

# KIC 003642335

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003642335-01	OBS	3010.01	60.866242	179.284662	746.7	4.565	12.7	13.3	0.52	3808	1.58	0.84
003642335-02	OBS	No	1.345252	131.534833	790.5	5.000	9.0	-1.0	0.52	3808	1.45	136.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003642335-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
003642335-02	OBS	FP	0.00	1	0	0	0	LPP_DV—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 003642335-01

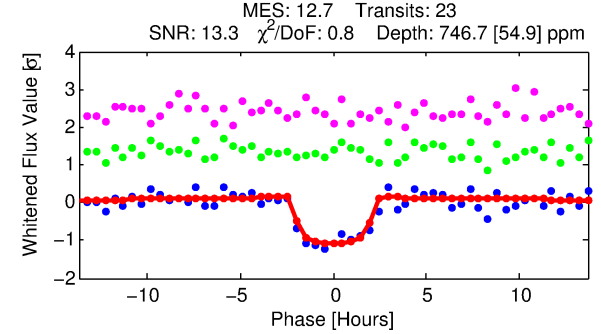
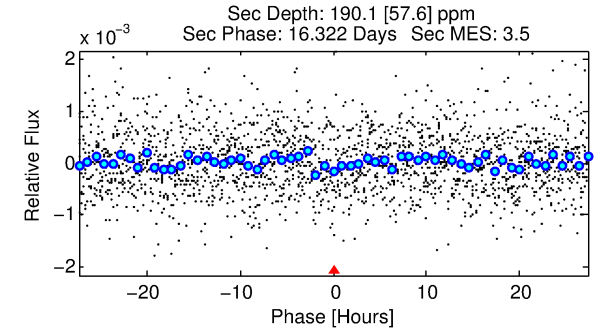
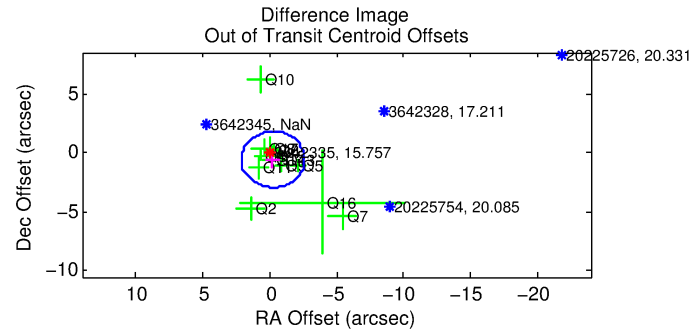
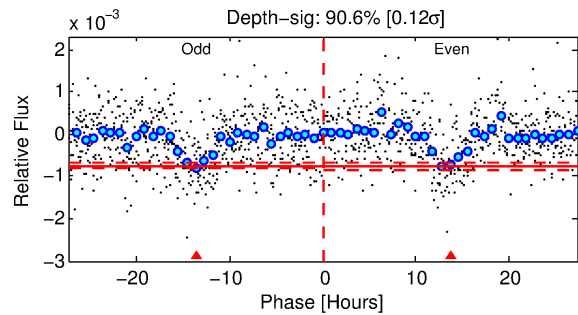
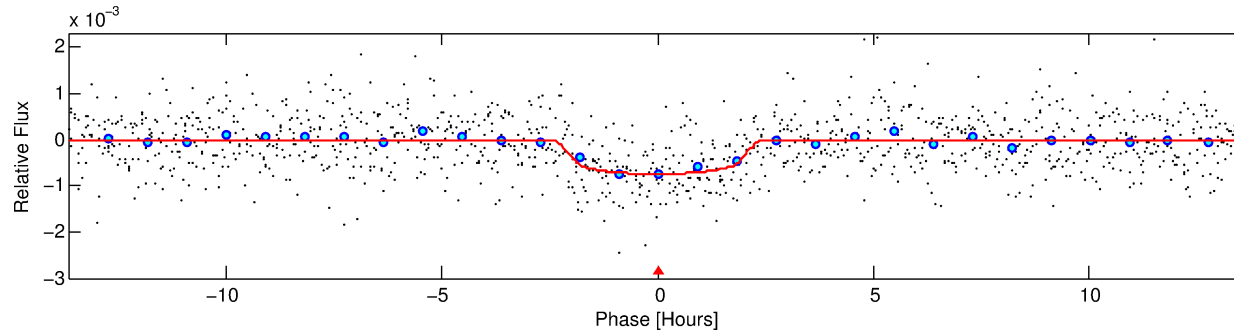
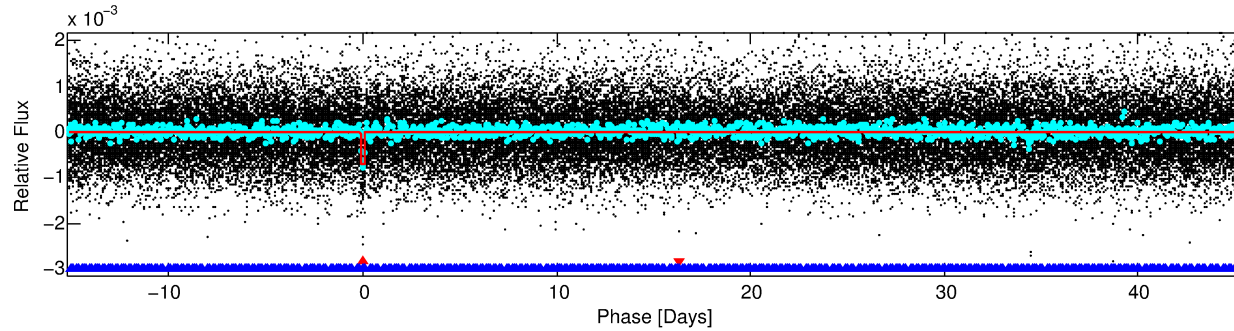
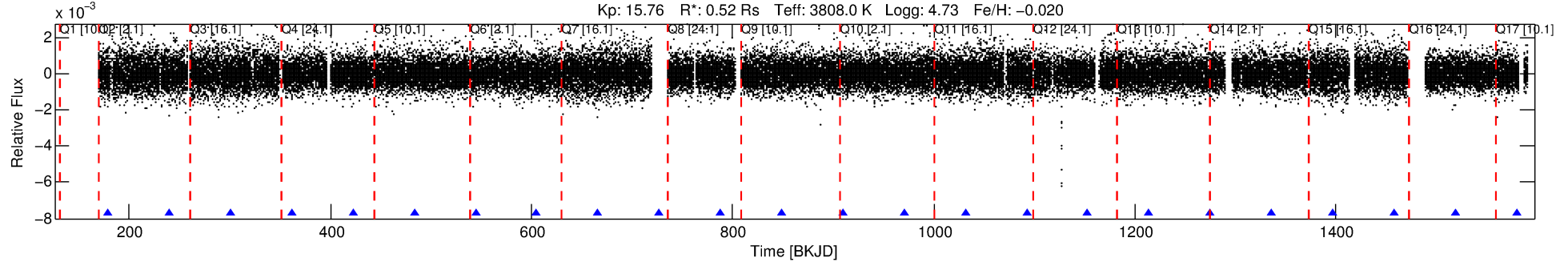
No Significant Match Found

# DV One-Page Summary

KIC: 3642335 Candidate: 1 of 2 Period: 60.866 d

KOI: K03010.01 Corr: 0.984

Kp: 15.76 R\*: 0.52 Rs Teff: 3808.0 K Logg: 4.73 Fe/H: -0.020



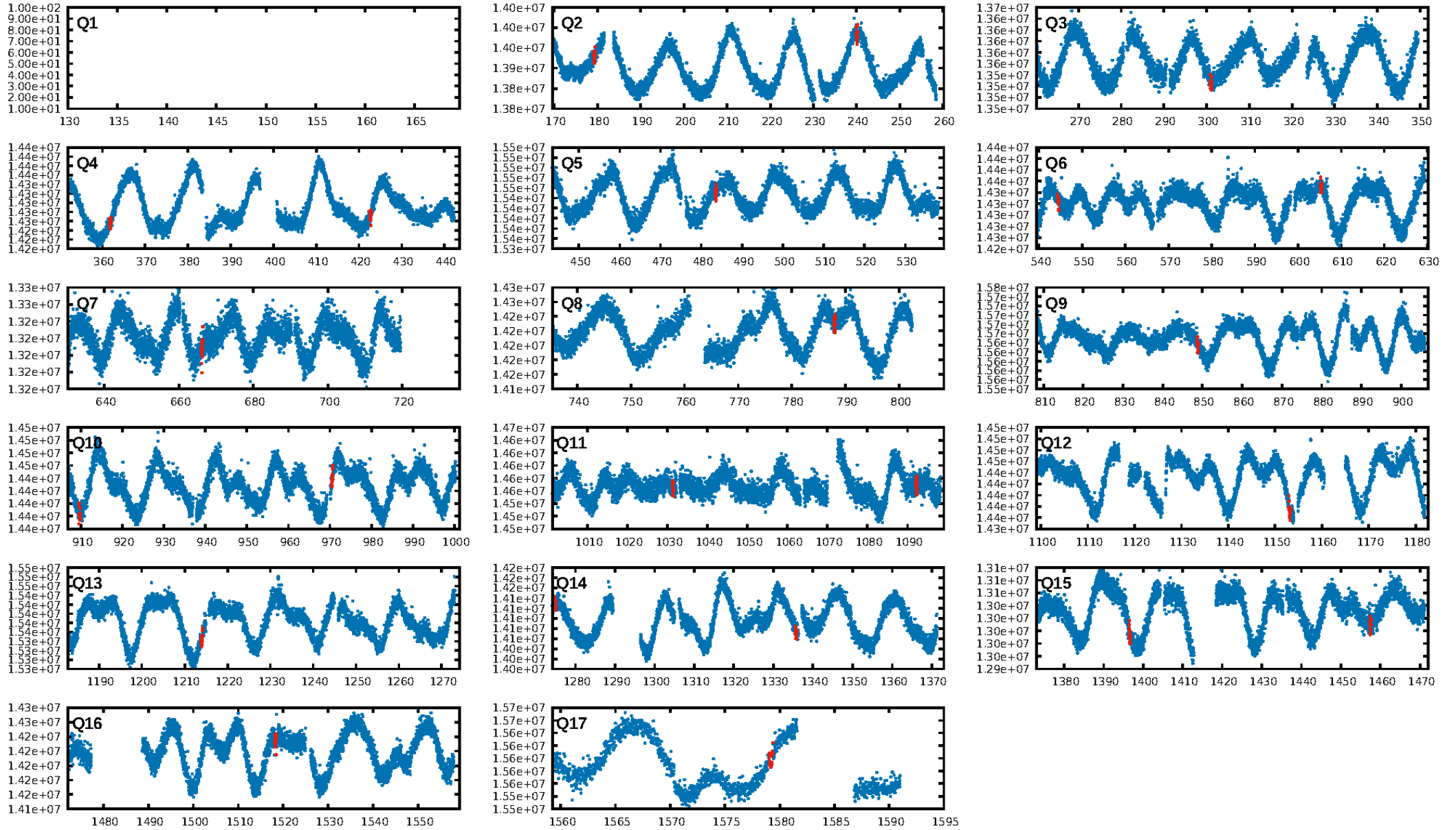
DV Fit Results:  
 Period = 60.86624 [0.00047] d  
 Epoch = 179.2847 [0.0066] BKJD  
 Rp/R\* = 0.0277 [0.0101]  
 a/R\* = 66.33 [100.76]  
 b = 0.80 [0.71]  
 Seff = 0.85 [0.09]  
 Teq = 244 [6] K  
 Rp = 1.58 [0.58] Re  
 a = 0.2464 [0.0127] AU  
 Ag = 2542.63 [2007.02] [1.27σ]  
 Teffp = 2684 [530] K [4.60σ]

DV Diagnostic Results:  
 ShortPeriod-sig: 100.0% [211.00σ]  
 LongPeriod-sig: N/A  
 ModelChiSquare2-sig: 99.0%  
 ModelChiSquareGof-sig: 100.0%  
 Bootstrap-pfa: 5.26e-32  
 RollingBand-fgt: 1.00 [22/22]  
 GhostDiagnostic-chr: 2.258  
 Centroid-sig: 5.2%  
 Centroid-so: 2.091 arcsec [2.12σ]  
 OotOffset-rm: 0.616 arcsec [0.78σ]  
 KicOffset-rm: 0.548 arcsec [1.17σ]  
 OotOffset-st: 4/3/3/4 [14]  
 KicOffset-st: 4/3/3/4 [14]  
 DiffImageQuality-fgm: 0.71 [10/14]  
 DiffImageOverlap-fno: 0.25 [4/16]

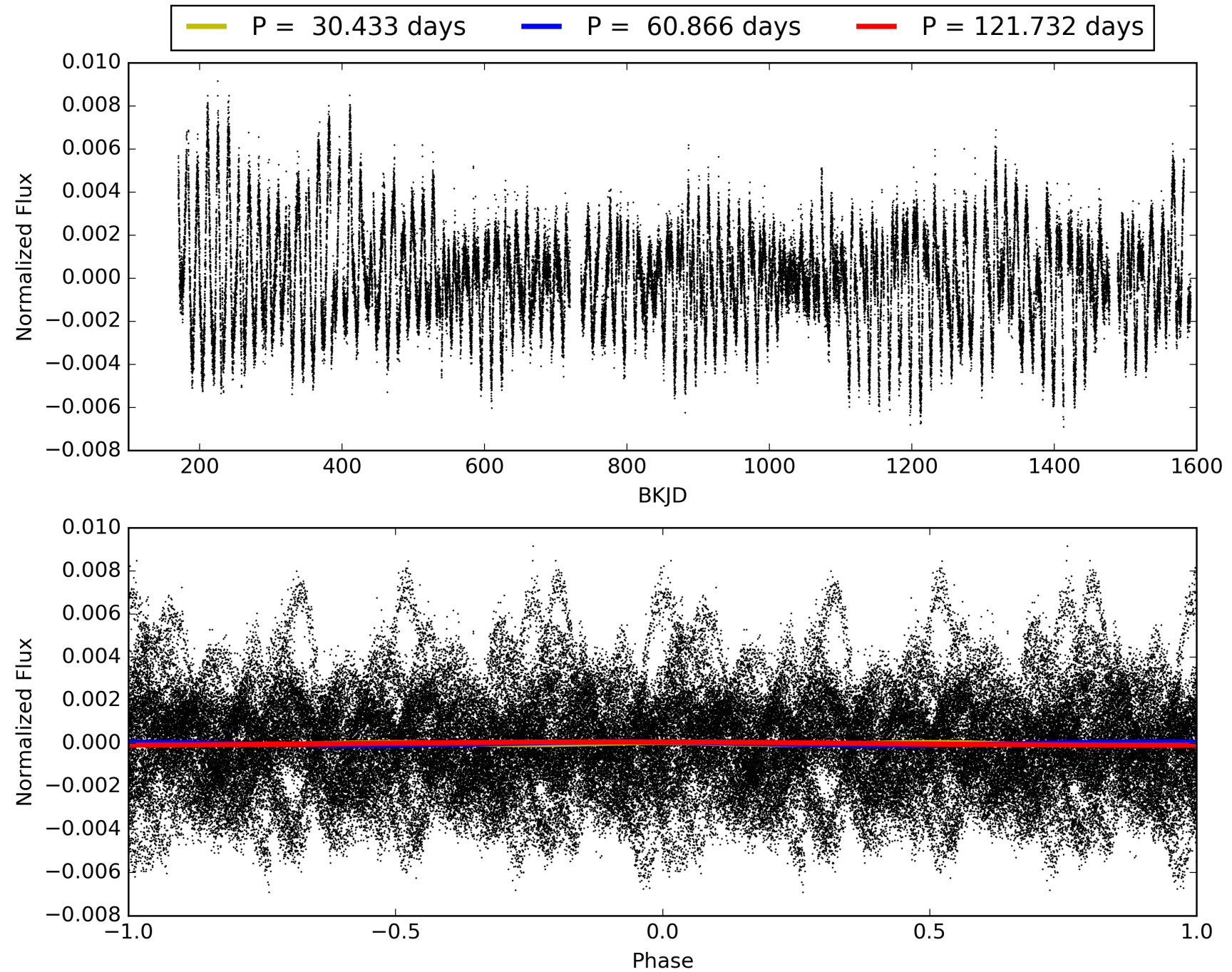
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:59:29 Z

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

# TCE 003642335-01, PDC Light Curves

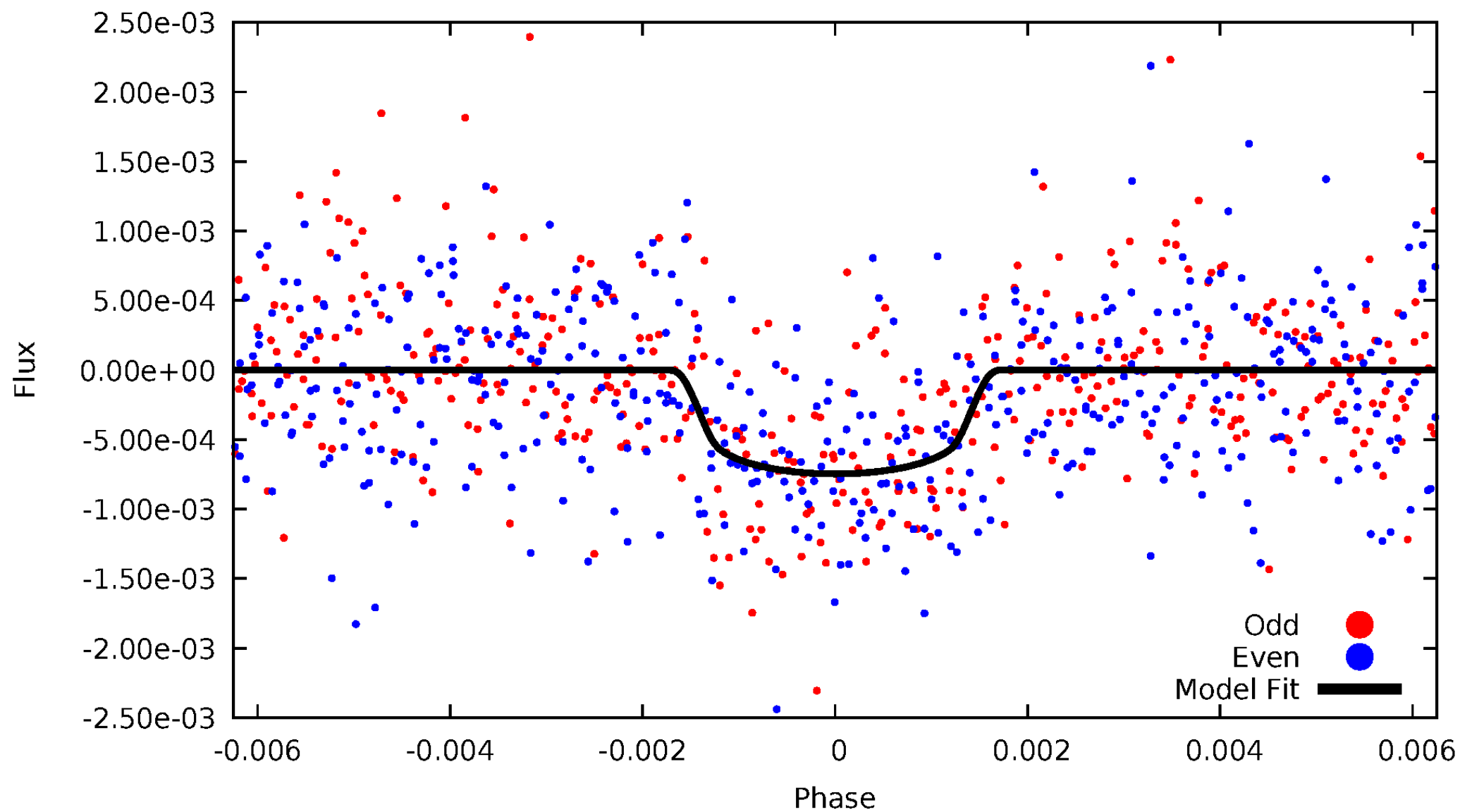


TCE 003642335-01



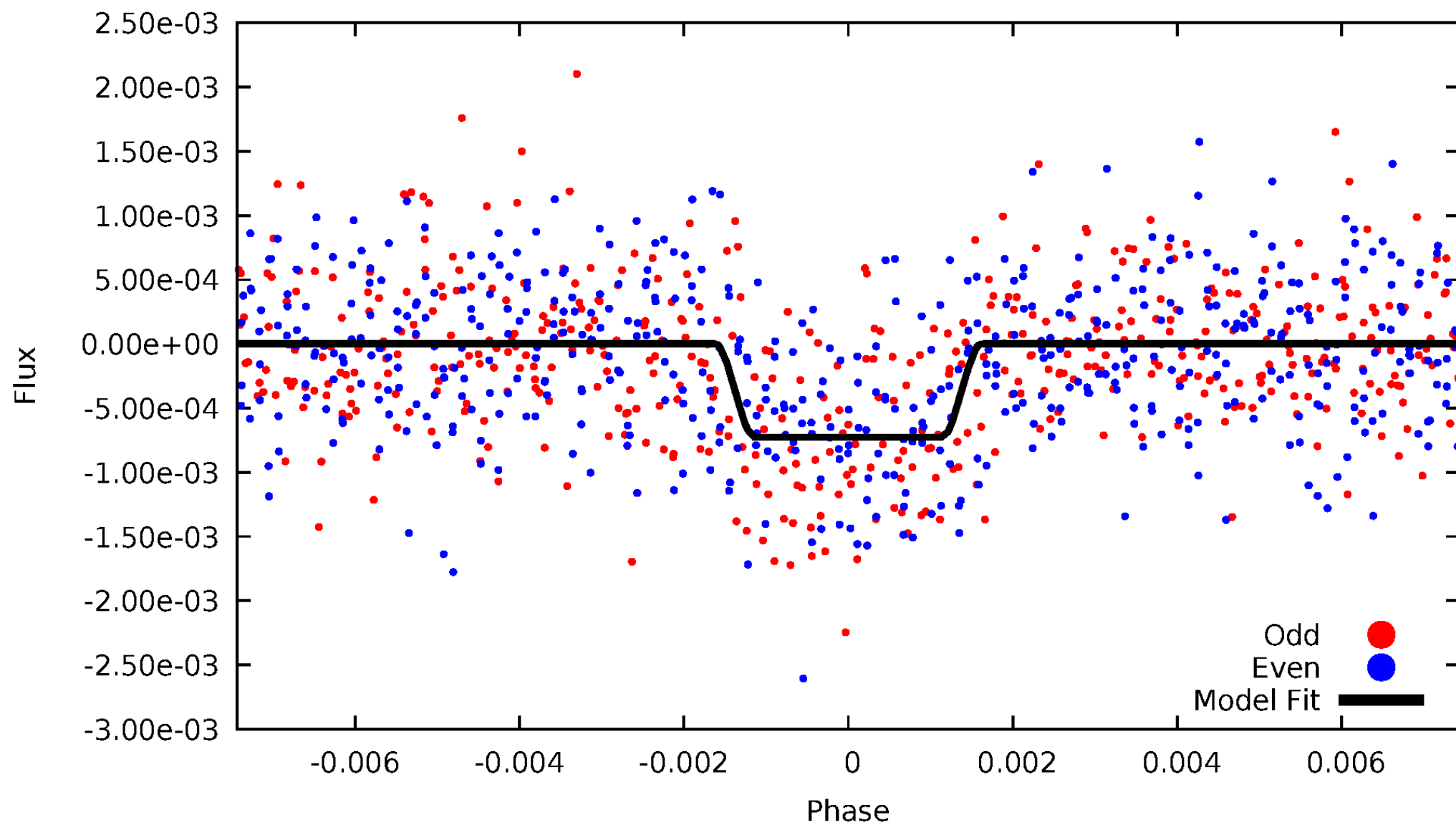
# DV Odd/Even

TCE 003642335-01



# ALT Odd/Even

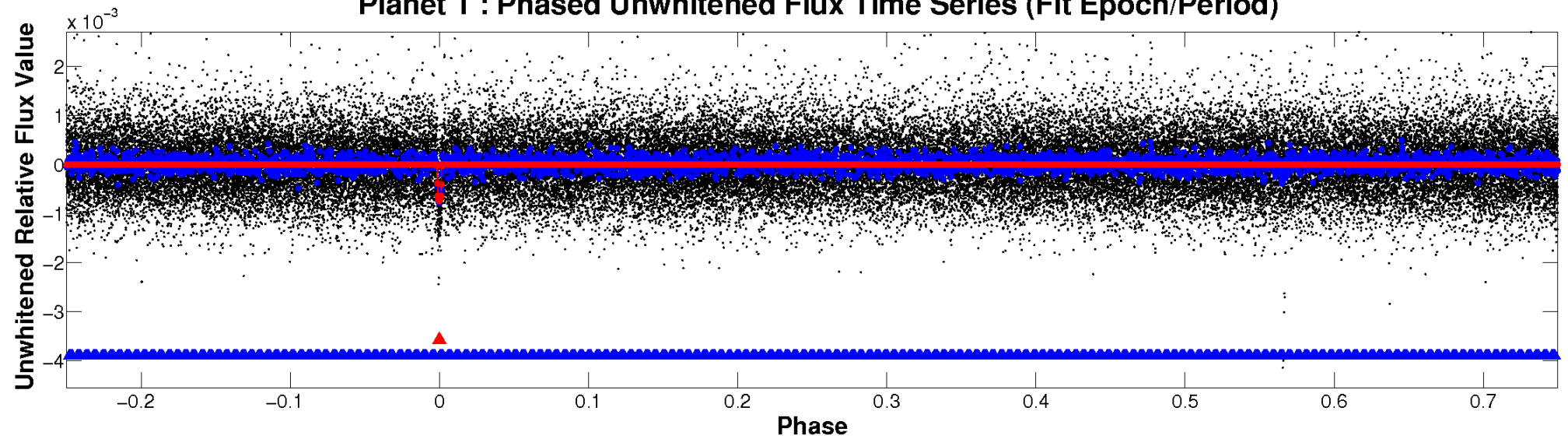
TCE 003642335-01



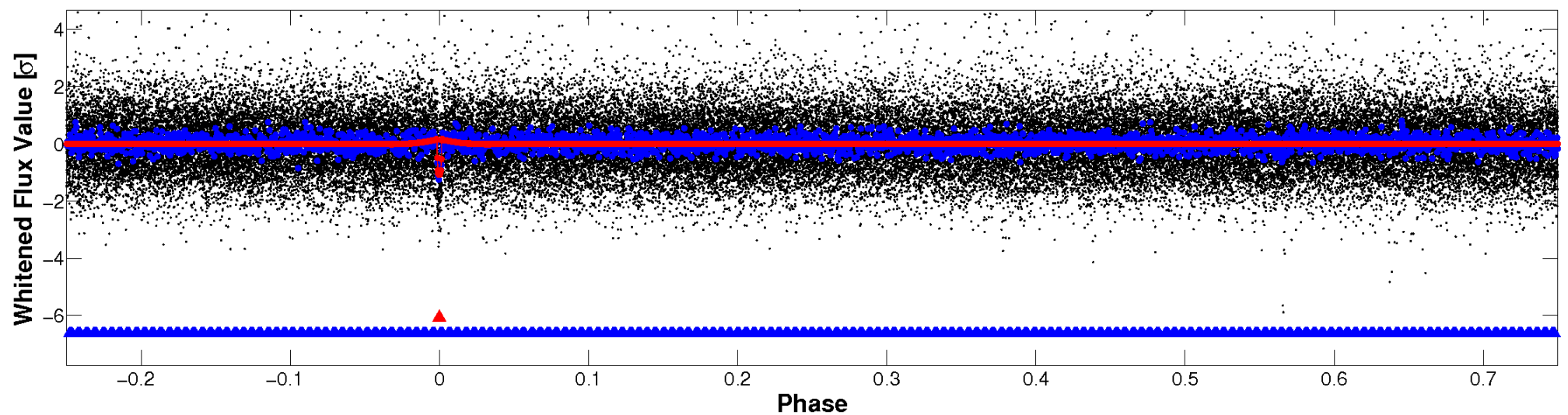


# Non-Whitened Vs. Whitened Light Curve

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

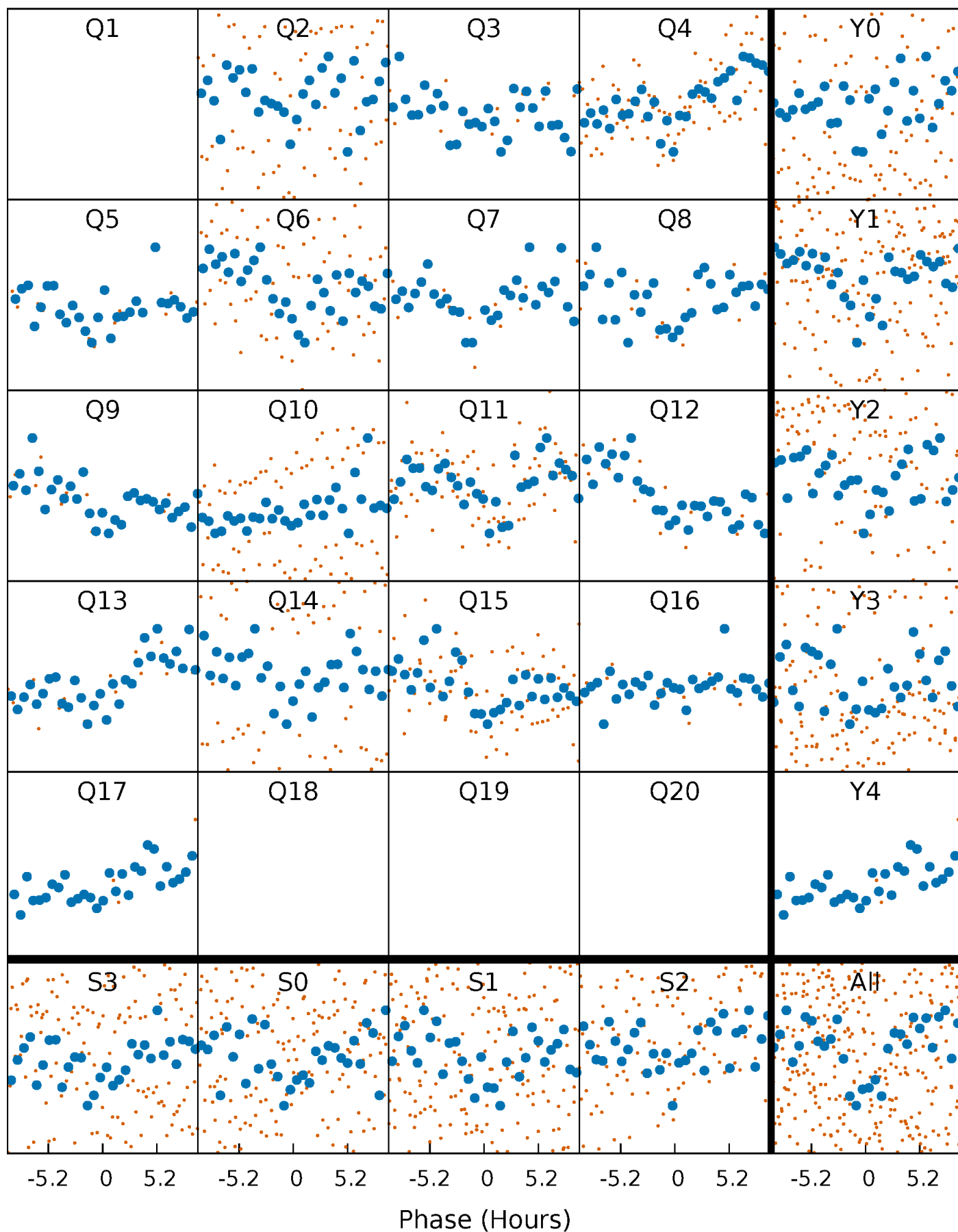


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

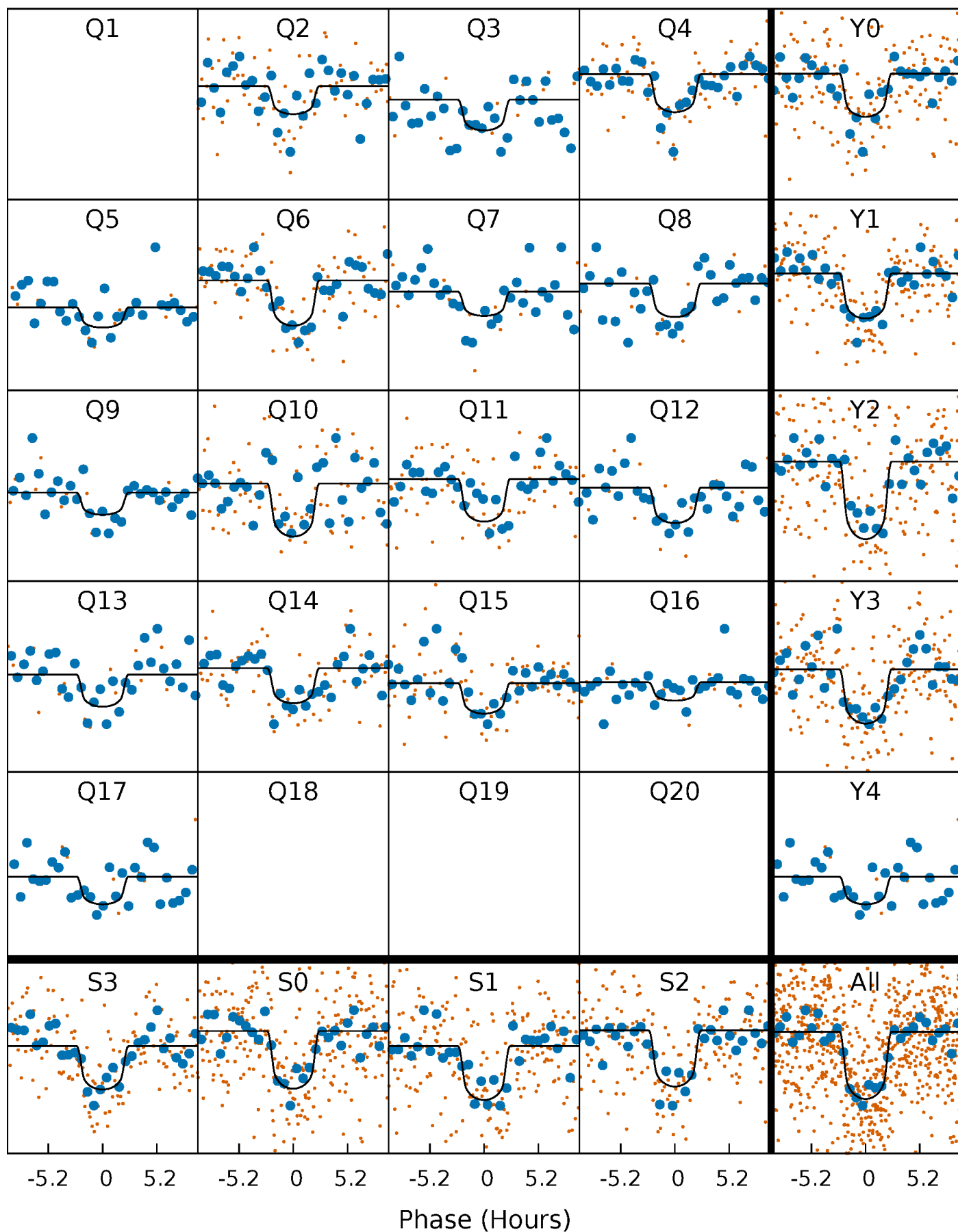
TCE 003642335-01 P= 60.866242 Days  $T_0=179.284662$  (BKJD)





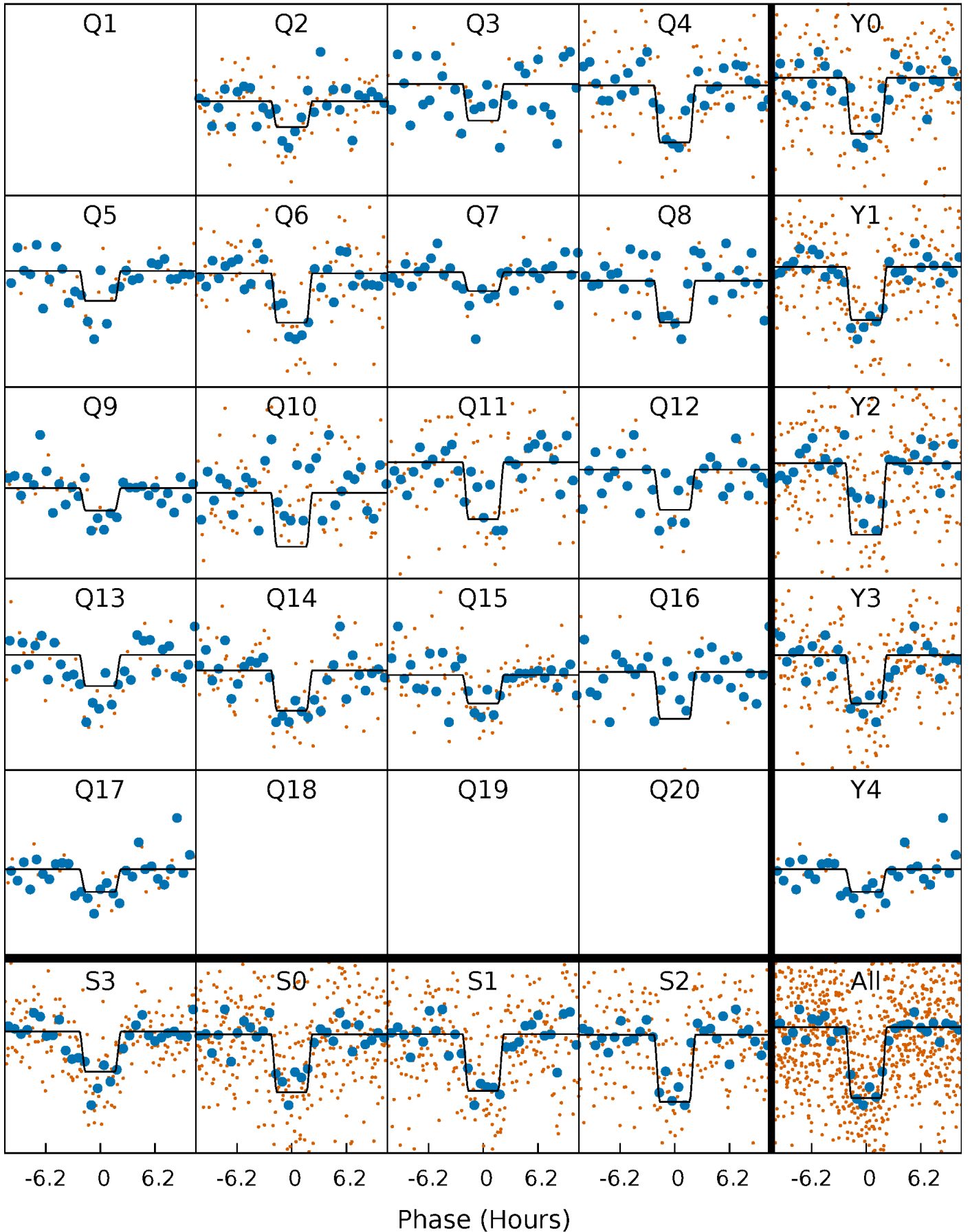
# DV Quarter-Phased Transit Curves

TCE 003642335-01 P= 60.866242 Days  $T_0=179.284662$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

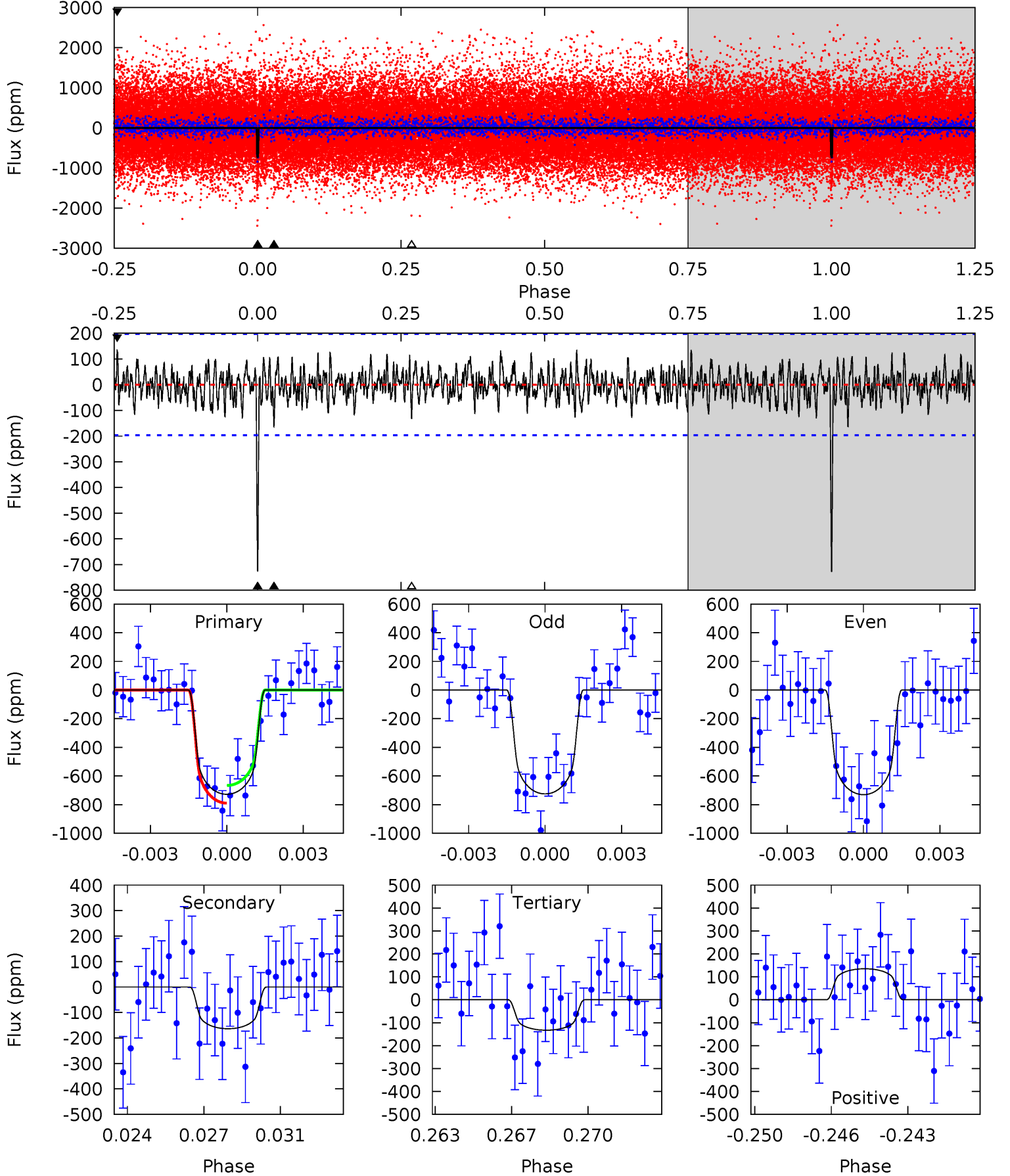
TCE 003642335-01 P= 60.867121 Days  $T_0=179.274221$  (BKJD)



# DV Model-Shift Uniqueness Test

003642335-01, P = 60.866242 Days, E = 118.418420 Days

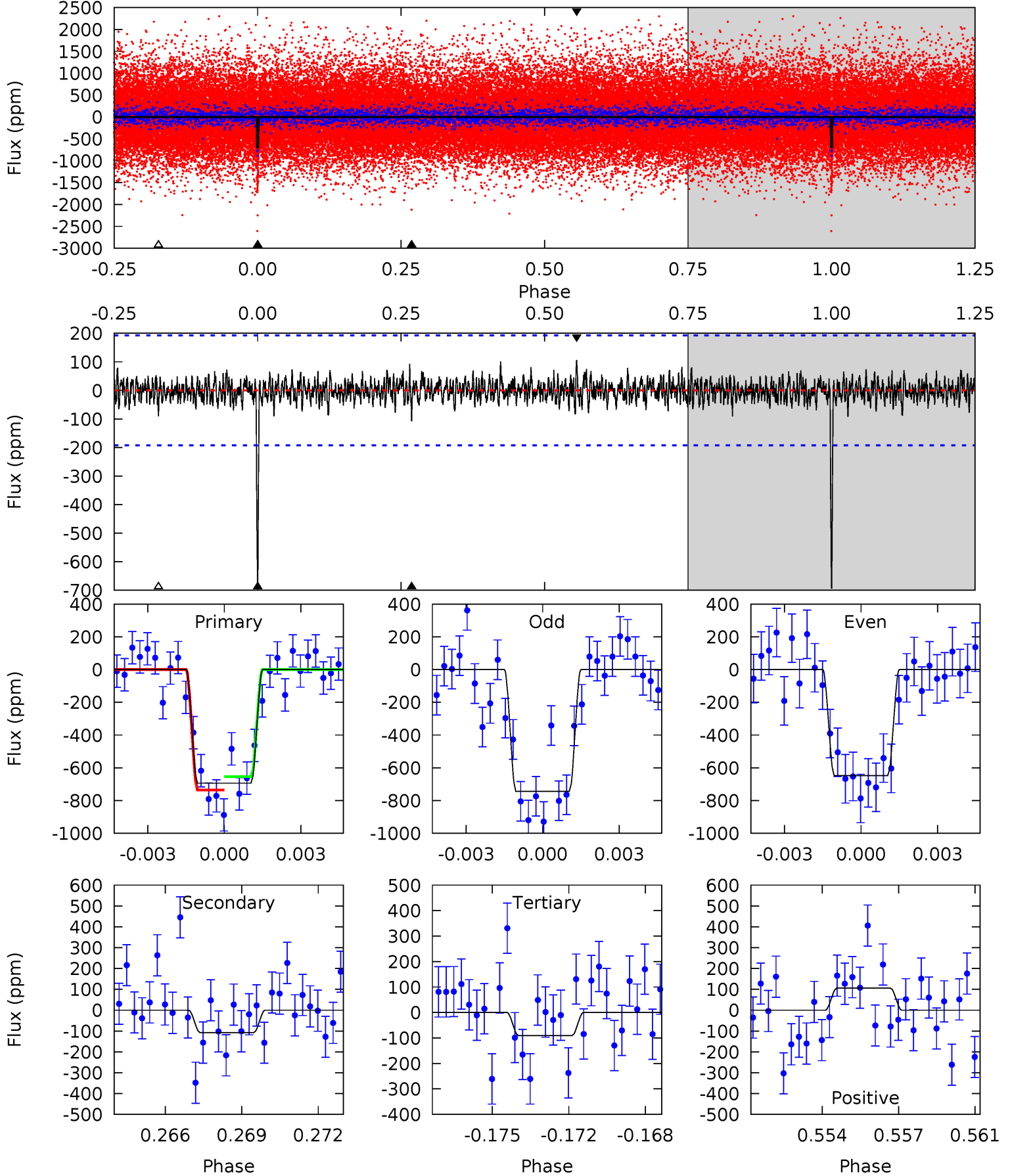
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	4.35	3.53	3.59	5.23	2.93	1.24	15.8	15.8	0.82	0.76	0.07	0.96	0.16	1.65



# Alt Model-Shift Uniqueness Test

003642335-01, P = 60.867121 Days, E = 118.407100 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
18.9	2.94	2.46	2.88	5.24	2.94	0.78	16.4	16.0	0.47	0.05	1.30	0.87	0.13	1.12



### Stellar Parameters For KIC 003642335

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3808^{+69}_{-76}$	$4.734^{+0.033}_{-0.027}$	$-0.020^{+0.150}_{-0.150}$	$0.522^{+0.028}_{-0.035}$	$0.539^{+0.030}_{-0.037}$	$5.338^{+0.872}_{-0.572}$
	+2%/-2%	+1%/-1%	+750%/-750%	+5%/-7%	+6%/-7%	+16%/-11%
Source	SPE70	PHO2	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 003642335-01 / KOI 3010.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-164 \pm 38$	$1.60^{+0.58}_{-0.59}$	$341^{+7}_{-8}$	$2990^{+401}_{-266}$	$2142^{+3072}_{-1067}$
Alt.	$-108 \pm 37$	$1.52^{+0.57}_{-0.58}$	$341^{+7}_{-8}$	$2842^{+456}_{-275}$	$1480^{+2729}_{-807}$

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

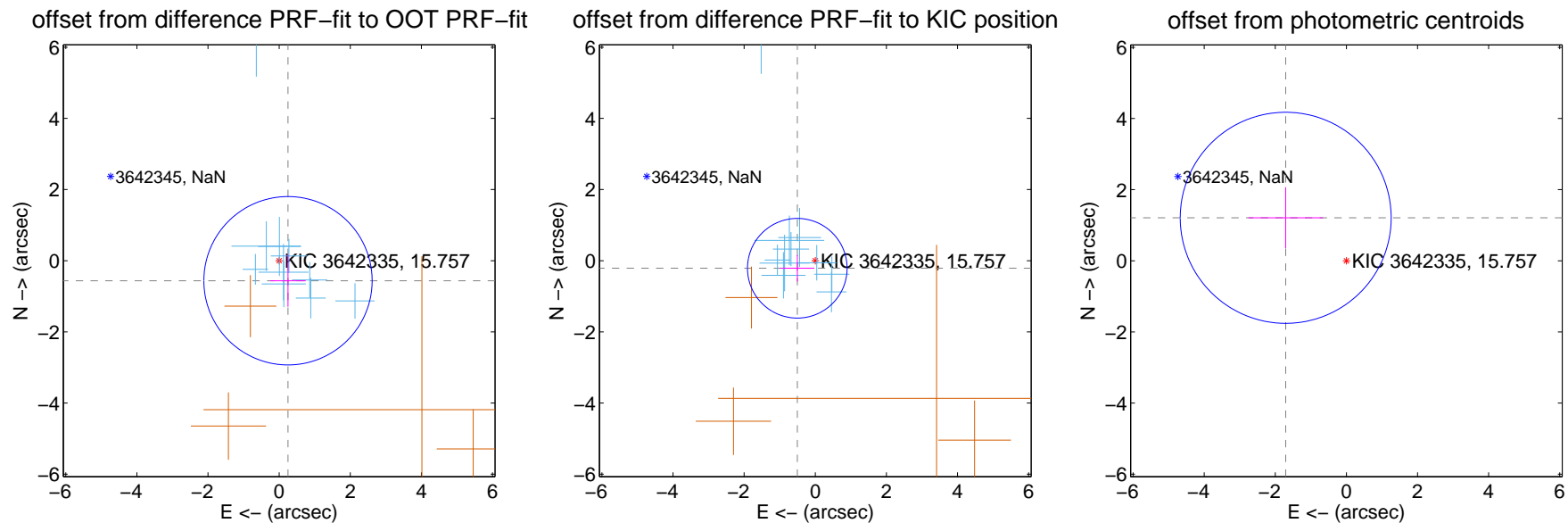
## DV Centroid Data

Supplemental centroid analysis for 003642335-01. Kepler magnitude: 15.76. Transit SNR 13.35

There are 10 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

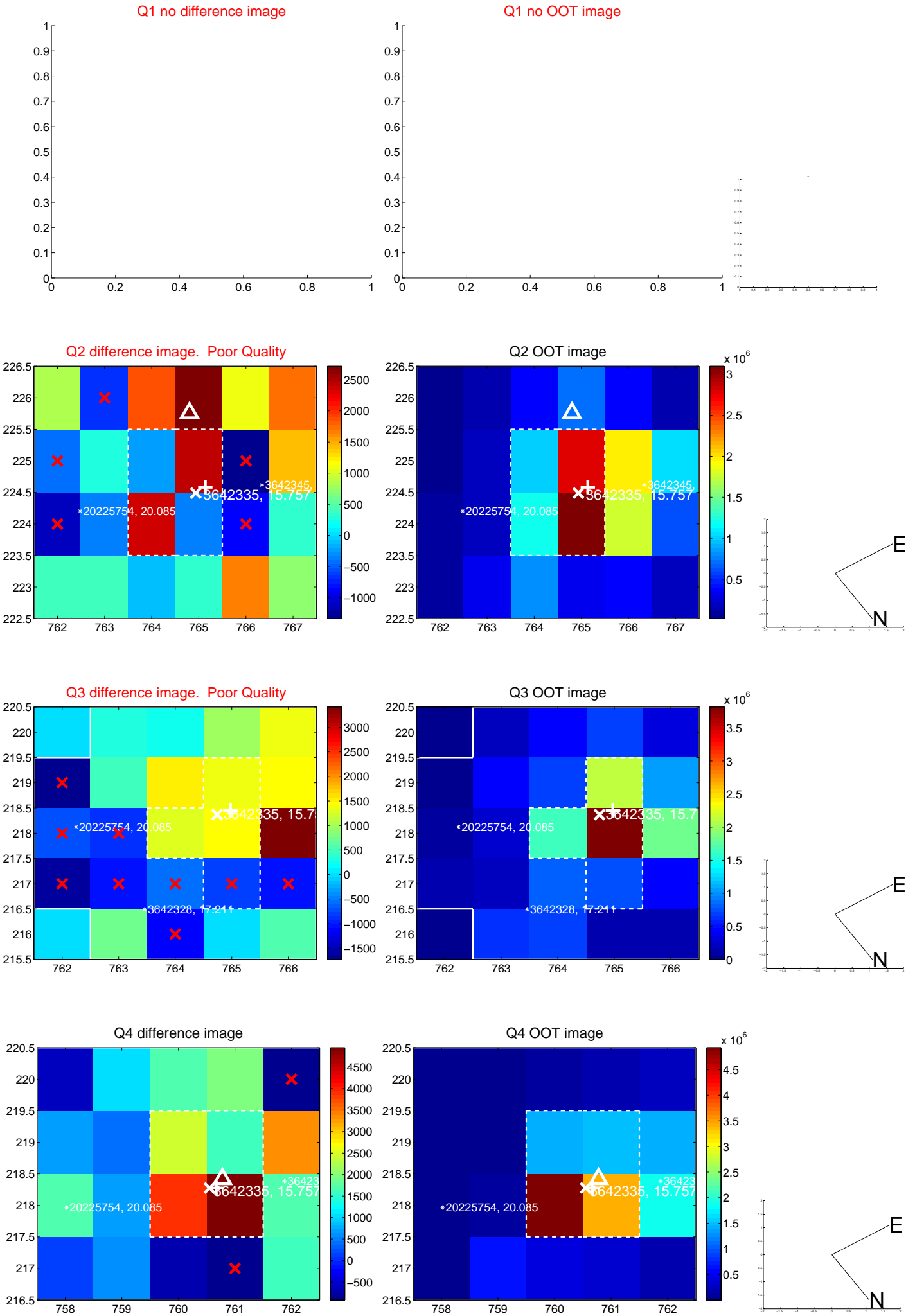
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.616 \pm 0.789$	0.78	$-0.249 \pm 0.497$	$-0.563 \pm 0.730$
PRF-fit source offset from KIC position	$0.548 \pm 0.467$	1.17	$0.506 \pm 0.482$	$-0.212 \pm 0.371$
photometric centroid source offset	$2.09 \pm 0.99$	2.12	$1.71 \pm 1.05$	$1.21 \pm 0.86$



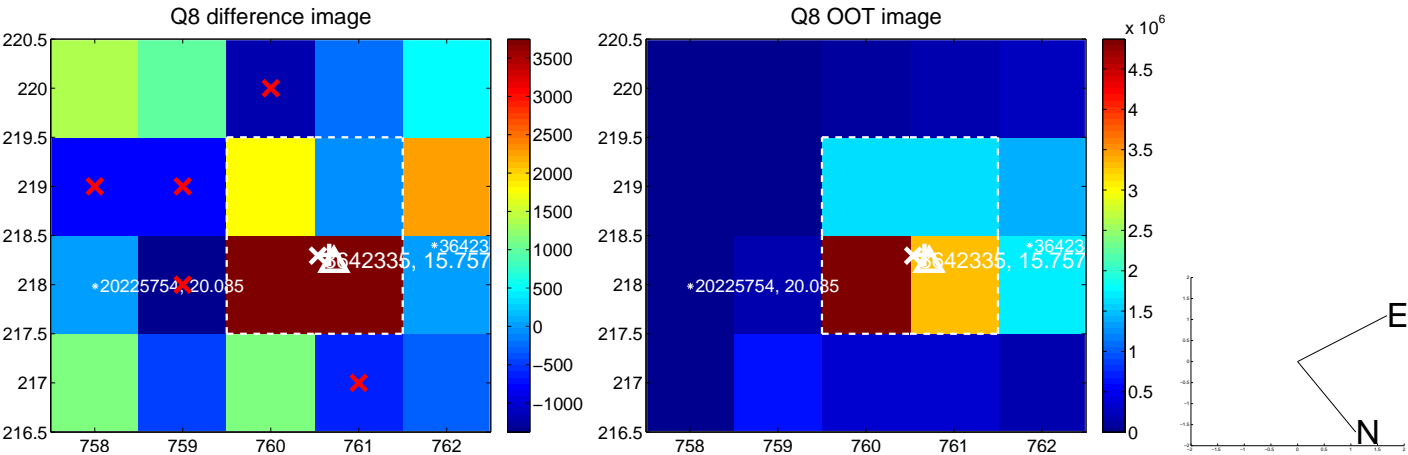
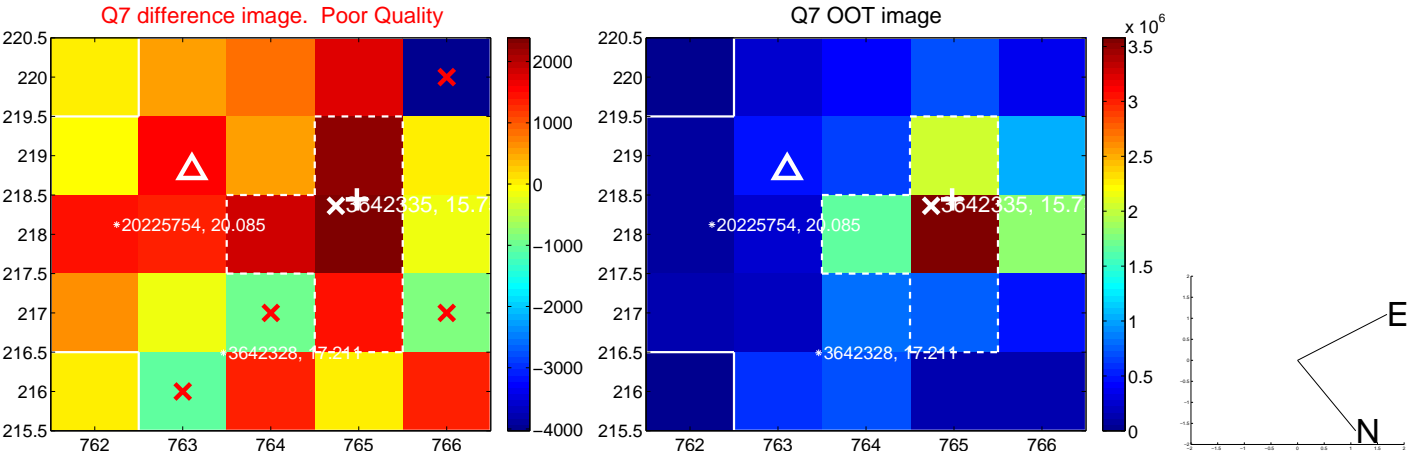
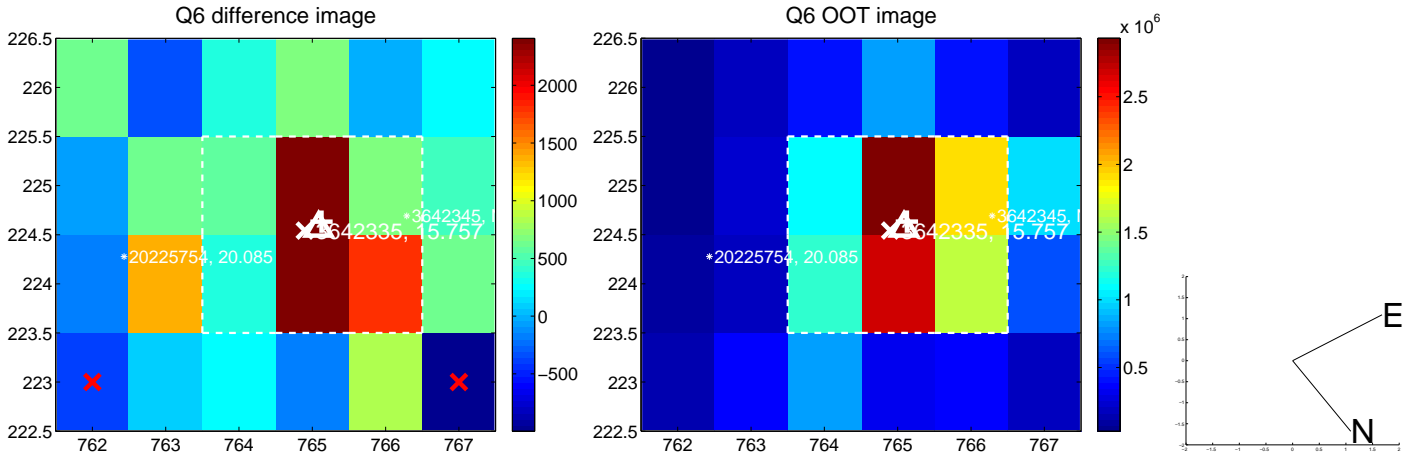
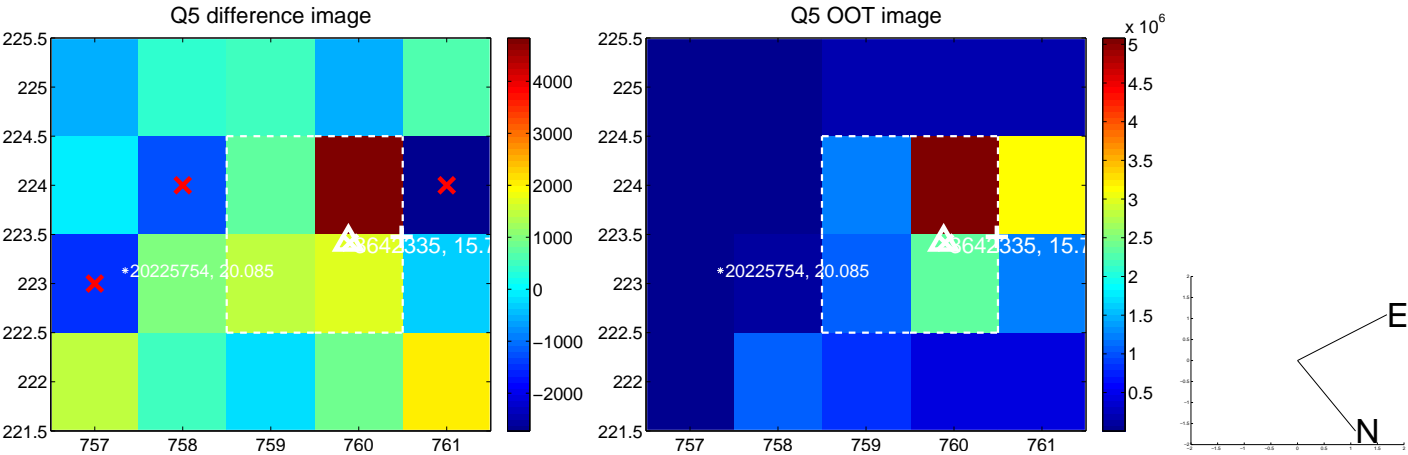
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



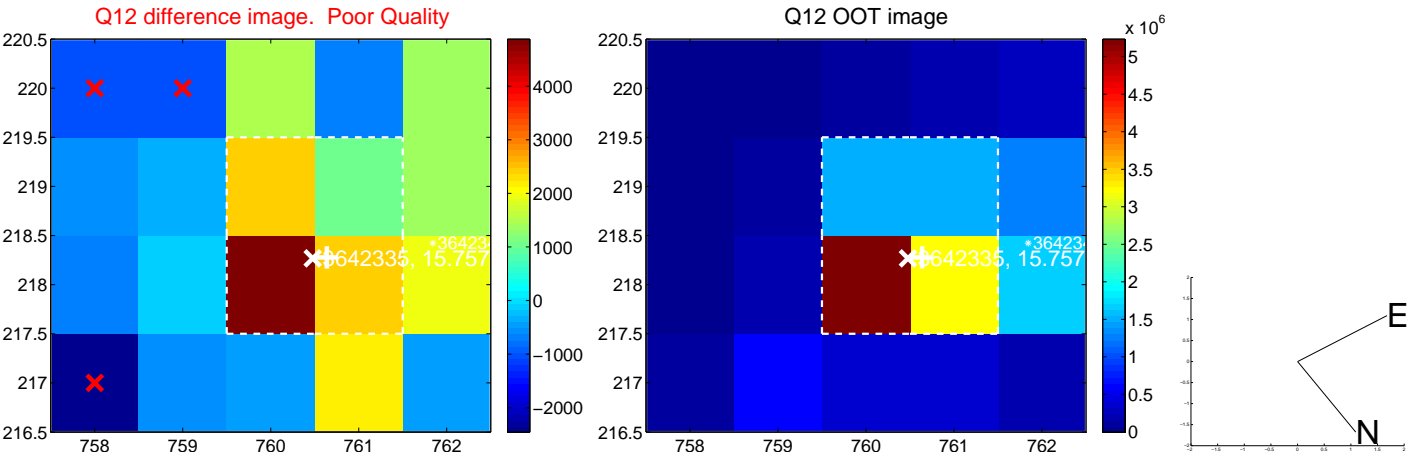
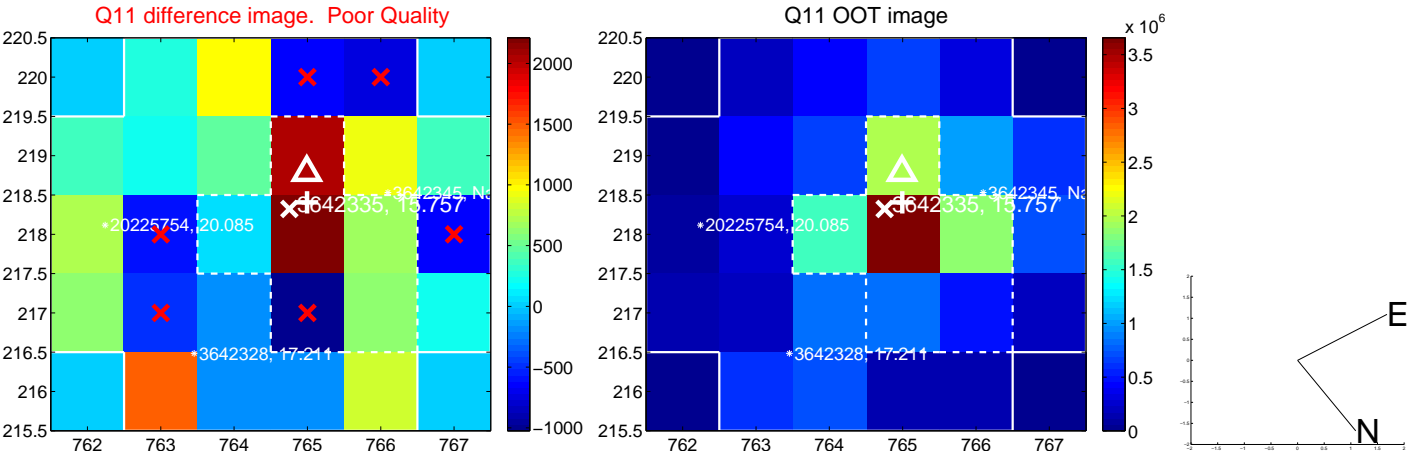
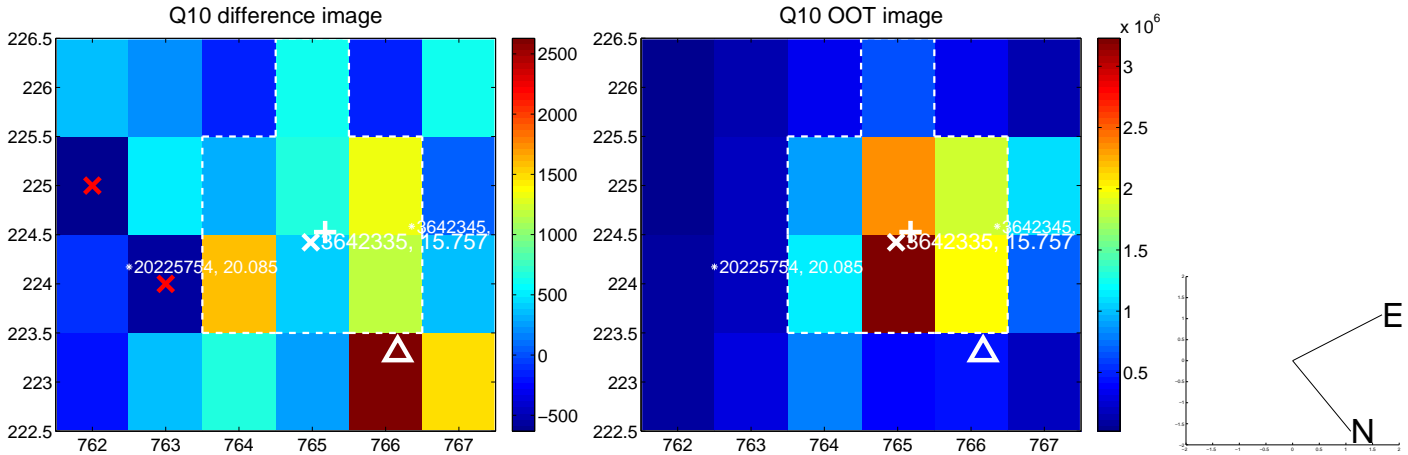
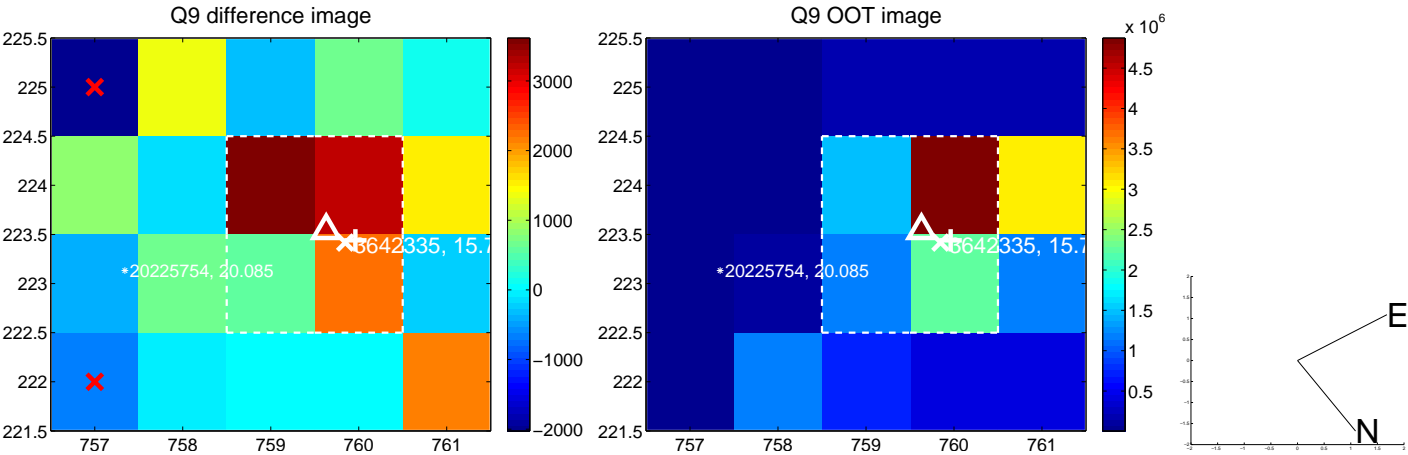
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



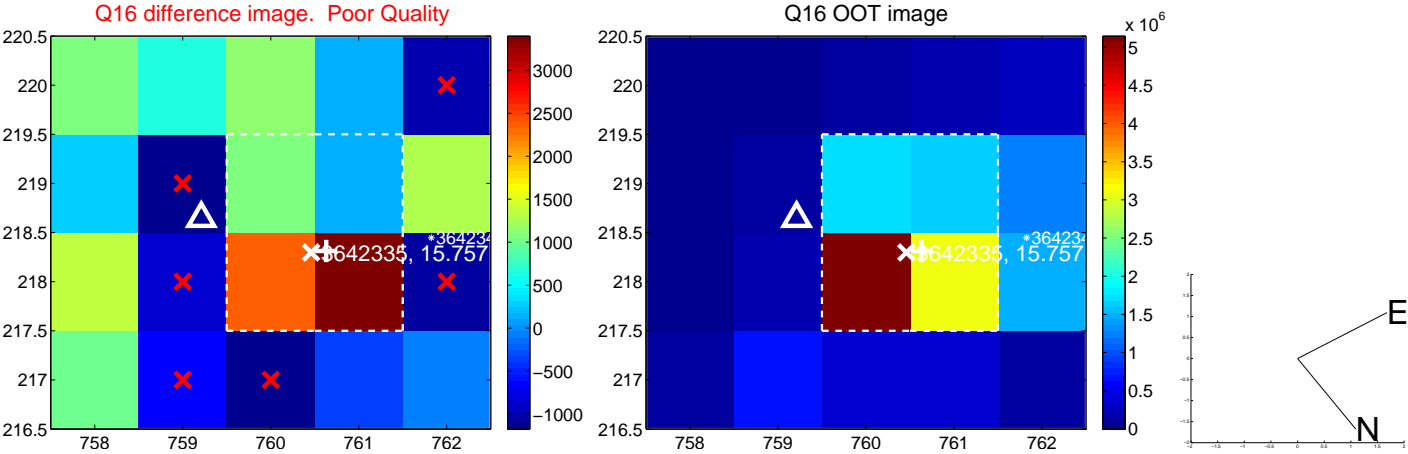
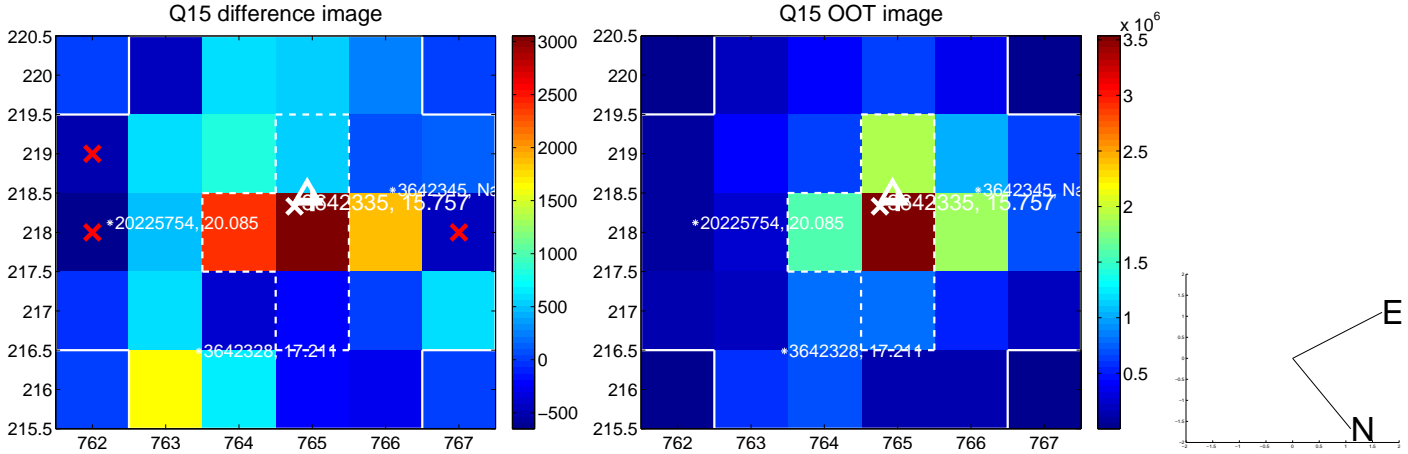
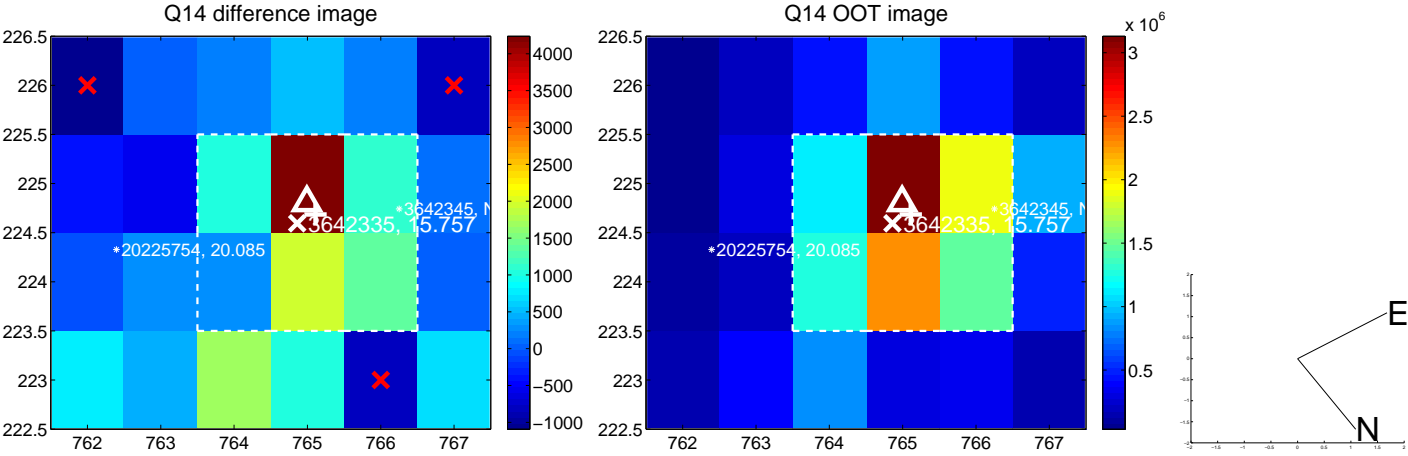
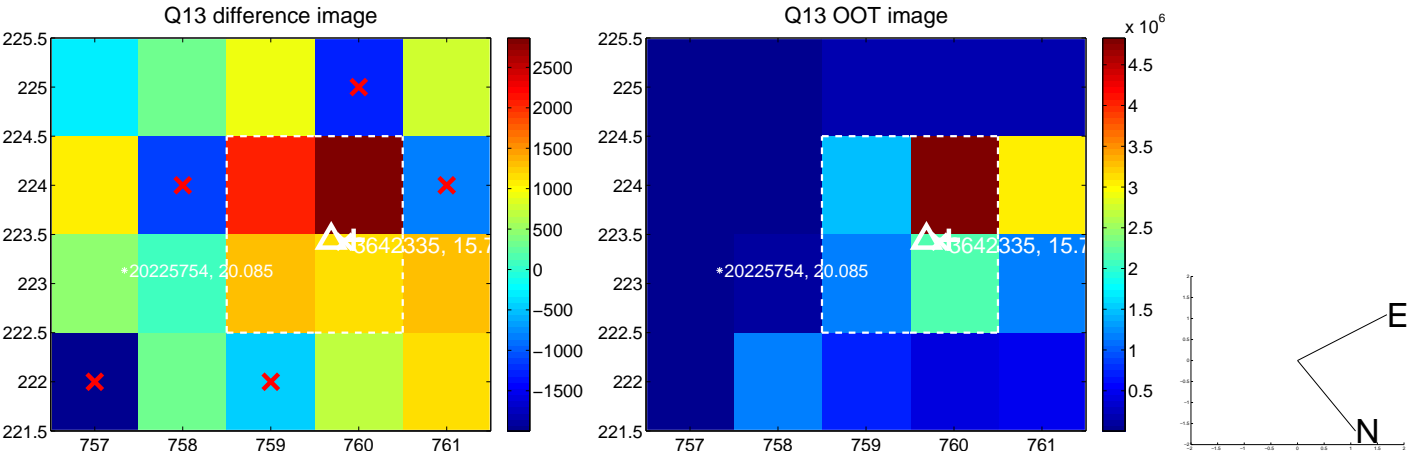
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



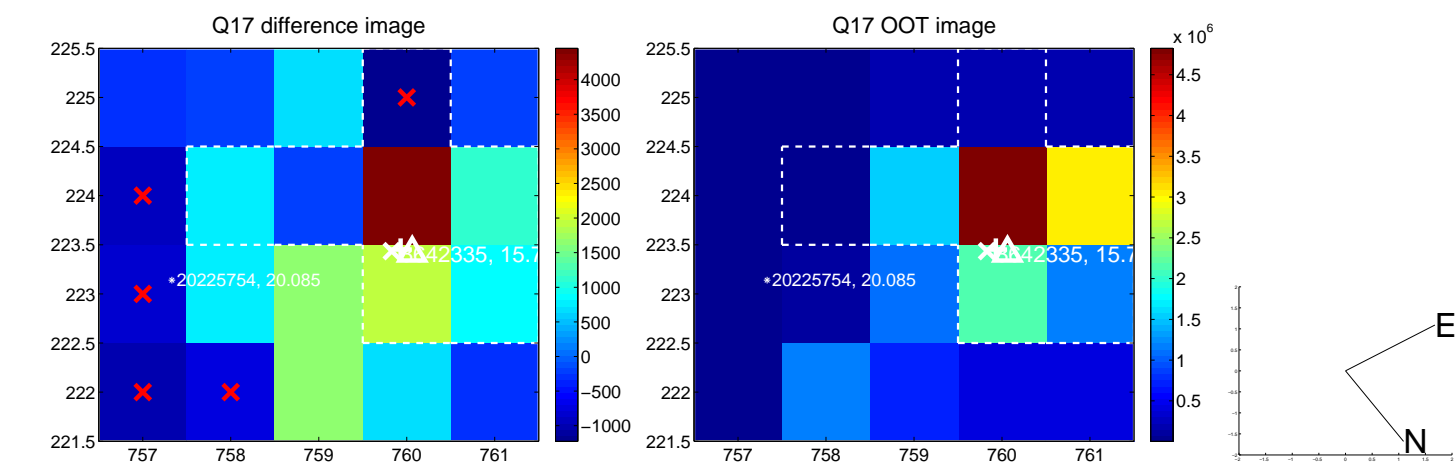
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



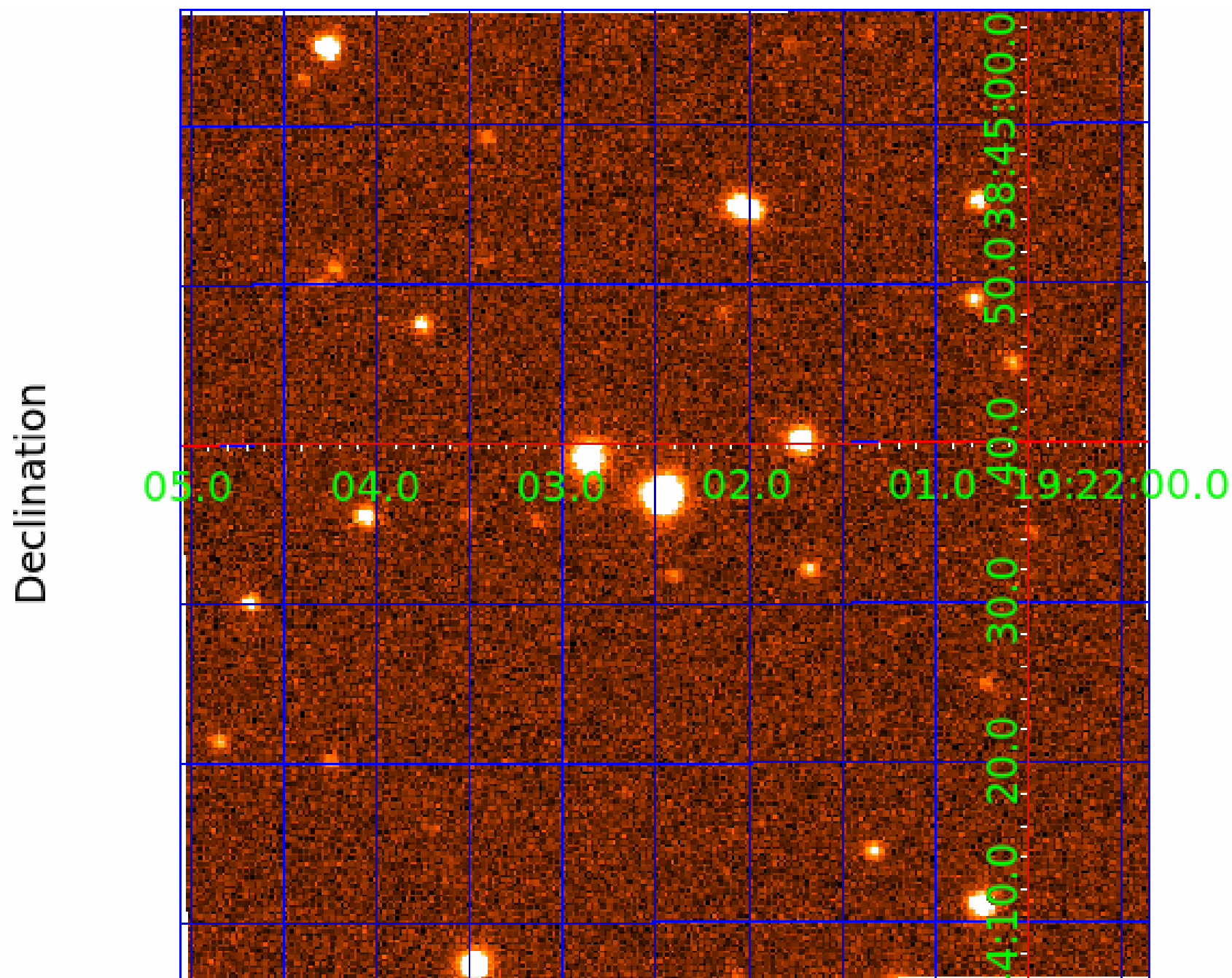
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 003642335

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003642335-01	OBS	3010.01	60.866242	179.284662	746.7	4.565	12.7	13.3	0.52	3808	1.58	0.84
003642335-02	OBS	No	1.345252	131.534833	790.5	5.000	9.0	-1.0	0.52	3808	1.45	136.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003642335-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
003642335-02	OBS	FP	0.00	1	0	0	0	LPP_DV—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.

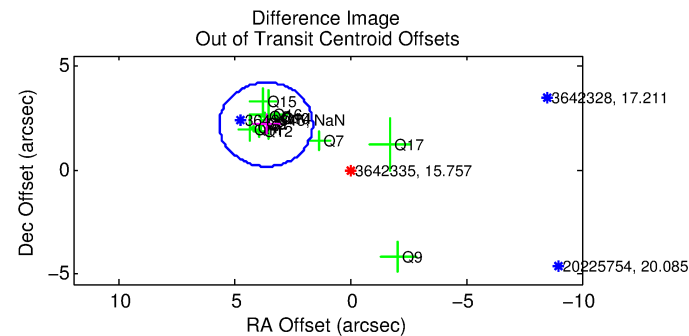
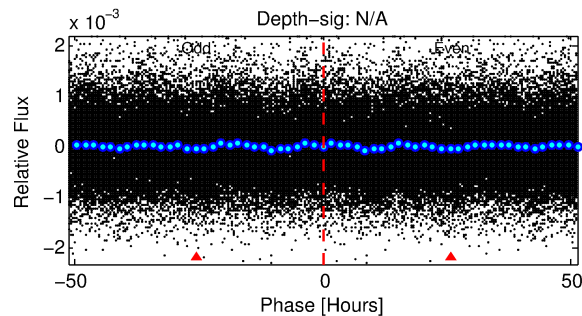
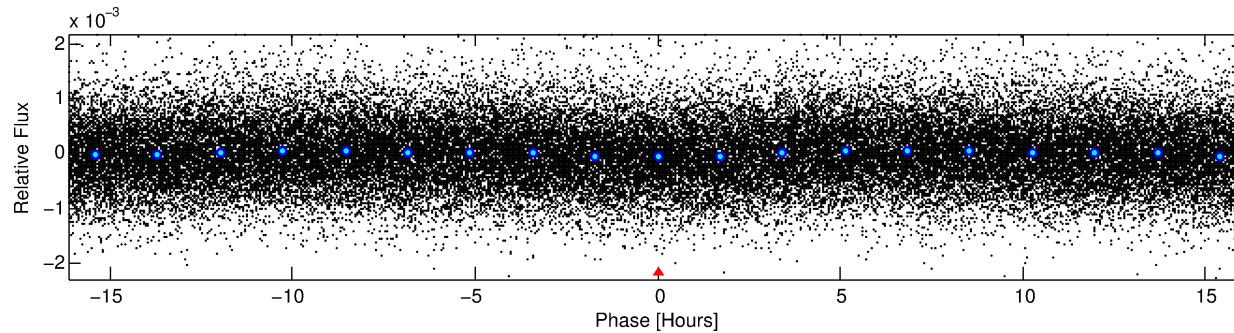
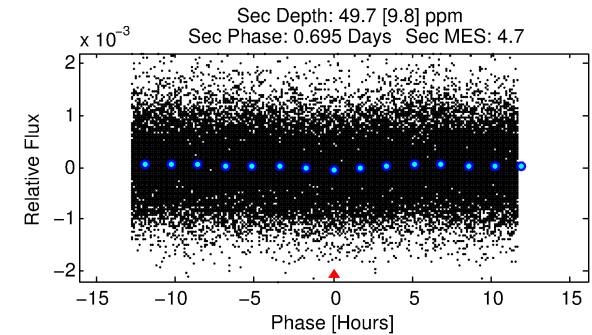
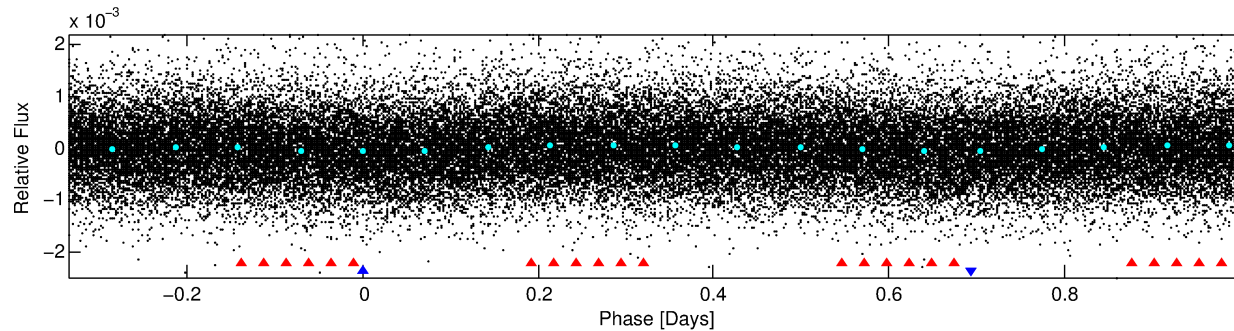
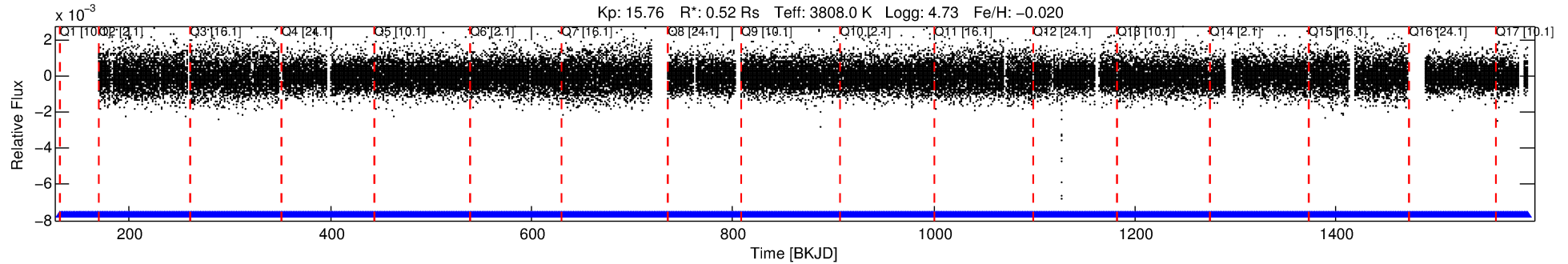
## Ephemeris Match Information For 003642335-02

No Significant Match Found

# DV One-Page Summary

KIC: 3642335 Candidate: 2 of 2 Period: 1.345 d  
KOI: K03010 Corr: No Ephemeris Match

Kp: 15.76 R\*: 0.52 Rs Teff: 3808.0 K Logg: 4.73 Fe/H: -0.020



## TPS TCE Results:

Period = 1.34525 d  
Epoch = 131.5348 BKJD

DV fit results are unavailable

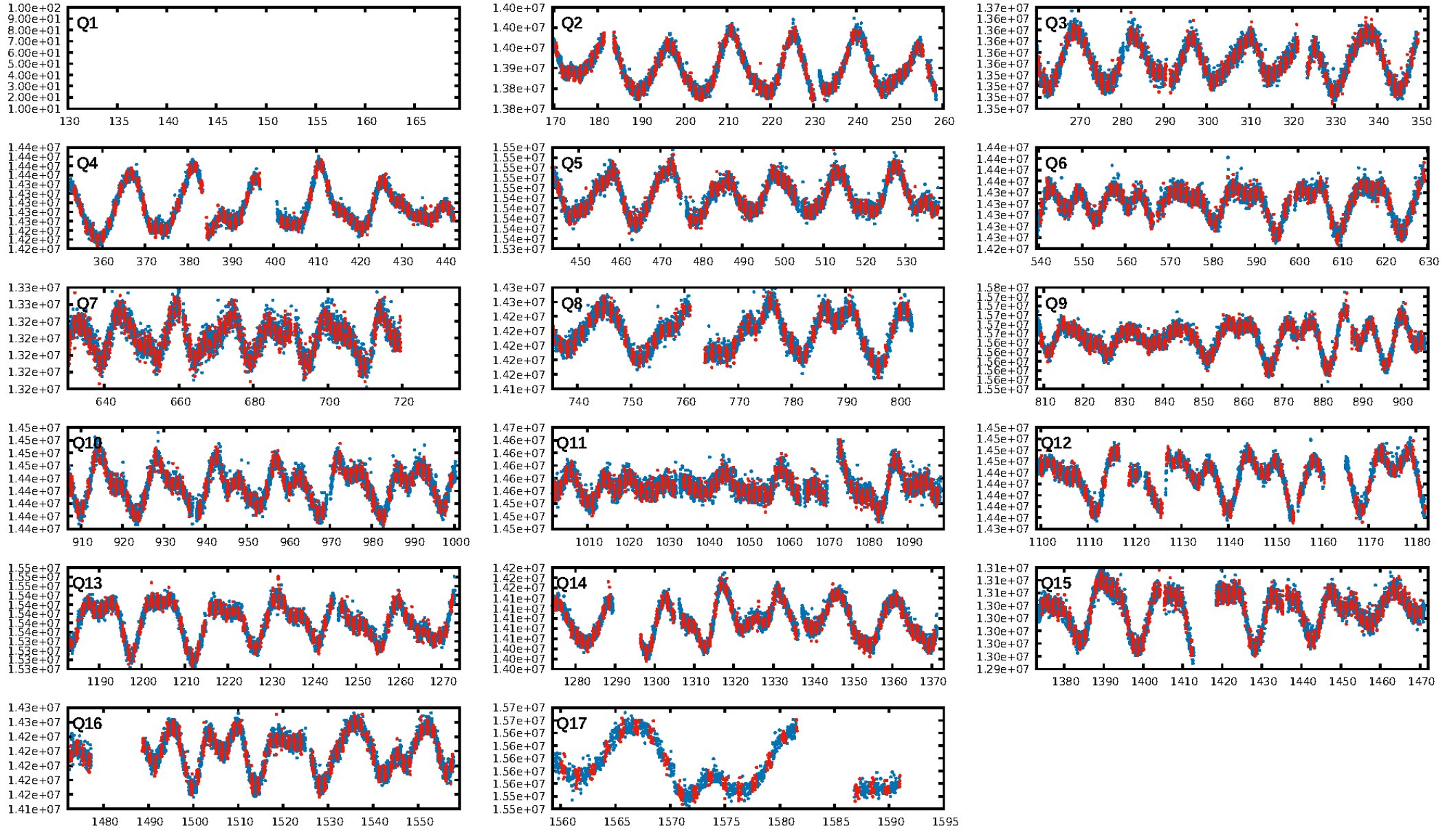
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [211.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.94e-19  
RollingBand-fgt: 1.00 [954/954]  
GhostDiagnostic-chr: 0.4331  
Centroid-sig: 0.0%  
Centroid-so: 3.916 arcsec [4.76 $\sigma$ ]  
OotOffset-rm: 4.258 arcsec [6.33 $\sigma$ ]  
KicOffset-rm: 5.266 arcsec [6.98 $\sigma$ ]  
OotOffset-st: 4/3/4/2 [13]  
KicOffset-st: 4/3/4/2 [13]  
DiffImageQuality-fgm: 0.77 [10/13]  
DiffImageOverlap-fno: 1.00 [16/16]

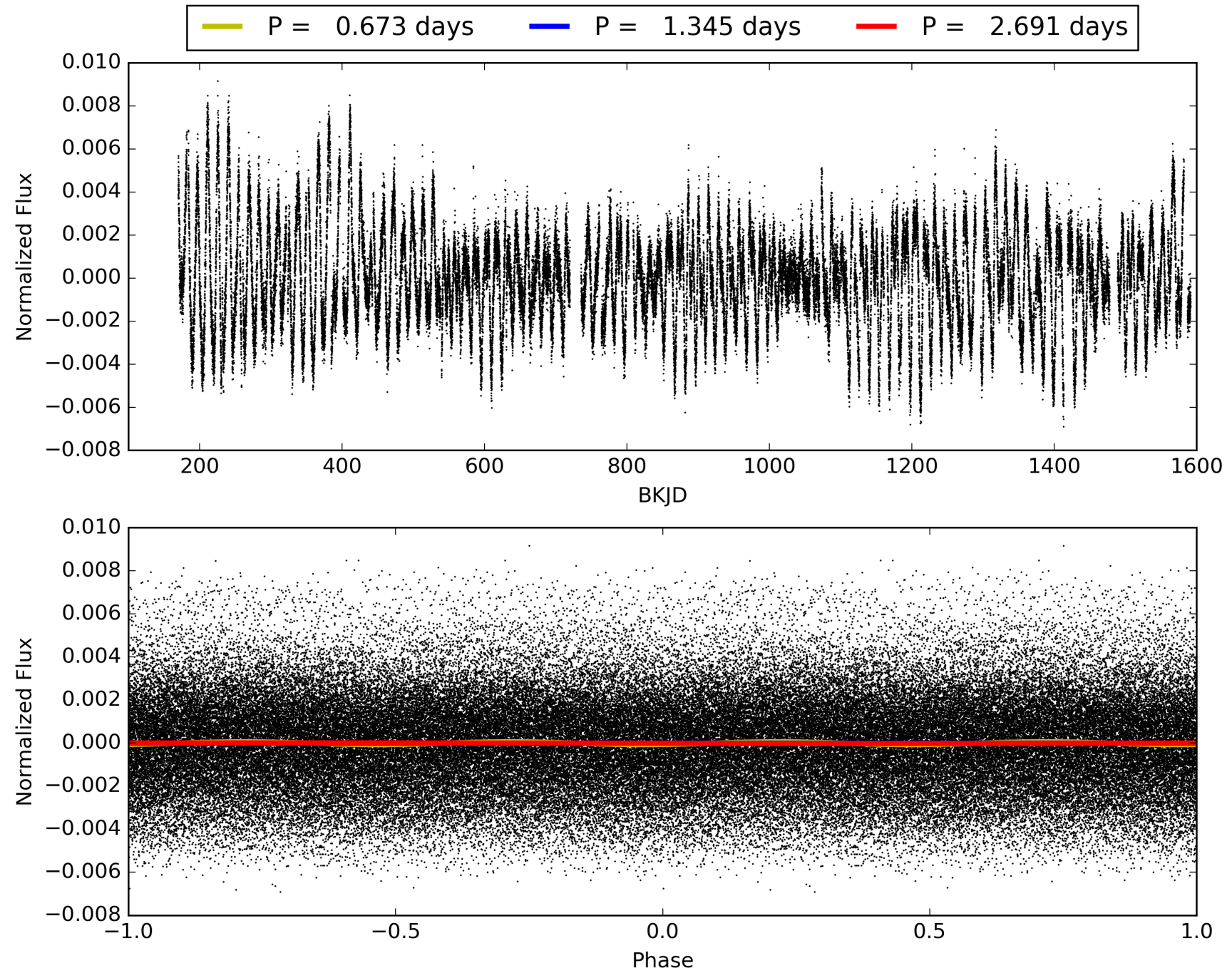
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:59:38 Z

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

# TCE 003642335-02, PDC Light Curves

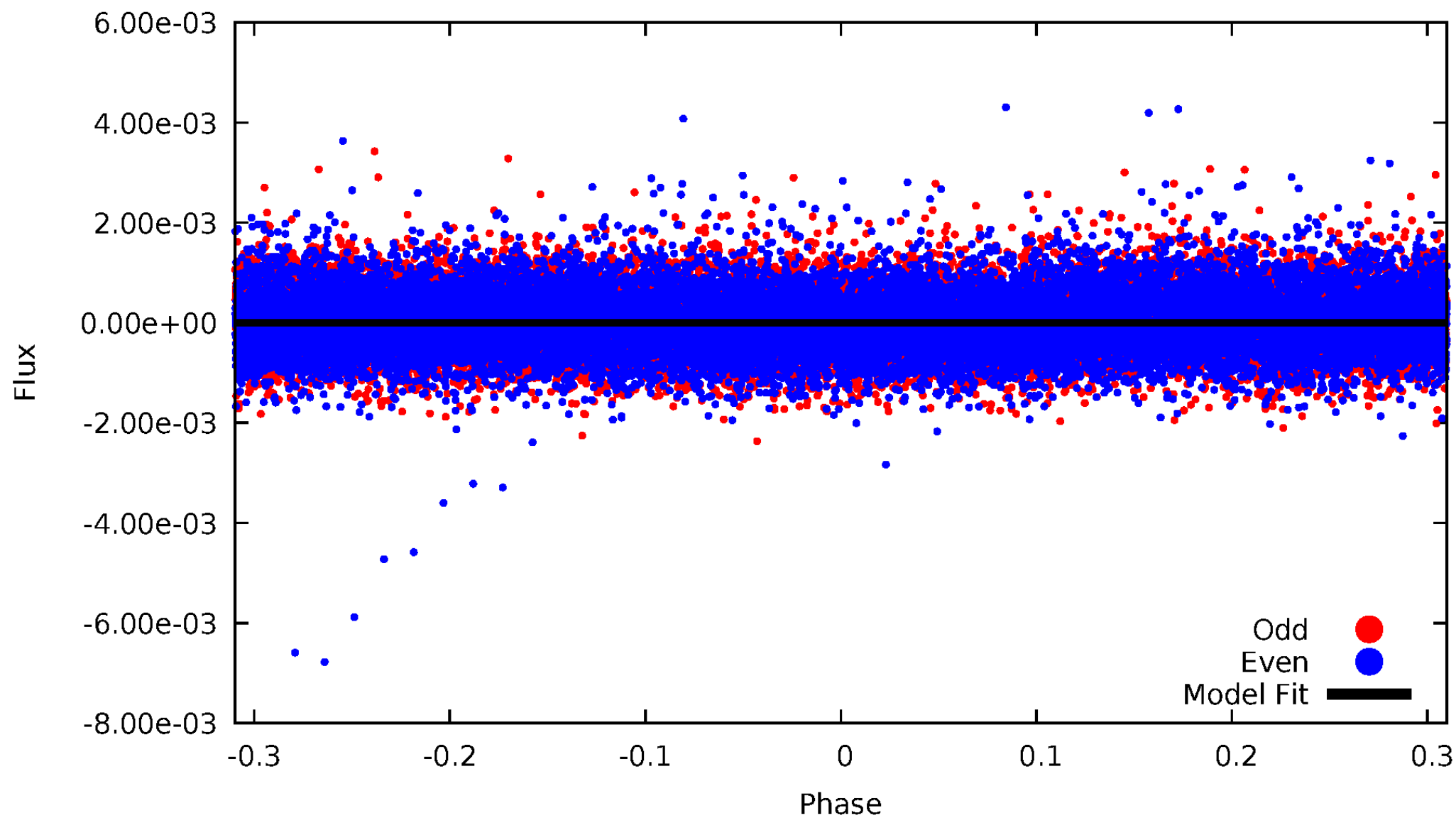


TCE 003642335-02



# DV Odd/Even

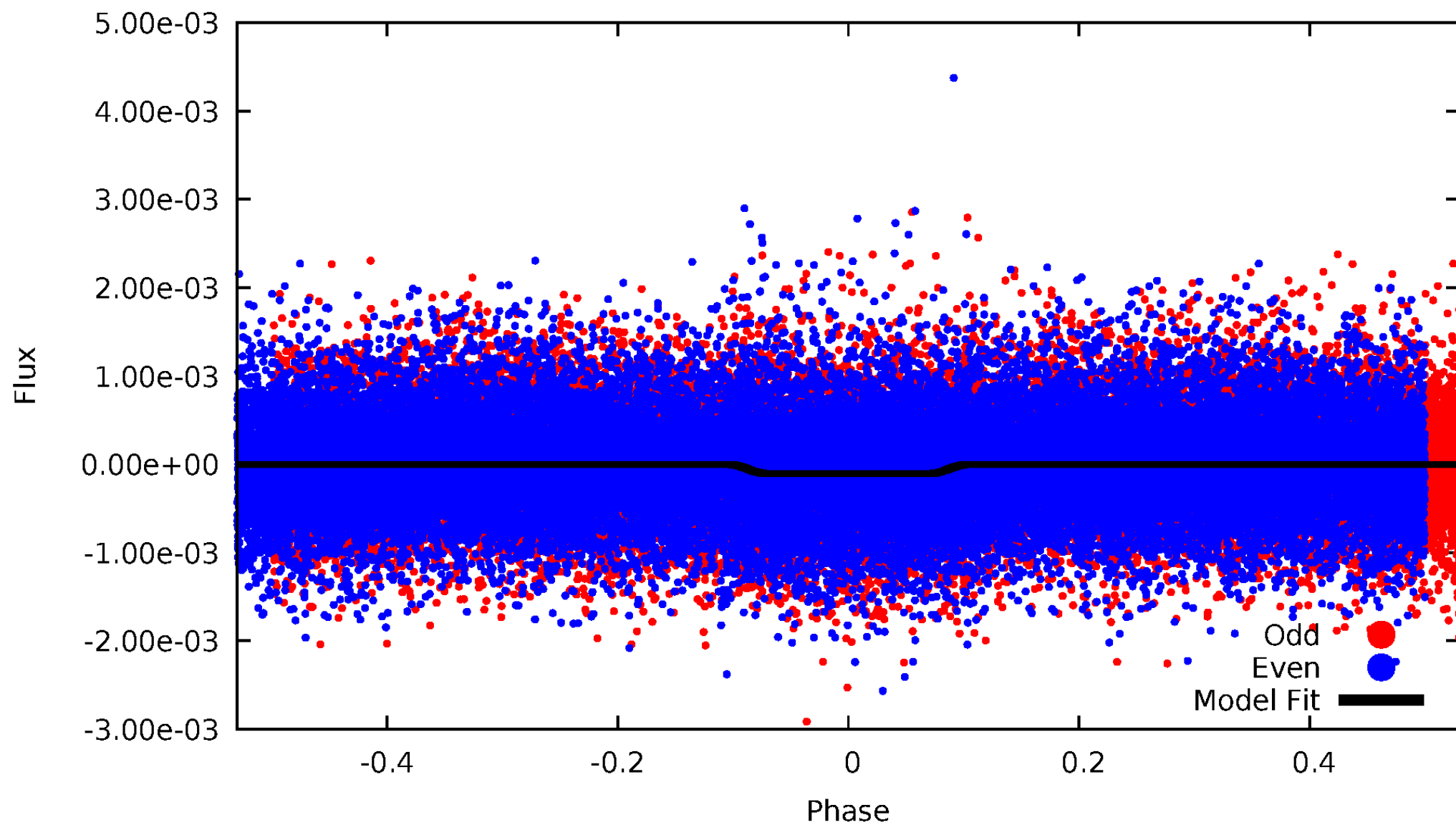
TCE 003642335-02





# ALT Odd/Even

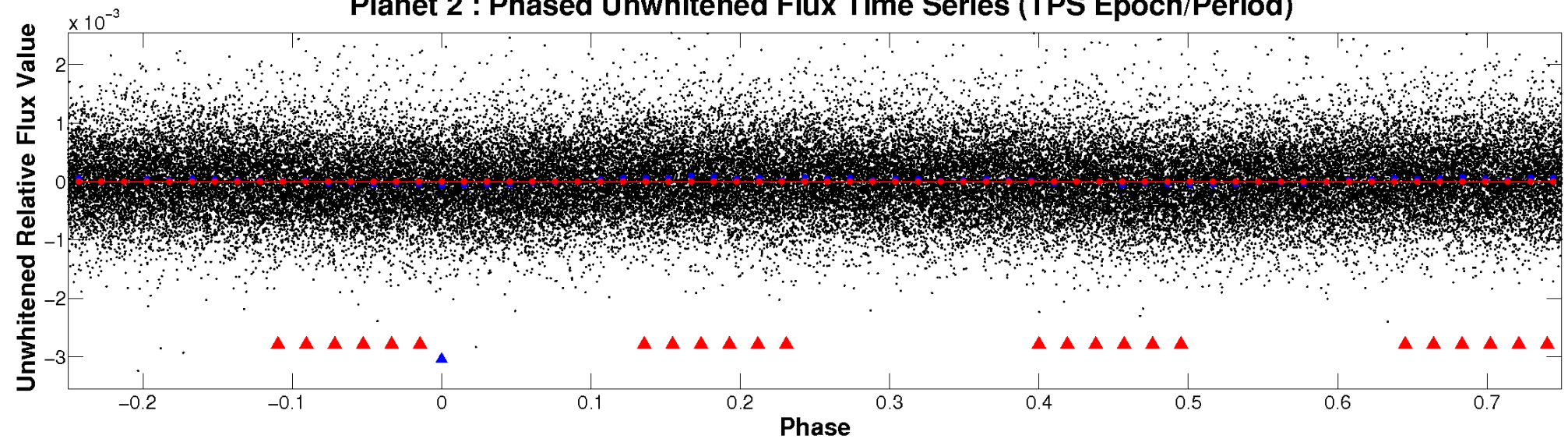
TCE 003642335-02



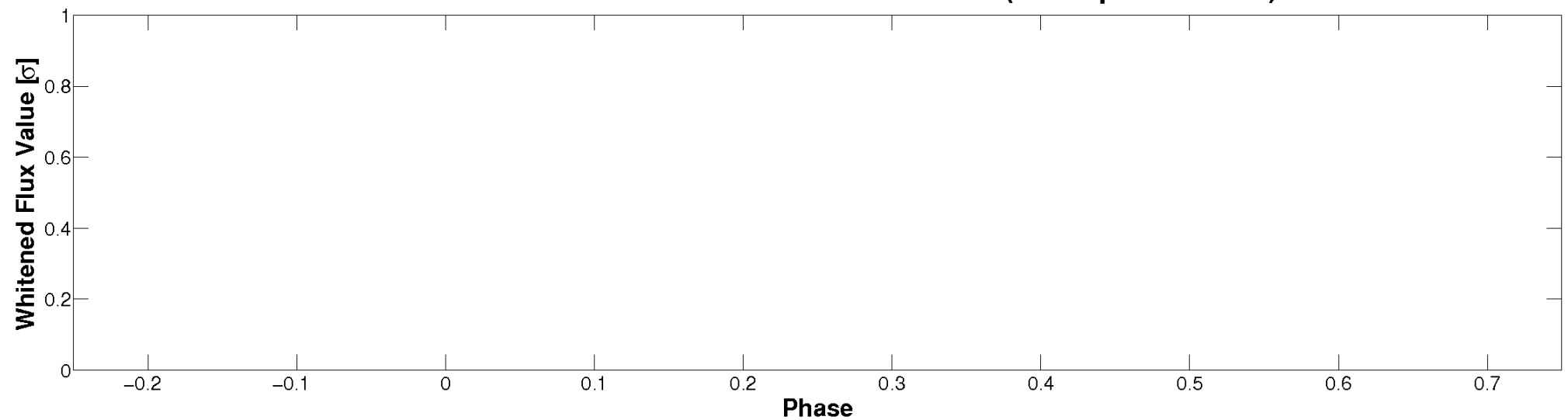


# Non-Whitened Vs. Whitened Light Curve

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

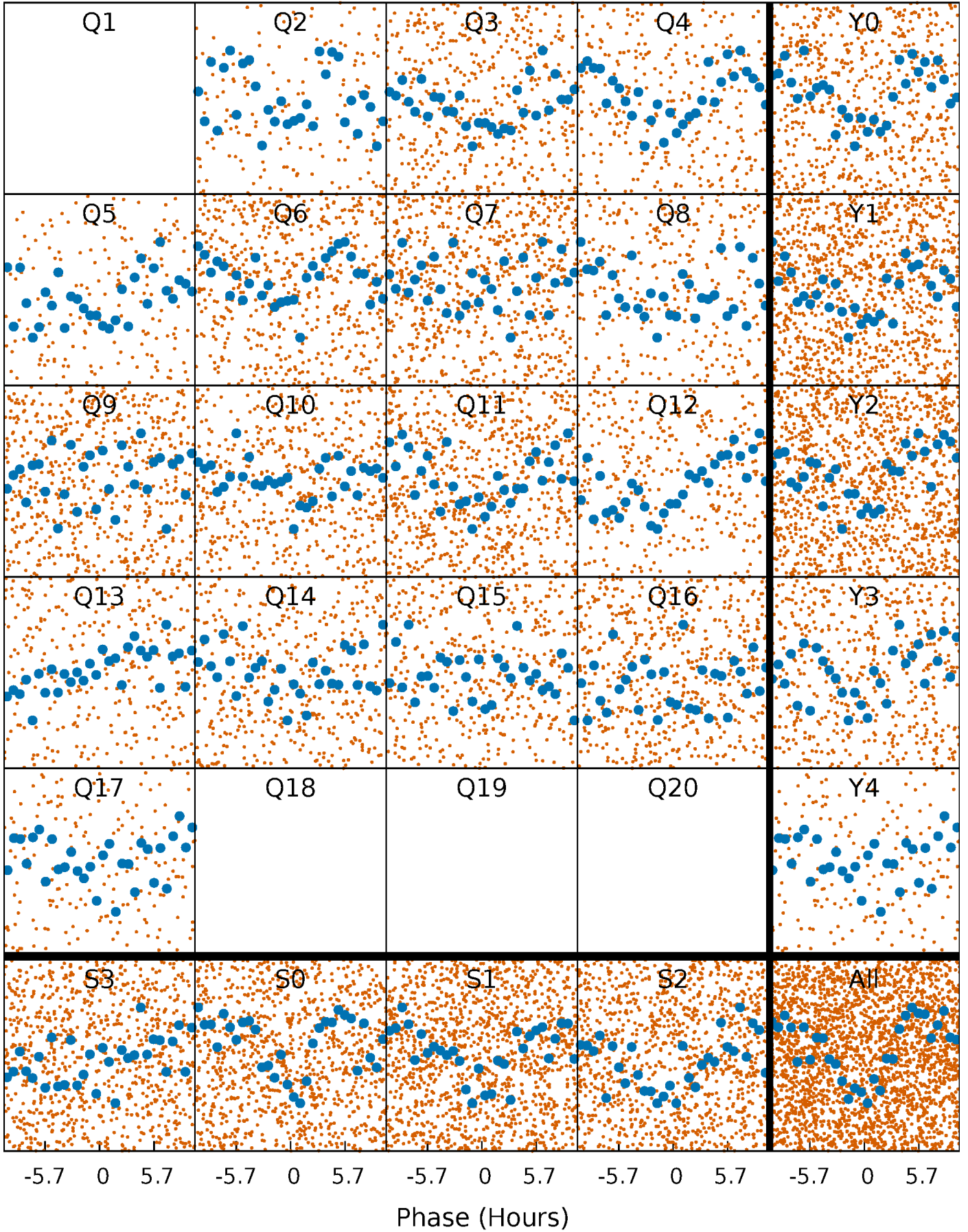


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



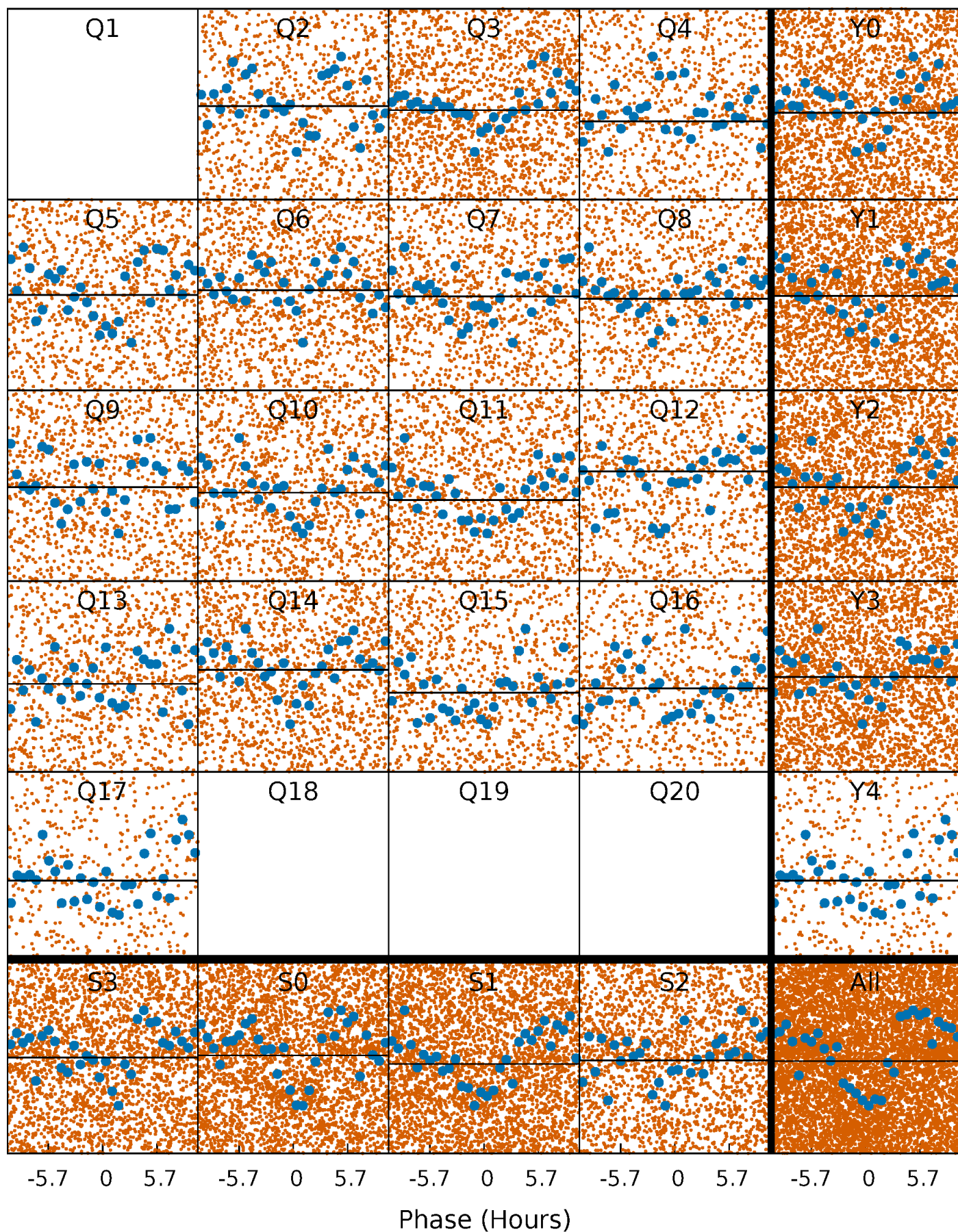
# PDC Quarter-Phased Transit Curves

TCE 003642335-02 P= 1.345252 Days  $T_0=131.534833$  (BKJD)



# DV Quarter-Phased Transit Curves

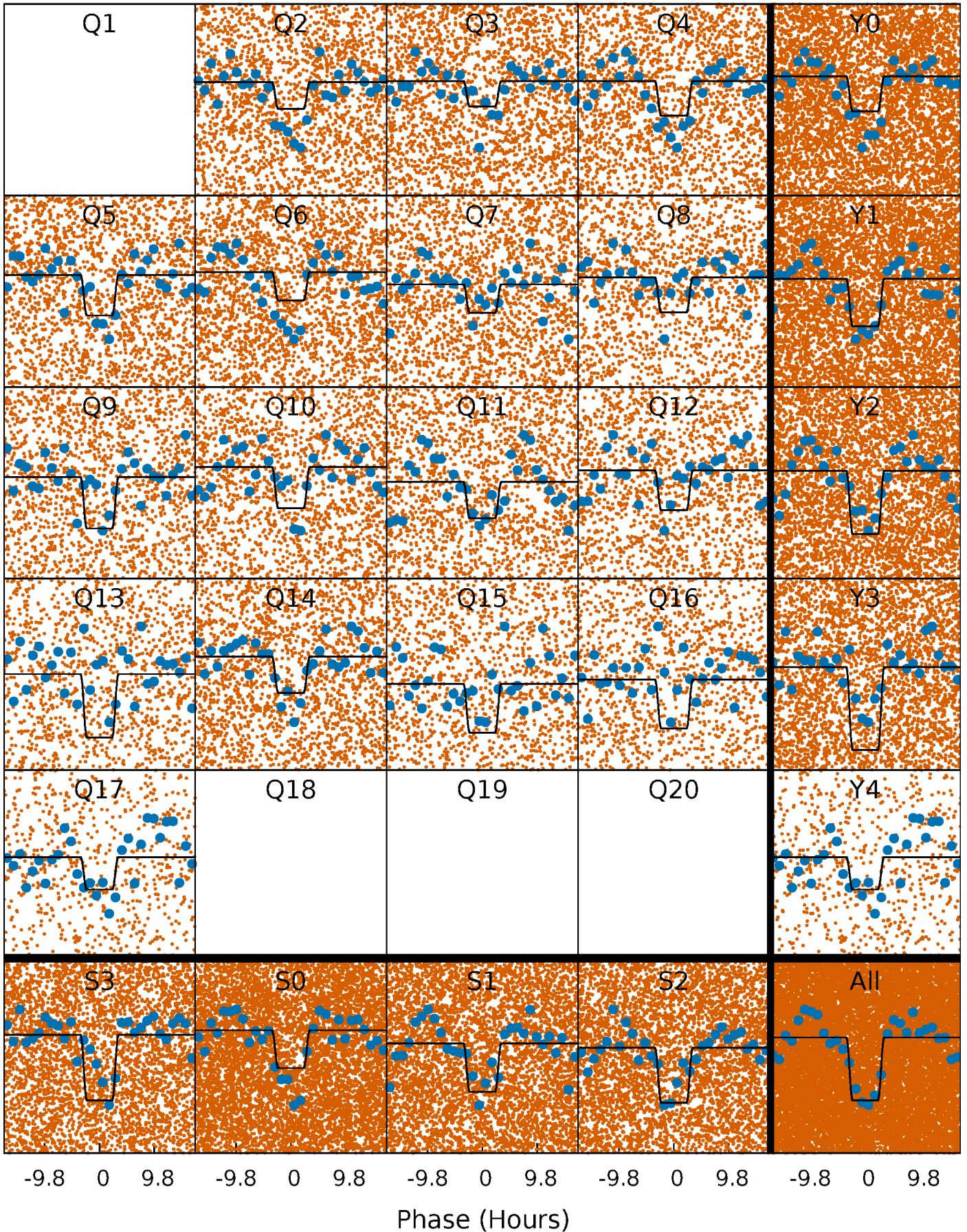
TCE 003642335-02 P= 1.345252 Days  $T_0=131.534833$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

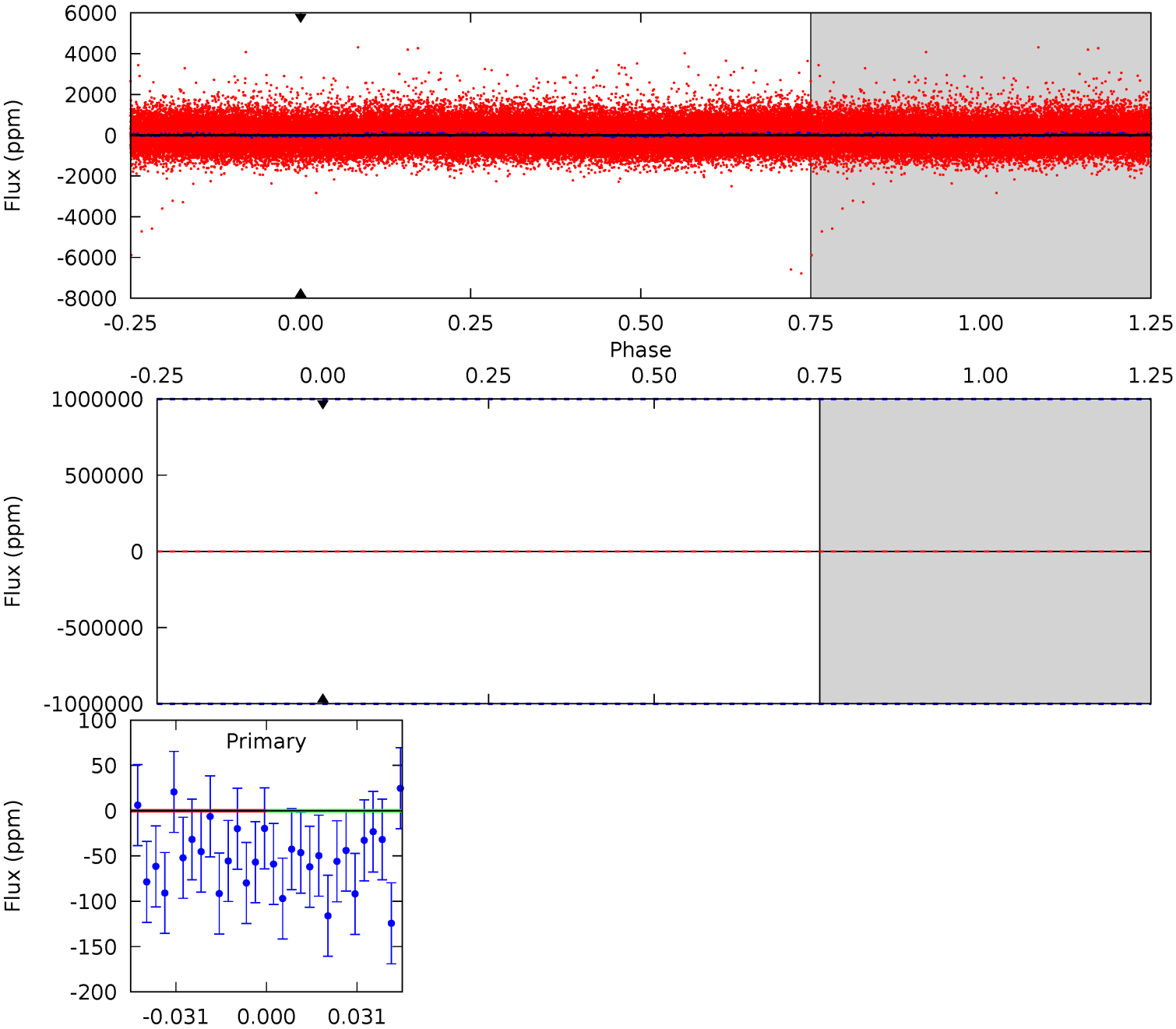
TCE 003642335-02 P= 1.345252 Days  $T_0=131.525630$  (BKJD)



# DV Model-Shift Uniqueness Test

003642335-02, P = 1.345252 Days, E = 131.534833 Days

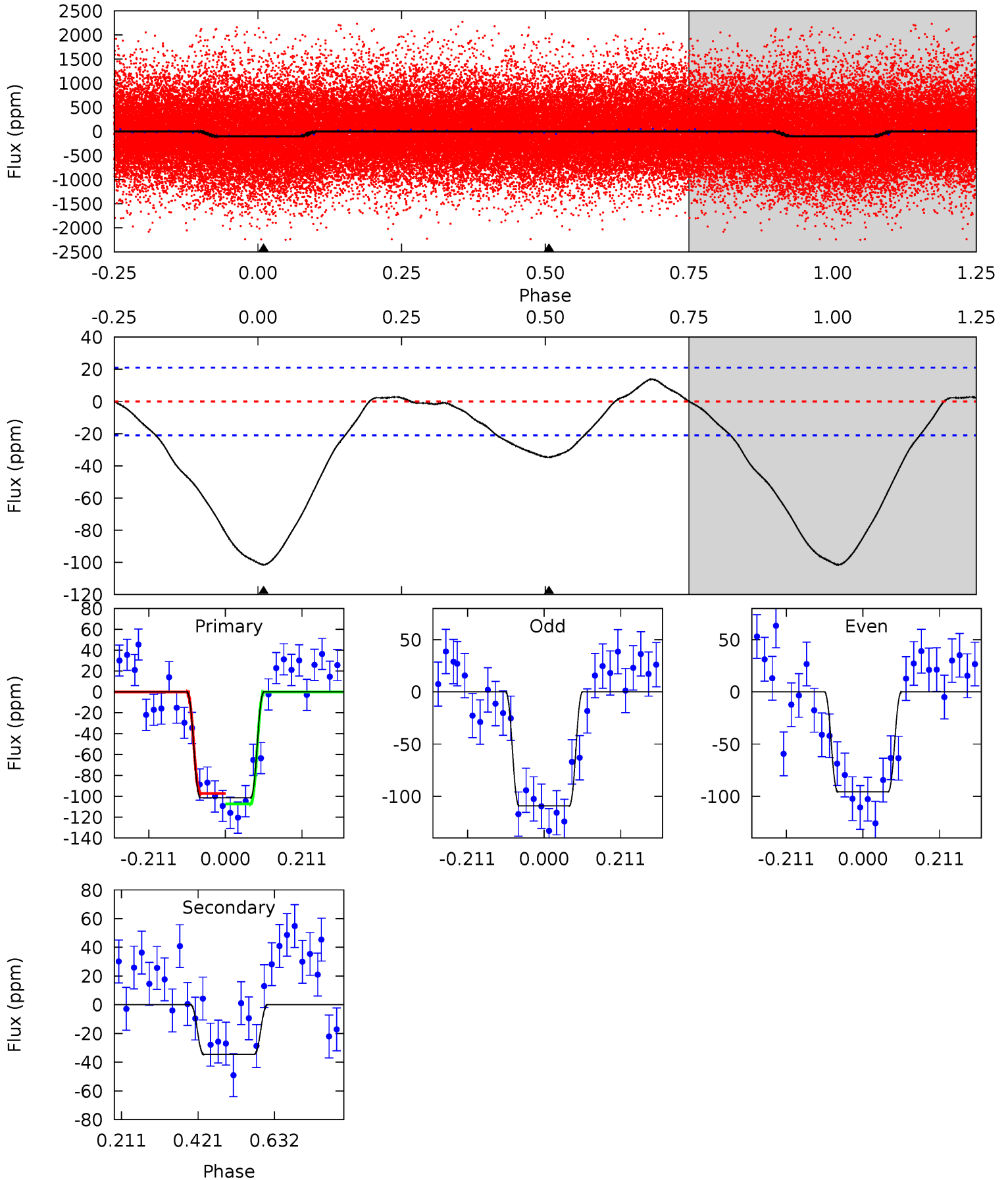
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003642335-02, P = 1.345252 Days, E = 131.525630 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
21.3	7.26	0	0	4.41	1.25	0.98	21.3	21.3	7.26	7.26	1.42	1.04	0.12	1.04



### Stellar Parameters For KIC 003642335

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3808^{+69}_{-76}$	$4.734^{+0.033}_{-0.027}$	$-0.020^{+0.150}_{-0.150}$	$0.522^{+0.028}_{-0.035}$	$0.539^{+0.030}_{-0.037}$	$5.338^{+0.872}_{-0.572}$
	+2%/-2%	+1%/-1%	+750%/-750%	+5%/-7%	+6%/-7%	+16%/-11%
Source	SPE70	PHO2	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 003642335-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$4.37^{+4.60}_{-2.90}$	$1215^{+26}_{-28}$	$3039^{+5596}_{-10720}$	$15^{+2253}_{-1490}$
Alt.	$-35 \pm 5$	$4.08^{+4.70}_{-2.99}$	$1217^{+27}_{-29}$	$1767^{+880}_{-3613}$	$0.427^{+5.282}_{-0.331}$

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



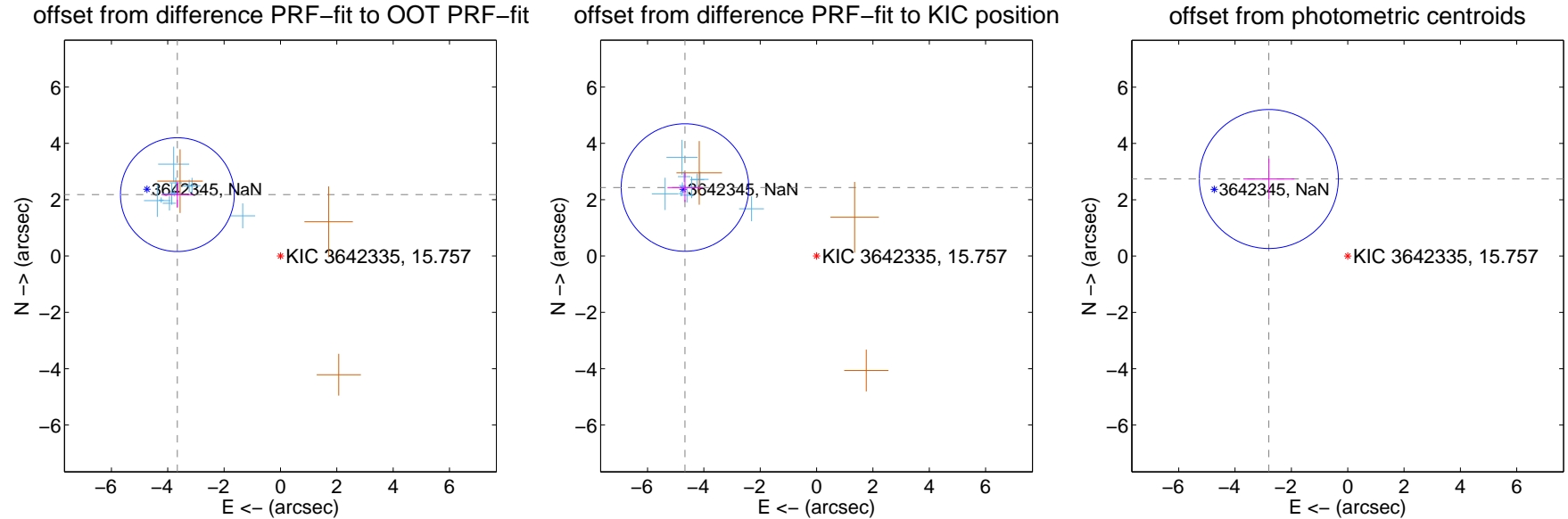
## DV Centroid Data

Supplemental centroid analysis for 003642335-02. Kepler magnitude: 15.76. Transit SNR -1.00

There are 10 quarters with good PRF difference image offsets

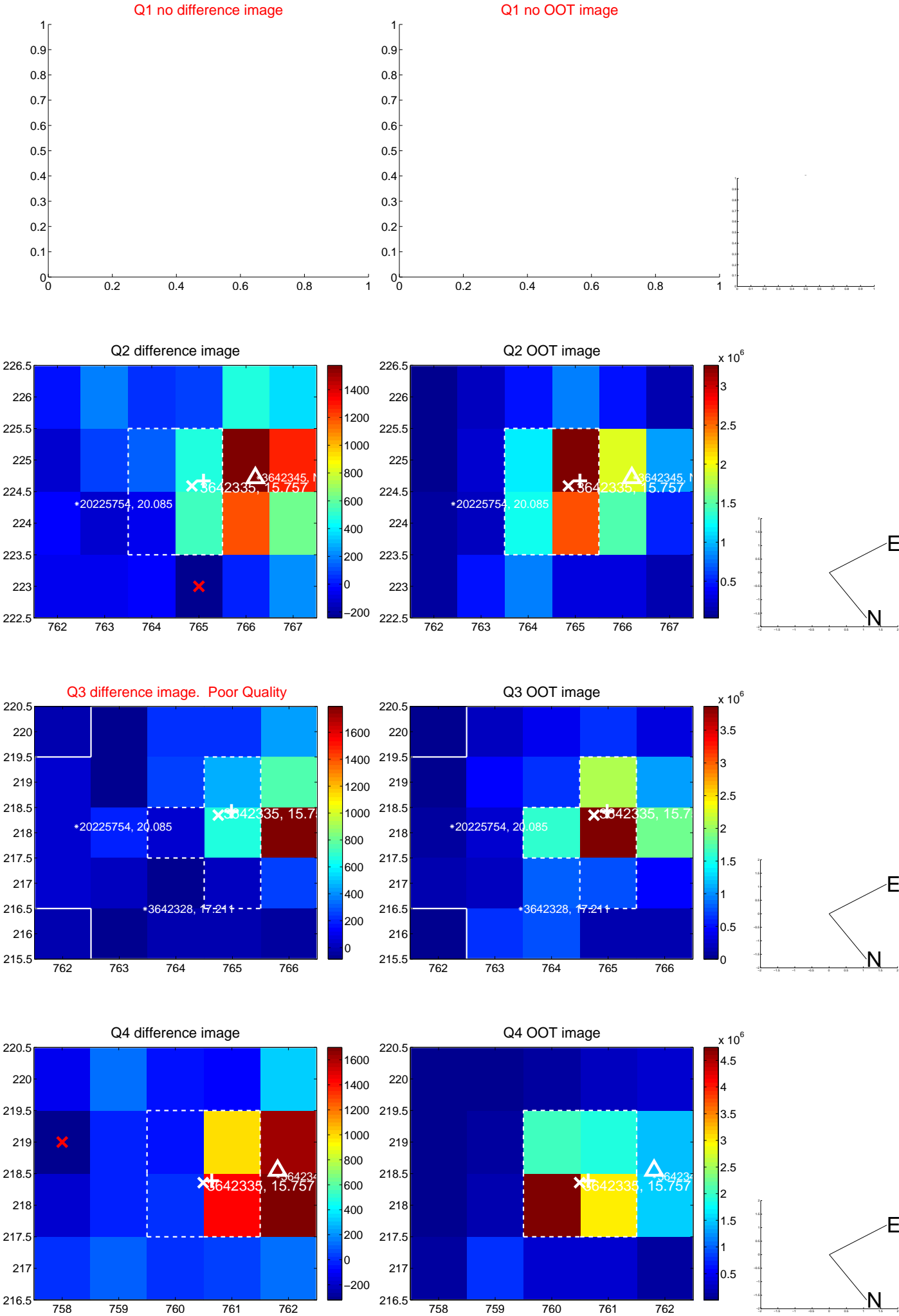
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.258 \pm 0.673$	<b>6.33</b>	$3.658 \pm 0.565$	$2.179 \pm 0.461$
PRF-fit source offset from KIC position	$5.266 \pm 0.754$	<b>6.98</b>	$4.671 \pm 0.622$	$2.431 \pm 0.516$
photometric centroid source offset	$3.92 \pm 0.82$	<b>4.76</b>	$2.80 \pm 0.91$	$2.74 \pm 0.72$

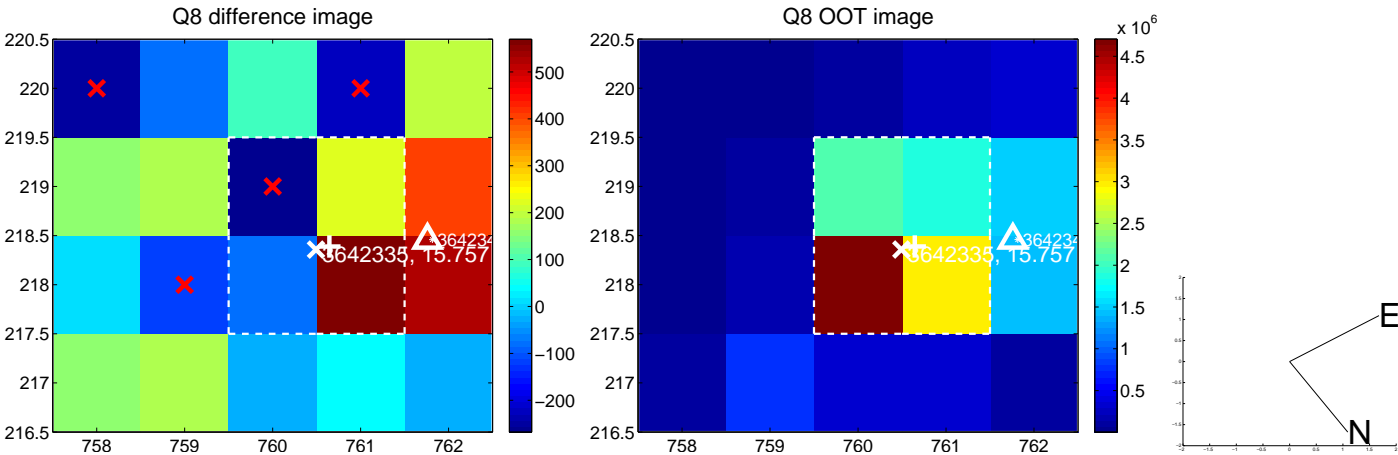
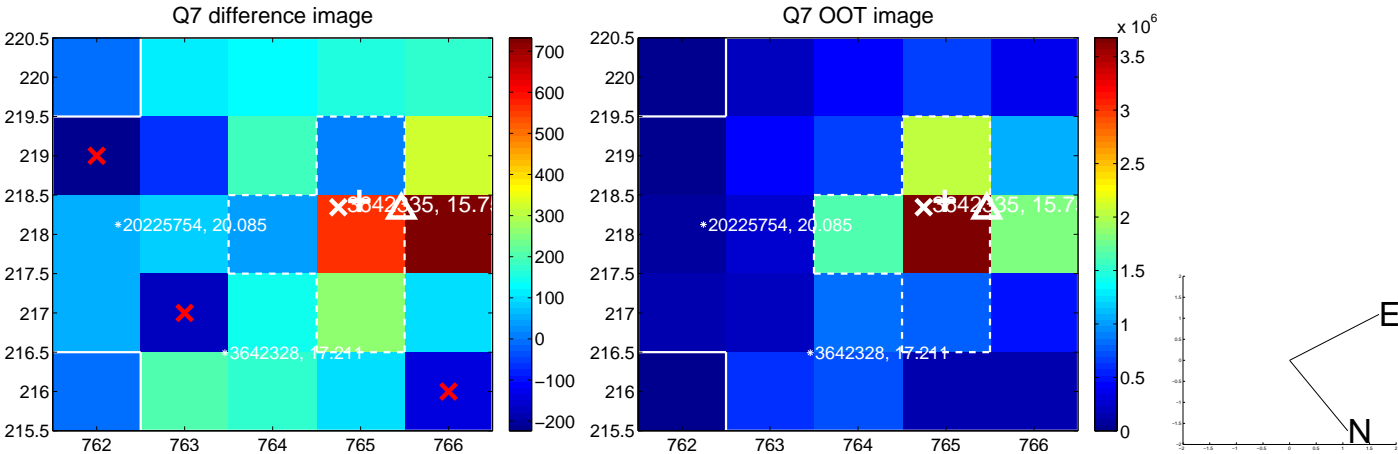
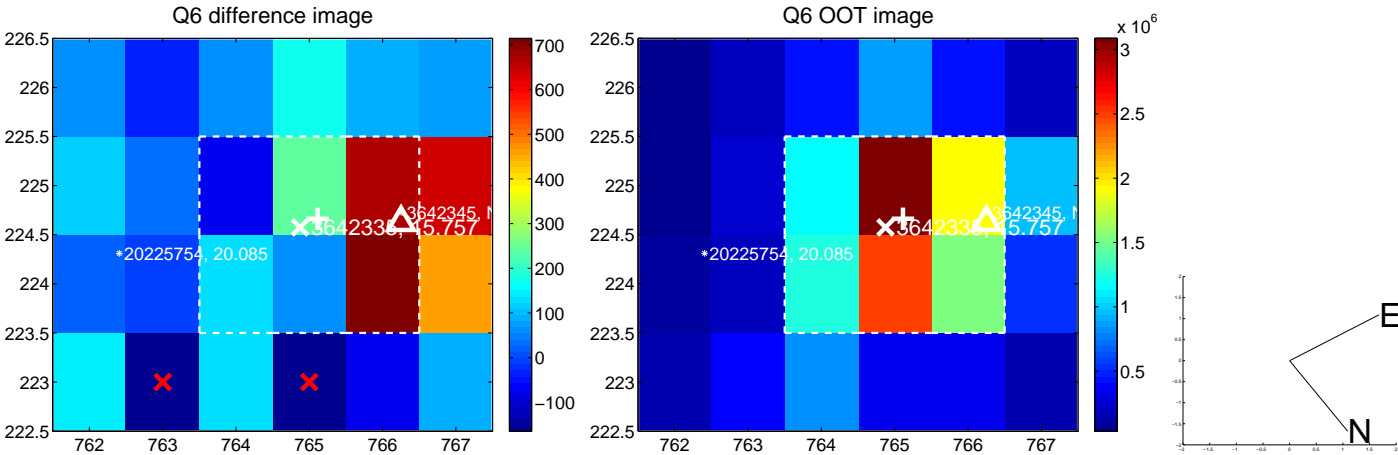
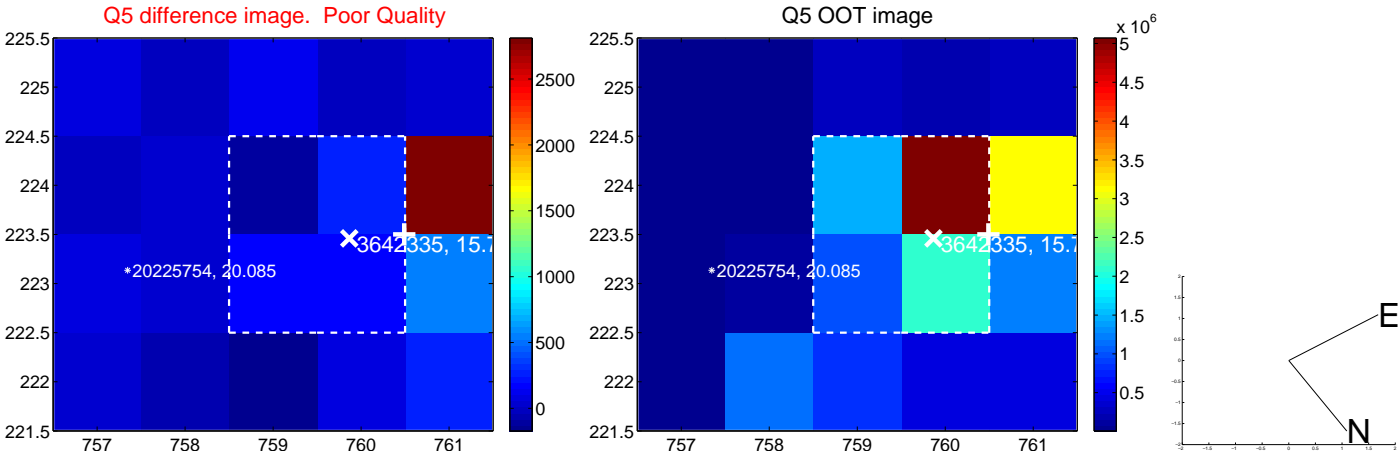


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

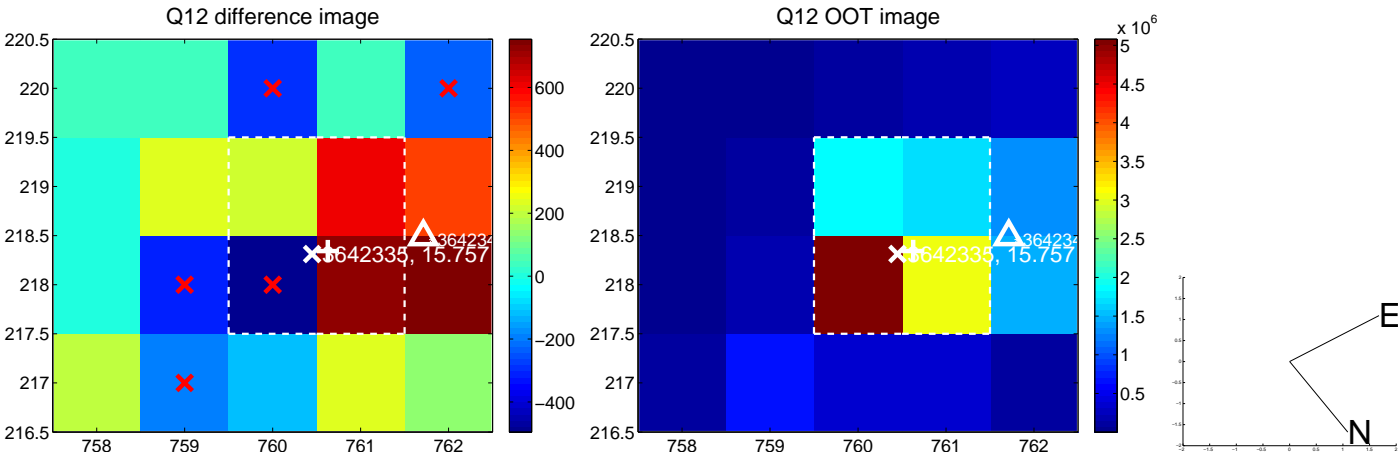
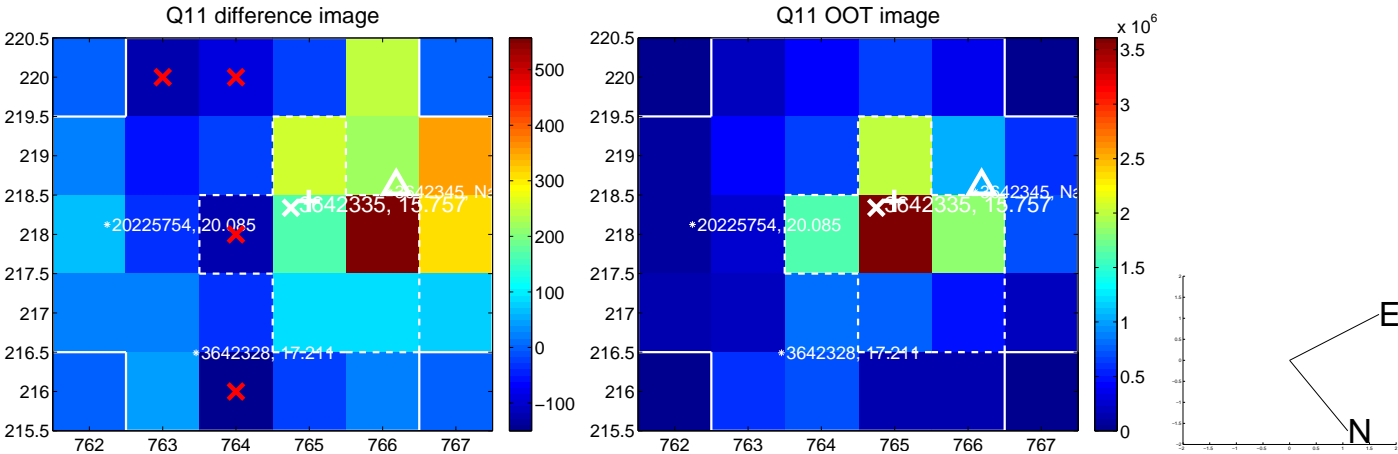
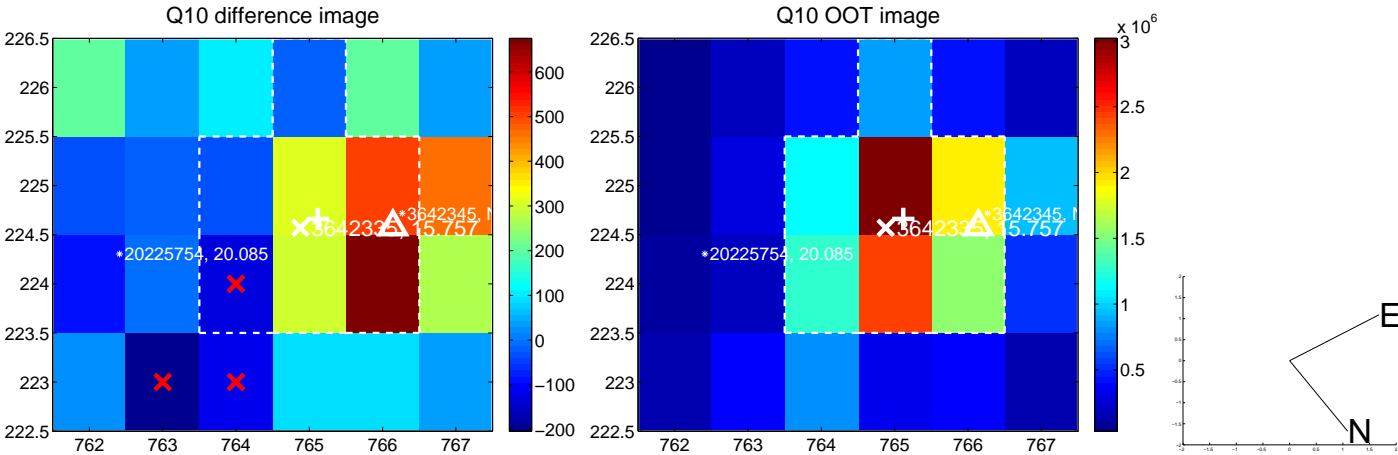
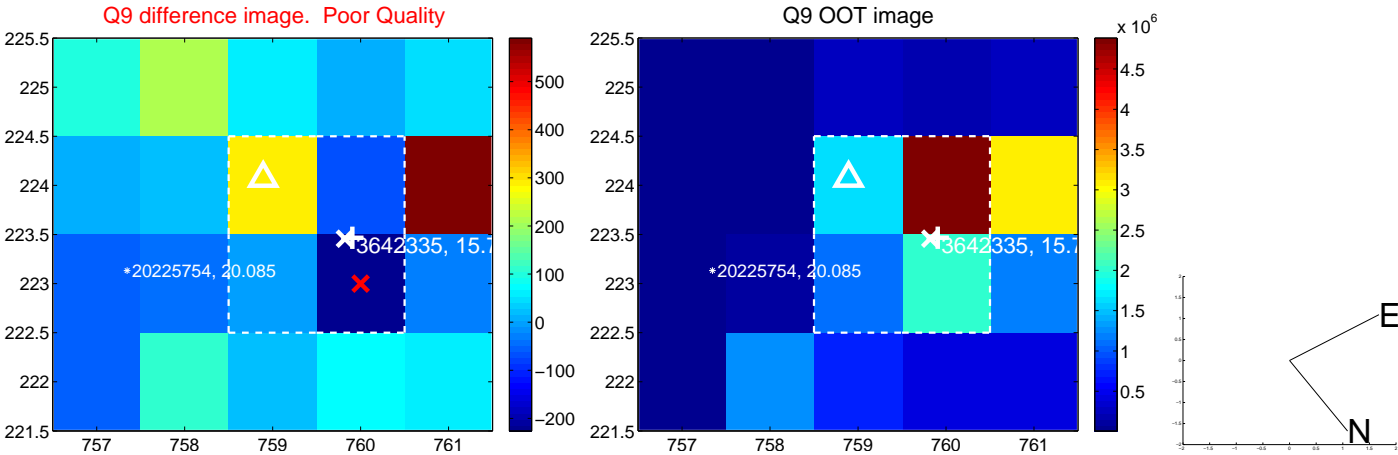
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



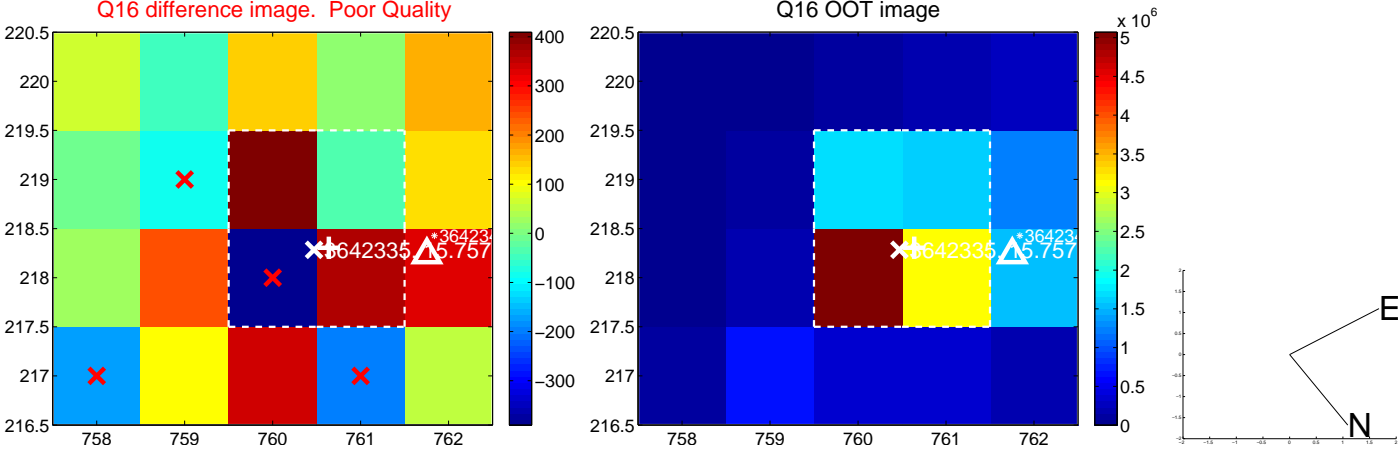
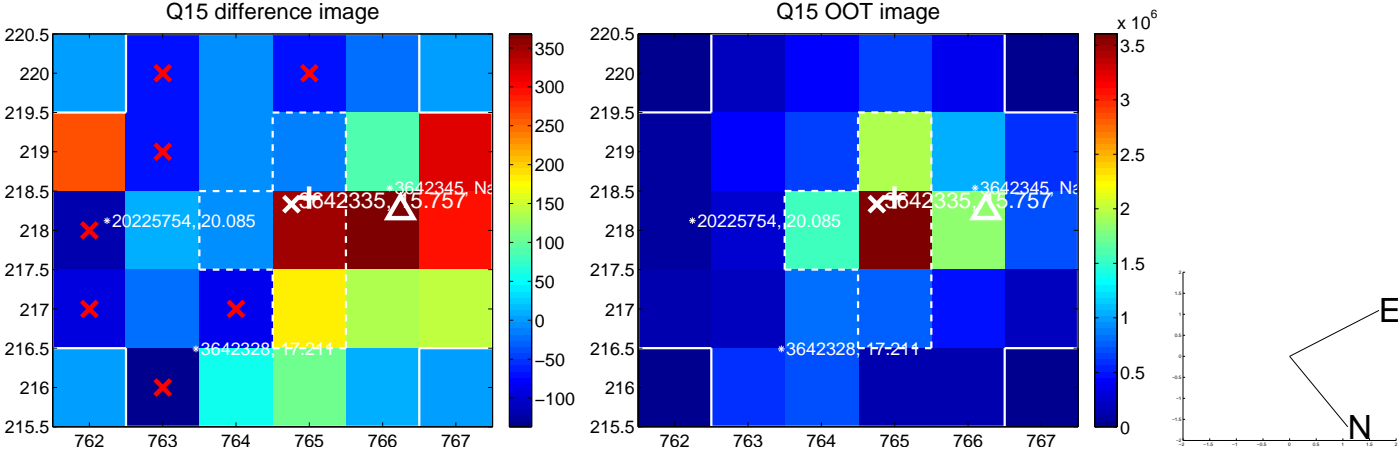
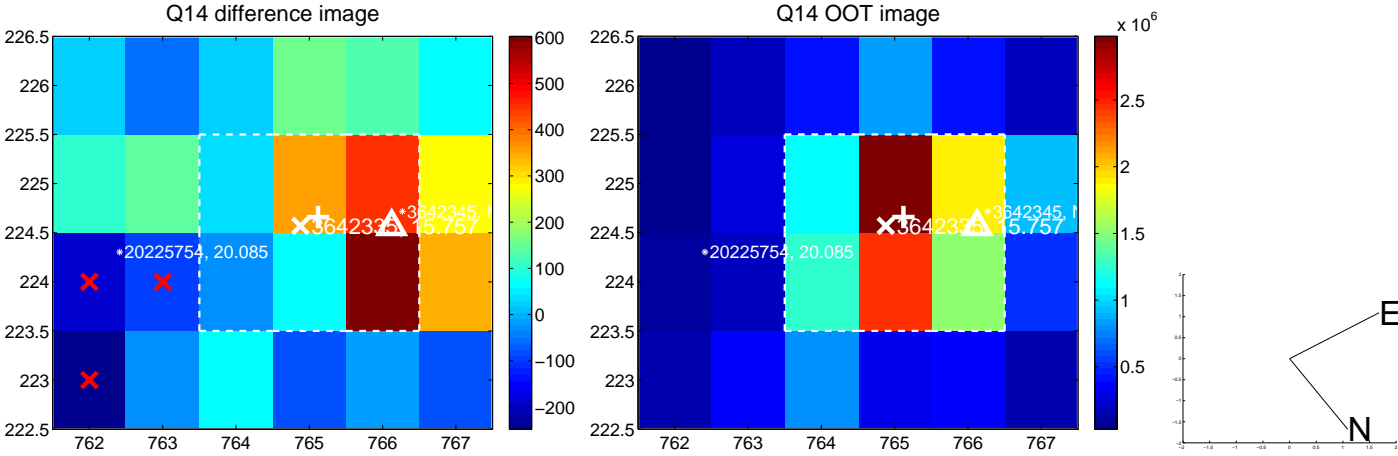
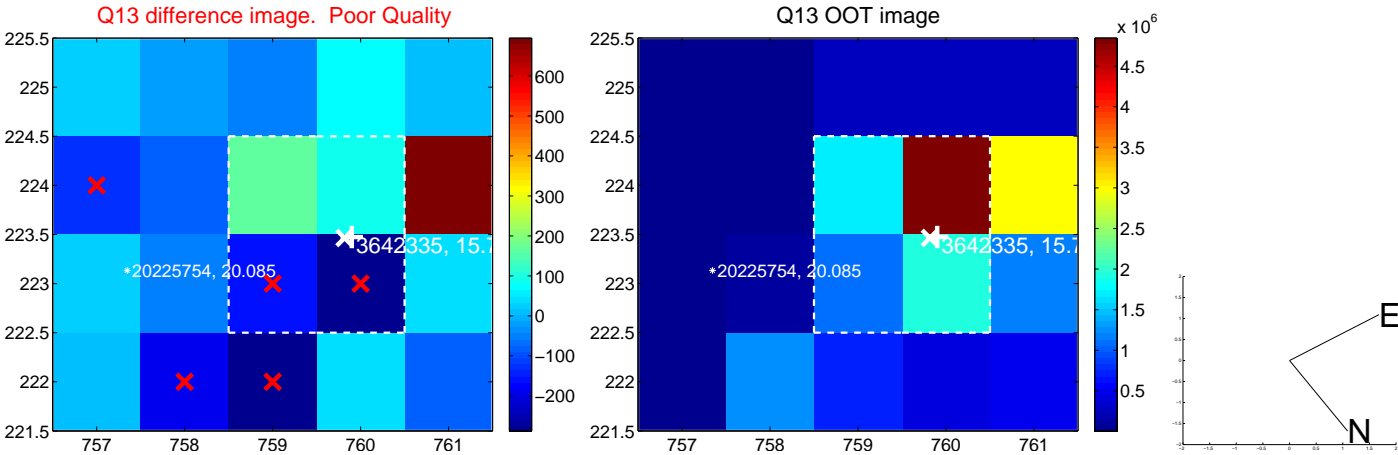
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



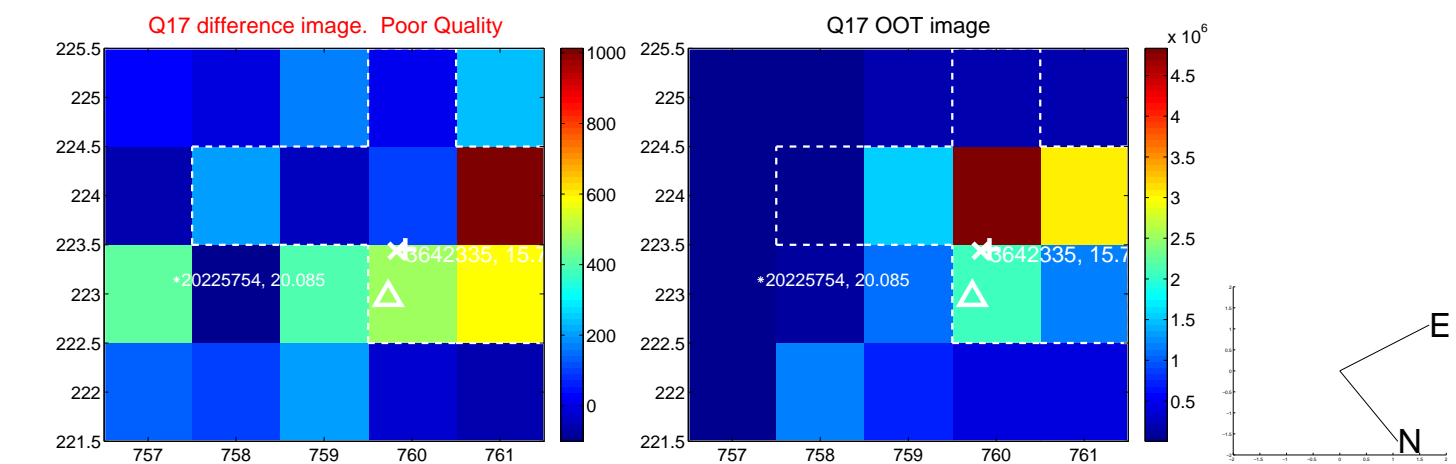
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



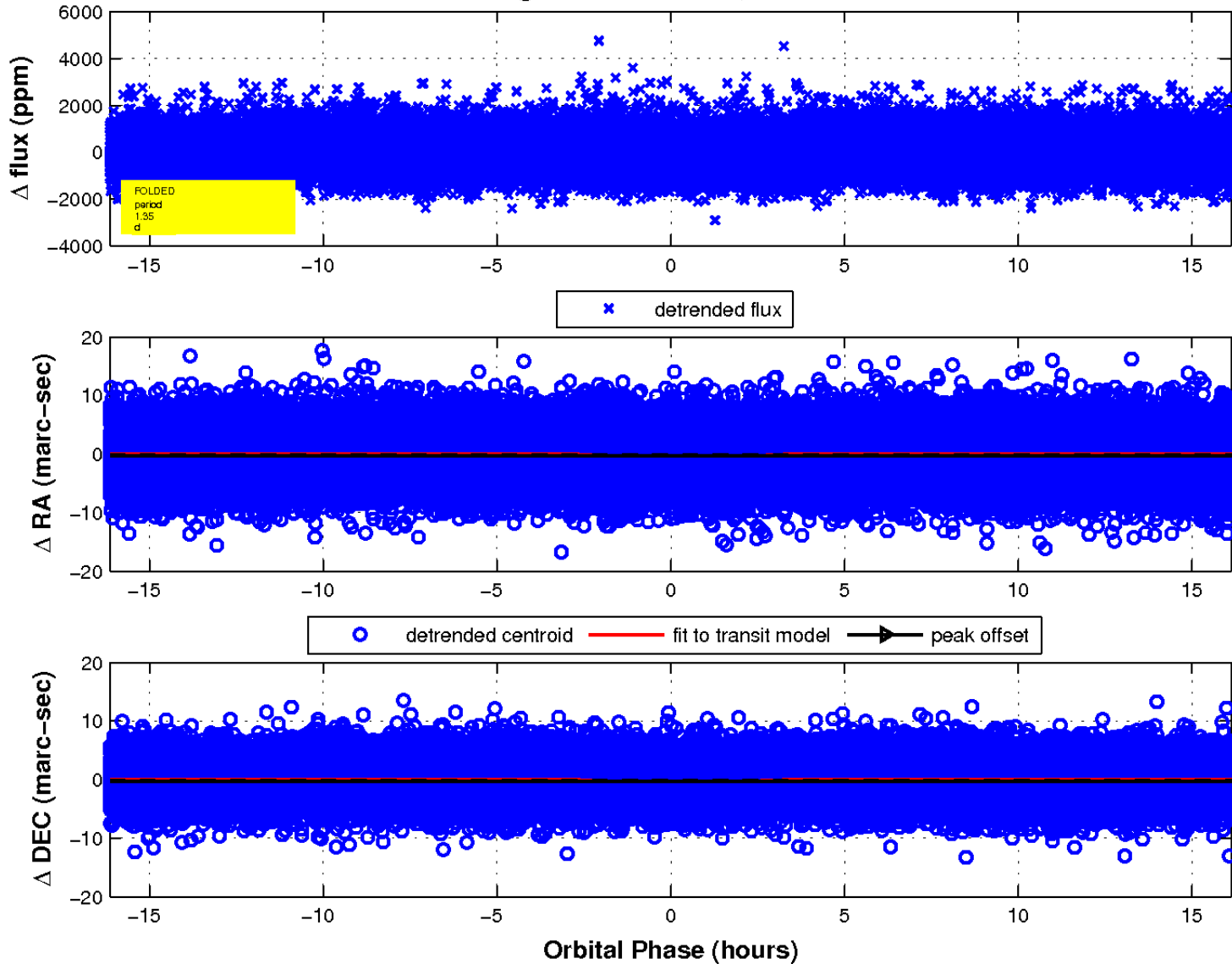
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

