

# KIC 009838414

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009838414-01	OBS	5717.01	1.332448	132.148267	875.4	3.921	10.2	10.8	0.76	4611	2.80	504.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009838414-01	OBS	FP	0.00	0	0	0	1	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.

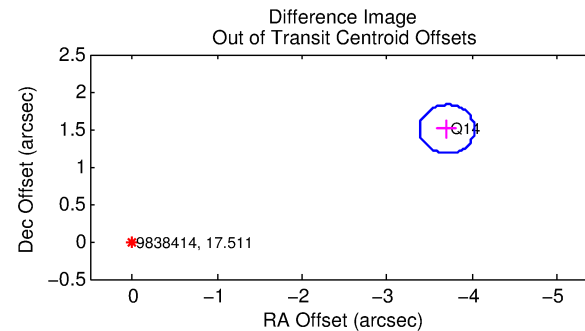
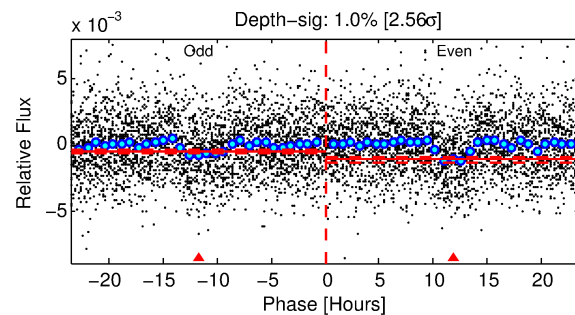
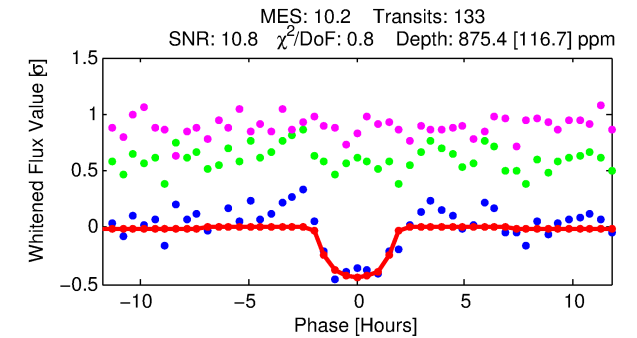
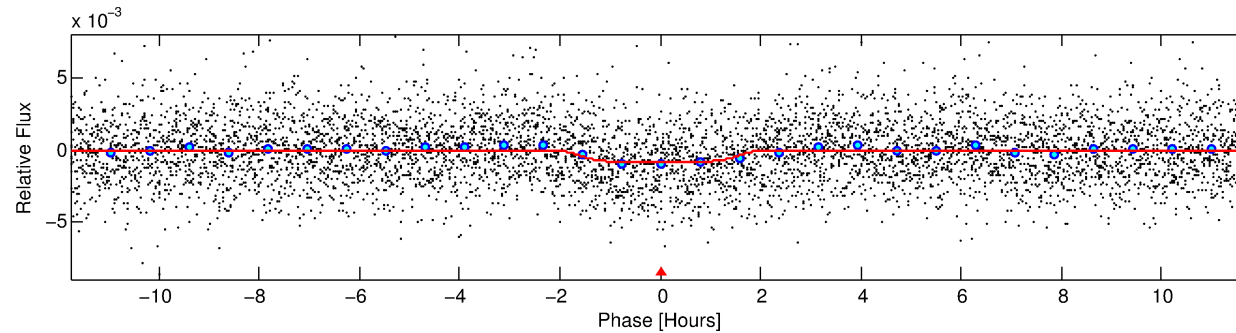
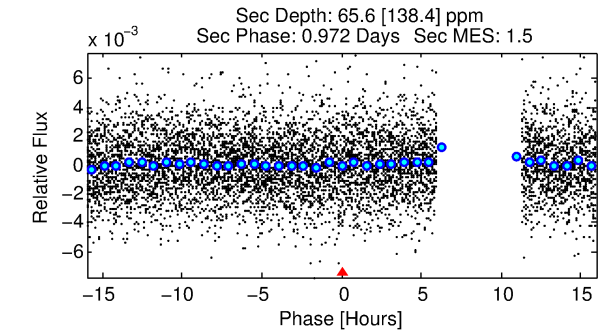
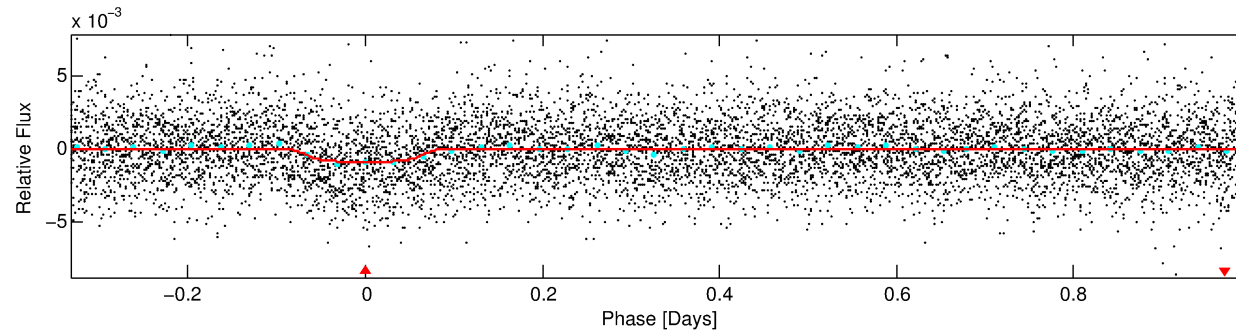
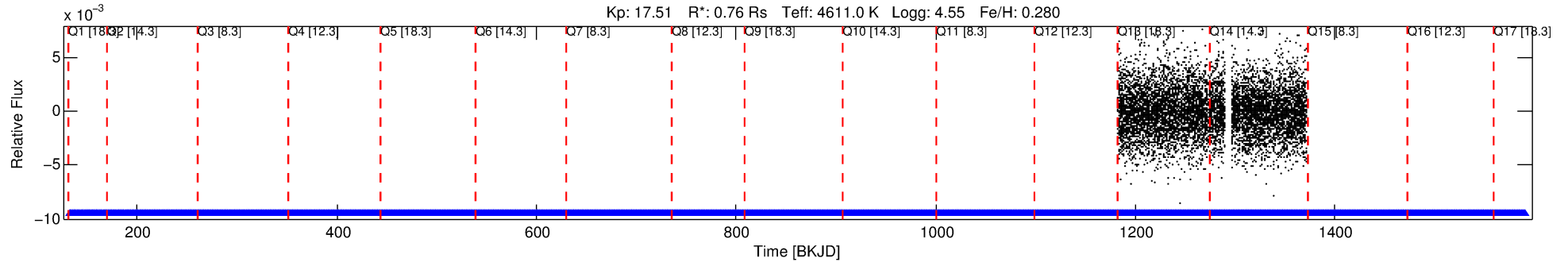
## Ephemeris Match Information For 009838414-01

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	$\sigma_P$	$\sigma_T$
009838414-01	9838414	009959765-01	9959765	1:1	1402.7	352	-1	13.79	17.51	0.03	Col-Anomaly	1	0.98	2.02

**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: 9838414 Candidate: 1 of 1 Period: 1.332 d  
KOI: K05717 Corr: No Ephemeris Match



## DV Fit Results:

Period = 1.33245 [0.00001] d  
Epoch = 132.1483 [0.0052] BKJD  
Rp/R\* = 0.0337 [0.0073]  
a/R\* = 1.61 [0.71]  
b = 0.90 [0.15]  
Seff = 504.76 [93.85]  
Teq = 1209 [56] K  
Rp = 2.80 [0.66] Re  
a = 0.0215 [0.0017] AU  
Ag = 2.14 [4.61] [0.25σ]  
Teffp = 2260 [1219] K [0.86σ]

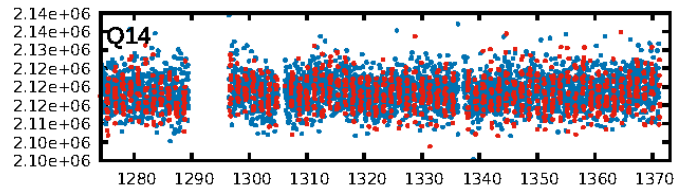
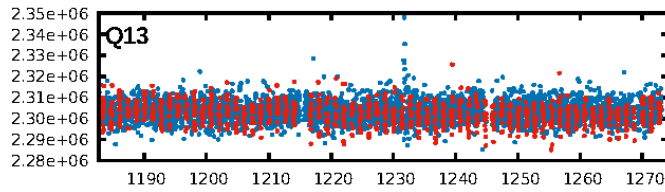
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.38e-20  
RollingBand-fgt: 1.00 [133/133]  
GhostDiagnostic-chr: 1.814  
Centroid-sig: 0.6%  
Centroid-so: 3.141 arcsec [2.31σ]  
OotOffset-rm: 4.001 arcsec [36.91σ]  
KicOffset-rm: 4.028 arcsec [36.98σ]  
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]

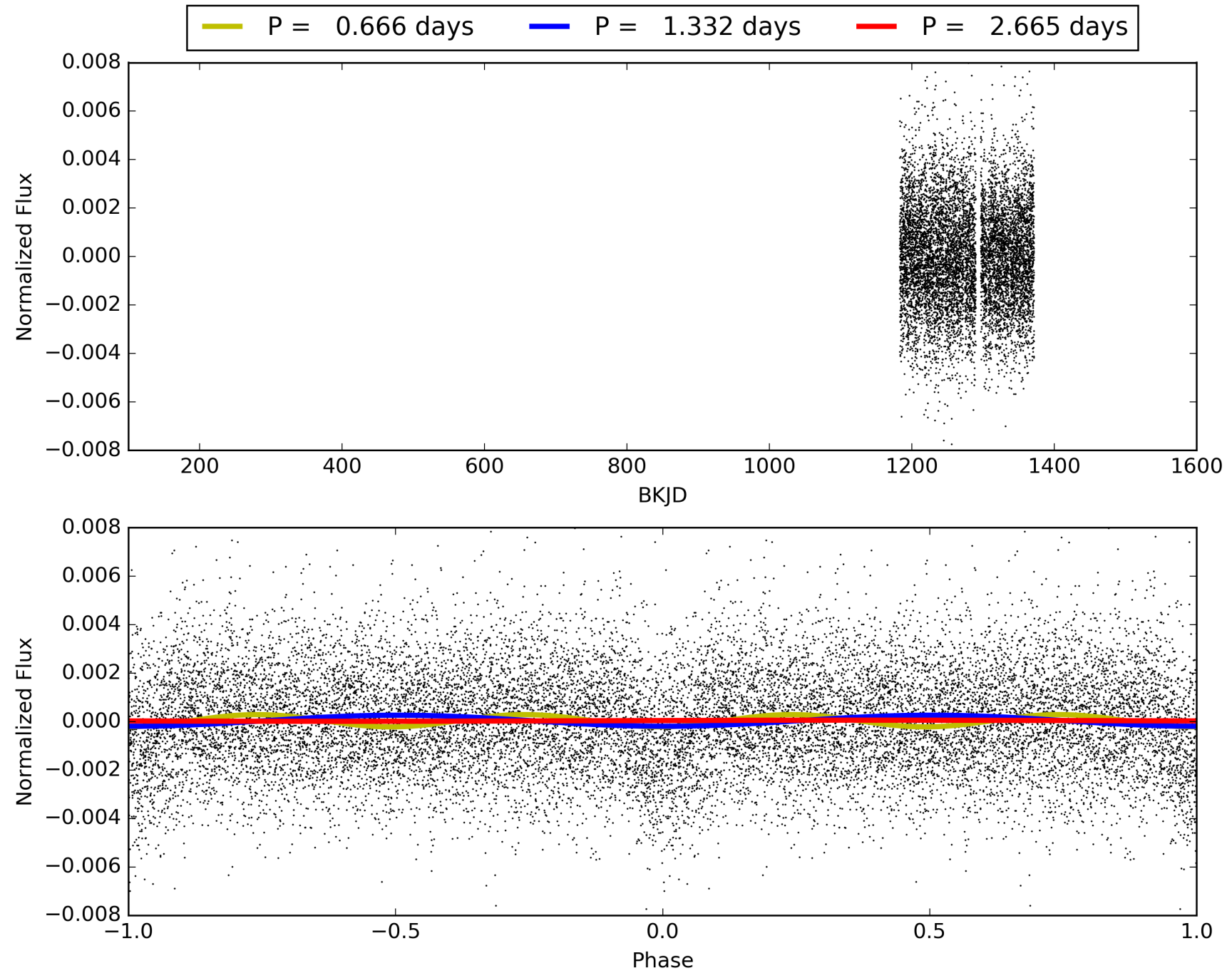
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:12:26 Z

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

# TCE 009838414-01, PDC Light Curves

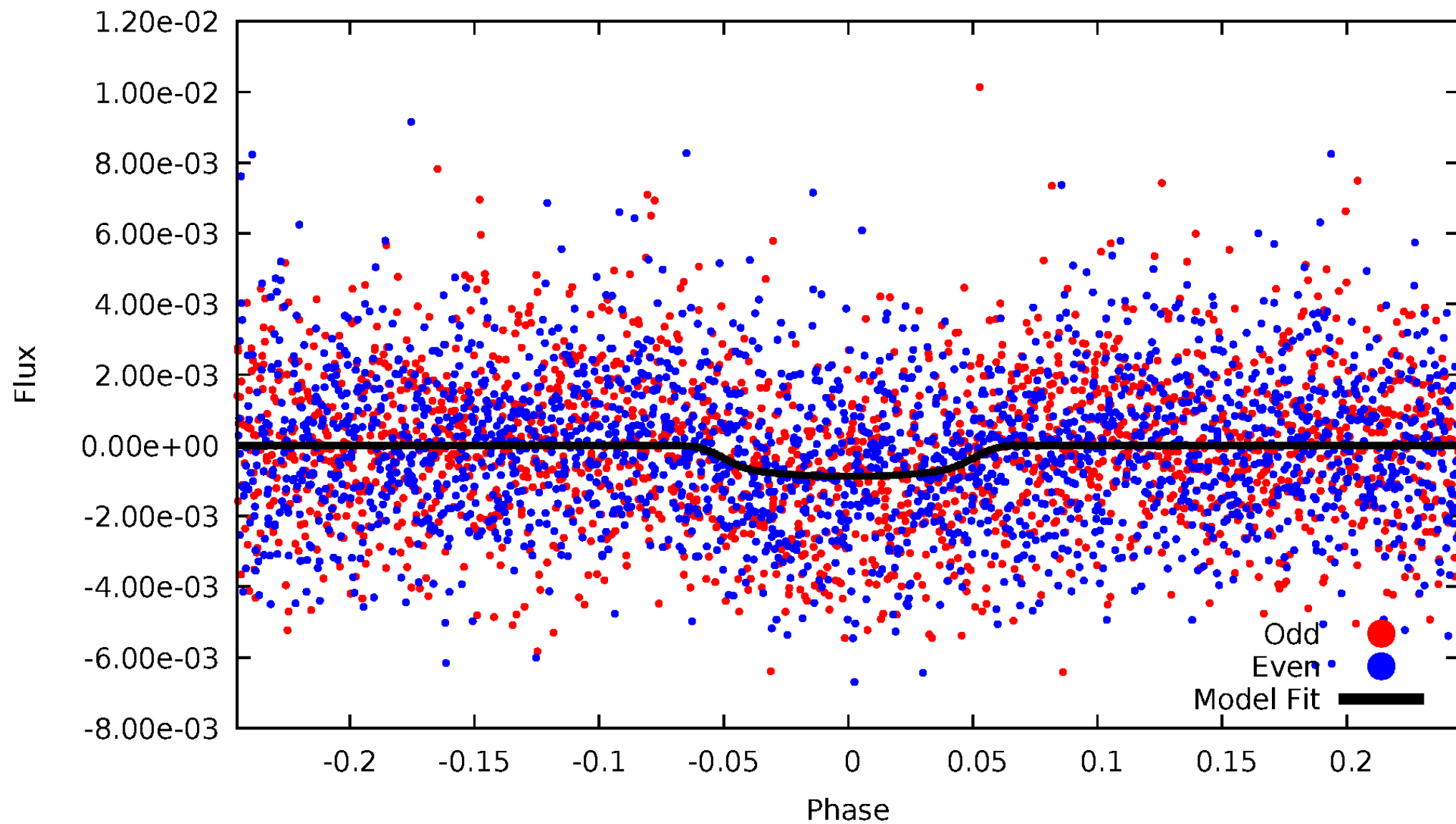


TCE 009838414-01



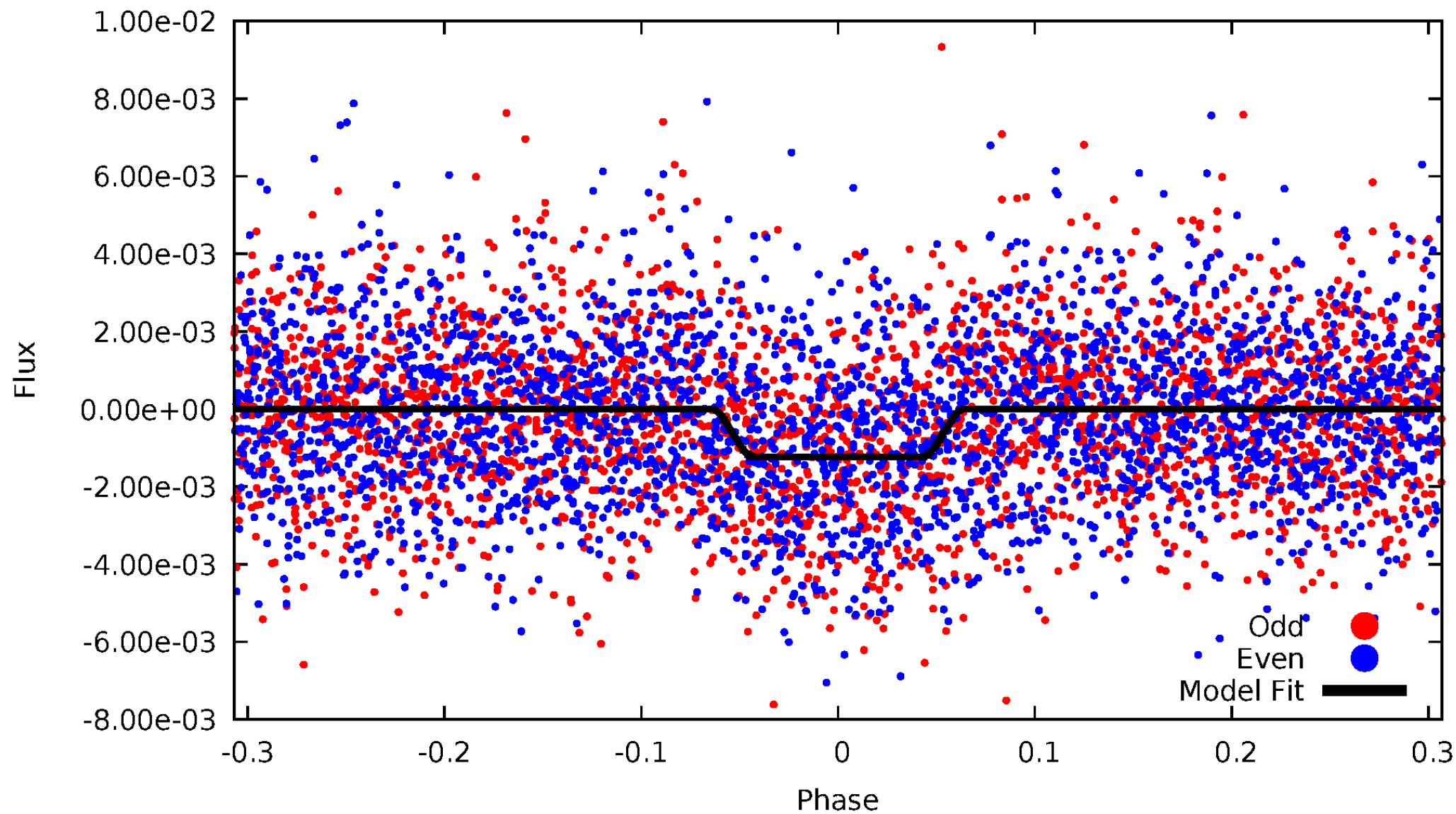
# DV Odd/Even

TCE 009838414-01

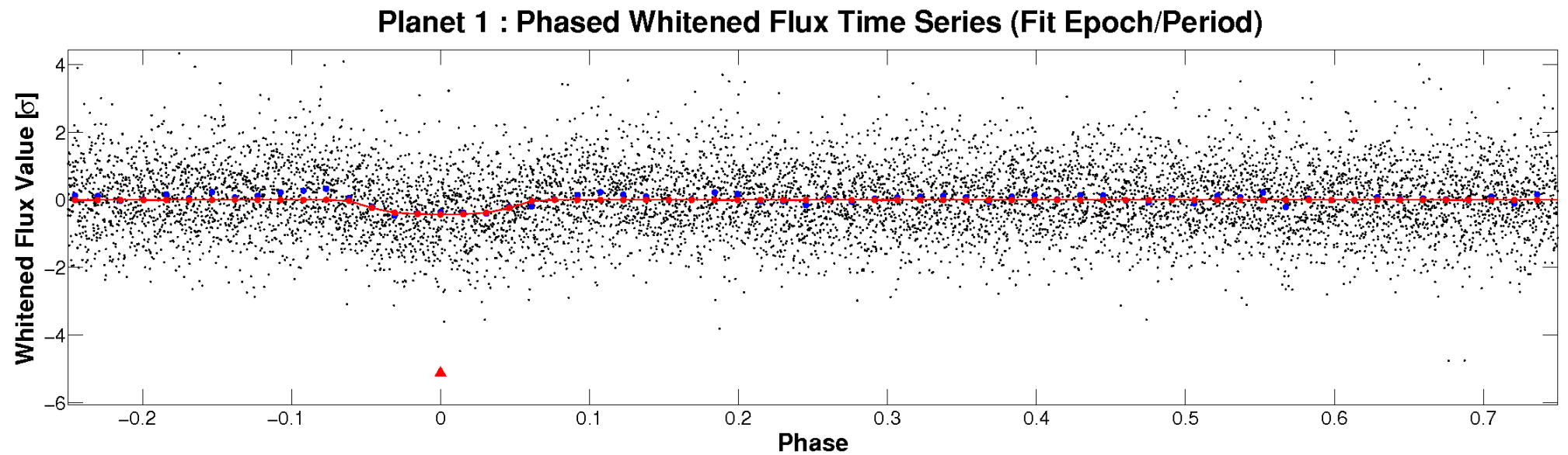
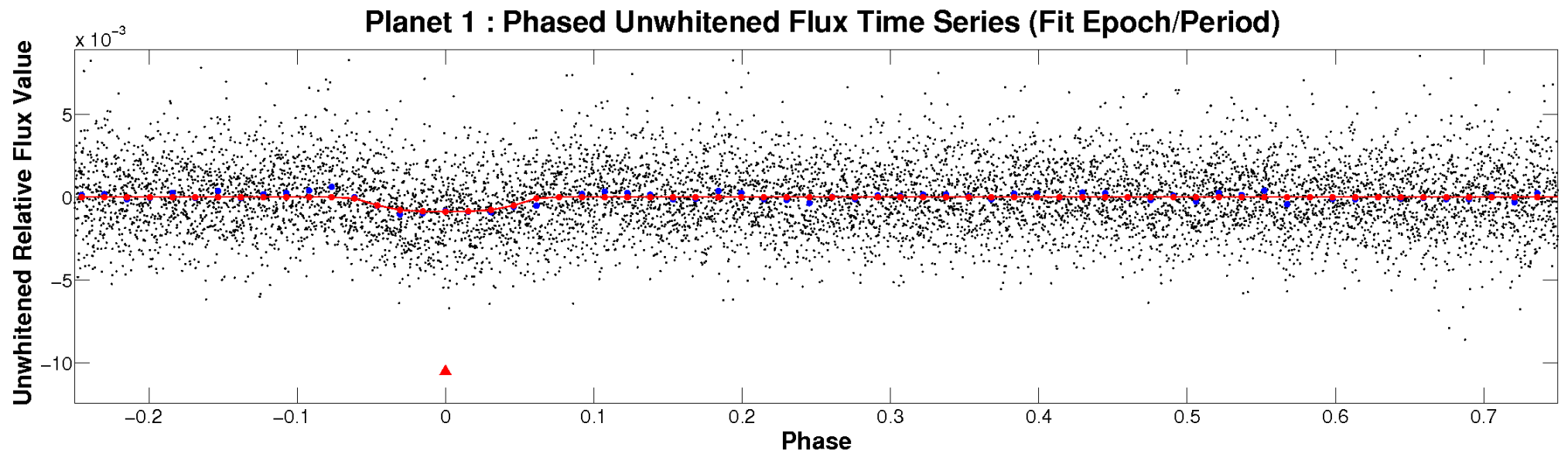


# ALT Odd/Even

TCE 009838414-01



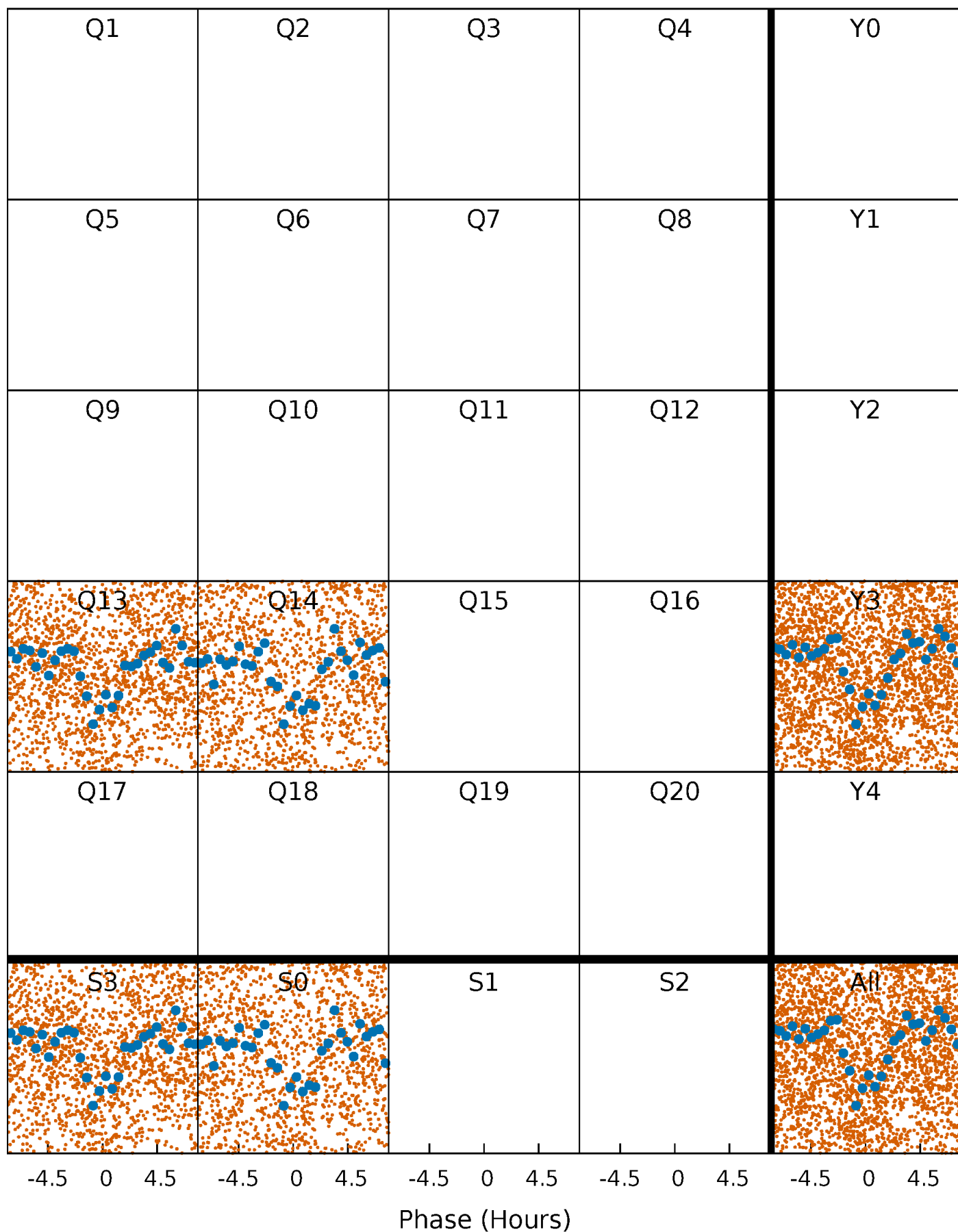
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

TCE 009838414-01 P= 1.332448 Days  $T_0=132.148267$  (BKJD)





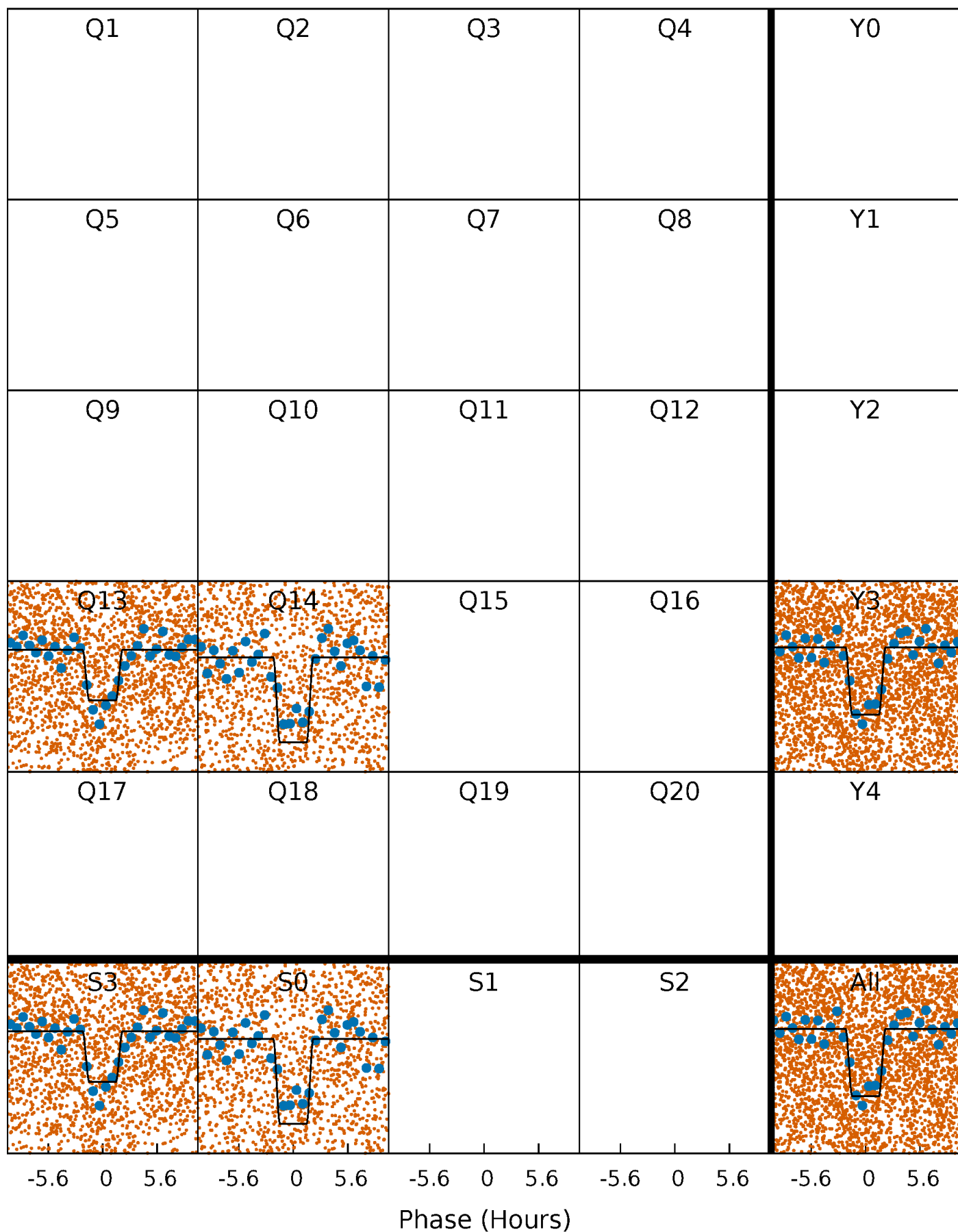
# DV Quarter-Phased Transit Curves

TCE 009838414-01   P= 1.332448 Days    $T_0=132.148267$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

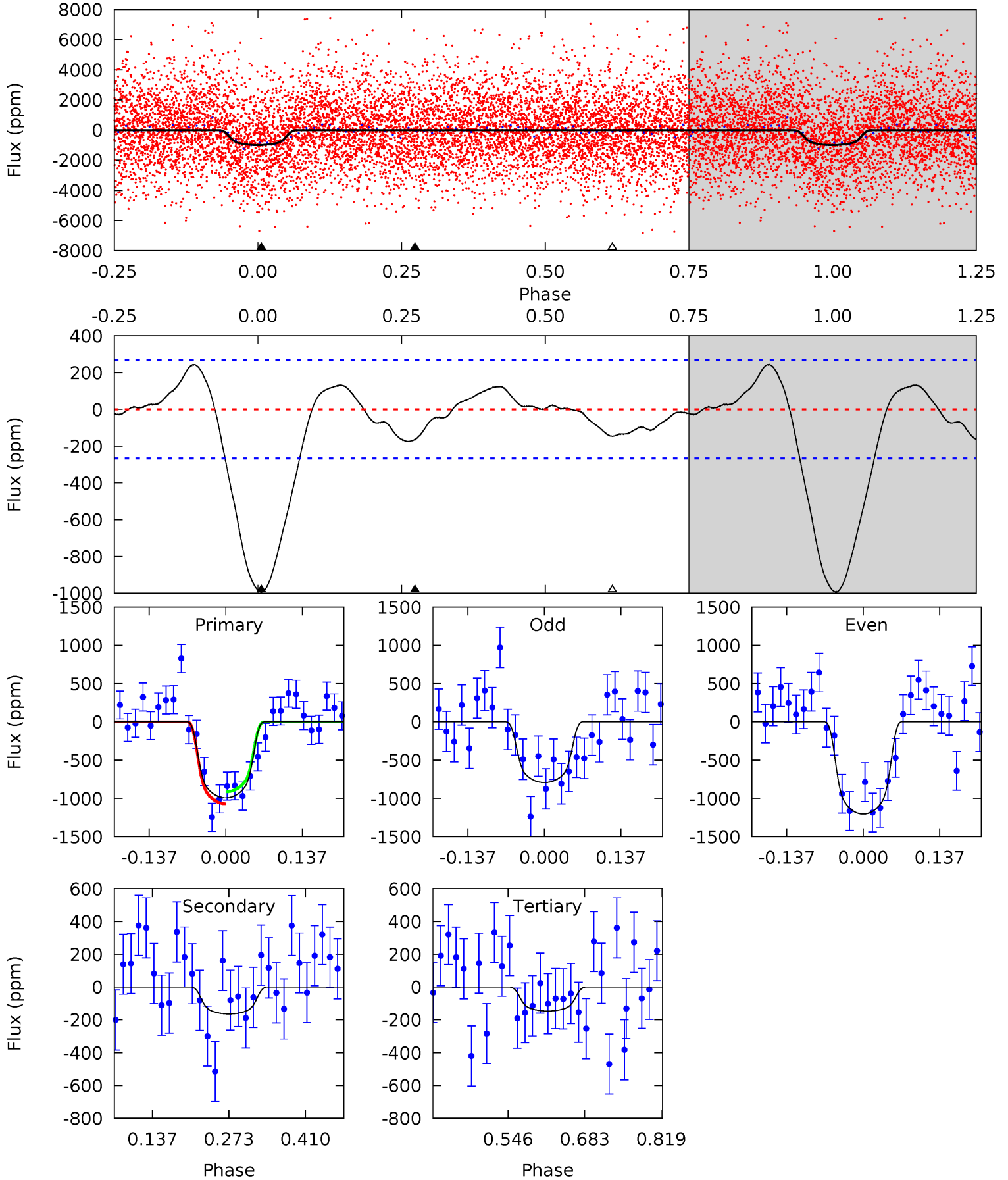
TCE 009838414-01 P= 1.332606 Days  $T_0=132.016881$  (BKJD)



# DV Model-Shift Uniqueness Test

009838414-01, P = 1.332448 Days, E = 132.148267 Days

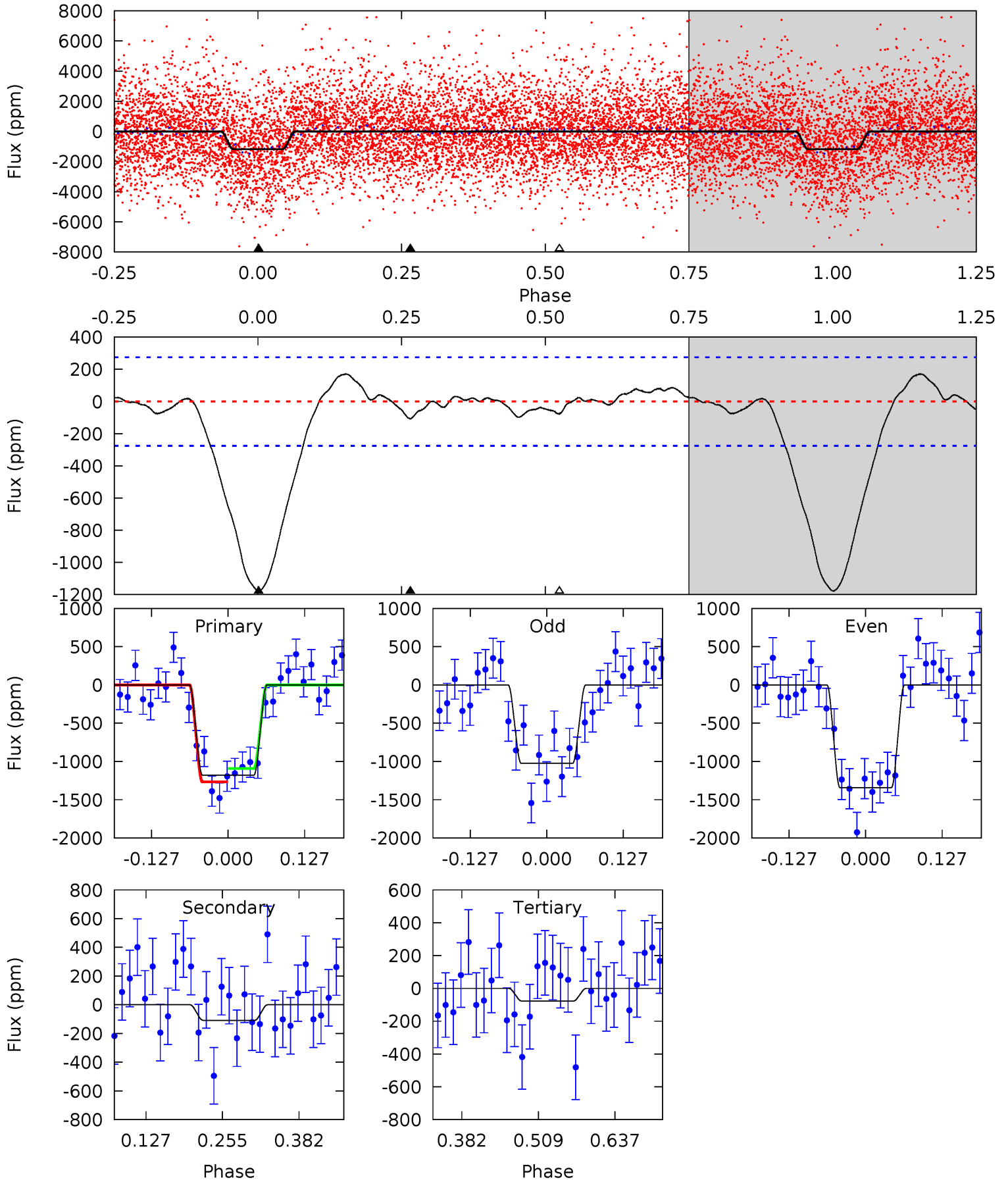
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.7	2.77	2.47	0	4.50	1.49	1.25	14.3	16.7	0.30	2.77	3.54	0.96	0.20	1.32



# Alt Model-Shift Uniqueness Test

009838414-01, P = 1.332606 Days, E = 132.016881 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
19.3	1.78	1.27	0	4.51	1.52	0.83	18.0	19.3	0.51	1.78	2.61	0.93	0.13	1.44



### Stellar Parameters For KIC 009838414

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4611^{+166}_{-166}$	$4.551^{+0.065}_{-0.025}$	$0.280^{+0.150}_{-0.300}$	$0.760^{+0.036}_{-0.071}$	$0.748^{+0.053}_{-0.053}$	$2.403^{+0.657}_{-0.236}$
	+4%/-4%	+1%/-1%	+54%/-107%	+5%/-9%	+7%/-7%	+27%/-10%
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 009838414-01 / KOI 5717.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-164 \pm 59$	$2.76^{+0.58}_{-0.61}$	$1676^{+66}_{-67}$	$3272^{+322}_{-327}$	$5.480^{+4.250}_{-2.439}$
Alt.	$-108 \pm 61$	$2.84^{+0.66}_{-0.58}$	$1677^{+67}_{-71}$	$3007^{+374}_{-438}$	$3.254^{+3.329}_{-2.030}$

$T_{\text{max}}$  = 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

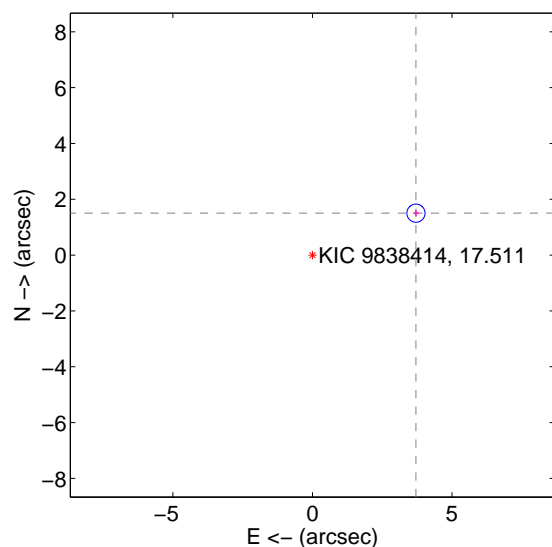
Supplemental centroid analysis for 009838414-01. Kepler magnitude: 17.51. Transit SNR 10.81

There are 0 quarters with good PRF difference image offsets

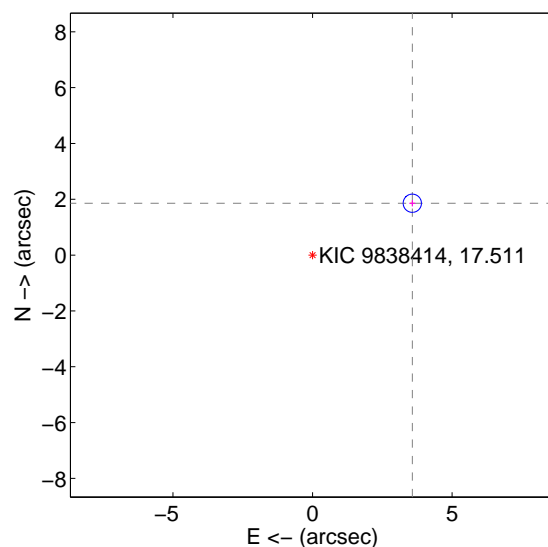
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.001 \pm 0.108$	36.91	$-3.708 \pm 0.107$	$1.502 \pm 0.114$
PRF-fit source offset from KIC position	$4.028 \pm 0.109$	36.98	$-3.574 \pm 0.107$	$1.858 \pm 0.114$
photometric centroid source offset	$3.14 \pm 1.36$	2.31	$-2.22 \pm 1.32$	$2.22 \pm 1.40$

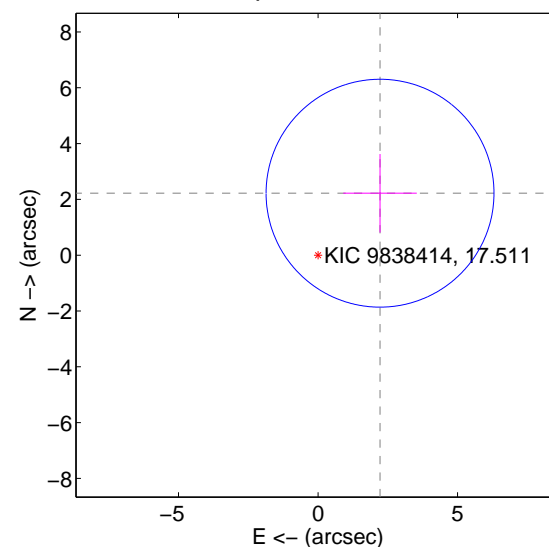
offset from difference PRF-fit to OOT PRF-fit



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.





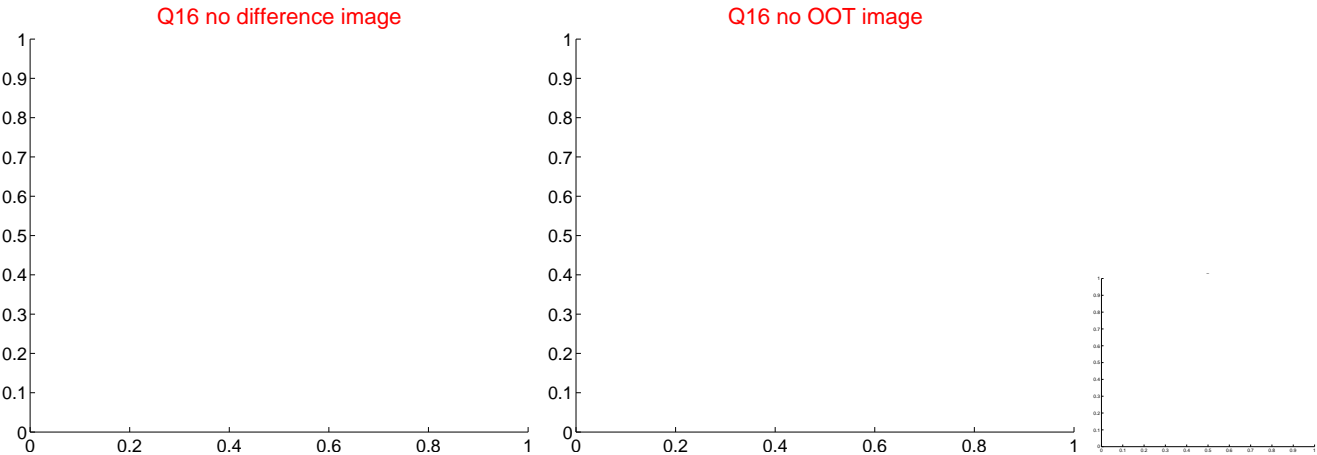
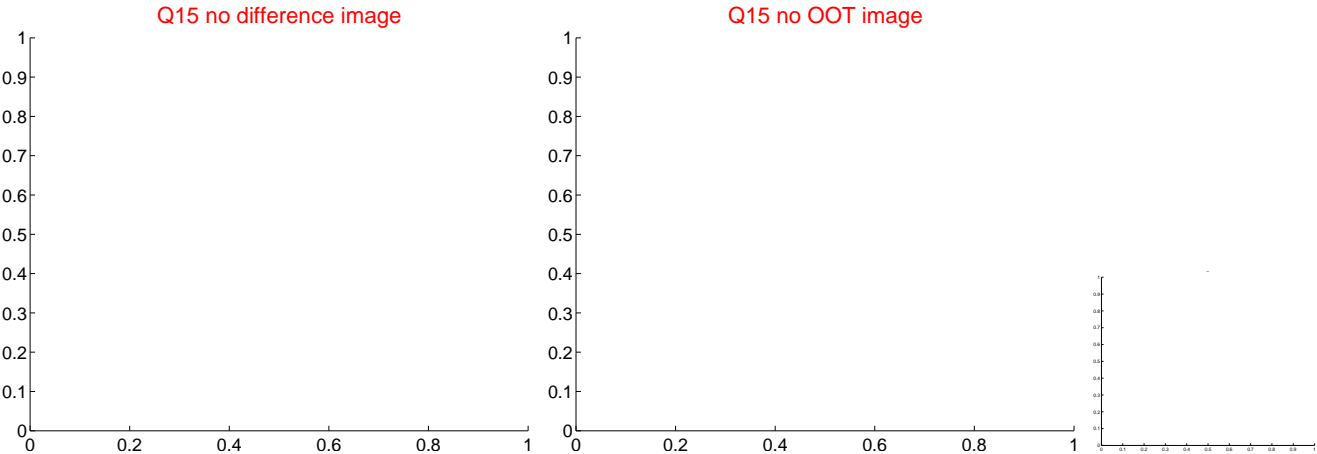
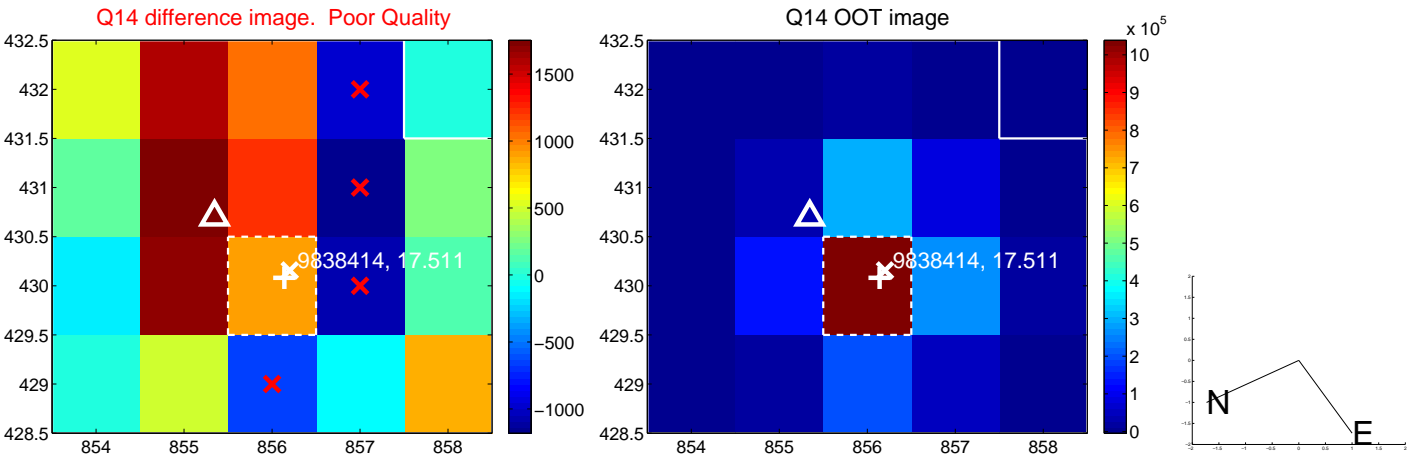
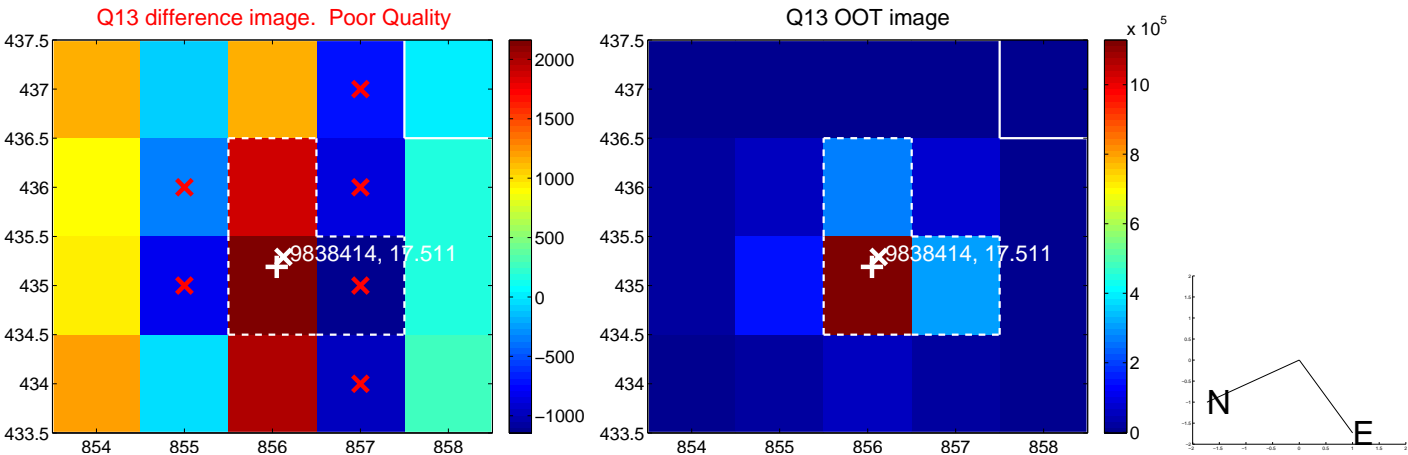
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



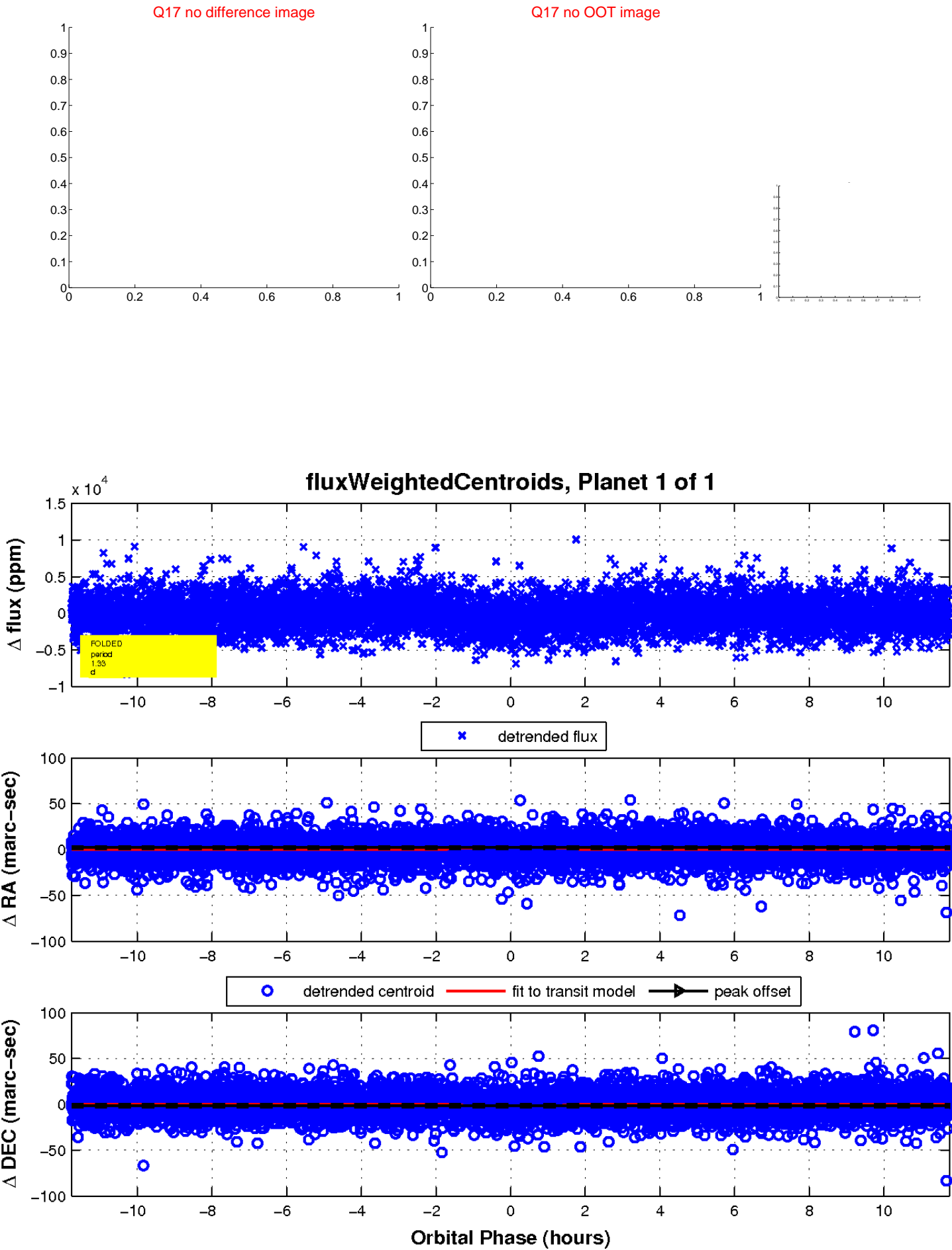
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

