

# KIC 010015937

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010015937-01	OBS	1720.01	59.658312	168.087721	1052.0	5.428	18.5	20.7	0.83	5243	3.50	5.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010015937-01	OBS	PC	1.00	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 010015937-01

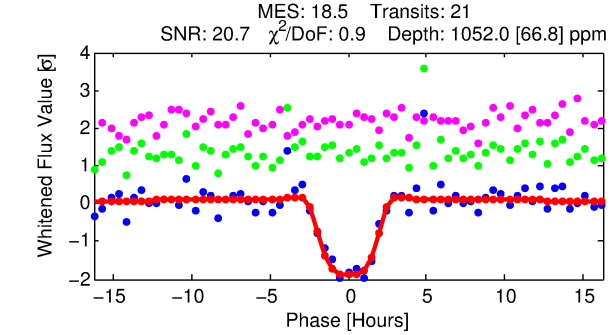
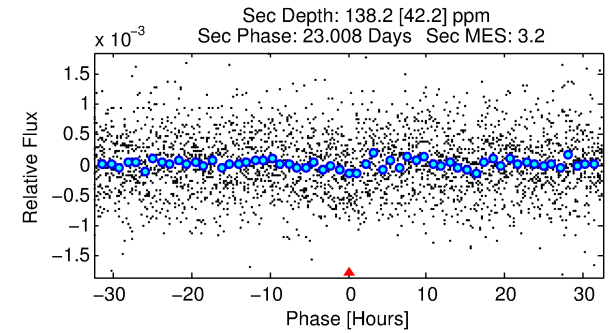
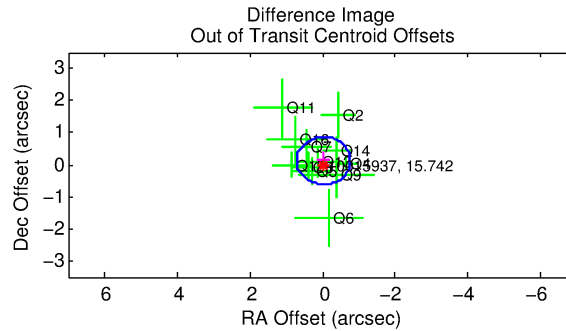
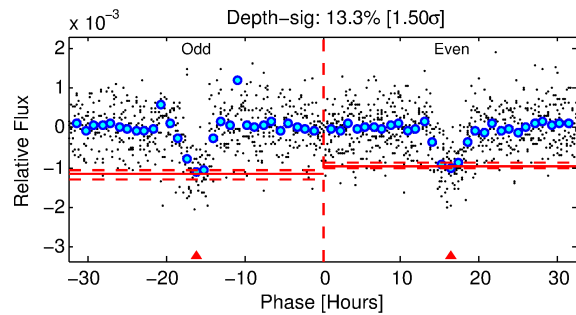
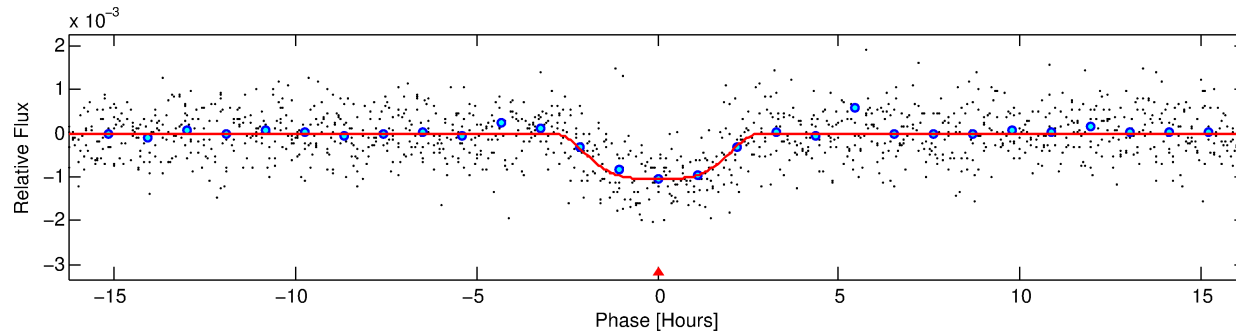
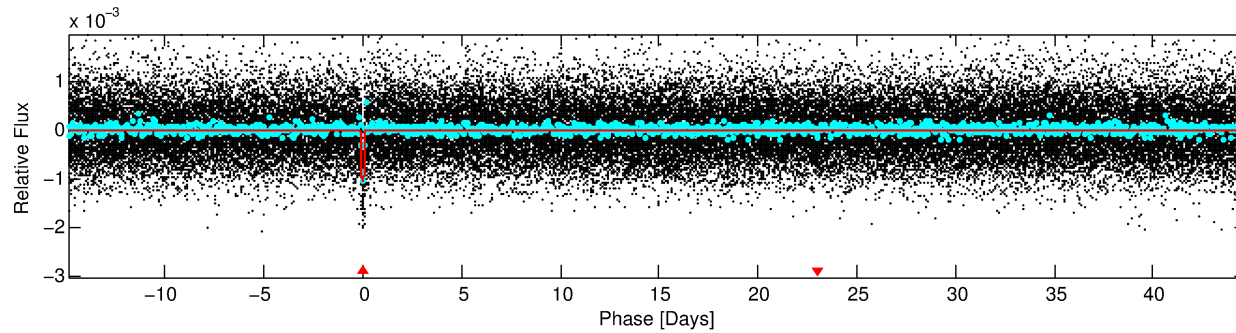
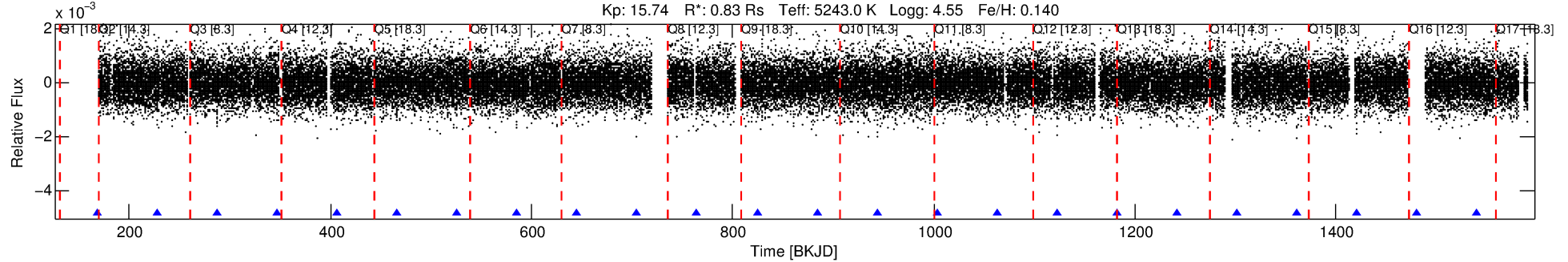
No Significant Match Found

# DV One-Page Summary

KIC: 10015937 Candidate: 1 of 1 Period: 59.658 d

KOI: K01720.01 Corr: 0.962

Kp: 15.74 R\*: 0.83 Rs Teff: 5243.0 K Logg: 4.55 Fe/H: 0.140



## DV Fit Results:

Period = 59.65831 [0.00050] d  
Epoch = 168.0877 [0.0064] BKJD  
Rp/R\* = 0.0387 [0.0022]  
a/R\* = 35.95 [5.05]  
b = 0.95 [0.02]  
Seff = 5.67 [0.82]  
Teq = 393 [14] K  
Rp = 3.51 [0.35] Re  
a = 0.2872 [0.0233] AU  
Ag = 510.60 [179.32] [2.84σ]  
Teffp = 2892 [240] K [10.38σ]

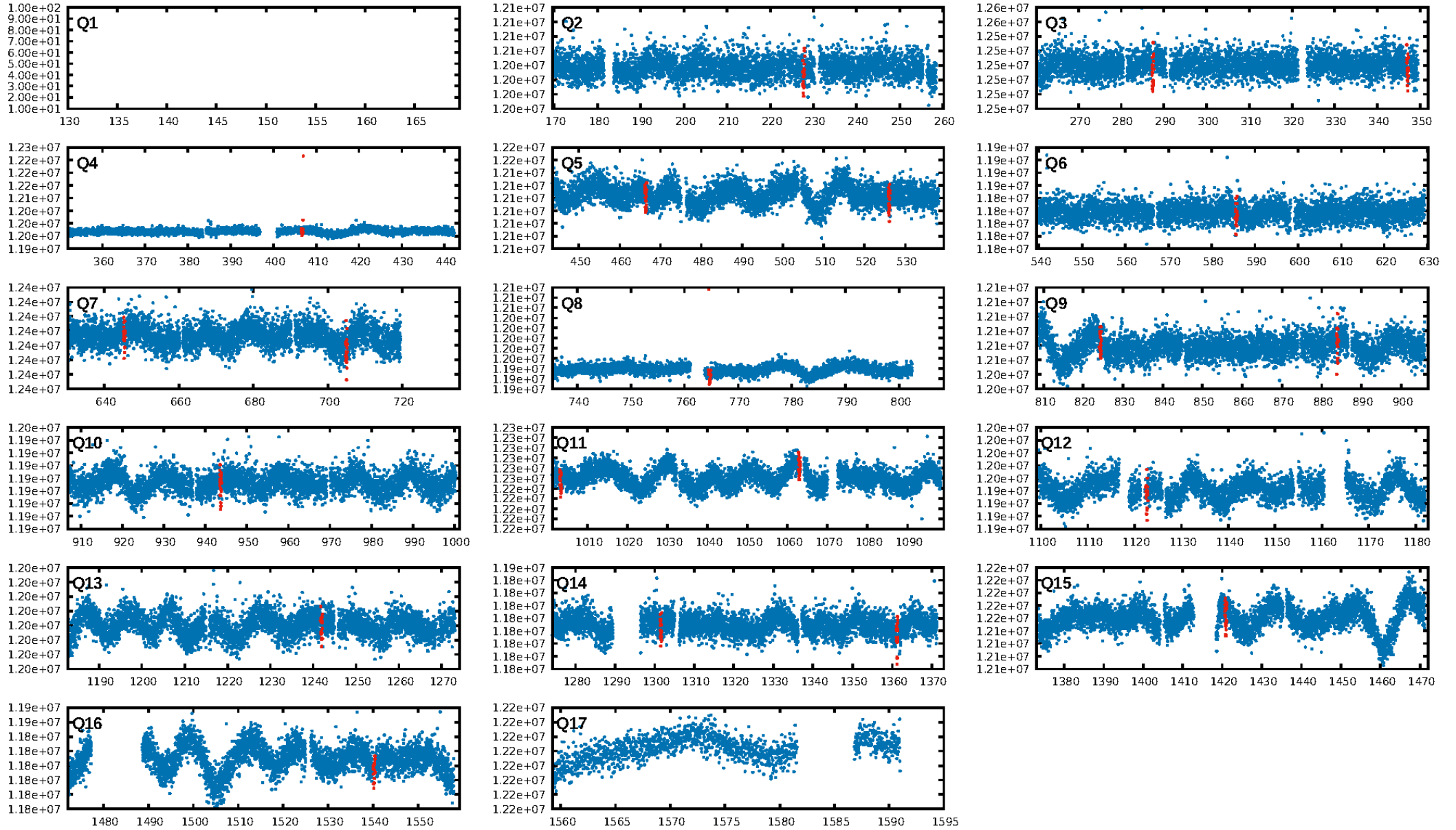
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 54.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.49e-76  
RollingBand-fgt: 1.00 [21/21]  
GhostDiagnostic-chr: 2.402  
Centroid-sig: 0.0%  
Centroid-so: 0.299 arcsec [0.53σ]  
OotOffset-rm: 0.128 arcsec [0.52σ]  
KicOffset-rm: 0.268 arcsec [1.11σ]  
OotOffset-st: 3/4/2/3 [12]  
KicOffset-st: 3/4/2/3 [12]  
DiffImageQuality-fgm: 1.00 [12/12]  
DiffImageOverlap-fno: 1.00 [13/13]

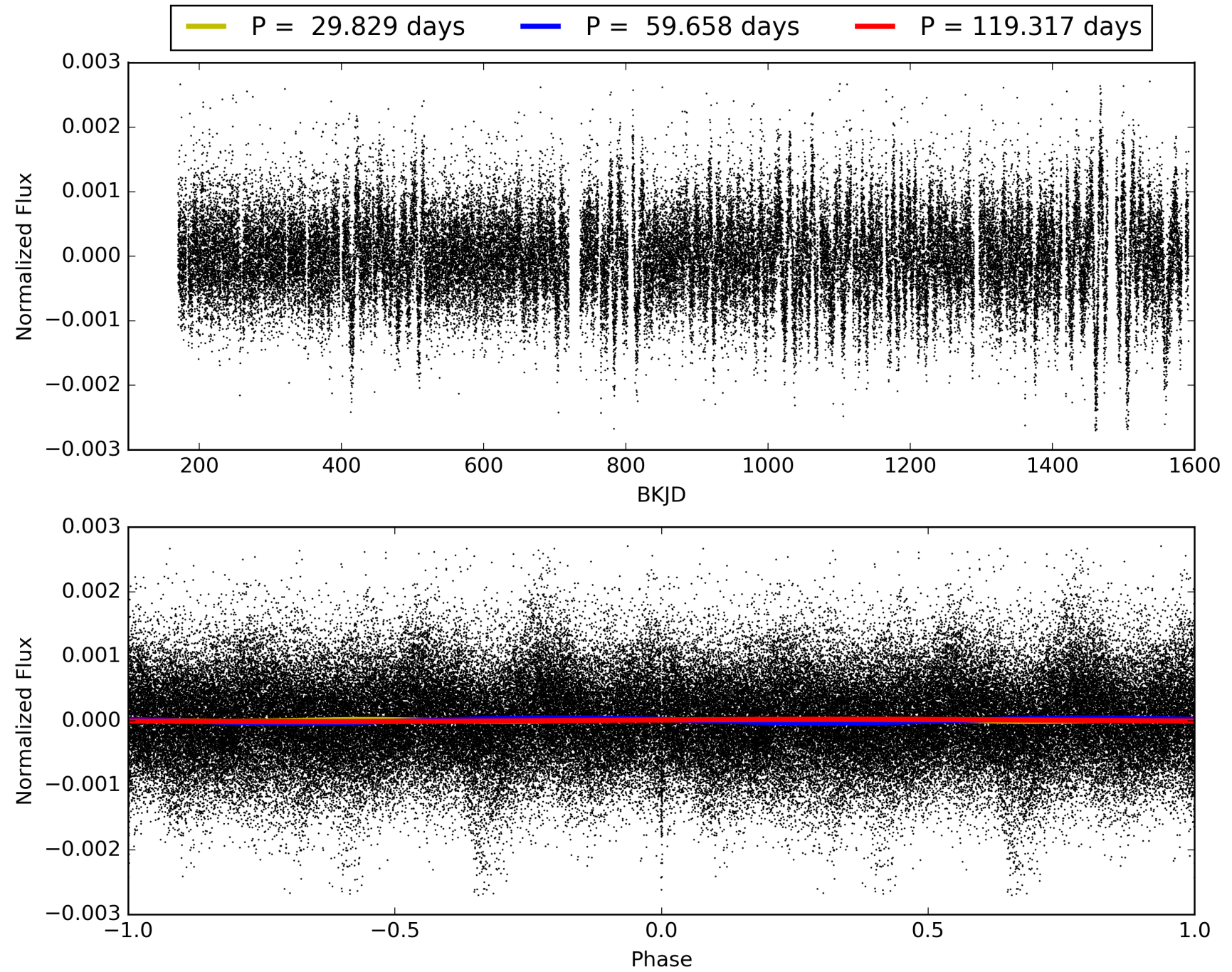
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:23:19 Z

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

# TCE 010015937-01, PDC Light Curves

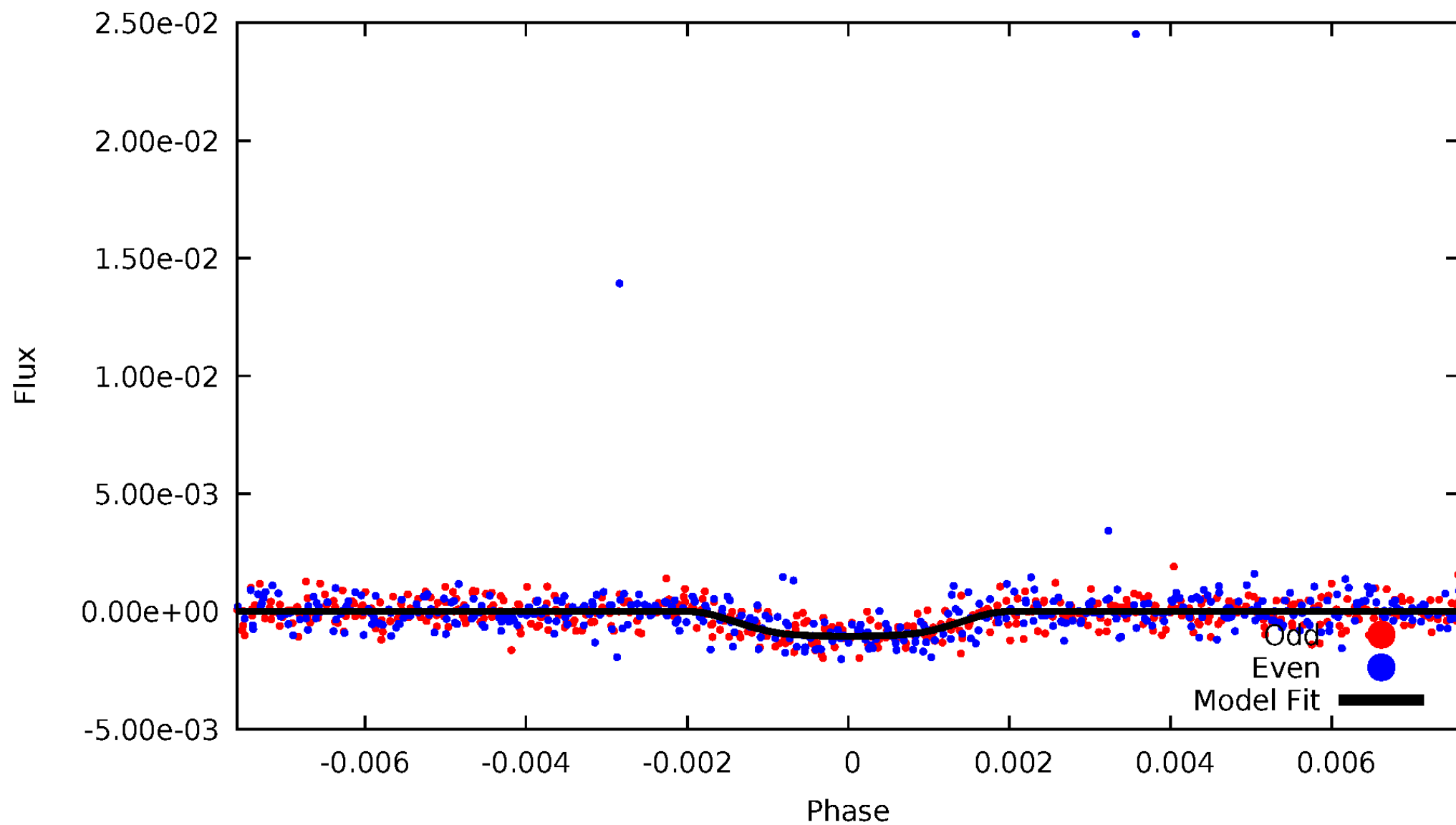


# TCE 010015937-01



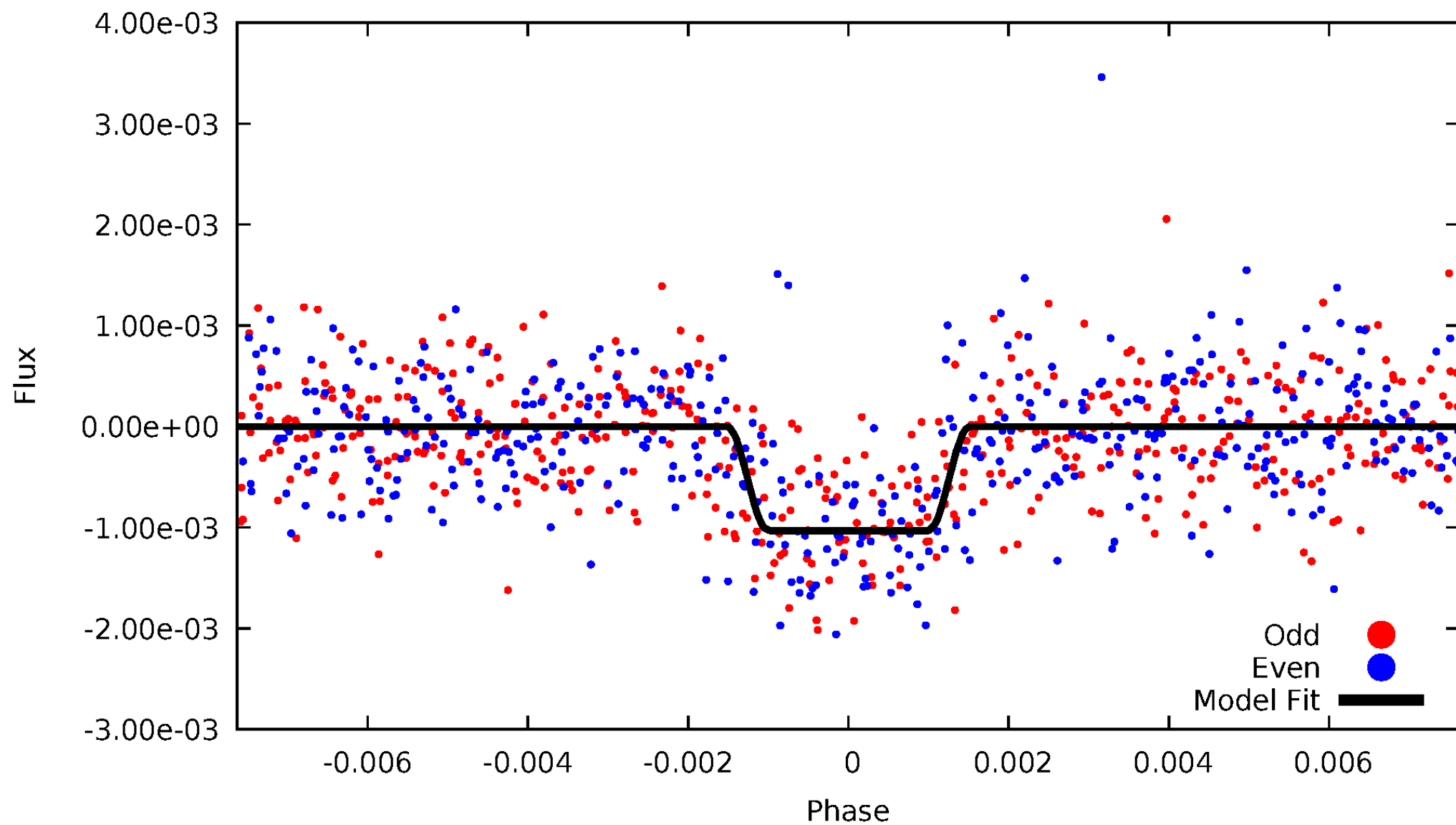
# DV Odd/Even

TCE 010015937-01



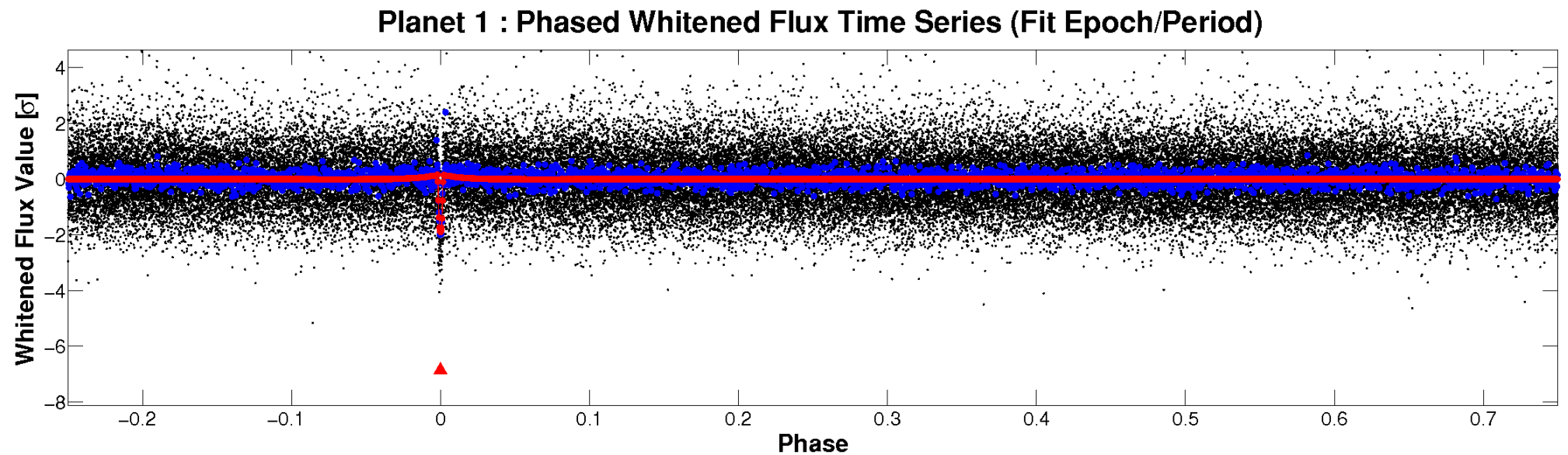
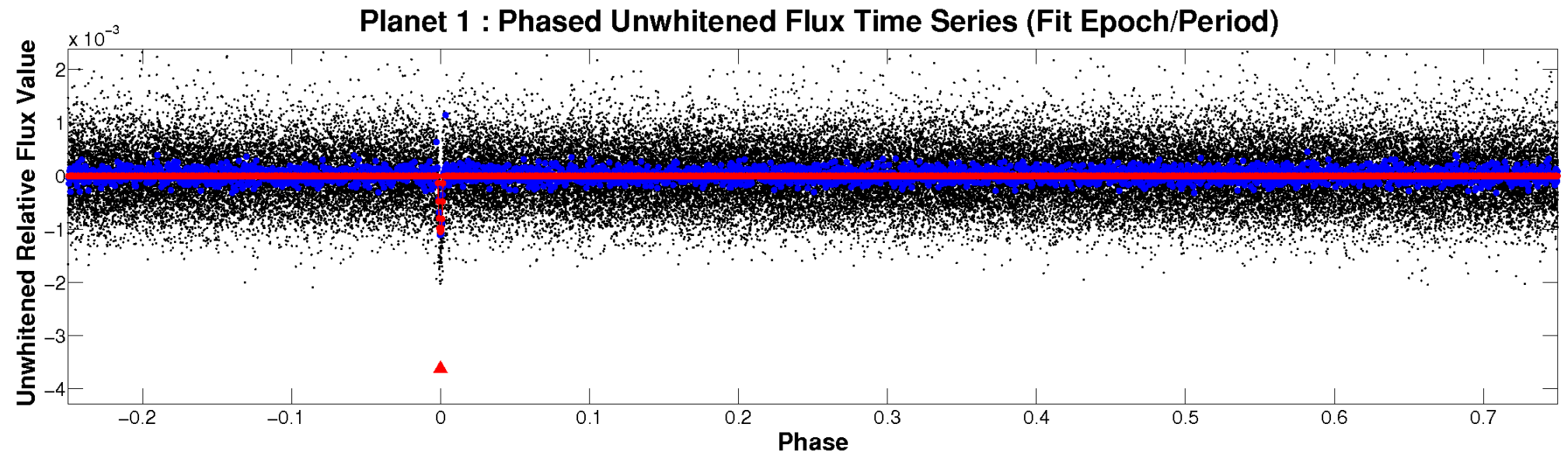
# ALT Odd/Even

TCE 010015937-01



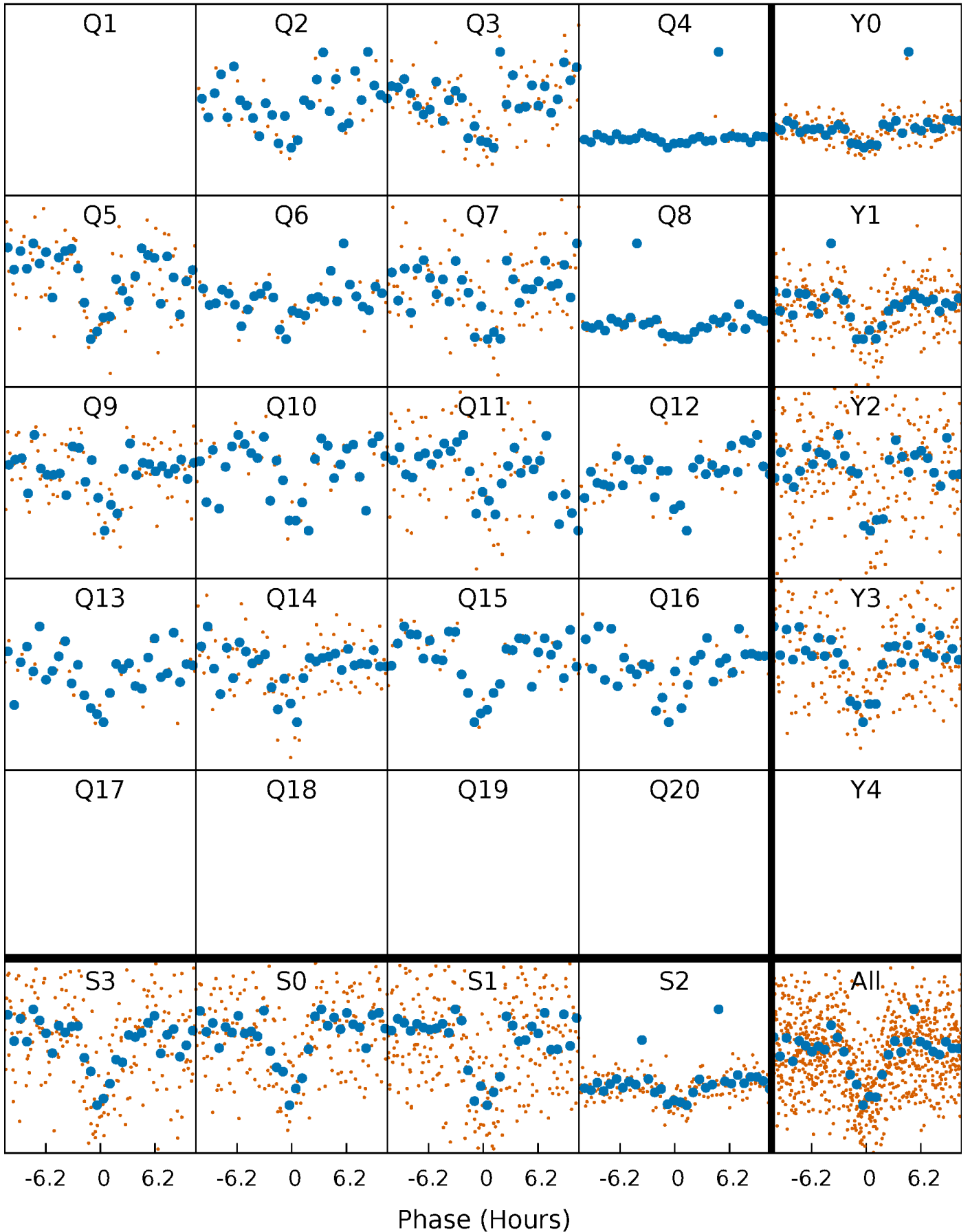


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

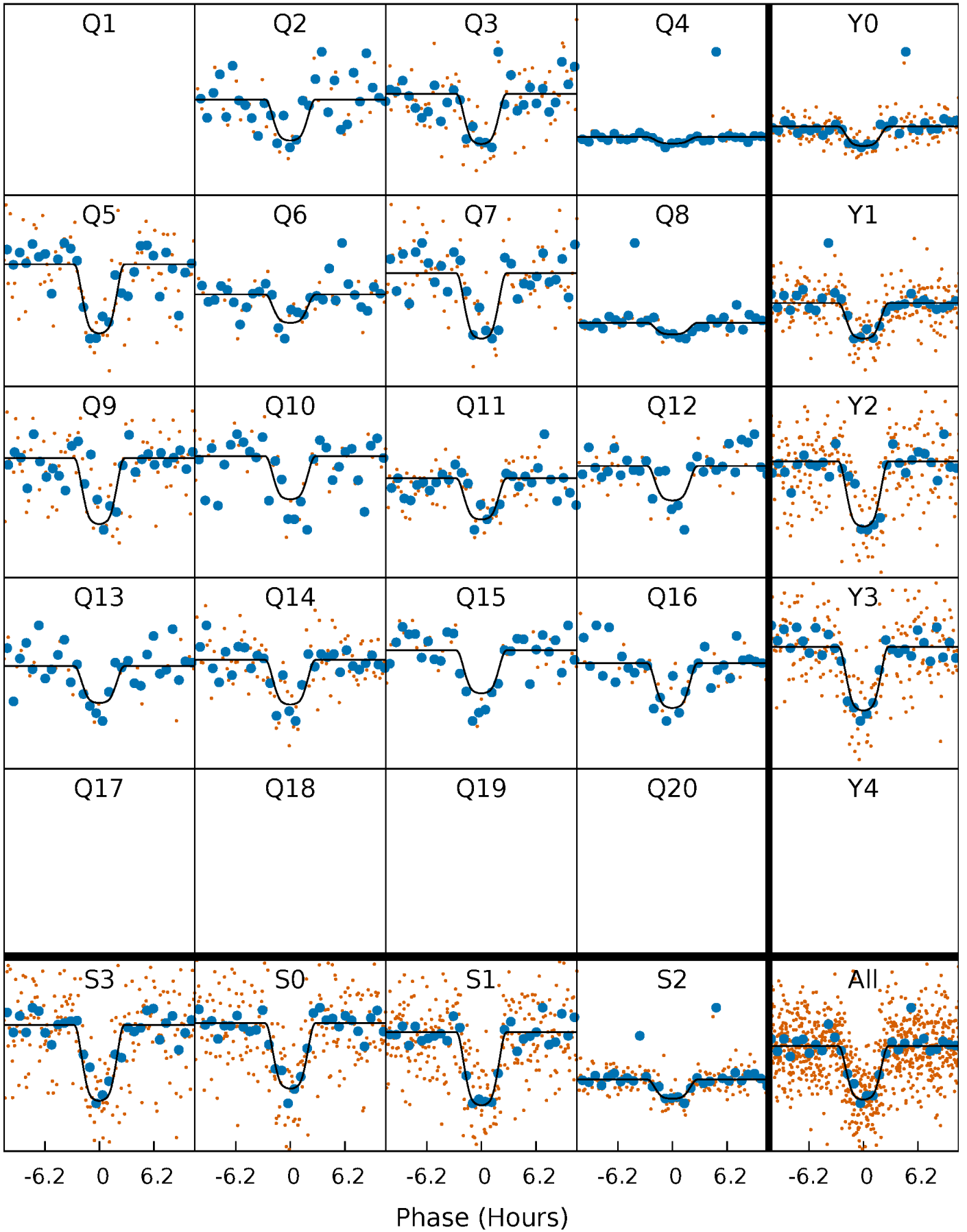
TCE 010015937-01 P= 59.658312 Days  $T_0=168.087721$  (BKJD)





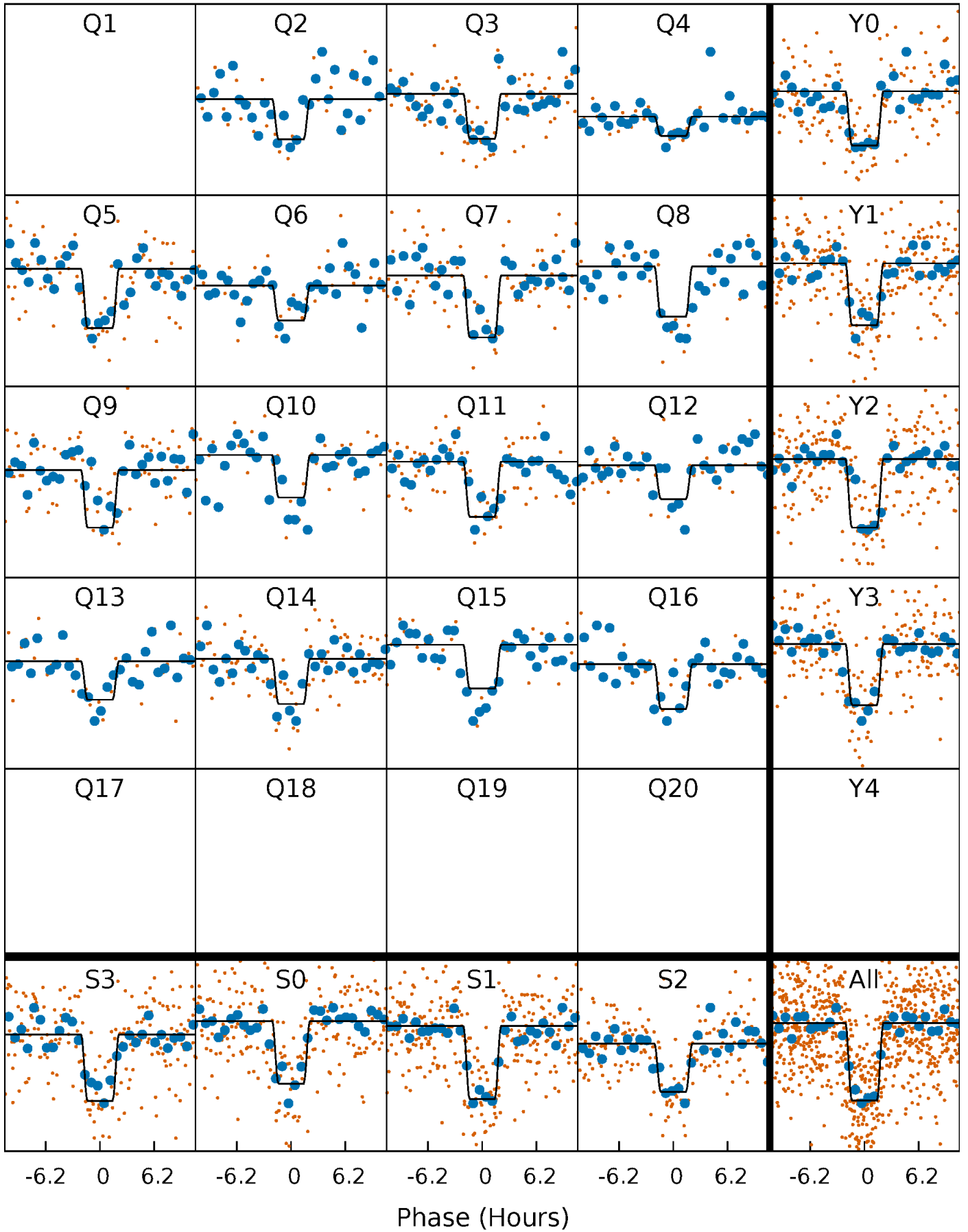
# DV Quarter-Phased Transit Curves

TCE 010015937-01 P= 59.658312 Days  $T_0=168.087721$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

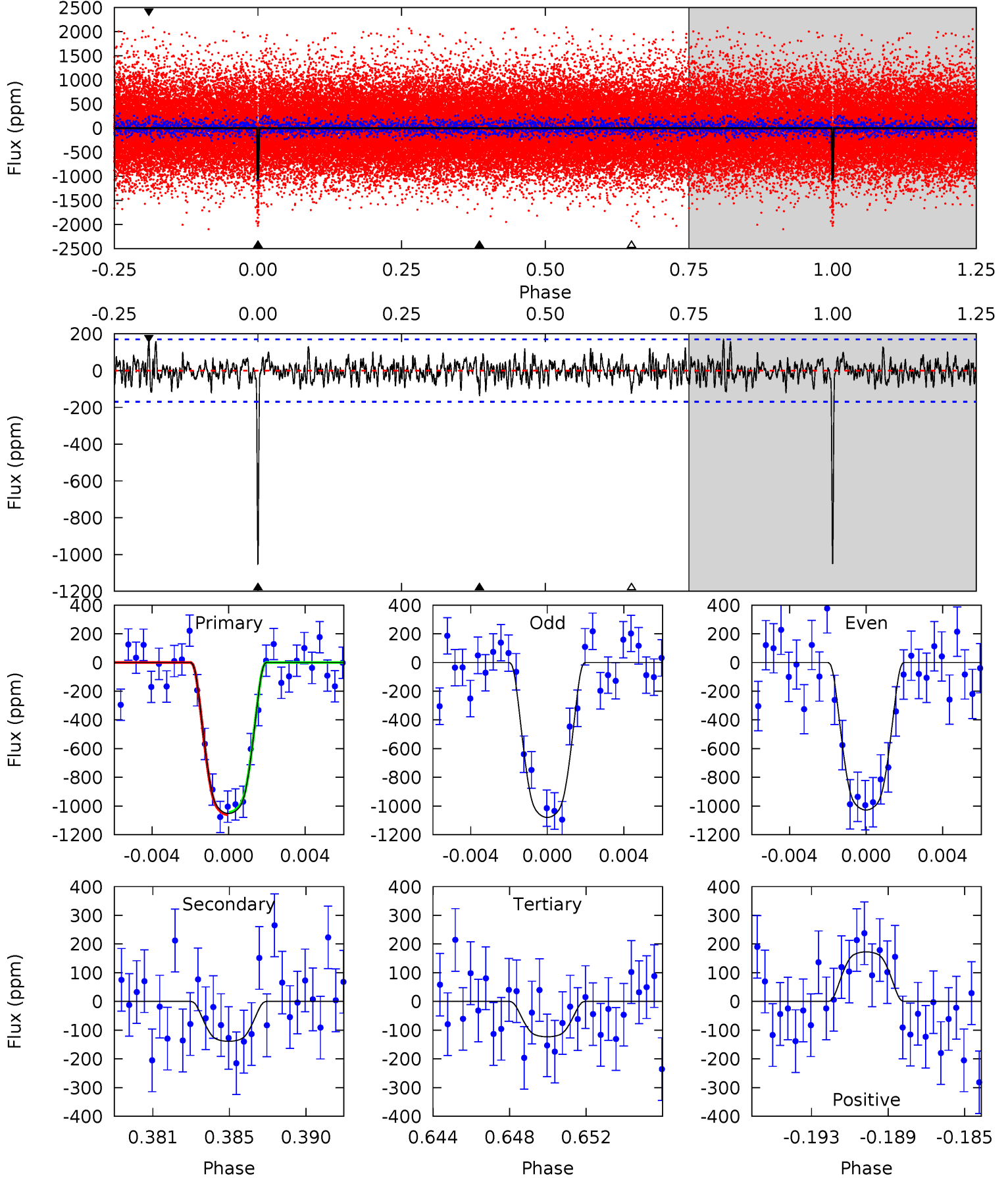
TCE 010015937-01 P= 59.658301 Days  $T_0=168.091822$  (BKJD)



# DV Model-Shift Uniqueness Test

010015937-01, P = 59.658312 Days, E = 168.087721 Days

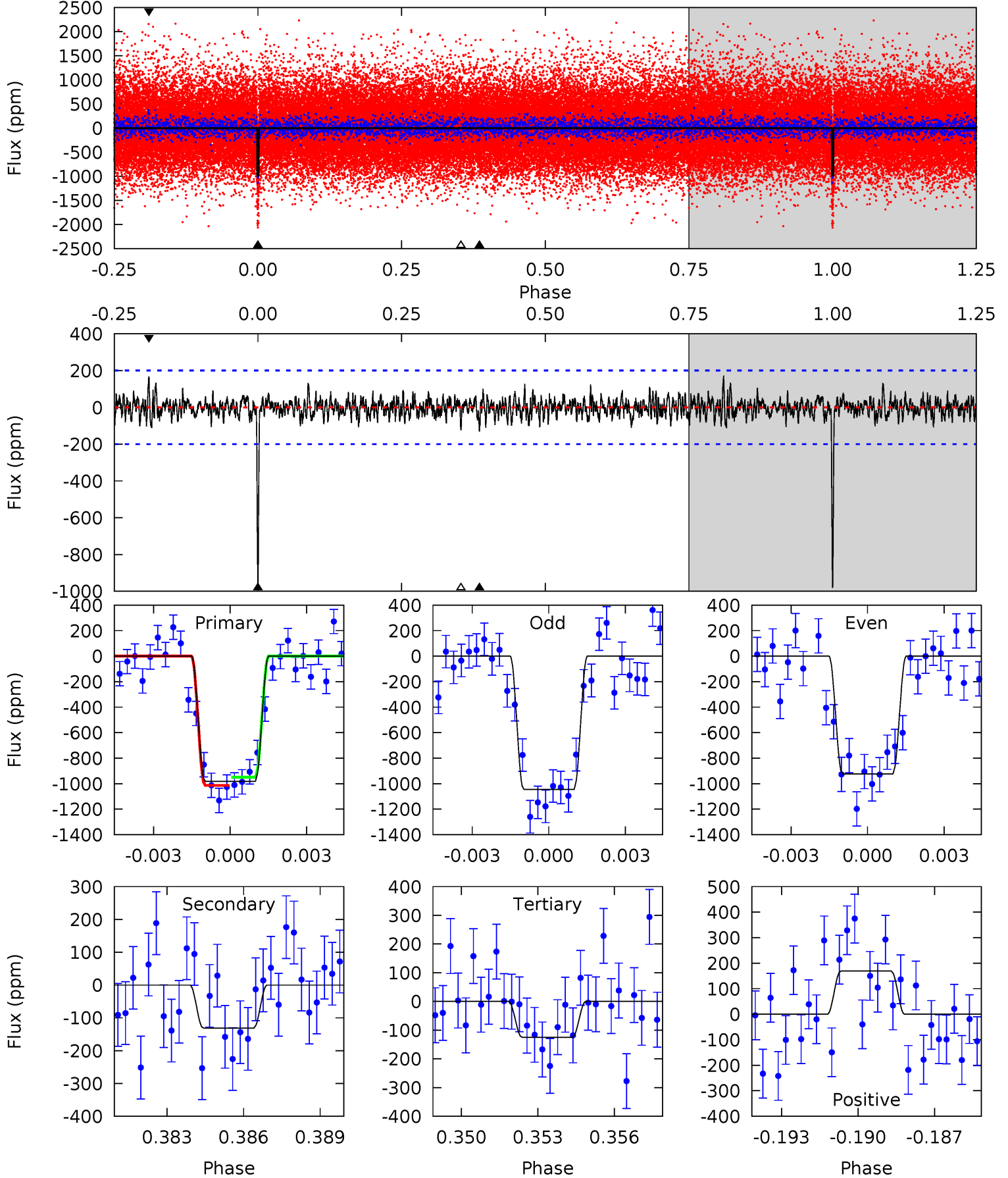
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.2	4.25	3.76	5.29	5.19	2.87	1.32	28.4	26.9	0.48	-1.04	0.79	1.02	0.14	0.26



# Alt Model-Shift Uniqueness Test

010015937-01, P = 59.658301 Days, E = 168.091822 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
25.7	3.44	3.28	4.44	5.25	2.97	1.03	22.5	21.3	0.16	-1.00	1.58	1.03	0.15	0.83



### Stellar Parameters For KIC 010015937

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5243^{+84}_{-73}$	$4.547^{+0.028}_{-0.077}$	$0.140^{+0.150}_{-0.150}$	$0.831^{+0.069}_{-0.040}$	$0.887^{+0.037}_{-0.050}$	$2.178^{+0.237}_{-0.466}$
	+2%/-1%	+1%/-2%	+107%/-107%	+8%/-5%	+4%/-6%	+11%/-21%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 010015937-01 / KOI 1720.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-139 \pm 33$	$3.55^{+0.27}_{-0.26}$	$555^{+14}_{-12}$	$3399^{+133}_{-149}$	$497^{+150}_{-129}$
Alt.	$-131 \pm 38$	$2.94^{+0.24}_{-0.21}$	$554^{+14}_{-11}$	$3559^{+200}_{-218}$	$673^{+251}_{-227}$

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

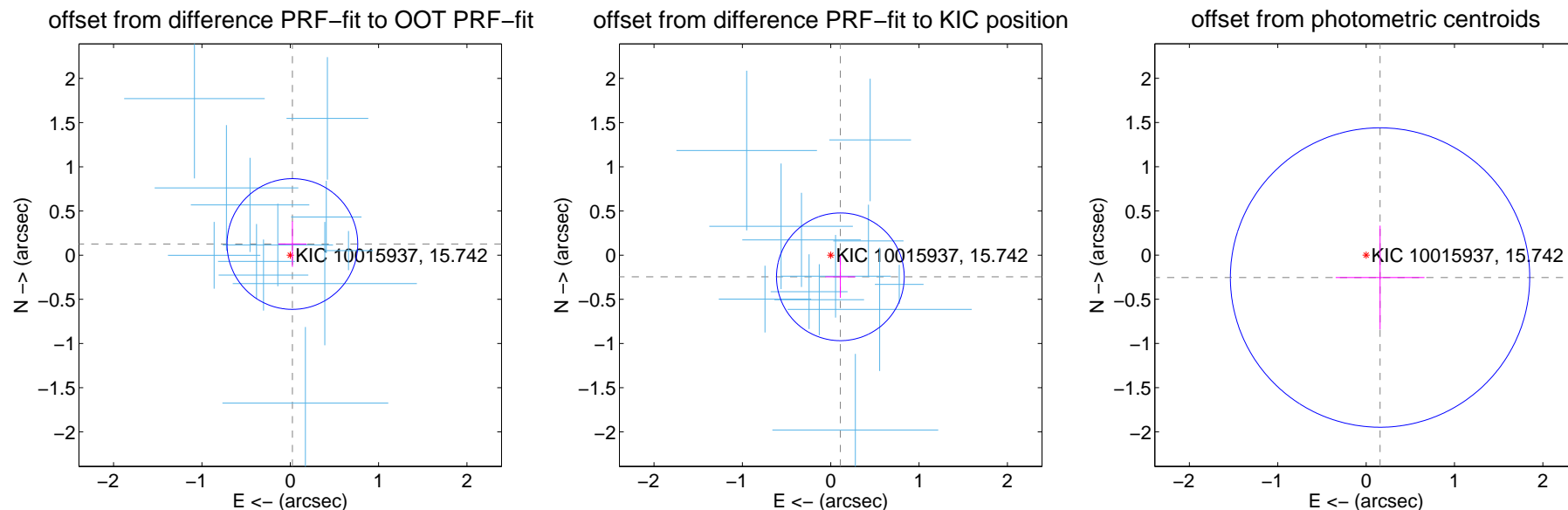
## DV Centroid Data

Supplemental centroid analysis for 010015937-01. Kepler magnitude: 15.74. Transit SNR 20.68

There are 12 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.46 arcsec

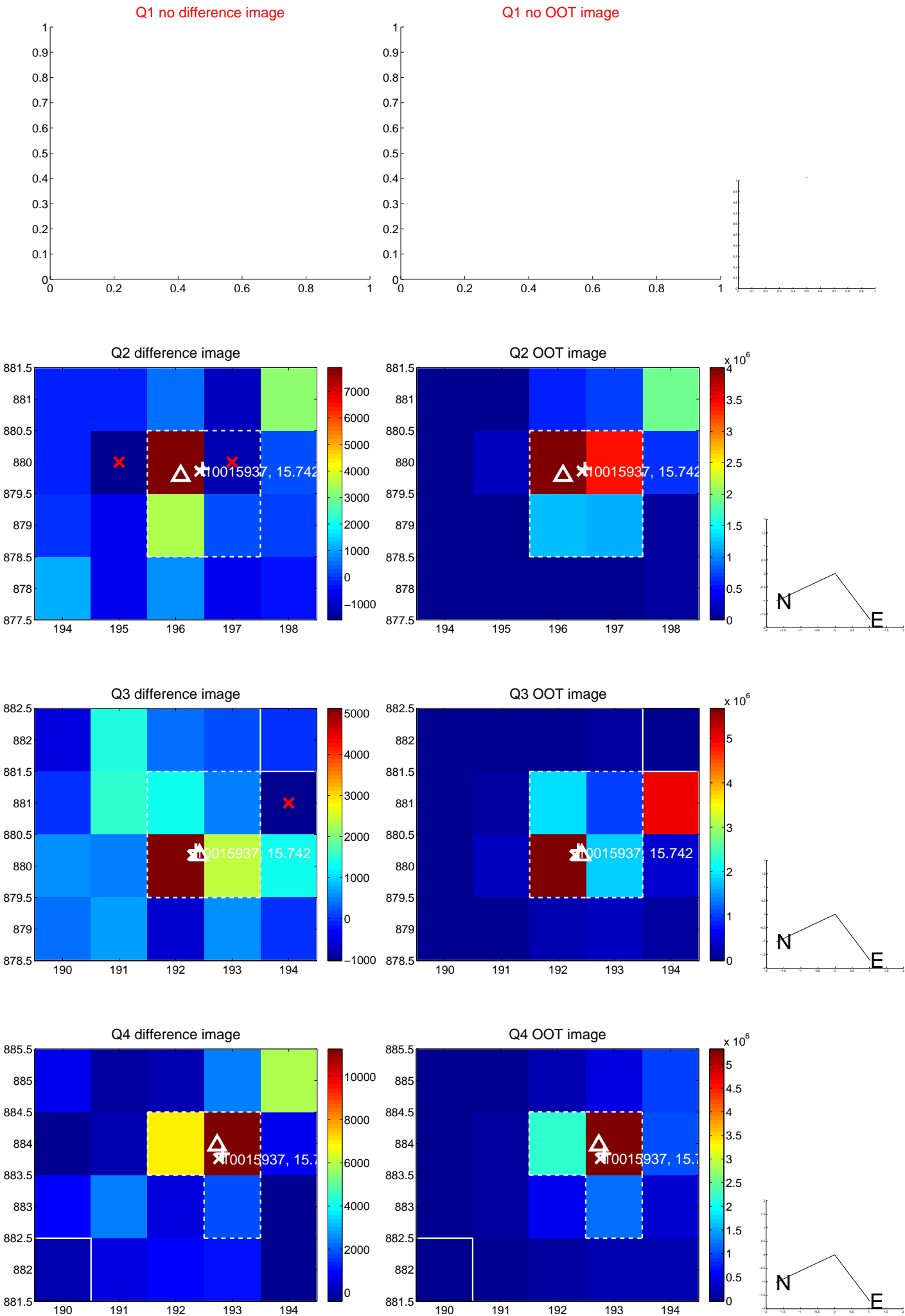
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.128 \pm 0.247$	0.52	$-0.024 \pm 0.159$	$0.126 \pm 0.258$
PRF-fit source offset from KIC position	$0.268 \pm 0.241$	1.11	$-0.109 \pm 0.169$	$-0.245 \pm 0.238$
photometric centroid source offset	$0.30 \pm 0.56$	0.53	$-0.16 \pm 0.50$	$-0.25 \pm 0.59$



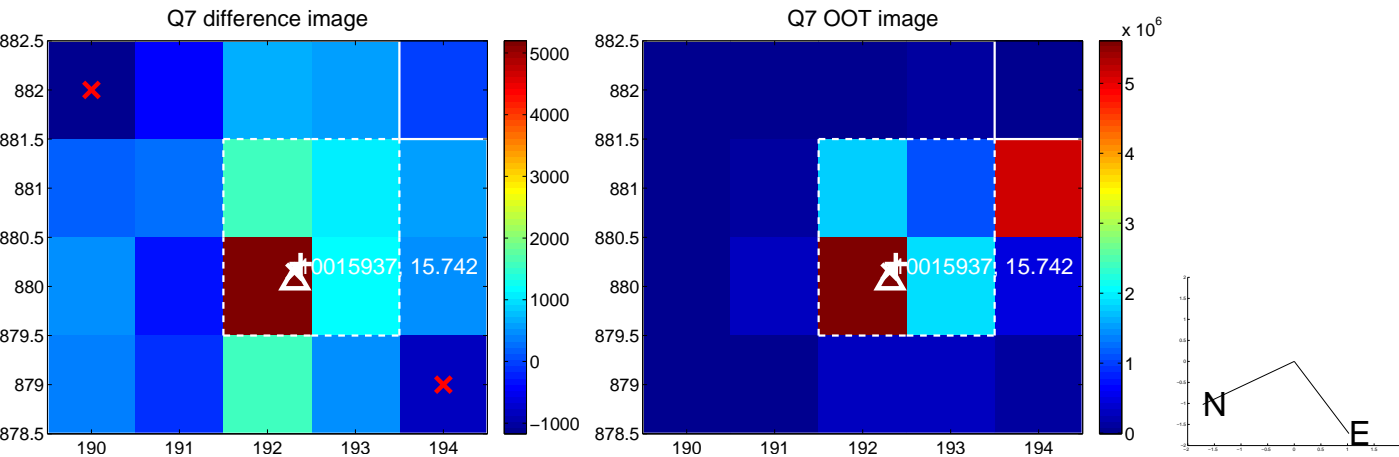
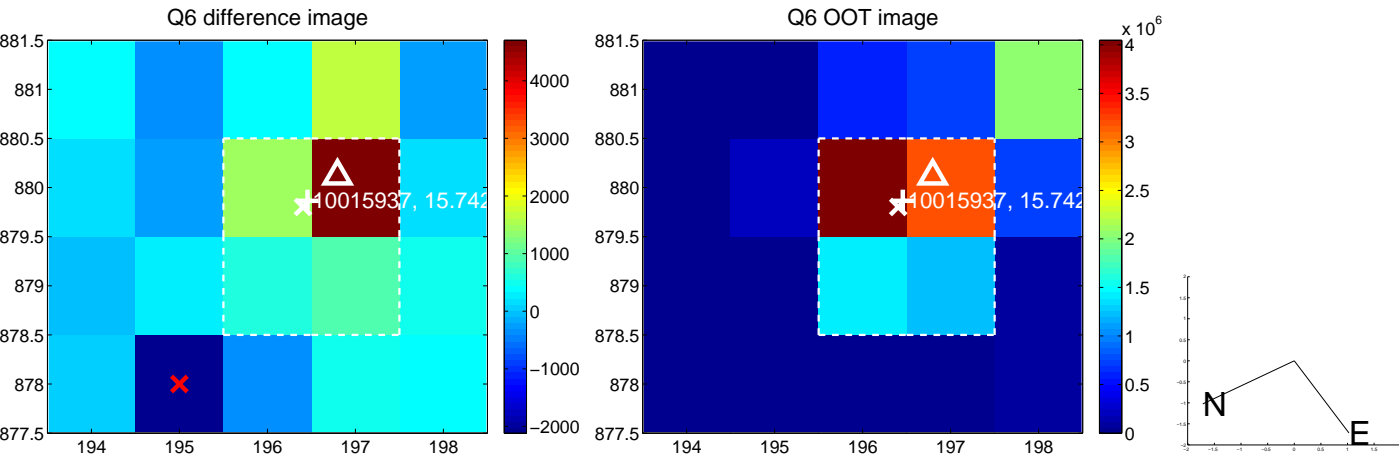
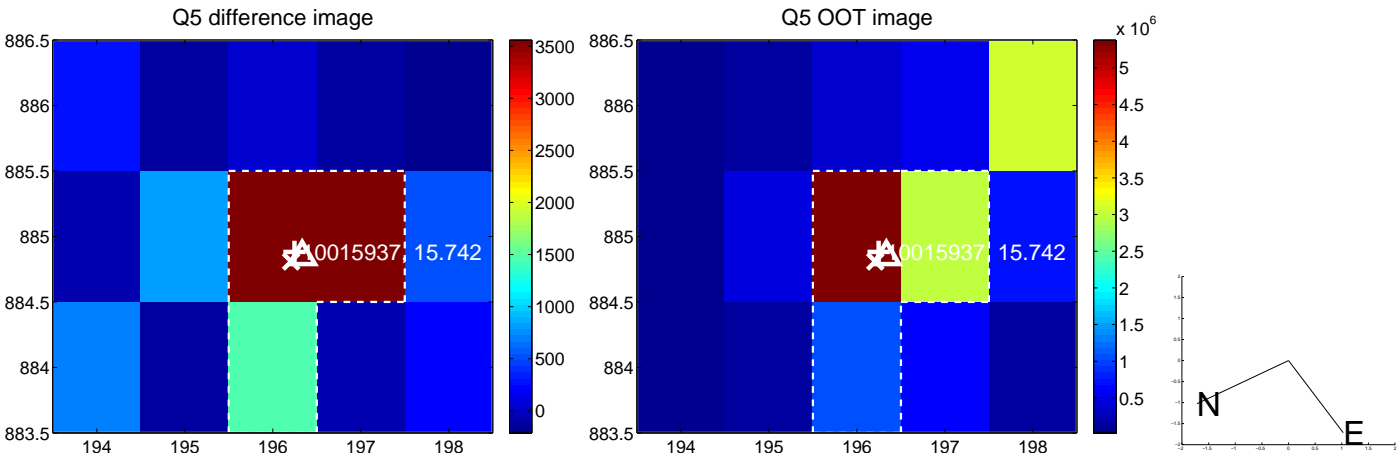
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



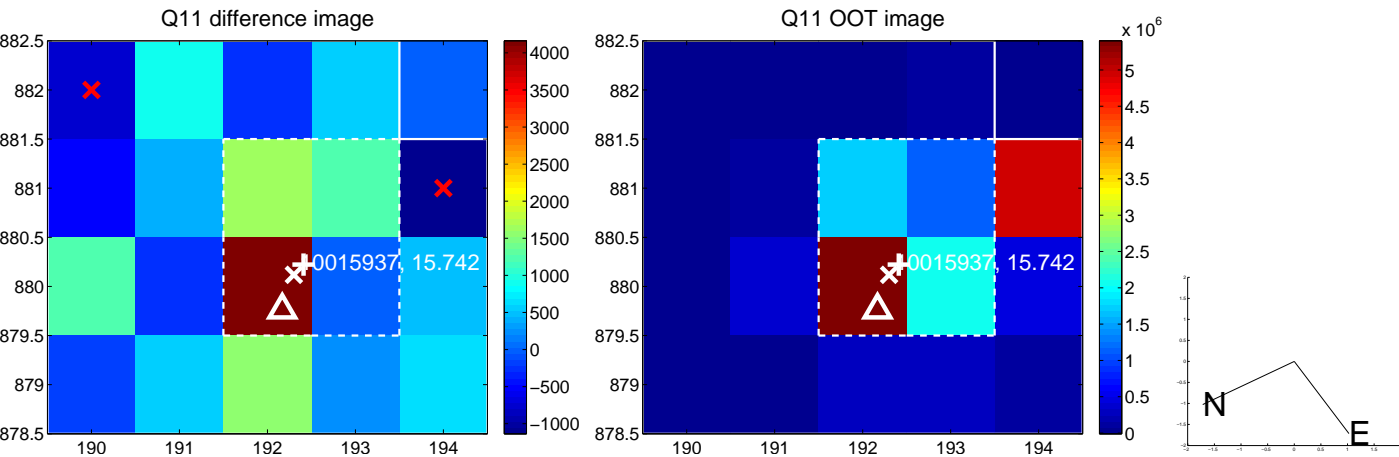
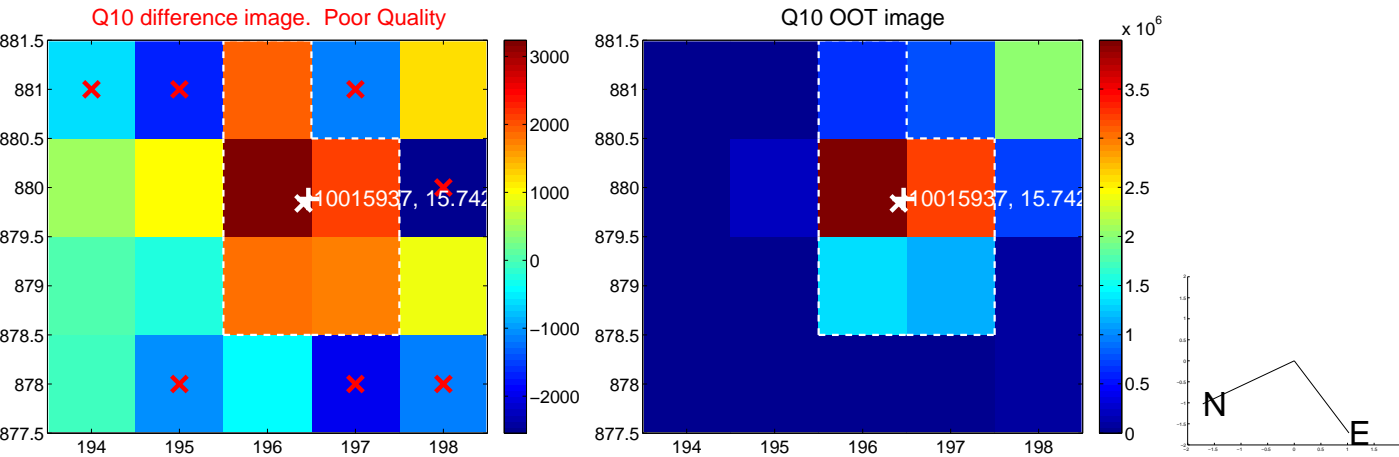
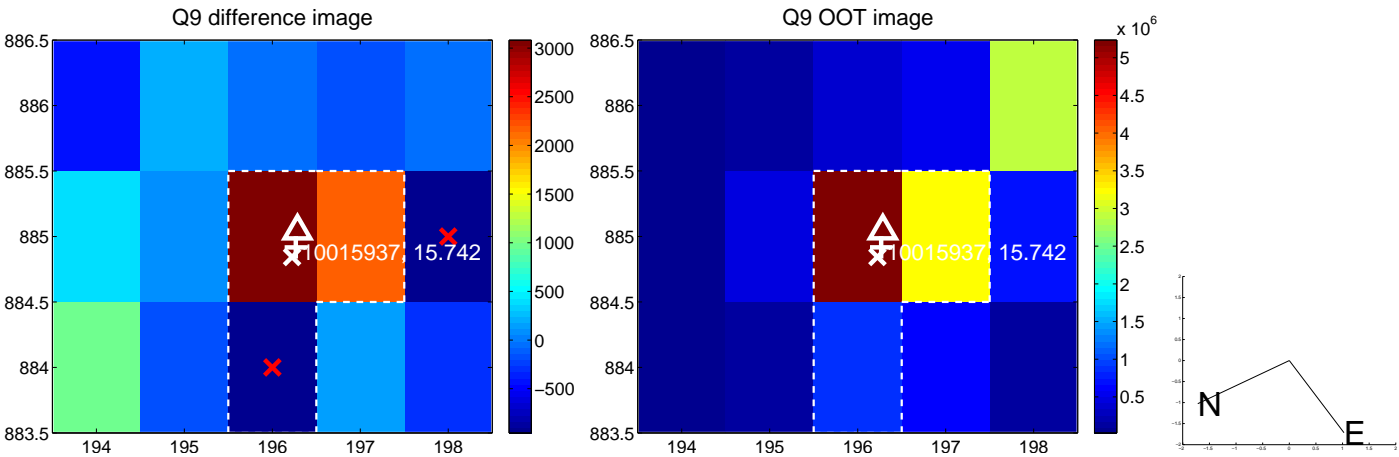
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



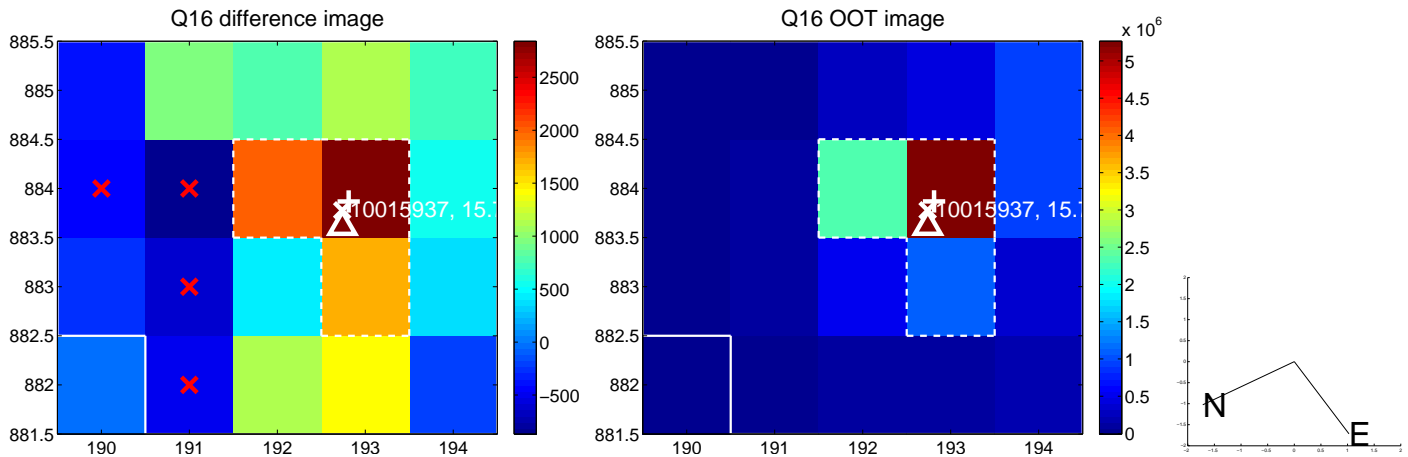
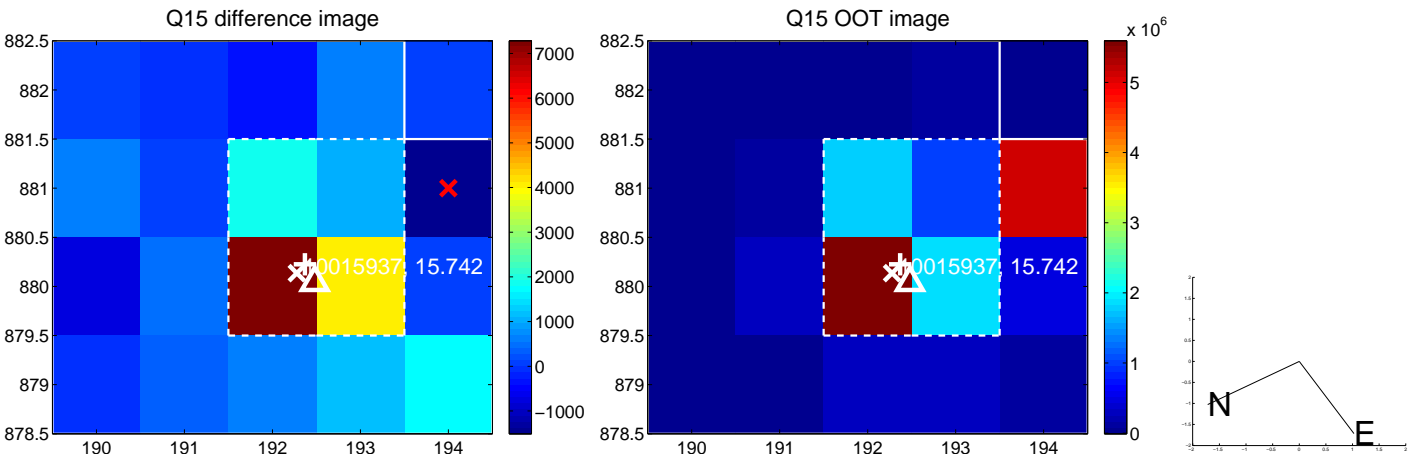
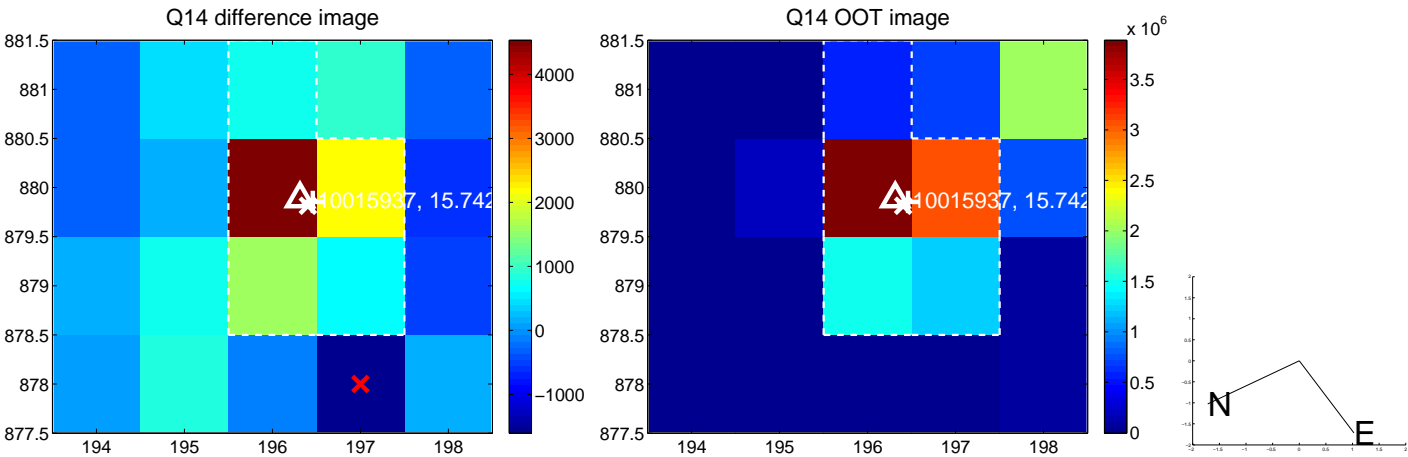
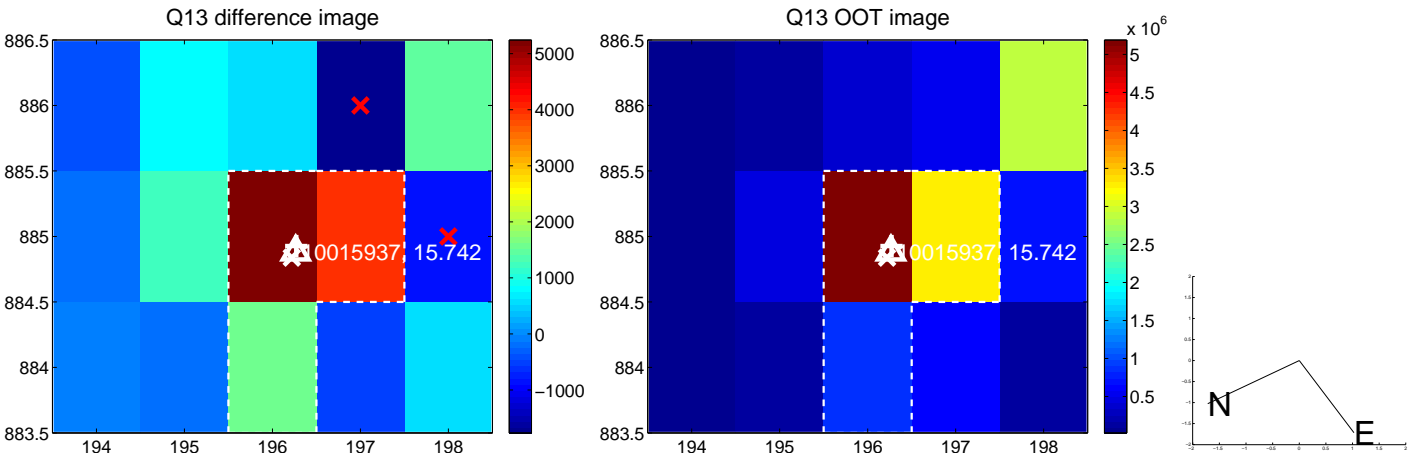
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



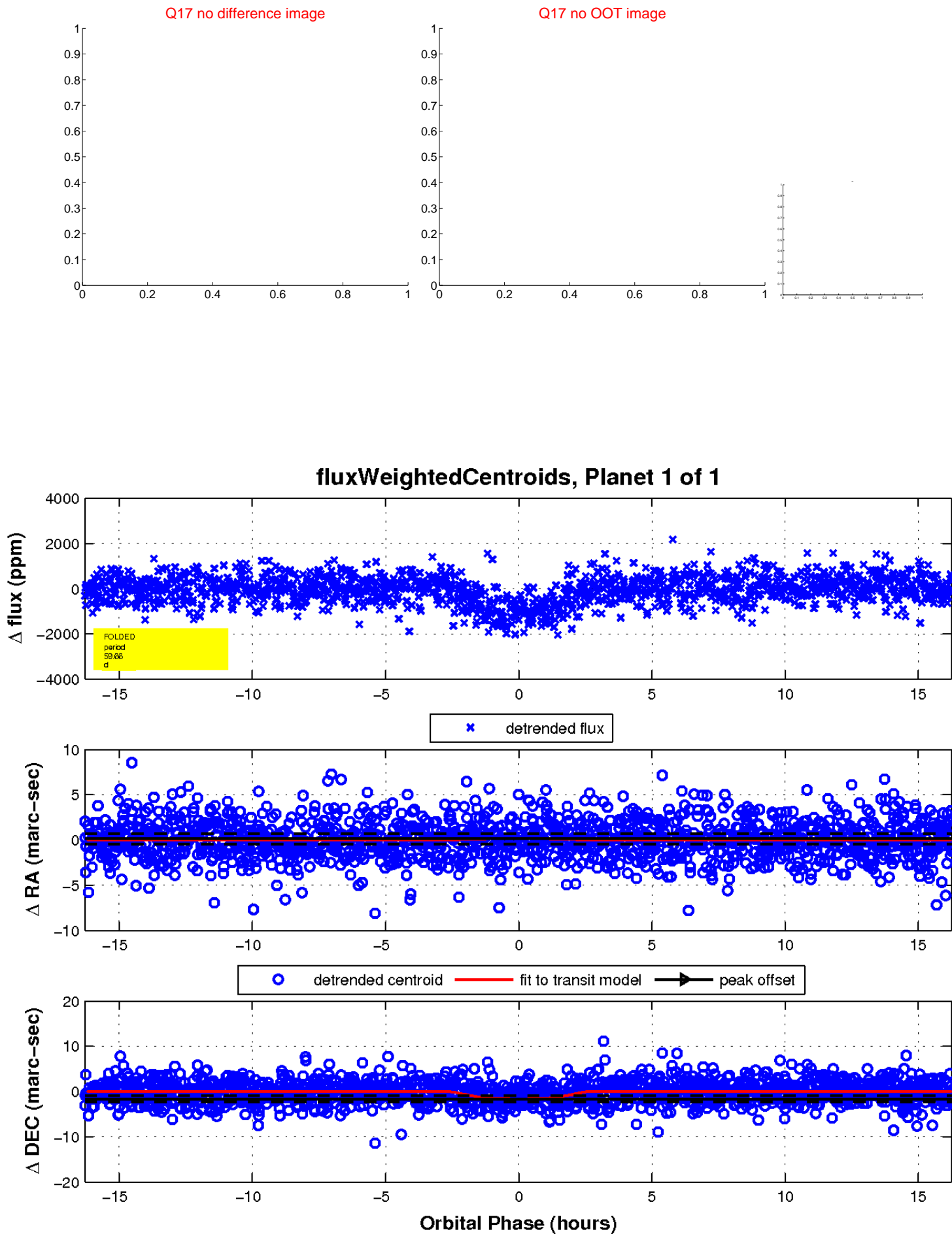
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

