

# KIC 003836375

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003836375-01	OBS	0807.01	1.540391	131.995464	605.4	1.874	32.0	34.1	0.92	5663	2.70	1106.25

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003836375-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—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 003836375-01

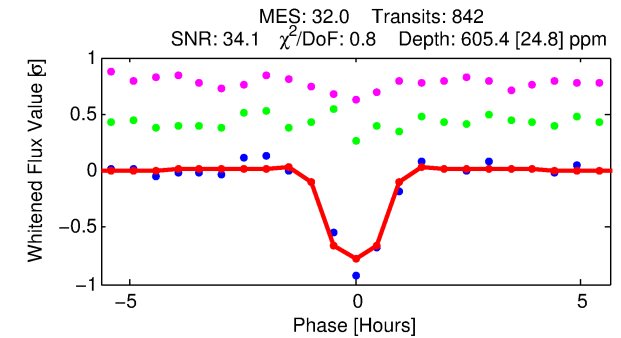
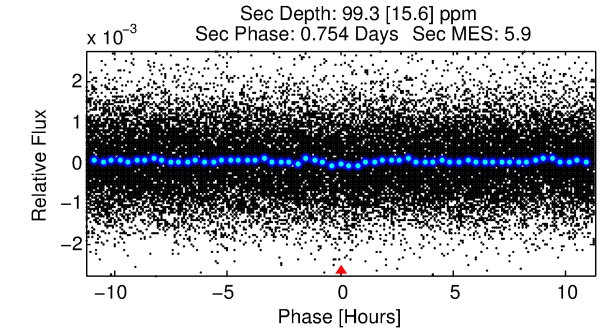
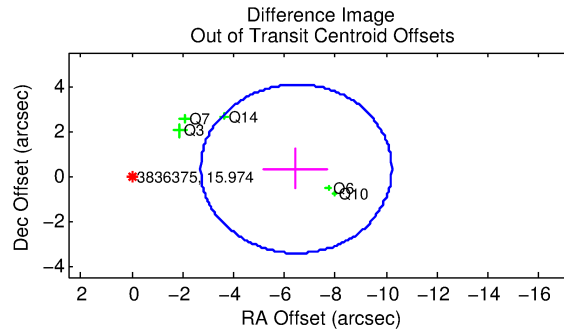
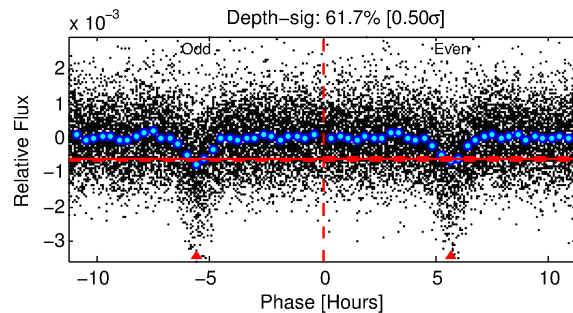
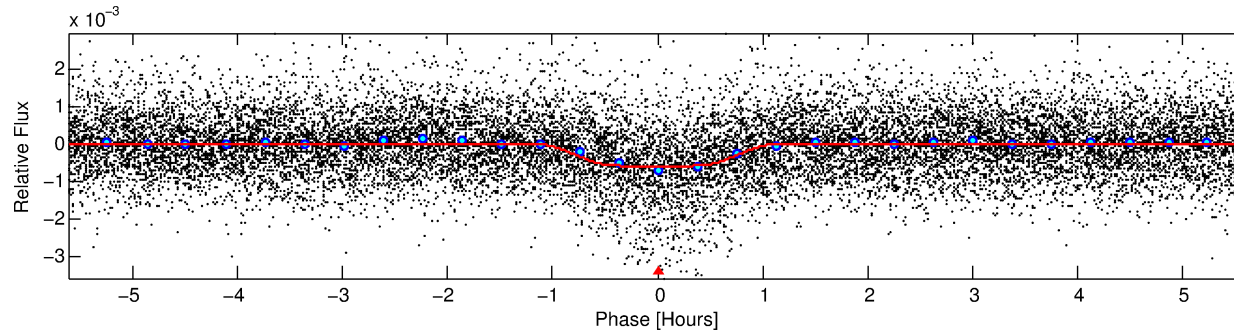
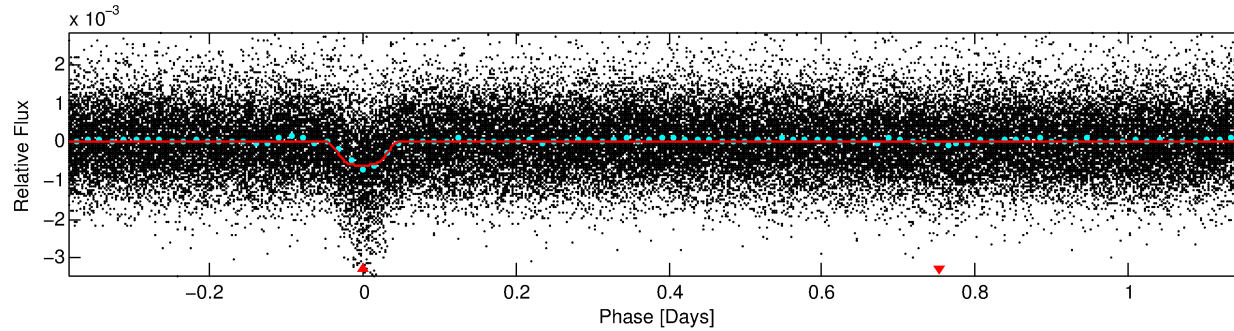
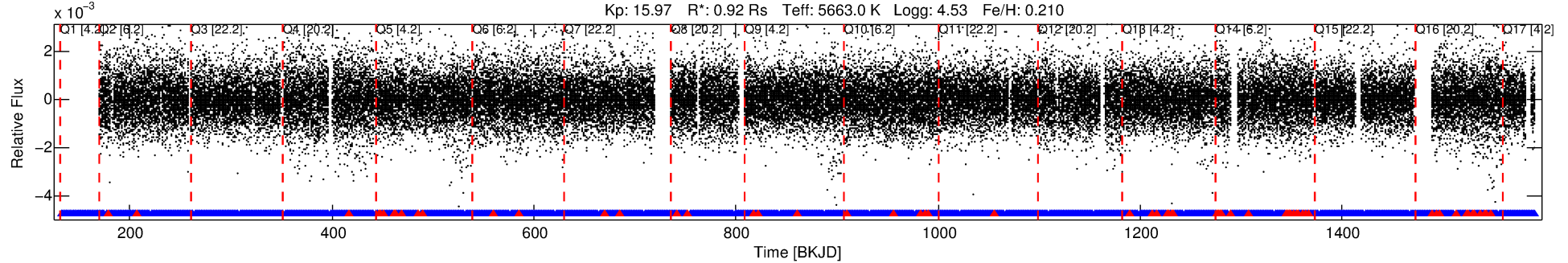
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
003836375-01	3836375	6363.01	3836413	1:1	40.3	9	5	13.76	15.97	122.58	Direct-PRF	0	0.26	0.05

**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: 3836375 Candidate: 1 of 1 Period: 1.540 d  
KOI: K00807.01 Corr: 0.874

Kp: 15.97 R\*: 0.92 Rs Teff: 5663.0 K Logg: 4.53 Fe/H: 0.210



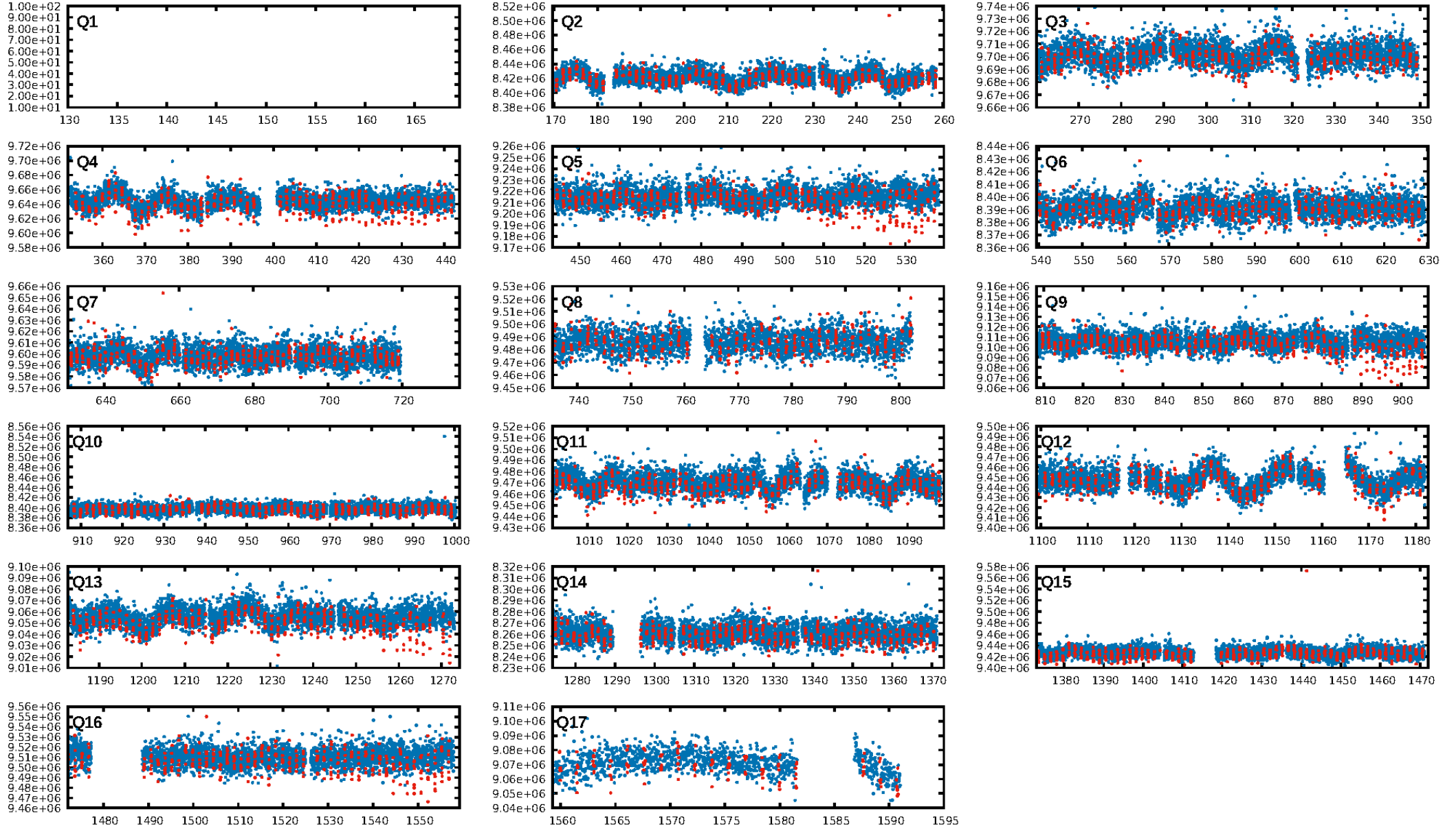
## DV Fit Results:

Period = 1.54039 [0.00000] d  
Epoch = 131.9955 [0.0008] BKJD  
Rp/R\* = 0.0271 [0.0038]  
a/R\* = 3.24 [1.78]  
b = 0.90 [0.13]  
Seff = 1106.25 [432.68]  
Teq = 1471 [144] K  
Rp = 2.70 [0.87] Re  
a = 0.0264 [0.0066] AU  
Ag = 5.21 [2.55] [1.65σ]  
Teffp = 3436 [299] K [5.92σ]

## DV Diagnostic Results:

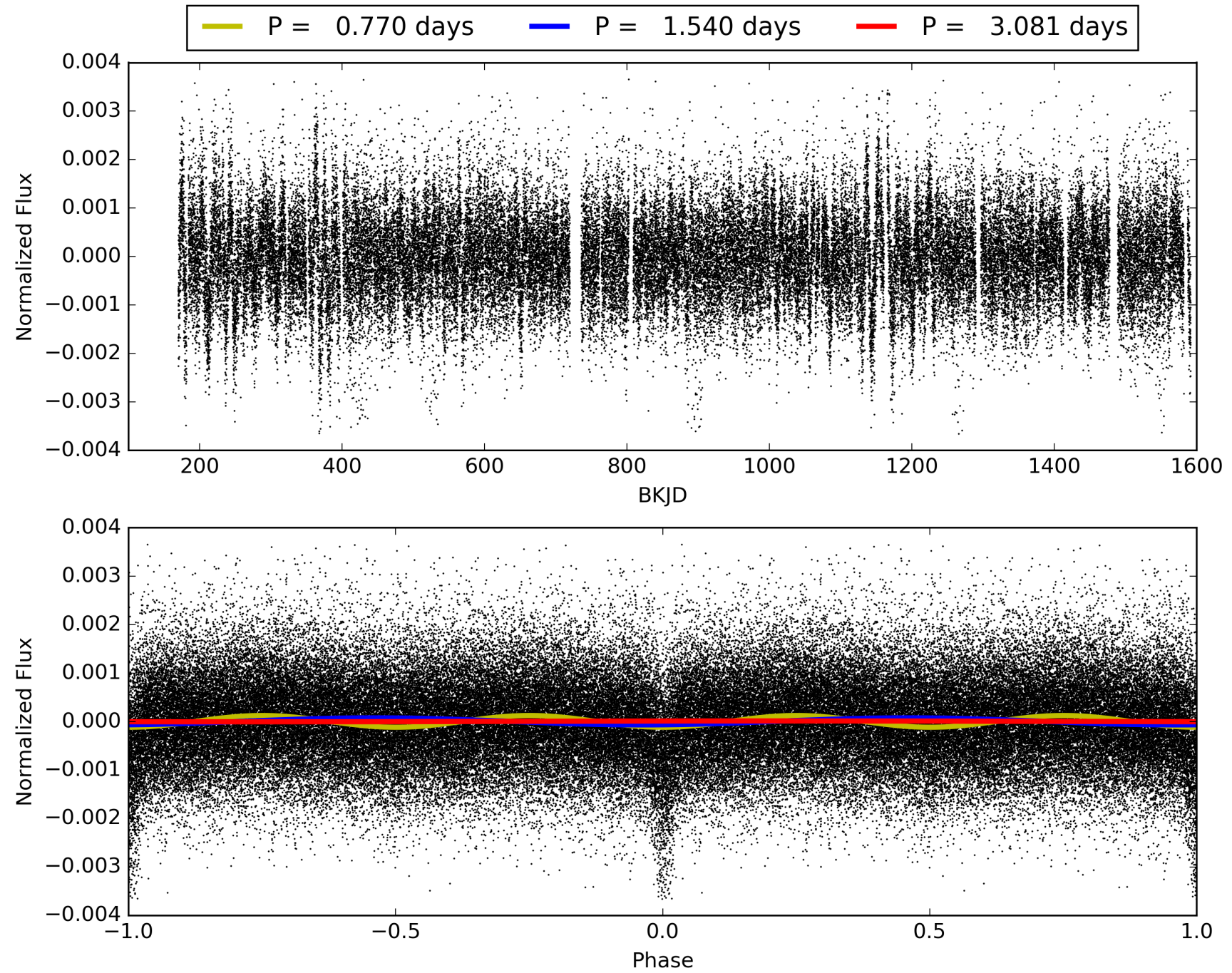
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.83e-215  
RollingBand-fgt: 0.93 [763/824]  
GhostDiagnostic-chr: -0.3802  
Centroid-sig: 0.0%  
Centroid-so: 4.711 arcsec [10.57σ]  
OotOffset-rm: 6.473 arcsec [5.17σ]  
KicOffset-rm: 6.600 arcsec [5.20σ]  
OotOffset-st: 3/2/0/0 [5]  
KicOffset-st: 3/2/0/0 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 1.00 [16/16]

# TCE 003836375-01, PDC Light Curves



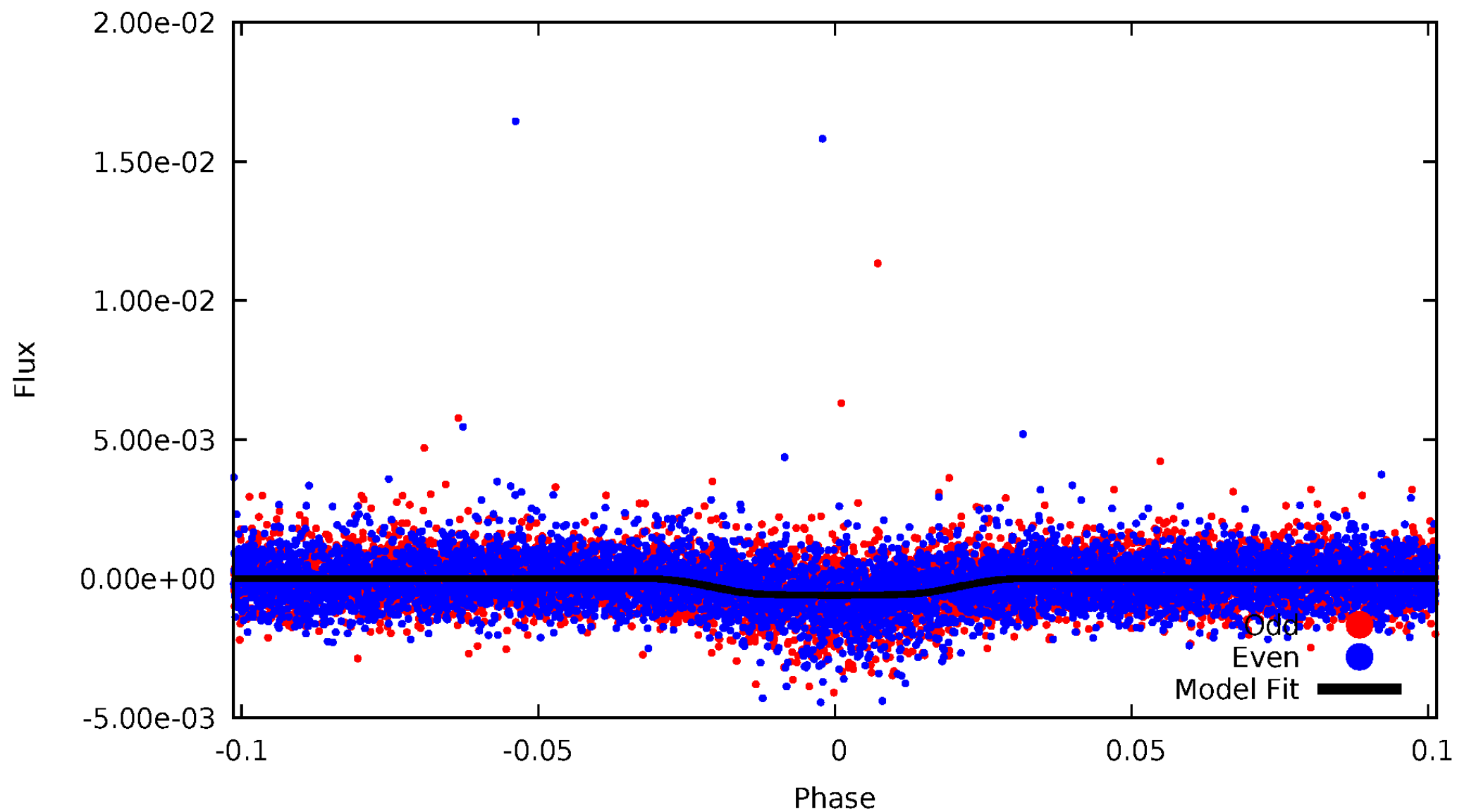


TCE 003836375-01



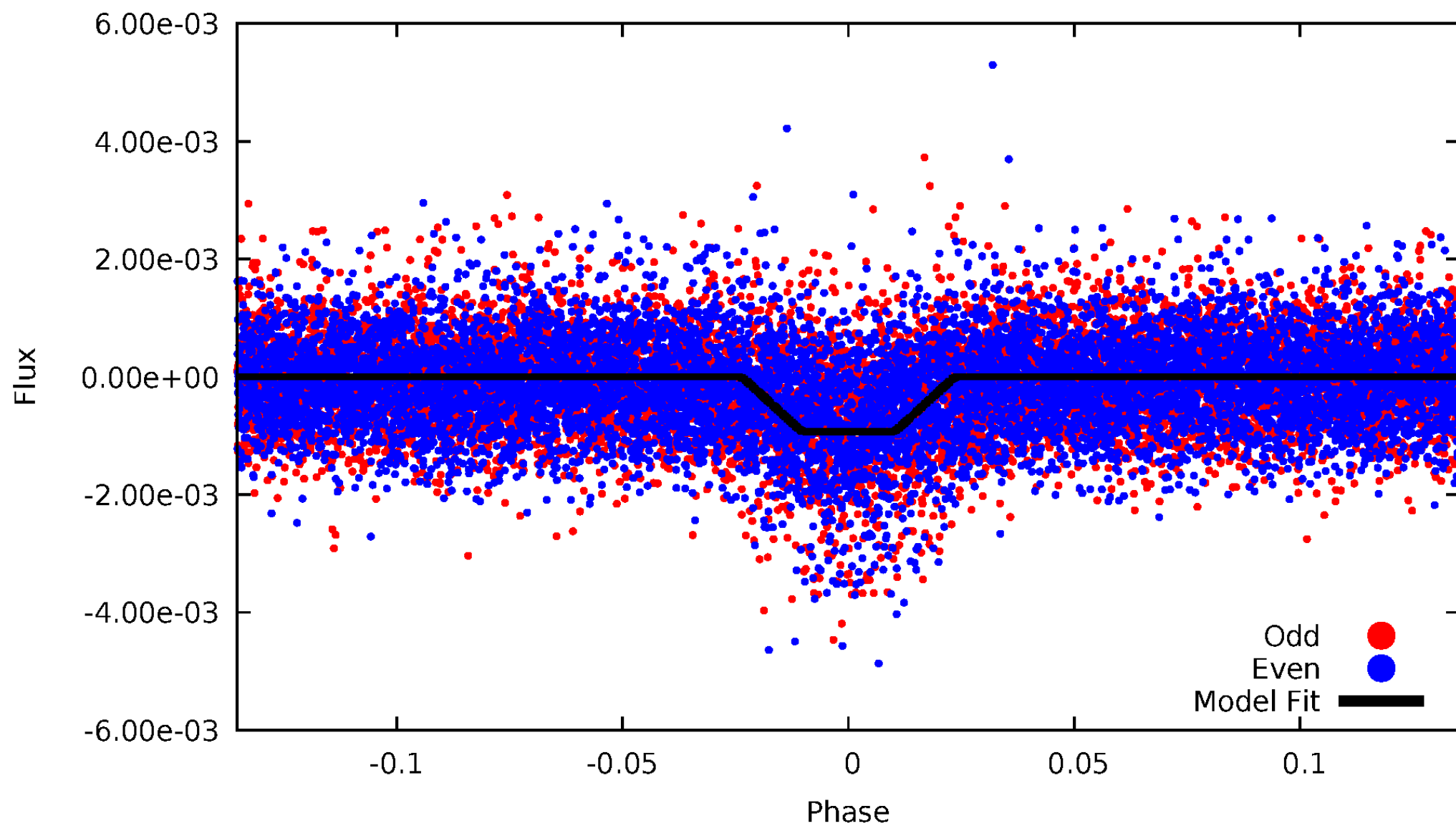
# DV Odd/Even

TCE 003836375-01



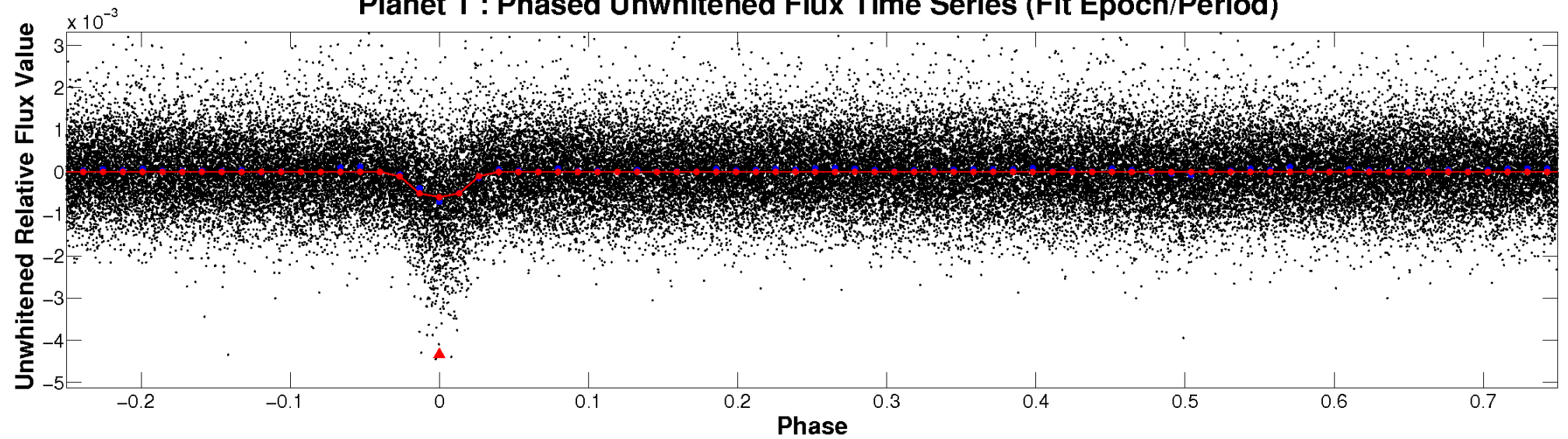
# ALT Odd/Even

TCE 003836375-01

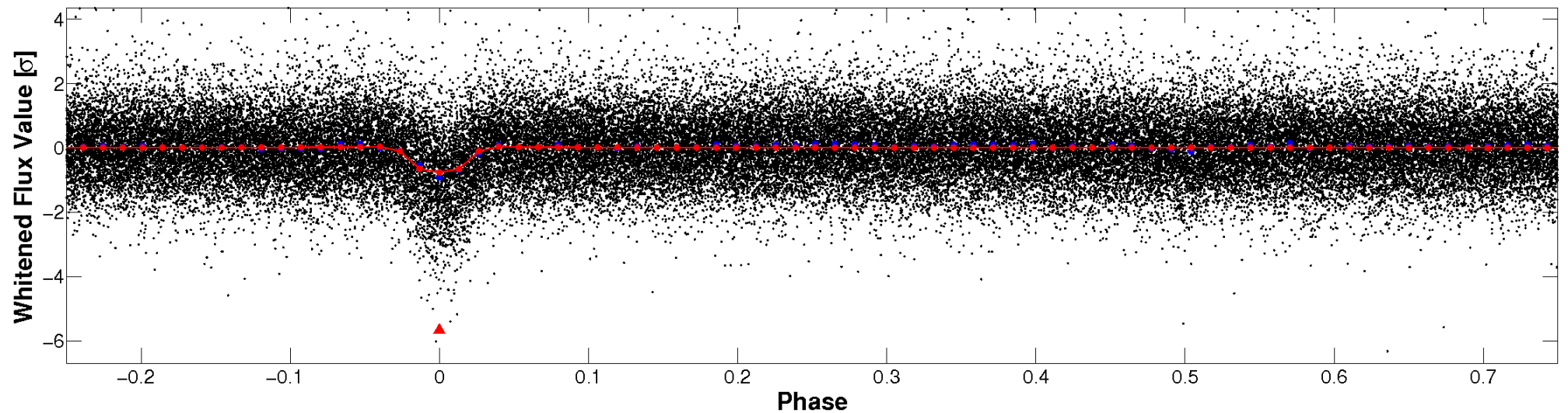


# Non-Whitened Vs. Whitened Light Curve

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



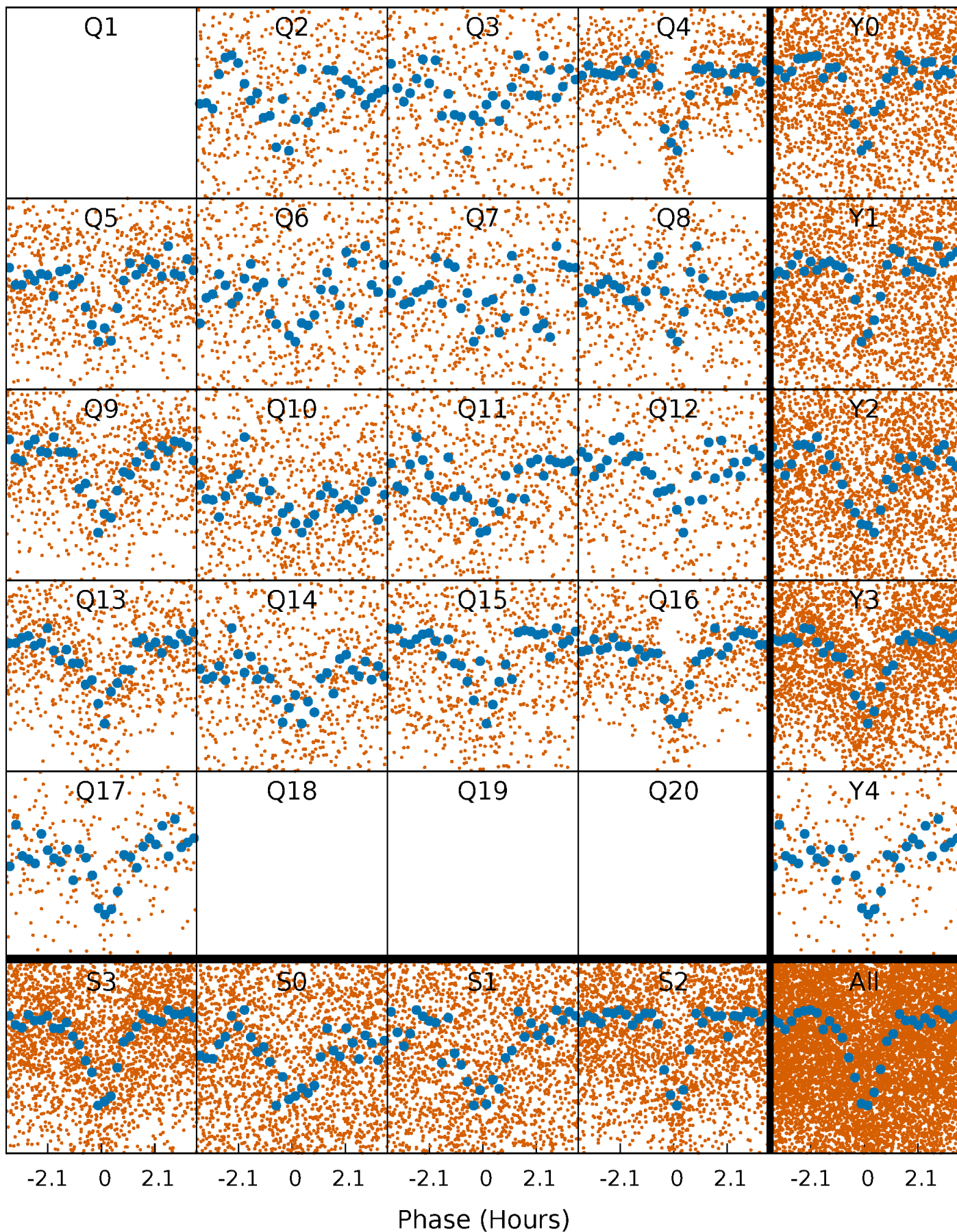
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

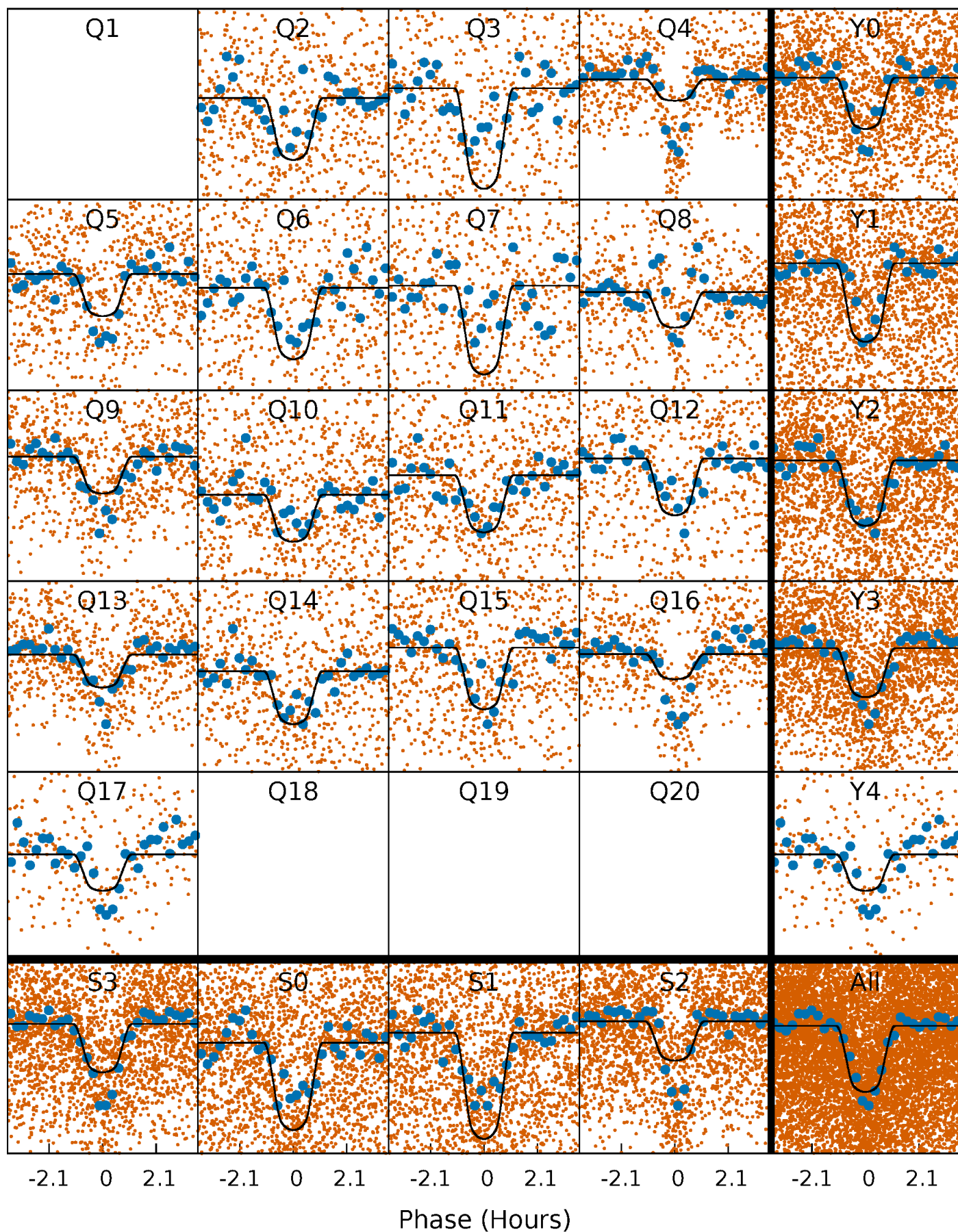
TCE 003836375-01 P= 1.540391 Days  $T_0=131.995464$  (BKJD)





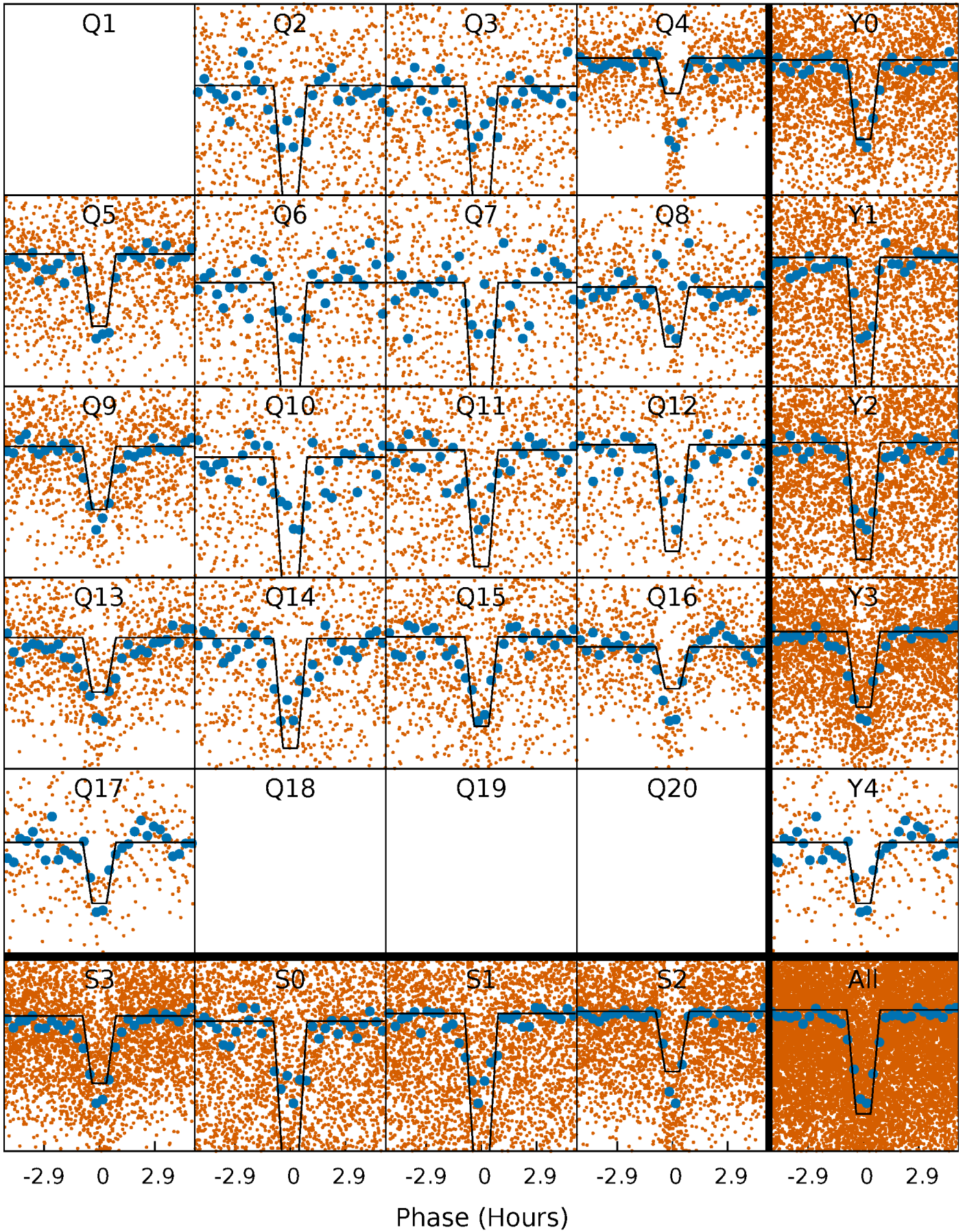
# DV Quarter-Phased Transit Curves

TCE 003836375-01 P= 1.540391 Days  $T_0=131.995464$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

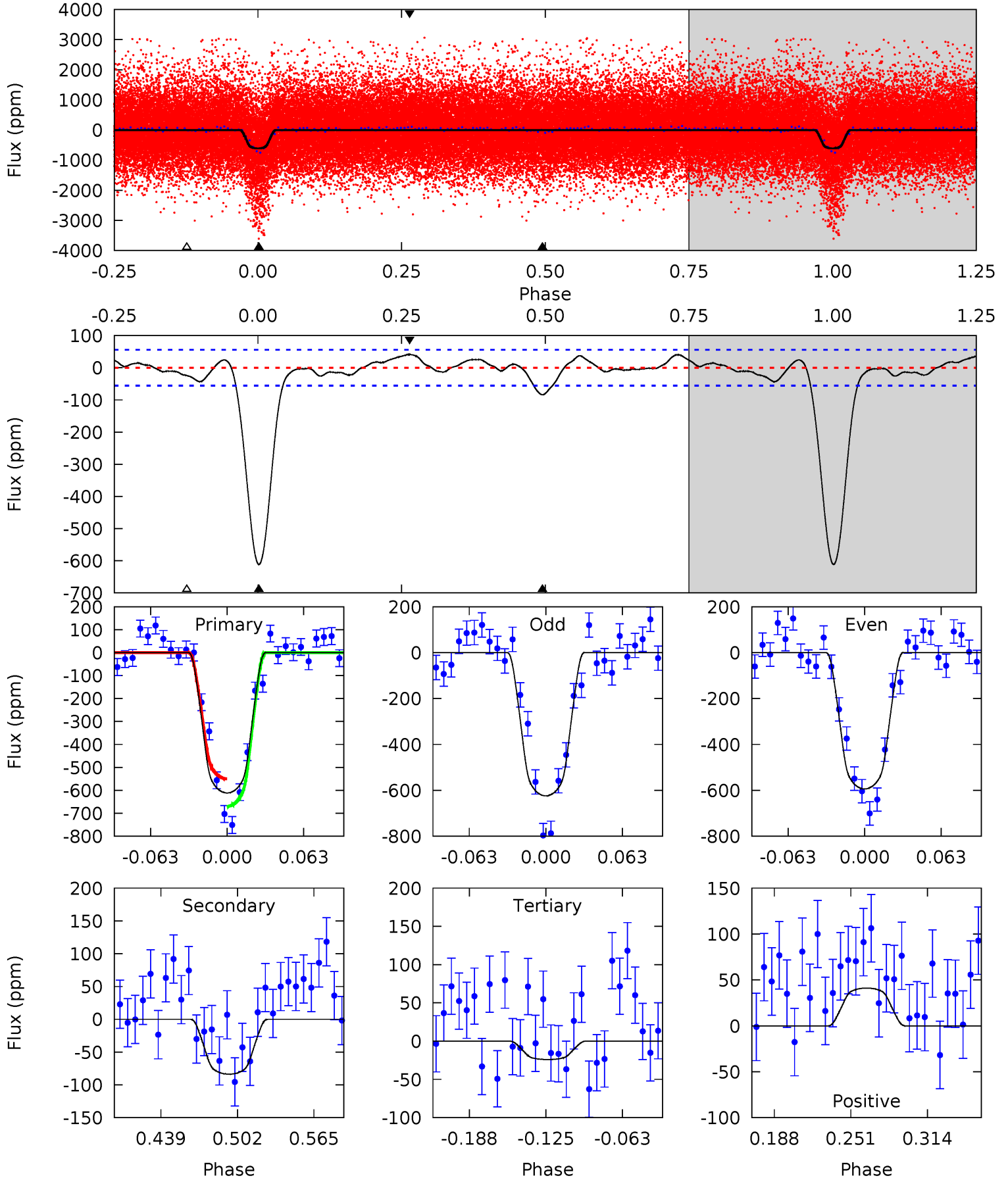
TCE 003836375-01 P= 1.540406 Days  $T_0=131.989914$  (BKJD)



# DV Model-Shift Uniqueness Test

003836375-01, P = 1.540391 Days, E = 131.995464 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
51.1	7.00	2.01	3.44	4.66	1.86	1.57	49.1	47.7	4.98	3.56	1.26	1.11	0.06	5.00

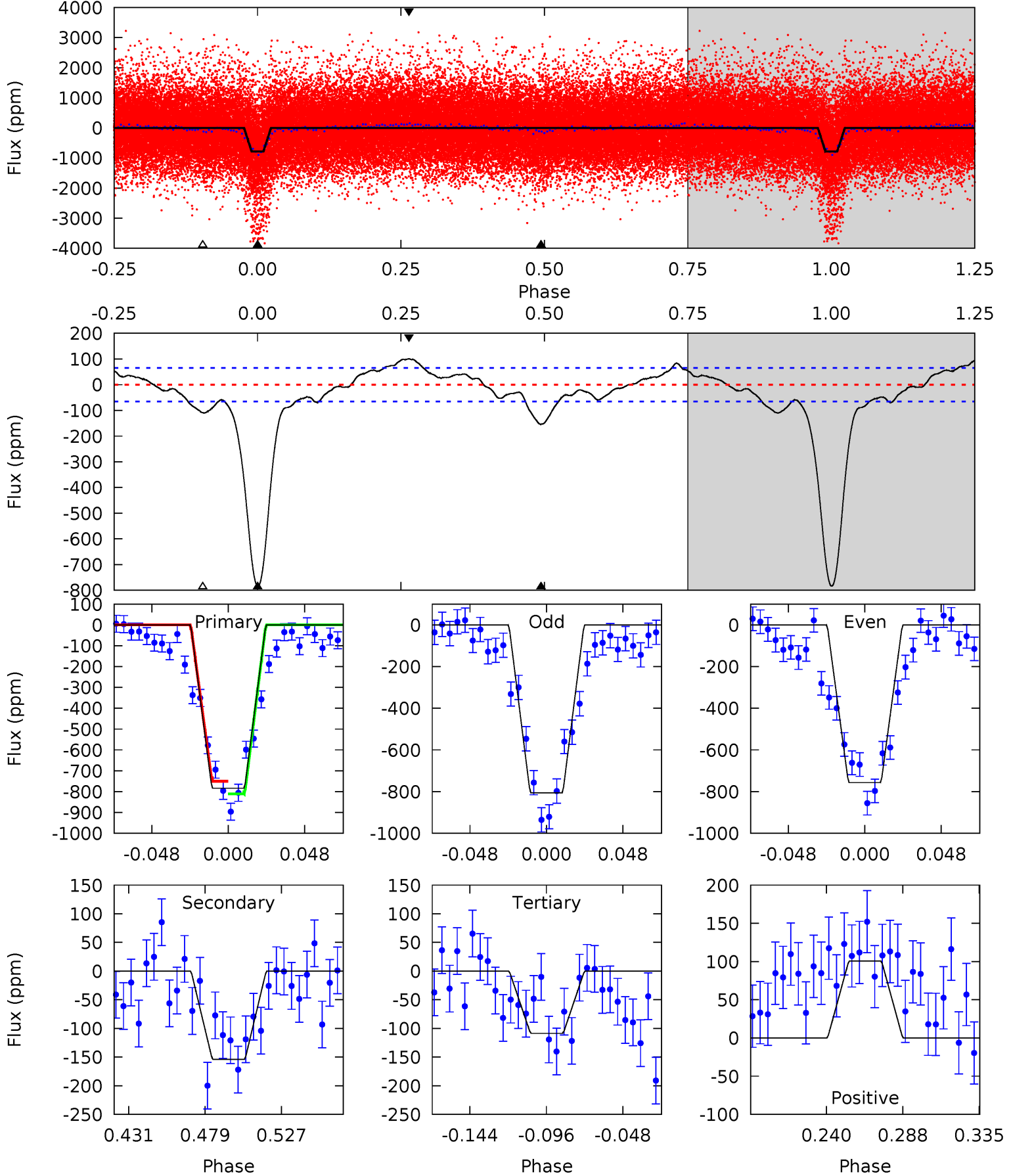




# Alt Model-Shift Uniqueness Test

003836375-01, P = 1.540406 Days, E = 131.989914 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
56.7	11.1	7.86	7.29	4.72	1.98	3.72	48.8	49.4	3.29	3.86	1.76	1.19	0.11	2.19





### Stellar Parameters For KIC 003836375

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5663^{+171}_{-188}$	$4.530^{+0.036}_{-0.204}$	$0.210^{+0.200}_{-0.300}$	$0.915^{+0.265}_{-0.083}$	$1.034^{+0.089}_{-0.122}$	$1.901^{+0.360}_{-0.947}$
	+3%/-3%	+1%/-5%	+95%/-143%	+29%/-9%	+9%/-12%	+19%/-50%
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 003836375-01 / KOI 0807.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	-84±12	$2.86^{+0.57}_{-0.46}$	$2109^{+142}_{-91}$	$3639^{+216}_{-192}$	$3.800^{+1.602}_{-1.158}$
Alt.	-154±14	$3.19^{+0.56}_{-0.49}$	$2108^{+136}_{-102}$	$3894^{+228}_{-198}$	$5.685^{+2.098}_{-1.639}$

$T_{\text{max}}$  = 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

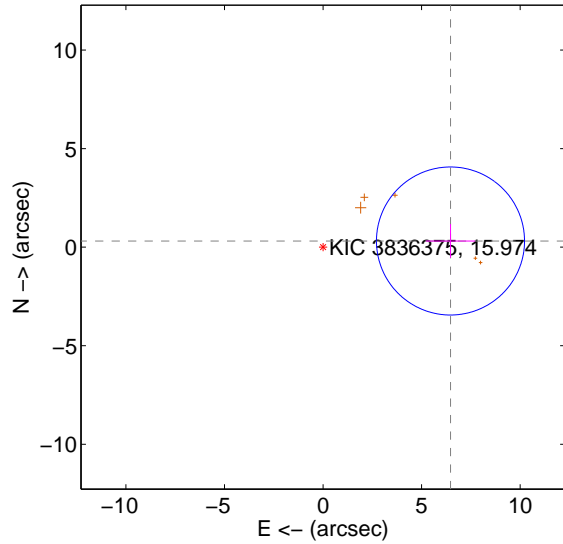
Supplemental centroid analysis for 003836375-01. Kepler magnitude: 15.97. Transit SNR 34.09

There are 0 quarters with good PRF difference image offsets

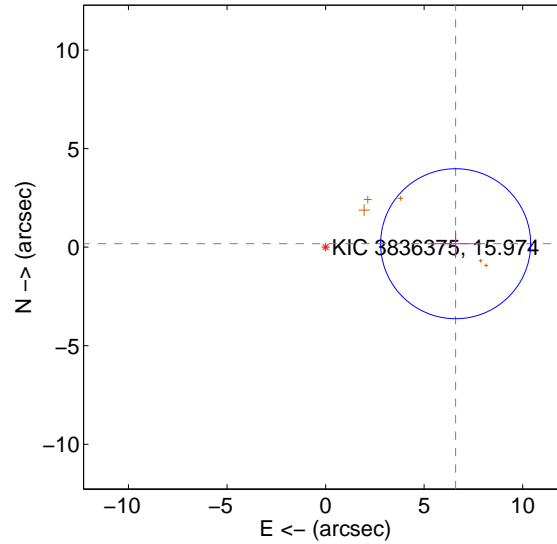
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.473 \pm 1.252$	5.17	$-6.466 \pm 1.253$	$0.313 \pm 0.857$
PRF-fit source offset from KIC position	$6.600 \pm 1.268$	5.20	$-6.598 \pm 1.286$	$0.175 \pm 0.676$
photometric centroid source offset	$4.71 \pm 0.45$	10.57	$-2.91 \pm 0.43$	$-3.71 \pm 0.46$

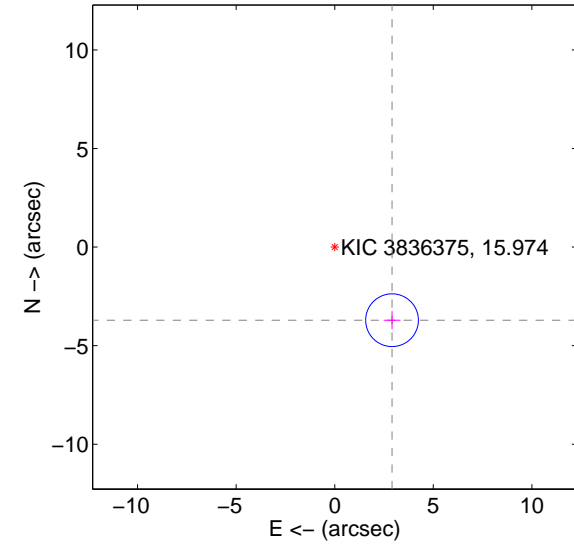
offset from difference PRF-fit to OOT PRF-fit



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.

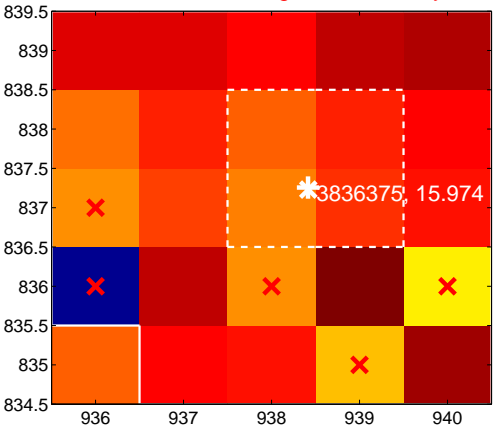
Q1 no difference image



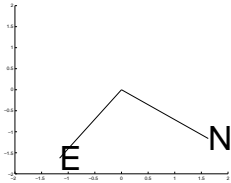
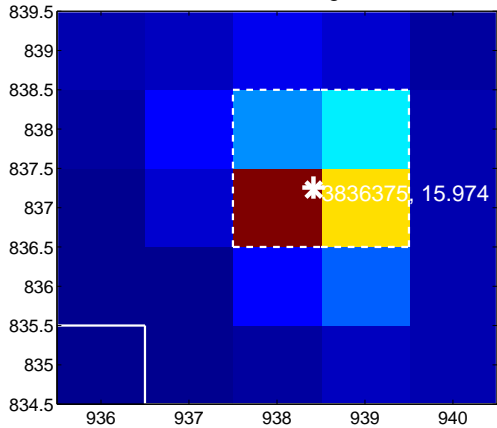
Q1 no OOT image



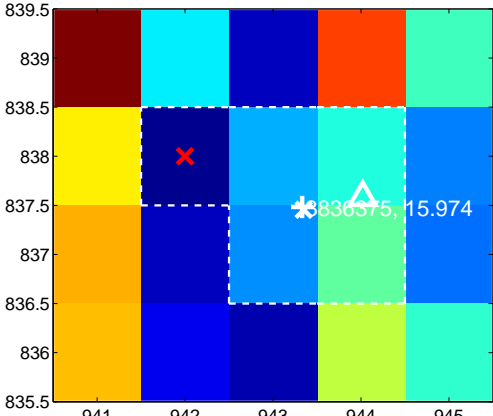
Q2 difference image. Poor Quality



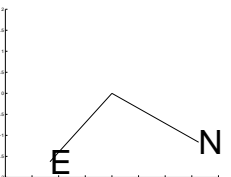
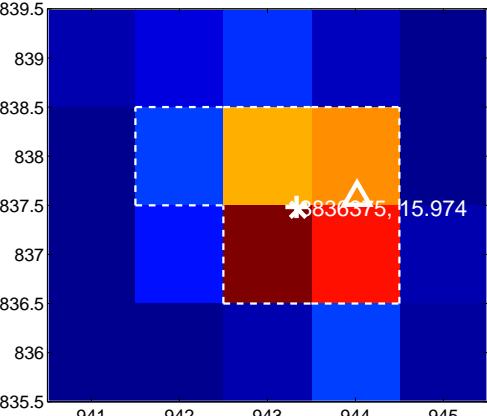
Q2 OOT image



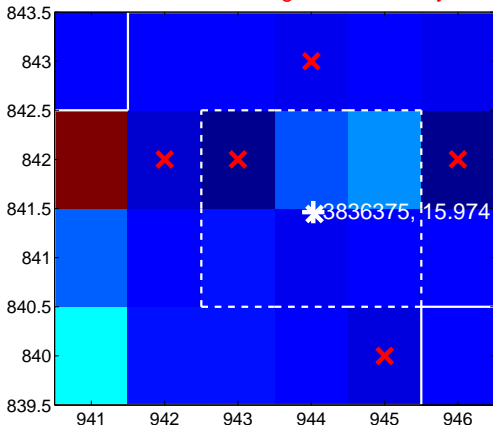
Q3 difference image. Poor Quality



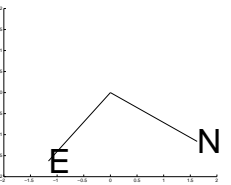
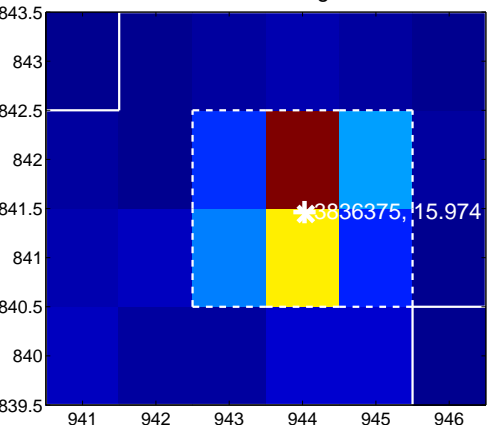
Q3 OOT image



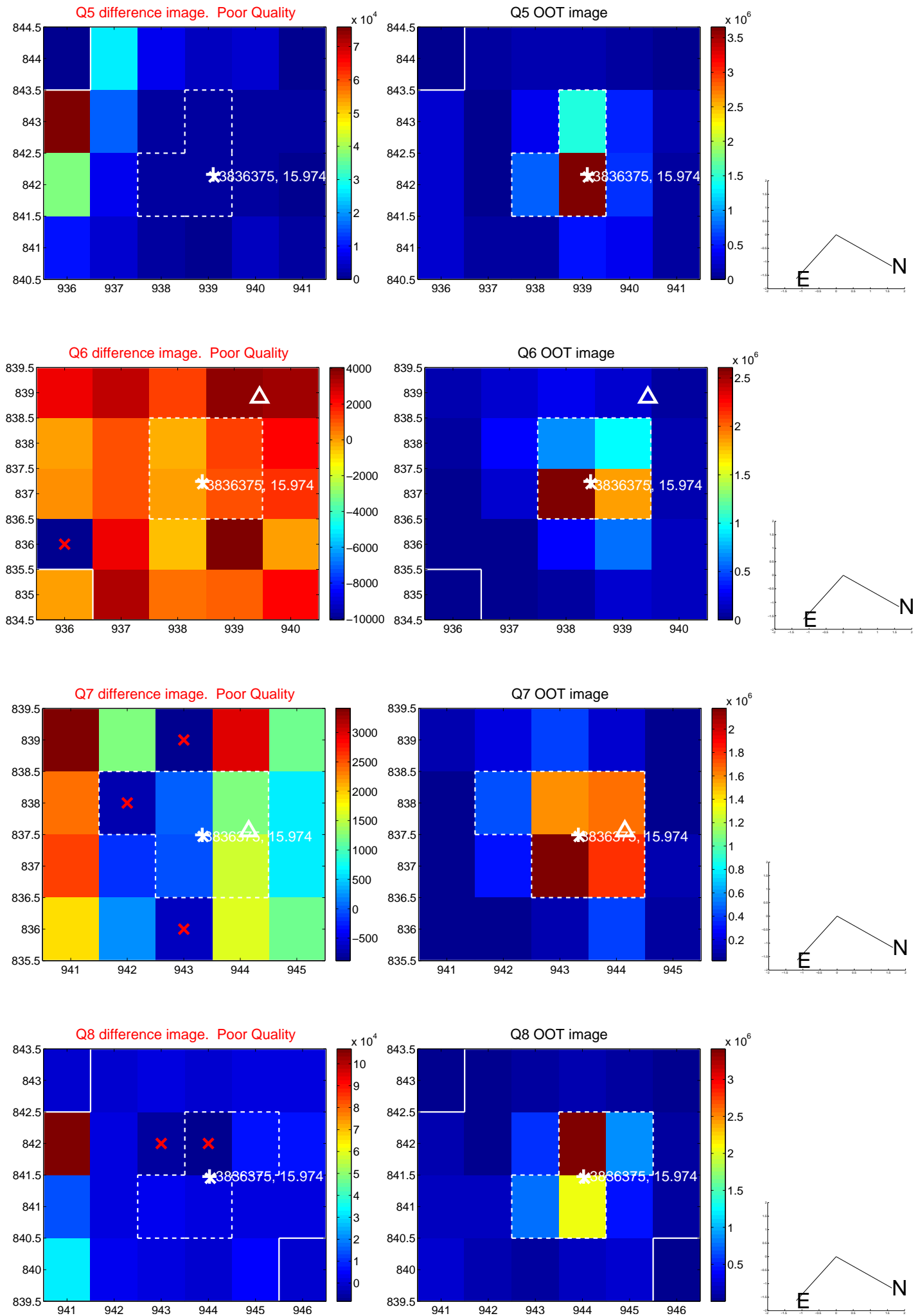
Q4 difference image. Poor Quality



Q4 OOT image

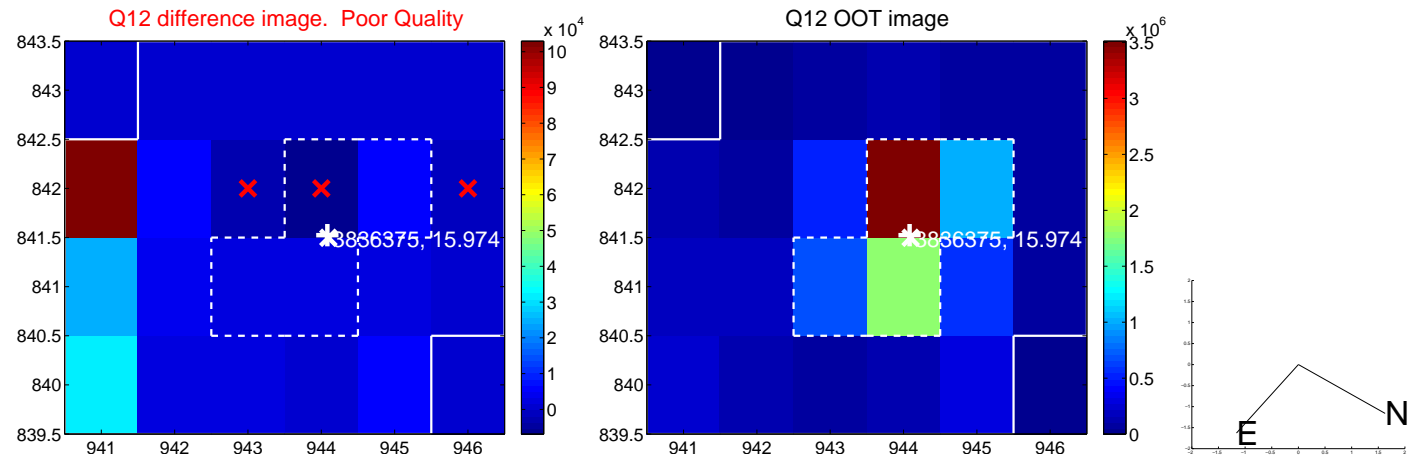
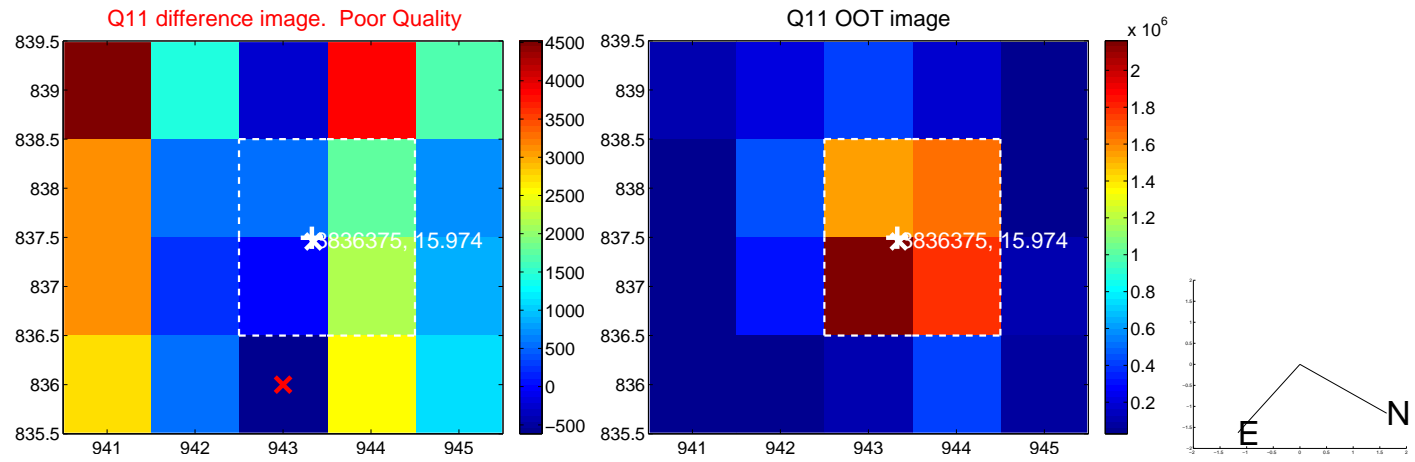
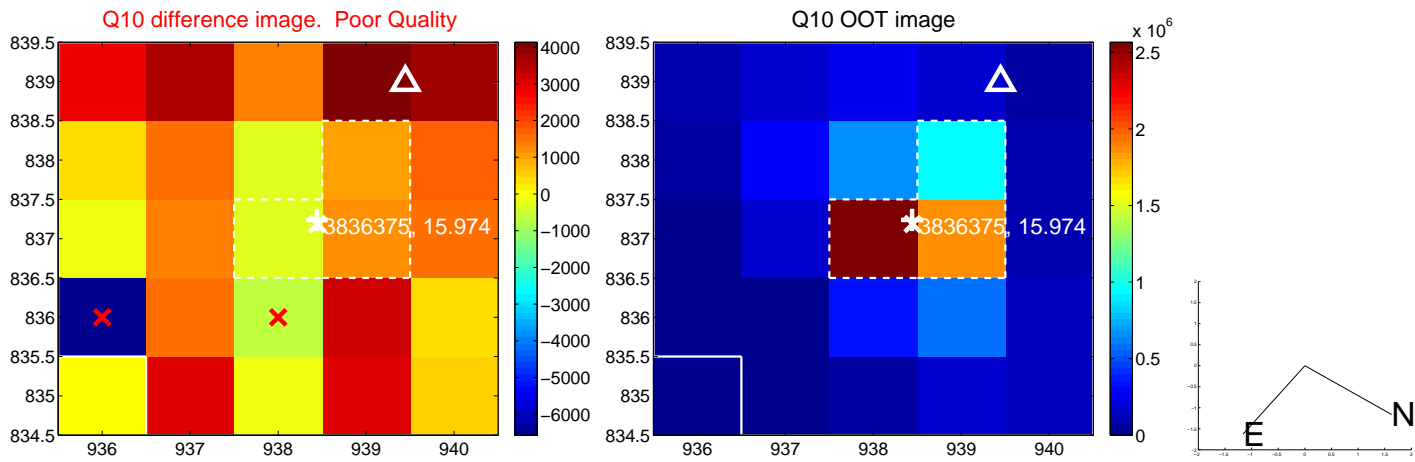
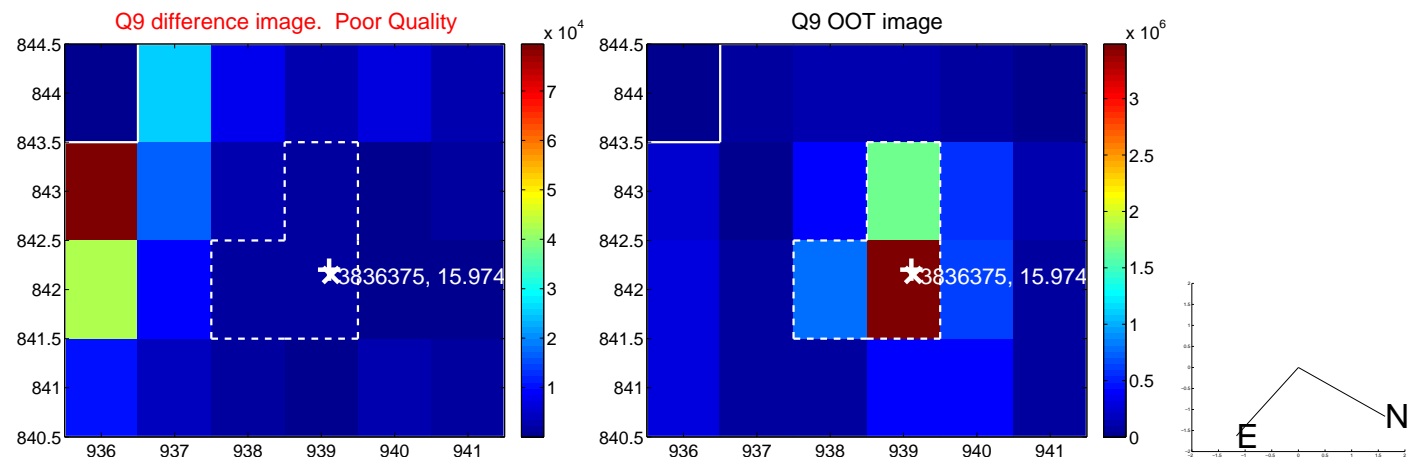


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

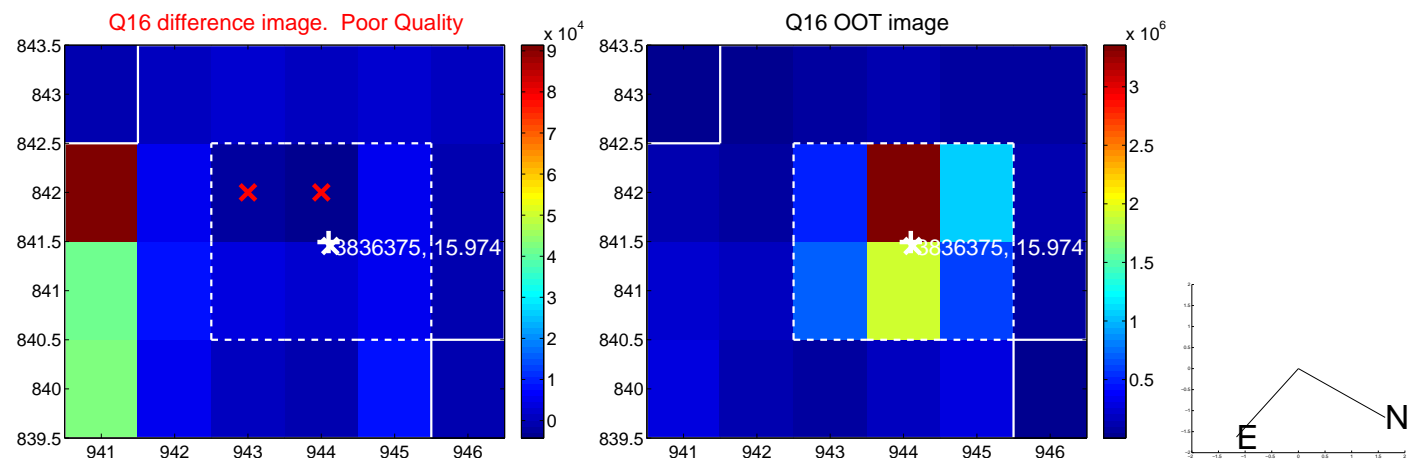
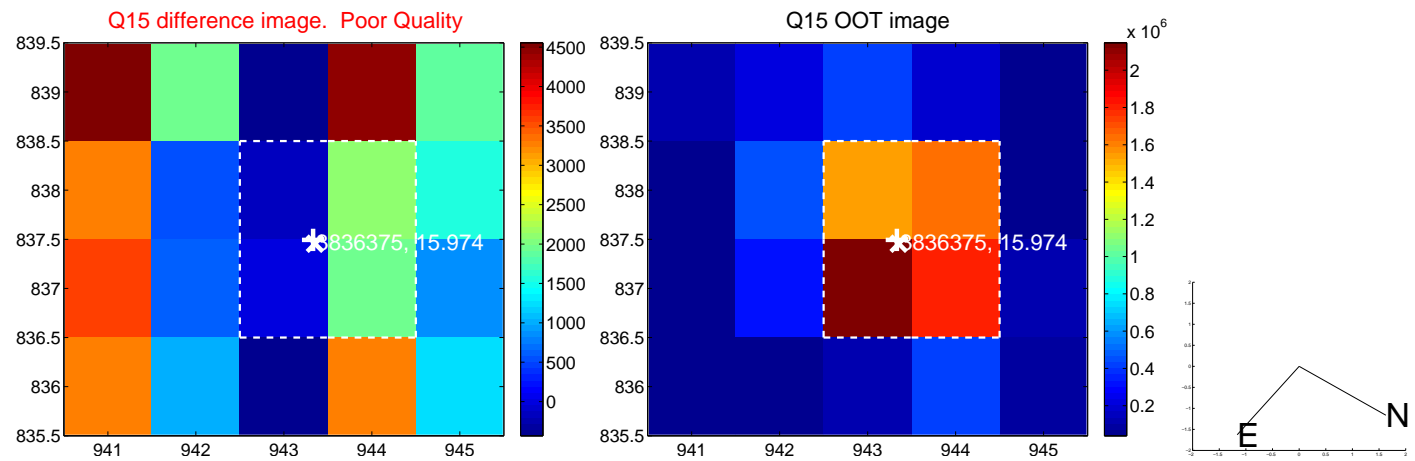
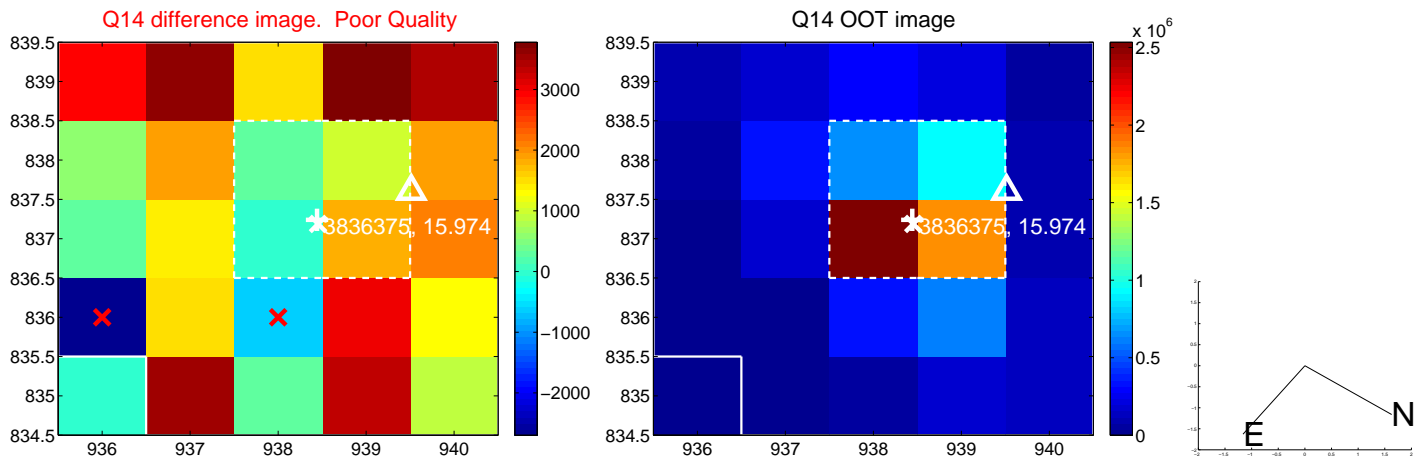
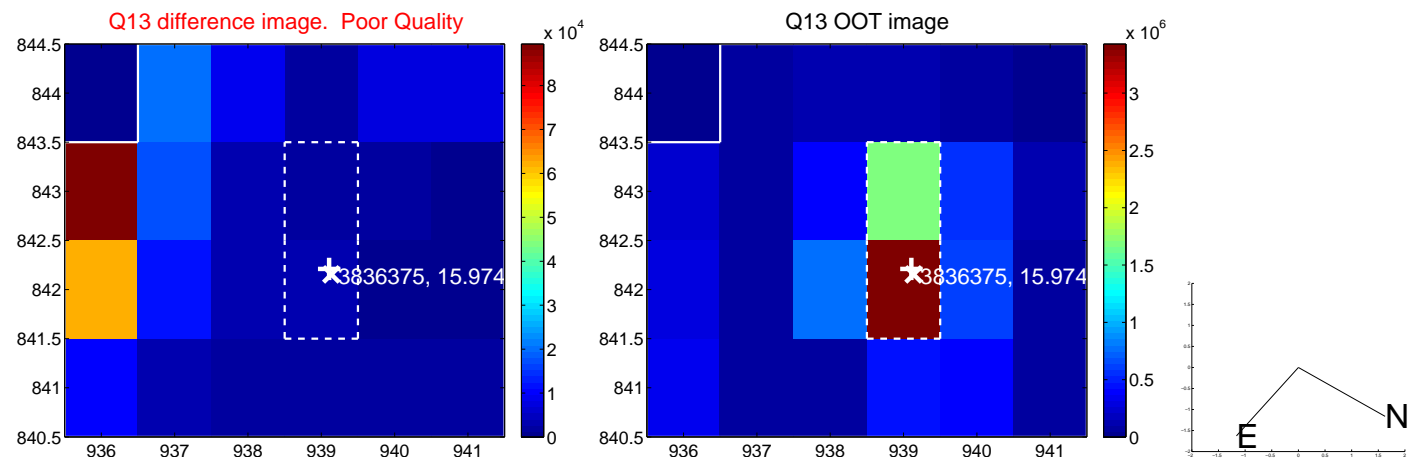




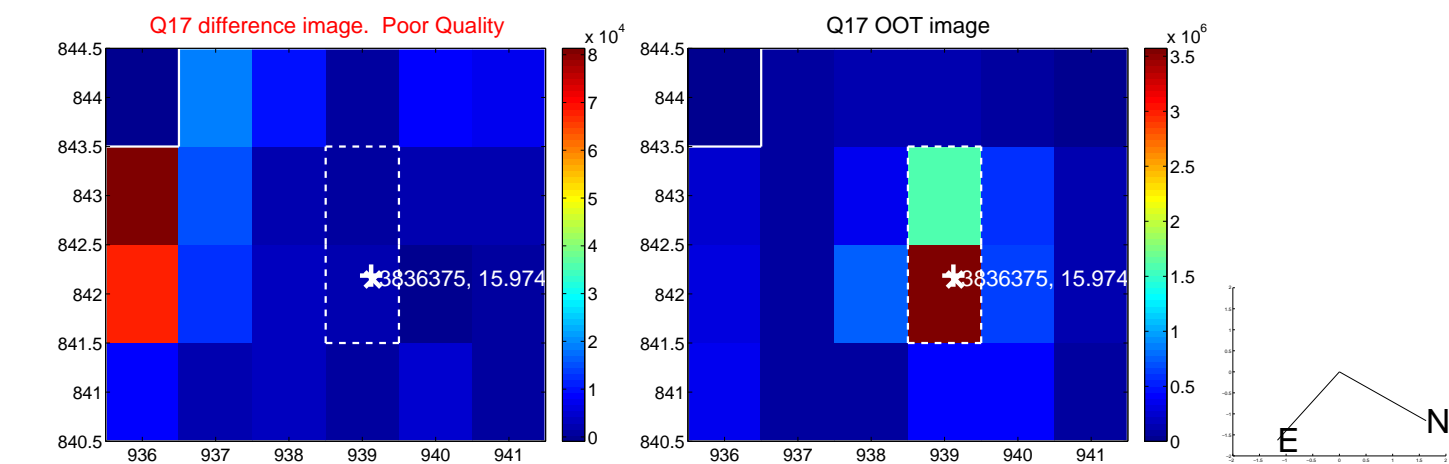
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



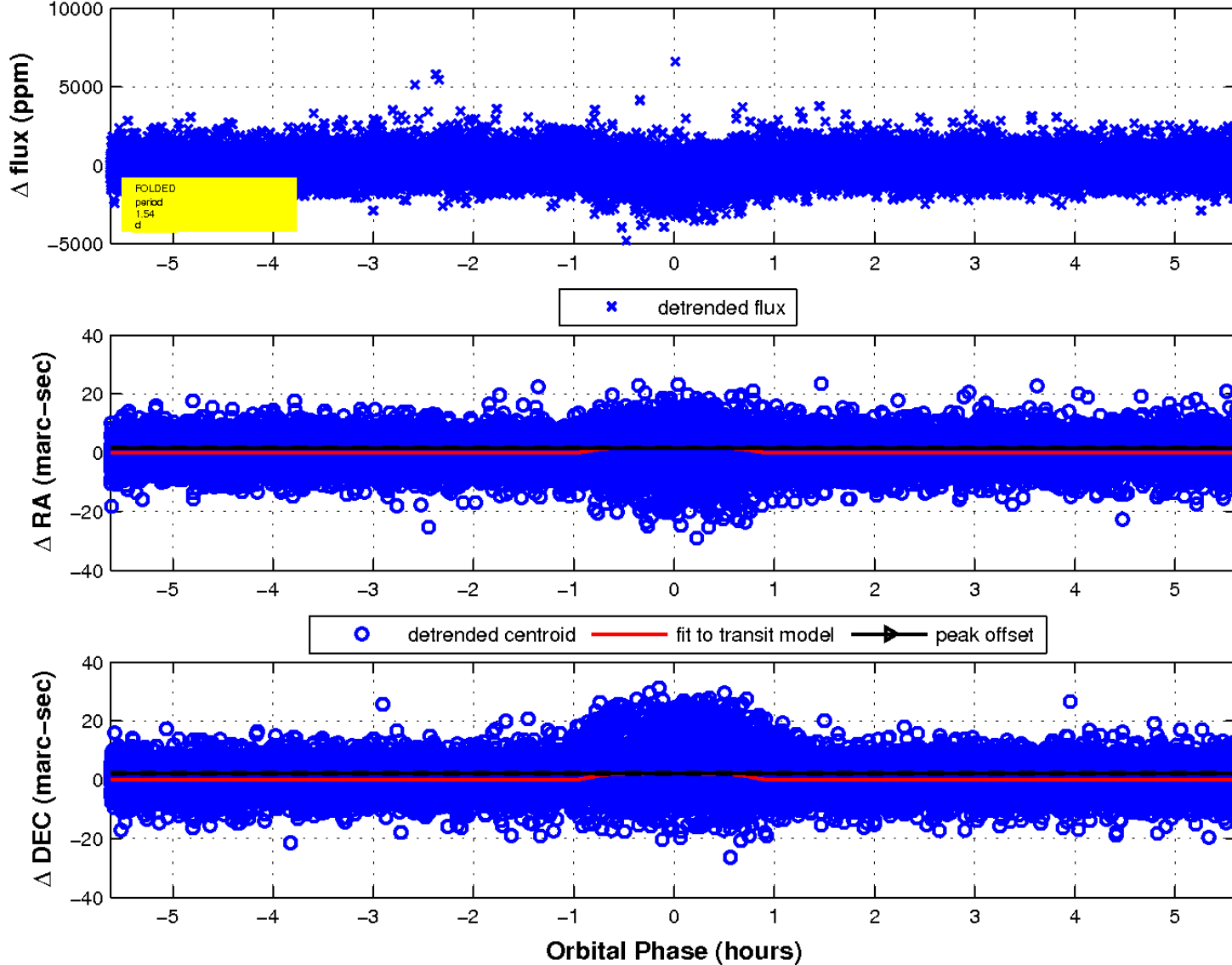
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

