

# KIC 009072639

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009072639-01	OBS	4198.01	1.182849	131.978386	21.9	3.024	13.4	14.3	2.64	6017	1.37	14547.95

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009072639-01	OBS	FP	0.09	0	0	1	0	CENT_UNRESOLVED_OFFSET

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

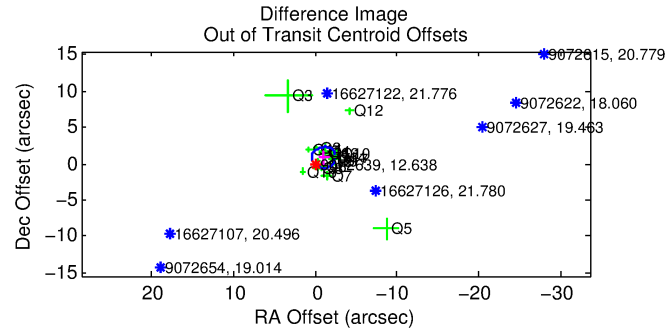
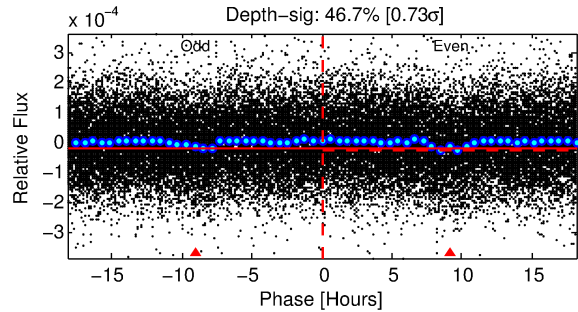
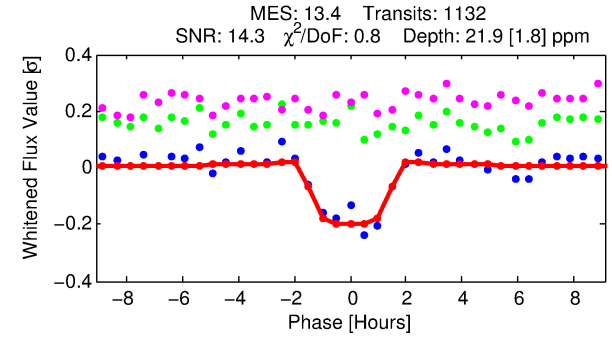
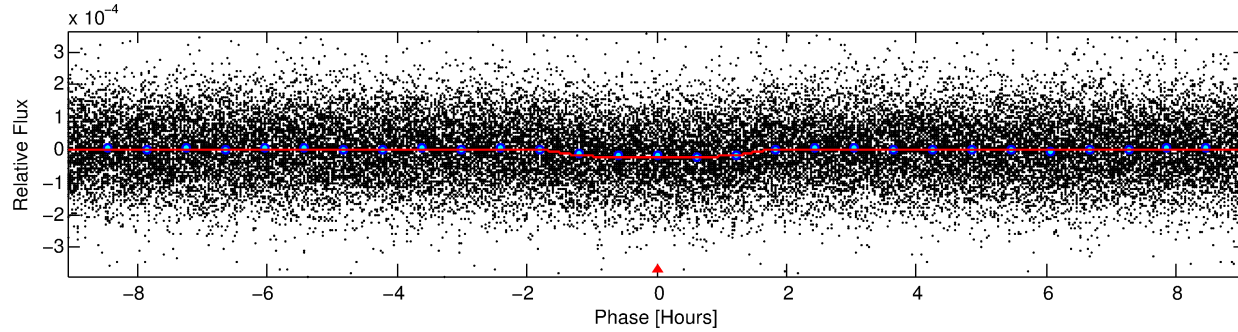
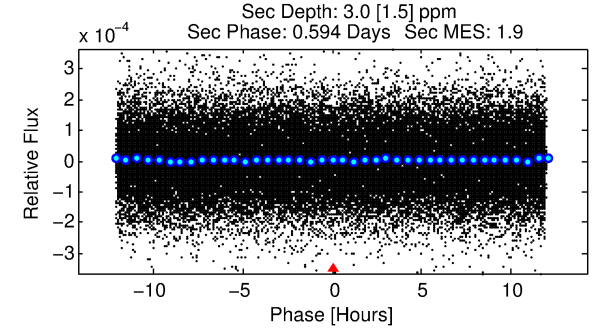
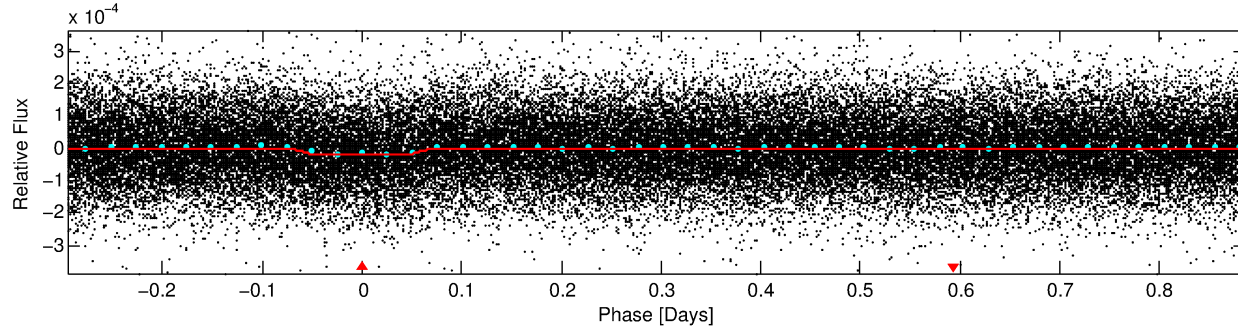
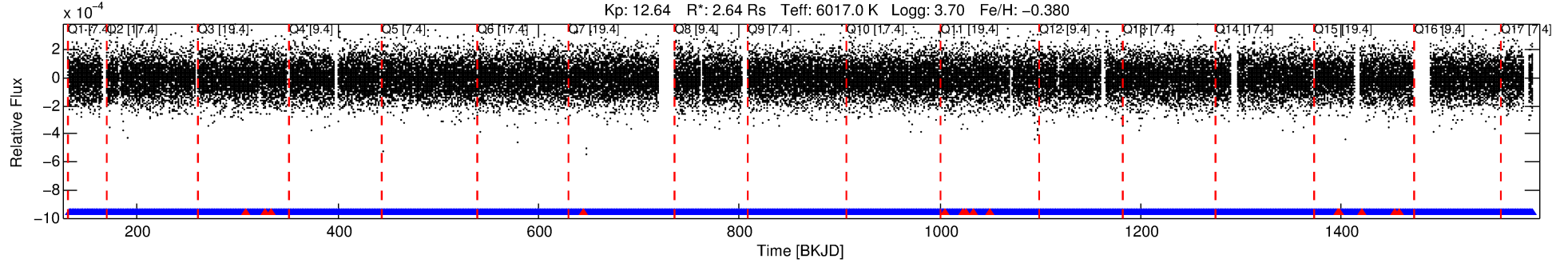
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009072639-01

No Significant Match Found

# DV One-Page Summary

KIC: 9072639 Candidate: 1 of 1 Period: 1.183 d  
KOI: K04198.01 Corr: 0.969



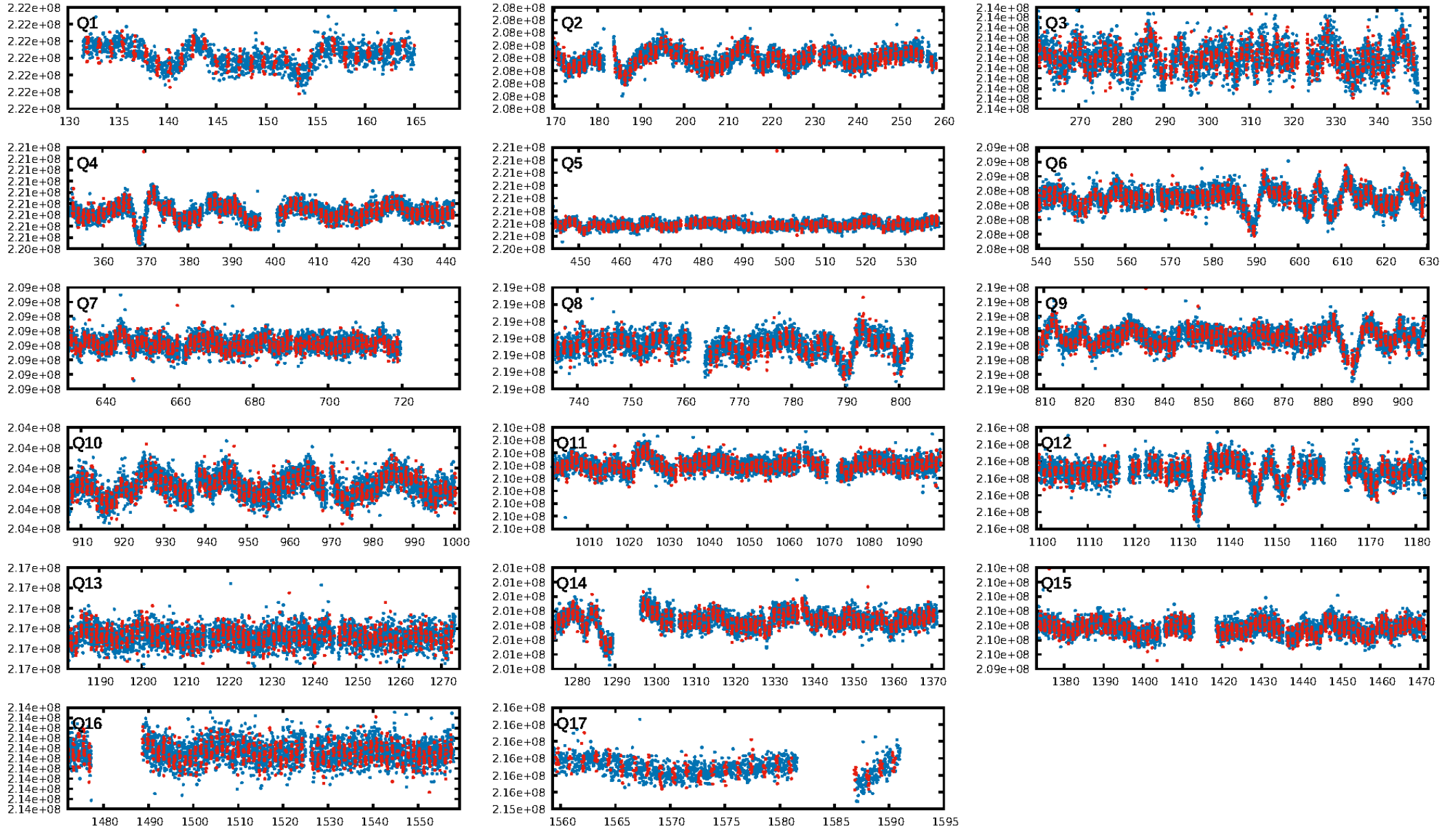
## DV Fit Results:

Period = 1.18285 [0.00001] d  
Epoch = 131.9784 [0.0026] BKJD  
Rp/R\* = 0.0047 [0.0007]  
a/R\* = 2.01 [1.17]  
b = 0.80 [0.35]  
Seff = 14547.95 [6543.29]  
Teff = 2800 [315] K  
Rp = 1.37 [0.51] Re  
a = 0.0237 [0.0070] AU  
Ag = 0.49 [0.36] [-1.39σ]  
Teffp = 3631 [540] K [1.33σ]

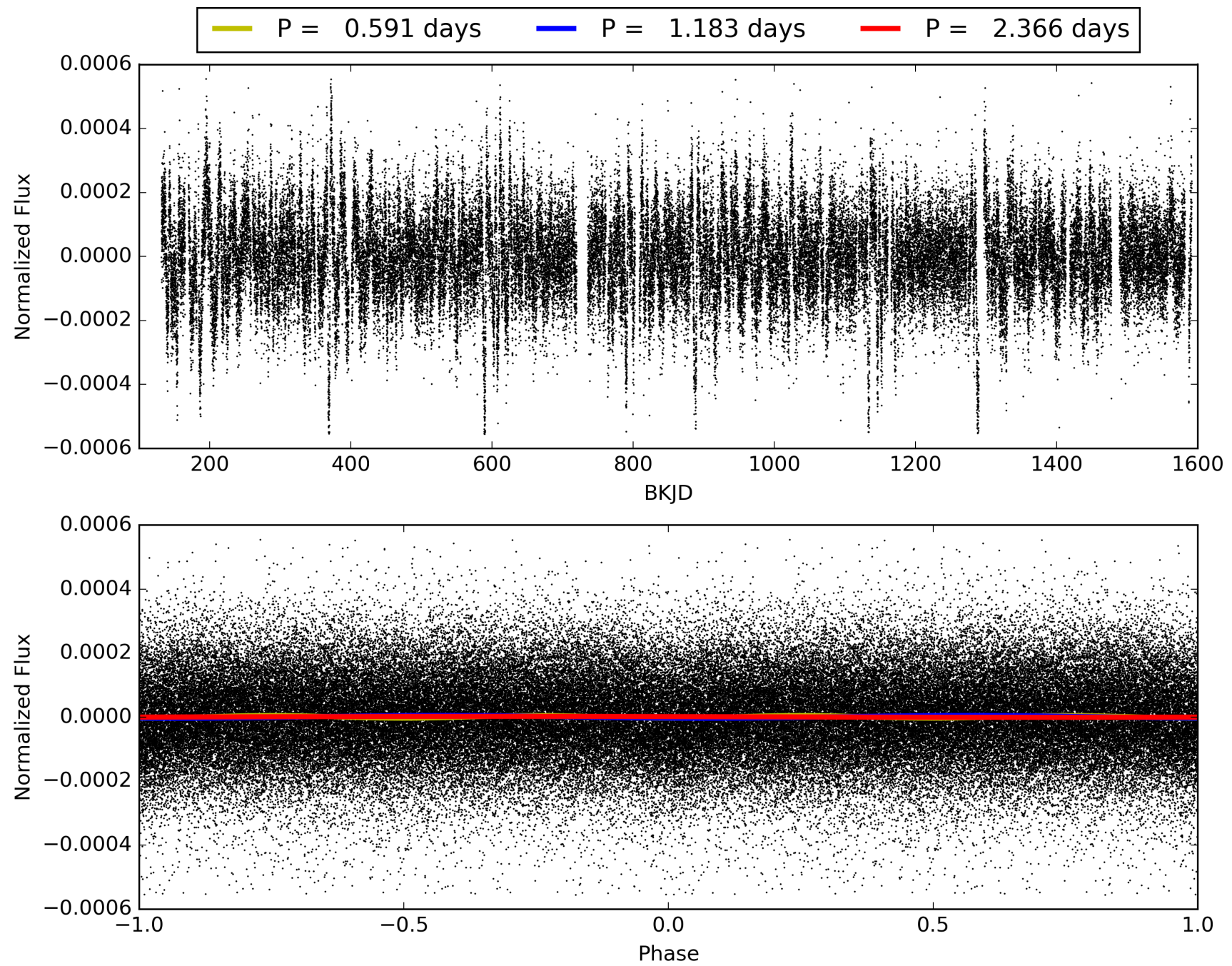
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.51e-36  
RollingBand-fgt: 0.99 [1067/1081]  
GhostDiagnostic-chr: 5.621  
Centroid-sig: 16.8%  
Centroid-so: 0.655 arcsec [1.04σ]  
OotOffset-rm: 1.394 arcsec [2.87σ]  
KicOffset-rm: 1.384 arcsec [2.56σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.69 [11/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009072639-01, PDC Light Curves



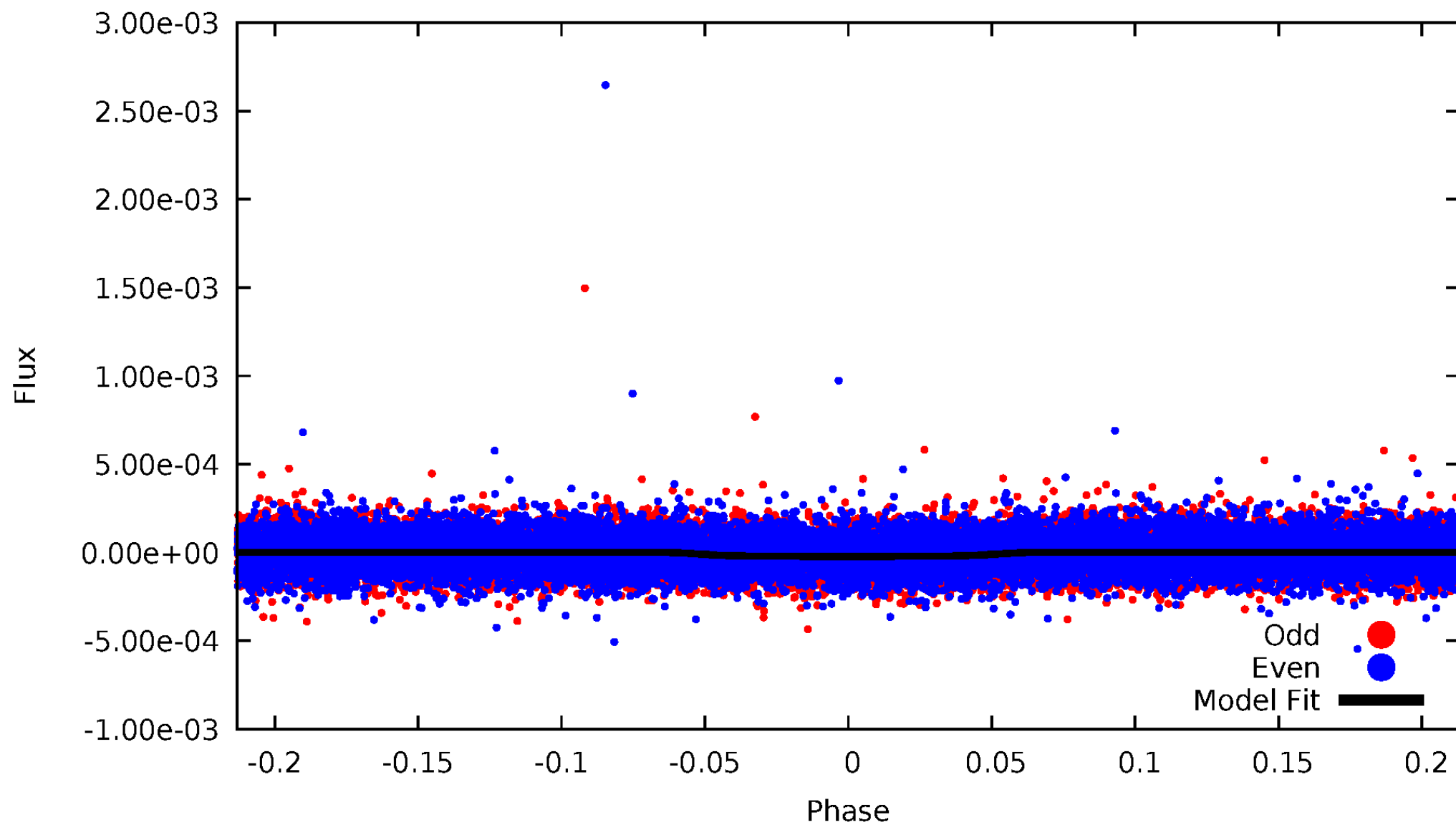
TCE 009072639-01





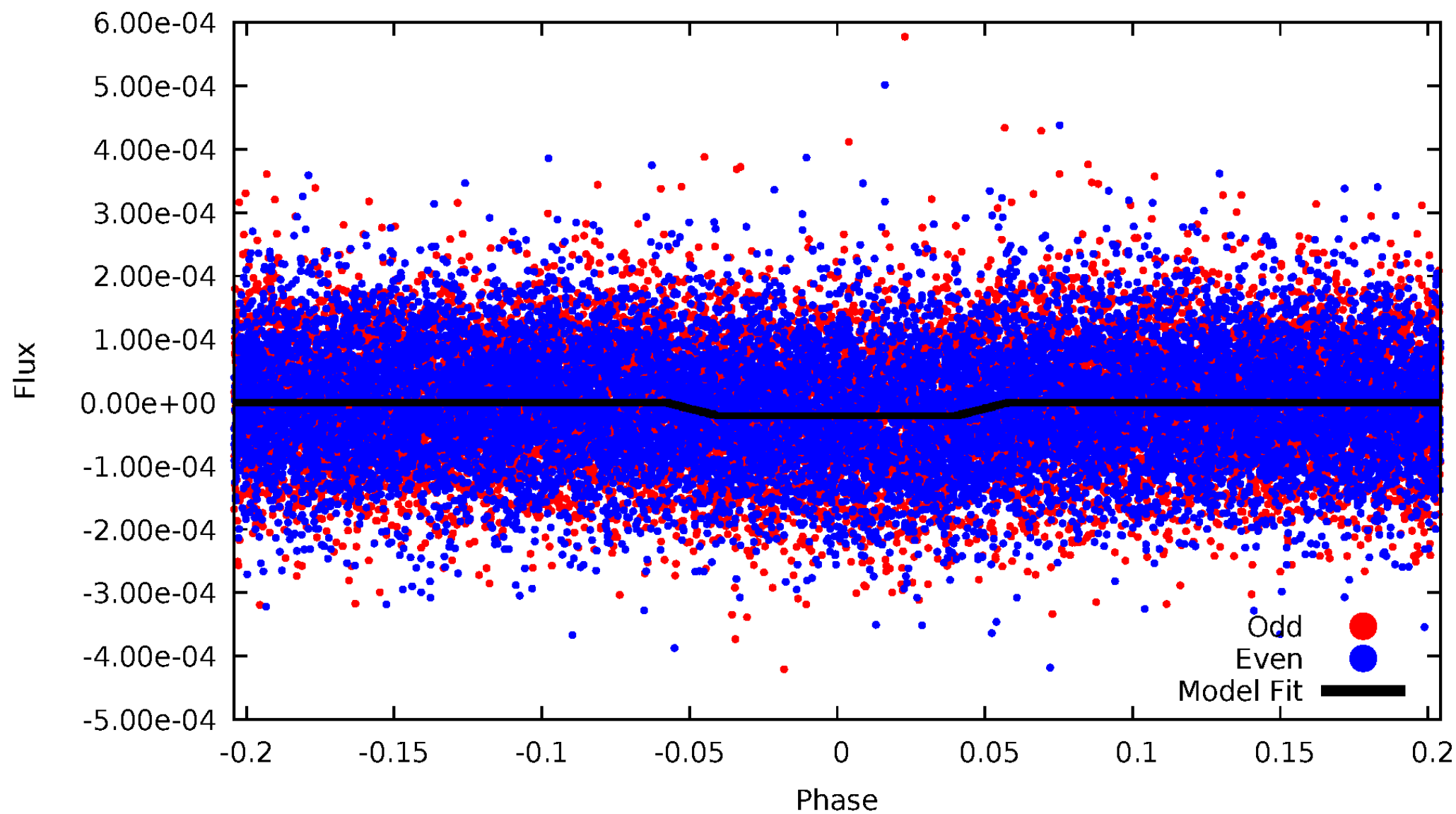
# DV Odd/Even

TCE 009072639-01



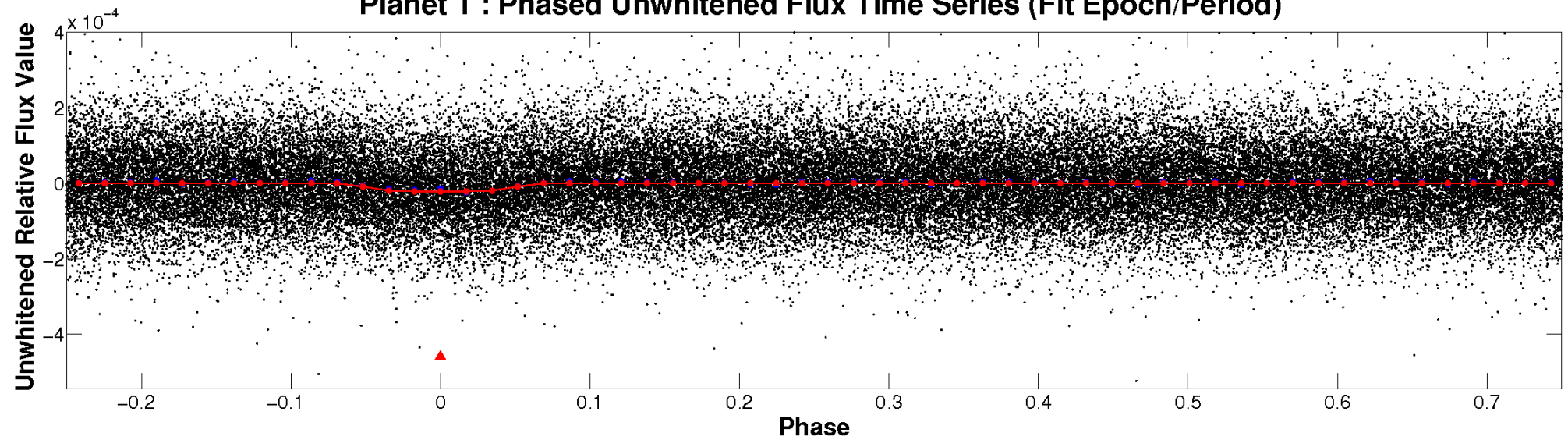
# ALT Odd/Even

TCE 009072639-01

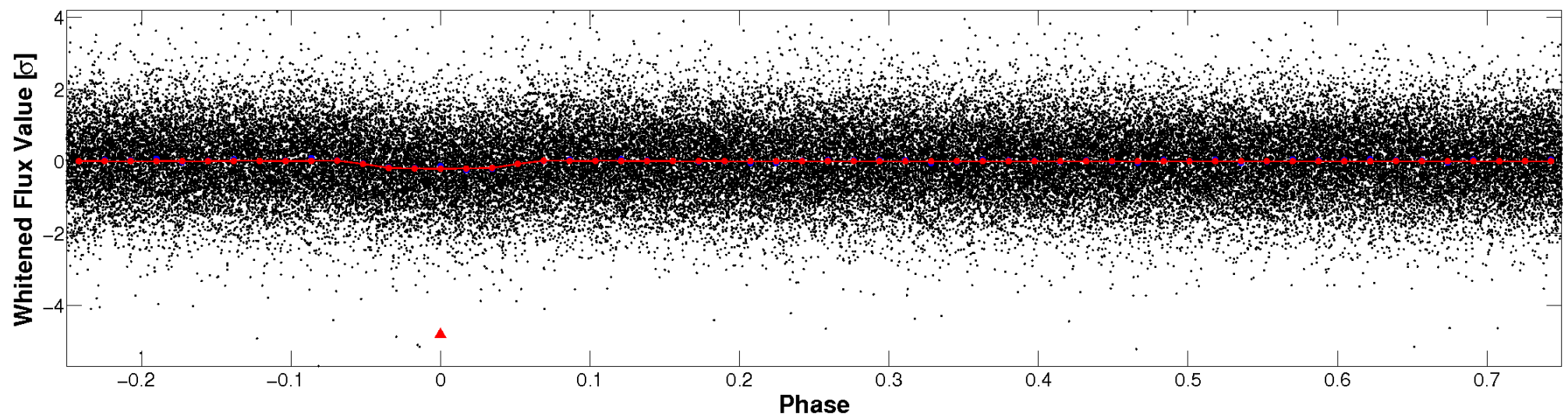


# Non-Whitened Vs. Whitened Light Curve

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

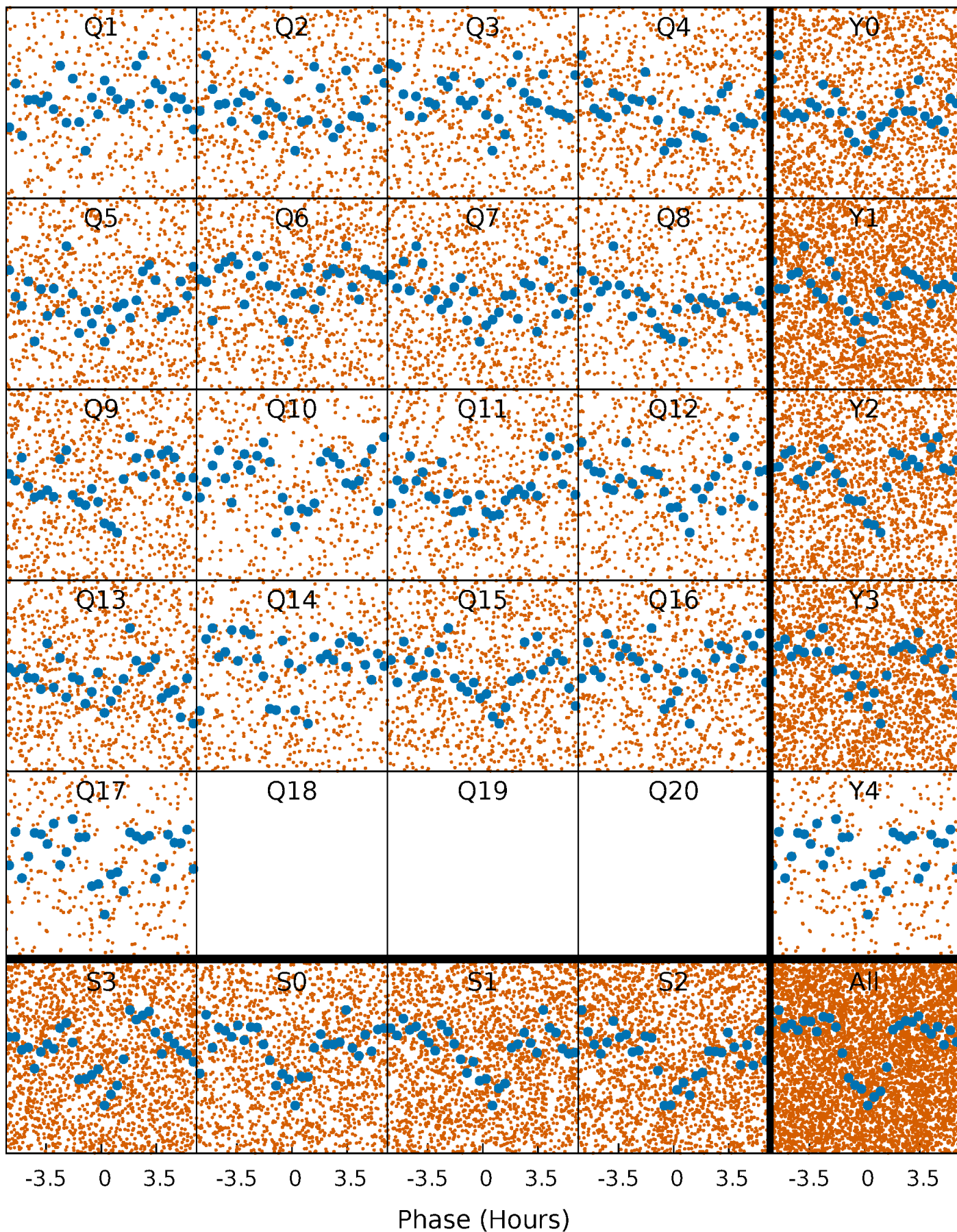


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

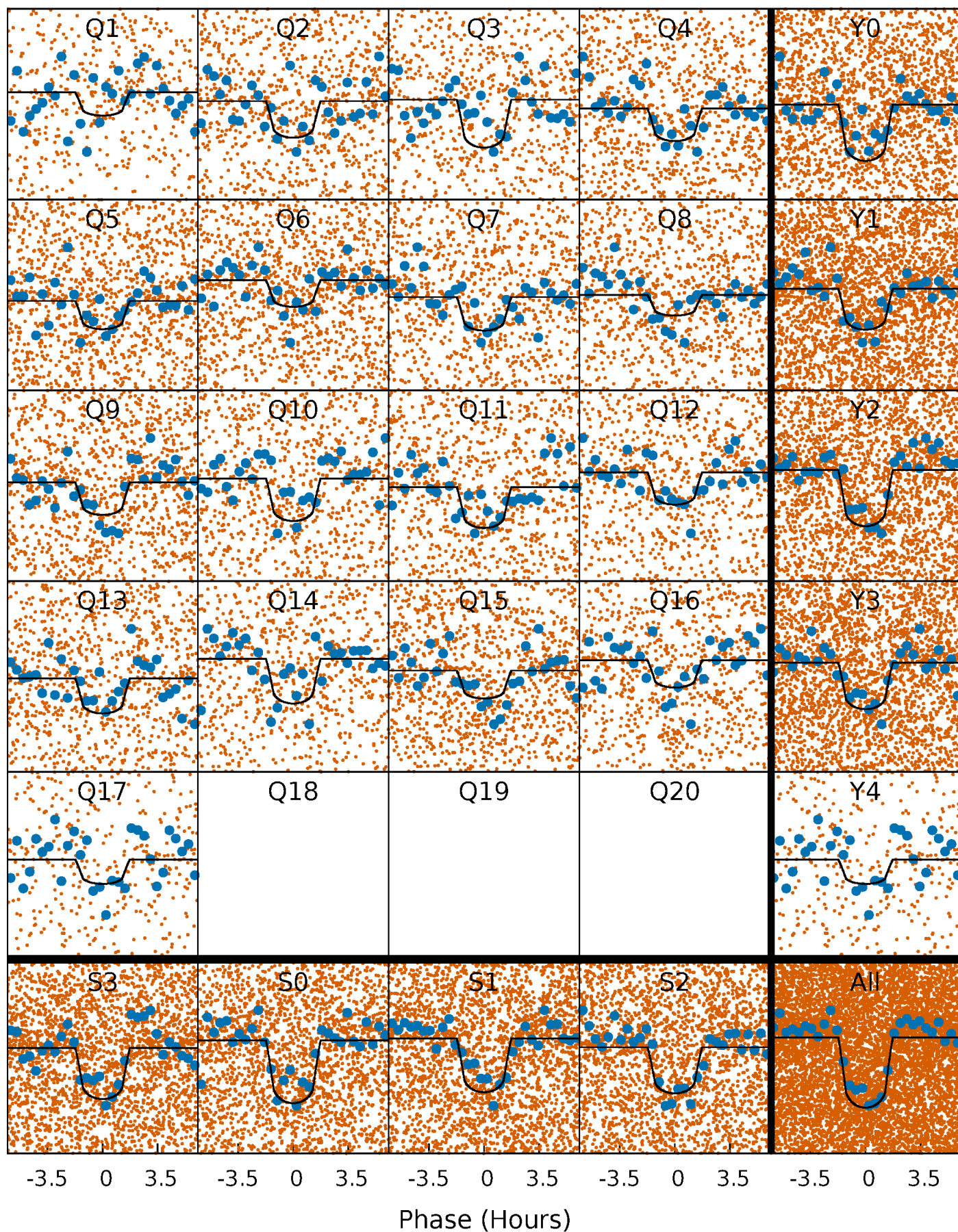
TCE 009072639-01 P= 1.182849 Days  $T_0=131.978386$  (BKJD)





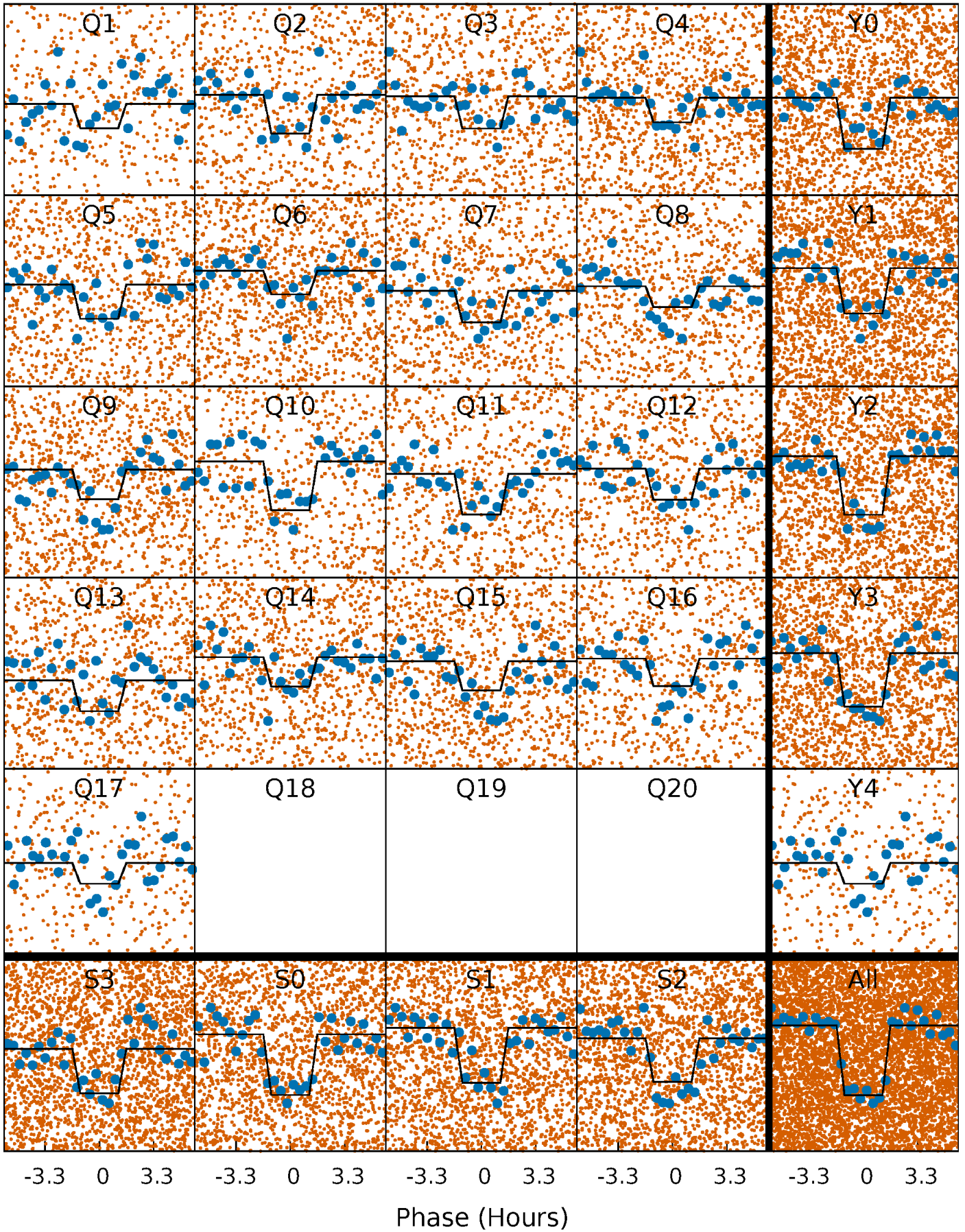
# DV Quarter-Phased Transit Curves

TCE 009072639-01 P= 1.182849 Days  $T_0=131.978386$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009072639-01 P= 1.182858 Days  $T_0=131.973434$  (BKJD)

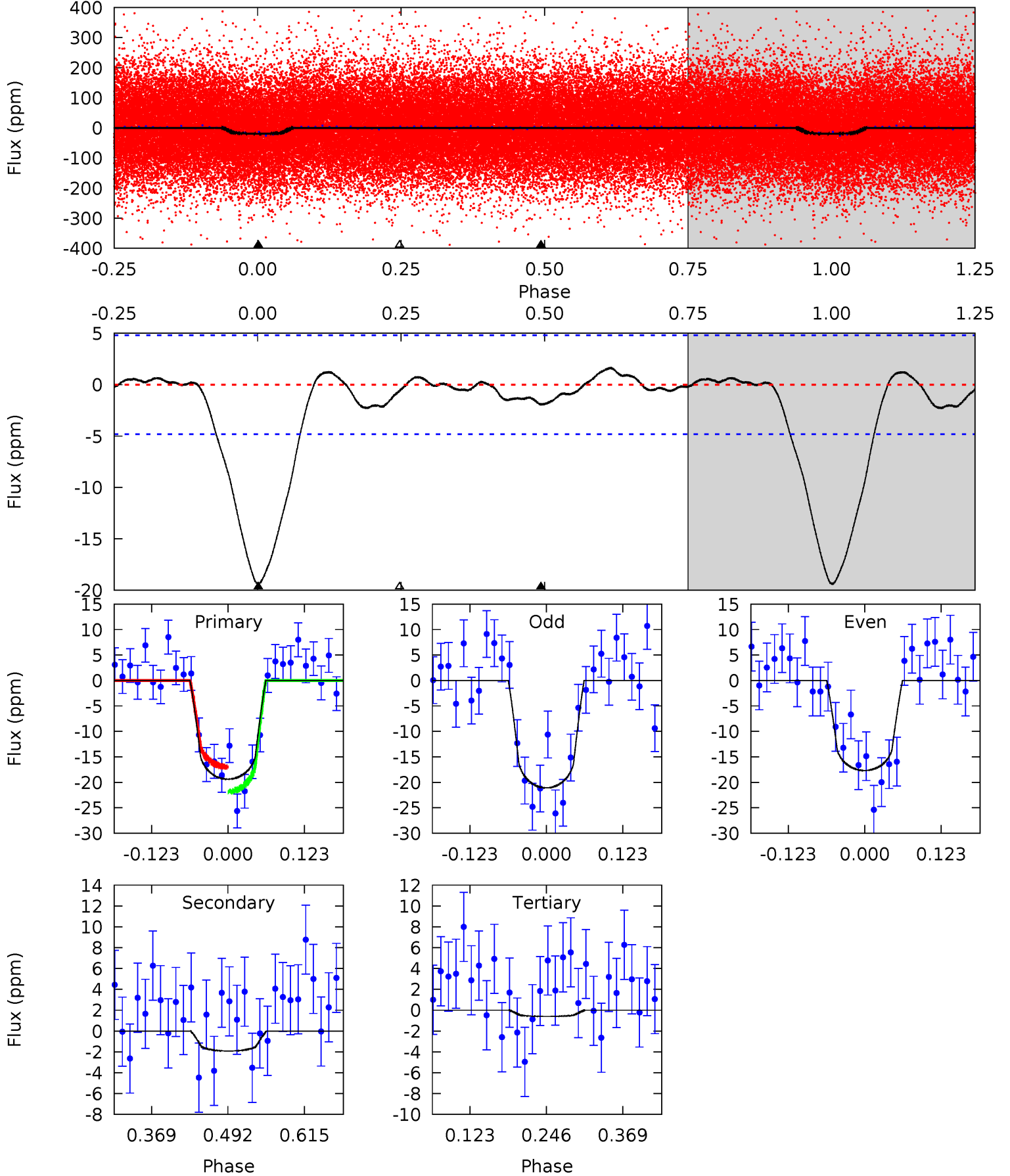




# DV Model-Shift Uniqueness Test

009072639-01, P = 1.182849 Days, E = 130.795537 Days

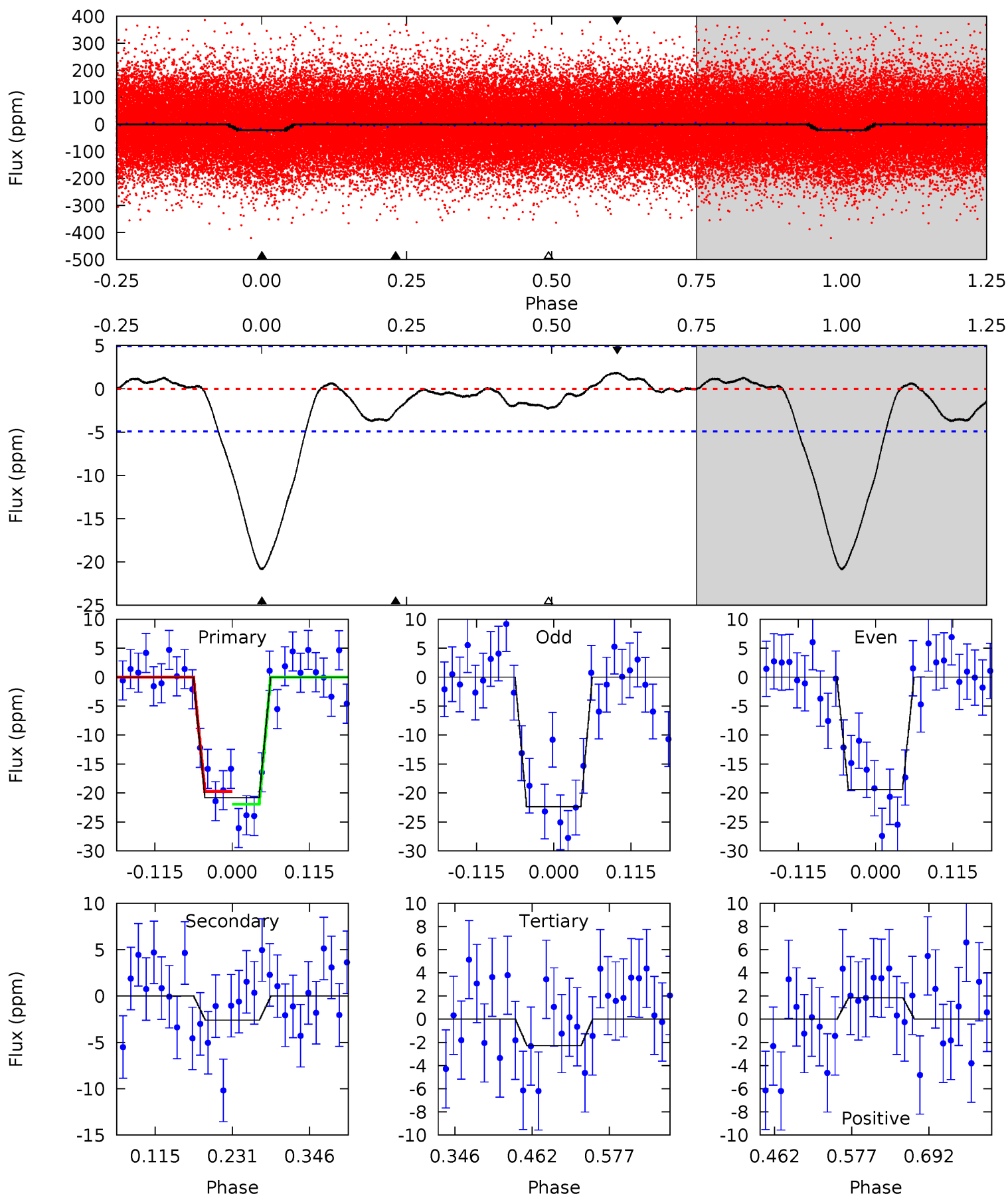
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	1.81	0.56	0	4.52	1.54	0.82	17.7	18.2	1.24	1.81	1.61	1.02	0.08	2.27



# Alt Model-Shift Uniqueness Test

009072639-01, P = 1.182858 Days, E = 130.790576 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
19.1	2.38	2.10	1.71	4.53	1.57	1.01	17.0	17.4	0.29	0.68	1.35	1.03	0.08	1.00





### Stellar Parameters For KIC 009072639

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6017^{+120}_{-120}$	$3.699^{+0.248}_{-0.078}$	$-0.380^{+0.150}_{-0.150}$	$2.639^{+0.358}_{-0.894}$	$1.269^{+0.111}_{-0.240}$	$0.097^{+0.148}_{-0.026}$
	+2%/-2%	+7%/-2%	+39%/-39%	+14%/-34%	+9%/-19%	+152%/-26%
Source	SPE59	SPE59	SPE59	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009072639-01 / KOI 4198.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2 \pm 1$	$1.30^{+0.25}_{-0.28}$	$3852^{+189}_{-303}$	$2752^{+901}_{-5995}$	$0.347^{+0.329}_{-0.194}$
Alt.	$-3 \pm 1$	$1.25^{+0.29}_{-0.25}$	$3870^{+187}_{-268}$	$3379^{+612}_{-5846}$	$0.508^{+0.381}_{-0.228}$

$T_{max}$  = 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

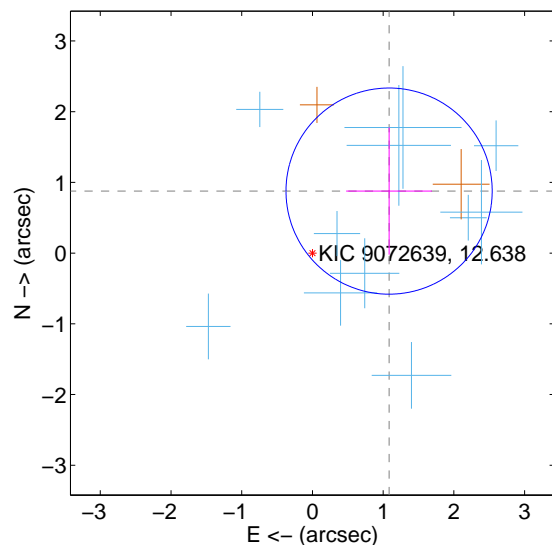
Supplemental centroid analysis for 009072639-01. Kepler magnitude: 12.64. Transit SNR 14.34

There are 11 quarters with good PRF difference image offsets

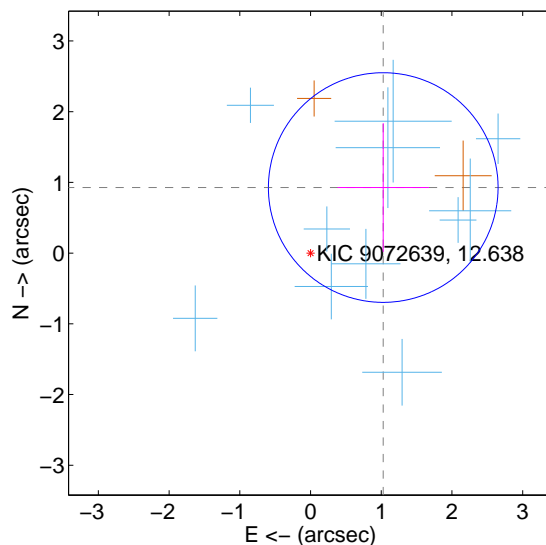
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.394 \pm 0.486$	2.87	$-1.084 \pm 0.607$	$0.877 \pm 0.899$
PRF-fit source offset from KIC position	$1.384 \pm 0.541$	2.56	$-1.028 \pm 0.647$	$0.927 \pm 0.910$
photometric centroid source offset	$0.65 \pm 0.63$	1.04	$-0.21 \pm 0.67$	$-0.62 \pm 0.62$

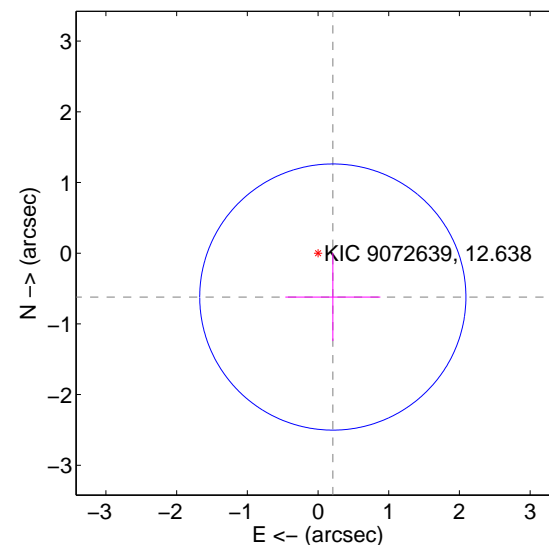
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

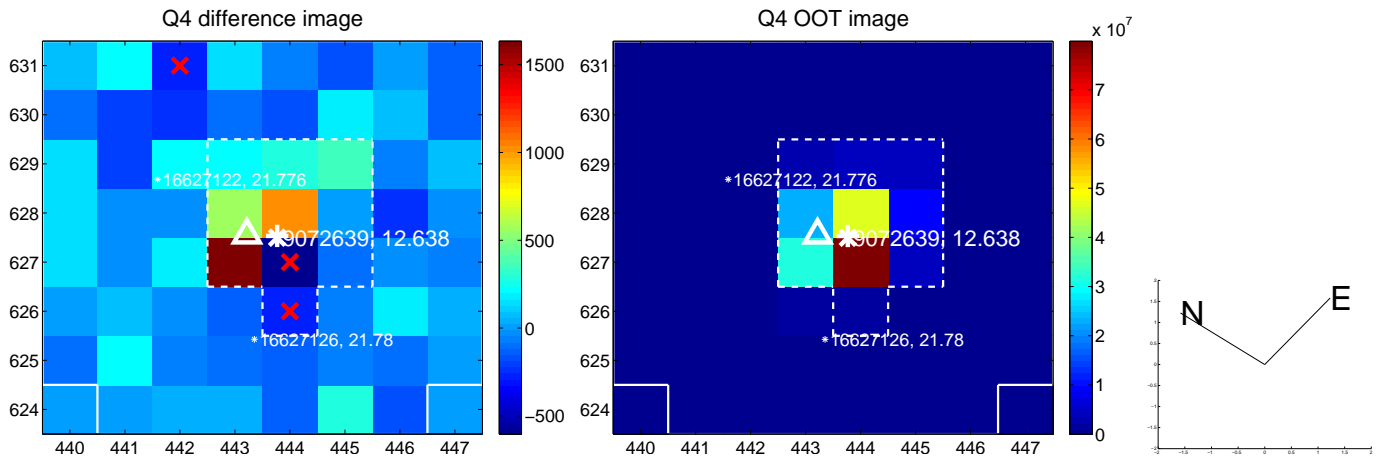
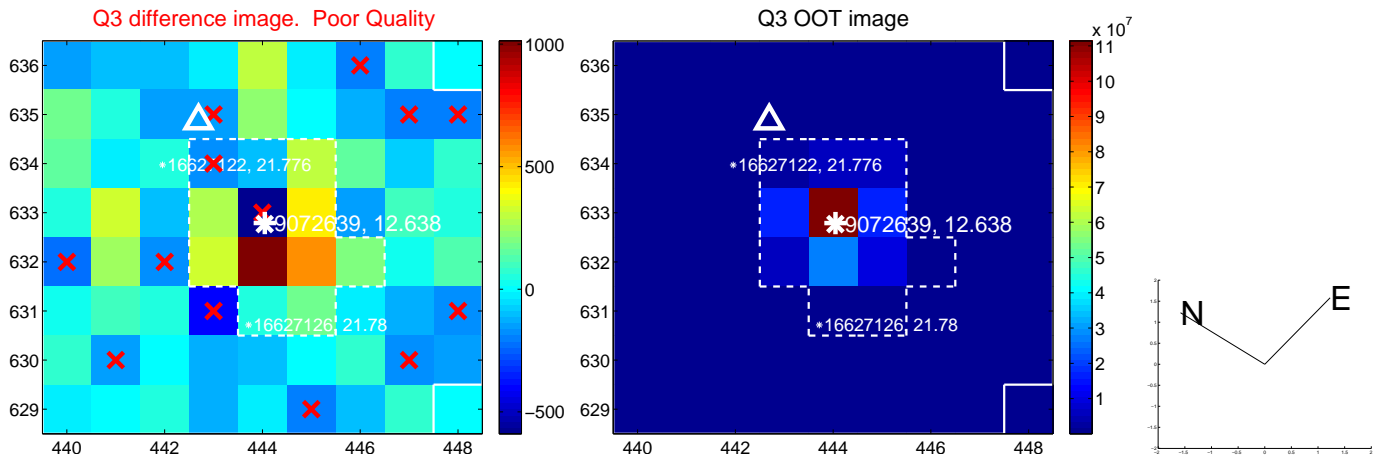
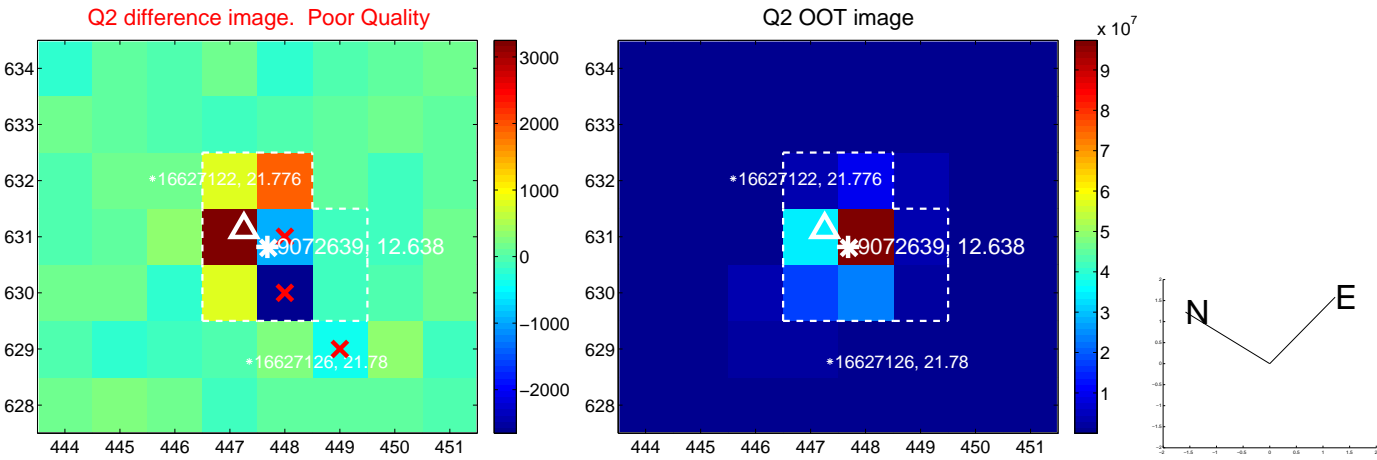
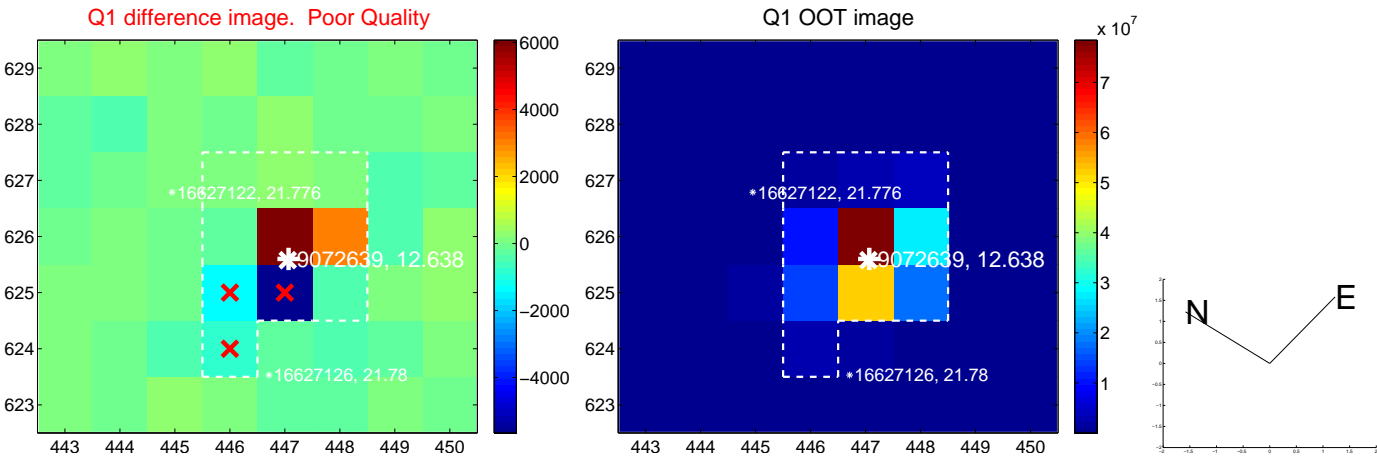


offset from photometric centroids

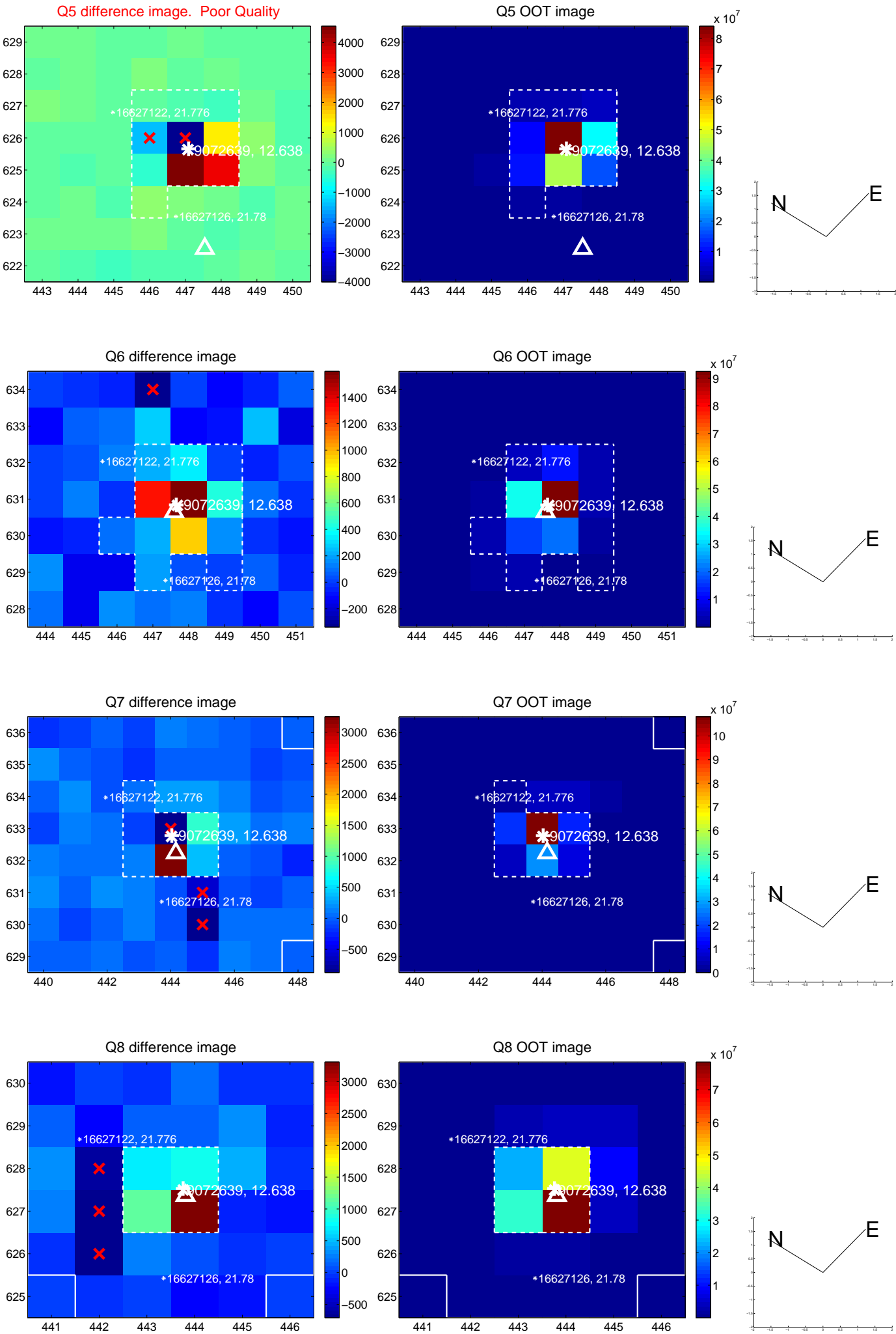


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

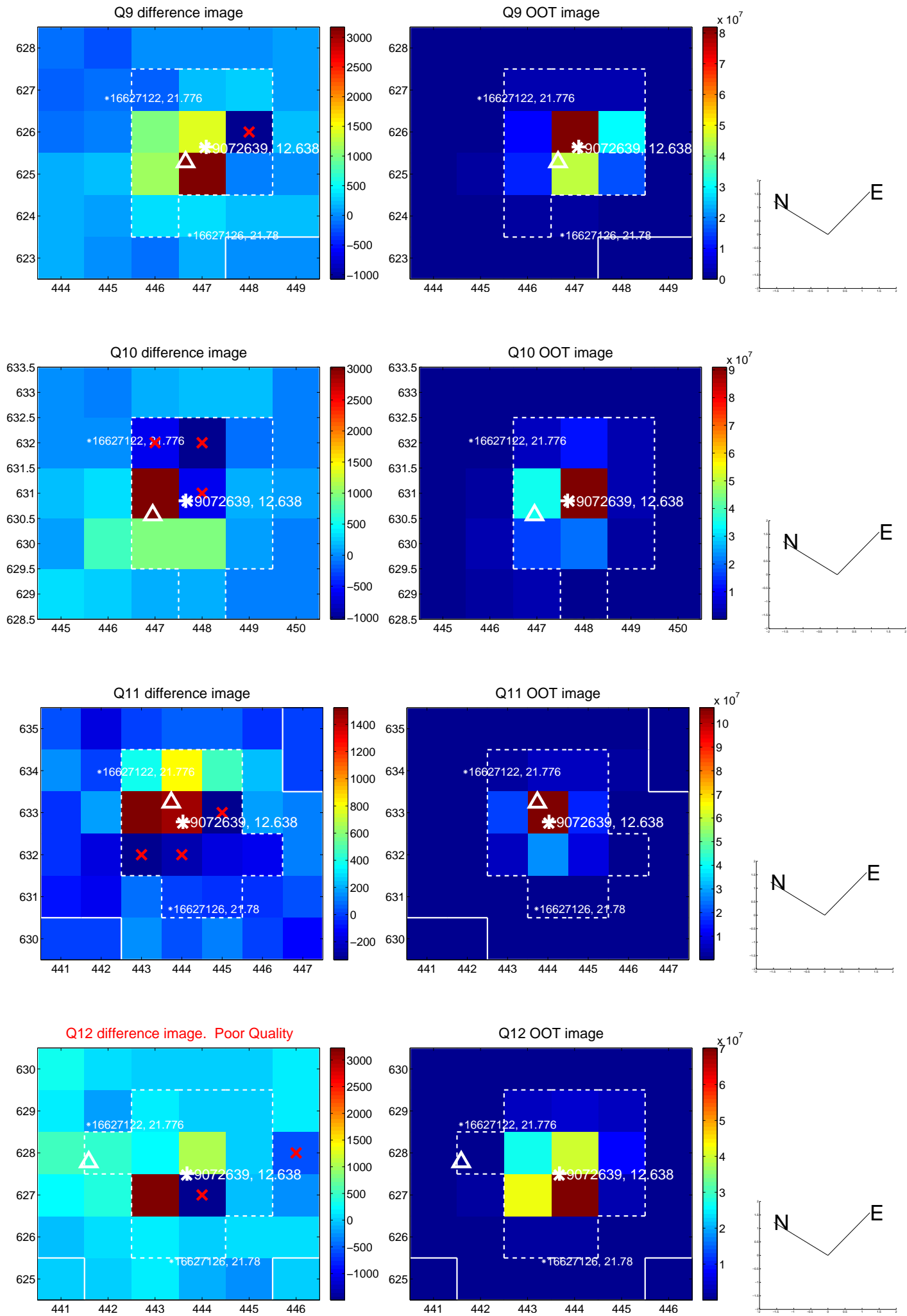


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

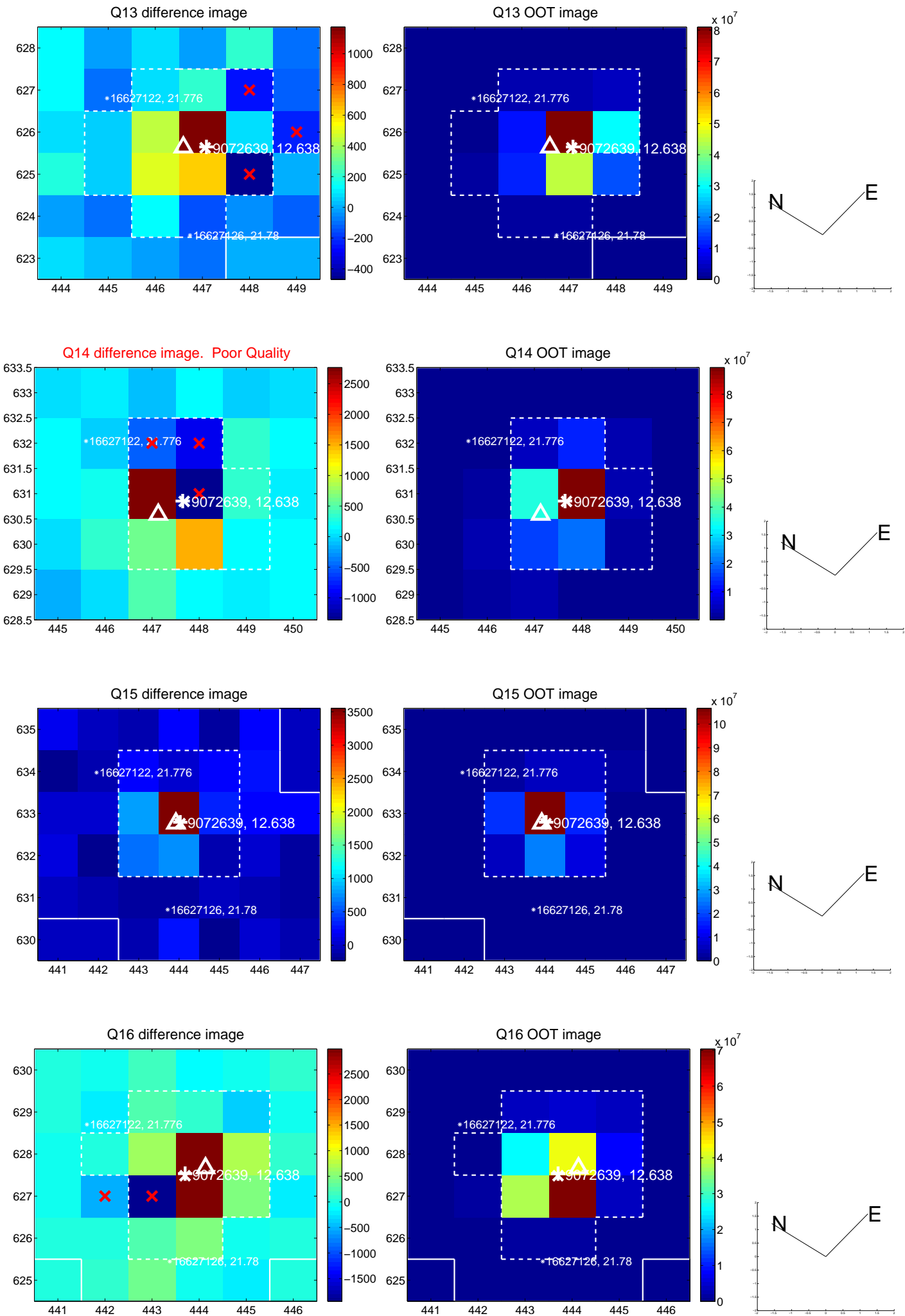




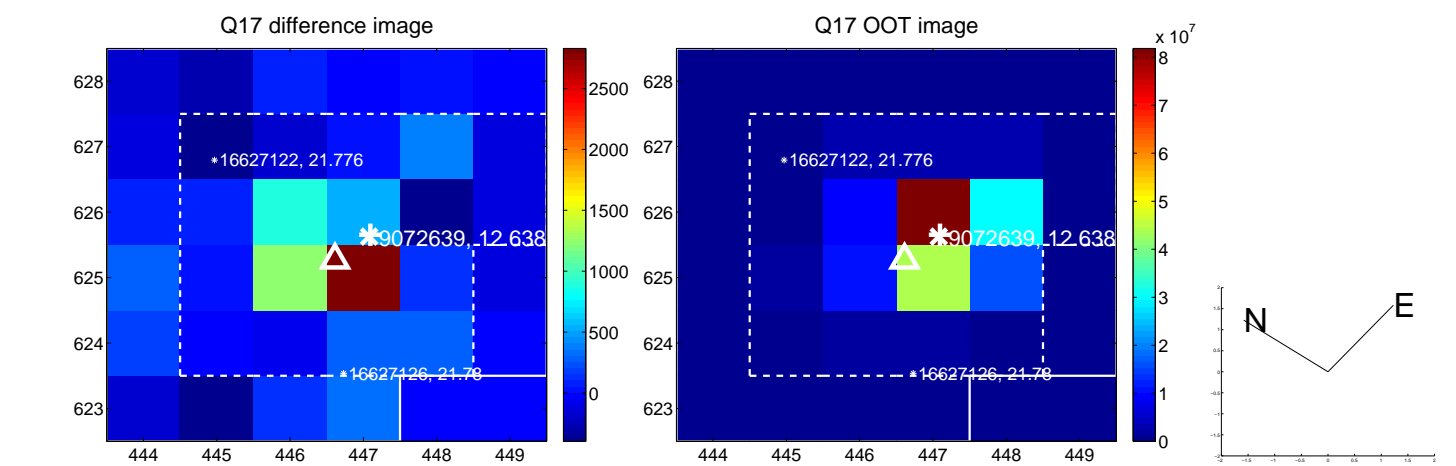
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



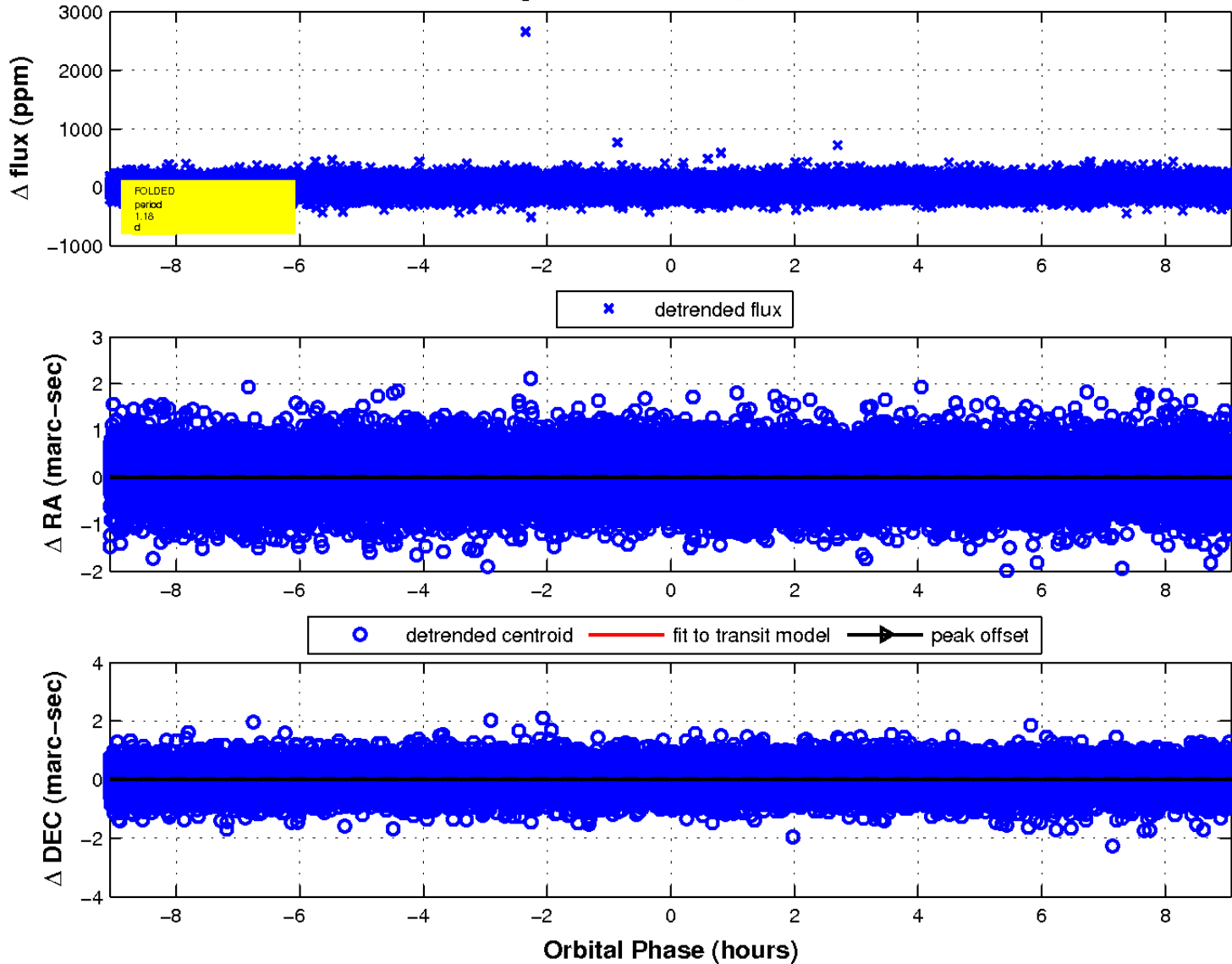
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

