

# KIC 002445154

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002445154-01	OBS	1023.01	8.412077	139.643203	606.1	5.267	40.9	29.7	0.62	4502	2.12	28.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002445154-01	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 002445154-01

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	$\sigma_P$	$\sigma_T$
002445154-01	2445154	5983.01	2445134	1:1	16.7	1	4	13.55	15.16	232.90	Direct-PRF	0	0.34	0.18

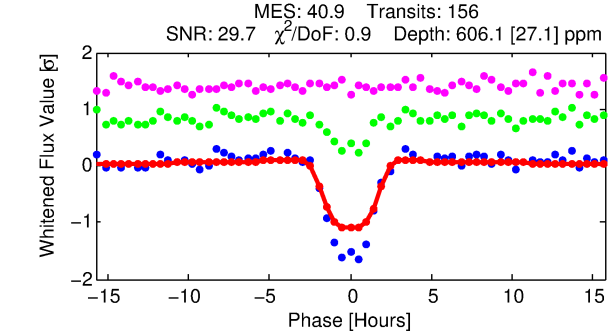
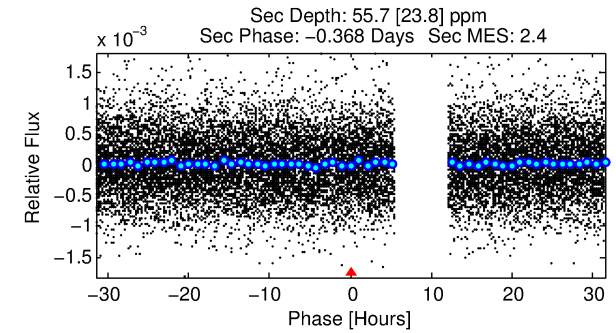
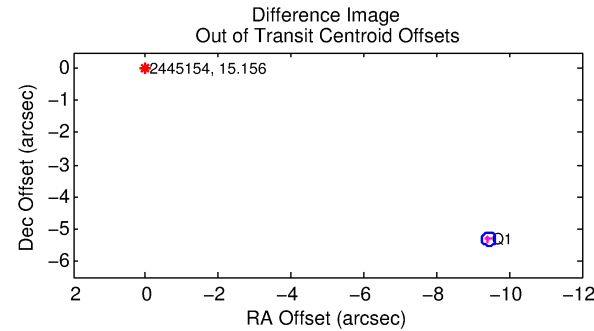
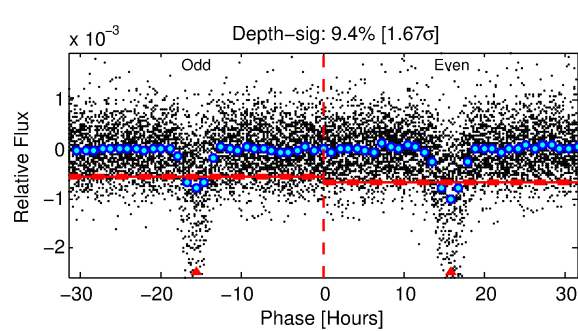
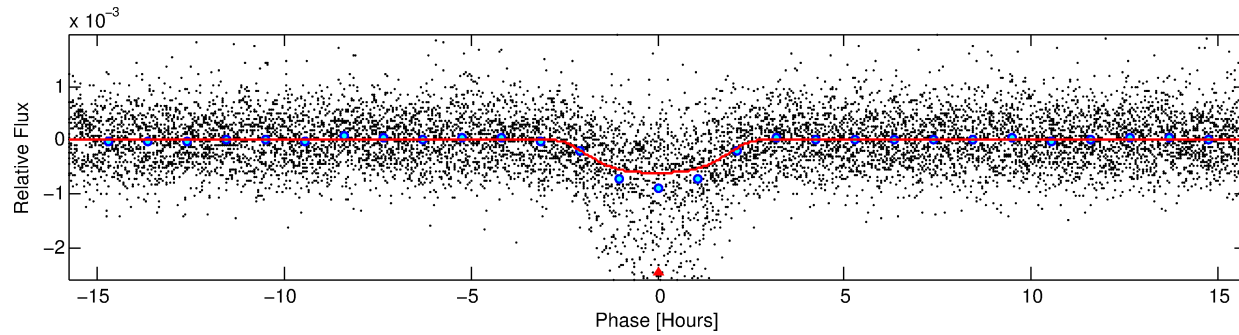
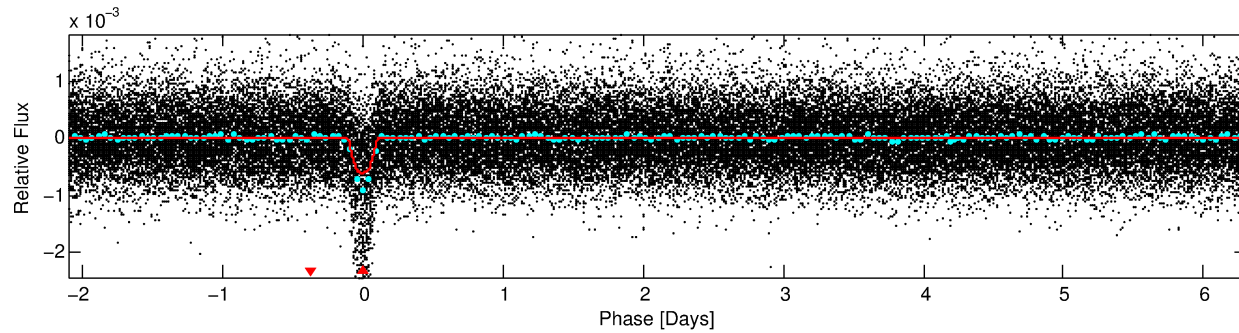
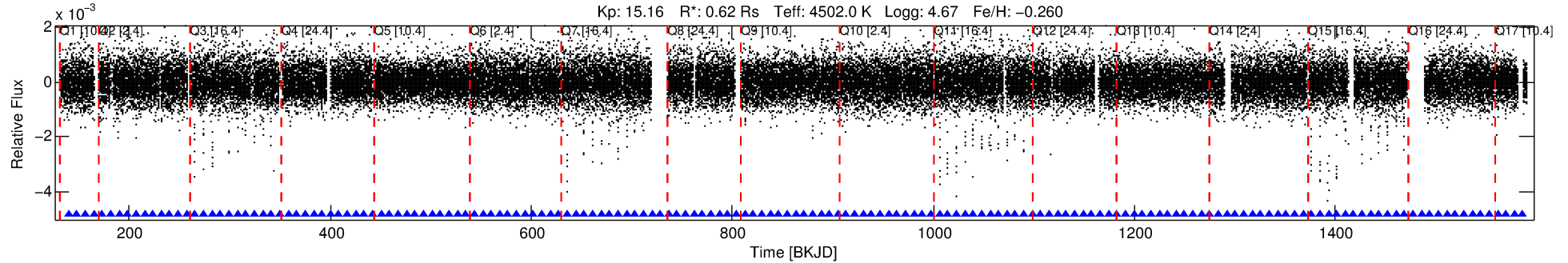
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  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: 2445154 Candidate: 1 of 1 Period: 8.412 d

KOI: K01023.01 Corr: 0.972

Kp: 15.16 R\*: 0.62 Rs Teff: 4502.0 K Logg: 4.67 Fe/H: -0.260



## DV Fit Results:

Period = 8.41208 [0.00004] d  
Epoch = 139.6432 [0.0041] BKJD  
Rp/R\* = 0.0312 [0.0012]  
a/R\* = 4.61 [0.33]  
b = 0.96 [0.01]  
Seff = 28.71 [4.39]  
Teq = 590 [23] K  
Rp = 2.12 [0.21] Re  
a = 0.0703 [0.0050] AU  
Ag = 33.83 [15.00] [2.19σ]  
Teffp = 2201 [247] K [6.49σ]

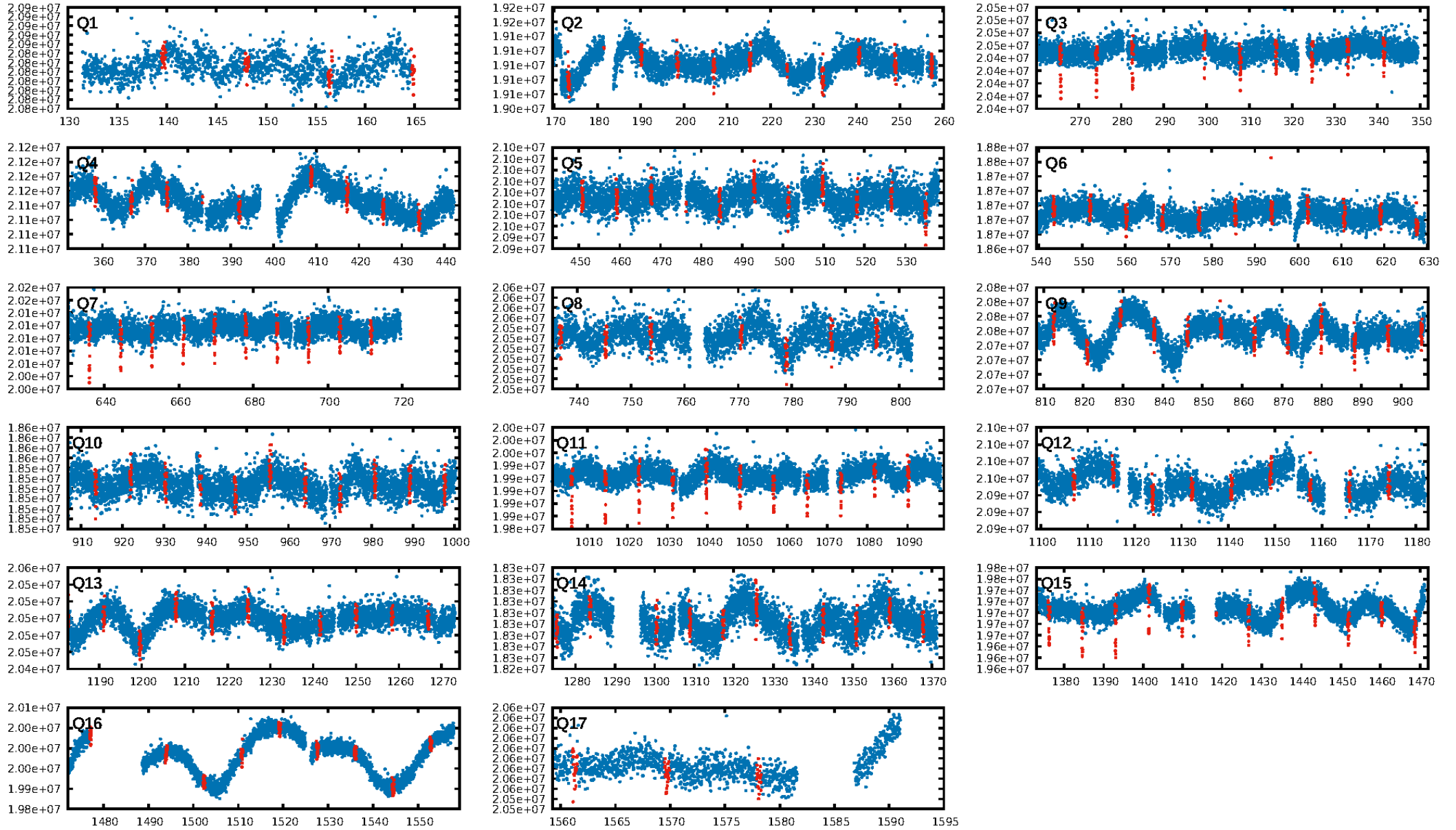
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [149/149]  
GhostDiagnostic-chr: -0.5031  
Centroid-sig: 0.0%  
Centroid-so: 87.820 arcsec [235.60σ]  
OotOffset-rm: 10.826 arcsec [160.66σ]  
KicOffset-rm: 10.986 arcsec [163.06σ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [17/17]

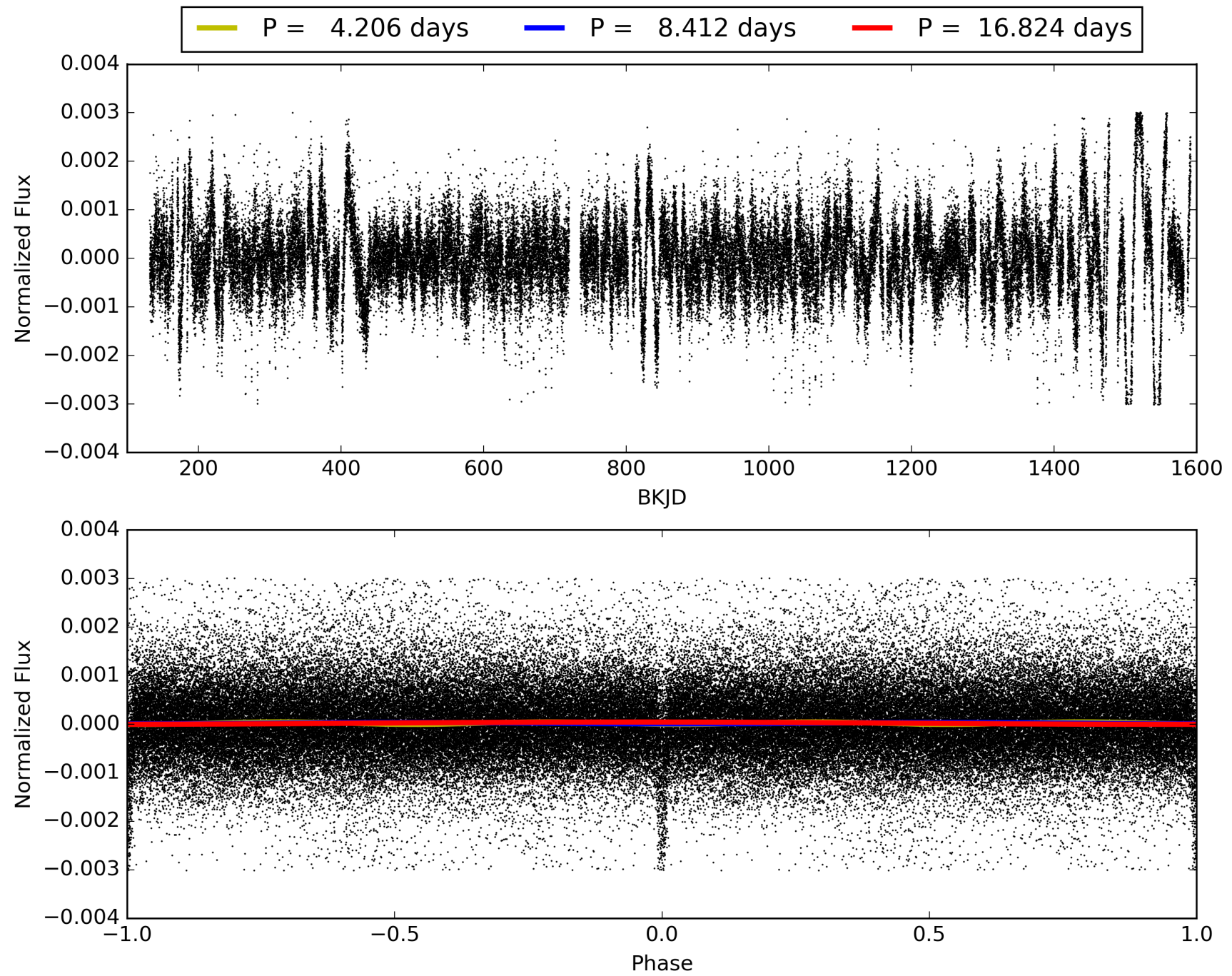
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:30:23 Z

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

# TCE 002445154-01, PDC Light Curves

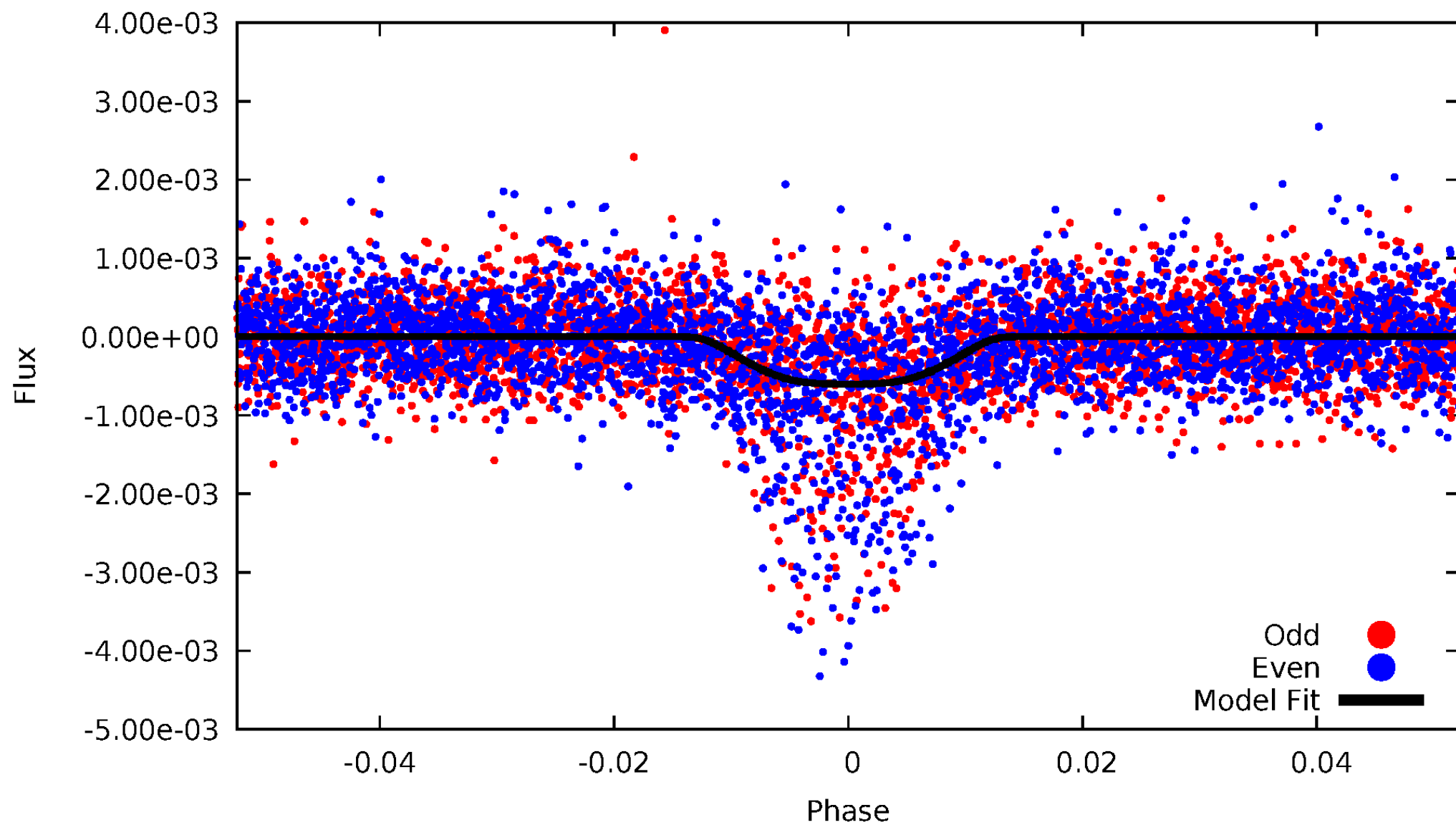


TCE 002445154-01



# DV Odd/Even

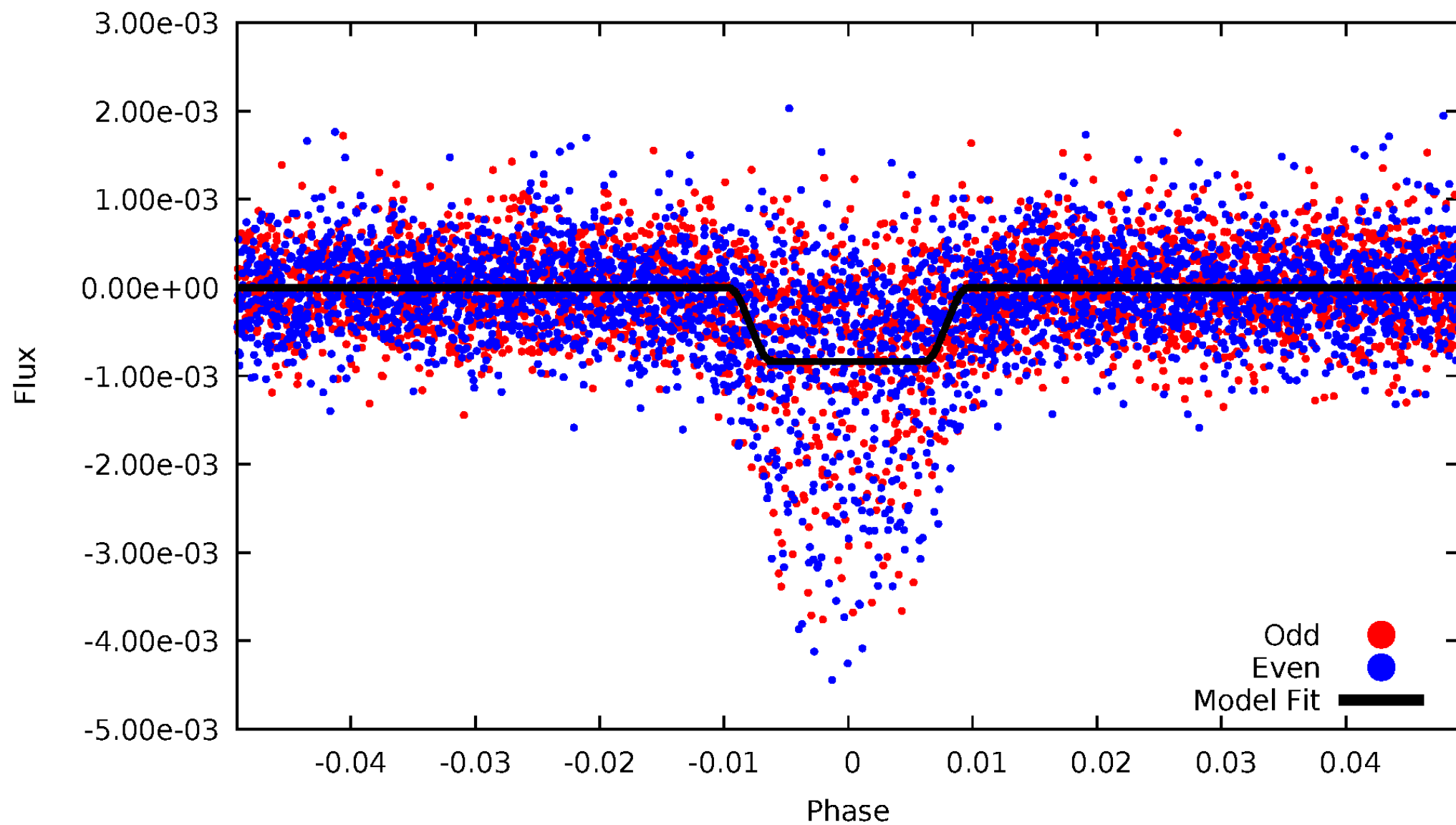
TCE 002445154-01





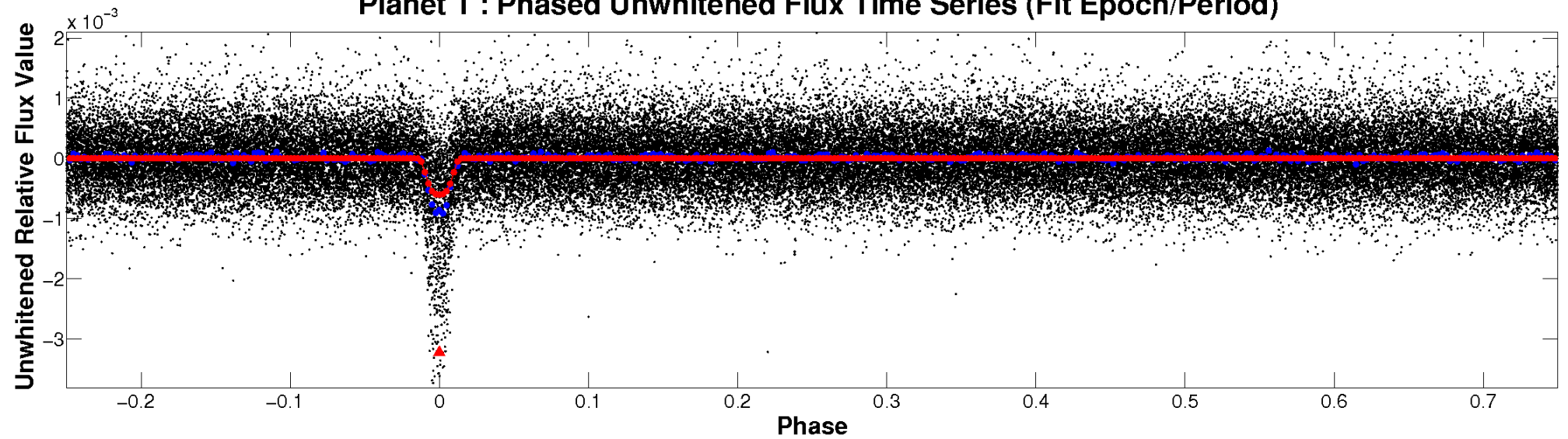
# ALT Odd/Even

TCE 002445154-01

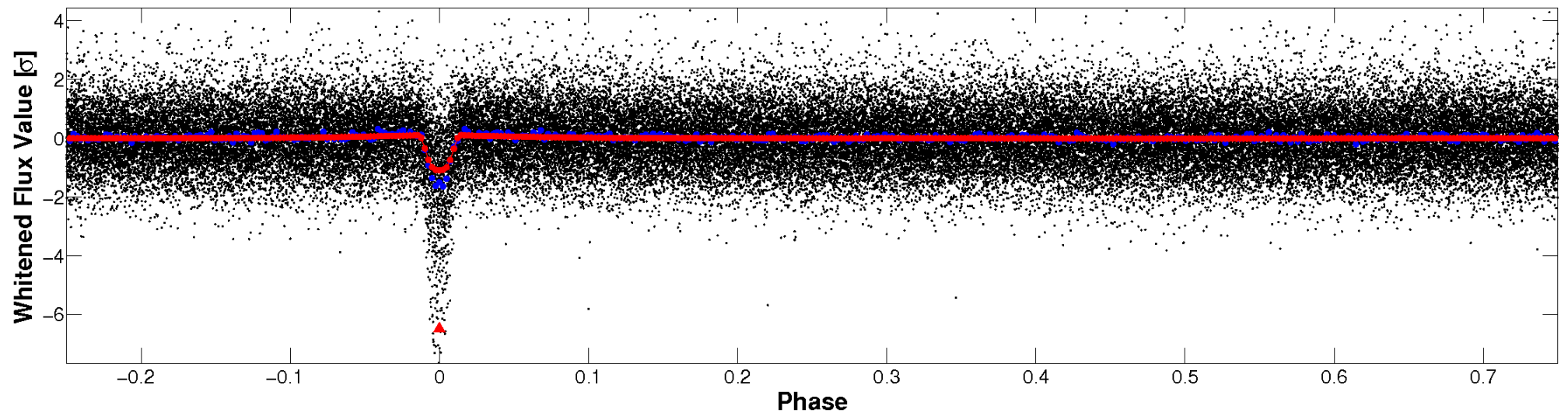


# Non-Whitened Vs. Whitened Light Curve

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

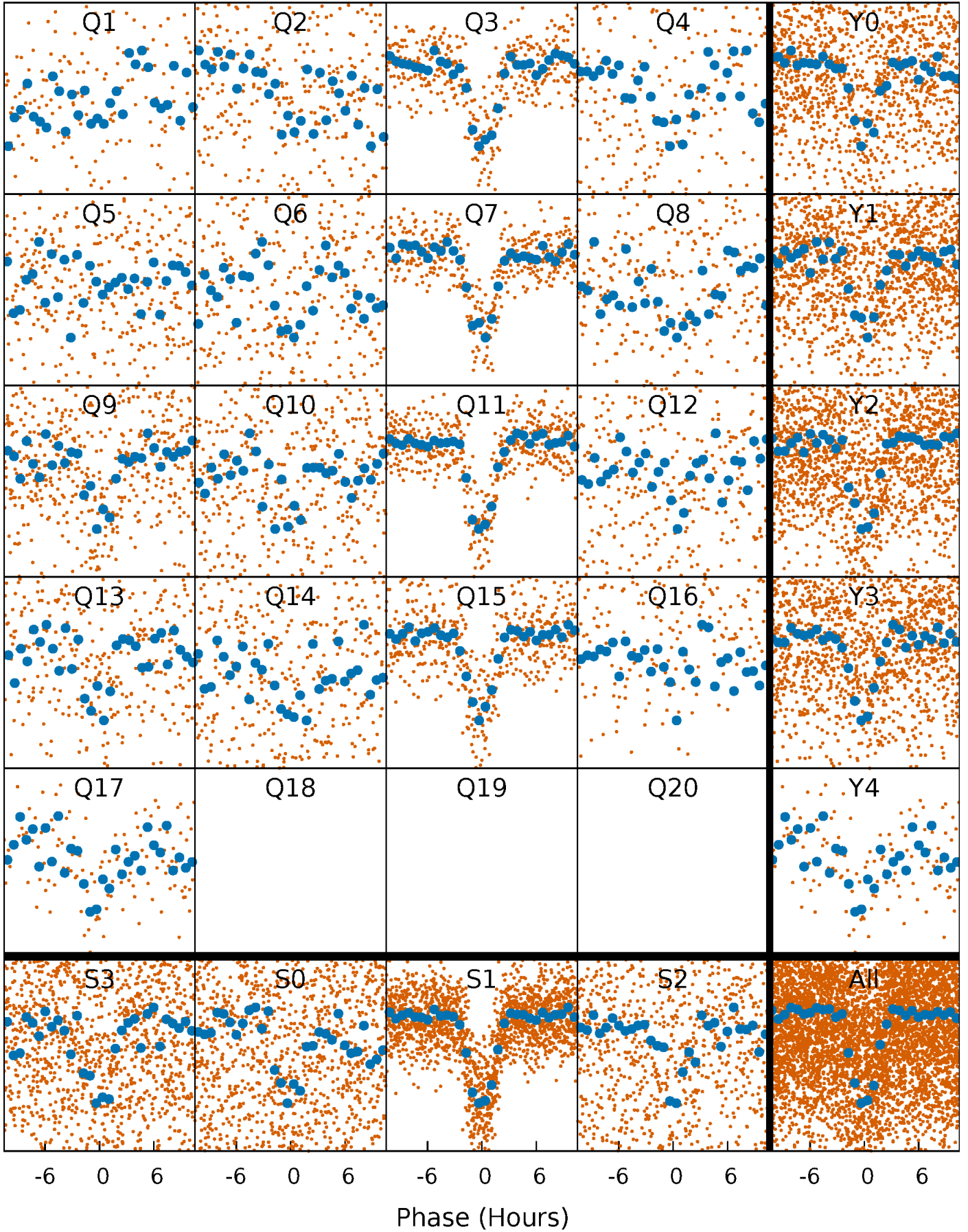


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

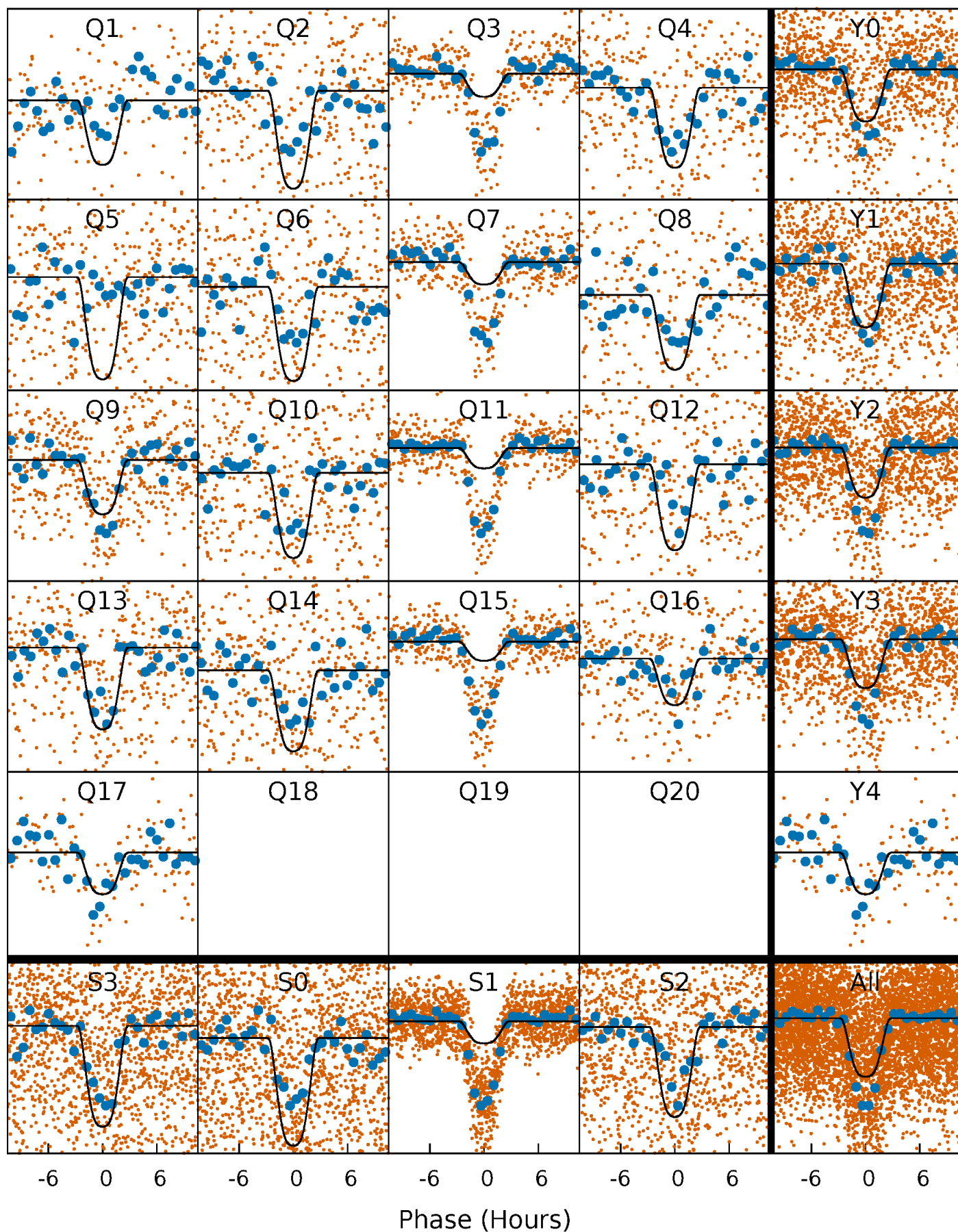
TCE 002445154-01 P= 8.412077 Days  $T_0=139.643203$  (BKJD)





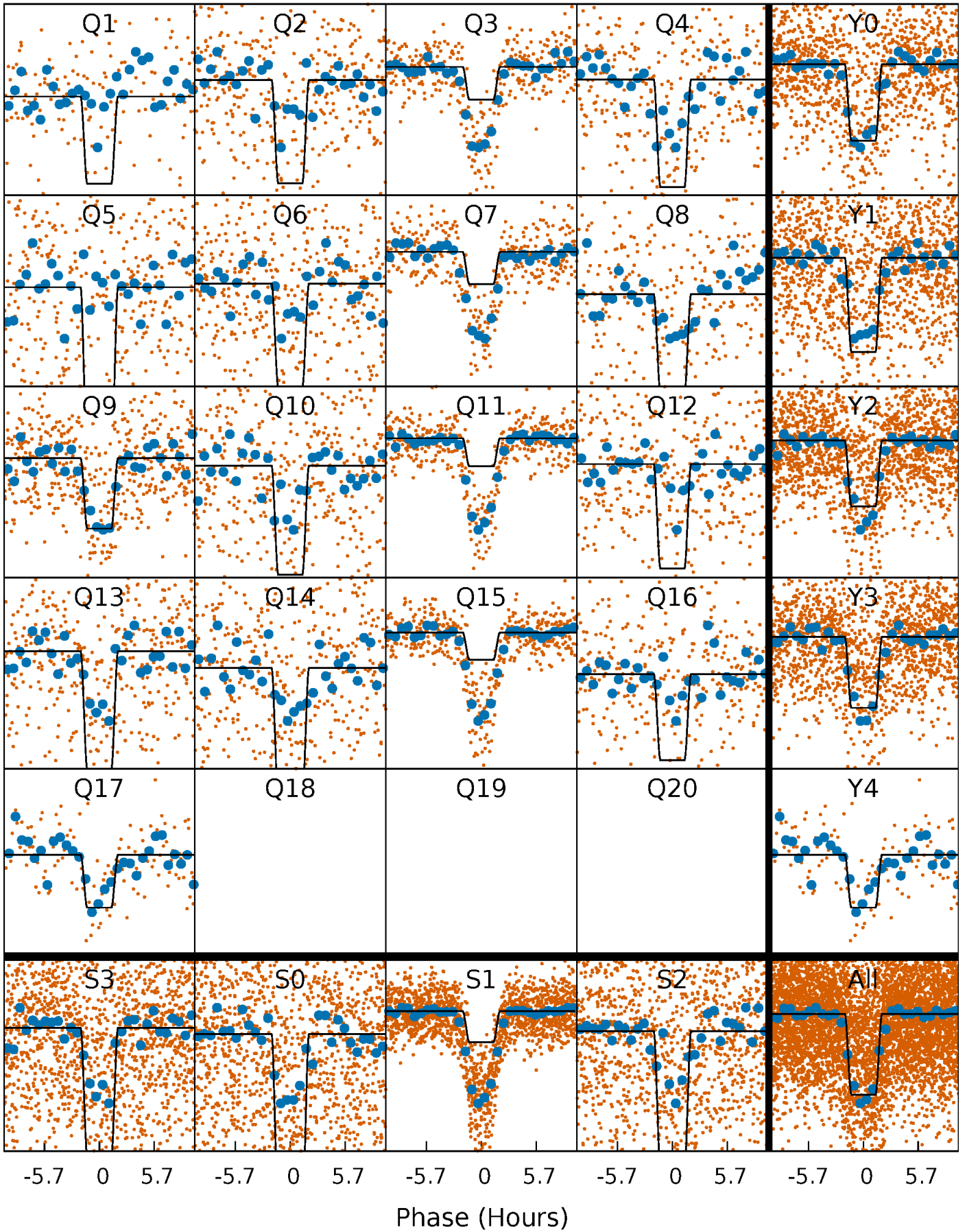
# DV Quarter-Phased Transit Curves

TCE 002445154-01 P= 8.412077 Days  $T_0=139.643203$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

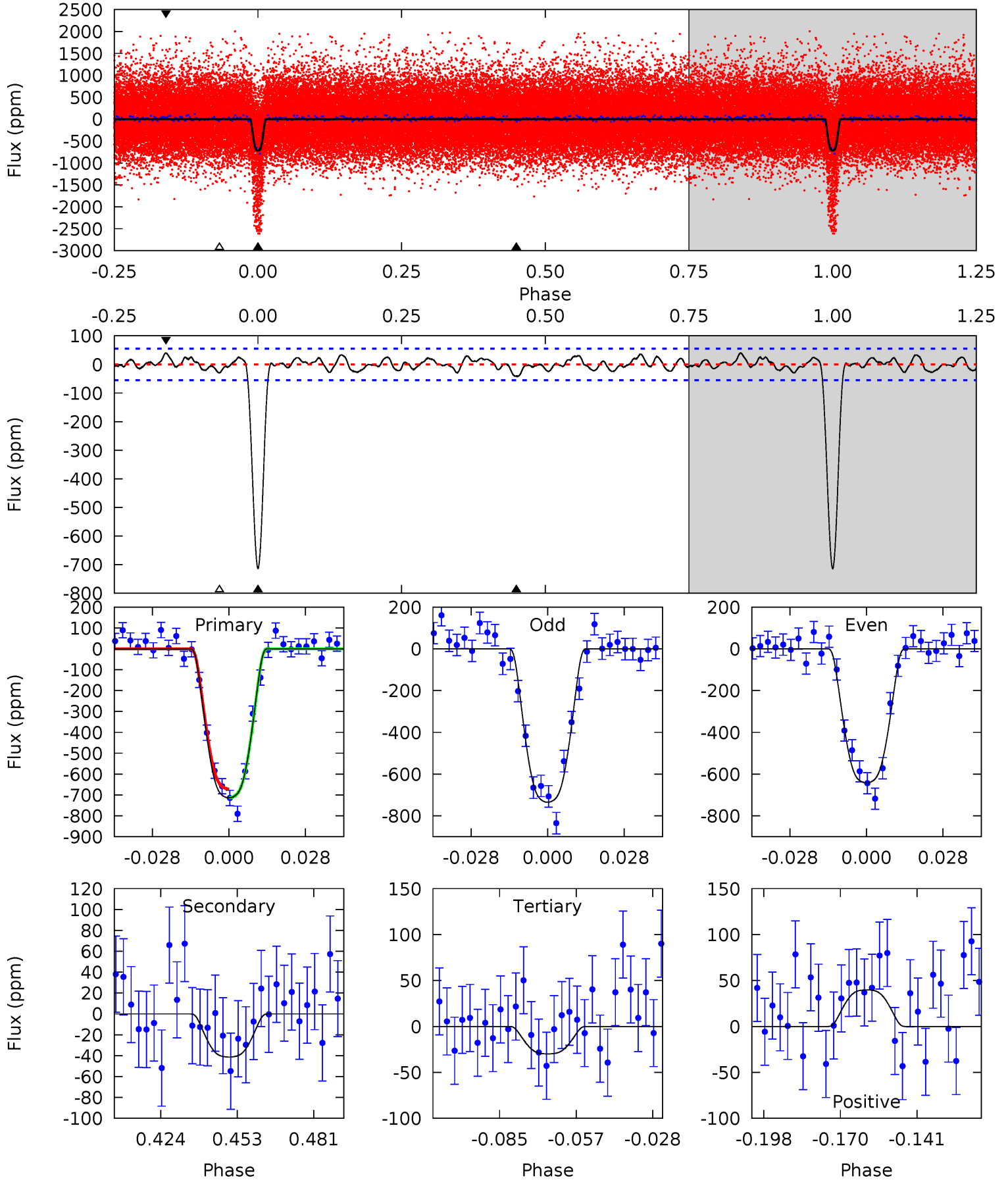
TCE 002445154-01 P= 8.411917 Days  $T_0=139.657521$  (BKJD)



# DV Model-Shift Uniqueness Test

002445154-01, P = 8.412077 Days, E = 131.231126 Days

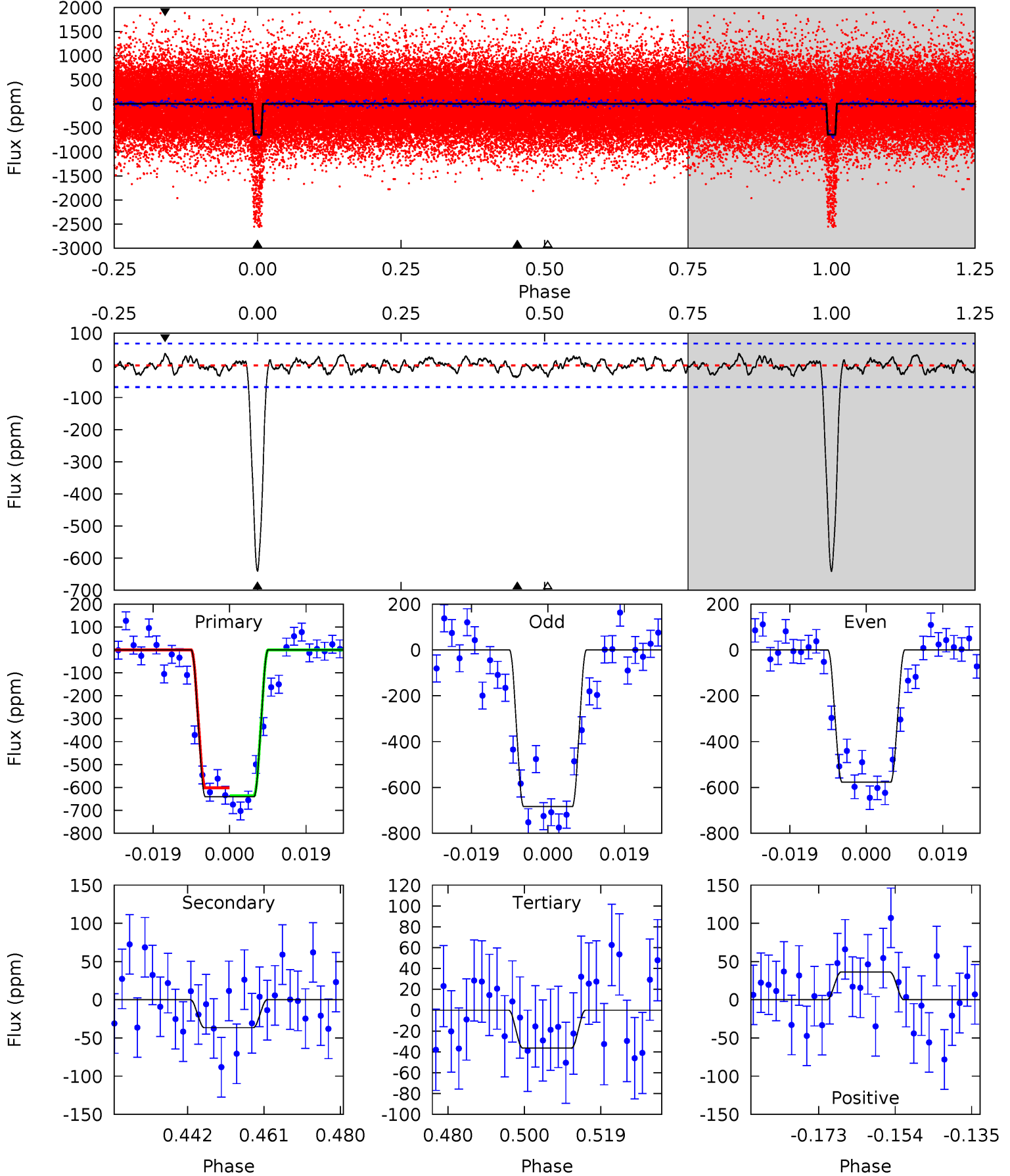
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.5	3.62	2.62	3.48	4.82	2.19	1.34	59.8	59.0	1.00	0.13	4.04	1.59	0.05	0



# Alt Model-Shift Uniqueness Test

002445154-01, P = 8.411917 Days, E = 131.245604 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
46.3	2.65	2.63	2.63	4.90	2.34	1.03	43.7	43.7	0.02	0.02	3.86	1.70	0.05	0



### Stellar Parameters For KIC 002445154

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4502^{+121}_{-134}$	$4.668^{+0.028}_{-0.048}$	$-0.260^{+0.300}_{-0.300}$	$0.621^{+0.057}_{-0.046}$	$0.662^{+0.057}_{-0.063}$	$3.896^{+0.576}_{-0.728}$
	+3%/-3%	+1%/-1%	+115%/-115%	+9%/-7%	+9%/-10%	+15%/-19%
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 002445154-01 / KOI 1023.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-41 \pm 11$	$2.14^{+0.14}_{-0.13}$	$830^{+25}_{-29}$	$2719^{+114}_{-128}$	$24^{+7}_{-7}$
Alt.	$-37 \pm 14$	$1.98^{+0.12}_{-0.12}$	$830^{+25}_{-27}$	$2731^{+139}_{-170}$	$25^{+10}_{-10}$

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



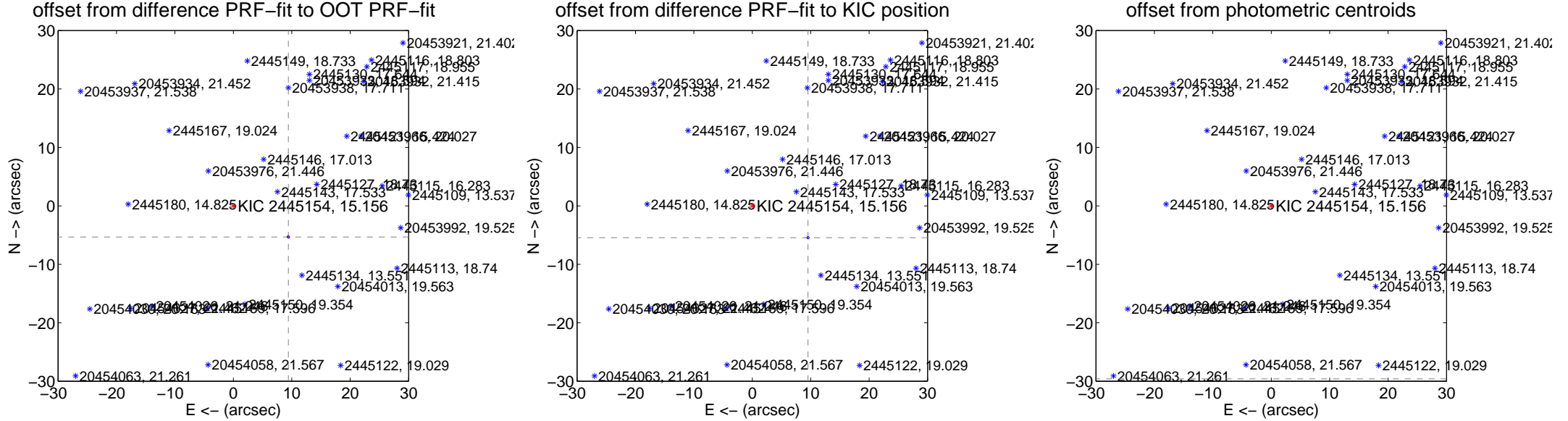
## DV Centroid Data

Supplemental centroid analysis for 002445154-01. Kepler magnitude: 15.16. Transit SNR 29.74

There are 1 quarters with good PRF difference image offsets

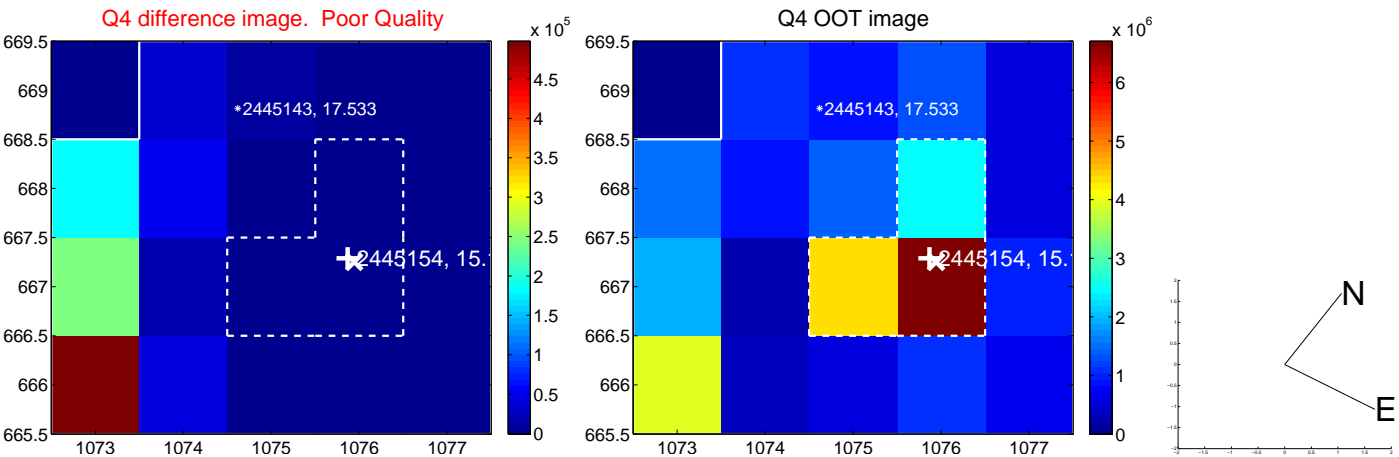
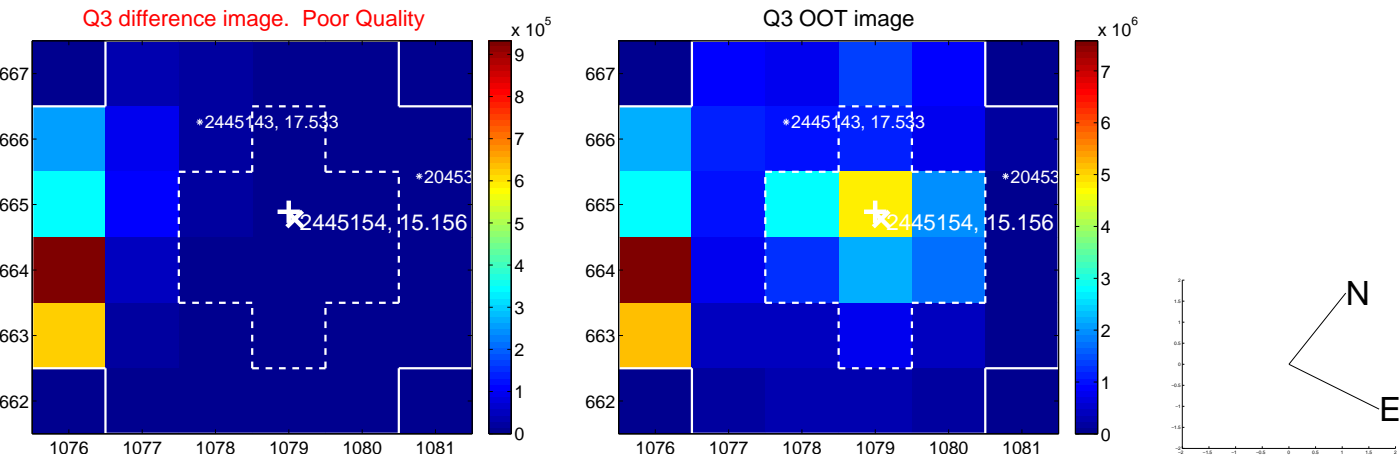
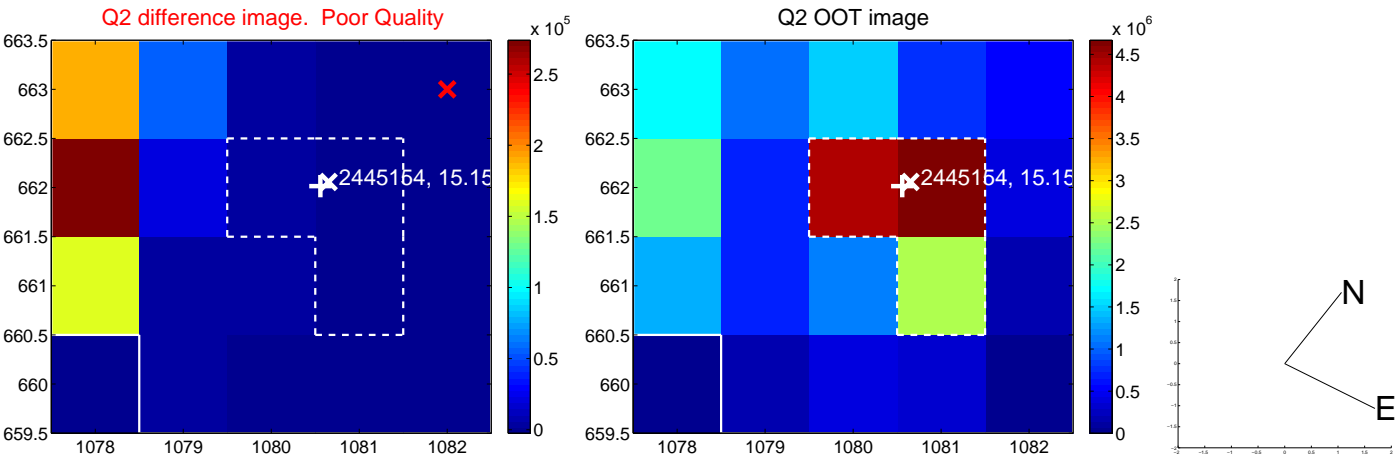
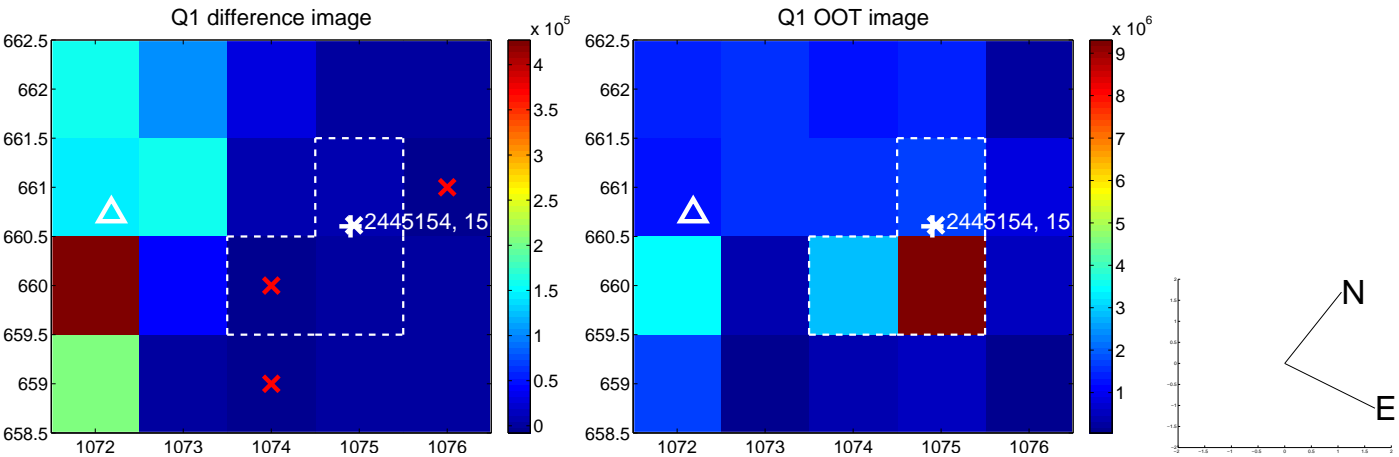
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$10.826 \pm 0.067$	160.66	$-9.424 \pm 0.067$	$-5.328 \pm 0.067$
PRF-fit source offset from KIC position	$10.986 \pm 0.067$	163.06	$-9.538 \pm 0.067$	$-5.451 \pm 0.067$
photometric centroid source offset	$87.83 \pm 0.37$	235.60	$-82.69 \pm 0.38$	$-29.60 \pm 0.35$

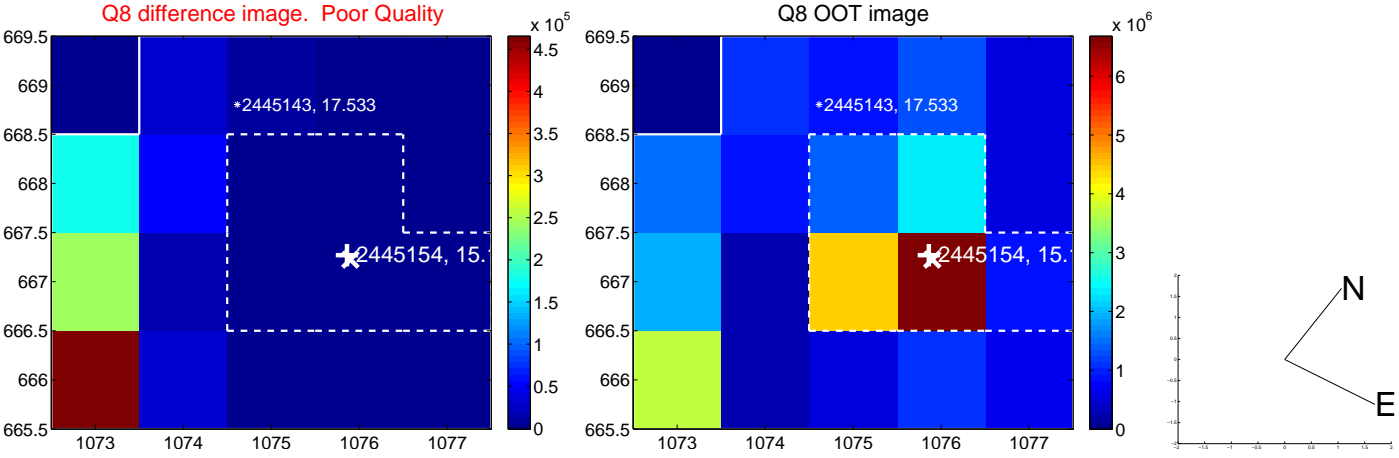
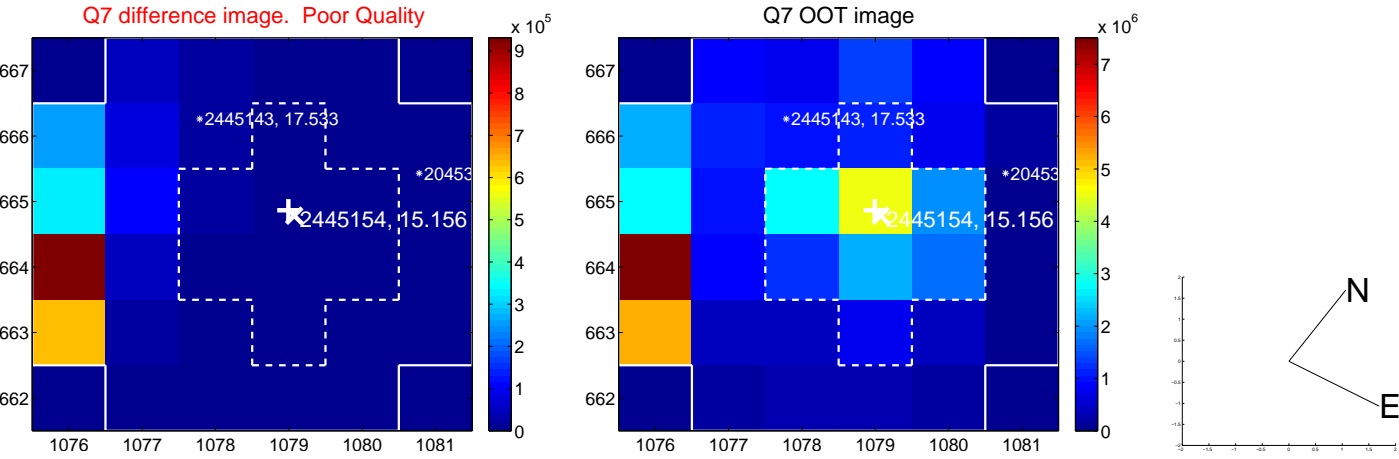
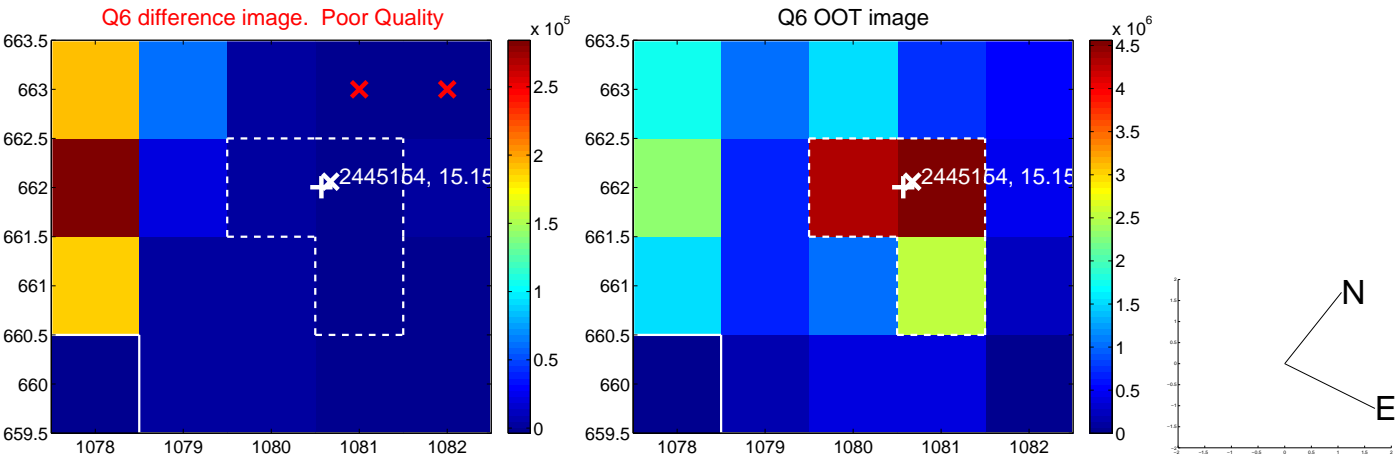
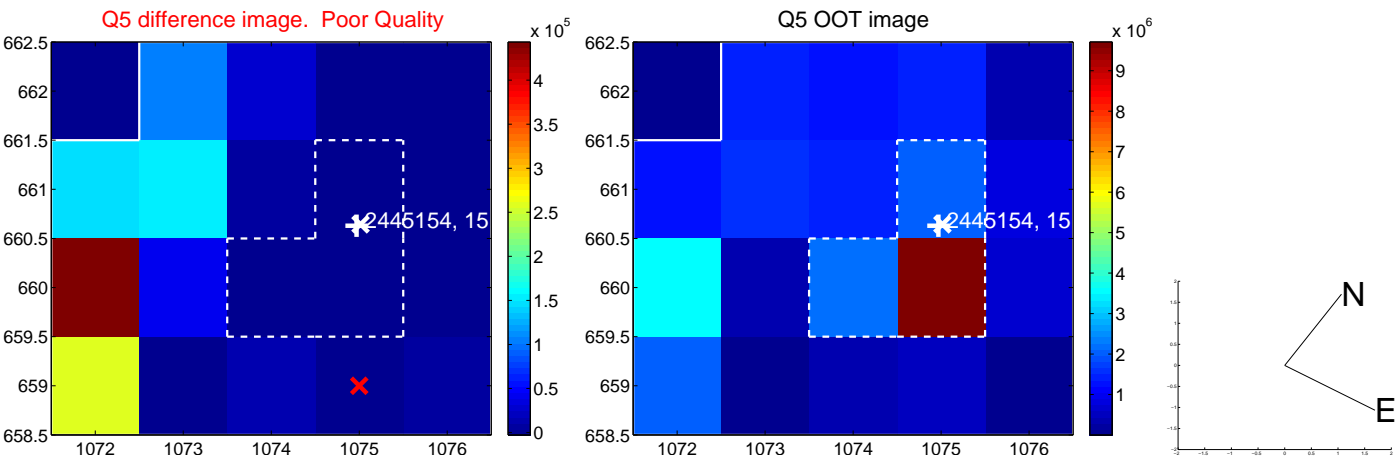


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.

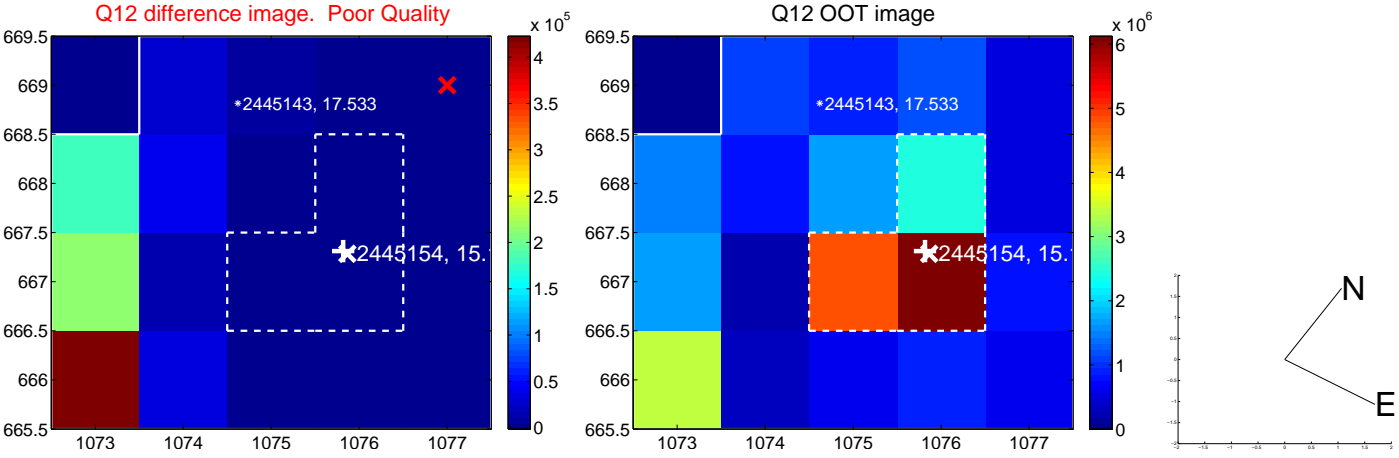
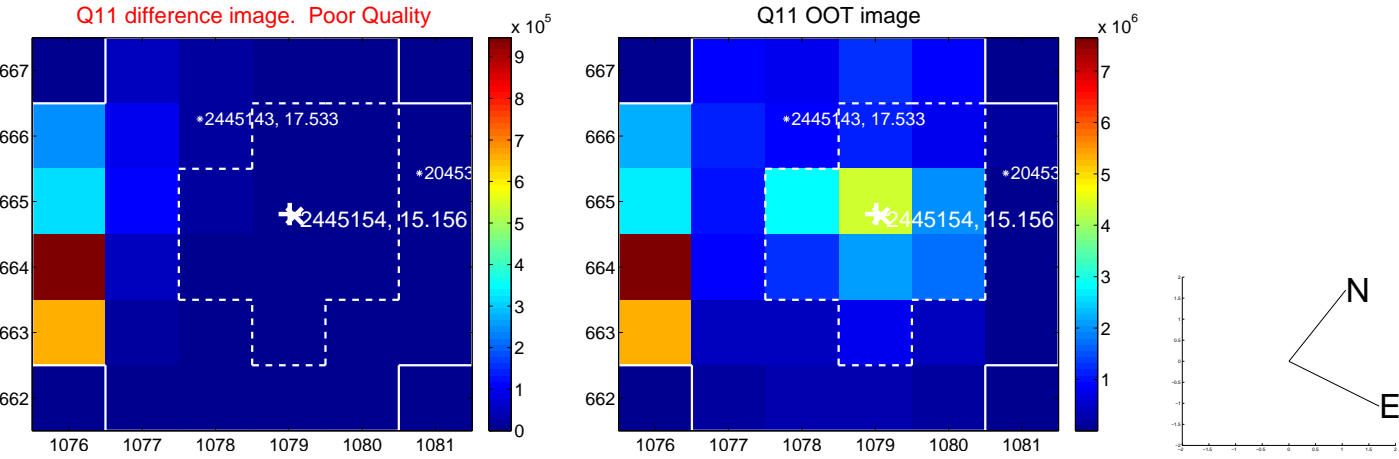
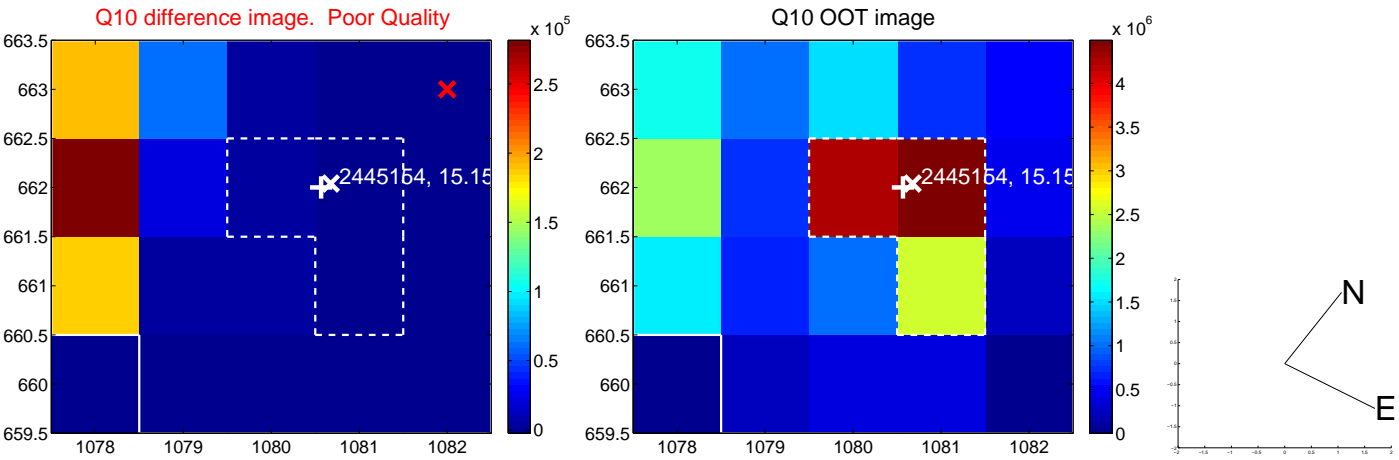
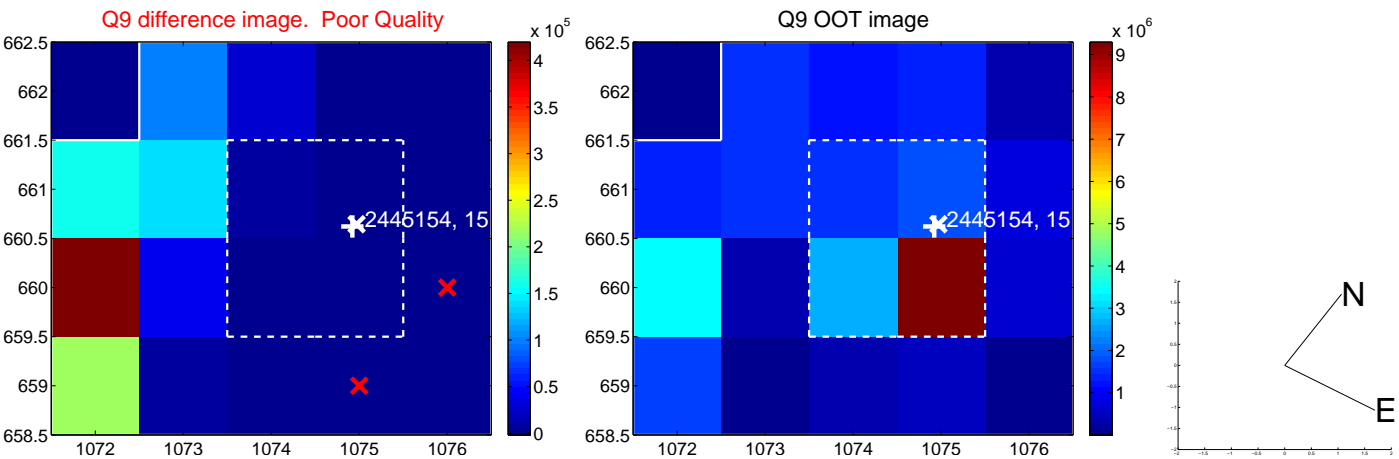
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



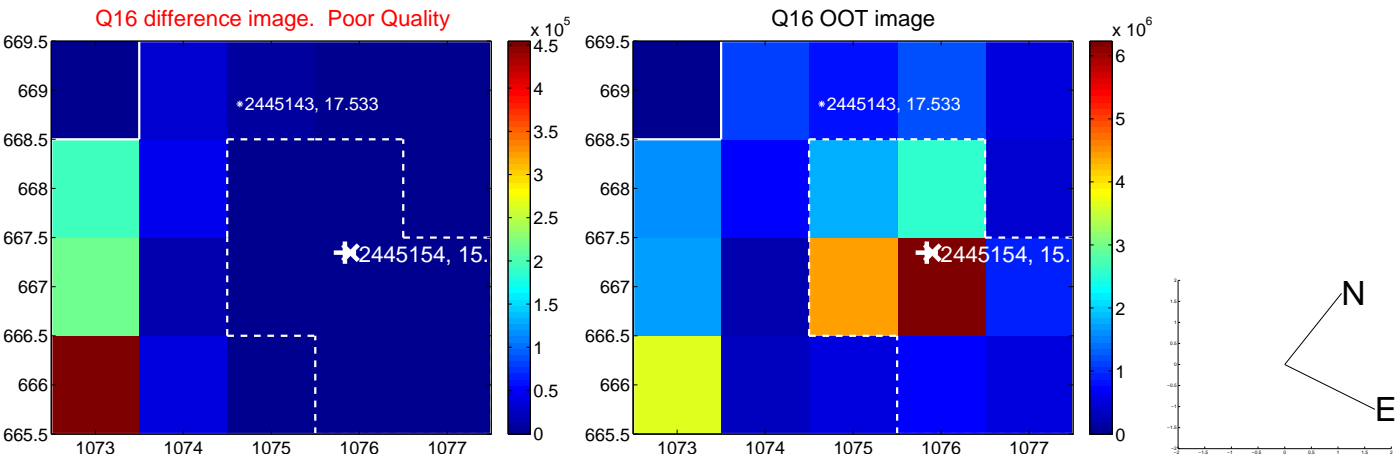
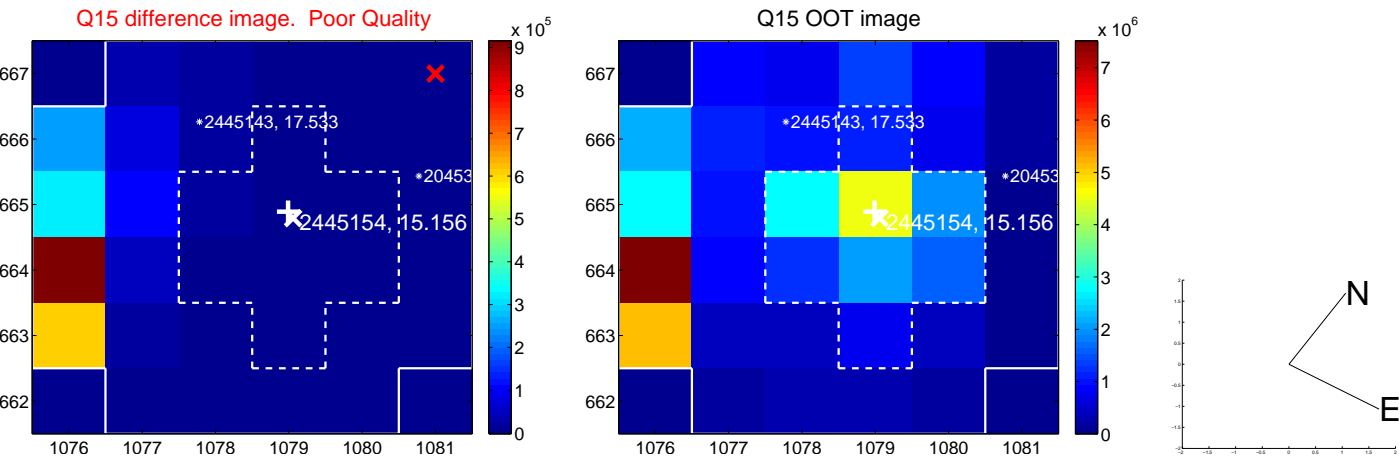
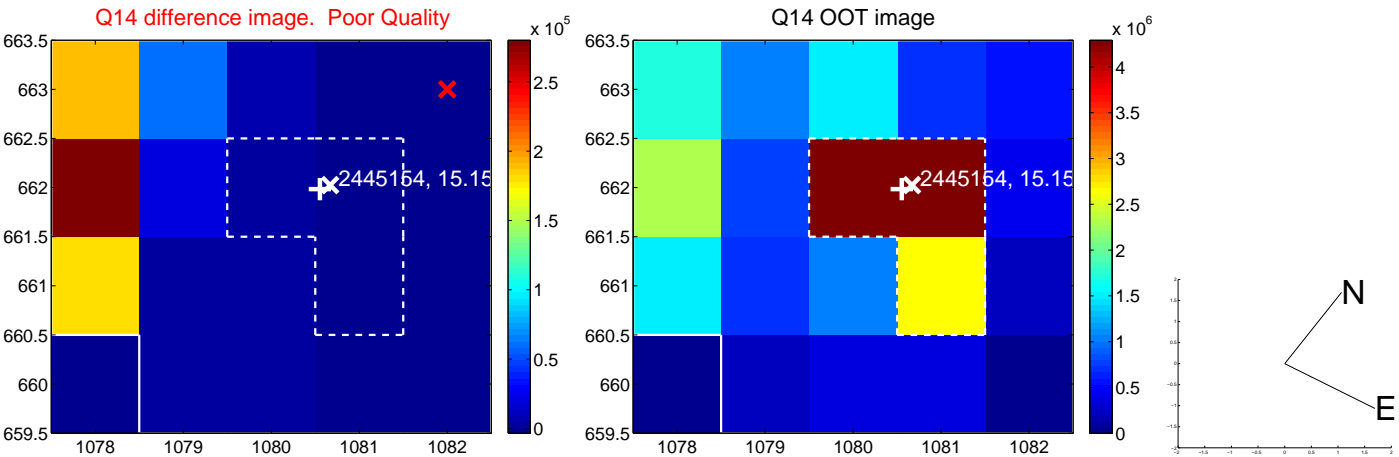
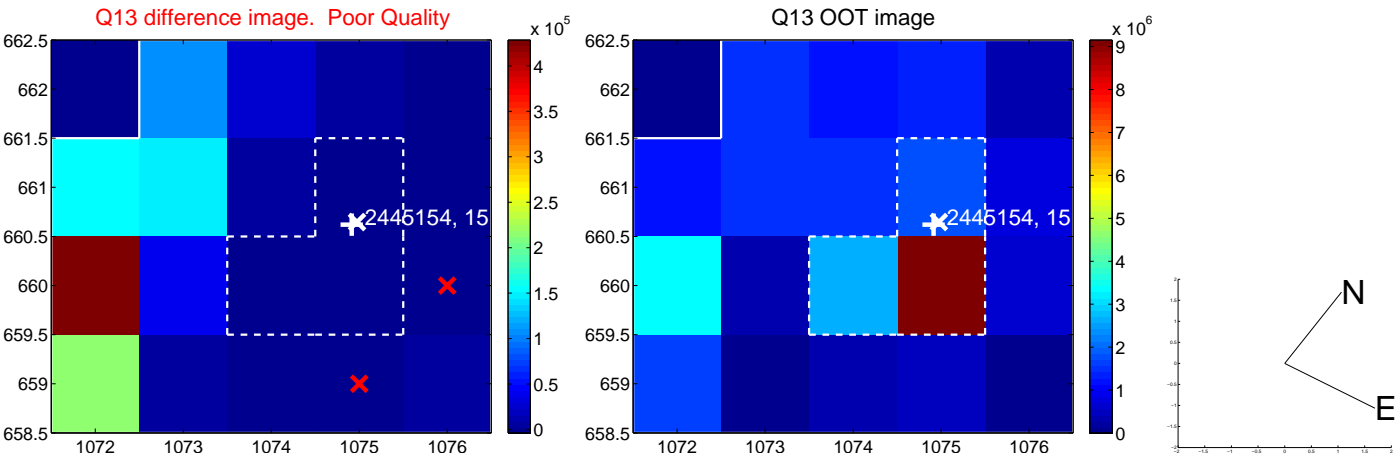
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

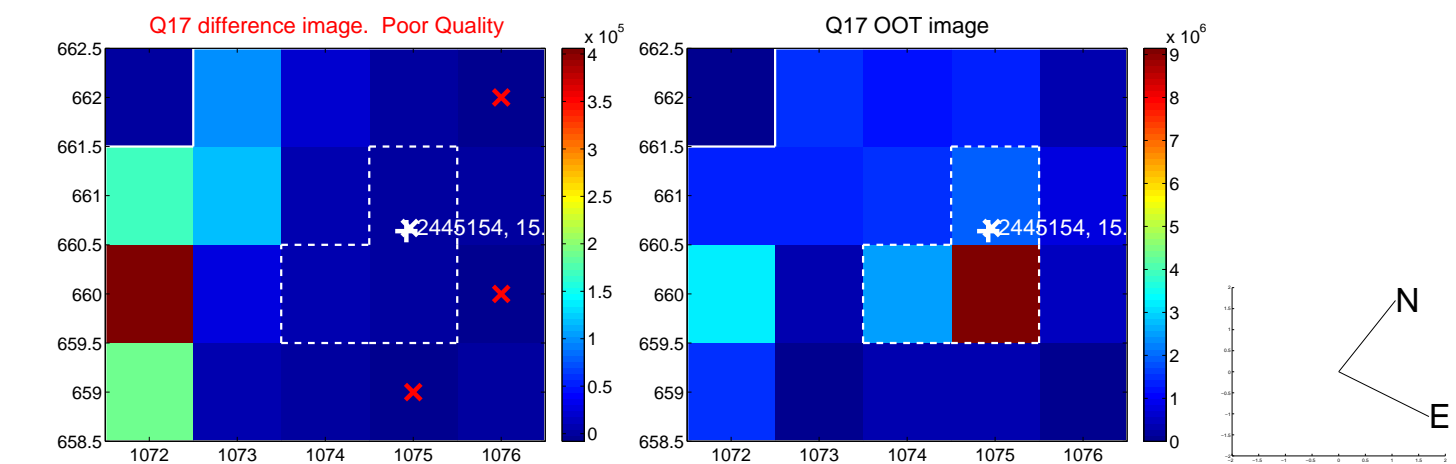


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

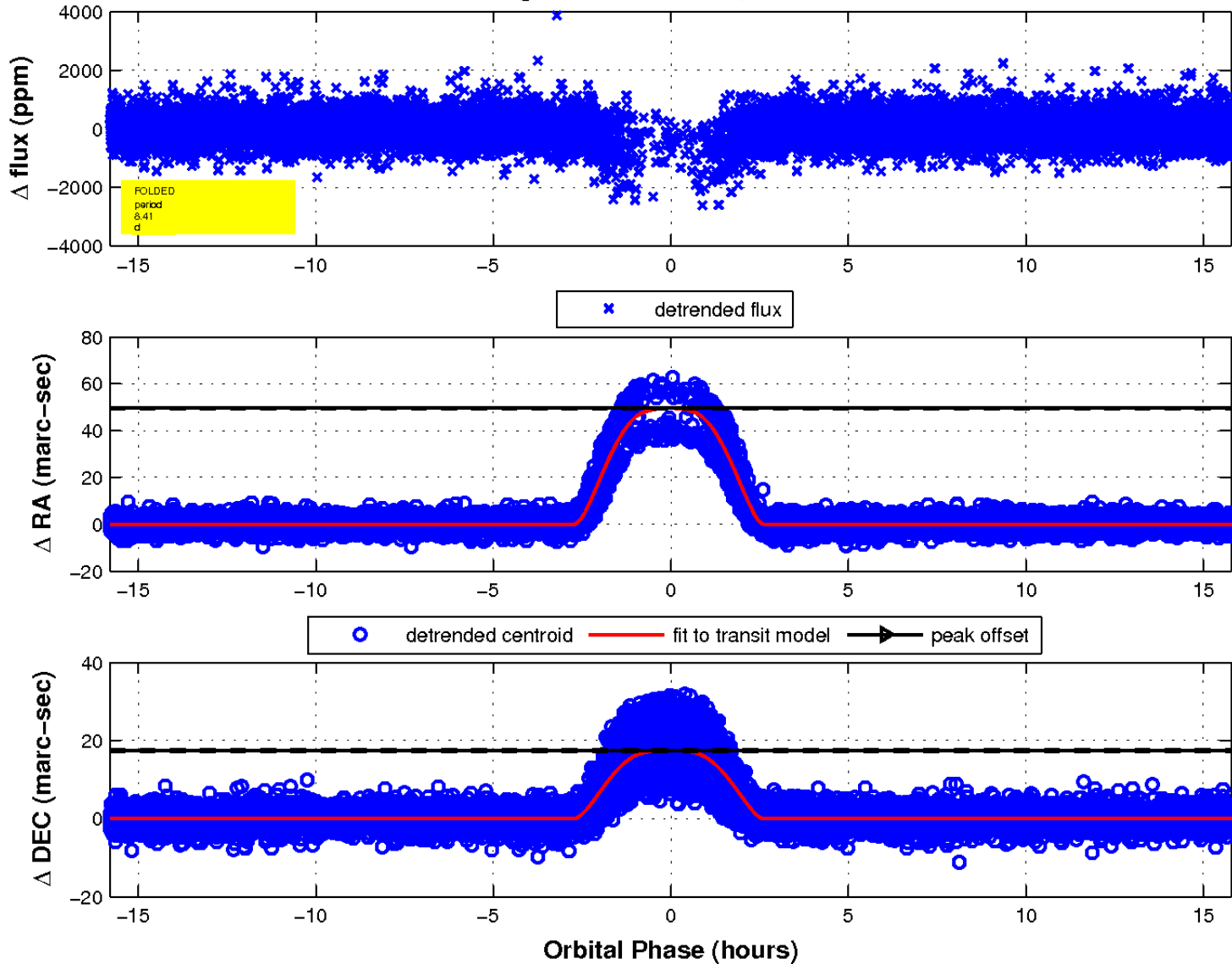




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

