

# KIC 010936170

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010936170-01	OBS	No	370.440871	405.662255	920.2	5.030	7.2	7.9	0.51	3799	1.59	0.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010936170-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

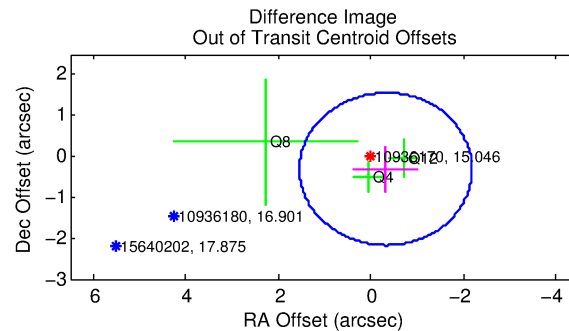
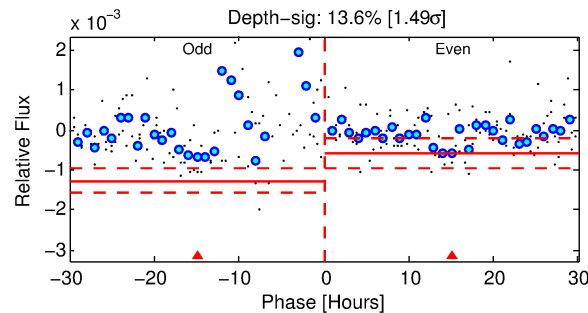
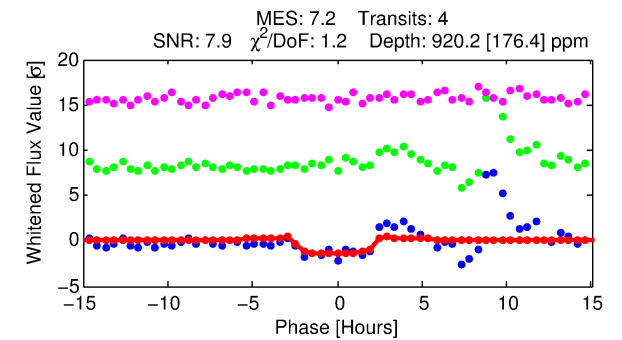
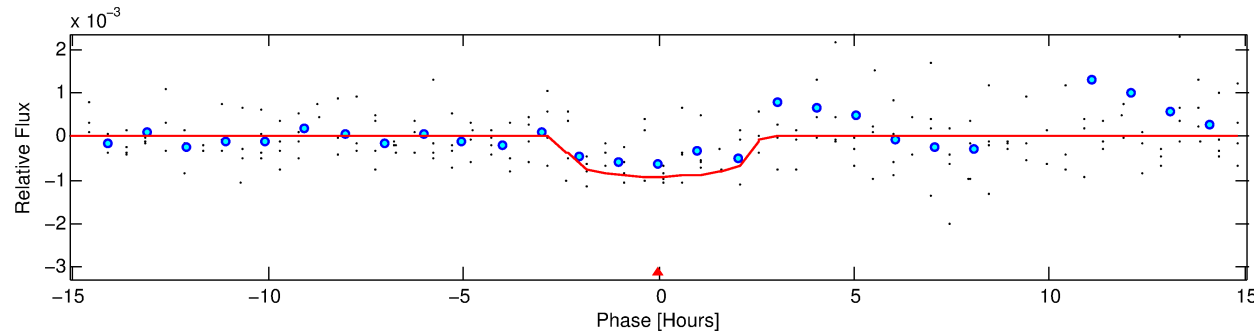
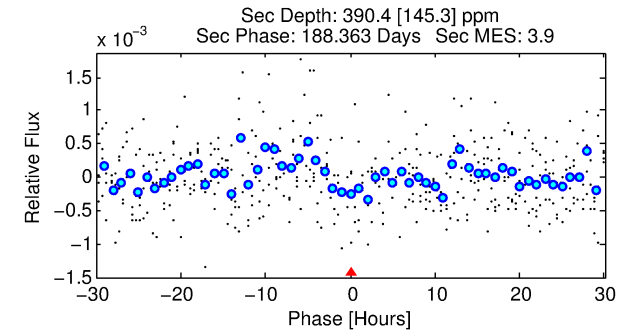
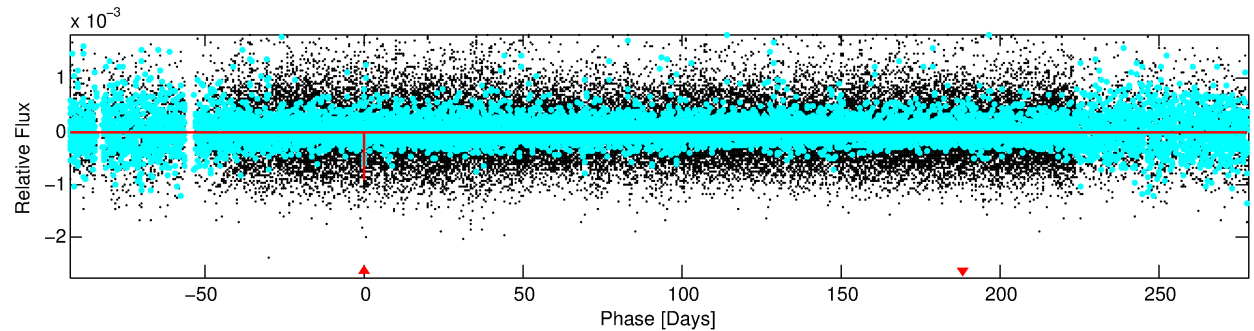
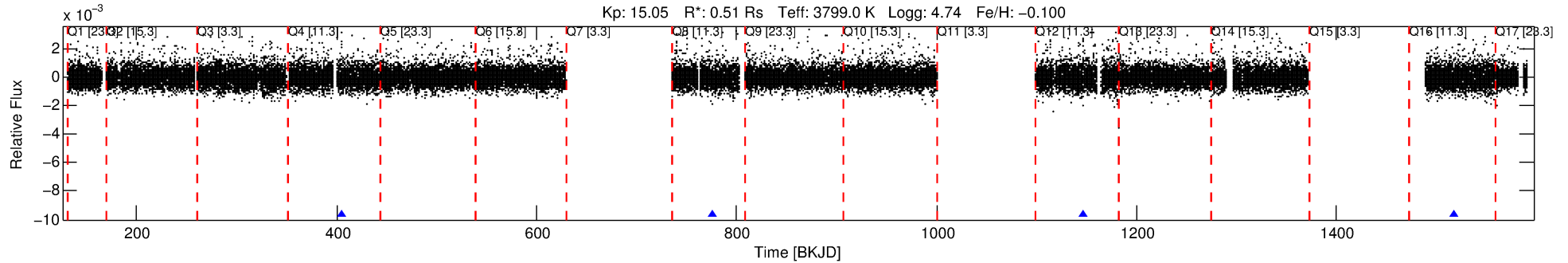
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010936170-01

No Significant Match Found

# DV One-Page Summary

KIC: 10936170 Candidate: 1 of 1 Period: 370.441 d



## DV Fit Results:

Period = 370.44087 [0.00831] d  
Epoch = 405.6623 [0.0149] BKJD  
Rp/R\* = 0.0287 [0.2875]  
a/R\* = 486.59 [21714.17]  
b = 0.56 [55.60]  
Seff = 0.07 [0.01]  
Teq = 133 [3] K  
Rp = 1.60 [16.00] Re  
a = 0.8114 [0.0375] AU  
Ag = 55549.58 [1114447.16] [0.05σ]  
Teffp = 3154 [15819] K [0.19σ]

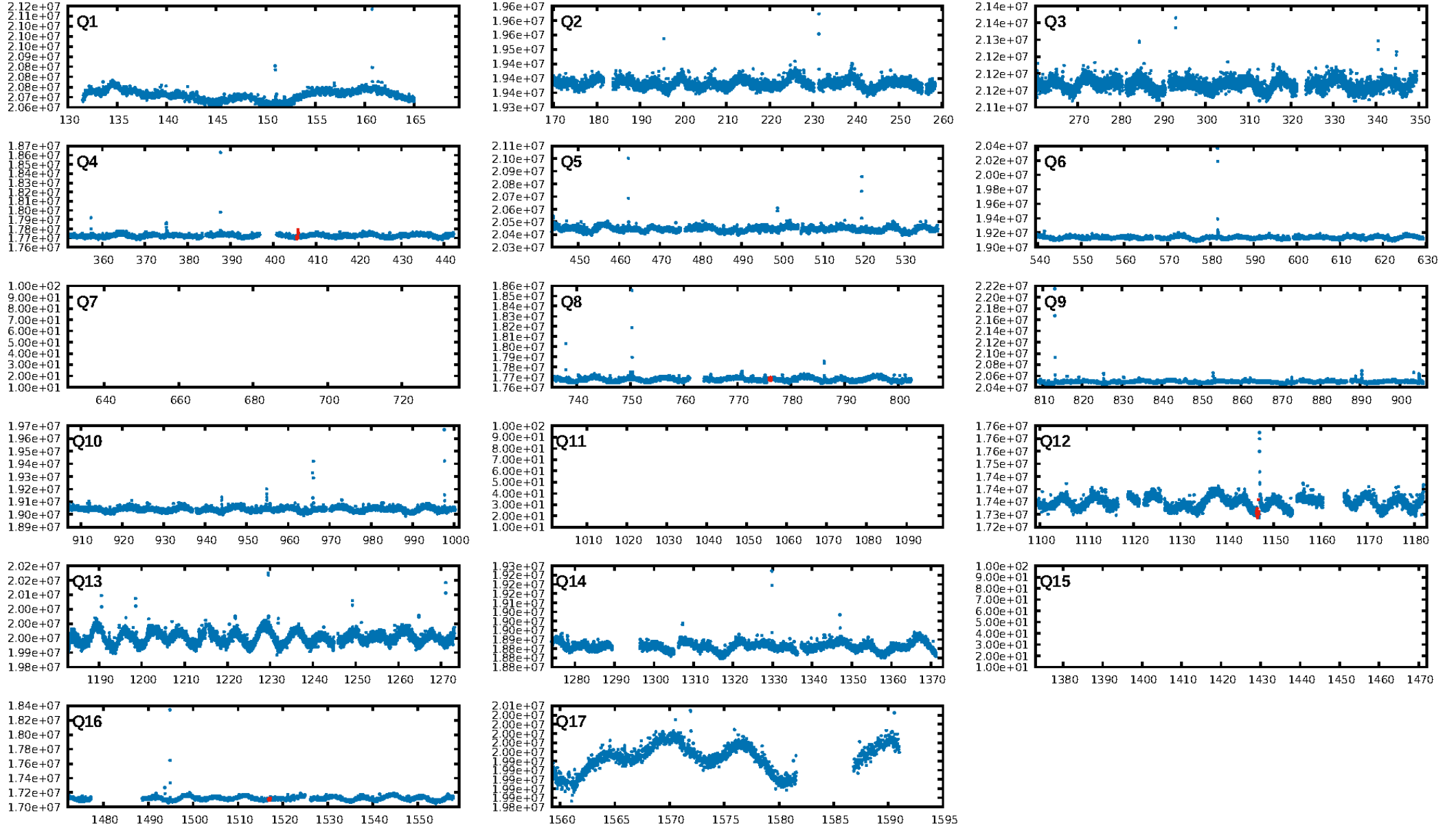
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 89.5%  
**Bootstrap-pfa: 9.82e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.321  
Centroid-sig: 89.9%  
Centroid-so: 1.104 arcsec [0.83σ]  
OotOffset-rm: 0.447 arcsec [0.72σ]  
OotOffset-st: 0/0/3/0 [3]  
KicOffset-rm: 0.744 arcsec [1.32σ]  
KicOffset-st: 0/0/3/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [4/4]

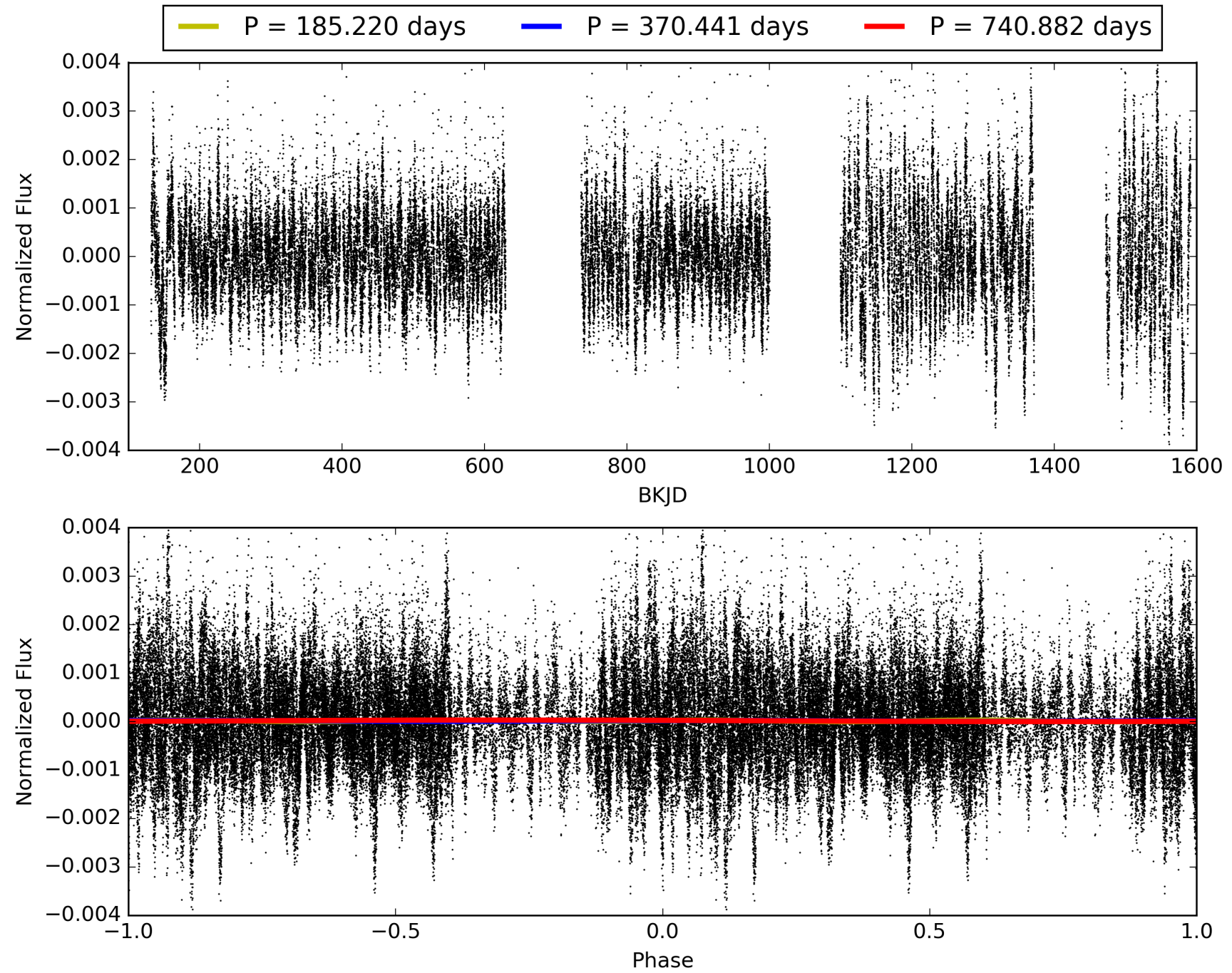
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:14:06 Z

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

# TCE 010936170-01, PDC Light Curves

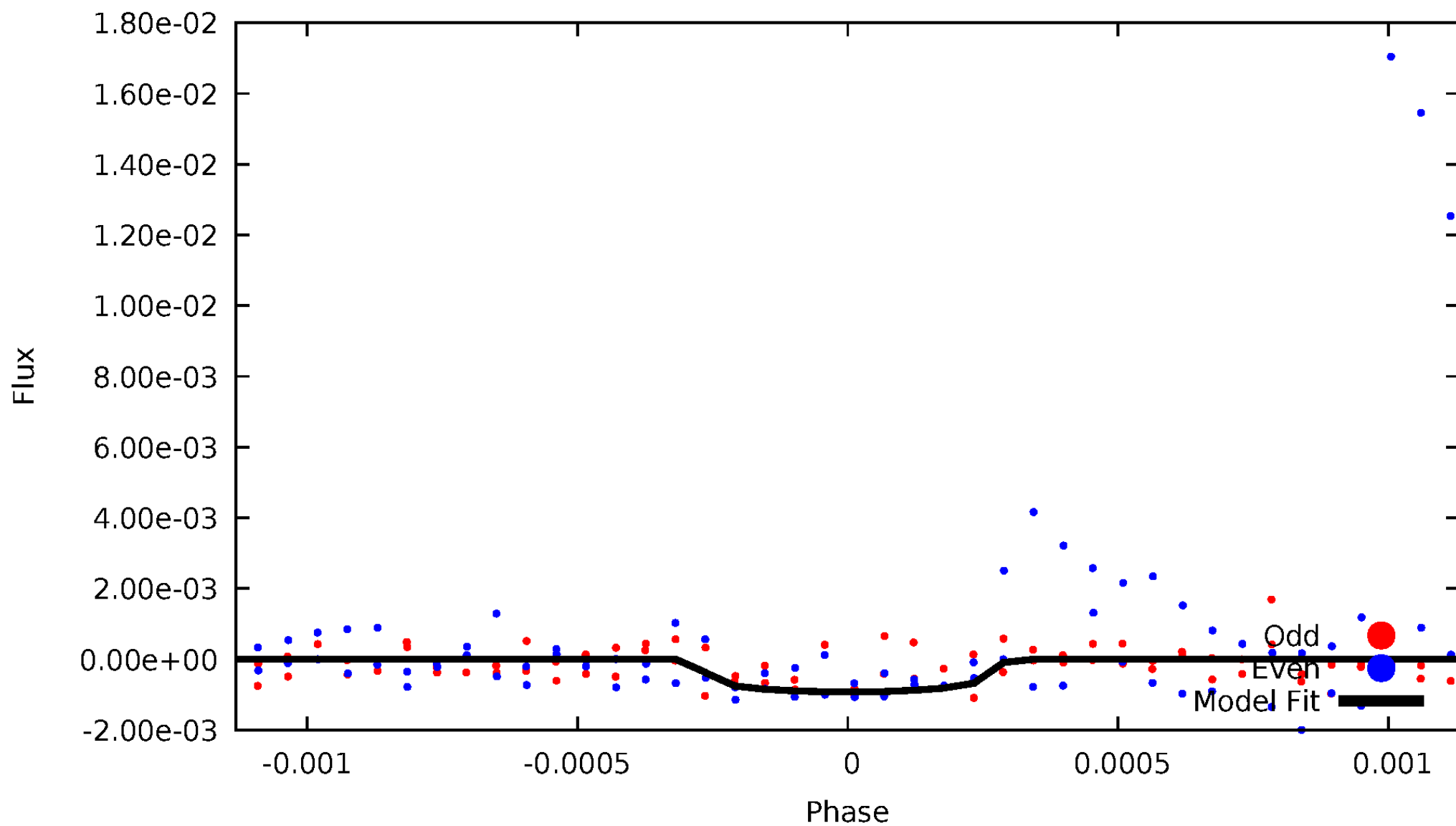


TCE 010936170-01



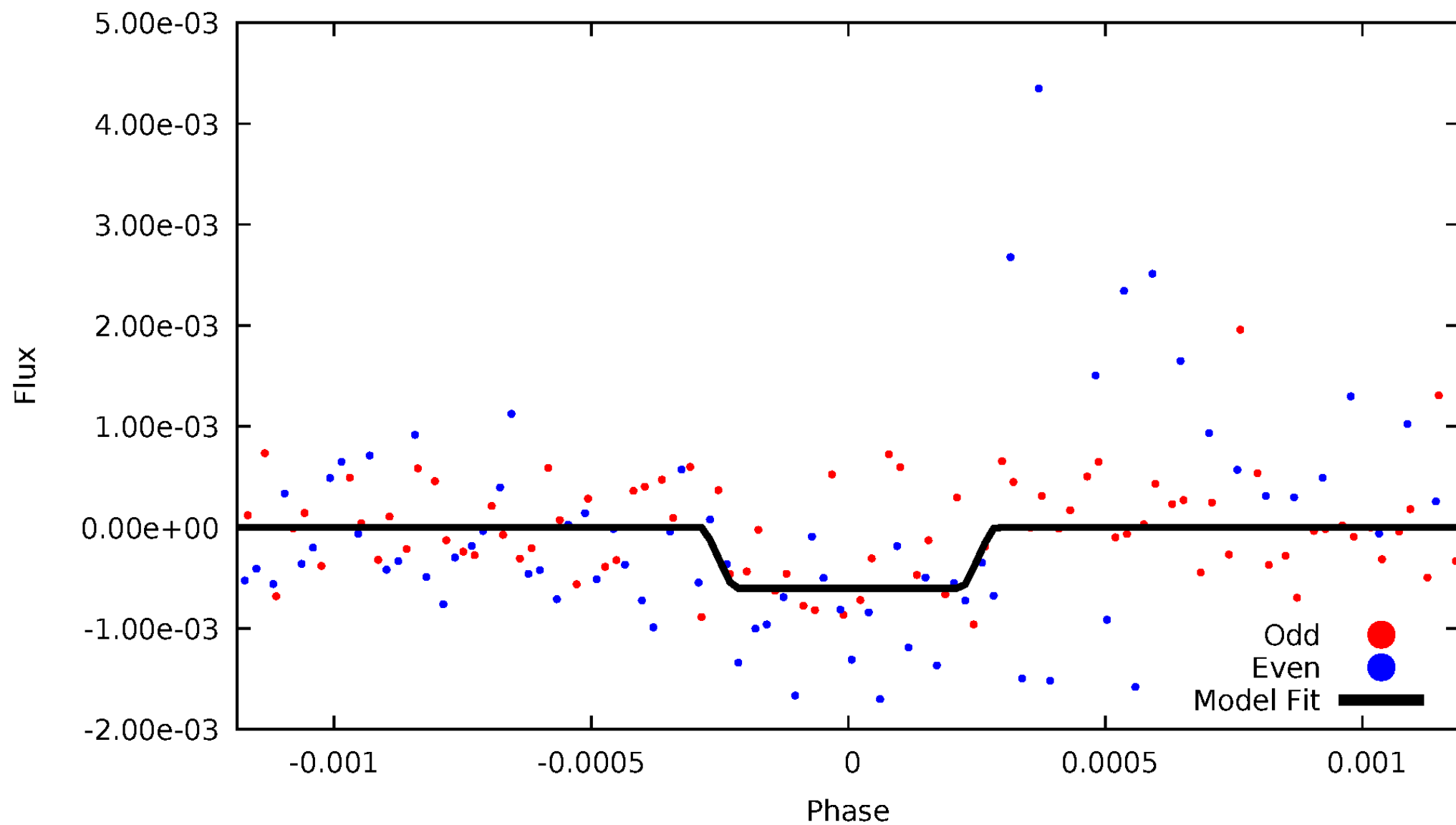
# DV Odd/Even

TCE 010936170-01



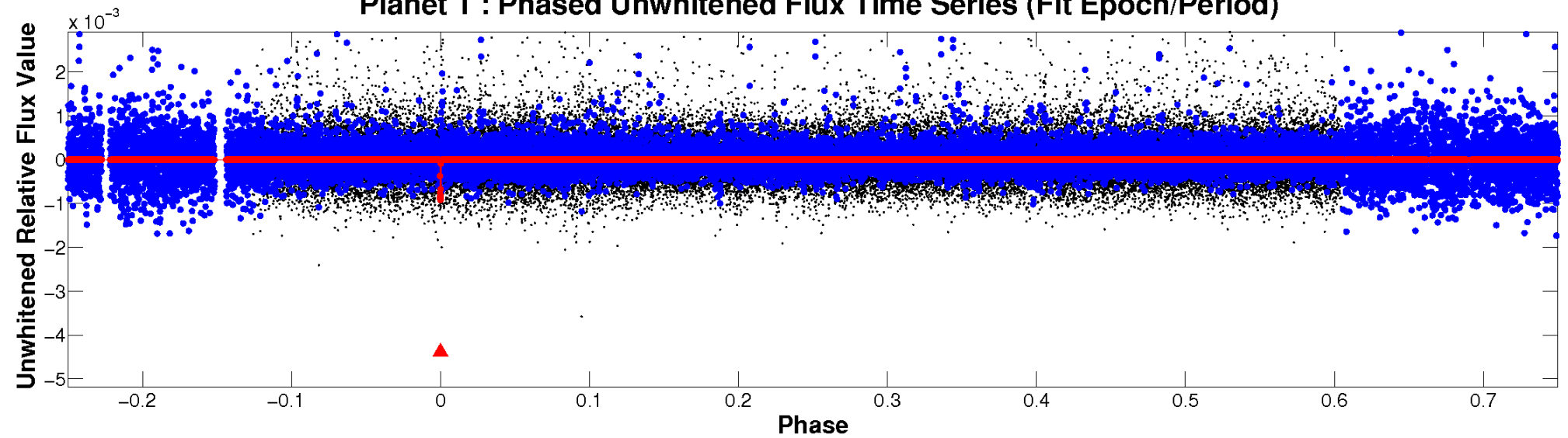
# ALT Odd/Even

TCE 010936170-01

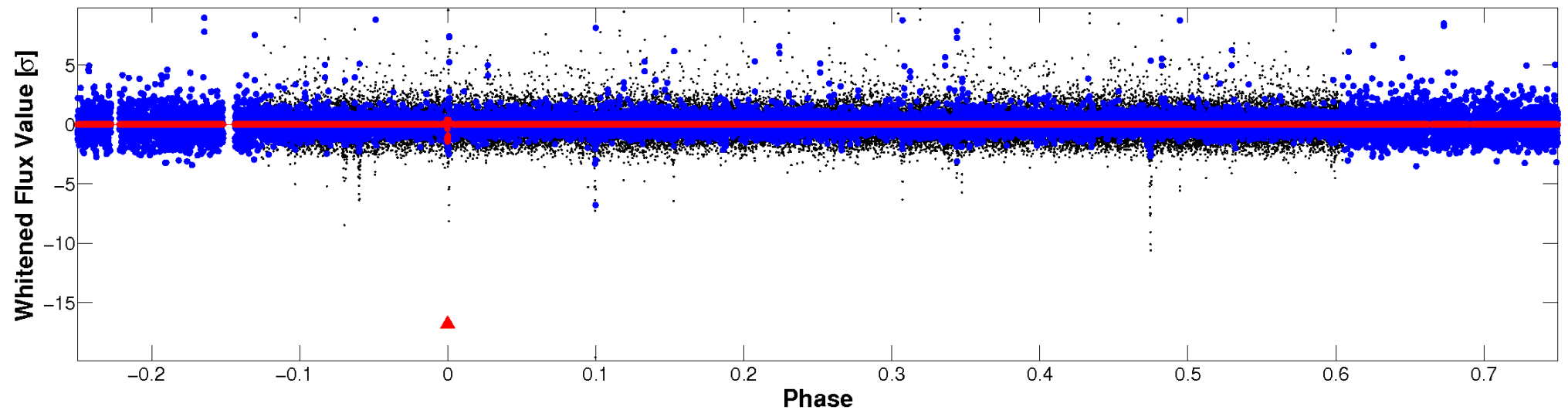


# Non-Whitened Vs. Whitened Light Curve

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

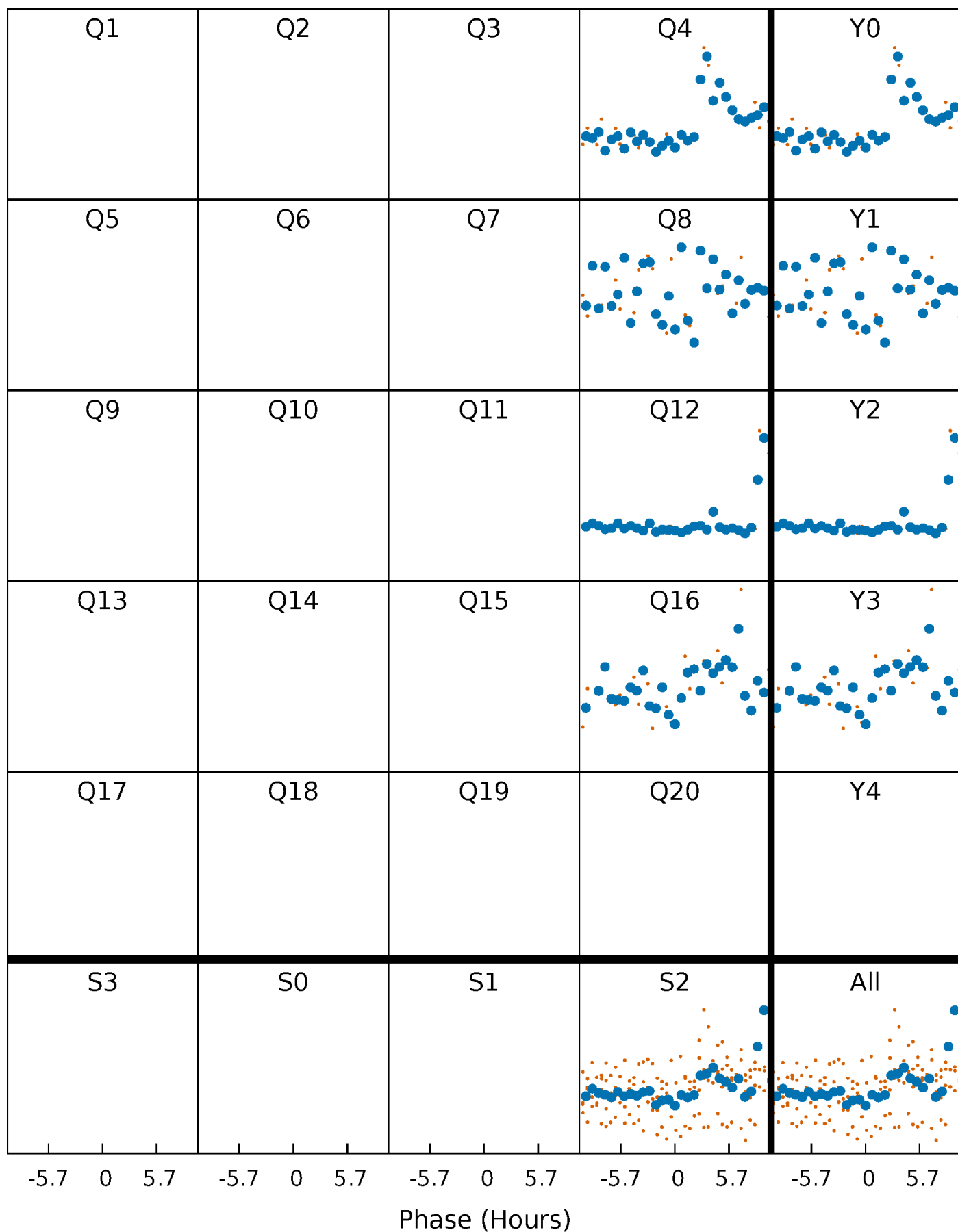


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

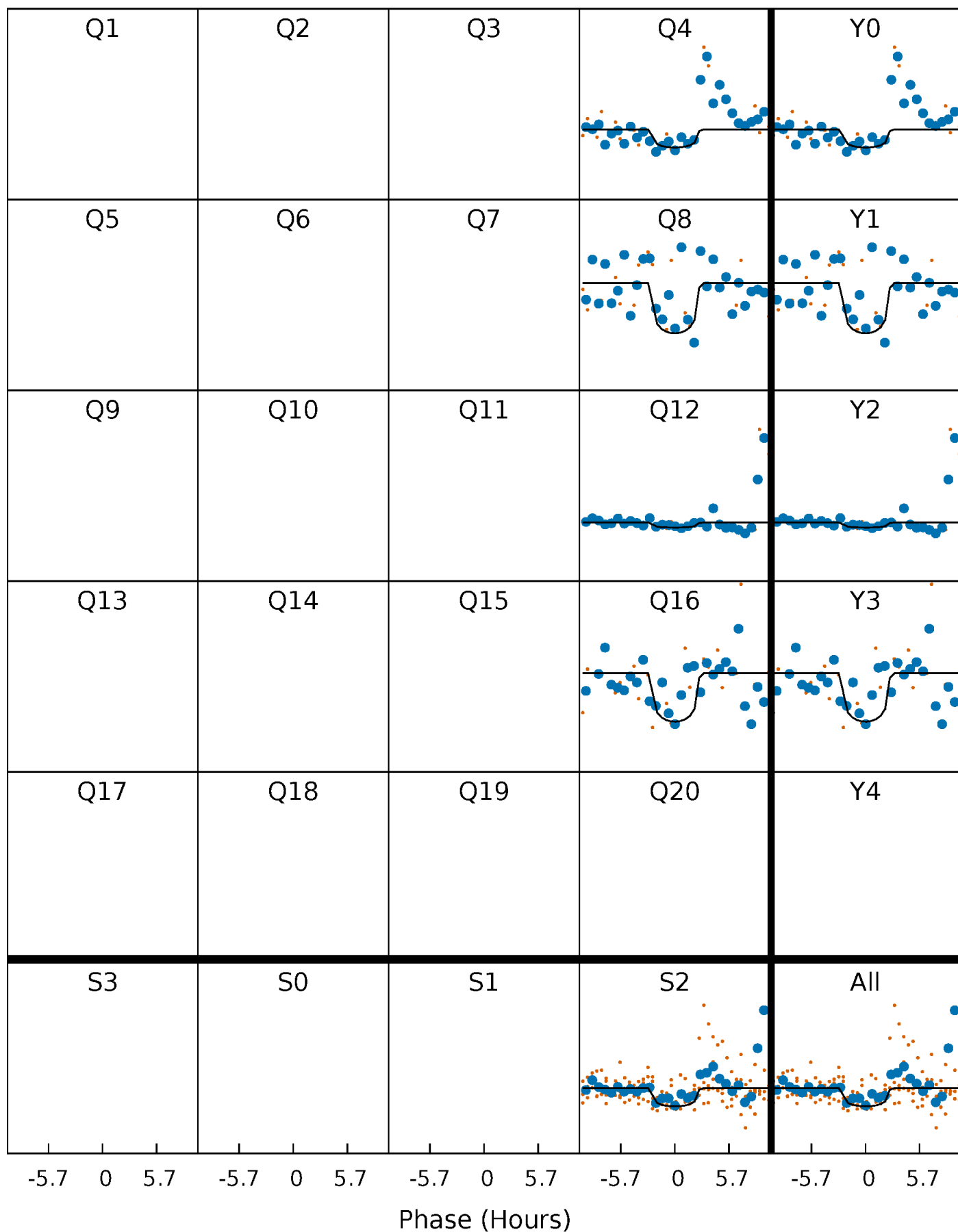
TCE 010936170-01 P=370.440871 Days  $T_0=405.662255$  (BKJD)





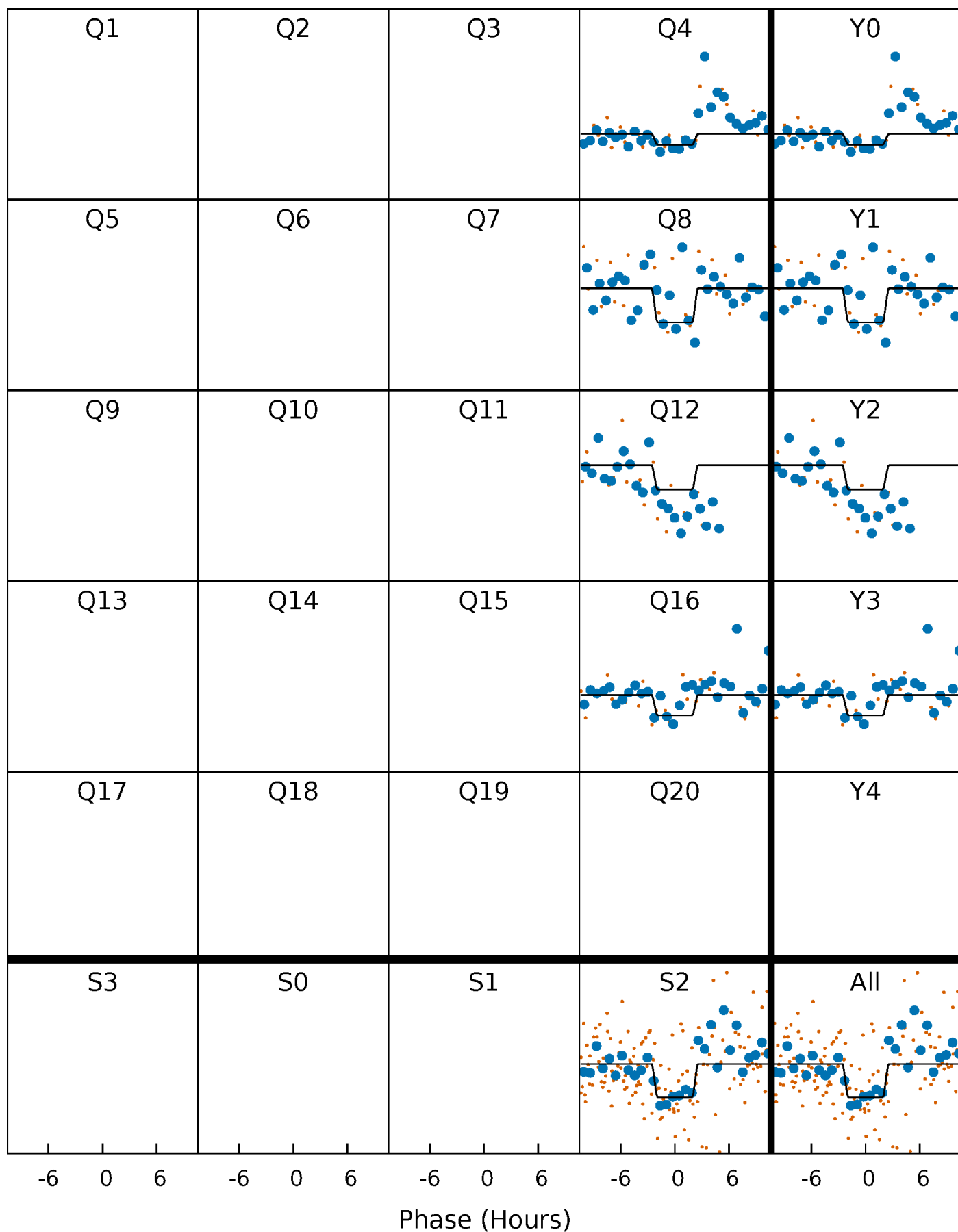
# DV Quarter-Phased Transit Curves

TCE 010936170-01 P=370.440871 Days  $T_0=405.662255$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

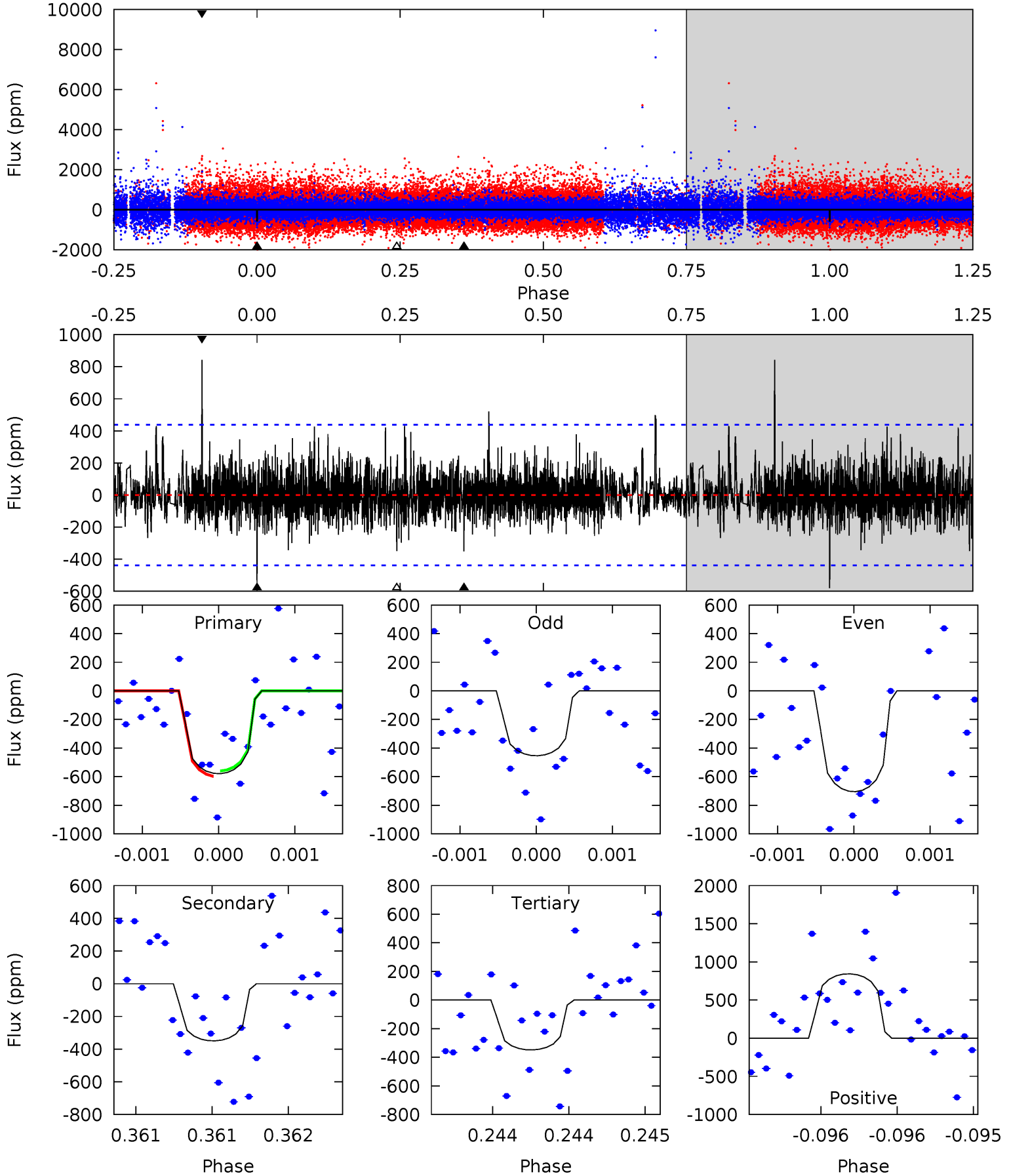
TCE 010936170-01 P=370.446820 Days  $T_0=405.652356$  (BKJD)



# DV Model-Shift Uniqueness Test

010936170-01, P = 370.440871 Days, E = 35.221384 Days

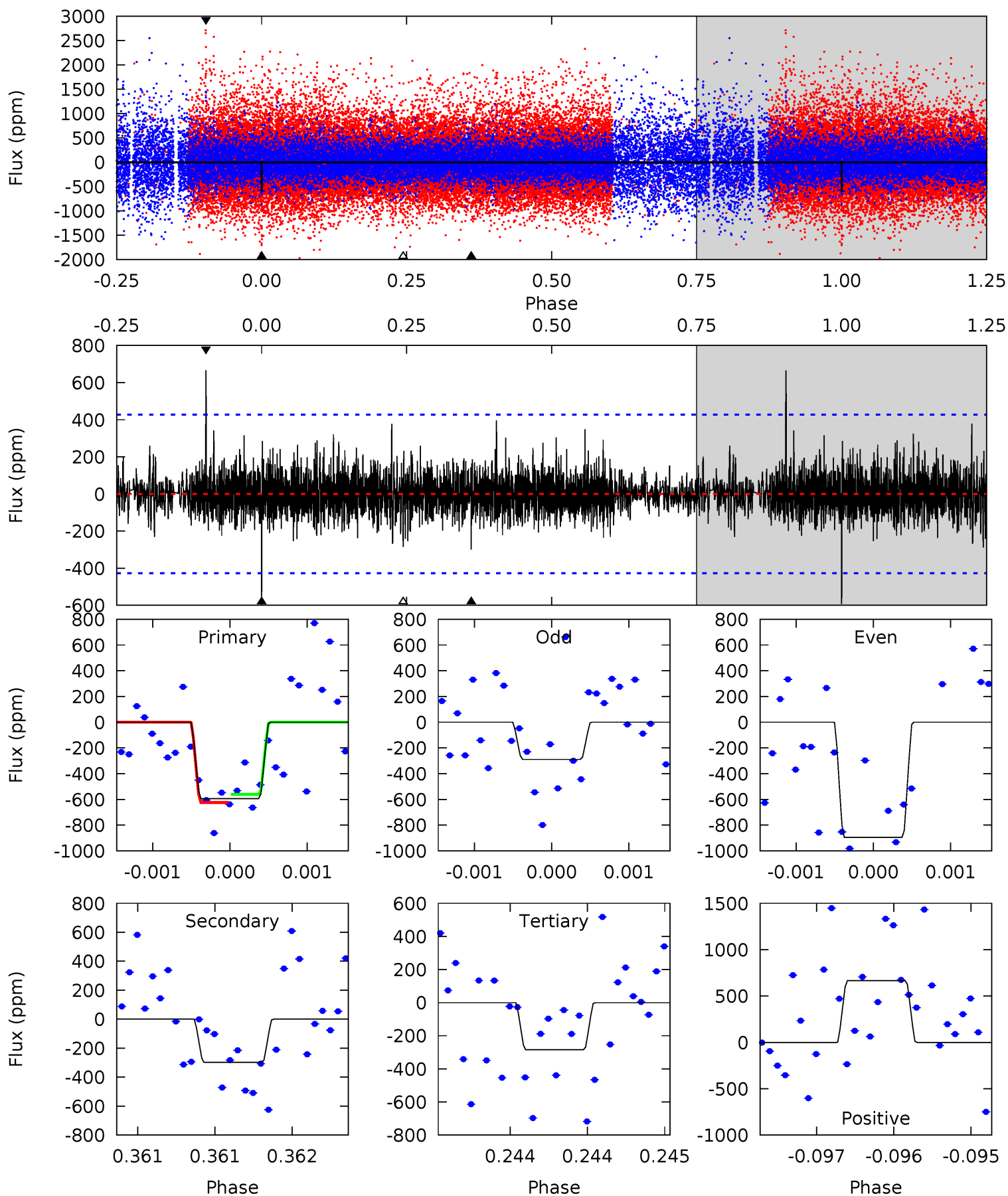
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.32	4.42	4.40	10.7	5.54	3.43	1.29	2.92	-3.34	0.02	-6.24	1.55	1.07	0.59	0.23



# Alt Model-Shift Uniqueness Test

010936170-01, P = 370.446820 Days, E = 35.205536 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
7.70	3.88	3.70	8.65	5.55	3.45	1.07	4.00	-0.95	0.18	-4.77	3.97	1.29	0.53	0.40



### Stellar Parameters For KIC 010936170

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3799^{+53}_{-61}$	$4.738^{+0.032}_{-0.020}$	$-0.100^{+0.100}_{-0.100}$	$0.510^{+0.021}_{-0.030}$	$0.518^{+0.024}_{-0.027}$	$5.508^{+0.819}_{-0.487}$
	+1%/-2%	+1%/-0%	+100%/-100%	+4%/-6%	+5%/-5%	+15%/-9%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 010936170-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-350 \pm 79$	$11.25^{+12.44}_{-7.95}$	$185^{+3}_{-4}$	$2023^{+672}_{-271}$	$945^{+10612}_{-726}$
Alt.	$-299 \pm 77$	$11.54^{+12.09}_{-8.03}$	$185^{+3}_{-4}$	$1979^{+625}_{-256}$	$775^{+7812}_{-591}$

$T_{max}$  = 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

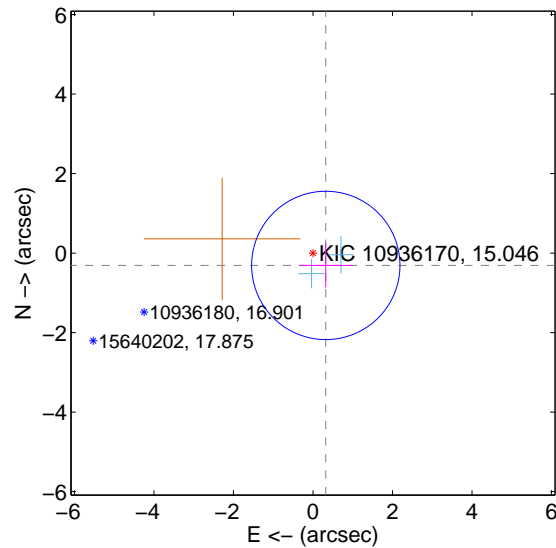
Supplemental centroid analysis for 010936170-01. Kepler magnitude: 15.05. Transit SNR 7.87

There are 2 quarters with good PRF difference image offsets

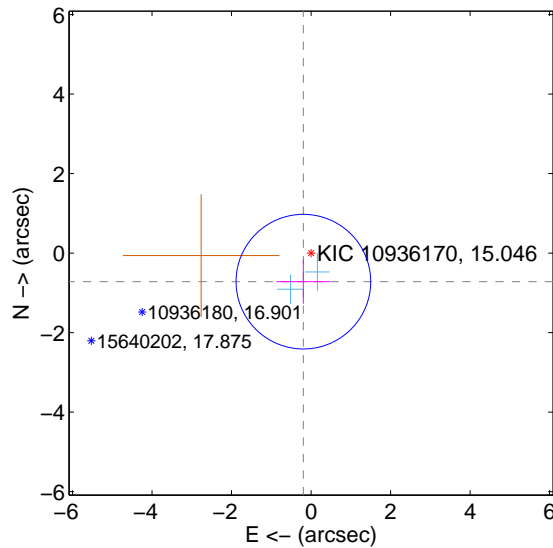
The direct PRF centroid is offset from the target star catalog position by about 0.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.447 \pm 0.622$	0.72	$-0.322 \pm 0.678$	$-0.310 \pm 0.555$
PRF-fit source offset from KIC position	$0.744 \pm 0.564$	1.32	$0.193 \pm 0.678$	$-0.719 \pm 0.555$
photometric centroid source offset	$1.10 \pm 1.32$	0.83	$1.10 \pm 1.32$	$0.13 \pm 1.42$

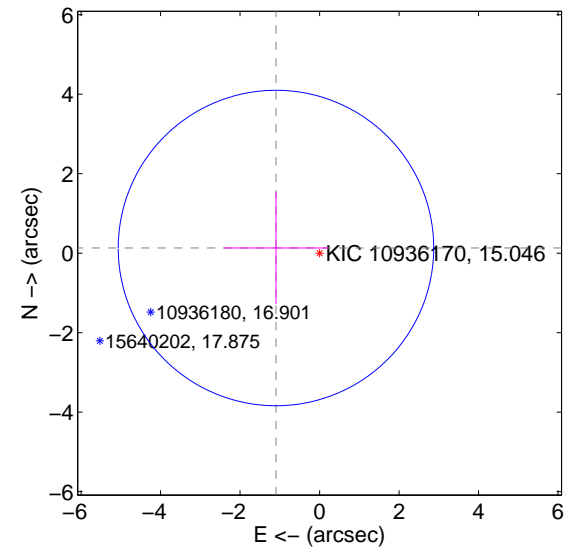
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



Q2 no difference image



Q2 no OOT image



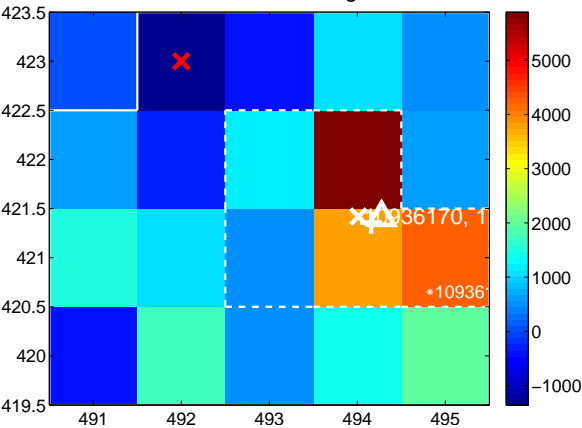
Q3 no difference image



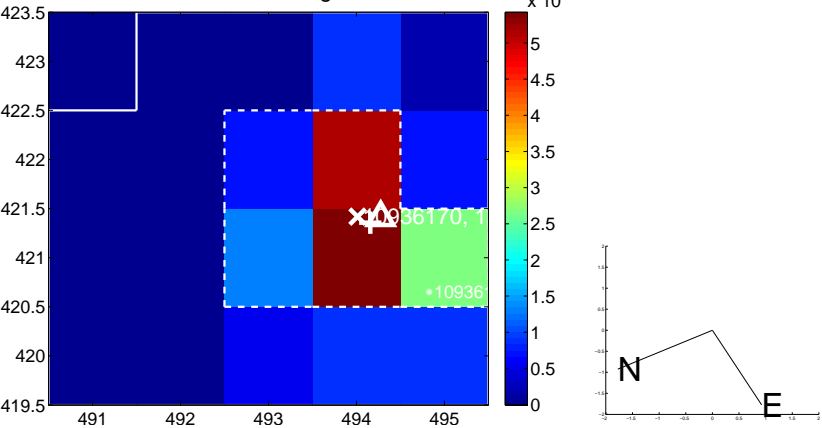
Q3 no OOT image



Q4 difference image



Q4 OOT image



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

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



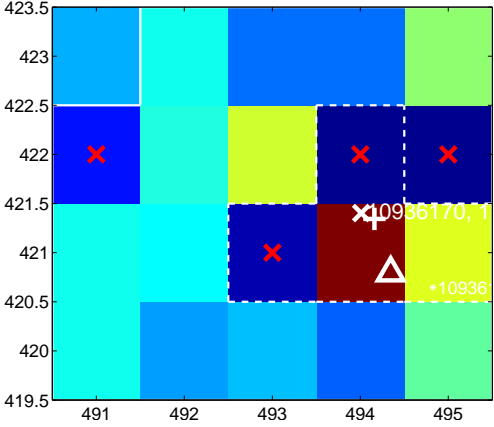
Q7 no difference image



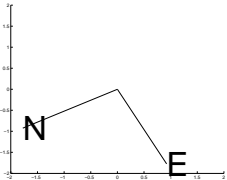
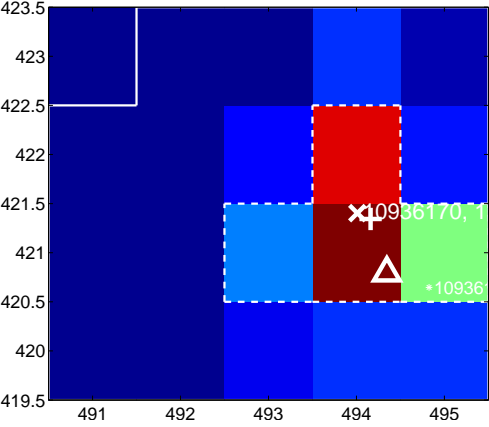
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image





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



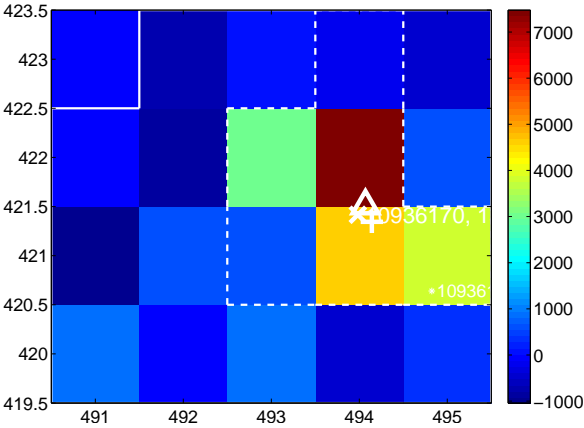
Q11 no difference image



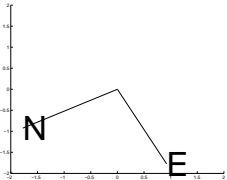
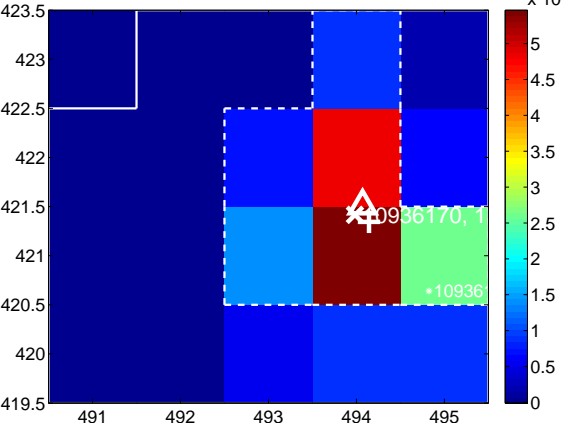
Q11 no OOT image



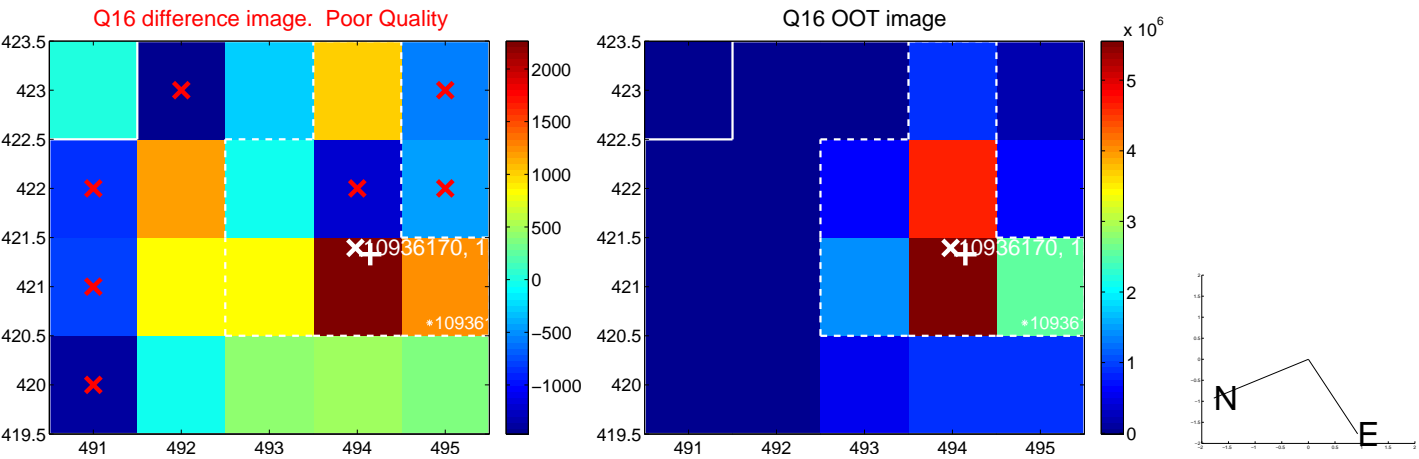
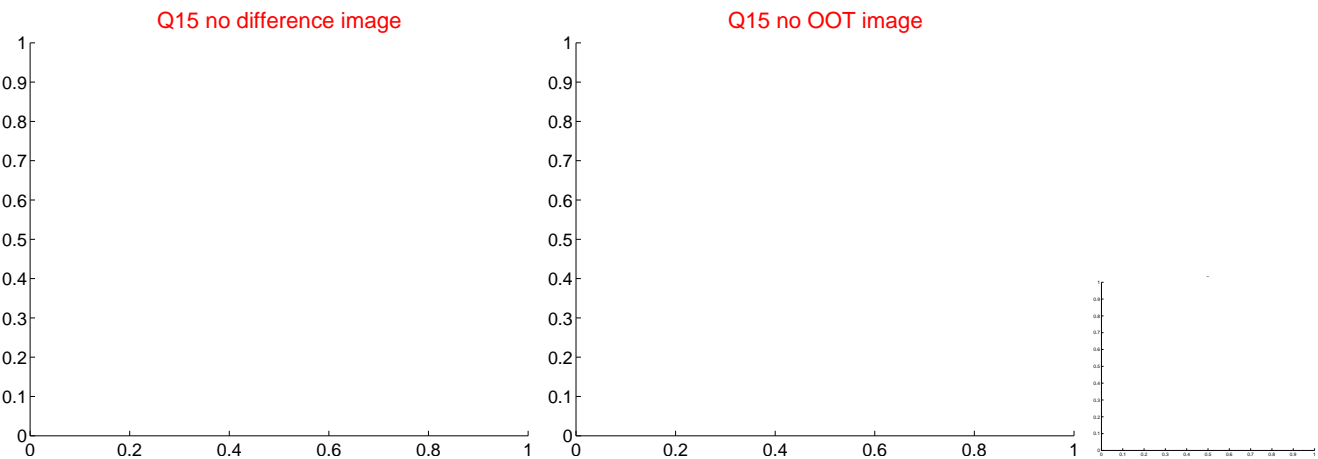
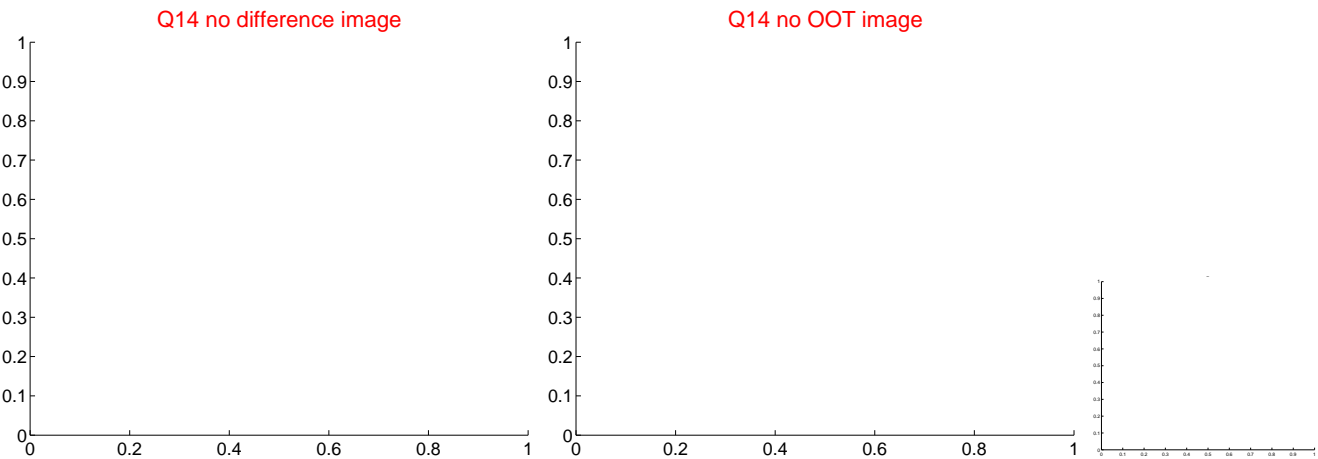
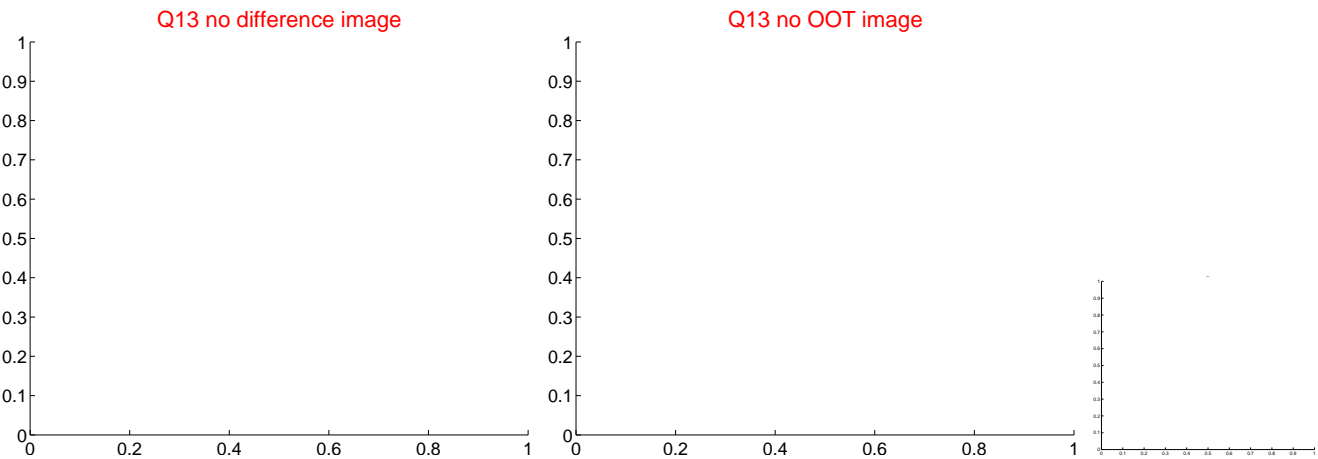
Q12 difference image



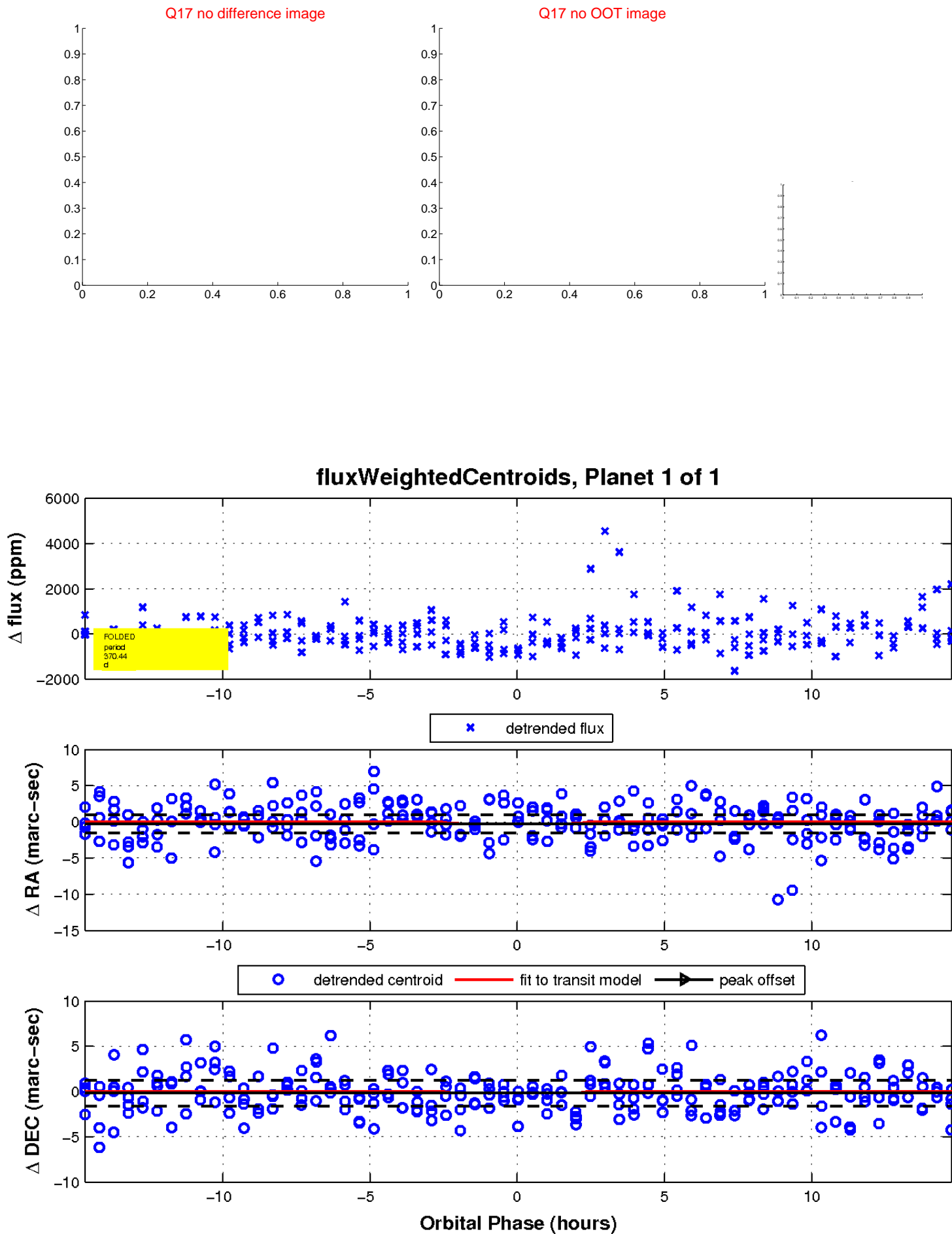
Q12 OOT image



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

