

# KIC 008554366

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008554366-01	OBS	No	307.771444	182.131010	915.1	4.405	16.0	6.4	0.84	5497	2.71	0.88
008554366-02	OBS	No	377.417324	260.084278	977.8	3.000	13.6	6.9	0.84	5497	2.70	0.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008554366-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_POS_DV
008554366-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—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.

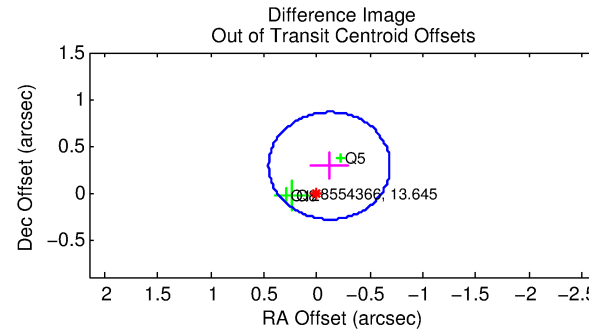
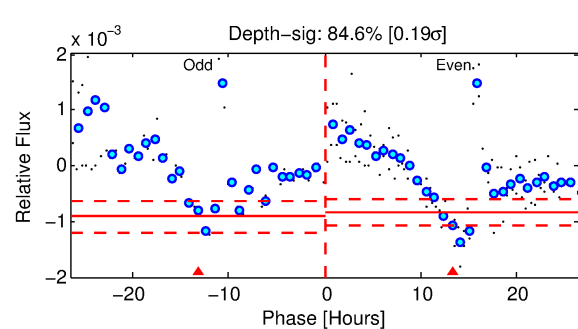
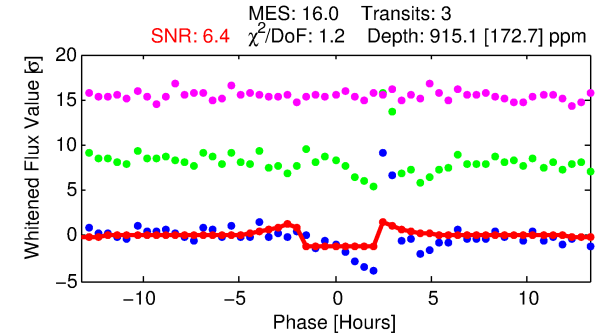
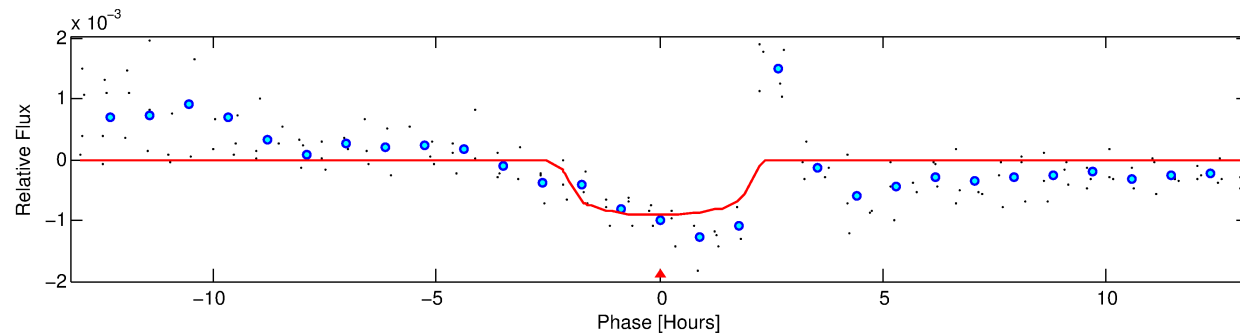
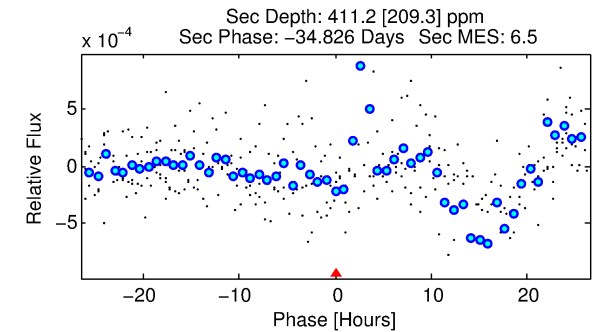
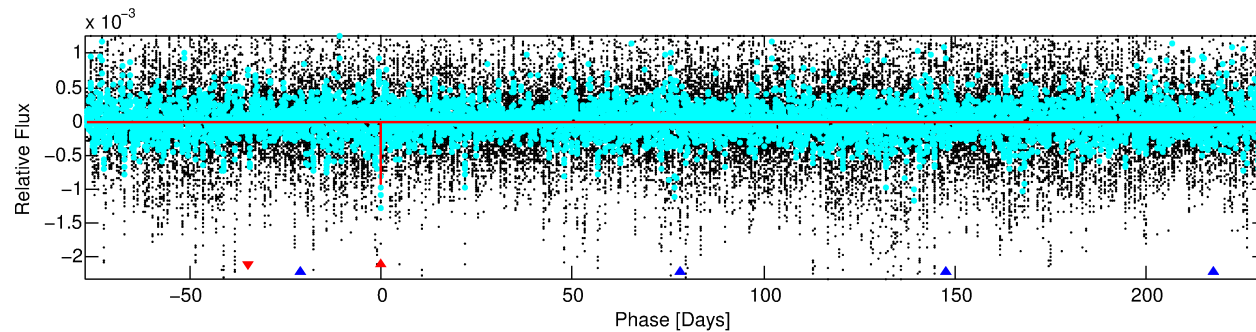
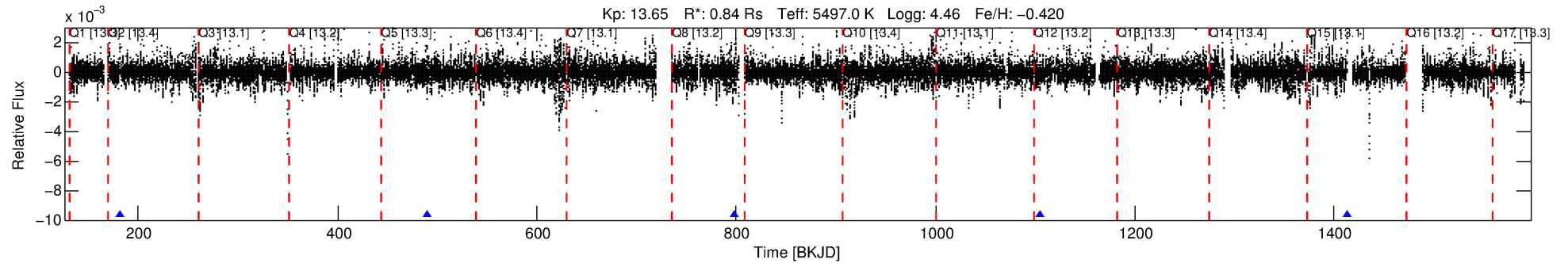
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008554366-01

No Significant Match Found

# DV One-Page Summary

KIC: 8554366 Candidate: 1 of 2 Period: 307.771 d



## DV Fit Results:

Period = 307.77144 [0.00483] d  
Epoch = 182.1310 [0.0111] BKJD  
Rp/R\* = 0.0295 [0.0227]  
a/R\* = 410.01 [1324.61]  
b = 0.69 [2.54]  
Seff = 0.88 [0.30]  
Teq = 247 [21] K  
Rp = 2.71 [2.17] Re  
a = 0.8098 [0.1643] AU  
Ag = 20238.72 [33481.33] [0.60 $\sigma$ ]  
Teffp = 4560 [1855] K [2.32 $\sigma$ ]

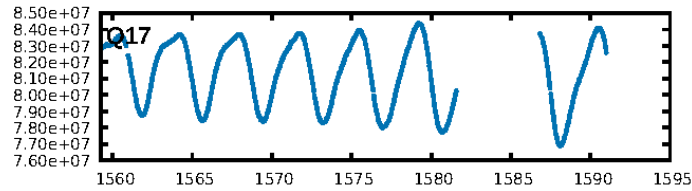
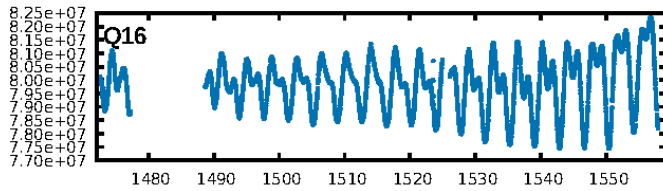
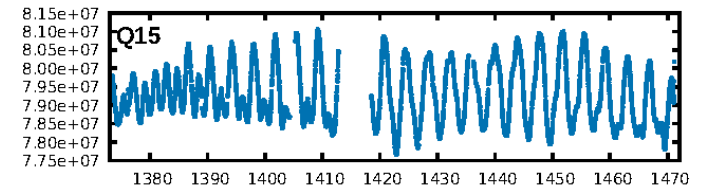
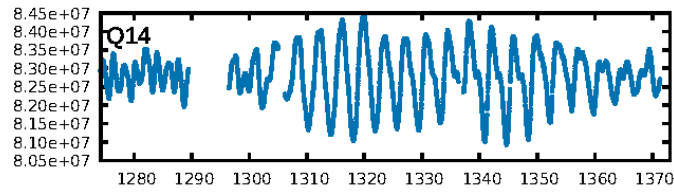
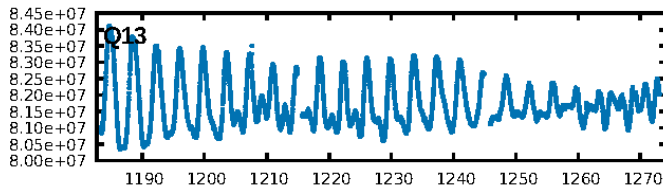
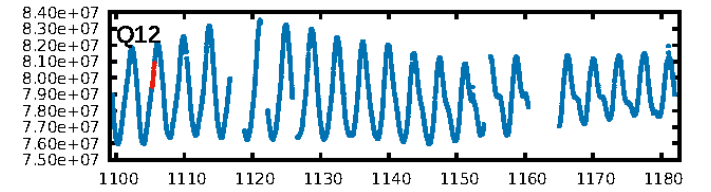
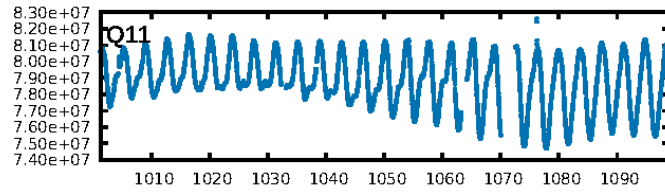
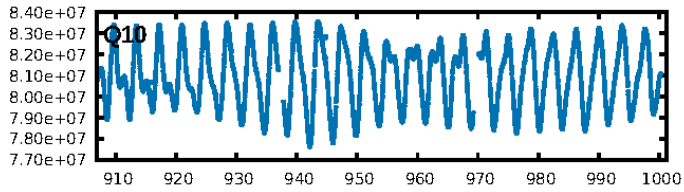
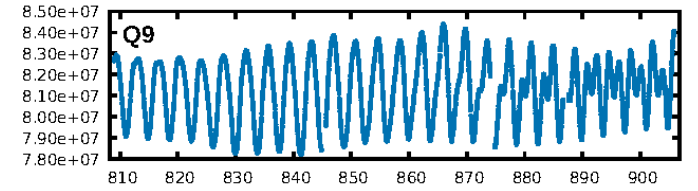
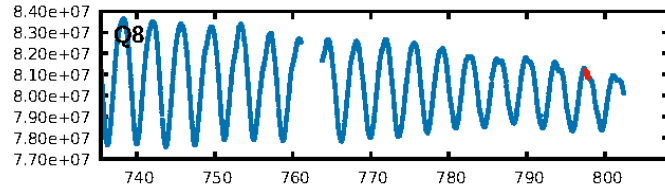
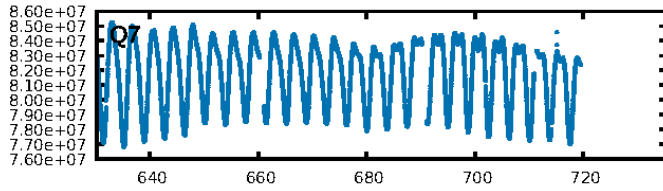
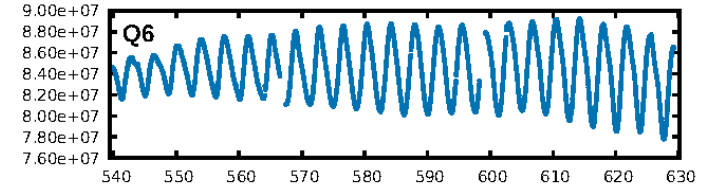
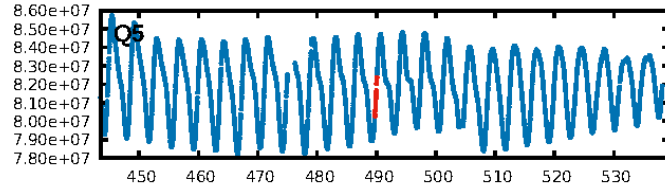
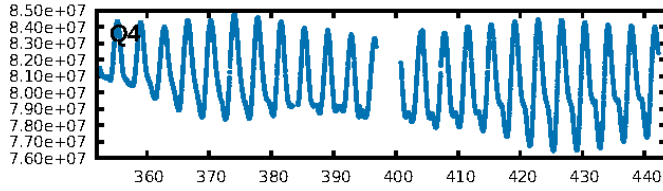
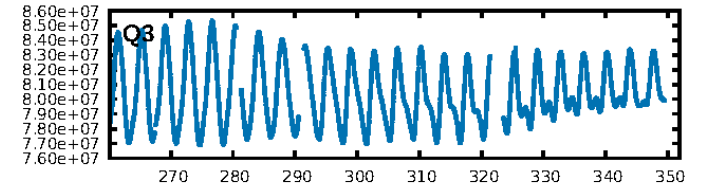
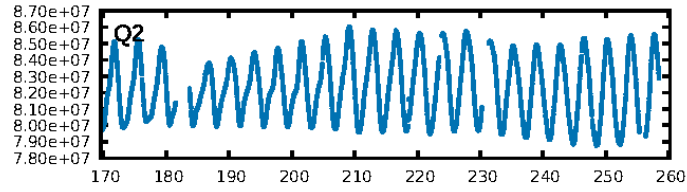
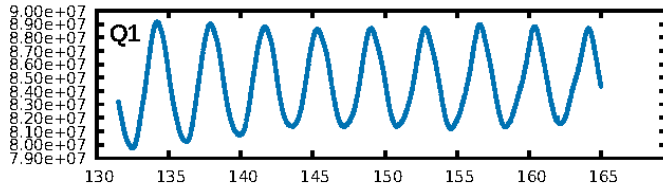
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [313.61 $\sigma$ ]  
ModelChiSquare2-sig: 42.9%  
ModelChiSquareGof-sig: 71.7%  
Bootstrap-pfa: 3.53e-14  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.9998  
Centroid-sig: 22.2%  
Centroid-so: 0.446 arcsec [0.69 $\sigma$ ]  
OotOffset-rm: 0.311 arcsec [1.63 $\sigma$ ]  
KicOffset-rm: 0.403 arcsec [2.45 $\sigma$ ]  
OotOffset-st: 0/0/2/1 [3]  
KicOffset-st: 0/0/2/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

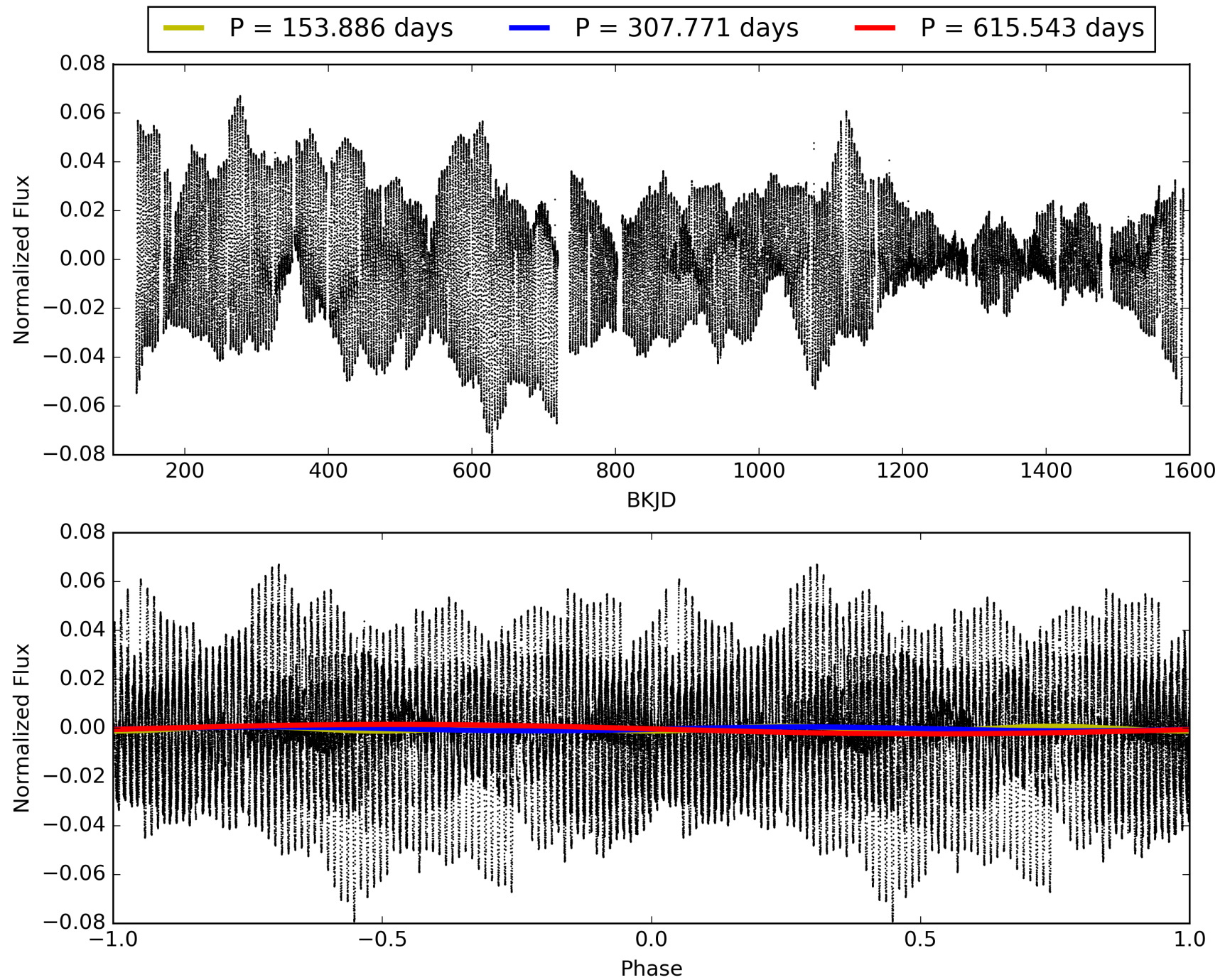
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:49:03 Z

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

# TCE 008554366-01, PDC Light Curves

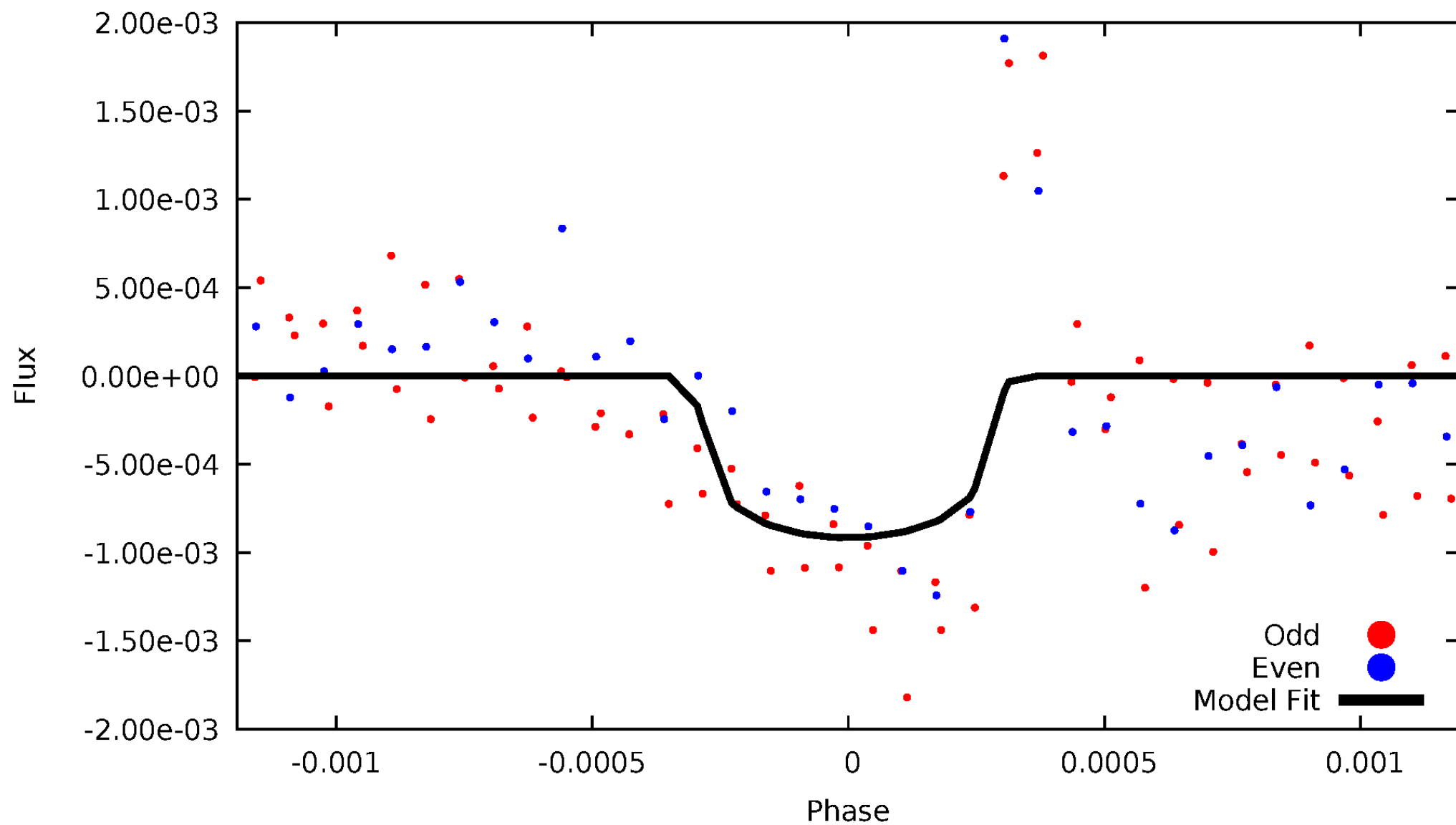


TCE 008554366-01



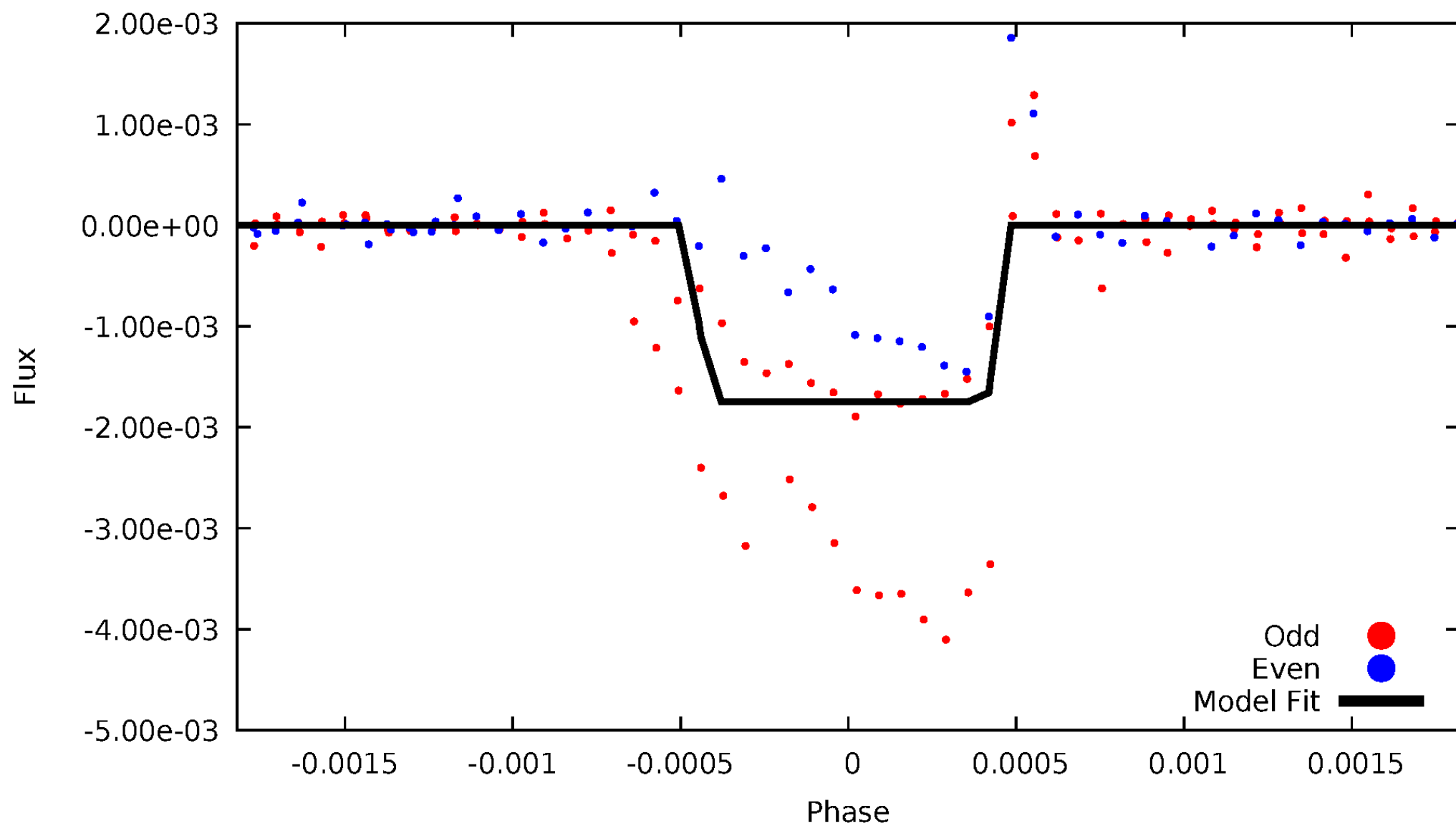
# DV Odd/Even

TCE 008554366-01



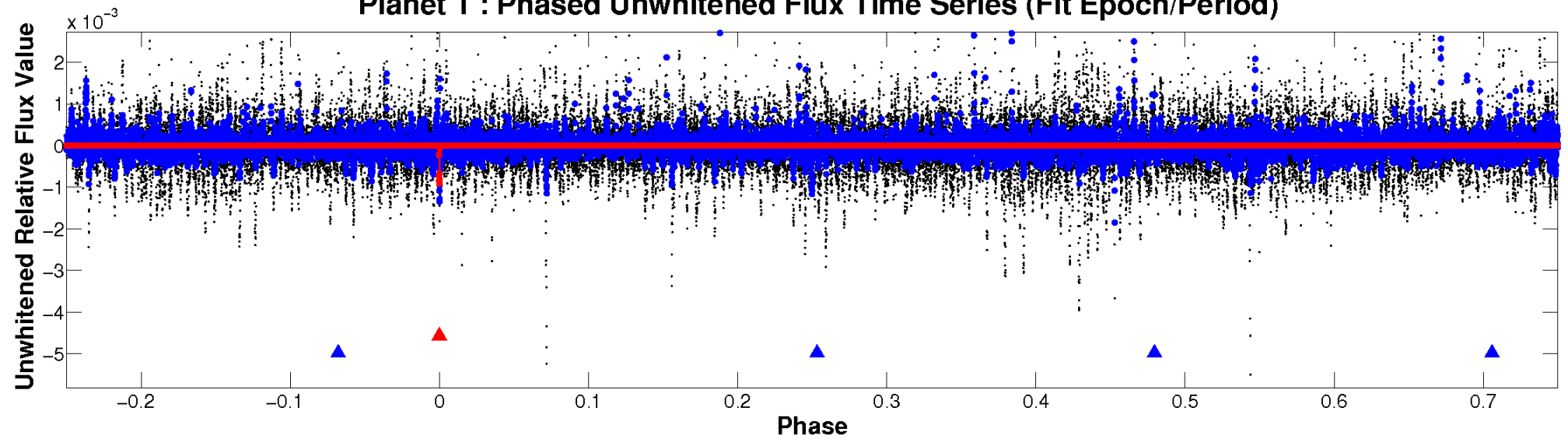
# ALT Odd/Even

TCE 008554366-01

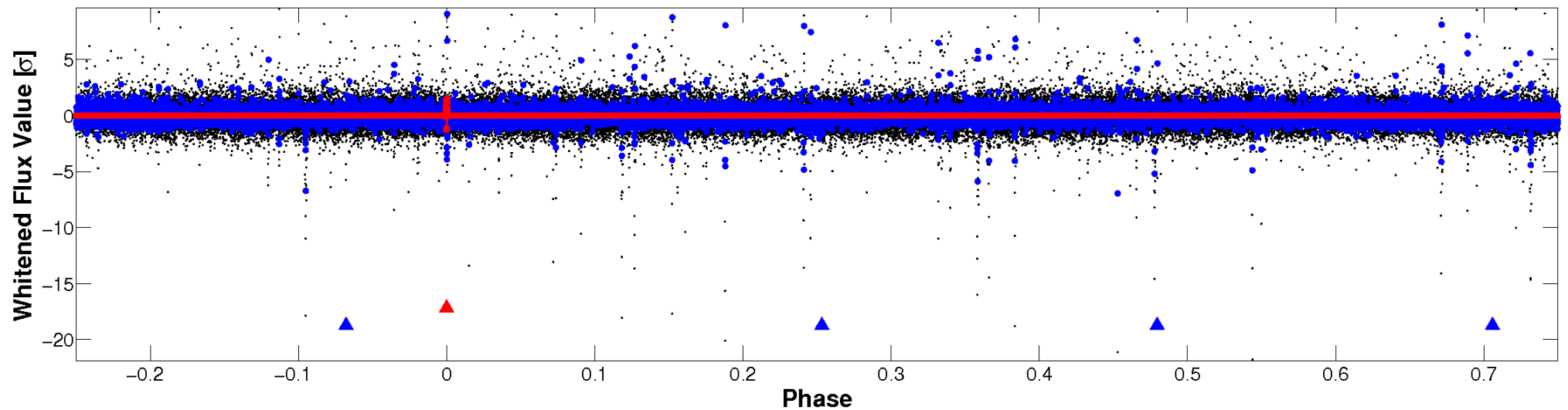


# Non-Whitened Vs. Whitened Light Curve

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



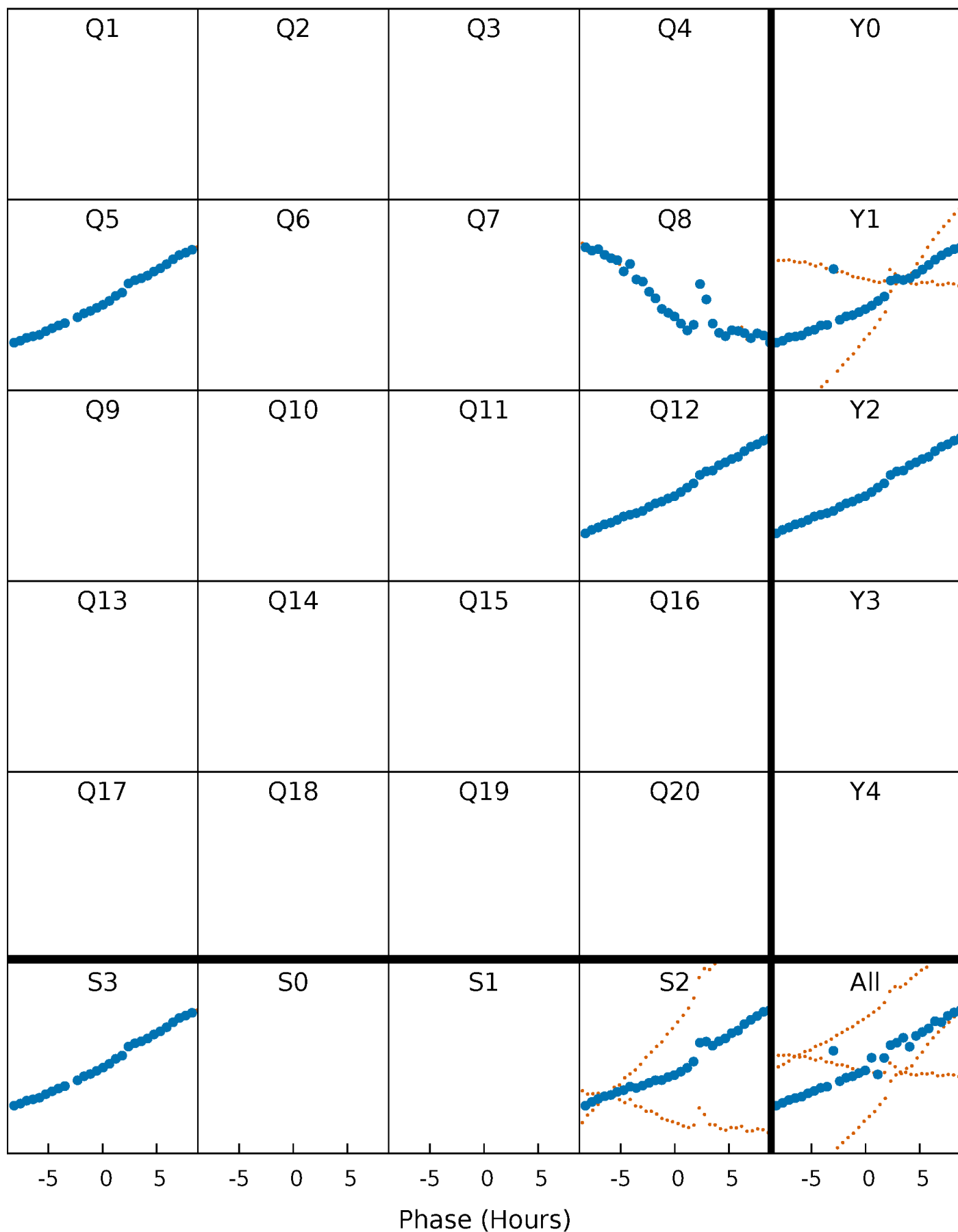
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

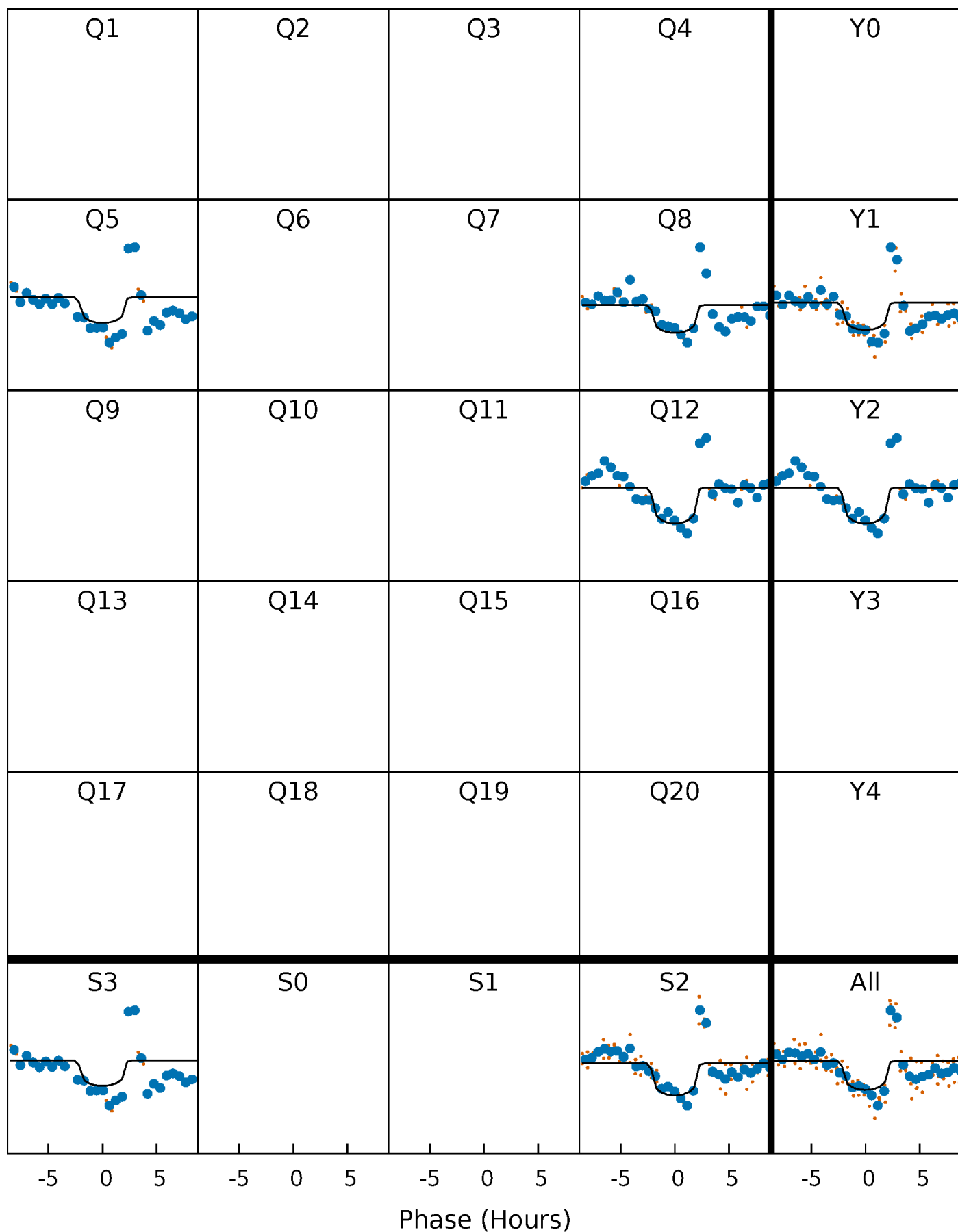
TCE 008554366-01 P=307.771444 Days  $T_0=182.131010$  (BKJD)





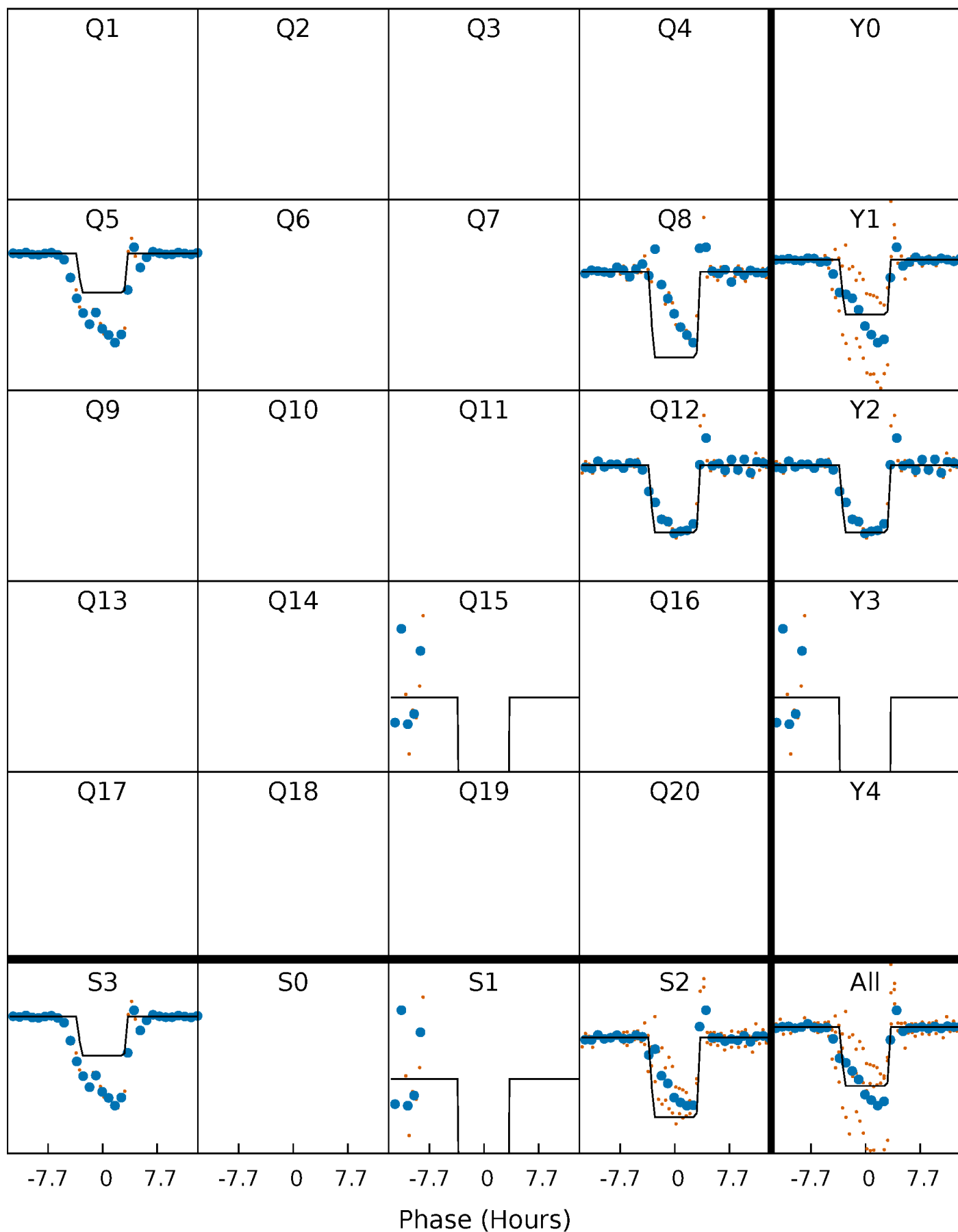
# DV Quarter-Phased Transit Curves

TCE 008554366-01     $P=307.771444$  Days     $T_0=182.131010$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

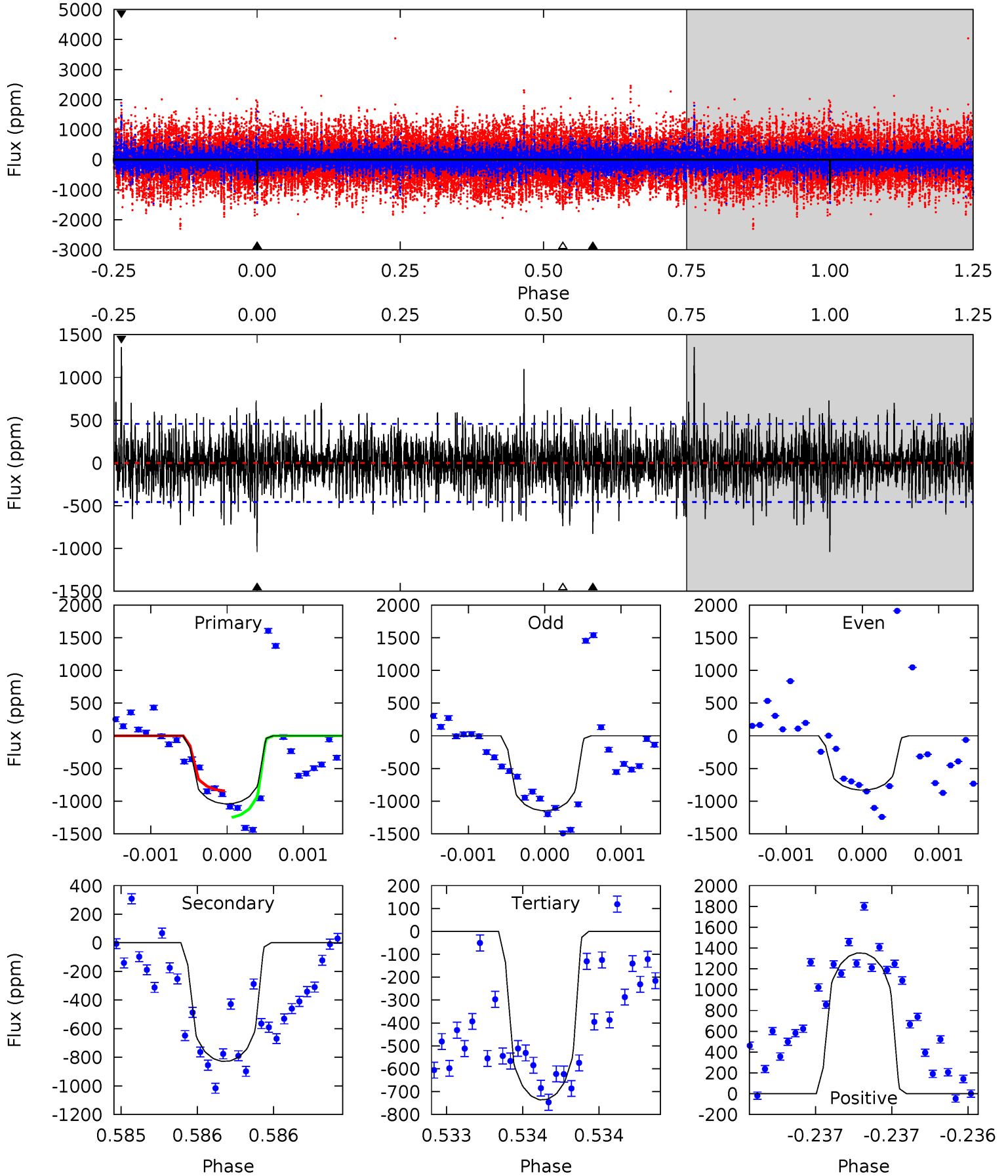
TCE 008554366-01 P=307.770281 Days  $T_0=182.077868$  (BKJD)



# DV Model-Shift Uniqueness Test

008554366-01, P = 307.771444 Days, E = 182.131010 Days

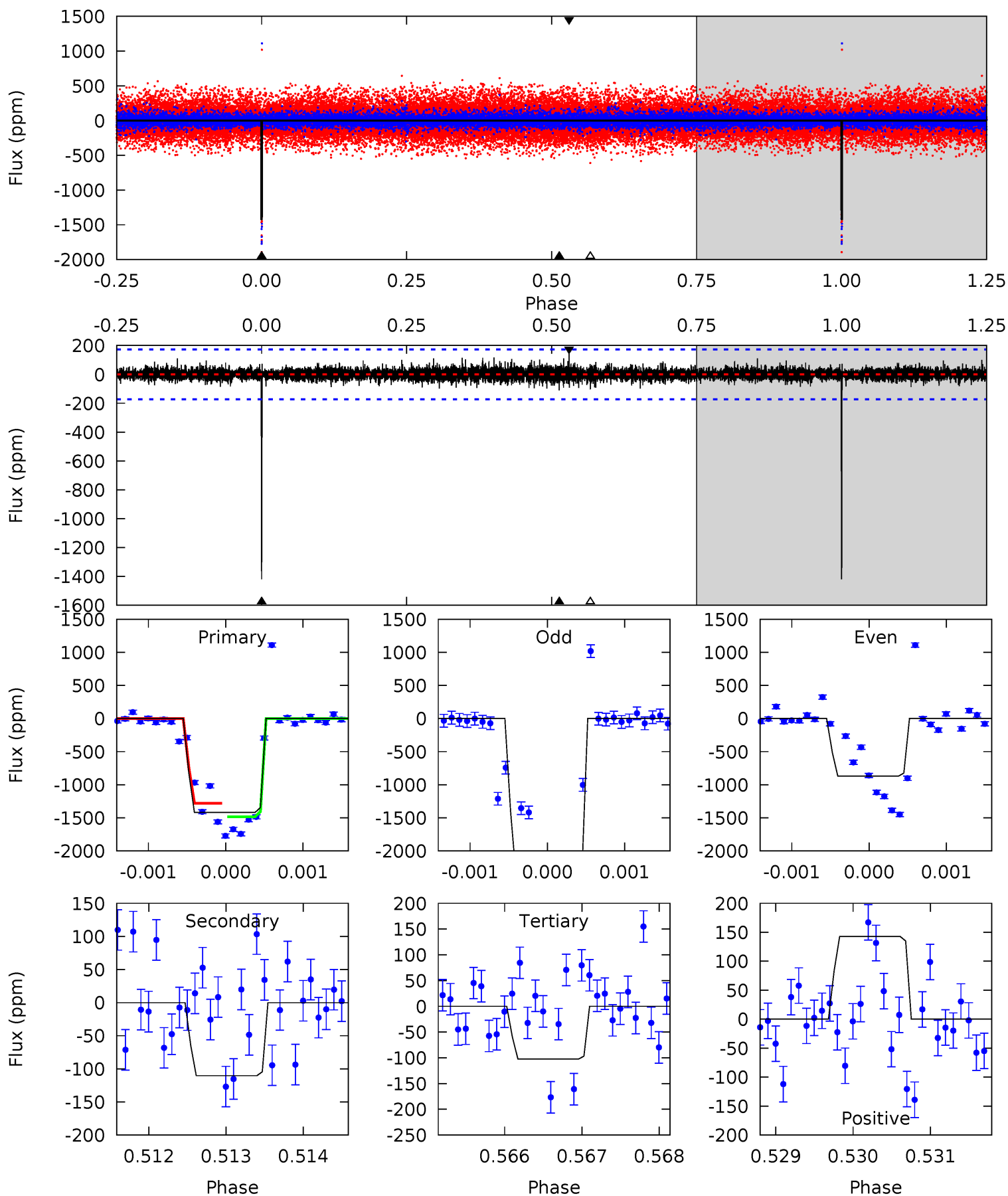
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	10.0	8.92	16.4	5.54	3.43	2.53	3.69	-3.78	1.12	-6.35	1.70	1.13	0.57	2.47



# Alt Model-Shift Uniqueness Test

008554366-01, P = 307.770281 Days, E = 182.077868 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
44.9	3.49	3.24	4.51	5.46	3.31	0.73	41.7	40.4	0.26	-1.02	31.2	1.25	0.09	0



### Stellar Parameters For KIC 008554366

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5497^{+162}_{-162}$	$4.461^{+0.139}_{-0.186}$	$-0.420^{+0.350}_{-0.300}$	$0.842^{+0.182}_{-0.121}$	$0.747^{+0.114}_{-0.045}$	$1.764^{+1.057}_{-0.773}$
	+3%/-3%	+3%/-4%	+83%/-71%	+22%/-14%	+15%/-6%	+60%/-44%
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 008554366-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-829 \pm 82$	$3.00^{+1.95}_{-1.76}$	$346^{+22}_{-19}$	$5218^{+3244}_{-905}$	$34054^{+163569}_{-21897}$
Alt.	$-110 \pm 32$	$3.92^{+2.10}_{-1.97}$	$348^{+21}_{-21}$	$3298^{+862}_{-433}$	$2629^{+8425}_{-1628}$

$T_{max}$  = 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

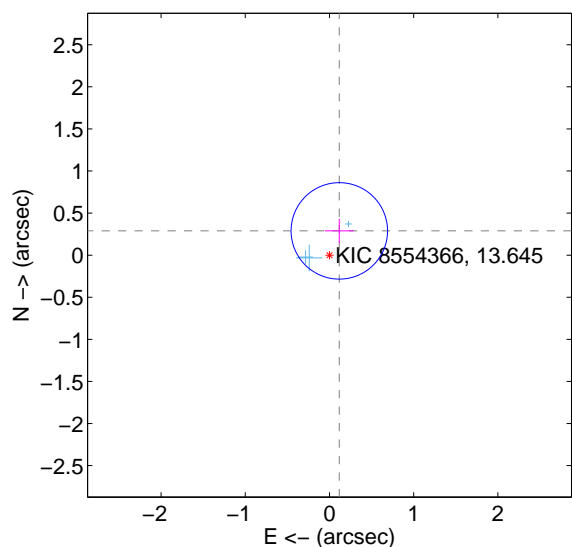
Supplemental centroid analysis for 008554366-01. Kepler magnitude: 13.64. Transit SNR 6.39

There are 3 quarters with good PRF difference image offsets

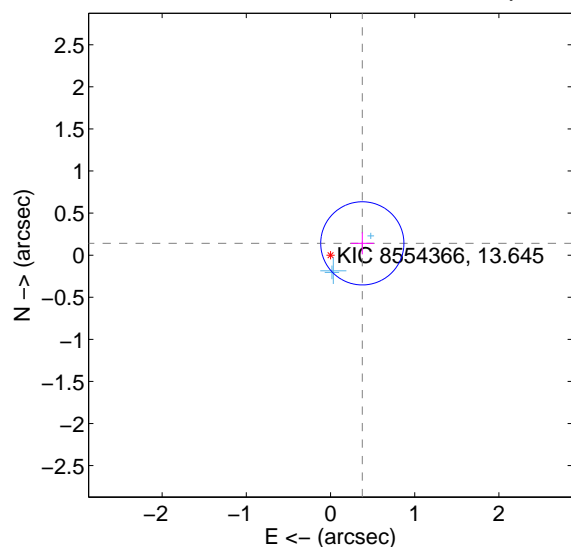
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.311 \pm 0.191$	1.63	$-0.117 \pm 0.172$	$0.288 \pm 0.145$
PRF-fit source offset from KIC position	$0.403 \pm 0.165$	2.45	$-0.378 \pm 0.136$	$0.140 \pm 0.130$
photometric centroid source offset	$0.45 \pm 0.65$	0.69	$-0.30 \pm 0.65$	$0.33 \pm 0.65$

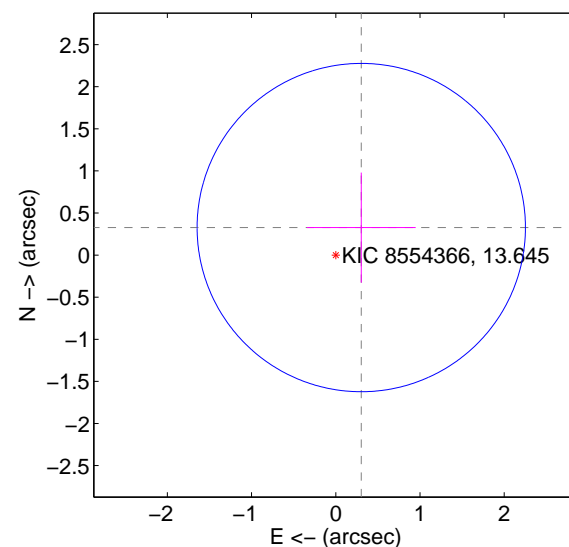
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



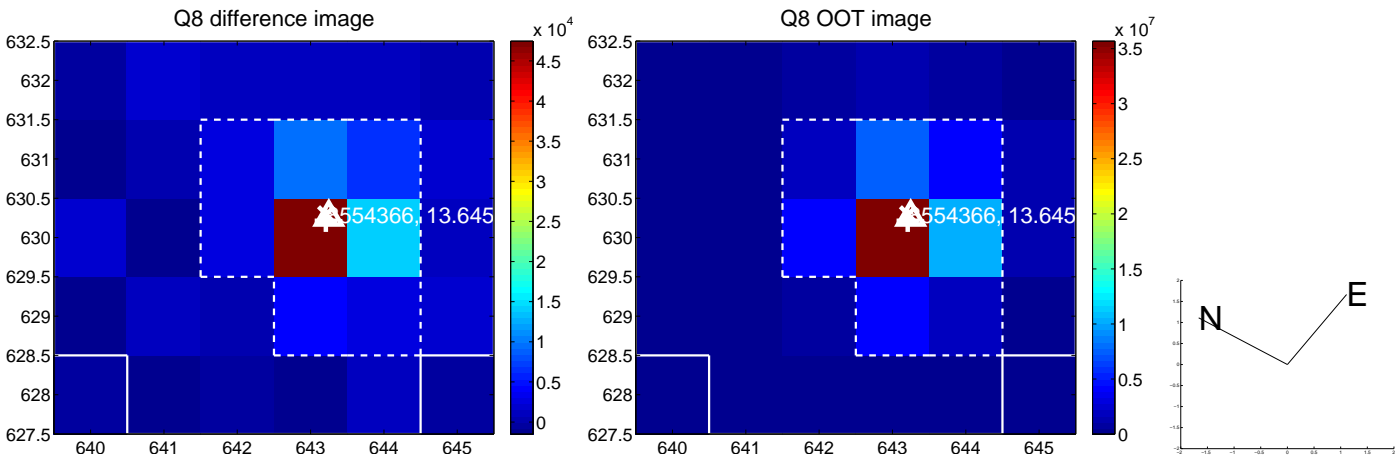
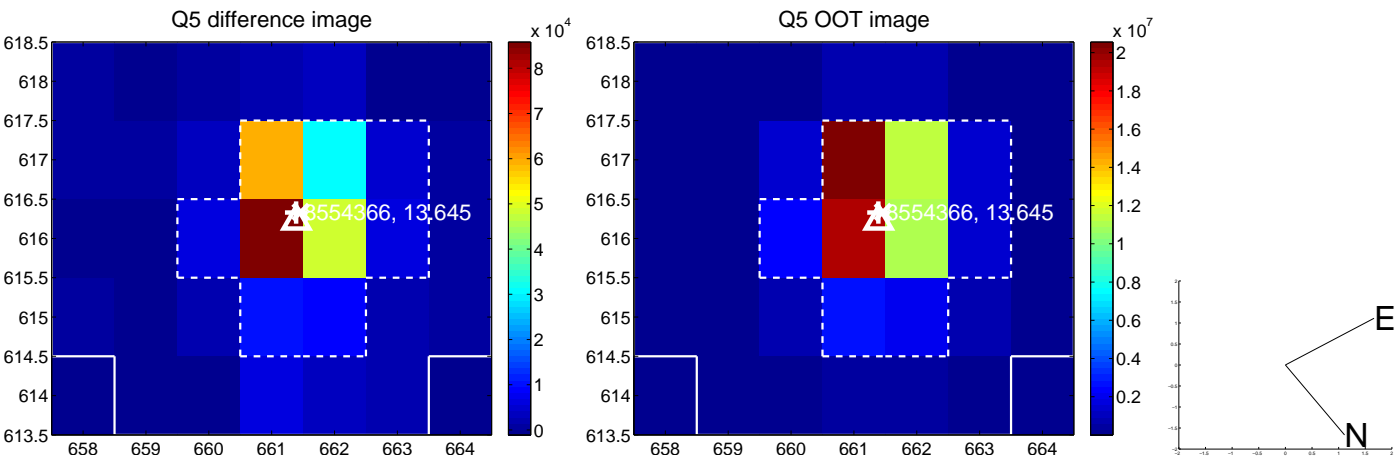
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

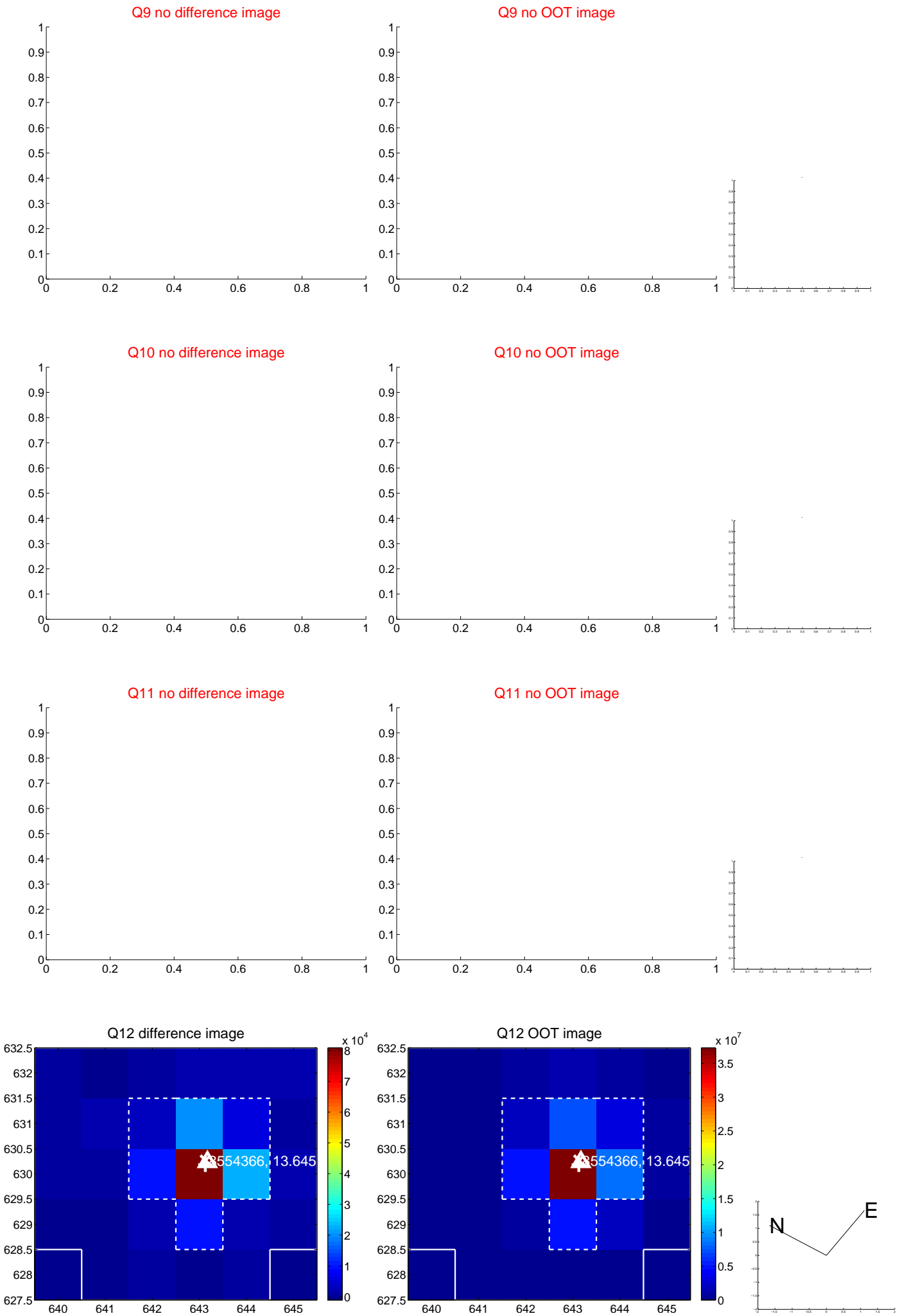




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



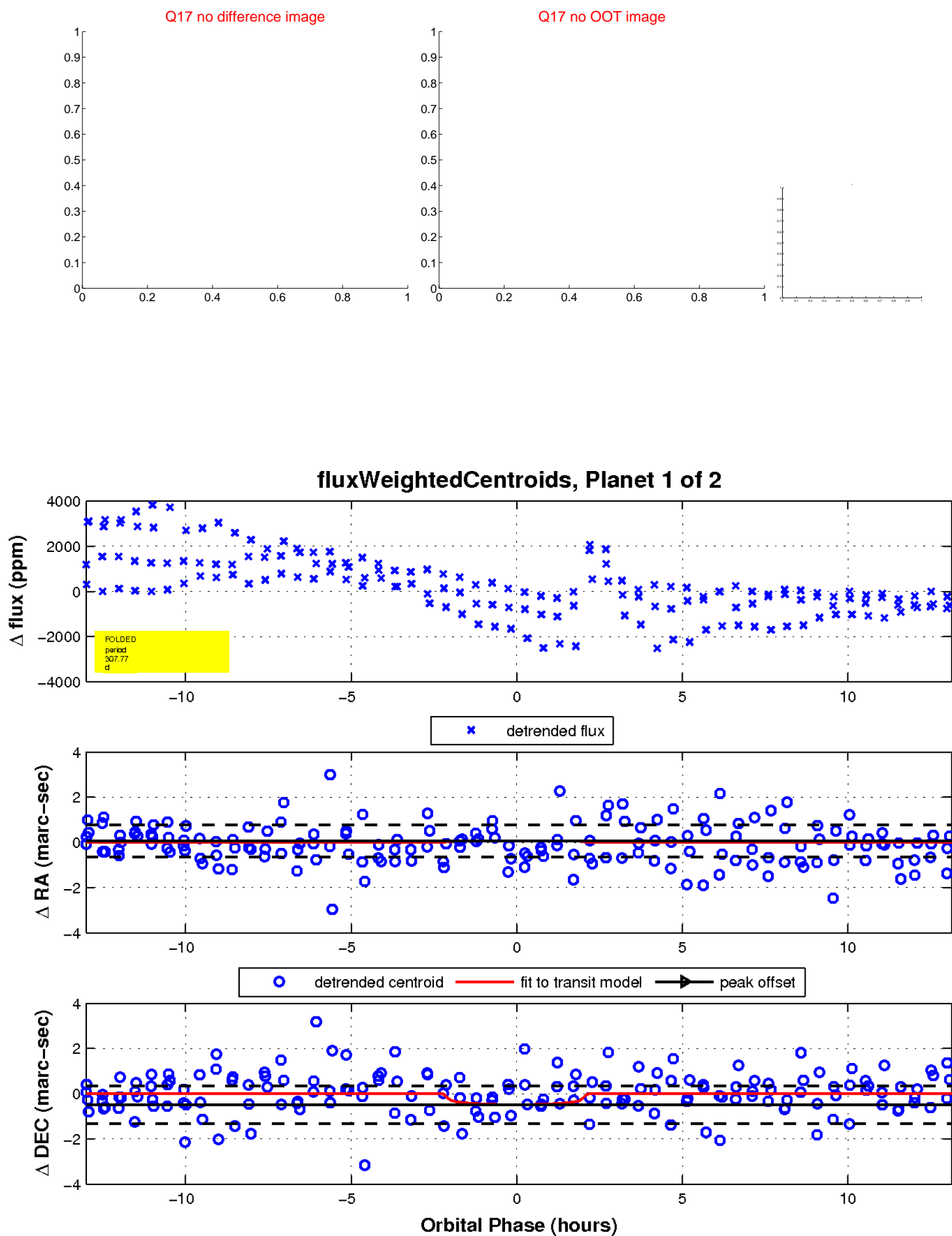
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

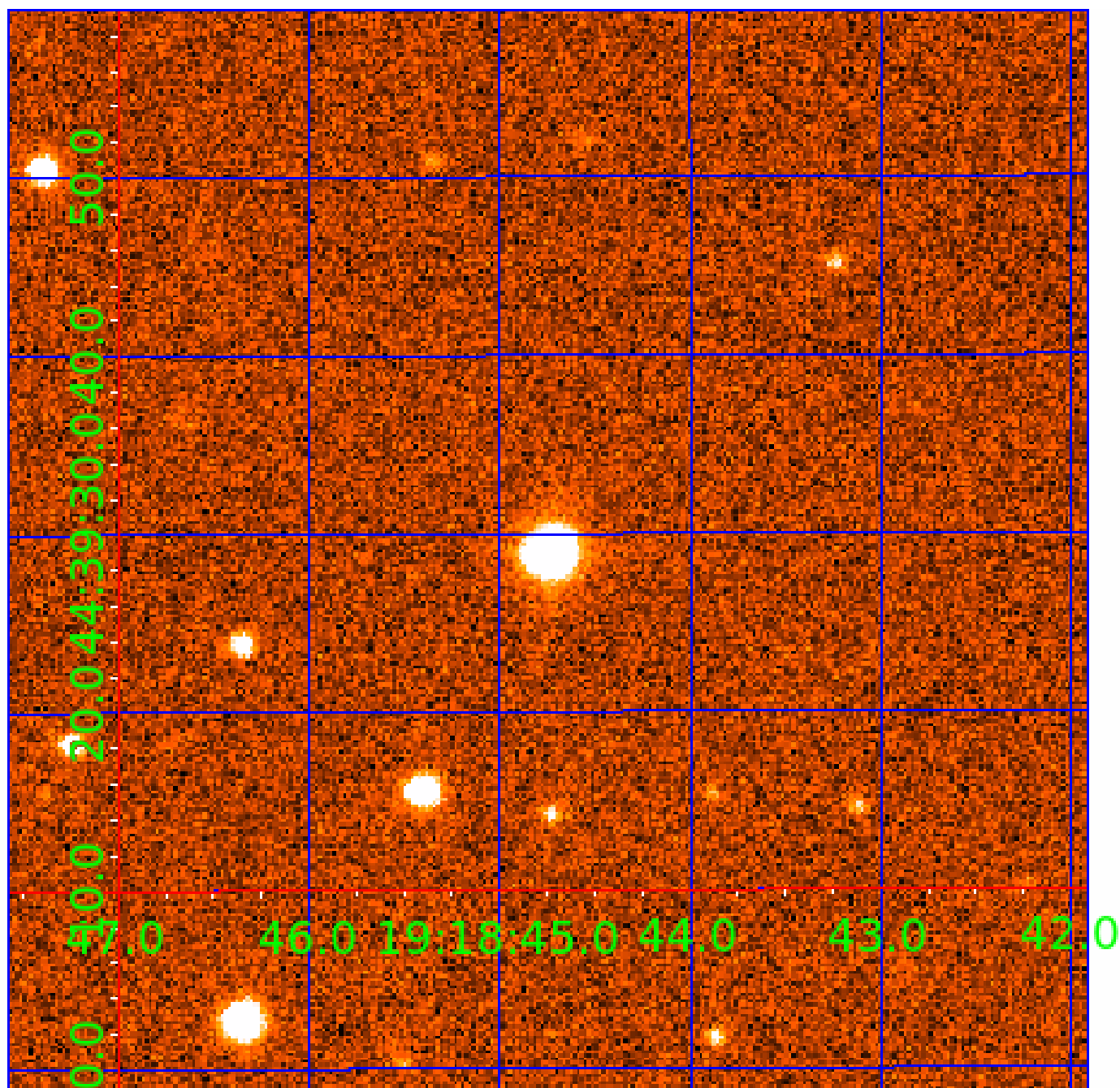


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008554366

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008554366-01	OBS	No	307.771444	182.131010	915.1	4.405	16.0	6.4	0.84	5497	2.71	0.88
008554366-02	OBS	No	377.417324	260.084278	977.8	3.000	13.6	6.9	0.84	5497	2.70	0.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008554366-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_POS_DV
008554366-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—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.

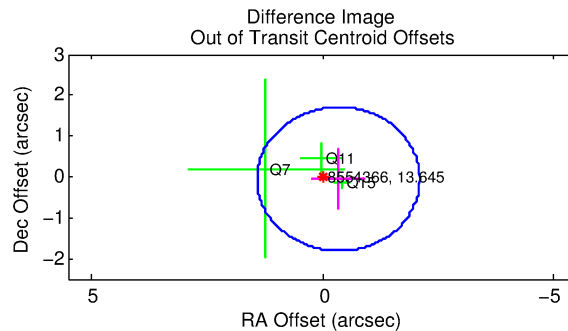
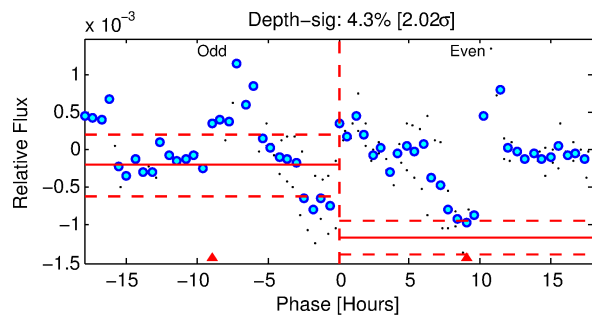
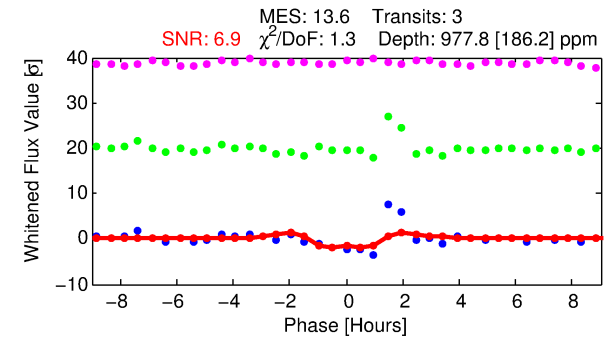
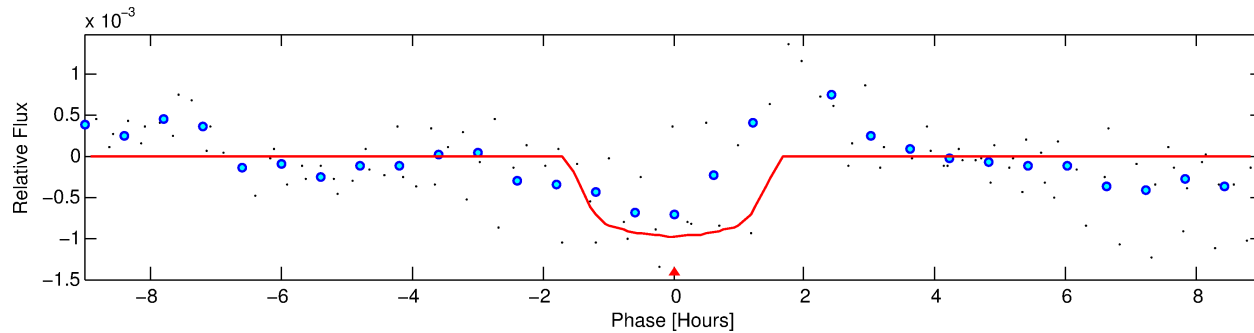
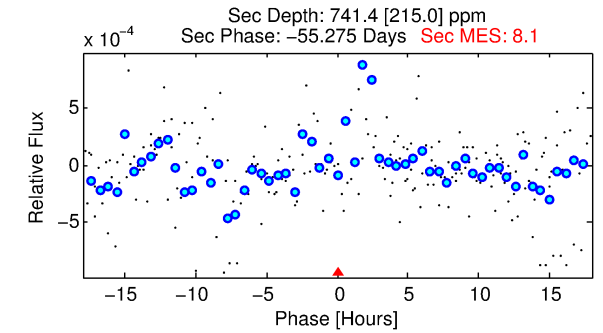
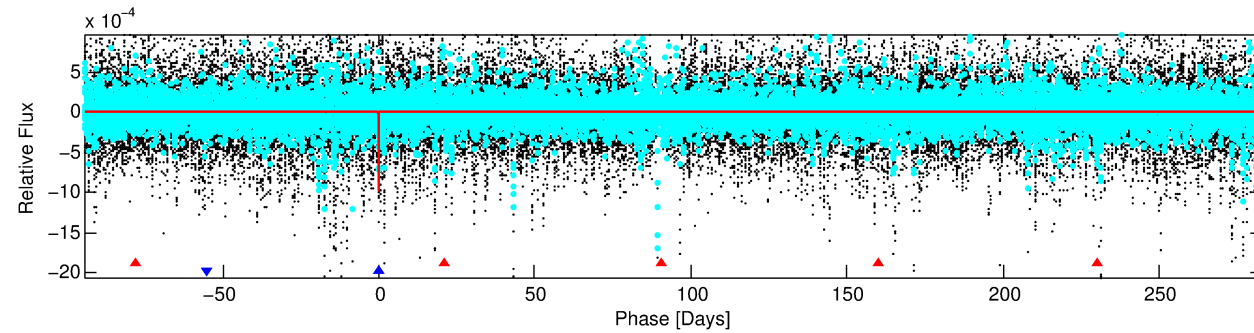
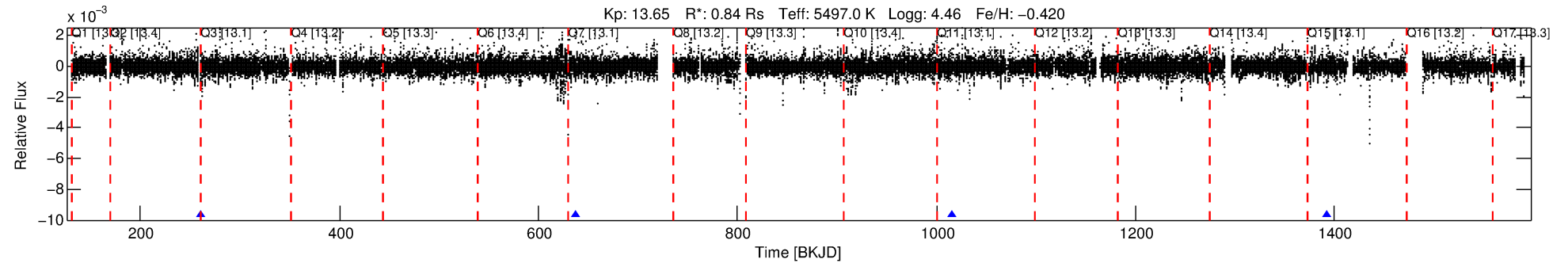
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008554366-02

No Significant Match Found

# DV One-Page Summary

KIC: 8554366 Candidate: 2 of 2 Period: 377.417 d



## DV Fit Results:

Period = 377.41732 [0.00362] d  
Epoch = 260.0843 [0.0085] BKJD  
Rp/R\* = 0.0294 [0.0484]  
a/R\* = 852.45 [5923.79]  
b = 0.52 [9.78]  
Seff = 0.67 [0.23]  
Teff = 231 [20] K  
Rp = 2.70 [4.48] Re  
a = 0.9278 [0.1882] AU  
Ag = 48177.31 [160058.82] [0.30σ]  
Teffp = 5292 [4378] K [1.16σ]

## DV Diagnostic Results:

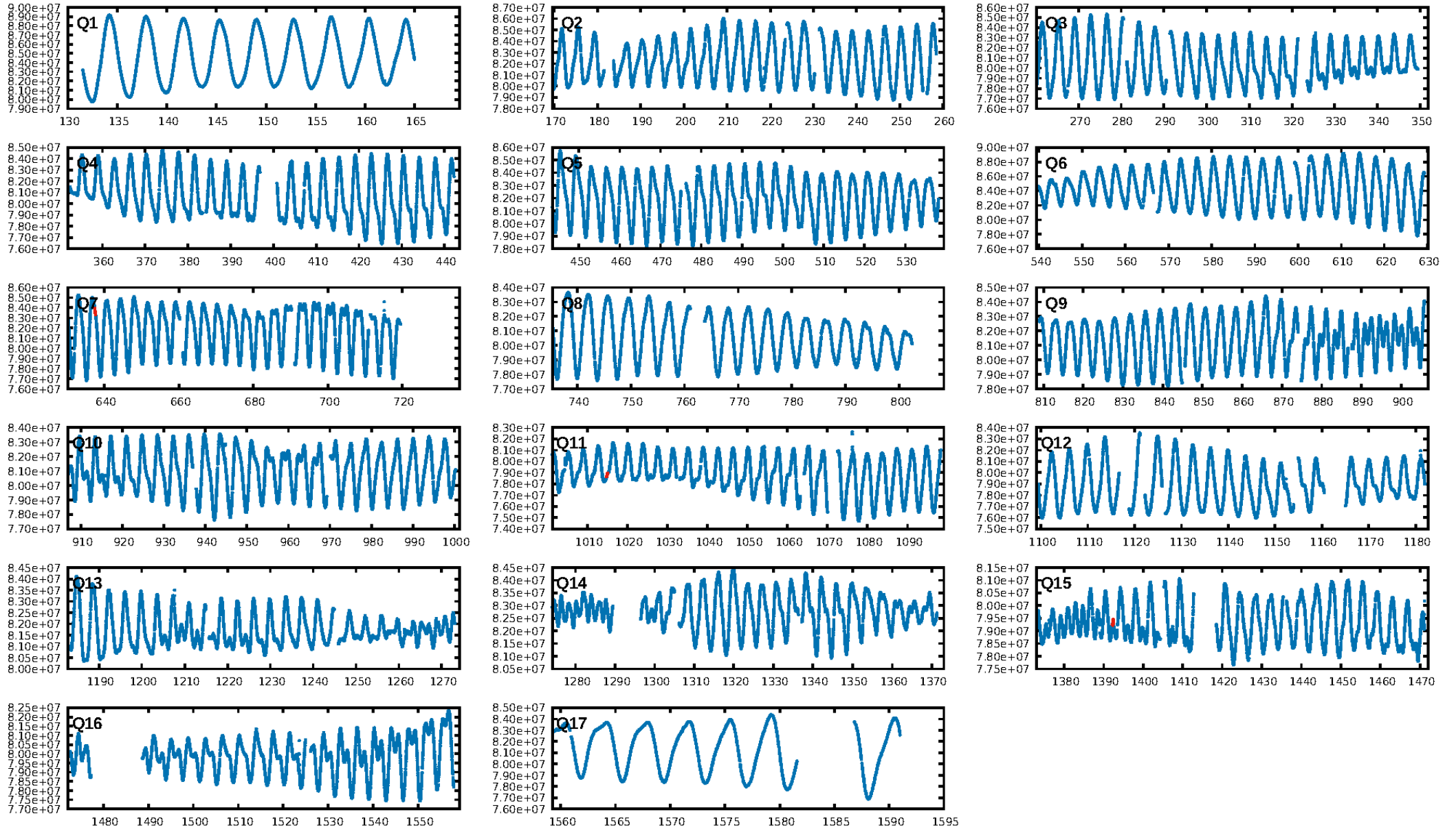
ShortPeriod-sig: 100.0% [313.61σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.8%  
ModelChiSquareGof-sig: 92.9%  
**Bootstrap-pfa: 4.49e-11**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -4.992  
Centroid-sig: 68.2%  
Centroid-so: 0.561 arcsec [0.80σ]  
OotOffset-rm: 0.350 arcsec [0.60σ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-rm: 0.662 arcsec [1.11σ]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:49:22 Z

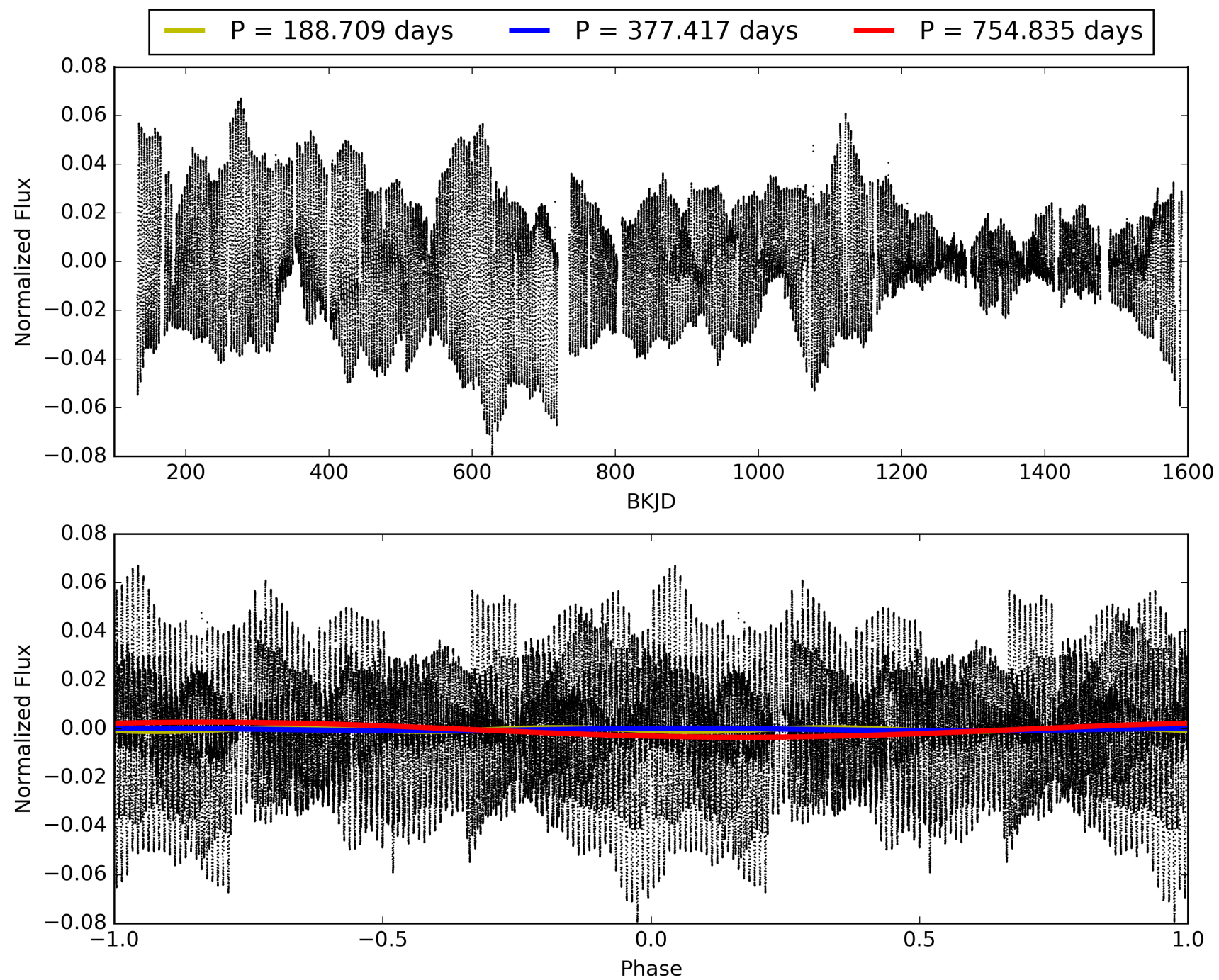
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008554366-02, PDC Light Curves

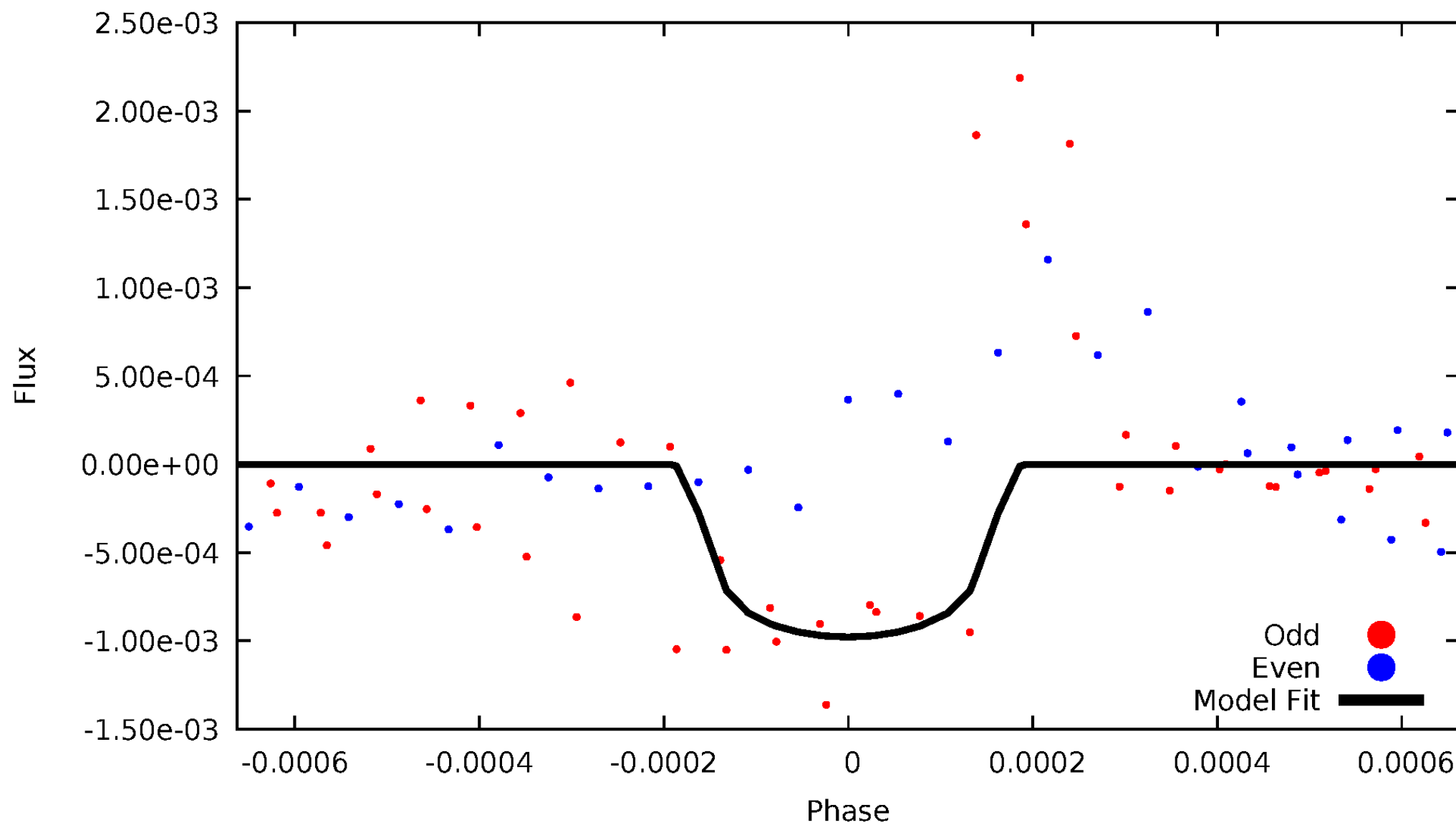


TCE 008554366-02



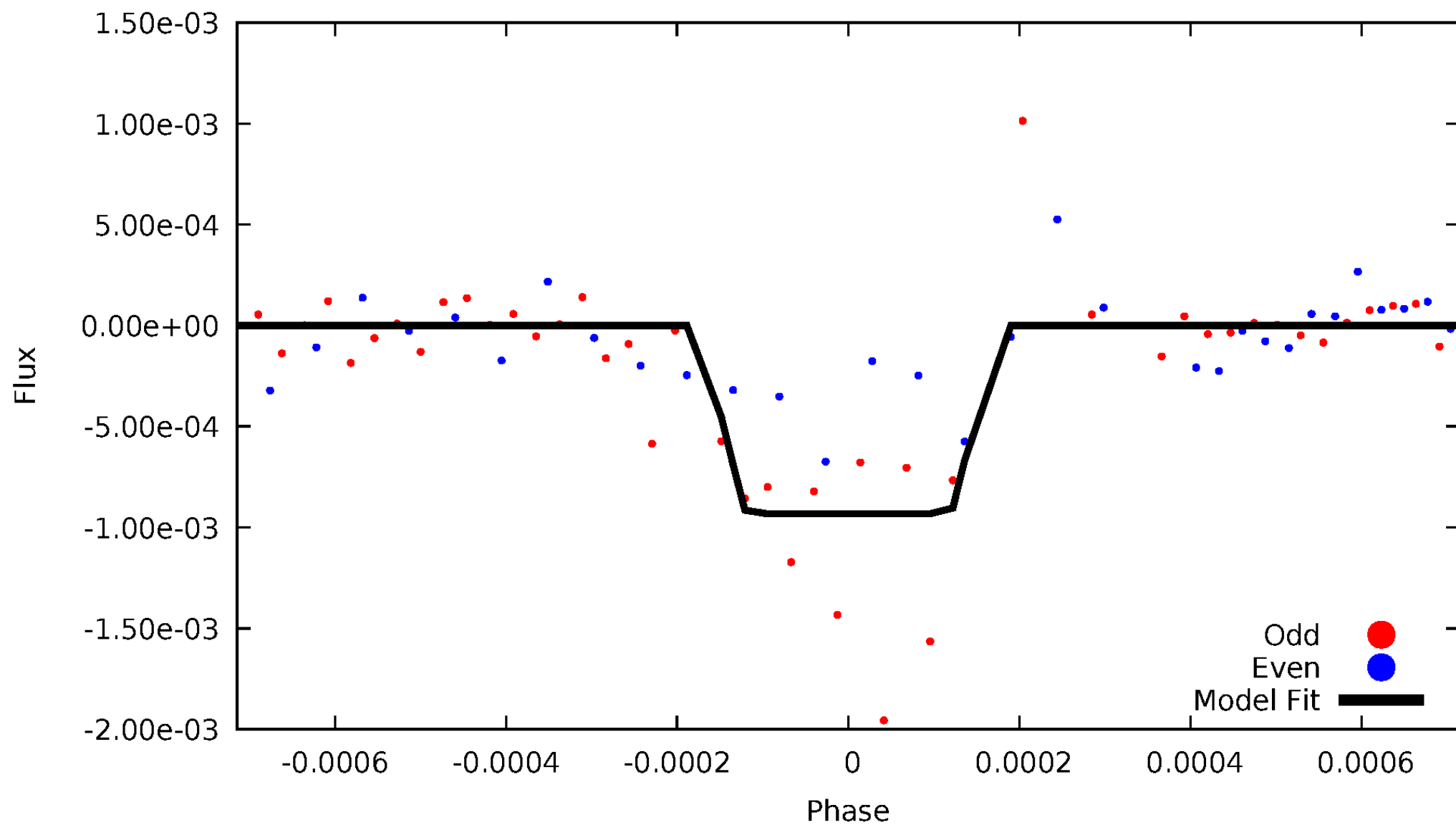
# DV Odd/Even

TCE 008554366-02



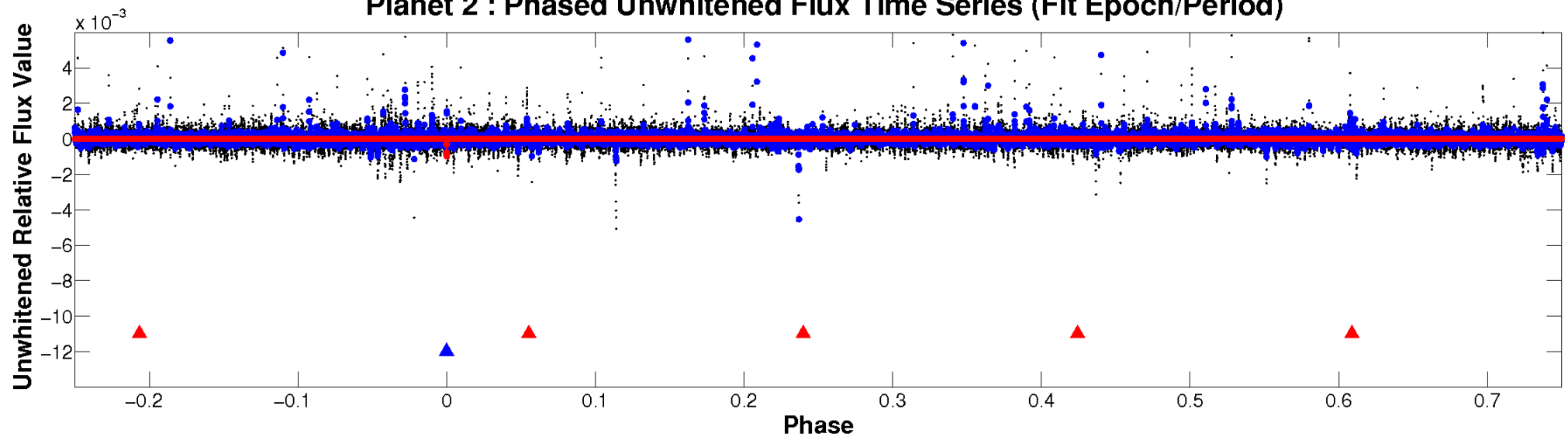
# ALT Odd/Even

TCE 008554366-02

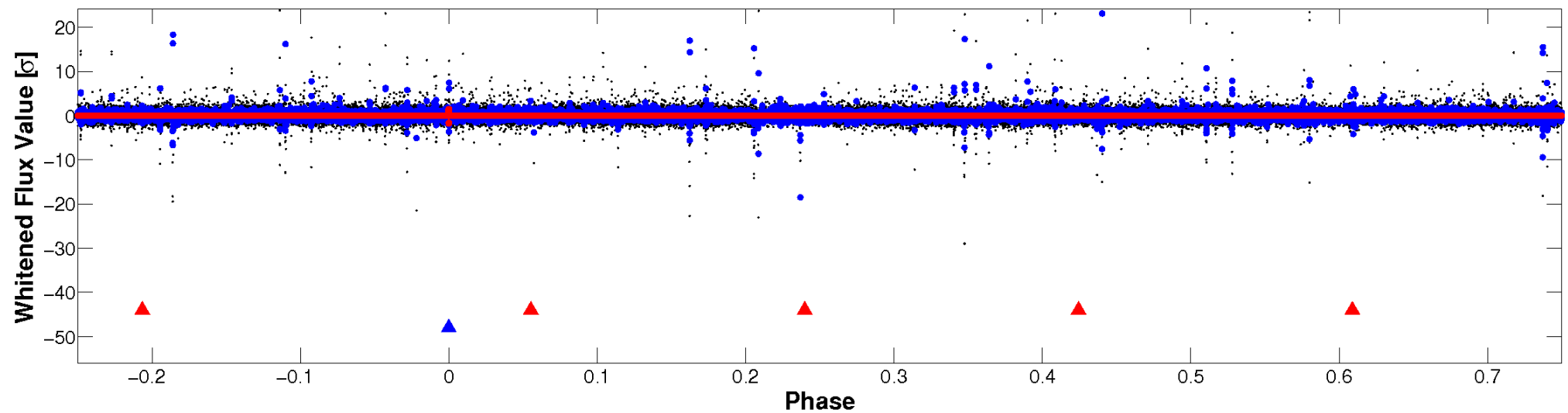


# Non-Whitened Vs. Whitened Light Curve

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

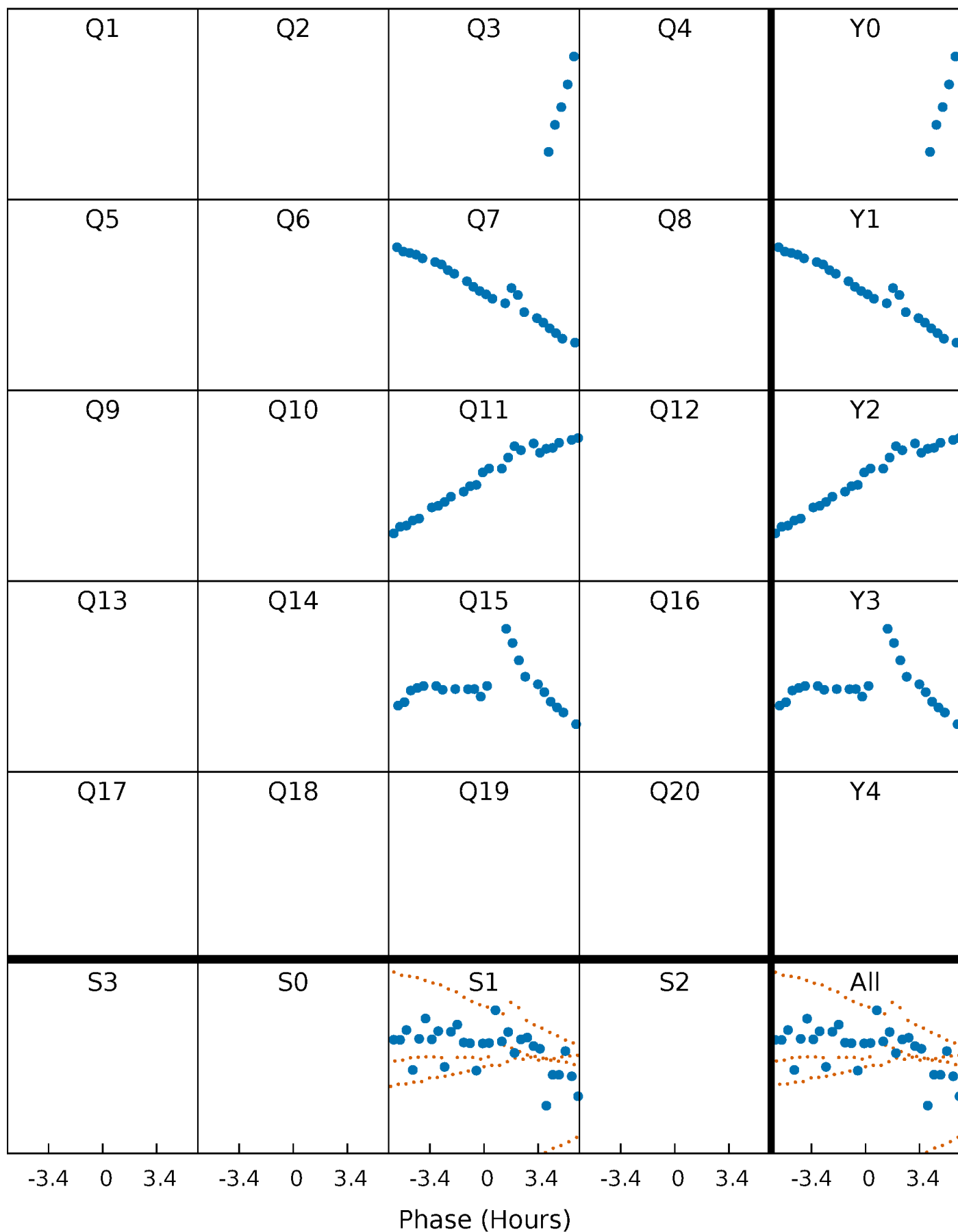


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



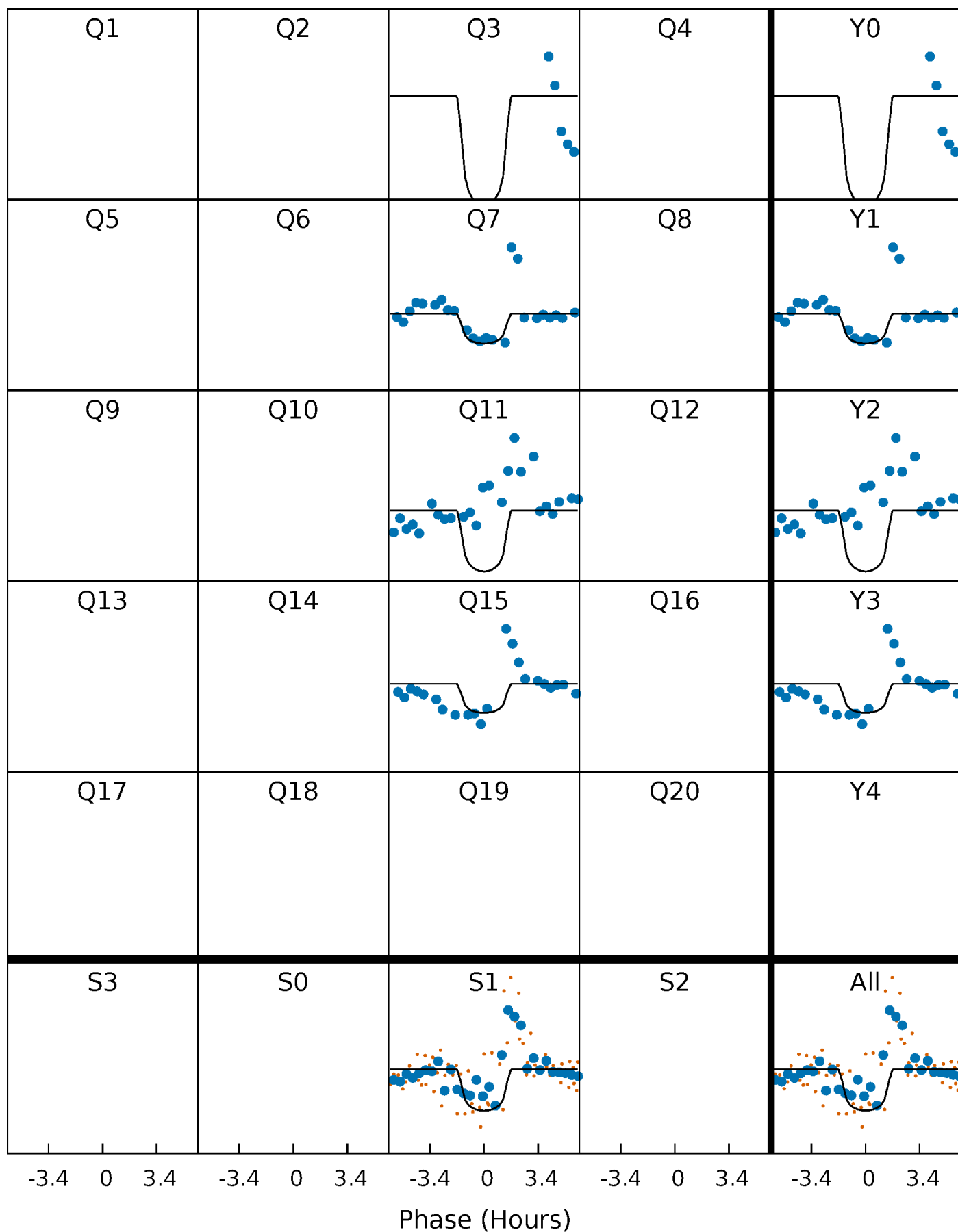
# PDC Quarter-Phased Transit Curves

TCE 008554366-02   P=377.417324 Days    $T_0=260.084278$  (BKJD)



# DV Quarter-Phased Transit Curves

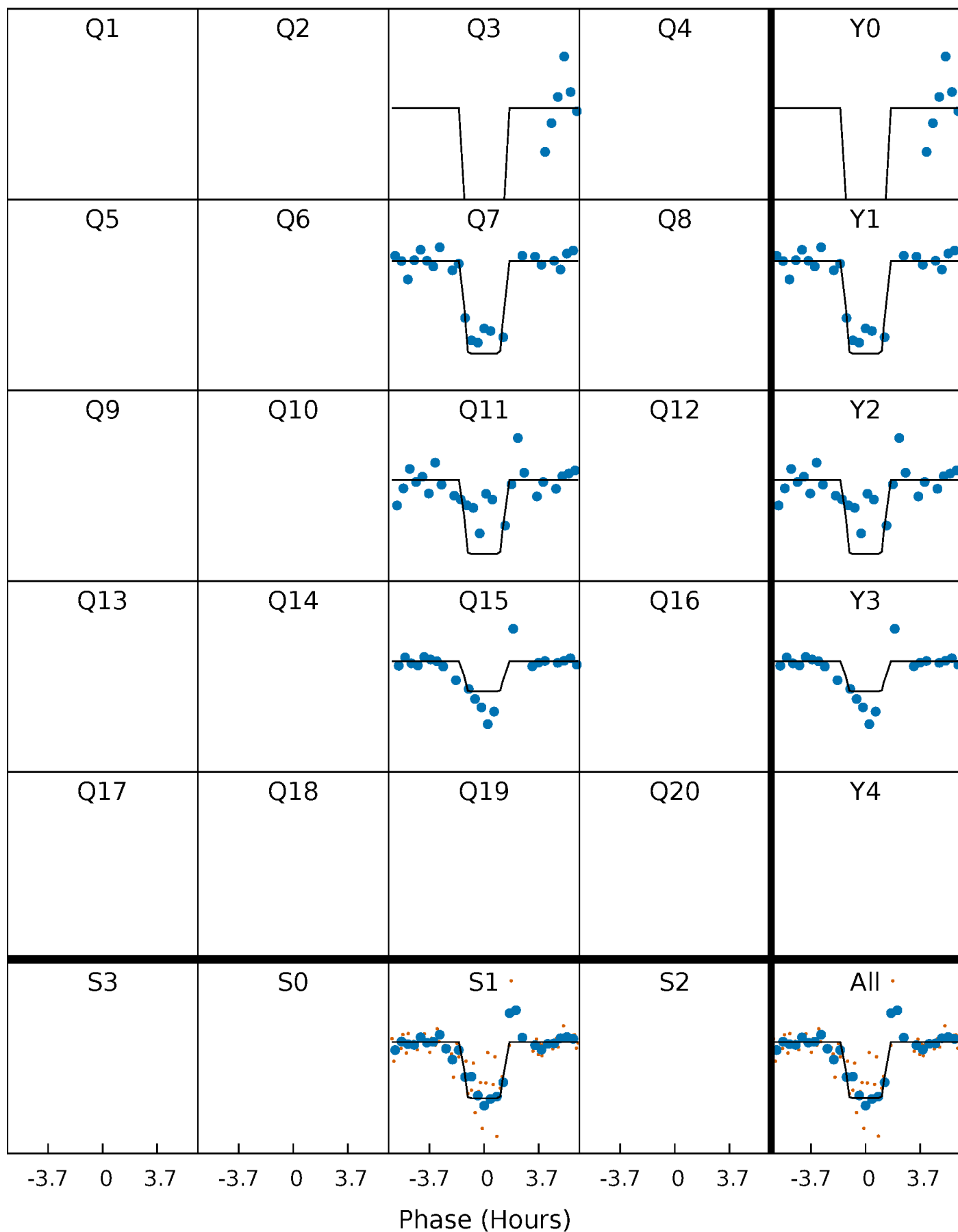
TCE 008554366-02     $P=377.417324$  Days     $T_0=260.084278$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

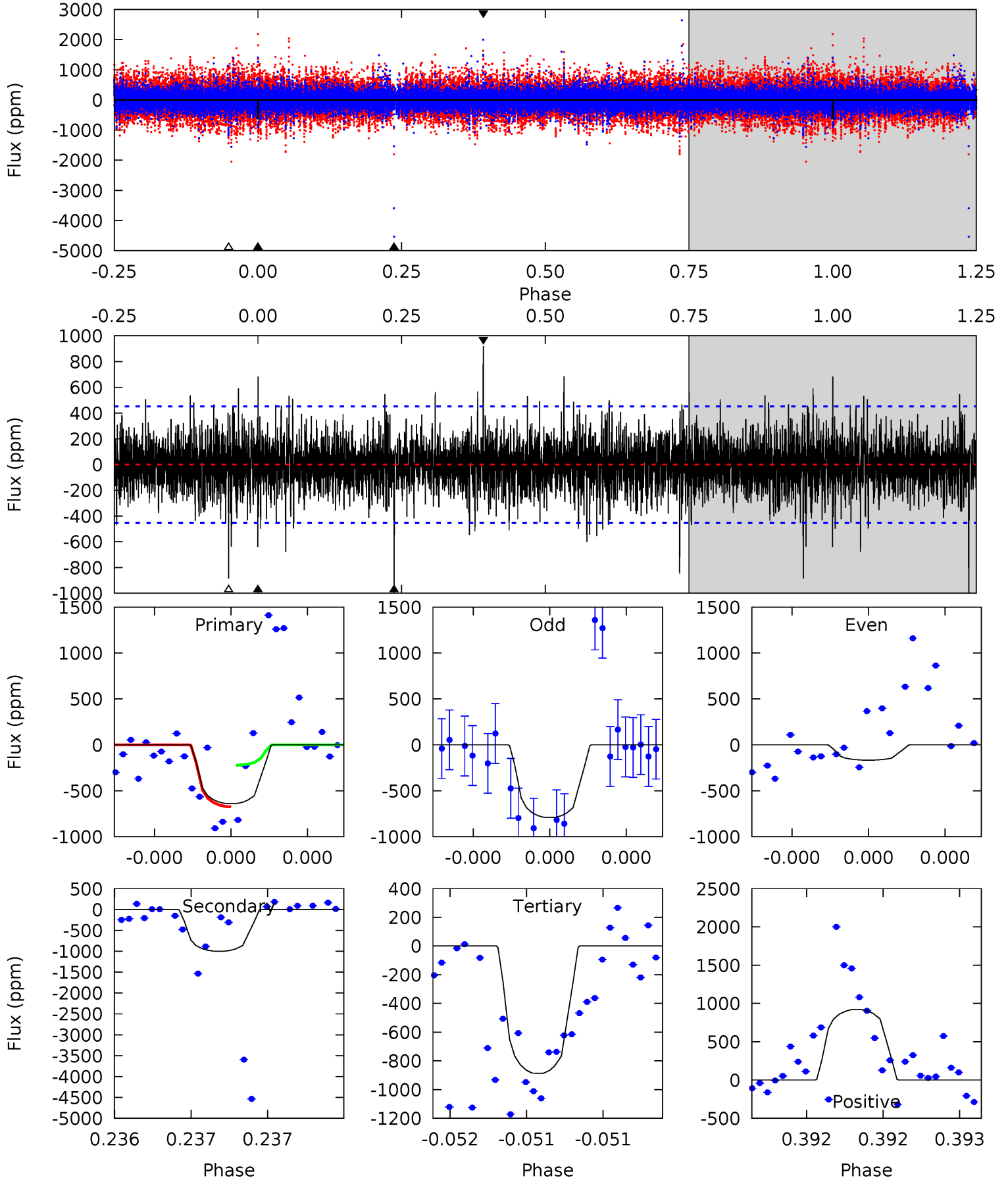
TCE 008554366-02 P=377.403190 Days  $T_0=260.102025$  (BKJD)



# DV Model-Shift Uniqueness Test

008554366-02, P = 377.417324 Days, E = 260.084278 Days

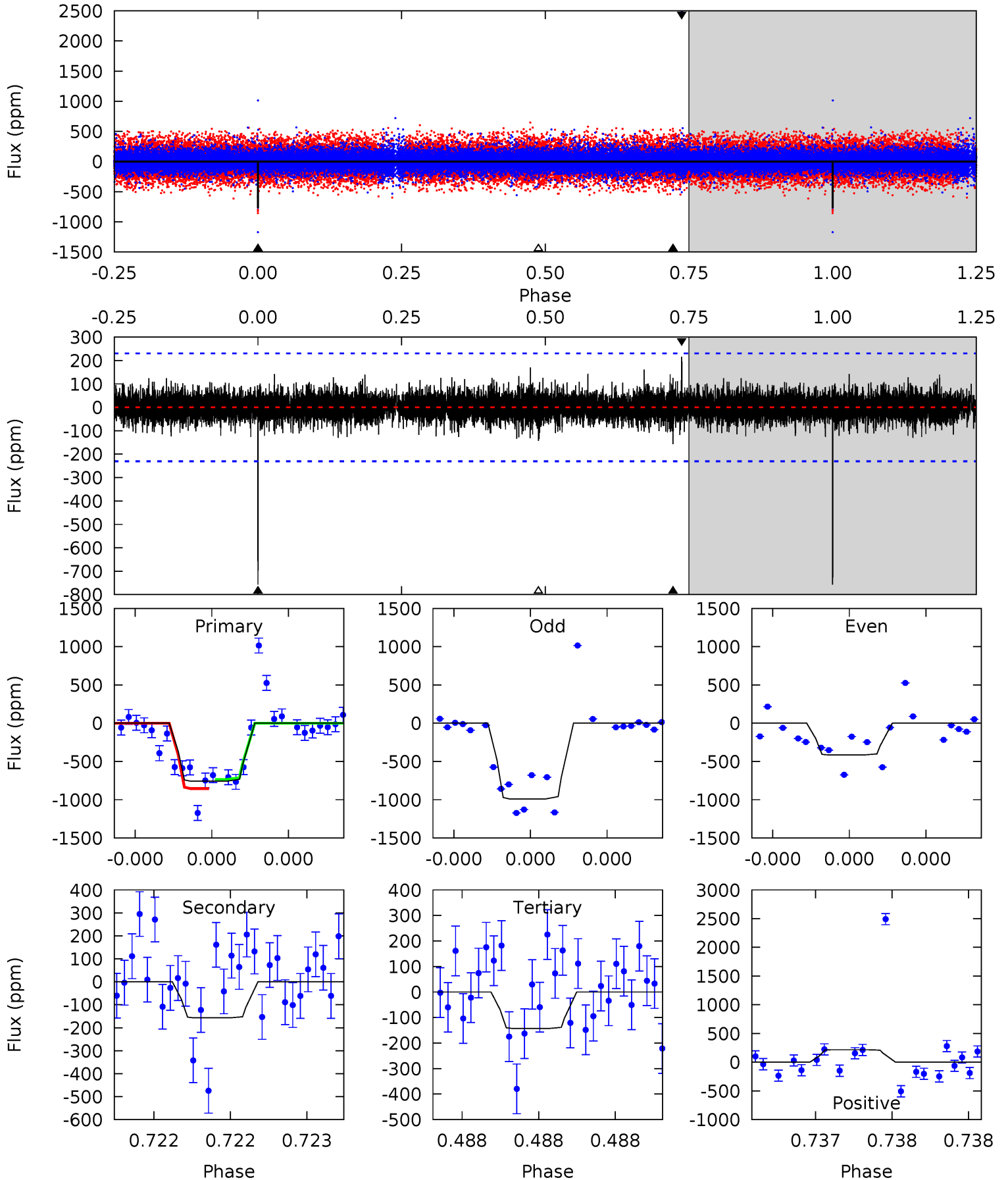
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.97	12.4	11.0	11.5	5.63	3.57	1.77	-3.07	-3.48	1.40	0.99	3.63	0.68	0.48	2.92



# Alt Model-Shift Uniqueness Test

008554366-02, P = 377.403190 Days, E = 260.102025 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
18.5	3.84	3.50	5.29	5.64	3.58	0.80	15.0	13.2	0.34	-1.45	8.27	1.11	0.22	1.43



### Stellar Parameters For KIC 008554366

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5497^{+162}_{-162}$	$4.461^{+0.139}_{-0.186}$	$-0.420^{+0.350}_{-0.300}$	$0.842^{+0.182}_{-0.121}$	$0.747^{+0.114}_{-0.045}$	$1.764^{+1.057}_{-0.773}$
	+3%/-3%	+3%/-4%	+83%/-71%	+22%/-14%	+15%/-6%	+60%/-44%
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 008554366-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-998 \pm 80$	$4.19^{+3.96}_{-2.67}$	$323^{+22}_{-19}$	$4705^{+3025}_{-977}$	$27352^{+173259}_{-20245}$
Alt.	$-157 \pm 41$	$4.25^{+4.01}_{-2.60}$	$324^{+22}_{-17}$	$3380^{+1409}_{-610}$	$3883^{+26008}_{-2886}$

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

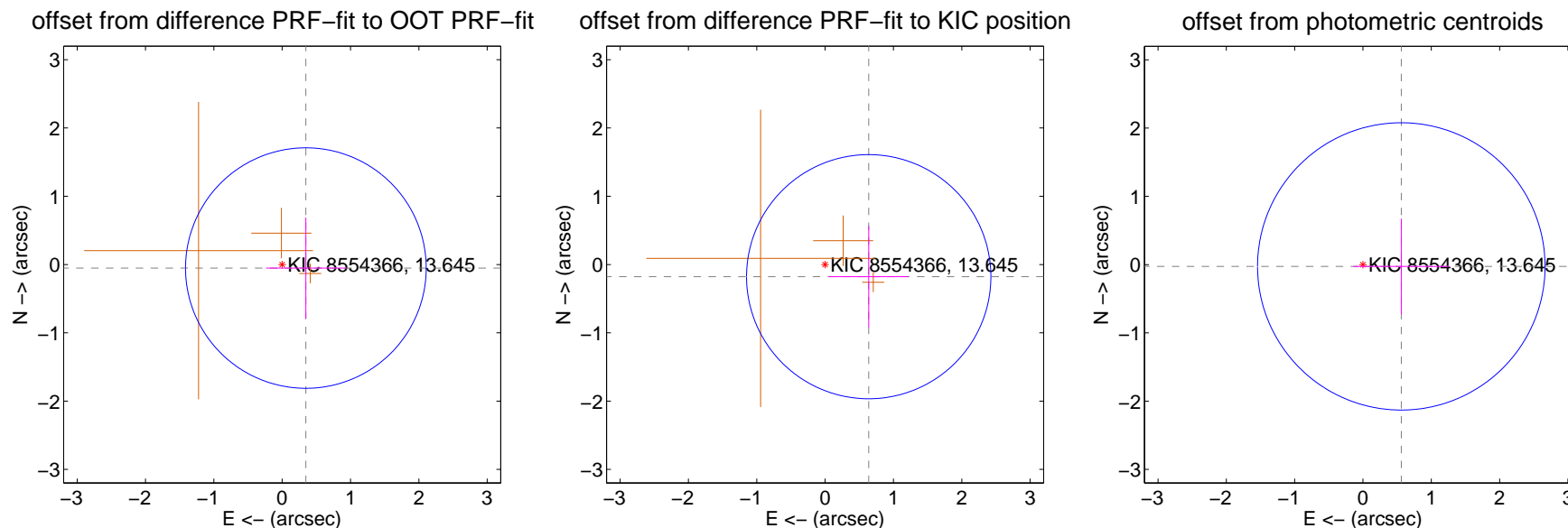
## DV Centroid Data

Supplemental centroid analysis for 008554366-02. Kepler magnitude: 13.64. Transit SNR 6.94

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.350 \pm 0.587$	0.60	$-0.346 \pm 0.583$	$-0.052 \pm 0.741$
PRF-fit source offset from KIC position	$0.662 \pm 0.596$	1.11	$-0.638 \pm 0.583$	$-0.178 \pm 0.741$
photometric centroid source offset	$0.56 \pm 0.70$	0.80	$-0.56 \pm 0.70$	$-0.03 \pm 0.70$



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

Q5 no difference image



Q5 no OOT image



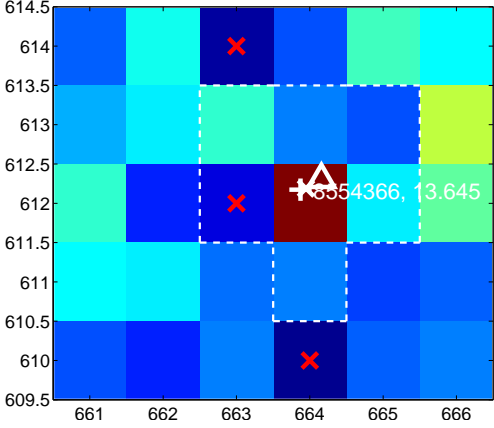
Q6 no difference image



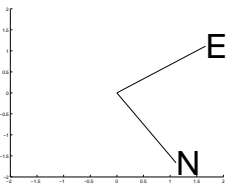
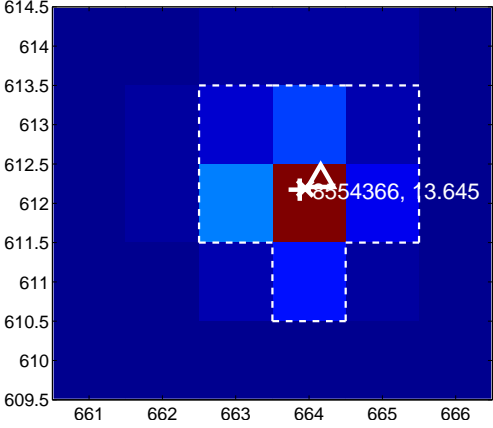
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 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.

Q9 no difference image



Q9 no OOT image



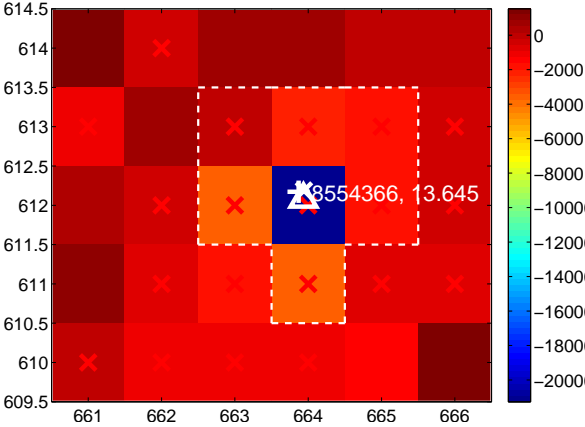
Q10 no difference image



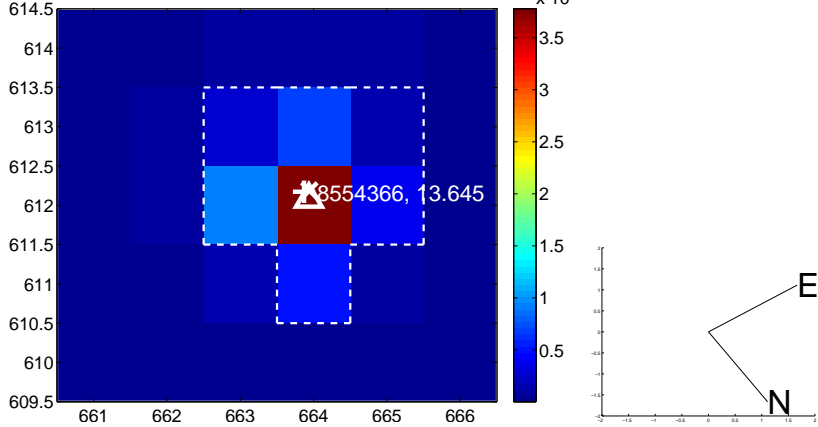
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



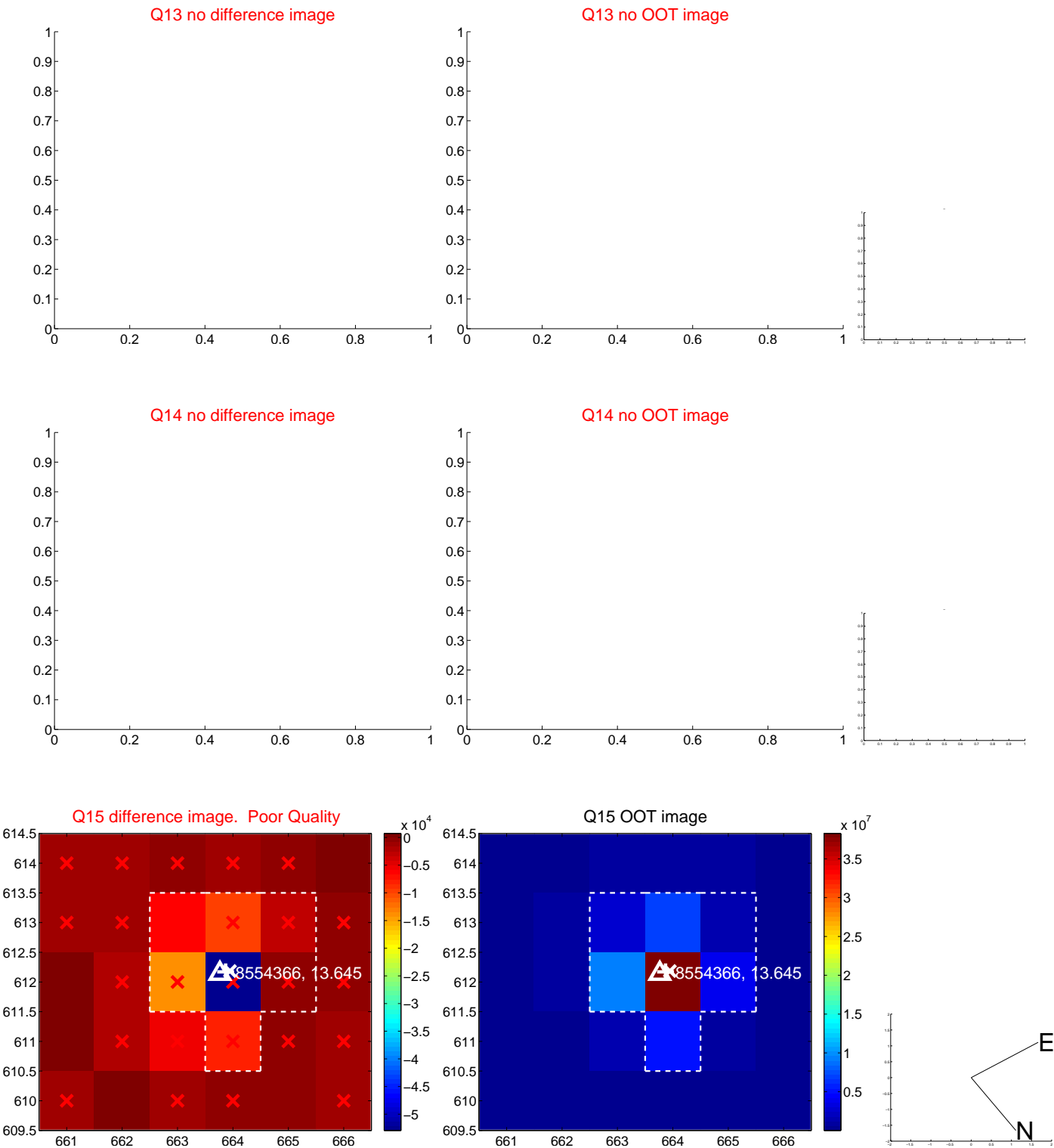
Q12 no difference image



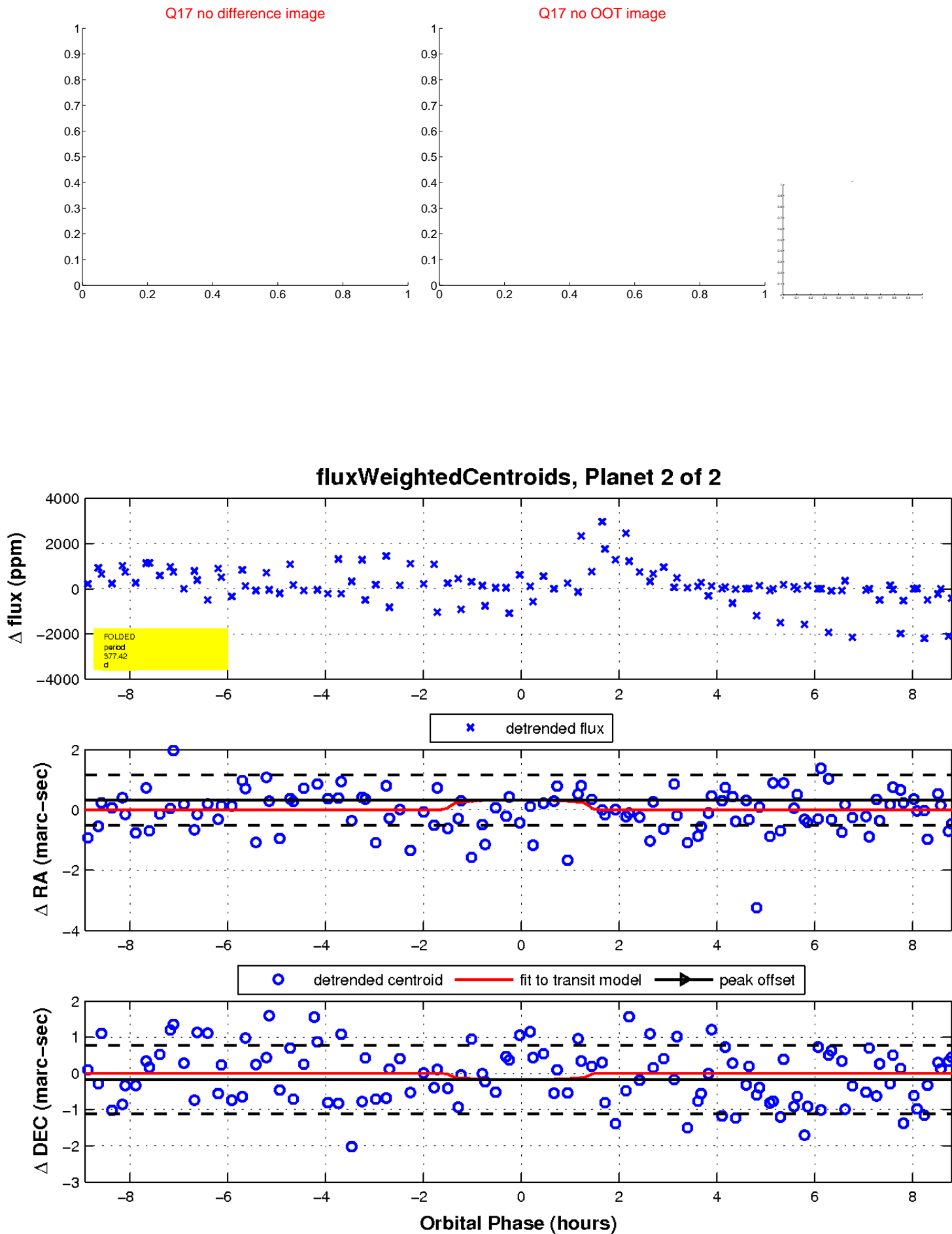
Q12 no OOT image



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

