

# KIC 012645057

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012645057-01	OBS	4497.01	6.830068	135.760267	186.0	3.436	11.2	12.0	0.80	5807	1.28	143.06

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012645057-01	OBS	PC	1.00	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.

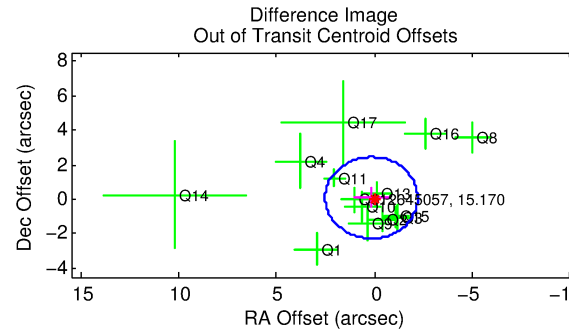
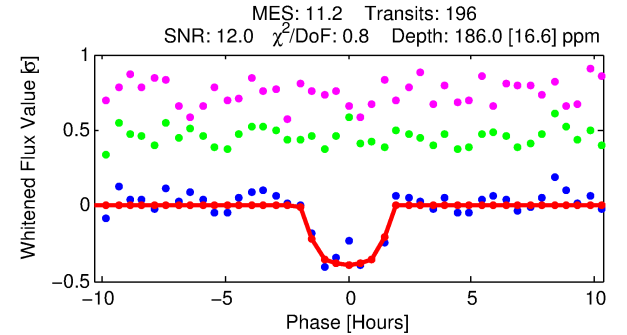
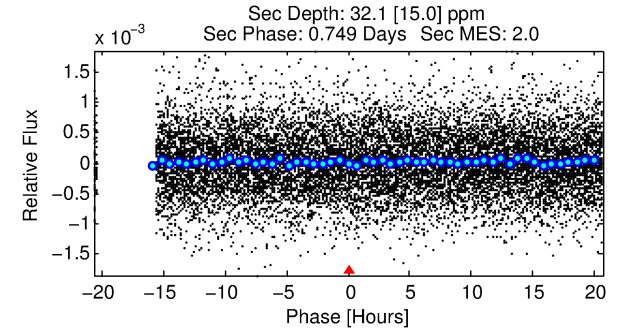
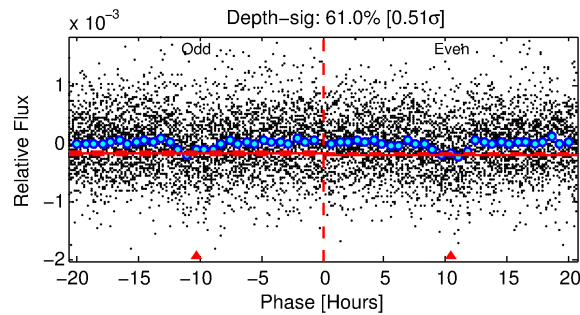
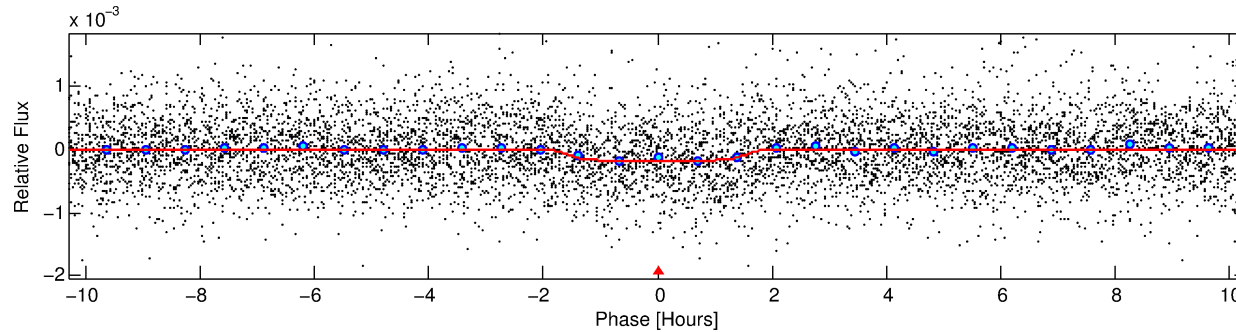
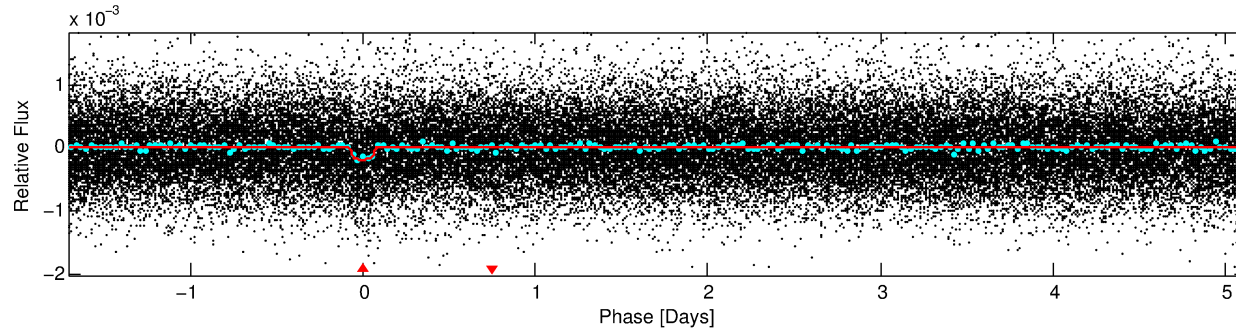
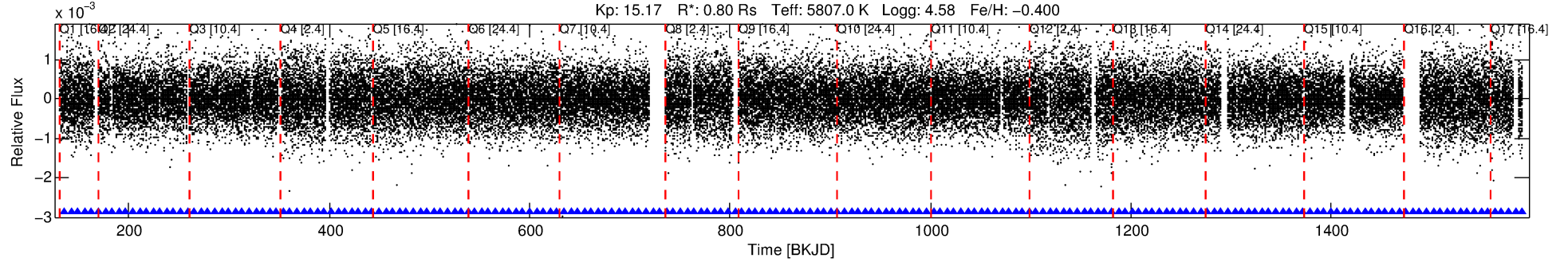
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012645057-01

No Significant Match Found

# DV One-Page Summary

KIC: 12645057 Candidate: 1 of 1 Period: 6.830 d  
KOI: K04497.01 Corr: 0.991



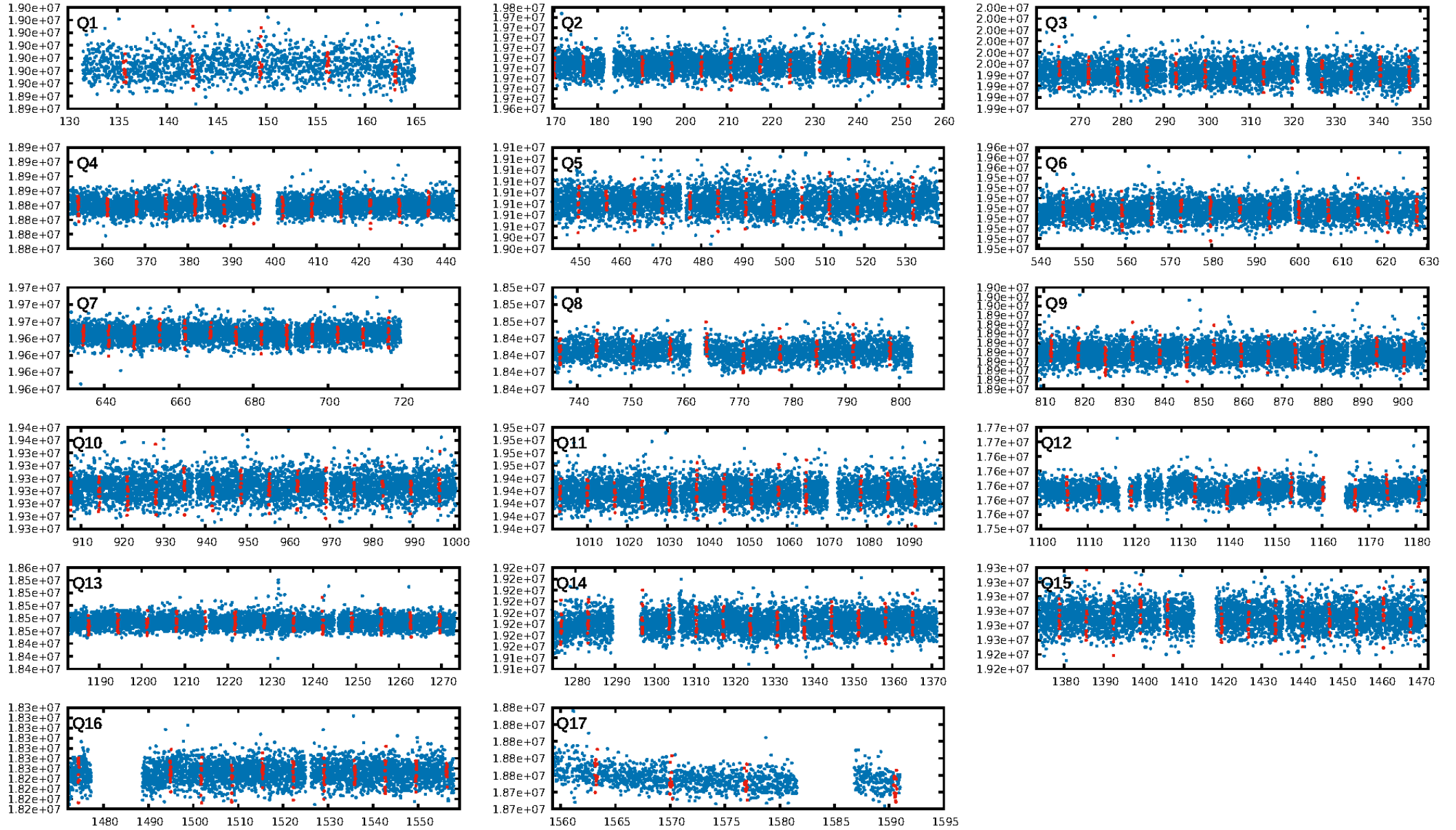
## DV Fit Results:

Period = 6.83007 [0.00005] d  
Epoch = 135.7603 [0.0057] BKJD  
Rp/R\* = 0.0146 [0.0070]  
a/R\* = 7.44 [17.60]  
b = 0.89 [0.57]  
Seff = 143.06 [43.25]  
Teq = 882 [67] K  
Rp = 1.28 [0.68] Re  
a = 0.0675 [0.0129] AU  
Ag = 49.28 [54.21] [0.89 $\sigma$ ]  
Teffp = 3613 [967] K [2.82 $\sigma$ ]

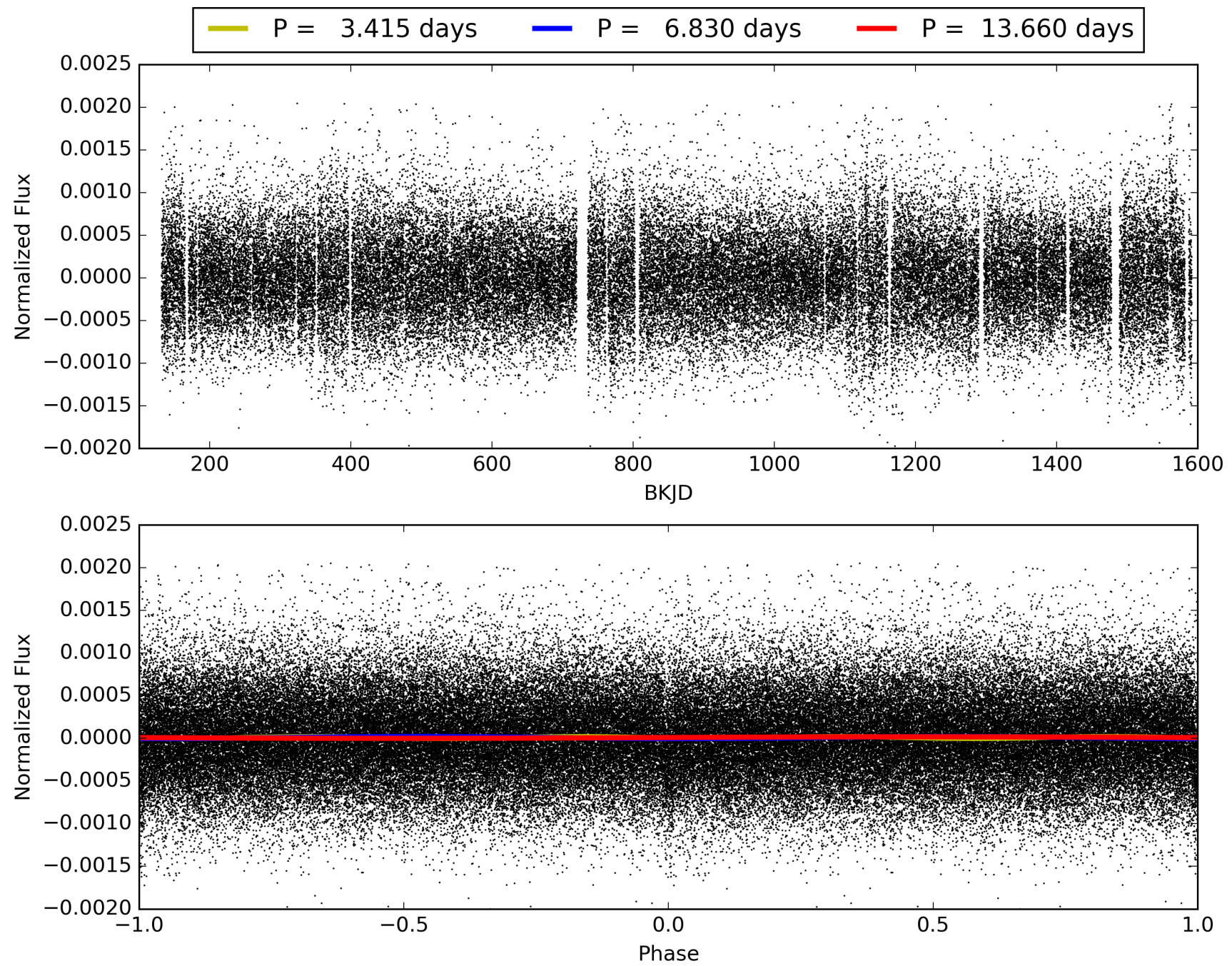
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.58e-29  
RollingBand-fgt: 1.00 [187/187]  
GhostDiagnostic-chr: 3.014  
Centroid-sig: 40.6%  
Centroid-so: 1.751 arcsec [1.35 $\sigma$ ]  
OotOffset-rm: 0.178 arcsec [0.23 $\sigma$ ]  
KicOffset-rm: 0.233 arcsec [0.33 $\sigma$ ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 0.36 [5/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012645057-01, PDC Light Curves



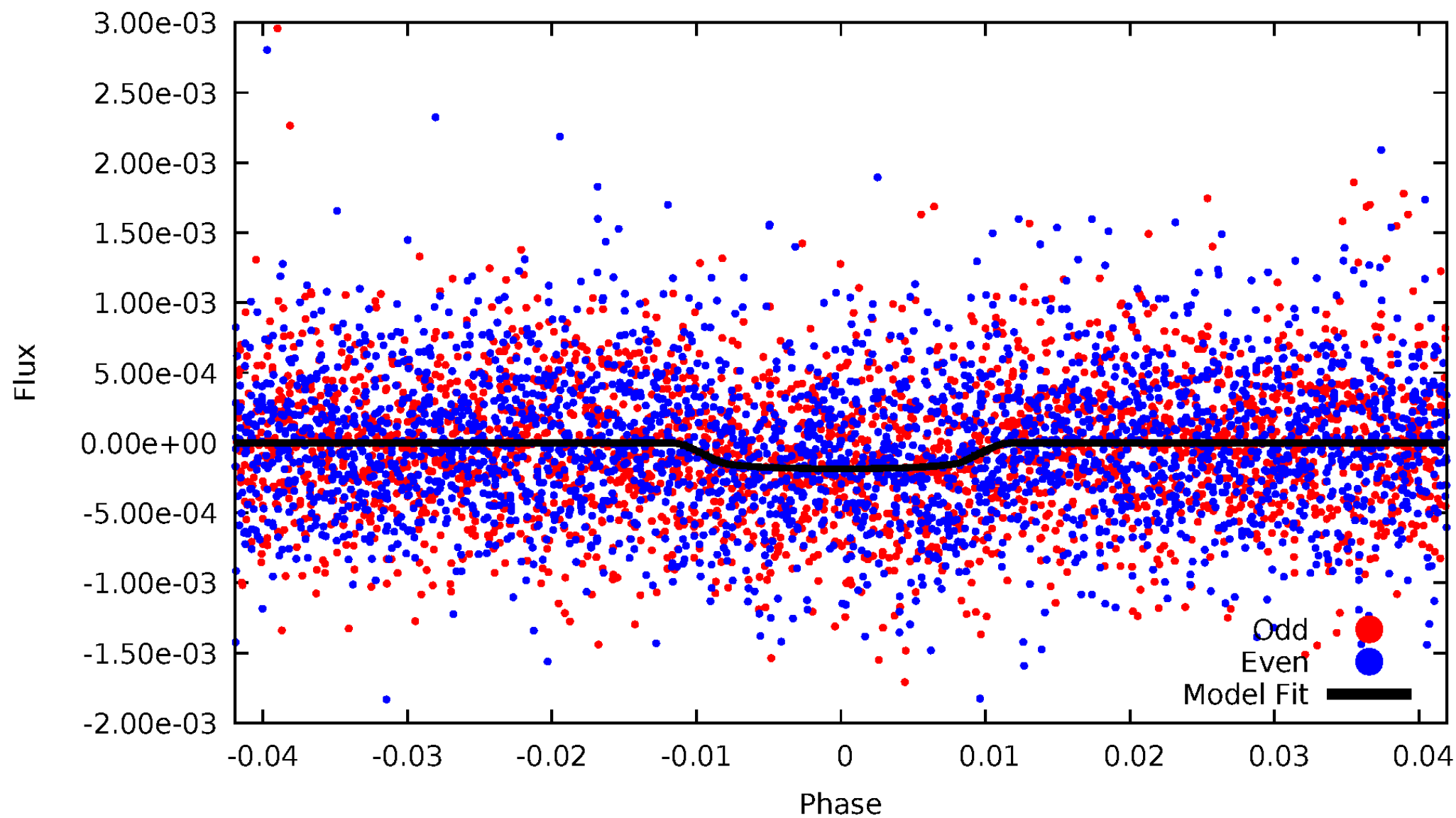
# TCE 012645057-01





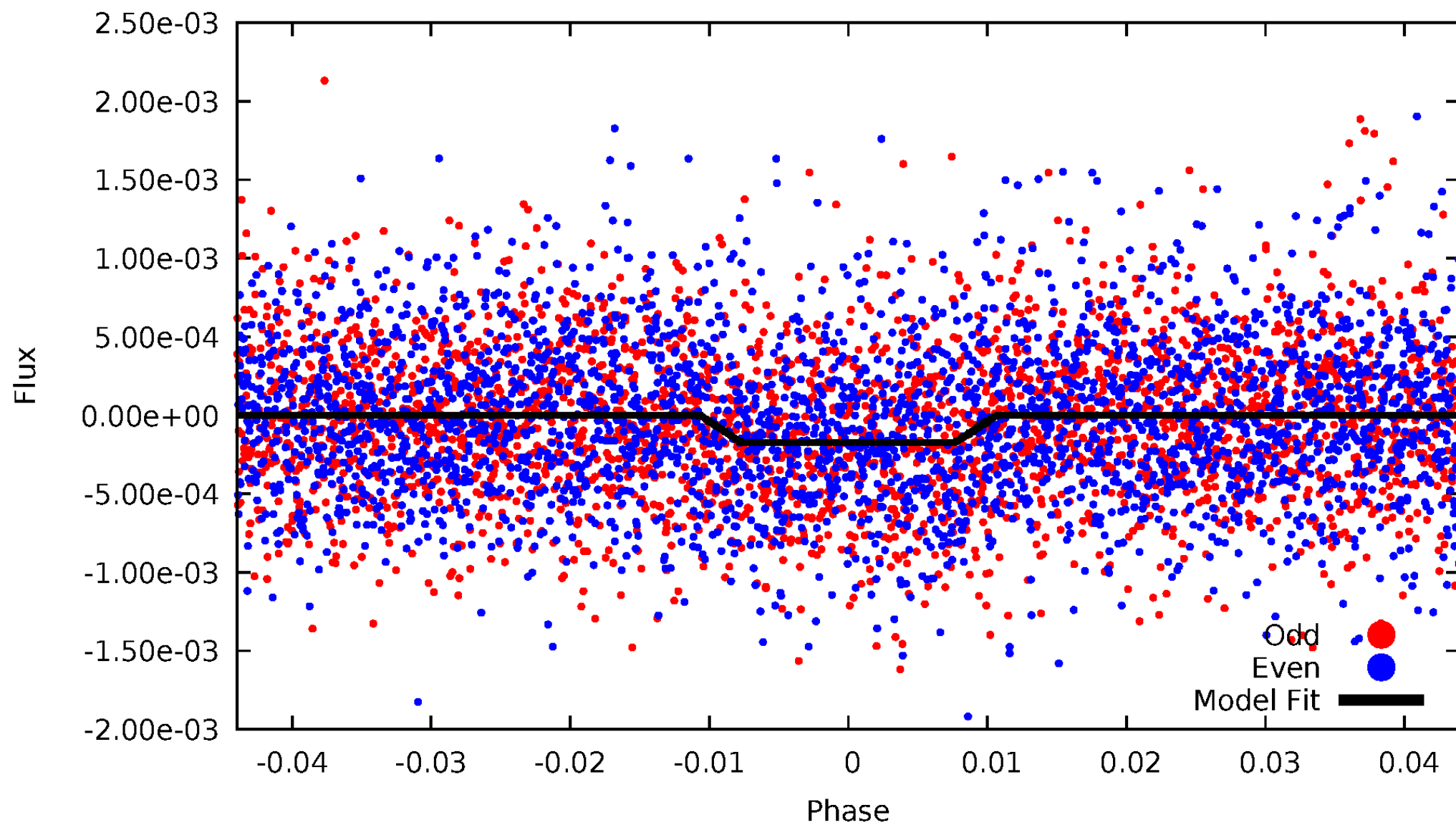
# DV Odd/Even

TCE 012645057-01



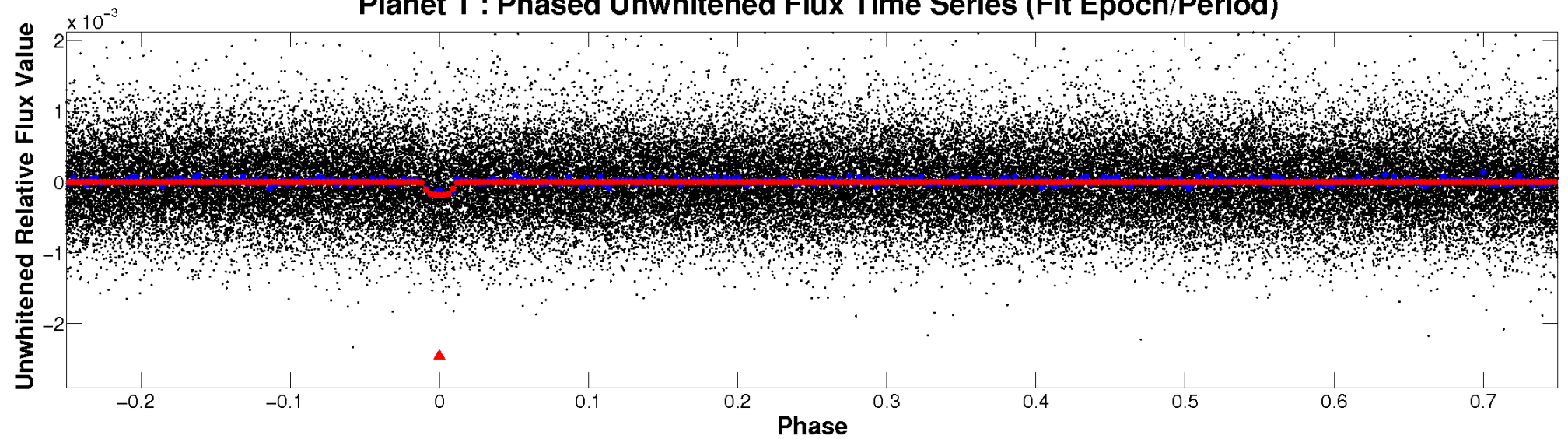
# ALT Odd/Even

TCE 012645057-01

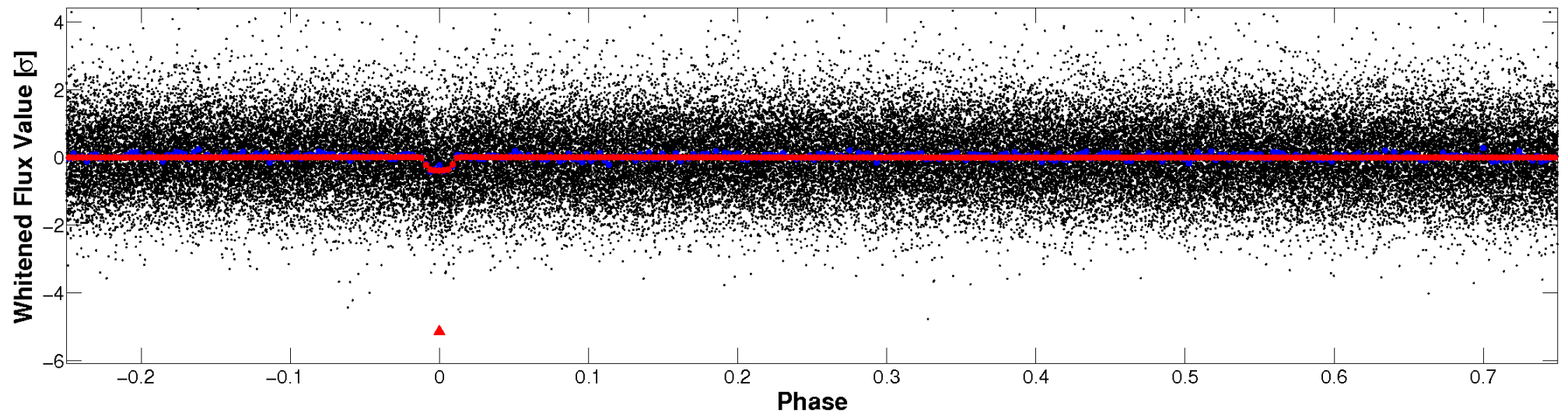


# Non-Whitened Vs. Whitened Light Curve

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

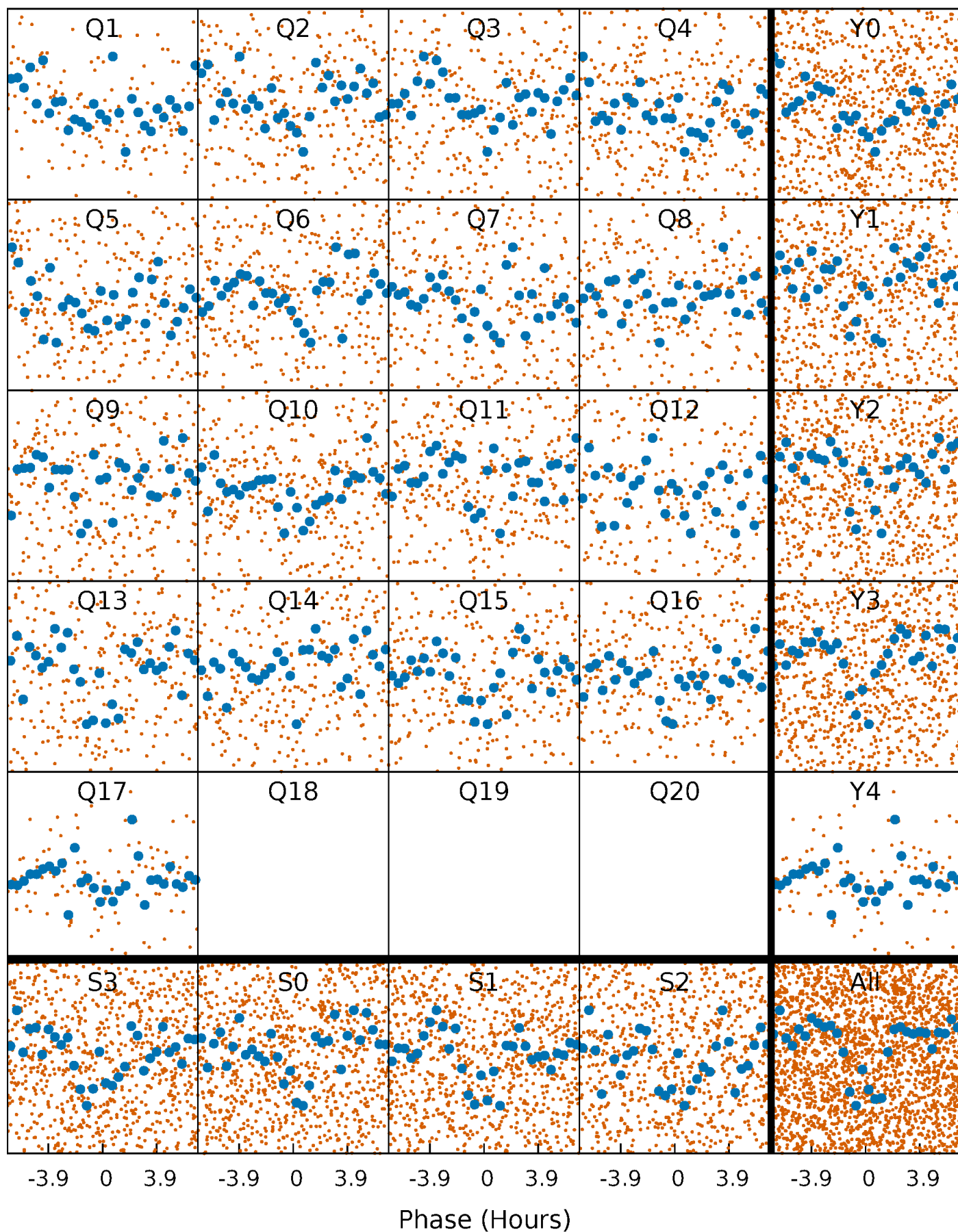


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

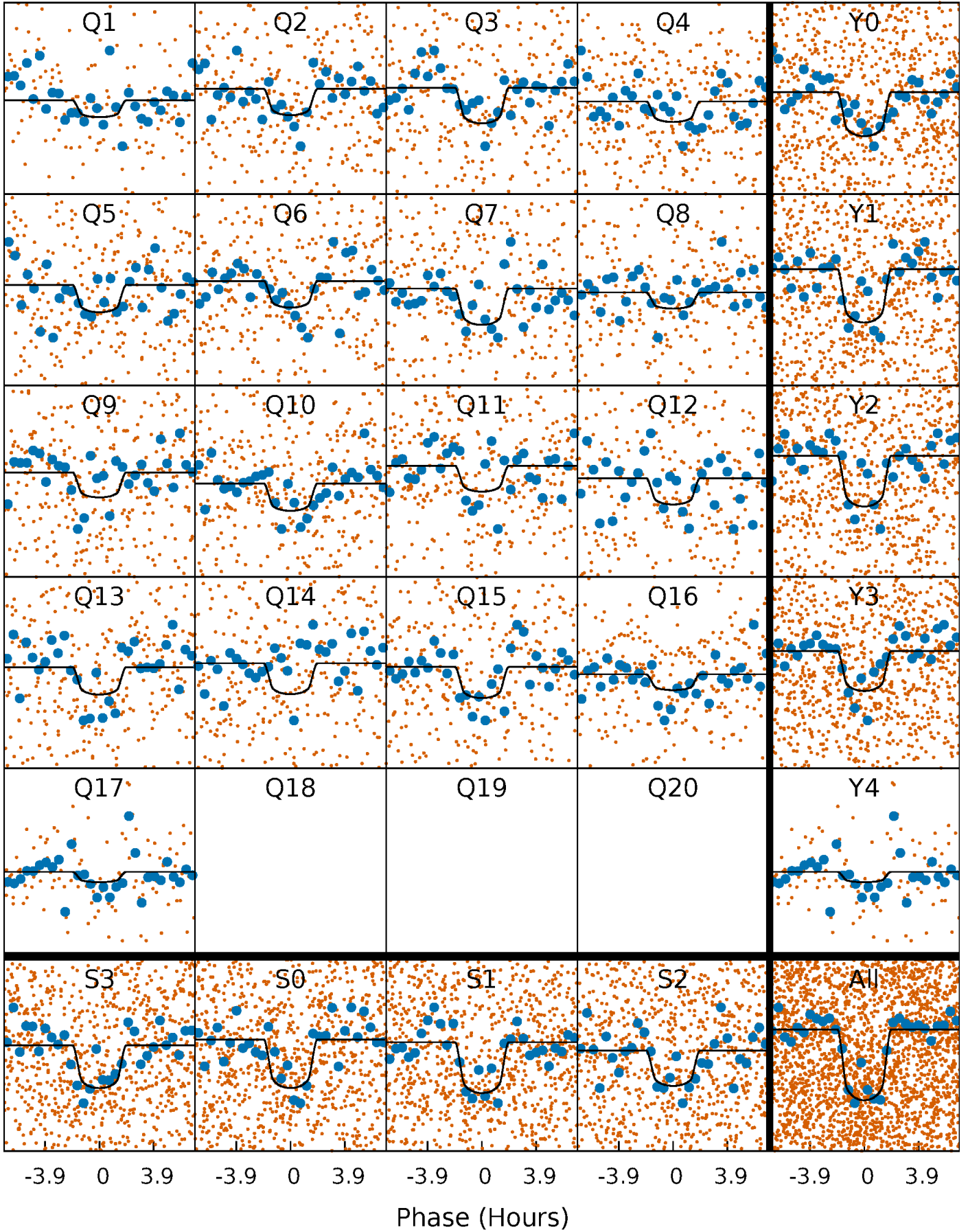
TCE 012645057-01 P= 6.830068 Days  $T_0=135.760267$  (BKJD)





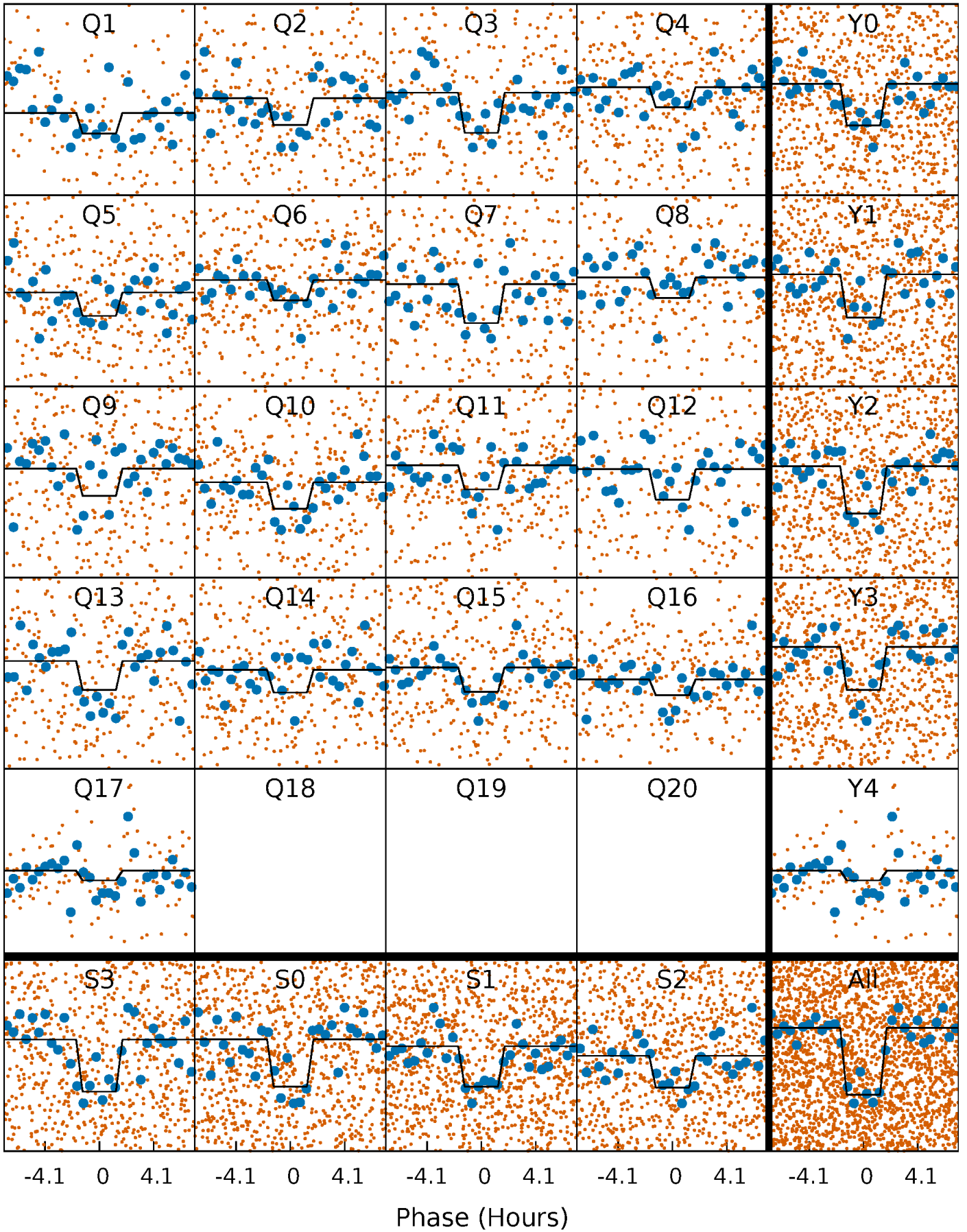
# DV Quarter-Phased Transit Curves

TCE 012645057-01 P= 6.830068 Days  $T_0=135.760267$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

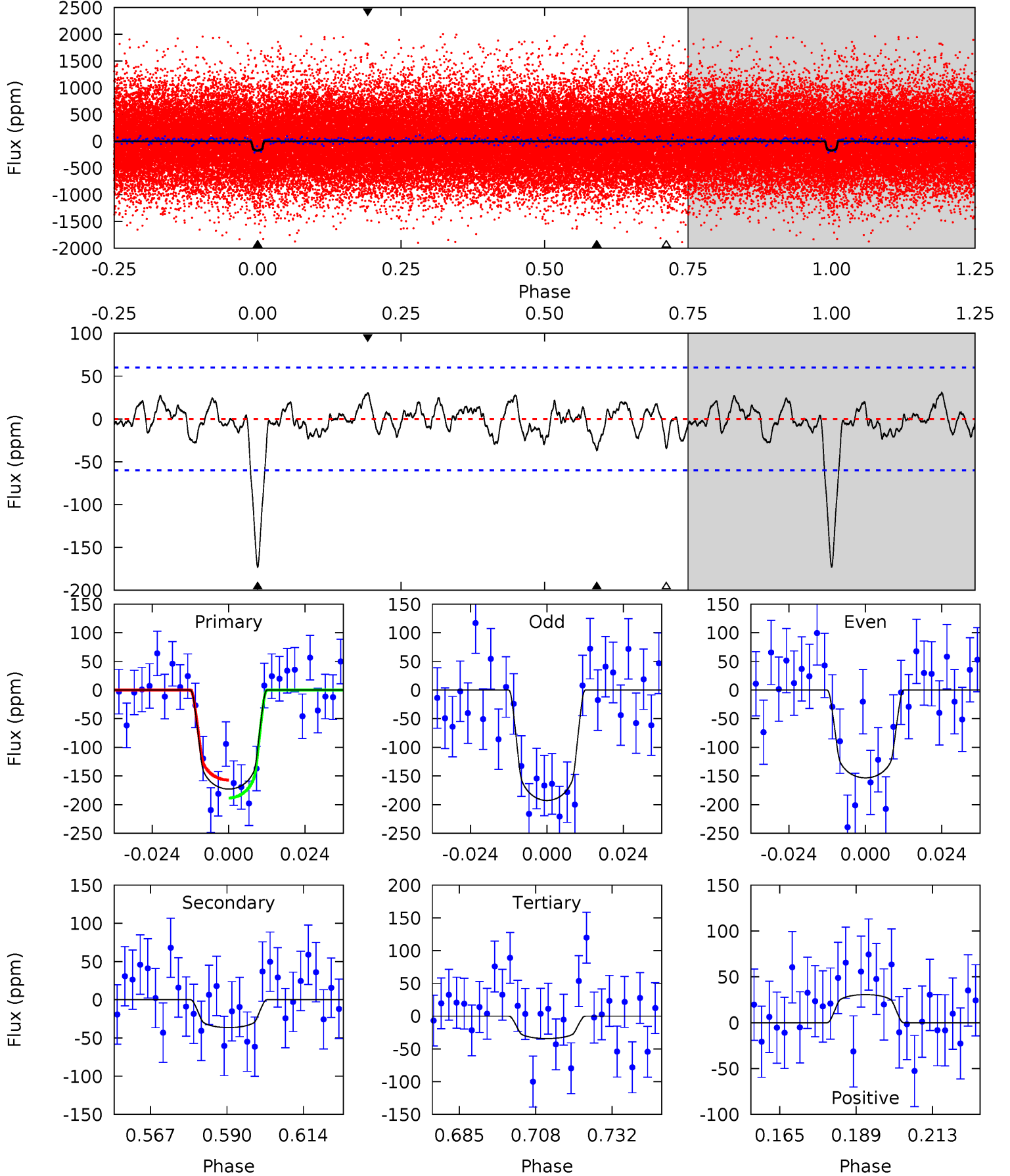
TCE 012645057-01 P= 6.829971 Days  $T_0=135.771330$  (BKJD)



# DV Model-Shift Uniqueness Test

012645057-01, P = 6.830068 Days, E = 128.930199 Days

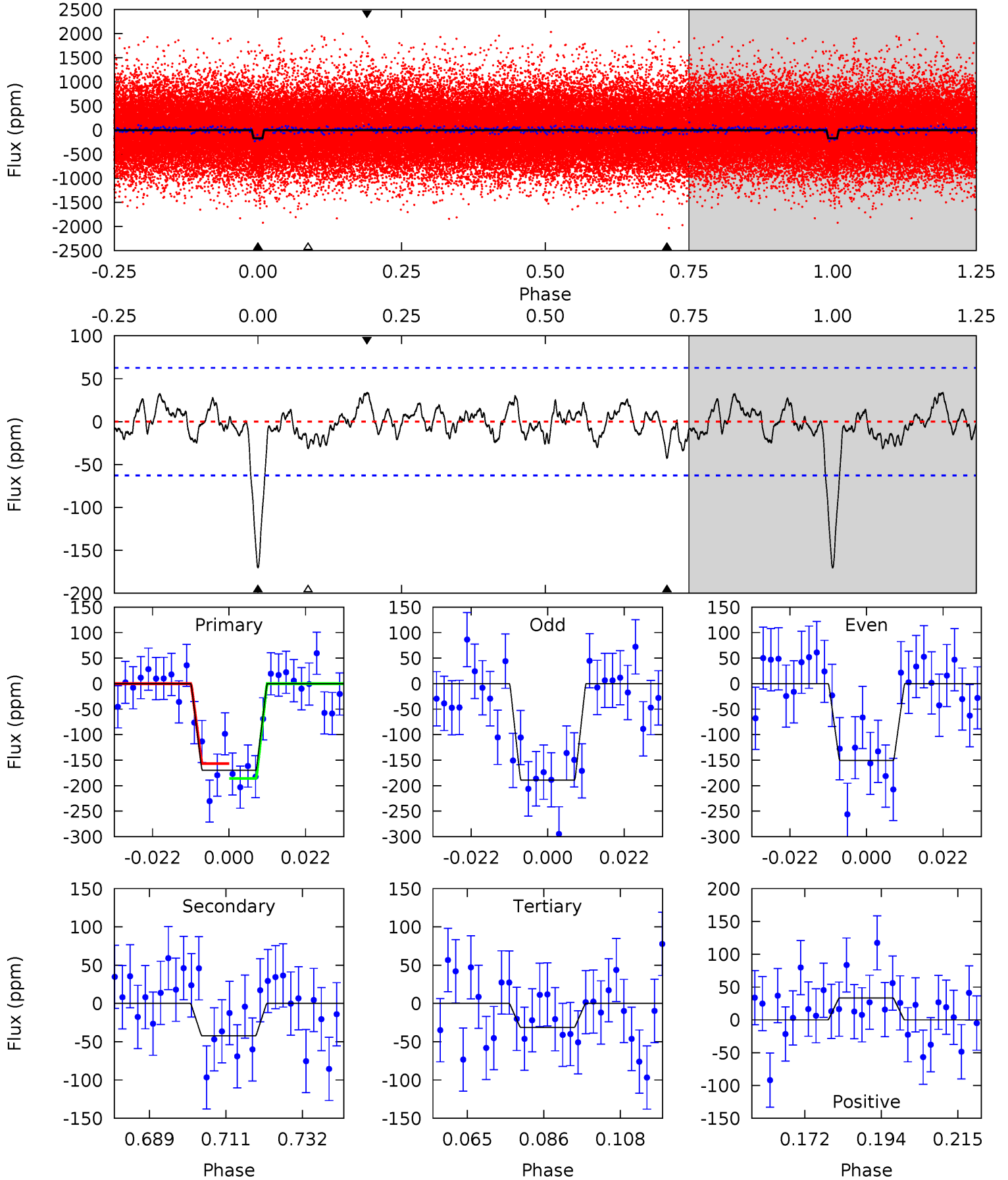
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	2.95	2.77	2.48	4.86	2.26	1.05	11.2	11.5	0.18	0.47	1.60	1.03	0.15	1.27



# Alt Model-Shift Uniqueness Test

012645057-01, P = 6.829971 Days, E = 128.941359 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
13.2	3.29	2.44	2.60	4.88	2.30	1.09	10.8	10.6	0.86	0.69	1.51	0.99	0.16	1.12





### Stellar Parameters For KIC 012645057

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5807^{+138}_{-173}$	$4.576^{+0.038}_{-0.152}$	$-0.400^{+0.300}_{-0.300}$	$0.800^{+0.181}_{-0.060}$	$0.886^{+0.087}_{-0.106}$	$2.439^{+0.457}_{-1.030}$
	+2%/-3%	+1%/-3%	+75%/-75%	+23%/-8%	+10%/-12%	+19%/-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 012645057-01 / KOI 4497.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-36 \pm 12$	$1.32^{+0.70}_{-0.63}$	$1250^{+69}_{-46}$	$3996^{+1206}_{-572}$	$49^{+141}_{-30}$
Alt.	$-42 \pm 13$	$1.20^{+0.65}_{-0.56}$	$1253^{+62}_{-53}$	$4251^{+1470}_{-604}$	$69^{+223}_{-42}$

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

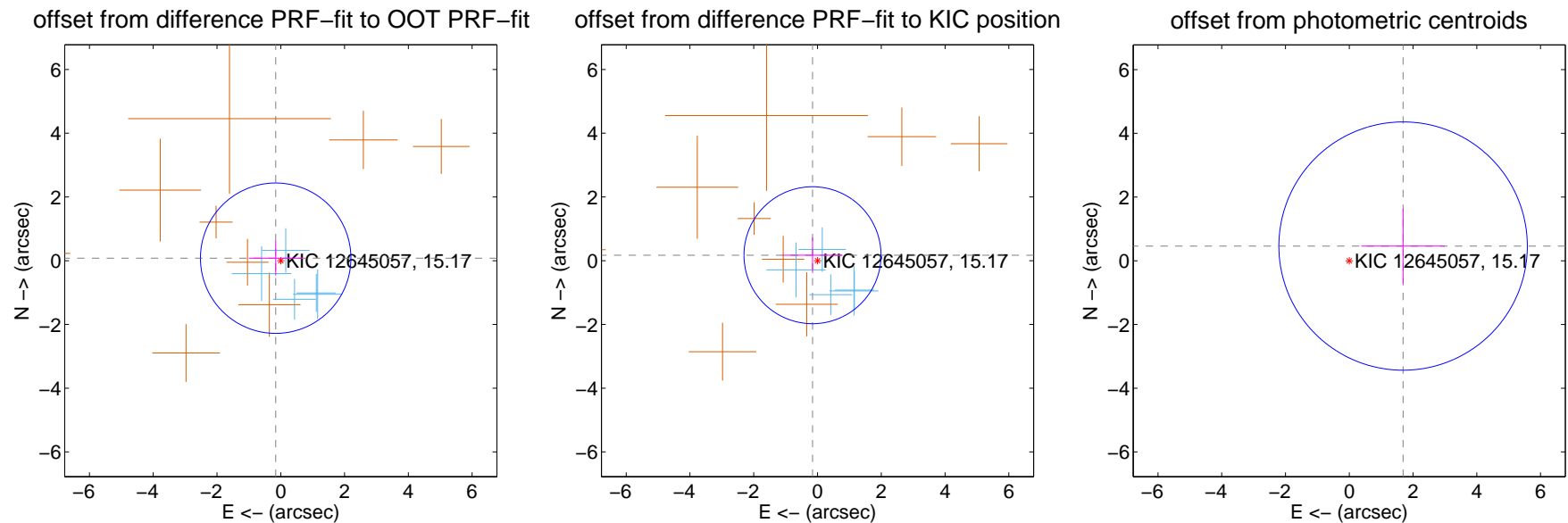
## DV Centroid Data

Supplemental centroid analysis for 012645057-01. Kepler magnitude: 15.17. Transit SNR 12.03

There are 5 quarters with good PRF difference image offsets

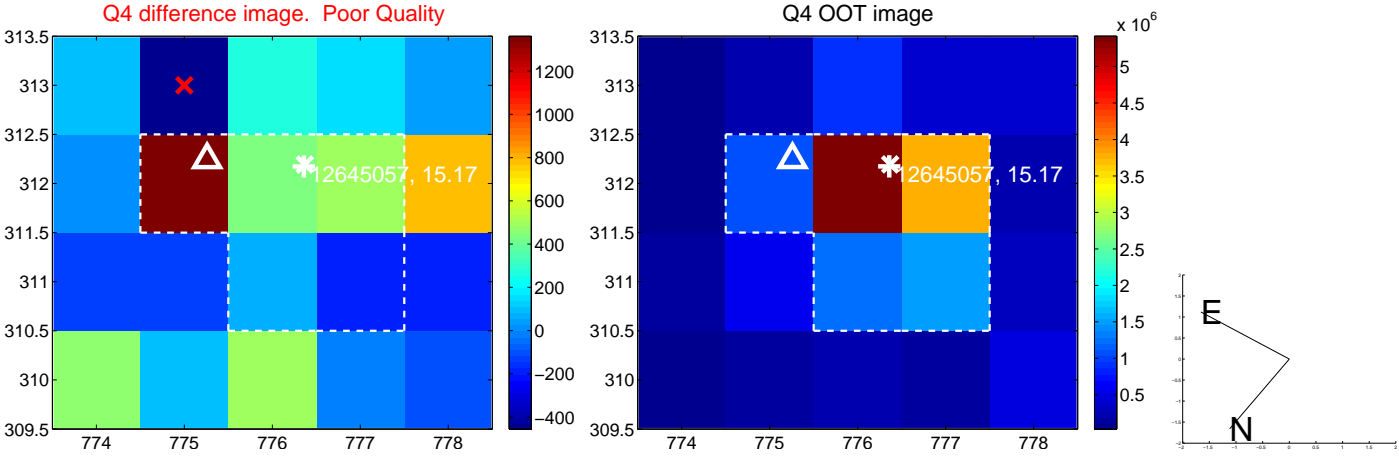
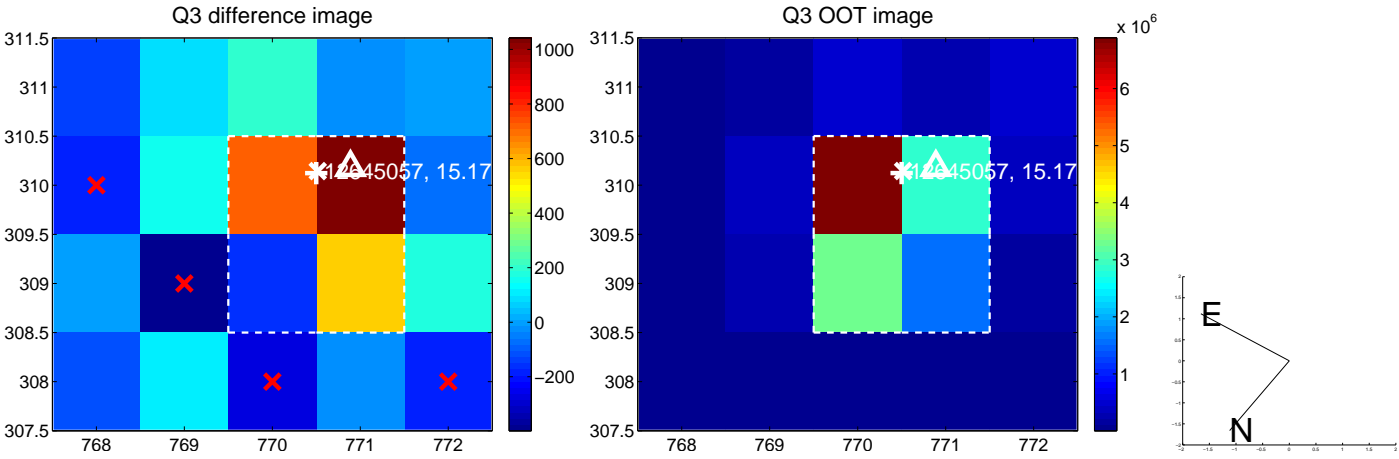
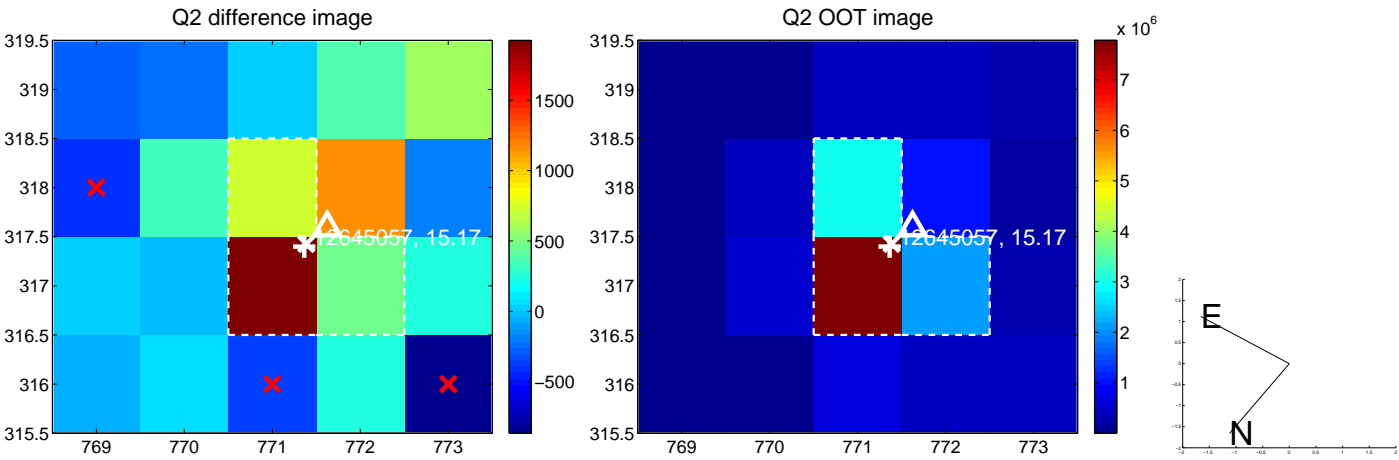
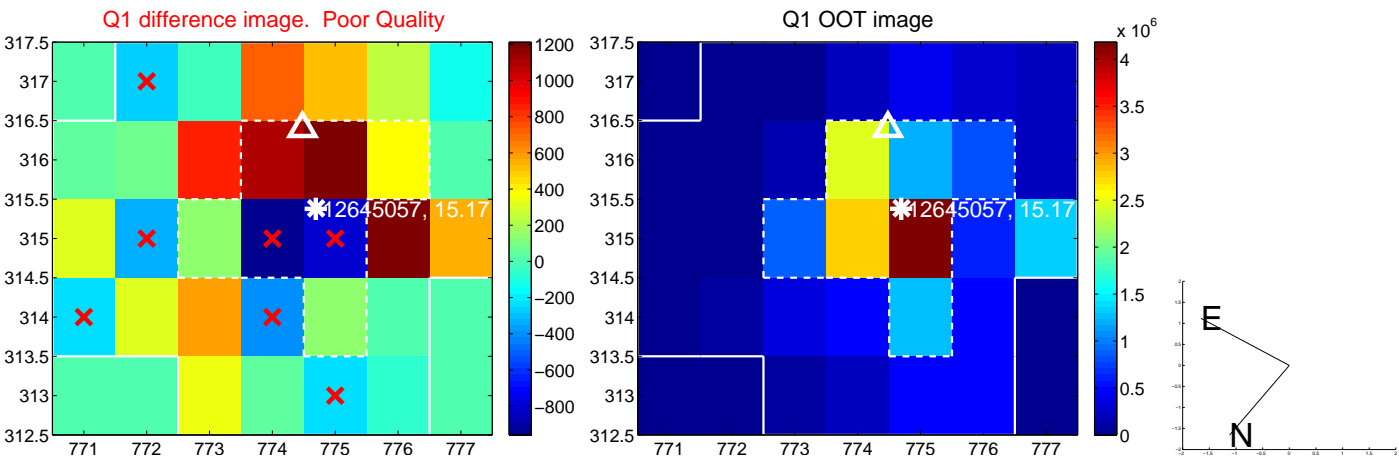
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.178 \pm 0.786$	0.23	$0.160 \pm 0.841$	$0.079 \pm 0.541$
PRF-fit source offset from KIC position	$0.233 \pm 0.716$	0.33	$0.157 \pm 0.938$	$0.172 \pm 0.555$
photometric centroid source offset	$1.75 \pm 1.30$	1.35	$-1.69 \pm 1.31$	$0.46 \pm 1.18$

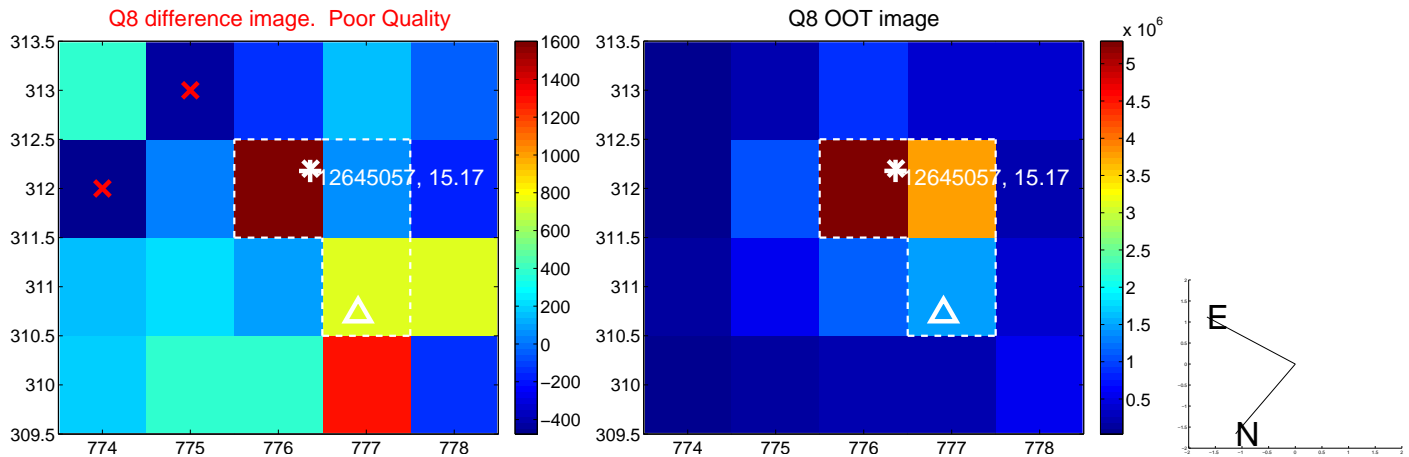
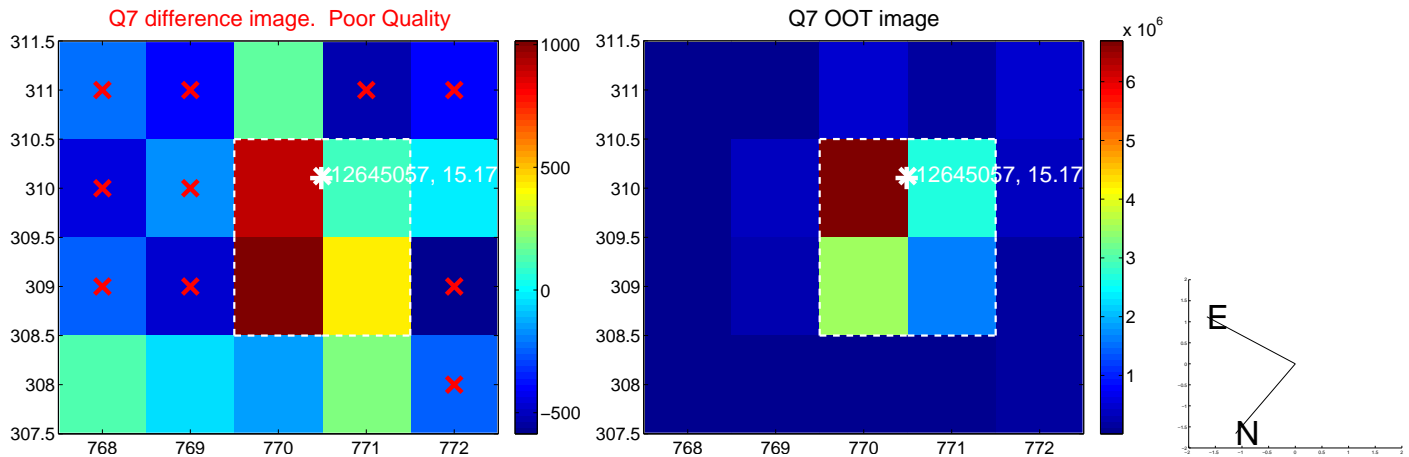
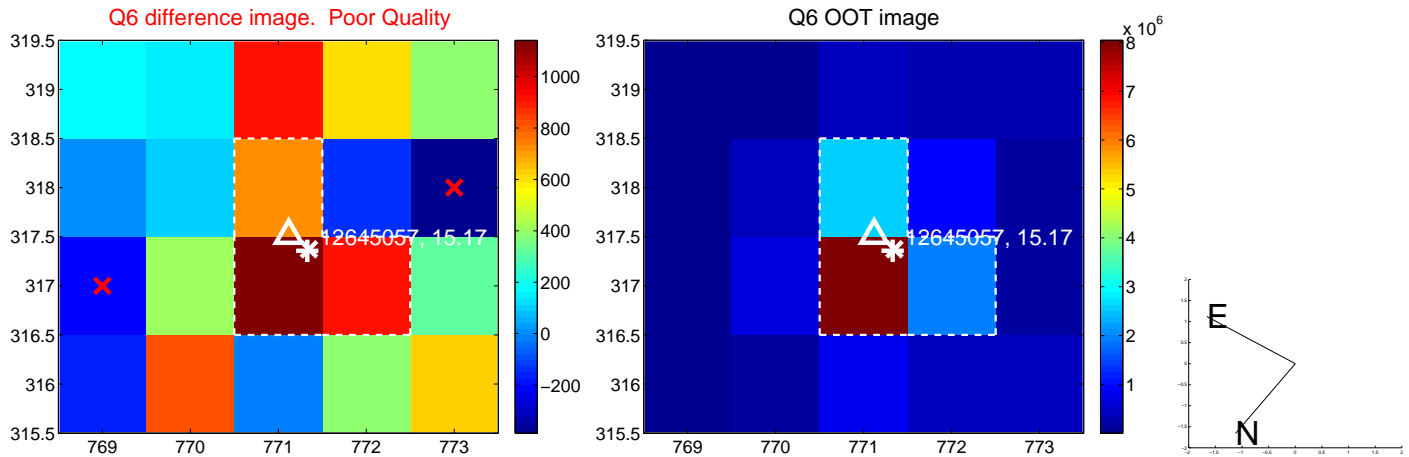
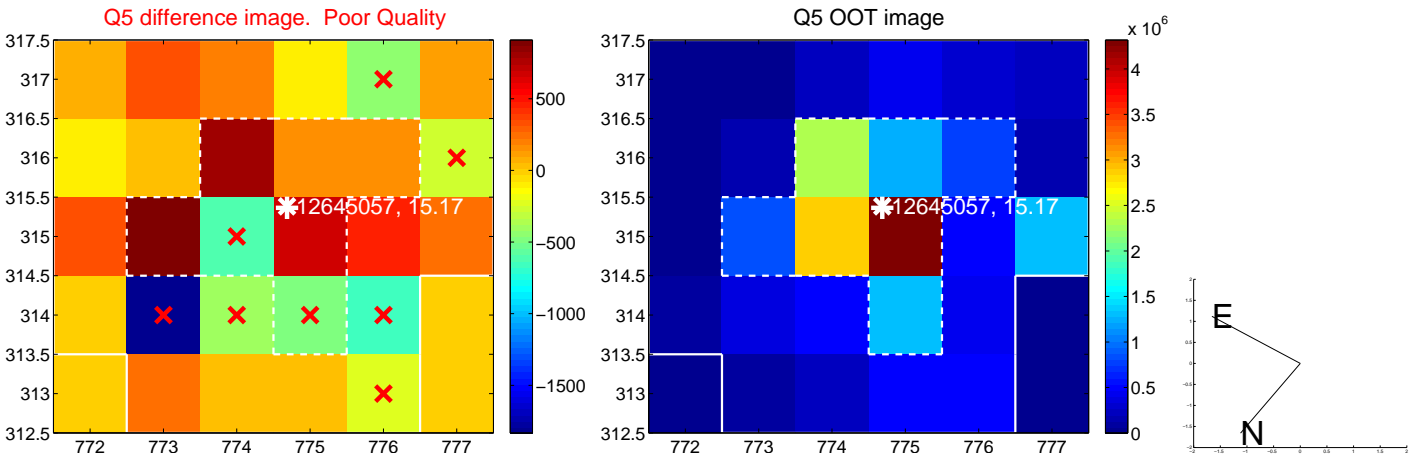


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

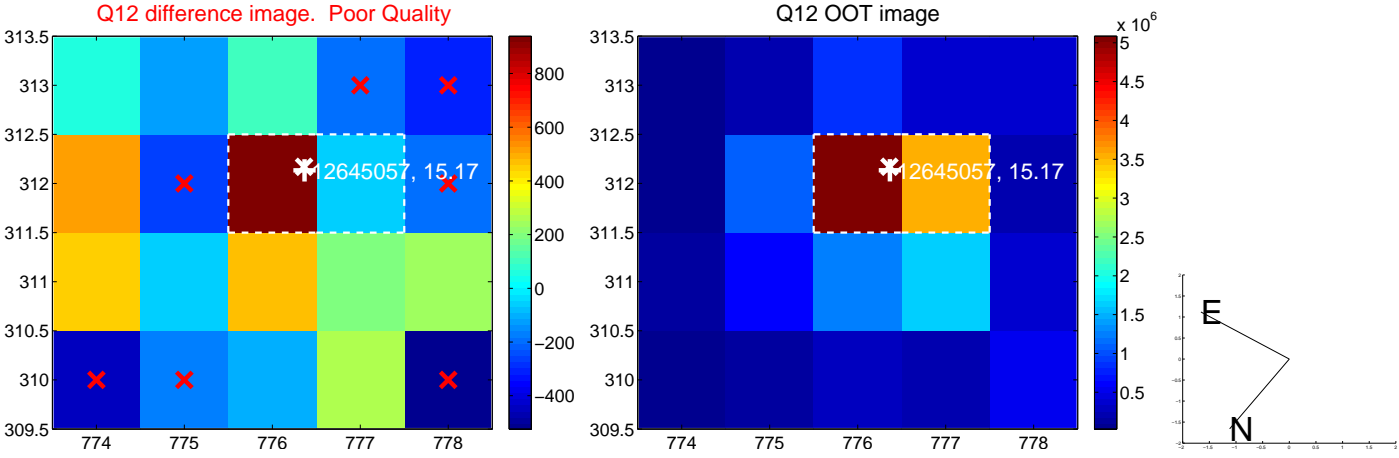
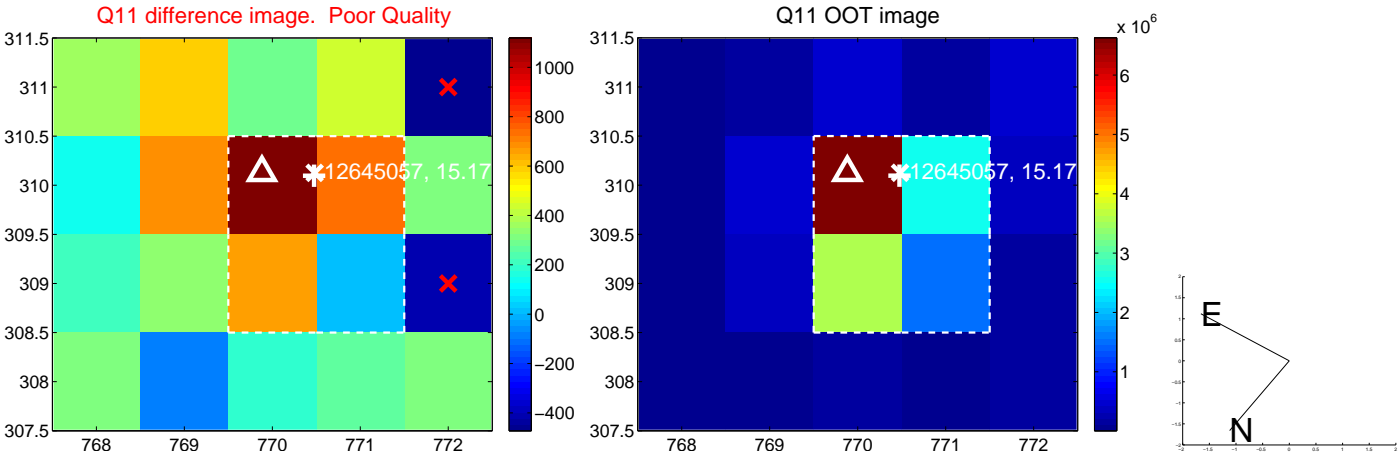
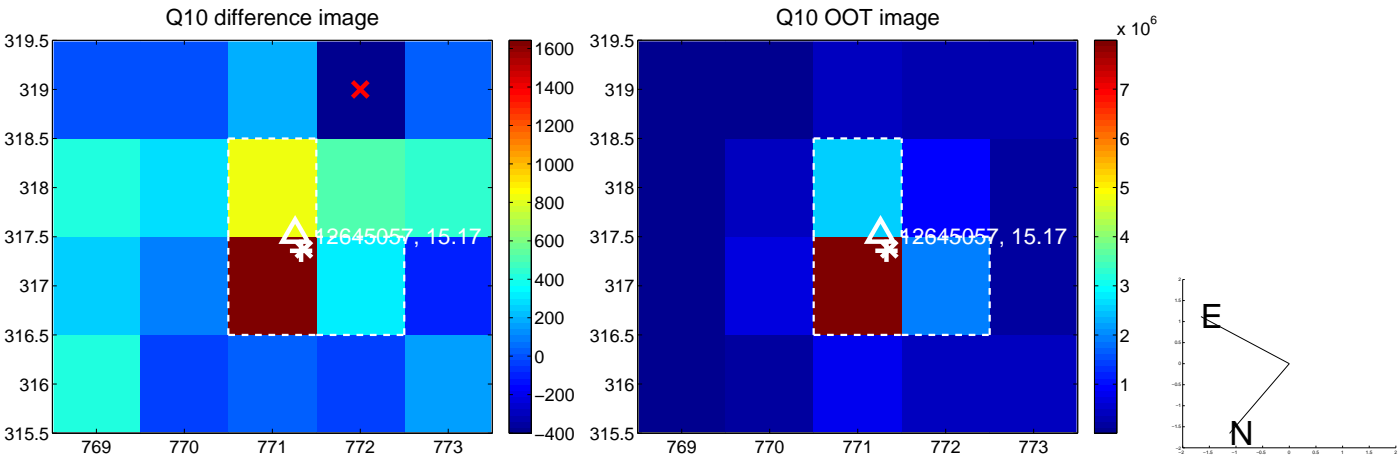
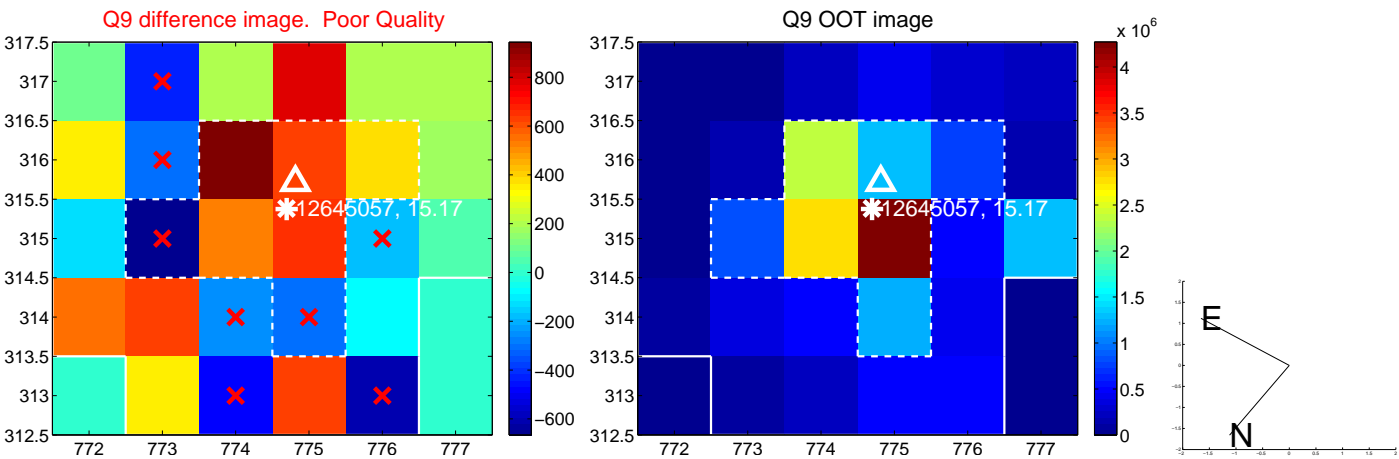


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

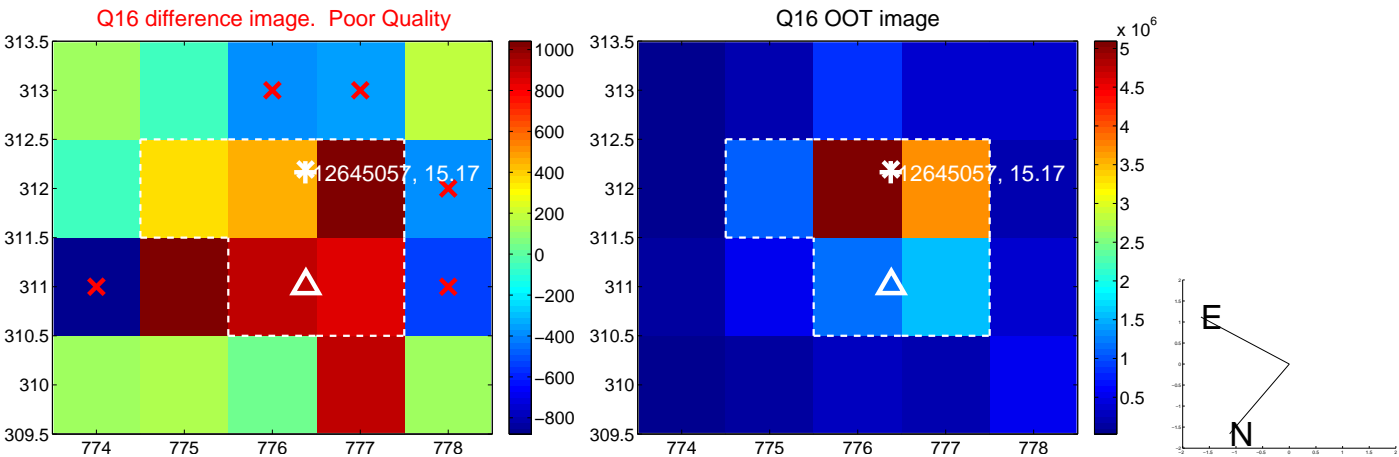
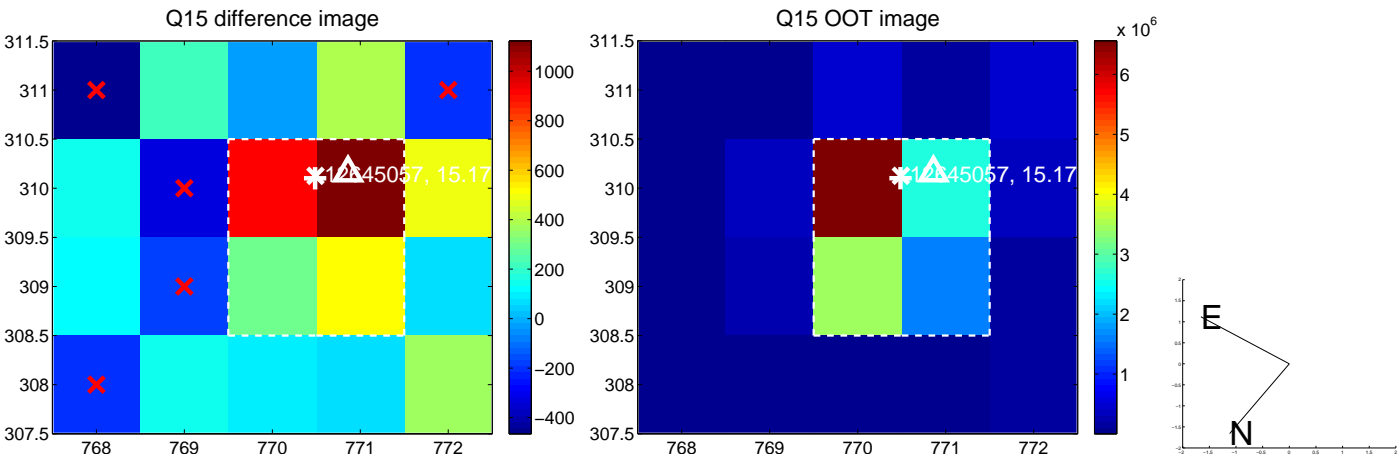
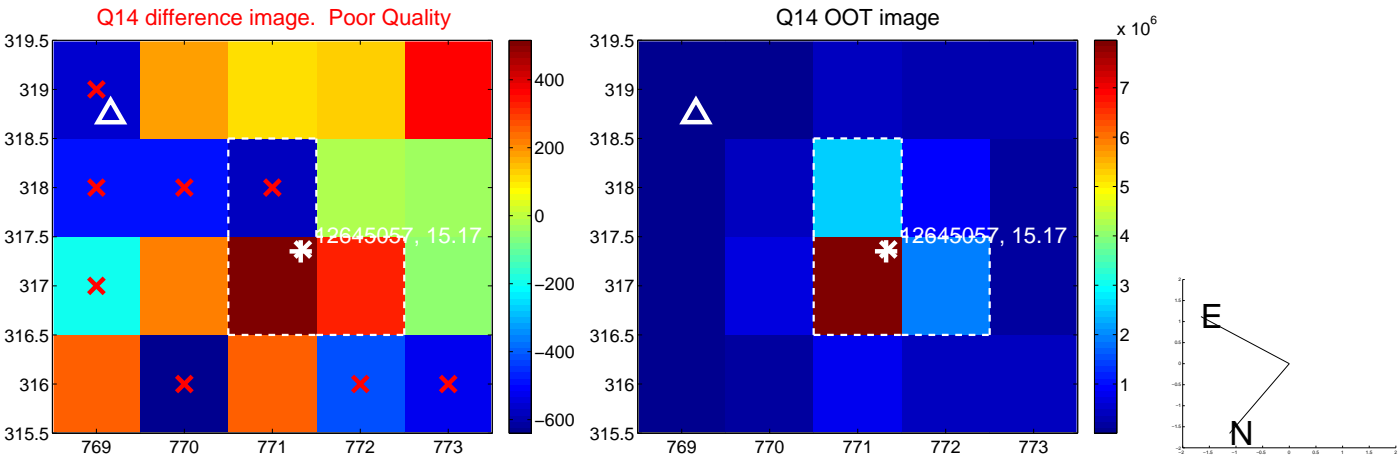
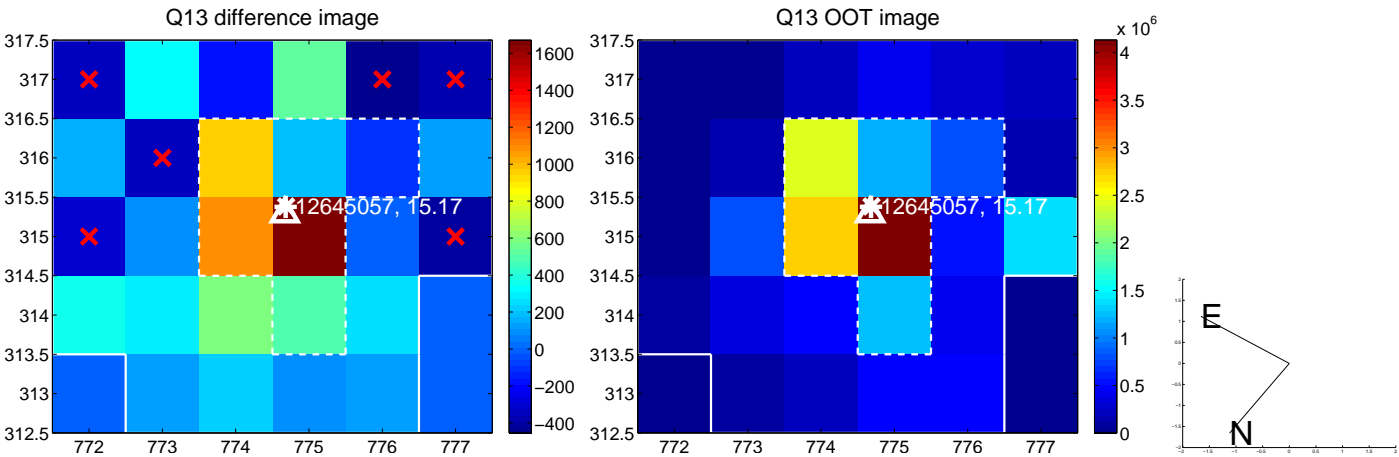




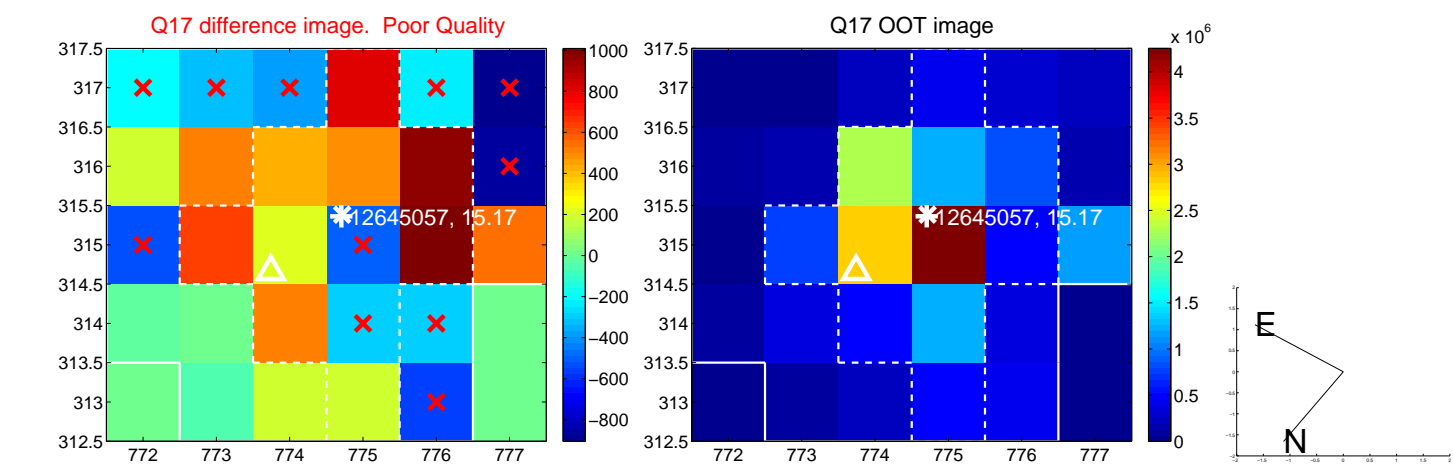
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



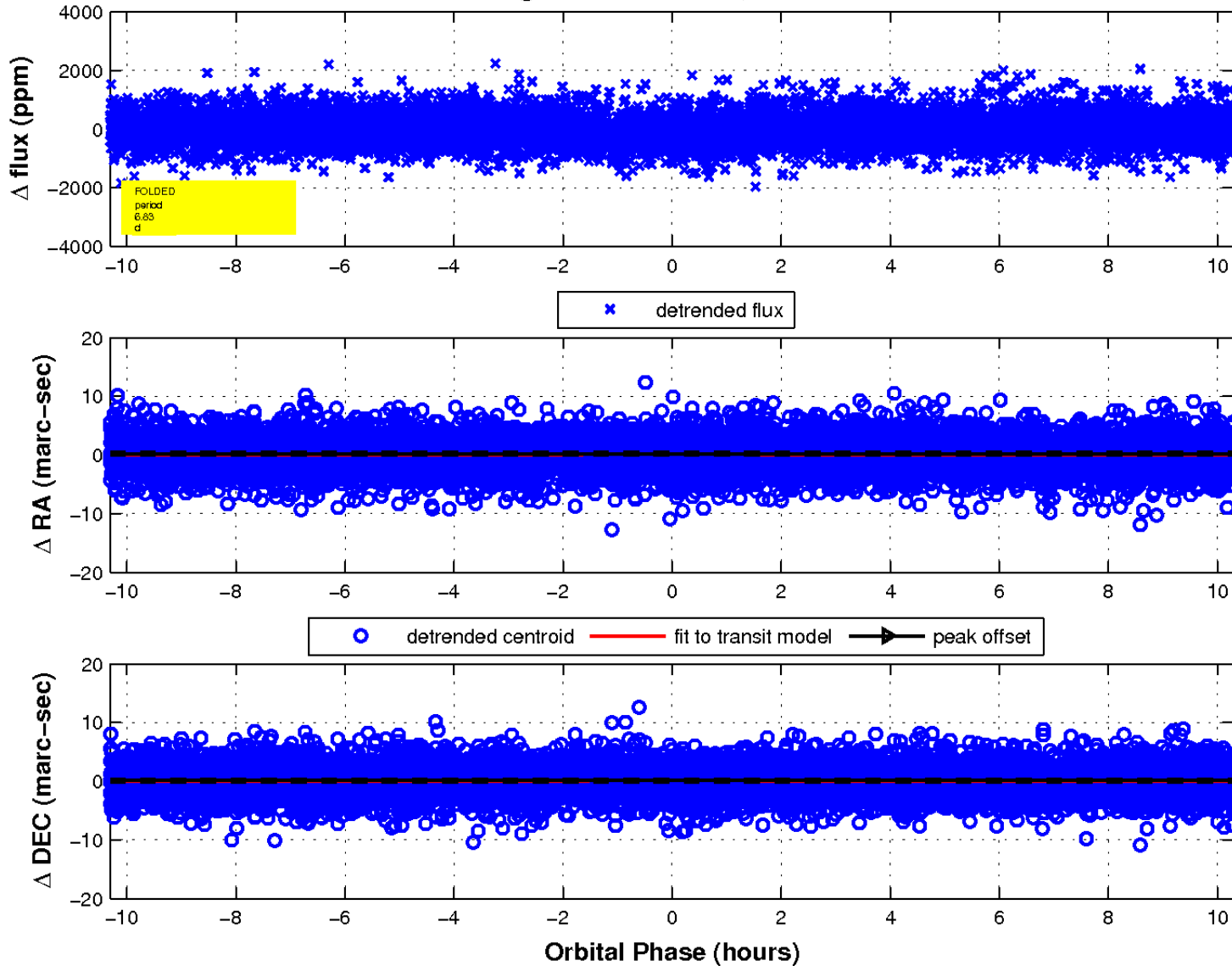
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

