FUNDAMENTAL PARAMETERS OF EXOWHALES AND THEIR HOST PLANETS

BY

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A dissertation submitted to the Graduate School

in partial fulfillment of the requirements

for the degree

Doctor of Philosophy

Major Subject: Astronomy

New Mexico State University

Las Cruces New Mexico

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"Fundamental Parameters of Exowhales and Their Host Planets" a dissertation prepared by John W. Smith in partial fulfillment of the requirements for the degree, Doctor of Philosophy, has been approved and accepted by the following:

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DEDICATION

I dedicate this work to the love of my life, Shamoo.

ACKNOWLEDGMENTS

My greatest thanks to Shamoo, for unending encouragmenet and support.

To all those who have supported exowhale research, you have my deepest thanks. To those fools in the academy who doubted the existence of exowhales, shove it up your blowhole.

VITA

EDUCATION

2007-2009	M.S., Astronomy
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PROFESSIONAL ORGANIZATIONS

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PUBLICATIONS

Coughlin, J.L. and López-Morales, M., 2012, The Astrophysical Journal, 750, 100. *Modeling Multi-Wavelength Stellar Astrometry. III. Determination of the Absolute Masses of Exoplanets and Their Host Stars*

Harrison, T.E., Coughlin, J.L., Ule, N.M., and López-Morales, M., 2012, The Astronomical Journal, 143, 4. *Kepler Cycle 1 Observations of Low Mass Stars: New Eclipsing Binaries, Single Star Rotation Rates, and the Nature and Frequency of Starspots*

CONFERENCE PROCEEDINGS

Coughlin, J. L., López-Morales, M., Harrison, T. E., Ule, N., Hoffman, D. I. 2011, in ASP Conf. Ser. 448, 16^{th} Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. C. Johns-Krull (Seattle, WA:ASP), 121. *New Low-Mass Eclipsing Binaries from Kepler*

FIELD OF STUDY

Major Field: Extrasolar Planets & Whales

ABSTRACT

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The number of known extrasolar planets, planets that orbit stars other than our own Sun, has dramatically increased in recent years. Recently much theoretical work has shown that whales could exist on these planets, i.e., exowhales. In this thesis we present overwhelming evidence for the existance of exowhales, and conclude their favorite food is exoplankton.

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DATA ON COMPACT DISC

The FITS files were created on a MacBookPro2,2 with a 2.16 GHz Intel Core 2 Duo and 4 GB of RAM running Mac OS Leopard (v10.5.8). The C code was compiled using the GNU project's gcc (v4.2).

DIRTY/
- dirtydust_v2rev2_8mar2010.tar.gz
- dirtyv2_r88_20sep10.tar.gz

arbitrary geometry code/
- day90.00_myshell_grid30_tau1.00_ff0.75_pos.fits
- day90.00_myshell_grid30_tau1.00_ff0.75_tau_per_pc.fits
- day90.00_myshell_subgrids_grid30_tau1.00_ff0.75_pos.fits
- day90.00_myshell_subgrids_grid30_tau1.00_ff0.75_tau_per_pc.fits
- day90.00_mytorus_theta5.00_grid30_tau1.00_pos.fits
- day90.00_mytorus_theta5.00_grid30_tau1.00_solid_pos.fits
- day90.00_mytorus_theta5.00_grid30_tau1.00_solid_tau_per_pc.fits
- day90.00_mytorus_theta5.00_grid30_tau1.00_tau_per_pc.fits
- makefits
- writingFITS_USEME.c

LIST OF ABBREVIATIONS

2MASS	2 Micron All-Sky Survey
AGB	Asymptotic Giant Branch
AGN	Active Galactic Nucleus
ANDICAM	A Novel Dual Imaging CAMera
APO	Apache Point Observatory
ASM	All-Sky Monitor
AURA	Association of Universities for Research in Astronomy
COBE	COsmic Background Explorer
CorMASS	Cornell Massachusetts Slit Spectrograph
CTIO	Cerro Tololo Inter-american Observatory
DIRBE	Diffuse Infrared Background Experiment
DIRTY	DustI Radiative Transfer, Yeah!
ESA	European Space Agency
ff	Filing factor
FITS	Flexible Image Transport System
FWHM	Full-Width Half Max
FWZI	Full-Width Zero Intensity
IAU	International Astronomical Union
IR	Infrared
IRAF	Image Reduction and Analysis Facility
IRAS	Infrared Astronomical Satellite
ISM	Interstellar Medium
JPL	Jet Propulsion Lab
KPNO	Kitt Peak National Observatory
LMC	Large Magellanic Cloud
LSST	Large Synoptic Survey Telescope
MMRD	Maximum Magnitude Rate of Decline
MW	Milky Way
NASA	National Aeronautics and Space Administration
NICFPS	Near-Infrared Camera and Fabry-Perot Spectrometer
NOAO	National Optical Astronomy Observatory
NSF	National Science Foundation
PCA	Proportional Counter Array
RXTE	Rossi X-ray Timing Explorer
SED	Spectral Energy Distribution
SMARTS	Small and Moderate Aperture Research Telescope System
SMC	Small Magellanic Cloud
SN	Supernova
SQIID	Simultaneous Quad Infrared Imaging Device
STAR-PET	Stellar Performance Estimation Tool
STScI	Space Telescope Science Institute
UV	Ultraviolet

1. INTRODUCTION

1.1. Exoplanets

The field of exoplanets is exciting, as shown by **?**. In this thesis I present evidence for whales on exoplanets. I back up my claim with really bad statistics.

In §1.2 we talk in extensive detail about the biology and presumed intelligence of the discovered whales.

We conclude that we should worship these exowhales as our benevolant overlords, (see Chapter 1.2).

1.2. Whales Whales Whales Whales Whales Whales Whales Whales Whales Whales Whales Whales Whales Whales Whales

Whales are the gentle giants of the sea. Their natural enemy is the harpoon. It's theorized by **?** that they could exist in the upper atmosphers of exoplanets[1].

[1]Via the use of magic and JRAF

2. OBSERVATIONS OF WHALES IN KEPLER DATA USING EXOACOUSTIC IMAGING TECHNIQUES

2.1. Observing an Exowhale

We observed a certain star with an exoplanet through a telescope. In Figure 2.1 we plot a theoretical star-whale system.

3. Further Whale Observations

We get into detail about exowhales.

3.1. Whales and You: What you Need to Know

A subsection on whales and you.

3.1.1. Whales: The Noisy Killer

Everyone can hear you scream underwater.

3.1.1.1. Whale Colors A paragraph, (what you might want to label a subsubsubsection), and whale chromotography. We could go as deep in sections as a subparagraph, but, well, let's not.

Instead let's show a rotated deluxetable on whales with errorbars in Table 3.2.

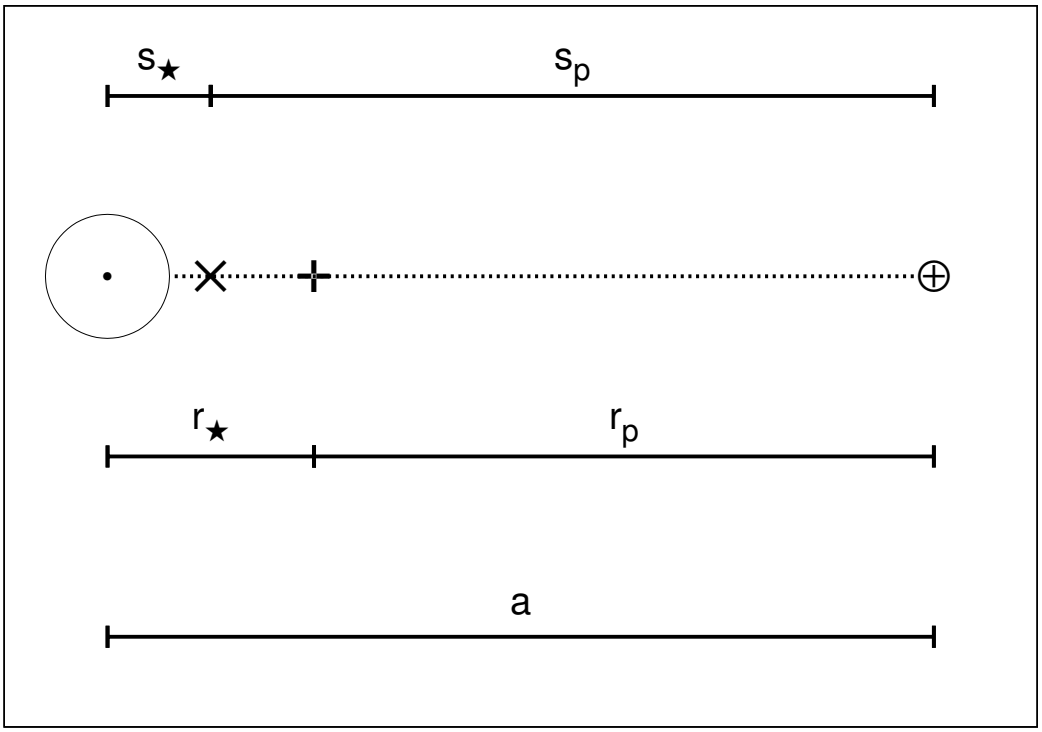

Fig. 2.1.— An illustration of a system containing a star, shown on the left, and a whale, shown on the right, separated by a distance a, not to scale. The star and whale lie at distances of $r_\star$ and r_p, respectively, from the barycenter of the system, which is marked via a "+" symbol. Similarly, the star and whale lie at distances of $s_\star$ and s_p, respectively, from the photocenter of the system, which is marked via a "×" symbol. All distances are sky-projected distances along the semi-major axis of the system, and thus are independent of the system's inclination. Note that although in this illustration the photocenter is to the left of the barycenter, it can lie anywhere between the star and whale.

Table 2.1. Currently Known Exoplanets with the Most Negative α_{WHALE} Values

Name	D (pc)	$M_\star$ ($M_\odot$)	$R_\star$ ($R_\odot$)	$T_\star$ (K)	M_p (M_J)	R_p (R_J)	P (Days)	α_{WHALE} (μas)
K Band (2.19 μm)								
WASP-12 b	427	1.28	1.63	6300	1.35	1.79	1.091	-0.05
WASP-19 b	250	0.93	0.99	5500	1.11	1.39	0.789	-0.05
WASP-33 b	115	1.50	1.44	7430	2.05	1.50	1.220	-0.04
55 Cnc e	12	0.96	0.96	5234	0.03	0.19	0.737	-0.01
CoRoT-1 b	480	0.95	1.11	5950	1.03	1.49	1.509	-0.01
L Band (3.45 μm)								
HD 209458 b	49	1.13	1.16	6065	0.69	1.36	3.525	-0.23
WASP-33 b	115	1.50	1.44	7430	2.05	1.50	1.220	-0.20
WASP-19 b	250	0.93	0.99	5500	1.11	1.39	0.789	-0.15
WASP-17 b	300	1.19	1.20	6550	0.49	1.51	3.735	-0.11
WASP-12 b	427	1.28	1.63	6300	1.35	1.79	1.091	-0.10
M Band (4.75 μm)								
HD 209458 b	49	1.13	1.16	6065	0.69	1.36	3.525	-0.66
HD 189733 b	19	0.81	0.76	5040	1.14	1.14	2.219	-0.47
WASP-33 b	115	1.50	1.44	7430	2.05	1.50	1.220	-0.29
WASP-19 b	250	0.93	0.99	5500	1.11	1.39	0.789	-0.21
WASP-17 b	300	1.19	1.20	6550	0.49	1.51	3.735	-0.19
N Band (10.0 μm)								
HD 189733 b	19	0.81	0.76	5040	1.14	1.14	2.219	-3.04
HD 209458 b	49	1.13	1.16	6065	0.69	1.36	3.525	-1.53
Gliese 436 b	10	0.45	0.46	3684	0.07	0.38	2.644	-0.95
WASP-34 b	120	1.01	0.93	5700	0.58	1.22	4.318	-0.64
GJ 1214 b	12	0.16	0.21	3026	0.02	0.24	1.580	-0.59

Table 3.2. Modeling Results: Median Values and Associated 1σ Uncertainties

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
PDC Light Curve With Eccentricity Fixed to Zero										
2.01	$0.0108^{+0.0013}_{-0.0011}$	$0.254^{+0.005}_{-0.005}$	$0.0769^{+0.0004}_{-0.0004}$	$83.92^{+0.7045}_{-0.5848}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.204732^{+3.1e-06}_{-3.0e-06}$	$4954.35796^{+0.00013}_{-0.00013}$	$0.421^{+0.07}_{-0.07}$	26.5
5.01	$-0.0088^{+0.0088}_{-0.0097}$	$0.123^{+0.010}_{-0.013}$	$0.0356^{+0.0009}_{-0.0011}$	$83.60^{+0.7978}_{-0.5911}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.780381^{+6.7e-05}_{-6.7e-05}$	$4965.97227^{+0.00119}_{-0.00121}$	$0.300^{+0.72}_{-0.35}$	2.69
10.01	$0.0014^{+0.0033}_{-0.0013}$	$0.151^{+0.004}_{-0.004}$	$0.0938^{+0.0006}_{-0.0007}$	$84.68^{+0.3495}_{-0.2975}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.522511^{+1.5e-05}_{-1.6e-05}$	$4954.11838^{+0.00043}_{-0.00041}$	$-5.752^{+4.04}_{-64.5}$	4.31
13.01	$0.0248^{+0.0013}_{-0.0015}$	$0.294^{+0.005}_{-0.006}$	$0.0659^{+0.0002}_{-0.0003}$	$79.79^{+0.5070}_{-0.4079}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.763589^{+2.3e-06}_{-2.3e-06}$	$4953.56510^{+0.00013}_{-0.00014}$	$0.339^{+0.02}_{-0.02}$	15.9
18.01	$0.0000^{+0.0001}_{-0.0000}$	$0.174^{+0.027}_{-0.005}$	$0.0783^{+0.0025}_{-0.0007}$	$87.64^{+1.7674}_{-3.6176}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.548460^{+2.4e-05}_{-2.5e-05}$	$4955.90081^{+0.00068}_{-0.00064}$	$-78.785^{+238.}_{-525.}$	9.33
64.01	$0.0207^{+0.0104}_{-0.0100}$	$0.283^{+0.018}_{-0.019}$	$0.0425^{+0.0018}_{-0.0013}$	$75.01^{+1.1206}_{-1.0527}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.951178^{+2.8e-05}_{-2.9e-05}$	$4990.53822^{+0.00086}_{-0.00086}$	$-0.312^{+0.62}_{-0.84}$	10.4
97.01	$0.0066^{+0.0017}_{-0.0016}$	$0.156^{+0.003}_{-0.004}$	$0.0817^{+0.0005}_{-0.0005}$	$85.93^{+0.4176}_{-0.3637}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.885495^{+1.7e-05}_{-1.7e-05}$	$4967.27590^{+0.00030}_{-0.00031}$	$0.115^{+0.24}_{-0.23}$	2.24
102.01	$0.0140^{+0.0089}_{-0.0101}$	$0.199^{+0.026}_{-0.021}$	$0.0284^{+0.0008}_{-0.0007}$	$84.17^{+2.8540}_{-2.5667}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.735114^{+2.1e-05}_{-2.1e-05}$	$4968.06072^{+0.00101}_{-0.00102}$	$-0.187^{+0.34}_{-0.56}$	2.32
144.01	$0.0353^{+0.0337}_{-0.0292}$	$0.127^{+0.026}_{-0.012}$	$0.0352^{+0.0021}_{-0.0012}$	$86.86^{+2.3598}_{-2.5586}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.176149^{+1.5e-04}_{-1.6e-04}$	$4966.09112^{+0.00322}_{-0.00310}$	$2.019^{+5.88}_{-1.25}$	6.92
186.01	$-0.0014^{+0.0026}_{-0.0027}$	$0.126^{+0.005}_{-0.003}$	$0.1218^{+0.0011}_{-0.0008}$	$88.51^{+1.3964}_{-0.8215}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.243268^{+1.3e-05}_{-1.4e-05}$	$4966.66796^{+0.00037}_{-0.00036}$	$0.051^{+0.93}_{-1.12}$	3.20
188.01	$0.0033^{+0.0024}_{-0.0022}$	$0.092^{+0.004}_{-0.004}$	$0.1155^{+0.0016}_{-0.0018}$	$87.37^{+0.4475}_{-0.3527}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.797023^{+1.2e-05}_{-1.2e-05}$	$4966.50793^{+0.00029}_{-0.00028}$	$-0.309^{+0.43}_{-0.68}$	2.14
195.01	$0.0047^{+0.0027}_{-0.0030}$	$0.107^{+0.004}_{-0.004}$	$0.1165^{+0.0011}_{-0.0013}$	$86.42^{+0.3423}_{-0.2949}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.217522^{+1.2e-05}_{-1.3e-05}$	$4966.63096^{+0.00033}_{-0.00032}$	$-0.132^{+0.42}_{-0.56}$	2.38
196.01	$0.0060^{+0.0019}_{-0.0019}$	$0.221^{+0.005}_{-0.006}$	$0.1022^{+0.0007}_{-0.0008}$	$82.05^{+0.4642}_{-0.3994}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.855561^{+5.0e-06}_{-5.4e-06}$	$4970.18013^{+0.00024}_{-0.00023}$	$-0.168^{+0.19}_{-0.25}$	2.33
199.01	$0.0029^{+0.0030}_{-0.0032}$	$0.151^{+0.006}_{-0.007}$	$0.0963^{+0.0009}_{-0.0009}$	$86.81^{+1.0287}_{-0.7643}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.268695^{+1.7e-05}_{-1.6e-05}$	$4970.48096^{+0.00043}_{-0.00044}$	$0.079^{+0.41}_{-0.44}$	1.40
201.01	$-0.0059^{+0.0051}_{-0.0051}$	$0.093^{+0.009}_{-0.005}$	$0.0800^{+0.0021}_{-0.0012}$	$88.31^{+1.5193}_{-1.1075}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.225373^{+2.1e-05}_{-2.2e-05}$	$4970.56037^{+0.00039}_{-0.00039}$	$1.145^{+1.92}_{-0.81}$	3.60
202.01	$0.0053^{+0.0023}_{-0.0023}$	$0.225^{+0.004}_{-0.004}$	$0.1040^{+0.0006}_{-0.0006}$	$80.75^{+0.2992}_{-0.2744}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.720867^{+4.4e-06}_{-4.7e-06}$	$4966.02007^{+0.00023}_{-0.00023}$	$-0.333^{+0.22}_{-0.38}$	8.81
204.01	$-0.0019^{+0.0032}_{-0.0041}$	$0.151^{+0.012}_{-0.014}$	$0.0817^{+0.0017}_{-0.0022}$	$85.16^{+1.4103}_{-0.9589}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.246708^{+2.4e-05}_{-2.6e-05}$	$4966.37897^{+0.00067}_{-0.00064}$	$1.579^{+6.48}_{-3.05}$	2.08
229.01	$0.0000^{+0.0004}_{-0.0000}$	$0.400^{+0.005}_{-0.005}$	$0.2872^{+0.0327}_{-0.0289}$	$67.77^{+0.3073}_{-0.3087}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.573190^{+8.5e-05}_{-8.7e-05}$	$4967.93368^{+0.00196}_{-0.00200}$	$-2.565^{+3.04}_{-27.4}$	1.98
356.01	$0.0007^{+0.0140}_{-0.0115}$	$0.169^{+0.055}_{-0.026}$	$0.0334^{+0.0026}_{-0.0013}$	$84.64^{+3.6556}_{-4.5146}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.827099^{+3.1e-05}_{-3.2e-05}$	$5003.52457^{+0.00093}_{-0.00093}$	$-0.007^{+0.81}_{-1.10}$	1.52
412.01	$0.0063^{+0.0116}_{-0.0121}$	$0.100^{+0.025}_{-0.008}$	$0.0571^{+0.0030}_{-0.0012}$	$87.79^{+1.7520}_{-2.3886}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.146994^{+5.6e-05}_{-5.7e-05}$	$5003.32536^{+0.00073}_{-0.00075}$	$-0.487^{+1.49}_{-2.00}$	2.64
421.01	$-0.0059^{+0.0048}_{-0.0042}$	$0.076^{+0.005}_{-0.005}$	$0.1197^{+0.0021}_{-0.0024}$	$88.00^{+0.5723}_{-0.4216}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.454225^{+2.2e-05}_{-2.3e-05}$	$5005.81890^{+0.00028}_{-0.00026}$	$0.137^{+0.83}_{-0.72}$	4.01
433.01	$0.0001^{+0.0162}_{-0.0202}$	$0.352^{+0.055}_{-0.070}$	$0.2406^{+0.1861}_{-0.1474}$	$70.78^{+4.5618}_{-3.4365}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.030457^{+1.5e-04}_{-1.4e-04}$	$5004.09086^{+0.00179}_{-0.00180}$	$0.033^{+0.56}_{-0.10}$	7.51
611.01	$-0.0030^{+0.0078}_{-0.0075}$	$0.126^{+0.009}_{-0.006}$	$0.0760^{+0.0077}_{-0.0022}$	$83.75^{+0.3507}_{-0.5390}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.251646^{+2.8e-05}_{-2.6e-05}$	$5004.05985^{+0.00038}_{-0.00040}$	$-0.039^{+0.73}_{-0.74}$	2.12
684.01	$0.0802^{+0.0491}_{-0.0439}$	$0.066^{+0.028}_{-0.016}$	$0.0269^{+0.0029}_{-0.0019}$	$87.36^{+1.6669}_{-2.0032}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.035328^{+1.9e-04}_{-1.8e-04}$	$5005.25386^{+0.00223}_{-0.00229}$	$-0.183^{+0.17}_{-0.32}$	2.11
760.01	$0.0023^{+0.0054}_{-0.0052}$	$0.094^{+0.003}_{-0.003}$	$0.1055^{+0.0013}_{-0.0013}$	$85.85^{+0.1909}_{-0.1787}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.959343^{+4.4e-05}_{-4.4e-05}$	$5005.25676^{+0.00043}_{-0.00045}$	$-0.300^{+1.14}_{-1.38}$	1.83
801.01	$0.0061^{+0.0067}_{-0.0059}$	$0.221^{+0.021}_{-0.023}$	$0.0865^{+0.0023}_{-0.0025}$	$83.93^{+3.0796}_{-1.9812}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.625498^{+1.1e-05}_{-1.1e-05}$	$5003.82699^{+0.00035}_{-0.00037}$	$-0.722^{+0.87}_{-2.05}$	2.81
809.01	$-0.0023^{+0.0041}_{-0.0048}$	$0.163^{+0.017}_{-0.007}$	$0.1177^{+0.0027}_{-0.0011}$	$87.56^{+2.0953}_{-2.2216}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.594742^{+7.1e-06}_{-7.1e-06}$	$5003.64754^{+0.00024}_{-0.00023}$	$0.779^{+2.22}_{-2.24}$	3.47
813.01	$-0.0166^{+0.0094}_{-0.0091}$	$0.089^{+0.017}_{-0.012}$	$0.0897^{+0.0042}_{-0.0031}$	$87.62^{+2.2020}_{-1.5063}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.895887^{+5.2e-05}_{-5.4e-05}$	$5003.52771^{+0.00069}_{-0.00066}$	$-0.070^{+0.34}_{-0.42}$	1.72

Table 3.2 (continued)

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
830.01	$0.0024^{+0.0031}_{-0.0032}$	$0.099^{+0.006}_{-0.002}$	$0.1370^{+0.0026}_{-0.0010}$	$89.03^{+0.8555}_{-1.0199}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.525638^{+1.1e-05}_{-1.1e-05}$	$5003.04715^{+0.00015}_{-0.00015}$	$-0.775^{+1.88}_{-2.58}$	4.23
838.01	$0.0001^{+0.0044}_{-0.0028}$	$0.118^{+0.009}_{-0.010}$	$0.1047^{+0.0235}_{-0.0139}$	$84.18^{+0.5842}_{-0.5591}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.859423^{+8.1e-05}_{-8.2e-05}$	$5006.01042^{+0.00077}_{-0.00082}$	$1.279^{+100.}_{-18.1}$	7.50
840.01	$-0.0045^{+0.0061}_{-0.0061}$	$0.113^{+0.008}_{-0.008}$	$0.1048^{+0.0024}_{-0.0026}$	$85.44^{+0.5689}_{-0.4960}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.040348^{+2.2e-05}_{-2.3e-05}$	$5002.94813^{+0.00041}_{-0.00042}$	$0.104^{+1.14}_{-1.13}$	4.10
843.01	$-0.0007^{+0.0052}_{-0.0135}$	$0.132^{+0.027}_{-0.032}$	$0.0544^{+0.0028}_{-0.0034}$	$84.60^{+2.7198}_{-1.8763}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.190630^{+1.1e-04}_{-1.1e-04}$	$5004.43891^{+0.00134}_{-0.00137}$	$0.935^{+61.1}_{-2.33}$	1.51
897.01	$0.0032^{+0.0036}_{-0.0032}$	$0.159^{+0.008}_{-0.010}$	$0.1166^{+0.0016}_{-0.0019}$	$85.30^{+0.9264}_{-0.7186}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.052344^{+8.8e-06}_{-8.7e-06}$	$5002.89010^{+0.00022}_{-0.00022}$	$-1.469^{+1.28}_{-4.03}$	2.58
908.01	$0.0050^{+0.0060}_{-0.0052}$	$0.092^{+0.012}_{-0.004}$	$0.0839^{+0.0026}_{-0.0010}$	$88.63^{+1.2397}_{-1.4946}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.708363^{+4.8e-05}_{-4.8e-05}$	$5004.44523^{+0.00048}_{-0.00046}$	$0.200^{+0.78}_{-0.61}$	1.47
913.01	$0.0021^{+0.0027}_{-0.0027}$	$0.105^{+0.004}_{-0.002}$	$0.1240^{+0.0012}_{-0.0007}$	$89.05^{+0.8784}_{-0.8239}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.082286^{+2.0e-05}_{-1.9e-05}$	$5002.63669^{+0.00023}_{-0.00023}$	$0.162^{+1.88}_{-1.85}$	2.82
931.01	$0.0007^{+0.0034}_{-0.0010}$	$0.112^{+0.009}_{-0.003}$	$0.1201^{+0.0024}_{-0.0008}$	$88.67^{+1.0903}_{-1.4164}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.855646^{+2.3e-05}_{-2.2e-05}$	$5003.67760^{+0.00028}_{-0.00030}$	$-2.995^{+6.90}_{-45.3}$	2.63
961.02	$0.0017^{+0.0198}_{-0.0184}$	$0.292^{+0.076}_{-0.072}$	$0.0486^{+0.0108}_{-0.0050}$	$75.39^{+4.6244}_{-4.8234}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$0.453296^{+6.3e-06}_{-6.3e-06}$	$4966.86709^{+0.00116}_{-0.00114}$	$0.048^{+0.32}_{-0.34}$	1.95
961.03	$0.0159^{+0.0472}_{-0.0397}$	$0.060^{+0.004}_{-0.004}$	$0.4879^{+1.0011}_{-0.4024}$	$86.69^{+0.2489}_{-0.2260}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.865033^{+5.5e-05}_{-5.8e-05}$	$4966.79647^{+0.00259}_{-0.00251}$	$0.000^{+0.00}_{-0.00}$	2.30
1419.01	$0.0131^{+0.0145}_{-0.0130}$	$0.322^{+0.049}_{-0.050}$	$0.0555^{+0.0128}_{-0.0034}$	$73.38^{+3.0786}_{-3.1111}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.336074^{+2.7e-05}_{-2.8e-05}$	$5011.25875^{+0.00087}_{-0.00092}$	$-0.874^{+0.85}_{-2.18}$	1.99
1459.01	$0.0267^{+0.0110}_{-0.0127}$	$0.403^{+0.044}_{-0.061}$	$0.0930^{+0.0367}_{-0.0143}$	$69.77^{+4.0056}_{-3.0350}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$0.692024^{+7.7e-06}_{-7.2e-06}$	$4966.11024^{+0.00088}_{-0.00092}$	$1.794^{+1.71}_{-0.97}$	9.55
				CLM Light Curve With Eccentricity Fixed to Zero						
1.01	$-0.0002^{+0.0004}_{-0.0004}$	$0.142^{+0.000}_{-0.000}$	$0.1250^{+0.0002}_{-0.0002}$	$83.90^{+0.0307}_{-0.0291}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.470614^{+1.3e-06}_{-1.3e-06}$	$4955.76254^{+0.00005}_{-0.00005}$	$0.250^{+0.80}_{-0.80}$	1.94
2.01	$0.0113^{+0.0014}_{-0.0013}$	$0.255^{+0.005}_{-0.005}$	$0.0766^{+0.0004}_{-0.0004}$	$83.74^{+0.6427}_{-0.5590}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.204733^{+3.1e-06}_{-3.0e-06}$	$4954.35793^{+0.00013}_{-0.00014}$	$0.240^{+0.06}_{-0.04}$	7.61
5.01	$-0.0021^{+0.0079}_{-0.0087}$	$0.114^{+0.012}_{-0.016}$	$0.0354^{+0.0011}_{-0.0013}$	$84.15^{+0.9448}_{-0.7226}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.780406^{+6.8e-05}_{-7.0e-05}$	$4965.97184^{+0.00120}_{-0.00121}$	$0.238^{+0.92}_{-0.92}$	2.08
10.01	$0.0019^{+0.0030}_{-0.0032}$	$0.159^{+0.005}_{-0.005}$	$0.0929^{+0.0007}_{-0.0007}$	$84.11^{+0.3818}_{-0.3455}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.522496^{+1.9e-05}_{-1.9e-05}$	$4954.11867^{+0.00052}_{-0.00053}$	$-1.296^{+2.76}_{-4.42}$	2.71
13.01	$0.0253^{+0.0012}_{-0.0016}$	$0.287^{+0.005}_{-0.005}$	$0.0656^{+0.0002}_{-0.0003}$	$80.36^{+0.4700}_{-0.4390}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.763585^{+1.6e-06}_{-1.7e-06}$	$4953.56529^{+0.00008}_{-0.00009}$	$0.286^{+0.02}_{-0.01}$	3.89
17.01	$-0.0015^{+0.0015}_{-0.0019}$	$0.165^{+0.005}_{-0.006}$	$0.0955^{+0.0008}_{-0.0009}$	$85.73^{+0.6314}_{-0.5396}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.234699^{+1.2e-05}_{-1.2e-05}$	$4954.48575^{+0.00035}_{-0.00036}$	$1.249^{+3.52}_{-1.93}$	2.65
18.01	$-0.0037^{+0.0040}_{-0.0044}$	$0.173^{+0.016}_{-0.004}$	$0.0771^{+0.0015}_{-0.0005}$	$87.86^{+1.6741}_{-2.5008}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.548447^{+2.6e-05}_{-2.7e-05}$	$4955.90128^{+0.00074}_{-0.00072}$	$1.457^{+2.51}_{-3.06}$	3.73
20.01	$0.0003^{+0.0010}_{-0.0005}$	$0.142^{+0.002}_{-0.002}$	$0.1174^{+0.0005}_{-0.0005}$	$88.17^{+0.5236}_{-0.4041}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.437979^{+1.1e-05}_{-1.0e-05}$	$5004.00819^{+0.00011}_{-0.00011}$	$-2.544^{+4.51}_{-30.3}$	1.57
64.01	$0.0312^{+0.0117}_{-0.0112}$	$0.304^{+0.028}_{-0.019}$	$0.0427^{+0.0050}_{-0.0014}$	$73.80^{+1.1307}_{-1.7207}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.951144^{+3.3e-05}_{-3.5e-05}$	$4990.53863^{+0.00112}_{-0.00109}$	$-0.120^{+0.39}_{-0.51}$	7.24
97.01	$0.0084^{+0.0022}_{-0.0022}$	$0.154^{+0.004}_{-0.004}$	$0.0808^{+0.0005}_{-0.0006}$	$86.17^{+0.5356}_{-0.4202}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.885522^{+2.0e-05}_{-2.0e-05}$	$4967.27550^{+0.00034}_{-0.00034}$	$-0.174^{+0.06}_{-0.09}$	2.06
127.01	$-0.0026^{+0.0031}_{-0.0037}$	$0.117^{+0.008}_{-0.008}$	$0.0982^{+0.0018}_{-0.0018}$	$87.45^{+1.3596}_{-0.9077}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.578772^{+2.1e-05}_{-2.1e-05}$	$4967.02976^{+0.00048}_{-0.00048}$	$0.151^{+0.87}_{-0.93}$	3.80
128.01	$-0.0007^{+0.0006}_{-0.0029}$	$0.116^{+0.003}_{-0.003}$	$0.0983^{+0.0007}_{-0.0008}$	$85.73^{+0.2412}_{-0.2261}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.942764^{+2.7e-05}_{-2.6e-05}$	$4969.32912^{+0.00043}_{-0.00044}$	$3.129^{+88.2}_{-2.57}$	5.15
144.01	$0.0306^{+0.0323}_{-0.0303}$	$0.127^{+0.052}_{-0.011}$	$0.0290^{+0.0030}_{-0.0011}$	$86.94^{+2.4182}_{-4.6598}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.176232^{+2.6e-04}_{-2.3e-04}$	$4966.09100^{+0.00508}_{-0.00522}$	$-0.253^{+0.42}_{-0.75}$	2.32
183.01	$0.0009^{+0.0026}_{-0.0024}$	$0.143^{+0.005}_{-0.006}$	$0.1160^{+0.0010}_{-0.0011}$	$86.89^{+0.7468}_{-0.5931}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.684312^{+9.8e-06}_{-9.3e-06}$	$4966.35461^{+0.00030}_{-0.00031}$	$-0.485^{+1.71}_{-2.27}$	3.36
186.01	$-0.0044^{+0.0035}_{-0.0035}$	$0.125^{+0.016}_{-0.003}$	$0.1161^{+0.0032}_{-0.0008}$	$88.53^{+1.2341}_{-2.1877}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.243284^{+2.0e-05}_{-2.1e-05}$	$4966.66745^{+0.00052}_{-0.00055}$	$1.022^{+1.42}_{-0.49}$	1.87
188.01	$-0.0034^{+0.0031}_{-0.0032}$	$0.096^{+0.005}_{-0.006}$	$0.1119^{+0.0019}_{-0.0023}$	$87.02^{+0.5816}_{-0.4387}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.797013^{+1.8e-05}_{-1.9e-05}$	$4966.50811^{+0.00042}_{-0.00043}$	$0.682^{+1.17}_{-0.34}$	1.69

Table 3.2 (continued)

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
195.01	$0.0000^{+0.0016}_{-0.0000}$	$0.120^{+0.004}_{-0.004}$	$0.1163^{+0.0011}_{-0.0012}$	$85.39^{+0.2986}_{-0.2548}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.217557^{+1.7e-05}_{-1.7e-05}$	$4966.63025^{+0.00043}_{-0.00045}$	$-2.605^{+5.29}_{-183.}$	1.36
196.01	$0.0053^{+0.0027}_{-0.0026}$	$0.222^{+0.007}_{-0.008}$	$0.0987^{+0.0009}_{-0.0011}$	$81.90^{+0.6662}_{-0.5586}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.855556^{+6.7e-06}_{-6.5e-06}$	$4970.18029^{+0.00029}_{-0.00029}$	$-0.070^{+0.13}_{-0.20}$	1.21
201.01	$-0.0015^{+0.0030}_{-0.0042}$	$0.094^{+0.010}_{-0.006}$	$0.0795^{+0.0022}_{-0.0013}$	$88.18^{+1.6531}_{-1.1858}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.225404^{+2.8e-05}_{-2.7e-05}$	$4970.55976^{+0.00050}_{-0.00053}$	$1.572^{+10.9}_{-3.07}$	1.91
202.01	$0.0040^{+0.0026}_{-0.0031}$	$0.231^{+0.005}_{-0.006}$	$0.0981^{+0.0007}_{-0.0007}$	$80.22^{+0.3884}_{-0.3450}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.720865^{+6.1e-06}_{-6.3e-06}$	$4966.02018^{+0.00032}_{-0.00031}$	$0.041^{+0.30}_{-0.41}$	1.47
203.01	$-0.0007^{+0.0029}_{-0.0029}$	$0.211^{+0.008}_{-0.009}$	$0.1286^{+0.0014}_{-0.0014}$	$86.30^{+1.6250}_{-1.0981}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.485701^{+4.4e-06}_{-4.2e-06}$	$4965.79327^{+0.00024}_{-0.00025}$	$0.648^{+3.78}_{-2.04}$	19.4
204.01	$0.0052^{+0.0088}_{-0.0085}$	$0.181^{+0.019}_{-0.027}$	$0.0737^{+0.0022}_{-0.0032}$	$82.70^{+2.0921}_{-1.2986}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.246635^{+5.5e-05}_{-5.8e-05}$	$4966.38059^{+0.00156}_{-0.00149}$	$-0.759^{+2.15}_{-2.36}$	3.28
214.01	$-0.0062^{+0.0113}_{-0.0121}$	$0.107^{+0.024}_{-0.016}$	$0.0873^{+0.0570}_{-0.0059}$	$84.86^{+0.9593}_{-1.5310}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.311885^{+5.1e-05}_{-5.2e-05}$	$4964.74112^{+0.00140}_{-0.00138}$	$0.297^{+1.53}_{-0.94}$	9.26
217.01	$-0.0035^{+0.0048}_{-0.0051}$	$0.308^{+0.041}_{-0.028}$	$0.9595^{+0.5014}_{-0.2870}$	$73.38^{+1.7996}_{-2.7018}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.905132^{+4.7e-05}_{-5.0e-05}$	$4966.41317^{+0.00103}_{-0.00107}$	$0.001^{+0.02}_{-0.02}$	14.1
229.01	$-0.0001^{+0.0033}_{-0.0124}$	$0.118^{+0.030}_{-0.010}$	$0.0481^{+0.0028}_{-0.0011}$	$87.30^{+2.0647}_{-2.8908}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.573283^{+9.2e-05}_{-9.5e-05}$	$4967.93051^{+0.00220}_{-0.00214}$	$0.473^{+16.3}_{-5.24}$	1.55
254.01	$-0.0043^{+0.0070}_{-0.0074}$	$0.117^{+0.008}_{-0.010}$	$0.1704^{+0.0047}_{-0.0054}$	$86.47^{+0.8810}_{-0.6047}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.455267^{+2.9e-05}_{-2.8e-05}$	$5003.82069^{+0.00067}_{-0.00068}$	$0.567^{+1.48}_{-1.55}$	6.44
356.01	$0.0492^{+0.0240}_{-0.0219}$	$0.144^{+0.036}_{-0.006}$	$0.0306^{+0.0017}_{-0.0006}$	$88.06^{+1.4945}_{-4.8438}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.826966^{+5.1e-05}_{-5.0e-05}$	$5003.52754^{+0.00143}_{-0.00145}$	$-0.024^{+0.14}_{-0.18}$	2.29
412.01	$0.0002^{+0.0060}_{-0.0001}$	$0.098^{+0.031}_{-0.008}$	$0.0477^{+0.0032}_{-0.0012}$	$87.86^{+1.6992}_{-2.8928}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.146970^{+1.3e-04}_{-1.3e-04}$	$5003.32630^{+0.00177}_{-0.00176}$	$-8.920^{+8.77}_{-339.}$	4.62
421.01	$-0.0010^{+0.0046}_{-0.0048}$	$0.076^{+0.006}_{-0.008}$	$0.1157^{+0.0027}_{-0.0038}$	$87.96^{+1.0035}_{-0.5585}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.454260^{+3.5e-05}_{-3.5e-05}$	$5005.81883^{+0.00041}_{-0.00042}$	$0.687^{+3.43}_{-1.77}$	2.07
433.01	$0.0001^{+0.0051}_{-0.0001}$	$0.094^{+0.027}_{-0.005}$	$0.0471^{+0.0032}_{-0.0012}$	$88.25^{+1.4186}_{-2.7352}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.030278^{+1.6e-04}_{-1.6e-04}$	$5004.09410^{+0.00190}_{-0.00191}$	$-5.396^{+18.5}_{-237.}$	1.58
611.01	$0.0025^{+0.0093}_{-0.0091}$	$0.154^{+0.024}_{-0.029}$	$0.1562^{+0.1307}_{-0.0764}$	$81.93^{+1.8034}_{-1.4920}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.251641^{+3.9e-05}_{-4.1e-05}$	$5004.06018^{+0.00058}_{-0.00056}$	$-0.010^{+0.13}_{-0.22}$	2.82
667.01	$0.0002^{+0.0247}_{-0.0018}$	$0.086^{+0.038}_{-0.009}$	$0.0775^{+0.0089}_{-0.0030}$	$87.96^{+1.7162}_{-3.0764}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.305106^{+2.4e-04}_{-2.3e-04}$	$5003.45531^{+0.00280}_{-0.00282}$	$-0.353^{+6.28}_{-66.9}$	2.33
684.01	$0.1004^{+0.0638}_{-0.0614}$	$0.049^{+0.010}_{-0.005}$	$0.0250^{+0.0014}_{-0.0012}$	$88.99^{+0.7713}_{-1.0734}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.035349^{+2.4e-04}_{-2.5e-04}$	$5005.25460^{+0.00308}_{-0.00304}$	$0.015^{+0.04}_{-0.05}$	1.86
760.01	$0.0020^{+0.0068}_{-0.0069}$	$0.096^{+0.004}_{-0.004}$	$0.1044^{+0.0017}_{-0.0017}$	$85.70^{+0.2468}_{-0.2116}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.959295^{+5.6e-05}_{-5.6e-05}$	$5005.25690^{+0.00056}_{-0.00056}$	$-0.112^{+0.56}_{-0.49}$	1.41
767.01	$0.0052^{+0.0038}_{-0.0038}$	$0.141^{+0.006}_{-0.007}$	$0.1224^{+0.0015}_{-0.0018}$	$85.95^{+0.6974}_{-0.5371}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.816536^{+1.5e-05}_{-1.6e-05}$	$5003.96629^{+0.00028}_{-0.00028}$	$-0.163^{+0.23}_{-0.46}$	1.81
801.01	$0.0130^{+0.0074}_{-0.0082}$	$0.207^{+0.038}_{-0.017}$	$0.0804^{+0.0038}_{-0.0017}$	$85.57^{+4.3150}_{-3.9176}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.625528^{+1.7e-05}_{-1.6e-05}$	$5003.82578^{+0.00053}_{-0.00054}$	$-0.184^{+0.24}_{-0.47}$	2.13
809.01	$0.0074^{+0.0052}_{-0.0051}$	$0.205^{+0.014}_{-0.017}$	$0.1153^{+0.0021}_{-0.0024}$	$83.03^{+1.3933}_{-1.0817}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.594732^{+1.1e-05}_{-1.0e-05}$	$5003.64783^{+0.00034}_{-0.00034}$	$0.028^{+0.19}_{-0.26}$	1.62
813.01	$-0.0113^{+0.0170}_{-0.0157}$	$0.081^{+0.022}_{-0.005}$	$0.0810^{+0.0049}_{-0.0016}$	$88.56^{+1.1321}_{-2.2494}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.895873^{+9.6e-05}_{-9.4e-05}$	$5003.52774^{+0.00122}_{-0.00125}$	$0.116^{+0.23}_{-0.20}$	1.84
830.01	$0.0012^{+0.0026}_{-0.0023}$	$0.099^{+0.005}_{-0.002}$	$0.1274^{+0.0021}_{-0.0011}$	$88.94^{+0.9826}_{-0.8831}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.525644^{+1.2e-05}_{-1.3e-05}$	$5003.04701^{+0.00019}_{-0.00017}$	$-1.527^{+3.24}_{-8.31}$	1.37
838.01	$-0.0151^{+0.0116}_{-0.0116}$	$0.152^{+0.015}_{-0.030}$	$0.1845^{+0.0840}_{-0.1044}$	$81.97^{+1.9229}_{-0.9304}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.859266^{+1.2e-04}_{-1.2e-04}$	$5006.01125^{+0.00113}_{-0.00114}$	$-0.043^{+0.04}_{-0.22}$	1.78
840.01	$-0.0033^{+0.0074}_{-0.0070}$	$0.112^{+0.011}_{-0.016}$	$0.0952^{+0.0031}_{-0.0043}$	$85.44^{+1.1176}_{-0.7342}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.040330^{+3.1e-05}_{-2.9e-05}$	$5002.94851^{+0.00051}_{-0.00050}$	$0.179^{+0.99}_{-0.69}$	2.33
843.01	$0.0269^{+0.0223}_{-0.0197}$	$0.140^{+0.045}_{-0.046}$	$0.0507^{+0.0039}_{-0.0044}$	$84.08^{+4.3353}_{-2.9613}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.190464^{+1.8e-04}_{-1.8e-04}$	$5004.44160^{+0.00207}_{-0.00221}$	$-0.188^{+0.18}_{-0.37}$	1.74
897.01	$0.0065^{+0.0054}_{-0.0055}$	$0.172^{+0.011}_{-0.013}$	$0.1163^{+0.0021}_{-0.0024}$	$84.24^{+1.0754}_{-0.8300}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.052357^{+1.5e-05}_{-1.4e-05}$	$5002.88992^{+0.00036}_{-0.00039}$	$-0.020^{+0.34}_{-0.45}$	2.27
908.01	$0.0176^{+0.0103}_{-0.0095}$	$0.093^{+0.020}_{-0.005}$	$0.0794^{+0.0041}_{-0.0013}$	$88.35^{+1.3065}_{-2.1367}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.708360^{+8.6e-05}_{-8.2e-05}$	$5004.44498^{+0.00085}_{-0.00087}$	$-0.167^{+0.11}_{-0.24}$	1.78
913.01	$0.0016^{+0.0038}_{-0.0041}$	$0.105^{+0.007}_{-0.003}$	$0.1098^{+0.0017}_{-0.0008}$	$88.83^{+1.0892}_{-1.1304}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$4.082304^{+3.0e-05}_{-3.1e-05}$	$5002.63661^{+0.00039}_{-0.00038}$	$-0.702^{+2.07}_{-2.44}$	1.82
1176.01	$-0.0016^{+0.0039}_{-0.0038}$	$0.138^{+0.011}_{-0.014}$	$0.1268^{+0.0034}_{-0.0046}$	$86.29^{+1.6953}_{-0.9589}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.973750^{+9.4e-06}_{-9.6e-06}$	$5011.68870^{+0.00021}_{-0.00021}$	$0.338^{+1.19}_{-0.97}$	1.87
1419.01	$0.0146^{+0.0371}_{-0.0304}$	$0.221^{+0.103}_{-0.068}$	$0.0475^{+0.0060}_{-0.0039}$	$80.02^{+5.1744}_{-6.7217}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$1.336124^{+5.1e-05}_{-4.9e-05}$	$5011.25829^{+0.00175}_{-0.00165}$	$-0.439^{+1.43}_{-1.95}$	1.91

Table 3.2 (continued)

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
1459.01	$0.0327^{+0.0157}_{-0.0151}$	$0.243^{+0.056}_{-0.035}$	$0.0637^{+0.0053}_{-0.0033}$	$79.92^{+2.7393}_{-3.8427}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$0.692019^{+9.5e-06}_{-9.5e-06}$	$4966.11081^{+0.00113}_{-0.00116}$	$2.865^{+2.60}_{-1.11}$	3.50
1541.01	$0.0494^{+0.0084}_{-0.0091}$	$0.192^{+0.005}_{-0.005}$	$0.1726^{+0.0014}_{-0.0017}$	$85.74^{+0.5331}_{-0.4268}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$2.379290^{+1.5e-05}_{-1.5e-05}$	$4966.65042^{+0.00050}_{-0.00055}$	$0.143^{+0.18}_{-0.15}$	29.8
1543.01	$0.0266^{+0.0225}_{-0.0236}$	$0.158^{+0.014}_{-0.006}$	$0.1422^{+0.0042}_{-0.0024}$	$87.93^{+1.8368}_{-1.6934}$	$0.000^{+0.000}_{-0.000}$	$0.000^{+0.000}_{-0.000}$	$3.964266^{+4.6e-05}_{-4.4e-05}$	$4969.02968^{+0.00091}_{-0.00091}$	$-1.080^{+1.05}_{-3.26}$	46.4
PDC Light Curve With Eccentricity Allowed To Vary										
2.01	$0.0106^{+0.0013}_{-0.0011}$	$0.270^{+0.013}_{-0.010}$	$0.0768^{+0.0003}_{-0.0004}$	$83.10^{+0.8755}_{-1.0221}$	$0.001^{+0.002}_{-0.002}$	$0.067^{+0.043}_{-0.034}$	$2.204732^{+3.1e-06}_{-3.0e-06}$	$4954.35797^{+0.00013}_{-0.00013}$	$0.442^{+0.07}_{-0.07}$	26.5
5.01	$0.0077^{+0.0211}_{-0.0100}$	$0.126^{+0.007}_{-0.009}$	$0.0357^{+0.0008}_{-0.0009}$	$83.38^{+0.7151}_{-0.4133}$	$0.014^{+0.028}_{-0.025}$	$0.009^{+0.040}_{-0.058}$	$4.780380^{+6.7e-05}_{-6.6e-05}$	$4965.97242^{+0.00127}_{-0.00121}$	$-0.141^{+0.31}_{-1.11}$	2.70
10.01	$0.0032^{+0.0043}_{-0.0027}$	$0.125^{+0.012}_{-0.006}$	$0.0938^{+0.0006}_{-0.0007}$	$86.30^{+0.3346}_{-0.6457}$	$-0.002^{+0.024}_{-0.023}$	$-0.188^{+0.089}_{-0.062}$	$3.522511^{+1.5e-05}_{-1.6e-05}$	$4954.11837^{+0.00046}_{-0.00046}$	$-2.726^{+1.65}_{-9.39}$	4.31
13.01	$0.0250^{+0.0013}_{-0.0015}$	$0.295^{+0.015}_{-0.011}$	$0.0657^{+0.0002}_{-0.0003}$	$79.74^{+0.8677}_{-1.1544}$	$0.002^{+0.001}_{-0.001}$	$0.020^{+0.049}_{-0.032}$	$1.763589^{+2.3e-06}_{-2.3e-06}$	$4953.56511^{+0.00013}_{-0.00014}$	$0.341^{+0.02}_{-0.02}$	15.9
18.01	$0.0023^{+0.0092}_{-0.0022}$	$0.171^{+0.041}_{-0.015}$	$0.0782^{+0.0010}_{-0.0006}$	$87.70^{+1.7823}_{-2.5452}$	$-0.018^{+0.121}_{-0.160}$	$-0.055^{+0.197}_{-0.111}$	$3.548460^{+2.4e-05}_{-2.6e-05}$	$4955.90075^{+0.00088}_{-0.00085}$	$-3.250^{+2.41}_{-30.4}$	9.32
64.01	$0.0134^{+0.0090}_{-0.0092}$	$0.231^{+0.015}_{-0.012}$	$0.0427^{+0.0027}_{-0.0013}$	$80.10^{+0.6878}_{-1.0034}$	$-0.009^{+0.012}_{-0.013}$	$-0.226^{+0.064}_{-0.064}$	$1.951177^{+2.8e-05}_{-2.9e-05}$	$4990.53809^{+0.00096}_{-0.00098}$	$-0.423^{+0.89}_{-1.41}$	10.4
97.01	$0.0070^{+0.0017}_{-0.0016}$	$0.155^{+0.012}_{-0.010}$	$0.0817^{+0.0005}_{-0.0005}$	$86.02^{+0.6034}_{-0.7233}$	$-0.000^{+0.003}_{-0.003}$	$-0.010^{+0.077}_{-0.071}$	$4.885495^{+1.7e-05}_{-1.7e-05}$	$4967.27590^{+0.00030}_{-0.00031}$	$0.115^{+0.23}_{-0.22}$	2.24
102.01	$0.0255^{+0.0095}_{-0.0120}$	$0.179^{+0.018}_{-0.014}$	$0.0303^{+0.0017}_{-0.0014}$	$84.56^{+0.7794}_{-0.9164}$	$0.010^{+0.009}_{-0.009}$	$-0.402^{+0.218}_{-0.183}$	$1.735108^{+2.1e-05}_{-2.1e-05}$	$4968.06104^{+0.00108}_{-0.00105}$	$-0.090^{+0.17}_{-0.21}$	2.32
144.01	$0.0712^{+0.0482}_{-0.0409}$	$0.263^{+0.020}_{-0.037}$	$0.0347^{+0.0006}_{-0.0005}$	$79.28^{+3.8171}_{-1.1387}$	$0.397^{+0.086}_{-0.058}$	$0.652^{+0.084}_{-0.173}$	$4.176174^{+1.7e-04}_{-1.7e-04}$	$4966.09365^{+0.00376}_{-0.00420}$	$1.016^{+1.47}_{-0.55}$	6.89
186.01	$-0.0031^{+0.0038}_{-0.0033}$	$0.119^{+0.014}_{-0.013}$	$0.1224^{+0.0011}_{-0.0010}$	$88.35^{+0.7668}_{-0.7526}$	$-0.002^{+0.028}_{-0.029}$	$-0.075^{+0.103}_{-0.127}$	$3.243267^{+1.3e-05}_{-1.4e-05}$	$4966.66801^{+0.00037}_{-0.00036}$	$0.027^{+0.46}_{-0.71}$	3.20
188.01	$0.0051^{+0.0030}_{-0.0030}$	$0.077^{+0.009}_{-0.009}$	$0.1153^{+0.0016}_{-0.0018}$	$88.16^{+0.4271}_{-0.4090}$	$-0.006^{+0.008}_{-0.008}$	$-0.174^{+0.120}_{-0.114}$	$3.797023^{+1.3e-05}_{-1.2e-05}$	$4966.50793^{+0.00028}_{-0.00028}$	$-0.212^{+0.26}_{-0.46}$	2.14
195.01	$0.0071^{+0.0034}_{-0.0033}$	$0.094^{+0.011}_{-0.011}$	$0.1160^{+0.0012}_{-0.0013}$	$87.22^{+0.5812}_{-0.6459}$	$0.006^{+0.006}_{-0.007}$	$-0.113^{+0.114}_{-0.121}$	$3.217521^{+1.2e-05}_{-1.2e-05}$	$4966.63098^{+0.00033}_{-0.00033}$	$-0.083^{+0.27}_{-0.35}$	2.38
196.01	$0.0073^{+0.0021}_{-0.0019}$	$0.202^{+0.015}_{-0.023}$	$0.1023^{+0.0007}_{-0.0008}$	$83.35^{+1.3374}_{-1.0172}$	$-0.008^{+0.007}_{-0.007}$	$-0.096^{+0.084}_{-0.116}$	$1.855561^{+5.1e-06}_{-5.3e-06}$	$4970.18009^{+0.00024}_{-0.00023}$	$-0.129^{+0.16}_{-0.18}$	2.33
199.01	$0.0051^{+0.0032}_{-0.0051}$	$0.141^{+0.017}_{-0.017}$	$0.0963^{+0.0009}_{-0.0009}$	$87.34^{+0.9351}_{-0.9736}$	$0.026^{+0.024}_{-0.023}$	$-0.069^{+0.116}_{-0.135}$	$3.268695^{+1.7e-05}_{-1.6e-05}$	$4970.48100^{+0.00043}_{-0.00044}$	$0.068^{+0.22}_{-0.23}$	1.40
201.01	$-0.0076^{+0.0061}_{-0.0053}$	$0.090^{+0.015}_{-0.008}$	$0.0796^{+0.0018}_{-0.0009}$	$88.72^{+1.1788}_{-1.2048}$	$-0.007^{+0.009}_{-0.009}$	$-0.010^{+0.131}_{-0.123}$	$4.225373^{+2.1e-05}_{-2.2e-05}$	$4970.56037^{+0.00040}_{-0.00039}$	$0.966^{+1.47}_{-0.62}$	3.60
202.01	$0.0069^{+0.0023}_{-0.0023}$	$0.198^{+0.009}_{-0.012}$	$0.1038^{+0.0006}_{-0.0006}$	$82.79^{+0.7640}_{-0.6781}$	$-0.017^{+0.006}_{-0.007}$	$-0.125^{+0.051}_{-0.062}$	$1.720867^{+4.4e-06}_{-4.6e-06}$	$4966.01997^{+0.00024}_{-0.00024}$	$-0.238^{+0.16}_{-0.23}$	8.81
204.01	$-0.0053^{+0.0046}_{-0.0056}$	$0.141^{+0.013}_{-0.015}$	$0.0817^{+0.0017}_{-0.0021}$	$85.87^{+0.9701}_{-0.7645}$	$-0.016^{+0.025}_{-0.027}$	$-0.073^{+0.131}_{-0.129}$	$3.246707^{+2.4e-05}_{-2.5e-05}$	$4966.37895^{+0.00068}_{-0.00069}$	$1.055^{+2.87}_{-0.64}$	2.08
229.01	$0.0264^{+0.0155}_{-0.0168}$	$0.148^{+0.022}_{-0.018}$	$0.0500^{+0.0014}_{-0.0008}$	$85.95^{+2.5816}_{-2.2049}$	$-0.043^{+0.014}_{-0.013}$	$0.236^{+0.134}_{-0.153}$	$3.573177^{+6.7e-05}_{-7.0e-05}$	$4967.93350^{+0.00156}_{-0.00154}$	$-0.332^{+0.37}_{-0.80}$	1.93
356.01	$0.0262^{+0.0151}_{-0.0201}$	$0.166^{+0.042}_{-0.014}$	$0.0347^{+0.0035}_{-0.0021}$	$84.64^{+0.9385}_{-2.1961}$	$-0.050^{+0.021}_{-0.026}$	$-0.215^{+0.365}_{-0.310}$	$1.827096^{+3.3e-05}_{-3.5e-05}$	$5003.52430^{+0.00109}_{-0.00116}$	$-0.029^{+0.18}_{-0.21}$	1.52
412.01	$0.0152^{+0.0151}_{-0.0155}$	$0.082^{+0.018}_{-0.011}$	$0.0566^{+0.0029}_{-0.0008}$	$88.87^{+1.0283}_{-1.2331}$	$0.002^{+0.021}_{-0.019}$	$-0.202^{+0.192}_{-0.203}$	$4.146994^{+5.6e-05}_{-5.7e-05}$	$5003.32538^{+0.00073}_{-0.00076}$	$-0.373^{+0.55}_{-1.70}$	2.64
421.01	$-0.0087^{+0.0055}_{-0.0044}$	$0.086^{+0.009}_{-0.012}$	$0.1188^{+0.0025}_{-0.0026}$	$87.62^{+0.9498}_{-0.5578}$	$0.005^{+0.006}_{-0.007}$	$0.127^{+0.141}_{-0.125}$	$4.454225^{+2.2e-05}_{-2.2e-05}$	$5005.81889^{+0.00027}_{-0.00027}$	$0.113^{+0.54}_{-0.45}$	4.01
433.01	$0.0437^{+0.0998}_{-0.0339}$	$0.161^{+0.076}_{-0.028}$	$0.0529^{+0.0015}_{-0.0010}$	$84.46^{+3.1427}_{-2.2738}$	$0.269^{+0.022}_{-0.096}$	$0.412^{+0.332}_{-0.179}$	$4.030406^{+1.1e-04}_{-1.1e-04}$	$5004.09261^{+0.00159}_{-0.00148}$	$0.287^{+0.76}_{-0.43}$	7.50
611.01	$0.0133^{+0.0068}_{-0.0067}$	$0.108^{+0.007}_{-0.005}$	$0.0758^{+0.0077}_{-0.0021}$	$85.39^{+0.3427}_{-0.4494}$	$-0.021^{+0.005}_{-0.005}$	$-0.157^{+0.054}_{-0.066}$	$3.251646^{+2.8e-05}_{-2.5e-05}$	$5004.05972^{+0.00038}_{-0.00041}$	$0.081^{+0.25}_{-0.26}$	2.12
684.01	$0.0453^{+0.0358}_{-0.0314}$	$0.131^{+0.015}_{-0.013}$	$0.0351^{+0.0207}_{-0.0036}$	$84.59^{+0.7313}_{-1.0427}$	$0.002^{+0.005}_{-0.006}$	$-0.274^{+0.154}_{-0.164}$	$4.035281^{+2.1e-04}_{-2.1e-04}$	$5005.25327^{+0.00252}_{-0.00265}$	$-0.157^{+0.16}_{-0.24}$	2.11
760.01	$0.0018^{+0.0085}_{-0.0065}$	$0.090^{+0.006}_{-0.006}$	$0.1055^{+0.0013}_{-0.0013}$	$86.16^{+0.4756}_{-0.4736}$	$0.085^{+0.033}_{-0.032}$	$-0.051^{+0.074}_{-0.067}$	$4.959343^{+4.4e-05}_{-4.4e-05}$	$5005.25710^{+0.00048}_{-0.00048}$	$-0.182^{+0.69}_{-2.58}$	1.83

Table 3.2 (continued)

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
801.01	$0.0121^{+0.0064}_{-0.0082}$	$0.215^{+0.030}_{-0.021}$	$0.0837^{+0.0024}_{-0.0008}$	$87.23^{+2.5490}_{-3.4209}$	$-0.012^{+0.024}_{-0.026}$	$0.079^{+0.123}_{-0.139}$	$1.625498^{+1.1e-05}_{-1.1e-05}$	$5003.82697^{+0.00035}_{-0.00038}$	$-0.474^{+0.37}_{-0.82}$	2.81
809.01	$-0.0142^{+0.0054}_{-0.0058}$	$0.151^{+0.024}_{-0.022}$	$0.1230^{+0.0016}_{-0.0019}$	$86.26^{+0.9381}_{-1.1708}$	$-0.113^{+0.010}_{-0.010}$	$-0.269^{+0.160}_{-0.140}$	$1.594742^{+7.4e-06}_{-7.5e-06}$	$5003.64725^{+0.00026}_{-0.00026}$	$0.387^{+0.28}_{-0.17}$	3.46
813.01	$-0.0205^{+0.0188}_{-0.0106}$	$0.101^{+0.026}_{-0.018}$	$0.0876^{+0.0031}_{-0.0011}$	$88.09^{+1.4899}_{-2.8157}$	$-0.006^{+0.016}_{-0.045}$	$0.176^{+0.171}_{-0.221}$	$3.895881^{+5.3e-05}_{-5.5e-05}$	$5003.52771^{+0.00078}_{-0.00082}$	$-0.034^{+0.28}_{-0.36}$	1.72
830.01	$0.0070^{+0.0036}_{-0.0059}$	$0.089^{+0.023}_{-0.012}$	$0.1370^{+0.0016}_{-0.0010}$	$89.20^{+0.6777}_{-0.9649}$	$-0.028^{+0.007}_{-0.013}$	$-0.126^{+0.201}_{-0.138}$	$3.525638^{+1.0e-05}_{-1.1e-05}$	$5003.04714^{+0.00015}_{-0.00017}$	$-0.524^{+0.53}_{-0.93}$	4.22
838.01	$0.0001^{+0.0007}_{-0.0004}$	$0.054^{+0.003}_{-0.004}$	$0.1080^{+0.0433}_{-0.0191}$	$88.37^{+0.1654}_{-0.1793}$	$-0.079^{+0.105}_{-0.096}$	$-0.678^{+0.087}_{-0.069}$	$4.859425^{+8.4e-05}_{-8.7e-05}$	$5006.00988^{+0.00111}_{-0.00115}$	$9.589^{+85.4}_{-54.7}$	7.51
840.01	$-0.0074^{+0.0079}_{-0.0078}$	$0.085^{+0.009}_{-0.009}$	$0.1049^{+0.0023}_{-0.0027}$	$87.34^{+0.4691}_{-0.5066}$	$-0.003^{+0.018}_{-0.018}$	$-0.285^{+0.138}_{-0.114}$	$3.040347^{+2.2e-05}_{-2.3e-05}$	$5002.94812^{+0.00042}_{-0.00043}$	$0.085^{+0.82}_{-0.77}$	4.10
843.01	$-0.0005^{+0.0022}_{-0.0088}$	$0.112^{+0.009}_{-0.008}$	$0.0550^{+0.0029}_{-0.0036}$	$86.21^{+0.6140}_{-0.5054}$	$0.024^{+0.160}_{-0.164}$	$-0.240^{+0.274}_{-0.185}$	$4.190622^{+1.2e-04}_{-1.1e-04}$	$5004.43916^{+0.00175}_{-0.00170}$	$0.970^{+17.3}_{-9.81}$	1.51
897.01	$0.0054^{+0.0057}_{-0.0048}$	$0.126^{+0.017}_{-0.017}$	$0.1154^{+0.0018}_{-0.0020}$	$87.18^{+0.8279}_{-0.7868}$	$0.011^{+0.023}_{-0.023}$	$-0.196^{+0.150}_{-0.135}$	$2.052344^{+8.6e-06}_{-8.7e-06}$	$5002.89012^{+0.00024}_{-0.00024}$	$-0.986^{+0.73}_{-3.16}$	2.58
908.01	$0.0093^{+0.0068}_{-0.0092}$	$0.094^{+0.025}_{-0.014}$	$0.0844^{+0.0021}_{-0.0013}$	$88.28^{+1.2959}_{-1.7425}$	$-0.031^{+0.020}_{-0.051}$	$-0.017^{+0.202}_{-0.172}$	$4.708363^{+4.9e-05}_{-4.9e-05}$	$5004.44518^{+0.00051}_{-0.00056}$	$0.155^{+0.52}_{-0.31}$	1.47
913.01	$0.0047^{+0.0031}_{-0.0040}$	$0.095^{+0.012}_{-0.009}$	$0.1241^{+0.0013}_{-0.0008}$	$89.18^{+0.7440}_{-0.7086}$	$-0.013^{+0.014}_{-0.013}$	$-0.103^{+0.103}_{-0.107}$	$4.082286^{+2.0e-05}_{-1.9e-05}$	$5002.63669^{+0.00023}_{-0.00022}$	$0.131^{+0.96}_{-0.92}$	2.82
931.01	$0.0027^{+0.0049}_{-0.0025}$	$0.111^{+0.020}_{-0.009}$	$0.1200^{+0.0013}_{-0.0008}$	$88.76^{+1.0292}_{-1.3306}$	$-0.027^{+0.035}_{-0.076}$	$-0.025^{+0.138}_{-0.097}$	$3.855646^{+2.3e-05}_{-2.3e-05}$	$5003.67756^{+0.00031}_{-0.00035}$	$-1.988^{+1.40}_{-8.15}$	2.63
961.02	$0.0026^{+0.0404}_{-0.0259}$	$0.298^{+0.028}_{-0.028}$	$0.0487^{+0.0076}_{-0.0046}$	$74.29^{+1.4869}_{-1.1549}$	$-0.034^{+0.164}_{-0.157}$	$0.036^{+0.083}_{-0.129}$	$0.453296^{+6.3e-06}_{-6.2e-06}$	$4966.86703^{+0.00143}_{-0.00144}$	$0.007^{+0.23}_{-0.22}$	1.95
961.03	$0.0000^{+0.0023}_{-0.0015}$	$0.061^{+0.005}_{-0.005}$	$0.1002^{+0.2972}_{-0.0580}$	$86.58^{+0.2826}_{-1.6218}$	$-0.085^{+0.583}_{-0.384}$	$-0.017^{+0.099}_{-0.217}$	$1.865069^{+6.2e-05}_{-6.5e-05}$	$4966.79490^{+0.00309}_{-0.00294}$	$-0.010^{+2.92}_{-5.75}$	2.30
1419.01	$0.0249^{+0.0172}_{-0.0150}$	$0.279^{+0.024}_{-0.024}$	$0.0558^{+0.0208}_{-0.0032}$	$77.67^{+1.2237}_{-1.0487}$	$-0.059^{+0.014}_{-0.015}$	$-0.169^{+0.089}_{-0.125}$	$1.336077^{+2.6e-05}_{-2.7e-05}$	$5011.25756^{+0.00102}_{-0.00101}$	$-0.556^{+0.24}_{-0.50}$	1.99
1459.01	$0.0181^{+0.0167}_{-0.0103}$	$0.368^{+0.021}_{-0.026}$	$0.1166^{+0.0424}_{-0.0340}$	$74.20^{+0.9911}_{-1.3131}$	$0.082^{+0.012}_{-0.013}$	$-0.177^{+0.071}_{-0.082}$	$0.692025^{+7.9e-06}_{-7.4e-06}$	$4966.11150^{+0.00100}_{-0.00105}$	$1.872^{+1.08}_{-0.77}$	9.54
CLM Light Curve With Eccentricity Allowed To Vary										
1.01	$-0.0004^{+0.0007}_{-0.0004}$	$0.131^{+0.002}_{-0.002}$	$0.1250^{+0.0002}_{-0.0002}$	$84.83^{+0.1677}_{-0.1817}$	$-0.010^{+0.033}_{-0.031}$	$-0.087^{+0.019}_{-0.018}$	$2.470614^{+1.3e-06}_{-1.3e-06}$	$4955.76250^{+0.00015}_{-0.00015}$	$0.210^{+0.46}_{-0.48}$	1.94
2.01	$0.0112^{+0.0014}_{-0.0013}$	$0.264^{+0.009}_{-0.008}$	$0.0765^{+0.0003}_{-0.0003}$	$83.35^{+0.7450}_{-0.7427}$	$-0.001^{+0.002}_{-0.002}$	$0.038^{+0.028}_{-0.026}$	$2.204733^{+3.1e-06}_{-3.0e-06}$	$4954.35792^{+0.00013}_{-0.00014}$	$0.249^{+0.06}_{-0.04}$	7.61
5.01	$-0.0000^{+0.0080}_{-0.0111}$	$0.136^{+0.007}_{-0.007}$	$0.0371^{+0.0009}_{-0.0009}$	$82.79^{+0.5165}_{-0.5651}$	$-0.015^{+0.099}_{-0.100}$	$-0.003^{+0.045}_{-0.046}$	$4.780376^{+7.1e-05}_{-7.1e-05}$	$4965.97212^{+0.00183}_{-0.00180}$	$0.021^{+3.54}_{-2.02}$	2.08
10.01	$0.0043^{+0.0042}_{-0.0039}$	$0.126^{+0.010}_{-0.008}$	$0.0929^{+0.0007}_{-0.0007}$	$86.21^{+0.4192}_{-0.5845}$	$0.012^{+0.021}_{-0.019}$	$-0.231^{+0.083}_{-0.071}$	$3.522496^{+1.9e-05}_{-1.9e-05}$	$4954.11873^{+0.00056}_{-0.00054}$	$-0.844^{+0.51}_{-2.55}$	2.71
13.01	$0.0255^{+0.0012}_{-0.0015}$	$0.309^{+0.009}_{-0.010}$	$0.0653^{+0.0002}_{-0.0003}$	$78.85^{+0.7264}_{-0.6362}$	$0.002^{+0.001}_{-0.001}$	$0.098^{+0.053}_{-0.042}$	$1.763585^{+1.6e-06}_{-1.6e-06}$	$4953.56529^{+0.00008}_{-0.00009}$	$0.292^{+0.02}_{-0.01}$	3.88
17.01	$-0.0038^{+0.0029}_{-0.0025}$	$0.147^{+0.015}_{-0.016}$	$0.0941^{+0.0009}_{-0.0009}$	$87.29^{+0.9074}_{-0.8624}$	$0.020^{+0.019}_{-0.019}$	$-0.058^{+0.102}_{-0.117}$	$3.234699^{+1.2e-05}_{-1.1e-05}$	$4954.48579^{+0.00034}_{-0.00037}$	$0.772^{+1.30}_{-0.30}$	2.65
18.01	$-0.0037^{+0.0046}_{-0.0060}$	$0.177^{+0.042}_{-0.023}$	$0.0771^{+0.0011}_{-0.0006}$	$87.71^{+1.7534}_{-2.8686}$	$0.014^{+0.096}_{-0.059}$	$-0.032^{+0.209}_{-0.153}$	$3.548447^{+2.7e-05}_{-2.8e-05}$	$4955.90133^{+0.00094}_{-0.00086}$	$1.118^{+4.16}_{-2.53}$	3.73
20.01	$0.0007^{+0.0016}_{-0.0006}$	$0.132^{+0.007}_{-0.007}$	$0.1172^{+0.0005}_{-0.0005}$	$88.63^{+0.5590}_{-0.4472}$	$0.007^{+0.039}_{-0.037}$	$-0.068^{+0.054}_{-0.050}$	$4.437979^{+1.1e-05}_{-1.0e-05}$	$5004.00820^{+0.00011}_{-0.00012}$	$-1.722^{+2.52}_{-6.72}$	1.57
64.01	$0.0196^{+0.0104}_{-0.0110}$	$0.268^{+0.020}_{-0.015}$	$0.0428^{+0.0067}_{-0.0016}$	$77.66^{+0.8119}_{-1.1367}$	$0.007^{+0.009}_{-0.010}$	$-0.151^{+0.060}_{-0.064}$	$1.951148^{+3.3e-05}_{-3.6e-05}$	$4990.53869^{+0.00118}_{-0.00112}$	$-0.188^{+0.63}_{-0.78}$	7.25
97.01	$0.0088^{+0.0021}_{-0.0021}$	$0.167^{+0.016}_{-0.012}$	$0.0807^{+0.0005}_{-0.0006}$	$85.55^{+0.8831}_{-1.1023}$	$-0.005^{+0.003}_{-0.004}$	$0.084^{+0.085}_{-0.073}$	$4.885521^{+2.0e-05}_{-2.0e-05}$	$4967.27548^{+0.00034}_{-0.00034}$	$-0.156^{+0.05}_{-0.08}$	2.05
127.01	$-0.0092^{+0.0028}_{-0.0033}$	$0.156^{+0.015}_{-0.012}$	$0.0966^{+0.0008}_{-0.0007}$	$87.18^{+2.4895}_{-1.7298}$	$0.041^{+0.007}_{-0.007}$	$0.341^{+0.073}_{-0.073}$	$3.578773^{+2.1e-05}_{-2.1e-05}$	$4967.02976^{+0.00047}_{-0.00047}$	$0.154^{+0.20}_{-0.28}$	3.79
128.01	$-0.0001^{+0.0000}_{-0.0000}$	$0.086^{+0.002}_{-0.002}$	$0.0984^{+0.0008}_{-0.0008}$	$87.50^{+0.0968}_{-0.1243}$	$0.071^{+0.152}_{-0.187}$	$-0.311^{+0.037}_{-0.042}$	$4.942765^{+2.7e-05}_{-2.6e-05}$	$4969.32936^{+0.00078}_{-0.00082}$	$49.513^{+86.1}_{-49.6}$	5.15
144.01	$0.0880^{+0.0351}_{-0.0314}$	$0.133^{+0.022}_{-0.016}$	$0.0305^{+0.0033}_{-0.0017}$	$85.83^{+1.3423}_{-1.2473}$	$0.035^{+0.006}_{-0.006}$	$-0.155^{+0.209}_{-0.265}$	$4.176281^{+2.5e-04}_{-2.4e-04}$	$4966.09046^{+0.00506}_{-0.00535}$	$-0.090^{+0.11}_{-0.15}$	2.31

Table 3.2 (continued)

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
183.01	$0.0069^{+0.0026}_{-0.0025}$	$0.148^{+0.020}_{-0.019}$	$0.1159^{+0.0011}_{-0.0012}$	$86.78^{+1.0868}_{-1.2452}$	$-0.152^{+0.009}_{-0.008}$	$0.030^{+0.124}_{-0.138}$	$2.684313^{+9.7e-06}_{-9.2e-06}$	$4966.35439^{+0.00031}_{-0.00031}$	$-0.203^{+0.10}_{-0.18}$	3.35
186.01	$-0.0066^{+0.0054}_{-0.0043}$	$0.122^{+0.021}_{-0.014}$	$0.1161^{+0.0013}_{-0.0007}$	$88.66^{+1.1558}_{-1.4415}$	$-0.005^{+0.017}_{-0.019}$	$-0.035^{+0.134}_{-0.123}$	$3.243285^{+2.0e-05}_{-2.0e-05}$	$4966.66741^{+0.00052}_{-0.00055}$	$0.780^{+1.10}_{-0.32}$	1.86
188.01	$-0.0003^{+0.0009}_{-0.0030}$	$0.075^{+0.005}_{-0.004}$	$0.1080^{+0.0024}_{-0.0022}$	$88.52^{+0.6189}_{-0.3824}$	$0.103^{+0.094}_{-0.093}$	$-0.147^{+0.092}_{-0.098}$	$3.797011^{+1.8e-05}_{-1.8e-05}$	$4966.50823^{+0.00042}_{-0.00043}$	$0.957^{+9.93}_{-5.83}$	1.69
195.01	$0.0081^{+0.0047}_{-0.0047}$	$0.081^{+0.010}_{-0.010}$	$0.1163^{+0.0012}_{-0.0012}$	$87.75^{+0.4441}_{-0.4550}$	$0.018^{+0.007}_{-0.007}$	$-0.379^{+0.108}_{-0.114}$	$3.217557^{+1.7e-05}_{-1.7e-05}$	$4966.63031^{+0.00044}_{-0.00045}$	$-0.242^{+0.12}_{-0.29}$	1.36
196.01	$0.0066^{+0.0032}_{-0.0029}$	$0.180^{+0.019}_{-0.019}$	$0.0988^{+0.0010}_{-0.0011}$	$84.60^{+0.9580}_{-1.0762}$	$0.002^{+0.011}_{-0.011}$	$-0.217^{+0.109}_{-0.103}$	$1.855556^{+6.6e-06}_{-6.6e-06}$	$4970.18030^{+0.00030}_{-0.00030}$	$-0.055^{+0.10}_{-0.15}$	1.21
201.01	$-0.0034^{+0.0034}_{-0.0059}$	$0.098^{+0.013}_{-0.008}$	$0.0789^{+0.0022}_{-0.0008}$	$88.49^{+1.2420}_{-1.4910}$	$0.031^{+0.043}_{-0.033}$	$0.056^{+0.099}_{-0.117}$	$4.225405^{+2.8e-05}_{-2.7e-05}$	$4970.55978^{+0.00052}_{-0.00055}$	$1.104^{+5.04}_{-1.54}$	1.91
202.01	$0.0053^{+0.0026}_{-0.0028}$	$0.209^{+0.006}_{-0.010}$	$0.0981^{+0.0007}_{-0.0007}$	$82.02^{+0.6930}_{-0.4738}$	$-0.011^{+0.015}_{-0.015}$	$-0.105^{+0.039}_{-0.054}$	$1.720865^{+6.1e-06}_{-6.3e-06}$	$4966.02012^{+0.00035}_{-0.00035}$	$0.043^{+0.21}_{-0.26}$	1.47
203.01	$0.0046^{+0.0035}_{-0.0046}$	$0.180^{+0.034}_{-0.022}$	$0.1287^{+0.0013}_{-0.0014}$	$87.23^{+1.1967}_{-1.2664}$	$0.093^{+0.031}_{-0.030}$	$-0.169^{+0.168}_{-0.138}$	$1.485701^{+4.4e-06}_{-4.2e-06}$	$4965.79338^{+0.00025}_{-0.00027}$	$-0.301^{+0.67}_{-1.14}$	19.4
204.01	$0.0182^{+0.0132}_{-0.0157}$	$0.118^{+0.018}_{-0.018}$	$0.0693^{+0.0036}_{-0.0026}$	$87.19^{+1.4075}_{-1.0848}$	$-0.031^{+0.016}_{-0.018}$	$-0.224^{+0.186}_{-0.197}$	$3.246636^{+5.4e-05}_{-5.5e-05}$	$4966.38047^{+0.00153}_{-0.00150}$	$-0.428^{+0.25}_{-1.01}$	3.28
214.01	$-0.0233^{+0.0192}_{-0.1543}$	$0.109^{+0.008}_{-0.010}$	$0.0884^{+0.0325}_{-0.0057}$	$84.68^{+0.6625}_{-0.5261}$	$-0.019^{+0.008}_{-0.009}$	$0.015^{+0.063}_{-0.113}$	$3.311884^{+5.1e-05}_{-5.3e-05}$	$4964.74106^{+0.00139}_{-0.00141}$	$0.183^{+0.65}_{-0.18}$	9.26
217.01	$0.0190^{+0.0073}_{-0.0072}$	$0.102^{+0.016}_{-0.012}$	$0.1081^{+0.0031}_{-0.0011}$	$88.63^{+1.2886}_{-1.6338}$	$0.082^{+0.006}_{-0.007}$	$0.032^{+0.121}_{-0.140}$	$3.905094^{+3.7e-05}_{-3.7e-05}$	$4966.41399^{+0.00079}_{-0.00082}$	$0.114^{+0.35}_{-0.31}$	13.8
229.01	$0.0030^{+0.0230}_{-0.0056}$	$0.133^{+0.023}_{-0.016}$	$0.0479^{+0.0034}_{-0.0009}$	$86.91^{+2.3589}_{-2.0024}$	$0.020^{+0.092}_{-0.087}$	$0.090^{+0.191}_{-0.292}$	$3.573280^{+9.2e-05}_{-9.5e-05}$	$4967.93062^{+0.00228}_{-0.00223}$	$-0.248^{+1.34}_{-3.54}$	1.55
254.01	$0.0349^{+0.0168}_{-0.0123}$	$0.069^{+0.017}_{-0.013}$	$0.1713^{+0.0045}_{-0.0052}$	$88.62^{+0.3976}_{-0.5933}$	$0.052^{+0.006}_{-0.006}$	$-0.496^{+0.194}_{-0.135}$	$2.455264^{+2.9e-05}_{-2.8e-05}$	$5003.82083^{+0.00065}_{-0.00069}$	$-0.126^{+0.06}_{-0.10}$	6.42
356.01	$0.0701^{+0.0349}_{-0.0312}$	$0.139^{+0.041}_{-0.026}$	$0.0310^{+0.0030}_{-0.0009}$	$86.93^{+2.3117}_{-2.7558}$	$-0.003^{+0.011}_{-0.010}$	$-0.174^{+0.247}_{-0.296}$	$1.826970^{+5.3e-05}_{-5.2e-05}$	$5003.52752^{+0.00150}_{-0.00159}$	$-0.005^{+0.11}_{-0.11}$	2.29
412.01	$-0.0002^{+0.0005}_{-0.0012}$	$0.119^{+0.038}_{-0.014}$	$0.0477^{+0.0036}_{-0.0011}$	$86.47^{+2.5213}_{-2.7070}$	$0.013^{+0.512}_{-0.512}$	$0.026^{+0.242}_{-0.321}$	$4.146984^{+1.4e-04}_{-1.4e-04}$	$5003.32622^{+0.00295}_{-0.00288}$	$8.721^{+51.4}_{-33.8}$	4.62
421.01	$0.0003^{+0.0036}_{-0.0009}$	$0.063^{+0.006}_{-0.004}$	$0.1134^{+0.0031}_{-0.0023}$	$88.83^{+0.6649}_{-0.4695}$	$0.011^{+0.117}_{-0.119}$	$-0.118^{+0.098}_{-0.125}$	$4.454248^{+3.5e-05}_{-3.4e-05}$	$5005.81896^{+0.00042}_{-0.00042}$	$-1.164^{+7.39}_{-11.3}$	2.07
433.01	$-0.0002^{+0.0068}_{-0.0229}$	$0.086^{+0.013}_{-0.015}$	$0.0541^{+0.0058}_{-0.0056}$	$87.30^{+0.6371}_{-0.6889}$	$-0.231^{+0.110}_{-0.115}$	$-0.610^{+0.332}_{-0.276}$	$4.030290^{+1.9e-04}_{-1.8e-04}$	$5004.09156^{+0.00284}_{-0.01005}$	$0.135^{+8.59}_{-4.72}$	1.58
611.01	$-0.0018^{+0.0015}_{-0.0055}$	$0.109^{+0.005}_{-0.005}$	$0.1796^{+0.1310}_{-0.0758}$	$85.78^{+0.3957}_{-0.3992}$	$0.059^{+0.011}_{-0.010}$	$-0.371^{+0.136}_{-0.107}$	$3.251642^{+3.9e-05}_{-4.0e-05}$	$5004.06072^{+0.00063}_{-0.00061}$	$0.124^{+0.23}_{-0.16}$	2.82
667.01	$0.0003^{+0.0146}_{-0.0049}$	$0.099^{+0.051}_{-0.020}$	$0.0766^{+0.0081}_{-0.0026}$	$87.68^{+1.7035}_{-2.8017}$	$-0.256^{+0.282}_{-0.236}$	$0.029^{+0.360}_{-0.412}$	$4.305101^{+2.6e-04}_{-2.5e-04}$	$5003.45495^{+0.00322}_{-0.00353}$	$-0.137^{+7.53}_{-10.0}$	2.33
684.01	$0.0388^{+0.0504}_{-0.0729}$	$0.080^{+0.013}_{-0.011}$	$0.0307^{+0.0057}_{-0.0042}$	$87.08^{+0.5216}_{-0.7949}$	$0.040^{+0.029}_{-0.026}$	$-0.378^{+0.385}_{-0.236}$	$4.035404^{+2.6e-04}_{-2.5e-04}$	$5005.25403^{+0.00337}_{-0.00319}$	$0.017^{+0.06}_{-0.06}$	1.87
760.01	$0.0001^{+0.0092}_{-0.0079}$	$0.091^{+0.005}_{-0.005}$	$0.1048^{+0.0018}_{-0.0017}$	$86.18^{+0.3778}_{-0.4901}$	$0.002^{+0.137}_{-0.136}$	$-0.085^{+0.074}_{-0.062}$	$4.959296^{+5.7e-05}_{-5.6e-05}$	$5005.25691^{+0.00084}_{-0.00084}$	$-0.044^{+1.51}_{-3.02}$	1.41
767.01	$0.0111^{+0.0044}_{-0.0043}$	$0.122^{+0.019}_{-0.017}$	$0.1224^{+0.0016}_{-0.0017}$	$86.95^{+0.7904}_{-0.9652}$	$0.012^{+0.006}_{-0.007}$	$-0.146^{+0.145}_{-0.141}$	$2.816536^{+1.5e-05}_{-1.6e-05}$	$5003.96631^{+0.00028}_{-0.00028}$	$-0.075^{+0.10}_{-0.14}$	1.81
801.01	$0.0221^{+0.0117}_{-0.0103}$	$0.153^{+0.026}_{-0.022}$	$0.0798^{+0.0039}_{-0.0012}$	$88.08^{+1.7431}_{-2.0569}$	$-0.004^{+0.012}_{-0.012}$	$-0.289^{+0.140}_{-0.179}$	$1.625529^{+1.7e-05}_{-1.6e-05}$	$5003.82575^{+0.00053}_{-0.00053}$	$-0.114^{+0.14}_{-0.21}$	2.13
809.01	$0.0168^{+0.0064}_{-0.0057}$	$0.177^{+0.028}_{-0.029}$	$0.1150^{+0.0021}_{-0.0026}$	$84.88^{+1.5312}_{-1.6161}$	$-0.022^{+0.009}_{-0.009}$	$-0.138^{+0.152}_{-0.168}$	$1.594732^{+1.0e-05}_{-1.0e-05}$	$5003.64776^{+0.00034}_{-0.00035}$	$0.046^{+0.08}_{-0.09}$	1.62
813.01	$-0.0612^{+0.0264}_{-0.0308}$	$0.060^{+0.014}_{-0.012}$	$0.0813^{+0.0063}_{-0.0018}$	$89.17^{+0.7397}_{-0.9617}$	$-0.090^{+0.011}_{-0.008}$	$-0.381^{+0.201}_{-0.202}$	$3.895869^{+9.5e-05}_{-9.4e-05}$	$5003.52768^{+0.00125}_{-0.00123}$	$0.050^{+0.04}_{-0.03}$	1.84
830.01	$-0.0000^{+0.0000}_{-0.0000}$	$0.095^{+0.005}_{-0.002}$	$0.1288^{+0.0019}_{-0.0019}$	$88.41^{+0.7408}_{-0.4725}$	$0.007^{+0.314}_{-0.340}$	$-0.106^{+0.038}_{-0.070}$	$3.525645^{+1.2e-05}_{-1.4e-05}$	$5003.04702^{+0.00026}_{-0.00028}$	$50.838^{+101.}_{-123.}$	1.38
838.01	$0.0003^{+0.0053}_{-0.0025}$	$0.087^{+0.004}_{-0.005}$	$0.1254^{+0.0555}_{-0.0448}$	$86.89^{+0.2559}_{-0.2515}$	$-0.022^{+0.053}_{-0.054}$	$-0.449^{+0.124}_{-0.078}$	$4.859269^{+1.2e-04}_{-1.2e-04}$	$5006.01102^{+0.00127}_{-0.00129}$	$0.199^{+5.84}_{-1.14}$	1.78
840.01	$0.0044^{+0.0112}_{-0.0101}$	$0.089^{+0.008}_{-0.009}$	$0.0959^{+0.0030}_{-0.0039}$	$87.10^{+0.4951}_{-0.4985}$	$0.084^{+0.037}_{-0.033}$	$-0.262^{+0.172}_{-0.119}$	$3.040329^{+3.1e-05}_{-3.0e-05}$	$5002.94877^{+0.00053}_{-0.00054}$	$-0.069^{+0.45}_{-1.31}$	2.33
843.01	$0.0686^{+0.0495}_{-0.0253}$	$0.148^{+0.025}_{-0.014}$	$0.0507^{+0.0037}_{-0.0031}$	$83.64^{+1.0836}_{-1.7704}$	$0.060^{+0.006}_{-0.007}$	$0.065^{+0.157}_{-0.157}$	$4.190477^{+1.7e-04}_{-1.8e-04}$	$5004.44189^{+0.00209}_{-0.00221}$	$-0.056^{+0.05}_{-0.09}$	1.74
897.01	$0.0132^{+0.0076}_{-0.0070}$	$0.122^{+0.018}_{-0.017}$	$0.1162^{+0.0021}_{-0.0025}$	$86.96^{+0.7474}_{-0.7906}$	$-0.001^{+0.011}_{-0.010}$	$-0.326^{+0.155}_{-0.136}$	$2.052357^{+1.5e-05}_{-1.4e-05}$	$5002.88992^{+0.00036}_{-0.00039}$	$-0.006^{+0.16}_{-0.18}$	2.27
908.01	$0.0214^{+0.0115}_{-0.0191}$	$0.098^{+0.028}_{-0.017}$	$0.0794^{+0.0031}_{-0.0014}$	$88.24^{+1.3406}_{-2.2814}$	$-0.000^{+0.016}_{-0.014}$	$0.011^{+0.198}_{-0.223}$	$4.708359^{+8.8e-05}_{-8.2e-05}$	$5004.44499^{+0.00092}_{-0.00098}$	$-0.114^{+0.09}_{-0.18}$	1.78

Table 3.2 (continued)

KOI	J	$r_{\rm sum}$	k	i (°)	$e\cos w$	$e\sin w$	P (Days)	T_0 (BJD-2450000)	A_{L_p}	χ^2_{red}
913.01	$0.0021^{+0.0058}_{-0.0025}$	$0.103^{+0.013}_{-0.010}$	$0.1112^{+0.0016}_{-0.0016}$	$88.15^{+0.9795}_{-0.7173}$	$-0.017^{+0.040}_{-0.043}$	$-0.069^{+0.124}_{-0.113}$	$4.082302^{+3.1e-05}_{-3.2e-05}$	$5002.63659^{+0.00041}_{-0.00040}$	$-0.604^{+1.27}_{-4.19}$	1.82
1176.01	$0.0002^{+0.0061}_{-0.0047}$	$0.119^{+0.011}_{-0.009}$	$0.1300^{+0.0028}_{-0.0033}$	$86.97^{+0.5149}_{-0.5087}$	$0.056^{+0.121}_{-0.126}$	$-0.234^{+0.136}_{-0.102}$	$1.973750^{+9.6e-06}_{-9.8e-06}$	$5011.68879^{+0.00032}_{-0.00030}$	$-0.088^{+1.93}_{-3.98}$	1.87
1419.01	$0.0225^{+0.0451}_{-0.0184}$	$0.256^{+0.146}_{-0.037}$	$0.0434^{+0.0020}_{-0.0015}$	$76.88^{+7.5639}_{-27.934}$	$-0.285^{+0.826}_{-0.468}$	$0.390^{+0.214}_{-0.299}$	$1.336130^{+5.8e-05}_{-5.5e-05}$	$5011.25785^{+0.00480}_{-0.00363}$	$-1.040^{+0.97}_{-1.81}$	1.91
1459.01	$0.0498^{+0.0771}_{-0.0366}$	$0.400^{+0.021}_{-0.025}$	$0.0917^{+0.0365}_{-0.0152}$	$69.02^{+2.2429}_{-0.8466}$	$0.004^{+0.014}_{-0.014}$	$0.027^{+0.023}_{-0.096}$	$0.692022^{+9.3e-06}_{-9.4e-06}$	$4966.11051^{+0.00117}_{-0.00119}$	$0.972^{+1.13}_{-0.58}$	3.50
1541.01	$0.0595^{+0.0121}_{-0.0113}$	$0.390^{+0.004}_{-0.005}$	$0.1693^{+0.0008}_{-0.0008}$	$82.85^{+0.6984}_{-0.6713}$	$-0.012^{+0.012}_{-0.008}$	$0.775^{+0.018}_{-0.017}$	$2.379293^{+1.5e-05}_{-1.5e-05}$	$4966.65019^{+0.00052}_{-0.00058}$	$0.485^{+0.13}_{-0.14}$	28.7
1543.01	$0.1226^{+0.0745}_{-0.0324}$	$0.369^{+0.008}_{-0.004}$	$0.1426^{+0.0021}_{-0.0014}$	$86.08^{+3.0058}_{-22.298}$	$0.114^{+0.010}_{-0.011}$	$0.797^{+0.010}_{-0.007}$	$3.964230^{+8.1e-05}_{-7.4e-05}$	$4969.03213^{+0.00187}_{-0.00315}$	$-0.065^{+0.19}_{-0.20}$	38.4

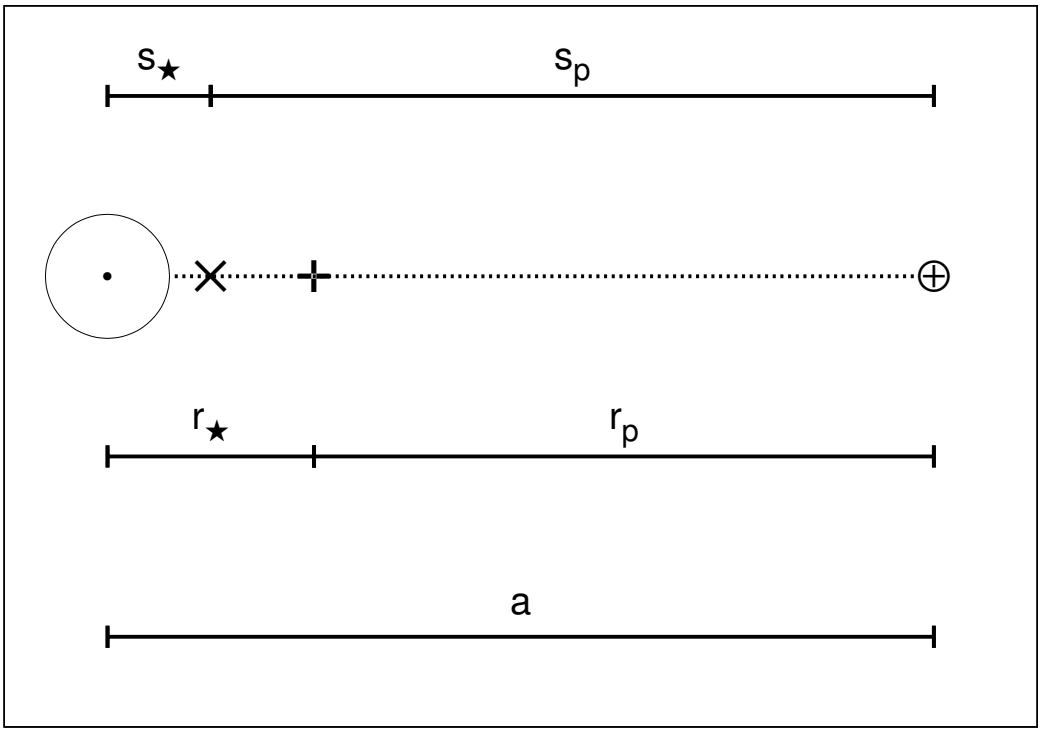

Fig. 2.2.— An illustration of a system containing a star, shown on the left, and a whale, shown on the right, separated by a distance a, not to scale. The star and whale lie at distances of $r_\star$ and r_p, respectively, from the barycenter of the system, which is marked via a "+" symbol. Similarly, the star and whale lie at distances of $s_\star$ and s_p, respectively, from the photocenter of the system, which is marked via a "×" symbol. All distances are sky-projected distances along the semi-major axis of the system, and thus are independent of the system's inclination. Note that although in this illustration the photocenter is to the left of the barycenter, it can lie anywhere between the star and whale.

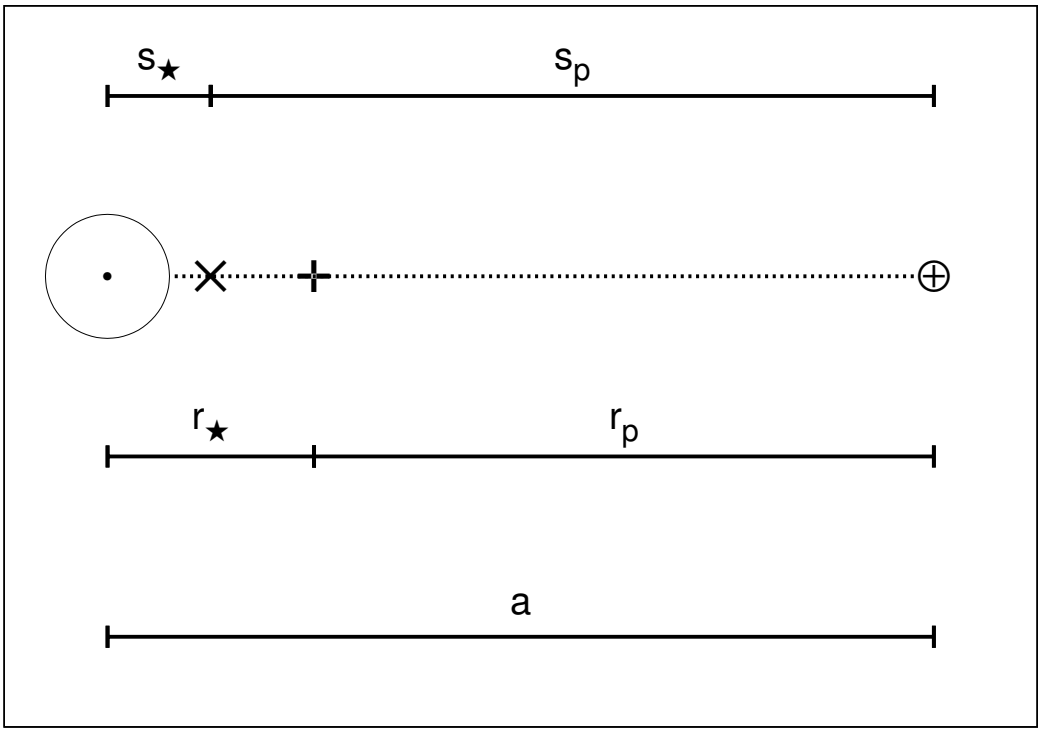

Fig. 2.3.— An illustration of a system containing a star, shown on the left, and a whale, shown on the right, separated by a distance a, not to scale. The star and whale lie at distances of $r_\star$ and r_p, respectively, from the barycenter of the system, which is marked via a "+" symbol. Similarly, the star and whale lie at distances of $s_\star$ and s_p, respectively, from the photocenter of the system, which is marked via a "×" symbol. All distances are sky-projected distances along the semi-major axis of the system, and thus are independent of the system's inclination. Note that although in this illustration the photocenter is to the left of the barycenter, it can lie anywhere between the star and whale.

APPENDICES

APPENDIX A. WHALE PHASE DISPERSION MINIMIZATION (WPDM)

In this appendix we further explain the WPDM technique introduced in Section 2.1. Equations show whales exist.

$$p = \frac{T}{P} - int(\frac{T}{P}) \tag{A.1}$$

where p is the phase of a given point, with a time value, T, for a given period, P, and int() returns the argument rounded down to the nearest integer value.

A.1. Appendix subsection

Did you know that this won't show up as listed in the table of contents, in accordance with NMSU thesis policy? Exciting.

APPENDIX B. EXOWHALE CONTACT

What do you do if contacted by an exowhale? Panic and swim to your nearest spaceship.