

# KIC 002020437

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002020437-01	OBS	No	499.496660	284.771652	762.8	15.291	8.3	7.7	0.72	5117	1.99	0.25

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002020437-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

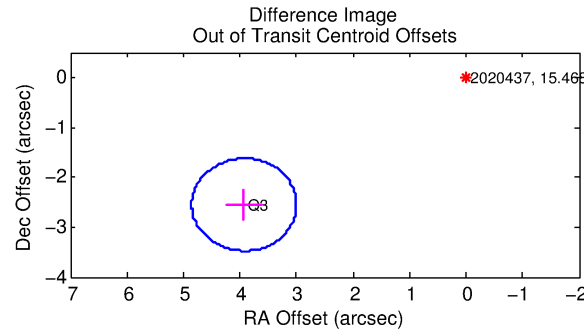
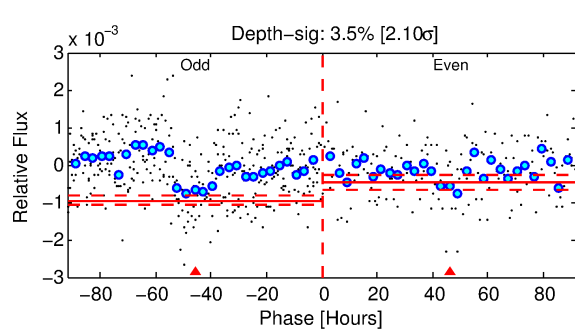
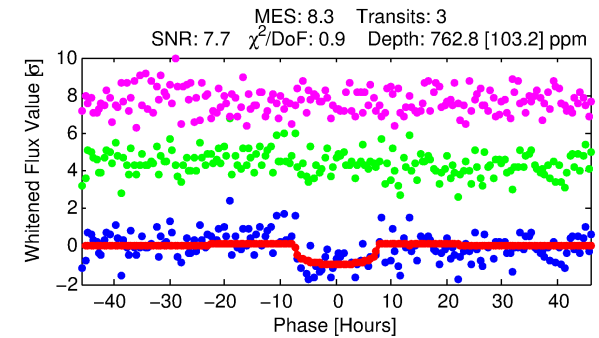
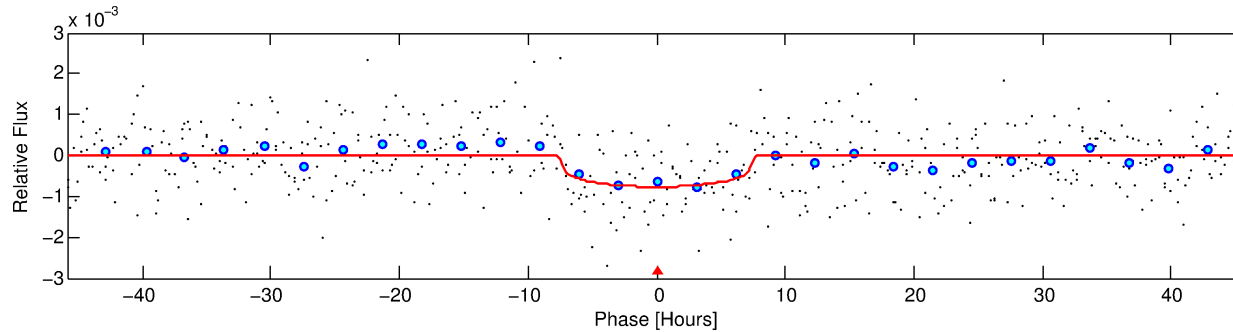
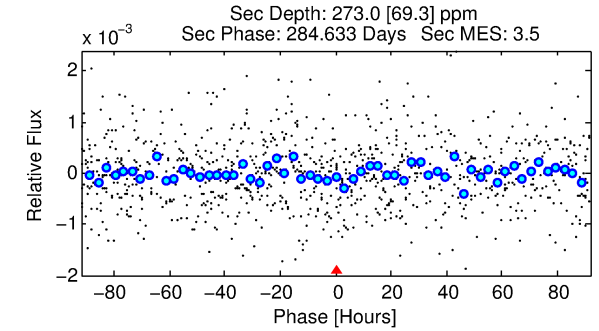
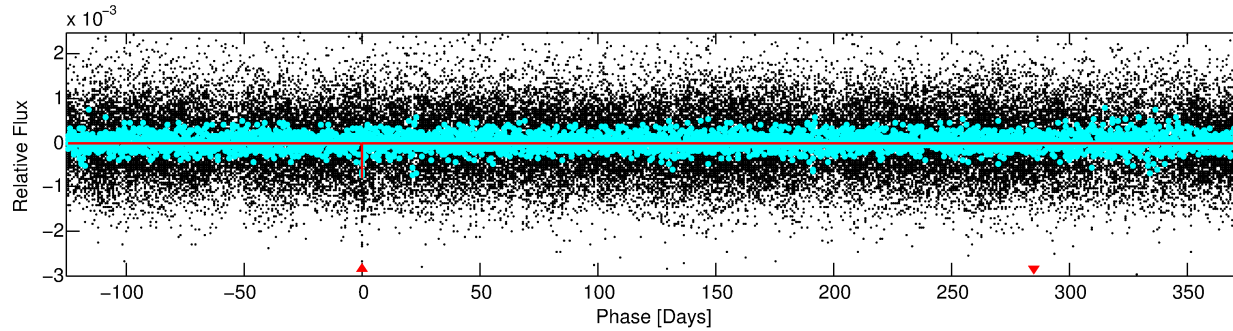
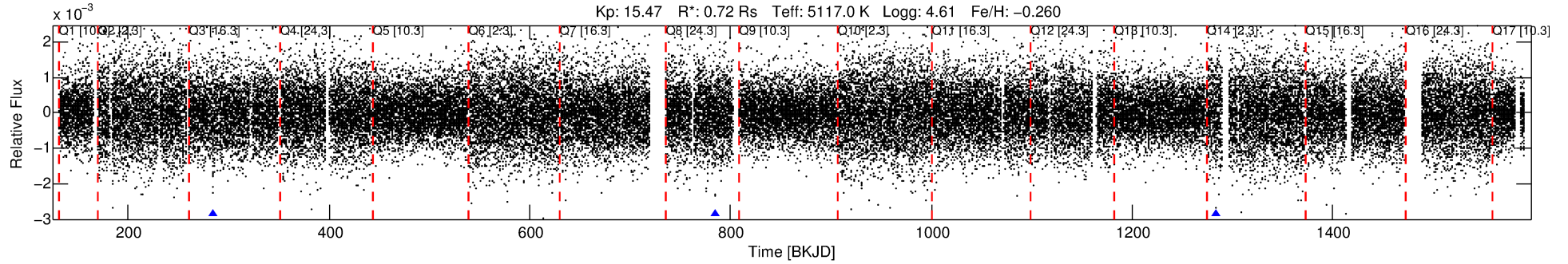
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002020437-01

No Significant Match Found

# DV One-Page Summary

KIC: 2020437 Candidate: 1 of 1 Period: 499.497 d



## DV Fit Results:

Period = 499.49666 [0.02010] d  
Epoch = 284.7717 [0.0261] BKJD  
Rp/R\* = 0.0255 [0.0243]  
a/R\* = 227.05 [788.85]  
b = 0.47 [5.77]  
Seff = 0.25 [0.05]  
Teq = 180 [8] K  
Rp = 1.99 [1.91] Re  
a = 1.1248 [0.1111] AU  
Ag = 47764.17 [92008.87] [0.52σ]  
Teff = 4120 [1983] K [1.99σ]

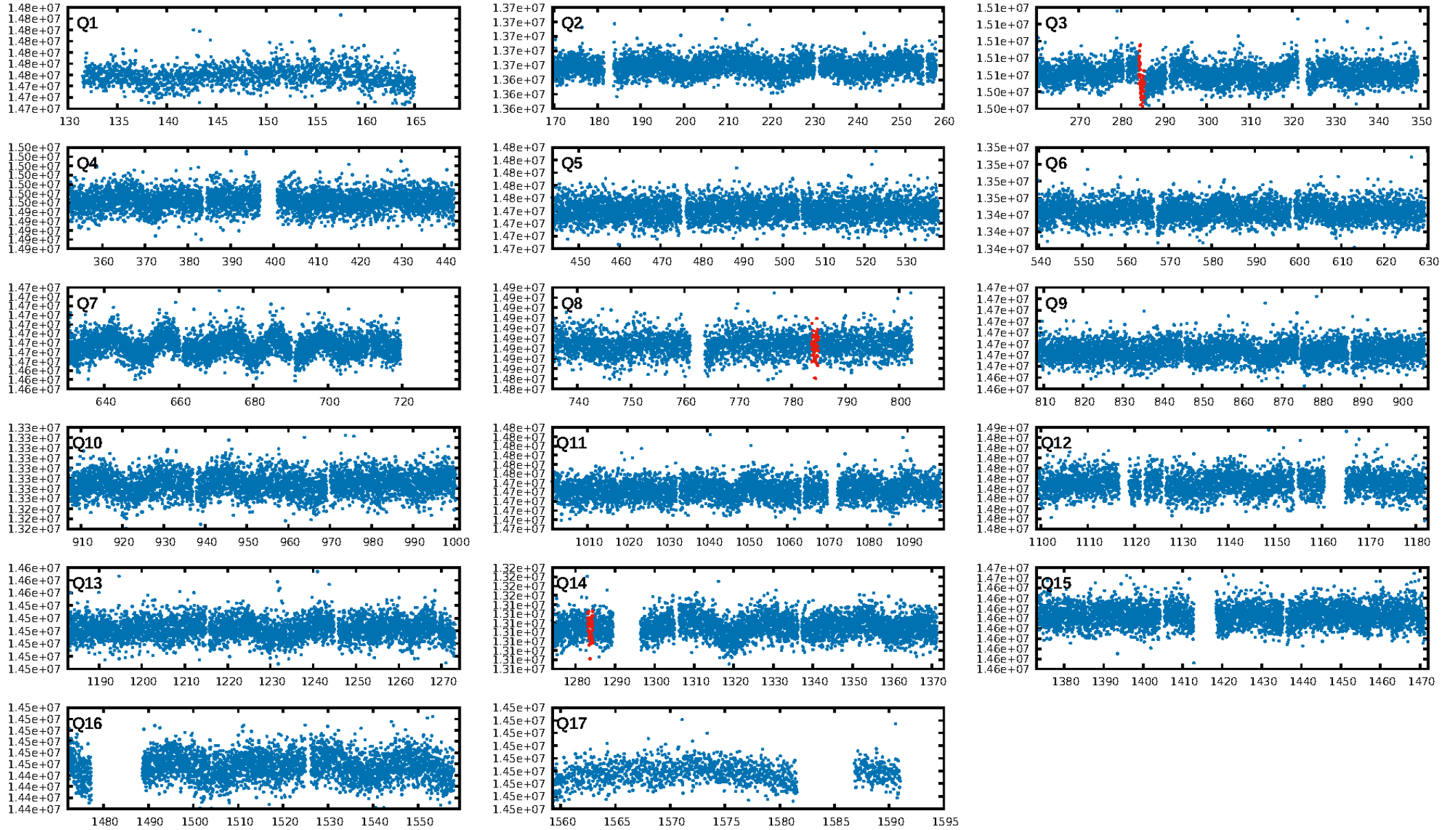
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 3.0%  
ModelChiSquareGoF-sig: 99.8%  
Bootstrap-pfa: 2.81e-17  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.112  
Centroid-sig: 28.6%  
Centroid-so: 2.549 arcsec [1.19σ]  
OotOffset-rm: 4.682 arcsec [15.16σ]  
KicOffset-rm: 4.661 arcsec [15.09σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

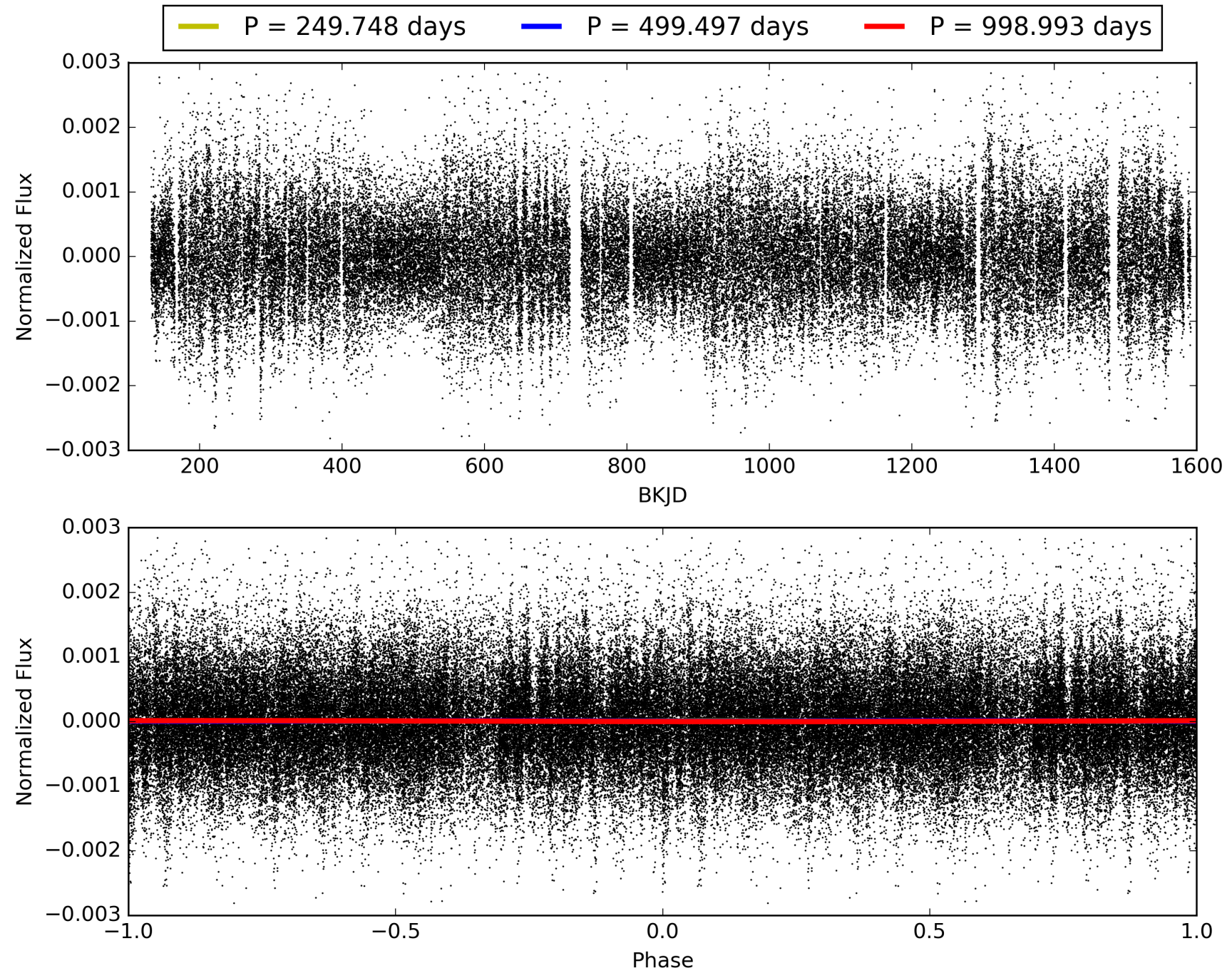
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 20:24:24 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002020437-01, PDC Light Curves

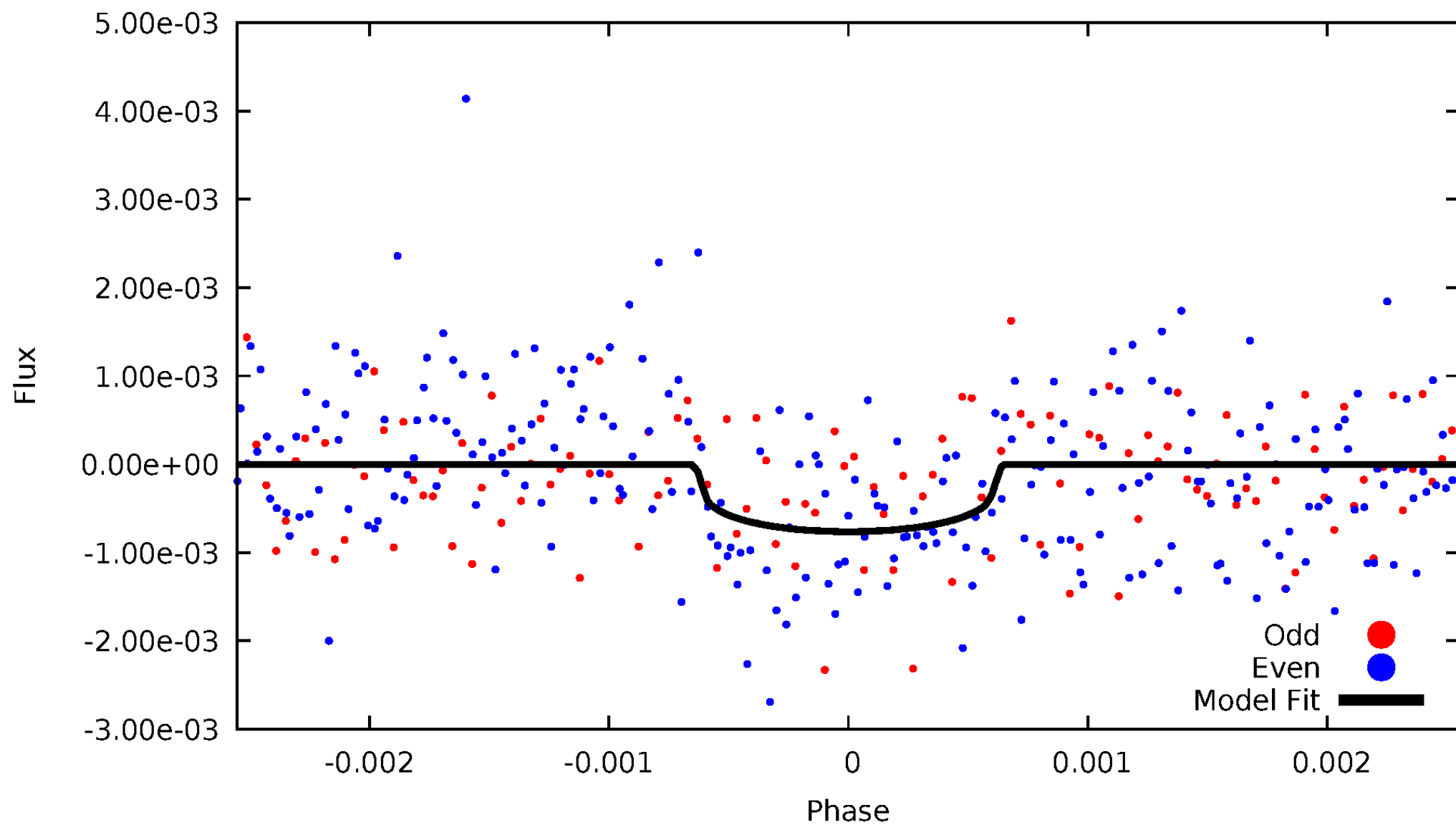


TCE 002020437-01



# DV Odd/Even

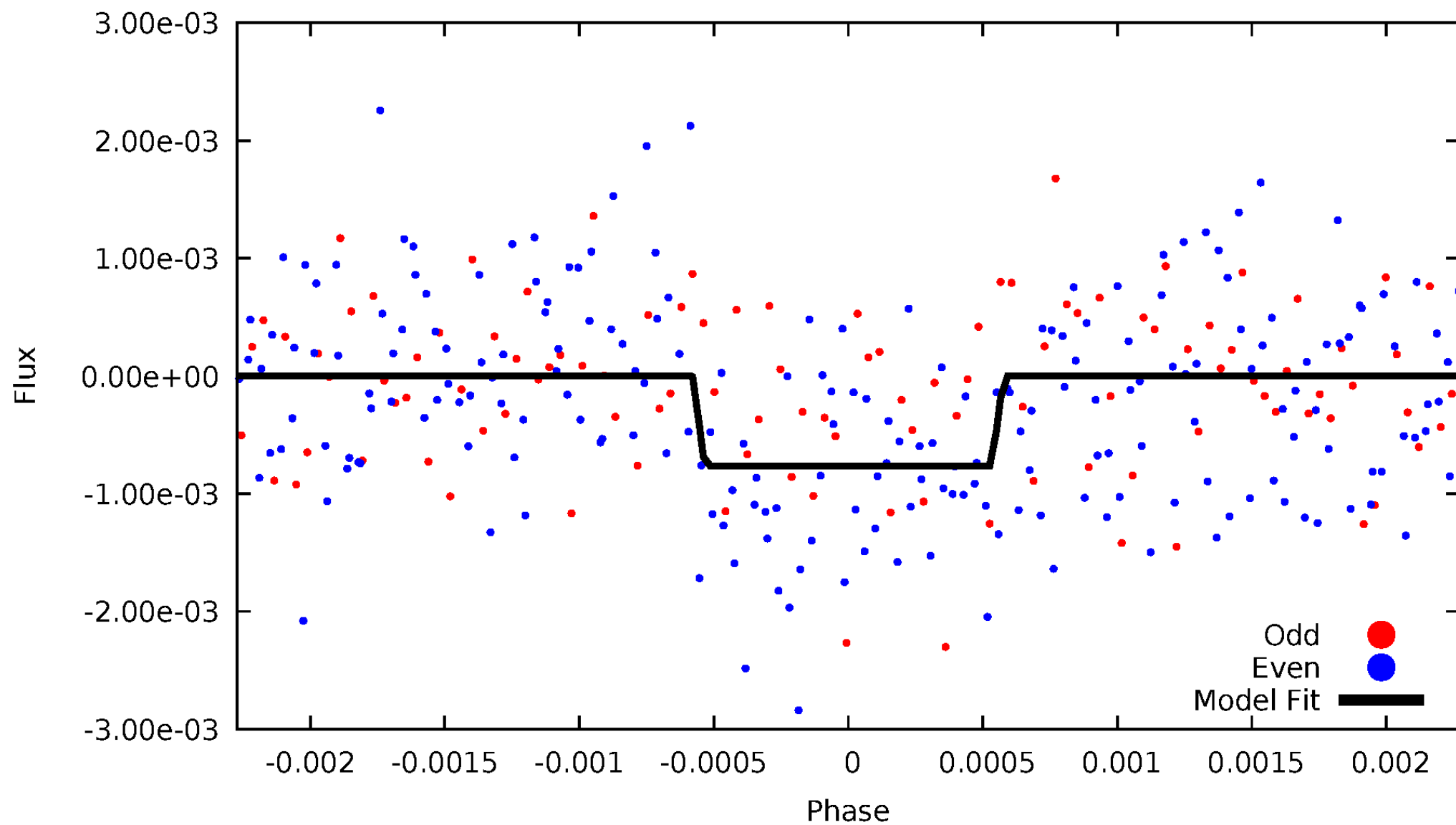
TCE 002020437-01



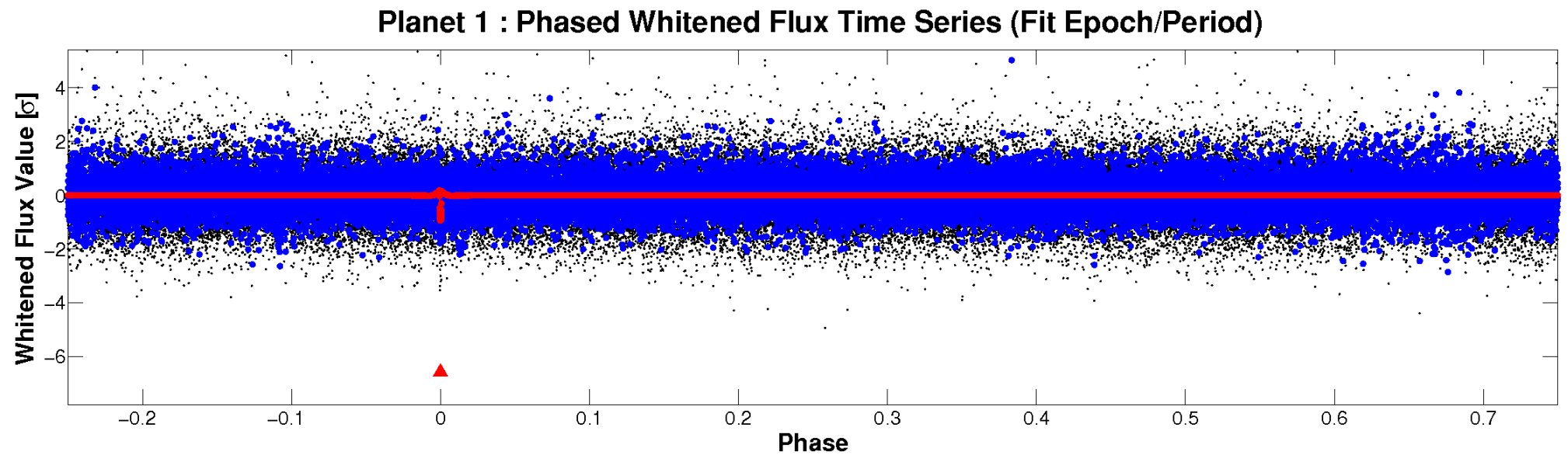
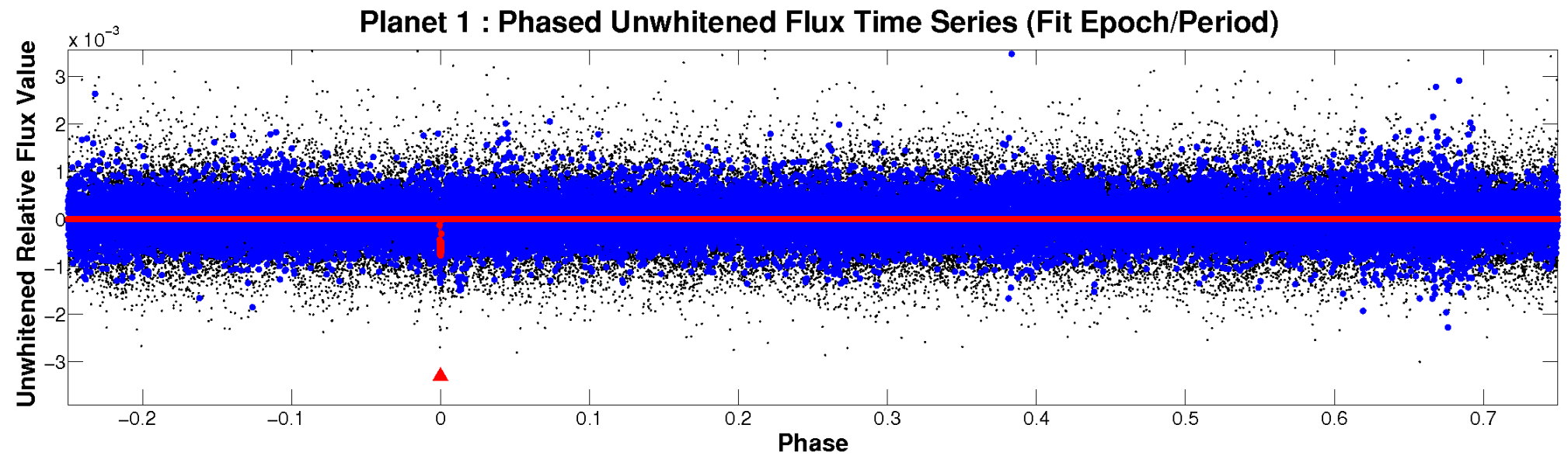


# ALT Odd/Even

TCE 002020437-01

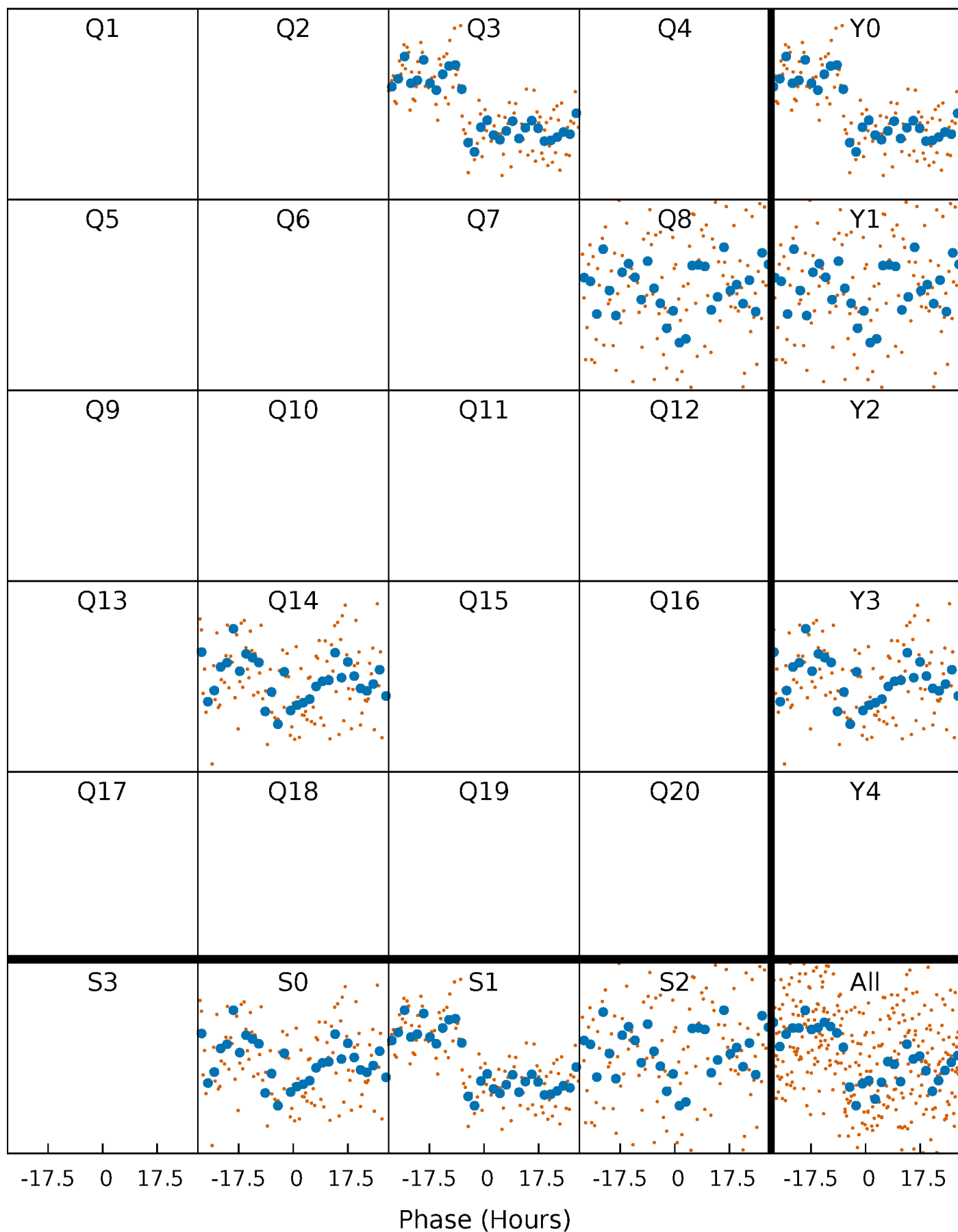


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

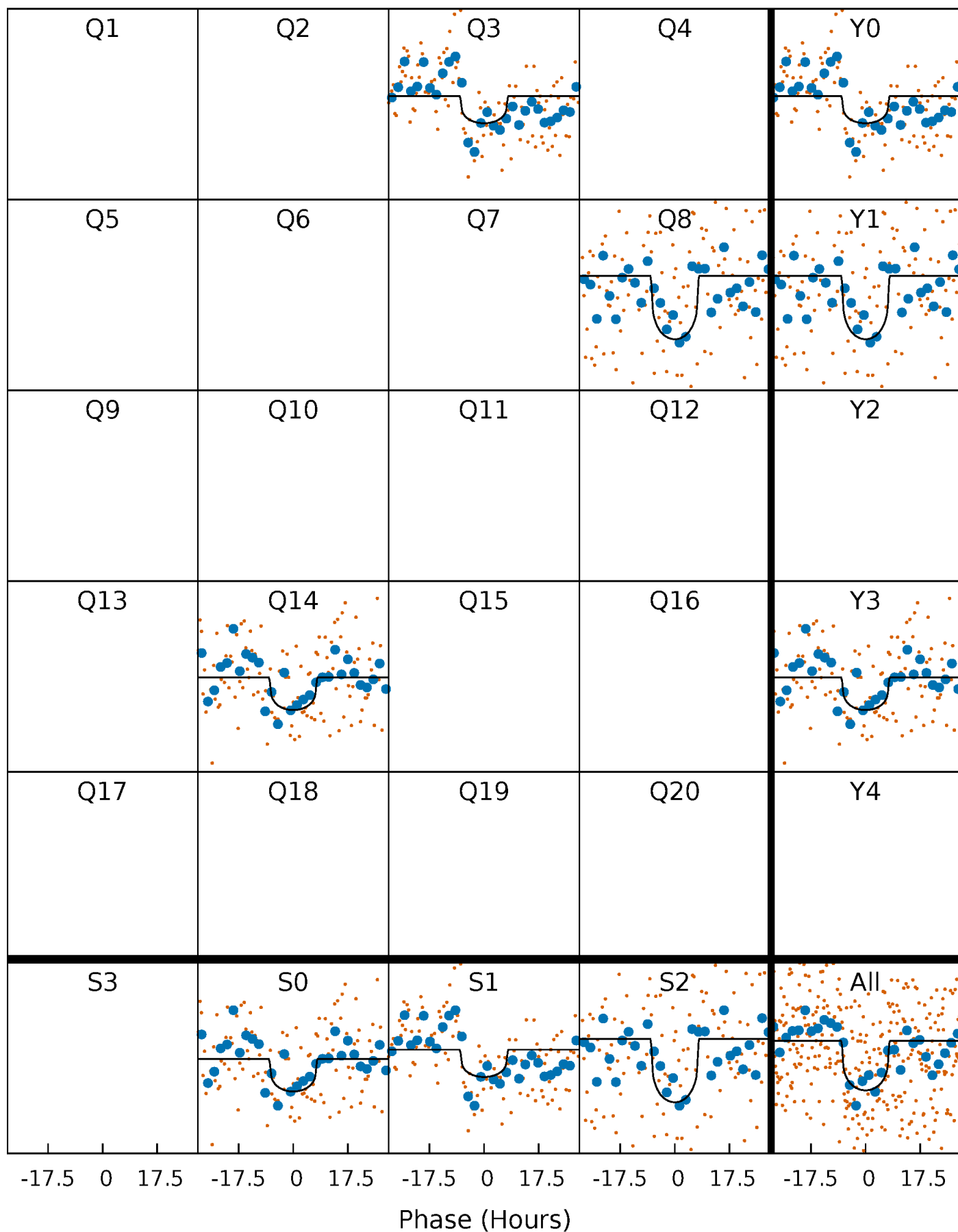
TCE 002020437-01 P=499.496660 Days  $T_0=284.771652$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 002020437-01 P=499.496660 Days  $T_0=284.771652$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

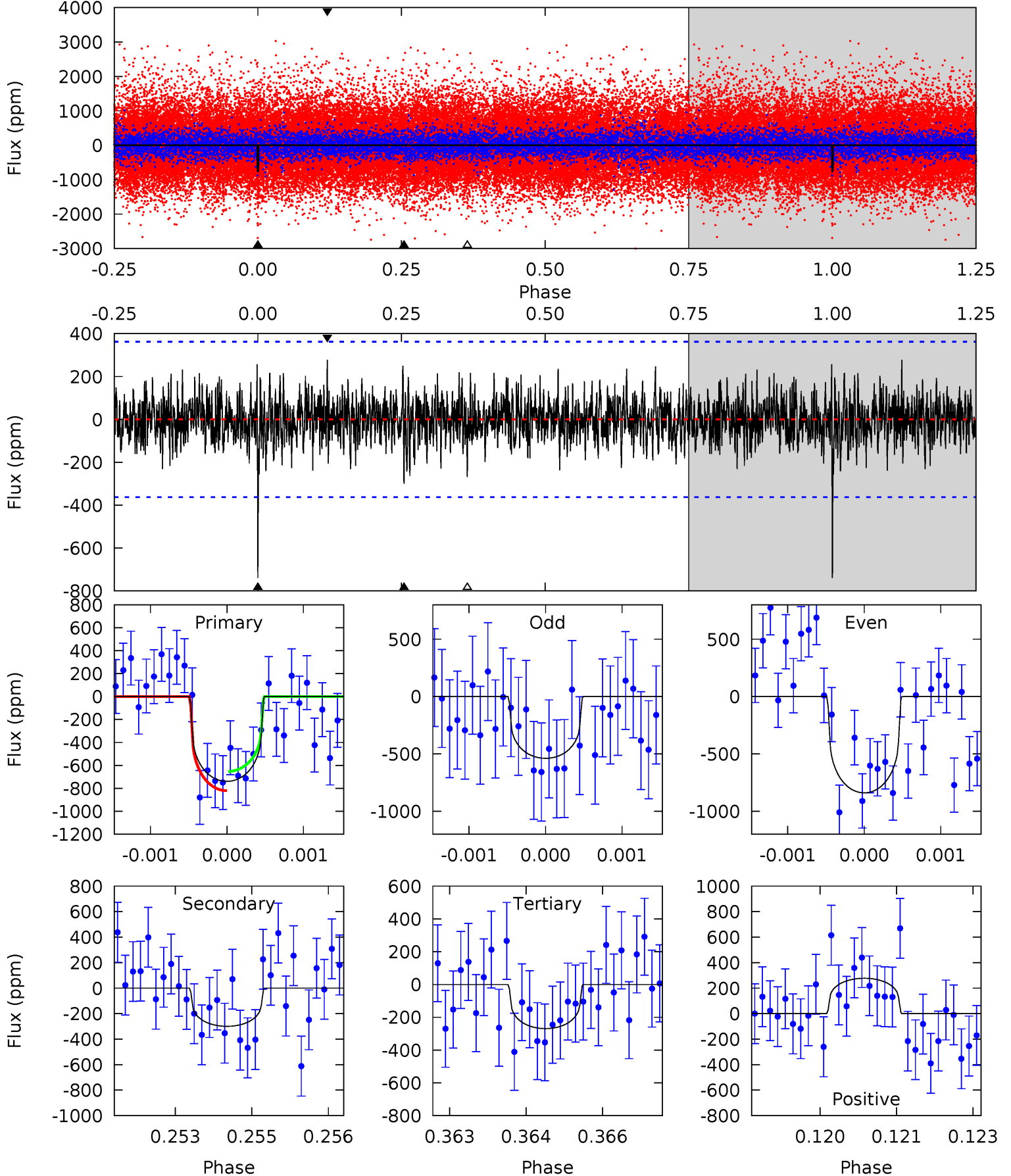
TCE 002020437-01 P=499.471129 Days  $T_0=284.751547$  (BKJD)



# DV Model-Shift Uniqueness Test

002020437-01, P = 499.496660 Days, E = 284.771652 Days

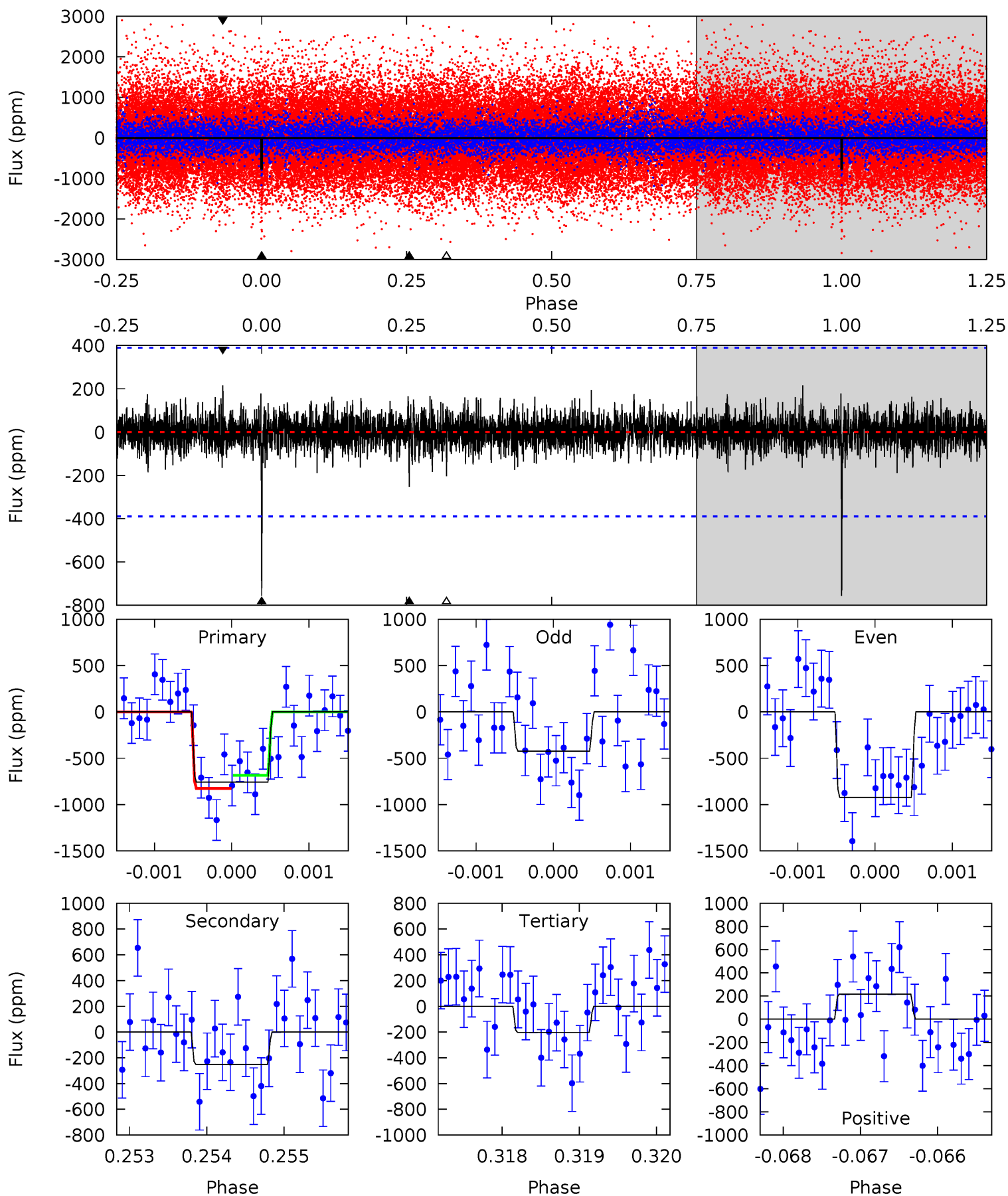
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	4.46	4.01	4.13	5.40	3.21	1.16	7.00	6.88	0.45	0.33	2.10	1.17	0.27	1.25



# Alt Model-Shift Uniqueness Test

002020437-01, P = 499.471129 Days, E = 284.751547 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	3.51	2.83	3.00	5.43	3.26	0.72	7.71	7.55	0.67	0.51	3.27	1.00	0.22	0.98



### Stellar Parameters For KIC 002020437

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5117^{+153}_{-138}$	$4.608^{+0.039}_{-0.072}$	$-0.260^{+0.300}_{-0.300}$	$0.717^{+0.088}_{-0.059}$	$0.761^{+0.081}_{-0.073}$	$2.914^{+0.586}_{-0.700}$
	+3%/-3%	+1%/-2%	+115%/-115%	+12%/-8%	+11%/-10%	+20%/-24%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 002020437-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-299 \pm 67$	$2.45^{+1.69}_{-1.57}$	$254^{+10}_{-9}$	$4064^{+2225}_{-666}$	$34543^{+237816}_{-23099}$
Alt.	$-252 \pm 72$	$2.48^{+1.79}_{-1.52}$	$253^{+10}_{-8}$	$3917^{+1858}_{-676}$	$27640^{+158137}_{-18779}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

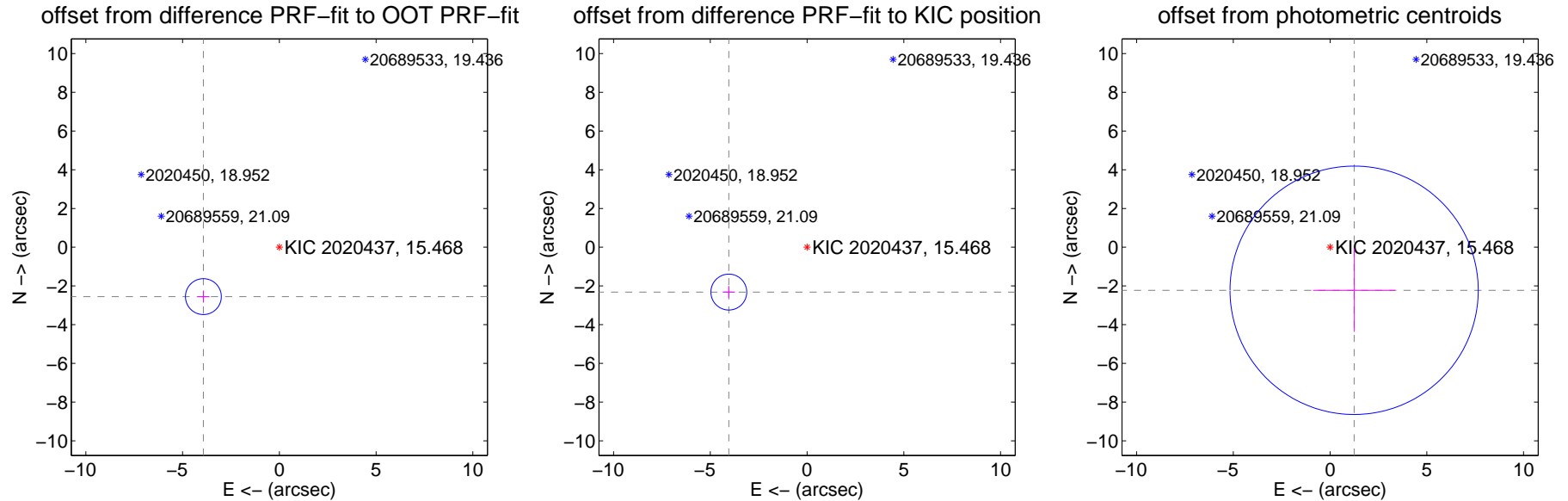
## DV Centroid Data

Supplemental centroid analysis for 002020437-01. Kepler magnitude: 15.47. Transit SNR 7.71

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.682 \pm 0.309$	15.16	$3.926 \pm 0.309$	$-2.551 \pm 0.308$
PRF-fit source offset from KIC position	$4.661 \pm 0.309$	15.09	$4.044 \pm 0.309$	$-2.317 \pm 0.308$
photometric centroid source offset	$2.55 \pm 2.14$	1.19	$-1.24 \pm 2.12$	$-2.22 \pm 2.14$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q1 no difference image



Q1 no OOT image



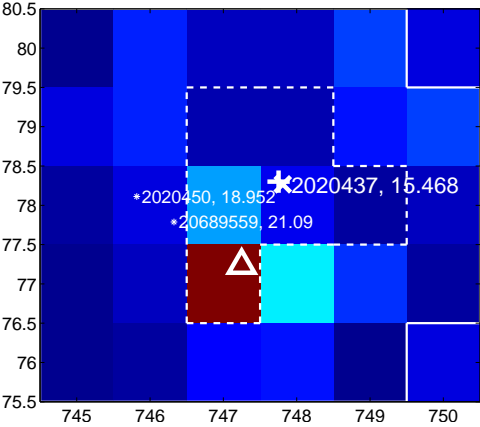
Q2 no difference image



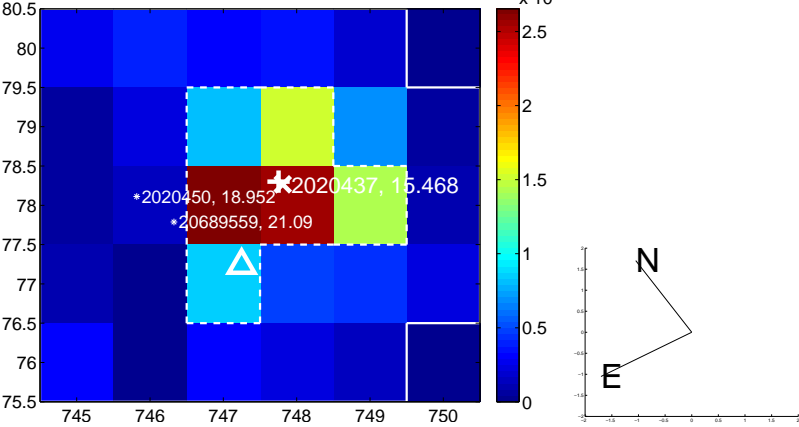
Q2 no OOT image



Q3 difference image



Q3 OOT image



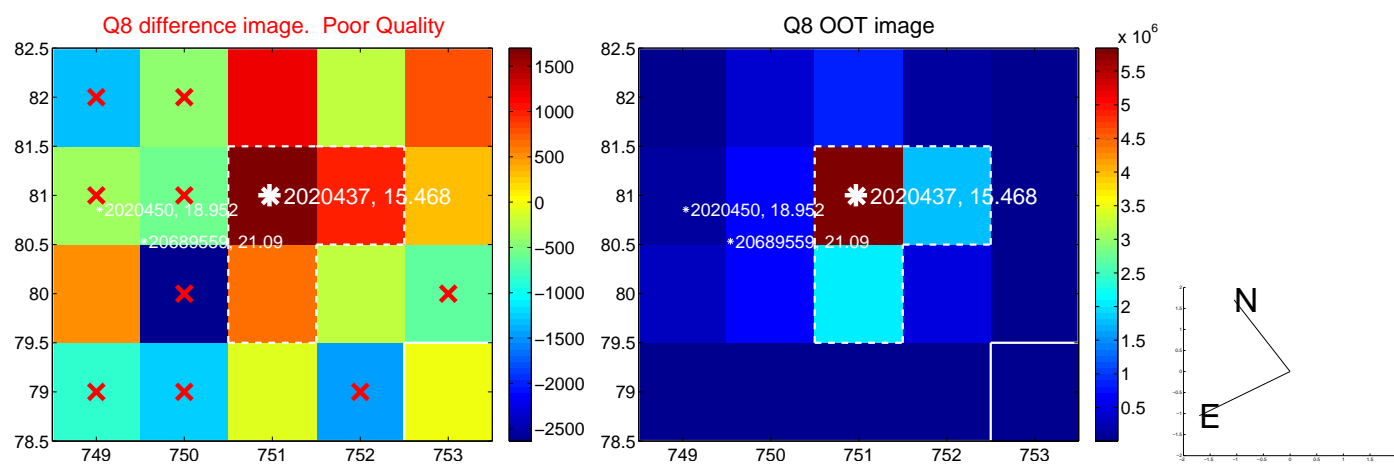
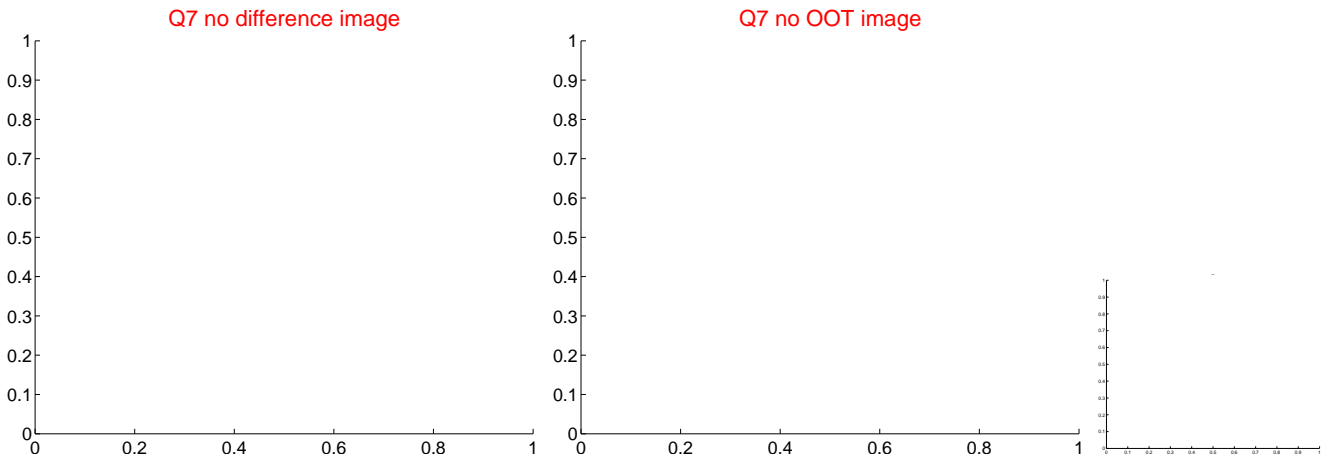
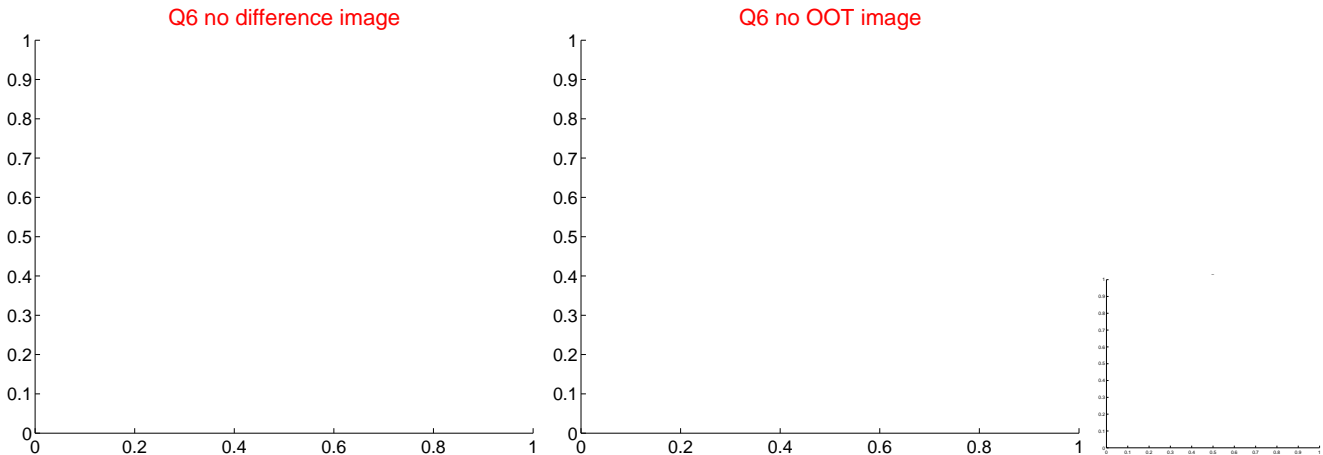
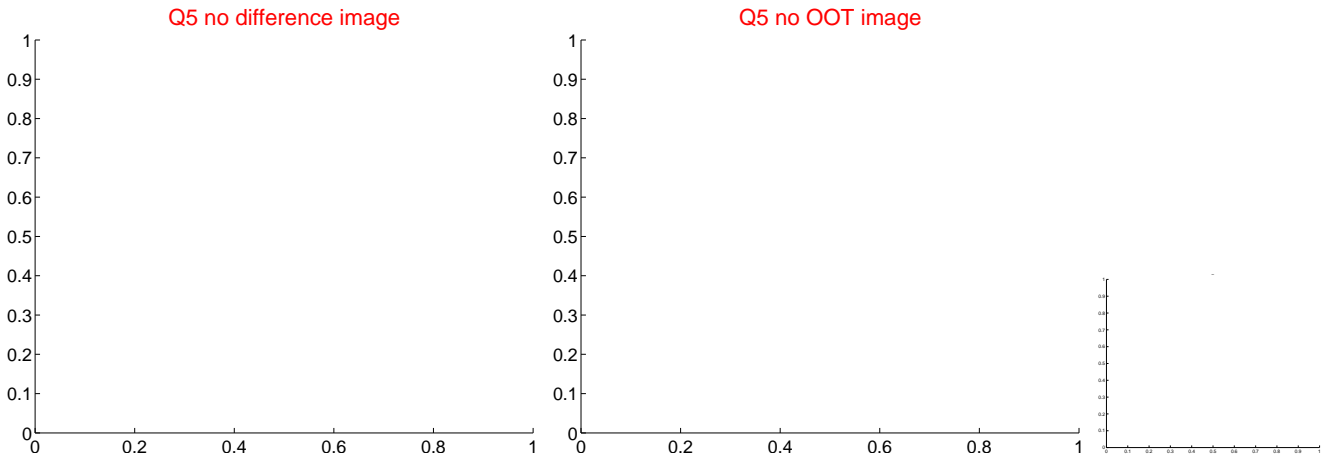
Q4 no difference image



Q4 no OOT image



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



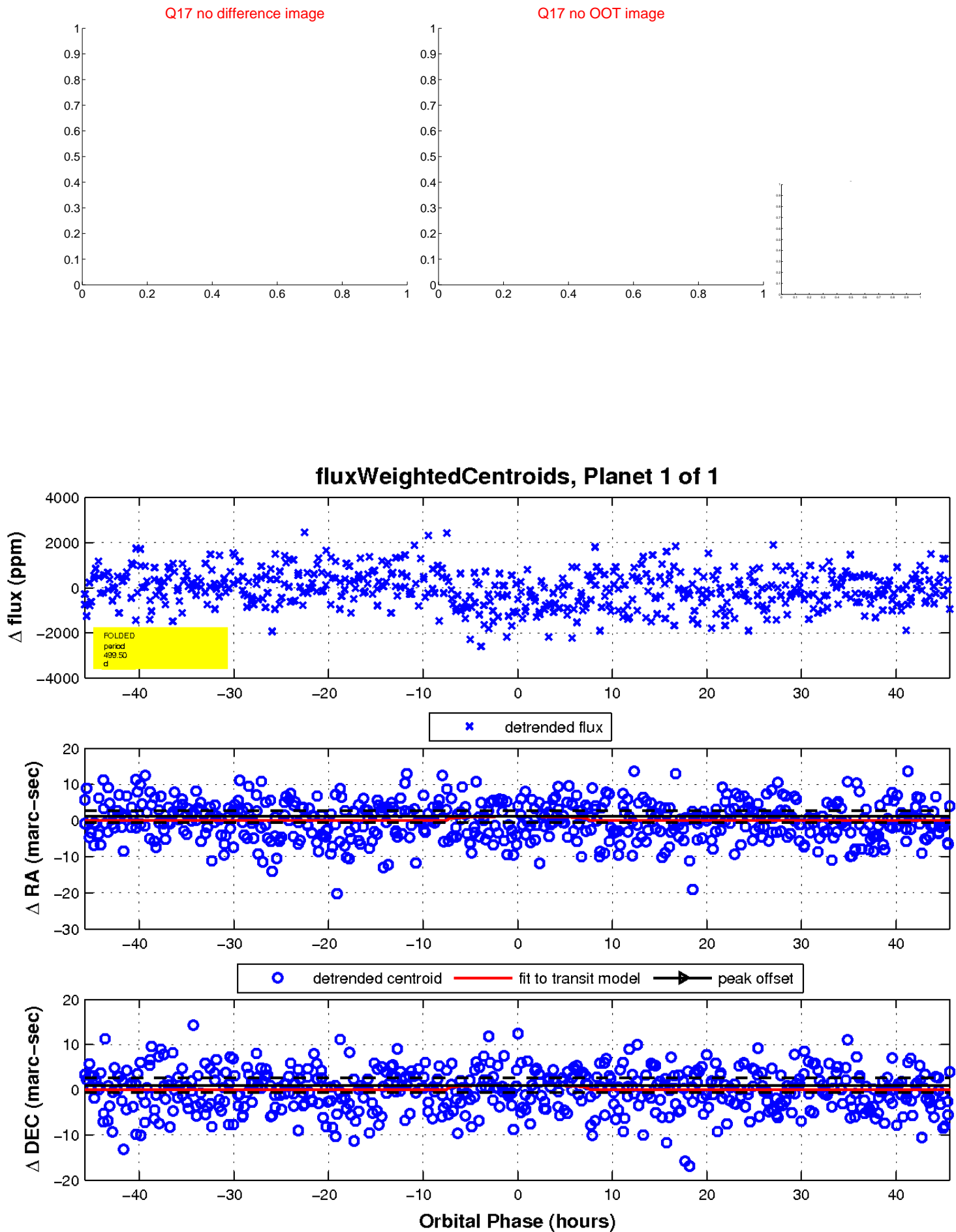
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

