TABLE 1
Model Comparison

AICc Qualitative Comparison	Free Parameters	$N_{\rm free}$	$N_{\rm data}$	RMS	$\ln \mathcal{L}$	BIC	AICc	ΔAICc
AICc Favored Model	e_b, K_b, e_c, K_c, σ, γ	22	588	8.25	-1833.48	3779.66	3685.16	0.00
Ruled Out	e_b, K_b, K_c, σ, γ	20	588	12.90	-2216.28	4532.50	4446.45	761.29
	K_b, e_c, K_c, σ, γ	20	588	15.13	-2521.79	5143.53	5057.48	1372.32
	K_b, K_c, σ, γ	18	588	17.58	-2719.20	5525.60	5448.02	1762.86
	e_b, K_b, e_c, K_c, γ	16	588	8.34	-3046.58	6167.60	6098.53	2413.37
	e_b, K_b, σ, γ	17	588	21.41	-3113.43	6307.67	6234.34	2549.18
	K_b, σ, γ	15	588	24.97	-3546.24	7160.55	7095.73	3410.57
	e_b, K_b, K_c, γ	14	588	13.58	-14649.83	29361.34	29300.79	25615.63
	K_b, e_c, K_c, γ	14	588	15.29	-20791.92	41645.52	41584.98	37899.82
	e_c, K_c, σ, γ	17	588	95.12	-25444.42	50969.66	50896.33	47211.17
	K_c, σ, γ	15	588	95.96	-25874.34	51816.74	51751.93	48066.77
	σ, γ	12	588	98.00	-26851.46	53751.84	53699.86	50014.70
	K_b, K_c, γ	12	588	18.30	-30982.90	62014.72	61962.74	58277.58
	e_b, K_b, γ	11	588	22.12	-67075.94	134194.44	134146.75	130461.59
	K_b, γ	9	588	25.30	-82461.00	164951.81	164912.73	161227.57
	e_c, K_c, γ	11	588	95.55	-979344.68	1958731.90	1958684.22	1954999.06
	K_c, γ	9	588	96.17	-1024894.21	2049818.21	2049779.14	2046093.98
	γ	6	588	98.16	-1060523.52	2121057.71	2121031.59	2117346.43

TABLE 2
MCMC Posteriors

Parameter	Credible Interval	Maximum Likelihood	Units
Modified MCMC Step Parameters			
P_b	$7.1268746^{+6.1e-06}_{-5.9e-06}$	7.126874	days
$T\mathrm{conj_b}$	$2456306.8465^{+0.004}_{-0.0039}$	2456306.8464	JD
$T\mathrm{peri_b}$	$2456305.776^{+0.016}_{-0.015}$	2456305.775	JD
e_b	$0.1286^{+0.0018}_{-0.0017}$	0.1286	
ω_b	0.399 ± 0.014	0.399	radians
K_b	141.54 ± 0.26	141.52	m s^{-1}
P_c	5139^{+21}_{-15}	5135	days
$T\mathrm{conj_c}$	2460076^{+71}_{-27}	2460076	JD
$T\mathrm{peri_c}$	2461060^{+39}_{-30}	2461056	JD
e_c	$0.398^{+0.016}_{-0.0079}$	0.399	
ω_c	-2.707 ± 0.021	-2.707	radians
K_c	$53.26^{+0.94}_{-0.79}$	53.19	m s^{-1}
Orbital Parameters			
P_b	$7.1268746^{+6.1e-06}_{-5.9e-06}$	7.126874	days
$T\mathrm{conj_b}$	$2456306.8465^{+0.004}_{-0.0039}$	2456306.8464	JD
$T\mathrm{peri_b}$	$2456305.776^{+0.016}_{-0.015}$	2456305.775	JD
e_b	$0.1286^{+0.0018}_{-0.0017}$	0.1286	
ω_b	0.399 ± 0.014	0.399	radians
K_b	141.54 ± 0.26	141.52	m s^{-1}
P_c	5139^{+21}_{-15}	5135	days
$T\mathrm{conj_c}$	2460076^{+71}_{-27}	2460076	JD
$T\mathrm{peri_c}$	2461060^{+39}_{-30}	2461056	JD
e_c	$0.398^{+0.016}_{-0.0079}$	0.399	
ω_c	-2.707 ± 0.021	-2.707	radians
K_c	$53.26^{+0.94}_{-0.79}$	53.19	m s^{-1}
Other Parameters			
$\gamma_{\mathrm{Hamilton}}$	$-14.2^{+1.1}_{-1.2}$	-14.1	m s-1
γ_{HJS}	-1.1 ± 1.7	-1.0	m s-1
$\gamma_{\mathrm{HIRES-pre}}$	-9.23 ± 0.77	-9.13	m s-1
$\gamma_{\mathrm{HIRES-post}}$	$-5.93^{+0.47}_{-0.49}$	-5.91	m s-1
$\gamma_{\mathrm{CORALIE}}$	-13416.8 ± 1.6	-13416.6	m s-1
γ_{APF}	$-26.45^{+0.44}_{-0.42}$	-26.47	m s-1
$\dot{\gamma}$	$\equiv 0.0$	$\equiv 0.0$	m s^{-1} d^{-1}
$\ddot{\gamma}$	$\equiv 0.0$	$\equiv 0.0$	m s^{-1} d^{-2}
$\sigma_{\mathrm{Hamilton}}$	$9.891^{+0.082}_{-0.17}$	10.0	m s^{-1}
σ_{HJS}	4.9 ± 2.3	4.4	m s^{-1}
$\sigma_{\mathrm{HIRES-pre}}$	$3.37^{+0.43}_{-0.37}$	3.2	m s^{-1}
$\sigma_{\mathrm{HIRES-post}}$	$3.78^{+0.37}_{-0.32}$	3.6	m s^{-1}
$\sigma_{\mathrm{CORALIE}}$	$0.00032^{+0.027}_{-0.00032}$	$1e-08$	m s^{-1}
σ_{APF}	2.4 ± 0.2	2.3	m s^{-1}

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Reference epoch for γ,$\dot{\gamma}$,$\ddot{\gamma}$: 2454929.324

TABLE 3
Derived Posteriors

Parameter	Credible Interval	Maximum Likelihood	Units
$M_b \sin i$	1.383 ± 0.039	1.424	$\mathrm{M_{Jup}}$
a_b	$0.0739^{+0.001}_{-0.0011}$	0.0751	AU
$M_c \sin i$	$4.32^{+0.14}_{-0.13}$	4.42	$\mathrm{M_{Jup}}$
a_c	$5.95^{+0.083}_{-0.086}$	6.041	AU

TABLE 4
Summary of Priors

e_b constrained to be < 0.99
e_c constrained to be < 0.99
K constrained to be > 0
Bounded prior: $0.0 < \sigma_{\mathrm{Hamilton}} < 10.0$
Bounded prior: $0.0 < \sigma_{\mathrm{HIRES-pre}} < 10.0$
Bounded prior: $0.0 < \sigma_{\mathrm{HIRES-post}} < 10.0$
Bounded prior: $0.0 < \sigma_{\mathrm{APF}} < 10.0$
Bounded prior: $0.0 < \sigma_{\mathrm{HJS}} < 10.0$
Bounded prior: $0.0 < \sigma_{\mathrm{CORALIE}} < 10.0$

TABLE 5
Final Convergence Criterion

Criterion	Final Value
minAfactor	70.492
maxArchange	0.014
maxGR	1.026
minTz	1133.933

TABLE 6
Radial Velocities

Time (JD)	RV (m s^{-1})	RV Unc. (m s^{-1})	Inst.
2451005.96200	-173.23	8.08	Hamilton
2451006.96700	-160.31	8.87	Hamilton
2451014.91800	-124.84	8.64	Hamilton
2451025.98000	-61.23	8.24	Hamilton
2451027.94000	-153.96	7.51	Hamilton
2451049.81200	-179.22	10.38	Hamilton
2451075.85737	-55.42	3.46	Hamilton
2451077.87293	-170.30	3.95	Hamilton
2451078.81604	-143.71	3.89	Hamilton
2451079.79381	-55.56	3.86	Hamilton
2451081.74453	95.46	4.04	Hamilton
2451100.75549	-68.91	4.36	Hamilton
2451101.75100	24.04	7.11	Hamilton
2451132.65300	-55.19	8.05	Hamilton
2451352.96400	89.53	8.65	Hamilton
2451362.95900	-124.79	5.44	Hamilton
2451363.95900	-84.34	5.57	Hamilton
2451364.95500	10.73	5.78	Hamilton
2451377.90170	-111.44	4.56	Hamilton
2451378.93600	-34.40	5.73	Hamilton
2451379.93031	88.63	4.20	Hamilton
2451380.93155	123.37	4.27	Hamilton
2451386.94238	64.82	4.65	Hamilton
2451387.86992	132.54	4.34	Hamilton
2451388.94298	55.72	4.82	Hamilton
2451389.94885	-76.20	4.59	Hamilton
2451390.99100	-140.44	6.26	Hamilton
2451391.96648	-117.69	4.65	Hamilton
2451392.94573	-33.61	4.85	Hamilton
2451401.84799	131.99	4.45	Hamilton
2451402.84803	99.22	4.26	Hamilton
2451403.83861	-36.54	4.59	Hamilton
2451416.88215	135.49	3.47	Hamilton
2451417.88300	-8.86	6.00	Hamilton
2451418.78978	-104.51	4.49	Hamilton
2451419.77222	-140.74	4.78	Hamilton
2451427.81688	-110.27	4.54	Hamilton
2451428.78433	-26.41	6.43	Hamilton
2451429.89239	98.66	5.15	Hamilton
2451435.87319	-27.36	4.50	Hamilton
2451436.74416	63.82	4.39	Hamilton
2451437.72192	132.63	5.43	Hamilton
2451438.79352	35.74	4.46	Hamilton
2451439.78885	-74.67	5.20	Hamilton
2451444.82400	172.72	6.32	Hamilton
2451445.78600	105.94	5.02	Hamilton
2451446.75800	-33.63	5.53	Hamilton
2451447.71400	-108.96	5.32	Hamilton
2451448.74600	-105.96	6.04	Hamilton
2451453.82122	-42.61	4.21	Hamilton

Note. — Only the first 50 of 588 RVs are displayed in this table. Use `radvel table -t rv` to save the full LaTeX table as a separate file.

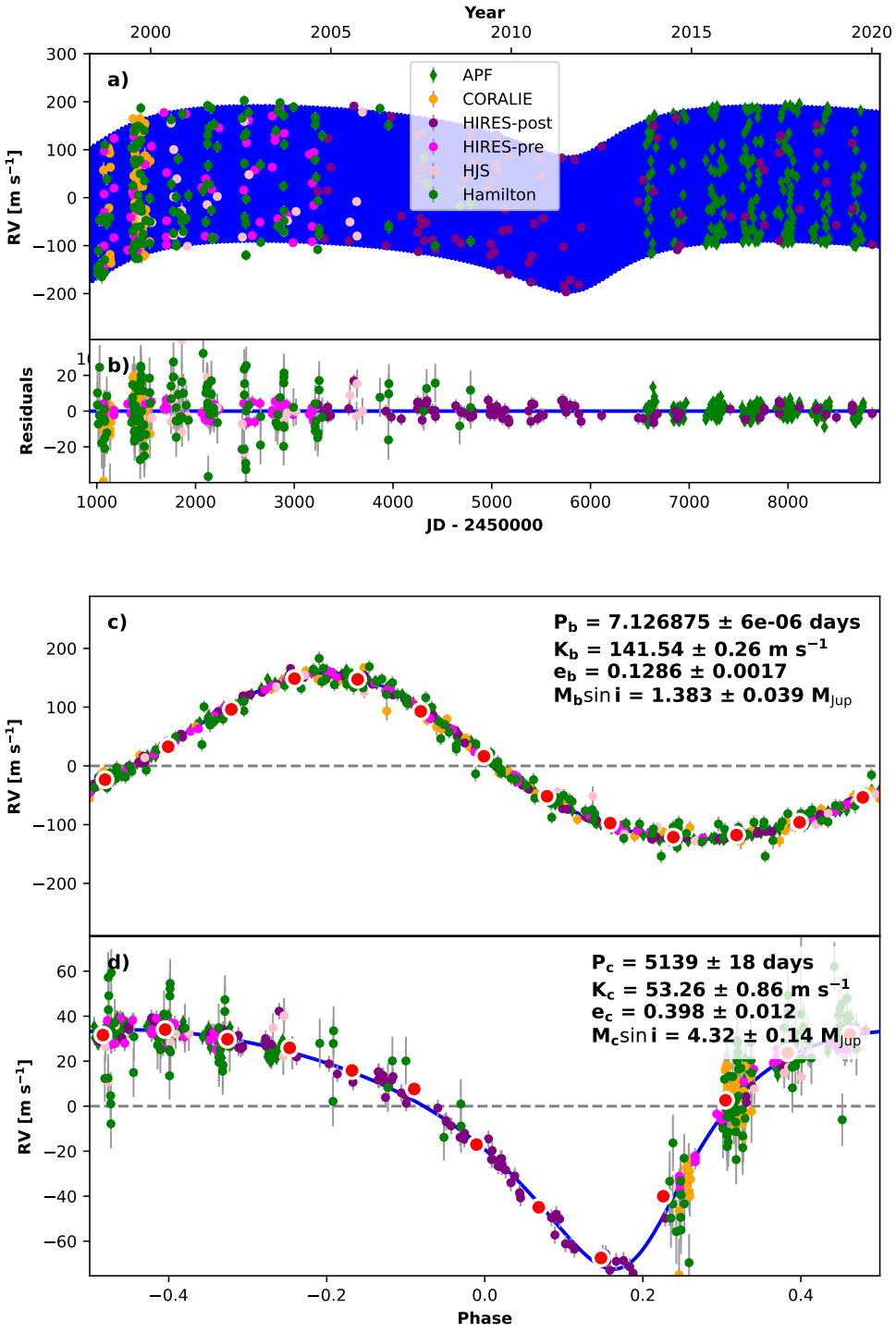

FIG. 1.— Best-fit 2-planet Keplerian orbital model for HD217107. The maximum likelihood model is plotted while the orbital parameters listed in Table 2 are the median values of the posterior distributions. The thin blue line is the best fit 2-planet model. We add in quadrature the RV jitter term(s) listed 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 phase. The phase-folded model for planet b is shown as the blue line.

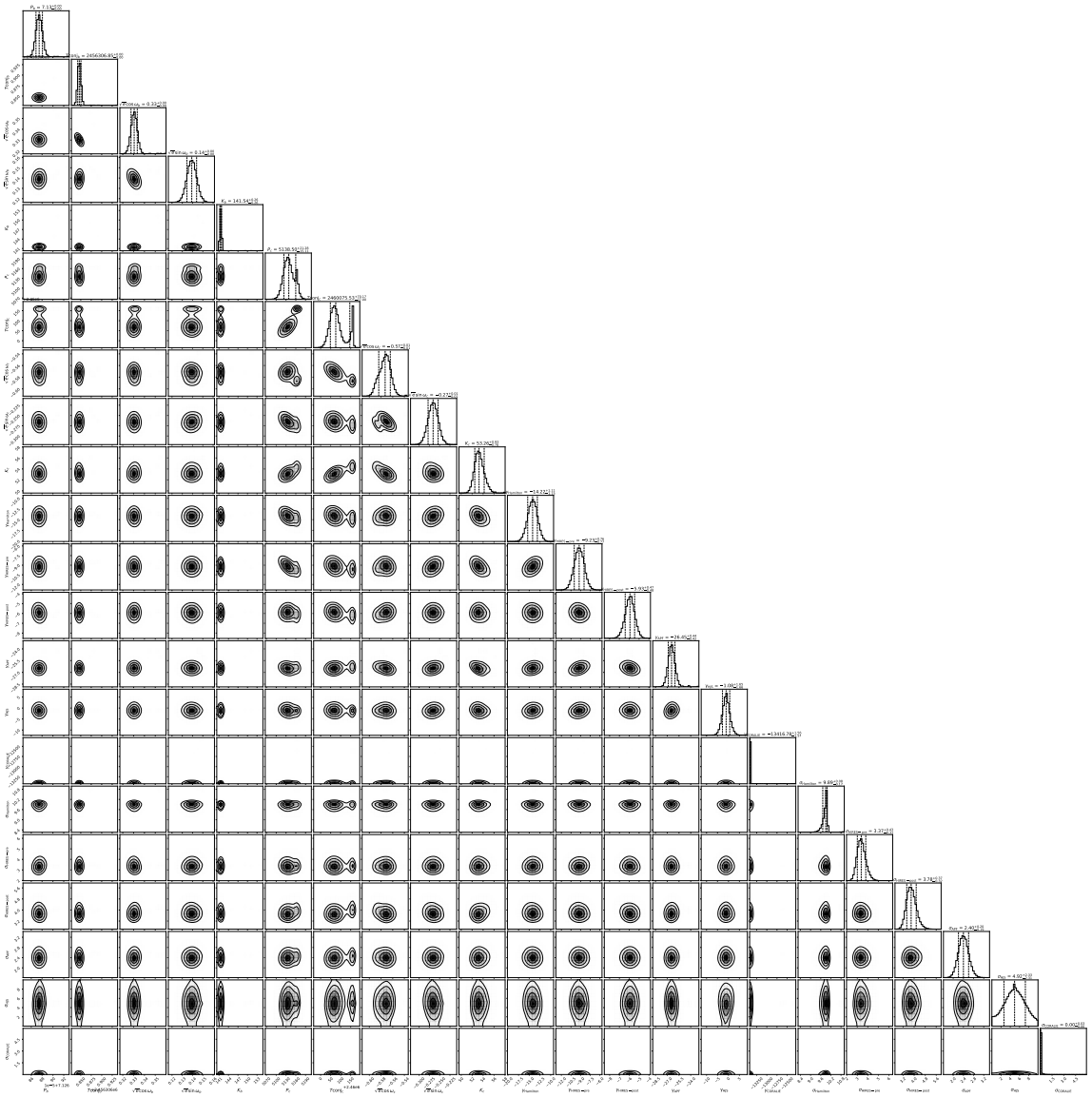

FIG. 2.— Posterior distributions for all free parameters.

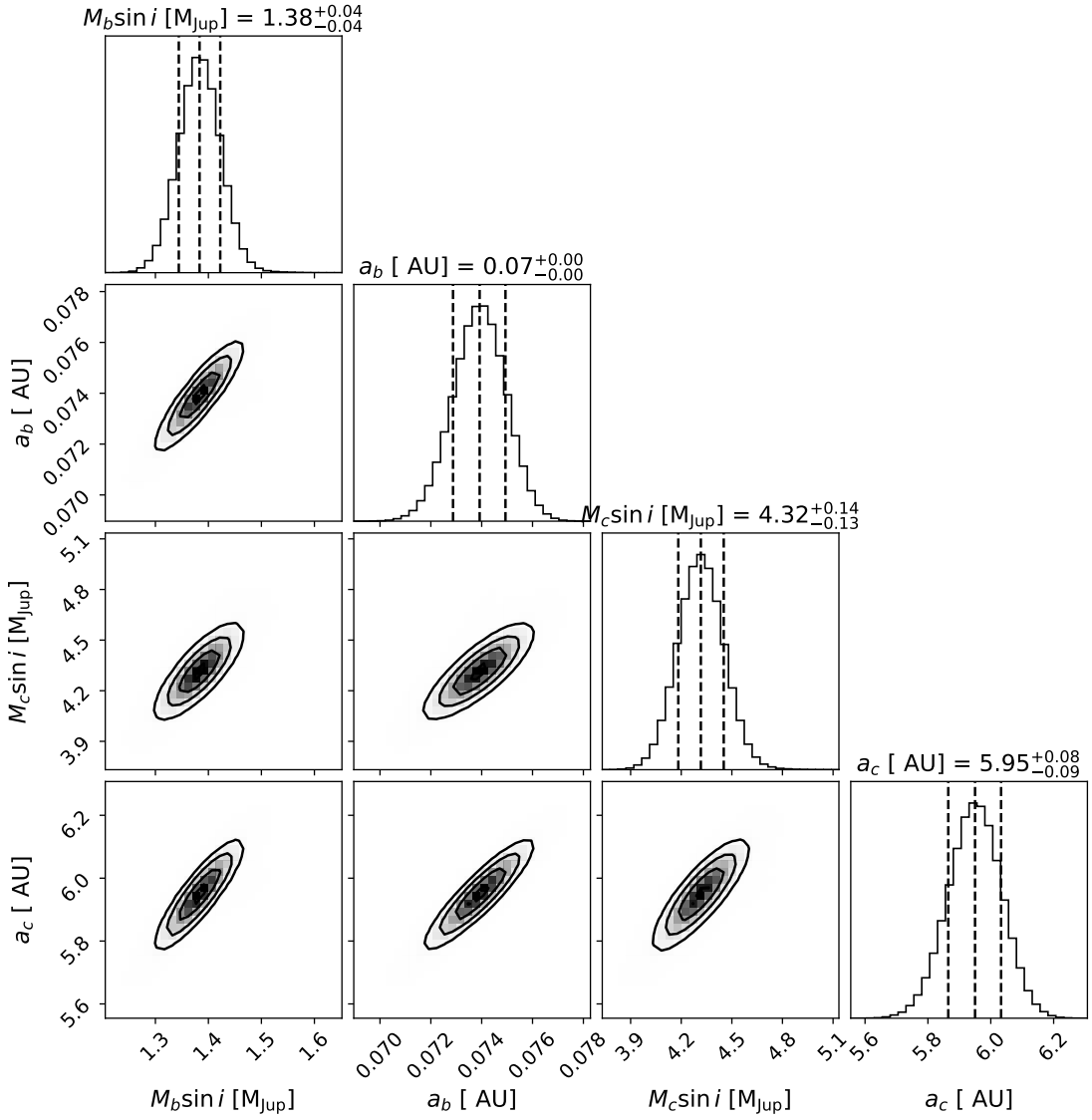

FIG. 3.— Posterior distributions for all derived parameters.