

# KIC 003448323

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003448323-01	OBS	6336.01	0.513483	131.743364	81.3	2.581	7.7	10.1	0.88	5495	0.93	4368.94
003448323-02	OBS	No	115.348678	233.638341	1205.3	3.791	8.1	6.4	0.88	5495	4.31	3.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003448323-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_UNRESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
003448323-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—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.

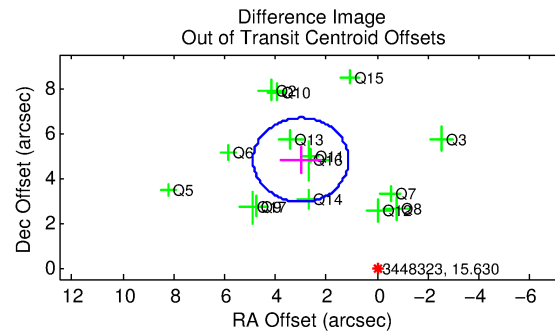
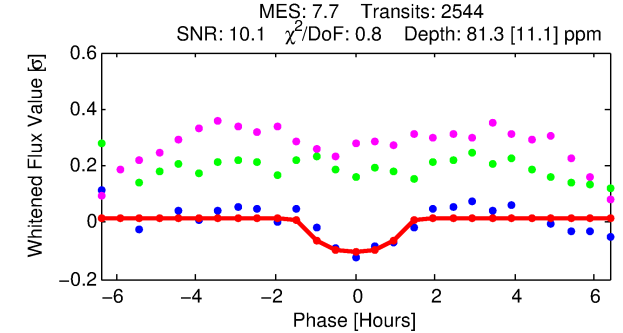
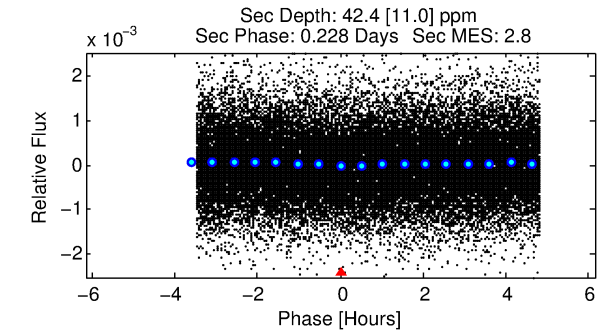
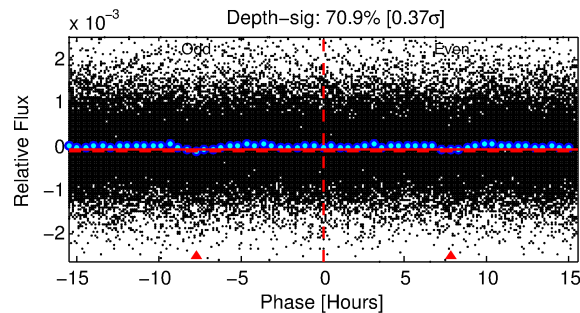
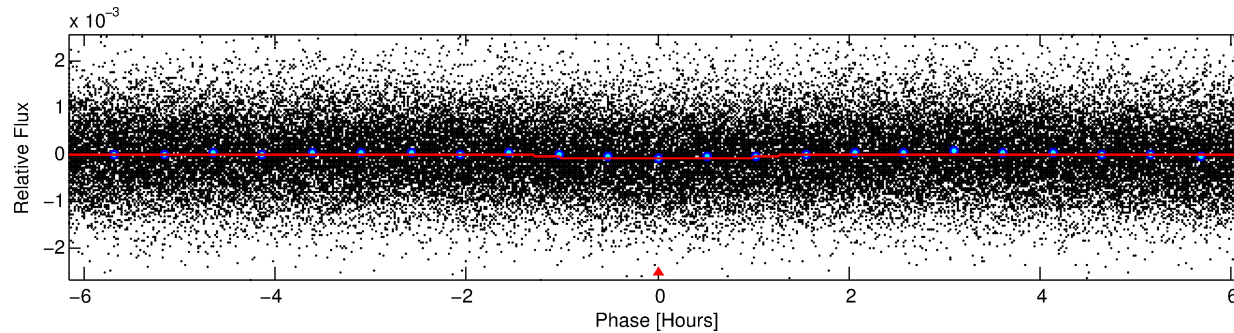
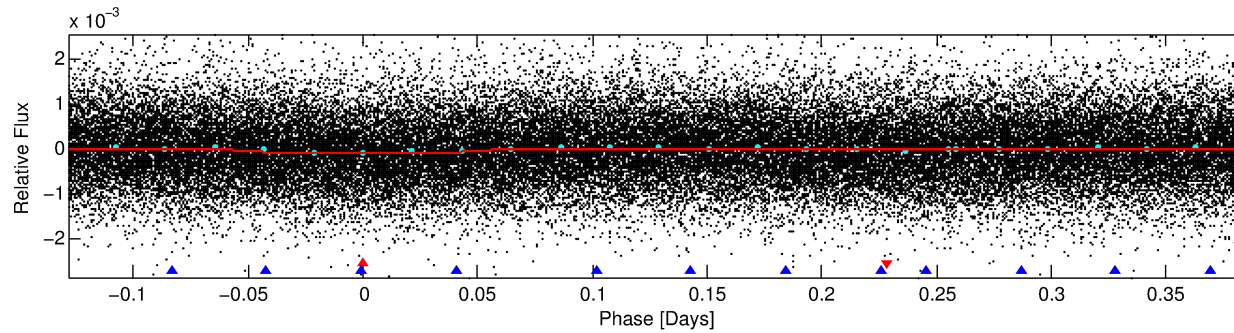
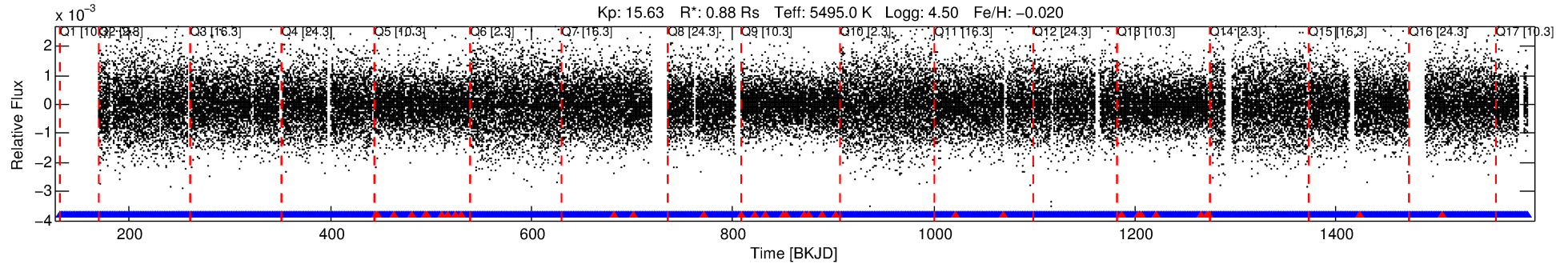
## Ephemeris Match Information For 003448323-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
003448323-01	3448323	003448245-pri	3448245	1:1	73.0	-16	-7	11.86	15.63	4082.70	Direct-PRF	0	1.70	0.64

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 3448323 Candidate: 1 of 2 Period: 0.513 d  
KOI: K06336.01 Corr: 0.960



## DV Fit Results:

Period = 0.51348 [0.00001] d  
Epoch = 131.7434 [0.0029] BKJD  
Rp/R\* = 0.0097 [0.0083]  
a/R\* = 1.20 [1.38]  
b = 0.88 [1.03]  
Seff = 4368.94 [1385.22]  
Teq = 2073 [164] K  
Rp = 0.93 [0.83] Re  
a = 0.0121 [0.0024] AU  
Ag = 3.91 [6.87] [0.42 $\sigma$ ]  
Teffp = 4506 [1958] K [1.24 $\sigma$ ]

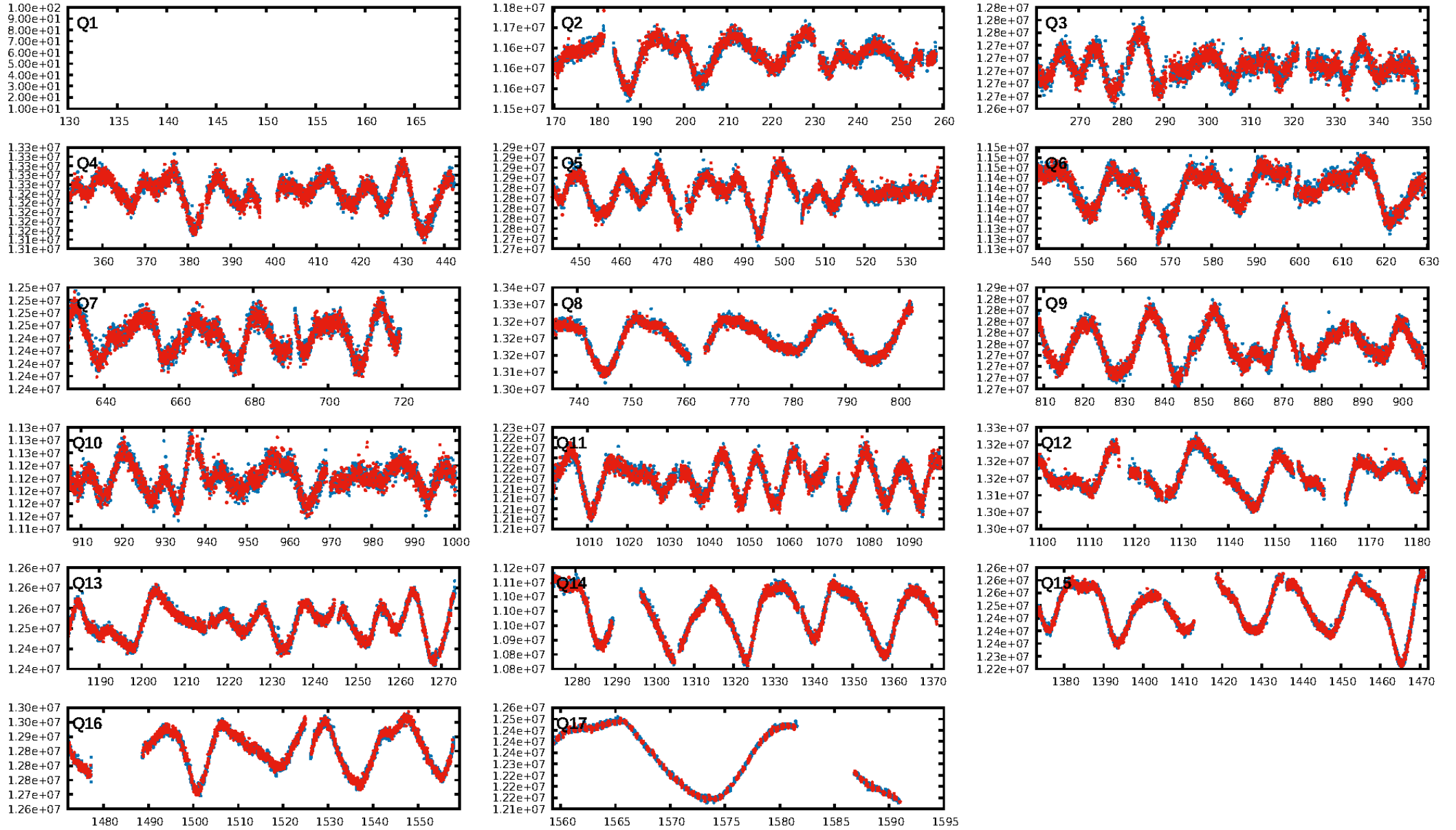
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [601.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.09e-11**  
RollingBand-fgt: 0.99 [2458/2491]  
**GhostDiagnostic-chr: 0.1318**  
**Centroid-sig: 0.0%**  
Centroid-so: 2.910 arcsec [2.55 $\sigma$ ]  
**OotOffset-rm: 5.658 arcsec [9.06 $\sigma$ ]**  
**KicOffset-rm: 5.606 arcsec [8.87 $\sigma$ ]**  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.00 [0/15]  
DiffImageOverlap-fno: 1.00 [16/16]

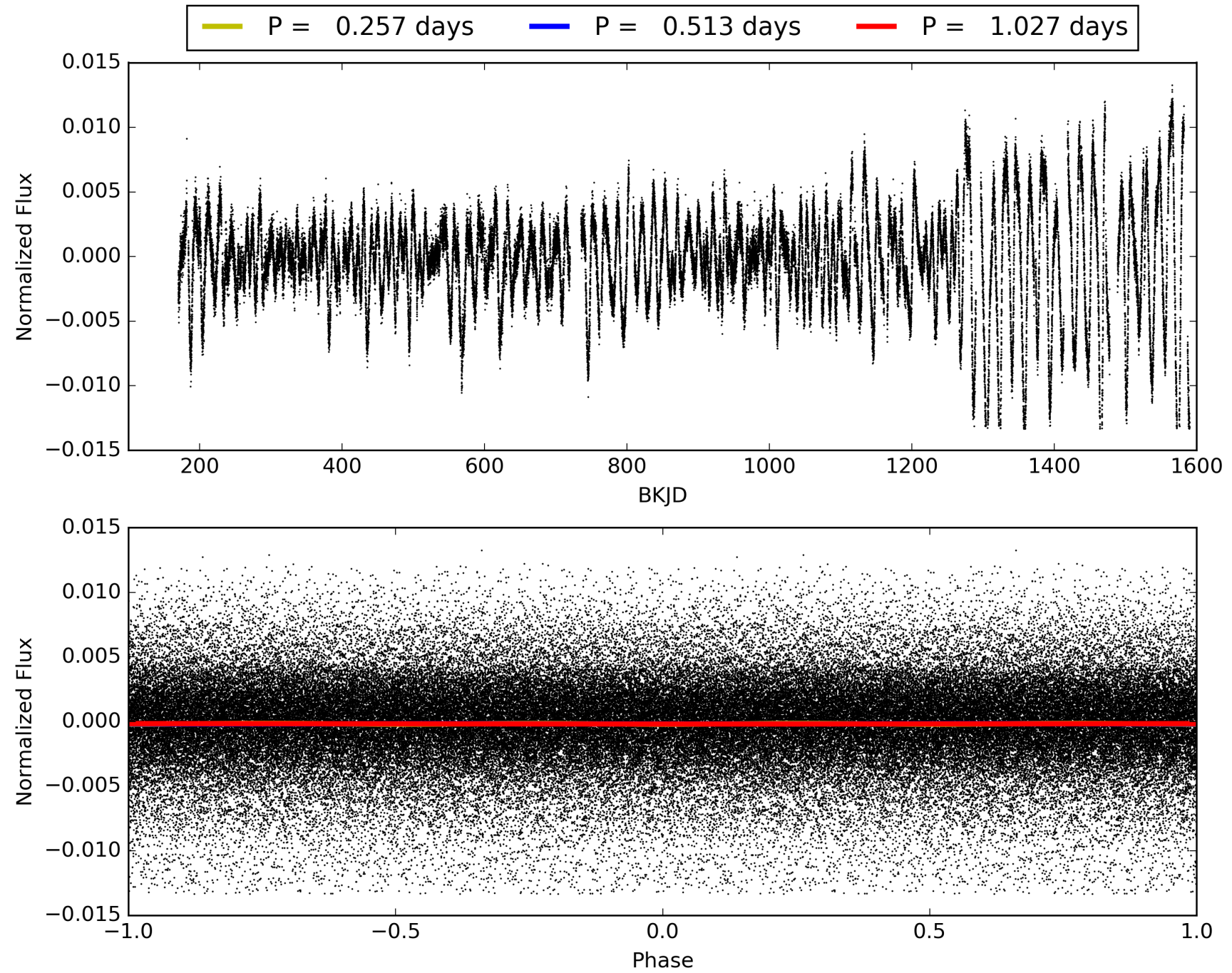
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:33:47 Z

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

# TCE 003448323-01, PDC Light Curves



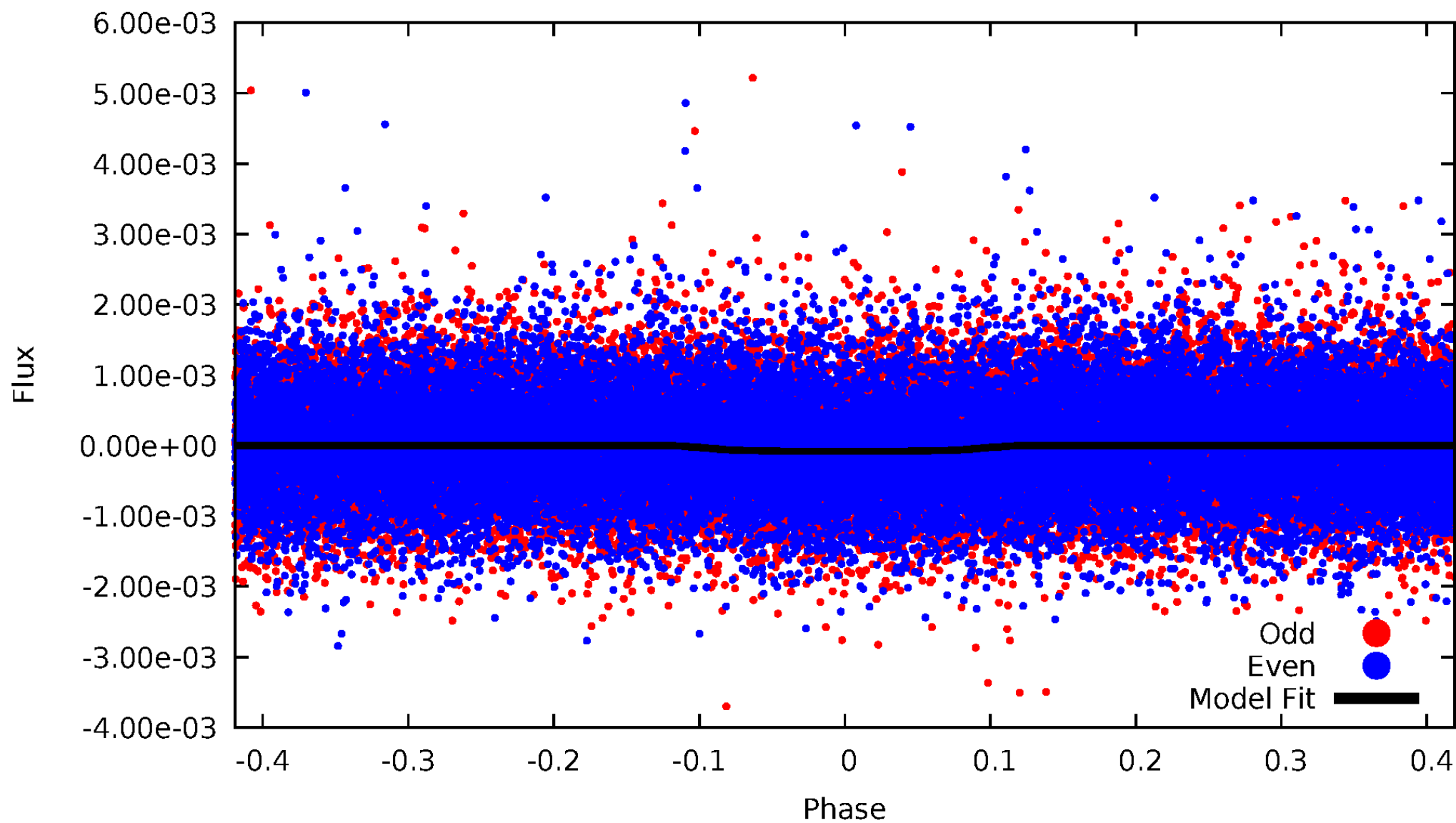
TCE 003448323-01





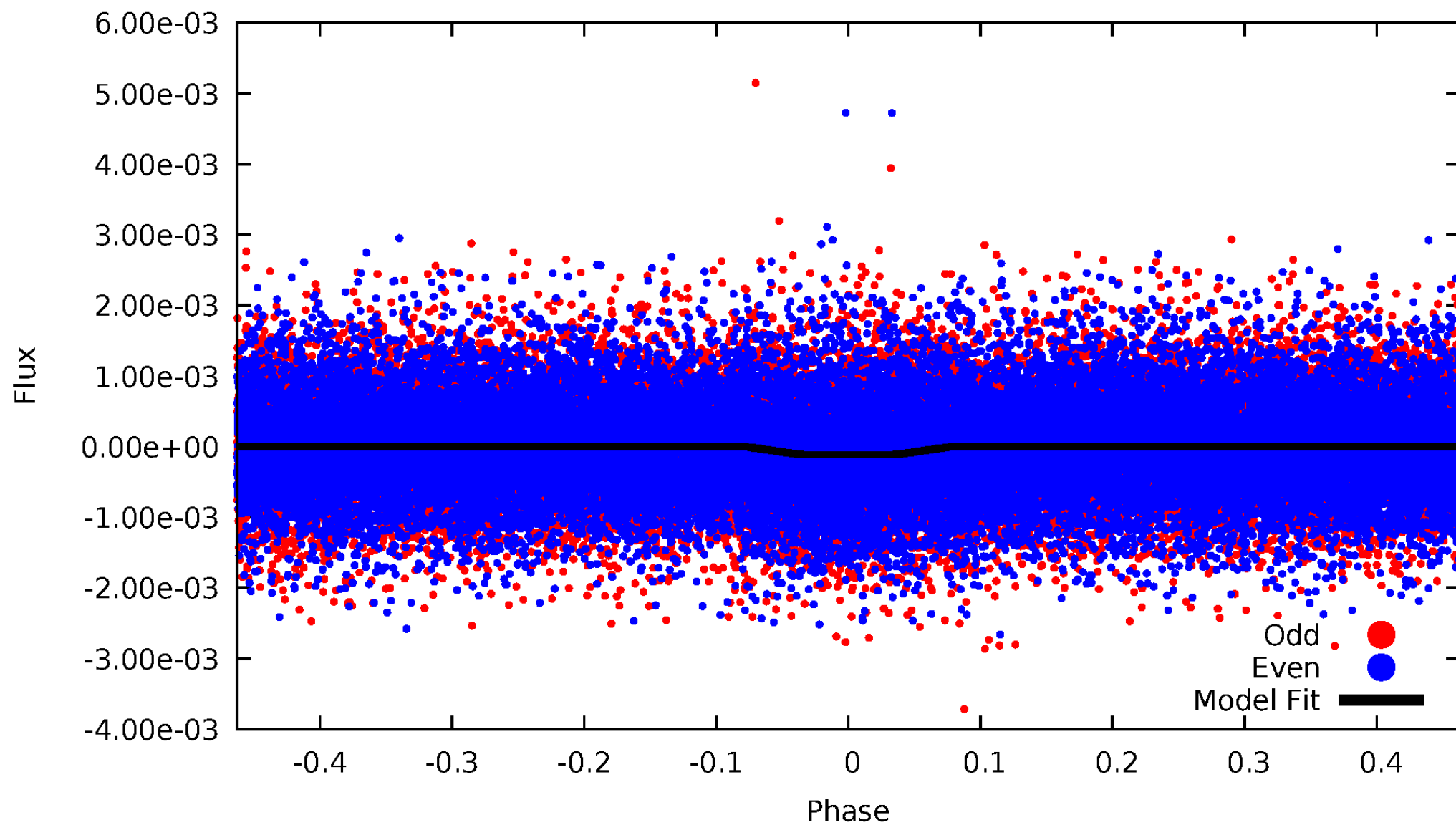
# DV Odd/Even

TCE 003448323-01

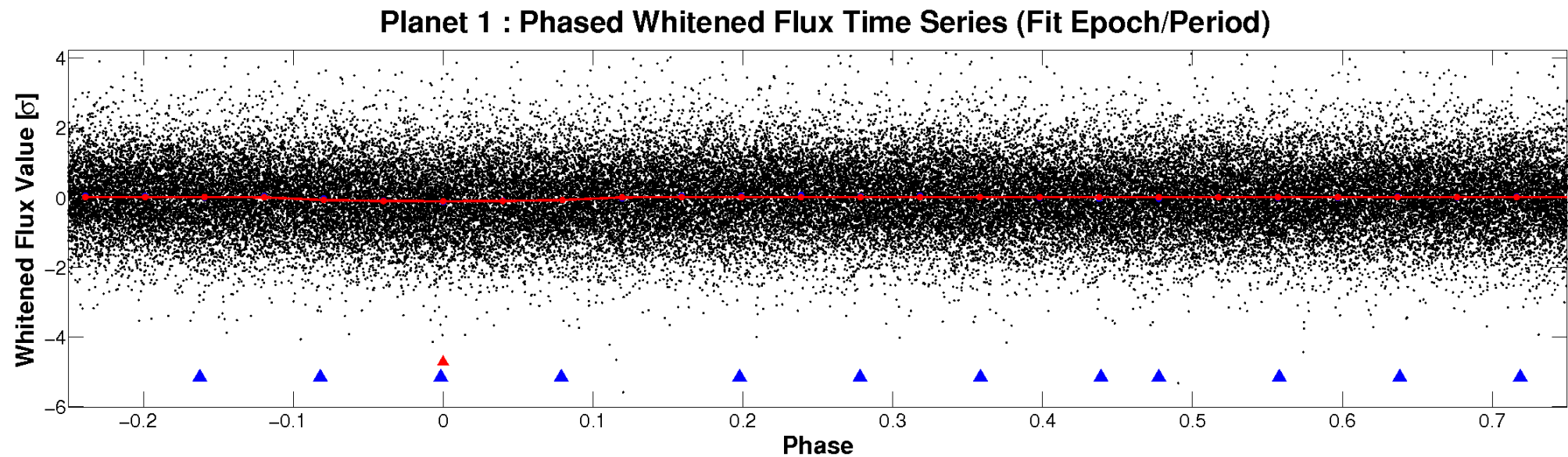
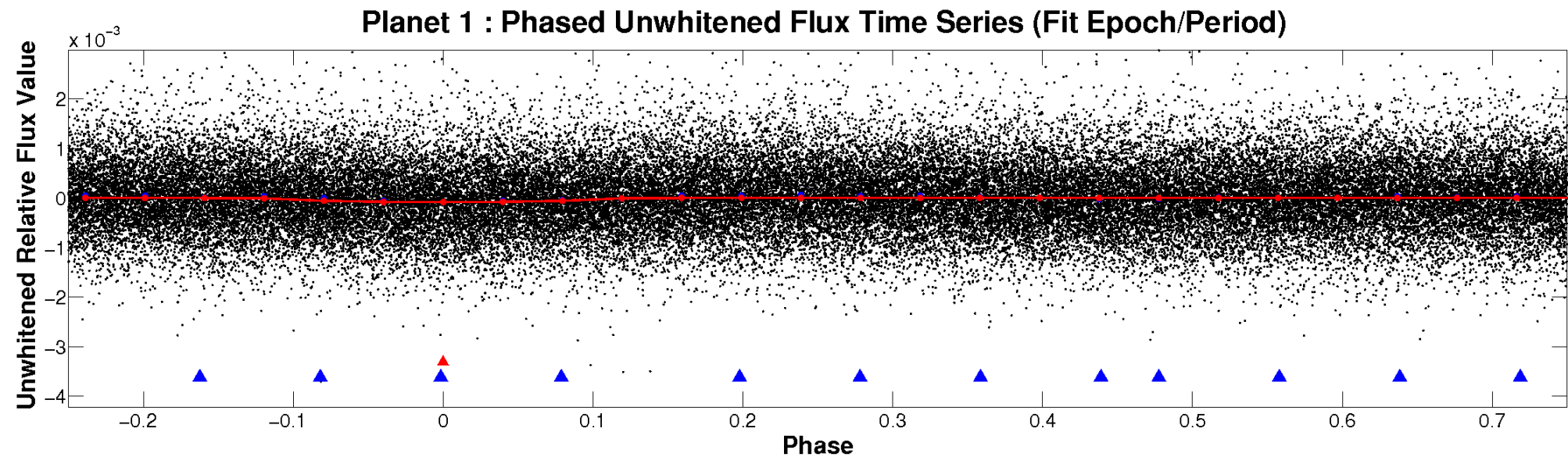


# ALT Odd/Even

TCE 003448323-01

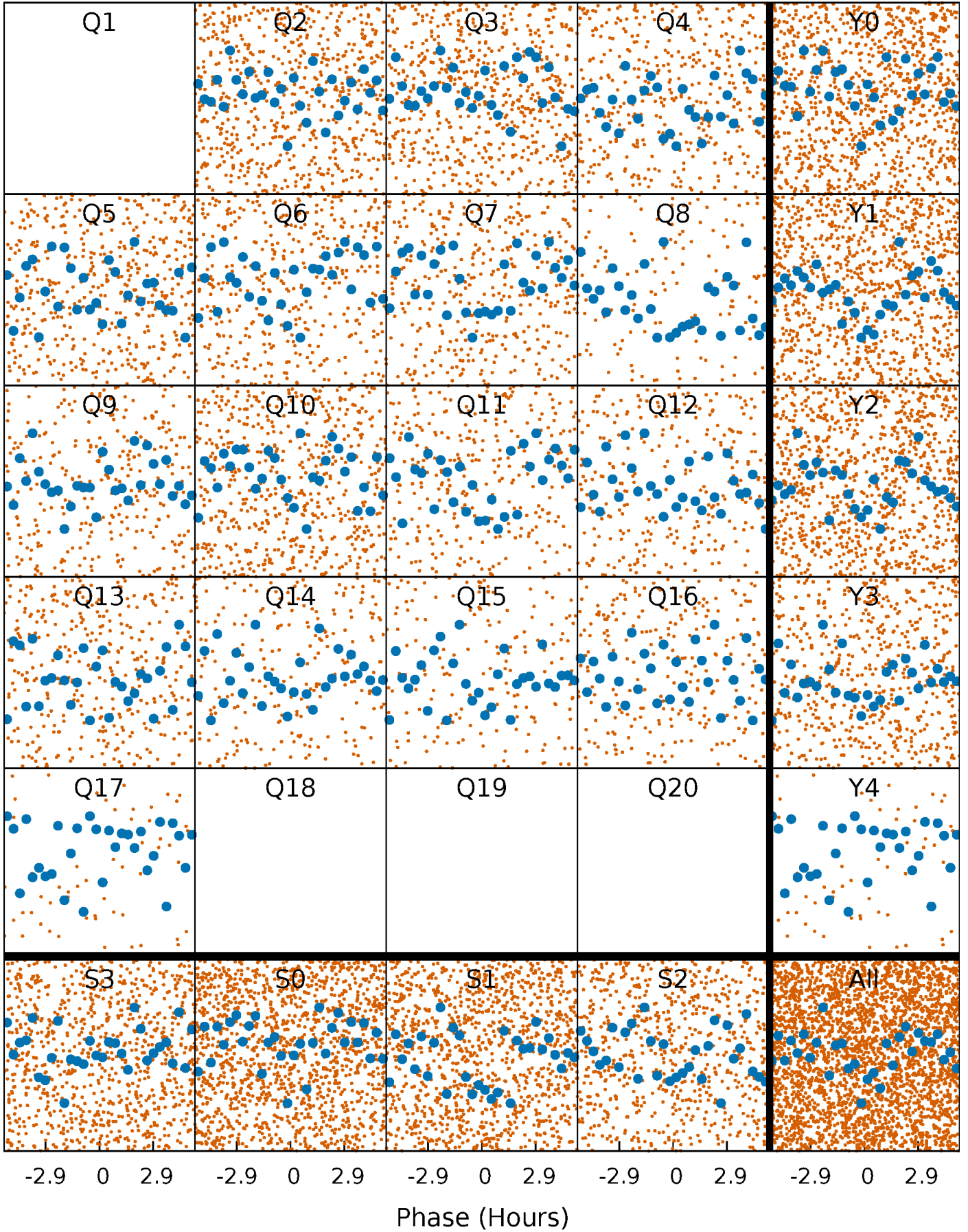


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

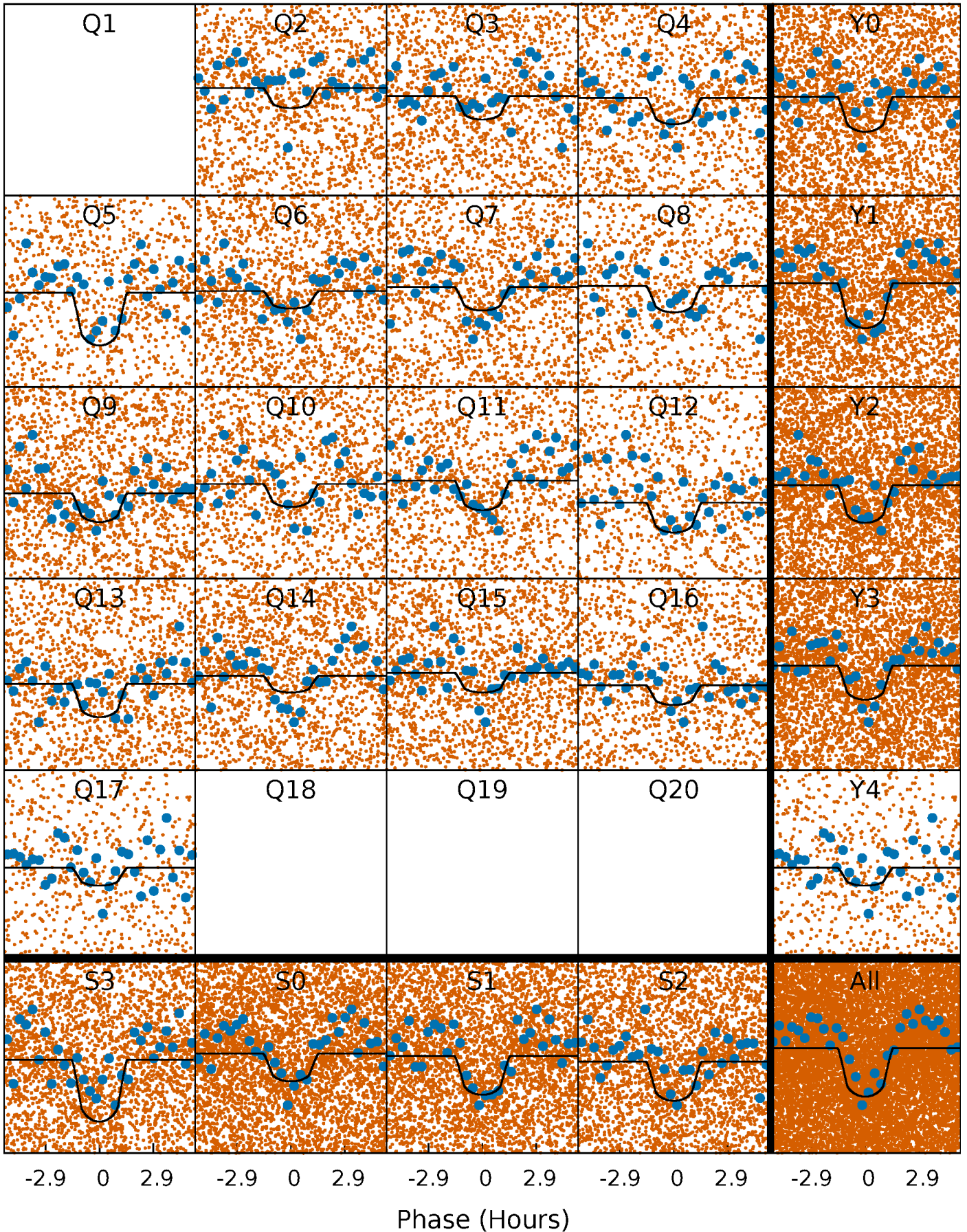
TCE 003448323-01 P= 0.513483 Days  $T_0=131.743364$  (BKJD)





# DV Quarter-Phased Transit Curves

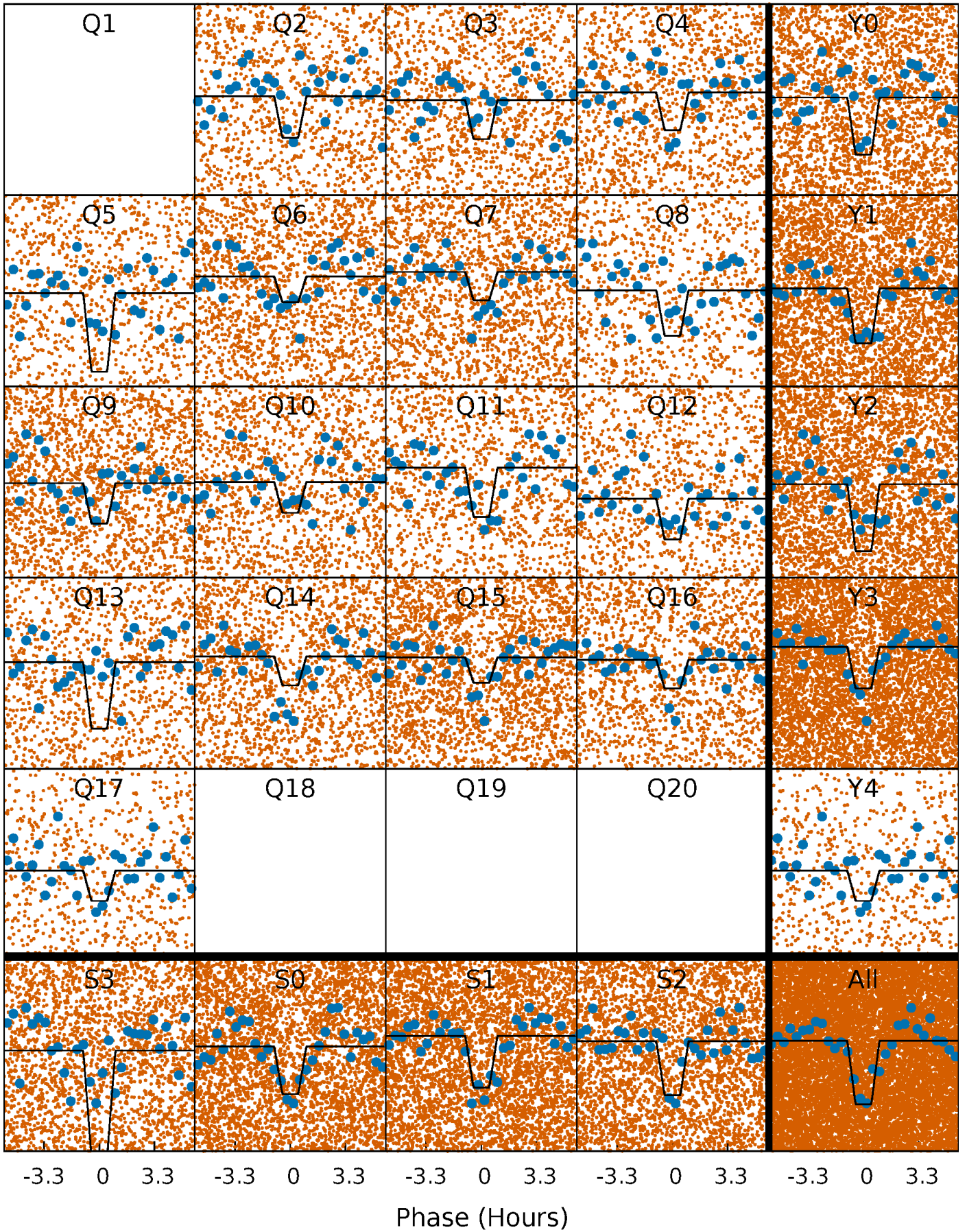
TCE 003448323-01 P= 0.513483 Days  $T_0=131.743364$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

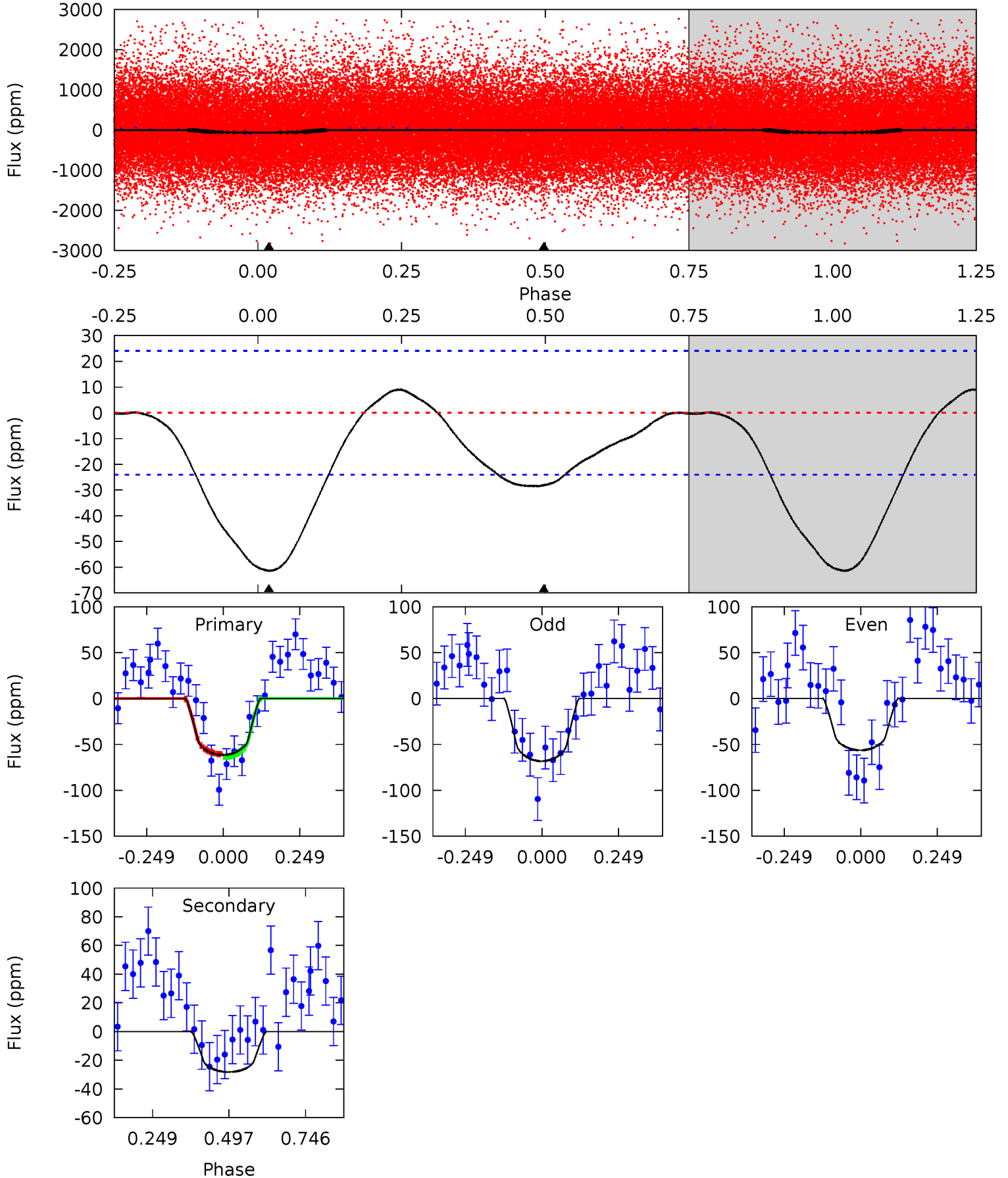
TCE 003448323-01 P= 0.513490 Days  $T_0=131.734800$  (BKJD)



# DV Model-Shift Uniqueness Test

003448323-01, P = 0.513483 Days, E = 131.743364 Days

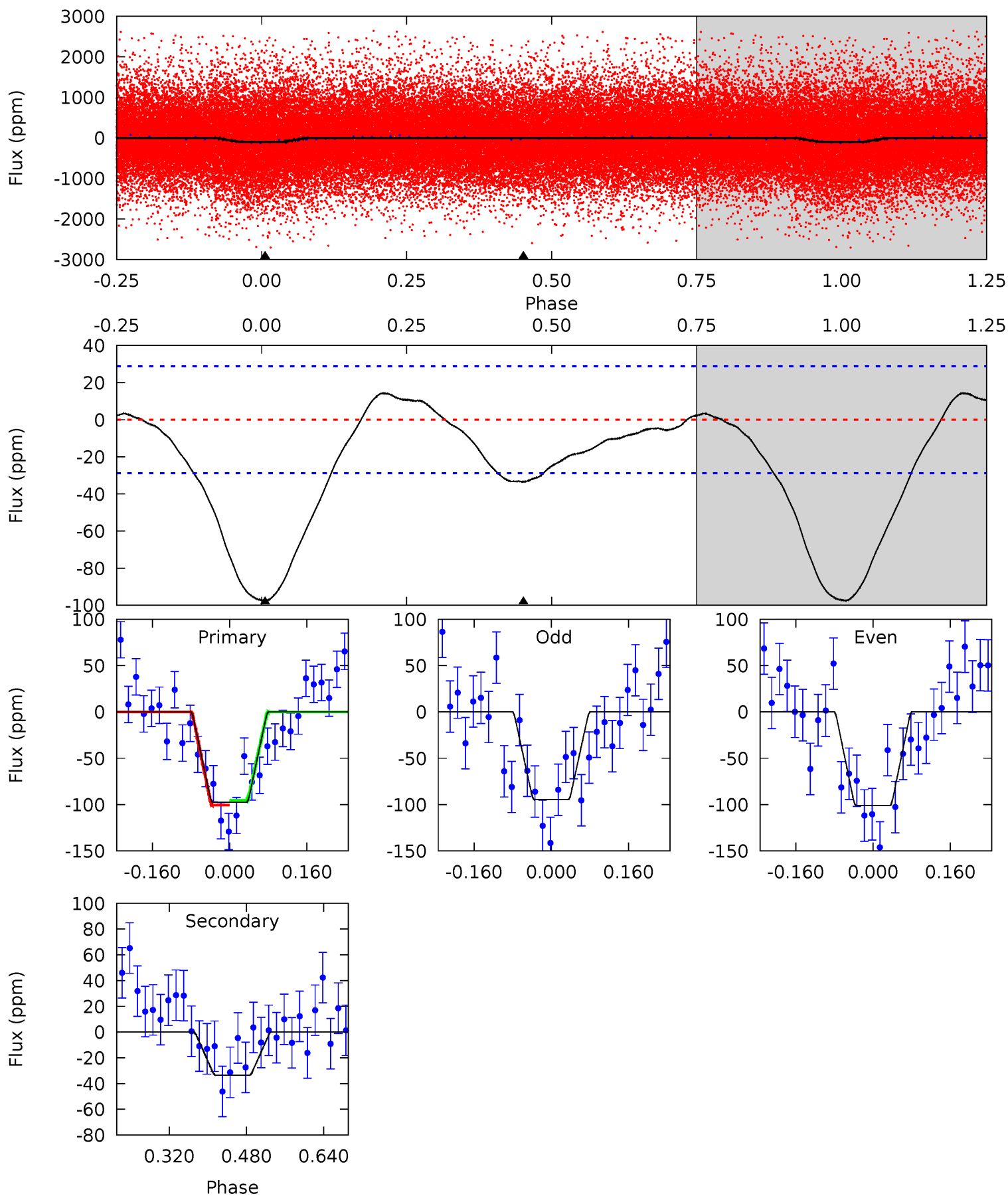
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	5.12	0	0	4.37	1.15	0.68	11.2	11.2	5.12	5.12	1.09	0.87	0.13	0.26



# Alt Model-Shift Uniqueness Test

003448323-01, P = 0.513490 Days, E = 131.734800 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
15.1	5.19	0	0	4.47	1.40	1.17	15.1	15.1	5.19	5.19	0.49	0.98	0.13	0.40





### Stellar Parameters For KIC 003448323

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5495^{+164}_{-164}$	$4.495^{+0.069}_{-0.161}$	$-0.020^{+0.300}_{-0.300}$	$0.882^{+0.210}_{-0.105}$	$0.887^{+0.101}_{-0.082}$	$1.820^{+0.523}_{-0.763}$
	+3%/-3%	+2%/-4%	+1500%/-1500%	+24%/-12%	+11%/-9%	+29%/-42%
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 003448323-01 / KOI 6336.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-28 \pm 6$	$1.10^{+0.69}_{-0.67}$	$2944^{+168}_{-150}$	$3939^{+2052}_{-821}$	$1.837^{+10.281}_{-1.183}$
Alt.	$-33 \pm 6$	$1.12^{+0.74}_{-0.69}$	$2938^{+169}_{-146}$	$4027^{+2258}_{-791}$	$2.071^{+11.868}_{-1.335}$

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

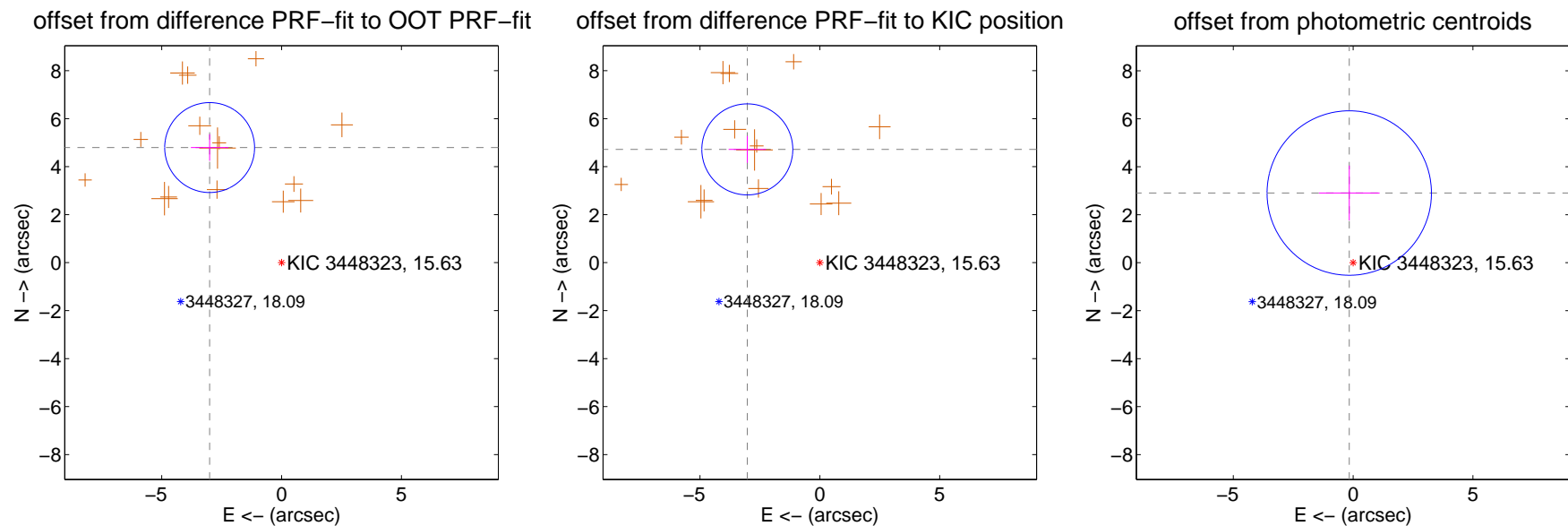
## DV Centroid Data

Supplemental centroid analysis for 003448323-01. Kepler magnitude: 15.63. Transit SNR 10.07

There are 0 quarters with good PRF difference image offsets

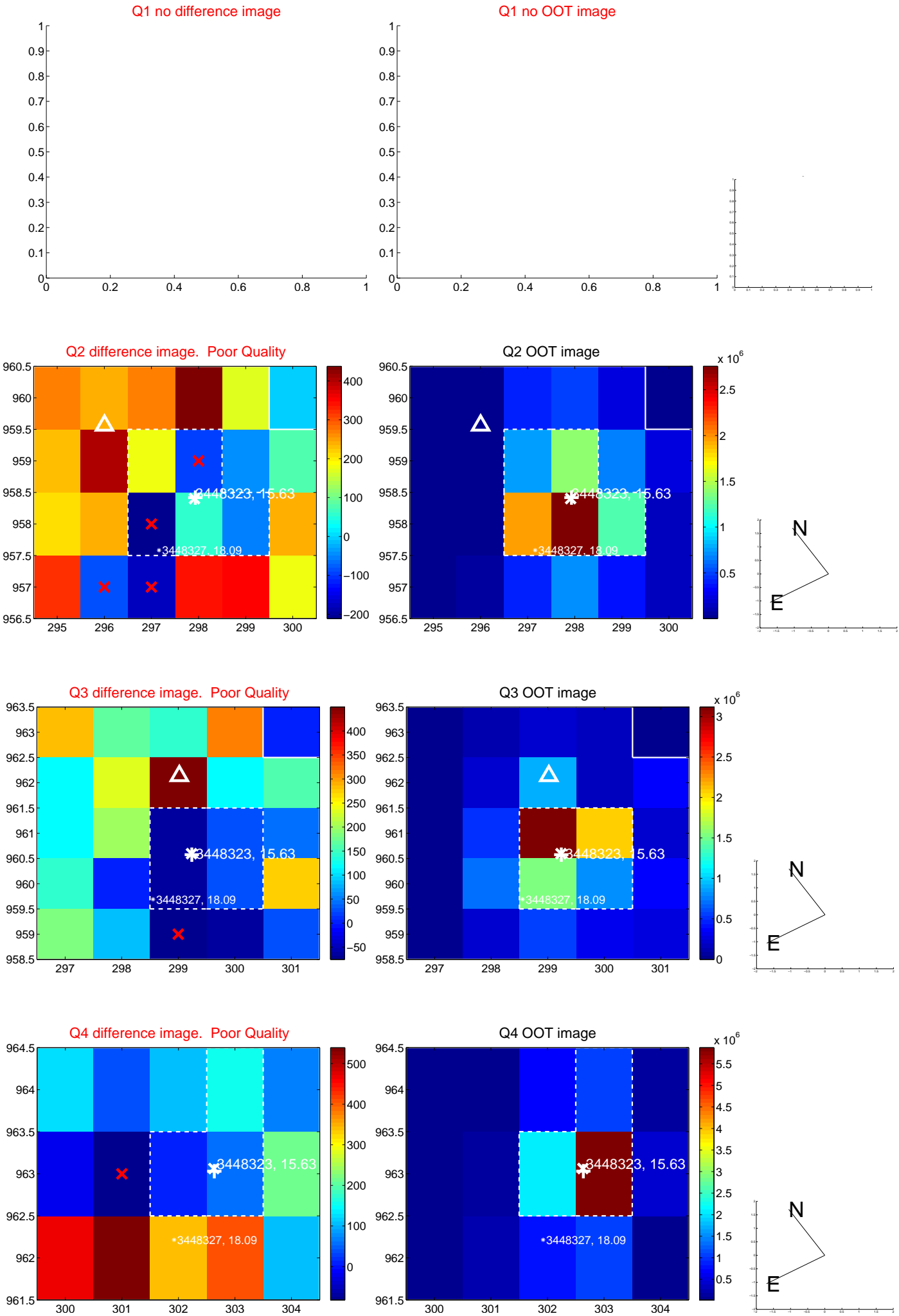
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.658 \pm 0.625$	9.06	$3.000 \pm 0.783$	$4.796 \pm 0.550$
PRF-fit source offset from KIC position	$5.606 \pm 0.632$	8.87	$3.025 \pm 0.778$	$4.720 \pm 0.562$
photometric centroid source offset	$2.91 \pm 1.14$	2.55	$0.16 \pm 1.27$	$2.91 \pm 1.14$

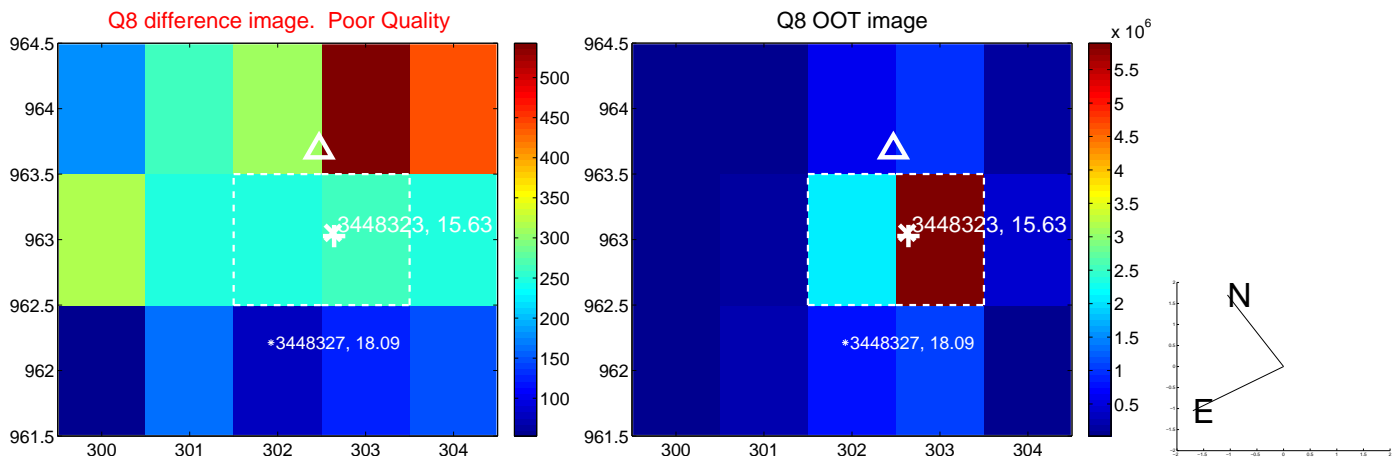
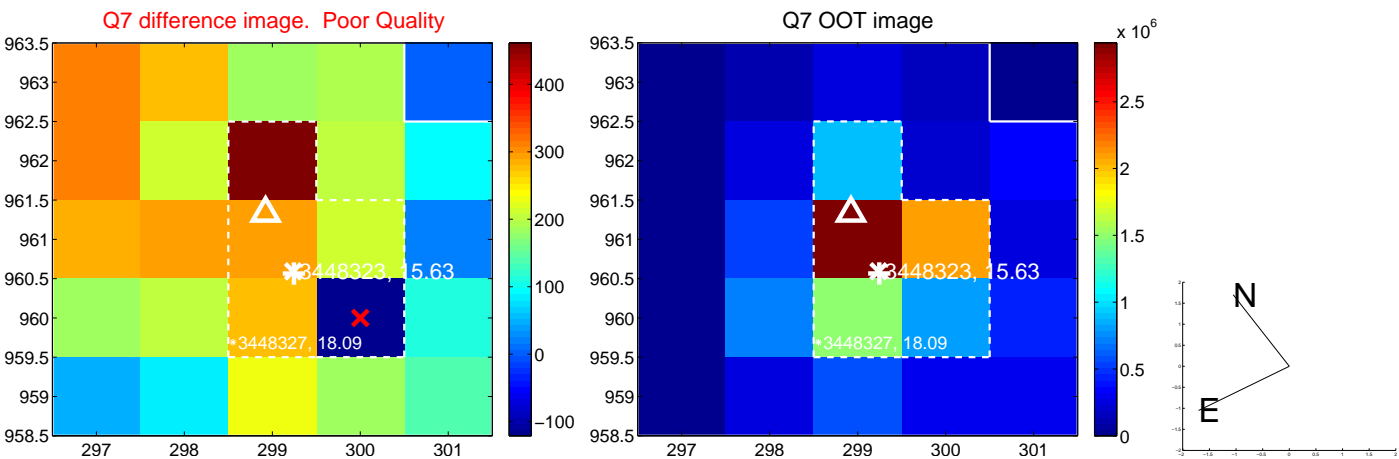
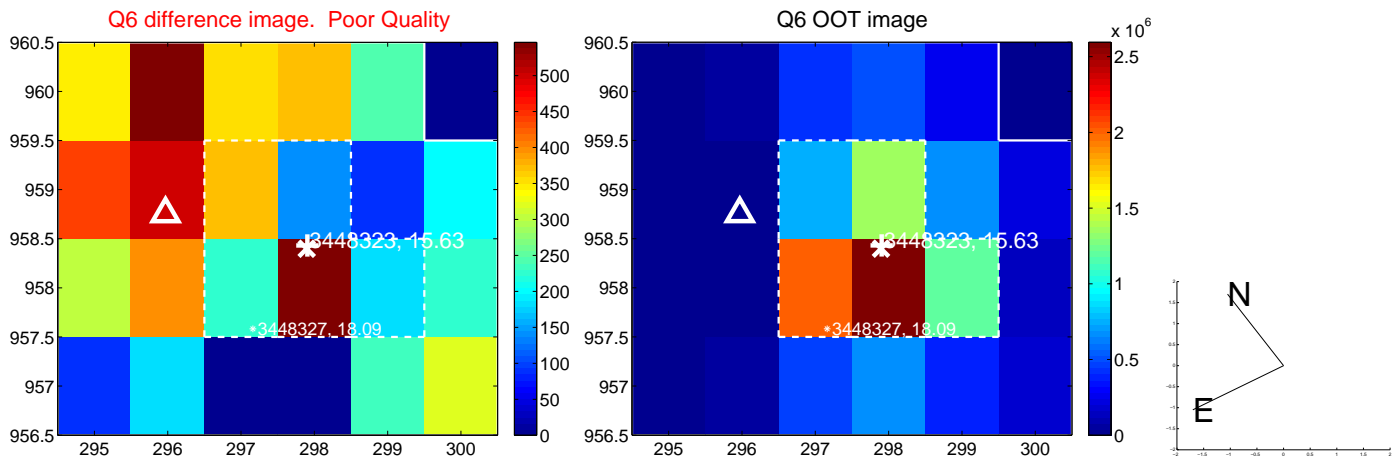
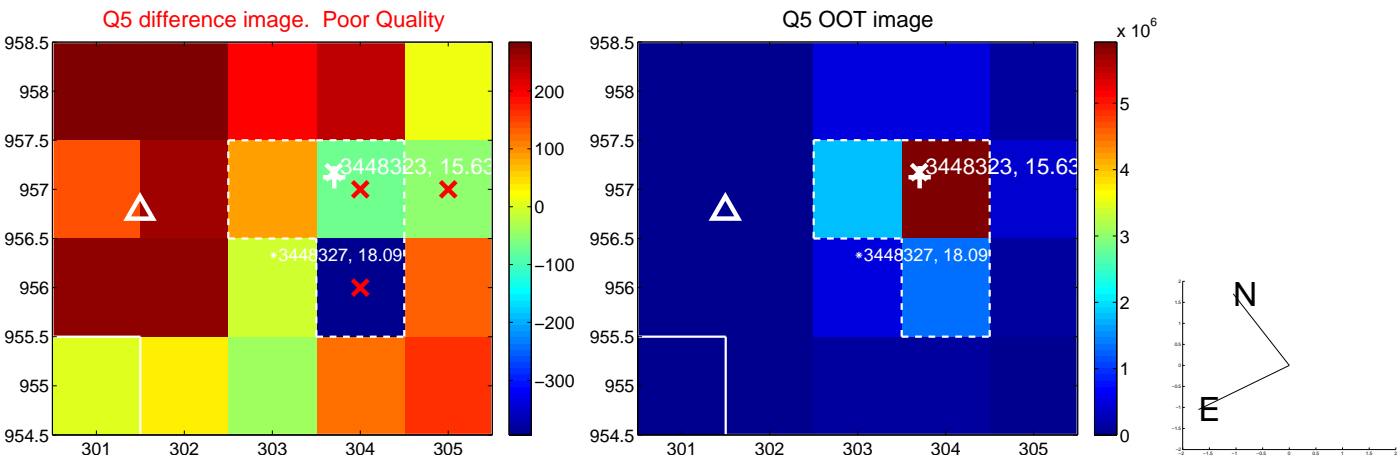


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

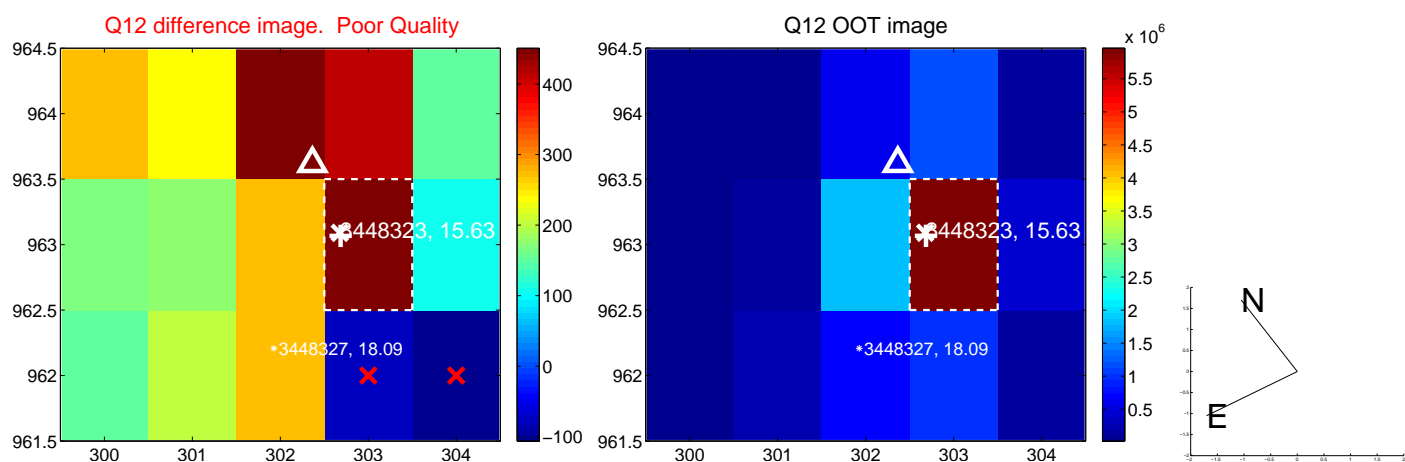
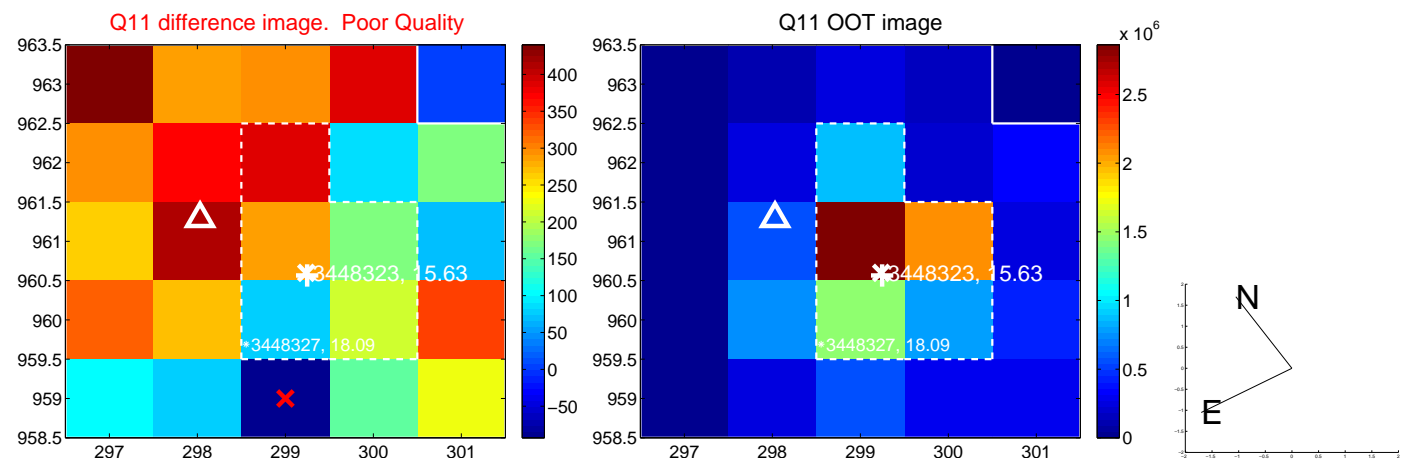
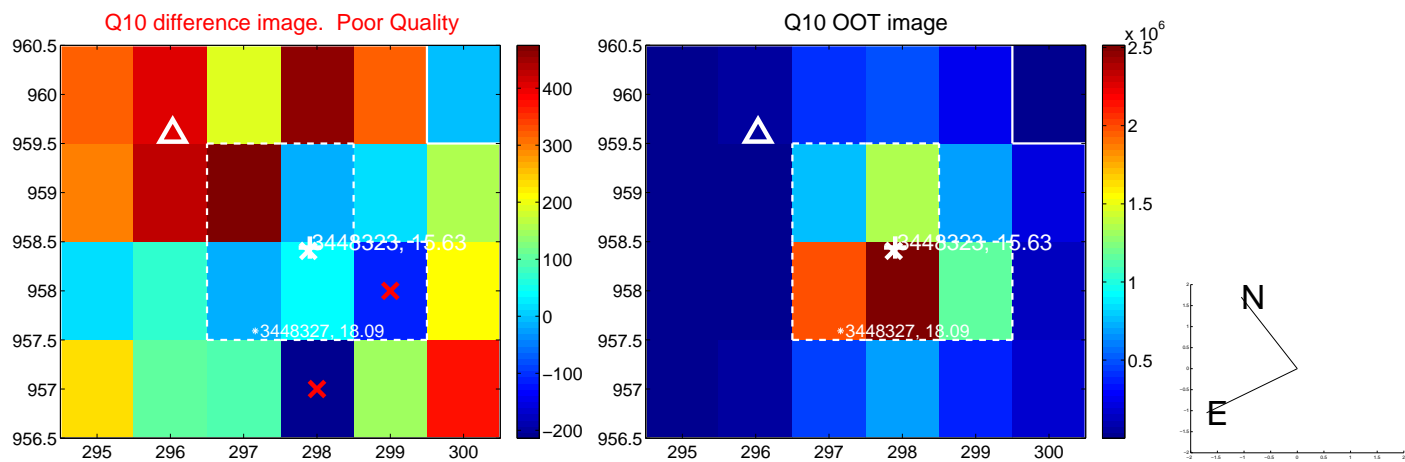
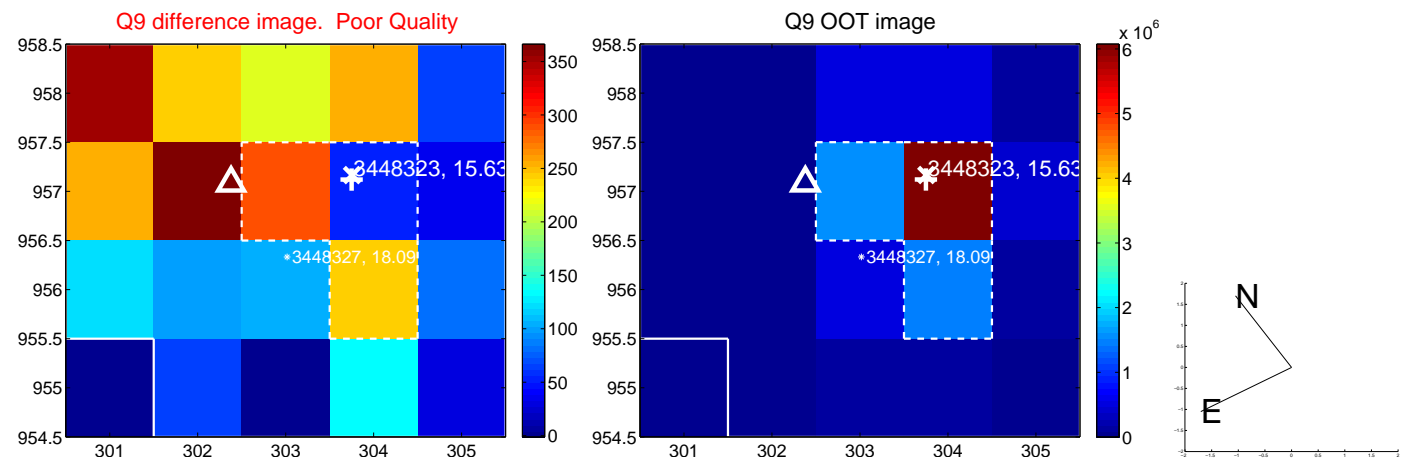


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

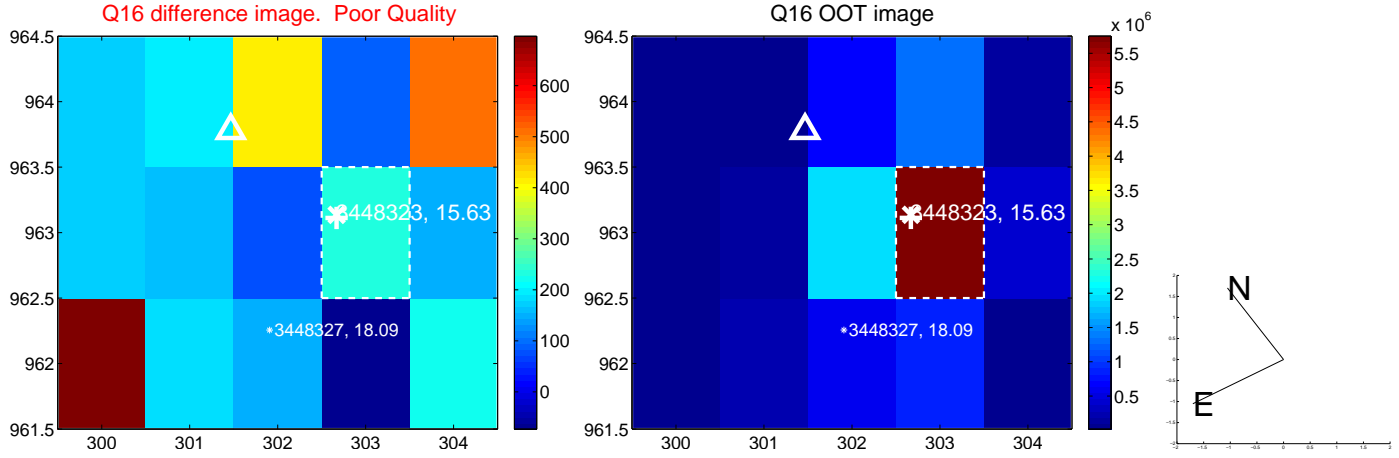
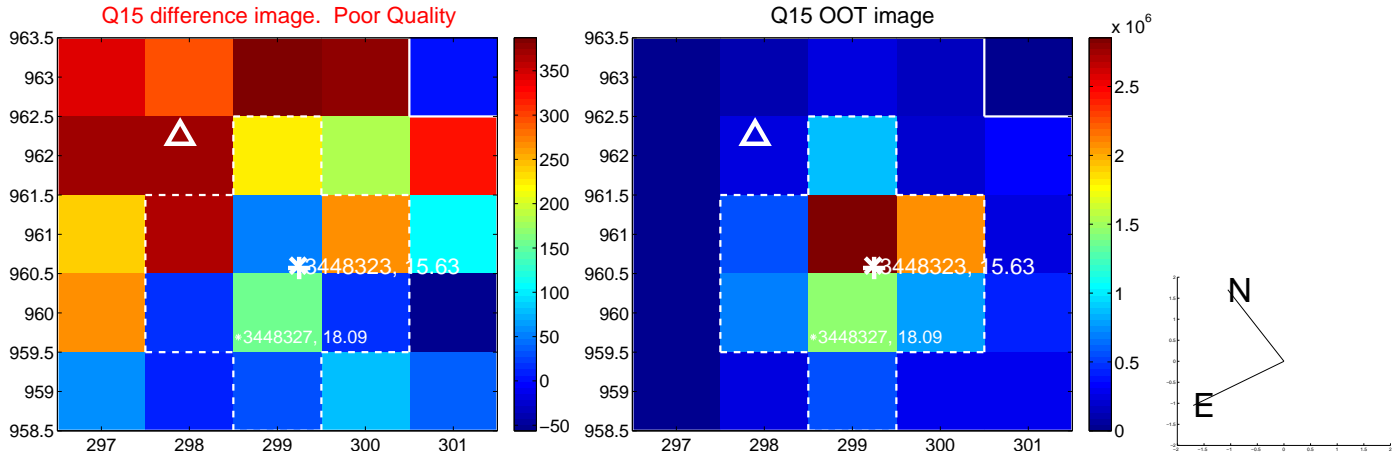
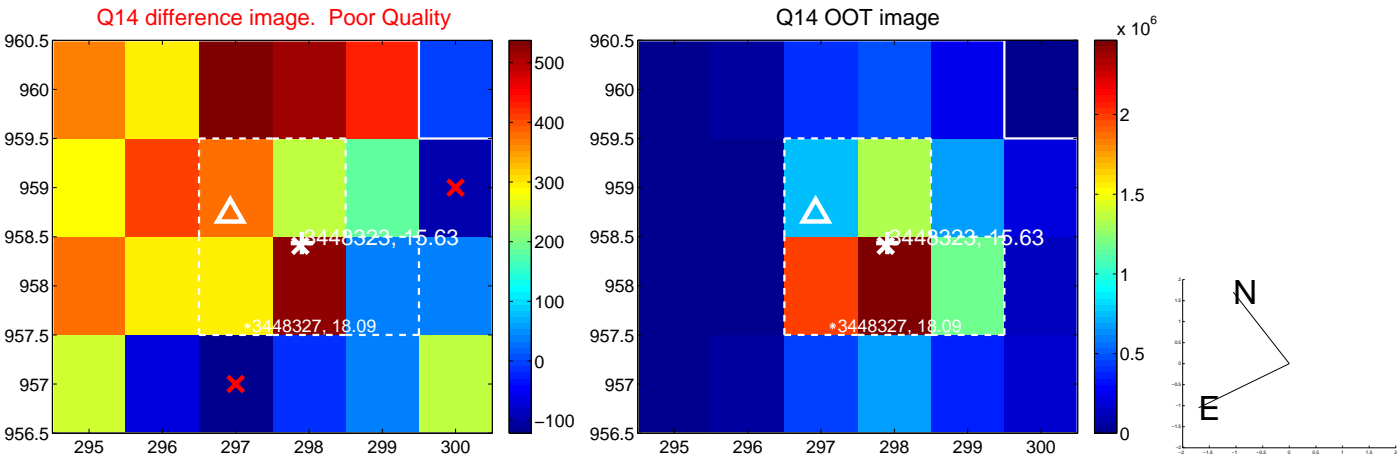
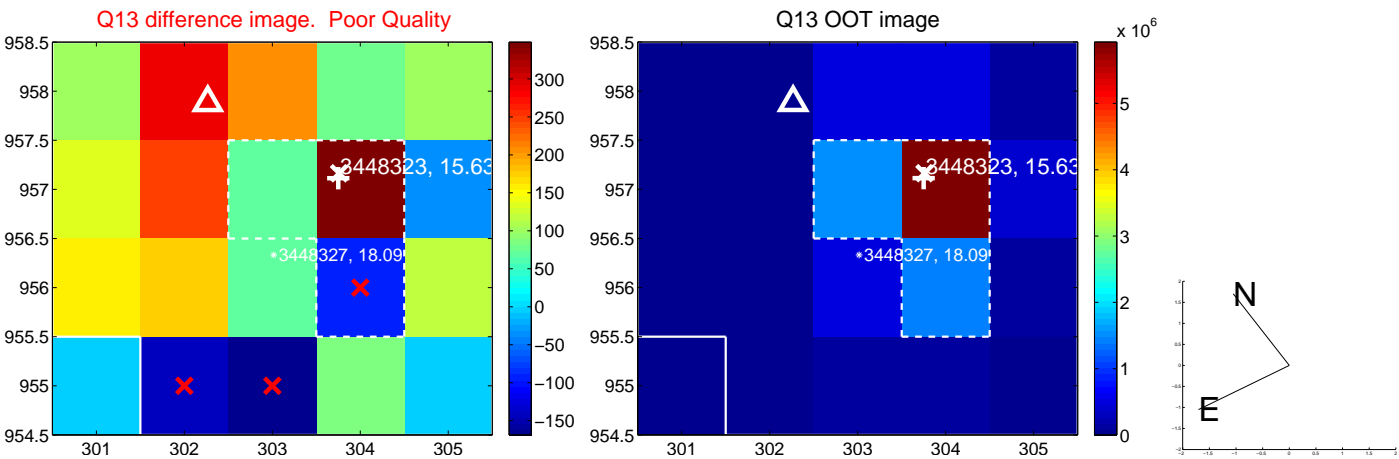




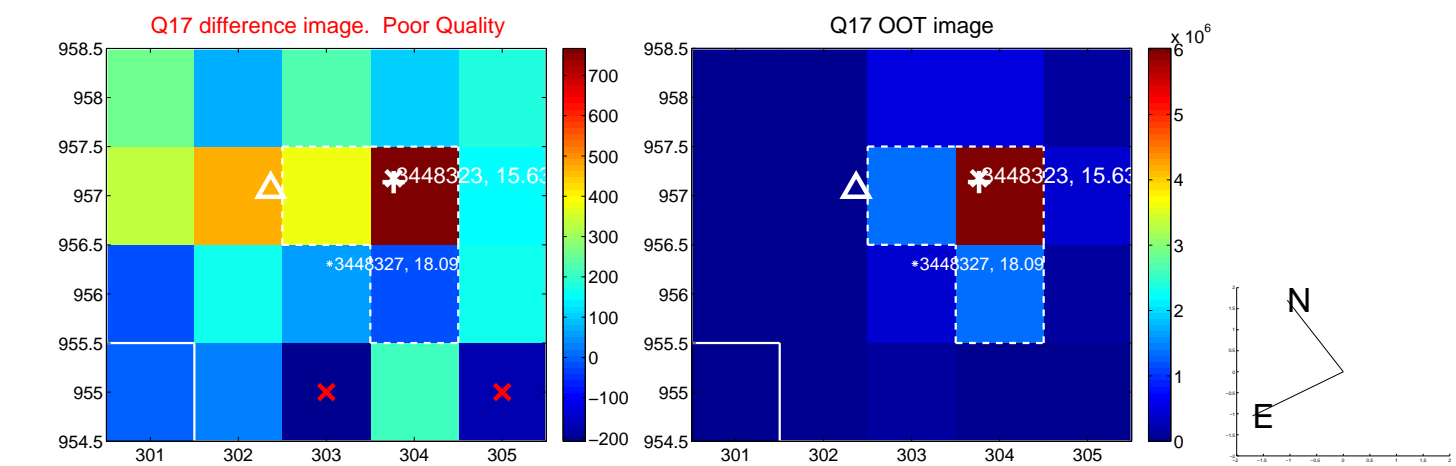
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



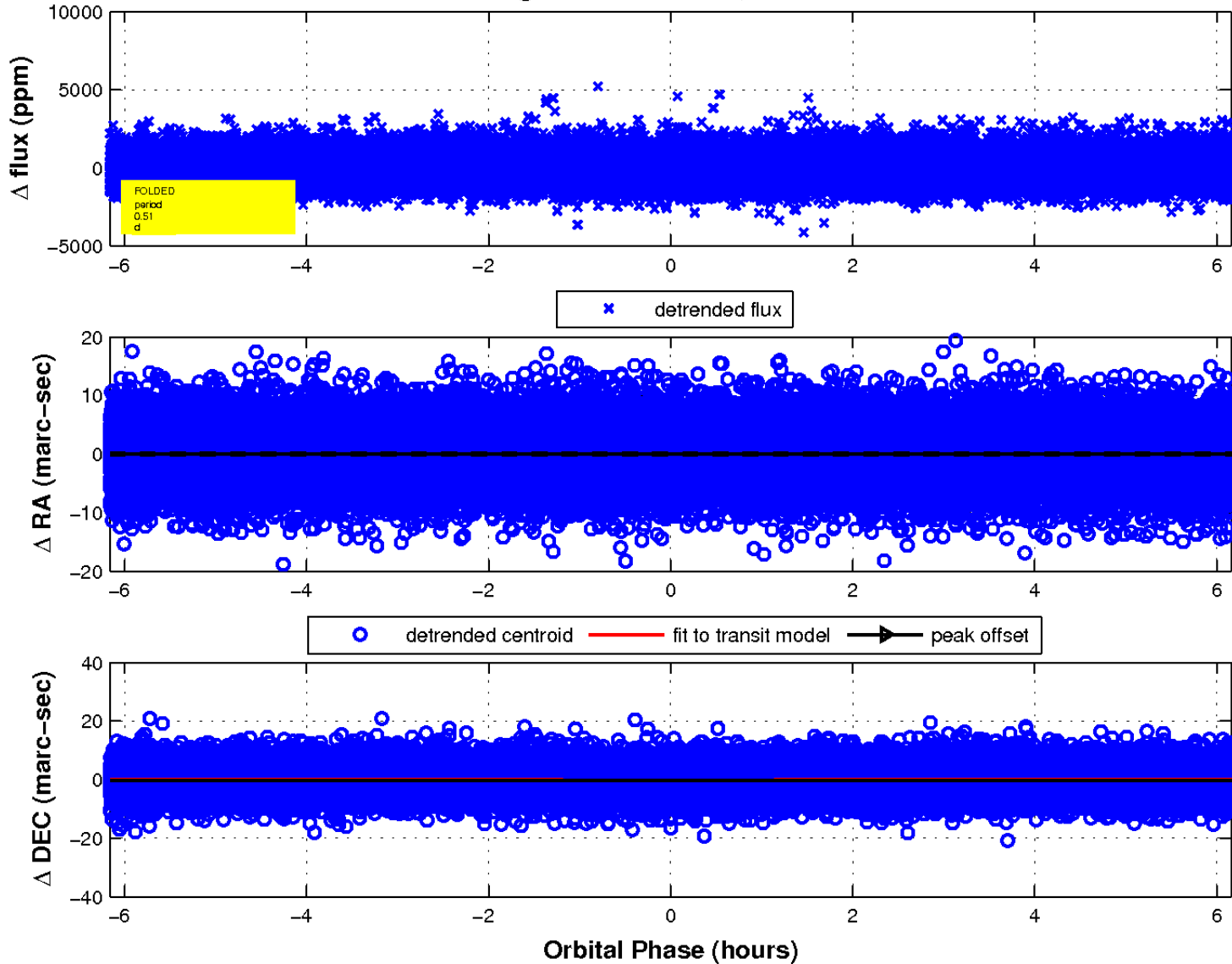
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

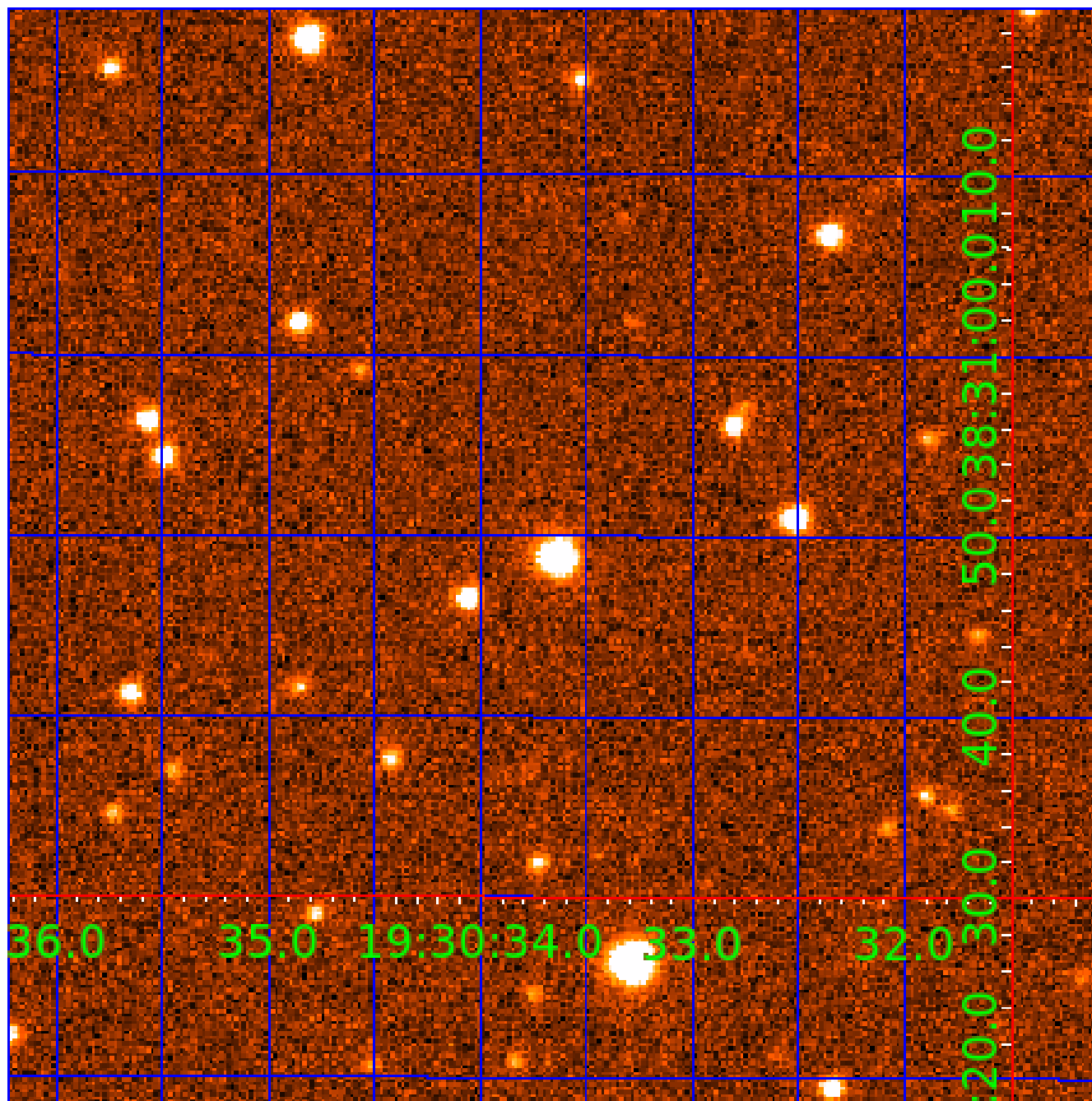


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 003448323

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003448323-01	OBS	6336.01	0.513483	131.743364	81.3	2.581	7.7	10.1	0.88	5495	0.93	4368.94
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003448323-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_UNRESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
003448323-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQU_ALT—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.

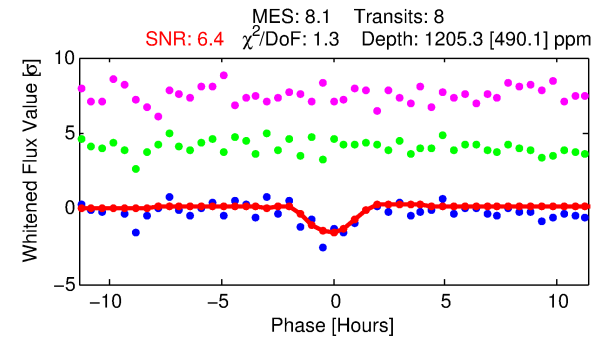
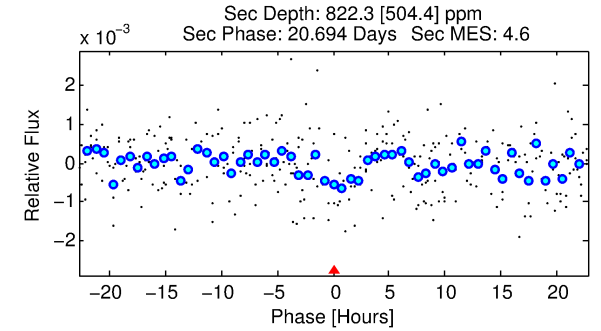
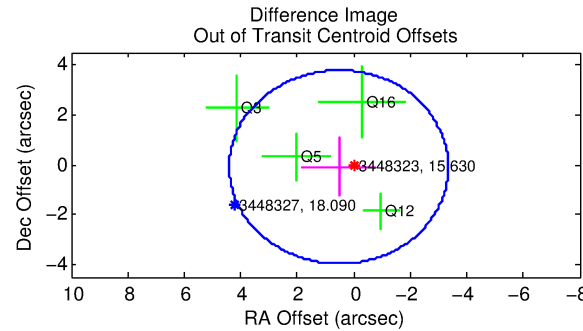
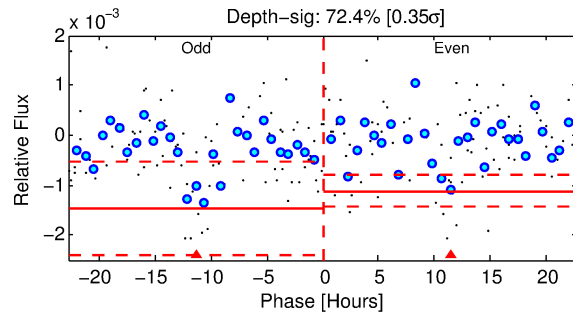
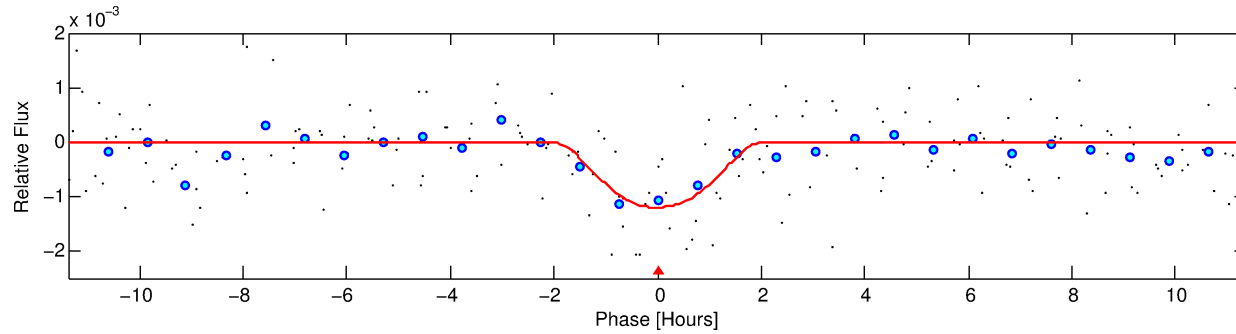
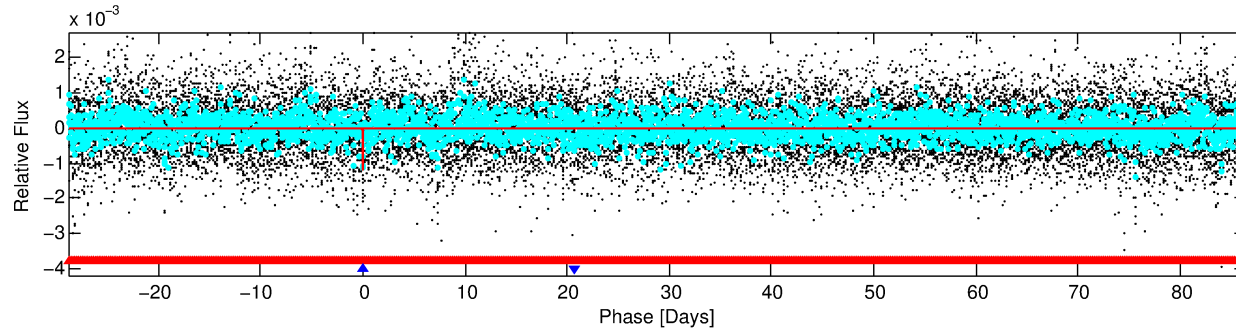
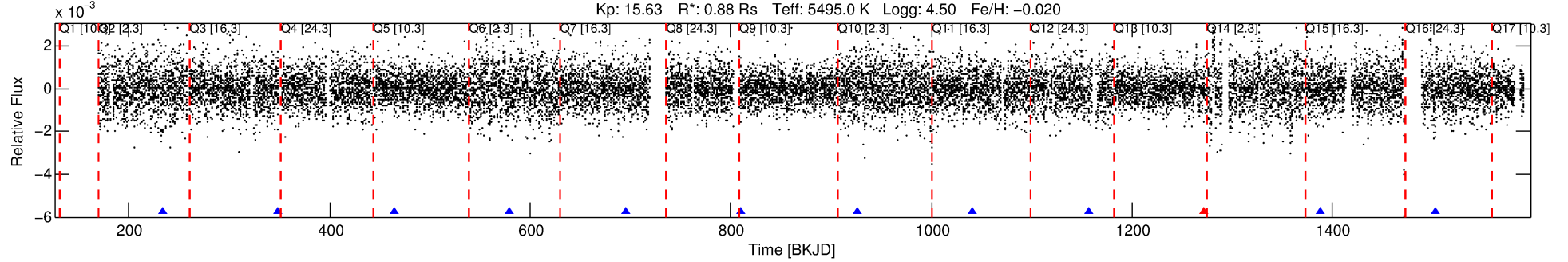
## Ephemeris Match Information For 003448323-02

No Significant Match Found

# DV One-Page Summary

KIC: 3448323 Candidate: 2 of 2 Period: 115.349 d  
KOI: K06336 Corr: No Ephemeris Match

Kp: 15.63 R\*: 0.88 Rs Teff: 5495.0 K Logg: 4.50 Fe/H: -0.020



## DV Fit Results:

Period = 115.34868 [0.00228] d  
Epoch = 233.6383 [0.0149] BKJD  
Rp/R\* = 0.0447 [0.0526]  
a/R\* = 91.69 [62.89]  
b = 0.97 [0.13]  
Seff = 3.20 [1.01]  
Teq = 341 [27] K  
Rp = 4.31 [5.16] Re  
a = 0.4457 [0.0897] AU  
Ag = 4844.05 [11846.41] [0.41σ]  
Teffp = 4399 [2673] K [1.52σ]

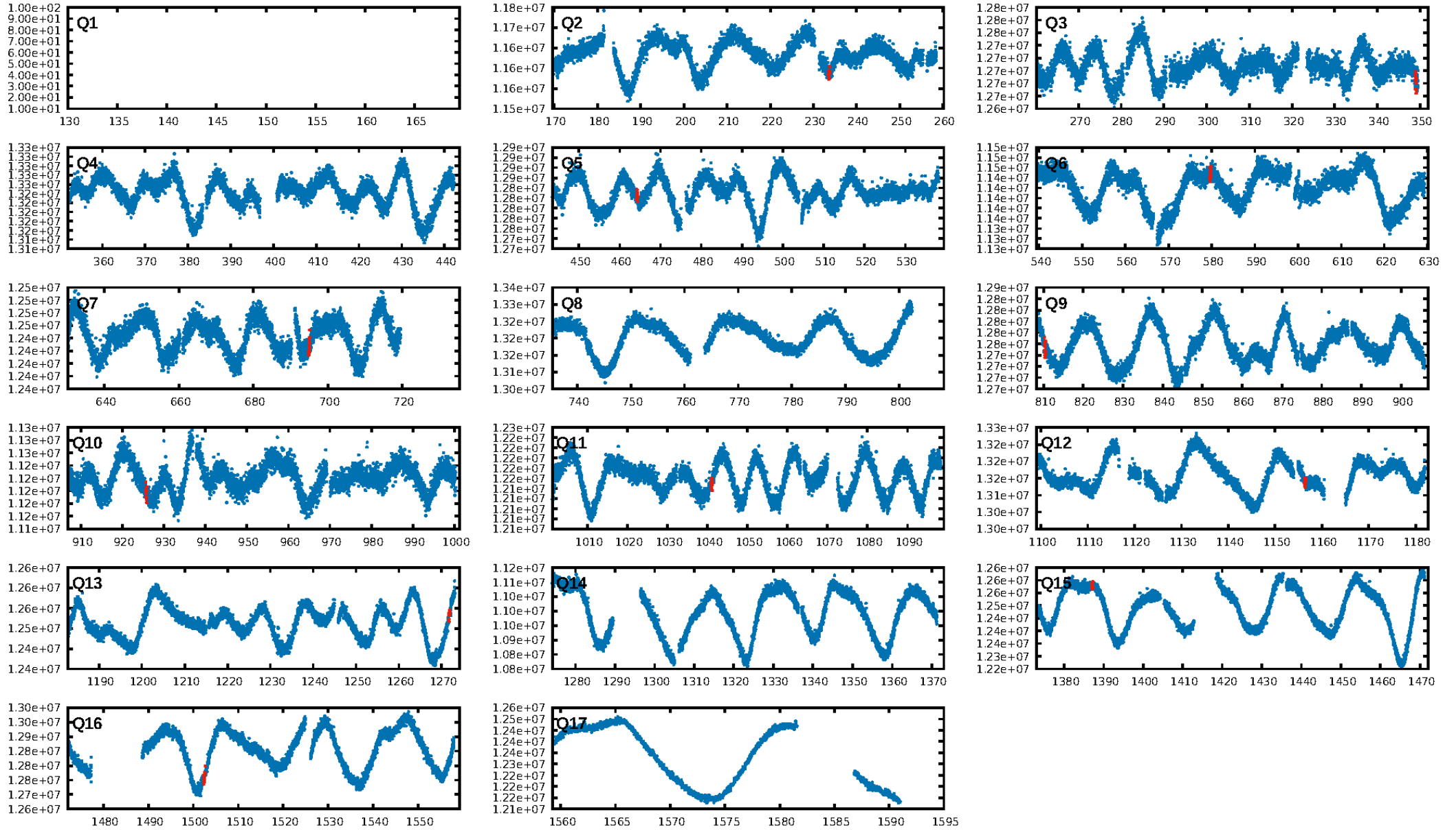
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [601.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 15.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.12e-11  
RollingBand-fgt: 0.88 [7/8]  
GhostDiagnostic-chr: -1.143  
Centroid-sig: 8.0%  
Centroid-so: 1.934 arcsec [1.66σ]  
OotOffset-rm: 0.538 arcsec [0.42σ]  
KicOffset-rm: 0.594 arcsec [0.46σ]  
OotOffset-st: 0/1/2/1 [4]  
KicOffset-st: 0/1/2/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/10]

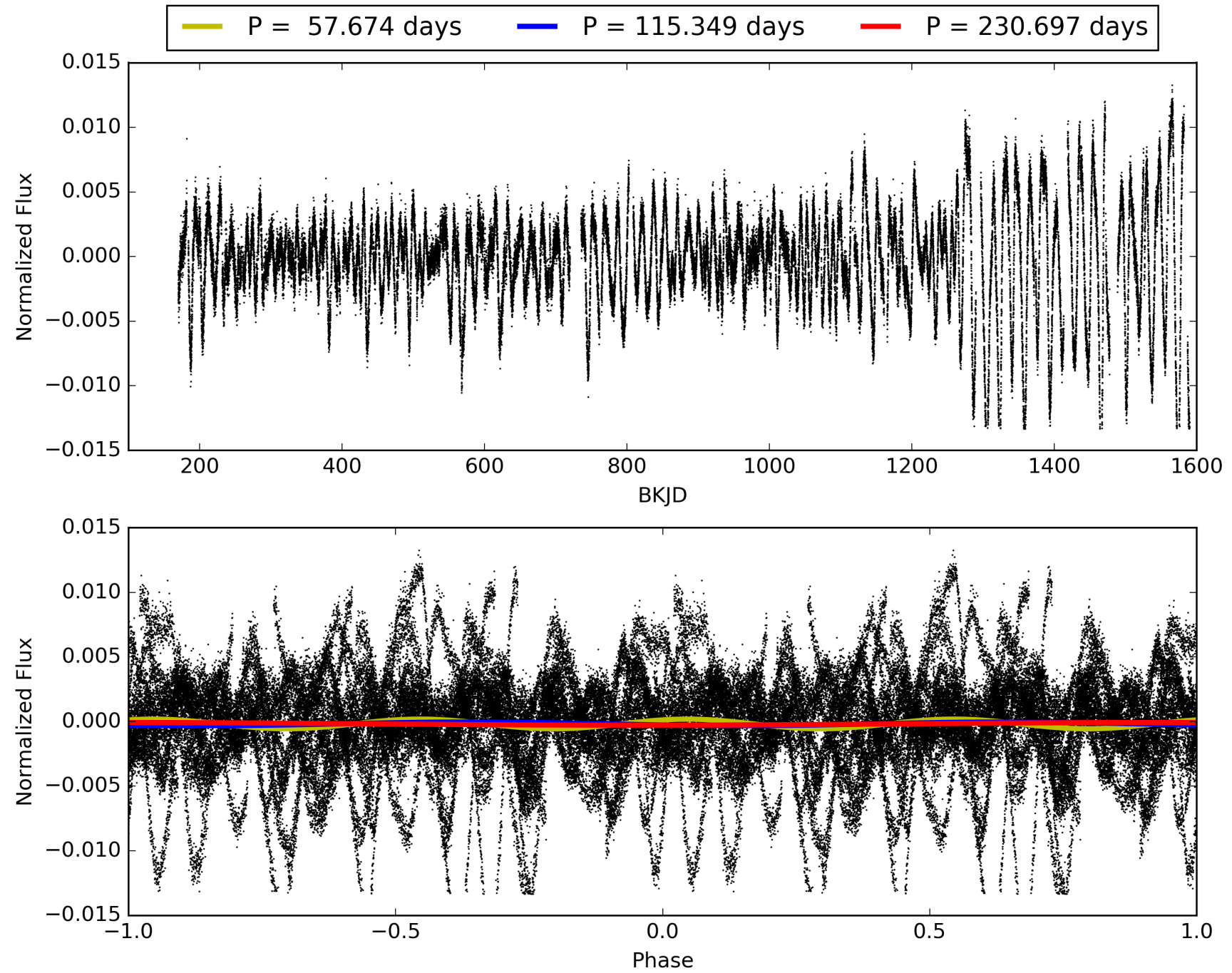
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:33:58 Z

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

# TCE 003448323-02, PDC Light Curves



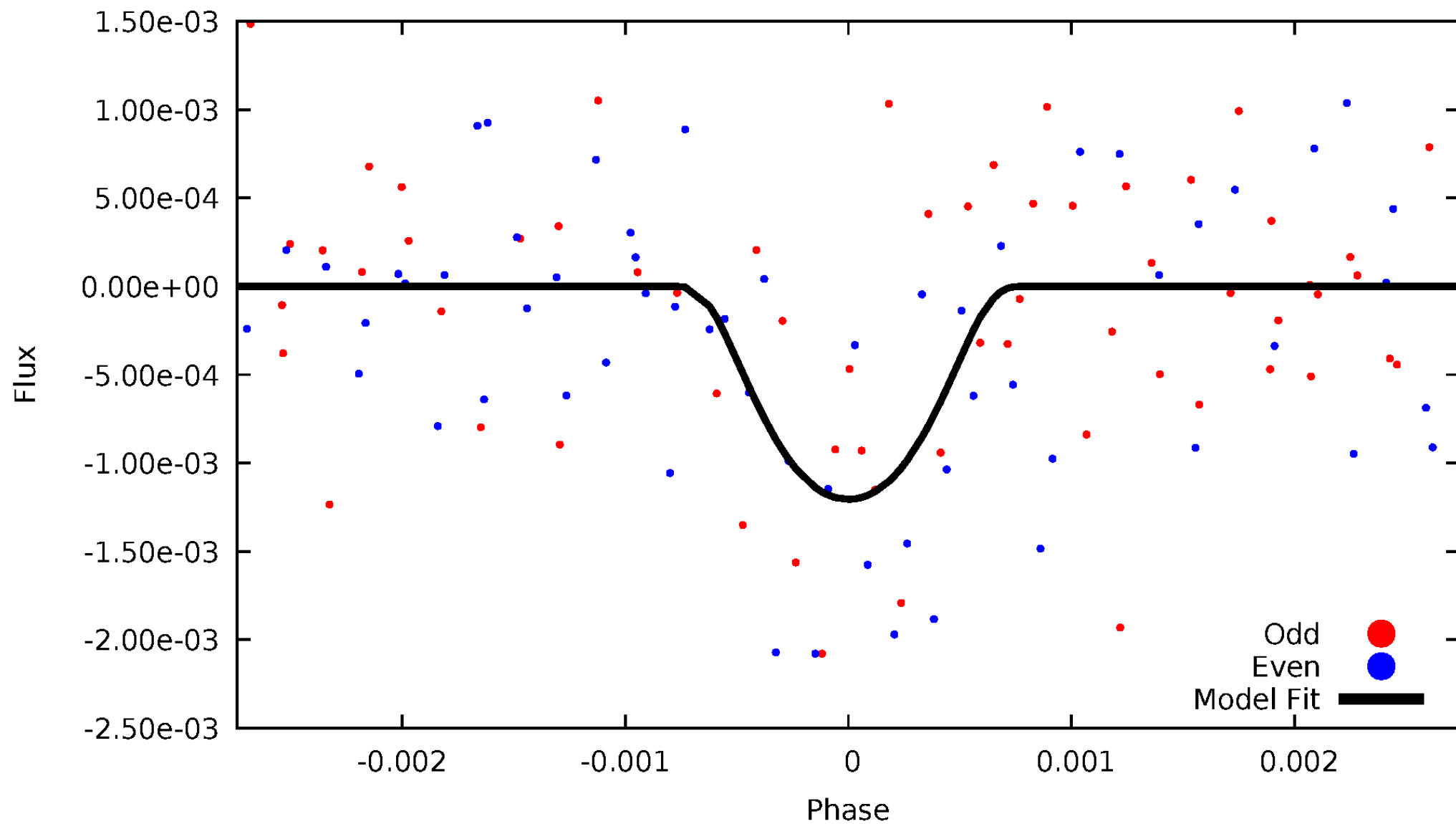
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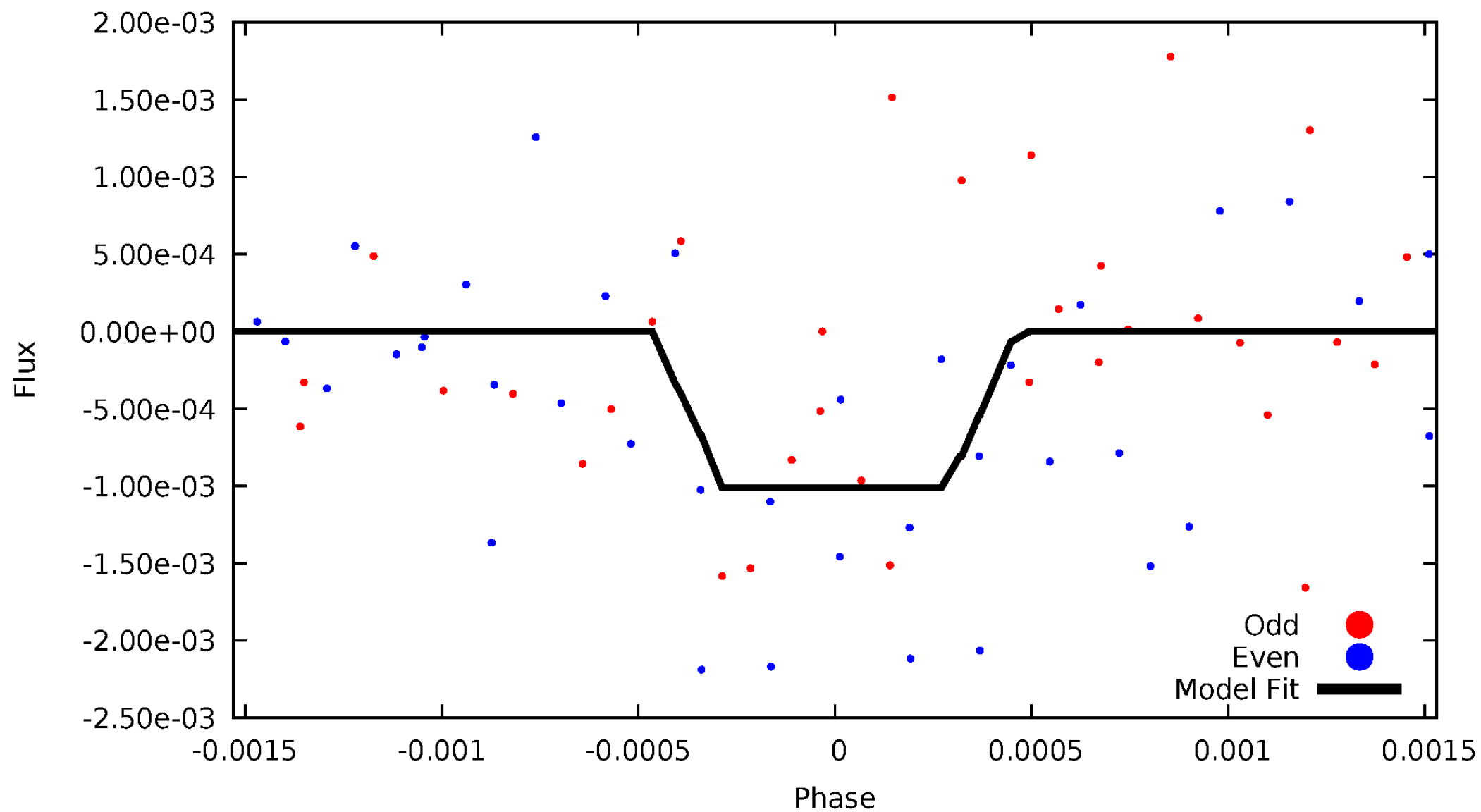
# DV Odd/Even

TCE 003448323-02



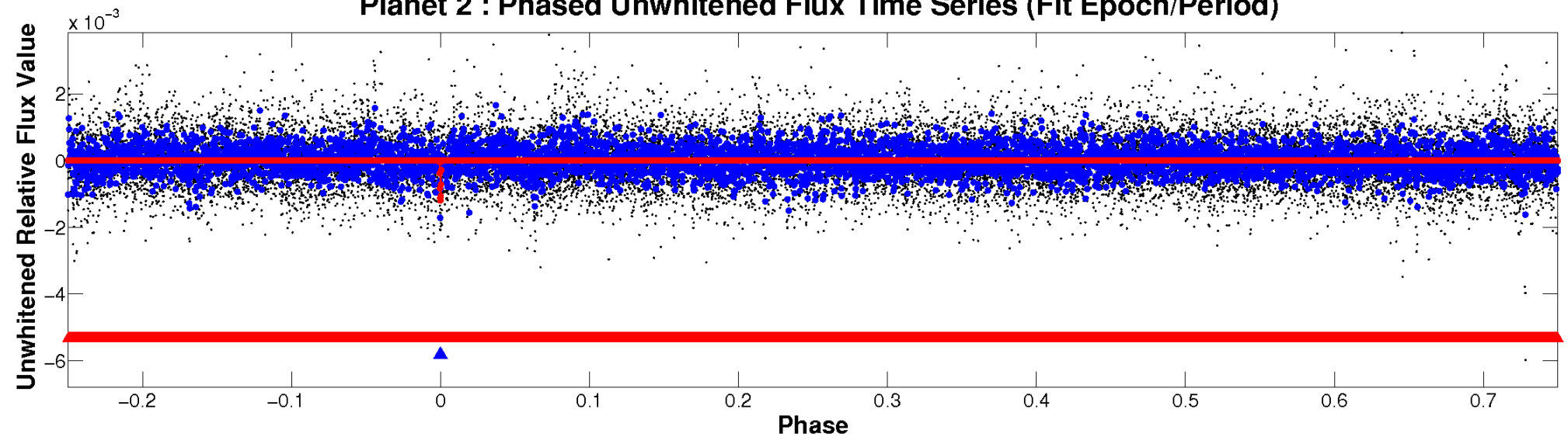
# ALT Odd/Even

TCE 003448323-02

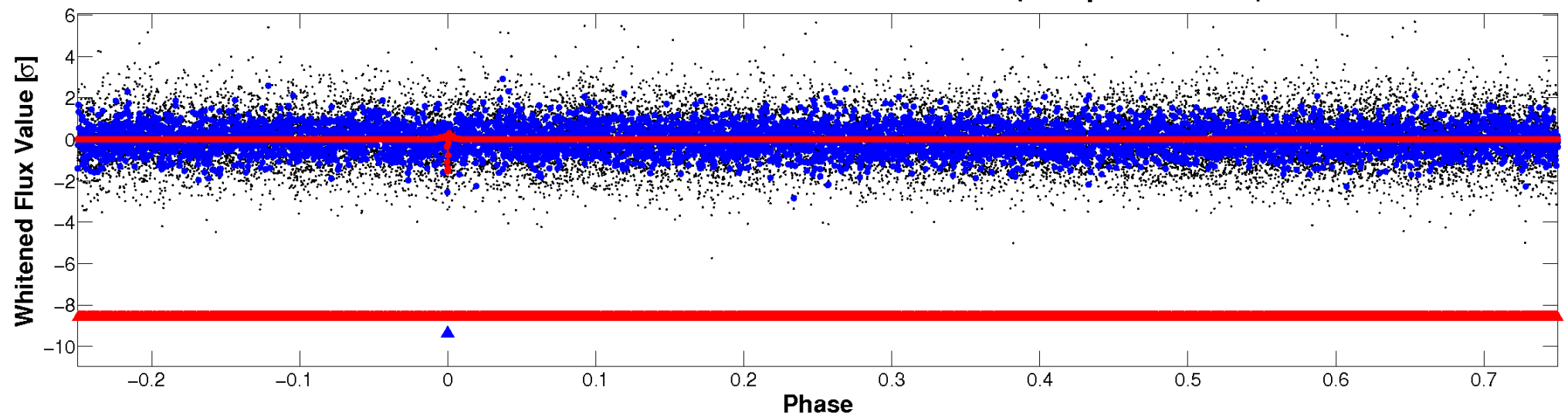


# Non-Whitened Vs. Whitened Light Curve

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

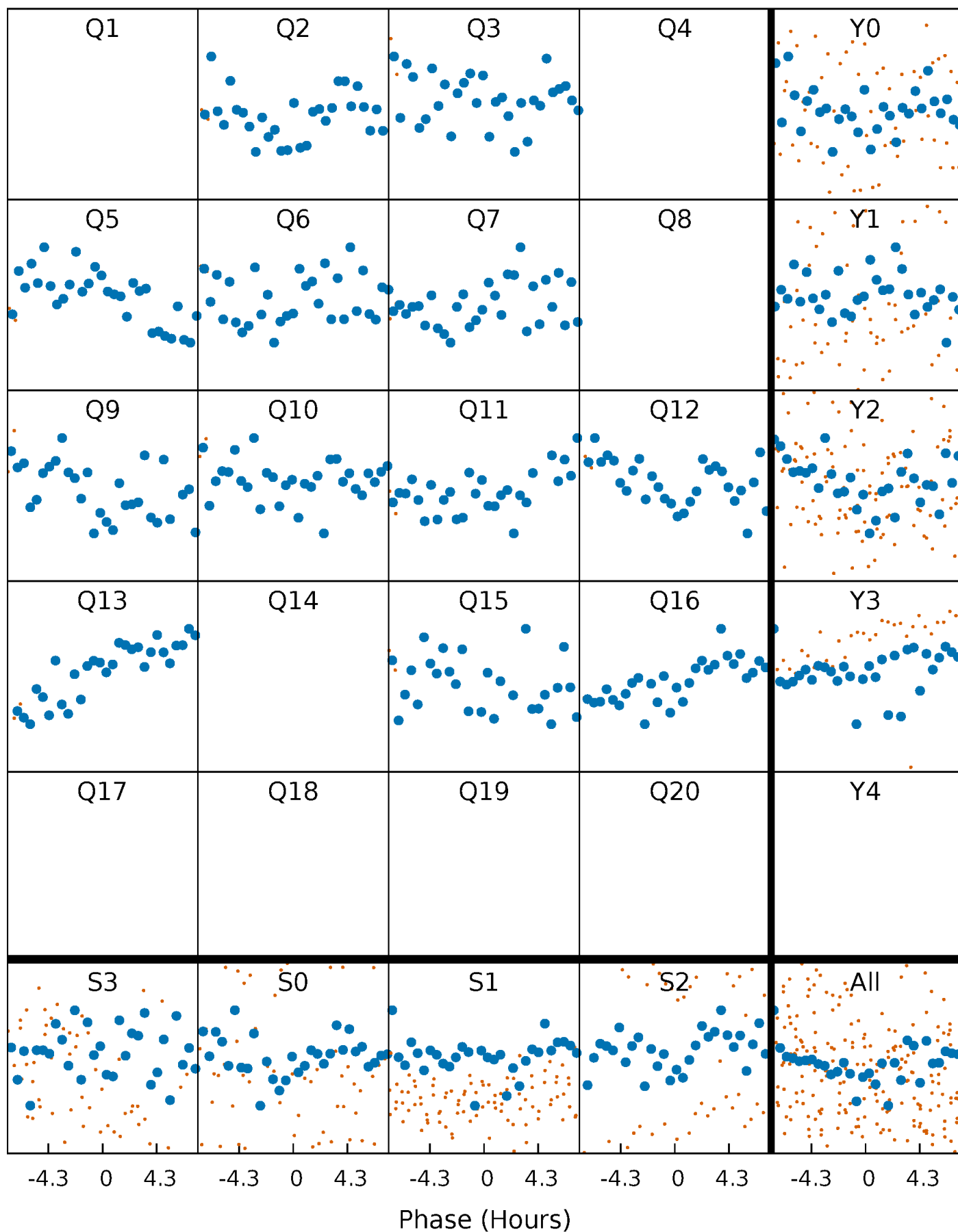


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



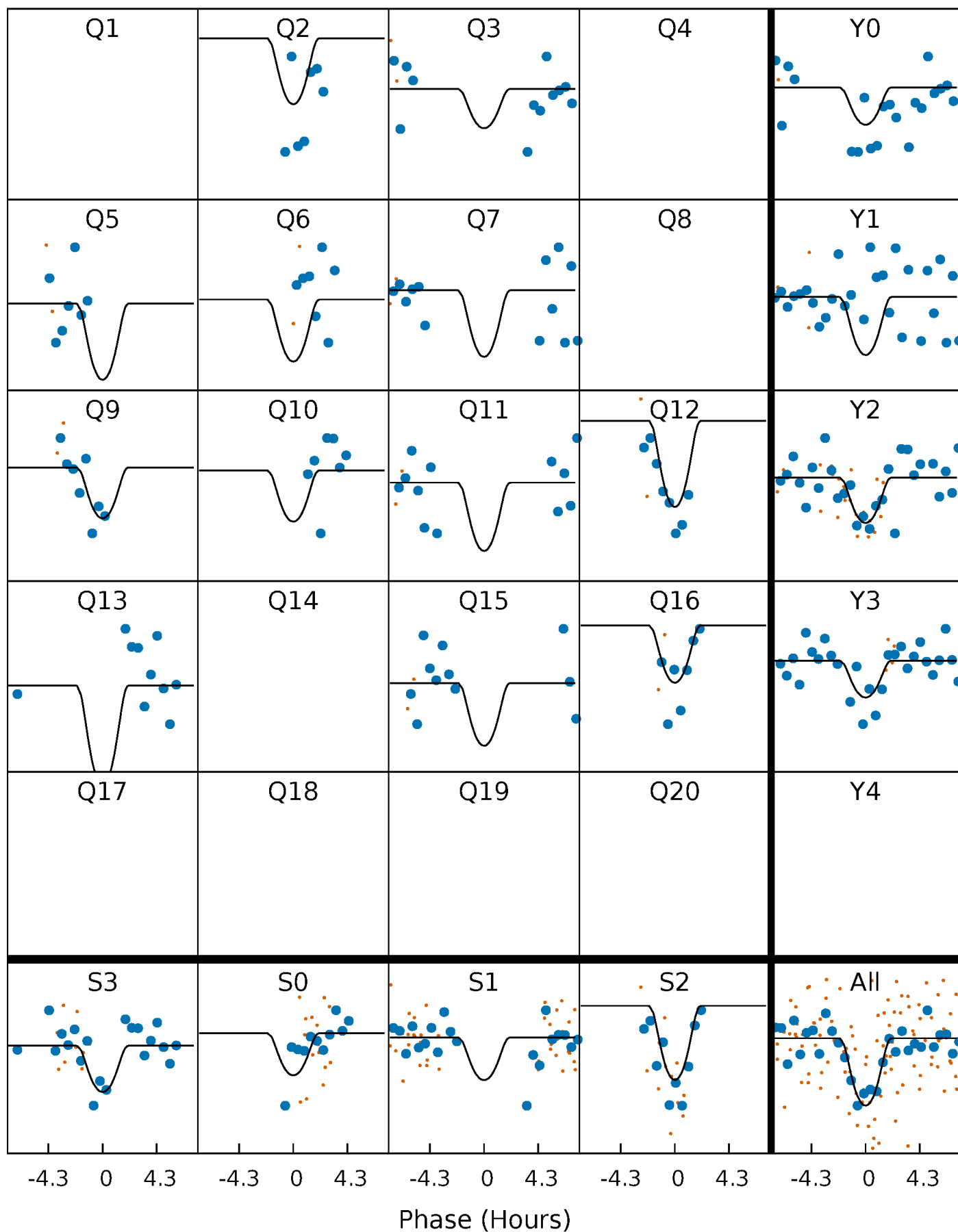
# PDC Quarter-Phased Transit Curves

TCE 003448323-02 P=115.348678 Days  $T_0=233.638341$  (BKJD)



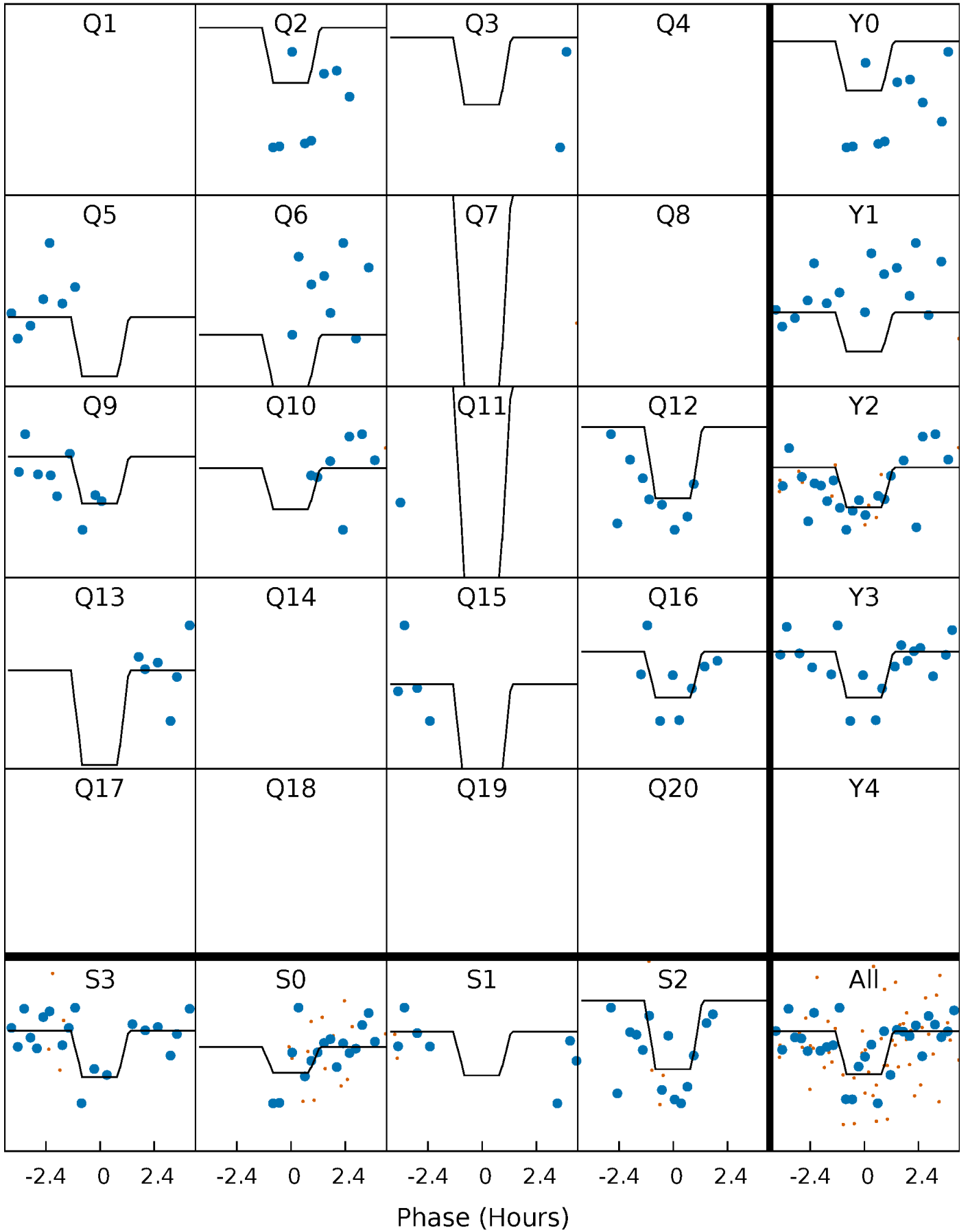
# DV Quarter-Phased Transit Curves

TCE 003448323-02 P=115.348678 Days  $T_0=233.638341$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003448323-02 P=115.349539 Days  $T_0=233.640041$  (BKJD)

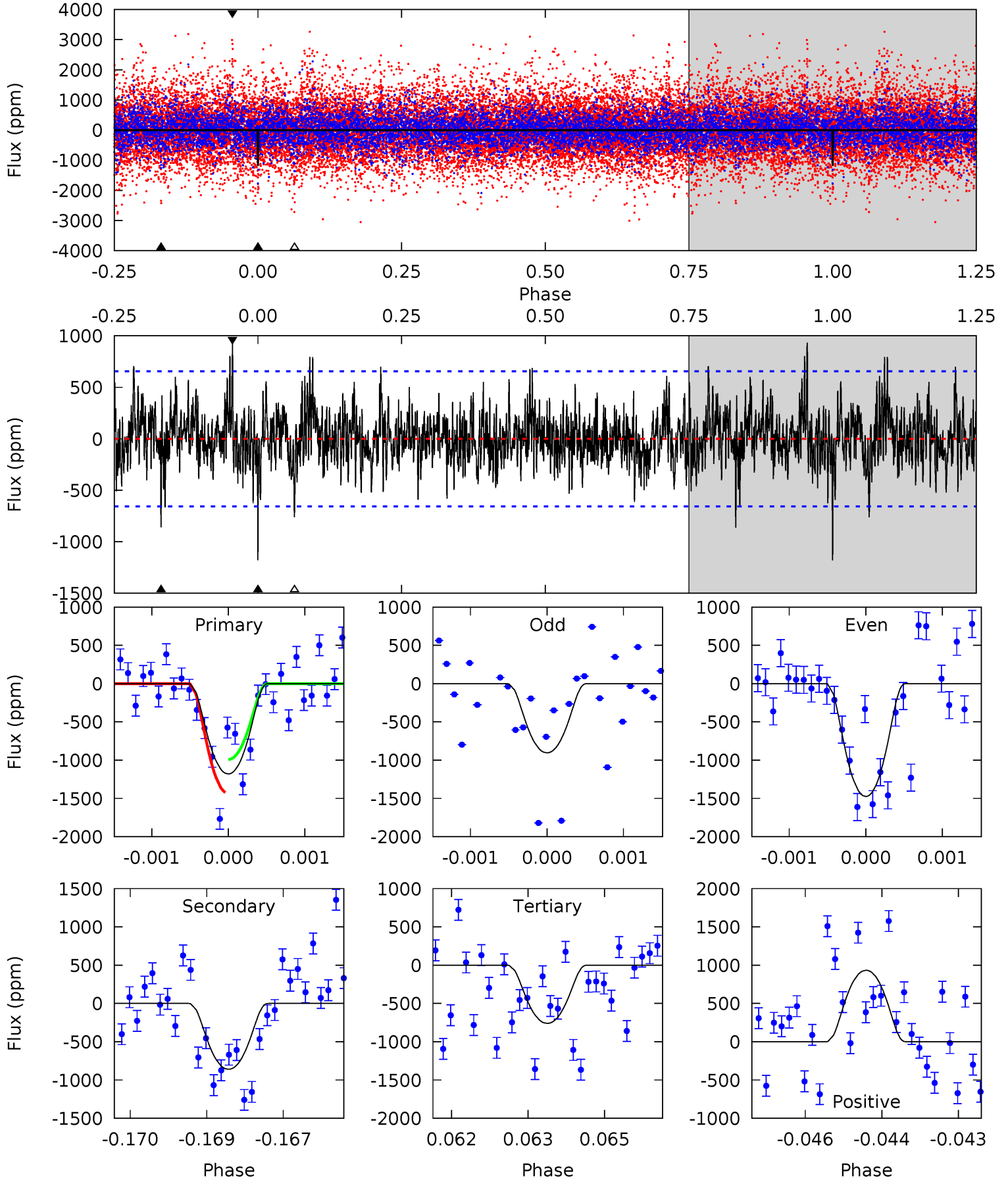




# DV Model-Shift Uniqueness Test

003448323-02, P = 115.348678 Days, E = 118.289663 Days

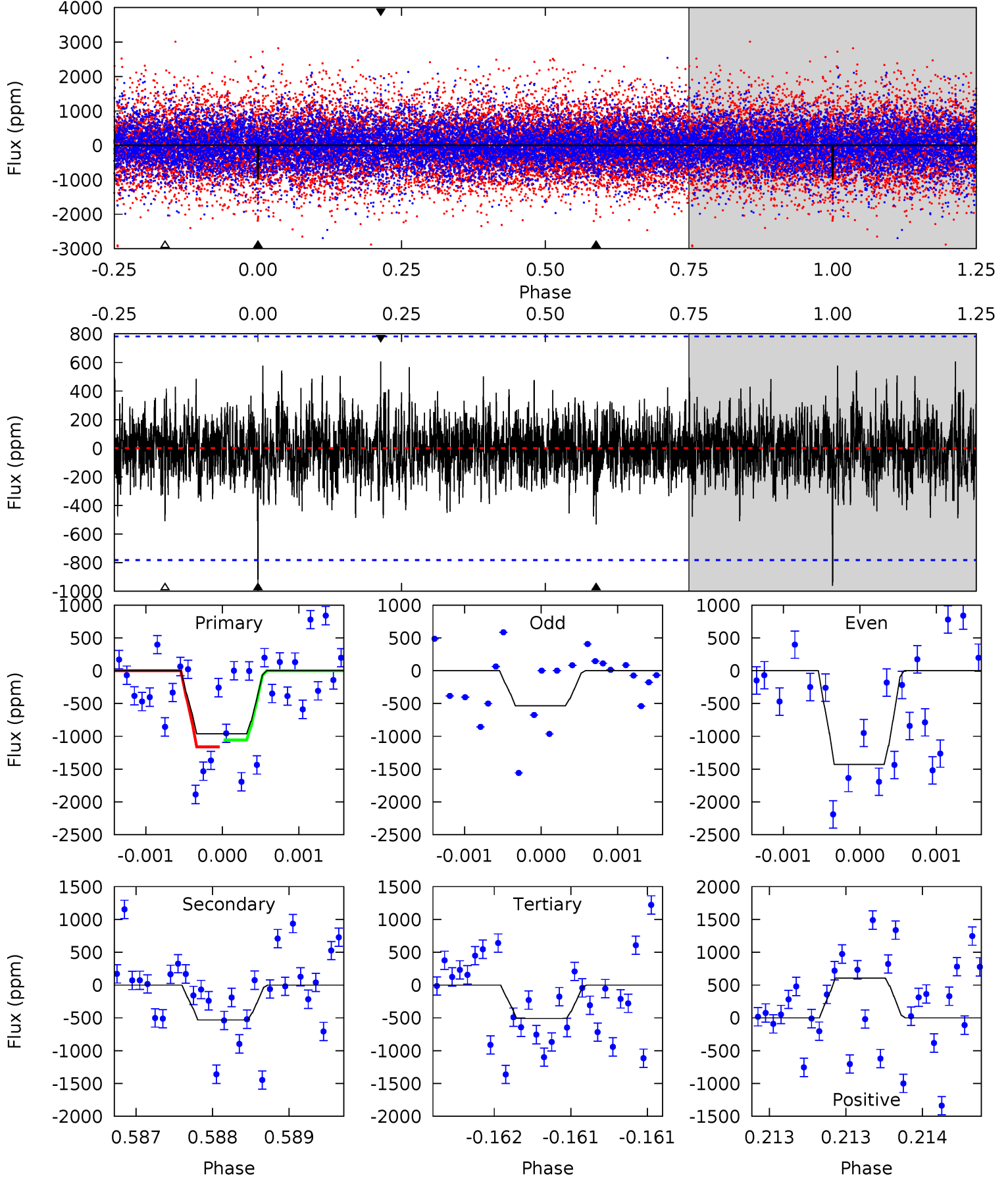
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.68	7.05	6.23	7.66	5.38	3.18	1.75	3.45	2.02	0.82	-0.60	2.34	0.73	0.44	1.75



# Alt Model-Shift Uniqueness Test

003448323-02, P = 115.349539 Days, E = 118.290502 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
6.73	3.73	3.57	4.25	5.48	3.33	1.03	3.16	2.49	0.16	-0.52	3.13	0.73	0.39	0.36



### Stellar Parameters For KIC 003448323

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5495^{+164}_{-164}$	$4.495^{+0.069}_{-0.161}$	$-0.020^{+0.300}_{-0.300}$	$0.882^{+0.210}_{-0.105}$	$0.887^{+0.101}_{-0.082}$	$1.820^{+0.523}_{-0.763}$
	+3%/-3%	+2%/-4%	+1500%/-1500%	+24%/-12%	+11%/-9%	+29%/-42%
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 003448323-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-860 \pm 122$	$5.69^{+4.79}_{-3.72}$	$482^{+30}_{-23}$	$4188^{+2555}_{-816}$	$2965^{+21886}_{-2132}$
Alt.	$-532 \pm 143$	$5.23^{+4.51}_{-3.43}$	$485^{+31}_{-22}$	$3935^{+2097}_{-711}$	$2036^{+15740}_{-1453}$

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

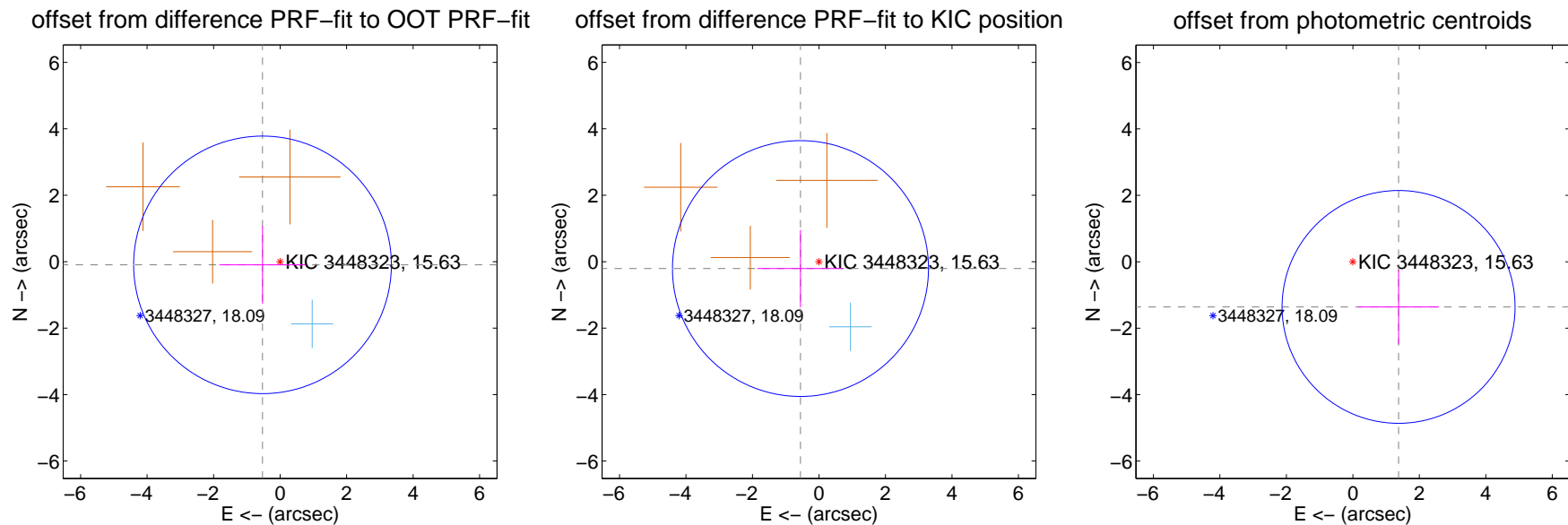
## DV Centroid Data

Supplemental centroid analysis for 003448323-02. Kepler magnitude: 15.63. Transit SNR 6.41

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.538 \pm 1.292$	0.42	$0.529 \pm 1.296$	$-0.095 \pm 1.165$
PRF-fit source offset from KIC position	$0.594 \pm 1.284$	0.46	$0.557 \pm 1.299$	$-0.206 \pm 1.163$
photometric centroid source offset	$1.93 \pm 1.17$	1.66	$-1.38 \pm 1.21$	$-1.36 \pm 1.12$



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.

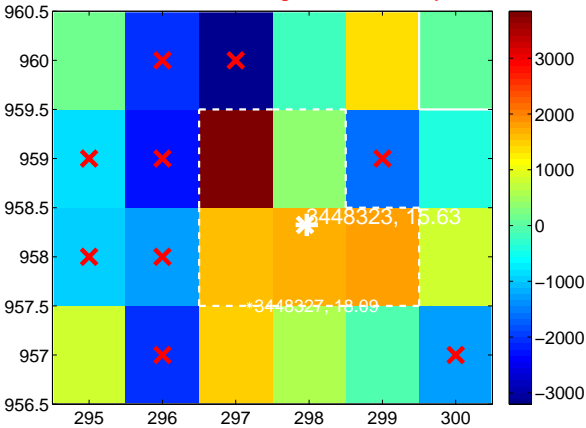
Q1 no difference image



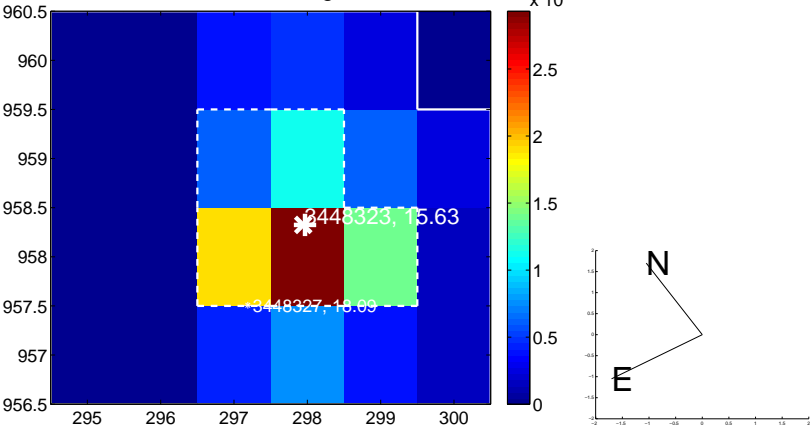
Q1 no OOT image



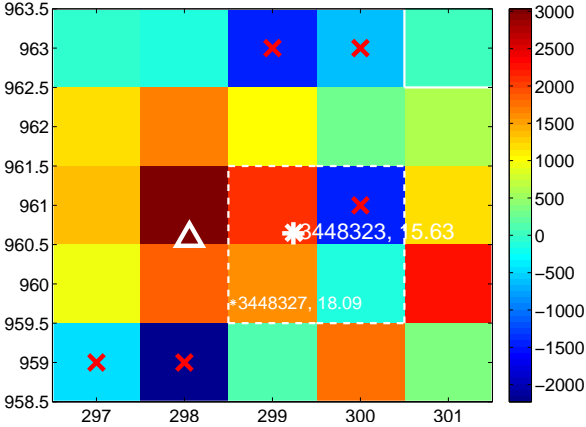
Q2 difference image. Poor Quality



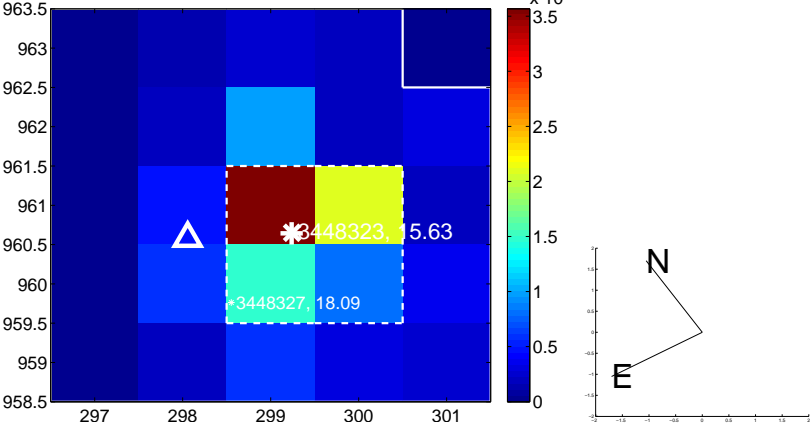
Q2 OOT image



Q3 difference image. Poor Quality



Q3 OOT image



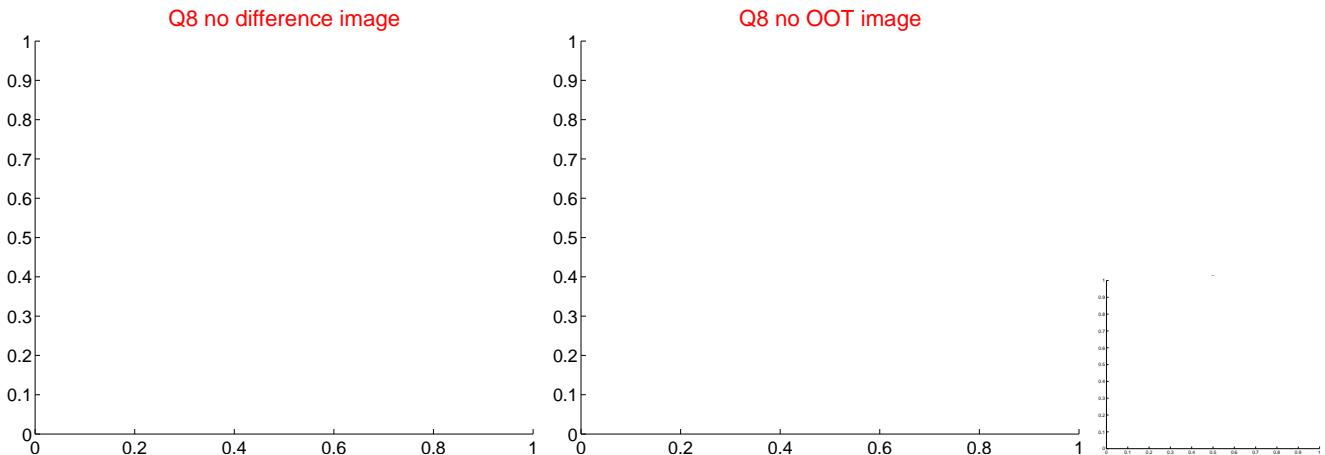
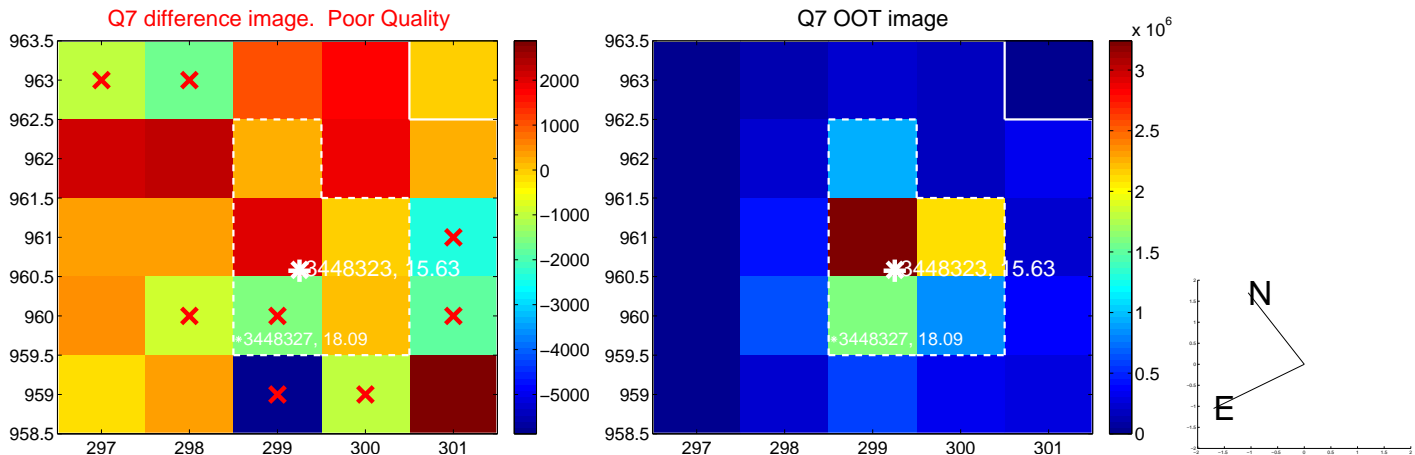
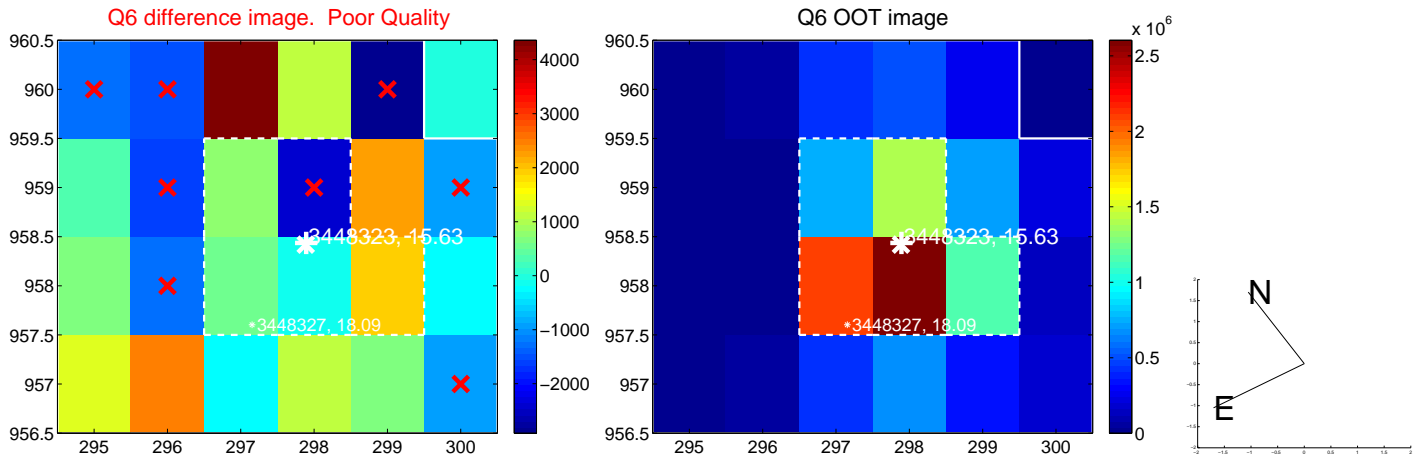
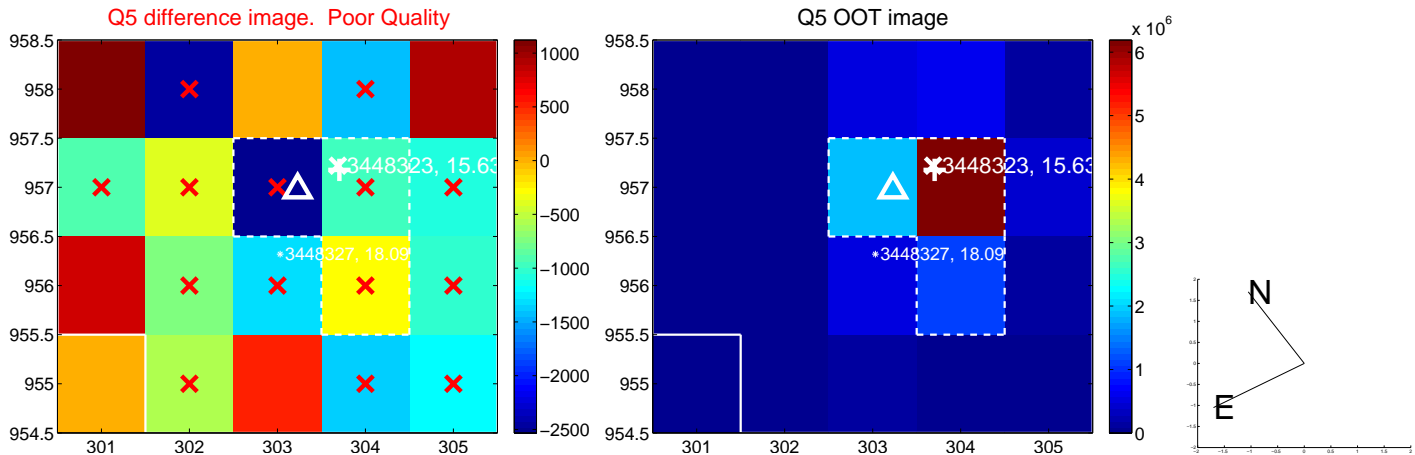
Q4 no difference image



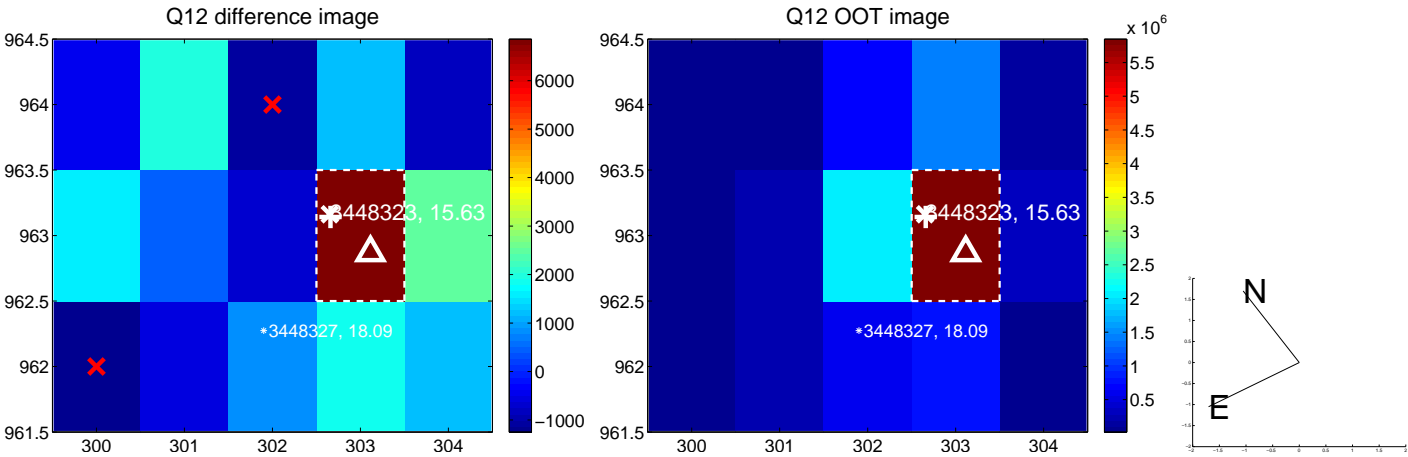
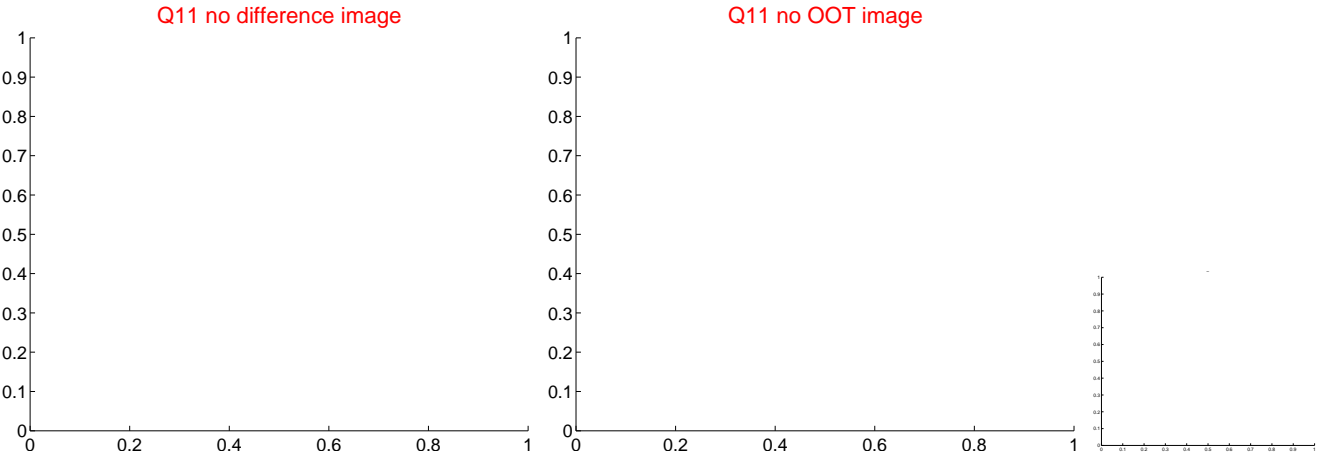
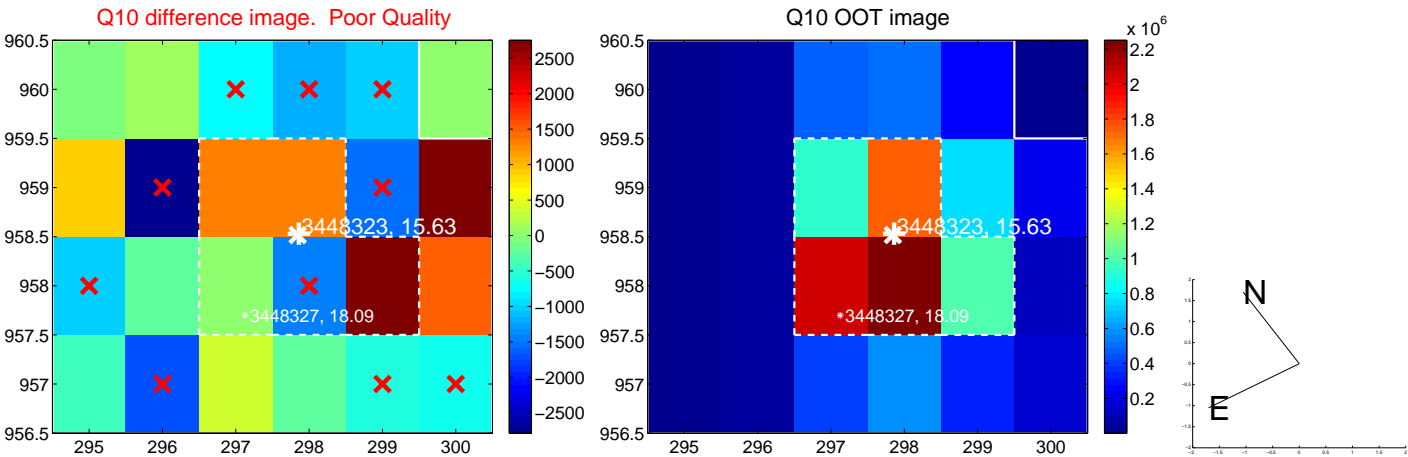
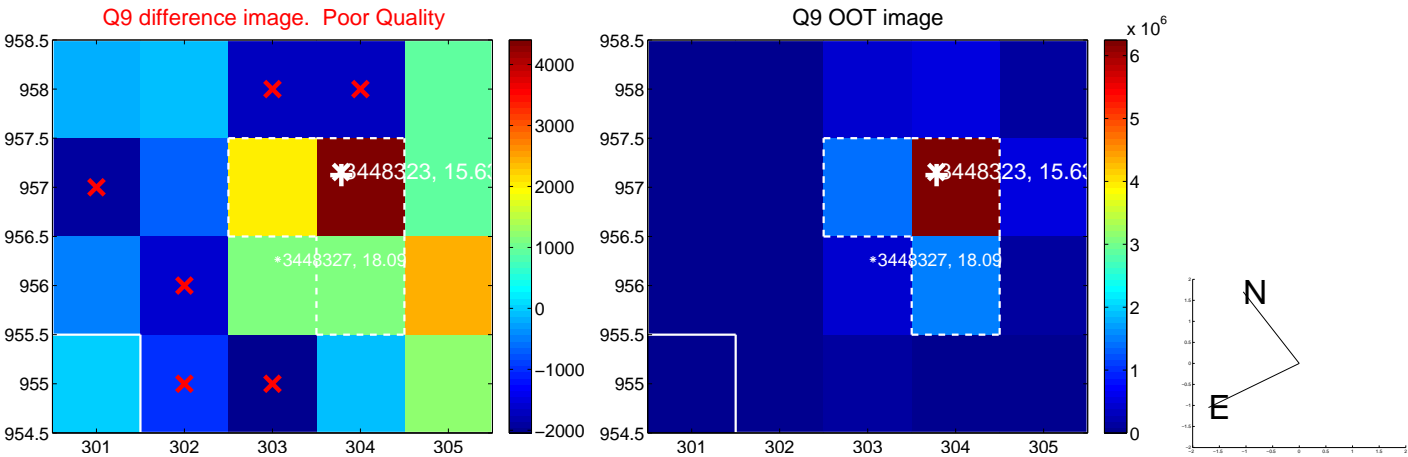
Q4 no OOT image



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

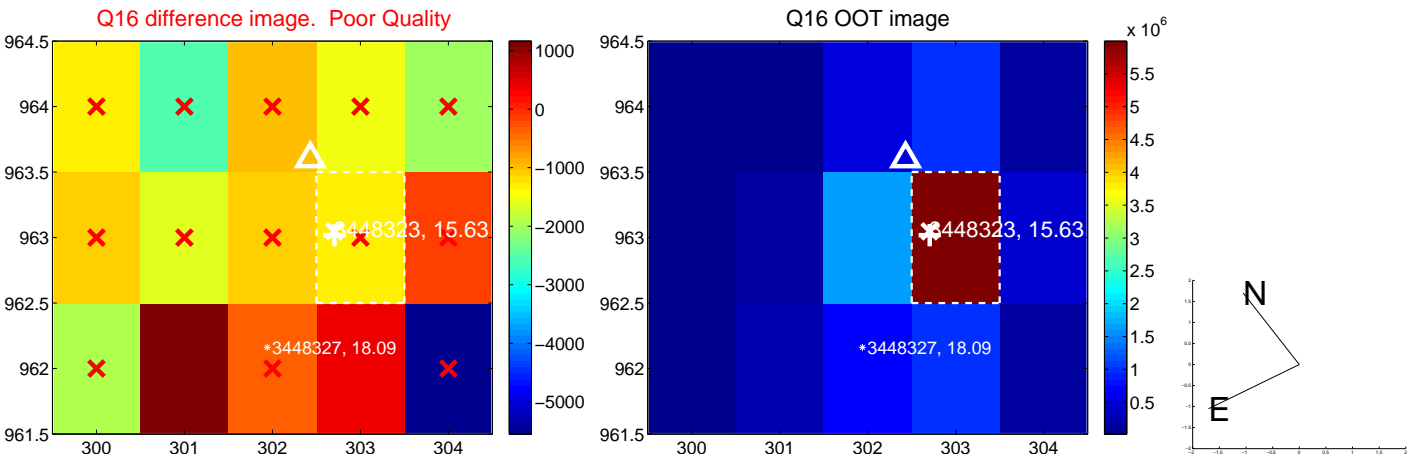
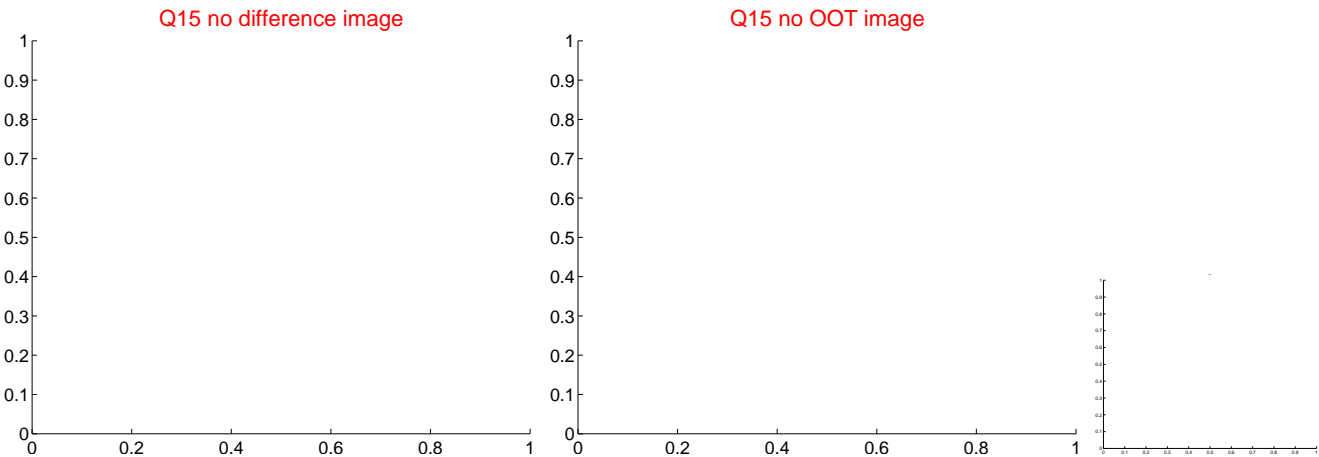
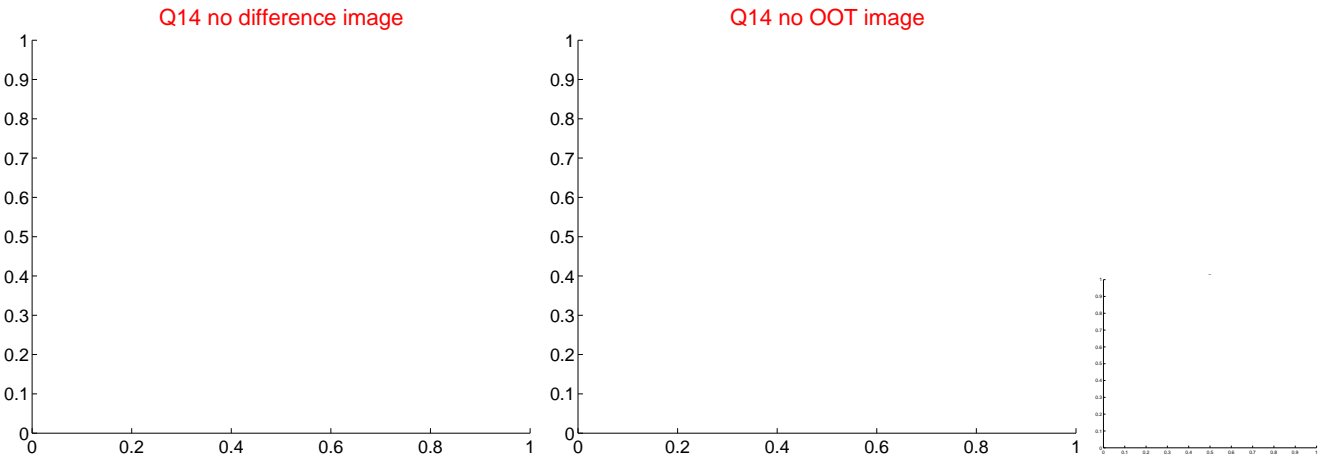
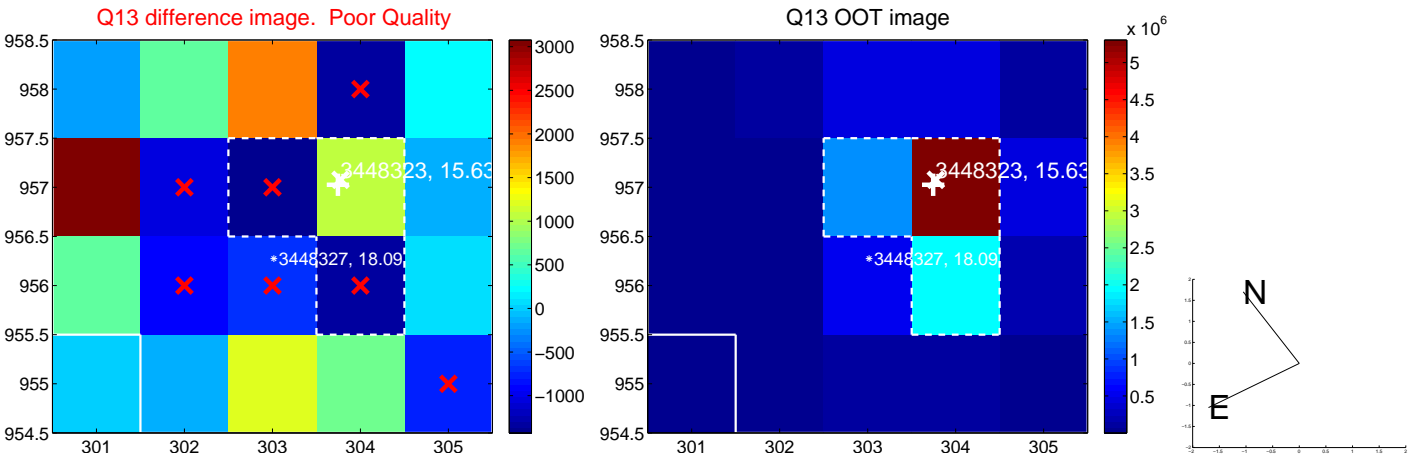


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

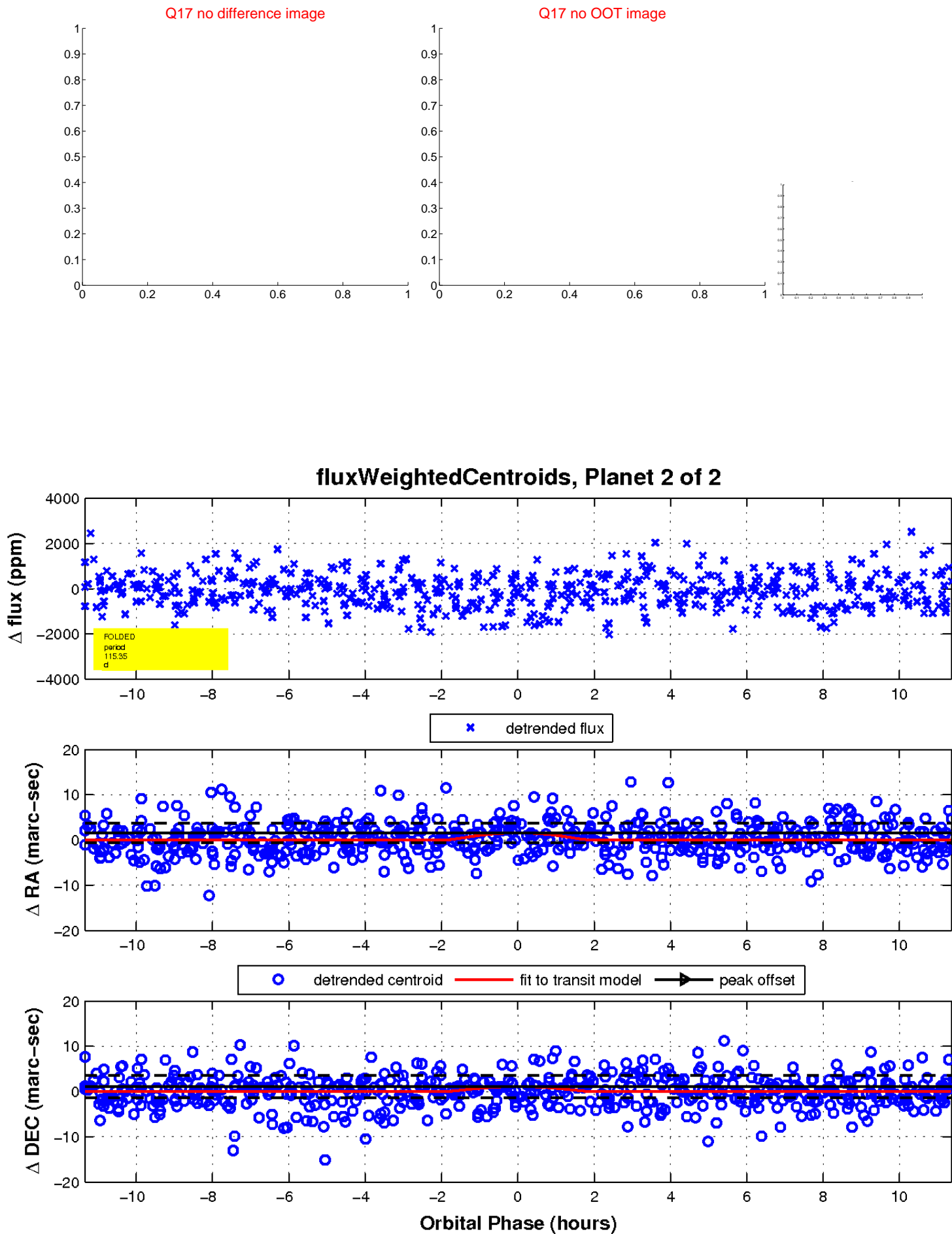




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

