

# KIC 008611832

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008611832-01	OBS	2414.01	22.596559	140.435603	137.7	6.482	18.0	18.9	1.10	5610	1.54	47.79
008611832-02	OBS	2414.02	45.348708	142.249147	163.9	4.946	12.8	14.5	1.10	5610	1.68	18.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008611832-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
008611832-02	OBS	PC	0.97	0	0	0	0	NO_COMMENT

**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.

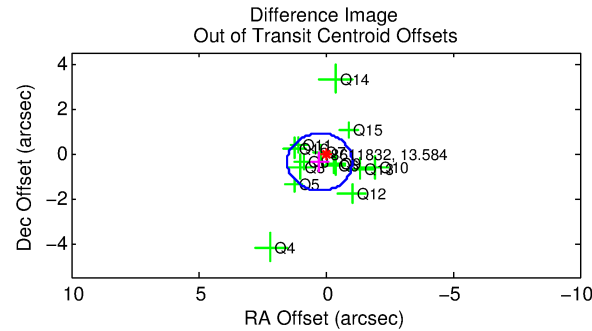
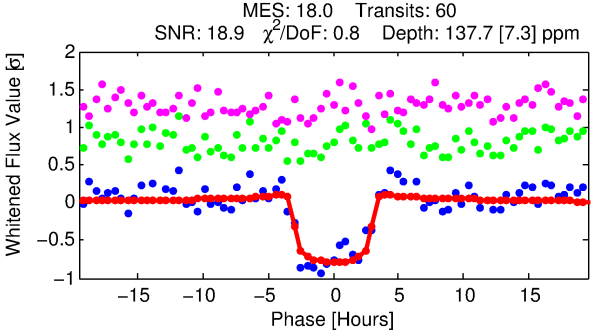
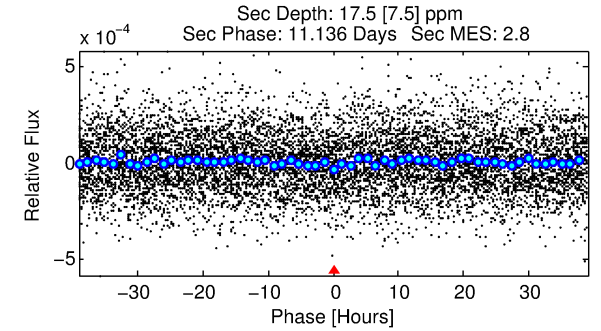
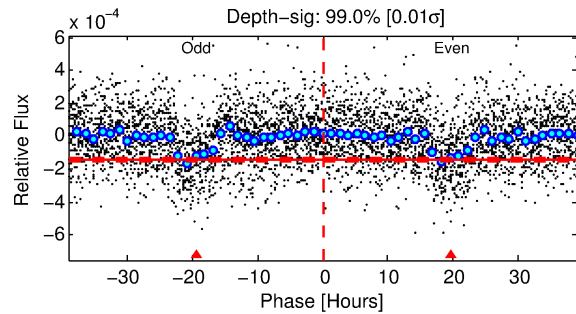
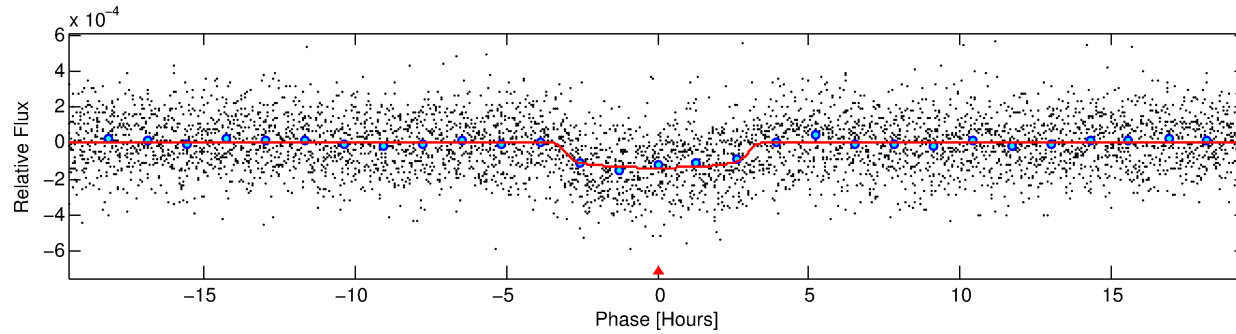
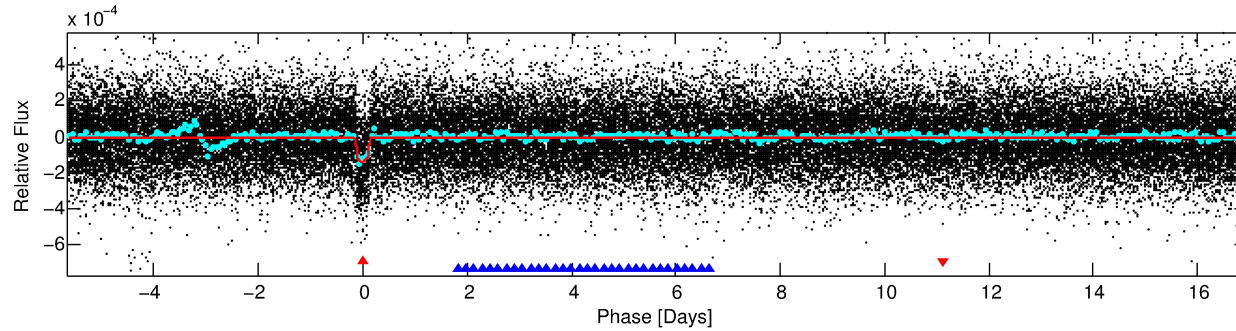
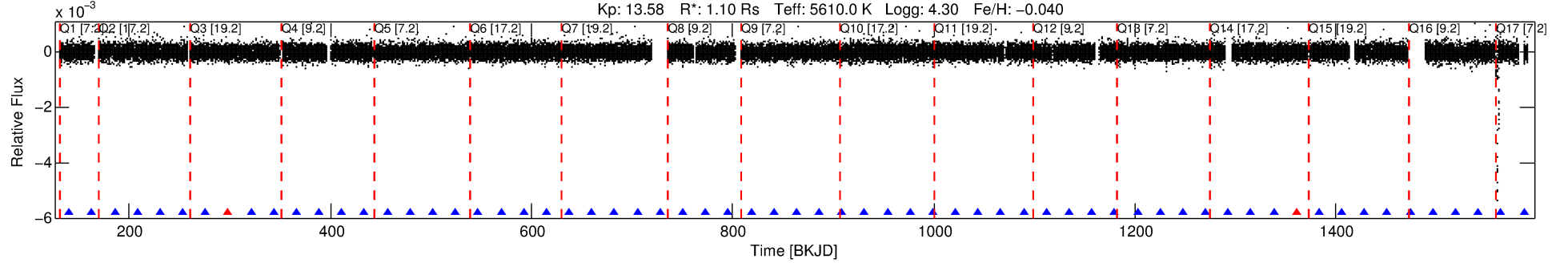
## Ephemeris Match Information For 008611832-01

No Significant Match Found

# DV One-Page Summary

KIC: 8611832 Candidate: 1 of 2 Period: 22.597 d  
KOI: K02414.01 Name: Kepler-384b Corr: 0.978

Kp: 13.58 R\*: 1.10 Rs Teff: 5610.0 K Logg: 4.30 Fe/H: -0.040



## DV Fit Results:

Period = 22.59656 [0.00017] d  
Epoch = 140.4356 [0.0062] BKJD  
Rp/R\* = 0.0128 [0.0022]  
a/R\* = 12.67 [9.88]  
b = 0.89 [0.18]  
Seff = 47.79 [13.87]  
Teq = 670 [49] K  
Rp = 1.54 [0.36] Re  
a = 0.1504 [0.0251] AU  
Ag = 92.25 [56.73] [1.61σ]  
Teffp = 3212 [445] K [5.68σ]

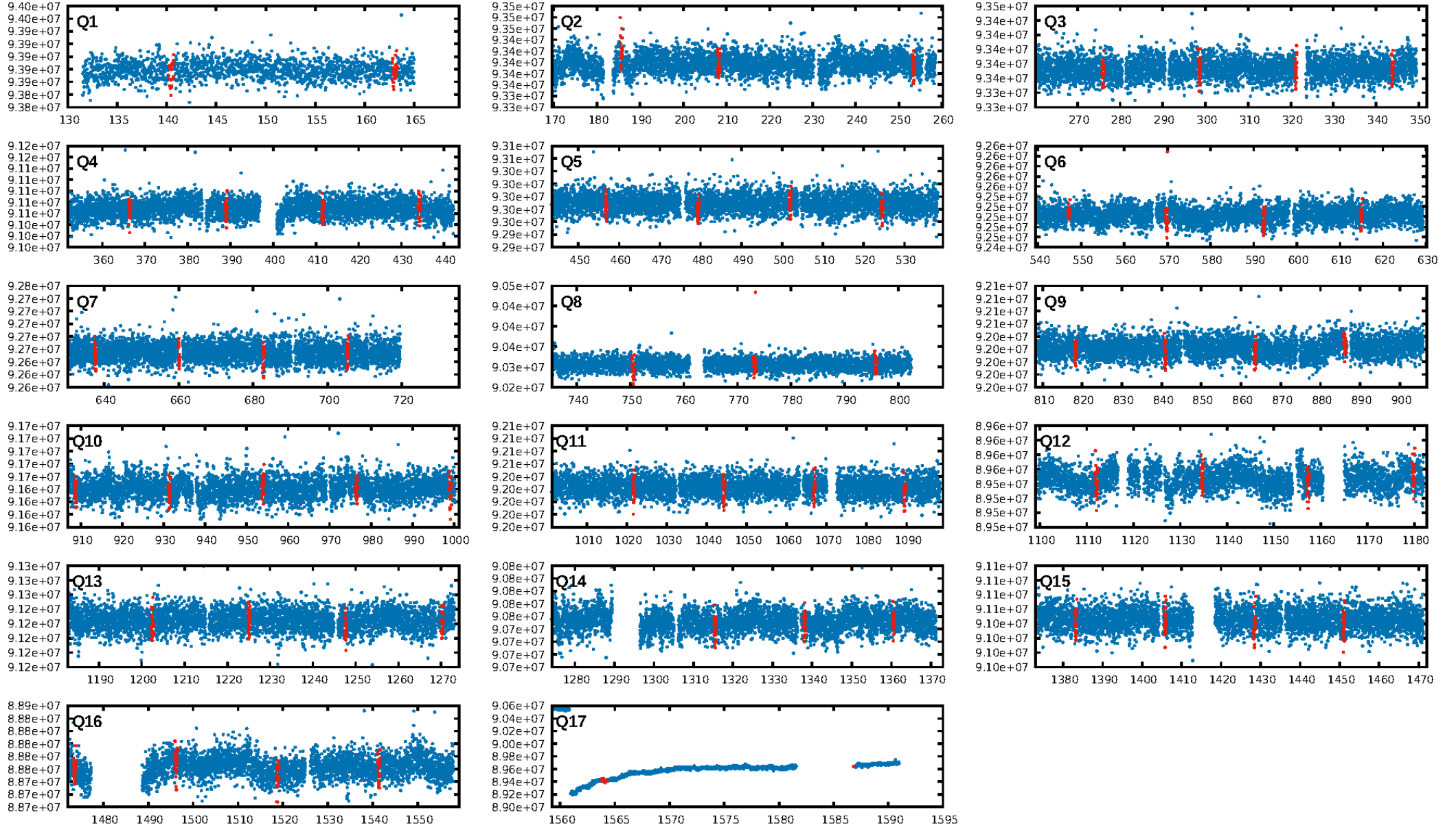
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [66.97σ]  
ModelChiSquare2-sig: 71.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.36e-70  
RollingBand-fgt: 0.96 [55/57]  
GhostDiagnostic-chr: 9.973  
Centroid-sig: 1.4%  
Centroid-so: 0.996 arcsec [1.50σ]  
OotOffset-rm: 0.448 arcsec [1.05σ]  
KicOffset-rm: 0.445 arcsec [0.94σ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.79 [11/14]  
DiffImageOverlap-fno: 1.00 [17/17]

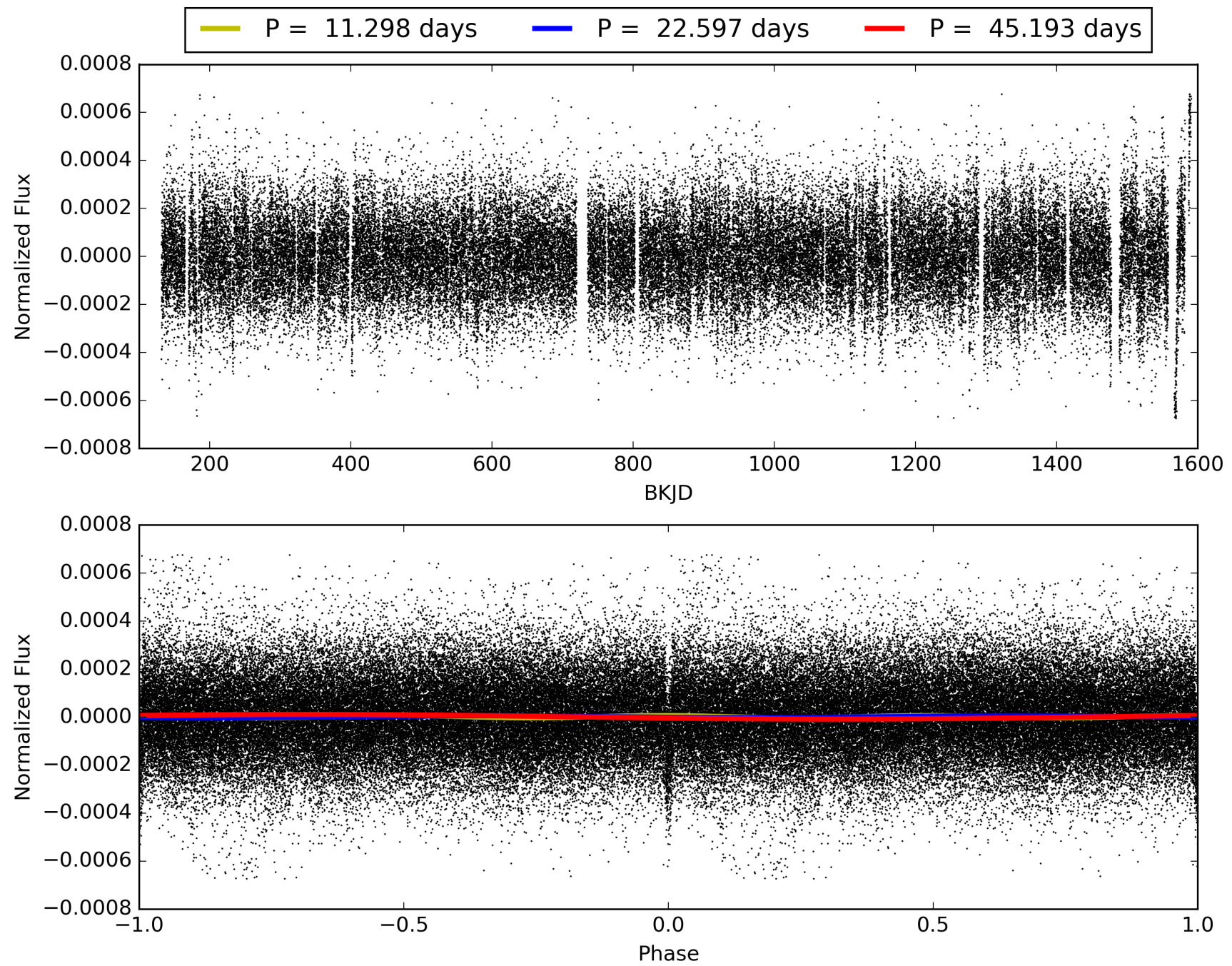
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:05:20 Z

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

# TCE 008611832-01, PDC Light Curves

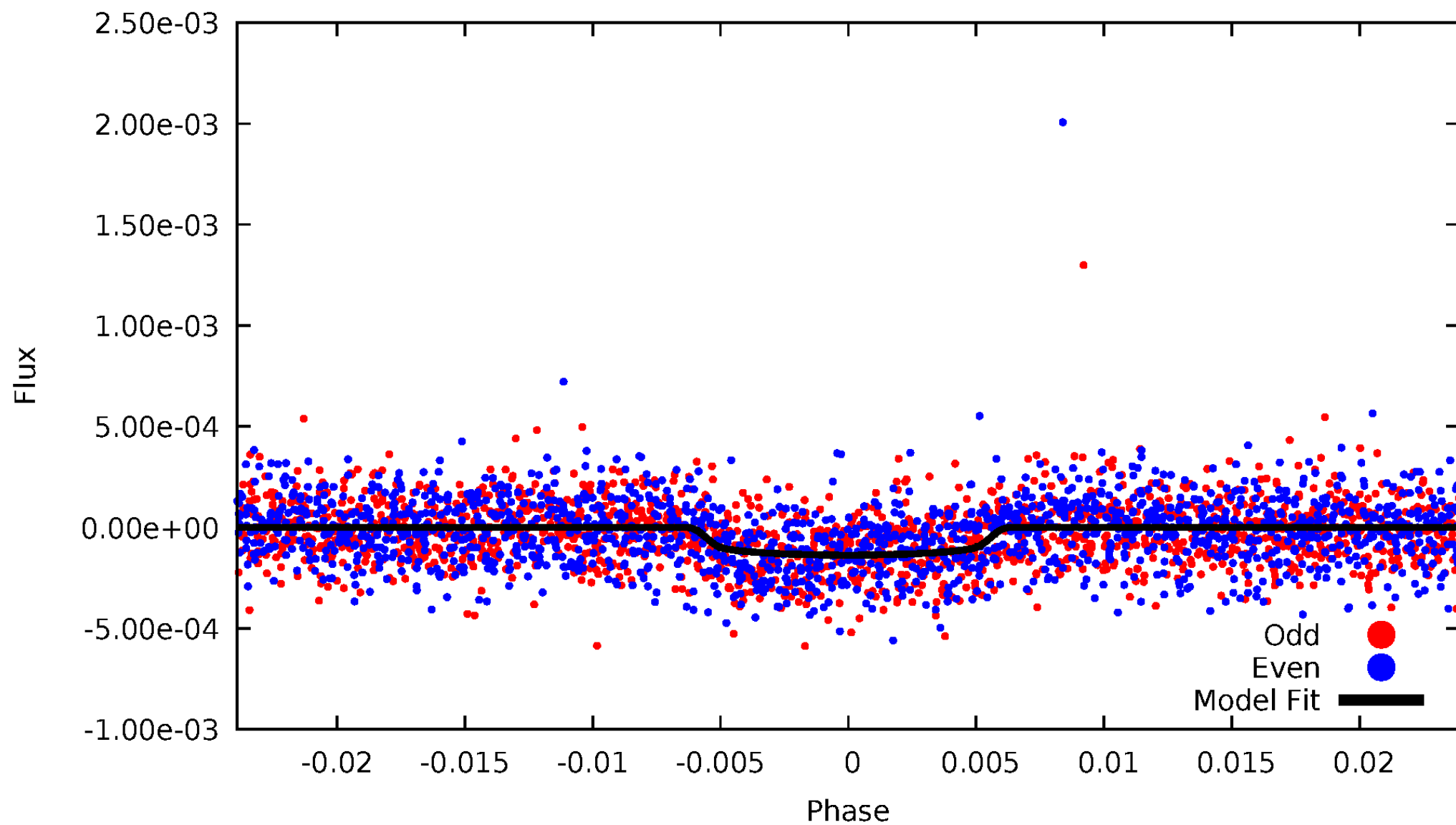


# TCE 008611832-01



# DV Odd/Even

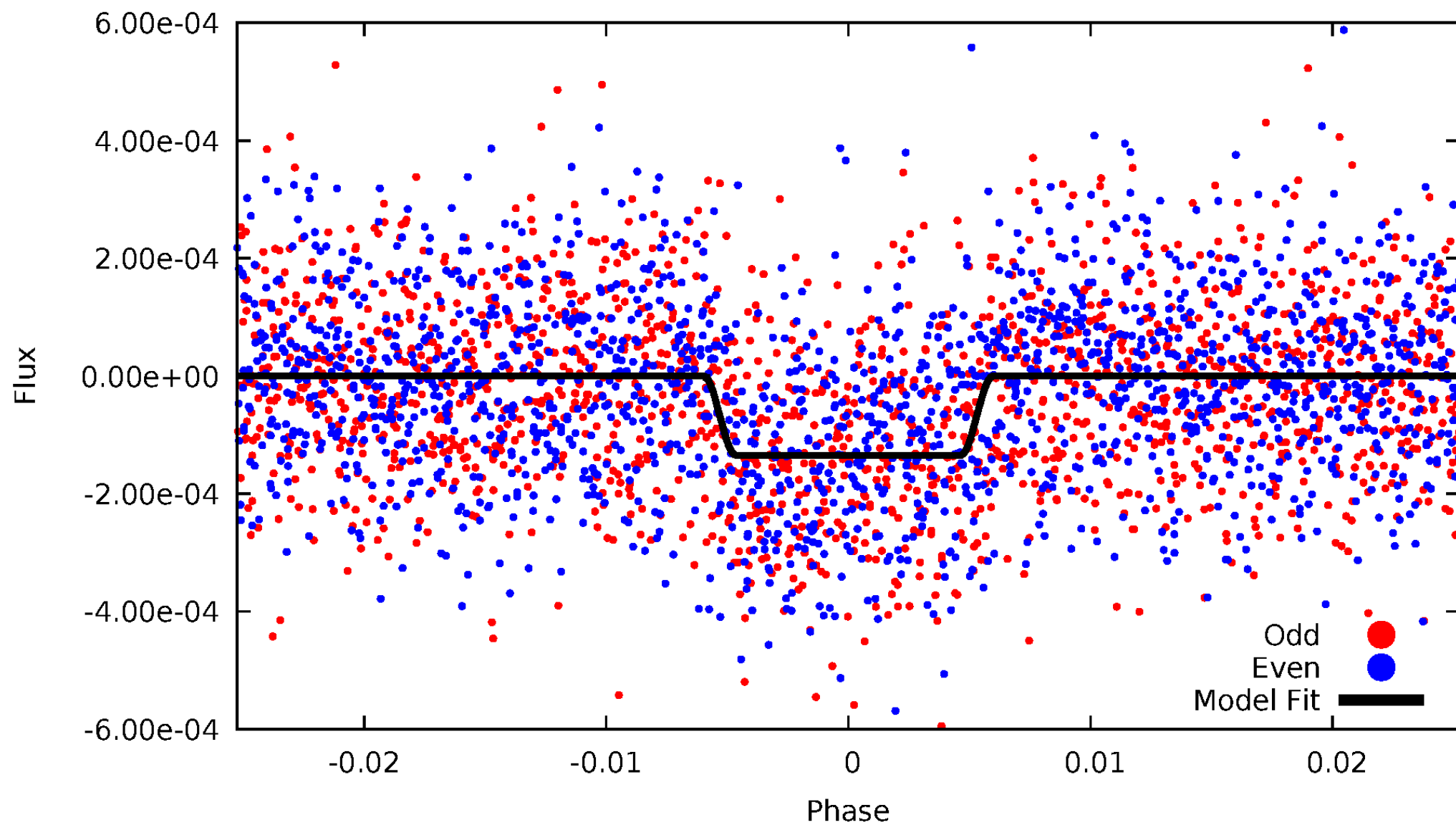
TCE 008611832-01





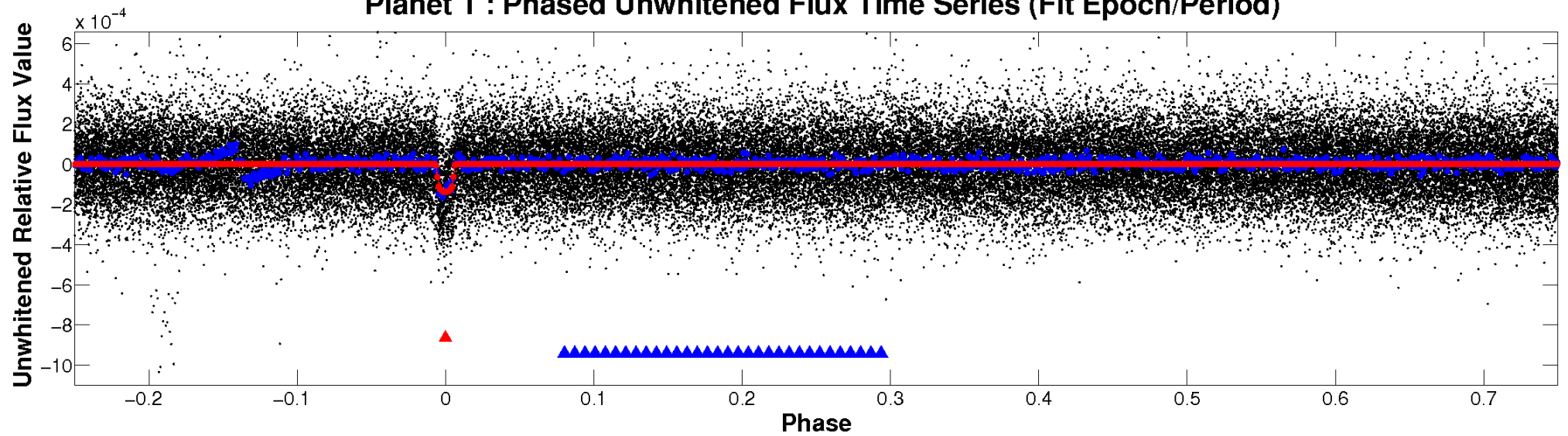
# ALT Odd/Even

TCE 008611832-01

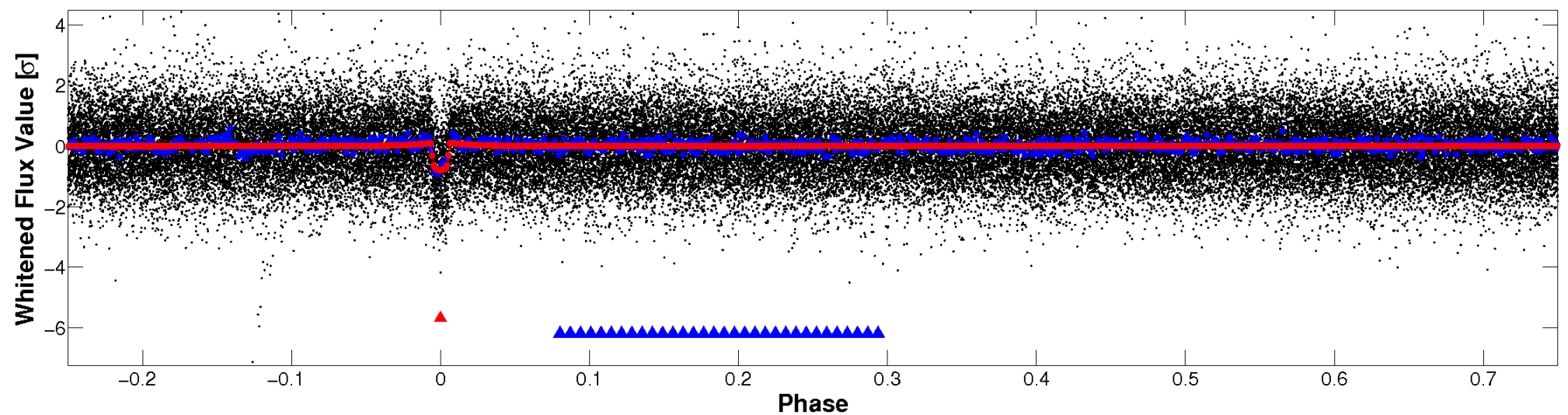


# Non-Whitened Vs. Whitened Light Curve

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

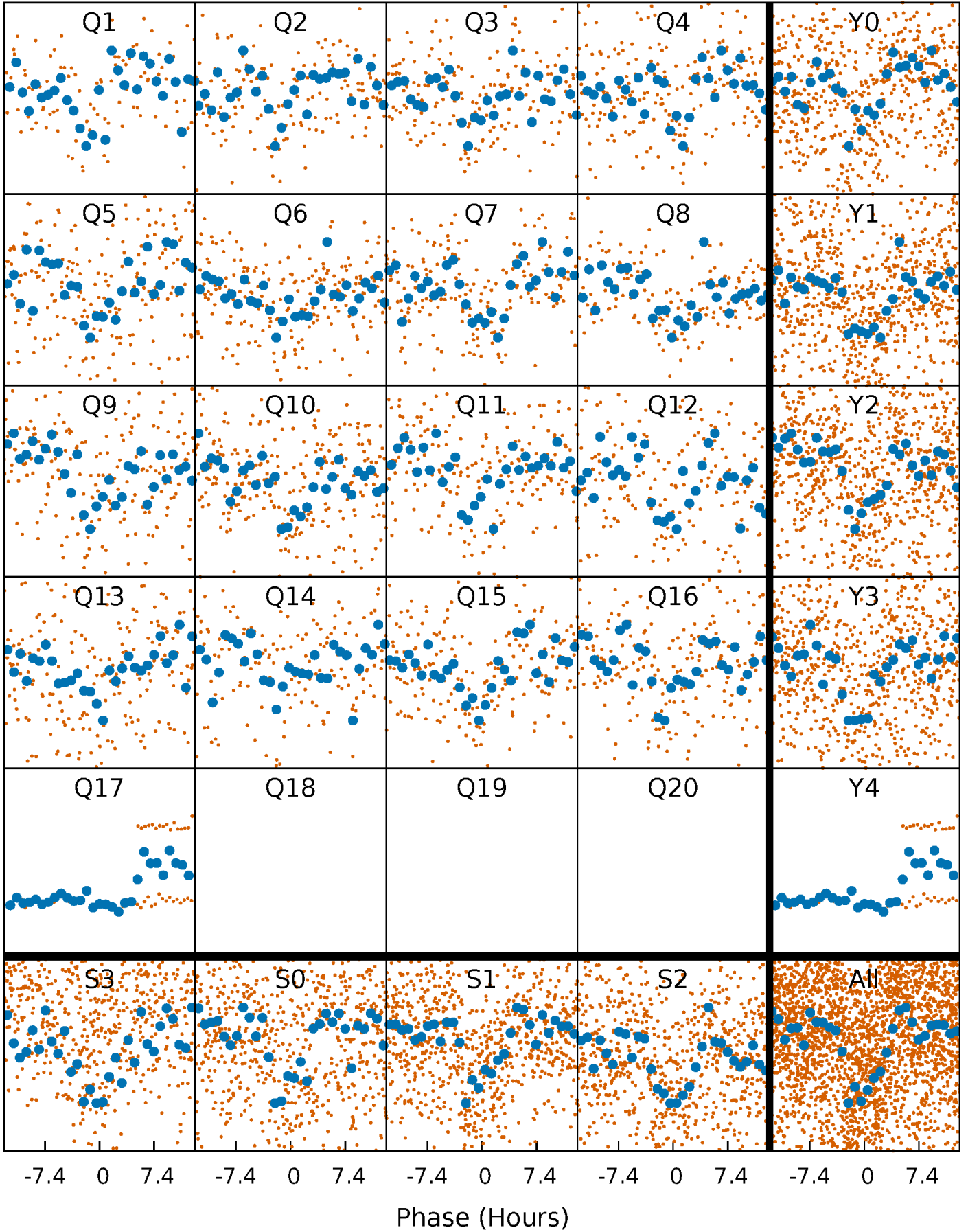


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

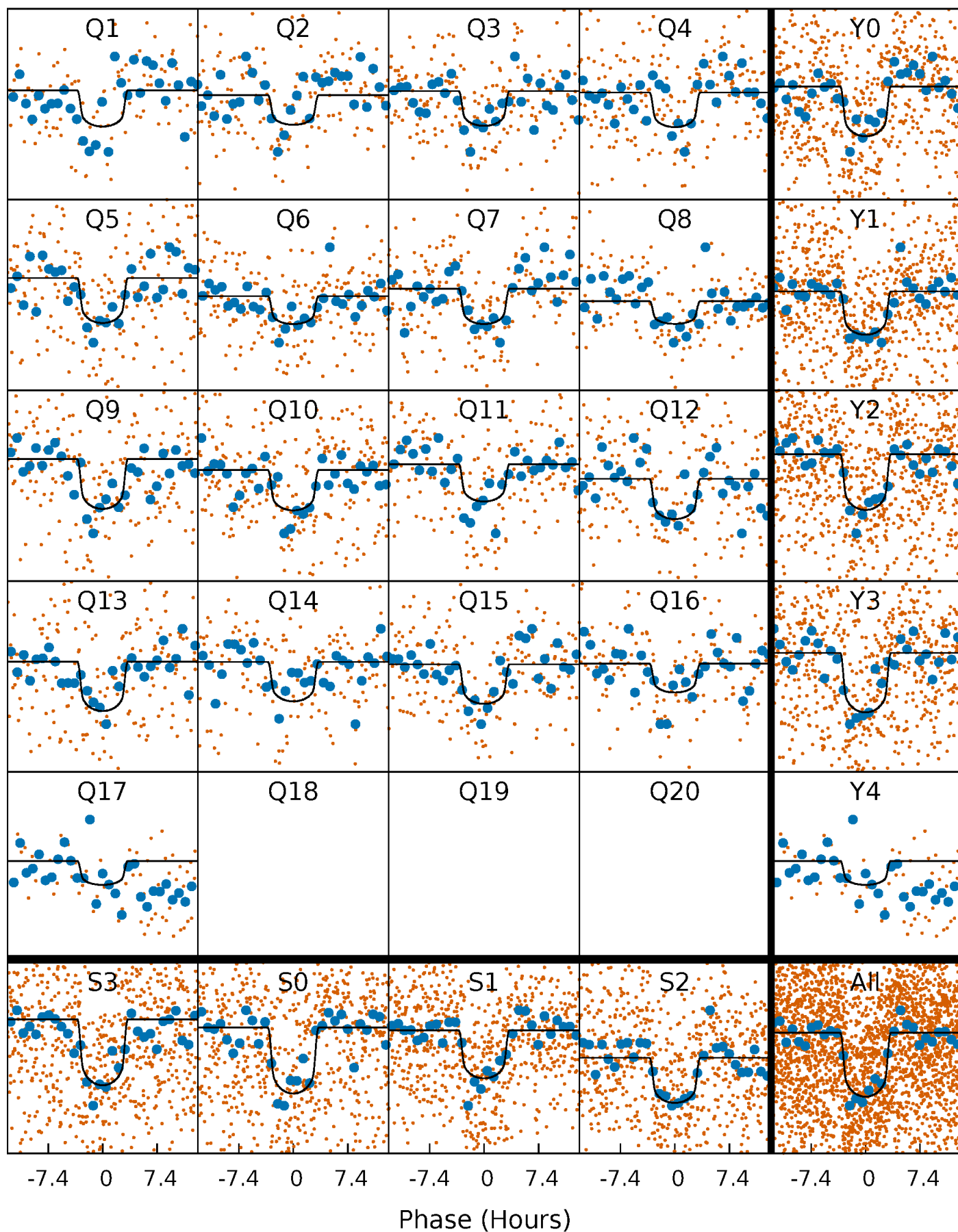
TCE 008611832-01   P= 22.596559 Days    $T_0=140.435603$  (BKJD)





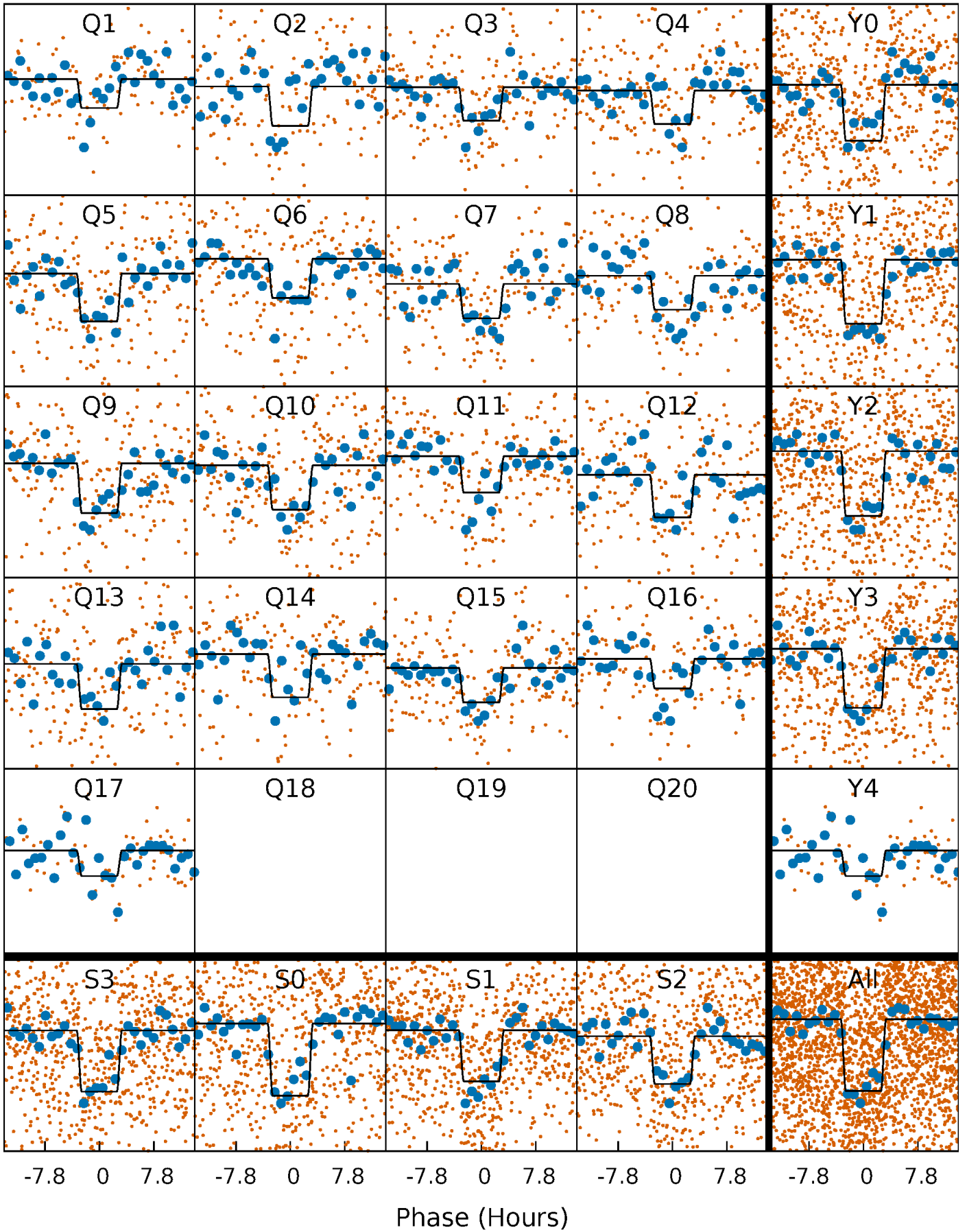
# DV Quarter-Phased Transit Curves

TCE 008611832-01 P= 22.596559 Days  $T_0=140.435603$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

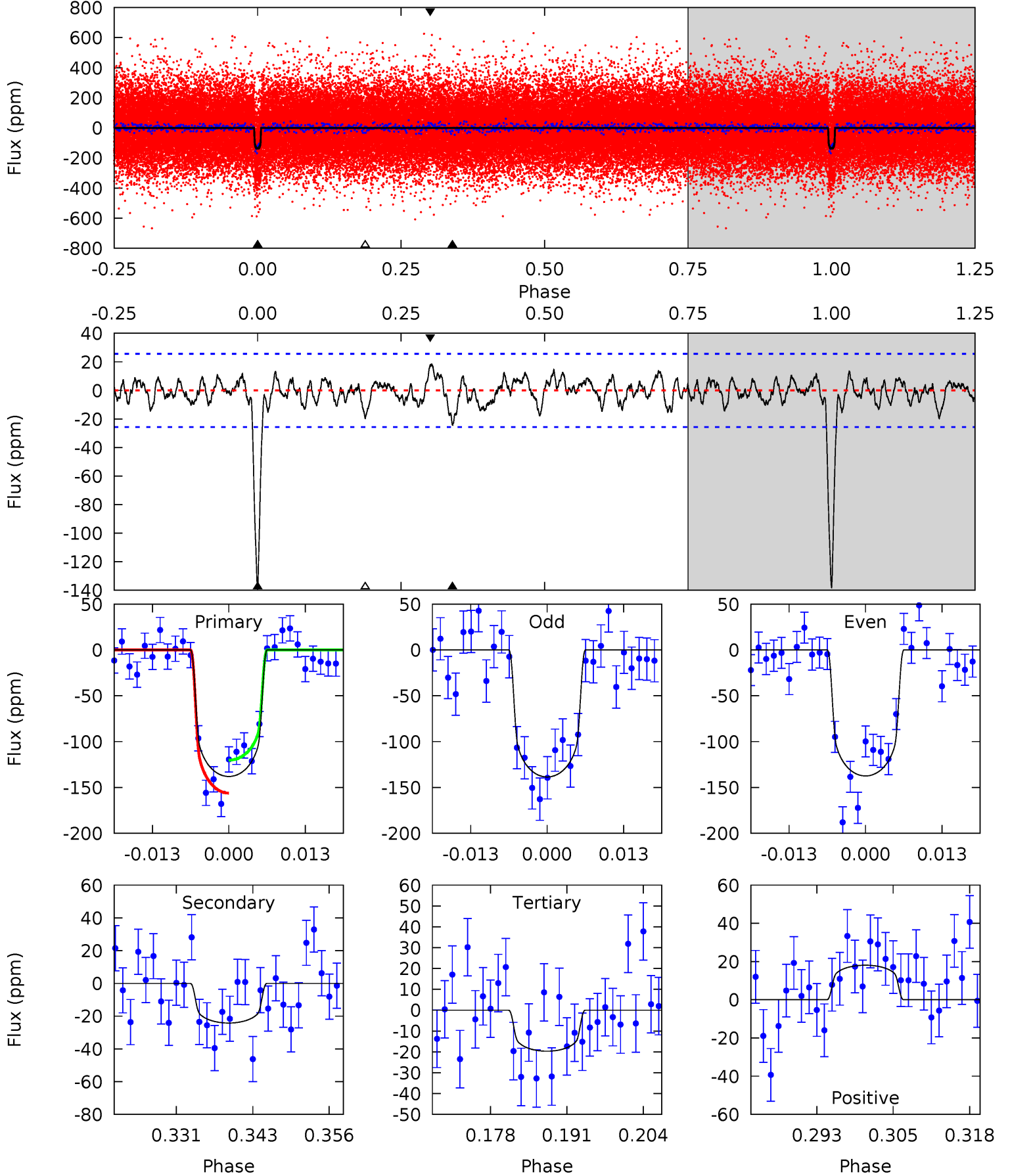
TCE 008611832-01 P= 22.596402 Days  $T_0=140.437071$  (BKJD)



# DV Model-Shift Uniqueness Test

008611832-01,  $P = 22.596559$  Days,  $E = 117.839044$  Days

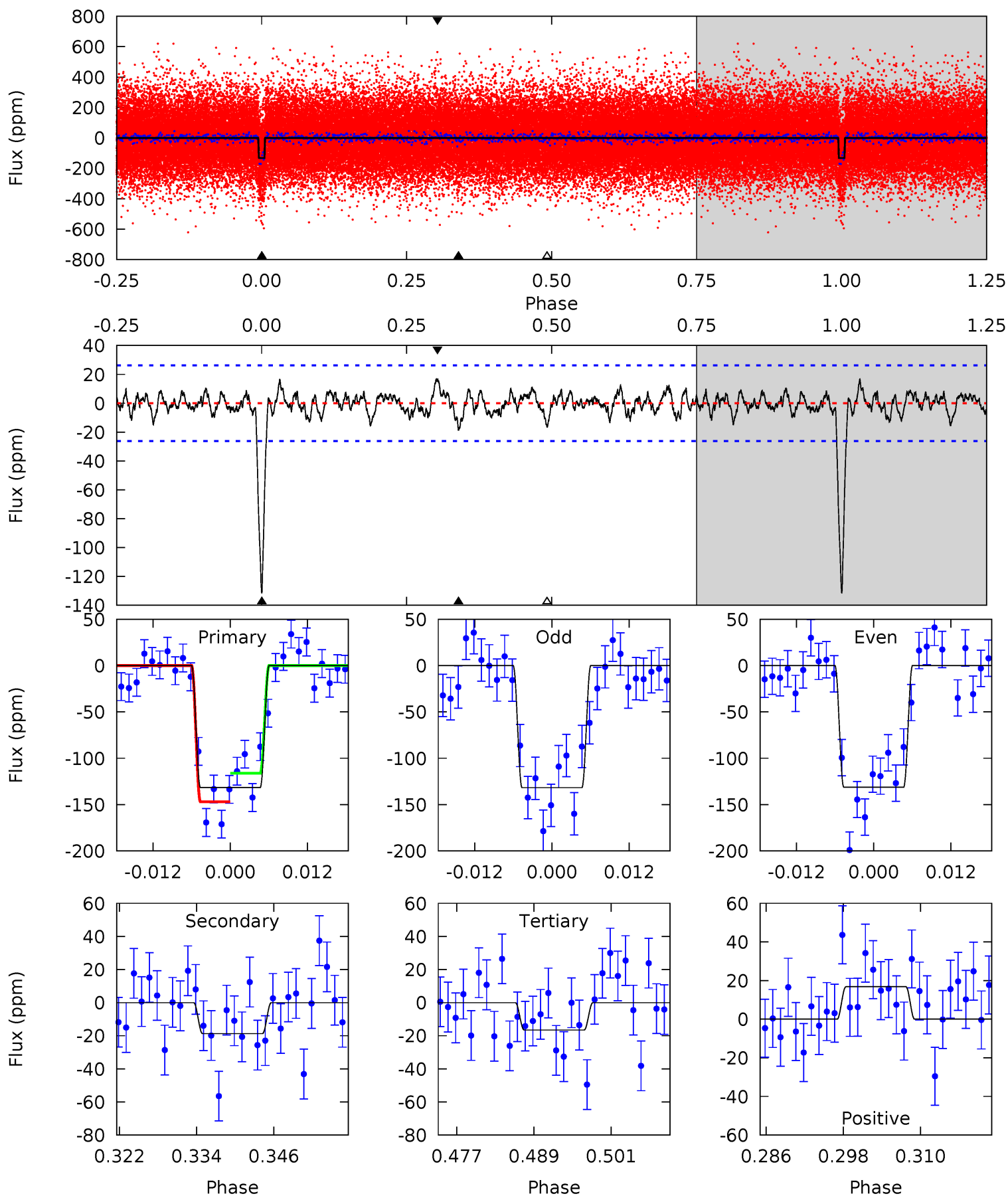
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.8	4.70	3.82	3.51	4.98	2.49	1.32	23.0	23.3	0.88	1.19	0.11	1.00	0.12	3.50



# Alt Model-Shift Uniqueness Test

008611832-01,  $P = 22.596402$  Days,  $E = 117.840669$  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
25.0	3.56	3.15	3.20	4.99	2.51	1.07	21.9	21.8	0.41	0.36	0.05	0.93	0.11	2.92



### Stellar Parameters For KIC 008611832

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5610^{+112}_{-101}$	$4.301^{+0.168}_{-0.112}$	$-0.040^{+0.150}_{-0.150}$	$1.104^{+0.176}_{-0.176}$	$0.889^{+0.072}_{-0.044}$	$0.931^{+0.721}_{-0.294}$
	+2%/-2%	+4%/-3%	+375%/-375%	+16%/-16%	+8%/-5%	+77%/-32%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 008611832-01 / KOI 2414.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-24 \pm 5$	$1.51^{+0.30}_{-0.29}$	$933^{+42}_{-49}$	$3835^{+309}_{-241}$	$130^{+79}_{-43}$
Alt.	$-19 \pm 5$	$1.39^{+0.31}_{-0.30}$	$932^{+47}_{-48}$	$3783^{+339}_{-291}$	$119^{+82}_{-48}$

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



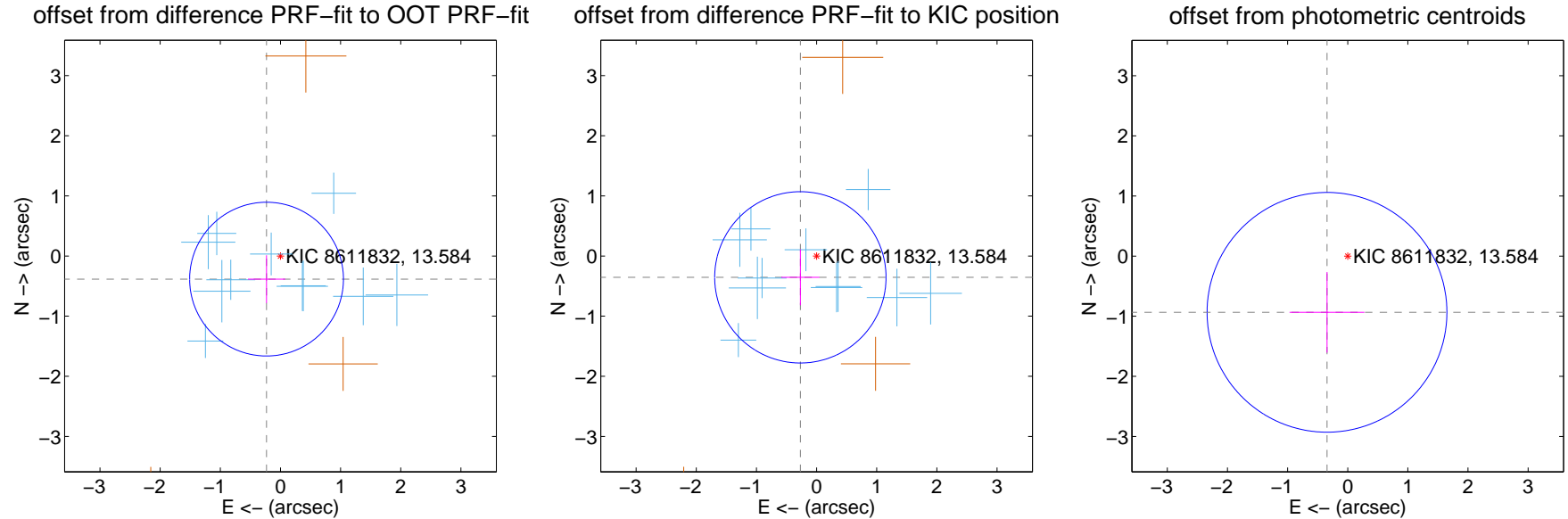
## DV Centroid Data

Supplemental centroid analysis for 008611832-01. Kepler magnitude: 13.58. Transit SNR 18.93

There are 11 quarters with good PRF difference image offsets

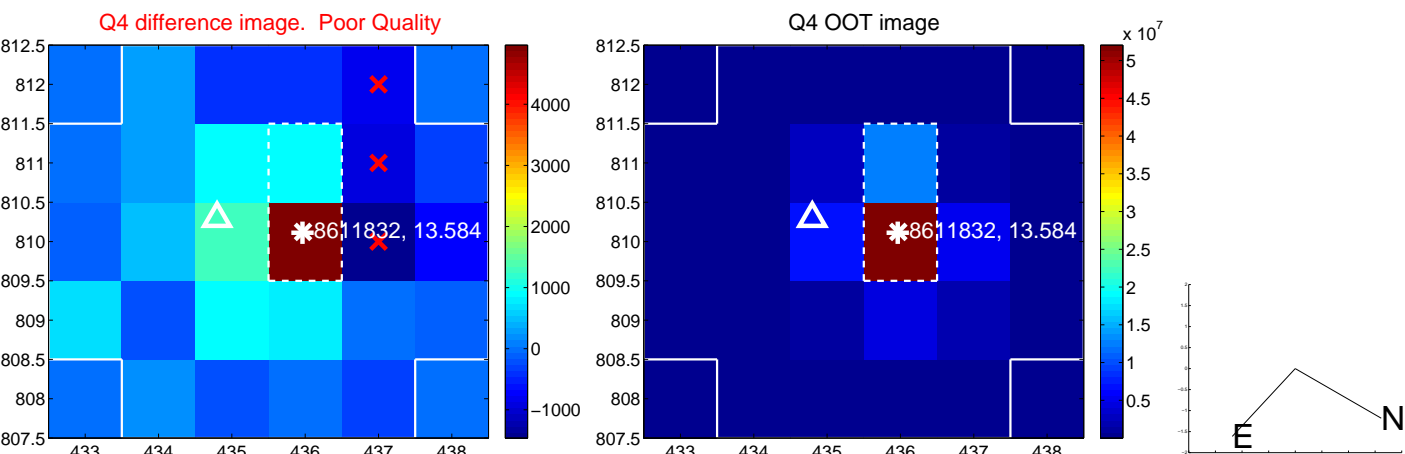
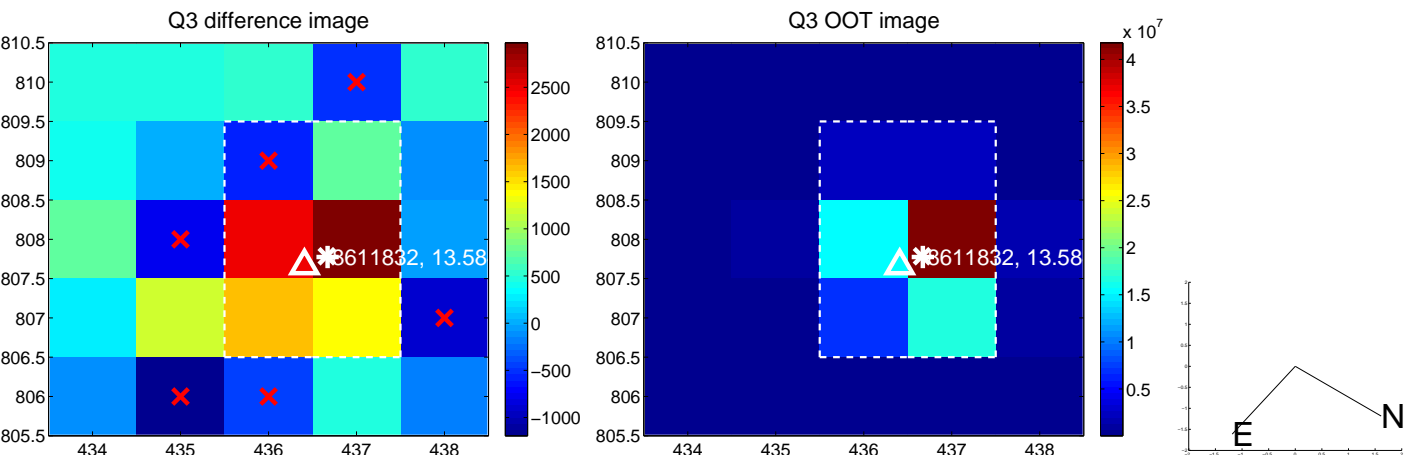
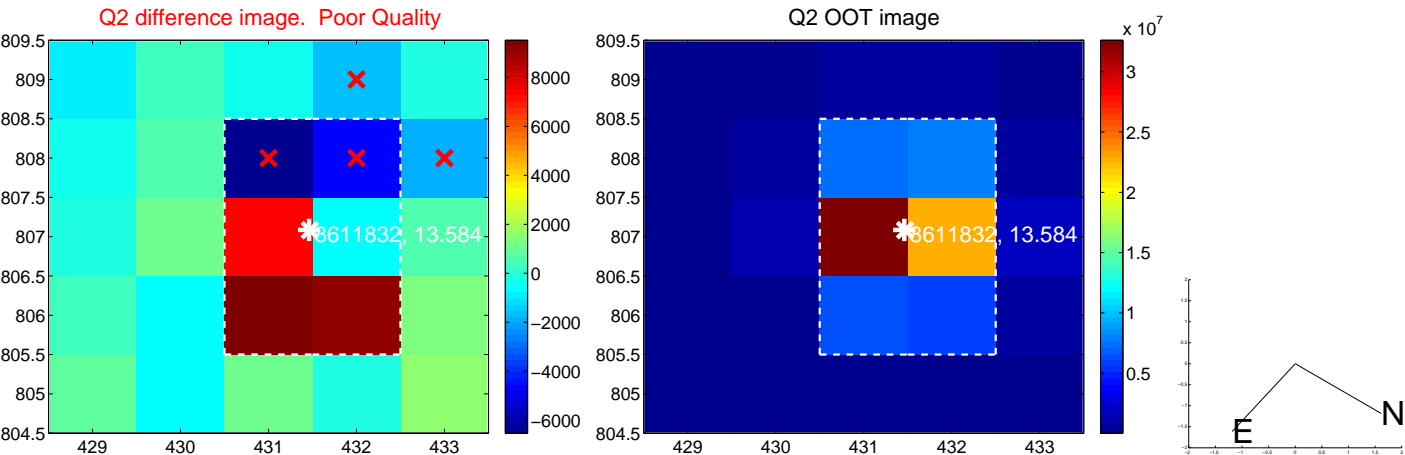
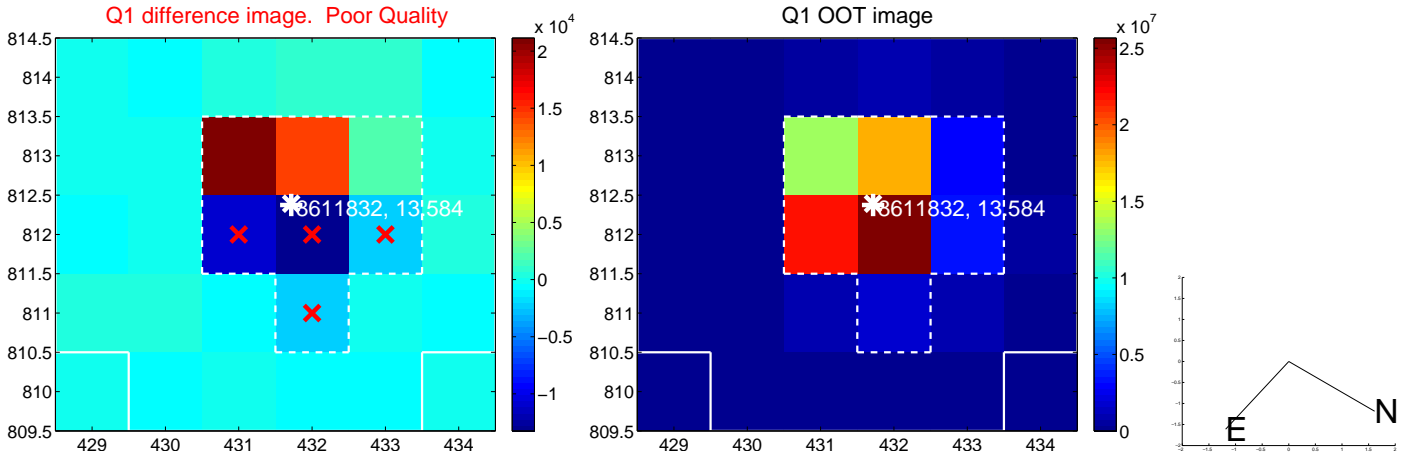
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.448 \pm 0.426$	1.05	$0.231 \pm 0.310$	$-0.384 \pm 0.397$
PRF-fit source offset from KIC position	$0.445 \pm 0.475$	0.94	$0.269 \pm 0.316$	$-0.354 \pm 0.463$
photometric centroid source offset	$1.00 \pm 0.66$	1.50	$0.34 \pm 0.62$	$-0.93 \pm 0.67$

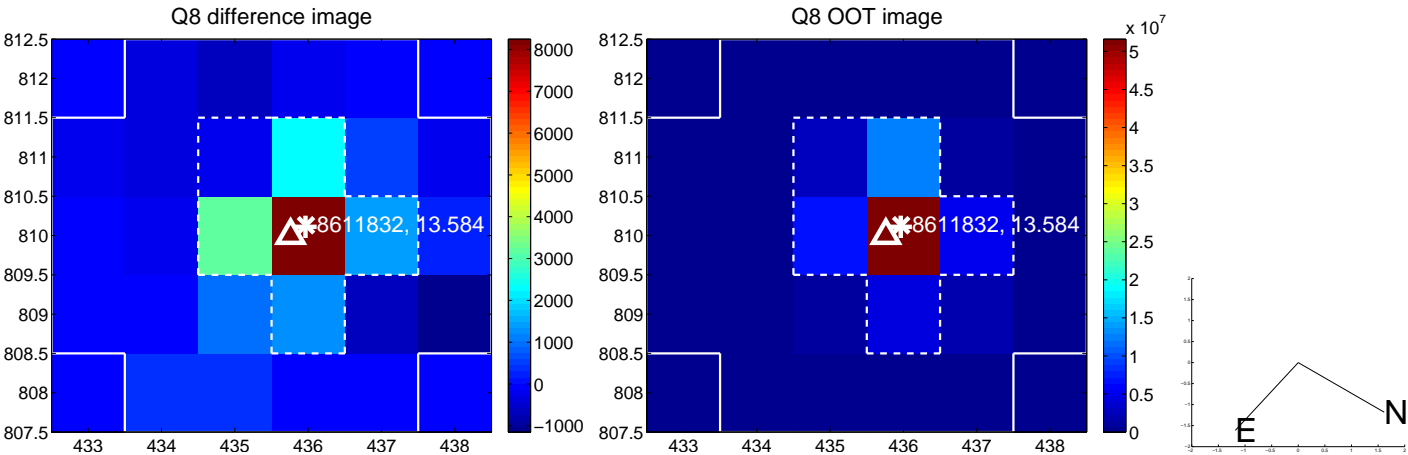
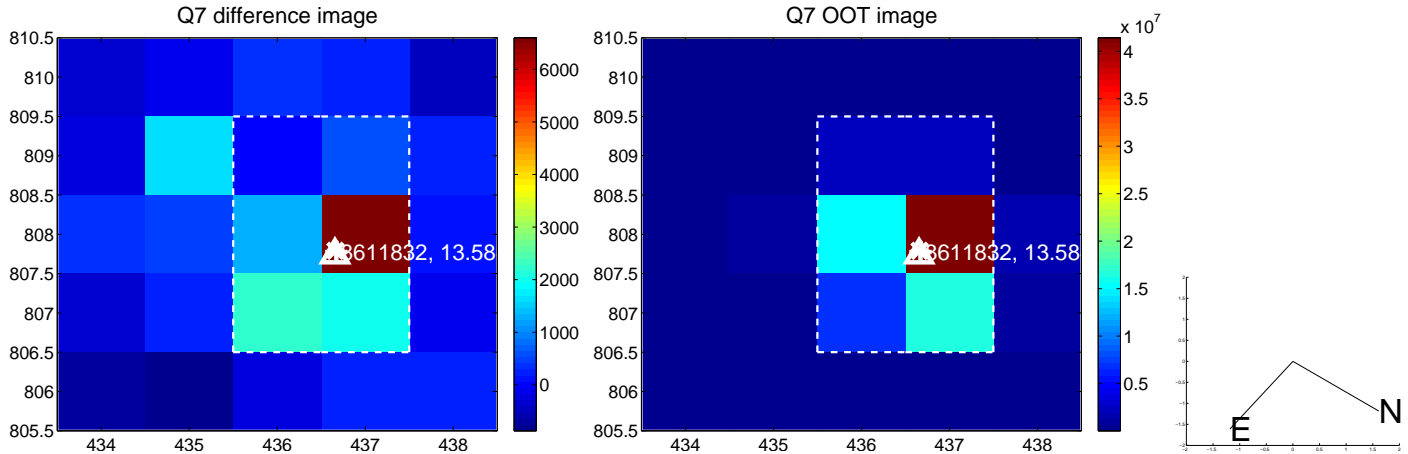
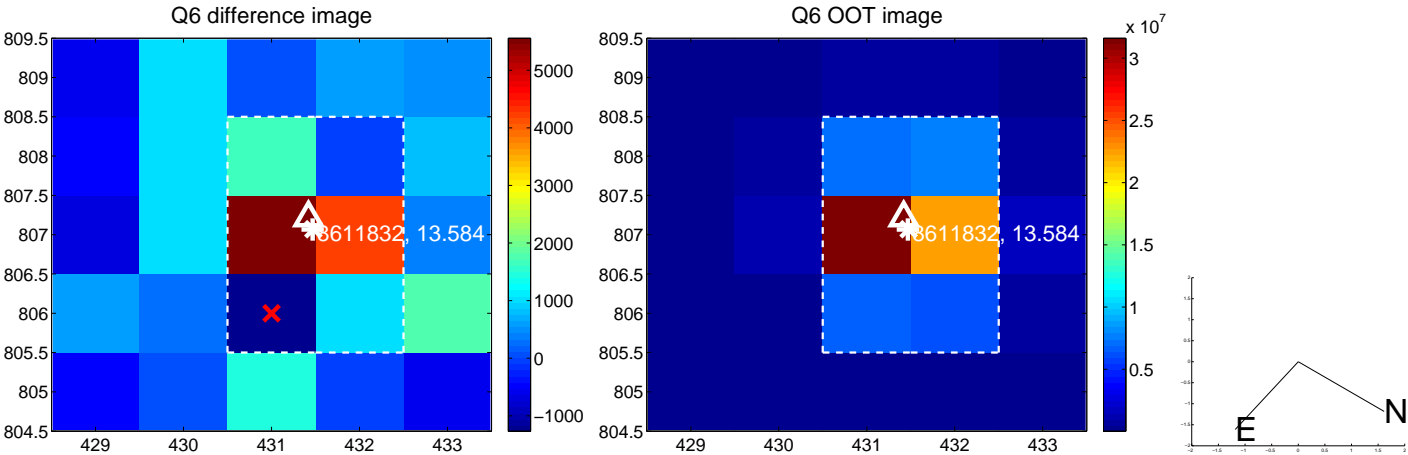
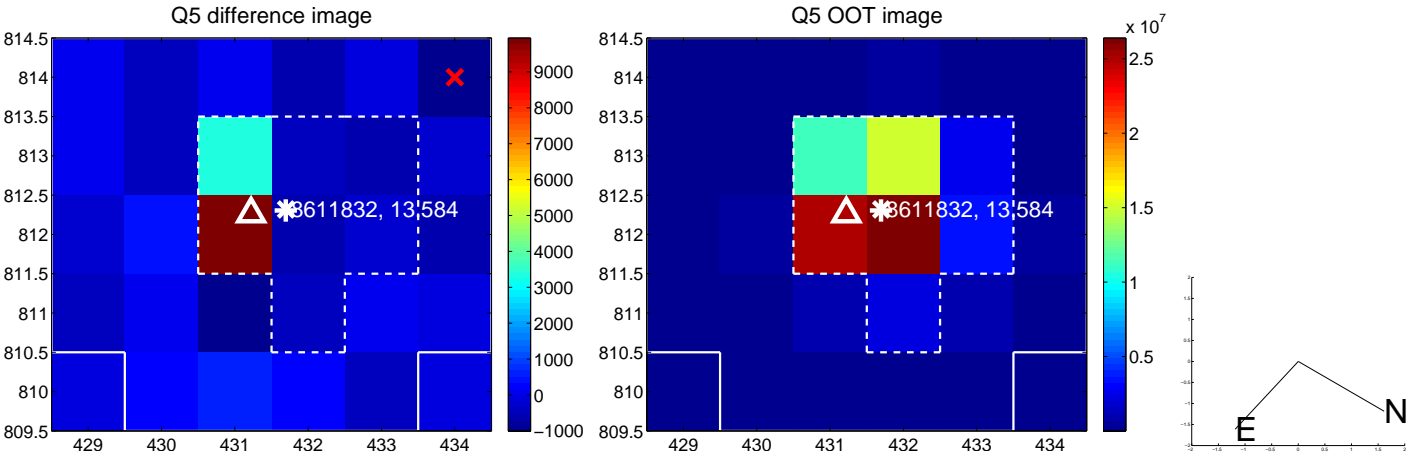


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

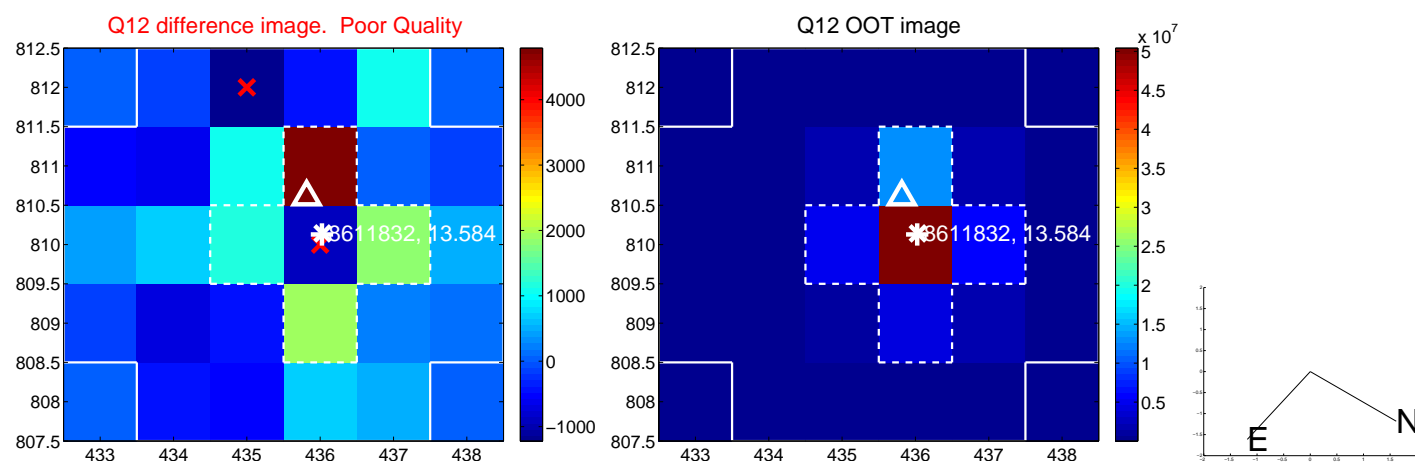
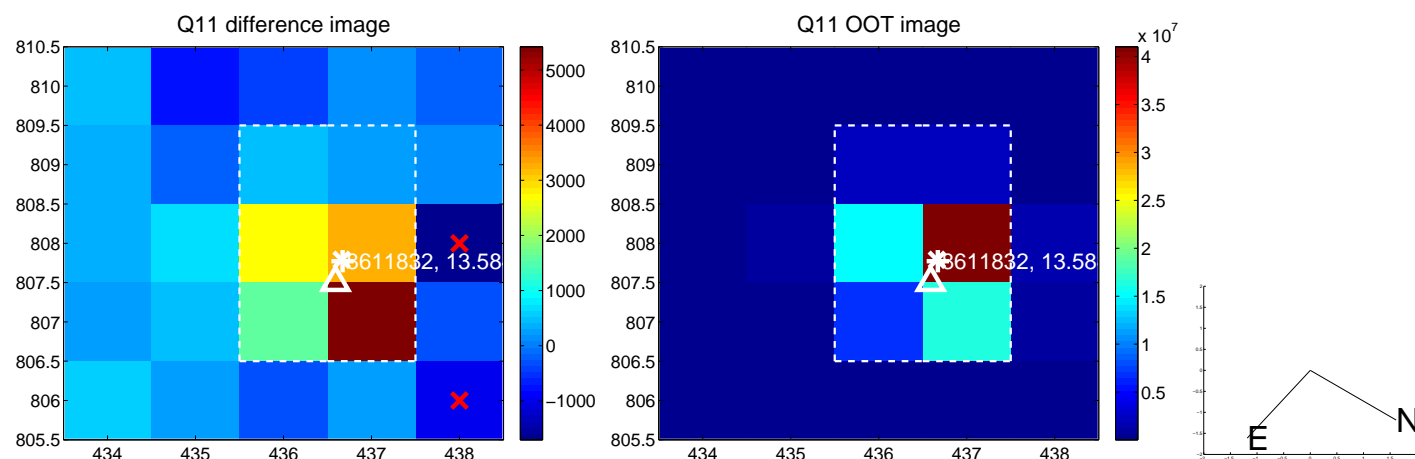
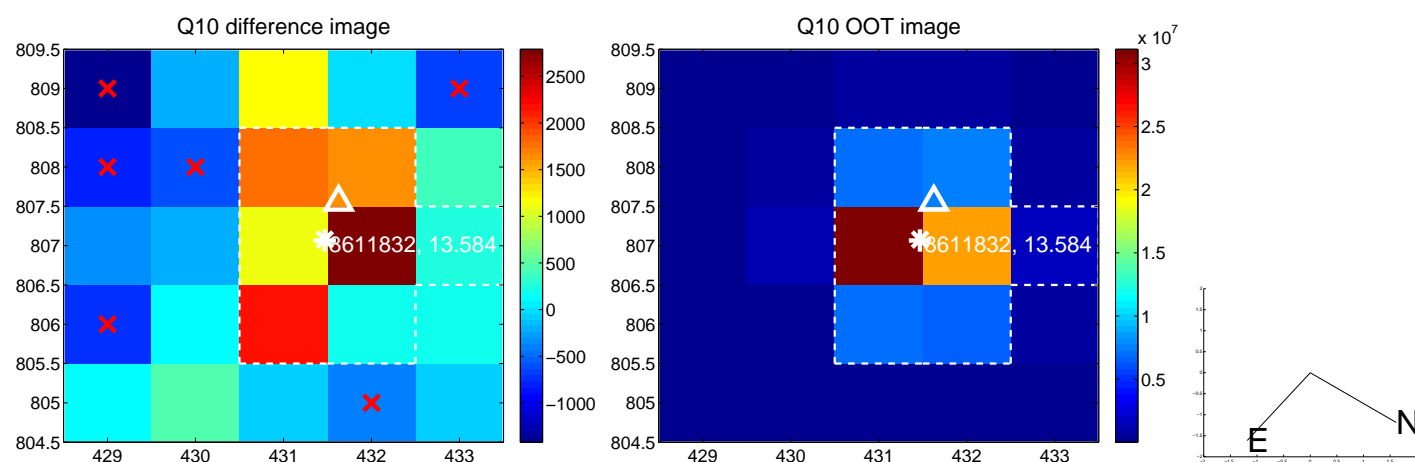
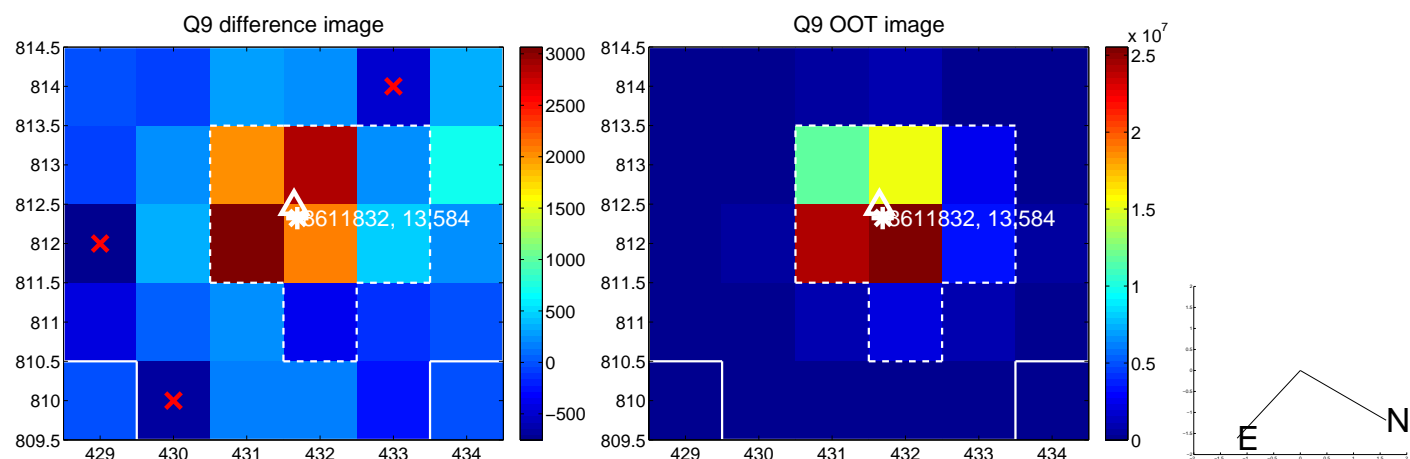
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



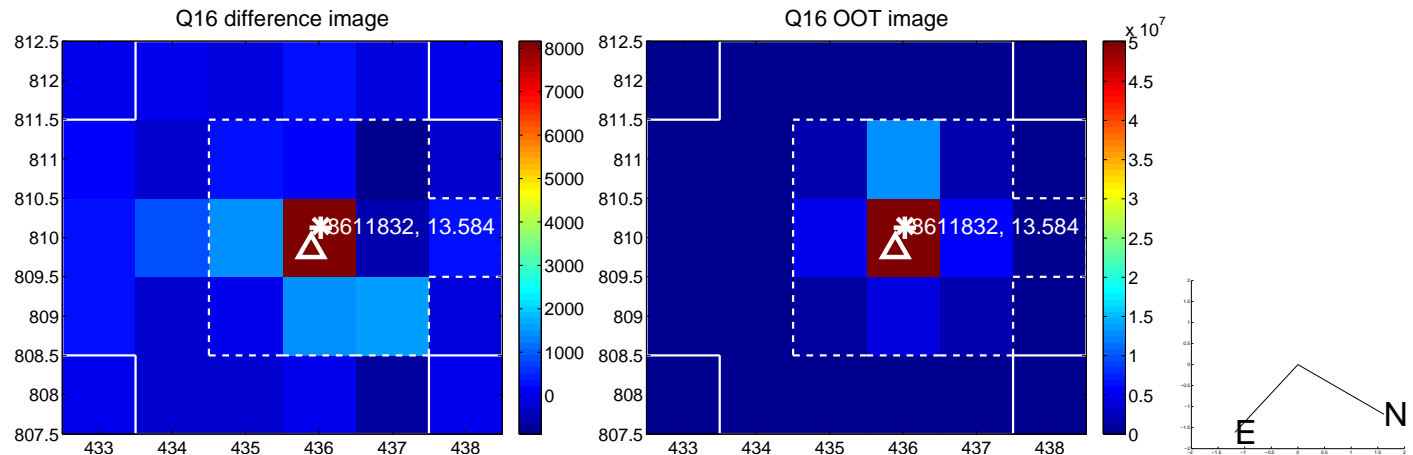
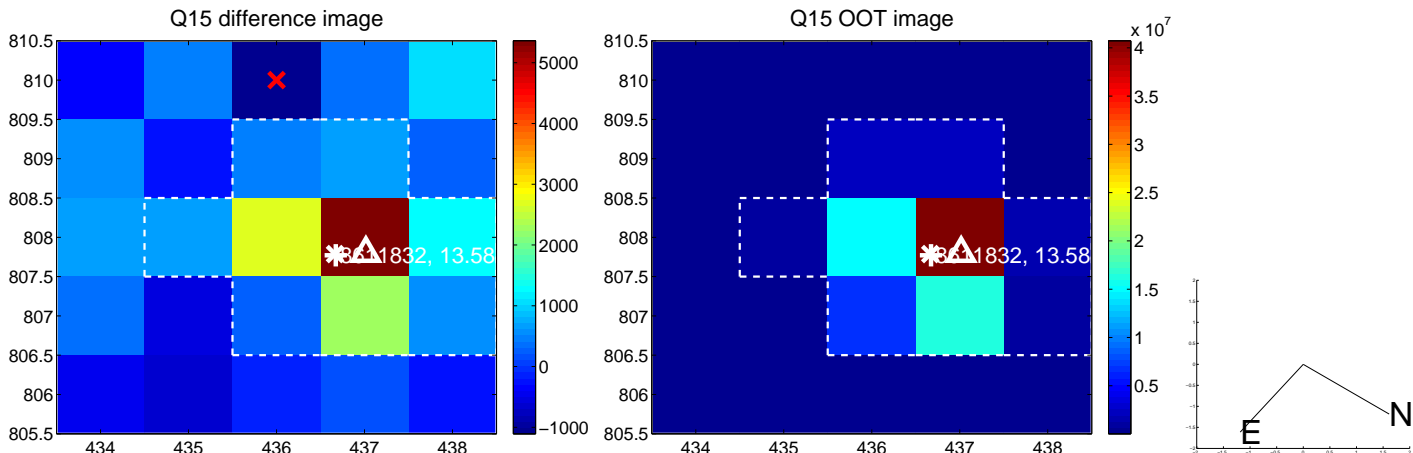
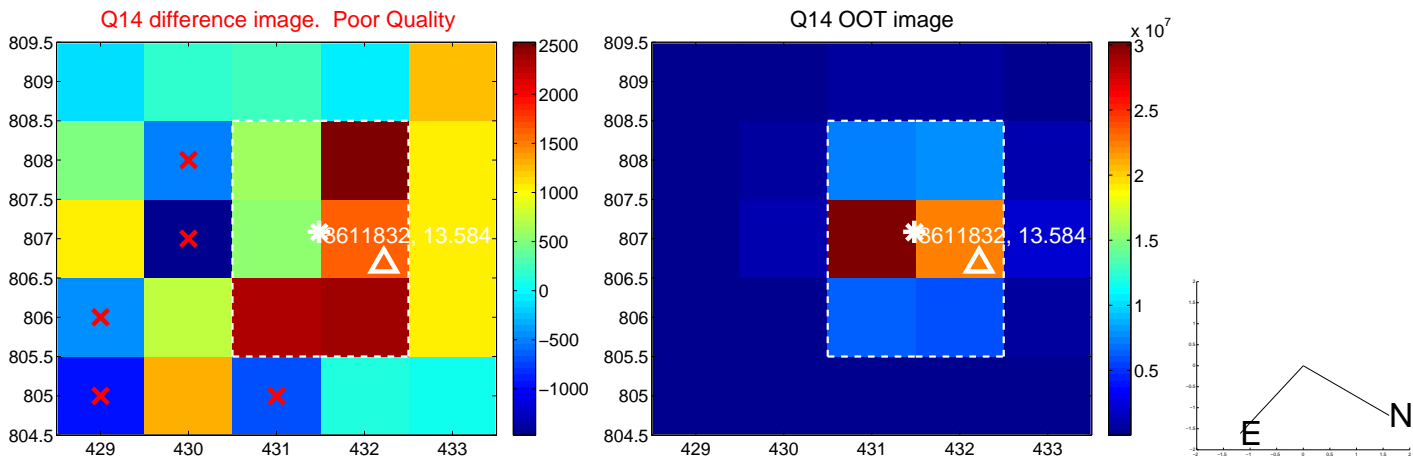
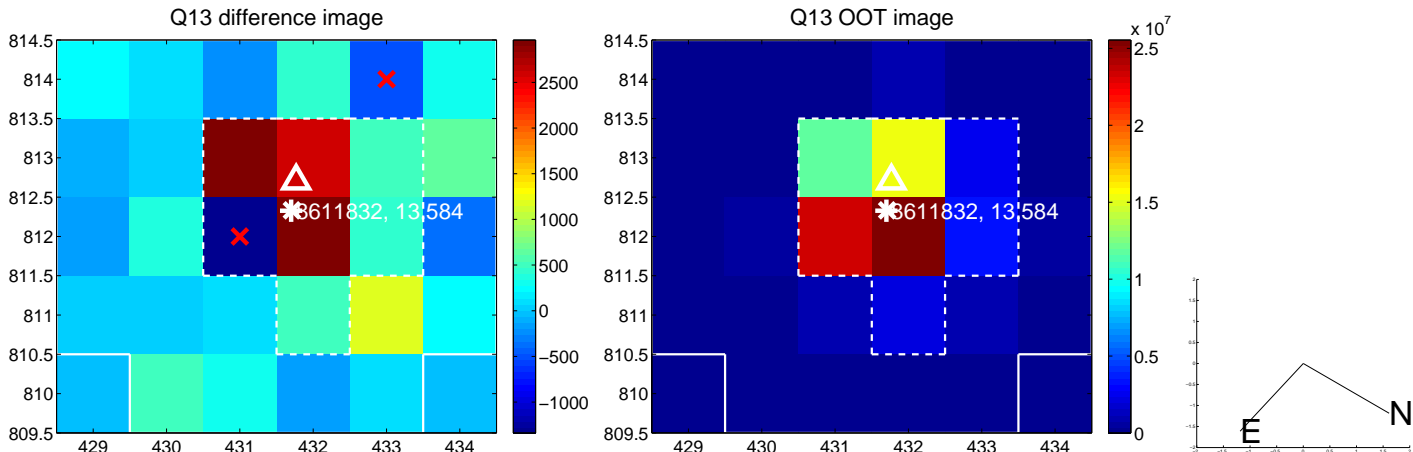
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

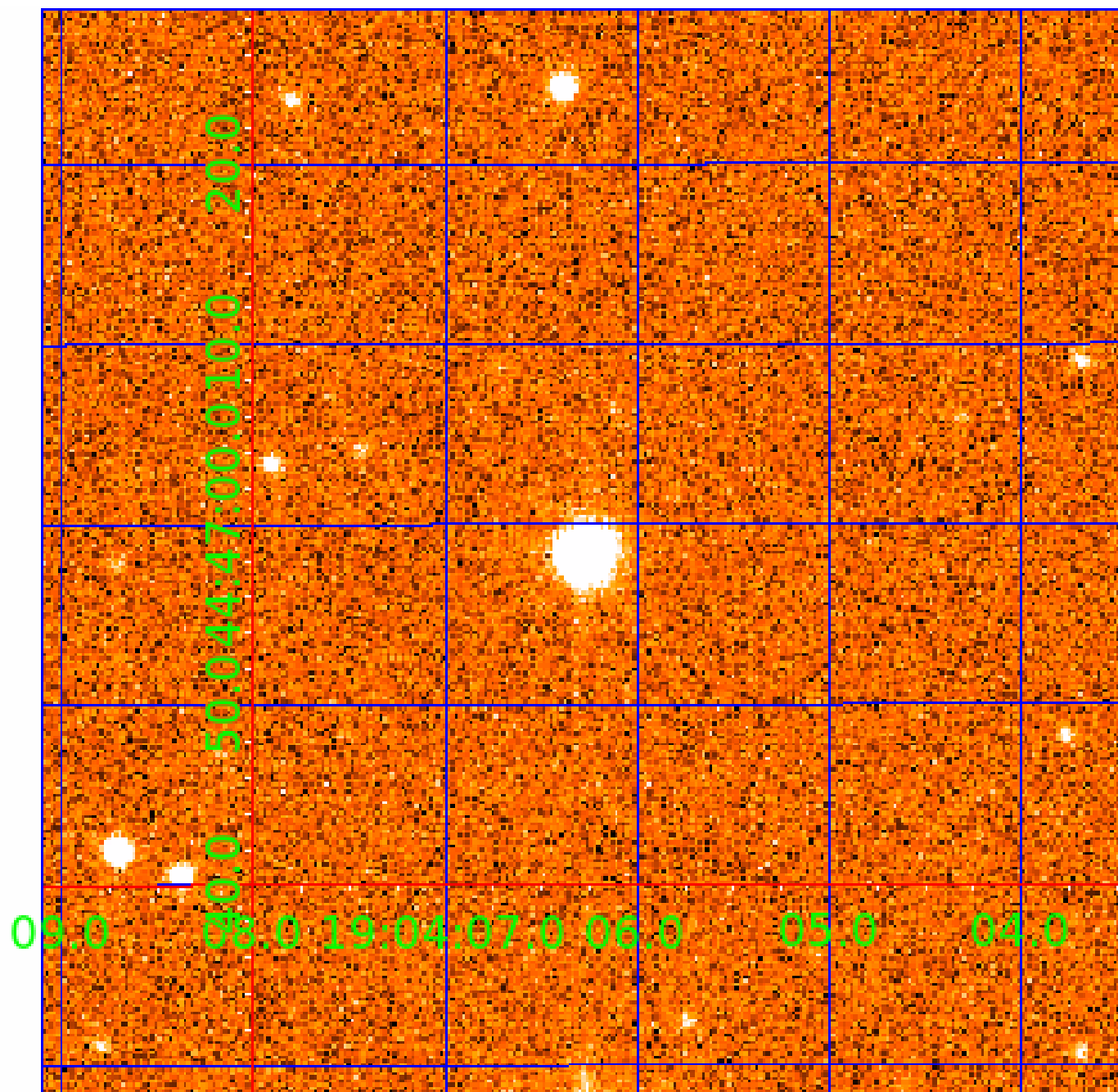






# UKIRT Image

Declination



# KIC 008611832

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008611832-01	OBS	2414.01	22.596559	140.435603	137.7	6.482	18.0	18.9	1.10	5610	1.54	47.79
008611832-02	OBS	2414.02	45.348708	142.249147	163.9	4.946	12.8	14.5	1.10	5610	1.68	18.88

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008611832-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
008611832-02	OBS	PC	0.97	0	0	0	0	NO_COMMENT

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

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

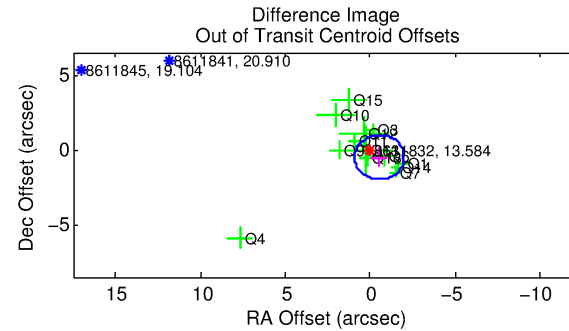
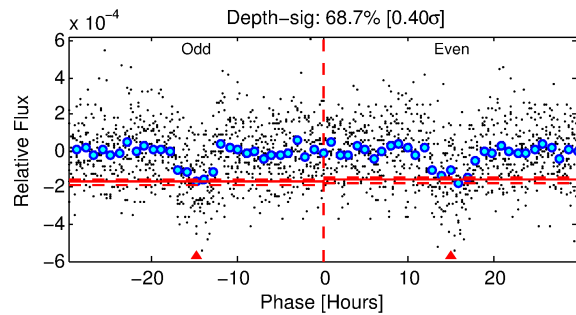
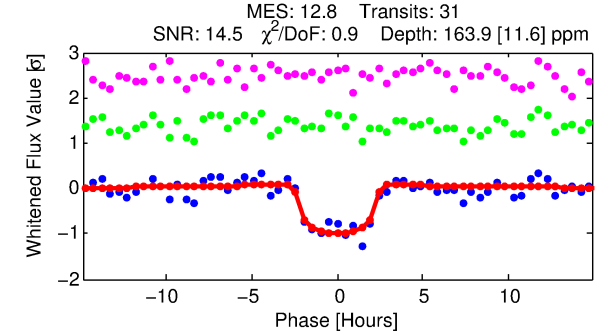
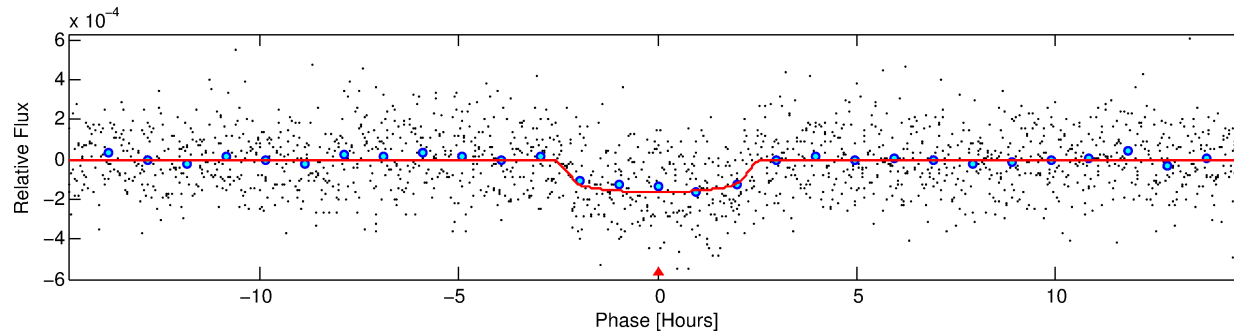
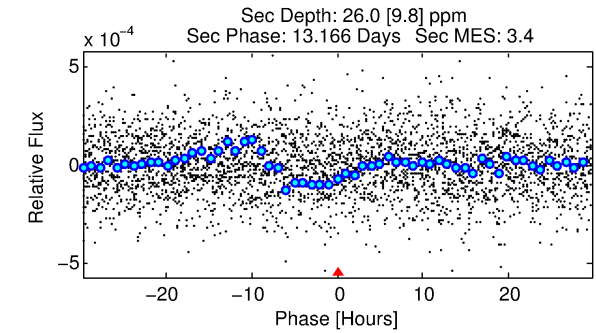
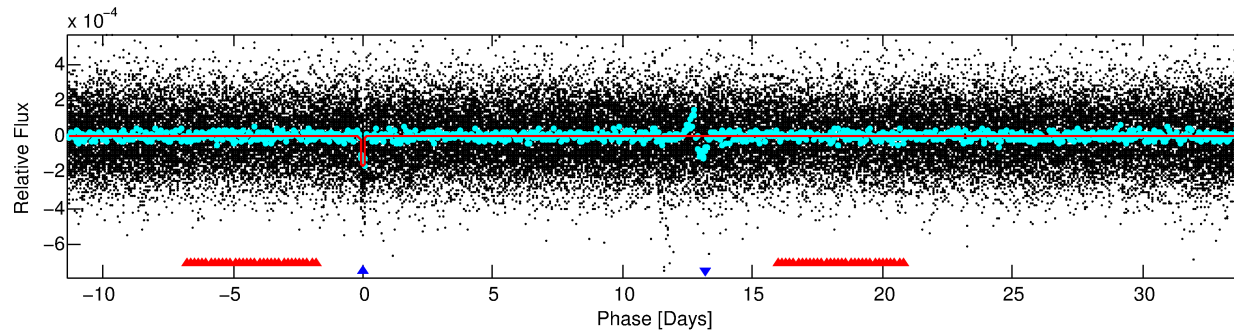
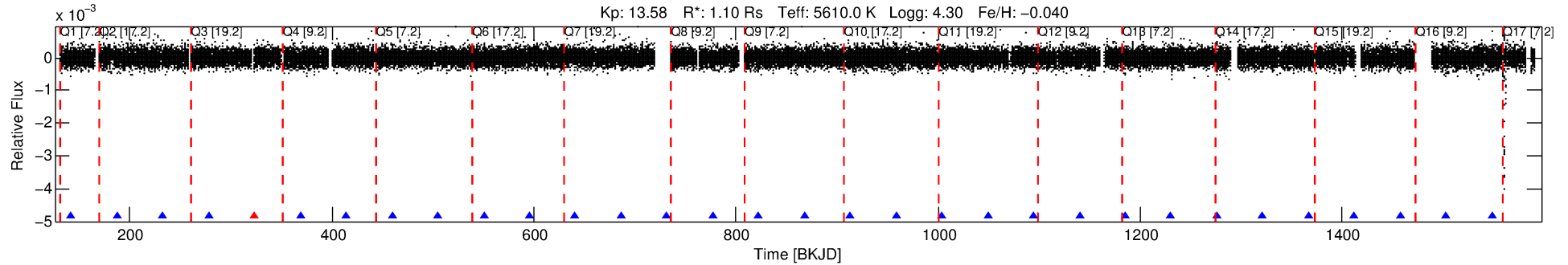
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008611832-02

No Significant Match Found

# DV One-Page Summary

KIC: 8611832 Candidate: 2 of 2 Period: 45.349 d  
KOI: K02414.02 Name: Kepler-384c Corr: 0.966



## DV Fit Results:

Period = 45.34871 [0.00037] d  
Epoch = 142.2491 [0.0066] BKJD  
Rp/R\* = 0.0140 [0.0041]  
a/R\* = 33.15 [44.69]  
b = 0.90 [0.30]  
Seff = 18.88 [5.48]  
Teq = 532 [39] K  
Rp = 1.68 [0.56] Re  
a = 0.2394 [0.0400] AU  
Ag = 289.47 [217.14] [1.33σ]  
Teffp = 3390 [594] K [4.80σ]

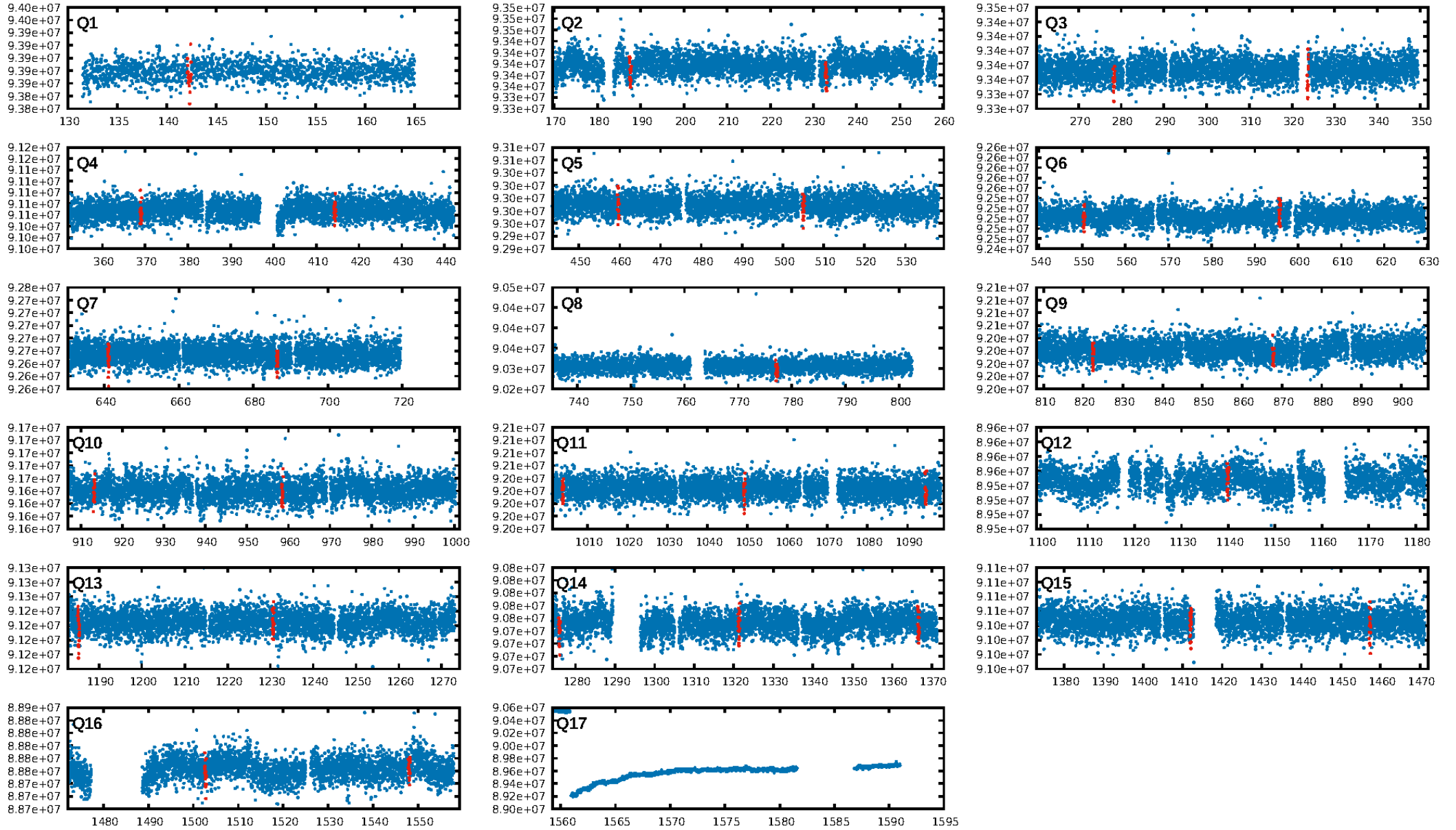
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [66.97σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 64.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.51e-37  
RollingBand-fgt: 0.97 [29/30]  
GhostDiagnostic-chr: 8.806  
Centroid-sig: 0.7%  
Centroid-so: 2.020 arcsec [2.48σ]  
OotOffset-rm: 0.741 arcsec [1.51σ]  
KicOffset-rm: 0.697 arcsec [1.43σ]  
OotOffset-st: 3/4/3/3 [13]  
KicOffset-st: 3/4/3/3 [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: 29-Jan-2016 00:05:27 Z

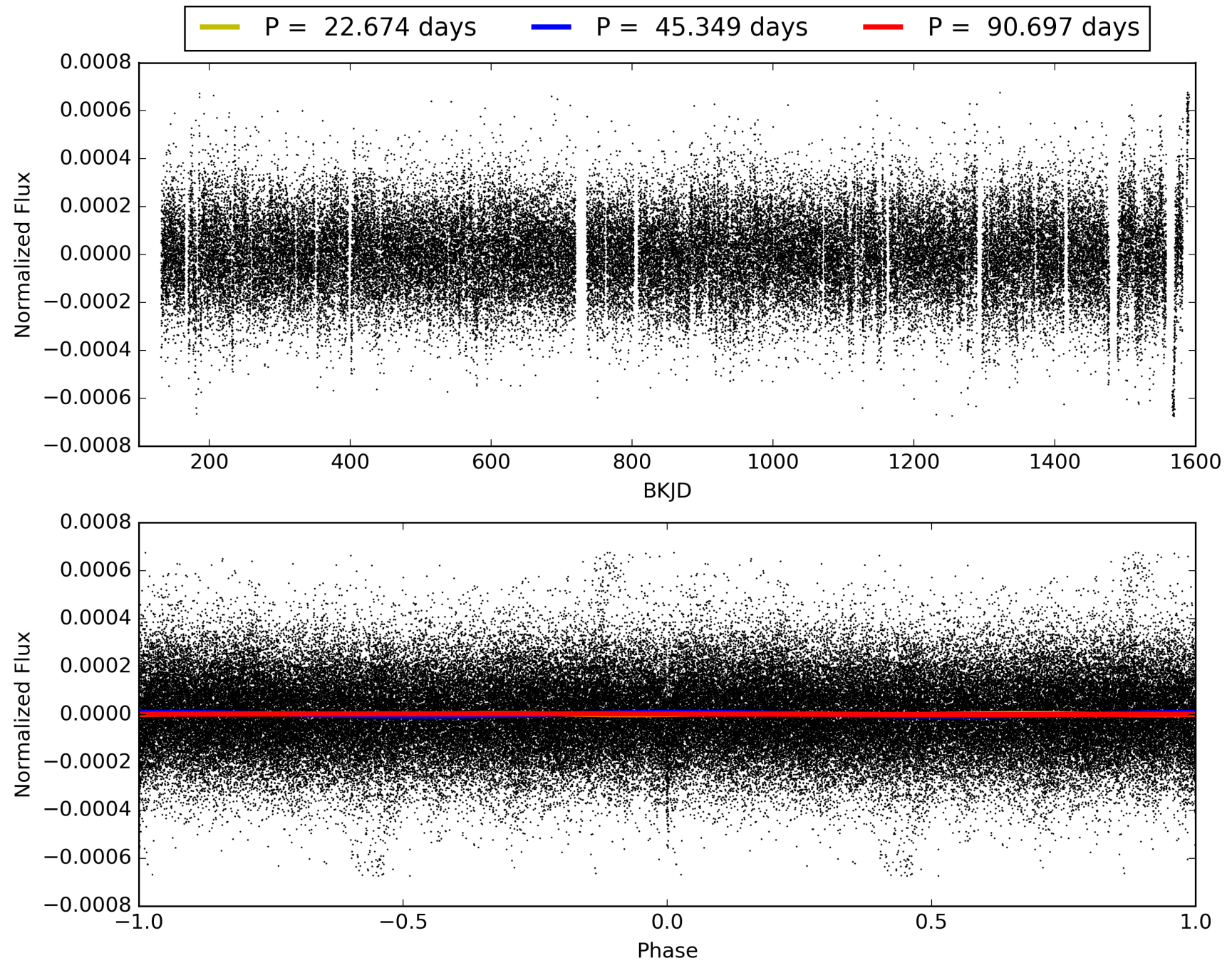
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008611832-02, PDC Light Curves



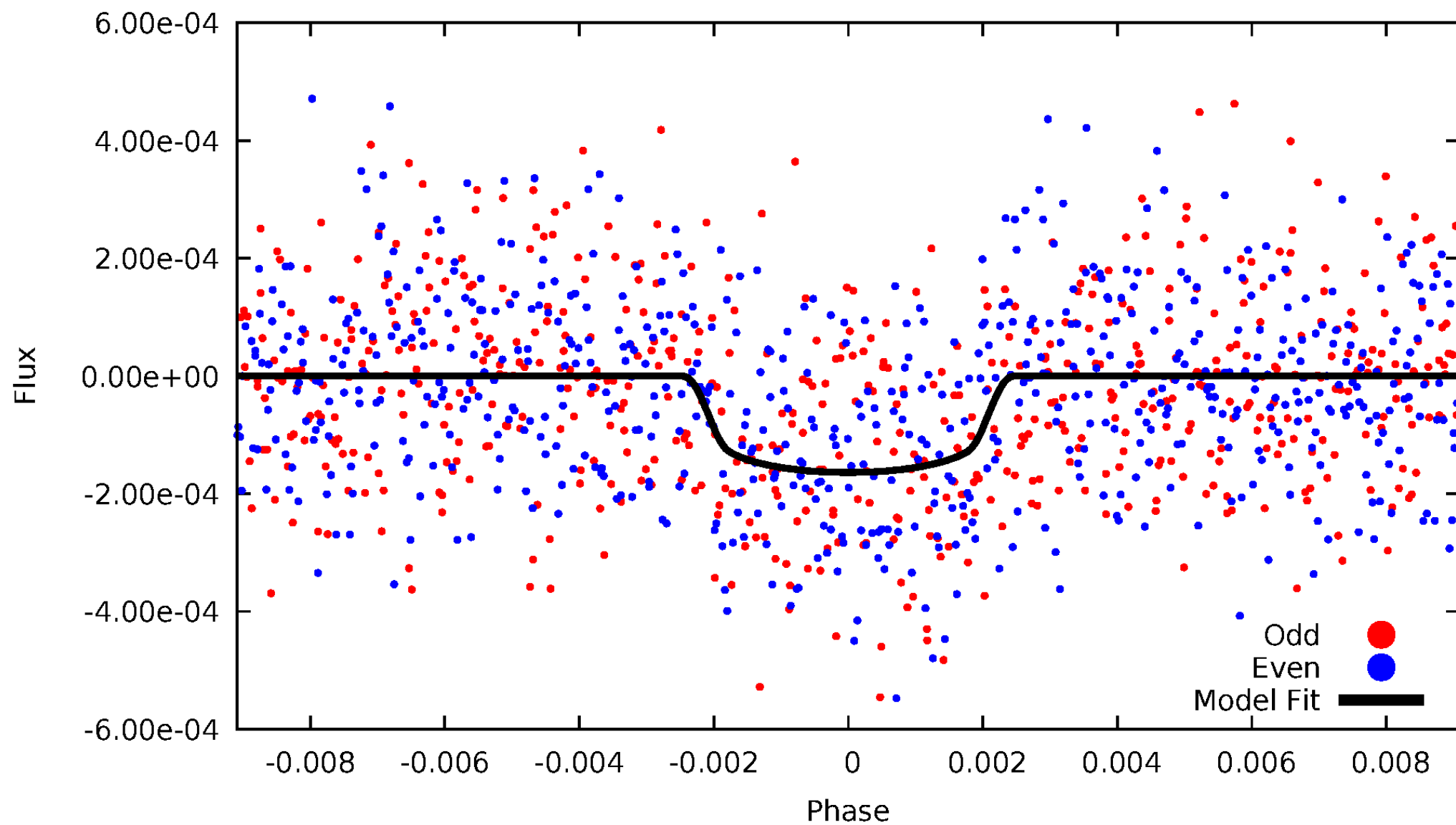


TCE 008611832-02



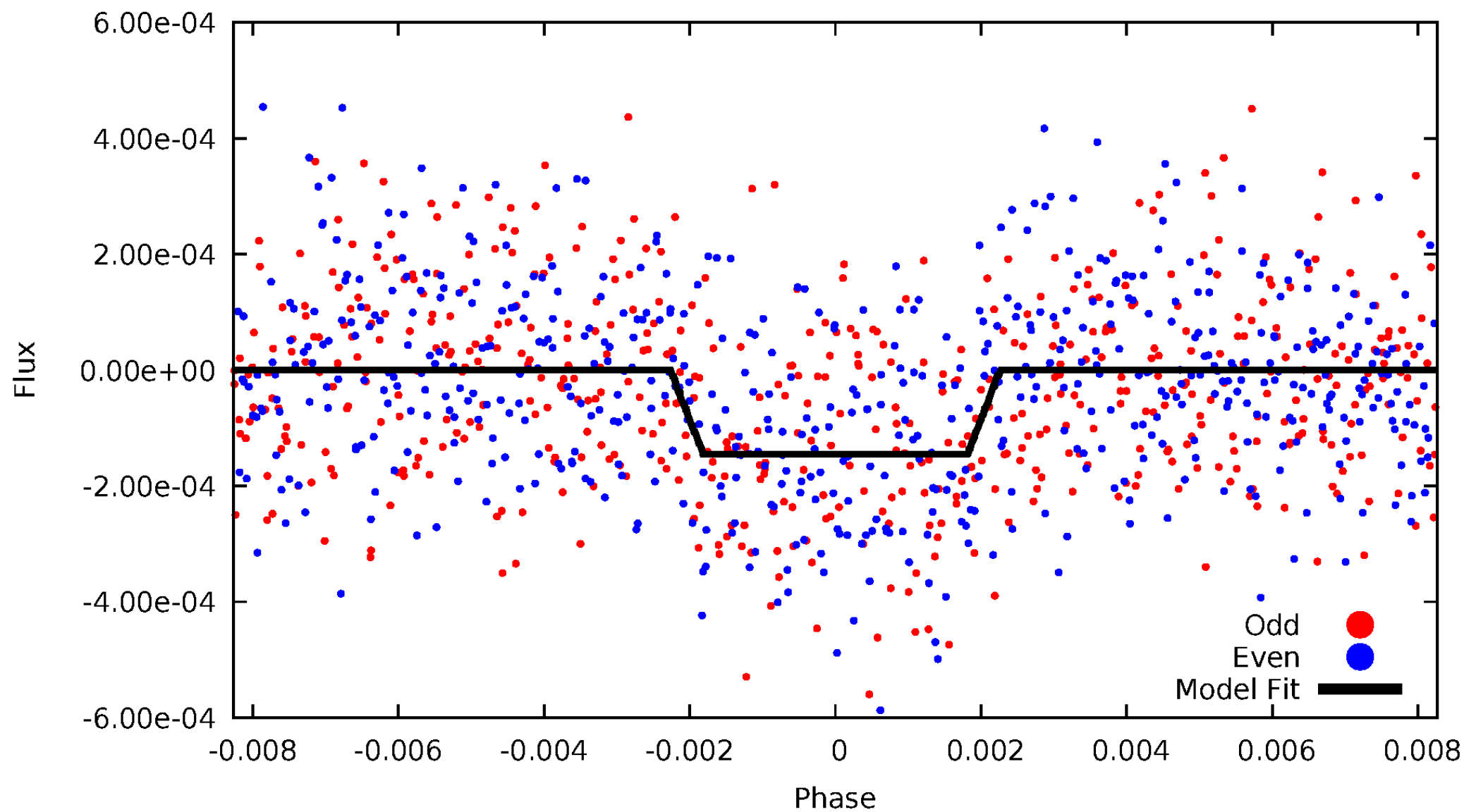
# DV Odd/Even

TCE 008611832-02



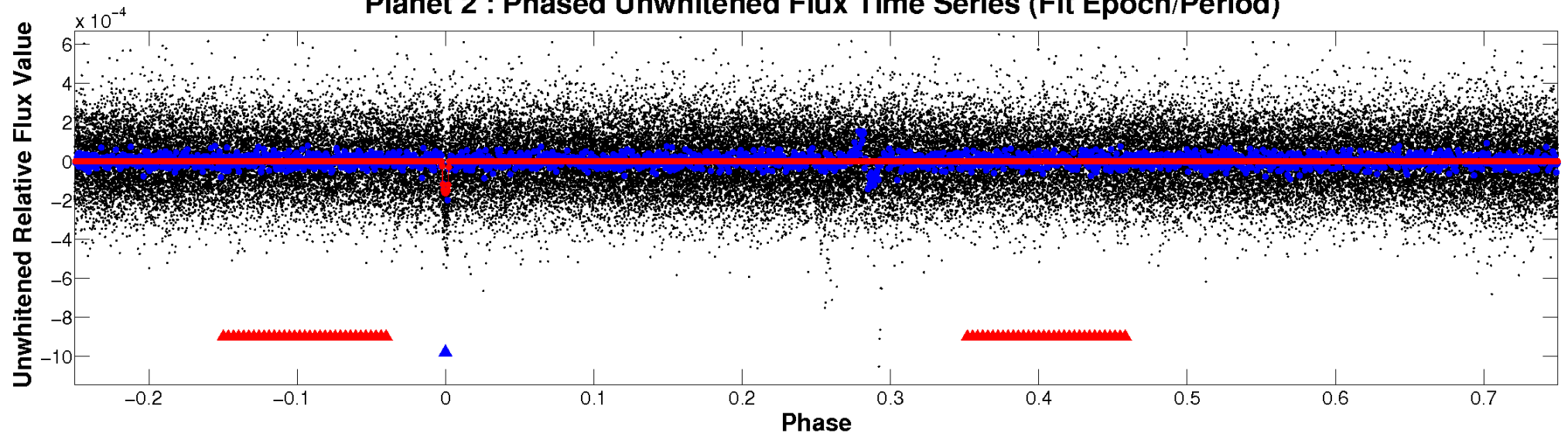
# ALT Odd/Even

TCE 008611832-02

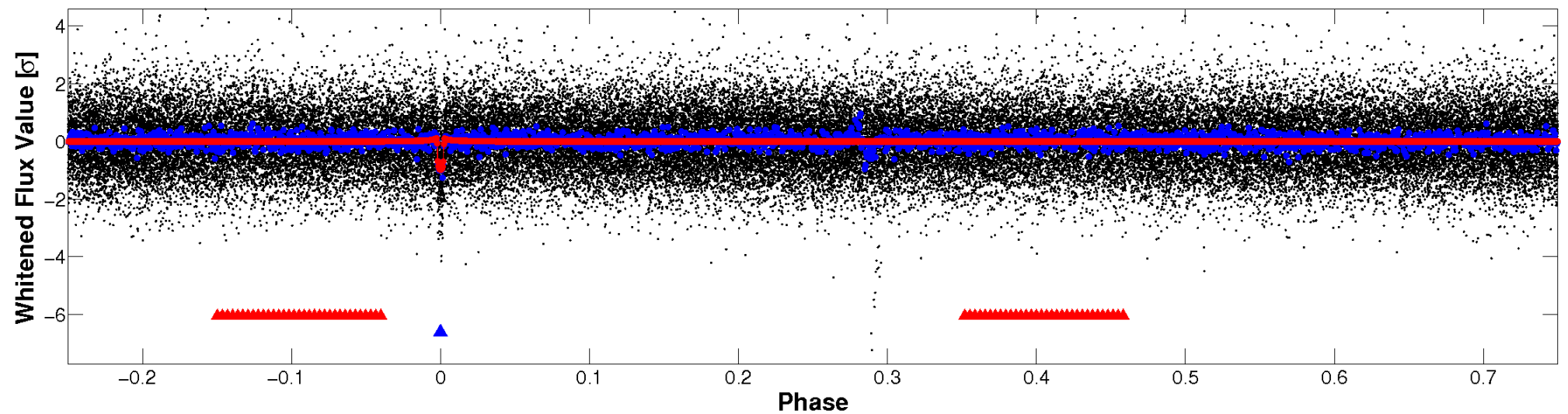


# Non-Whitened Vs. Whitened Light Curve

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

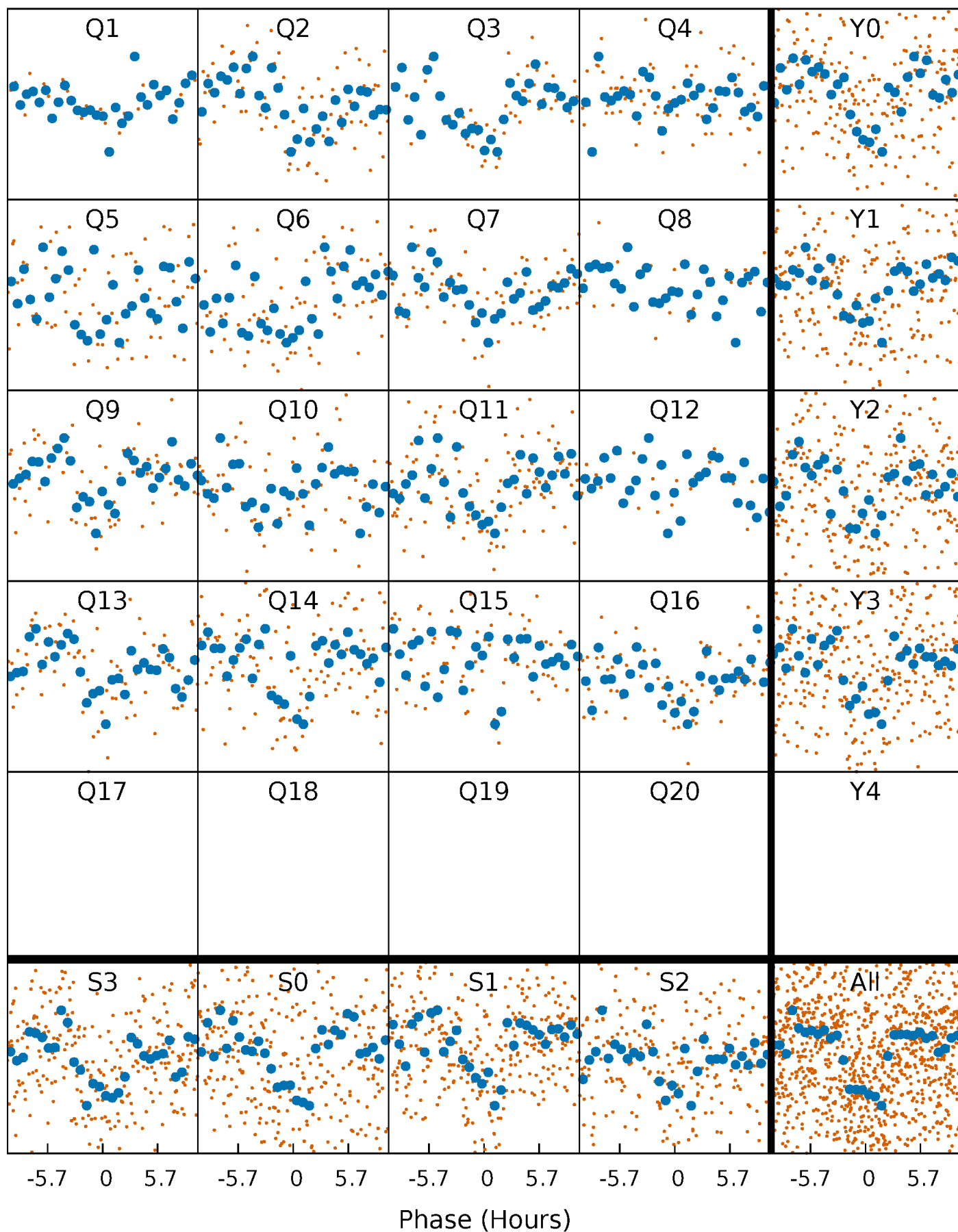


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

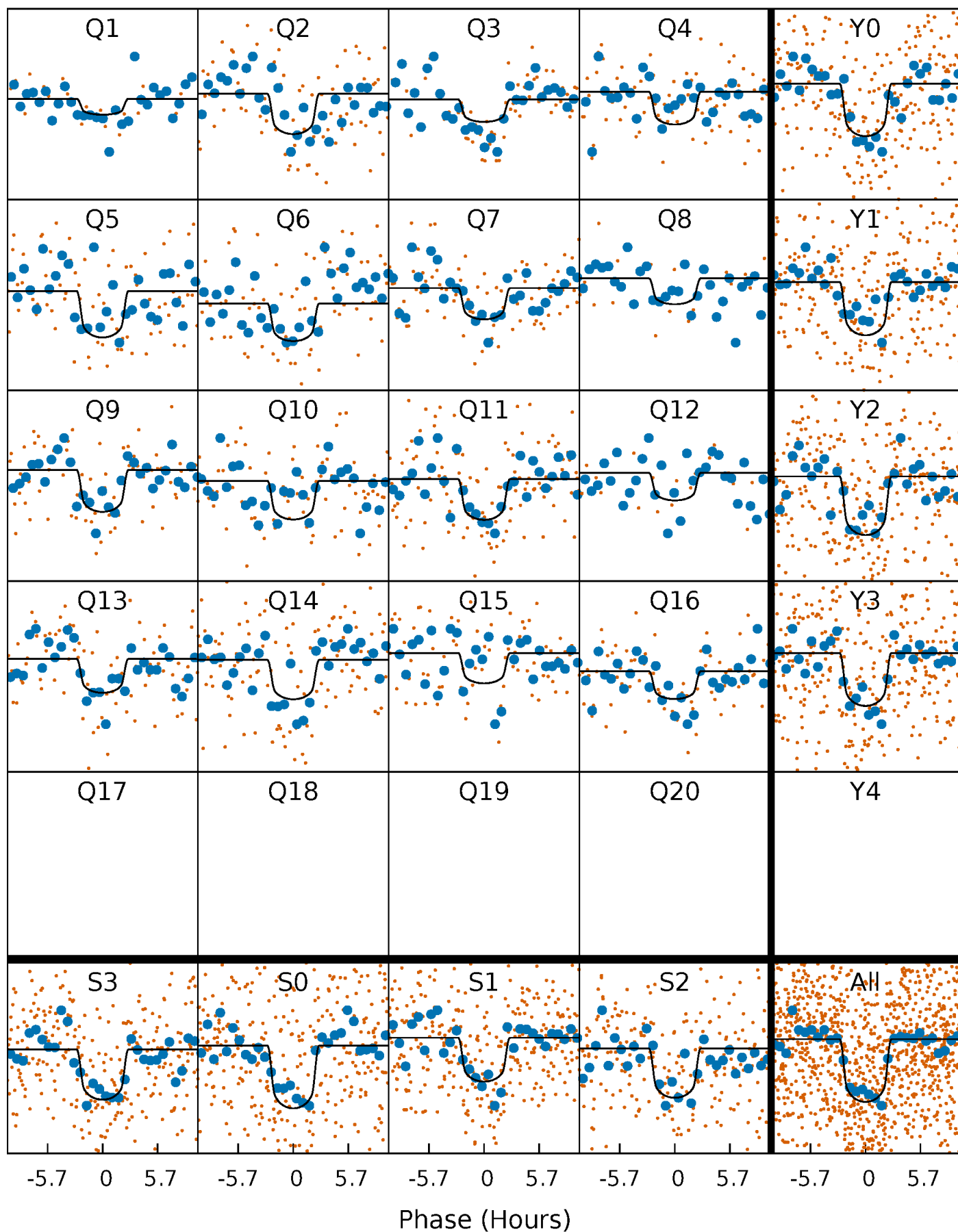
TCE 008611832-02   P= 45.348708 Days    $T_0=142.249147$  (BKJD)





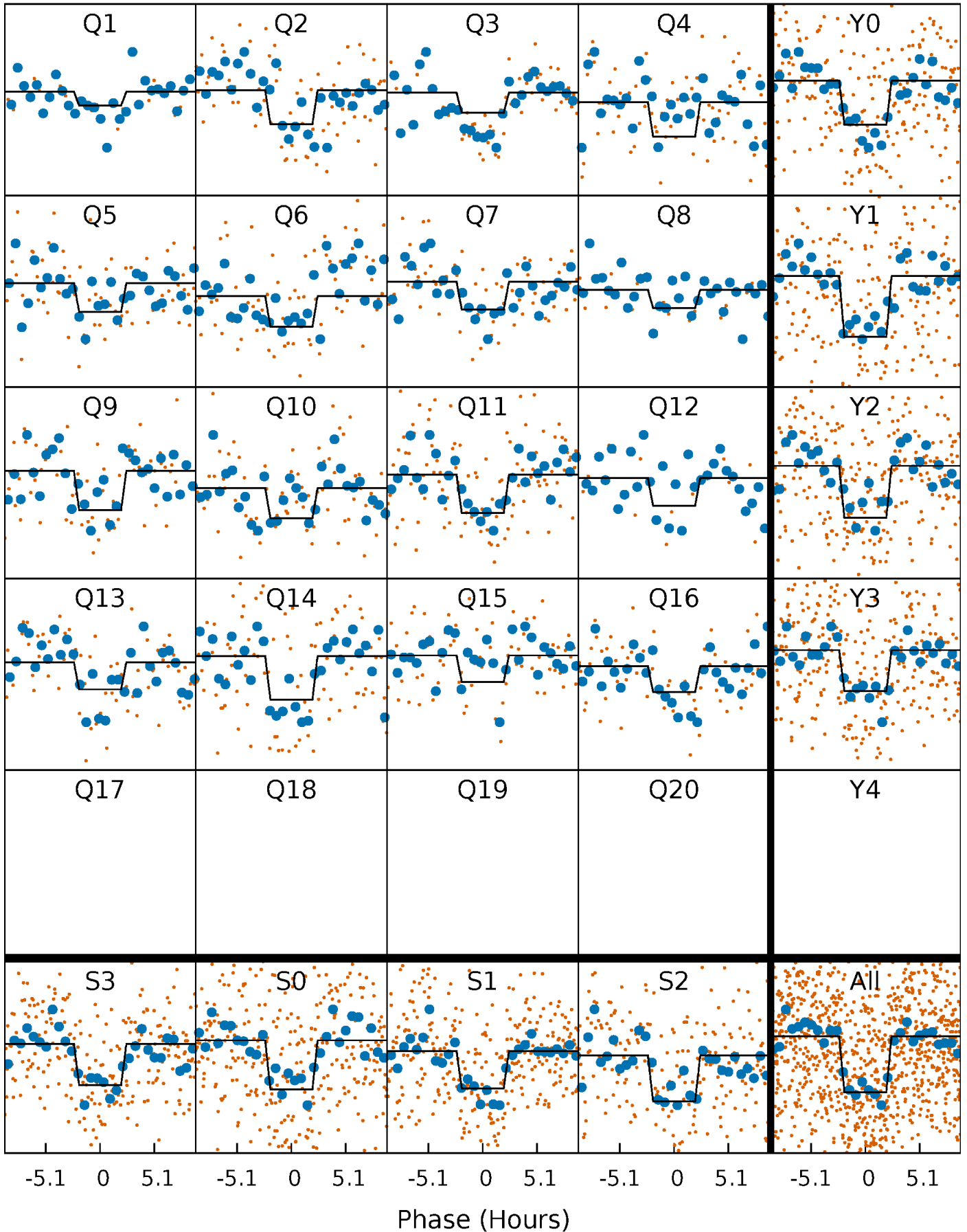
# DV Quarter-Phased Transit Curves

TCE 008611832-02 P= 45.348708 Days  $T_0=142.249147$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

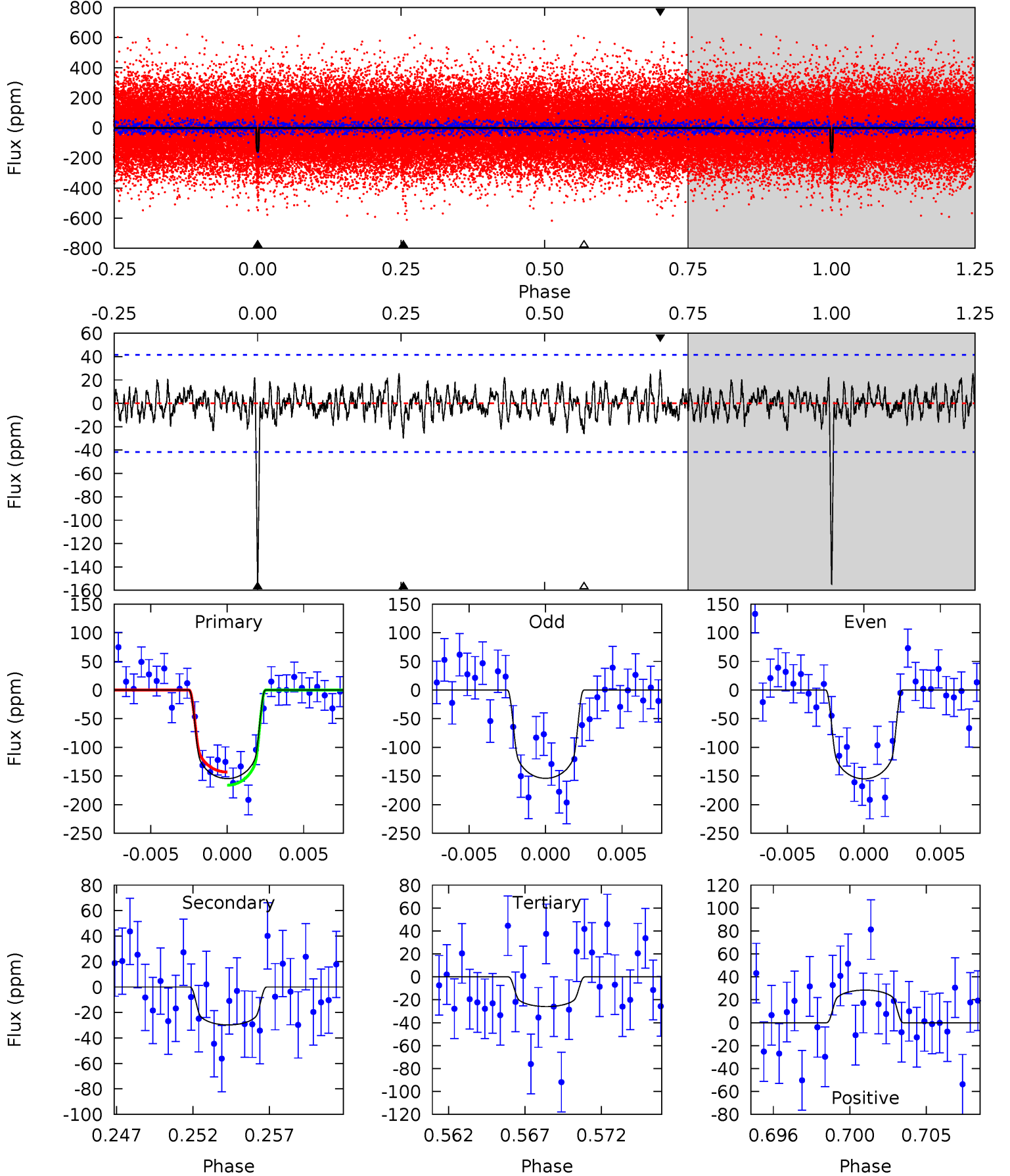
TCE 008611832-02 P= 45.348331 Days  $T_0=142.253585$  (BKJD)



# DV Model-Shift Uniqueness Test

008611832-02, P = 45.348708 Days, E = 96.900439 Days

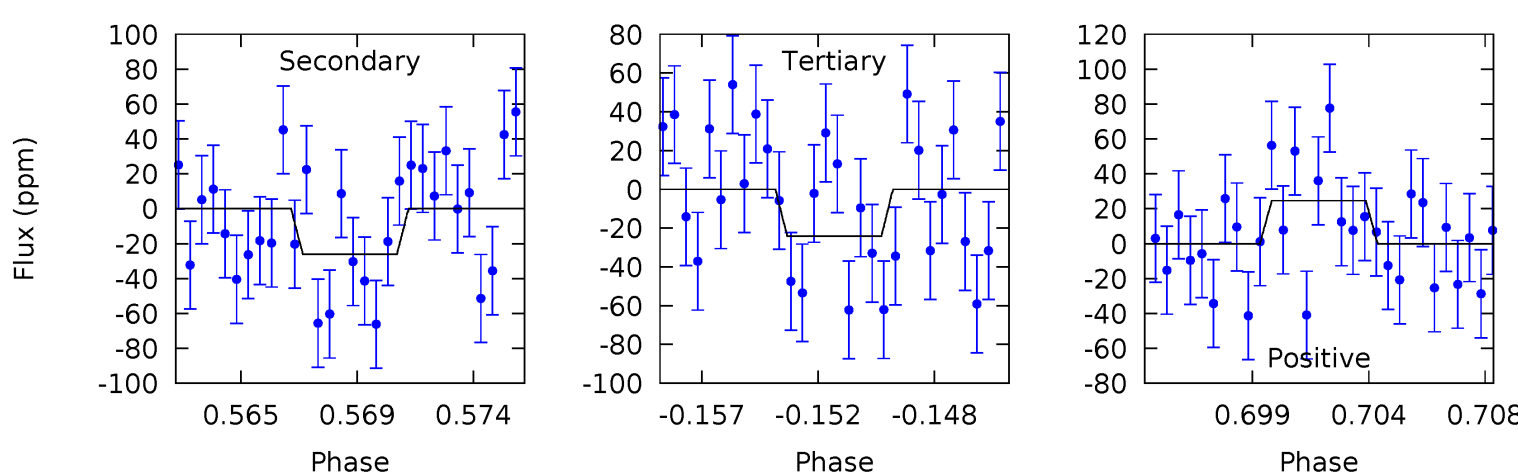
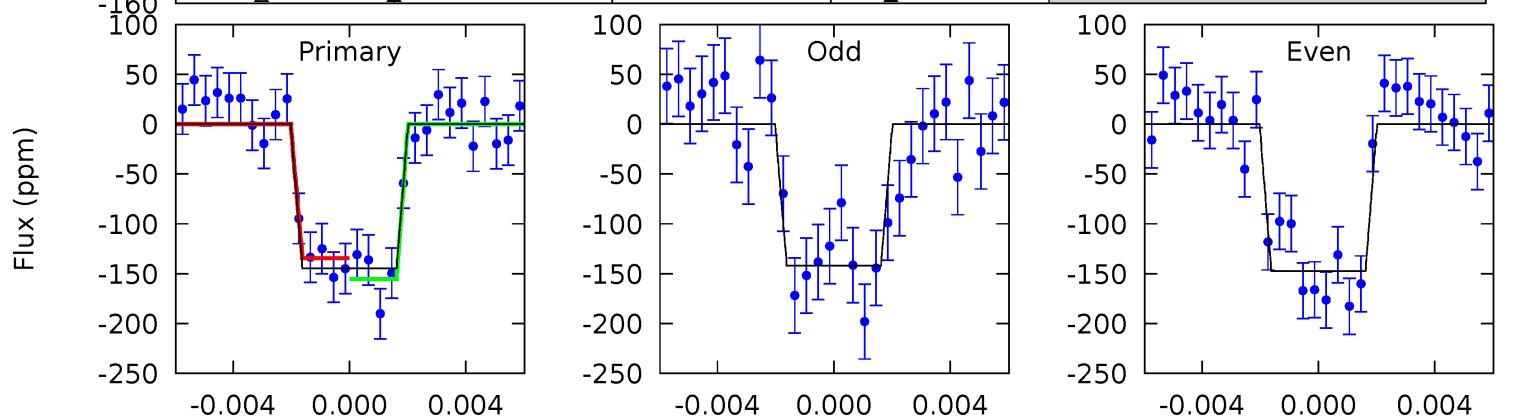
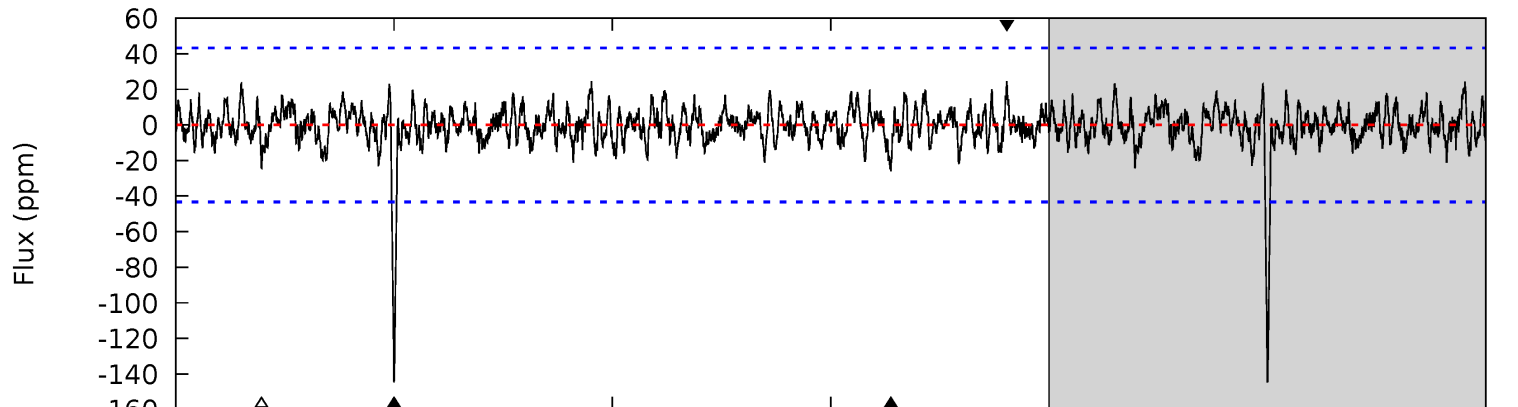
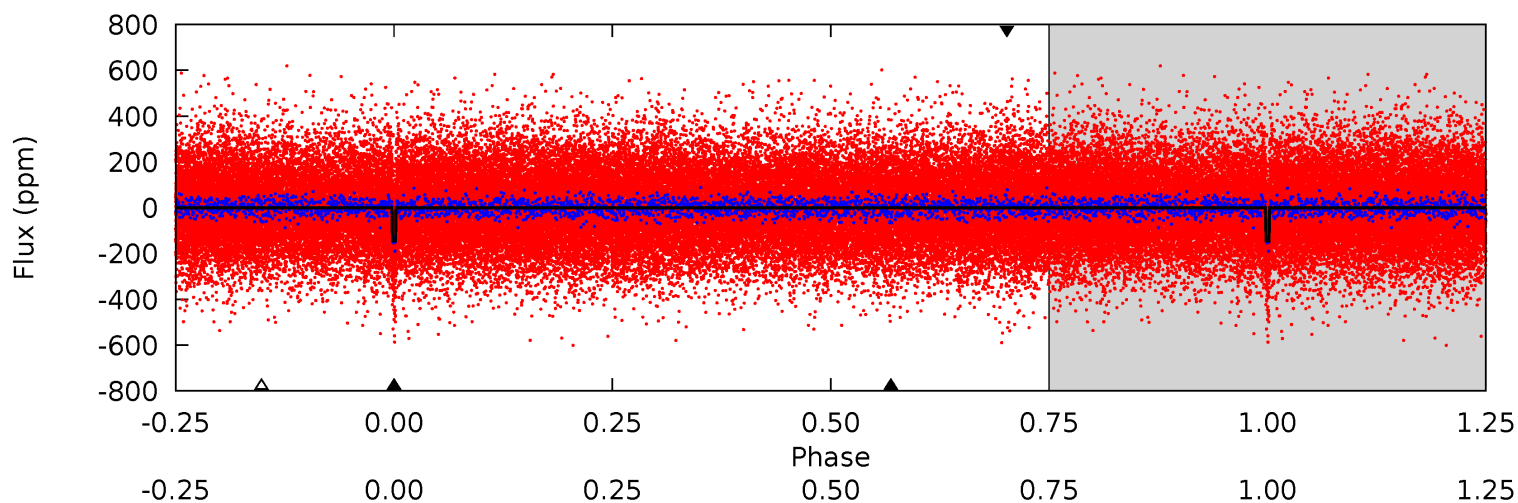
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.2	3.70	3.22	3.53	5.16	2.81	1.09	16.0	15.7	0.47	0.16	0.06	1.10	0.16	1.43



# Alt Model-Shift Uniqueness Test

008611832-02, P = 45.348331 Days, E = 96.905254 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
17.3	3.11	2.89	2.94	5.18	2.84	0.96	14.4	14.4	0.22	0.17	0.33	0.98	0.15	1.24



### Stellar Parameters For KIC 008611832

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5610^{+112}_{-101}$	$4.301^{+0.168}_{-0.112}$	$-0.040^{+0.150}_{-0.150}$	$1.104^{+0.176}_{-0.176}$	$0.889^{+0.072}_{-0.044}$	$0.931^{+0.721}_{-0.294}$
	+2%/-2%	+4%/-3%	+375%/-375%	+16%/-16%	+8%/-5%	+77%/-32%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 008611832-02 / KOI 2414.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-30 \pm 8$	$1.62^{+0.57}_{-0.48}$	$738^{+37}_{-38}$	$3878^{+545}_{-380}$	$353^{+408}_{-172}$
Alt.	$-26 \pm 8$	$1.43^{+0.52}_{-0.47}$	$741^{+33}_{-40}$	$3965^{+673}_{-429}$	$390^{+531}_{-201}$

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

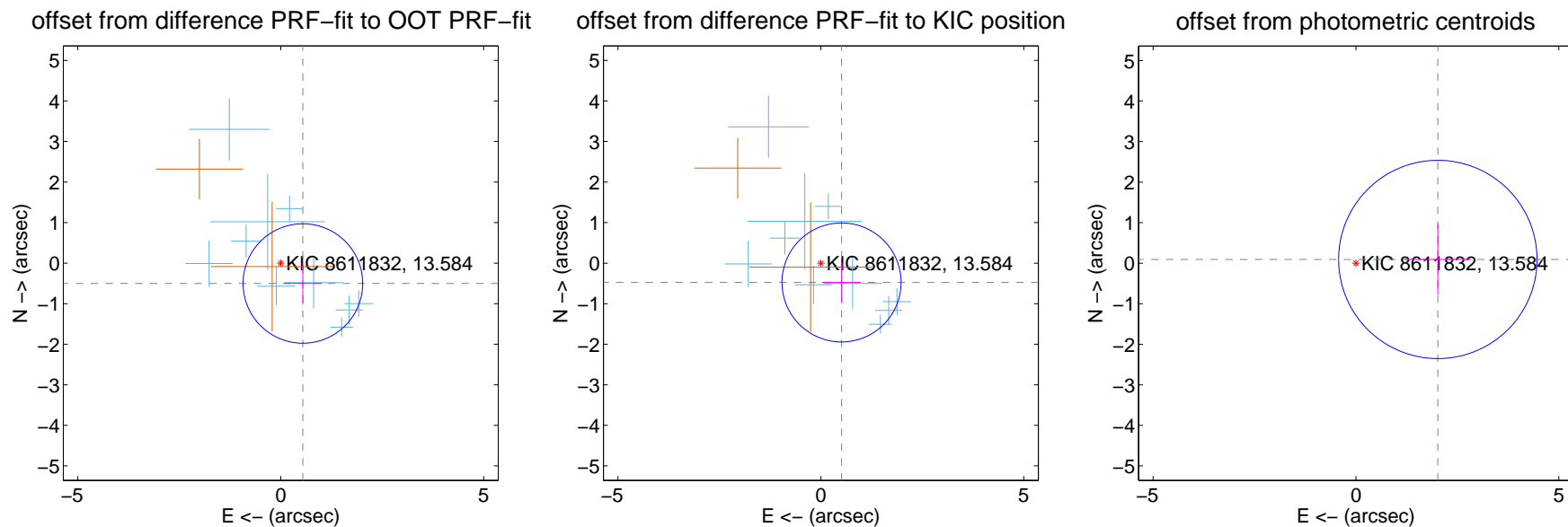
## DV Centroid Data

Supplemental centroid analysis for 008611832-02. Kepler magnitude: 13.58. Transit SNR 14.51

There are 10 quarters with good PRF difference image offsets

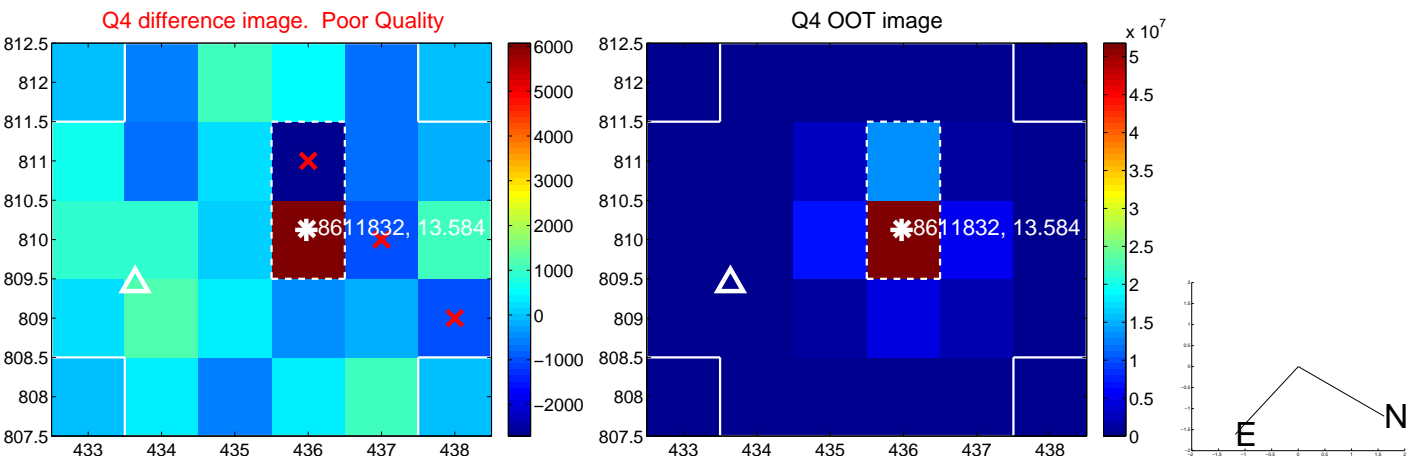
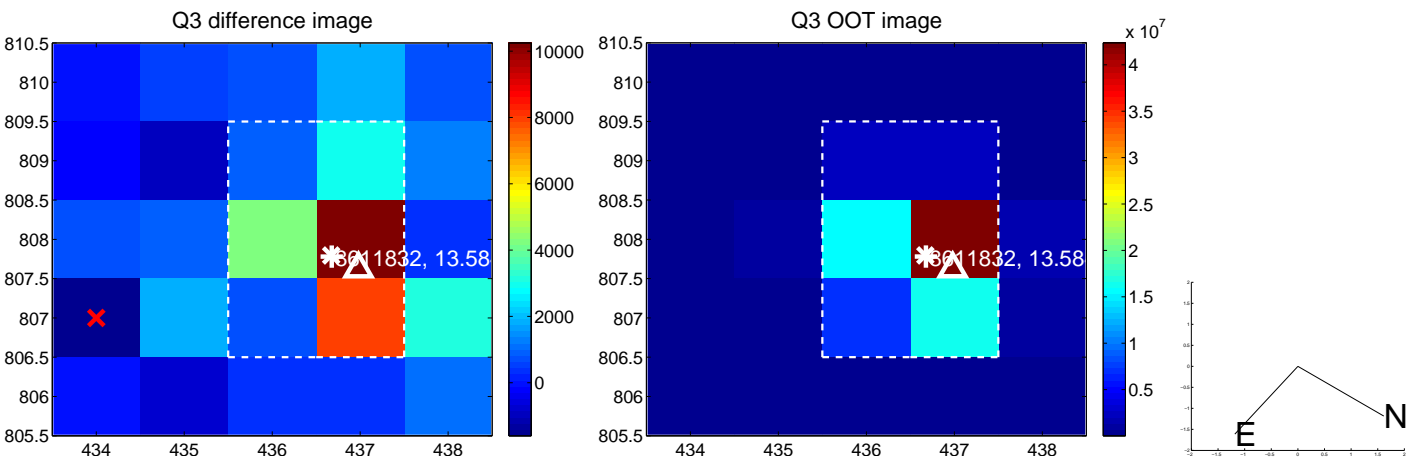
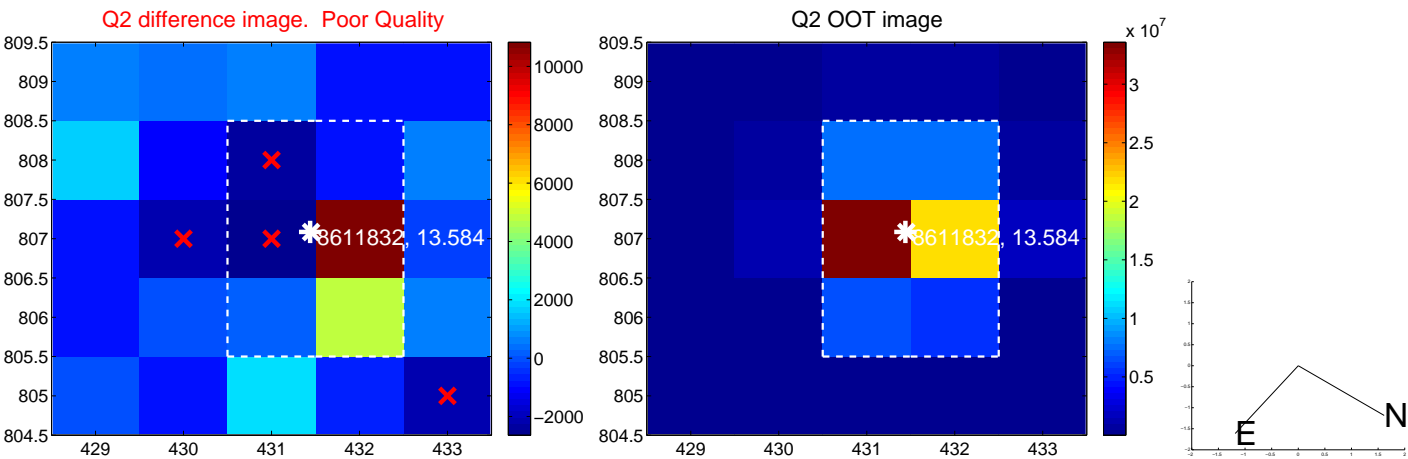
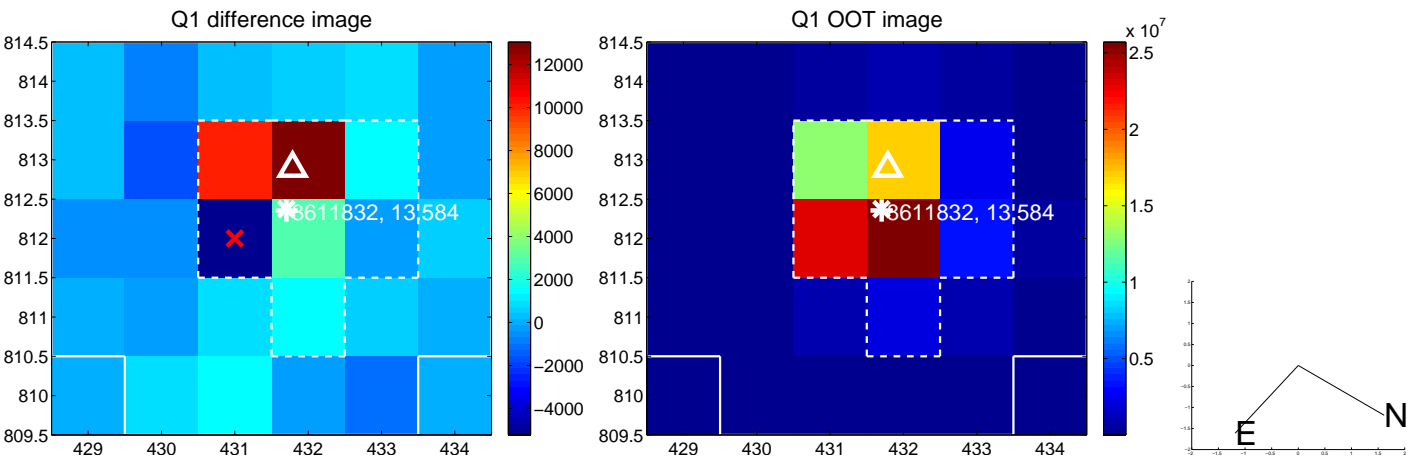
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.741 \pm 0.491$	1.51	$-0.545 \pm 0.474$	$-0.502 \pm 0.510$
PRF-fit source offset from KIC position	$0.697 \pm 0.489$	1.43	$-0.510 \pm 0.475$	$-0.476 \pm 0.504$
photometric centroid source offset	$2.02 \pm 0.81$	2.48	$-2.02 \pm 0.81$	$0.09 \pm 0.87$



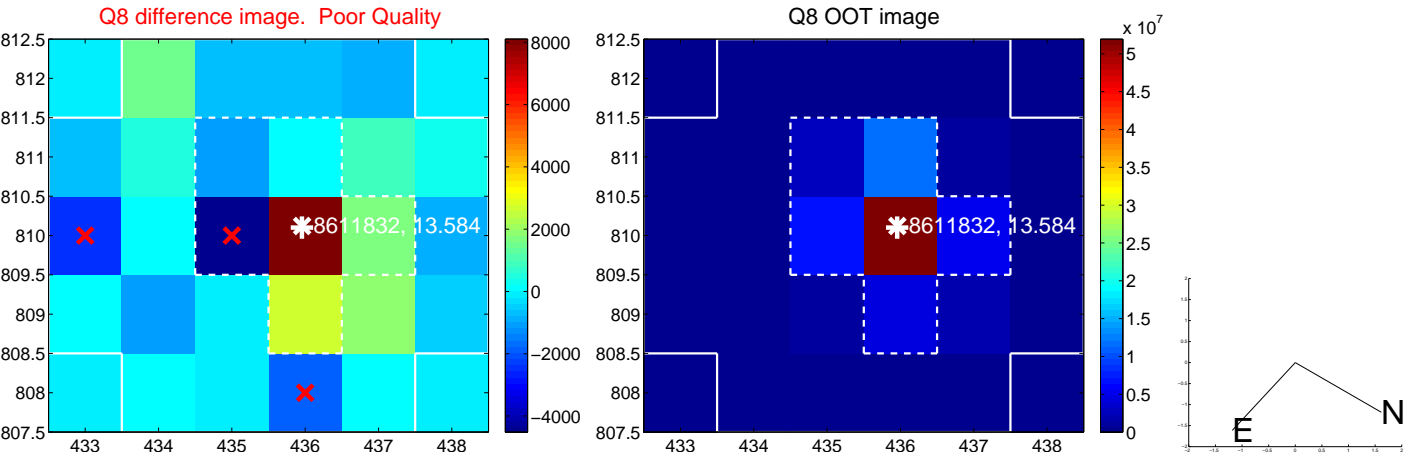
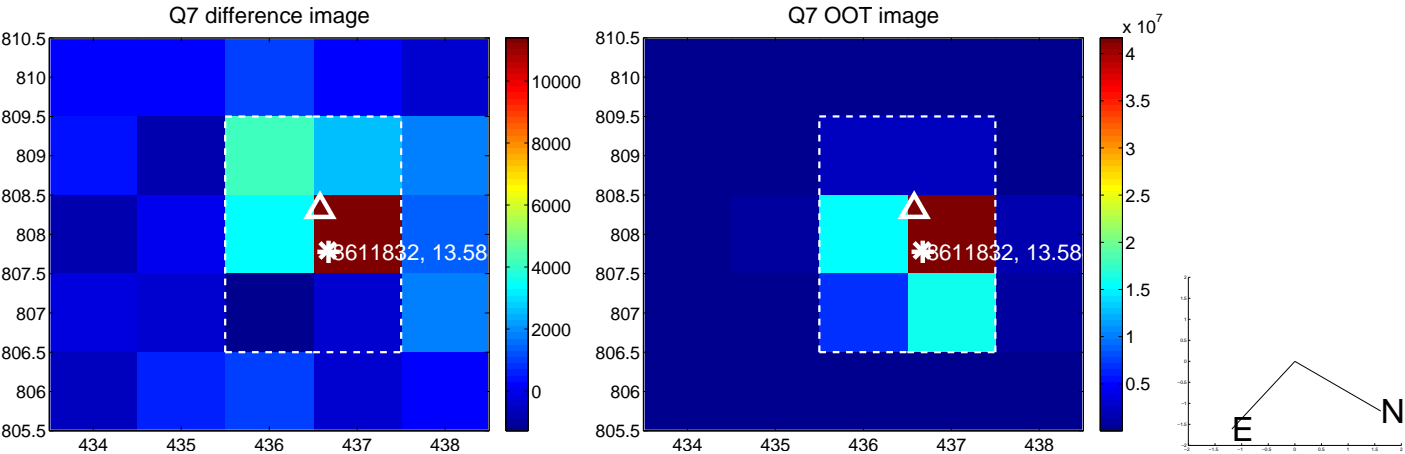
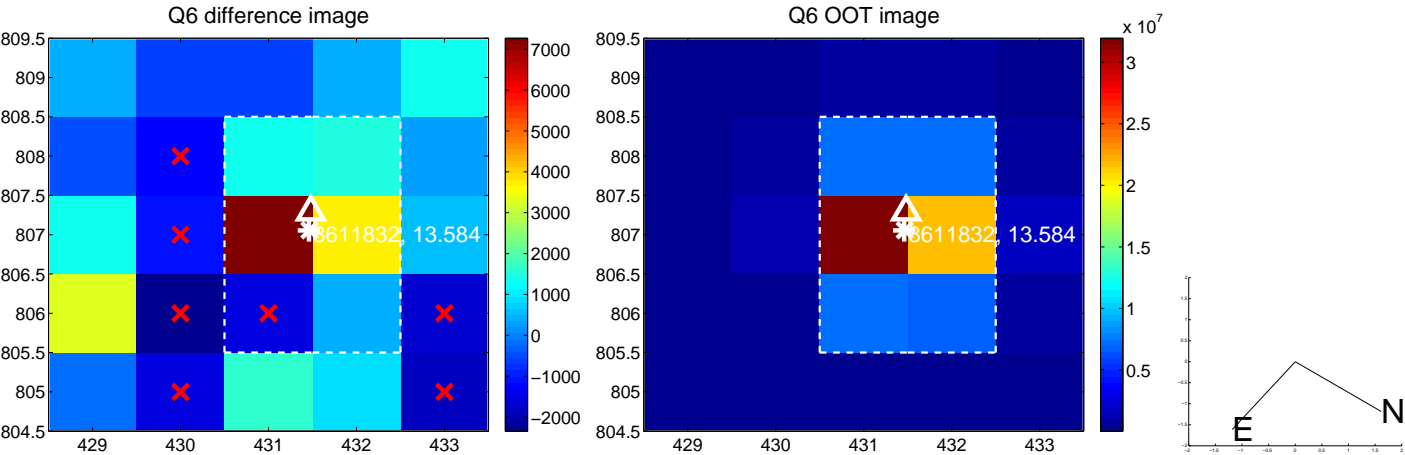
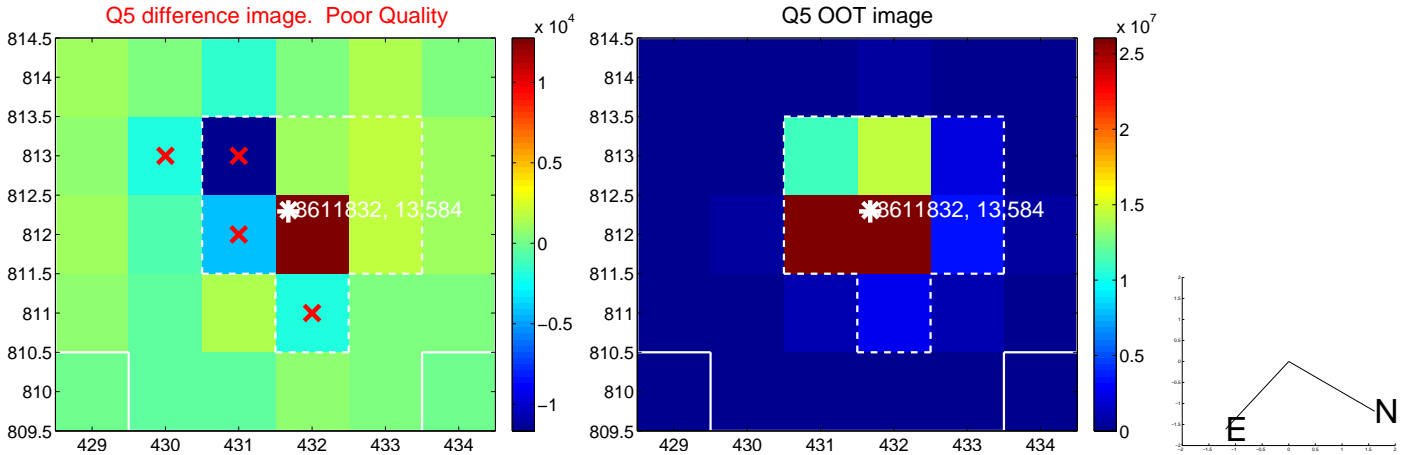
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

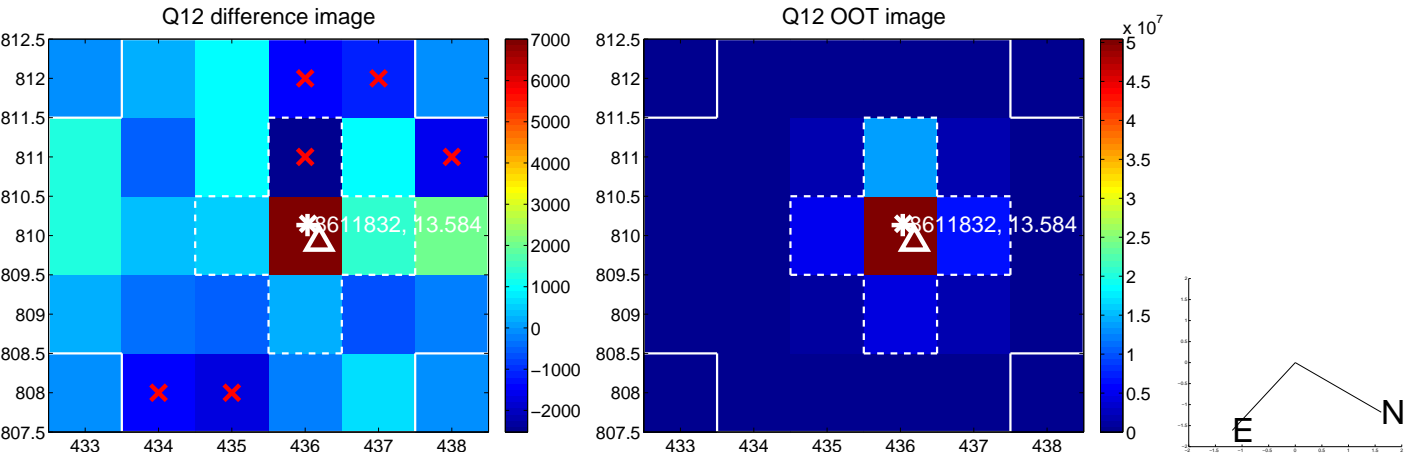
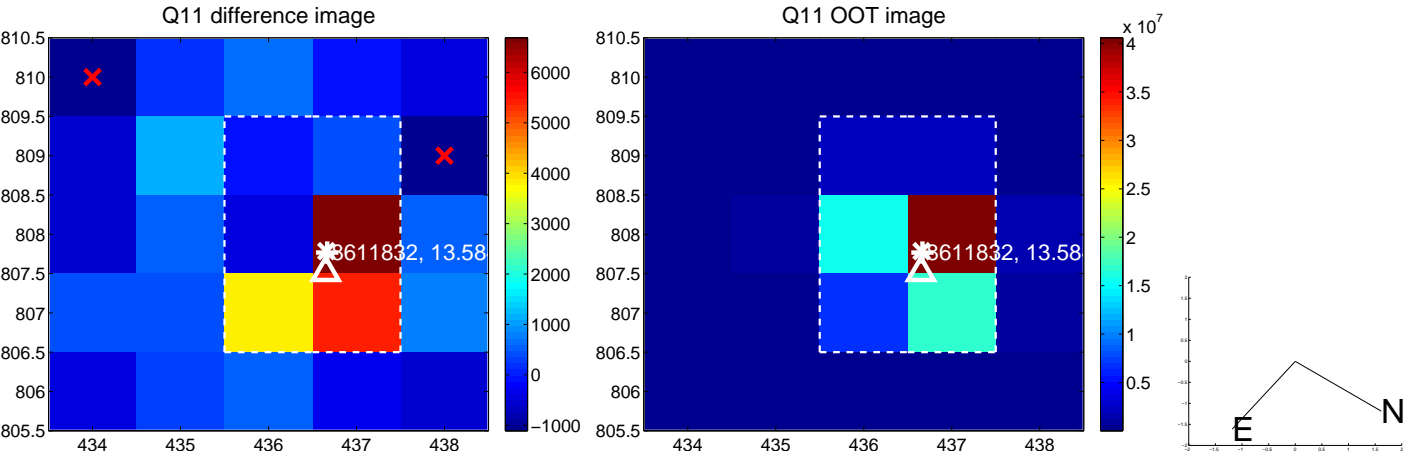
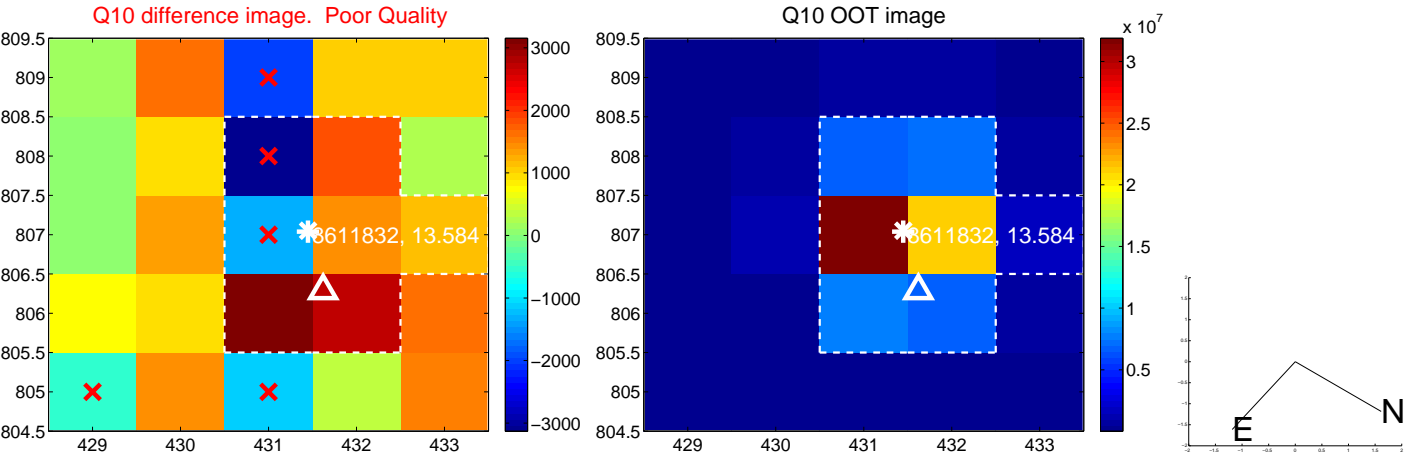
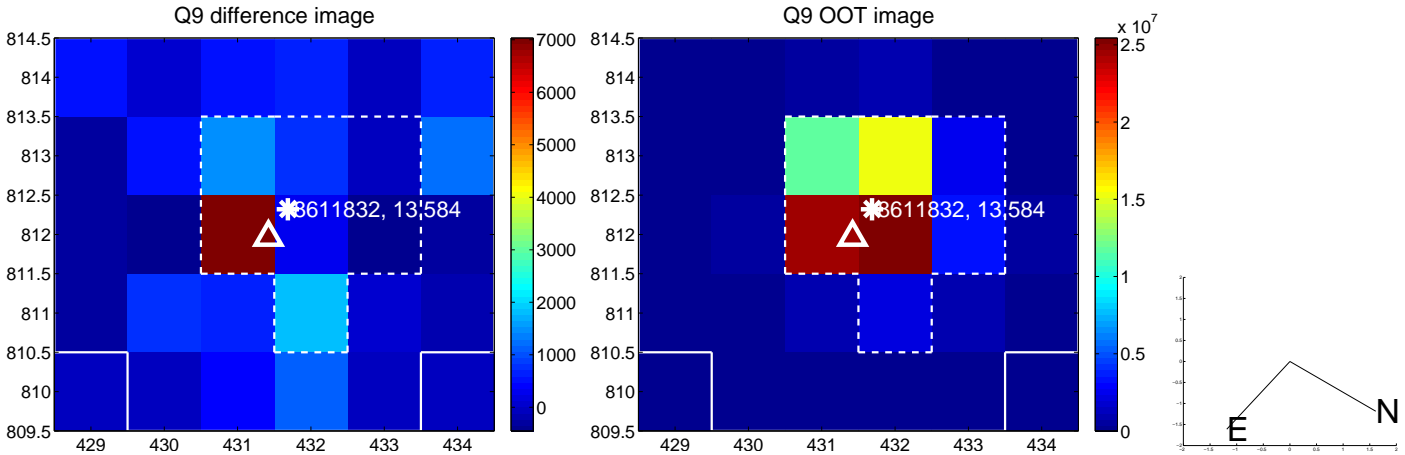




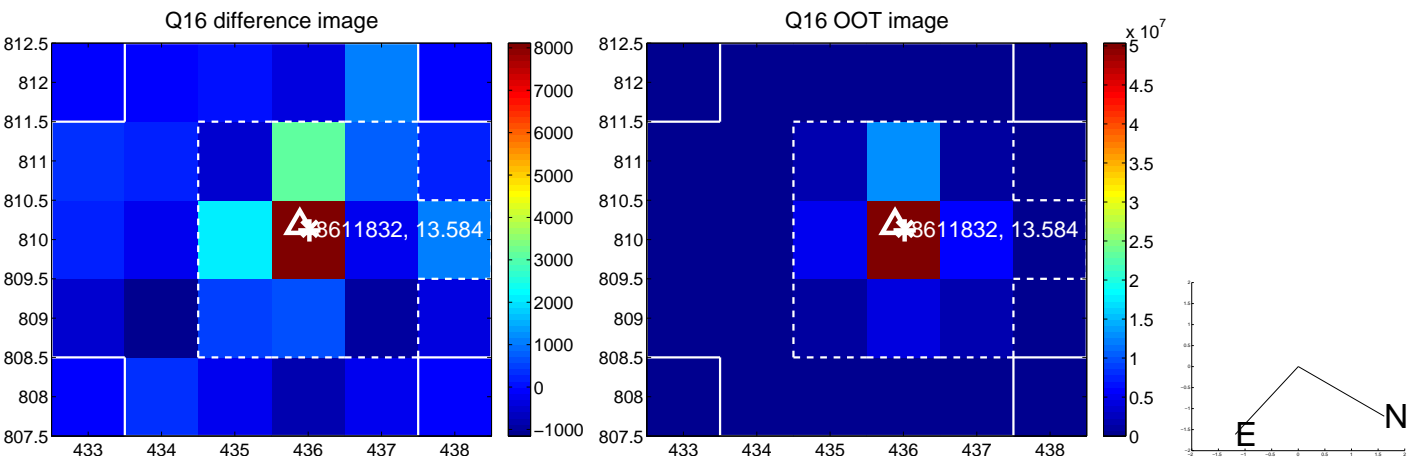
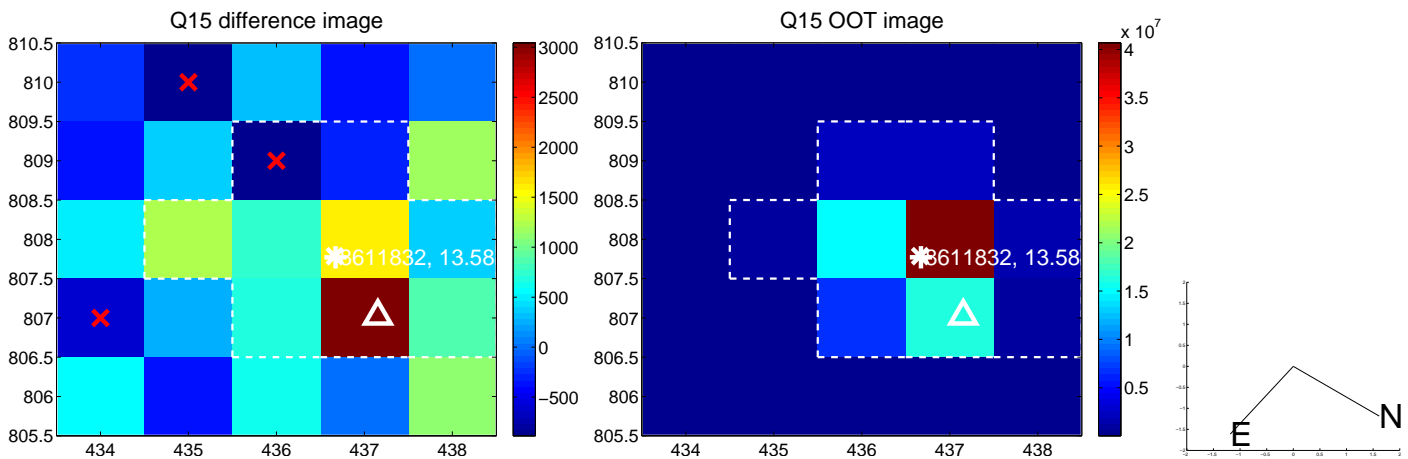
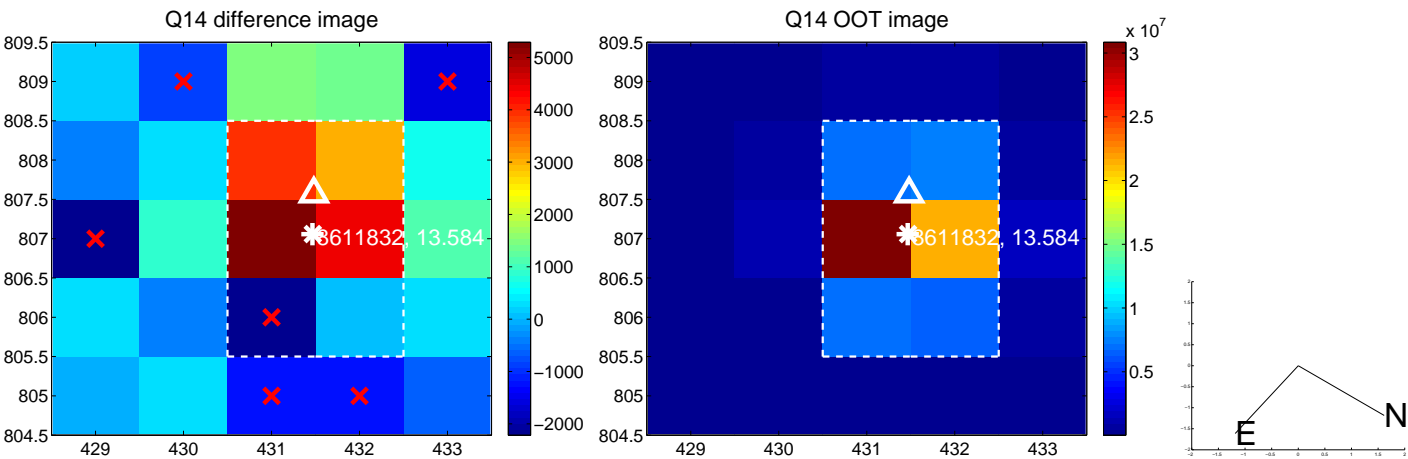
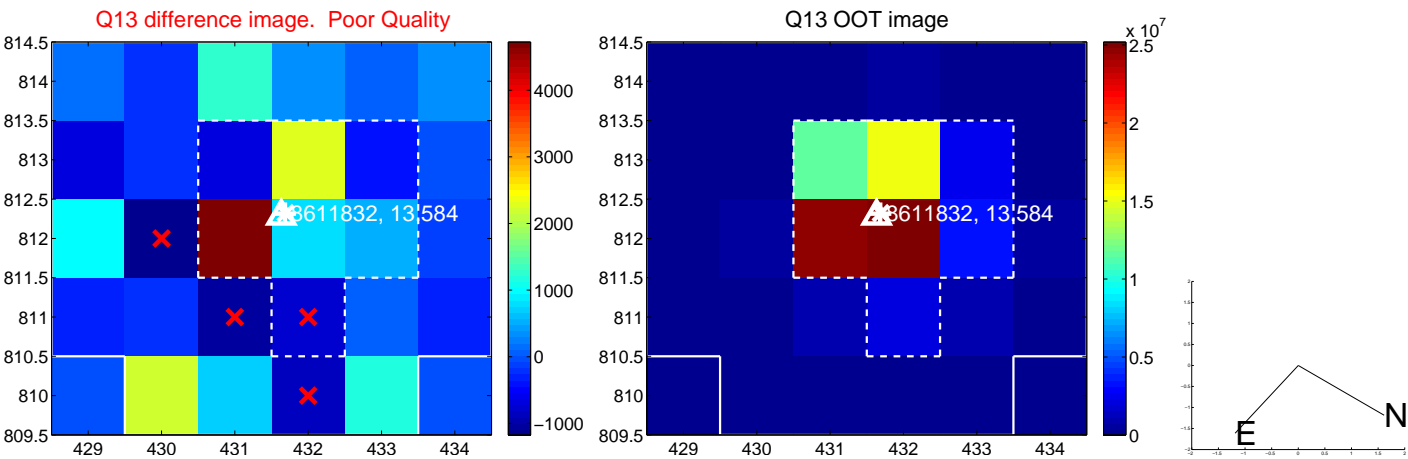
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



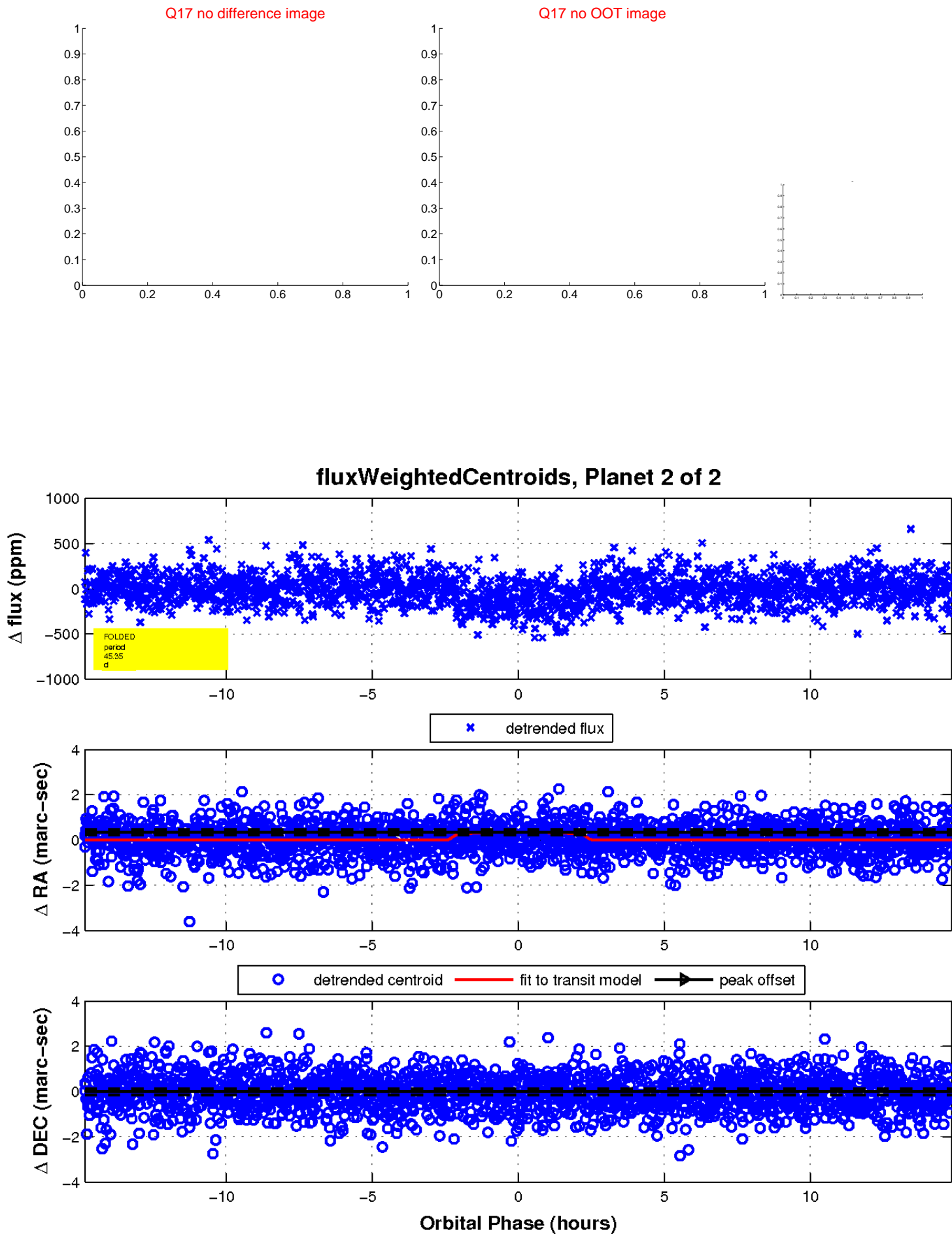
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

