

# KIC 009535637

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009535637-01	OBS	No	392.890142	348.739236	502.4	5.858	10.2	6.0	150.65	3291	367.50	1892.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009535637-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

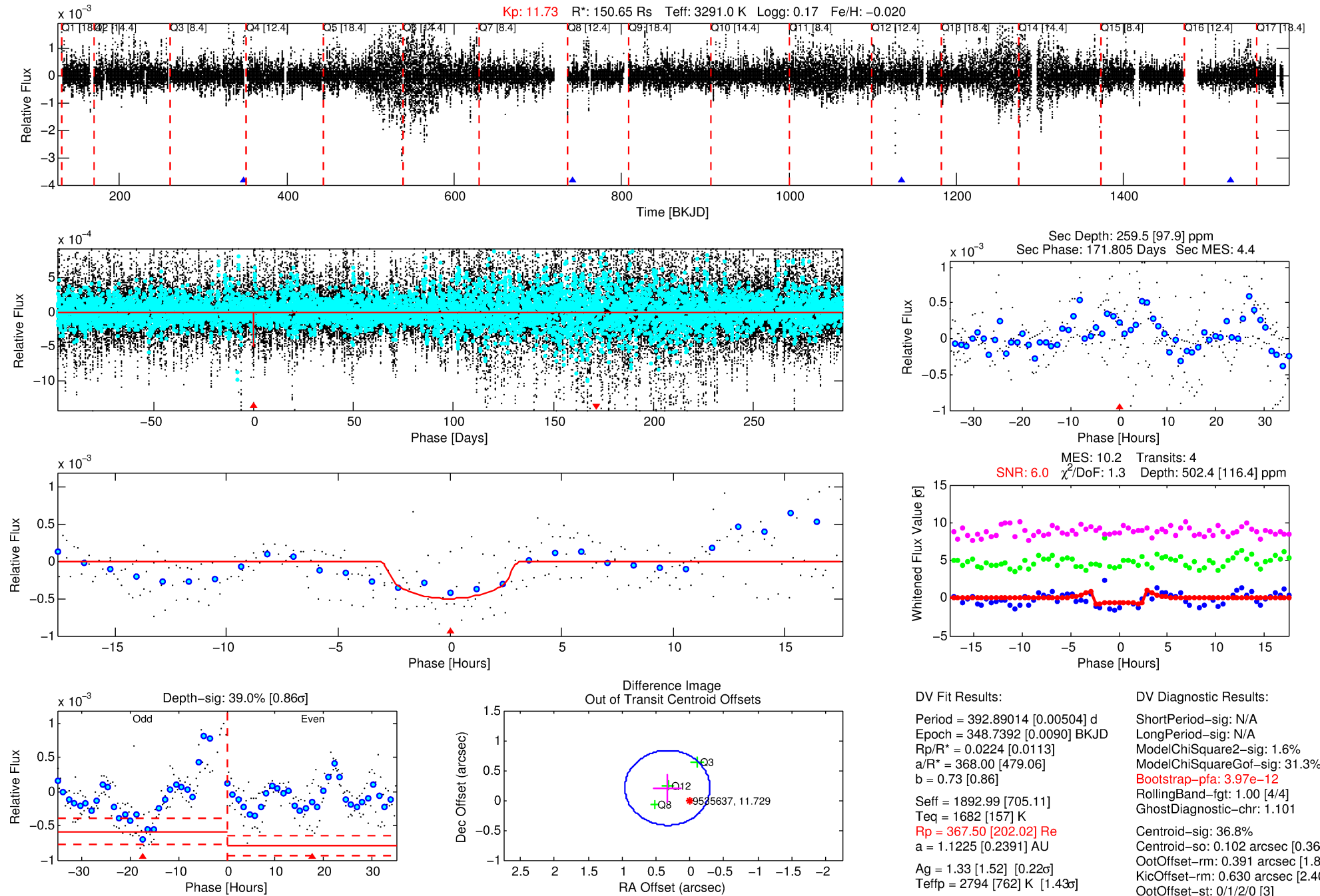
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009535637-01

No Significant Match Found

# DV One-Page Summary

KIC: 9535637 Candidate: 1 of 1 Period: 392.890 d



## DV Fit Results:

Period = 392.89014 [0.00504] d  
Epoch = 348.7392 [0.0090] BKJD  
Rp/R\* = 0.0224 [0.0113]  
a/R\* = 368.00 [479.06]  
b = 0.73 [0.86]  
Seff = 1892.99 [705.11]  
T<sub>eq</sub> = 1682 [157] K  
Rp = 367.50 [202.02] Re  
a = 1.1225 [0.2391] AU  
Ag = 1.33 [1.52] [0.22 $\sigma$ ]  
T<sub>eff</sub> = 2794 [762] K [1.43 $\sigma$ ]

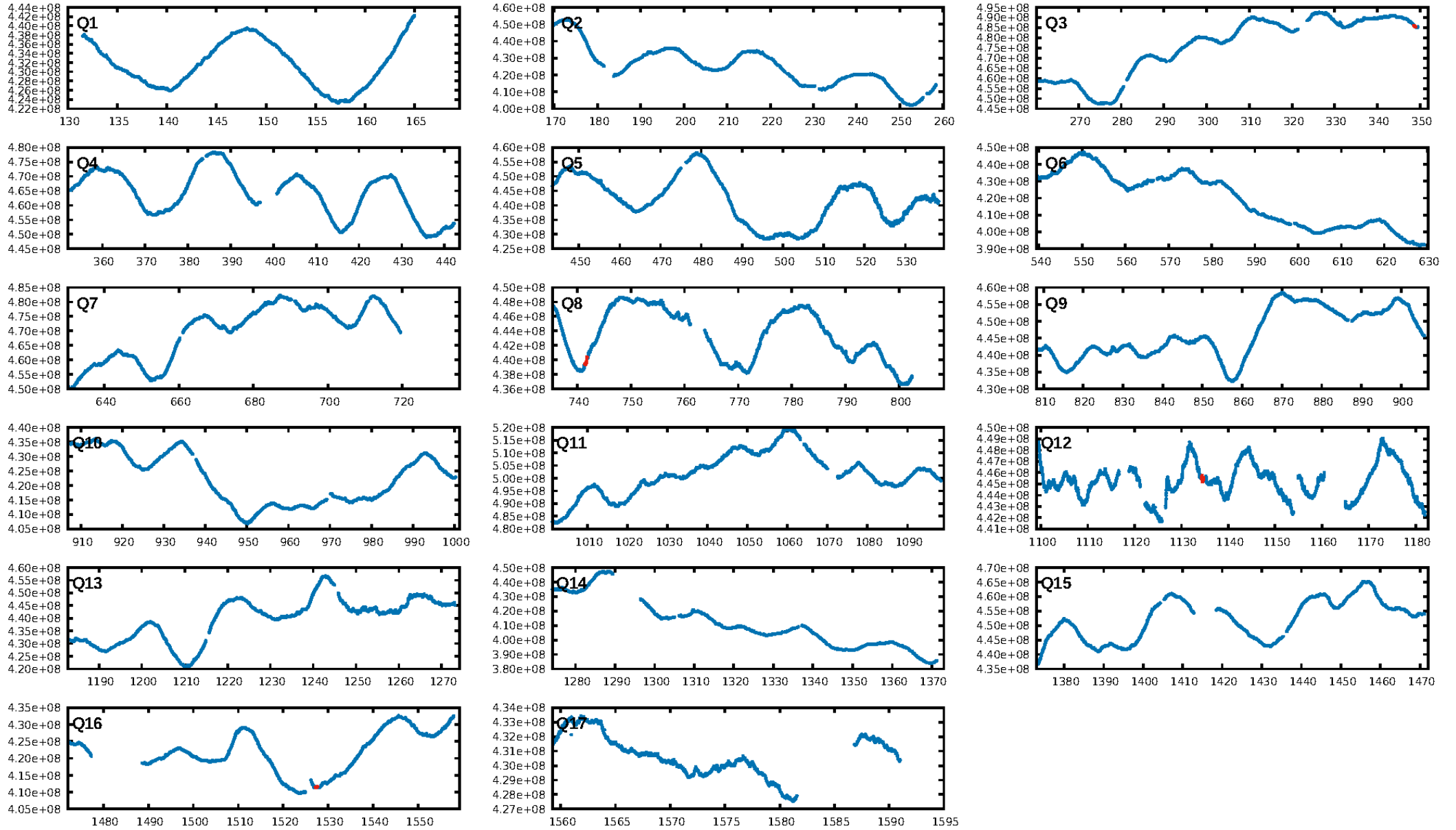
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.6%  
ModelChiSquareGof-sig: 31.3%  
**Bootstrap-pfa: 3.97e-12**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.101  
Centroid-sig: 36.8%  
Centroid-so: 0.102 arcsec [0.36 $\sigma$ ]  
OotOffset-rm: 0.391 arcsec [1.87 $\sigma$ ]  
KicOffset-rm: 0.630 arcsec [2.40 $\sigma$ ]  
OotOffset-st: 0/1/2/0 [3]  
KicOffset-st: 0/1/2/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

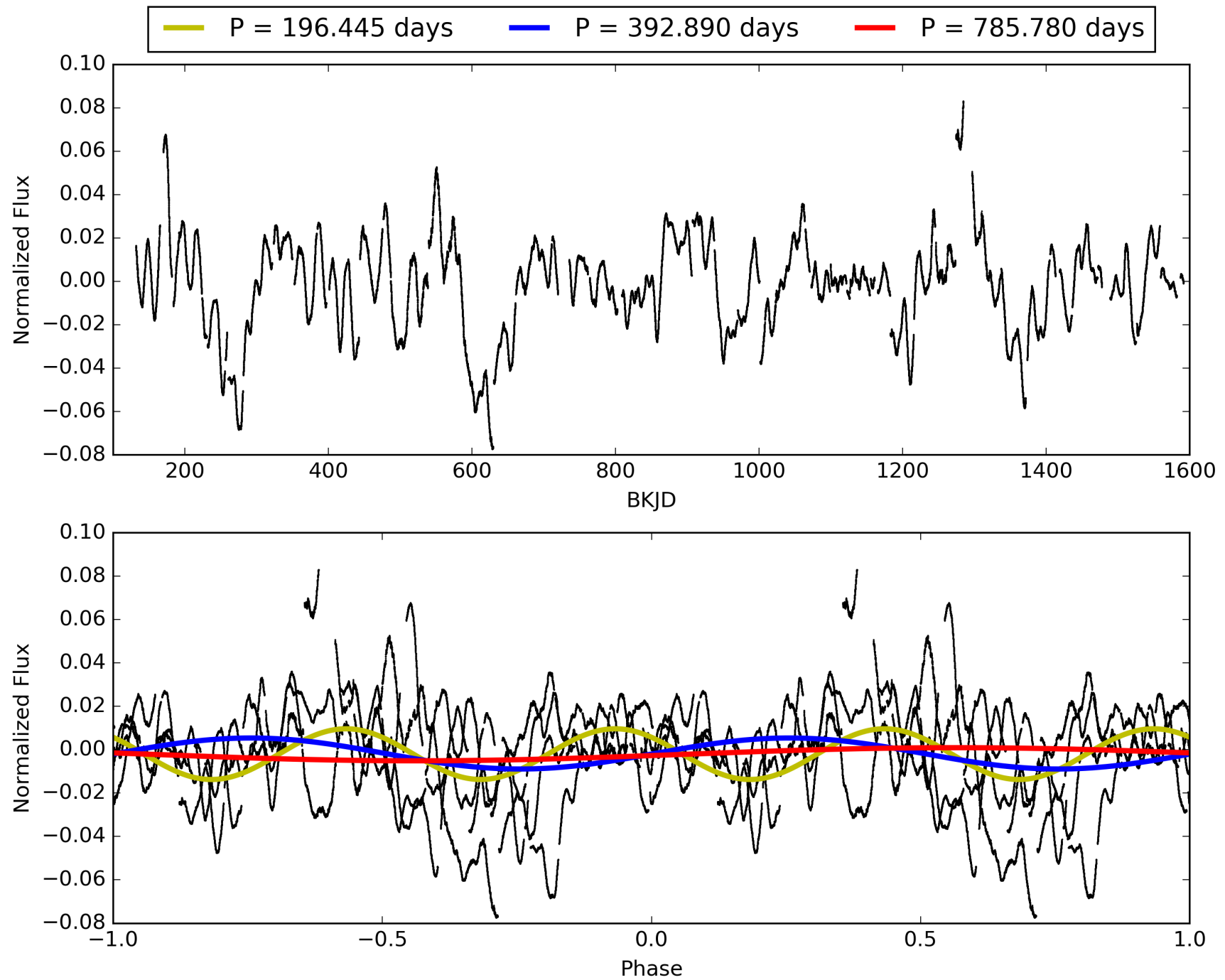
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:08:41 Z

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

# TCE 009535637-01, PDC Light Curves

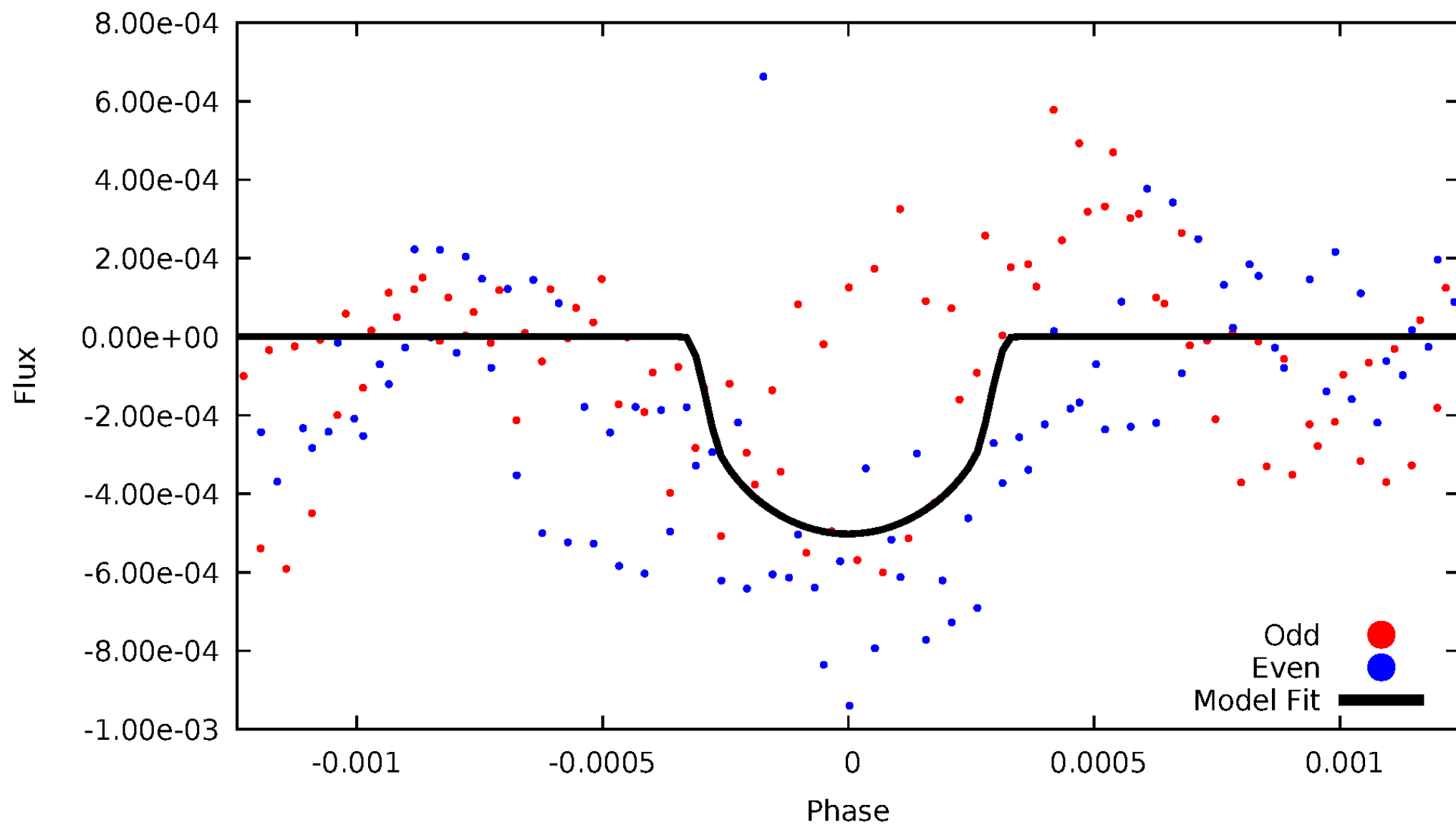


TCE 009535637-01



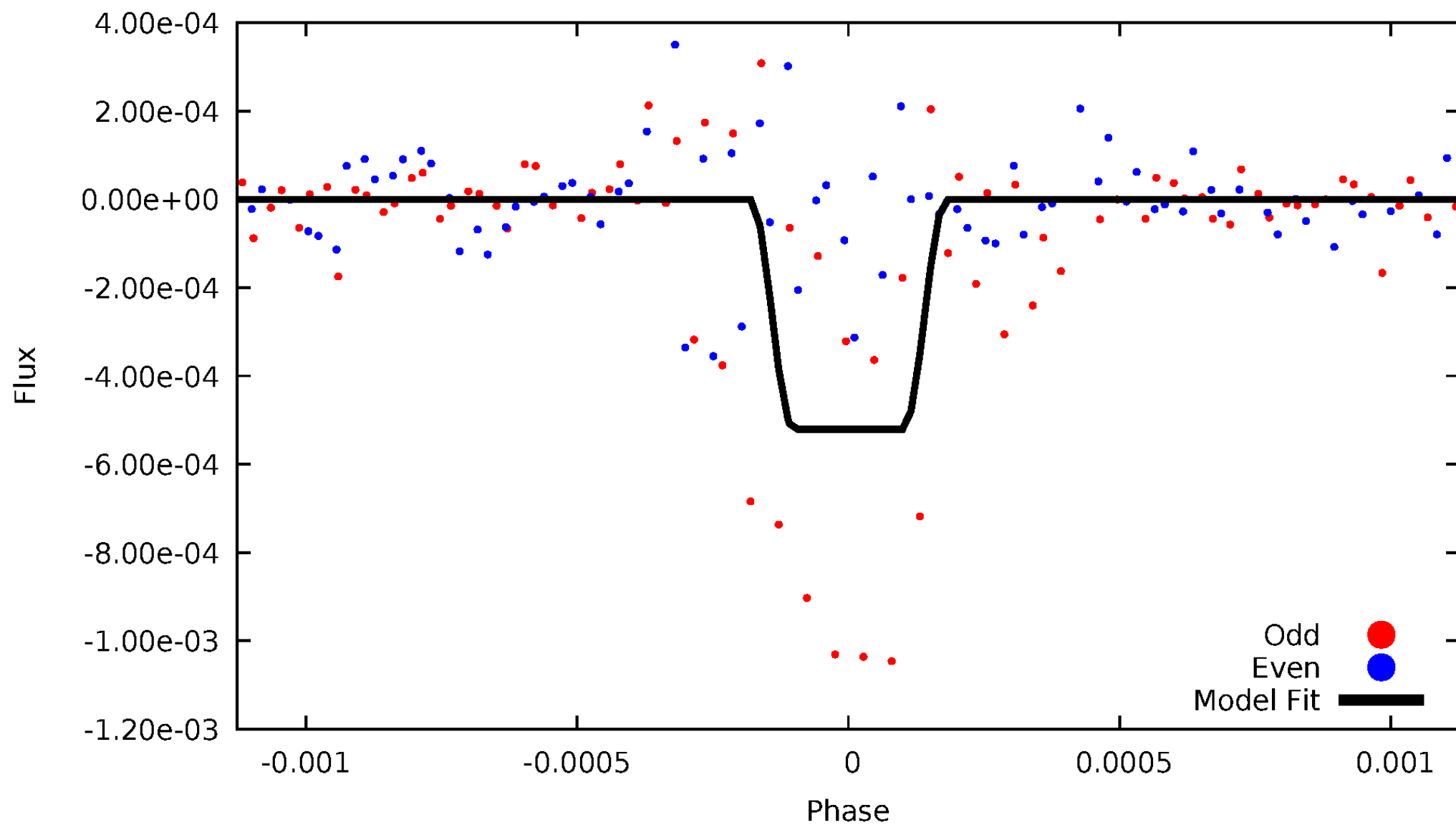
# DV Odd/Even

TCE 009535637-01



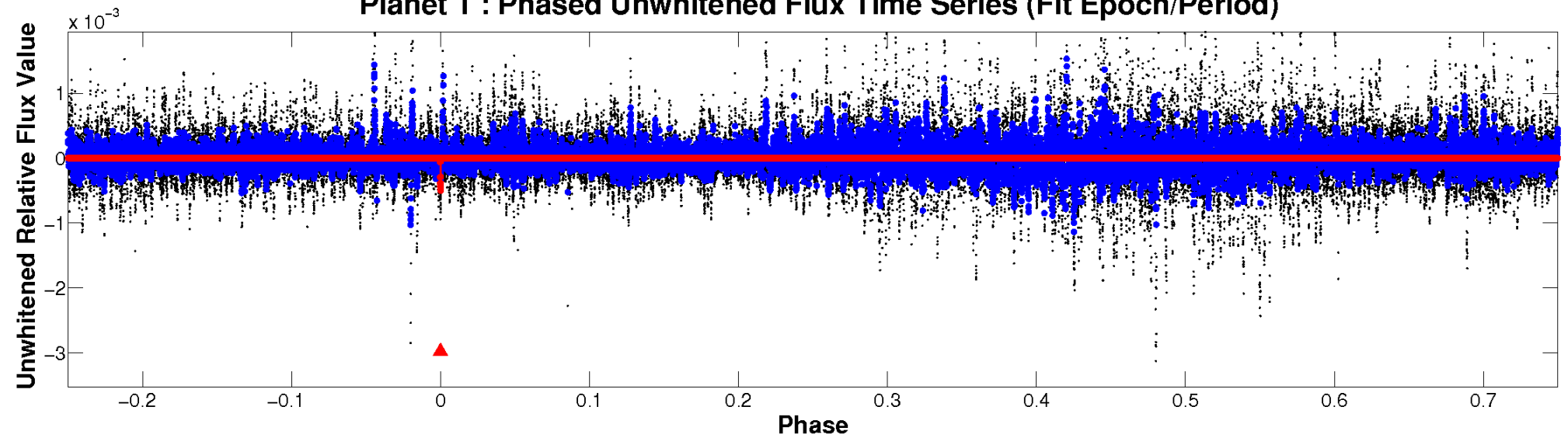
# ALT Odd/Even

TCE 009535637-01

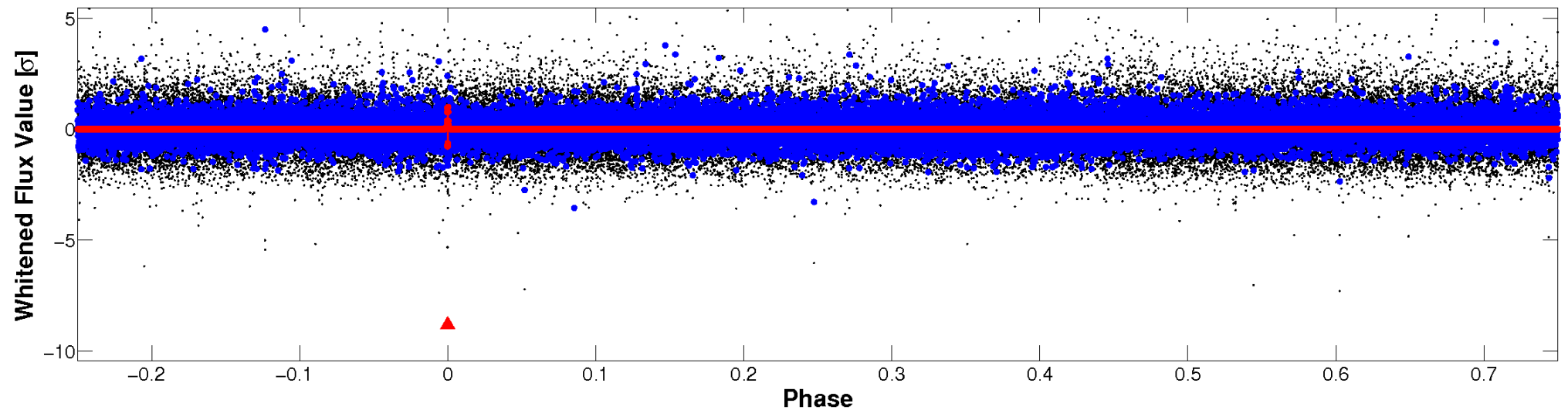


# Non-Whitened Vs. Whitened Light Curve

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

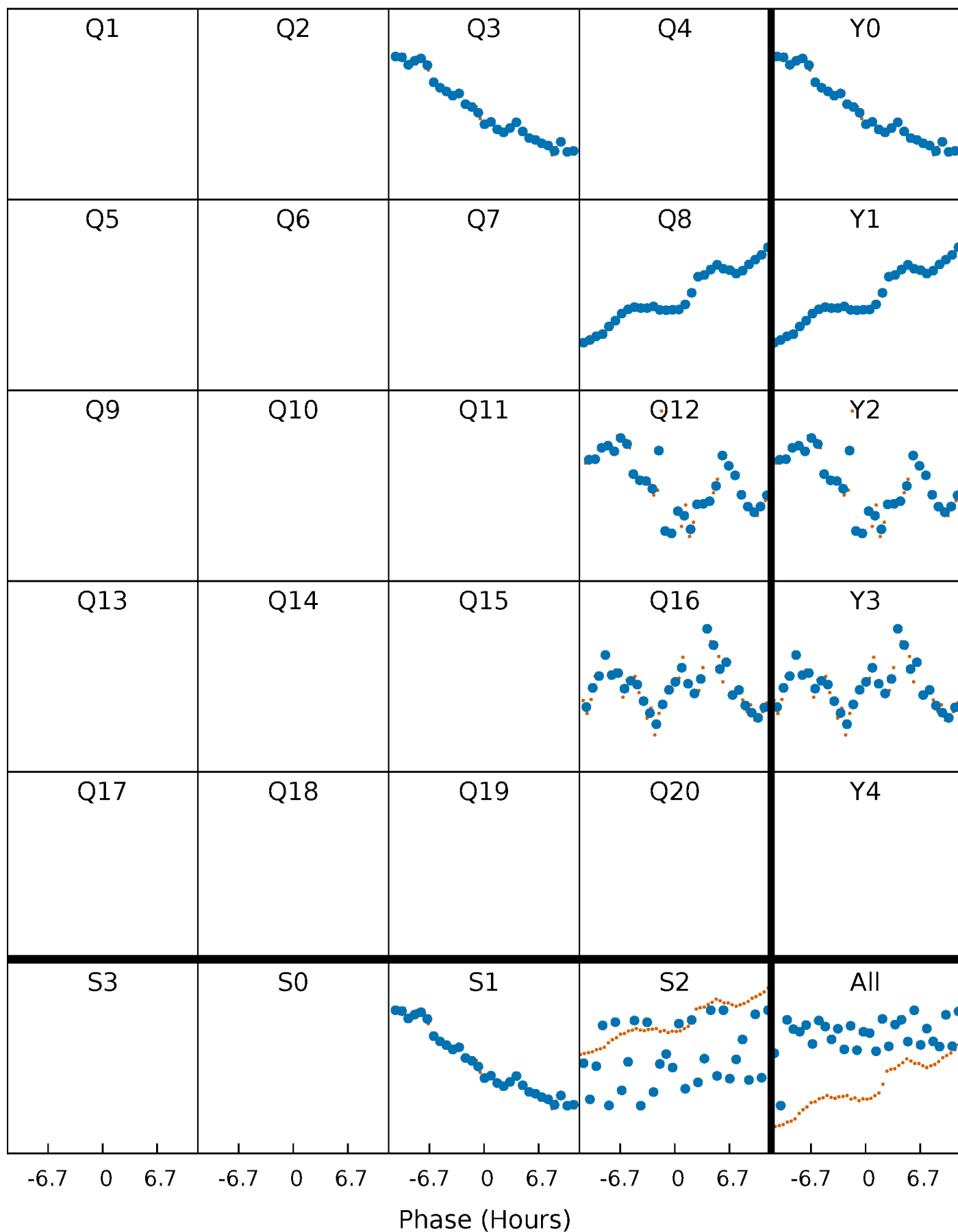


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

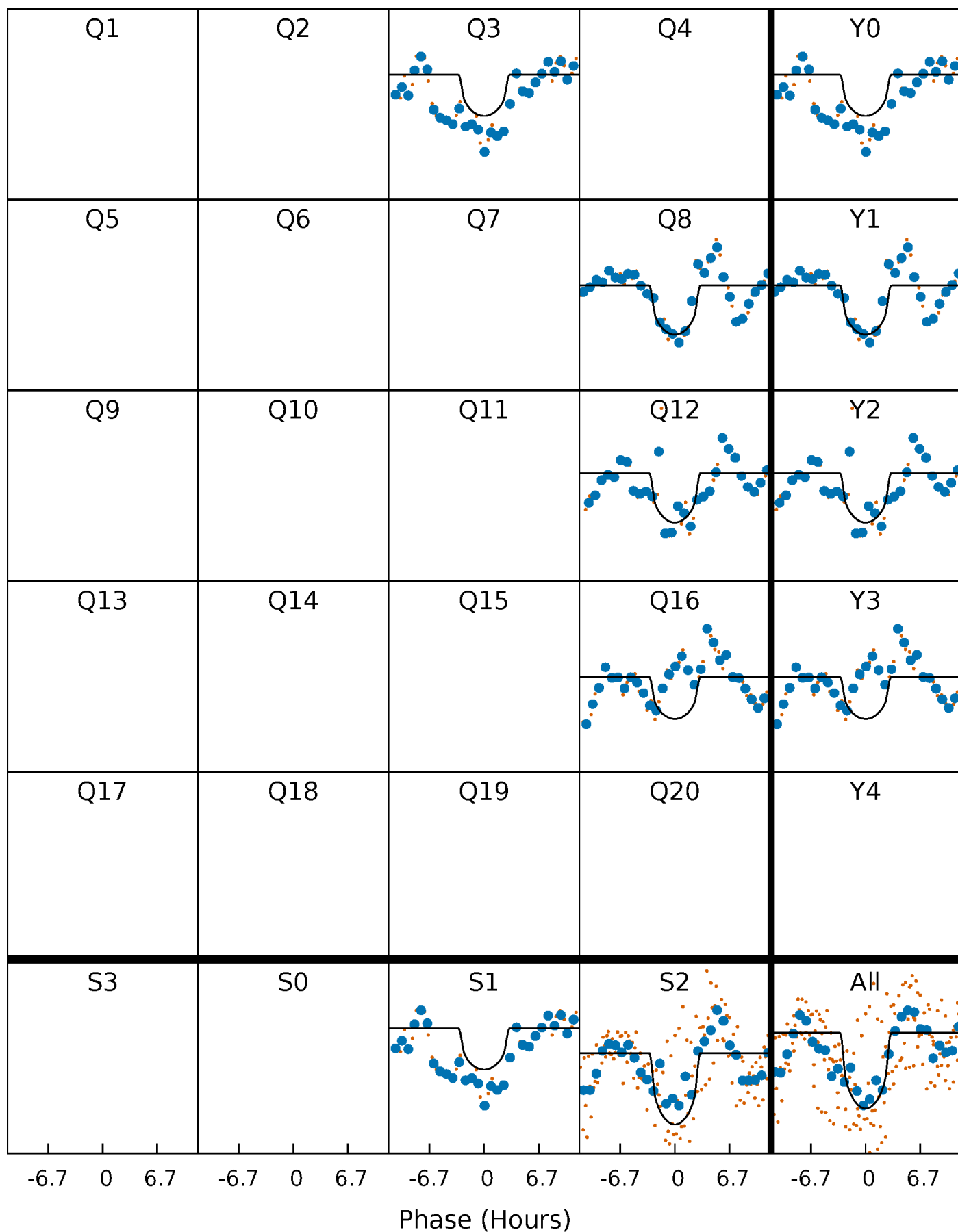
TCE 009535637-01 P=392.890142 Days  $T_0=348.739236$  (BKJD)





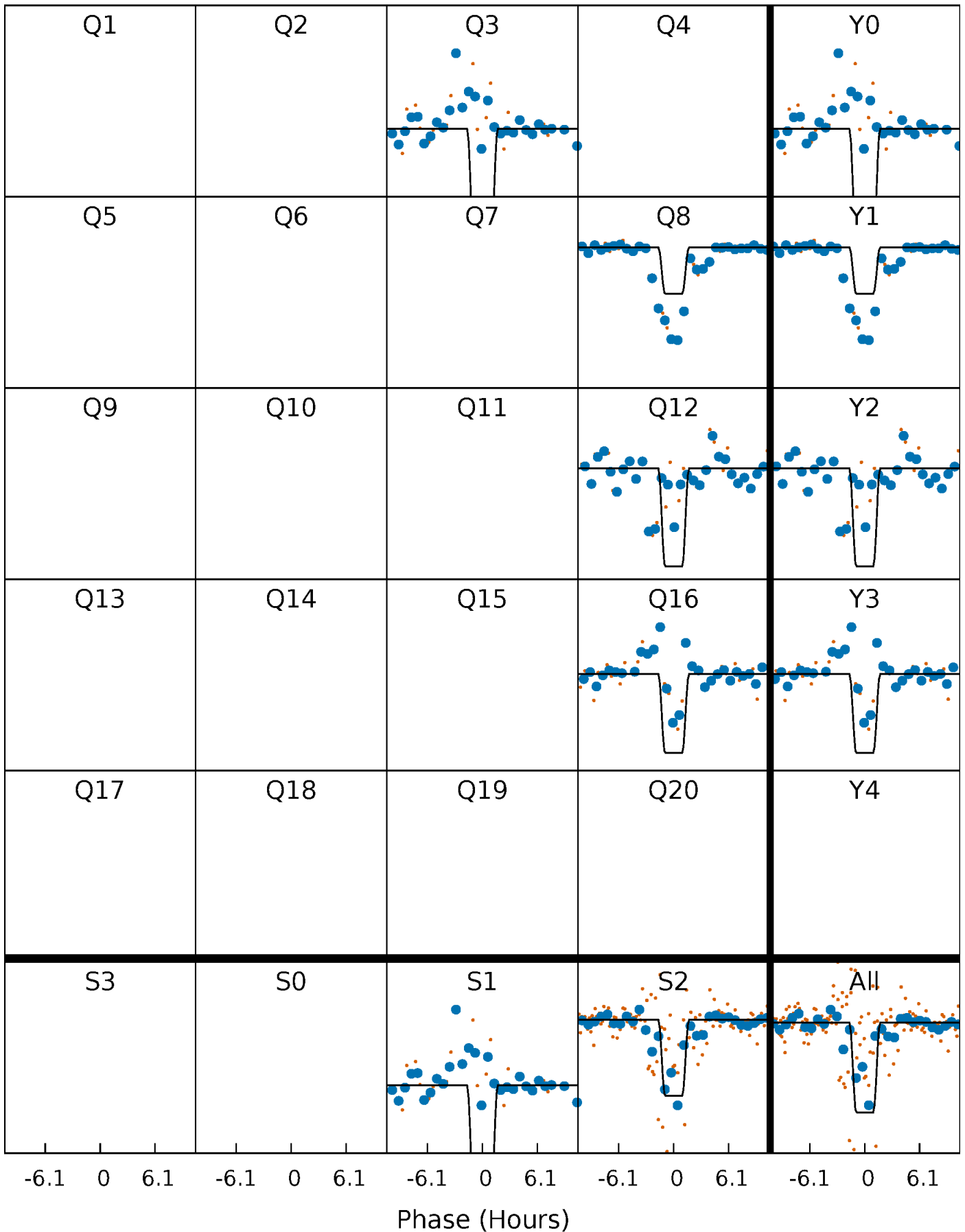
# DV Quarter-Phased Transit Curves

TCE 009535637-01     $P=392.890142$  Days     $T_0=348.739236$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

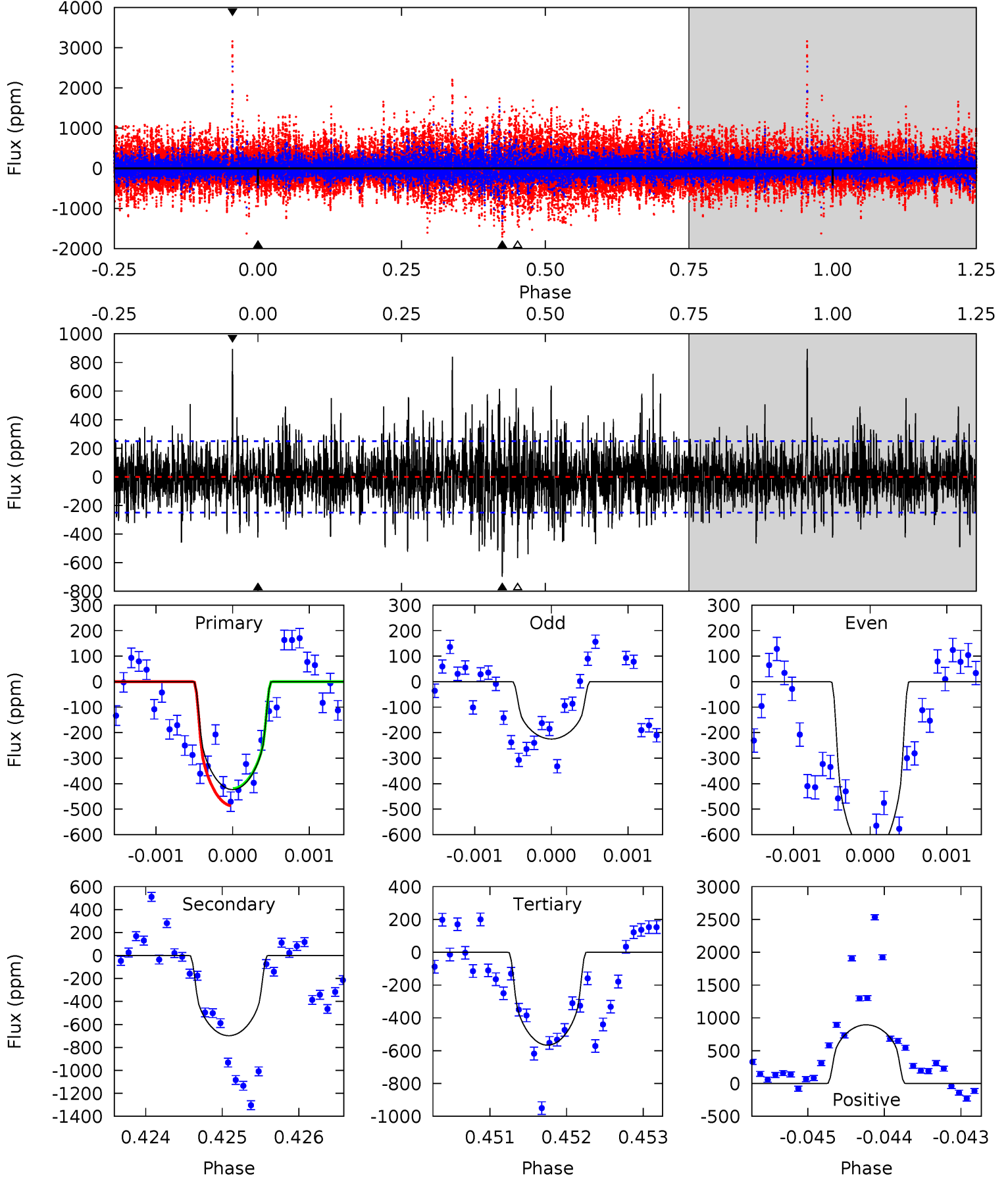
TCE 009535637-01 P=392.923736 Days  $T_0=348.742831$  (BKJD)



# DV Model-Shift Uniqueness Test

009535637-01, P = 392.890142 Days, E = 348.739236 Days

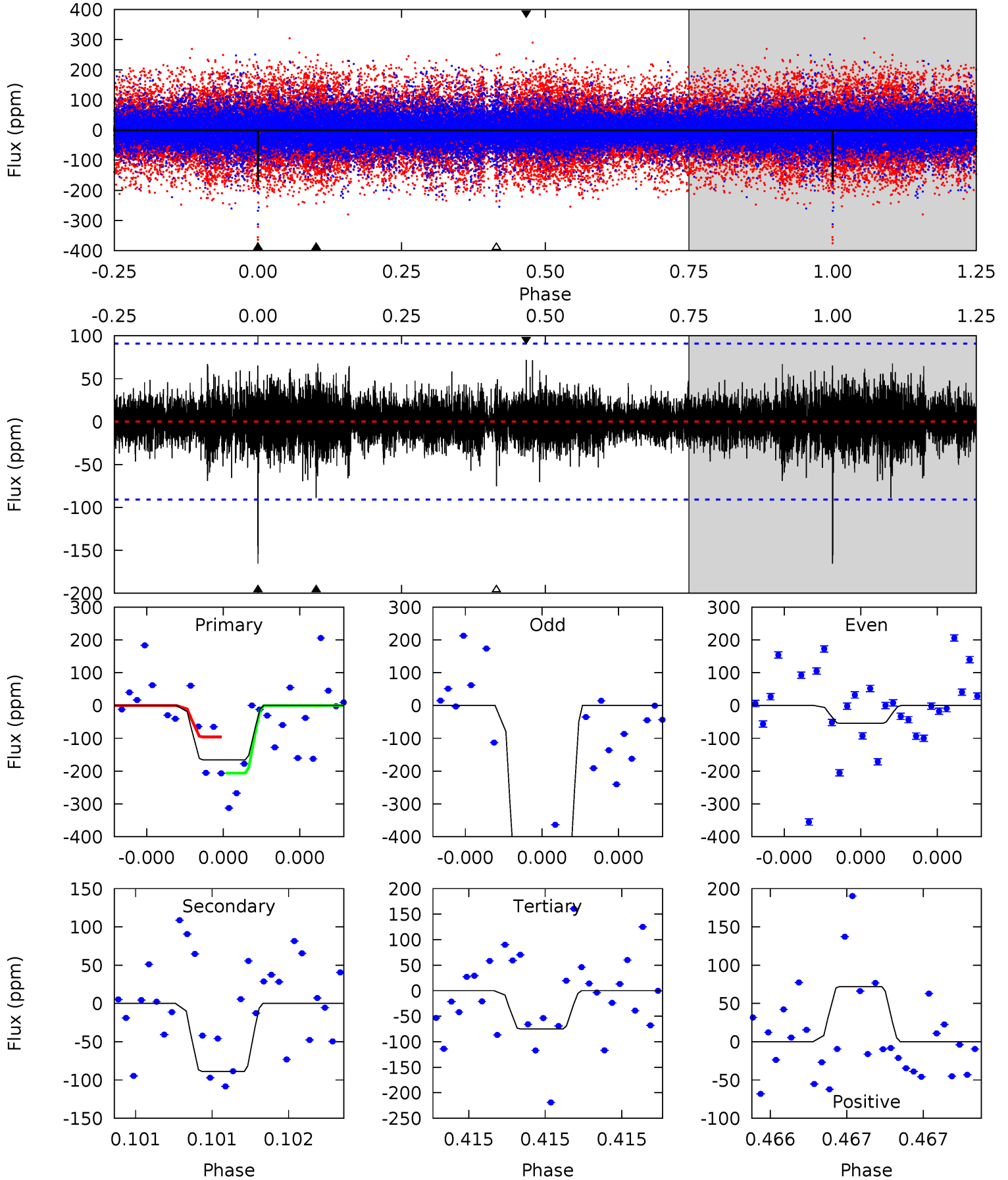
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.37	15.4	12.5	19.8	5.53	3.41	3.38	-3.16	-10.4	2.92	-4.33	4.49	0.96	0.56	0.74



# Alt Model-Shift Uniqueness Test

009535637-01, P = 392.923736 Days, E = 348.742831 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
10.3	5.50	4.66	4.47	5.64	3.58	0.91	5.61	5.80	0.85	1.04	22.9	1.91	0.30	0



### Stellar Parameters For KIC 009535637

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3291^{+107}_{-88}$	$0.169^{+0.208}_{-0.052}$	$-0.020^{+0.250}_{-0.150}$	$150.645^{+9.958}_{-31.865}$	$1.221^{+0.202}_{-0.166}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+123%/-31%	+1250%/-750%	+7%/-21%	+17%/-14%	+103%/-16%
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 009535637-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-698 \pm 45$	$355.99^{+195.08}_{-167.10}$	$2312^{+102}_{-137}$	$3429^{+872}_{-477}$	$3.860^{+9.697}_{-2.204}$
Alt.	$-89 \pm 16$	$367.09^{+175.51}_{-181.24}$	$2313^{+107}_{-131}$	$2268^{+731}_{-4413}$	$0.473^{+1.323}_{-0.268}$

$T_{max}$  = 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

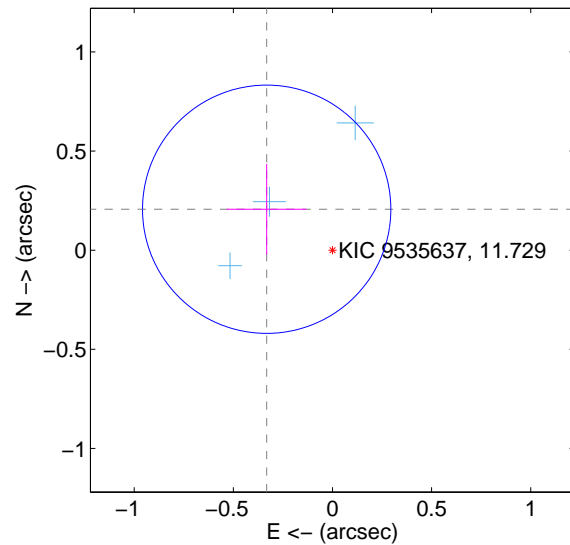
Supplemental centroid analysis for 009535637-01. **Kepler magnitude: 11.73.** Transit SNR 5.98

**There are 3 quarters with good PRF difference image offsets**

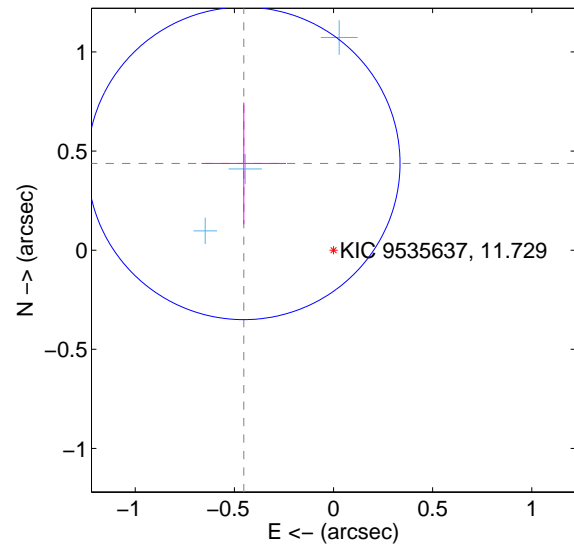
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.391 \pm 0.209$	1.87	$0.332 \pm 0.201$	$0.206 \pm 0.228$
PRF-fit source offset from KIC position	$0.630 \pm 0.263$	2.40	$0.453 \pm 0.214$	$0.438 \pm 0.307$
photometric centroid source offset	$0.10 \pm 0.28$	0.36	$0.08 \pm 0.28$	$0.06 \pm 0.28$

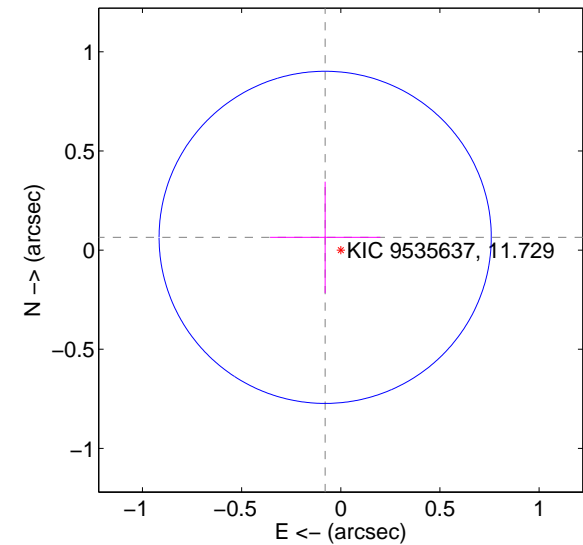
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



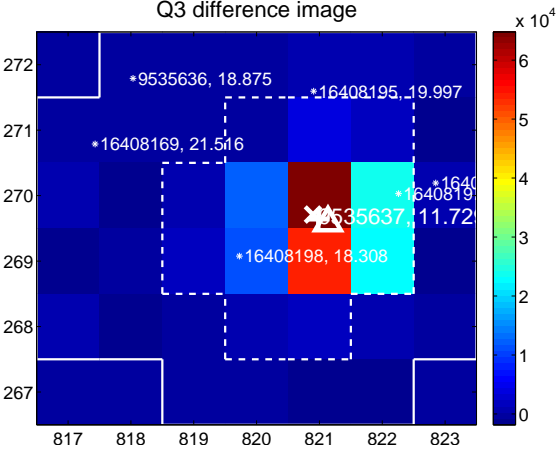
Q2 no difference image



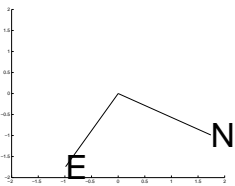
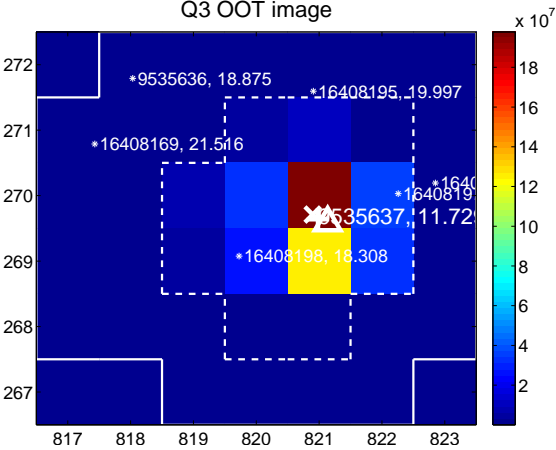
Q2 no OOT image



Q3 difference image



Q3 OOT image



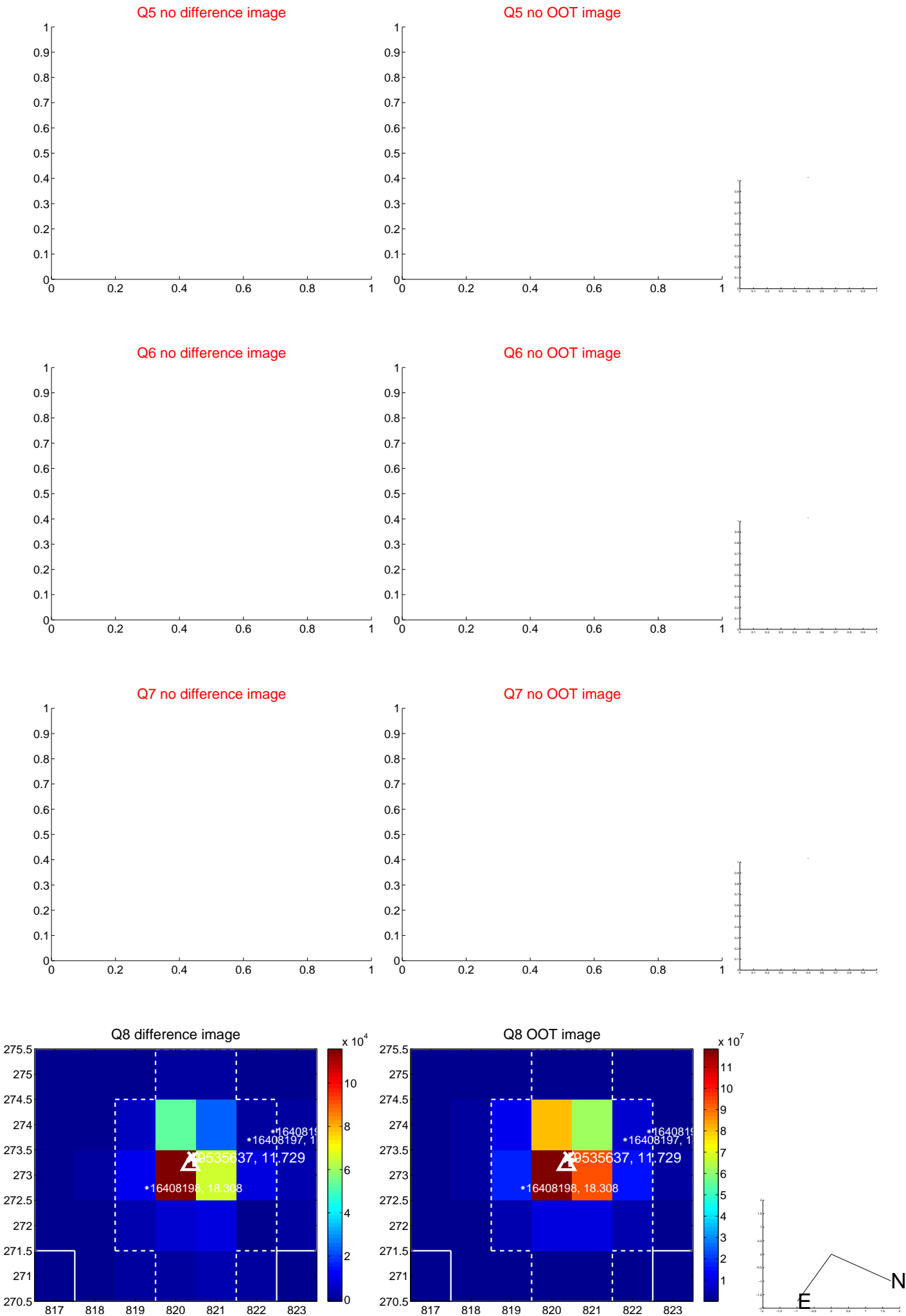
Q4 no difference image



Q4 no OOT image

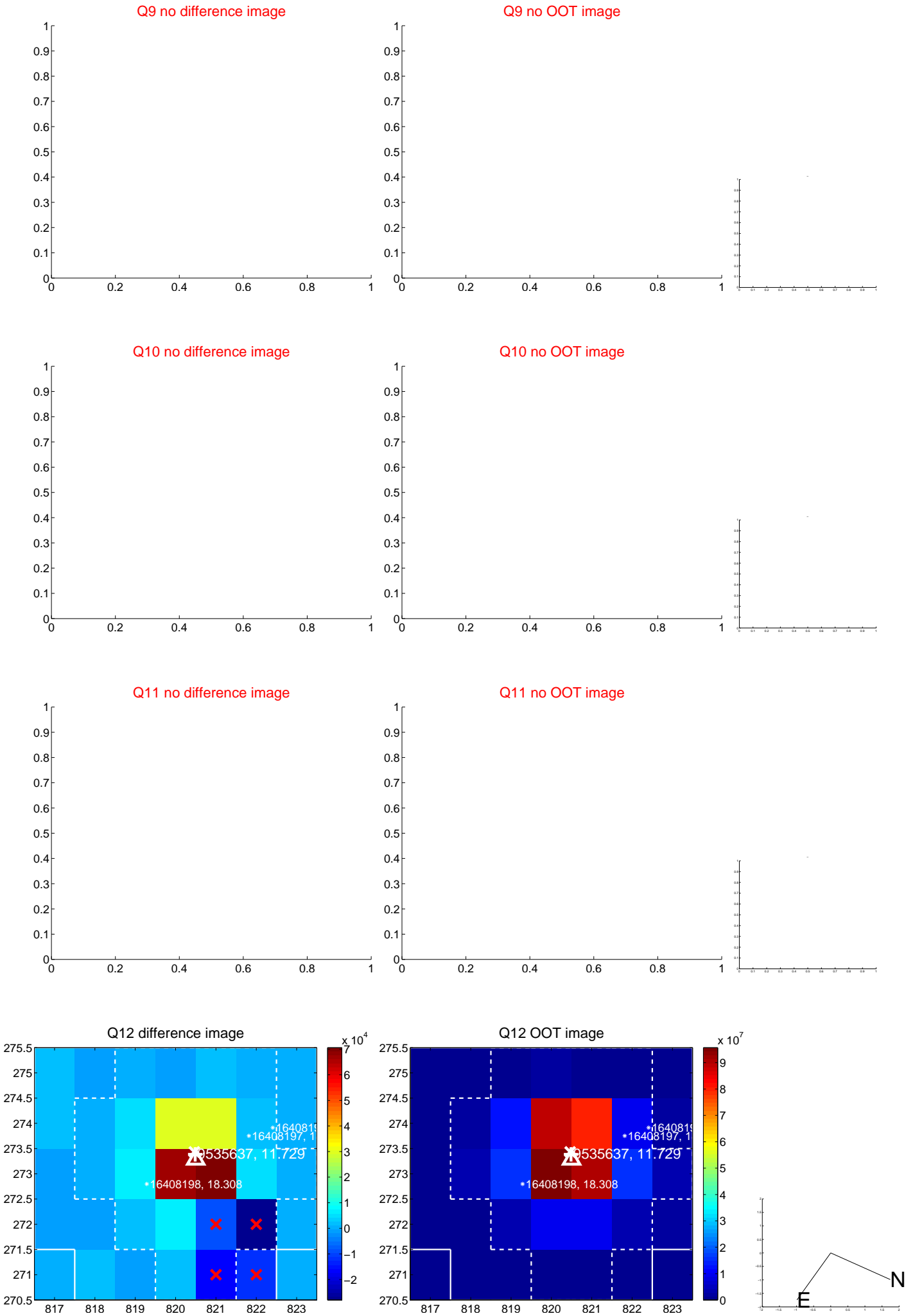


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





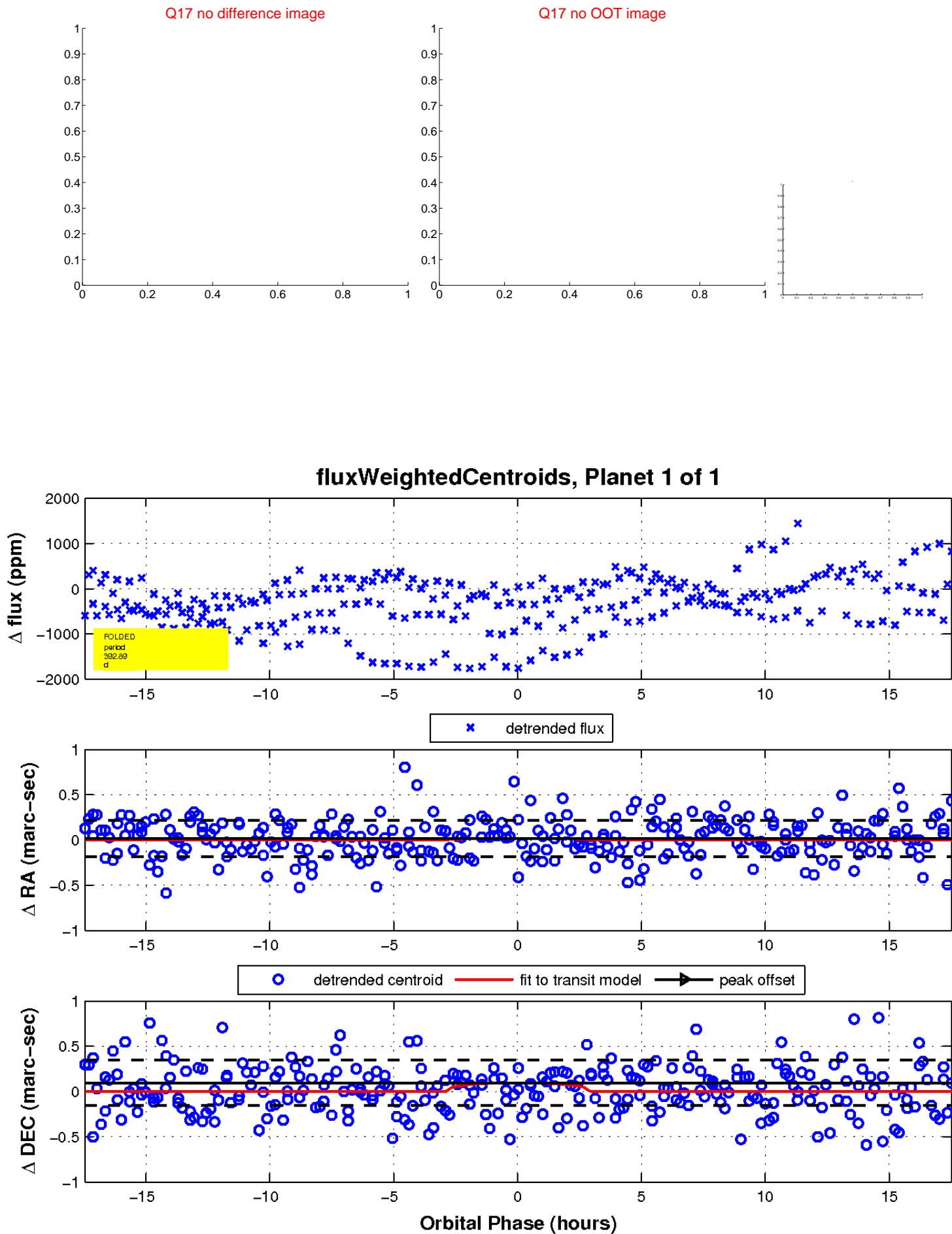
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

