TABLE 1
MCMC Posteriors

Parameter	Credible Interval	Maximum Likelihood	Units
Modified MCMC Step Parameters			
$\sqrt{e}\cos\omega_b$	$-0.232\ ^{+0.084}_{-0.062}$	-0.245	
$\sqrt{e}\sin\omega_b$	$0.15\ ^{+0.11}_{-0.13}$	0.16	
$\ln K_b$	$1.978\ ^{+0.033}_{-0.035}$	1.98	$\ln{(\mathrm{m\ s^{-1}})}$
$\sqrt{e}\cos\omega_c$	$-0.25\ ^{+0.32}_{-0.25}$	-0.29	
$\sqrt{e}\sin\omega_c$	$0.446\ ^{+0.096}_{-0.14}$	0.47	
$\ln K_c$	$0.79\ ^{+0.14}_{-0.13}$	0.81	$\ln{(\mathrm{m\ s^{-1}})}$
Orbital Parameters			
P_b	$1198.4\ \pm4.1$	1198.0	days
$T\mathrm{conj_b}$	$2456768\ \pm15$	2456770	JD
e_b	$0.085\ ^{+0.037}_{-0.034}$	0.085	
ω_b	$2.59\ ^{+0.49}_{-0.41}$	2.57	radians
K_b	$7.23\ \pm0.25$	7.25	$\mathrm{m\ s^{-1}}$
P_c	$75.73\ ^{+0.046}_{-0.039}$	75.724	days
$T\mathrm{conj_c}$	$2456279.5\ ^{+3.0}_{-2.8}$	2456279.7	JD
e_c	$0.29\ ^{+0.21}_{-0.13}$	0.31	
ω_c	$2.1\ ^{+0.35}_{-0.68}$	2.13	radians
K_c	$2.21\ ^{+0.33}_{-0.26}$	2.2	$\mathrm{m\ s^{-1}}$
Other Parameters			
γ_k	$0.21\ ^{+0.44}_{-0.46}$	0.21	$\mathrm{m\ s{-1}}$
γ_j	$0.18\ \pm0.21$	0.19	$\mathrm{m\ s{-1}}$
γ_a	$1.12\ \pm0.42$	1.11	$\mathrm{m\ s{-1}}$
$\dot{\gamma}$	$\equiv 0.0$	$\equiv 0.0$	$\mathrm{m\ s^{-1}\ day^{-1}}$
$\ddot{\gamma}$	$\equiv 0.0$	$\equiv 0.0$	$\mathrm{m\ s^{-1}\ day^{-2}}$
σ_k	$2.68\ ^{+0.4}_{-0.35}$	2.51	$\mathrm{m\ s^{-1}}$
σ_j	$2.94\ ^{+0.15}_{-0.14}$	2.89	$\mathrm{m\ s^{-1}}$
σ_a	$1.11\ ^{+0.39}_{-0.44}$	1.0	$\mathrm{m\ s^{-1}}$

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Reference epoch for $\gamma,\dot{\gamma},\ddot{\gamma}$: 2456778.0

TABLE 2
Summary of Priors

e_b constrained to be < 0.99

e_c constrained to be < 0.99

Gaussian prior on $T\mathrm{conj_b}$: 2456779.0 ± 300.0

Bounded prior: $0.0 < \sigma_k < 10.0$

Bounded prior: $0.0 < \sigma_j < 10.0$
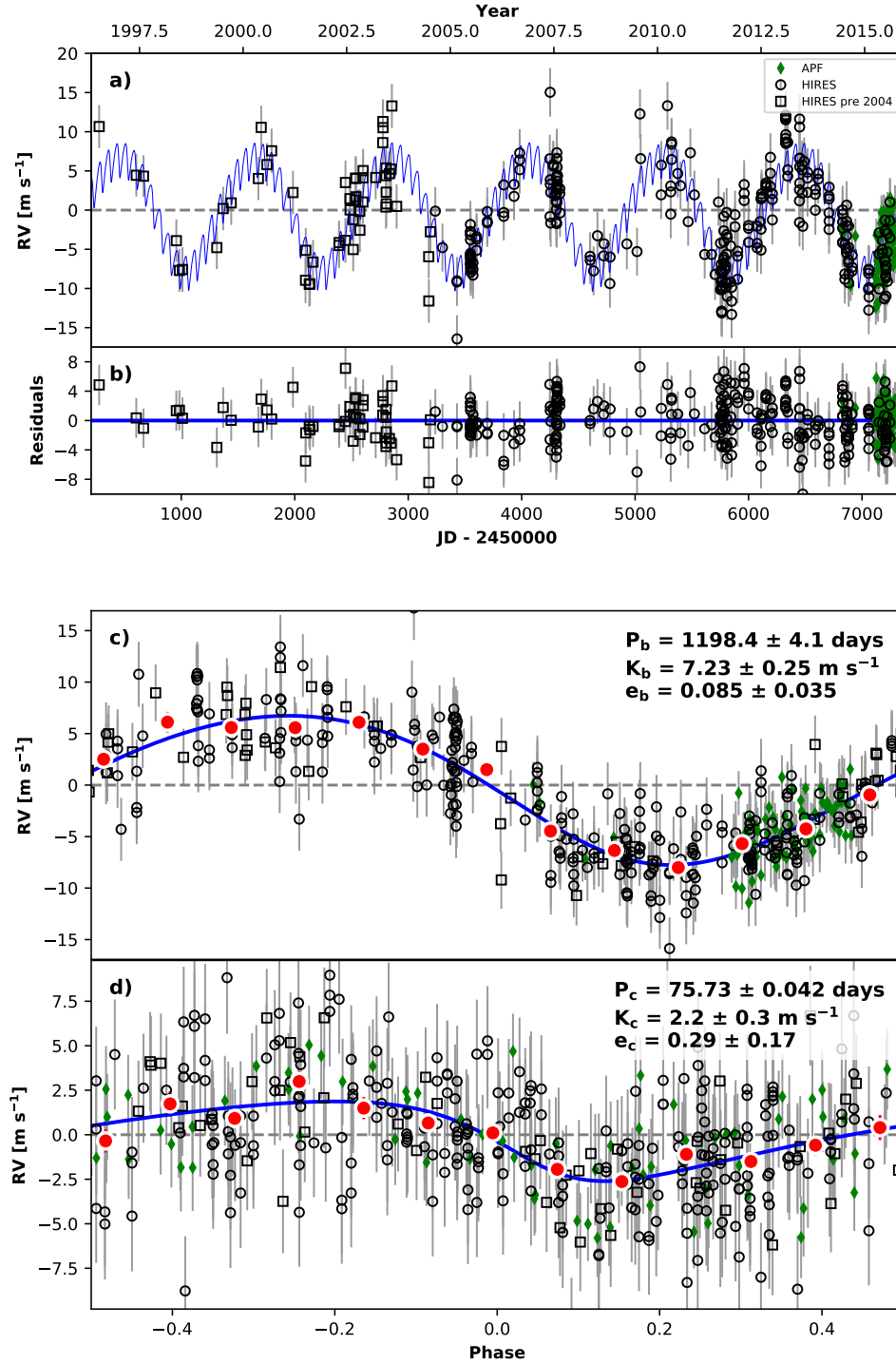
Bounded prior: $0.0 < \sigma_a < 10.0$

Fig. 1.— Best-fit 2-planet Keplerian orbital model for HD164922. The maximum likelihood model is plotted while the orbital parameters listed in Table 1 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 1 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 phase. The phase-folded model for planet b is shown as the blue line. Panel **d)** is the same as panel **c)** but for planet HD164922 c.
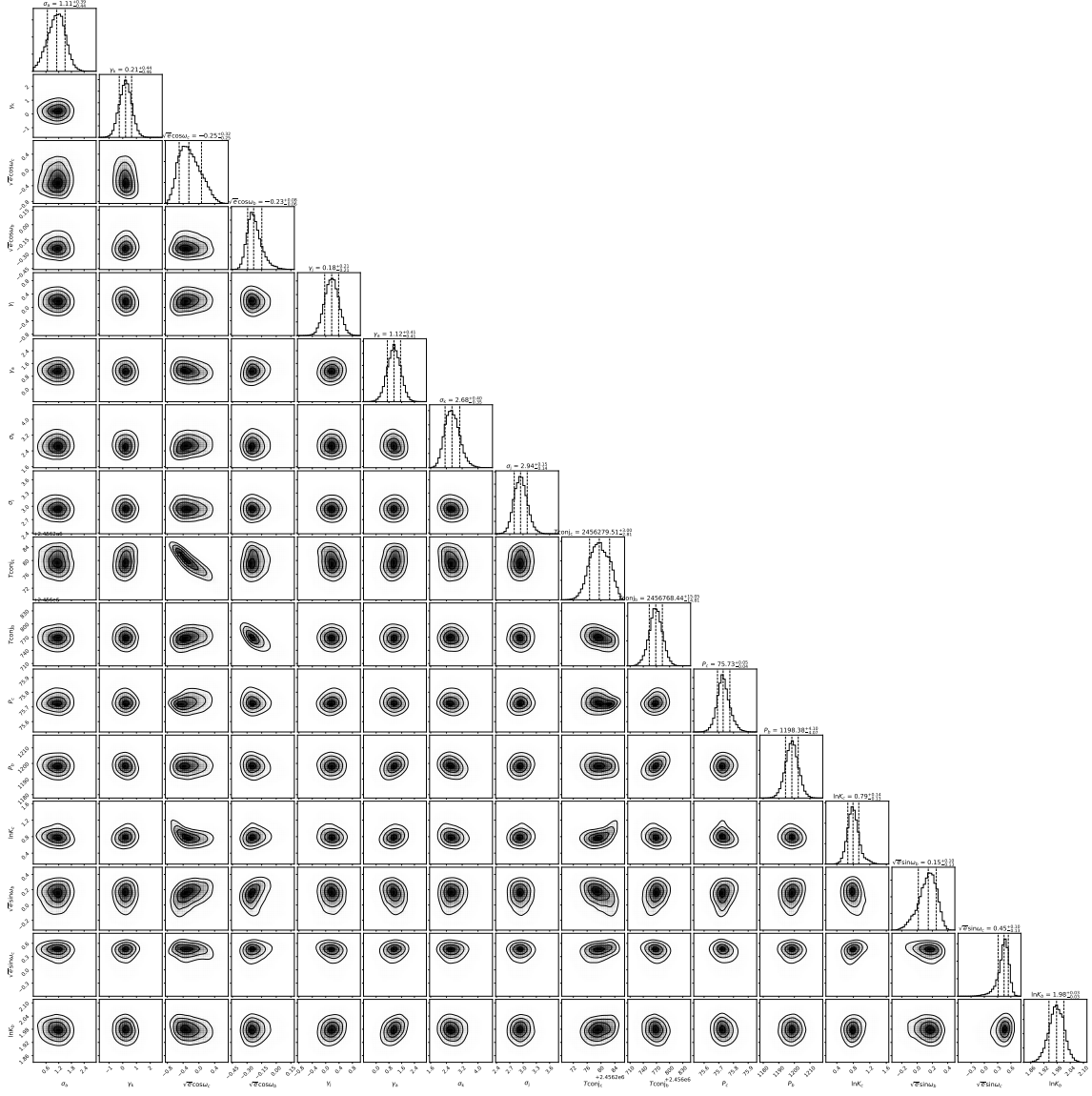
FIG. 2.— Posterior distributions for all free parameters.