

# KIC 009531877

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009531877-01	OBS	No	362.341724	191.150865	3391.1	4.310	7.7	8.6	7.50	4794	43.02	25.72

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009531877-01	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

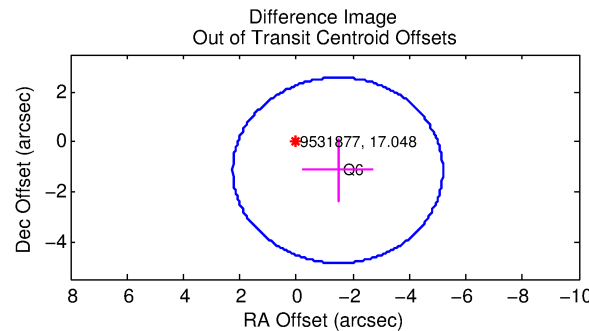
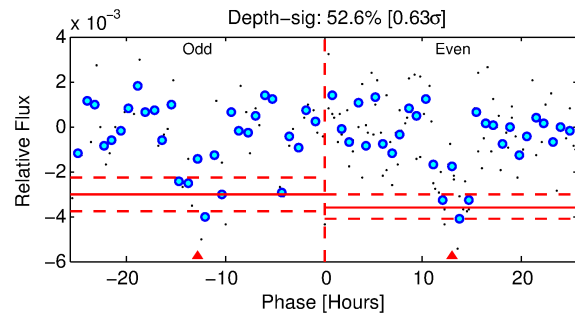
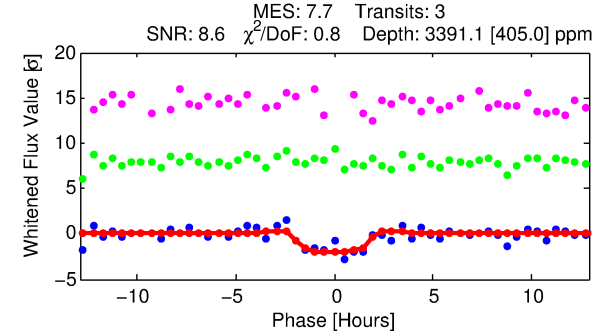
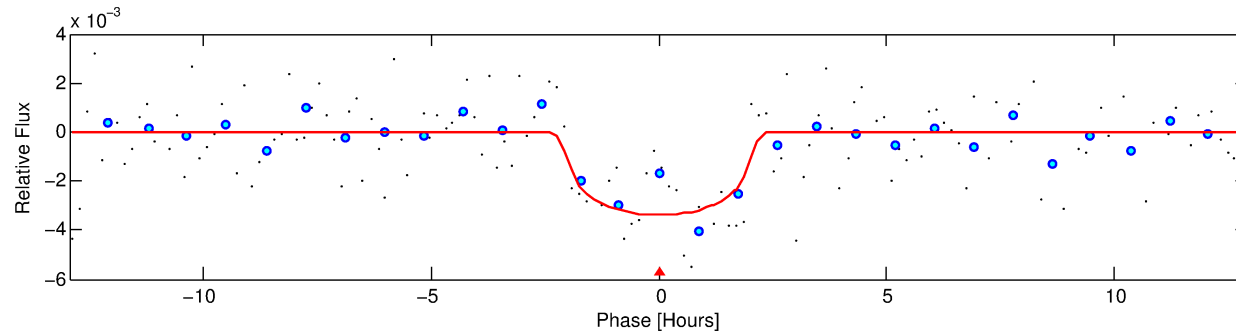
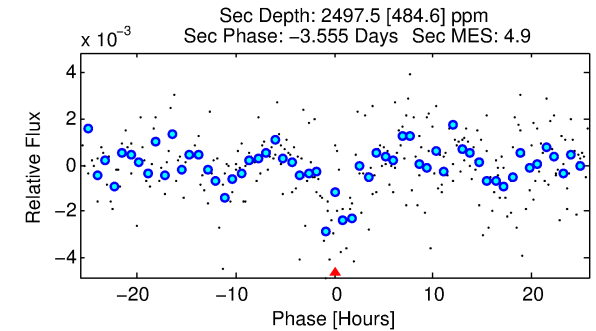
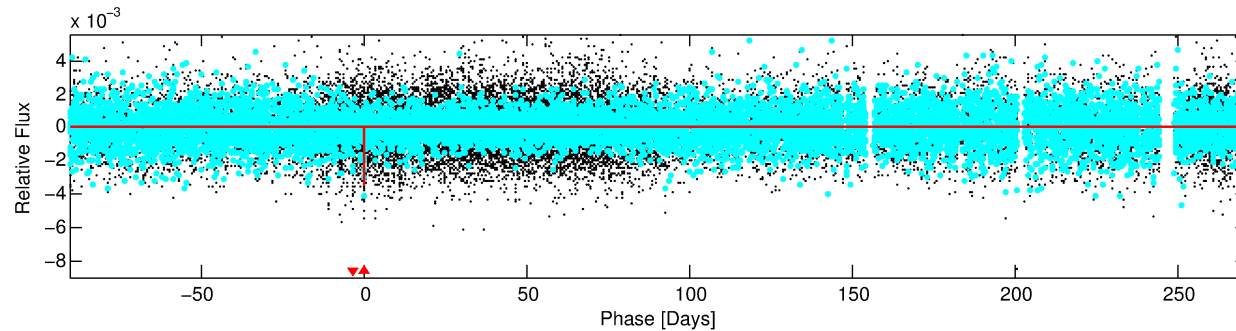
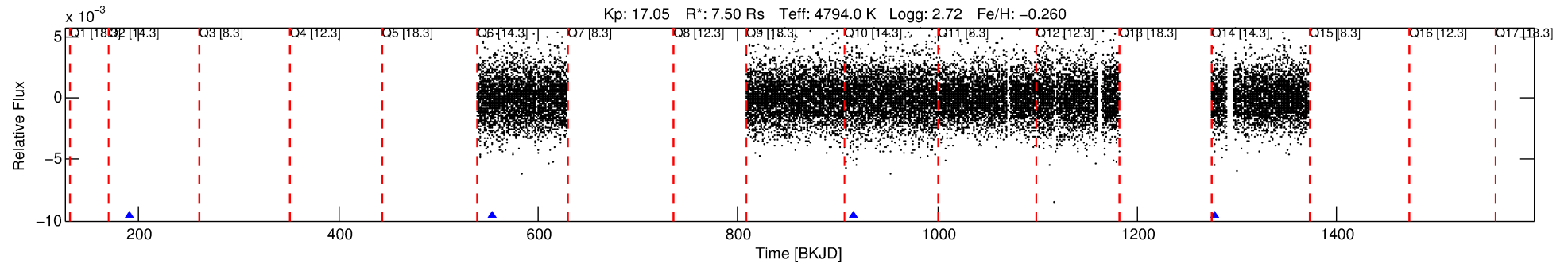
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009531877-01

No Significant Match Found

# DV One-Page Summary

KIC: 9531877 Candidate: 1 of 1 Period: 362.342 d



## DV Fit Results:

Period = 362.34172 [0.00715] d  
Epoch = 191.1509 [0.0155] BKJD  
Rp/R\* = 0.0526 [0.1115]  
a/R\* = 636.11 [4391.43]  
b = 0.36 [17.28]  
Seff = 25.72 [19.82]  
Teq = 574 [111] K  
Rp = 43.02 [93.80] Re  
a = 1.0174 [0.4857] AU  
Ag = 768.27 [3315.12] [0.23σ]  
Teffp = 4674 [4966] K [0.83σ]

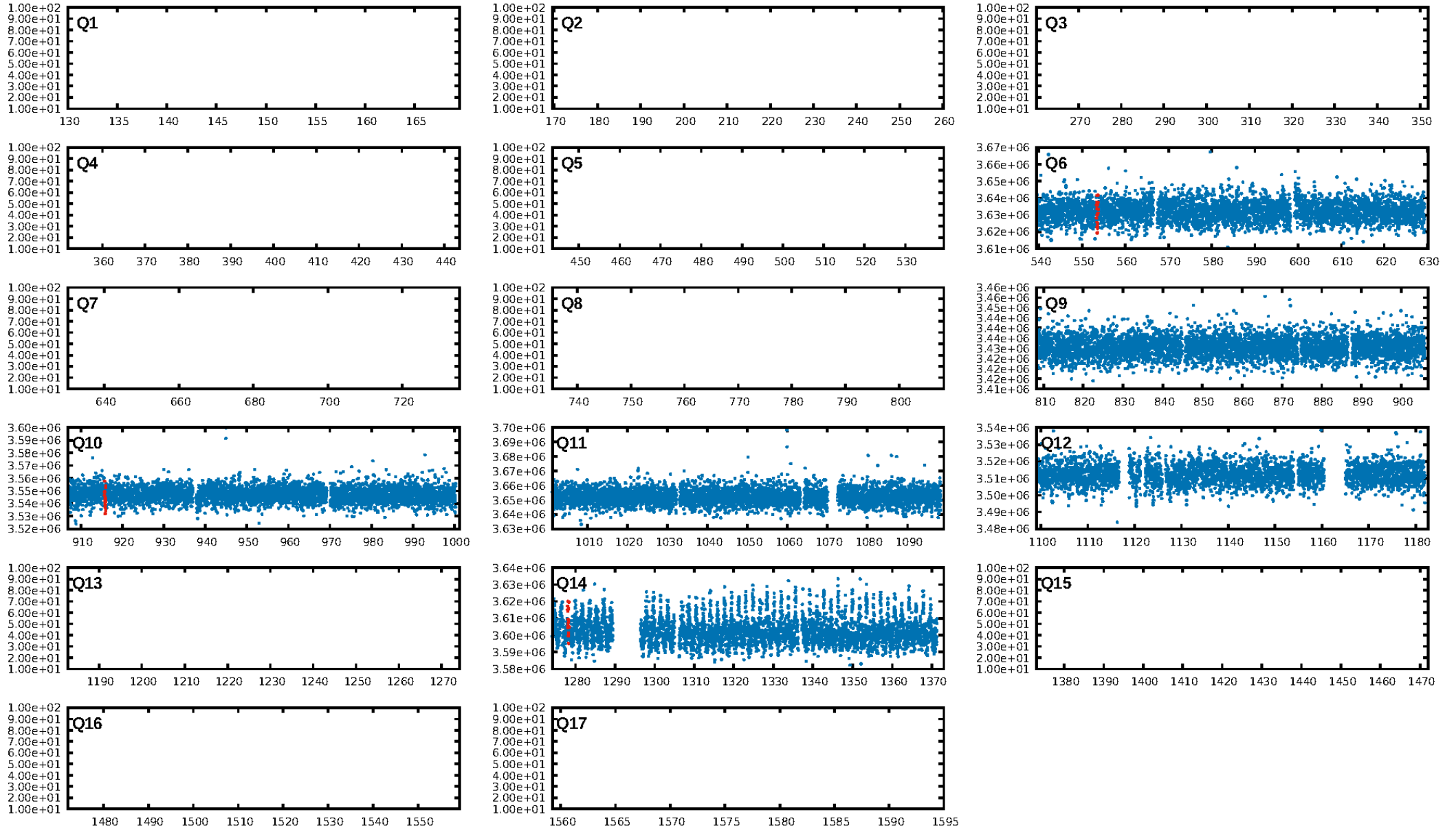
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 60.7%  
ModelChiSquareGof-sig: 96.8%  
Bootstrap-pfa: 4.57e-10  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -3.174  
Centroid-sig: 24.3%  
Centroid-so: 0.594 arcsec [0.53σ]  
OotOffset-rm: 1.862 arcsec [1.50σ]  
KicOffset-rm: 1.941 arcsec [1.56σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [2/2]

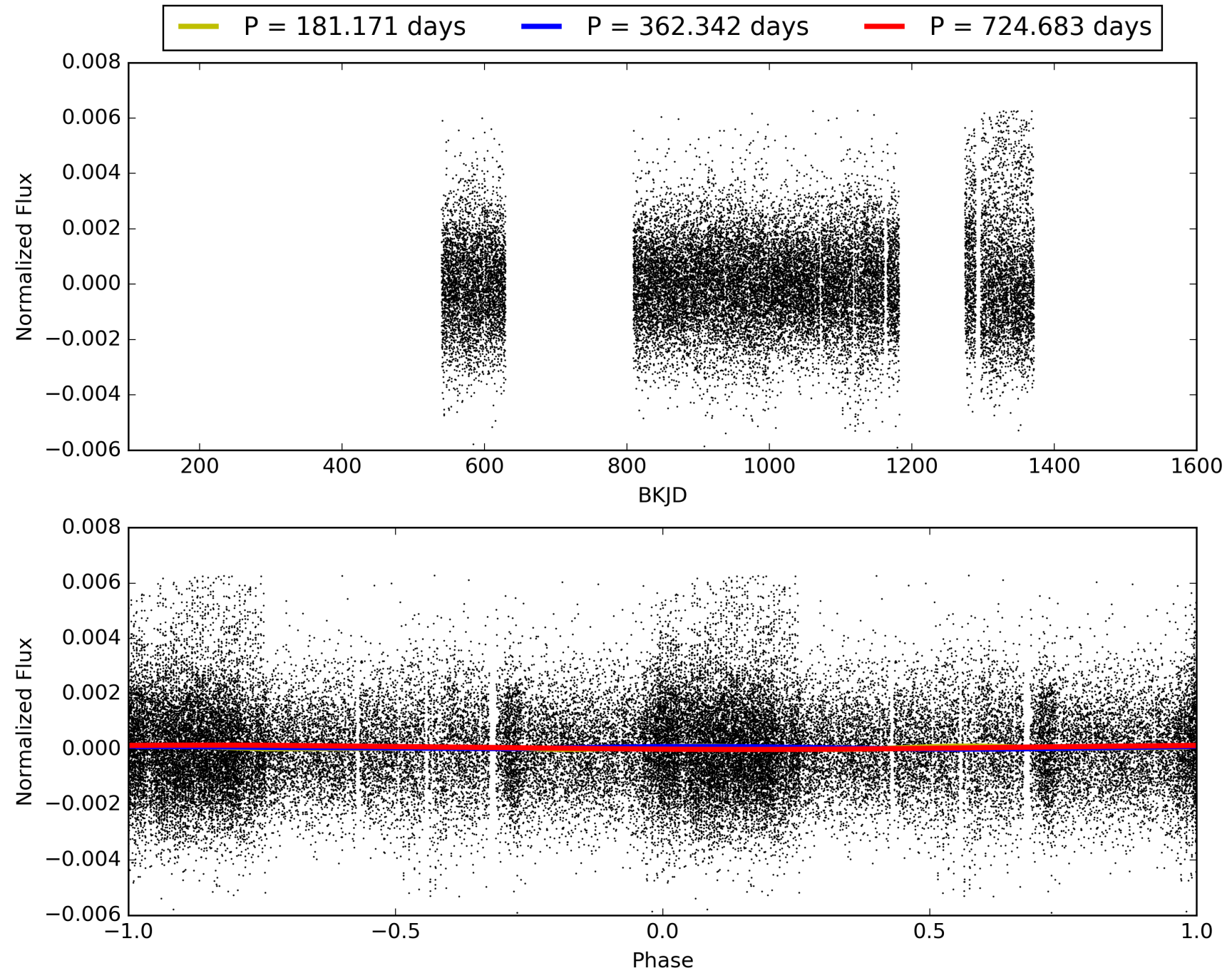
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:45:50 Z

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

# TCE 009531877-01, PDC Light Curves

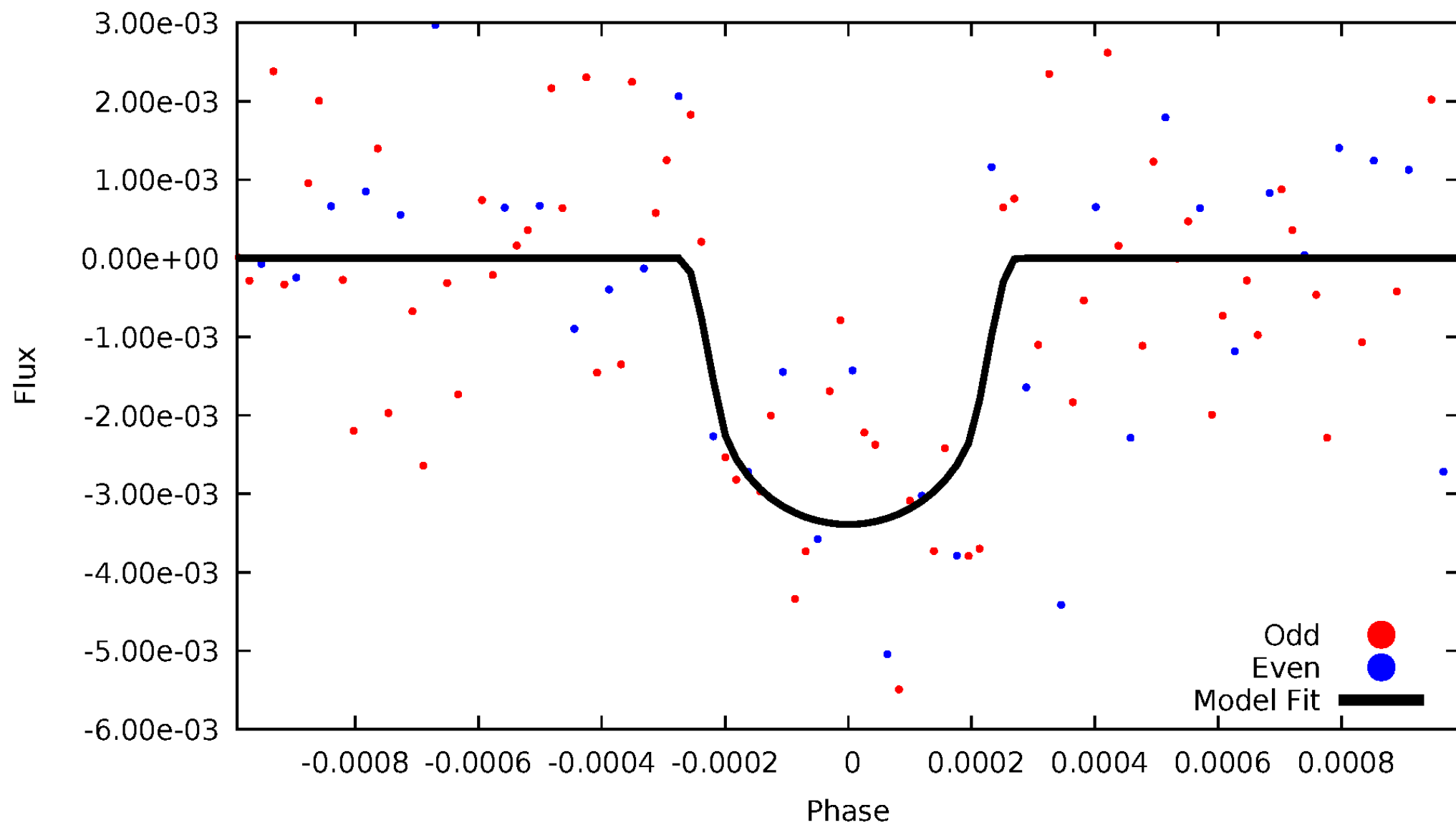


TCE 009531877-01



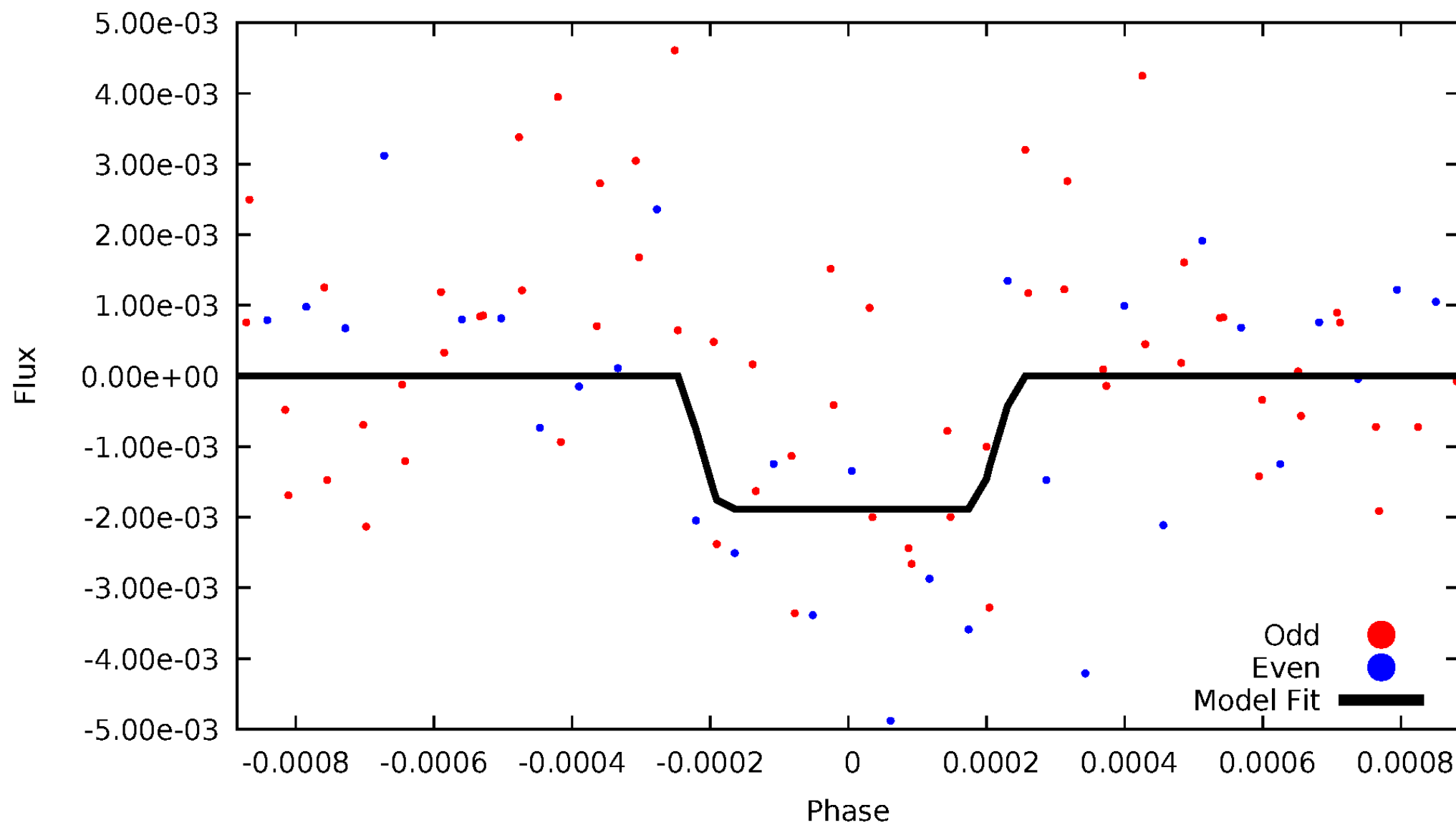
# DV Odd/Even

TCE 009531877-01



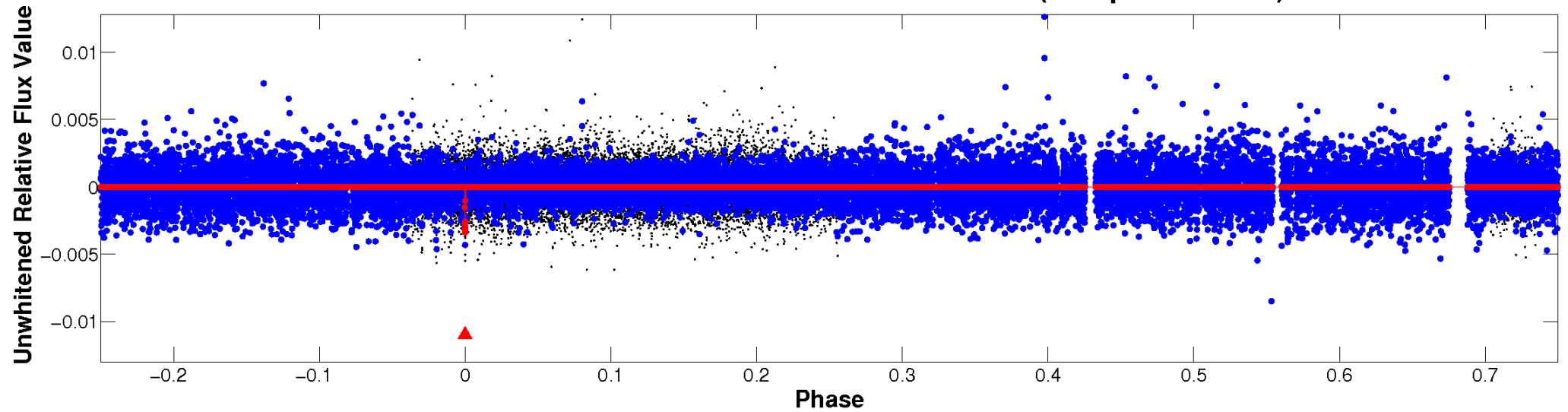
# ALT Odd/Even

TCE 009531877-01

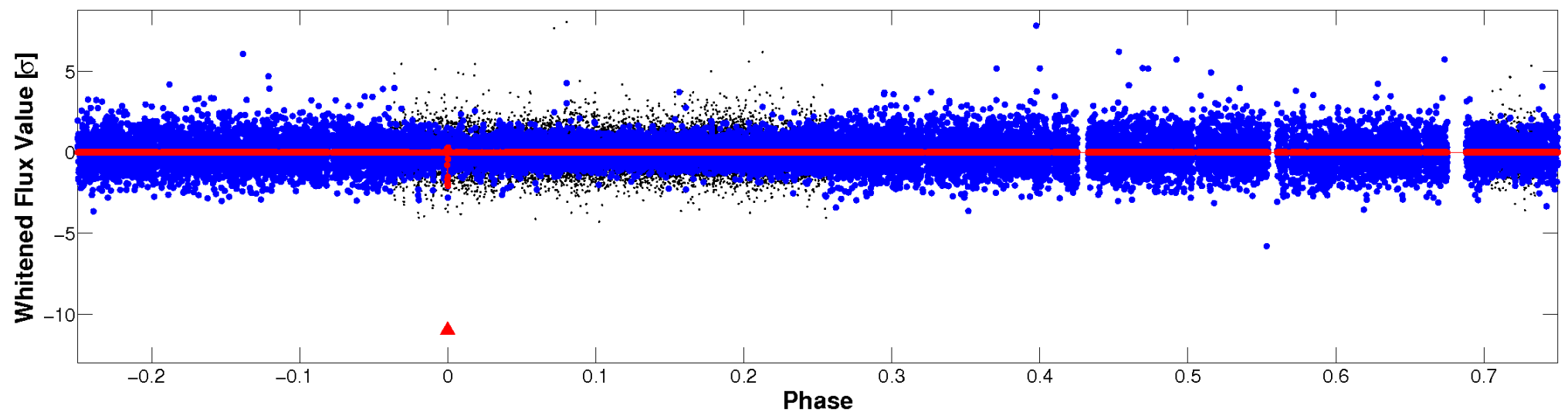


# Non-Whitened Vs. Whitened Light Curve

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

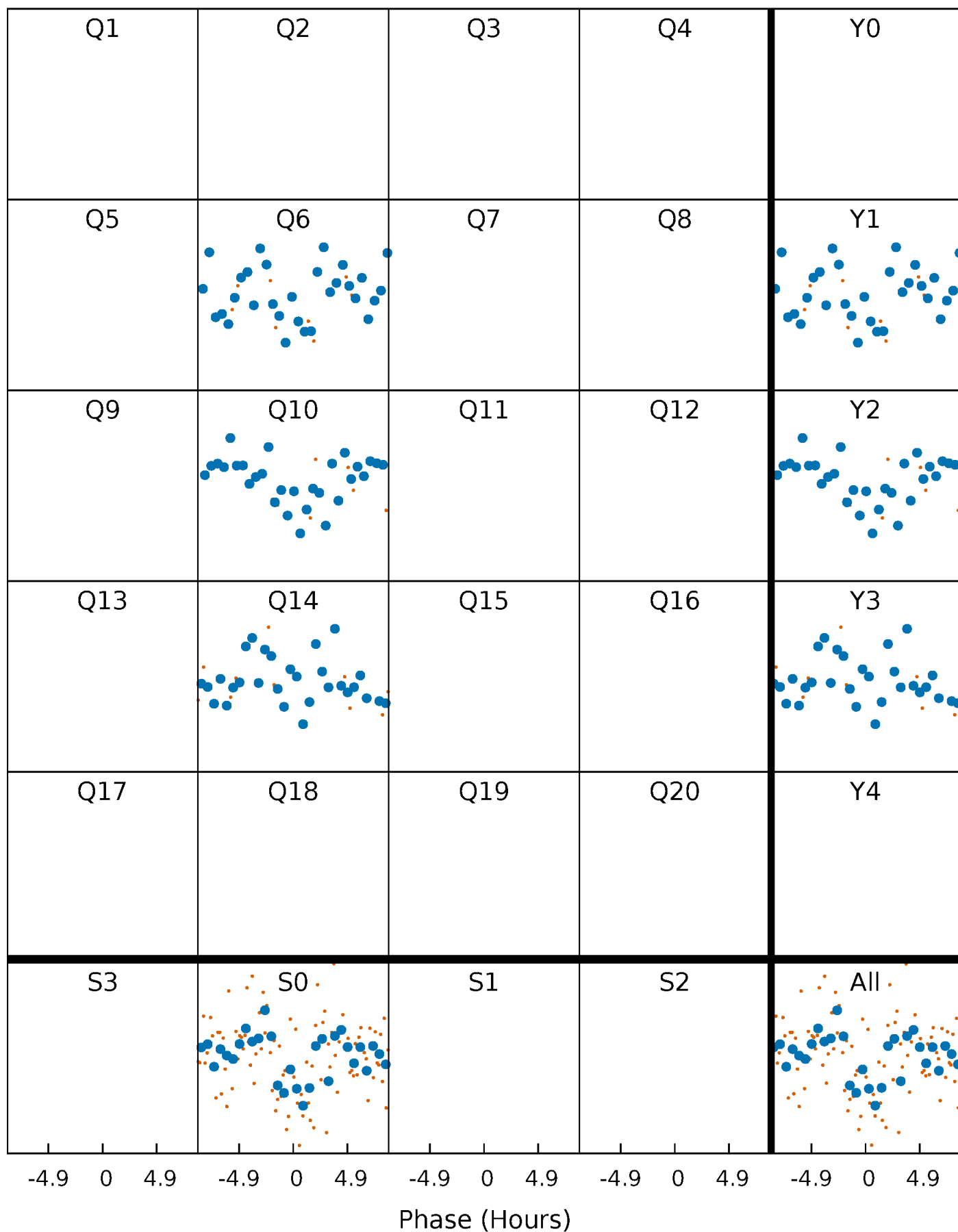


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

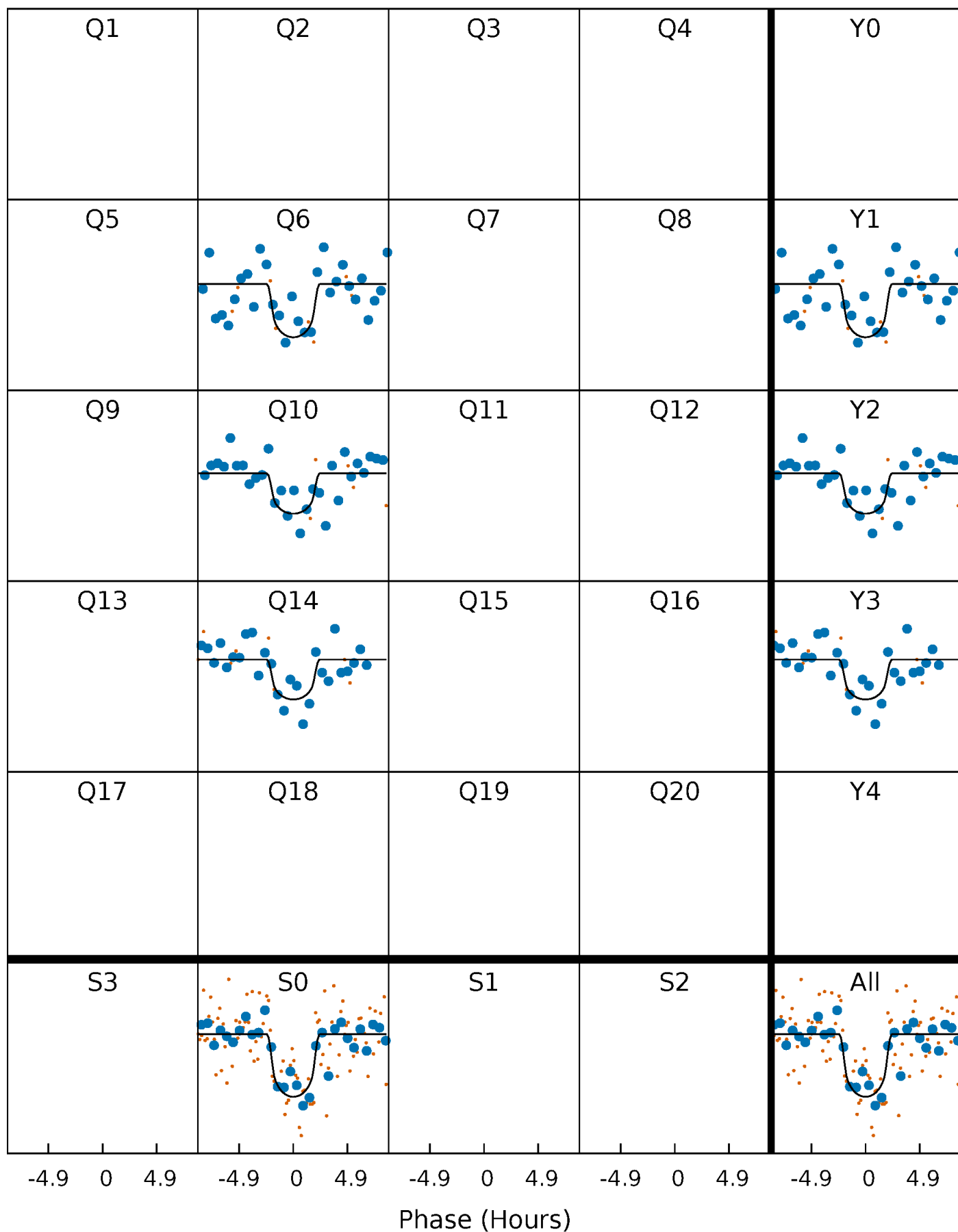
TCE 009531877-01 P=362.341724 Days  $T_0=191.150865$  (BKJD)





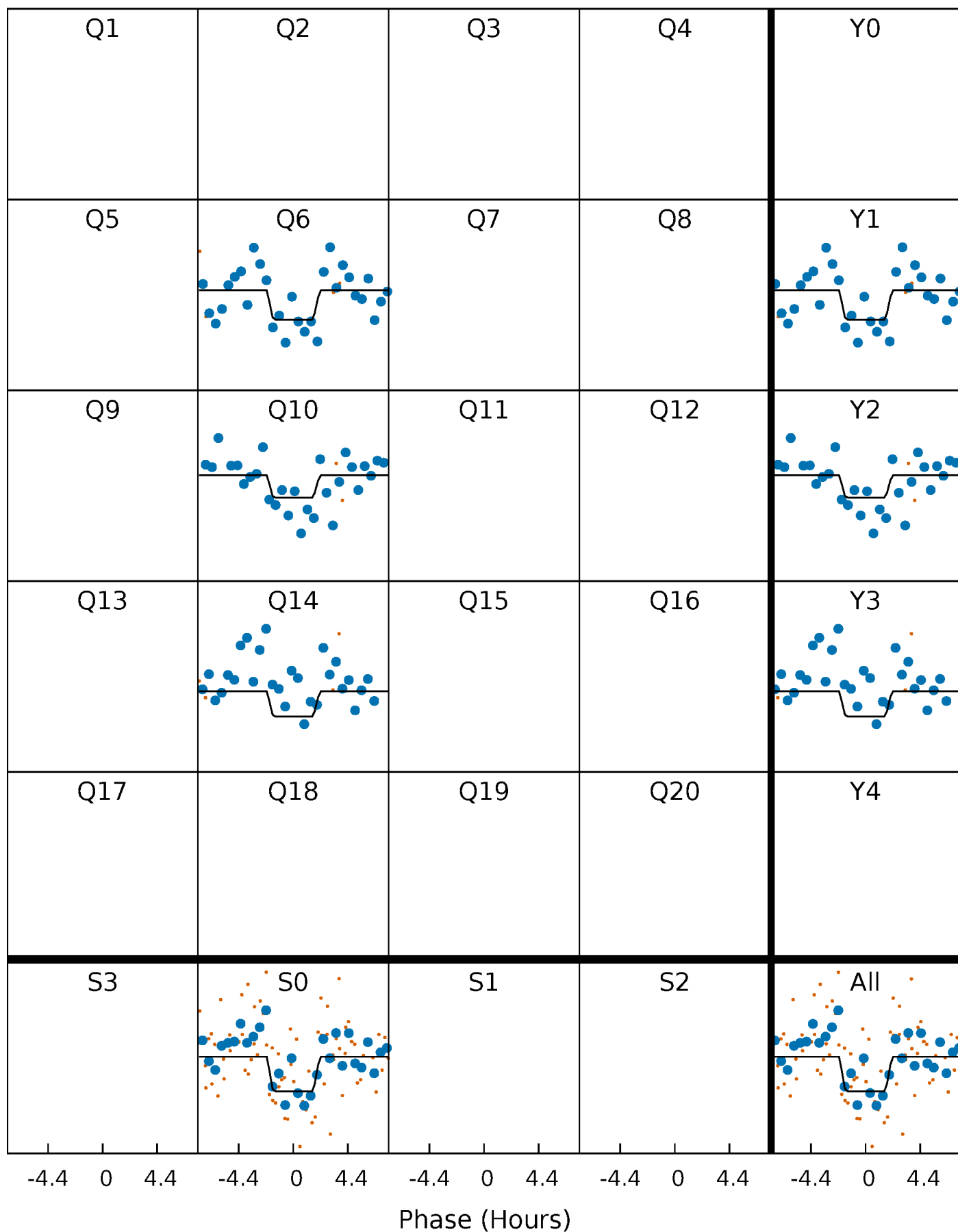
# DV Quarter-Phased Transit Curves

TCE 009531877-01 P=362.341724 Days  $T_0=191.150865$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

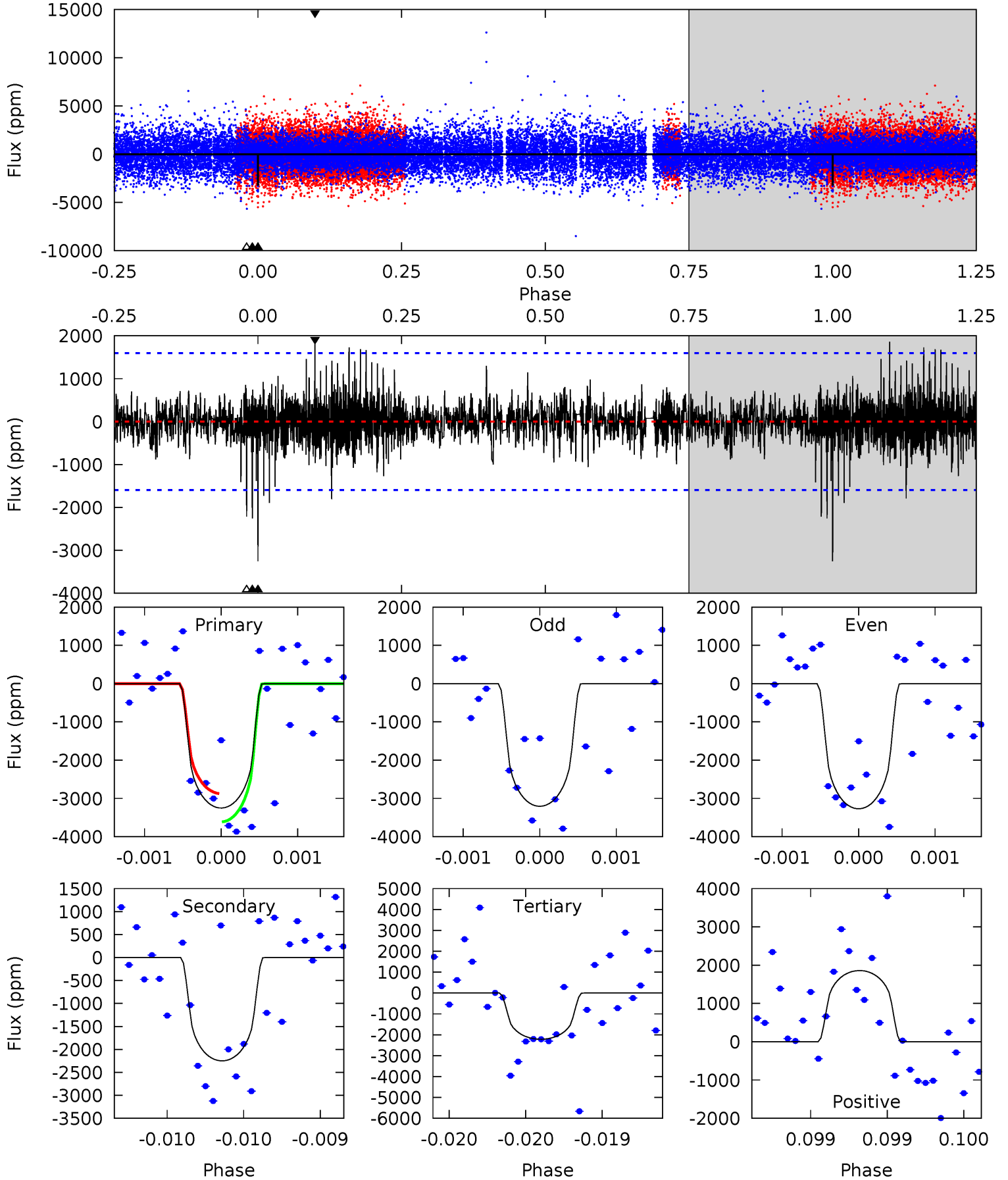
TCE 009531877-01 P=362.339320 Days  $T_0=191.156357$  (BKJD)



# DV Model-Shift Uniqueness Test

009531877-01, P = 362.341724 Days, E = 191.150865 Days

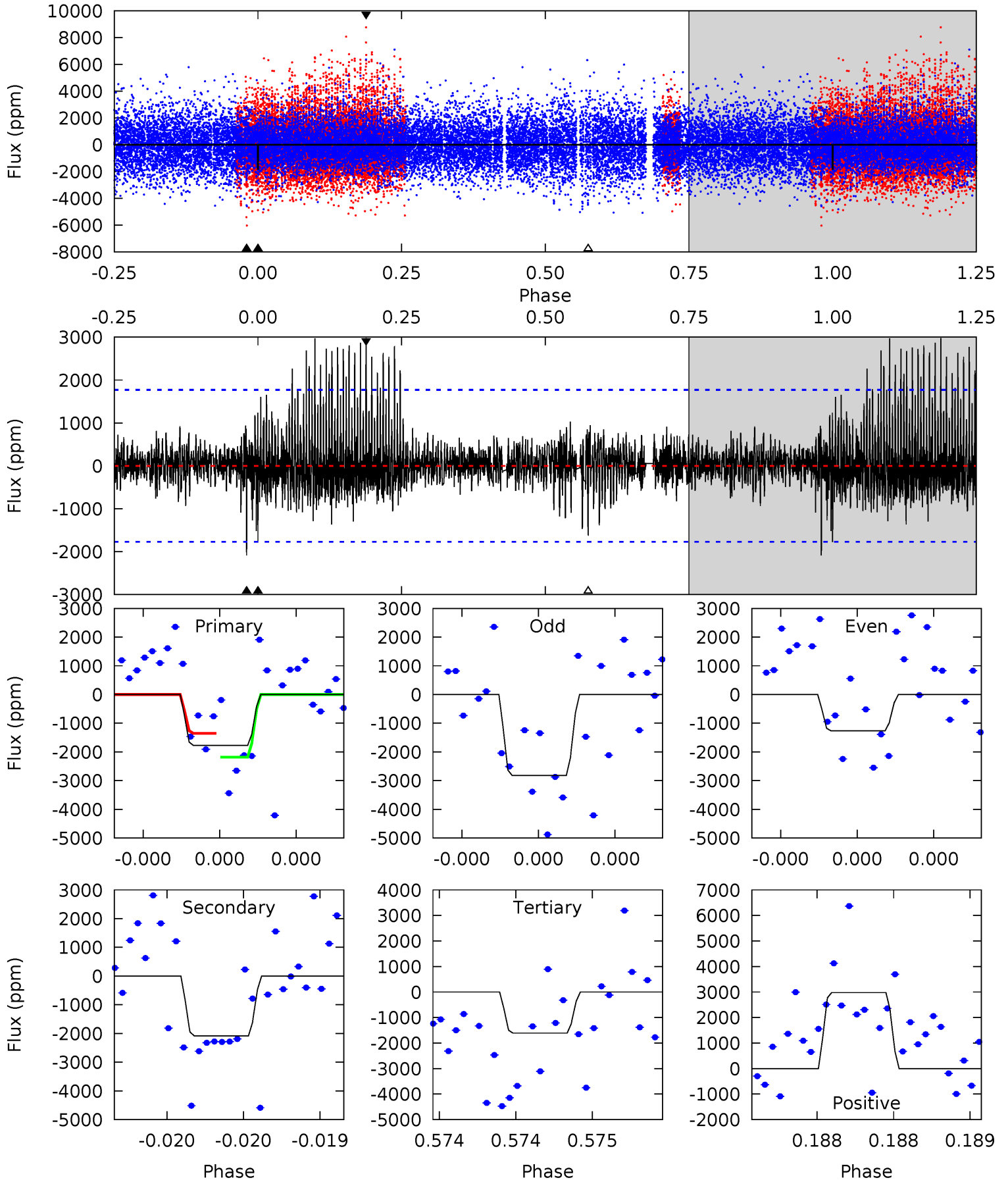
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	7.86	7.73	6.49	5.57	3.48	1.30	3.62	4.86	0.13	1.36	0.11	1.01	0.36	1.29



# Alt Model-Shift Uniqueness Test

009531877-01, P = 362.339320 Days, E = 191.156357 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
5.60	6.57	5.07	9.38	5.58	3.49	1.71	0.54	-3.78	1.50	-2.82	2.37	0.79	0.59	1.32



### Stellar Parameters For KIC 009531877

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4794^{+158}_{-129}$	$2.717^{+0.444}_{-0.296}$	$-0.260^{+0.300}_{-0.250}$	$7.500^{+3.761}_{-3.077}$	$1.071^{+0.381}_{-0.127}$	$0.004^{+0.013}_{-0.002}$
	+3%/-3%	+16%/-11%	+115%/-96%	+50%/-41%	+36%/-12%	+359%/-62%
Source	KIC0	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 009531877-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-2250 \pm 286$	$80.81^{+89.63}_{-56.95}$	$800^{+105}_{-95}$	$3650^{+1996}_{-663}$	$204^{+1963}_{-159}$
Alt.	$-2083 \pm 317$	$76.10^{+82.55}_{-50.45}$	$803^{+104}_{-96}$	$3684^{+1914}_{-697}$	$209^{+1821}_{-159}$

$T_{\text{max}}$  = 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

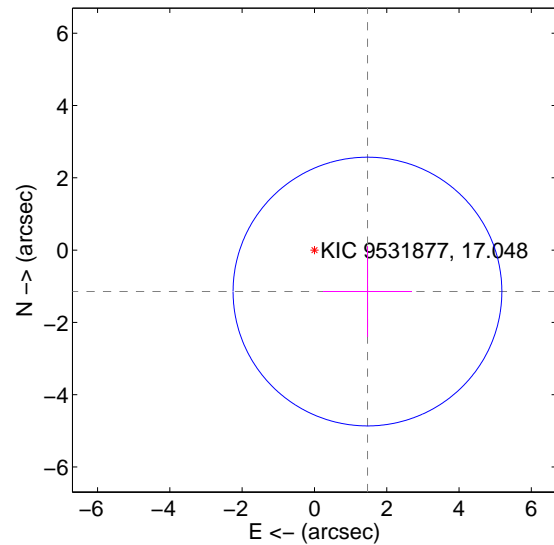
Supplemental centroid analysis for 009531877-01. Kepler magnitude: 17.05. Transit SNR 8.58

There are 0 quarters with good PRF difference image offsets

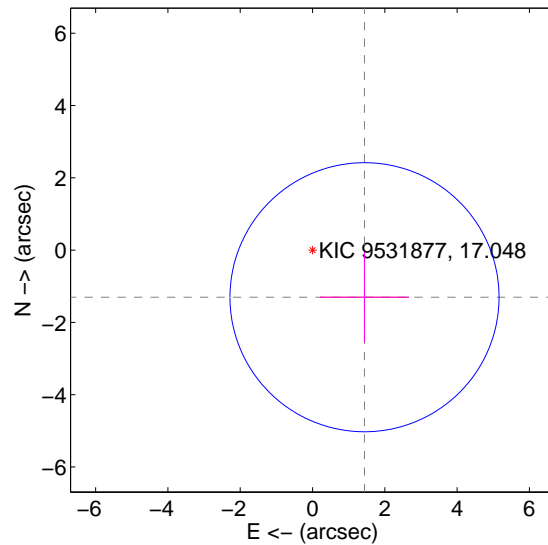
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.862 \pm 1.239$	1.50	$-1.467 \pm 1.231$	$-1.147 \pm 1.253$
PRF-fit source offset from KIC position	$1.941 \pm 1.241$	1.56	$-1.438 \pm 1.231$	$-1.304 \pm 1.253$
photometric centroid source offset	$0.59 \pm 1.12$	0.53	$0.05 \pm 1.29$	$0.59 \pm 1.12$

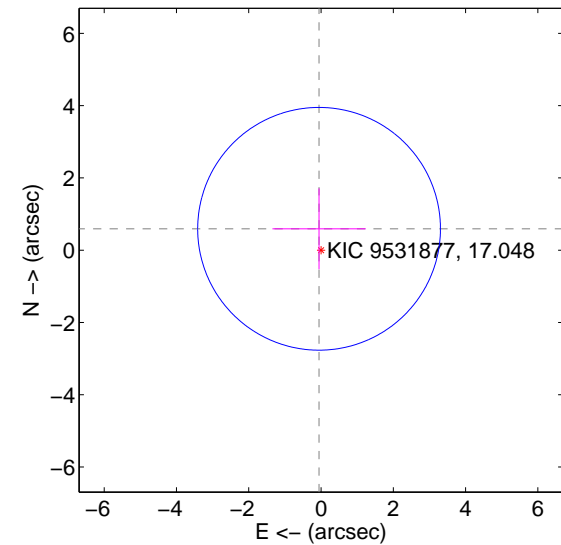
offset from difference PRF-fit to OOT PRF-fit



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

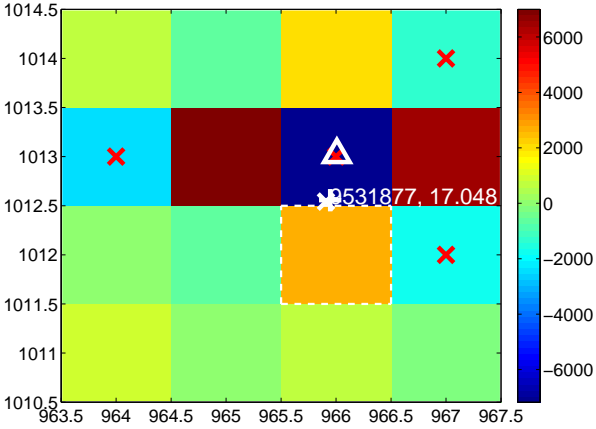
Q5 no difference image



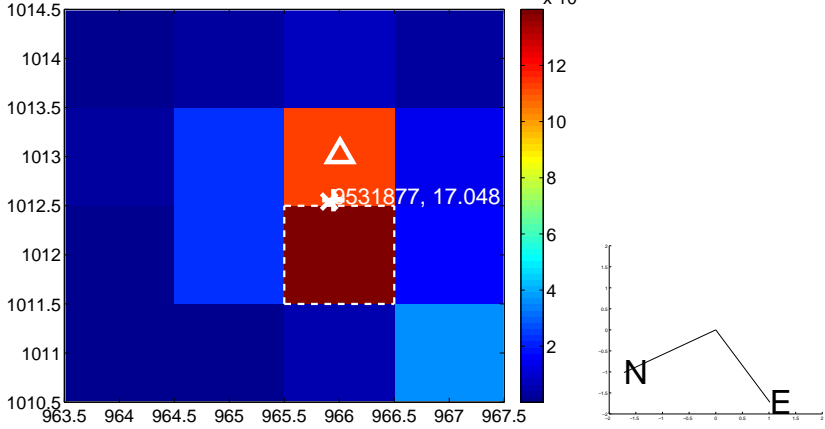
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



Q8 no difference image



Q8 no OOT image





white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

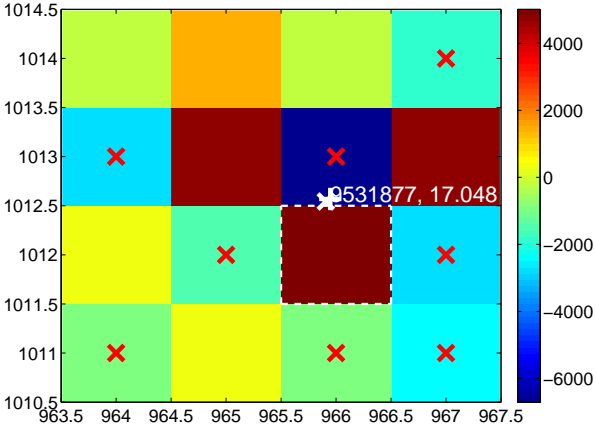
Q9 no difference image



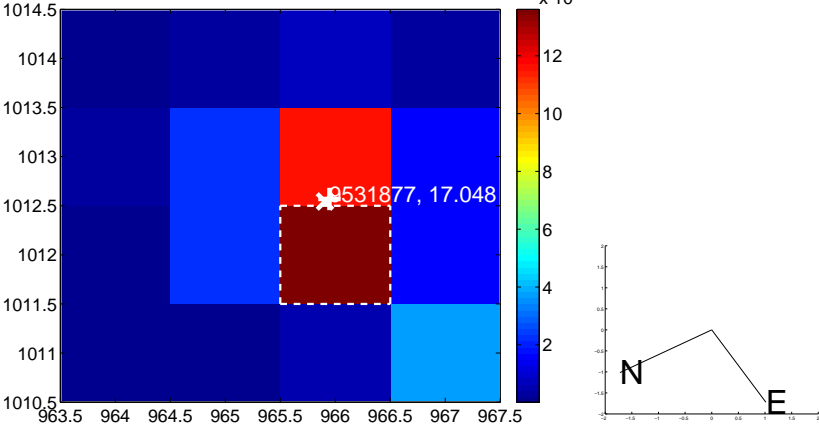
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



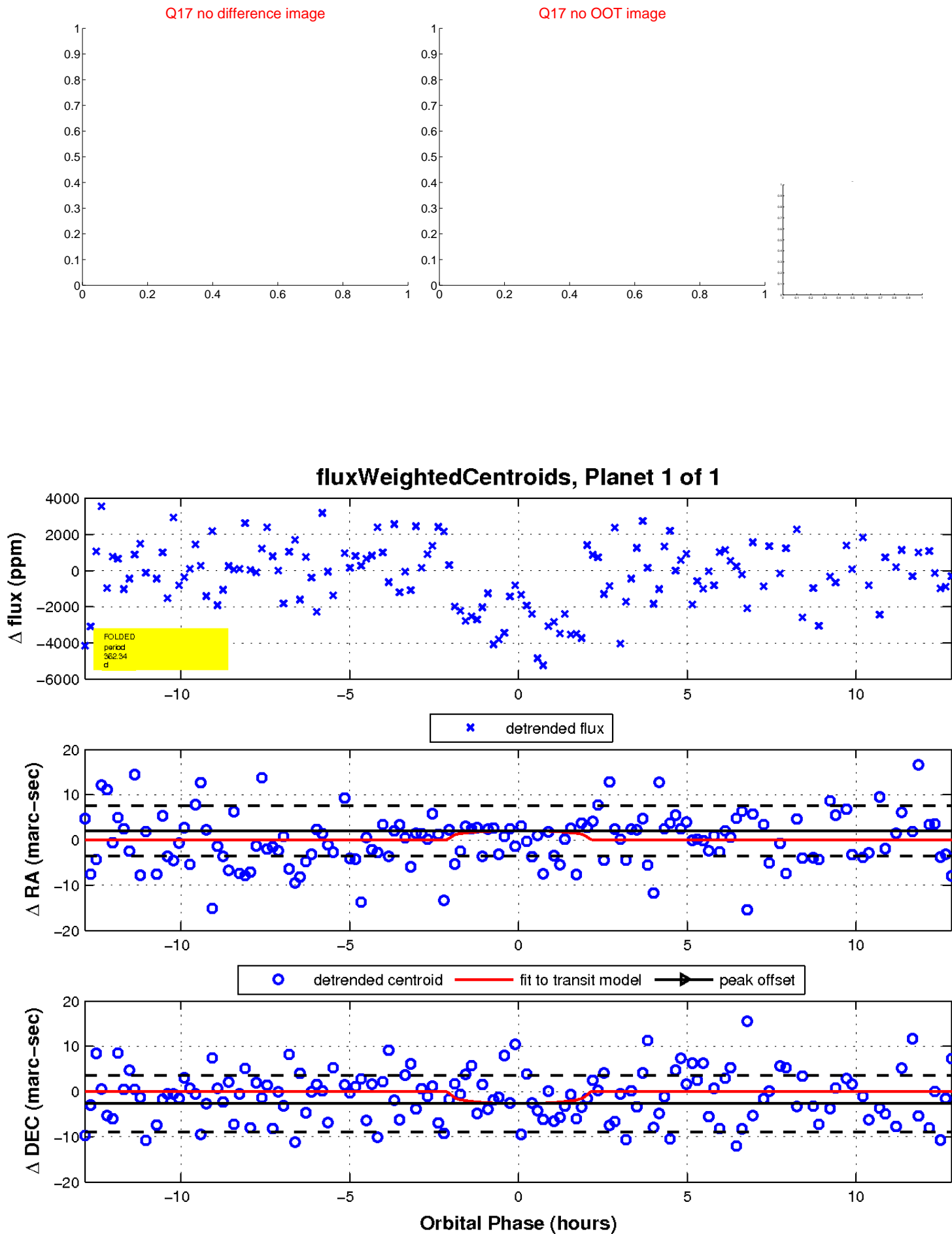
Q12 no OOT image



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.



UKIRT Image

