TABLE 1
Model Comparison

Statistic	0 planets	1 planets	**2 planets (adopted)**
$N_{\rm data}$ (number of measurements)	654	654	654
$N_{\rm free}$ (number of free parameters)	4	9	14
RMS (RMS of residuals in m s^{-1})	48.66	14.64	11.36
χ^2 (jitter fixed)	12351.4	1110.36	662.0
χ^2_ν (jitter fixed)	19.0	1.72	1.03
$\ln \mathcal{L}$ (natural log of the likelihood)	-8356.01	-2735.5	-2511.31
BIC (Bayesian information criterion)	16722.51	5486.47	5043.11

TABLE 2
MCMC Posteriors

Parameter	Credible Interval	Maximum Likelihood	Units
Modified MCMC Step Parameters			
$\sqrt{e}\cos\omega_b$	0.057 $^{+0.057}_{-0.075}$	0.069	
$\sqrt{e}\sin\omega_b$	0.087 $^{+0.047}_{-0.069}$	0.111	
$\sqrt{e}\cos\omega_c$	0.443 $^{+0.044}_{-0.05}$	0.446	
$\sqrt{e}\sin\omega_c$	-0.1 $^{+0.1}_{-0.09}$	-0.11	
Orbital Parameters			
P_b	14.6517 $^{+0.00029}_{-0.0003}$	14.6517	days
$T\mathrm{conj_b}$	2074.59 $\pm$0.26	2074.59	JD
e_b	0.0149 $^{+0.011}_{-0.0095}$	0.02	
ω_b	0.96 $^{+0.71}_{-0.7}$	1.0	radians
K_b	70.28 $\pm$0.67	70.27	m s^{-1}
P_c	3673 $^{+470}_{-410}$	3672	days
$T\mathrm{conj_c}$	4503 $^{+1100}_{-1300}$	4504	JD
e_c	0.215 $\pm$0.039	0.21	
ω_c	-0.22 $^{+0.23}_{-0.2}$	-0.23	radians
K_c	20.9 $^{+3.7}_{-3.0}$	20.9	m s^{-1}
Other Parameters			
$\gamma_{\rm k}$	-3.7 $^{+9.2}_{-9.8}$	-3.9	m s−1
$\gamma_{\rm j}$	-4.0 $^{+4.0}_{-4.9}$	-4.2	m s−1
$\dot{\gamma}$	0.0039 $^{+0.0011}_{-0.001}$	0.004	m s^{-1} day^{-1}
$\ddot{\gamma}$	-8.1e-06 $^{+2.2e-06}_{-2.3e-06}$	-8.1e-06	m s^{-1} day^{-2}
$\sigma_{\rm k}$	11.3 $^{+1.8}_{-1.6}$	10.5	m s^{-1}
$\sigma_{\rm j}$	11.25 $^{+0.33}_{-0.32}$	11.13	m s^{-1}

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Reference epoch for γ,$\dot{\gamma}$,$\ddot{\gamma}$: 14992.0

TABLE 3
Summary of Priors

e_b constrained to be < 0.99
e_c constrained to be < 0.99
K constrained to be > 0
Gaussian prior on P_b: 14.6521 ± 3.663025
Gaussian prior on P_c: 3847.22 ± 961.805
Bounded prior: $0.0 < \sigma_{\rm j} < 15.0$
Bounded prior: $0.0 < \sigma_{\rm k} < 15.0$

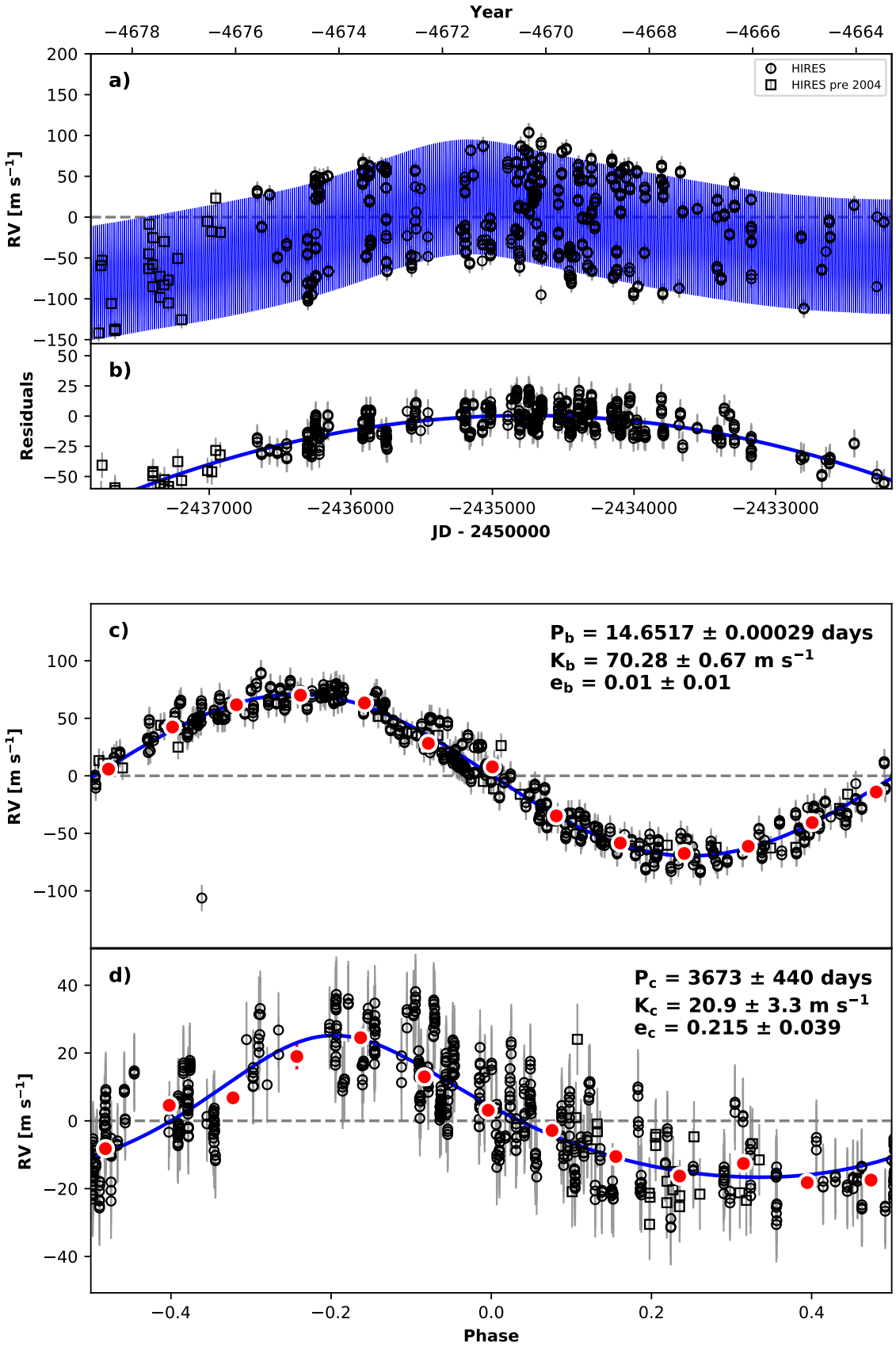

FIG. 1.— Best-fit 2-planet Keplerian orbital model for HD75732_2planet. The maximum likelihood model is plotted while the orbital parameters listed in Table 2 are the median values of the posterior distributions. The thin blue line is the best fit 2-planet model. We add in quadrature the RV jitter term(s) listed in Table 2 with the measurement uncertainties for all RVs. **b)** Residuals to the best fit 2-planet model. **c)** RVs phase-folded to the ephemeris of planet b. The Keplerian orbital models for all other planets (if any) have been subtracted. The small point colors and symbols are the same as in panel **a**. Red circles (if present) are the same velocities binned in 0.08 units of orbital

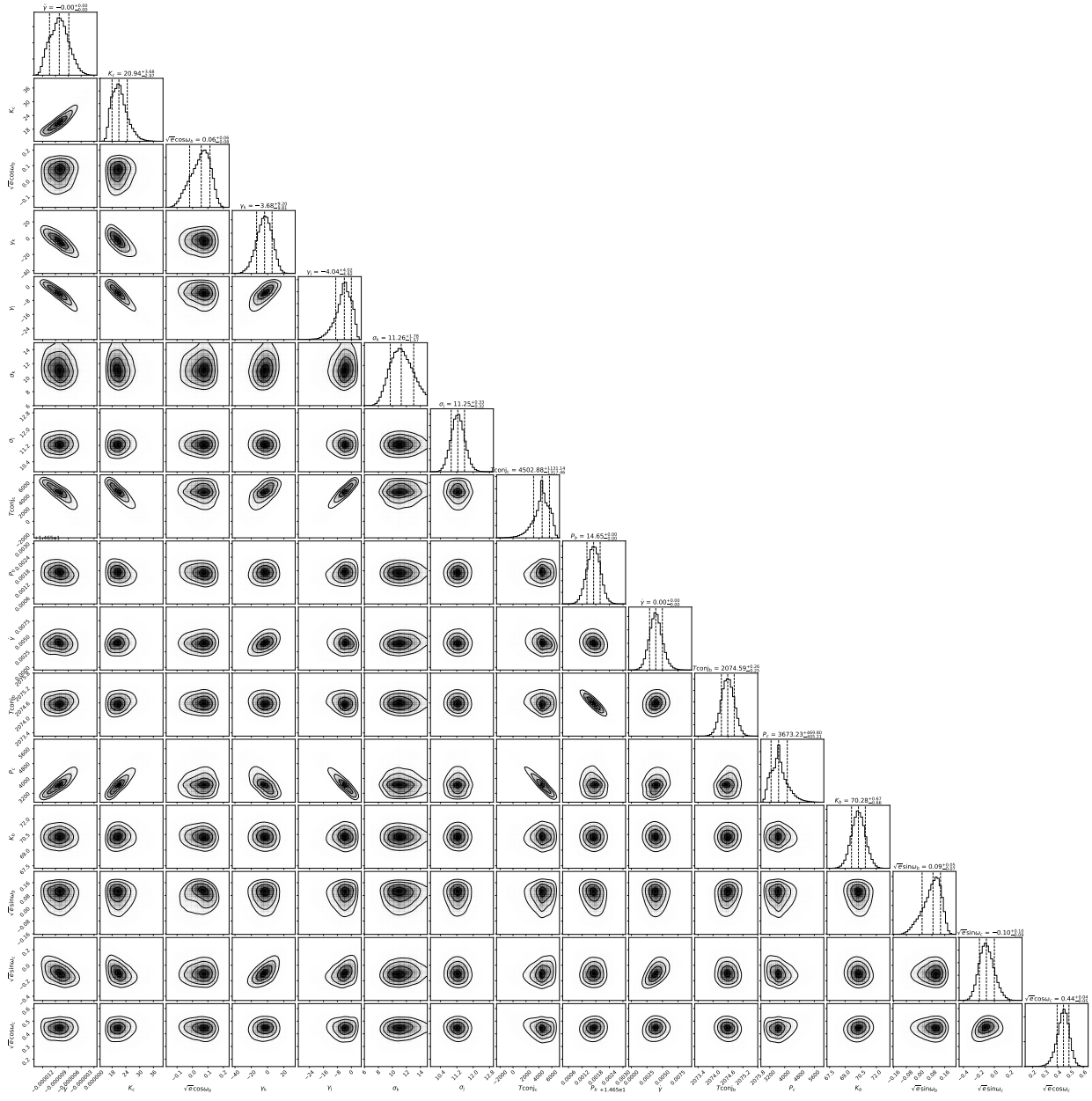

FIG. 2.— Posterior distributions for all free parameters.