

# KIC 004446859

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004446859-01	OBS	8246.01	425.655408	284.337343	157.4	11.002	7.2	7.0	1.20	6067	1.64	1.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004446859-01	OBS	PC	0.23	0	0	0	0	CENT_FEW_DIFFS

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

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

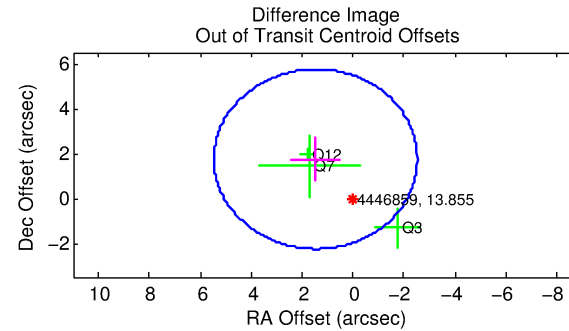
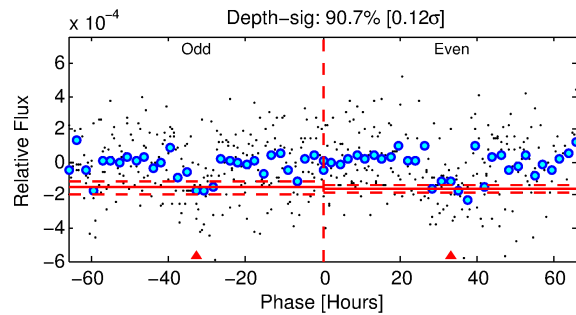
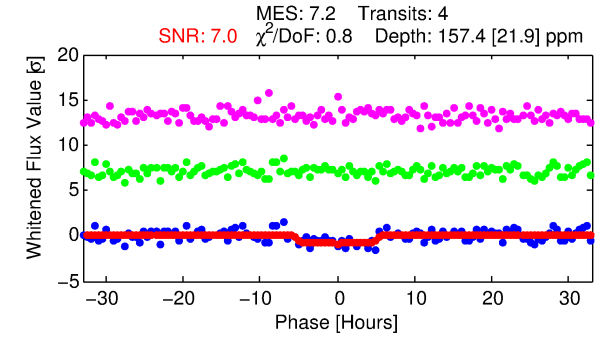
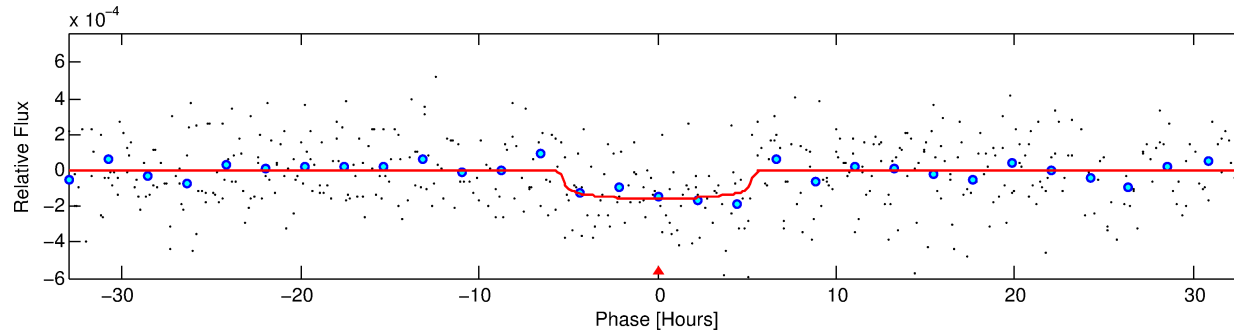
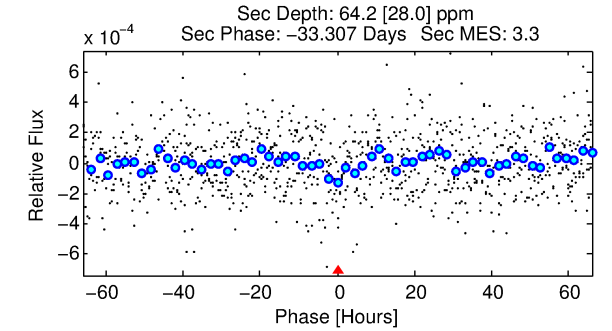
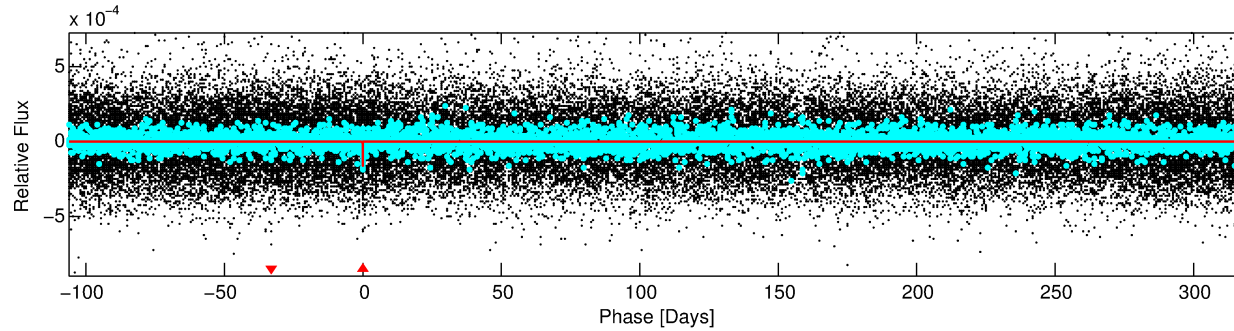
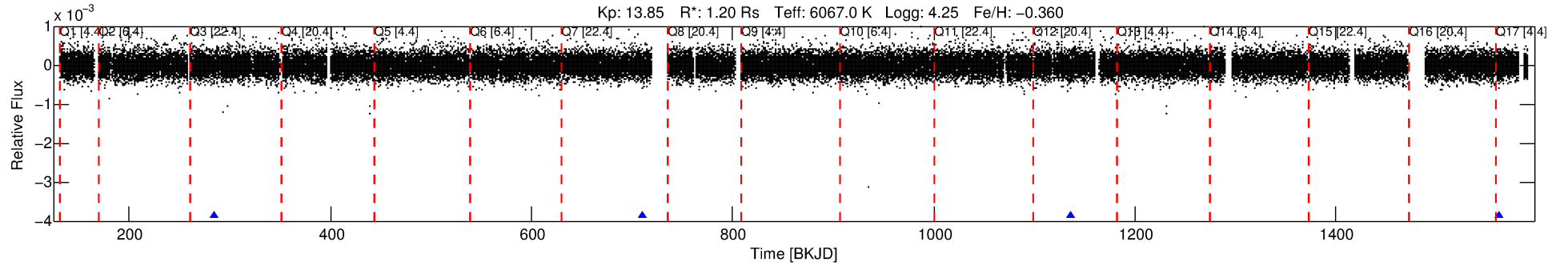
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004446859-01

No Significant Match Found

# DV One-Page Summary

KIC: 4446859 Candidate: 1 of 1 Period: 425.655 d



## DV Fit Results:

Period = 425.65541 [0.01215] d  
Epoch = 284.3373 [0.0237] BKJD  
Rp/R\* = 0.0125 [0.0079]  
a/R\* = 196.64 [641.64]  
b = 0.76 [1.79]  
Seff = 1.48 [0.60]  
Teq = 281 [29] K  
Rp = 1.63 [1.13] Re  
a = 1.0822 [0.2757] AU  
Ag = 15494.88 [21569.60] [0.72σ]  
Teff = 4852 [1628] K [2.81σ]

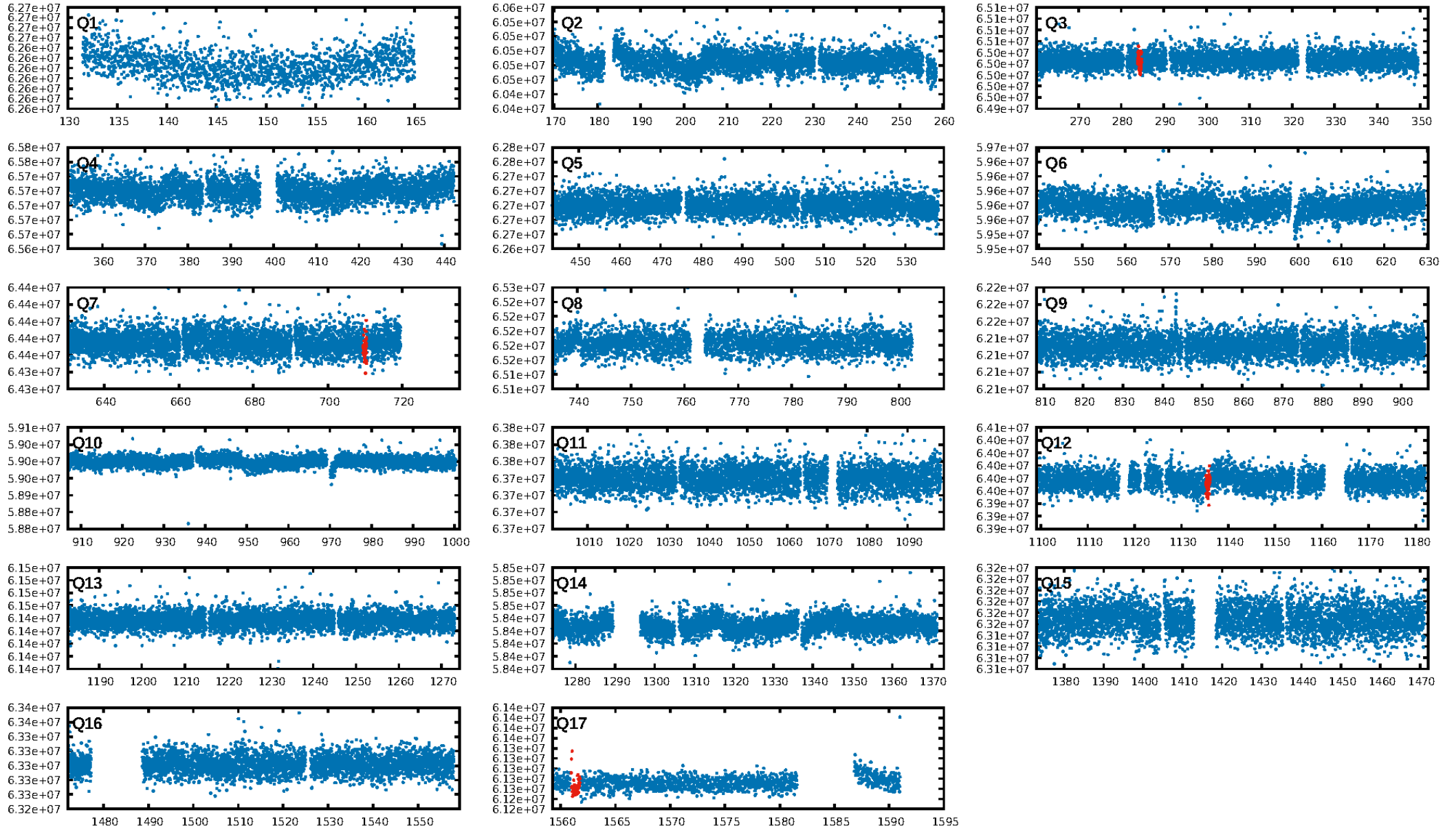
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 77.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.76e-10**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -4.515  
Centroid-sig: 17.0%  
Centroid-so: 2.547 arcsec [1.00σ]  
OotOffset-rm: 2.282 arcsec [1.71σ]  
KicOffset-rm: 2.264 arcsec [1.34σ]  
OotOffset-st: 0/2/1/0 [3]  
KicOffset-st: 0/2/1/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

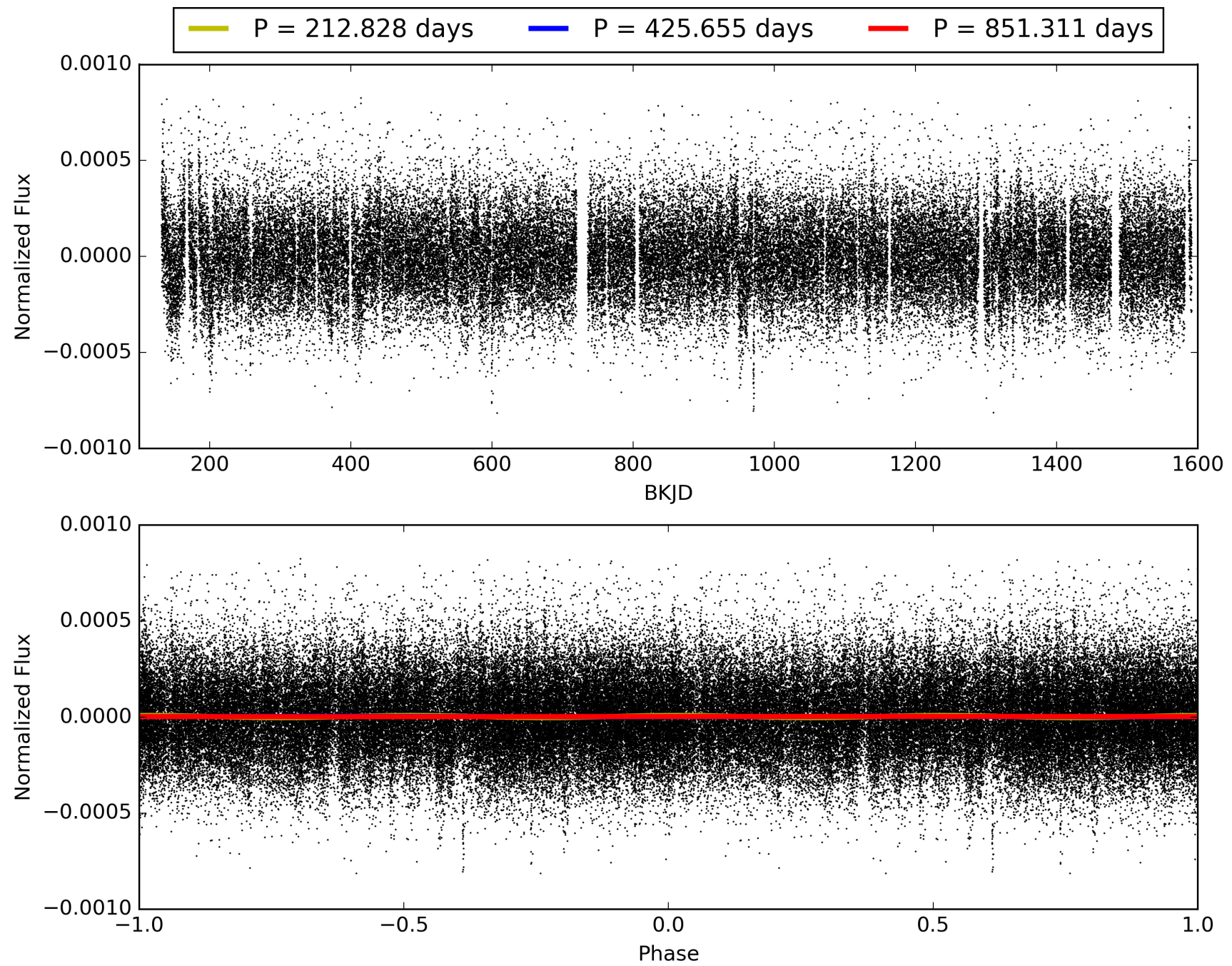
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:37:40 Z

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

# TCE 004446859-01, PDC Light Curves

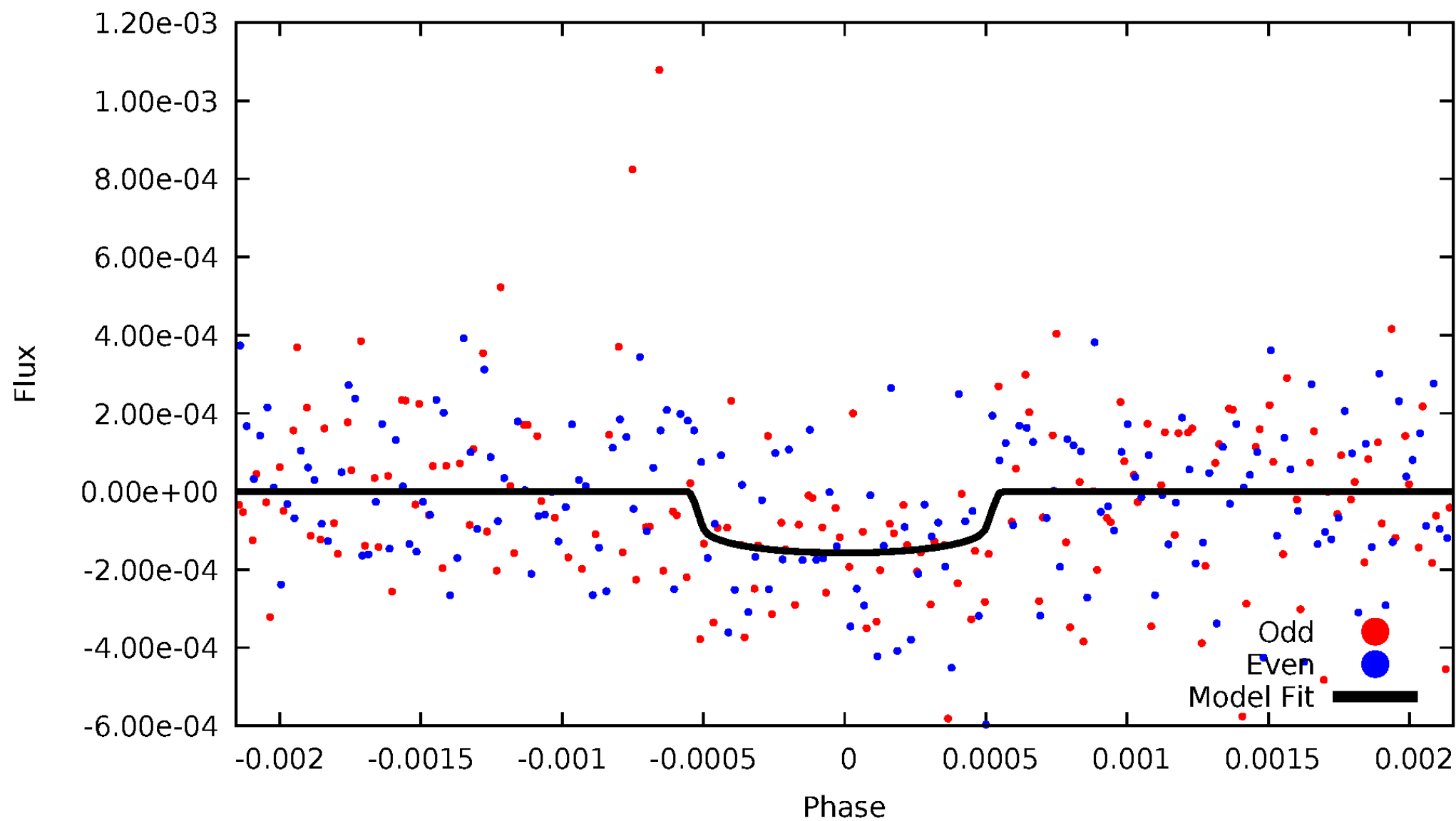


TCE 004446859-01



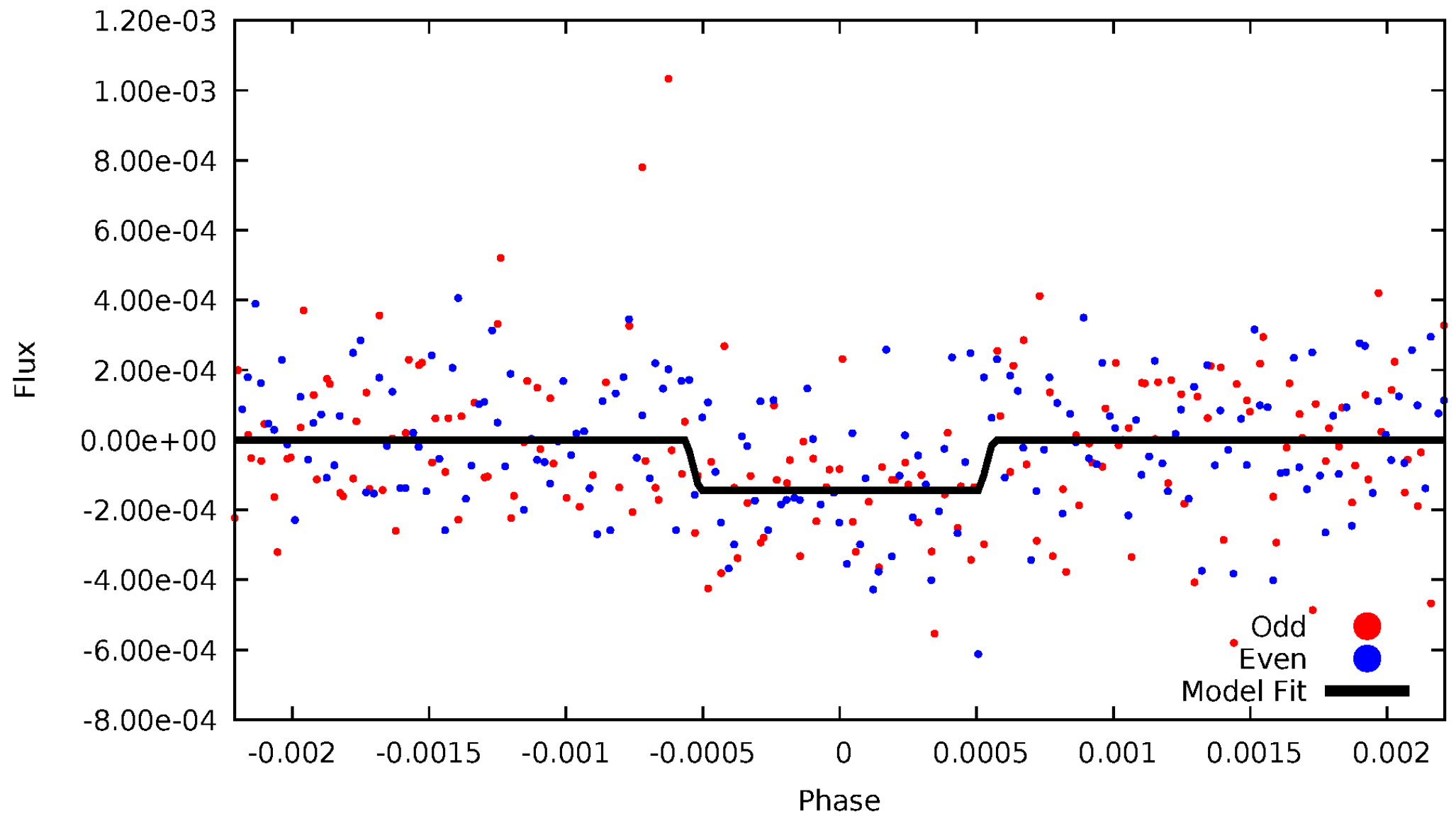
# DV Odd/Even

TCE 004446859-01

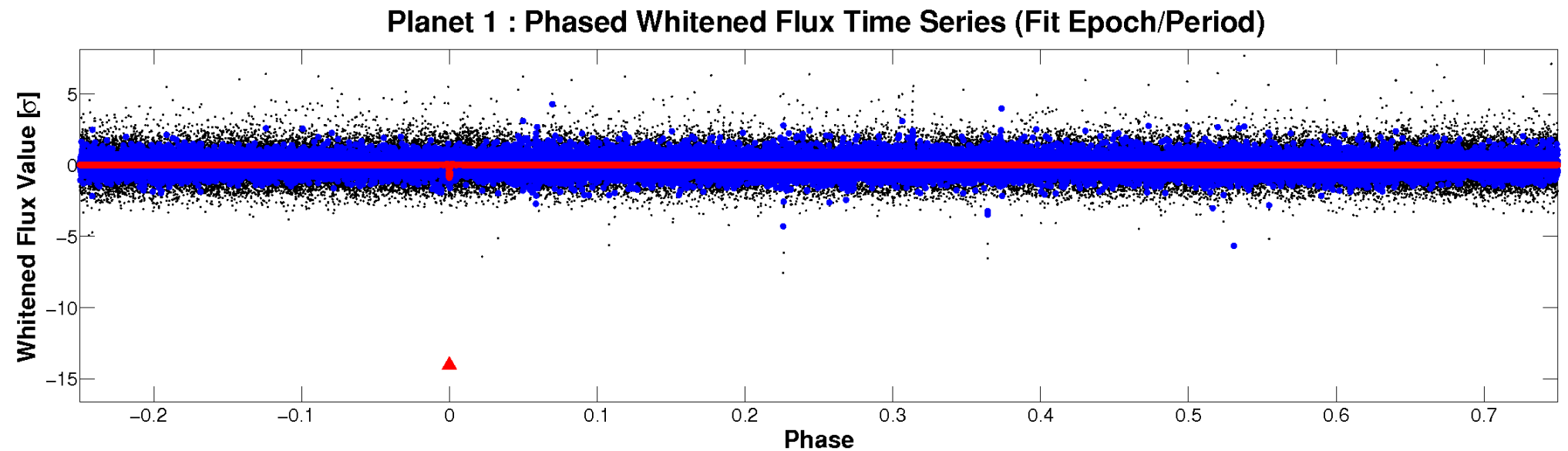
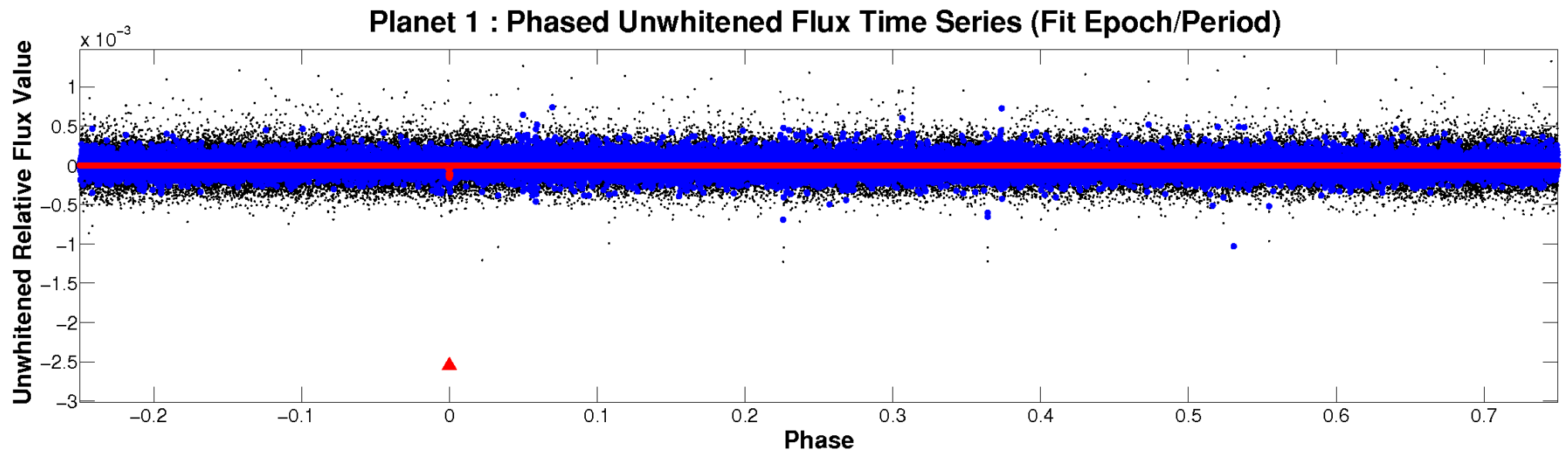


# ALT Odd/Even

TCE 004446859-01



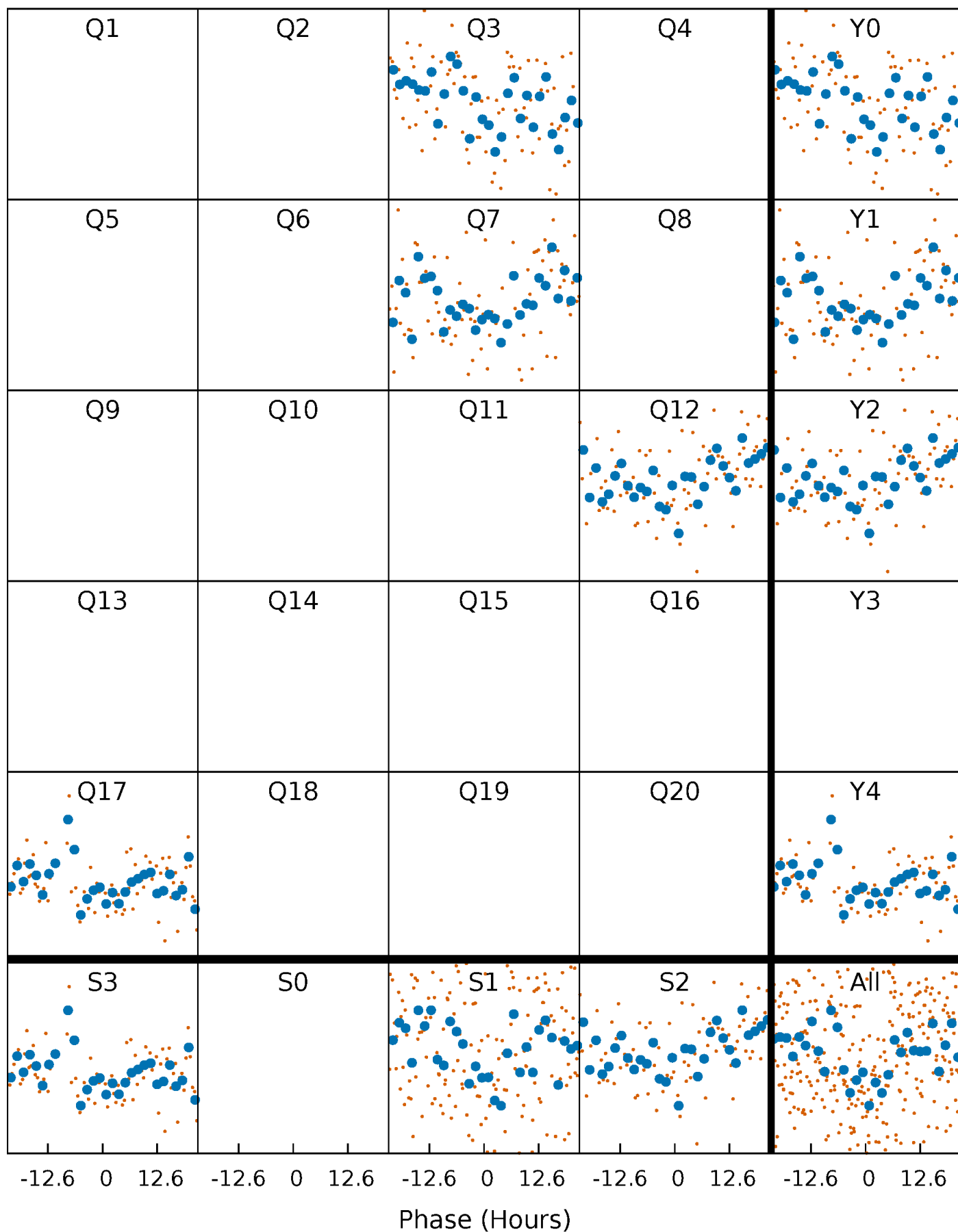
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

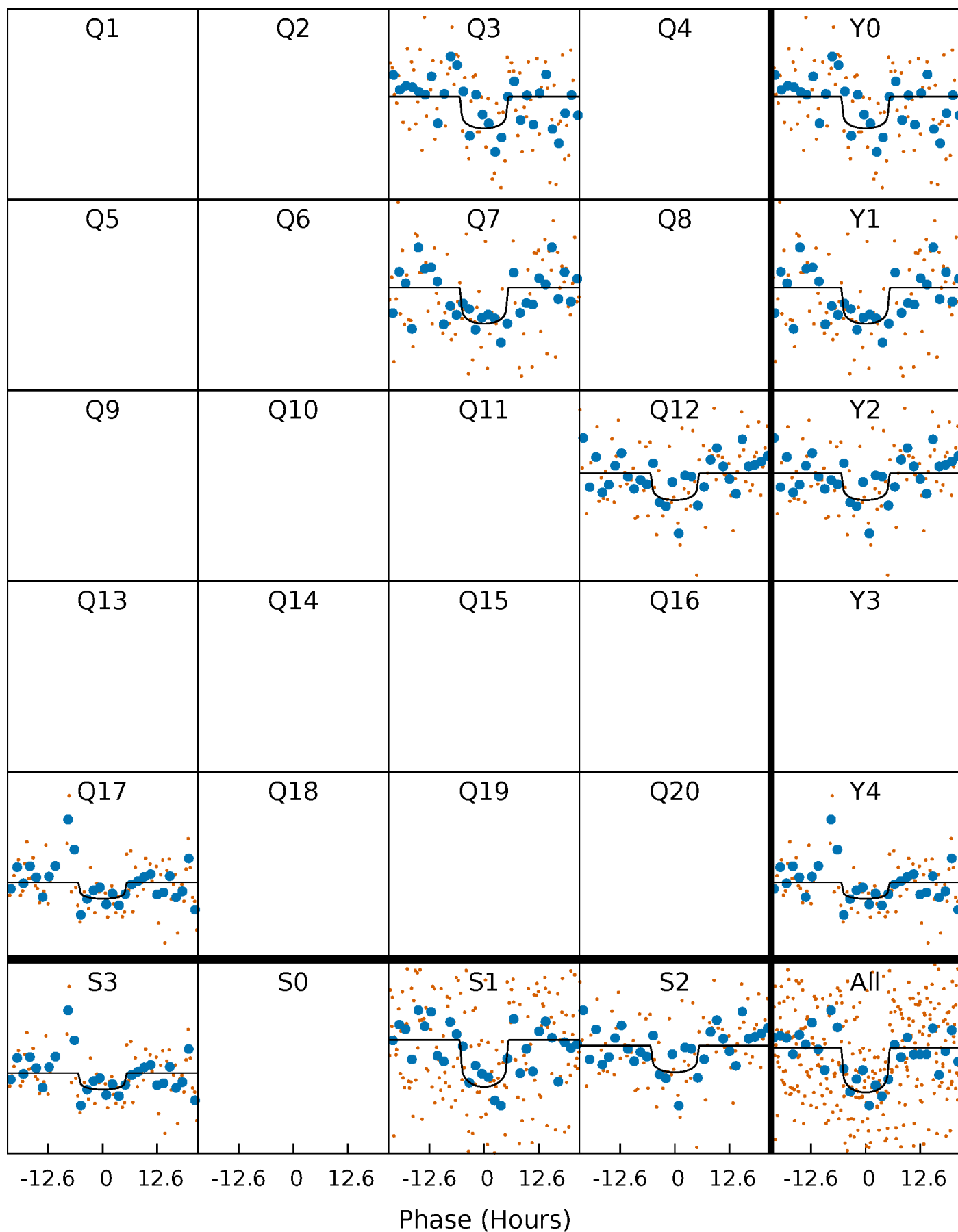
TCE 004446859-01 P=425.655409 Days  $T_0=284.337342$  (BKJD)





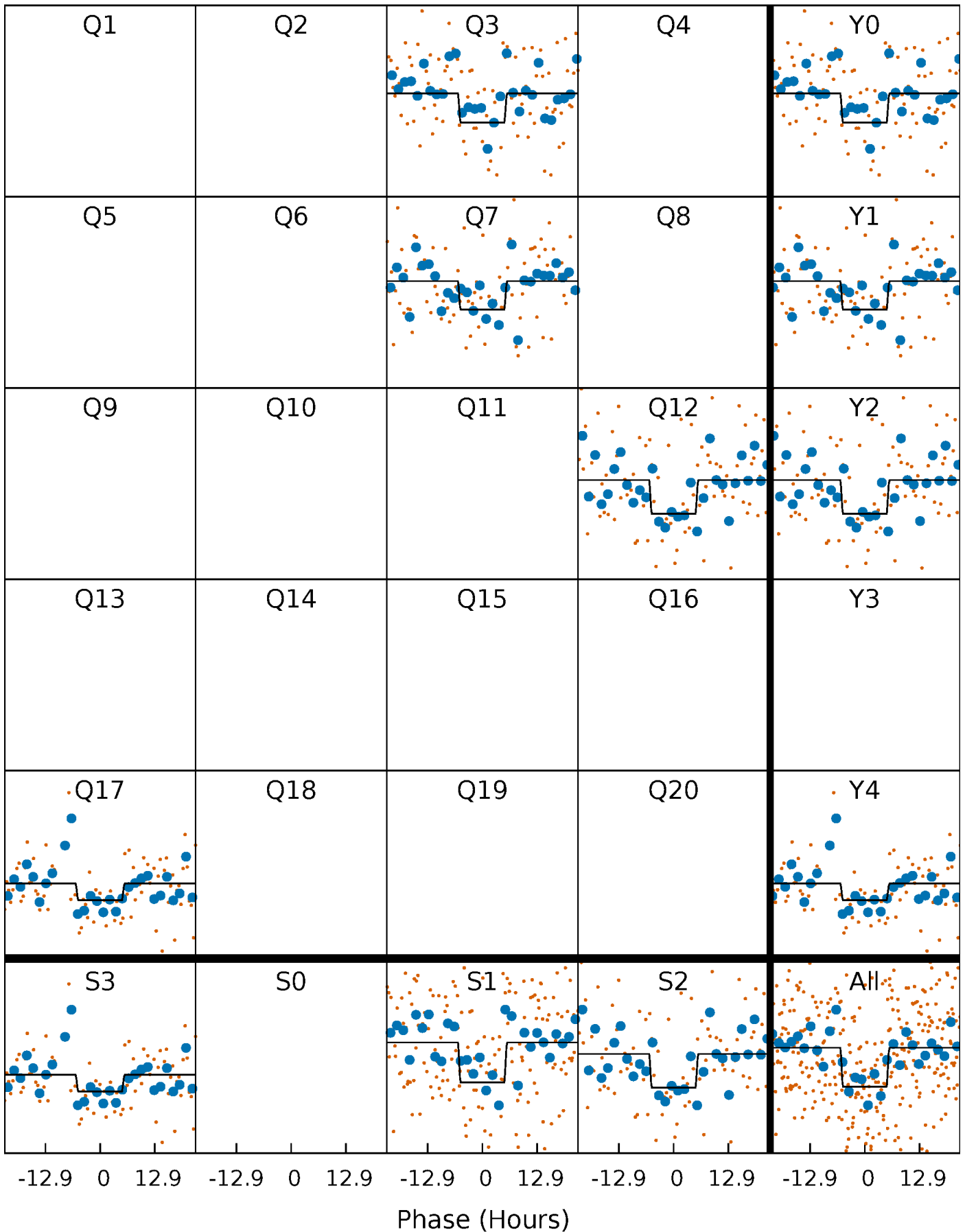
# DV Quarter-Phased Transit Curves

TCE 004446859-01 P=425.655409 Days  $T_0=284.337342$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

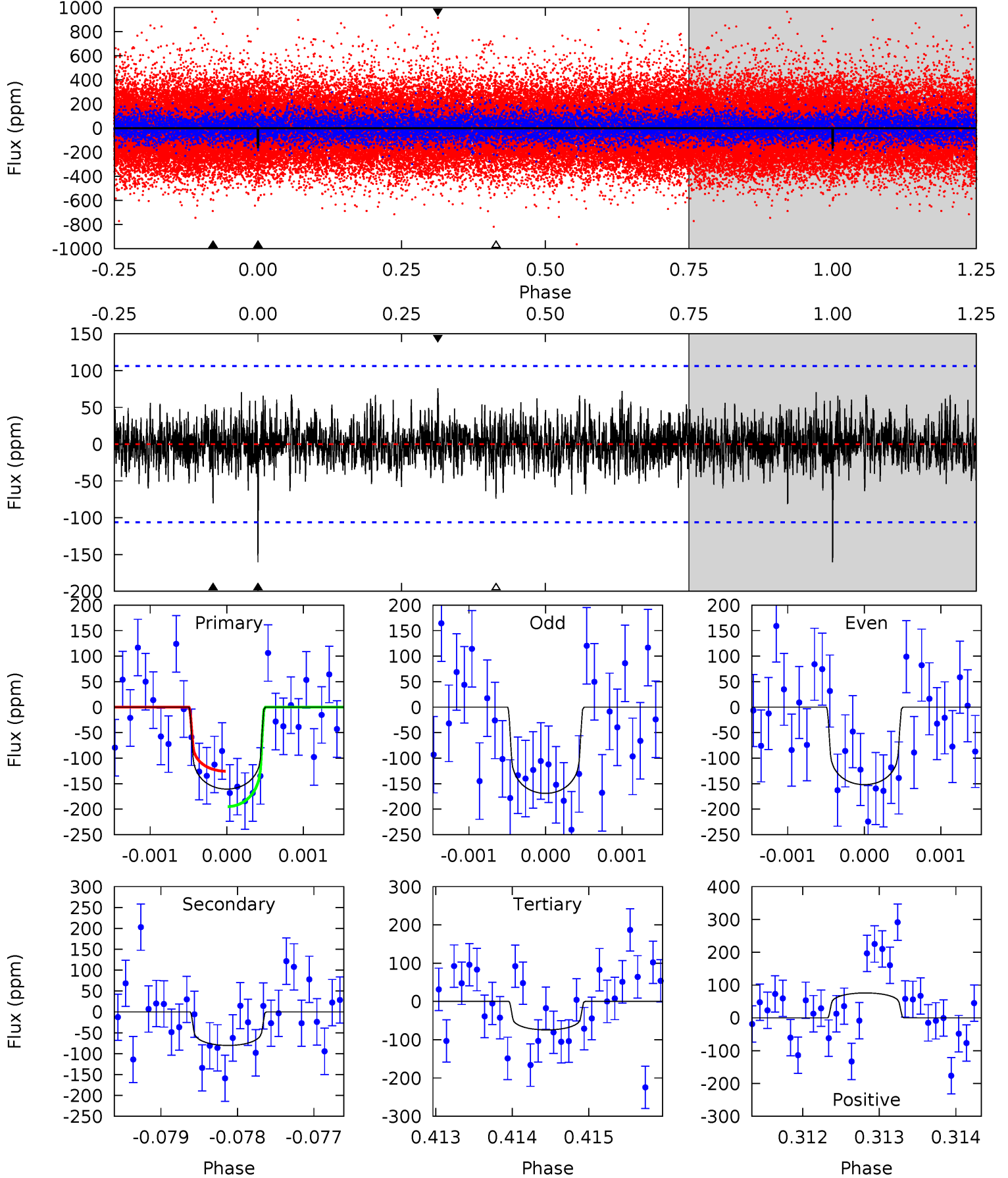
TCE 004446859-01 P=425.644677 Days  $T_0=284.356271$  (BKJD)



# DV Model-Shift Uniqueness Test

004446859-01, P = 425.655409 Days, E = 284.337342 Days

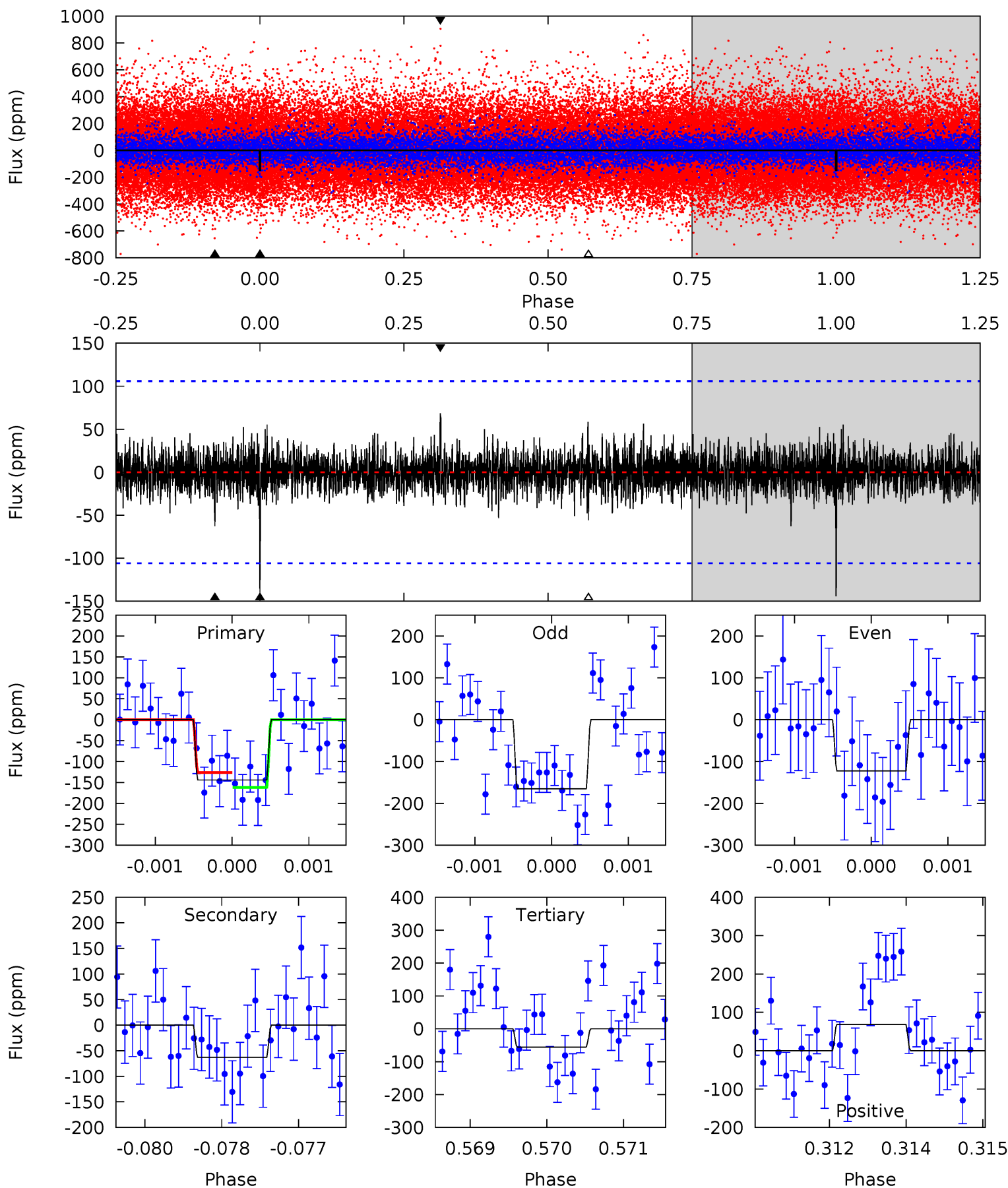
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.22	4.11	3.80	3.88	5.43	3.26	1.06	4.41	4.33	0.31	0.23	0.44	1.02	0.32	1.78



# Alt Model-Shift Uniqueness Test

004446859-01, P = 425.644677 Days, E = 284.356271 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
7.40	3.22	2.85	3.51	5.43	3.26	0.77	4.54	3.89	0.37	-0.29	1.10	1.09	0.32	0.92



### Stellar Parameters For KIC 004446859

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6067^{+182}_{-182}$	$4.253^{+0.220}_{-0.180}$	$-0.360^{+0.300}_{-0.300}$	$1.195^{+0.342}_{-0.279}$	$0.934^{+0.142}_{-0.107}$	$0.770^{+0.921}_{-0.366}$
	+3%/-3%	+5%/-4%	+83%/-83%	+29%/-23%	+15%/-11%	+120%/-48%
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 004446859-01 / KOI 8246.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-80 \pm 20$	$1.61^{+1.11}_{-0.87}$	$392^{+31}_{-30}$	$5151^{+2658}_{-943}$	$19012^{+80383}_{-12496}$
Alt.	$-63 \pm 19$	$1.62^{+1.03}_{-0.87}$	$392^{+30}_{-28}$	$4927^{+2263}_{-931}$	$15551^{+54364}_{-10689}$

$T_{max}$  = 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

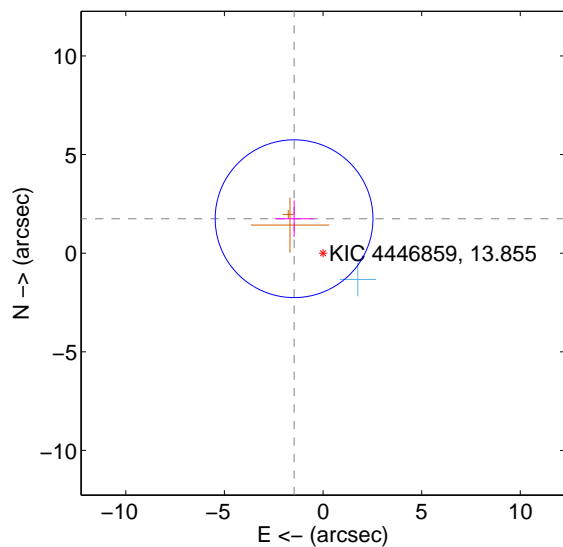
Supplemental centroid analysis for 004446859-01. Kepler magnitude: 13.86. Transit SNR 6.99

There are 1 quarters with good PRF difference image offsets

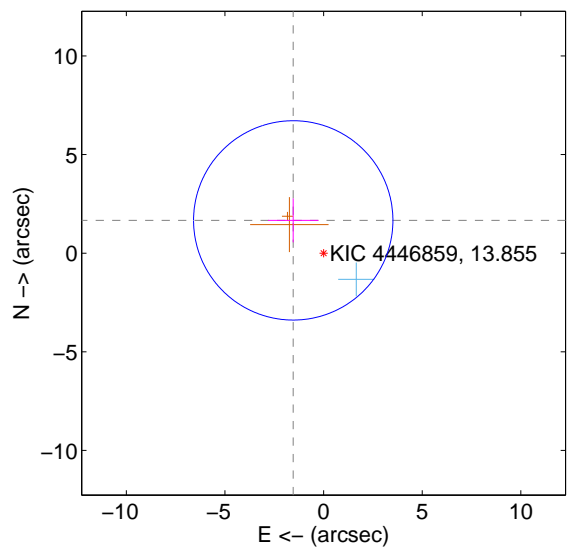
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.282 \pm 1.333$	1.71	$1.468 \pm 0.980$	$1.747 \pm 0.923$
PRF-fit source offset from KIC position	$2.264 \pm 1.684$	1.34	$1.538 \pm 1.281$	$1.662 \pm 1.115$
photometric centroid source offset	$2.55 \pm 2.56$	1.00	$0.62 \pm 2.34$	$2.47 \pm 2.57$

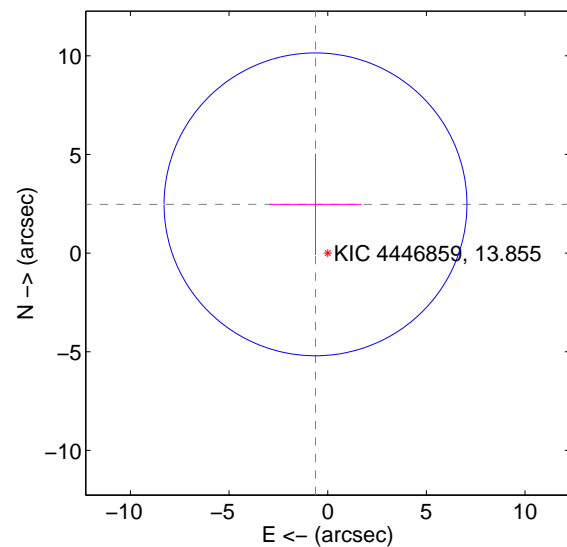
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

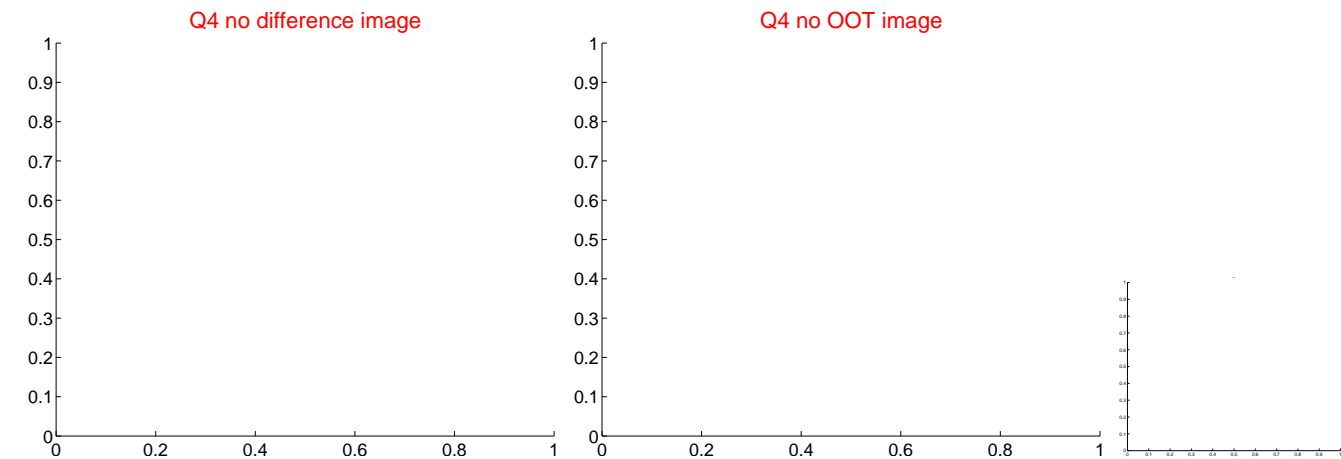
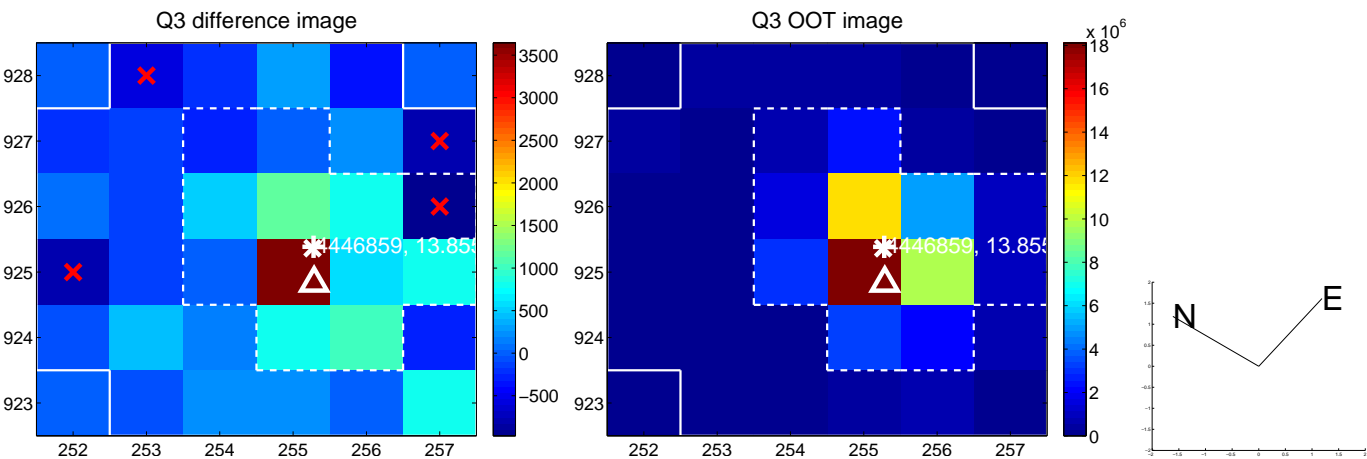


offset from photometric centroids



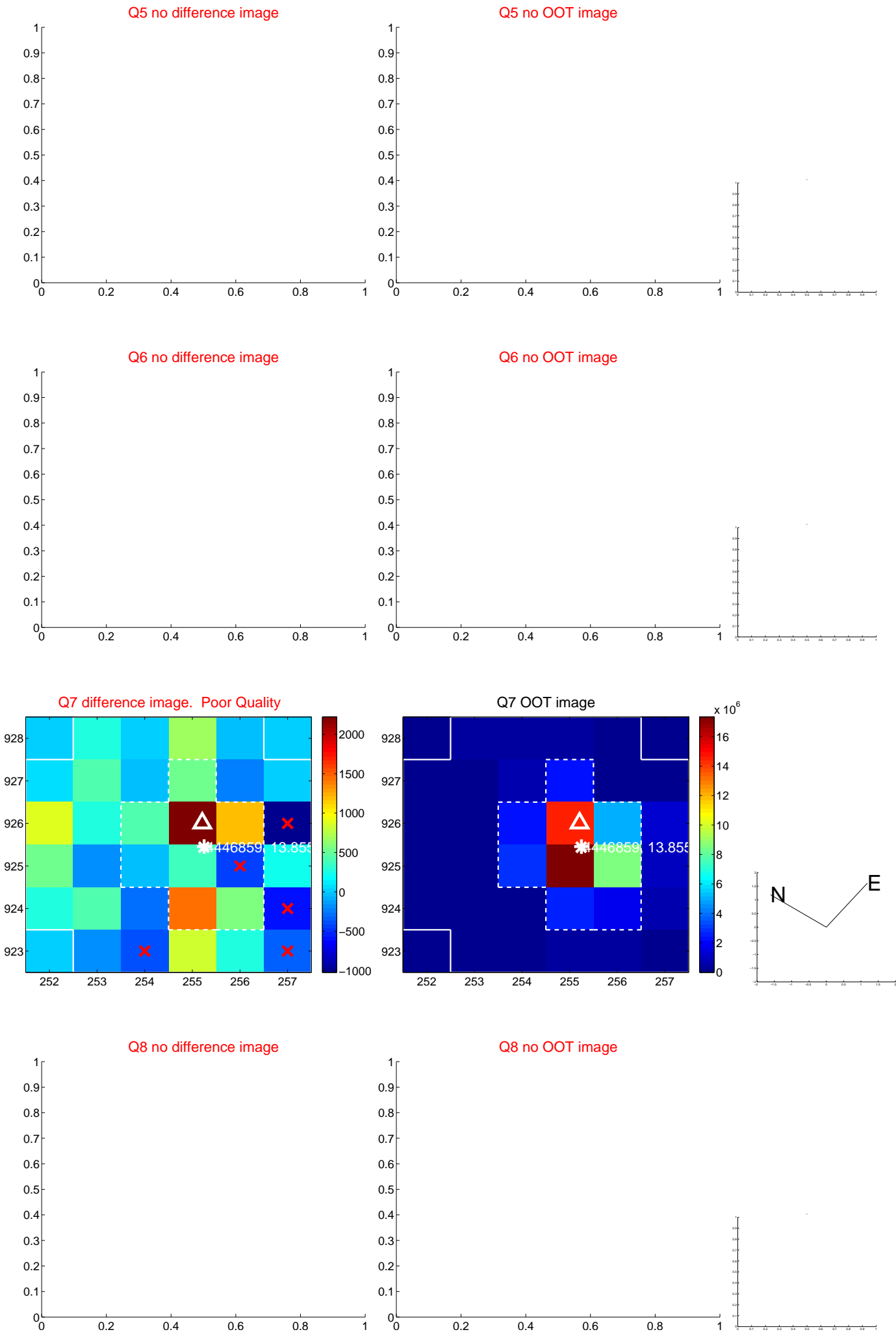
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

Q9 no difference image



Q9 no OOT image



Q10 no difference image



Q10 no OOT image



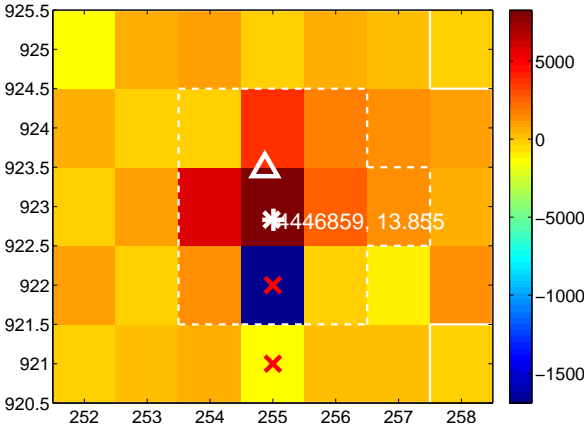
Q11 no difference image



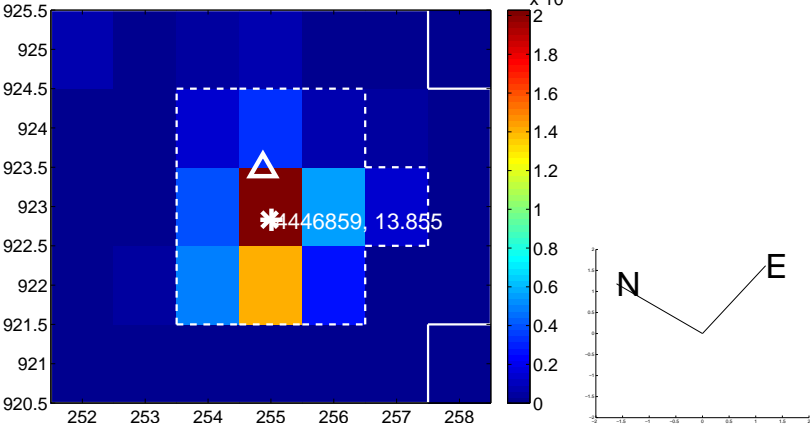
Q11 no OOT image



Q12 difference image. Poor Quality



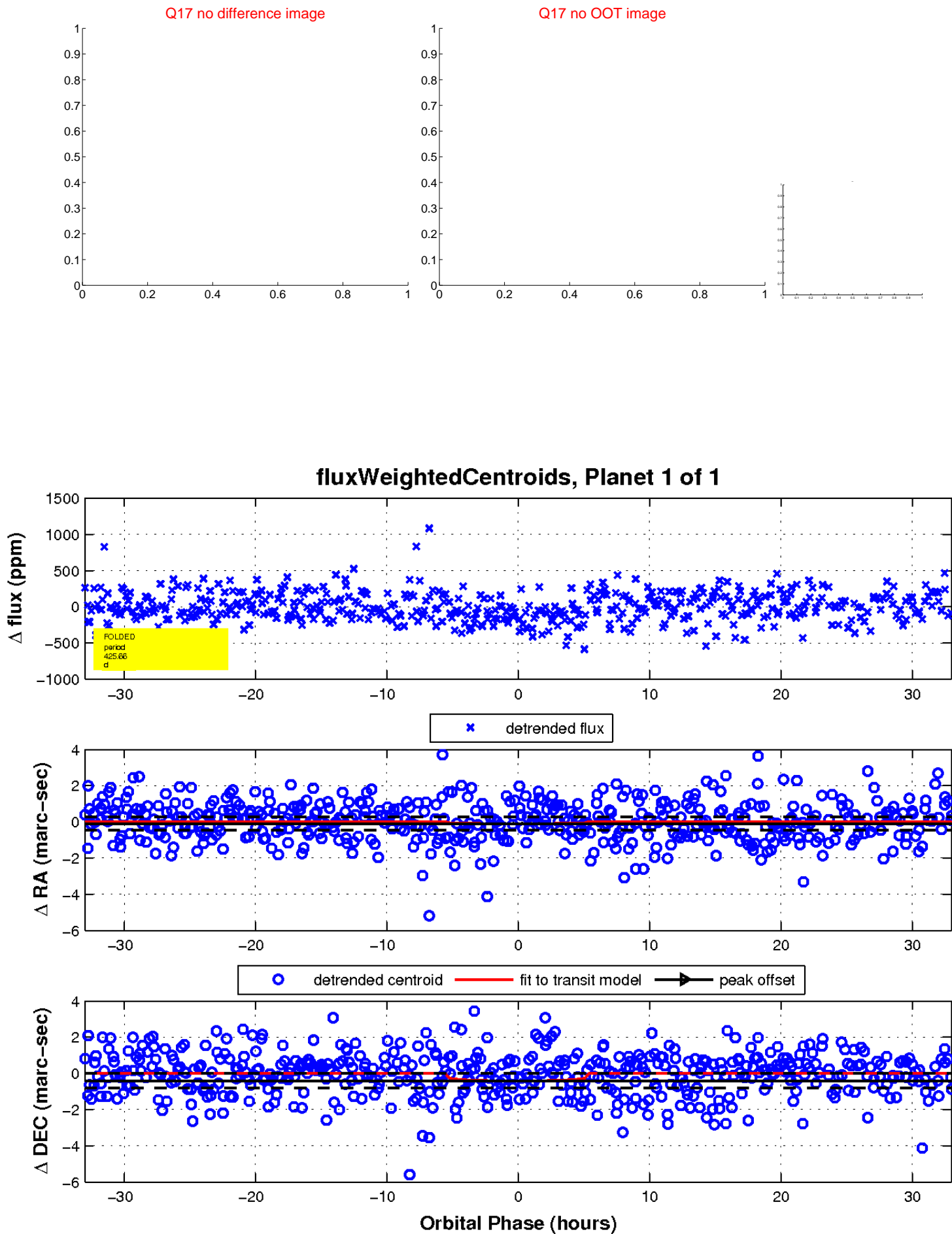
Q12 OOT image



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

