

# KIC 007816665

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007816665-01	OBS	4227.01	4.292572	131.779440	362.7	3.178	13.8	15.4	0.96	6137	2.07	430.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007816665-01	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 007816665-01

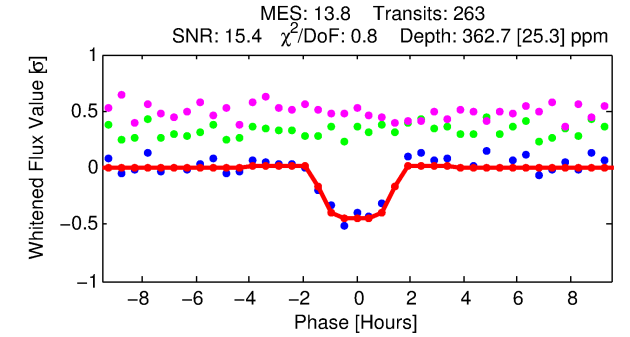
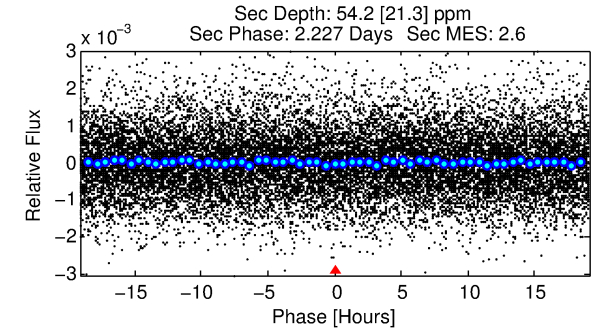
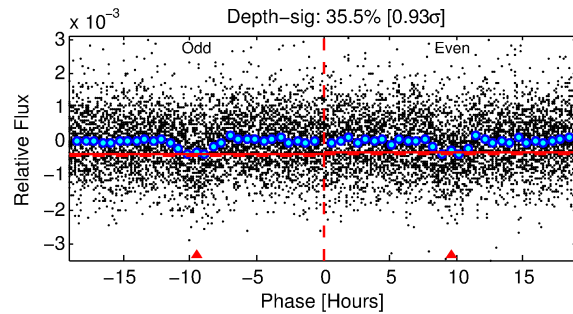
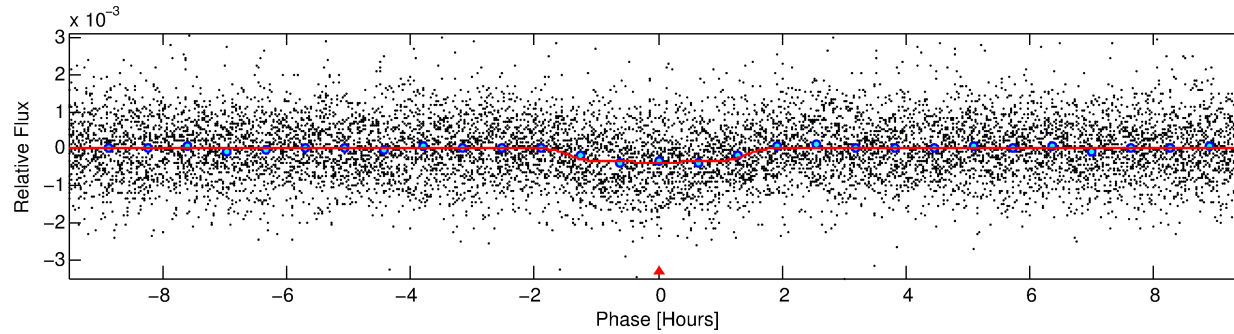
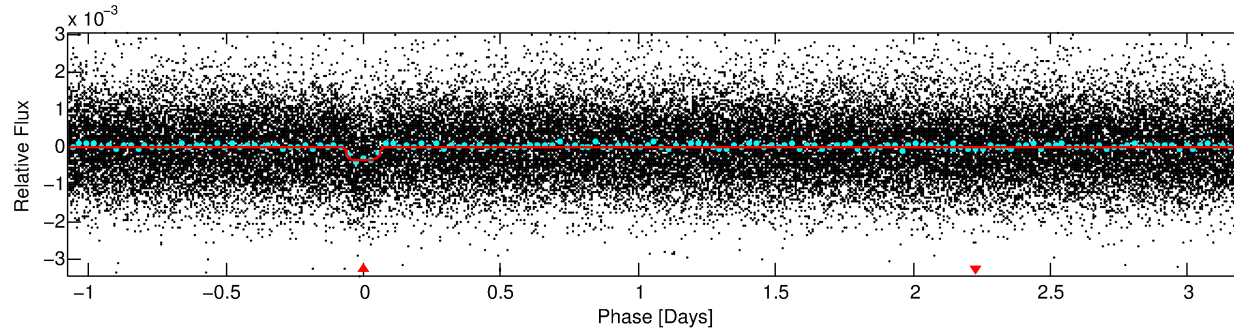
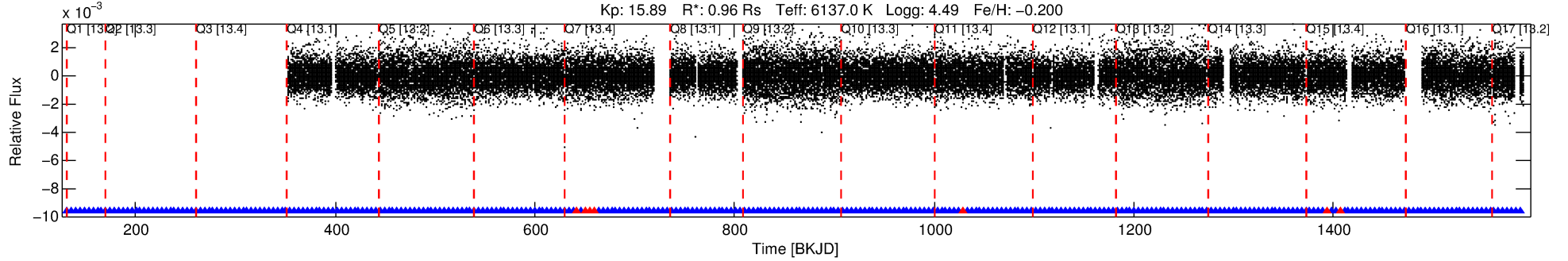
TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist (″)	$\Delta$ Row	$\Delta$ Col	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007816665-01	7816665	007816680-01	7816680	1:1	13.2	-3	2	15.57	15.88	378.97	Direct-PRF	0	0.37	0.41

**Notes:** P<sub>1</sub>:P<sub>2</sub> 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<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> 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: 7816665 Candidate: 1 of 1 Period: 4.293 d

KOI: K04227.01 Corr: 0.991



## DV Fit Results:

Period = 4.29257 [0.00002] d  
Epoch = 131.7794 [0.0037] BKJD  
Rp/R\* = 0.0197 [0.0087]  
a/R\* = 6.07 [13.49]  
b = 0.84 [0.83]  
Seff = 430.04 [172.89]  
Teq = 1161 [117] K  
Rp = 2.07 [1.10] Re  
a = 0.0524 [0.0132] AU  
Ag = 19.13 [19.82] [0.91 $\sigma$ ]  
Teffp = 3755 [923] K [2.79 $\sigma$ ]

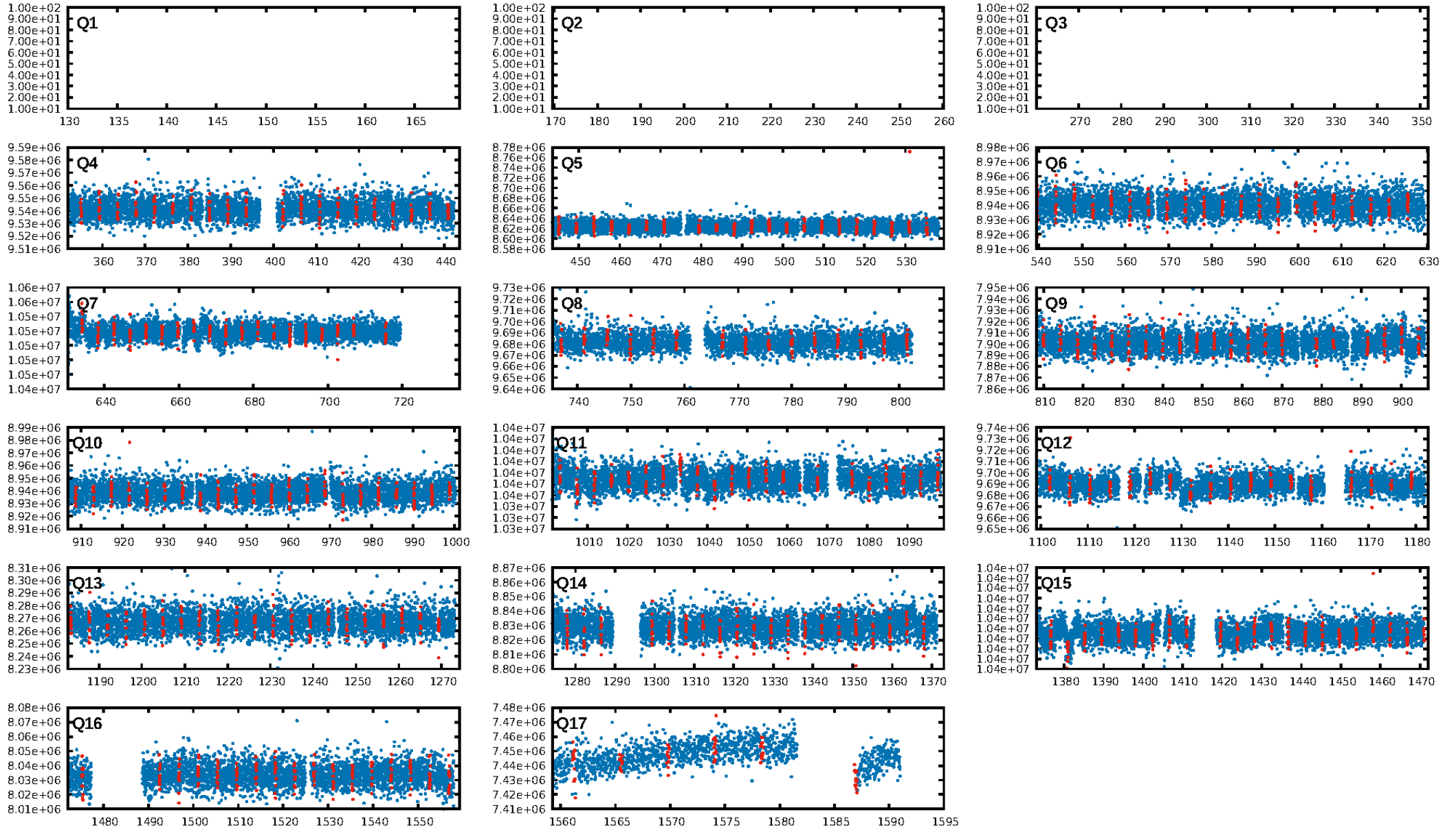
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.78e-43  
RollingBand-fgt: 0.97 [250/257]  
GhostDiagnostic-chr: -0.3692  
Centroid-sig: 0.0%  
Centroid-so: 23.989 arcsec [40.80 $\sigma$ ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [14/14]

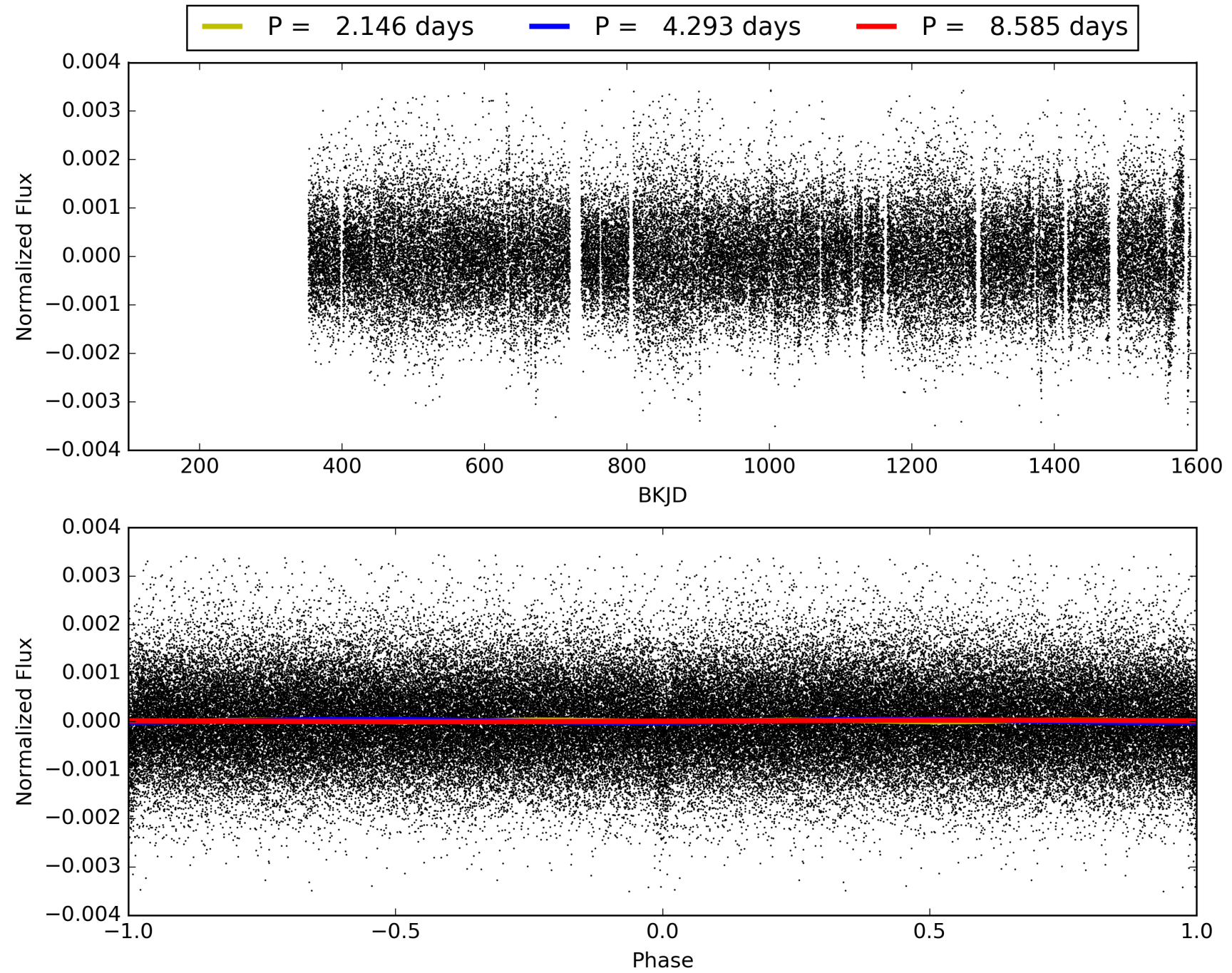
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:48:26 Z

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

# TCE 007816665-01, PDC Light Curves

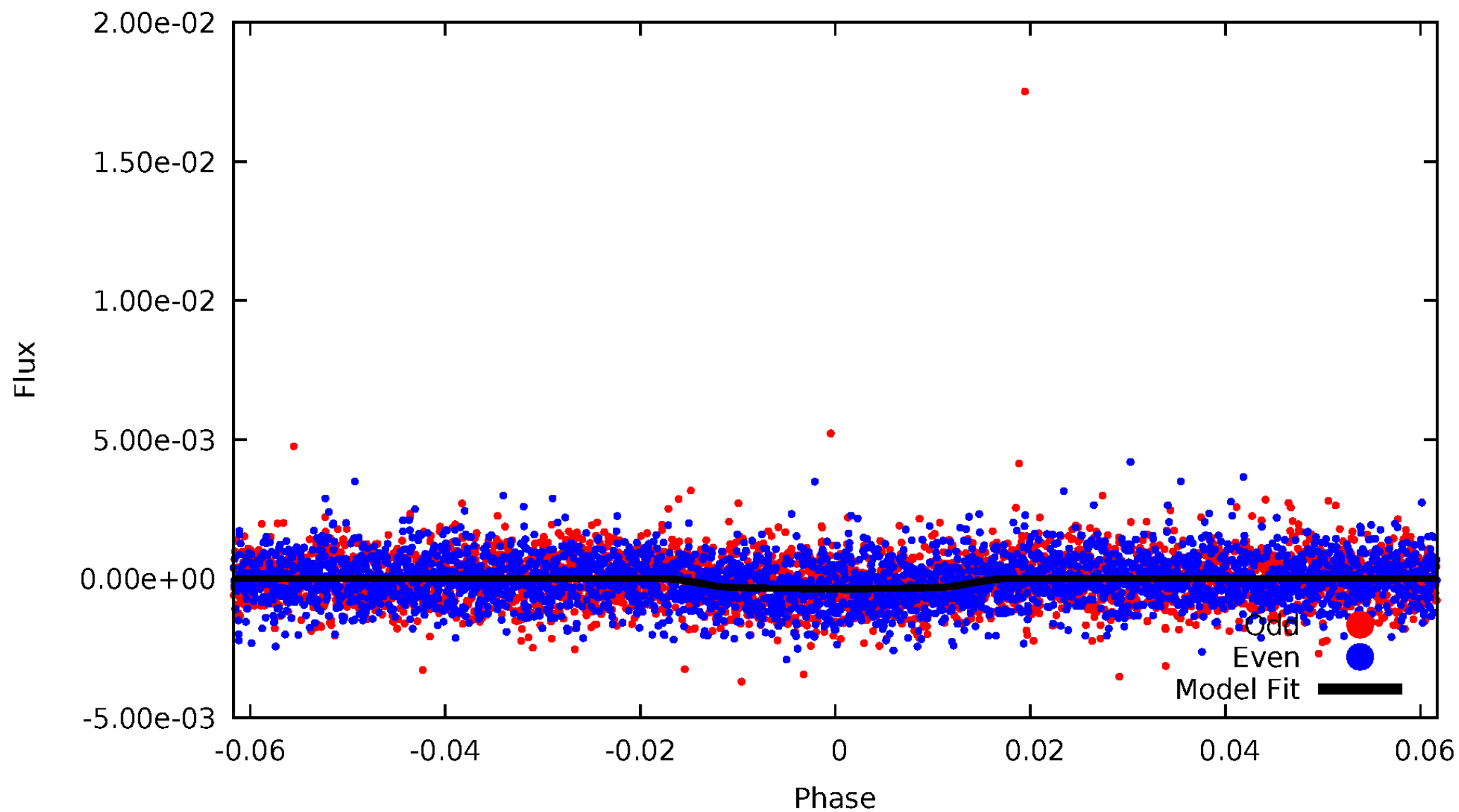


TCE 007816665-01



# DV Odd/Even

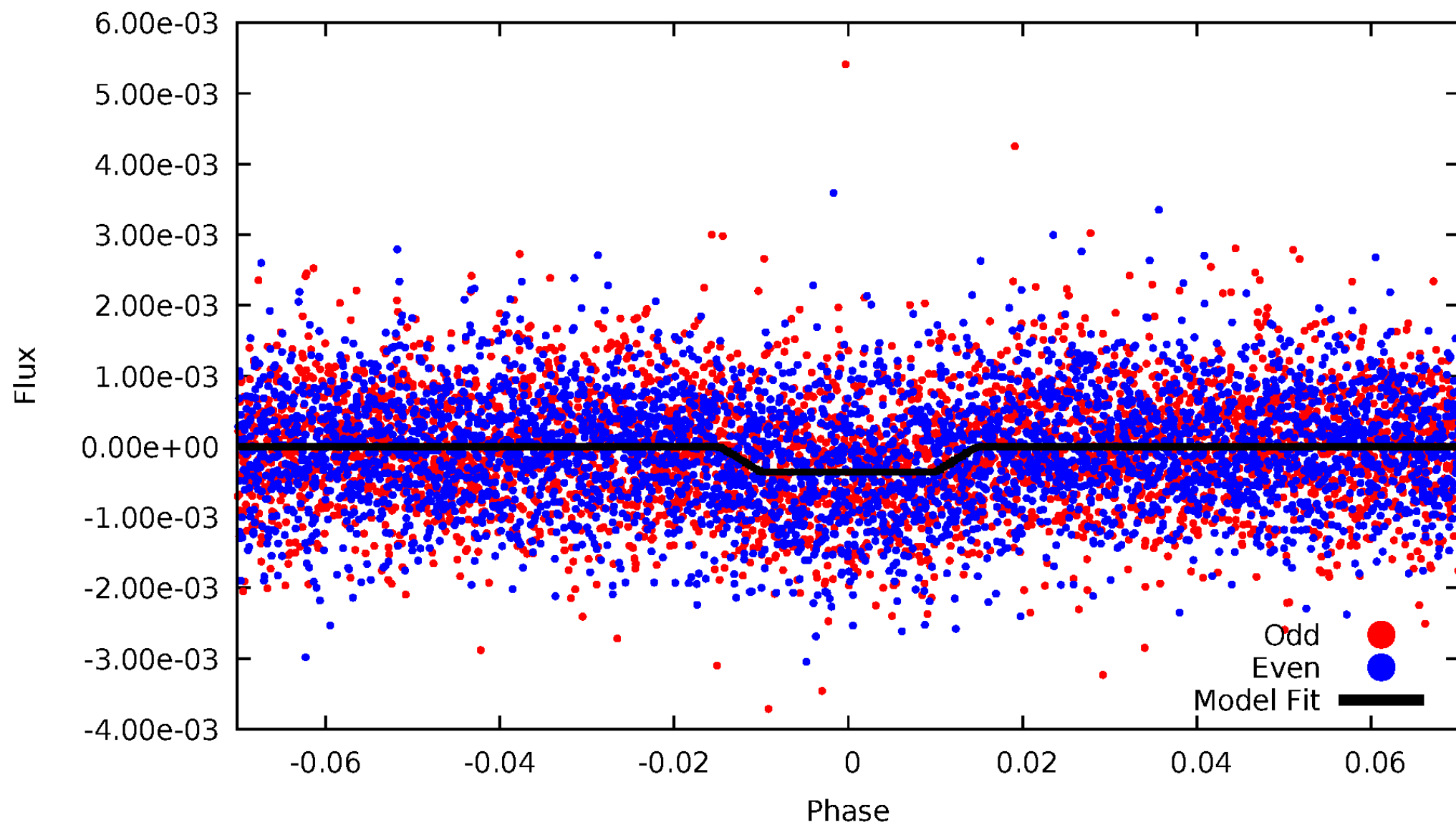
TCE 007816665-01





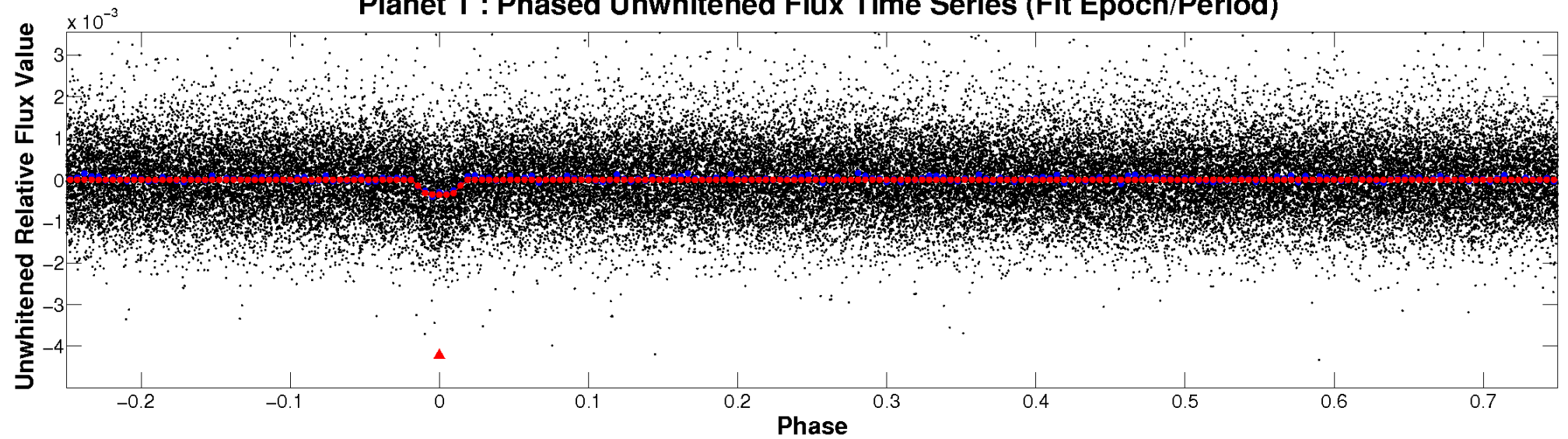
# ALT Odd/Even

TCE 007816665-01

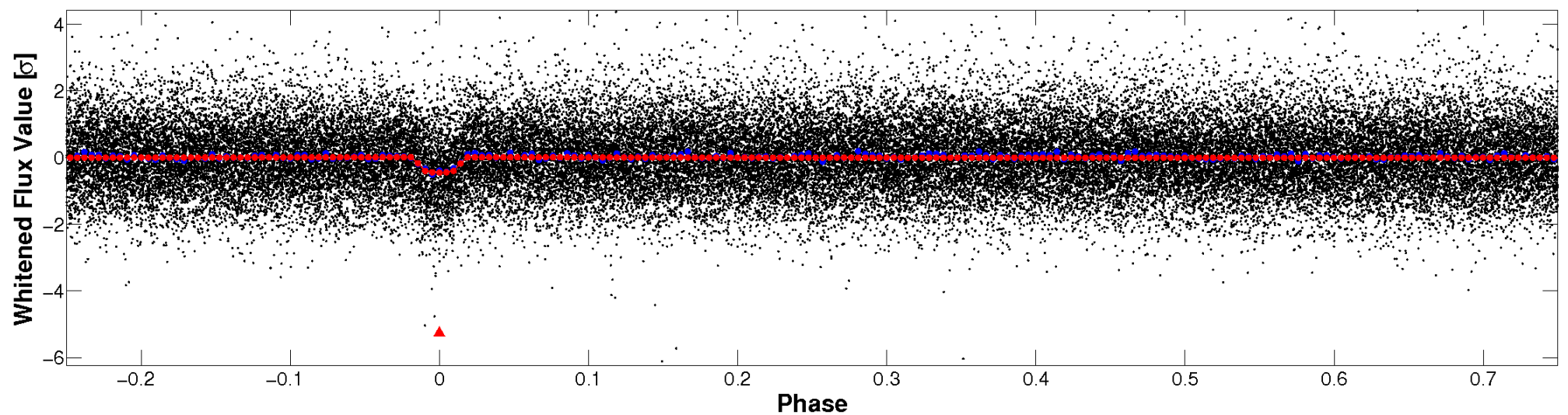


# Non-Whitened Vs. Whitened Light Curve

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

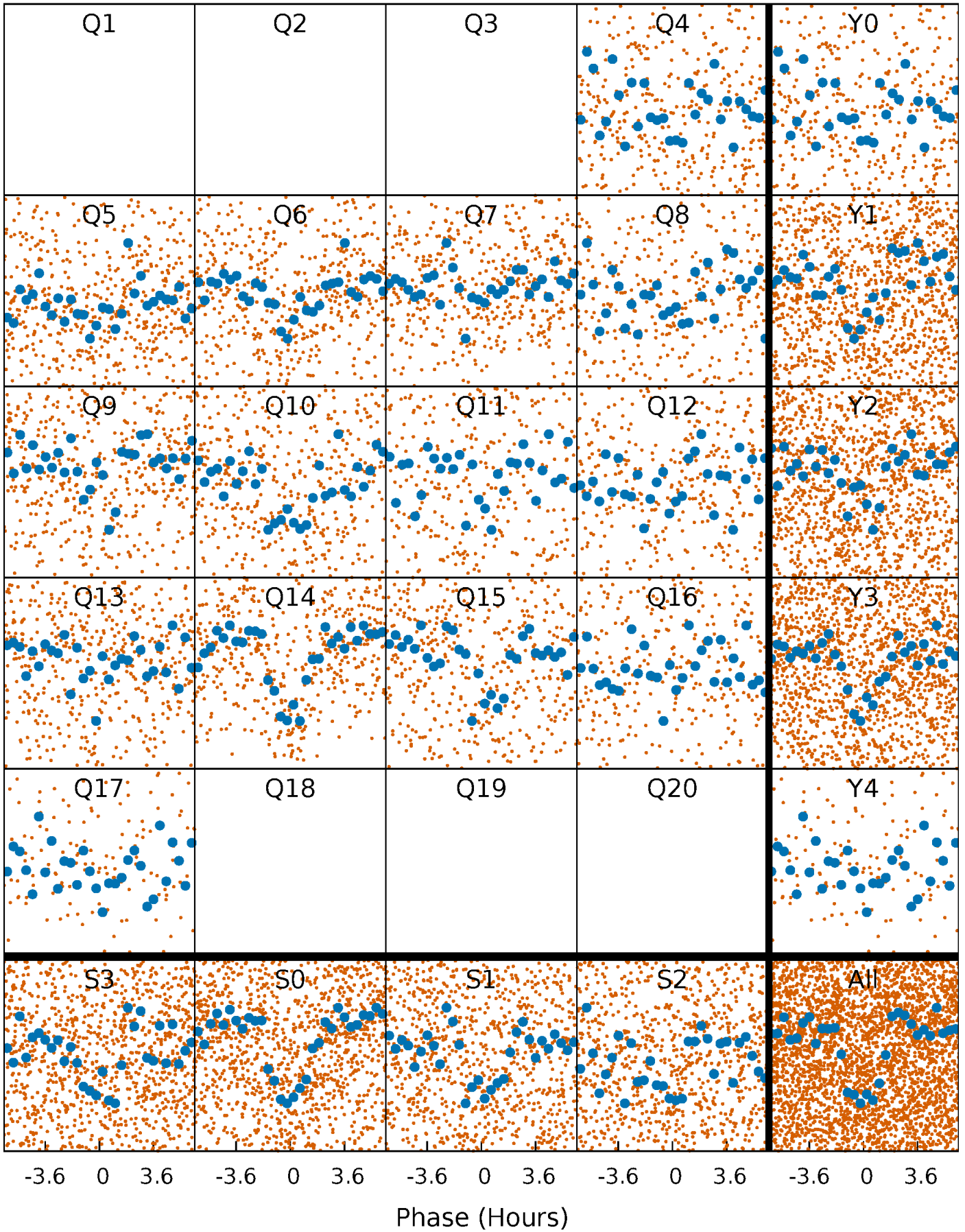


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

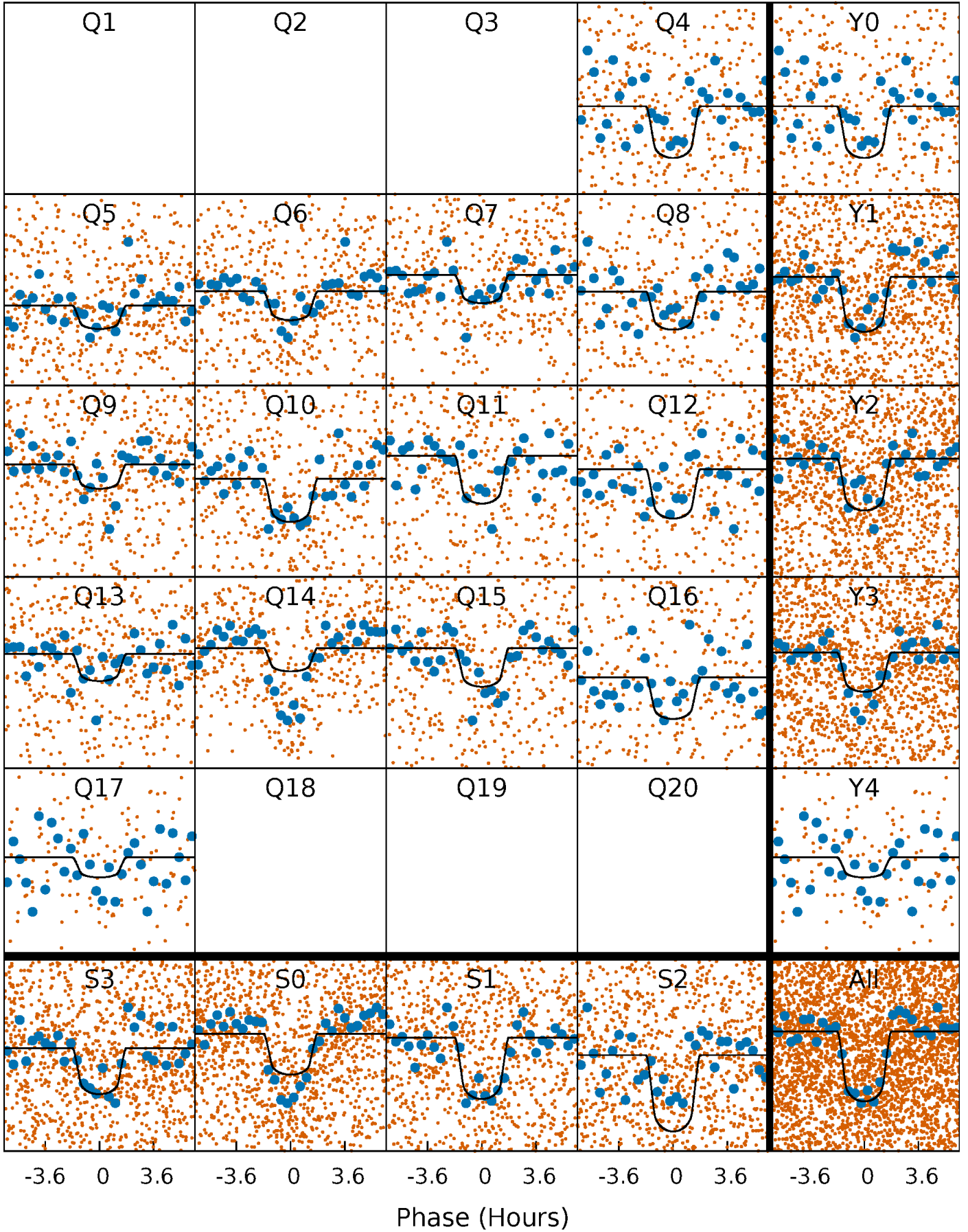
TCE 007816665-01 P= 4.292572 Days  $T_0=131.779440$  (BKJD)





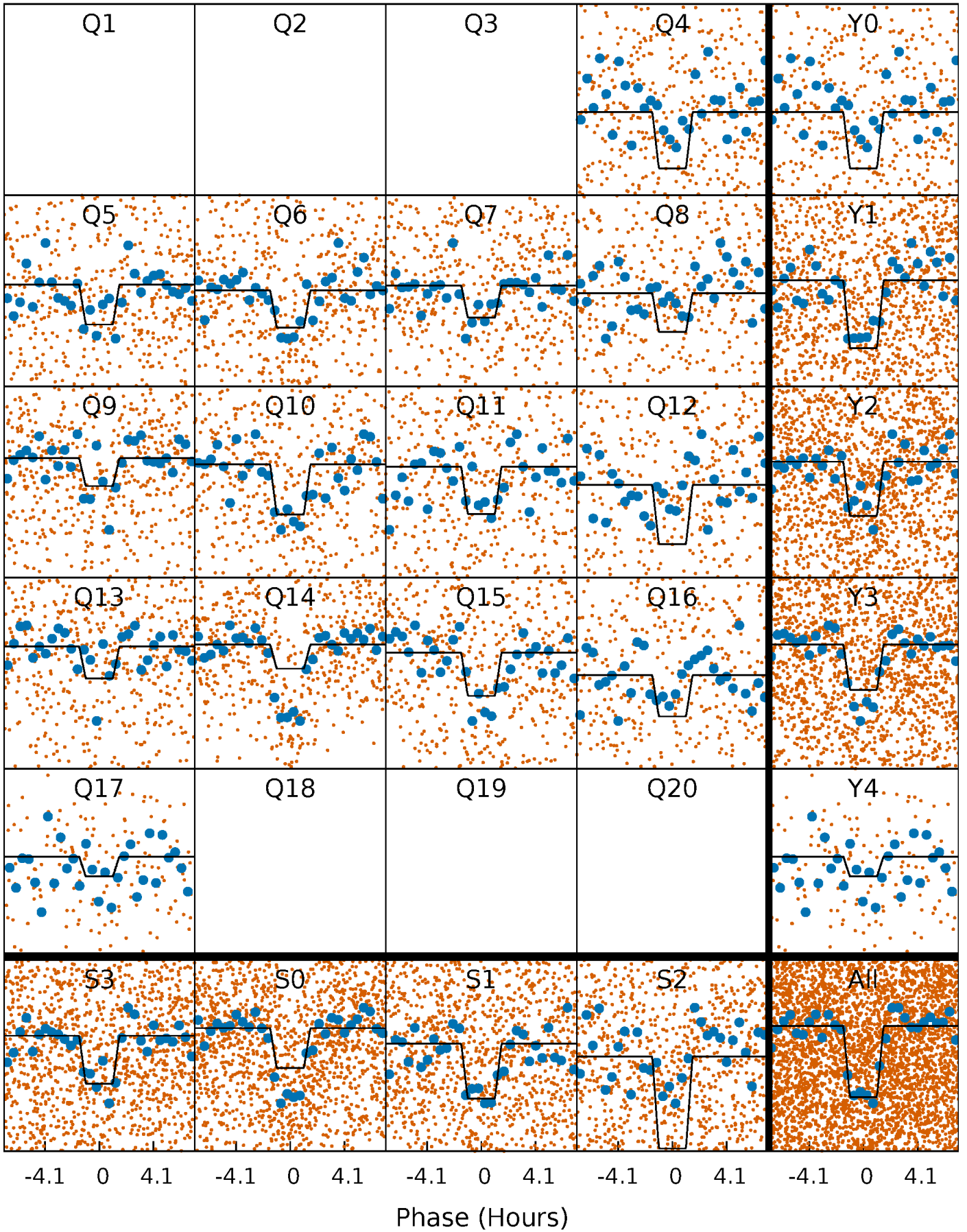
# DV Quarter-Phased Transit Curves

TCE 007816665-01   P= 4.292572 Days    $T_0=131.779440$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

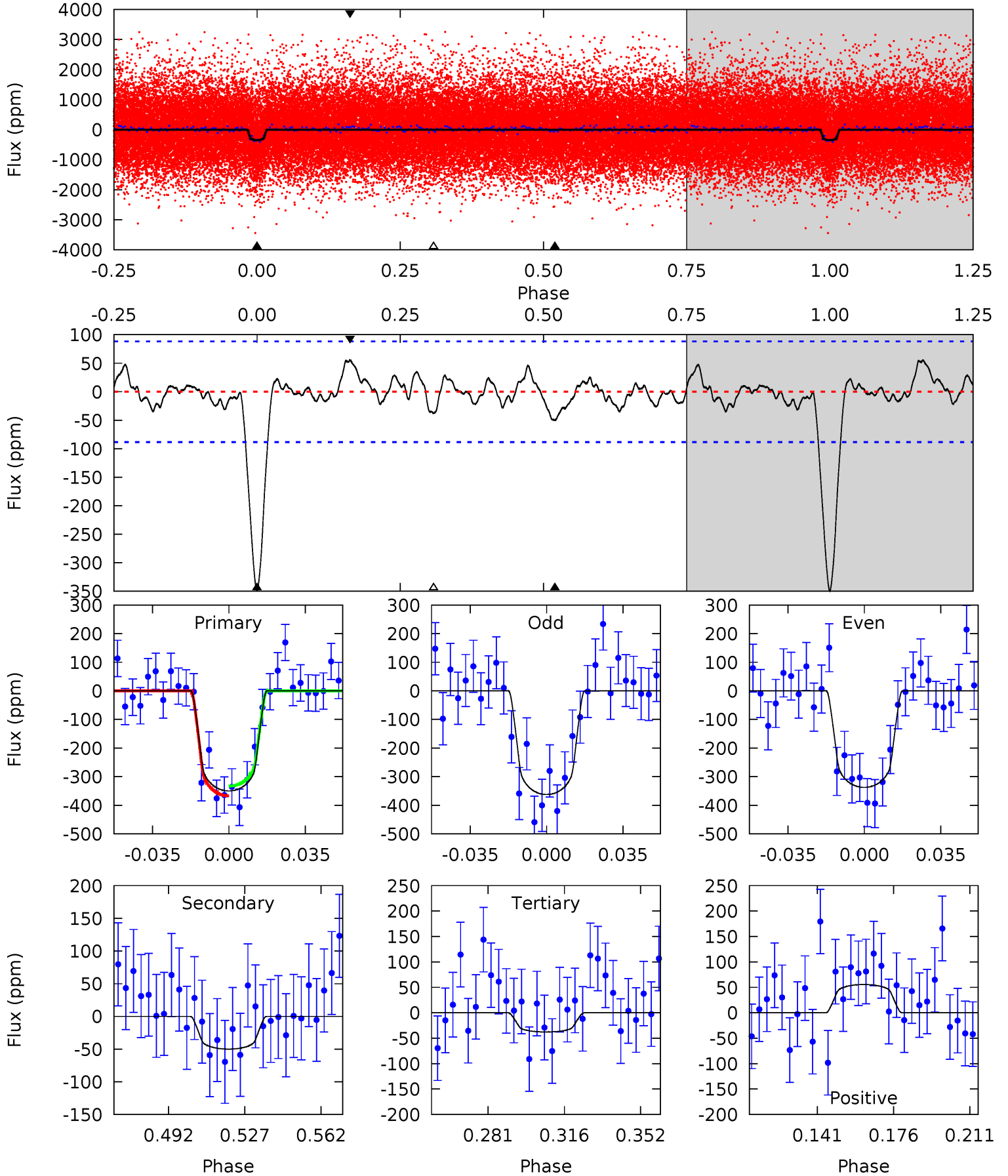
TCE 007816665-01 P= 4.292579 Days  $T_0=131.776603$  (BKJD)



# DV Model-Shift Uniqueness Test

007816665-01, P = 4.292572 Days, E = 131.779440 Days

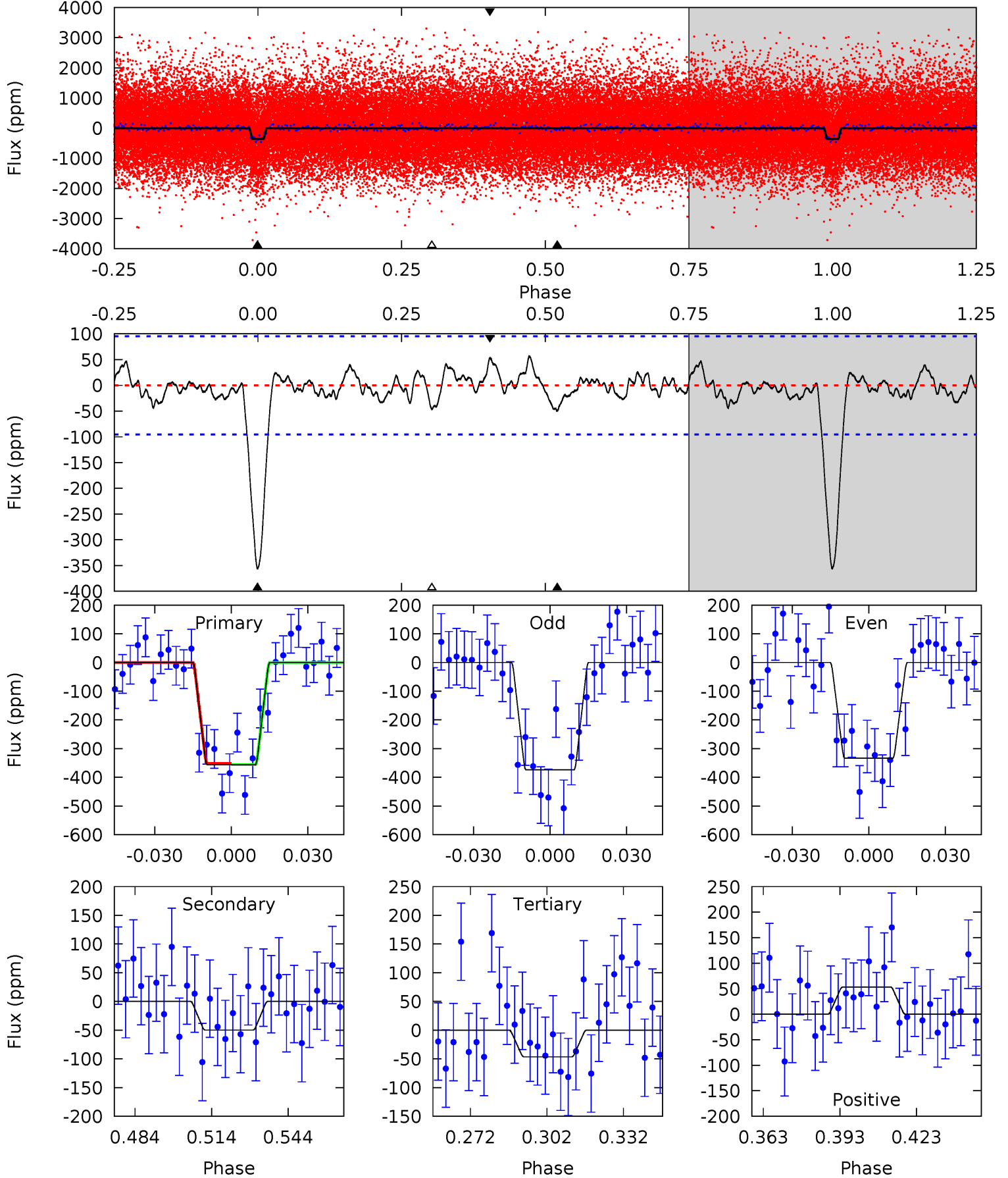
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	2.70	2.05	3.01	4.78	2.11	1.01	16.9	15.9	0.66	-0.30	0.68	0.98	0.14	0.92



# Alt Model-Shift Uniqueness Test

007816665-01, P = 4.292579 Days, E = 131.776603 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
18.0	2.51	2.34	2.68	4.81	2.17	0.98	15.6	15.3	0.17	-0.17	1.03	1.01	0.14	0.10





### Stellar Parameters For KIC 007816665

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6137^{+191}_{-255}$	$4.487^{+0.050}_{-0.200}$	$-0.200^{+0.300}_{-0.300}$	$0.963^{+0.288}_{-0.096}$	$1.038^{+0.139}_{-0.139}$	$1.638^{+0.427}_{-0.813}$
	+3%/-4%	+1%/-4%	+150%/-150%	+30%/-10%	+13%/-13%	+26%/-50%
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 007816665-01 / KOI 4227.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-50 \pm 18$	$2.20^{+1.02}_{-0.97}$	$1654^{+119}_{-88}$	$3930^{+933}_{-556}$	$15^{+31}_{-9}$
Alt.	$-50 \pm 20$	$2.11^{+1.00}_{-0.88}$	$1658^{+112}_{-87}$	$3966^{+984}_{-587}$	$15^{+32}_{-9}$

$T_{max}$  = 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

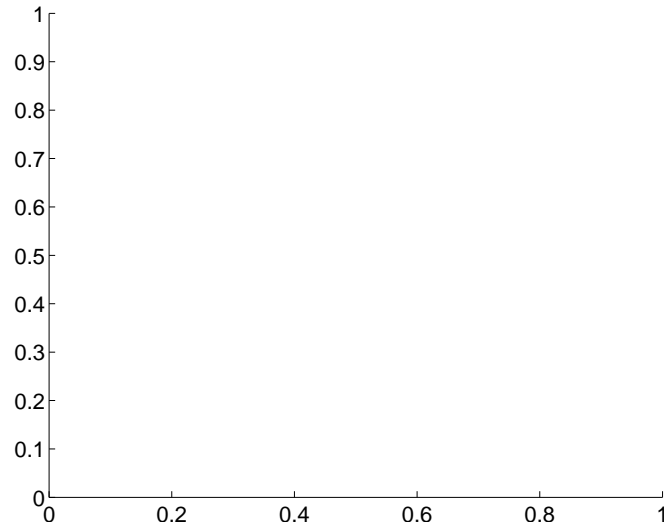
Supplemental centroid analysis for 007816665-01. Kepler magnitude: 15.89. Transit SNR 15.43

There are 0 quarters with good PRF difference image offsets

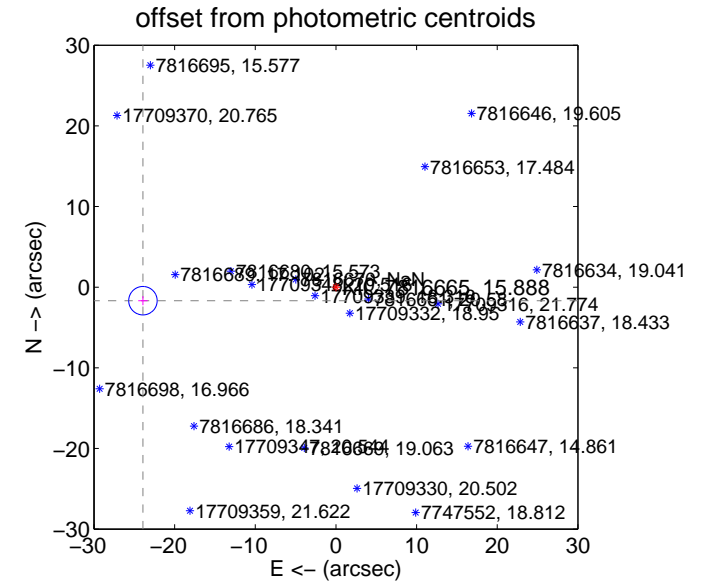
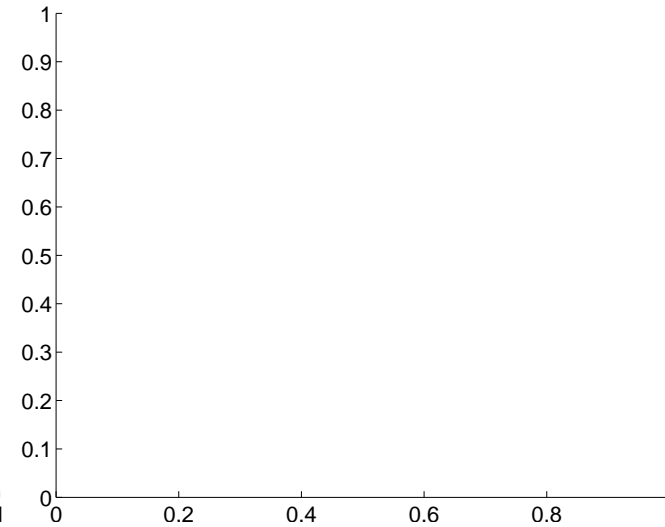
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$23.99 \pm 0.59$	40.80	$23.93 \pm 0.59$	$-1.68 \pm 0.56$

There is no PRF-fit offset from OOT-fit

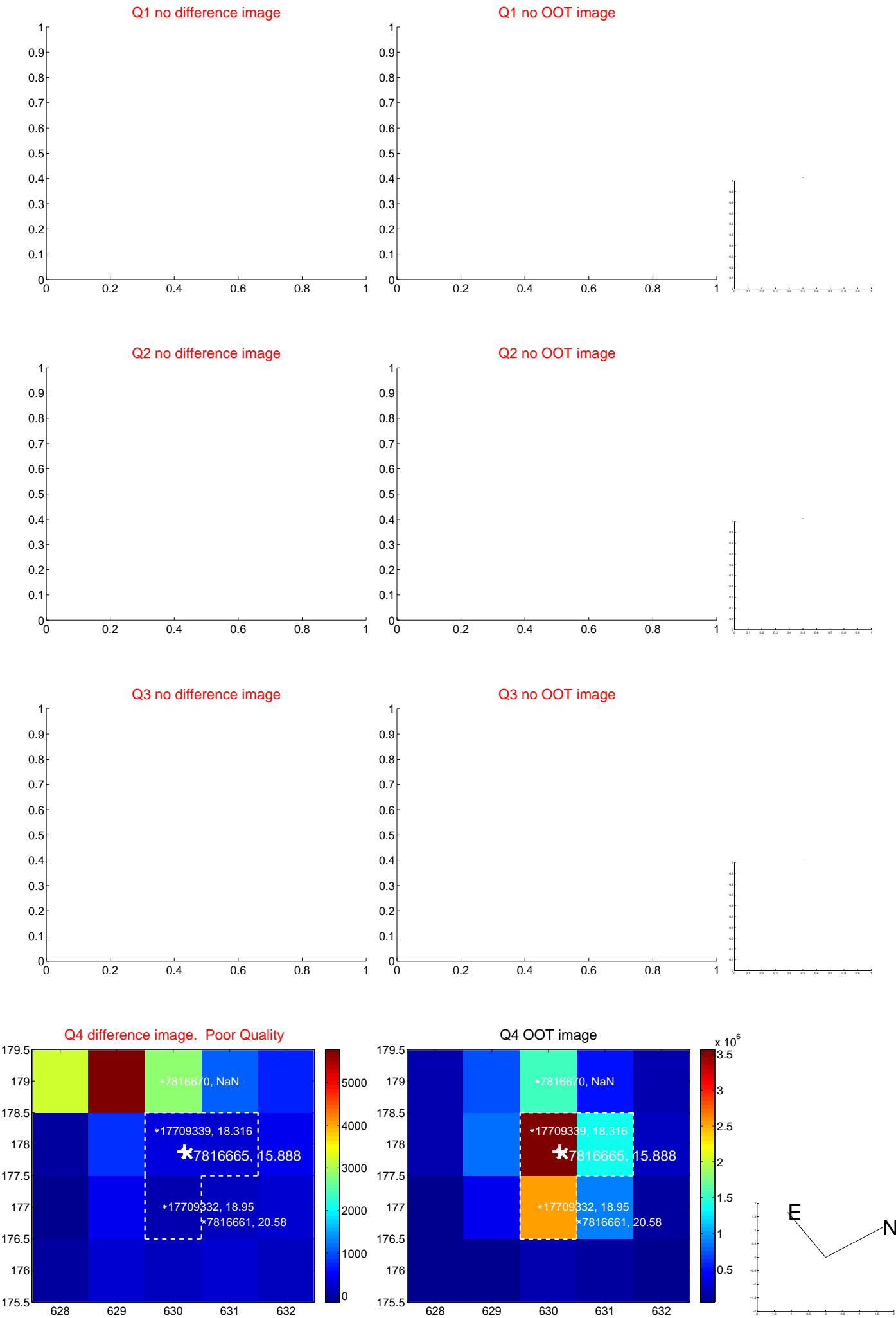


There is no PRF-fit offset from KIC

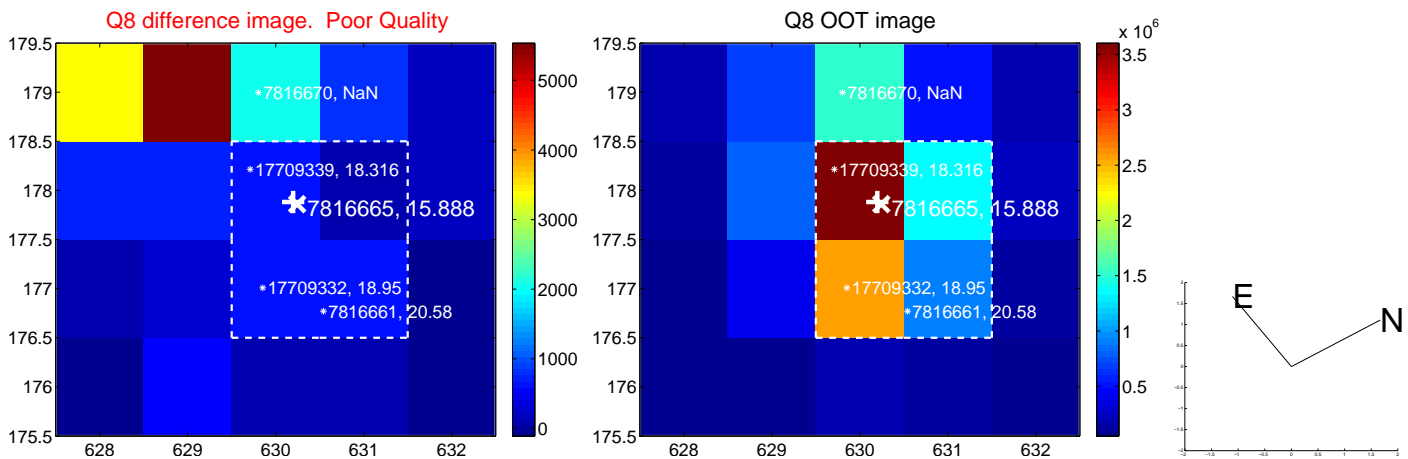
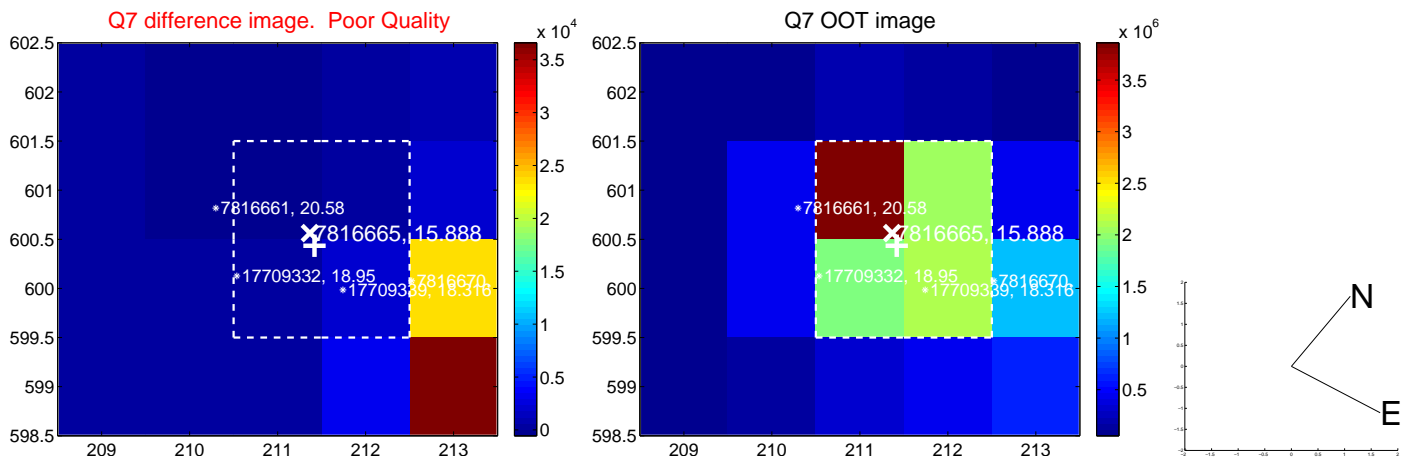
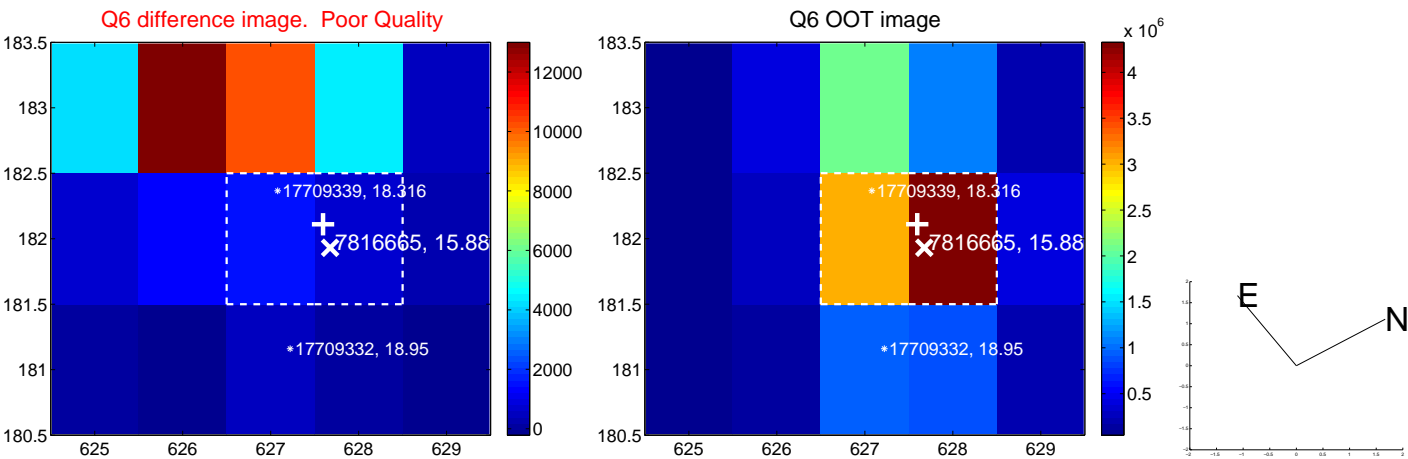
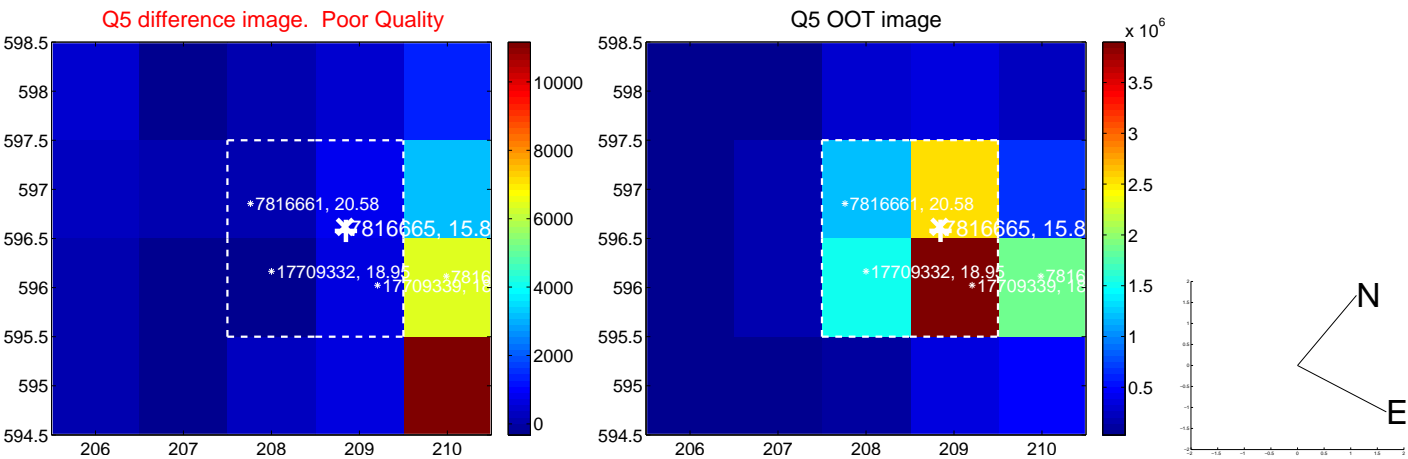


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

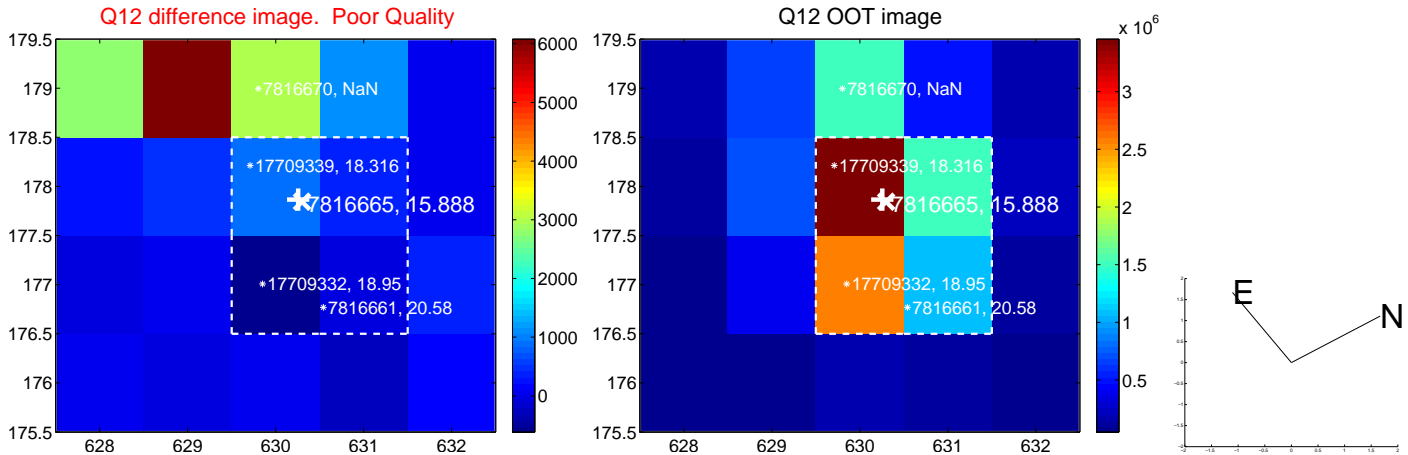
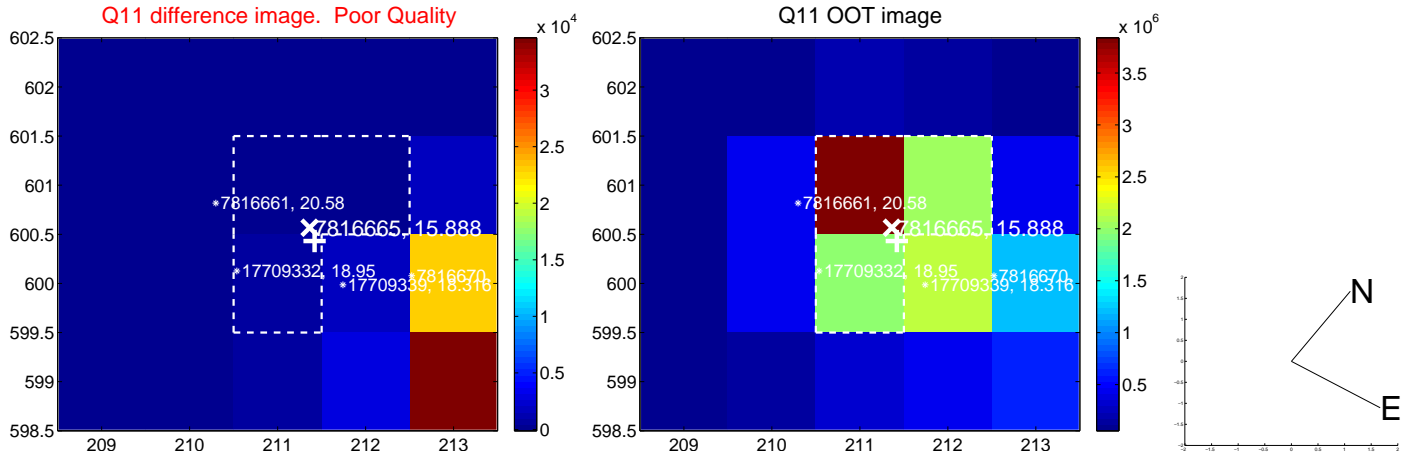
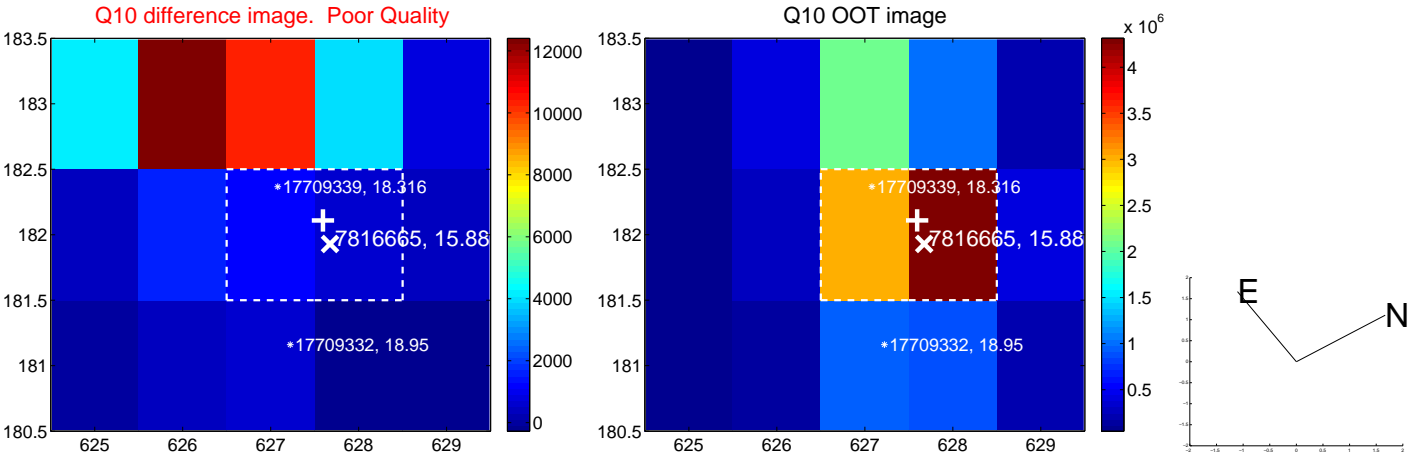
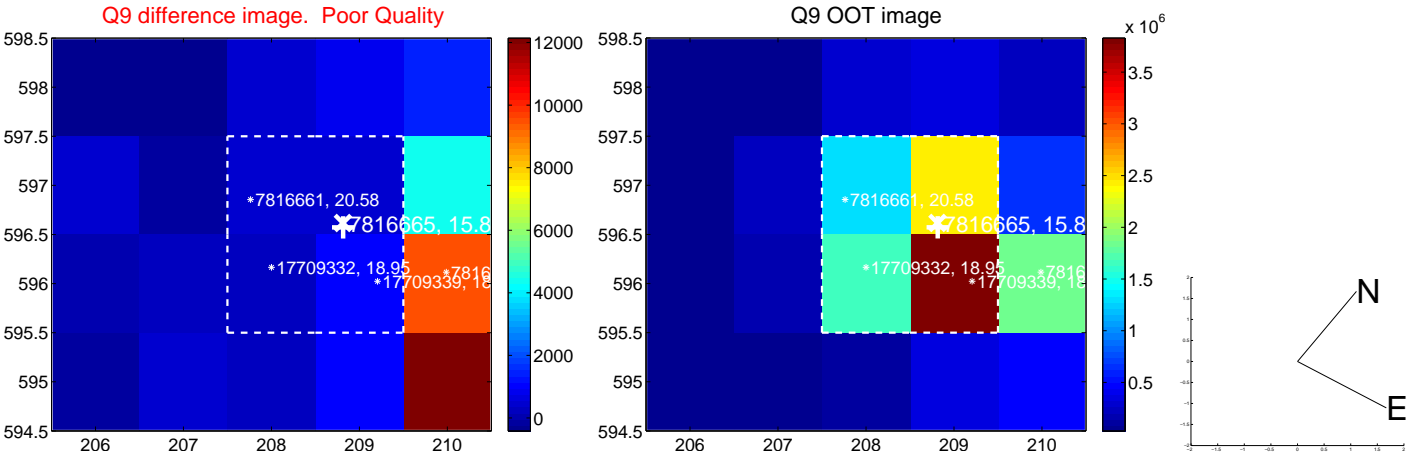


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

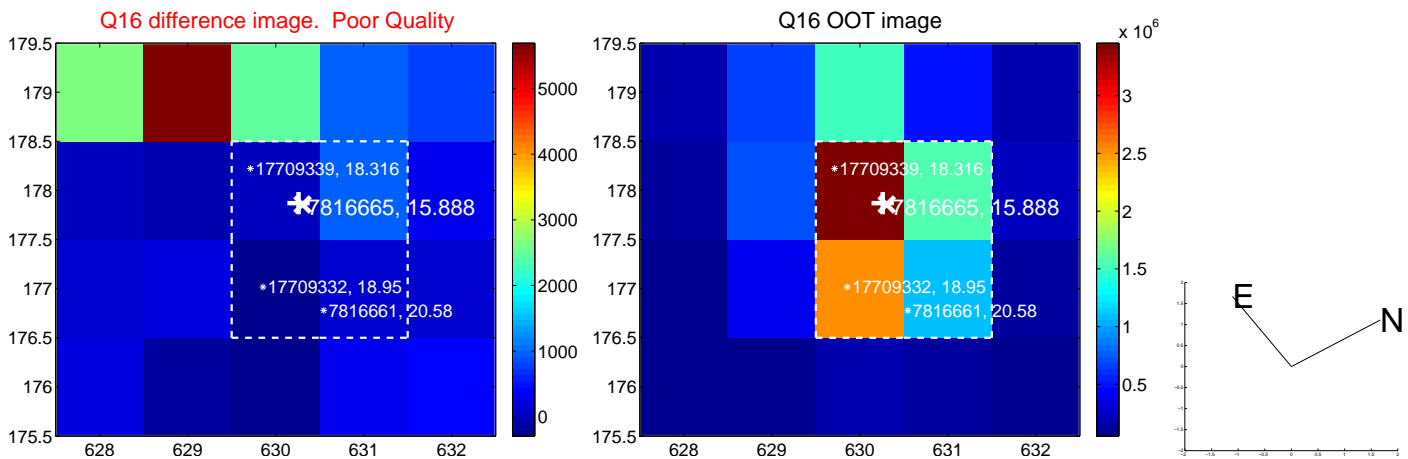
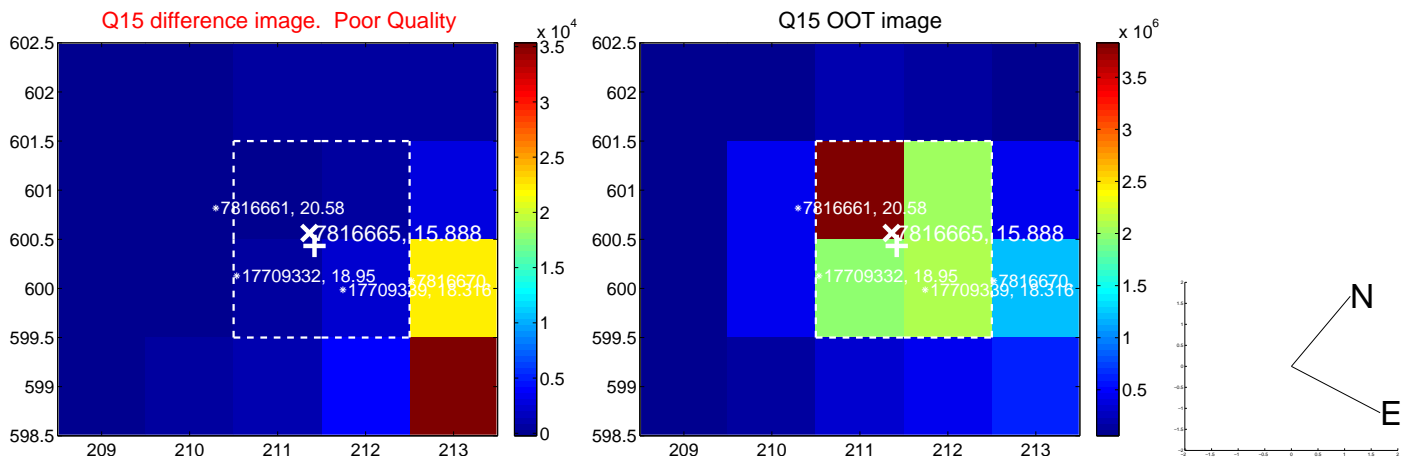
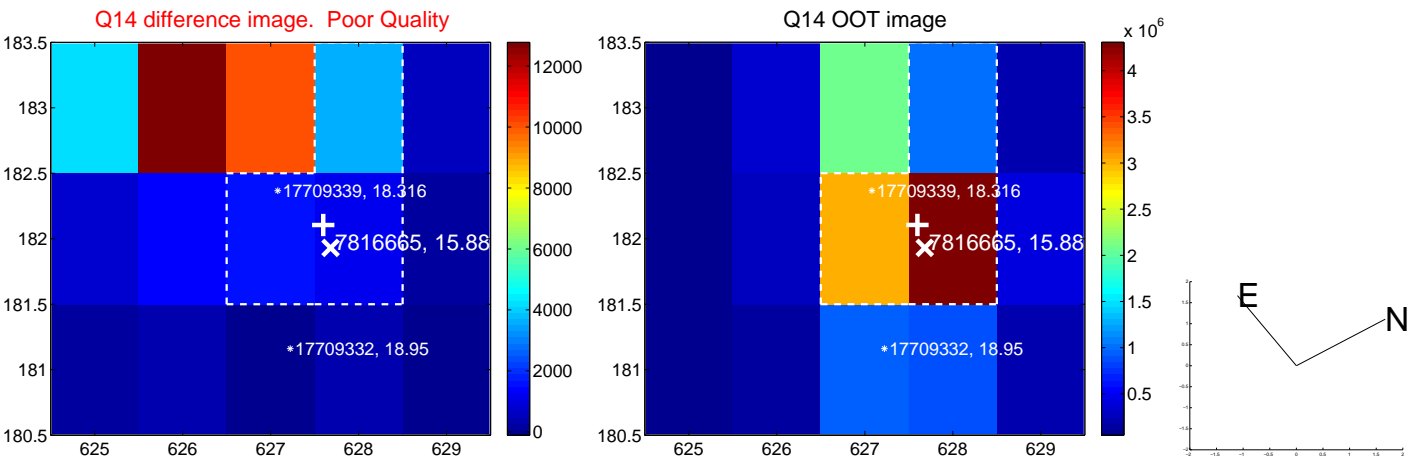
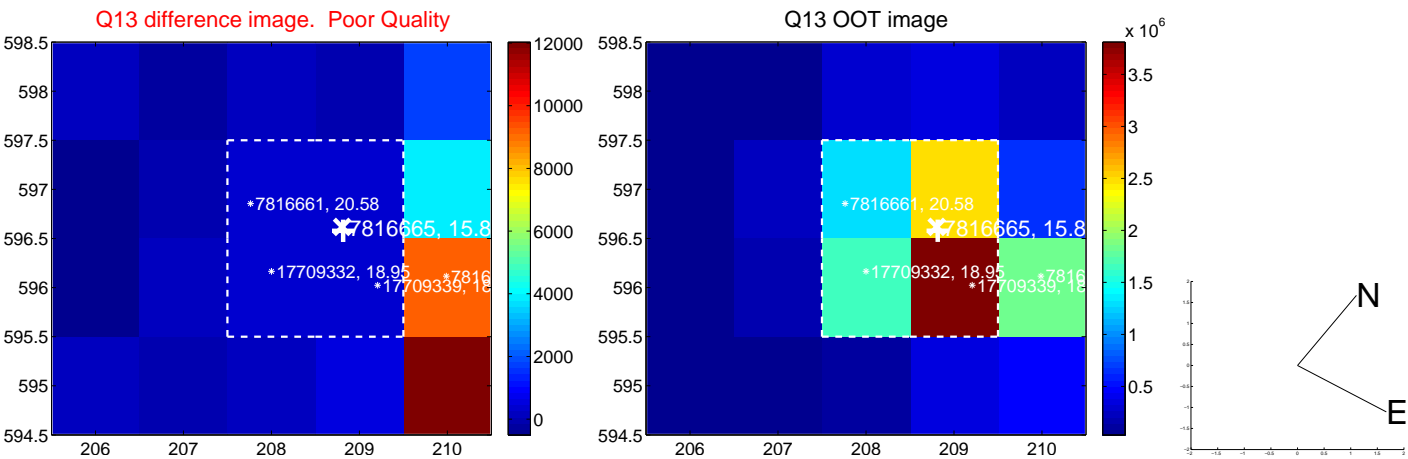




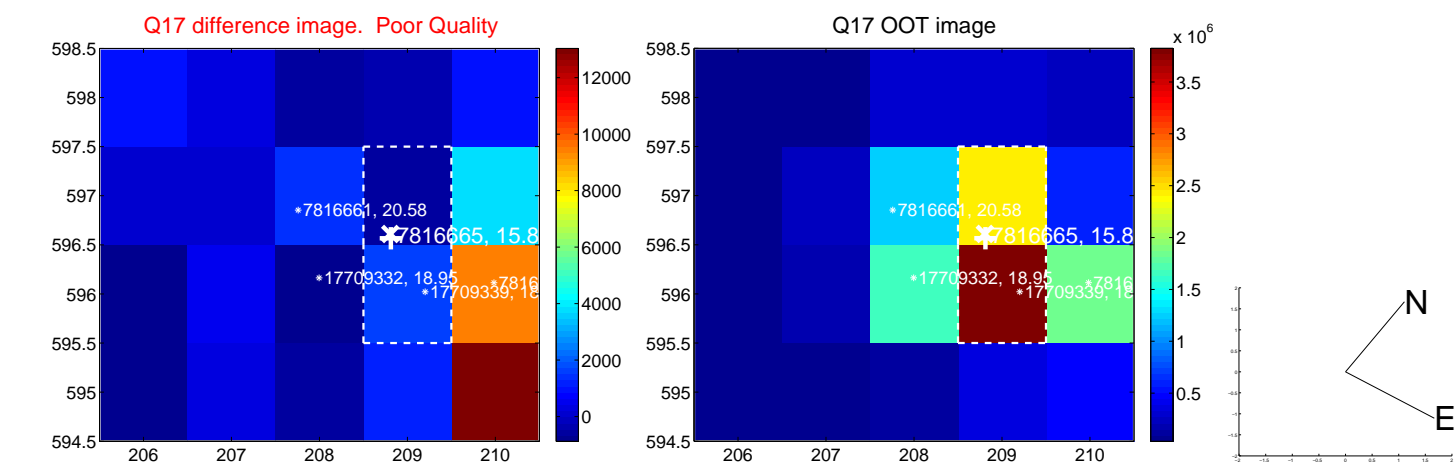
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



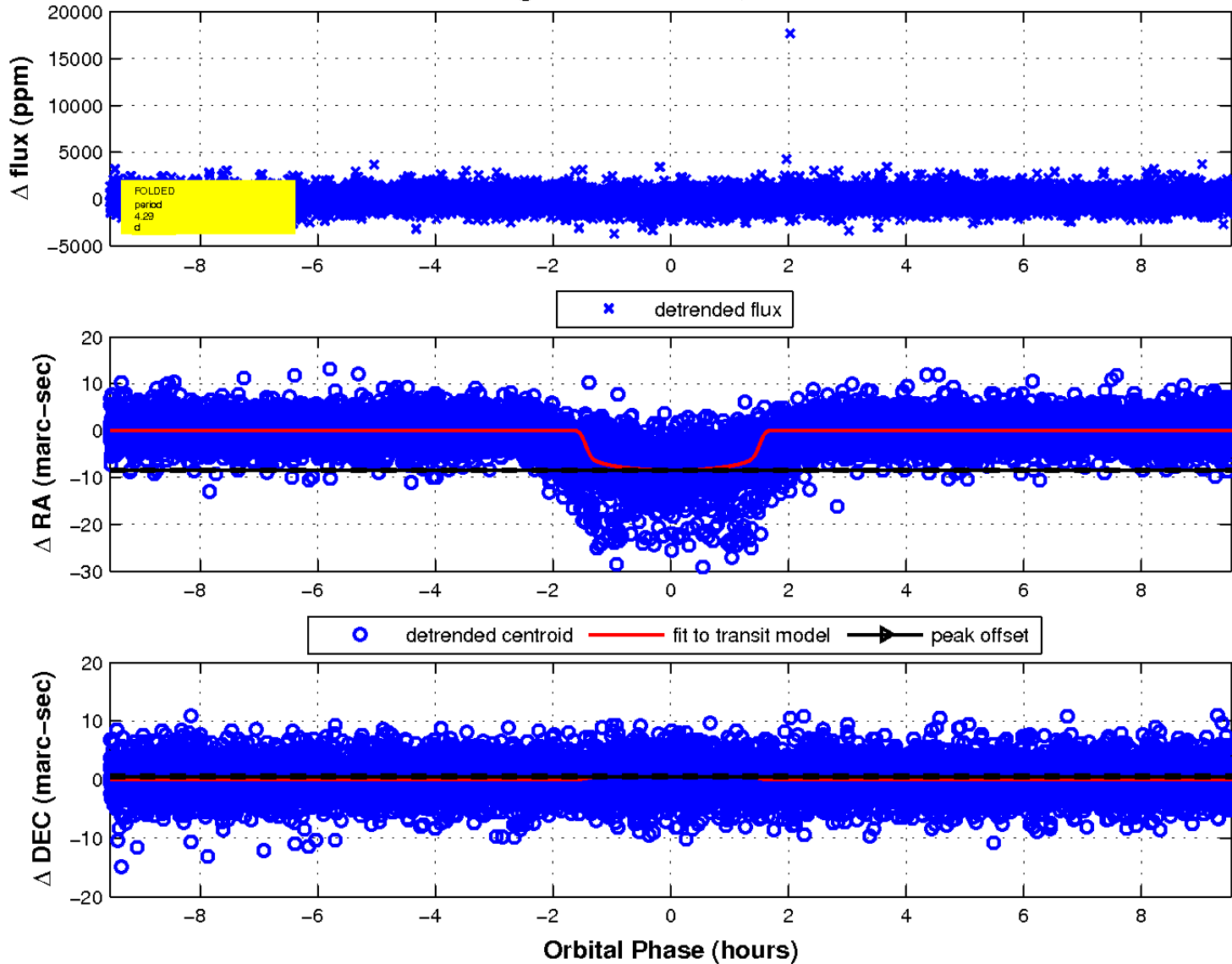
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

