

# KIC 004473226

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004473226-01	OBS	2229.01	14.833434	135.443311	802.5	4.441	15.2	16.6	0.90	5570	3.14	54.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004473226-01	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.

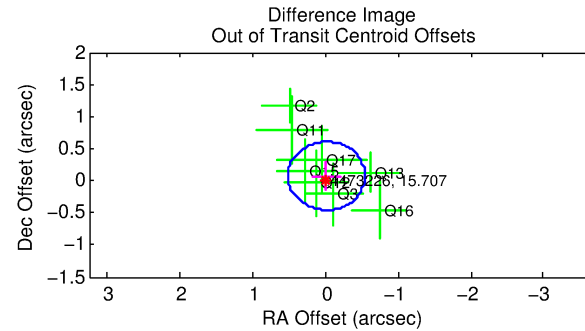
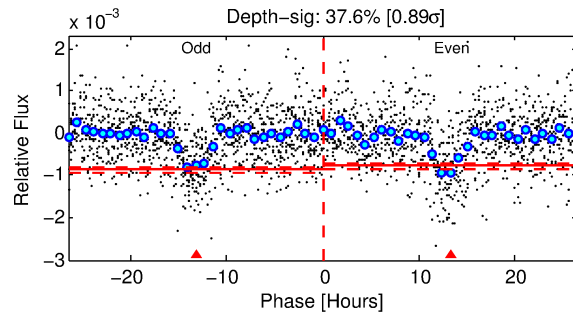
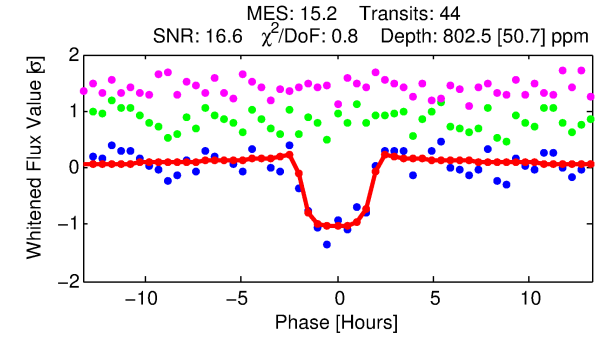
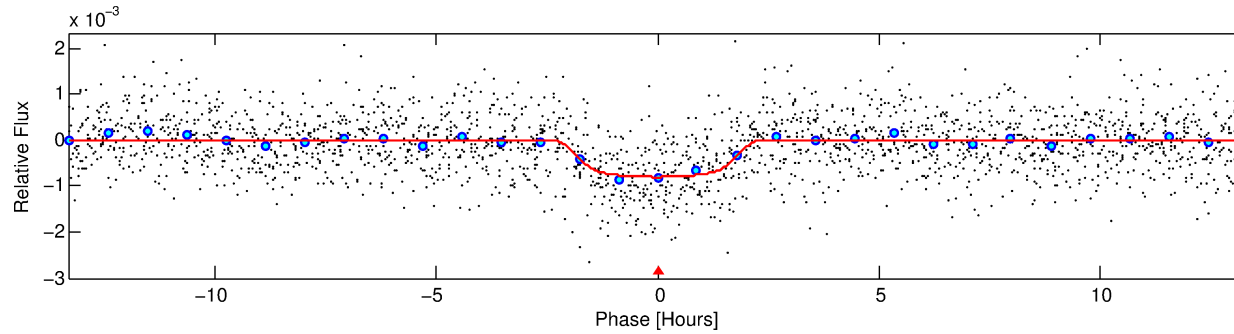
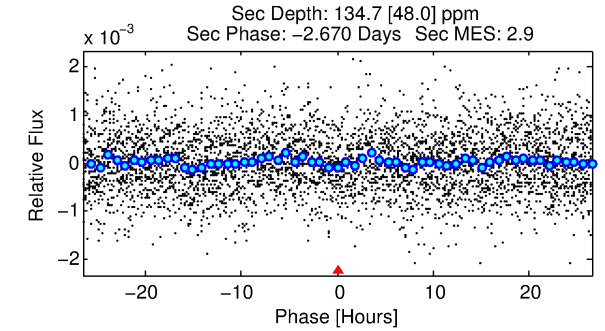
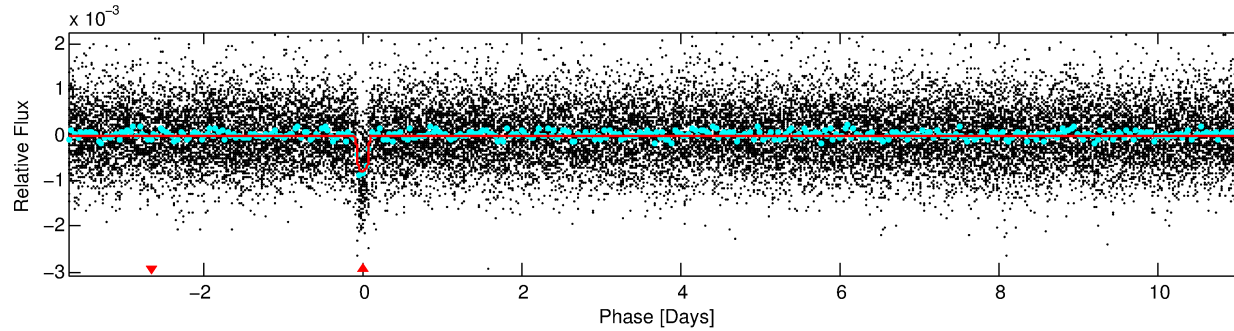
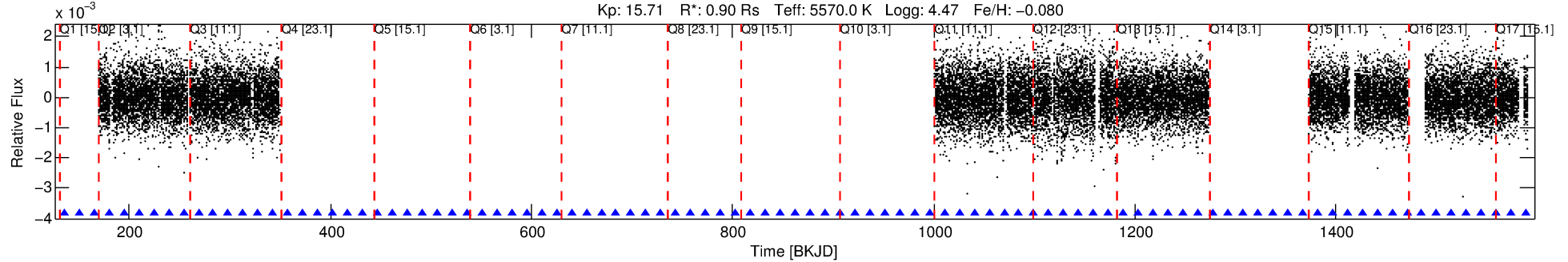
## Ephemeris Match Information For 004473226-01

No Significant Match Found

# DV One-Page Summary

KIC: 4473226 Candidate: 1 of 1 Period: 14.833 d  
KOI: K02229.01 Corr: 0.990

Kp: 15.71 R\*: 0.90 Rs Teff: 5570.0 K Logg: 4.47 Fe/H: -0.080



## DV Fit Results:

Period = 14.83343 [0.00008] d  
Epoch = 135.4433 [0.0050] BKJD  
Rp/R\* = 0.0318 [0.0022]  
a/R\* = 11.92 [2.99]  
b = 0.92 [0.04]  
Seff = 54.88 [9.79]  
Teq = 694 [31] K  
Rp = 3.14 [0.44] Re  
a = 0.1133 [0.0124] AU  
Ag = 96.76 [40.40] [2.37σ]  
Teffp = 3365 [325] K [8.17σ]

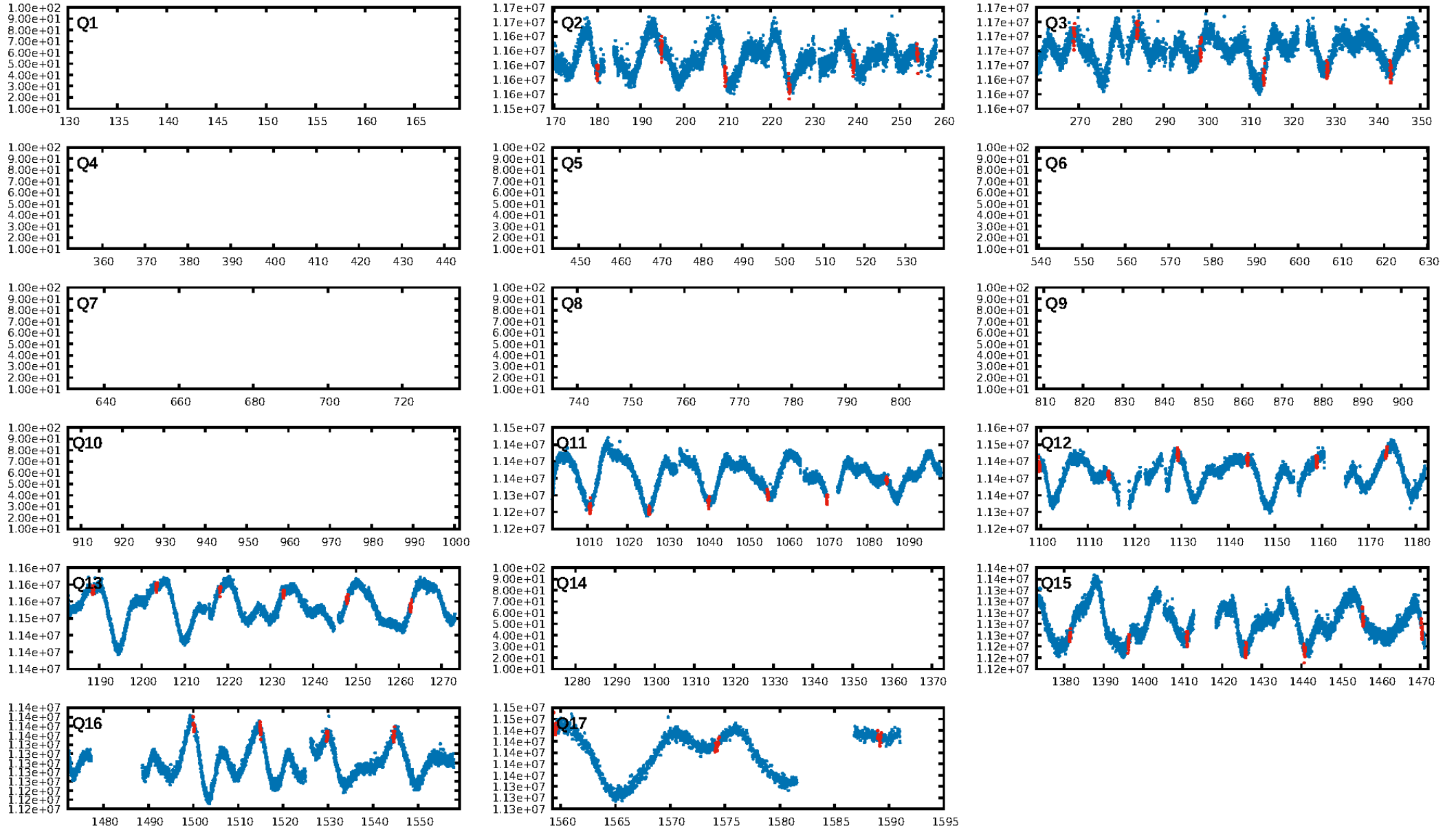
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 90.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.44e-48  
RollingBand-fgt: 1.00 [41/41]  
GhostDiagnostic-chr: 3.845  
Centroid-sig: 10.5%  
Centroid-so: 0.955 arcsec [1.30σ]  
OotOffset-rm: 0.076 arcsec [0.43σ]  
OotOffset-st: 1/3/2/2 [8]  
KicOffset-rm: 0.117 arcsec [0.56σ]  
KicOffset-st: 1/3/2/2 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

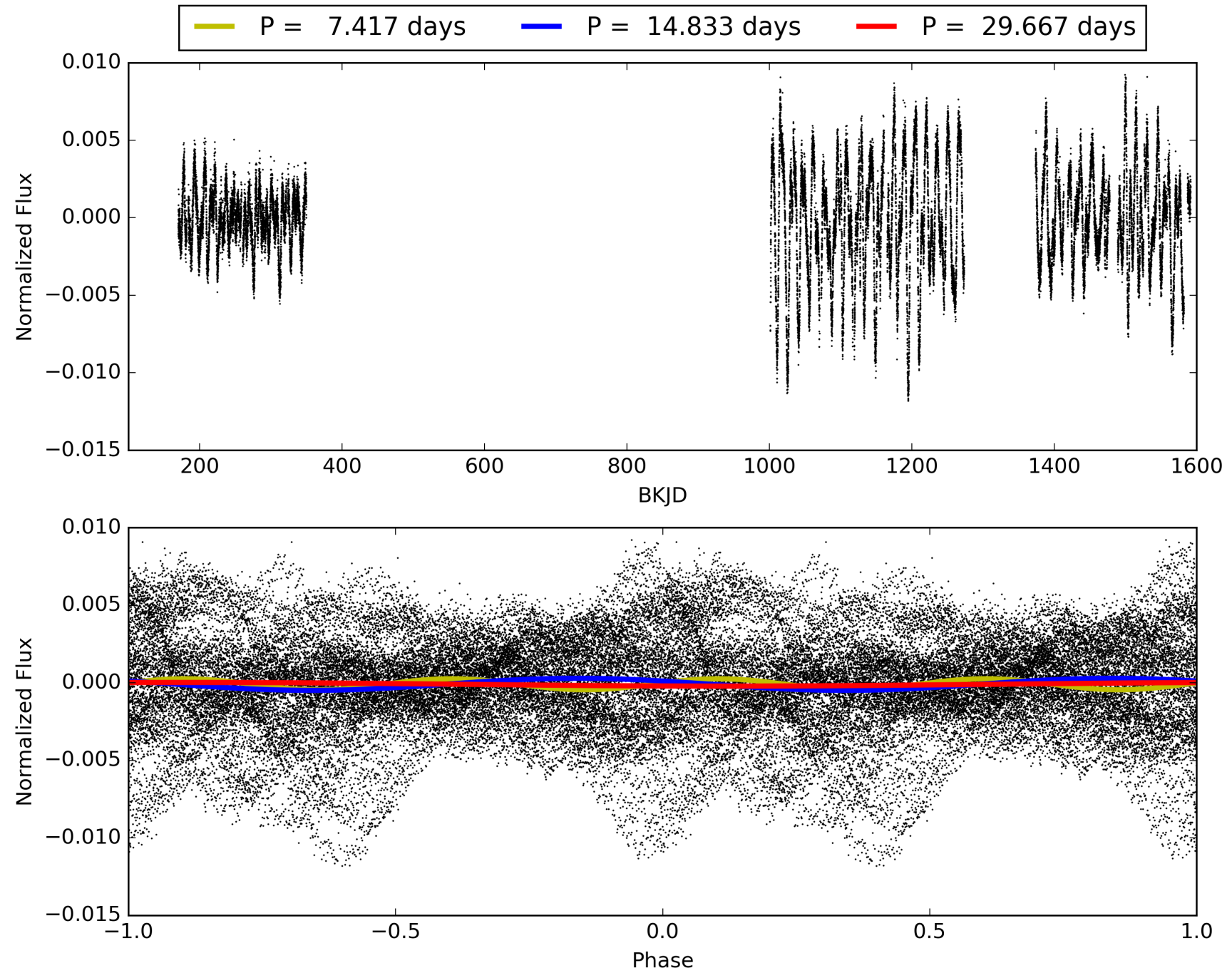
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:10:14 Z

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

# TCE 004473226-01, PDC Light Curves

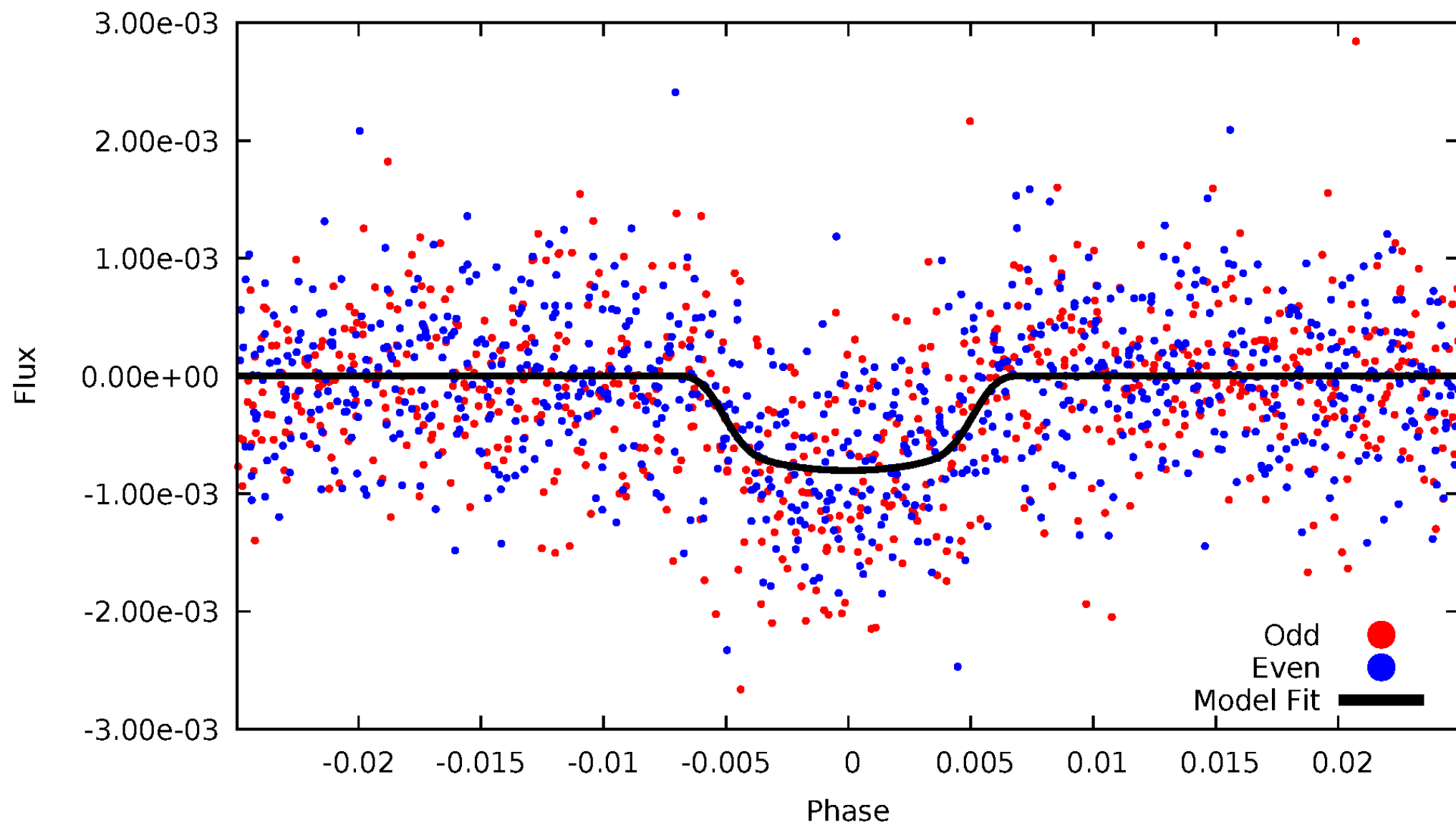


TCE 004473226-01



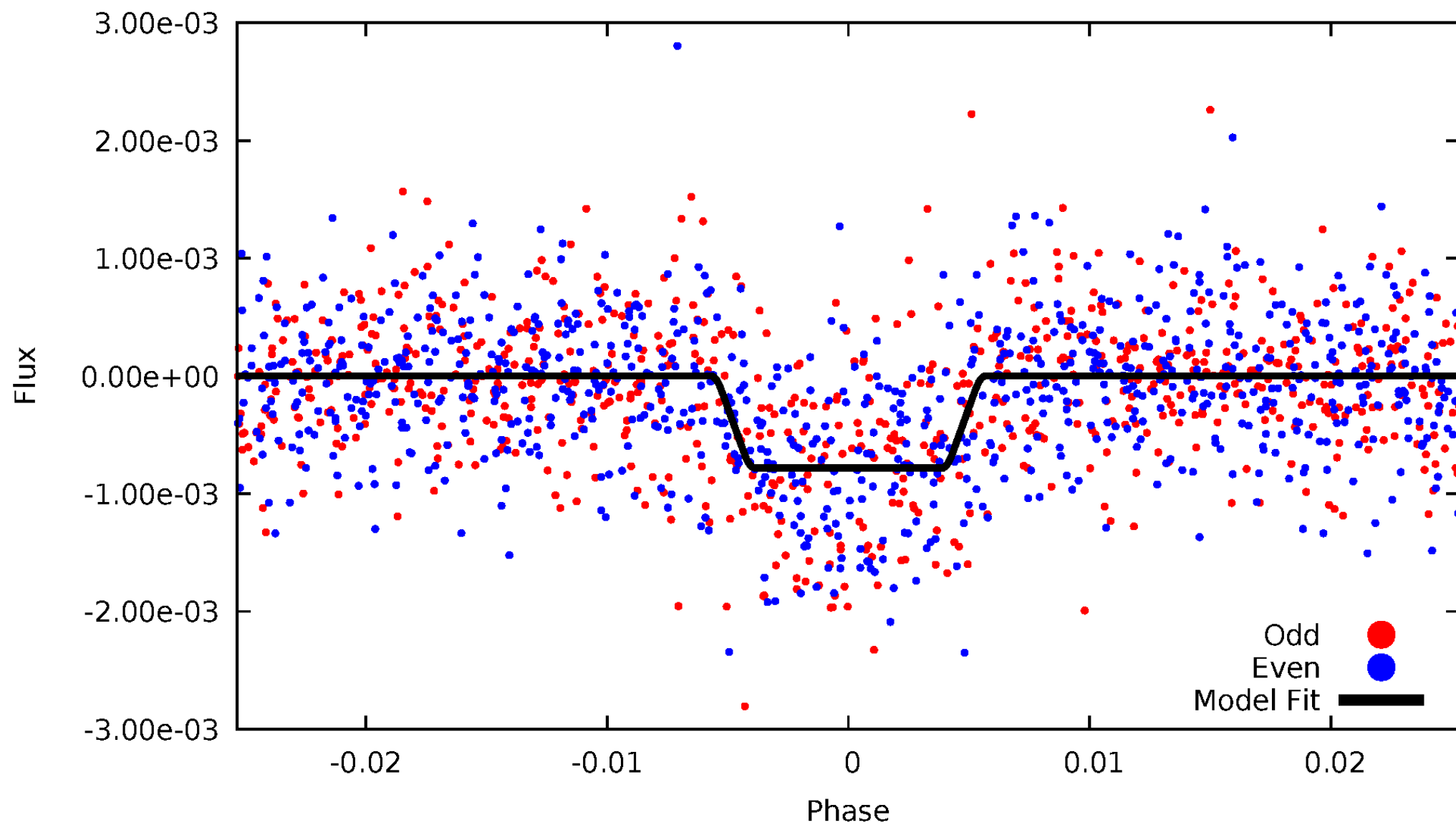
# DV Odd/Even

TCE 004473226-01



# ALT Odd/Even

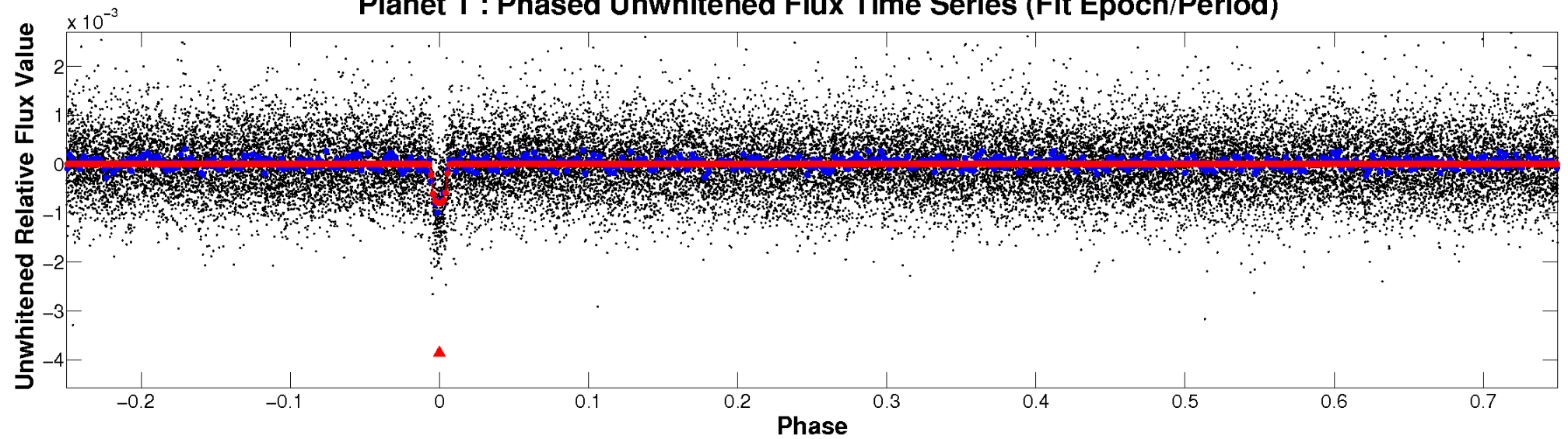
TCE 004473226-01



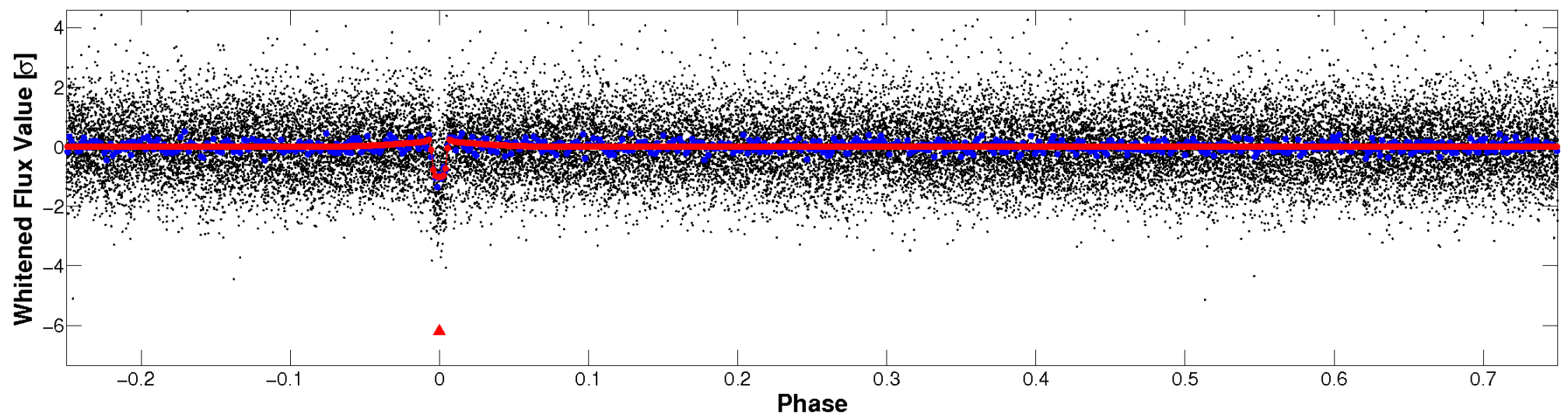


# Non-Whitened Vs. Whitened Light Curve

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

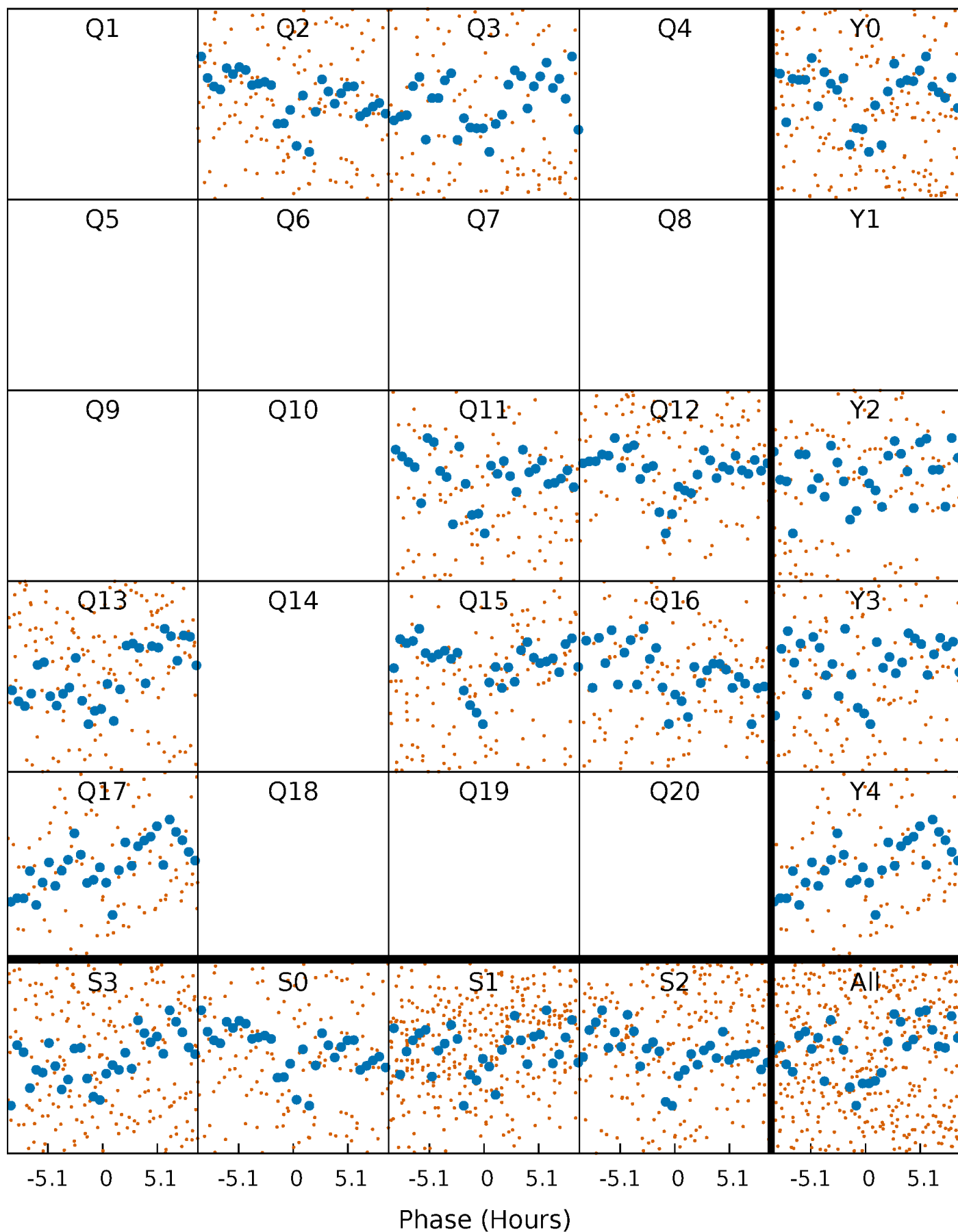


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

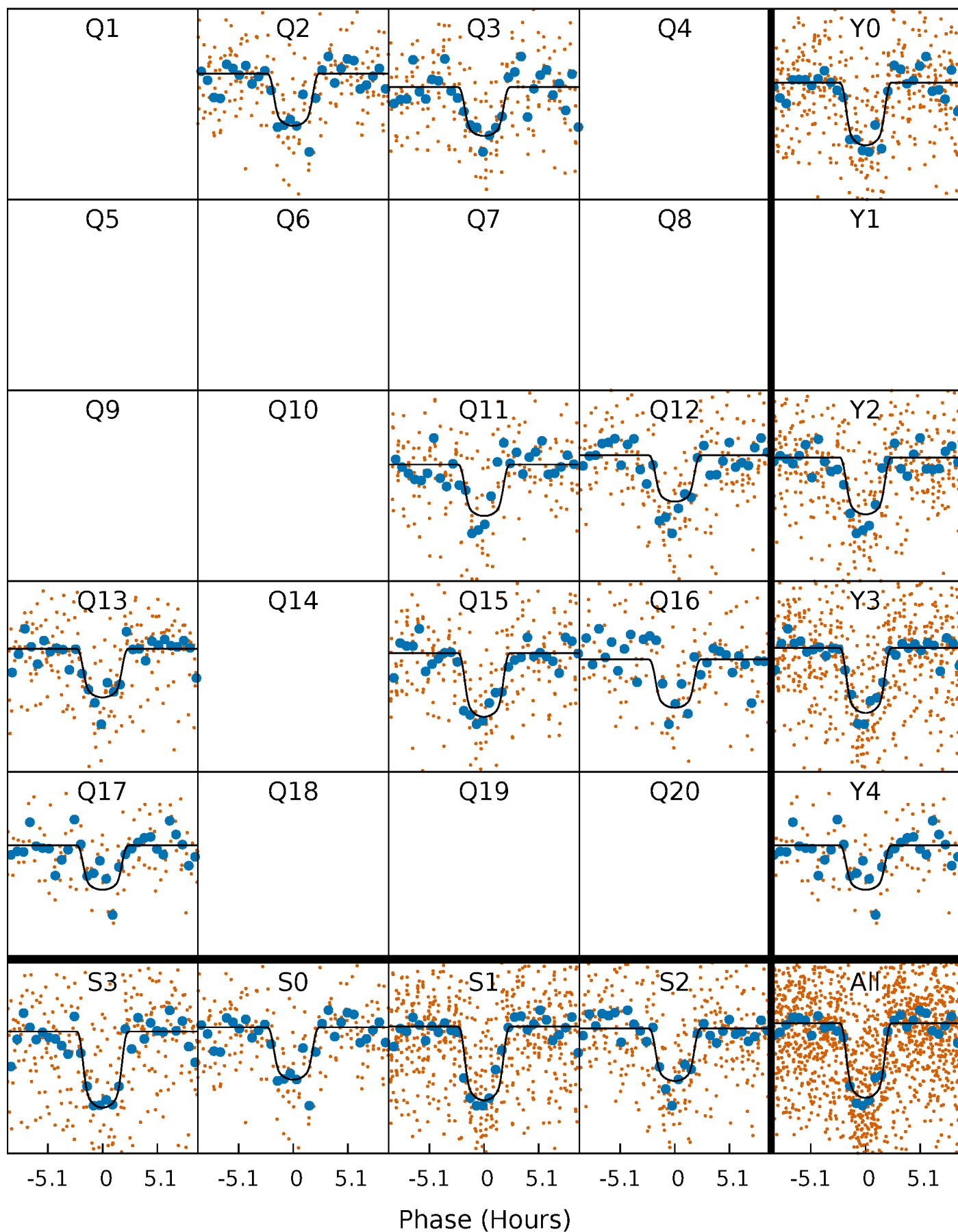
TCE 004473226-01 P= 14.833434 Days  $T_0=135.443311$  (BKJD)





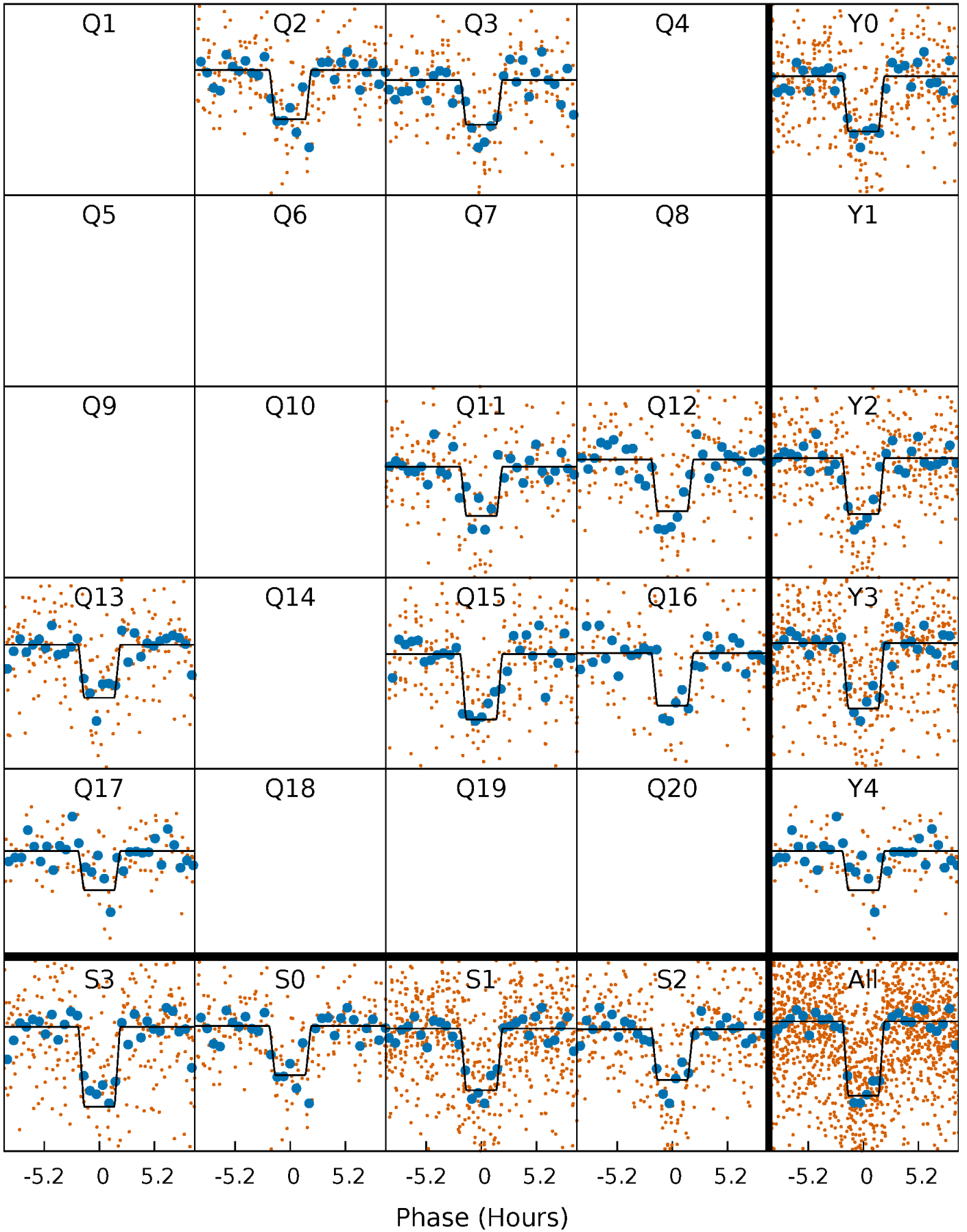
# DV Quarter-Phased Transit Curves

TCE 004473226-01   P= 14.833434 Days    $T_0=135.443311$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

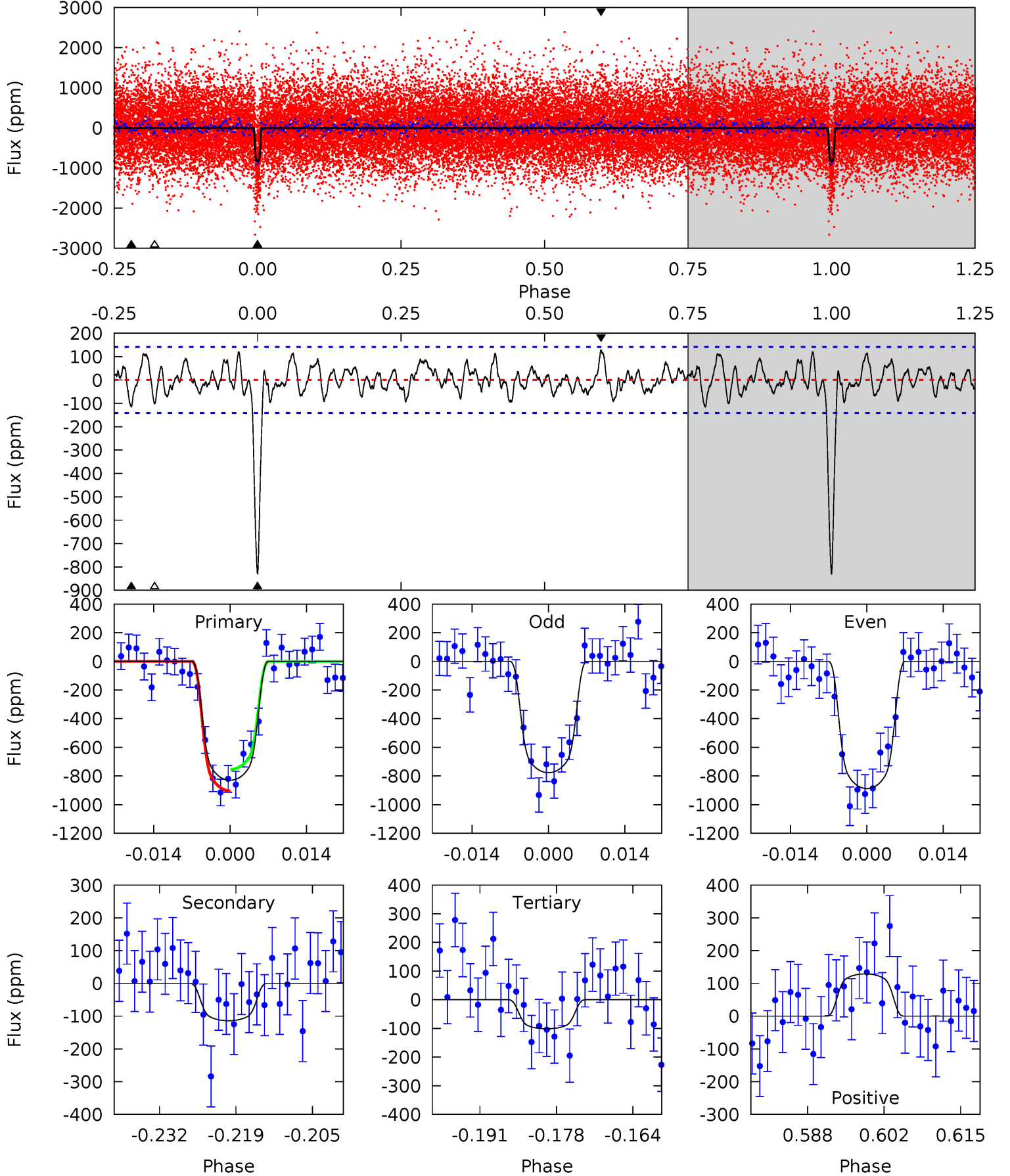
TCE 004473226-01   P= 14.833497 Days    $T_0=135.437574$  (BKJD)



# DV Model-Shift Uniqueness Test

004473226-01,  $P = 14.833434$  Days,  $E = 135.443311$  Days

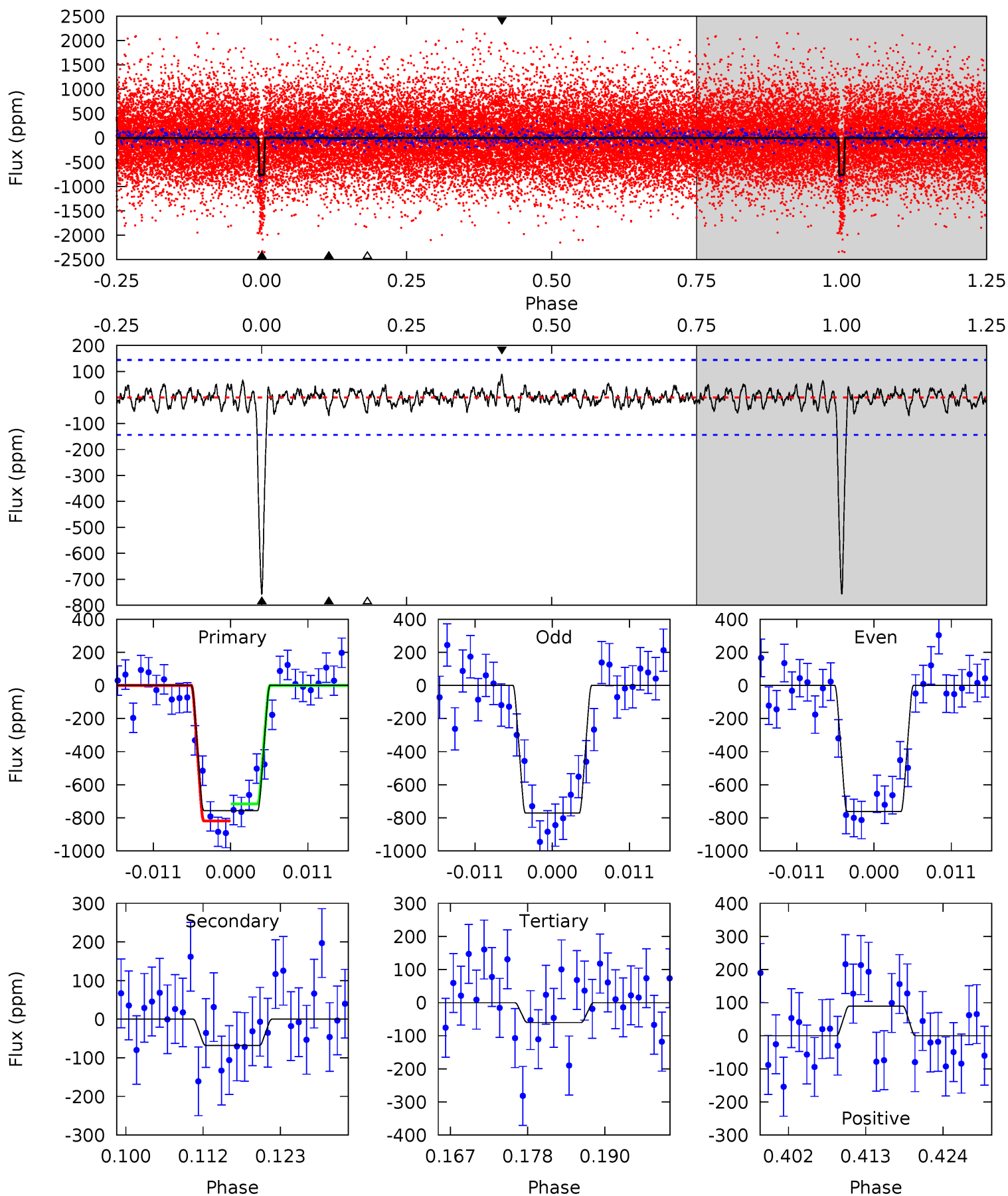
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.2	4.01	3.57	4.54	4.97	2.47	1.58	25.6	24.7	0.45	-0.53	1.96	0.99	0.13	2.64



# Alt Model-Shift Uniqueness Test

004473226-01, P = 14.833497 Days, E = 135.437574 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
26.3	2.37	2.09	3.11	5.01	2.54	0.82	24.2	23.2	0.29	-0.73	0.17	0.99	0.11	1.79



### Stellar Parameters For KIC 004473226

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5570^{+74}_{-83}$	$4.471^{+0.064}_{-0.096}$	$-0.080^{+0.150}_{-0.150}$	$0.904^{+0.110}_{-0.064}$	$0.882^{+0.055}_{-0.050}$	$1.680^{+0.470}_{-0.470}$
	+1%/-1%	+1%/-2%	+188%/-188%	+12%/-7%	+6%/-6%	+28%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 004473226-01 / KOI 2229.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-114 \pm 28$	$3.16^{+0.31}_{-0.29}$	$973^{+32}_{-28}$	$3637^{+173}_{-185}$	$79^{+27}_{-23}$
Alt.	$-68 \pm 29$	$2.77^{+0.27}_{-0.26}$	$970^{+36}_{-27}$	$3506^{+233}_{-292}$	$63^{+32}_{-27}$

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

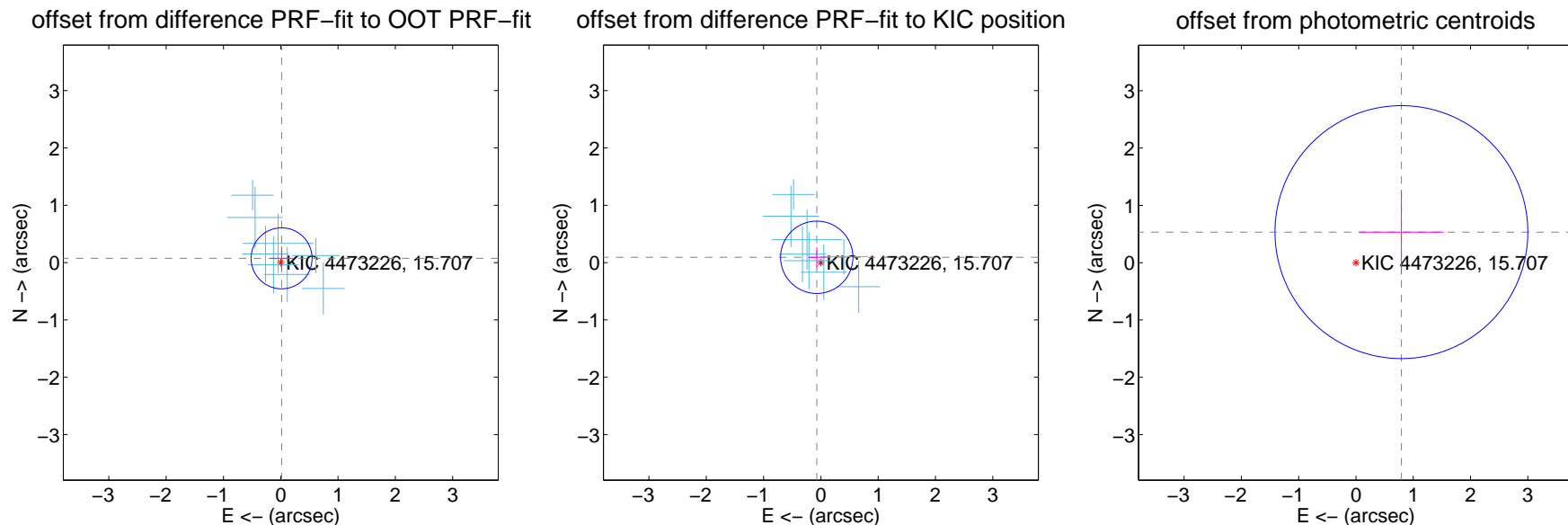
## DV Centroid Data

Supplemental centroid analysis for 004473226-01. Kepler magnitude: 15.71. Transit SNR 16.62

There are 8 quarters with good PRF difference image offsets

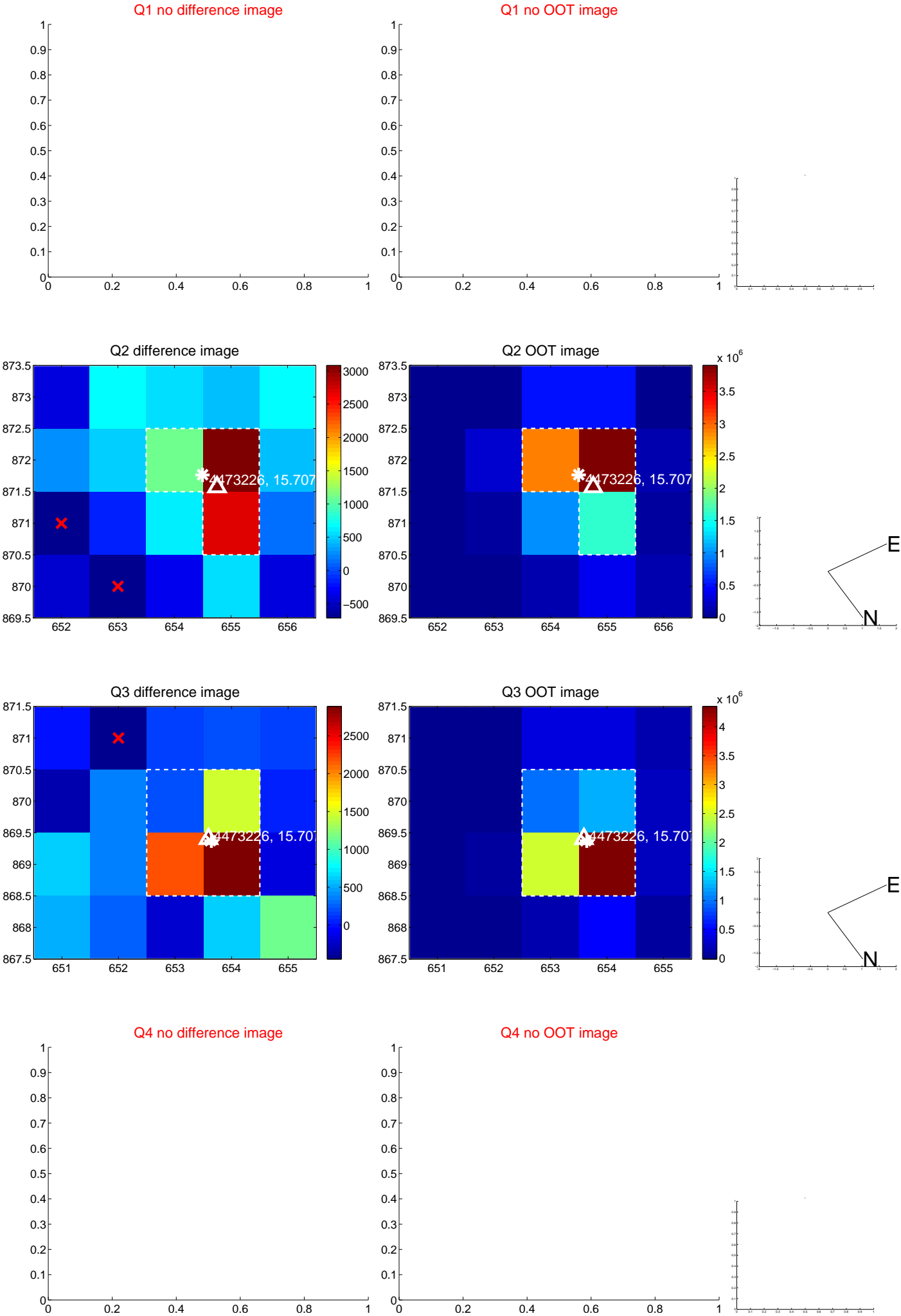
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.076 \pm 0.177$	0.43	$-0.015 \pm 0.201$	$0.074 \pm 0.209$
PRF-fit source offset from KIC position	$0.117 \pm 0.210$	0.56	$0.072 \pm 0.148$	$0.092 \pm 0.175$
photometric centroid source offset	$0.96 \pm 0.74$	1.30	$-0.79 \pm 0.74$	$0.53 \pm 0.74$



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.

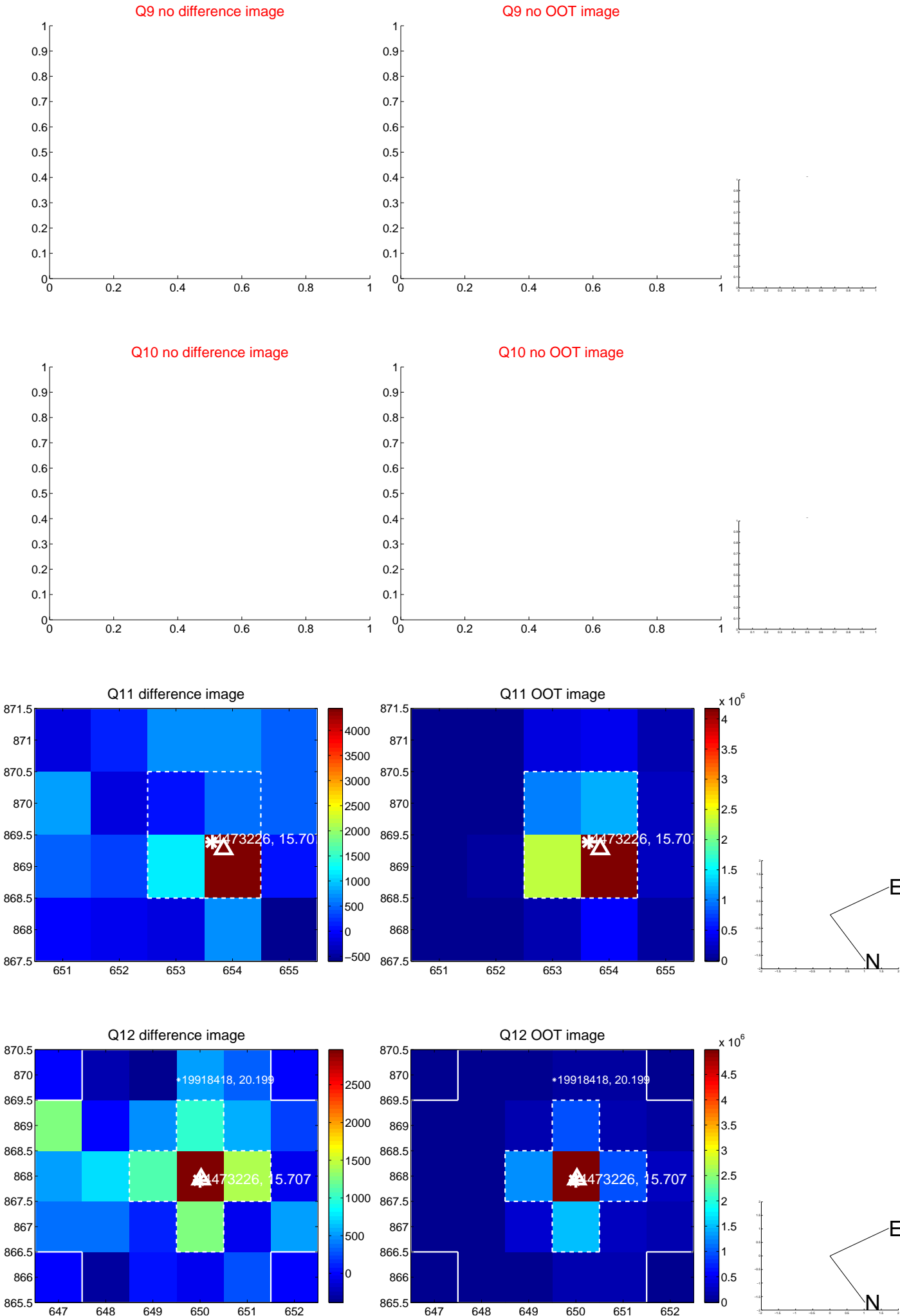




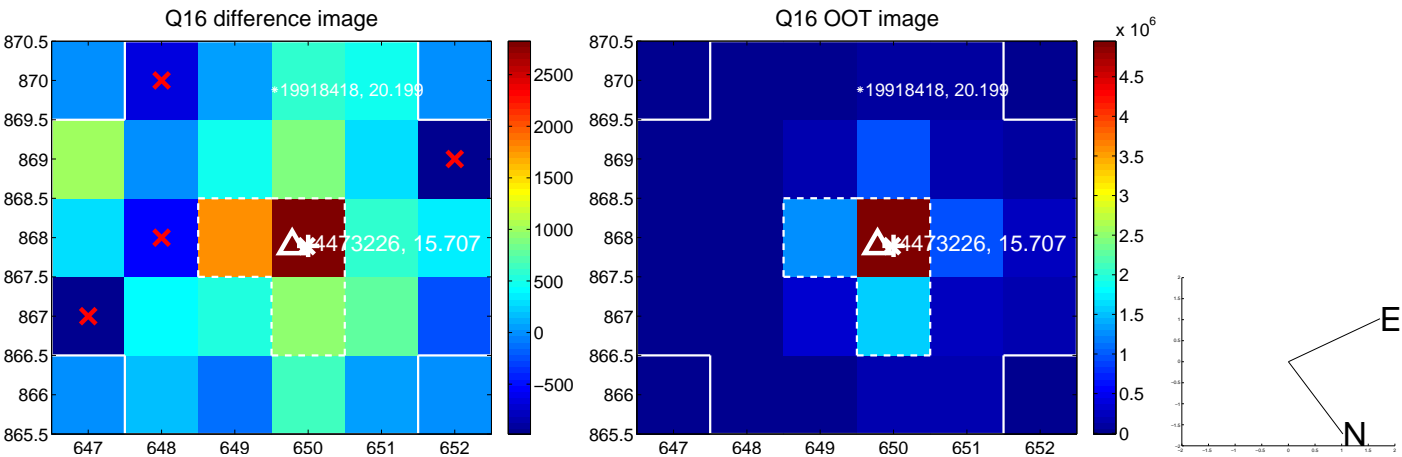
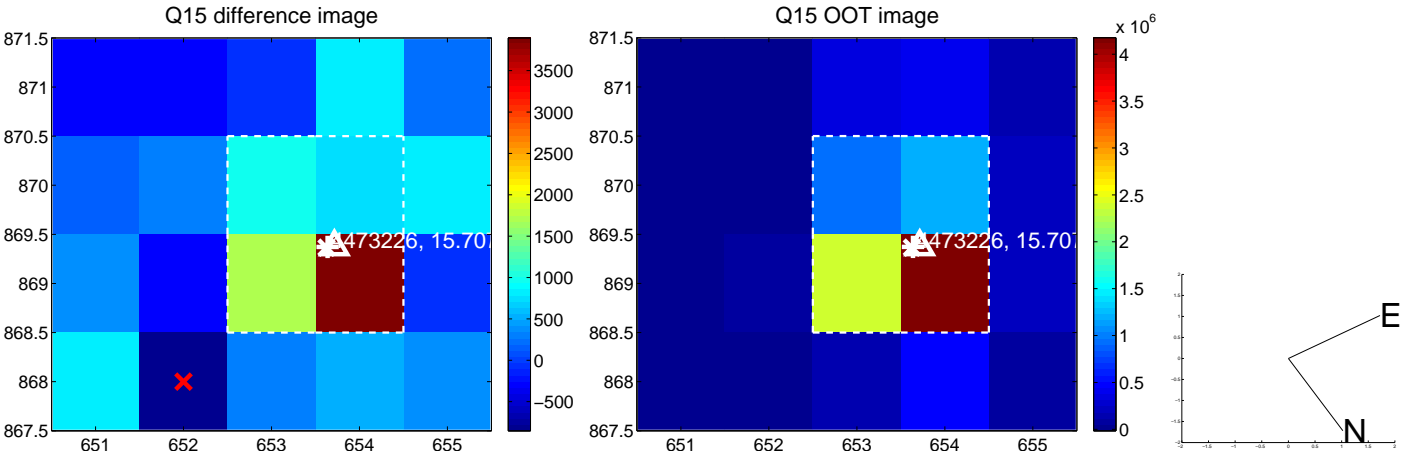
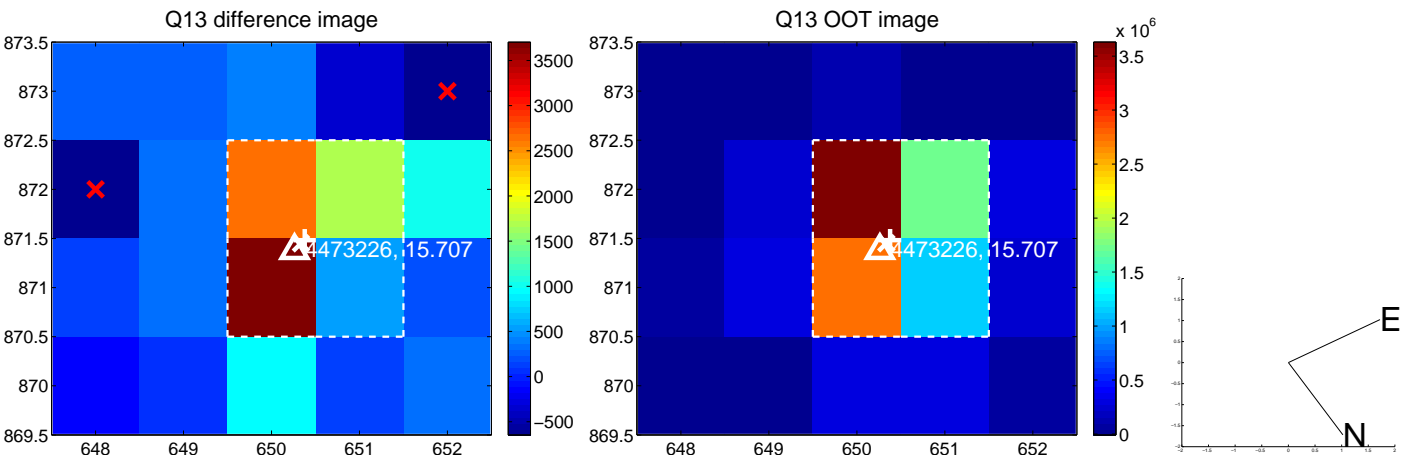
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



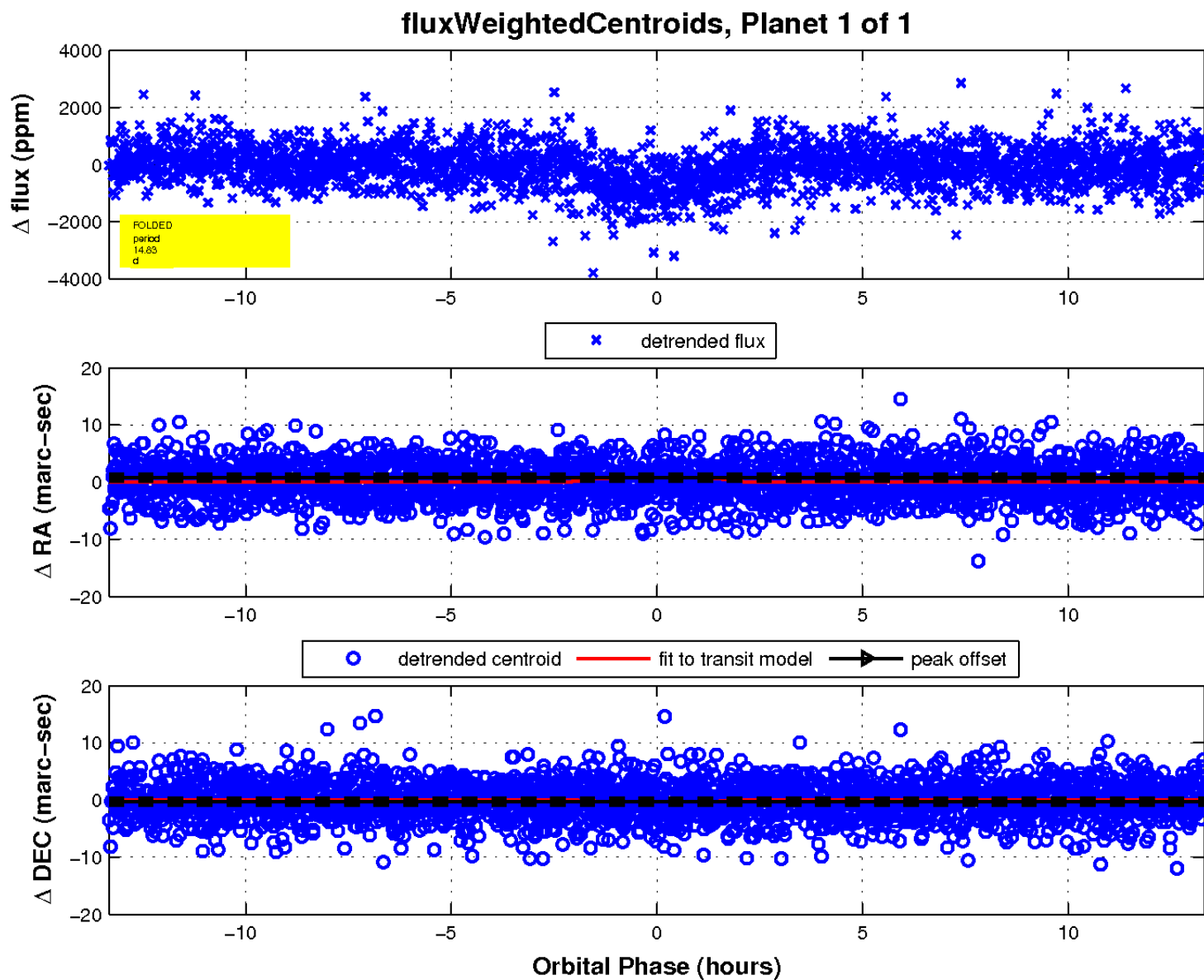
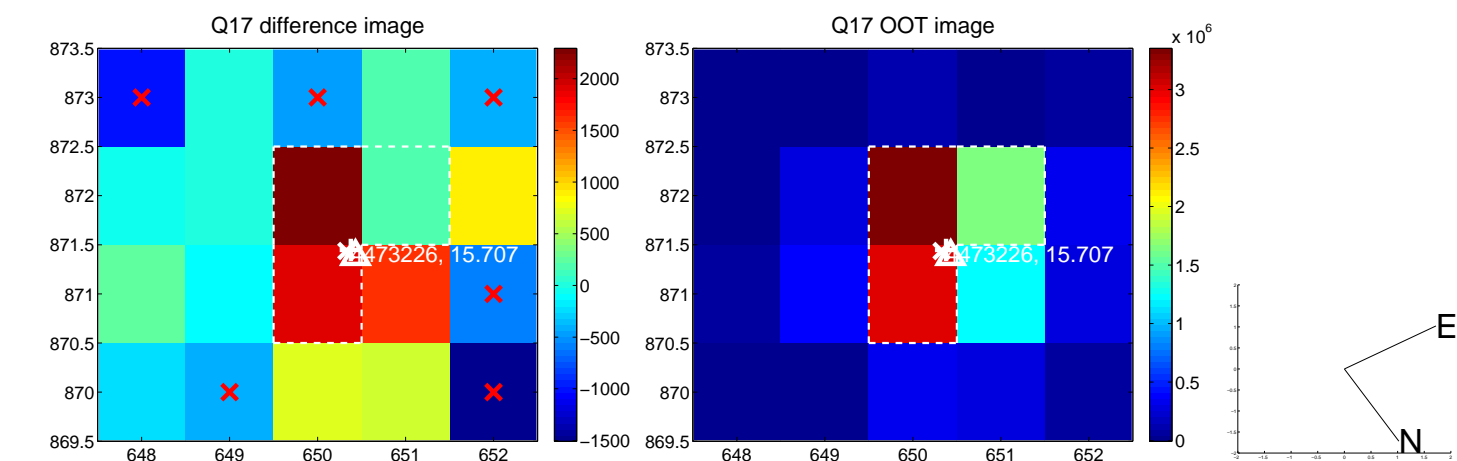
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



# UKIRT Image

Declination

