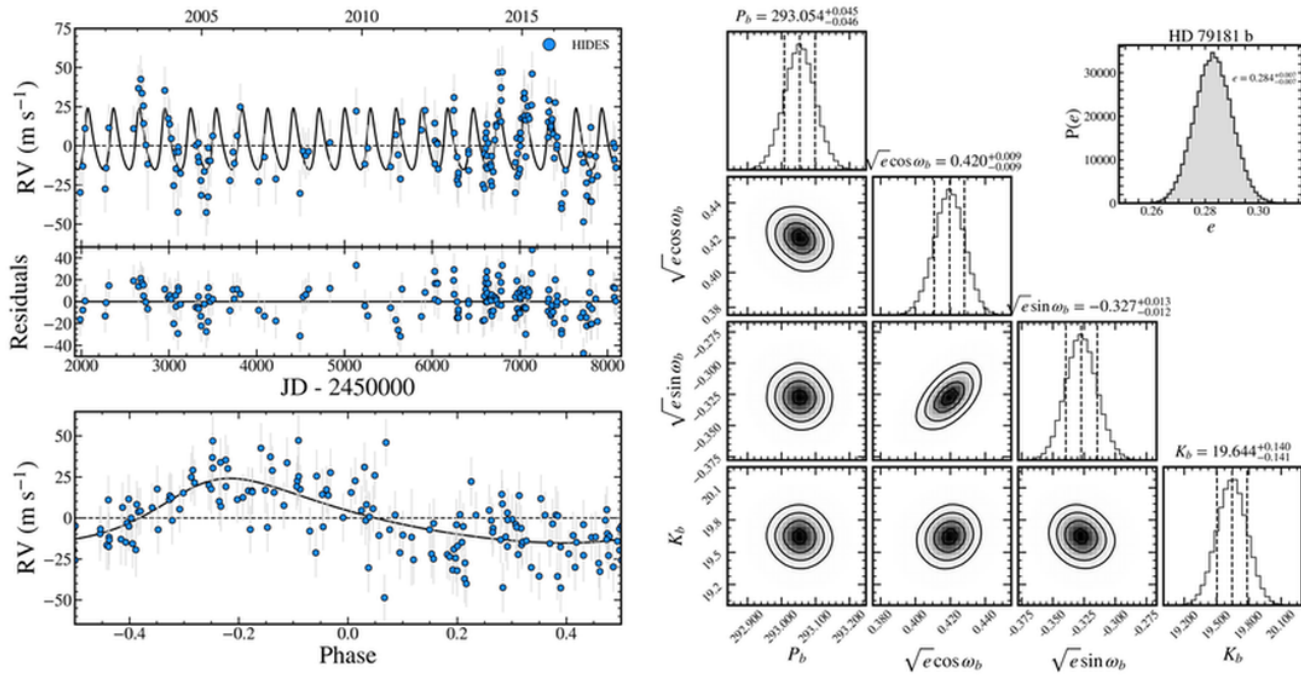
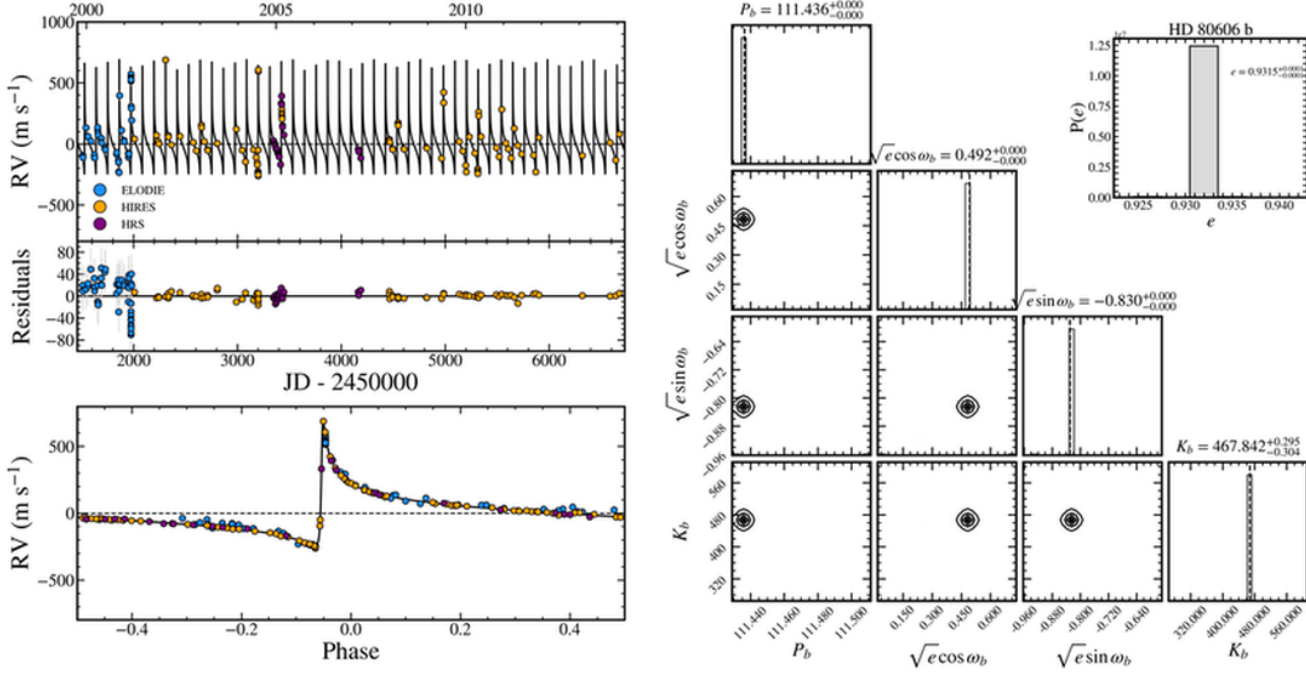


Figure 64. Summary of results for the warm Jupiters HD 75784 b and HD 79181 b.

HD 80606 b



HD 81688 b

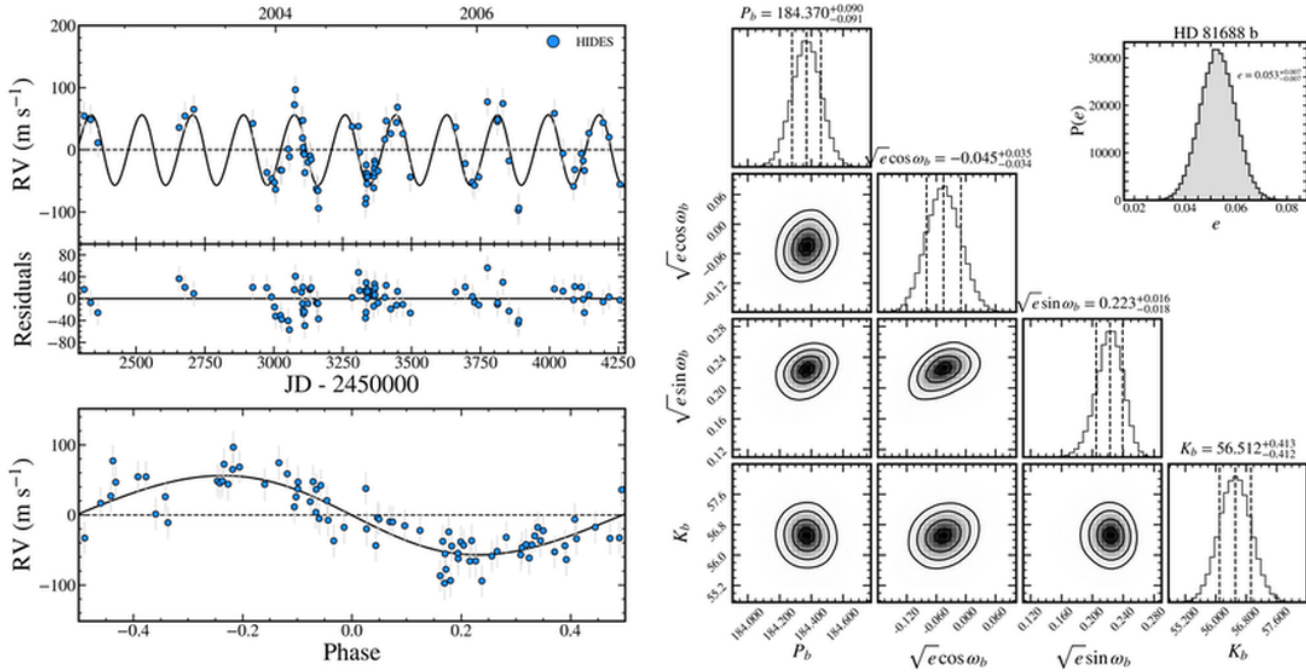
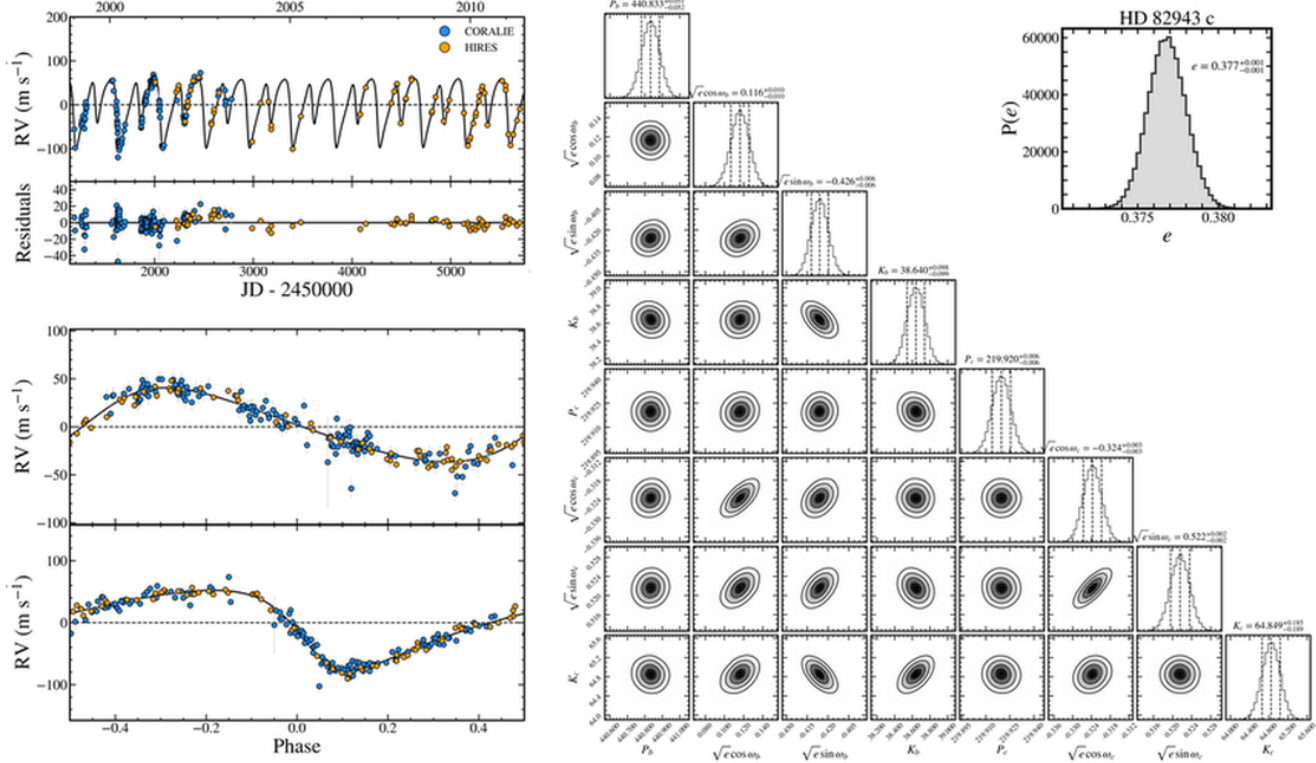


Figure 65. Summary of results for the warm Jupiters HD 80606 b and HD 81688 b.

HD 82943 c



HD 8574 b

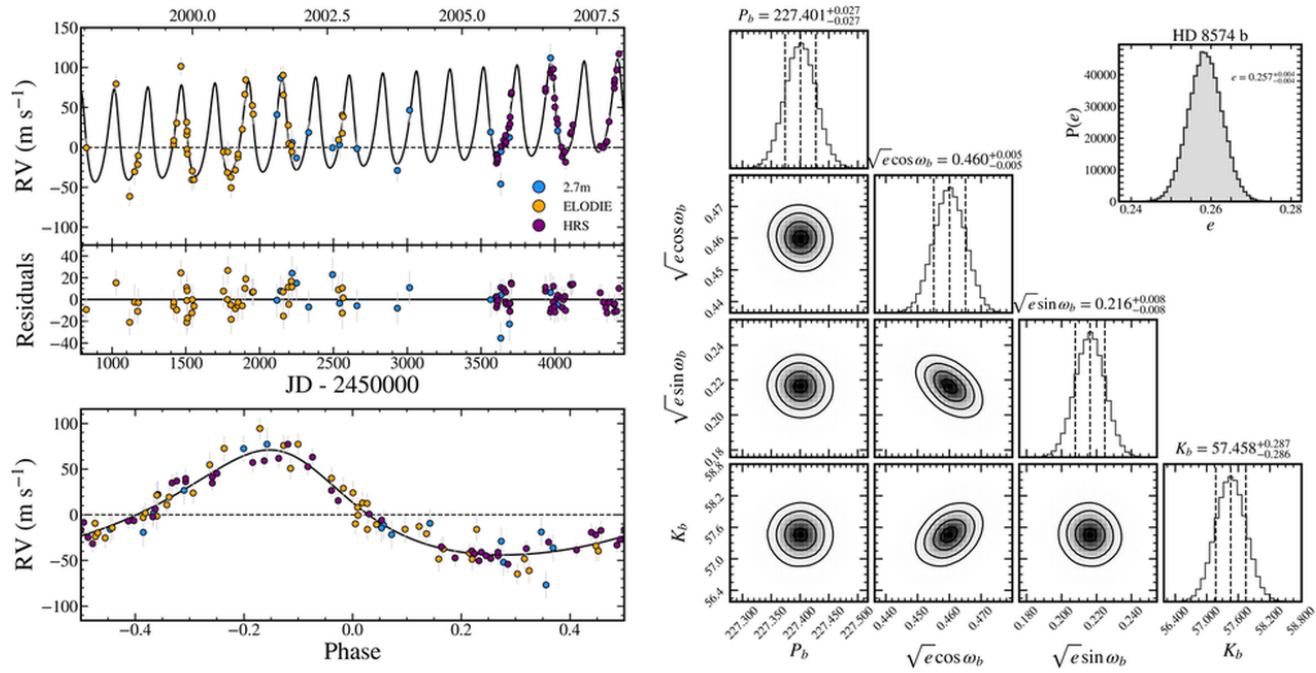
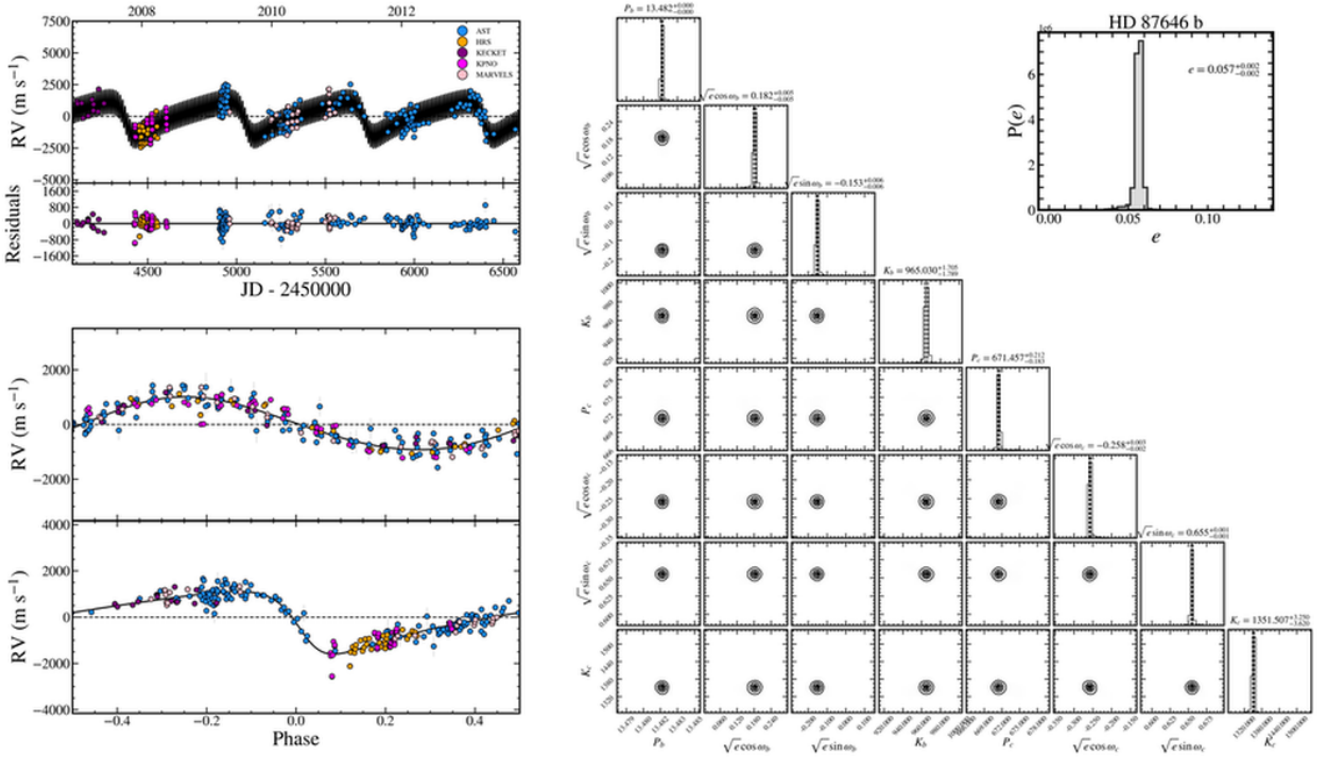


Figure 66. Summary of results for the warm Jupiters HD 82943 c and HD 8574 b.

HD 87646 b



HD 89744 b

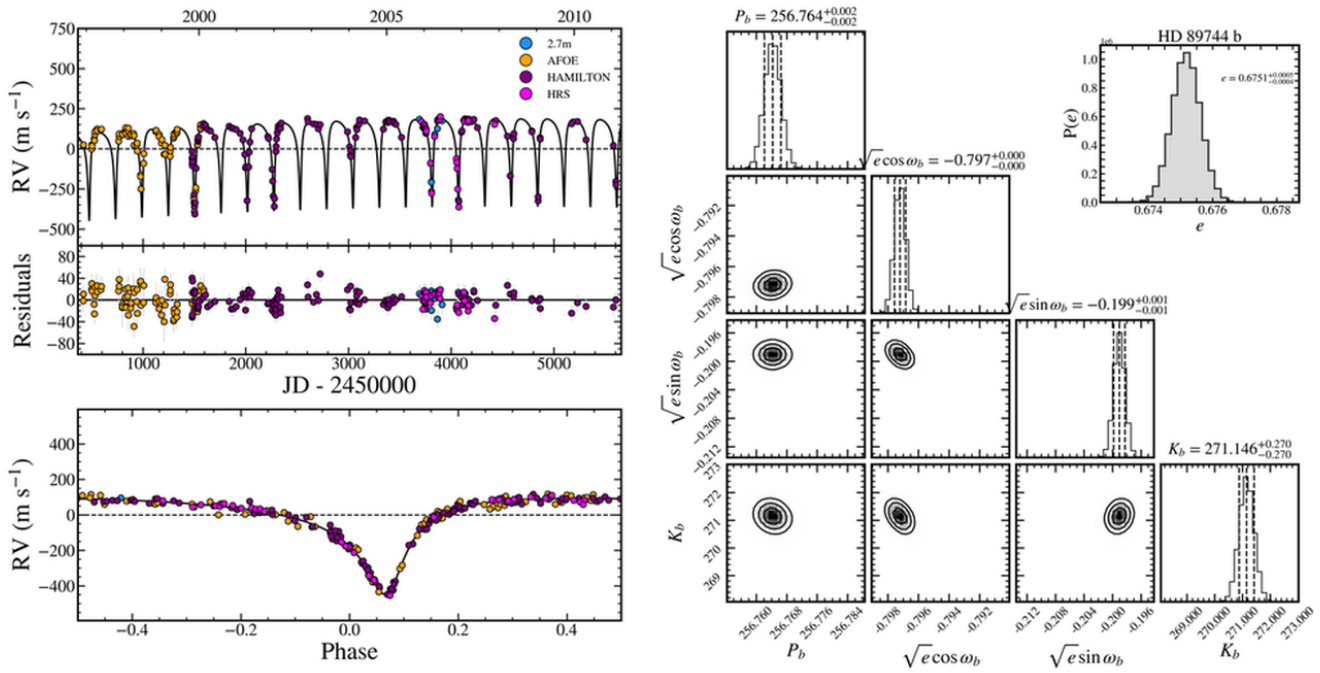
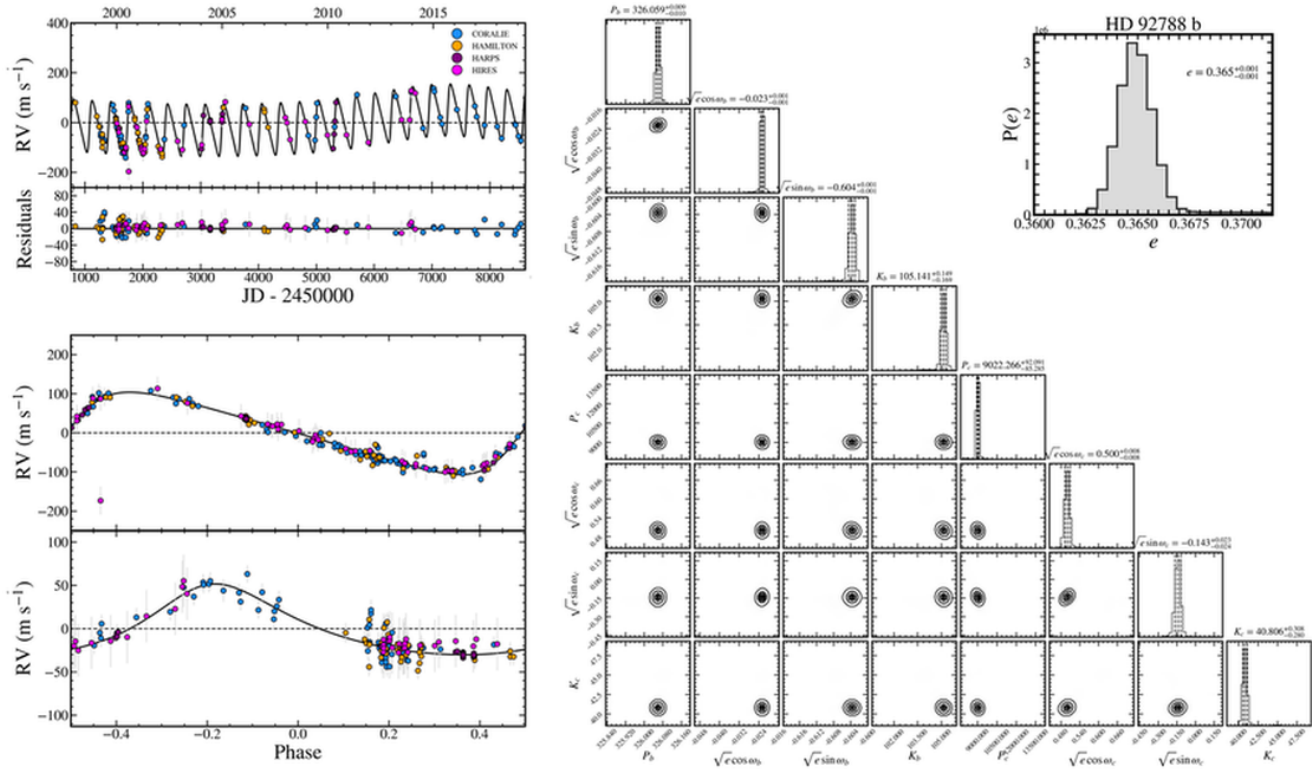


Figure 67. Summary of results for the warm Jupiters HD 87646 b and HD 89744 b.

HD 92788 b



HD 93083 b

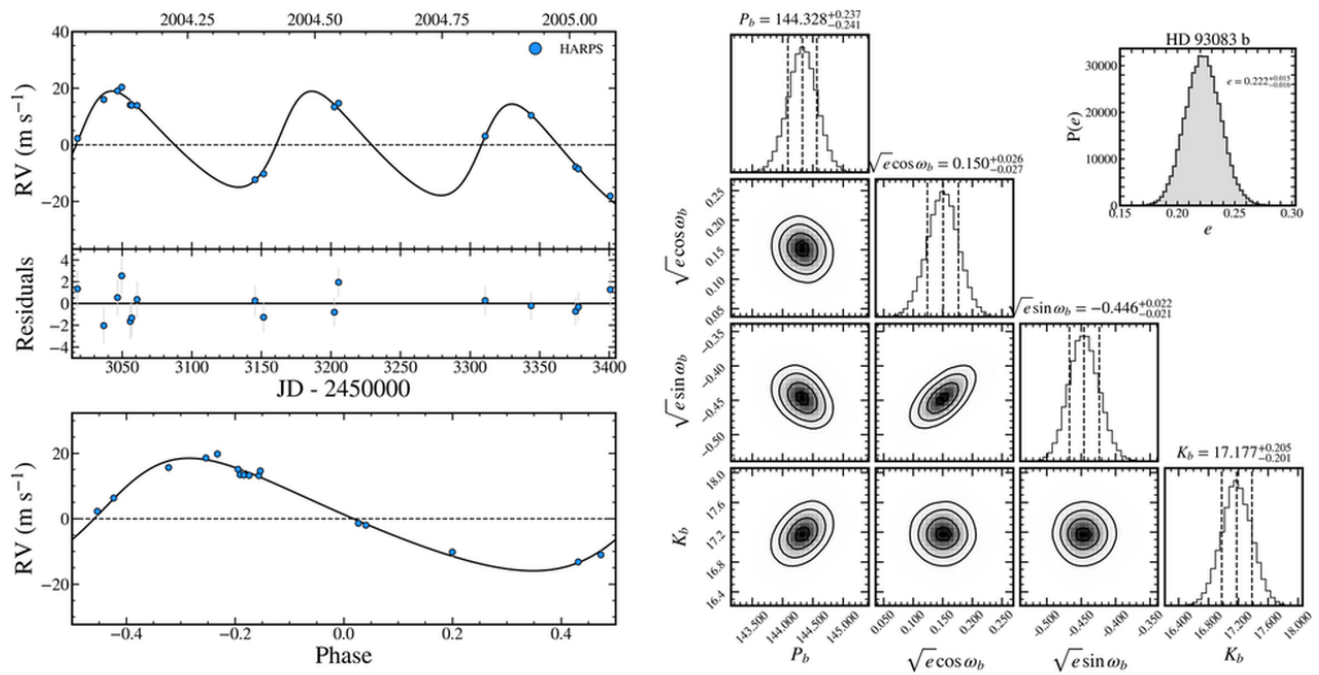
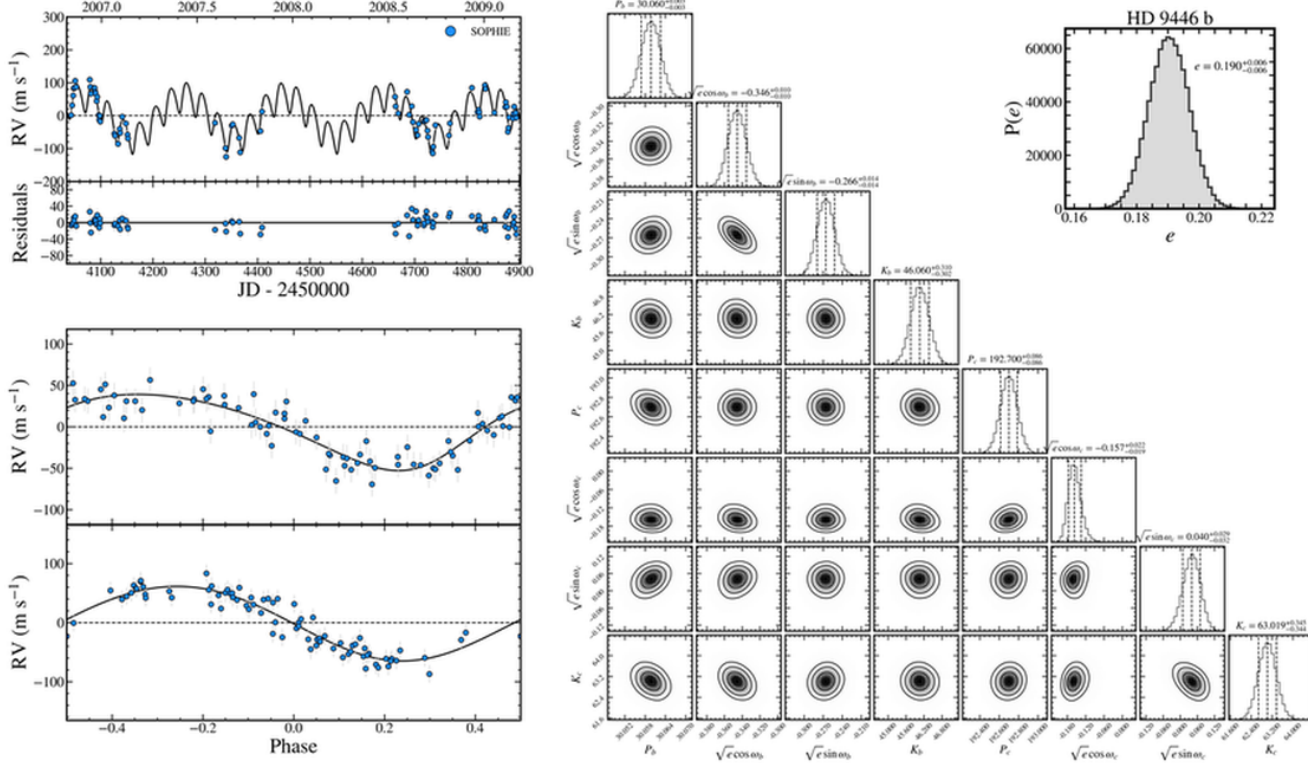


Figure 68. Summary of results for the warm Jupiters HD 92788 b and HD 93083 b.

HD 9446 b



HD 9446 c

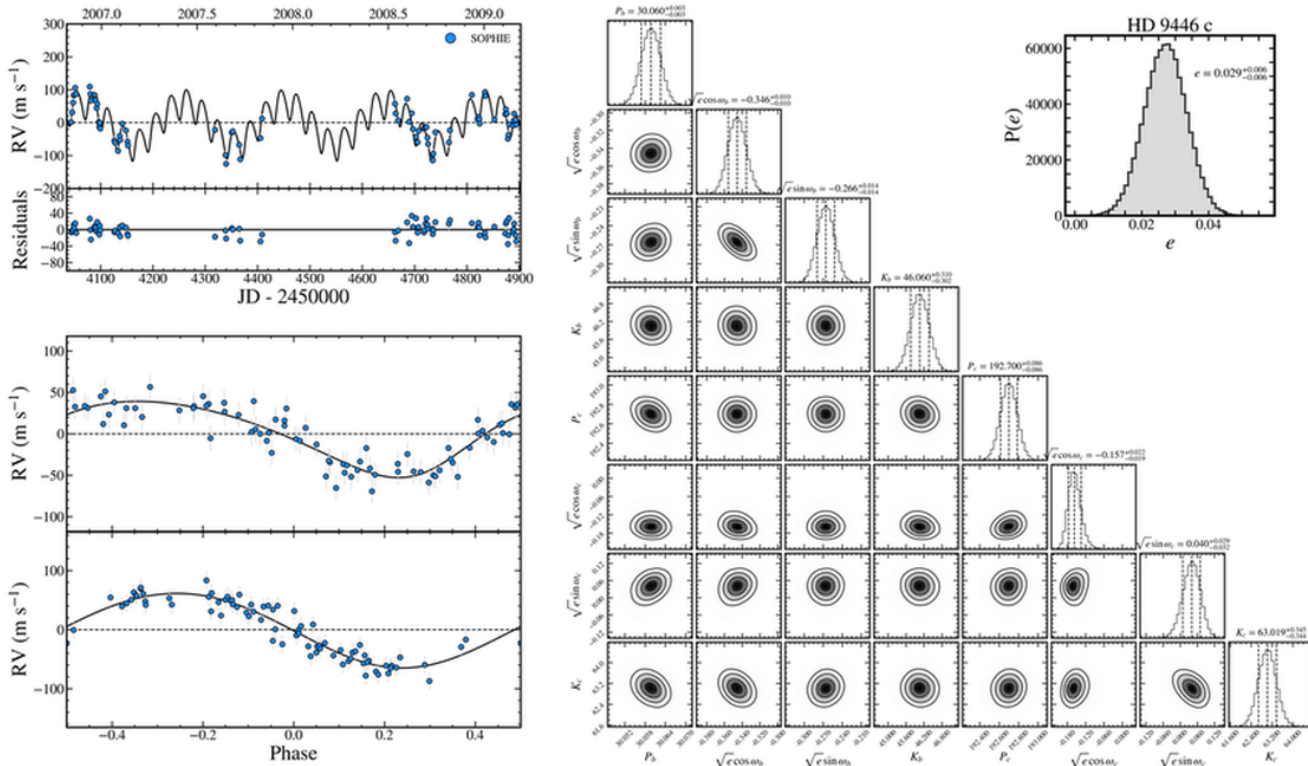
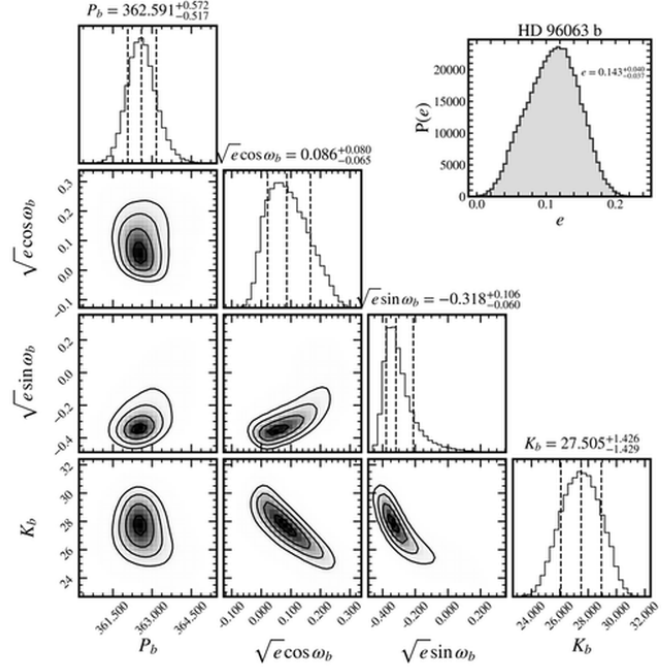
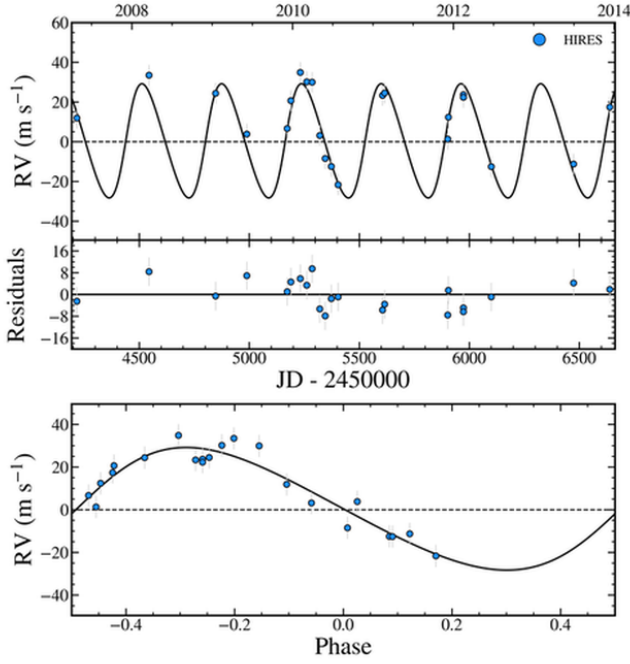


Figure 69. Summary of results for the warm Jupiters HD 9446 b and HD 9446 c.

HD 96063 b



HD 99283 b

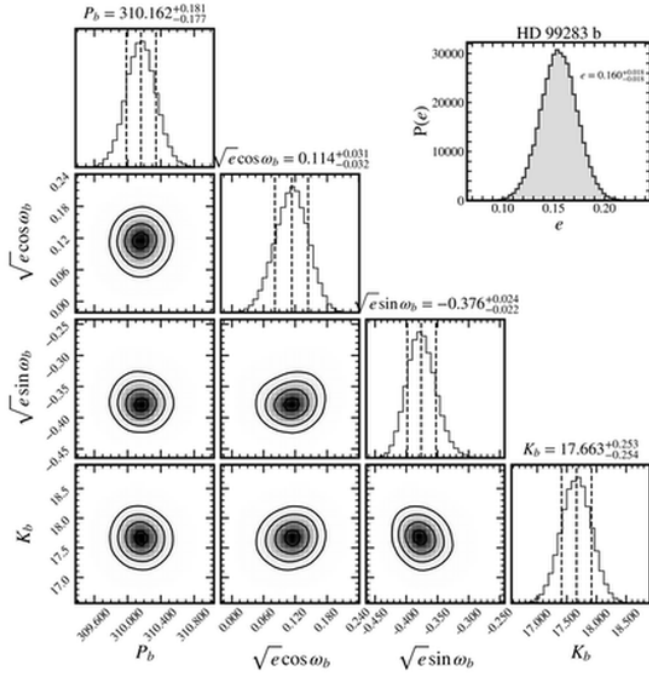
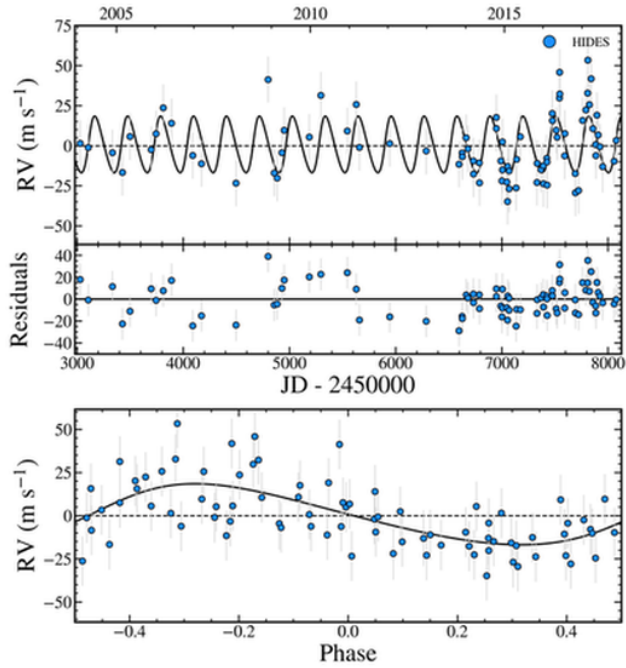
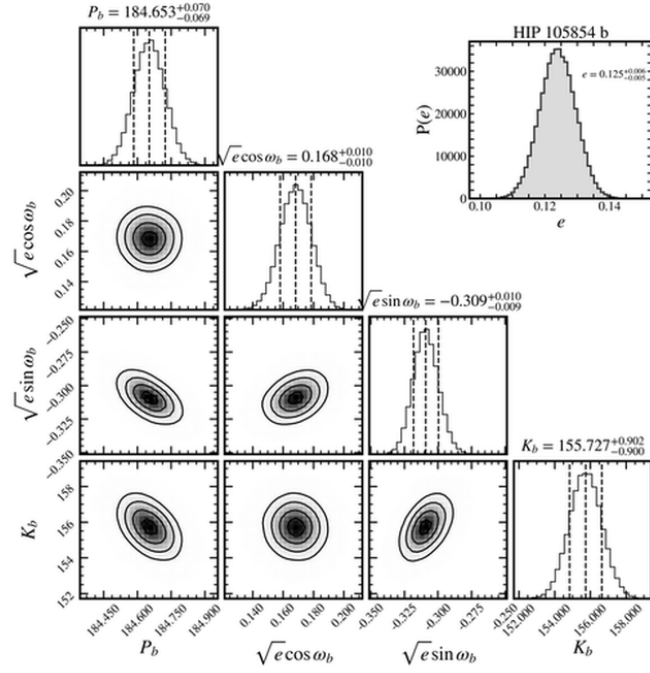
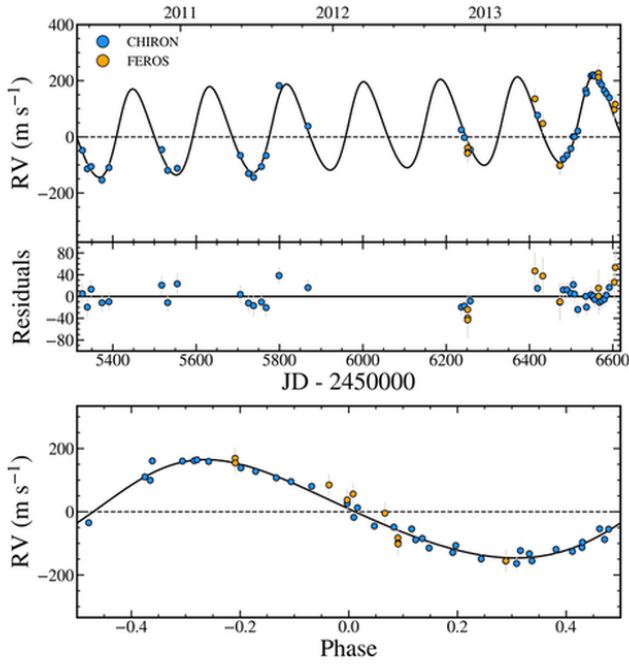


Figure 70. Summary of results for the warm Jupiters HD 96063 b and HD 99283 b.

HIP 105854 b



HIP 107773 b

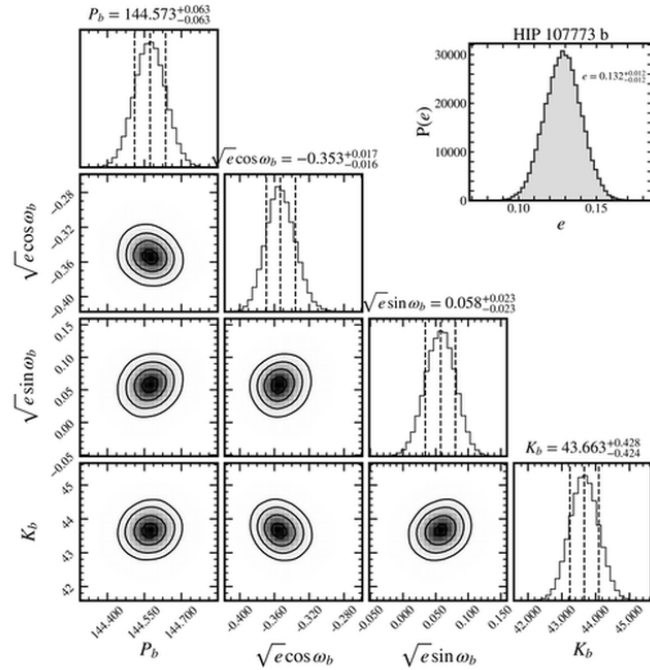
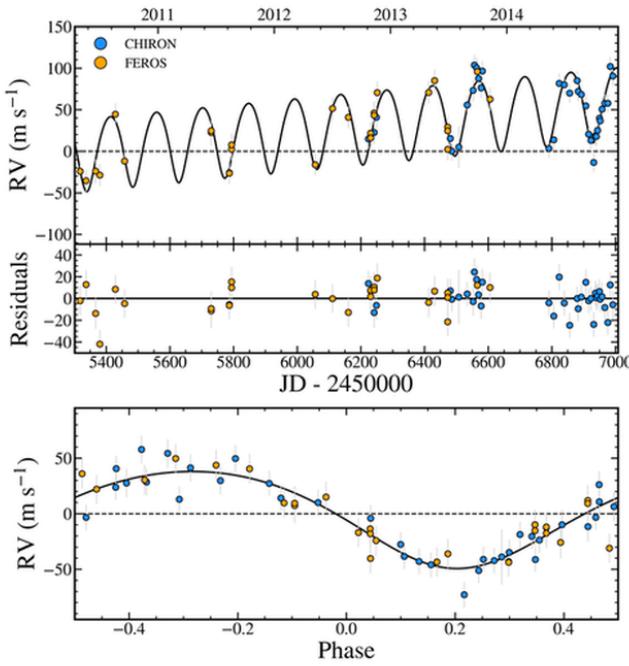
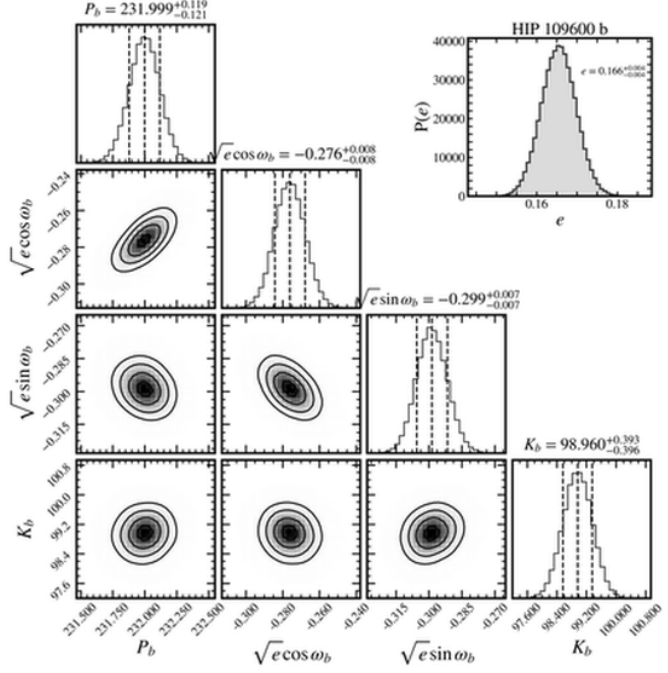
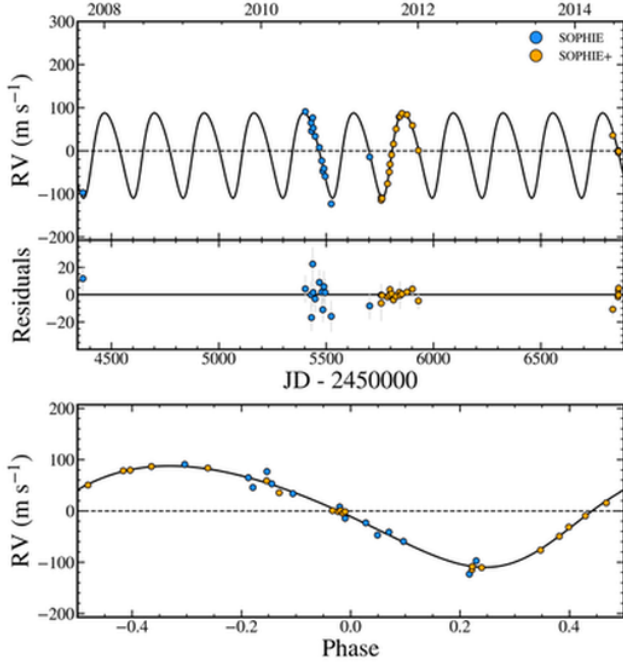


Figure 71. Summary of results for the warm Jupiters HIP 105854 b and HIP 107773 b.

HIP 109600 b



HIP 12961 b

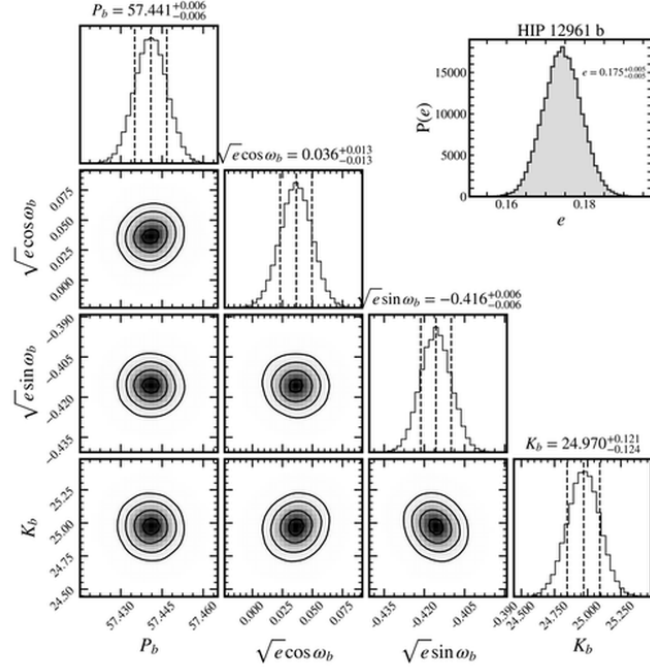
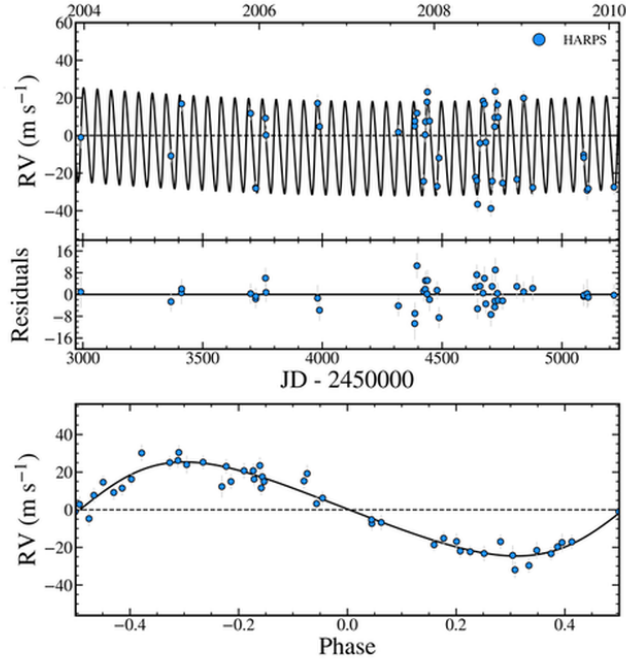
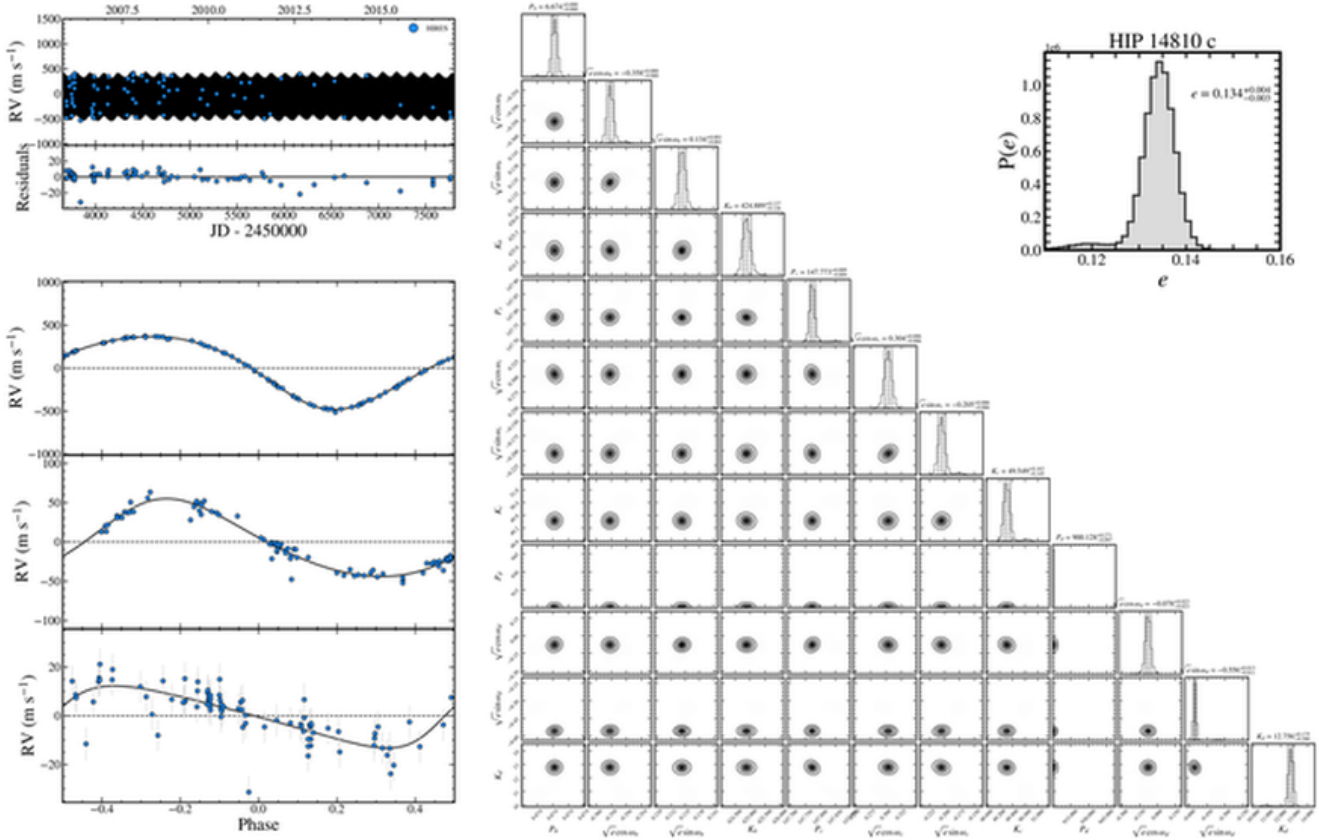


Figure 72. Summary of results for the warm Jupiters HIP 109600 b and HIP 12961 b.

HIP 14810 c



HIP 34222 b

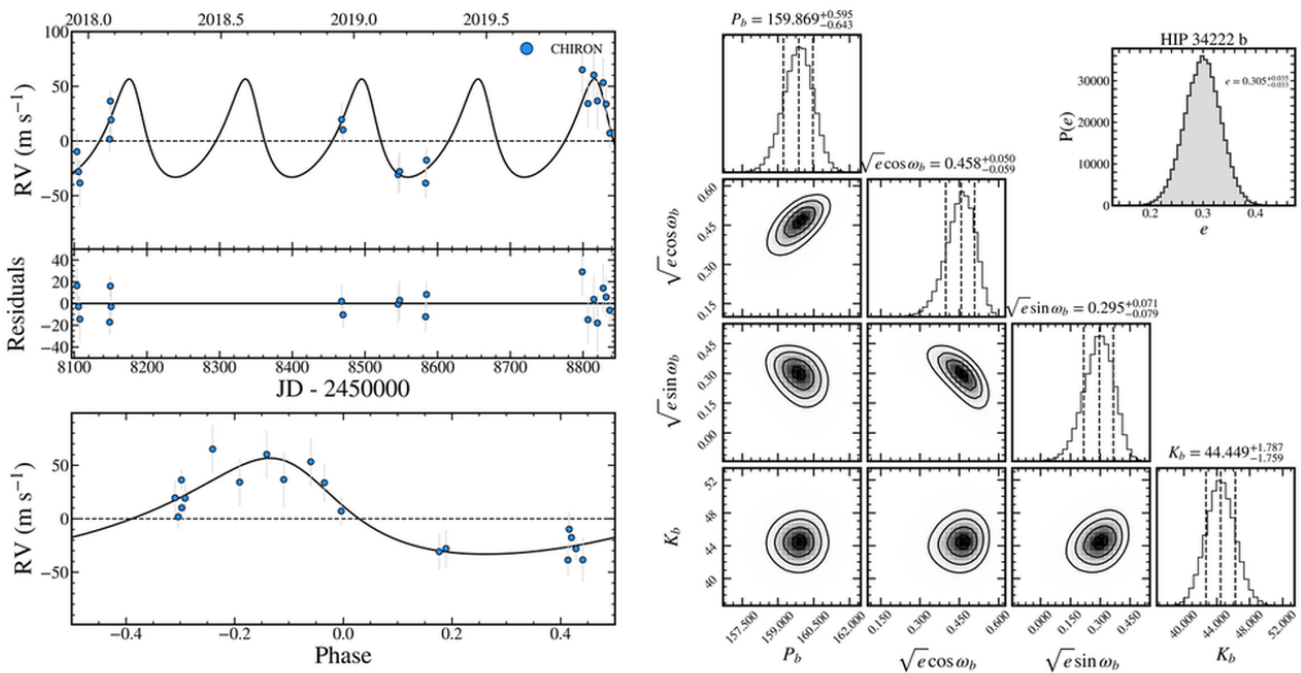
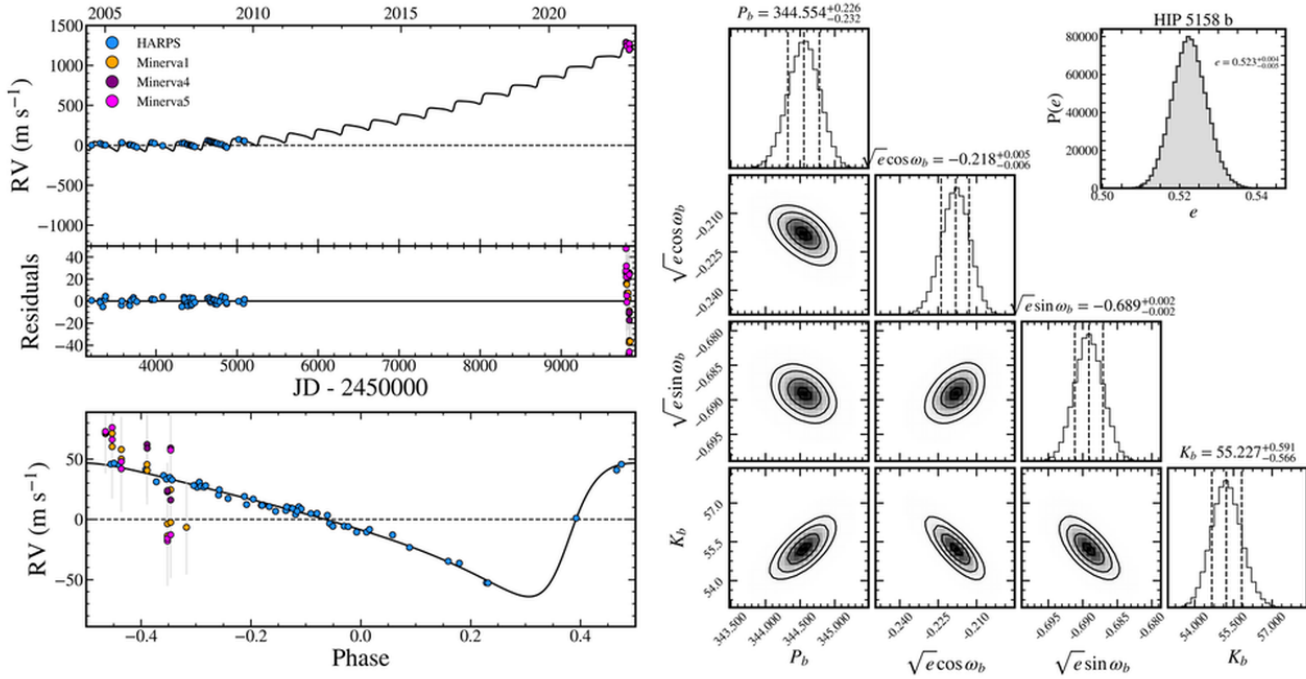


Figure 73. Summary of results for the warm Jupiters HIP 14810 c and HIP 34222 b.

HIP 5158 b



HIP 57274 c

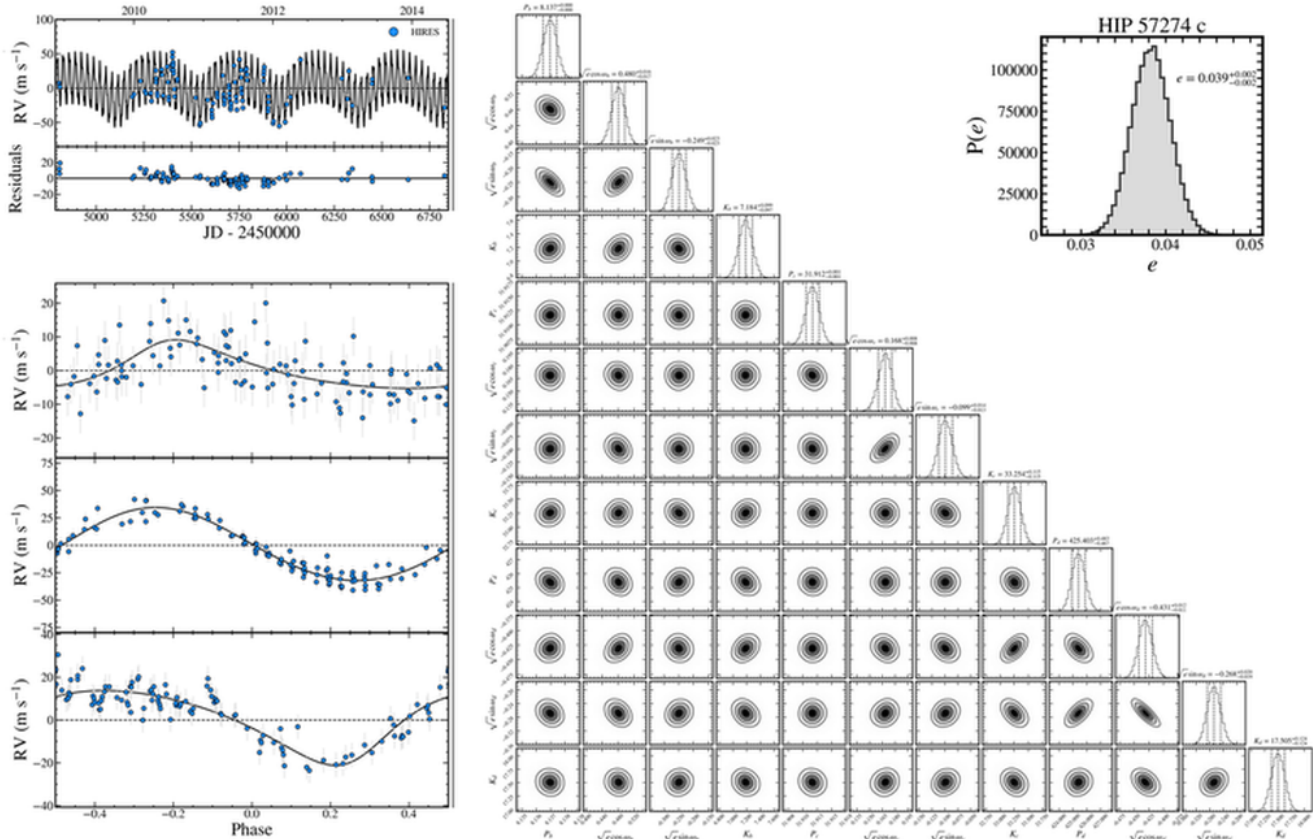
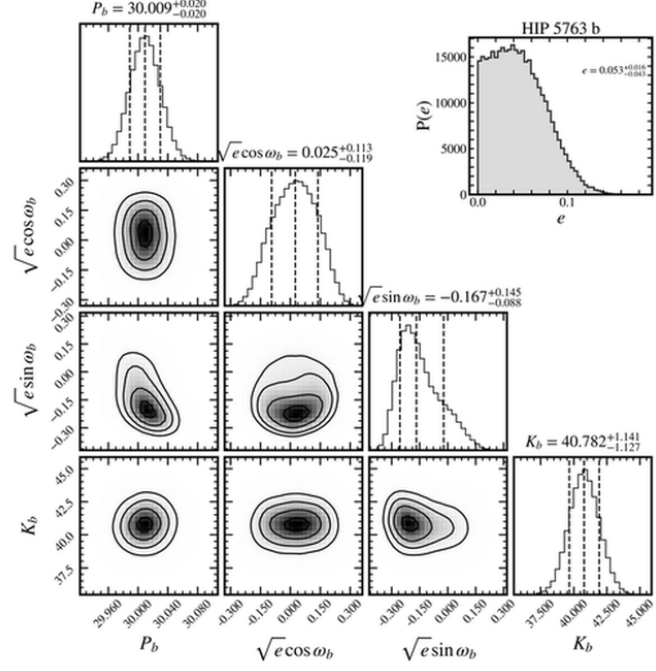
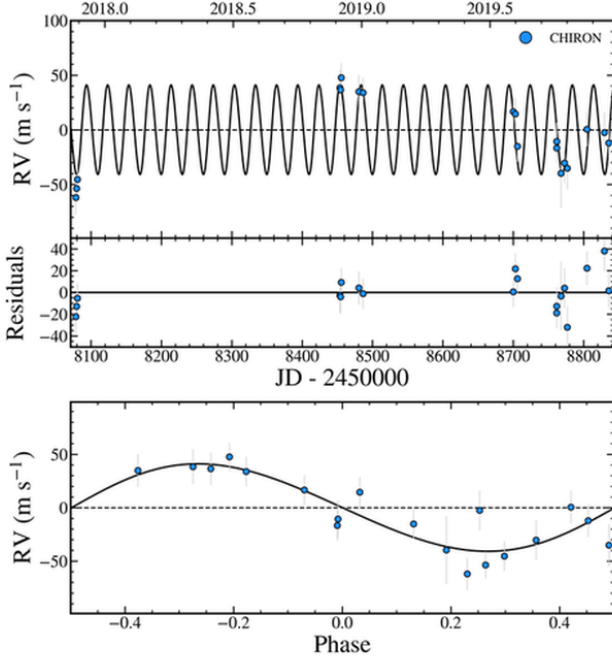


Figure 74. Summary of results for the warm Jupiters HIP 5158 b and HIP 57274 c.

HIP 5763 b



HIP 63242 b

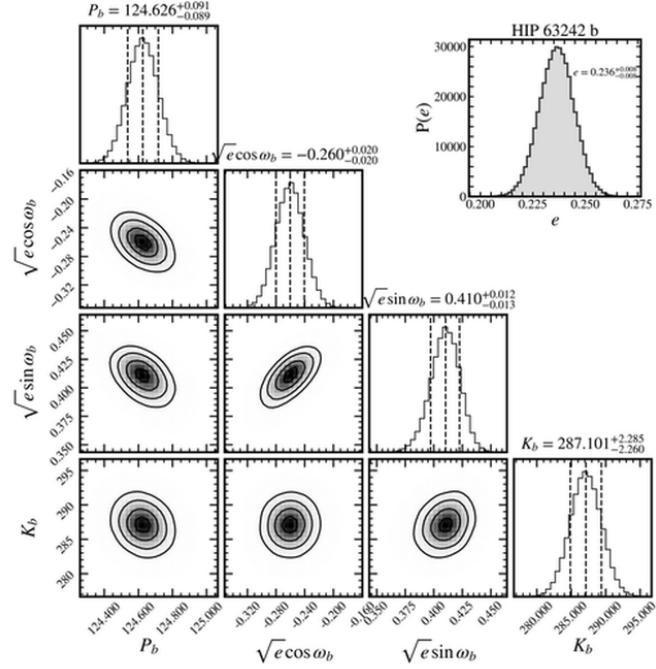
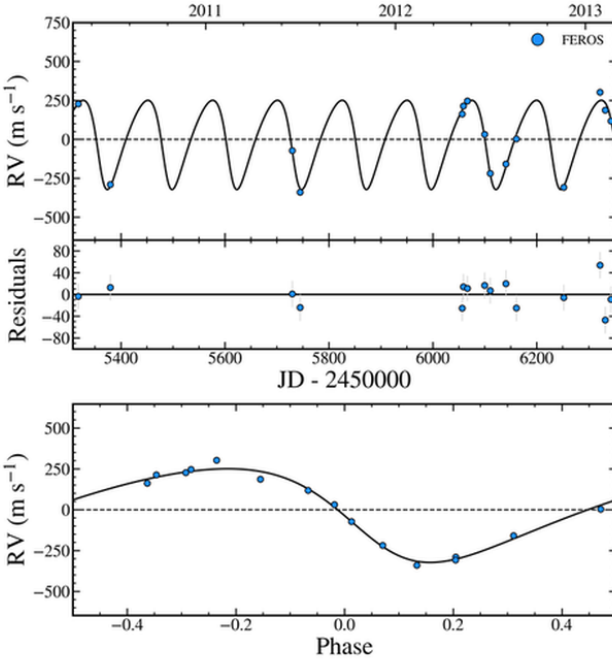
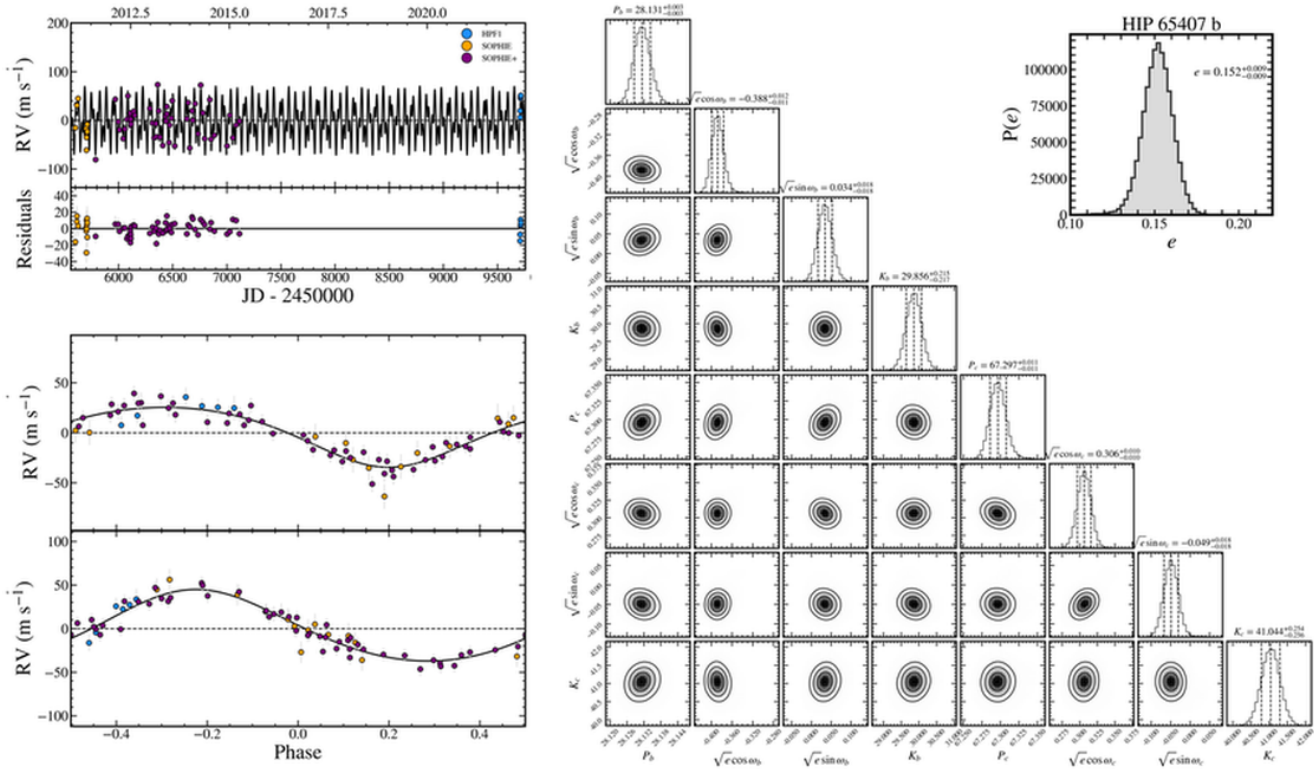


Figure 75. Summary of results for the warm Jupiters HIP 5763 b and HIP 63242 b.

HIP 65407 b



HIP 65407 c

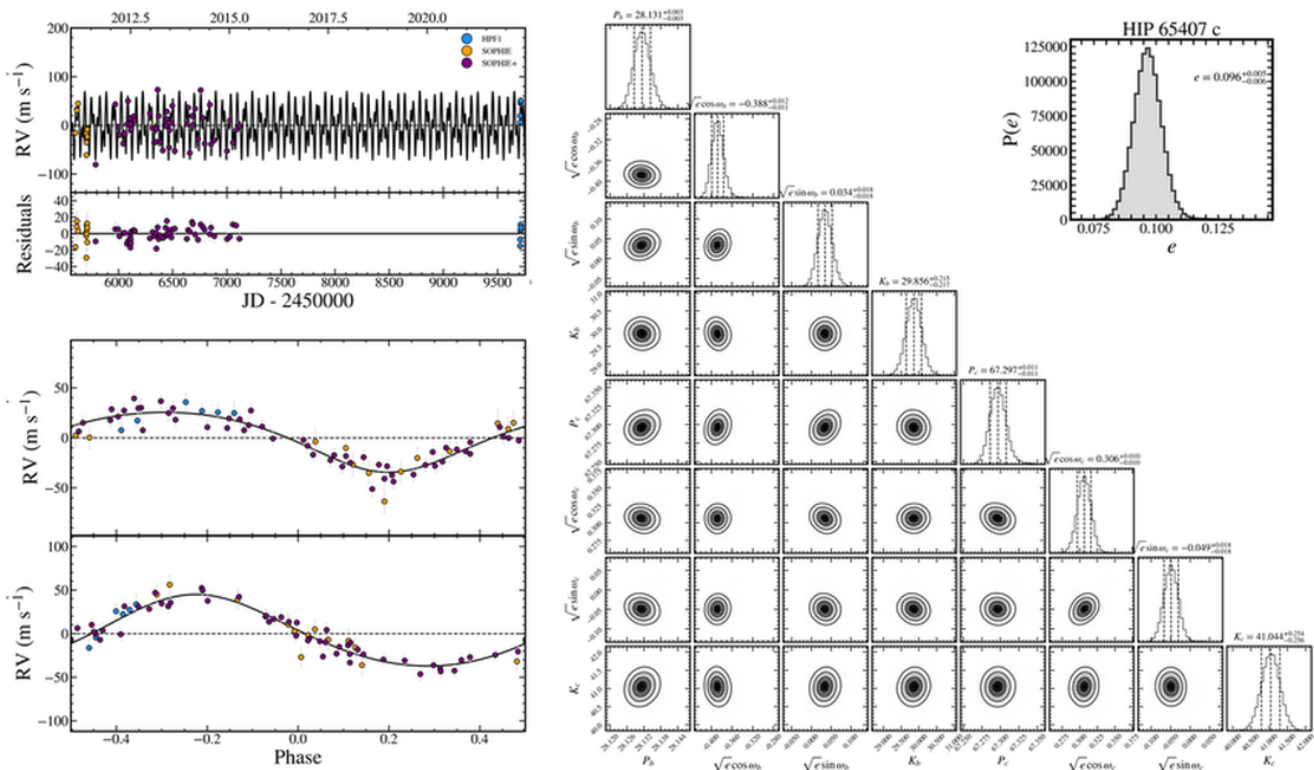
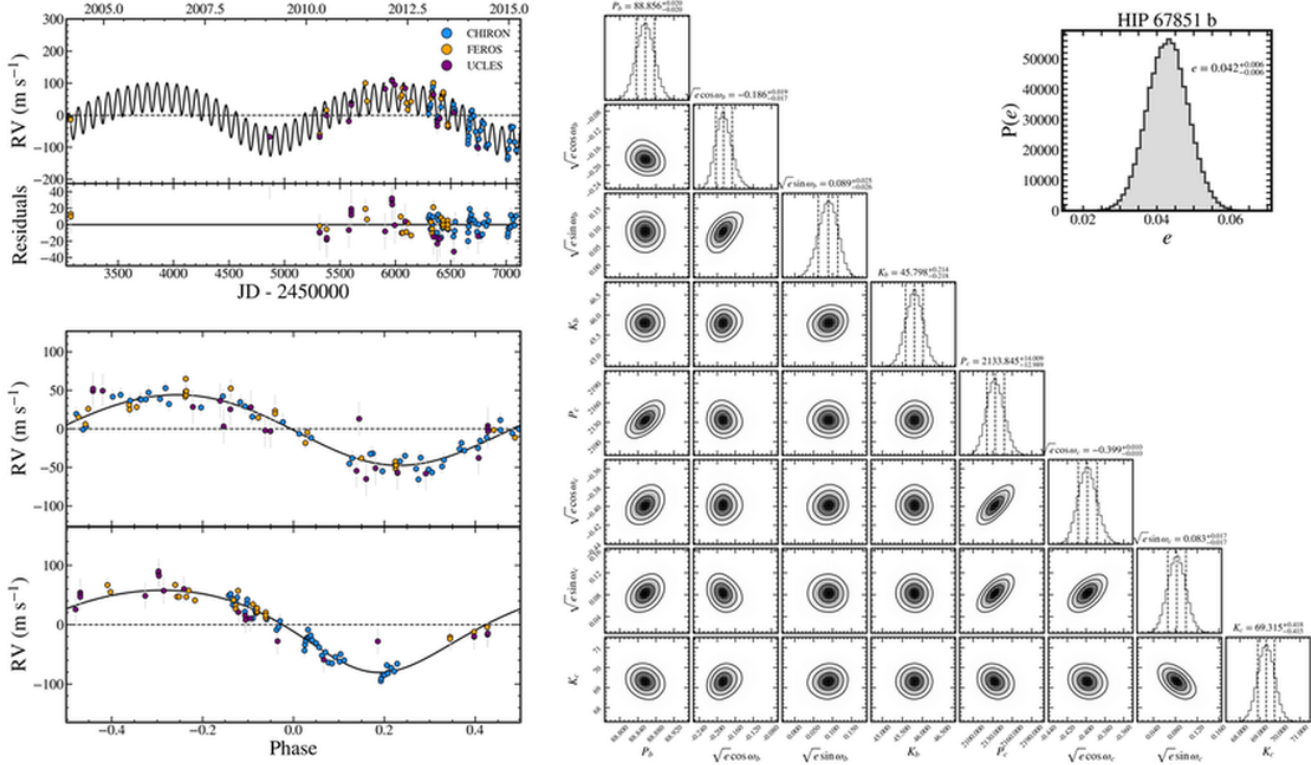


Figure 76. Summary of results for the warm Jupiters HIP 65407 b and HIP 65407 c.

HIP 67851 b



HIP 79431 b

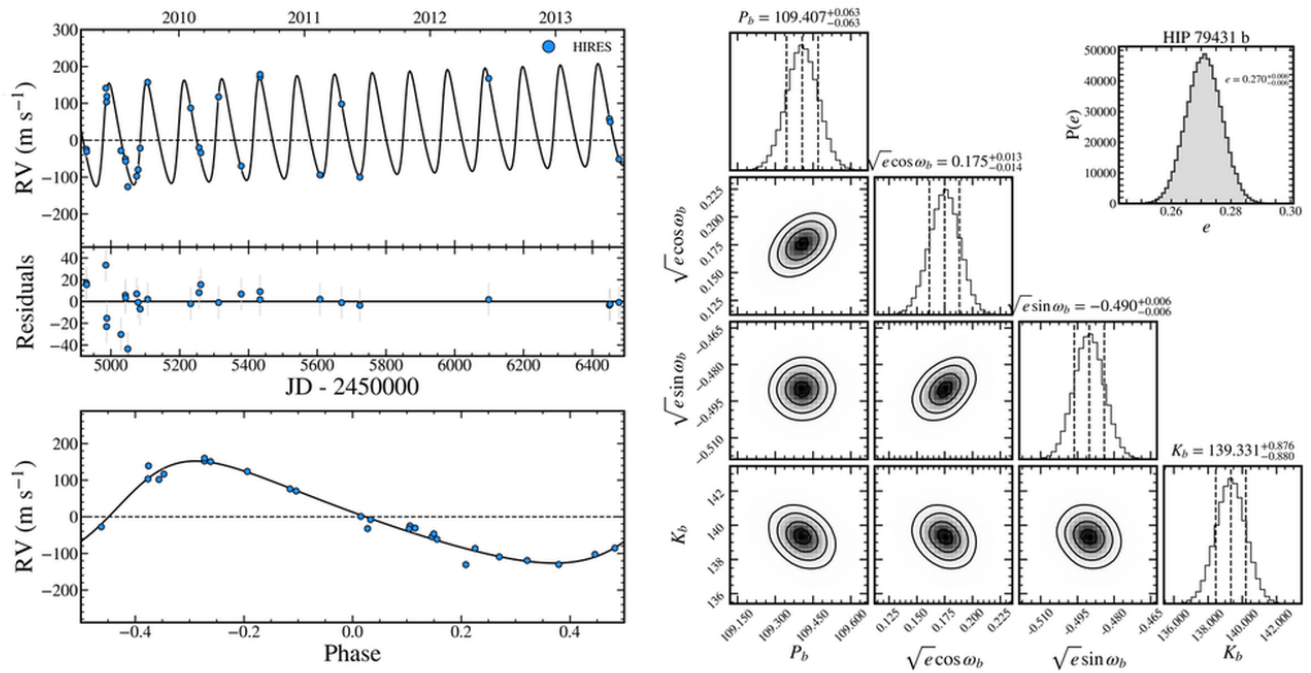
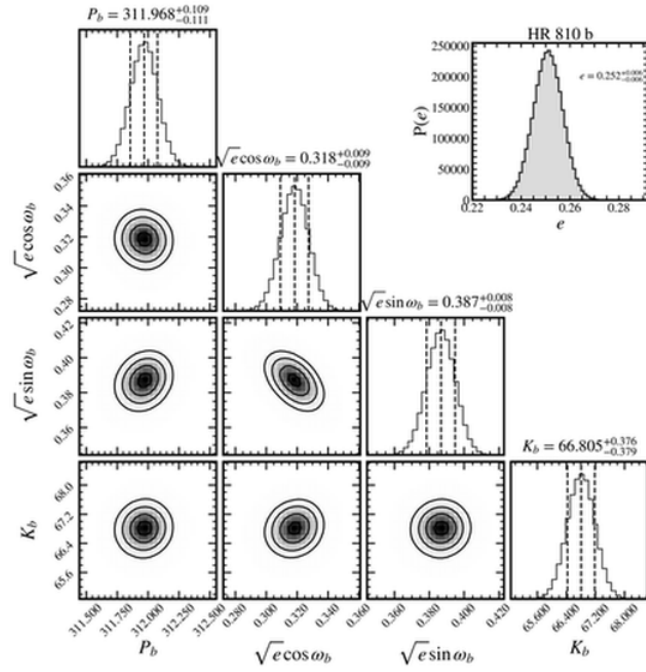
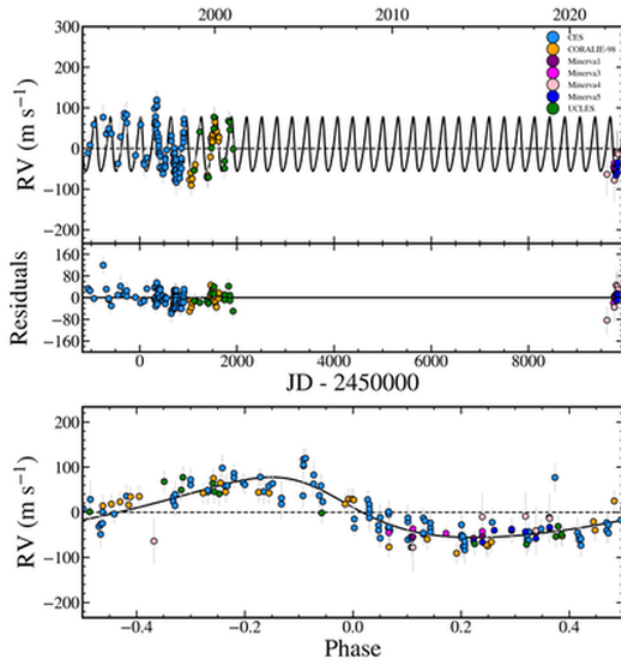


Figure 77. Summary of results for the warm Jupiters HIP 67851 b and HIP 79431 b.

HR 810 b



K2-114 b

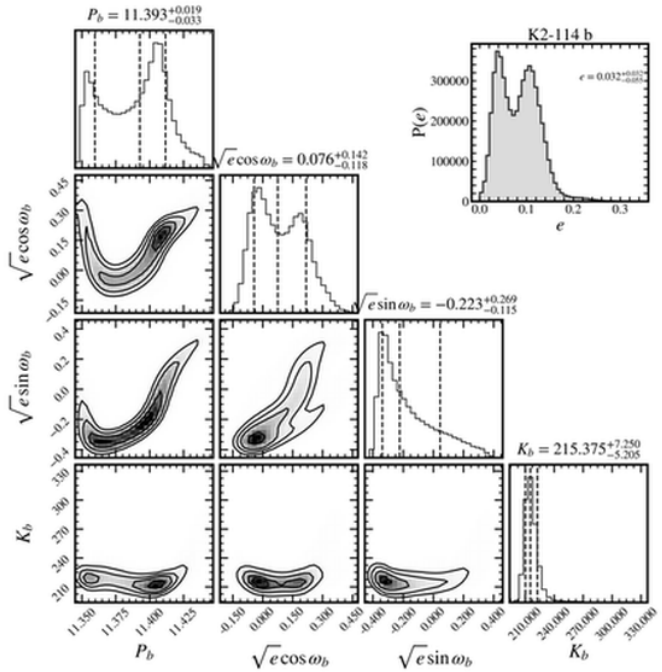
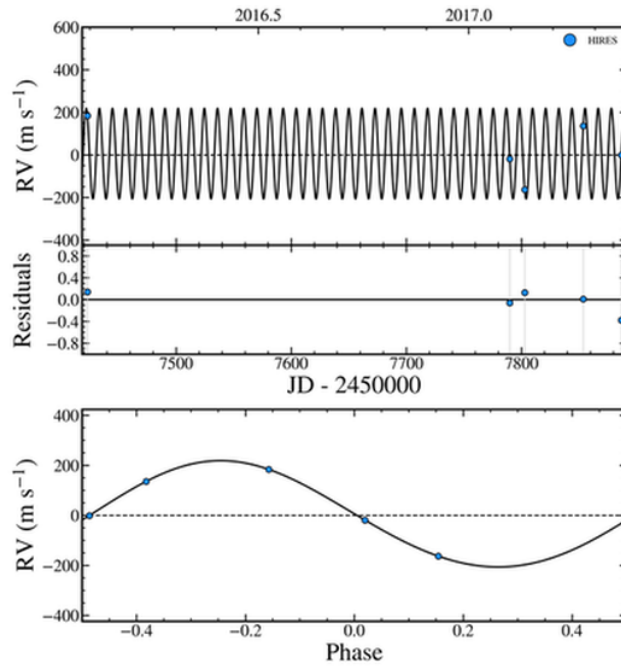
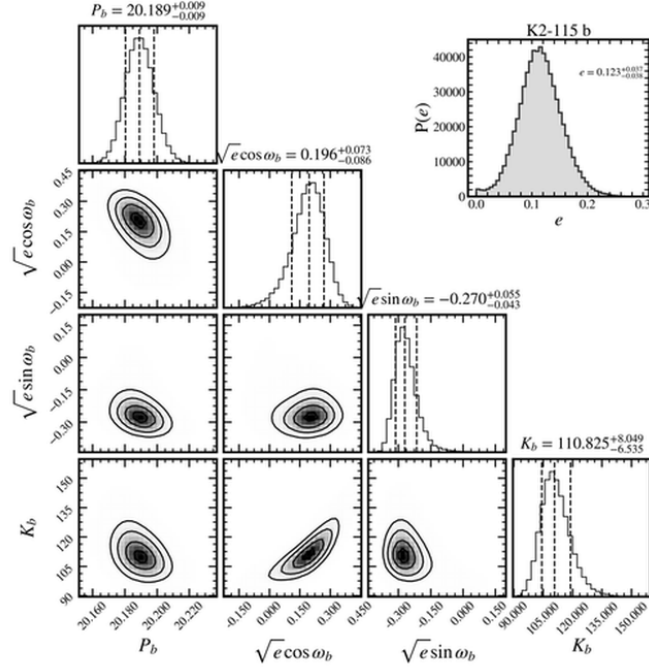
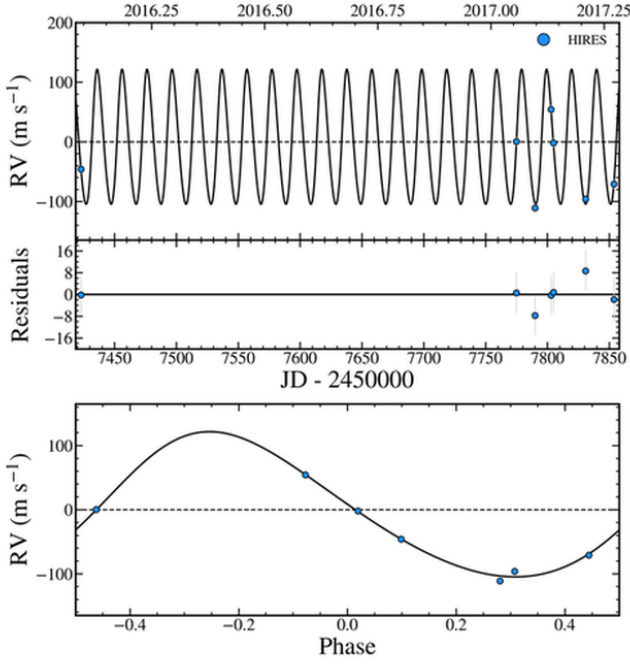


Figure 78. Summary of results for the warm Jupiters HR 810 b and K2-114 b.

K2-115 b



K2-139 b

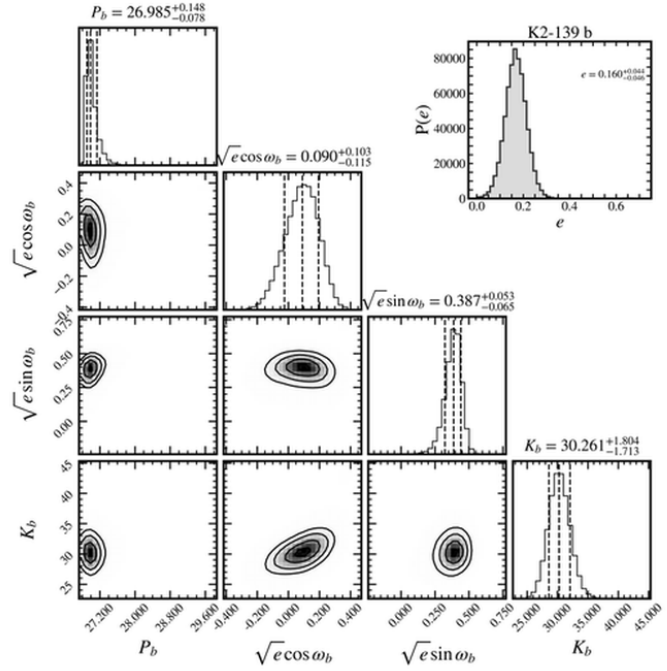
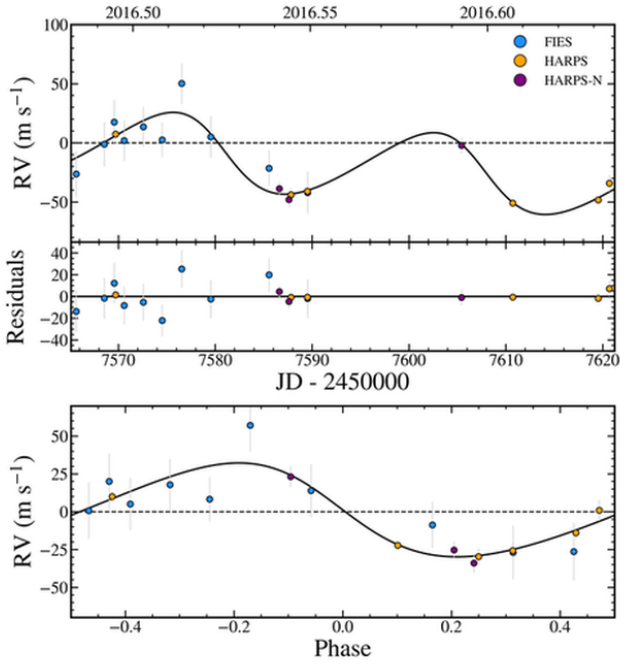
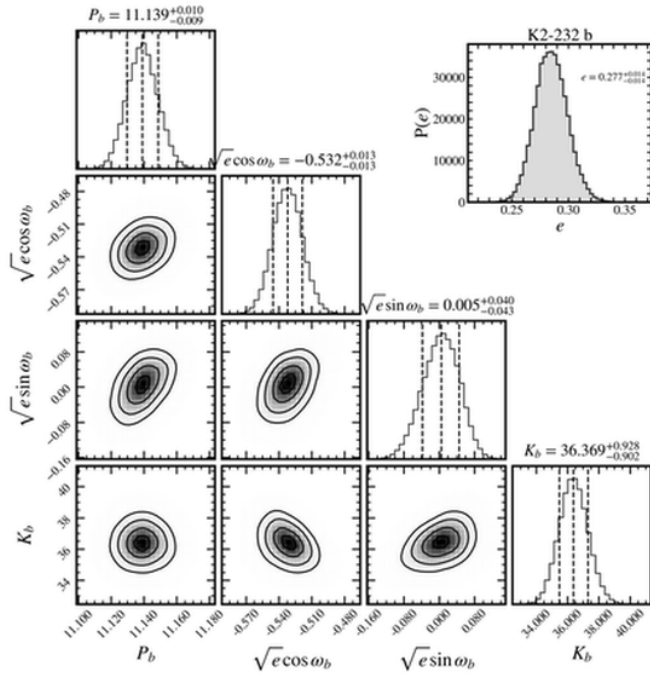
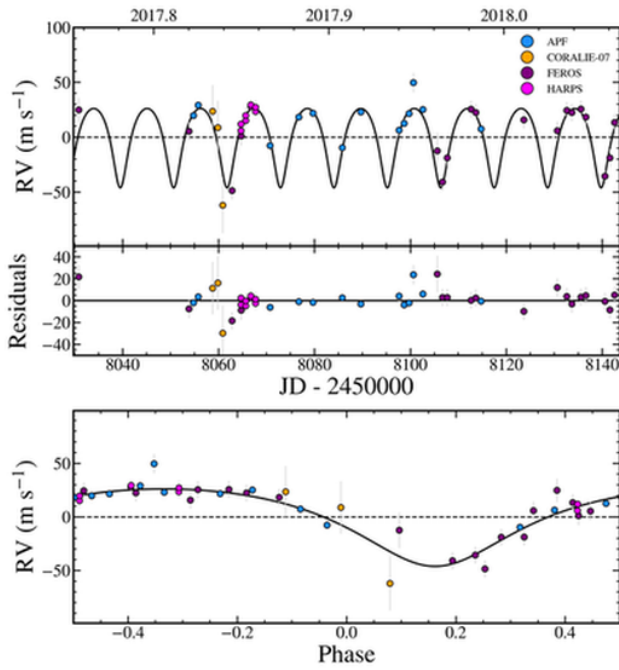


Figure 79. Summary of results for the warm Jupiters K2-115 b and K2-139 b.

K2-232 b



K2-261 b

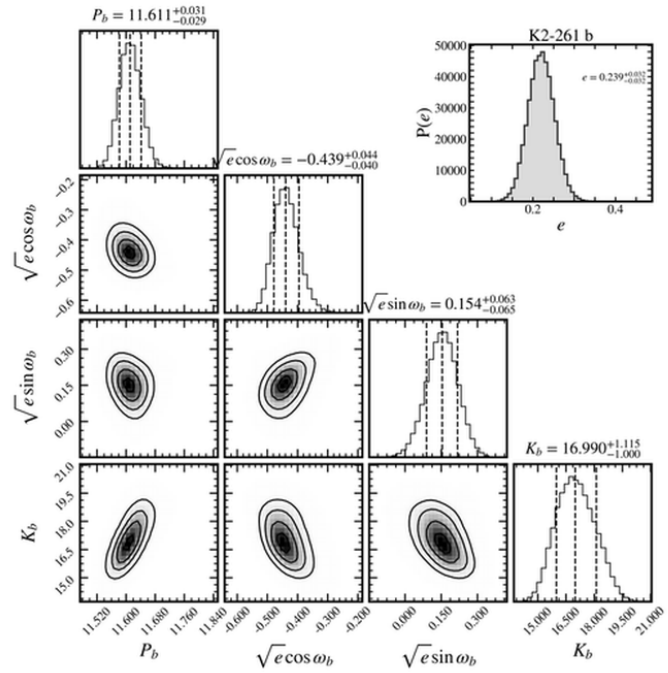
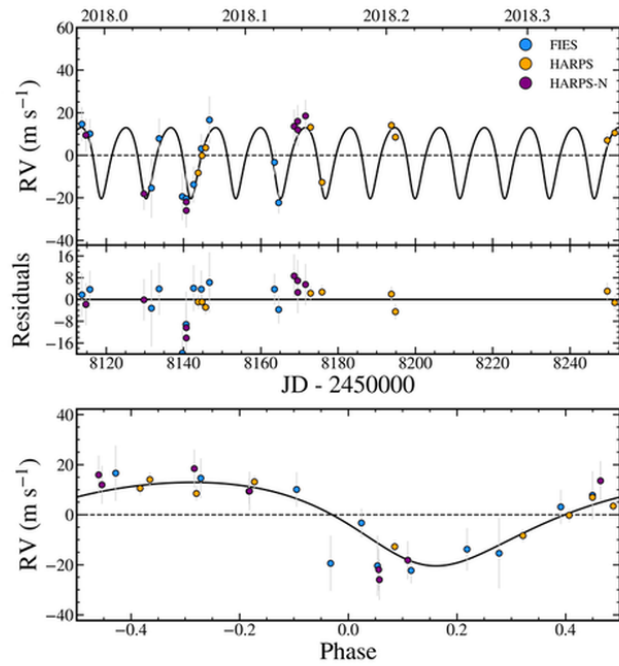
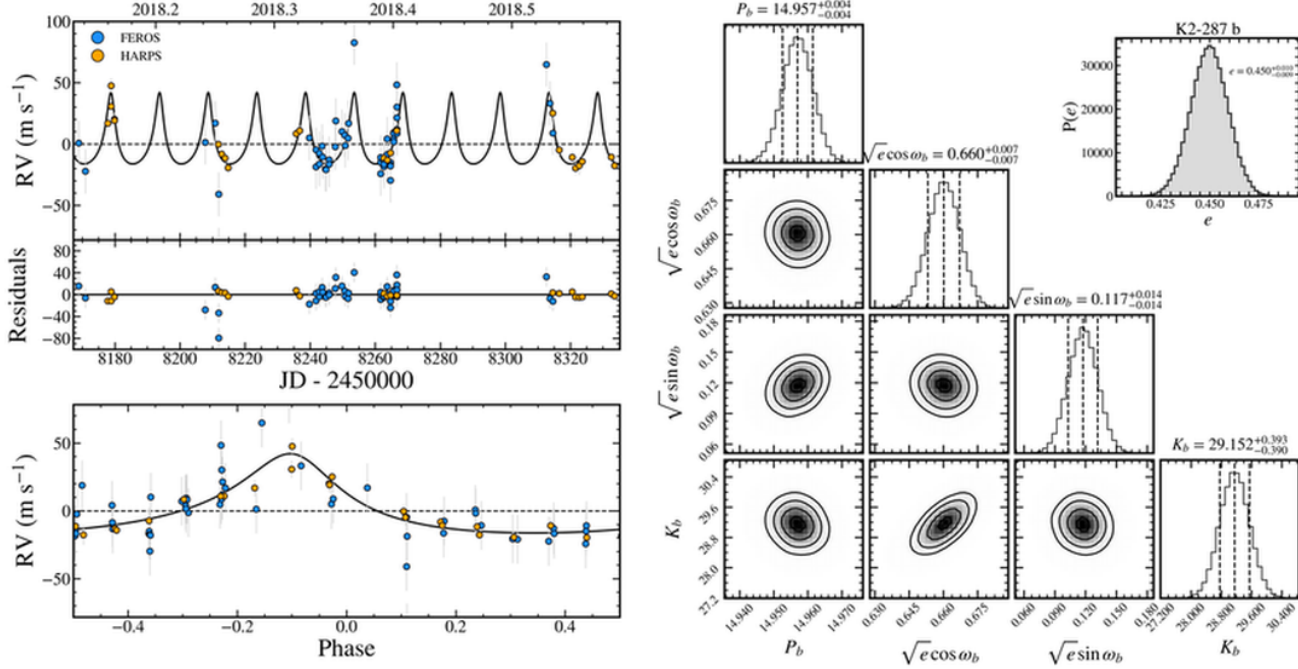


Figure 80. Summary of results for the warm Jupiters K2-232 b and K2-261 b.

K2-287 b



K2-290 c

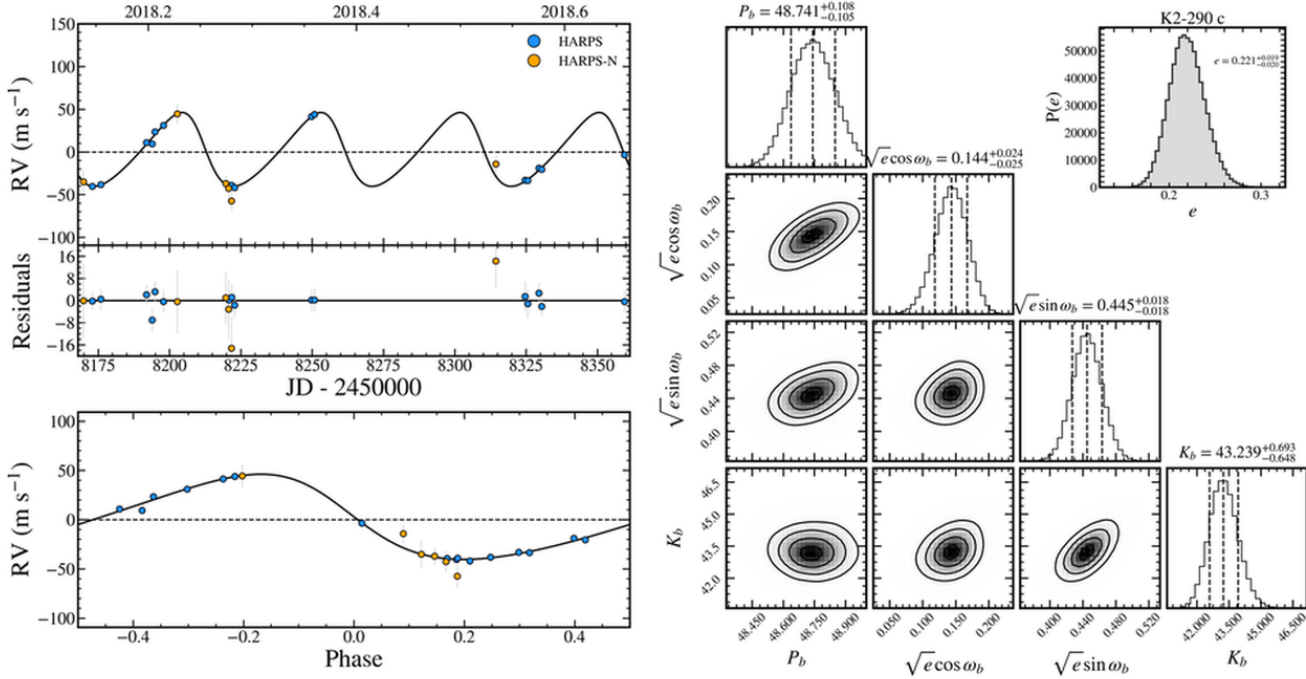
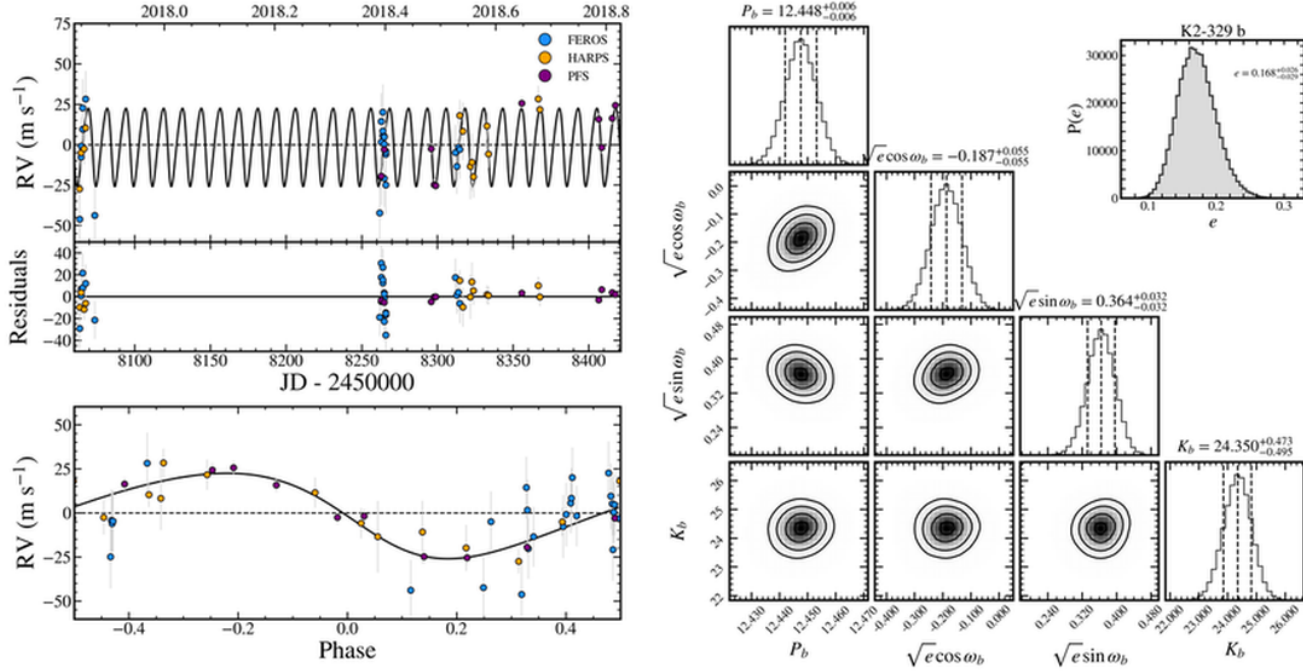


Figure 81. Summary of results for the warm Jupiters K2-287 b and K2-290 c.

K2-329 b



K2-99 b

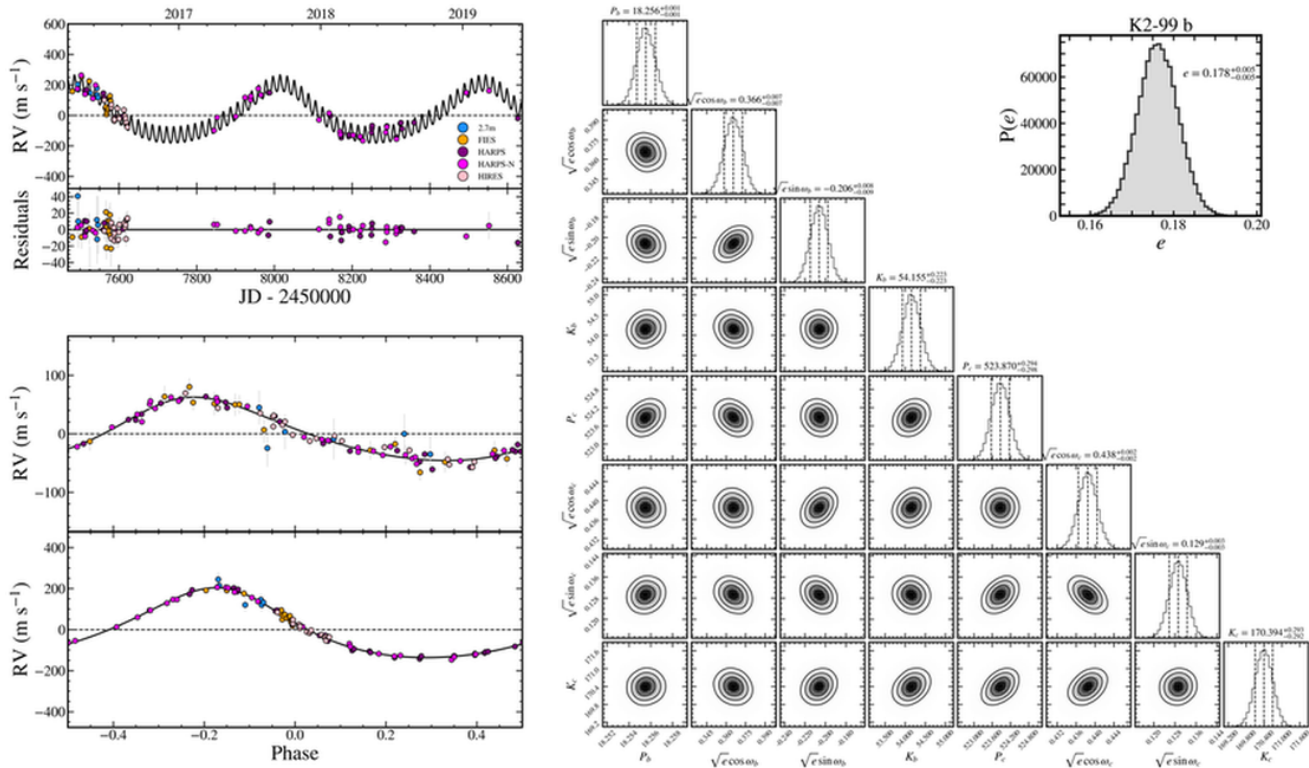
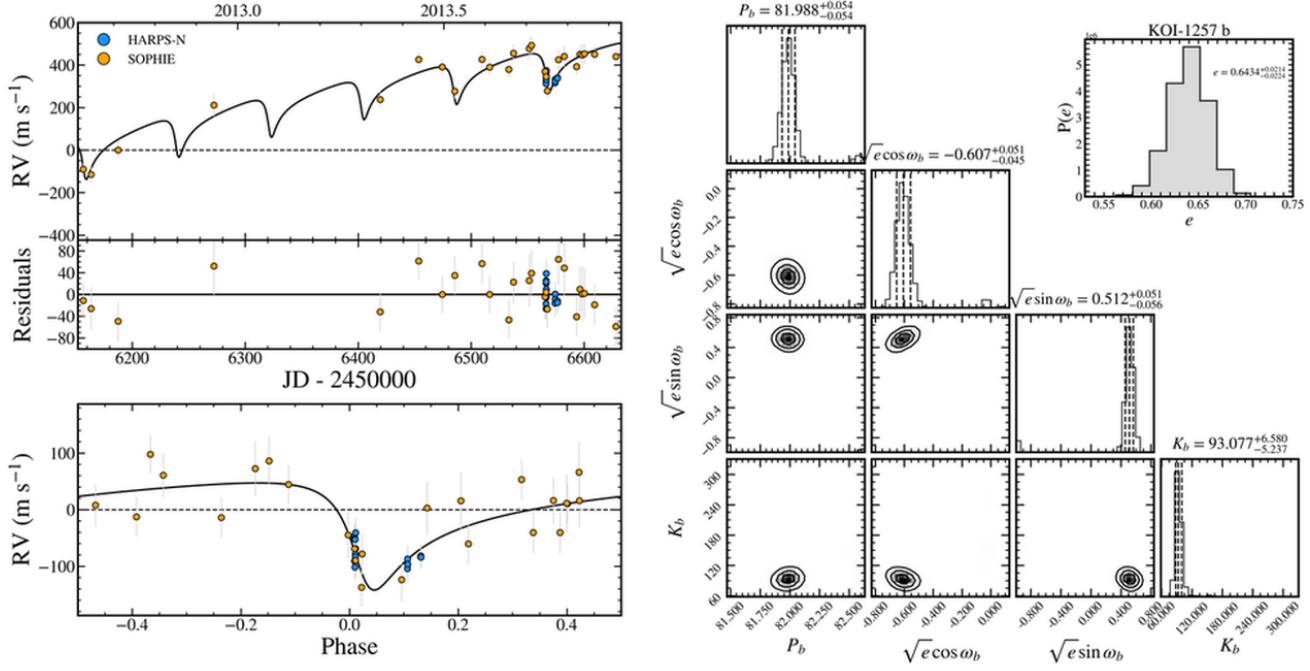


Figure 82. Summary of results for the warm Jupiters K2-329 b and K2-99 b.

KOI-1257 b



KOI-142 c

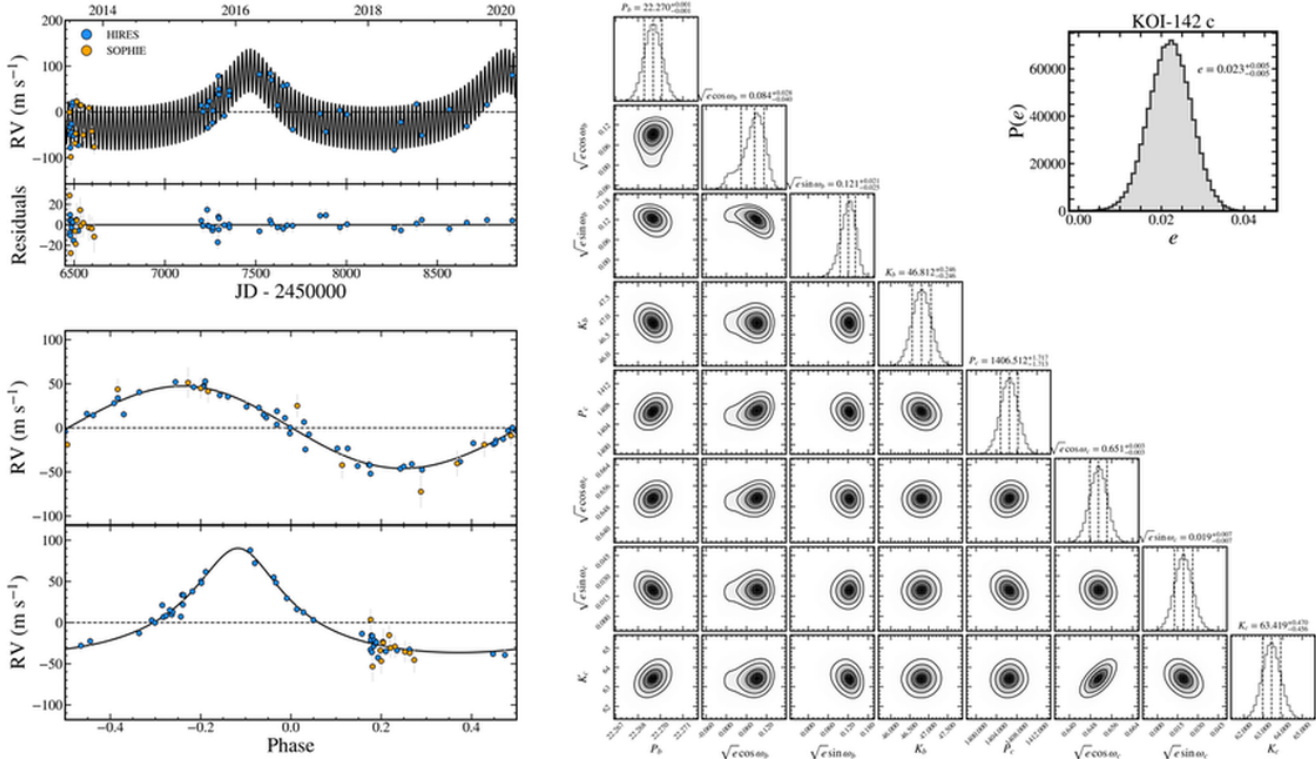
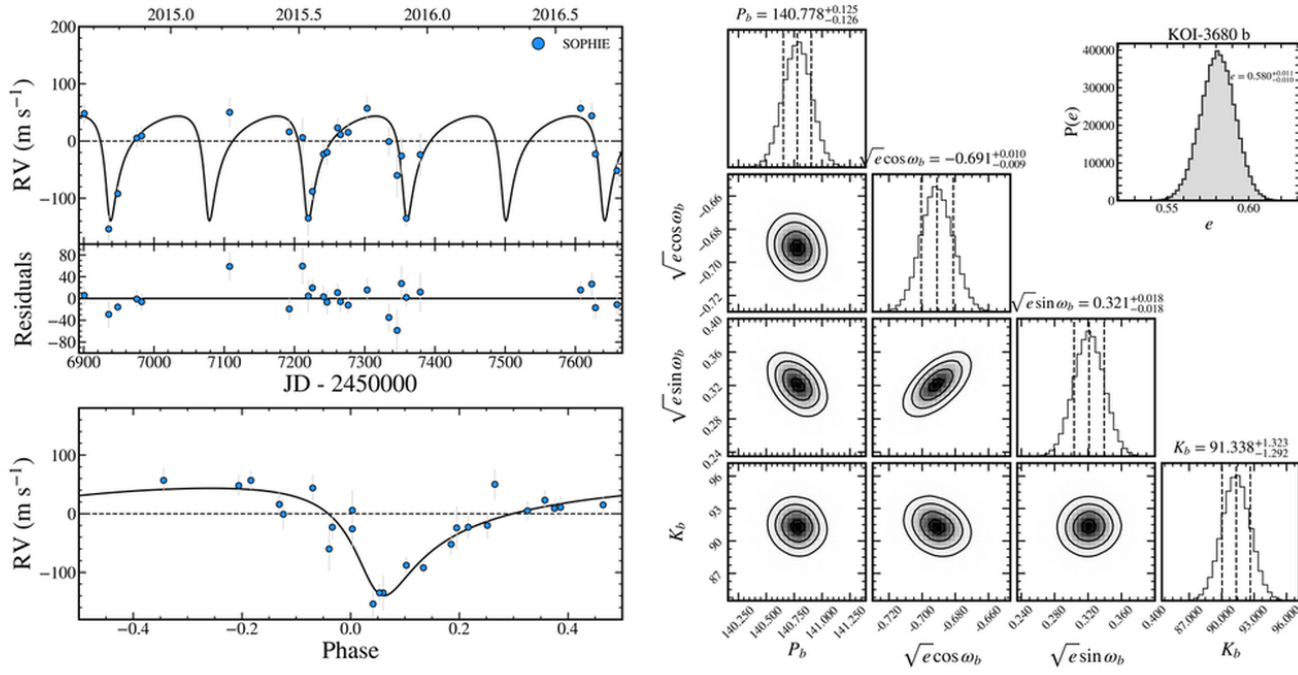


Figure 83. Summary of results for the warm Jupiters KOI-1257 b and KOI-142 c.

KOI-3680 b



KOI-94 d

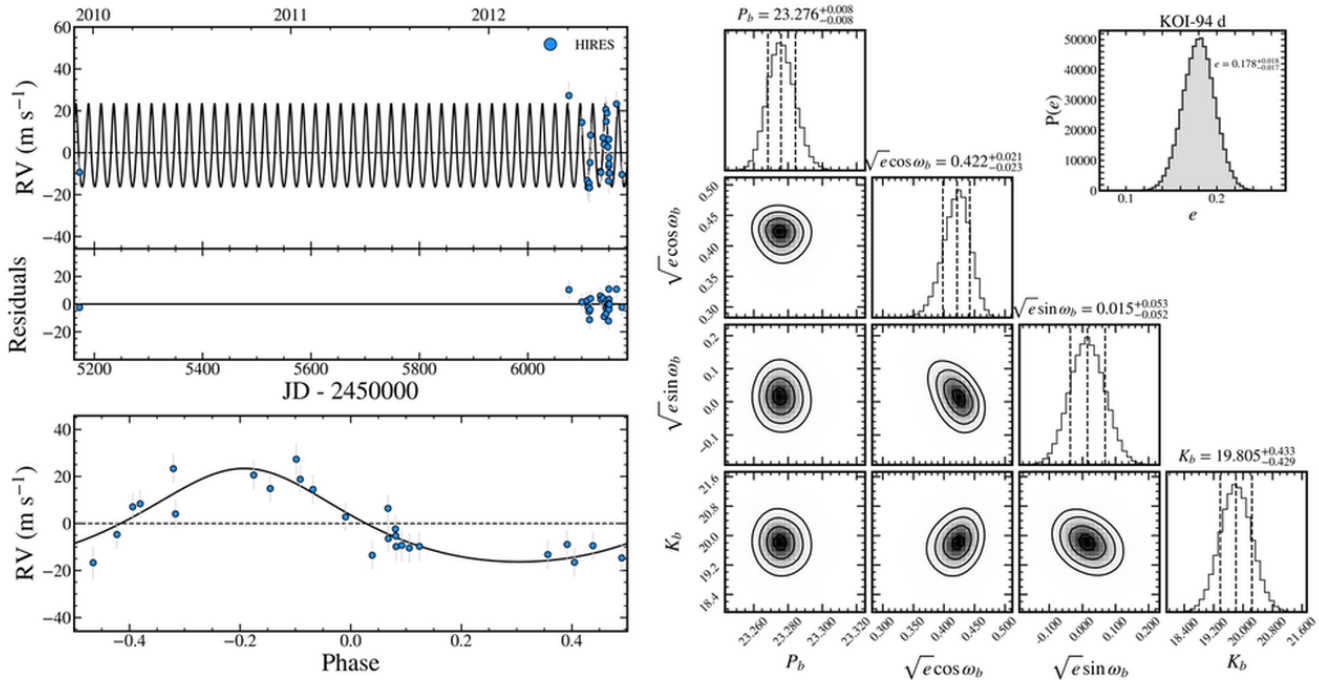
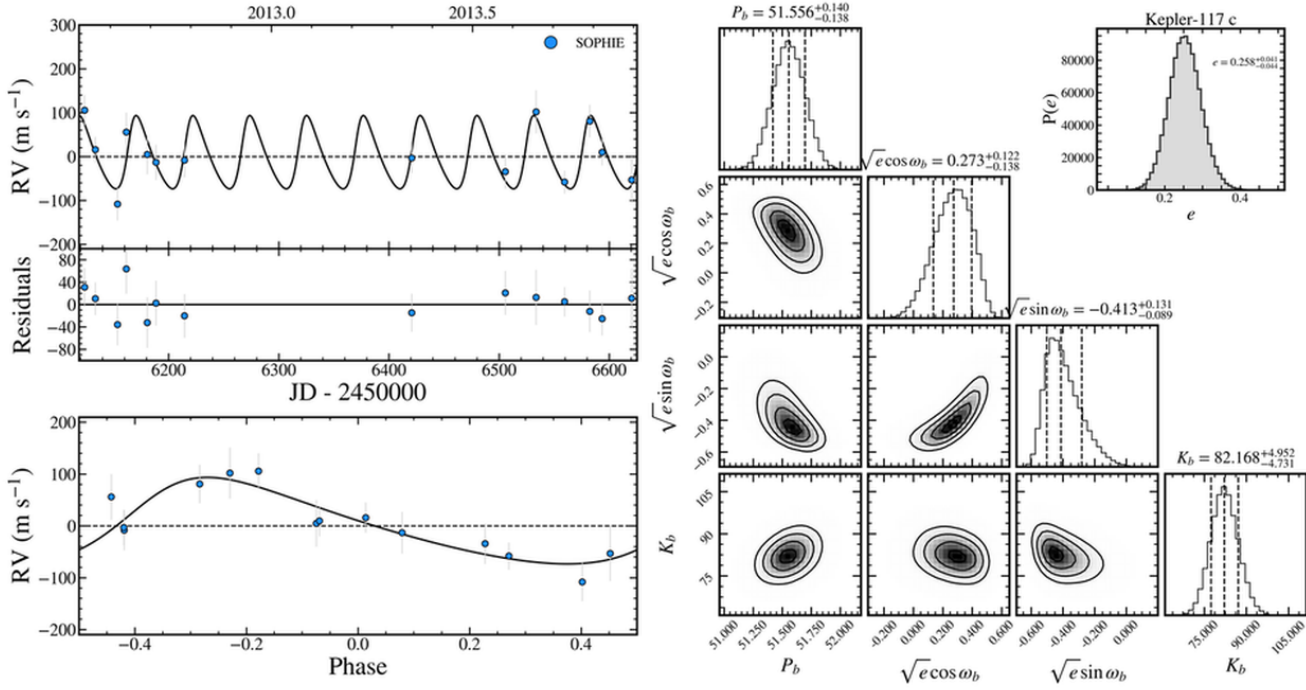


Figure 84. Summary of results for the warm Jupiters KOI-3680 b and KOI-94 d.

Kepler-117 c



Kepler-1514 b

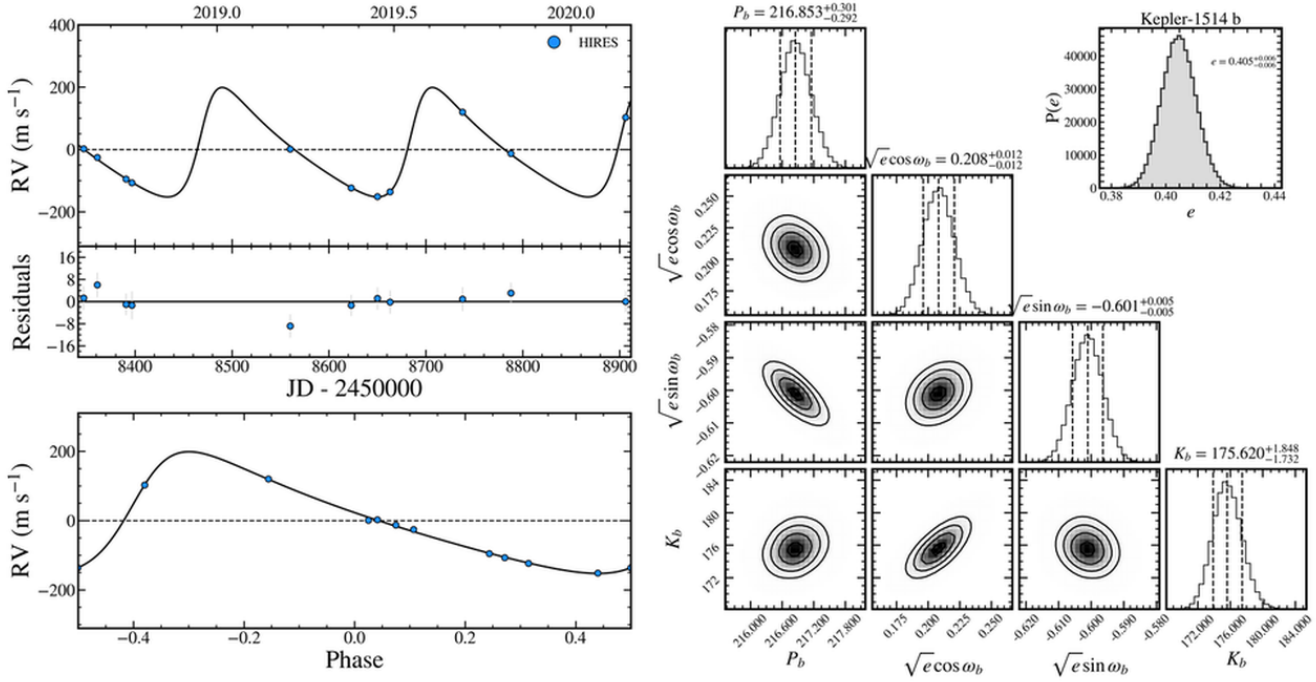
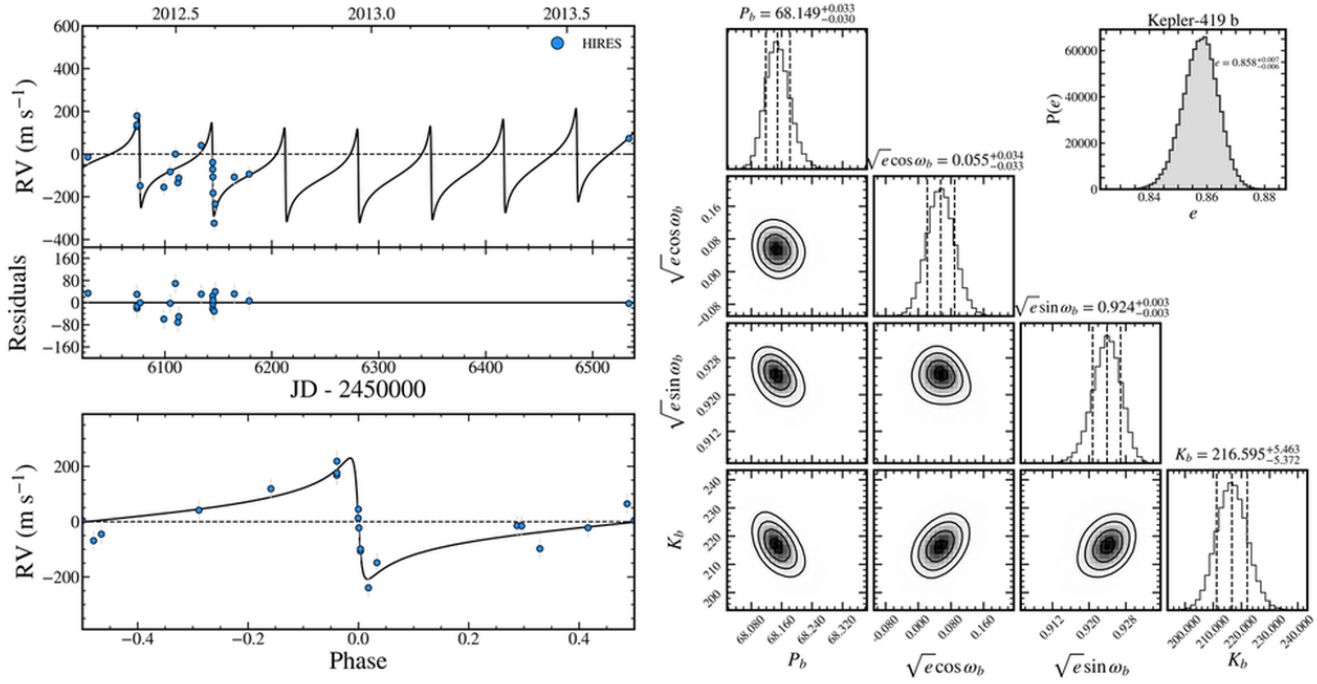


Figure 85. Summary of results for the warm Jupiters Kepler-117 c and Kepler-1514 b.

Kepler-419 b



Kepler-424 c

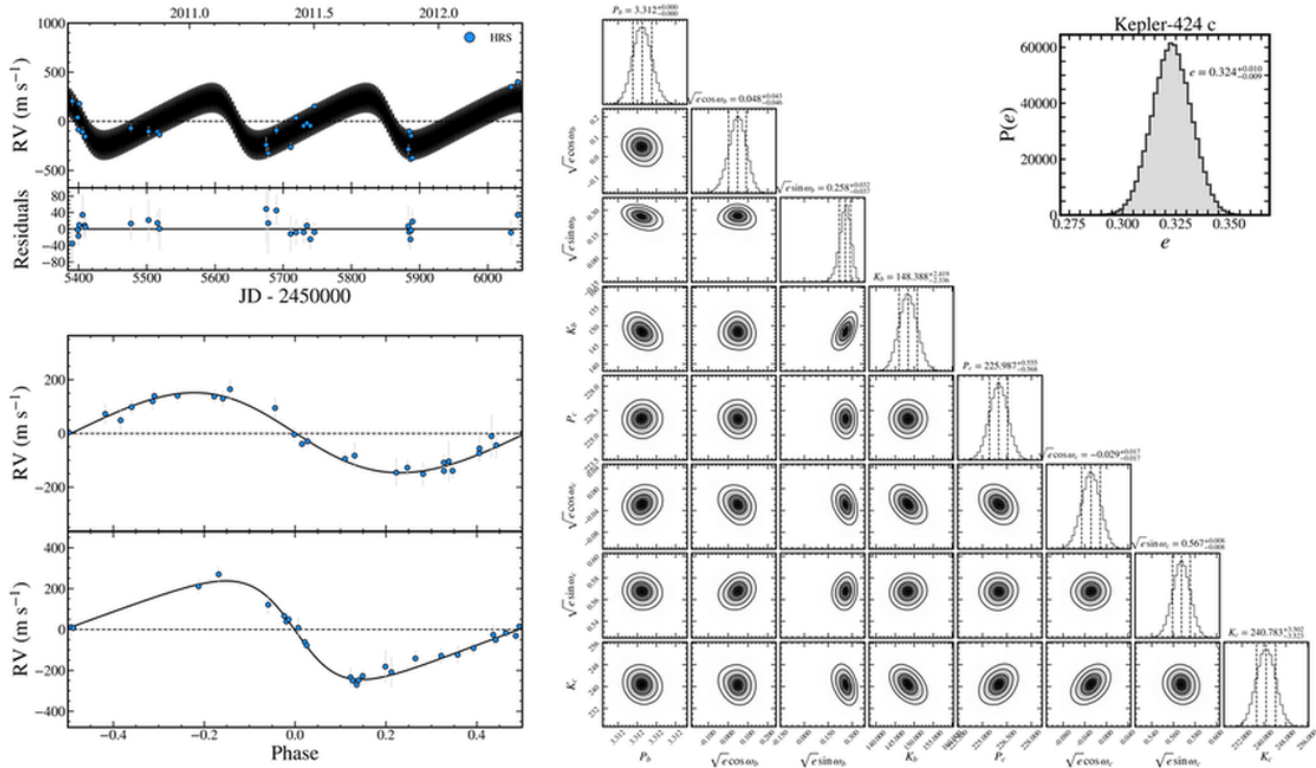
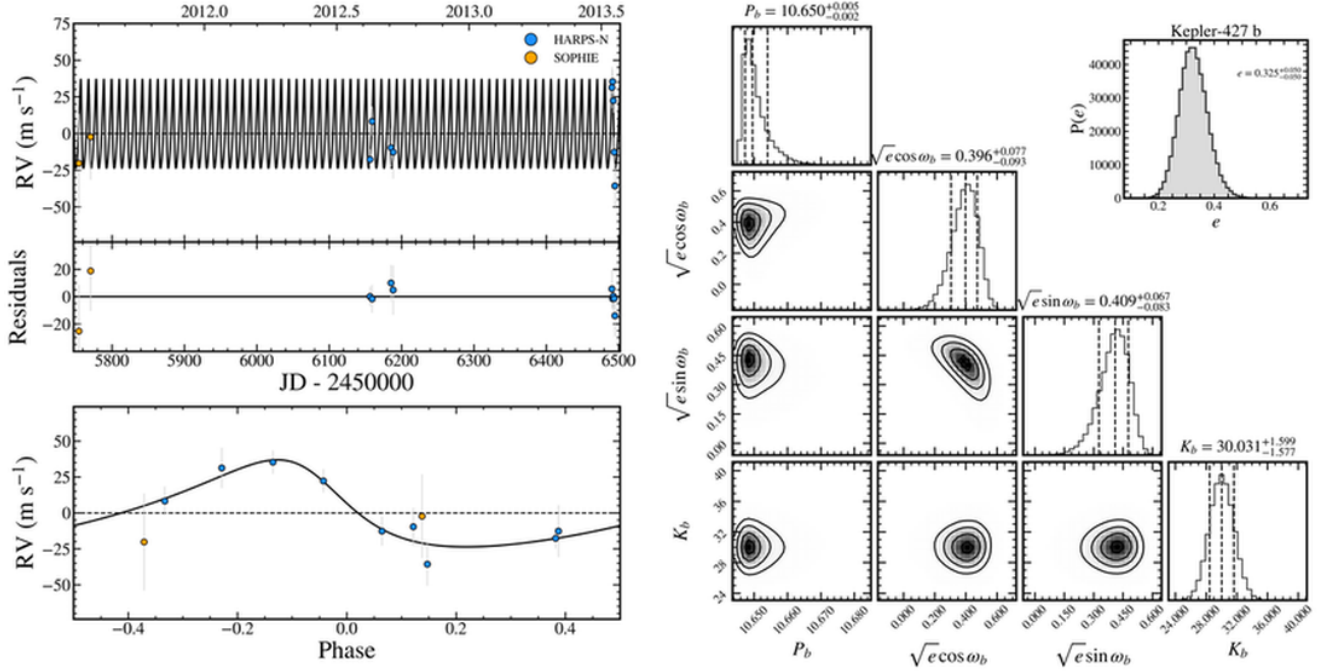


Figure 86. Summary of results for the warm Jupiters Kepler-419 b and Kepler-424 c.

Kepler-427 b



Kepler-432 b

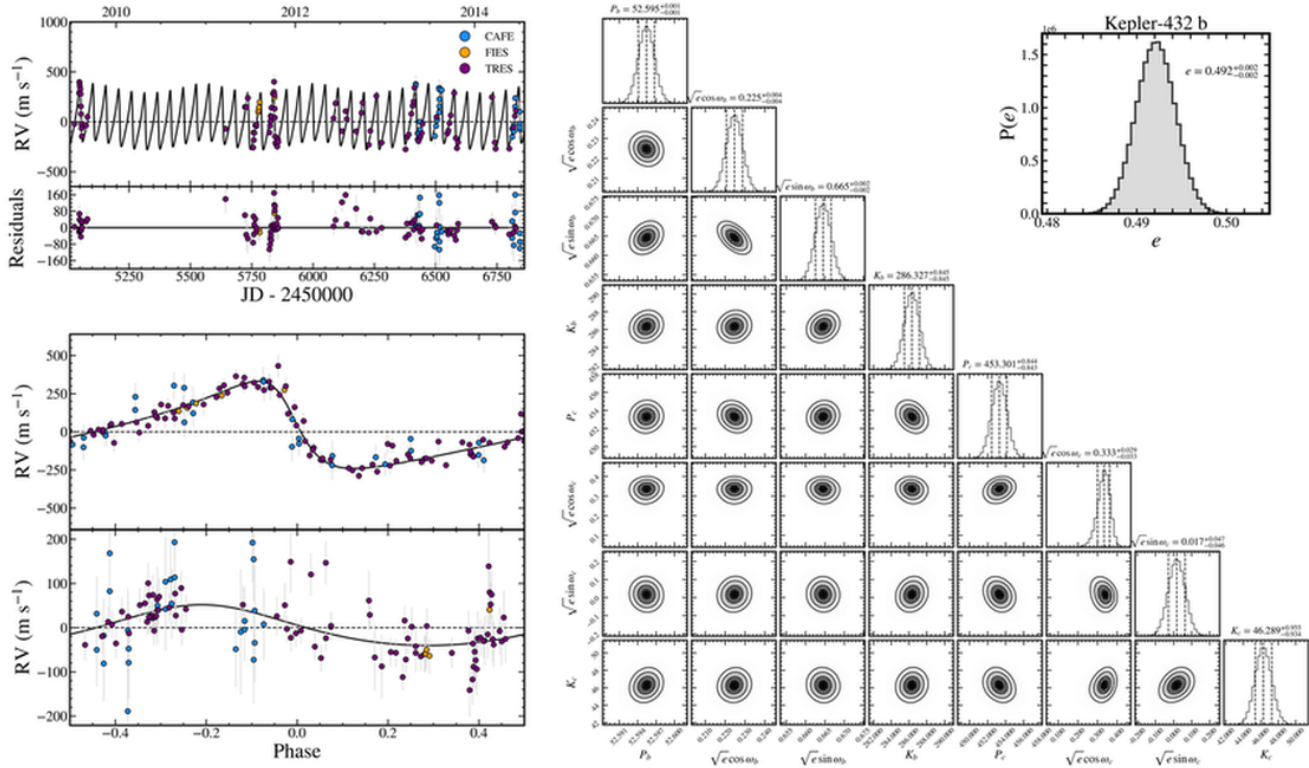
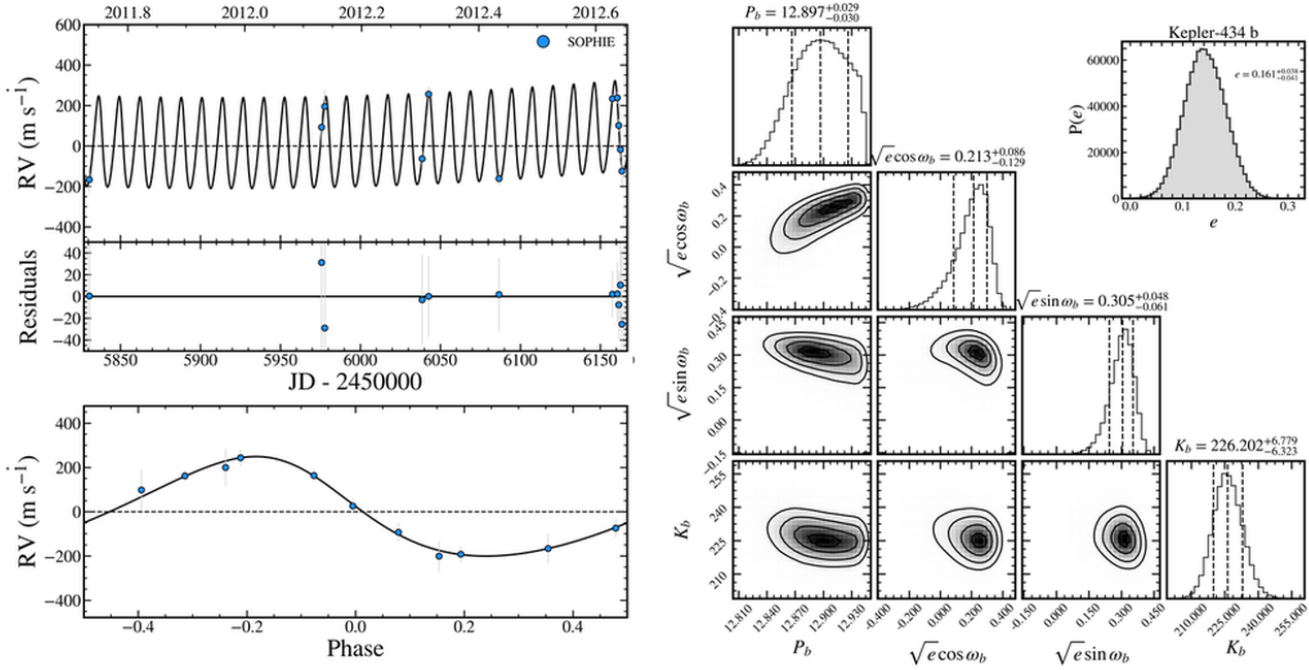


Figure 87. Summary of results for the warm Jupiters Kepler-427 b and Kepler-432 b.

Kepler-434 b



Kepler-643 b

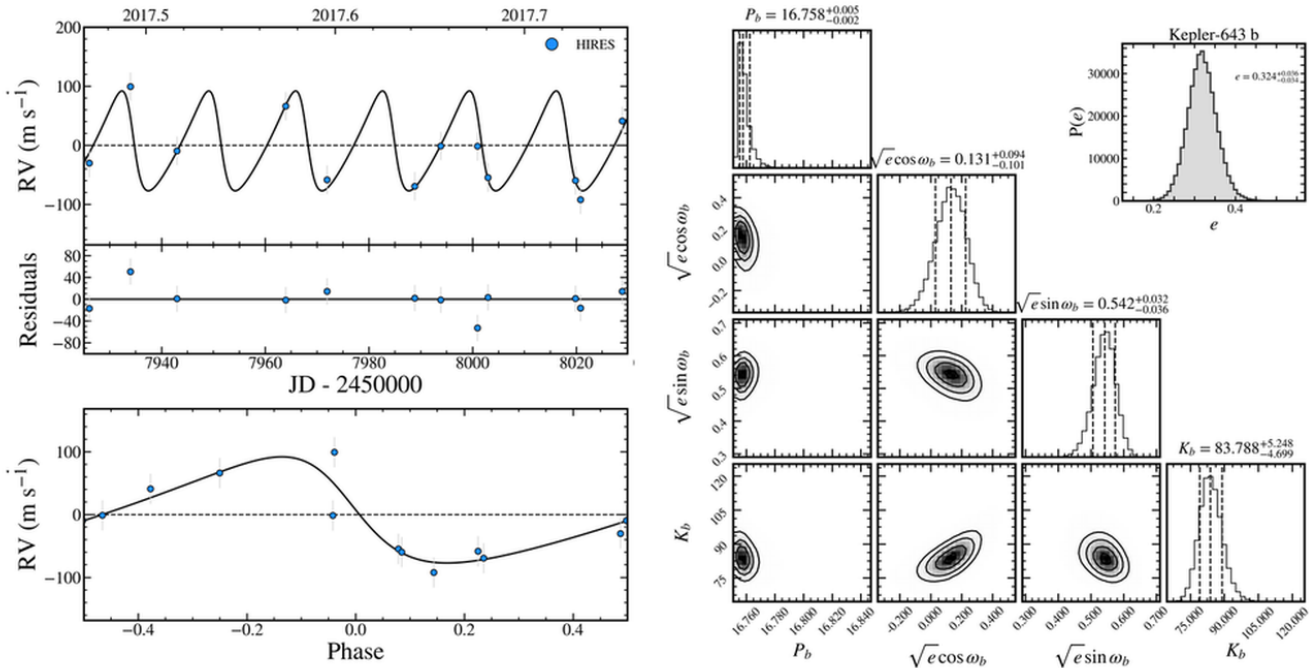


Figure 88. Summary of results for the warm Jupiters Kepler-434 b and Kepler-643 b.

Kepler-65 e

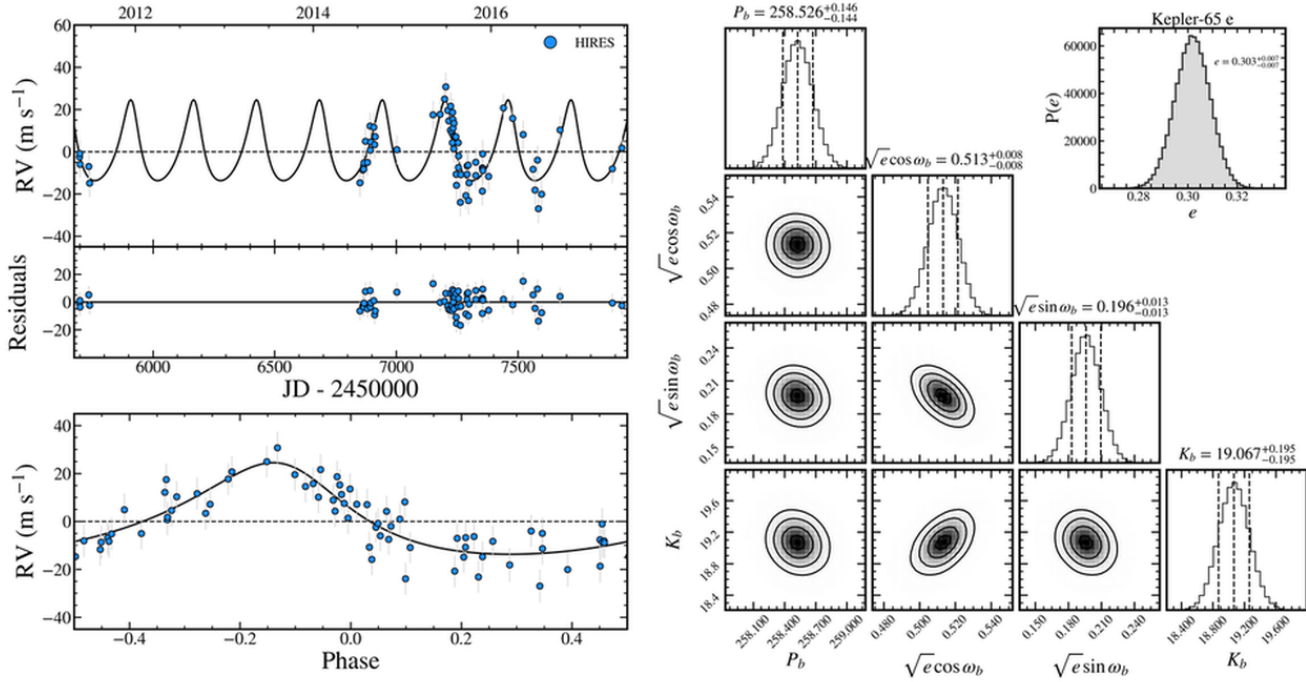
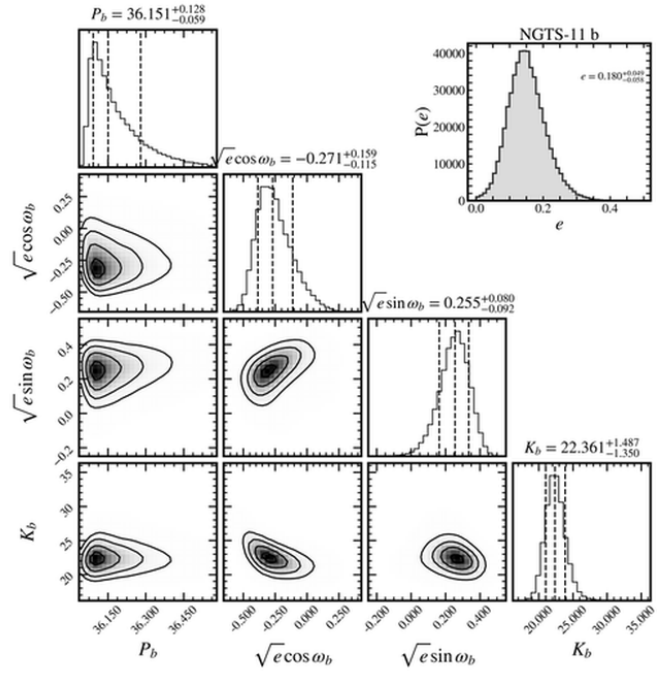
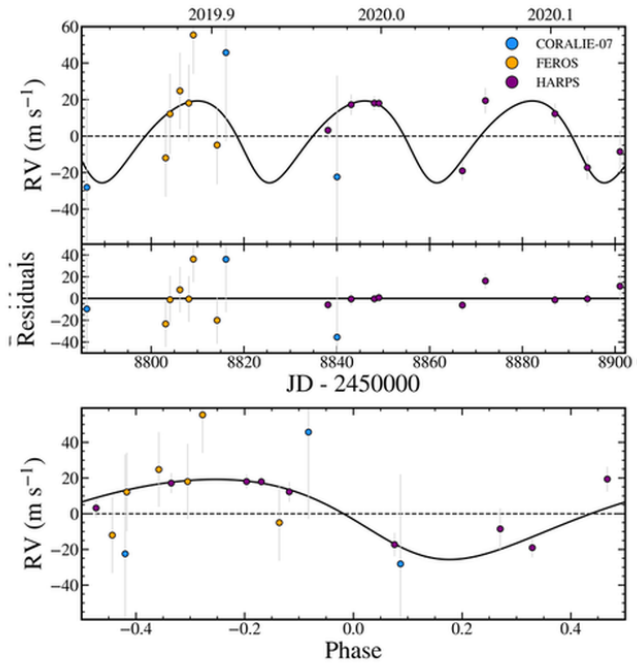


Figure 89. Summary of results for the warm Jupiters Kepler-65 e and NGC 2682 Sand 364 b.

NGTS-11 b



PH2 b

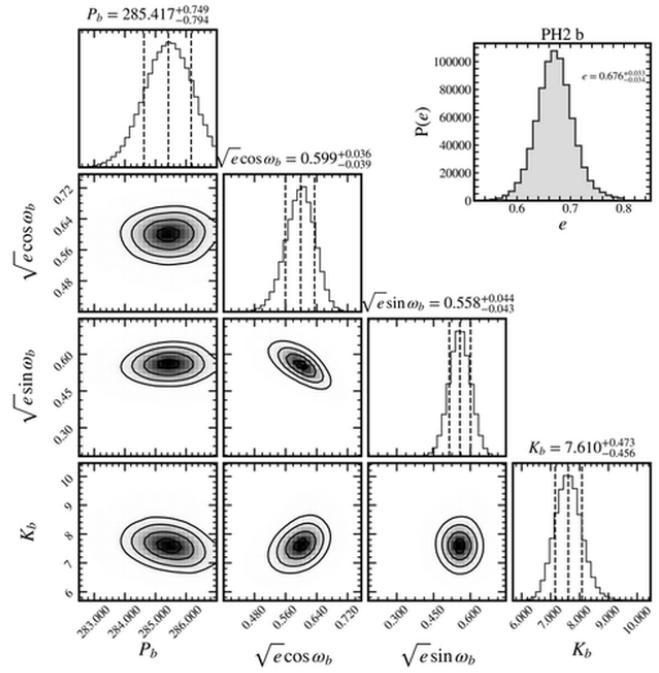
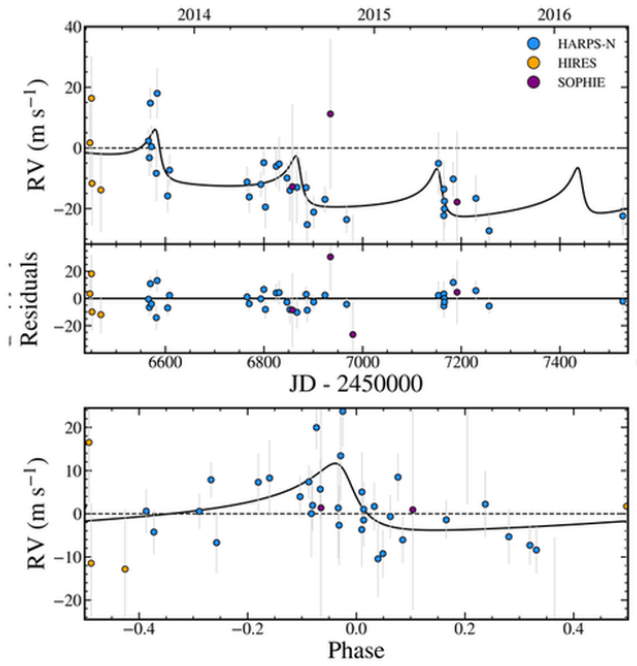
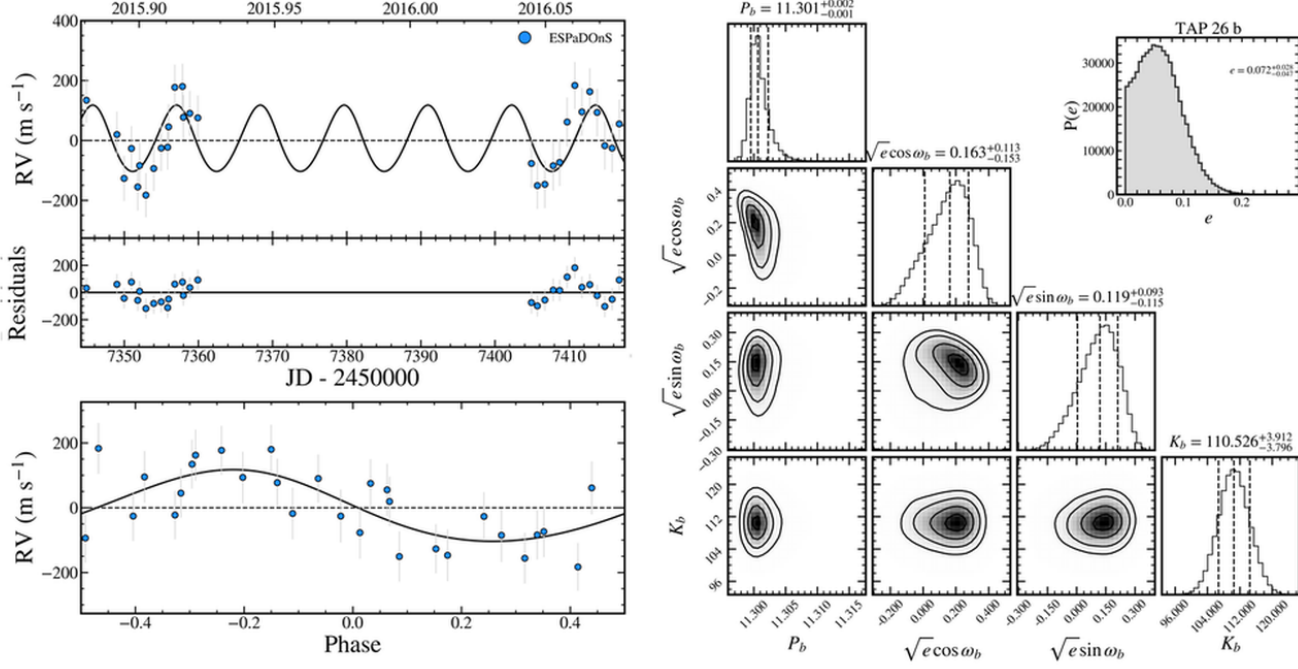


Figure 90. Summary of results for the warm Jupiters NGTS-11 b and PH2 b.

TAP 26 b



TIC 237913194 b

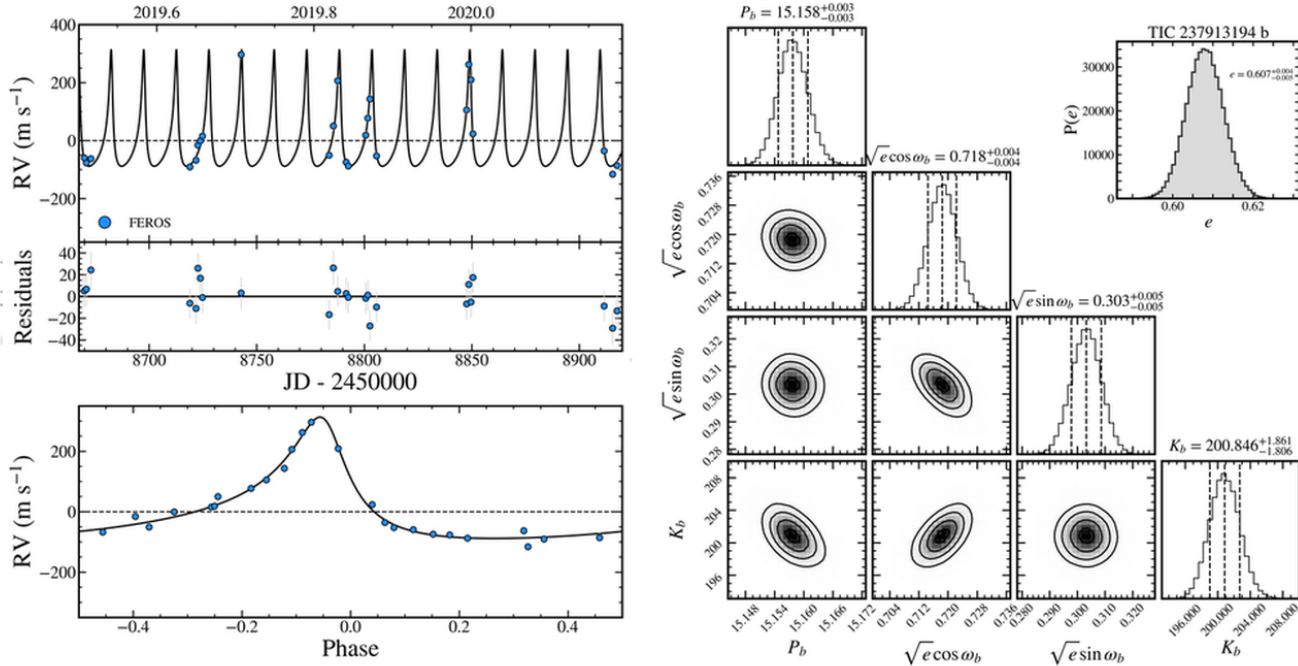
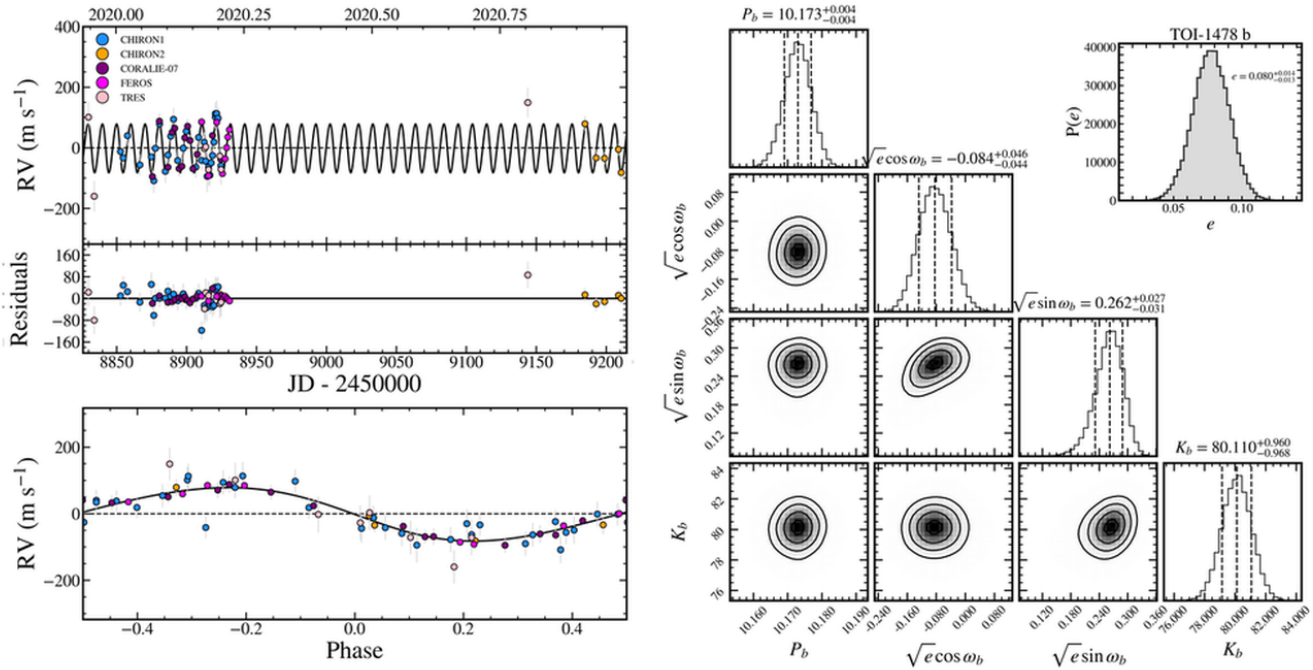


Figure 91. Summary of results for the warm Jupiters TAP 26 b and TIC 237913194 b.

TOI-1478 b



TOI-1670 c

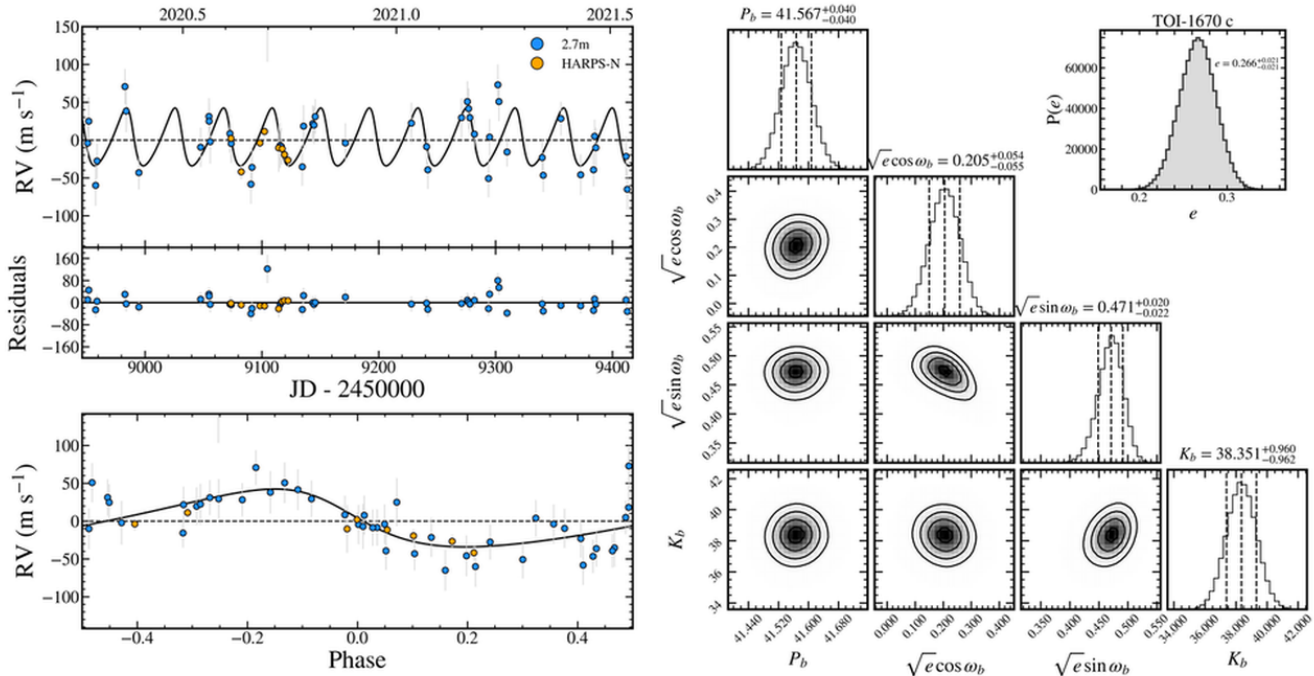
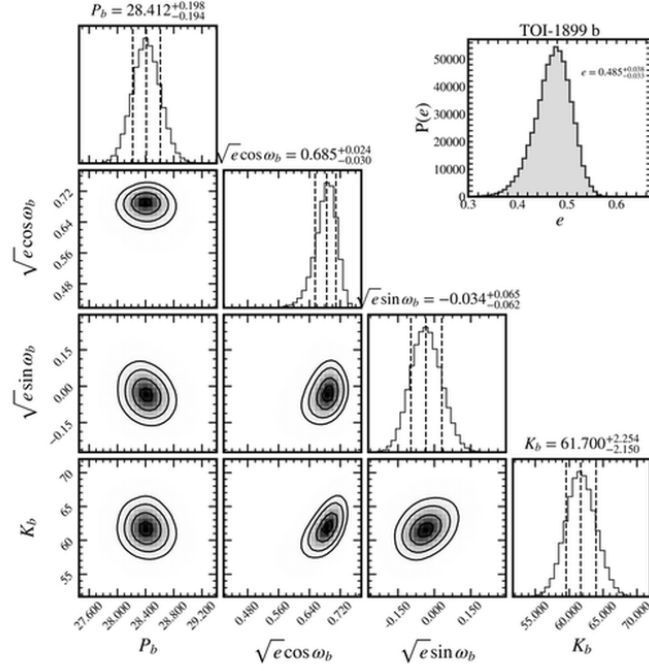
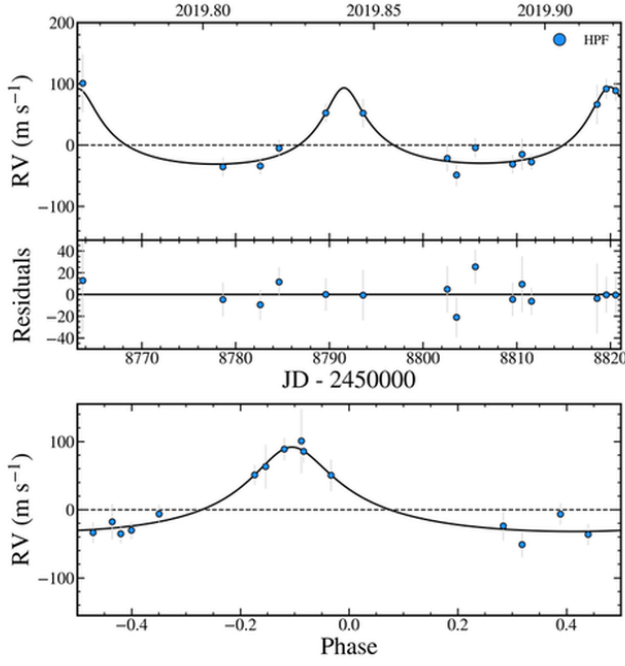


Figure 92. Summary of results for the warm Jupiters TOI-1478 b and TOI-1670 c.

TOI-1899 b



TOI-201 b

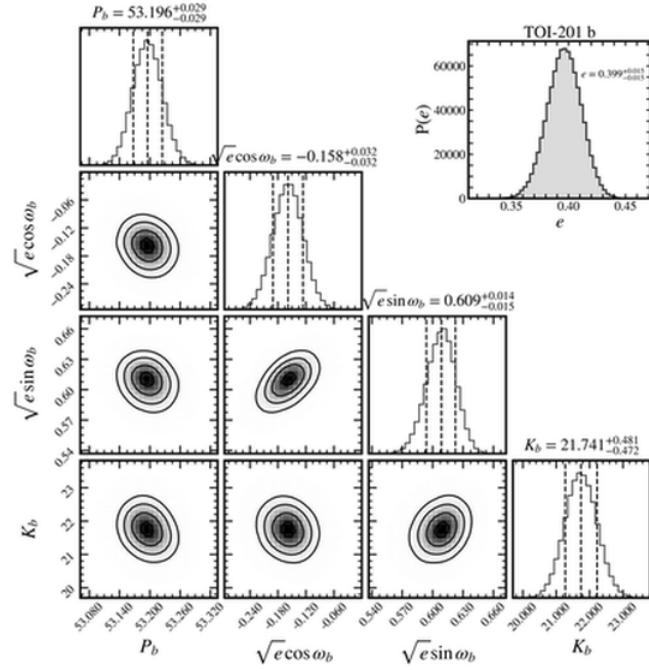
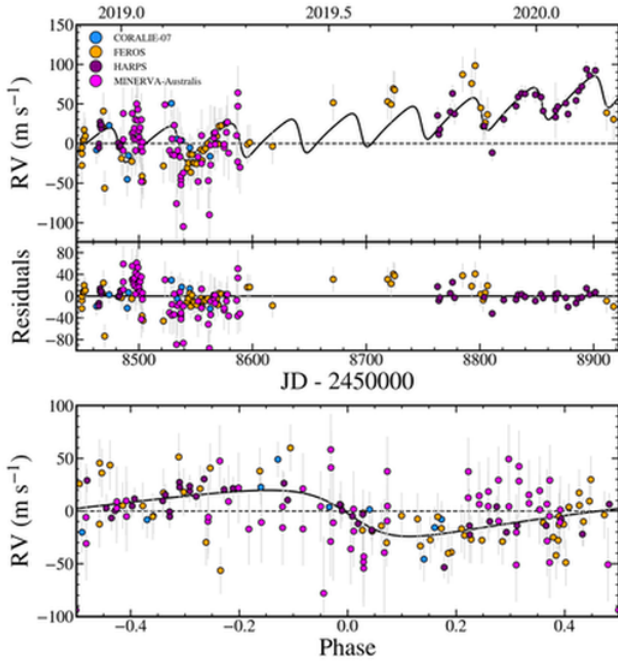
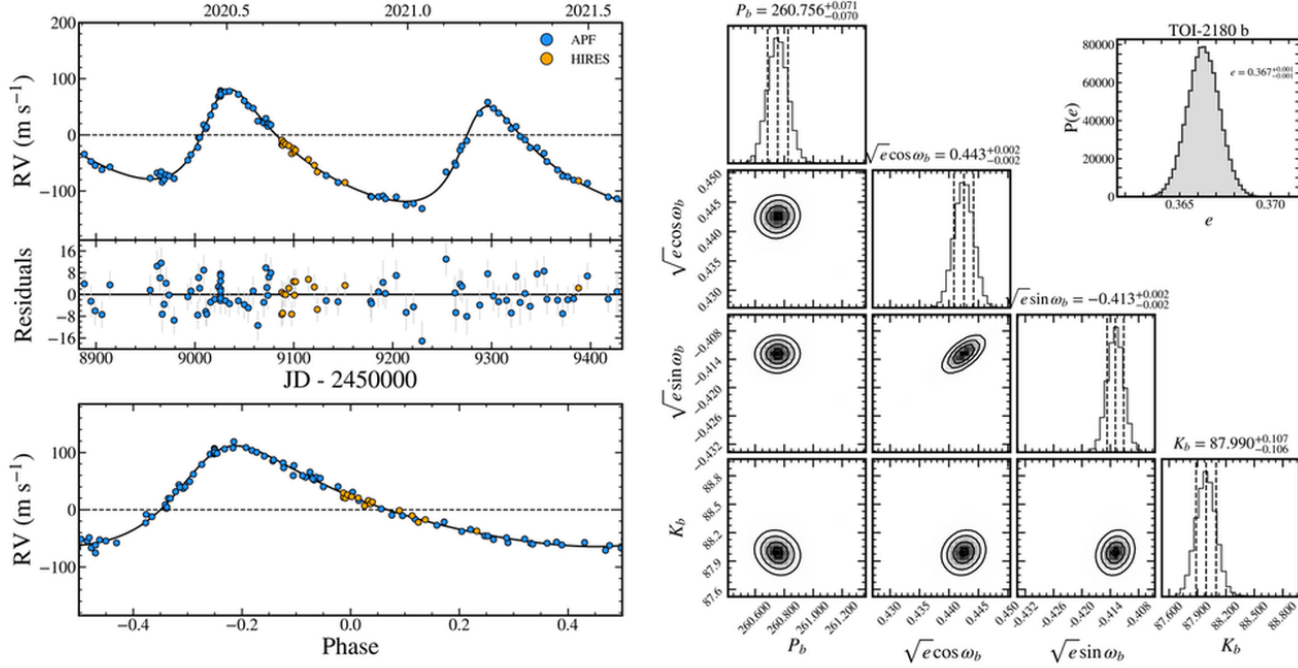


Figure 93. Summary of results for the warm Jupiters TOI-1899 b and TOI-201 b.

TOI-2180 b



TOI-2202 b

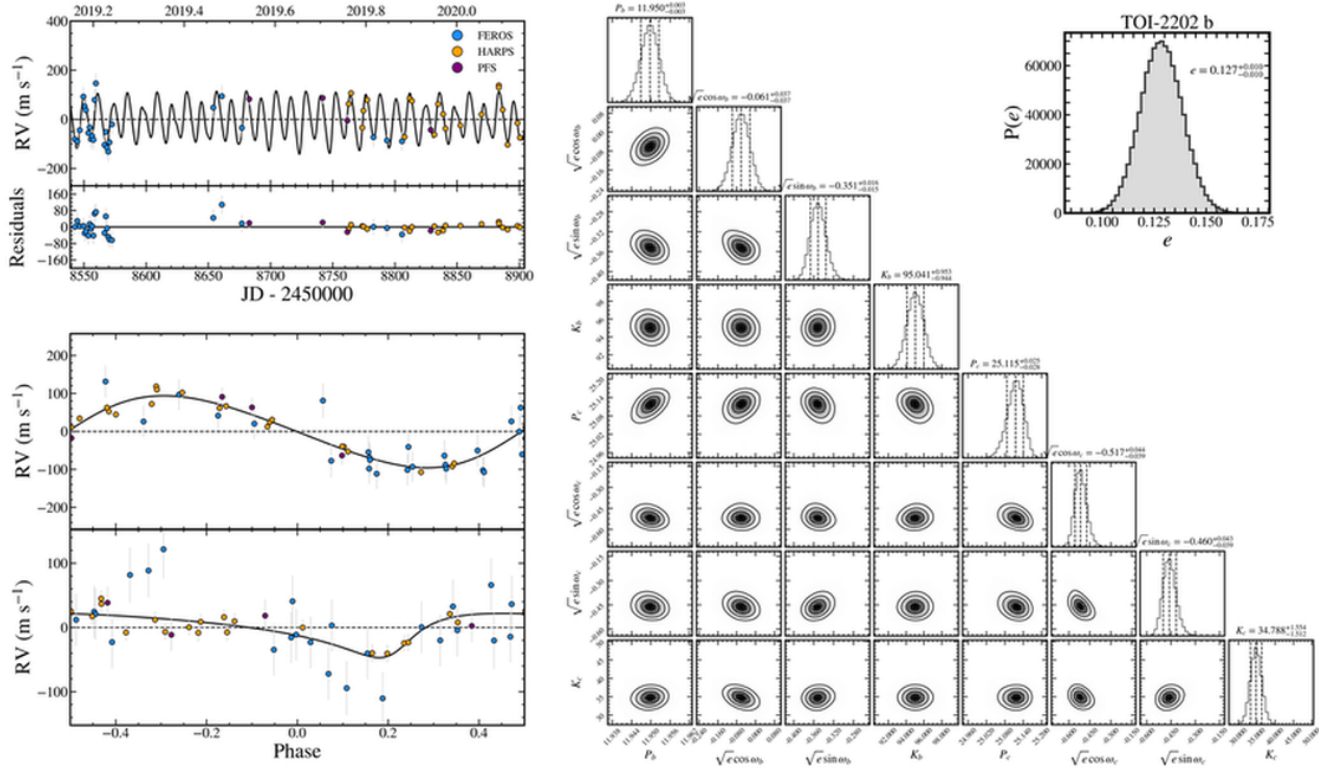
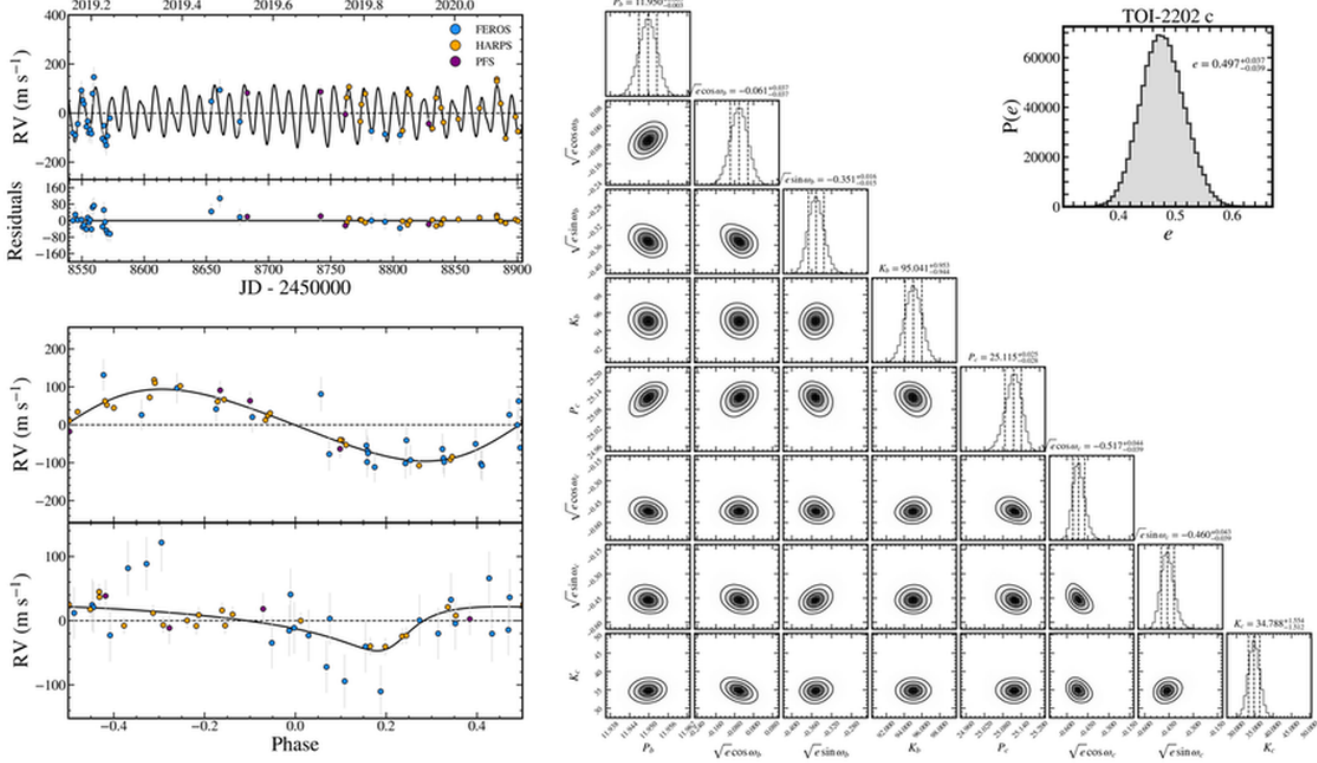


Figure 94. Summary of results for the warm Jupiters TOI-2180 b and TOI-2202 b.

TOI-2202 c



TOI-3362 b

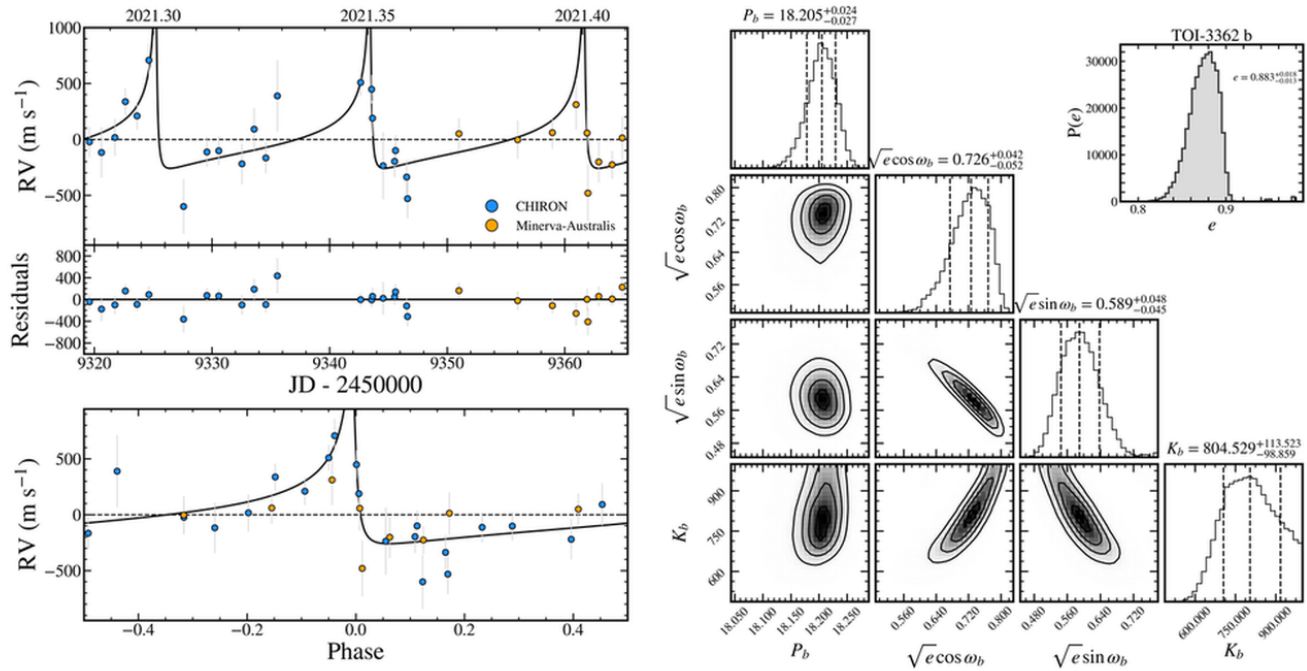
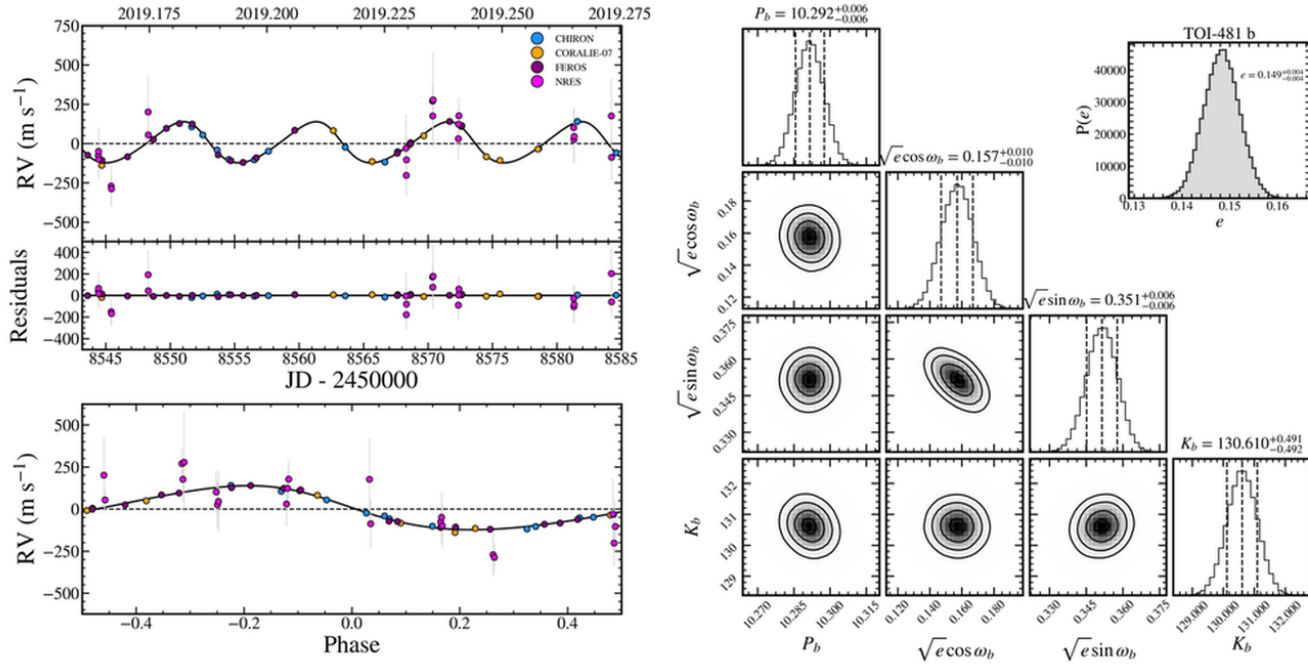


Figure 95. Summary of results for the warm Jupiters TOI-2202 c and TOI-3362 b.

TOI-481 b



TOI-558 b

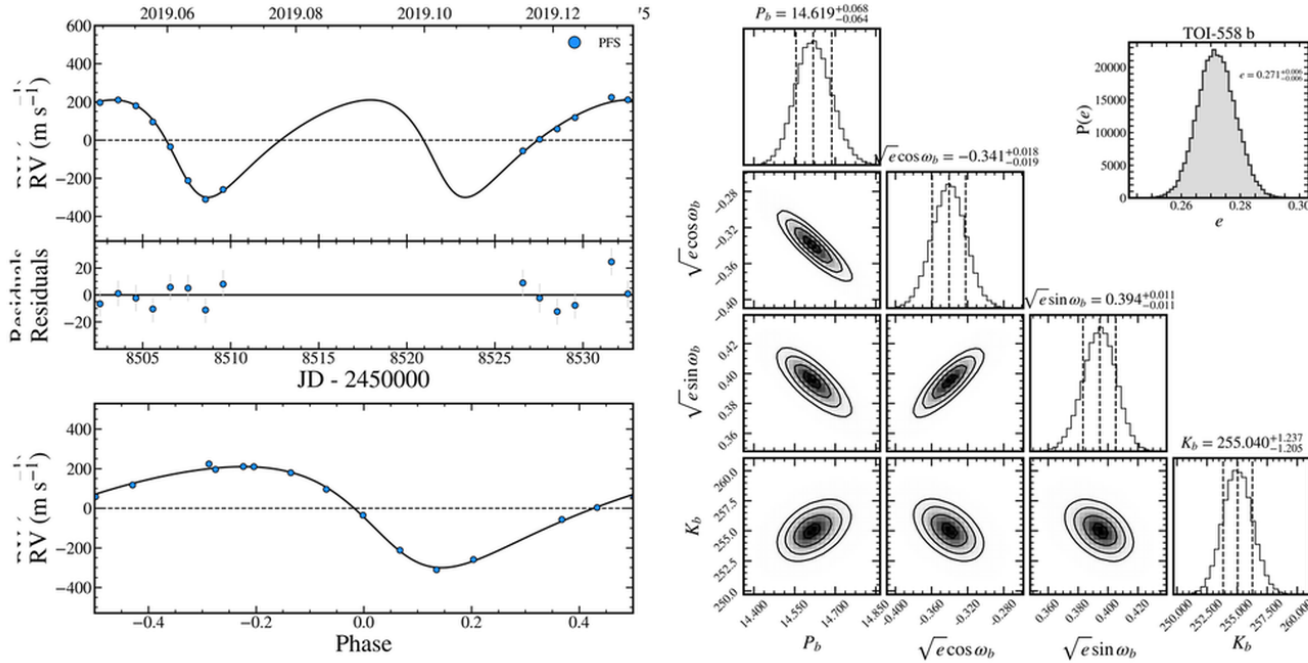
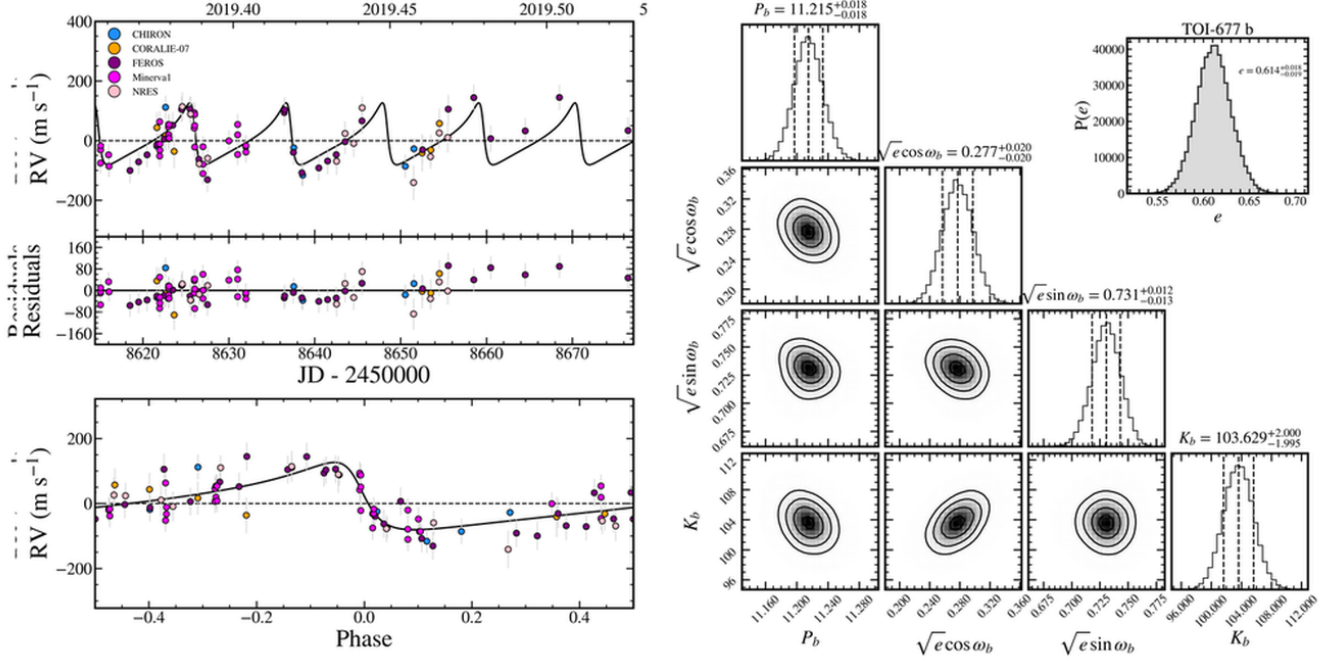


Figure 96. Summary of results for the warm Jupiters TOI-481 b and TOI-558 b.

TOI-677 b



TOI-892 b

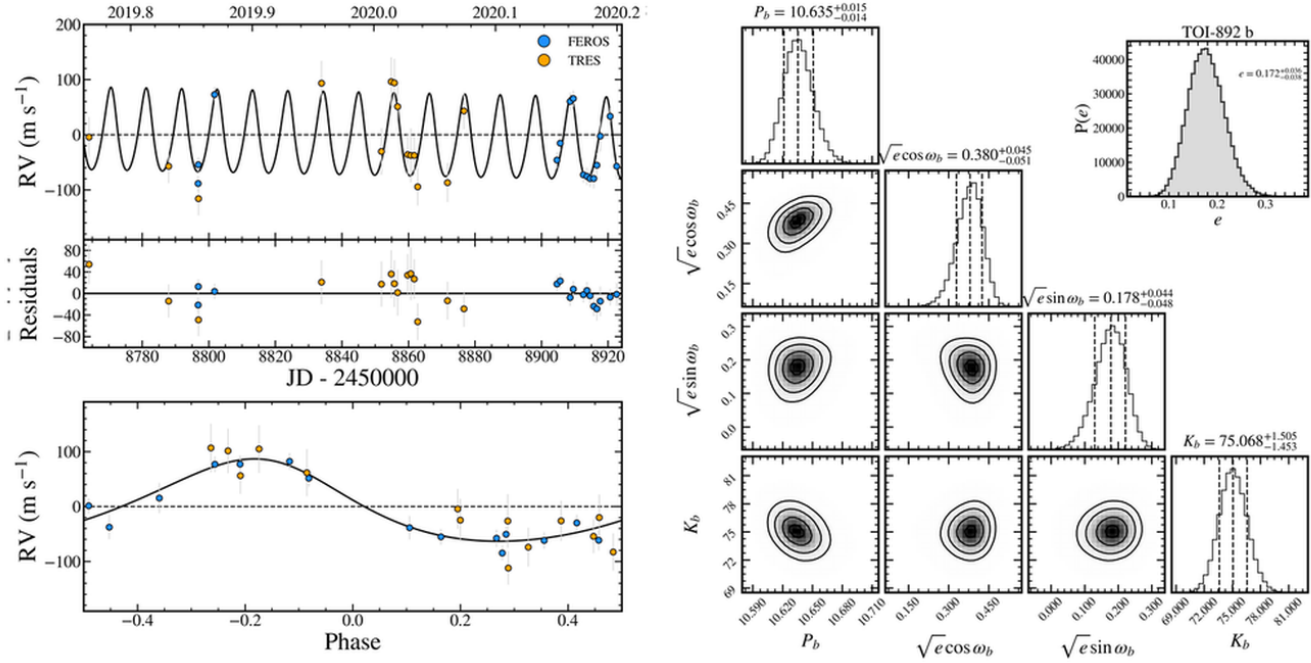
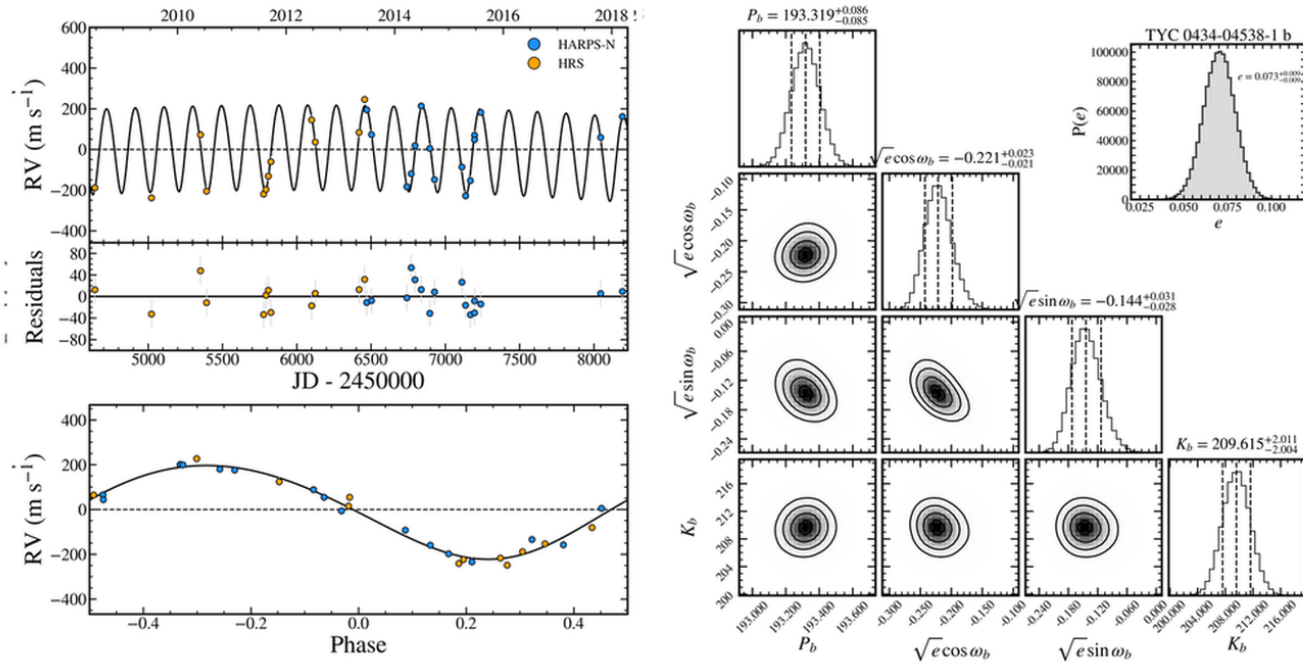


Figure 97. Summary of results for the warm Jupiters TOI-677 b and TOI-892 b.

TYC 0434-04538-1 b



TYC 1422-614-1 b

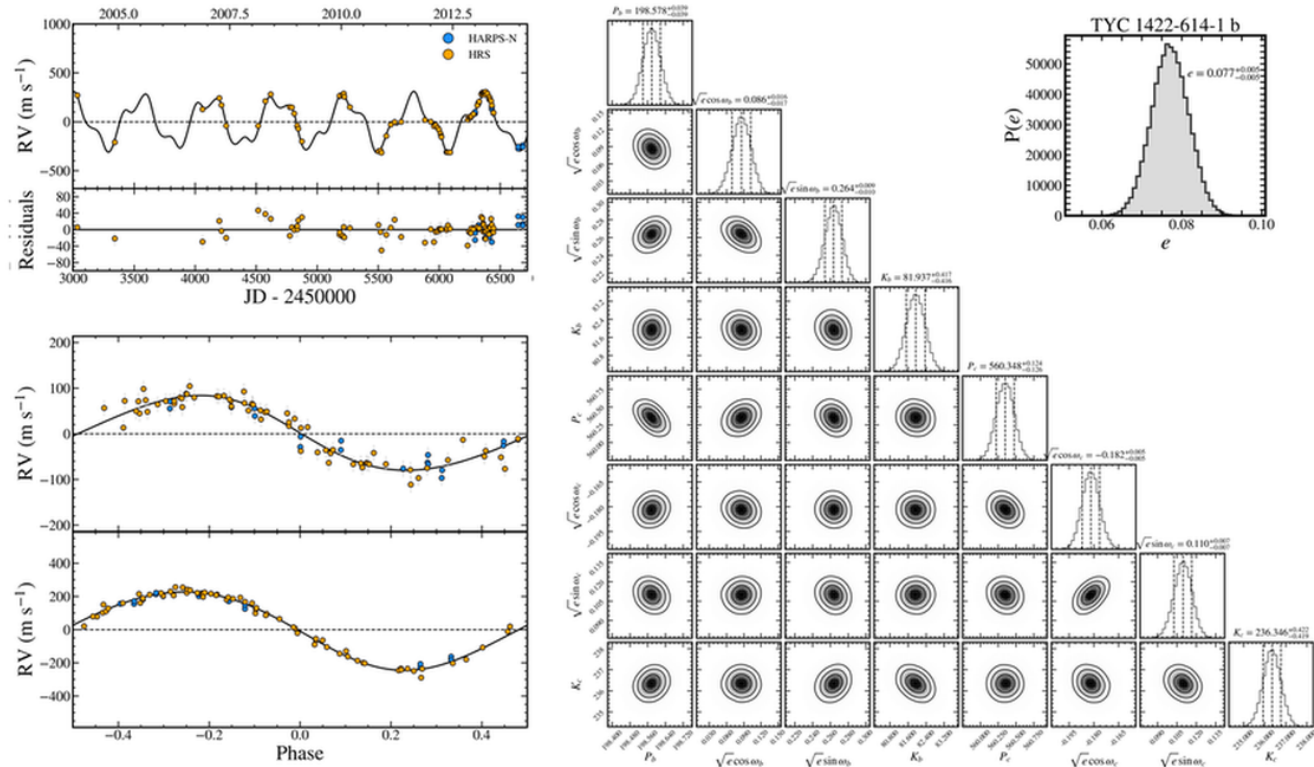
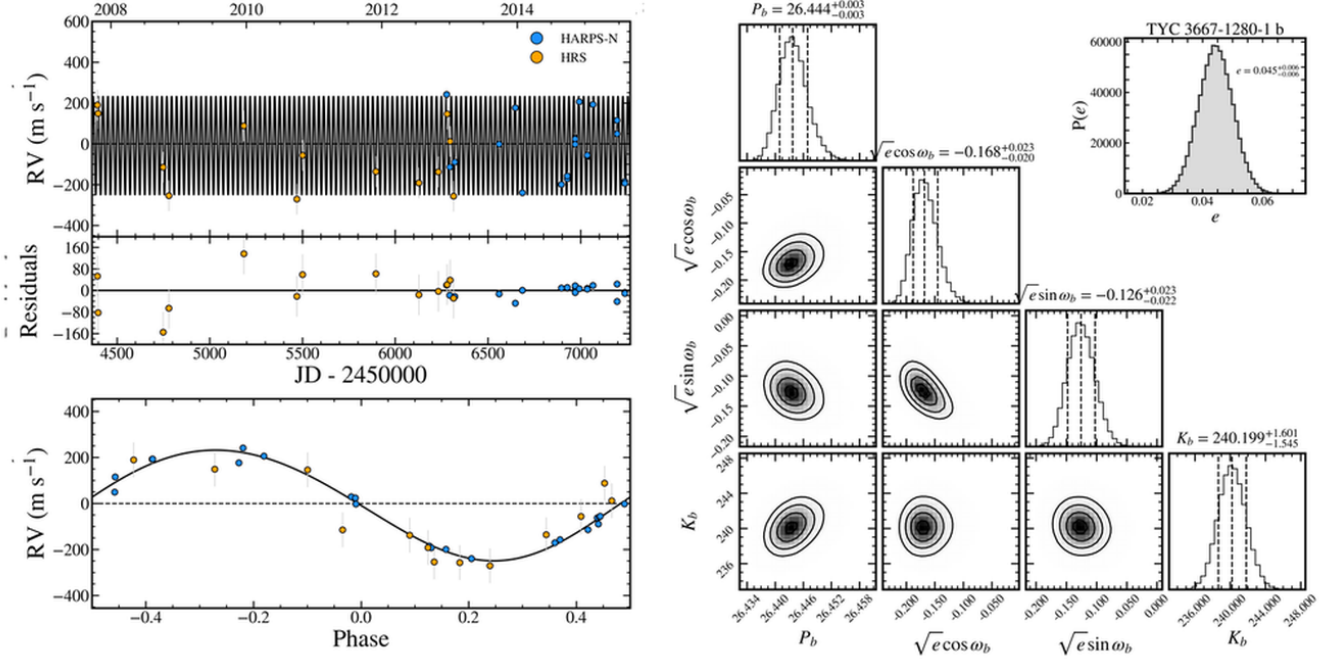


Figure 98. Summary of results for the warm Jupiters TYC 0434-04538-1 b and TYC 1422-614-1 b.

TYC 3667-1280-1 b



TYC 4282-00605-1 b

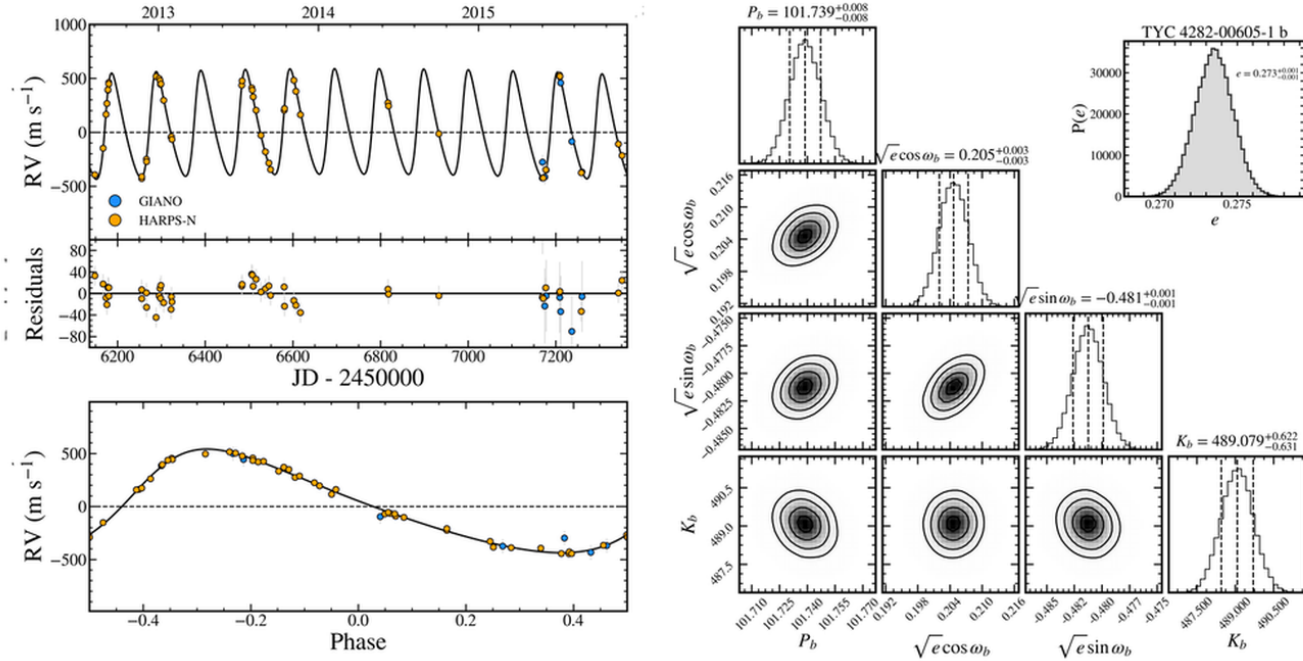
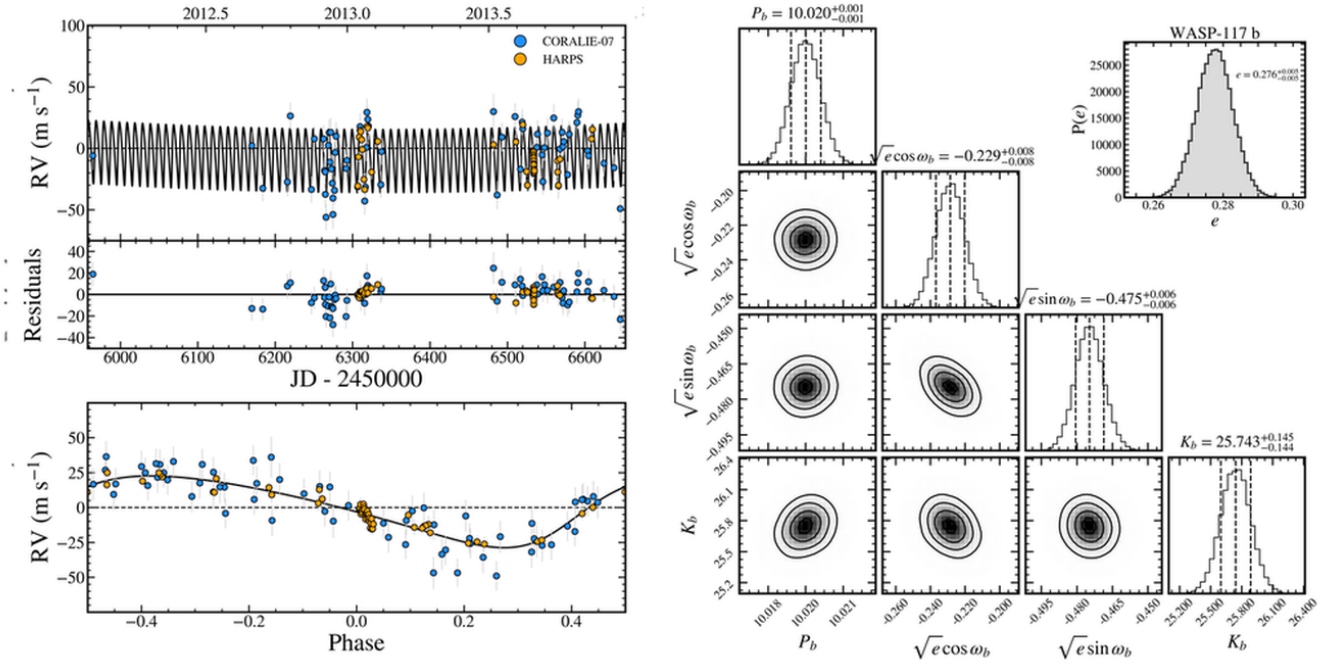


Figure 99. Summary of results for the warm Jupiters TYC 3667-1280-1 b and TYC 4282-00605-1 b.

WASP-117 b



WASP-130 b

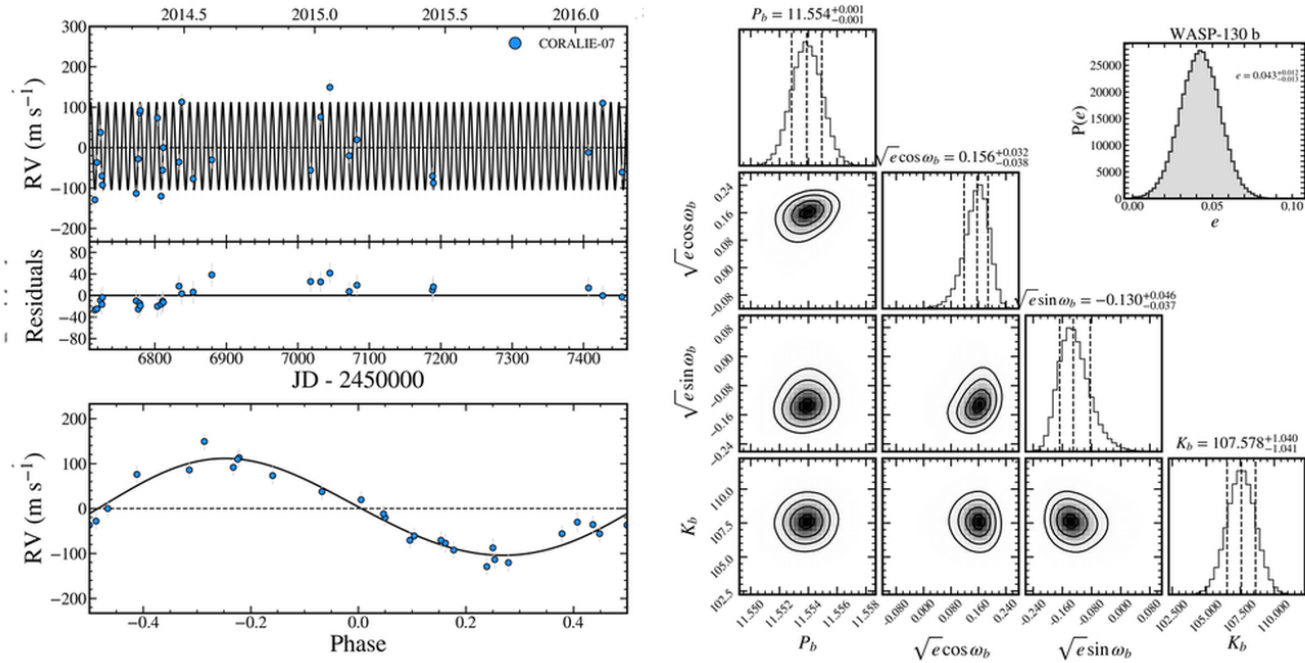
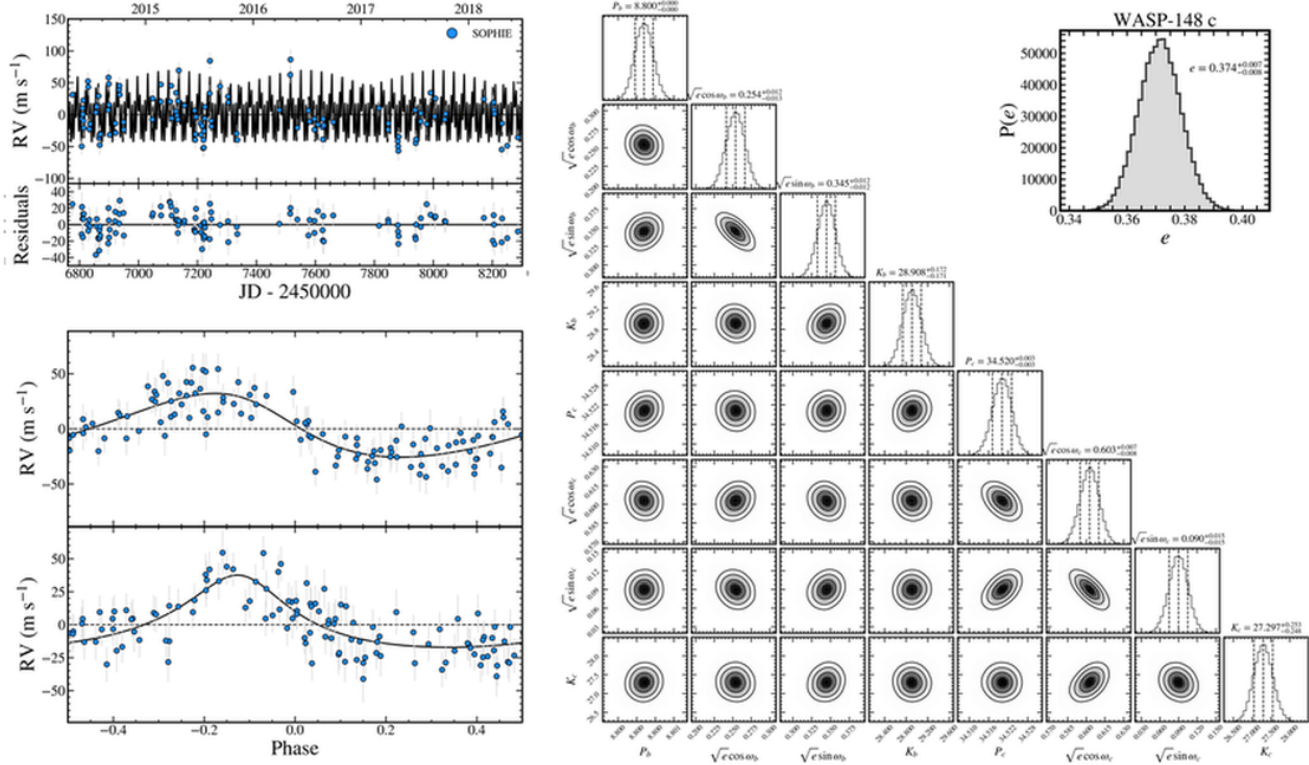


Figure 100. Summary of results for the warm Jupiters WASP-117 b and WASP-130 b.

WASP-148 c



XO-2 S c

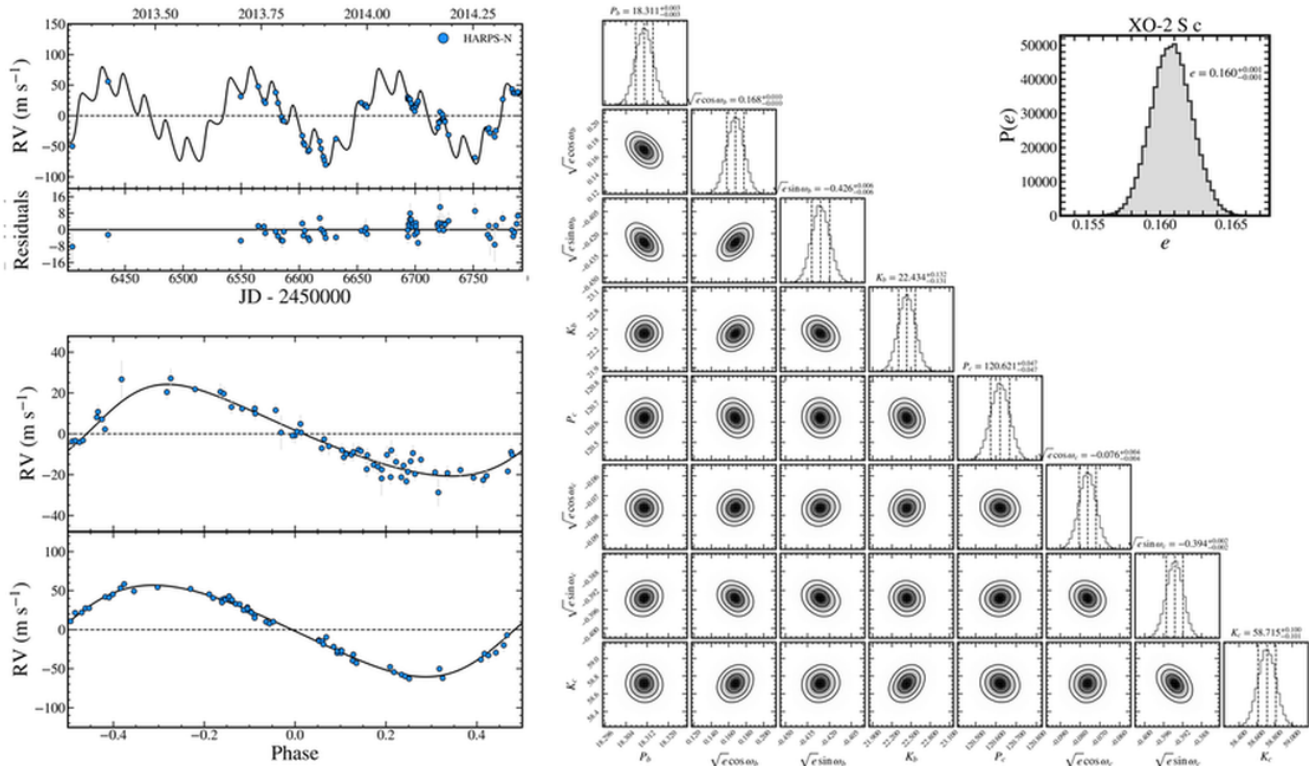
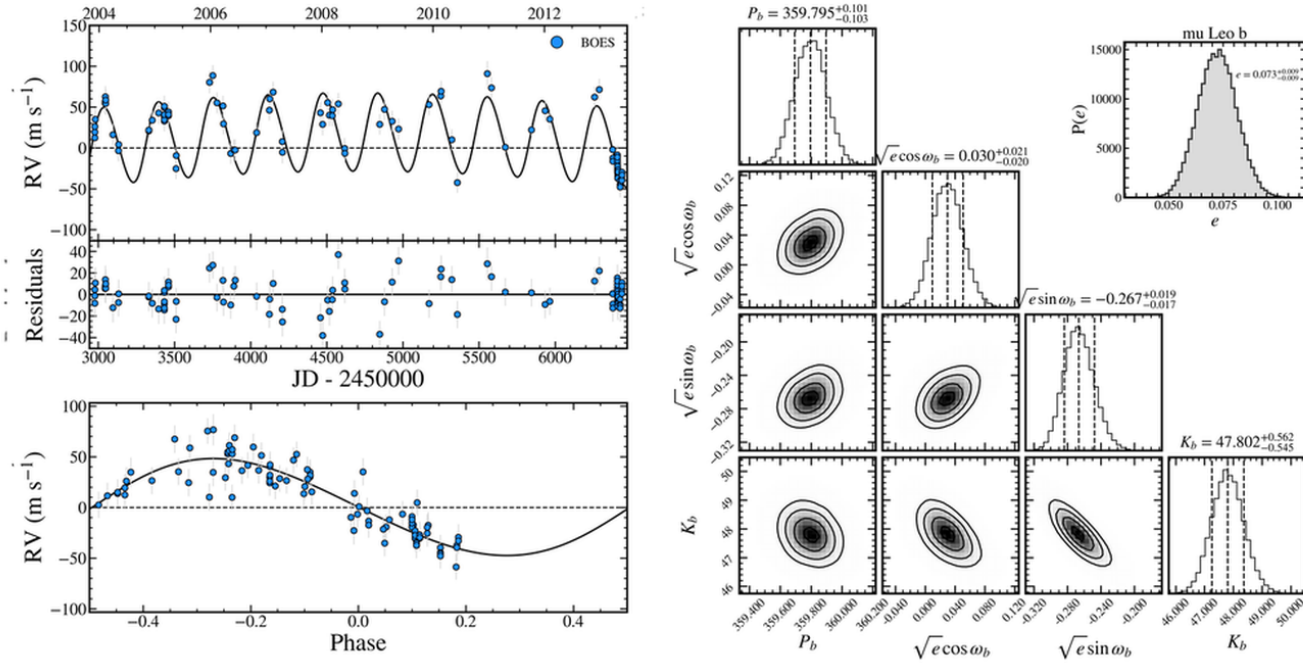


Figure 101. Summary of results for the warm Jupiters WASP-148 c and XO-2 S c.

mu Leo b



ome Ser b

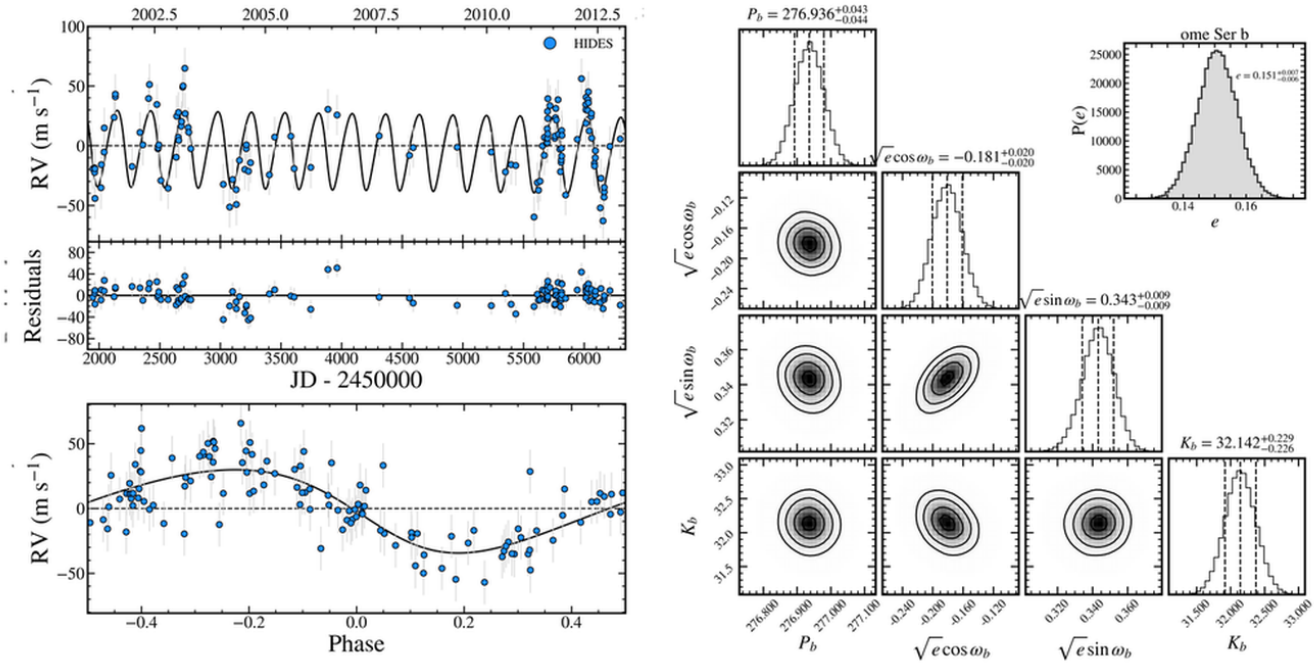
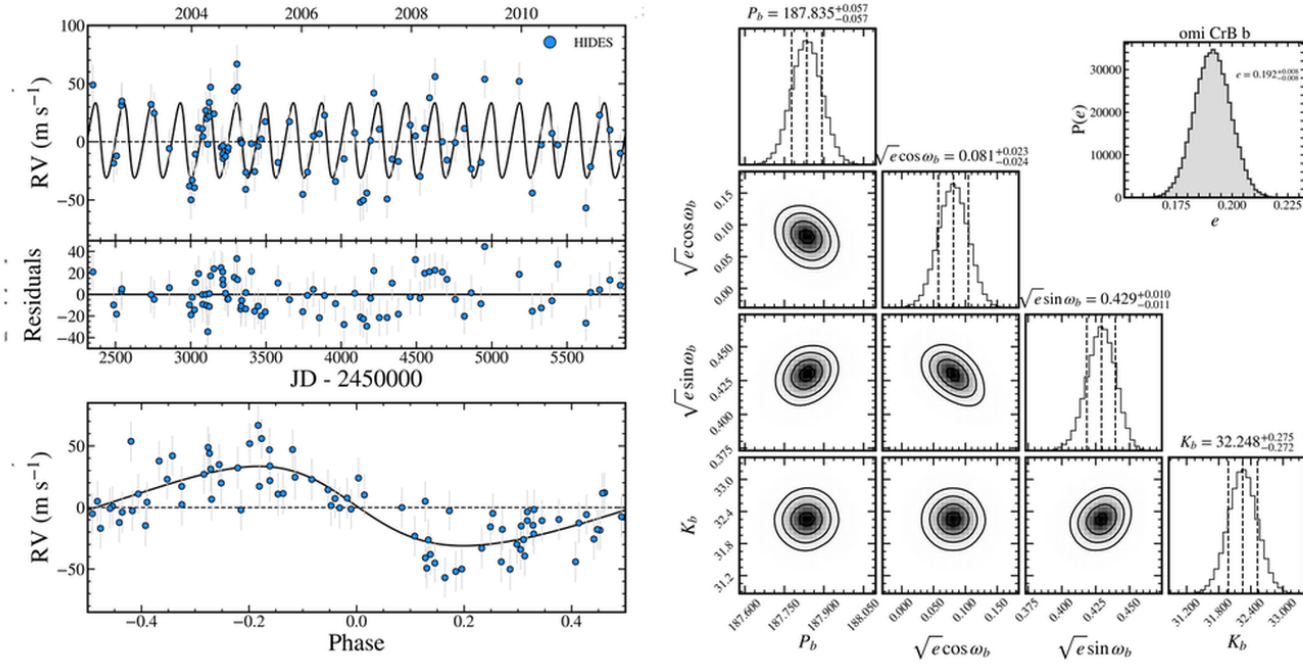
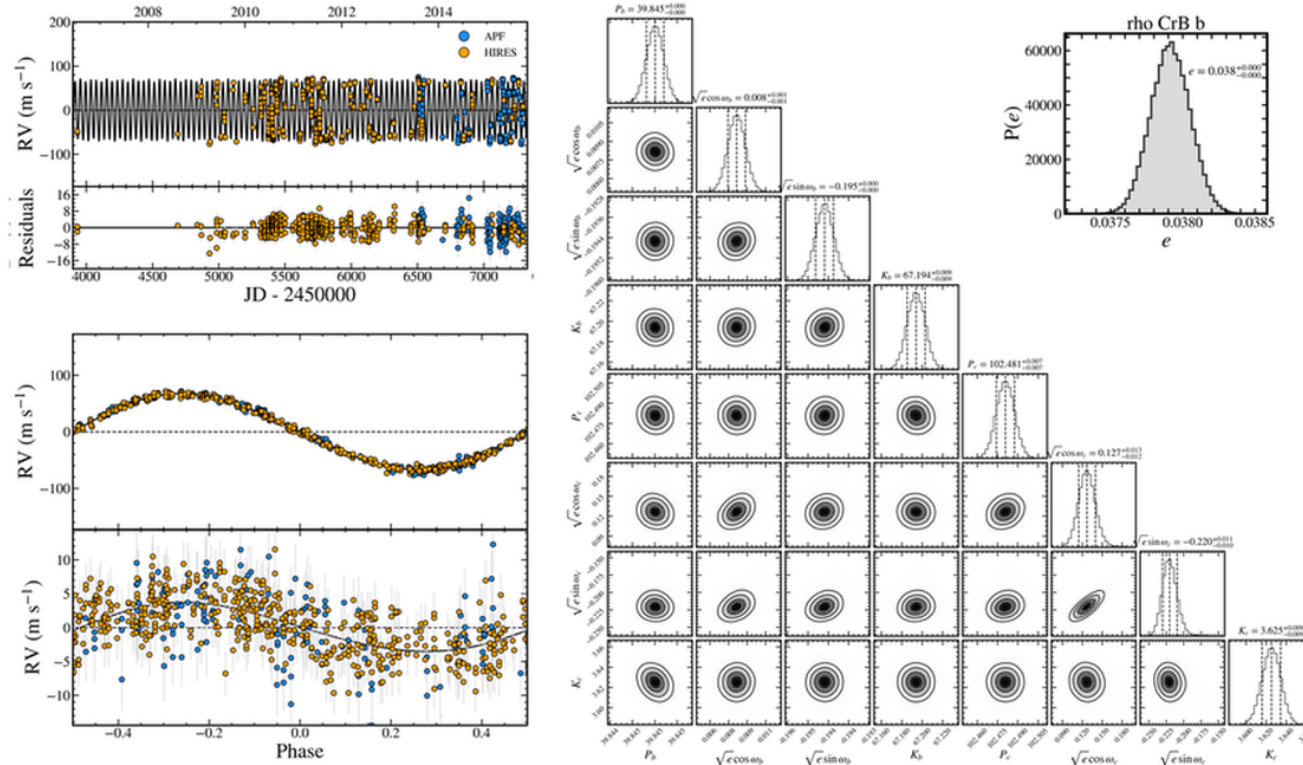


Figure 102. Summary of results for the warm Jupiters mu Leo b and ome Ser b.

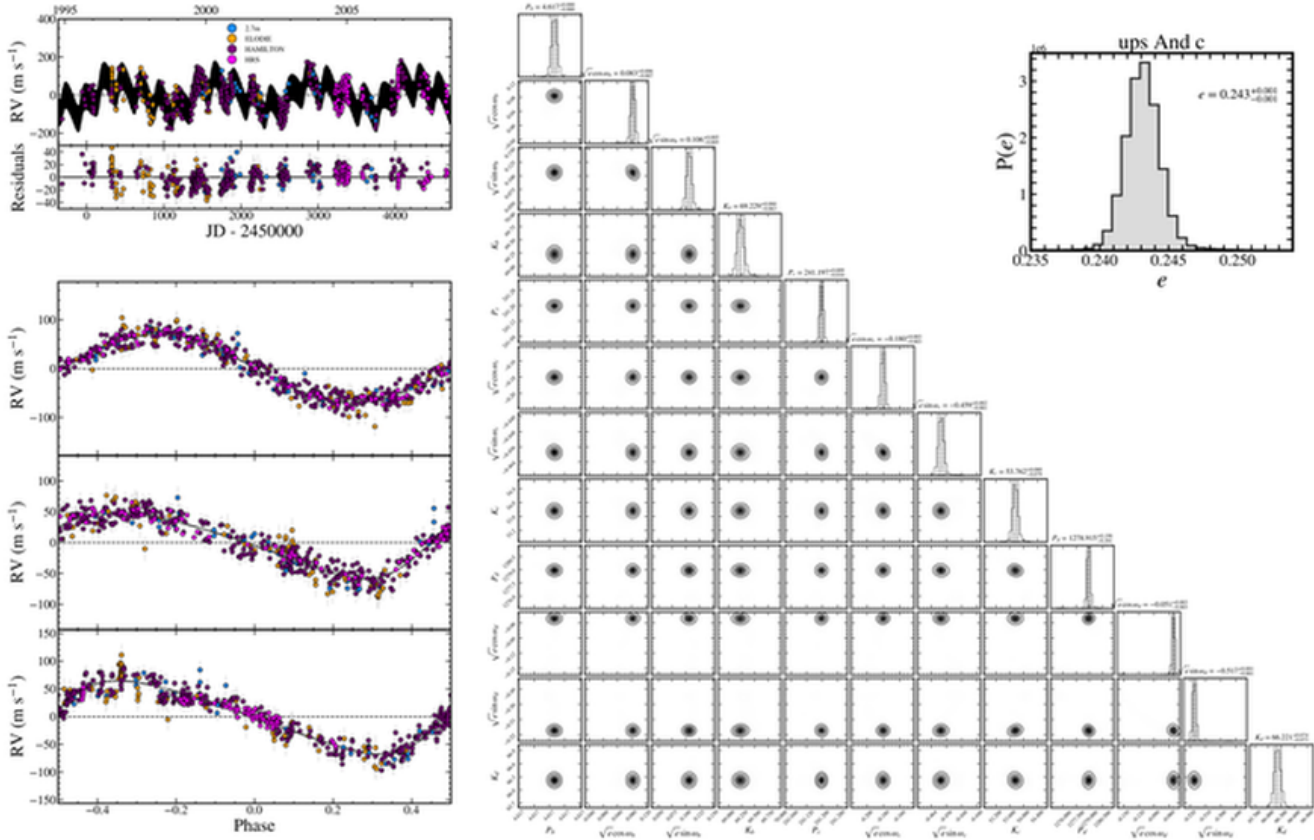
omi CrB b



rho CrB b

Figure 103. Summary of results for the warm Jupiters *omi CrB b* and *rho CrB b*.

ups And c



xi Aql b

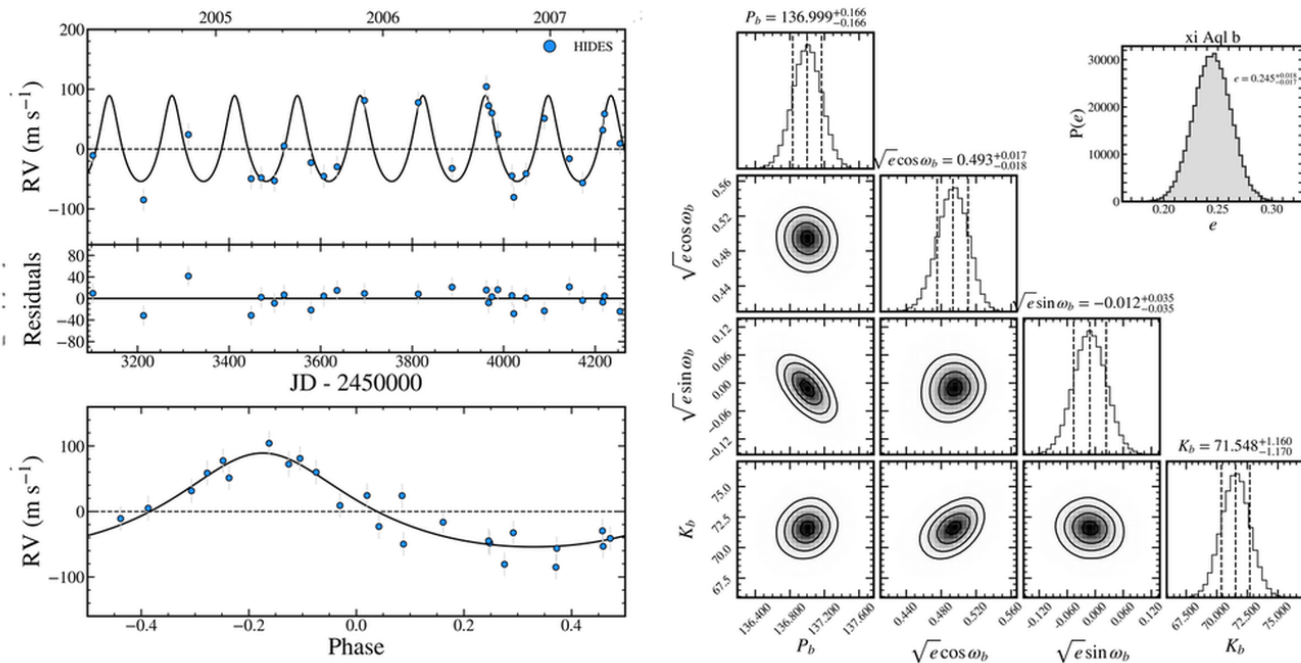


Figure 104. Summary of results for the warm Jupiters ups And c and xi Aql b.

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