

# KIC 008365196

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008365196-02	OBS	No	469.241681	269.501230	2376.9	3.432	13.5	8.2	0.74	4483	3.69	0.17
008365196-03	OBS	No	402.568599	291.617881	3743.7	4.054	10.8	14.5	0.74	4483	8.20	0.21
008365196-04	OBS	No	240.253899	234.912424	1380.1	3.475	10.6	5.4	0.74	4483	2.88	0.42
008365196-05	OBS	No	275.786499	369.213334	1758.7	3.000	9.6	-1.0	0.74	4483	2.95	0.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008365196-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008365196-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS
008365196-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008365196-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

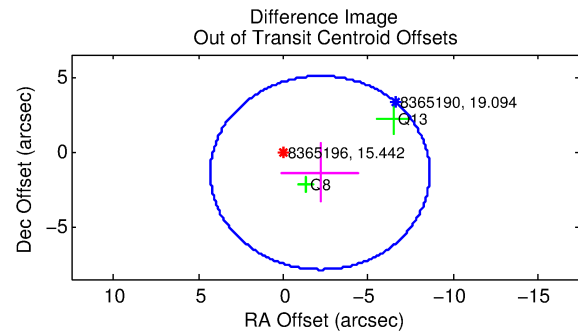
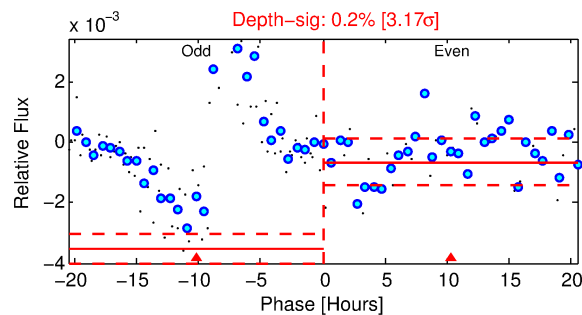
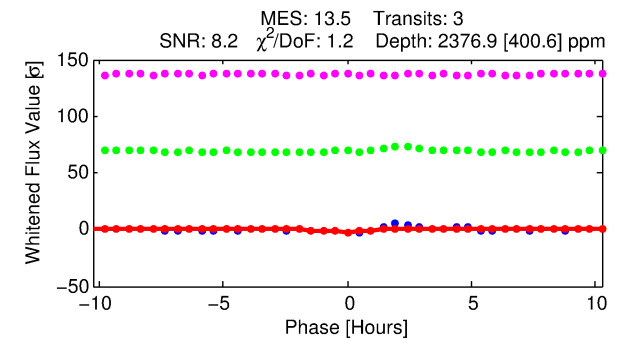
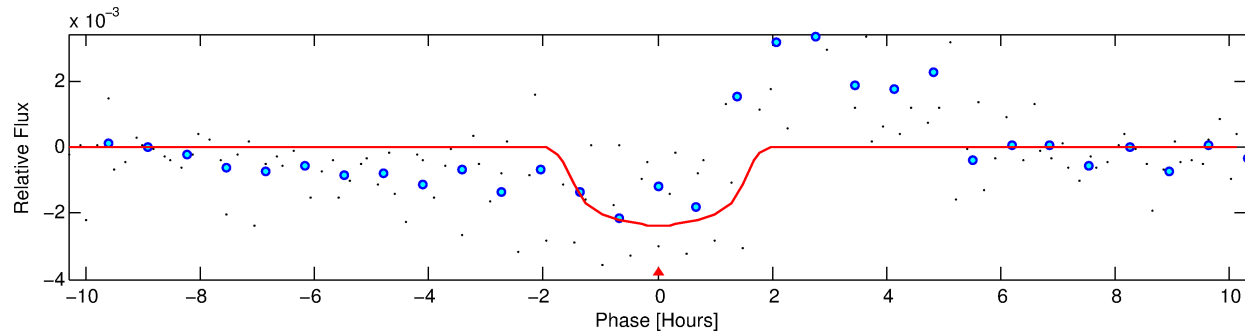
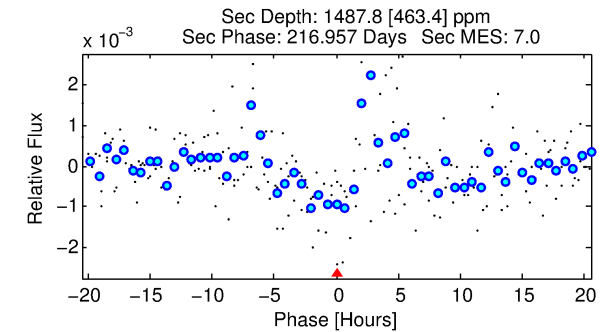
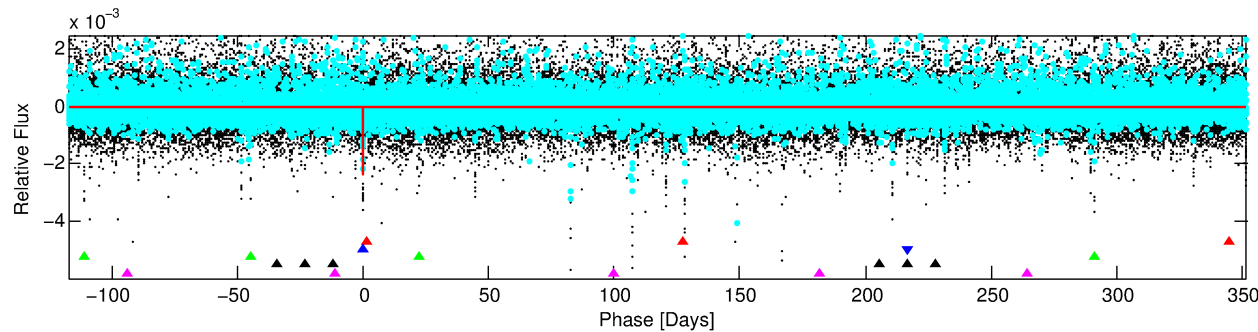
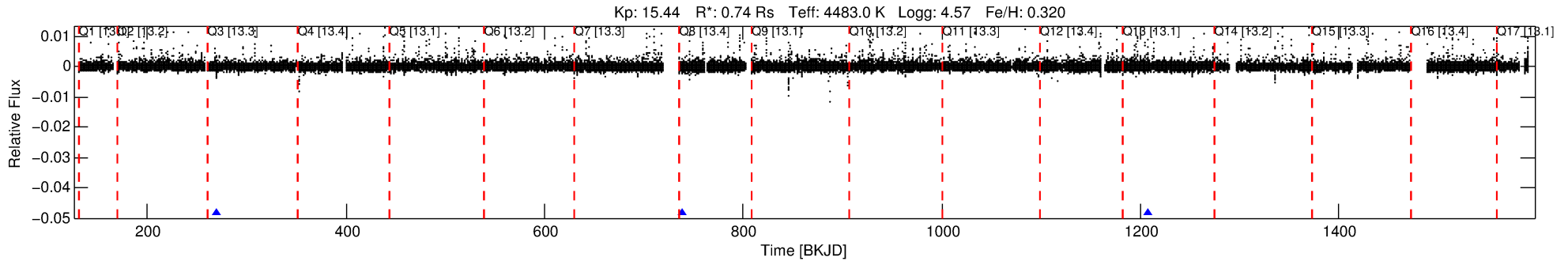
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008365196-02

No Significant Match Found

# DV One-Page Summary

KIC: 8365196 Candidate: 2 of 5 Period: 469.242 d



## DV Fit Results:

Period = 469.24168 [0.00674] d  
Epoch = 269.5012 [0.0061] BKJD  
Rp/R\* = 0.0457 [0.0913]  
a/R\* = 904.68 [5147.23]  
b = 0.59 [6.63]  
Seff = 0.17 [0.03]  
Teff = 165 [7] K  
Rp = 3.69 [7.37] Re  
a = 1.0667 [0.0780] AU  
Ag = 68469.88 [274223.23] [0.25σ]  
Teffp = 4117 [4123] K [0.96σ]

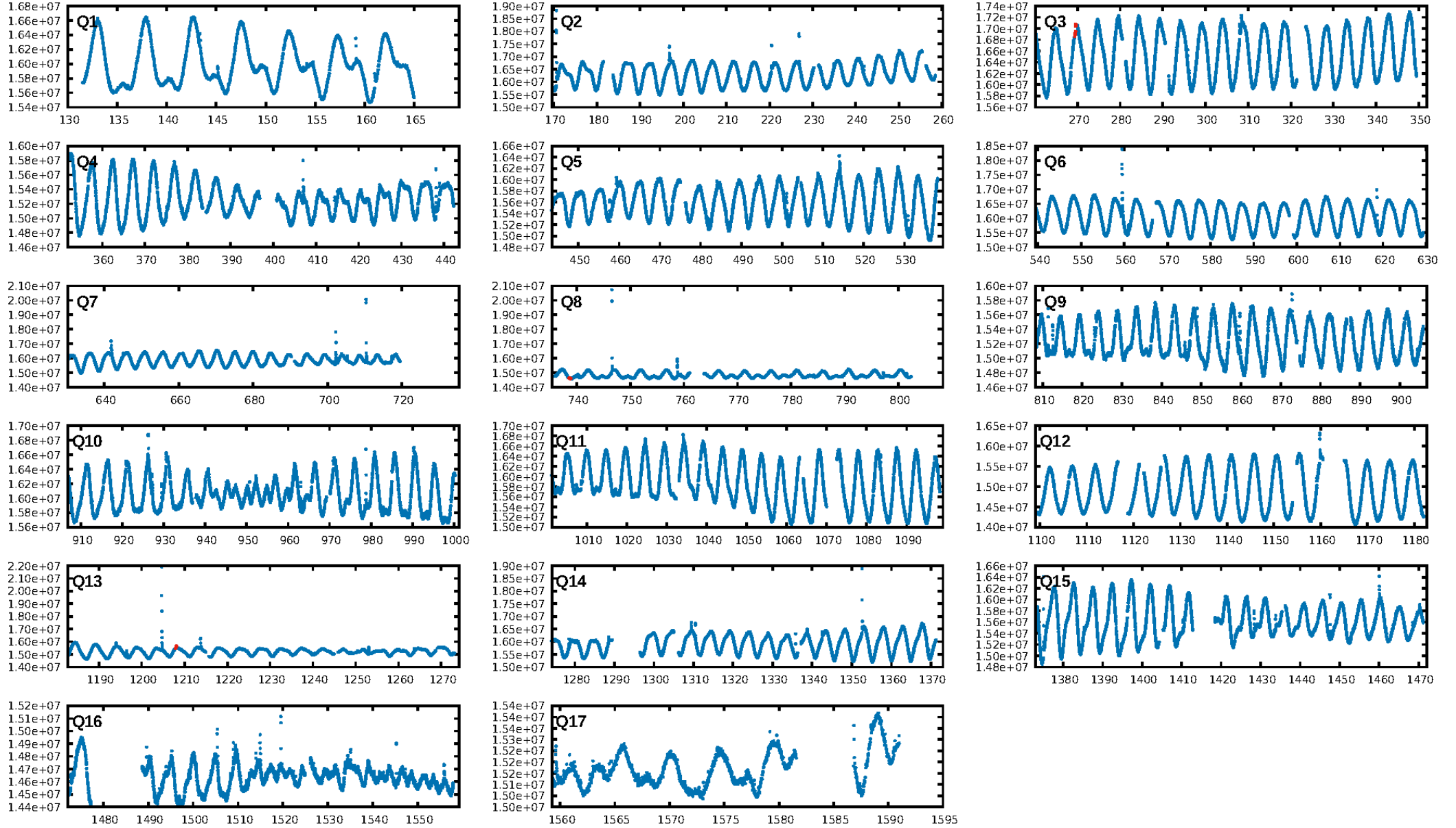
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [301.27σ]  
LongPeriod-sig: 100.0% [537.91σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 42.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 4.791  
Centroid-sig: 0.2%  
Centroid-so: 1.623 arcsec [1.87σ]  
OotOffset-rm: 2.594 arcsec [1.20σ]  
KicOffset-rm: 2.698 arcsec [1.29σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

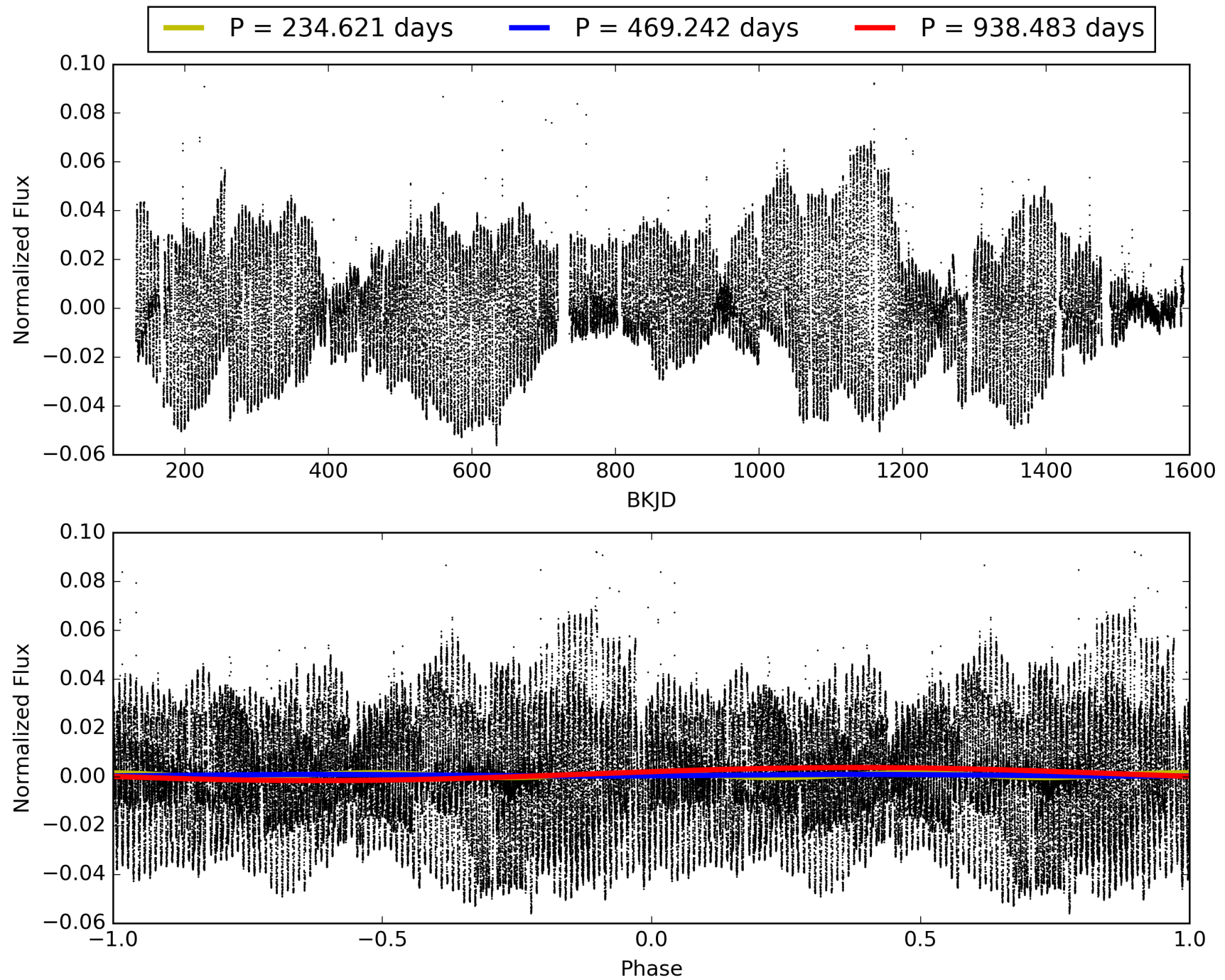
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:47:44 Z

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

# TCE 008365196-02, PDC Light Curves



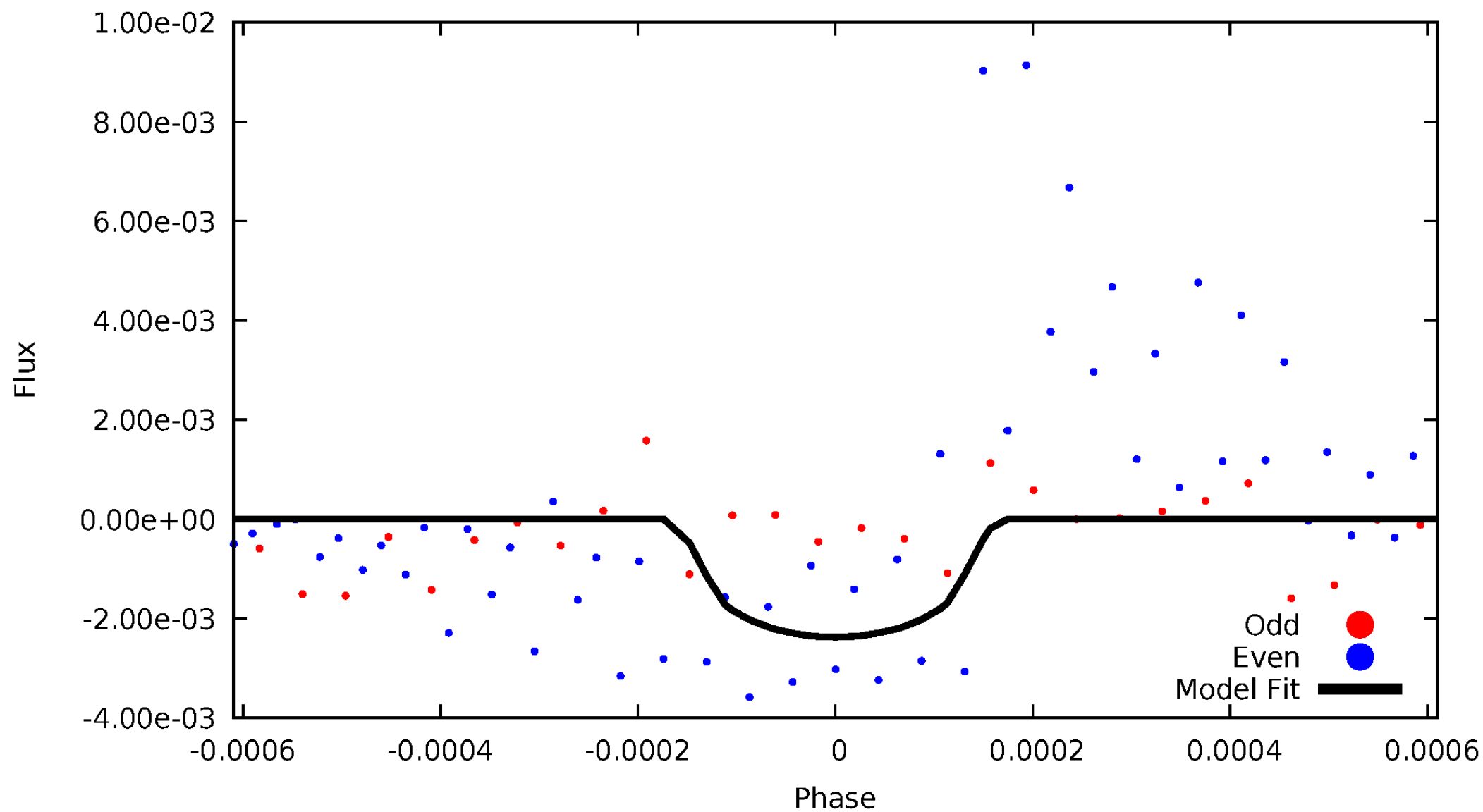
TCE 008365196-02





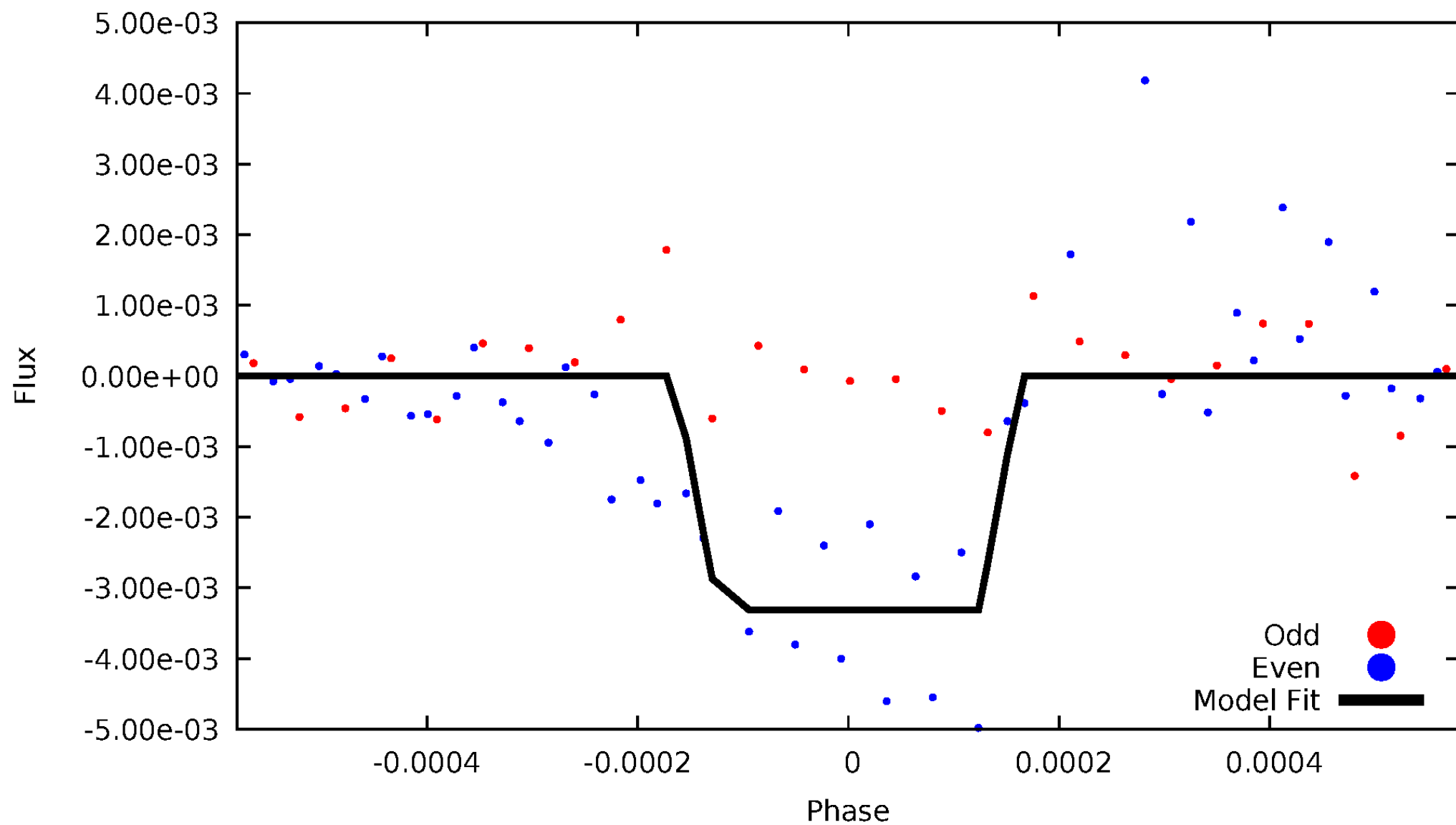
# DV Odd/Even

TCE 008365196-02



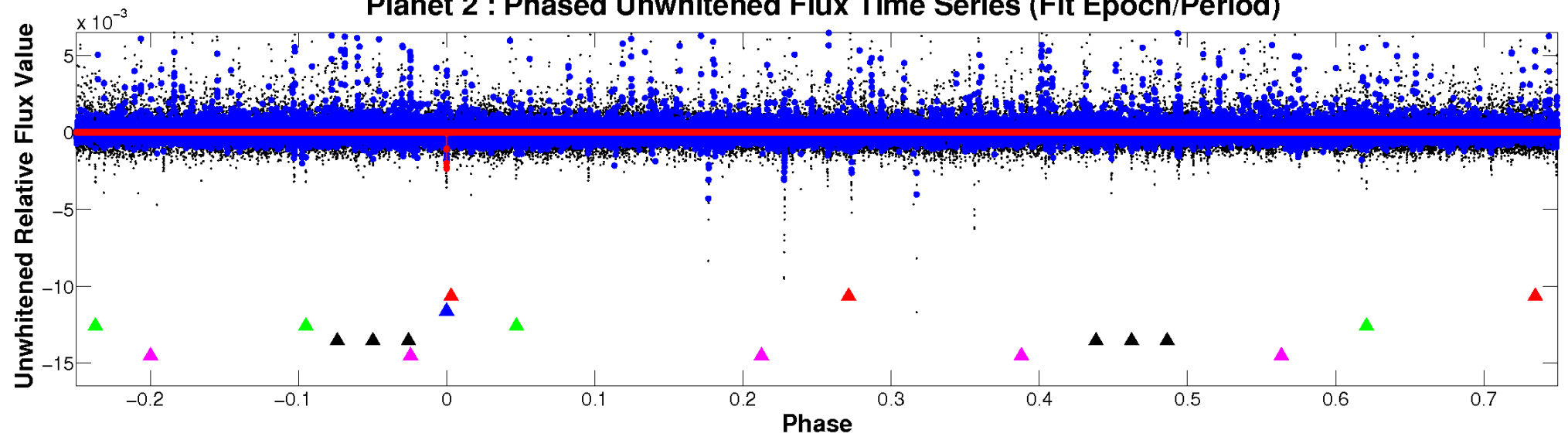
# ALT Odd/Even

TCE 008365196-02

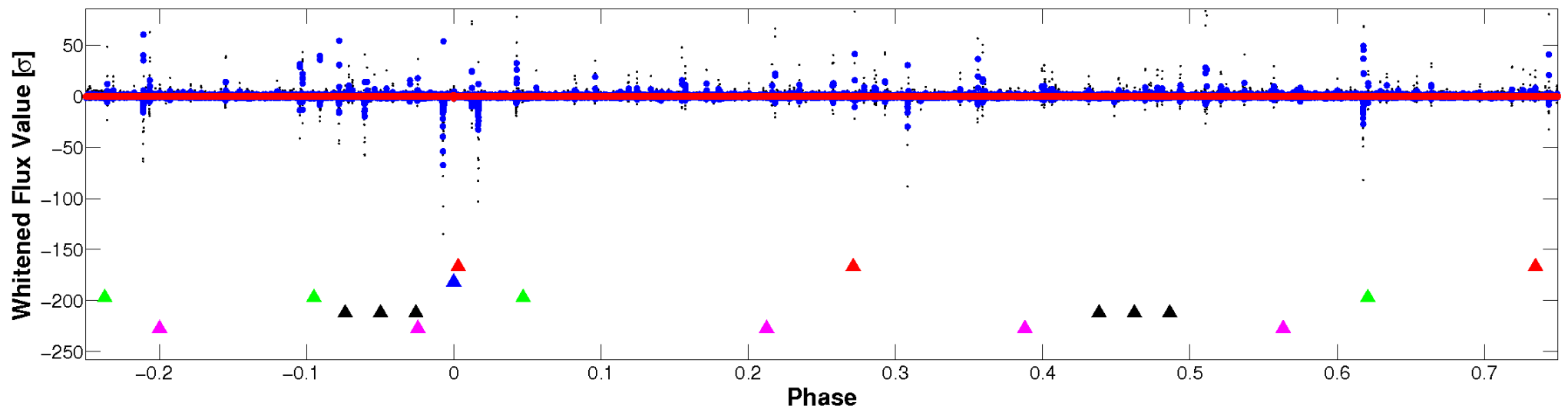


# Non-Whitened Vs. Whitened Light Curve

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

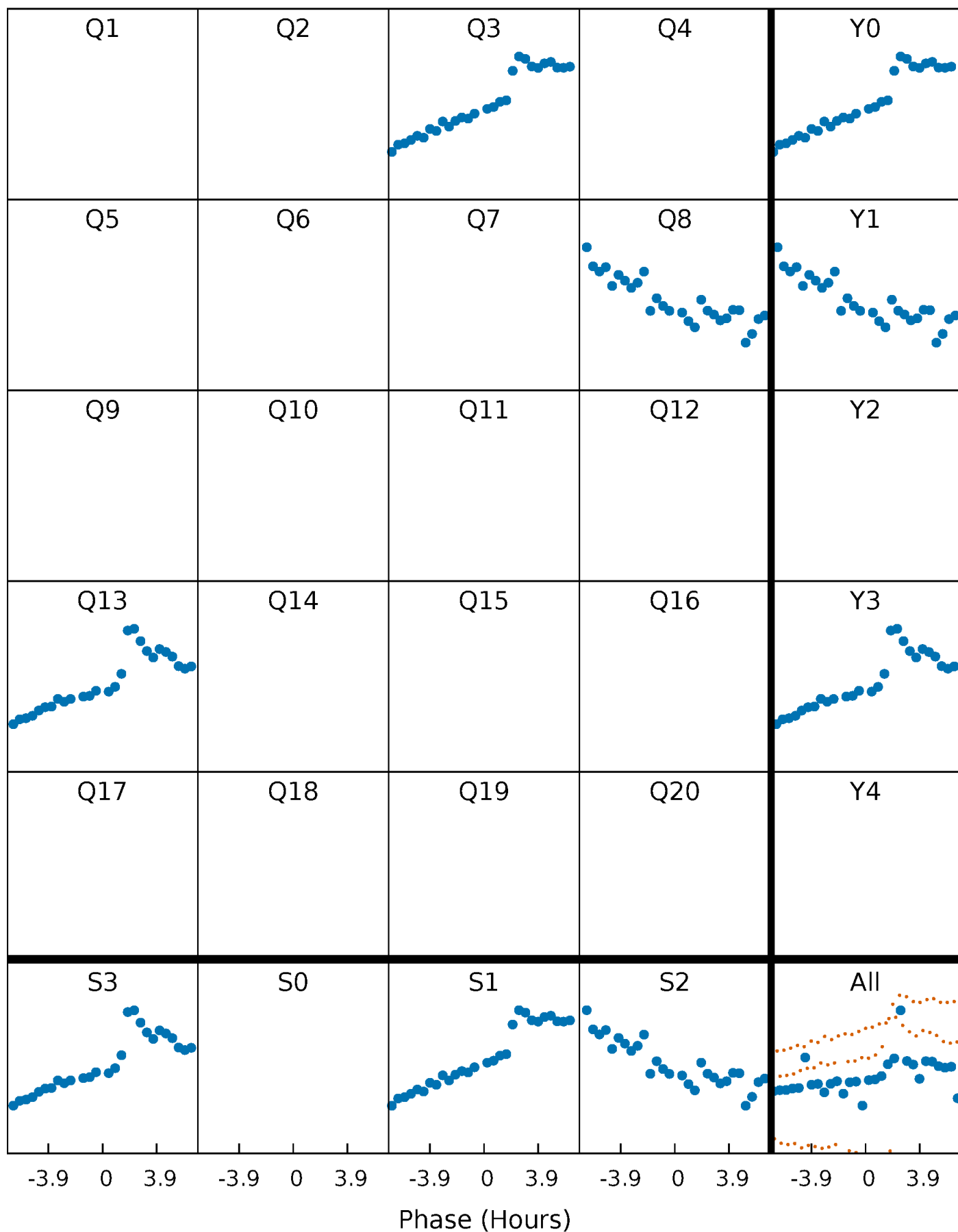


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



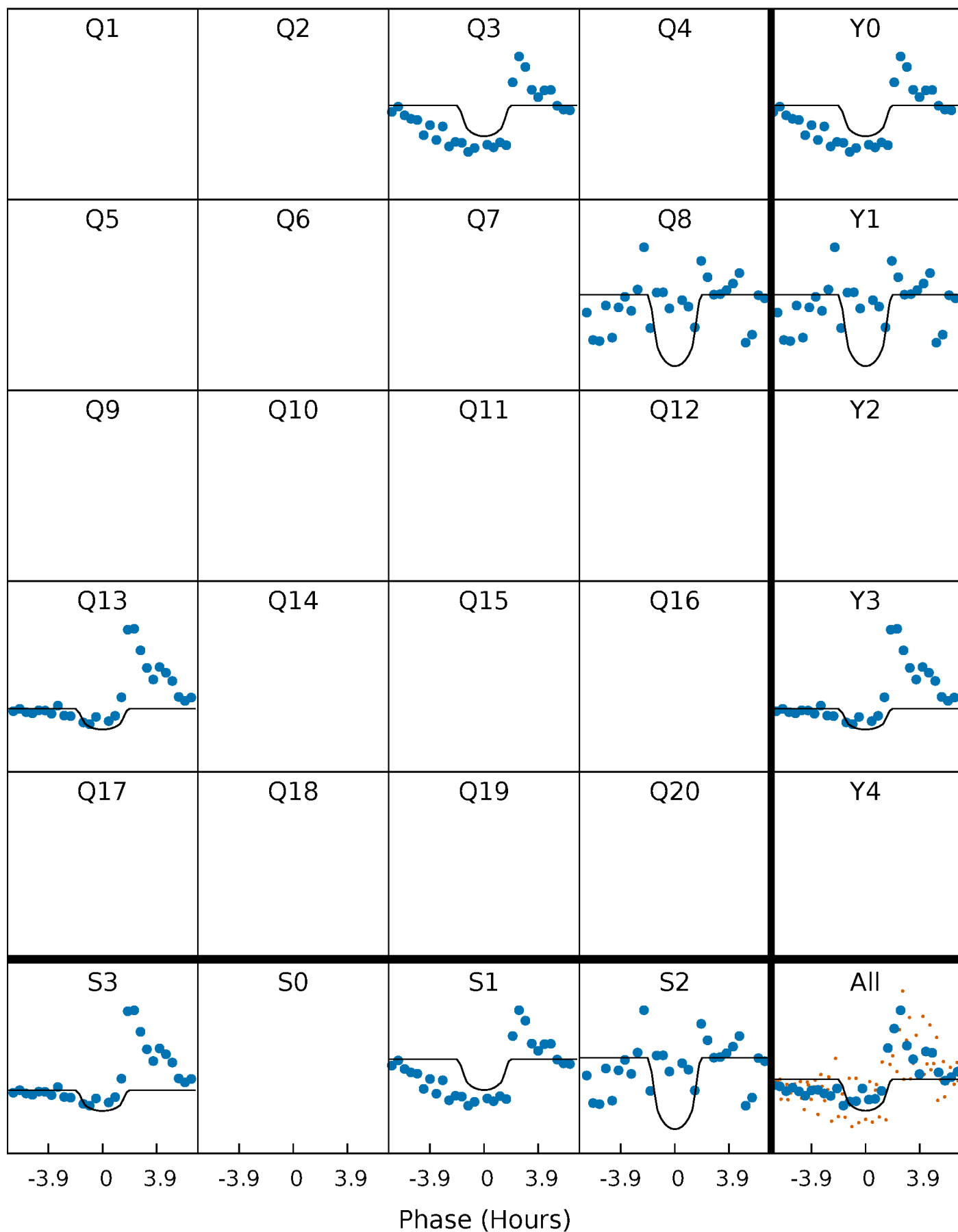
# PDC Quarter-Phased Transit Curves

TCE 008365196-02     $P=469.241681$  Days     $T_0=269.501230$  (BKJD)



# DV Quarter-Phased Transit Curves

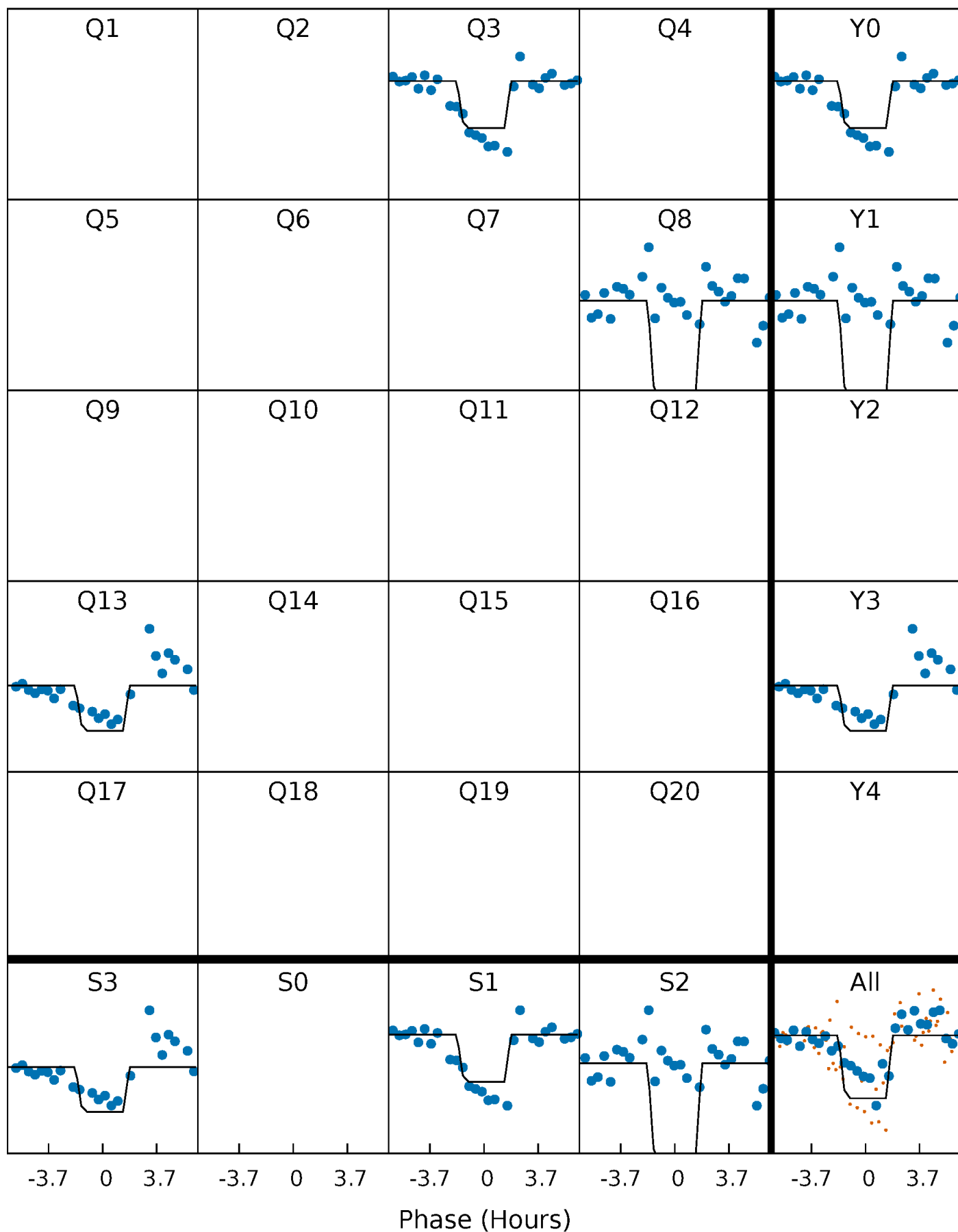
TCE 008365196-02     $P=469.241681$  Days     $T_0=269.501230$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

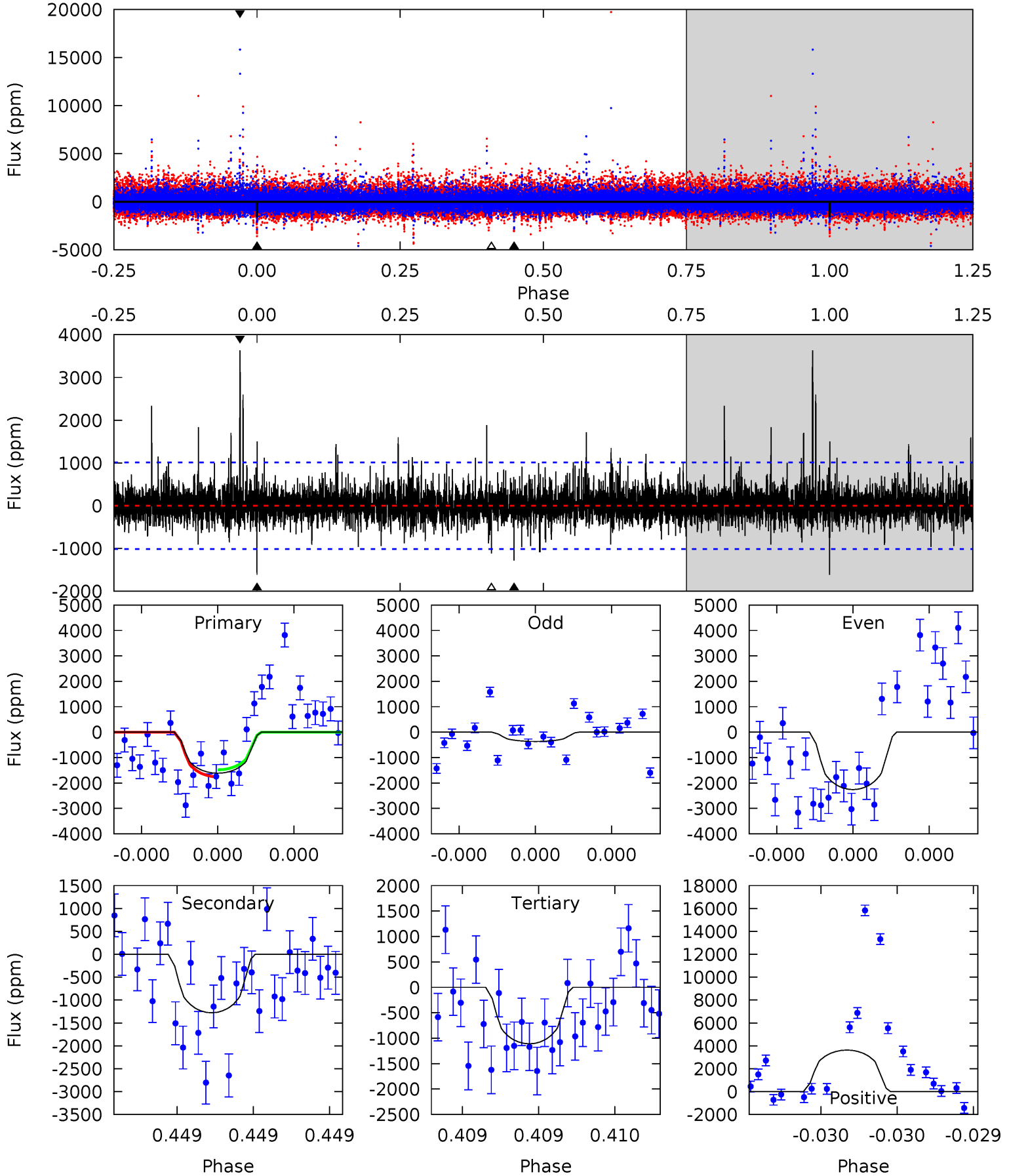
TCE 008365196-02 P=469.229461 Days  $T_0=269.504681$  (BKJD)



# DV Model-Shift Uniqueness Test

008365196-02, P = 469.241681 Days, E = 269.501230 Days

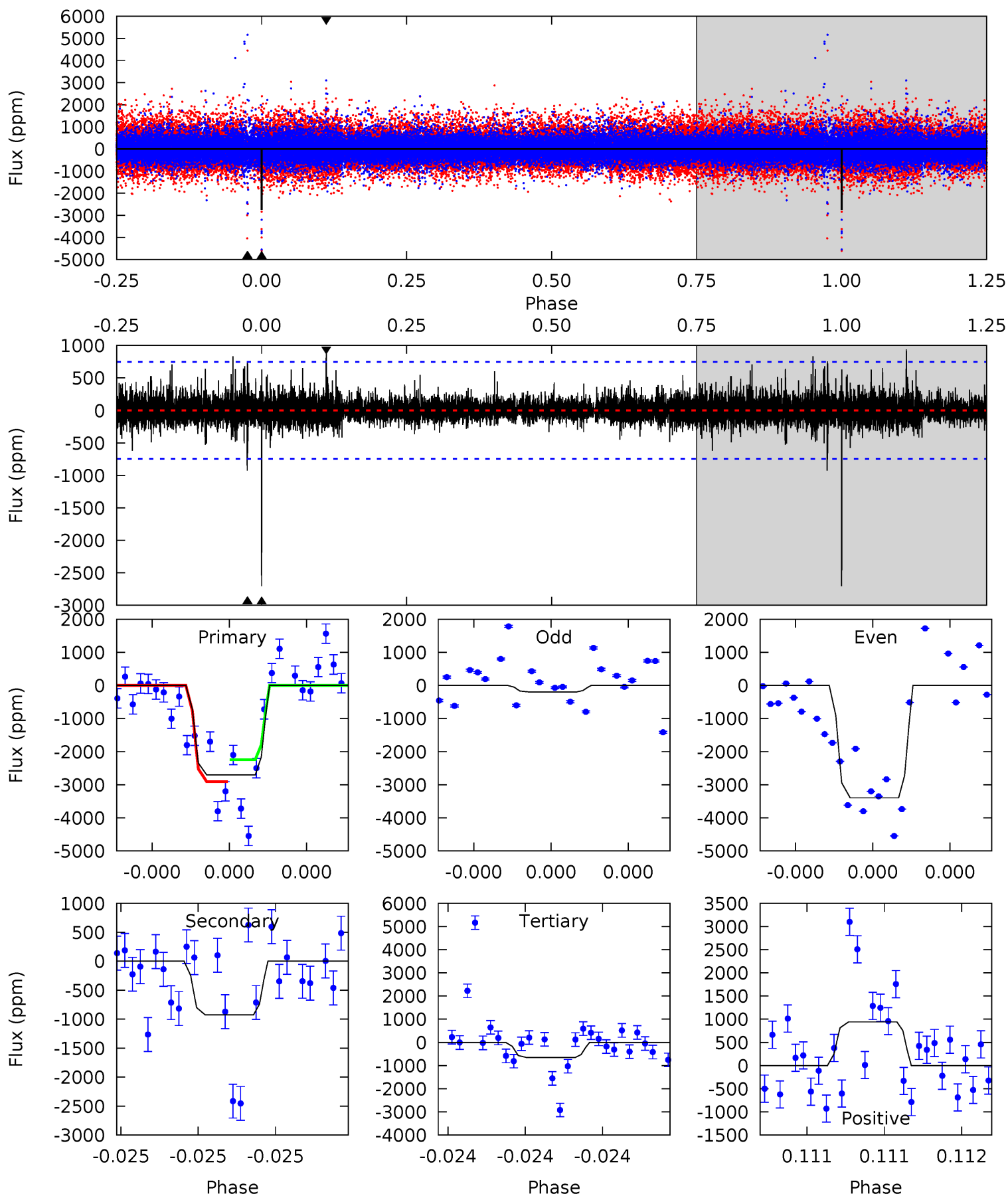
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.02	7.14	6.20	20.3	5.66	3.61	1.54	2.82	-11.3	0.94	-13.1	1.61	2.31	0.69	0.75



# Alt Model-Shift Uniqueness Test

008365196-02, P = 469.229461 Days, E = 269.504681 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
20.5	6.99	4.97	7.11	5.65	3.60	0.89	15.5	13.4	2.02	-0.12	10.6	0.95	0.26	2.44



### Stellar Parameters For KIC 008365196

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4483^{+154}_{-154}$	$4.567^{+0.060}_{-0.020}$	$0.320^{+0.100}_{-0.300}$	$0.739^{+0.029}_{-0.063}$	$0.734^{+0.041}_{-0.050}$	$2.566^{+0.651}_{-0.186}$
	+3%/-3%	+1%/-0%	+31%/-94%	+4%/-9%	+6%/-7%	+25%/-7%
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 008365196-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1278 \pm 179$	$6.36^{+6.25}_{-4.28}$	$228^{+9}_{-8}$	$3380^{+1689}_{-593}$	$20522^{+171821}_{-15415}$
Alt.	$-924 \pm 132$	$6.92^{+6.08}_{-4.76}$	$228^{+8}_{-8}$	$3158^{+1513}_{-505}$	$12409^{+110019}_{-8989}$

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

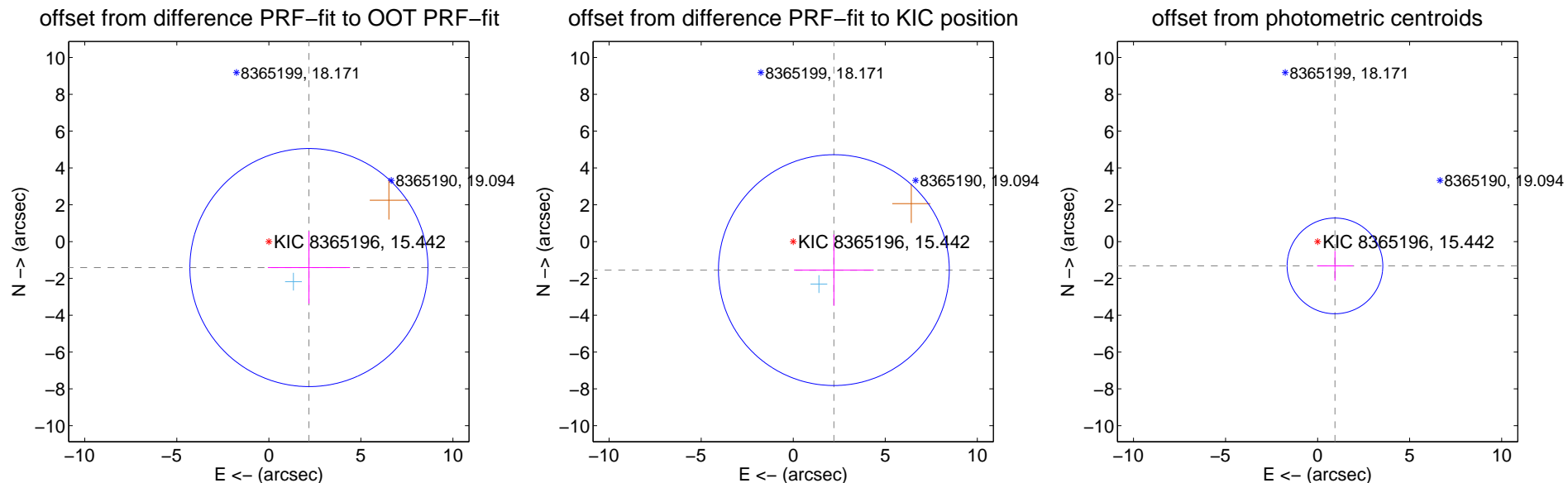
## DV Centroid Data

Supplemental centroid analysis for 008365196-02. Kepler magnitude: 15.44. Transit SNR 8.15

There are 1 quarters with good PRF difference image offsets

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

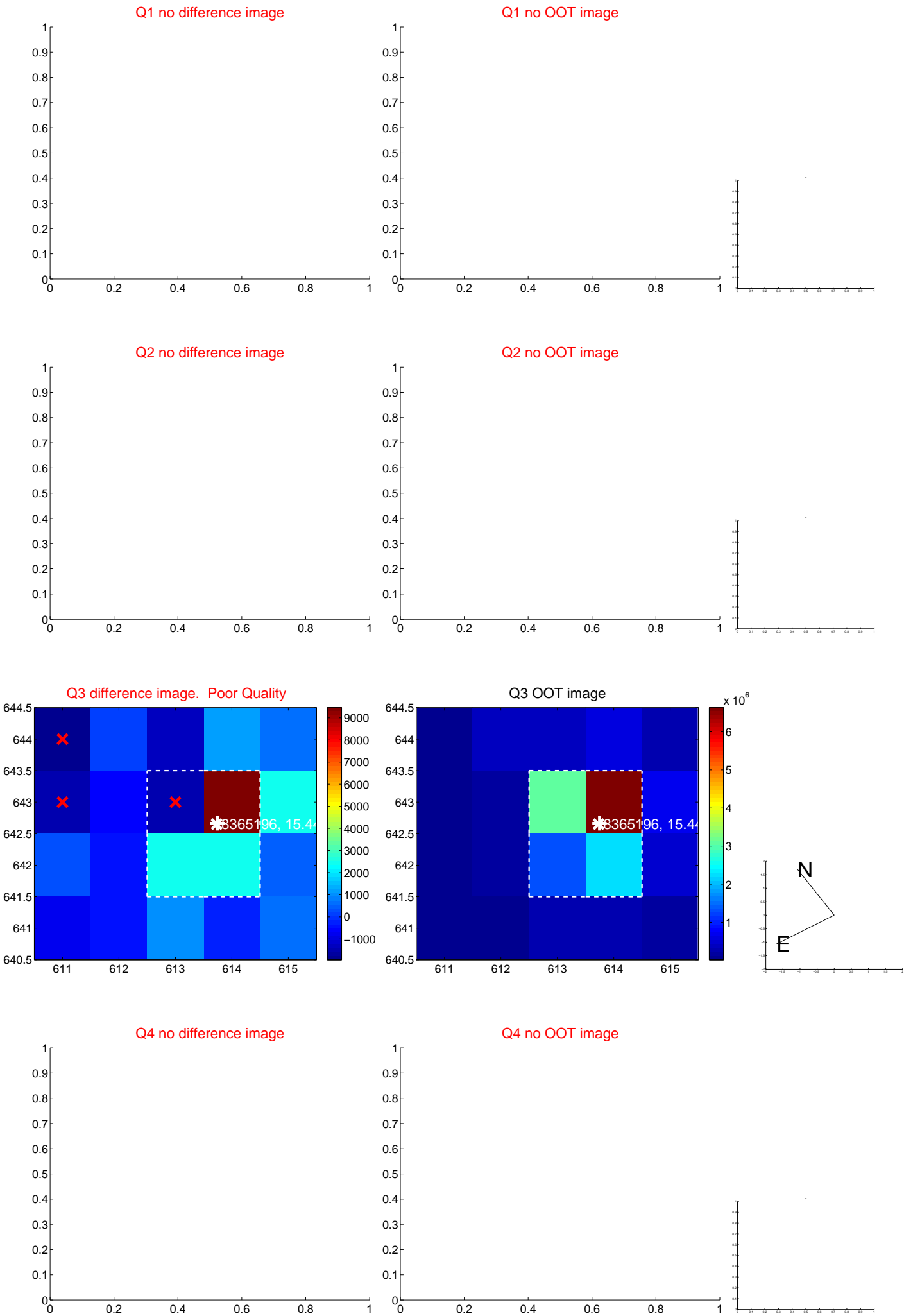
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.594 \pm 2.155$	1.20	$-2.177 \pm 2.233$	$-1.411 \pm 1.958$
PRF-fit source offset from KIC position	$2.698 \pm 2.090$	1.29	$-2.208 \pm 2.162$	$-1.550 \pm 1.934$
photometric centroid source offset	$1.62 \pm 0.87$	1.87	$-0.94 \pm 0.97$	$-1.32 \pm 0.81$



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: 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



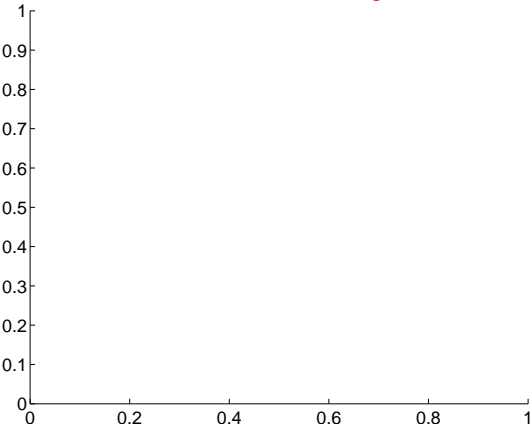
Q6 no difference image



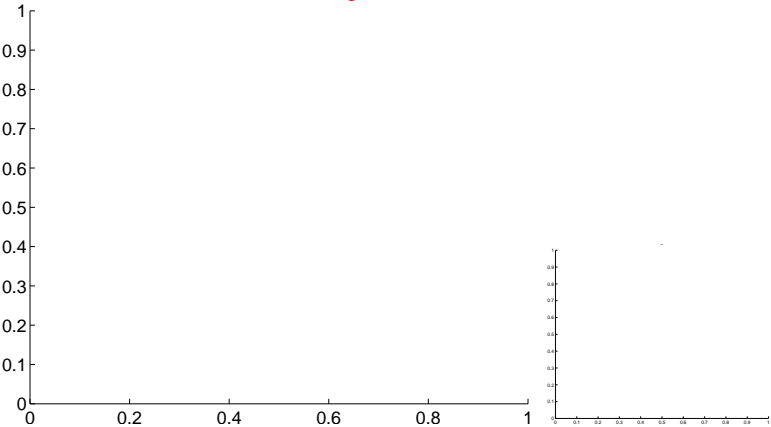
Q6 no OOT image



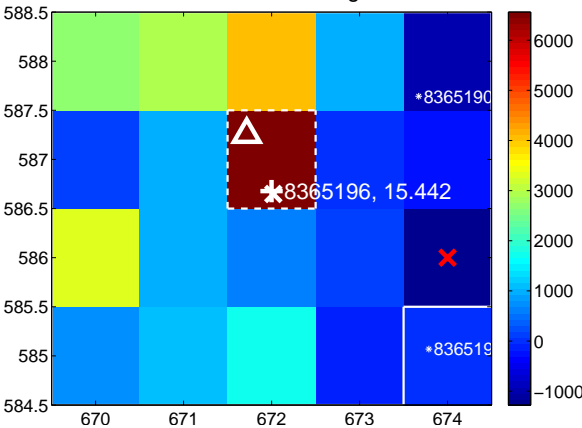
Q7 no difference image



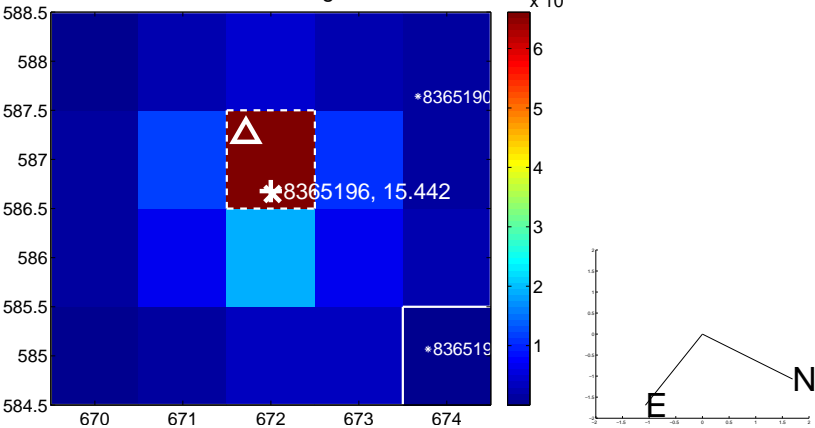
Q7 no OOT image



Q8 difference image



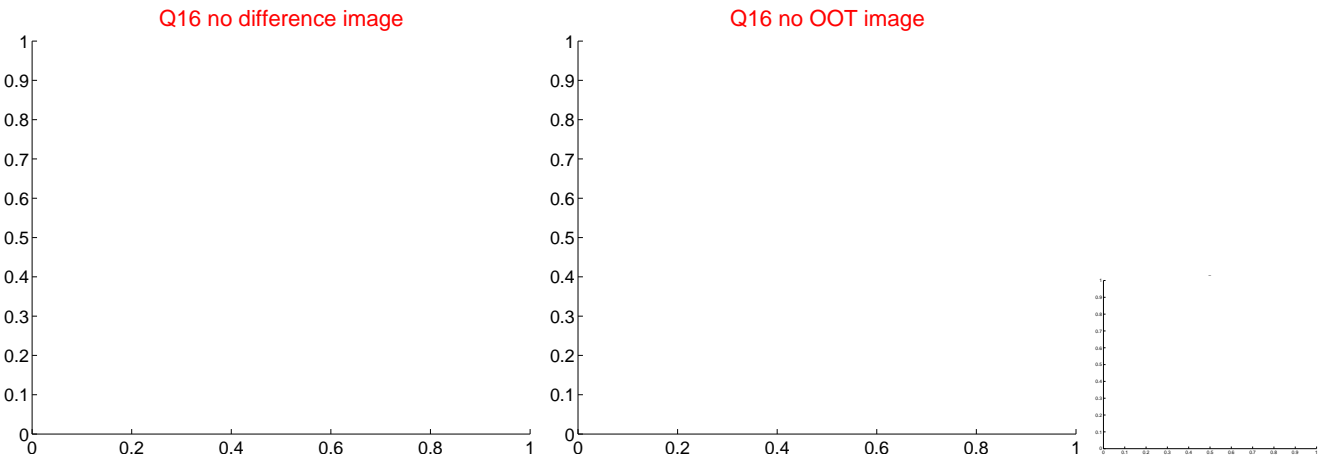
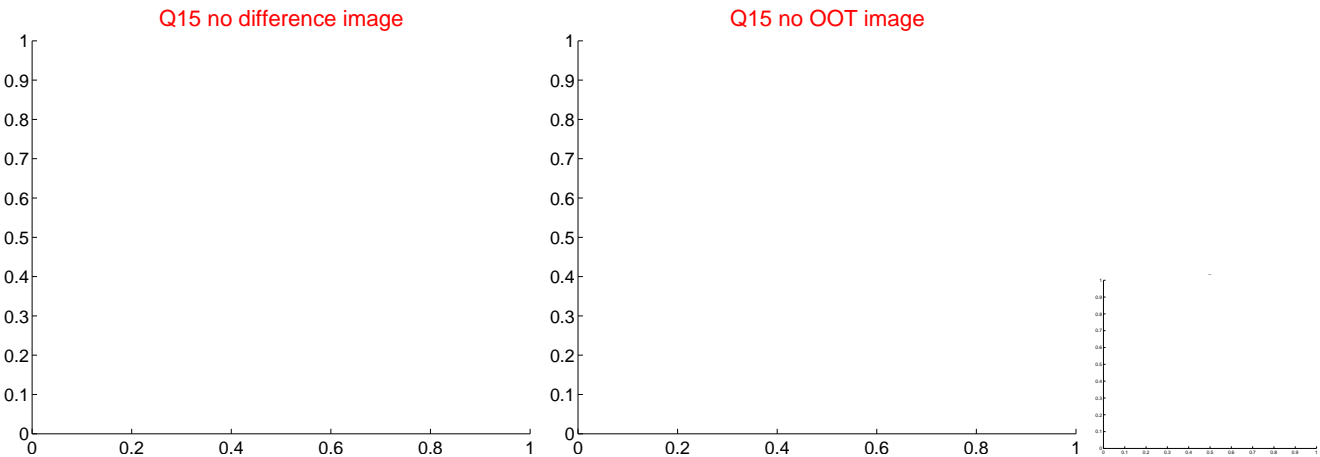
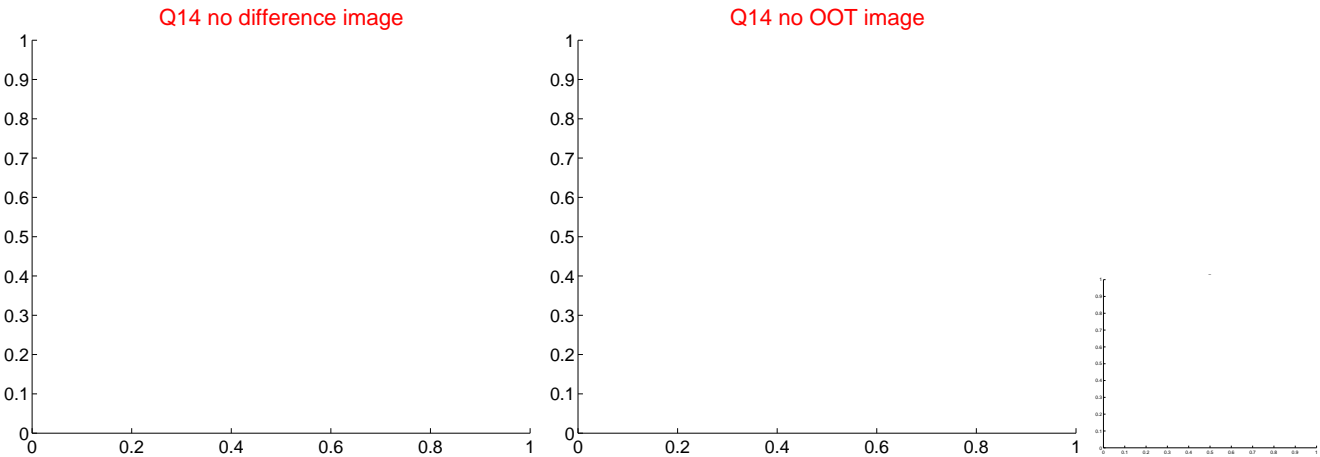
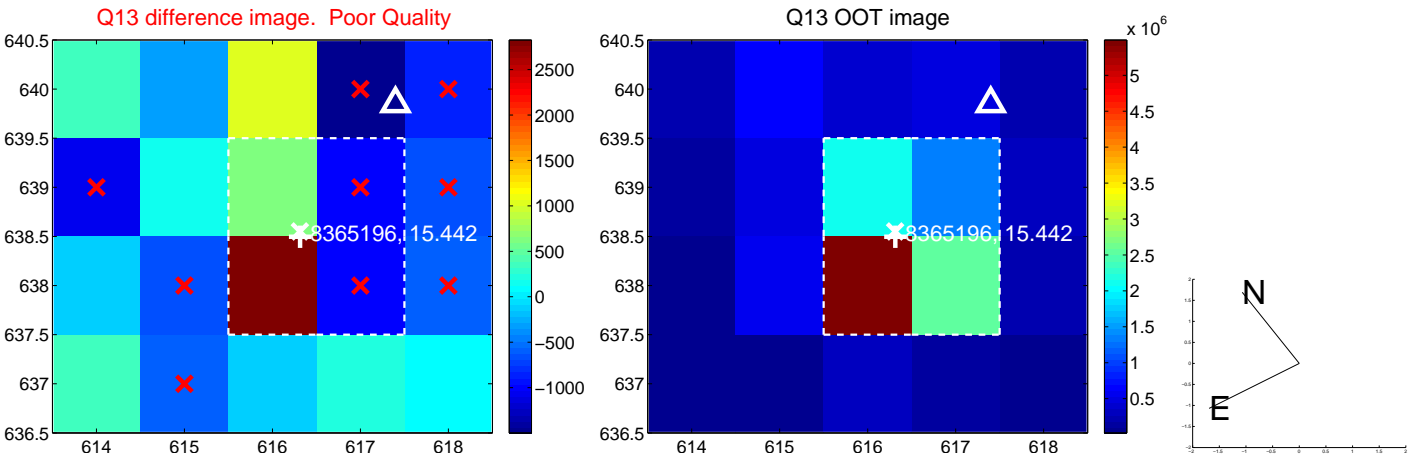
Q8 OOT image



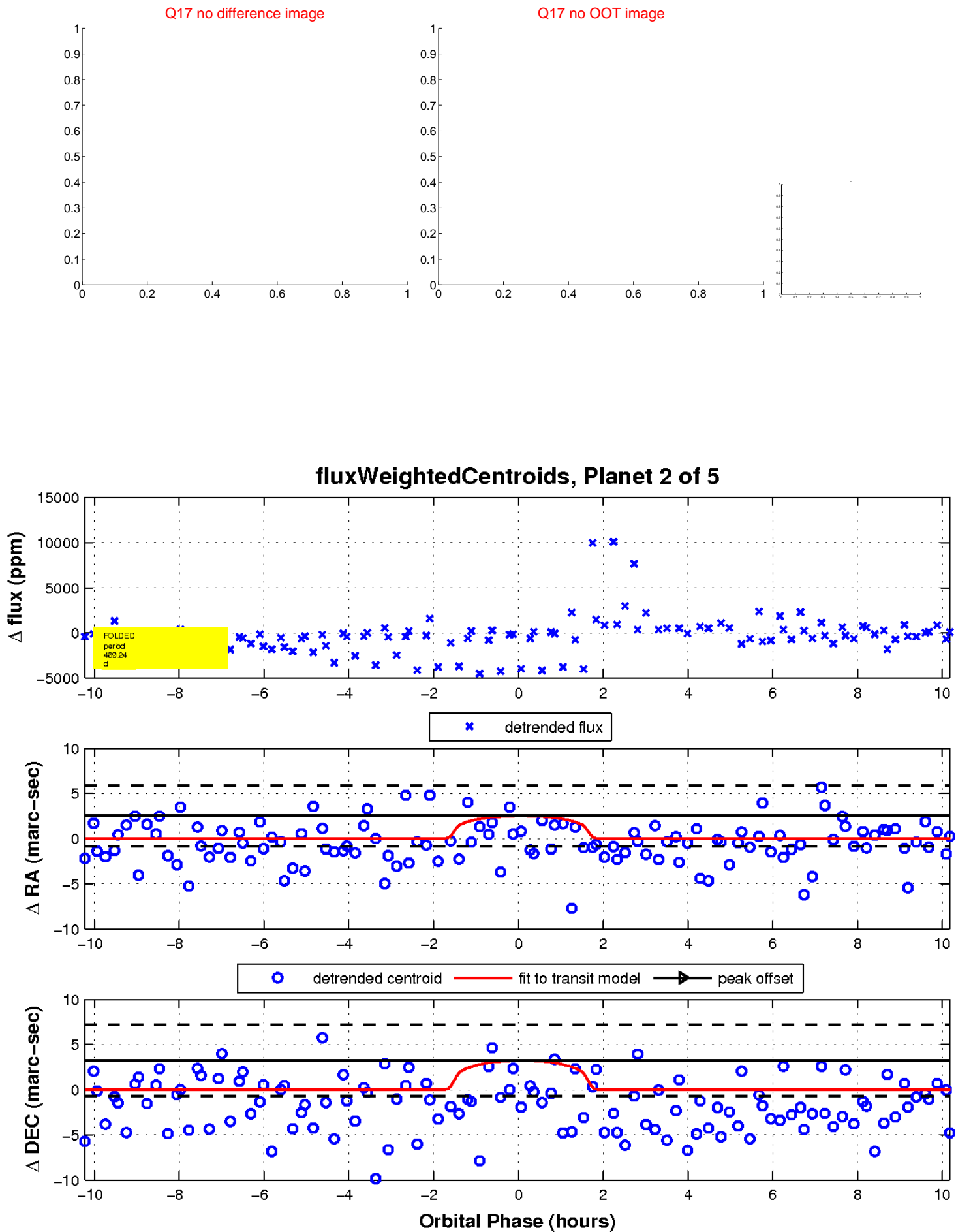
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



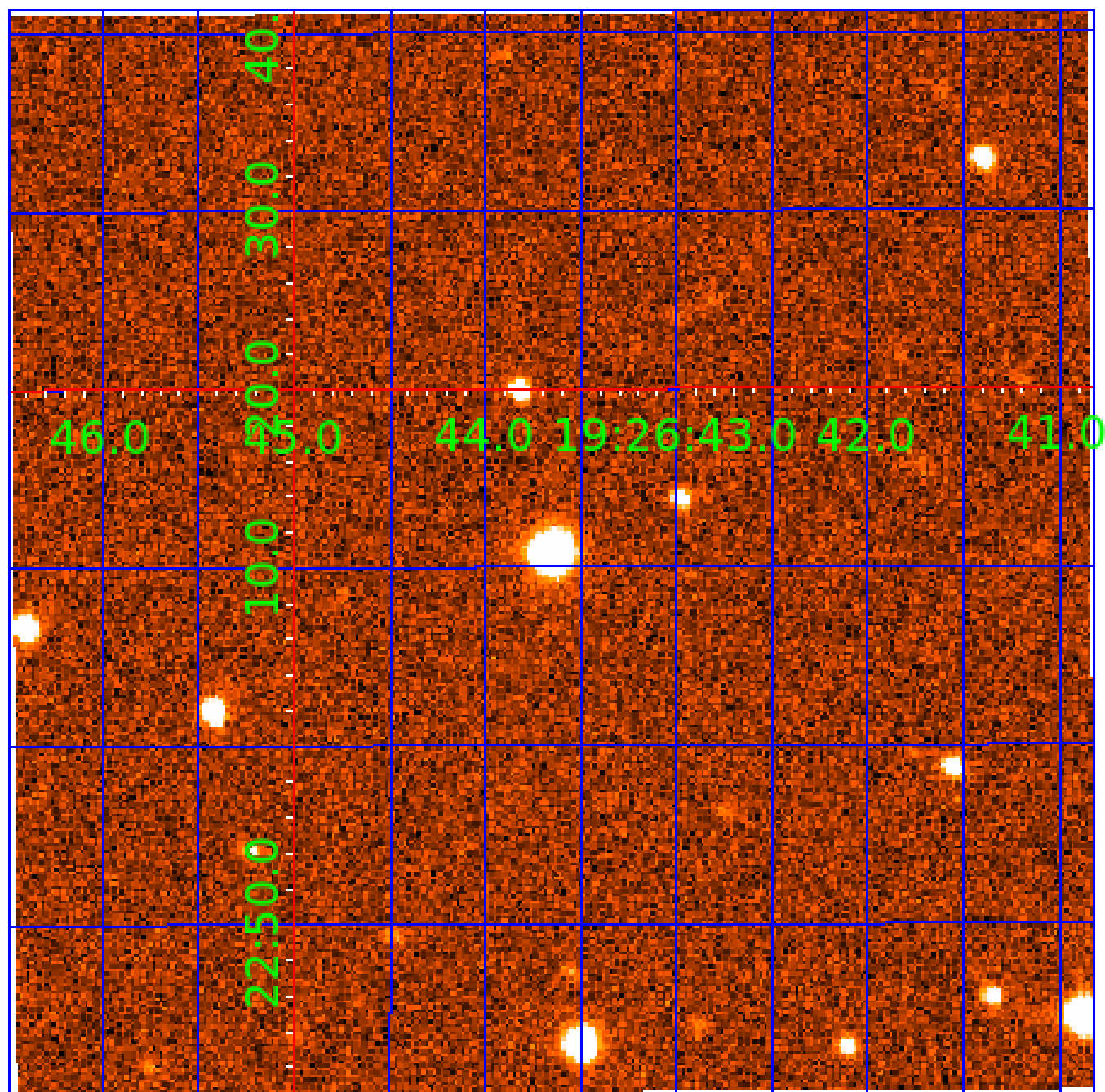
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 008365196

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008365196-02	OBS	No	469.241681	269.501230	2376.9	3.432	13.5	8.2	0.74	4483	3.69	0.17
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008365196-05	OBS	No	275.786499	369.213334	1758.7	3.000	9.6	-1.0	0.74	4483	2.95	0.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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008365196-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS
008365196-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008365196-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

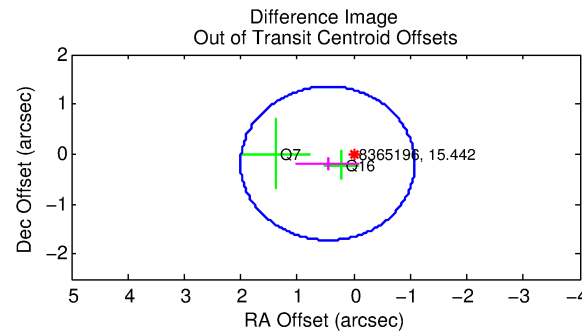
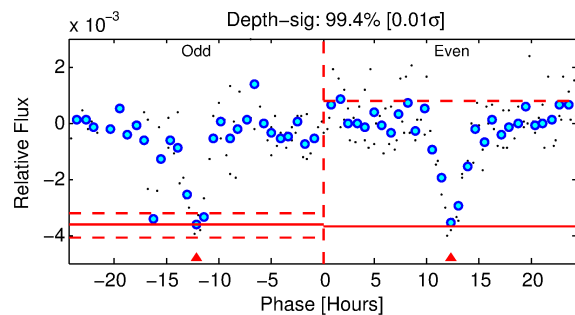
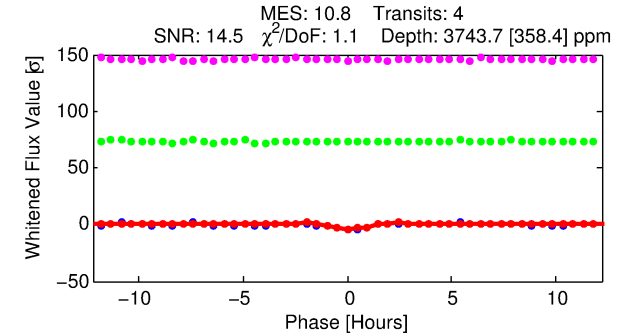
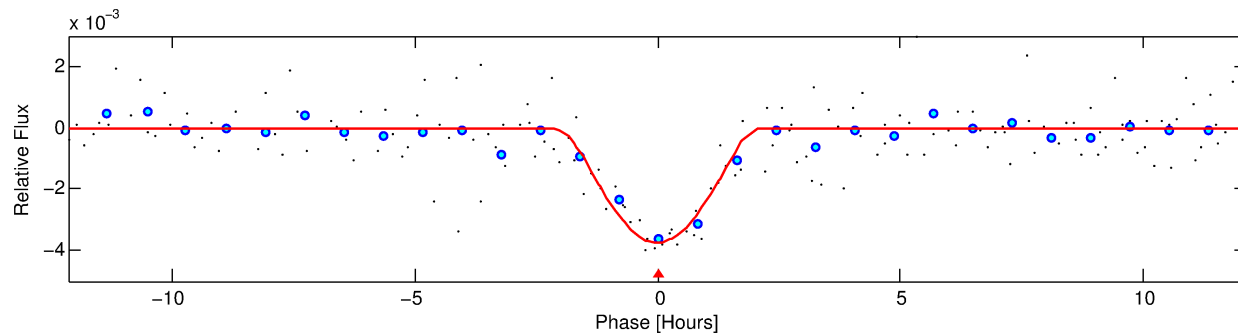
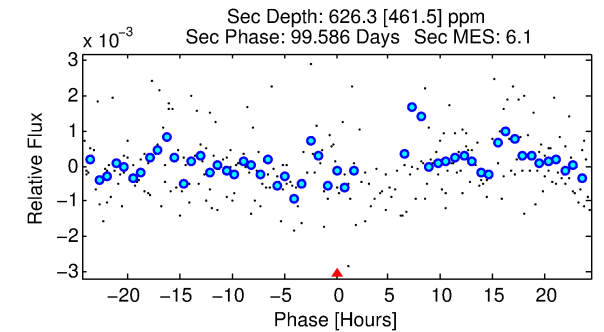
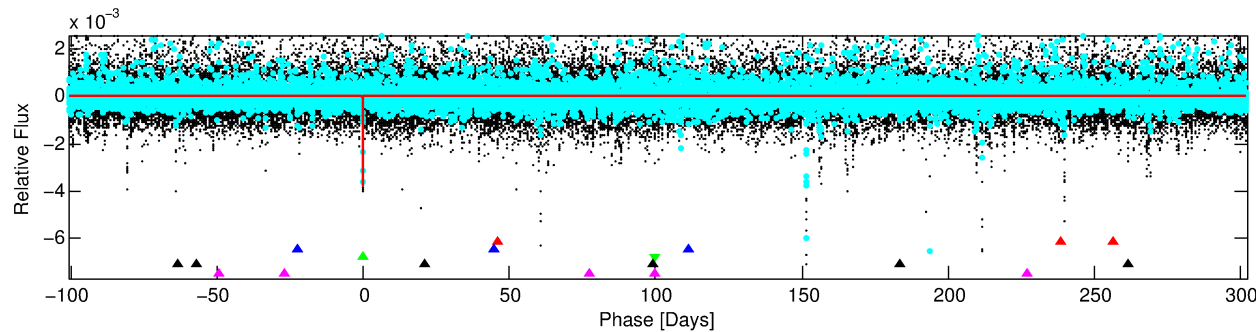
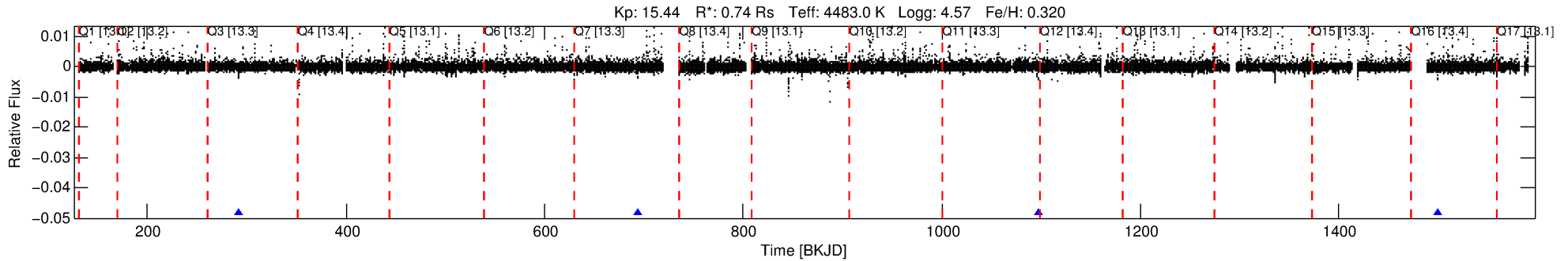
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008365196-03

No Significant Match Found

# DV One-Page Summary

KIC: 8365196 Candidate: 3 of 5 Period: 402.569 d



## DV Fit Results:

Period = 402.56860 [0.00281] d  
Epoch = 291.6179 [0.0054] BKJD  
Rp/R\* = 0.1017 [0.2385]  
a/R\* = 373.11 [188.86]  
b = 0.99 [0.36]  
Seff = 0.21 [0.04]  
Teq = 173 [8] K  
Rp = 8.20 [19.25] Re  
a = 0.9631 [0.0705] AU  
Ag = 4750.08 [22553.98] [0.21σ]  
Teffp = 2224 [2640] K [0.78σ]

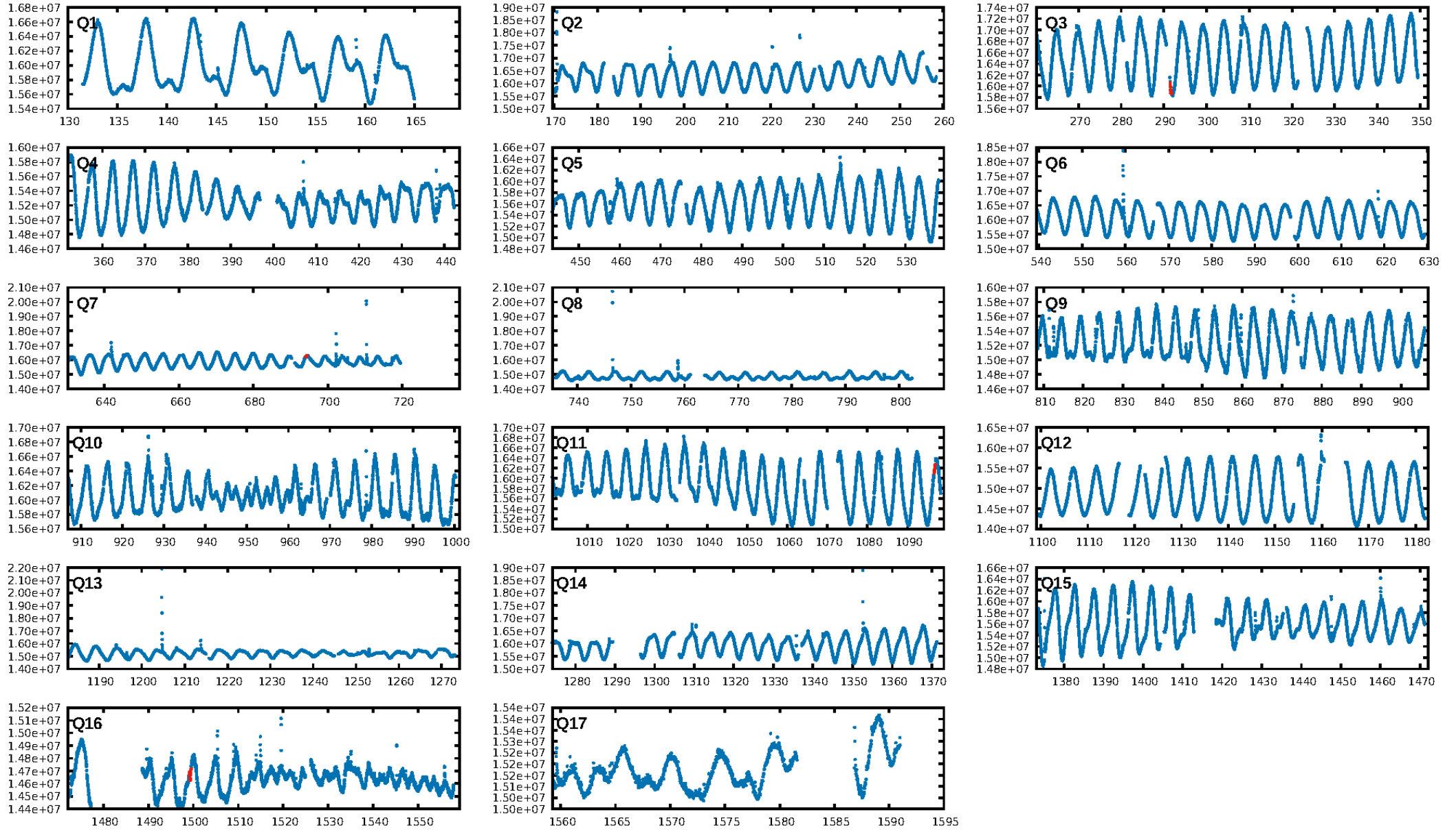
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [603.35σ]  
LongPeriod-sig: 100.0% [301.27σ]  
ModelChiSquare2-sig: 47.6%  
ModelChiSquareGof-sig: 98.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.855  
Centroid-sig: 0.6%  
Centroid-so: 1.031 arcsec [1.82σ]  
OotOffset-rm: 0.498 arcsec [0.97σ]  
KicOffset-rm: 0.526 arcsec [1.18σ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [2/2]

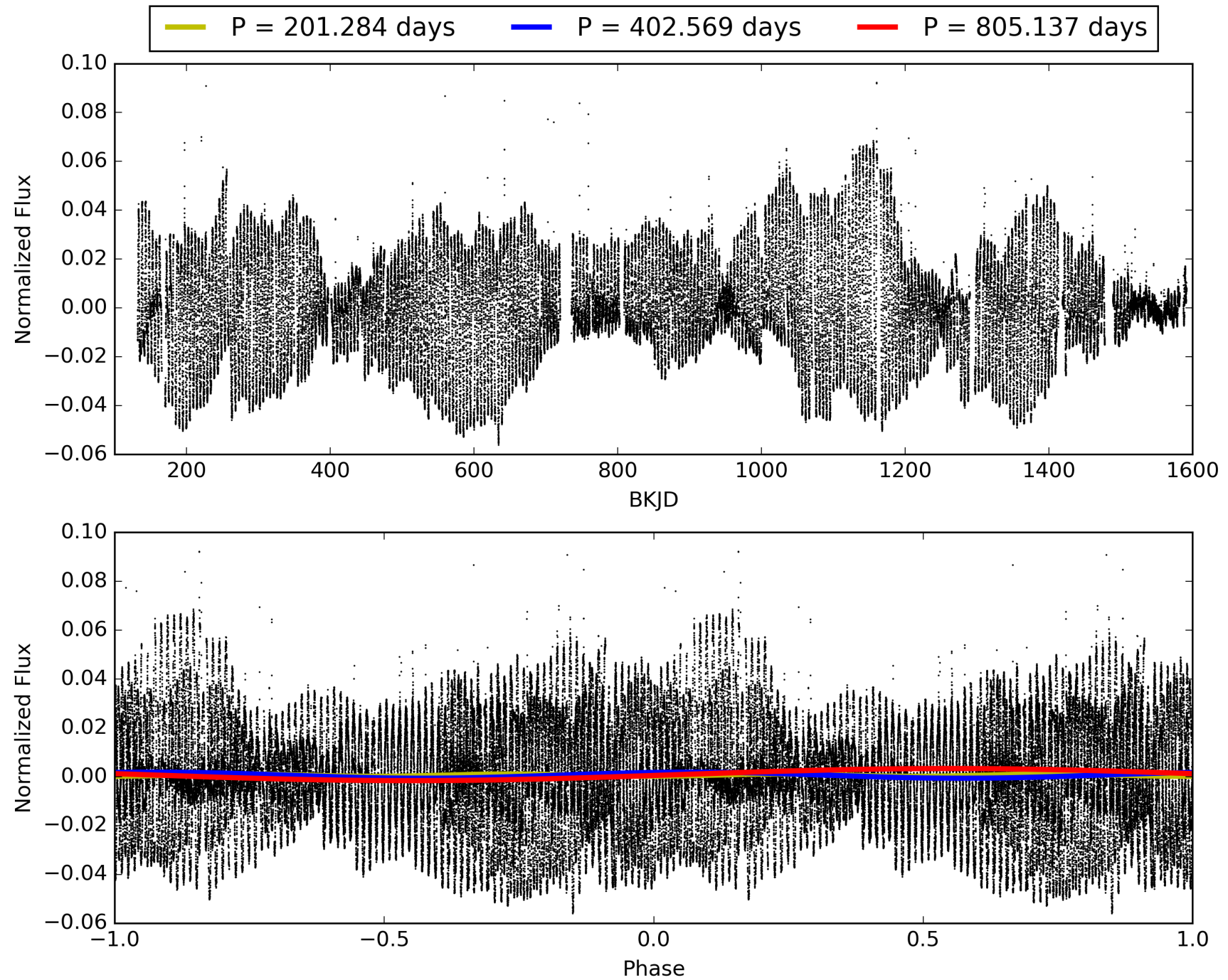
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:47:59 Z

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

# TCE 008365196-03, PDC Light Curves



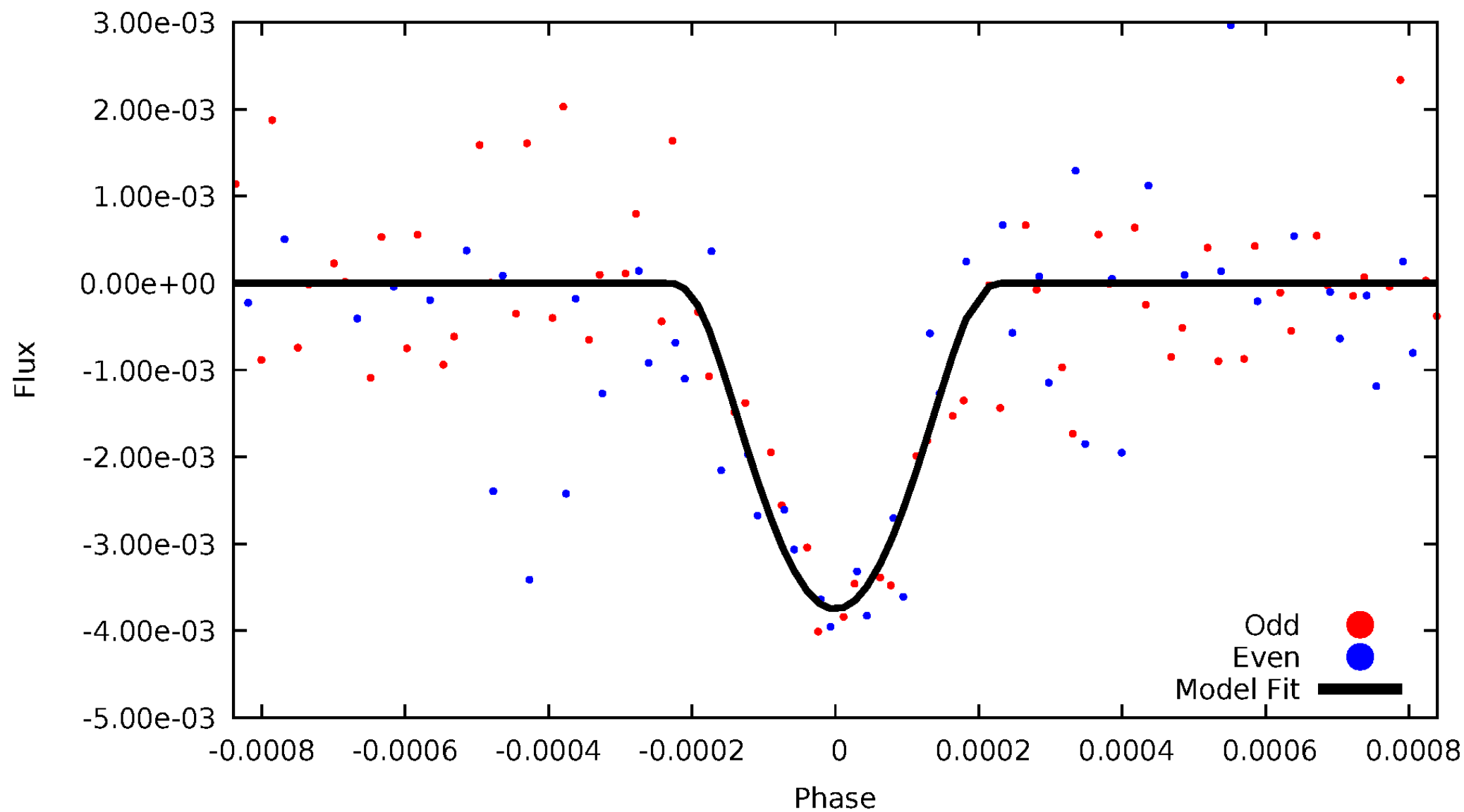
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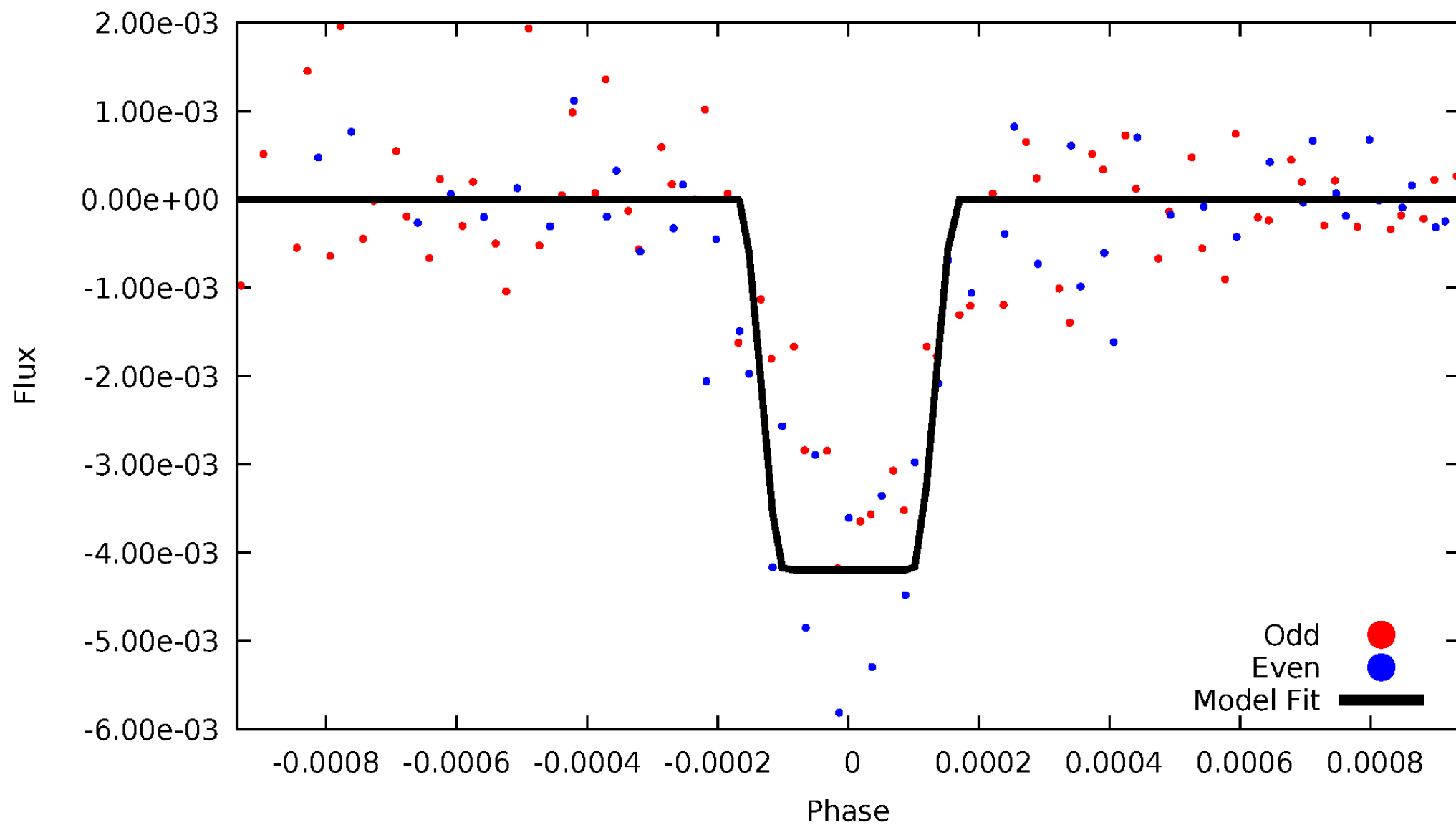
# DV Odd/Even

TCE 008365196-03



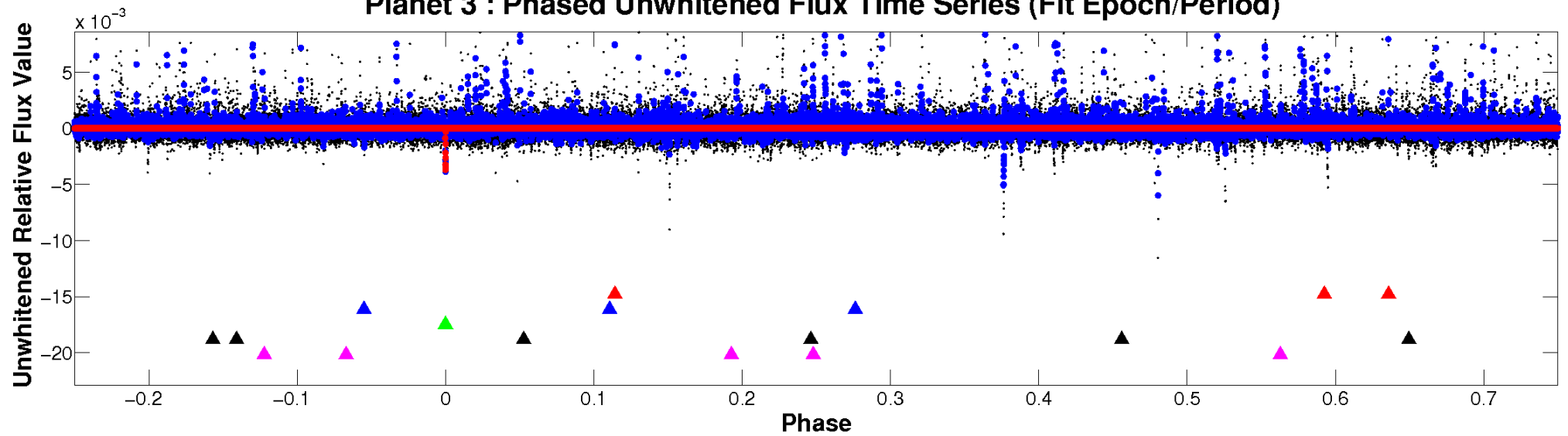
# ALT Odd/Even

TCE 008365196-03

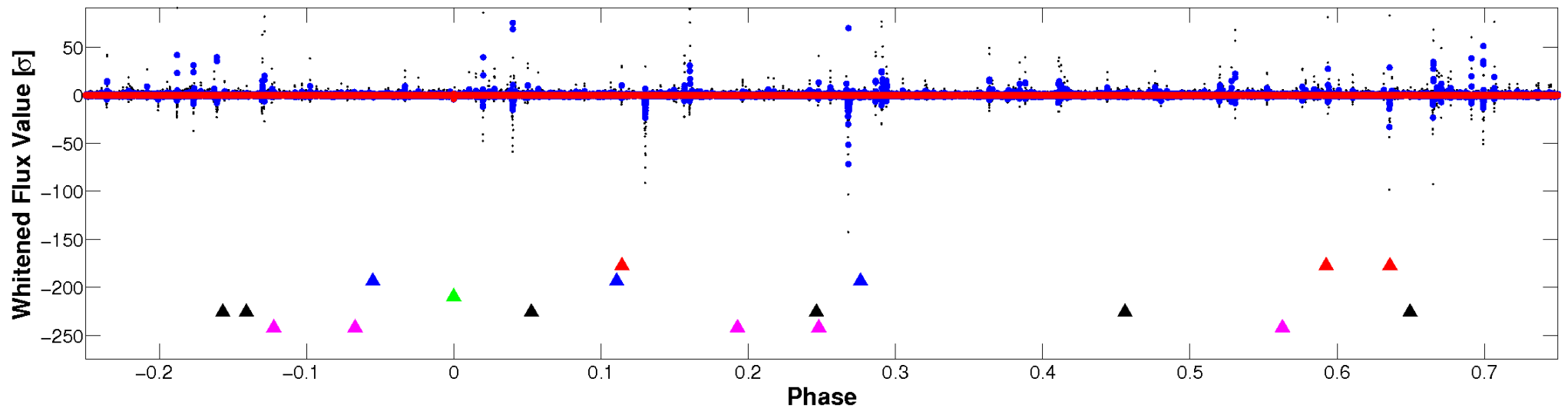


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

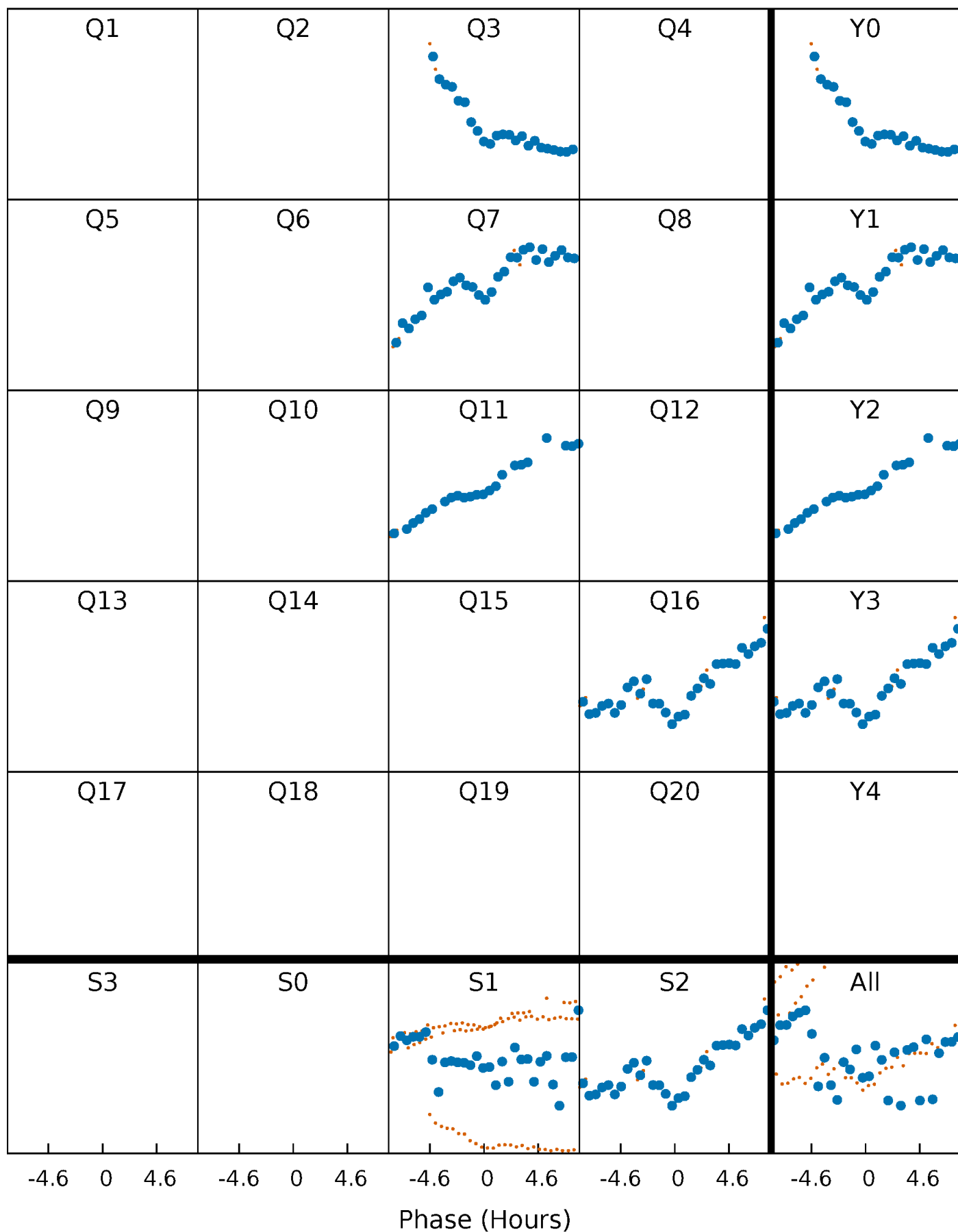


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



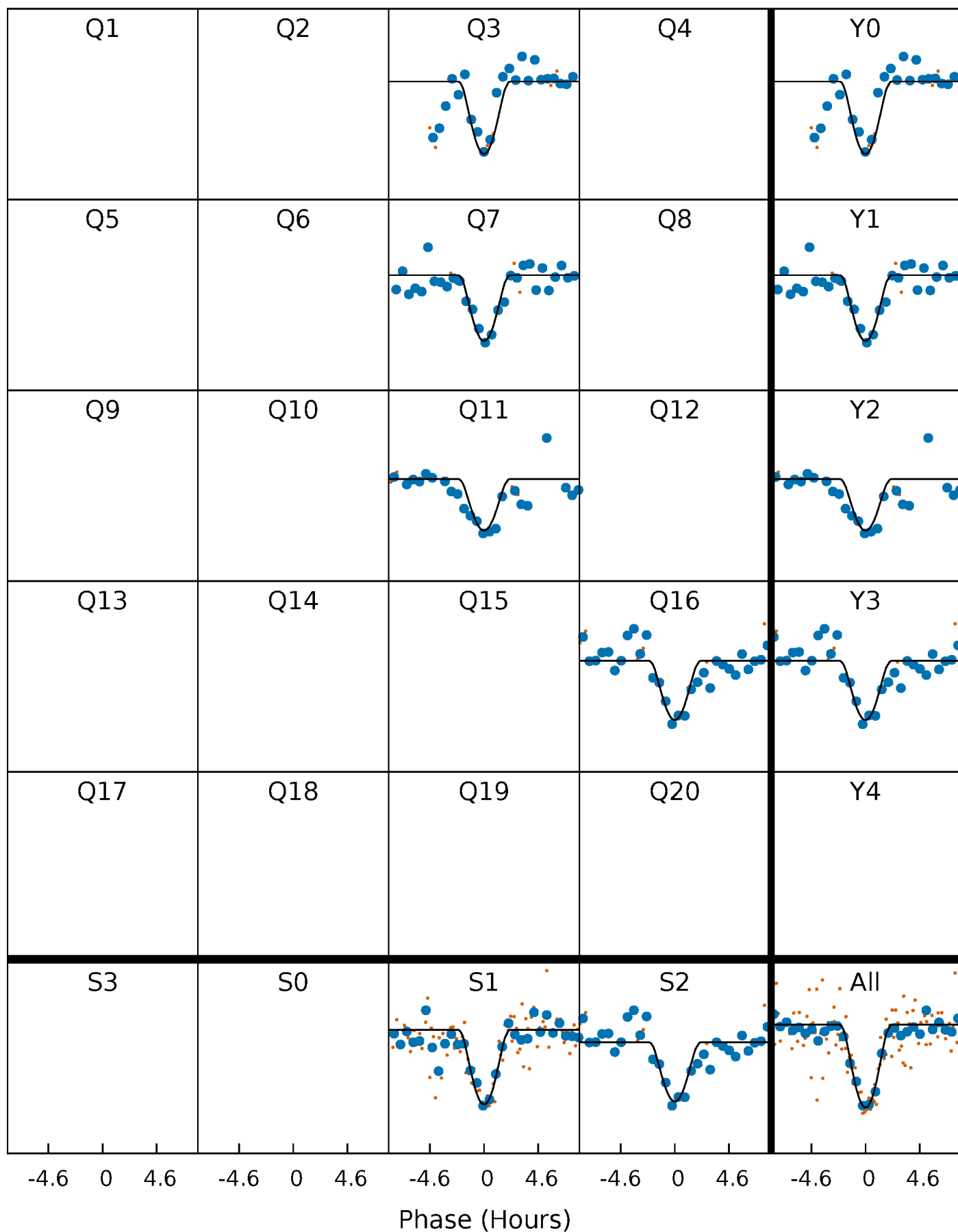
# PDC Quarter-Phased Transit Curves

TCE 008365196-03     $P=402.568599$  Days     $T_0=291.617881$  (BKJD)



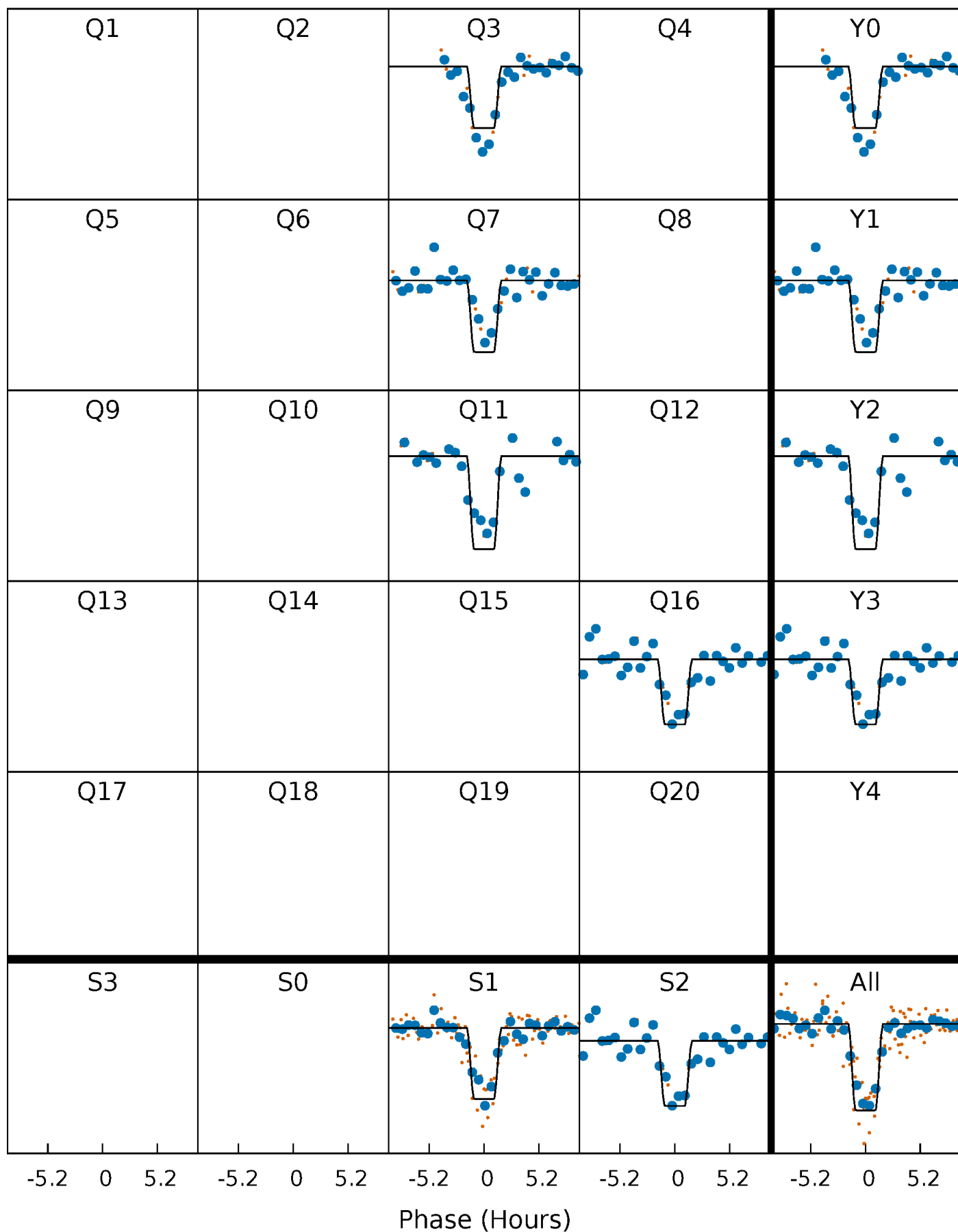
# DV Quarter-Phased Transit Curves

TCE 008365196-03     $P=402.568599$  Days     $T_0=291.617881$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

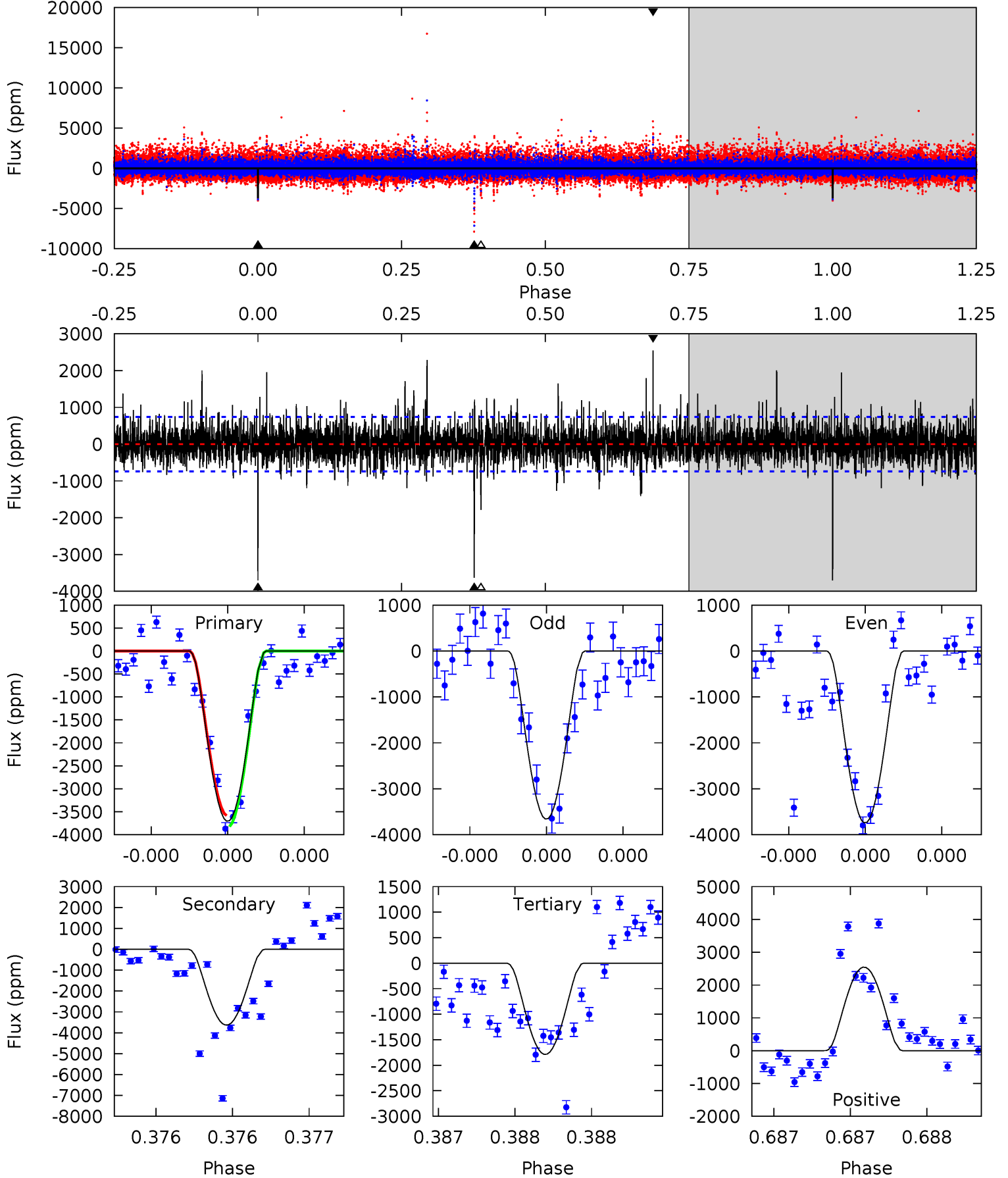
TCE 008365196-03     $P=402.568377$  Days     $T_0=291.615433$  (BKJD)



# DV Model-Shift Uniqueness Test

008365196-03, P = 402.568599 Days, E = 291.617881 Days

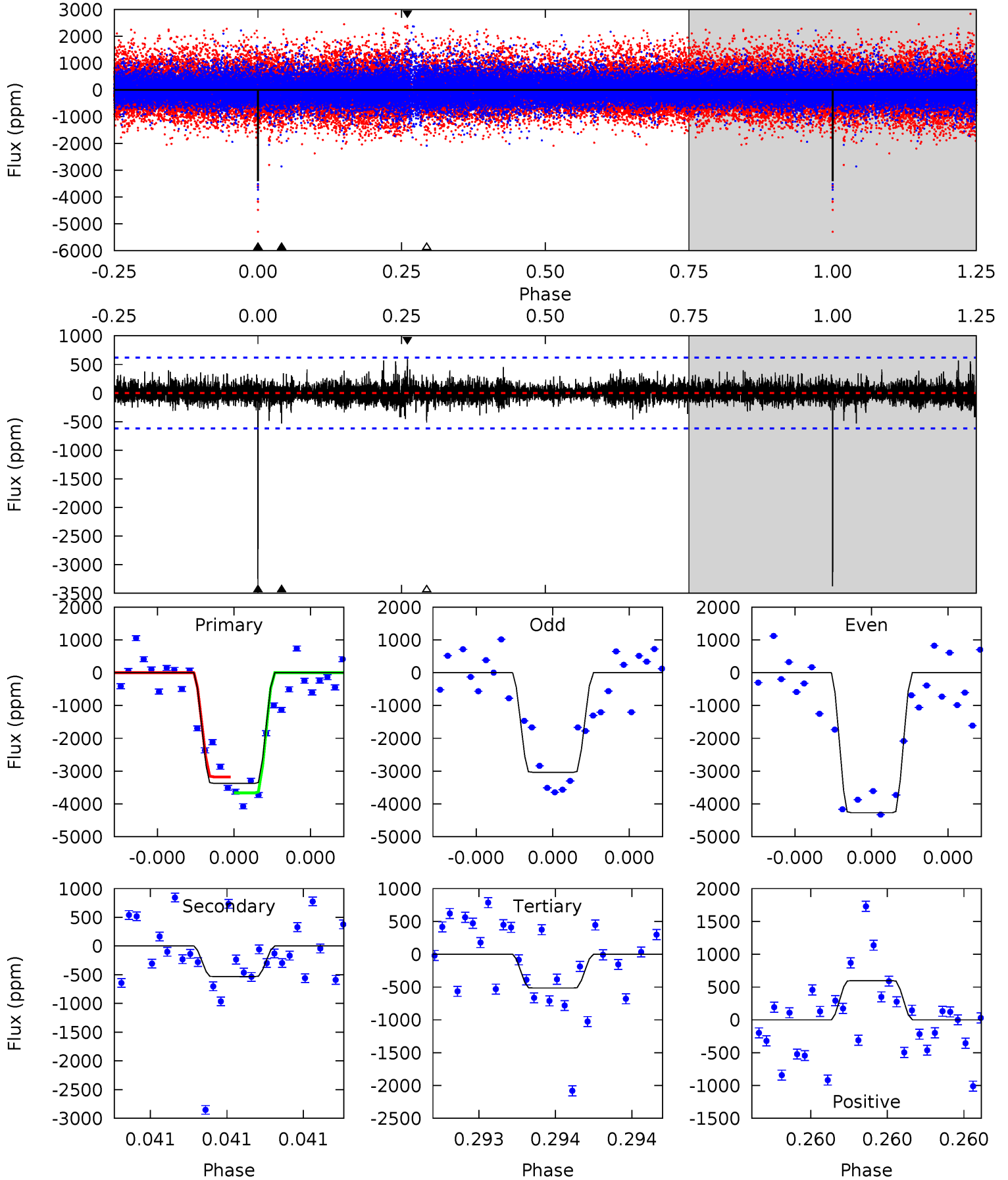
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.9	27.3	13.5	19.2	5.59	3.50	2.58	14.5	8.75	13.9	8.16	0.13	1.01	0.41	0.90



# Alt Model-Shift Uniqueness Test

008365196-03, P = 402.568377 Days, E = 291.615433 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
30.8	4.85	4.69	5.45	5.65	3.60	0.89	26.1	25.4	0.15	-0.60	5.02	1.10	0.15	2.24





### Stellar Parameters For KIC 008365196

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4483^{+154}_{-154}$	$4.567^{+0.060}_{-0.020}$	$0.320^{+0.100}_{-0.300}$	$0.739^{+0.029}_{-0.063}$	$0.734^{+0.041}_{-0.050}$	$2.566^{+0.651}_{-0.186}$
	+3%/-3%	+1%/-0%	+31%/-94%	+4%/-9%	+6%/-7%	+25%/-7%
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 008365196-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-3627 \pm 133$	$15.87^{+15.43}_{-10.85}$	$240^{+9}_{-9}$	$3014^{+1341}_{-484}$	$7336^{+66669}_{-5454}$
Alt.	$-531 \pm 110$	$15.09^{+14.64}_{-9.93}$	$240^{+9}_{-9}$	$2392^{+789}_{-352}$	$1182^{+9172}_{-894}$

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

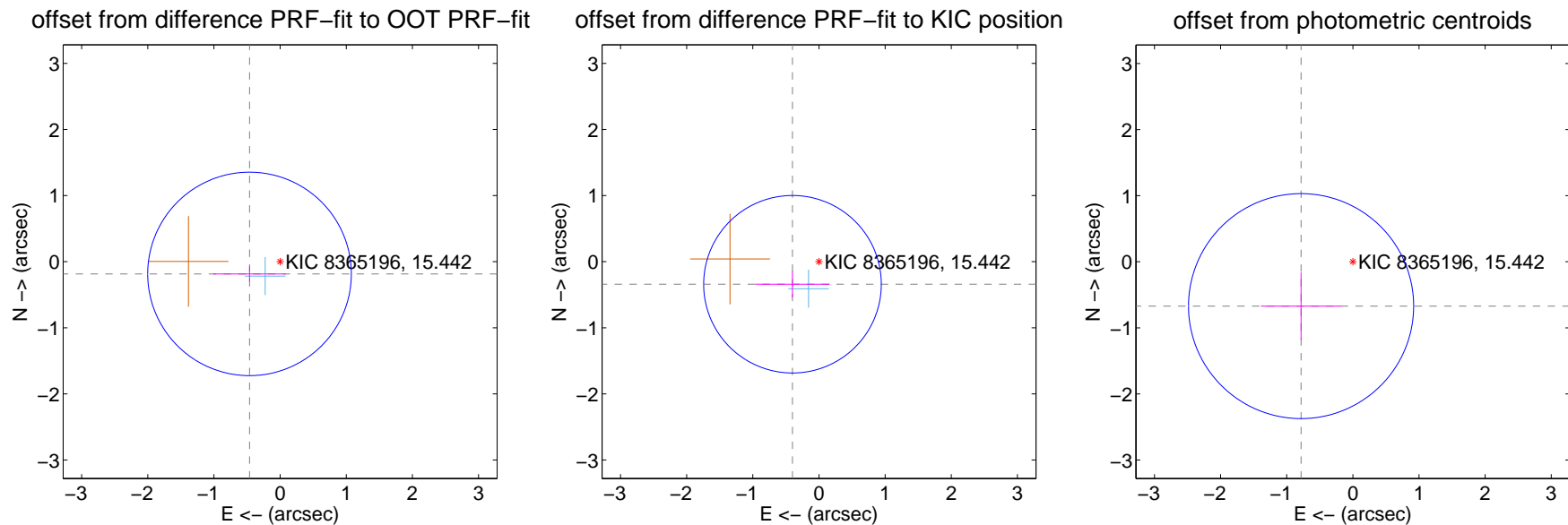
## DV Centroid Data

Supplemental centroid analysis for 008365196-03. Kepler magnitude: 15.44. Transit SNR 14.54

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.498 \pm 0.513$	0.97	$0.463 \pm 0.551$	$-0.185 \pm 0.114$
PRF-fit source offset from KIC position	$0.526 \pm 0.448$	1.18	$0.401 \pm 0.563$	$-0.341 \pm 0.199$
photometric centroid source offset	$1.03 \pm 0.57$	1.82	$0.78 \pm 0.61$	$-0.67 \pm 0.51$

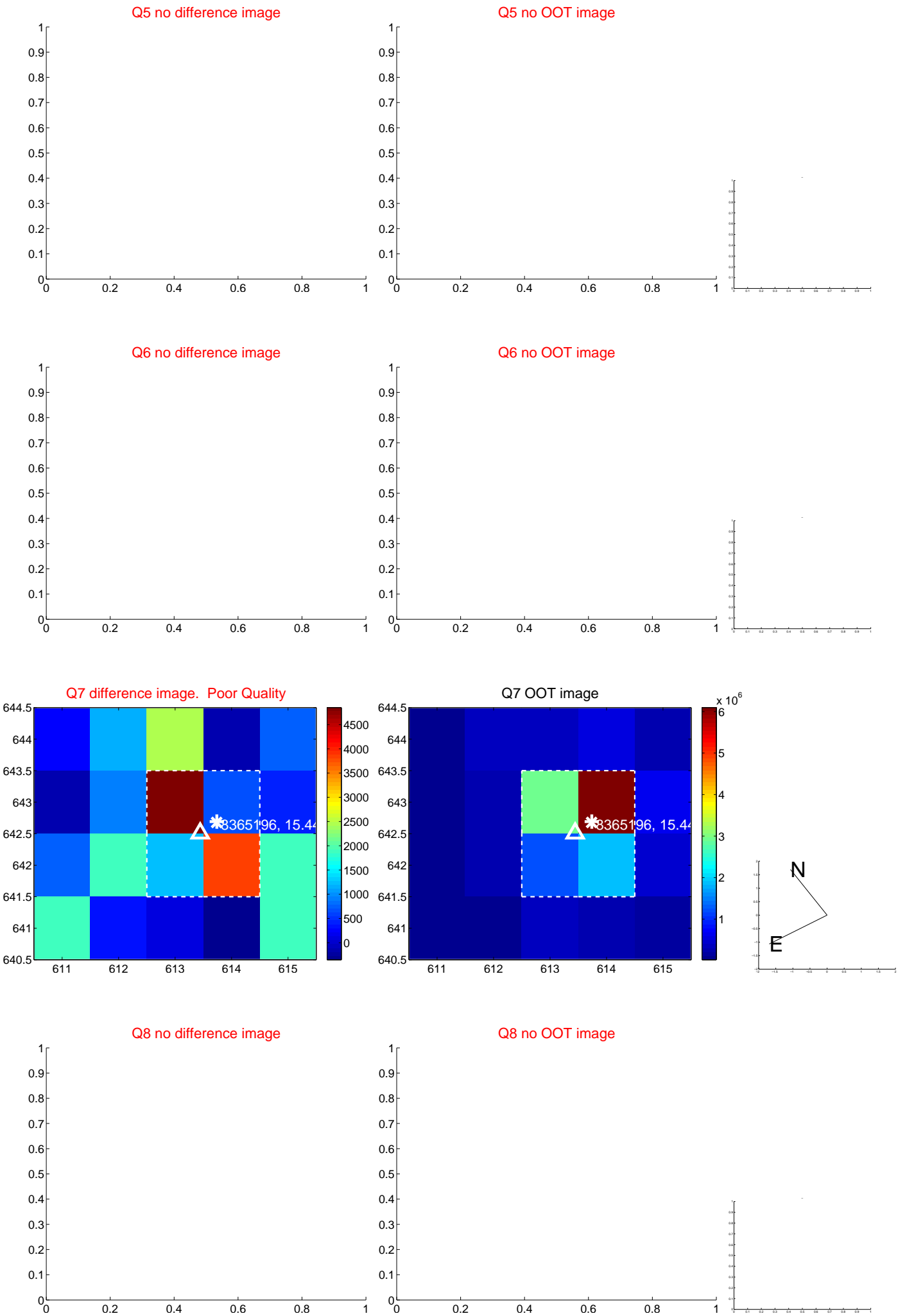


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



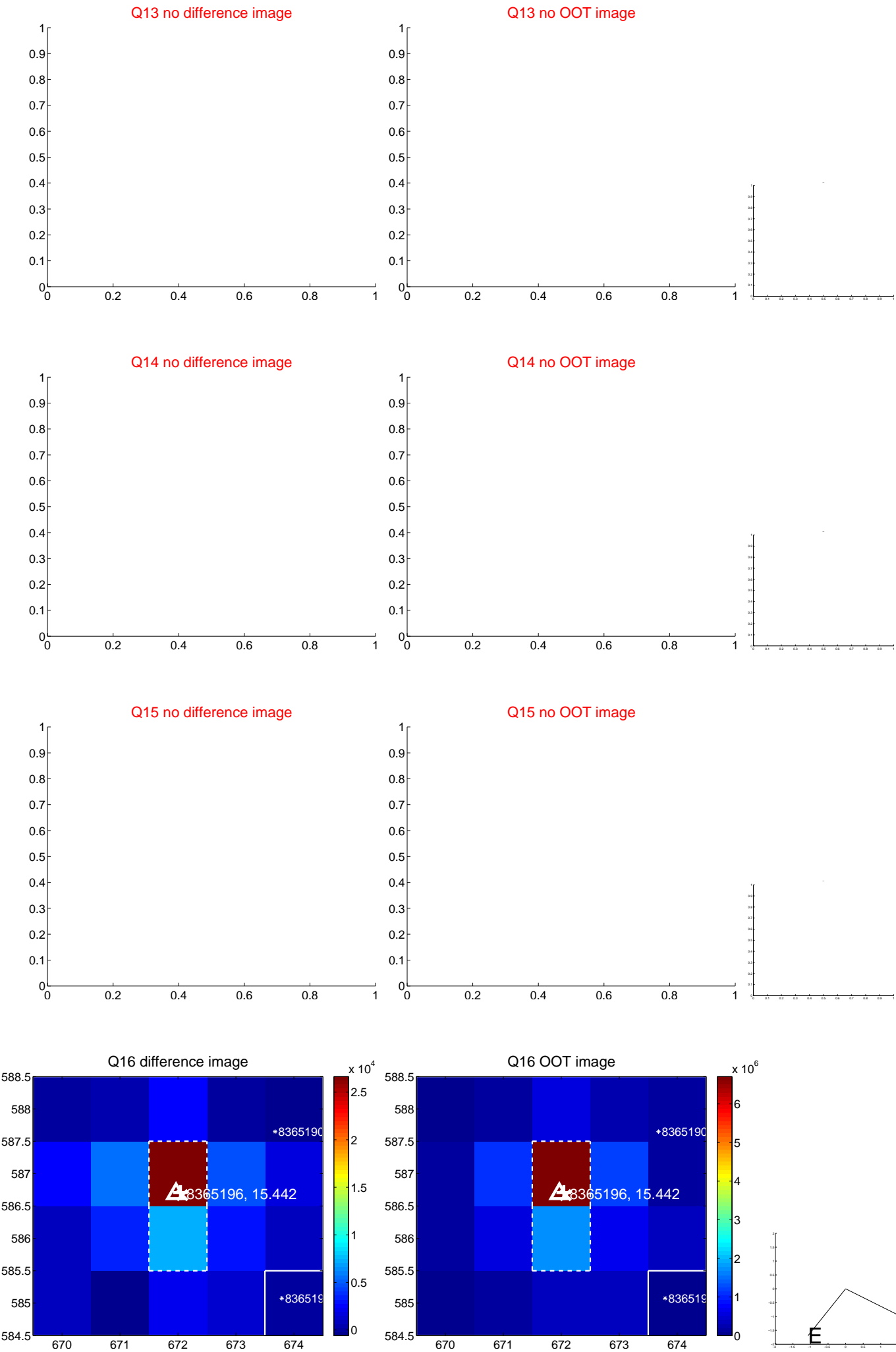
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



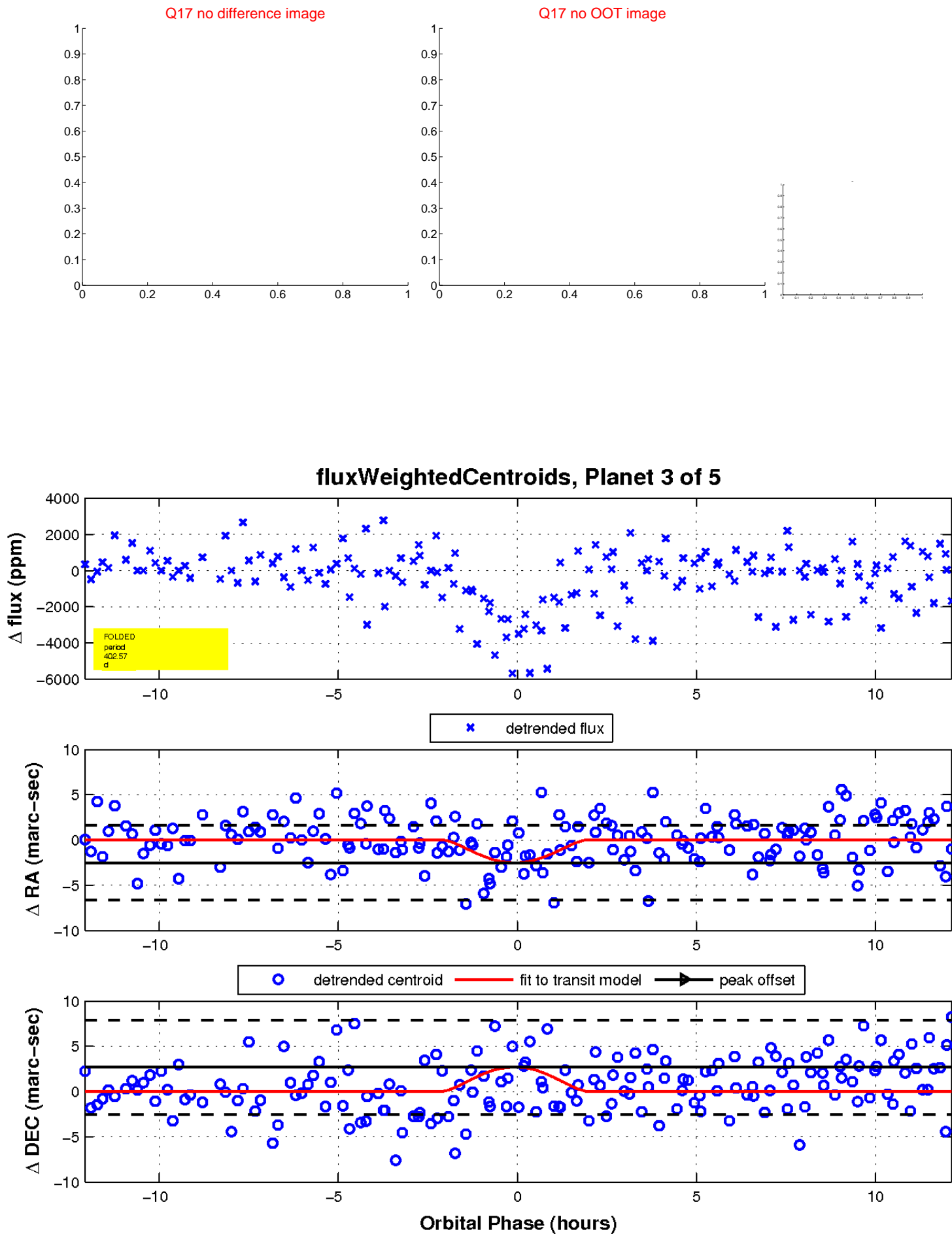
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

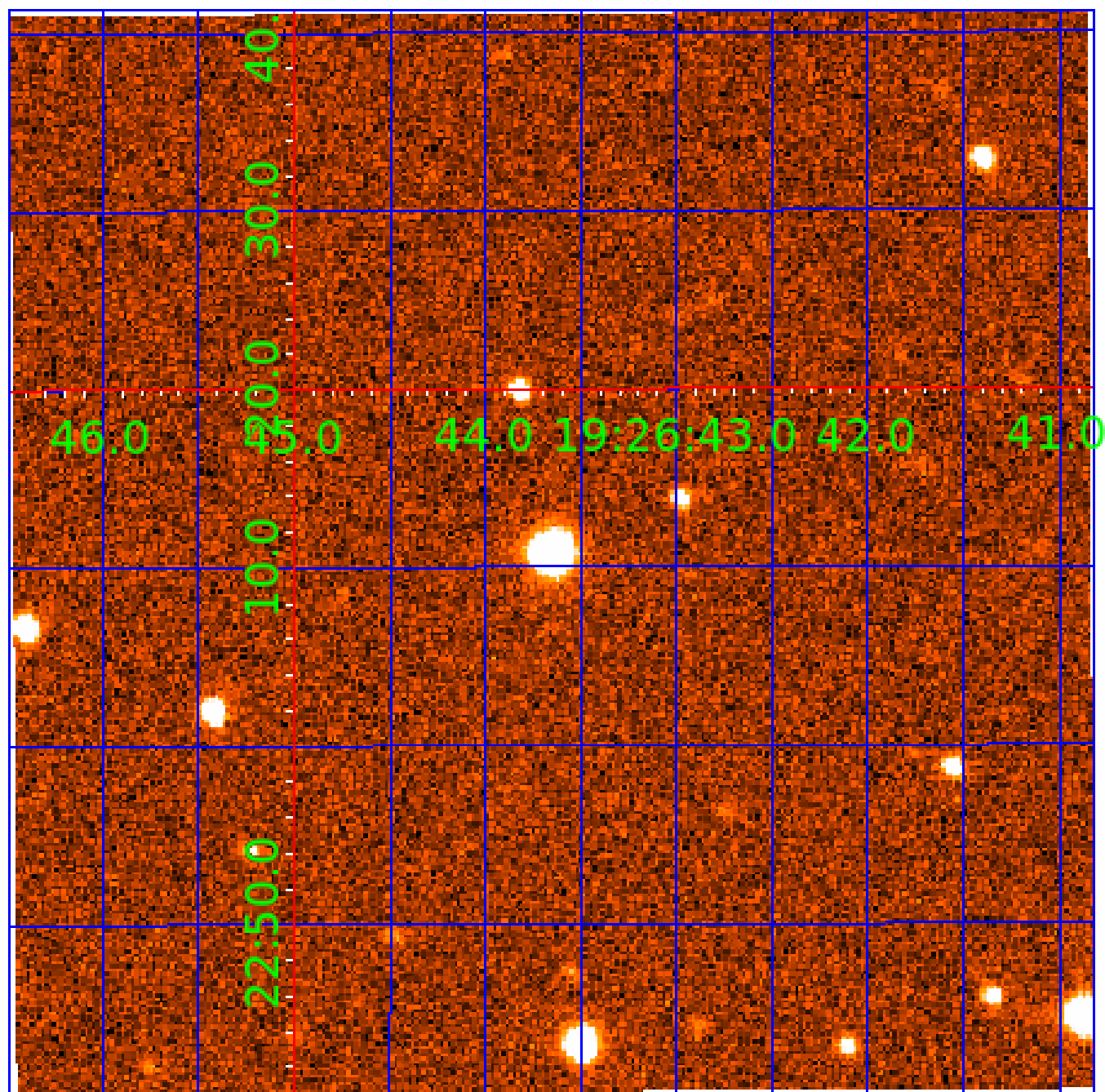


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008365196

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008365196-02	OBS	No	469.241681	269.501230	2376.9	3.432	13.5	8.2	0.74	4483	3.69	0.17
008365196-03	OBS	No	402.568599	291.617881	3743.7	4.054	10.8	14.5	0.74	4483	8.20	0.21
008365196-04	OBS	No	240.253899	234.912424	1380.1	3.475	10.6	5.4	0.74	4483	2.88	0.42
008365196-05	OBS	No	275.786499	369.213334	1758.7	3.000	9.6	-1.0	0.74	4483	2.95	0.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008365196-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008365196-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS
008365196-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008365196-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

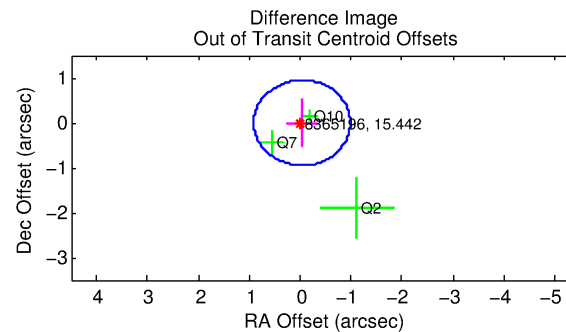
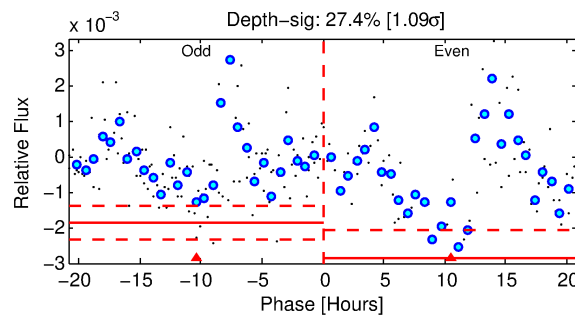
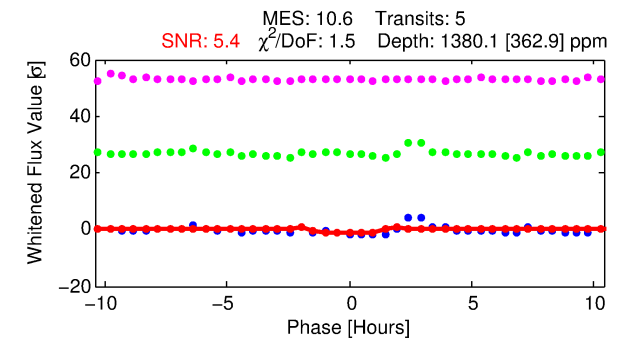
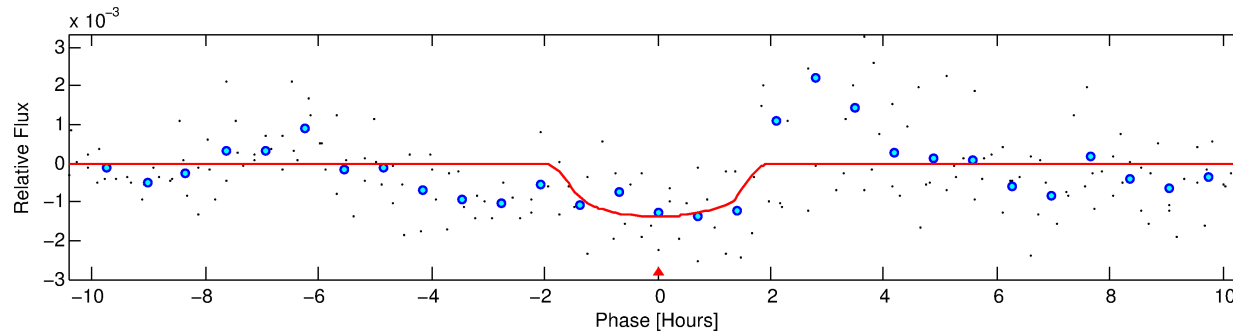
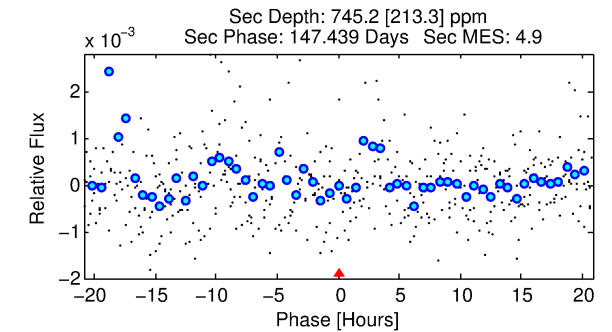
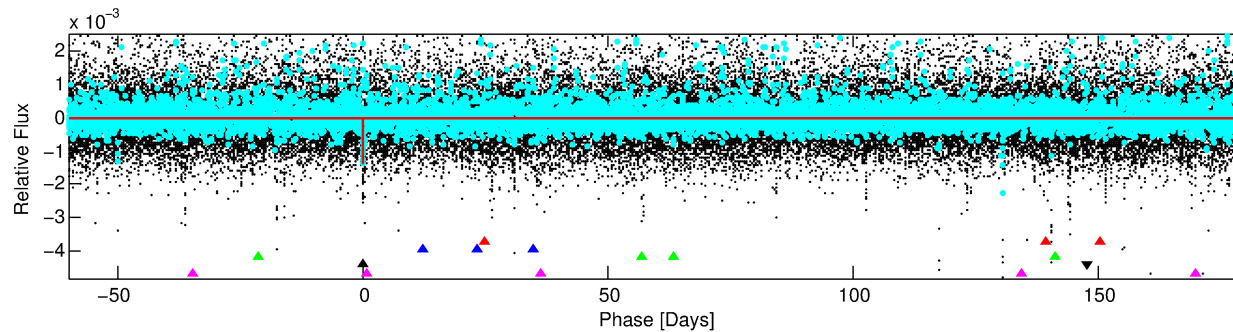
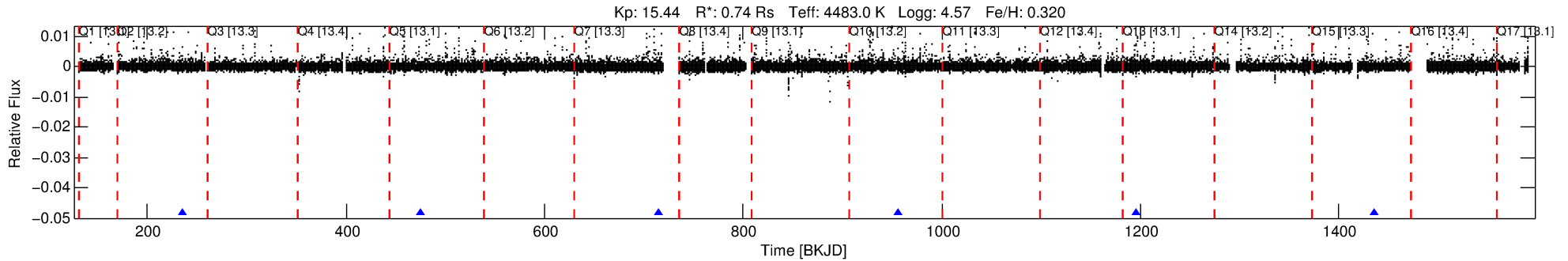
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008365196-04

No Significant Match Found

# DV One-Page Summary

KIC: 8365196 Candidate: 4 of 5 Period: 240.254 d



## DV Fit Results:

Period = 240.25390 [0.00484] d  
Epoch = 234.9124 [0.0138] BKJD  
Rp/R\* = 0.0358 [0.0631]  
a/R\* = 421.48 [2196.79]  
b = 0.66 [4.59]  
Seff = 0.42 [0.07]  
Teq = 206 [9] K  
Rp = 2.88 [5.09] Re  
a = 0.6827 [0.0499] AU  
Ag = 22981.35 [81377.66] [0.28σ]  
Teffp = 3917 [3469] K [1.07σ]

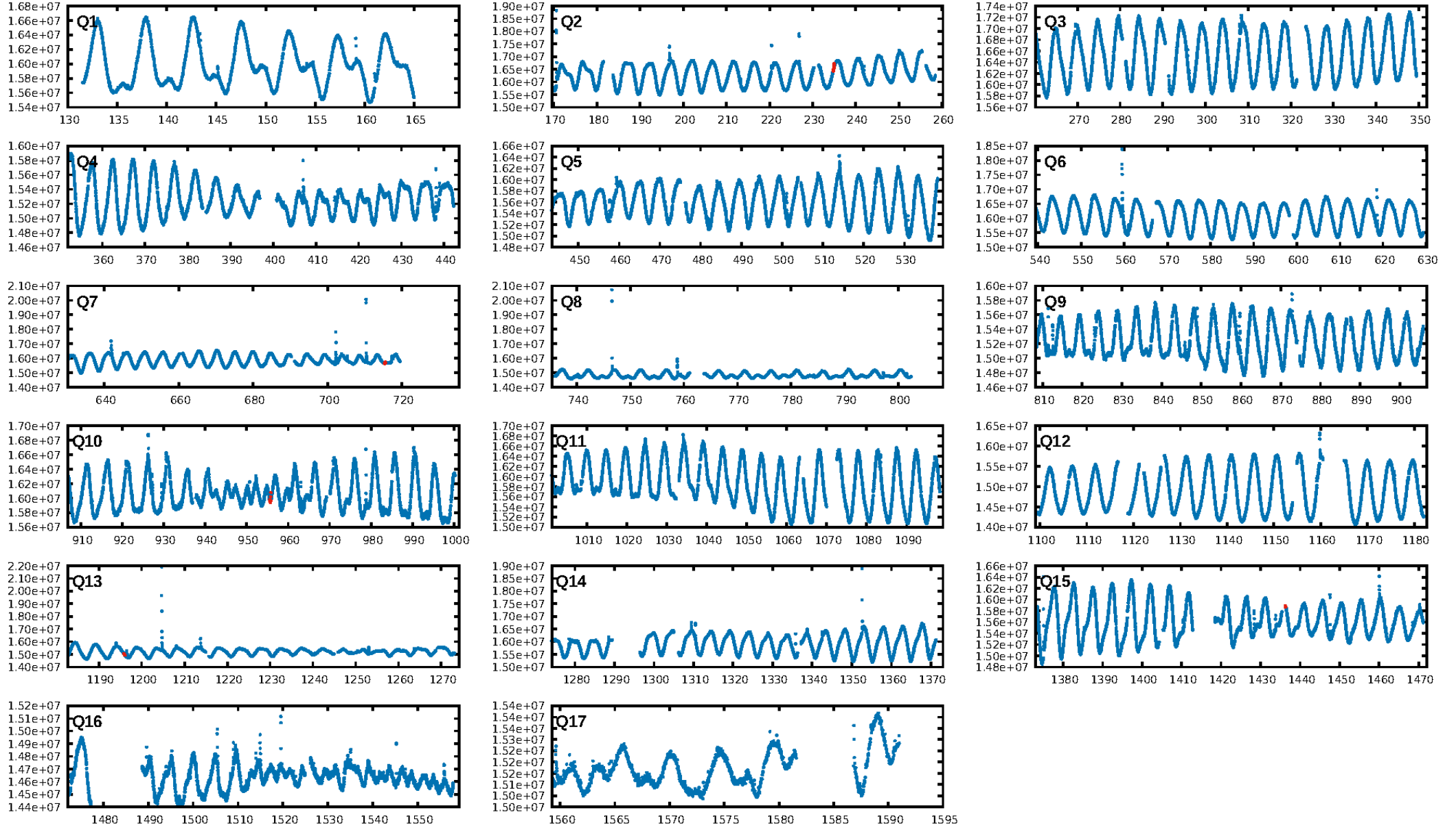
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [185.76σ]  
ModelChiSquare2-sig: 4.0%  
ModelChiSquareGof-sig: 77.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -1.904  
Centroid-sig: 50.2%  
Centroid-so: 0.989 arcsec [0.72σ]  
OotOffset-rm: 0.035 arcsec [0.11σ]  
KicOffset-rm: 0.073 arcsec [0.26σ]  
OotOffset-st: 2/1/0/0 [3]  
KicOffset-st: 2/1/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [4/4]

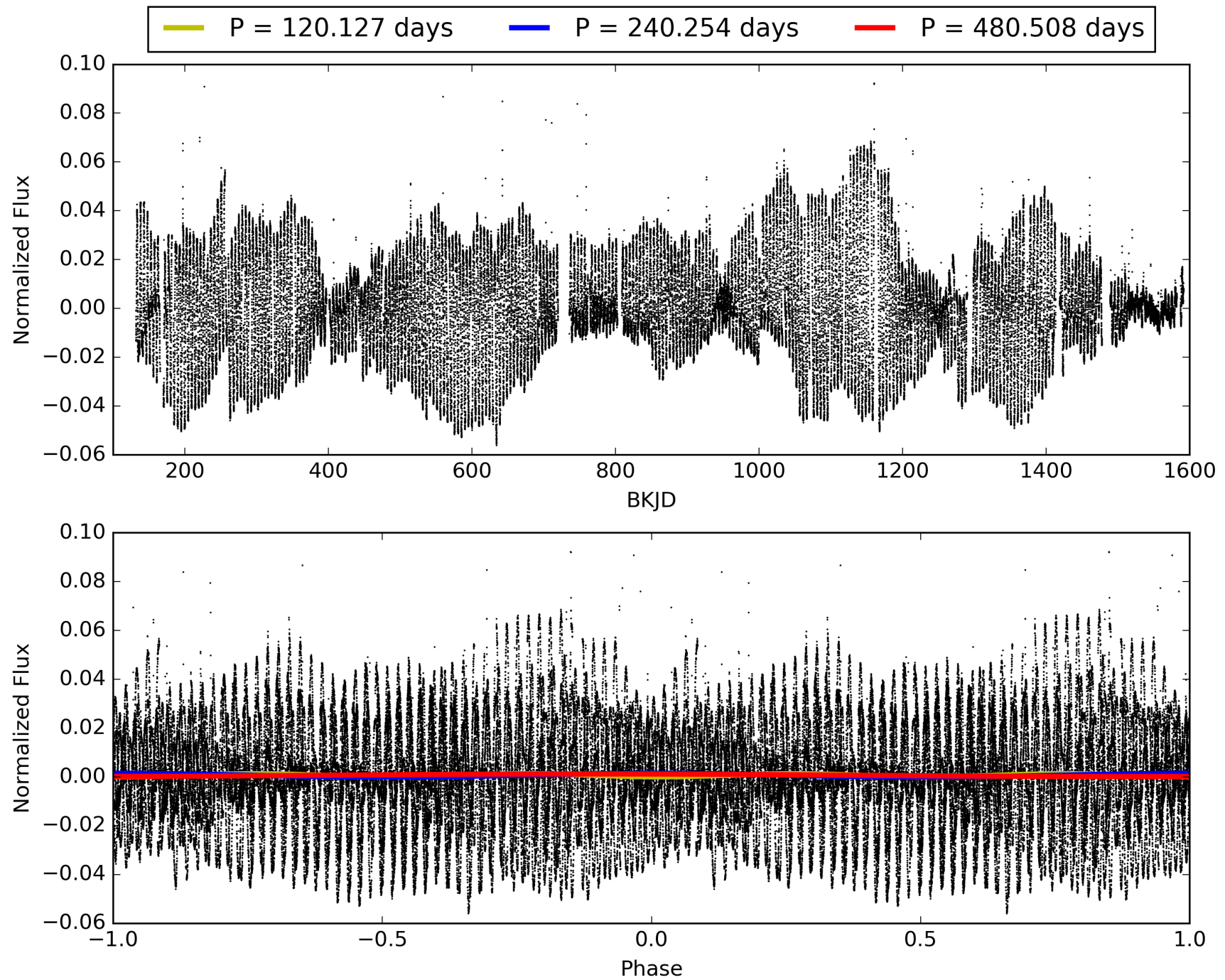
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:48:12 Z

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

# TCE 008365196-04, PDC Light Curves

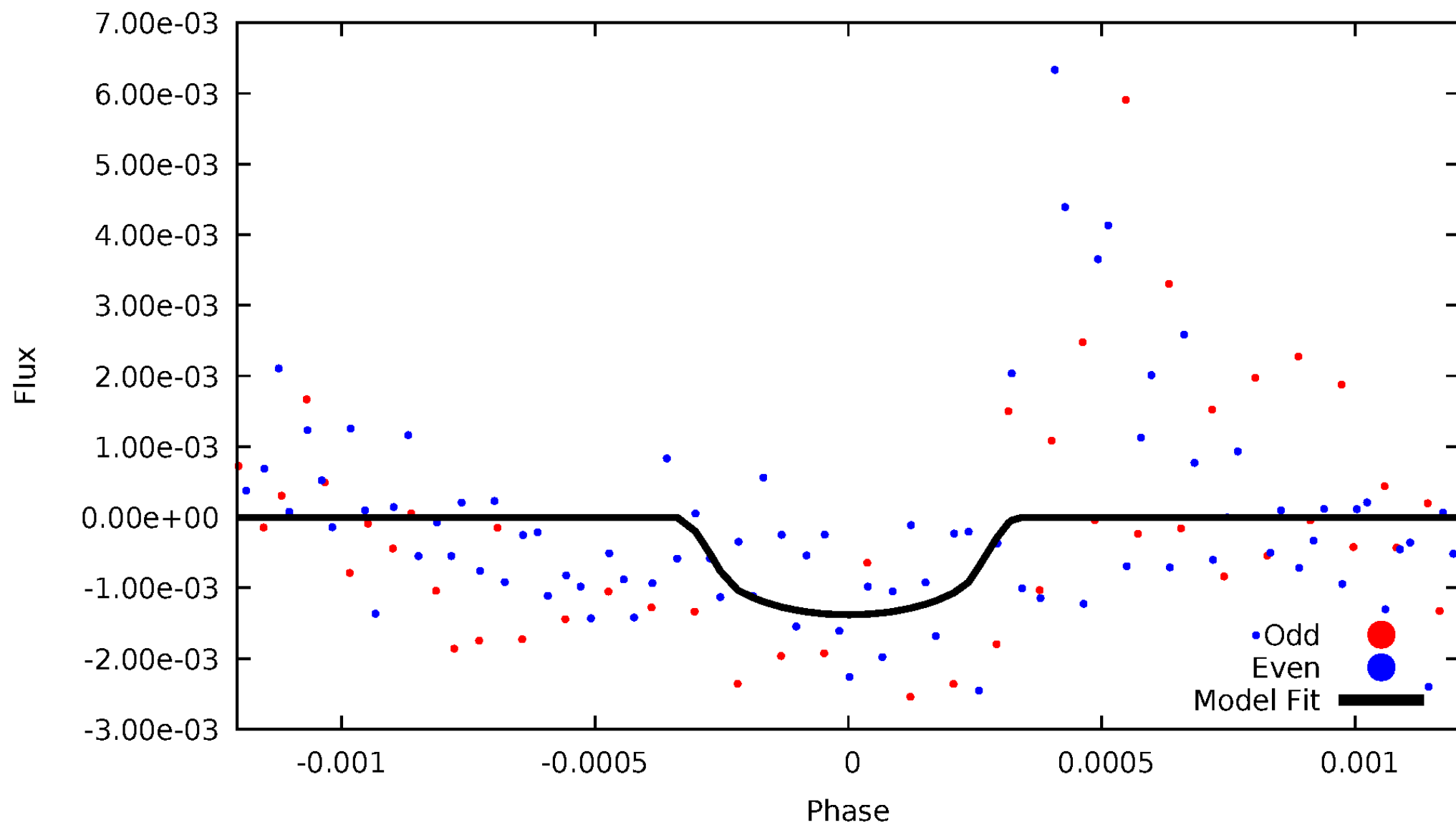


TCE 008365196-04



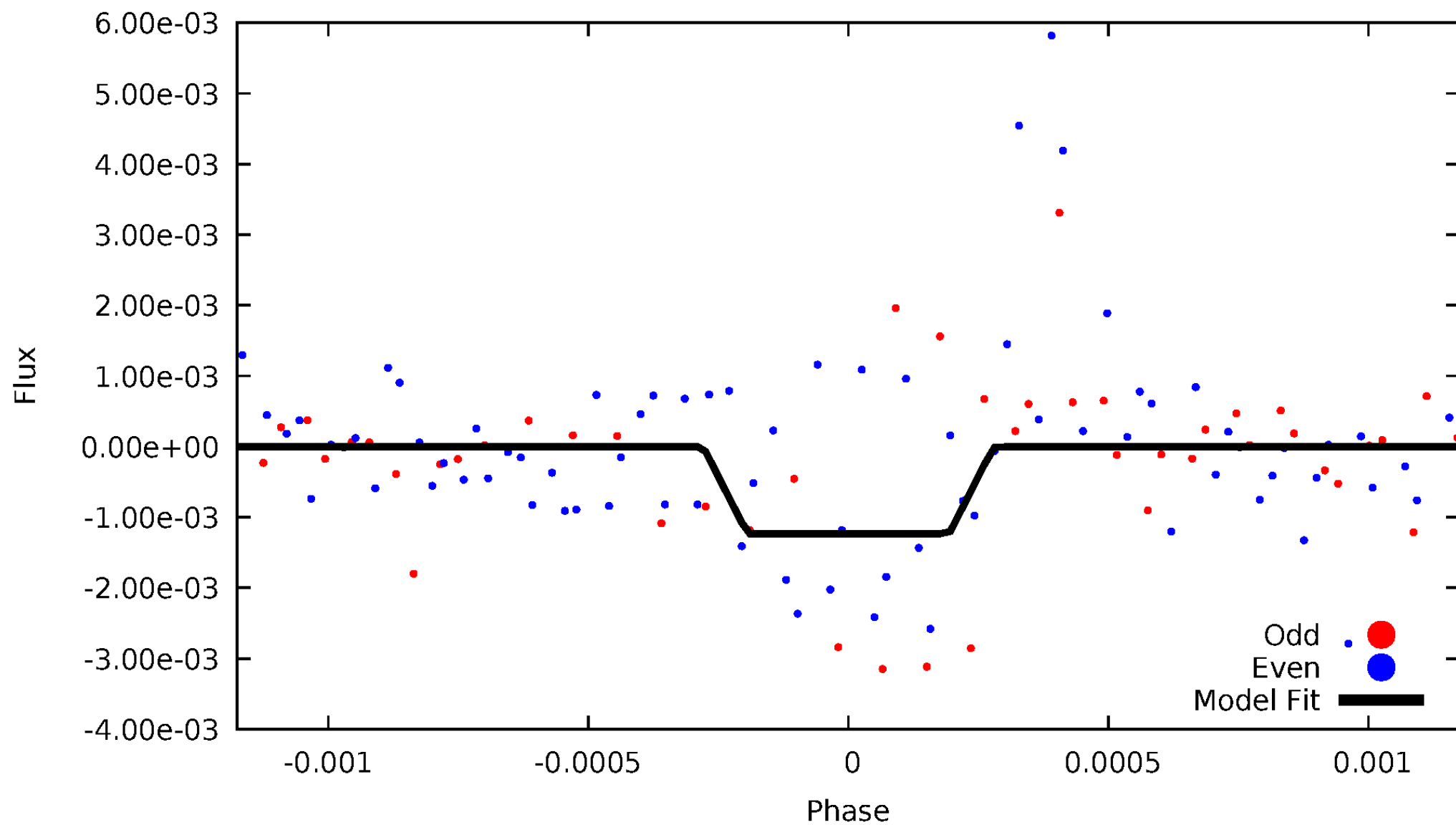
# DV Odd/Even

TCE 008365196-04



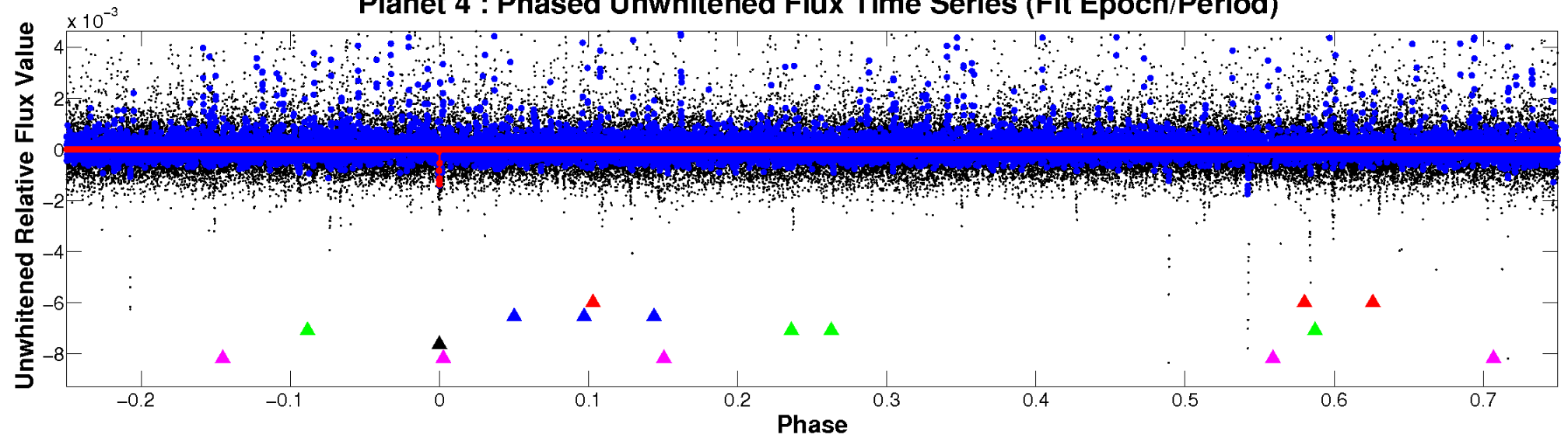
# ALT Odd/Even

TCE 008365196-04

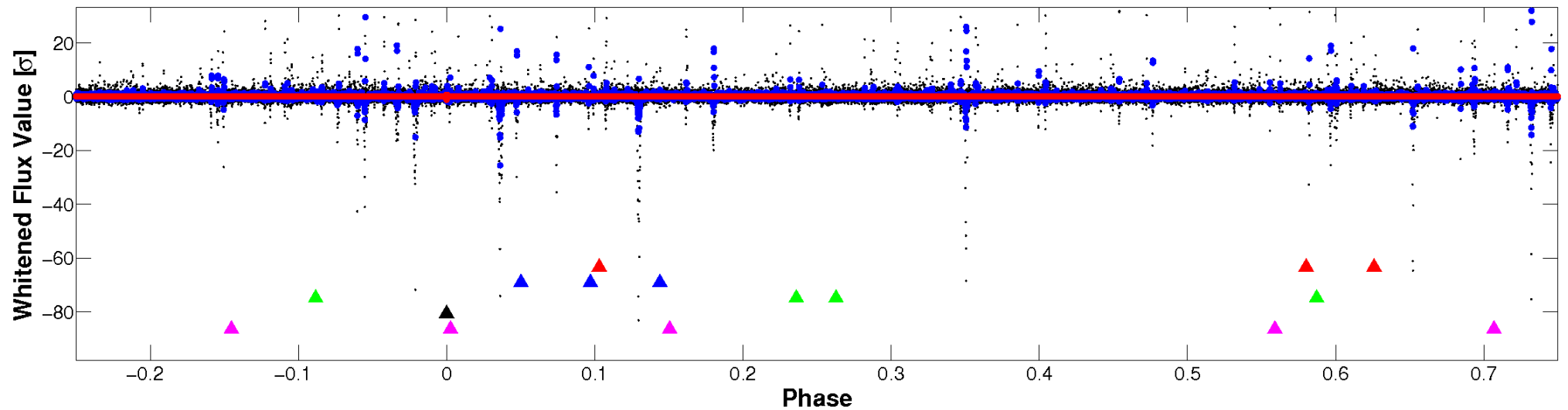


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



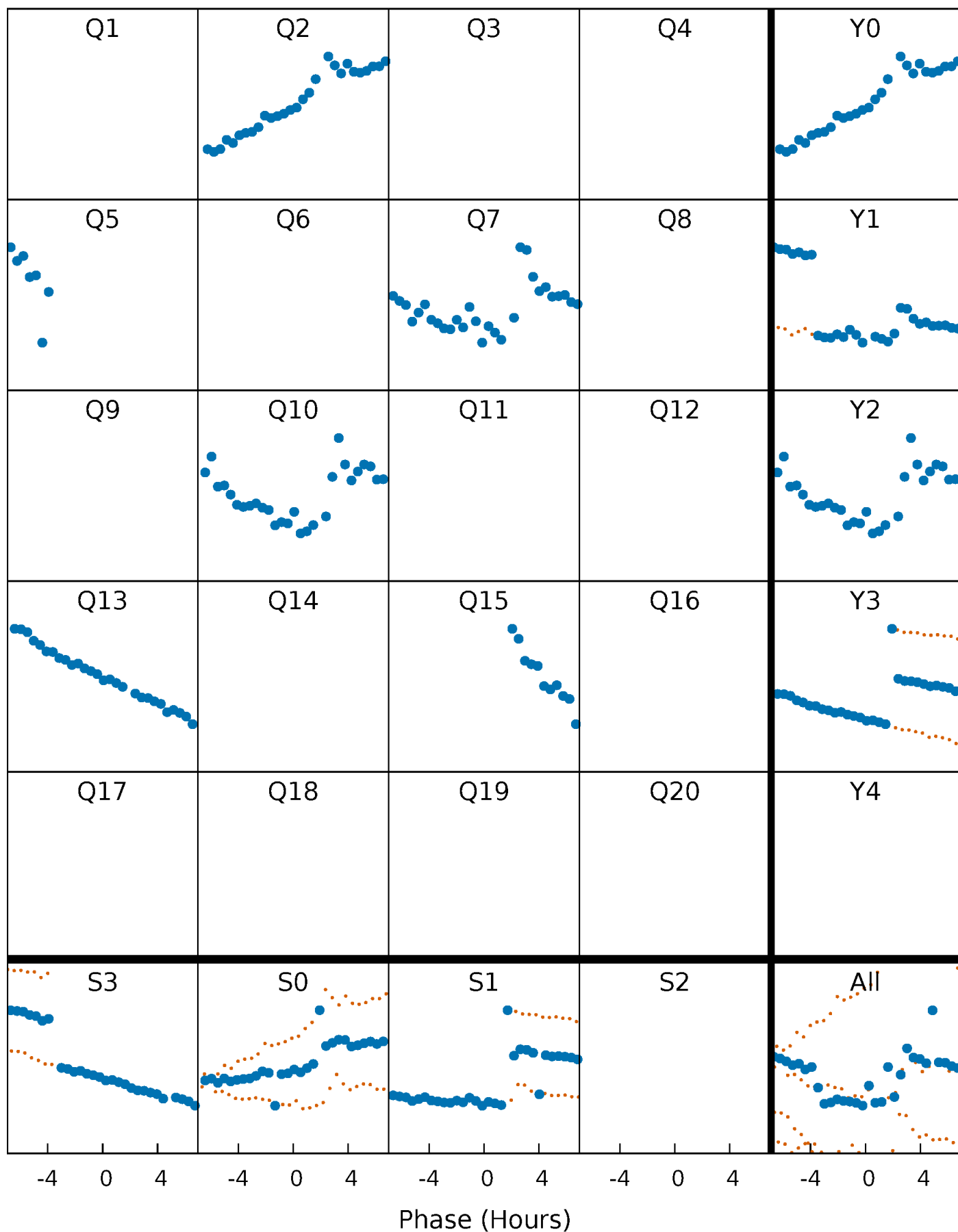
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

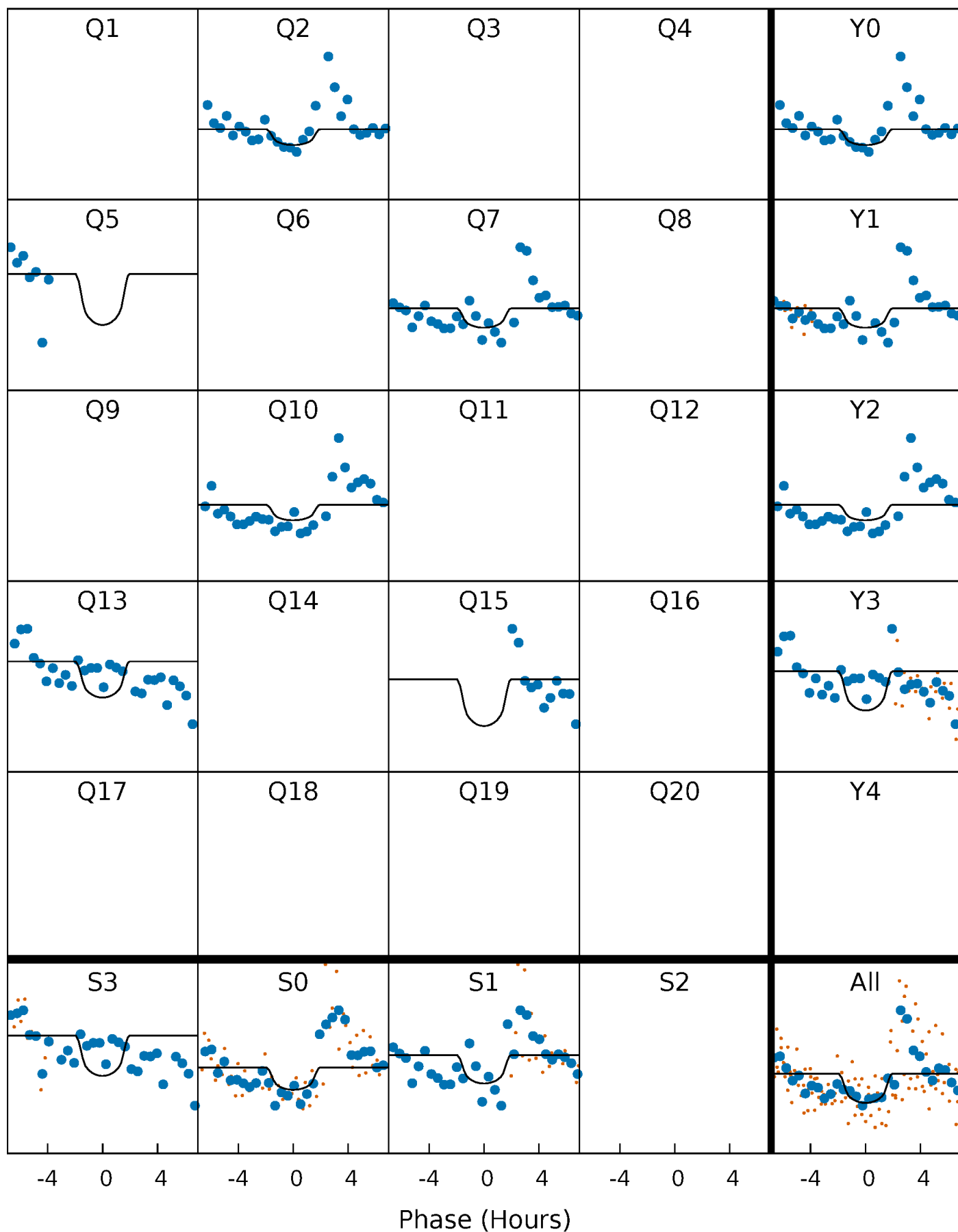
TCE 008365196-04     $P=240.253899$  Days     $T_0=234.912424$  (BKJD)





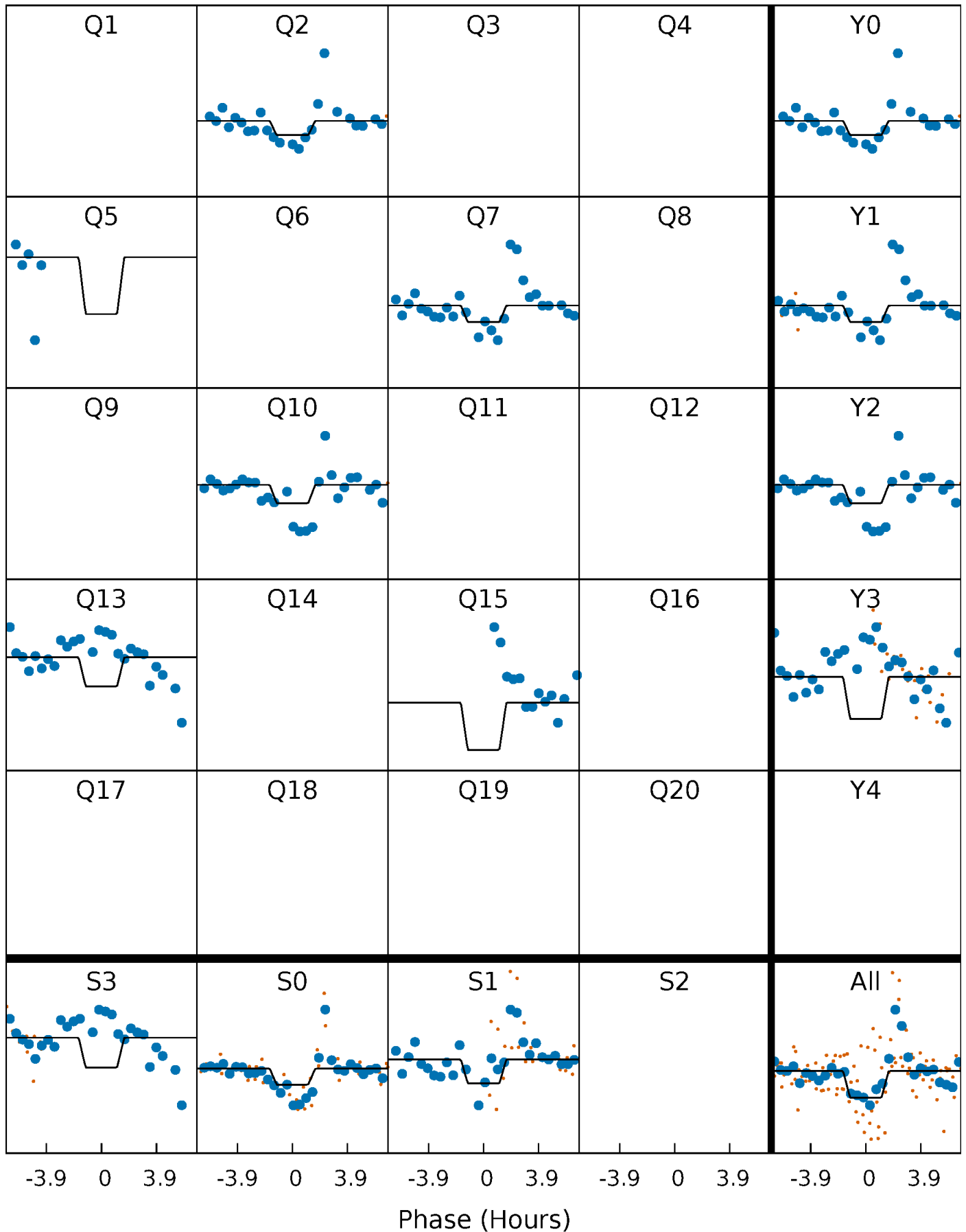
# DV Quarter-Phased Transit Curves

TCE 008365196-04 P=240.253899 Days  $T_0=234.912424$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

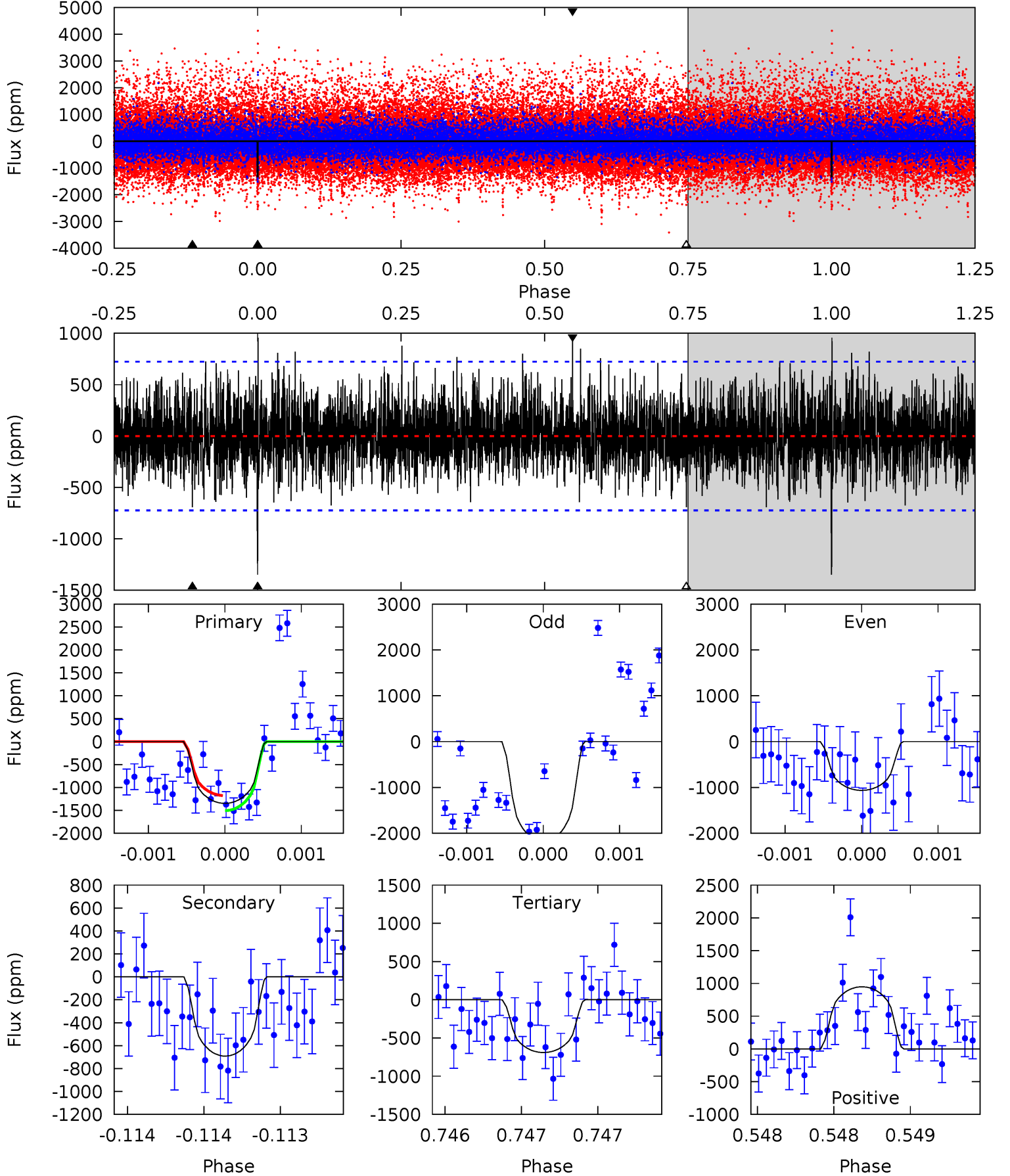
TCE 008365196-04 P=240.263871 Days  $T_0=234.916503$  (BKJD)



# DV Model-Shift Uniqueness Test

008365196-04, P = 240.253899 Days, E = 234.912424 Days

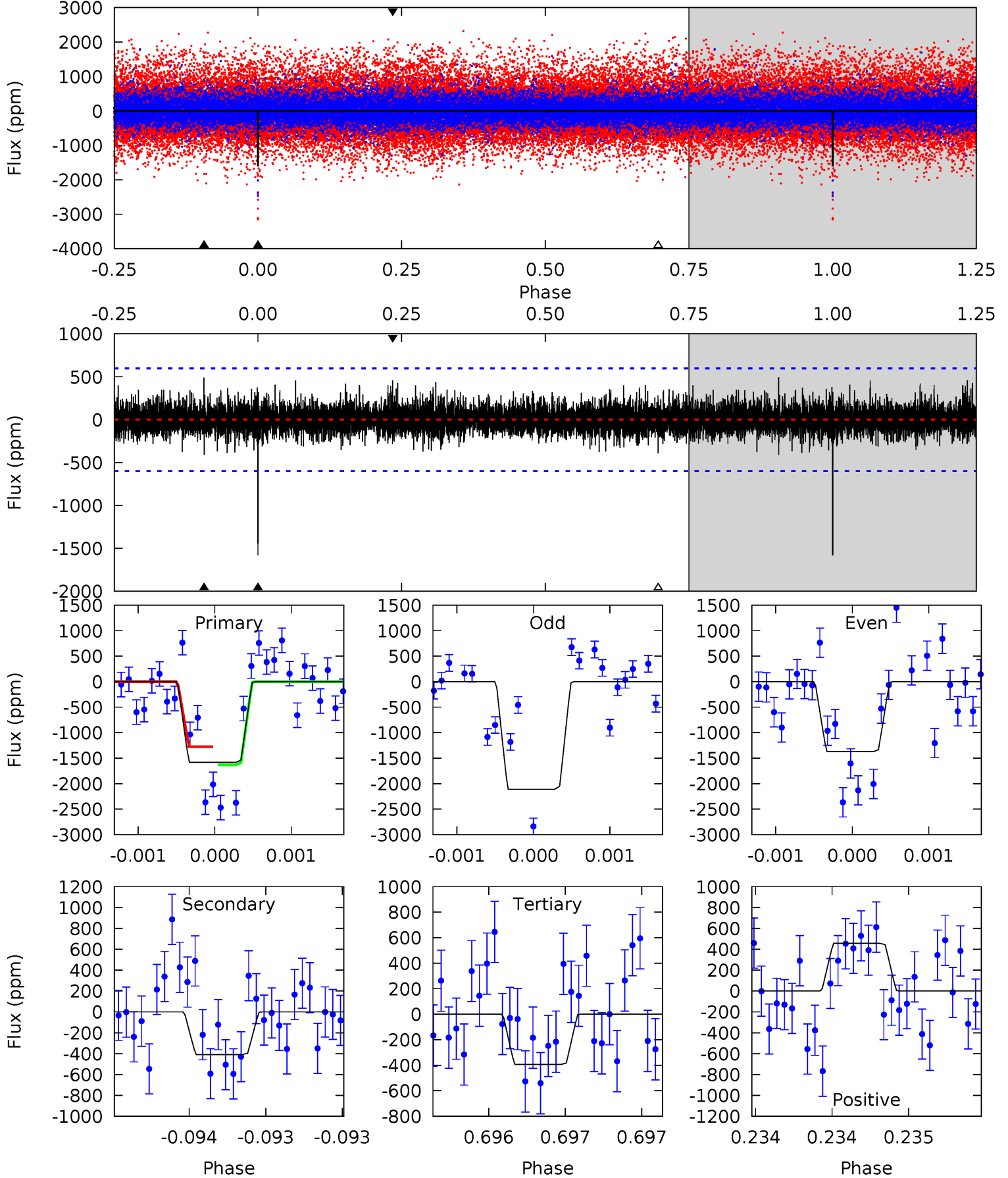
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	5.29	5.28	7.26	5.53	3.42	1.70	5.03	3.06	0.01	-1.96	3.69	0.97	0.42	1.27



# Alt Model-Shift Uniqueness Test

008365196-04, P = 240.263871 Days, E = 234.916503 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
14.7	3.79	3.65	4.25	5.55	3.44	0.99	11.0	10.4	0.14	-0.45	3.12	0.39	0.24	1.69



### Stellar Parameters For KIC 008365196

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4483^{+154}_{-154}$	$4.567^{+0.060}_{-0.020}$	$0.320^{+0.100}_{-0.300}$	$0.739^{+0.029}_{-0.063}$	$0.734^{+0.041}_{-0.050}$	$2.566^{+0.651}_{-0.186}$
	+3%/-3%	+1%/-0%	+31%/-94%	+4%/-9%	+6%/-7%	+25%/-7%
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 008365196-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-692 \pm 131$	$4.49^{+4.29}_{-2.92}$	$286^{+10}_{-10}$	$3436^{+1548}_{-600}$	$8951^{+62577}_{-6647}$
Alt.	$-408 \pm 108$	$4.86^{+3.84}_{-3.25}$	$285^{+10}_{-11}$	$3083^{+1392}_{-483}$	$4321^{+35578}_{-3039}$

$T_{max}$  = 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

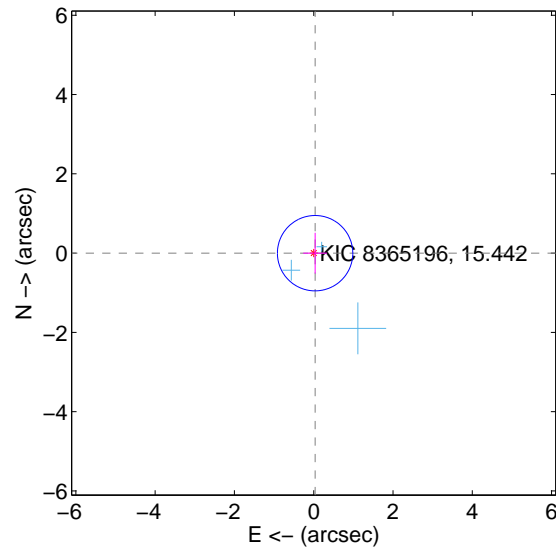
Supplemental centroid analysis for 008365196-04. Kepler magnitude: 15.44. Transit SNR 5.43

There are 3 quarters with good PRF difference image offsets

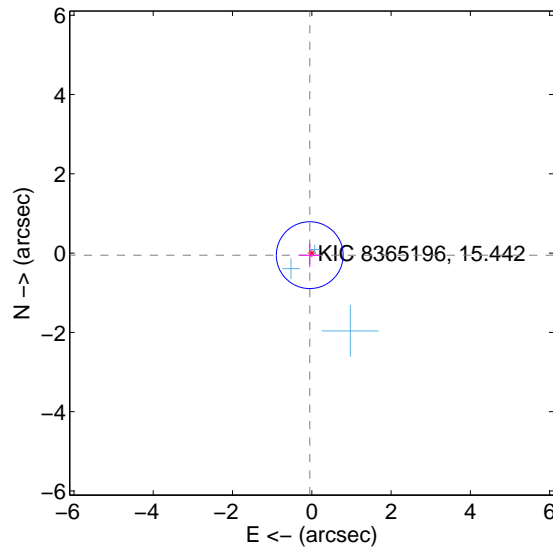
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.035 \pm 0.317$	0.11	$-0.035 \pm 0.301$	$-0.002 \pm 0.514$
PRF-fit source offset from KIC position	$0.073 \pm 0.281$	0.26	$0.051 \pm 0.260$	$-0.052 \pm 0.300$
photometric centroid source offset	$0.99 \pm 1.37$	0.72	$0.65 \pm 1.27$	$0.74 \pm 1.44$

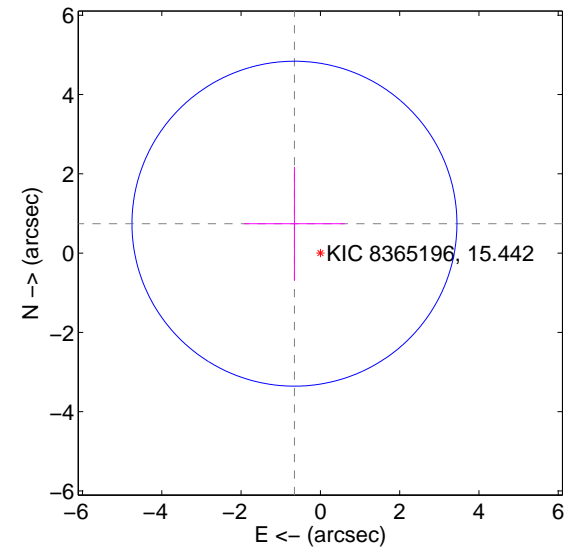
offset from difference PRF-fit to OOT PRF-fit



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.

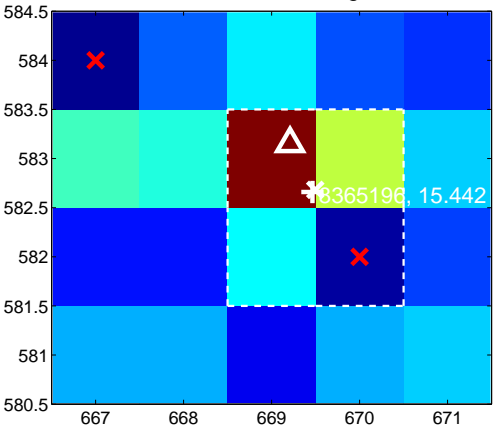
Q1 no difference image



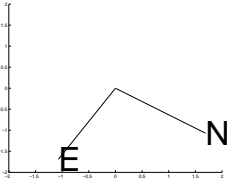
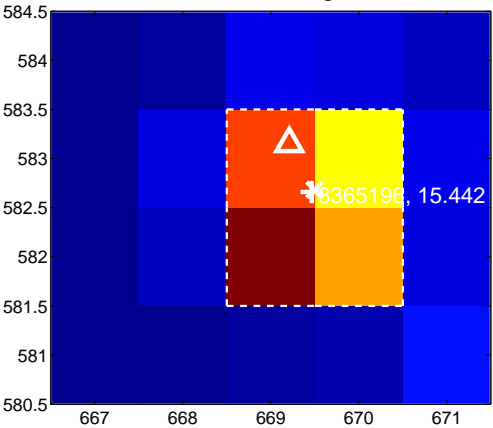
Q1 no OOT image



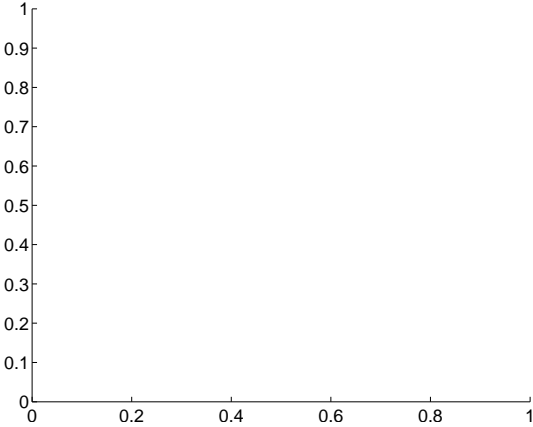
Q2 difference image



Q2 OOT image



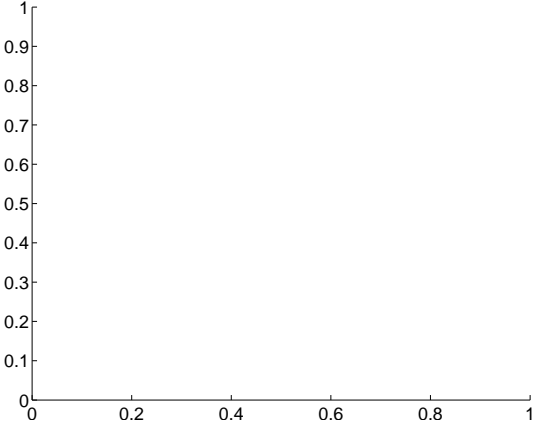
Q3 no difference image



Q3 no OOT image



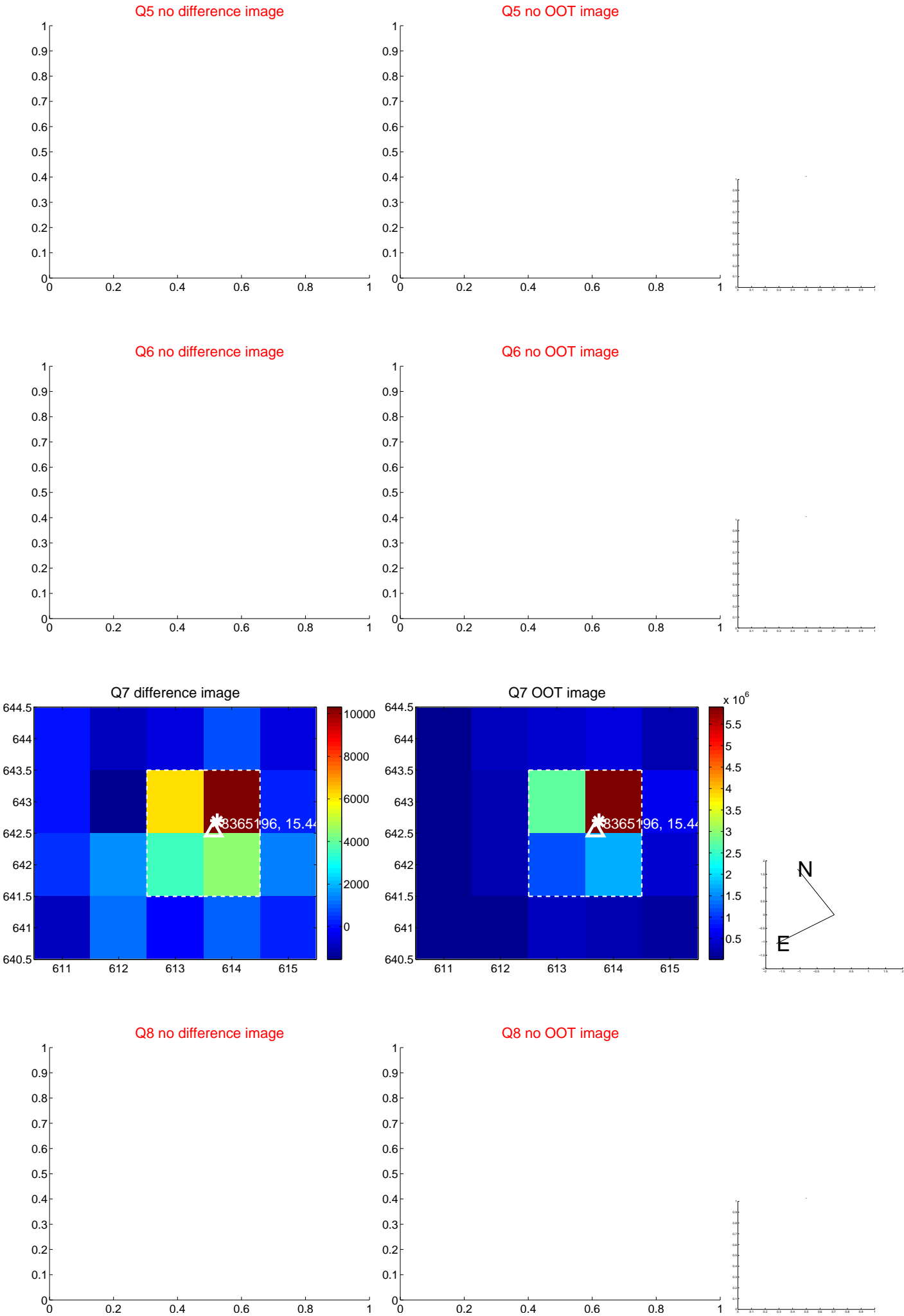
Q4 no difference image



Q4 no OOT image



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



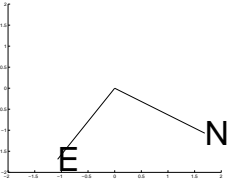
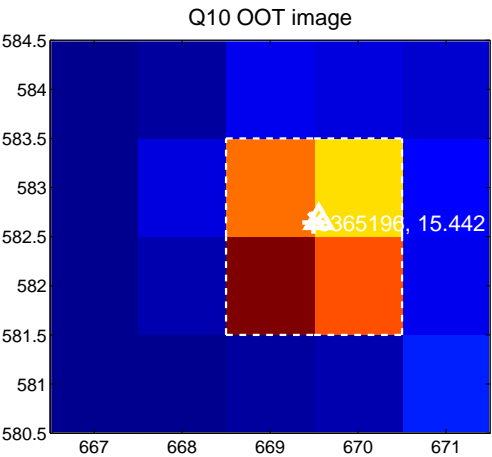
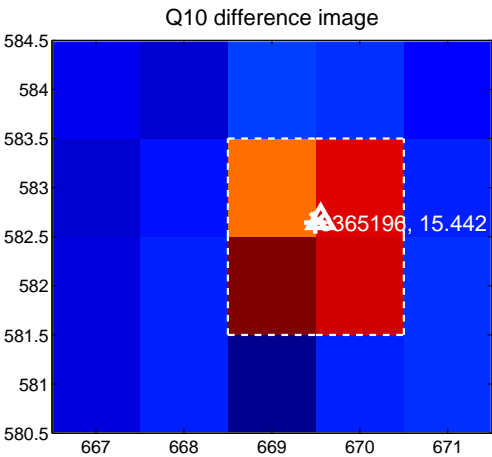


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

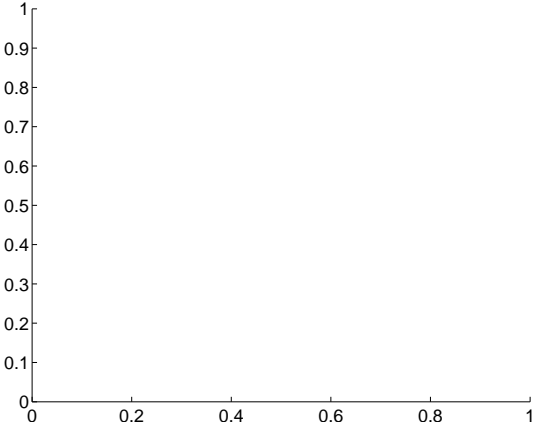
Q9 no difference image



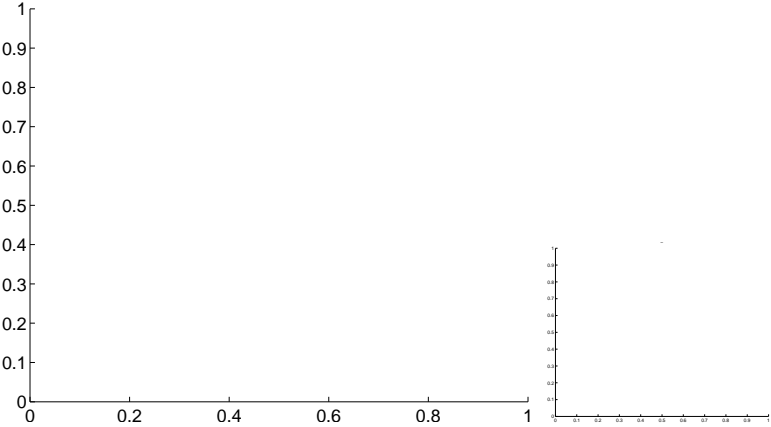
Q9 no OOT image



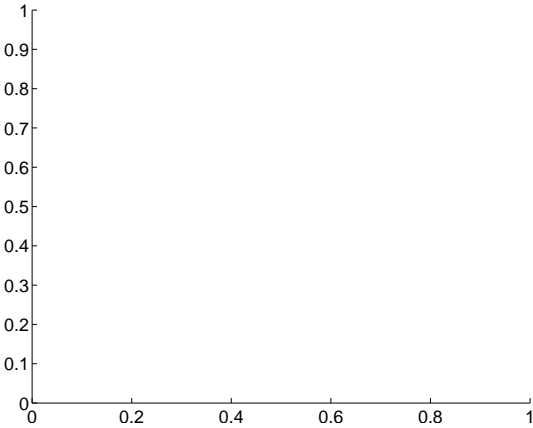
Q11 no difference image



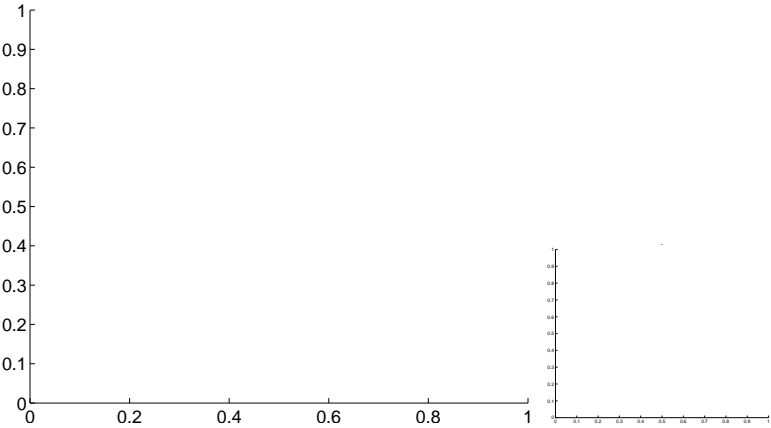
Q11 no OOT image



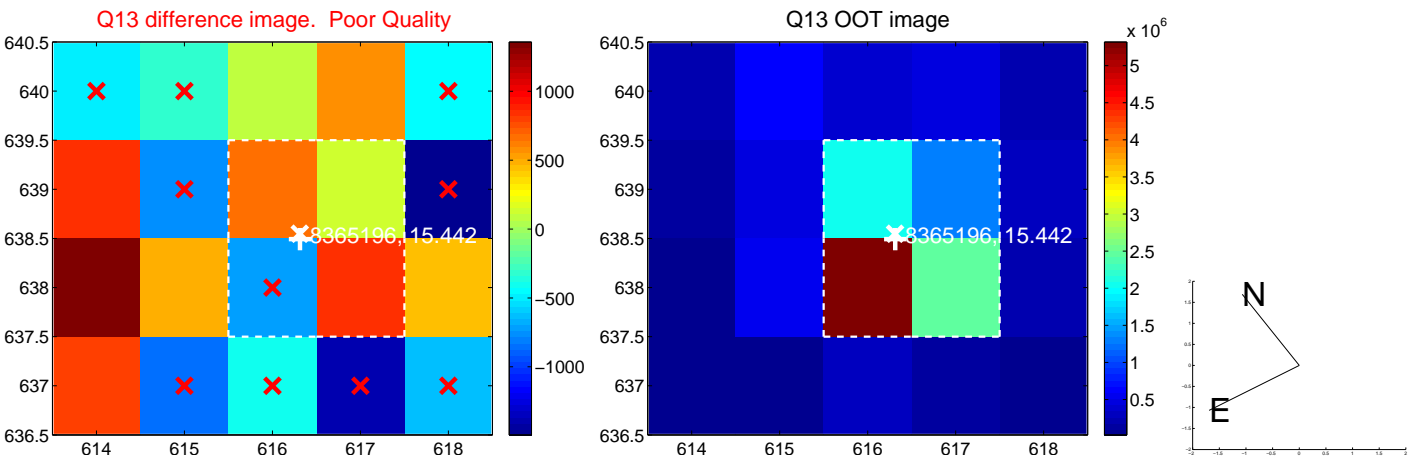
Q12 no difference image



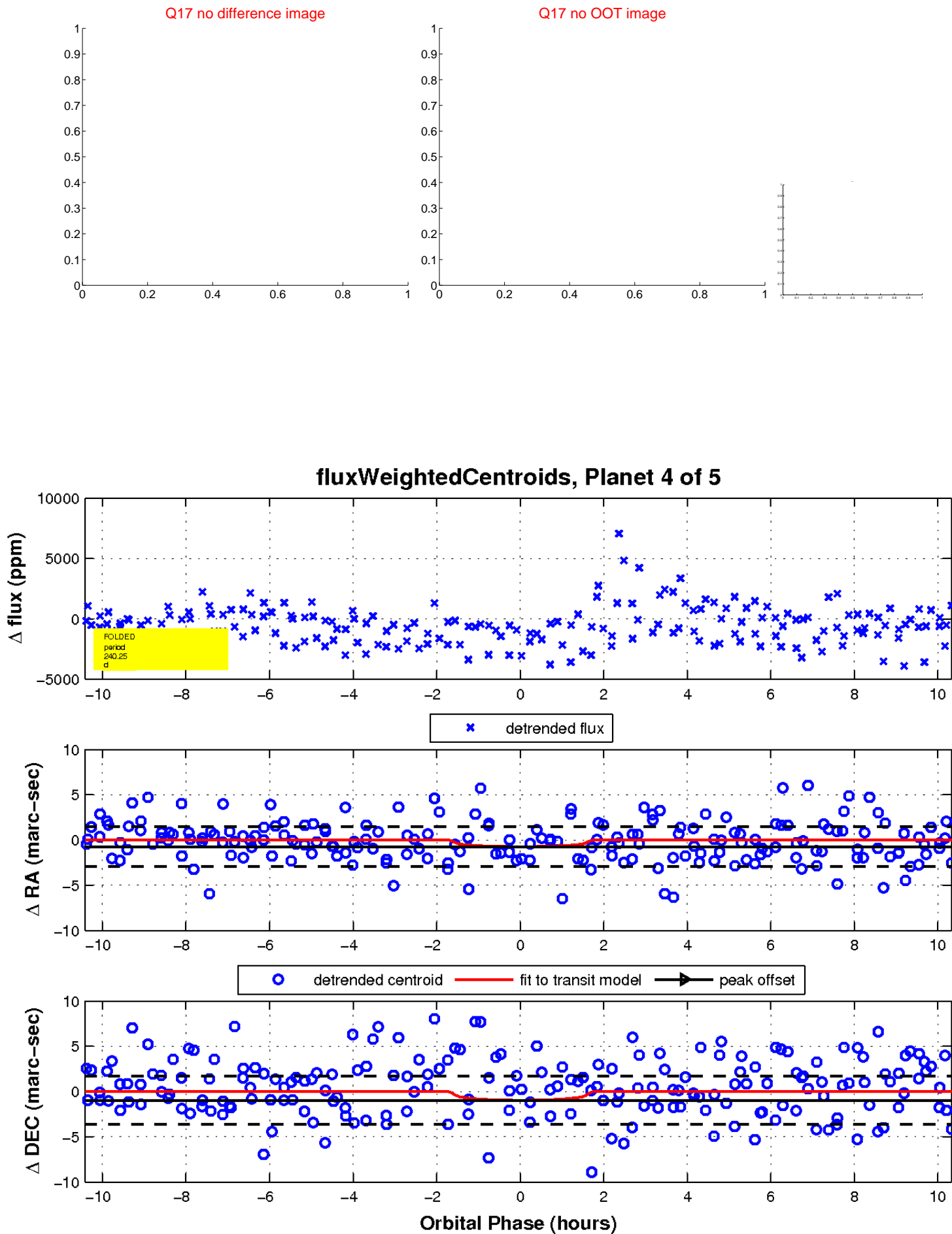
Q12 no OOT image



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

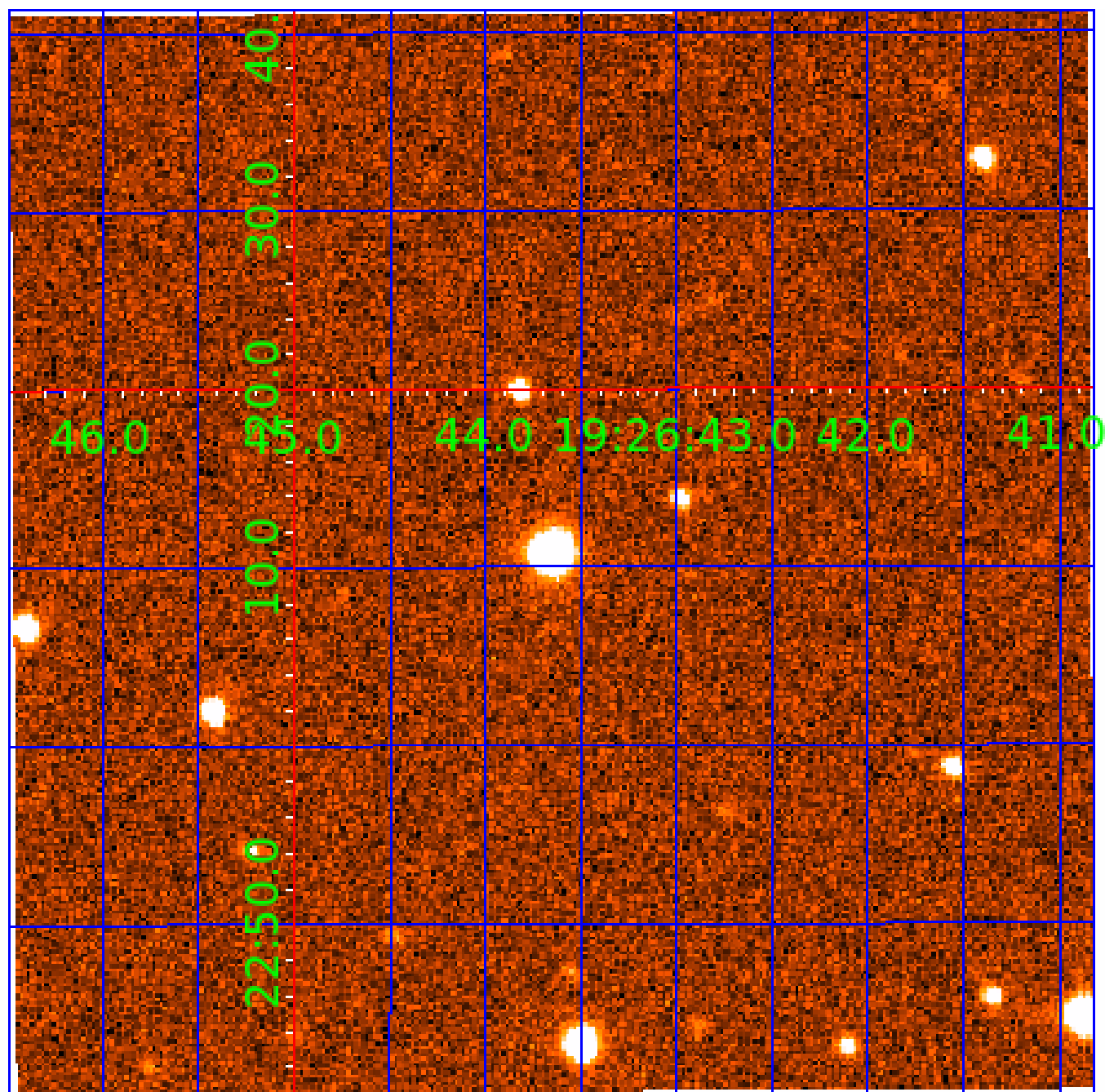


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008365196

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008365196-02	OBS	No	469.241681	269.501230	2376.9	3.432	13.5	8.2	0.74	4483	3.69	0.17
008365196-03	OBS	No	402.568599	291.617881	3743.7	4.054	10.8	14.5	0.74	4483	8.20	0.21
008365196-04	OBS	No	240.253899	234.912424	1380.1	3.475	10.6	5.4	0.74	4483	2.88	0.42
008365196-05	OBS	No	275.786499	369.213334	1758.7	3.000	9.6	-1.0	0.74	4483	2.95	0.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008365196-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008365196-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS
008365196-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008365196-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

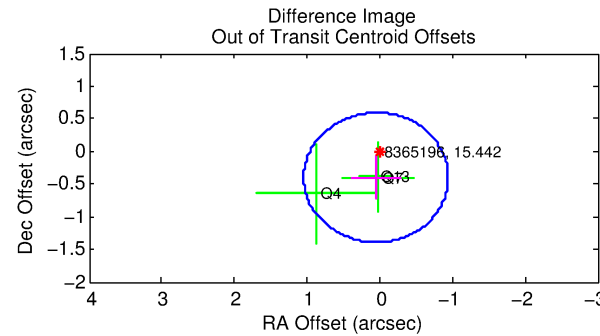
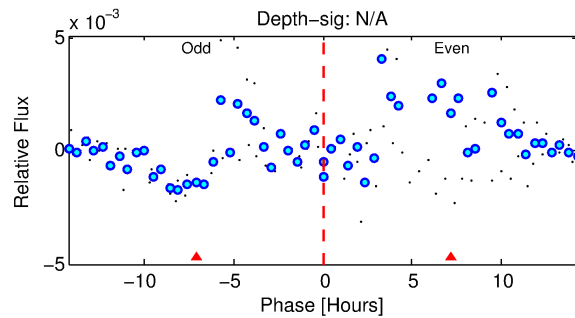
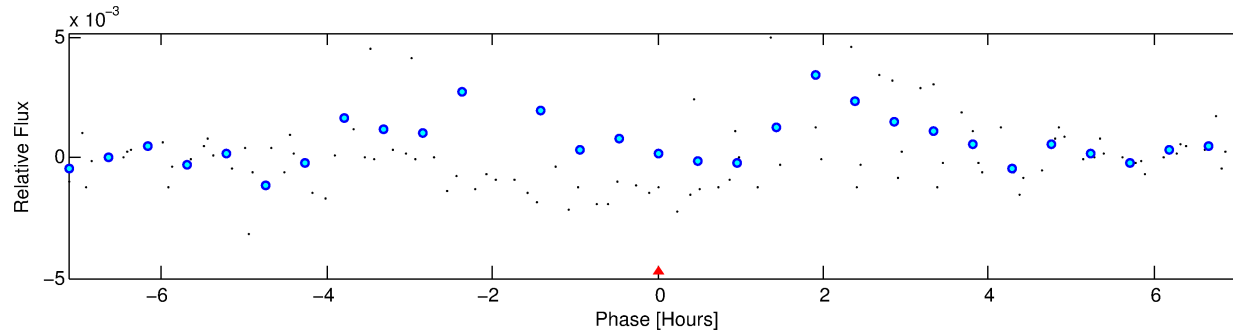
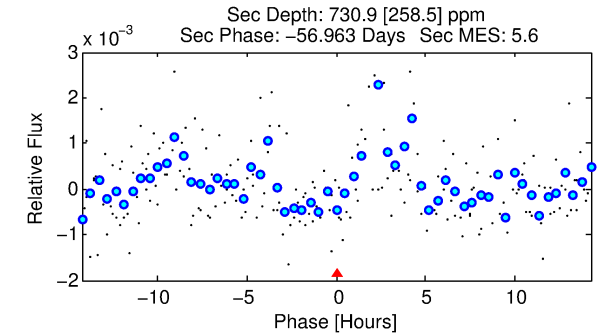
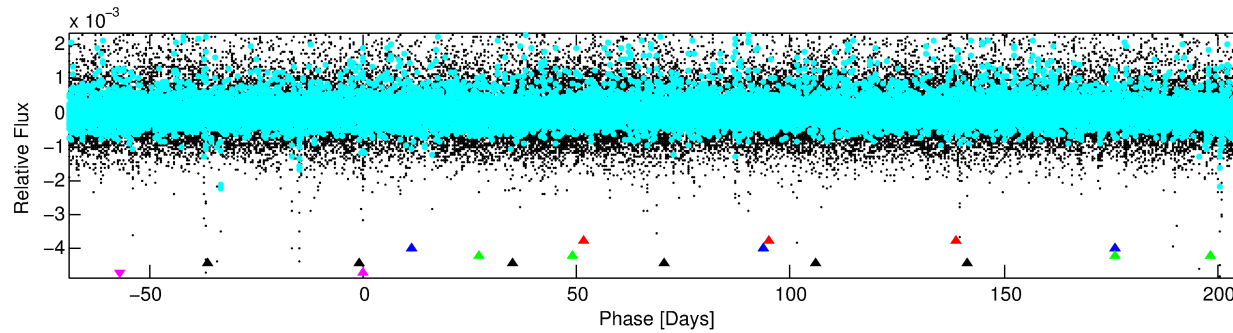
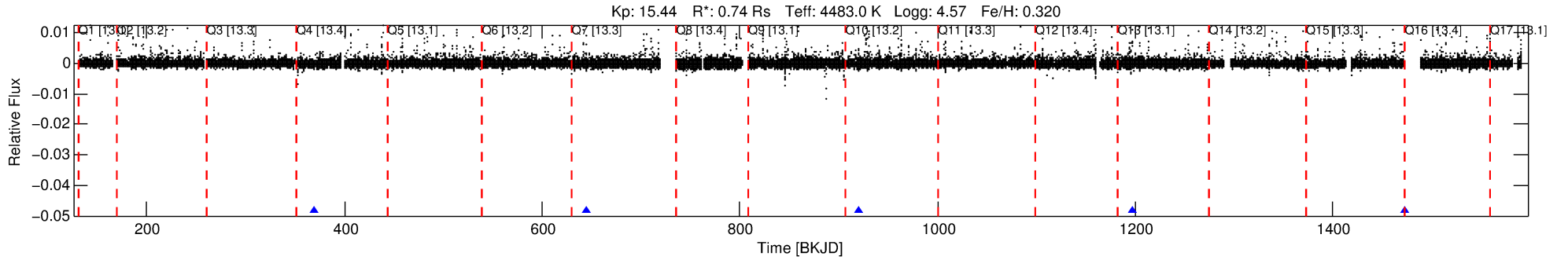
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008365196-05

No Significant Match Found

# DV One-Page Summary

KIC: 8365196 Candidate: 5 of 5 Period: 275.786 d



## TPS TCE Results:

Period = 275.78650 d  
Epoch = 369.2133 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

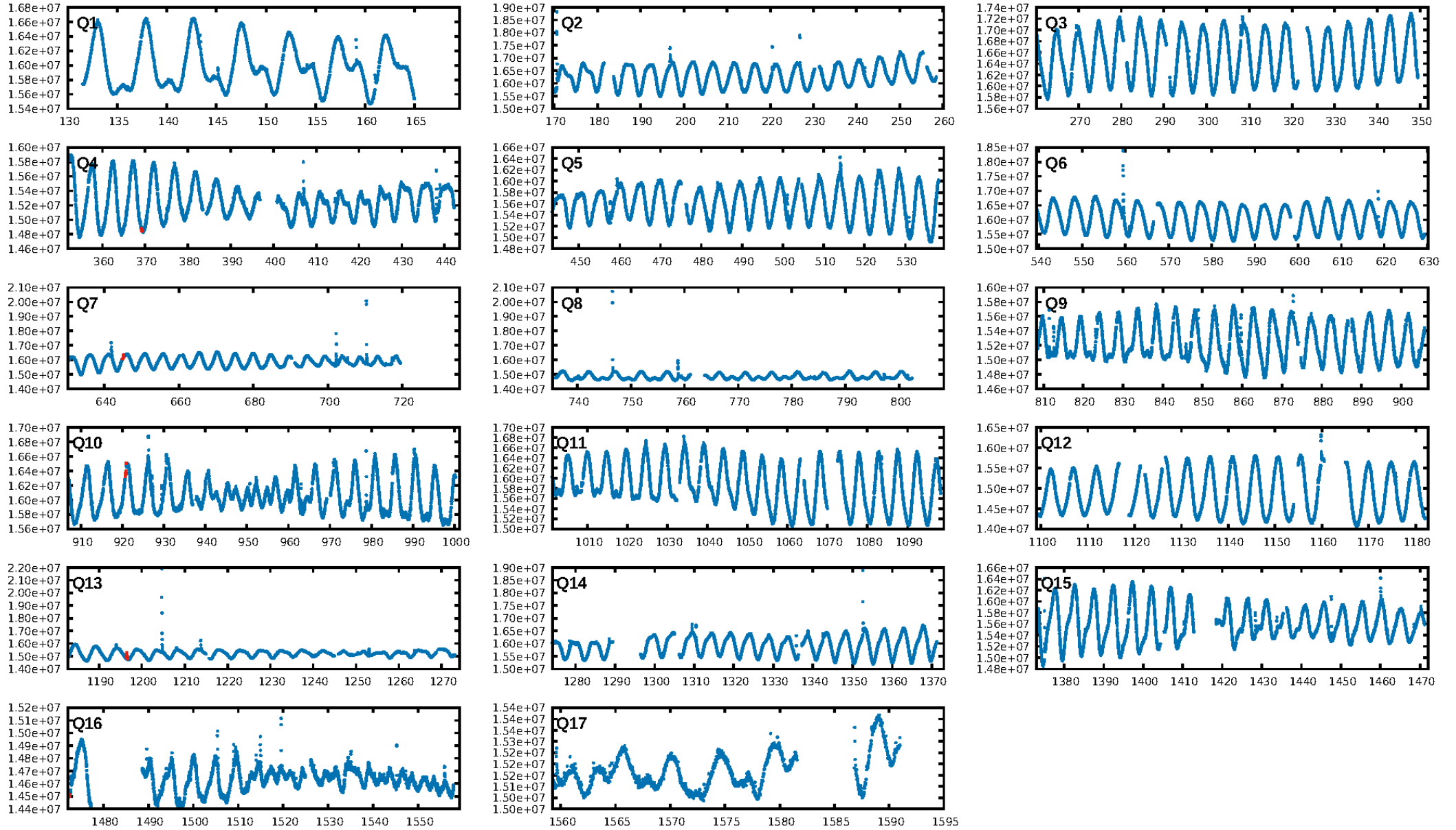
ShortPeriod-sig: 100.0% [185.76 $\sigma$ ]  
LongPeriod-sig: 100.0% [603.35 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.7014

Centroid-sig: 6.2%  
Centroid-so: 1.609 arcsec [1.41 $\sigma$ ]  
OotOffset-rm: 0.403 arcsec [1.22 $\sigma$ ]  
KicOffset-rm: 0.571 arcsec [1.72 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [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: 01-Feb-2016 17:48:29 Z

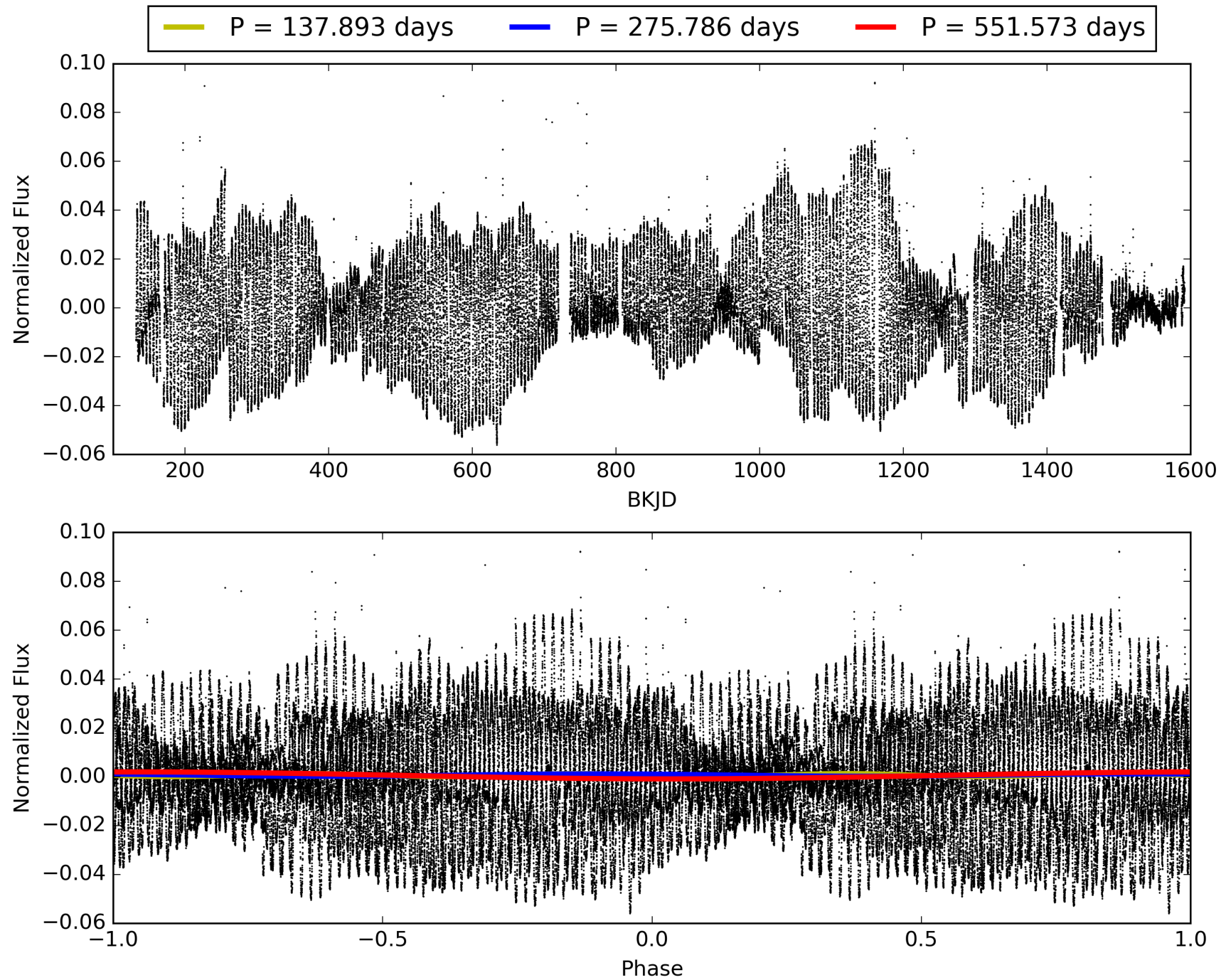
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008365196-05, PDC Light Curves





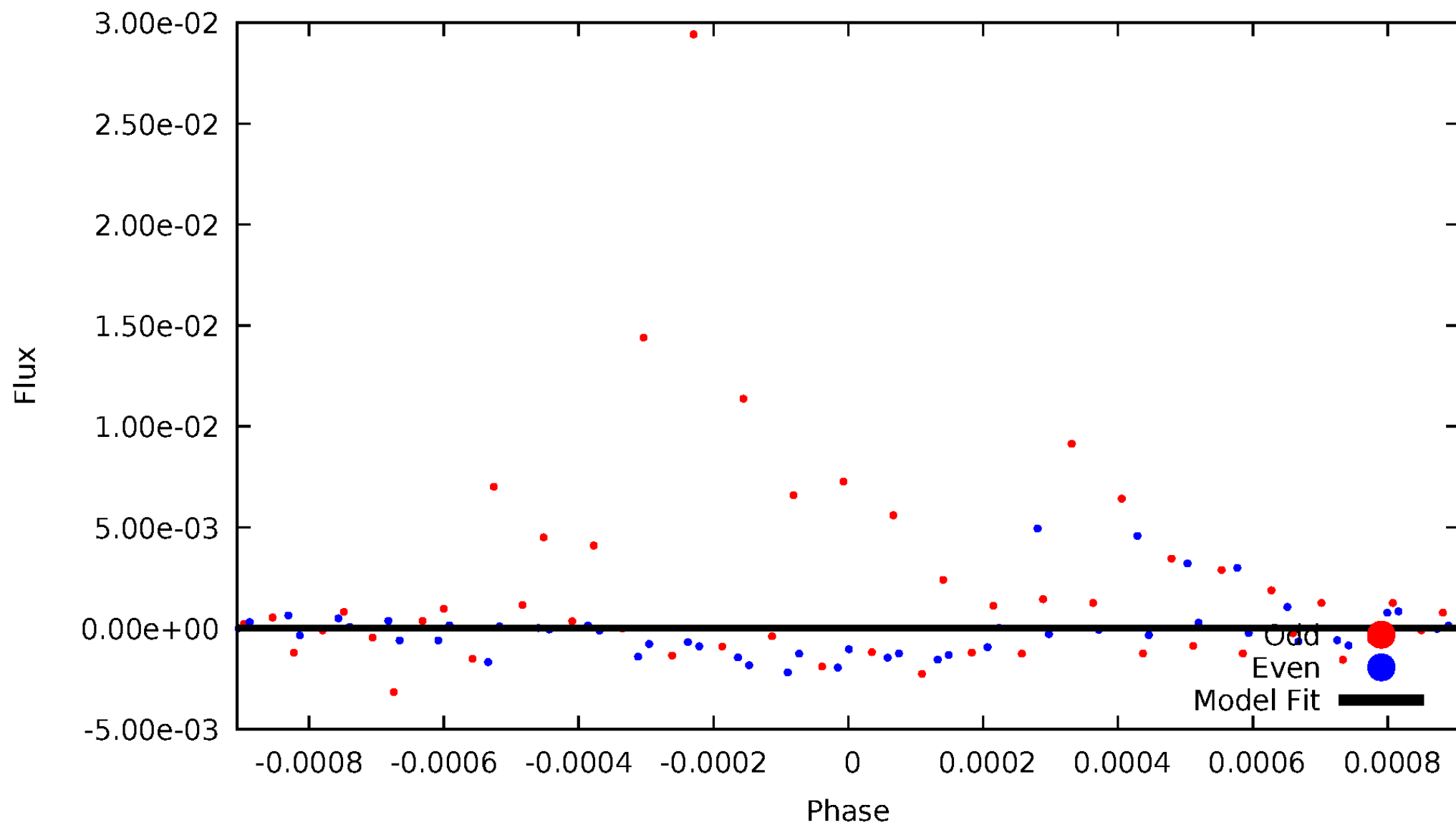
TCE 008365196-05





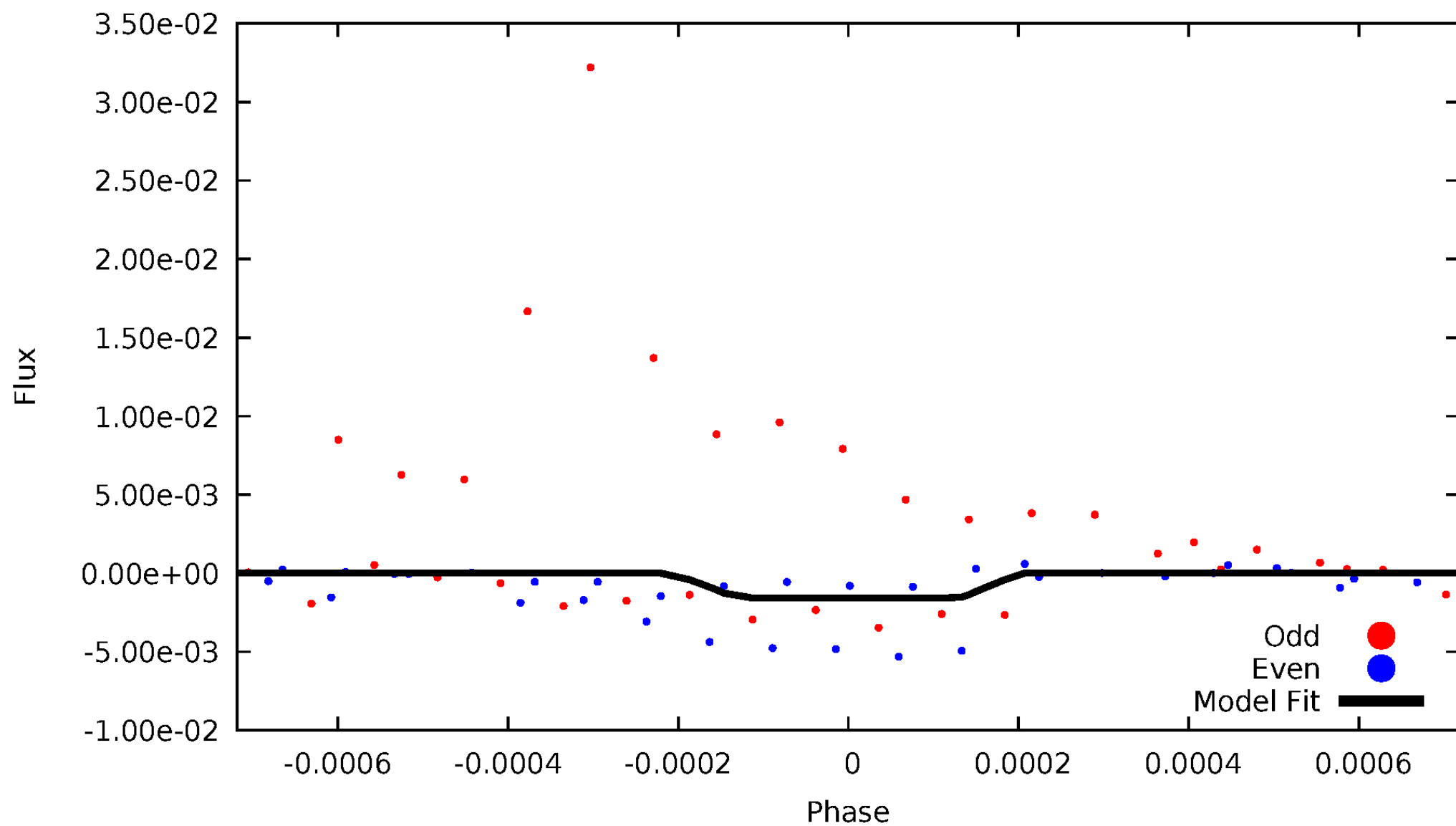
# DV Odd/Even

TCE 008365196-05

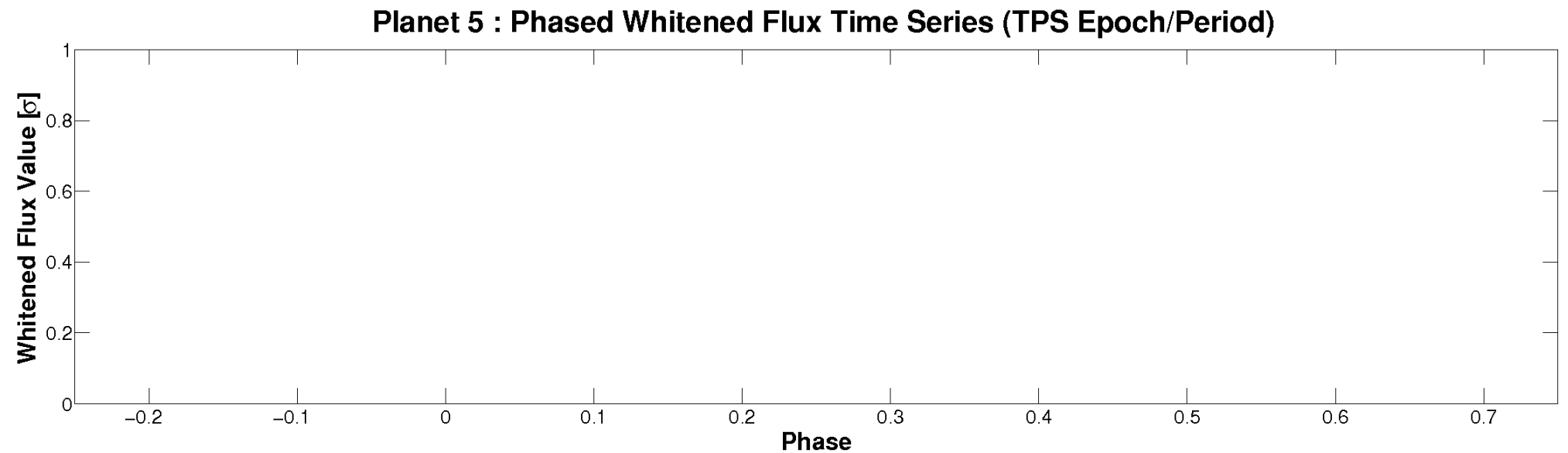
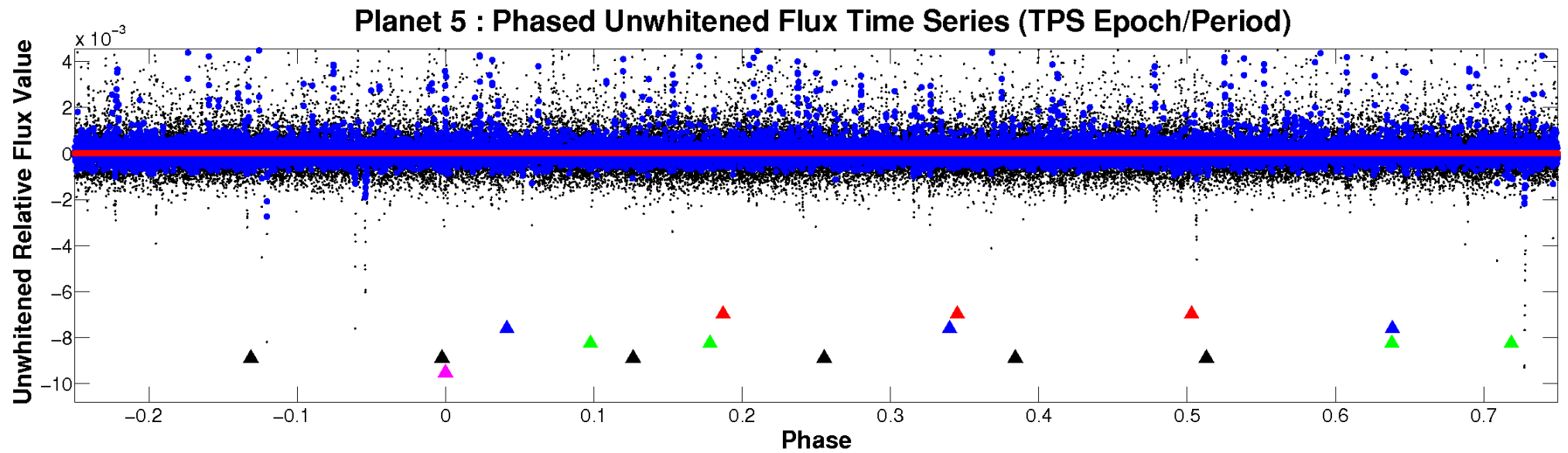


# ALT Odd/Even

TCE 008365196-05

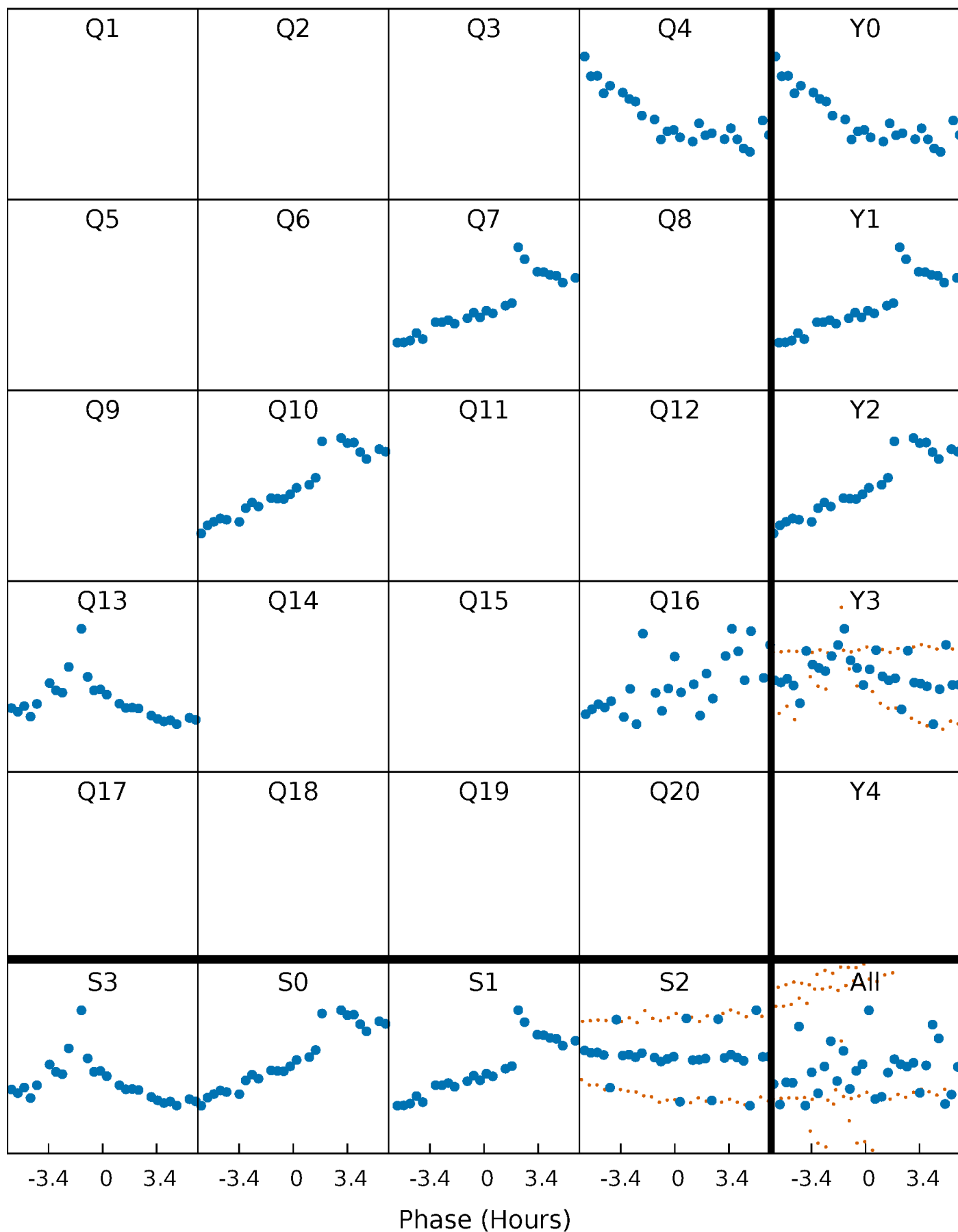


# Non-Whitened Vs. Whitened Light Curve



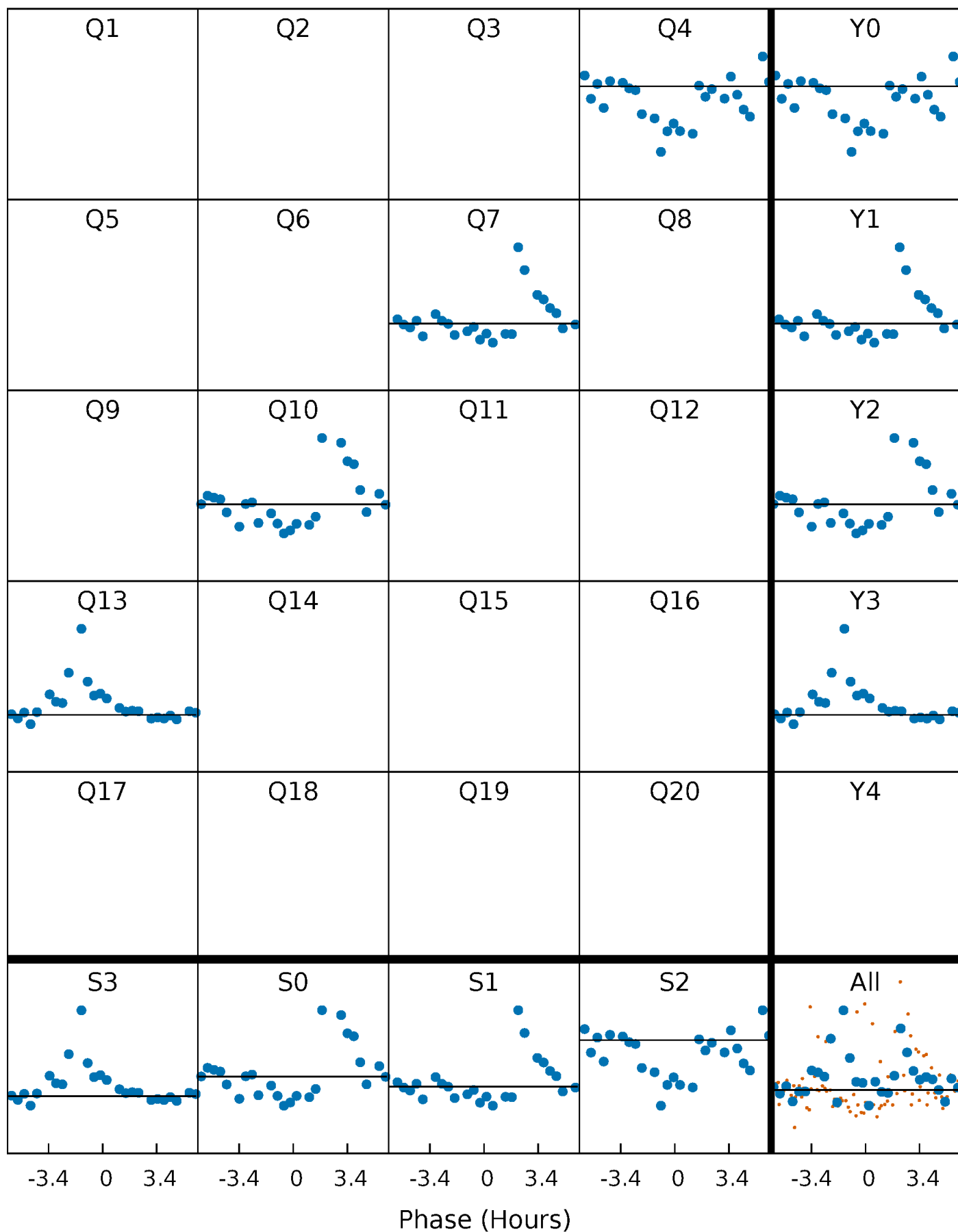
# PDC Quarter-Phased Transit Curves

TCE 008365196-05     $P=275.786499$  Days     $T_0=369.213334$  (BKJD)



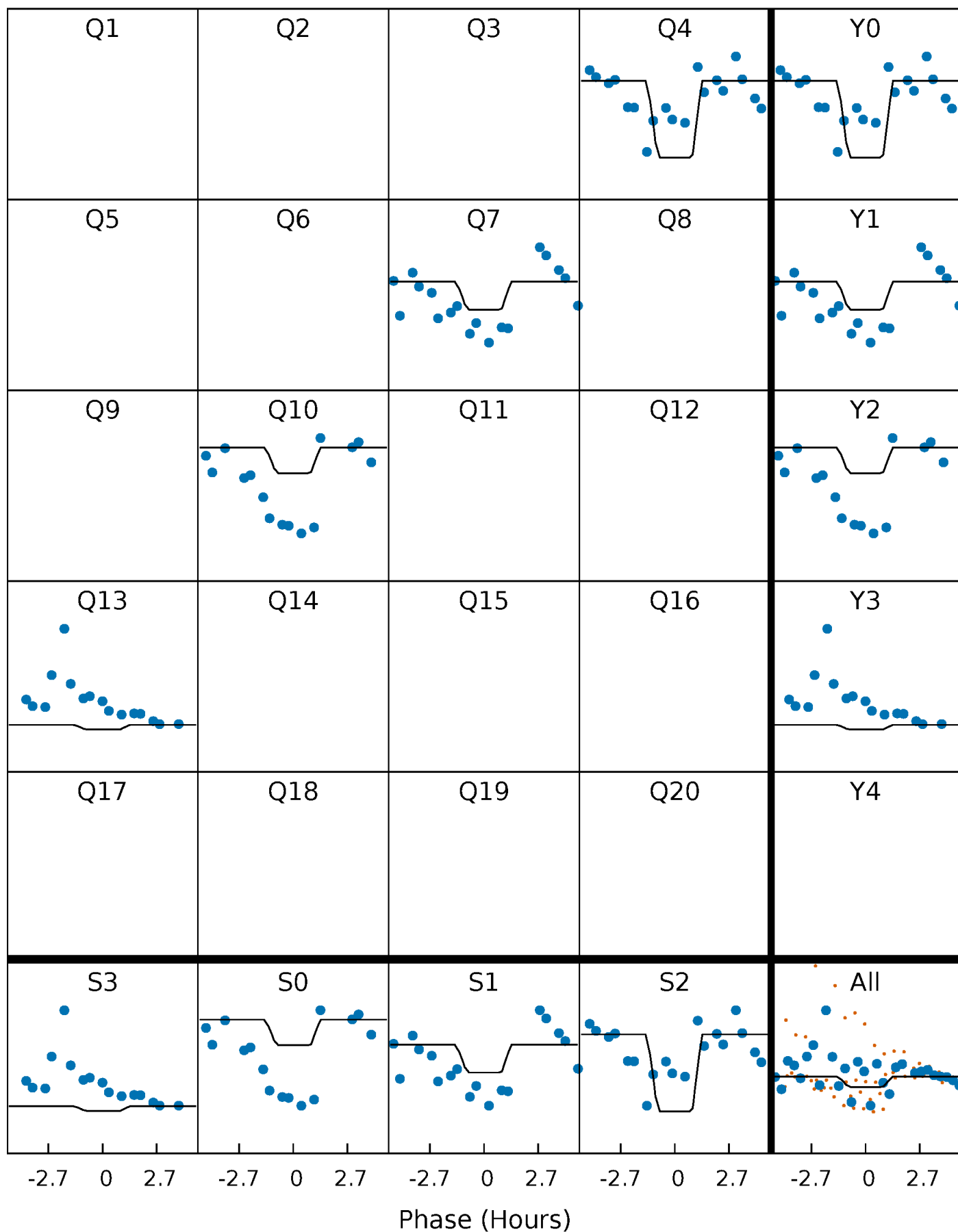
# DV Quarter-Phased Transit Curves

TCE 008365196-05     $P=275.786499$  Days     $T_0=369.213334$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

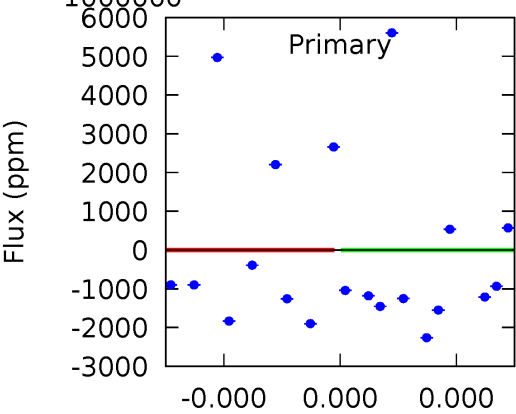
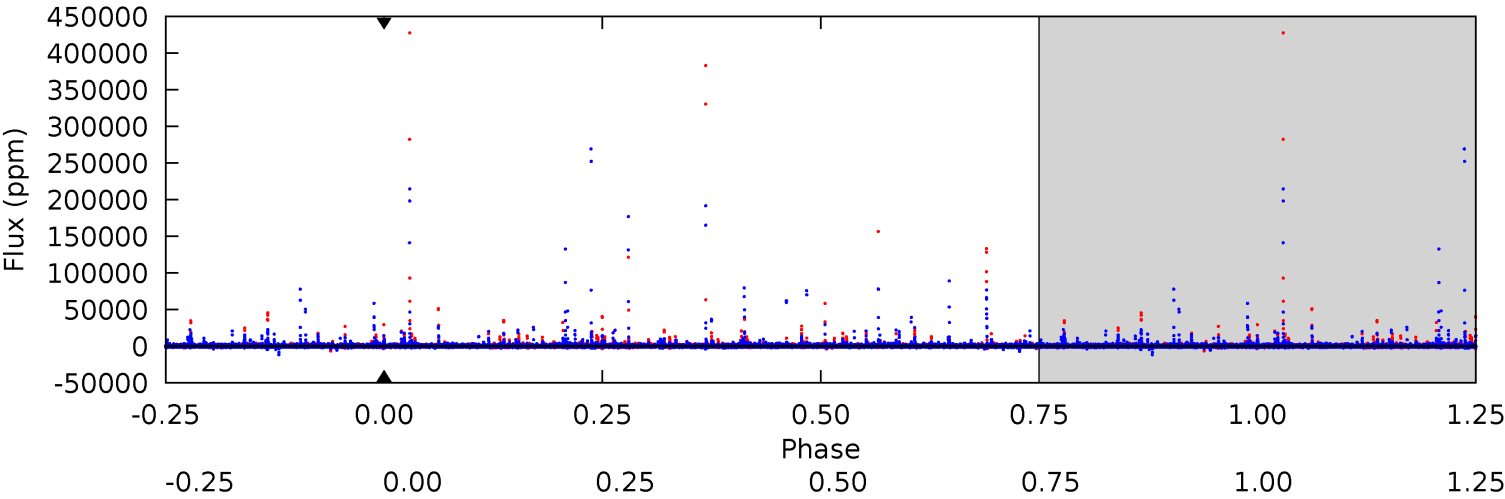
TCE 008365196-05     $P=275.786499$  Days     $T_0=369.233565$  (BKJD)



# DV Model-Shift Uniqueness Test

008365196-05, P = 275.786499 Days, E = 93.426835 Days

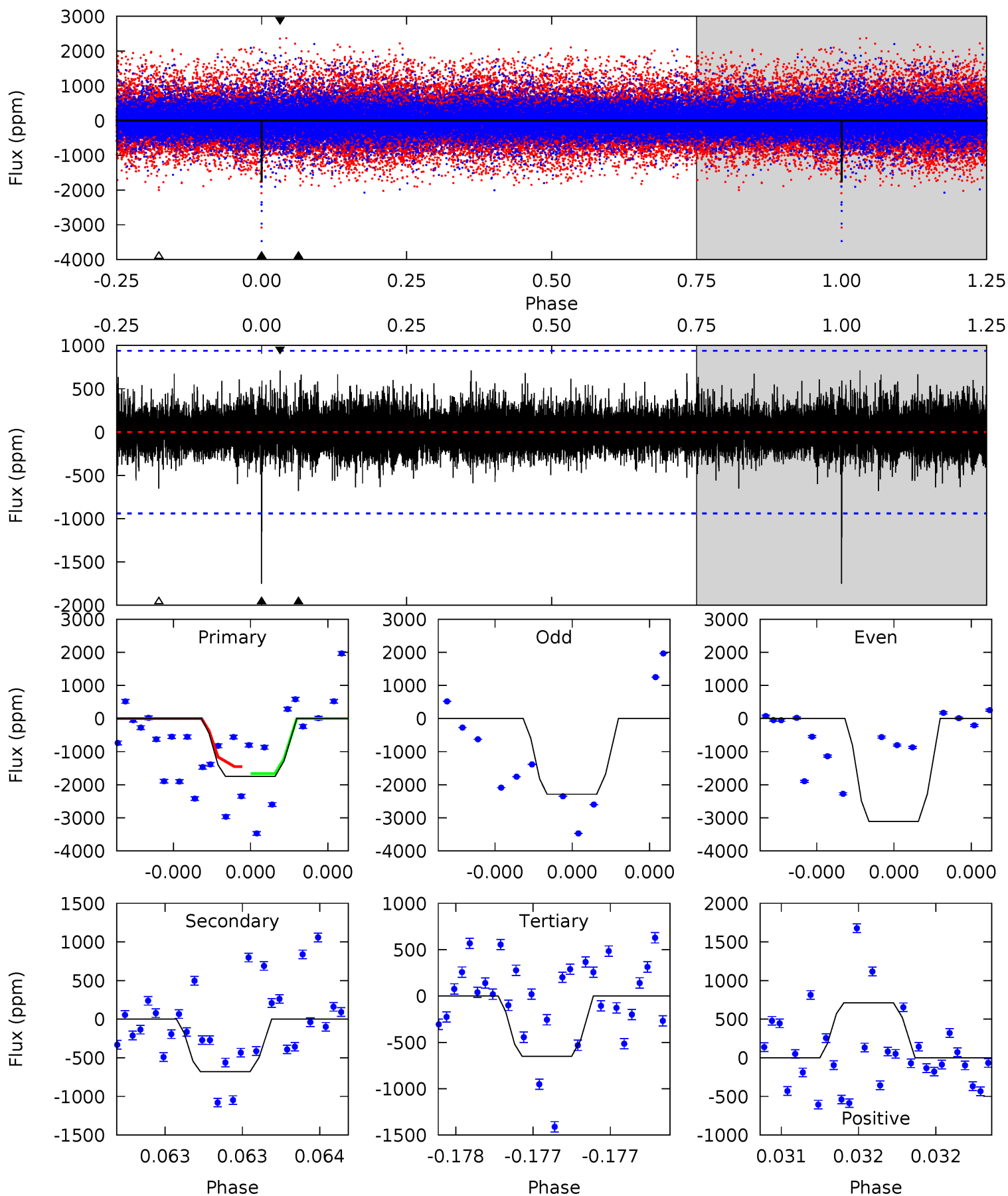
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008365196-05,  $P = 275.786499$  Days,  $E = 93.447066$  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
10.5	4.08	3.90	4.28	5.64	3.58	0.92	6.61	6.23	0.18	-0.20	2.91	0.20	0.29	0





### Stellar Parameters For KIC 008365196

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4483^{+154}_{-154}$	$4.567^{+0.060}_{-0.020}$	$0.320^{+0.100}_{-0.300}$	$0.739^{+0.029}_{-0.063}$	$0.734^{+0.041}_{-0.050}$	$2.566^{+0.651}_{-0.186}$
	+3%/-3%	+1%/-0%	+31%/-94%	+4%/-9%	+6%/-7%	+25%/-7%
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 008365196-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$6.52^{+6.11}_{-4.42}$	$273^{+10}_{-11}$	$-4164^{+14357}_{-7299}$	$-35158.255^{+1122669.653}_{-1370917.857}$
Alt.	$-680 \pm 167$	$6.88^{+6.46}_{-4.46}$	$272^{+10}_{-11}$	$2992^{+1245}_{-479}$	$4221^{+29199}_{-3104}$

$T_{\text{max}}$  = 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

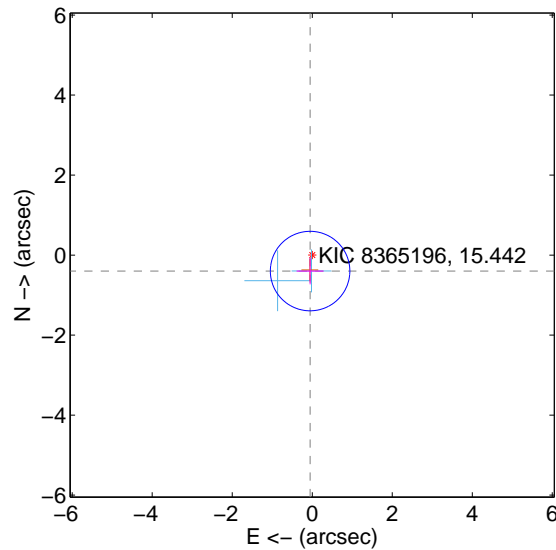
Supplemental centroid analysis for 008365196-05. Kepler magnitude: 15.44. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

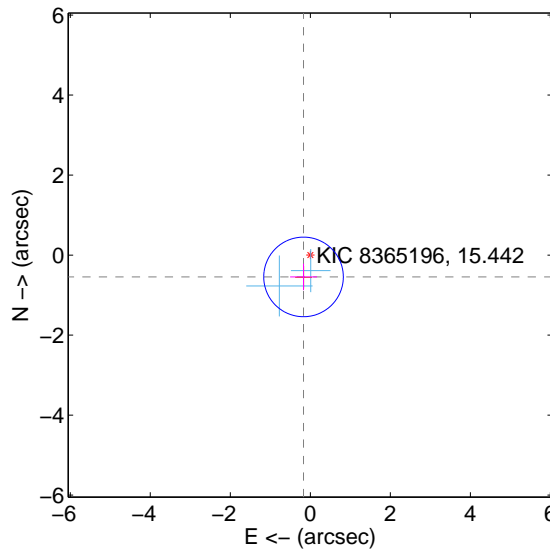
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.403 \pm 0.331$	1.22	$0.054 \pm 0.336$	$-0.399 \pm 0.331$
PRF-fit source offset from KIC position	$0.571 \pm 0.332$	1.72	$0.170 \pm 0.336$	$-0.545 \pm 0.331$
photometric centroid source offset	$1.61 \pm 1.14$	1.41	$1.06 \pm 1.24$	$-1.21 \pm 1.06$

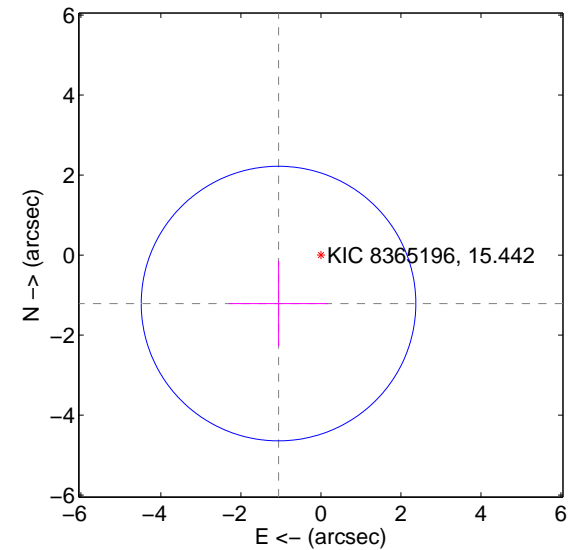
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

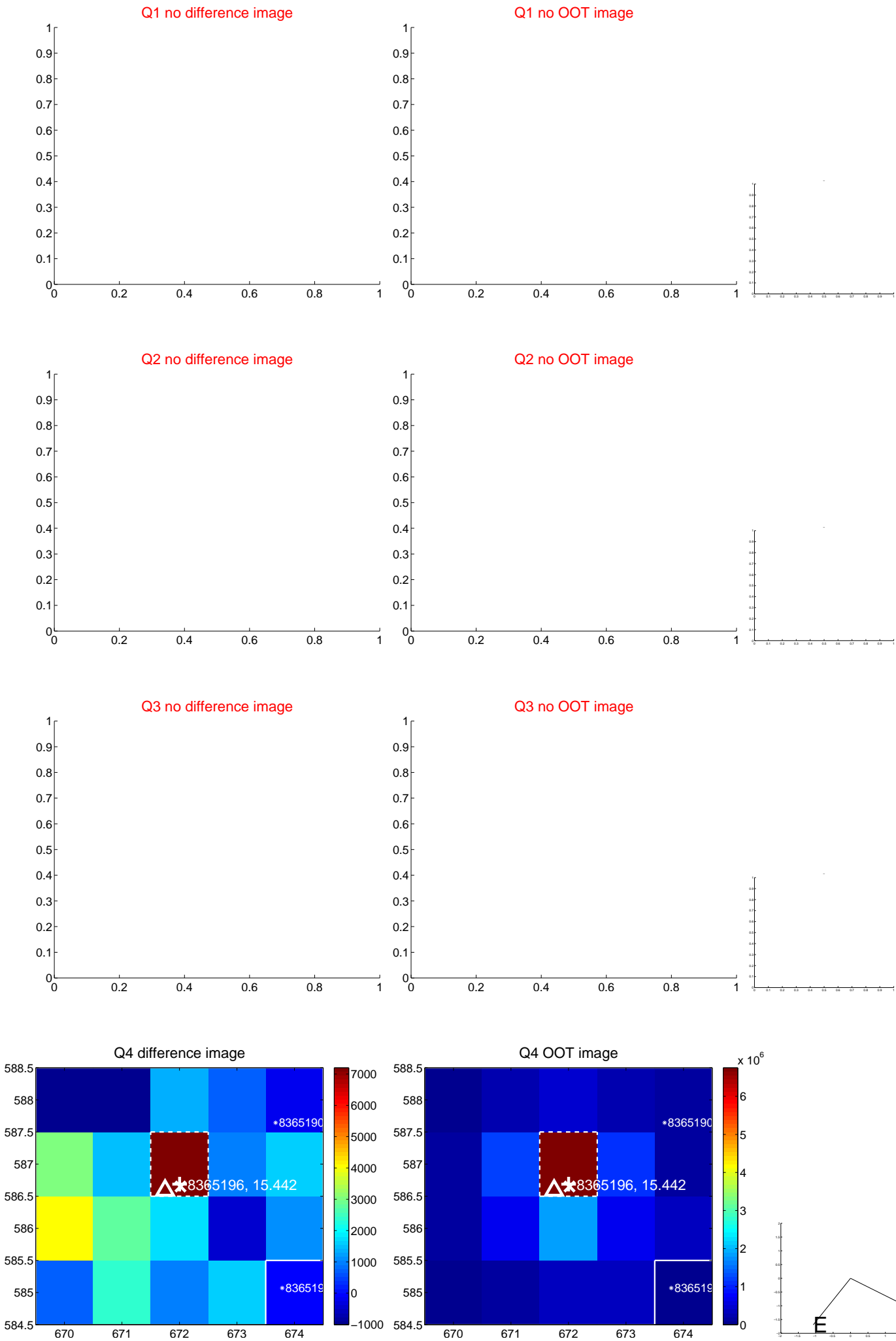


offset from photometric centroids

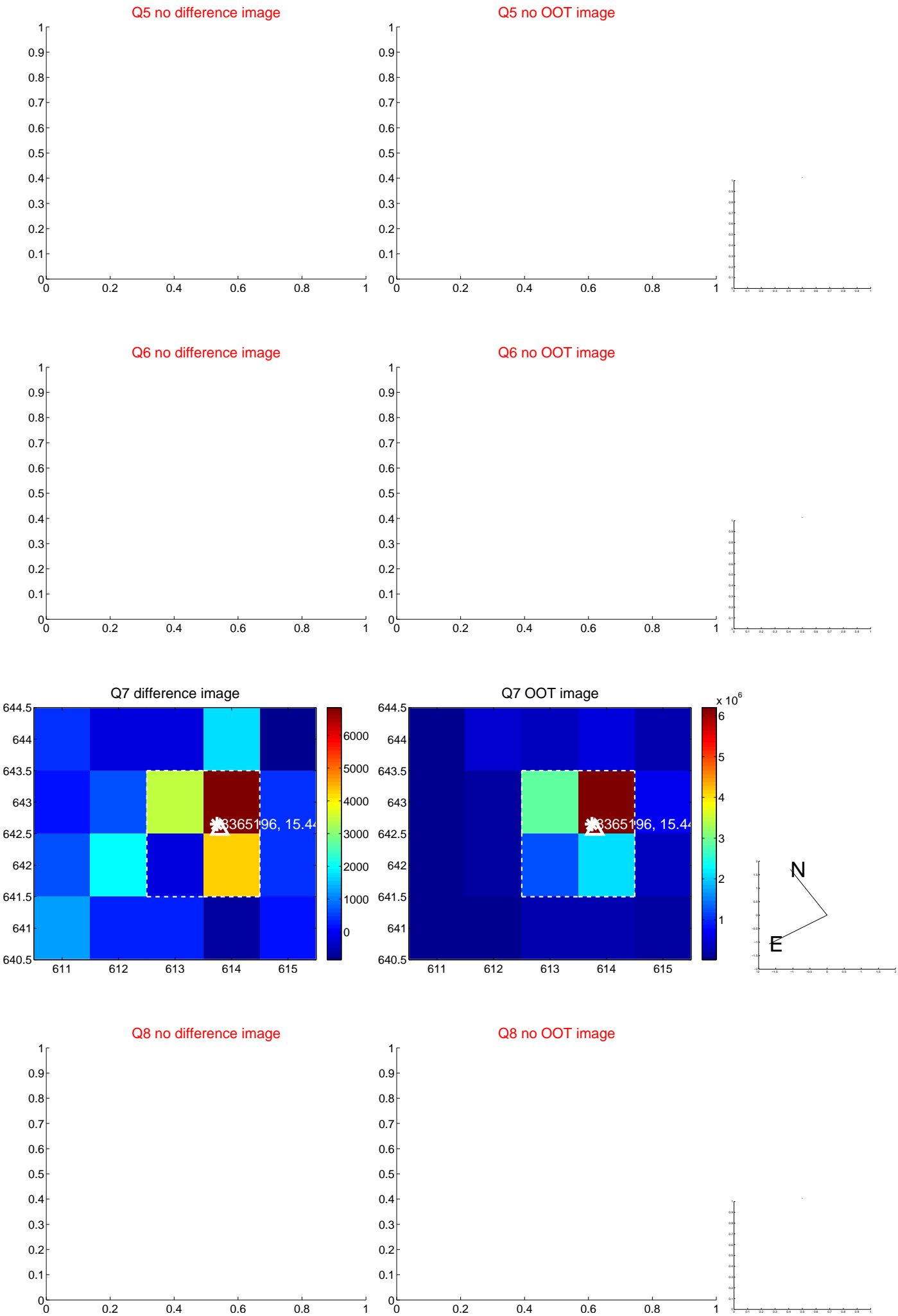


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

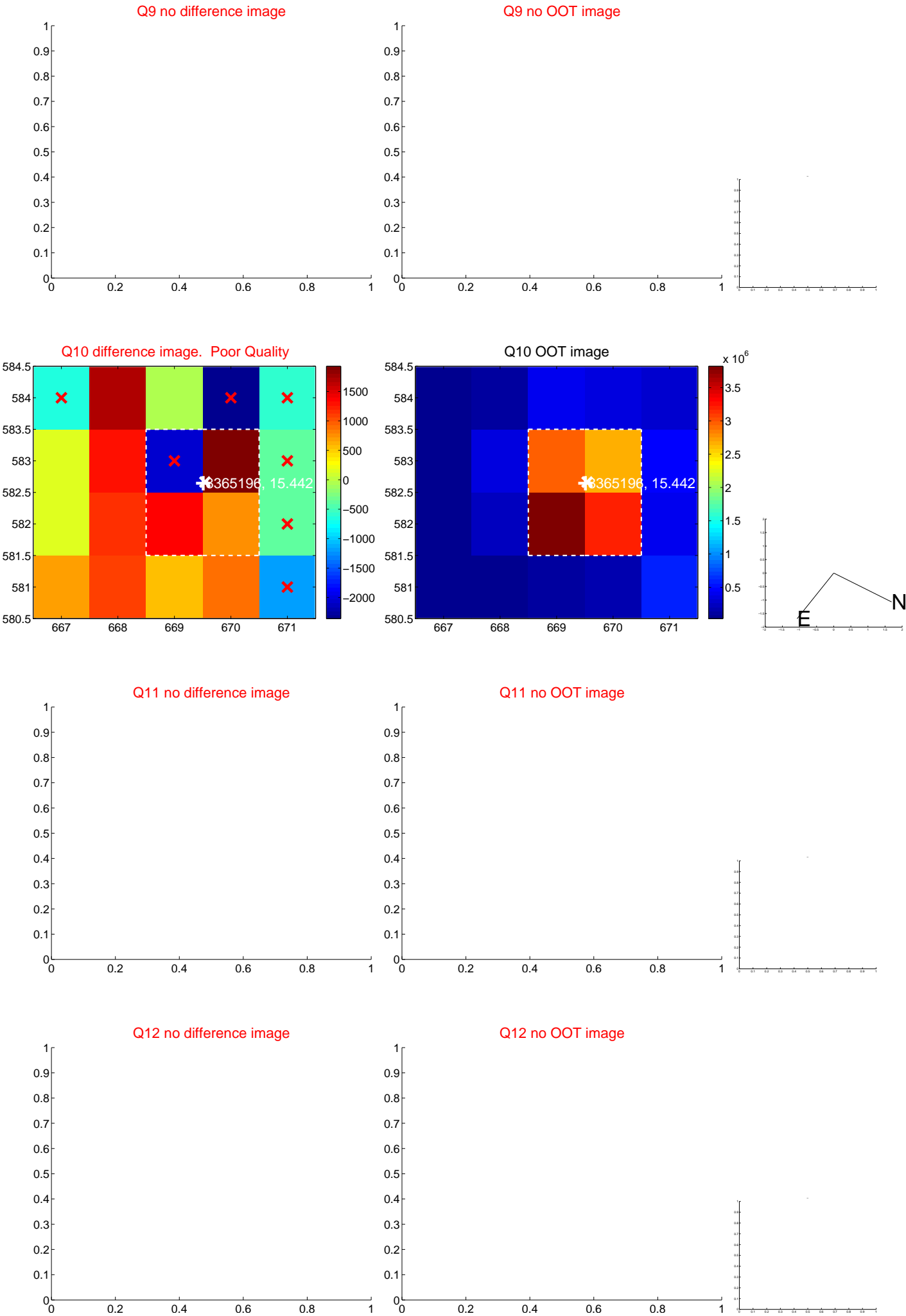
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



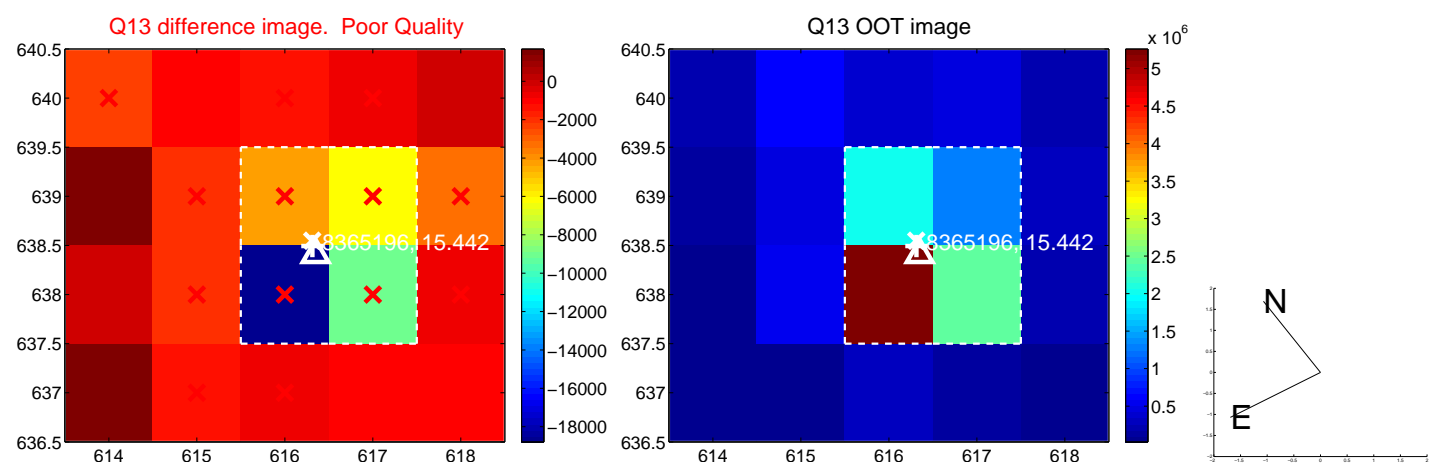
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



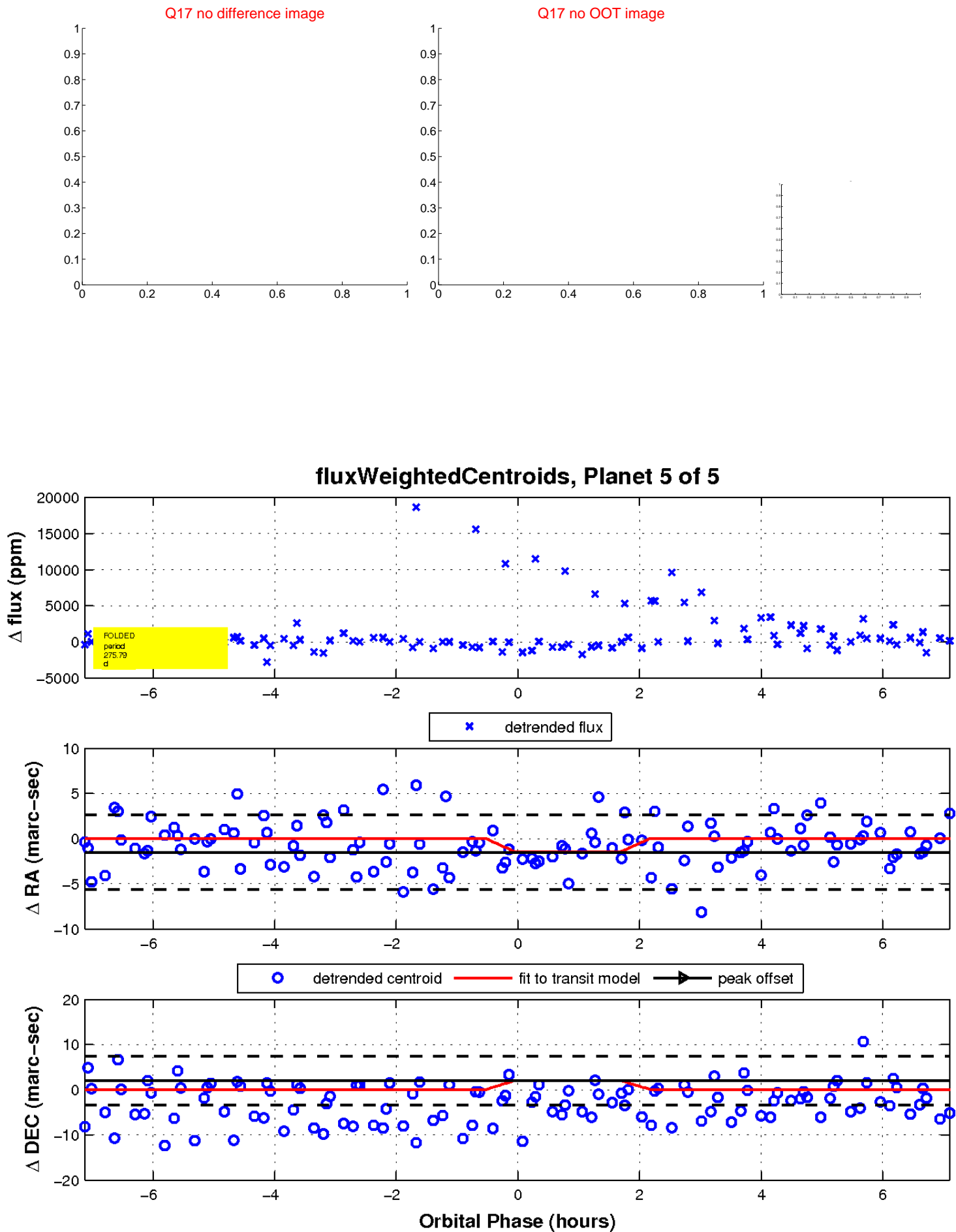
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

