

# KIC 003240706

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003240706-01	OBS	1098.01	5.489912	134.103629	552.3	3.766	29.5	33.3	0.96	5982	3.50	276.51
003240706-02	OBS	No	5.489900	131.525574	530.8	3.232	27.9	30.5	0.96	5982	3.37	276.51

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003240706-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST
003240706-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST

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

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

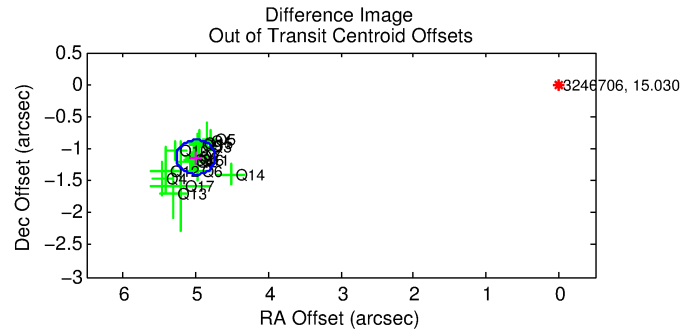
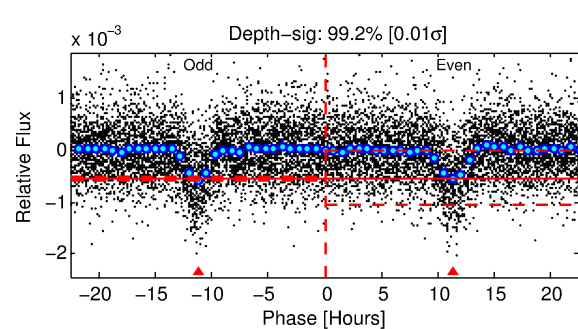
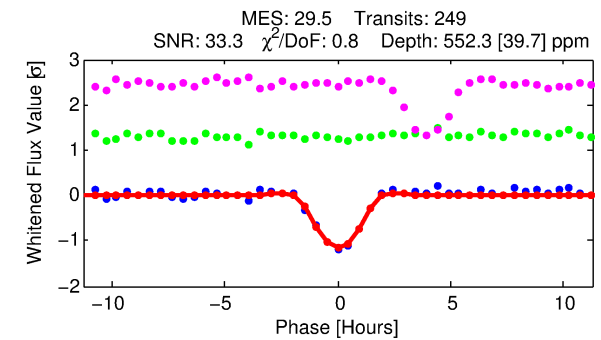
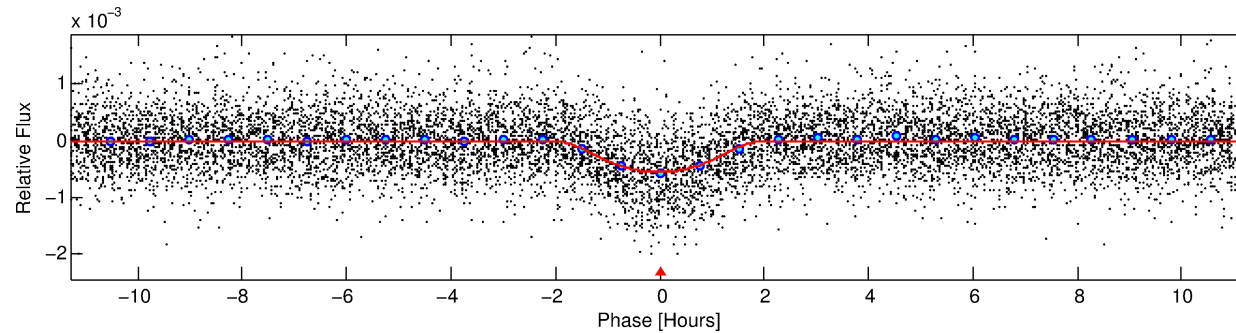
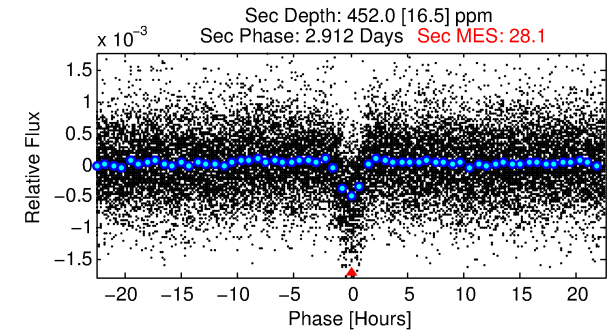
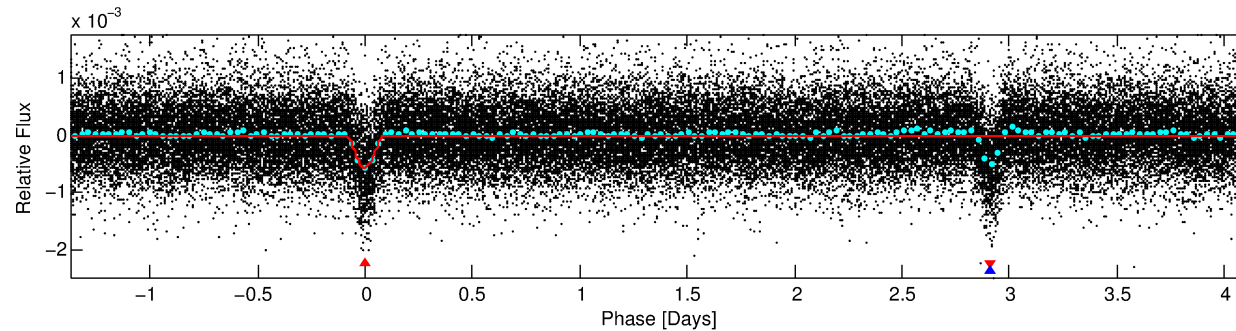
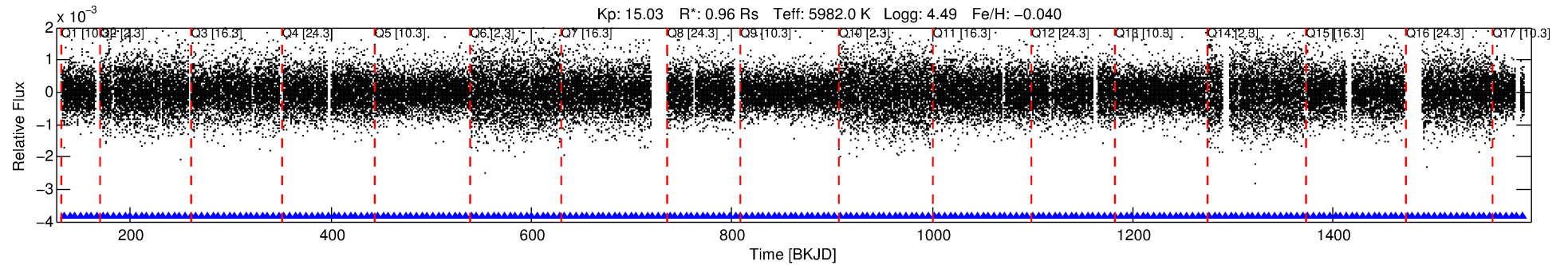
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003240706-01

No Significant Match Found

# DV One-Page Summary

KIC: 3240706 Candidate: 1 of 2 Period: 5.490 d  
KOI: K01098.01 Corr: 0.978



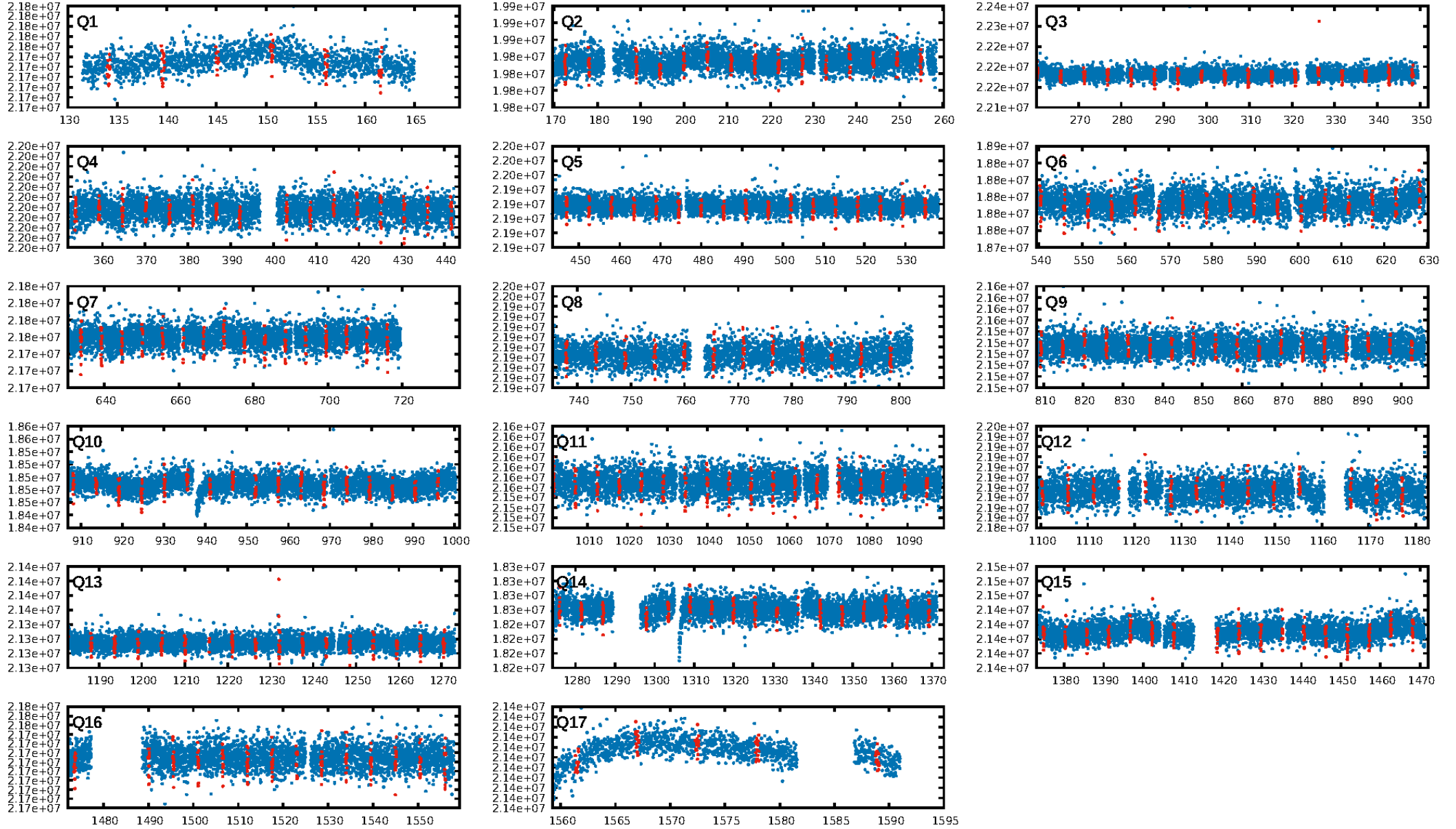
## DV Fit Results:

Period = 5.48991 [0.00002] d  
Epoch = 134.1036 [0.0026] BKJD  
Rp/R\* = 0.0334 [0.0149]  
a/R\* = 3.63 [0.61]  
b = 0.98 [0.03]  
Seff = 276.51 [98.60]  
Teq = 1040 [93] K  
Rp = 3.50 [1.81] Re  
a = 0.0618 [0.0139] AU  
Ag = 77.46 [73.79] [1.04σ]  
Teff = 4769 [1076] K [3.45σ]

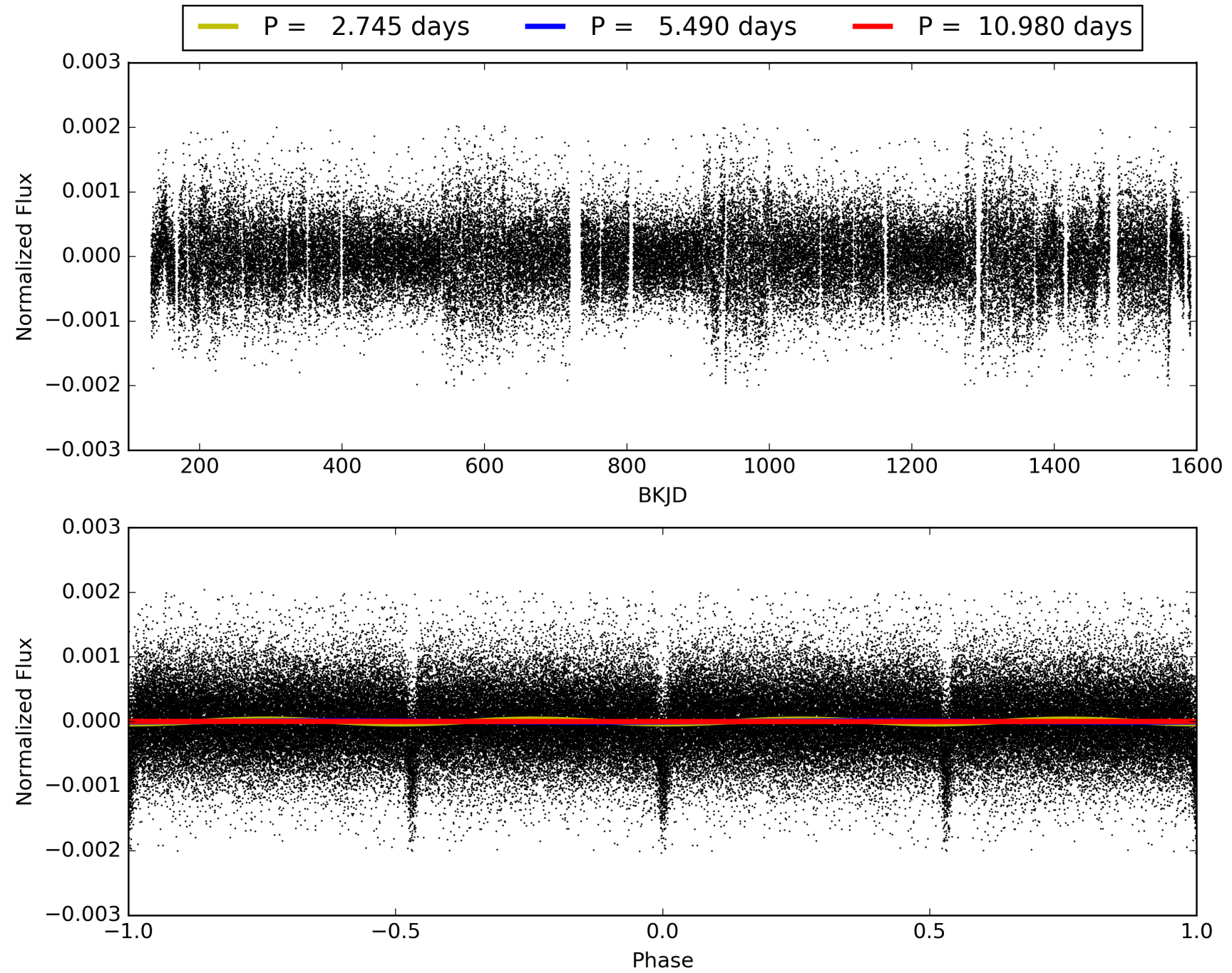
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.51e-189  
RollingBand-fgt: 1.00 [238/238]  
GhostDiagnostic-chr: 0.1502  
Centroid-sig: 0.0%  
Centroid-so: 9.020 arcsec [23.67σ]  
OotOffset-rm: 5.122 arcsec [57.49σ]  
KicOffset-rm: 5.146 arcsec [59.52σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 003240706-01, PDC Light Curves

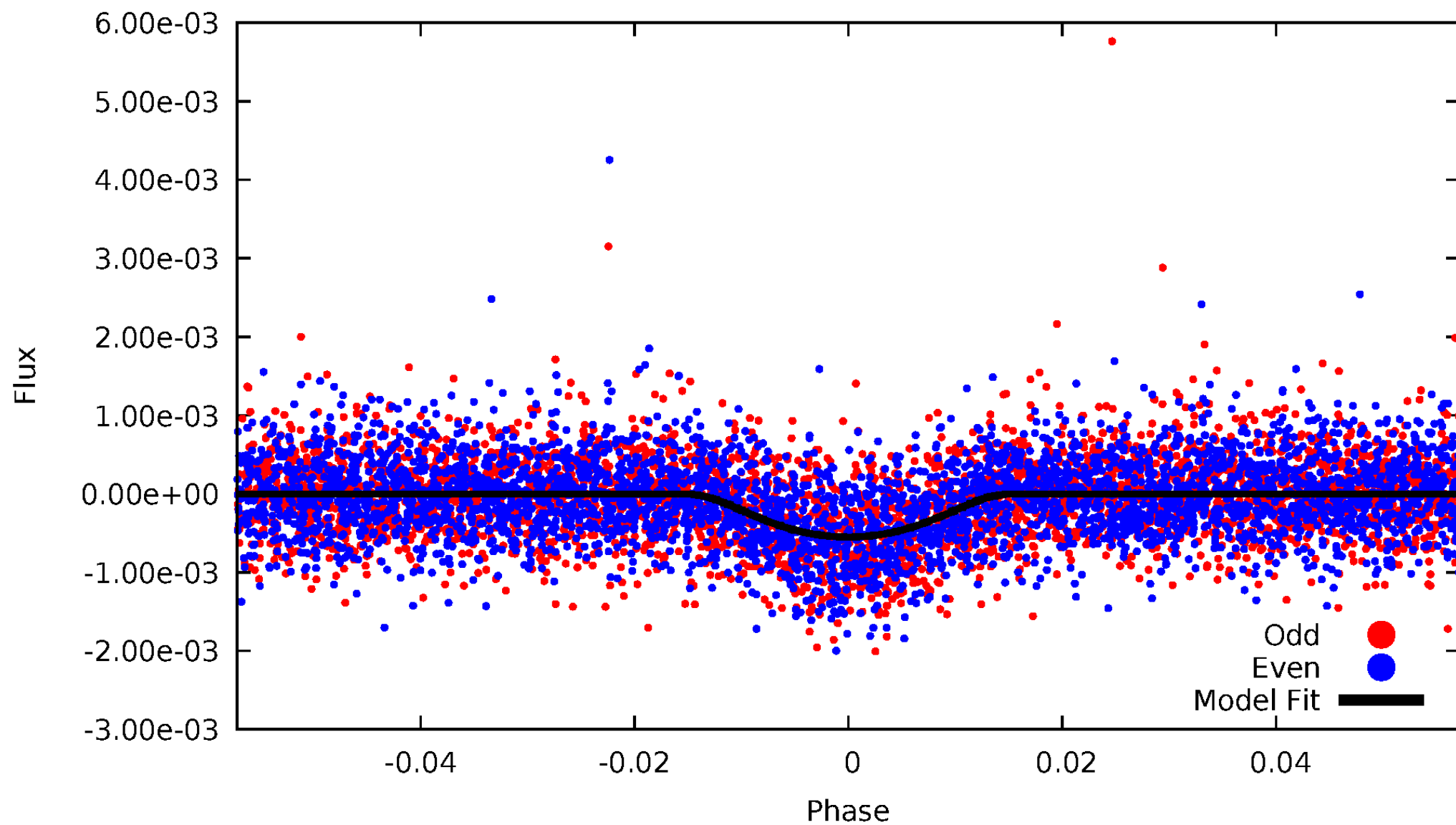


TCE 003240706-01



# DV Odd/Even

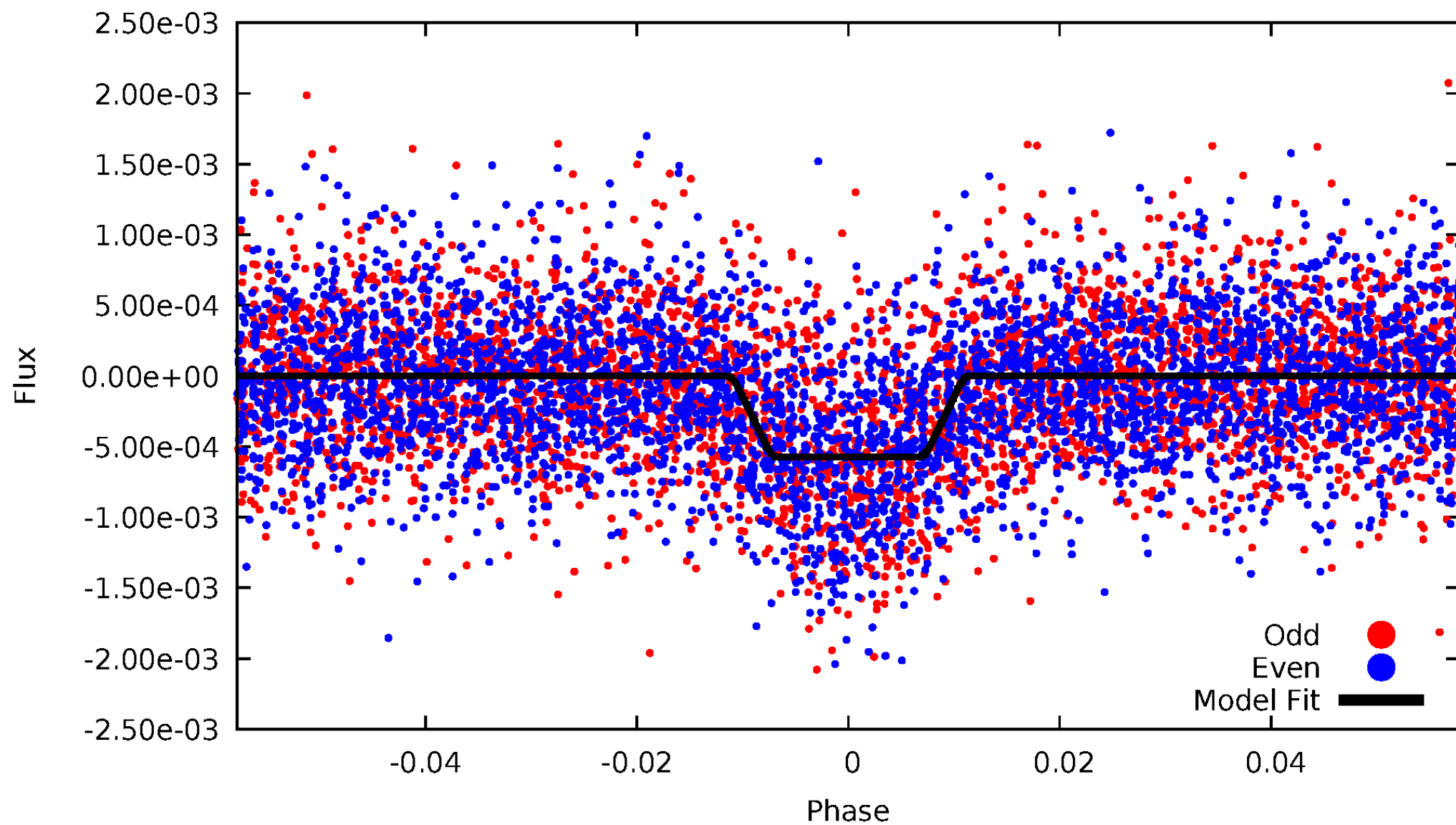
TCE 003240706-01





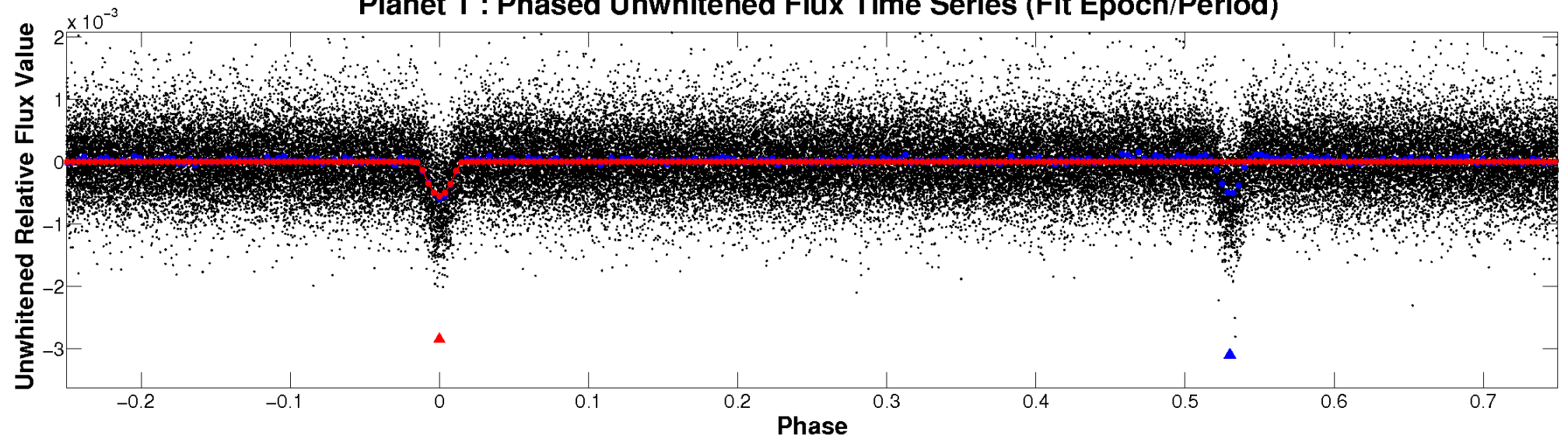
# ALT Odd/Even

TCE 003240706-01

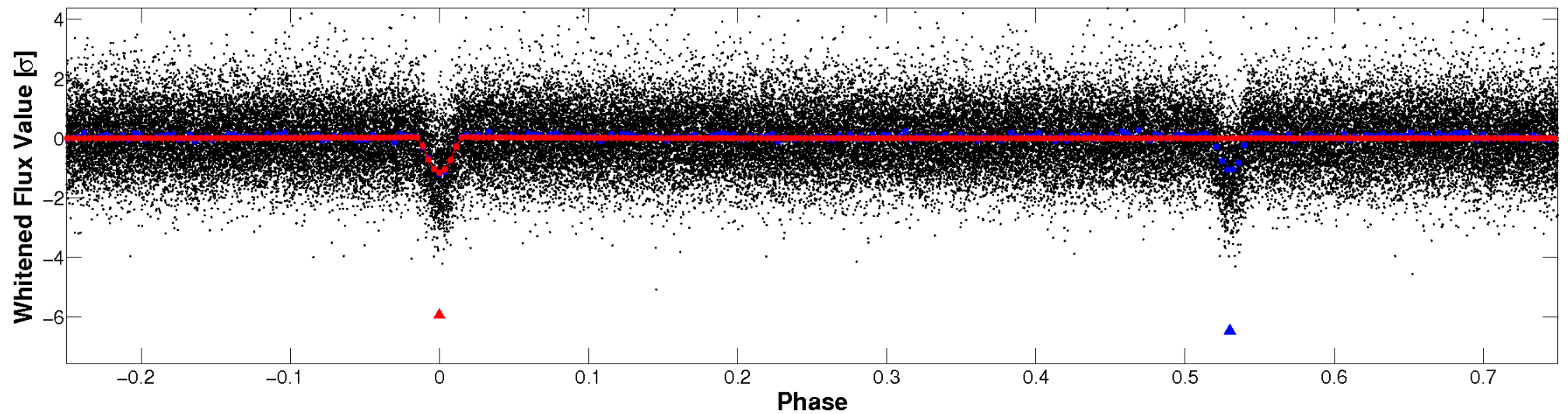


# Non-Whitened Vs. Whitened Light Curve

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

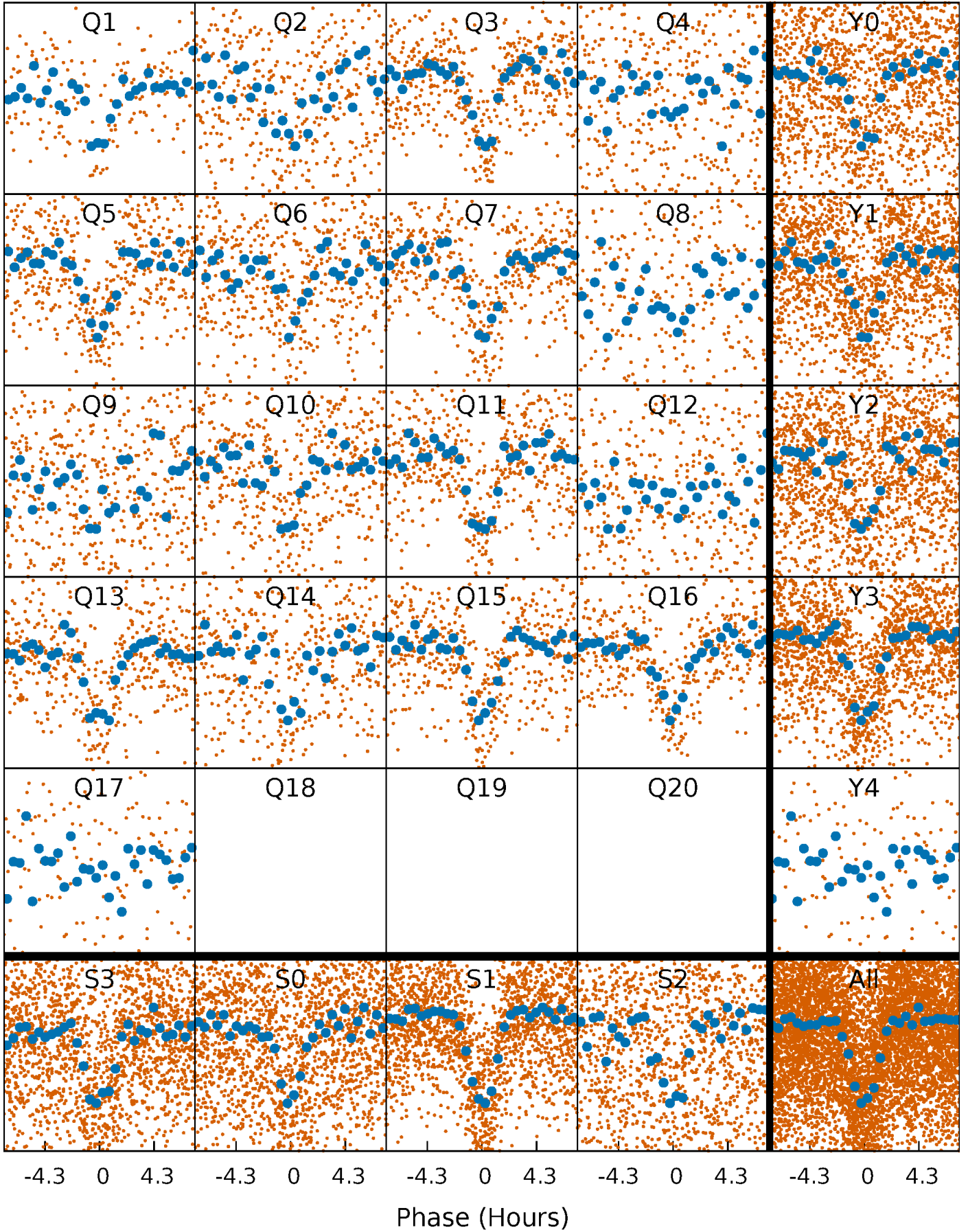


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

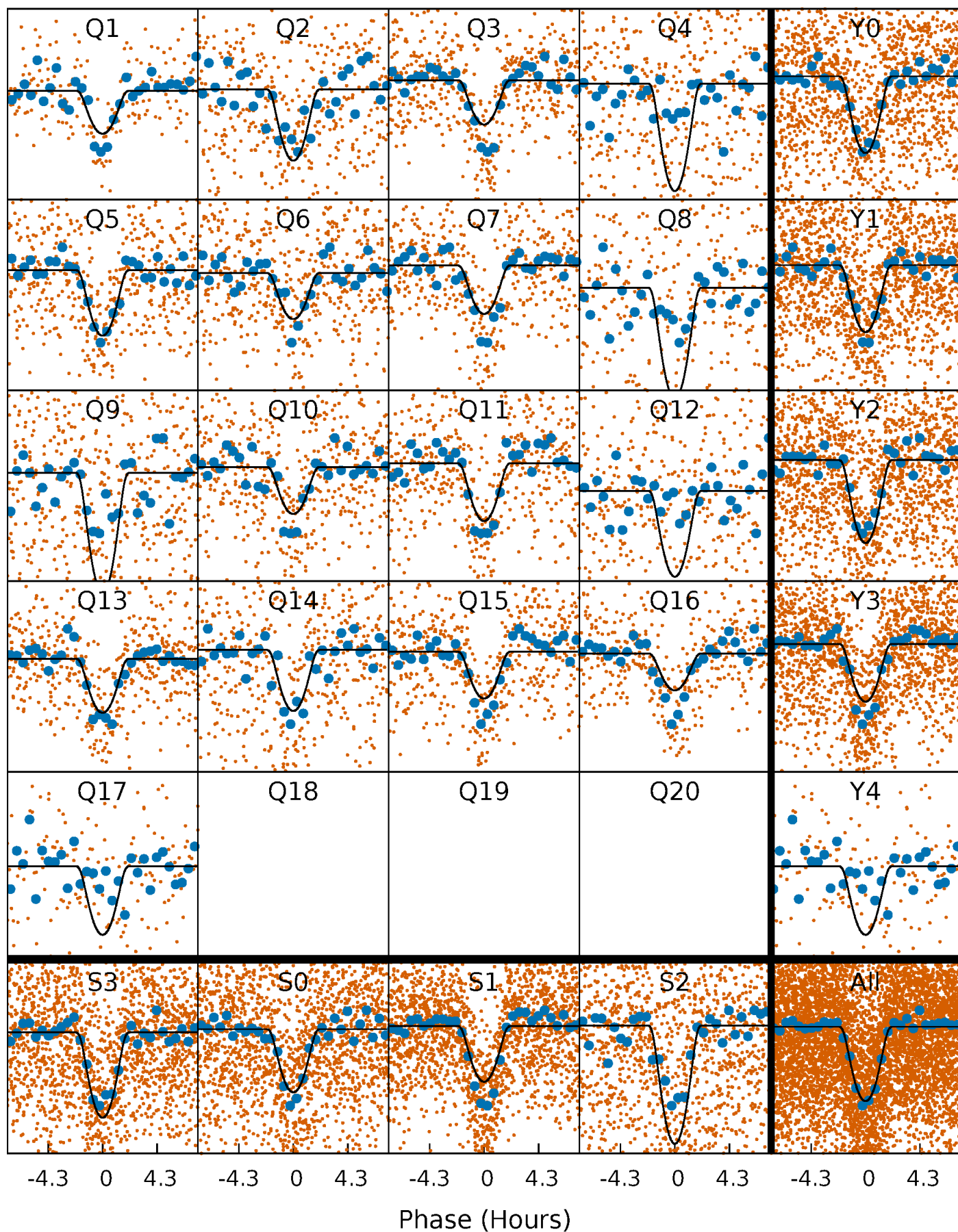
TCE 003240706-01 P= 5.489912 Days  $T_0=134.103629$  (BKJD)





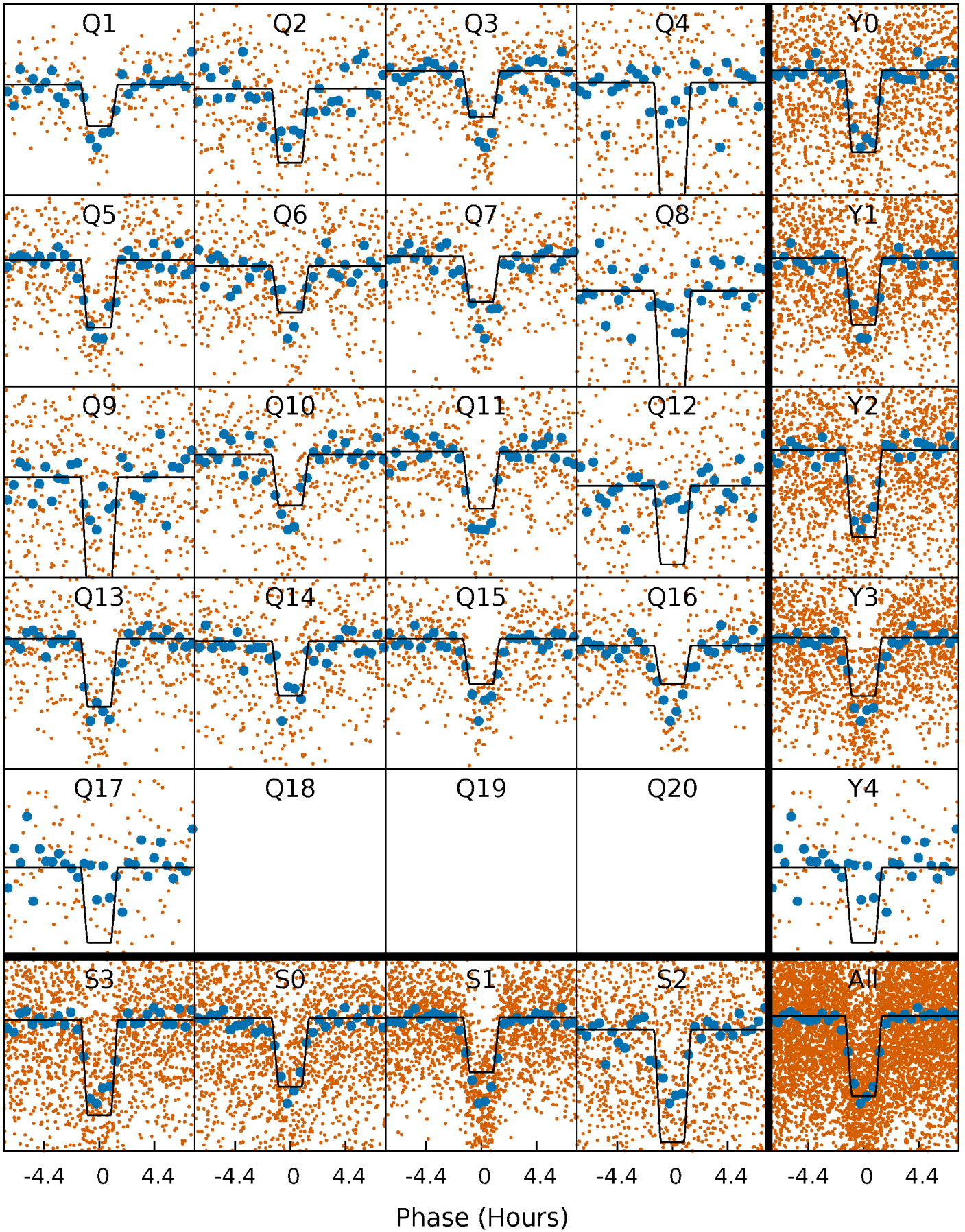
# DV Quarter-Phased Transit Curves

TCE 003240706-01 P= 5.489912 Days  $T_0=134.103629$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

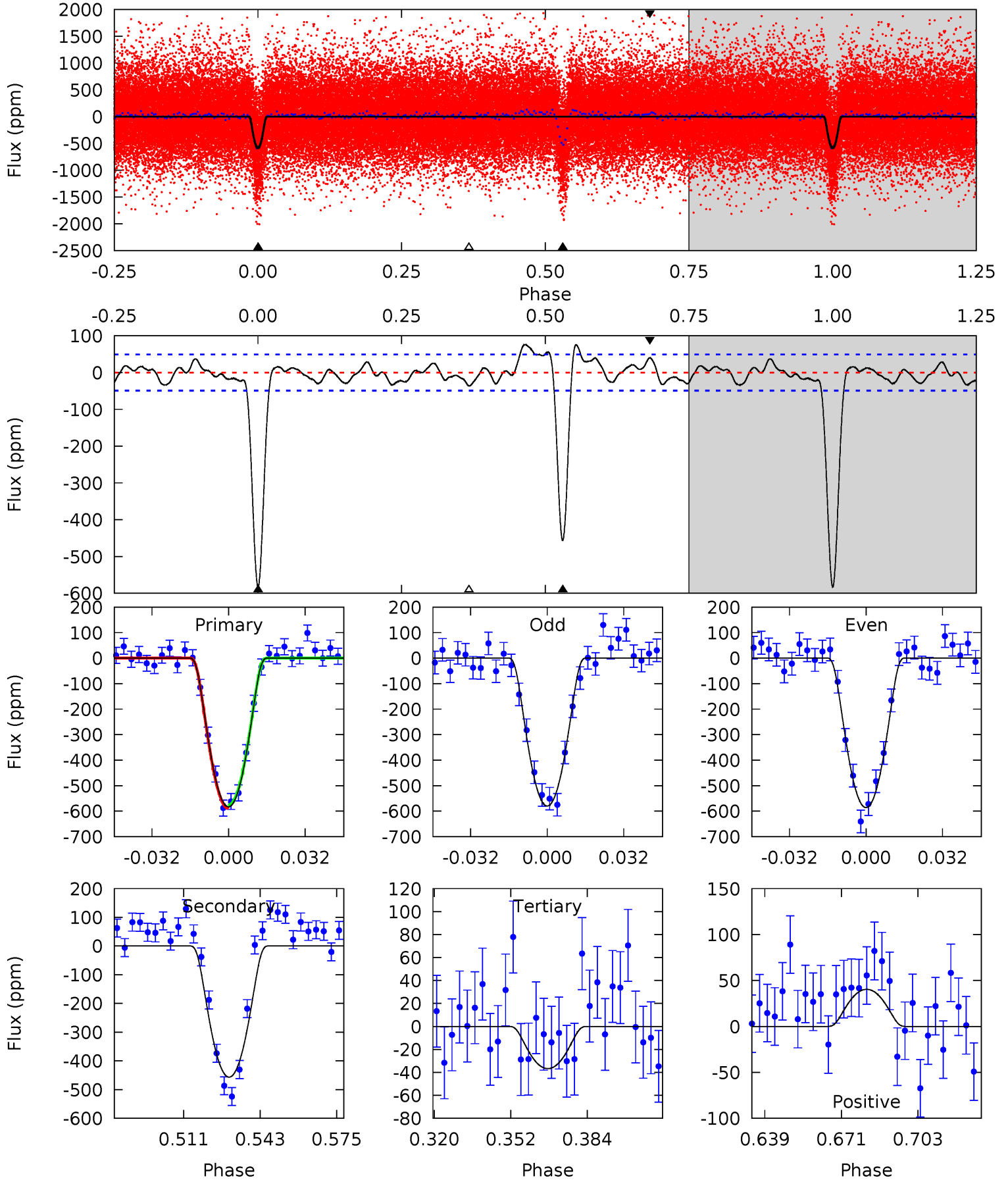
TCE 003240706-01 P= 5.489916 Days  $T_0=134.103632$  (BKJD)



# DV Model-Shift Uniqueness Test

003240706-01, P = 5.489912 Days, E = 128.613717 Days

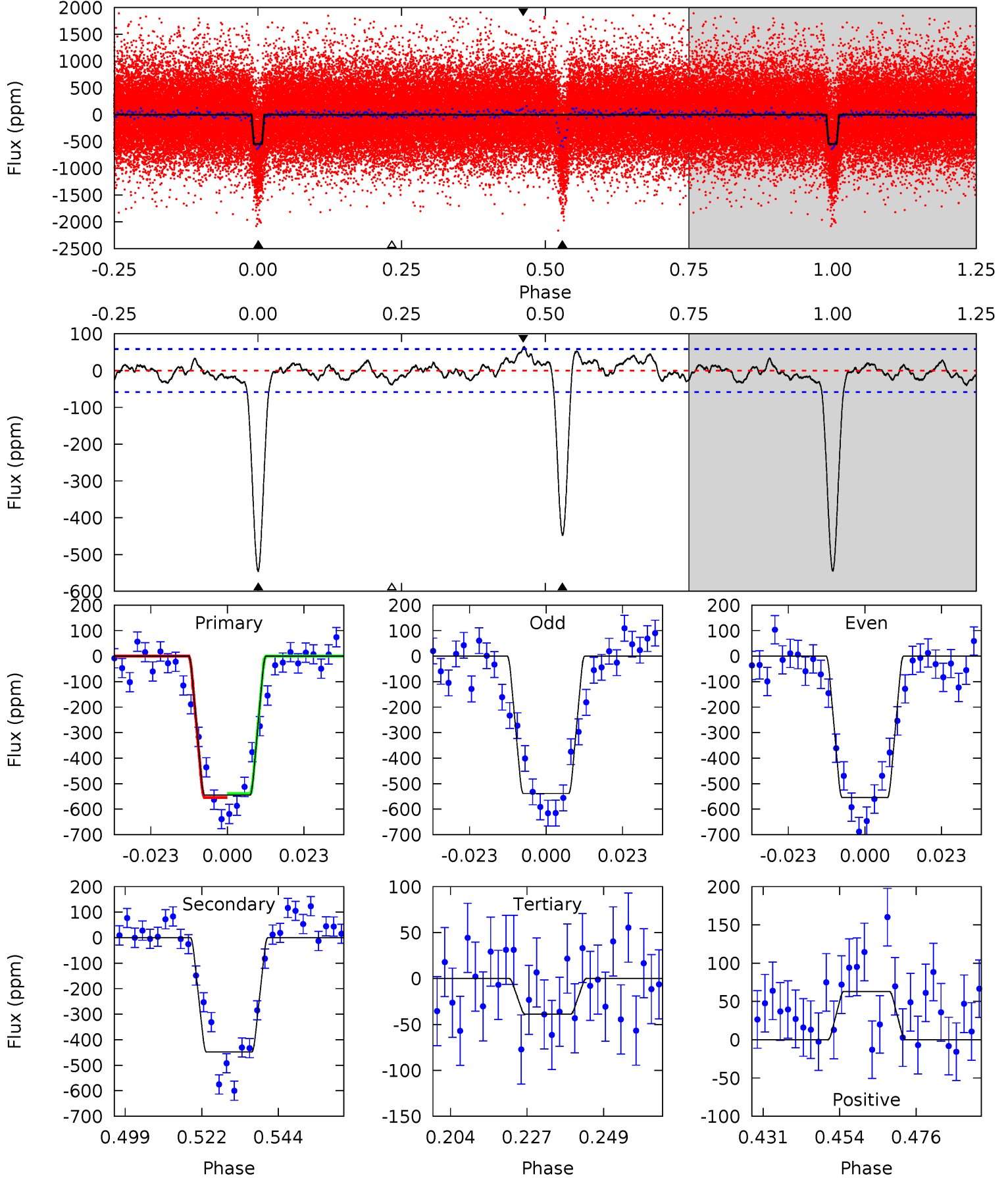
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.0	44.6	3.59	3.94	4.80	2.14	2.17	53.4	53.0	41.1	40.7	0.32	0.95	0.12	0.56



# Alt Model-Shift Uniqueness Test

003240706-01, P = 5.489916 Days, E = 128.613716 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
45.3	37.2	3.23	5.24	4.87	2.28	1.62	42.1	40.0	34.0	32.0	0.65	0.94	0.11	0.66





### Stellar Parameters For KIC 003240706

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5982^{+160}_{-195}$	$4.493^{+0.046}_{-0.184}$	$-0.040^{+0.250}_{-0.350}$	$0.960^{+0.251}_{-0.090}$	$1.047^{+0.116}_{-0.142}$	$1.667^{+0.403}_{-0.792}$
	+3%/-3%	+1%/-4%	+625%/-875%	+26%/-9%	+11%/-14%	+24%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003240706-01 / KOI 1098.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-457 \pm 10$	$3.64^{+1.85}_{-1.64}$	$1481^{+108}_{-65}$	$4895^{+1544}_{-712}$	$72^{+160}_{-41}$
Alt.	$-448 \pm 12$	$2.63^{+1.70}_{-1.59}$	$1480^{+90}_{-66}$	$5604^{+3933}_{-1067}$	$134^{+721}_{-84}$

$T_{max}$  = 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

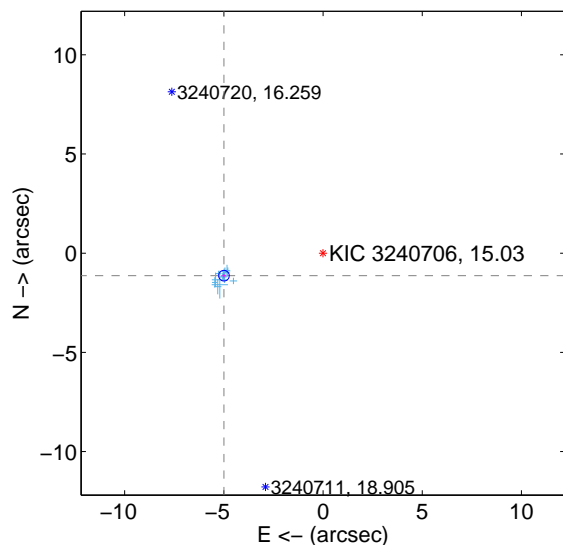
Supplemental centroid analysis for 003240706-01. Kepler magnitude: 15.03. Transit SNR 33.30

There are 17 quarters with good PRF difference image offsets

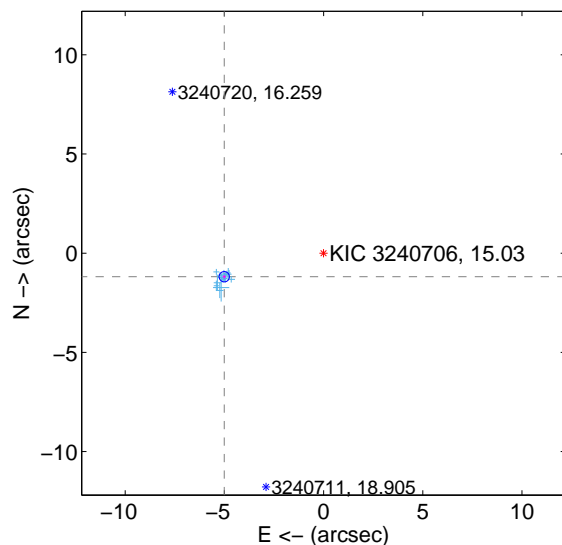
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>5.122 <math>\pm</math> 0.089</b>	<b>57.49</b>	4.994 $\pm$ 0.085	-1.135 $\pm$ 0.089
PRF-fit source offset from KIC position	<b>5.146 <math>\pm</math> 0.086</b>	<b>59.52</b>	5.007 $\pm$ 0.083	-1.187 $\pm$ 0.089
photometric centroid source offset	<b>9.02 <math>\pm</math> 0.38</b>	<b>23.67</b>	8.83 $\pm$ 0.38	-1.84 $\pm$ 0.33

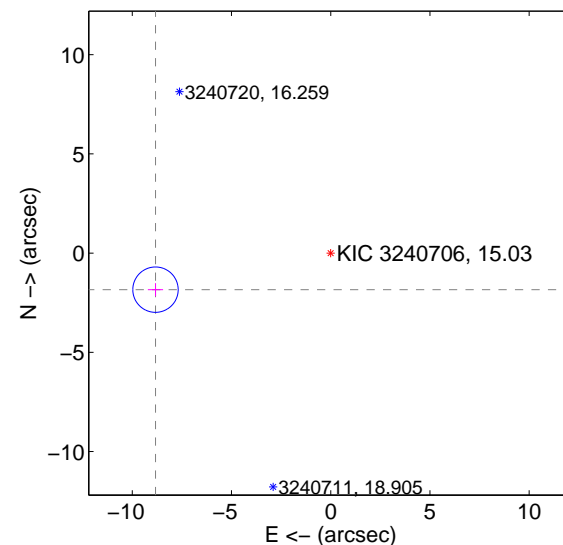
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

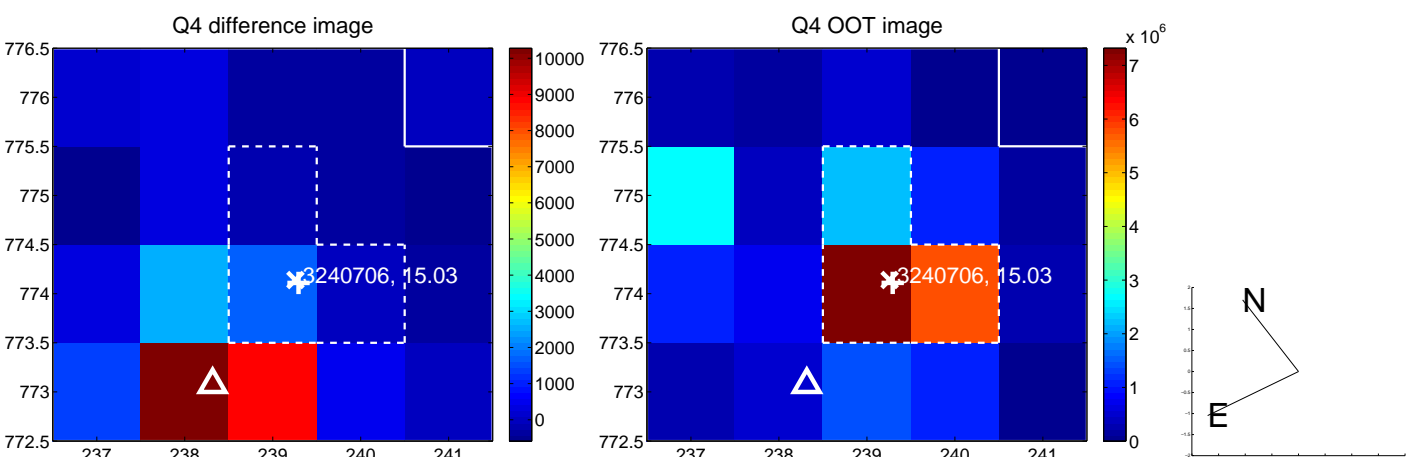
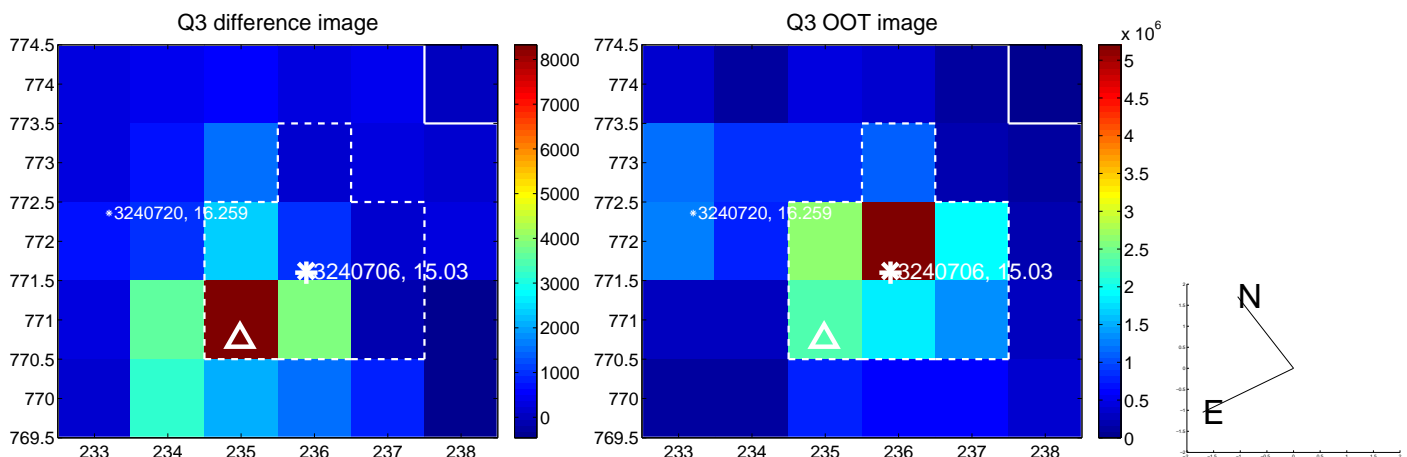
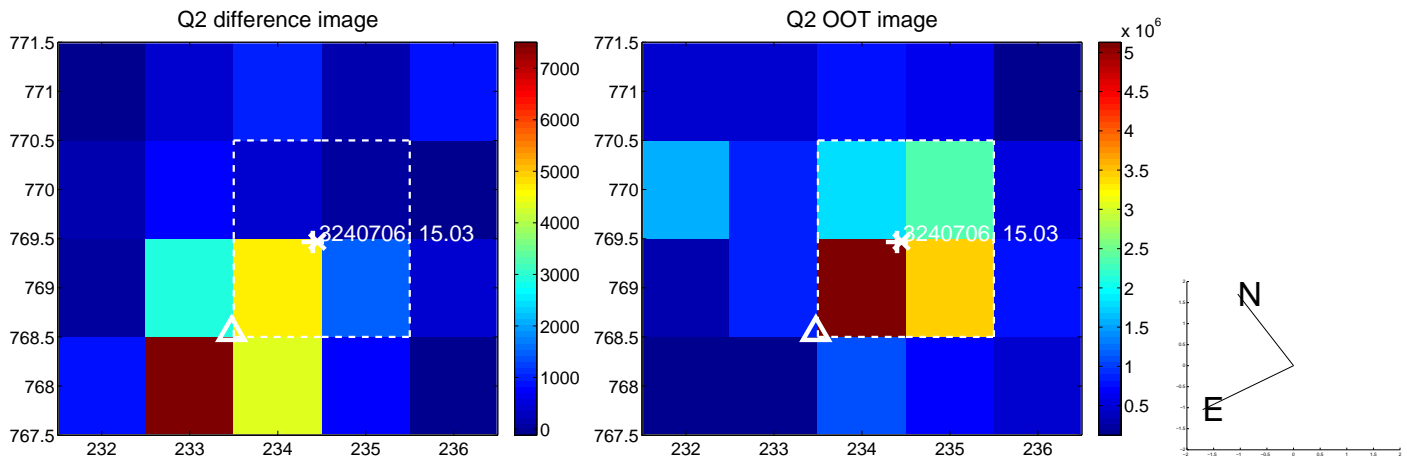
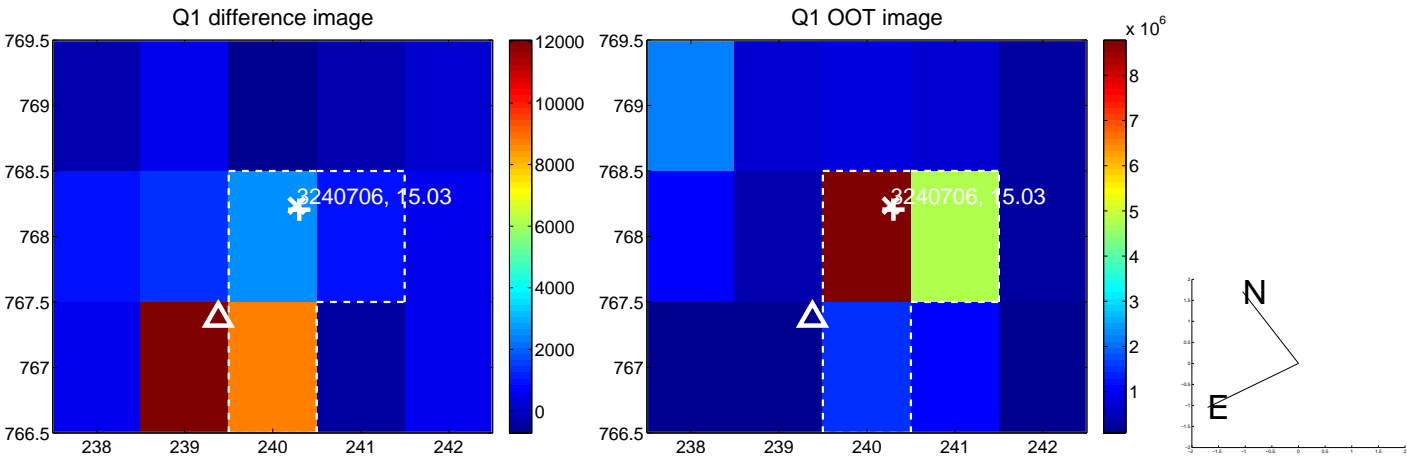


offset from photometric centroids

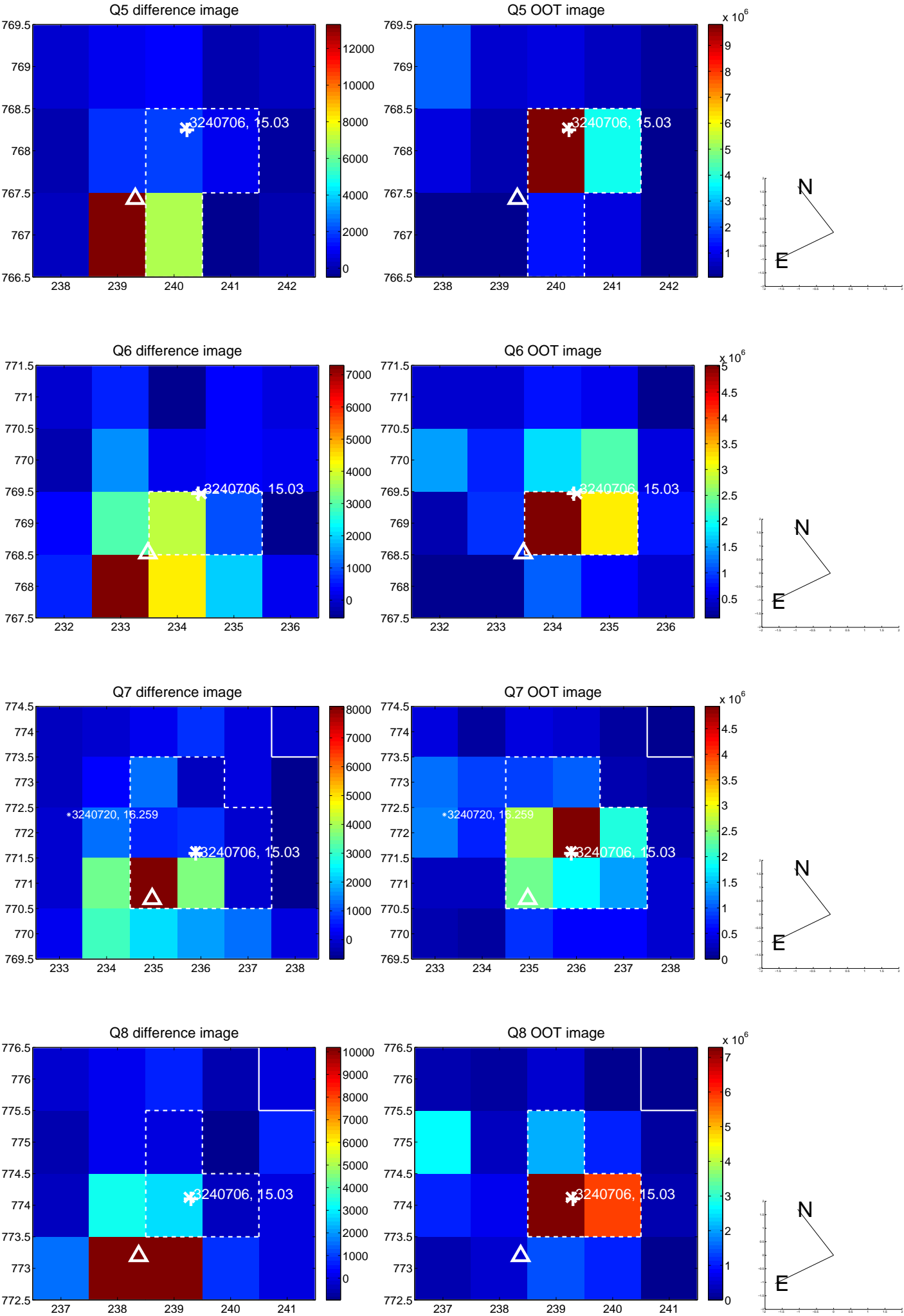


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

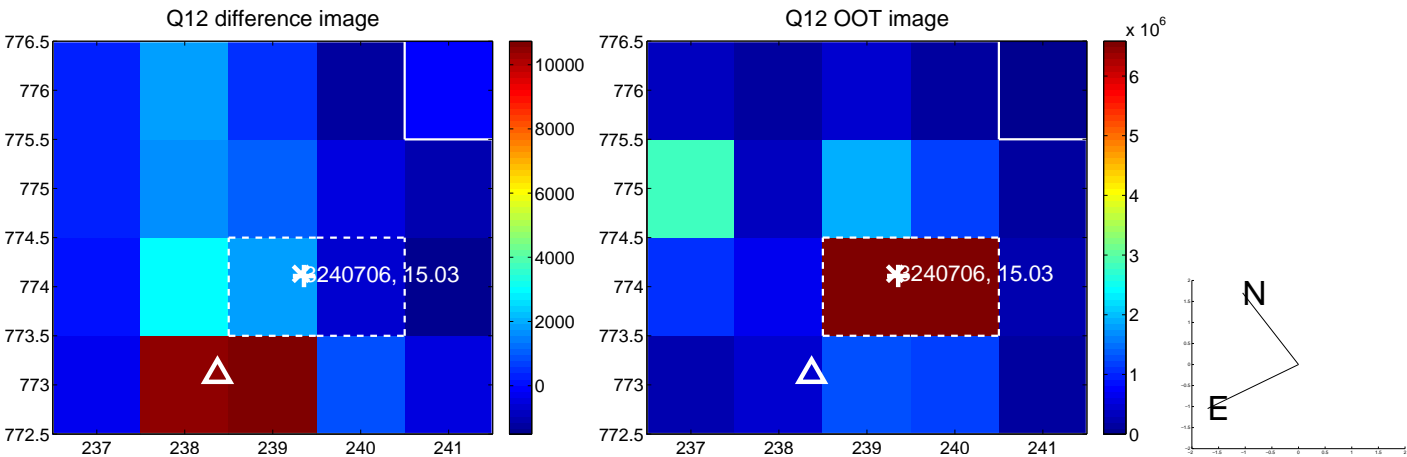
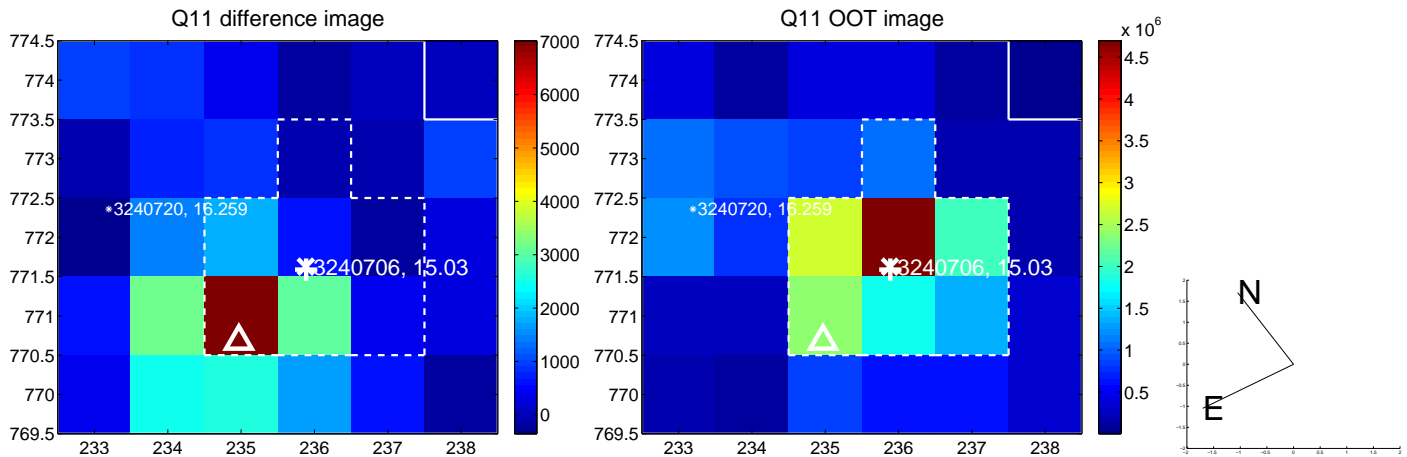
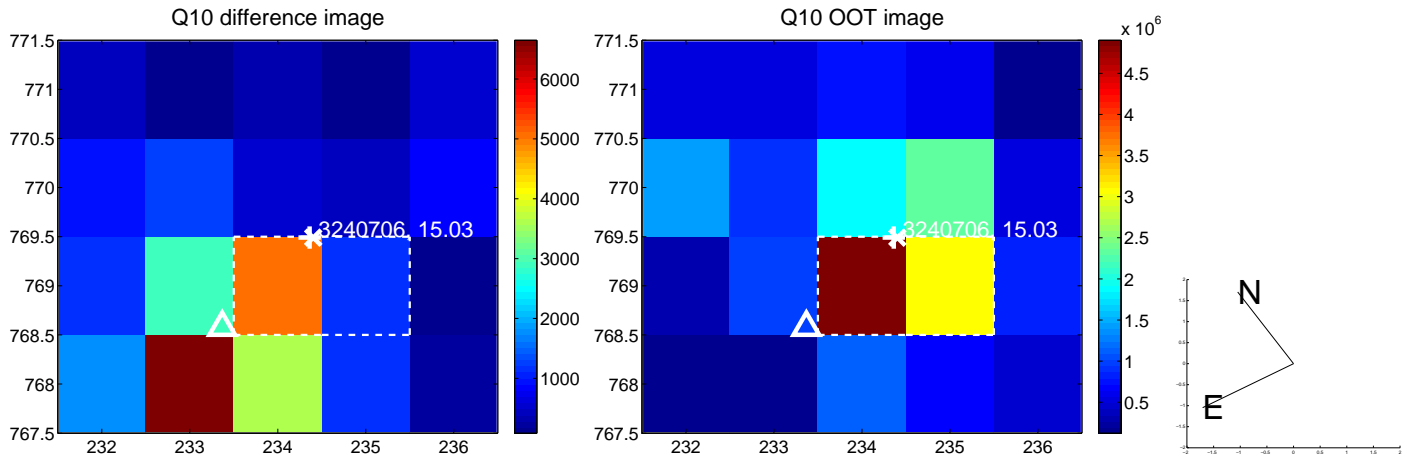
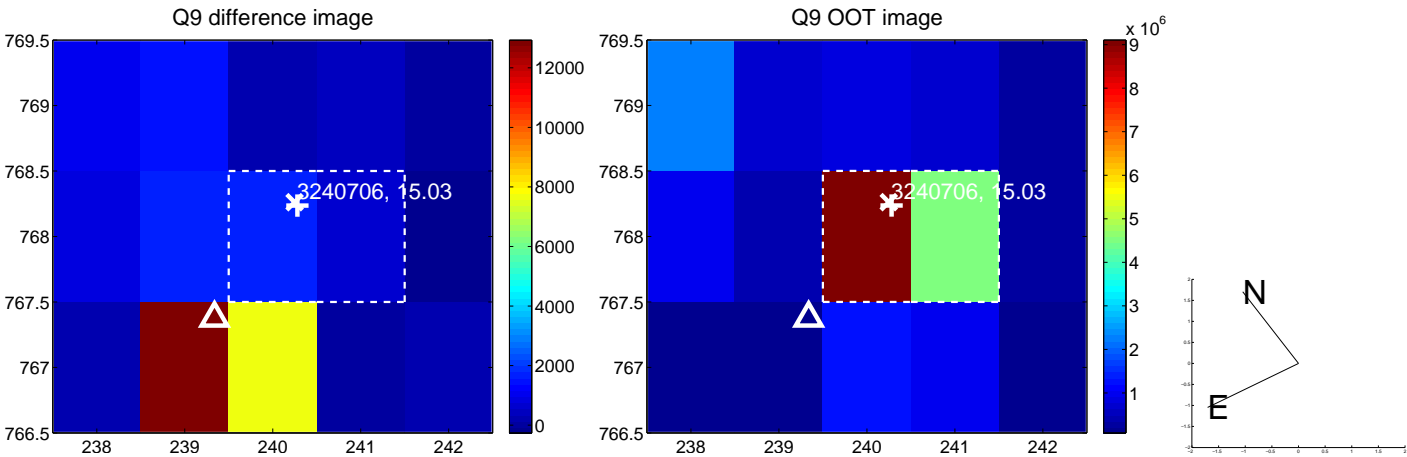


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

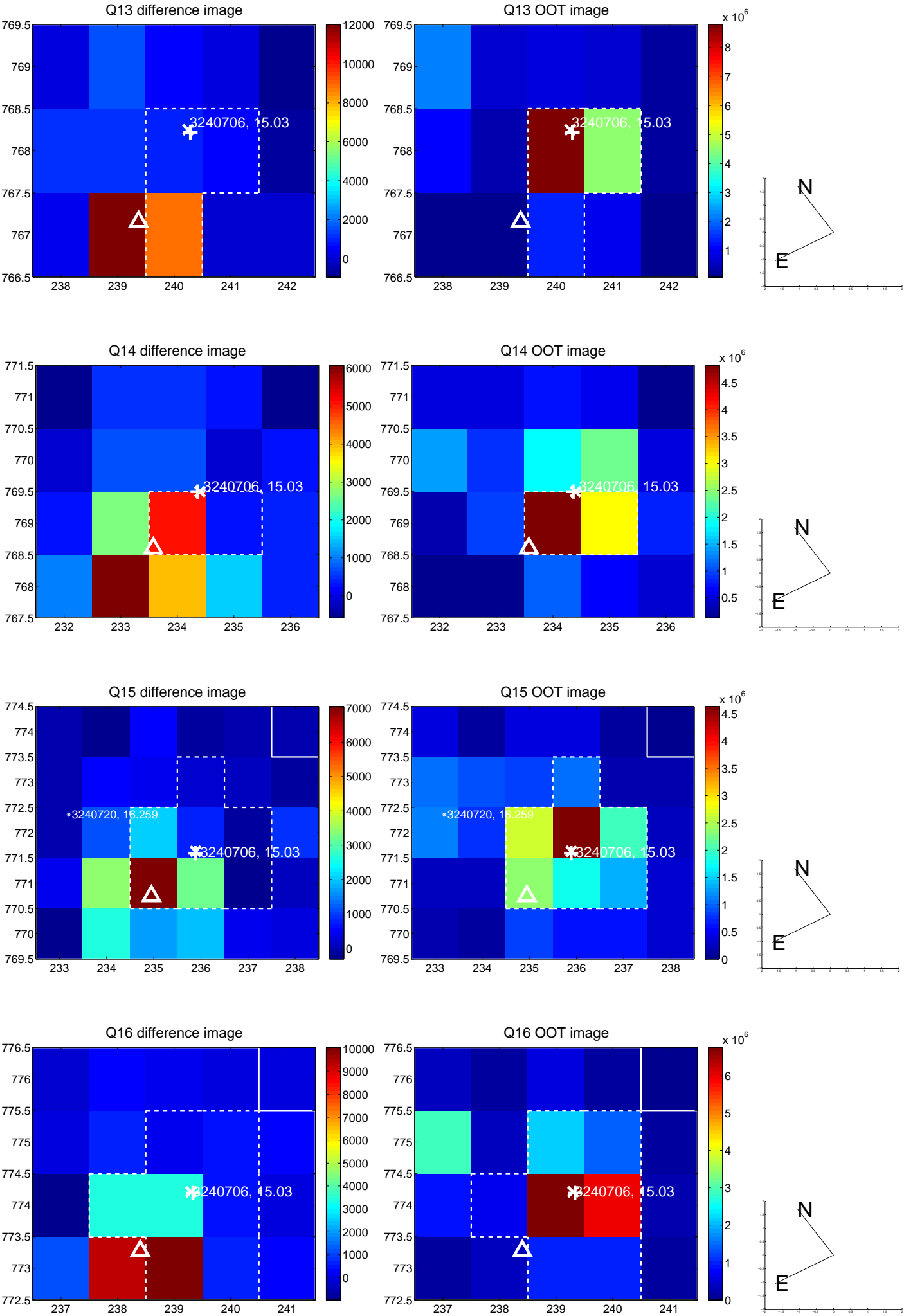




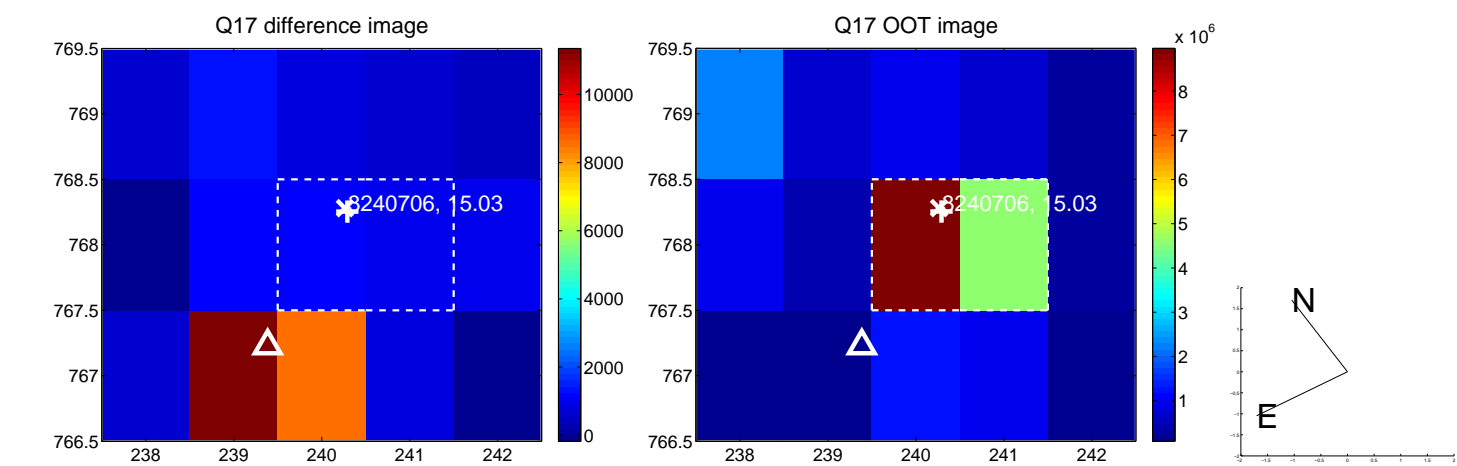
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



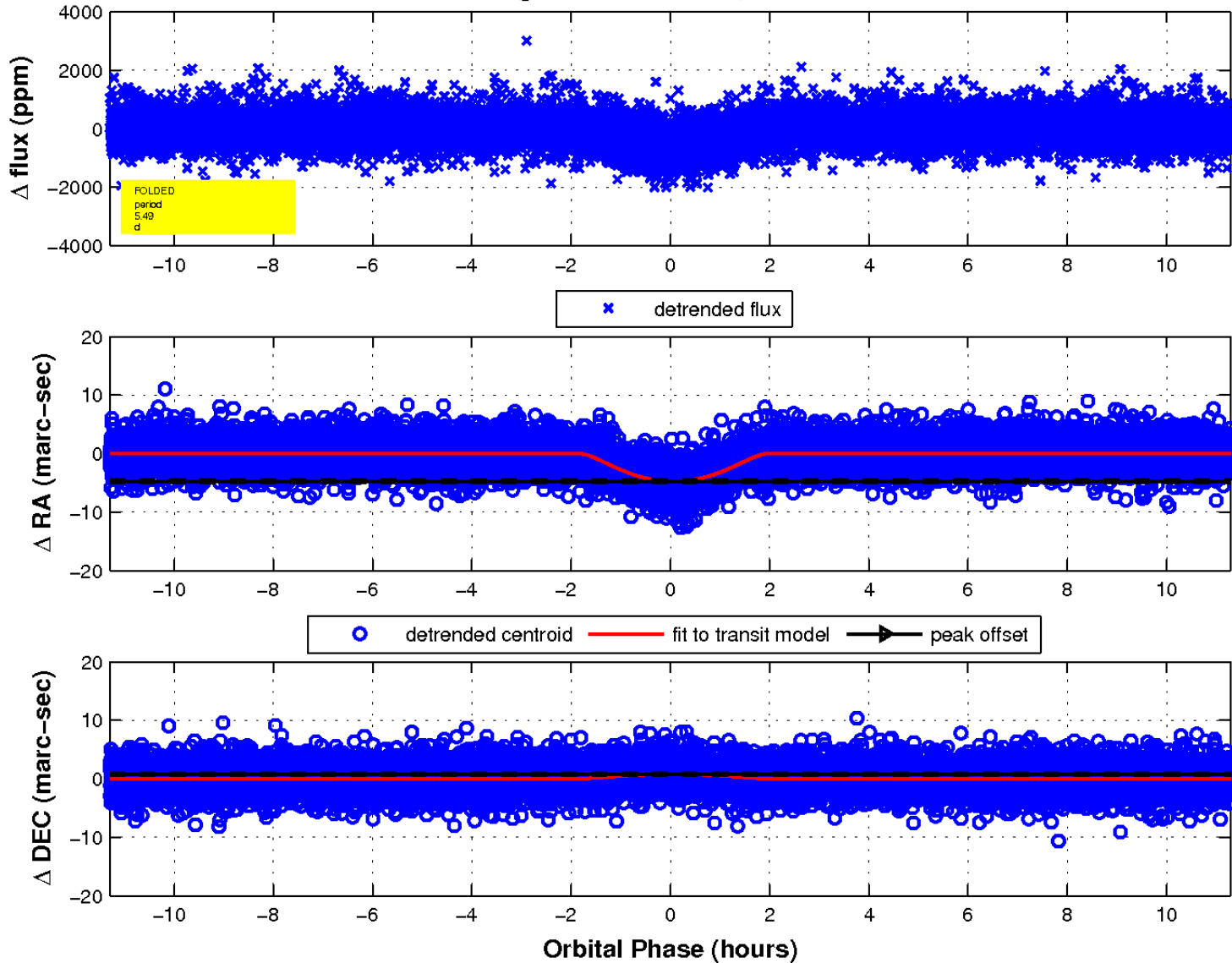
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



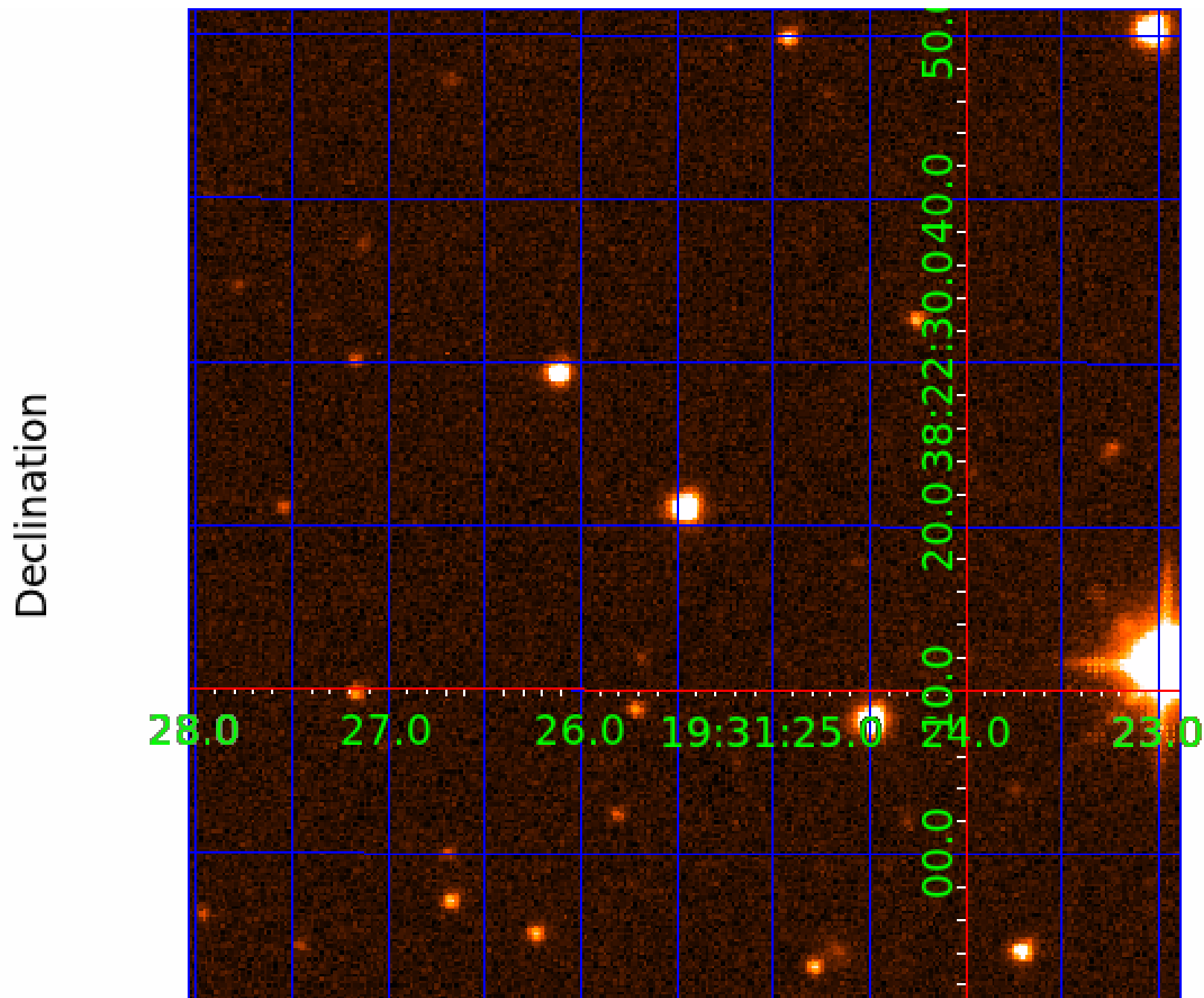
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image





# KIC 003240706

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003240706-01	OBS	1098.01	5.489912	134.103629	552.3	3.766	29.5	33.3	0.96	5982	3.50	276.51
003240706-02	OBS	No	5.489900	131.525574	530.8	3.232	27.9	30.5	0.96	5982	3.37	276.51

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003240706-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST
003240706-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST

**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.

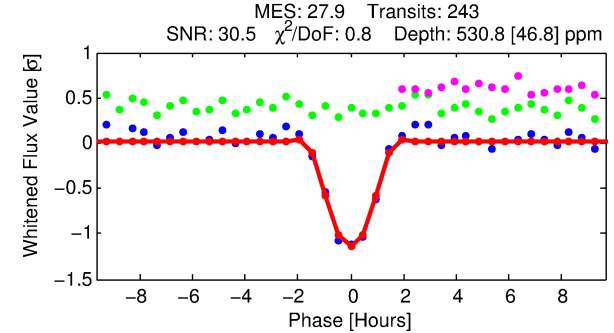
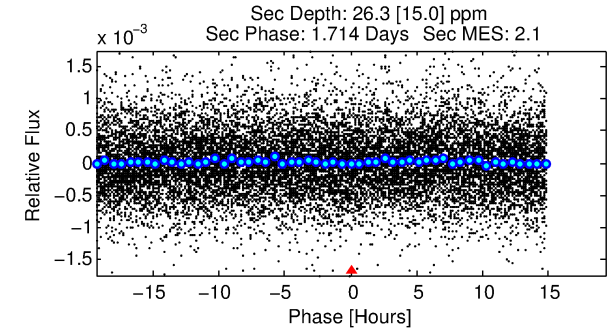
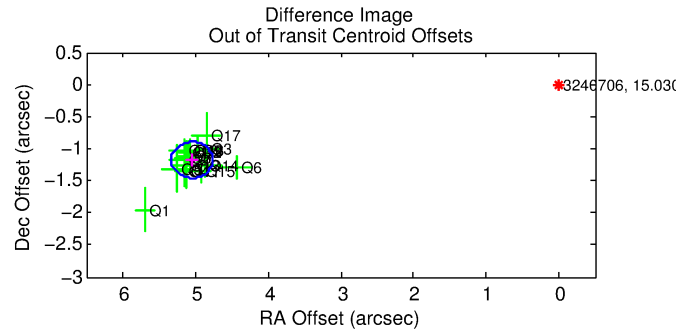
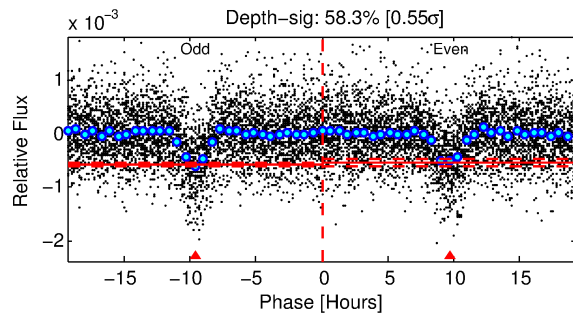
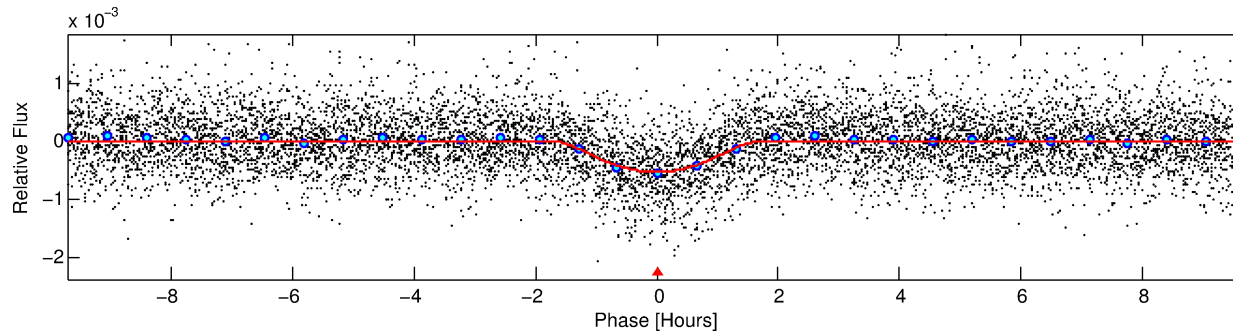
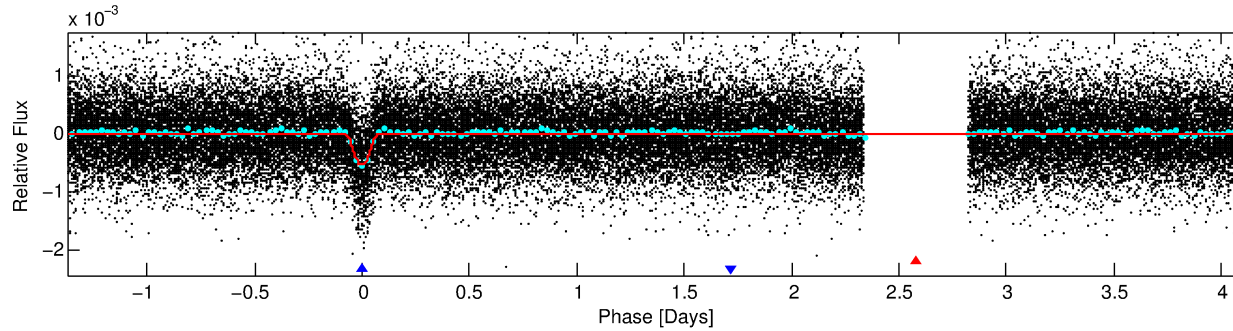
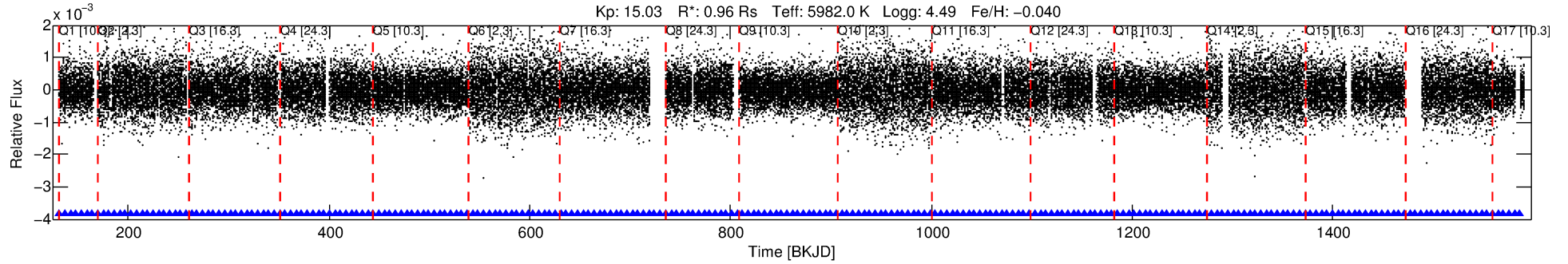
## Ephemeris Match Information For 003240706-02

No Significant Match Found

# DV One-Page Summary

KIC: 3240706 Candidate: 2 of 2 Period: 5.490 d  
KOI: K01098 Corr: No Ephemeris Match

Kp: 15.03 R\*: 0.96 Rs Teff: 5982.0 K Logg: 4.49 Fe/H: -0.040



## DV Fit Results:

Period = 5.48990 [0.00002] d  
Epoch = 131.5256 [0.0024] BKJD  
Rp/R\* = 0.0322 [0.0145]  
a/R\* = 4.18 [0.79]  
b = 0.98 [0.03]  
Seff = 276.51 [98.60]  
Teq = 1040 [93] K  
Rp = 3.37 [1.76] Re  
a = 0.0618 [0.0139] AU  
Ag = 4.87 [5.44] [0.71σ]  
Teff = 2388 [642] K [2.08σ]

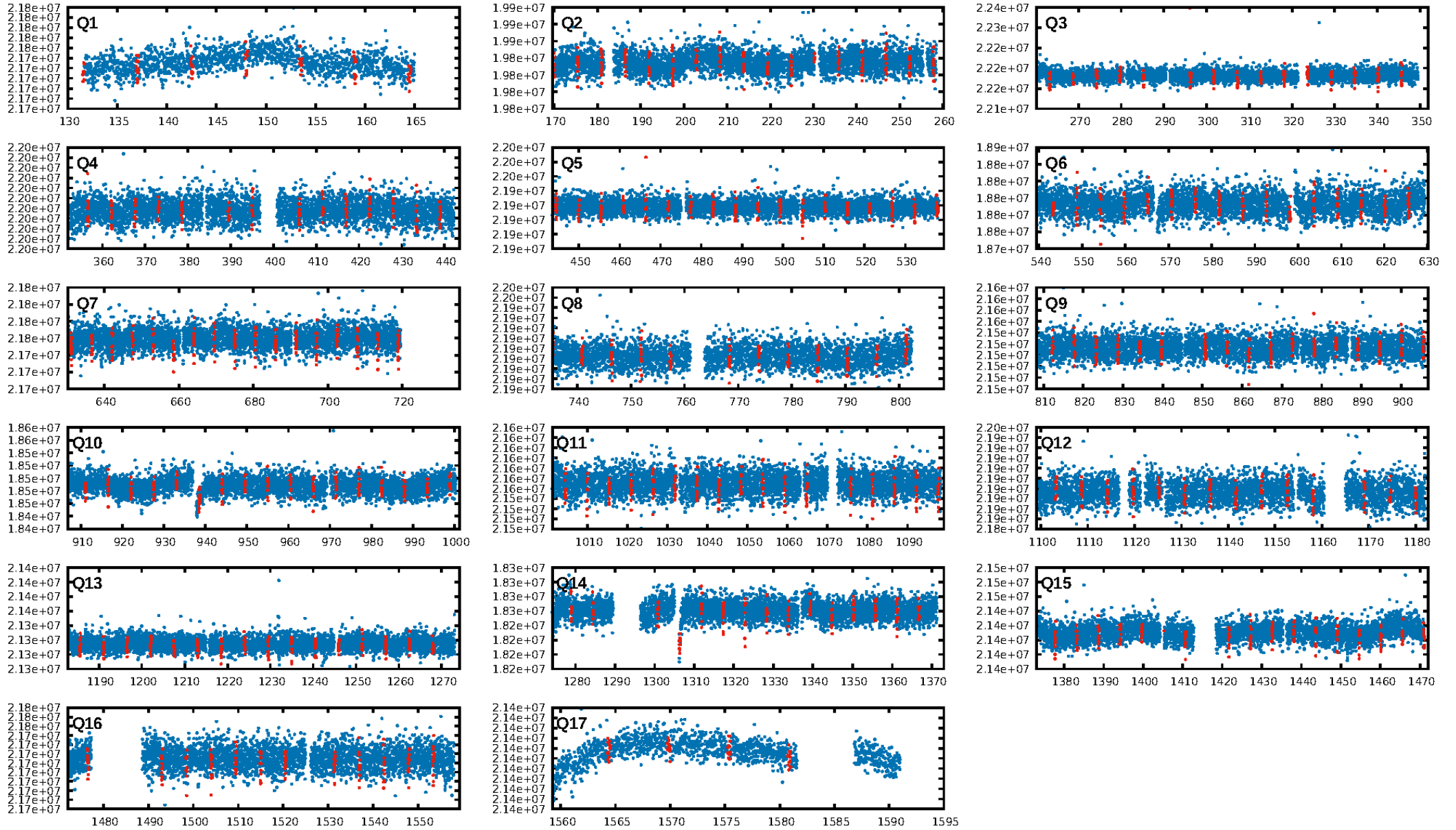
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: 1.50e-169  
RollingBand-fgt: 1.00 [232/232]  
GhostDiagnostic-chr: 0.1311  
Centroid-sig: 0.0%  
Centroid-so: 9.810 arcsec [22.85σ]  
OotOffset-rm: 5.182 arcsec [55.12σ]  
KicOffset-rm: 5.197 arcsec [55.70σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

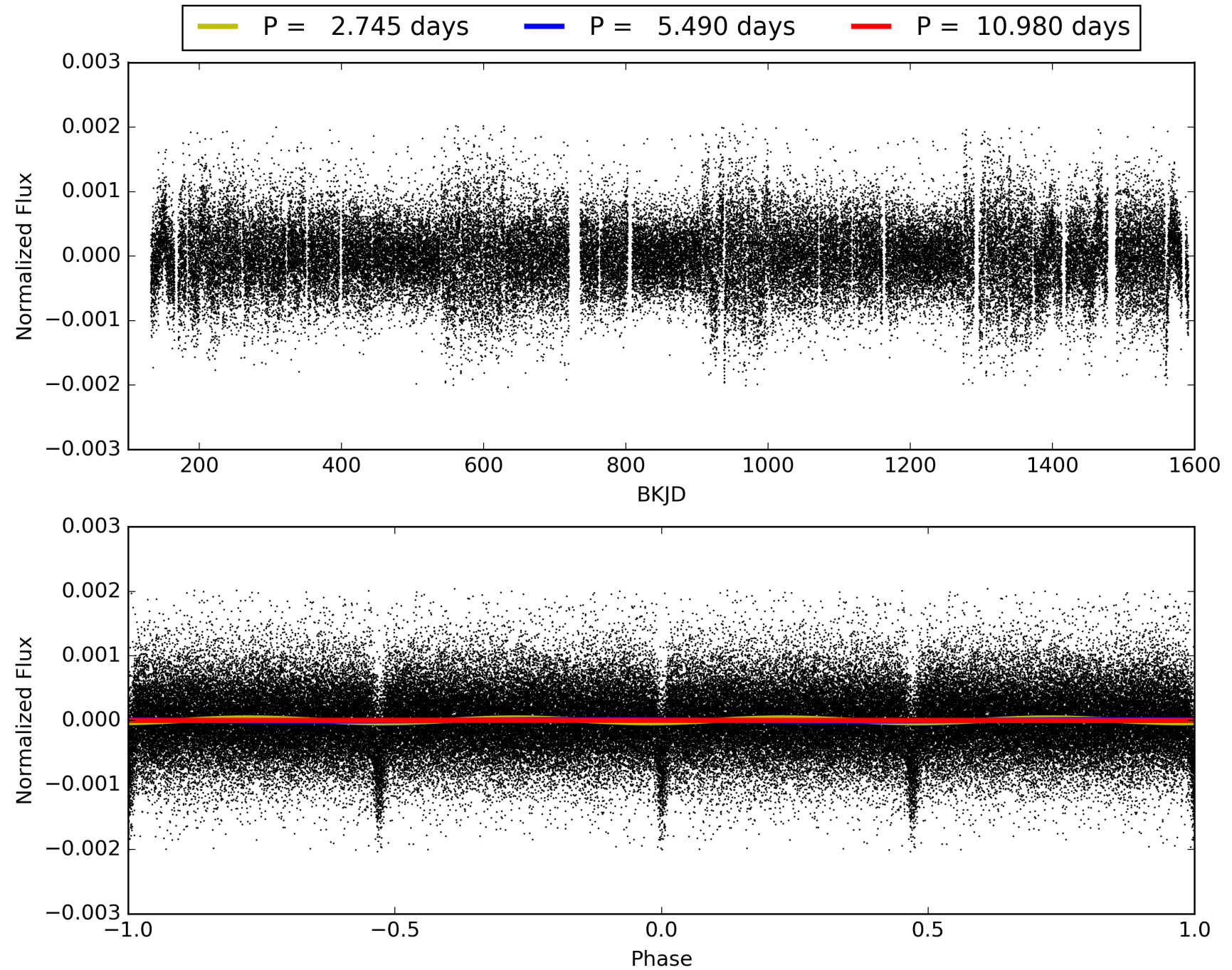
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:00:03 Z

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

# TCE 003240706-02, PDC Light Curves



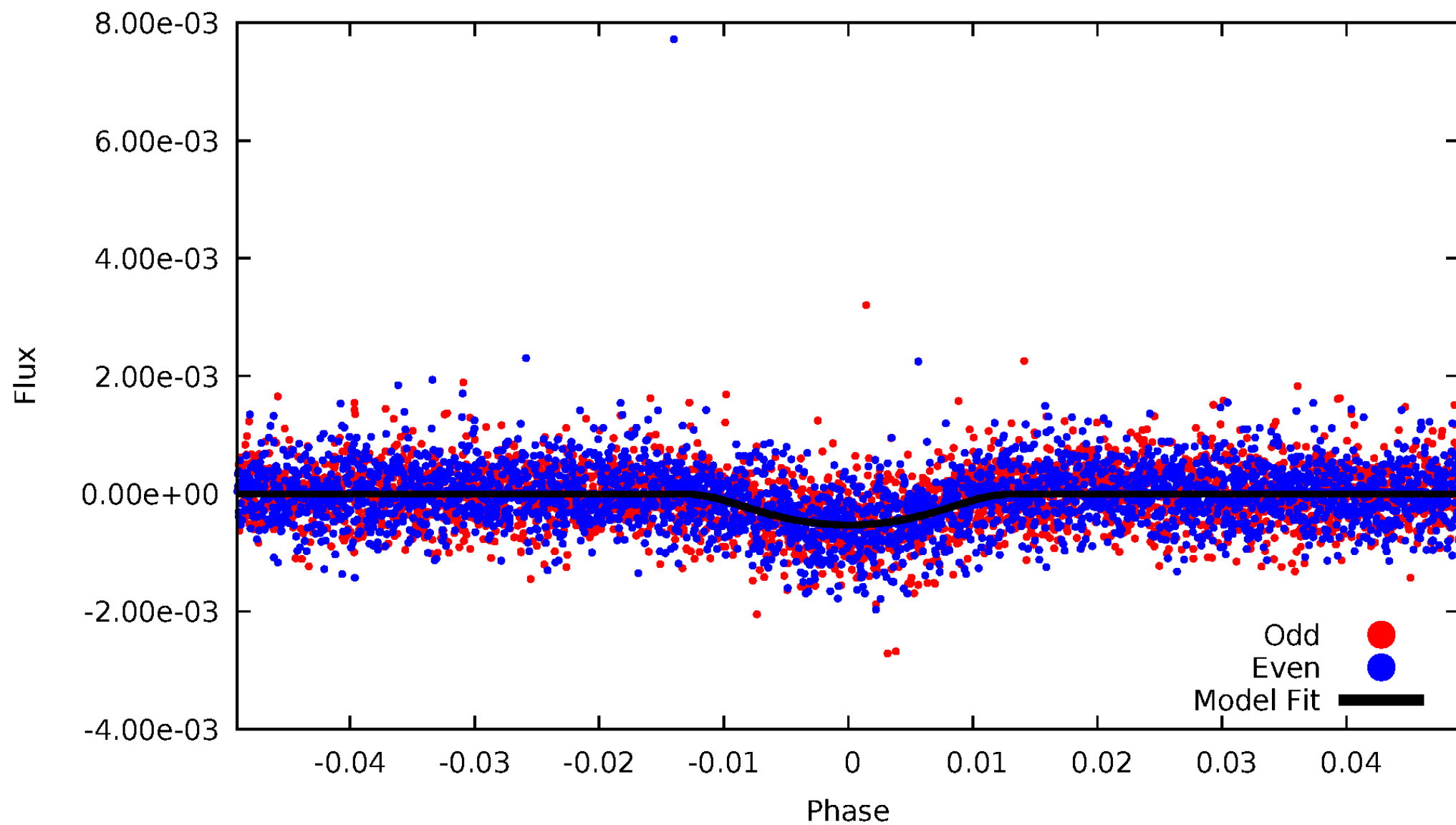
# TCE 003240706-02





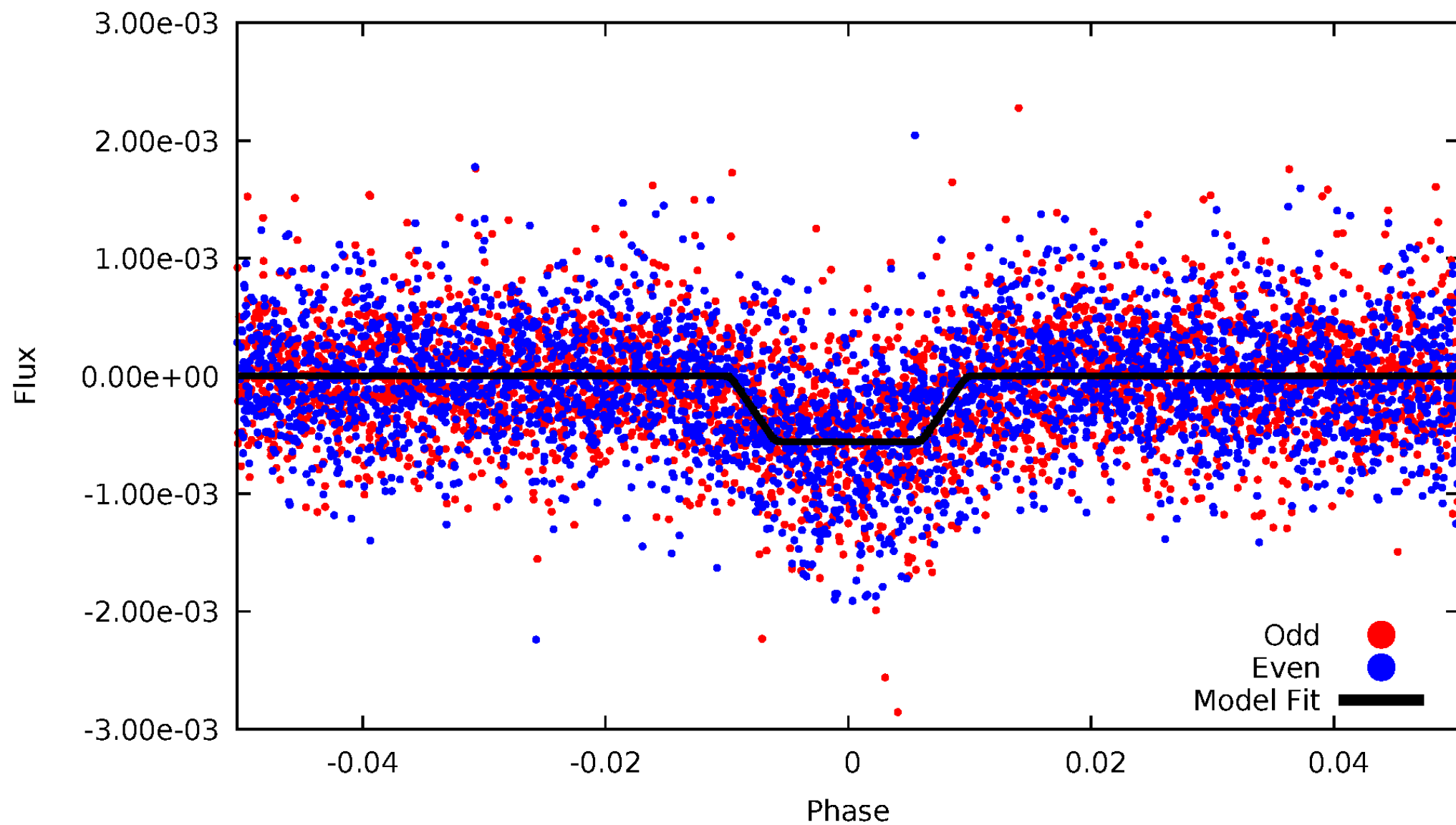
# DV Odd/Even

TCE 003240706-02



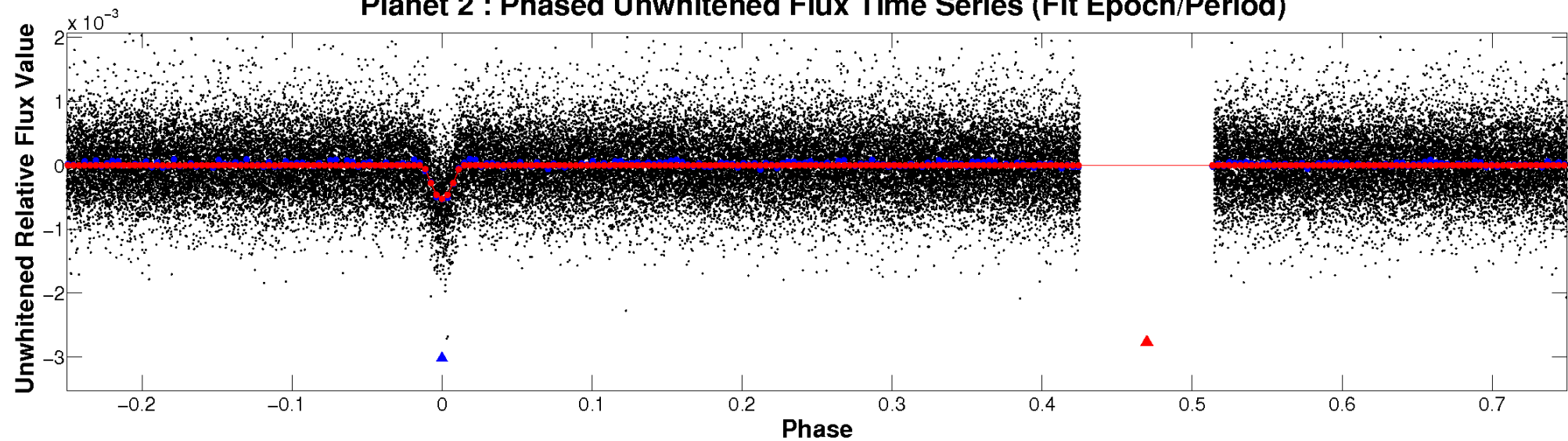
# ALT Odd/Even

TCE 003240706-02

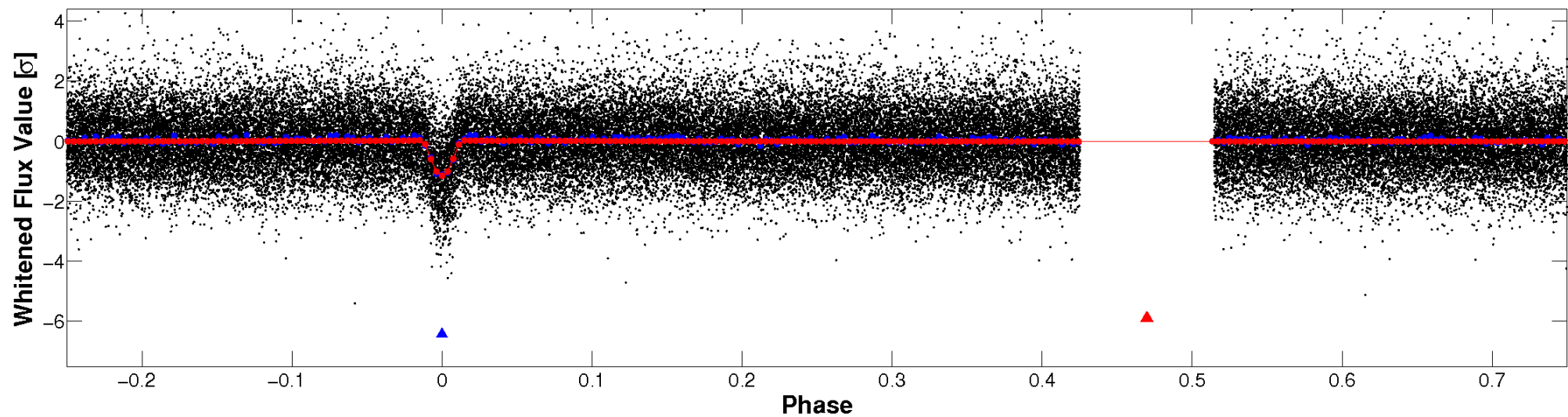


# Non-Whitened Vs. Whitened Light Curve

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

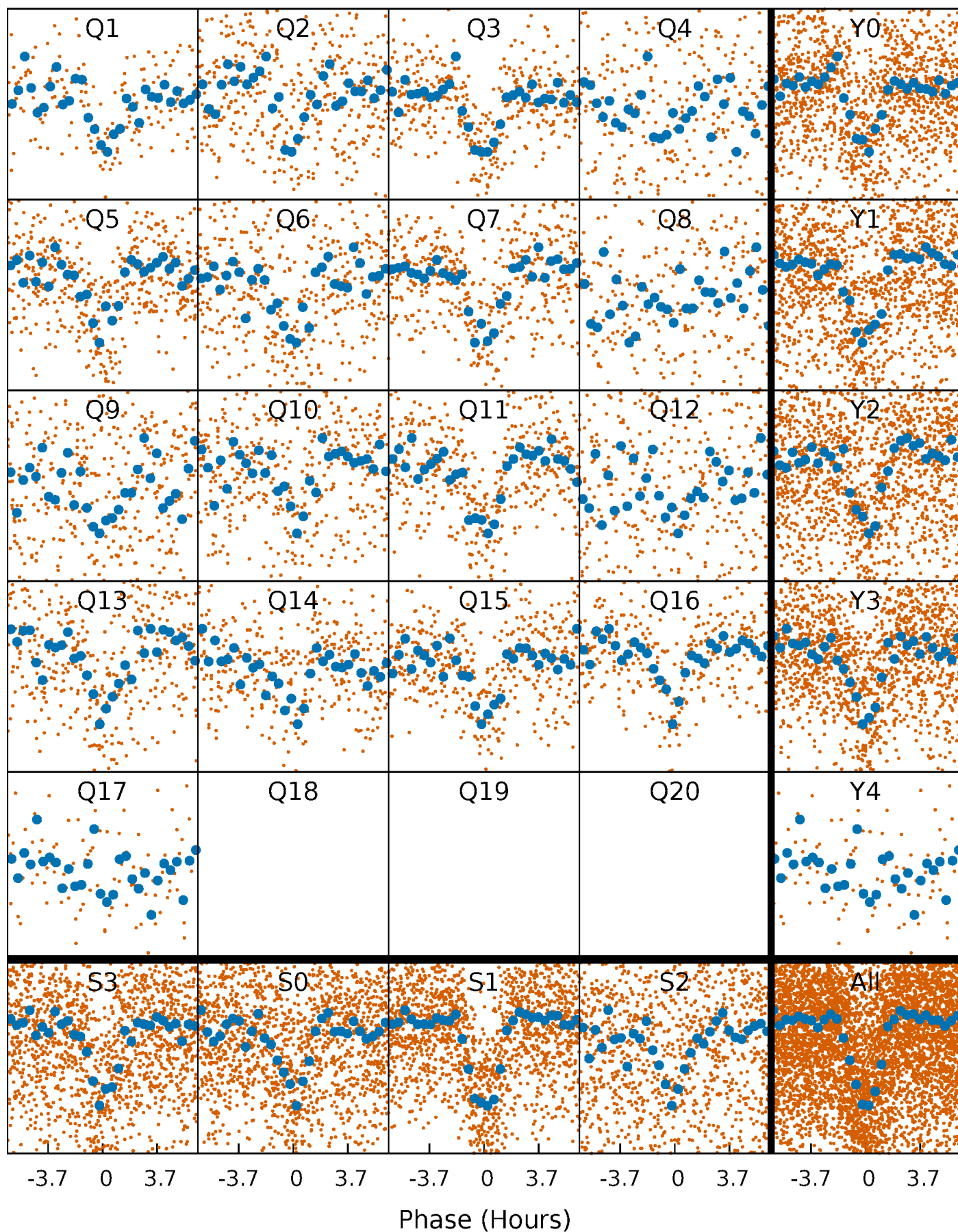


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



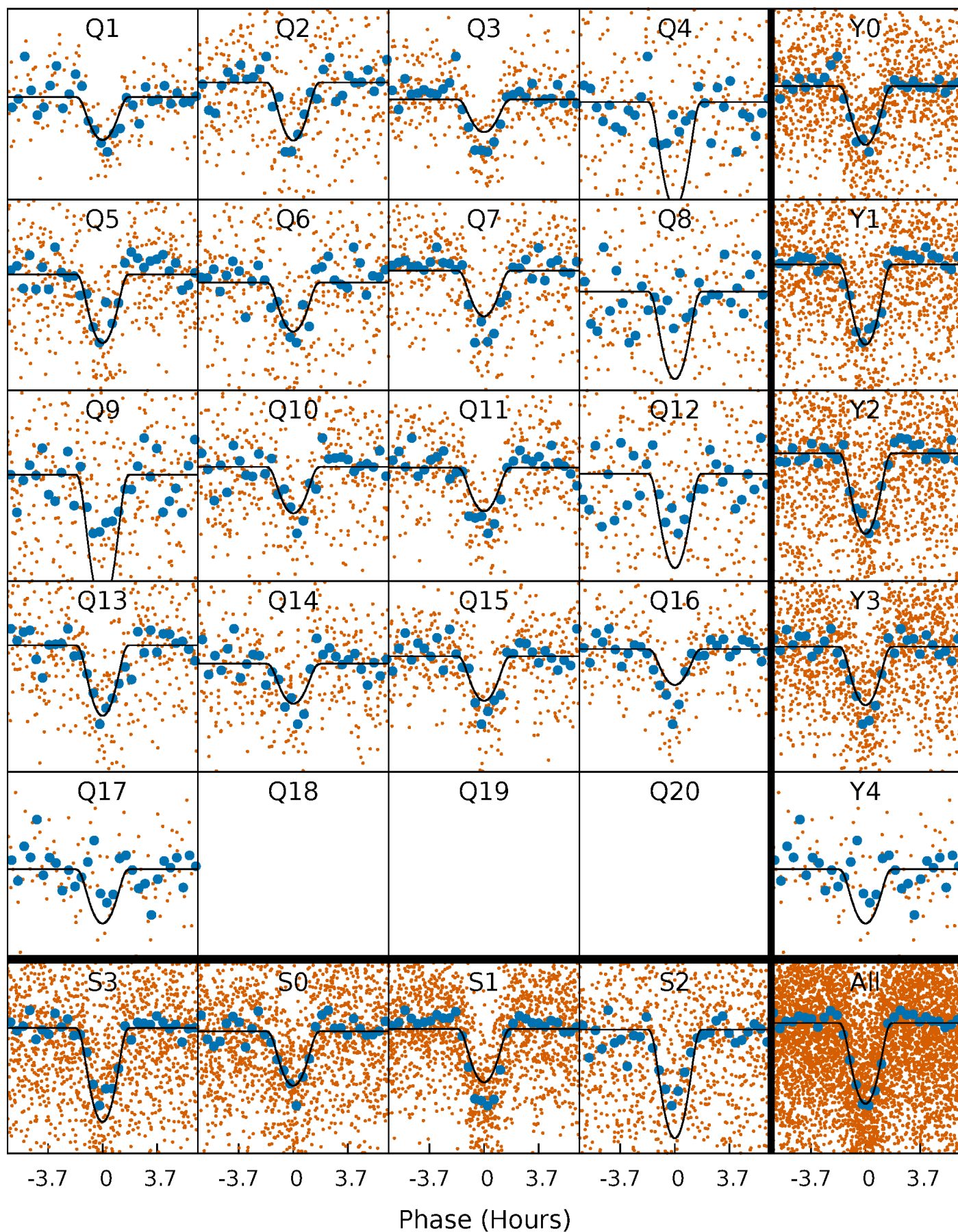
# PDC Quarter-Phased Transit Curves

TCE 003240706-02 P= 5.489900 Days  $T_0=131.525574$  (BKJD)



# DV Quarter-Phased Transit Curves

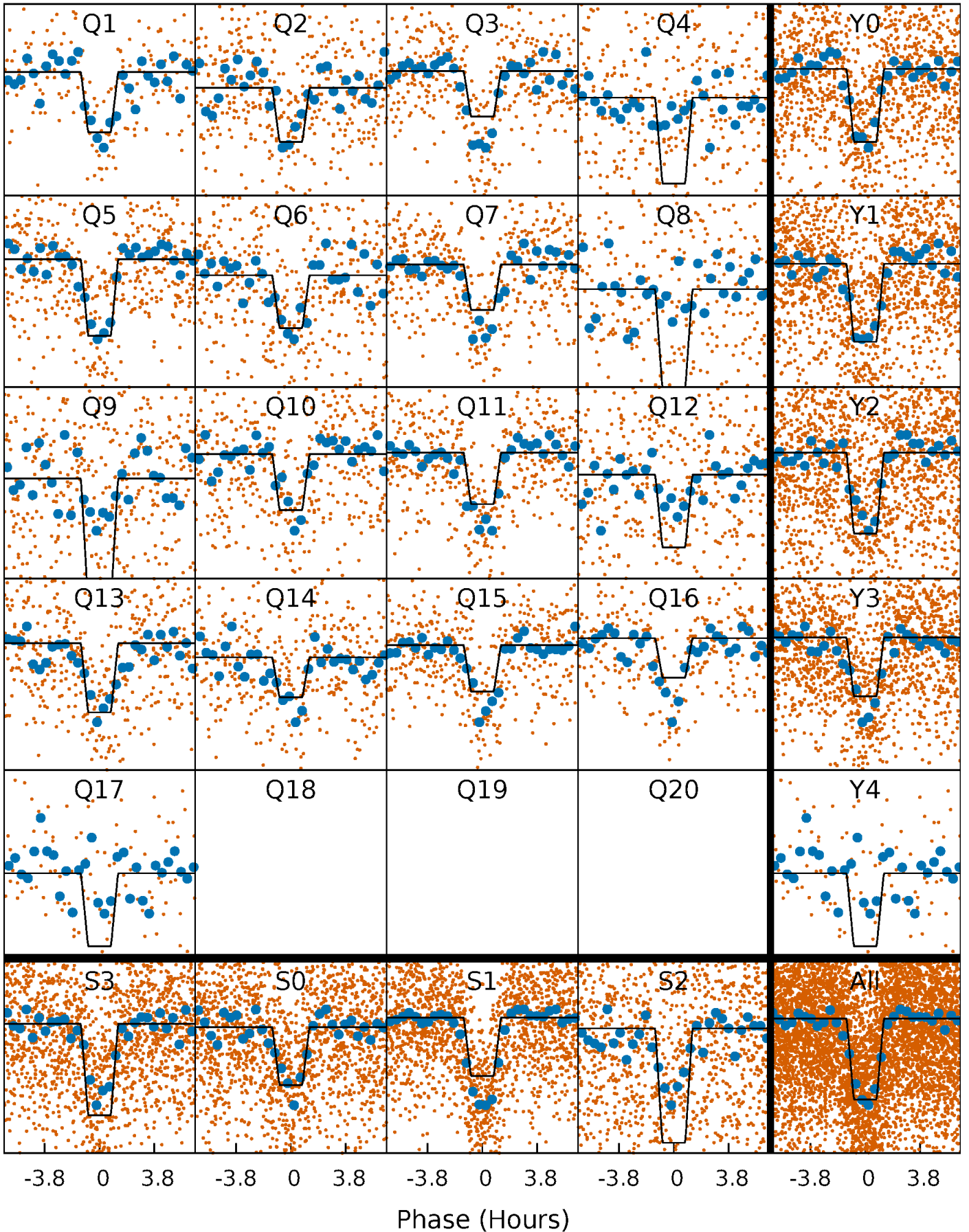
TCE 003240706-02   P= 5.489900 Days    $T_0=131.525574$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

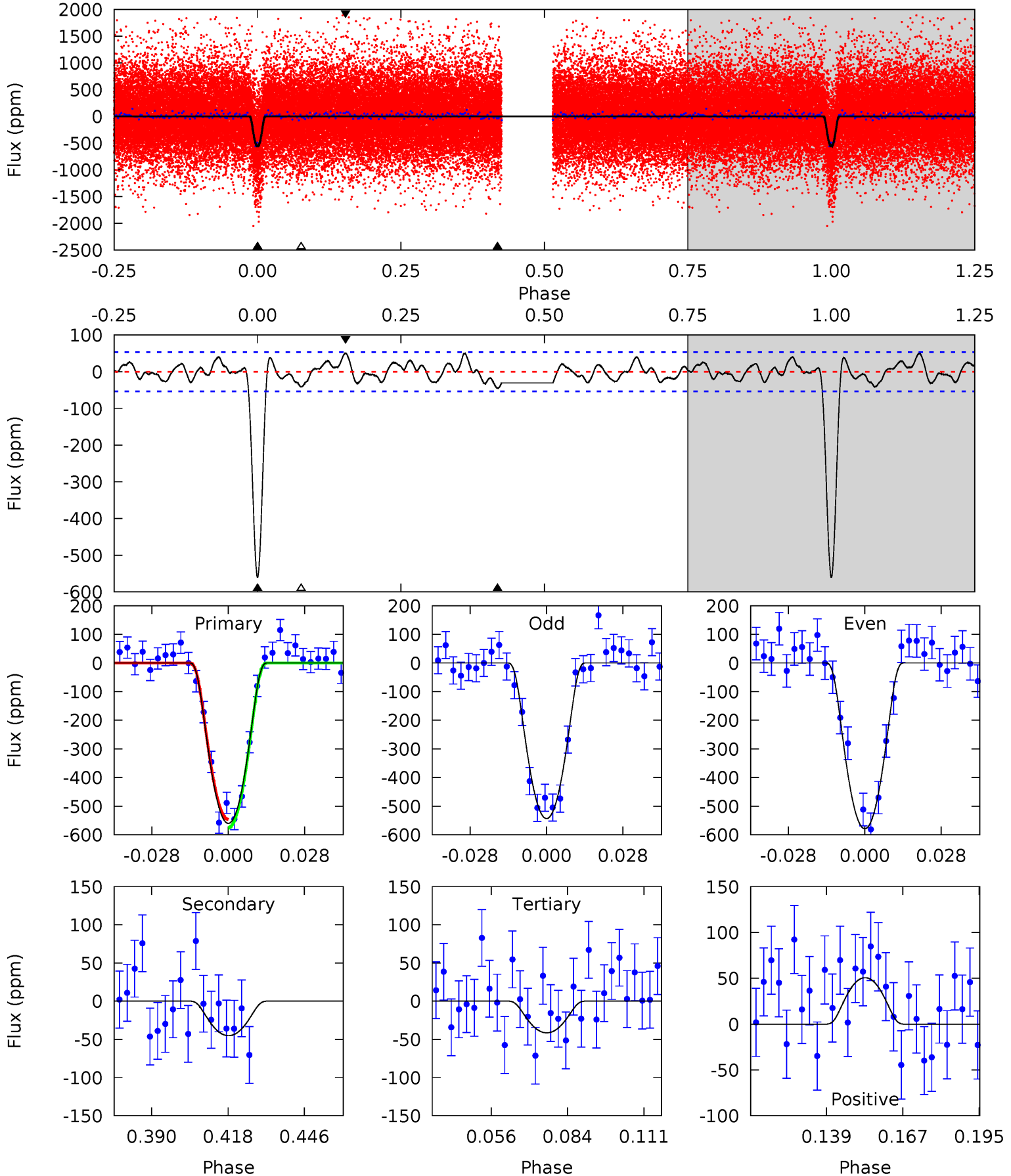
TCE 003240706-02   P= 5.489886 Days    $T_0=131.527406$  (BKJD)



# DV Model-Shift Uniqueness Test

003240706-02, P = 5.489900 Days, E = 126.035674 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
50.8	4.09	3.76	4.59	4.83	2.20	1.69	47.0	46.2	0.34	-0.49	1.61	0.99	0.08	1.30

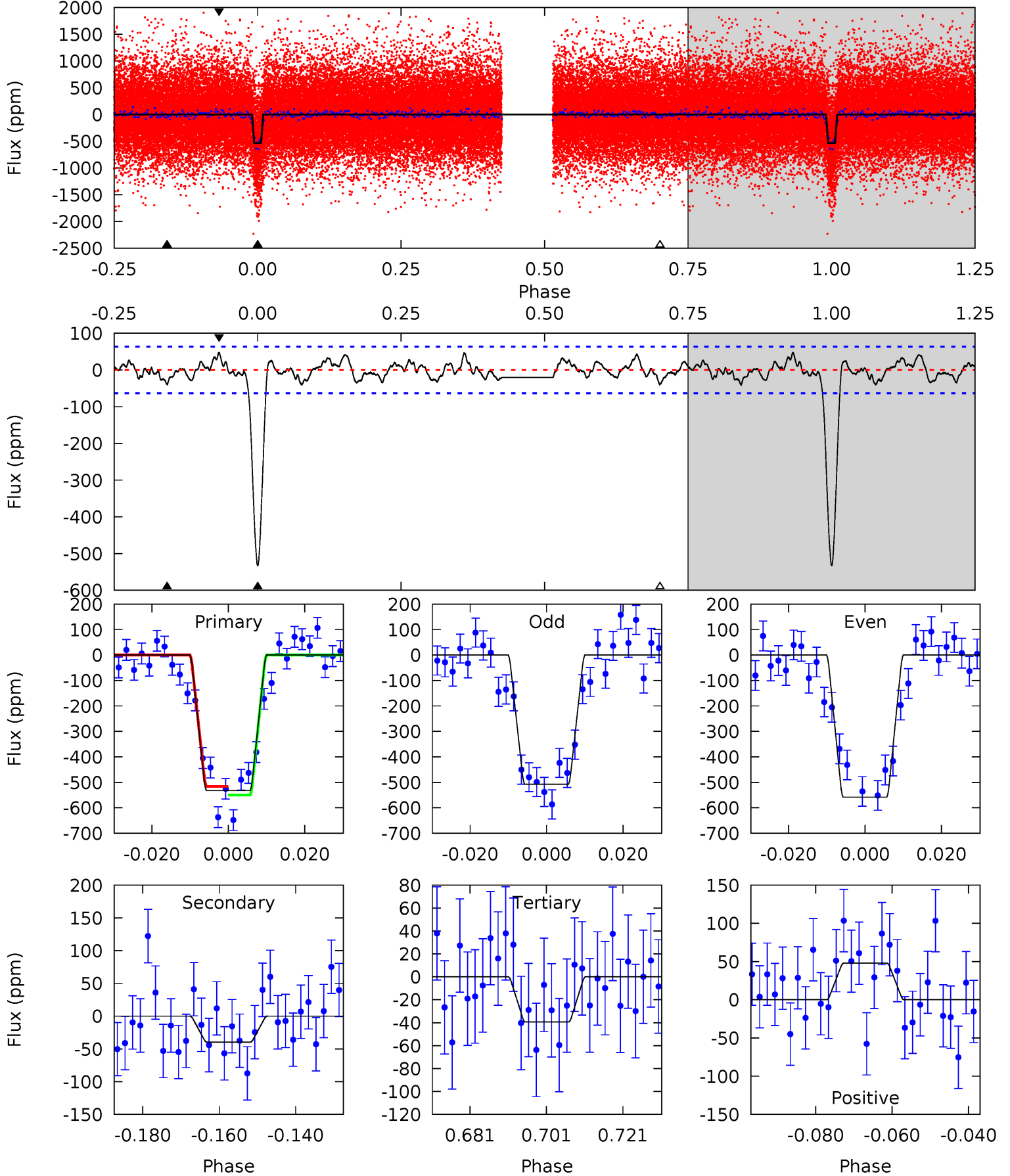




# Alt Model-Shift Uniqueness Test

003240706-02, P = 5.489886 Days, E = 126.037520 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
41.1	3.07	3.04	3.70	4.89	2.33	1.36	38.0	37.4	0.02	-0.63	1.95	1.00	0.08	1.31



### Stellar Parameters For KIC 003240706

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5982^{+160}_{-195}$	$4.493^{+0.046}_{-0.184}$	$-0.040^{+0.250}_{-0.350}$	$0.960^{+0.251}_{-0.090}$	$1.047^{+0.116}_{-0.142}$	$1.667^{+0.403}_{-0.792}$
	+3%/-3%	+1%/-4%	+625%/-875%	+26%/-9%	+11%/-14%	+24%/-48%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003240706-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-45 \pm 11$	$3.65^{+1.68}_{-1.60}$	$1481^{+90}_{-69}$	$3231^{+672}_{-376}$	$6.989^{+14.902}_{-3.921}$
Alt.	$-40 \pm 13$	$2.59^{+1.70}_{-1.43}$	$1478^{+89}_{-62}$	$3531^{+1131}_{-563}$	$12^{+46}_{-8}$

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

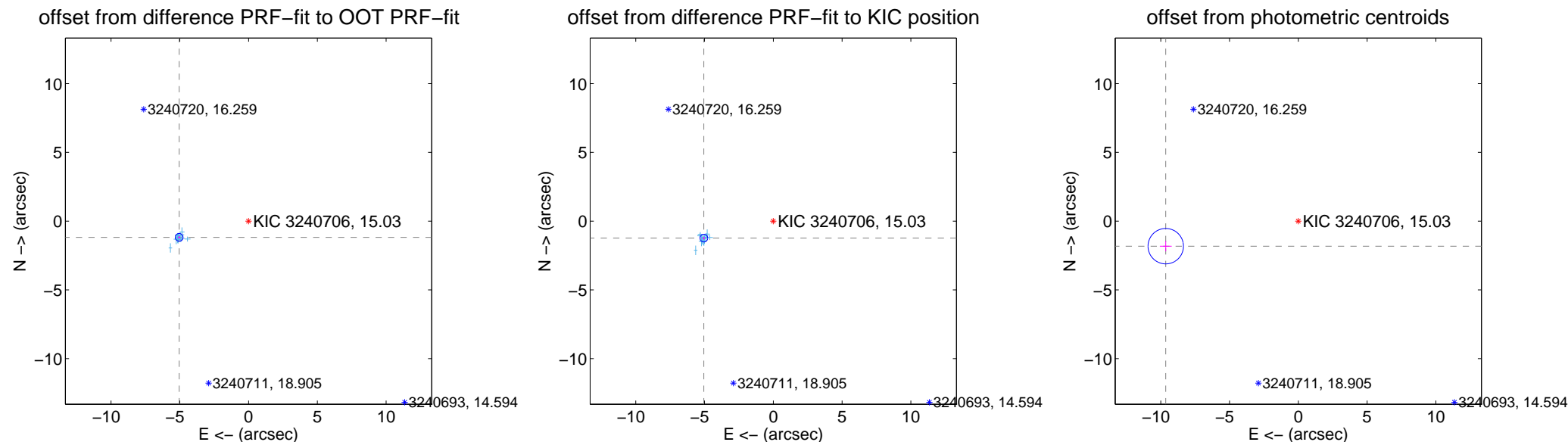
## DV Centroid Data

Supplemental centroid analysis for 003240706-02. Kepler magnitude: 15.03. Transit SNR 30.54

There are 17 quarters with good PRF difference image offsets

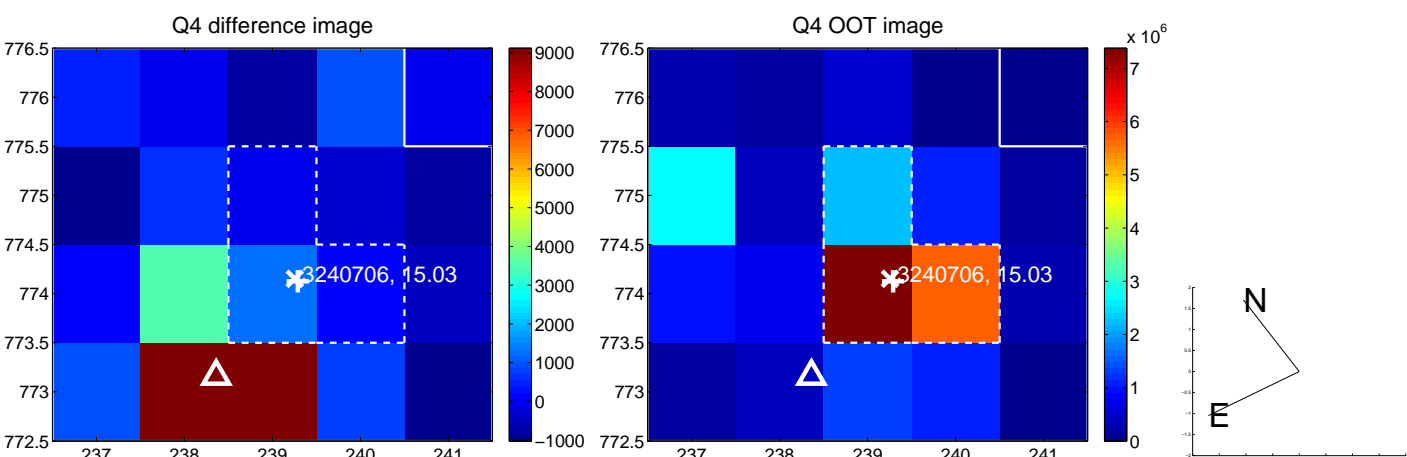
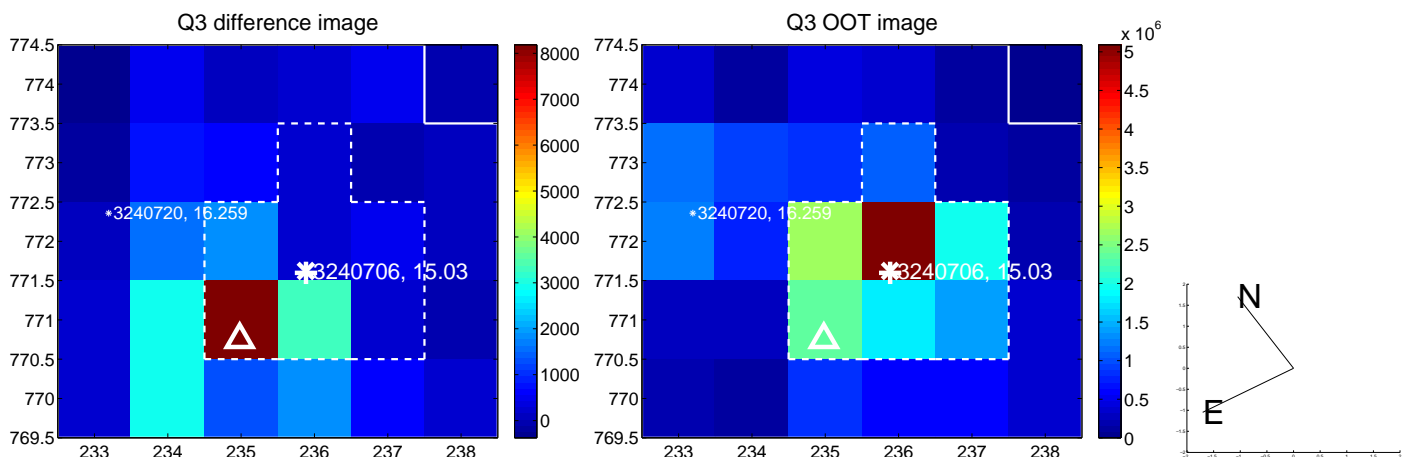
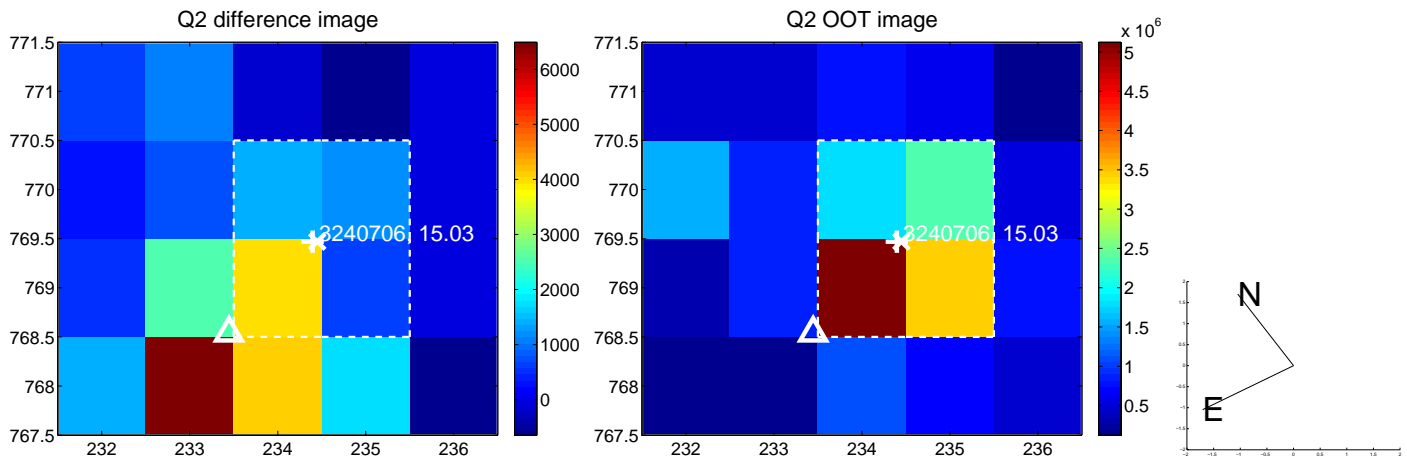
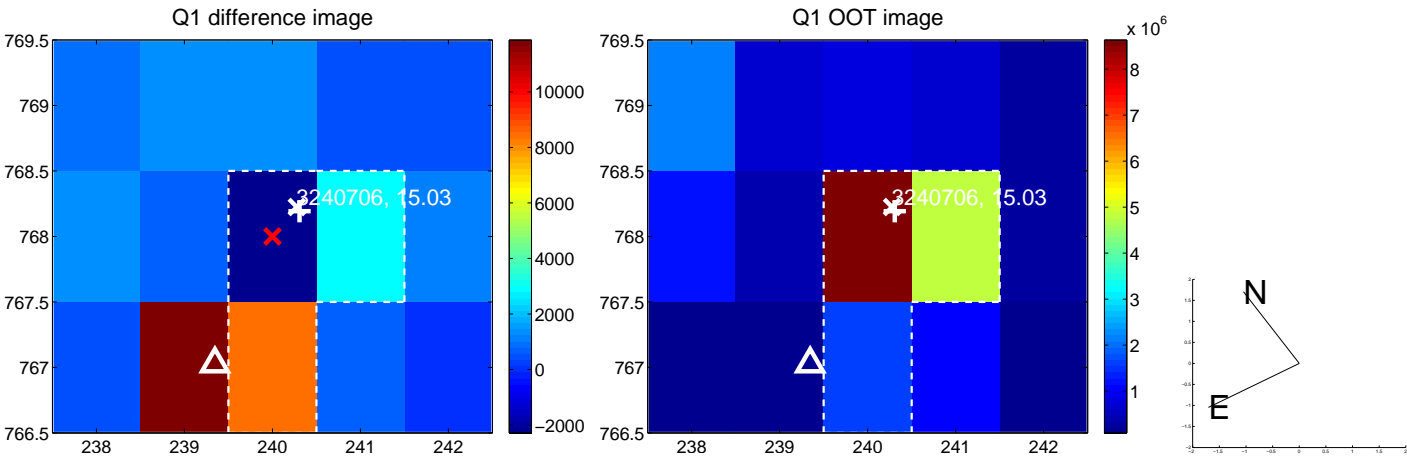
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.182 \pm 0.094$	<b>55.12</b>	$5.046 \pm 0.089$	$-1.179 \pm 0.088$
PRF-fit source offset from KIC position	$5.197 \pm 0.093$	<b>55.70</b>	$5.049 \pm 0.087$	$-1.234 \pm 0.096$
photometric centroid source offset	$9.81 \pm 0.43$	<b>22.85</b>	$9.64 \pm 0.43$	$-1.82 \pm 0.37$



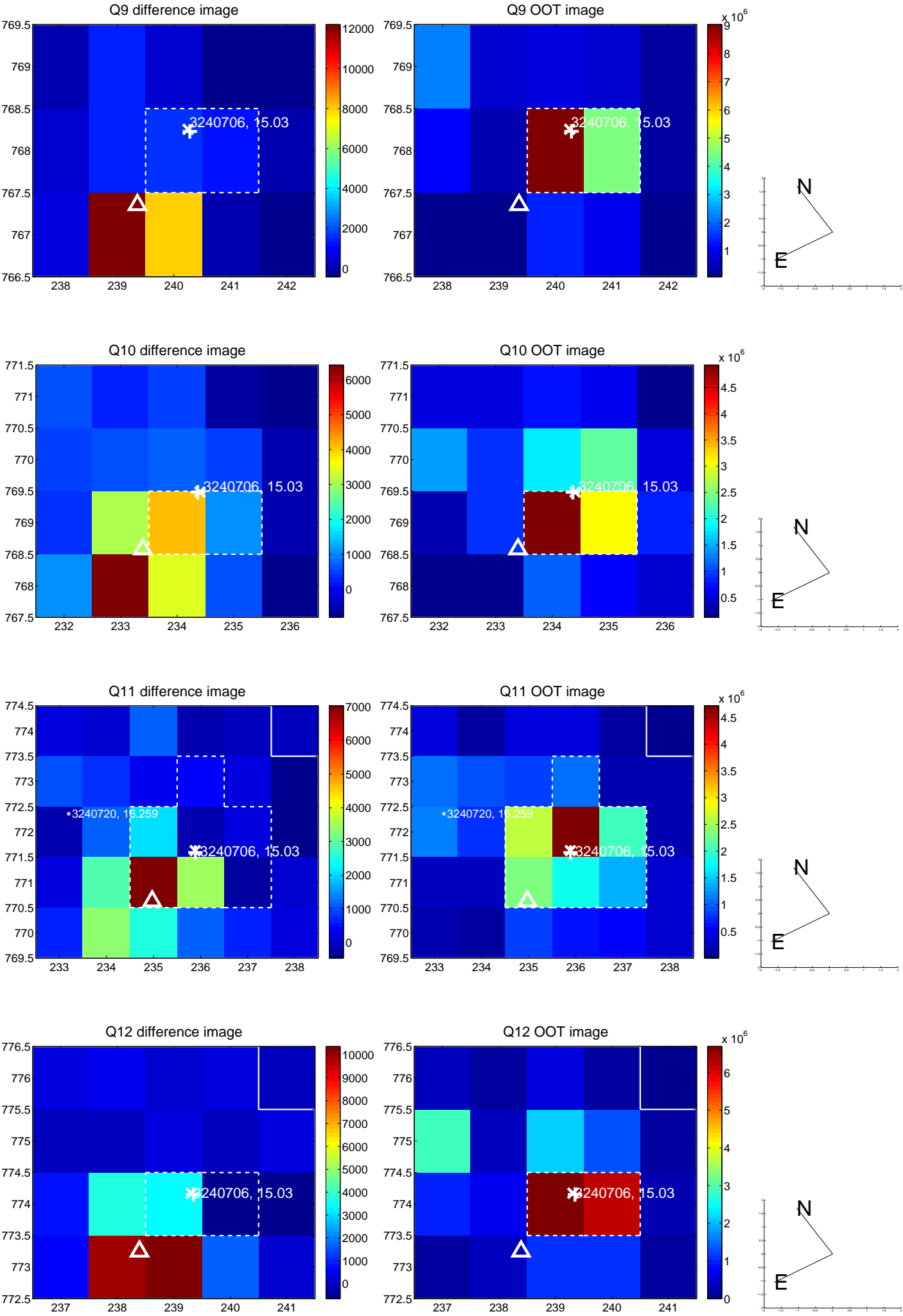
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

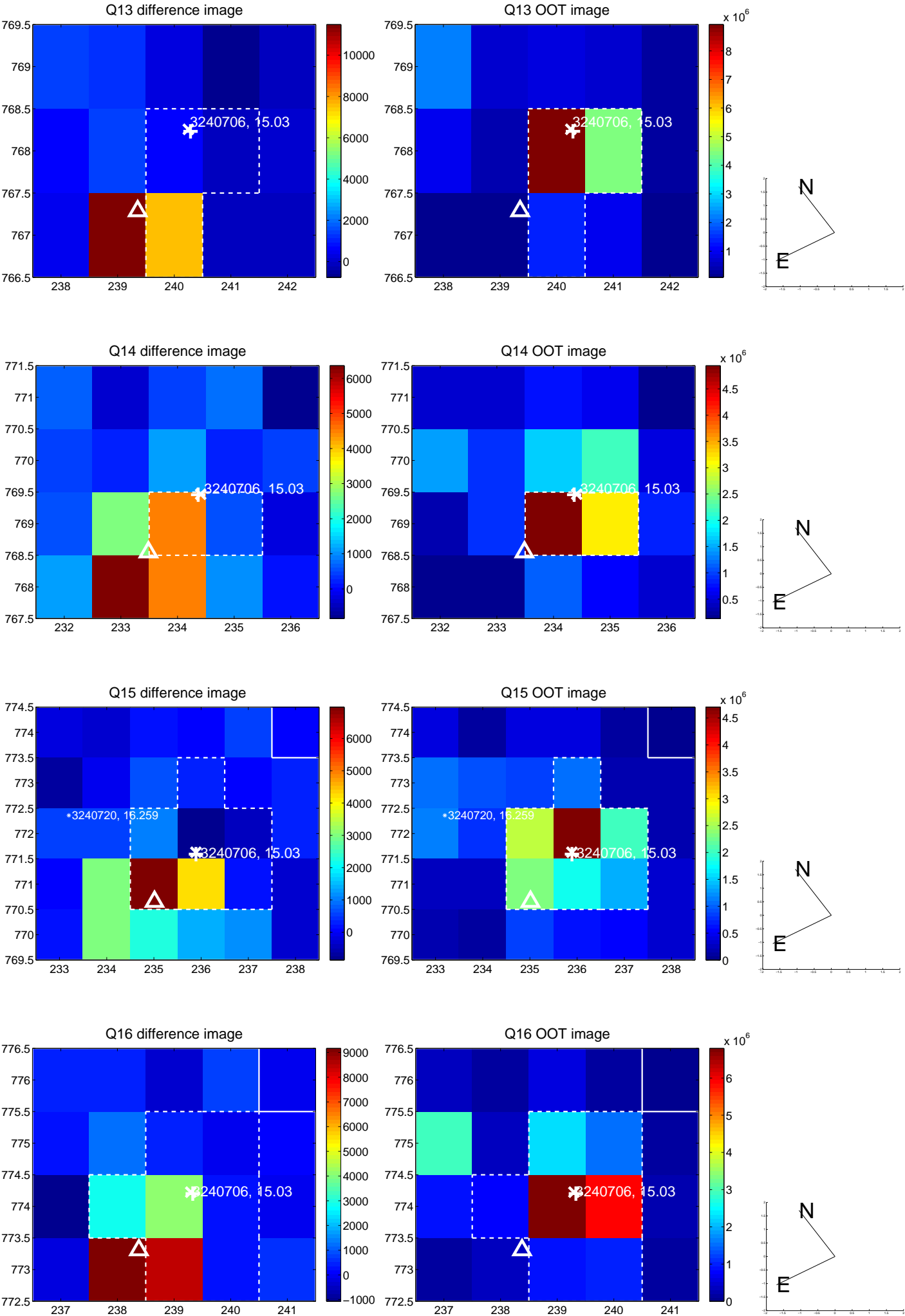




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

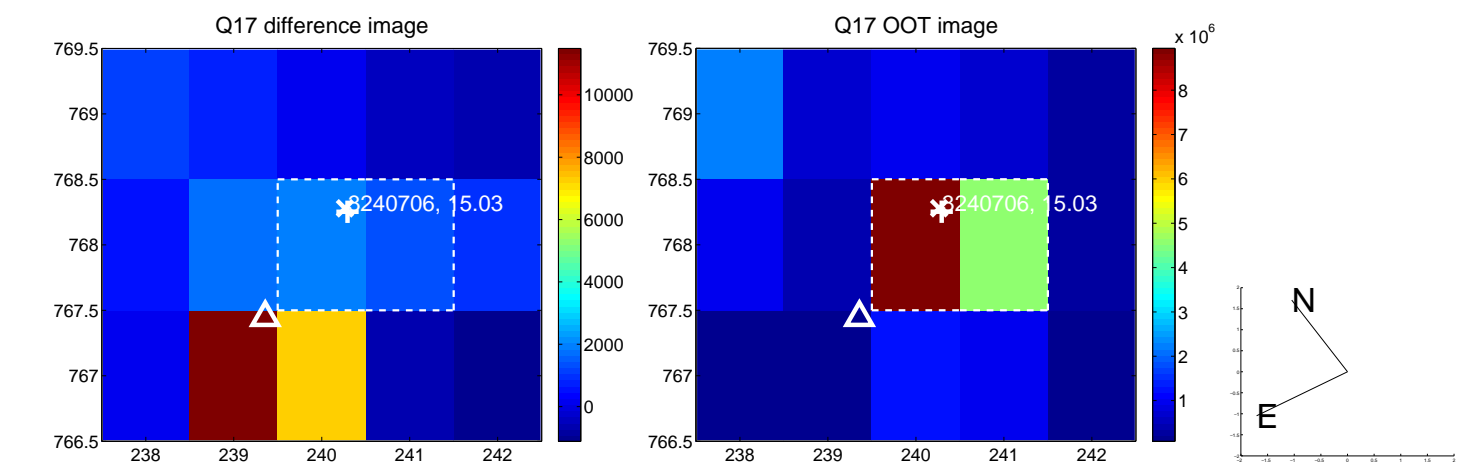


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

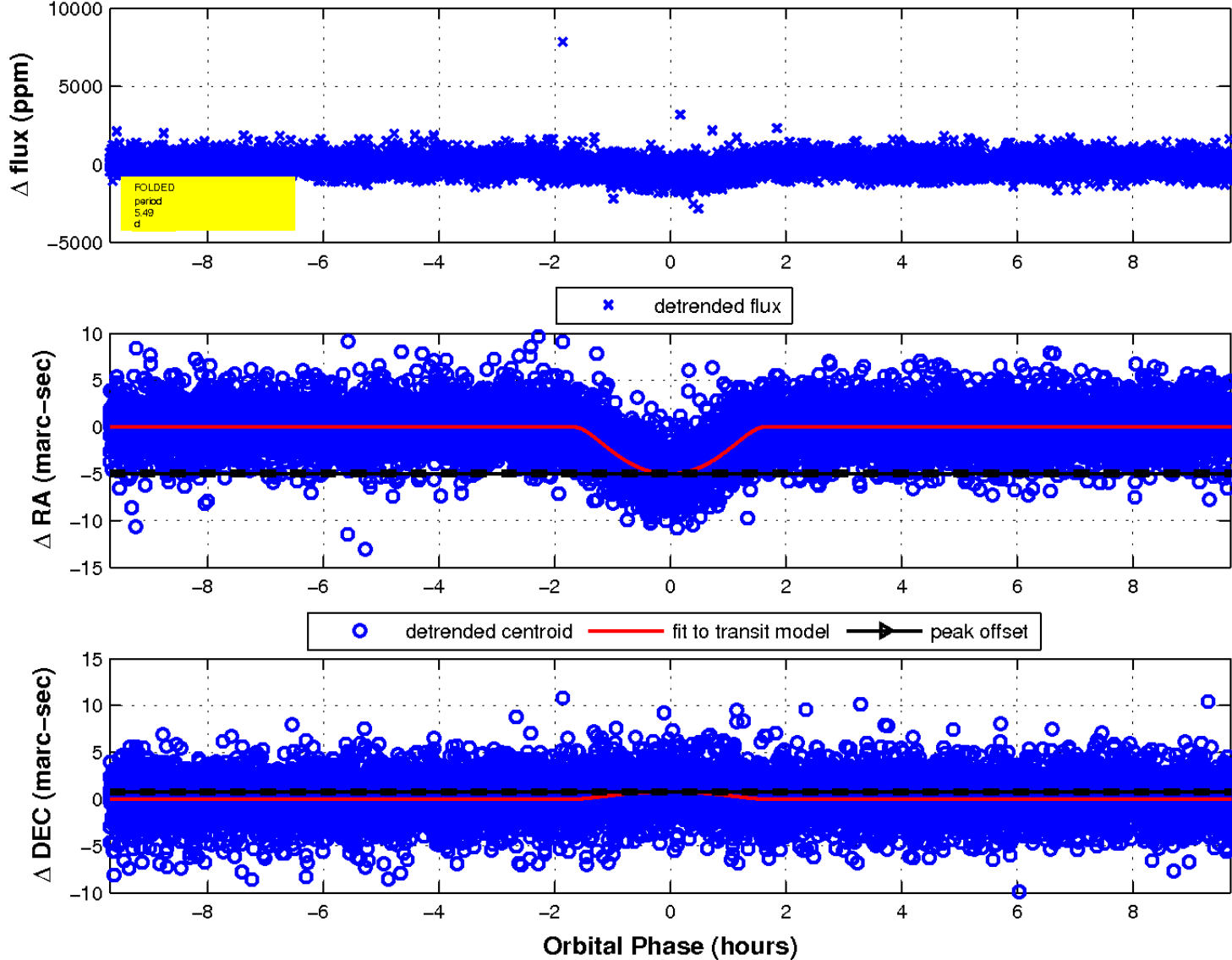




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

