

# KIC 008948424

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008948424-01	OBS	0322.01	5.888833	132.361266	19660.8	3.782	227.1	214.2	1.00	5780	18.83	245.41
008948424-02	OBS	No	5.888793	134.875033	810.9	3.064	9.6	10.7	1.00	5780	3.44	245.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008948424-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
008948424-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

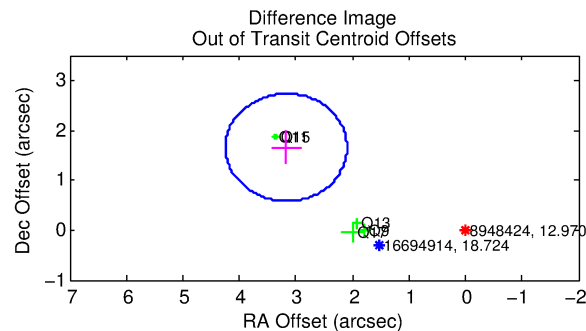
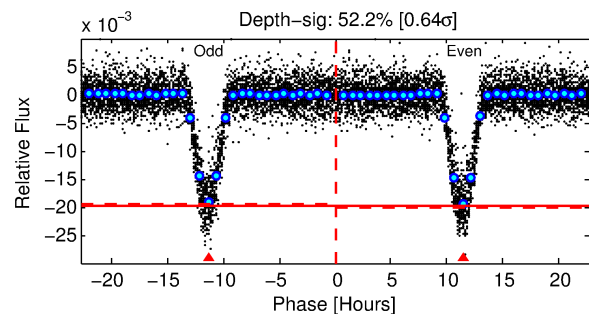
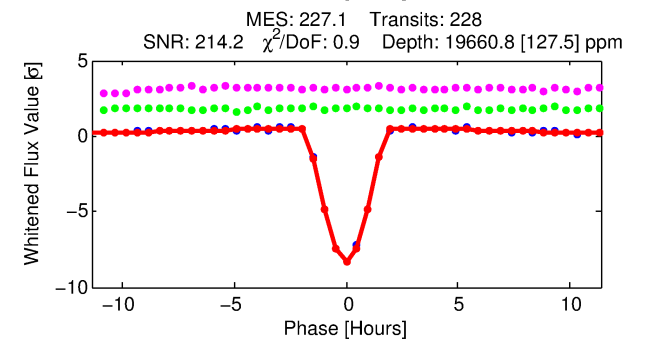
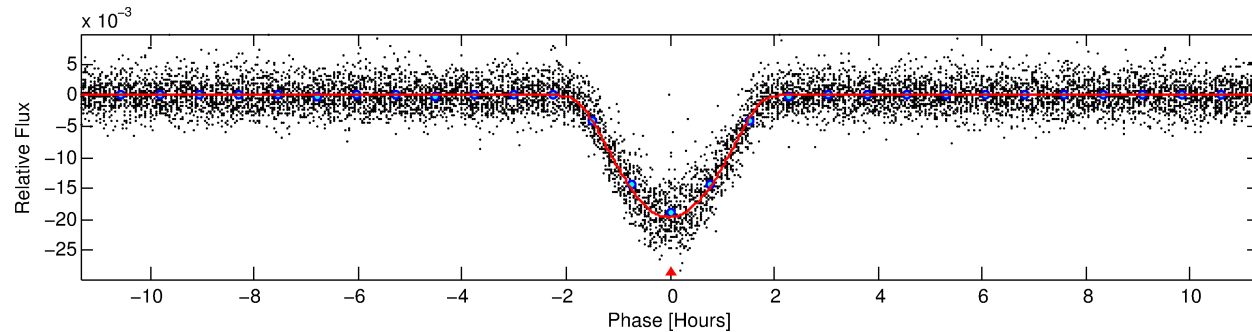
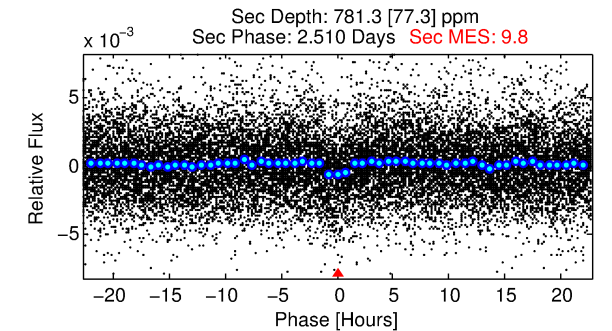
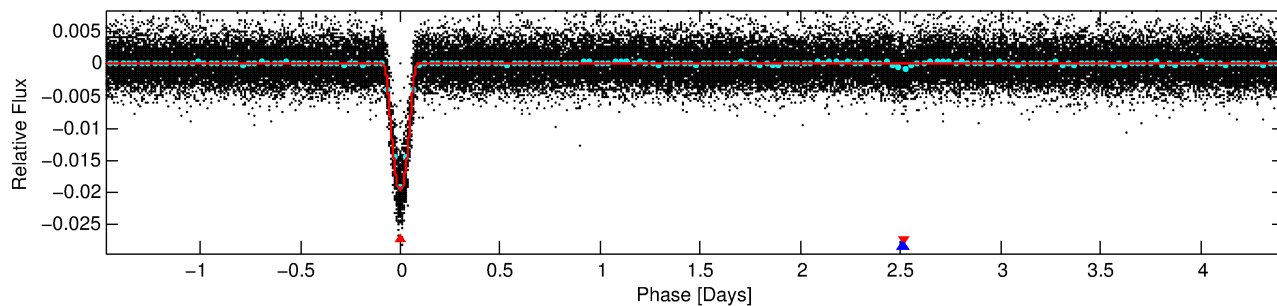
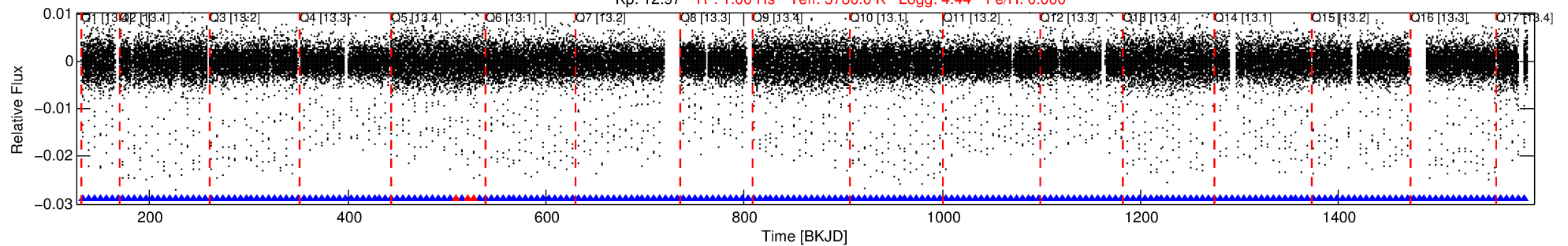
## Ephemeris Match Information For 008948424-01

No Significant Match Found

# DV One-Page Summary

KIC: 8948424 Candidate: 1 of 2 Period: 5.889 d  
KOI: K00322.01 Corr: 0.990

Kp: 12.97 R\*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



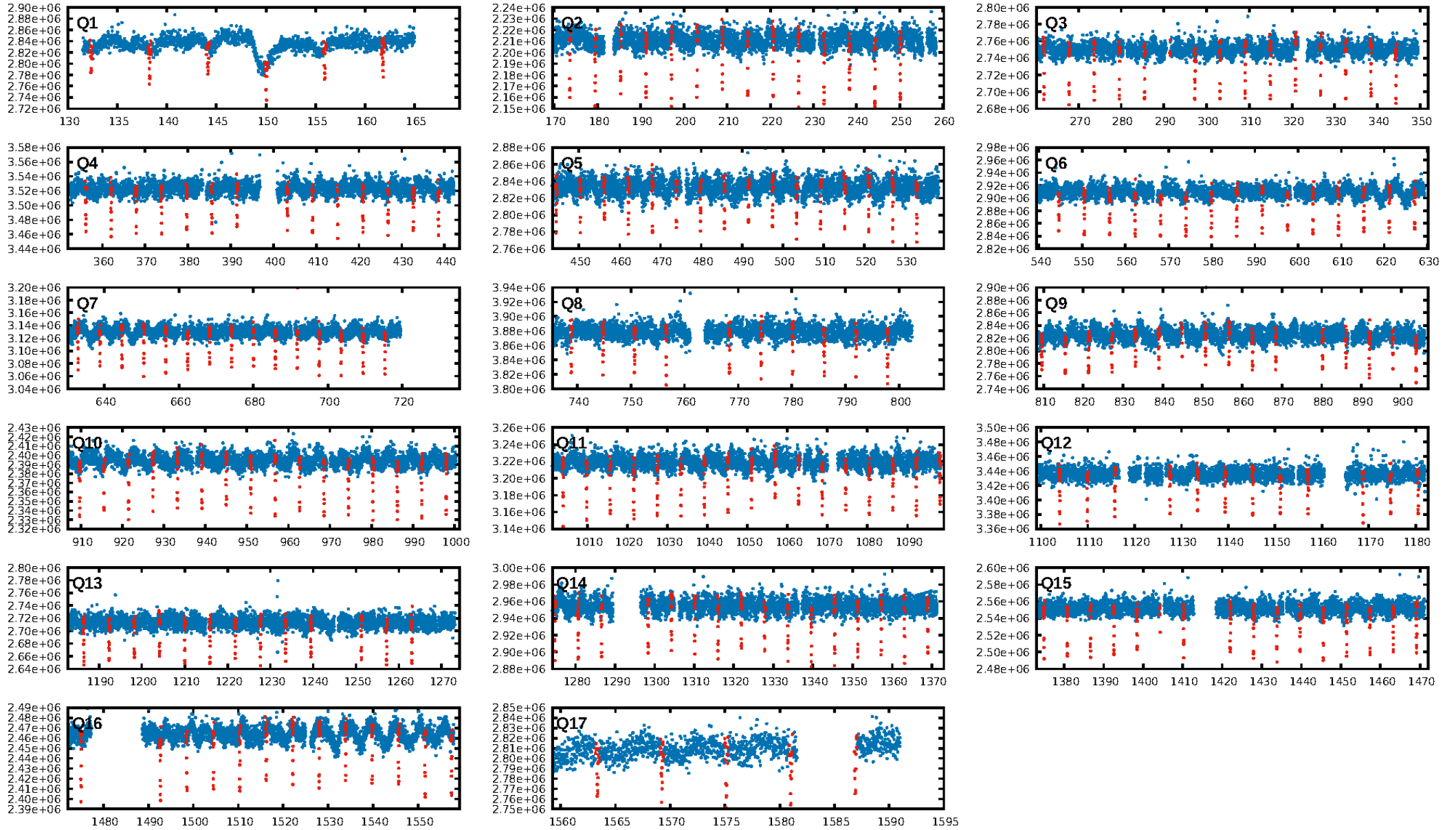
## DV Fit Results:

Period = 5.88883 [0.00000] d  
Epoch = 132.3613 [0.0004] BKJD  
Rp/R\* = 0.1726 [0.0130]  
a/R\* = 8.83 [0.18]  
b = 0.91 [0.02]  
Seff = 245.41 [0.00]  
Teq = 1009 [0] K  
Rp = 18.83 [1.42] Re  
a = 0.0638 [0.0000] AU  
Ag = 4.94 [0.89] [4.43σ]  
Teff = 2326 [105] K [12.58σ]

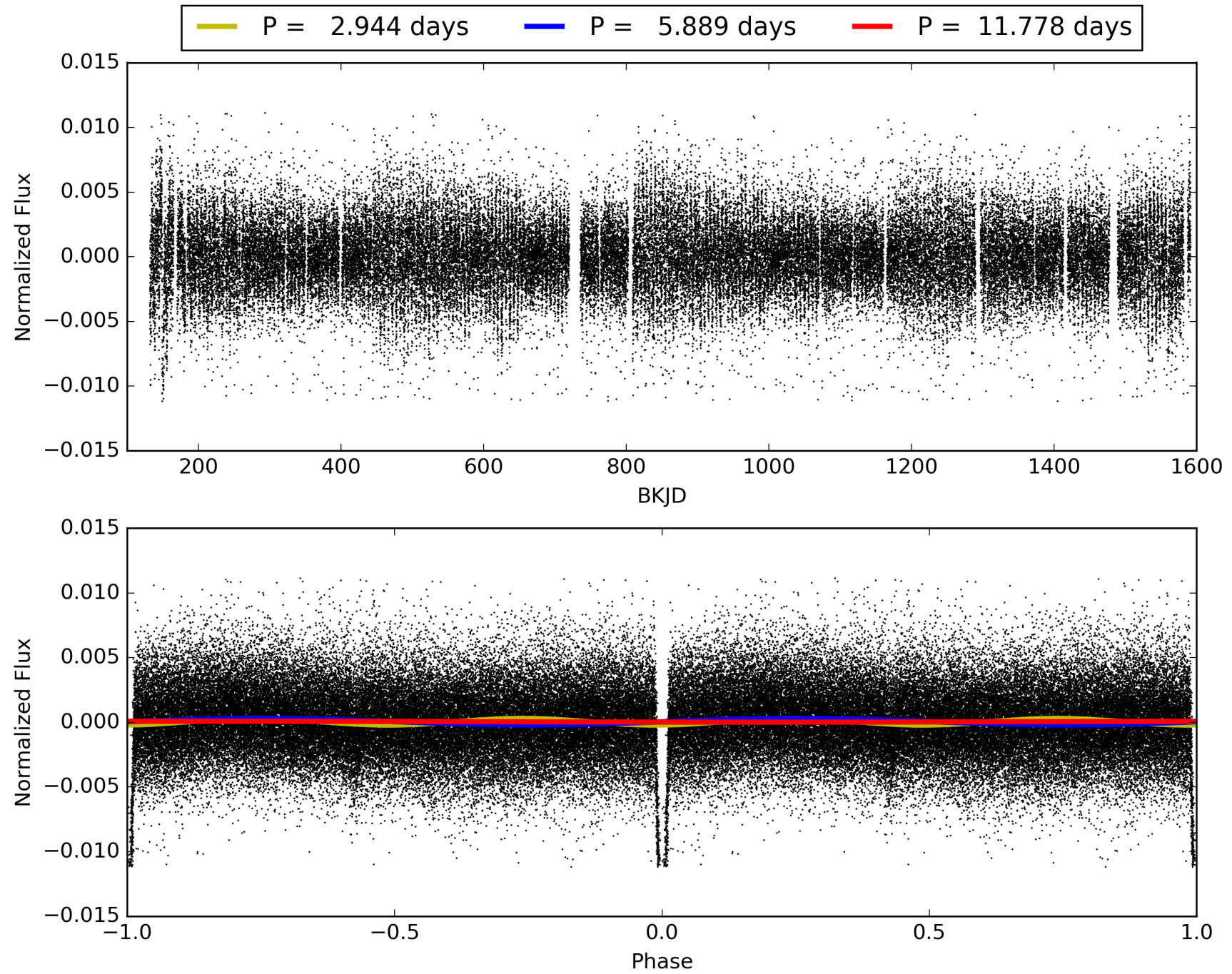
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.99 [214/217]  
GhostDiagnostic-chr: 5.508  
Centroid-sig: 0.0%  
Centroid-so: 1.640 arcsec [37.16σ]  
OotOffset-rm: 3.577 arcsec [9.97σ]  
KicOffset-rm: 1.537 arcsec [0.83σ]  
OotOffset-st: 0.2/0/3 [5]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 0.86 [12/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008948424-01, PDC Light Curves

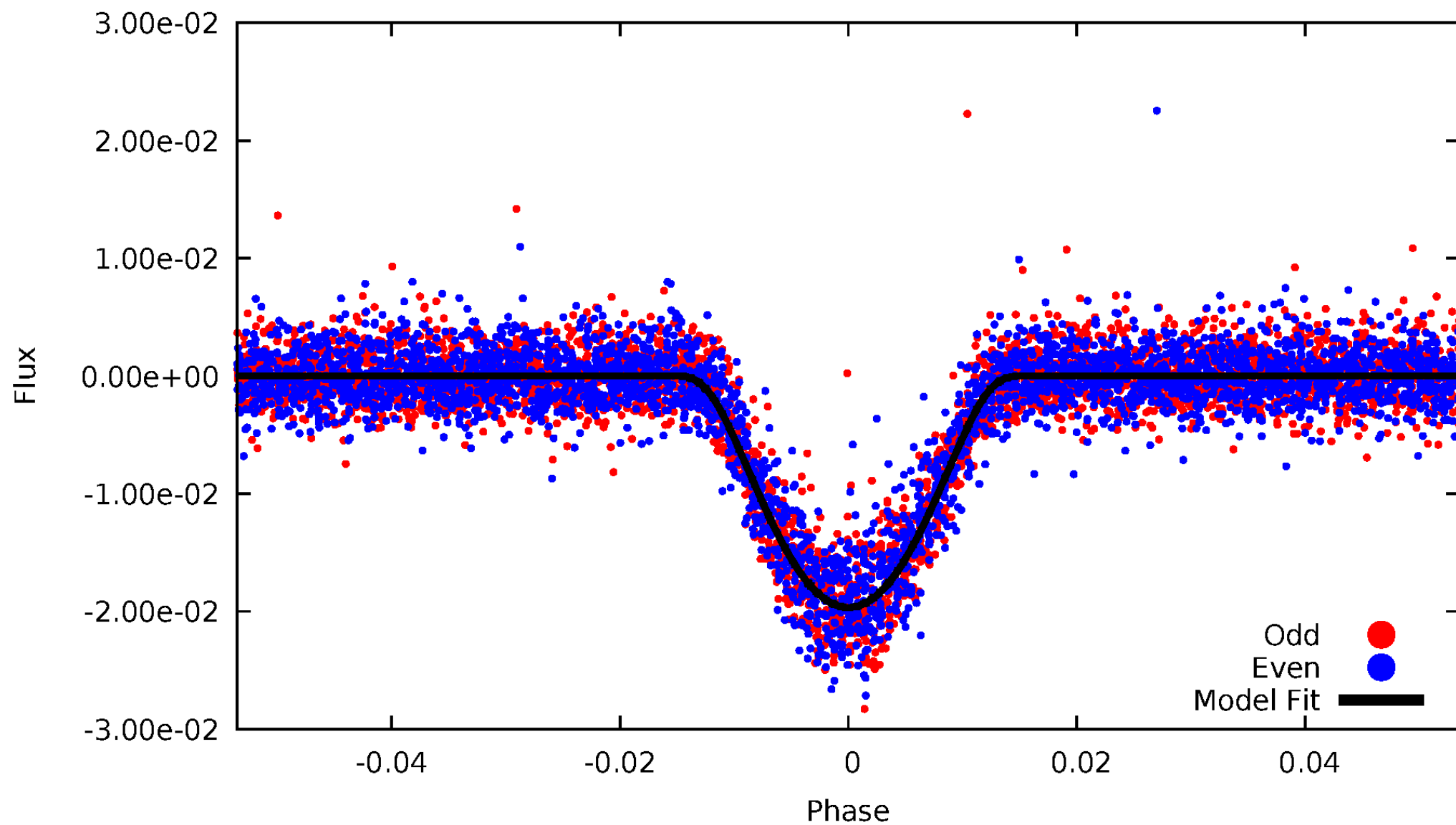


TCE 008948424-01



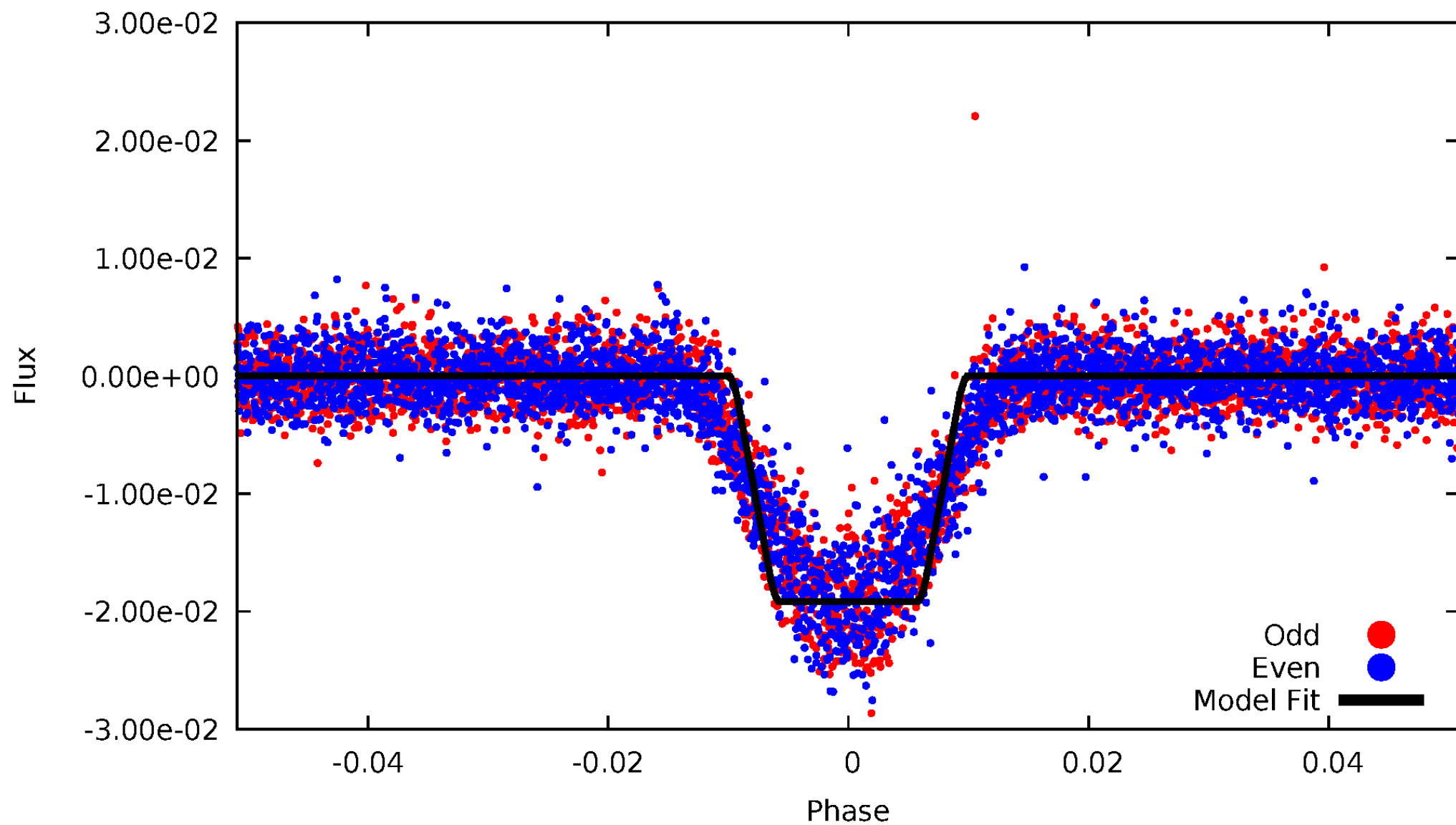
# DV Odd/Even

TCE 008948424-01



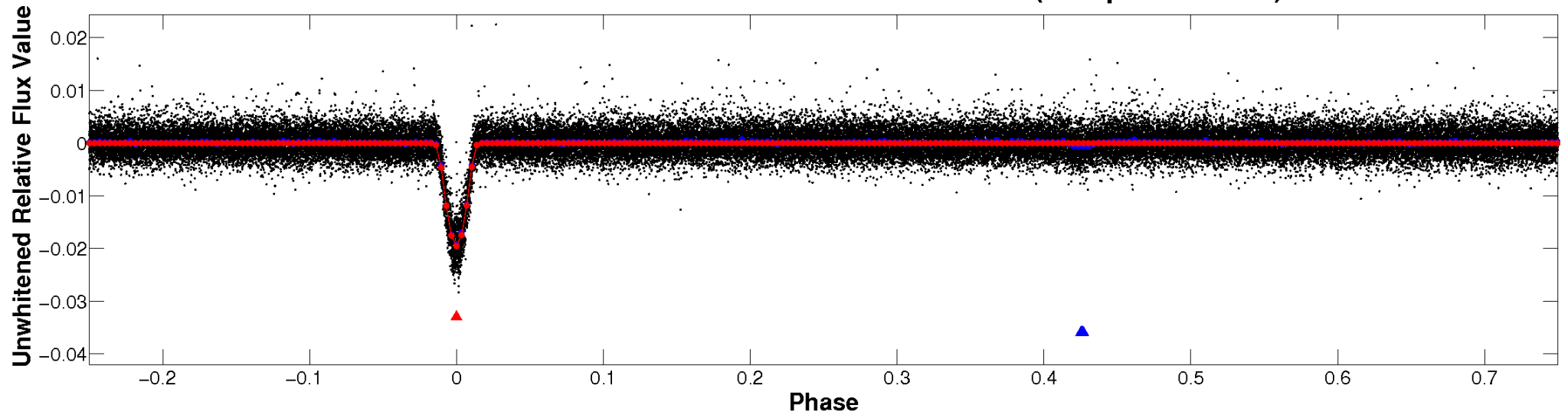
# ALT Odd/Even

TCE 008948424-01

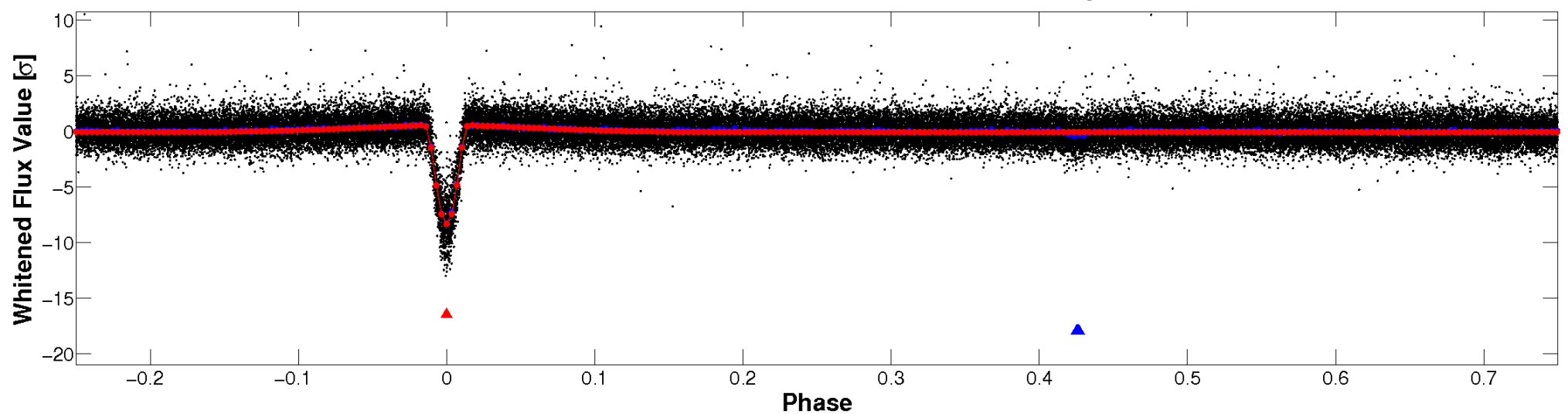


# Non-Whitened Vs. Whitened Light Curve

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

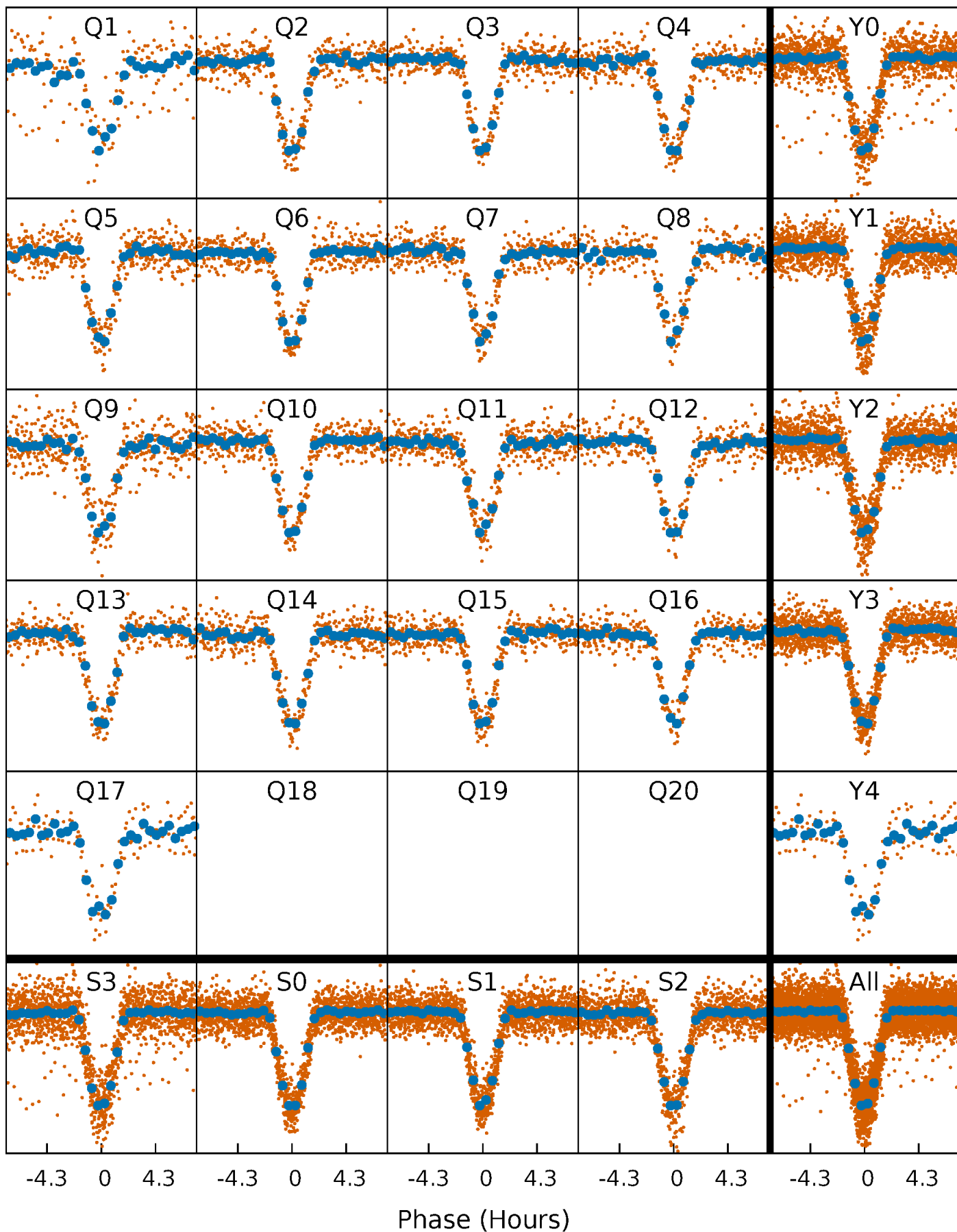


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



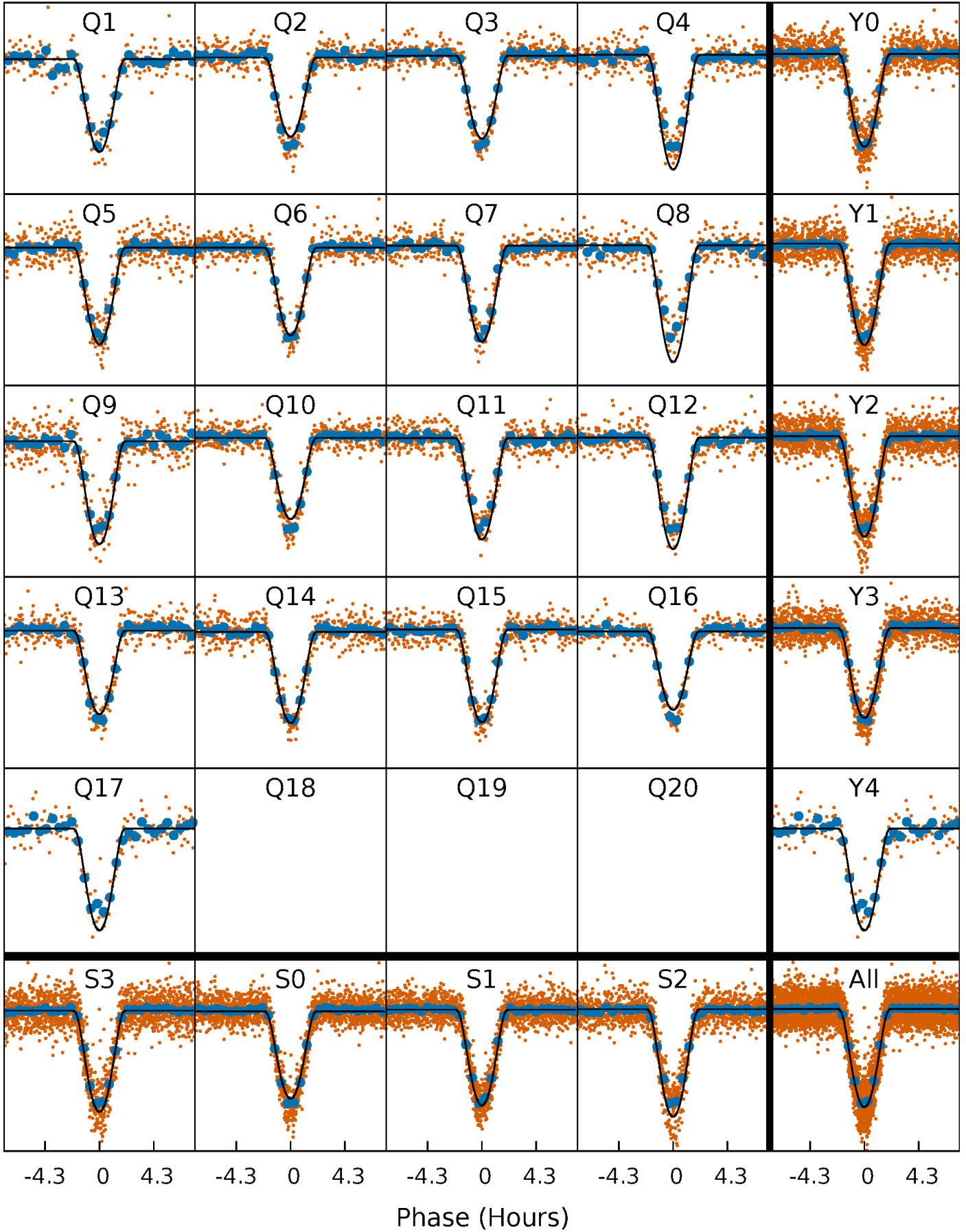
# PDC Quarter-Phased Transit Curves

TCE 008948424-01 P= 5.888833 Days  $T_0=132.361266$  (BKJD)



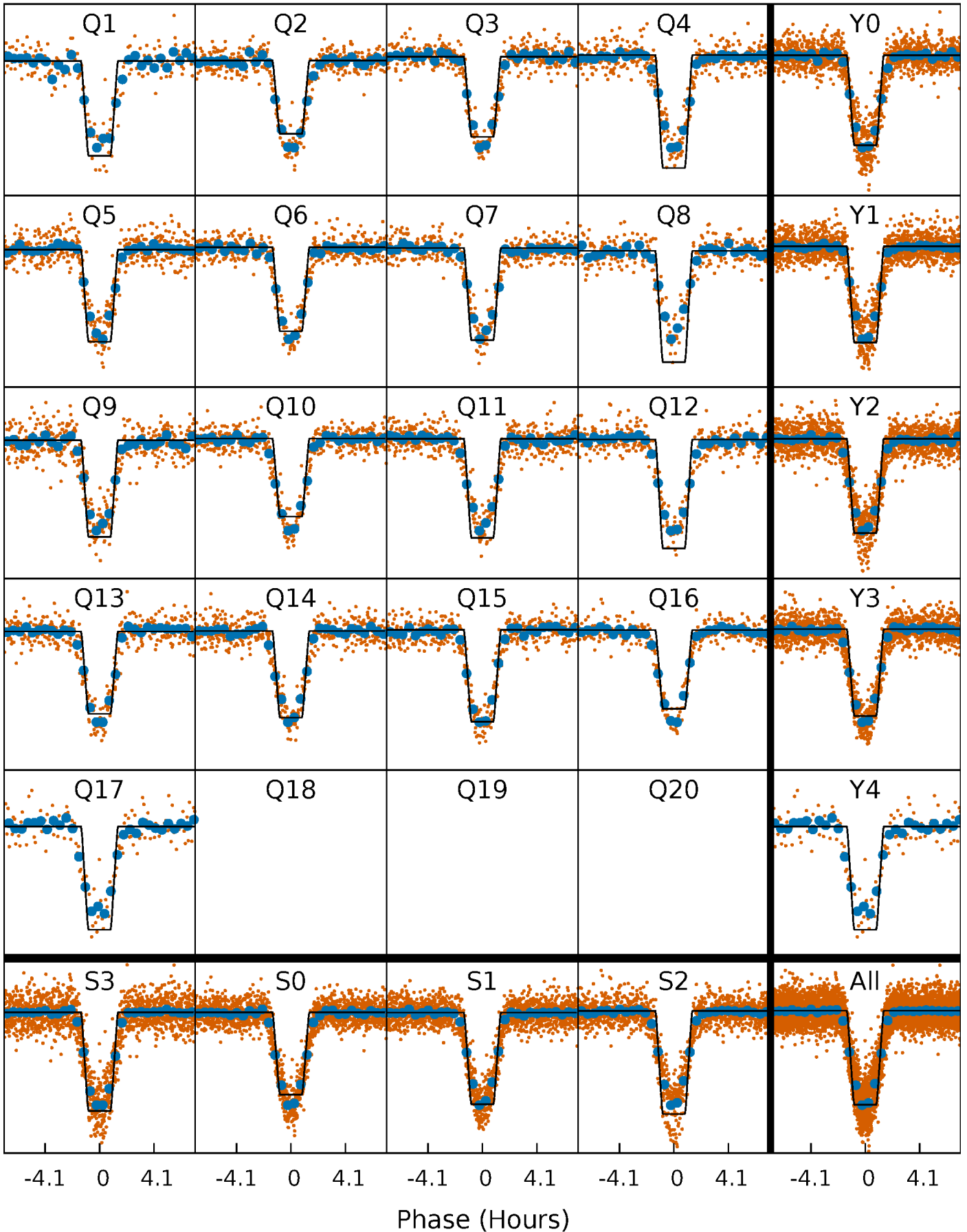
# DV Quarter-Phased Transit Curves

TCE 008948424-01 P= 5.888833 Days  $T_0=132.361266$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

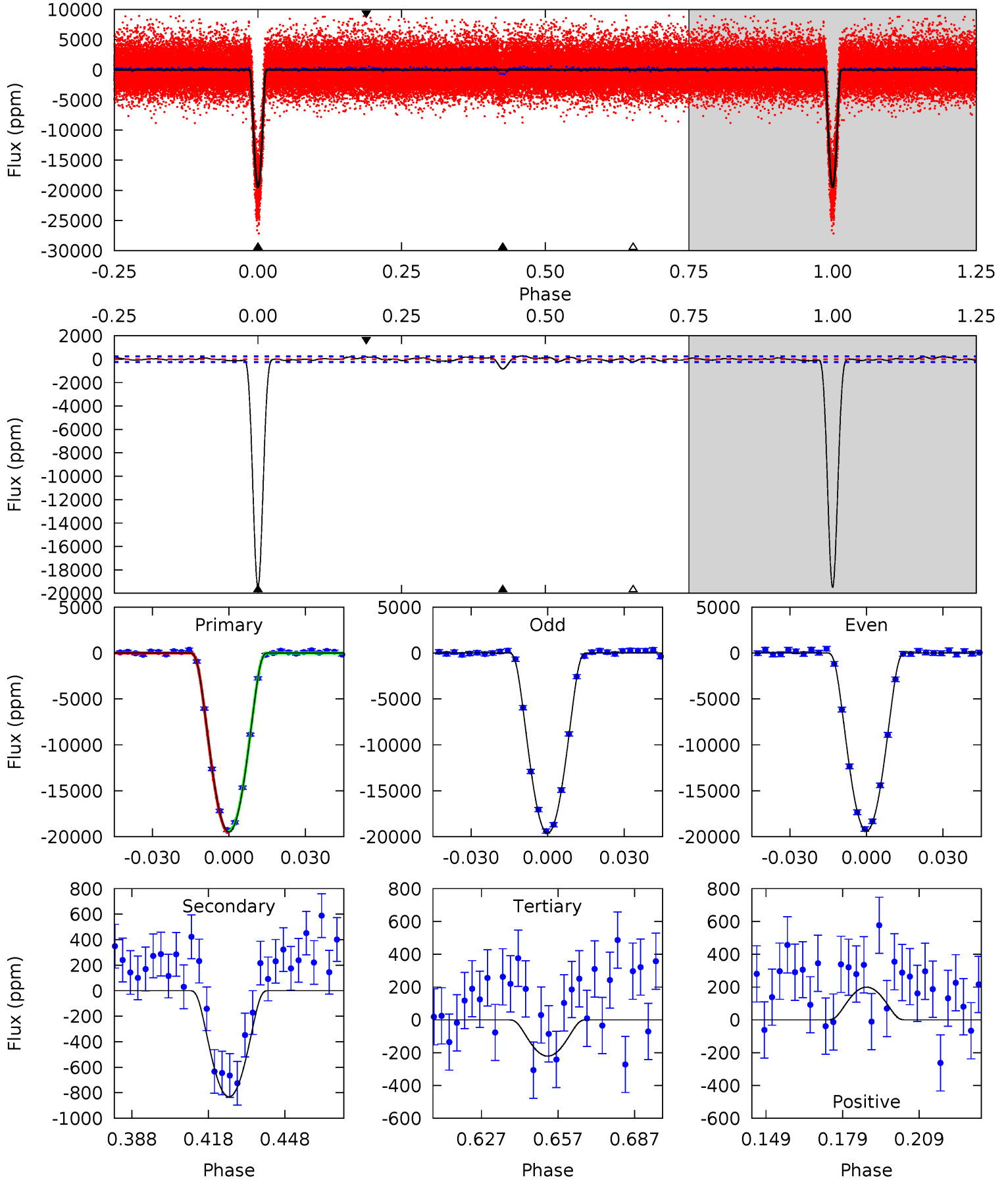
TCE 008948424-01 P= 5.888857 Days  $T_0=132.358144$  (BKJD)



# DV Model-Shift Uniqueness Test

008948424-01, P = 5.888833 Days, E = 126.472433 Days

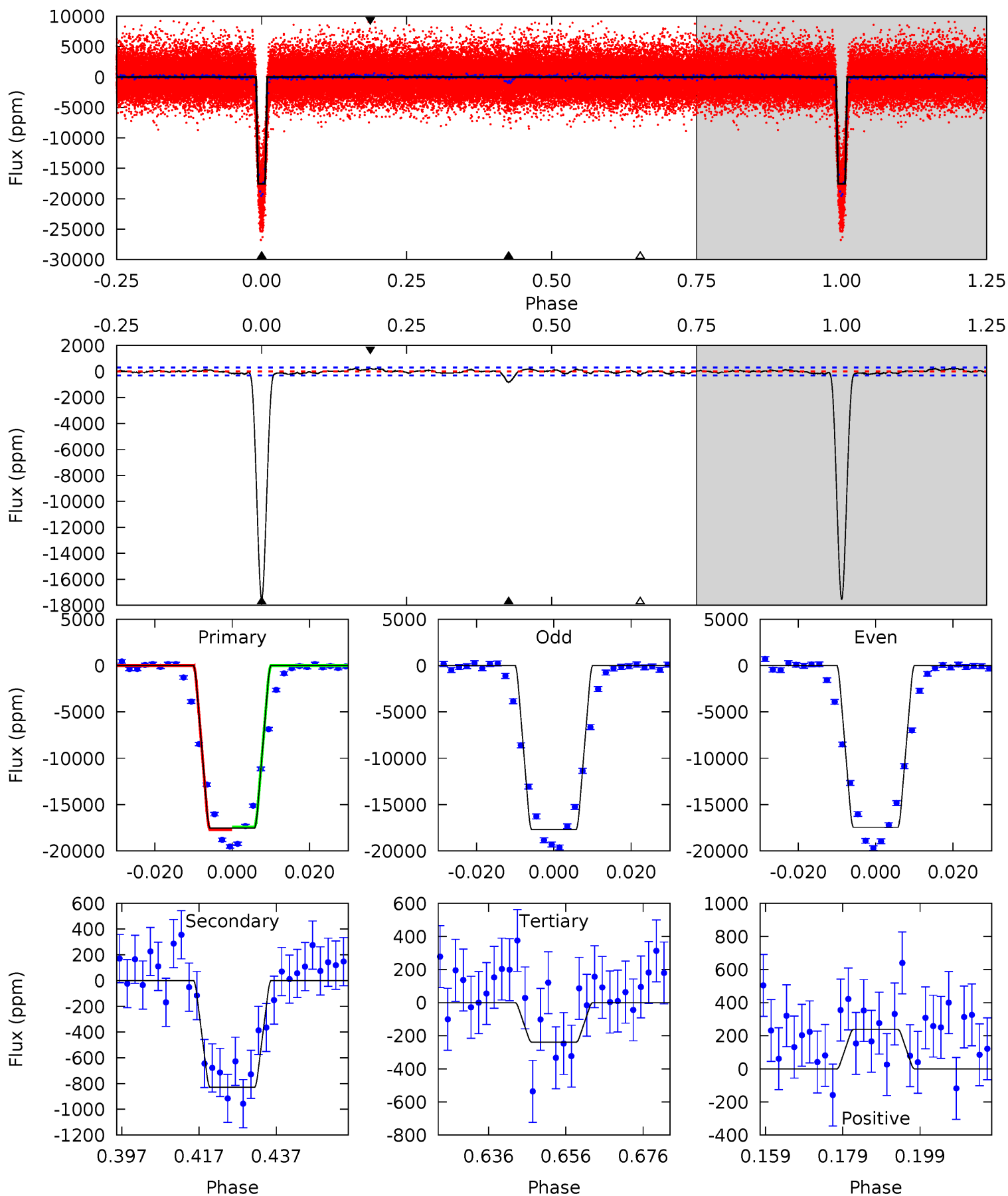
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
386.9	16.5	4.39	3.96	4.81	2.17	1.91	382.6	383.0	12.1	12.6	2.43	0.99	0.01	1.70



# Alt Model-Shift Uniqueness Test

008948424-01, P = 5.888857 Days, E = 126.469287 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
282.6	13.4	3.85	3.83	4.89	2.33	1.56	278.7	278.7	9.51	9.53	1.92	0.99	0.01	2.22



### Stellar Parameters For KIC 008948424

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

### Secondary Eclipse Parameters for KIC 008948424-01 / KOI 0322.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-832 \pm 50$	$18.90^{+1.93}_{-1.77}$	$1413^{+65}_{-66}$	$2995^{+104}_{-89}$	$5.245^{+1.138}_{-0.941}$
Alt.	$-829 \pm 62$	$15.25^{+1.82}_{-1.74}$	$1414^{+59}_{-72}$	$3196^{+122}_{-116}$	$8.038^{+2.223}_{-1.648}$

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

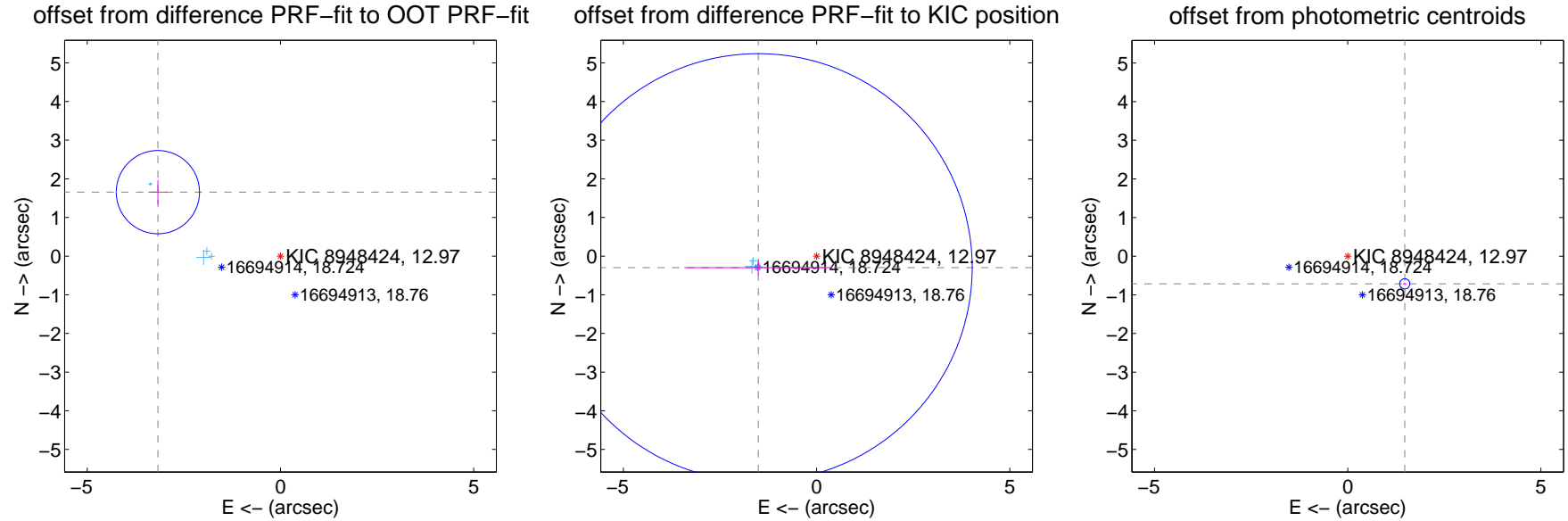
## DV Centroid Data

Supplemental centroid analysis for 008948424-01. Kepler magnitude: 12.97. Transit SNR 214.16

There are 12 quarters with good PRF difference image offsets

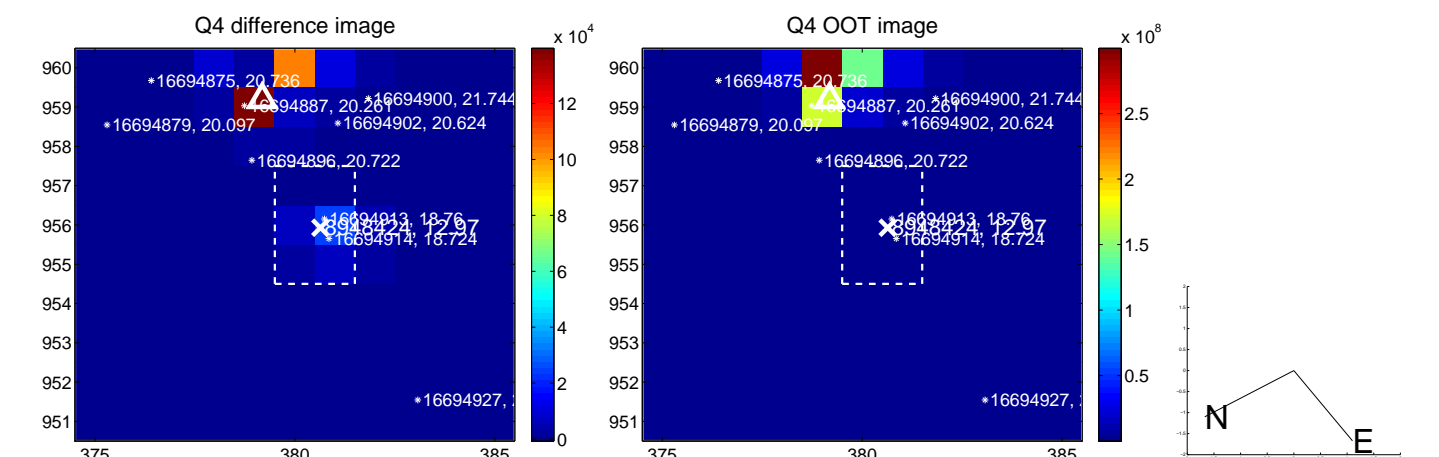
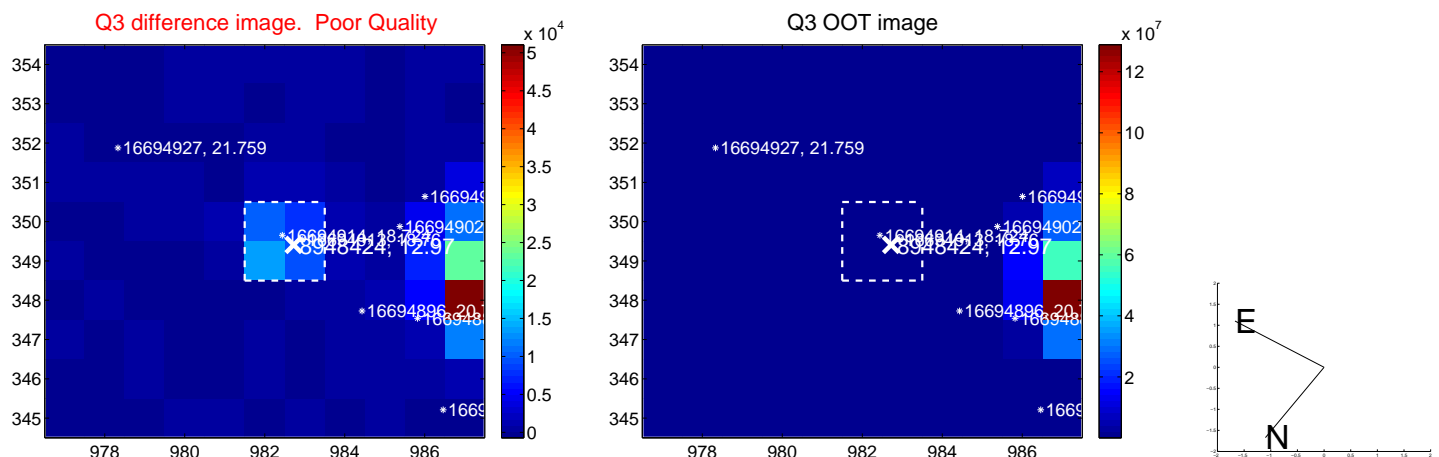
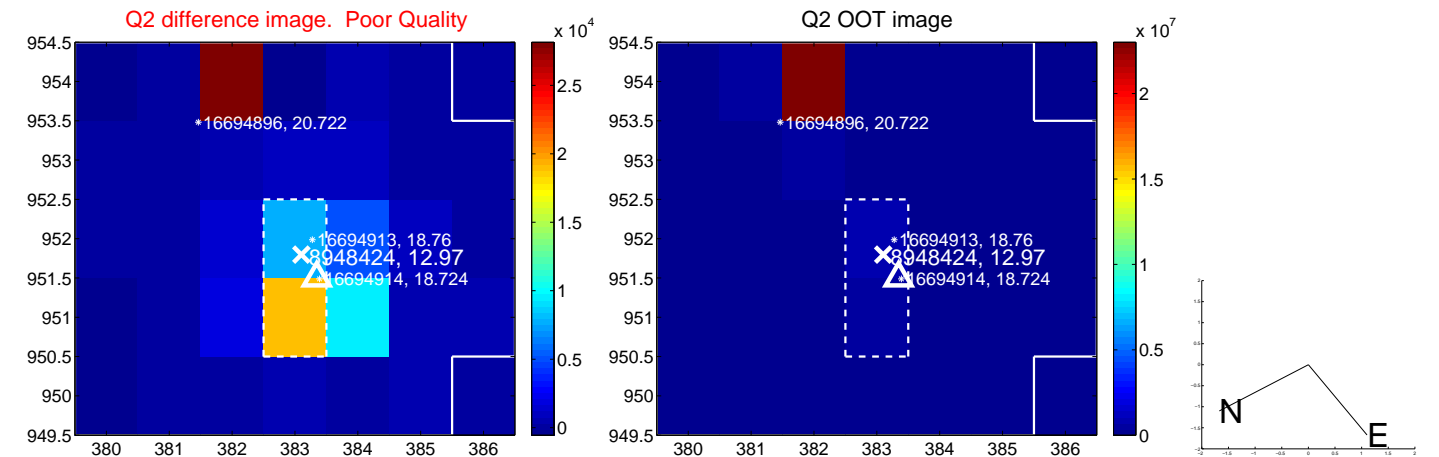
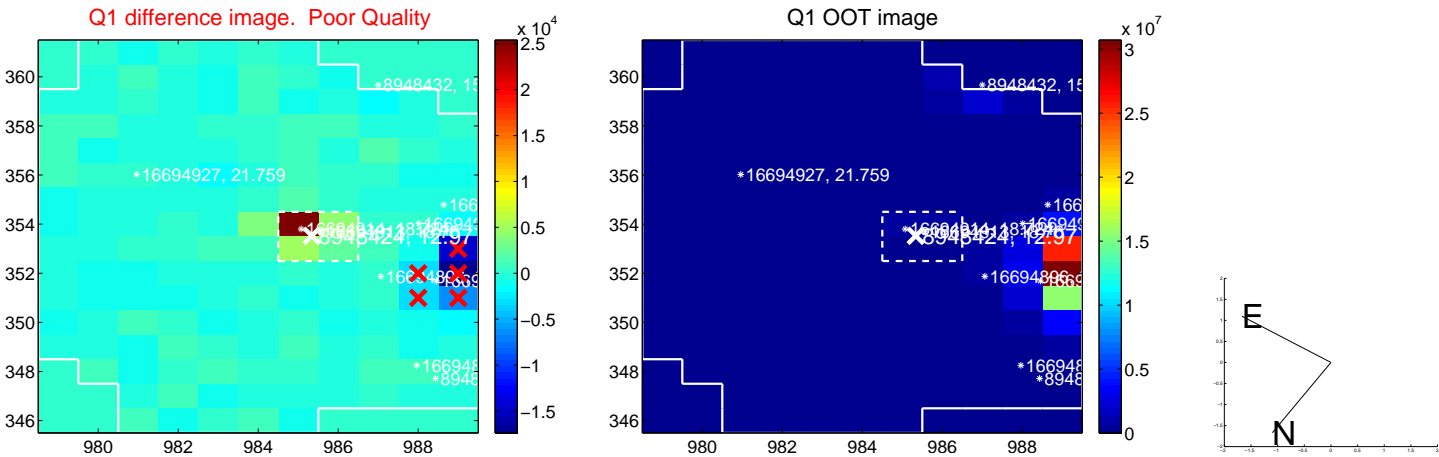
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.577 \pm 0.359$	$9.97$	$3.172 \pm 0.248$	$1.655 \pm 0.313$
PRF-fit source offset from KIC position	$1.537 \pm 1.845$	$0.83$	$1.508 \pm 1.912$	$-0.297 \pm 0.200$
photometric centroid source offset	$1.64 \pm 0.04$	$37.16$	$-1.48 \pm 0.05$	$-0.72 \pm 0.03$

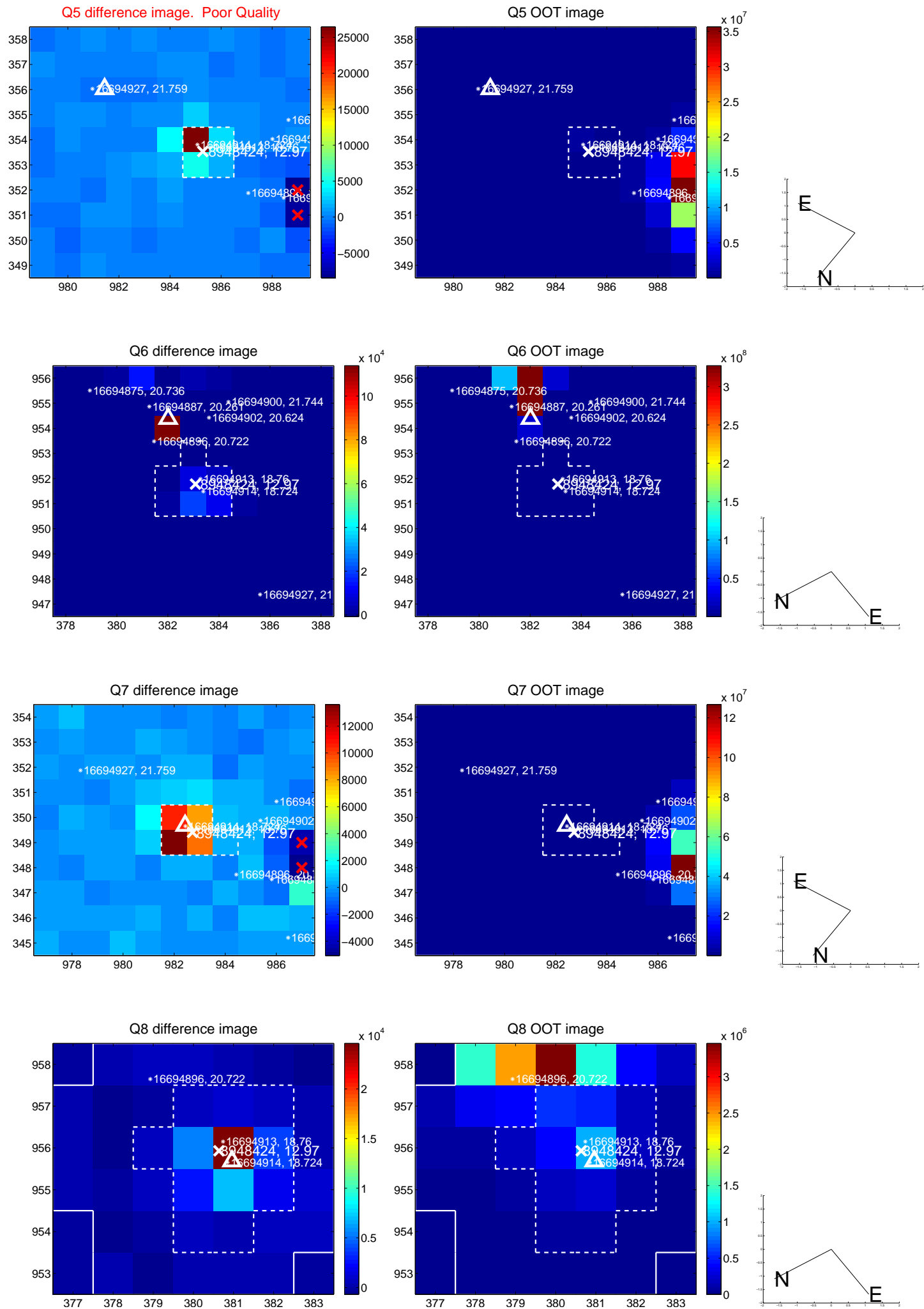


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

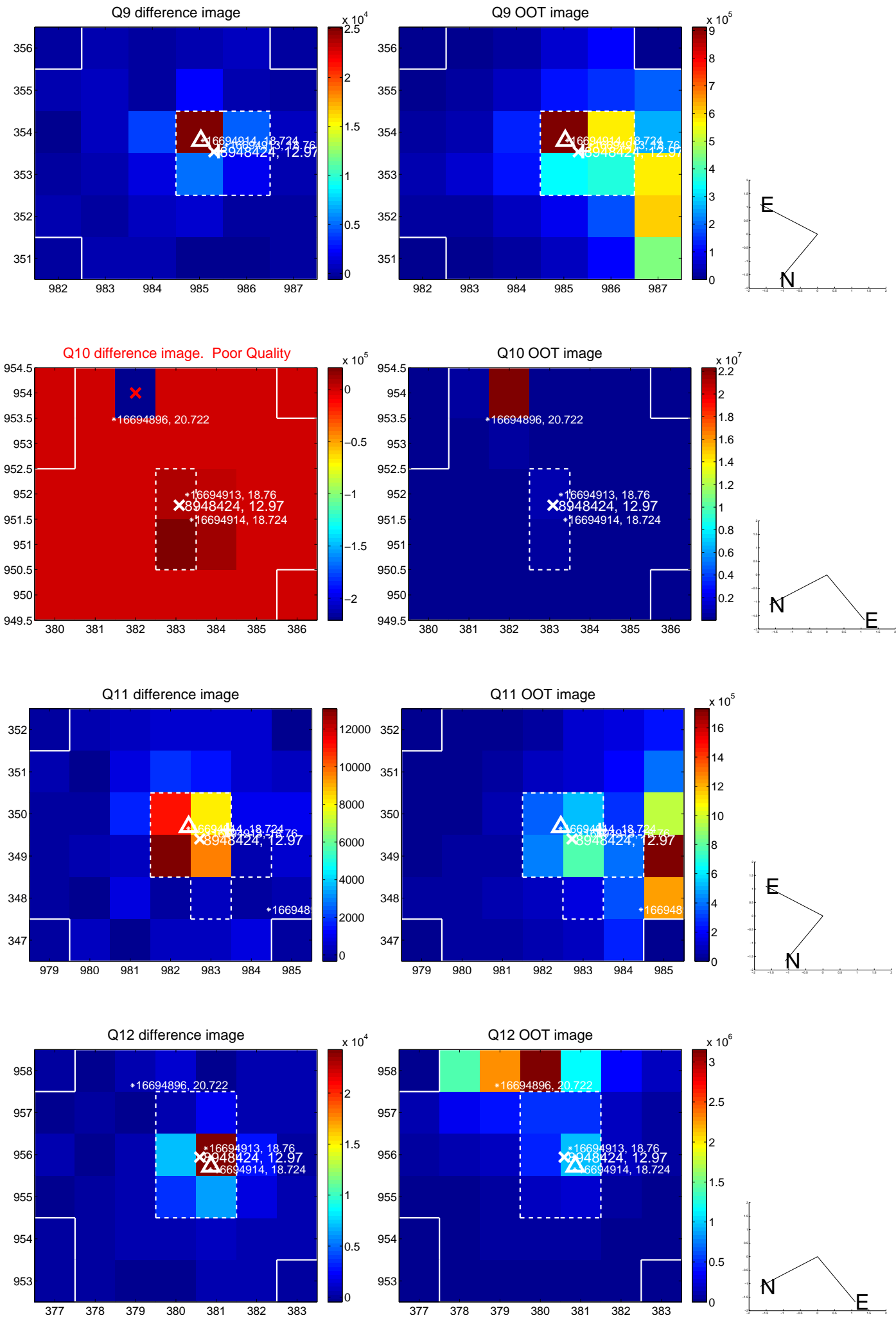
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



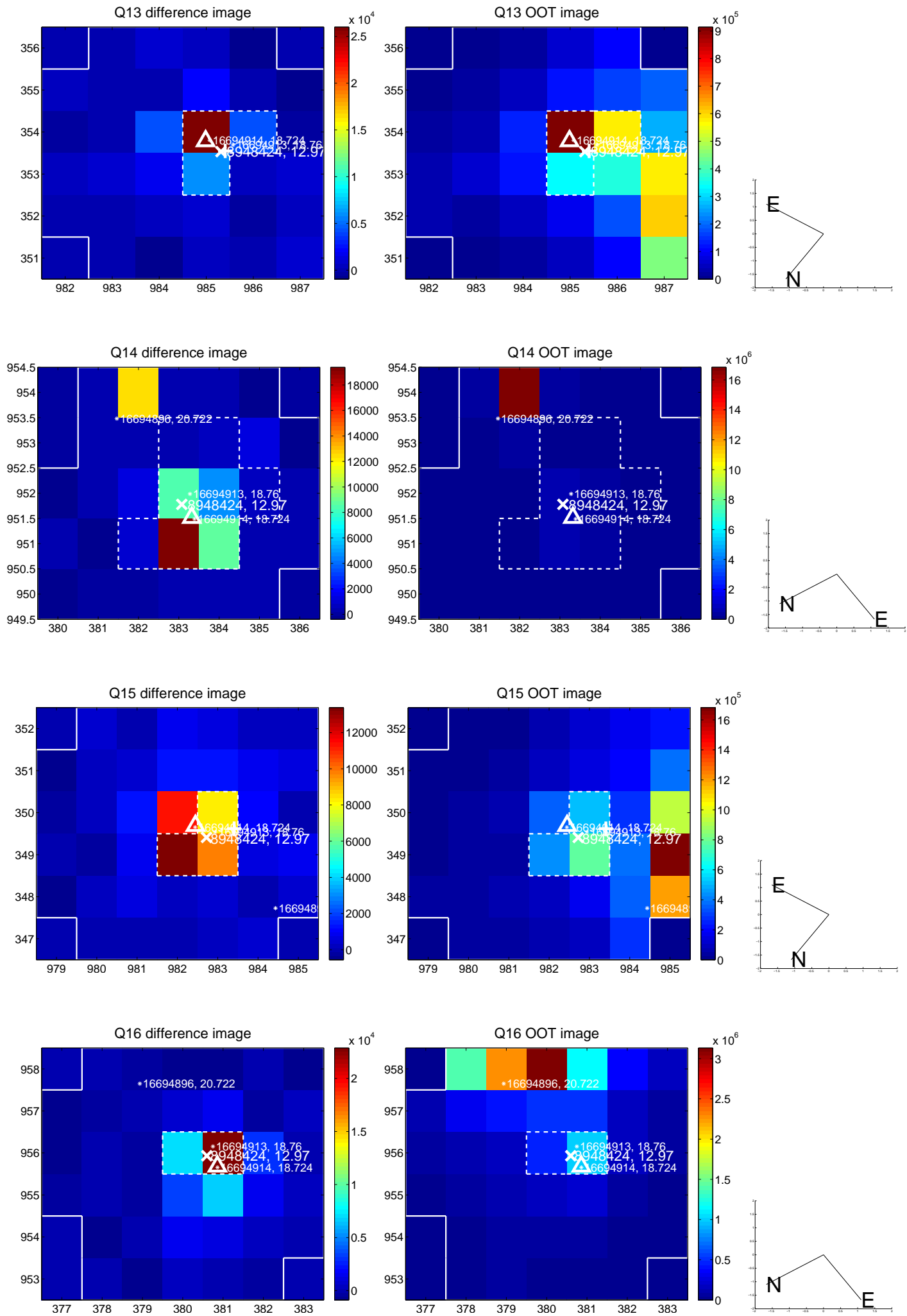
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



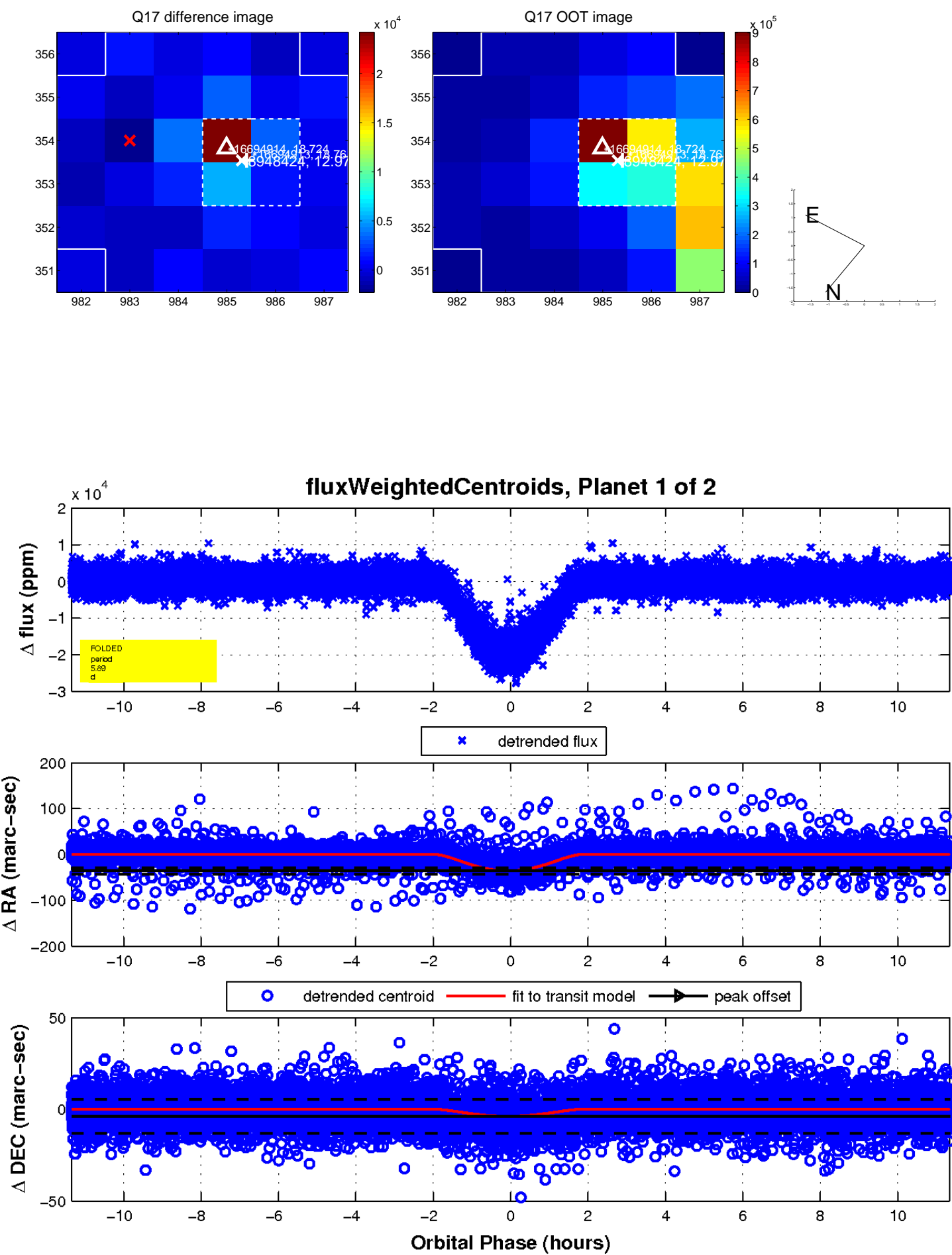
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

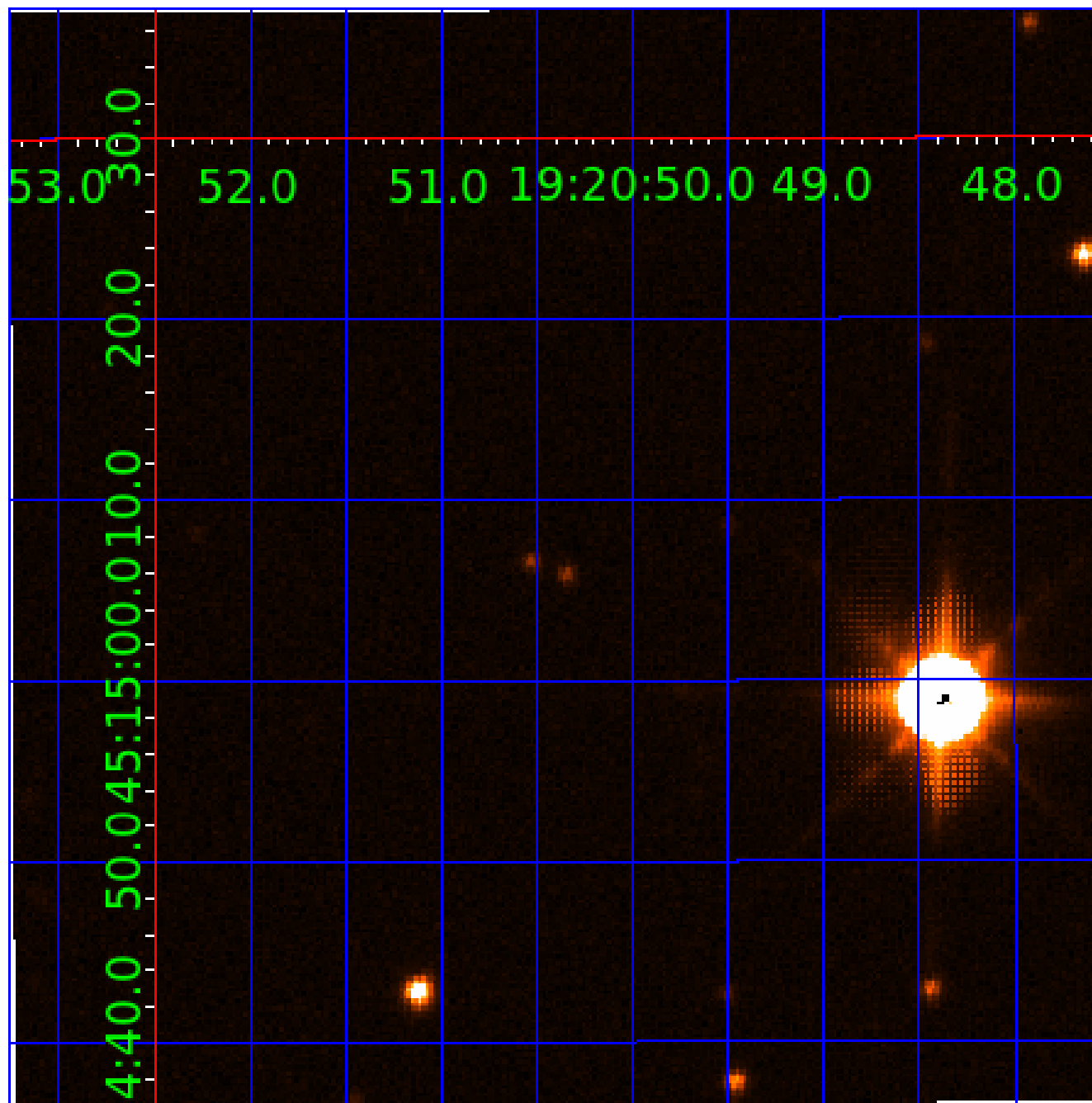


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008948424

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008948424-01	OBS	0322.01	5.888833	132.361266	19660.8	3.782	227.1	214.2	1.00	5780	18.83	245.41
008948424-02	OBS	No	5.888793	134.875033	810.9	3.064	9.6	10.7	1.00	5780	3.44	245.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008948424-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
008948424-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

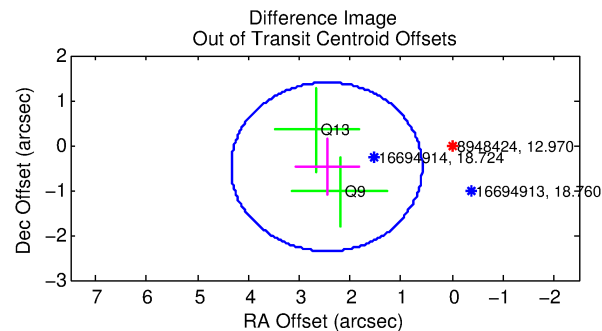
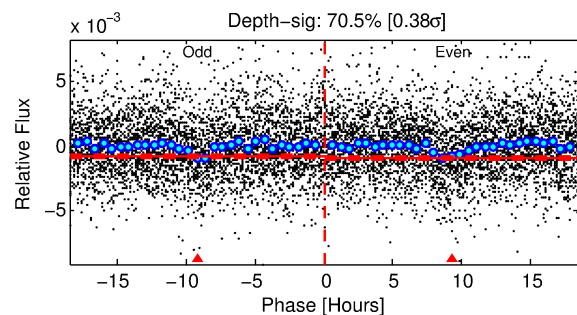
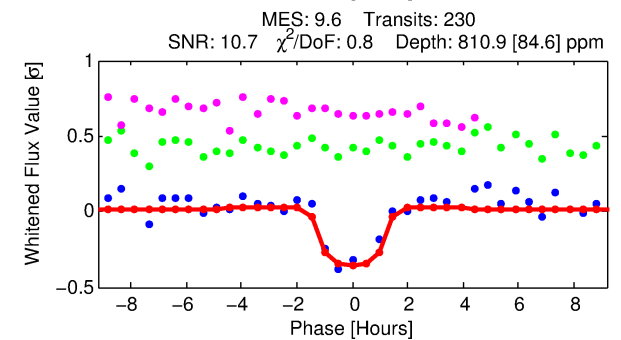
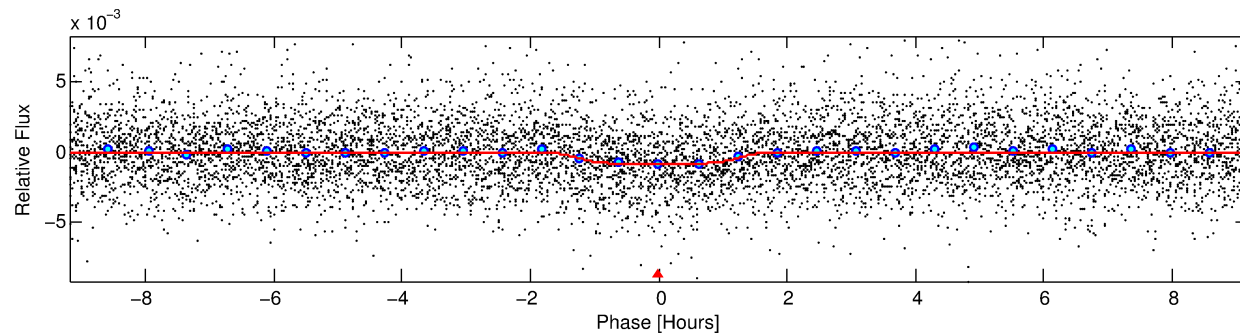
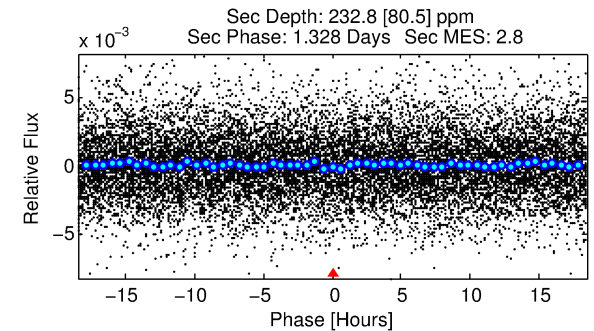
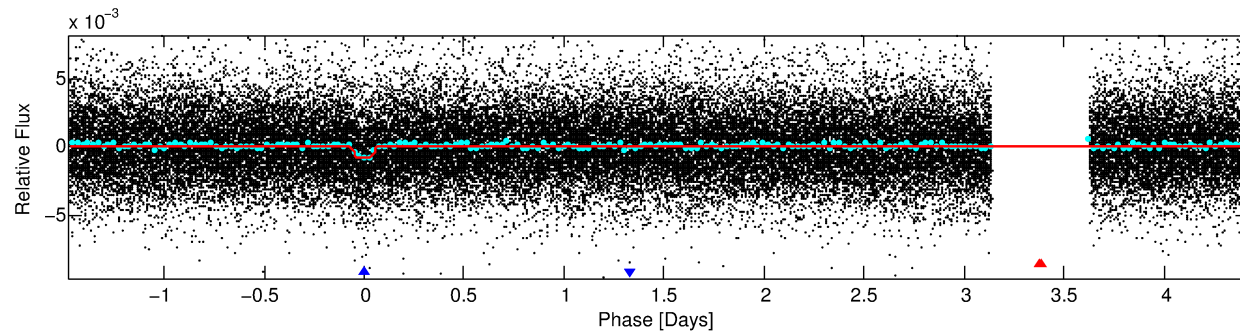
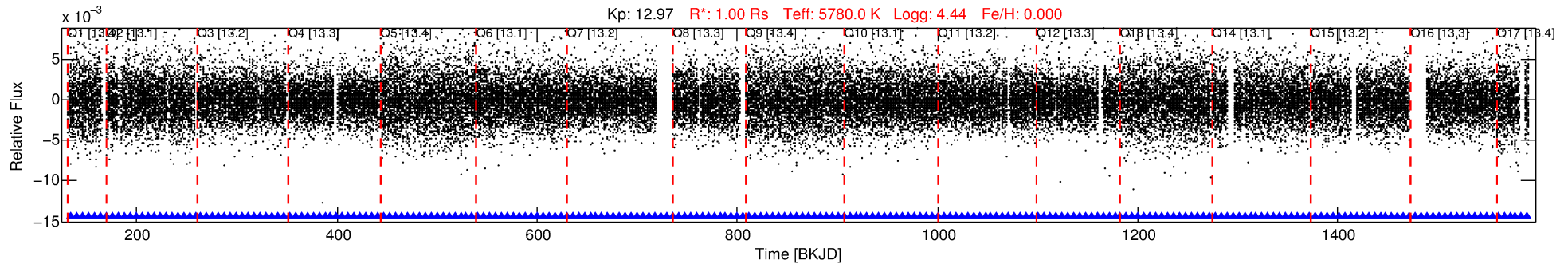
## Ephemeris Match Information For 008948424-02

No Significant Match Found

# DV One-Page Summary

KIC: 8948424 Candidate: 2 of 2 Period: 5.889 d

KOI: K00322 Corr: No Ephemeris Match



## DV Fit Results:

Period = 5.88879 [0.00005] d  
Epoch = 134.8750 [0.0057] BKJD  
 $R_p/R^*$  = 0.0315 [0.0060]  
 $a/R^*$  = 7.13 [5.73]  
 $b$  = 0.91 [0.15]  
 $S_{\text{eff}}$  = 245.42 [0.00]  
 $T_{\text{eq}}$  = 1009 [0] K  
 $R_p$  = 3.44 [0.66]  $R_e$   
 $a$  = 0.0638 [0.0000] AU  
 $A_g$  = 44.22 [22.80] [1.90σ]  
 $T_{\text{eff}}$  = 4024 [519] K [5.81σ]

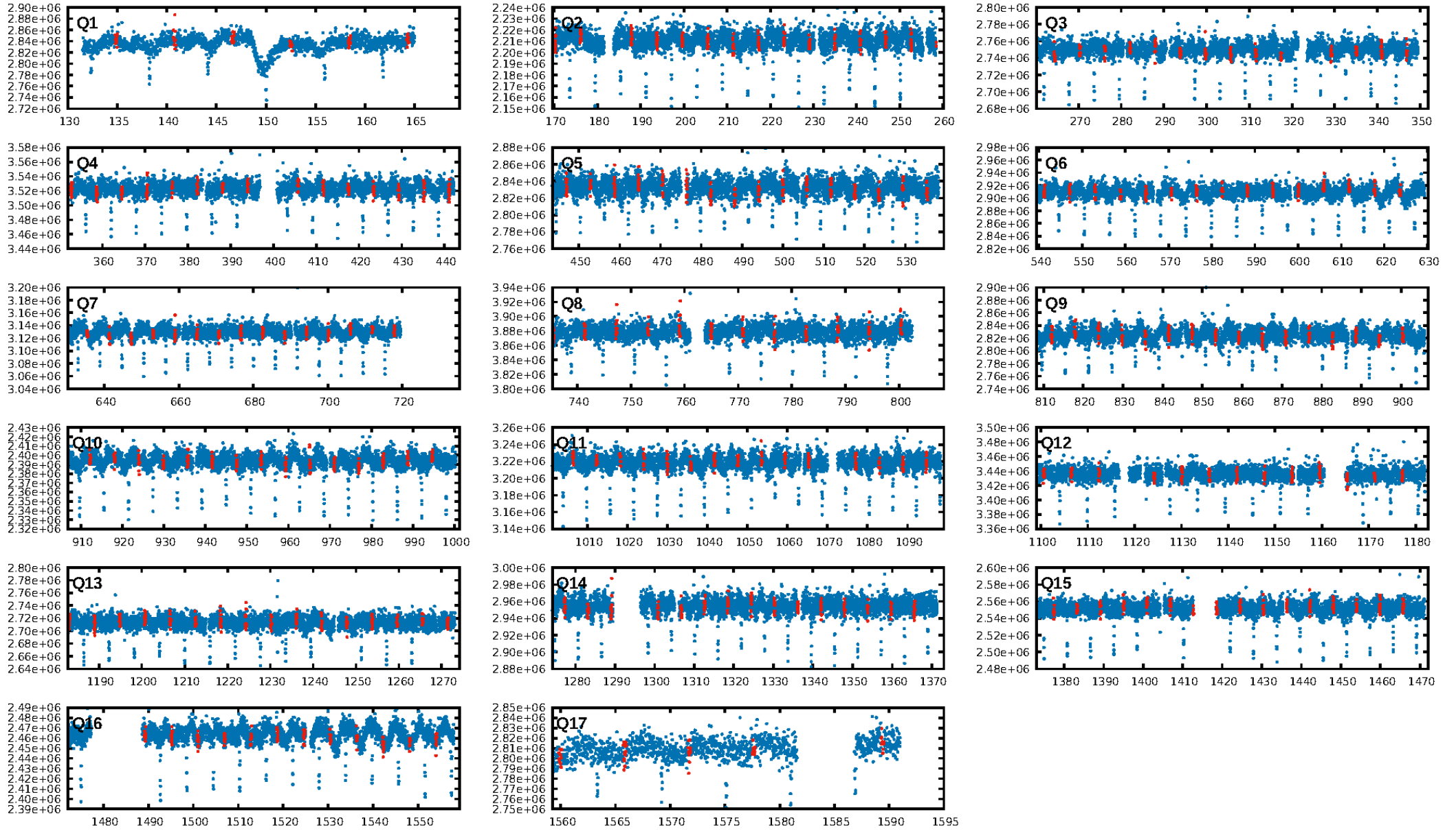
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.03e-21  
RollingBand-fgt: 1.00 [219/219]  
GhostDiagnostic-chr: 3.198  
Centroid-sig: 1.0%  
Centroid-so: 1.123 arcsec [1.31σ]  
OotOffset-rm: 2.506 arcsec [4.00σ]  
KicOffset-rm: 2.672 arcsec [0.96σ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 1/0/2/3 [6]  
DiffImageQuality-fgm: 0.17 [1/6]  
DiffImageOverlap-fno: 1.00 [17/17]

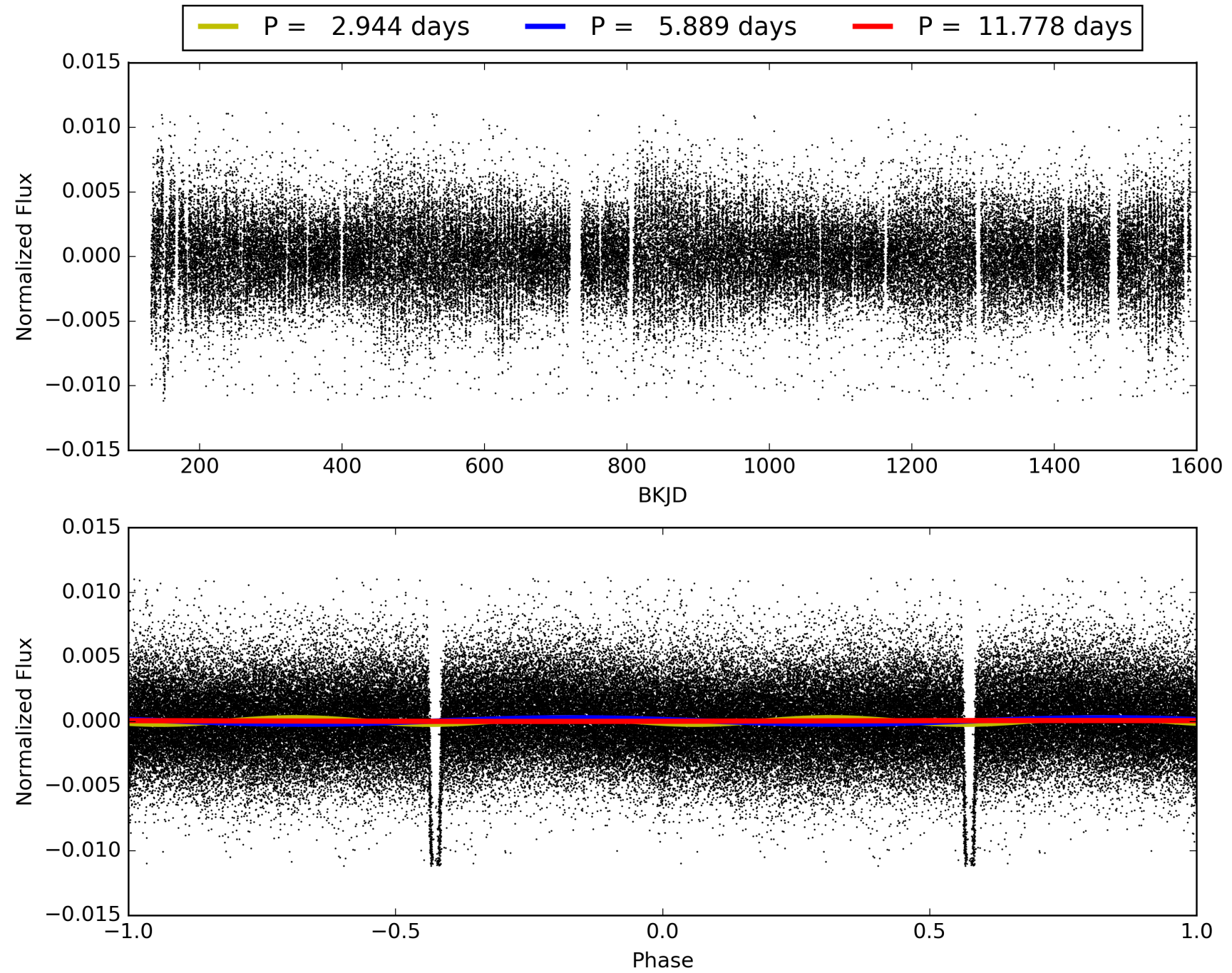
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:19:42 Z

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

# TCE 008948424-02, PDC Light Curves

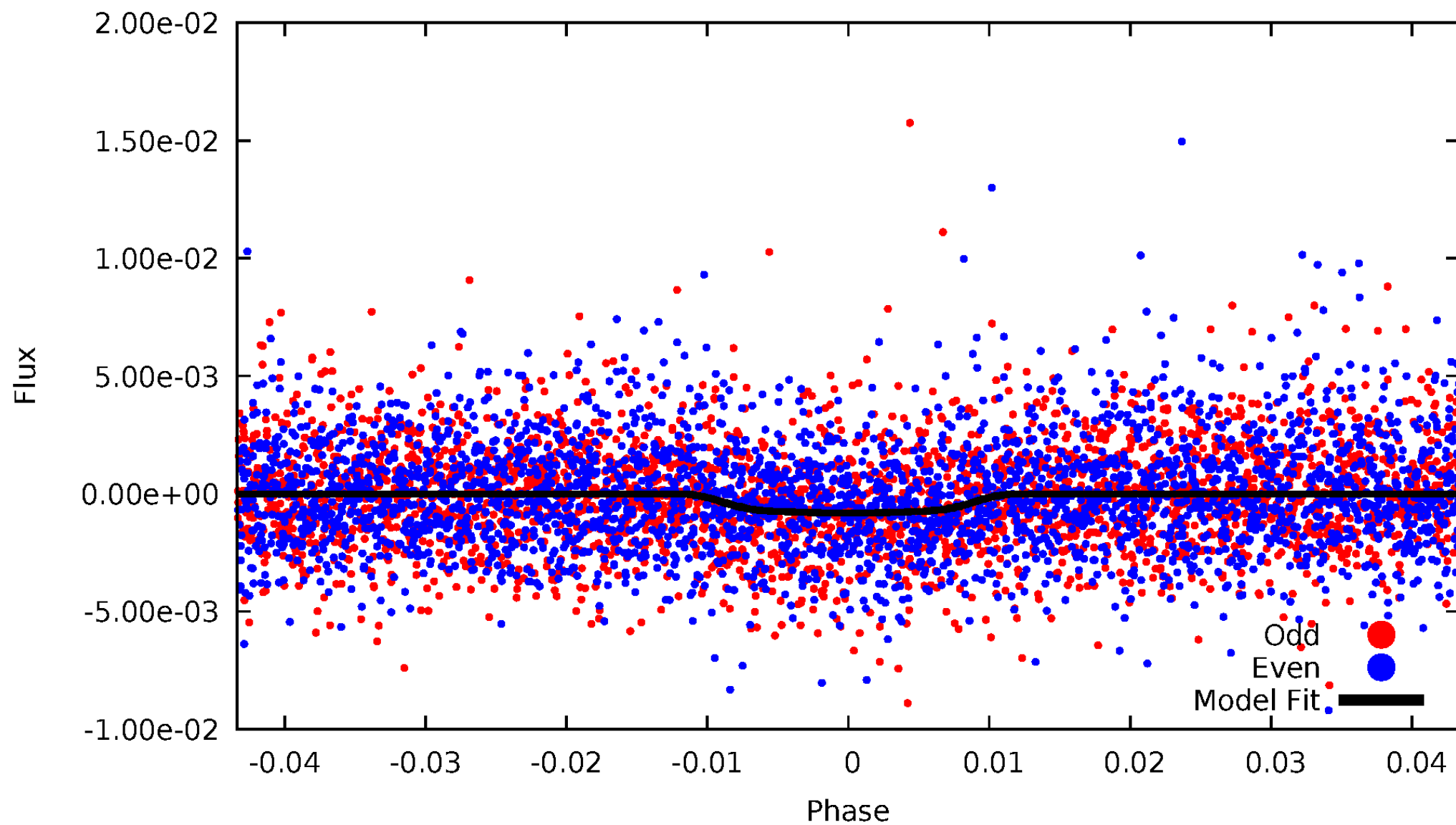


TCE 008948424-02



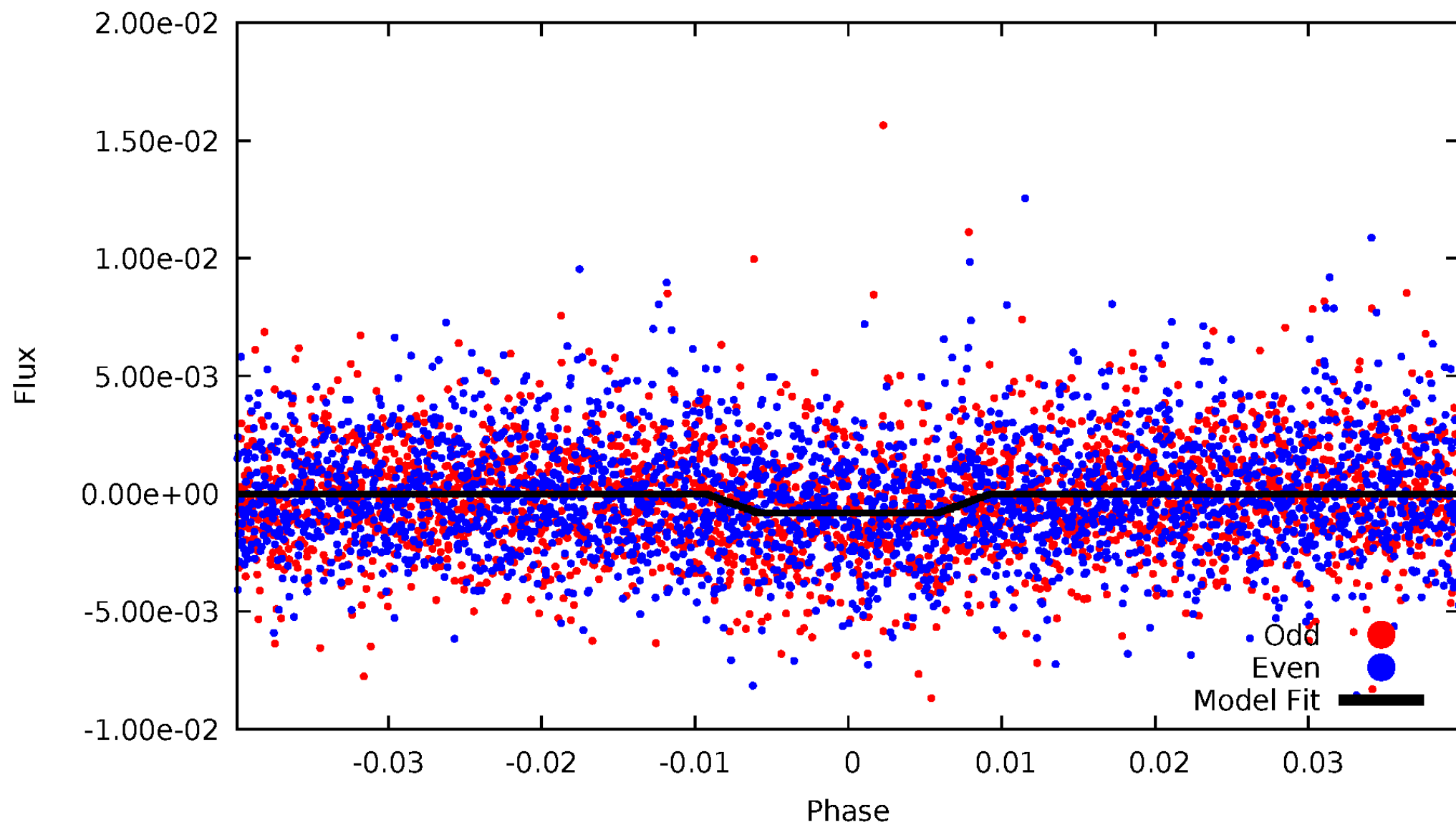
# DV Odd/Even

TCE 008948424-02



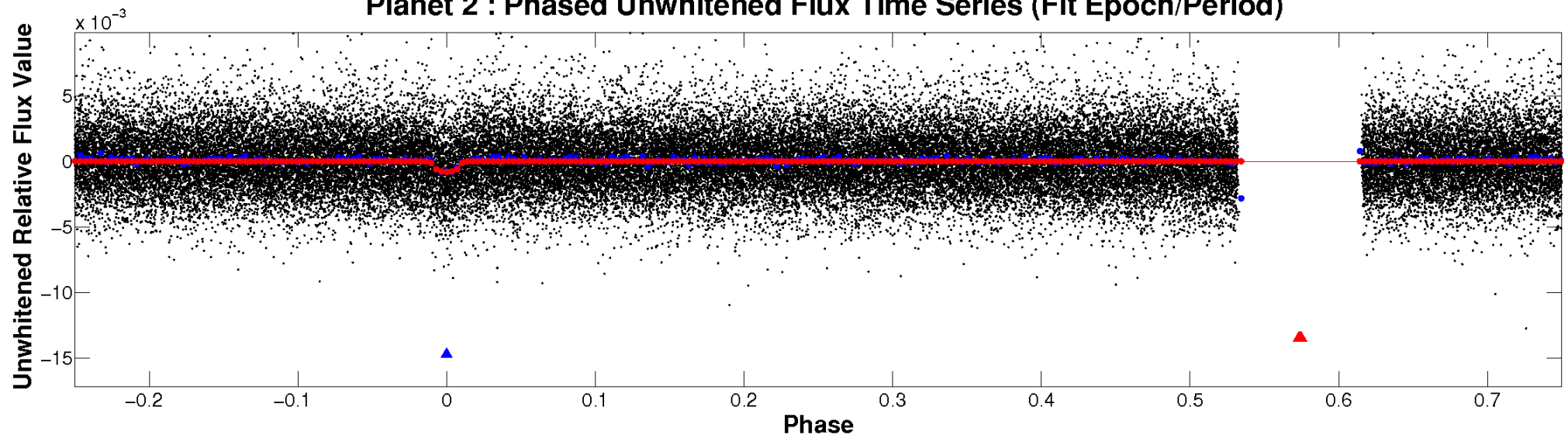
# ALT Odd/Even

TCE 008948424-02

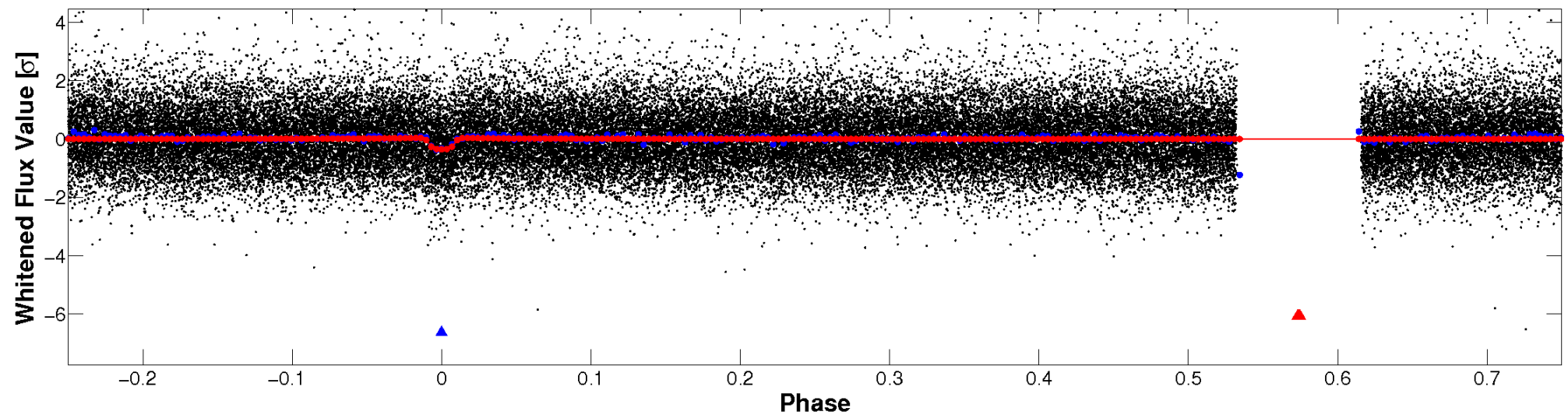


# Non-Whitened Vs. Whitened Light Curve

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

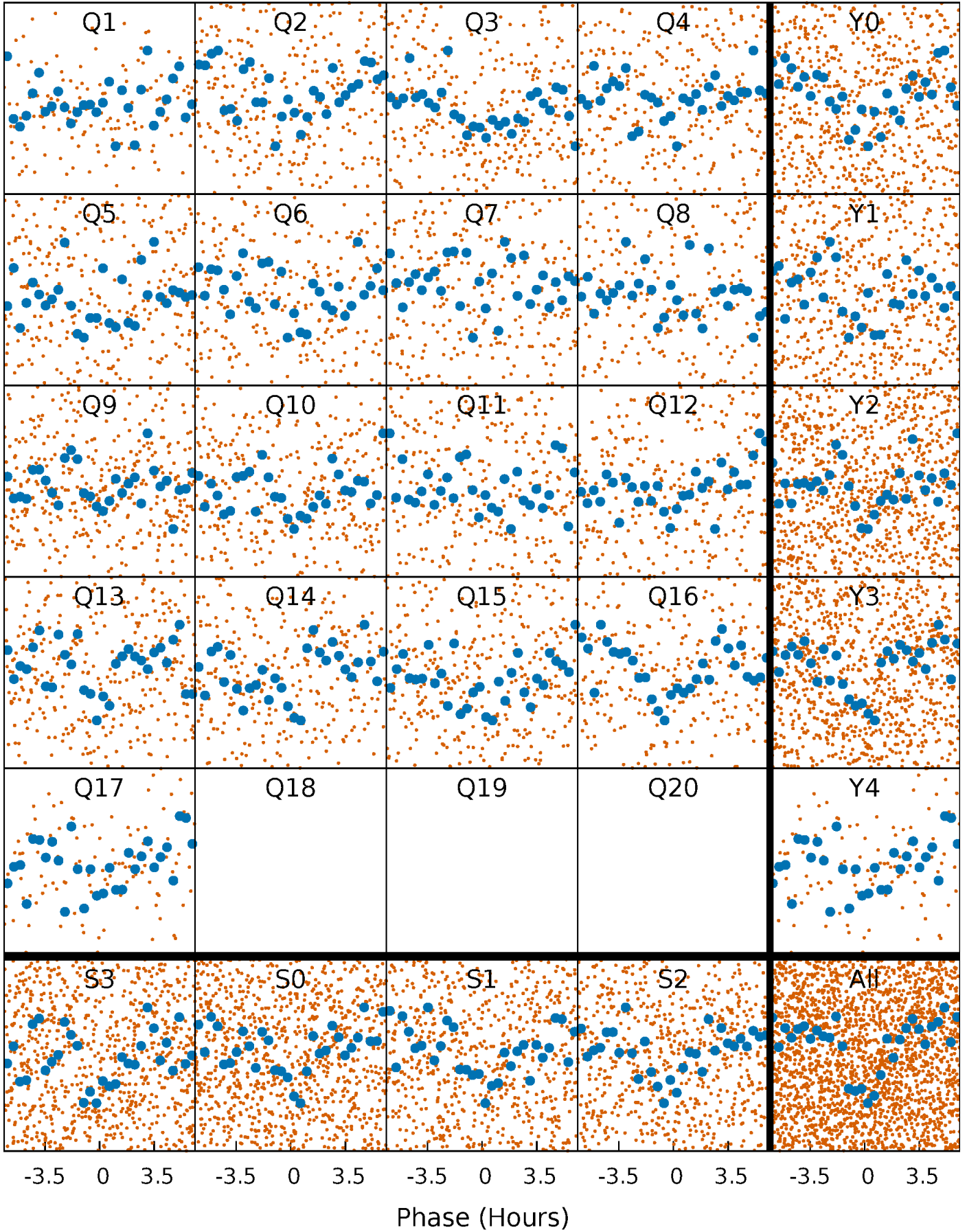


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



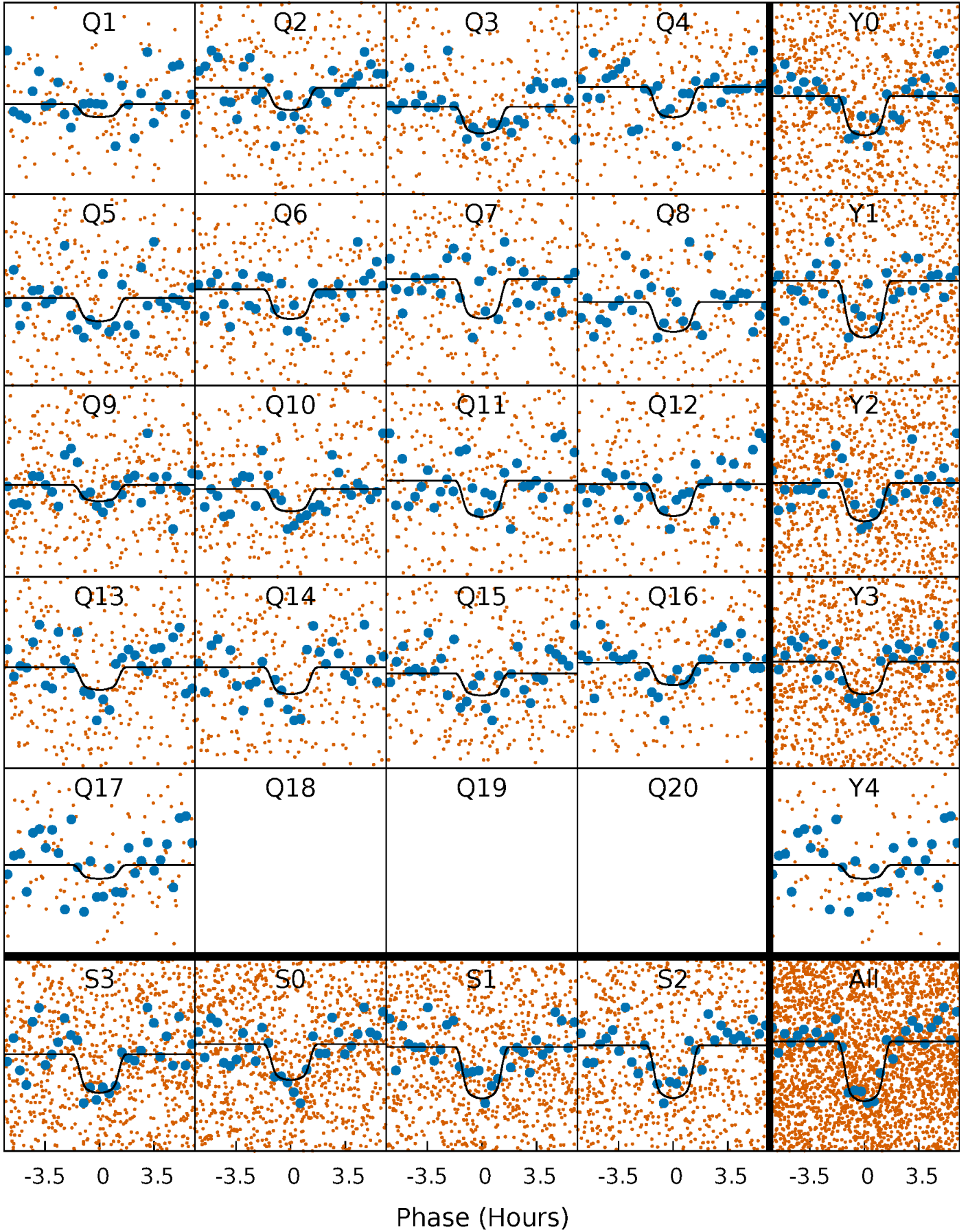
# PDC Quarter-Phased Transit Curves

TCE 008948424-02 P= 5.888793 Days  $T_0=134.875033$  (BKJD)



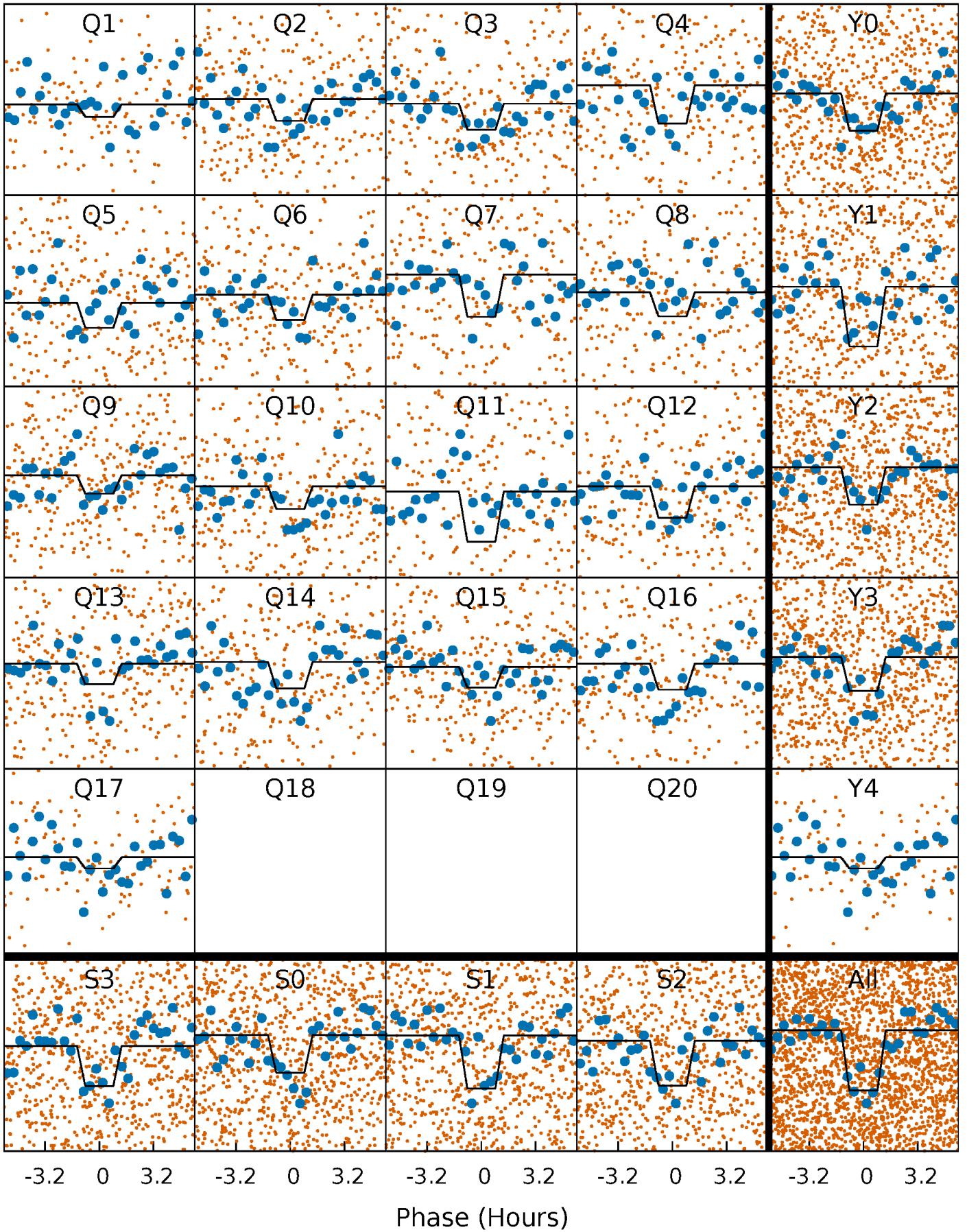
# DV Quarter-Phased Transit Curves

TCE 008948424-02   P= 5.888793 Days    $T_0=134.875033$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

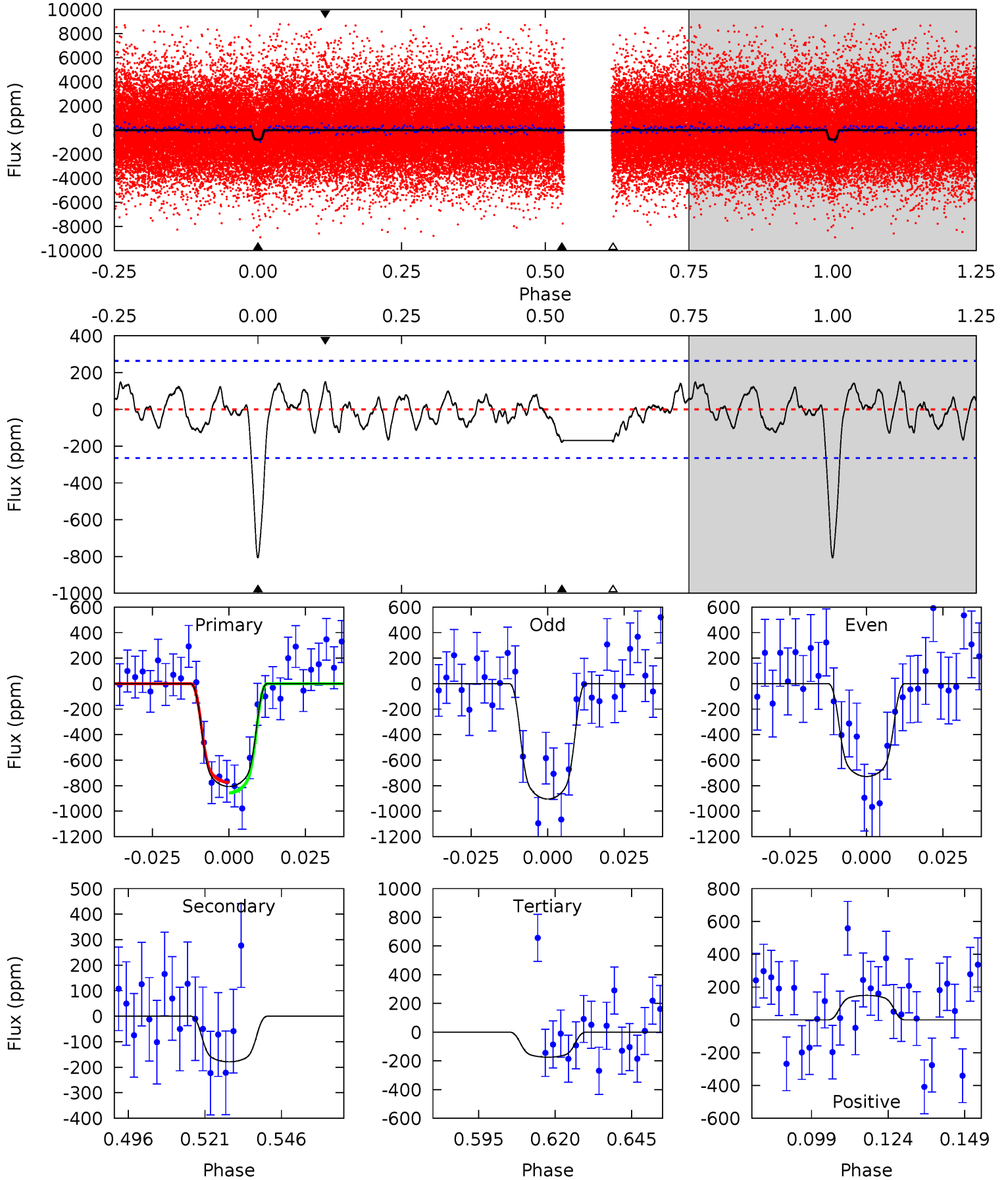
TCE 008948424-02   P= 5.888689 Days    $T_0=134.887465$  (BKJD)



# DV Model-Shift Uniqueness Test

008948424-02, P = 5.888793 Days, E = 128.986240 Days

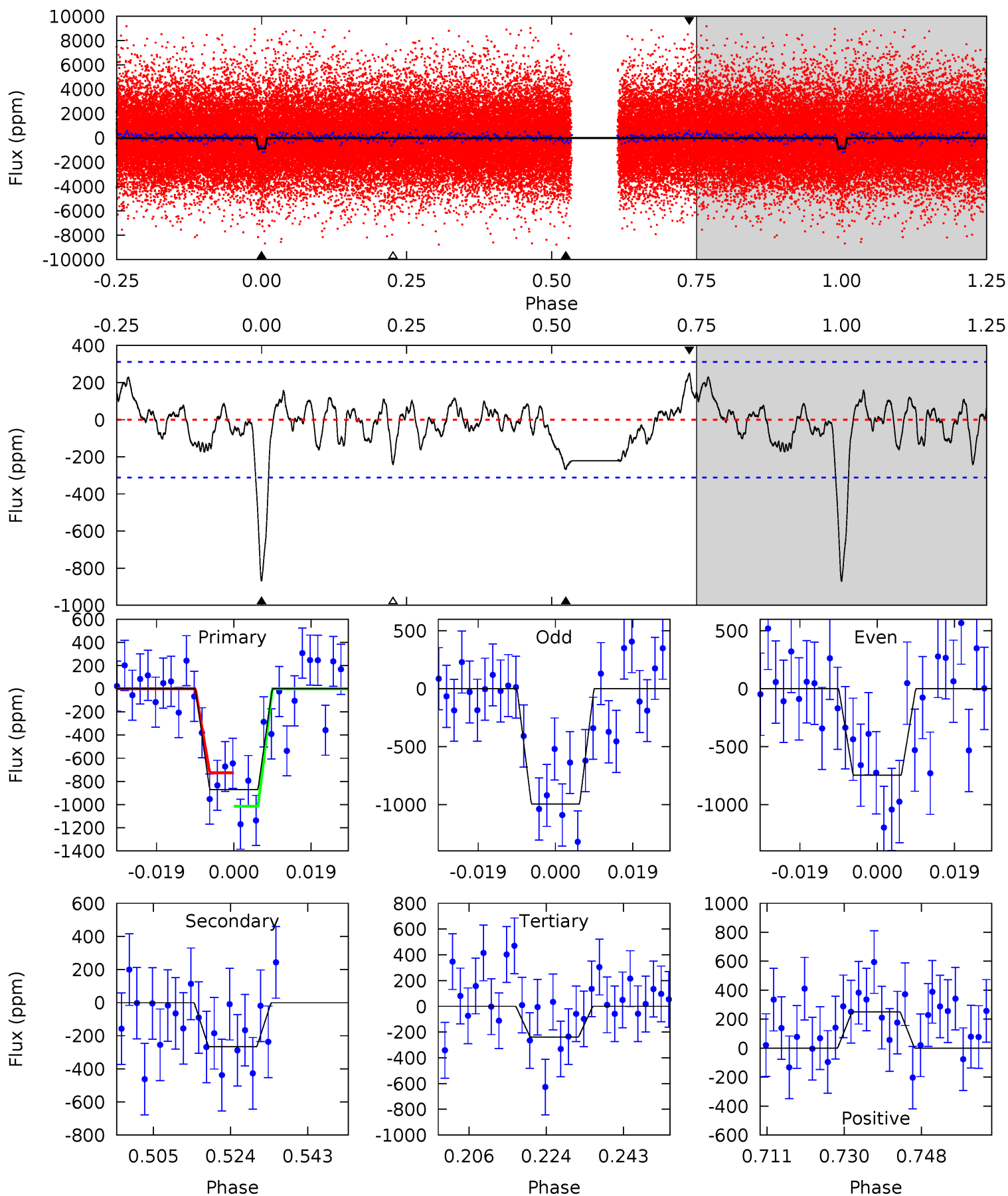
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	3.28	3.20	2.74	4.85	2.24	1.25	11.6	12.1	0.08	0.54	1.62	1.03	0.16	0.76



# Alt Model-Shift Uniqueness Test

008948424-02, P = 5.888689 Days, E = 128.998776 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
13.7	4.20	3.77	3.94	4.90	2.35	1.36	9.93	9.76	0.42	0.26	1.97	1.07	0.22	2.28



### Stellar Parameters For KIC 008948424

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

### Secondary Eclipse Parameters for KIC 008948424-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-179 \pm 55$	$3.43^{+0.73}_{-0.69}$	$1415^{+66}_{-67}$	$4062^{+430}_{-347}$	$33^{+23}_{-14}$
Alt.	$-266 \pm 64$	$3.17^{+0.72}_{-0.67}$	$1412^{+70}_{-66}$	$4481^{+567}_{-389}$	$57^{+45}_{-22}$

$T_{\text{max}}$  = 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

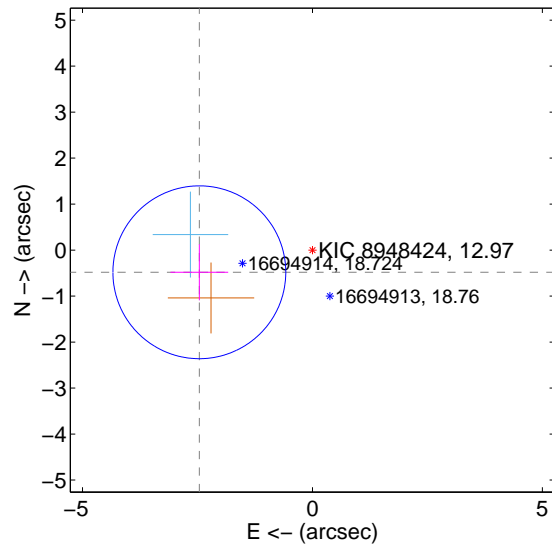
Supplemental centroid analysis for 008948424-02. Kepler magnitude: 12.97. Transit SNR 10.67

There are 1 quarters with good PRF difference image offsets

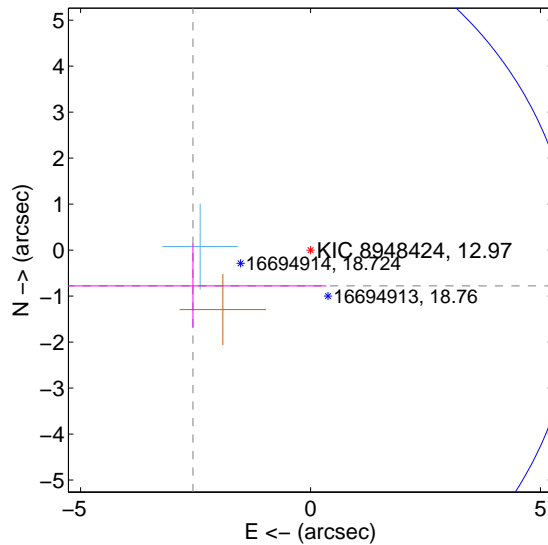
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	2.506 $\pm$ 0.626	4.00	2.459 $\pm$ 0.627	-0.482 $\pm$ 0.609
PRF-fit source offset from KIC position	2.672 $\pm$ 2.773	0.96	2.556 $\pm$ 2.898	-0.778 $\pm$ 0.917
photometric centroid source offset	1.12 $\pm$ 0.85	1.31	-0.77 $\pm$ 1.02	-0.82 $\pm$ 0.68

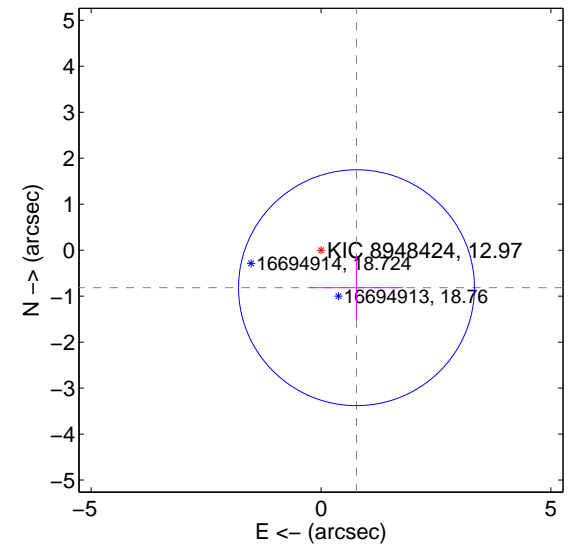
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

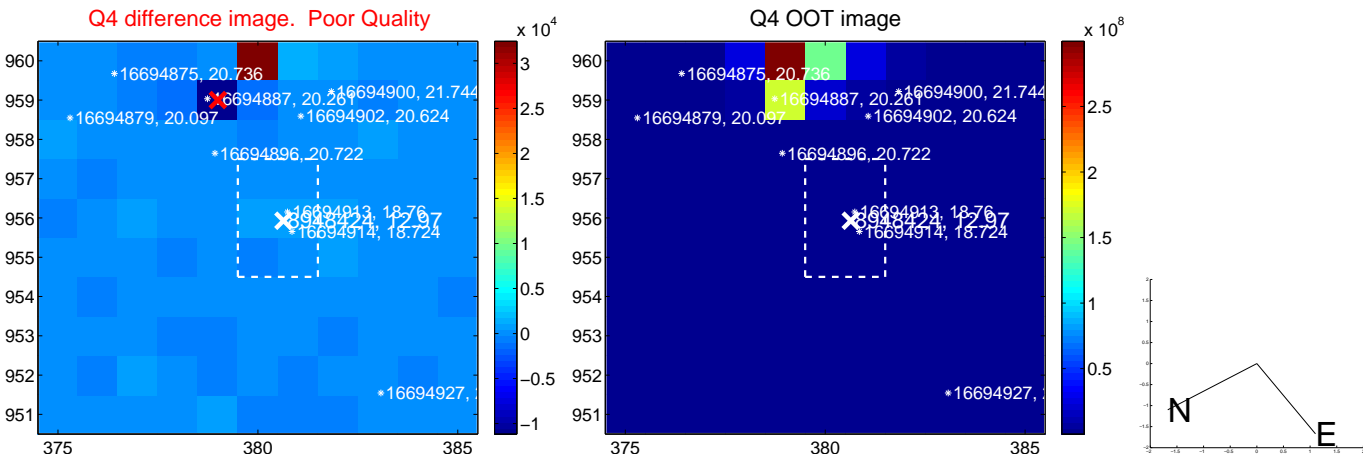
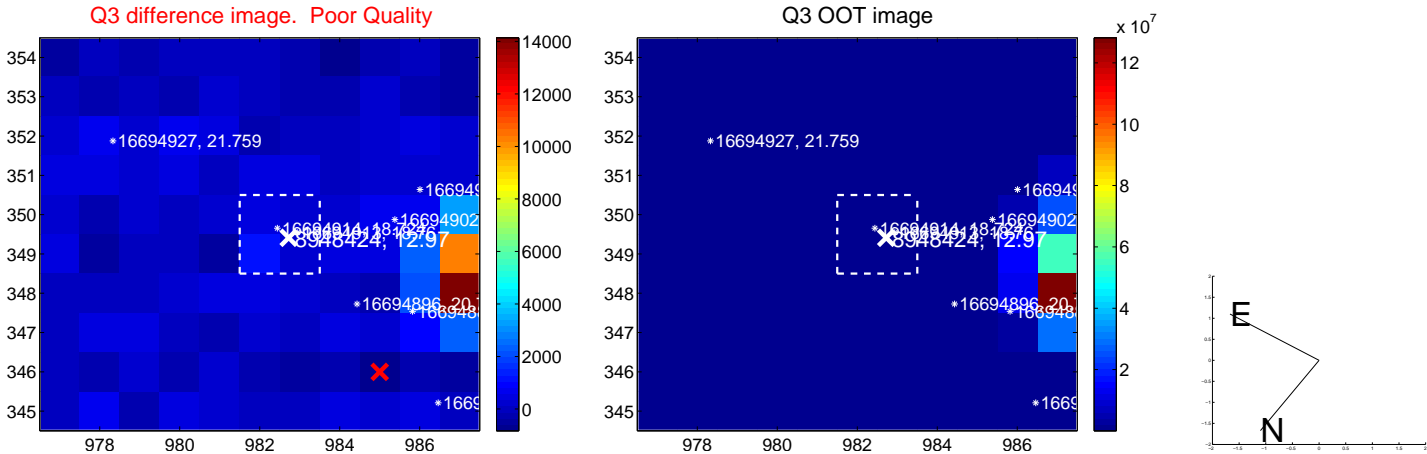
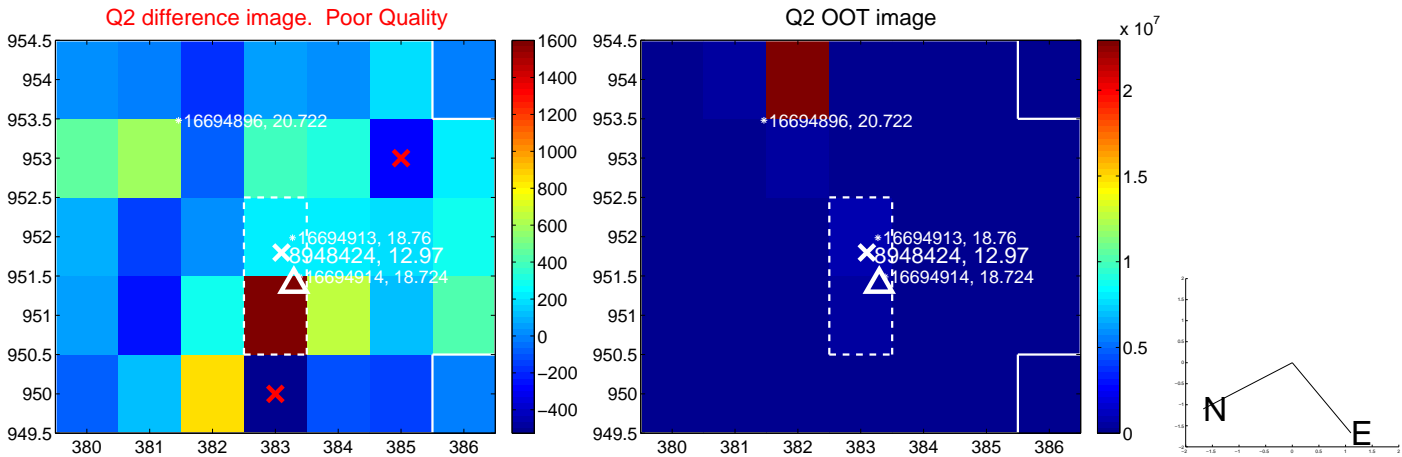
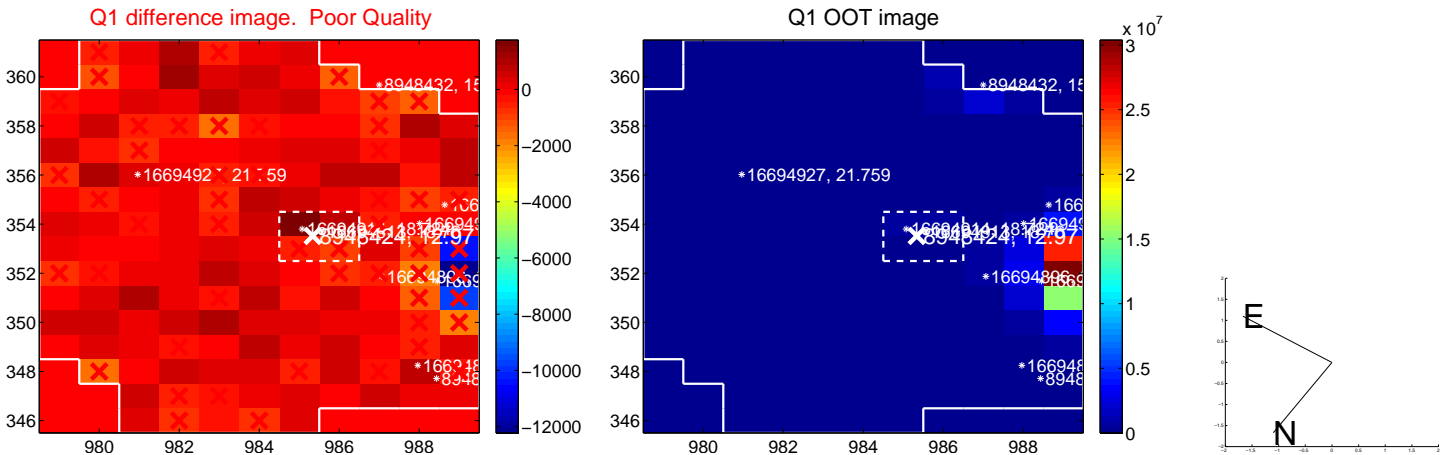


offset from photometric centroids

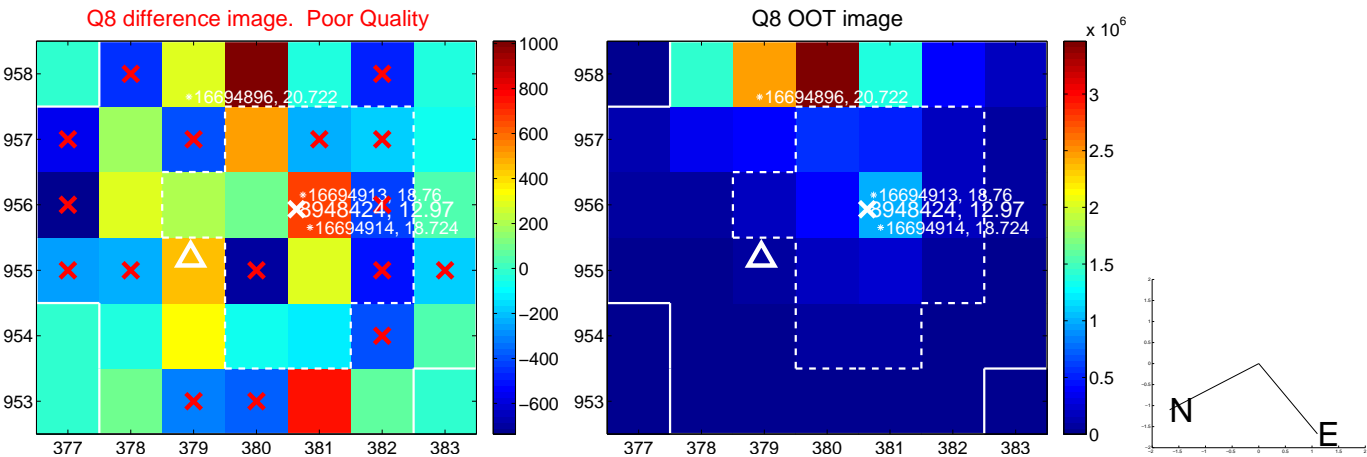
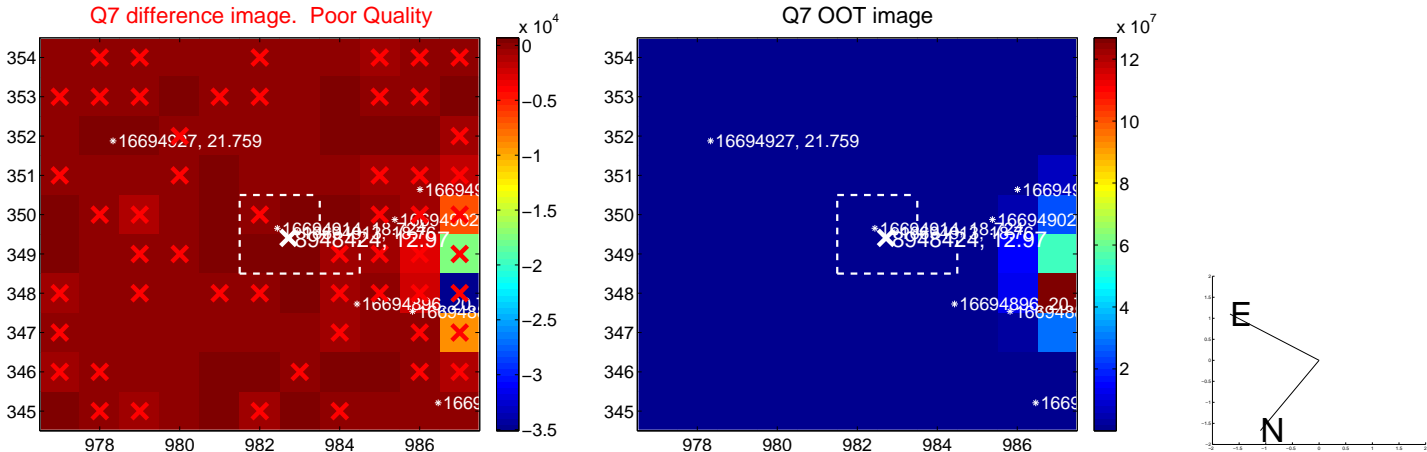
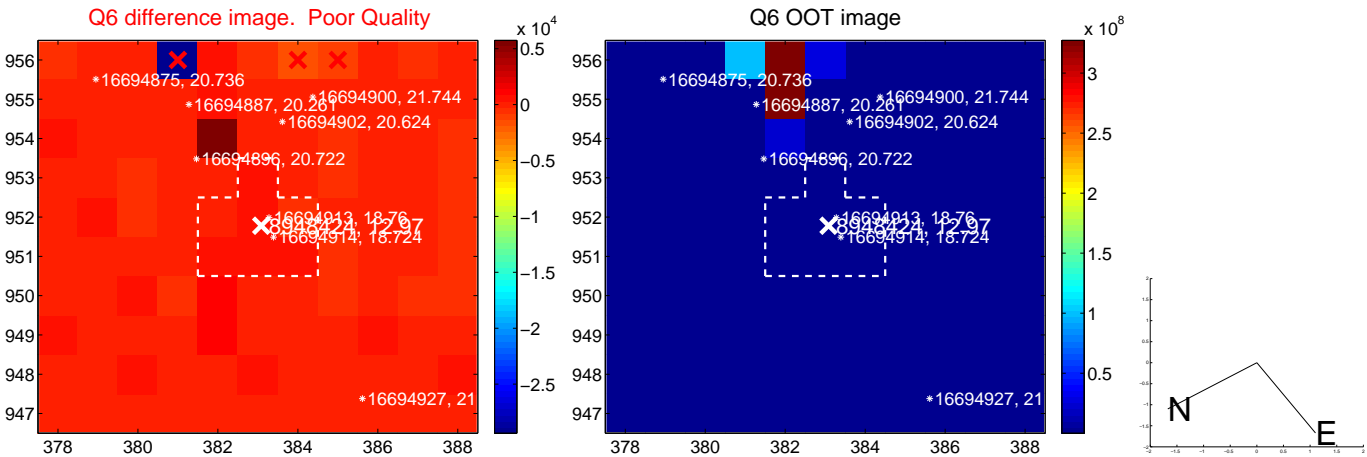
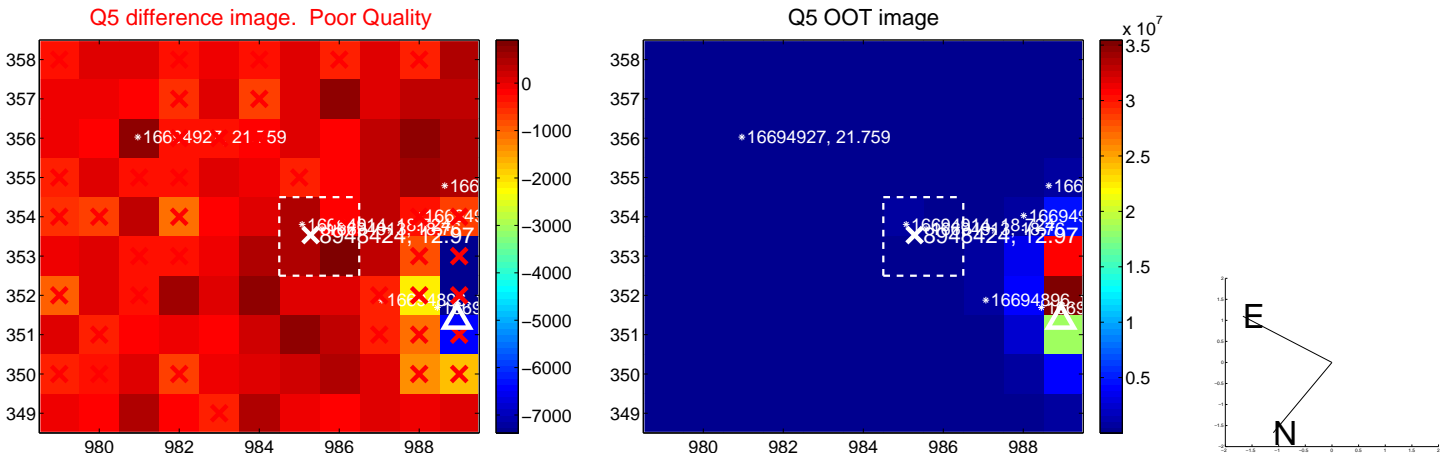


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

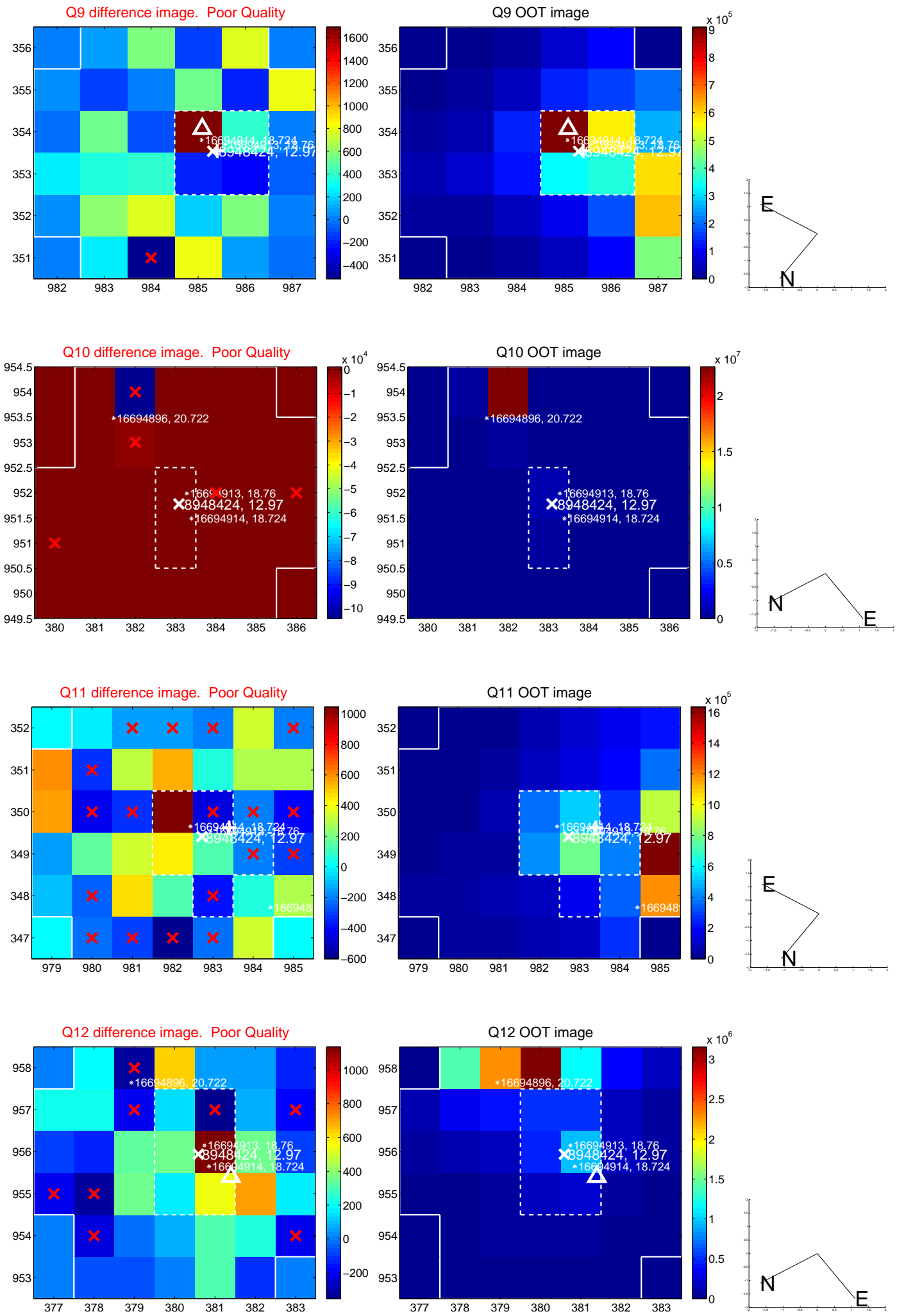
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



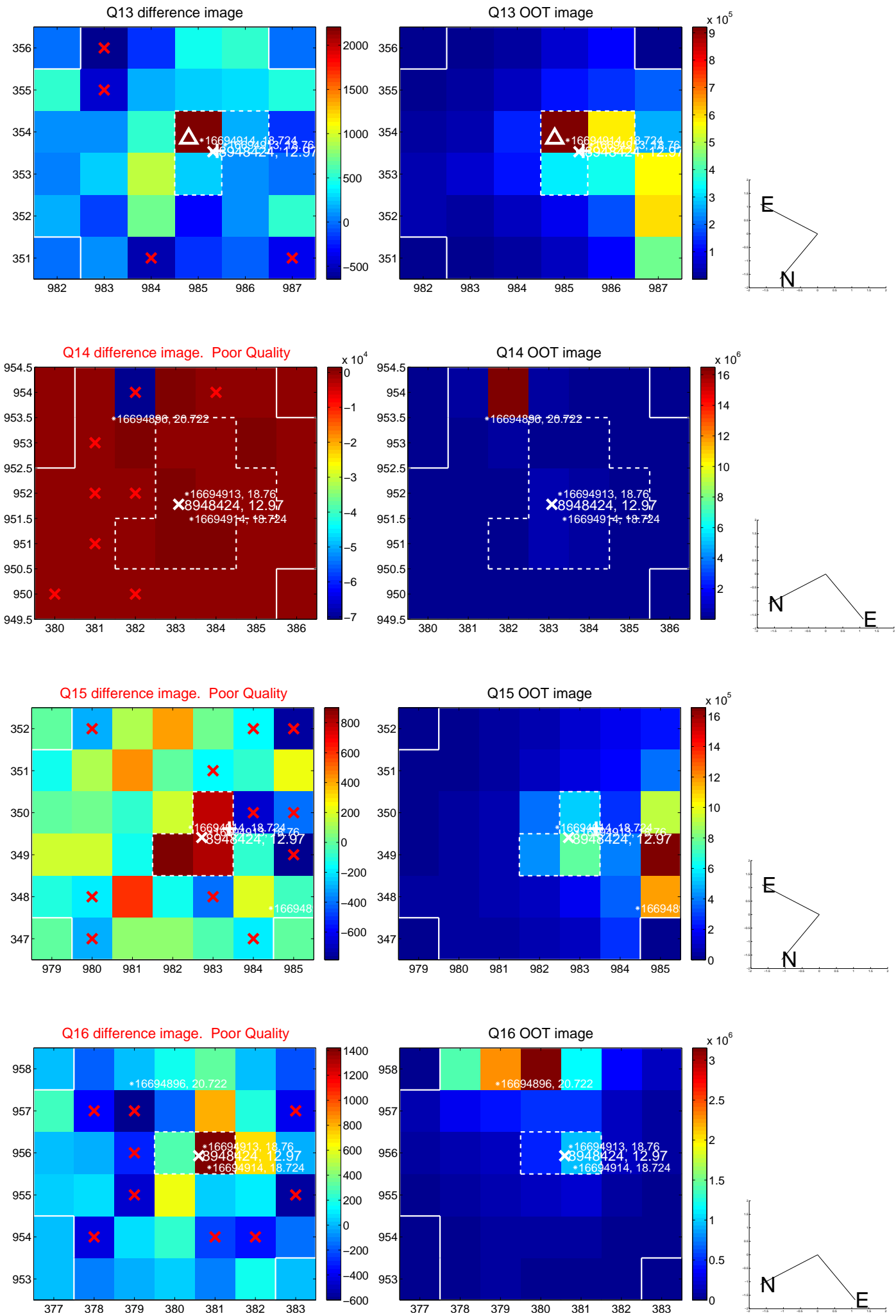
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



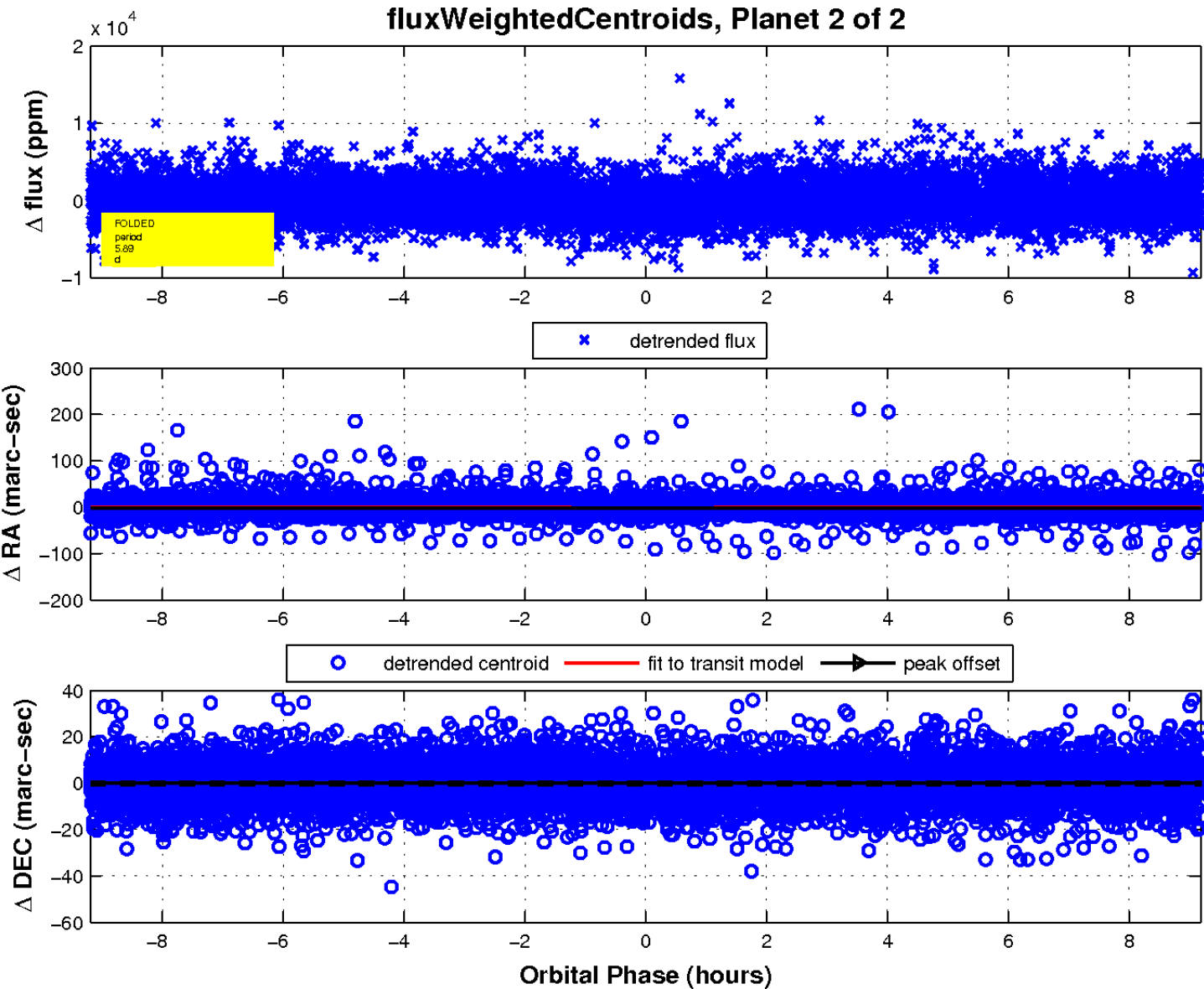
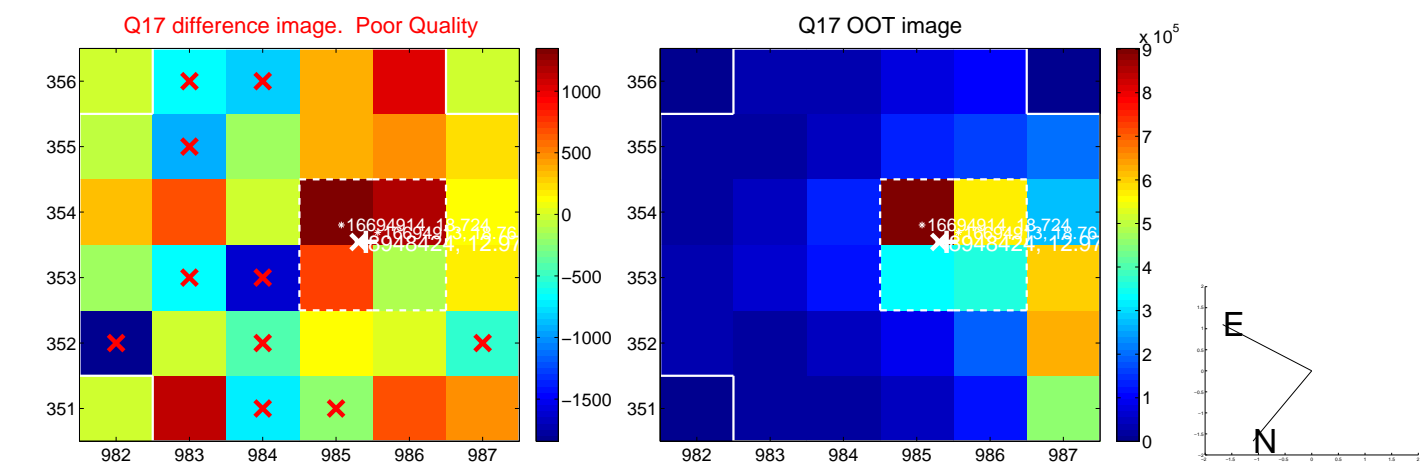
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

