

# KIC 003341760

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003341760-01	OBS	4973.01	0.523492	131.698428	42.0	0.764	12.7	16.2	2.46	6122	1.90	38249.15
003341760-02	OBS	No	0.523482	131.959551	10.4	2.151	9.9	7.2	2.46	6122	0.79	38250.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003341760-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
003341760-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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.

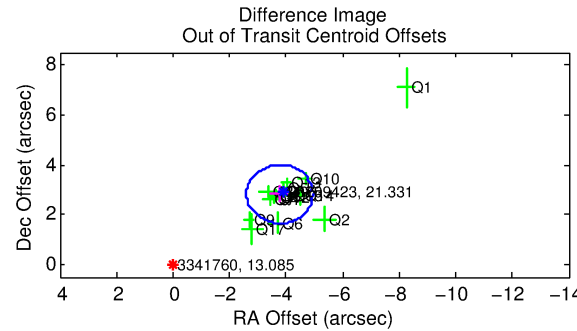
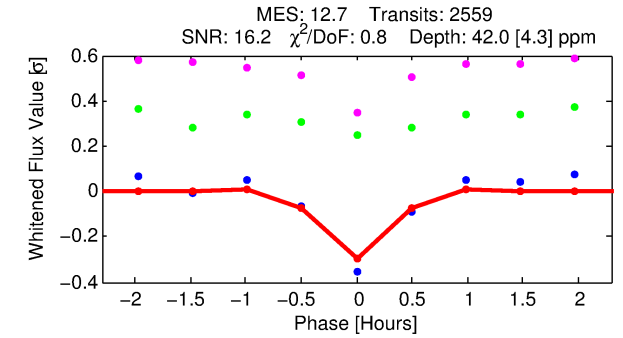
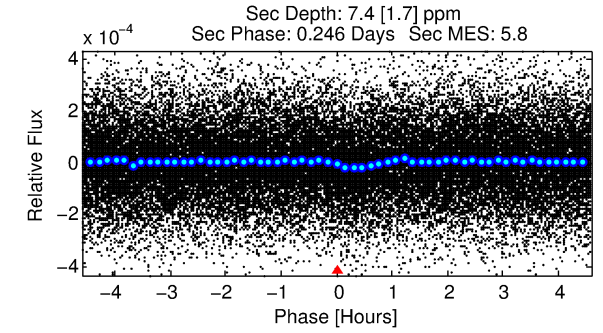
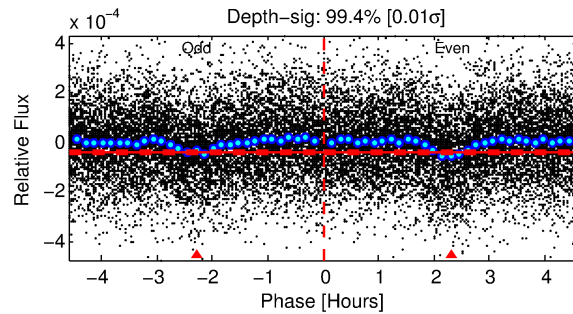
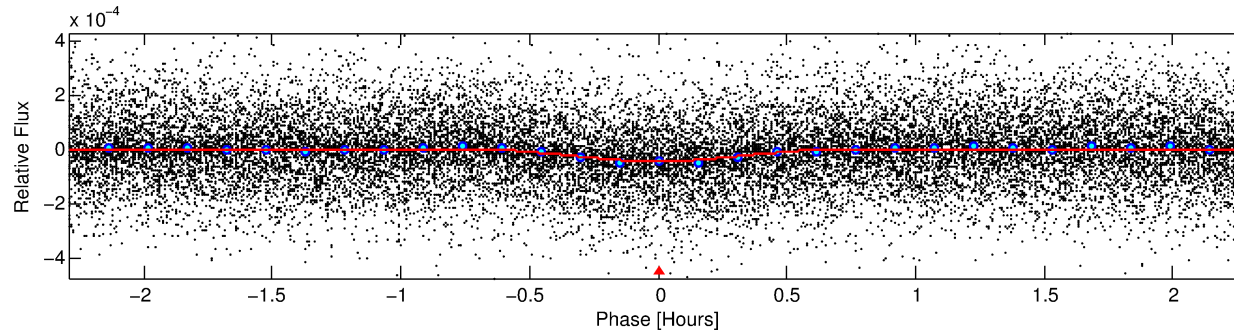
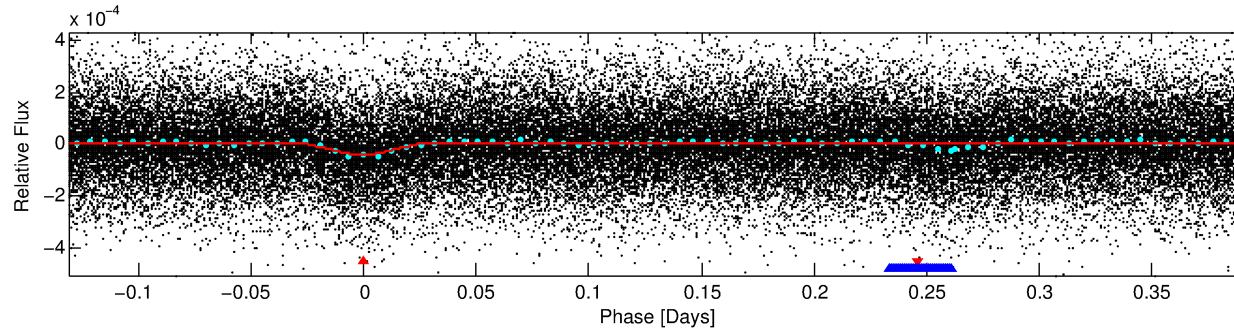
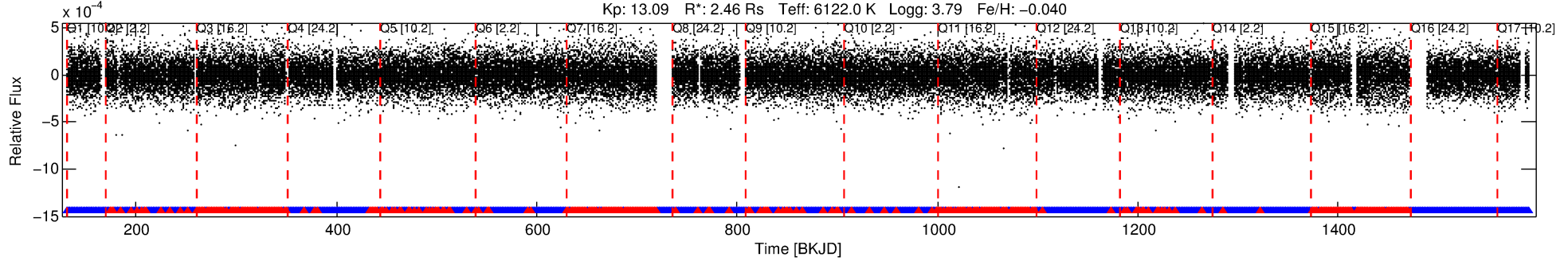
## Ephemeris Match Information For 003341760-01

No Significant Match Found

# DV One-Page Summary

KIC: 3341760 Candidate: 1 of 2 Period: 0.523 d  
KOI: K04973.01 Corr: 0.938

Kp: 13.09 R\*: 2.46 Rs Teff: 6122.0 K Logg: 3.79 Fe/H: -0.040



## DV Fit Results:

Period = 0.52349 [0.00001] d  
Epoch = 131.6984 [0.0009] BKJD  
Rp/R\* = 0.0071 [0.0013]  
a/R\* = 2.55 [2.08]  
b = 0.90 [0.21]  
Seff = 38249.15 [19789.94]  
Teq = 3566 [461] K  
Rp = 1.90 [0.75] Re  
a = 0.0141 [0.0045] AU  
Ag = 0.22 [0.15] [-5.20σ]  
Teffp = 3793 [423] K [0.36σ]

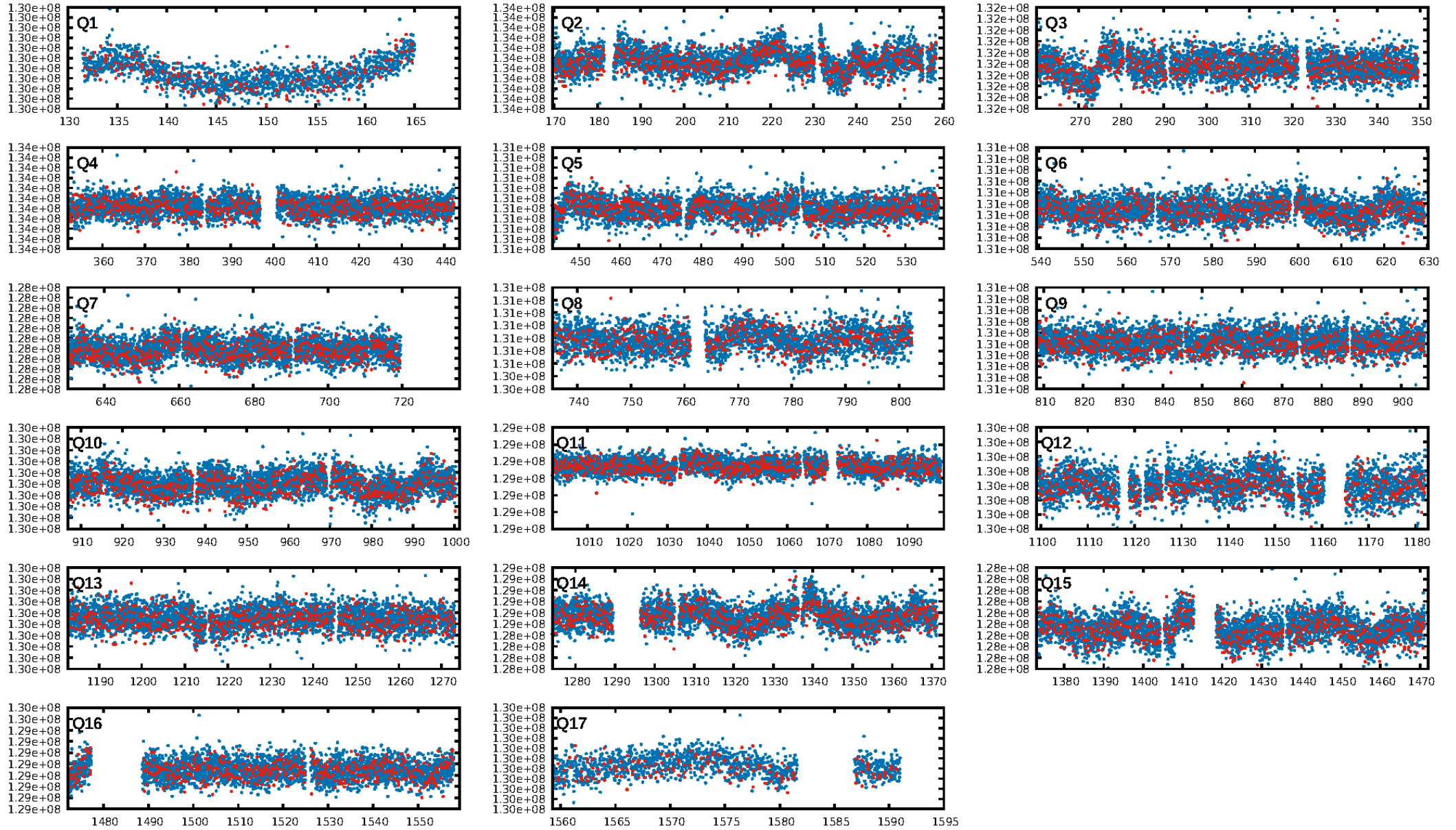
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.15e-52  
RollingBand-fgt: 0.79 [1923/2444]  
GhostDiagnostic-chr: 0.95  
Centroid-sig: 0.0%  
Centroid-so: 8.429 arcsec [10.11σ]  
OotOffset-rm: 4.708 arcsec [12.07σ]  
KicOffset-rm: 4.768 arcsec [11.36σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.88 [15/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:22:43 Z

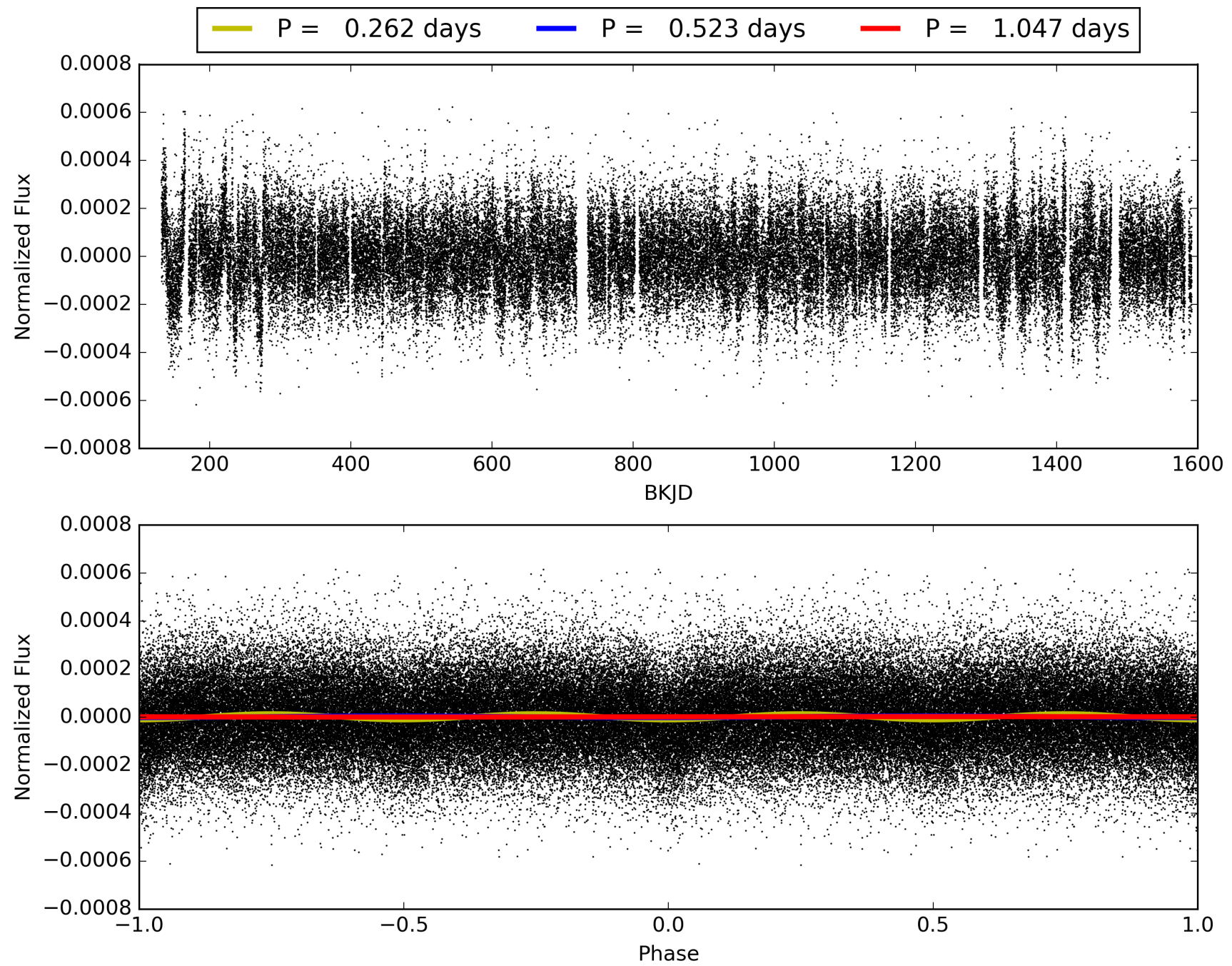
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003341760-01, PDC Light Curves



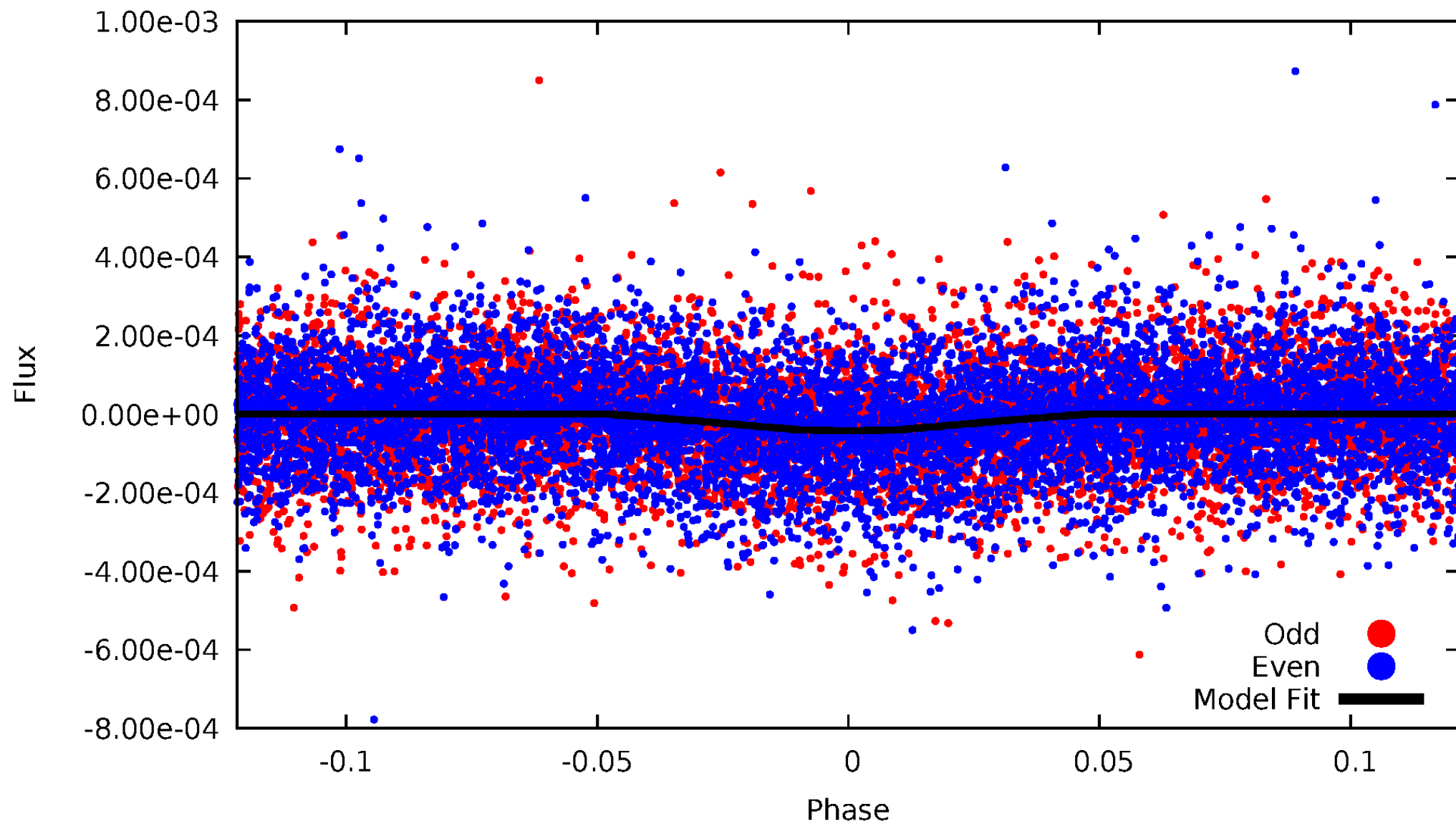


TCE 003341760-01



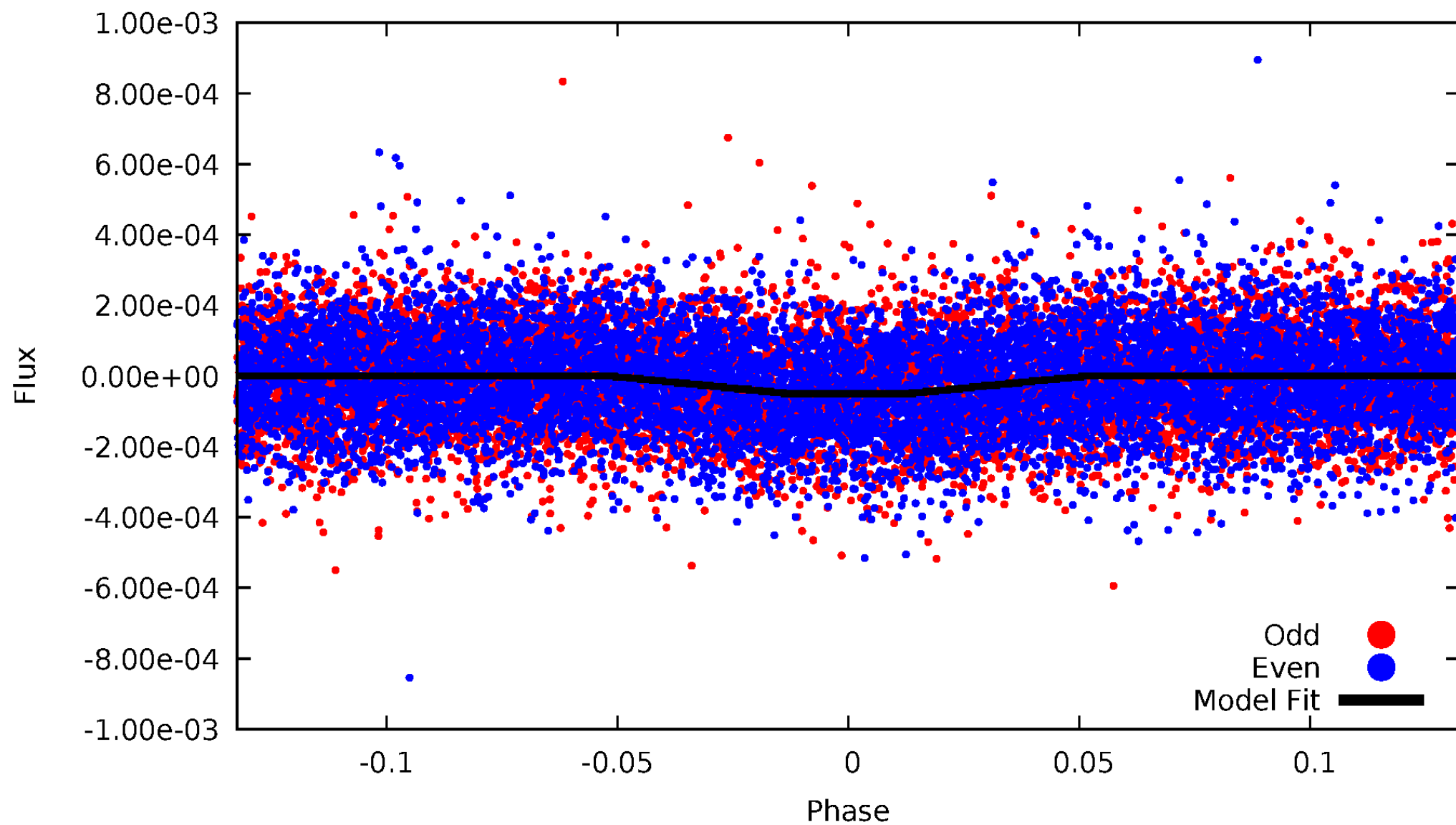
# DV Odd/Even

TCE 003341760-01



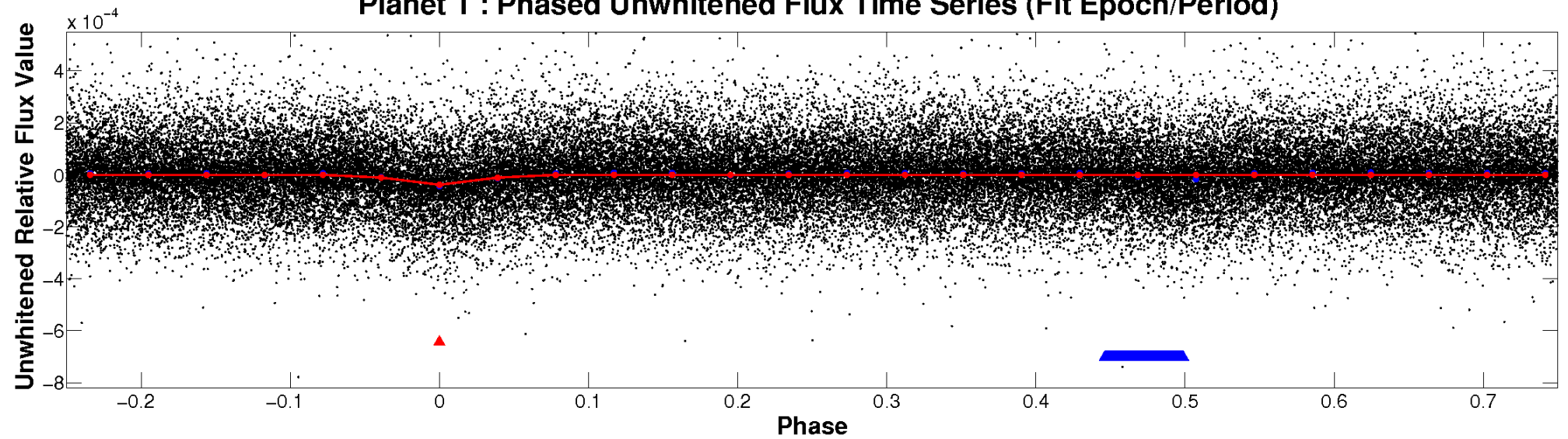
# ALT Odd/Even

TCE 003341760-01

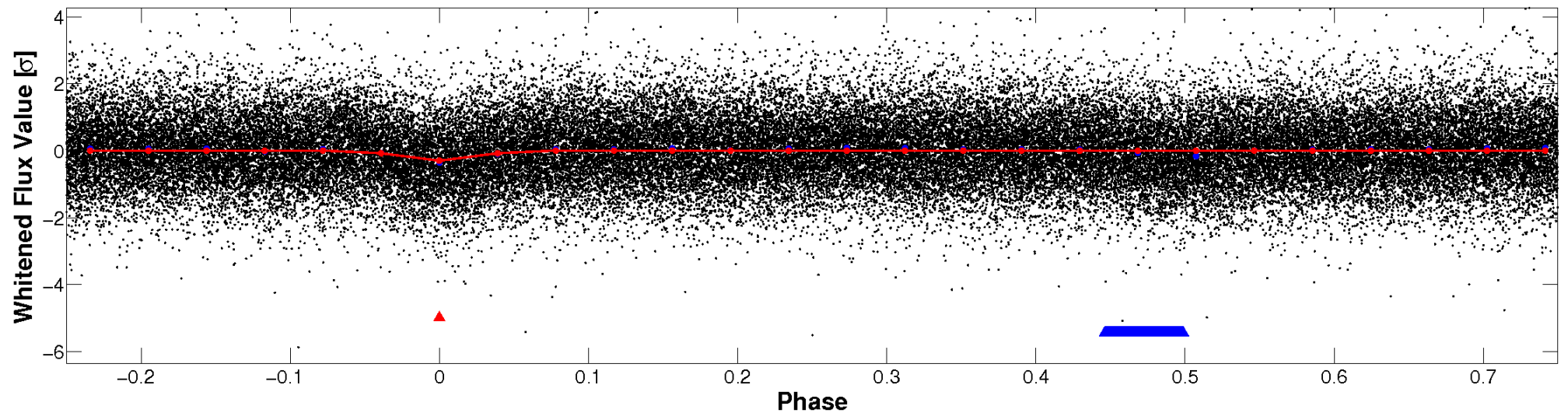


# Non-Whitened Vs. Whitened Light Curve

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



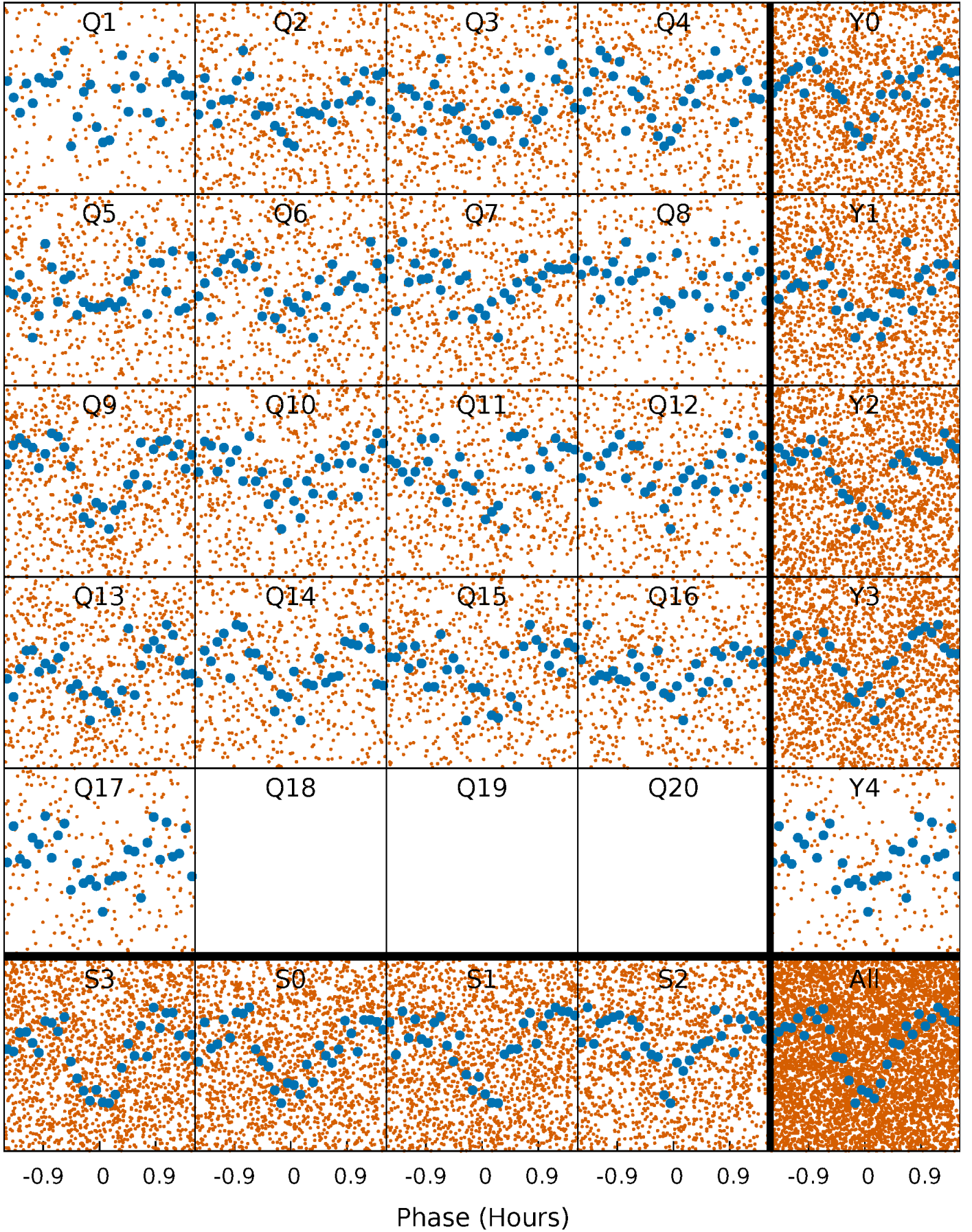
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

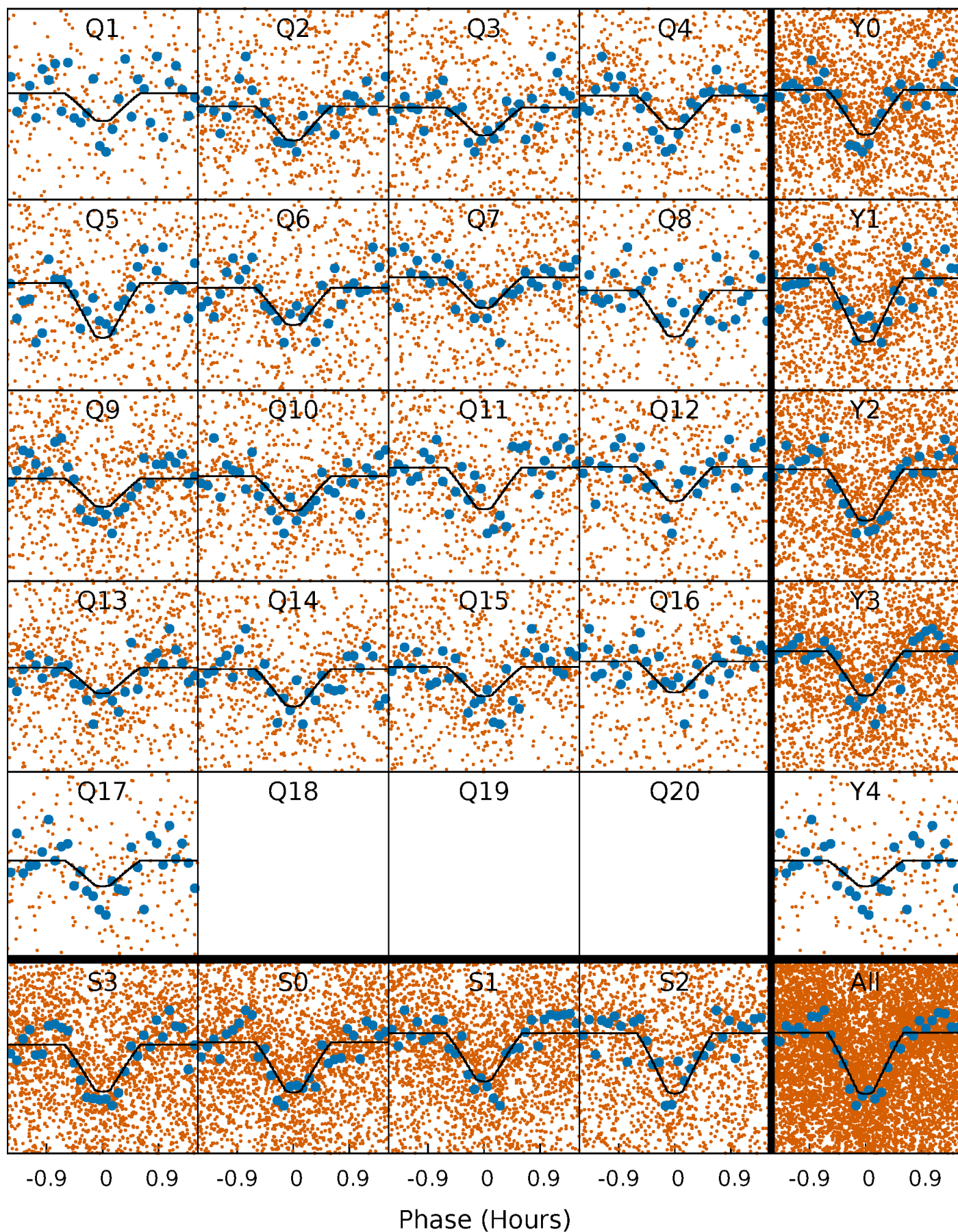
TCE 003341760-01   P= 0.523492 Days    $T_0=131.698428$  (BKJD)





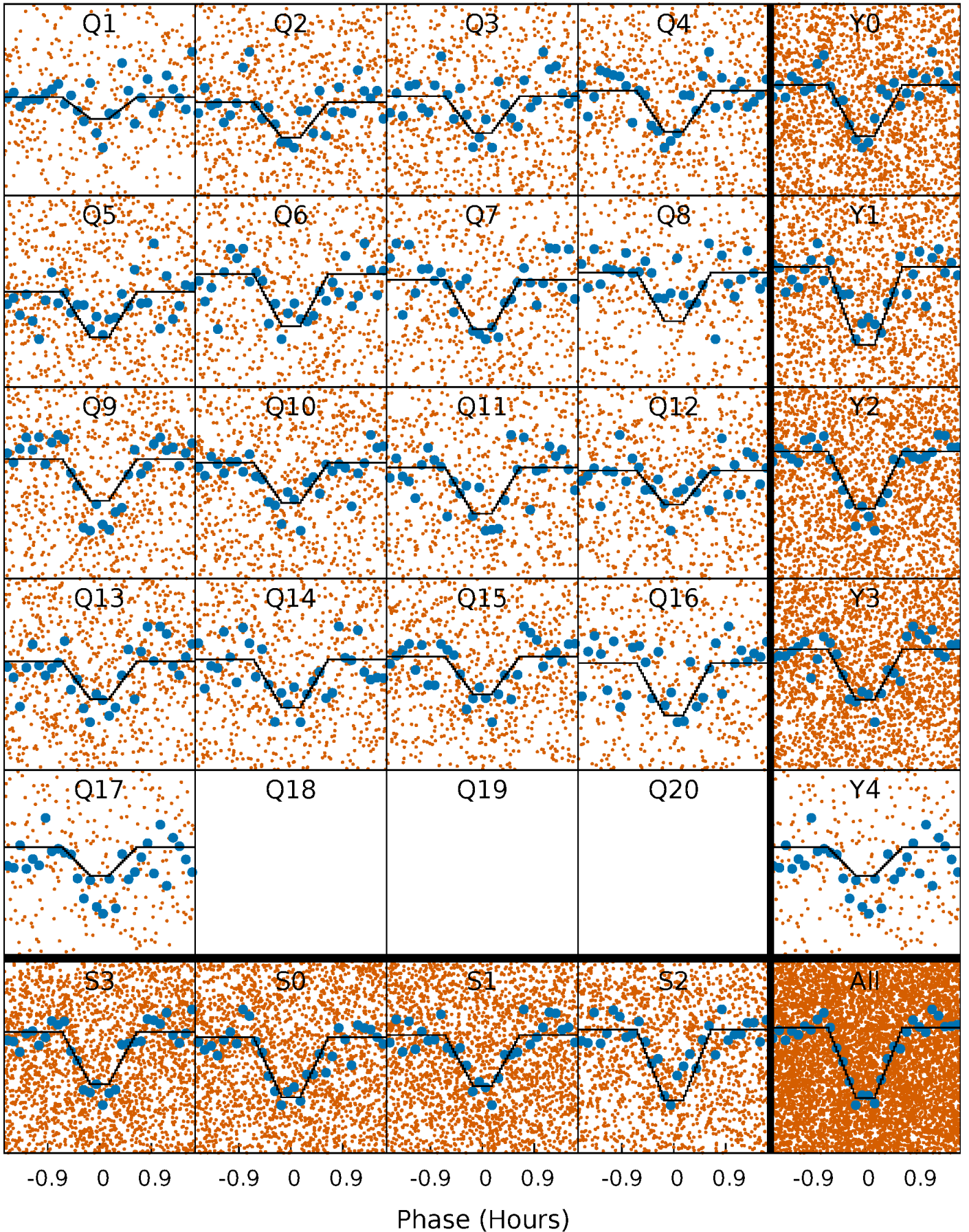
# DV Quarter-Phased Transit Curves

TCE 003341760-01 P= 0.523492 Days  $T_0=131.698428$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

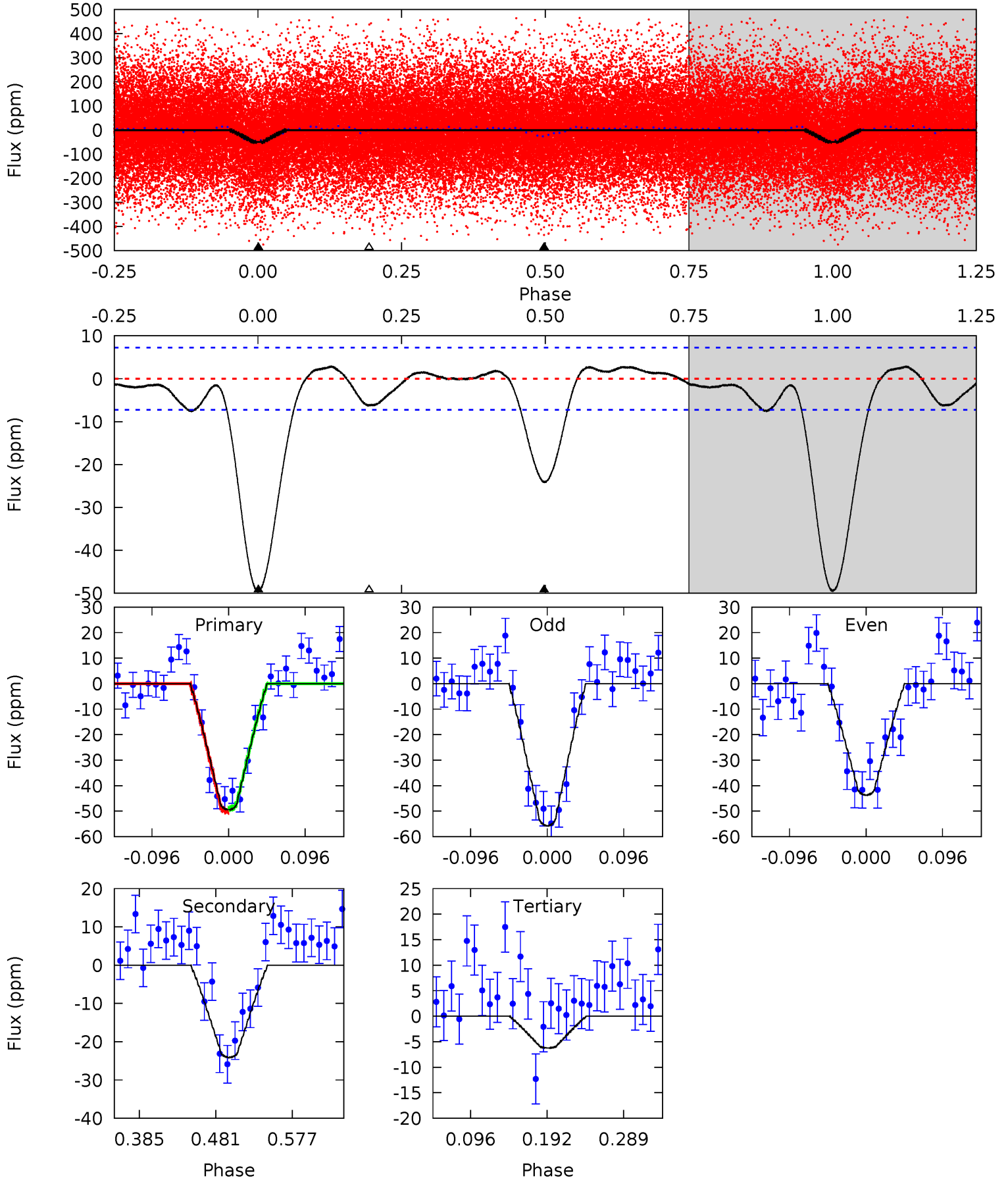
TCE 003341760-01 P= 0.523492 Days  $T_0=131.698434$  (BKJD)



# DV Model-Shift Uniqueness Test

003341760-01, P = 0.523492 Days, E = 131.174936 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
31.1	15.2	3.91	0	4.57	1.66	1.74	27.2	31.1	11.2	15.2	3.79	1.06	0.05	0.38

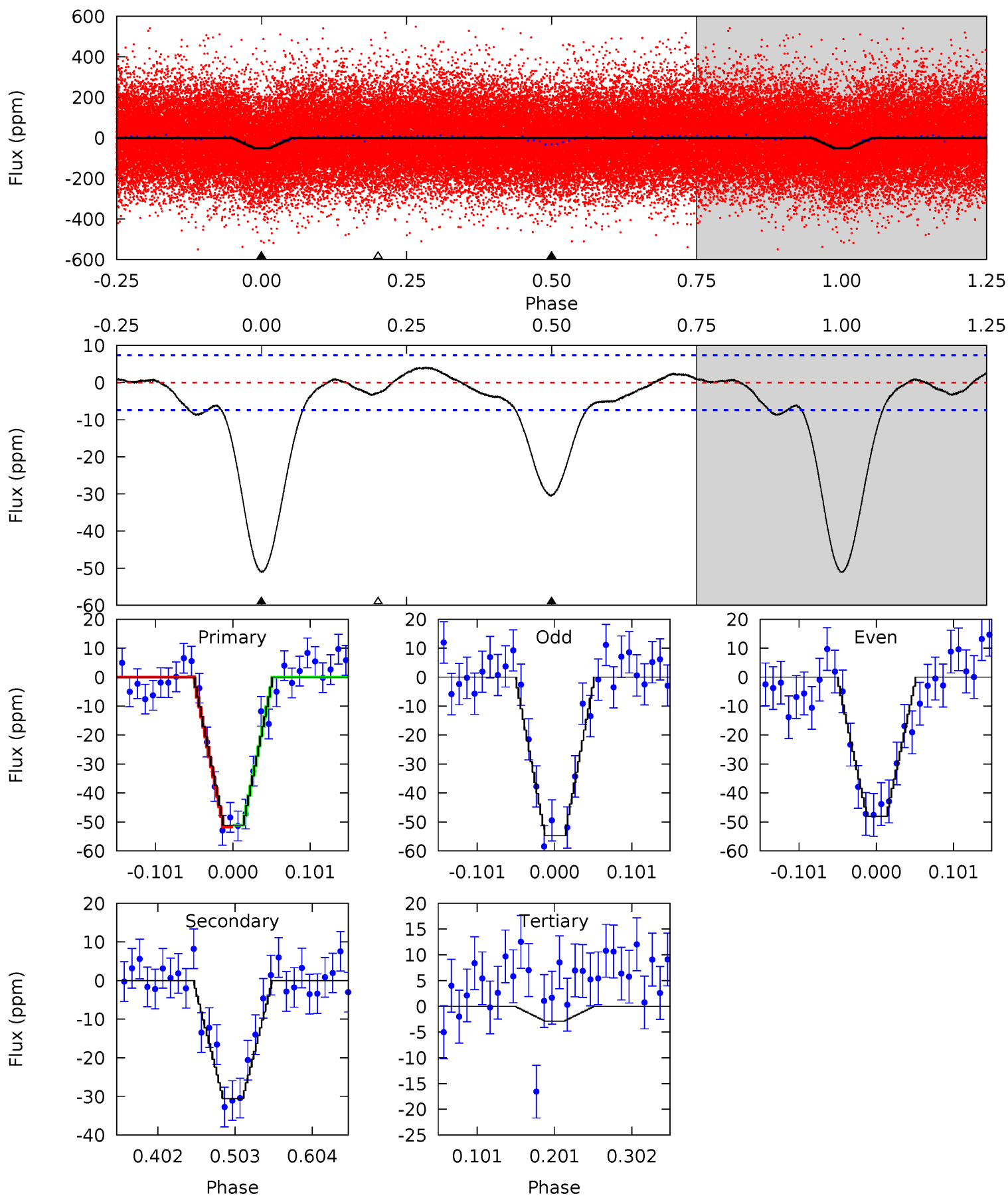




# Alt Model-Shift Uniqueness Test

003341760-01, P = 0.523492 Days, E = 131.174942 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
31.5	18.8	1.76	0	4.56	1.64	1.75	29.7	31.5	17.0	18.8	2.06	1.04	0.07	0.19





### Stellar Parameters For KIC 003341760

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6122^{+165}_{-165}$	$3.791^{+0.293}_{-0.098}$	$-0.040^{+0.300}_{-0.250}$	$2.455^{+0.394}_{-0.854}$	$1.357^{+0.228}_{-0.278}$	$0.129^{+0.271}_{-0.041}$
	+3%/-3%	+8%/-3%	+750%/-625%	+16%/-35%	+17%/-20%	+209%/-32%
Source	PHO1	FLK73	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 003341760-01 / KOI 4973.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-24 \pm 2$	$1.81^{+0.45}_{-0.46}$	$4910^{+270}_{-426}$	$4693^{+651}_{-610}$	$0.807^{+0.615}_{-0.274}$
Alt.	$-31 \pm 2$	$1.81^{+0.45}_{-0.45}$	$4884^{+302}_{-434}$	$4995^{+687}_{-495}$	$1.026^{+0.756}_{-0.351}$

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

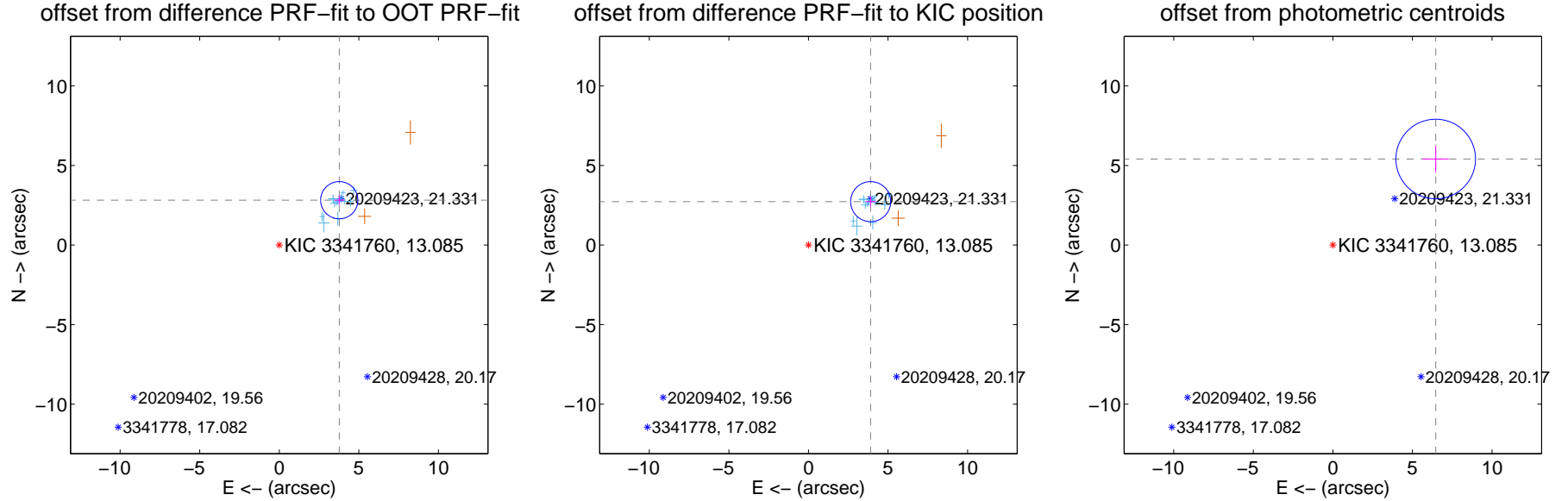
## DV Centroid Data

Supplemental centroid analysis for 003341760-01. Kepler magnitude: 13.09. Transit SNR 16.24

There are 15 quarters with good PRF difference image offsets

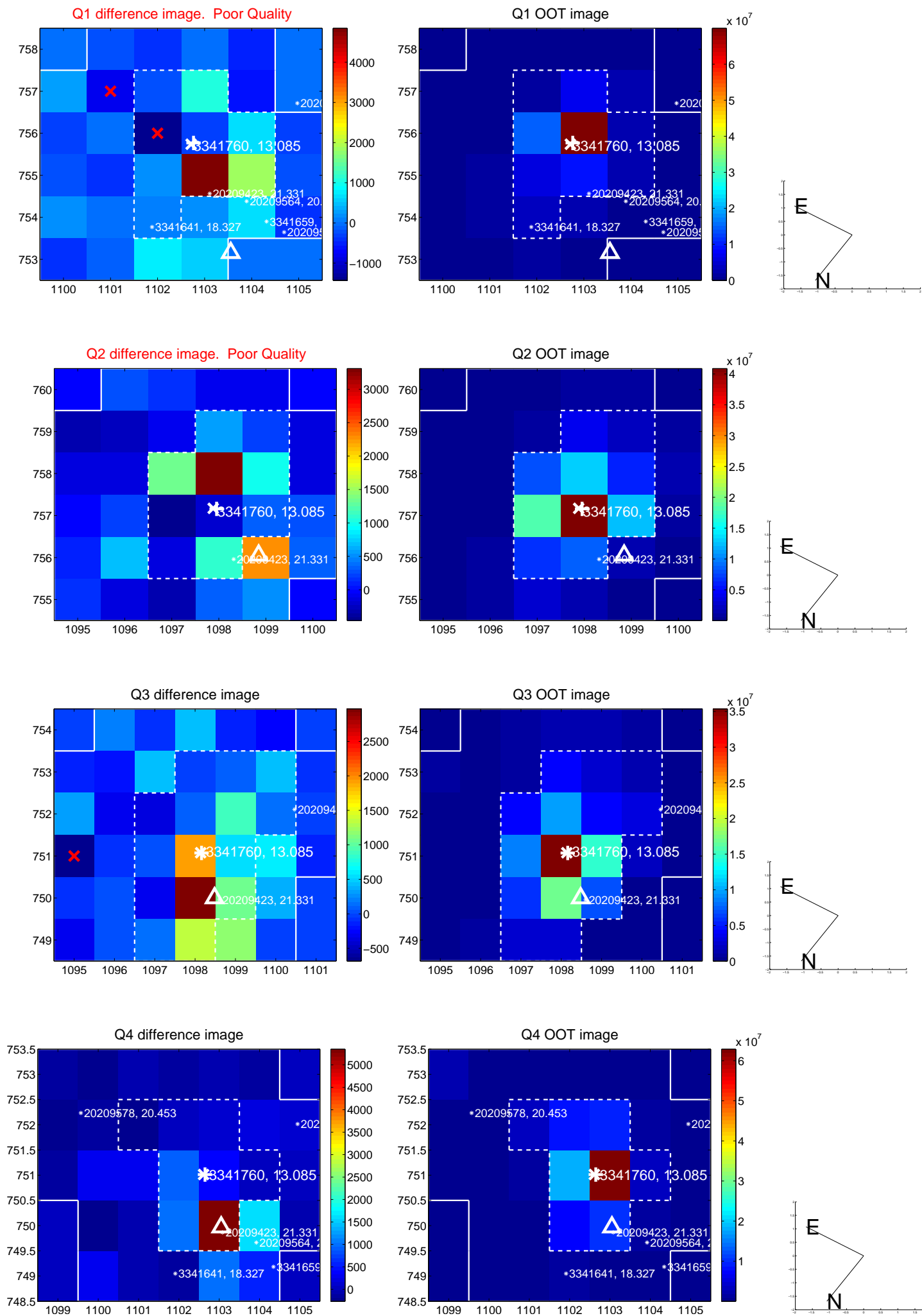
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.708 \pm 0.390$	<b>12.07</b>	$-3.770 \pm 0.295$	$2.820 \pm 0.293$
PRF-fit source offset from KIC position	$4.768 \pm 0.420$	<b>11.36</b>	$-3.910 \pm 0.325$	$2.729 \pm 0.311$
photometric centroid source offset	$8.43 \pm 0.83$	<b>10.11</b>	$-6.46 \pm 0.81$	$5.41 \pm 0.86$

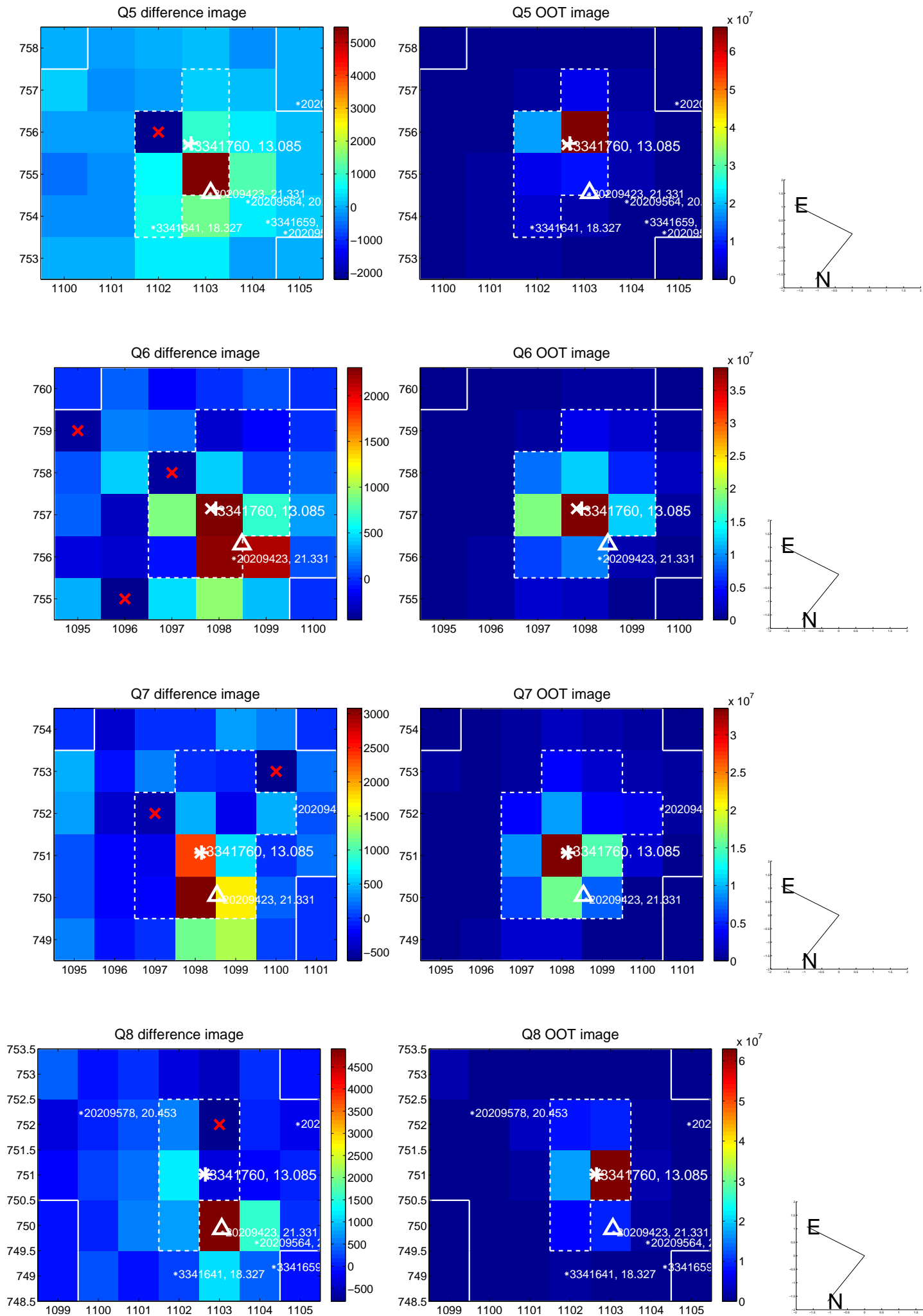


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

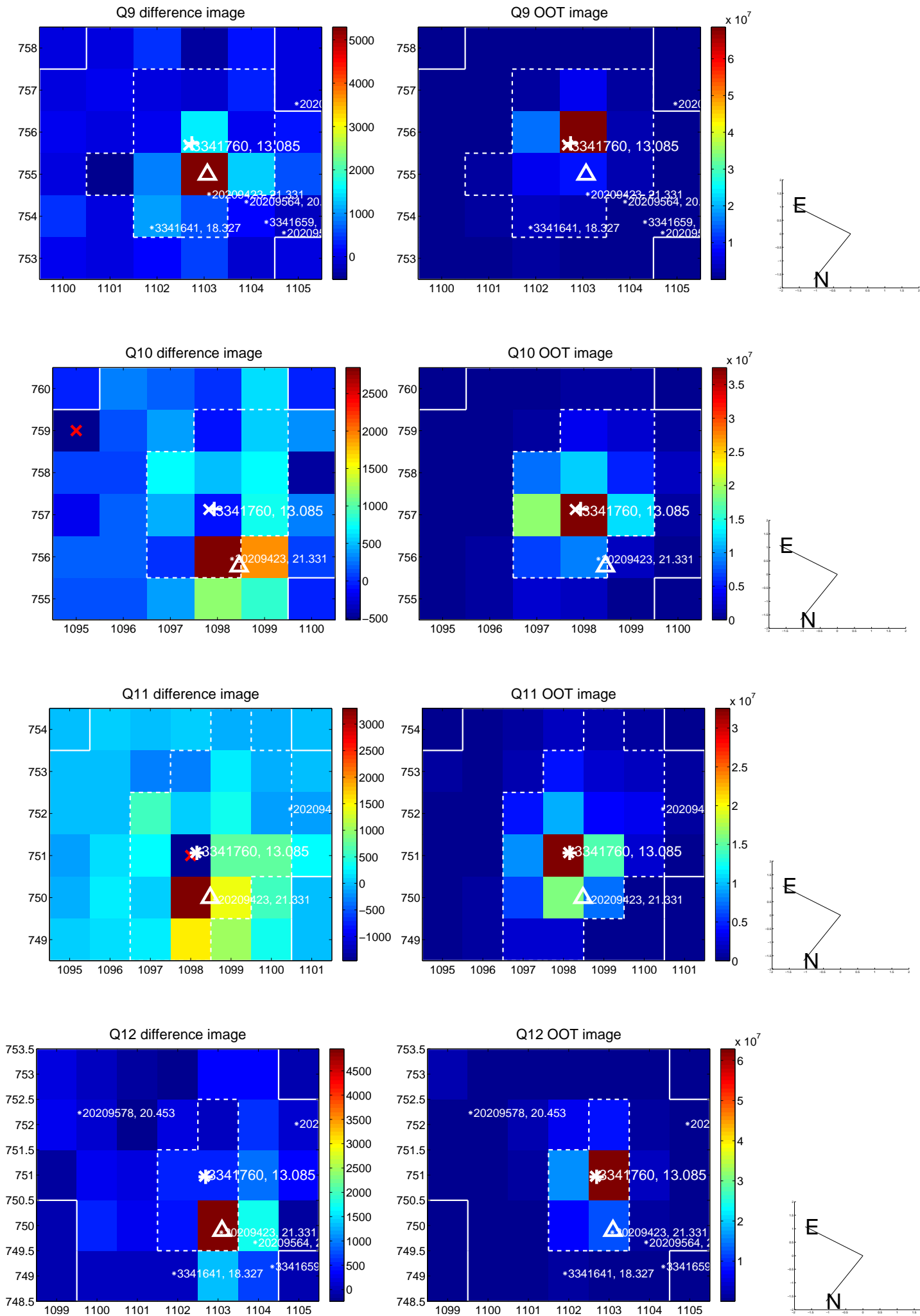


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

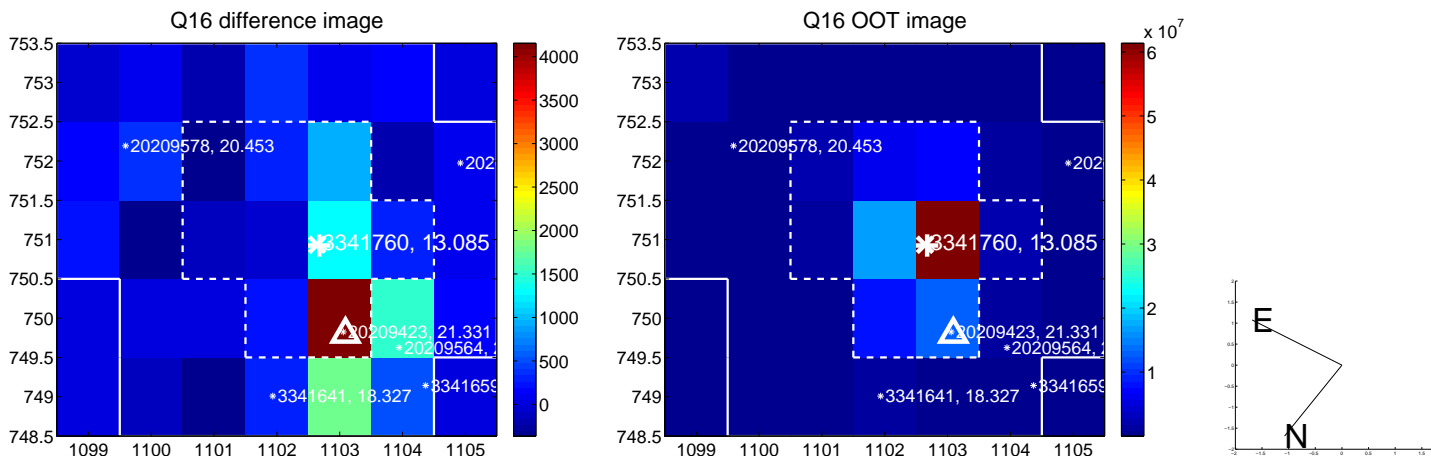
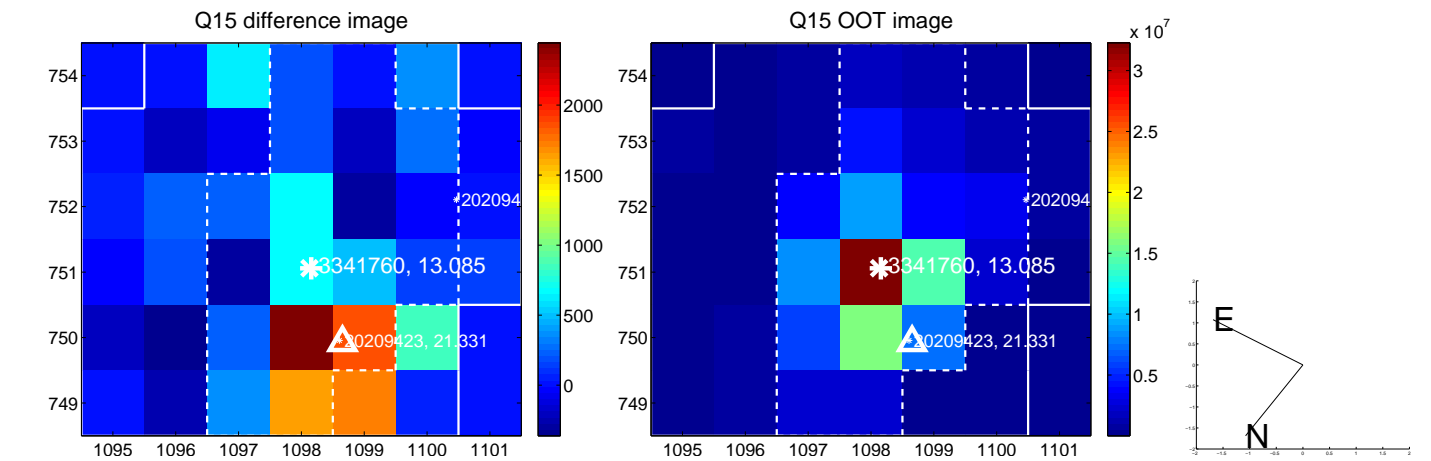
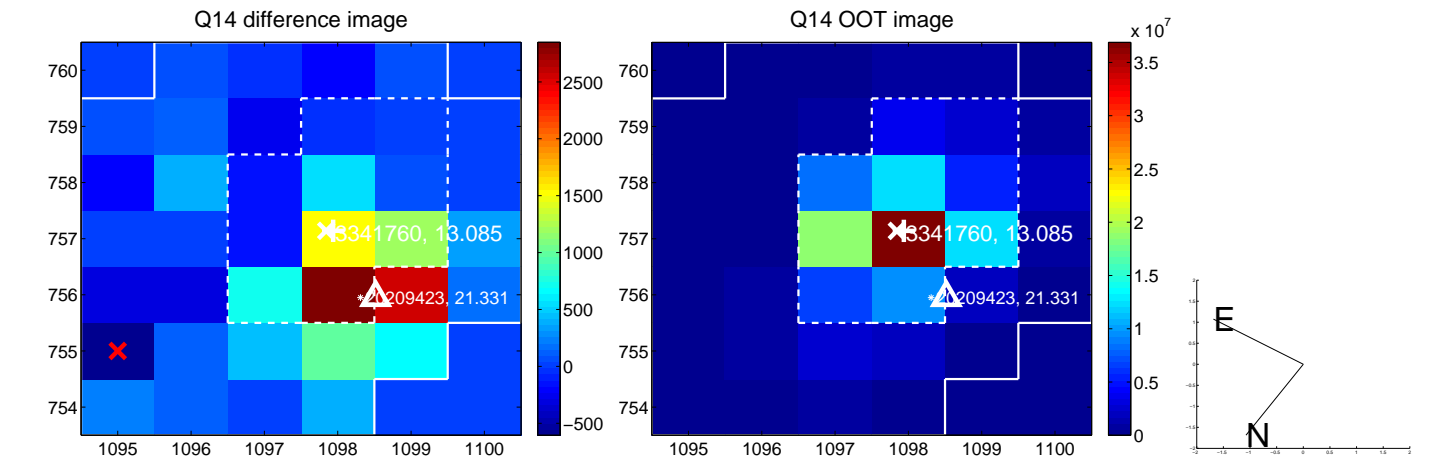
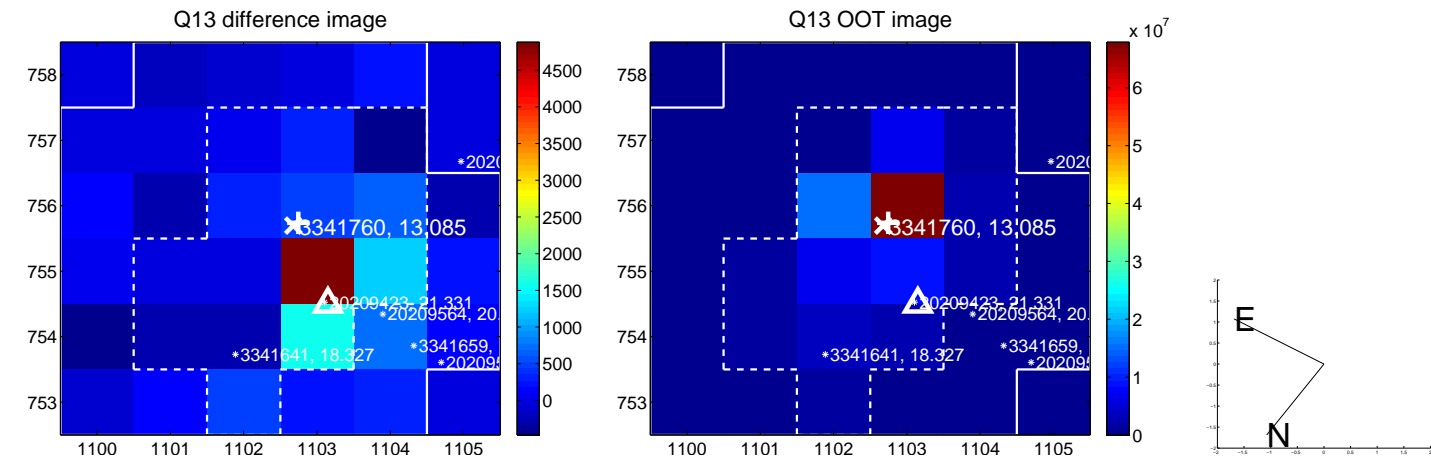




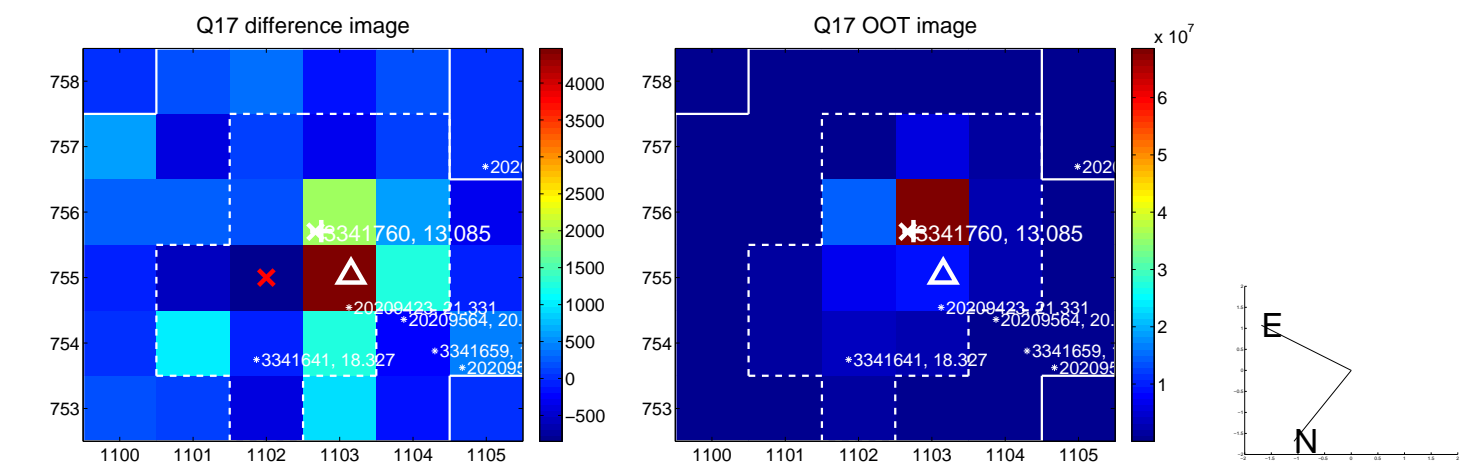
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



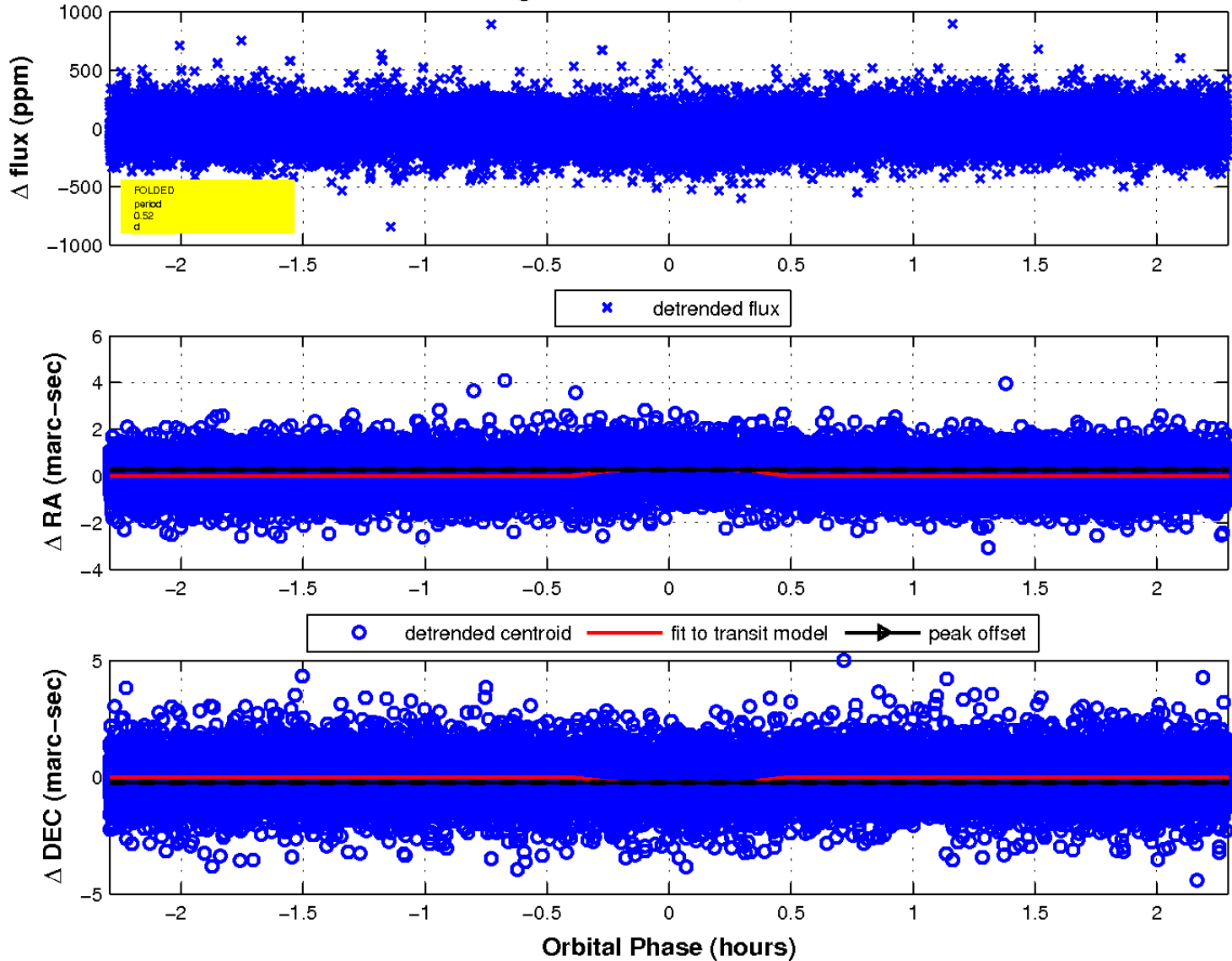
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

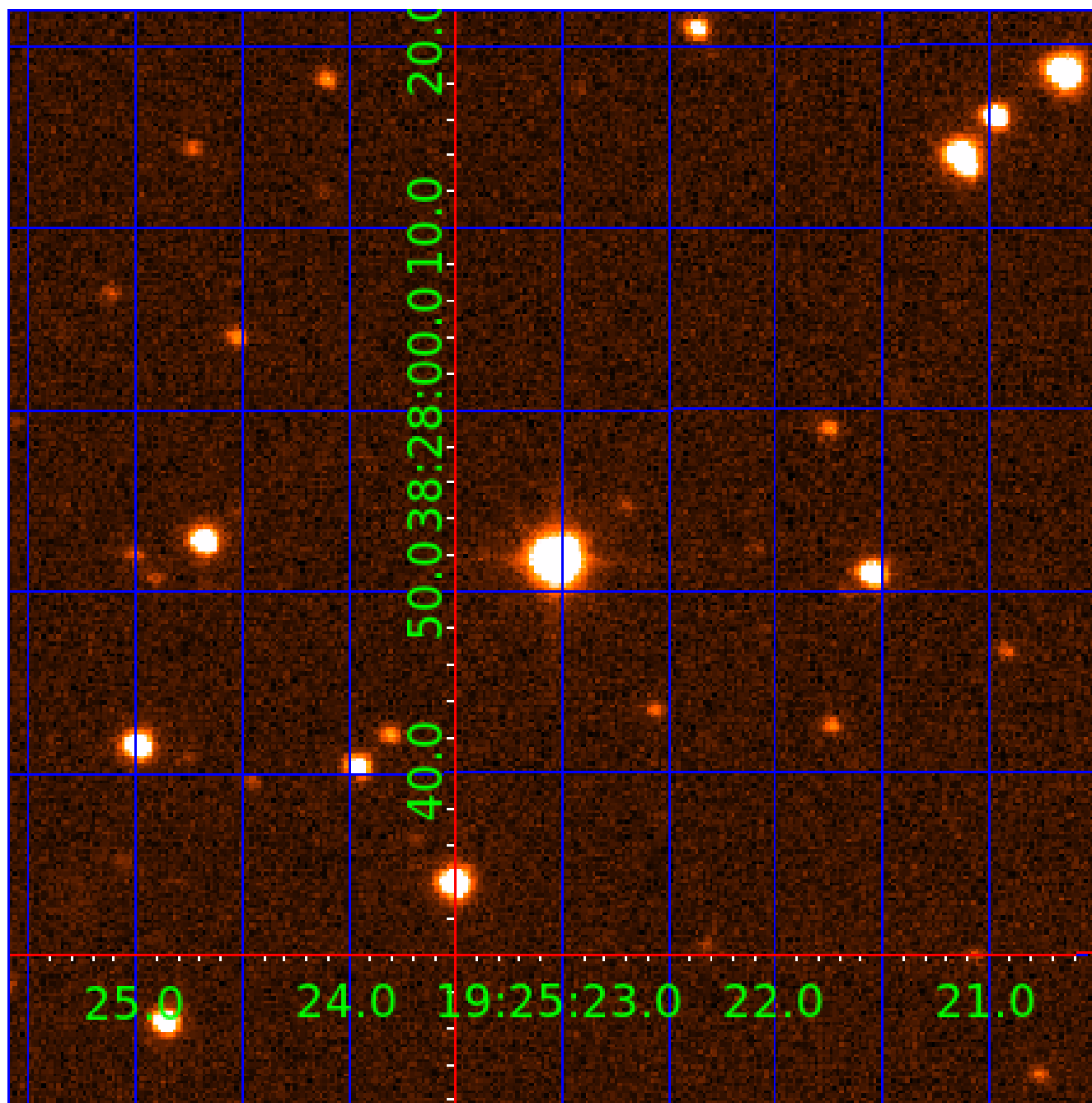


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 003341760

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003341760-01	OBS	4973.01	0.523492	131.698428	42.0	0.764	12.7	16.2	2.46	6122	1.90	38249.15
003341760-02	OBS	No	0.523482	131.959551	10.4	2.151	9.9	7.2	2.46	6122	0.79	38250.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003341760-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
003341760-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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 003341760-02

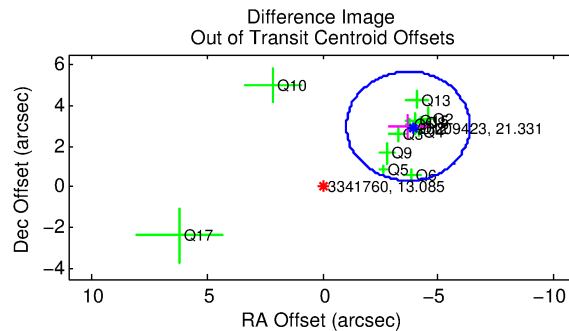
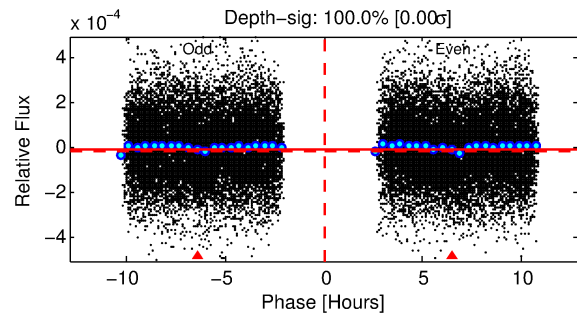
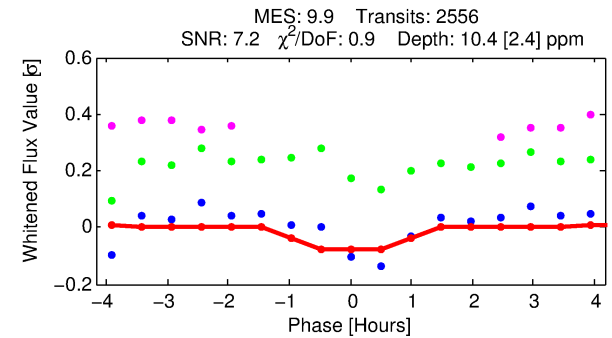
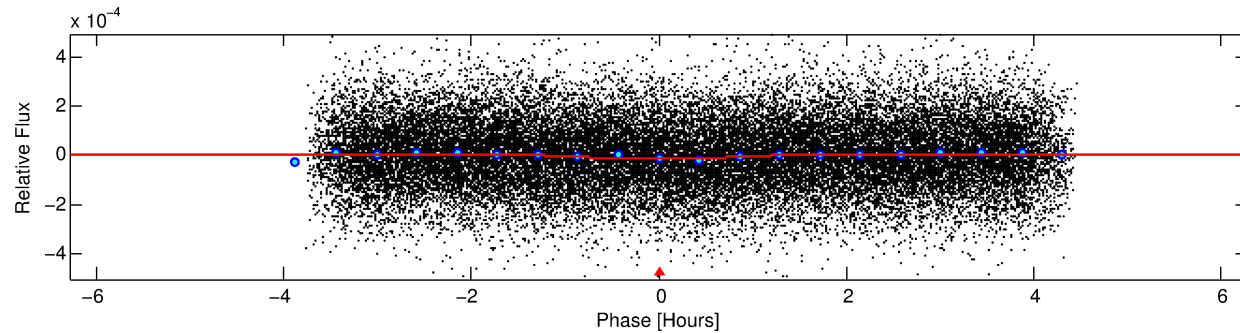
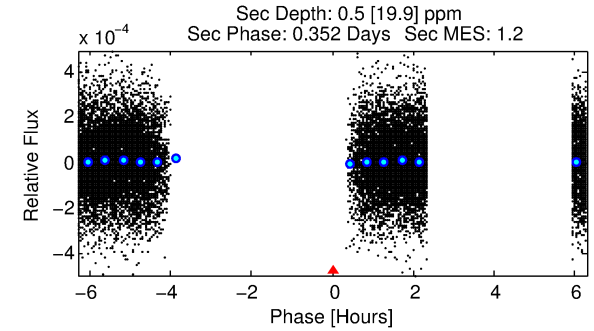
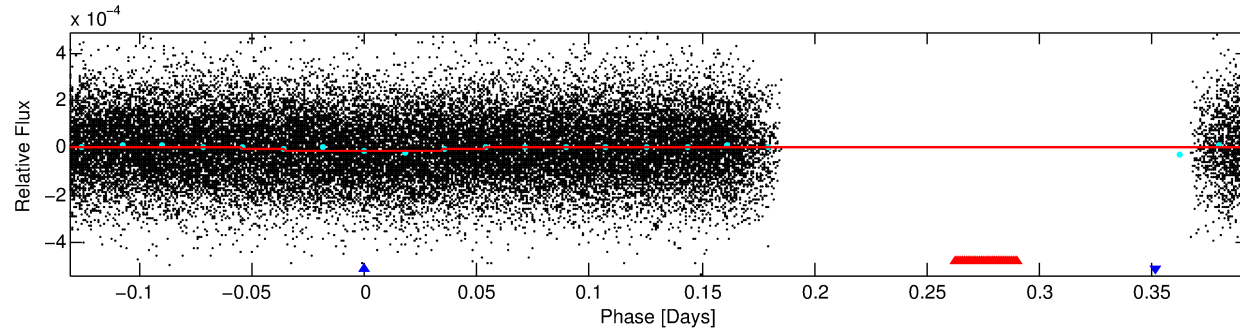
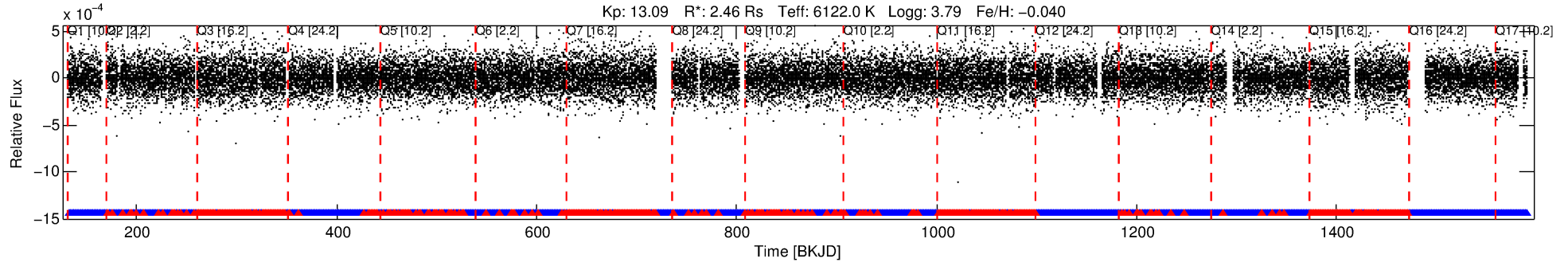
No Significant Match Found

# DV One-Page Summary

KIC: 3341760 Candidate: 2 of 2 Period: 0.523 d

KOI: K04973 Corr: No Ephemeris Match

Kp: 13.09 R\*: 2.46 Rs Teff: 6122.0 K Logg: 3.79 Fe/H: -0.040



## DV Fit Results:

Period = 0.52348 [0.00002] d  
Epoch = 131.9596 [0.0042] BKJD  
Rp/R\* = 0.0030 [0.0064]  
a/R\* = 1.95 [15.22]  
b = 0.10 [104.46]  
Seff = 38250.11 [19790.44]  
Teff = 3566 [461] K  
Rp = 0.79 [1.74] Re  
a = 0.0141 [0.0045] AU  
Ag = 0.09 [3.46] [-0.26σ]  
Teffp = 3023 [28941] K [-0.02σ]

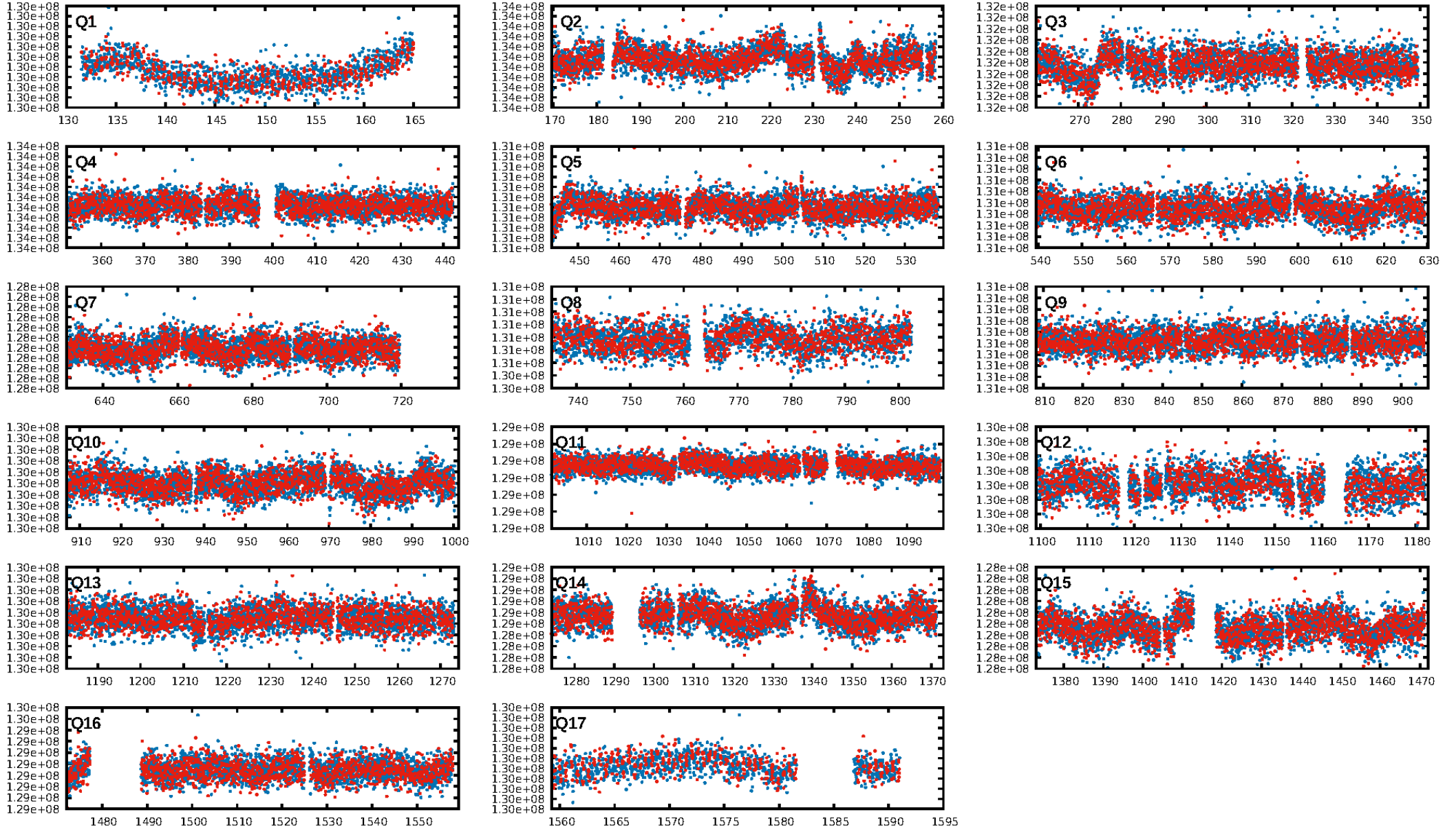
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.13e-22  
RollingBand-fgt: 0.75 [1839/2441]  
GhostDiagnostic-chr: 0.8132  
Centroid-sig: 0.0%  
Centroid-so: 13.954 arcsec [7.00σ]  
OotOffset-rm: 4.746 arcsec [5.33σ]  
KicOffset-rm: 4.789 arcsec [5.88σ]  
OotOffset-st: 3/2/3/5 [13]  
KicOffset-st: 3/2/3/5 [13]  
DiffImageQuality-fgm: 0.85 [11/13]  
DiffImageOverlap-fno: 0.00 [0/17]

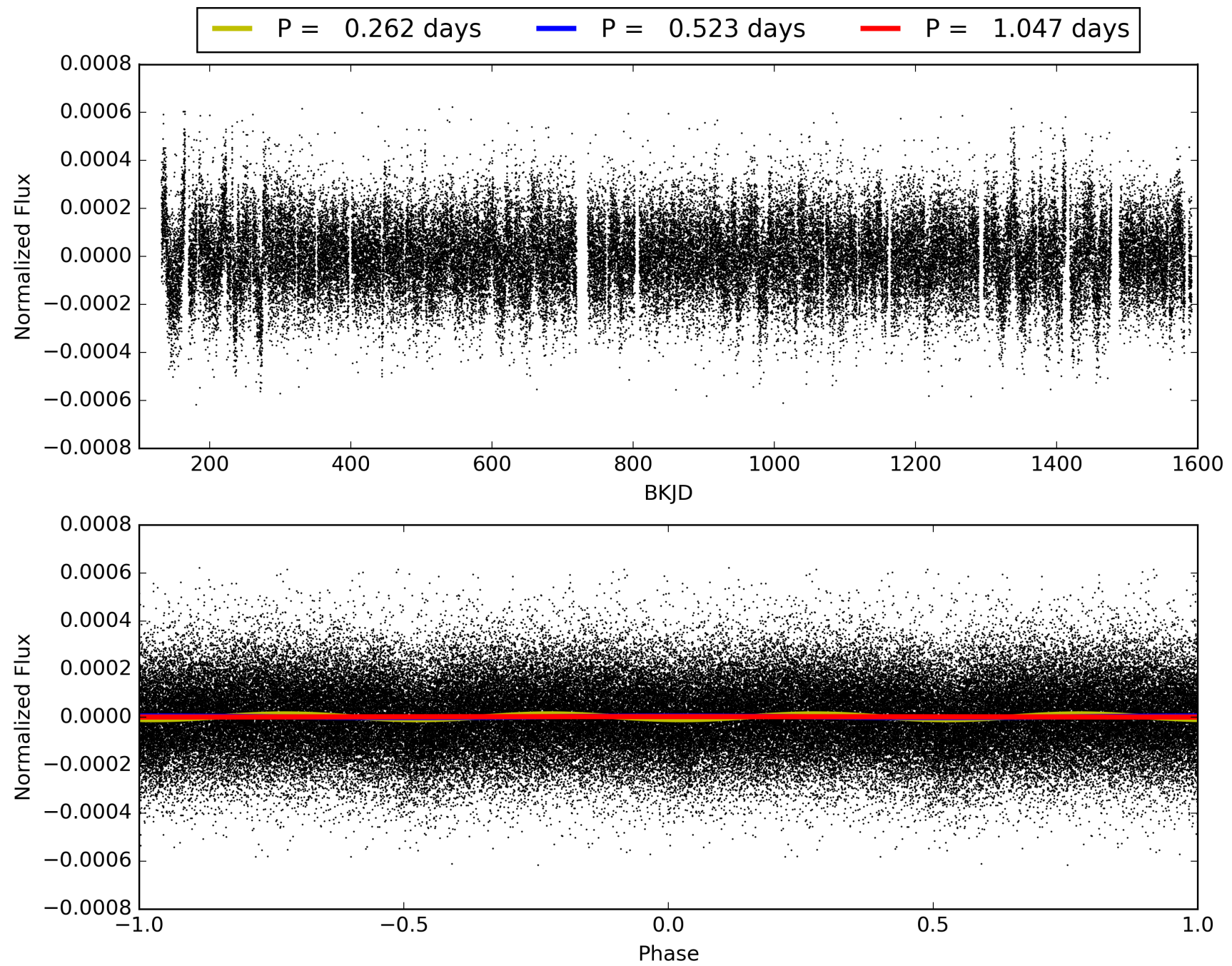
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:22:54 Z

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

# TCE 003341760-02, PDC Light Curves



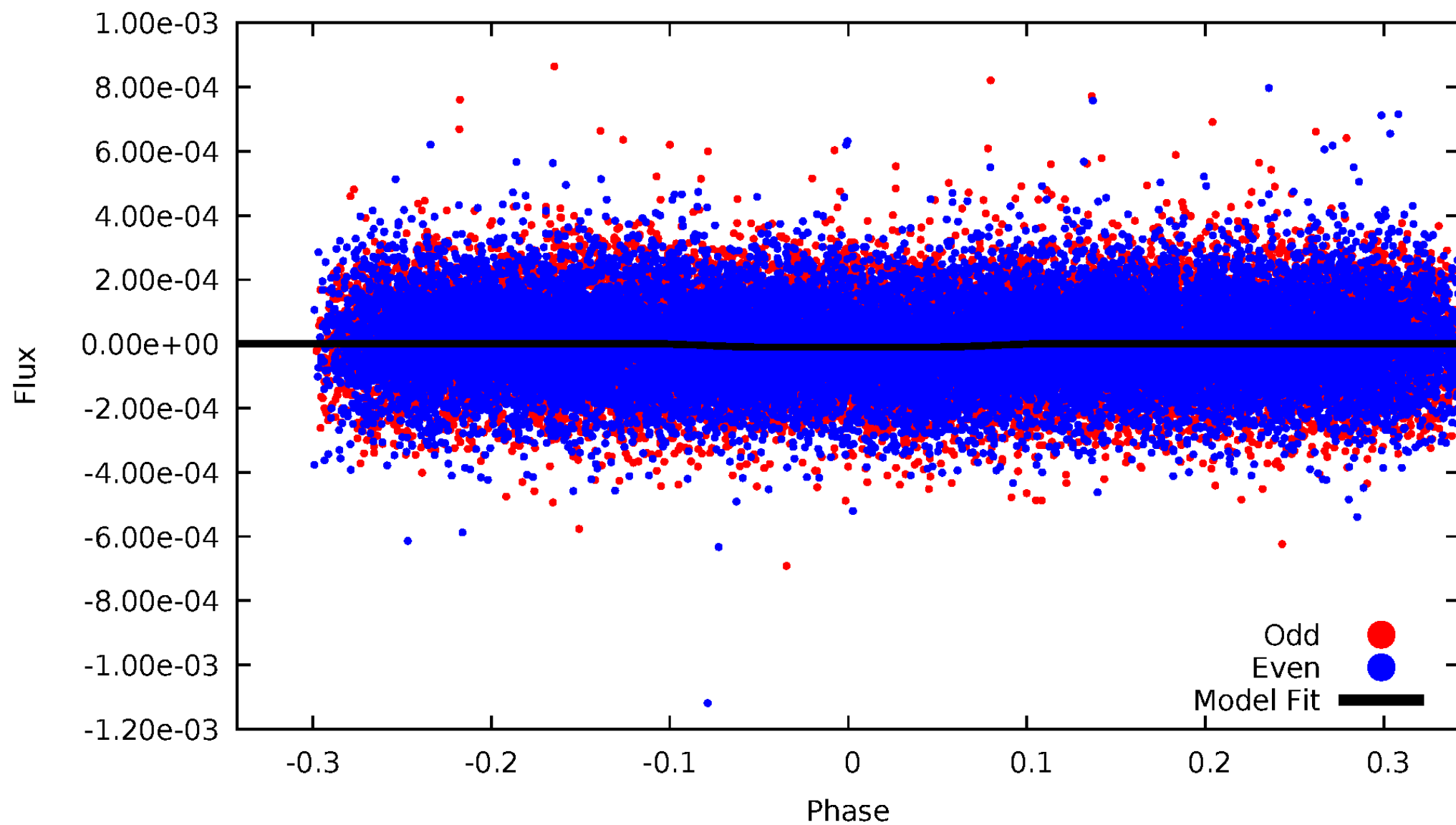
TCE 003341760-02





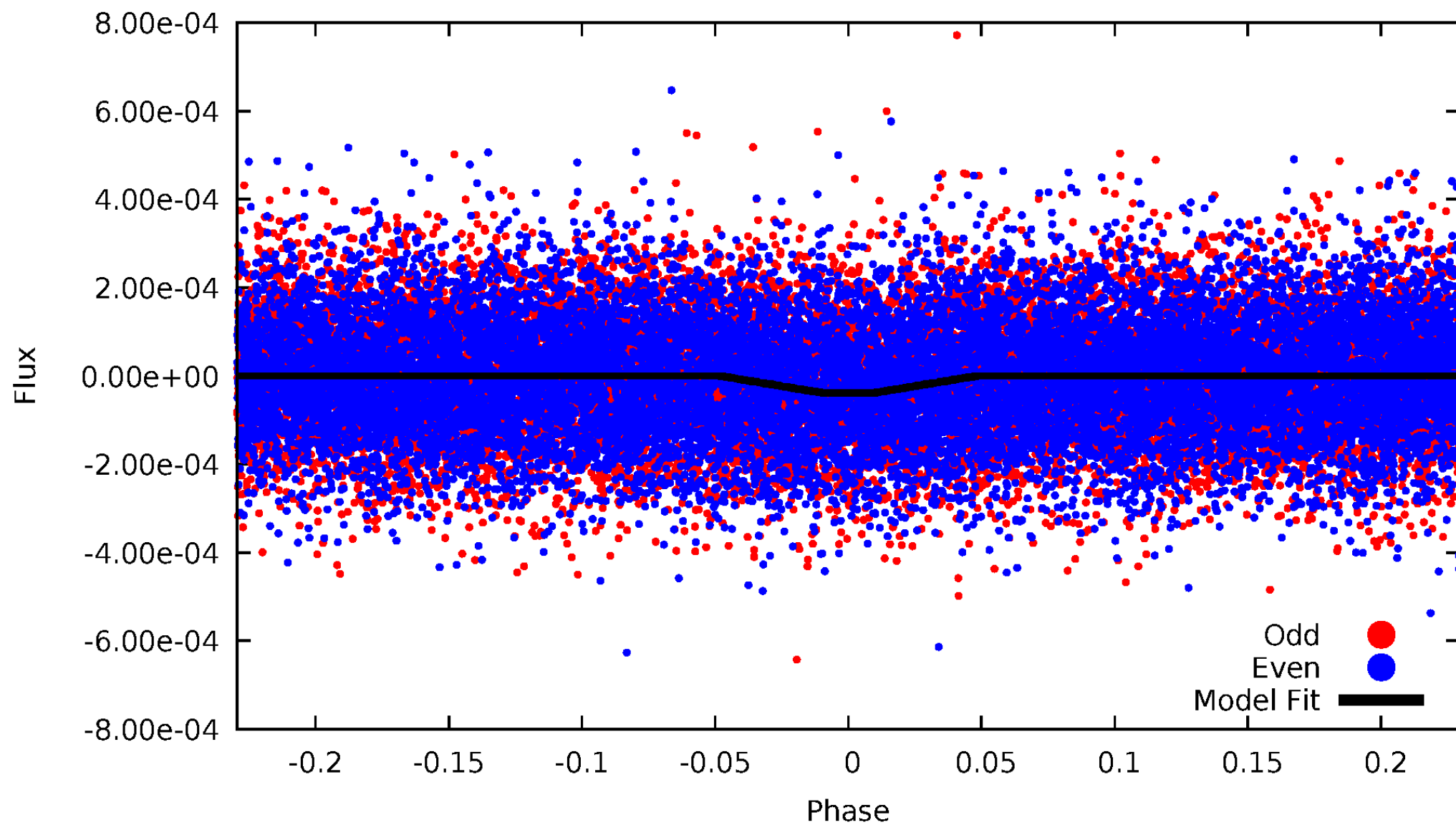
# DV Odd/Even

TCE 003341760-02



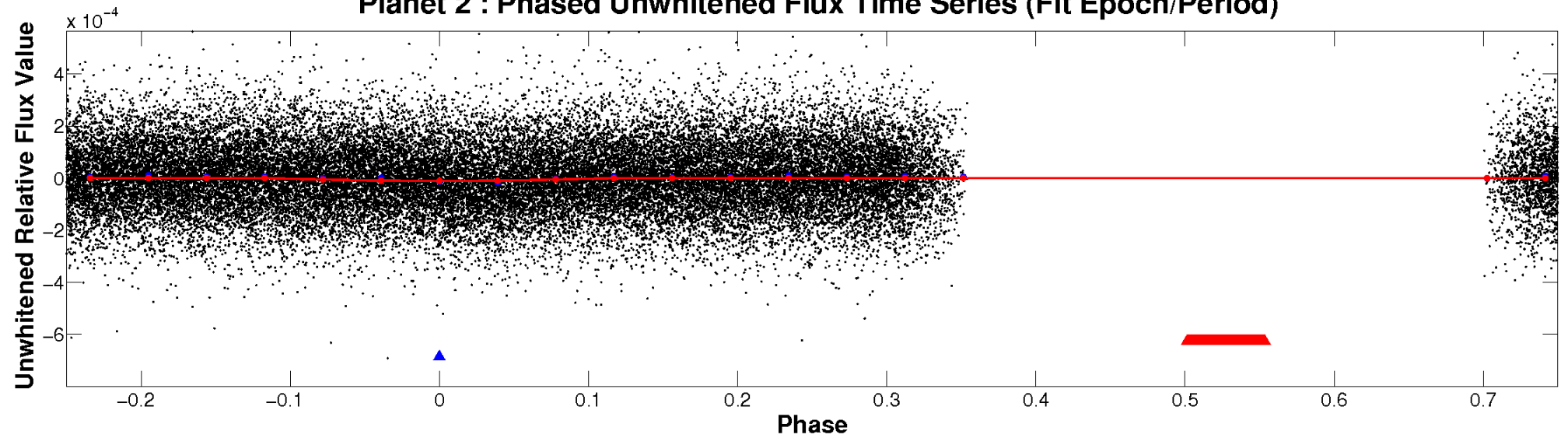
# ALT Odd/Even

TCE 003341760-02

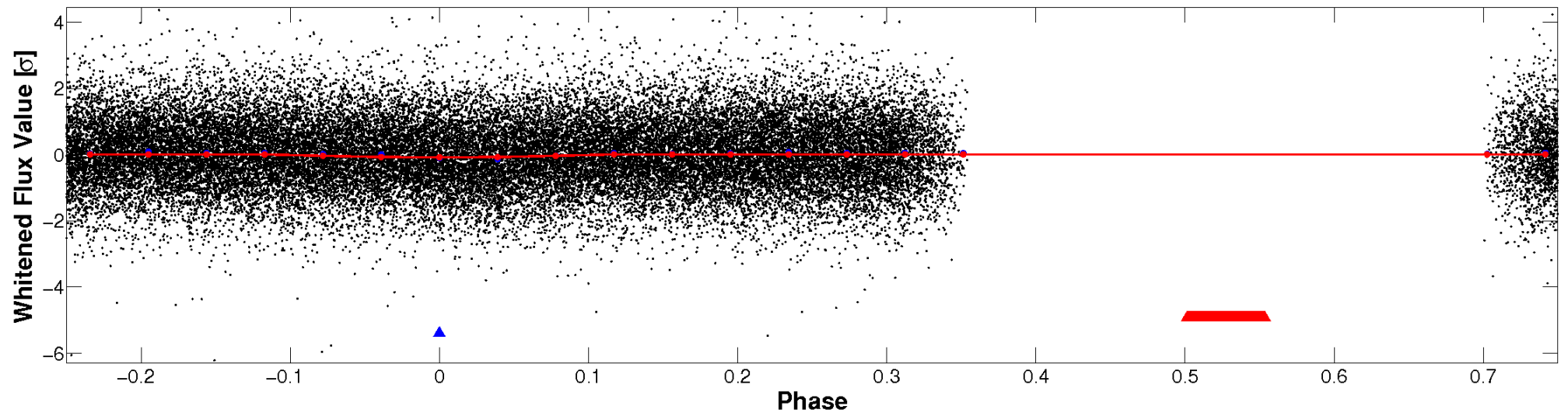


# Non-Whitened Vs. Whitened Light Curve

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

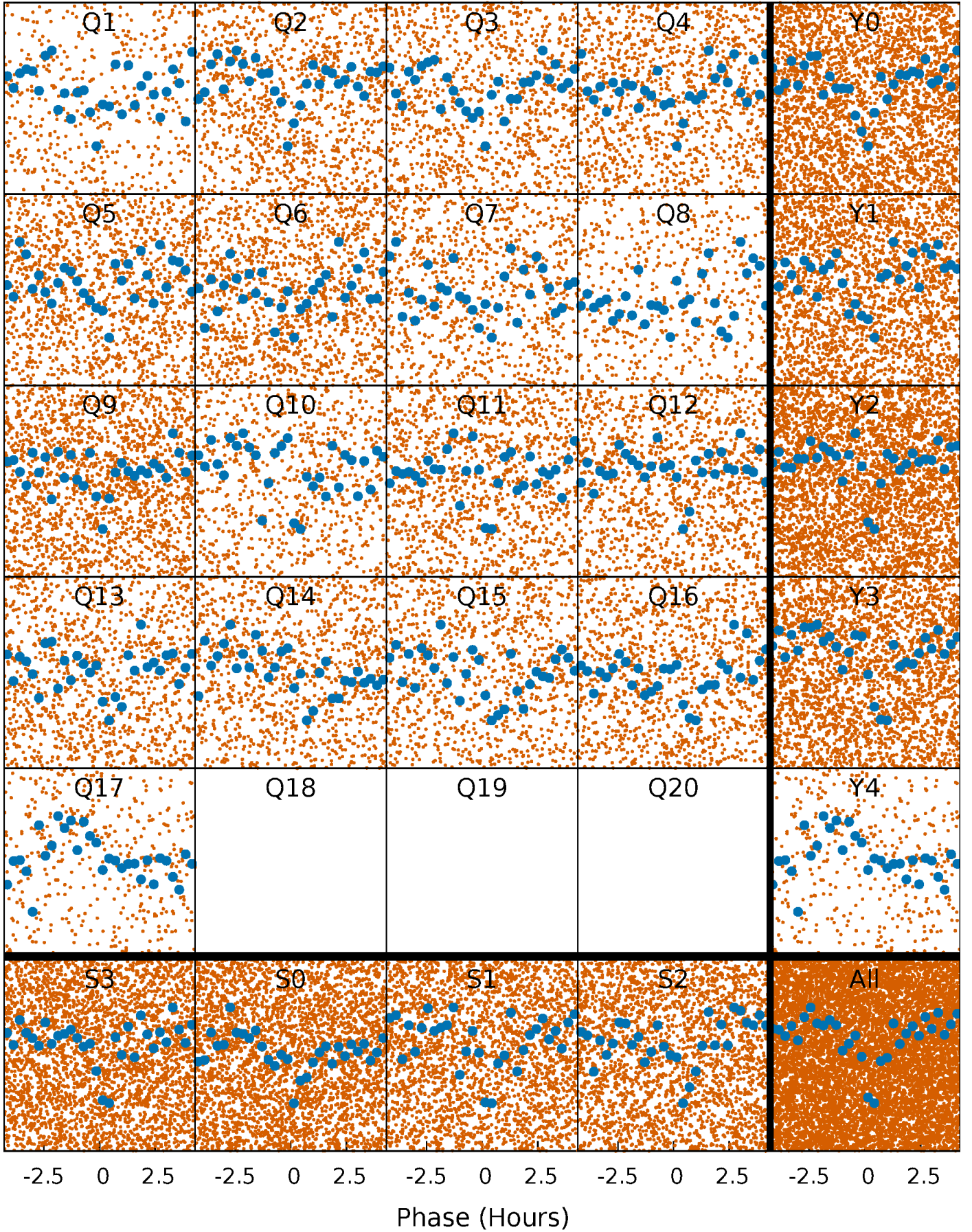


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

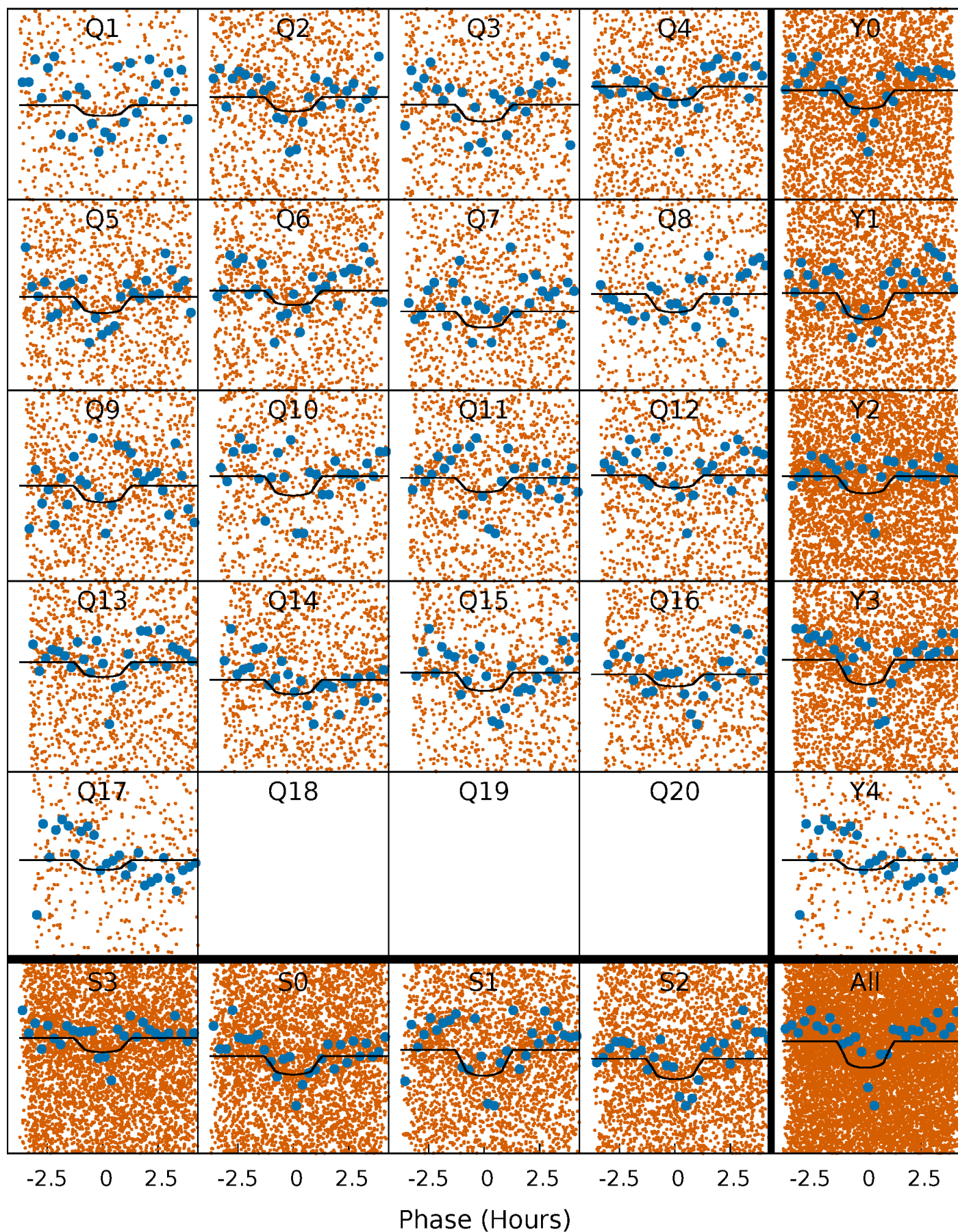
TCE 003341760-02   P= 0.523482 Days    $T_0=131.959551$  (BKJD)





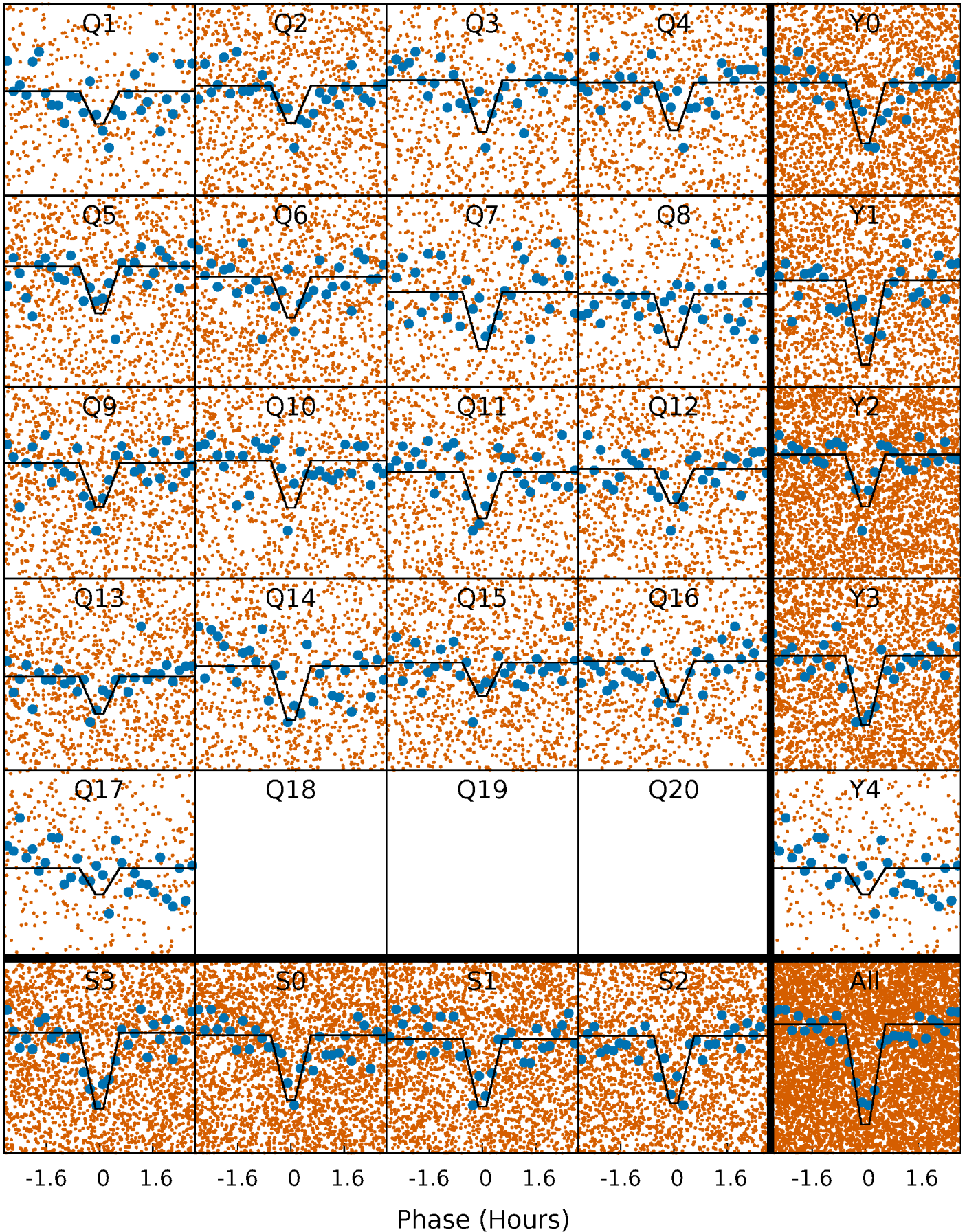
# DV Quarter-Phased Transit Curves

TCE 003341760-02   P= 0.523482 Days    $T_0=131.959551$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003341760-02   P= 0.523502 Days    $T_0=131.945386$  (BKJD)

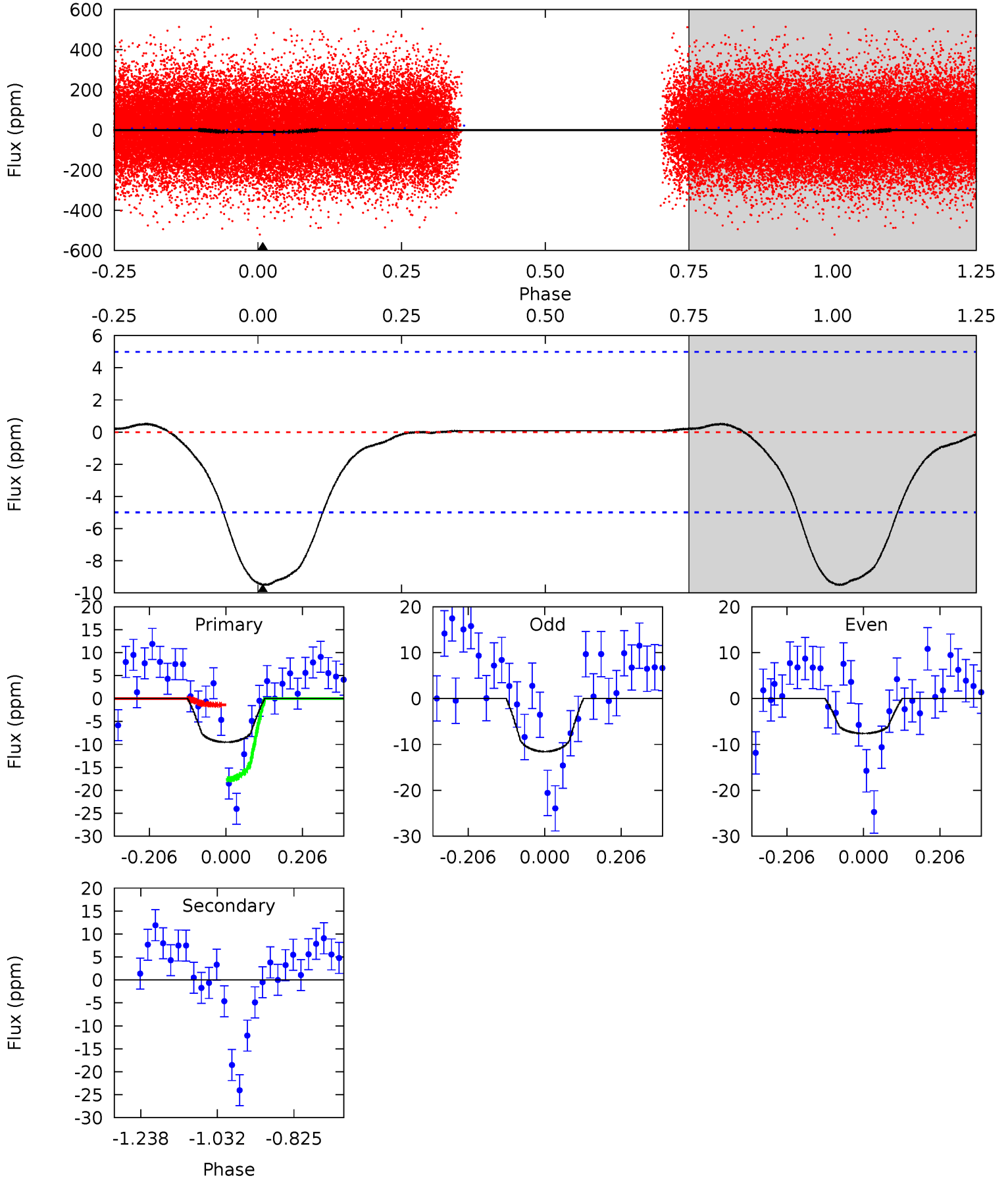




# DV Model-Shift Uniqueness Test

003341760-02, P = 0.523482 Days, E = 131.436069 Days

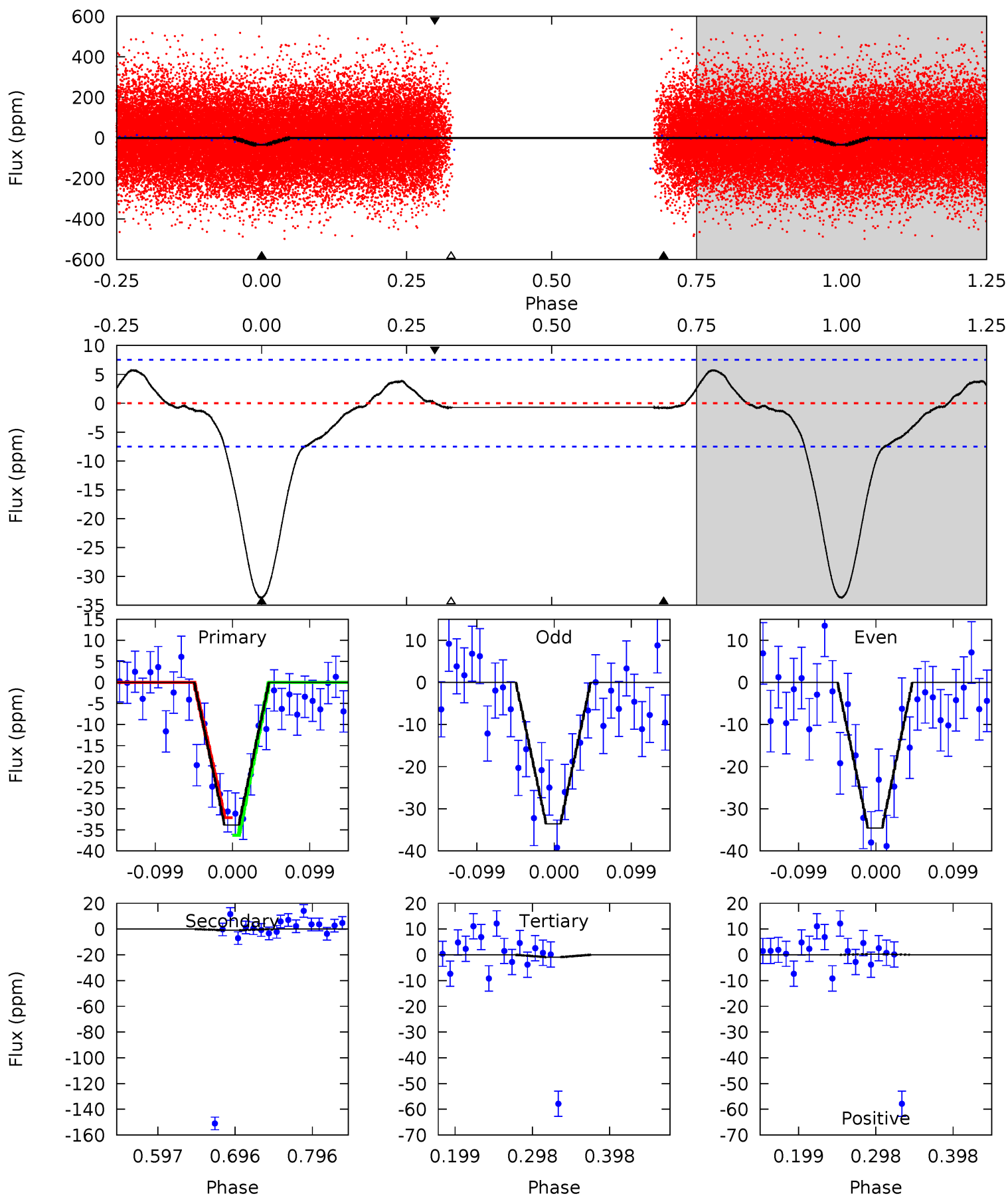
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.40	0	0	0	4.41	1.26	0.24	8.40	8.40	0	0	1.75	0.89	0.05	7.18



# Alt Model-Shift Uniqueness Test

003341760-02, P = 0.523502 Days, E = 131.421884 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
20.6	0.58	0.55	0.14	4.57	1.65	1.52	20.0	20.4	0.03	0.43	0.30	0.90	0.15	1.27



### Stellar Parameters For KIC 003341760

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6122^{+165}_{-165}$	$3.791^{+0.293}_{-0.098}$	$-0.040^{+0.300}_{-0.250}$	$2.455^{+0.394}_{-0.854}$	$1.357^{+0.228}_{-0.278}$	$0.129^{+0.271}_{-0.041}$
	+3%/-3%	+8%/-3%	+750%/-625%	+16%/-35%	+17%/-20%	+209%/-32%
Source	PHO1	FLK73	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 003341760-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1$	$1.47^{+1.38}_{-0.98}$	$4883^{+300}_{-427}$	$-4238^{+462}_{-327}$	$0.001^{+0.098}_{-0.089}$
Alt.	$-1 \pm 2$	$1.85^{+1.68}_{-1.20}$	$4909^{+296}_{-409}$	$-4144^{+921}_{-313}$	$0.022^{+0.215}_{-0.043}$

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

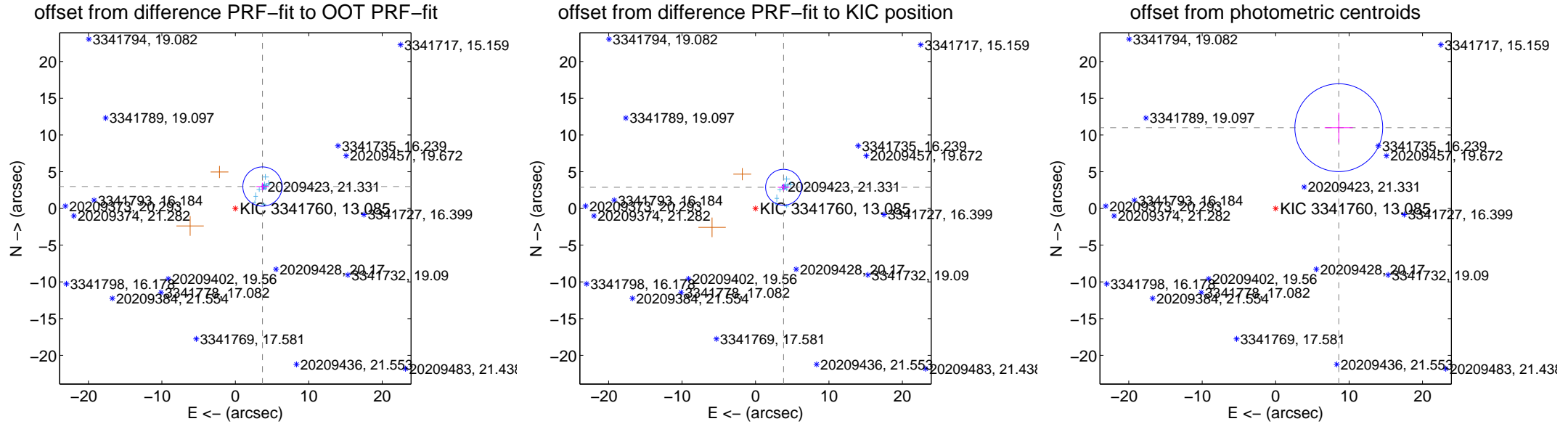
## DV Centroid Data

Supplemental centroid analysis for 003341760-02. Kepler magnitude: 13.09. Transit SNR 7.25

There are 11 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.746 \pm 0.890$	<b>5.33</b>	$-3.692 \pm 0.840$	$2.983 \pm 0.521$
PRF-fit source offset from KIC position	$4.789 \pm 0.814$	<b>5.88</b>	$-3.823 \pm 0.798$	$2.886 \pm 0.465$
photometric centroid source offset	$13.95 \pm 1.99$	<b>7.00</b>	$-8.59 \pm 1.92$	$10.99 \pm 2.04$

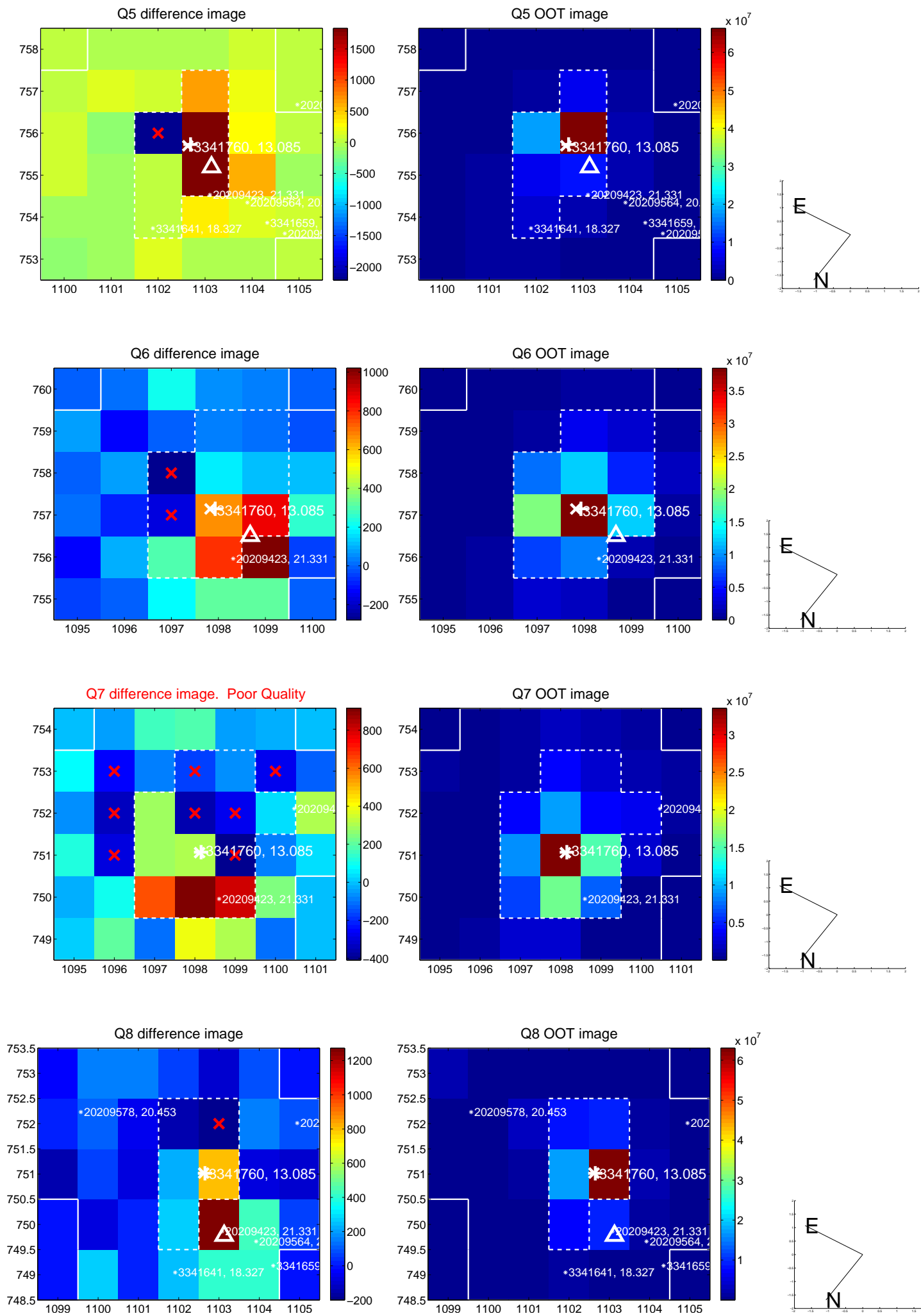


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

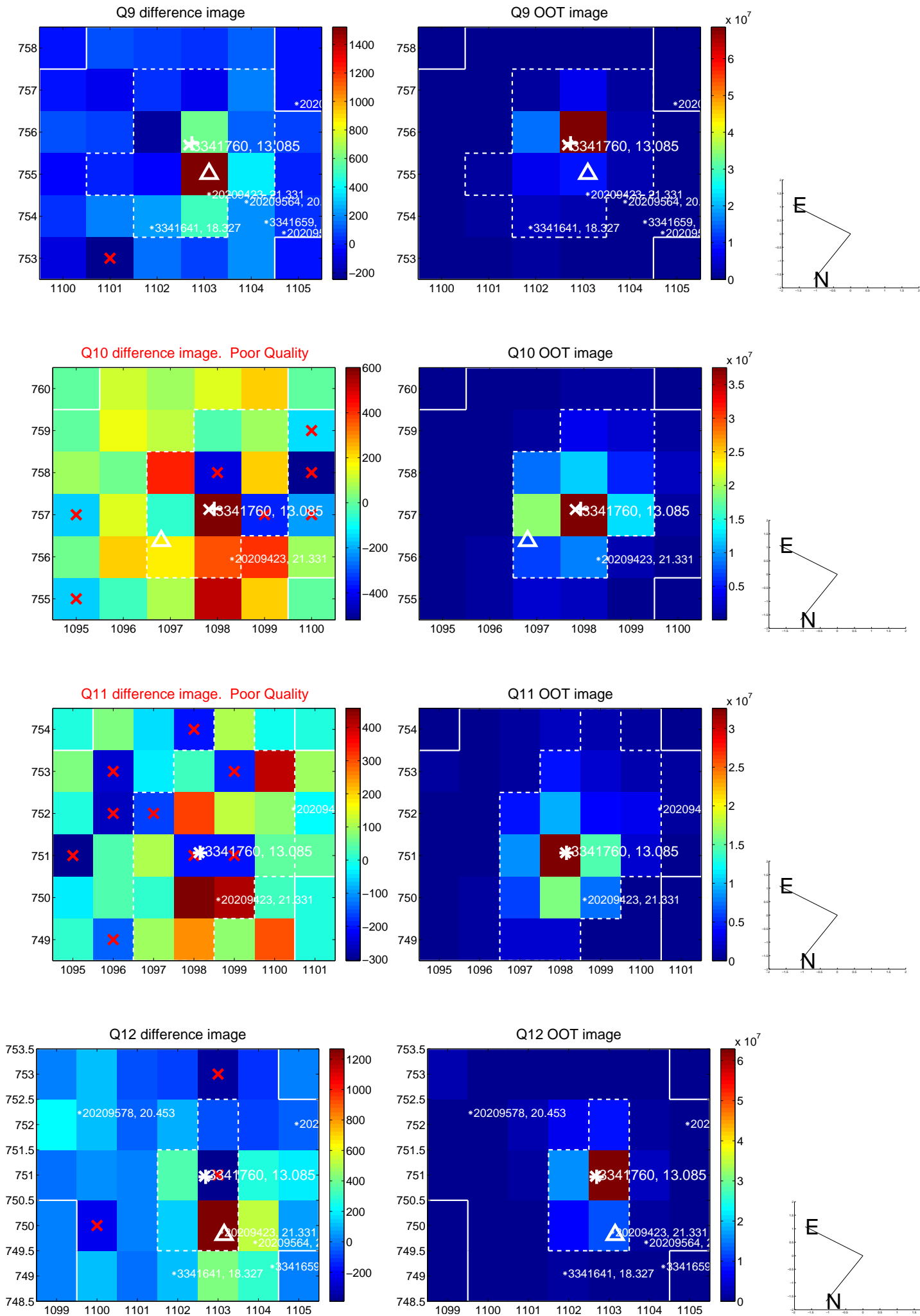




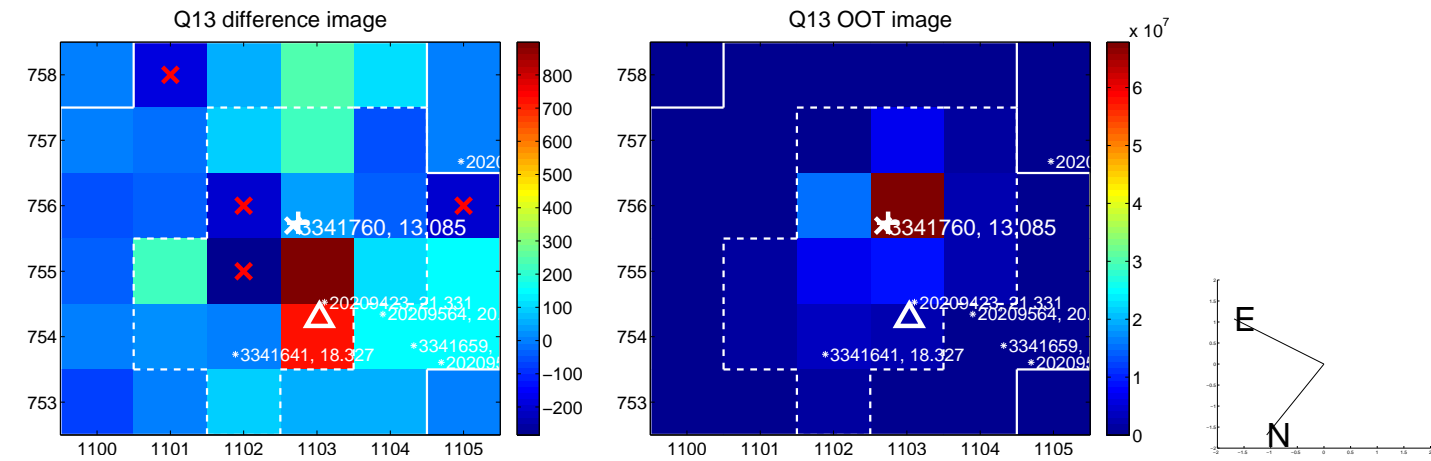
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



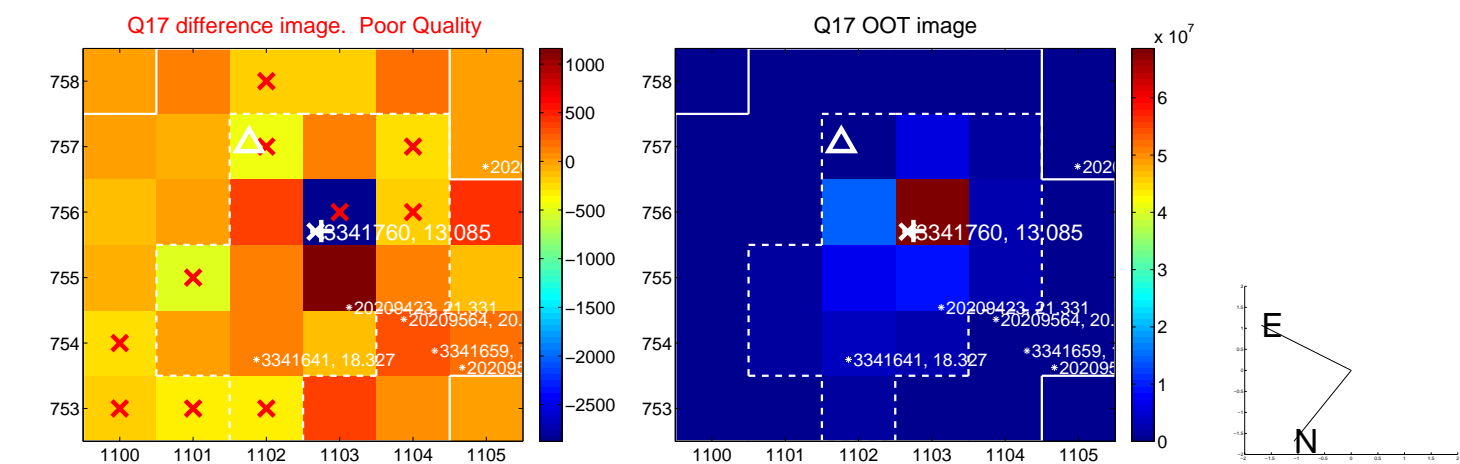
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



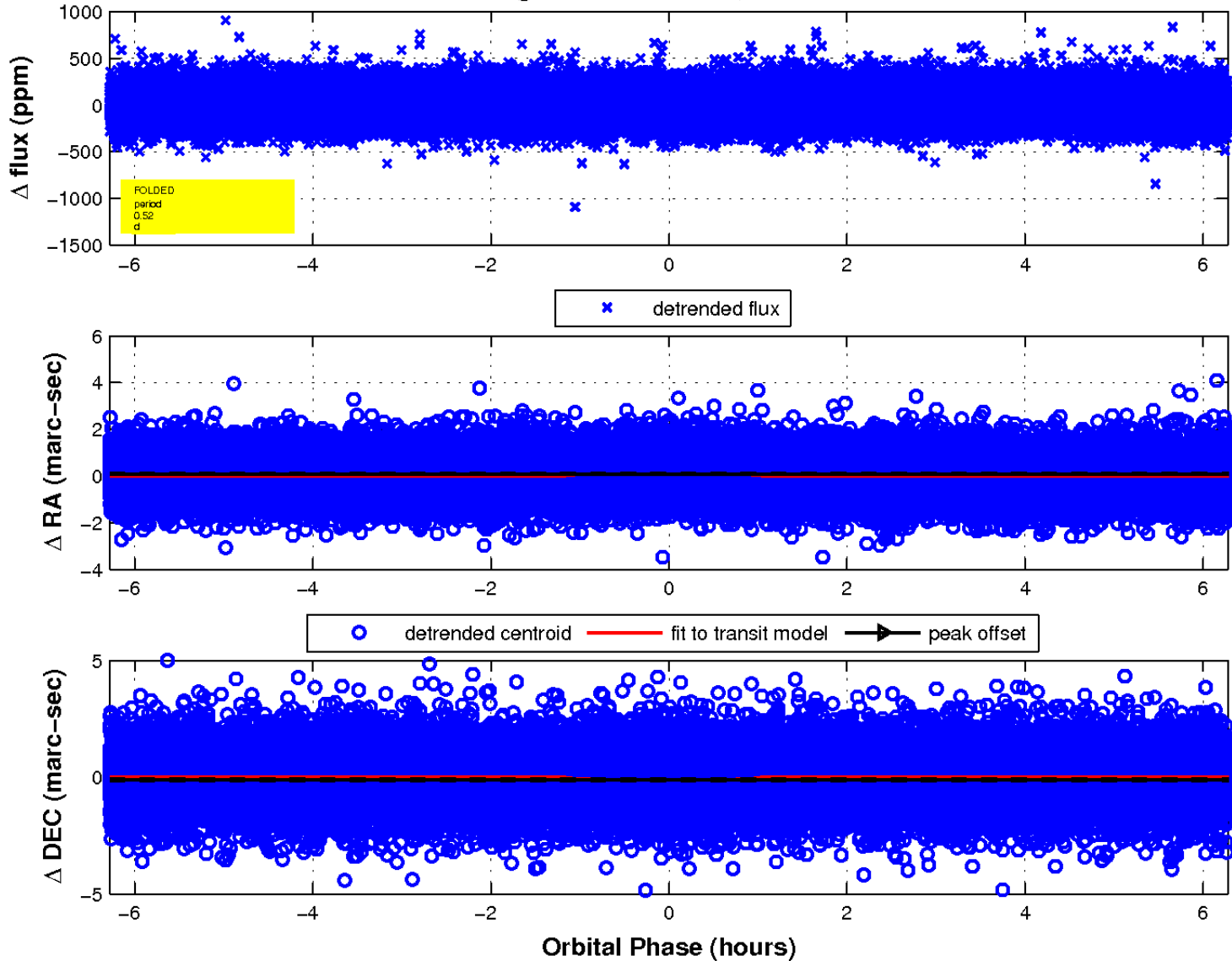
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

