

# KIC 009652649

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009652649-01	OBS	2884.01	2.488924	132.100172	48.1	4.553	12.9	12.8	0.83	5615	0.64	542.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009652649-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—HALO_GHOST—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 009652649-01

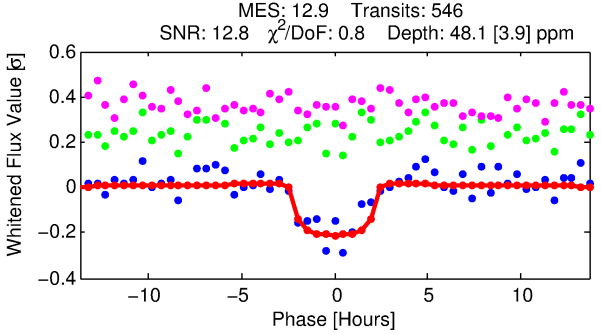
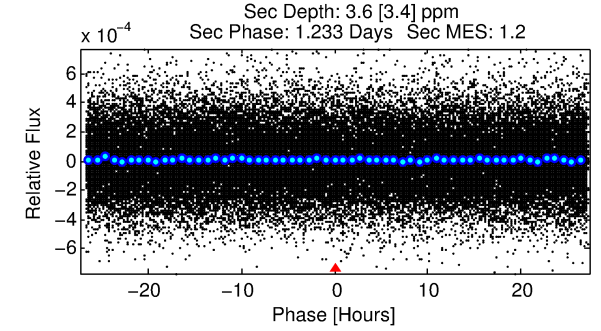
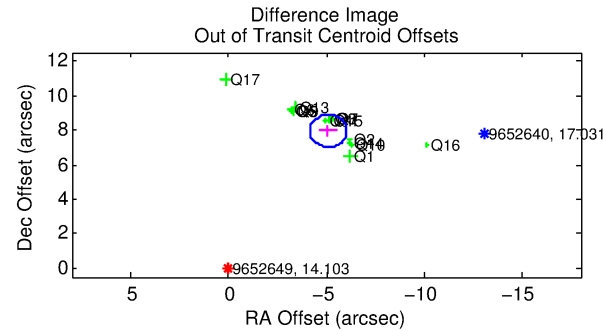
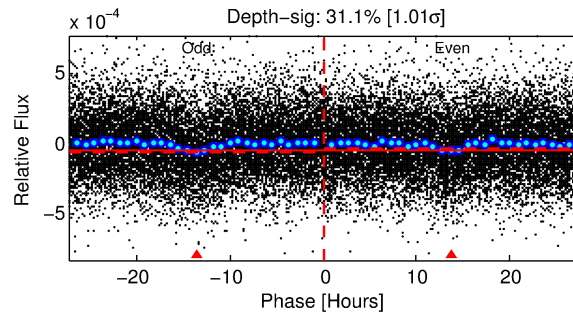
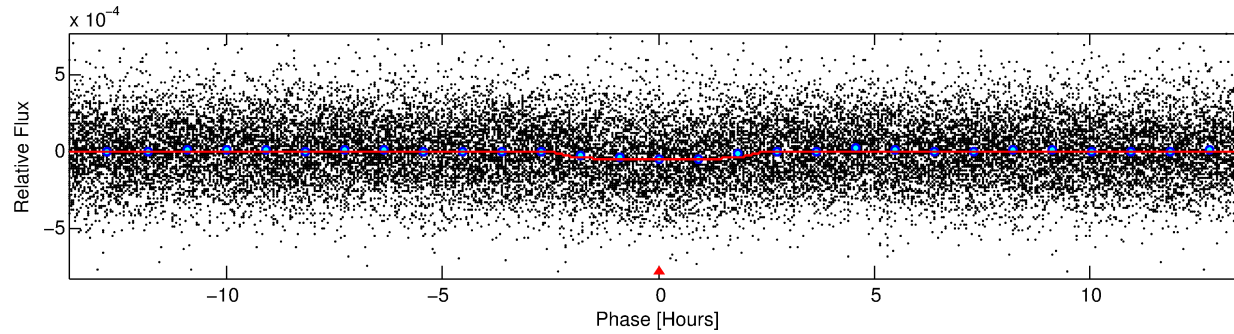
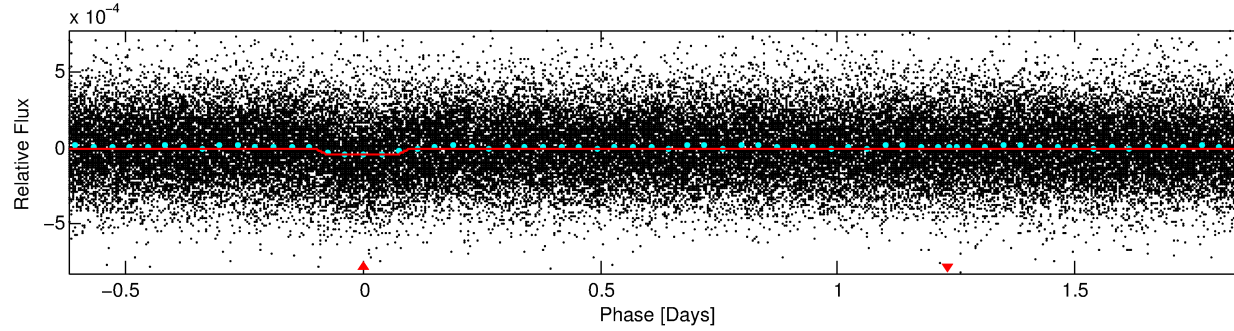
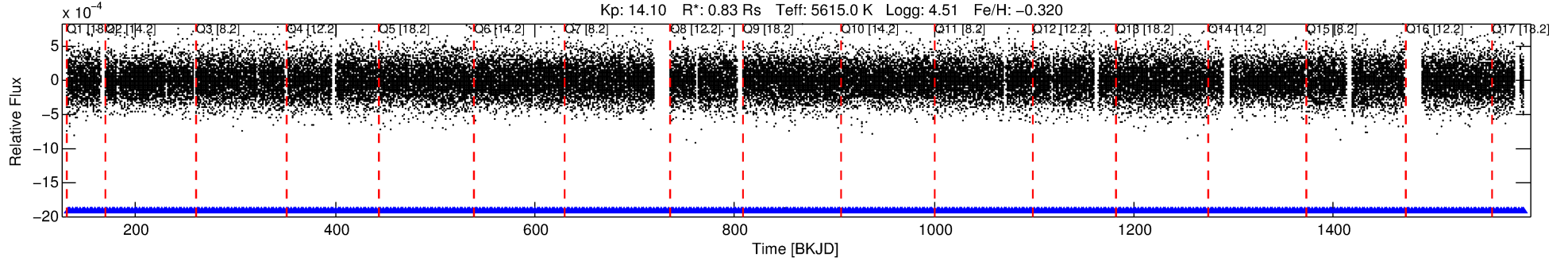
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009652649-01	9652649	7217.01	9652632	1:1	31.7	4	7	11.58	14.11	2740.20	Direct-PRF	0	2.94	1.47

**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: 9652649 Candidate: 1 of 1 Period: 2.489 d  
KOI: K02884.01 Corr: 0.915

Kp: 14.10 R\*: 0.83 Rs Teff: 5615.0 K Logg: 4.51 Fe/H: -0.320



## DV Fit Results:

Period = 2.48892 [0.00002] d  
Epoch = 132.1002 [0.0045] BKJD  
Rp/R\* = 0.0071 [0.0031]  
a/R\* = 2.66 [4.53]  
b = 0.81 [0.87]  
Seff = 542.89 [163.31]  
Teq = 1231 [93] K  
Rp = 0.64 [0.32] Re  
a = 0.0337 [0.0065] AU  
Ag = 5.40 [7.17] [0.61σ]  
Teffp = 2902 [944] K [1.76σ]

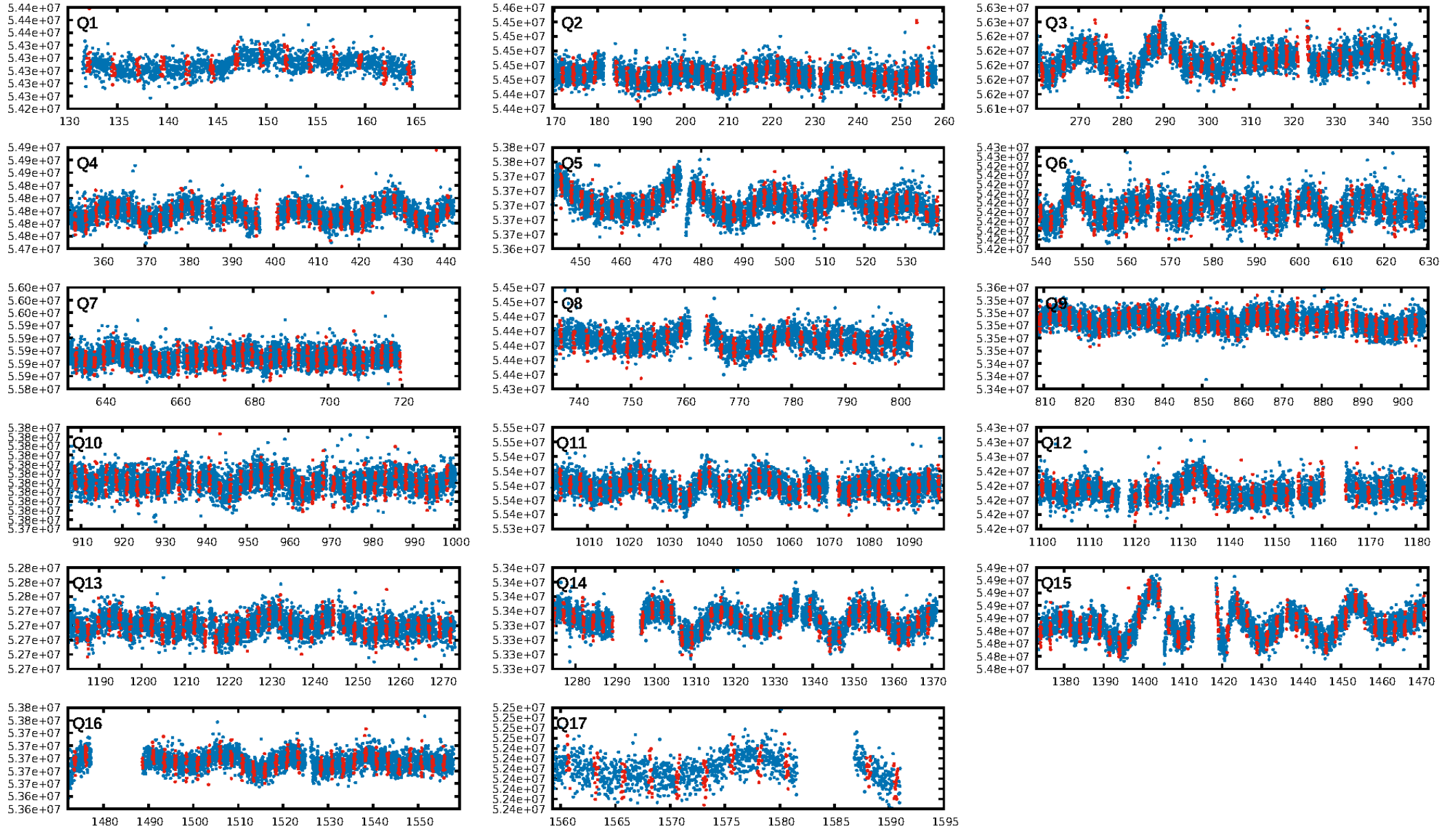
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.60e-36  
RollingBand-fgt: 1.00 [521/521]  
GhostDiagnostic-chr: -0.1566  
Centroid-sig: 0.0%  
Centroid-so: 11.765 arcsec [11.48σ]  
OotOffset-rm: 9.443 arcsec [29.98σ]  
KicOffset-rm: 9.389 arcsec [29.30σ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 0.21 [3/14]  
DiffImageOverlap-fno: 1.00 [17/17]

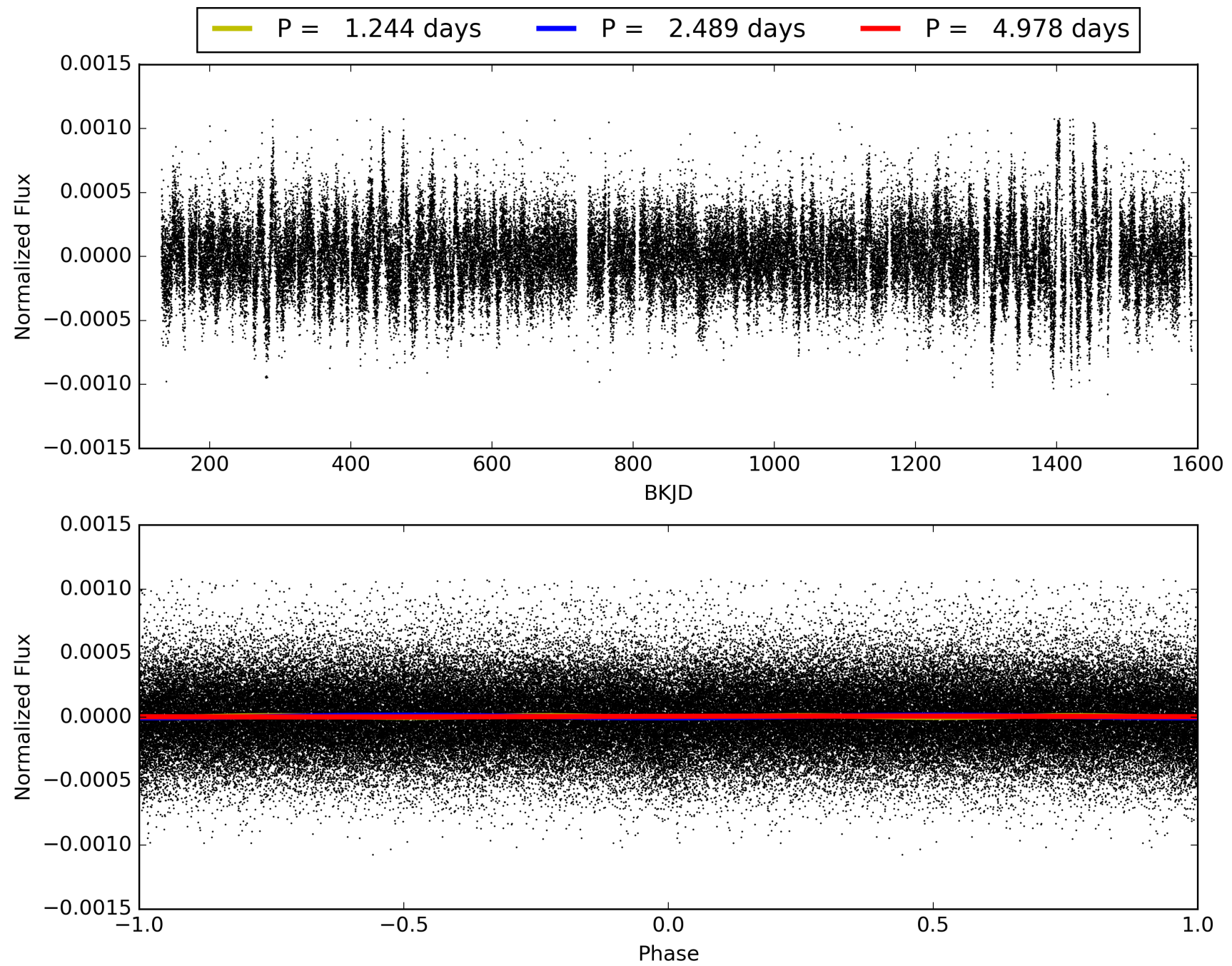
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:41:03 Z

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

# TCE 009652649-01, PDC Light Curves



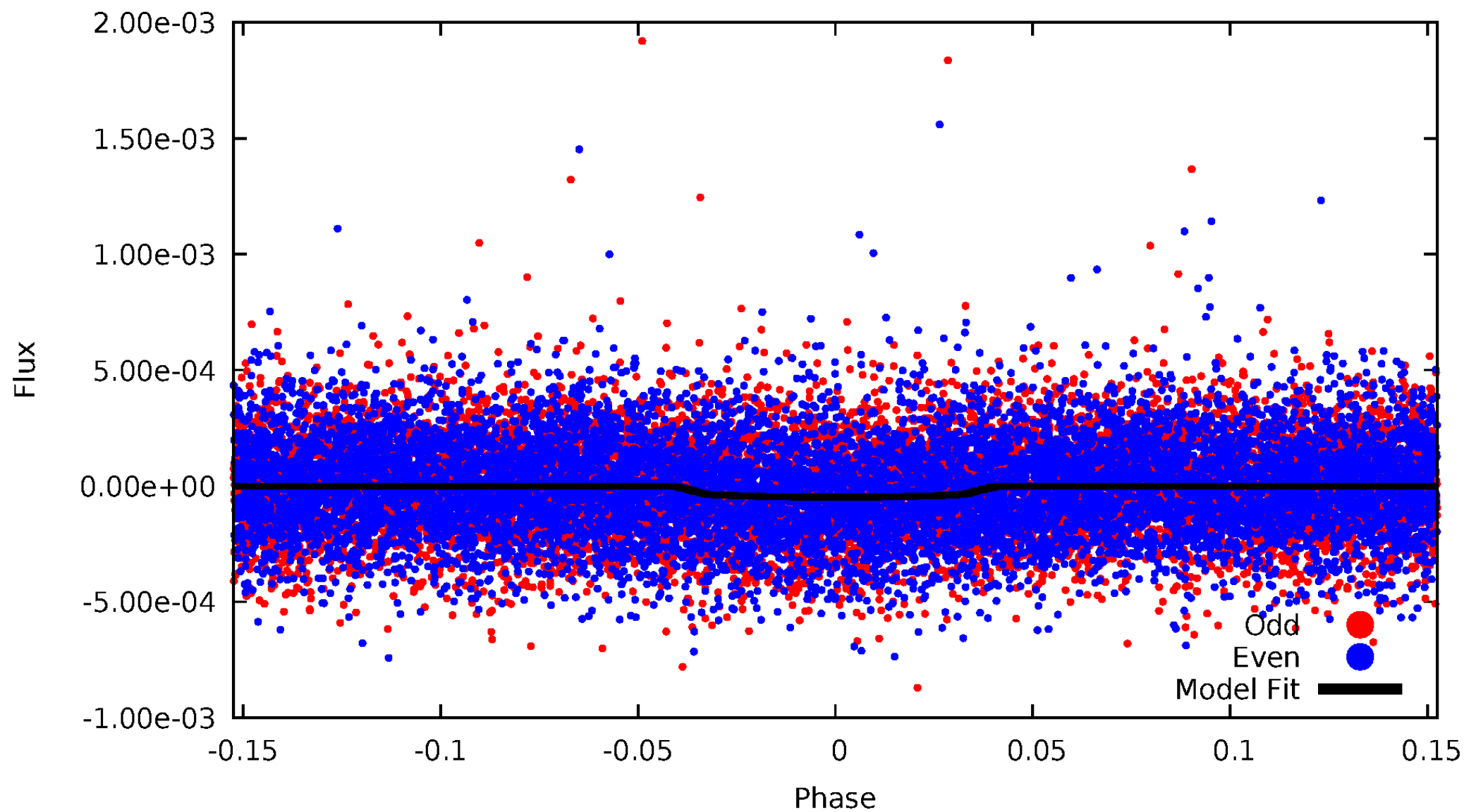
TCE 009652649-01





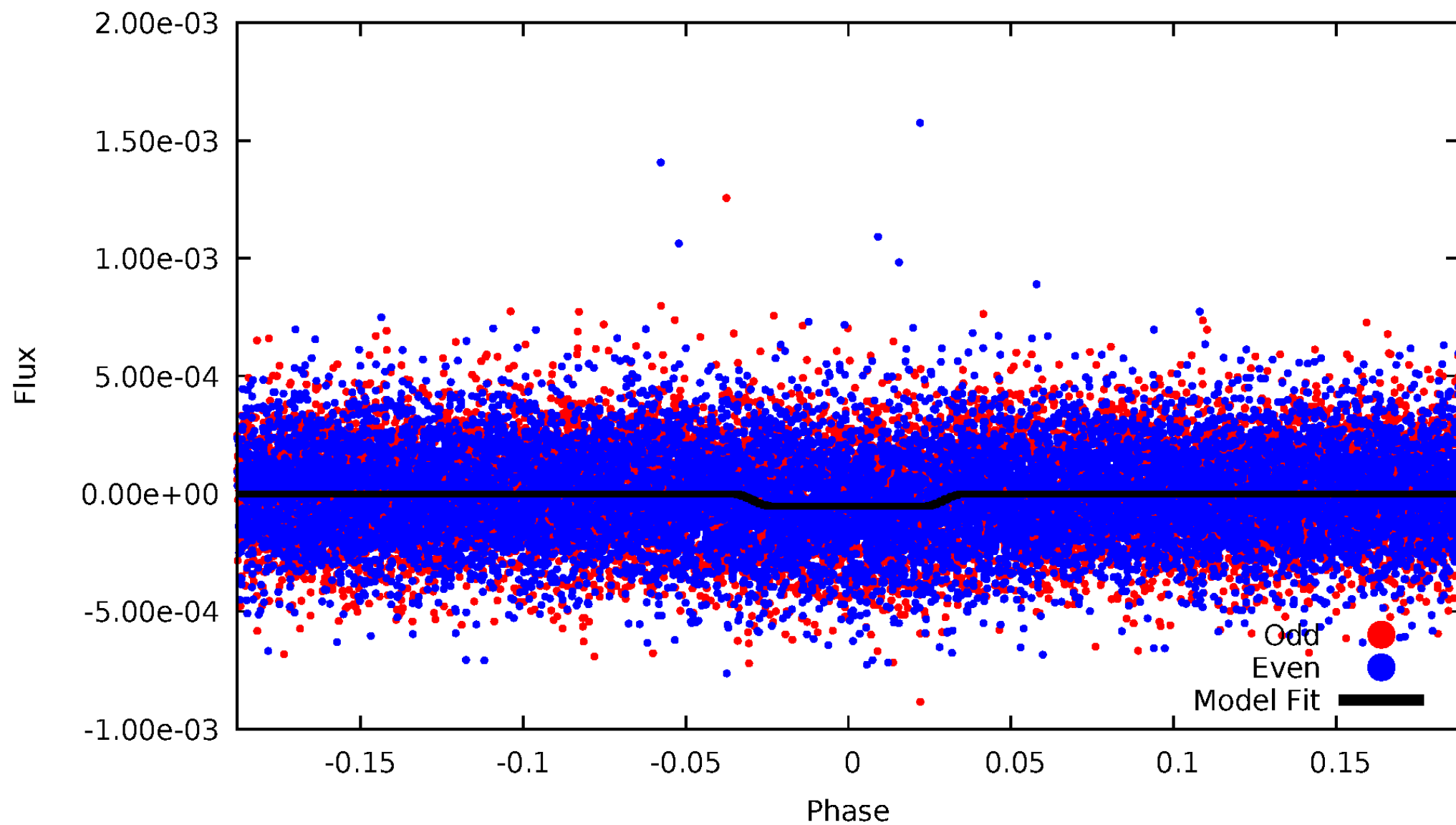
# DV Odd/Even

TCE 009652649-01



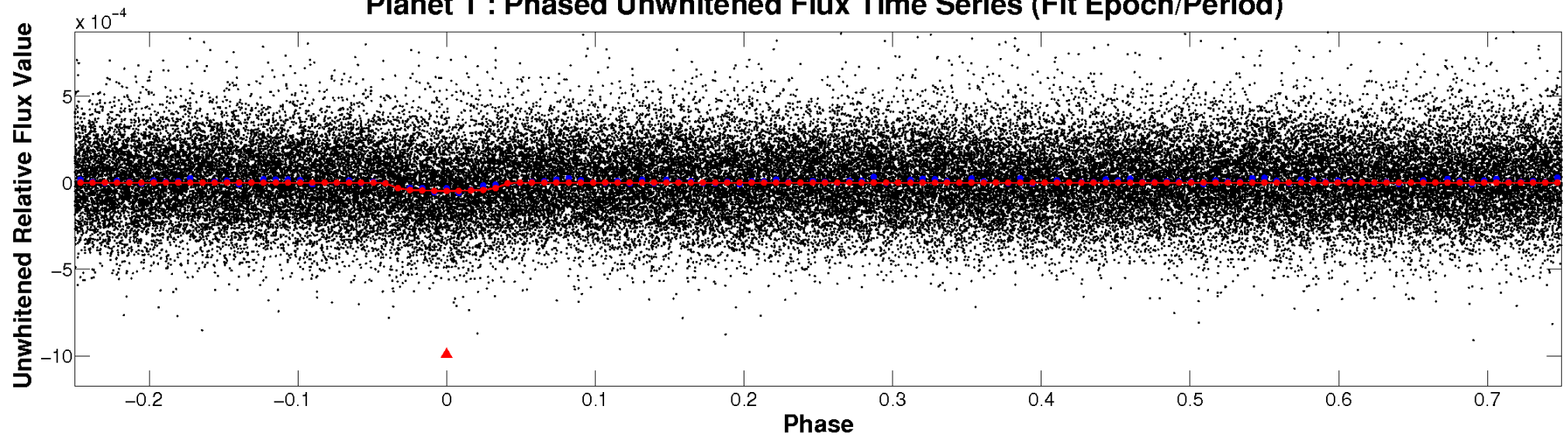
# ALT Odd/Even

TCE 009652649-01

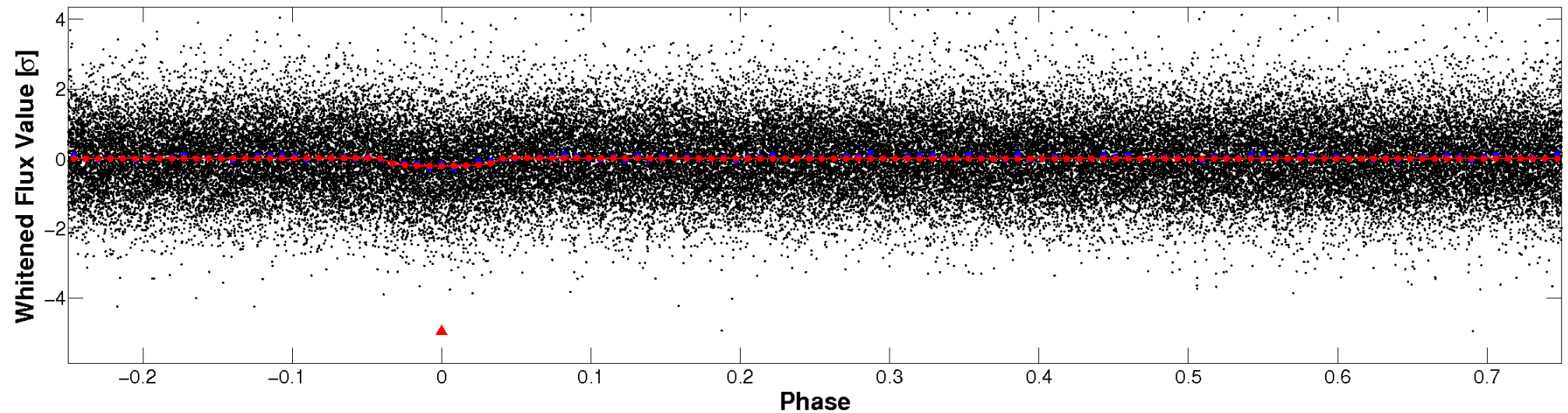


# Non-Whitened Vs. Whitened Light Curve

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

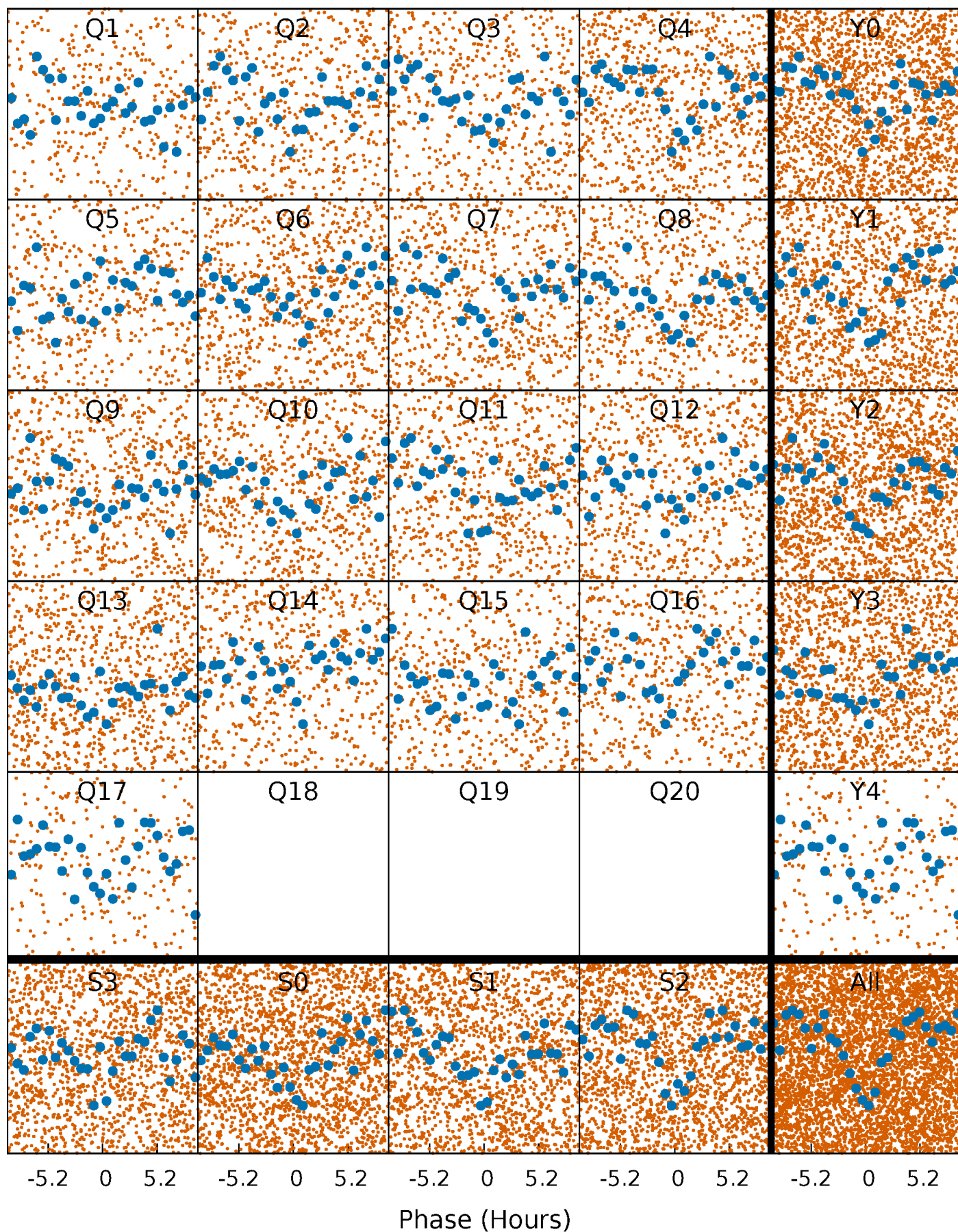


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

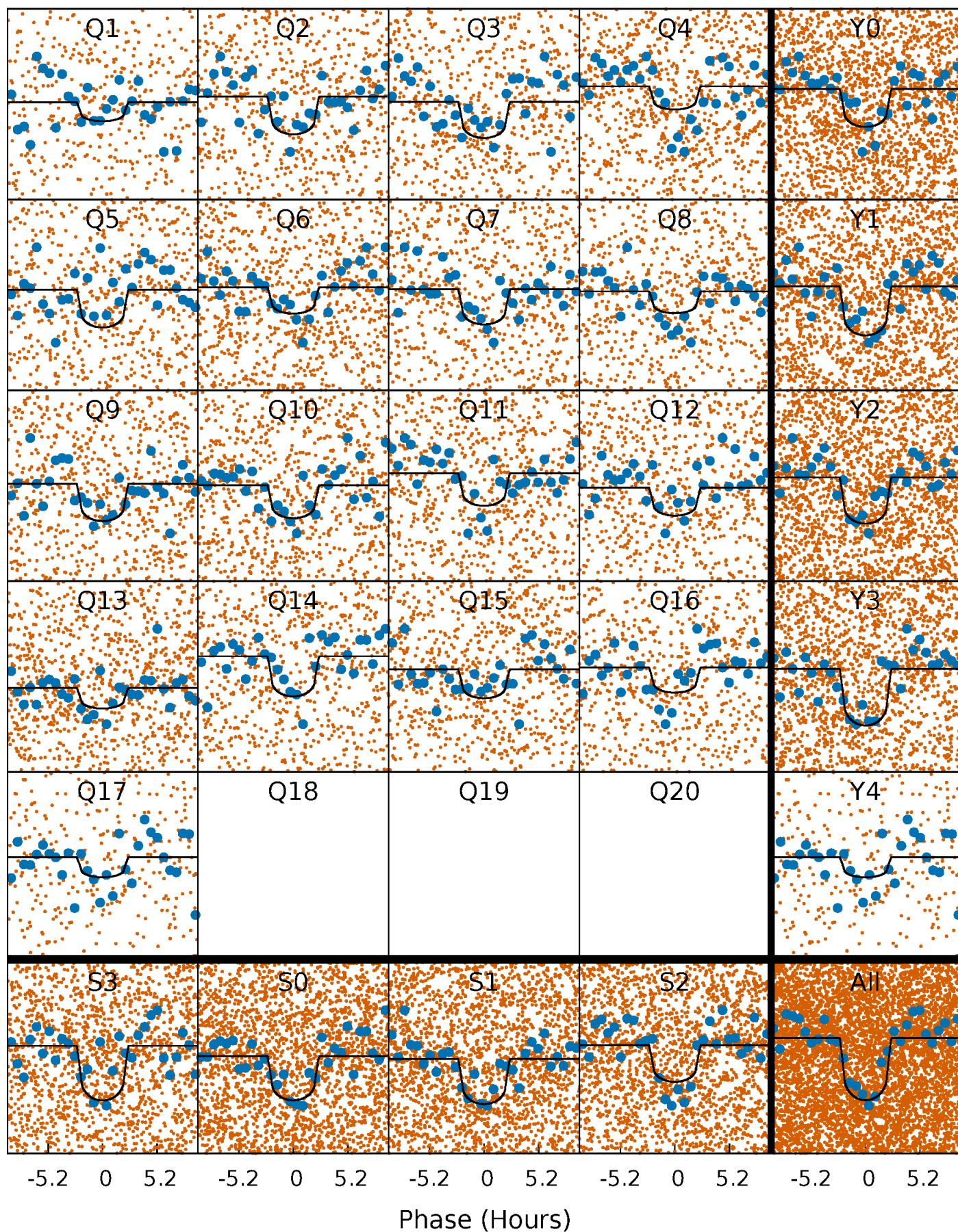
TCE 009652649-01 P= 2.488924 Days  $T_0=132.100172$  (BKJD)





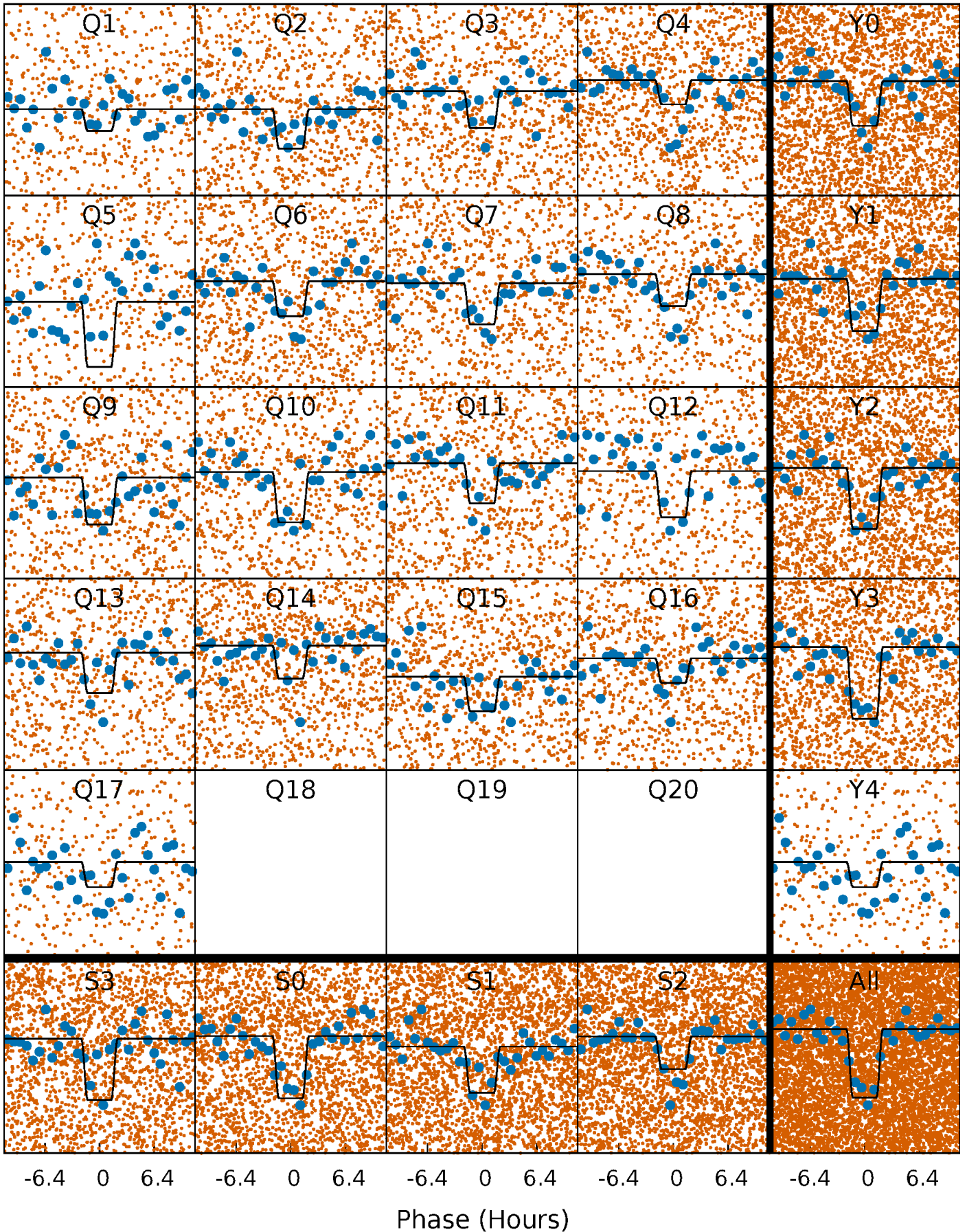
# DV Quarter-Phased Transit Curves

TCE 009652649-01 P= 2.488924 Days  $T_0=132.100172$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

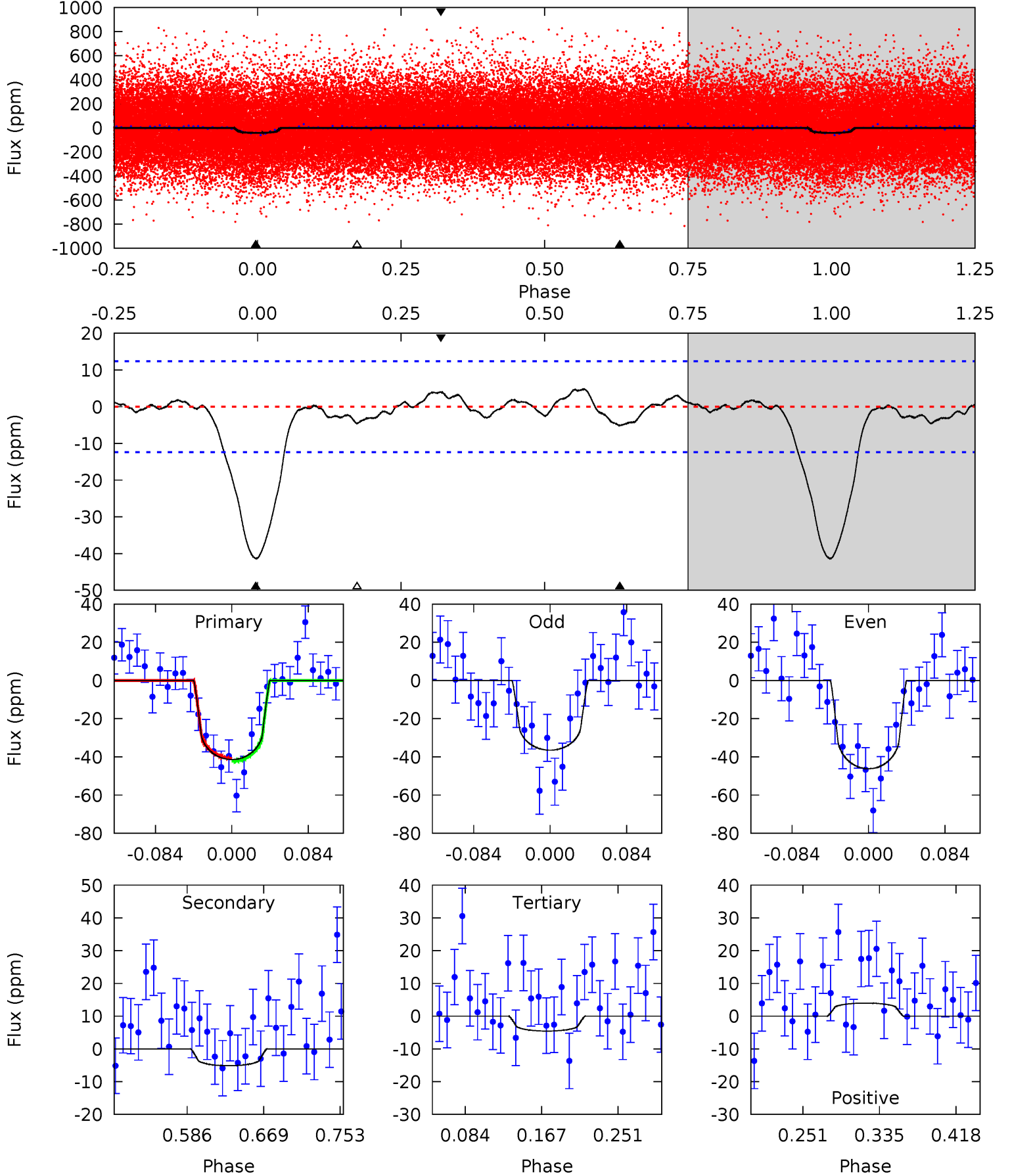
TCE 009652649-01 P= 2.488867 Days  $T_0=132.111168$  (BKJD)



# DV Model-Shift Uniqueness Test

009652649-01, P = 2.488924 Days, E = 129.611248 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
15.4	1.91	1.69	1.48	4.60	1.73	0.73	13.7	13.9	0.22	0.43	1.81	1.01	0.10	0.26

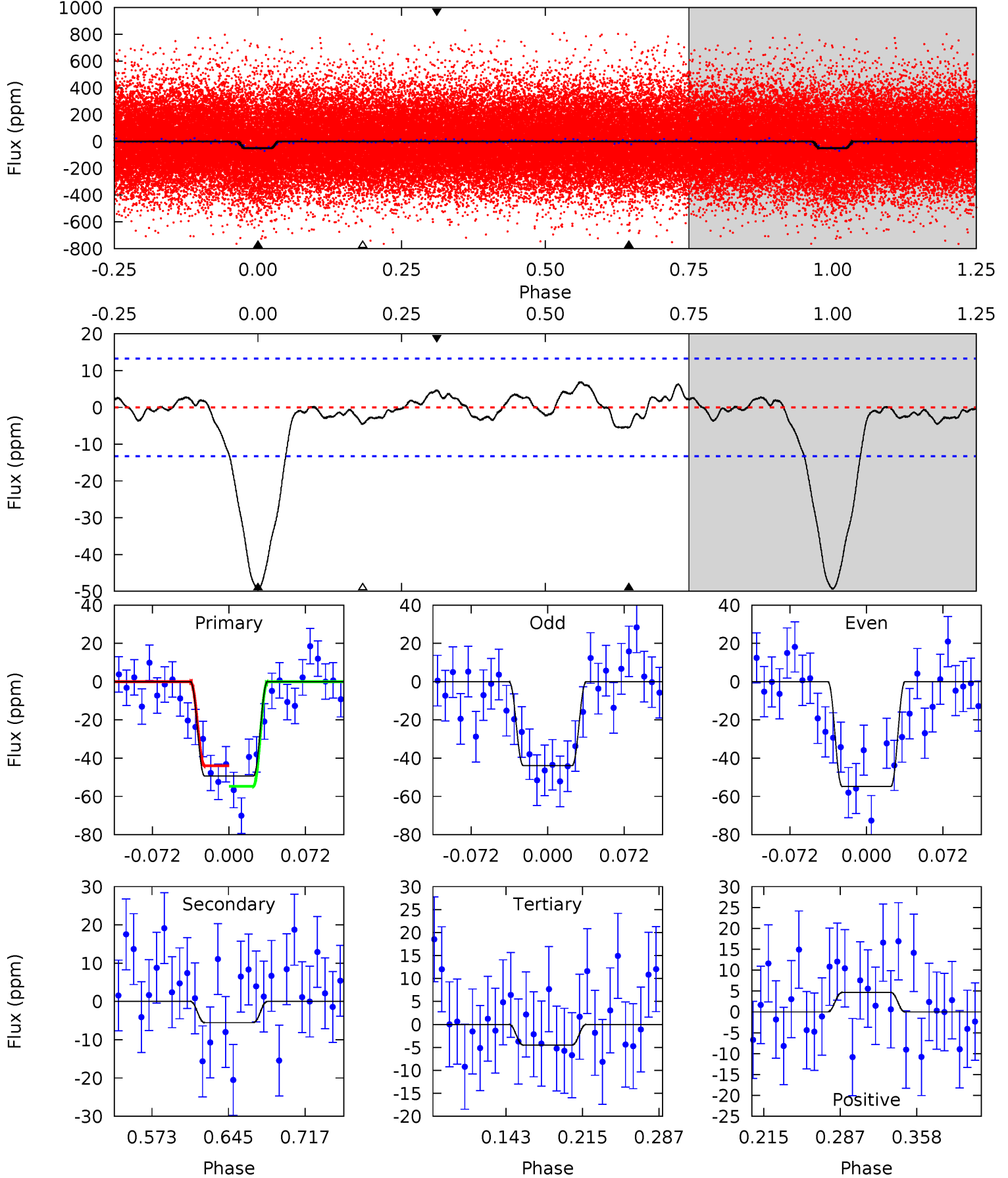




# Alt Model-Shift Uniqueness Test

009652649-01, P = 2.488867 Days, E = 129.622301 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
17.2	1.93	1.57	1.63	4.63	1.80	0.91	15.7	15.6	0.36	0.30	1.90	1.08	0.12	1.88





### Stellar Parameters For KIC 009652649

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5615^{+152}_{-152}$	$4.514^{+0.077}_{-0.154}$	$-0.320^{+0.300}_{-0.300}$	$0.833^{+0.189}_{-0.087}$	$0.827^{+0.106}_{-0.071}$	$2.017^{+0.685}_{-0.848}$
	+3%/-3%	+2%/-3%	+94%/-94%	+23%/-10%	+13%/-9%	+34%/-42%
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 009652649-01 / KOI 2884.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-5 \pm 3$	$0.66^{+0.30}_{-0.28}$	$1729^{+113}_{-73}$	$3571^{+838}_{-583}$	$7.066^{+16.781}_{-4.760}$
Alt.	$-6 \pm 3$	$0.69^{+0.29}_{-0.27}$	$1737^{+103}_{-72}$	$3561^{+743}_{-519}$	$6.777^{+12.437}_{-4.117}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

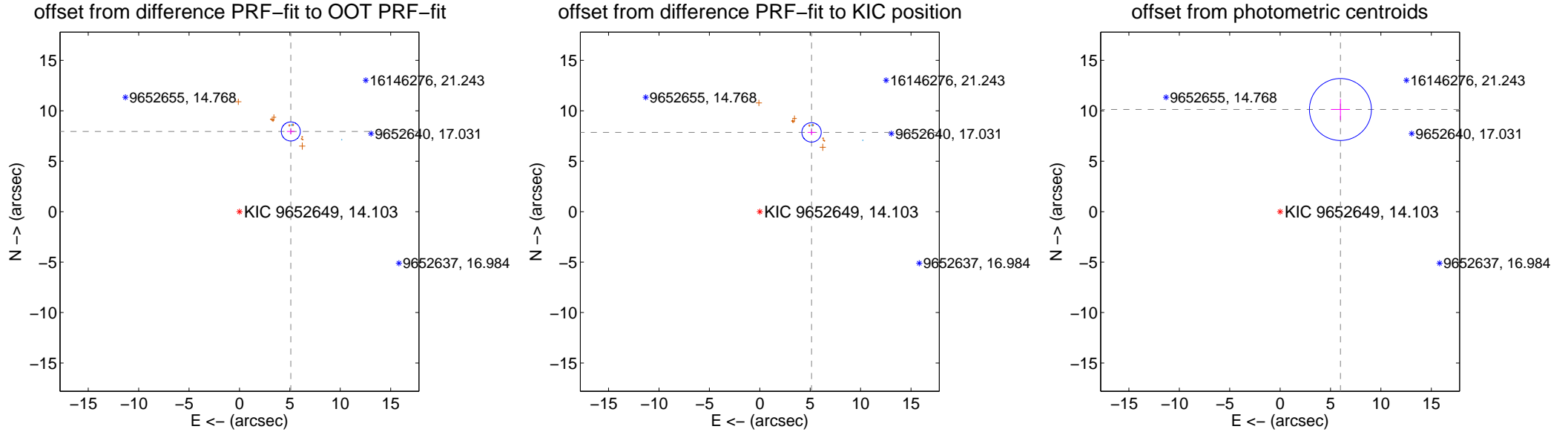
## DV Centroid Data

Supplemental centroid analysis for 009652649-01. Kepler magnitude: 14.10. Transit SNR 12.81

There are 3 quarters with good PRF difference image offsets

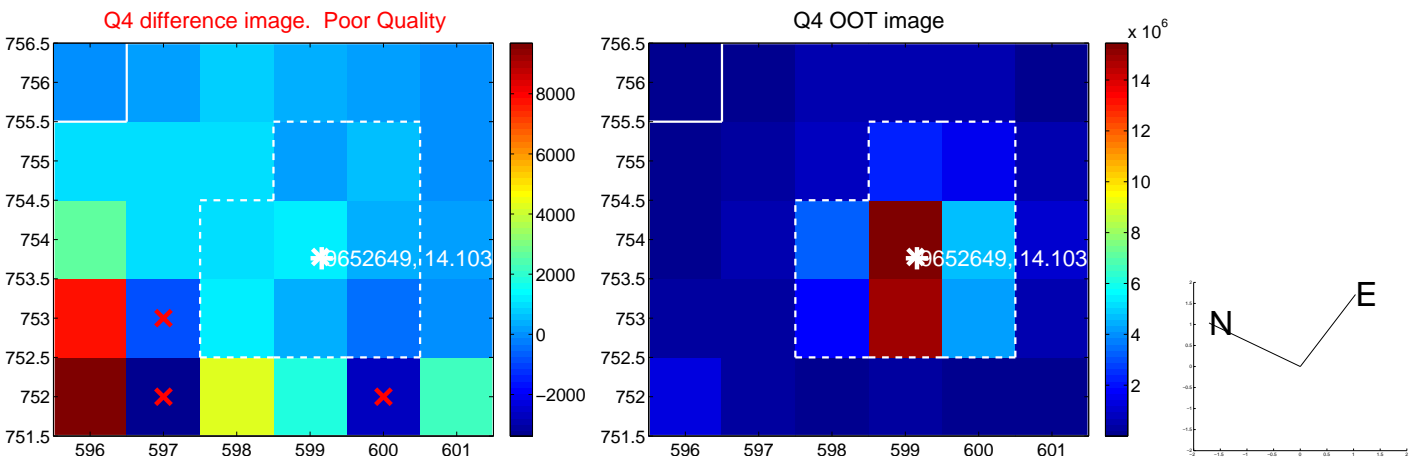
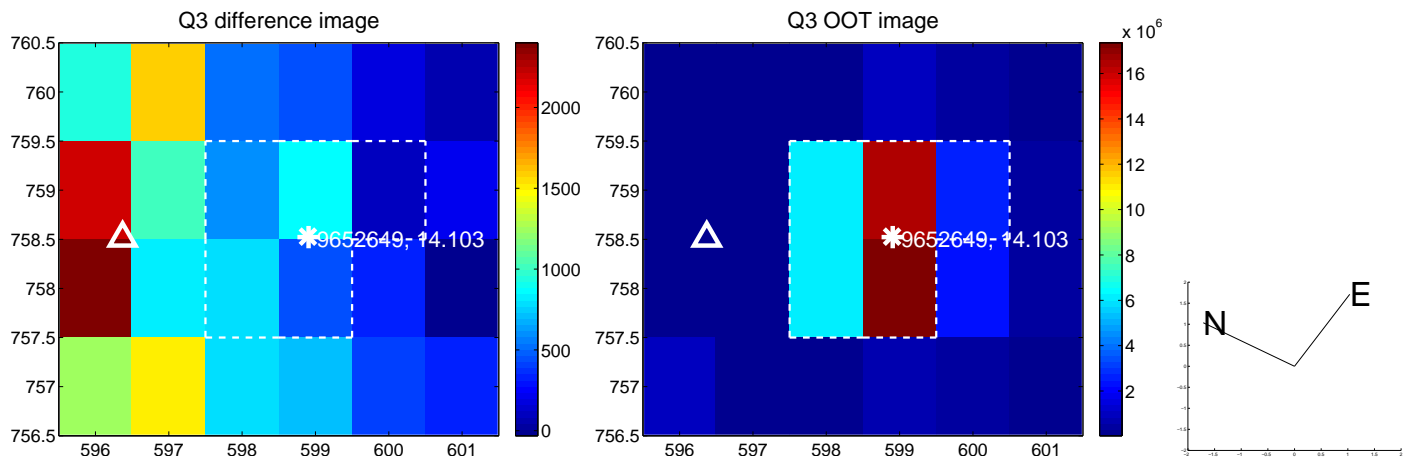
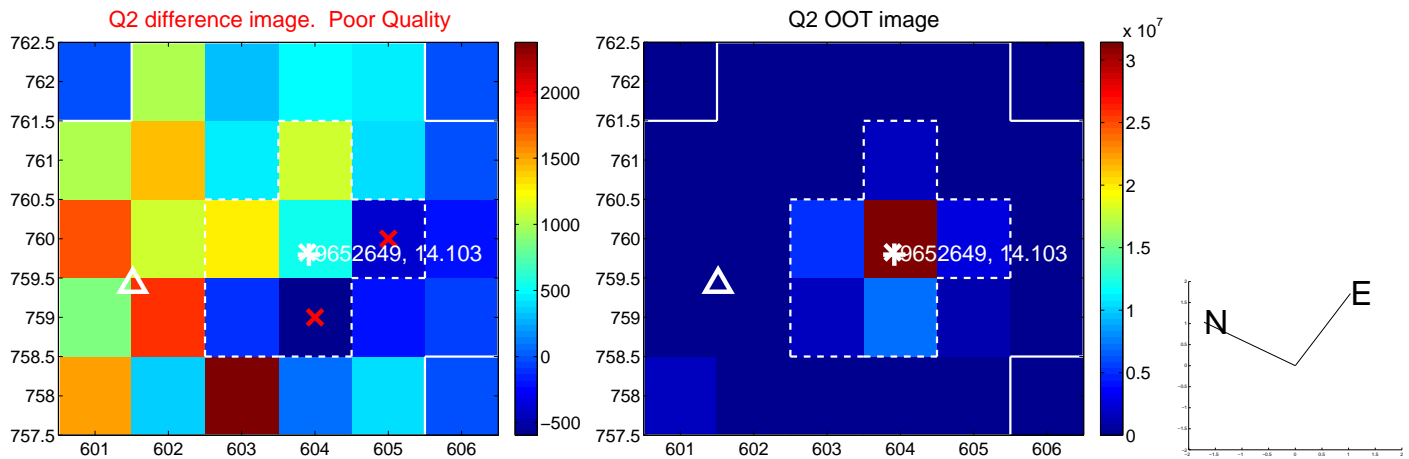
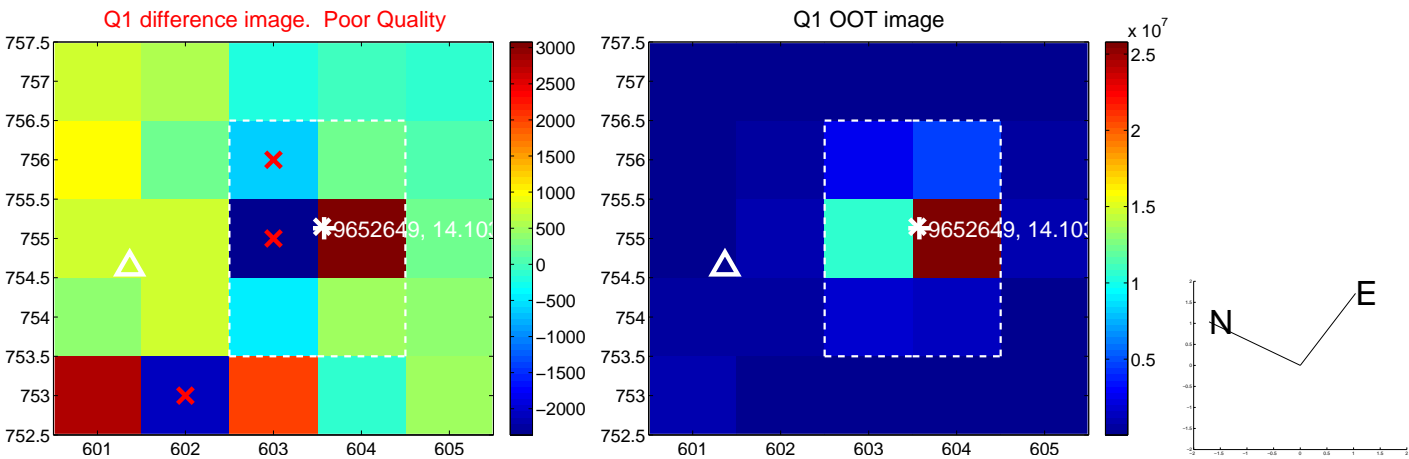
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$9.443 \pm 0.315$	29.98	$-5.093 \pm 0.388$	$7.952 \pm 0.280$
PRF-fit source offset from KIC position	$9.389 \pm 0.320$	29.30	$-5.136 \pm 0.394$	$7.859 \pm 0.283$
photometric centroid source offset	$11.76 \pm 1.02$	11.48	$-5.98 \pm 0.94$	$10.13 \pm 1.05$



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.

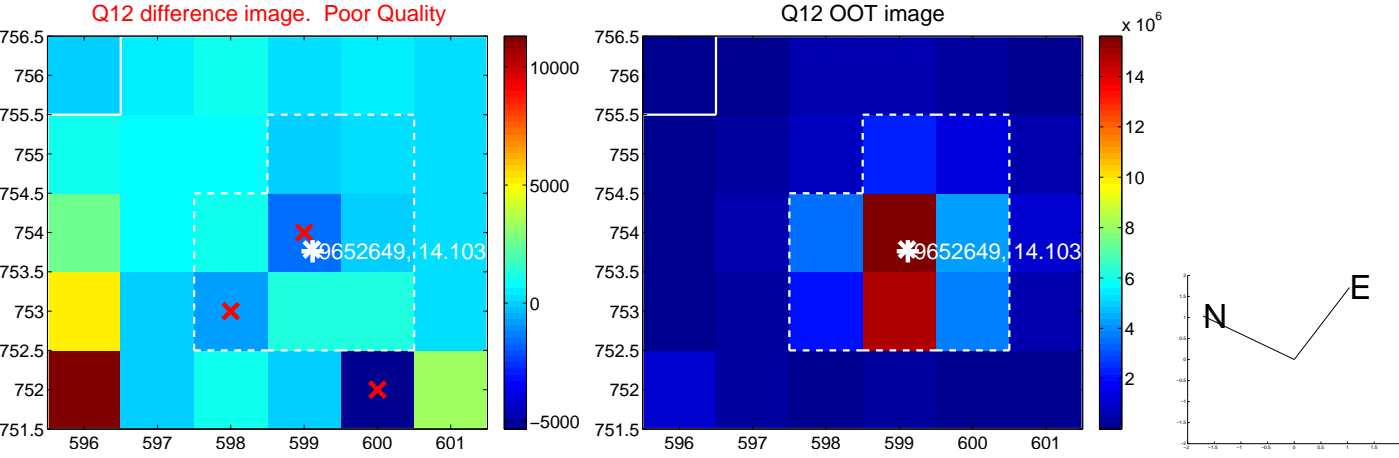
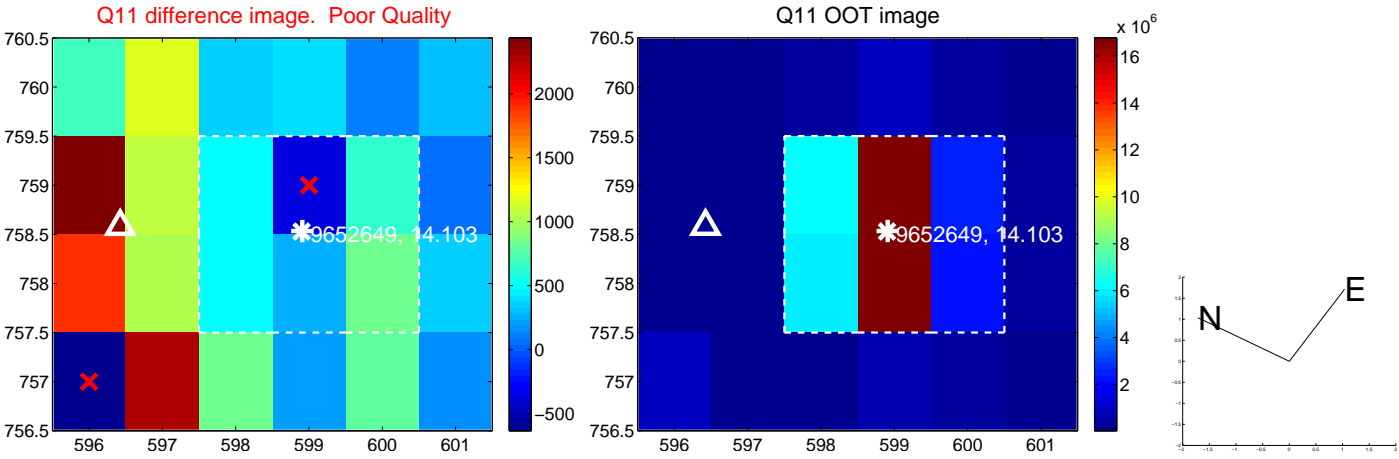
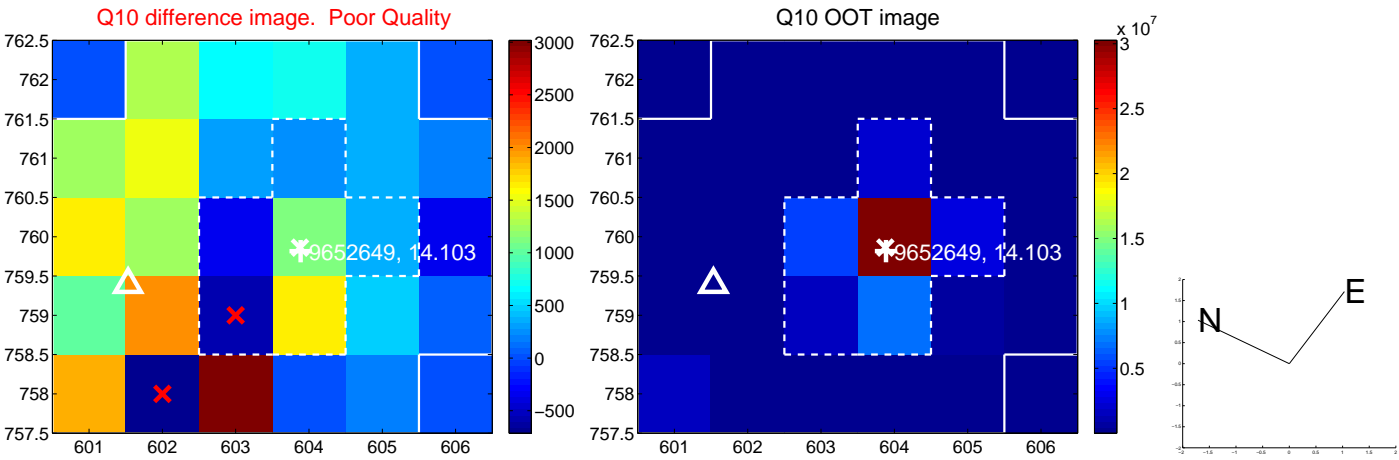
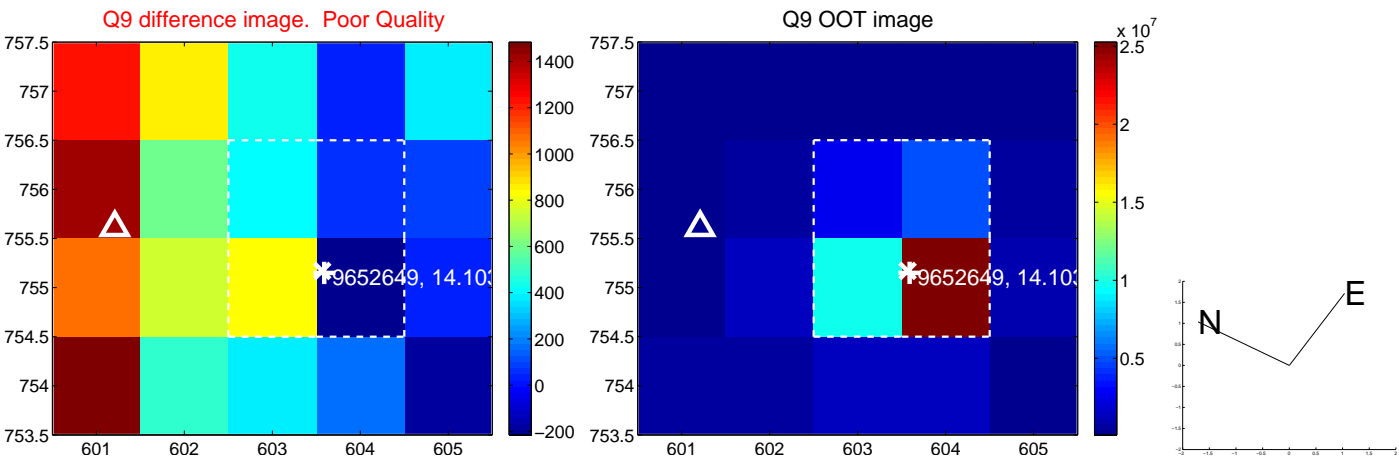
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



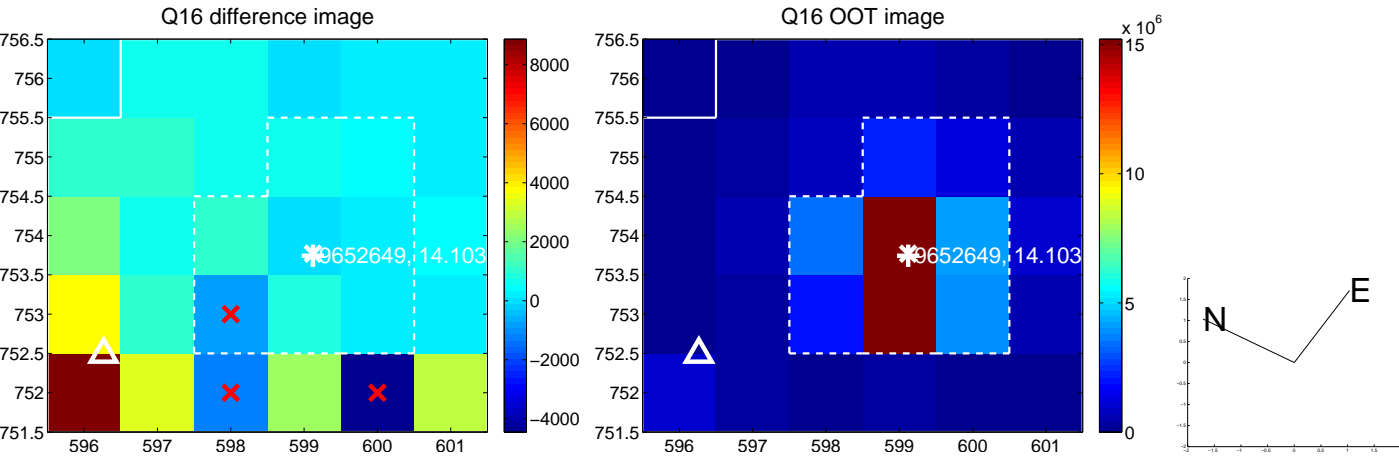
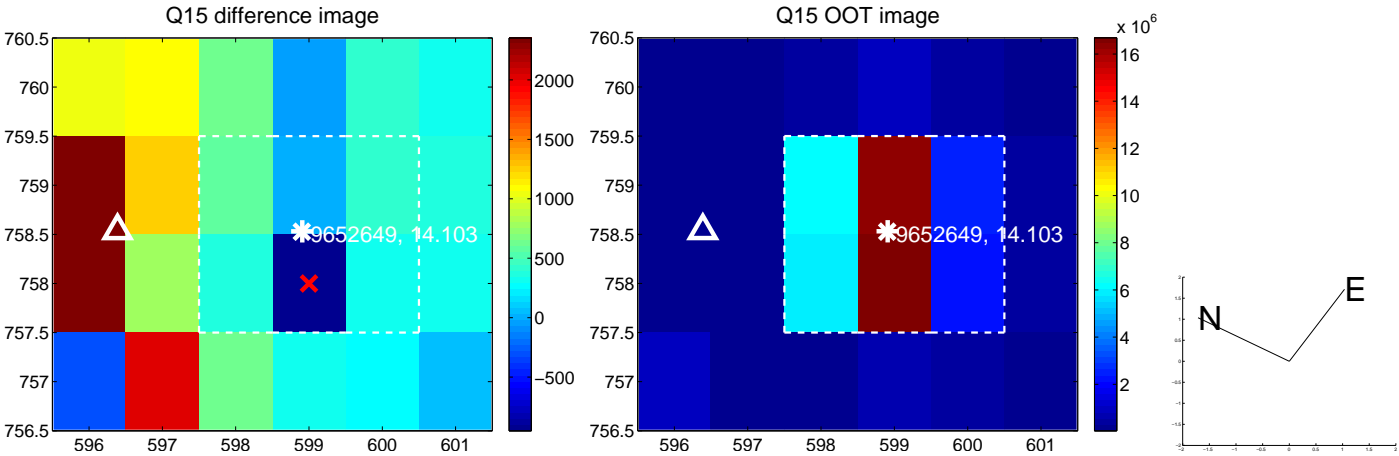
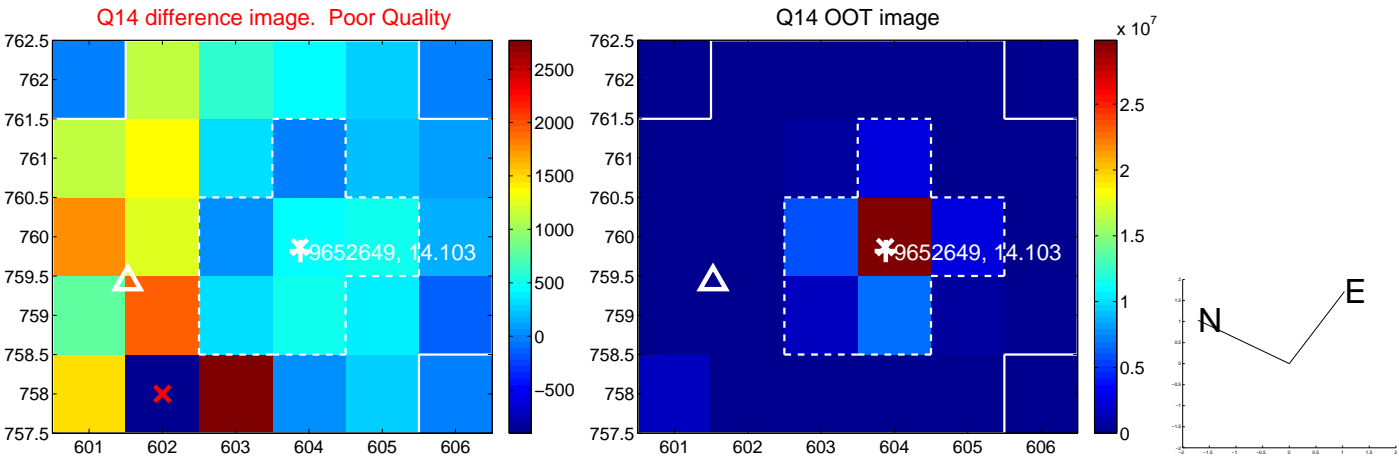
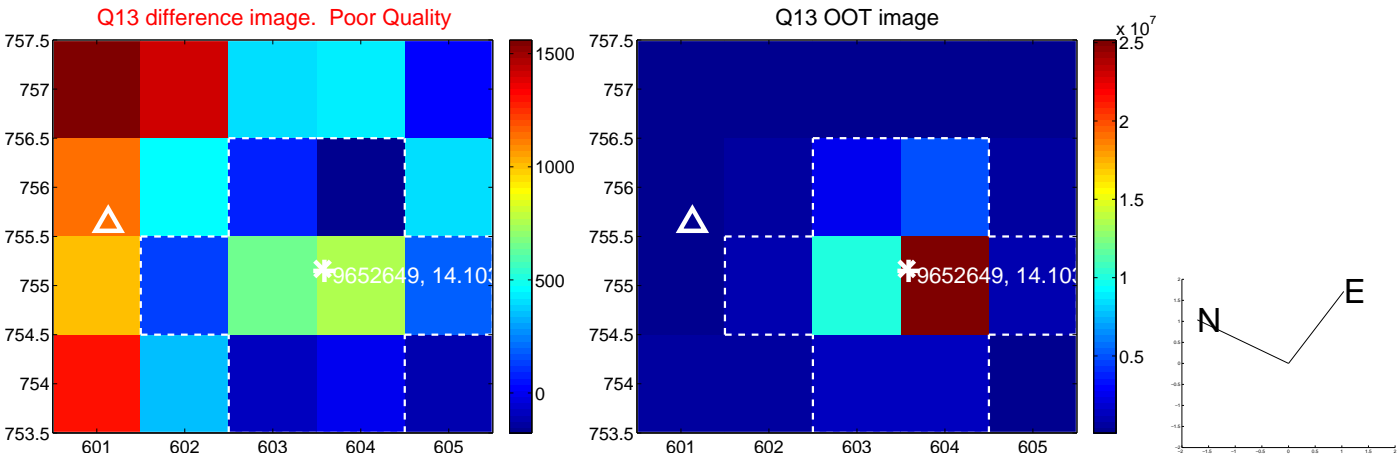




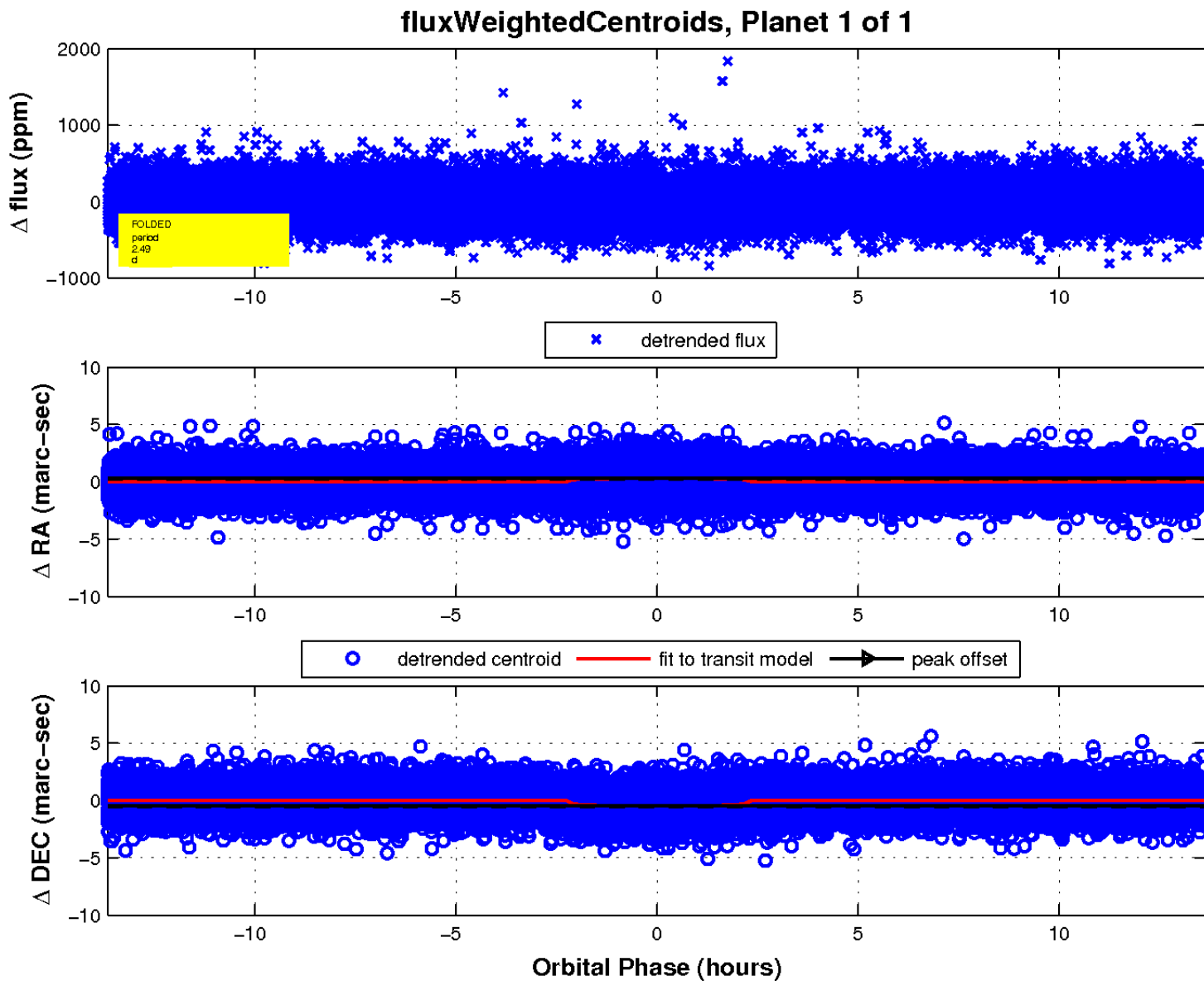
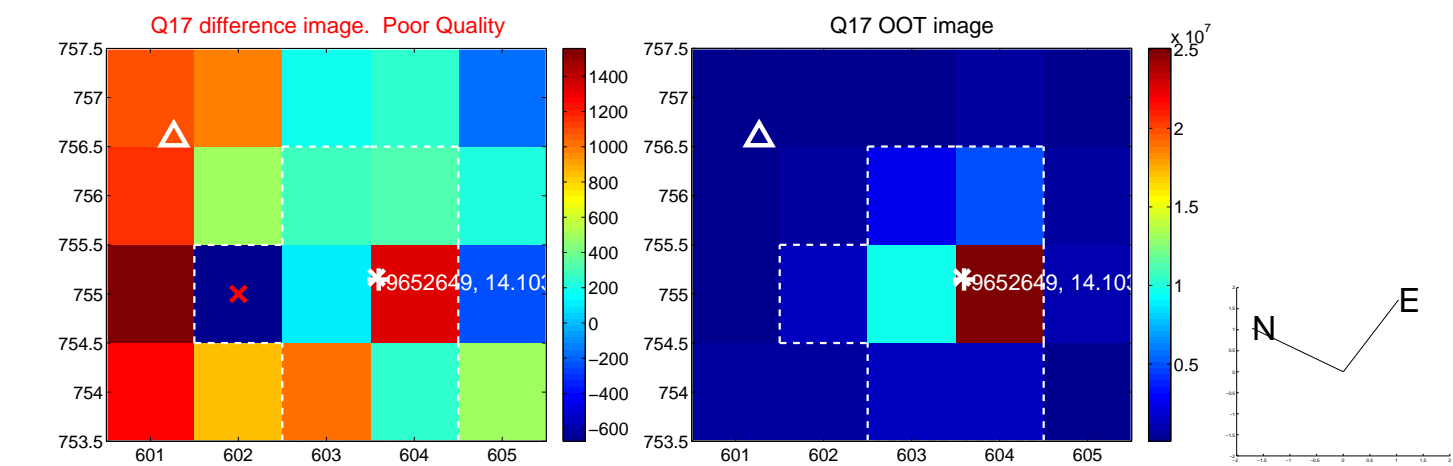
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

