

# KIC 008160932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008160932-01	OBS	No	374.472236	259.491336	5179.7	50.002	11.9	15.1	117.63	3442	1654.77	1756.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008160932-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—EPHEM_MATCH

**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.

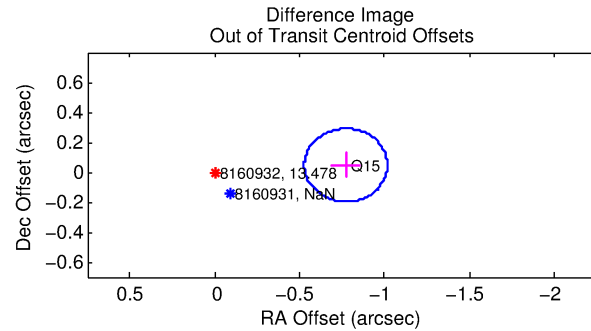
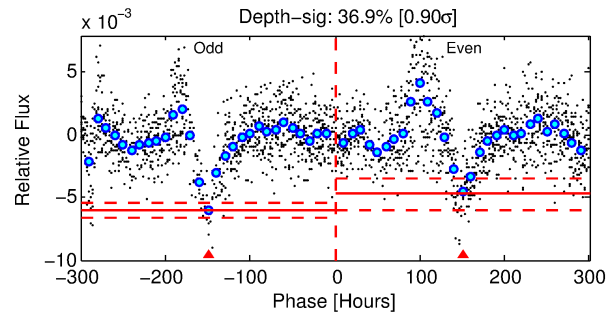
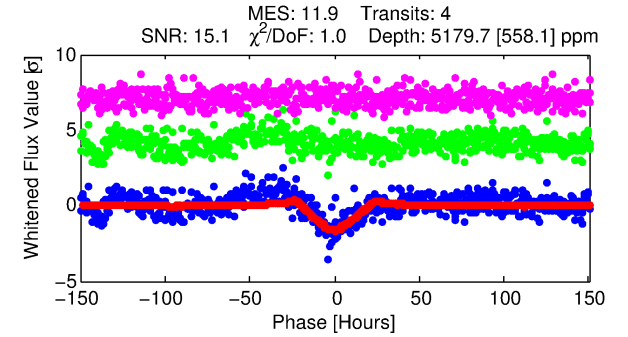
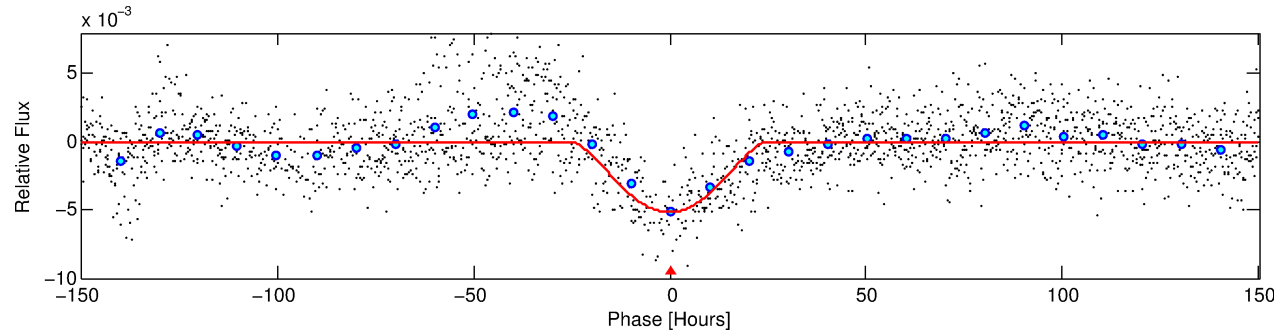
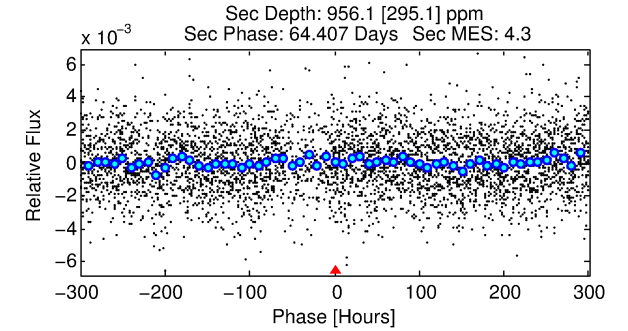
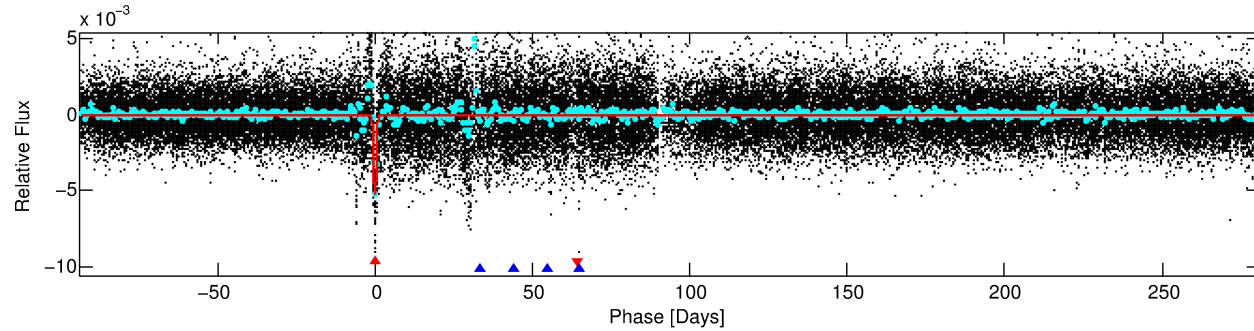
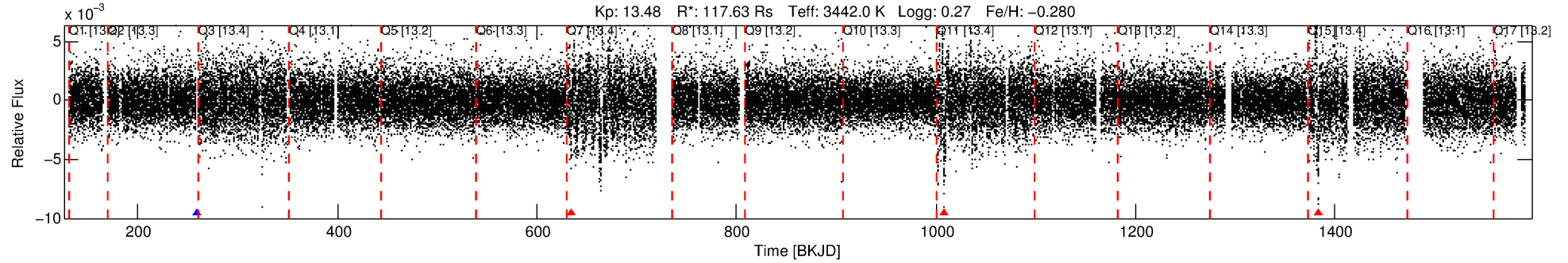
## Ephemeris Match Information For 008160932-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008160932-01	8160932	008362712-01	8362712	1:1	1926.3	-484	1	14.67	13.48	0.16	Col-Anomaly	1	0.96	0.86

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8160932 Candidate: 1 of 2 Period: 374.472 d



## DV Fit Results:

Period = 374.47224 [0.03363] d  
Epoch = 259.4913 [0.0723] BKJD  
Rp/R\* = 0.1289 [0.2806]  
a/R\* = 30.79 [10.65]  
b = 0.99 [0.40]  
Seff = 1756.23 [737.97]  
Teq = 1651 [173] K  
Rp = 1654.77 [3620.29] Re  
a = 0.9954 [0.2348] AU  
Ag = 0.19 [0.83] [-0.97σ]  
Teffp = 1686 [1840] K [0.02σ]

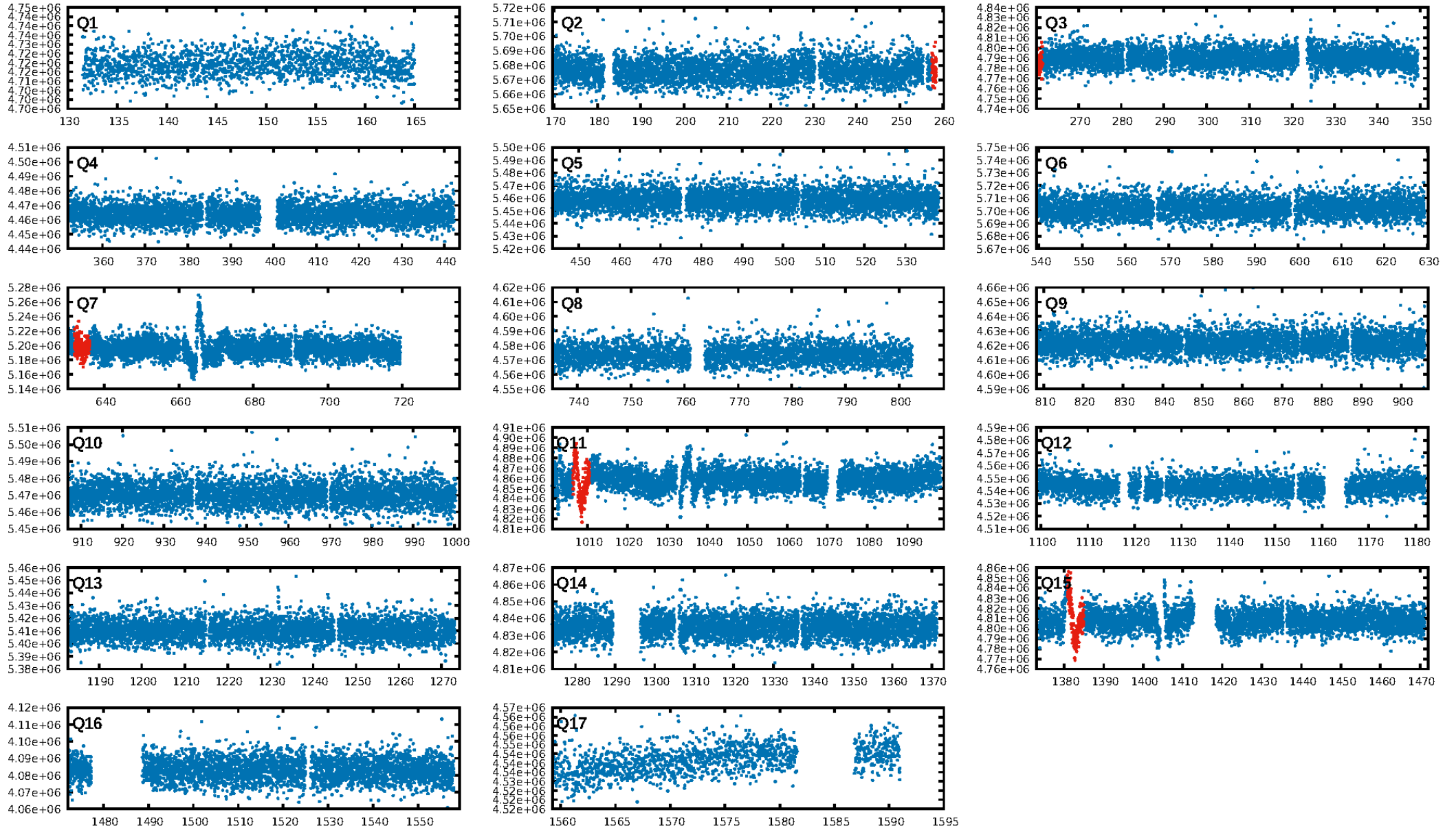
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.08σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 10.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.59e-19  
RollingBand-fgt: 0.25 [1/4]  
GhostDiagnostic-chr: 0.5735  
Centroid-sig: 16.8%  
Centroid-so: 0.449 arcsec [0.65σ]  
OotOffset-rm: 0.774 arcsec [9.49σ]  
KicOffset-rm: 1.862 arcsec [22.82σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

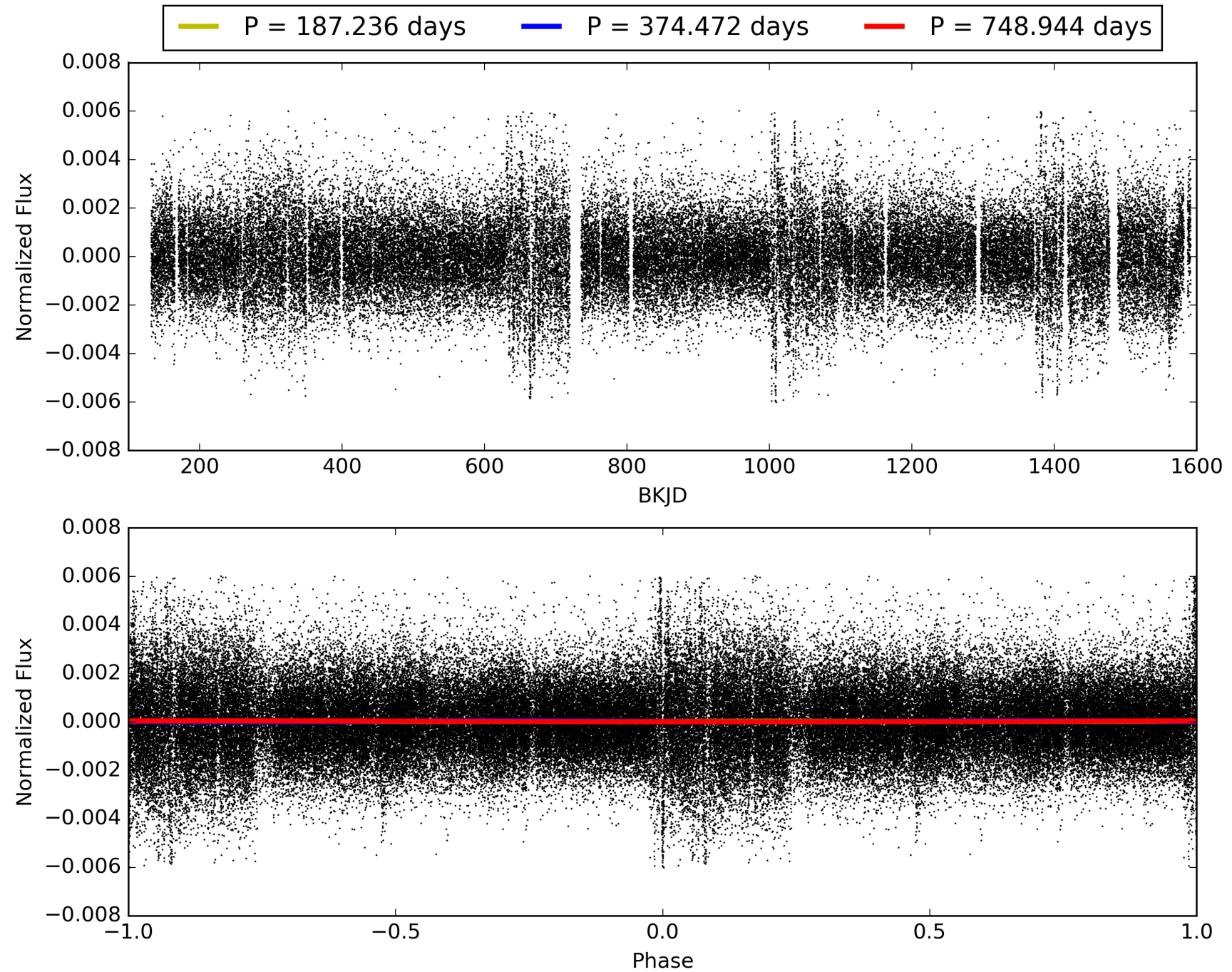
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:24:27 Z

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

# TCE 008160932-01, PDC Light Curves

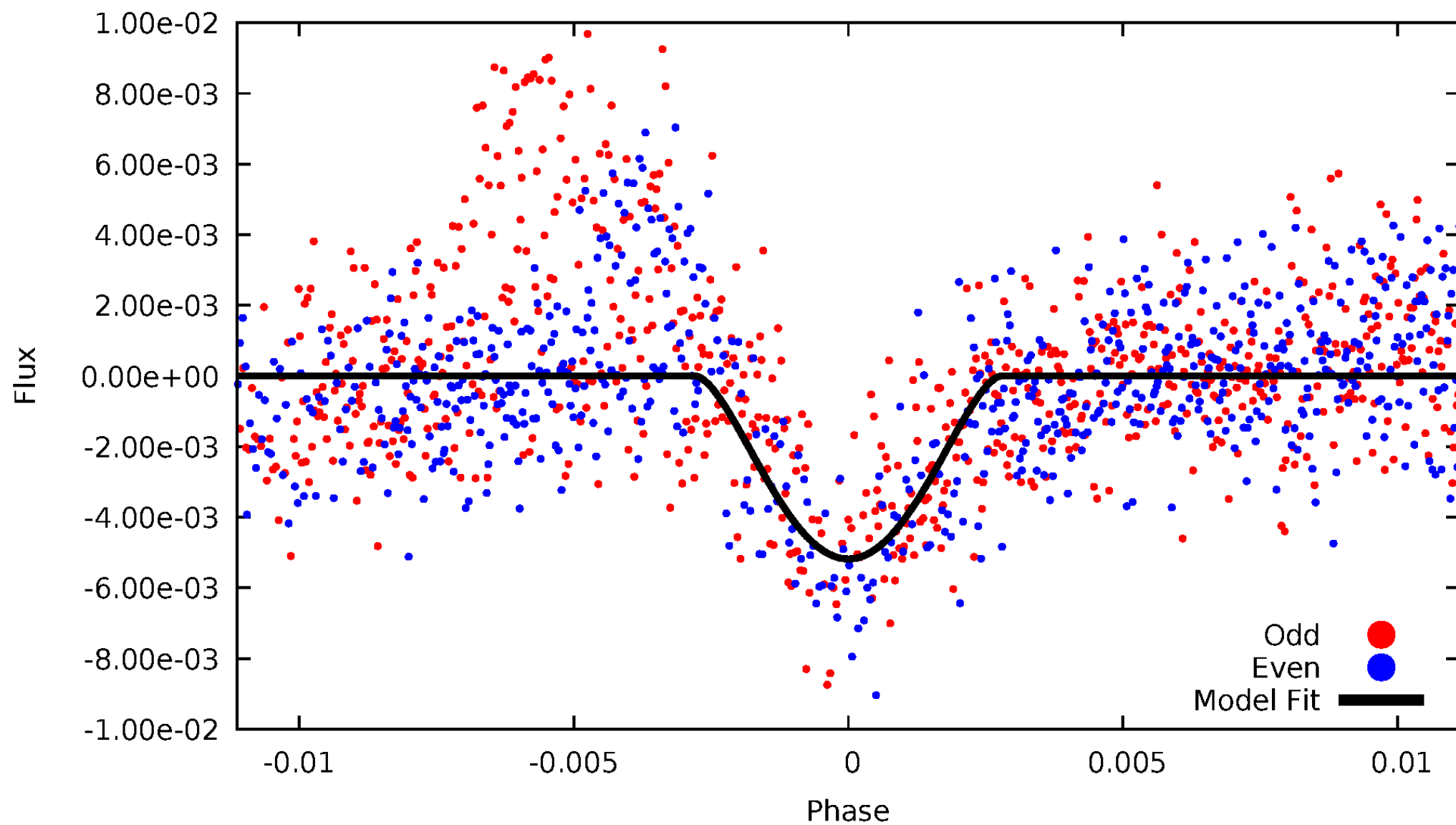


TCE 008160932-01



# DV Odd/Even

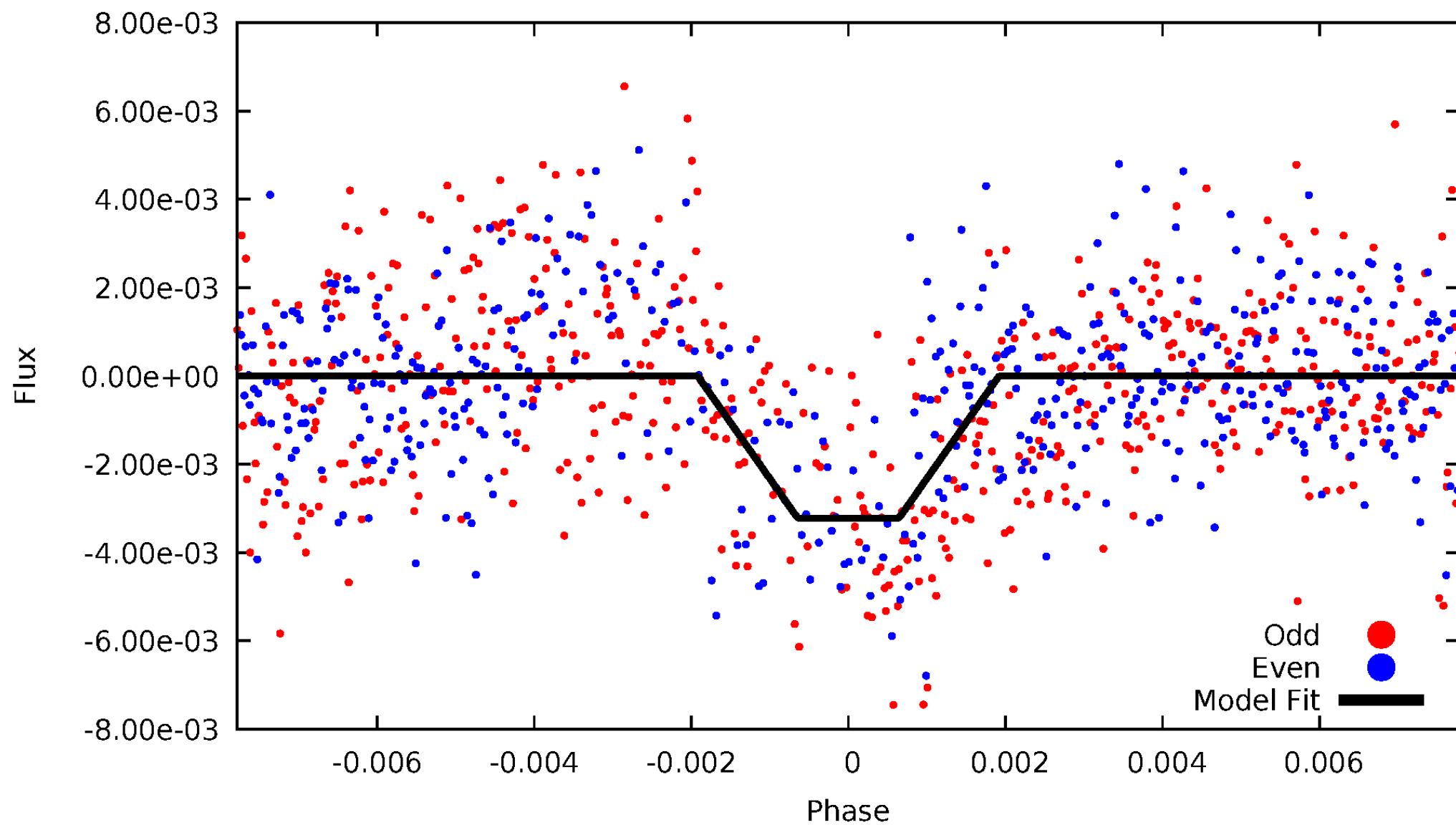
TCE 008160932-01





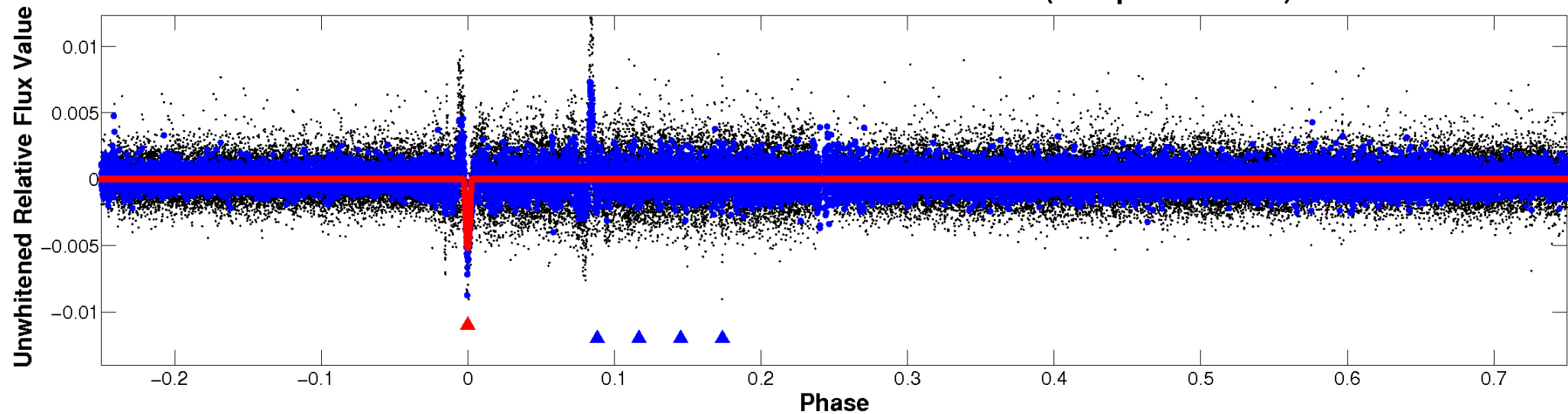
# ALT Odd/Even

TCE 008160932-01

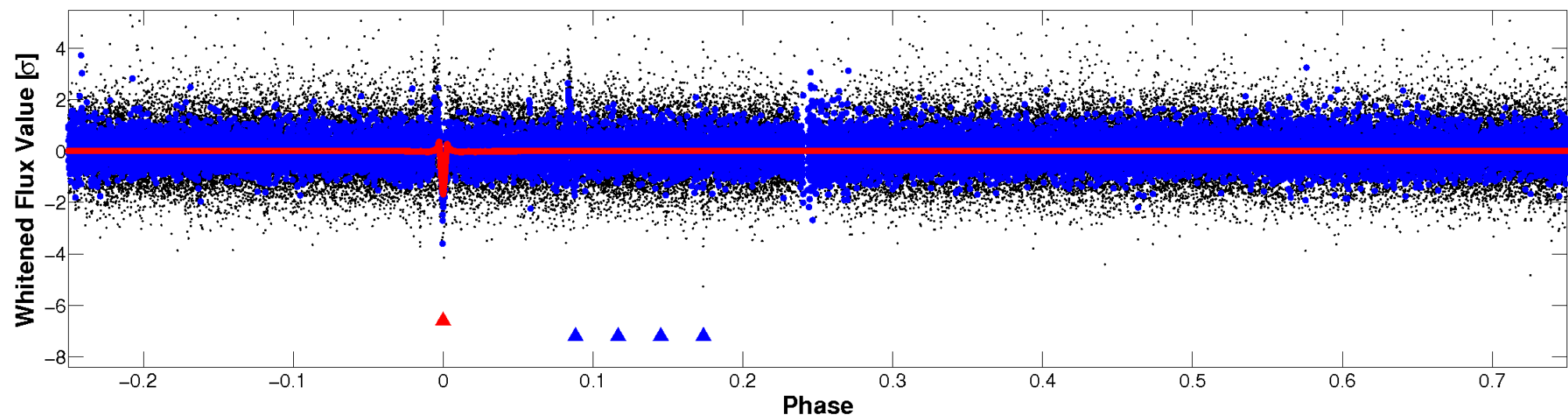


# Non-Whitened Vs. Whitened Light Curve

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

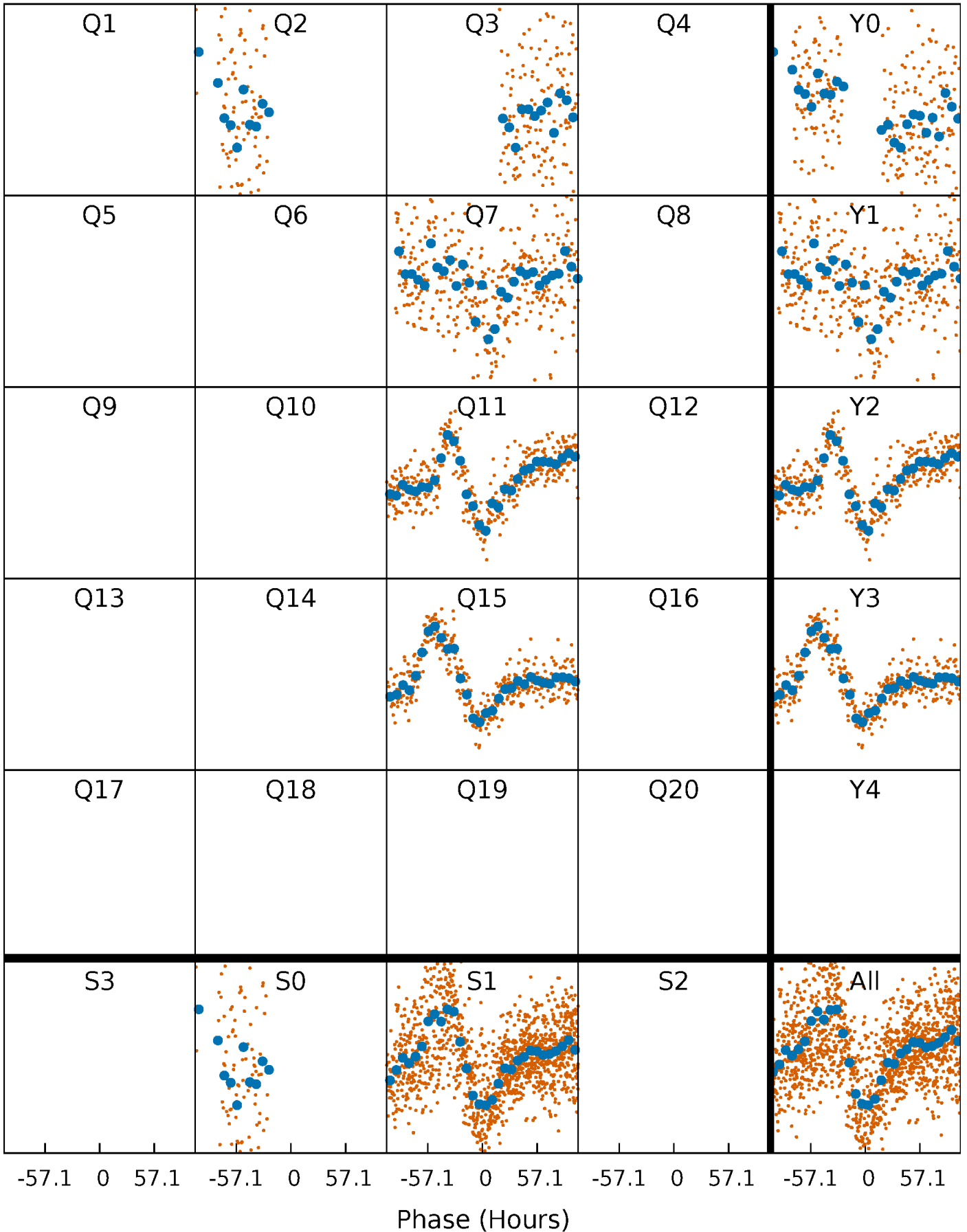


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

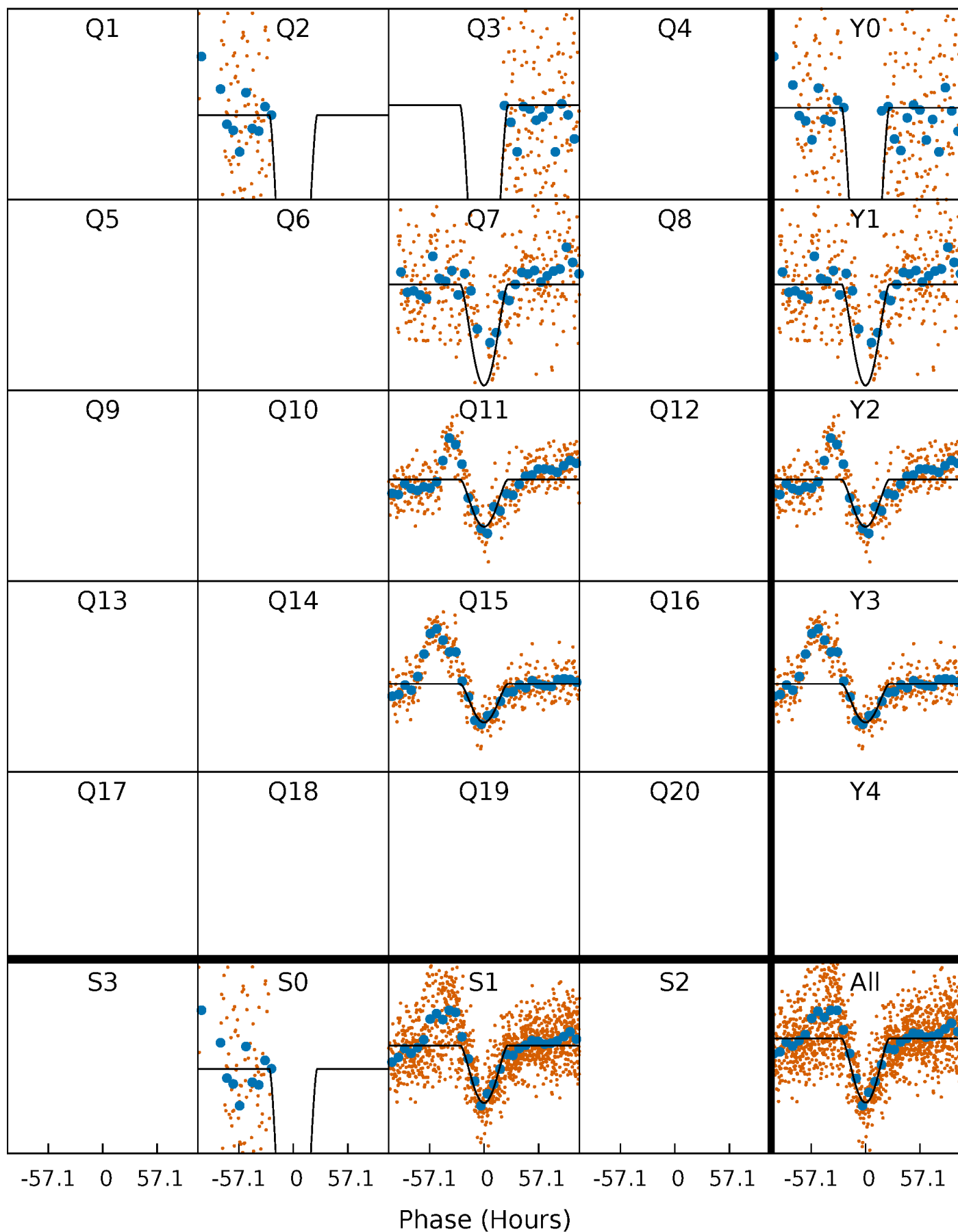
TCE 008160932-01 P=374.472236 Days  $T_0=259.491336$  (BKJD)





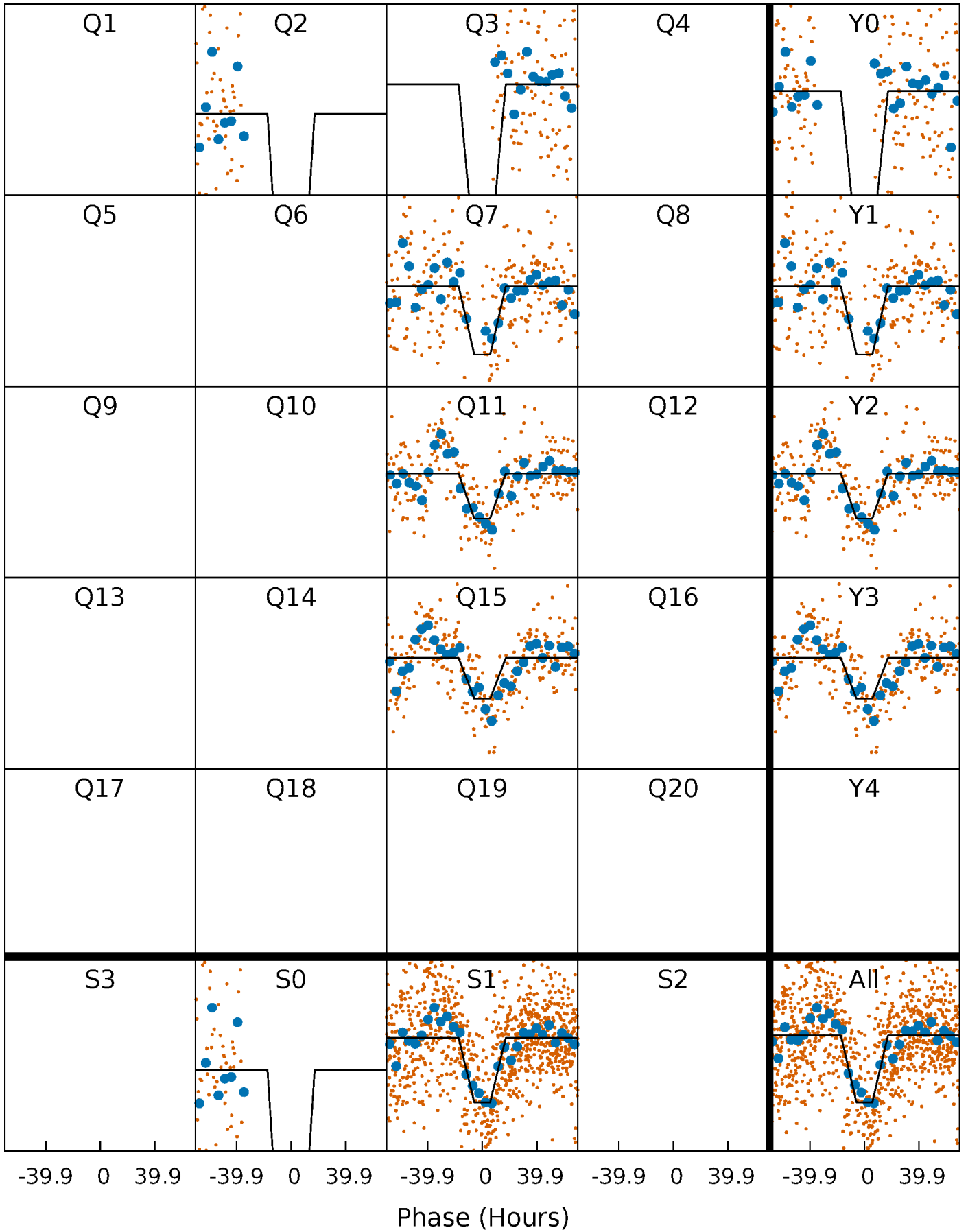
# DV Quarter-Phased Transit Curves

TCE 008160932-01 P=374.472236 Days  $T_0=259.491336$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

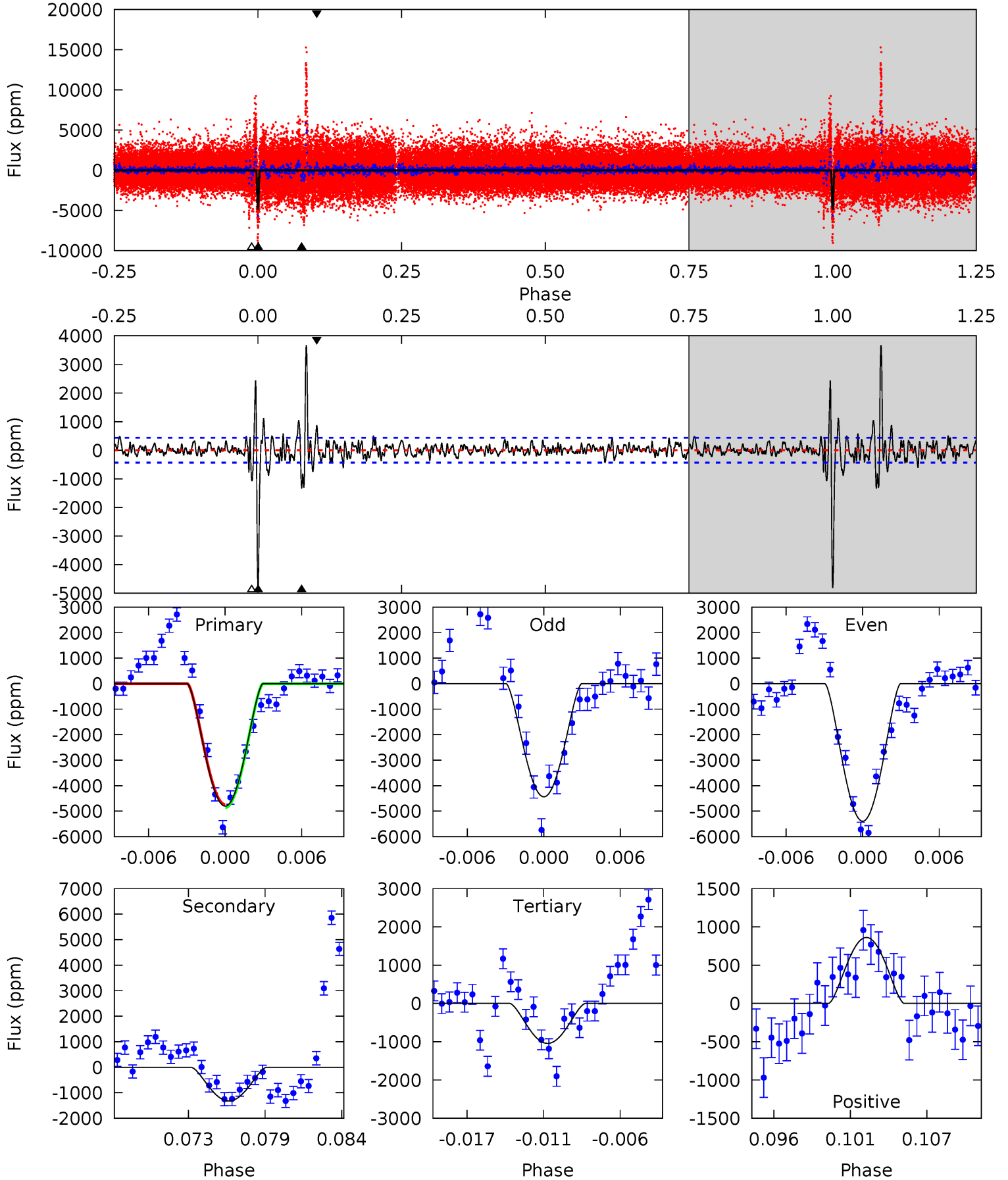
TCE 008160932-01 P=374.152106 Days  $T_0=259.950782$  (BKJD)



# DV Model-Shift Uniqueness Test

008160932-01, P = 374.472236 Days, E = 259.491336 Days

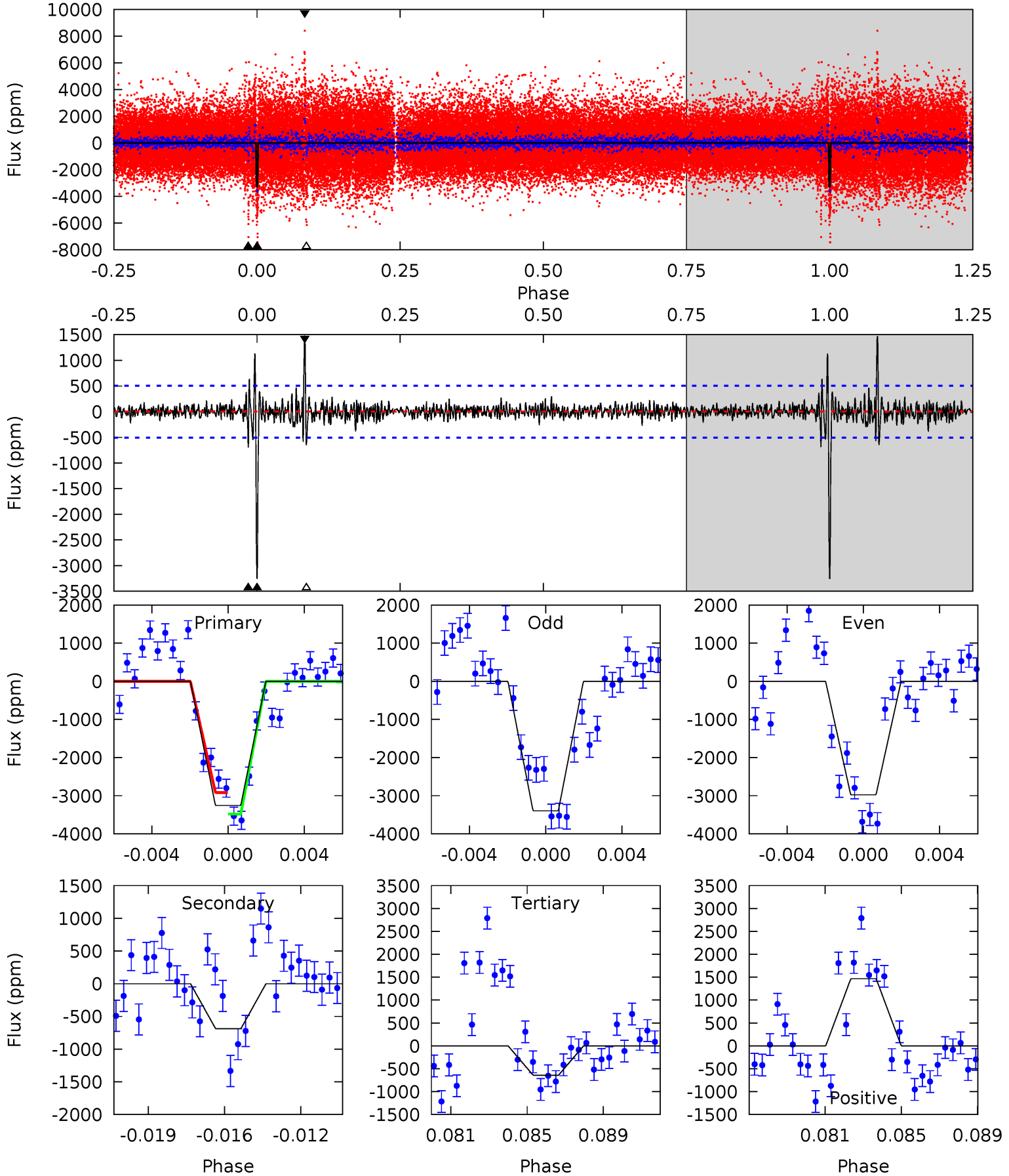
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
56.4	15.5	12.3	10.1	5.14	2.77	3.07	44.2	46.3	3.26	5.40	5.58	0.83	0.43	0.67



# Alt Model-Shift Uniqueness Test

008160932-01, P = 374.152106 Days, E = 259.950782 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
33.5	7.07	6.60	15.1	5.21	2.89	1.20	26.9	18.4	0.46	-8.00	2.15	0.75	0.31	2.91



### Stellar Parameters For KIC 008160932

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3442^{+119}_{-95}$	$0.269^{+0.240}_{-0.080}$	$-0.280^{+0.300}_{-0.150}$	$117.626^{+21.274}_{-26.001}$	$0.939^{+0.362}_{-0.040}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+89%/-30%	+107%/-54%	+18%/-22%	+39%/-4%	+124%/-29%
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 008160932-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1321 \pm 85$	$3018.38^{+2977.76}_{-1976.65}$	$2267^{+132}_{-152}$	$-2317^{+4863}_{-149}$	$0.084^{+0.666}_{-0.063}$
Alt.	$-688 \pm 97$	$2718.91^{+2904.55}_{-1896.28}$	$2263^{+146}_{-157}$	$-2348^{+4803}_{-128}$	$0.056^{+0.540}_{-0.044}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

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

## DV Centroid Data

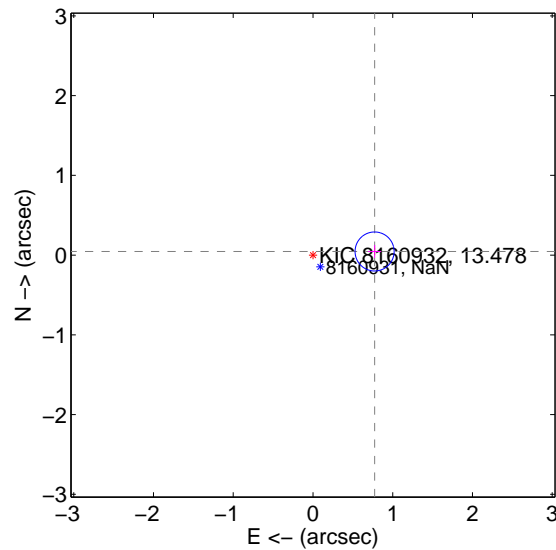
Supplemental centroid analysis for 008160932-01. Kepler magnitude: 13.48. Transit SNR 15.12

There are 0 quarters with good PRF difference image offsets

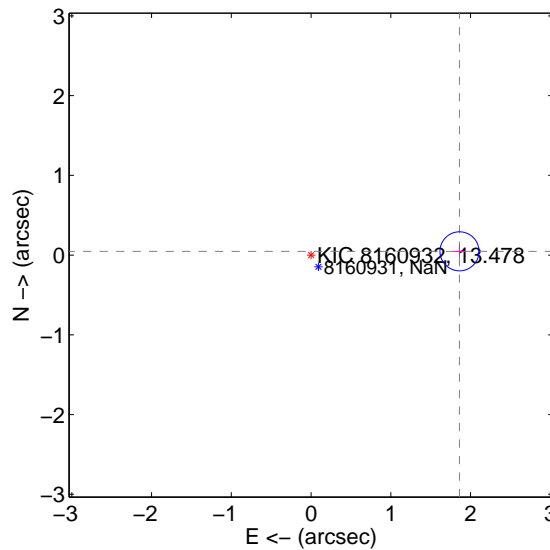
The direct PRF centroid is offset from the target star catalog position by about 1.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.774 \pm 0.082$	9.49	$-0.773 \pm 0.082$	$0.045 \pm 0.082$
PRF-fit source offset from KIC position	$1.862 \pm 0.082$	22.82	$-1.861 \pm 0.082$	$0.047 \pm 0.082$
photometric centroid source offset	$0.45 \pm 0.69$	0.65	$0.33 \pm 0.64$	$0.31 \pm 0.75$

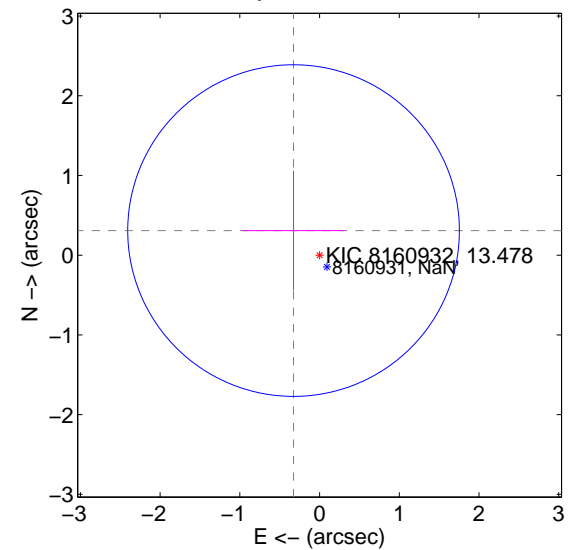
offset from difference PRF-fit to OOT PRF-fit



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.



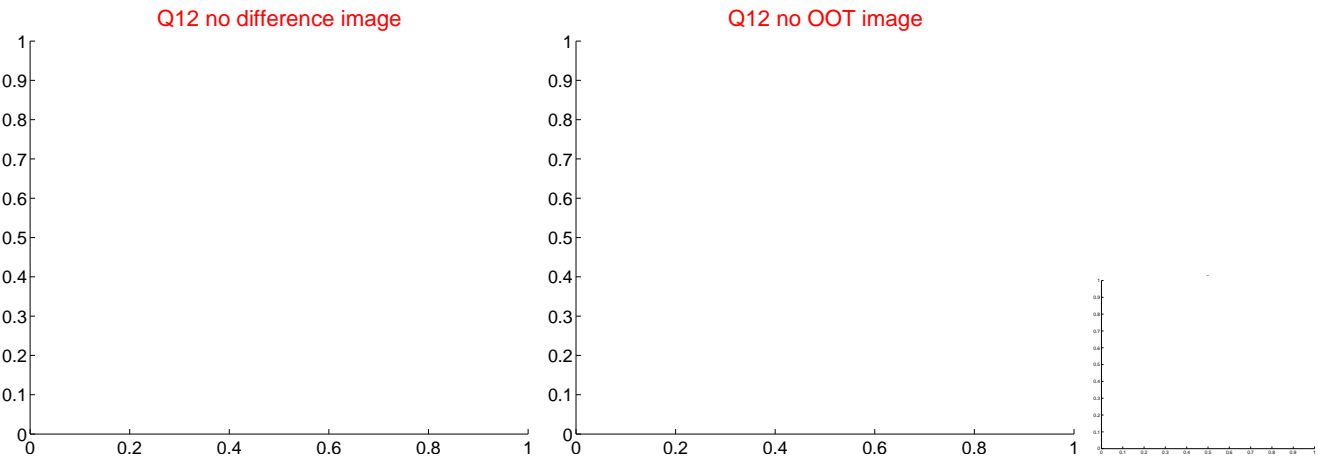
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



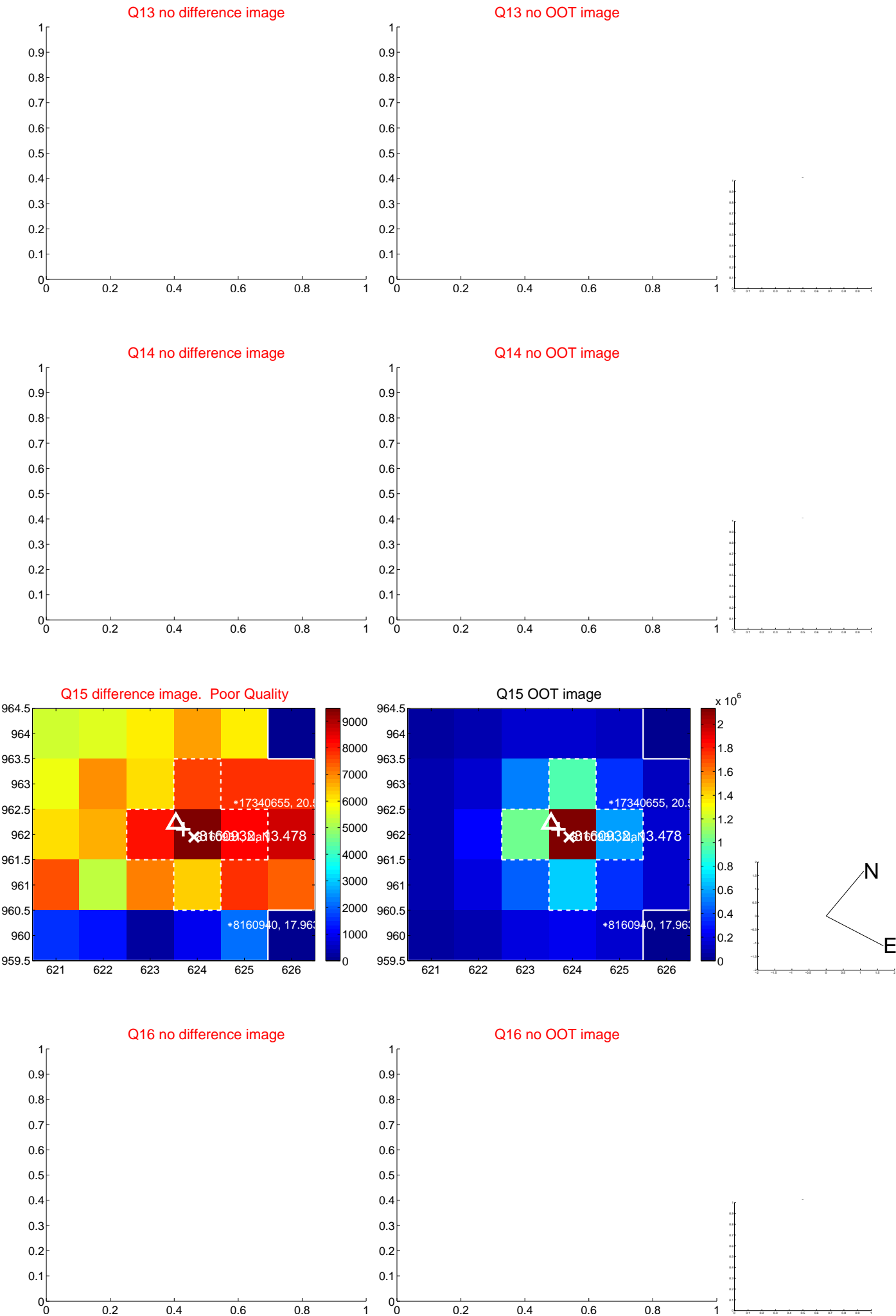
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



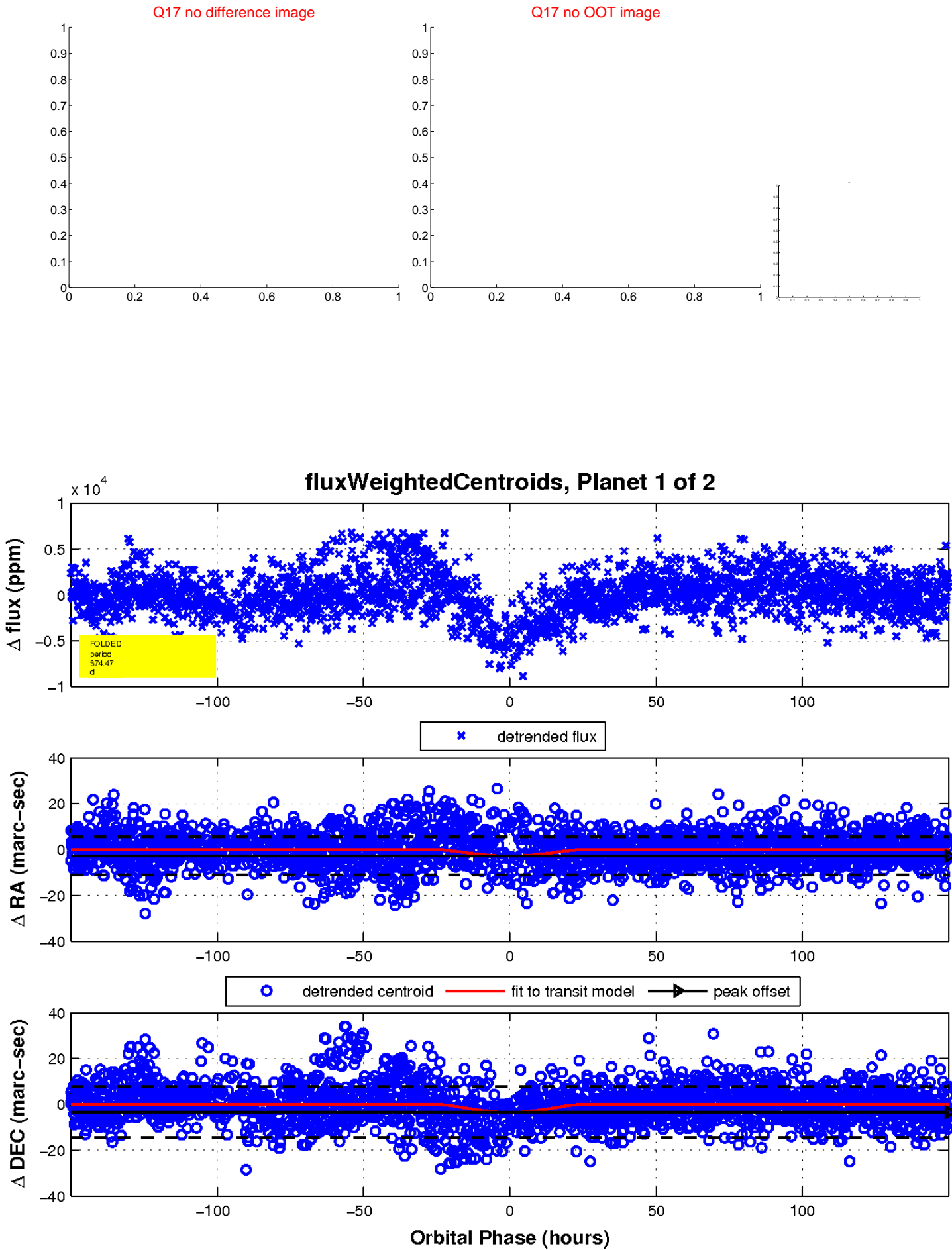
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

