

# KIC 004548011

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004548011-01	OBS	4288.01	6.283722	133.219792	37.6	4.094	11.0	12.8	1.23	5888	0.89	356.76
004548011-02	OBS	4288.02	9.087395	139.996432	38.5	3.637	10.0	10.4	1.23	5888	0.92	218.14
004548011-03	OBS	4288.04	13.950928	144.286698	37.1	5.321	8.1	8.9	1.23	5888	0.83	123.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004548011-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
004548011-02	OBS	PC	0.95	0	0	0	0	NO_COMMENT
004548011-03	OBS	PC	0.68	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.

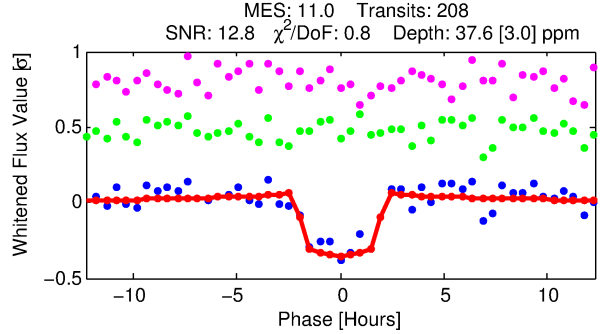
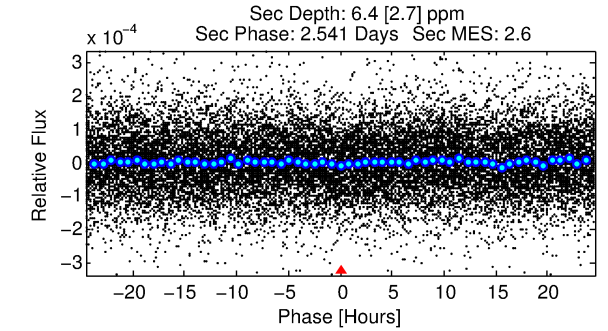
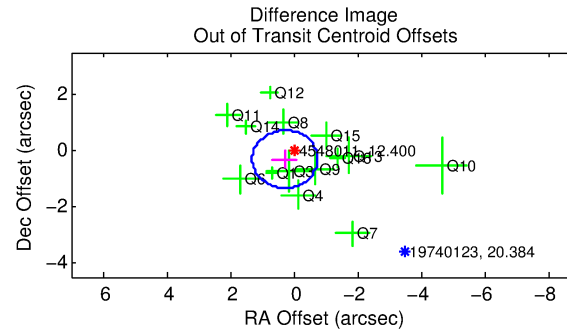
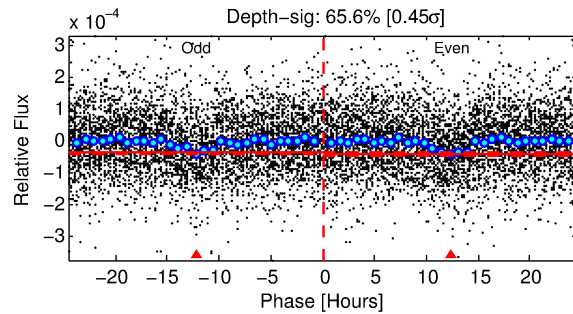
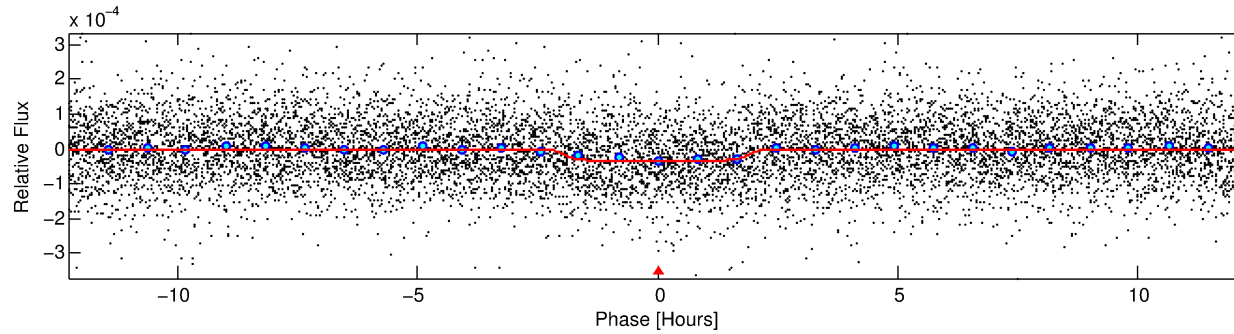
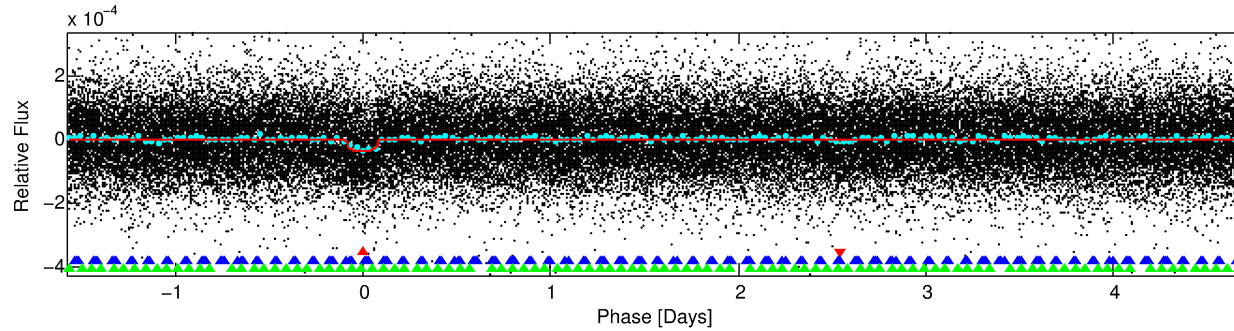
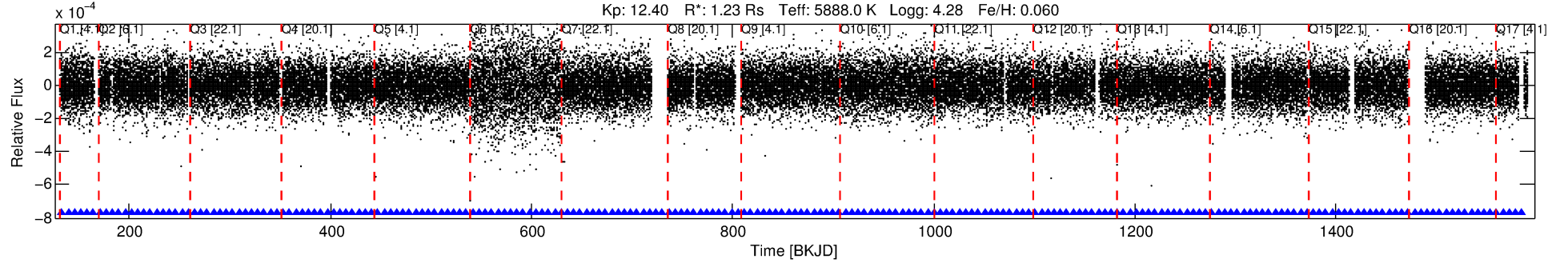
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004548011-01

No Significant Match Found

# DV One-Page Summary

KIC: 4548011 Candidate: 1 of 3 Period: 6.284 d  
KOI: K04288.01 Corr: 0.951



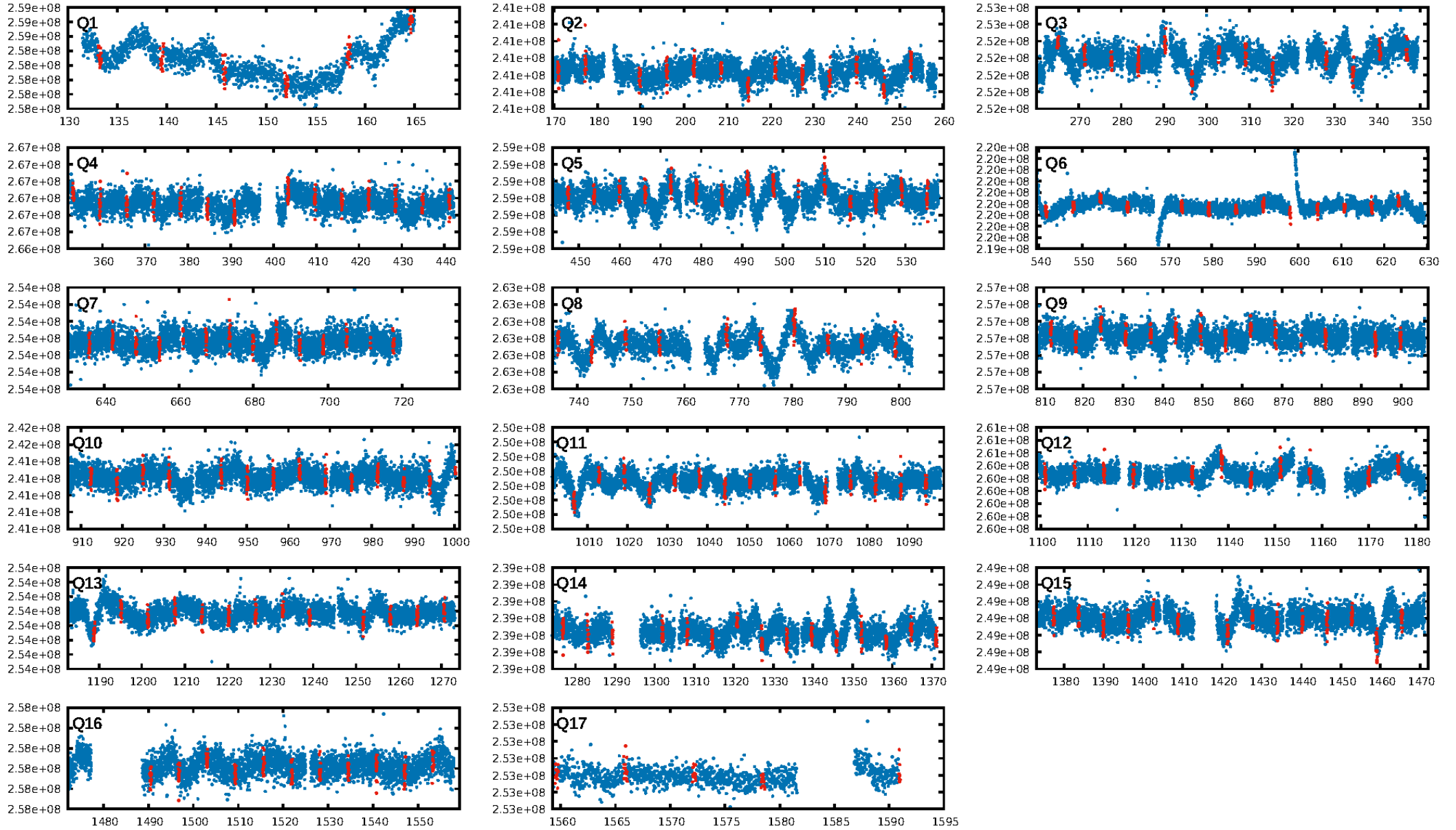
## DV Fit Results:

Period = 6.28372 [0.00004] d  
Epoch = 133.2198 [0.0048] BKJD  
Rp/R\* = 0.0067 [0.0024]  
a/R\* = 5.37 [9.32]  
b = 0.90 [0.39]  
Seff = 356.76 [93.84]  
Teff = 1108 [73] K  
Rp = 0.89 [0.36] Re  
a = 0.0674 [0.0106] AU  
Ag = 20.17 [17.67] [1.09 $\sigma$ ]  
Teffp = 3631 [767] K [3.28 $\sigma$ ]

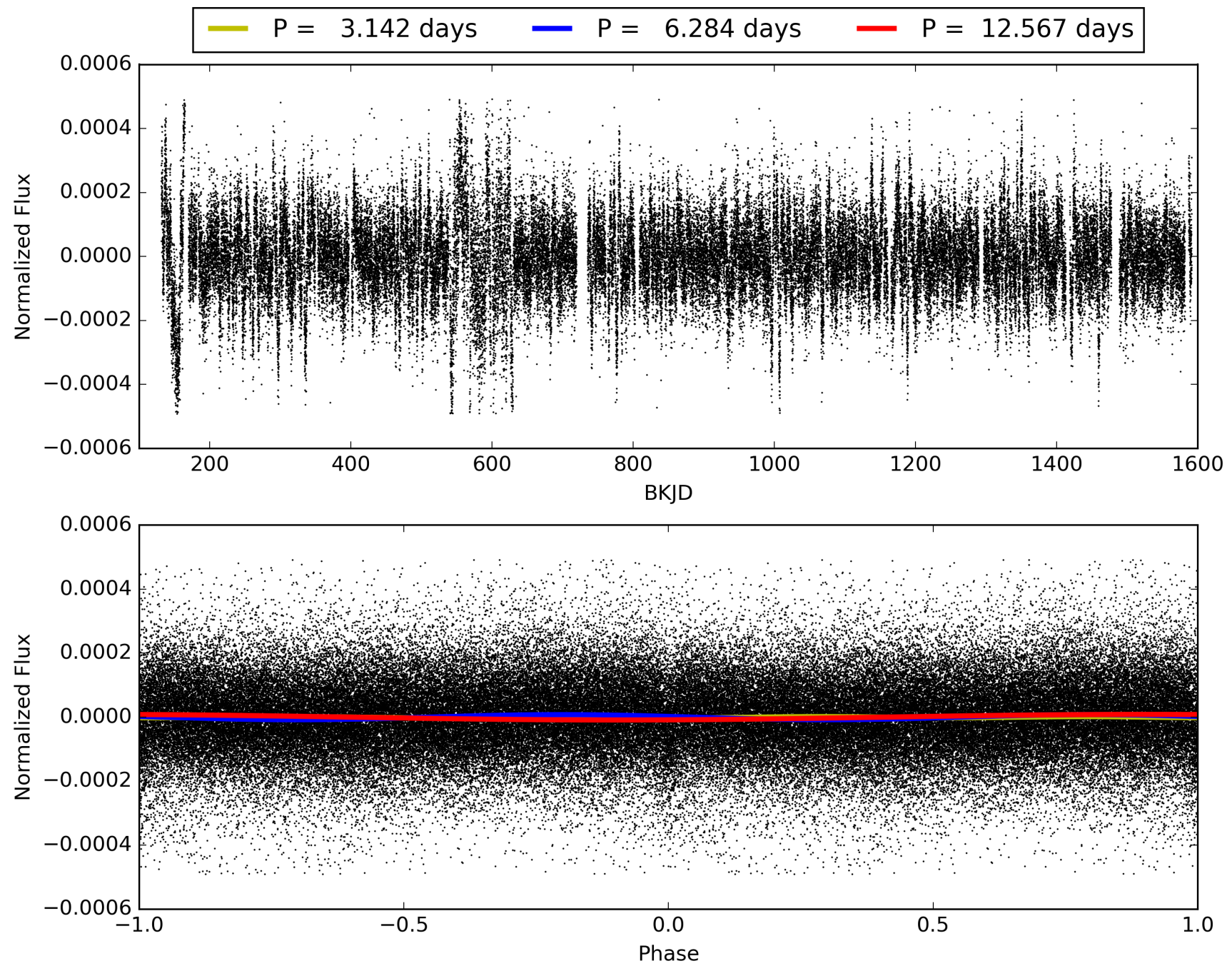
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [12.29 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.35e-27  
RollingBand-fgt: 1.00 [197/197]  
GhostDiagnostic-chr: 2.608  
Centroid-sig: 10.3%  
Centroid-so: 0.998 arcsec [1.23 $\sigma$ ]  
OotOffset-rm: 0.414 arcsec [1.21 $\sigma$ ]  
KicOffset-rm: 0.409 arcsec [0.95 $\sigma$ ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 004548011-01, PDC Light Curves



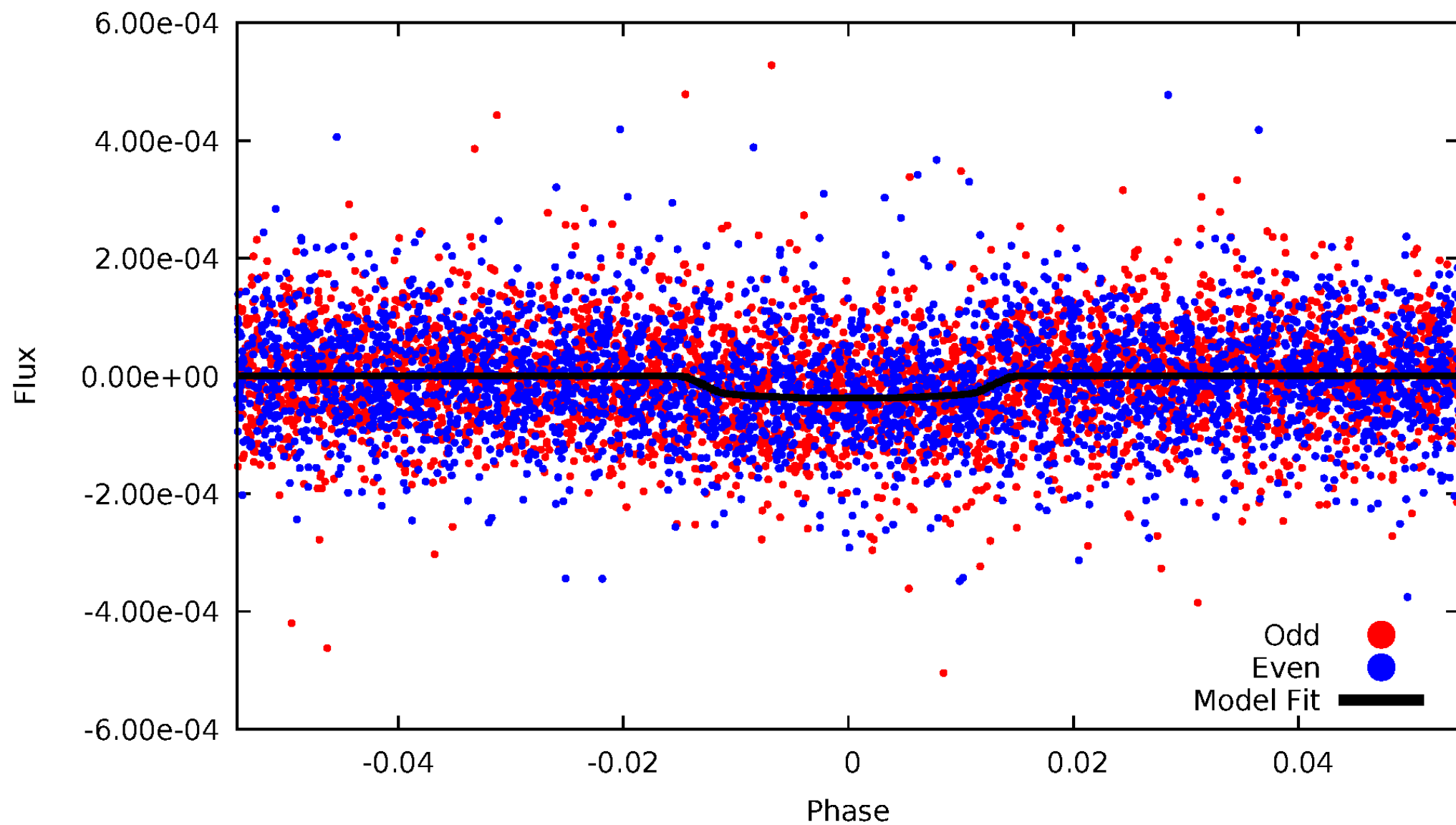
TCE 004548011-01





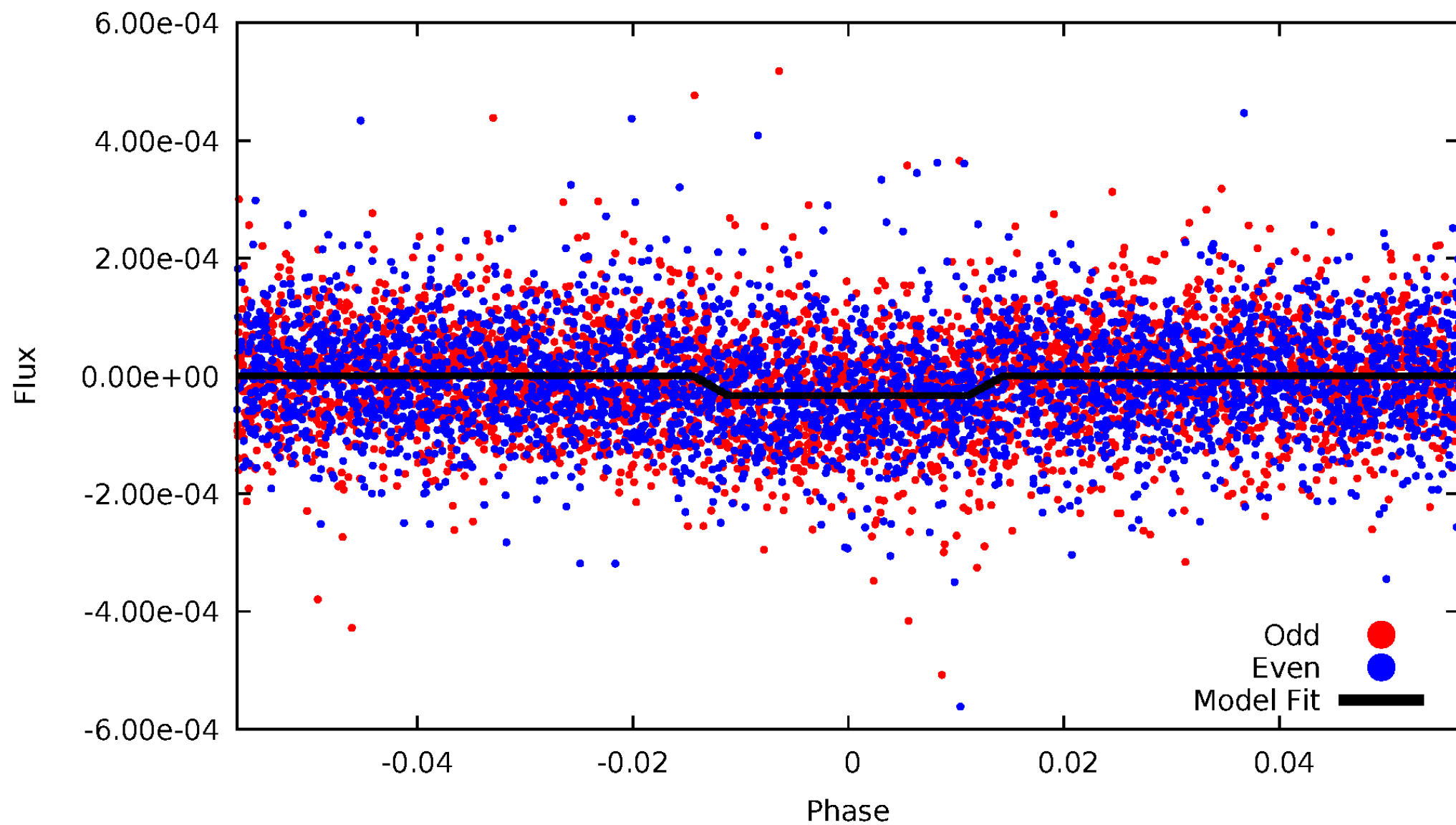
# DV Odd/Even

TCE 004548011-01



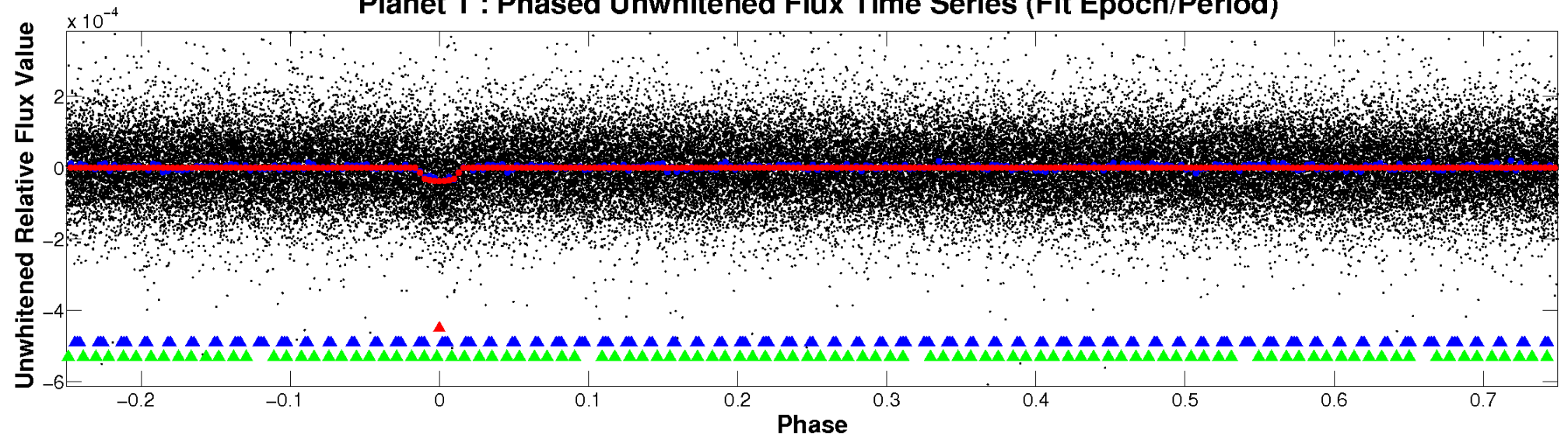
# ALT Odd/Even

TCE 004548011-01

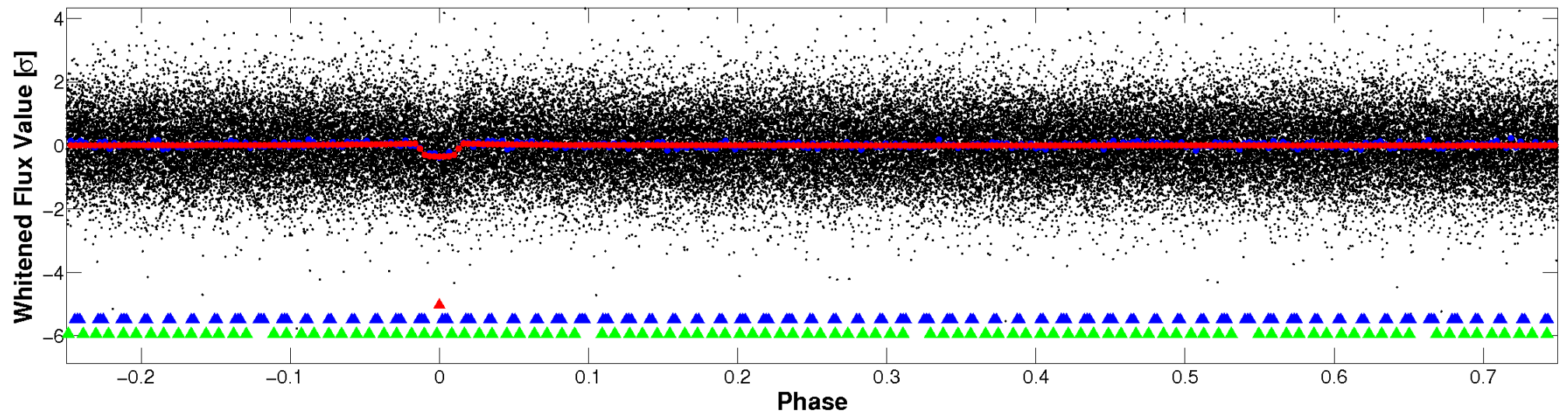


# Non-Whitened Vs. Whitened Light Curve

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

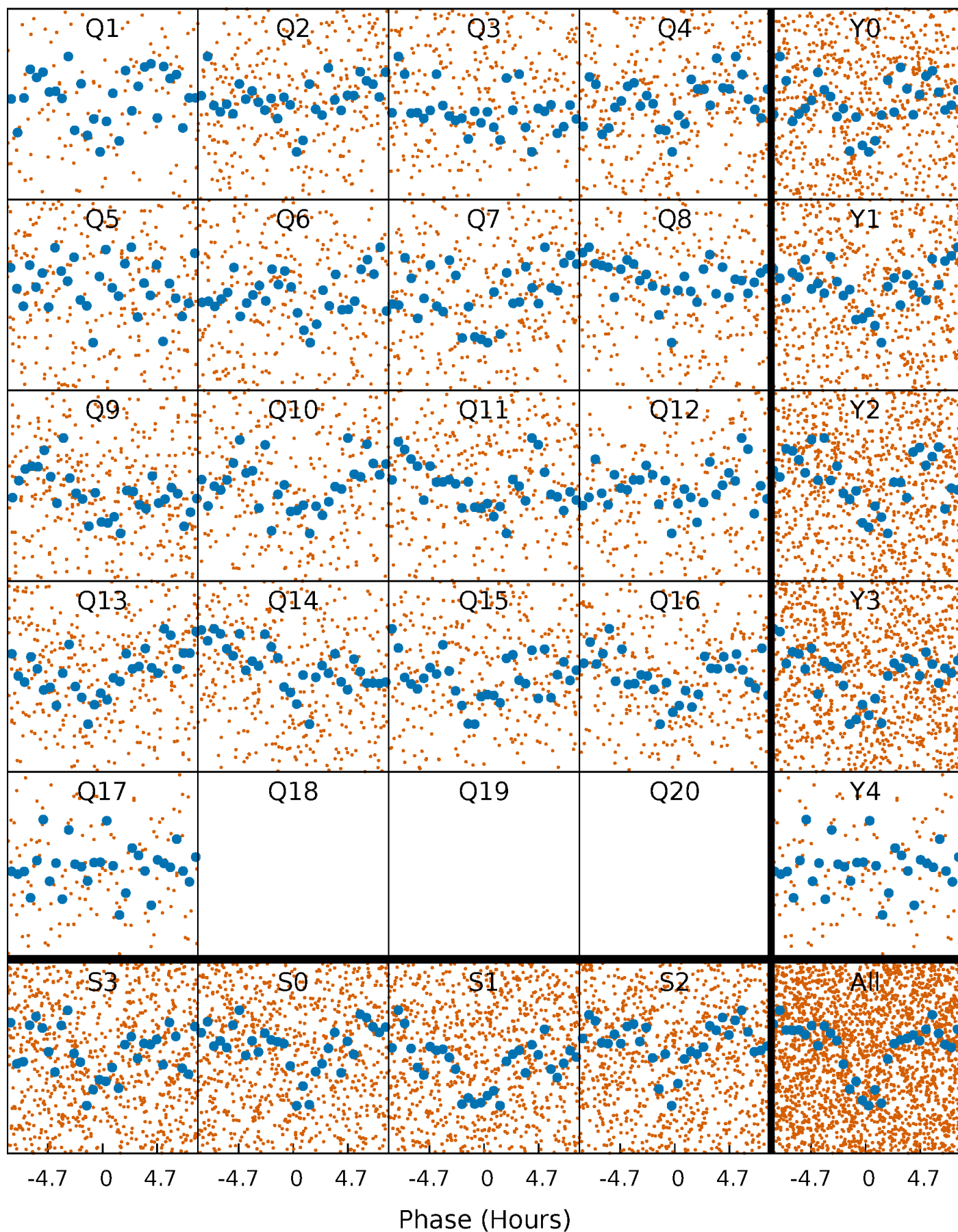


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

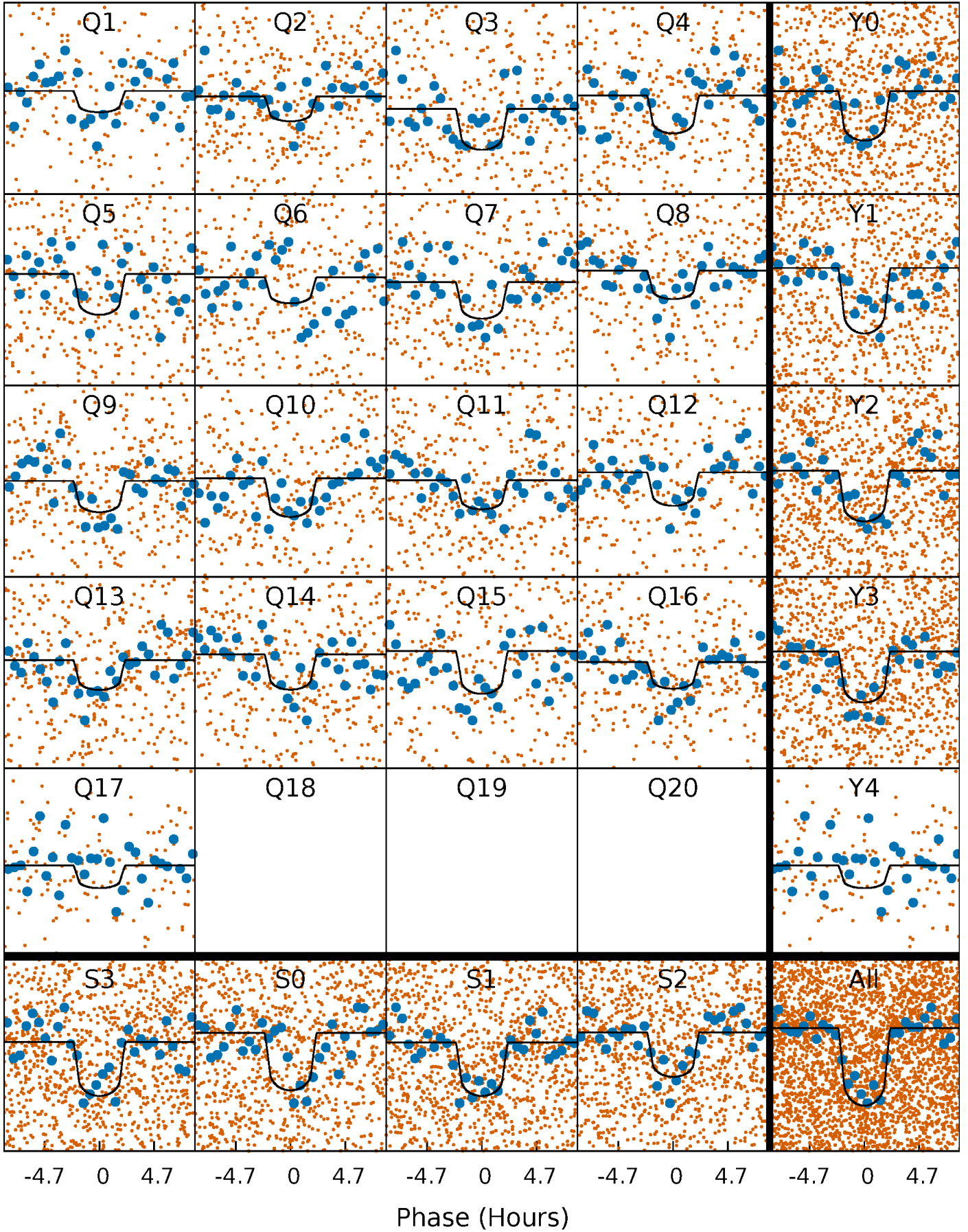
TCE 004548011-01 P= 6.283722 Days  $T_0=133.219792$  (BKJD)





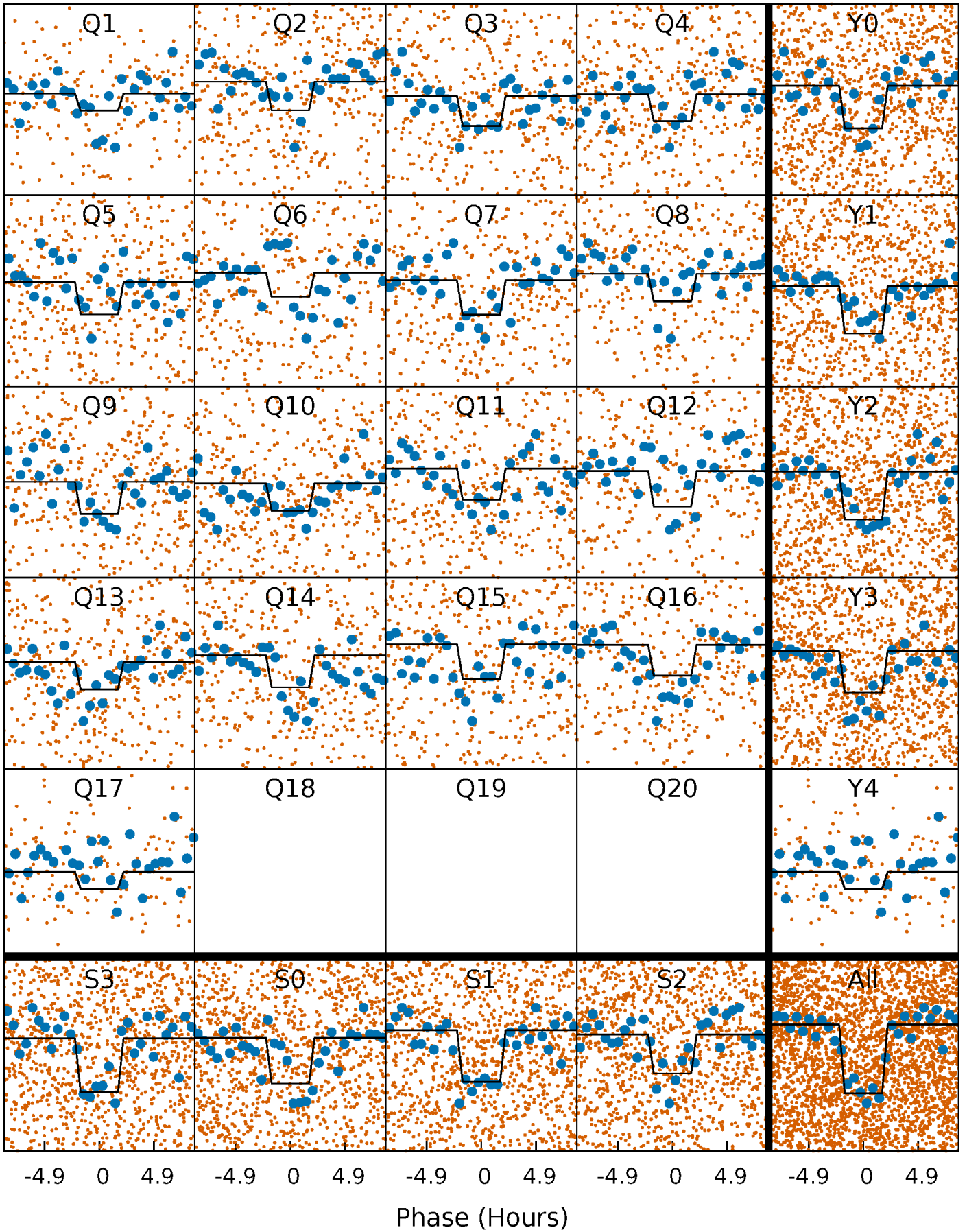
# DV Quarter-Phased Transit Curves

TCE 004548011-01   P= 6.283722 Days    $T_0=133.219792$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

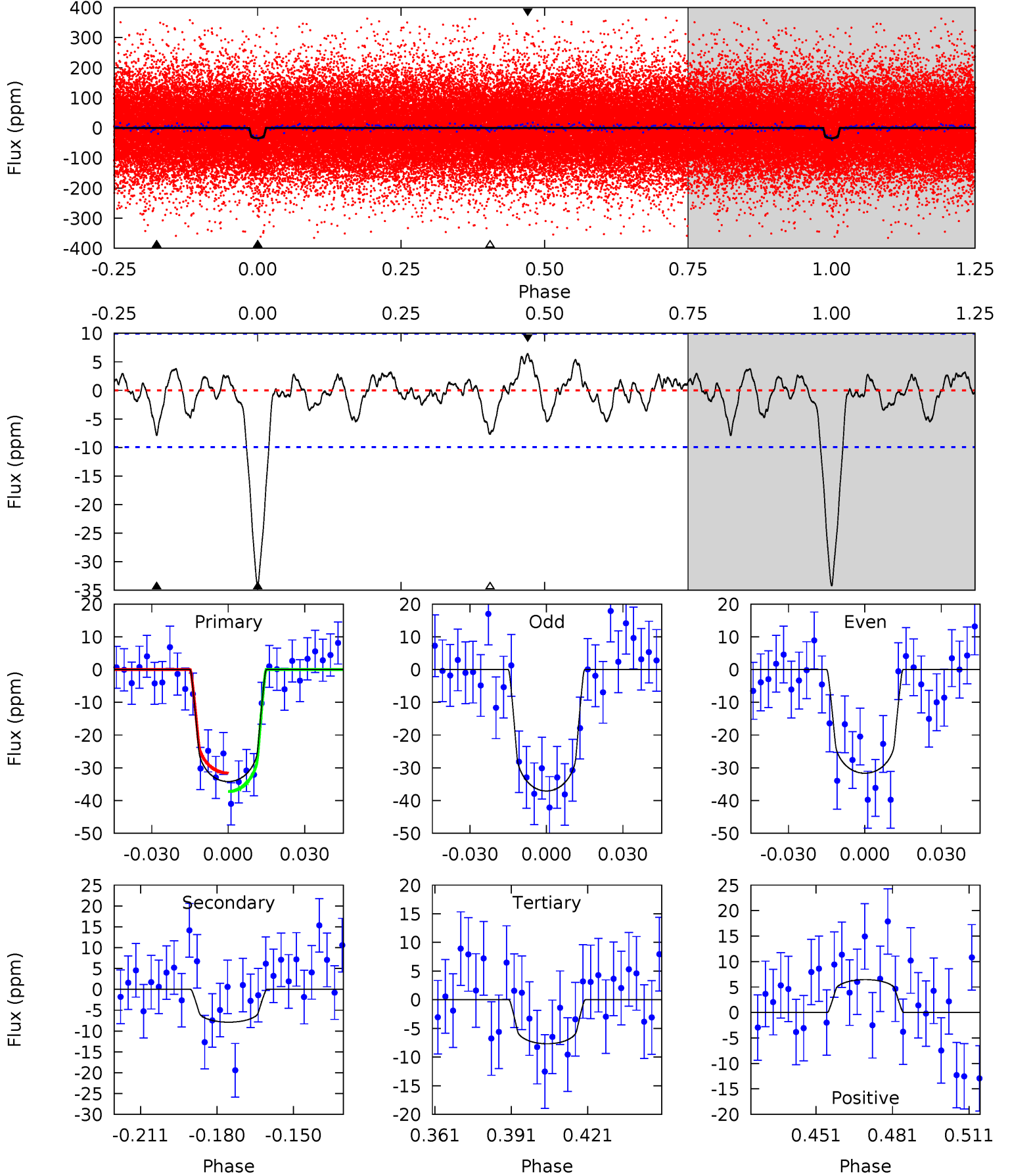
TCE 004548011-01 P= 6.283738 Days  $T_0=133.217196$  (BKJD)



# DV Model-Shift Uniqueness Test

004548011-01, P = 6.283722 Days, E = 126.936070 Days

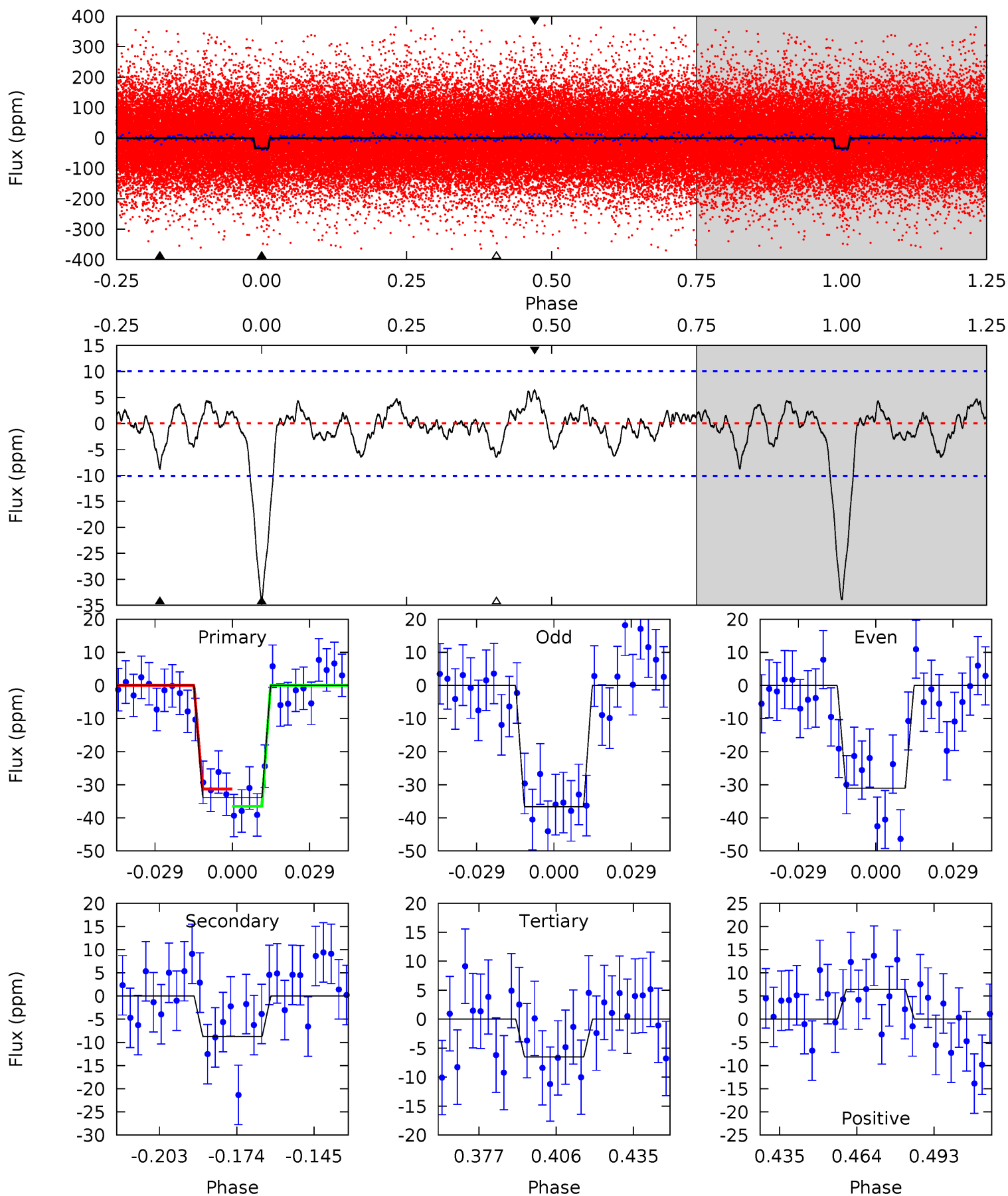
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.6	3.82	3.72	3.13	4.81	2.17	1.19	12.9	13.5	0.10	0.70	1.32	1.00	0.16	1.37



# Alt Model-Shift Uniqueness Test

004548011-01, P = 6.283738 Days, E = 126.933458 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
16.2	4.18	3.11	3.08	4.82	2.18	1.18	13.1	13.1	1.07	1.10	1.33	0.95	0.16	1.25





### Stellar Parameters For KIC 004548011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5888^{+105}_{-129}$	$4.275^{+0.144}_{-0.108}$	$0.060^{+0.150}_{-0.150}$	$1.227^{+0.207}_{-0.186}$	$1.036^{+0.089}_{-0.080}$	$0.789^{+0.456}_{-0.267}$
	+2%/-2%	+3%/-3%	+250%/-250%	+17%/-15%	+9%/-8%	+58%/-34%
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 004548011-01 / KOI 4288.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-8 \pm 2$	$0.87^{+0.36}_{-0.30}$	$1542^{+72}_{-77}$	$4095^{+777}_{-465}$	$25^{+36}_{-12}$
Alt.	$-9 \pm 2$	$0.77^{+0.31}_{-0.32}$	$1539^{+80}_{-78}$	$4396^{+1076}_{-562}$	$38^{+67}_{-21}$

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

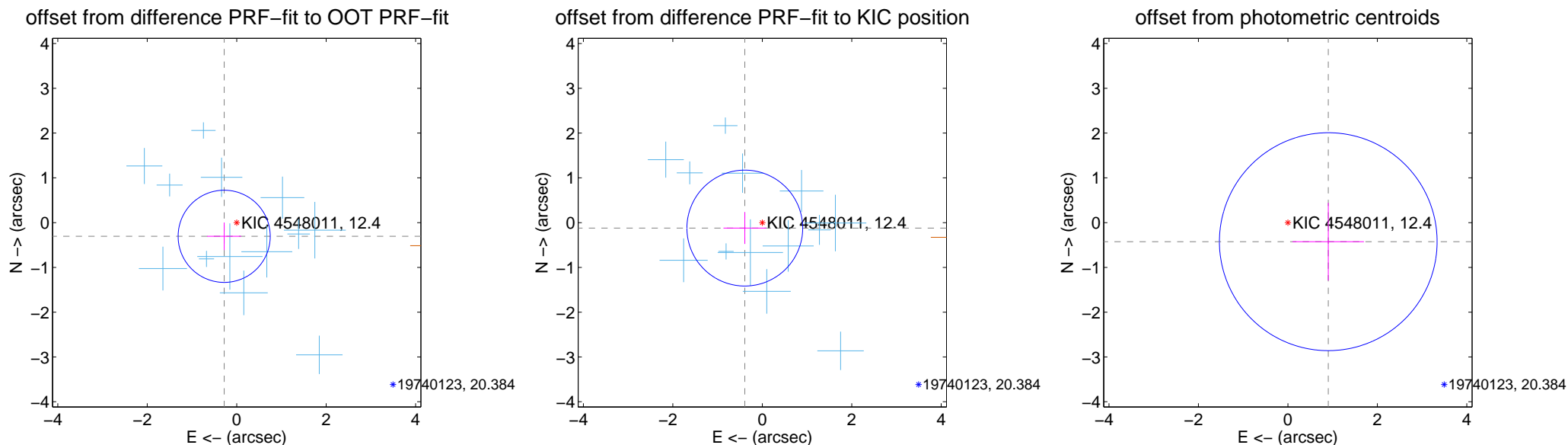
## DV Centroid Data

Supplemental centroid analysis for 004548011-01. Kepler magnitude: 12.40. Transit SNR 12.76

There are 13 quarters with good PRF difference image offsets

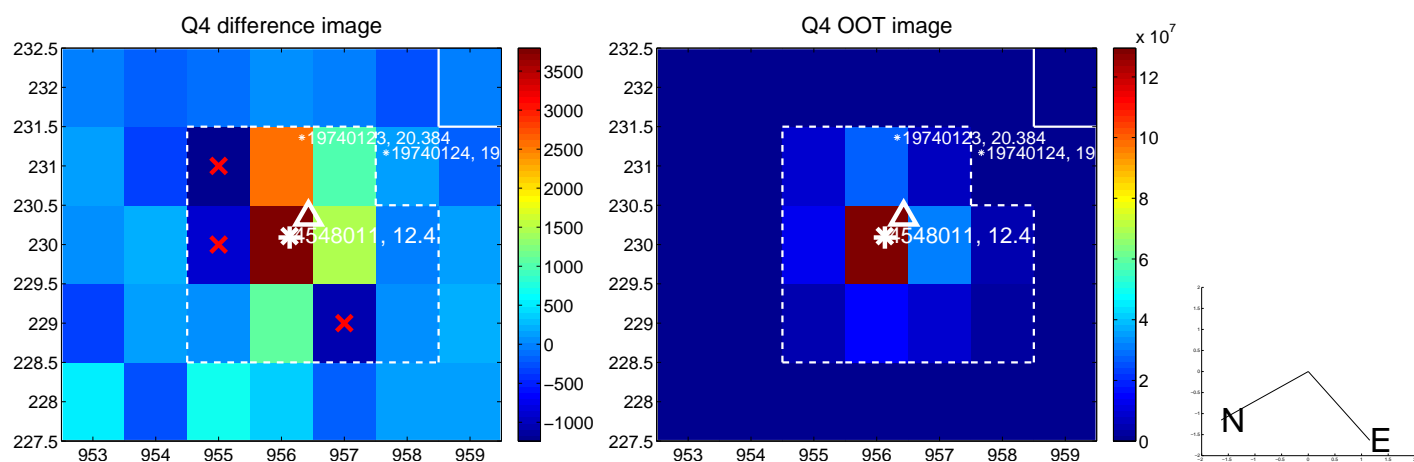
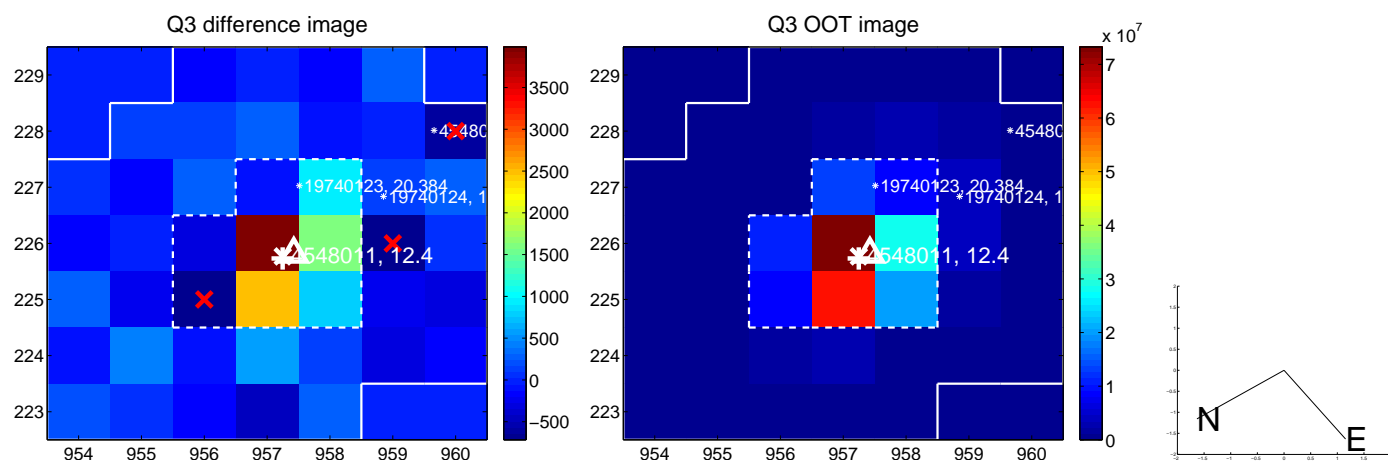
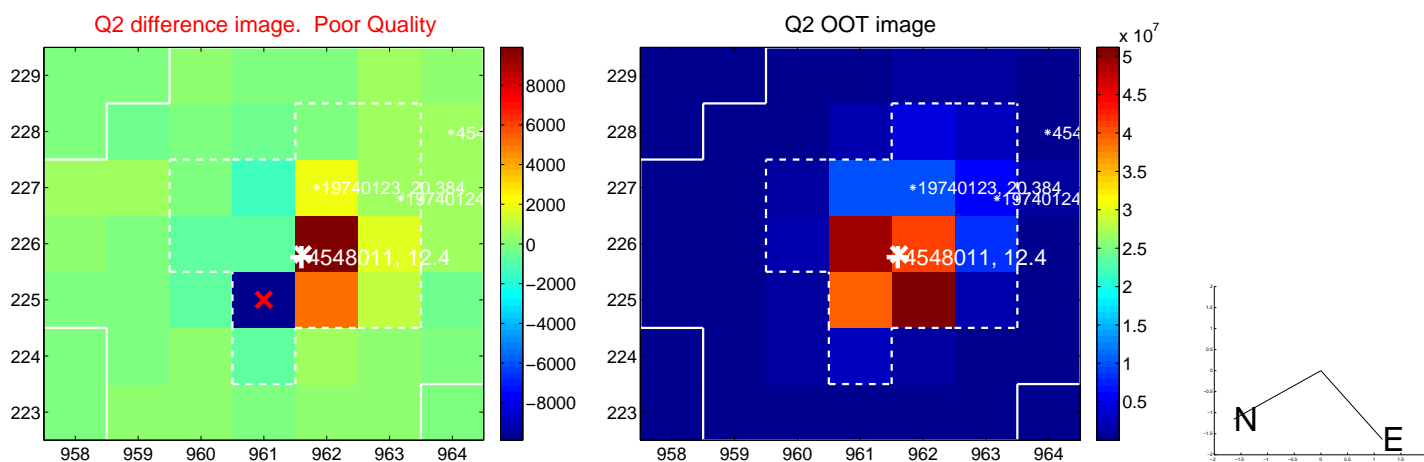
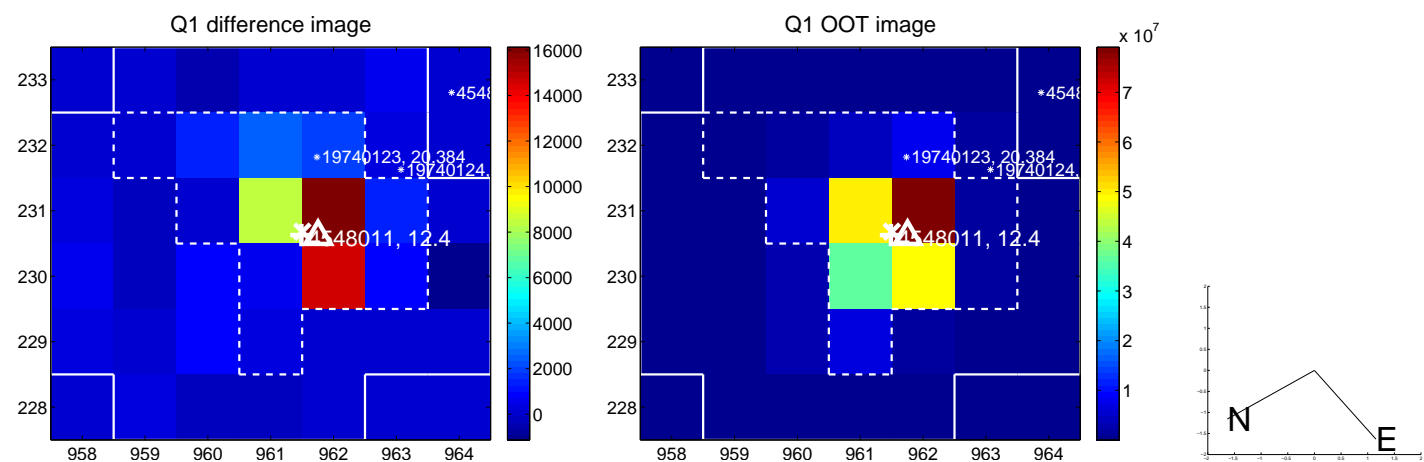
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.414 \pm 0.343$	1.21	$0.280 \pm 0.381$	$-0.306 \pm 0.308$
PRF-fit source offset from KIC position	$0.409 \pm 0.431$	0.95	$0.391 \pm 0.478$	$-0.122 \pm 0.356$
photometric centroid source offset	$1.00 \pm 0.81$	1.23	$-0.90 \pm 0.80$	$-0.43 \pm 0.87$

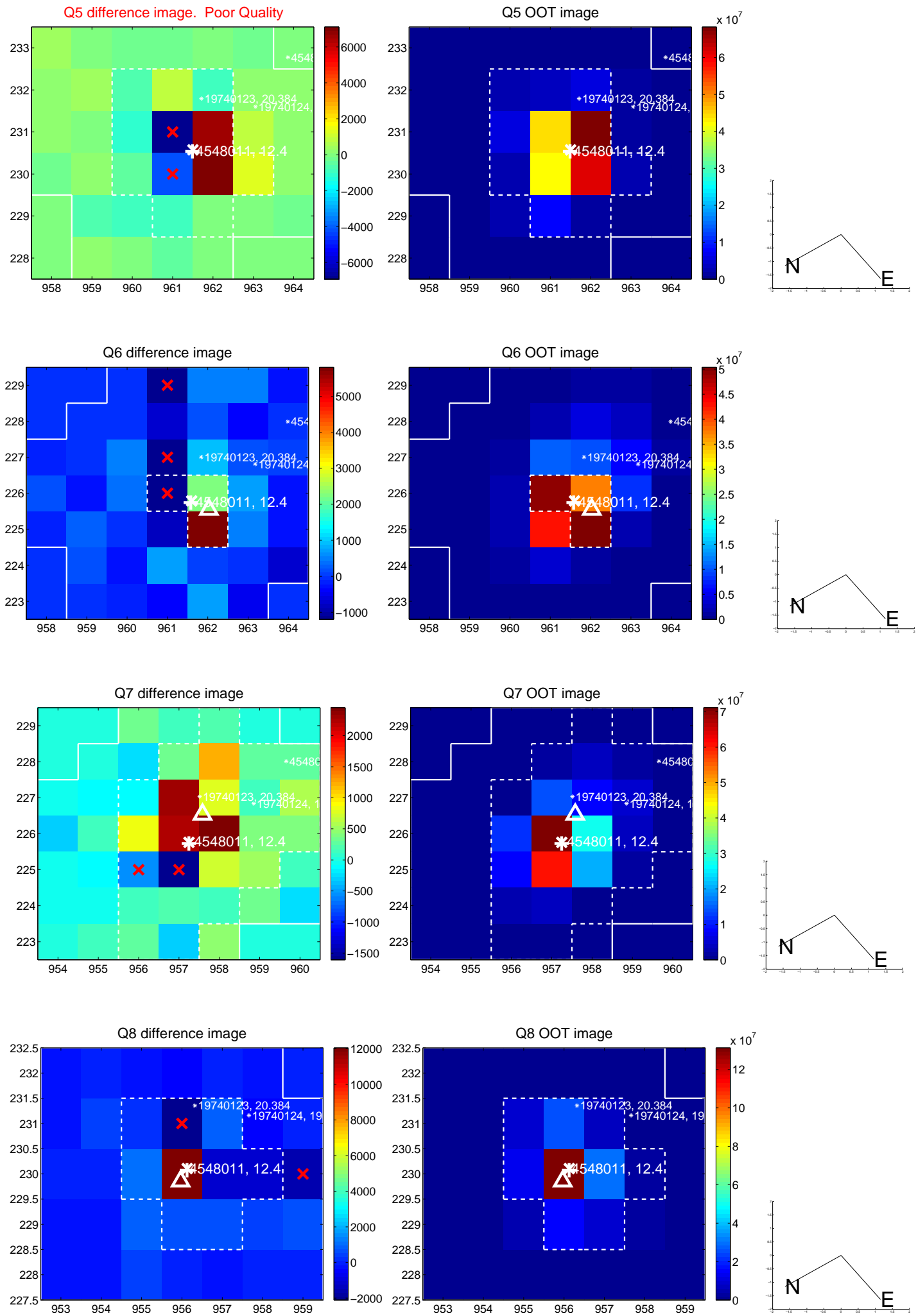


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

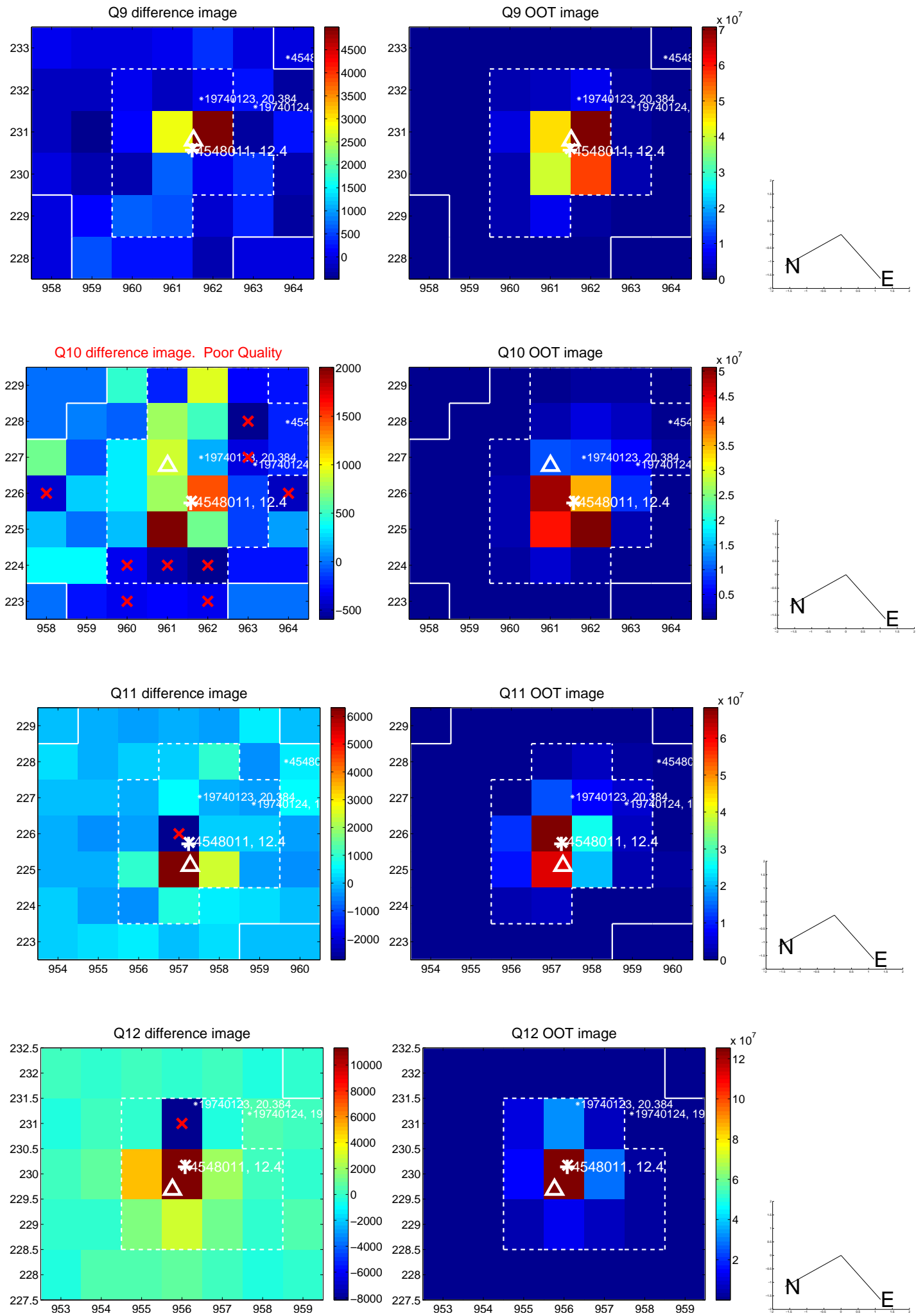


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

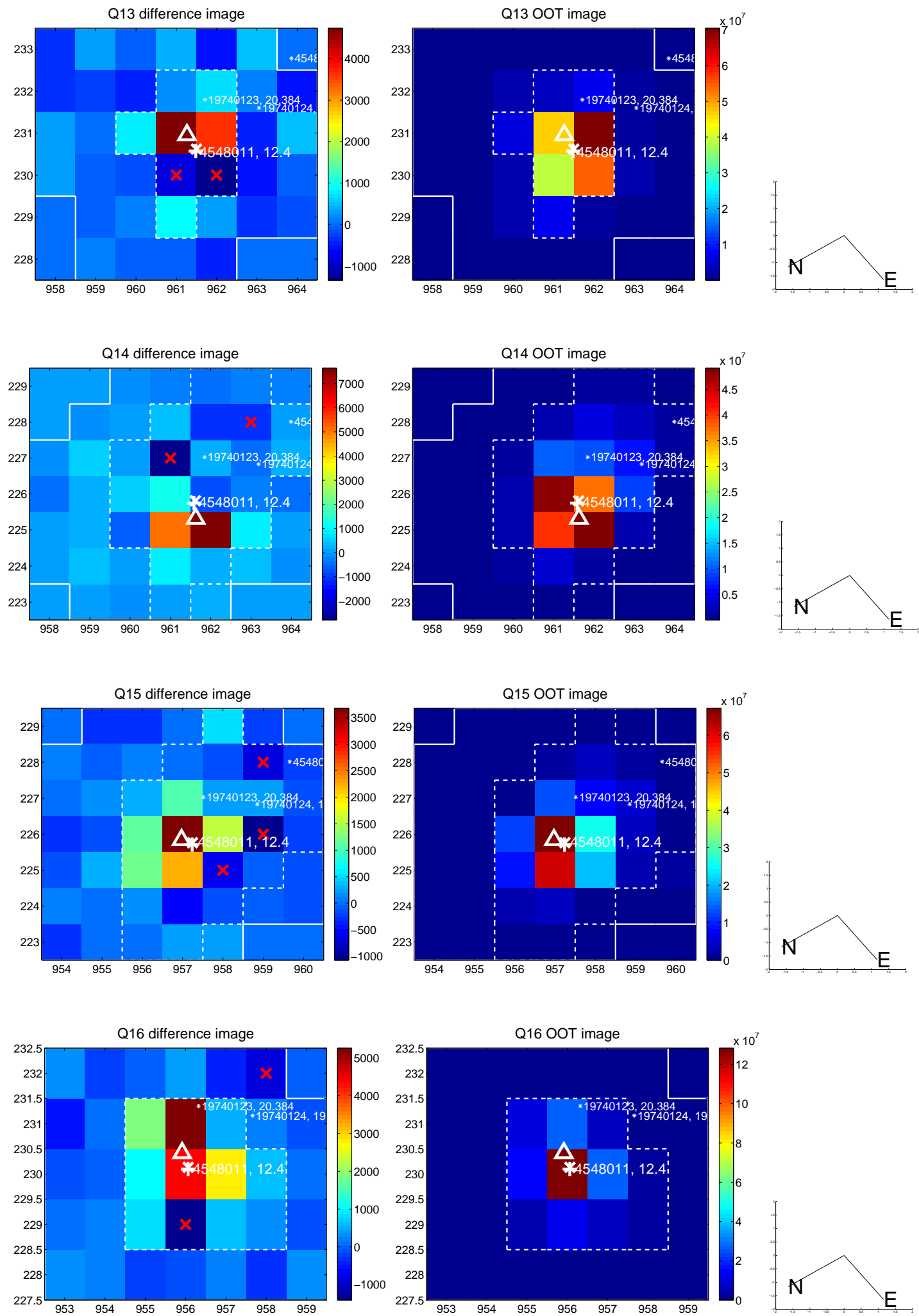




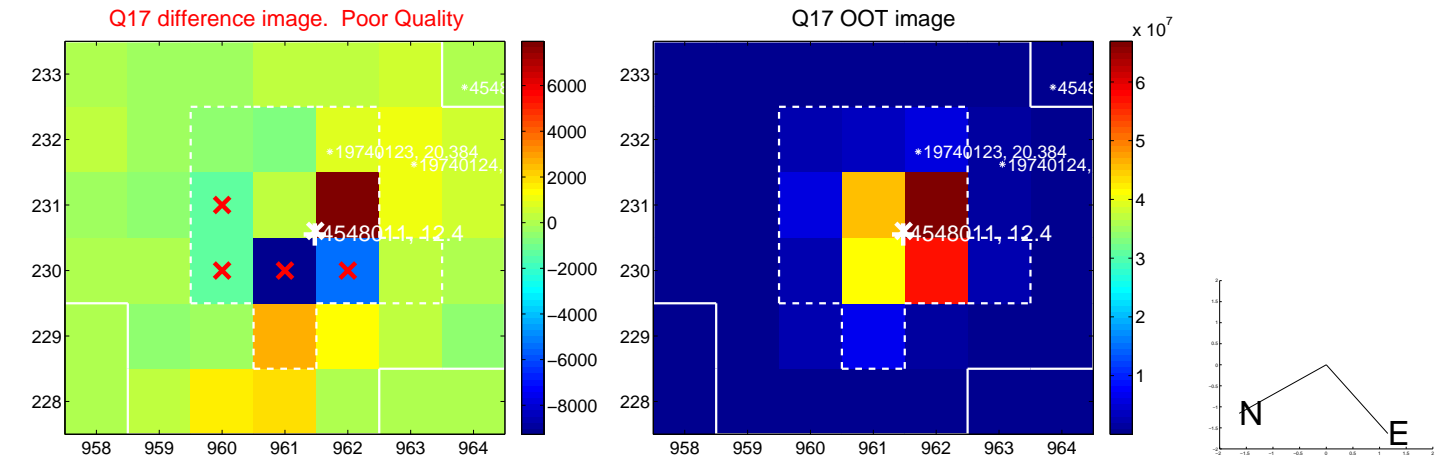
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



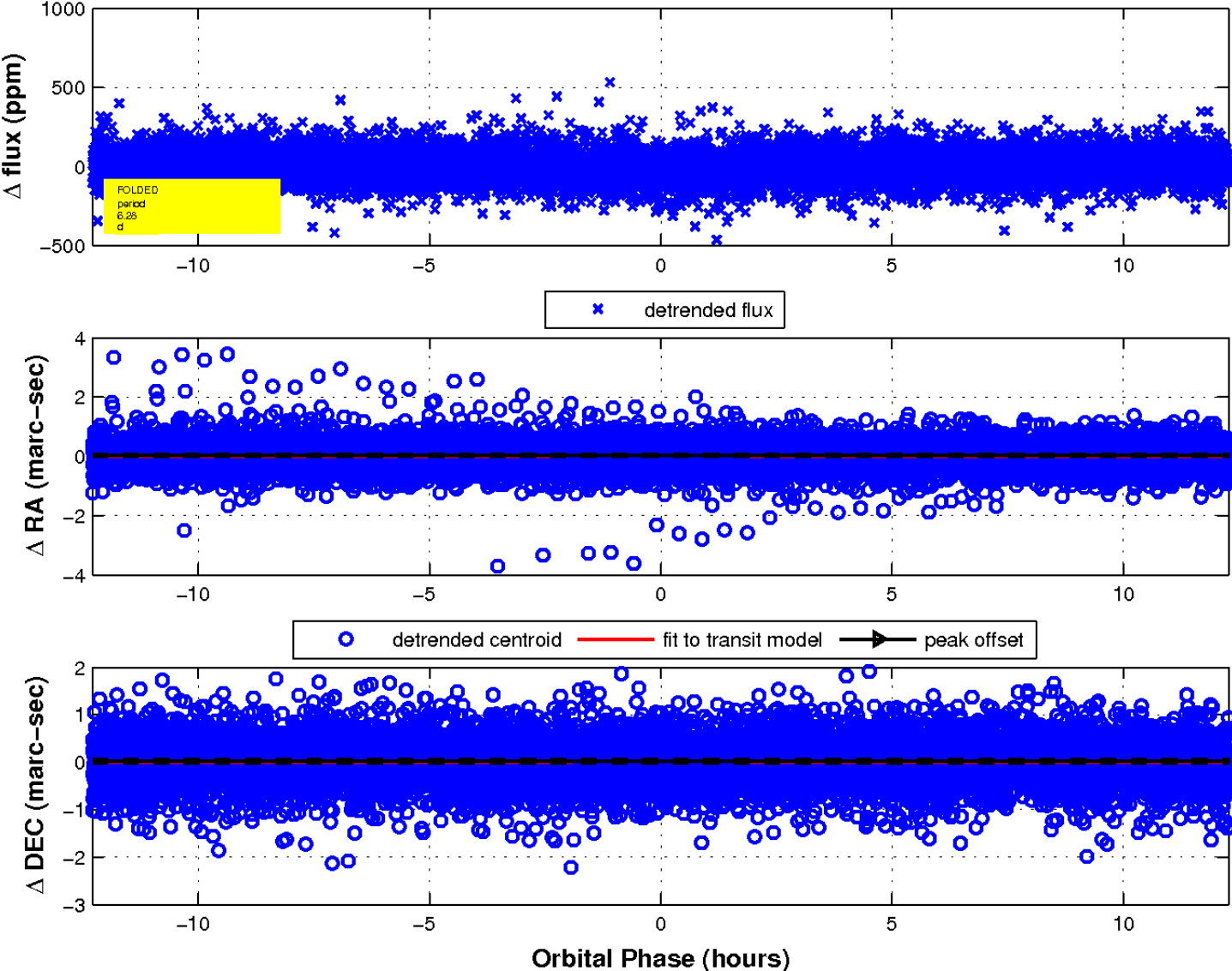
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

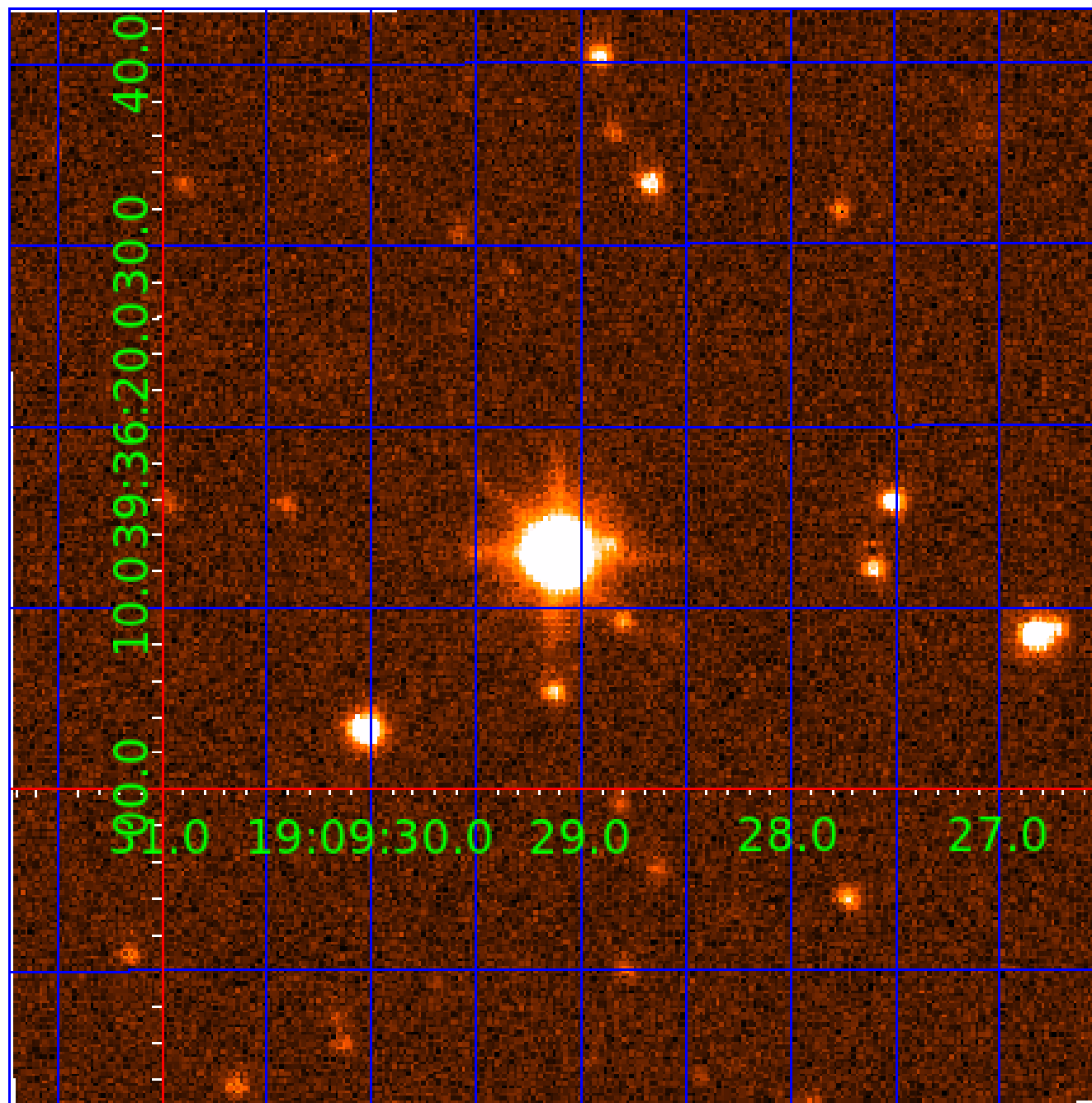


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 004548011

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004548011-01	OBS	4288.01	6.283722	133.219792	37.6	4.094	11.0	12.8	1.23	5888	0.89	356.76
004548011-02	OBS	4288.02	9.087395	139.996432	38.5	3.637	10.0	10.4	1.23	5888	0.92	218.14
004548011-03	OBS	4288.04	13.950928	144.286698	37.1	5.321	8.1	8.9	1.23	5888	0.83	123.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004548011-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
004548011-02	OBS	PC	0.95	0	0	0	0	NO_COMMENT
004548011-03	OBS	PC	0.68	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.

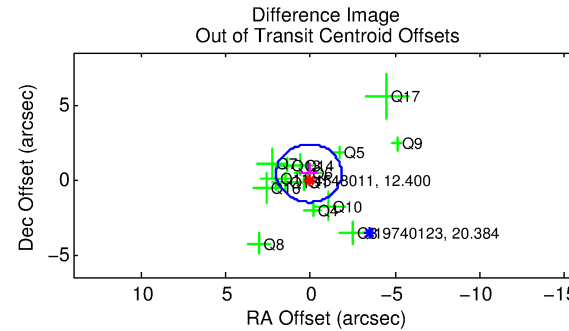
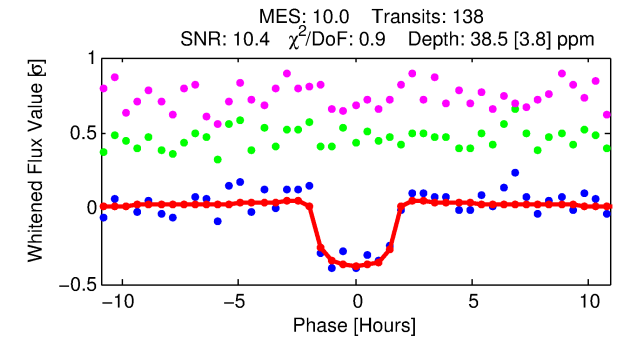
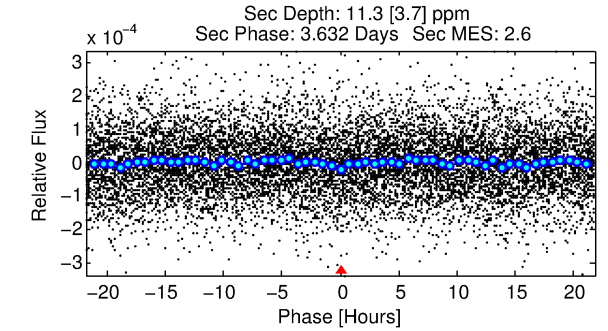
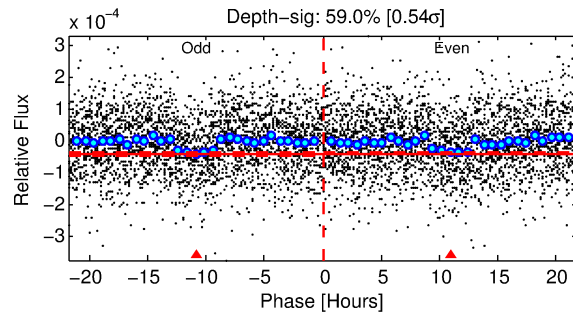
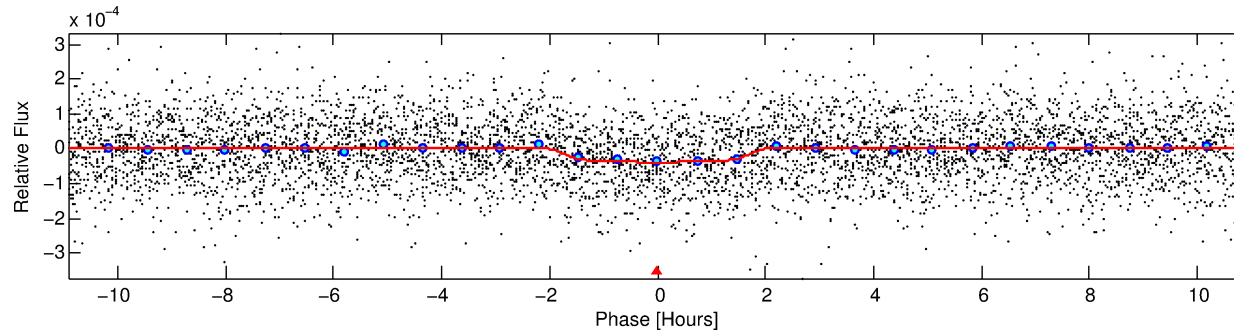
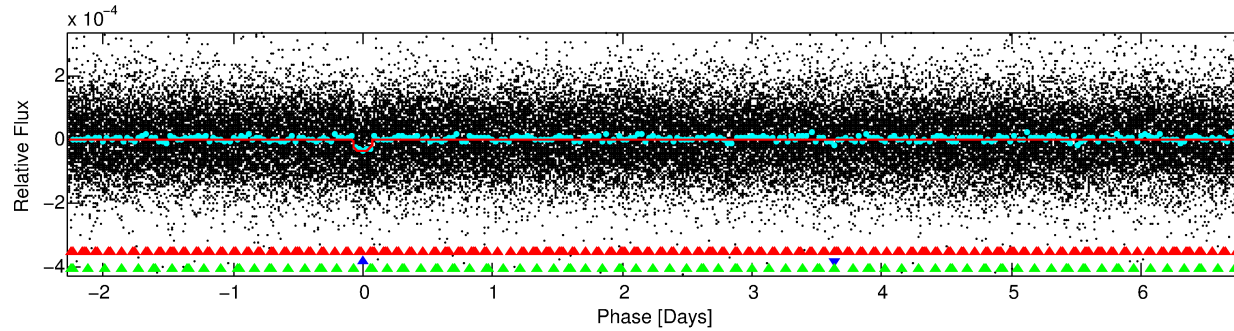
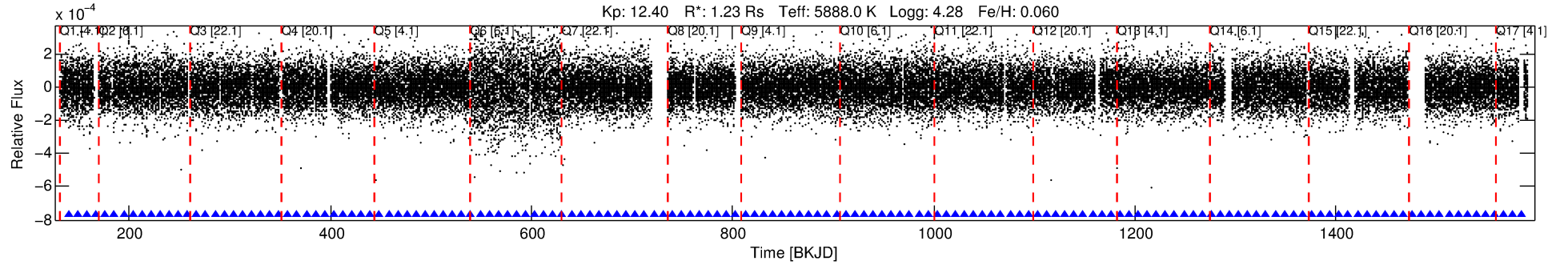
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 004548011-02

No Significant Match Found

# DV One-Page Summary

KIC: 4548011 Candidate: 2 of 3 Period: 9.087 d  
KOI: K04288.02 Corr: 0.965



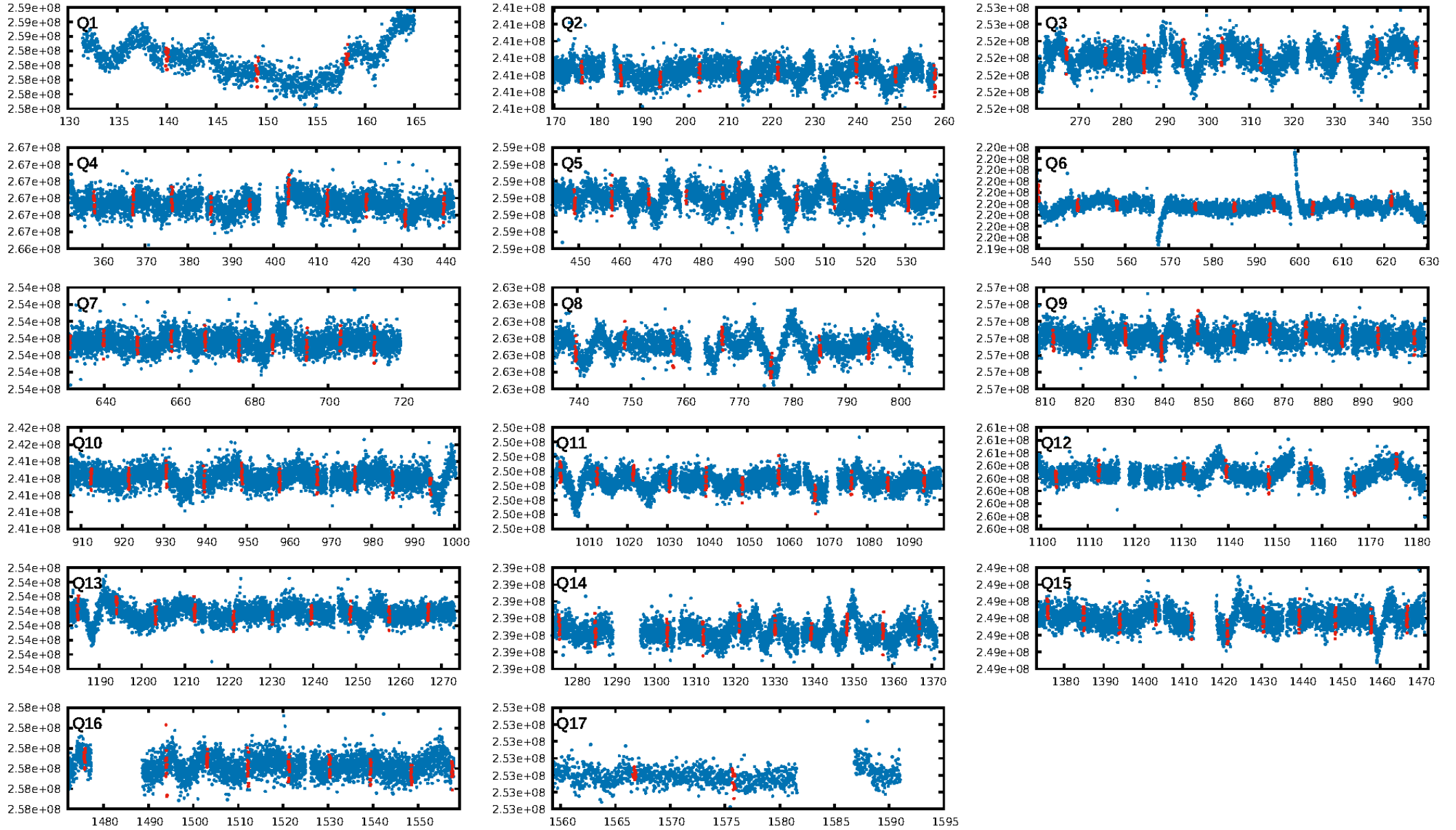
## DV Fit Results:

Period = 9.08740 [0.00007] d  
Epoch = 139.9964 [0.0064] BKJD  
Rp/R\* = 0.0069 [0.0031]  
a/R\* = 7.89 [17.67]  
b = 0.92 [0.39]  
Seff = 218.14 [57.38]  
Teq = 980 [64] K  
Rp = 0.92 [0.44] Re  
a = 0.0862 [0.0136] AU  
Ag = 54.62 [53.79] [1.00 $\sigma$ ]  
Teffp = 4119 [986] K [3.18 $\sigma$ ]

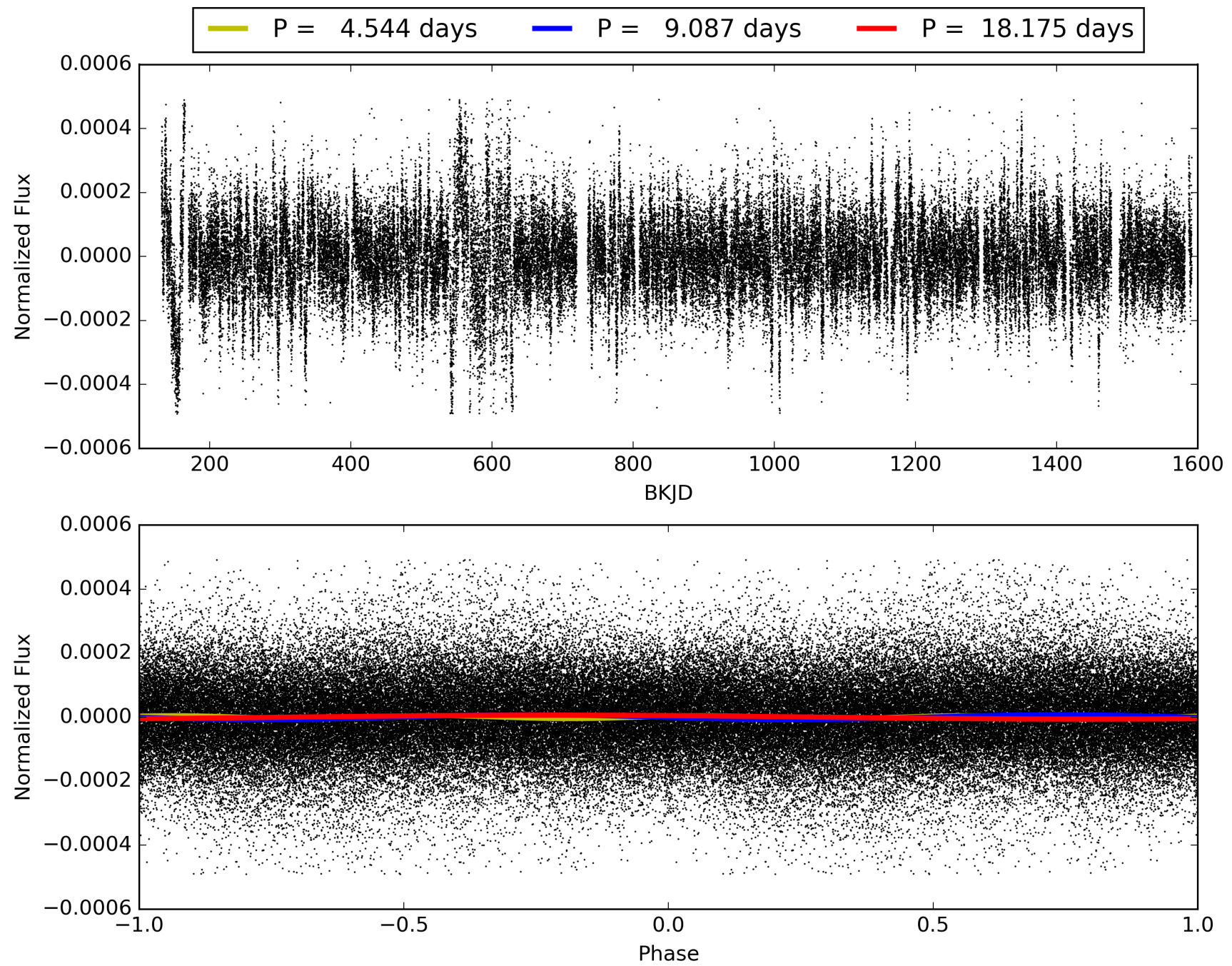
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.29 $\sigma$ ]  
LongPeriod-sig: 100.0% [18.11 $\sigma$ ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.19e-22  
RollingBand-fgt: 1.00 [134/134]  
GhostDiagnostic-chr: -3.395  
Centroid-sig: 0.0%  
Centroid-so: 2.437 arcsec [2.45 $\sigma$ ]  
OotOffset-rm: 0.434 arcsec [0.67 $\sigma$ ]  
KicOffset-rm: 0.642 arcsec [1.03 $\sigma$ ]  
OotOffset-st: 3/4/3/5 [15]  
KicOffset-st: 3/4/3/5 [15]  
DiffImageQuality-fgm: 0.67 [10/15]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 004548011-02, PDC Light Curves

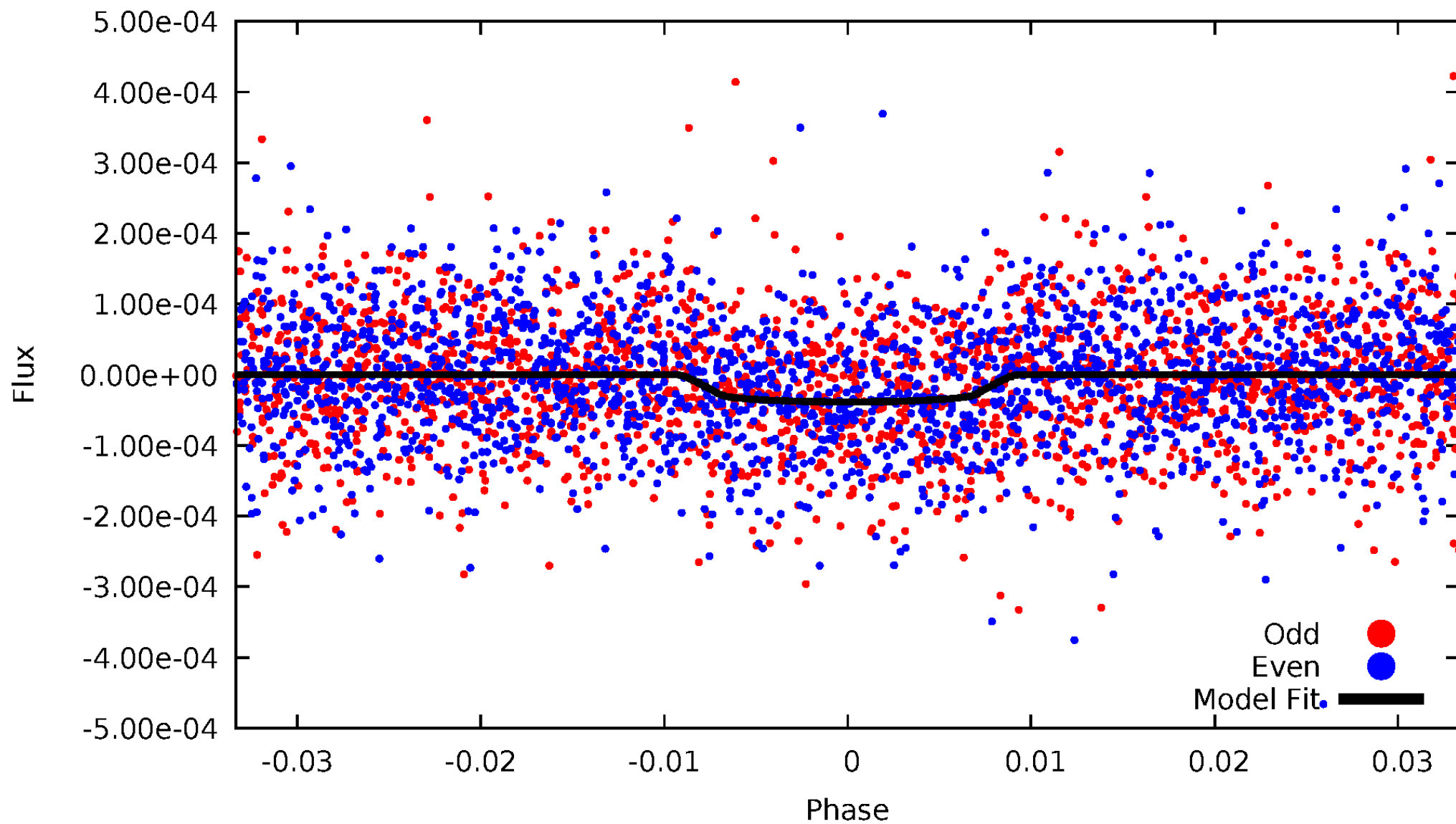


TCE 004548011-02



# DV Odd/Even

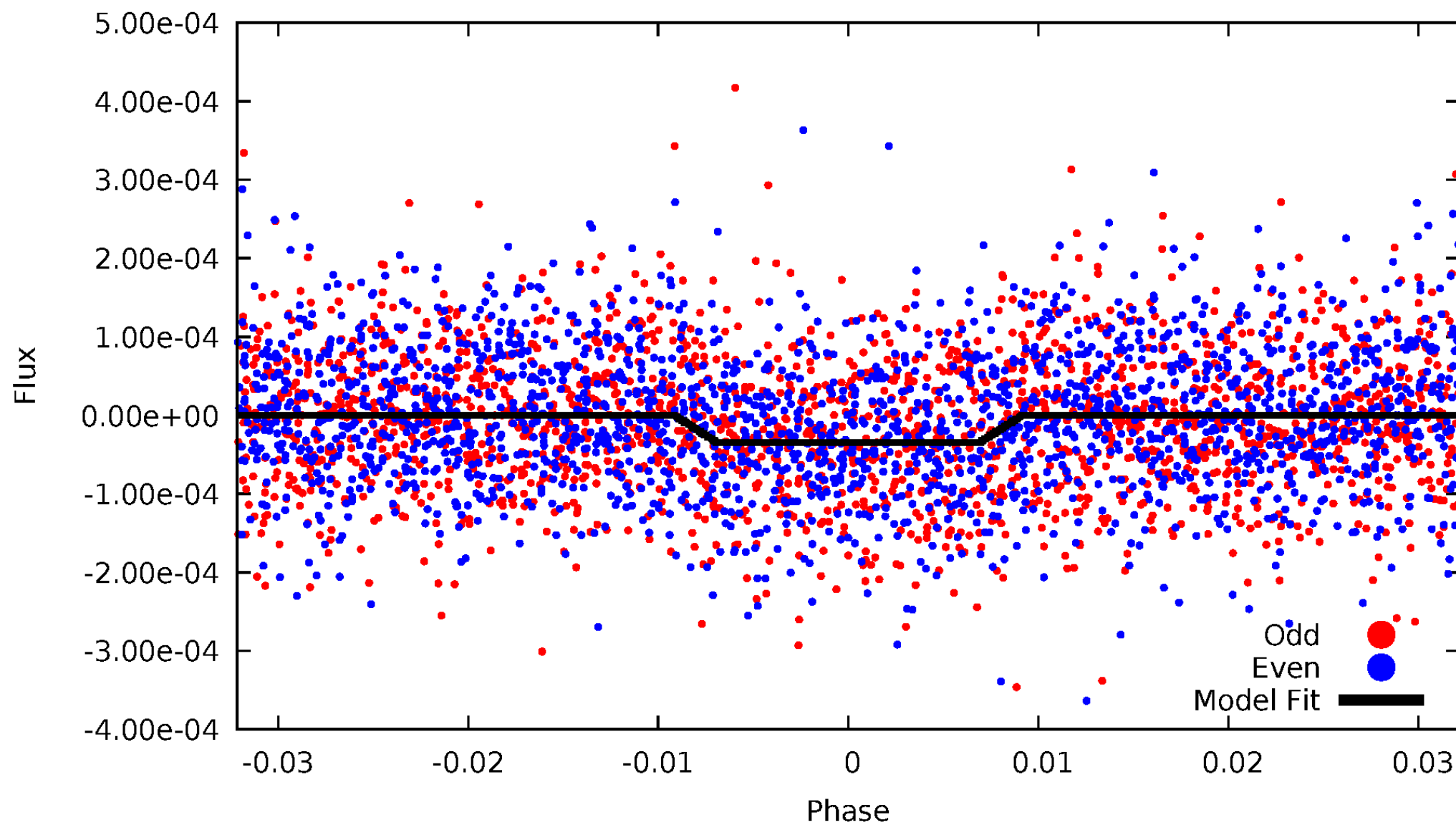
TCE 004548011-02





# ALT Odd/Even

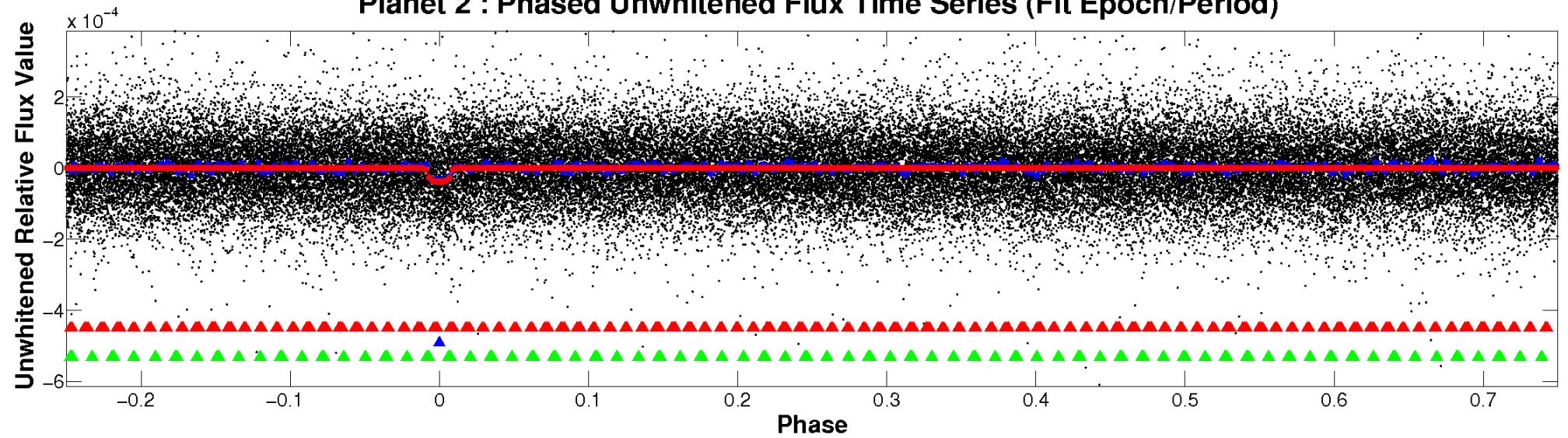
TCE 004548011-02



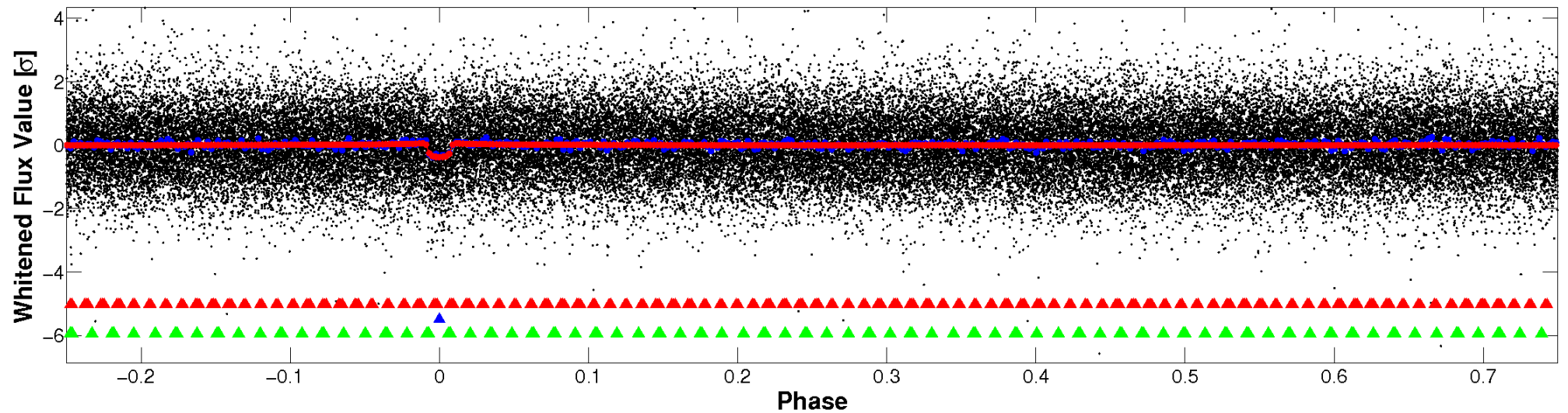


# Non-Whitened Vs. Whitened Light Curve

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

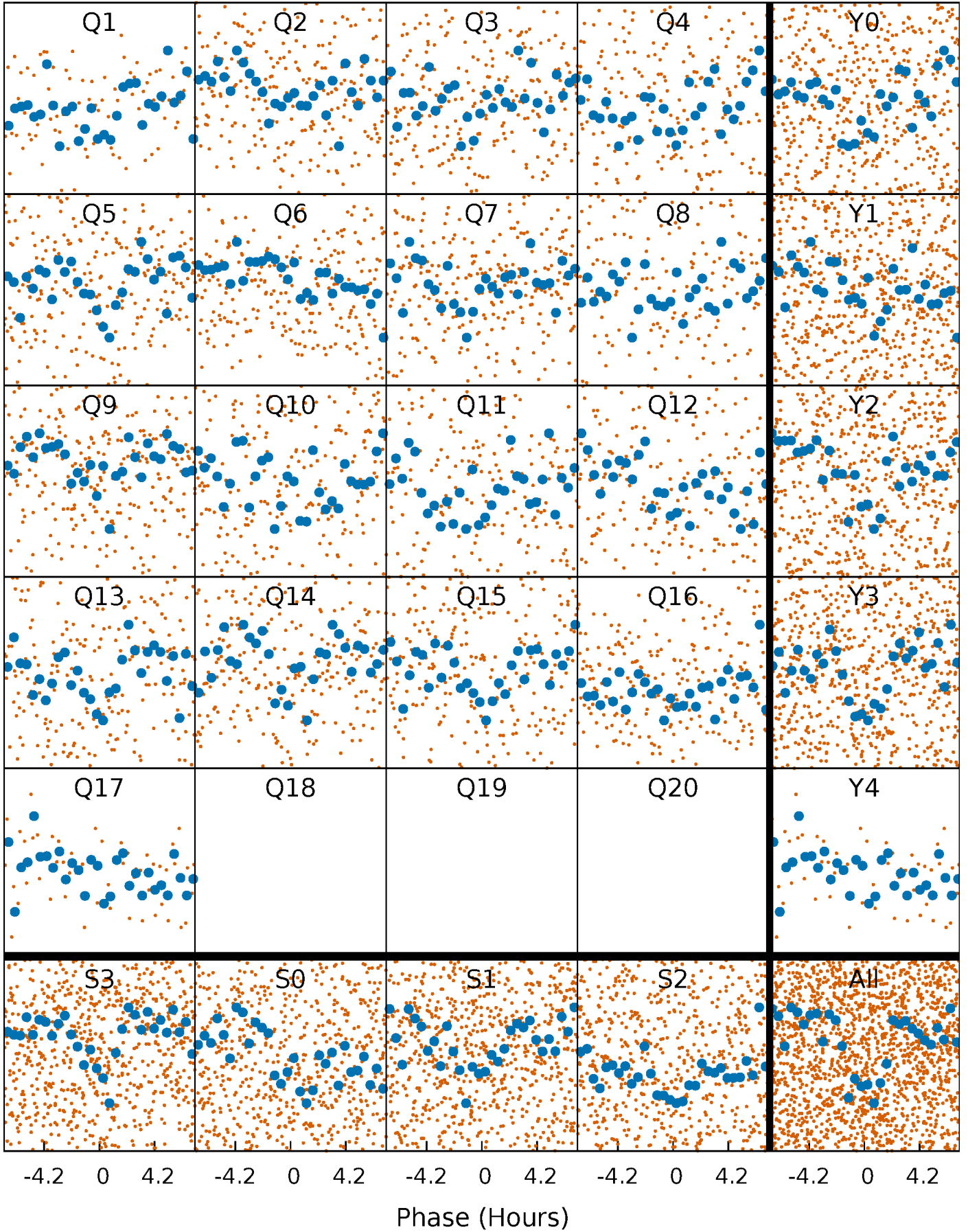


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



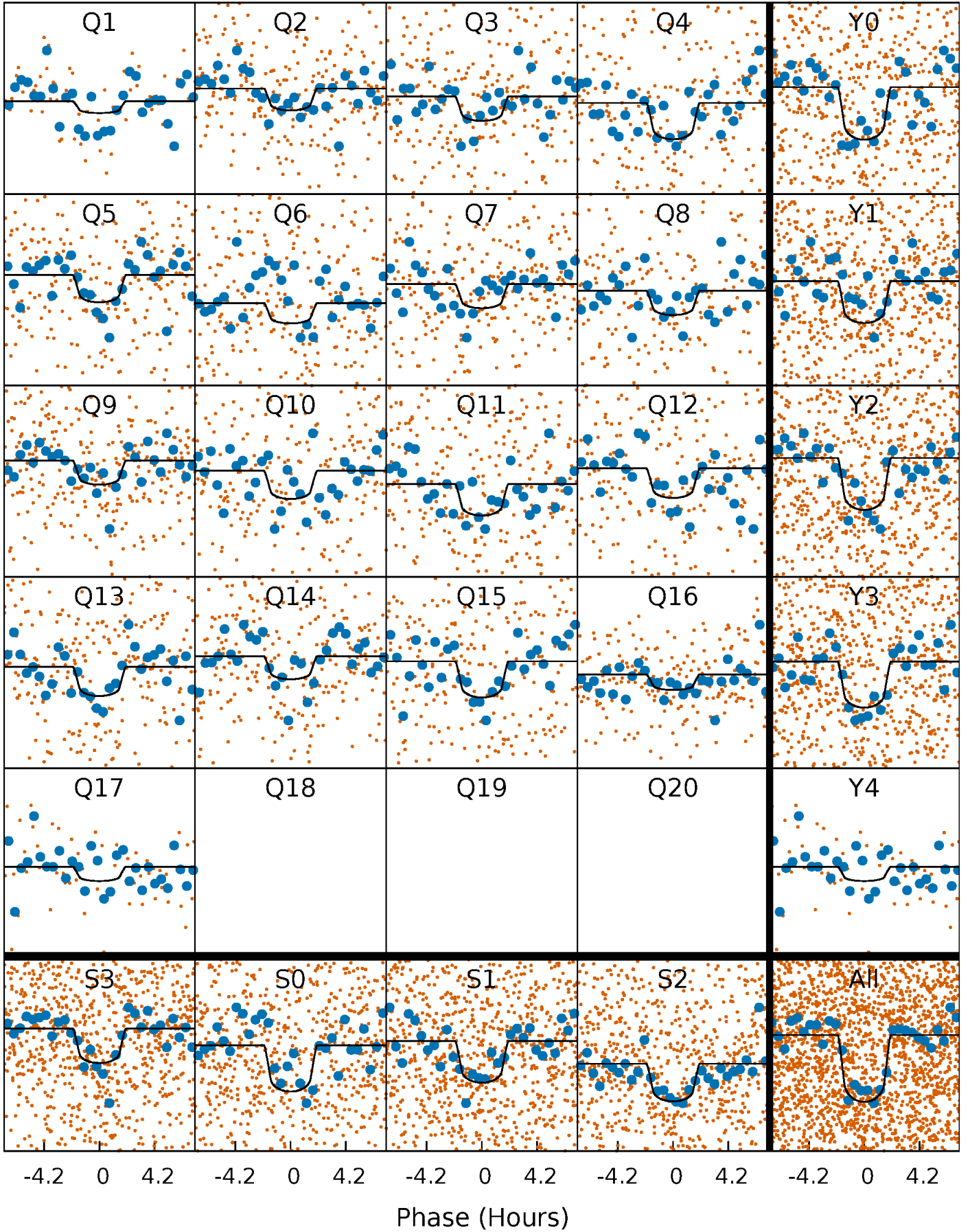
# PDC Quarter-Phased Transit Curves

TCE 004548011-02   P= 9.087395 Days    $T_0=139.996432$  (BKJD)



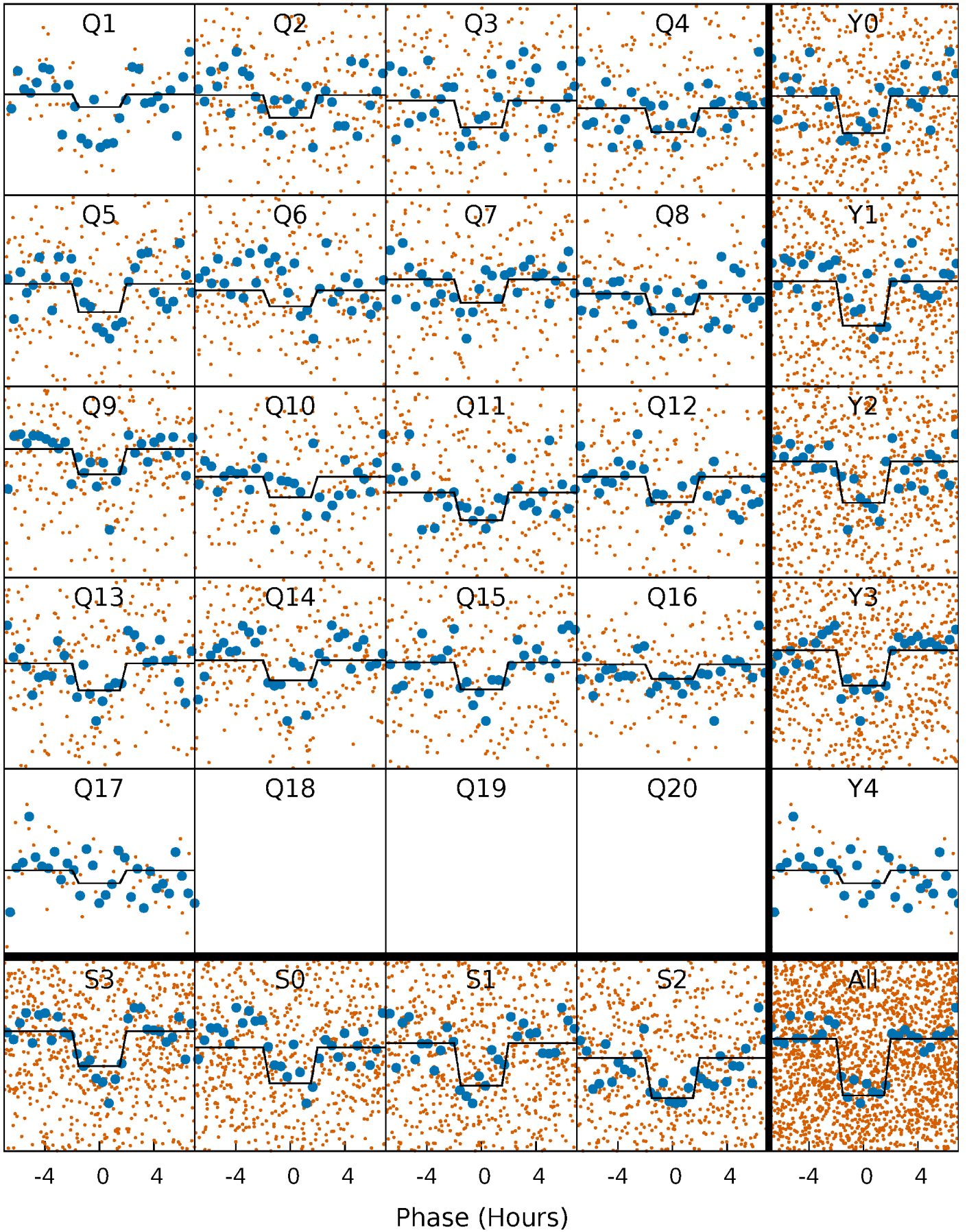
# DV Quarter-Phased Transit Curves

TCE 004548011-02   P= 9.087395 Days    $T_0=139.996432$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004548011-02    P= 9.087455 Days     $T_0=139.991887$  (BKJD)

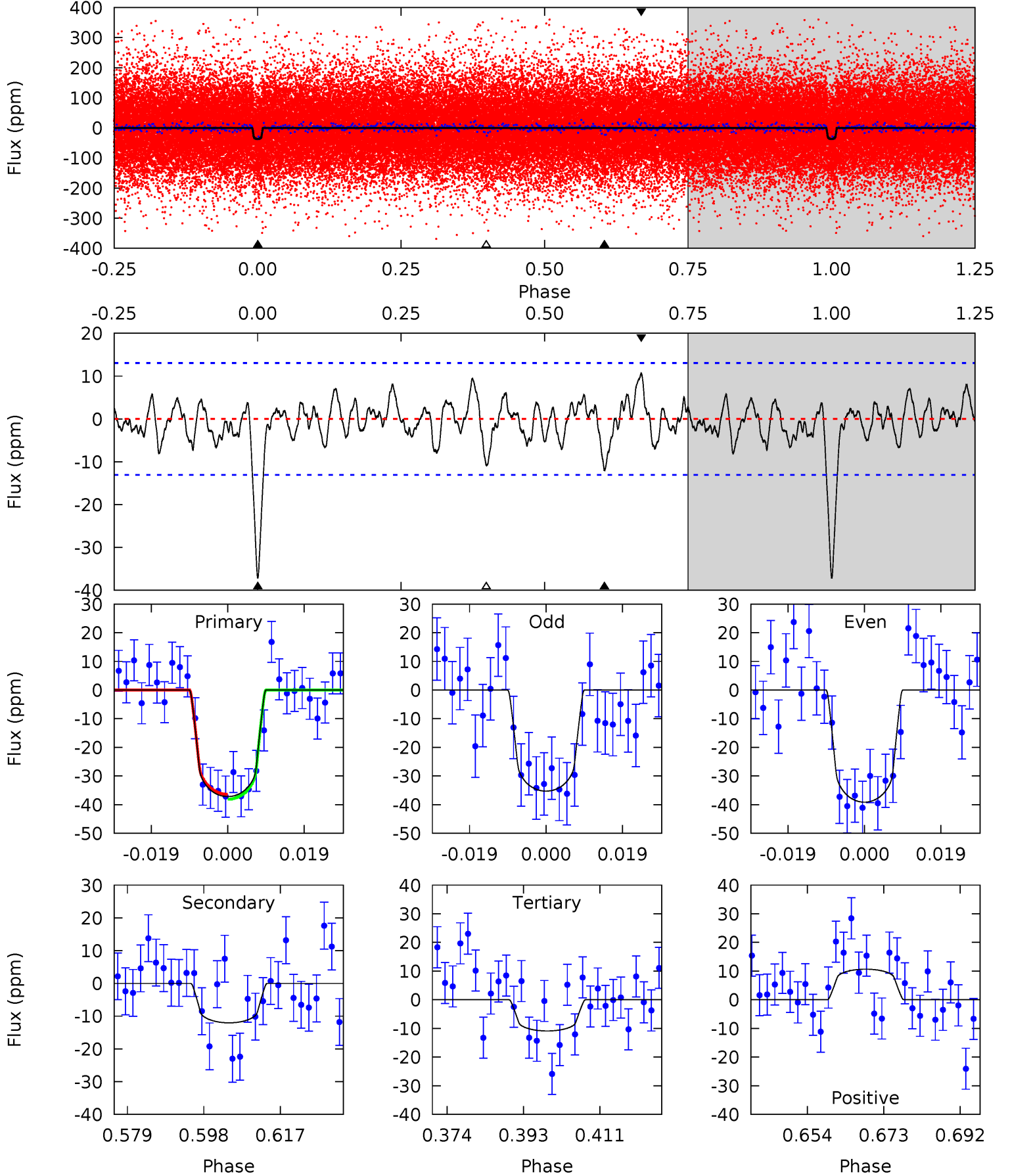




# DV Model-Shift Uniqueness Test

004548011-02, P = 9.087395 Days, E = 130.909037 Days

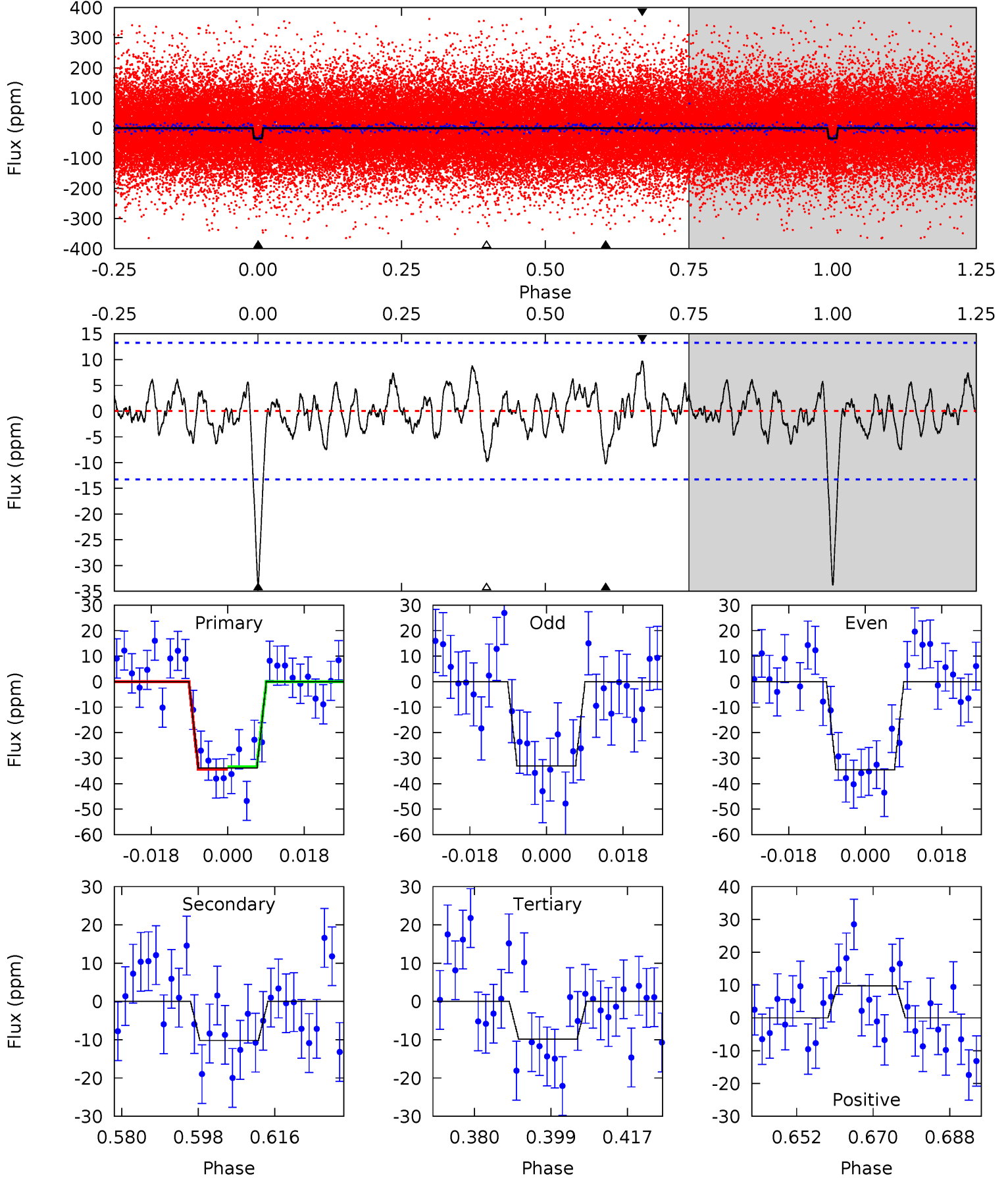
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	4.52	4.09	4.01	4.90	2.35	1.38	9.88	9.97	0.43	0.52	0.72	0.92	0.22	0.32



# Alt Model-Shift Uniqueness Test

004548011-02, P = 9.087455 Days, E = 130.904432 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	3.78	3.64	3.61	4.91	2.36	1.23	8.88	8.91	0.14	0.16	0.29	1.02	0.22	0.20





### Stellar Parameters For KIC 004548011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5888^{+105}_{-129}$	$4.275^{+0.144}_{-0.108}$	$0.060^{+0.150}_{-0.150}$	$1.227^{+0.207}_{-0.186}$	$1.036^{+0.089}_{-0.080}$	$0.789^{+0.456}_{-0.267}$
	+2%/-2%	+3%/-3%	+250%/-250%	+17%/-15%	+9%/-8%	+58%/-34%
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 004548011-02 / KOI 4288.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-12 \pm 3$	$0.92^{+0.39}_{-0.43}$	$1363^{+69}_{-63}$	$4402^{+1173}_{-573}$	$61^{+140}_{-34}$
Alt.	$-10 \pm 3$	$0.77^{+0.40}_{-0.39}$	$1361^{+60}_{-65}$	$4524^{+1751}_{-708}$	$71^{+233}_{-43}$

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

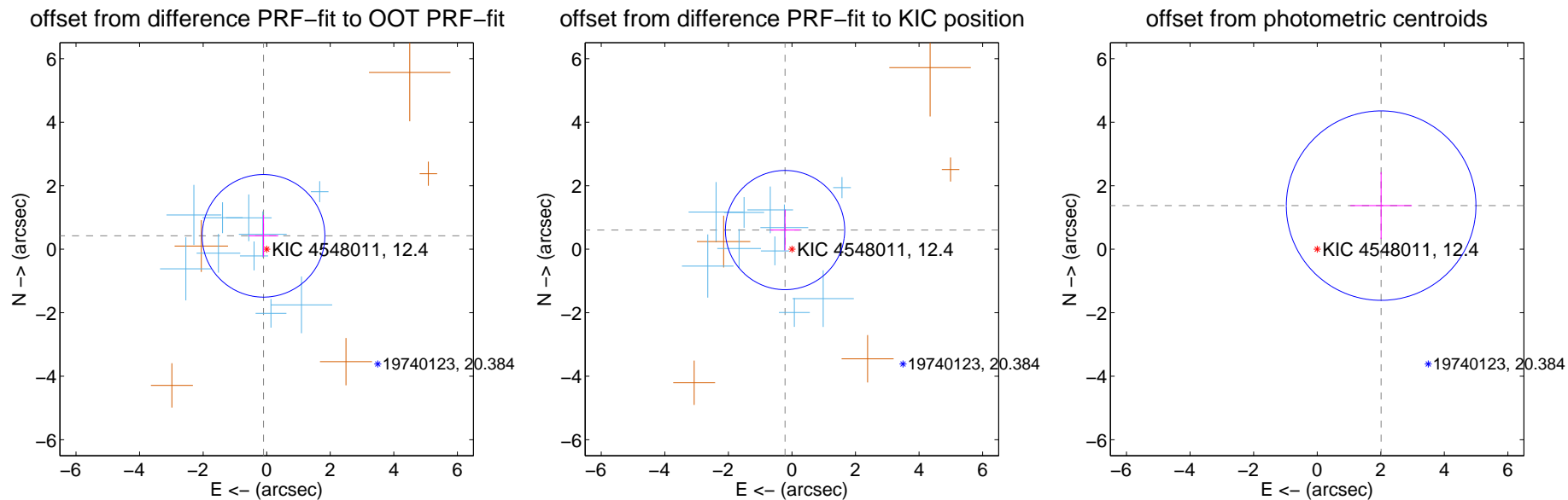
## DV Centroid Data

Supplemental centroid analysis for 004548011-02. Kepler magnitude: 12.40. Transit SNR 10.37

There are 10 quarters with good PRF difference image offsets

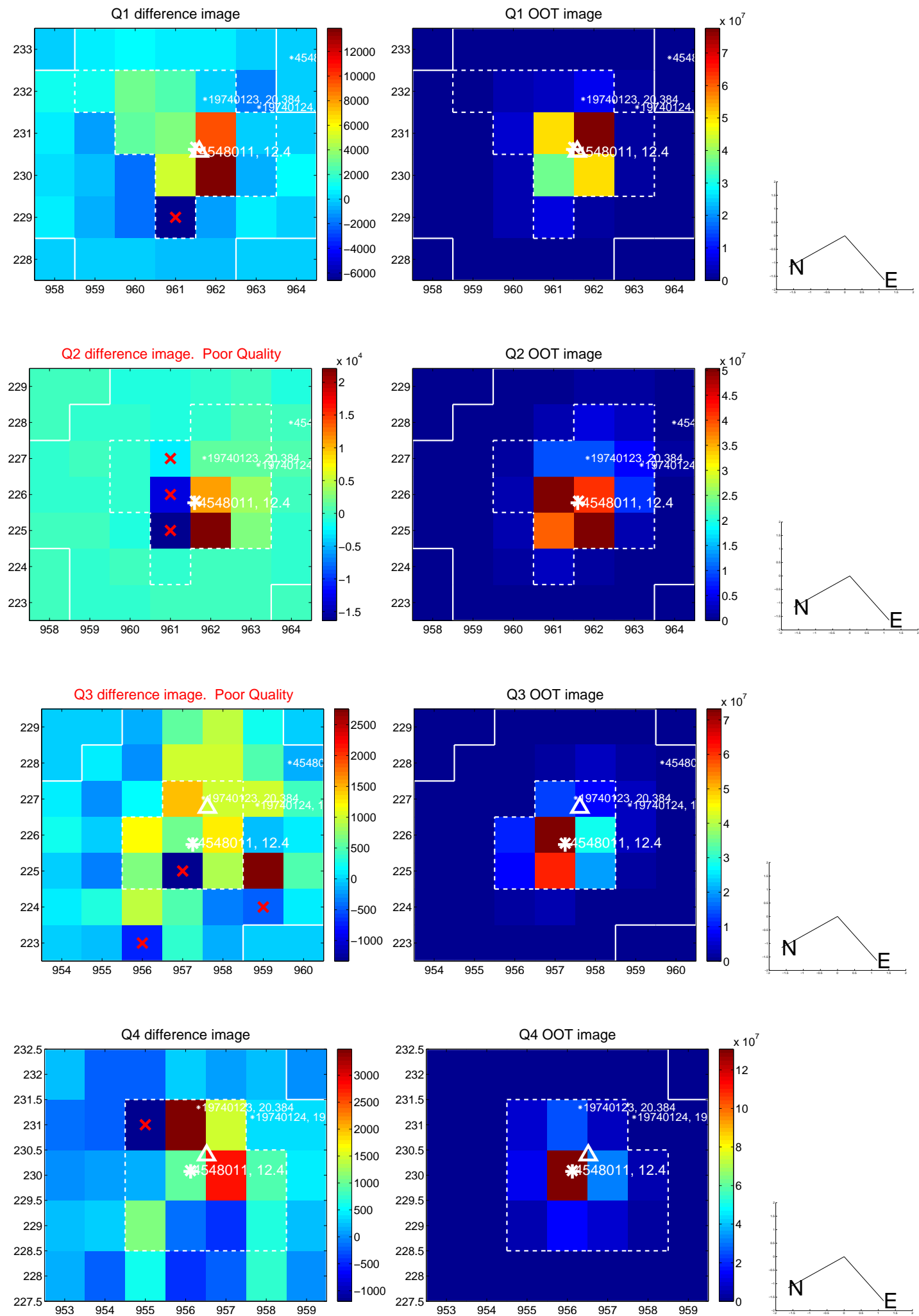
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.434 \pm 0.644$	0.67	$0.101 \pm 0.463$	$0.422 \pm 0.652$
PRF-fit source offset from KIC position	$0.642 \pm 0.626$	1.03	$0.217 \pm 0.464$	$0.604 \pm 0.644$
photometric centroid source offset	$2.44 \pm 0.99$	2.45	$-2.01 \pm 0.97$	$1.37 \pm 1.05$

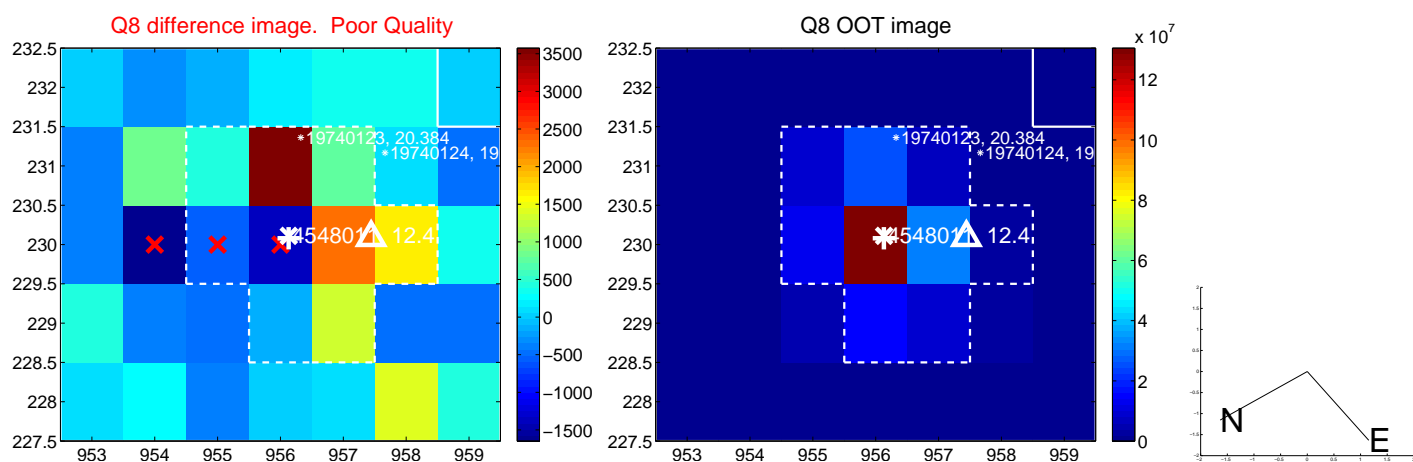
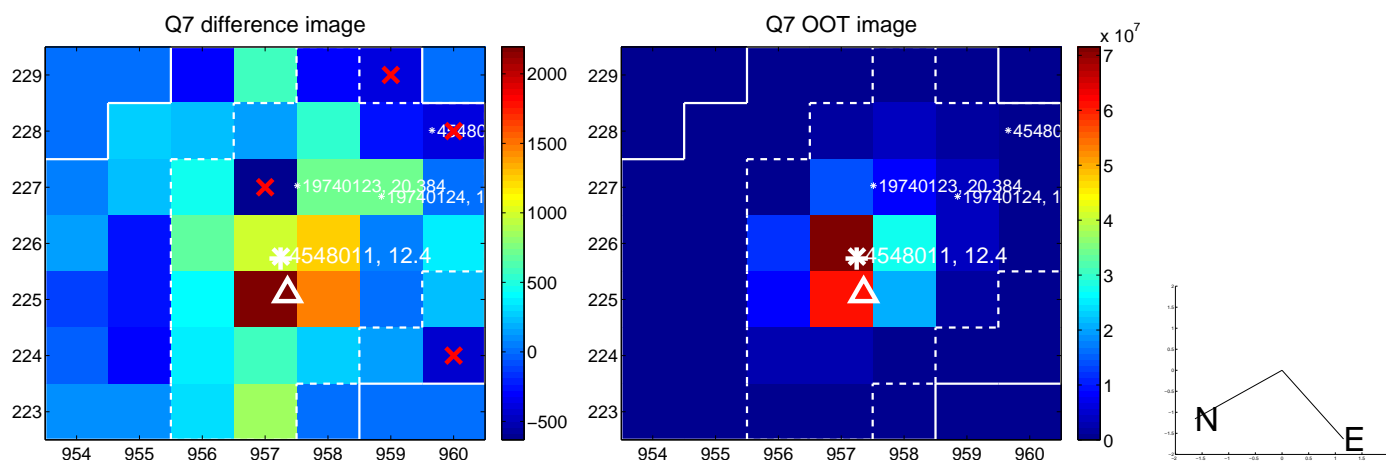
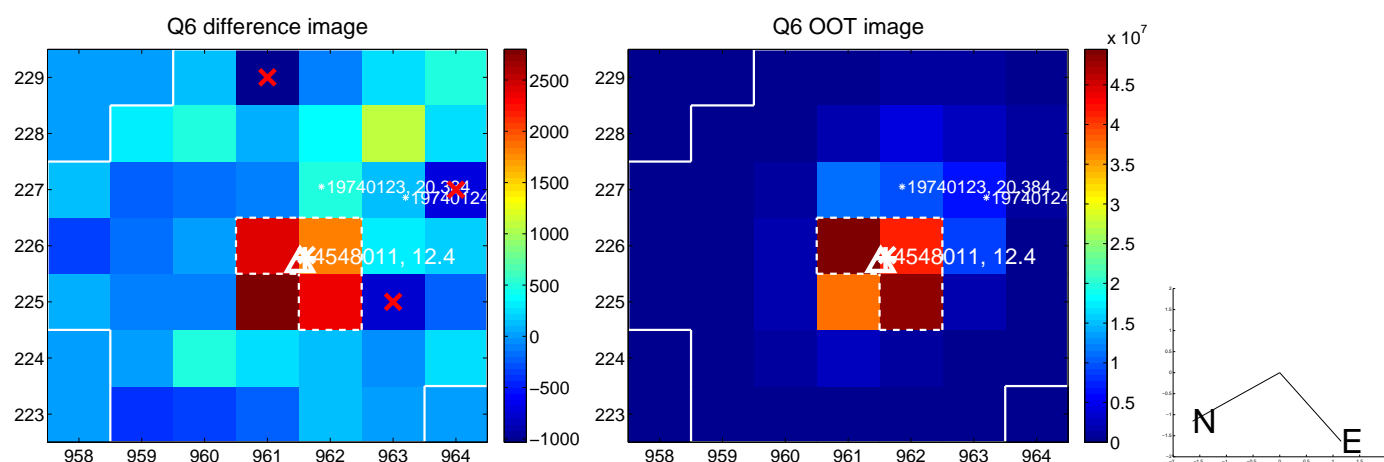
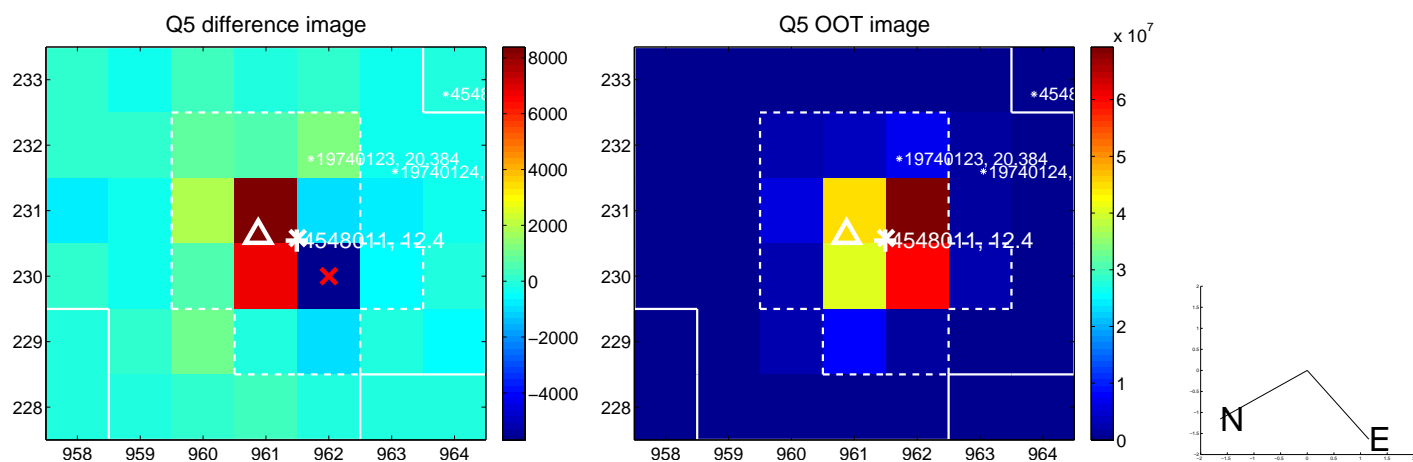


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

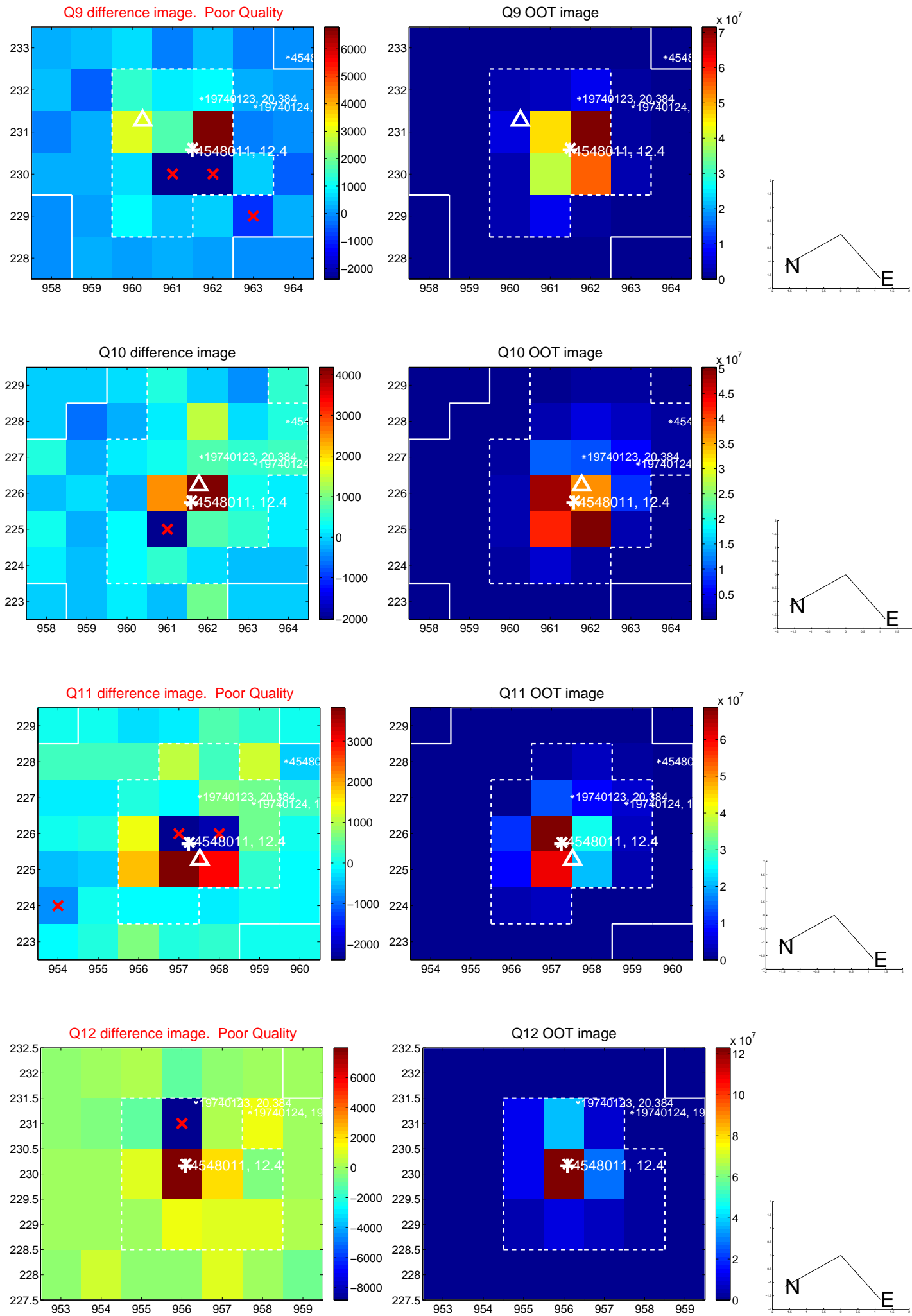
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



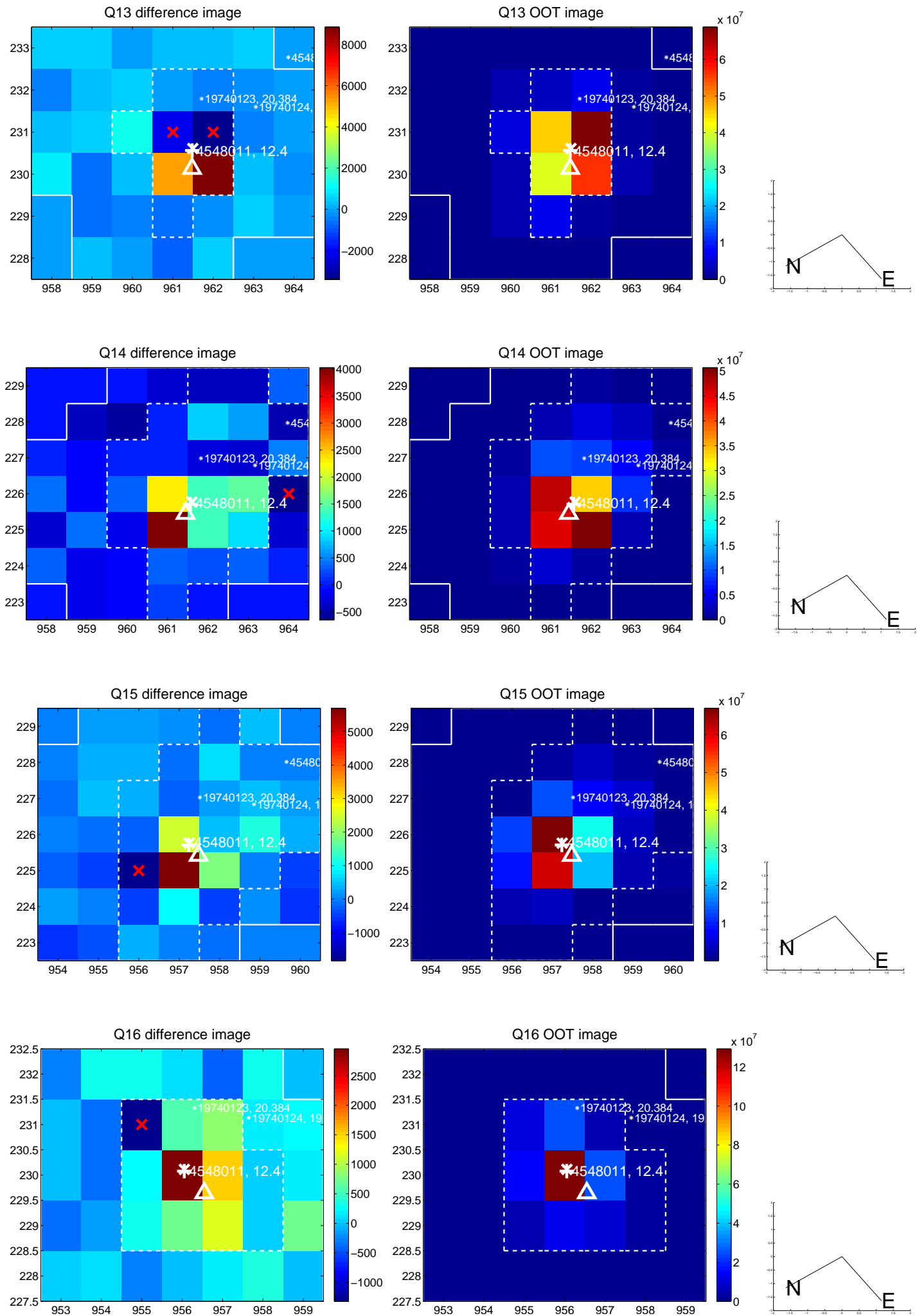
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

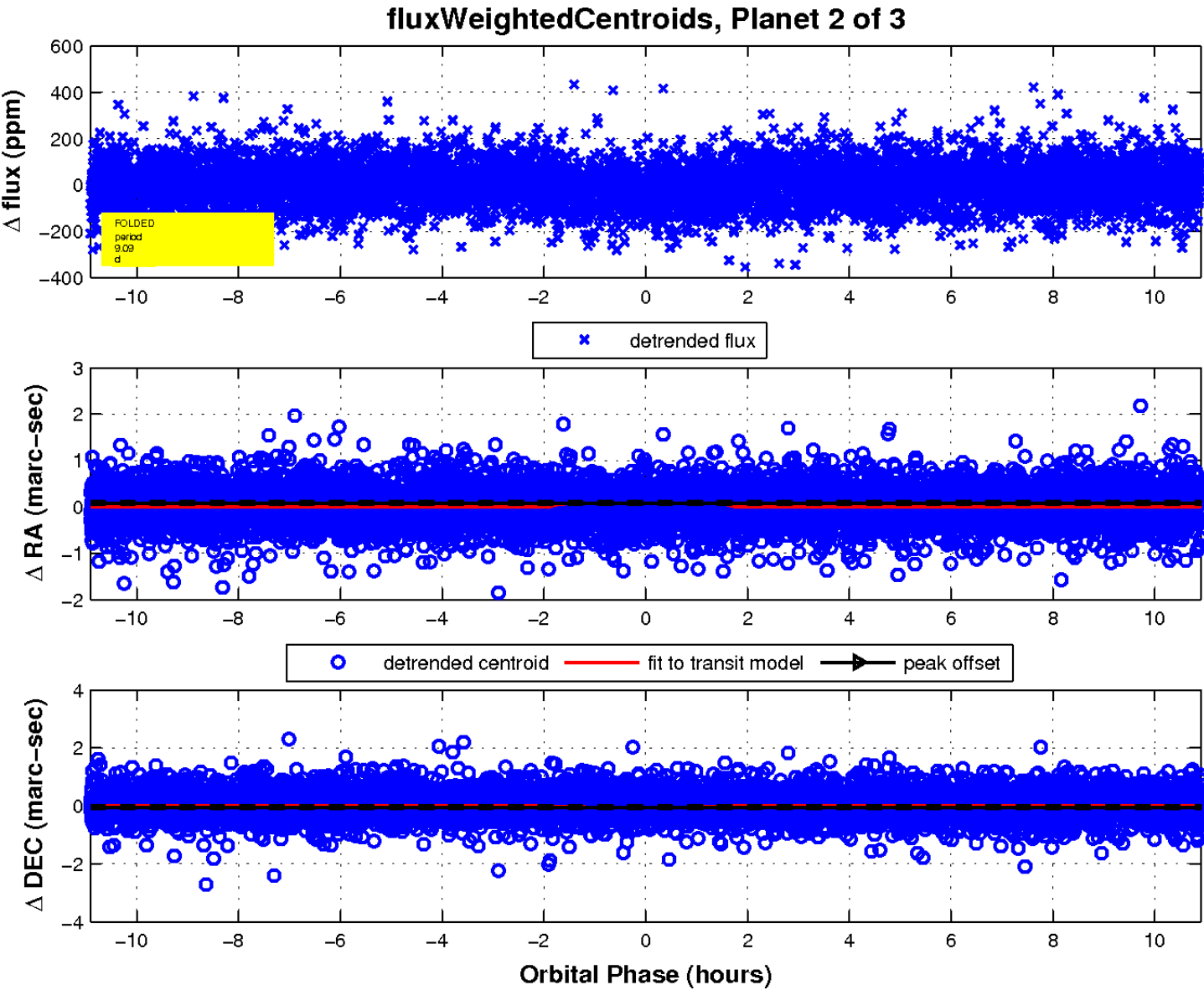
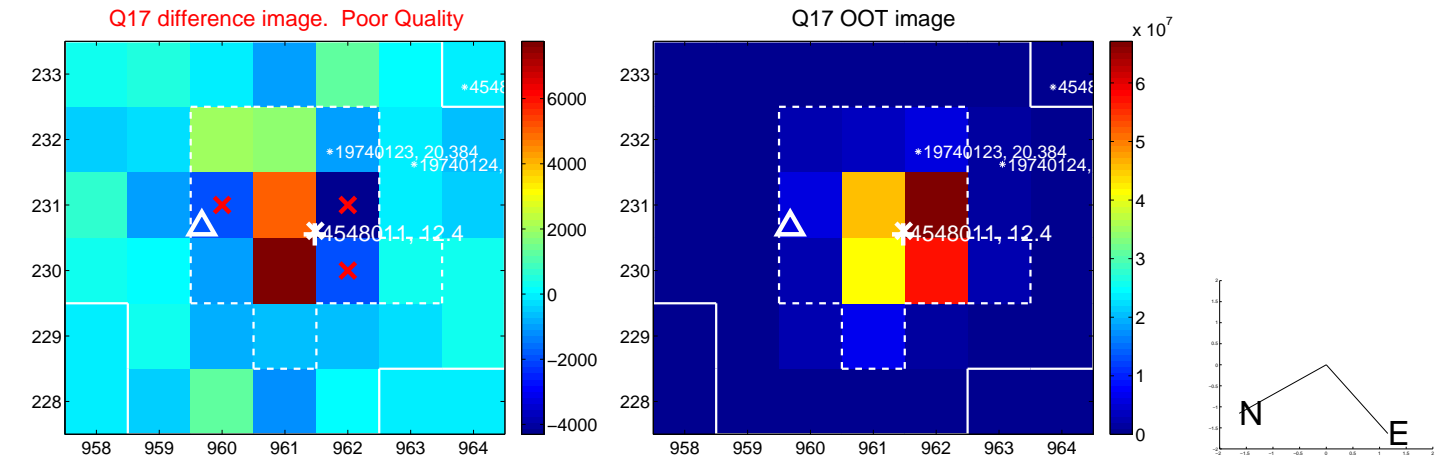


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



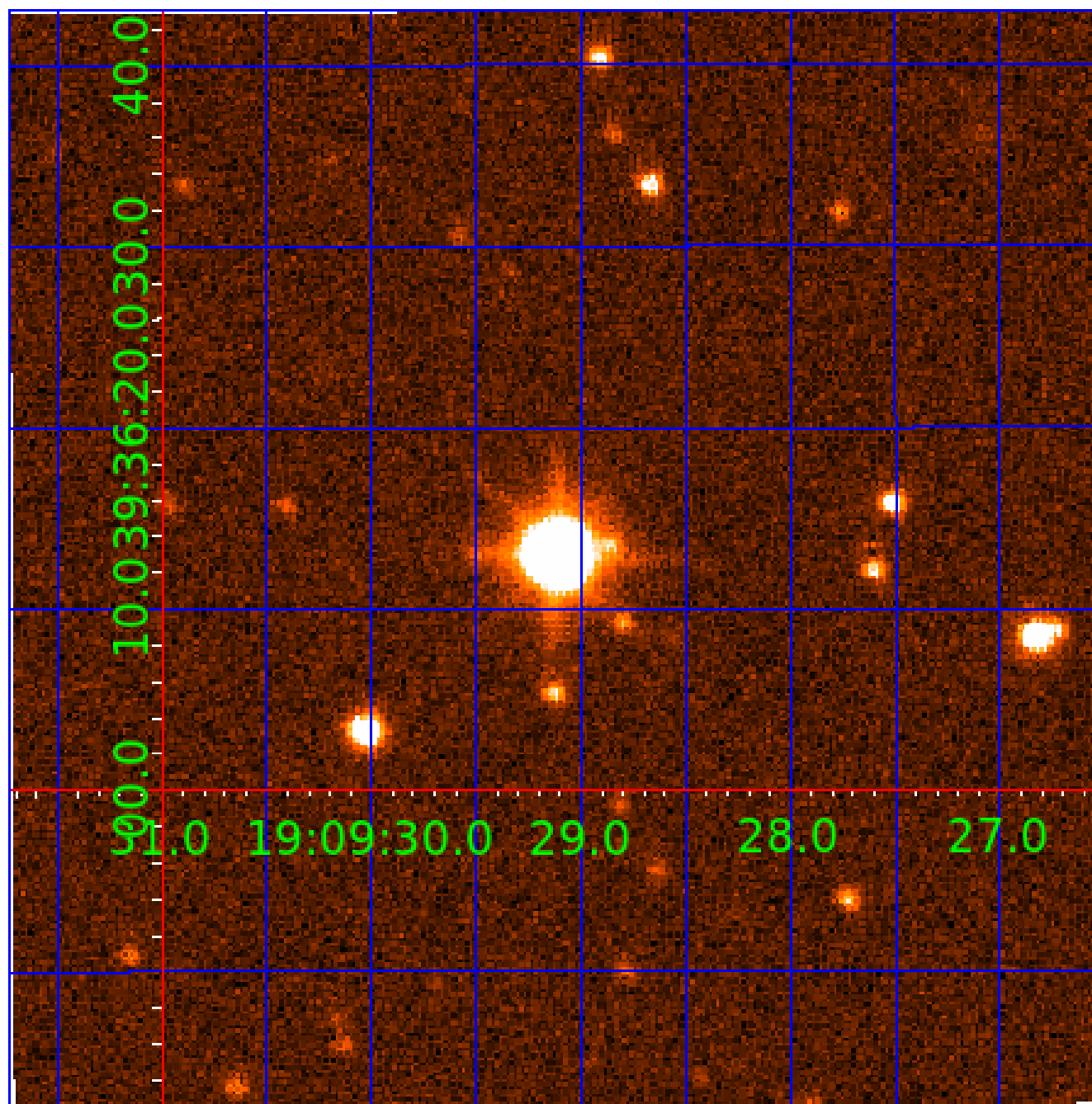


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 004548011

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004548011-01	OBS	4288.01	6.283722	133.219792	37.6	4.094	11.0	12.8	1.23	5888	0.89	356.76
004548011-02	OBS	4288.02	9.087395	139.996432	38.5	3.637	10.0	10.4	1.23	5888	0.92	218.14
004548011-03	OBS	4288.04	13.950928	144.286698	37.1	5.321	8.1	8.9	1.23	5888	0.83	123.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004548011-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
004548011-02	OBS	PC	0.95	0	0	0	0	NO_COMMENT
004548011-03	OBS	PC	0.68	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.

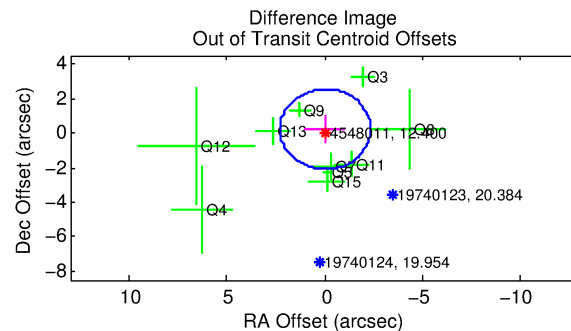
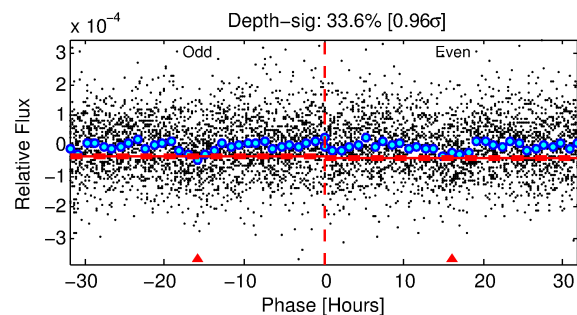
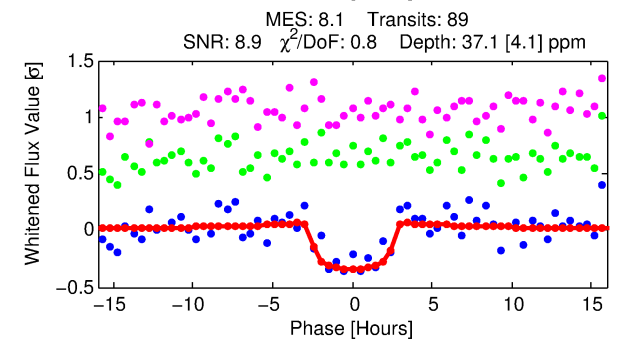
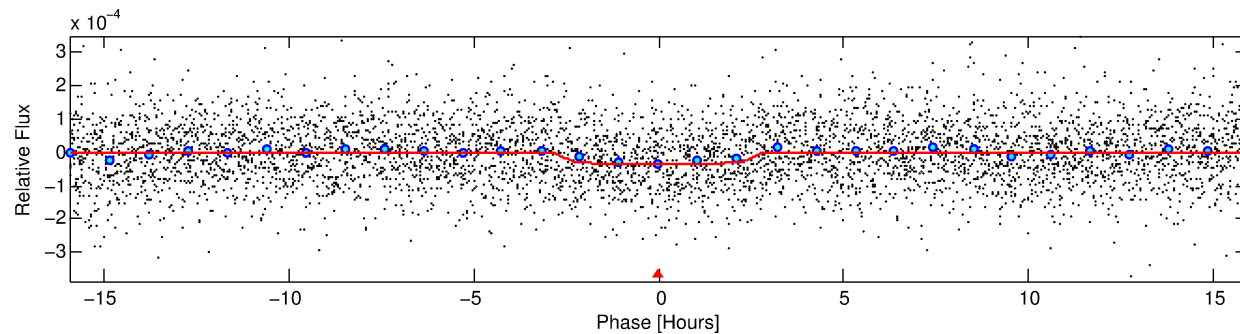
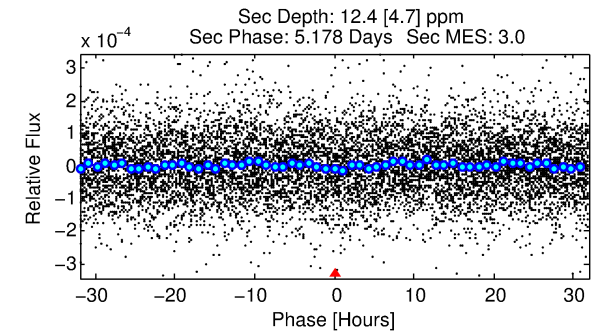
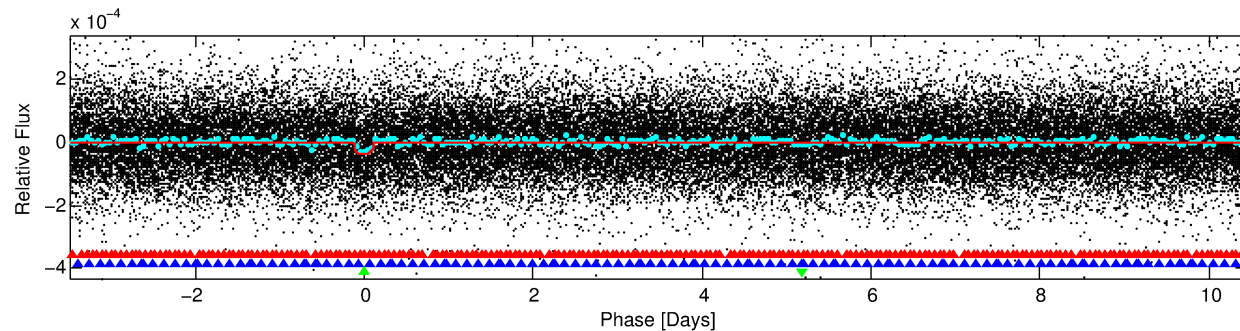
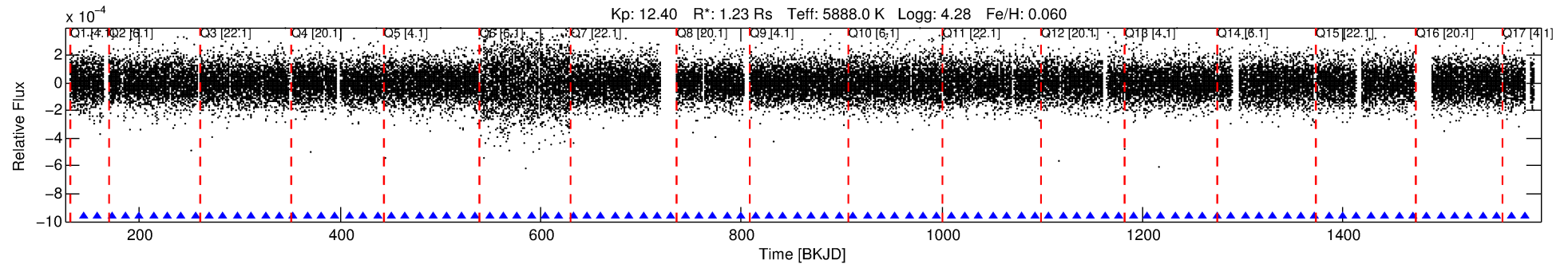
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004548011-03

No Significant Match Found

# DV One-Page Summary

KIC: 4548011 Candidate: 3 of 3 Period: 13.951 d  
KOI: K04288 Corr: No Ephemeris Match



## DV Fit Results:

Period = 13.95093 [0.00019] d  
Epoch = 144.2867 [0.0106] BKJD  
Rp/R\* = 0.0062 [0.0026]  
a/R\* = 12.21 [23.67]  
b = 0.80 [0.88]  
Seff = 123.18 [32.40]  
Teq = 849 [56] K  
Rp = 0.83 [0.37] Re  
a = 0.1147 [0.0181] AU  
Ag = 130.56 [124.28] [1.04σ]  
Teffp = 4440 [1025] K [3.50σ]

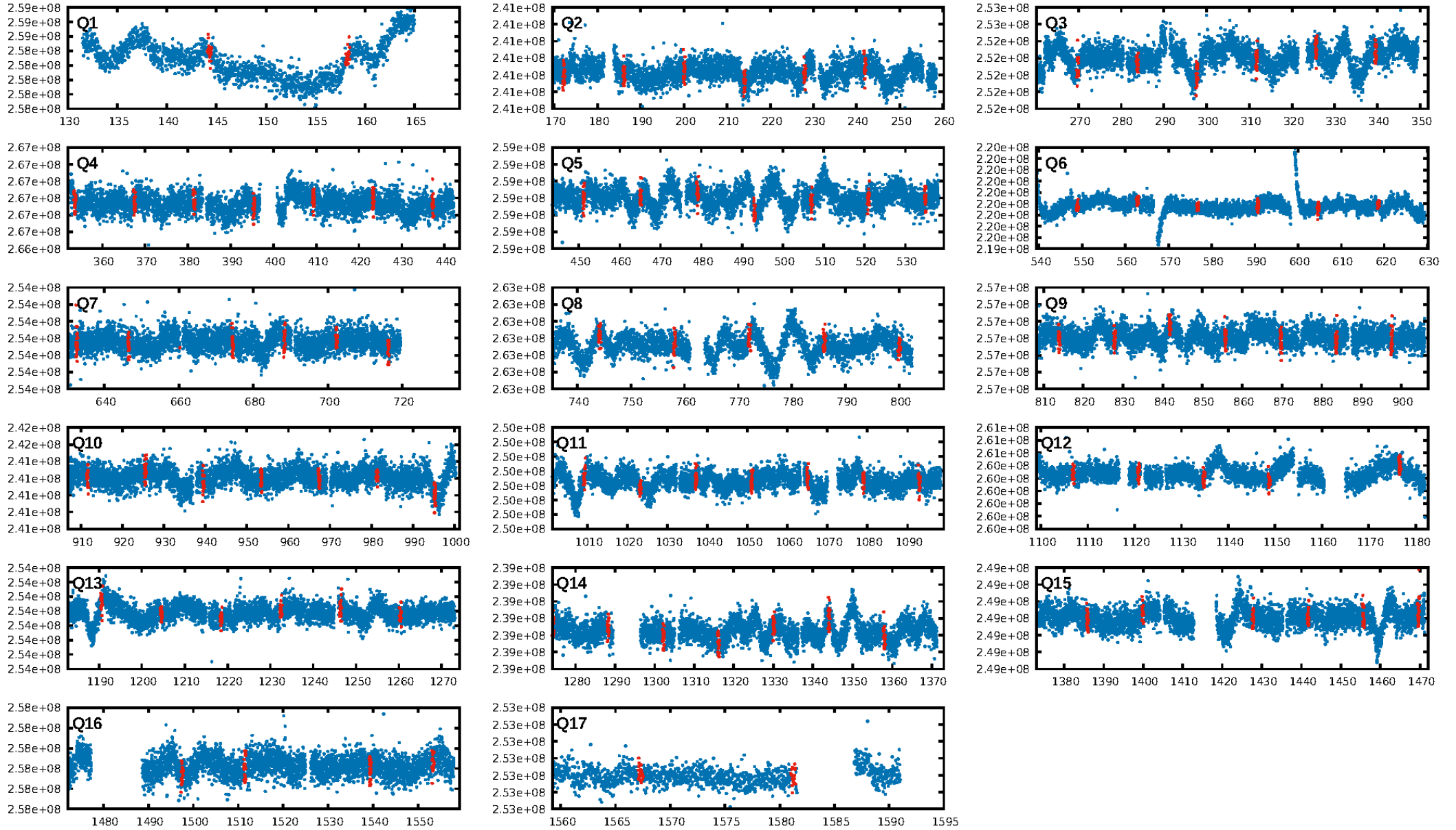
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [18.11σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.79e-15  
RollingBand-fgt: 1.00 [86/86]  
GhostDiagnostic-chr: 3.371  
Centroid-sig: 54.7%  
Centroid-so: 0.635 arcsec [0.59σ]  
OotOffset-rm: 0.228 arcsec [0.30σ]  
OotOffset-st: 0/4/3/3 [10]  
KicOffset-rm: 0.360 arcsec [0.58σ]  
KicOffset-st: 0/4/3/3 [10]  
DiffImageQuality-fgm: 0.60 [6/10]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:52:31 Z

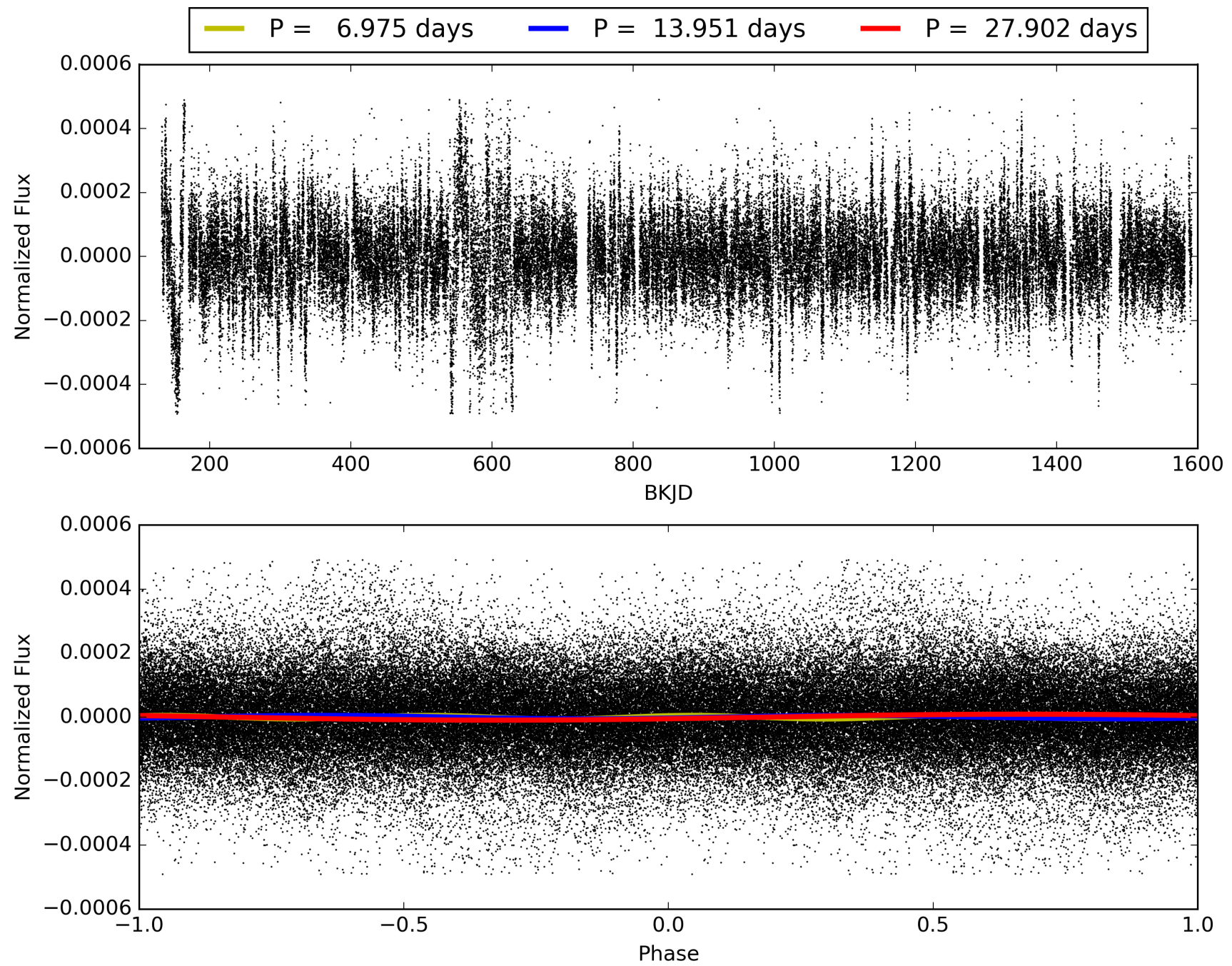
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 004548011-03, PDC Light Curves





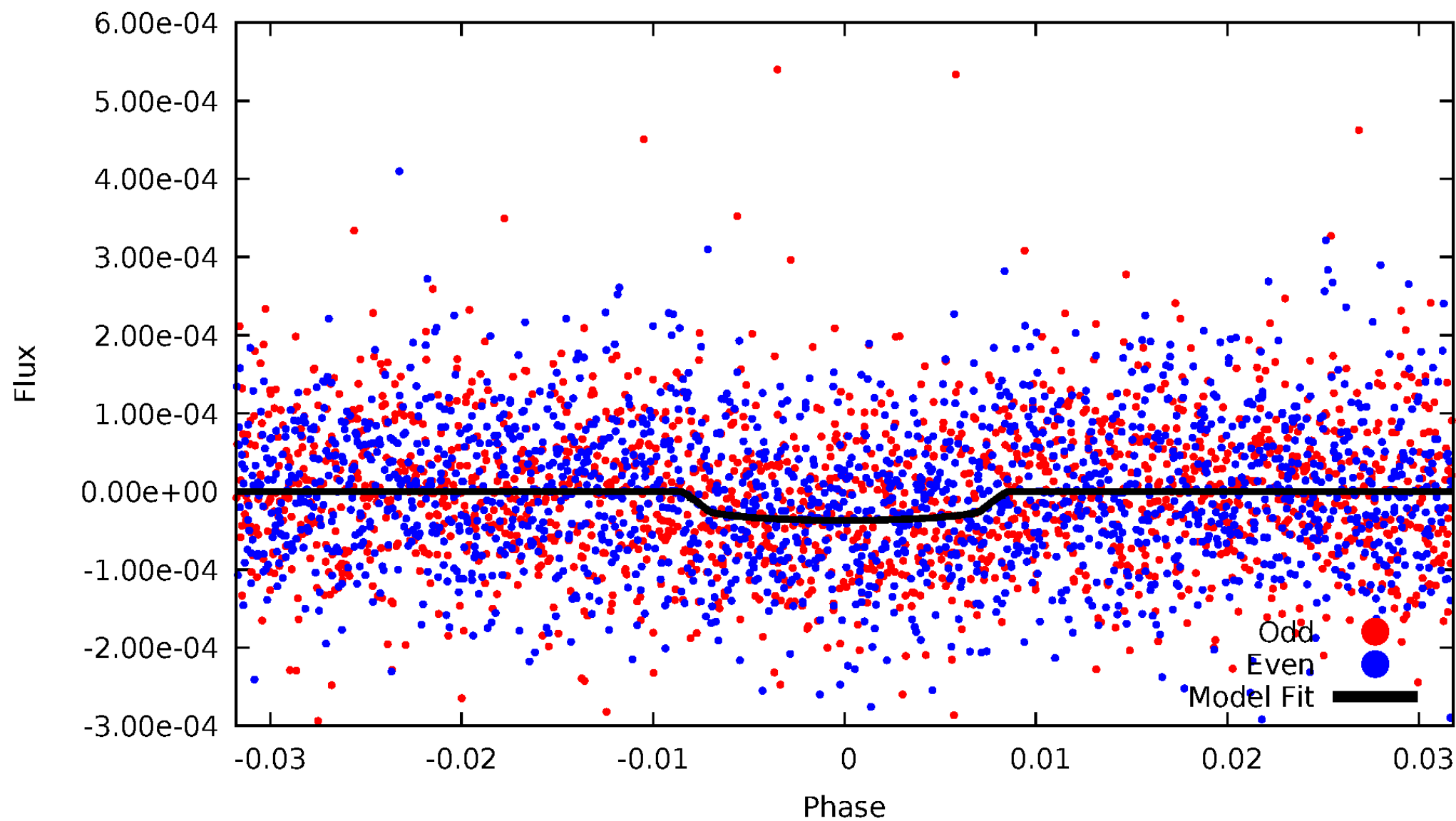
TCE 004548011-03





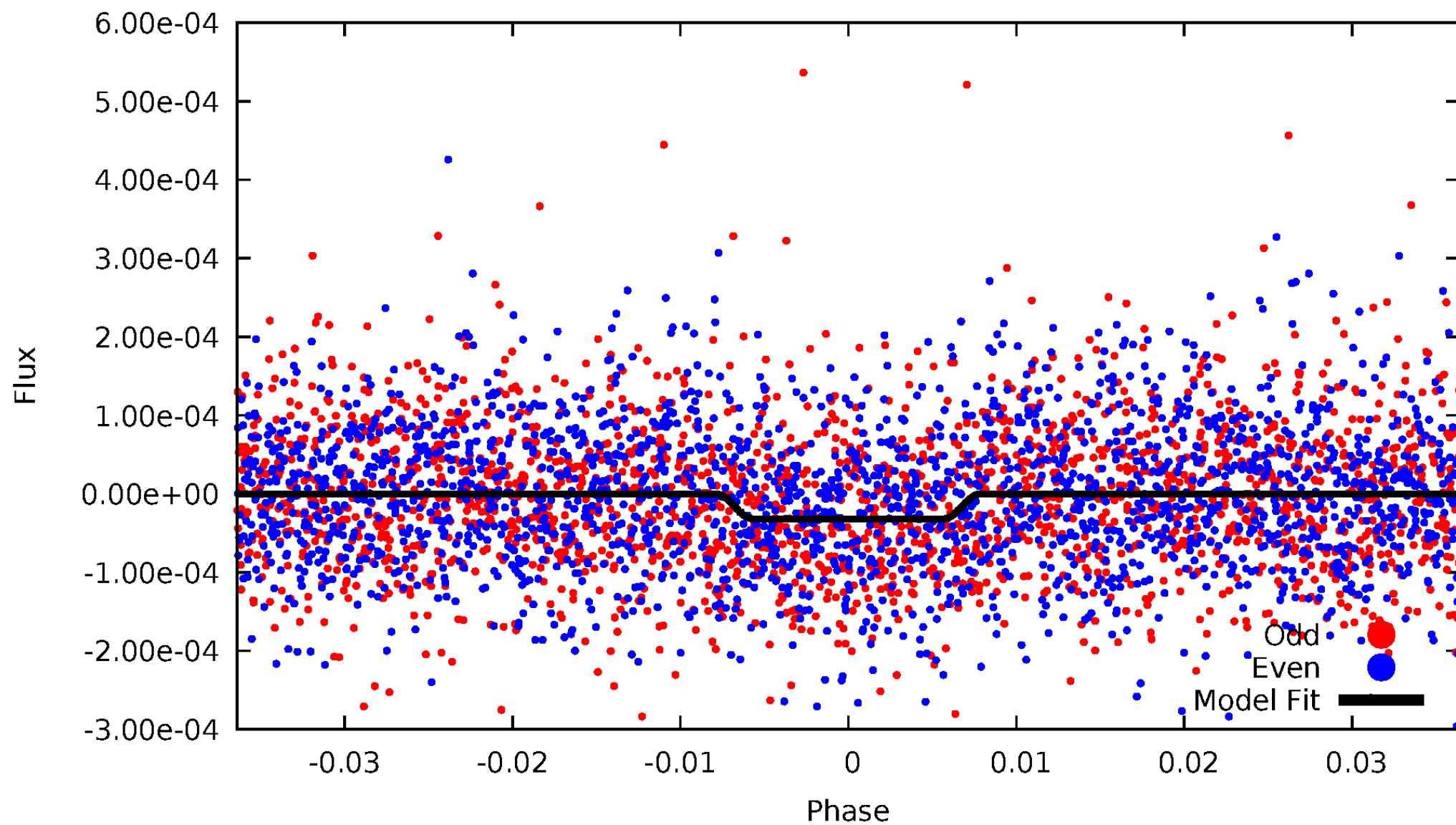
# DV Odd/Even

TCE 004548011-03

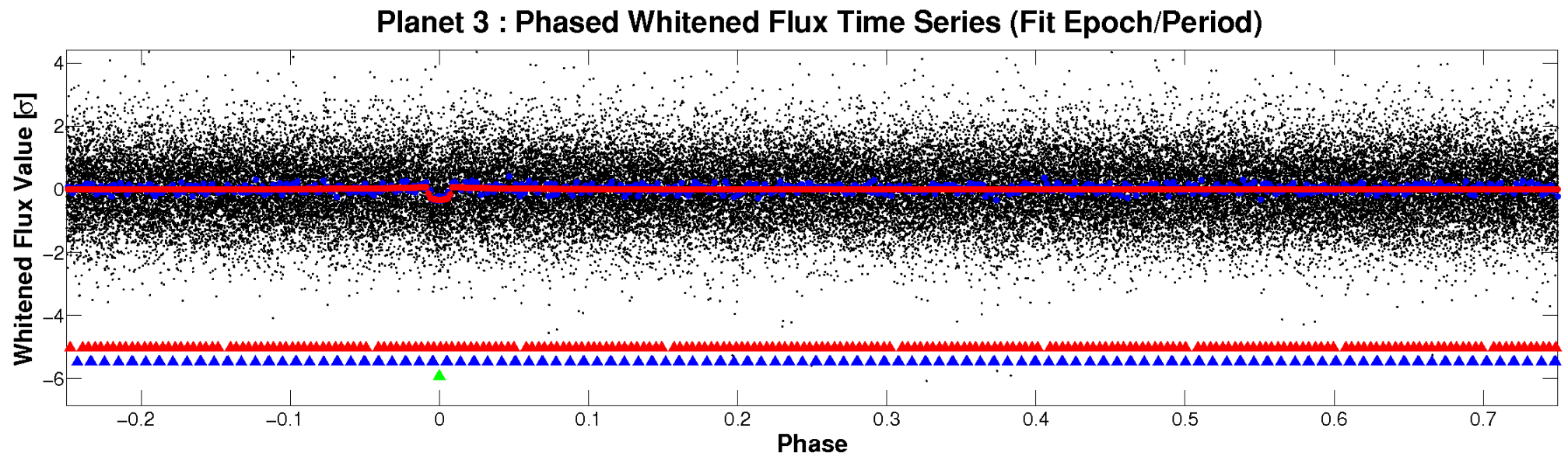
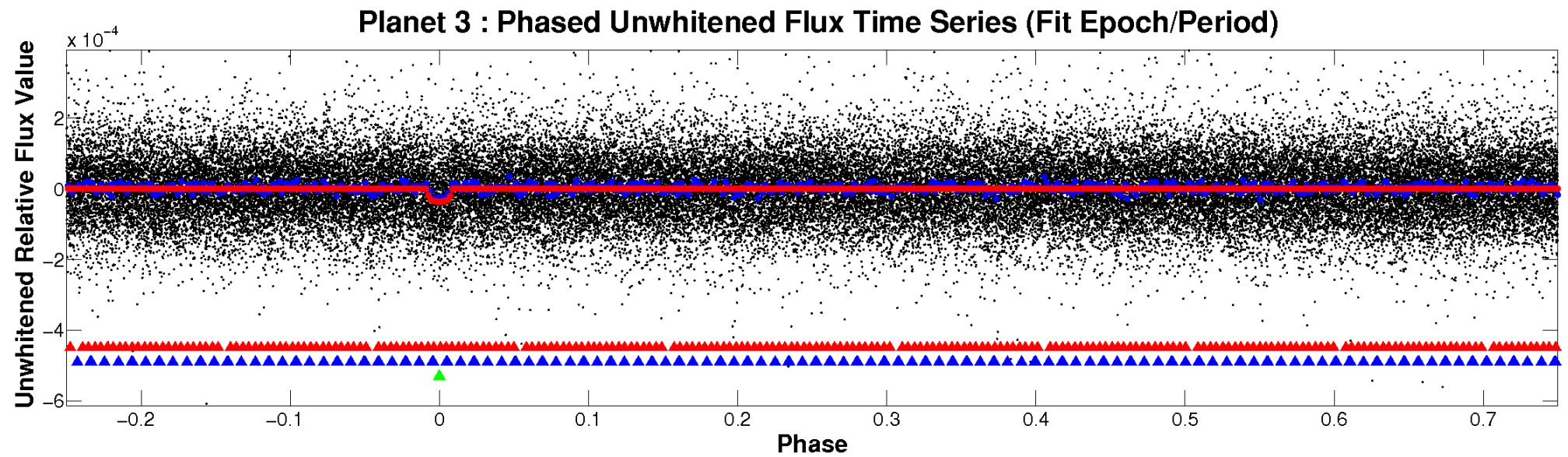


# ALT Odd/Even

TCE 004548011-03

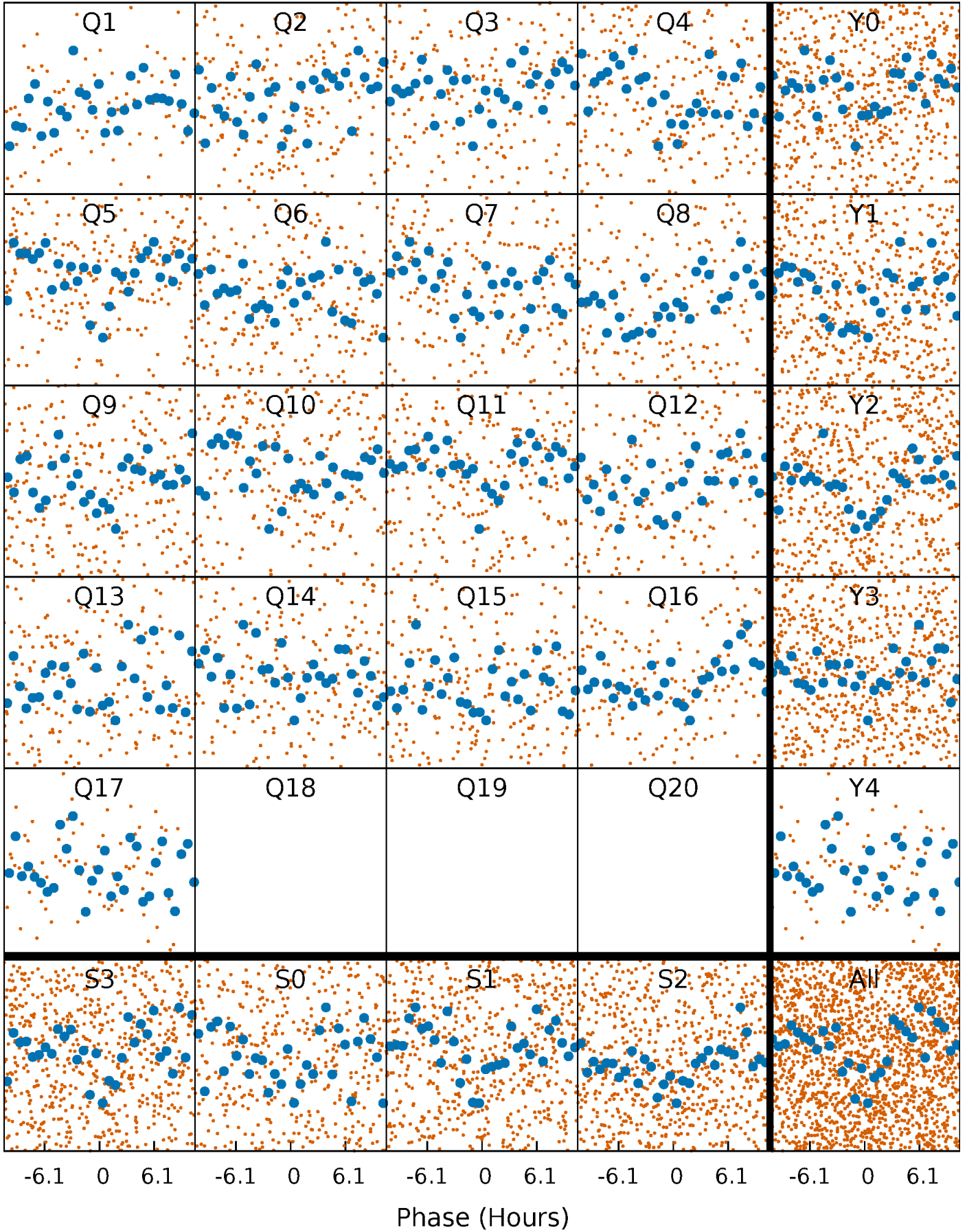


# Non-Whitened Vs. Whitened Light Curve



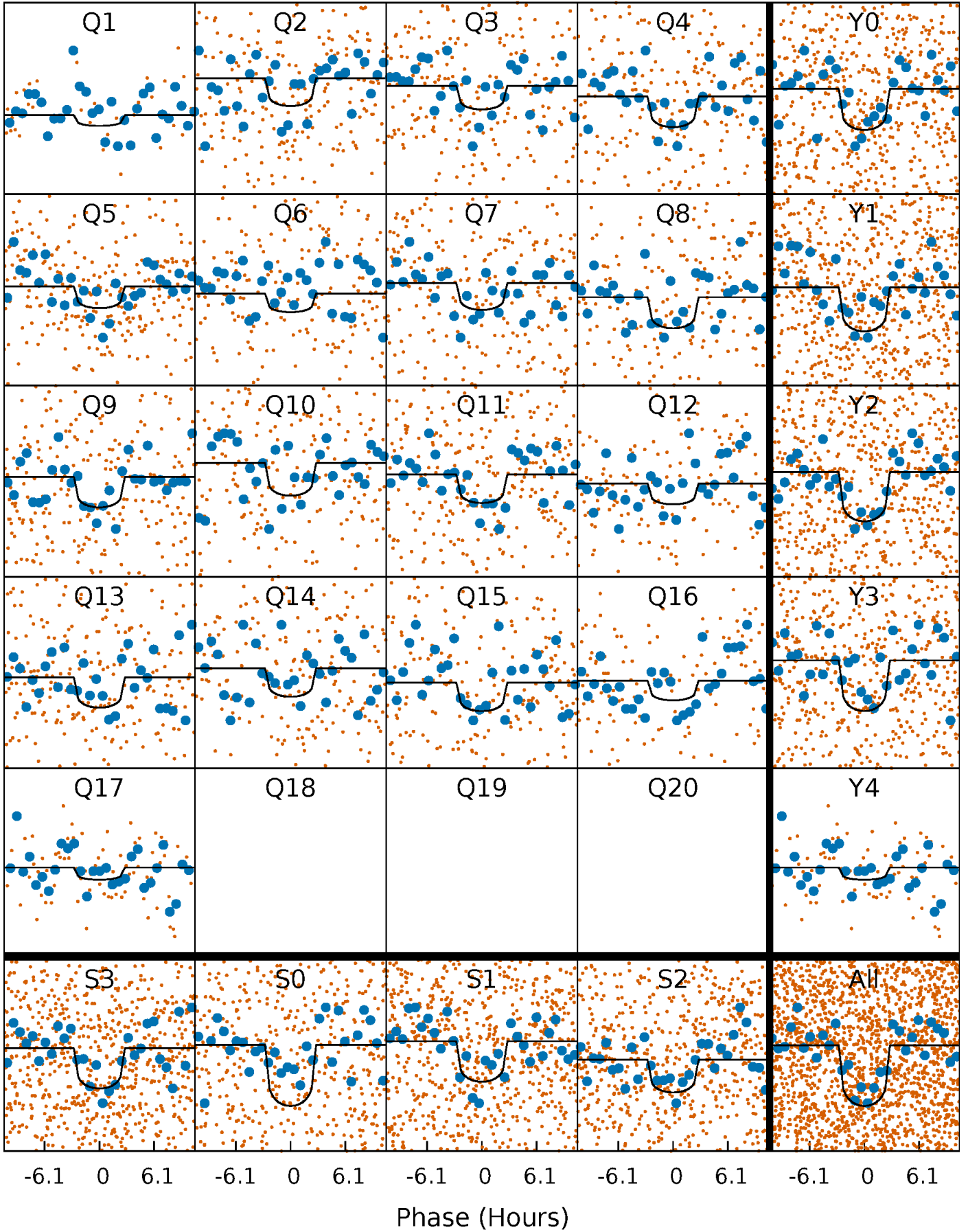
# PDC Quarter-Phased Transit Curves

TCE 004548011-03 P= 13.950928 Days  $T_0=144.286698$  (BKJD)



# DV Quarter-Phased Transit Curves

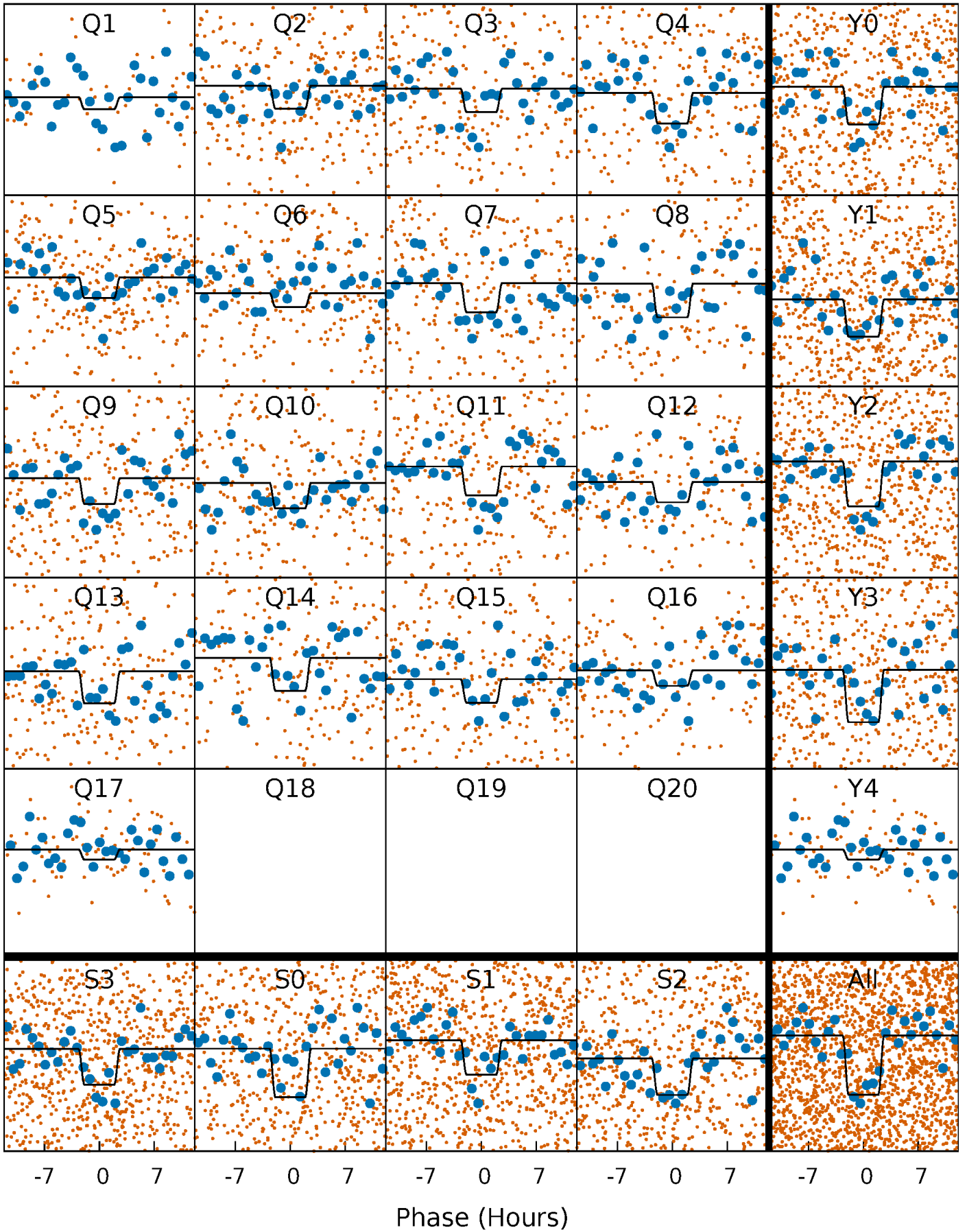
TCE 004548011-03 P= 13.950928 Days  $T_0=144.286698$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 004548011-03 P= 13.950525 Days  $T_0=144.307600$  (BKJD)

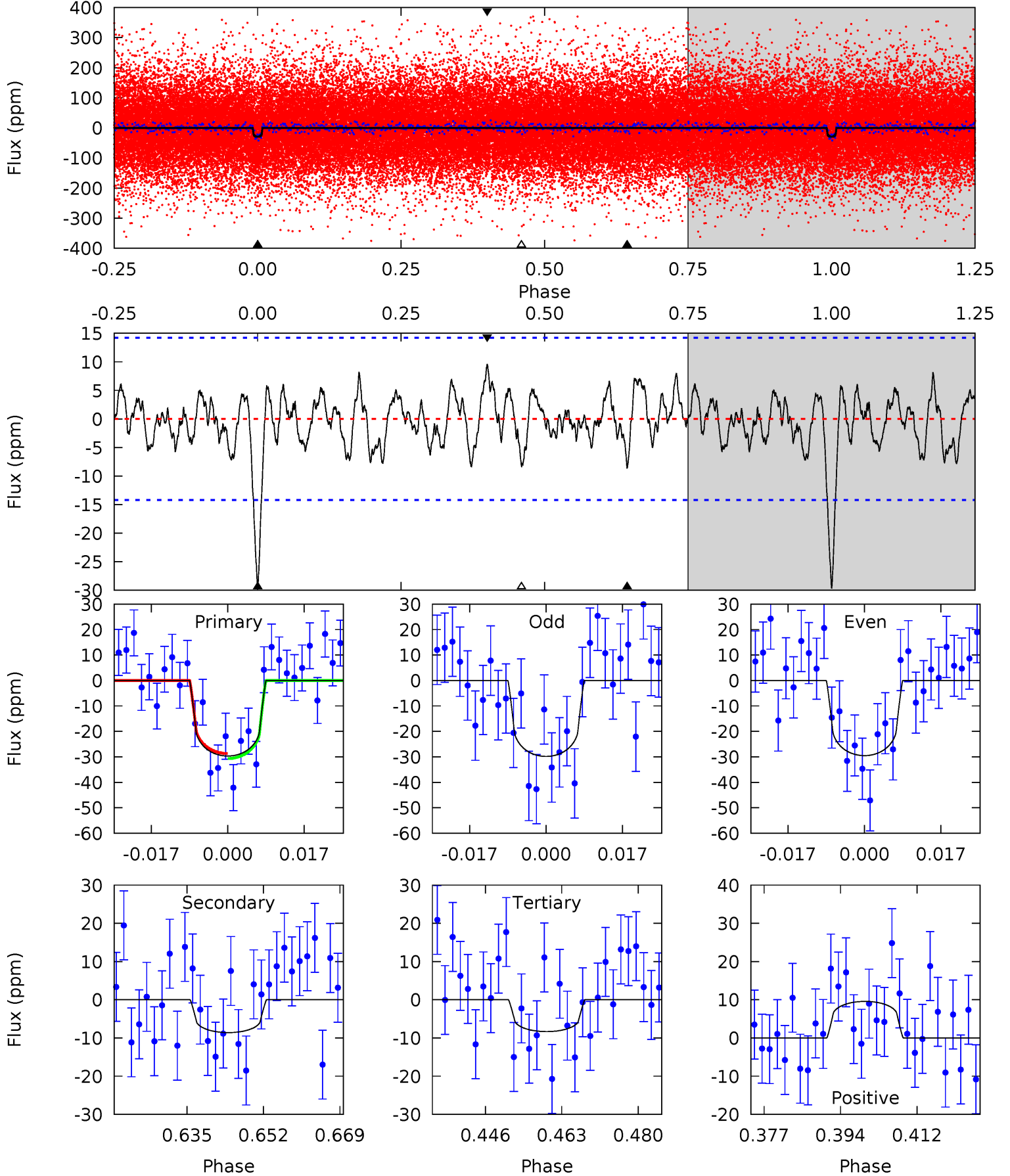




# DV Model-Shift Uniqueness Test

004548011-03, P = 13.950928 Days, E = 130.335770 Days

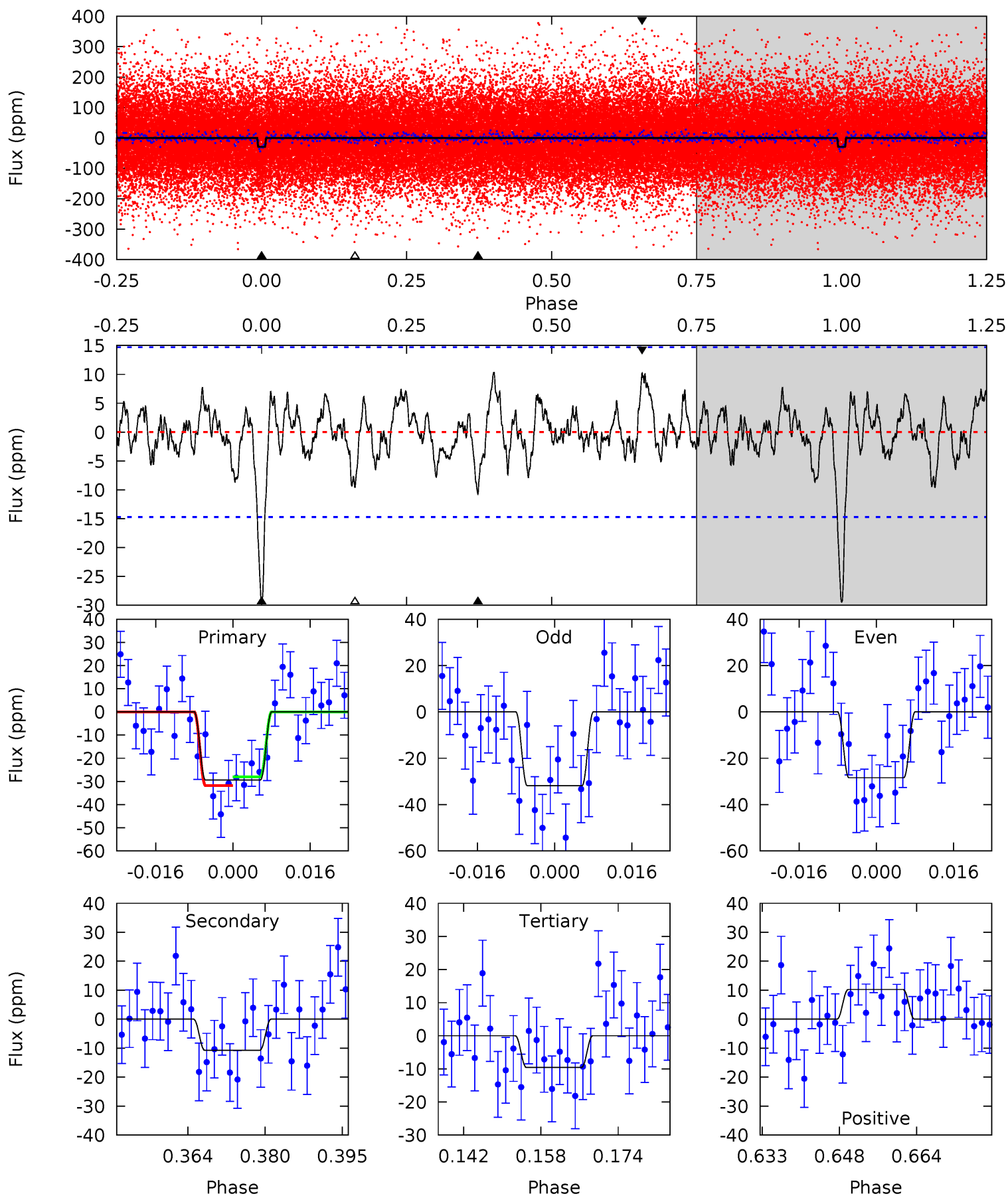
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	2.98	2.88	3.31	4.92	2.38	1.22	7.39	6.96	0.09	-0.34	0.05	0.90	0.24	0.34



# Alt Model-Shift Uniqueness Test

004548011-03, P = 13.950525 Days, E = 130.357075 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
9.86	3.61	3.22	3.44	4.94	2.41	1.19	6.64	6.43	0.39	0.17	0.57	0.88	0.26	0.63



### Stellar Parameters For KIC 004548011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5888^{+105}_{-129}$	$4.275^{+0.144}_{-0.108}$	$0.060^{+0.150}_{-0.150}$	$1.227^{+0.207}_{-0.186}$	$1.036^{+0.089}_{-0.080}$	$0.789^{+0.456}_{-0.267}$
	+2%/-2%	+3%/-3%	+250%/-250%	+17%/-15%	+9%/-8%	+58%/-34%
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 004548011-03 / KOI 4288.04

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 3$	$0.80^{+0.34}_{-0.33}$	$1178^{+56}_{-56}$	$4288^{+1007}_{-580}$	$93^{+173}_{-52}$
Alt.	$-11 \pm 3$	$0.76^{+0.35}_{-0.34}$	$1183^{+53}_{-57}$	$4599^{+1269}_{-655}$	$132^{+303}_{-76}$

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

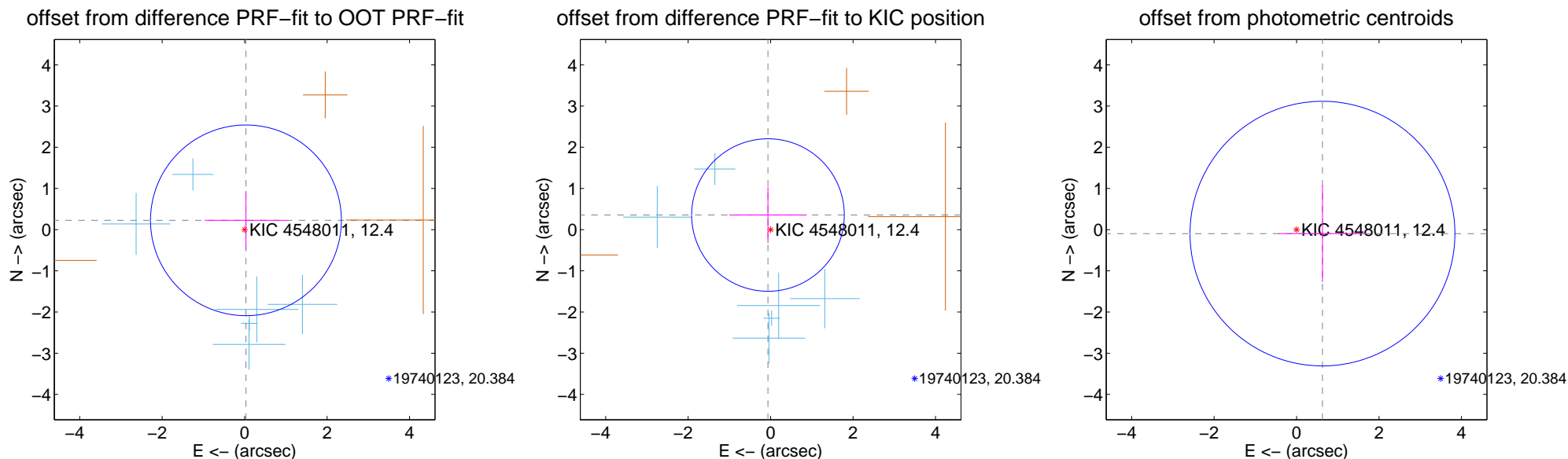
## DV Centroid Data

Supplemental centroid analysis for 004548011-03. Kepler magnitude: 12.40. Transit SNR 8.90

There are 6 quarters with good PRF difference image offsets

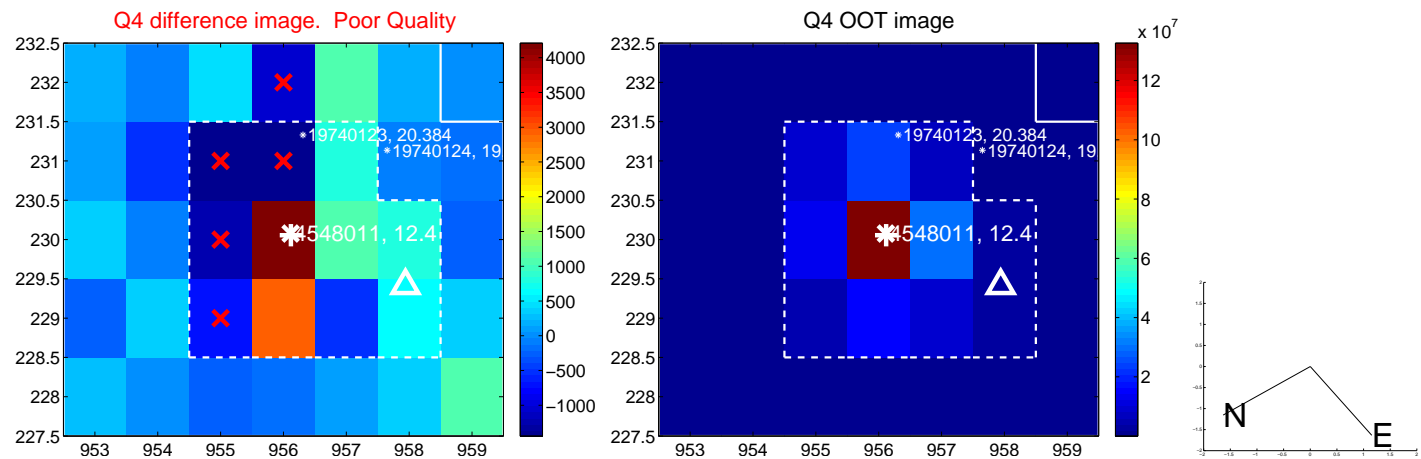
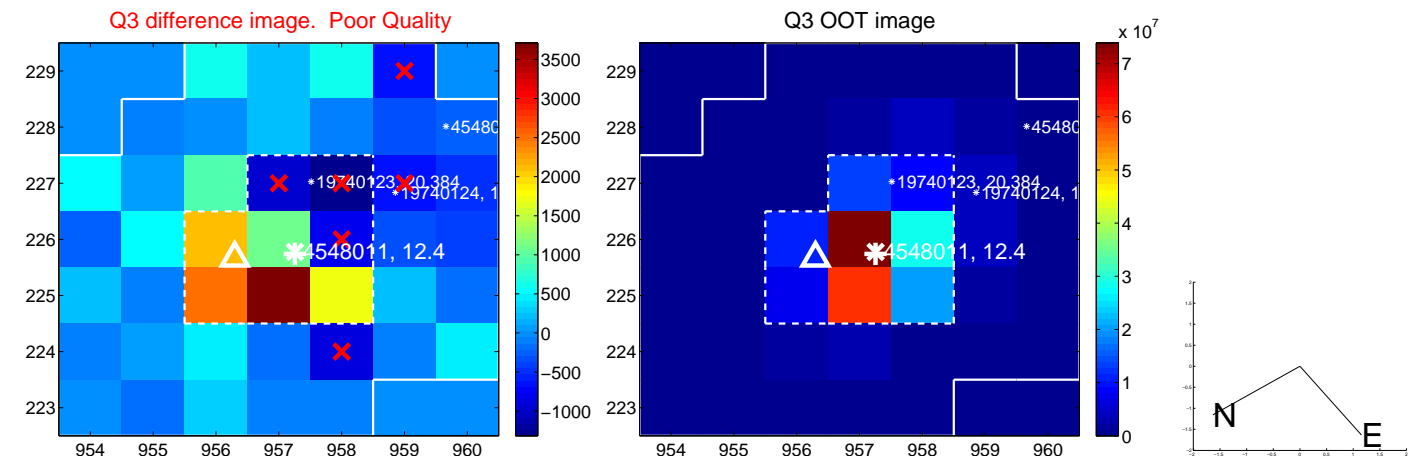
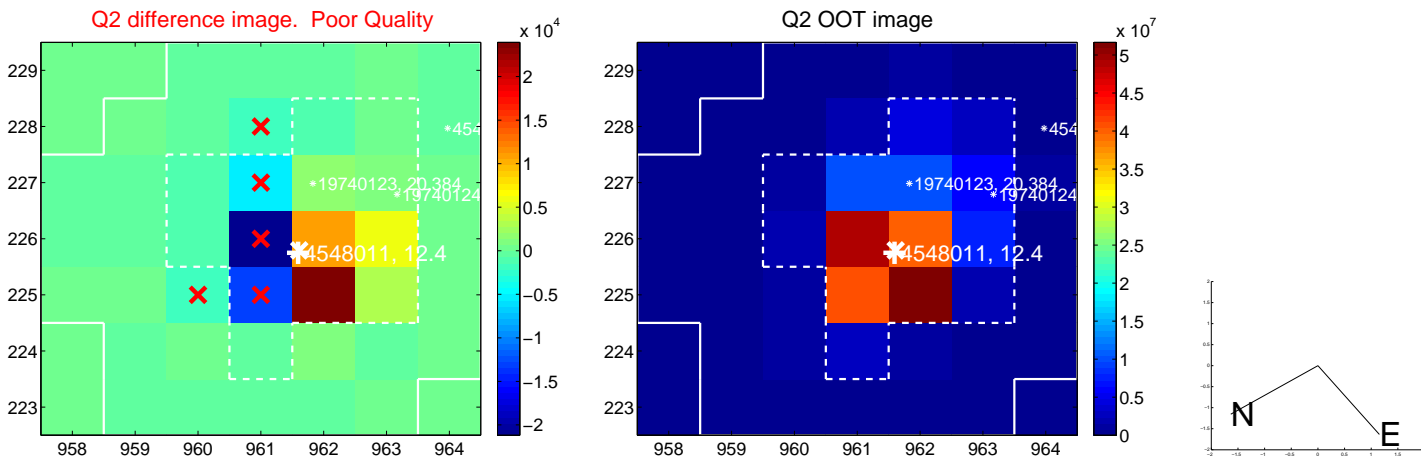
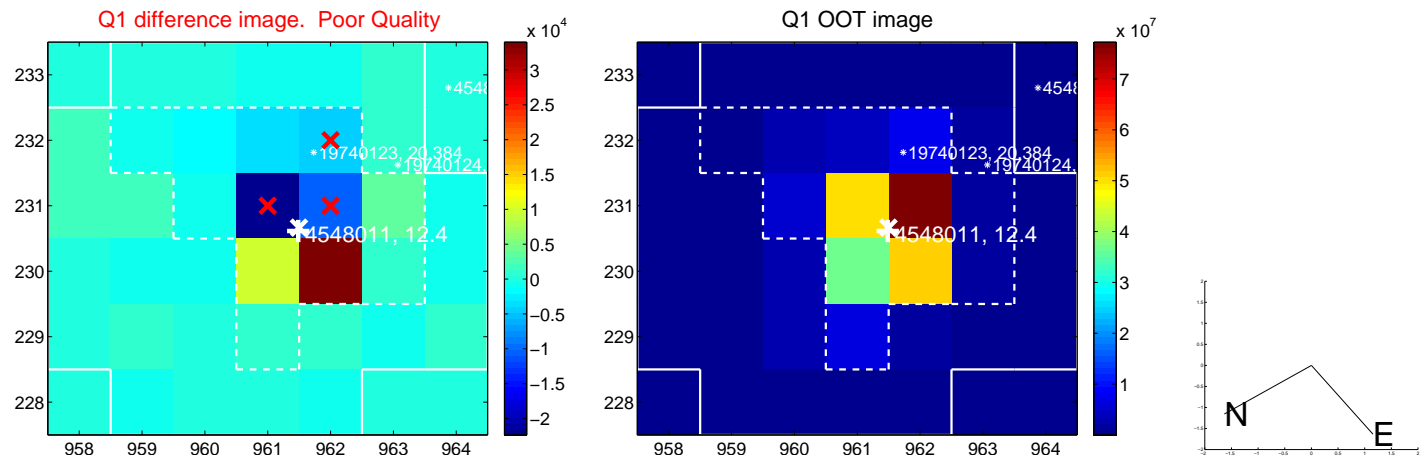
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.228 \pm 0.771$	0.30	$-0.031 \pm 0.997$	$0.226 \pm 0.712$
PRF-fit source offset from KIC position	$0.360 \pm 0.617$	0.58	$0.064 \pm 0.938$	$0.355 \pm 0.677$
photometric centroid source offset	$0.64 \pm 1.07$	0.59	$-0.63 \pm 1.07$	$-0.10 \pm 1.17$

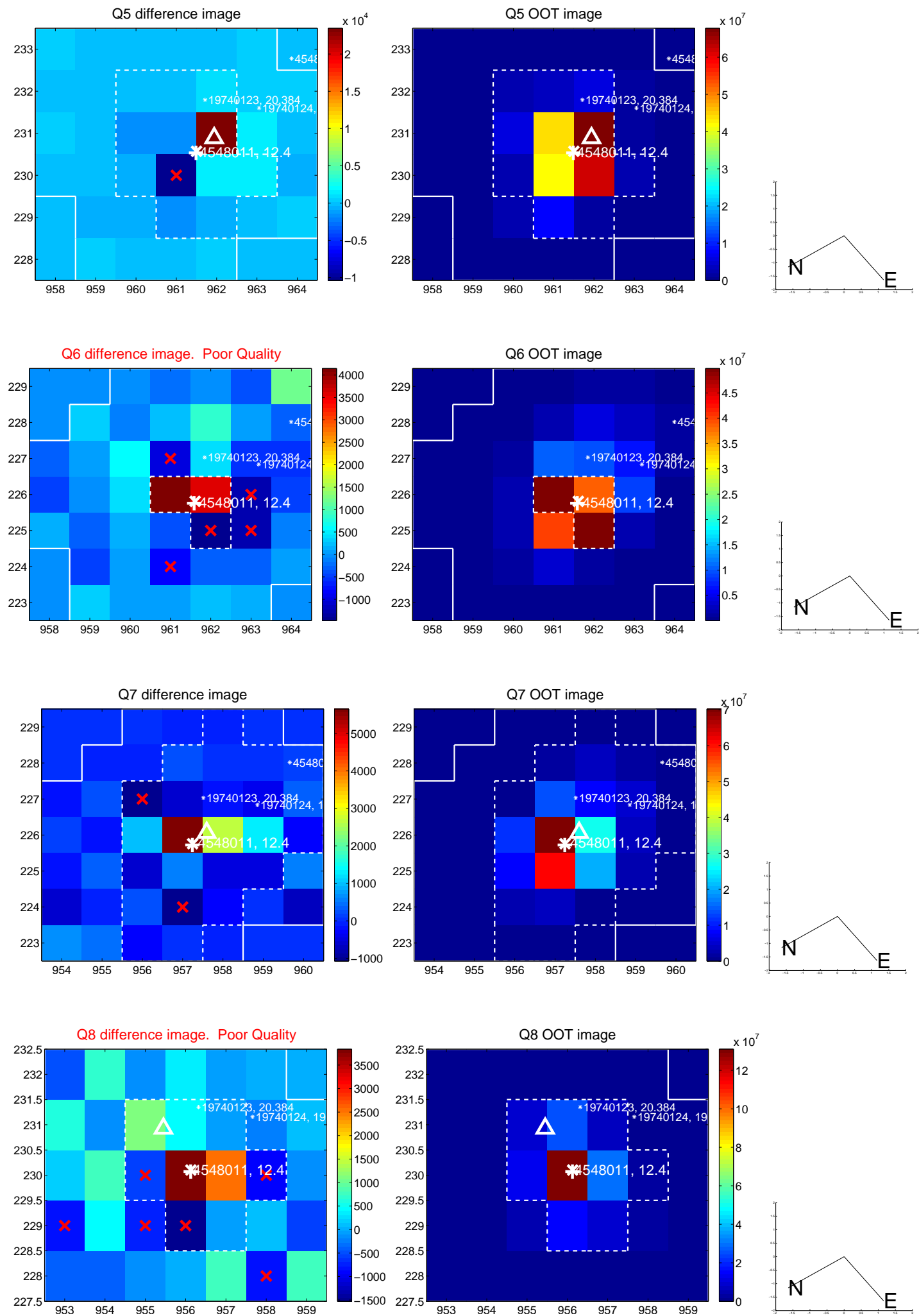


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

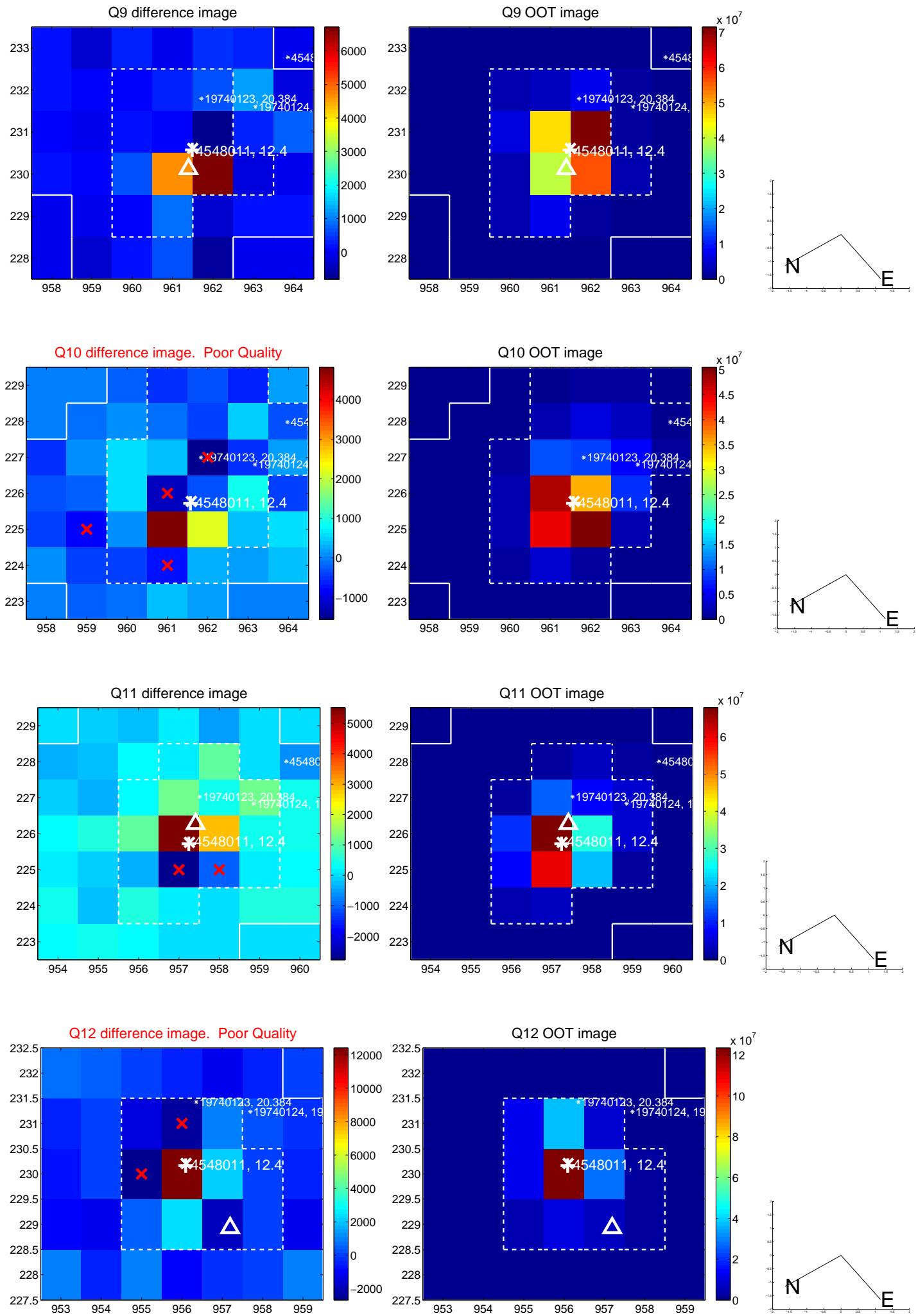


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

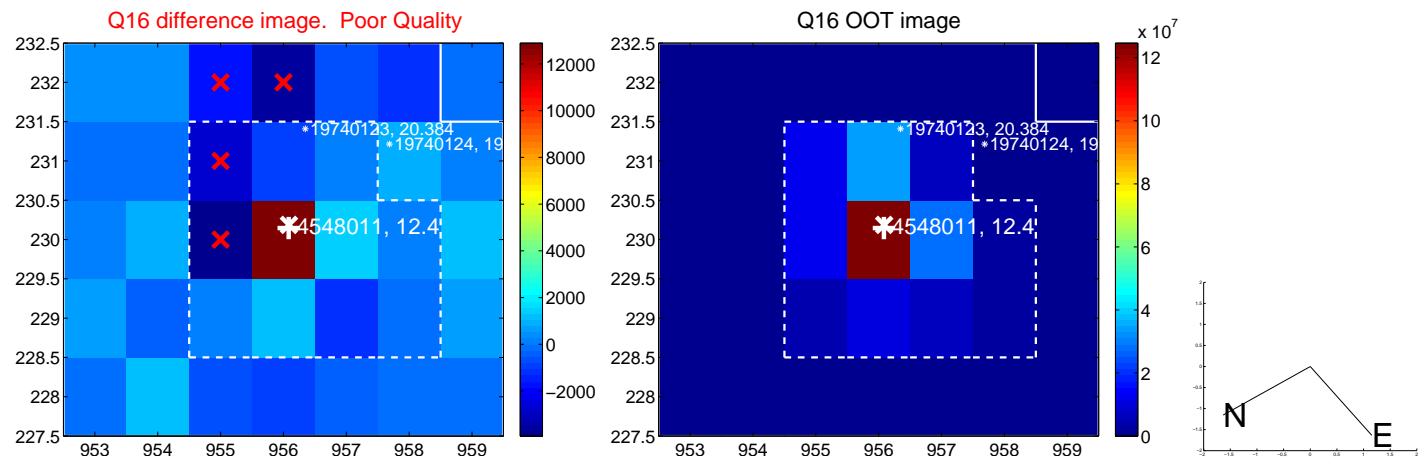
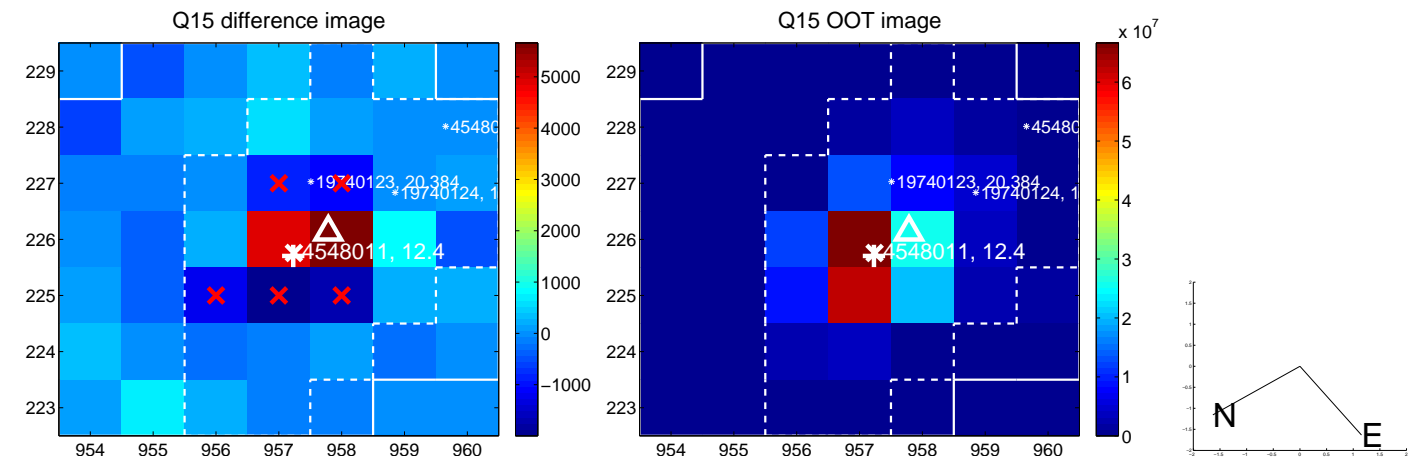
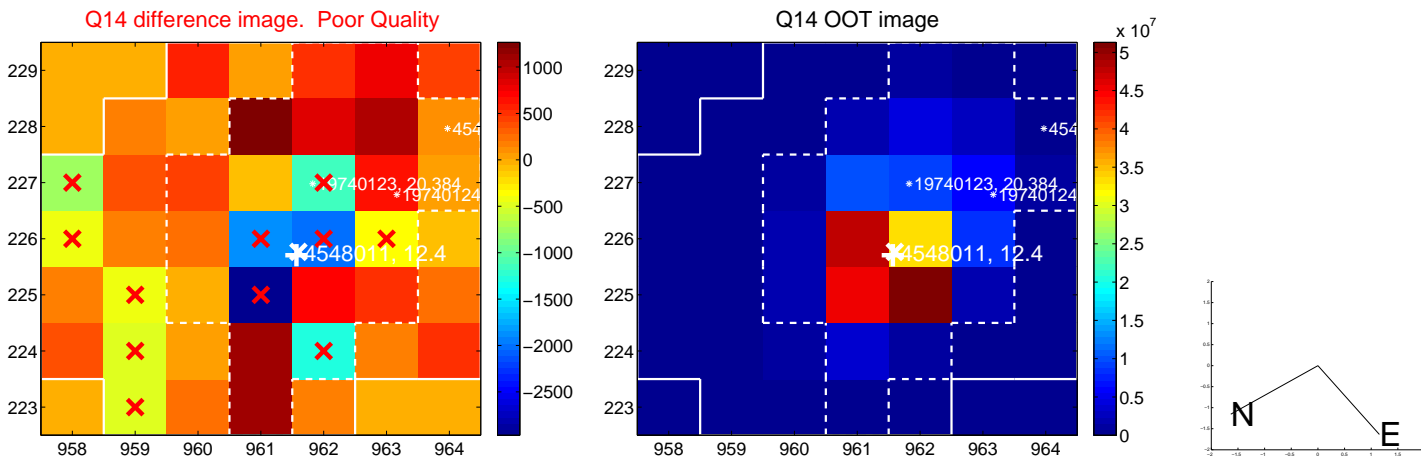
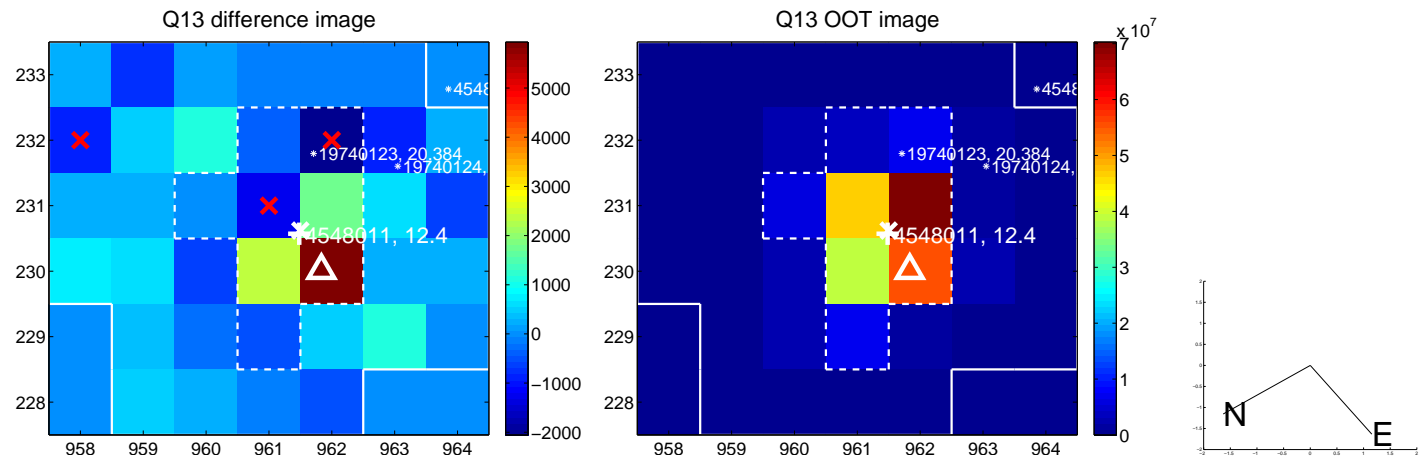




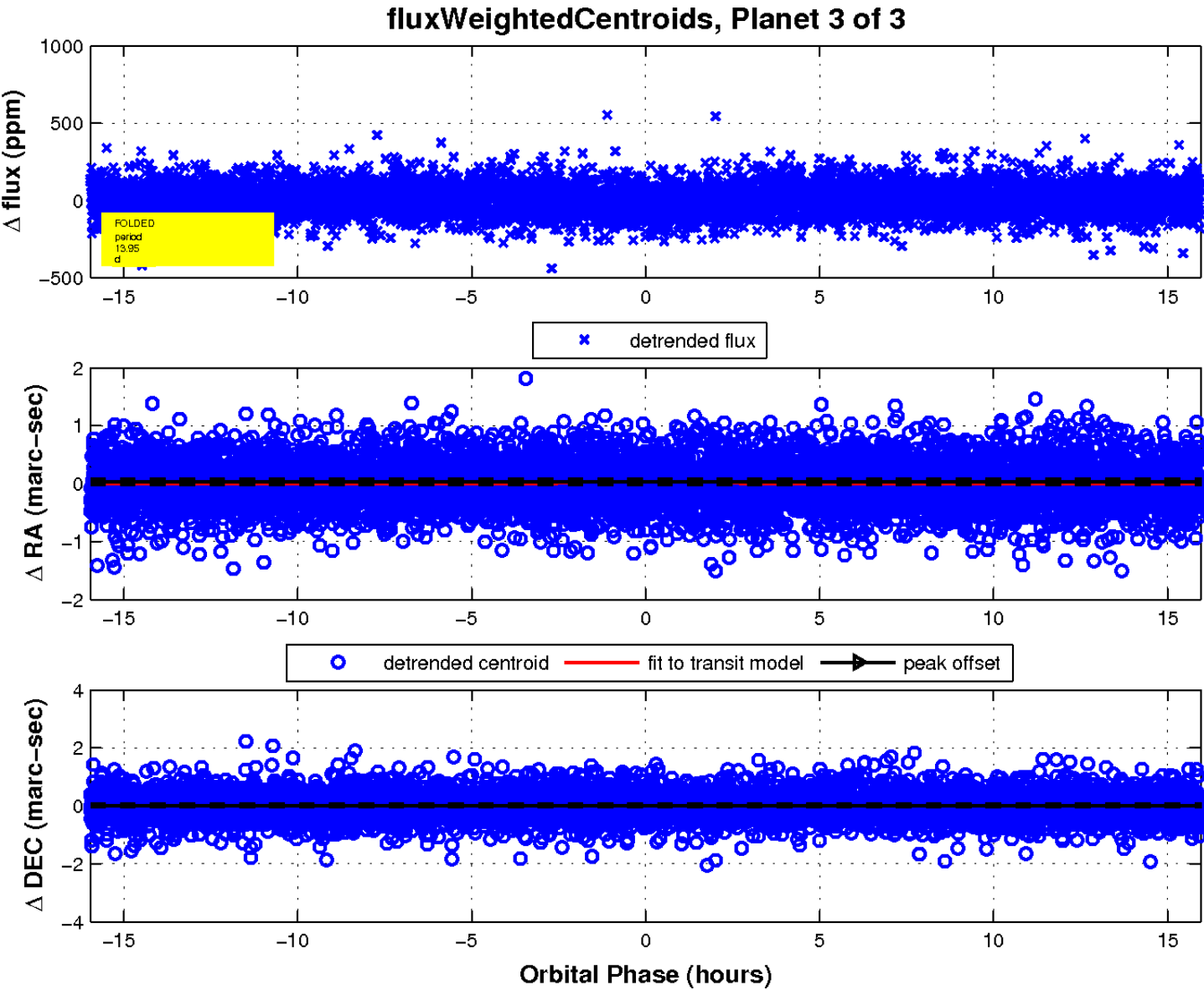
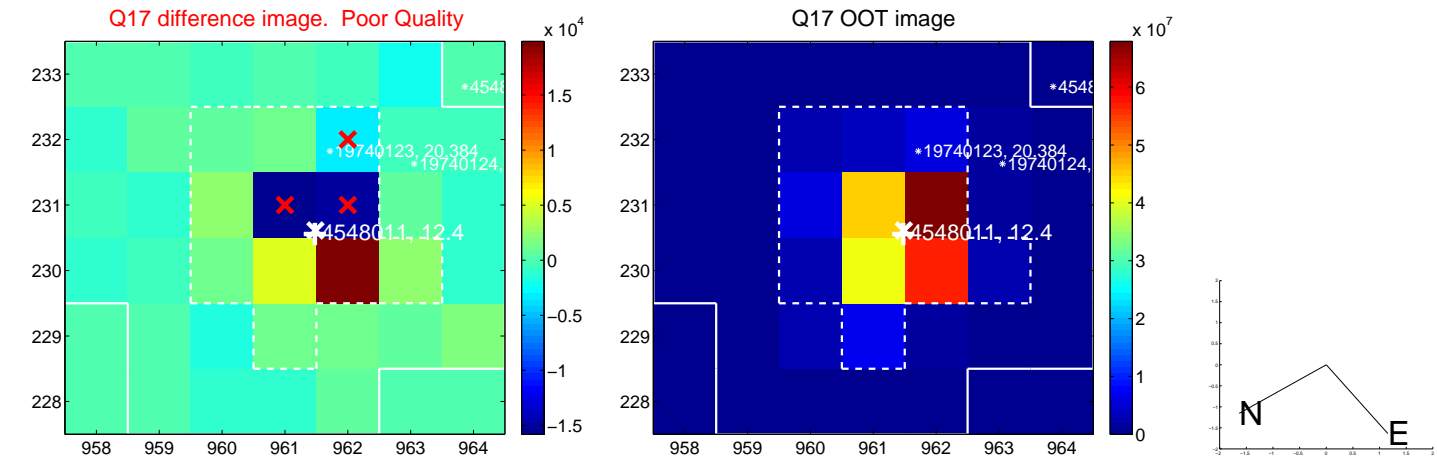
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

