

# KIC 008244060

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008244060-01	OBS	No	370.911150	230.779093	1346.9	12.469	12.0	12.1	0.92	5851	4.18	0.86
008244060-02	OBS	No	546.684633	190.803229	1117.9	33.420	8.3	9.2	0.92	5851	3.82	0.52

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008244060-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008244060-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

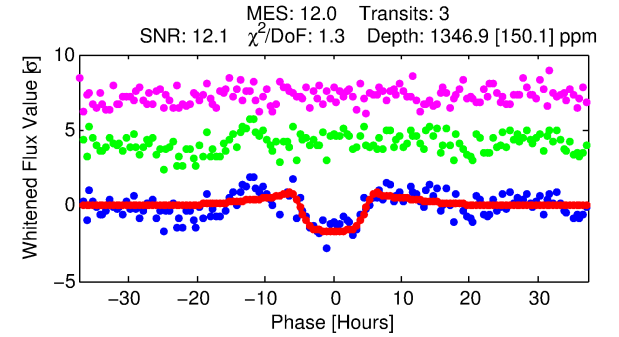
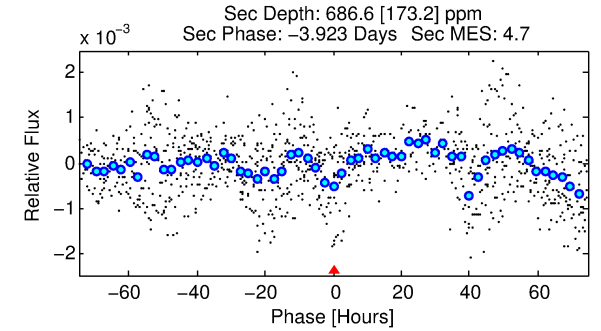
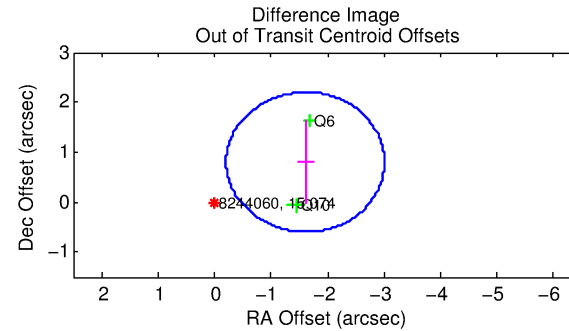
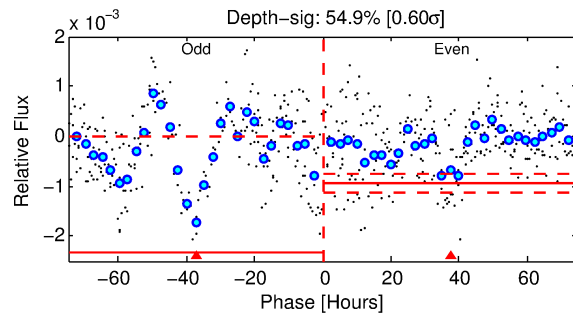
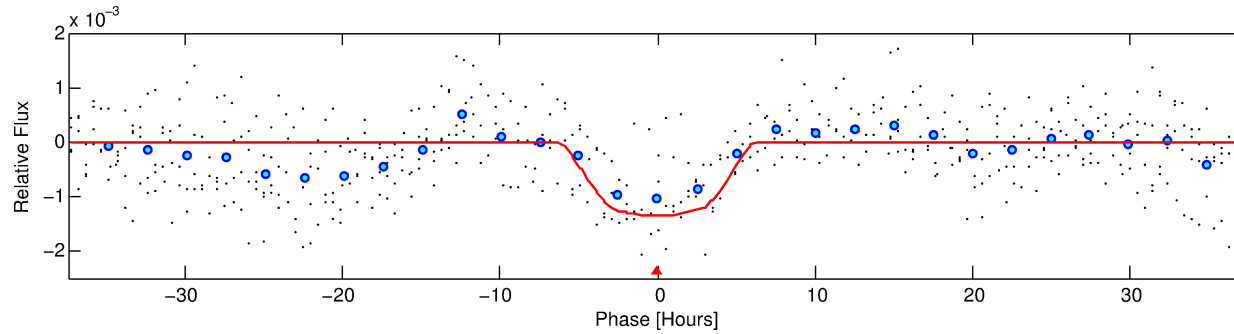
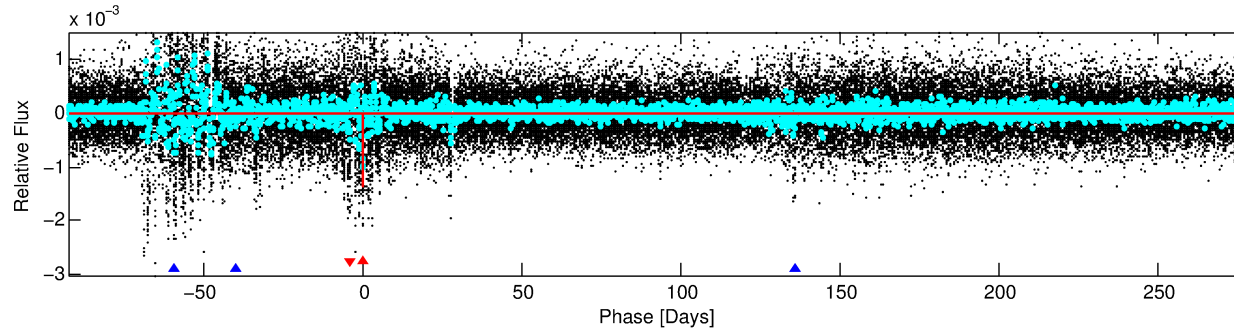
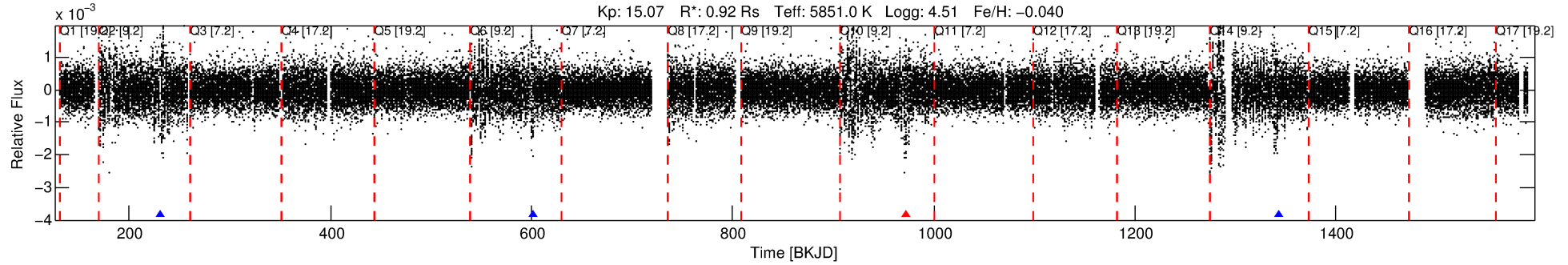
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008244060-01

No Significant Match Found

# DV One-Page Summary

KIC: 8244060 Candidate: 1 of 2 Period: 370.911 d



## DV Fit Results:

Period = 370.91115 [0.01341] d  
Epoch = 230.7791 [0.0277] BKJD  
Rp/R\* = 0.0418 [0.0032]  
a/R\* = 103.74 [17.51]  
b = 0.94 [0.02]  
Seff = 0.86 [0.33]  
Teq = 246 [24] K  
Rp = 4.18 [1.29] Re  
a = 1.0126 [0.2551] AU  
Ag = 22136.57 [10400.29] [2.13 $\sigma$ ]  
Teffp = 4635 [368] K [11.90 $\sigma$ ]

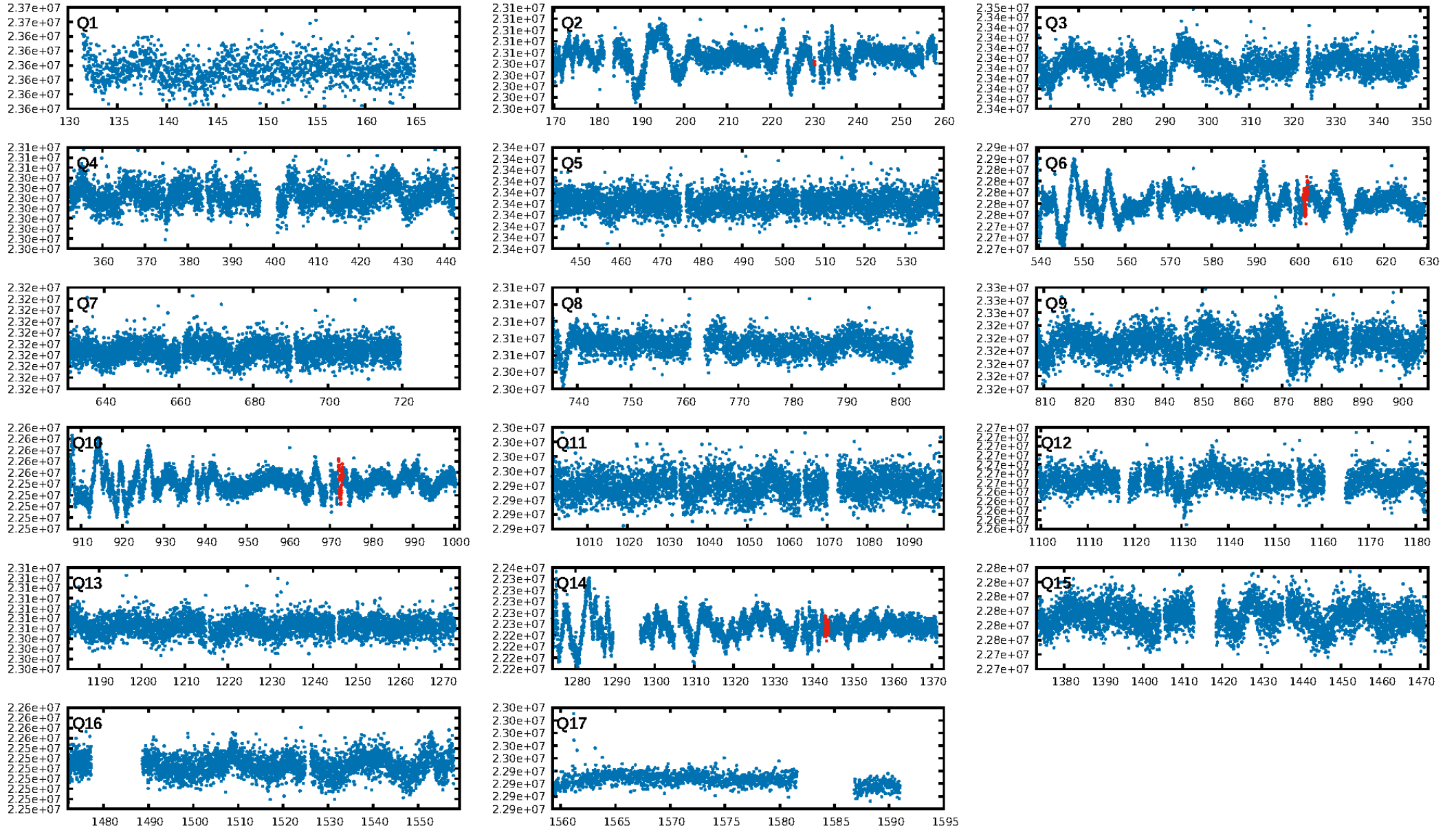
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [118.26 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 60.0%  
Bootstrap-pfa: 2.11e-12  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: 4.564  
Centroid-sig: 53.6%  
Centroid-so: 1.551 arcsec [0.99 $\sigma$ ]  
OotOffset-rm: 1.796 arcsec [3.85 $\sigma$ ]  
KicOffset-rm: 1.705 arcsec [3.62 $\sigma$ ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [3/3]

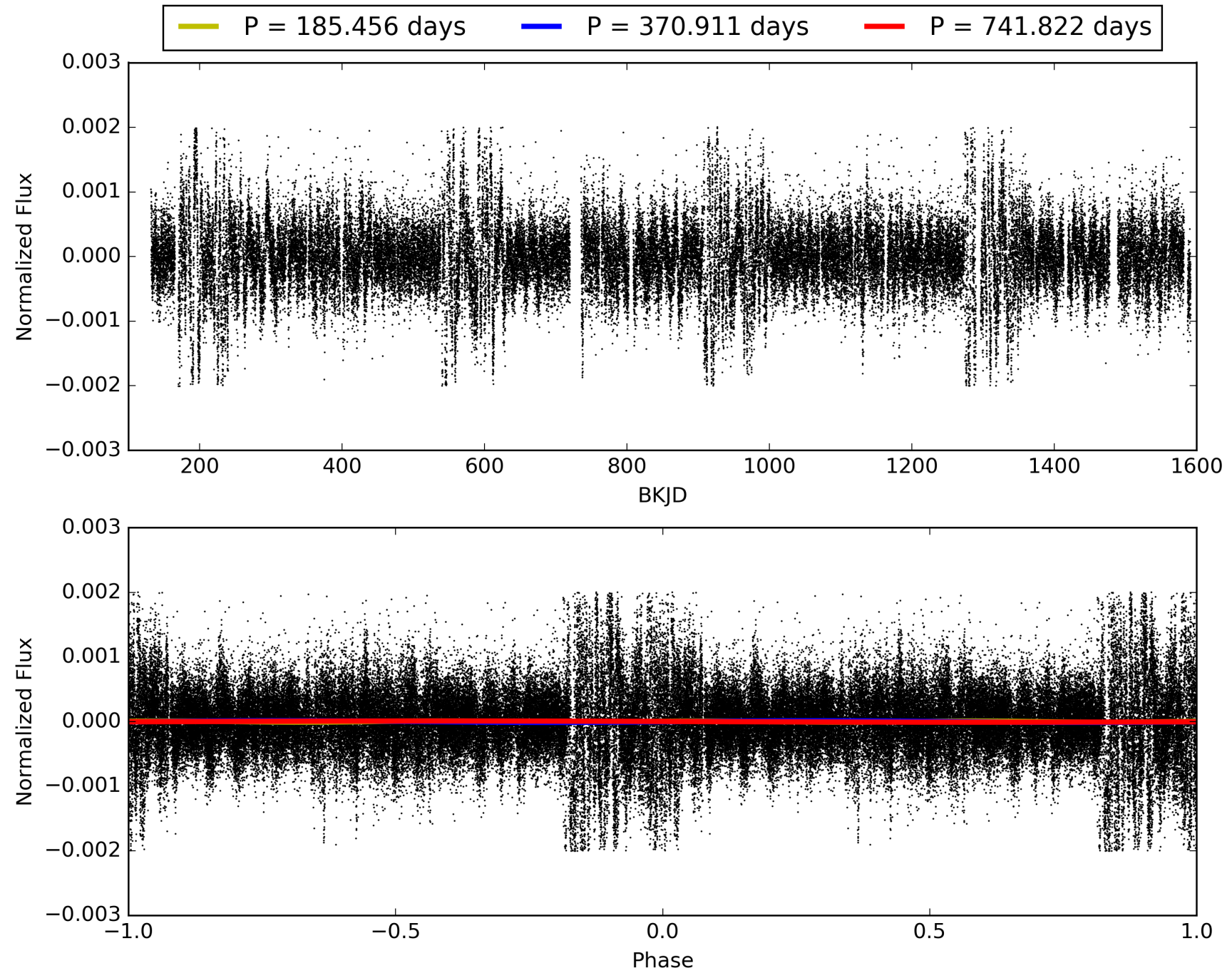
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:50:08 Z

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

# TCE 008244060-01, PDC Light Curves

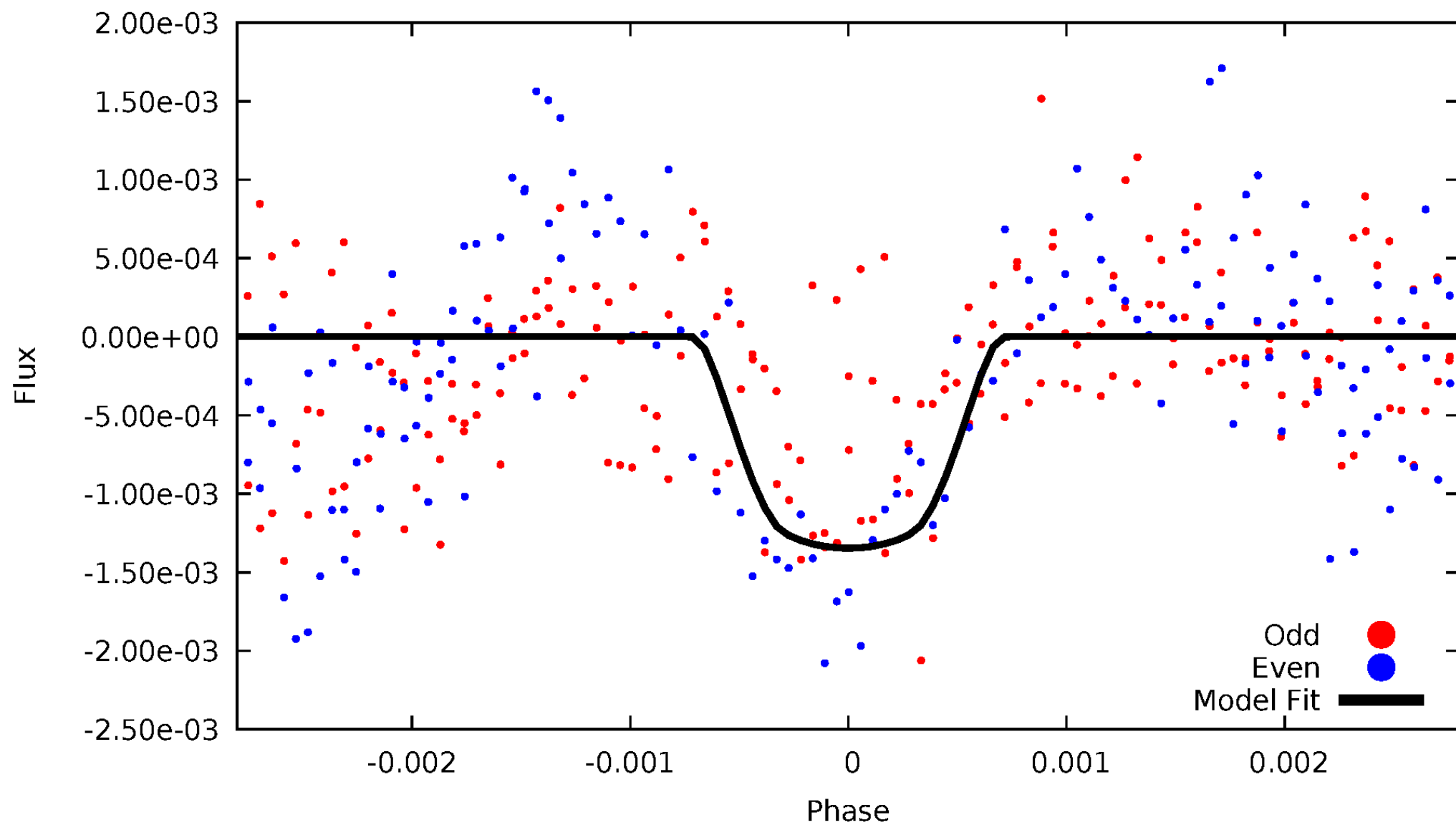


TCE 008244060-01



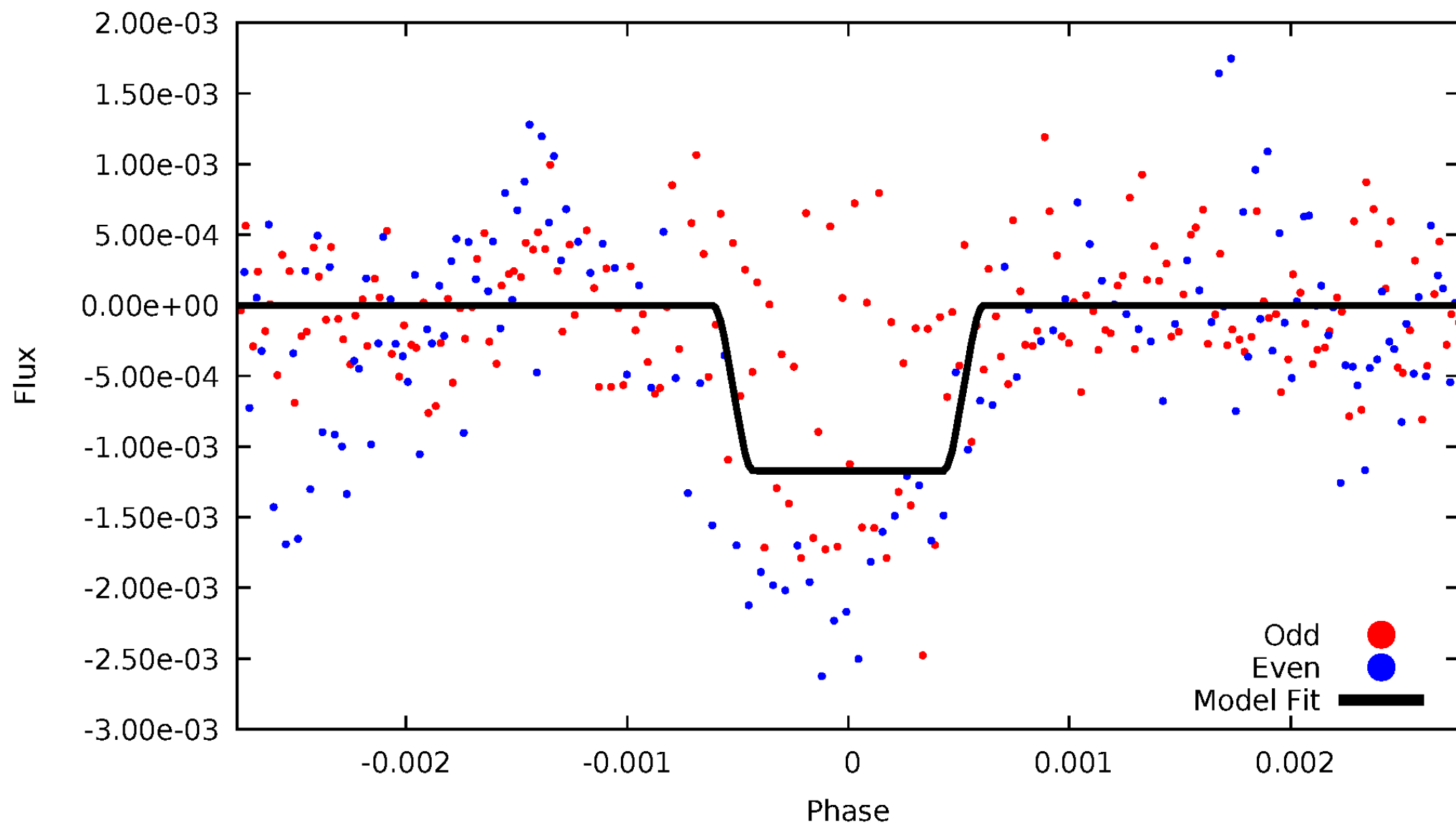
# DV Odd/Even

TCE 008244060-01



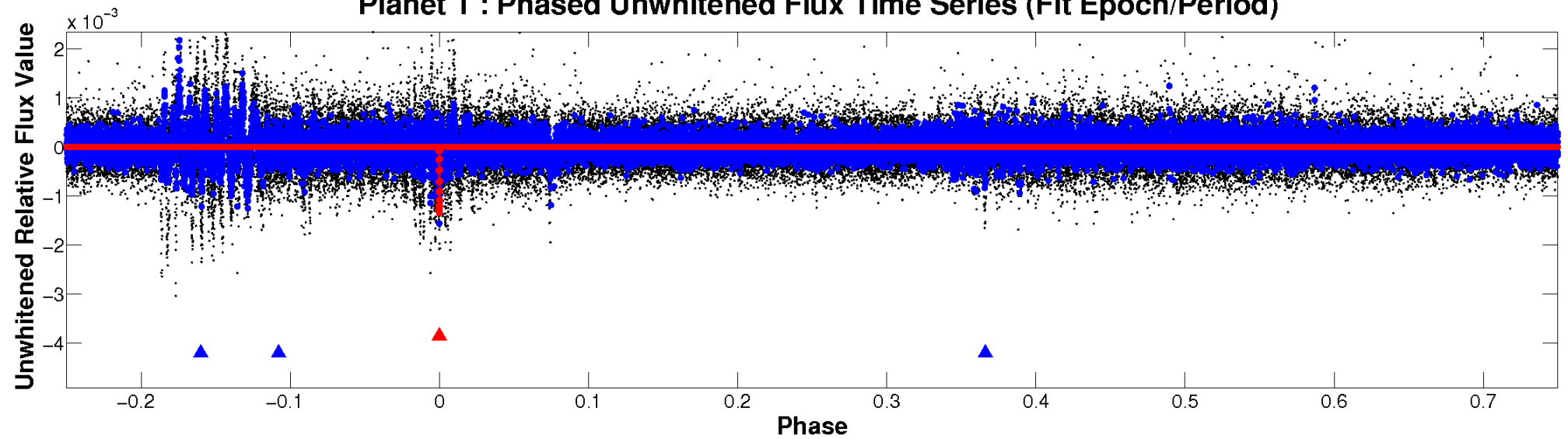
# ALT Odd/Even

TCE 008244060-01

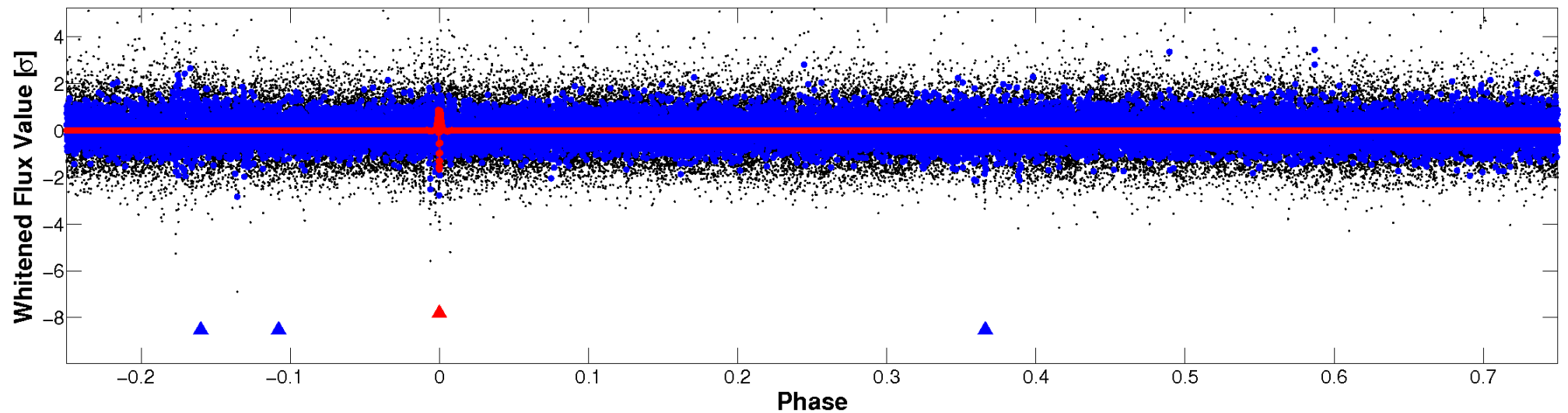


# Non-Whitened Vs. Whitened Light Curve

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



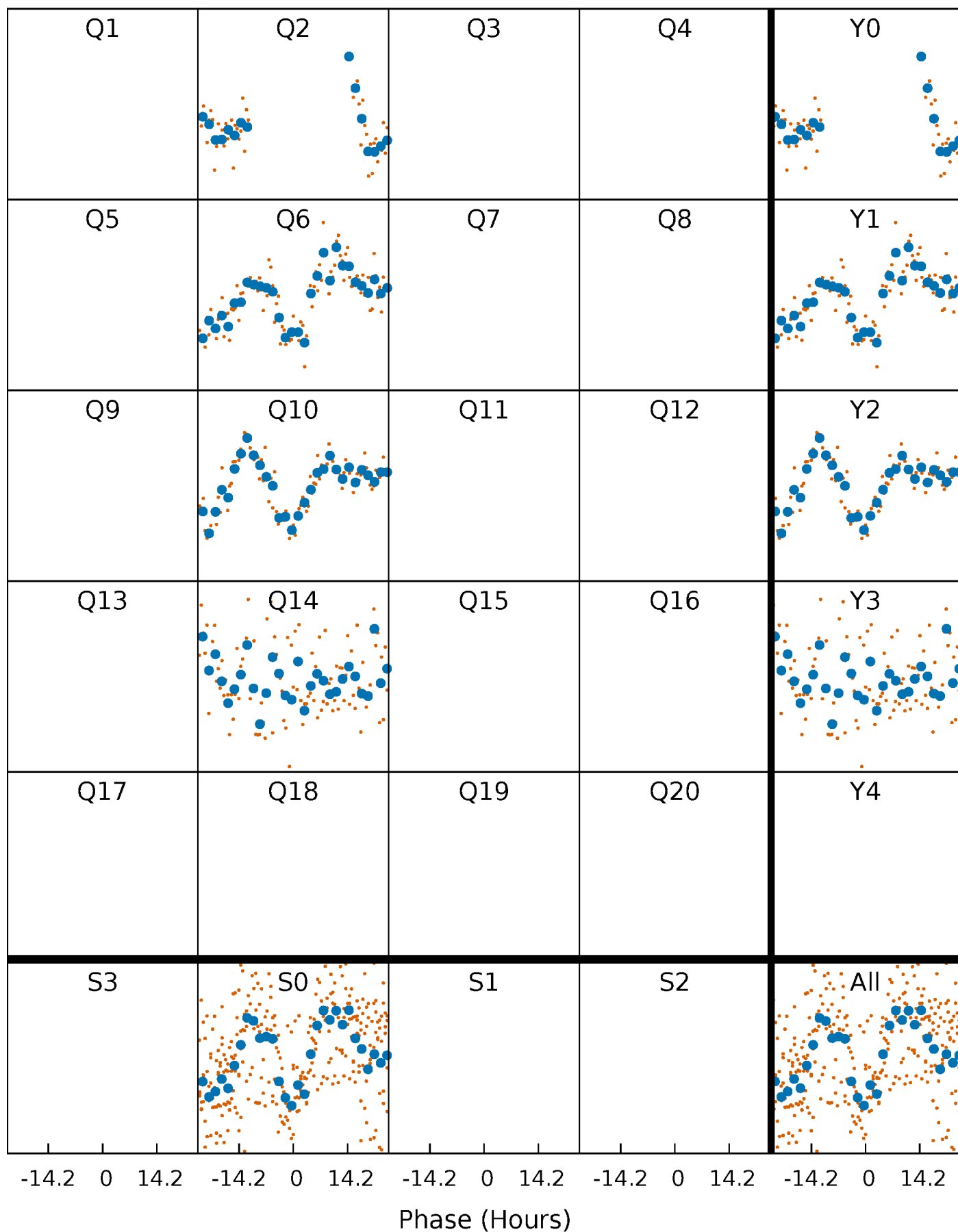
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

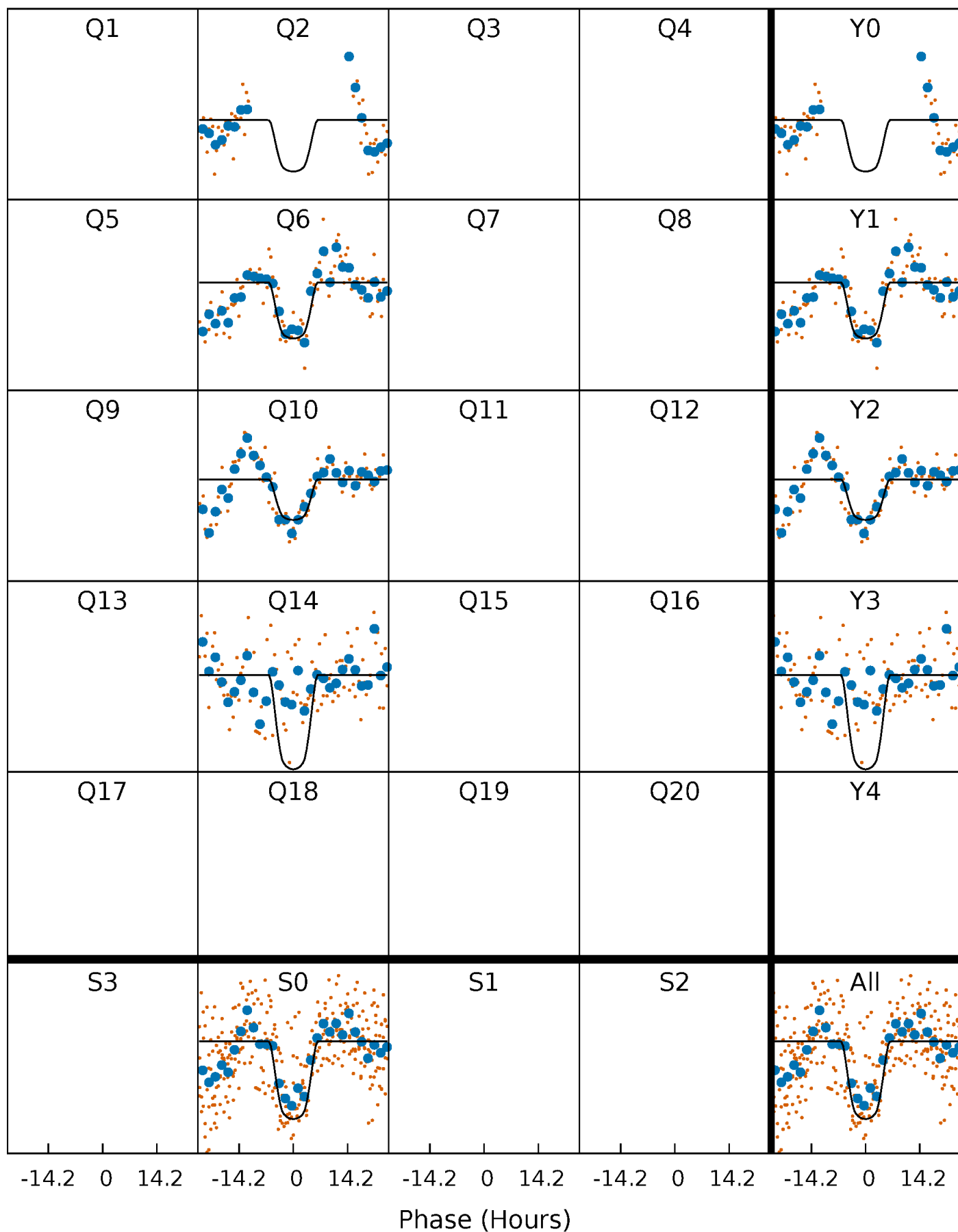
TCE 008244060-01 P=370.911150 Days  $T_0=230.779093$  (BKJD)





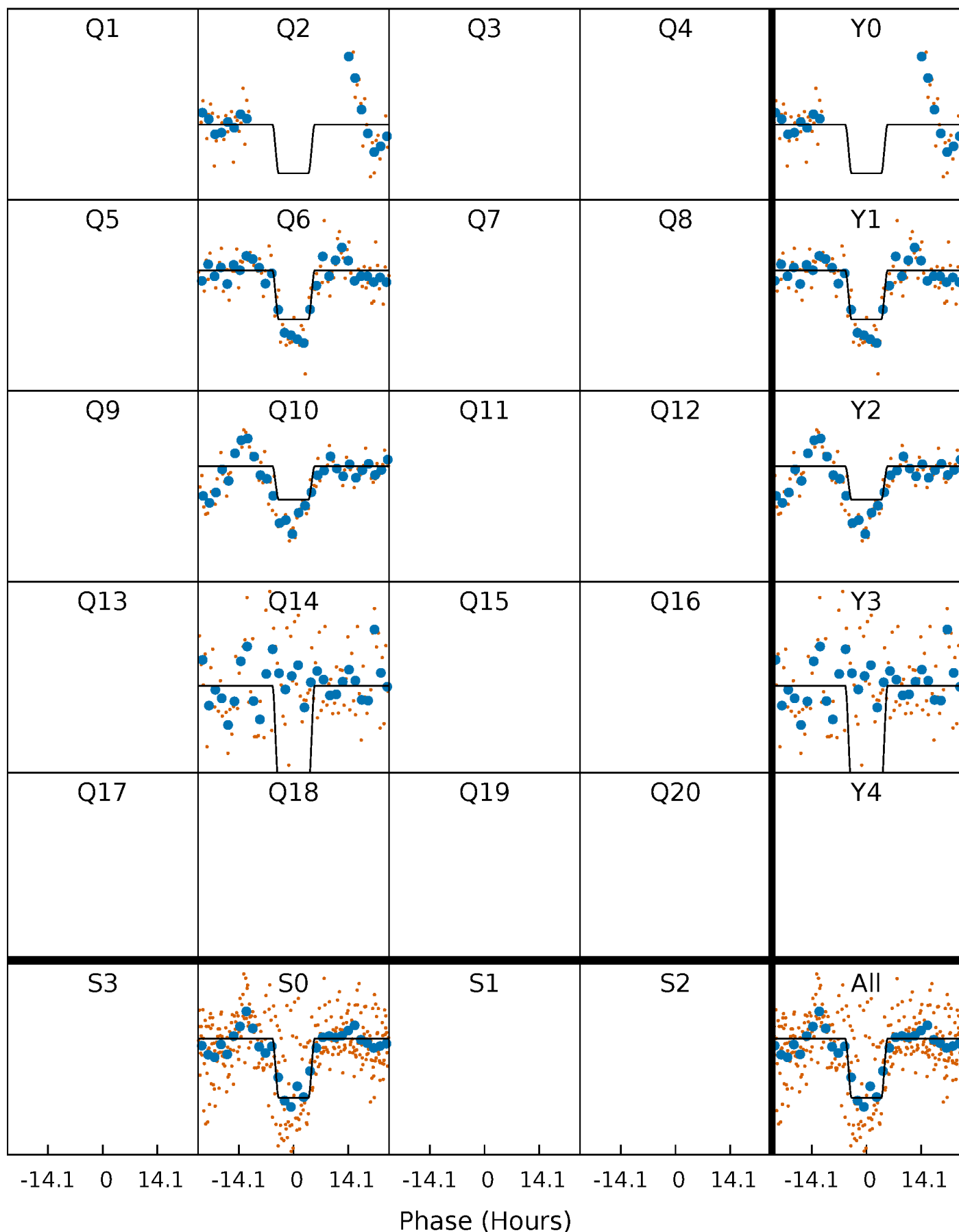
# DV Quarter-Phased Transit Curves

TCE 008244060-01 P=370.911150 Days  $T_0=230.779093$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

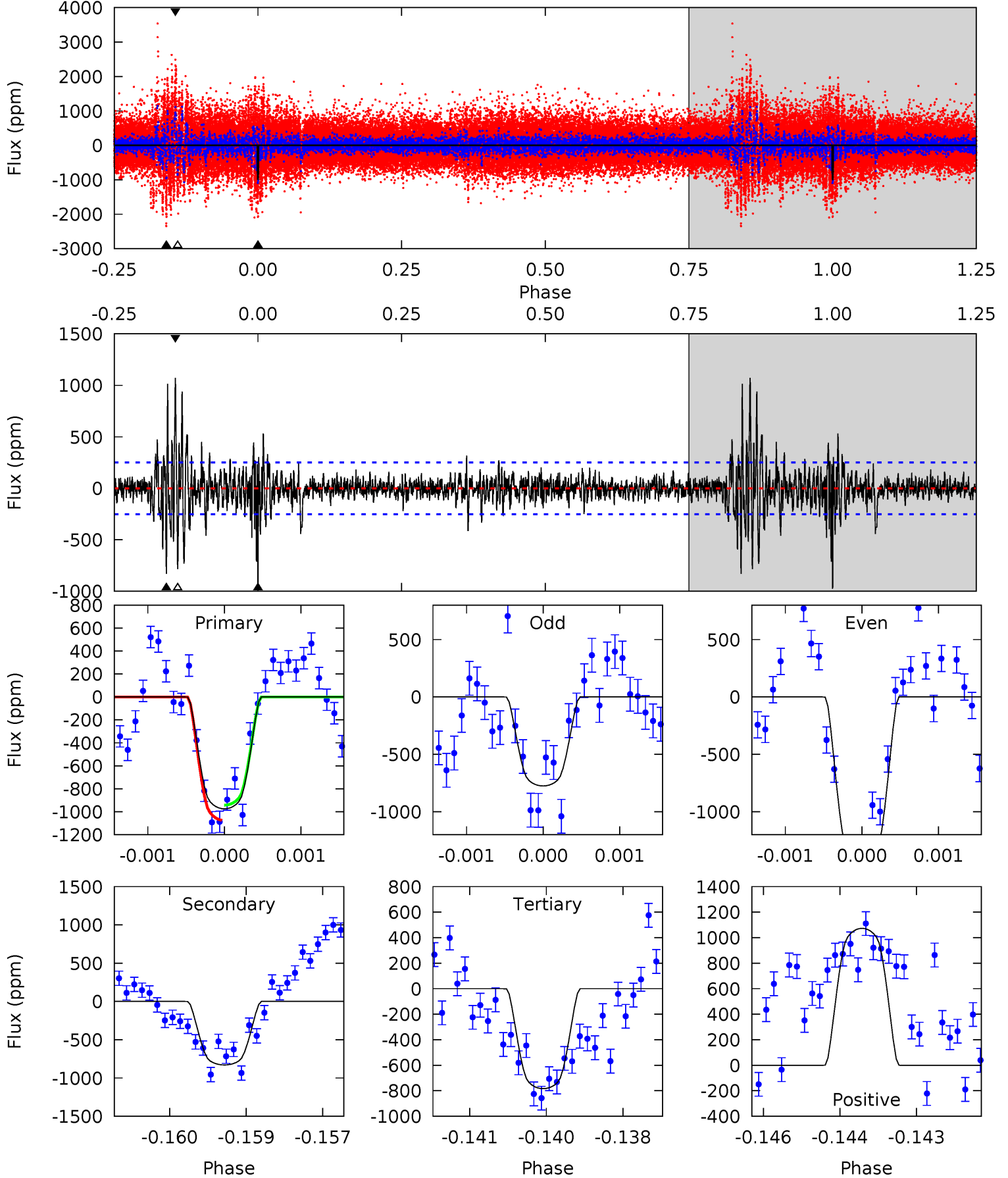
TCE 008244060-01 P=370.916792 Days  $T_0=230.772202$  (BKJD)



# DV Model-Shift Uniqueness Test

008244060-01, P = 370.911150 Days, E = 230.779093 Days

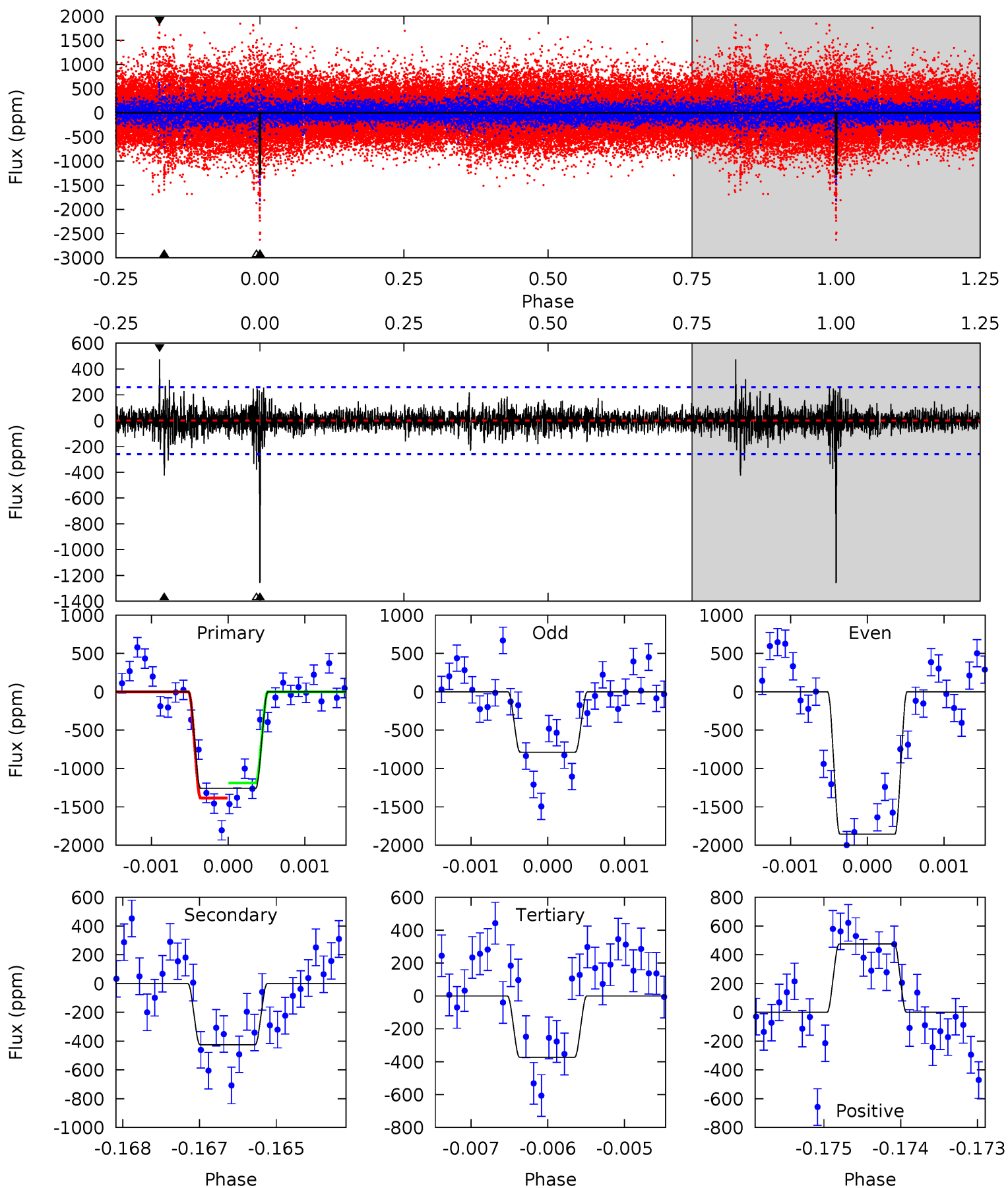
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.9	17.7	16.8	23.0	5.38	3.18	2.77	4.09	-2.10	0.99	-5.21	6.48	0.82	0.52	1.38



# Alt Model-Shift Uniqueness Test

008244060-01, P = 370.916792 Days, E = 230.772202 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
26.2	8.85	7.76	9.89	5.42	3.24	1.23	18.4	16.3	1.08	-1.04	10.8	0.74	0.27	2.03



### Stellar Parameters For KIC 008244060

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5851^{+157}_{-175}$	$4.515^{+0.050}_{-0.200}$	$-0.040^{+0.250}_{-0.300}$	$0.918^{+0.275}_{-0.092}$	$1.007^{+0.113}_{-0.139}$	$1.832^{+0.379}_{-0.976}$
	+3%/-3%	+1%/-4%	+625%/-750%	+30%/-10%	+11%/-14%	+21%/-53%
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 008244060-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-830 \pm 47$	$4.31^{+0.74}_{-0.51}$	$350^{+25}_{-16}$	$4952^{+202}_{-199}$	$24514^{+6627}_{-6209}$
Alt.	$-425 \pm 48$	$3.60^{+0.59}_{-0.47}$	$353^{+23}_{-17}$	$4682^{+246}_{-223}$	$18319^{+5416}_{-4977}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

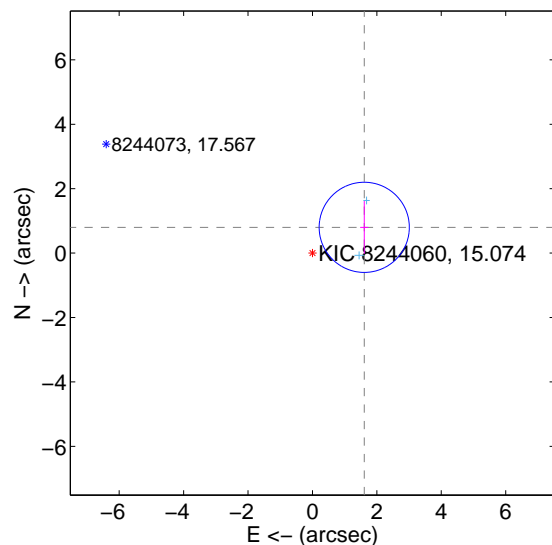
Supplemental centroid analysis for 008244060-01. Kepler magnitude: 15.07. Transit SNR 12.10

There are 2 quarters with good PRF difference image offsets

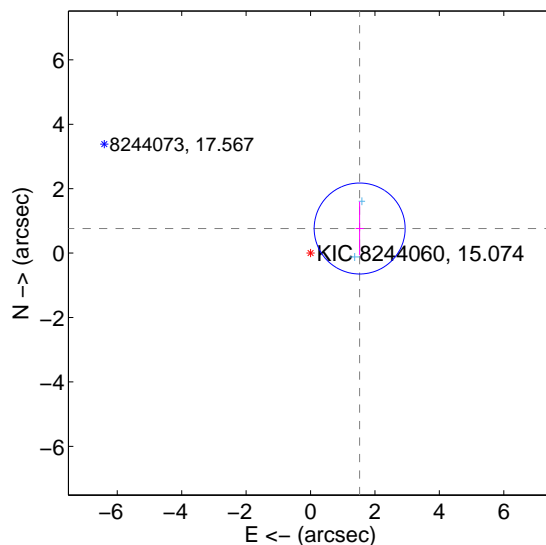
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.796 \pm 0.467$	3.85	$-1.608 \pm 0.129$	$0.800 \pm 0.819$
PRF-fit source offset from KIC position	$1.705 \pm 0.471$	3.62	$-1.525 \pm 0.126$	$0.764 \pm 0.831$
photometric centroid source offset	$1.55 \pm 1.57$	0.99	$1.55 \pm 1.57$	$0.08 \pm 1.65$

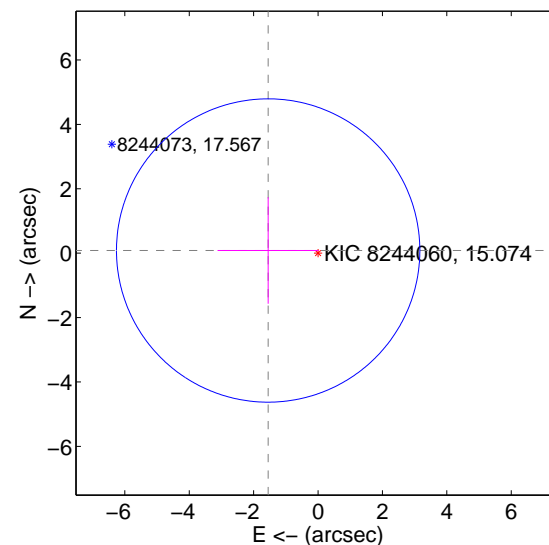
offset from difference PRF-fit to OOT PRF-fit



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.

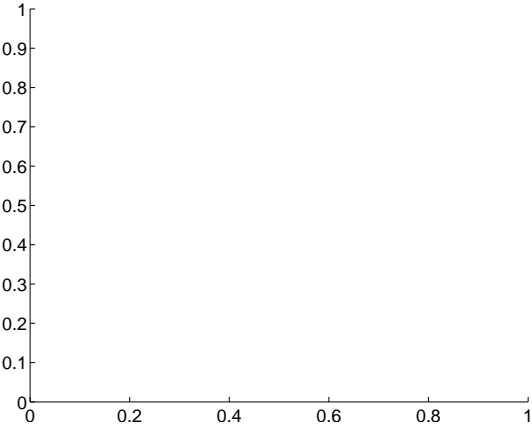
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



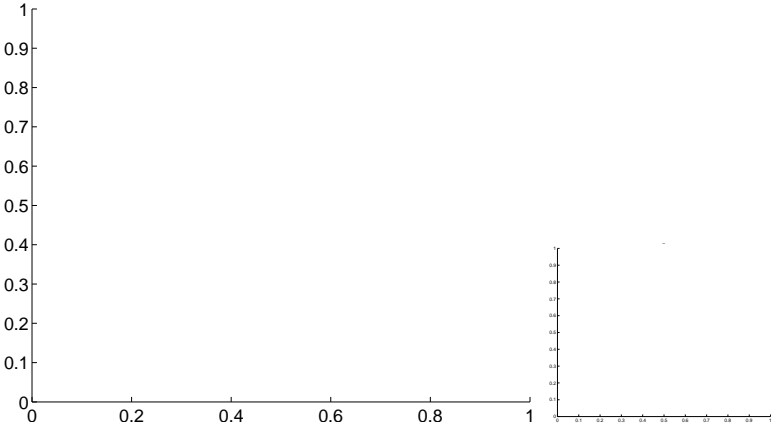


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

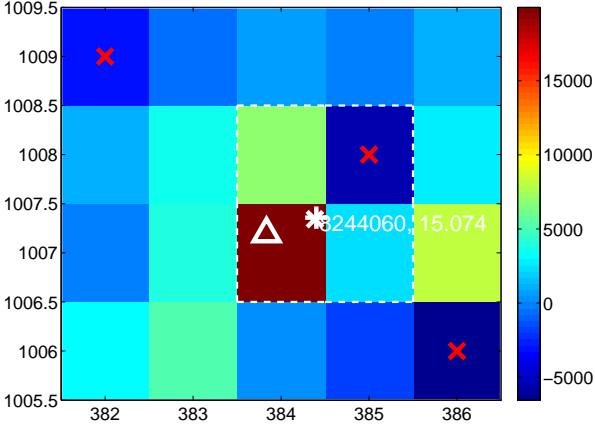
Q5 no difference image



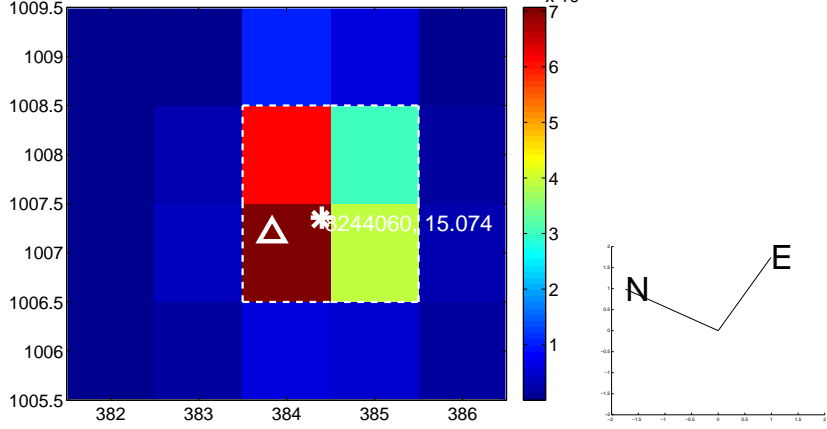
Q5 no OOT image



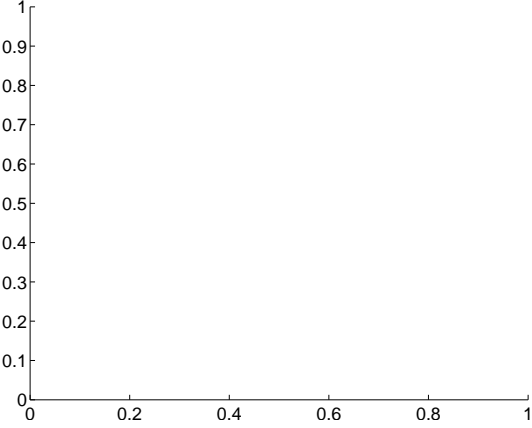
Q6 difference image



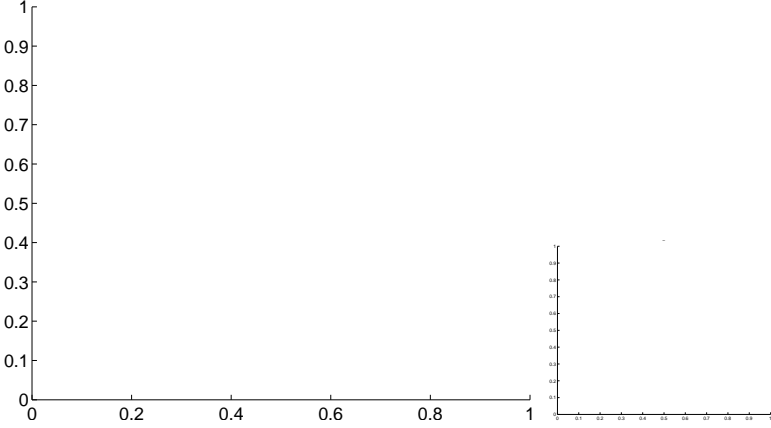
Q6 OOT image



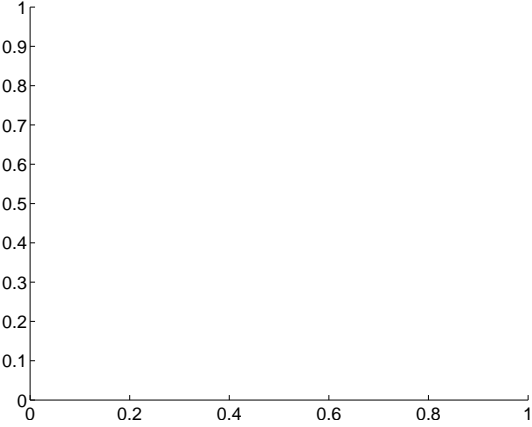
Q7 no difference image



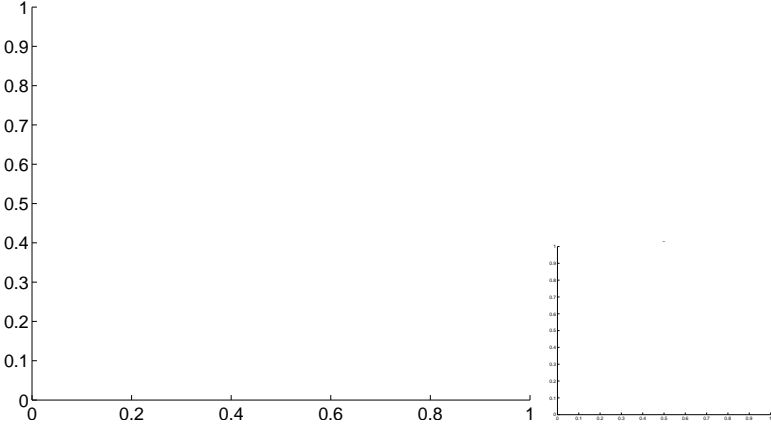
Q7 no OOT image



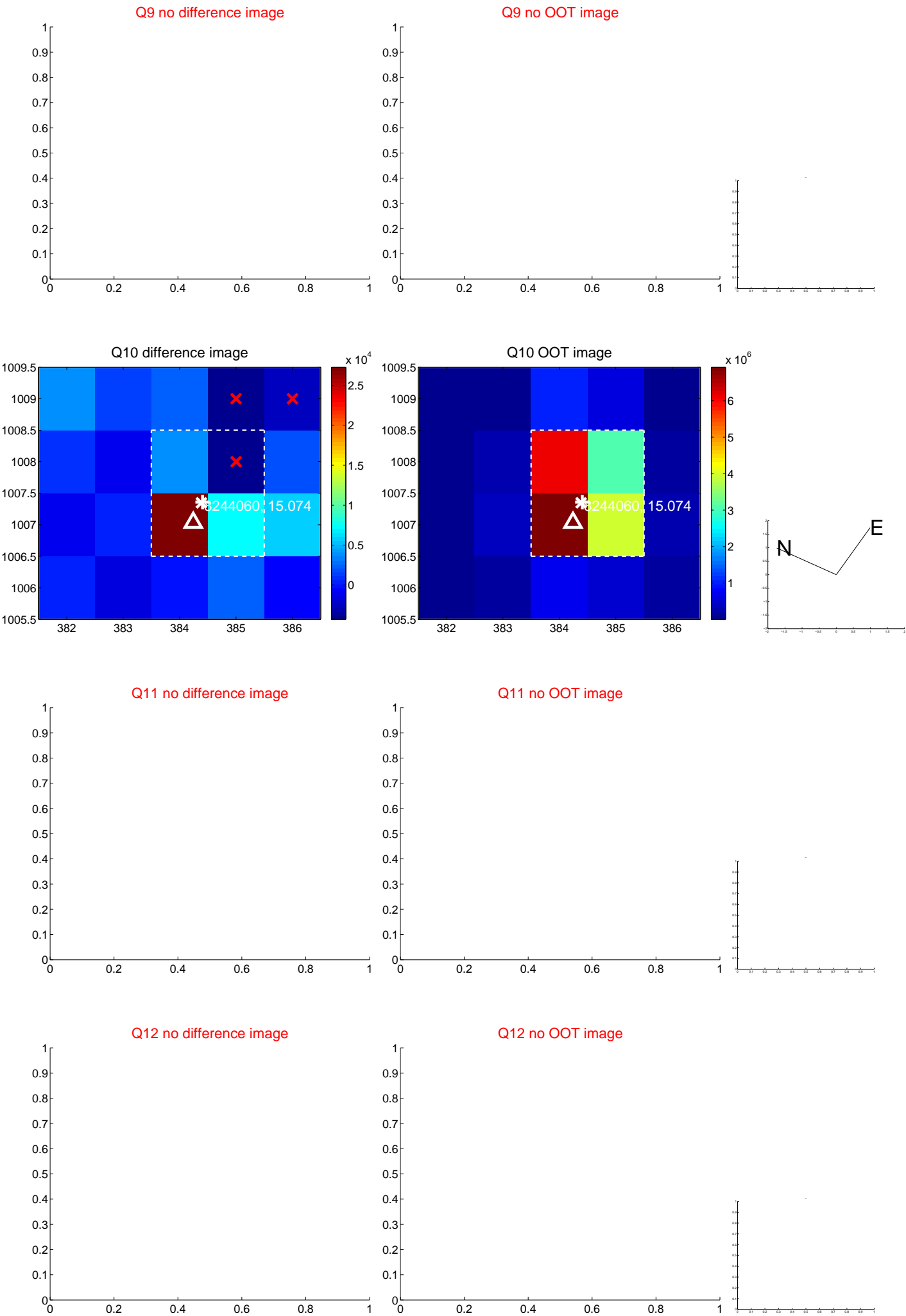
Q8 no difference image



Q8 no OOT image

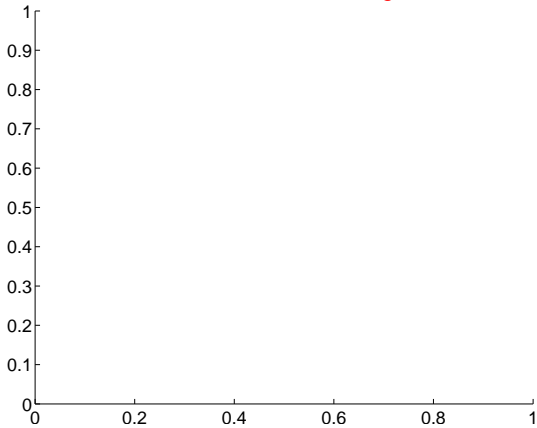


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

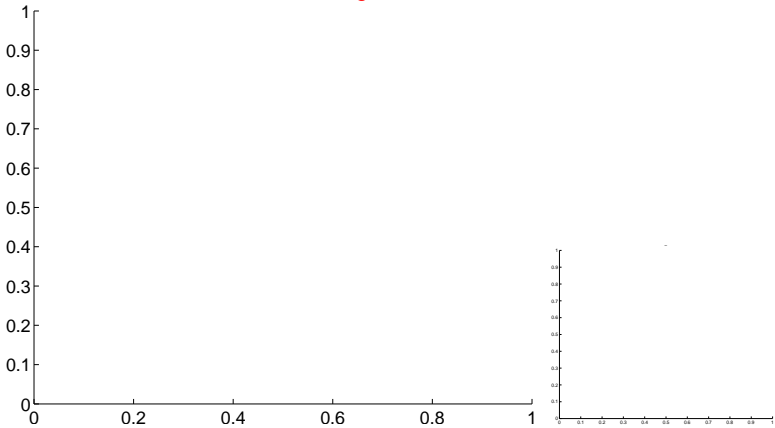


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

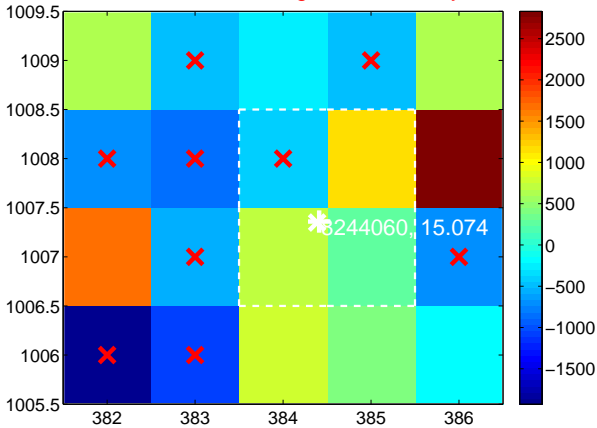
Q13 no difference image



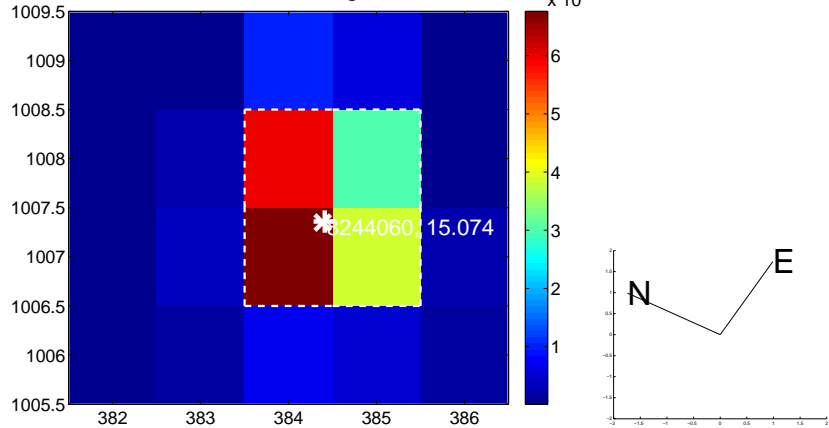
Q13 no OOT image



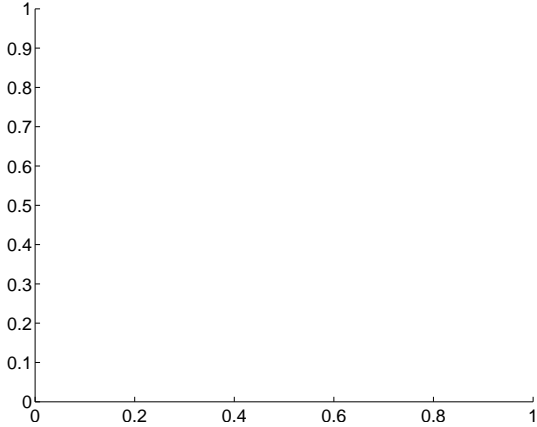
Q14 difference image. Poor Quality



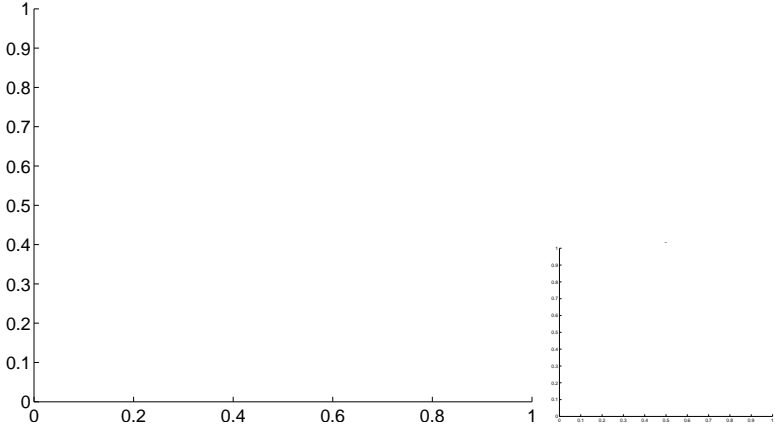
Q14 OOT image



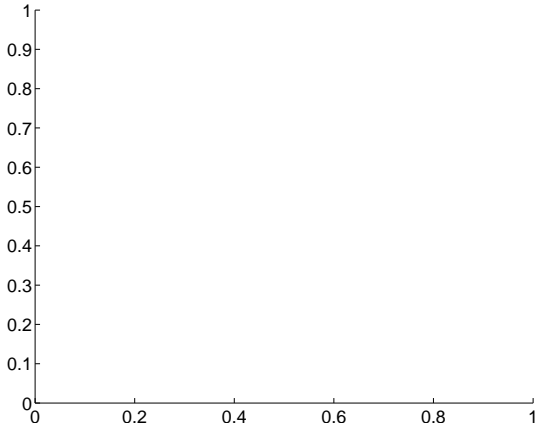
Q15 no difference image



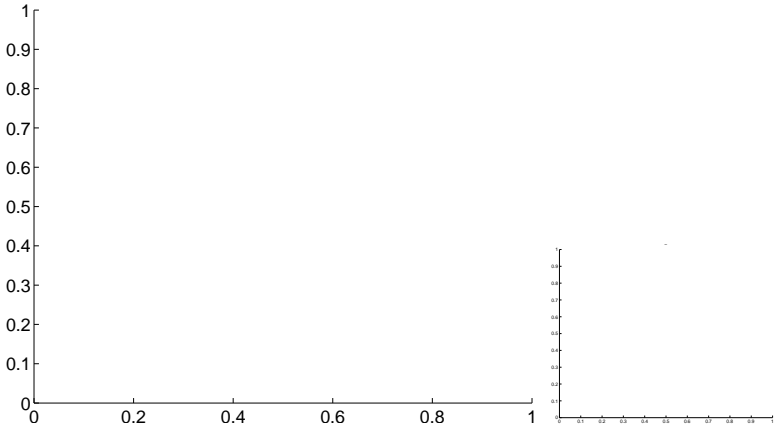
Q15 no OOT image



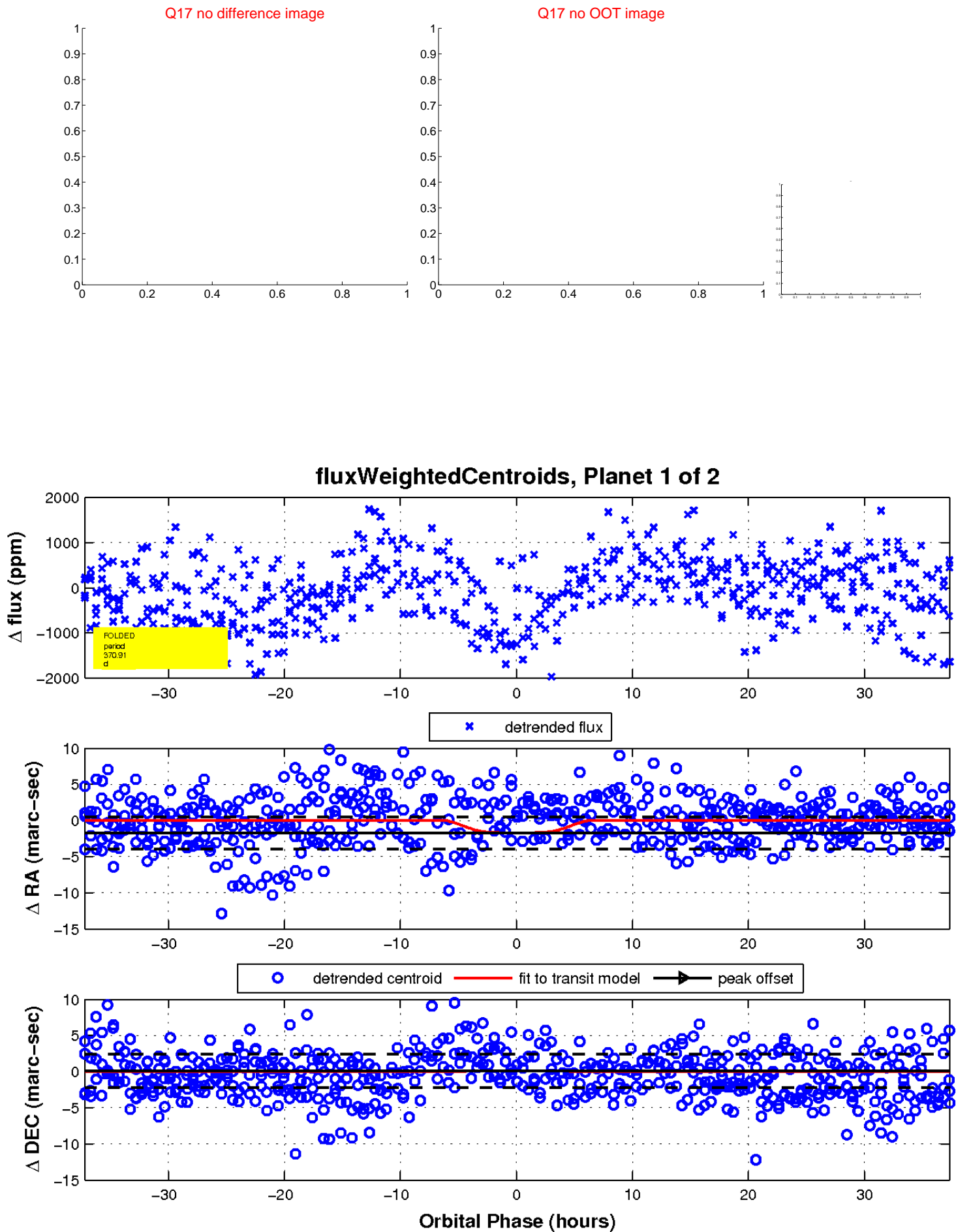
Q16 no difference image



Q16 no OOT image

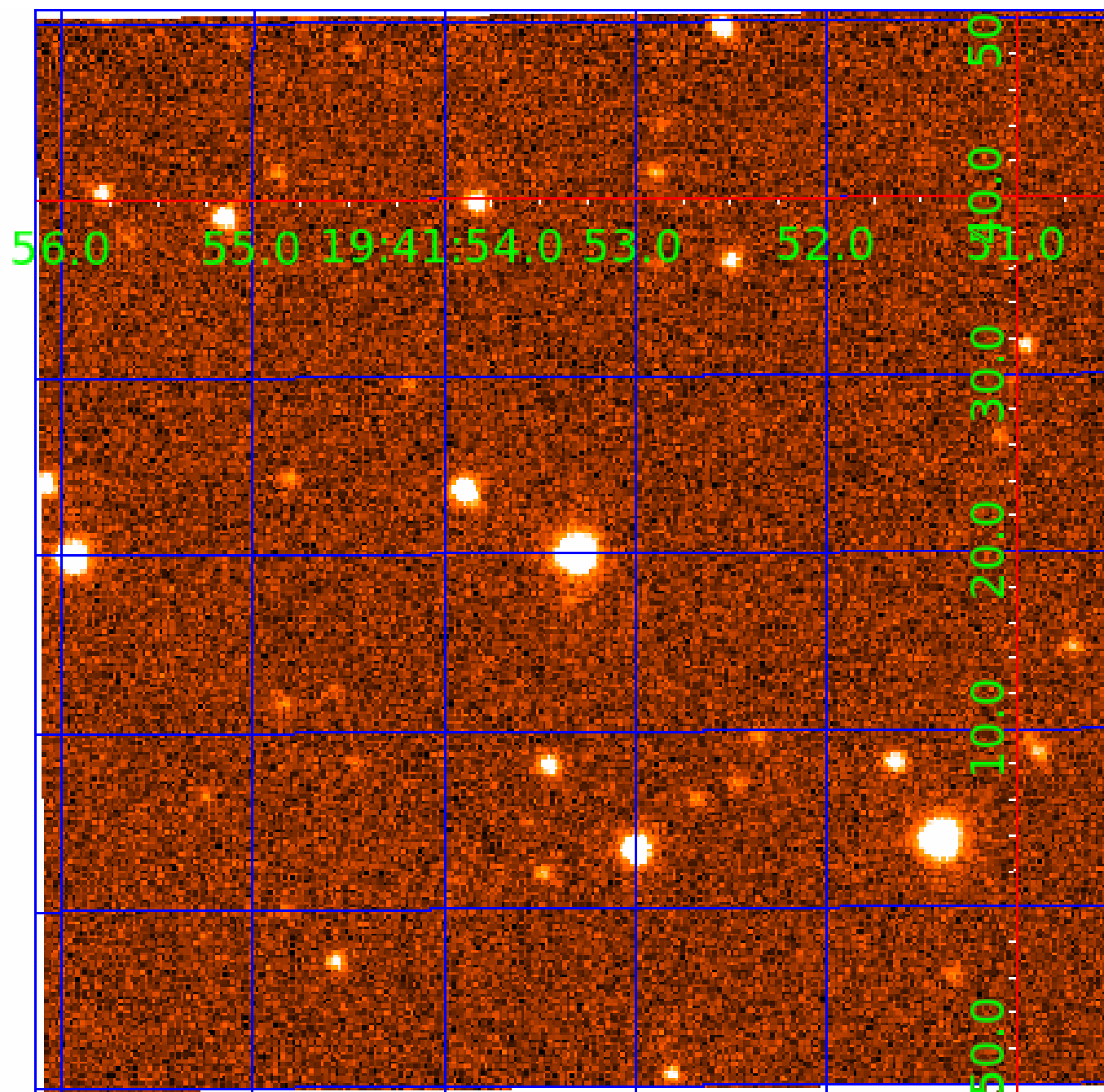


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008244060

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008244060-01	OBS	No	370.911150	230.779093	1346.9	12.469	12.0	12.1	0.92	5851	4.18	0.86
008244060-02	OBS	No	546.684633	190.803229	1117.9	33.420	8.3	9.2	0.92	5851	3.82	0.52

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008244060-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008244060-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—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.

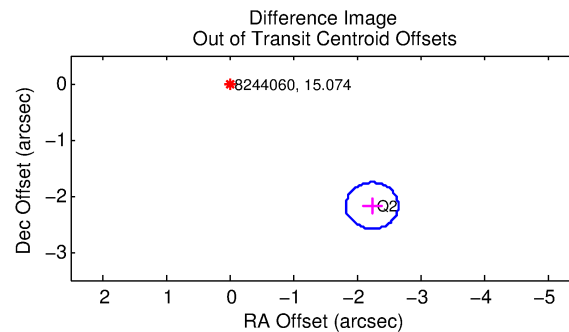
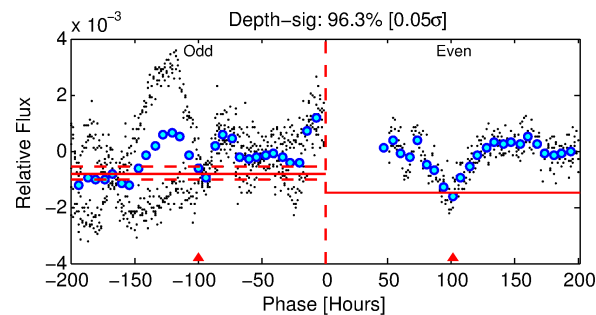
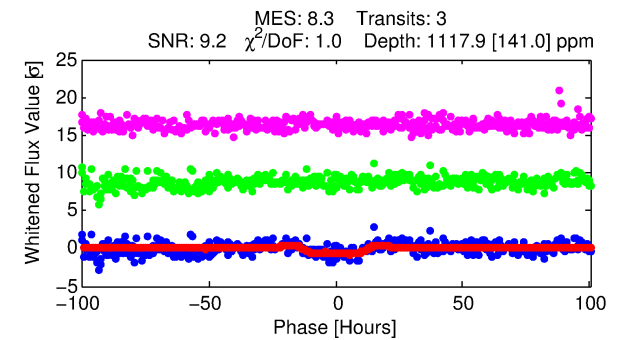
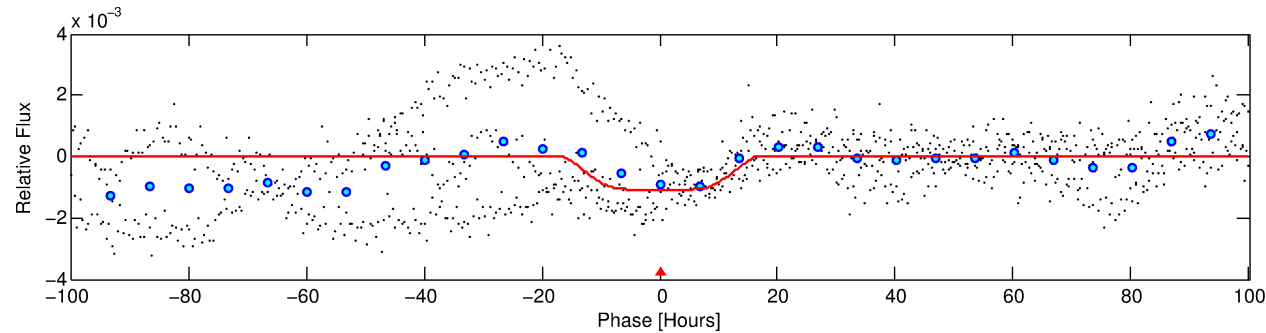
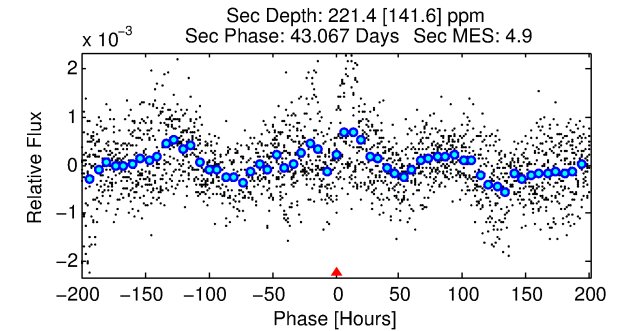
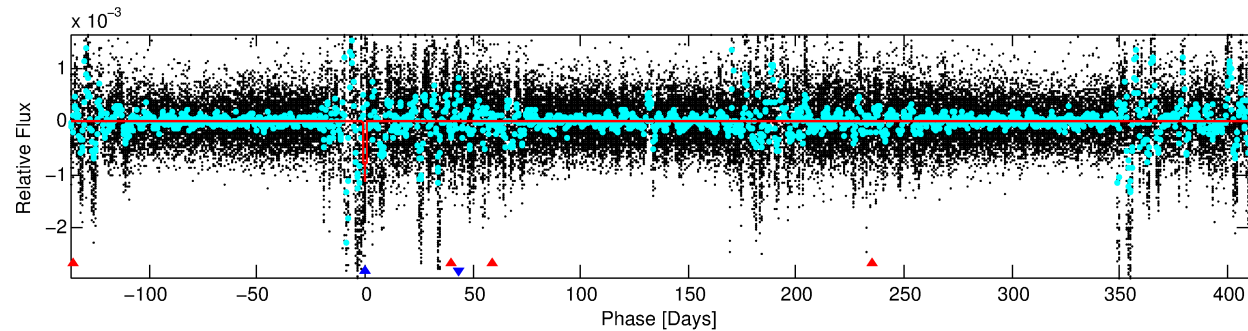
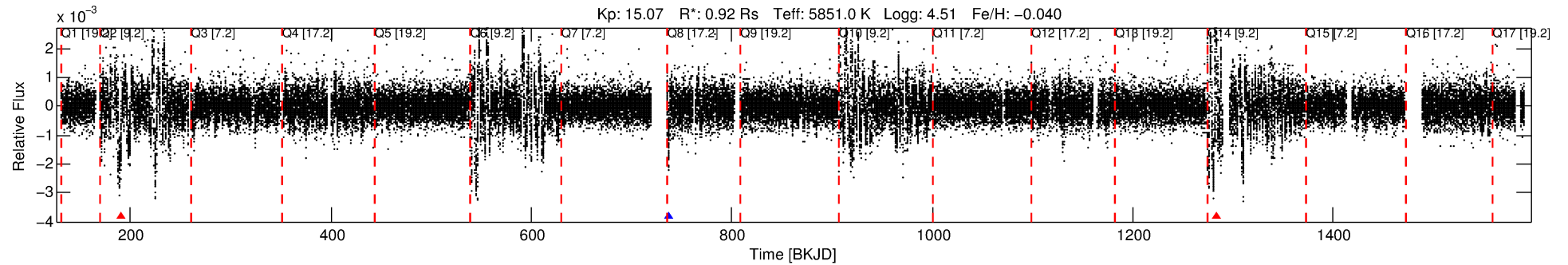
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008244060-02

No Significant Match Found

# DV One-Page Summary

KIC: 8244060 Candidate: 2 of 2 Period: 546.685 d



## DV Fit Results:

Period = 546.68463 [0.04348] d  
Epoch = 190.8032 [0.0479] BKJD  
Rp/R\* = 0.0381 [0.0029]  
a/R\* = 55.56 [7.92]  
b = 0.94 [0.02]  
Seff = 0.51 [0.20]  
Teq = 216 [21] K  
Rp = 3.82 [1.18] Re  
a = 1.3114 [0.3303] AU  
Ag = 14371.39 [10818.08] [1.33σ]  
Teff = 3656 [611] K [5.63σ]

## DV Diagnostic Results:

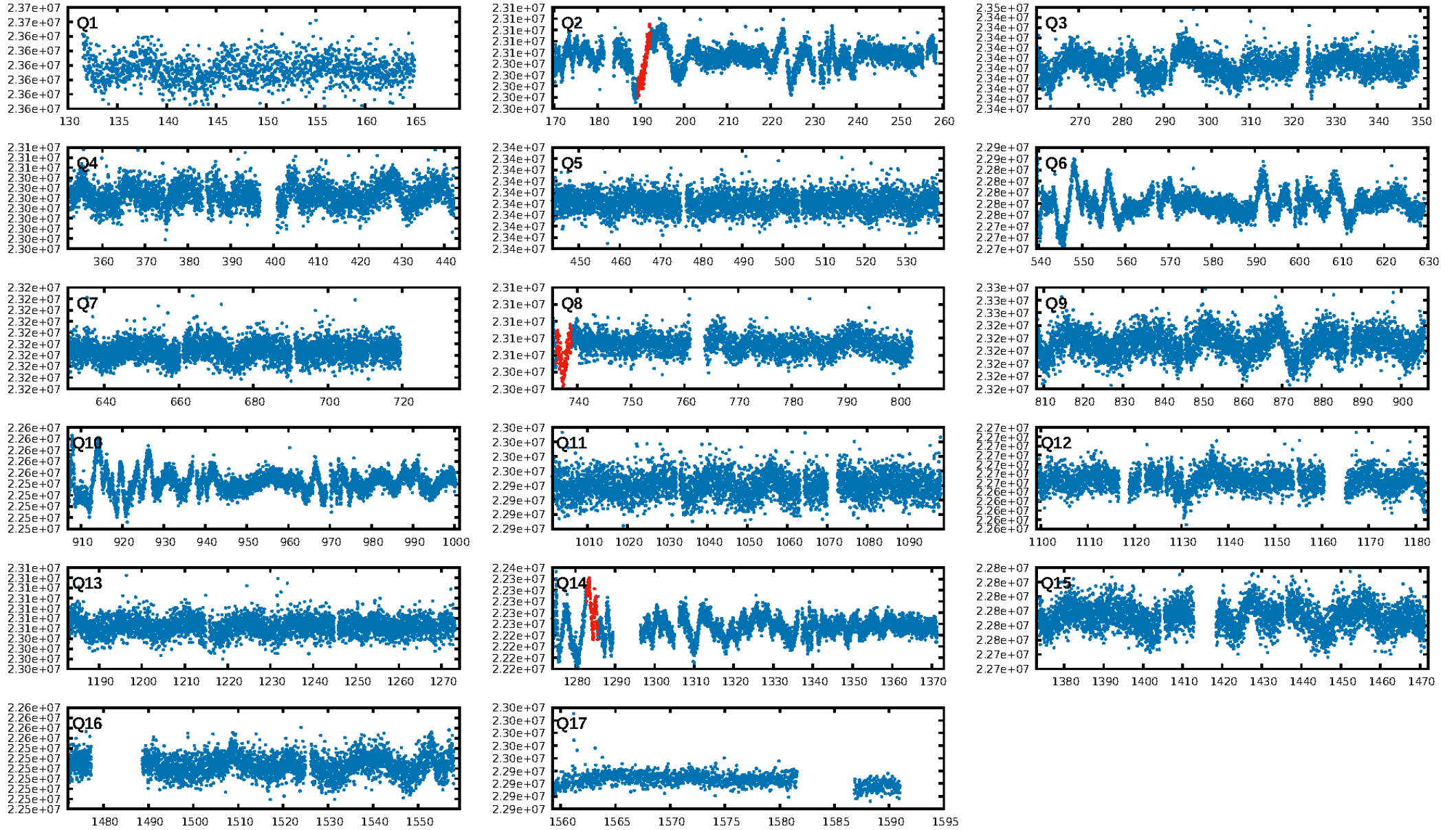
ShortPeriod-sig: 100.0% [118.26σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 27.0%  
ModelChiSquareGoF-sig: 99.8%  
Bootstrap-pfa: 1.48e-07  
RollingBand-fgt: 0.33 [1/3]  
GhostDiagnostic-chr: -1.758  
Centroid-sig: 0.0%  
Centroid-so: 4.703 arcsec [3.20σ]  
OotOffset-rm: 3.124 arcsec [22.82σ]  
KicOffset-rm: 3.046 arcsec [22.29σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:50:17 Z

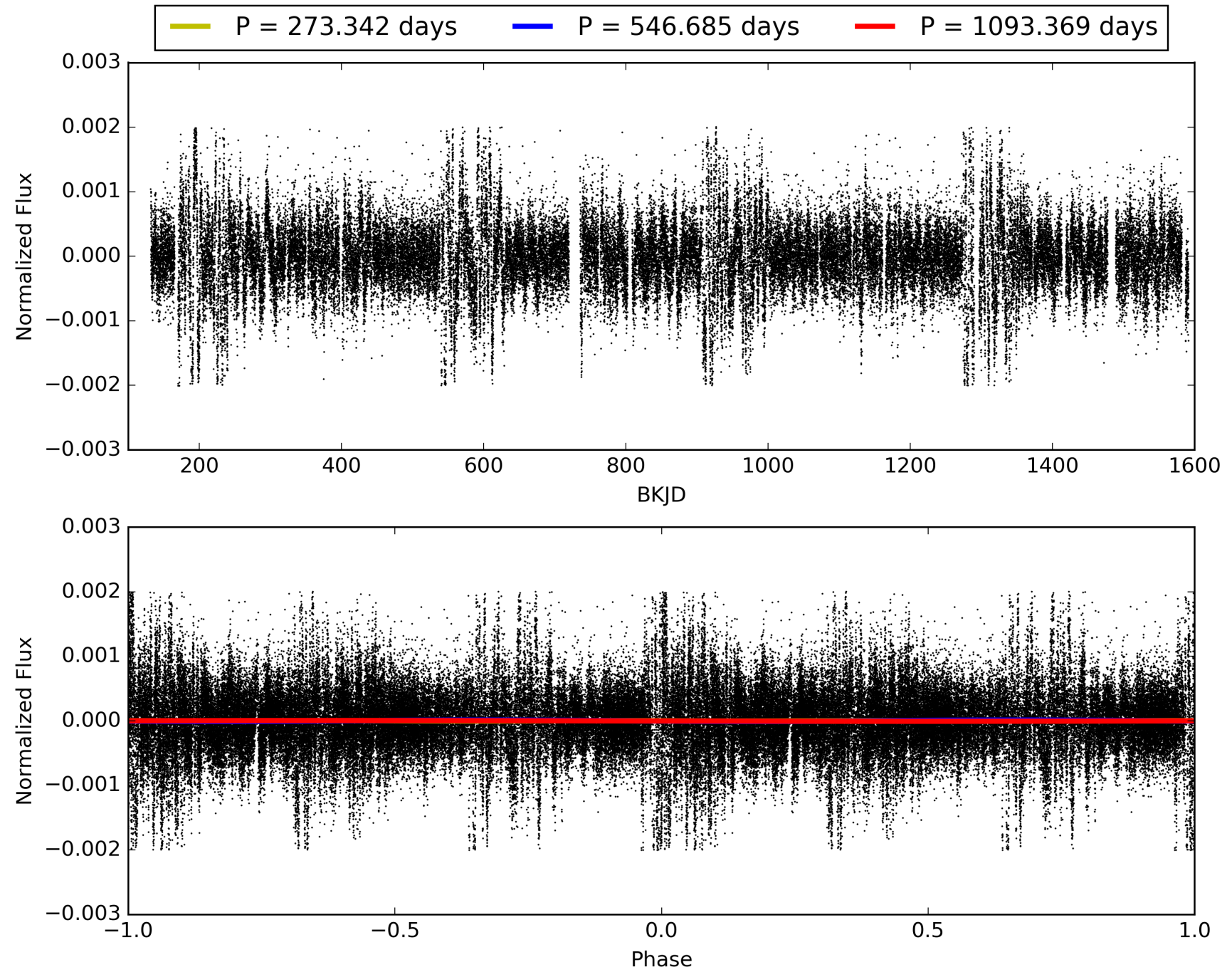
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008244060-02, PDC Light Curves

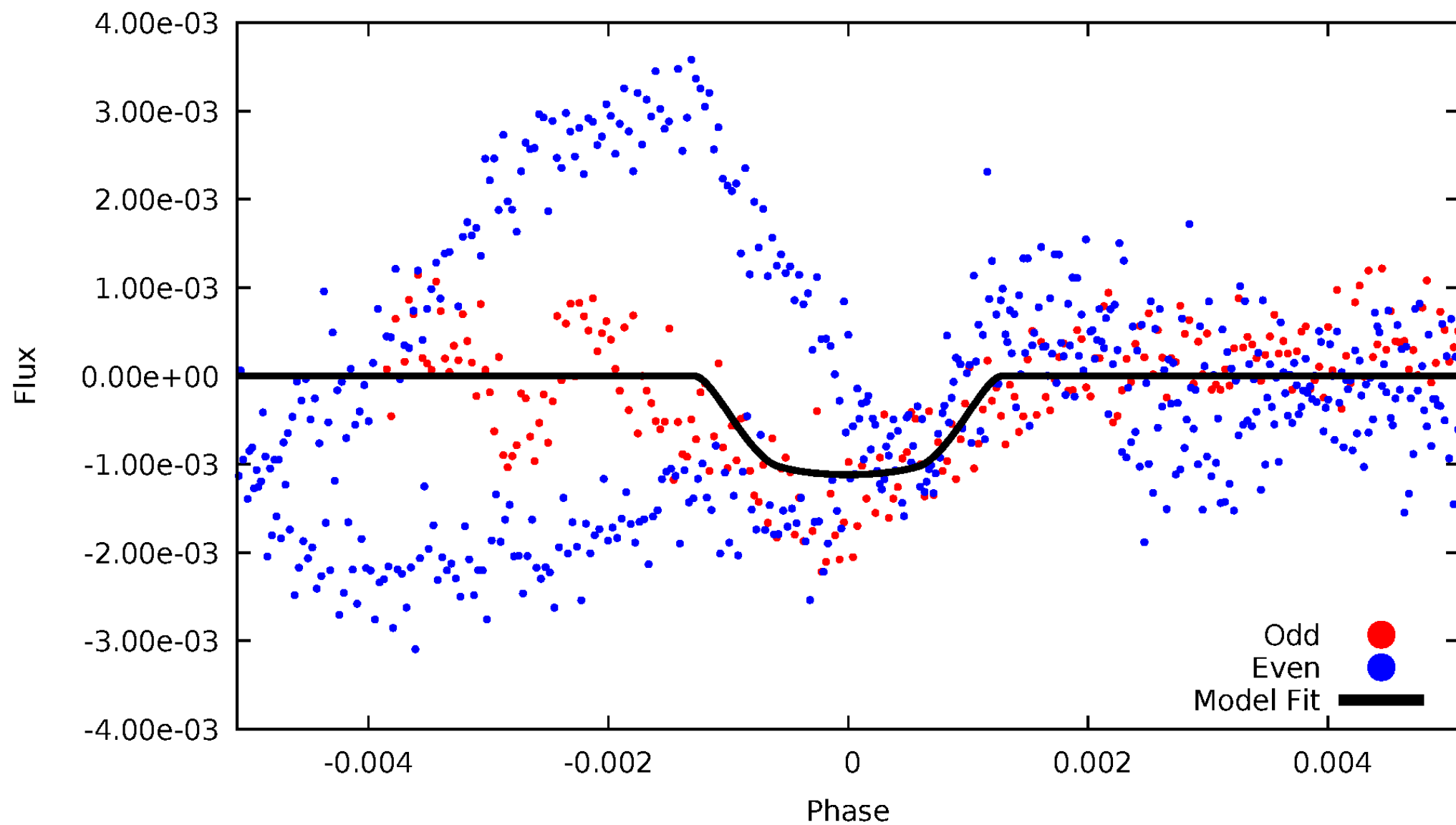


# TCE 008244060-02



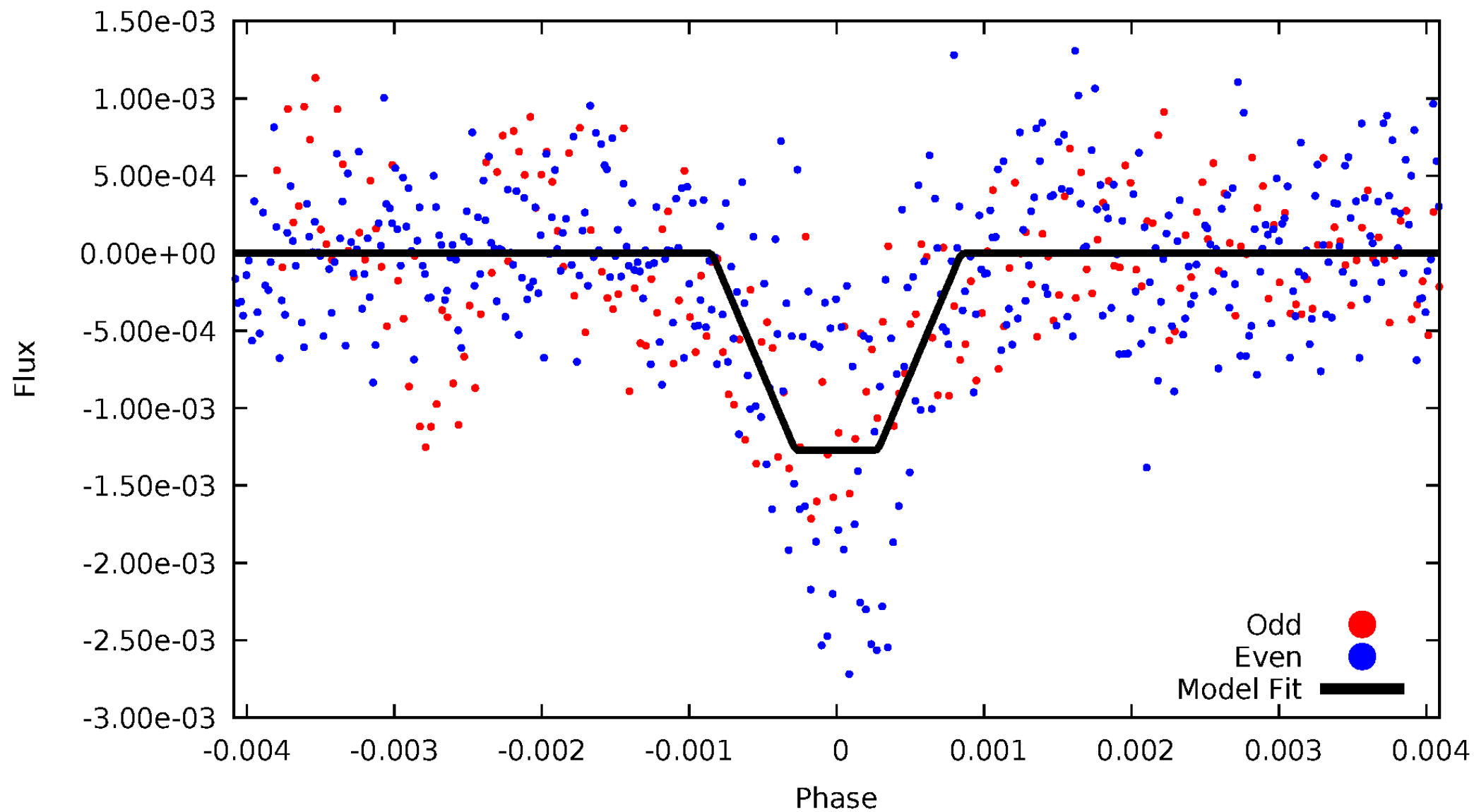
# DV Odd/Even

TCE 008244060-02



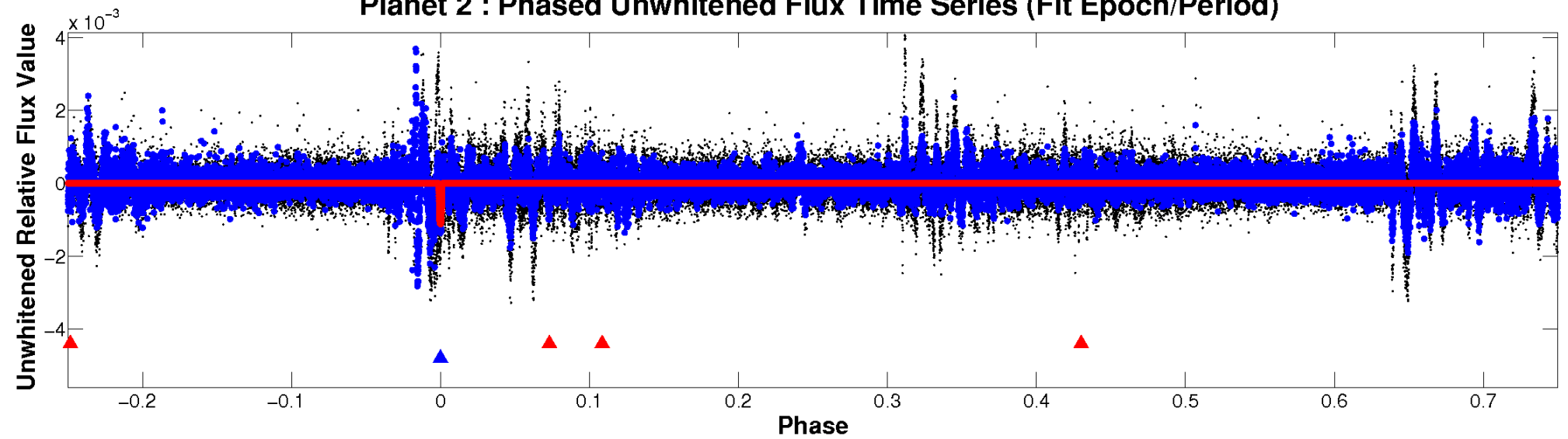
# ALT Odd/Even

TCE 008244060-02

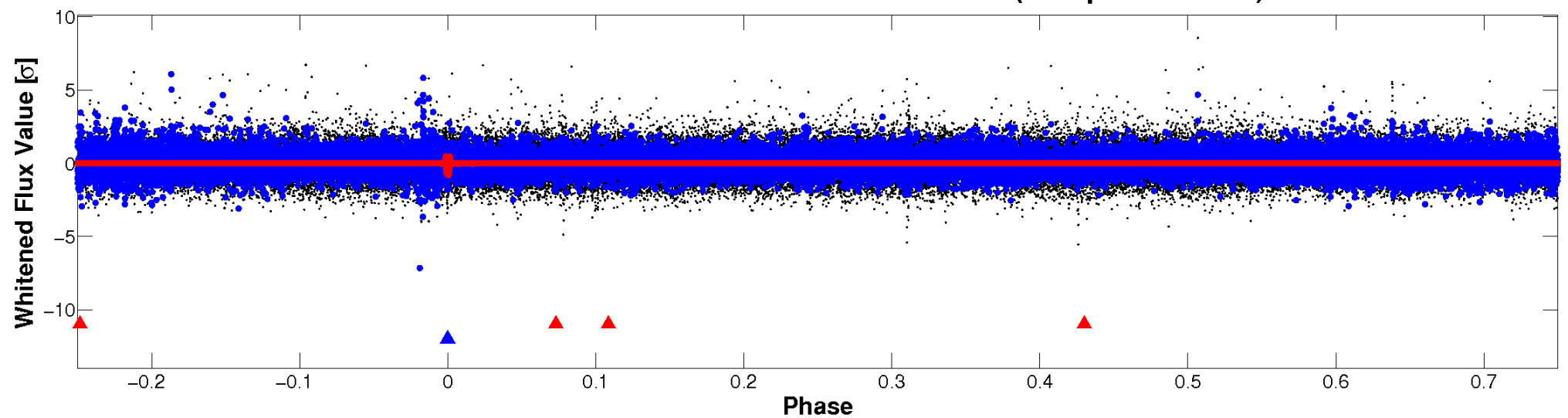


# Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

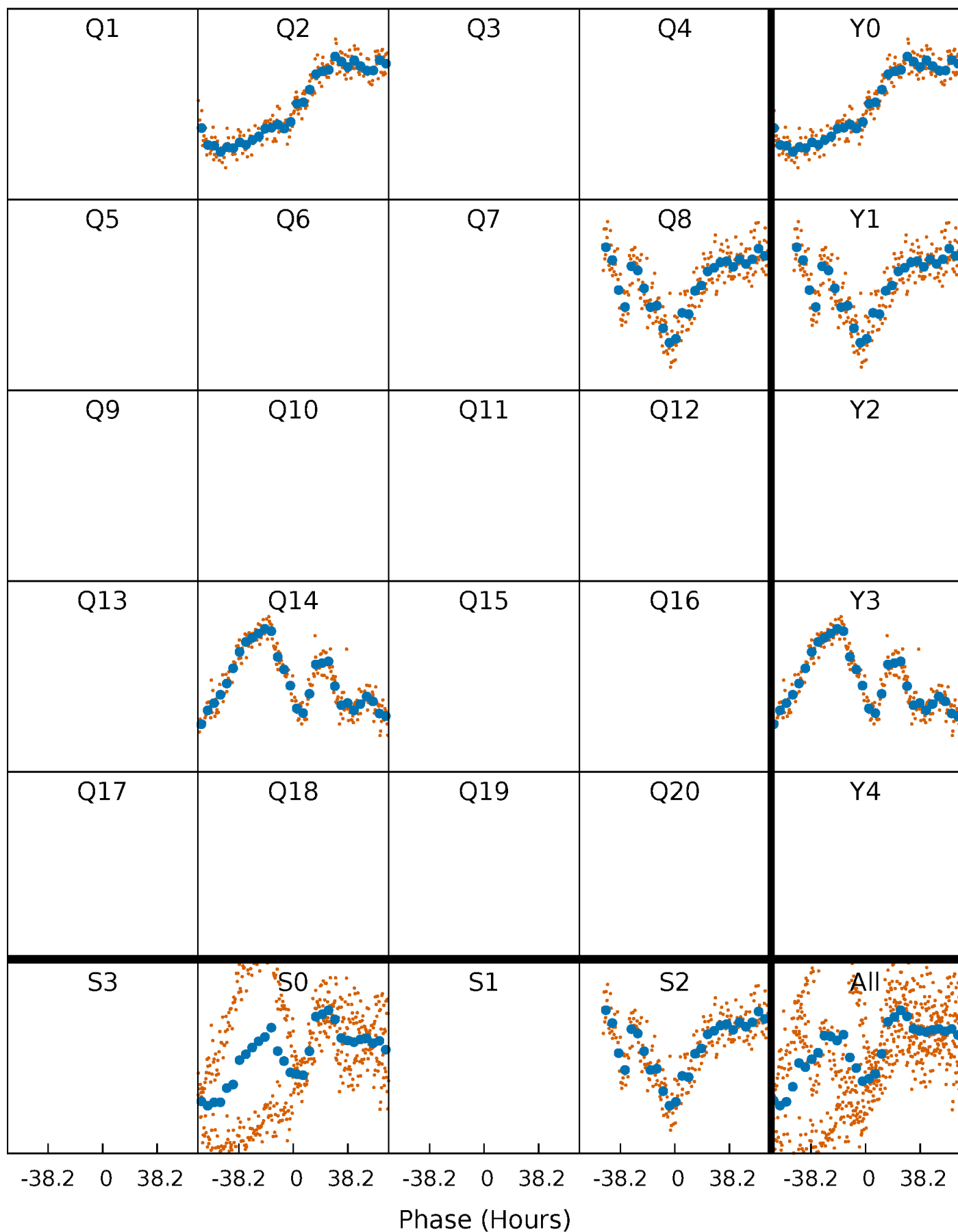


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



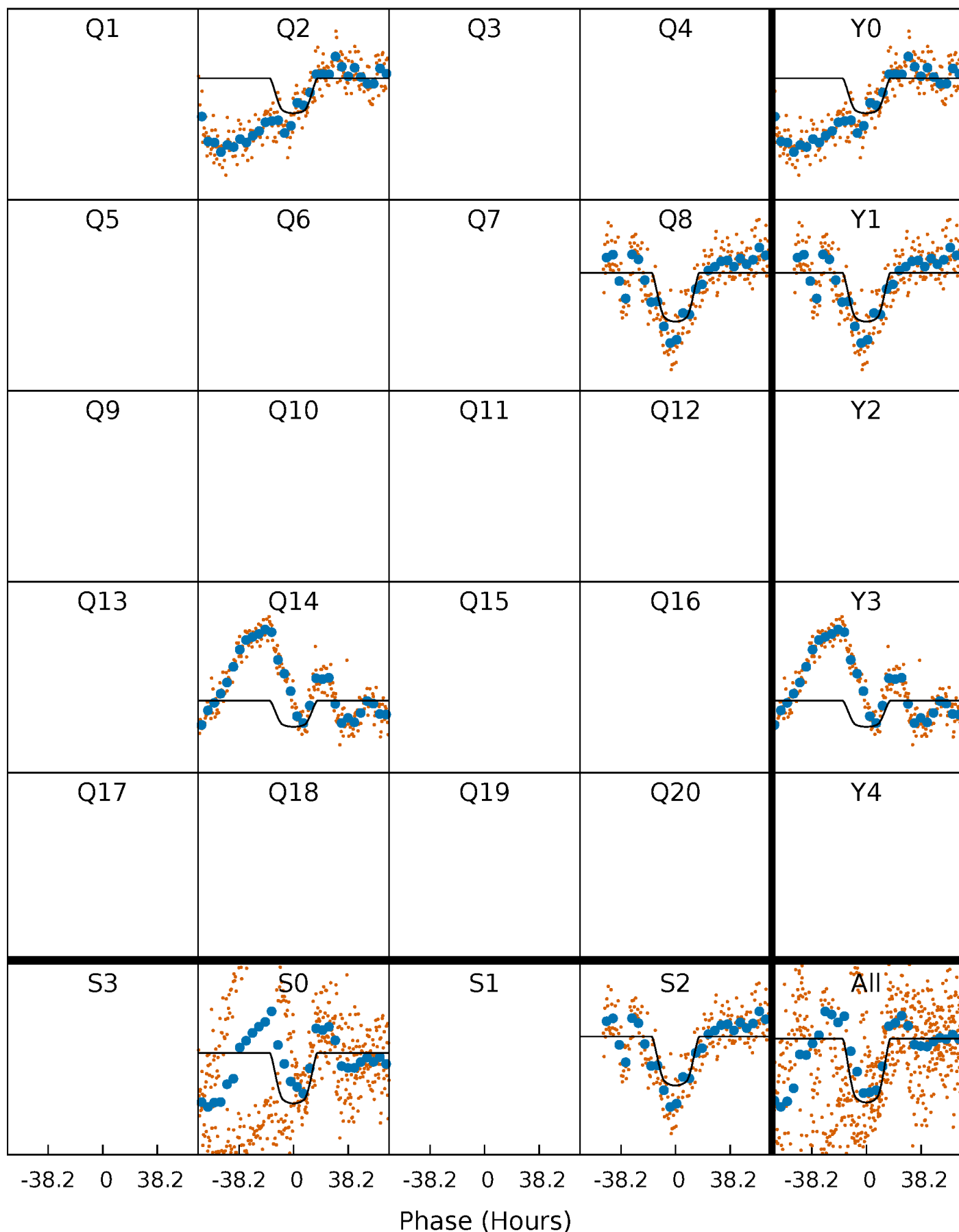
# PDC Quarter-Phased Transit Curves

TCE 008244060-02 P=546.684633 Days  $T_0=190.803229$  (BKJD)



# DV Quarter-Phased Transit Curves

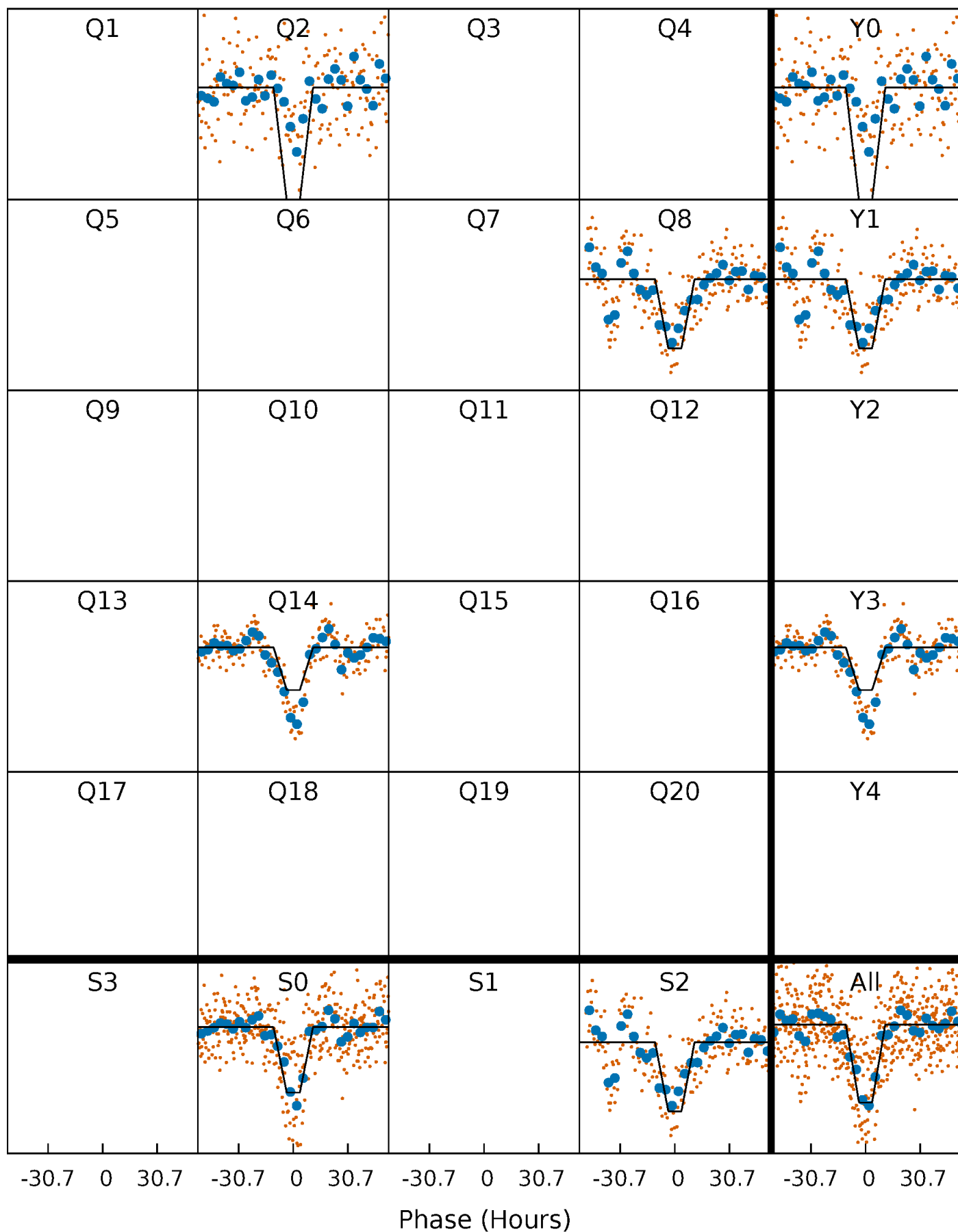
TCE 008244060-02 P=546.684633 Days  $T_0=190.803229$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

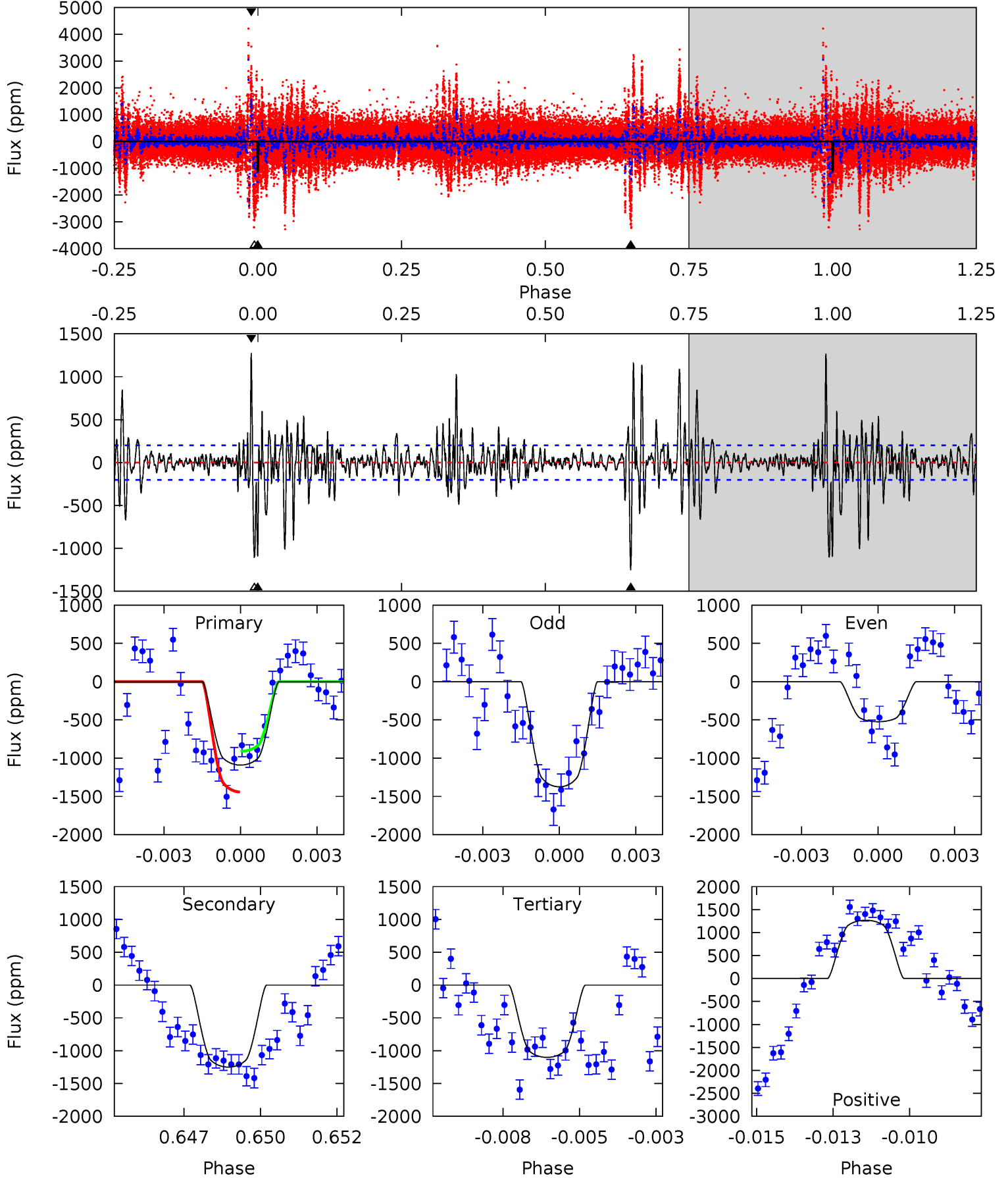
TCE 008244060-02 P=546.911045 Days  $T_0=190.549135$  (BKJD)



# DV Model-Shift Uniqueness Test

008244060-02, P = 546.684633 Days, E = 190.803229 Days

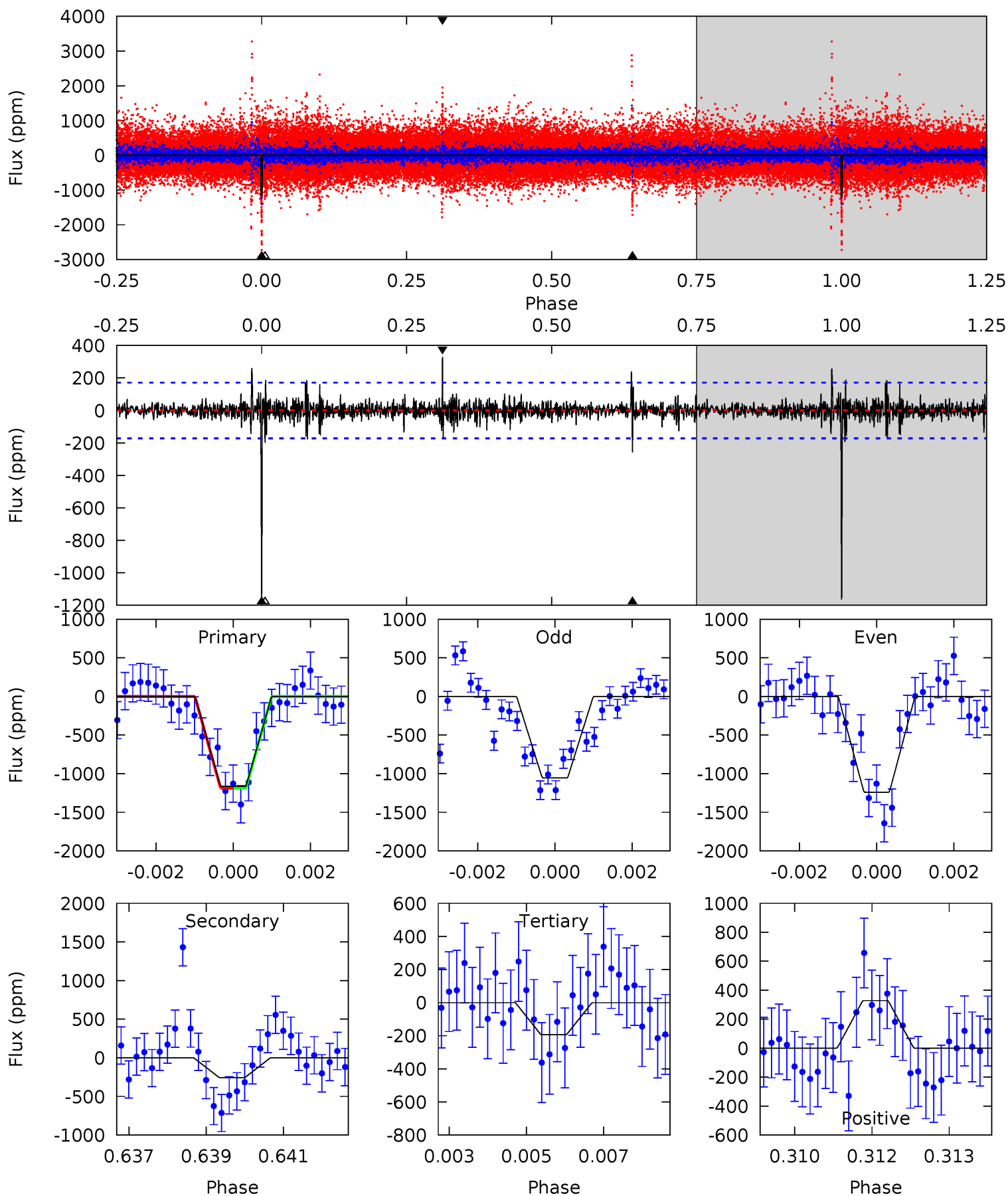
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.6	32.8	28.9	33.3	5.28	3.02	5.40	-0.30	-4.65	3.89	-0.45	10.7	0.60	0.50	6.84



# Alt Model-Shift Uniqueness Test

008244060-02, P = 546.911045 Days, E = 190.549135 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
36.3	8.04	6.08	10.3	5.36	3.14	1.15	30.3	26.1	1.96	-2.23	2.75	1.12	0.22	0.04



### Stellar Parameters For KIC 008244060

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5851^{+157}_{-175}$	$4.515^{+0.050}_{-0.200}$	$-0.040^{+0.250}_{-0.300}$	$0.918^{+0.275}_{-0.092}$	$1.007^{+0.113}_{-0.139}$	$1.832^{+0.379}_{-0.976}$
	+3%/-3%	+1%/-4%	+625%/-750%	+30%/-10%	+11%/-14%	+21%/-53%
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 008244060-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1250 \pm 38$	$3.95^{+0.62}_{-0.42}$	$308^{+22}_{-15}$	$5627^{+289}_{-224}$	$74568^{+18376}_{-17909}$
Alt.	$-257 \pm 32$	$3.70^{+0.57}_{-0.46}$	$308^{+22}_{-14}$	$4182^{+183}_{-173}$	$16925^{+5466}_{-4241}$

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

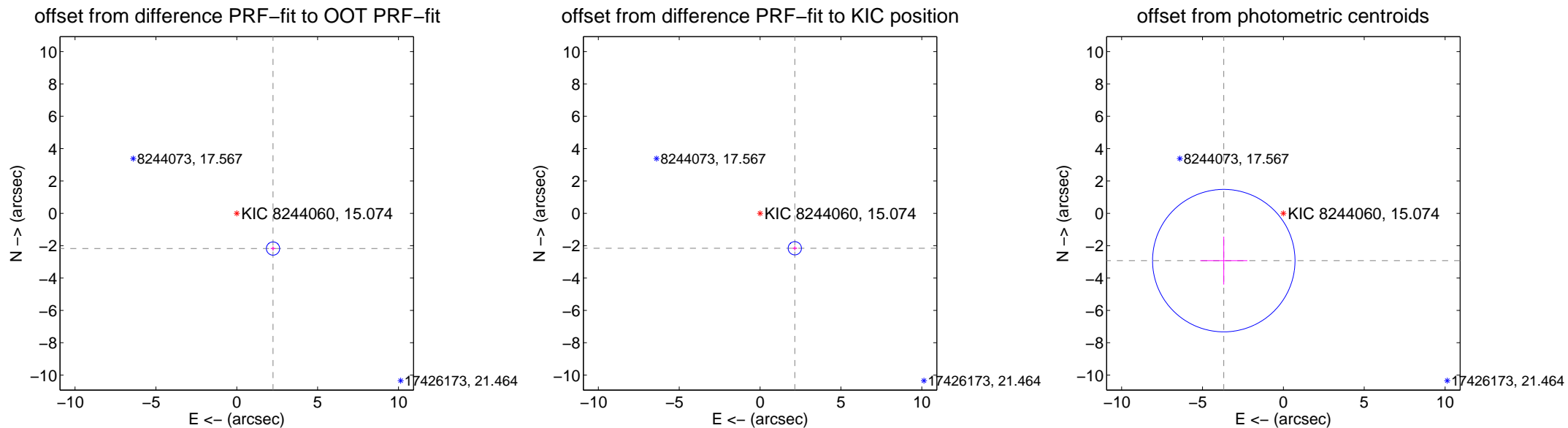
## DV Centroid Data

Supplemental centroid analysis for 008244060-02. Kepler magnitude: 15.07. Transit SNR 9.23

There are 0 quarters with good PRF difference image offsets

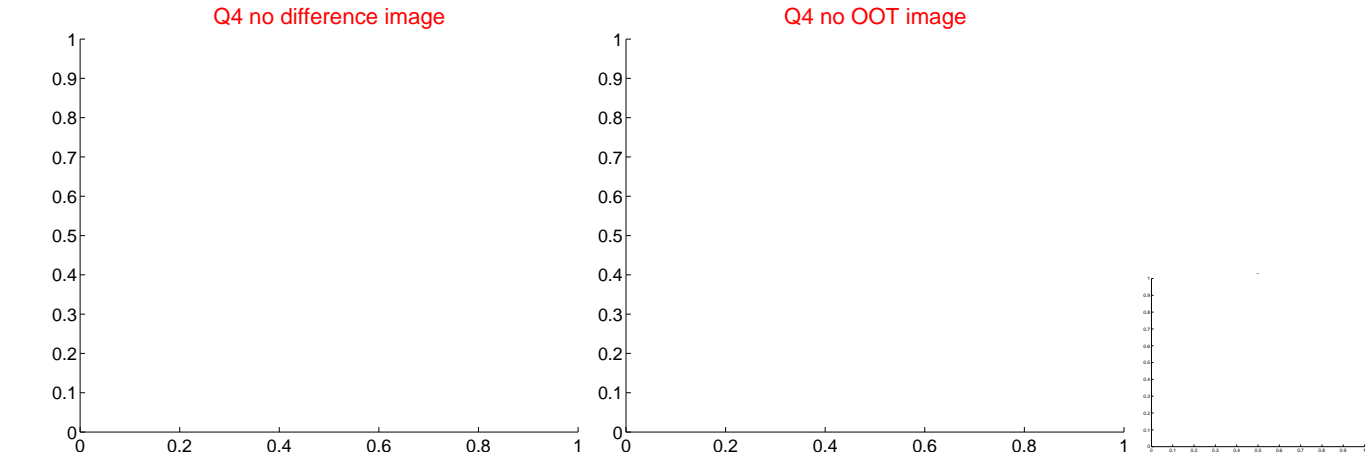
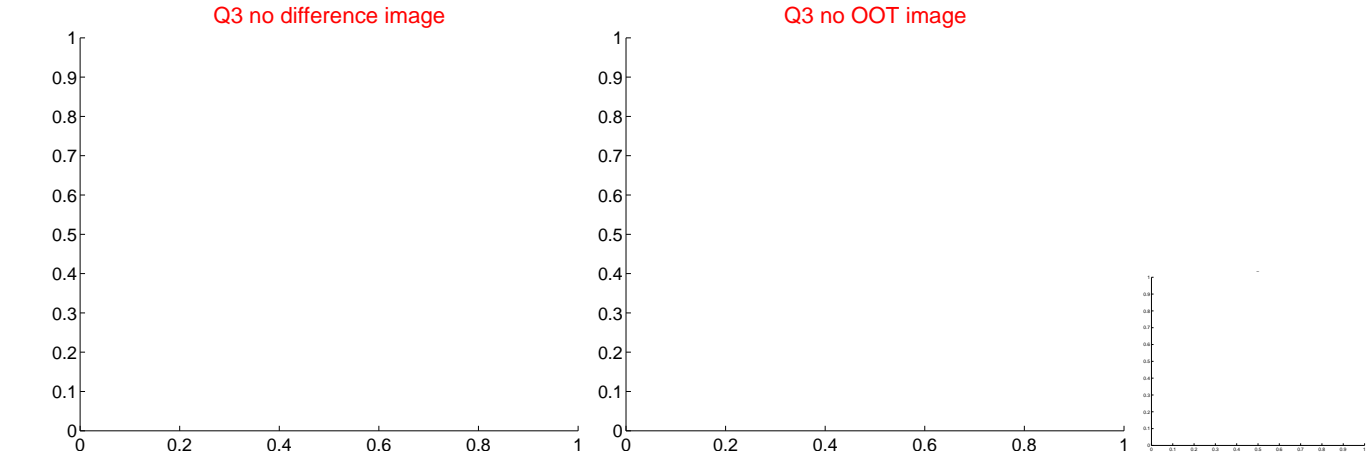
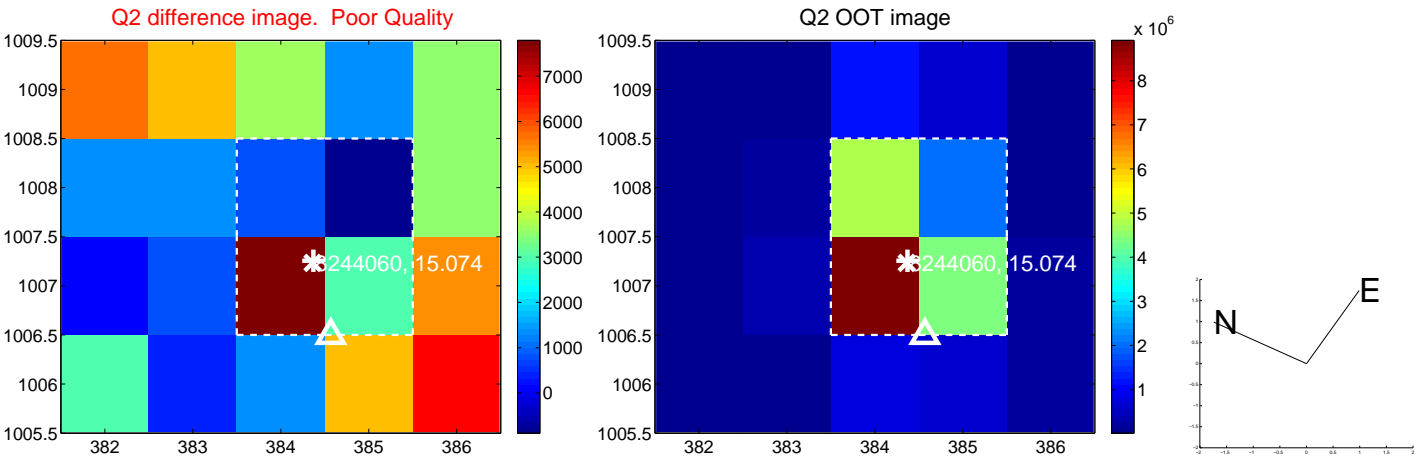
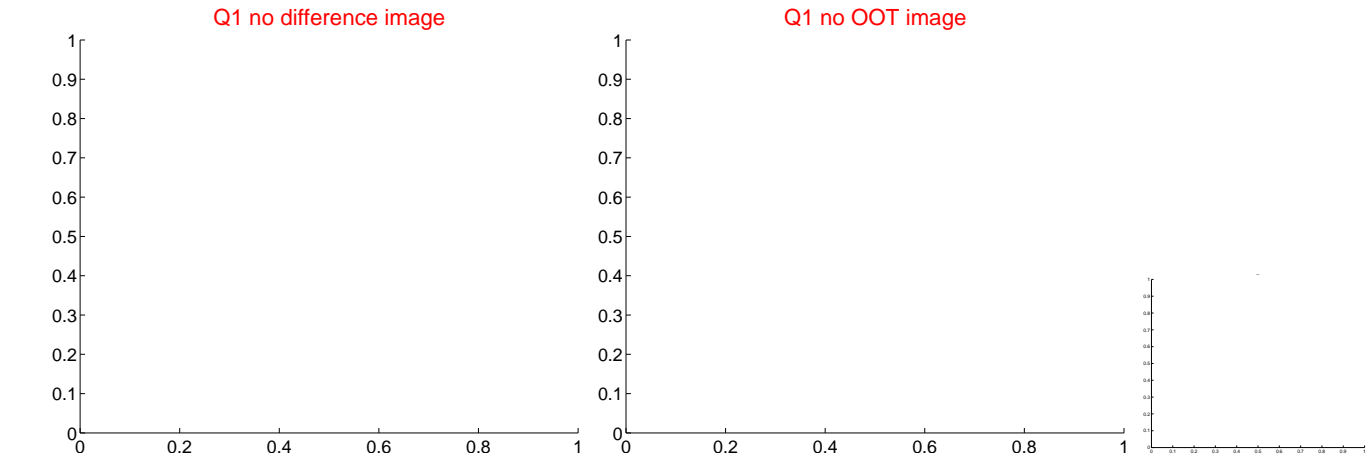
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.124 \pm 0.137$	22.82	$-2.241 \pm 0.145$	$-2.176 \pm 0.128$
PRF-fit source offset from KIC position	$3.046 \pm 0.137$	22.29	$-2.148 \pm 0.145$	$-2.159 \pm 0.128$
photometric centroid source offset	$4.70 \pm 1.47$	3.20	$3.68 \pm 1.46$	$-2.92 \pm 1.48$

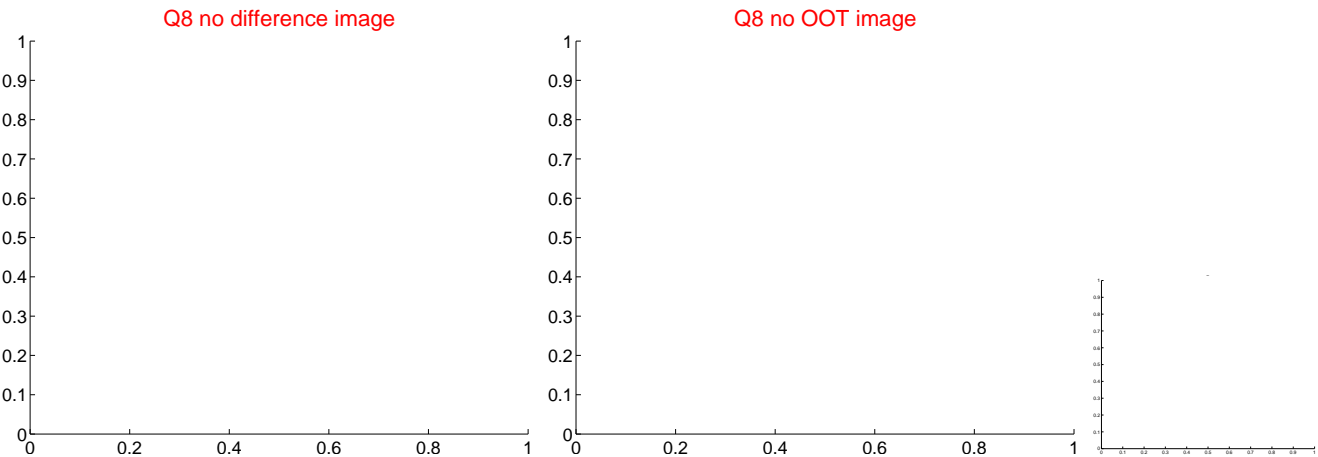
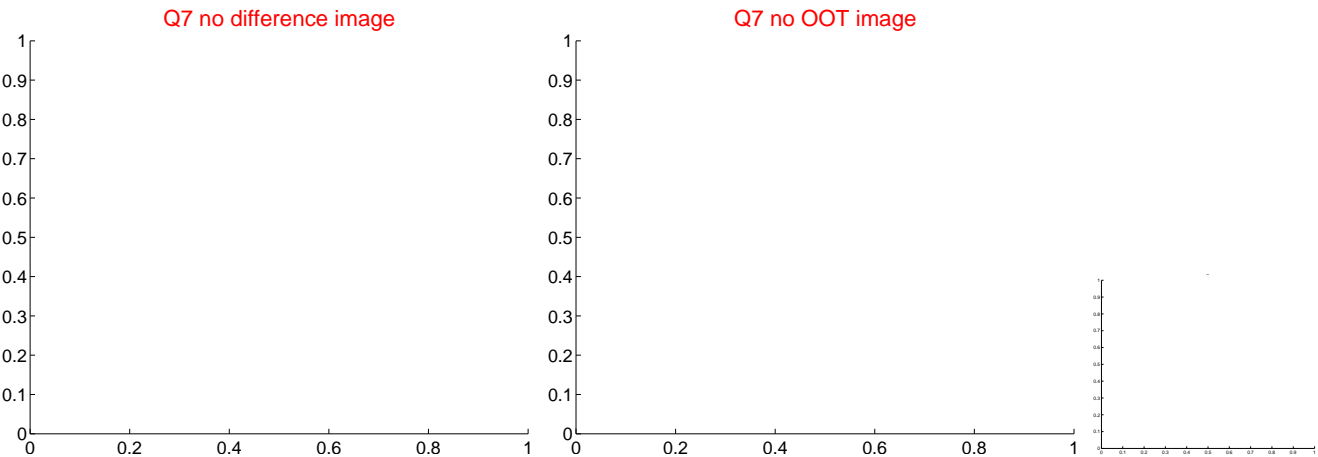
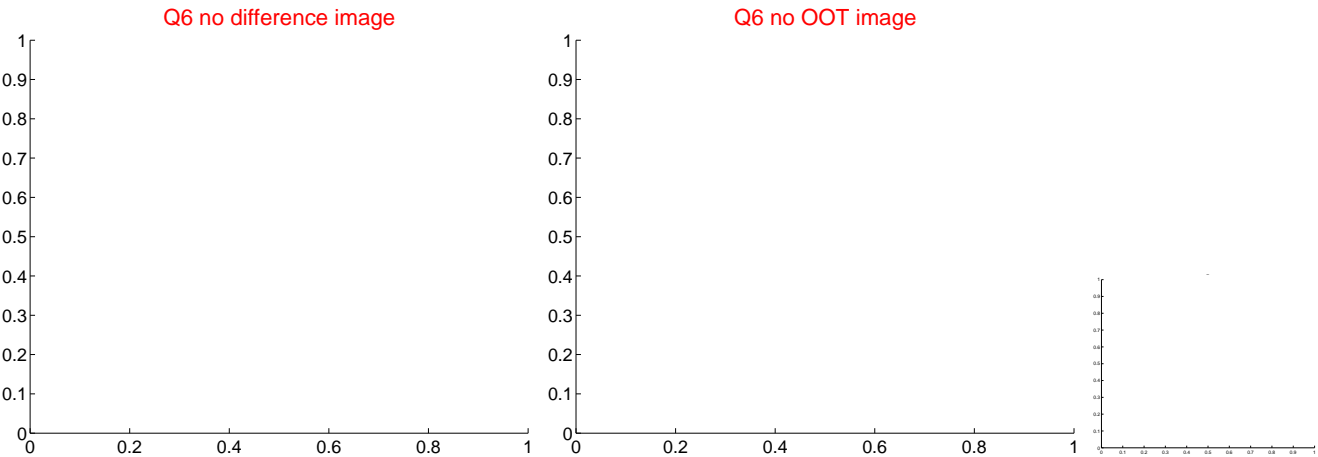
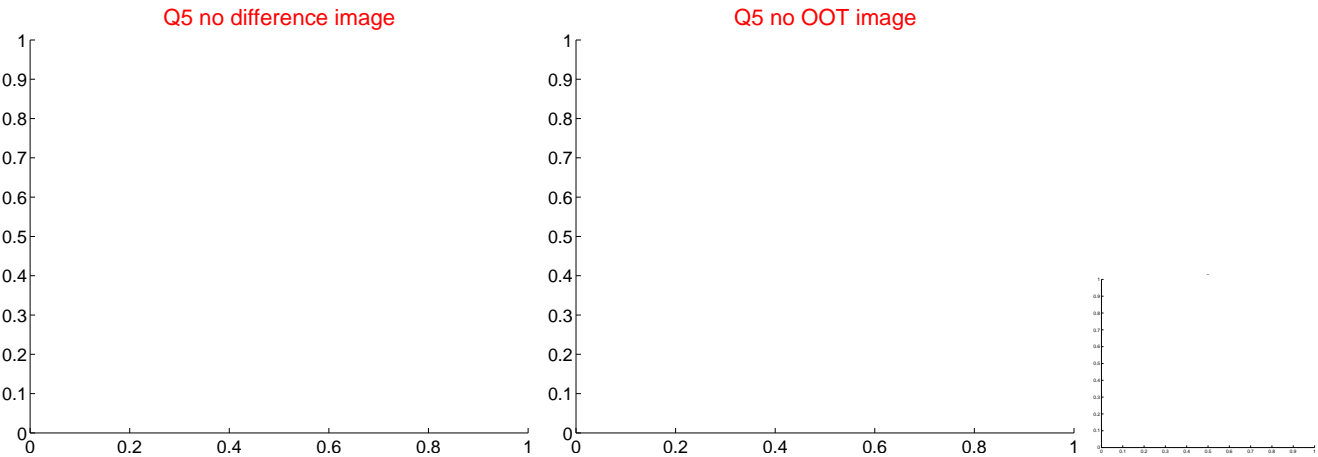


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





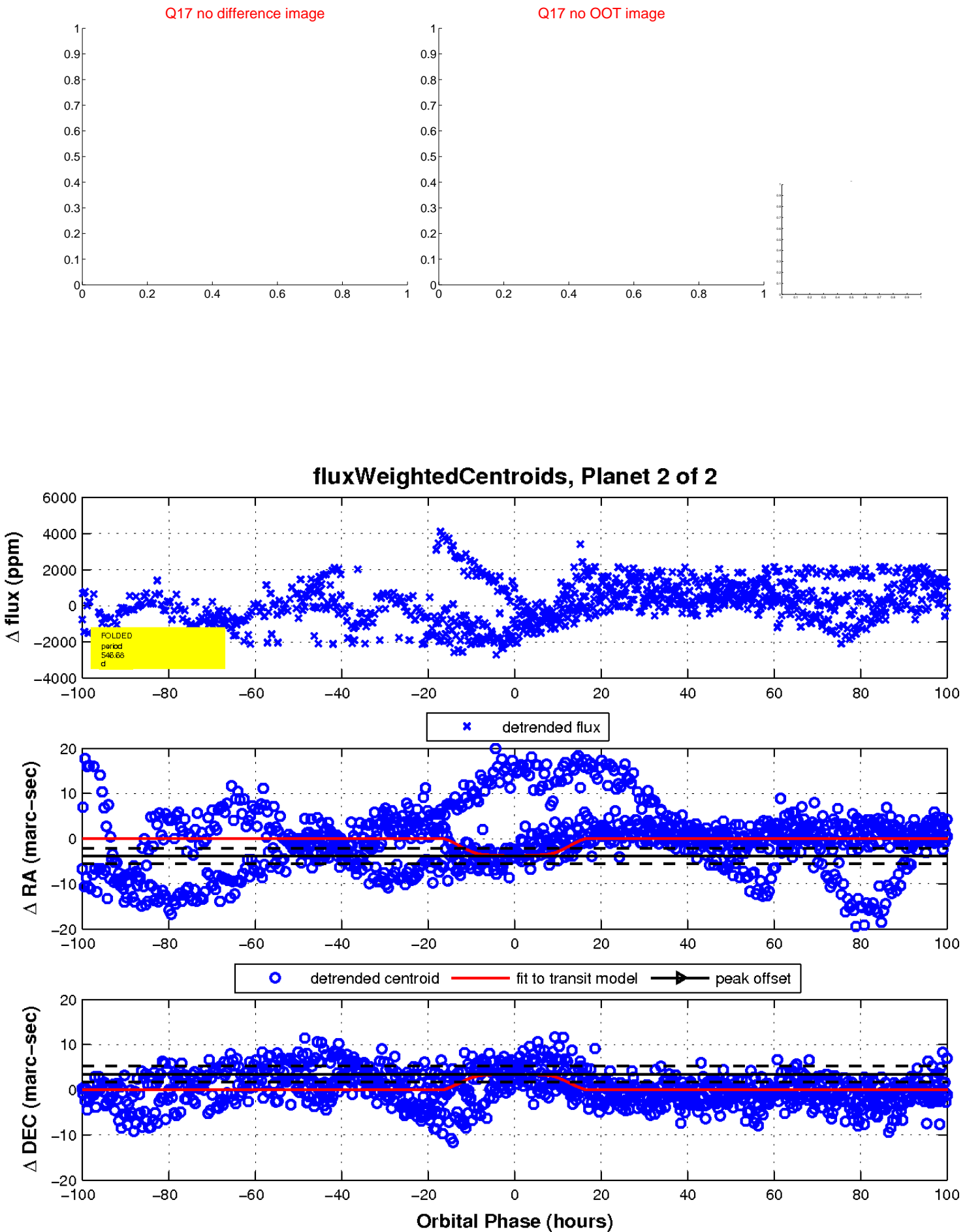
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

