

# KIC 009850843

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009850843-01	OBS	5724.01	8.480385	135.838382	119.1	5.404	9.1	9.0	1.07	6193	1.32	208.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009850843-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—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.

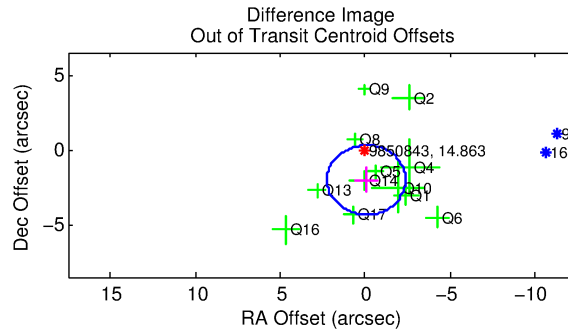
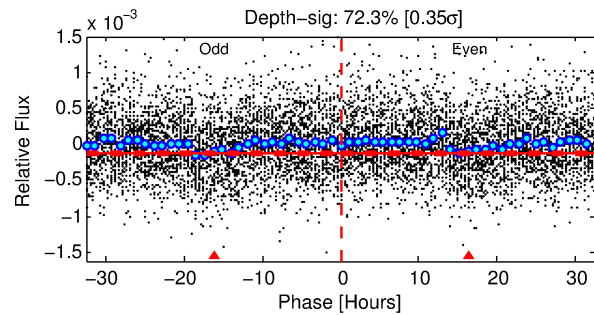
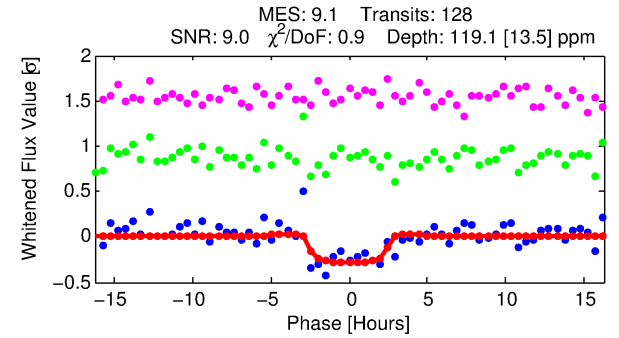
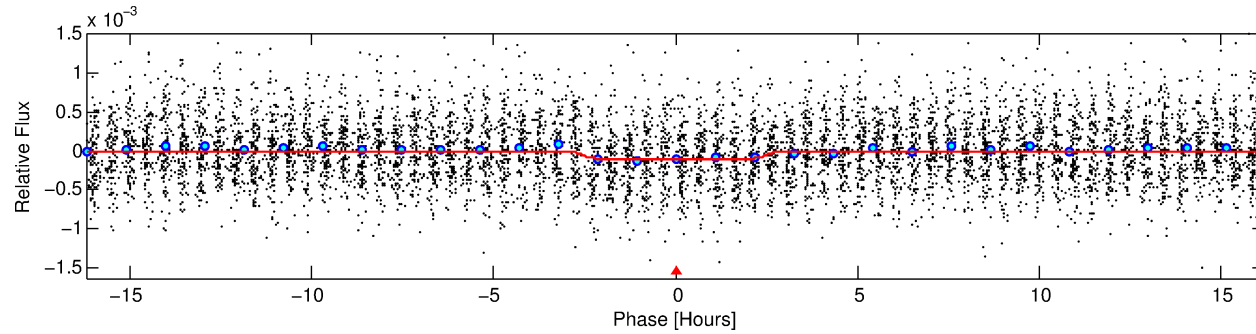
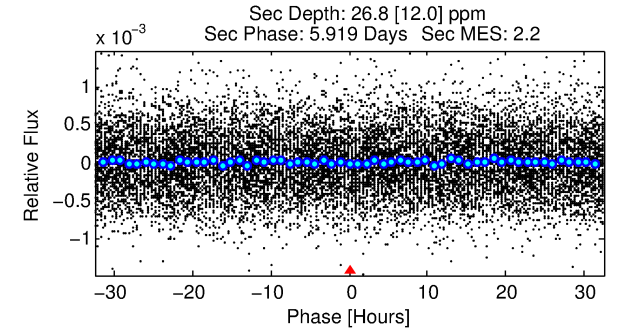
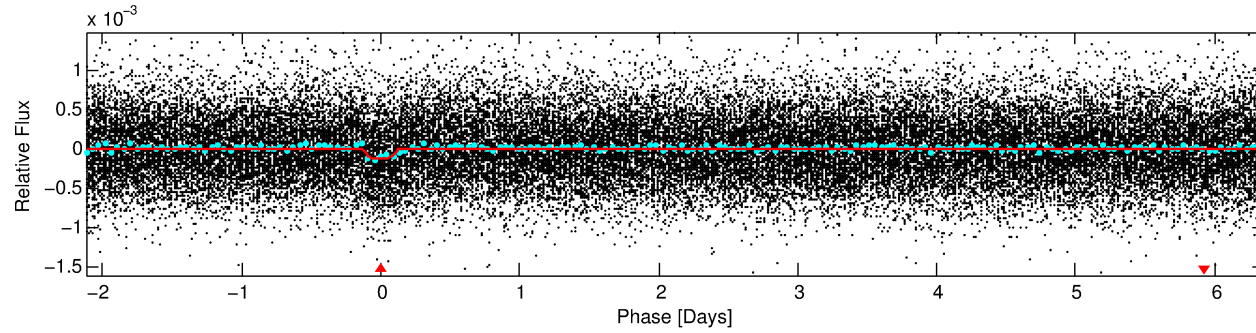
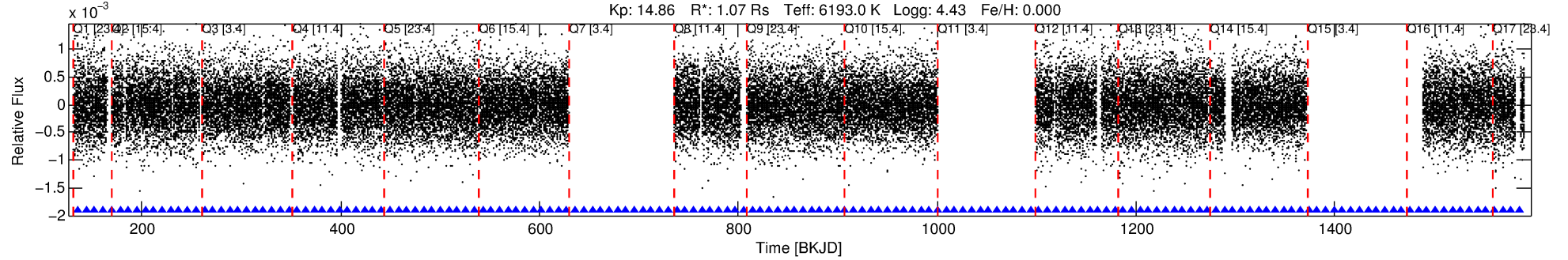
## Ephemeris Match Information For 009850843-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009850843-01	9850843	009851142-pri	9851142	1:1	218.0	53	12	7.63	14.86	765.55	Direct-PRF	0	0.41	0.57

**Notes:**  $P_1:P_2$  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.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  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: 9850843 Candidate: 1 of 1 Period: 8.480 d  
KOI: K05724.01 Corr: 0.849



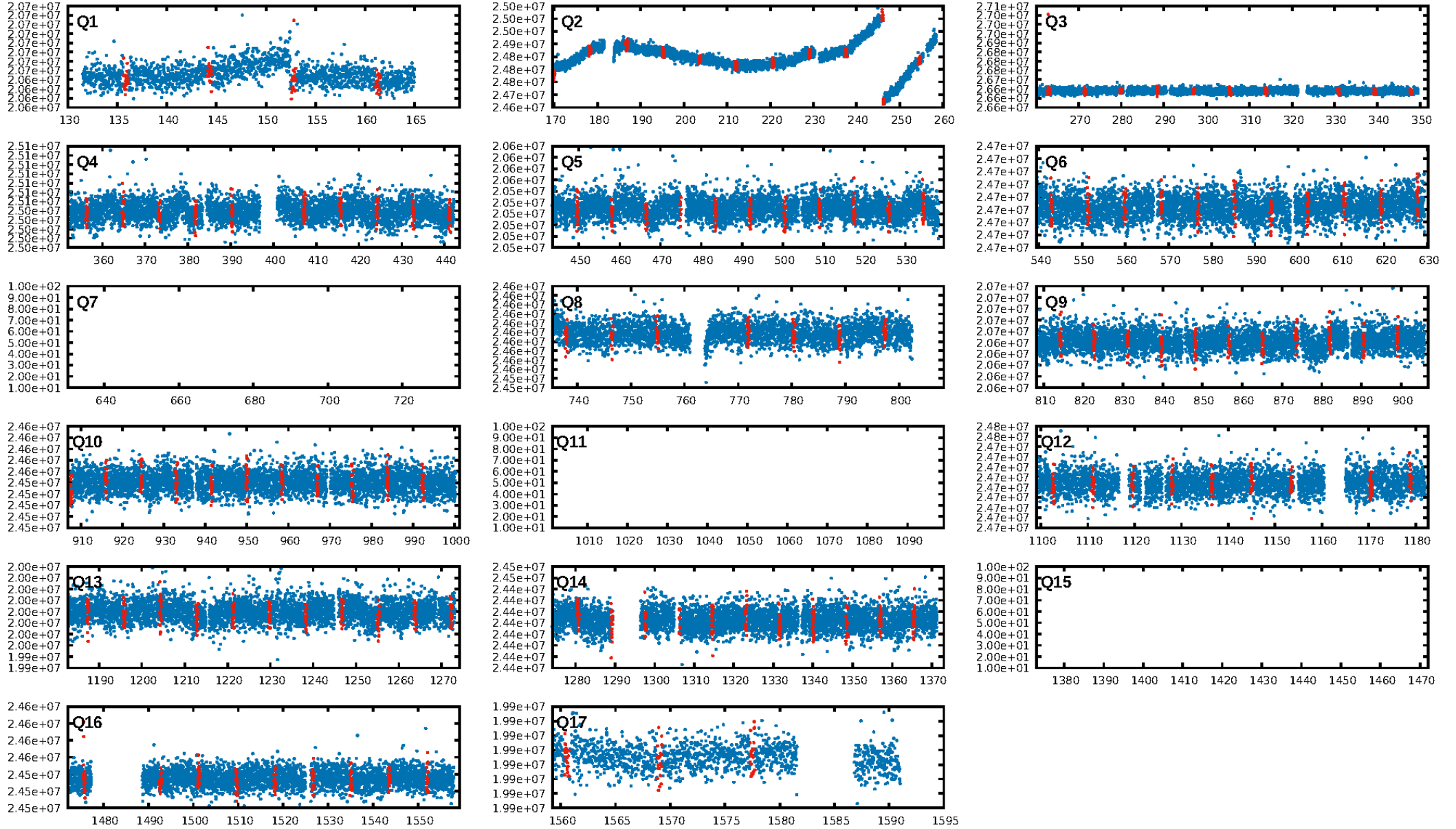
## DV Fit Results:

Period = 8.48038 [0.00011] d  
Epoch = 135.8384 [0.0100] BKJD  
Rp/R\* = 0.0114 [0.0067]  
a/R\* = 6.60 [19.77]  
b = 0.85 [1.00]  
Seff = 208.96 [91.47]  
Teff = 969 [106] K  
Rp = 1.32 [0.90] Re  
a = 0.0847 [0.0239] AU  
Ag = 60.54 [80.66] [0.74σ]  
Teffp = 4181 [1335] K [2.40σ]

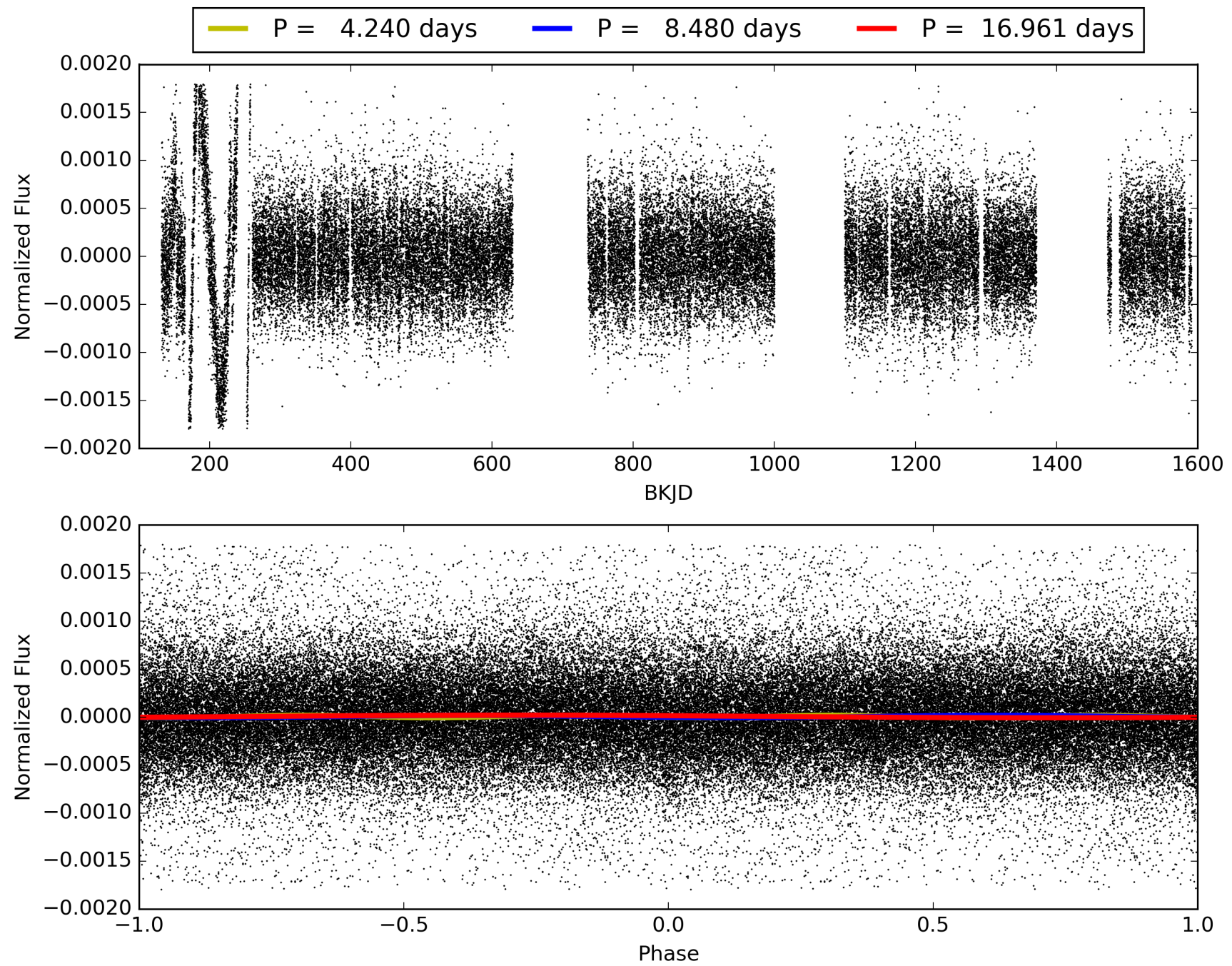
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 35.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.43e-19  
RollingBand-fgt: 1.00 [121/121]  
**GhostDiagnostic-chr: -0.1554**  
Centroid-sig: 9.6%  
Centroid-so: 2.256 arcsec [1.53σ]  
OotOffset-rm: 2.023 arcsec [2.62σ]  
KicOffset-rm: 2.100 arcsec [2.65σ]  
OotOffset-st: 4/0/3/5 [12]  
KicOffset-st: 4/0/3/5 [12]  
DiffImageQuality-fgm: 0.08 [1/12]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 009850843-01, PDC Light Curves

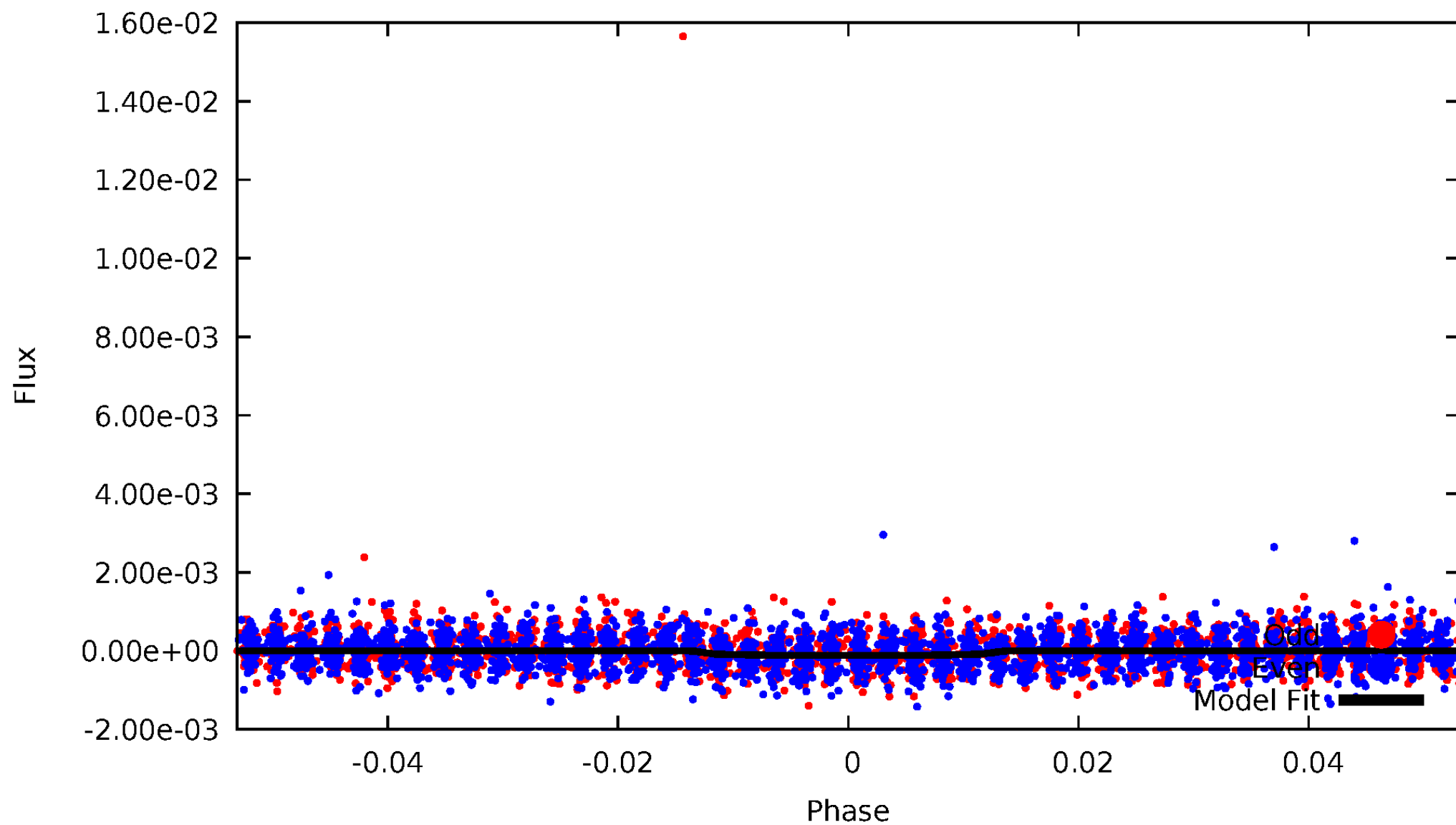


TCE 009850843-01



# DV Odd/Even

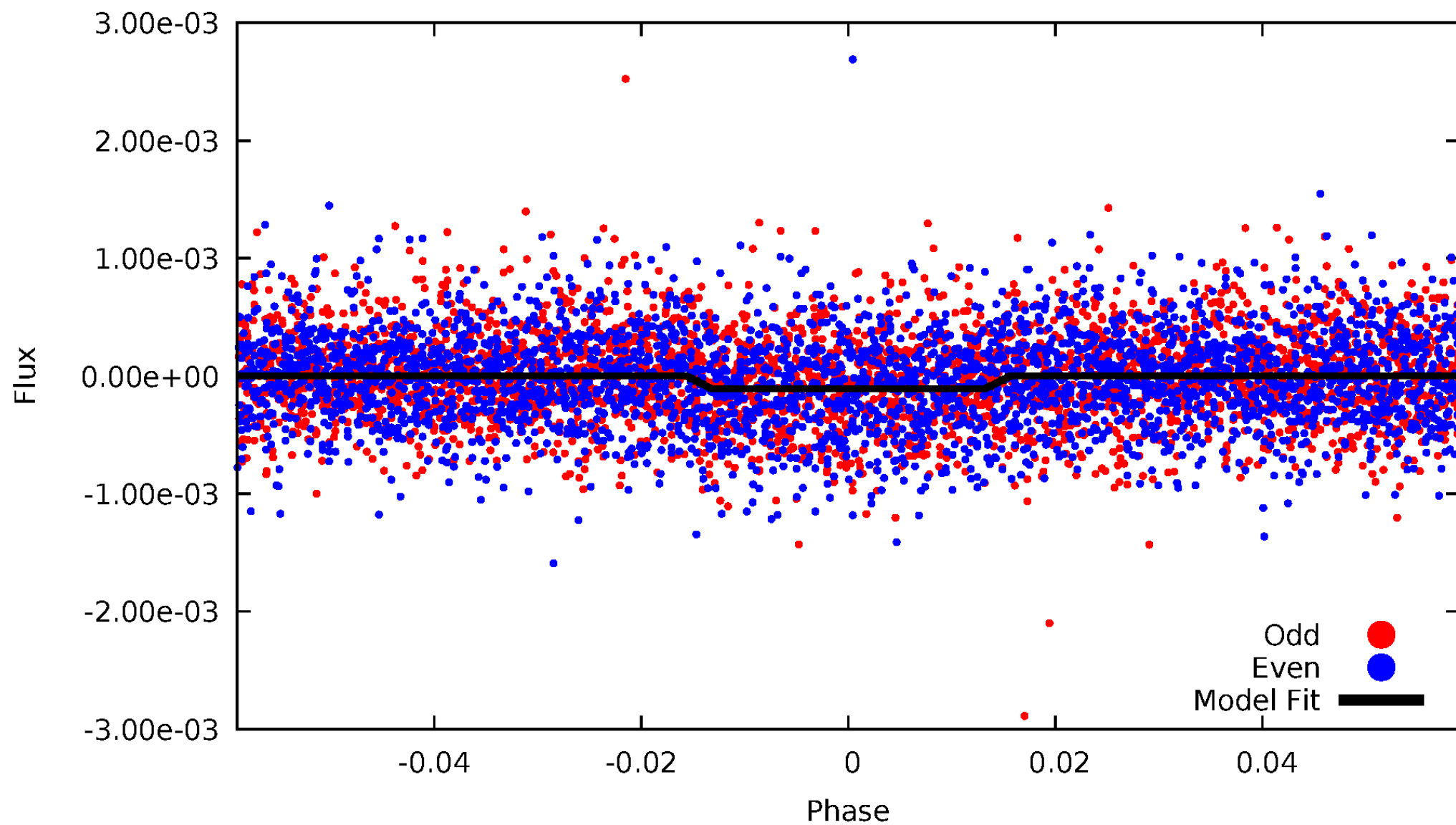
TCE 009850843-01



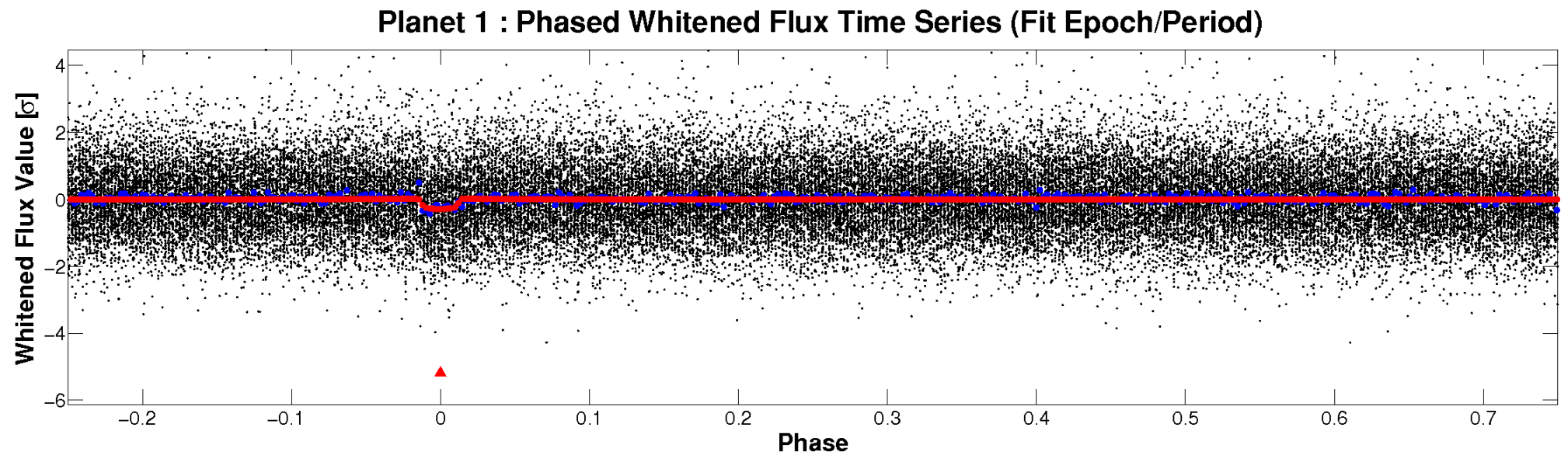
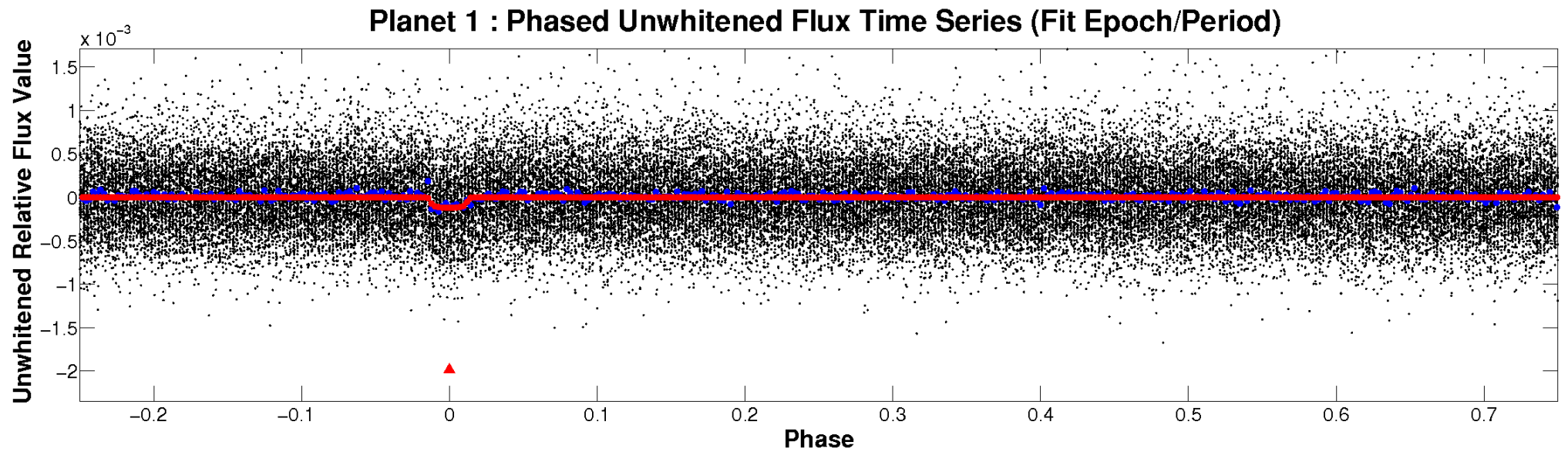


# ALT Odd/Even

TCE 009850843-01

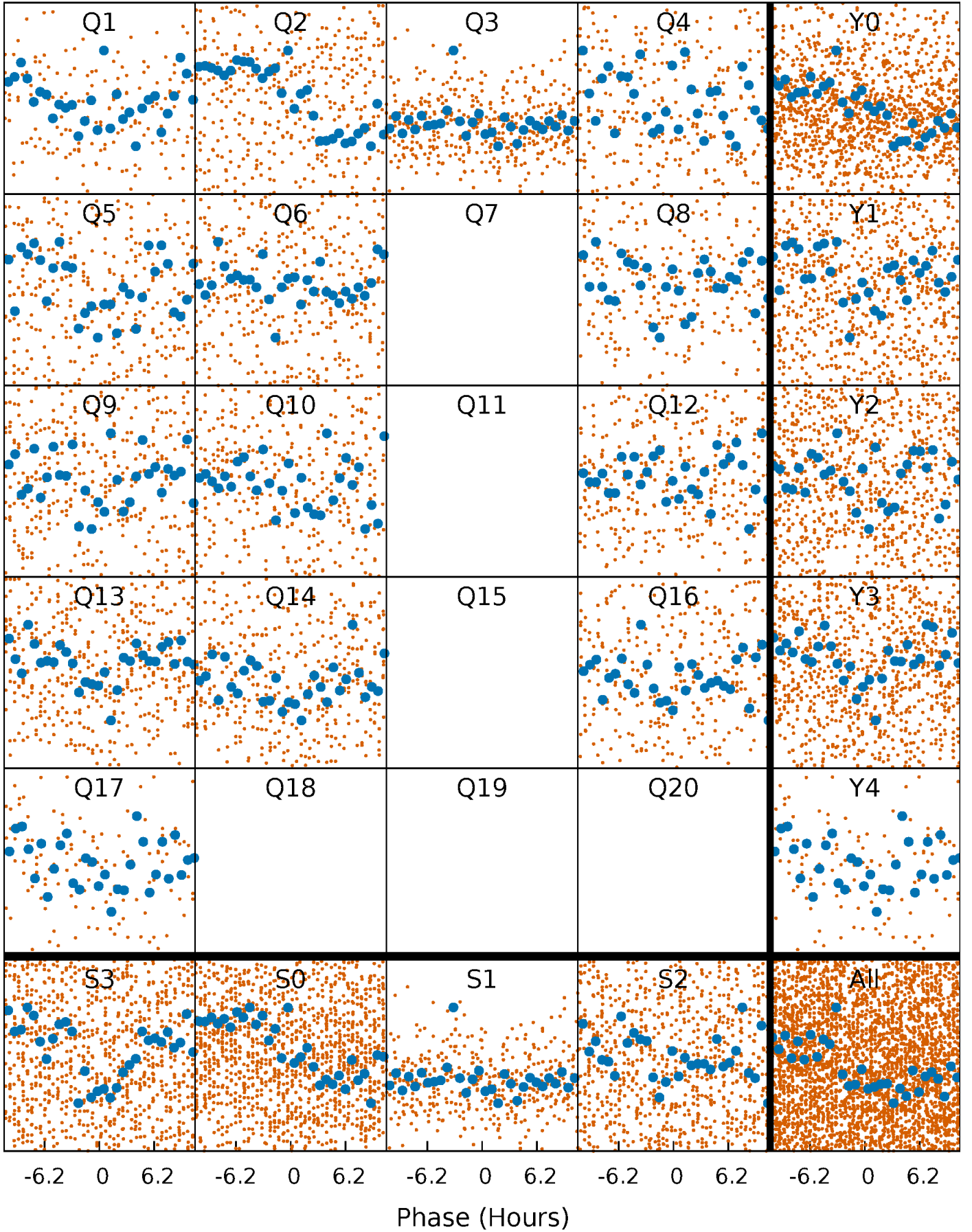


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

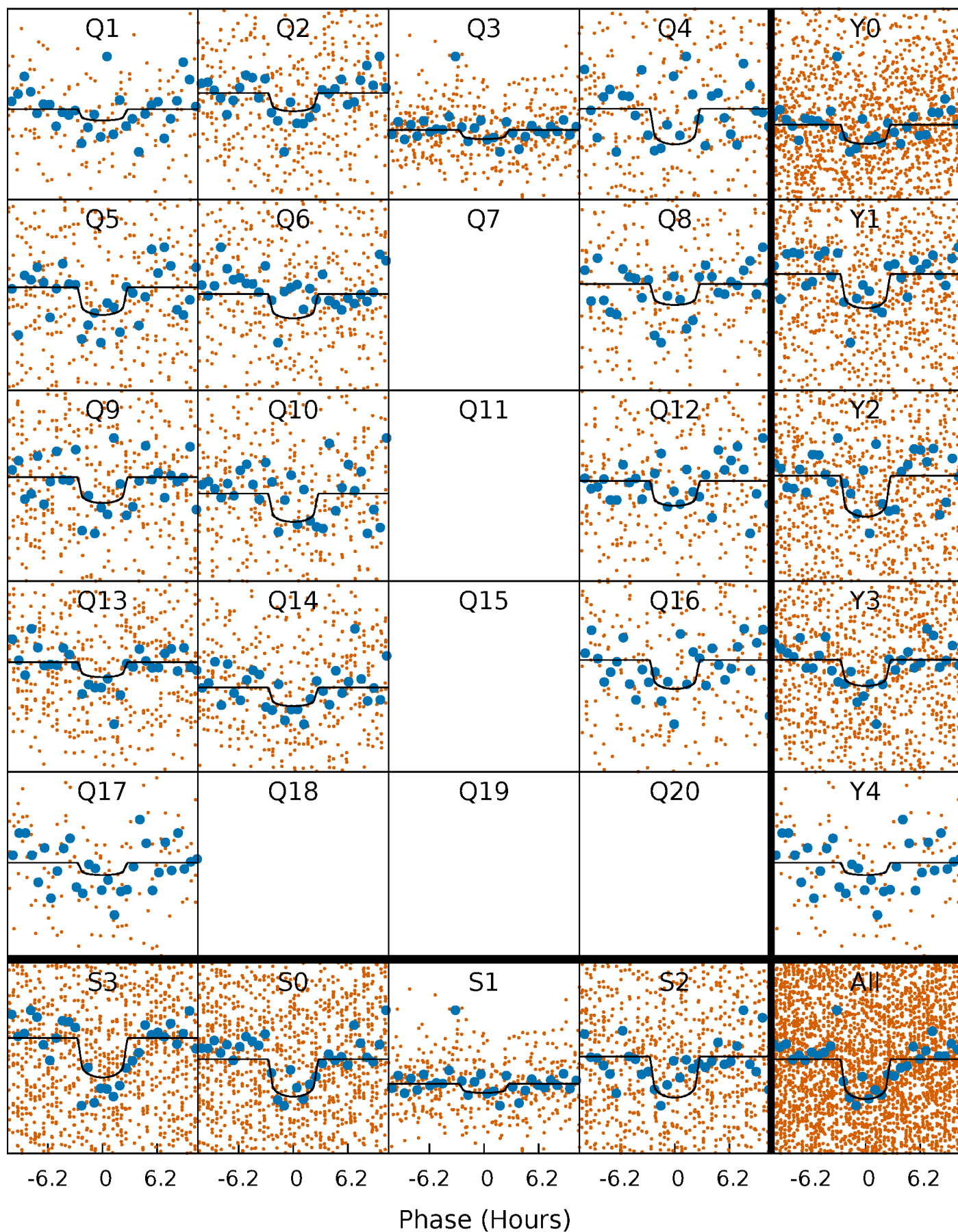
TCE 009850843-01   P= 8.480385 Days    $T_0=135.838382$  (BKJD)





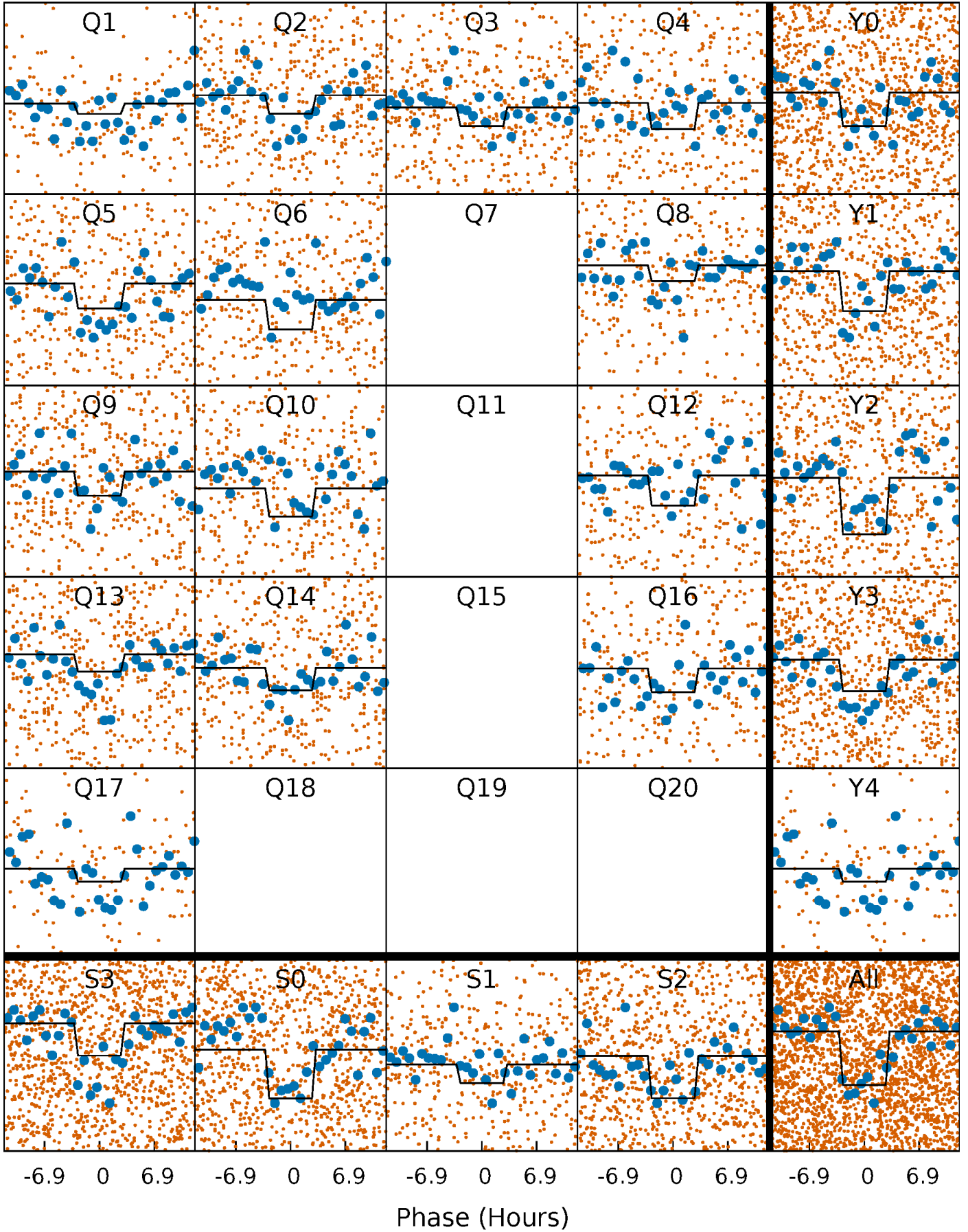
# DV Quarter-Phased Transit Curves

TCE 009850843-01 P= 8.480385 Days  $T_0=135.838382$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

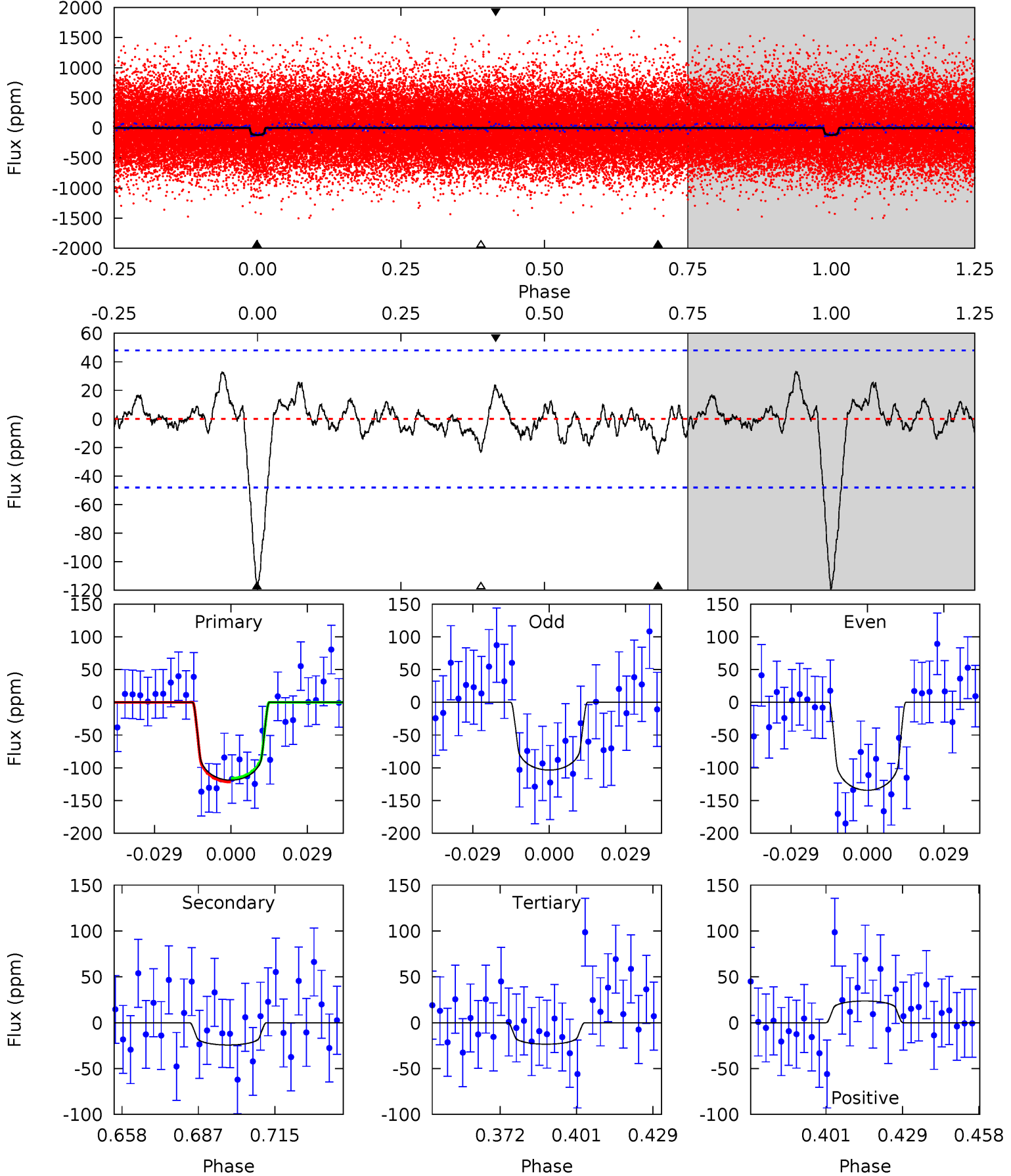
TCE 009850843-01 P= 8.480296 Days  $T_0=135.860539$  (BKJD)



# DV Model-Shift Uniqueness Test

009850843-01, P = 8.480385 Days, E = 127.357997 Days

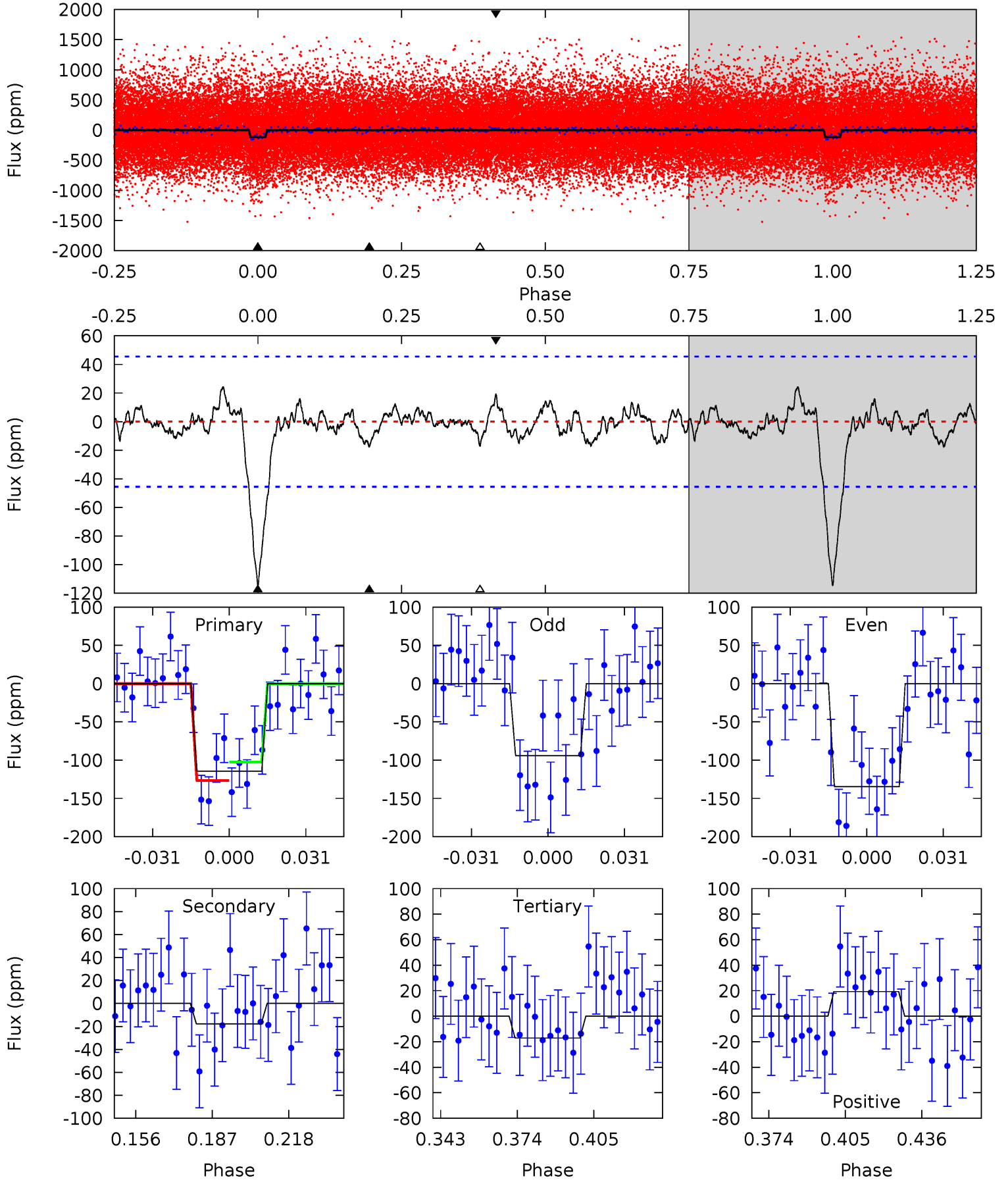
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	2.44	2.35	2.38	4.82	2.19	0.92	9.58	9.55	0.09	0.06	1.55	0.96	0.22	0.28



# Alt Model-Shift Uniqueness Test

009850843-01, P = 8.480296 Days, E = 127.380243 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
12.1	1.88	1.80	2.04	4.80	2.15	0.76	10.3	10.0	0.08	-0.16	2.15	1.09	0.18	1.28





### Stellar Parameters For KIC 009850843

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6193^{+173}_{-238}$	$4.434^{+0.056}_{-0.224}$	$0.000^{+0.250}_{-0.300}$	$1.067^{+0.357}_{-0.119}$	$1.127^{+0.155}_{-0.155}$	$1.307^{+0.380}_{-0.702}$
	+3%/-4%	+1%/-5%	+inf%/-inf%	+33%/-11%	+14%/-14%	+29%/-54%
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 009850843-01 / KOI 5724.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-24 \pm 10$	$1.48^{+0.81}_{-0.82}$	$1388^{+110}_{-75}$	$4195^{+1720}_{-713}$	$41^{+175}_{-27}$
Alt.	$-18 \pm 9$	$1.38^{+0.78}_{-0.78}$	$1380^{+105}_{-71}$	$4034^{+1641}_{-749}$	$34^{+149}_{-25}$

$T_{max}$  = 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

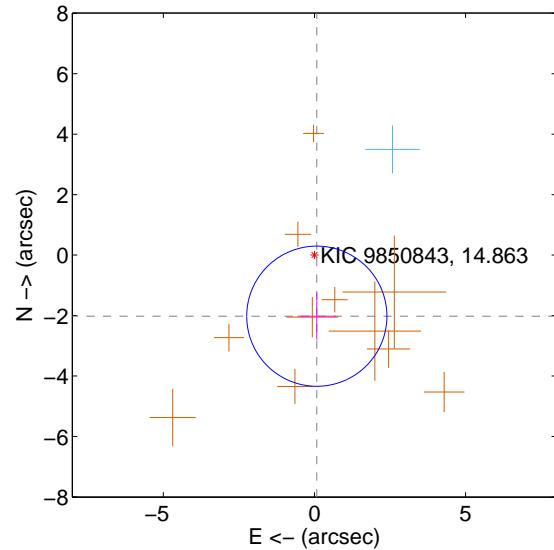
Supplemental centroid analysis for 009850843-01. Kepler magnitude: 14.86. Transit SNR 8.97

There are 1 quarters with good PRF difference image offsets

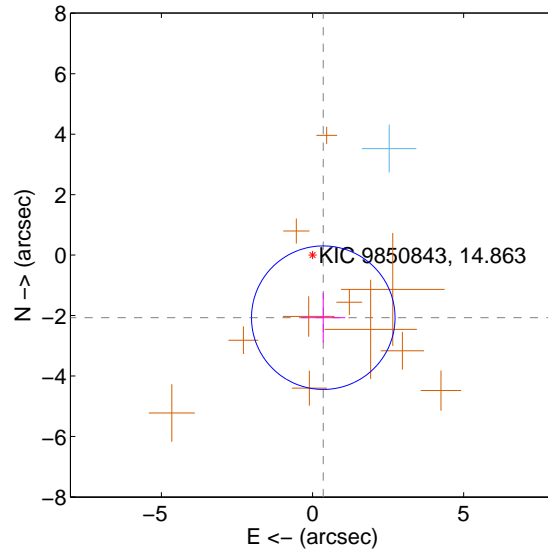
The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.023 \pm 0.773$	2.62	$-0.079 \pm 0.633$	$-2.021 \pm 0.779$
PRF-fit source offset from KIC position	$2.100 \pm 0.791$	2.65	$-0.355 \pm 0.726$	$-2.070 \pm 0.816$
photometric centroid source offset	$2.26 \pm 1.47$	1.53	$-1.84 \pm 1.37$	$1.31 \pm 1.66$

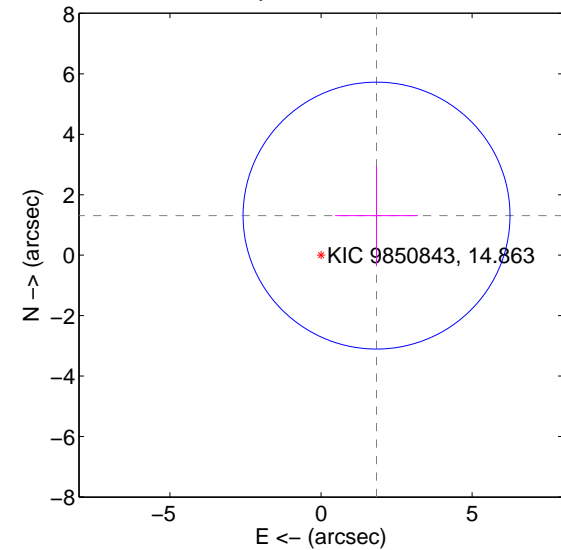
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

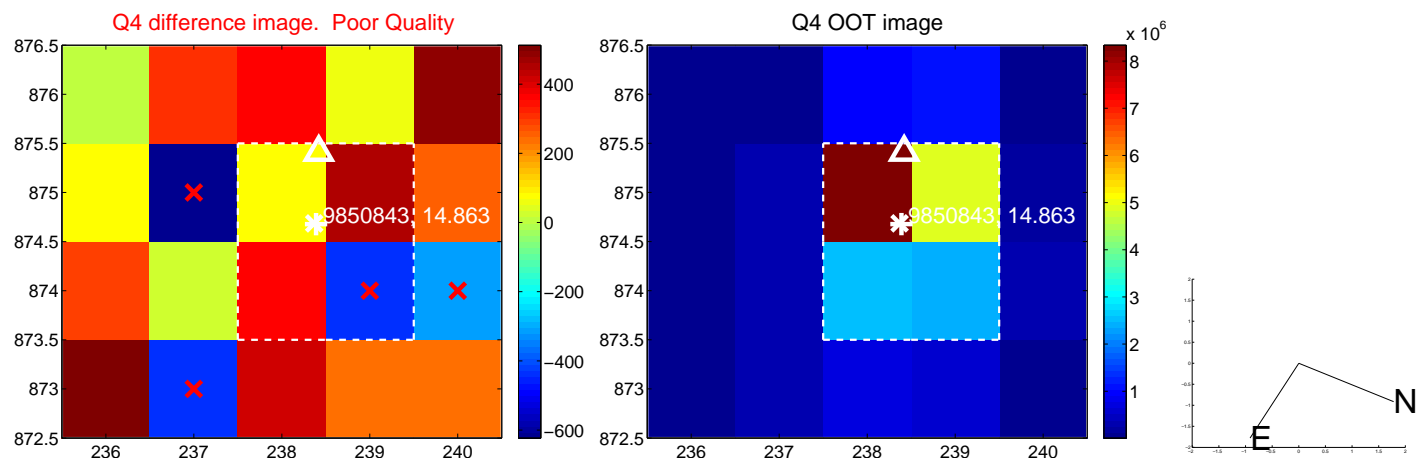
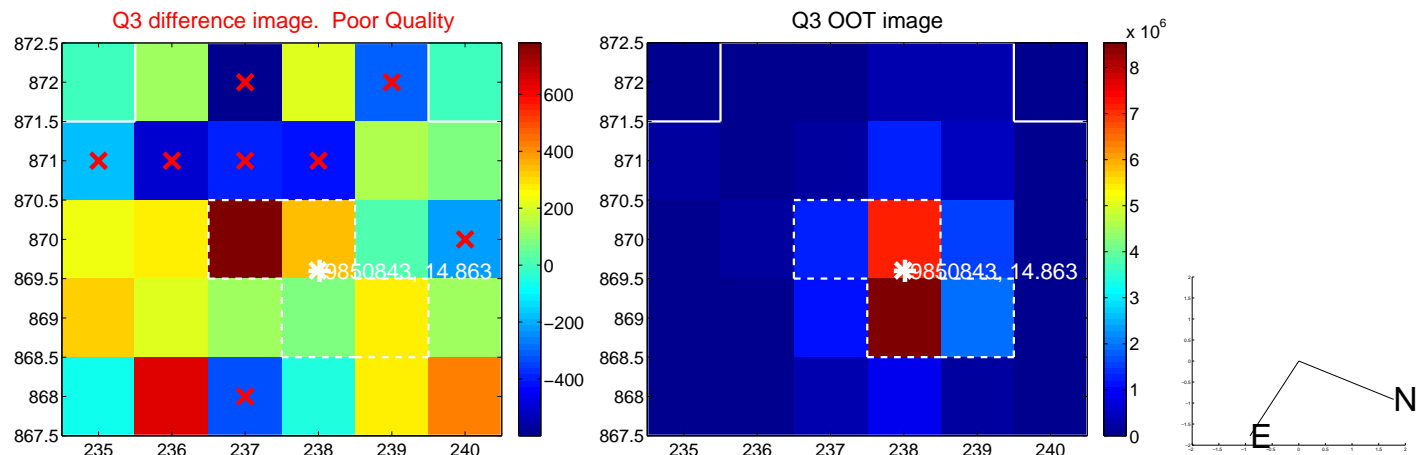
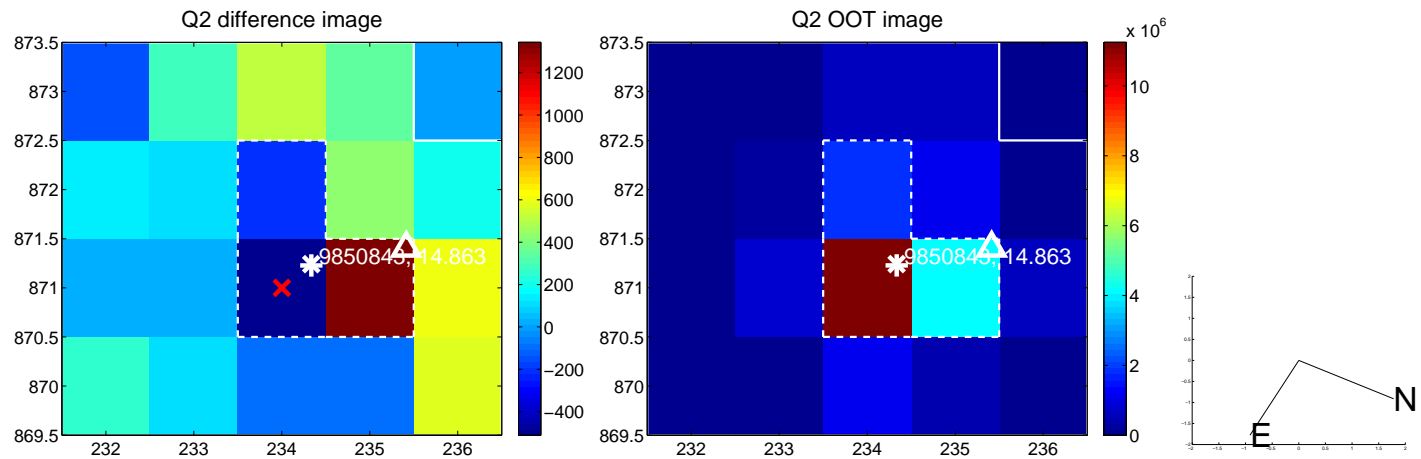
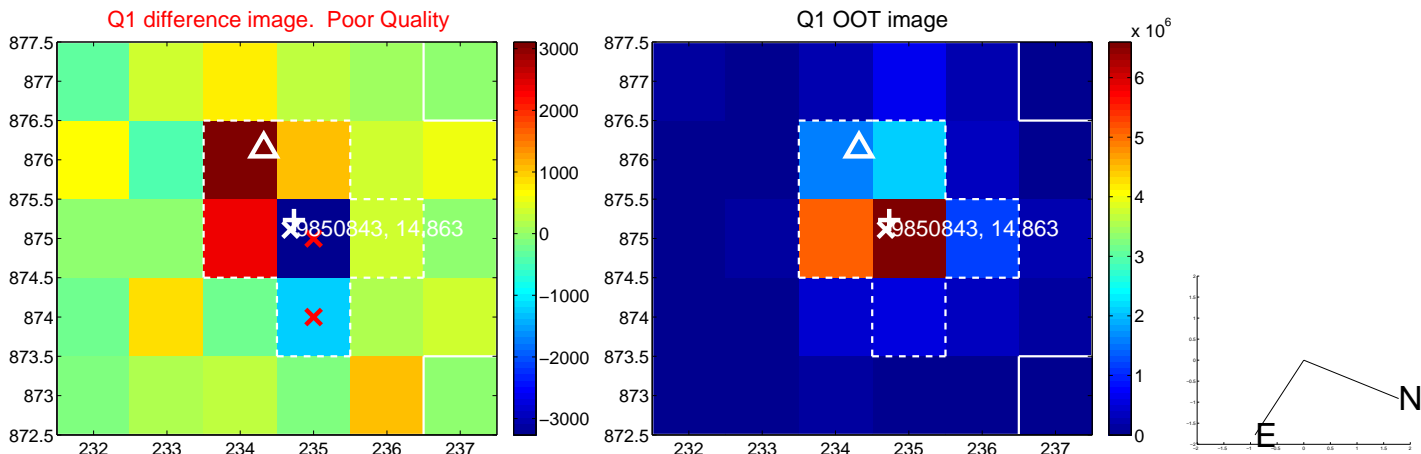


offset from photometric centroids

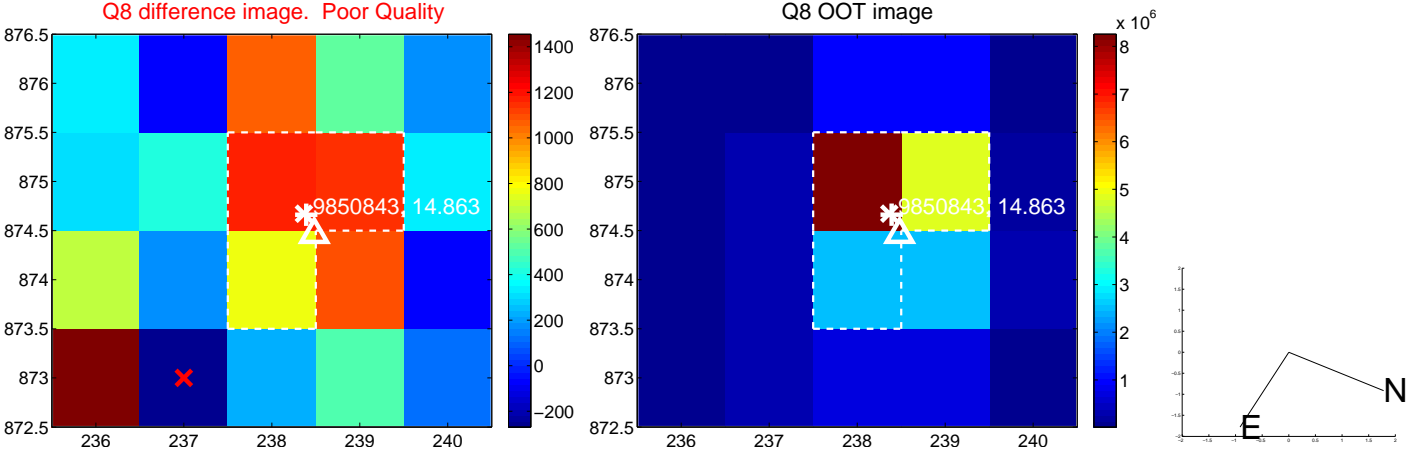
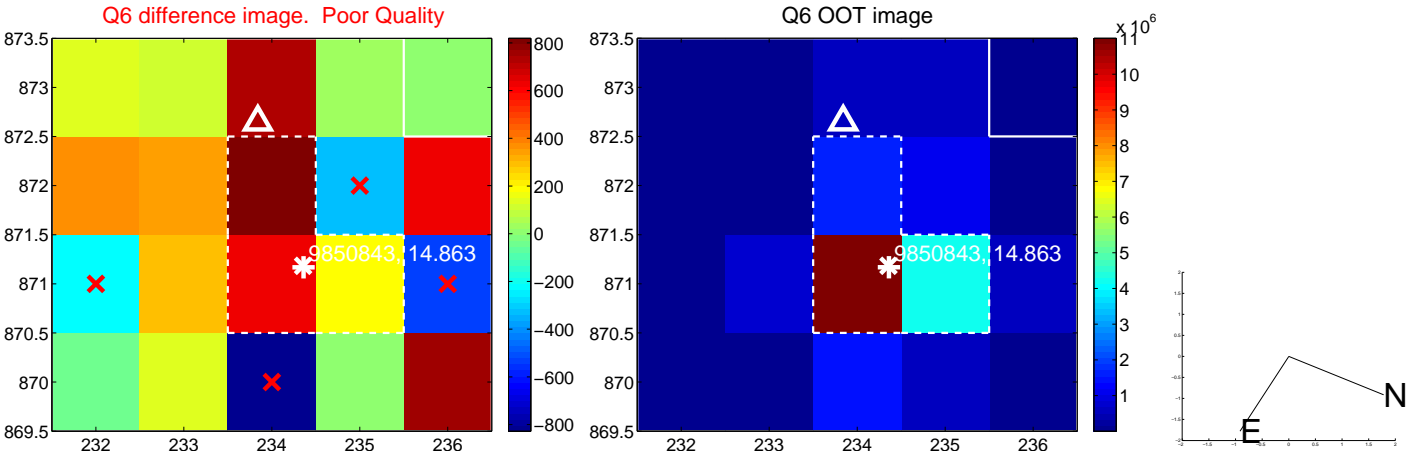
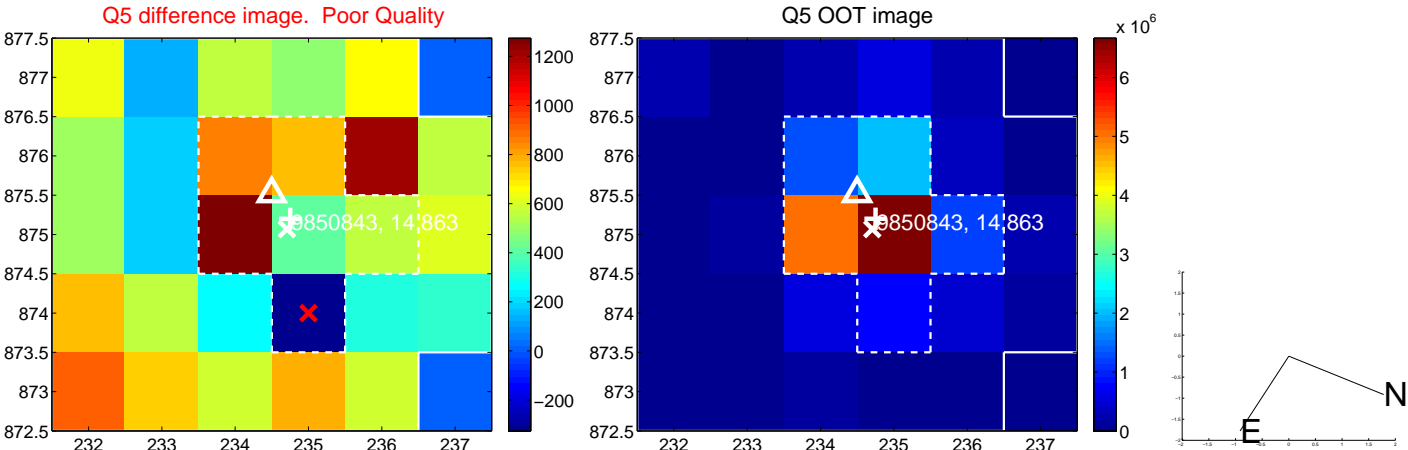


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs  $> 15,000$  are from the UKIRT catalog.

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

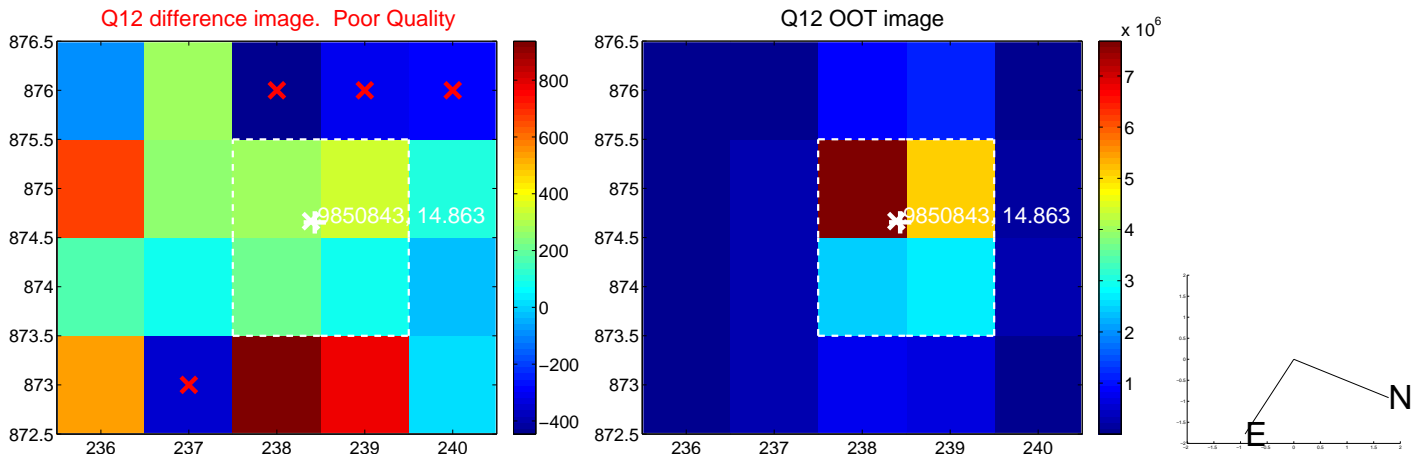
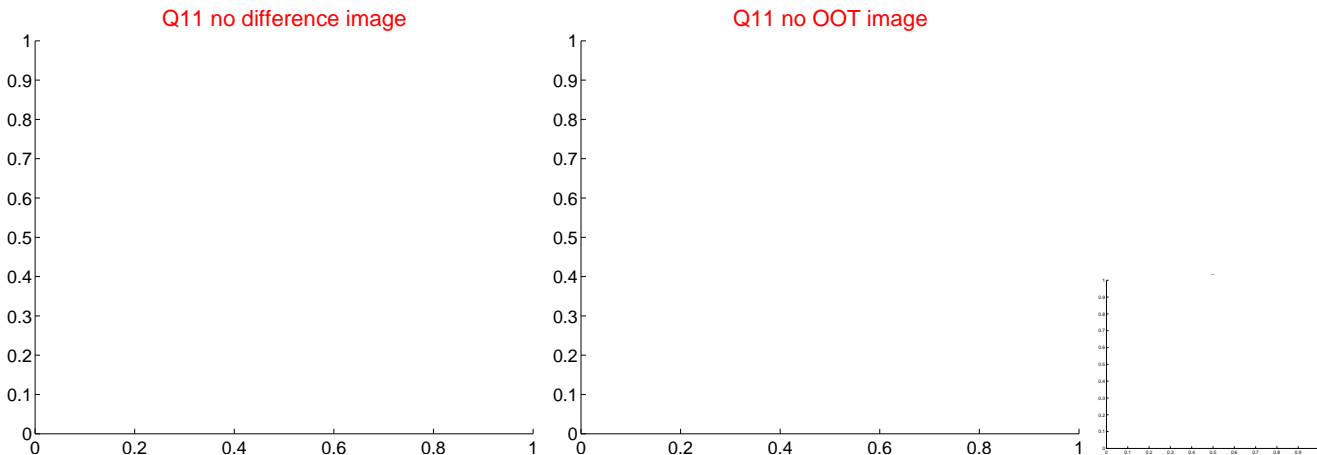
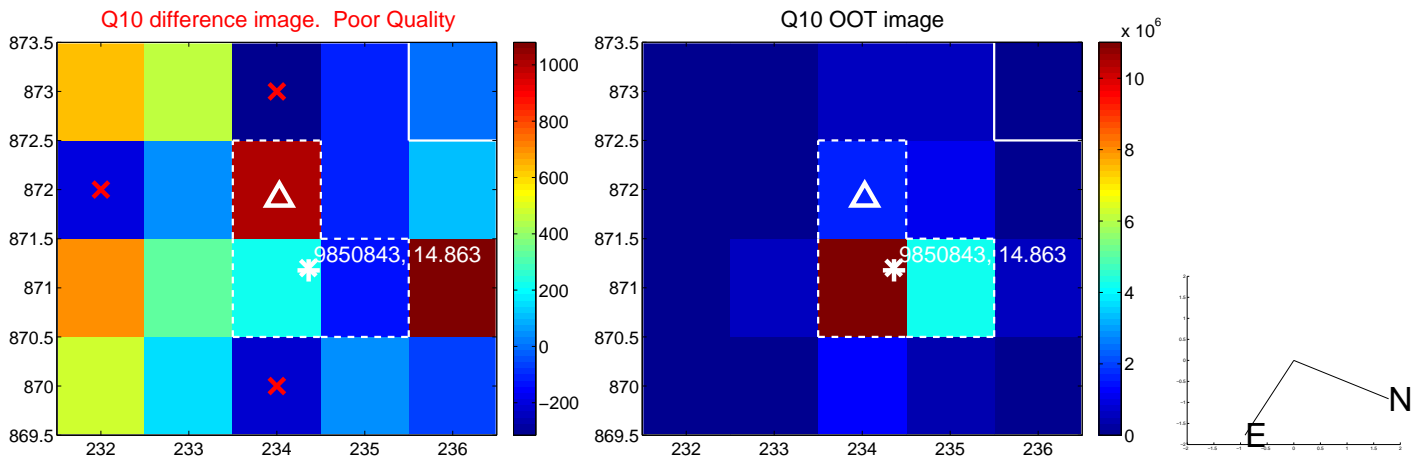
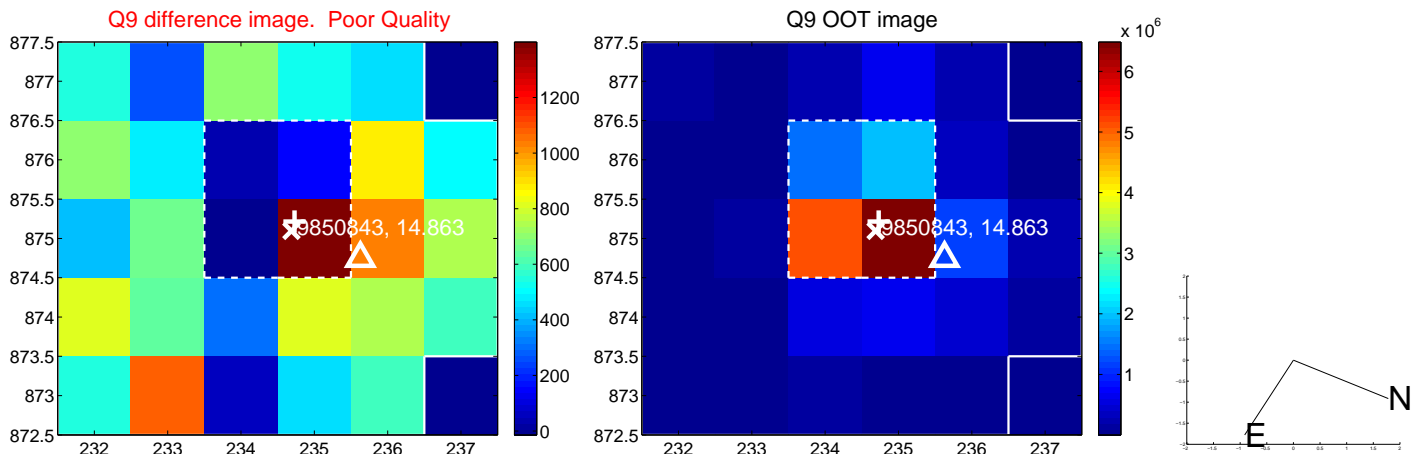


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

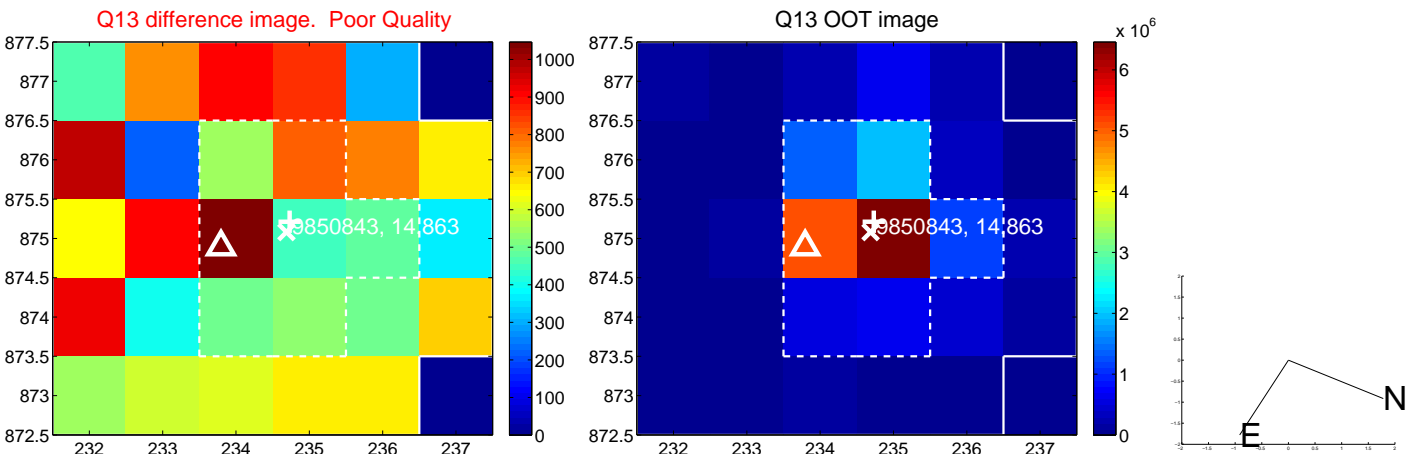




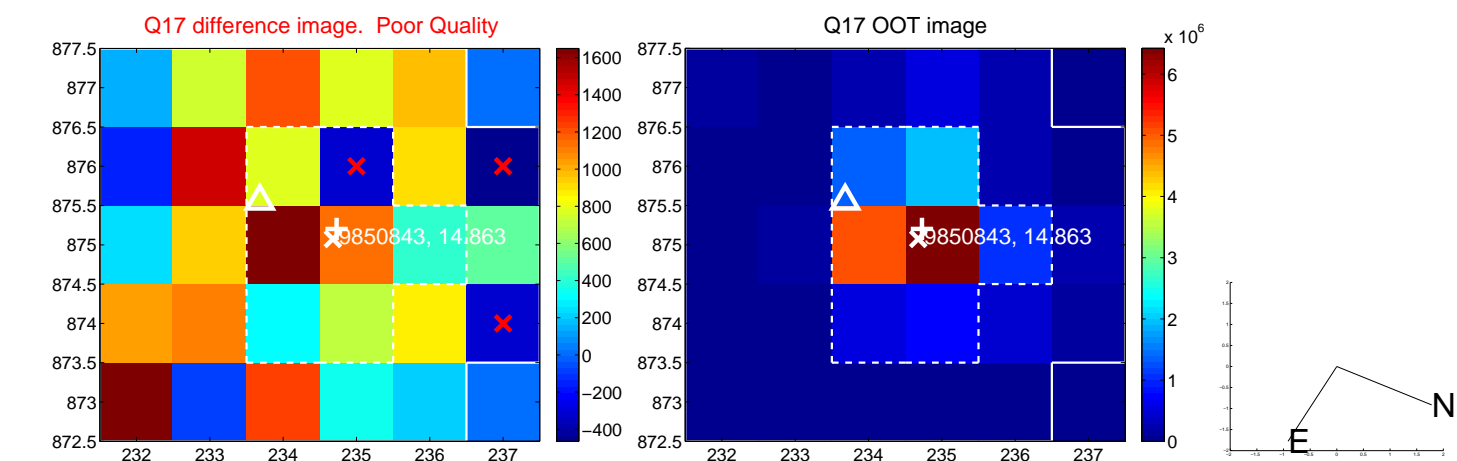
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



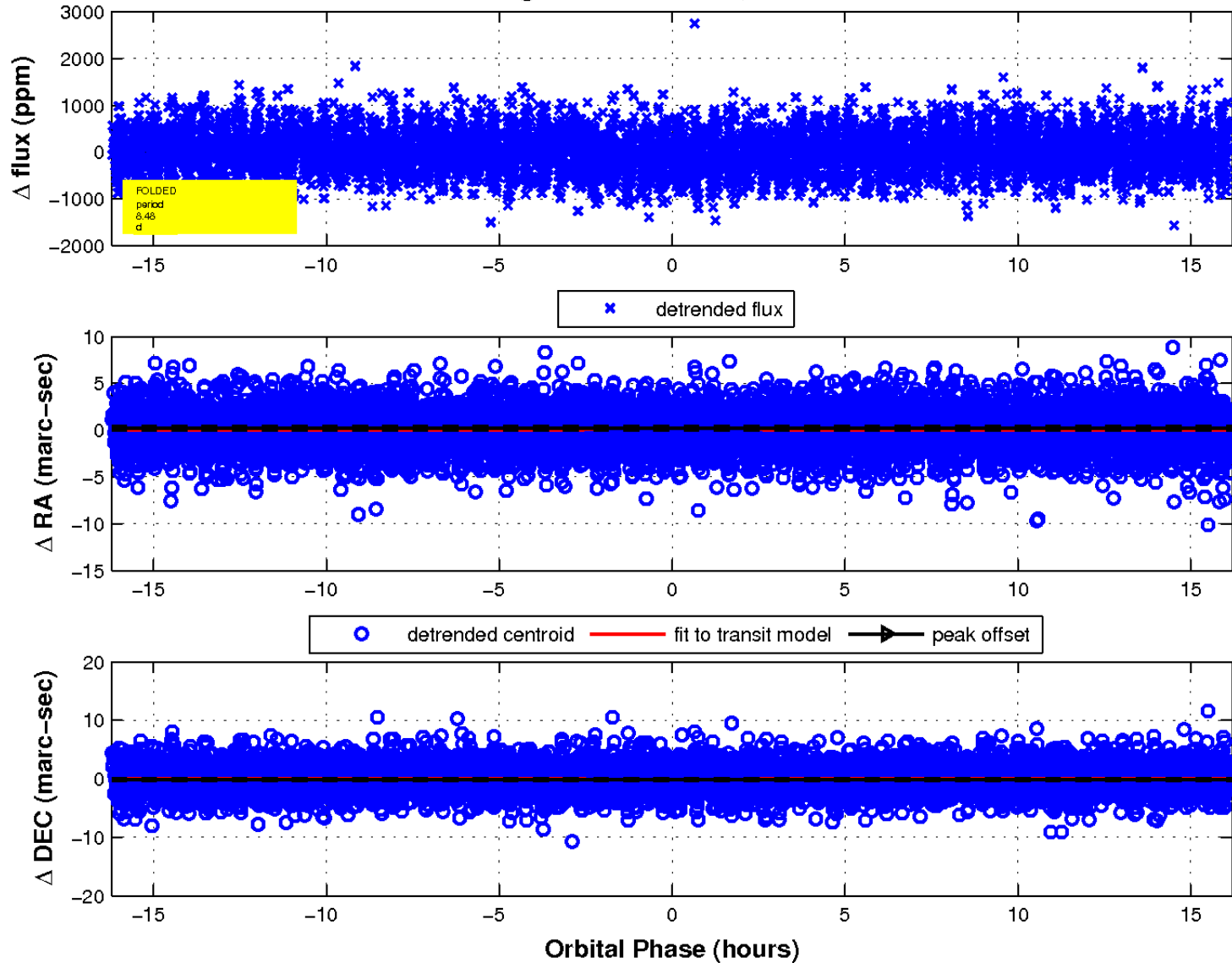
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

