

# KIC 012157366

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012157366-01	OBS	No	579.149369	308.554164	1795.9	7.804	15.5	9.5	0.67	4483	2.89	0.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012157366-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

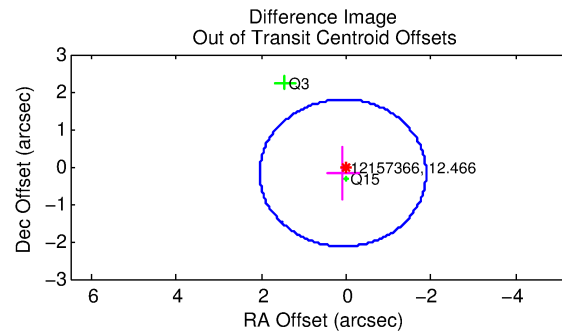
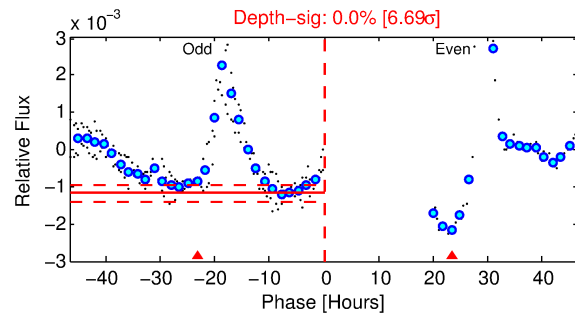
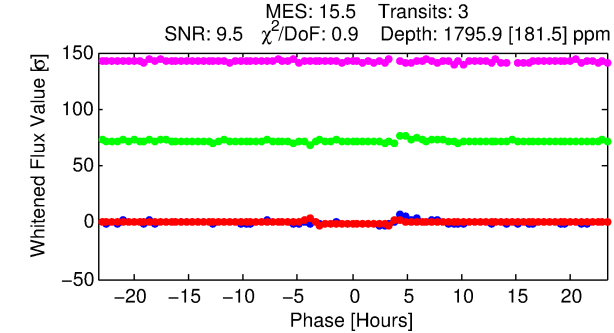
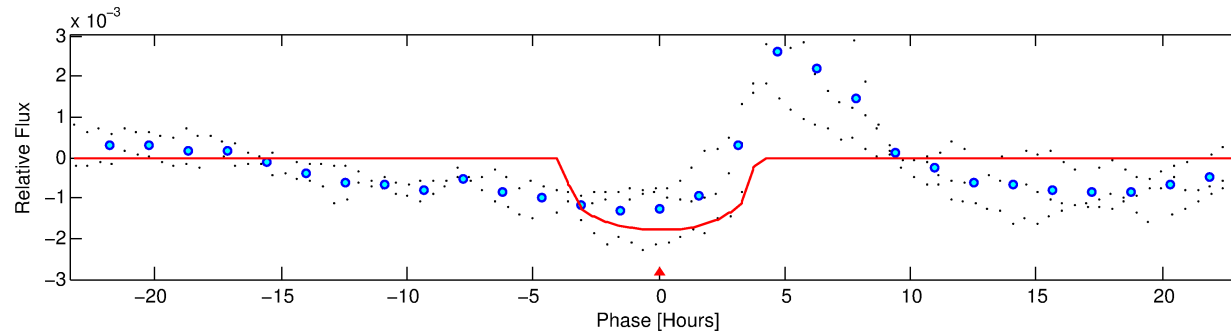
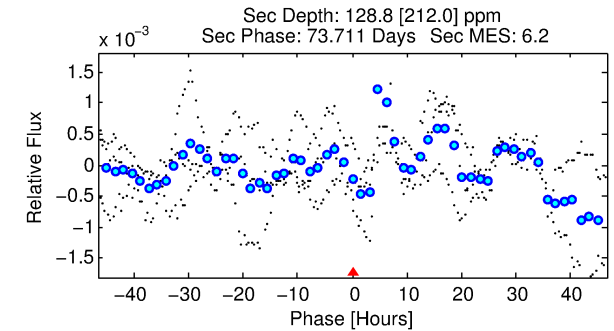
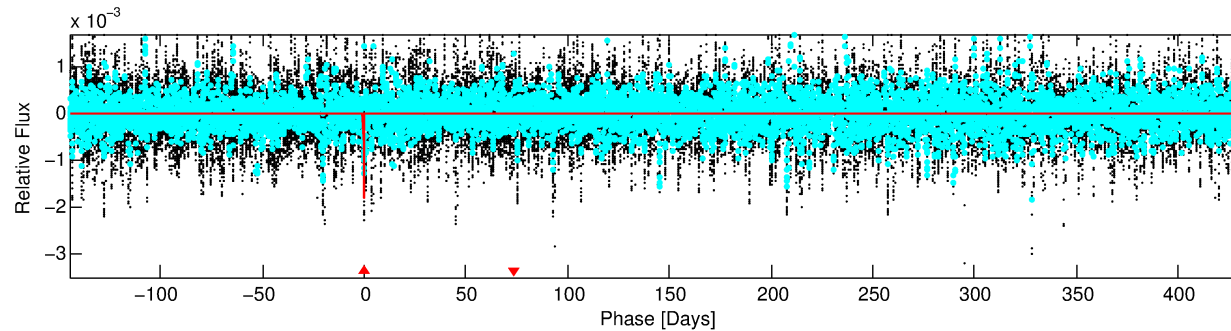
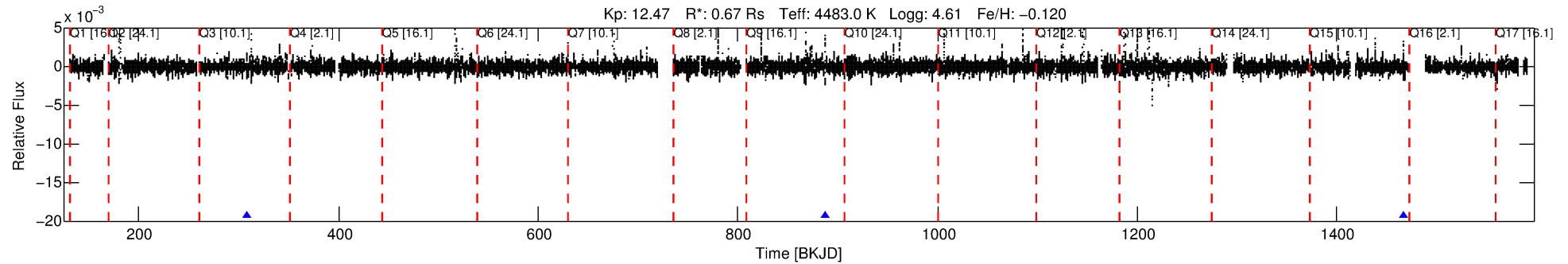
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012157366-01

No Significant Match Found

# DV One-Page Summary

KIC: 12157366 Candidate: 1 of 1 Period: 579.149 d



## DV Fit Results:

Period = 579.14937 [0.00196] d  
Epoch = 308.5542 [0.0035] BKJD  
Rp/R\* = 0.0397 [0.0108]  
a/R\* = 489.76 [403.36]  
b = 0.58 [0.97]  
Seff = 0.12 [0.02]  
Teq = 149 [6] K  
Rp = 2.89 [0.83] Re  
a = 1.1823 [0.0851] AU  
Ag = 11832.95 [20540.86] [0.58 $\sigma$ ]  
Teffp = 2397 [1042] K [2.16 $\sigma$ ]

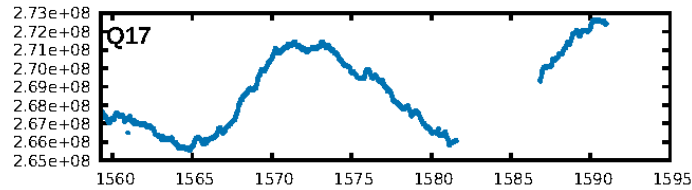
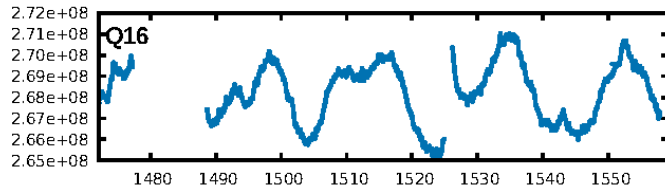
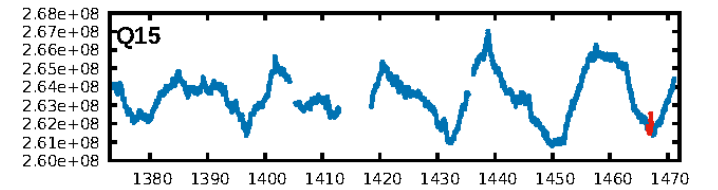
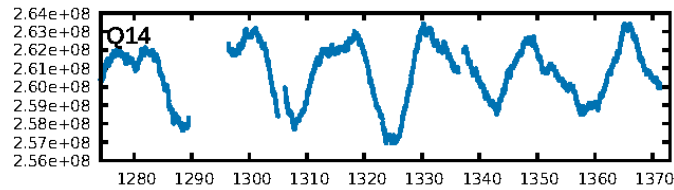
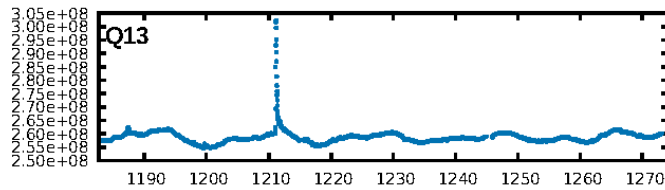
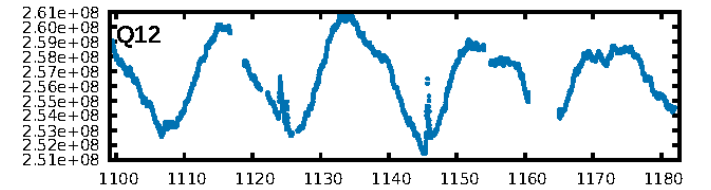
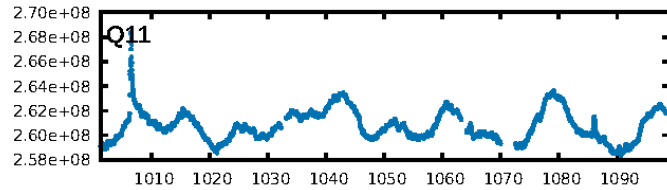
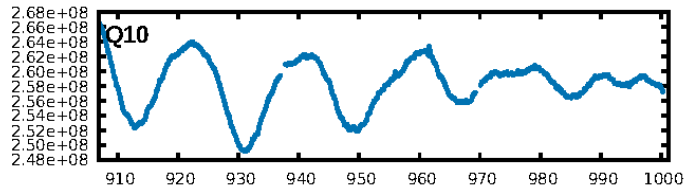
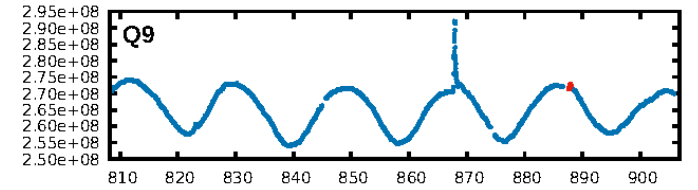
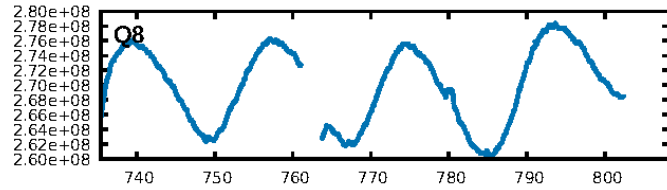
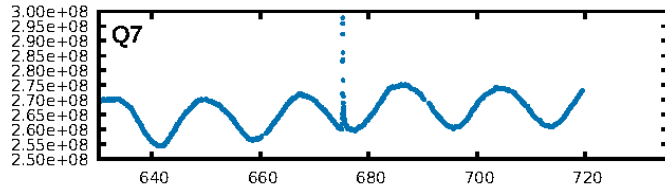
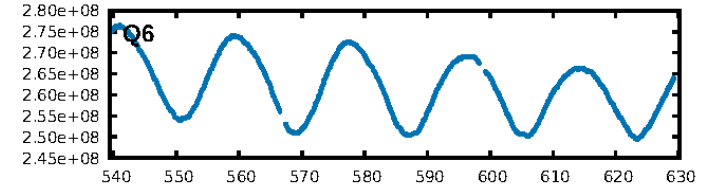
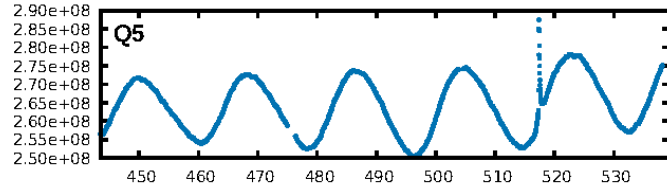
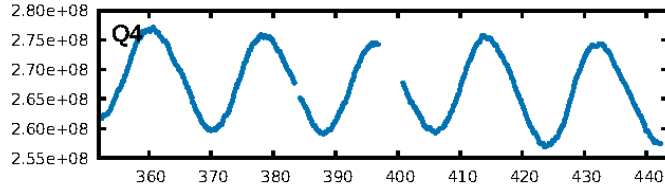
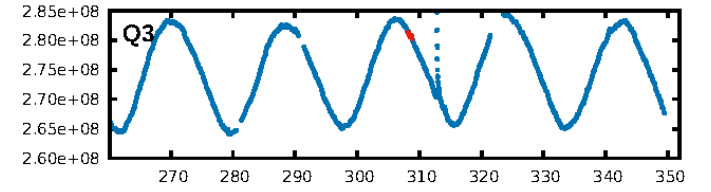
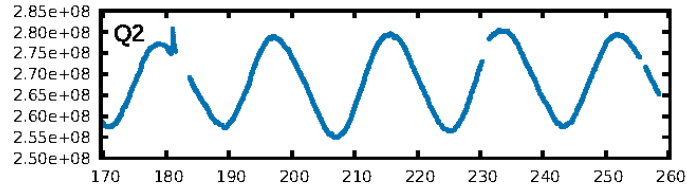
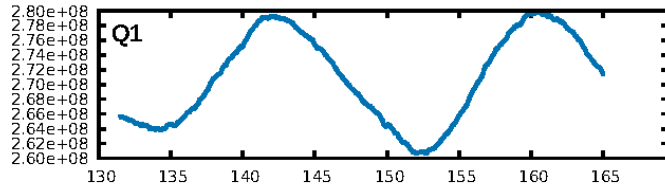
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.9%  
ModelChiSquareGof-sig: 99.1%  
Bootstrap-pfa: 1.51e-13  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.401  
Centroid-sig: 2.9%  
Centroid-so: 0.223 arcsec [1.74 $\sigma$ ]  
OotOffset-rm: 0.184 arcsec [0.28 $\sigma$ ]  
OotOffset-st: 0/2/0/0 [2]  
KicOffset-rm: 0.066 arcsec [0.17 $\sigma$ ]  
KicOffset-st: 0/2/0/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

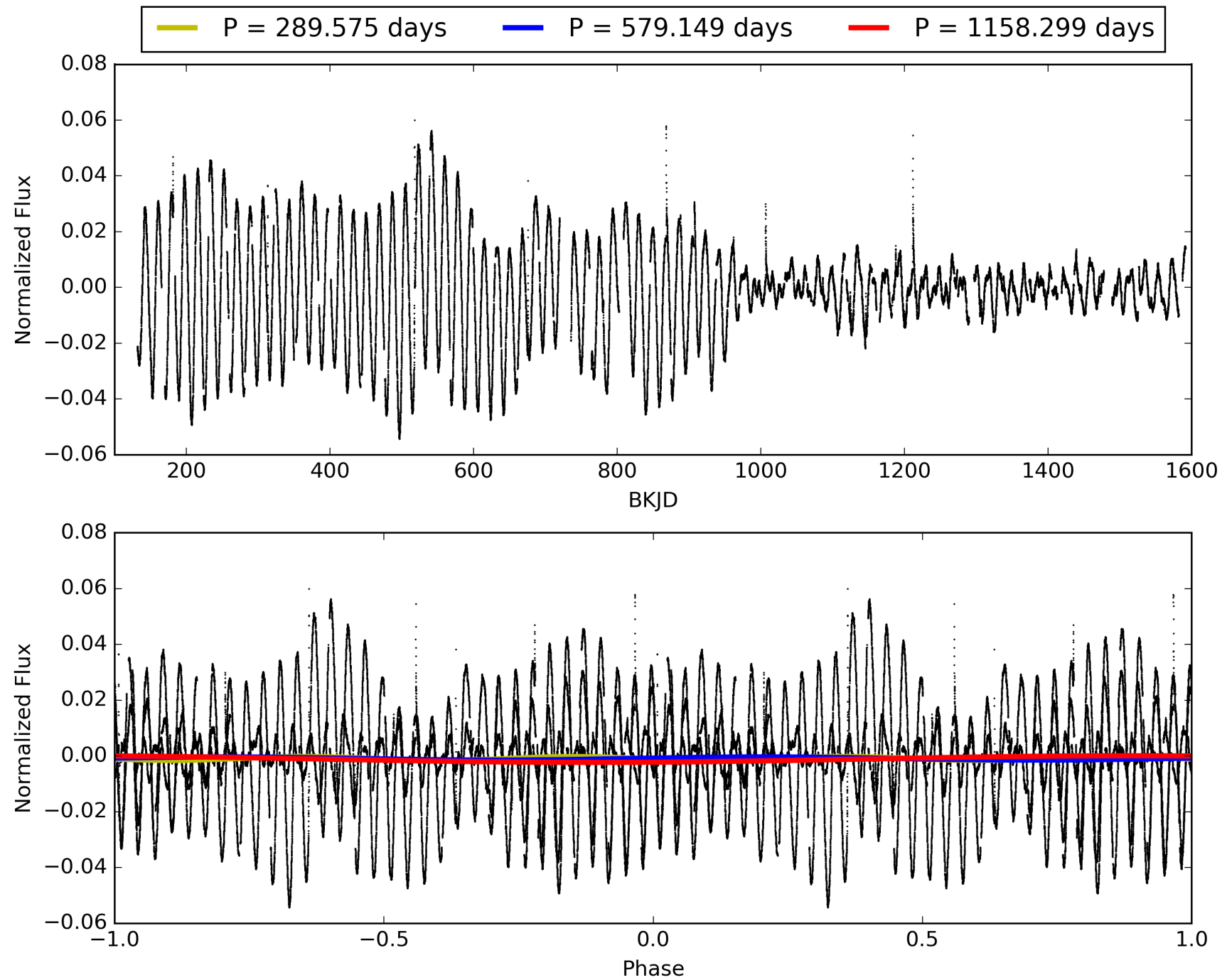
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:53:10 Z

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

# TCE 012157366-01, PDC Light Curves

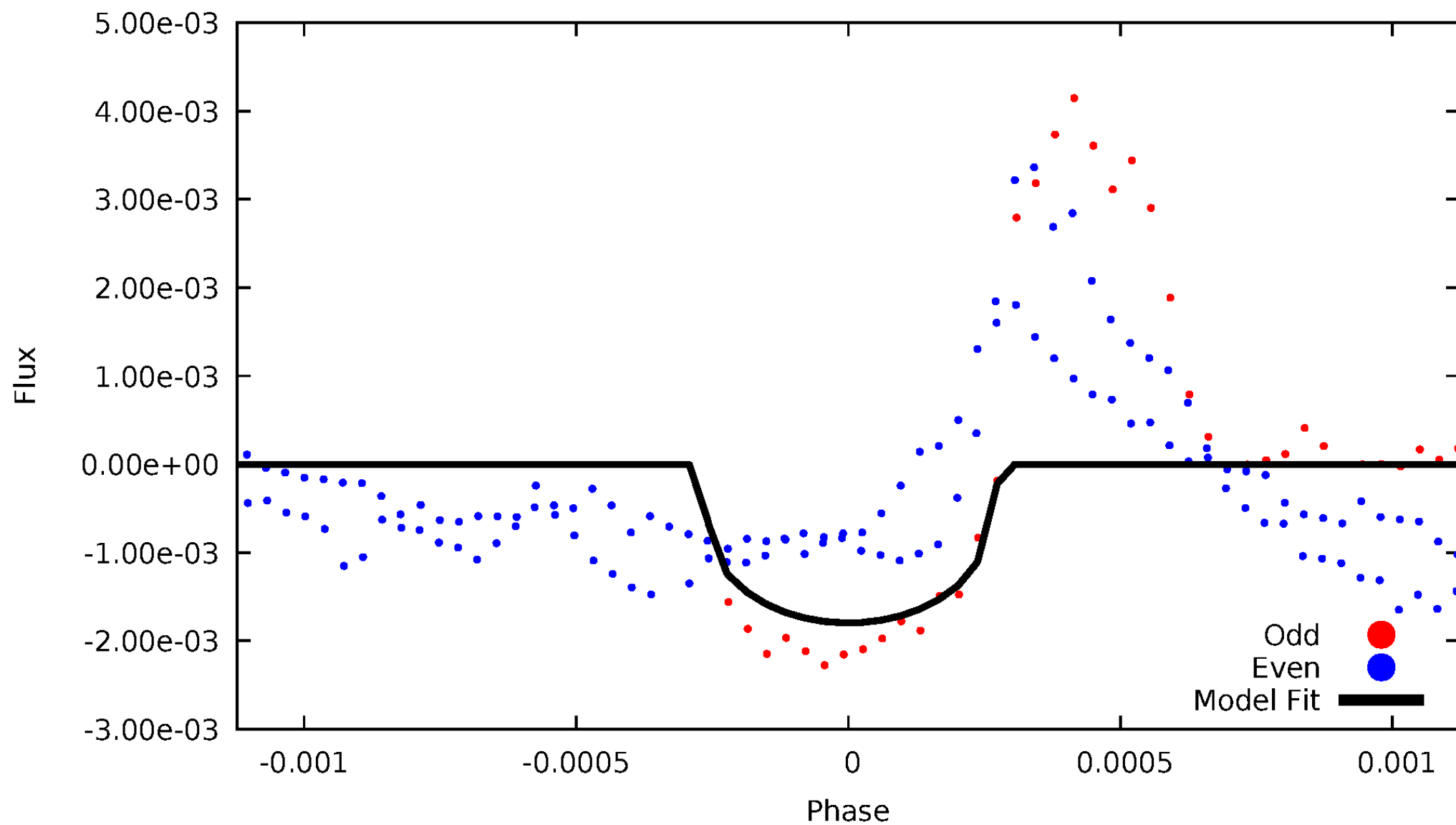


# TCE 012157366-01



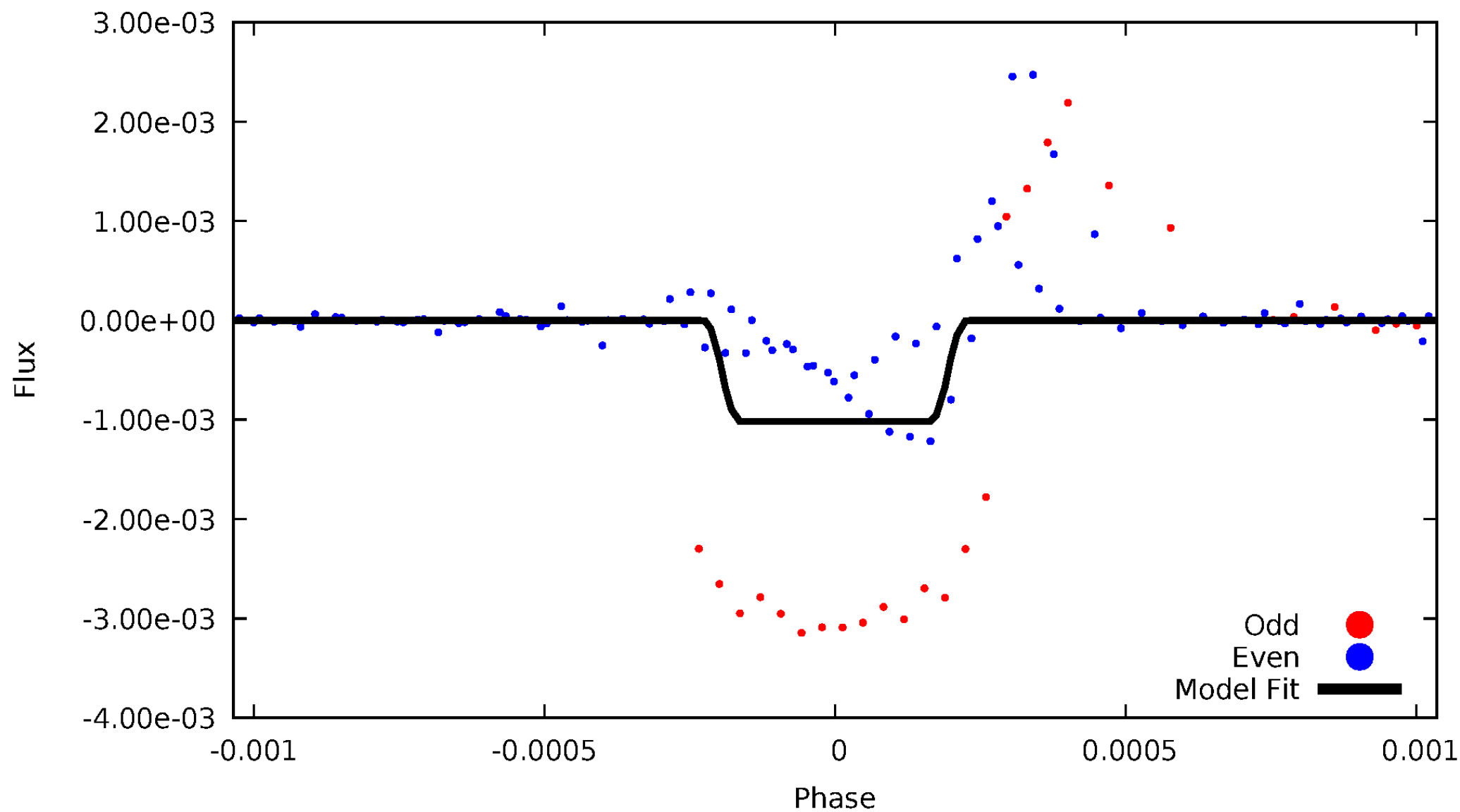
# DV Odd/Even

TCE 012157366-01



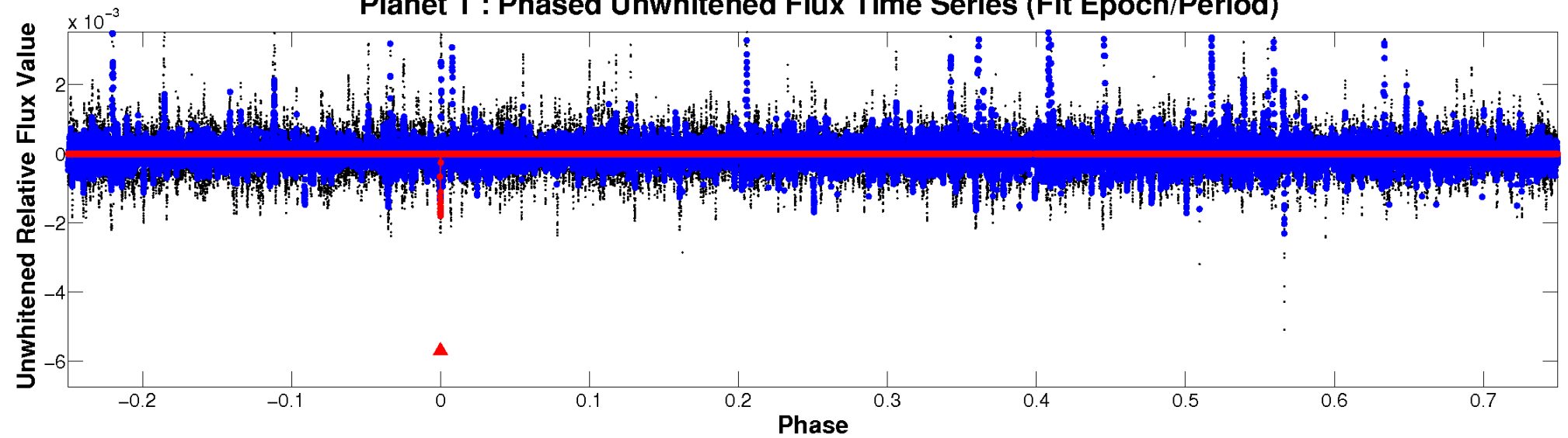
# ALT Odd/Even

TCE 012157366-01

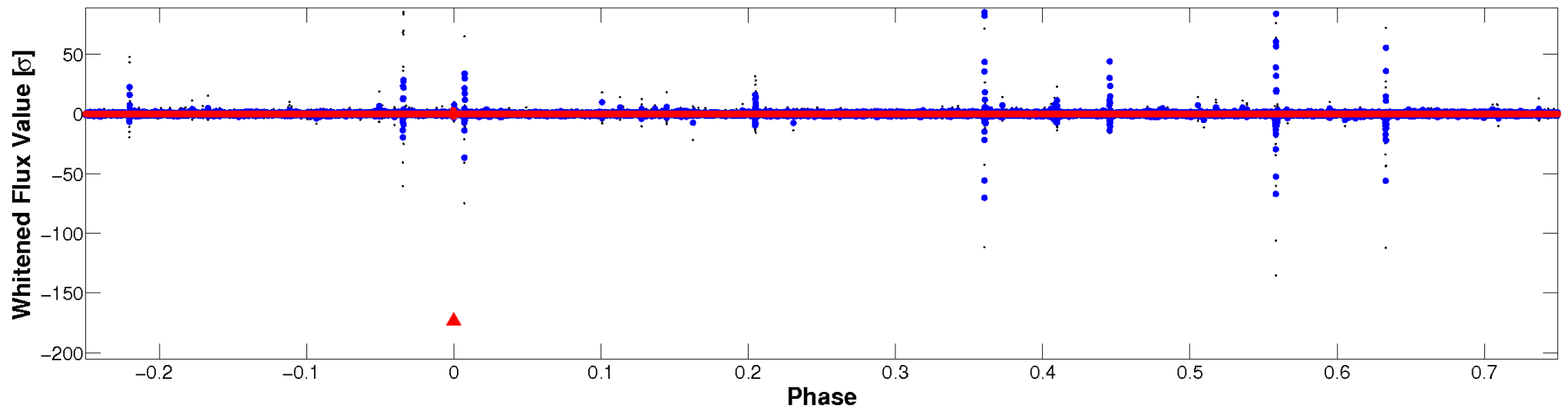


# Non-Whitened Vs. Whitened Light Curve

**Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

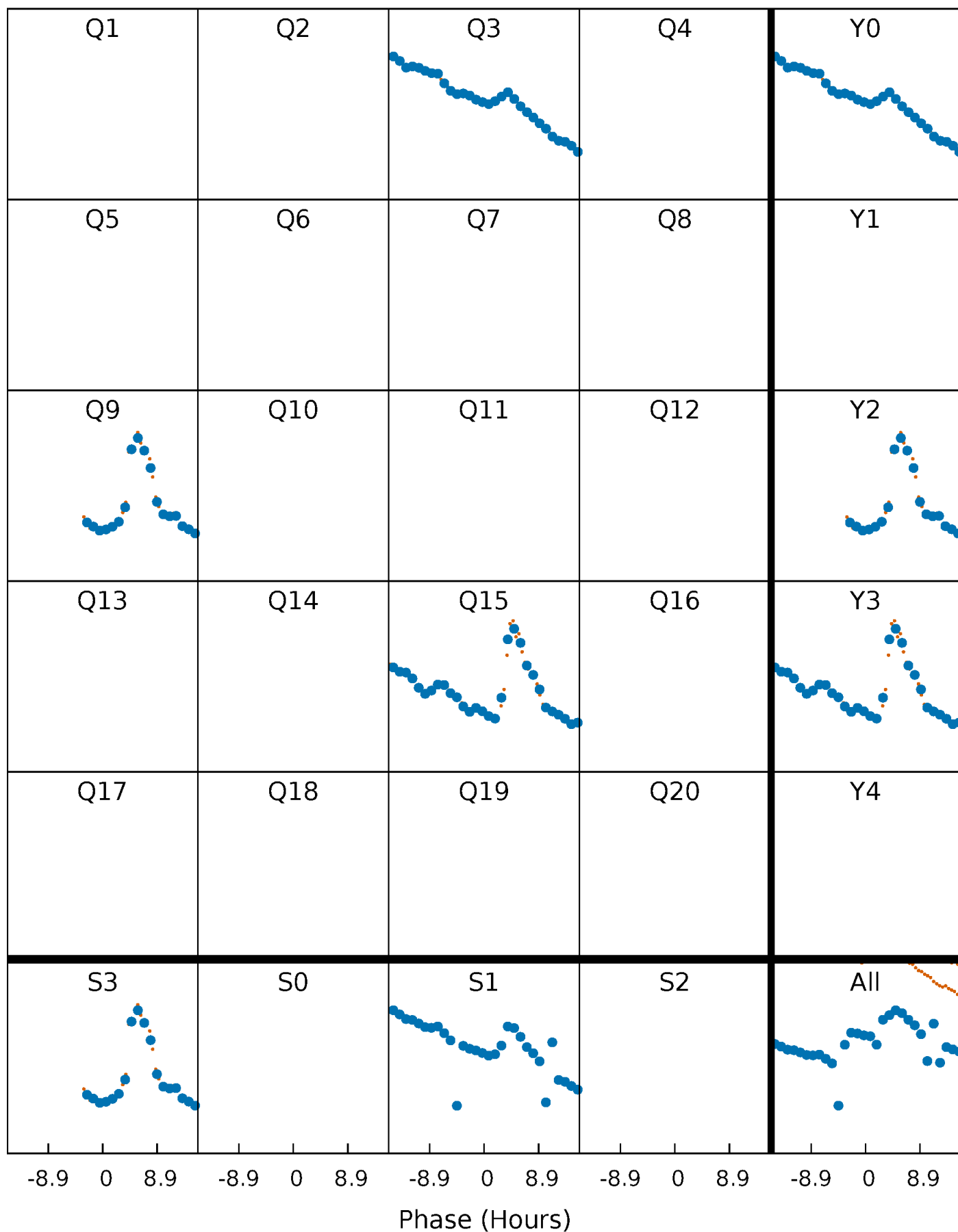


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

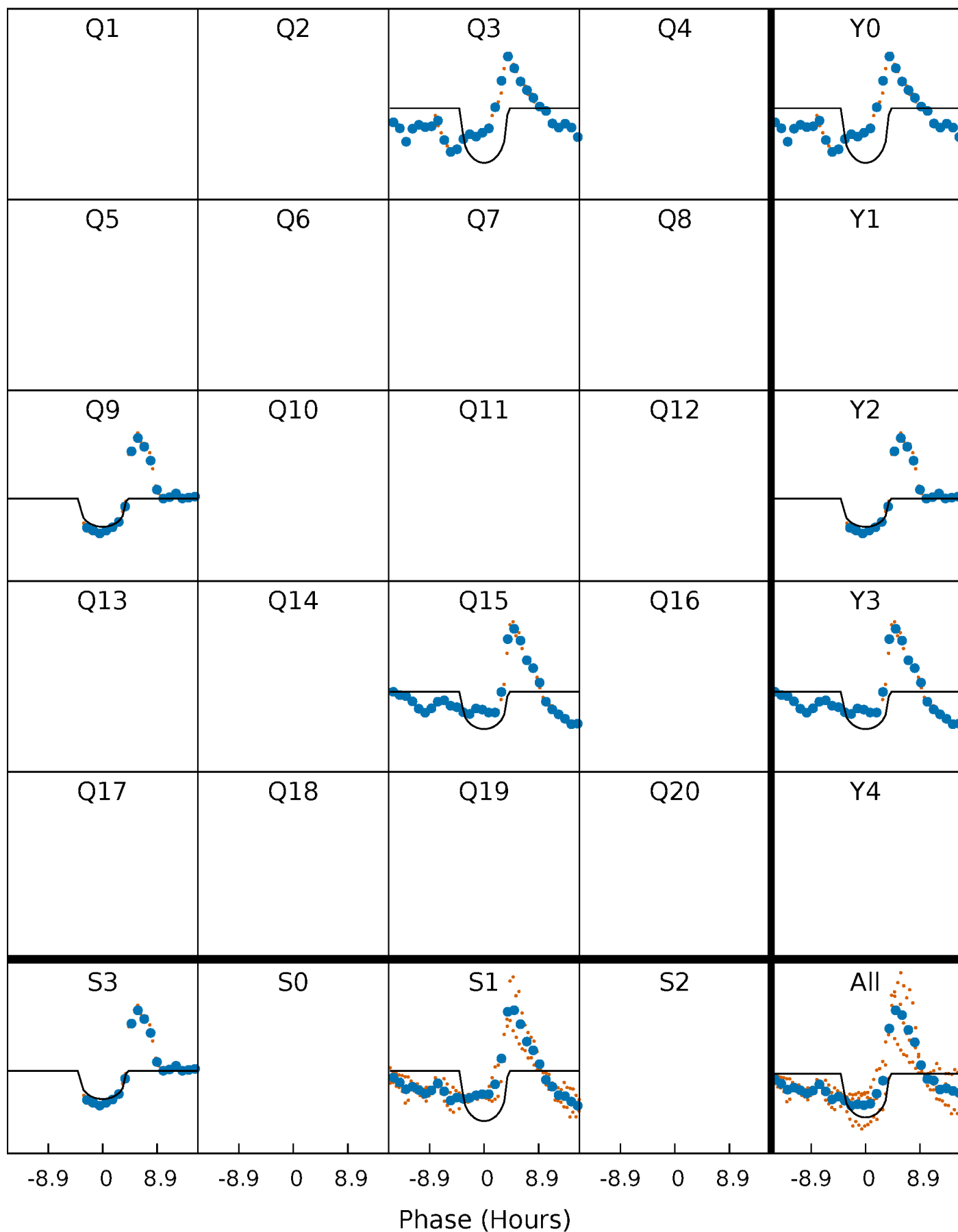
TCE 012157366-01 P=579.149369 Days  $T_0=308.554164$  (BKJD)





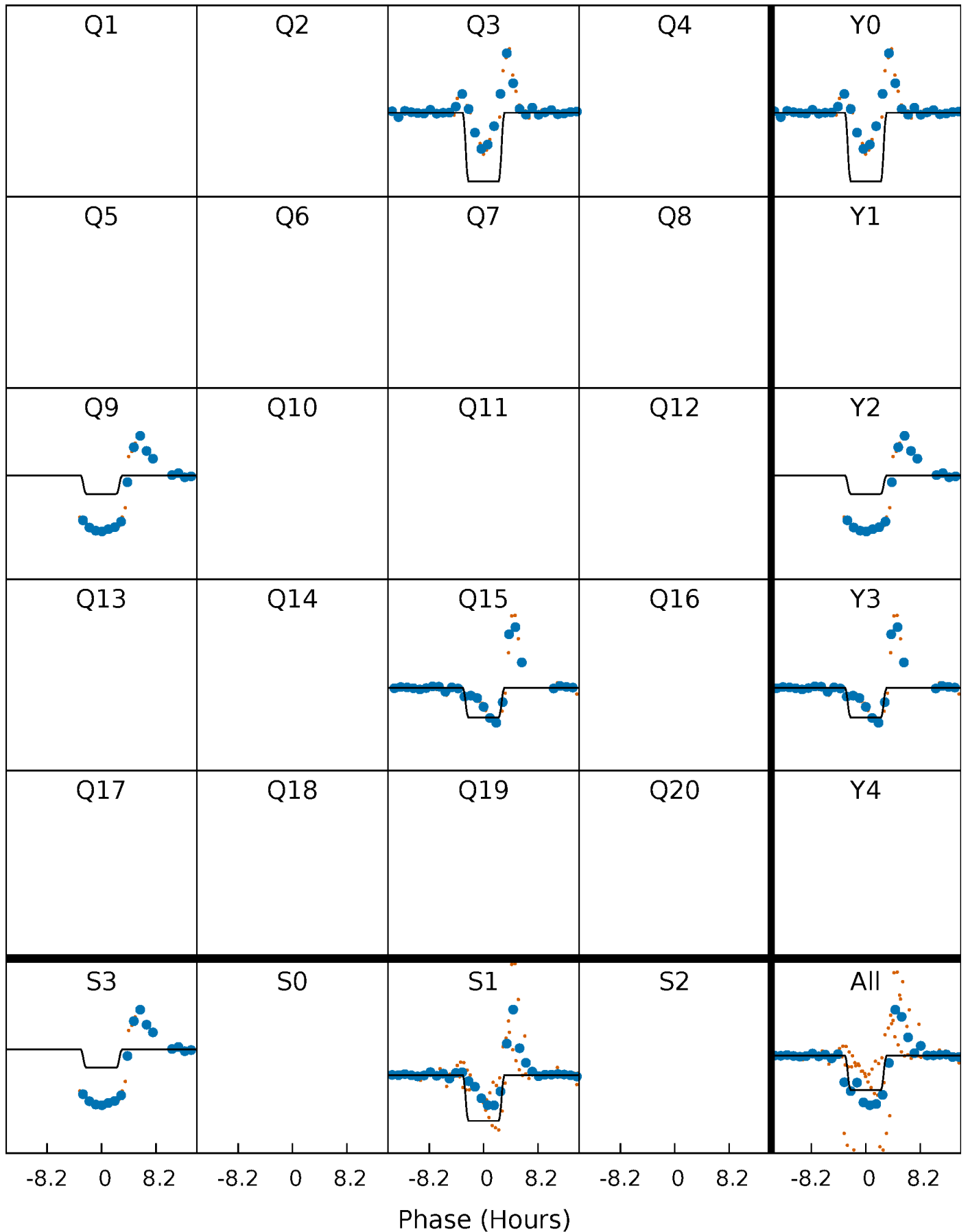
# DV Quarter-Phased Transit Curves

TCE 012157366-01 P=579.149369 Days  $T_0=308.554164$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

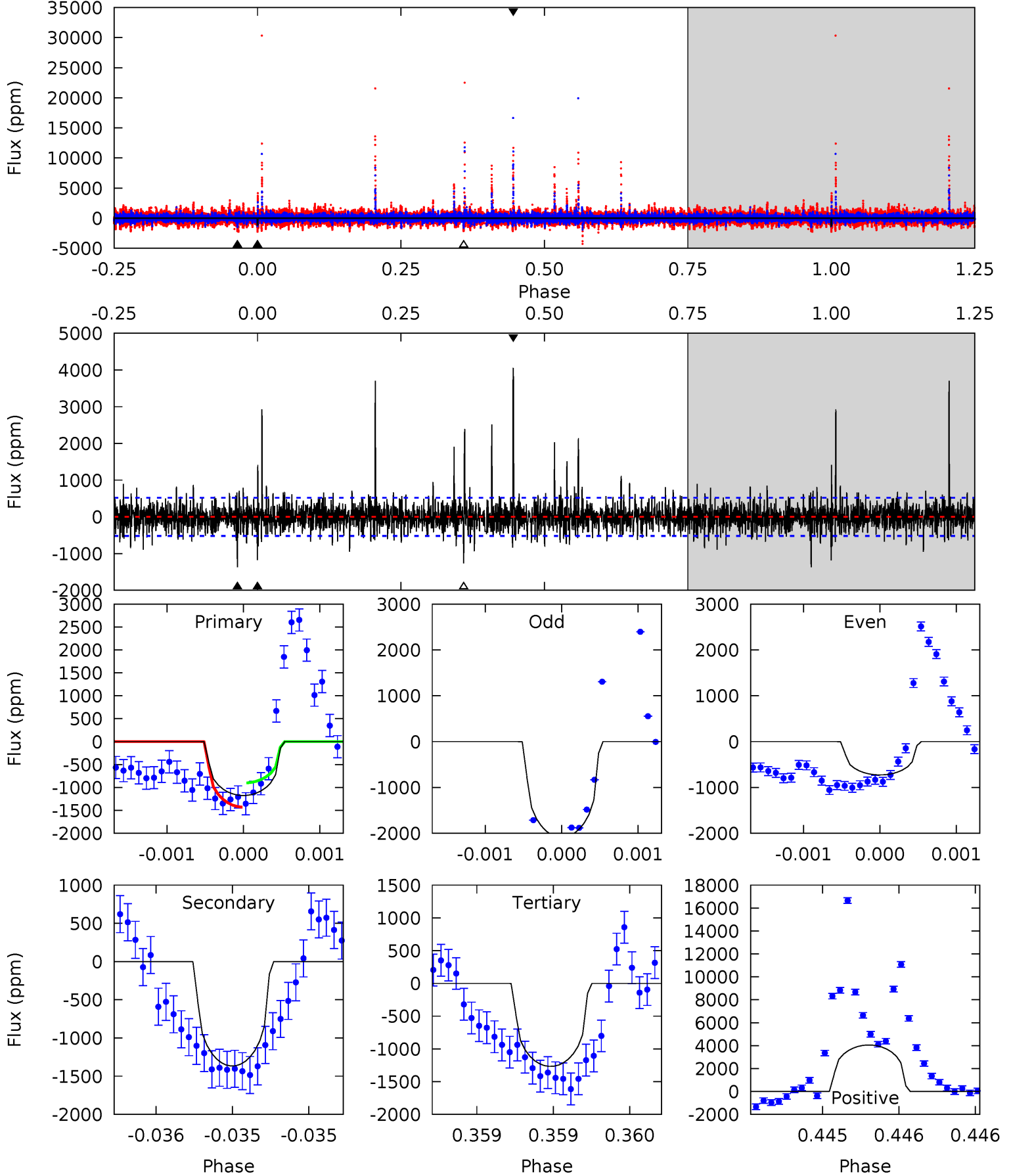
TCE 012157366-01 P=579.141580 Days  $T_0=308.570146$  (BKJD)



# DV Model-Shift Uniqueness Test

012157366-01, P = 579.149369 Days, E = 308.554164 Days

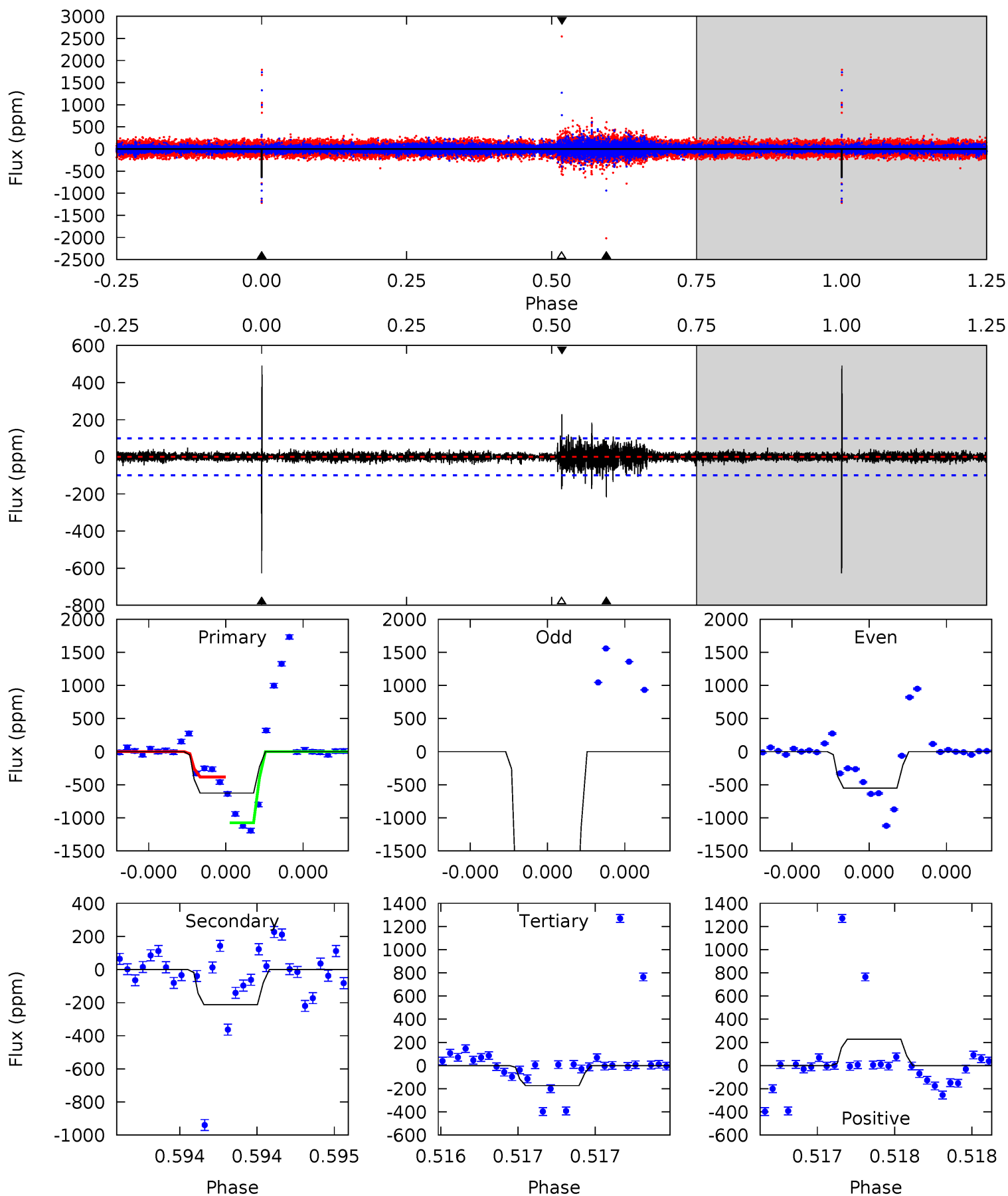
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	14.6	13.6	43.4	5.55	3.45	3.30	-0.97	-30.8	1.07	-28.8	2.04	1.25	0.75	2.82



# Alt Model-Shift Uniqueness Test

012157366-01, P = 579.141580 Days, E = 308.570146 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
35.2	11.9	9.73	12.8	5.59	3.50	0.96	25.4	22.4	2.21	-0.87	88.9	1.90	0.44	19.4



### Stellar Parameters For KIC 012157366

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4483^{+156}_{-156}$	$4.606^{+0.052}_{-0.024}$	$-0.120^{+0.300}_{-0.300}$	$0.668^{+0.044}_{-0.060}$	$0.658^{+0.067}_{-0.054}$	$3.105^{+0.722}_{-0.330}$
	+3%/-3%	+1%/-1%	+250%/-250%	+7%/-9%	+10%/-8%	+23%/-11%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 012157366-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1366 \pm 93$	$2.84^{+0.83}_{-0.80}$	$206^{+8}_{-8}$	$4390^{+586}_{-427}$	$130220^{+130130}_{-50553}$
Alt.	$-213 \pm 18$	$2.32^{+0.78}_{-0.80}$	$207^{+8}_{-8}$	$3425^{+532}_{-318}$	$30288^{+43909}_{-13229}$

$T_{max}$  = 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

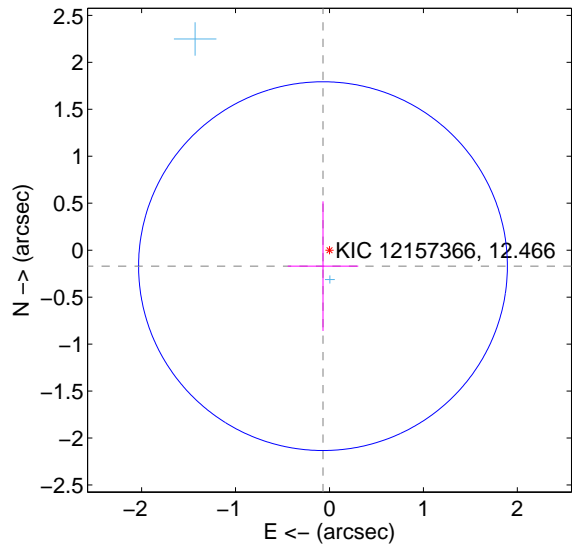
Supplemental centroid analysis for 012157366-01. Kepler magnitude: 12.47. Transit SNR 9.53

There are 2 quarters with good PRF difference image offsets

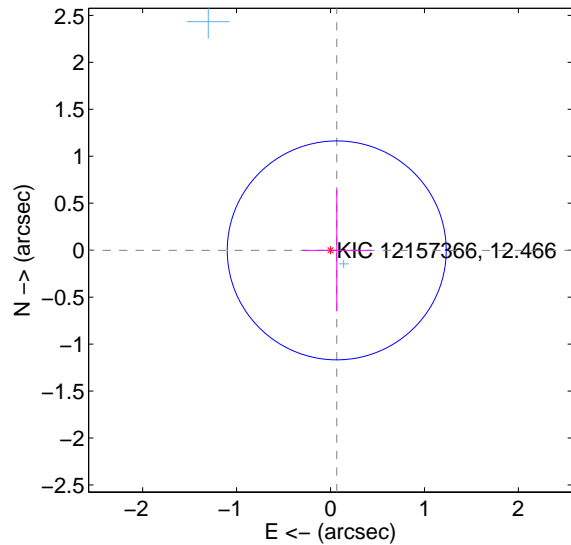
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.184 \pm 0.655$	0.28	$0.069 \pm 0.375$	$-0.170 \pm 0.690$
PRF-fit source offset from KIC position	$0.066 \pm 0.389$	0.17	$-0.066 \pm 0.367$	$-0.002 \pm 0.648$
photometric centroid source offset	$0.22 \pm 0.13$	1.74	$-0.20 \pm 0.11$	$-0.09 \pm 0.21$

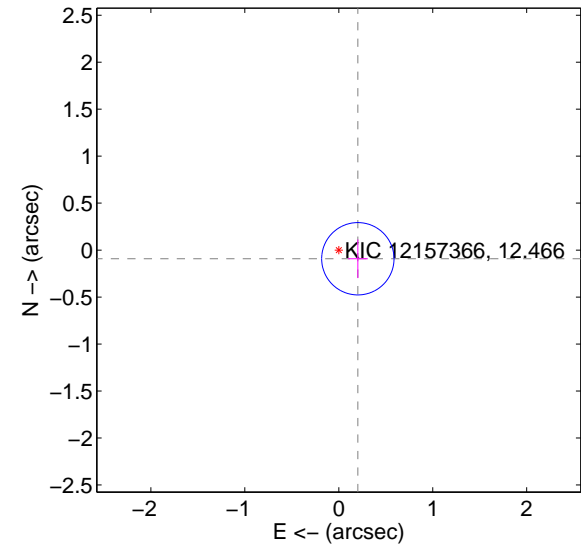
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

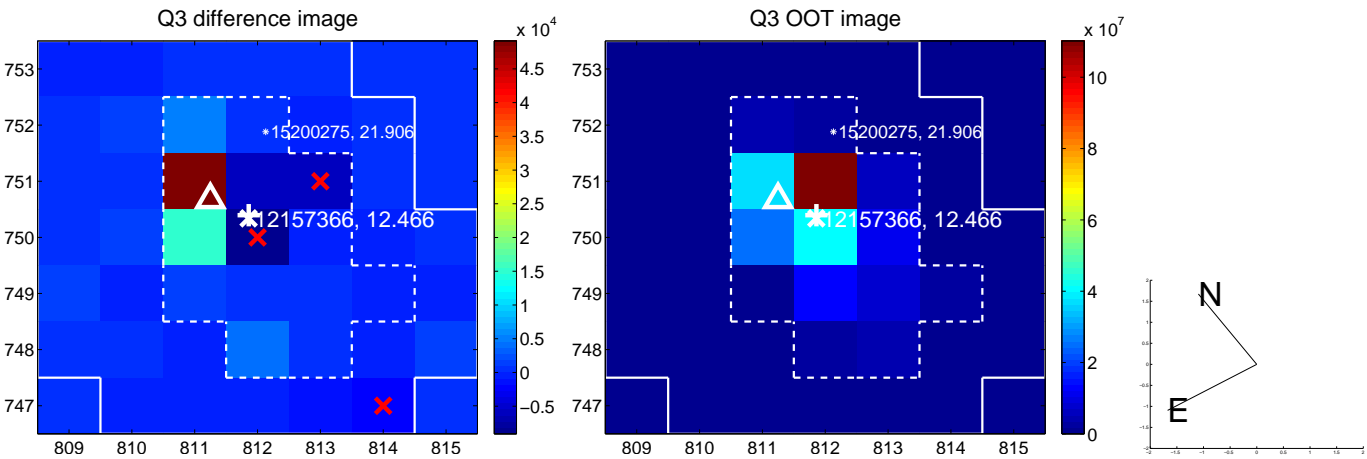


offset from photometric centroids

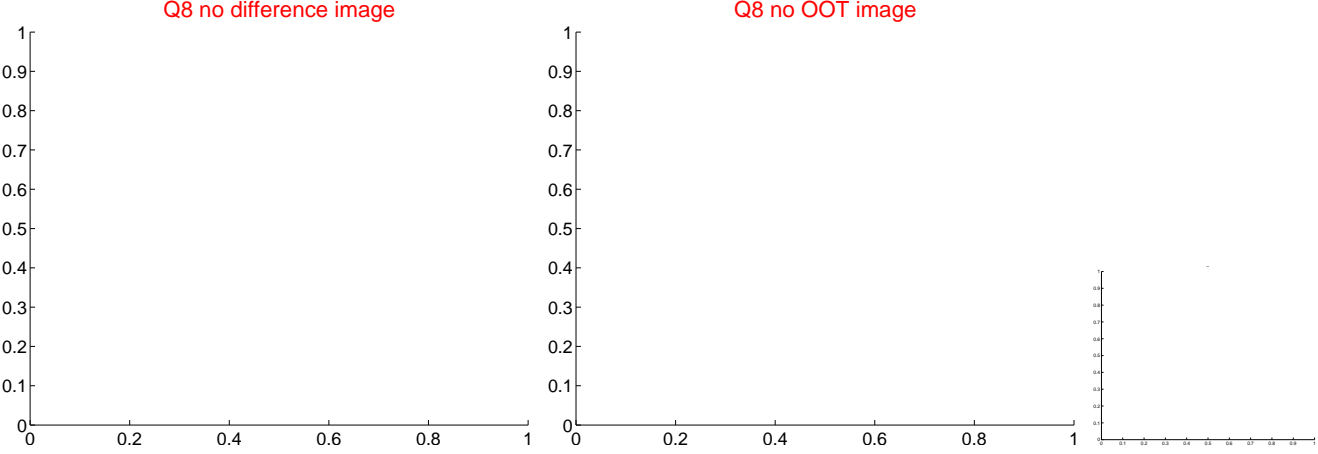
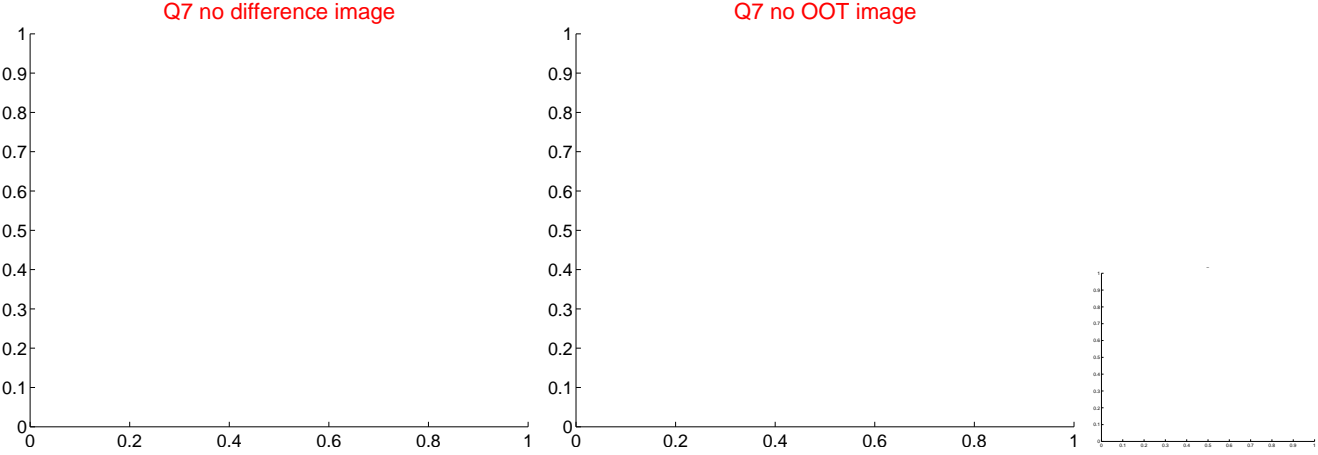


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.



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

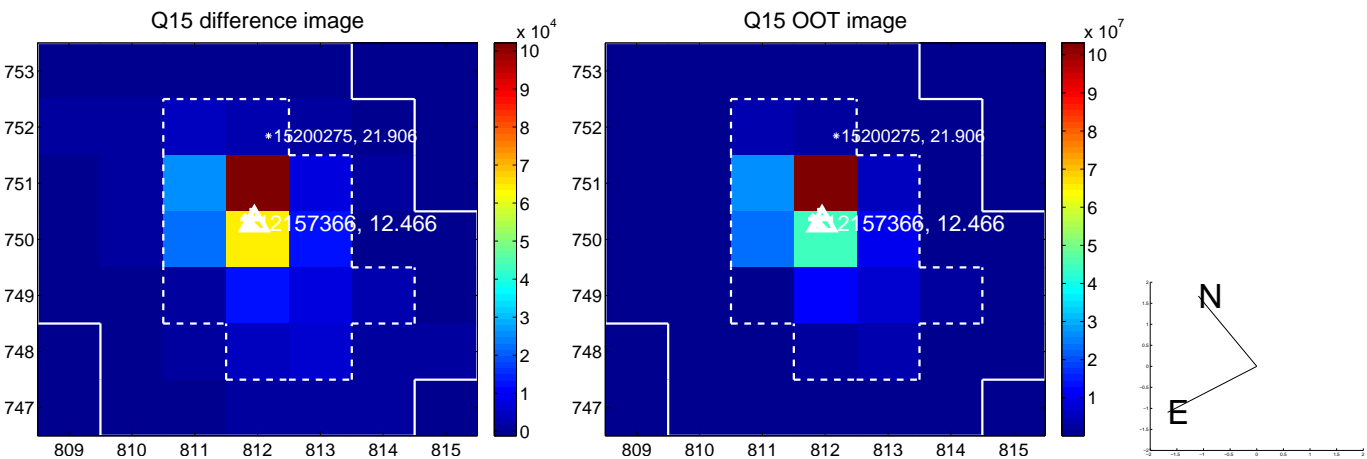




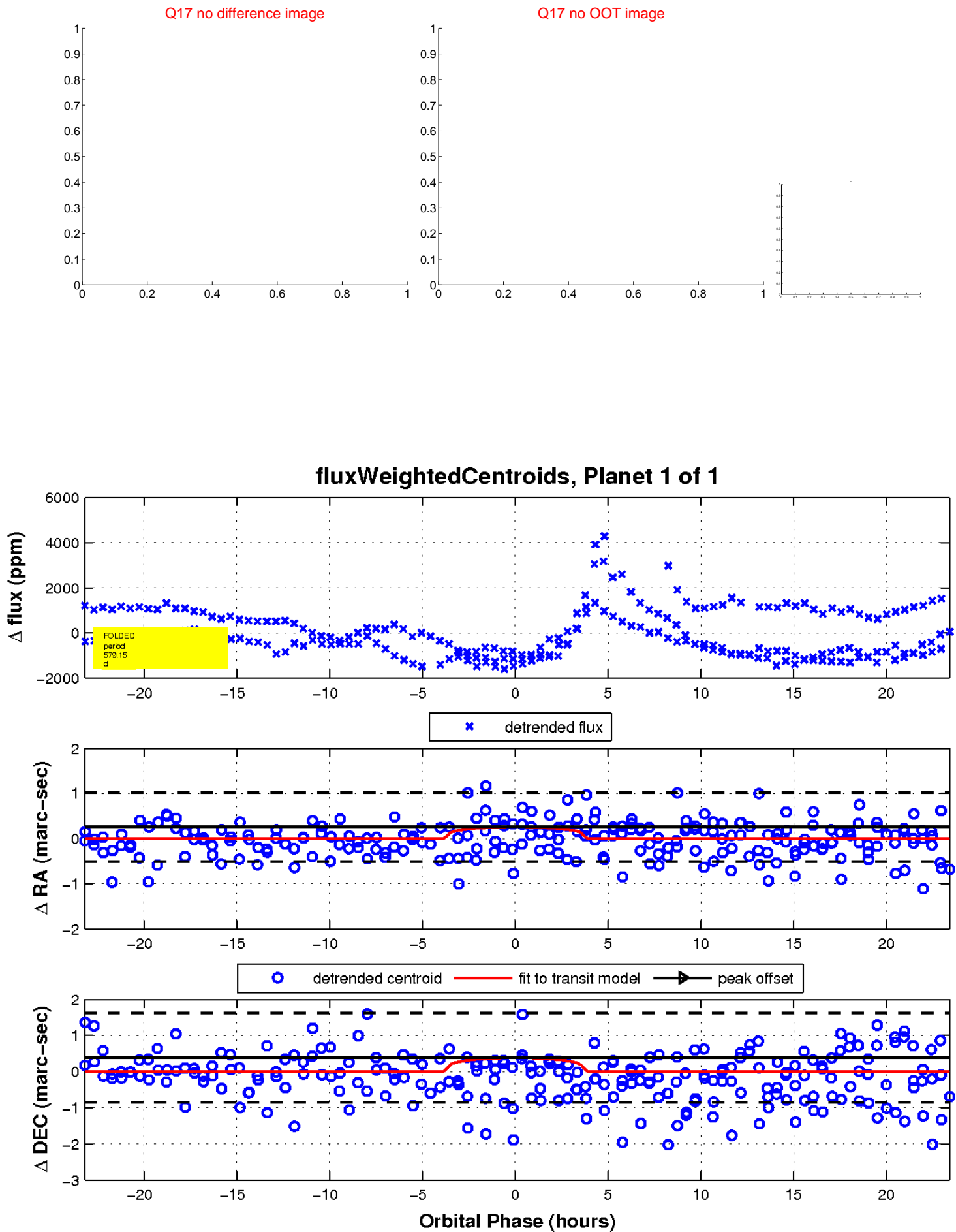
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

