

# KIC 010059645

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010059645-01	OBS	2520.01	6.494420	132.249994	362.3	2.104	14.8	16.4	0.74	4769	1.51	68.15

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010059645-01	OBS	PC	0.96	0	0	0	0	NO_COMMENT

**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.

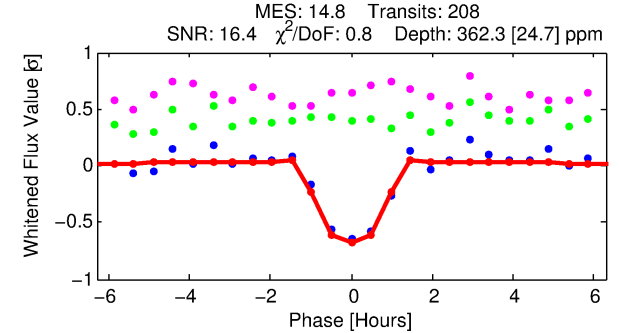
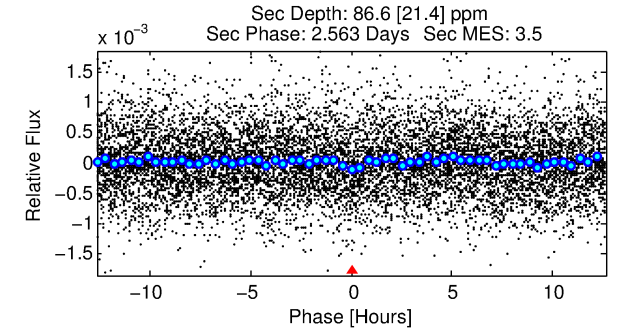
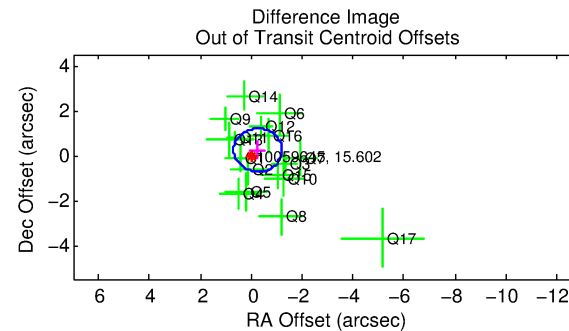
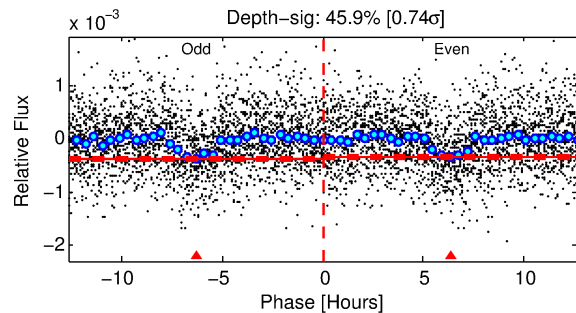
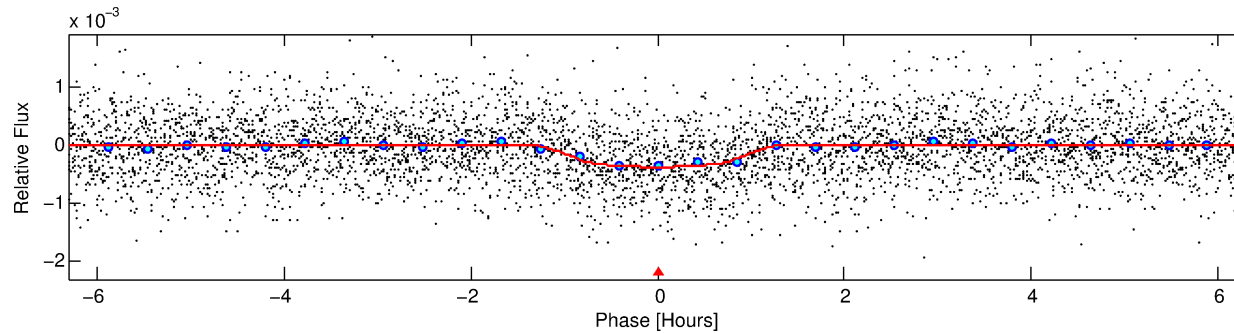
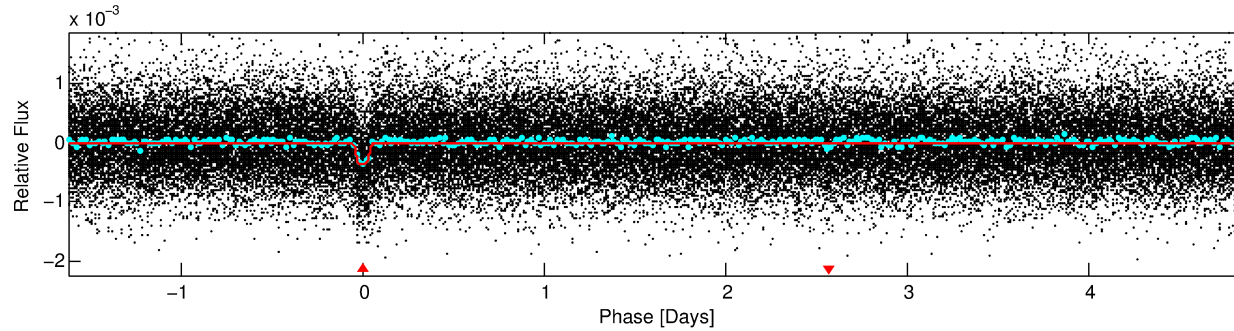
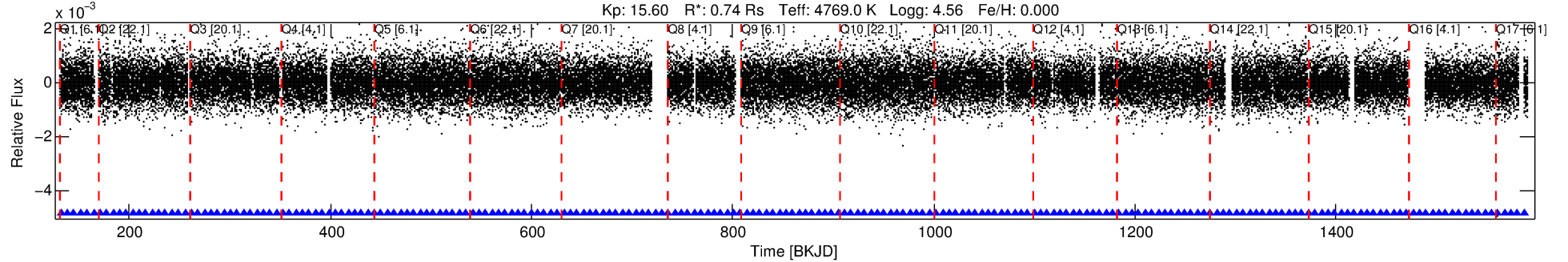
## Ephemeris Match Information For 010059645-01

No Significant Match Found

# DV One-Page Summary

KIC: 10059645 Candidate: 1 of 1 Period: 6.494 d  
KOI: K02520.01 Corr: 0.968

Kp: 15.60 R\*: 0.74 Rs Teff: 4769.0 K Logg: 4.56 Fe/H: 0.000



## DV Fit Results:

Period = 6.49442 [0.00002] d  
Epoch = 132.2500 [0.0027] BKJD  
Rp/R\* = 0.0187 [0.0158]  
a/R\* = 17.37 [47.54]  
b = 0.70 [2.03]  
Seff = 68.15 [11.41]  
Teq = 733 [31] K  
Rp = 1.51 [1.29] Re  
a = 0.0612 [0.0050] AU  
Ag = 77.90 [133.49] [0.58σ]  
Teffp = 3365 [1442] K [1.83σ]

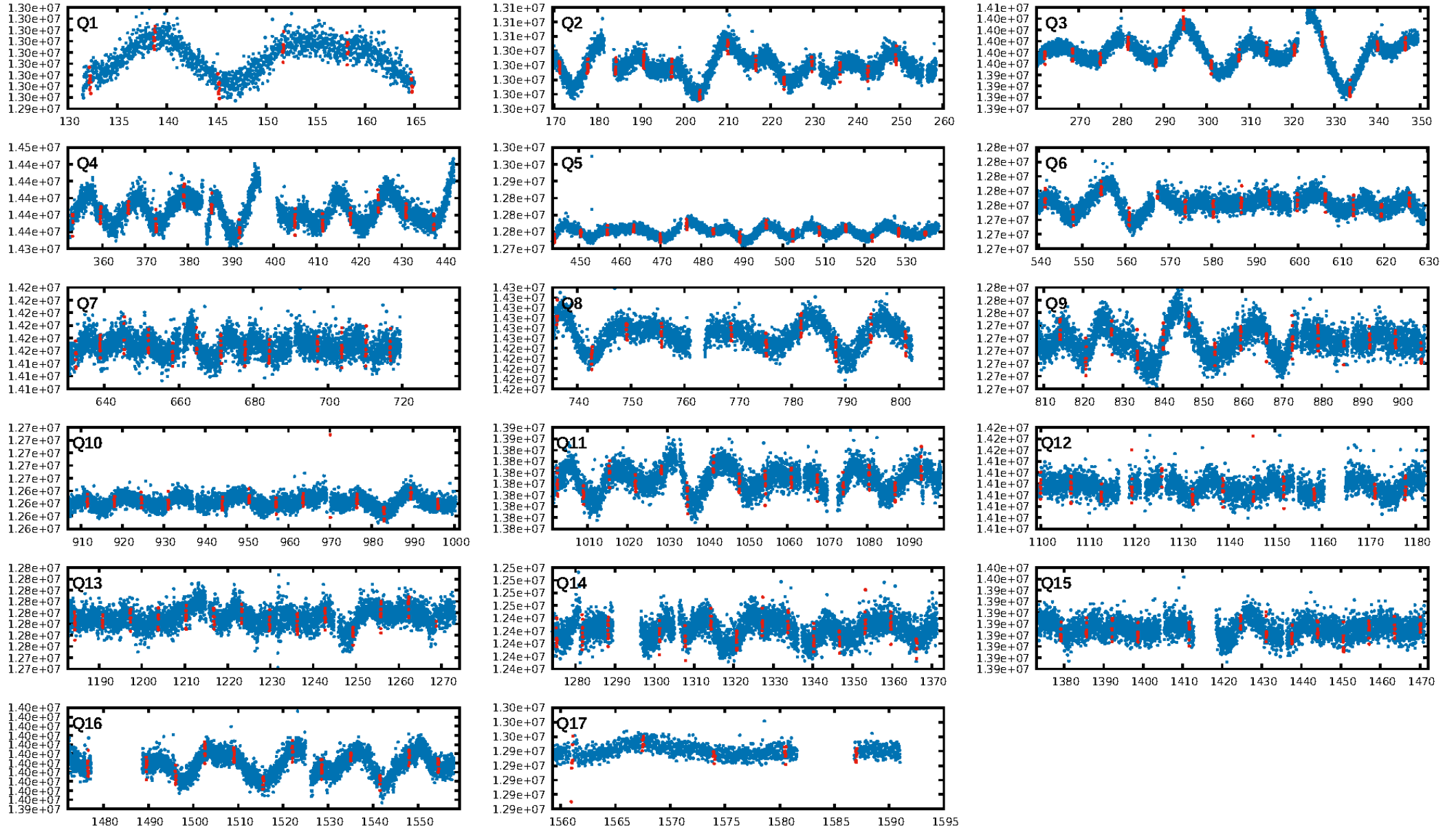
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.00e-48  
RollingBand-fgt: 1.00 [197/197]  
GhostDiagnostic-chr: 3.087  
Centroid-sig: 38.0%  
Centroid-so: 0.883 arcsec [1.19σ]  
OotOffset-rm: 0.347 arcsec [1.09σ]  
KicOffset-rm: 0.318 arcsec [1.01σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.59 [10/17]  
DiffImageOverlap-fno: 1.00 [17/17]

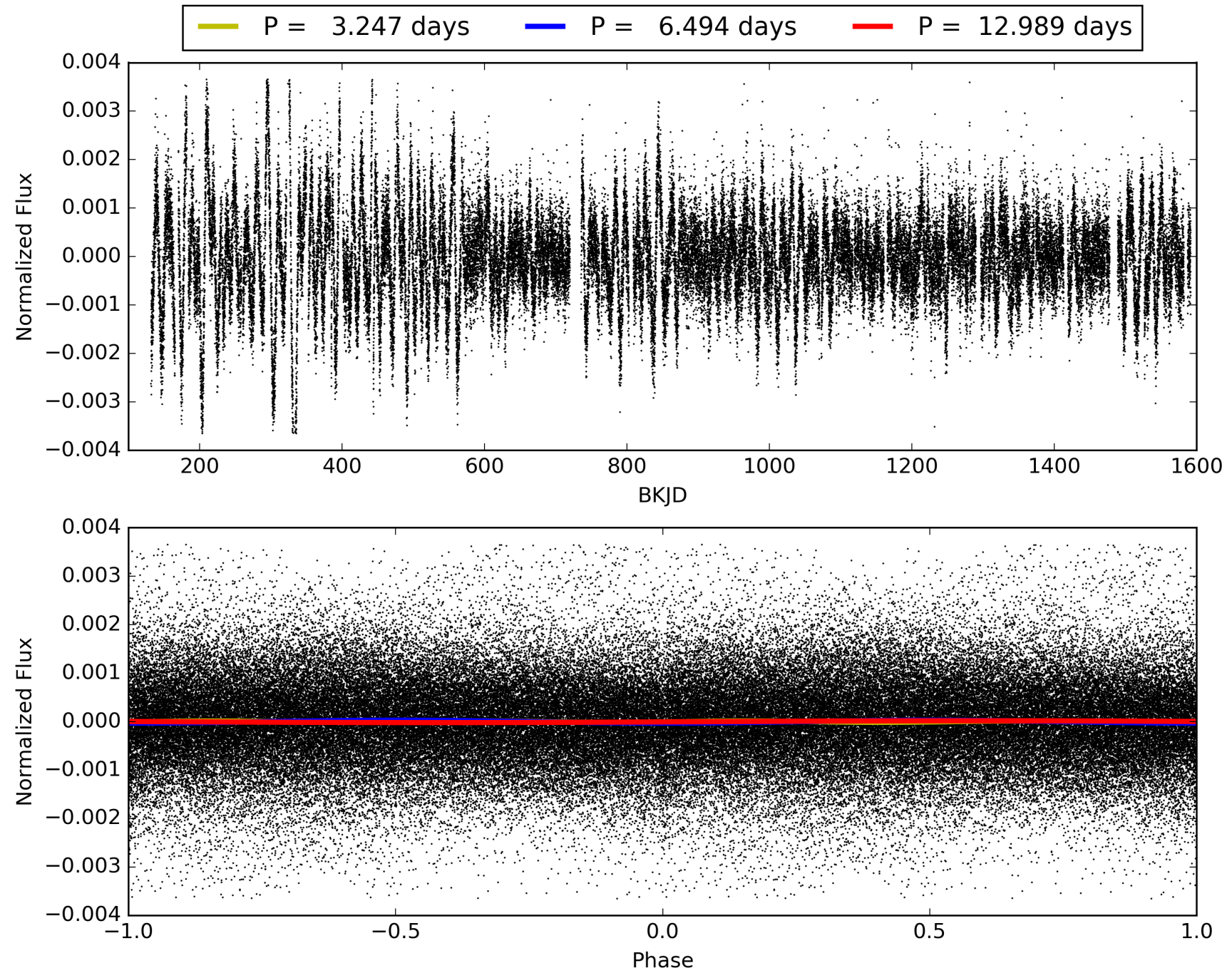
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:04:51 Z

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

# TCE 010059645-01, PDC Light Curves

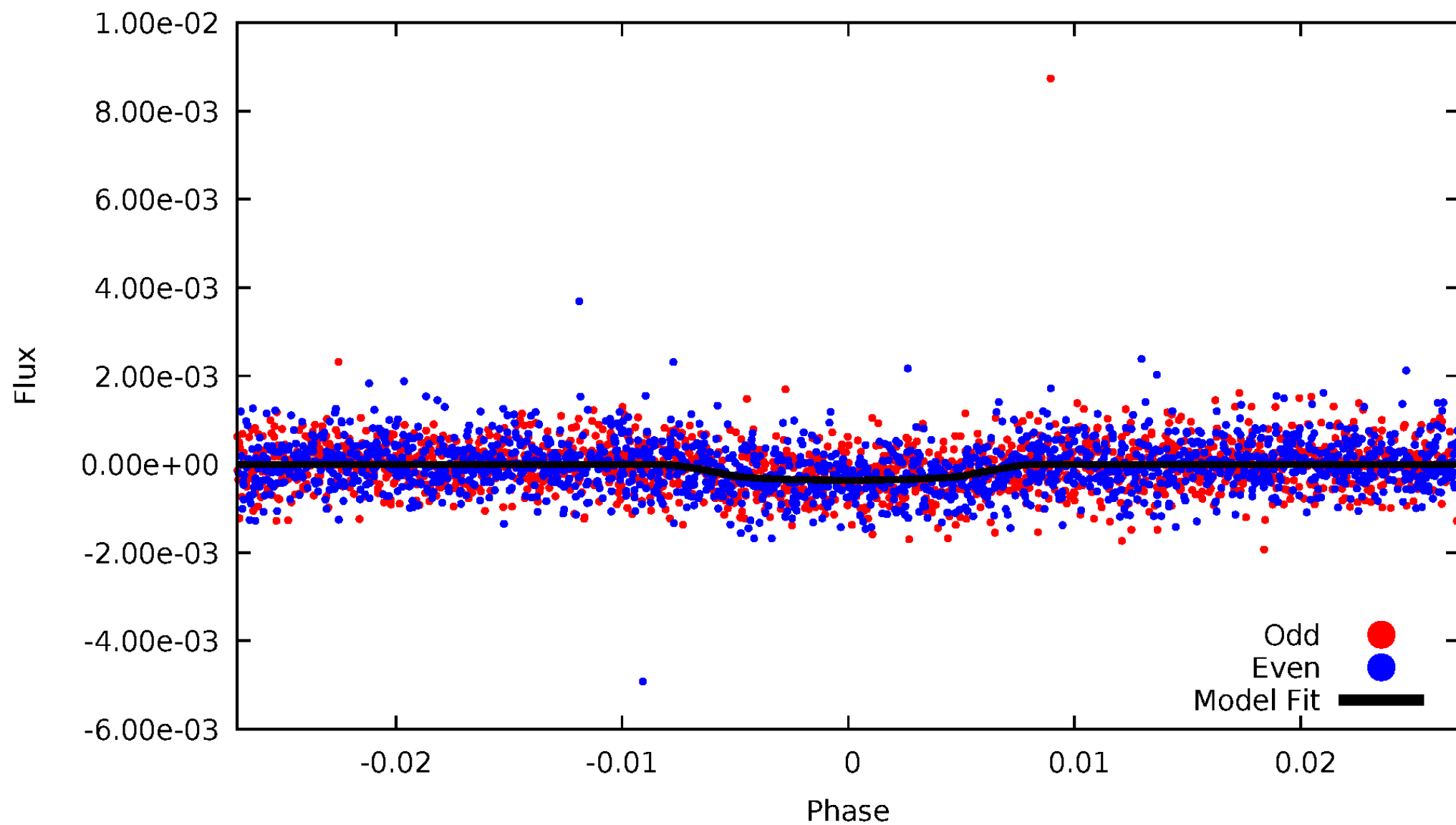


TCE 010059645-01



# DV Odd/Even

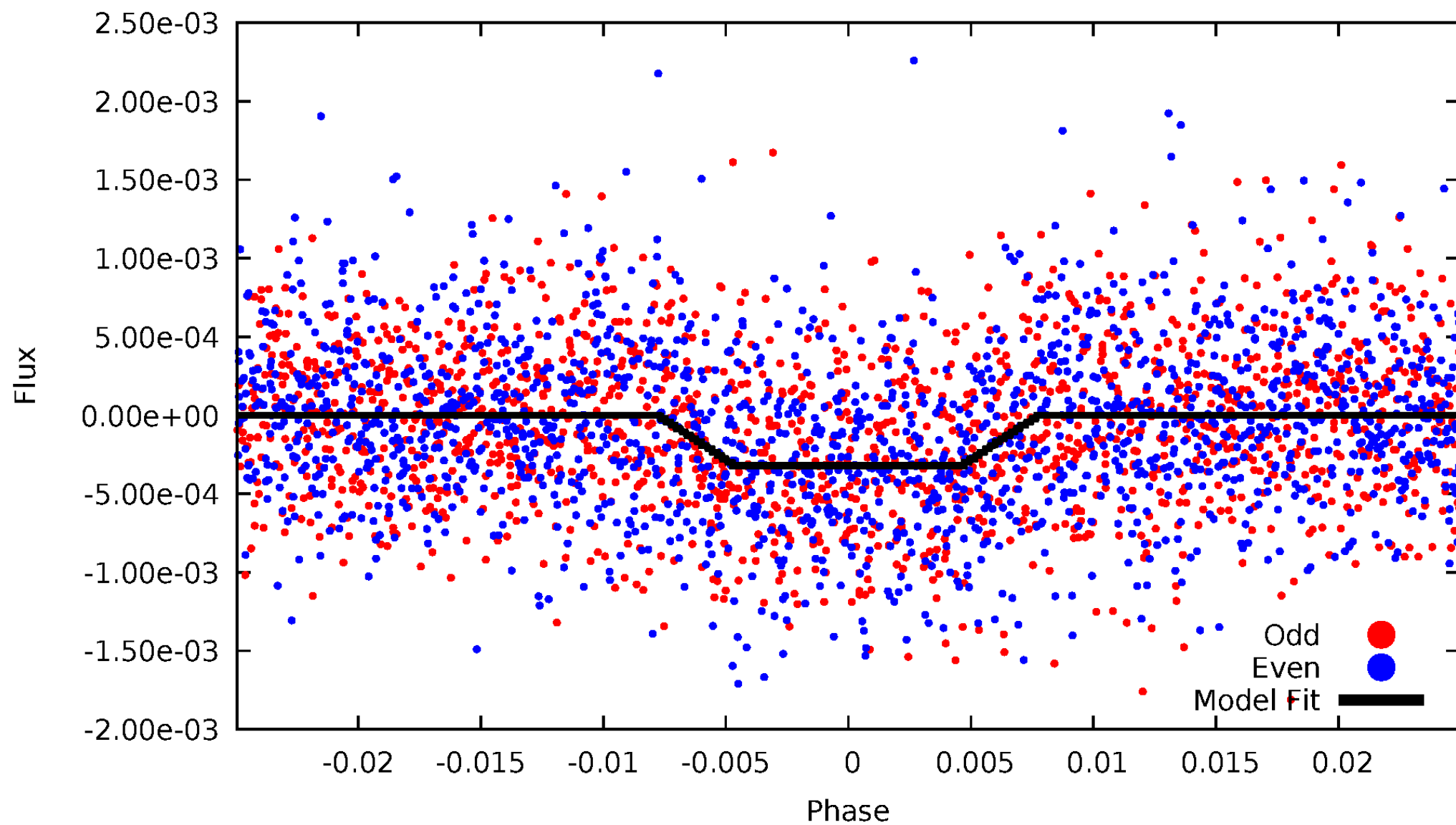
TCE 010059645-01



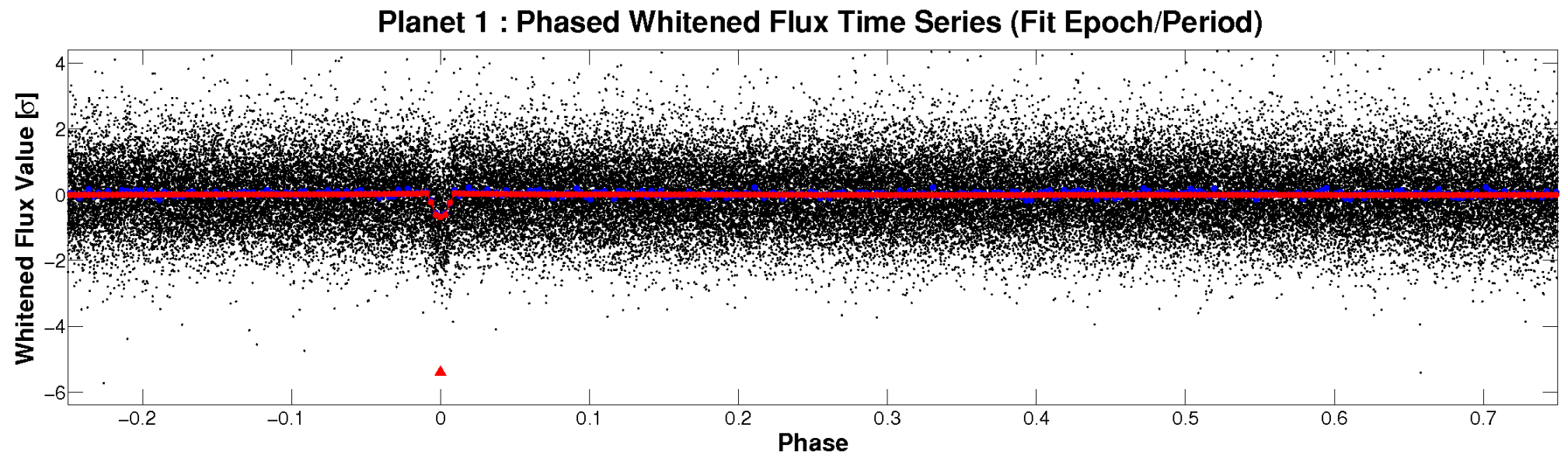
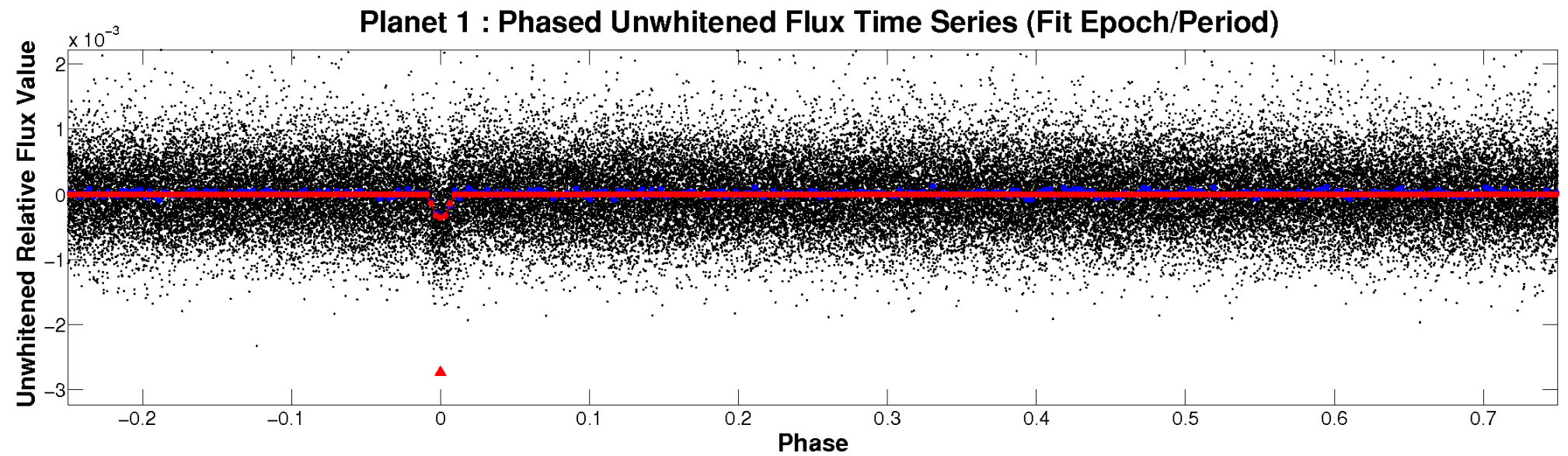


# ALT Odd/Even

TCE 010059645-01

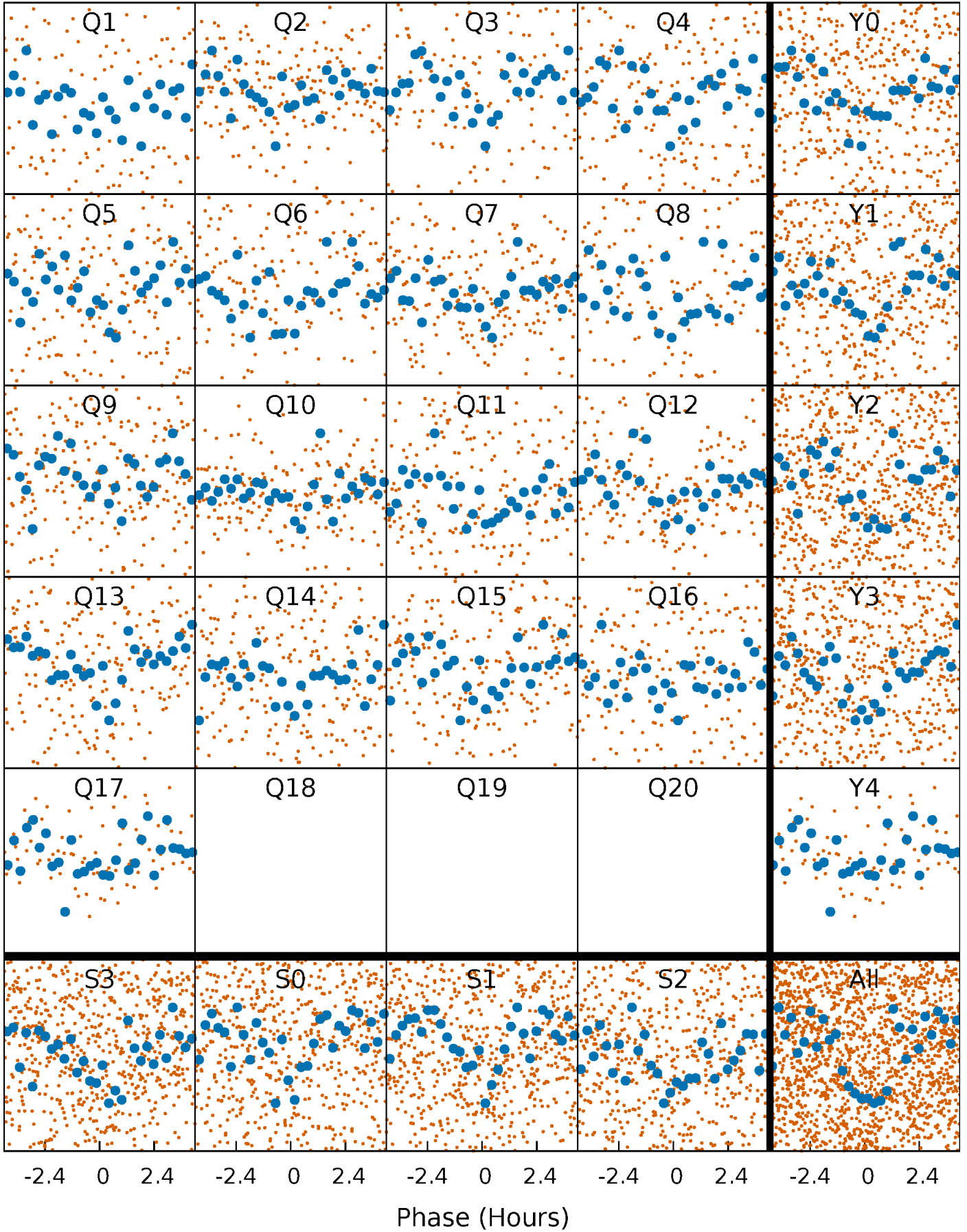


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

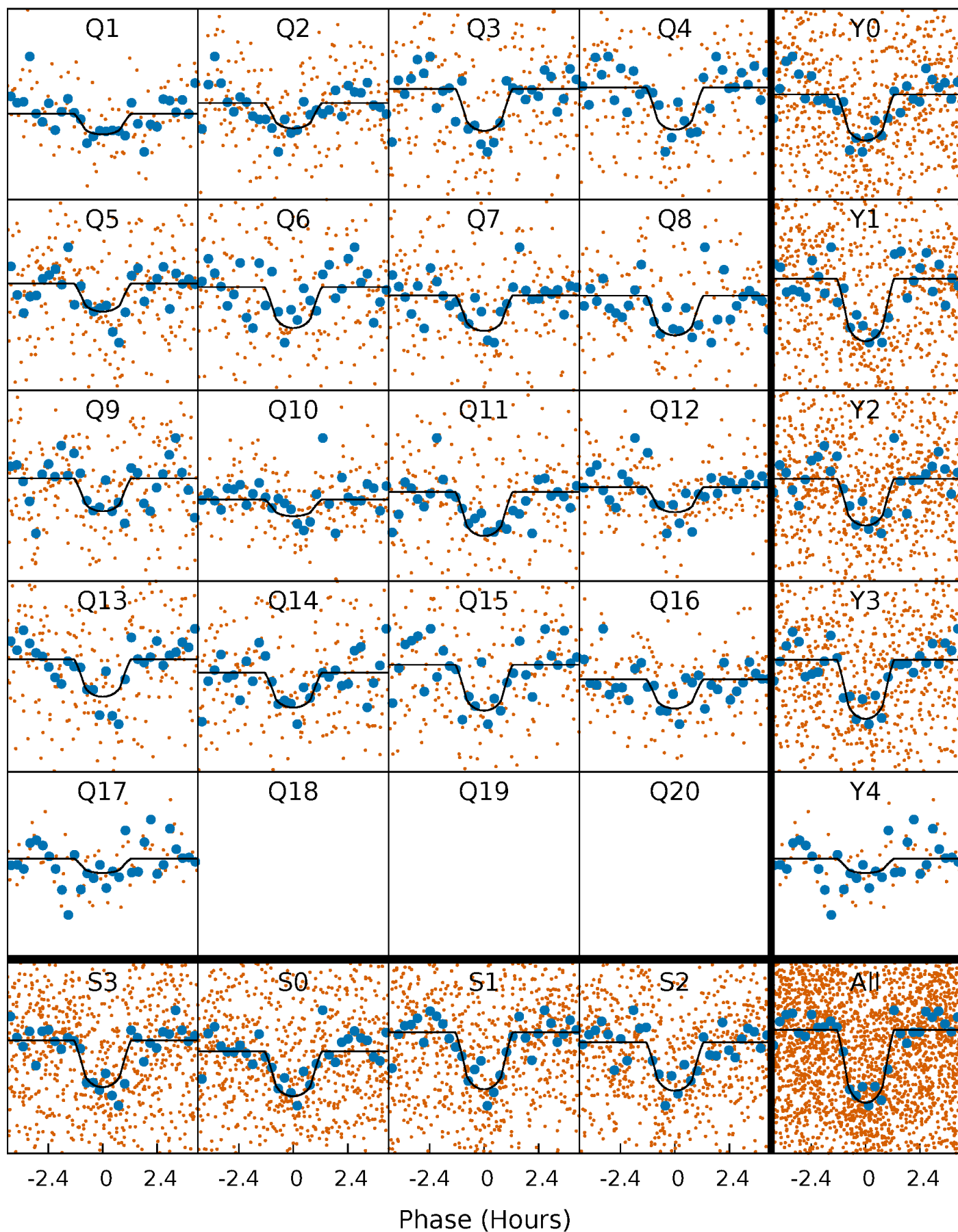
TCE 010059645-01 P= 6.494420 Days  $T_0=132.249994$  (BKJD)





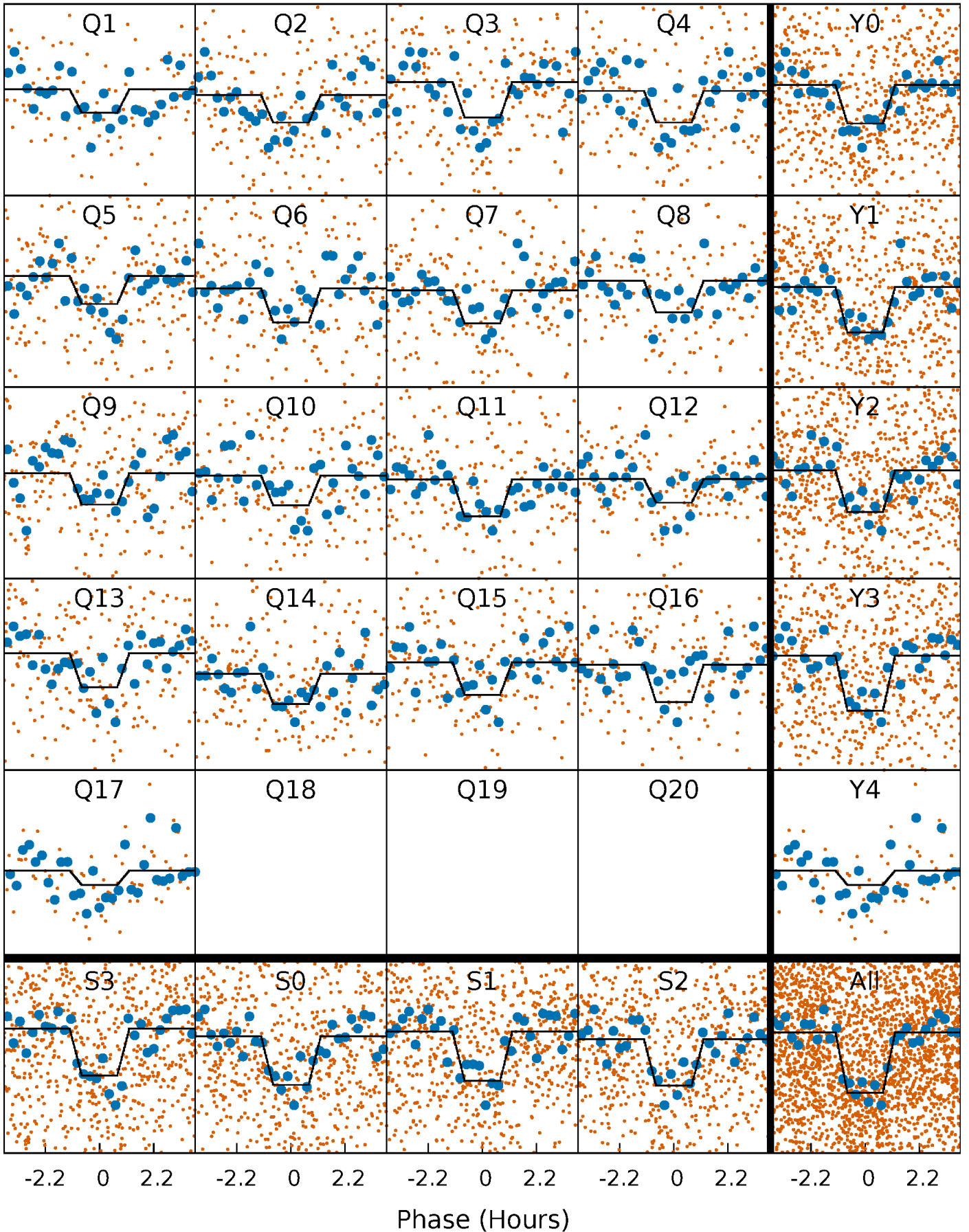
# DV Quarter-Phased Transit Curves

TCE 010059645-01 P= 6.494420 Days  $T_0=132.249994$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

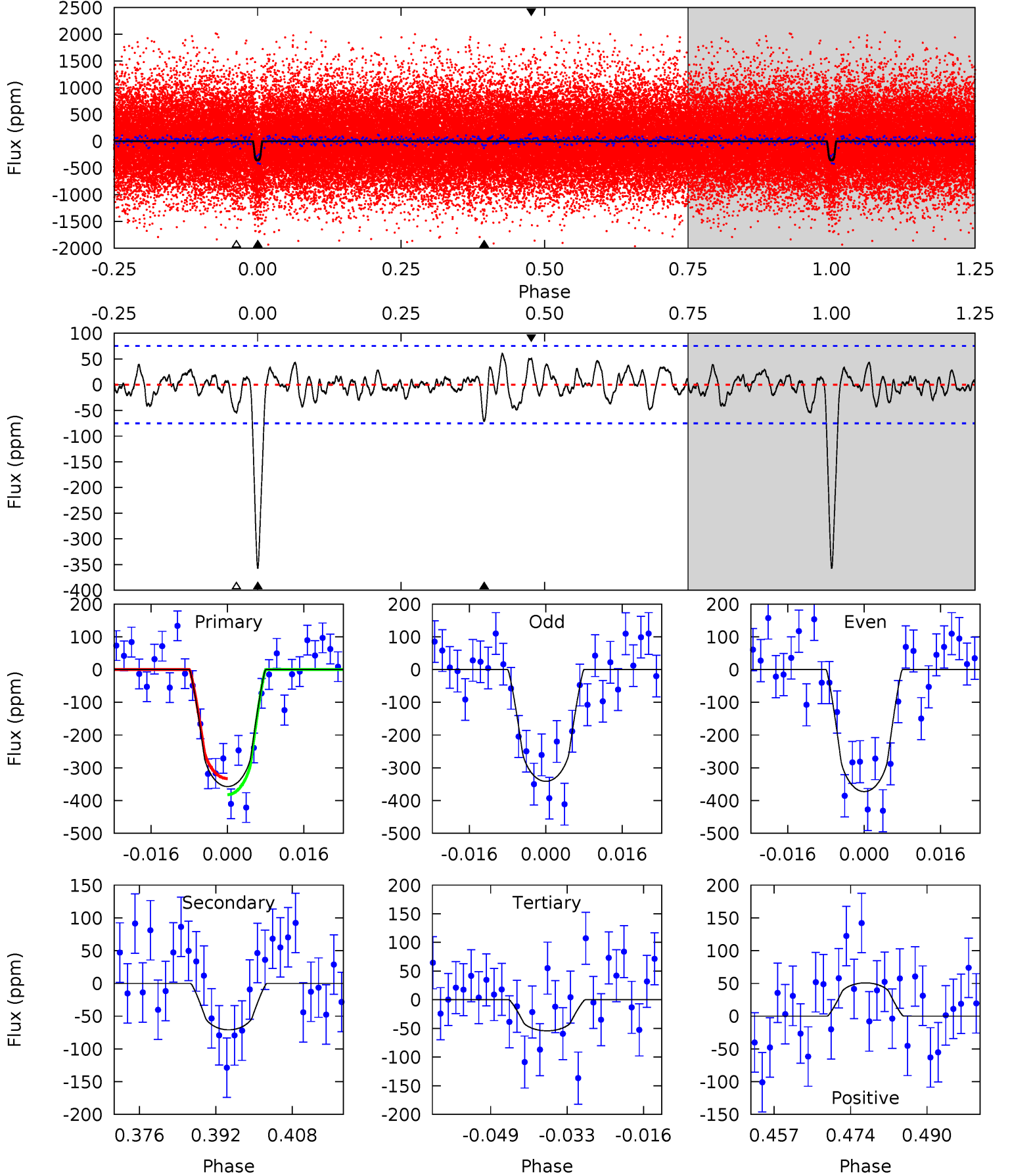
TCE 010059645-01 P= 6.494406 Days  $T_0=132.252264$  (BKJD)



# DV Model-Shift Uniqueness Test

010059645-01, P = 6.494420 Days, E = 125.755574 Days

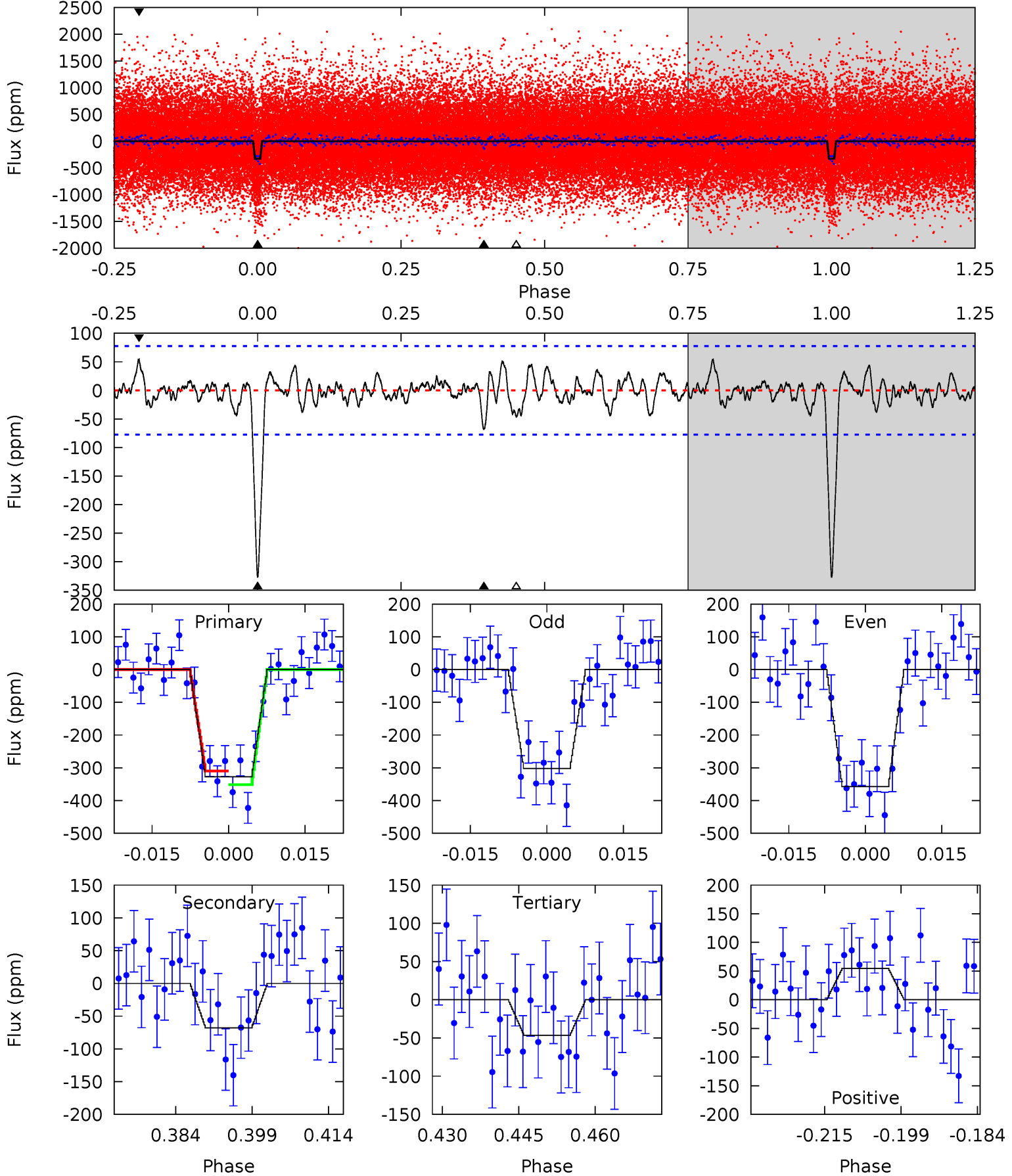
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.4	4.64	3.55	3.32	4.93	2.40	1.32	19.8	20.1	1.09	1.32	1.03	0.99	0.14	1.61



# Alt Model-Shift Uniqueness Test

010059645-01, P = 6.494406 Days, E = 125.757858 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
20.9	4.33	2.96	3.48	4.94	2.42	1.16	17.9	17.4	1.37	0.85	1.77	0.97	0.14	1.34



### Stellar Parameters For KIC 010059645

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4769^{+141}_{-127}$	$4.557^{+0.065}_{-0.030}$	$0.000^{+0.300}_{-0.300}$	$0.742^{+0.048}_{-0.071}$	$0.724^{+0.078}_{-0.052}$	$2.493^{+0.674}_{-0.301}$
	+3%/-3%	+1%/-1%	+inf%/-inf%	+6%/-10%	+11%/-7%	+27%/-12%
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 010059645-01 / KOI 2520.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-71 \pm 15$	$1.65^{+1.25}_{-0.92}$	$1018^{+34}_{-34}$	$3437^{+1155}_{-536}$	$51^{+216}_{-35}$
Alt.	$-68 \pm 16$	$1.69^{+1.18}_{-1.07}$	$1018^{+34}_{-35}$	$3381^{+1518}_{-486}$	$47^{+316}_{-31}$

$T_{\text{max}}$  = 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

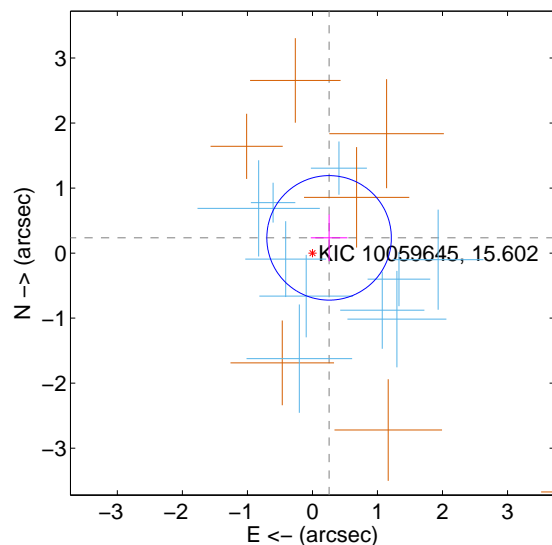
Supplemental centroid analysis for 010059645-01. Kepler magnitude: 15.60. Transit SNR 16.39

There are 10 quarters with good PRF difference image offsets

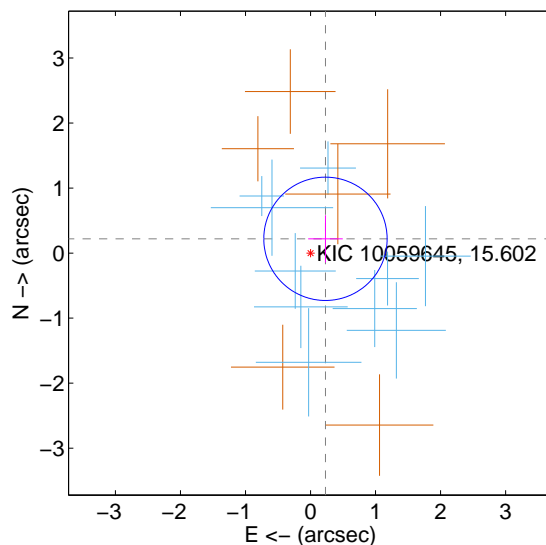
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.347 \pm 0.319$	1.09	$-0.256 \pm 0.282$	$0.234 \pm 0.358$
PRF-fit source offset from KIC position	$0.318 \pm 0.316$	1.01	$-0.230 \pm 0.266$	$0.220 \pm 0.363$
photometric centroid source offset	$0.88 \pm 0.74$	1.19	$-0.78 \pm 0.72$	$-0.42 \pm 0.79$

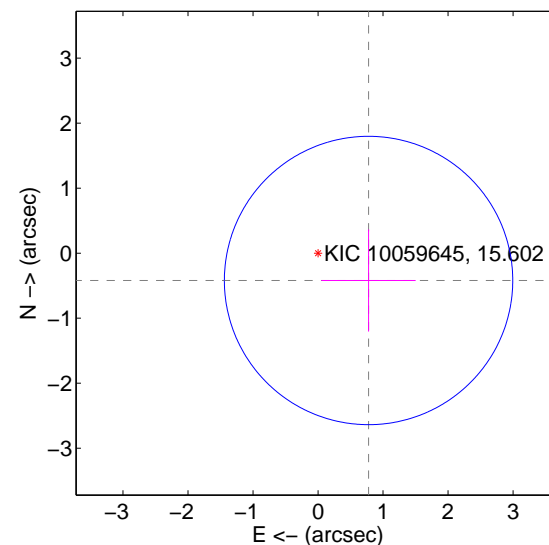
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

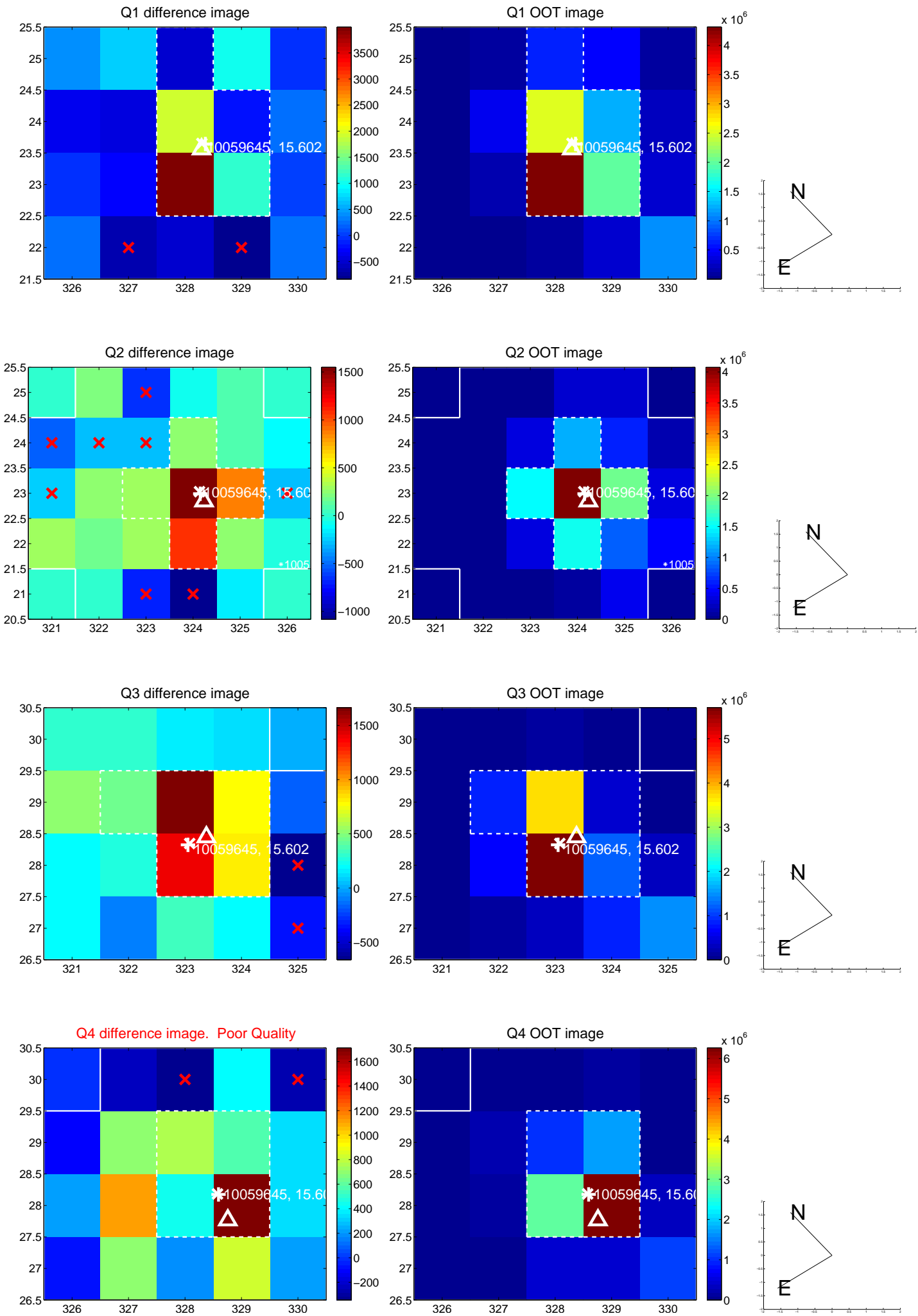


offset from photometric centroids

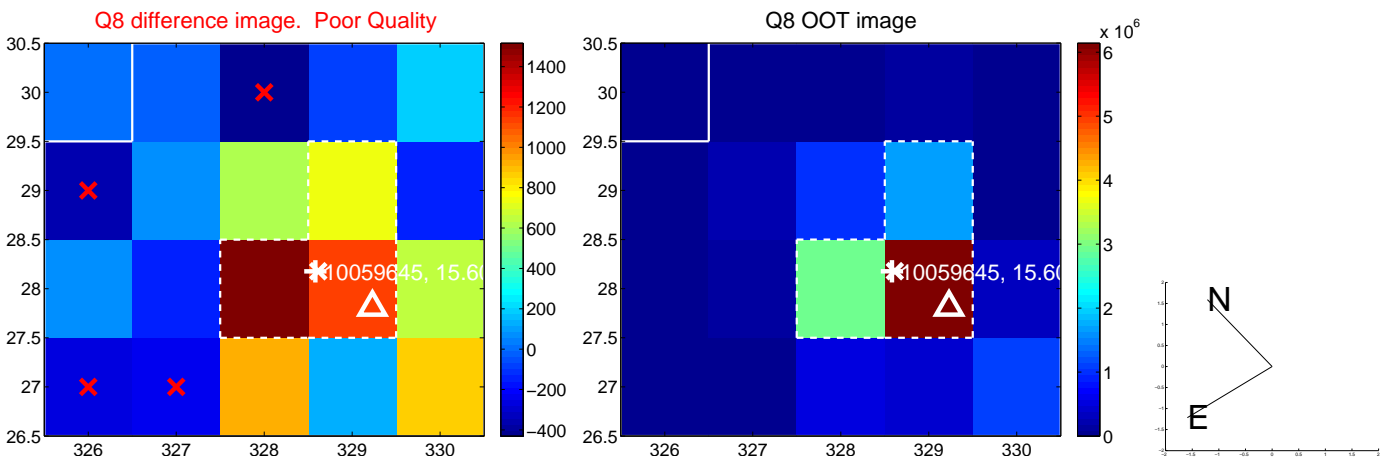
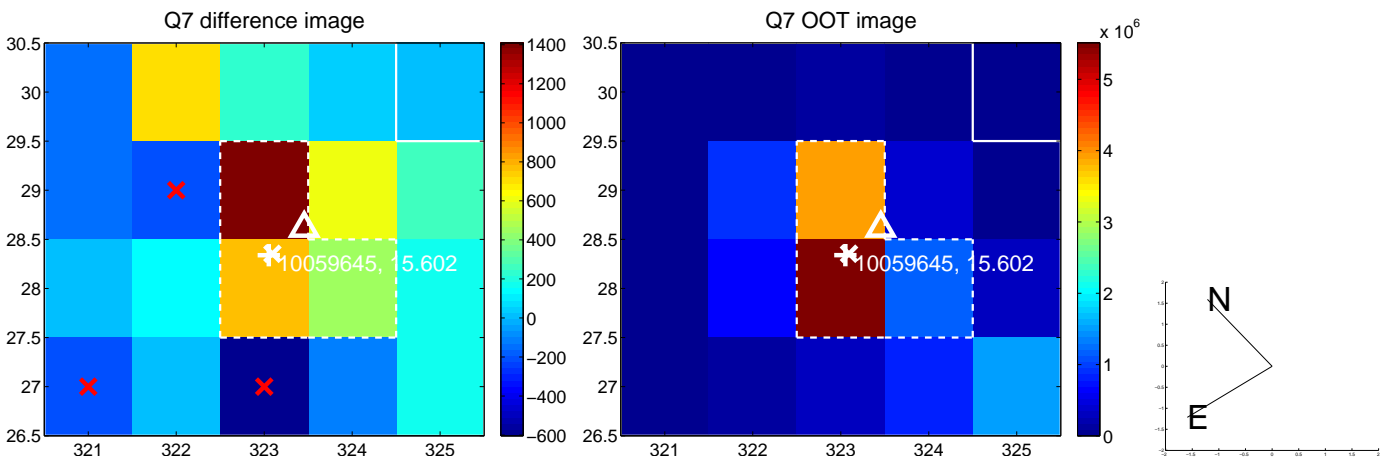
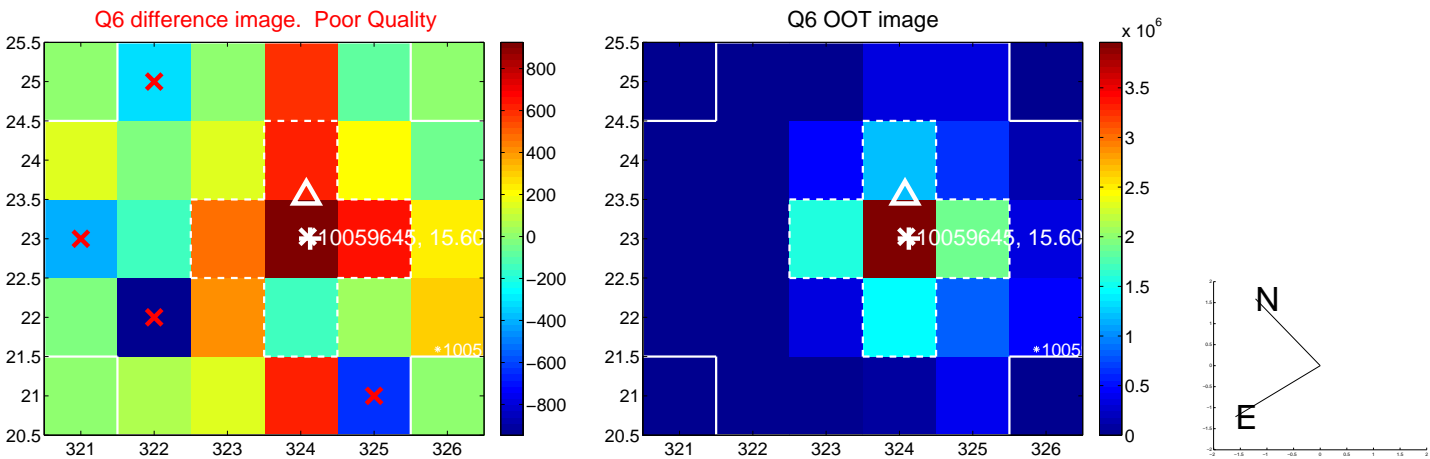
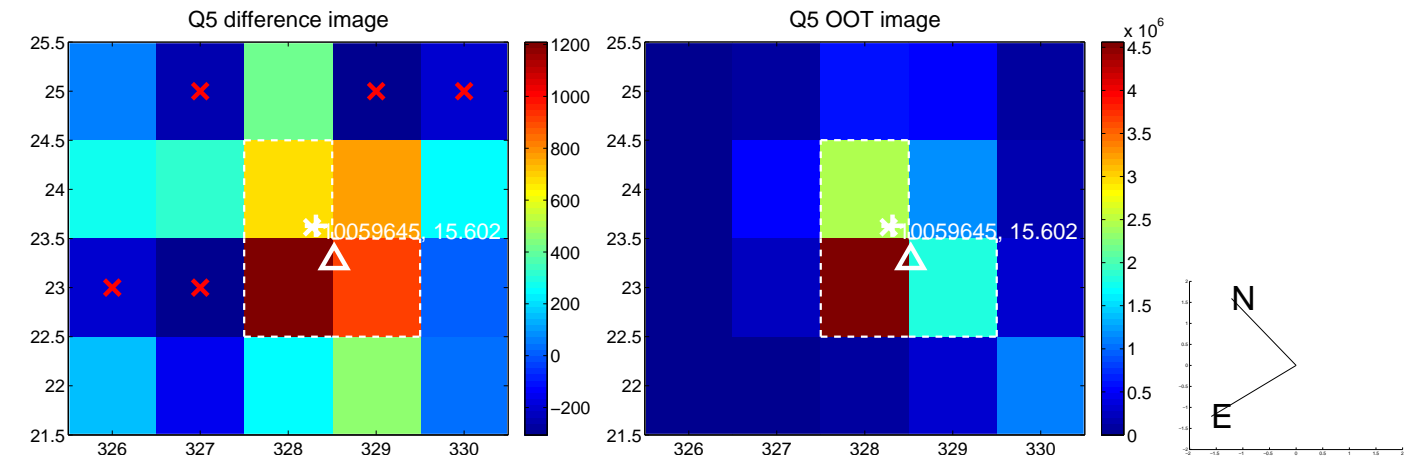


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

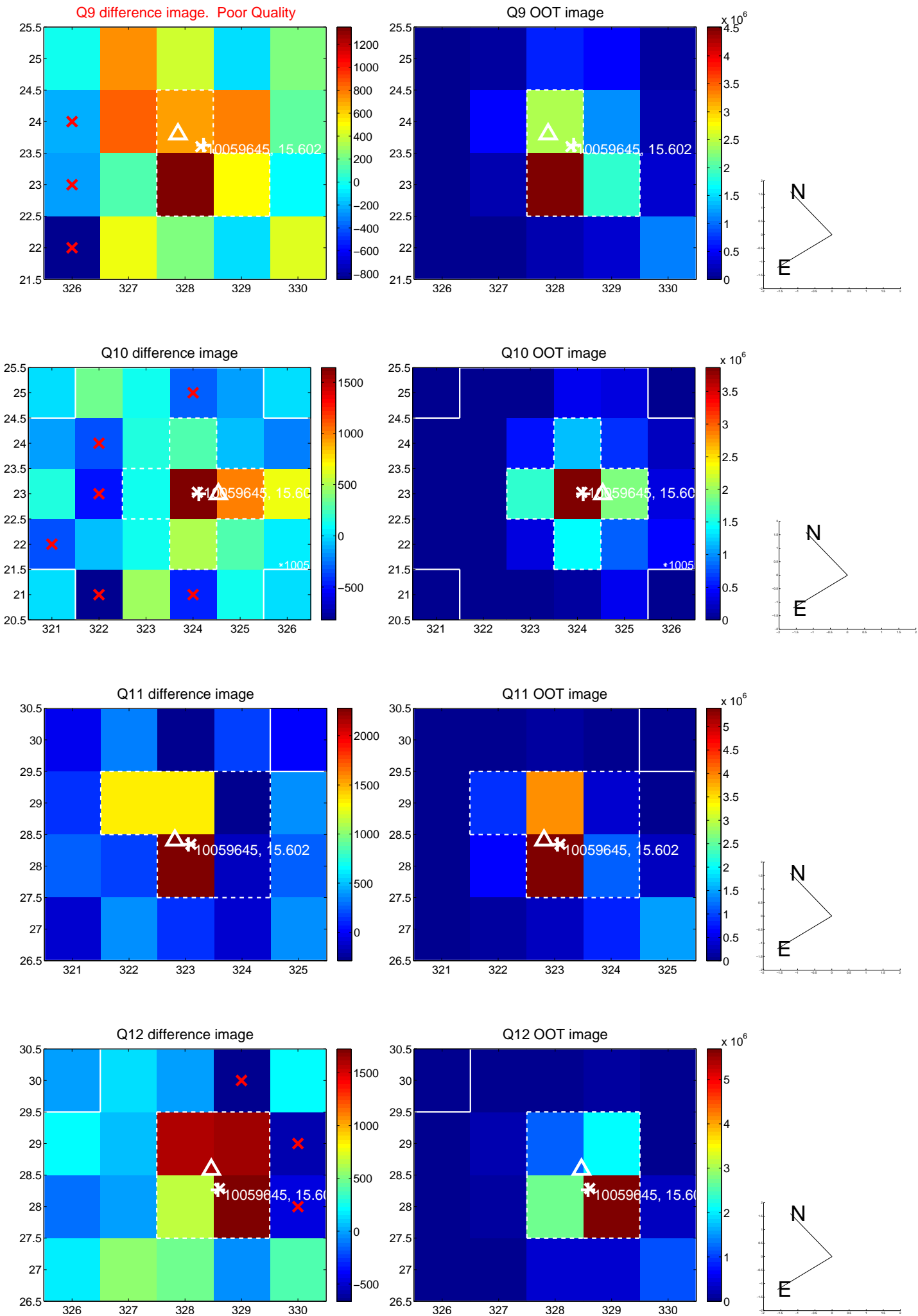
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



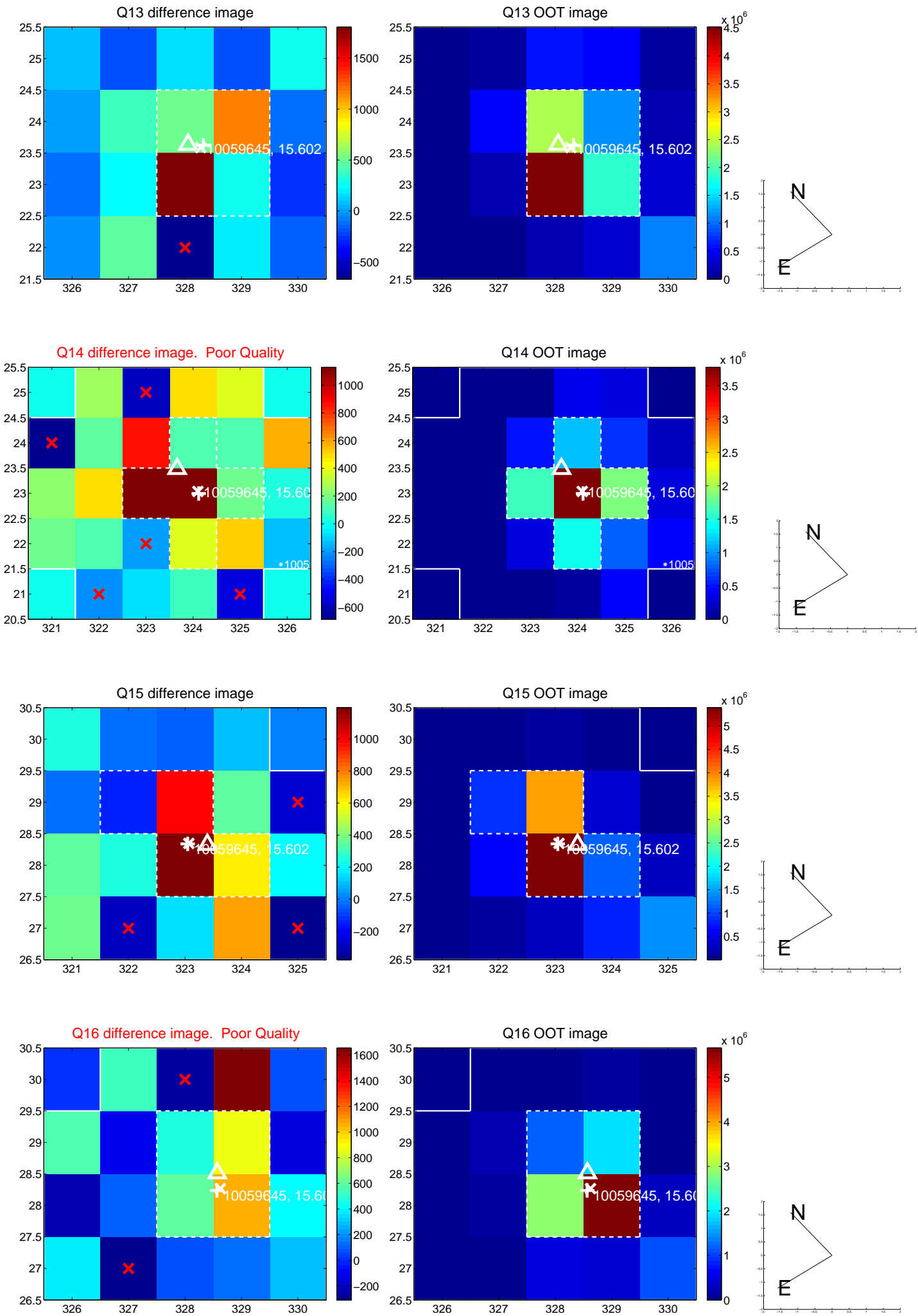
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

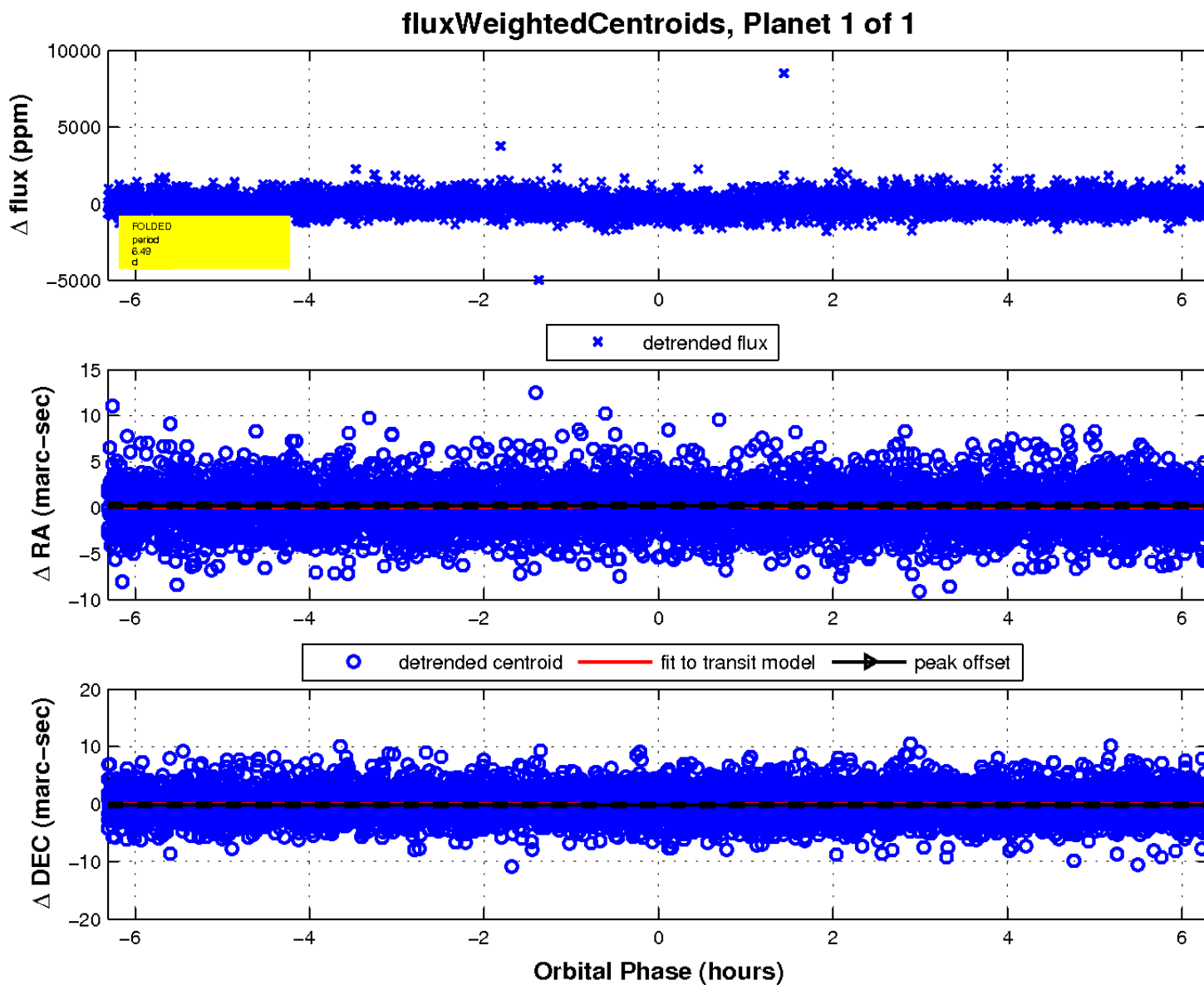
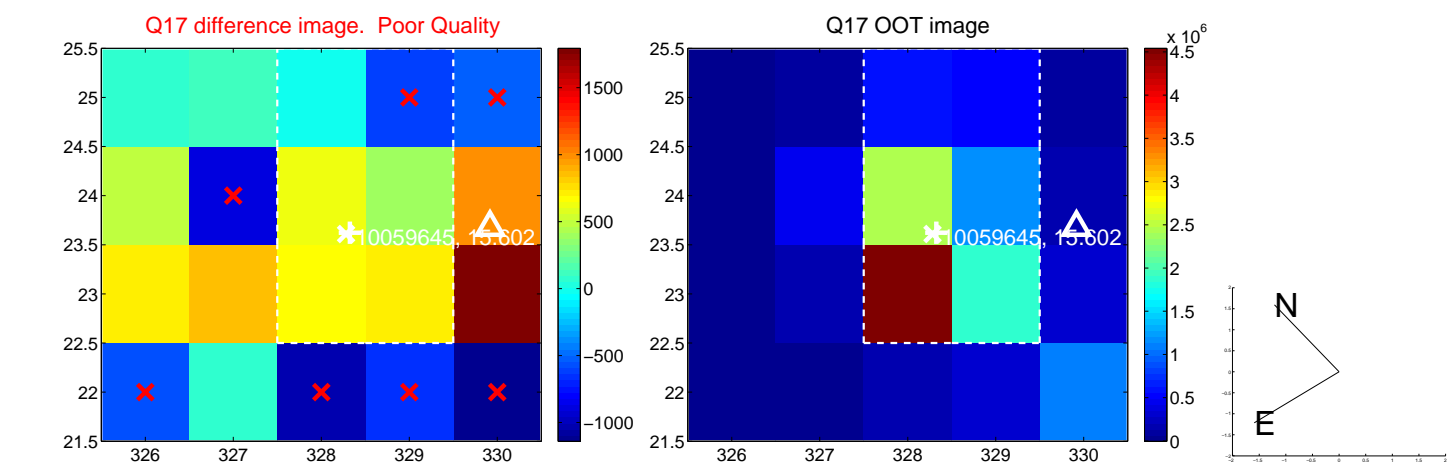


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

