

# KIC 009938836

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009938836-01	OBS	7978.01	7.268136	135.939105	46.8	4.984	7.8	8.2	2.22	6297	1.71	1030.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009938836-01	OBS	PC	0.84	0	0	0	0	CENT_KIC_POS

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

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

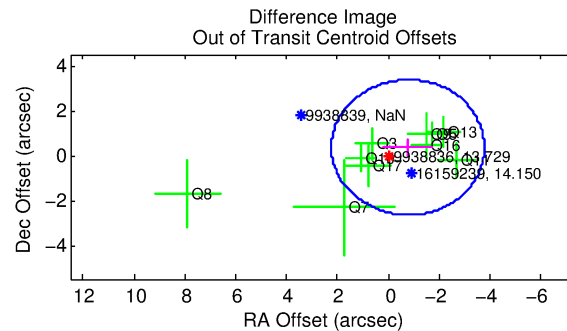
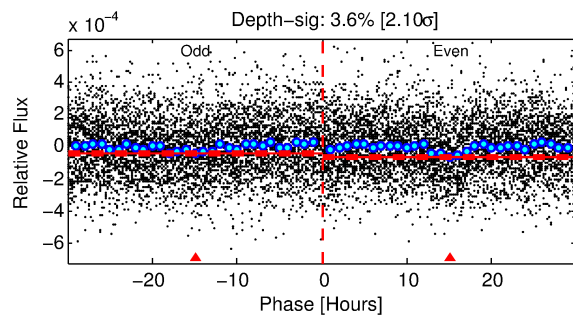
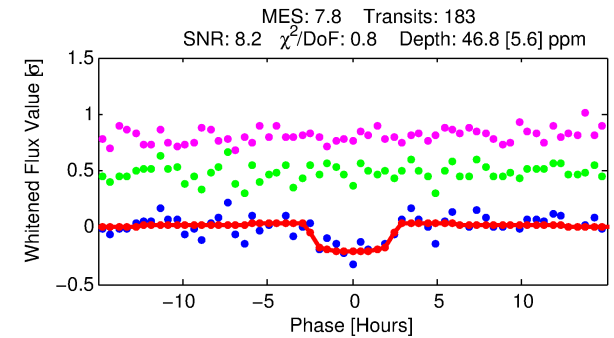
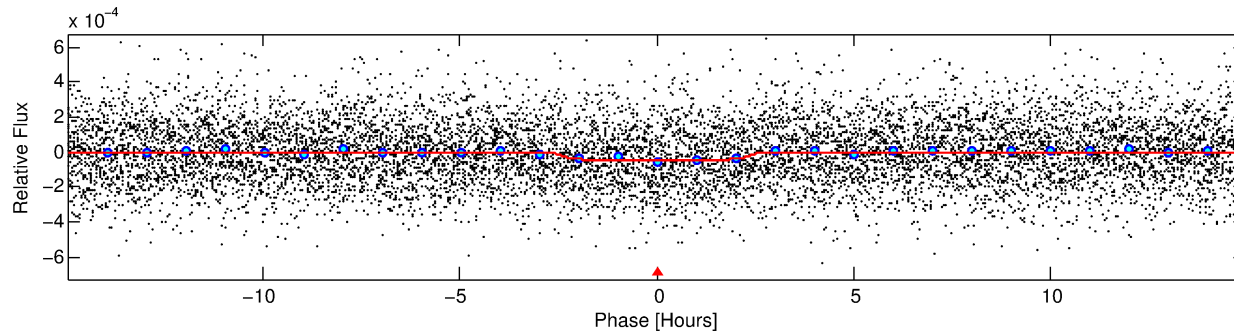
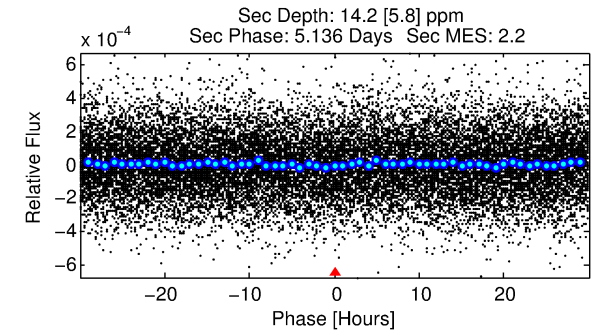
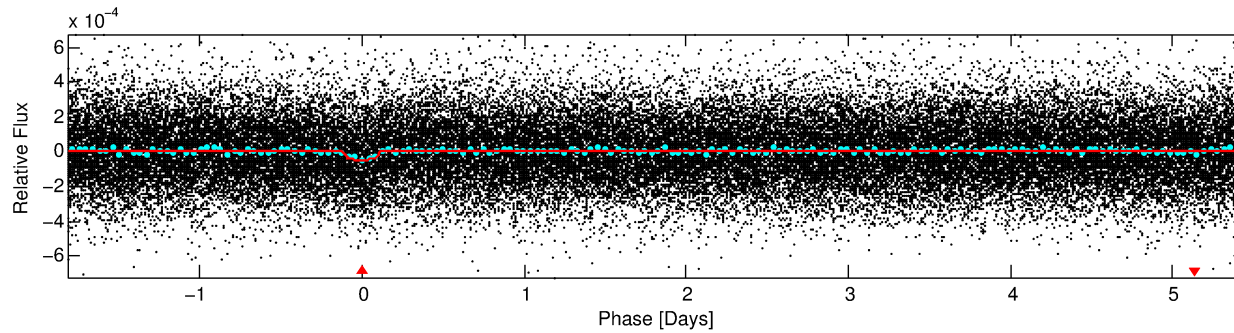
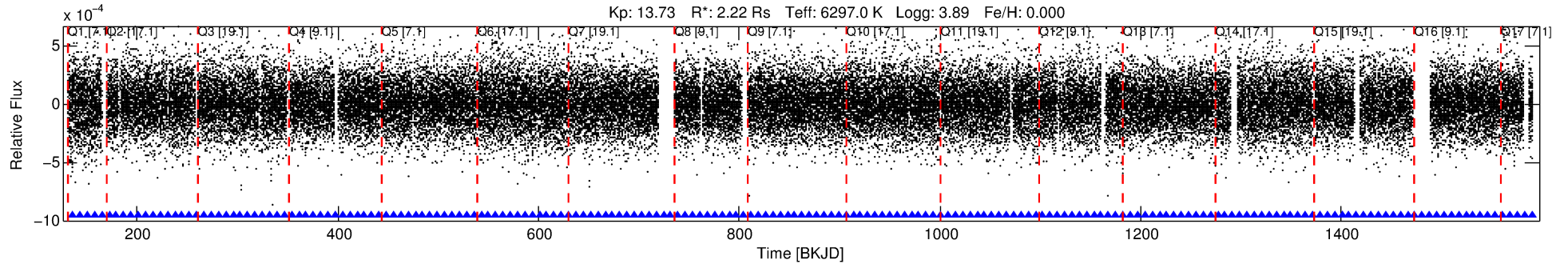
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009938836-01

No Significant Match Found

# DV One-Page Summary

KIC: 9938836 Candidate: 1 of 1 Period: 7.268 d



## DV Fit Results:

Period = 7.26814 [0.00008] d  
Epoch = 135.9391 [0.0091] BKJD  
Rp/R\* = 0.0071 [0.0033]  
a/R\* = 6.20 [14.99]  
b = 0.84 [0.86]  
Seff = 1030.31 [728.31]  
Teff = 1445 [255] K  
Rp = 1.71 [1.11] Re  
a = 0.0821 [0.0354] AU  
Ag = 17.94 [21.94] [0.77σ]  
Teffp = 4597 [1174] K [2.62σ]

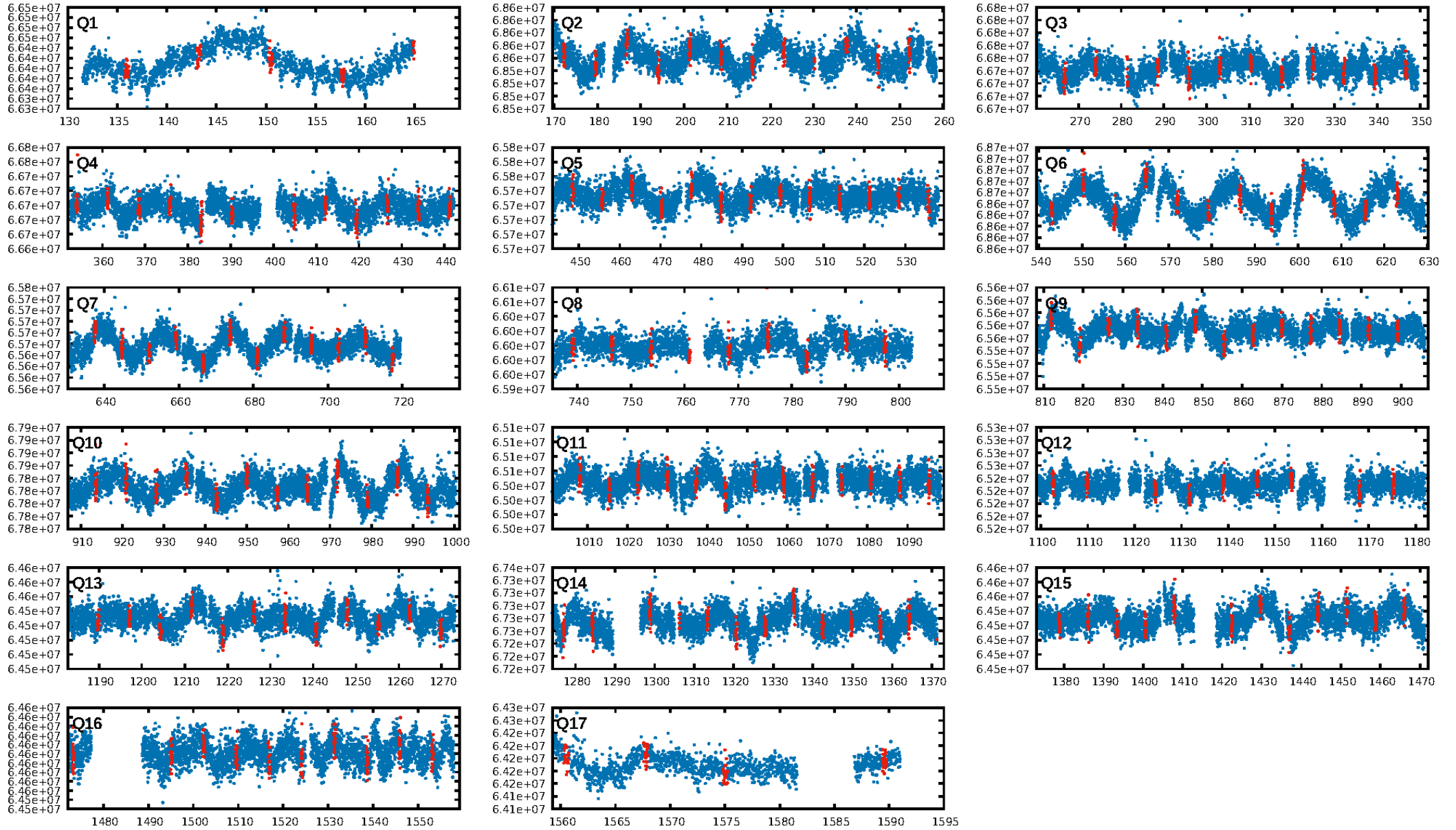
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.35e-15  
RollingBand-fgt: 1.00 [174/174]  
GhostDiagnostic-chr: -1.571  
Centroid-sig: 0.0%  
Centroid-so: 4.493 arcsec [2.91σ]  
OotOffset-rm: 0.853 arcsec [0.85σ]  
KicOffset-rm: 1.547 arcsec [1.68σ]  
OotOffset-st: 1/3/2/4 [10]  
KicOffset-st: 1/3/2/4 [10]  
DiffImageQuality-fgm: 0.70 [7/10]  
DiffImageOverlap-fno: 1.00 [17/17]

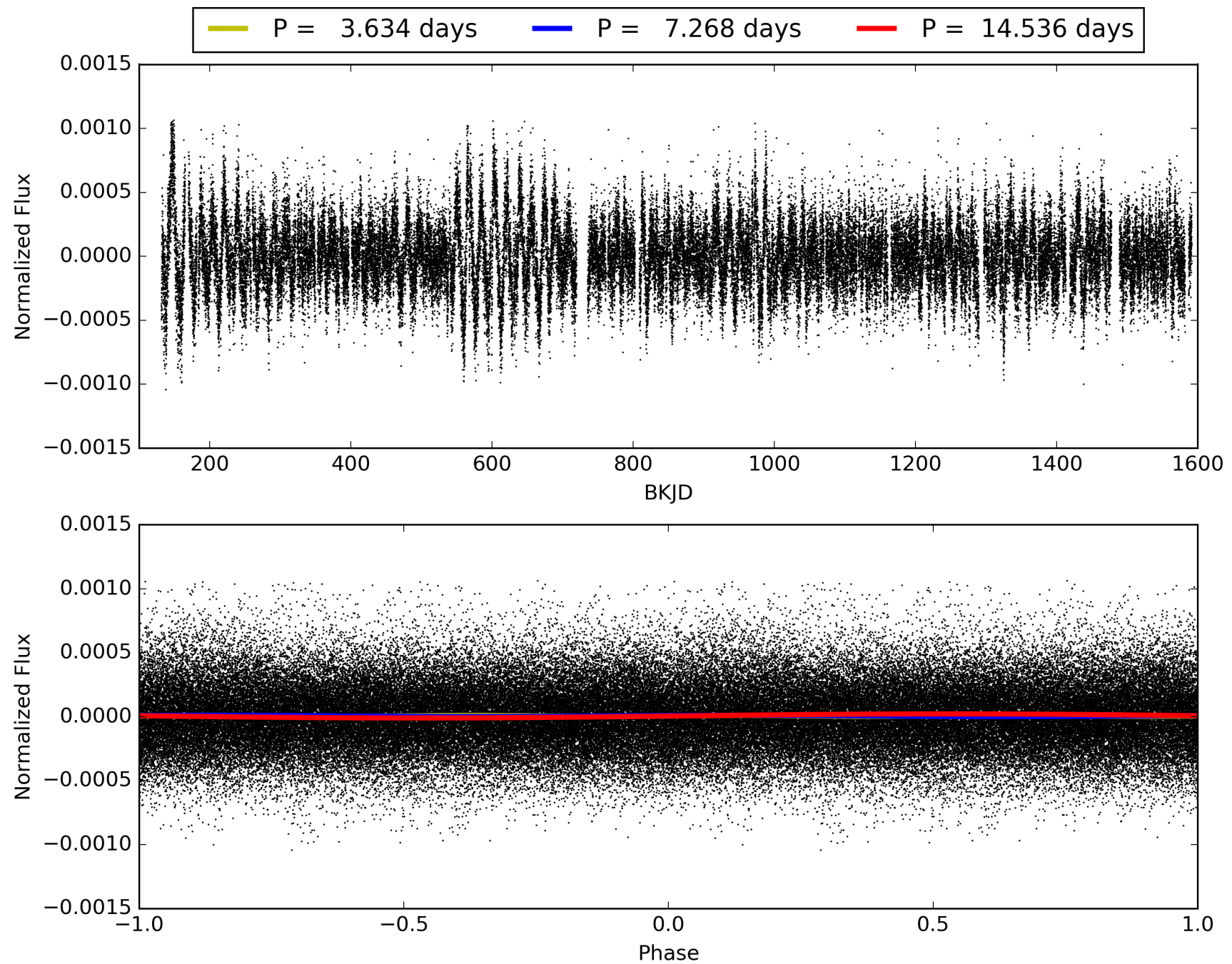
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:04:48 Z

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

# TCE 009938836-01, PDC Light Curves

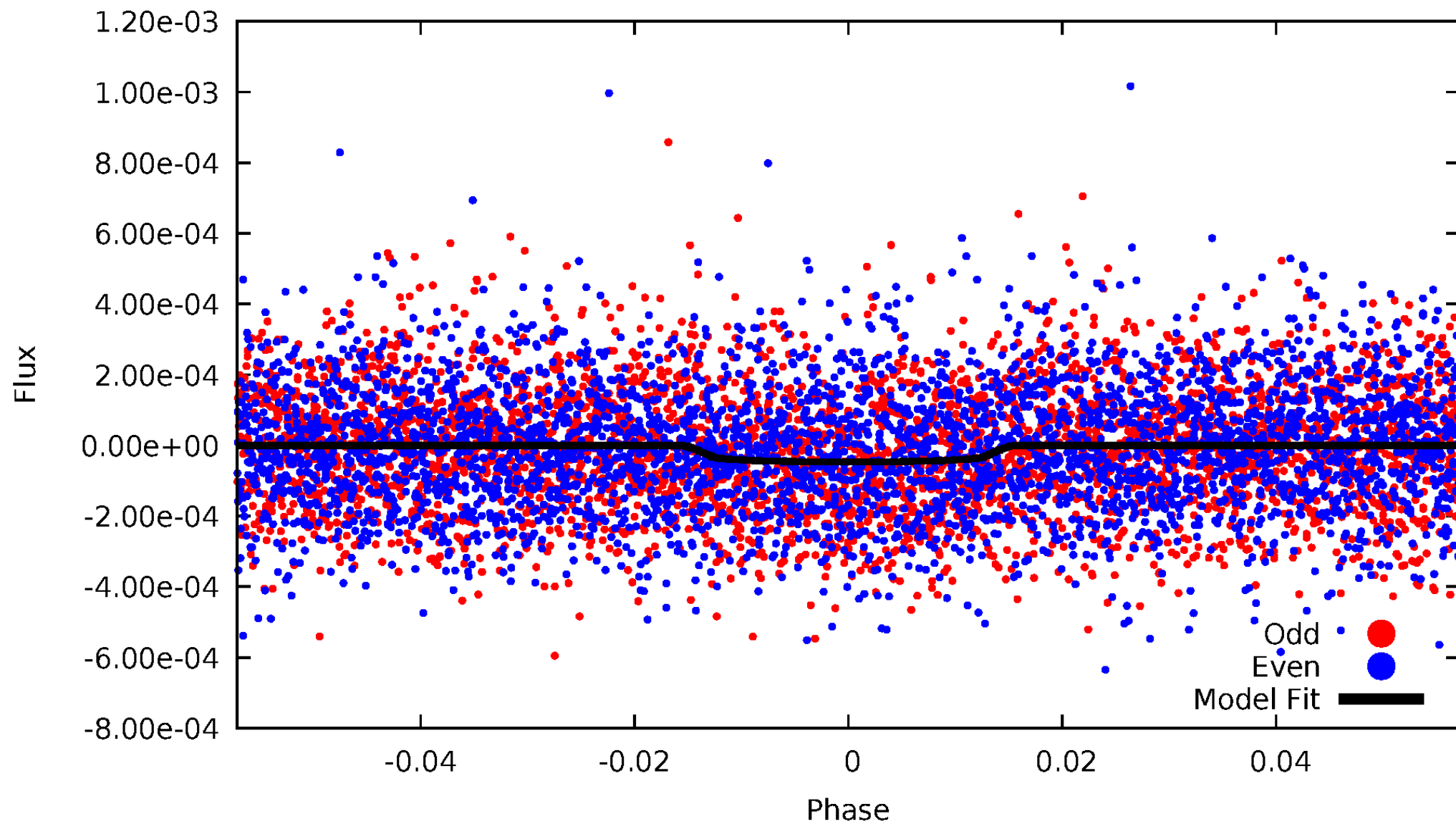


TCE 009938836-01



# DV Odd/Even

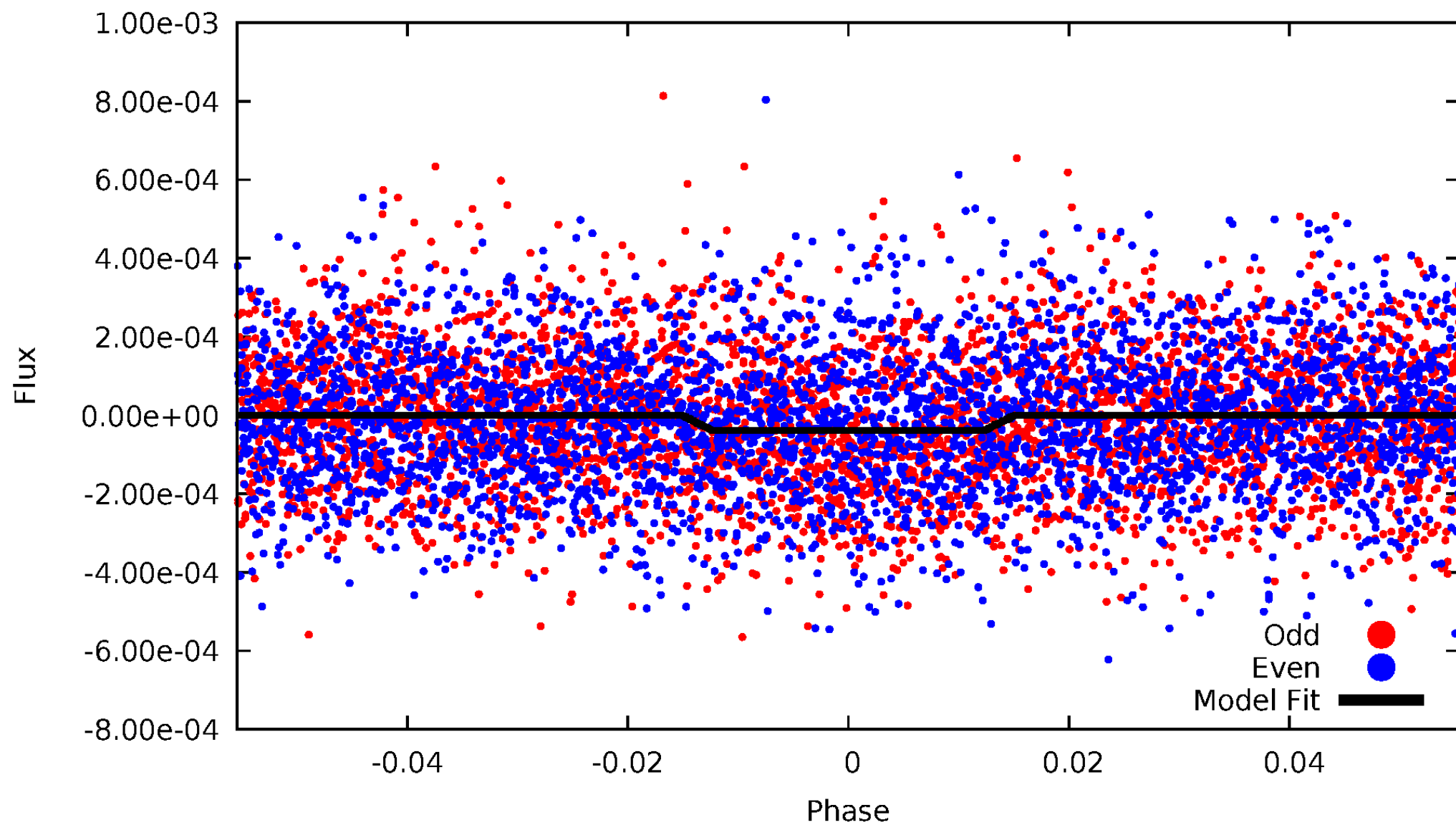
TCE 009938836-01





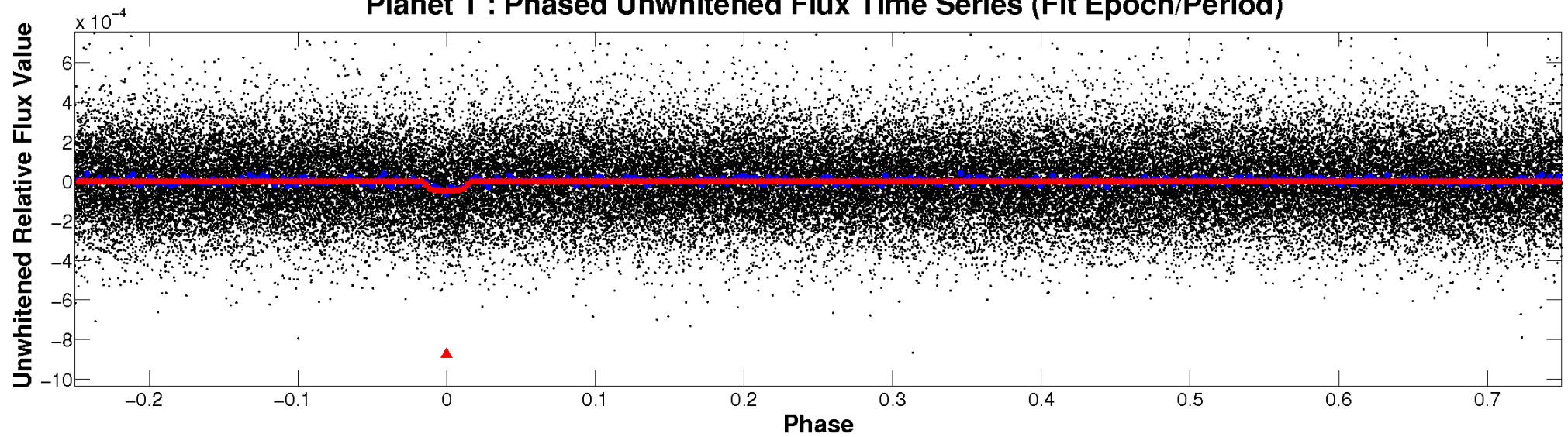
# ALT Odd/Even

TCE 009938836-01

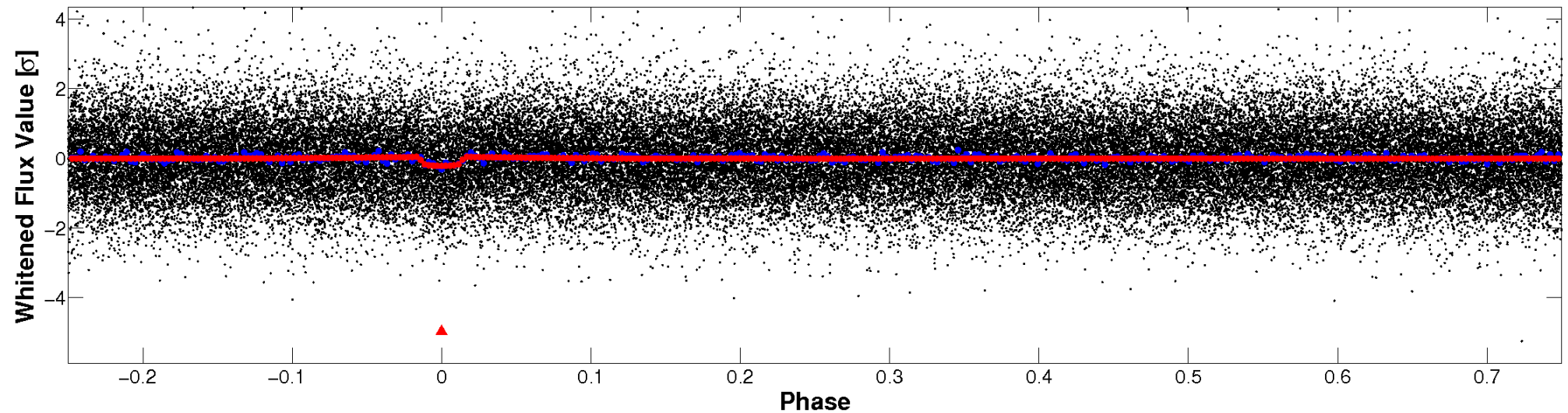


# Non-Whitened Vs. Whitened Light Curve

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

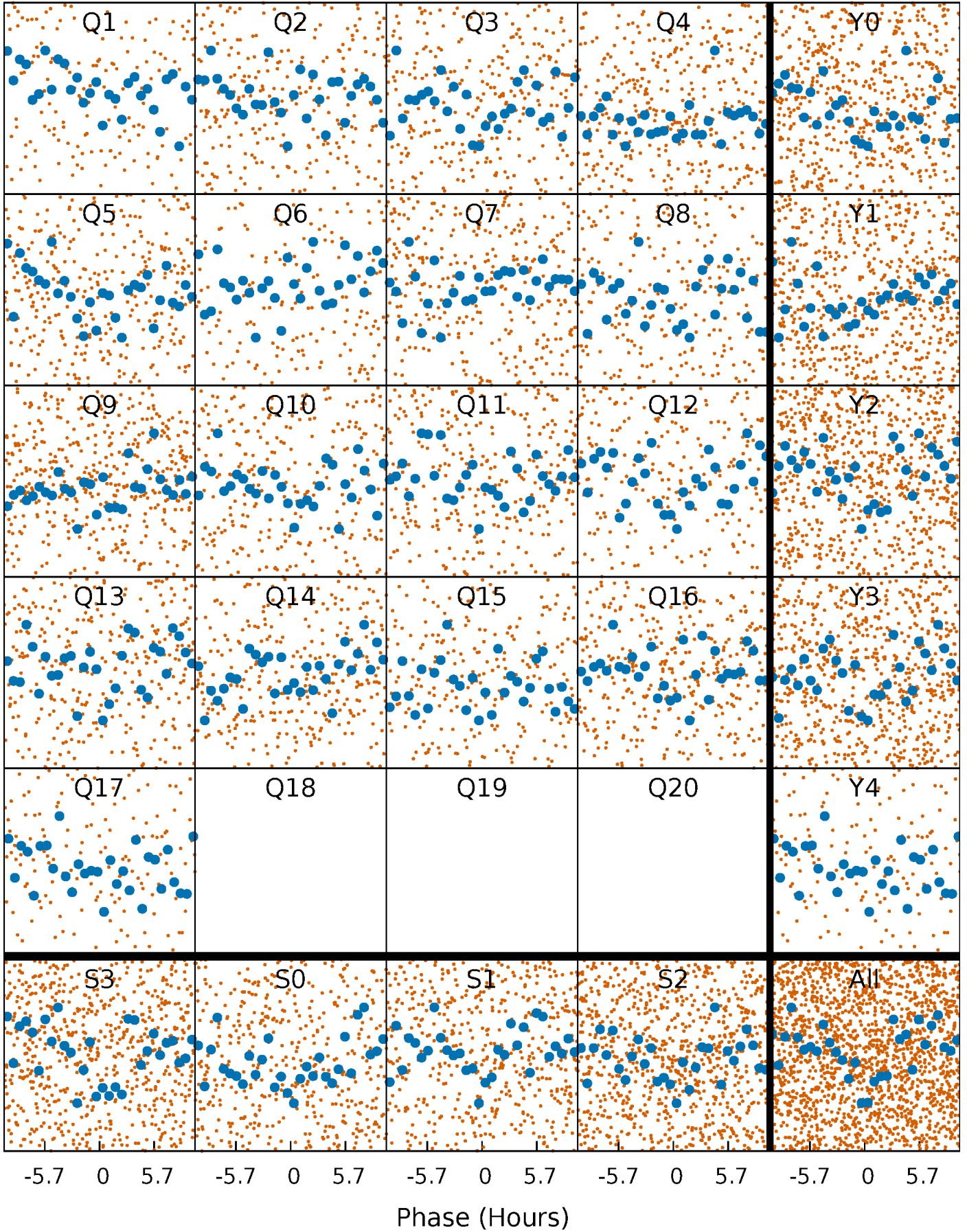


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

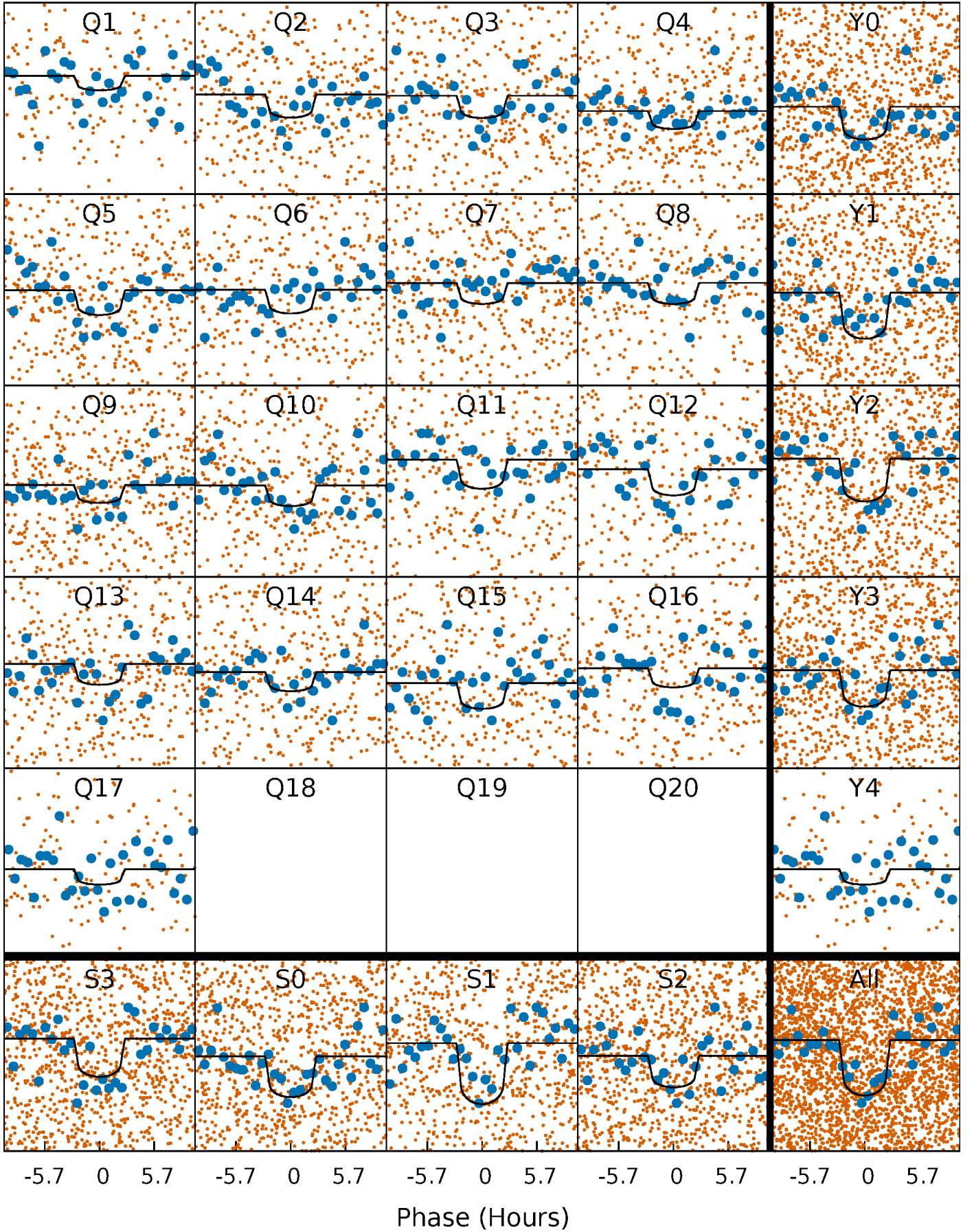
TCE 009938836-01 P= 7.268136 Days  $T_0=135.939105$  (BKJD)





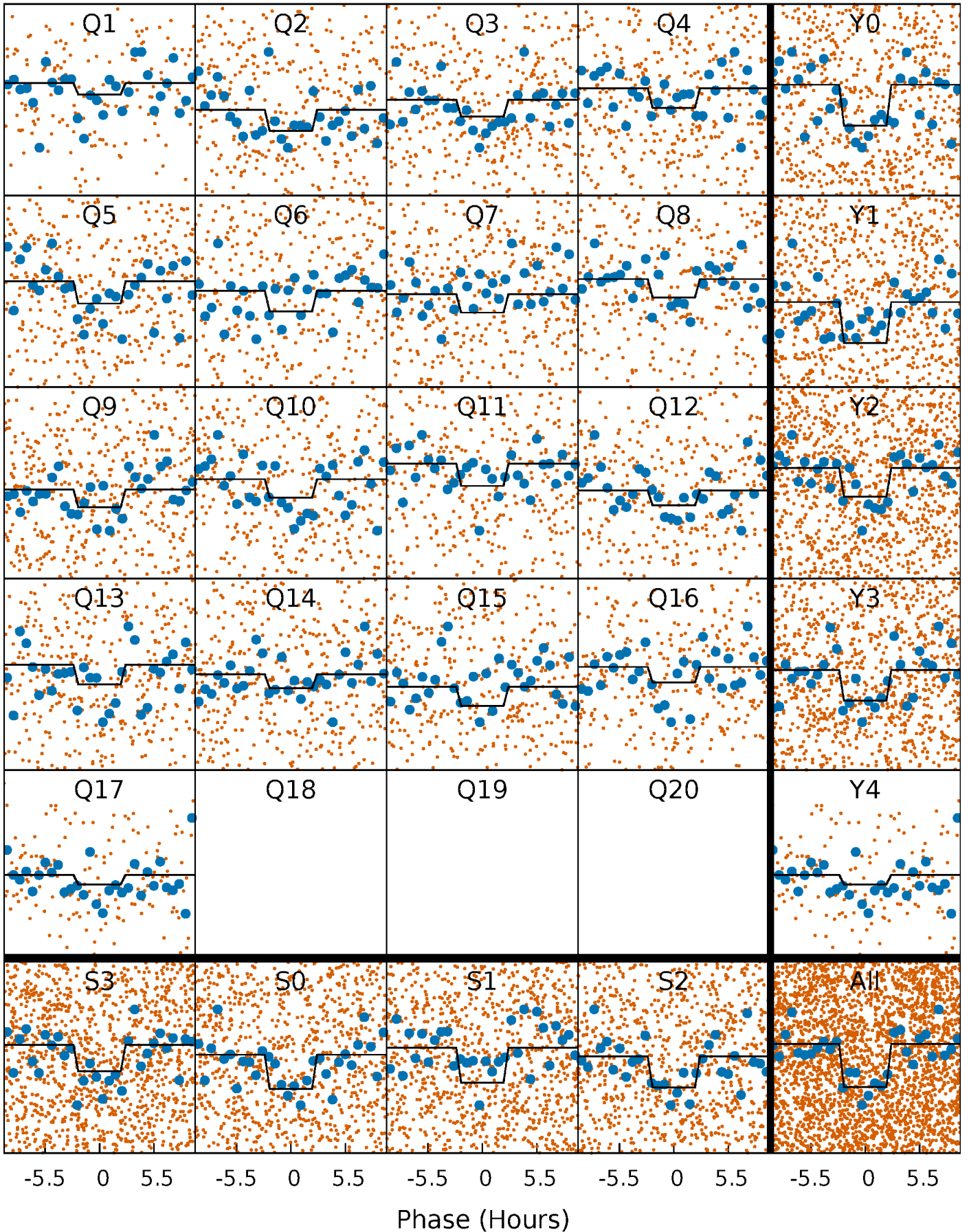
# DV Quarter-Phased Transit Curves

TCE 009938836-01 P= 7.268136 Days  $T_0=135.939105$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

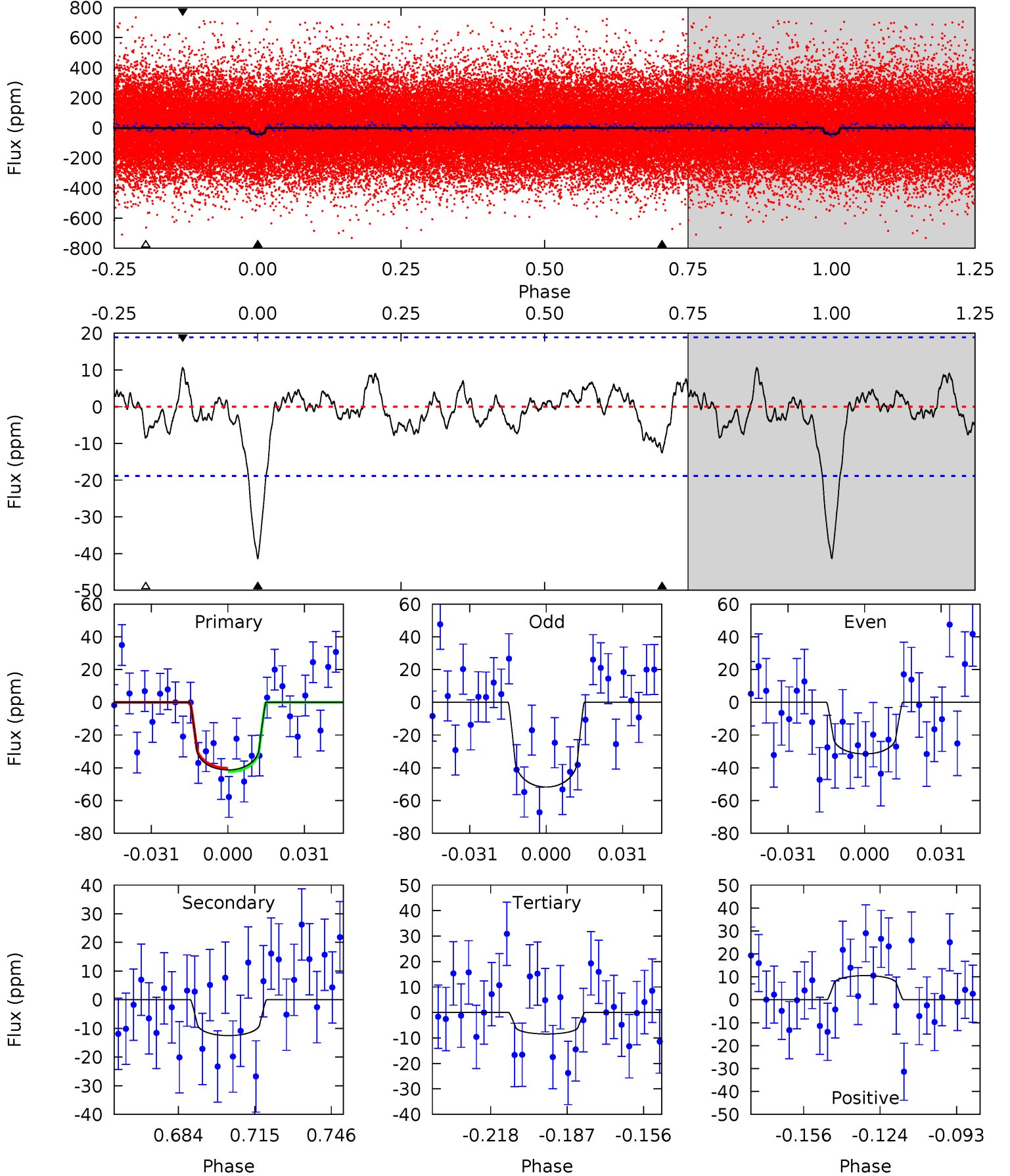
TCE 009938836-01 P= 7.268209 Days  $T_0=135.930952$  (BKJD)



# DV Model-Shift Uniqueness Test

009938836-01, P = 7.268136 Days, E = 128.670969 Days

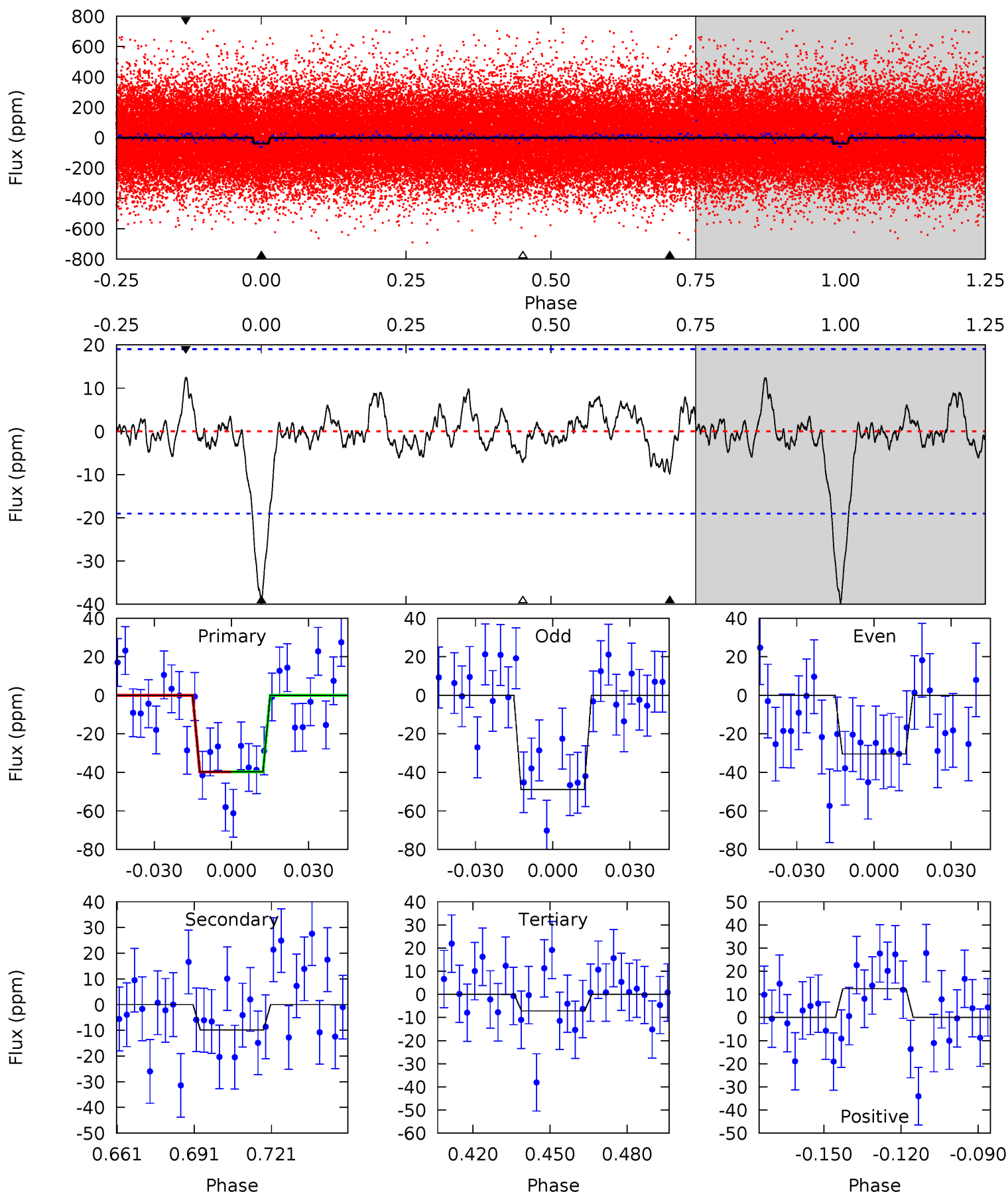
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	3.18	2.15	2.68	4.80	2.16	0.96	8.37	7.83	1.03	0.50	2.58	0.92	0.20	0.25



# Alt Model-Shift Uniqueness Test

009938836-01, P = 7.268209 Days, E = 128.662743 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
10.0	2.49	1.81	3.14	4.81	2.17	0.90	8.24	6.90	0.68	-0.66	2.33	0.95	0.24	0.01





### Stellar Parameters For KIC 009938836

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6297^{+198}_{-242}$	$3.890^{+0.405}_{-0.135}$	$0.000^{+0.250}_{-0.300}$	$2.219^{+0.536}_{-0.996}$	$1.398^{+0.212}_{-0.318}$	$0.180^{+0.686}_{-0.075}$
	+3%/-4%	+10%/-3%	+inf%/-inf%	+24%/-45%	+15%/-23%	+381%/-42%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009938836-01 / KOI 7978.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-13 \pm 4$	$1.55^{+0.87}_{-0.76}$	$1967^{+159}_{-224}$	$4579^{+1418}_{-691}$	$19^{+46}_{-12}$
Alt.	$-10 \pm 4$	$1.39^{+0.78}_{-0.73}$	$1981^{+150}_{-202}$	$4611^{+1661}_{-790}$	$18^{+57}_{-11}$

$T_{max}$  = 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

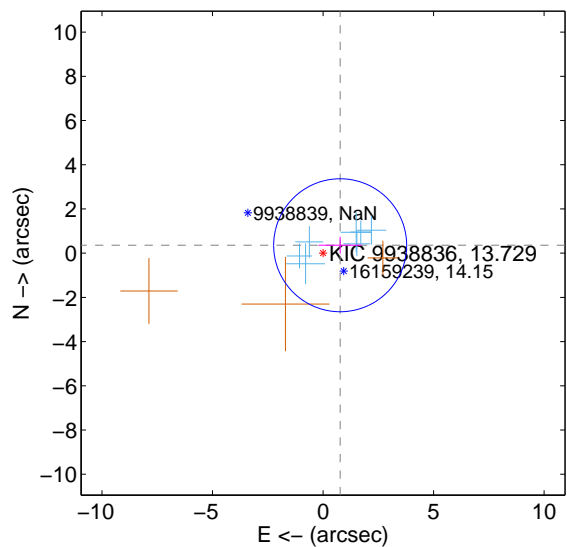
Supplemental centroid analysis for 009938836-01. Kepler magnitude: 13.73. Transit SNR 8.17

There are 7 quarters with good PRF difference image offsets

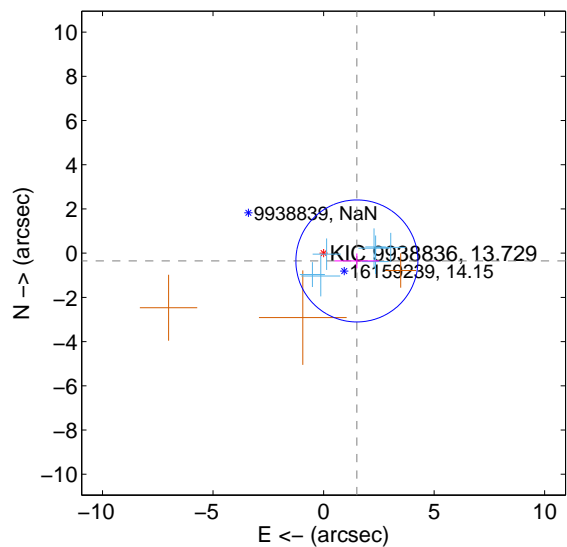
The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.853 \pm 1.003$	0.85	$-0.774 \pm 0.973$	$0.358 \pm 0.384$
PRF-fit source offset from KIC position	$1.547 \pm 0.920$	1.68	$-1.507 \pm 1.004$	$-0.352 \pm 0.336$
photometric centroid source offset	$4.49 \pm 1.54$	2.91	$-0.48 \pm 1.57$	$-4.47 \pm 1.54$

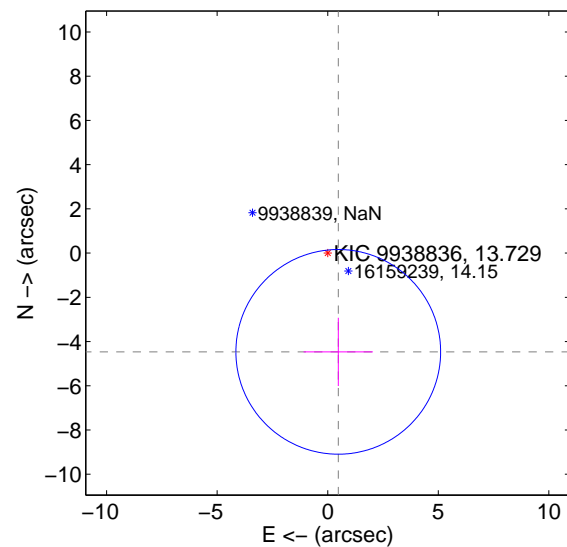
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

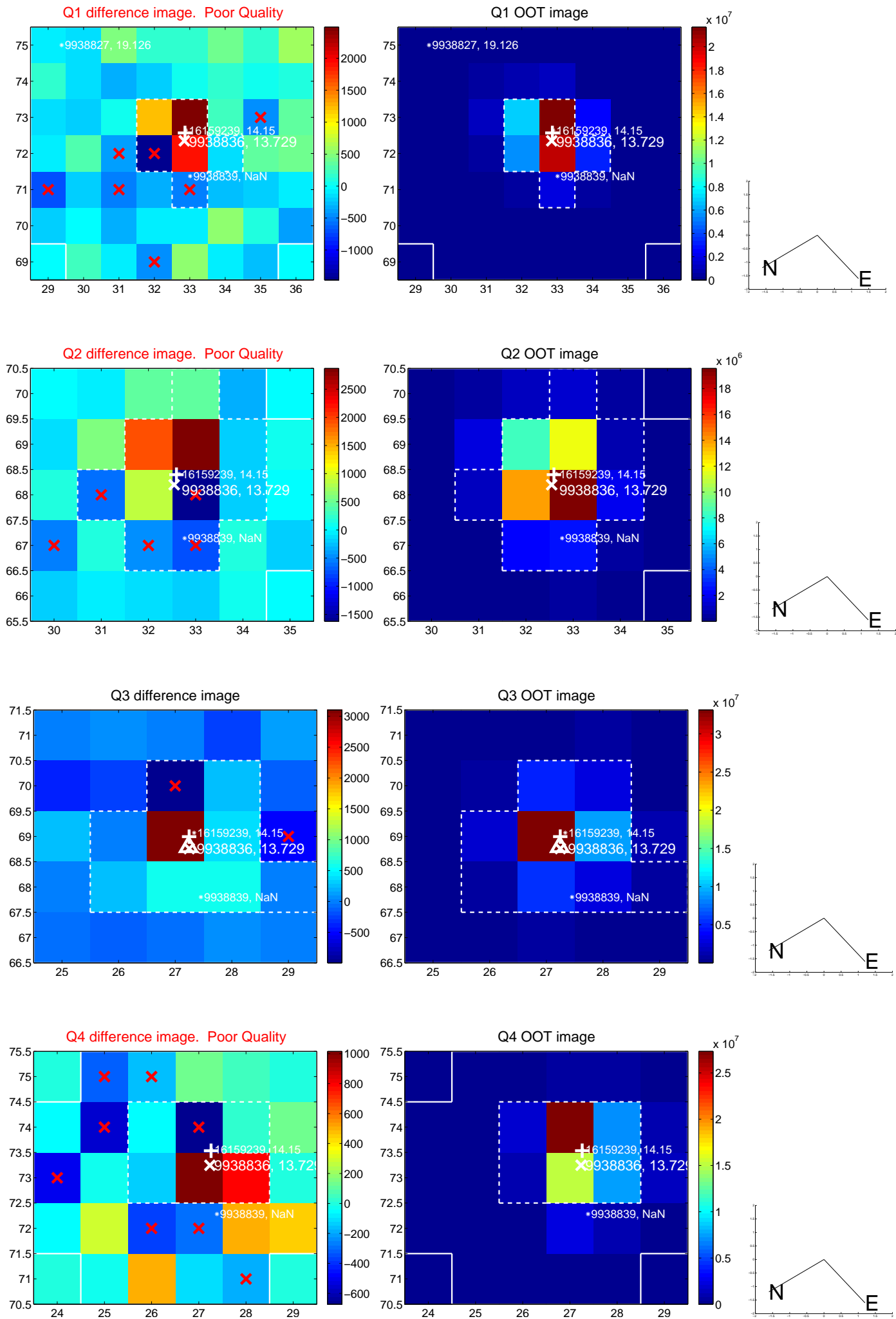


offset from photometric centroids

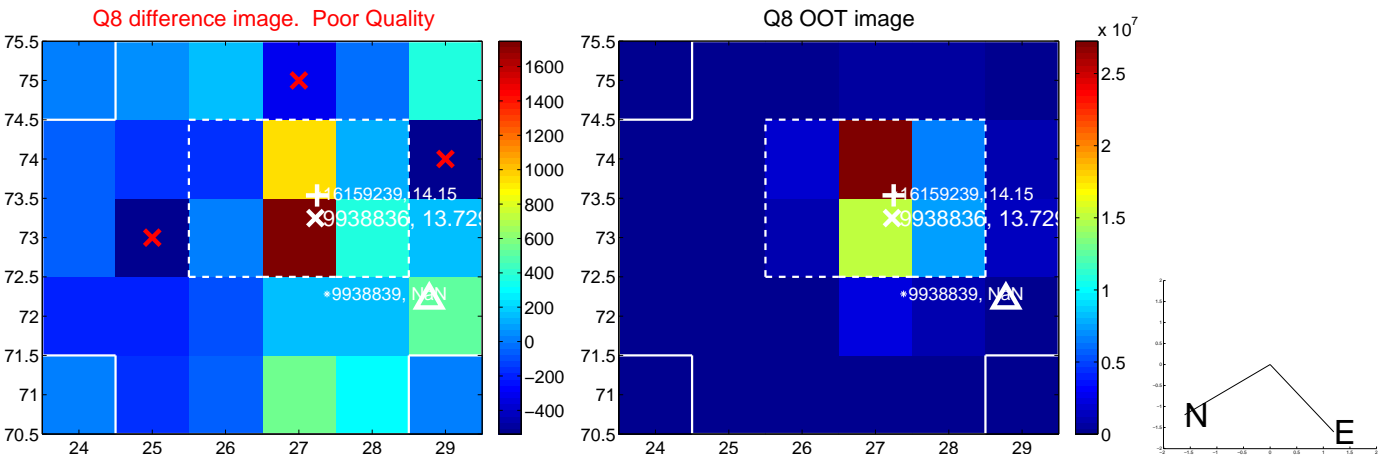
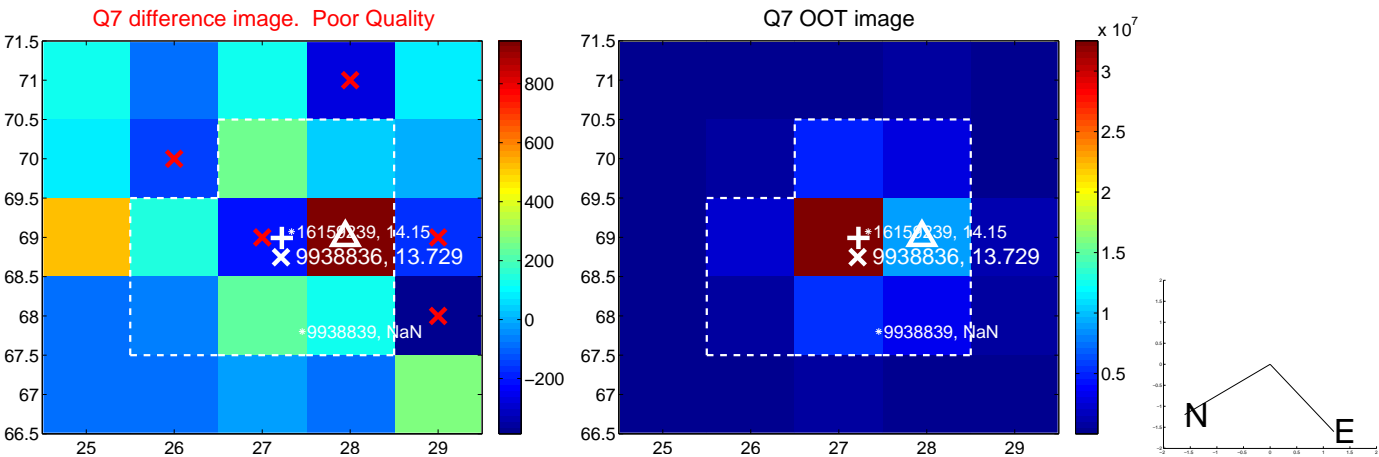
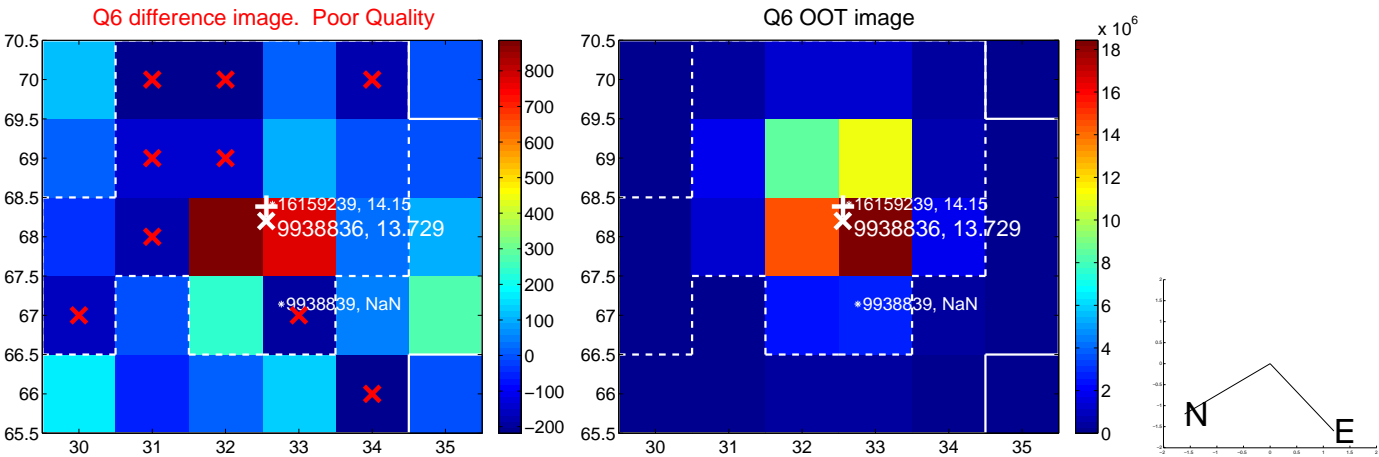
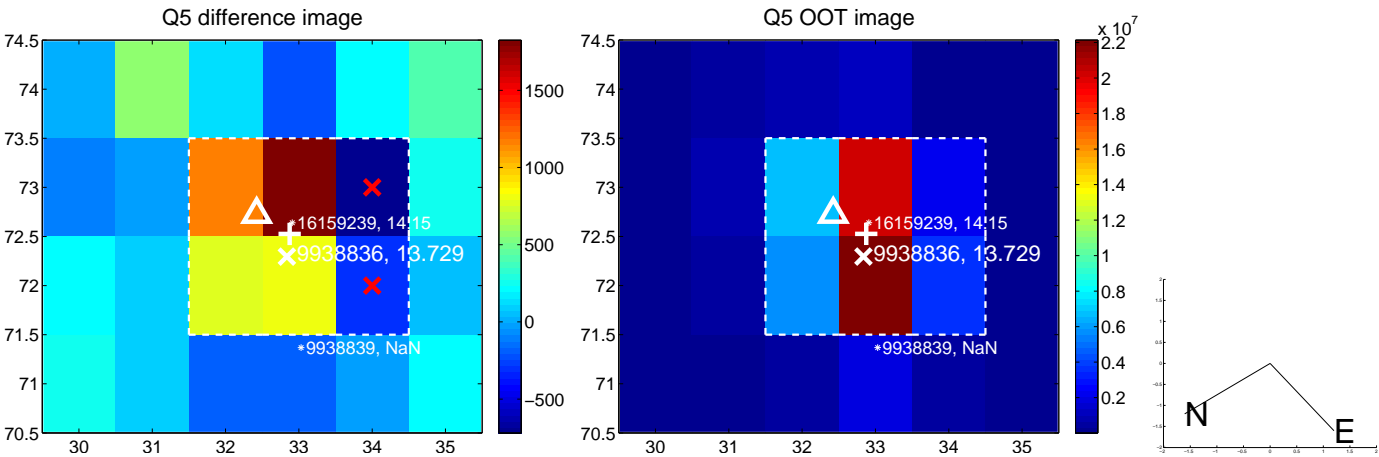


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

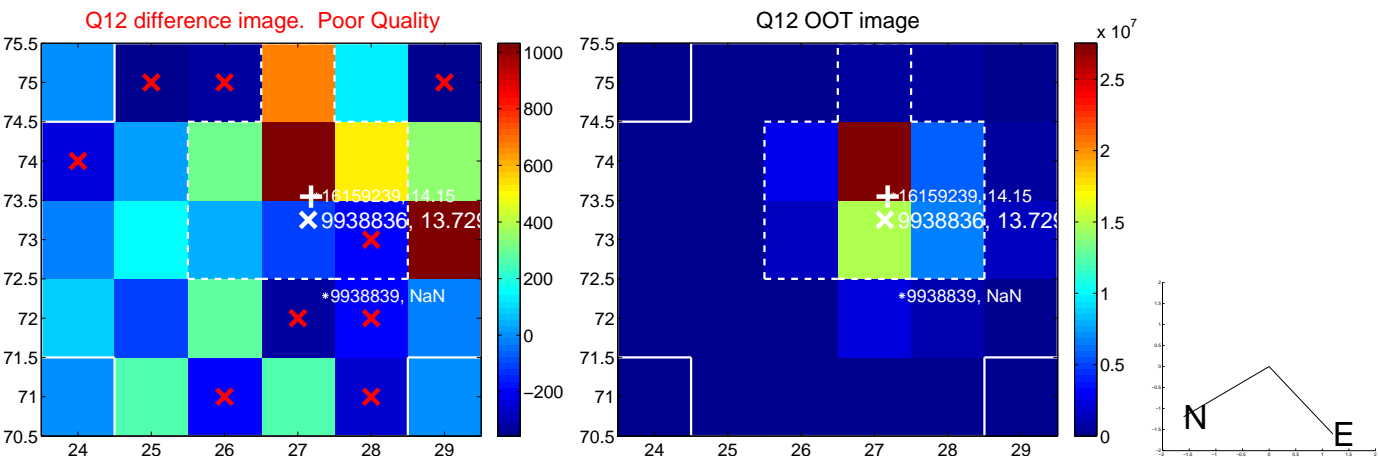
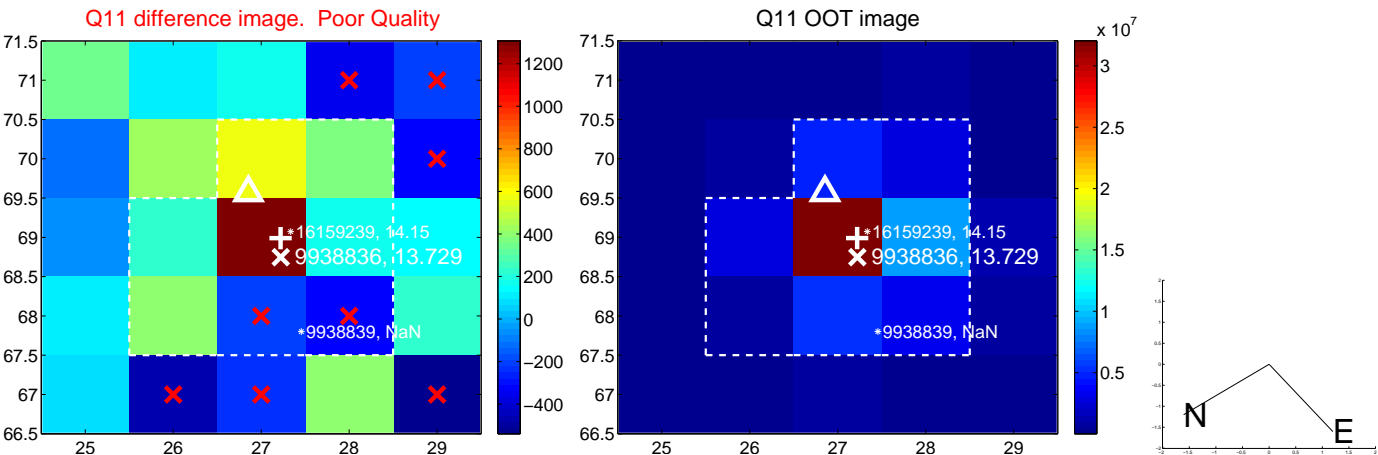
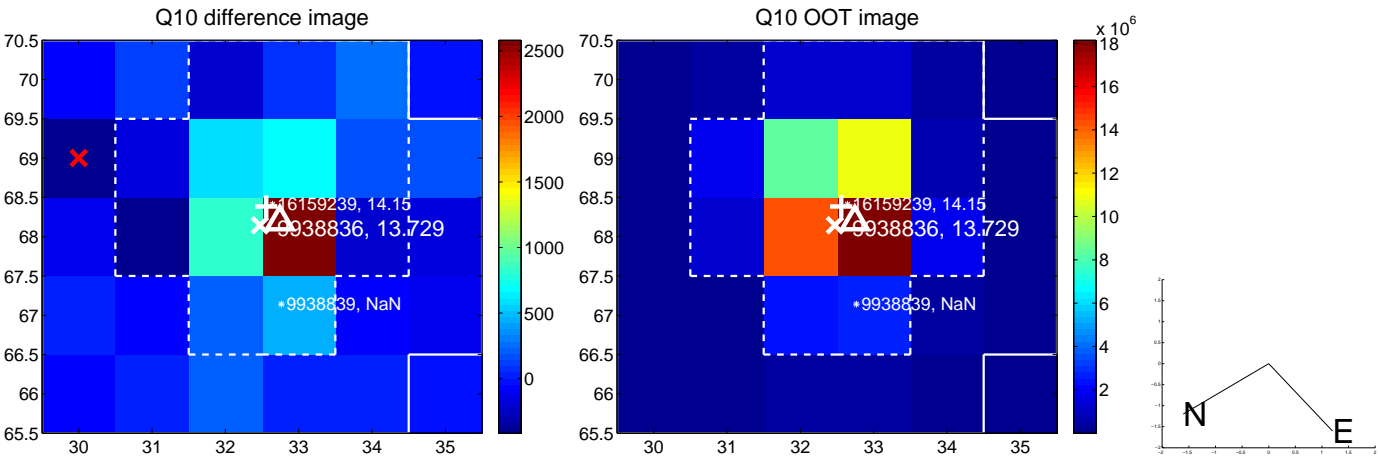
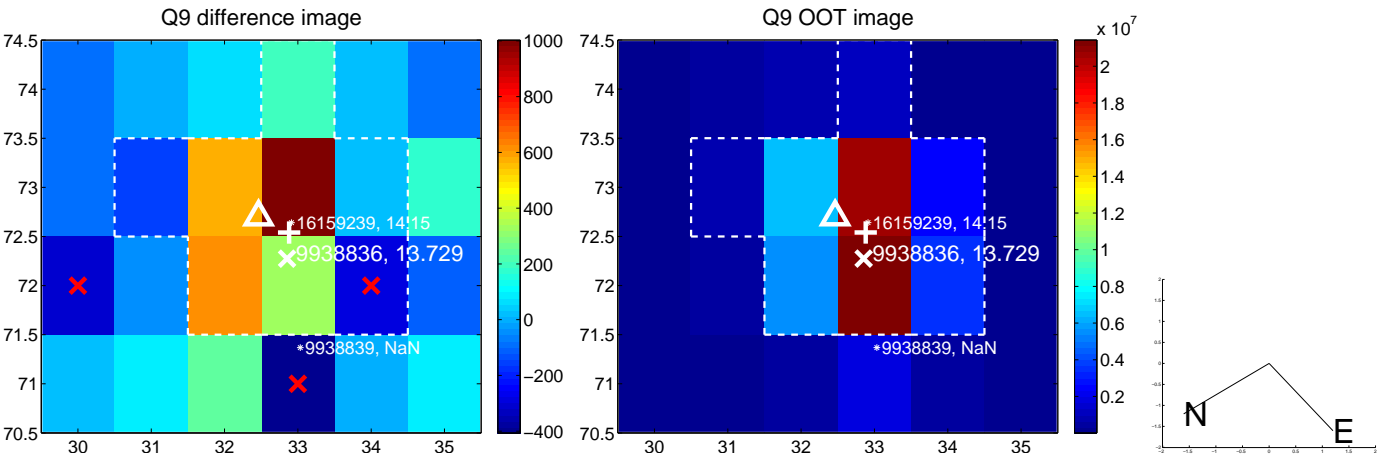


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

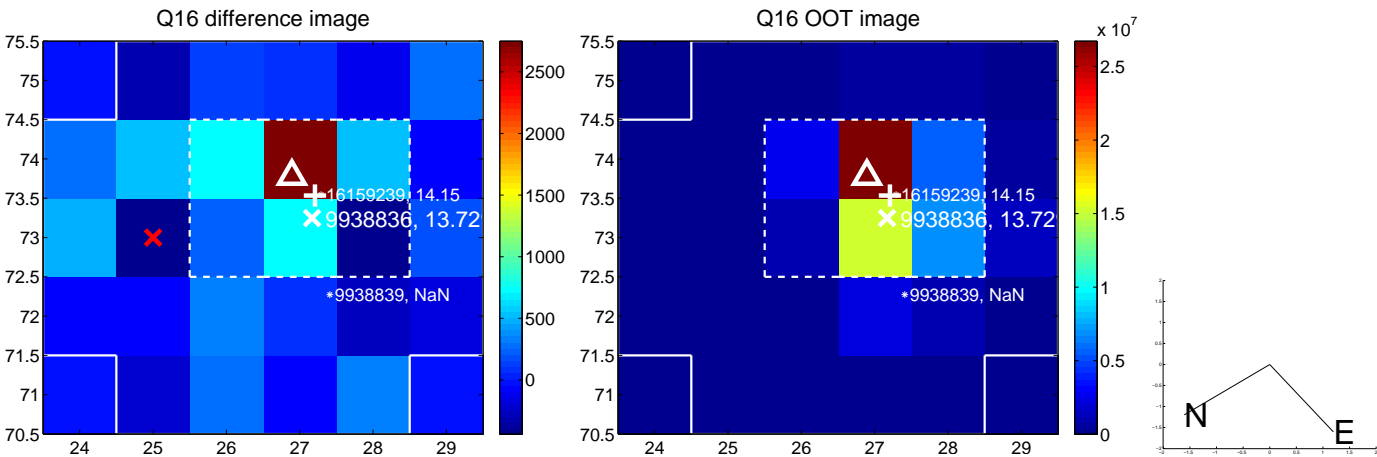
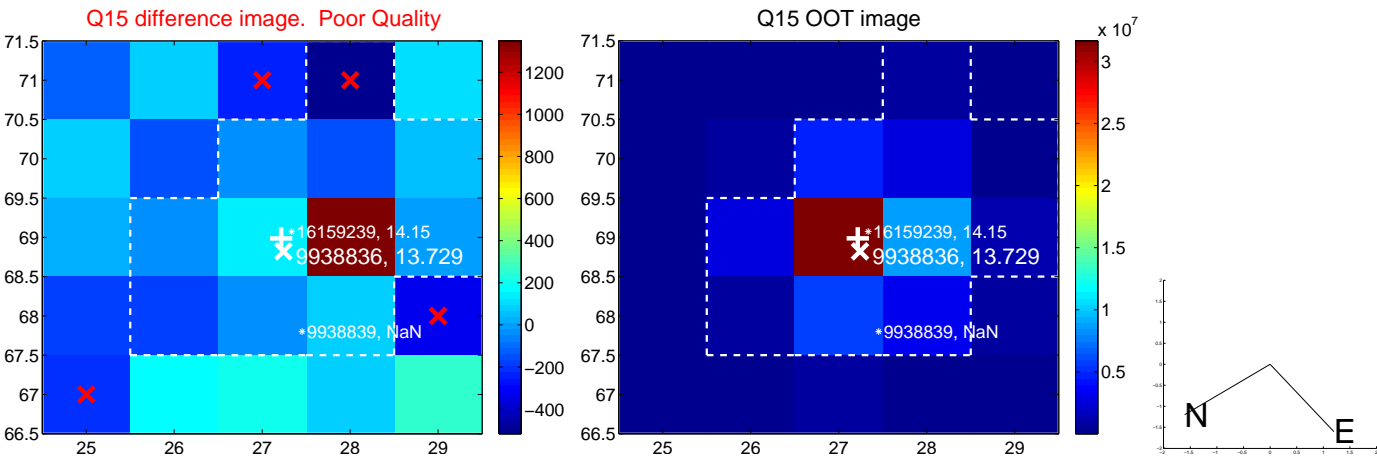
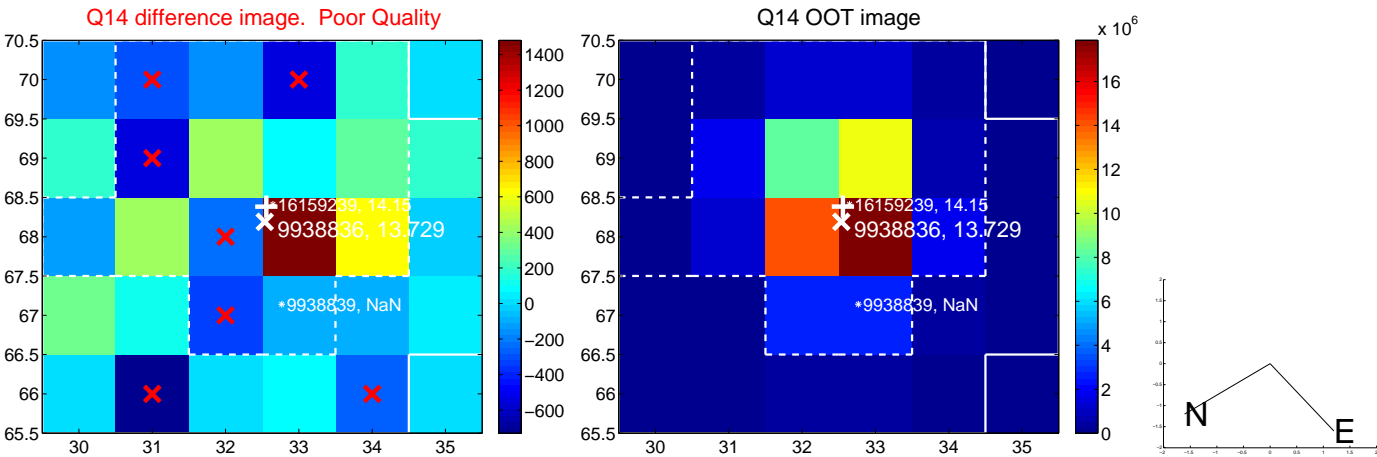
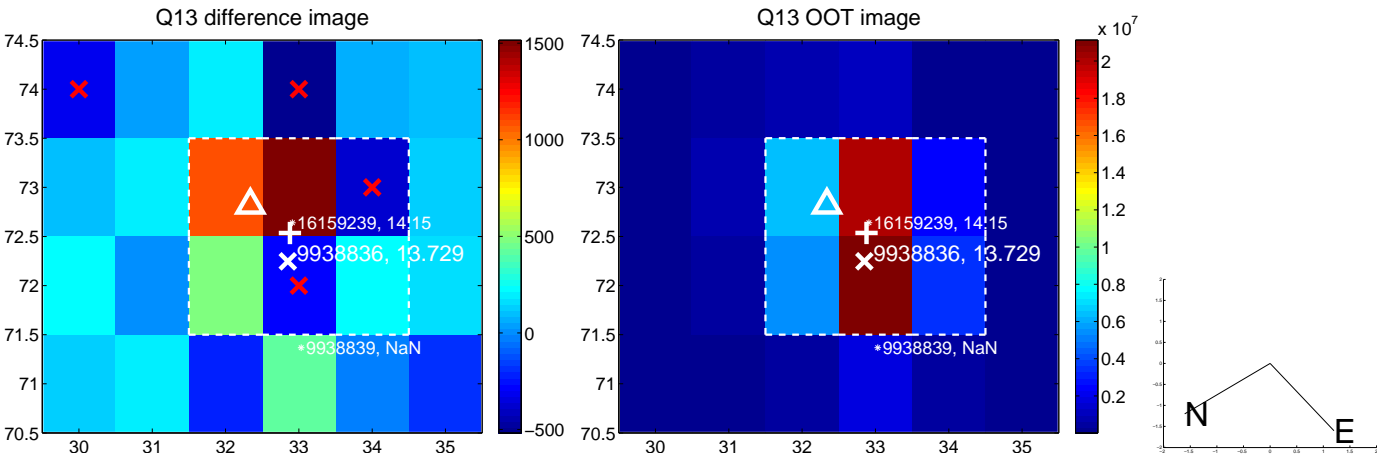




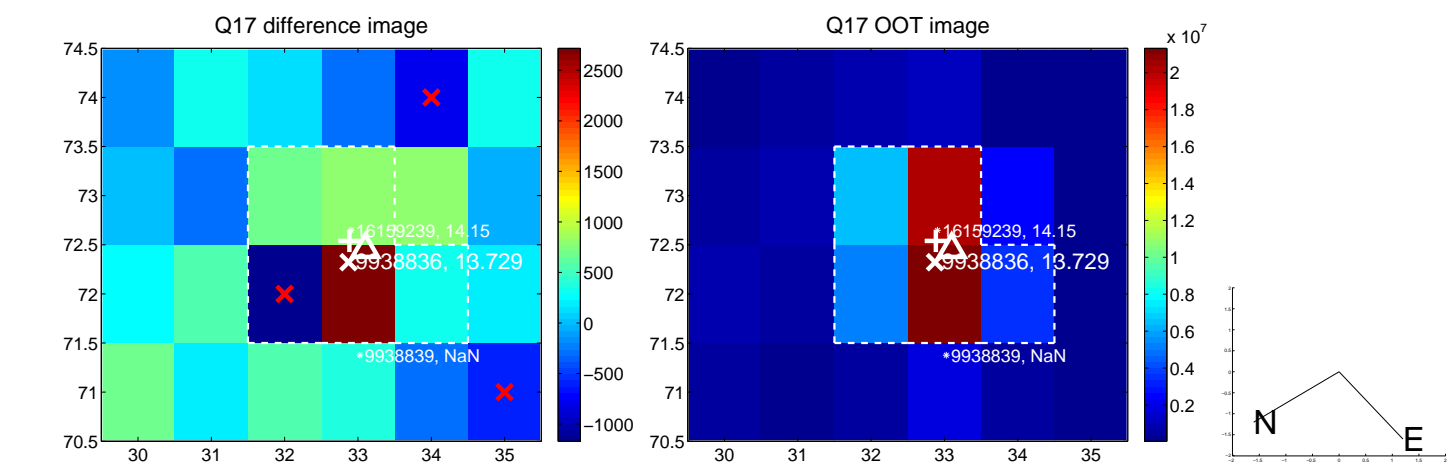
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



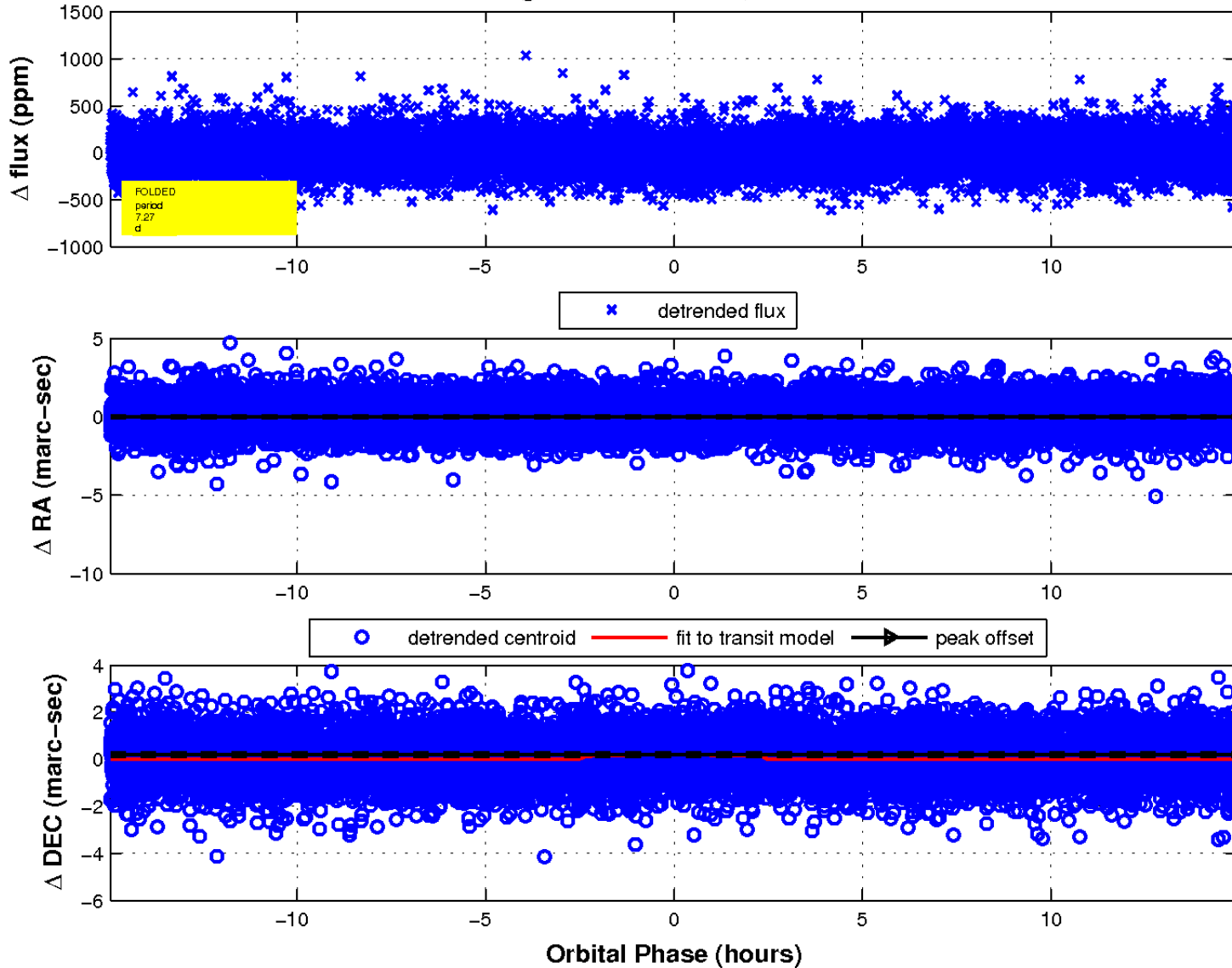
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

