

# KIC 005008954

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005008954-01	OBS	No	1.774539	133.114627	33.7	2.663	8.1	8.8	2.10	7254	1.42	9689.84
005008954-02	OBS	No	2.341311	133.486194	26.4	8.600	8.6	7.8	2.10	7254	1.27	6696.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005008954-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
005008954-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

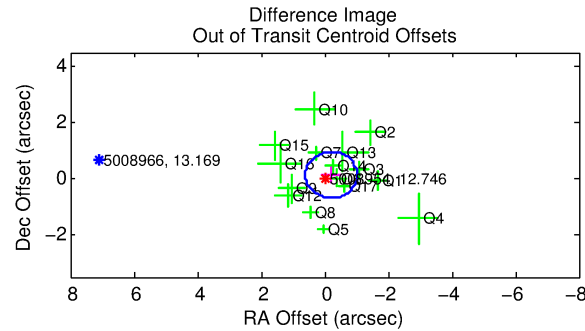
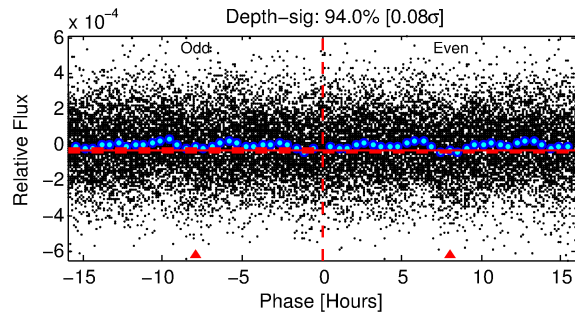
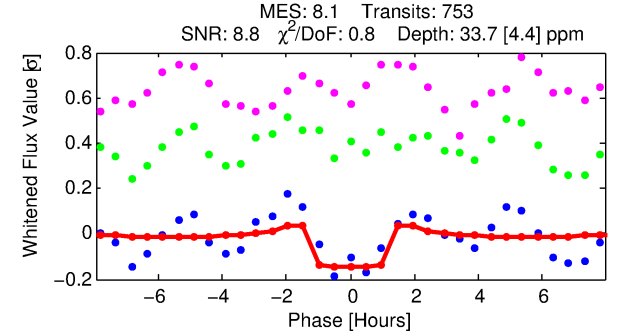
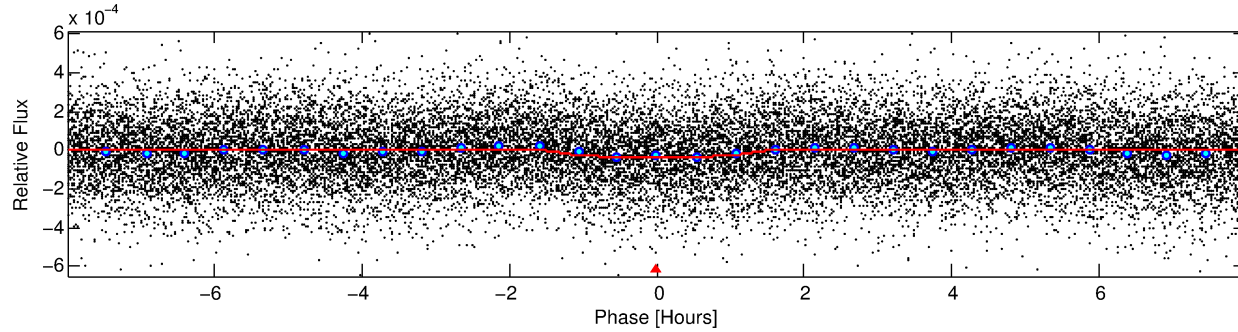
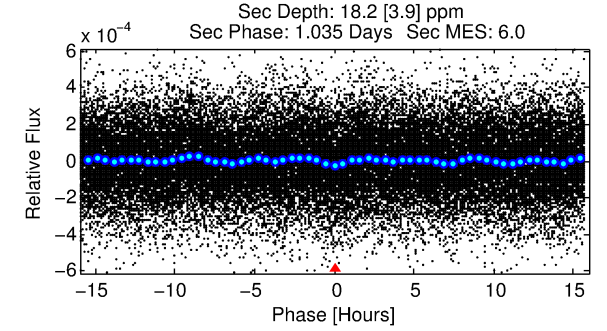
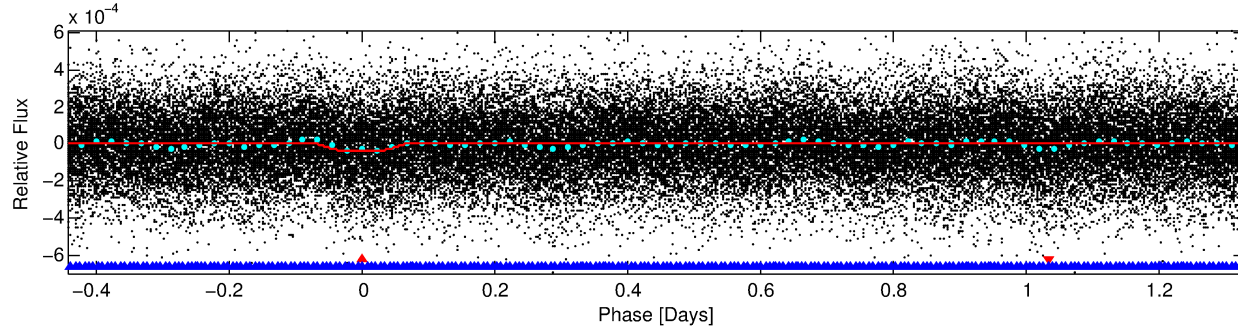
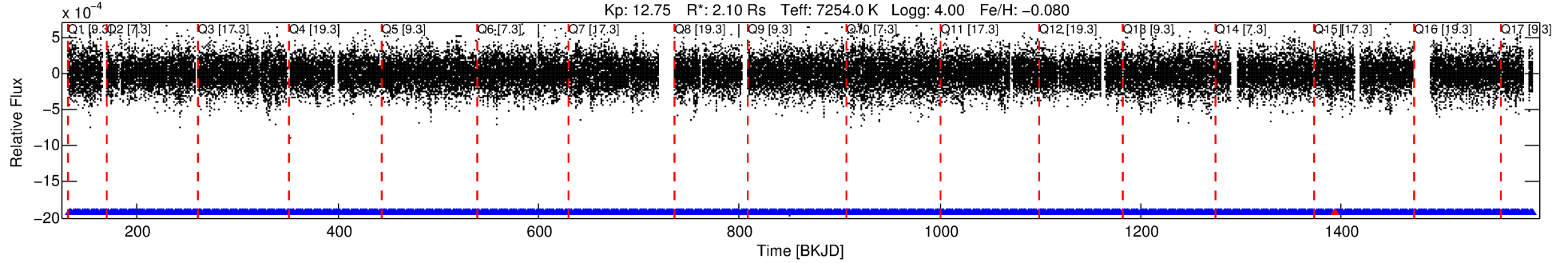
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005008954-01

No Significant Match Found

# DV One-Page Summary

KIC: 5008954 Candidate: 1 of 2 Period: 1.775 d



## DV Fit Results:

Period = 1.77454 [0.00001] d  
Epoch = 133.1146 [0.0025] BKJD  
Rp/R\* = 0.0062 [0.0013]  
a/R\* = 2.44 [2.70]  
b = 0.90 [0.27]  
Seff = 9689.84 [4284.73]  
Teq = 2530 [280] K  
Rp = 1.42 [0.53] Re  
a = 0.0336 [0.0090] AU  
Ag = 5.61 [3.54] [1.30σ]  
Teffp = 6021 [779] K [4.22σ]

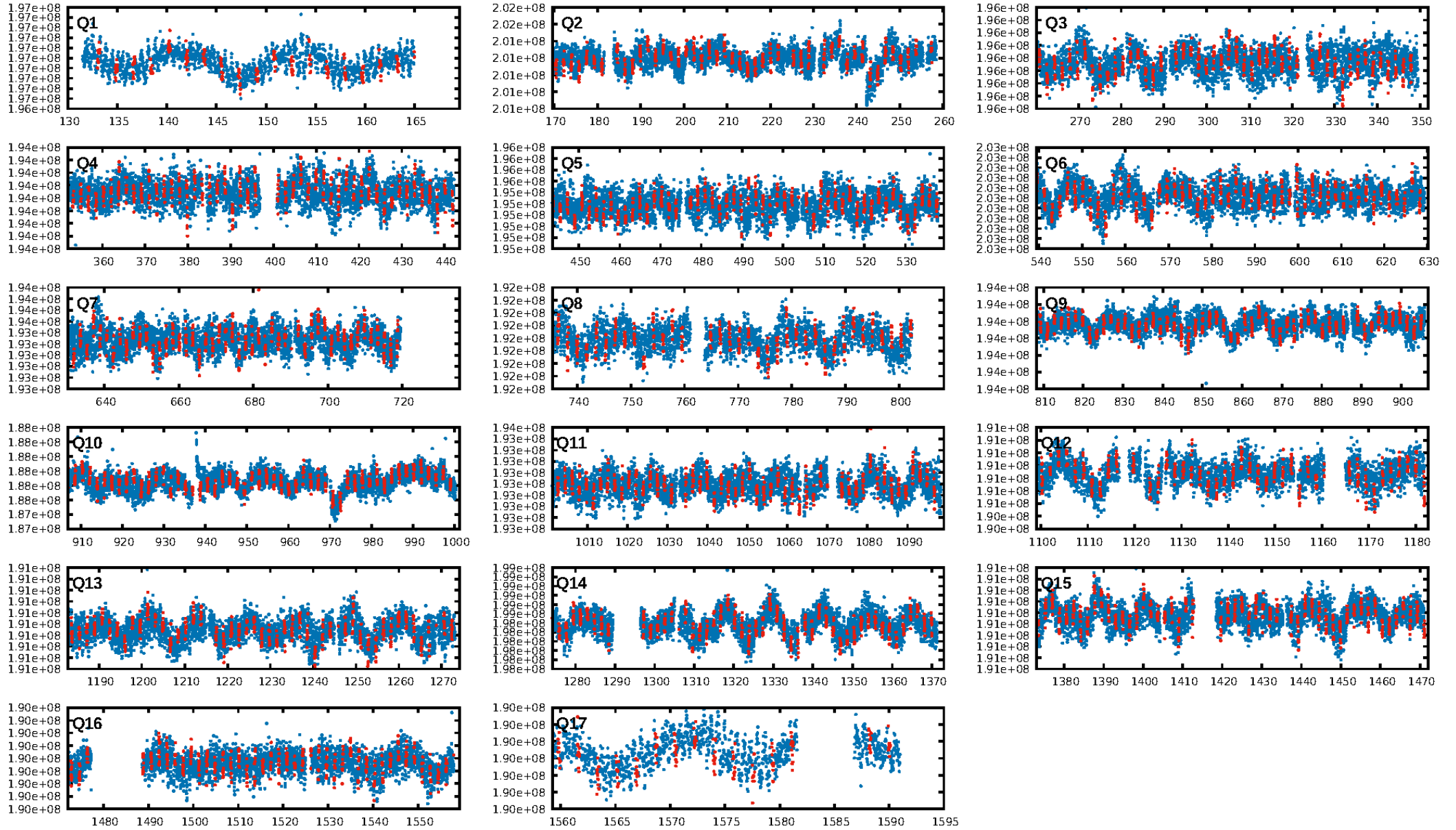
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 86.9% [1.51σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.50e-12**  
RollingBand-fgt: 1.00 [719/720]  
GhostDiagnostic-chr: 3.059  
Centroid-sig: 17.3%  
Centroid-so: 0.756 arcsec [1.29σ]  
OotOffset-rm: 0.247 arcsec [0.91σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-rm: 0.214 arcsec [0.72σ]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.94 [15/16]  
DiffImageOverlap-fno: 1.00 [17/17]

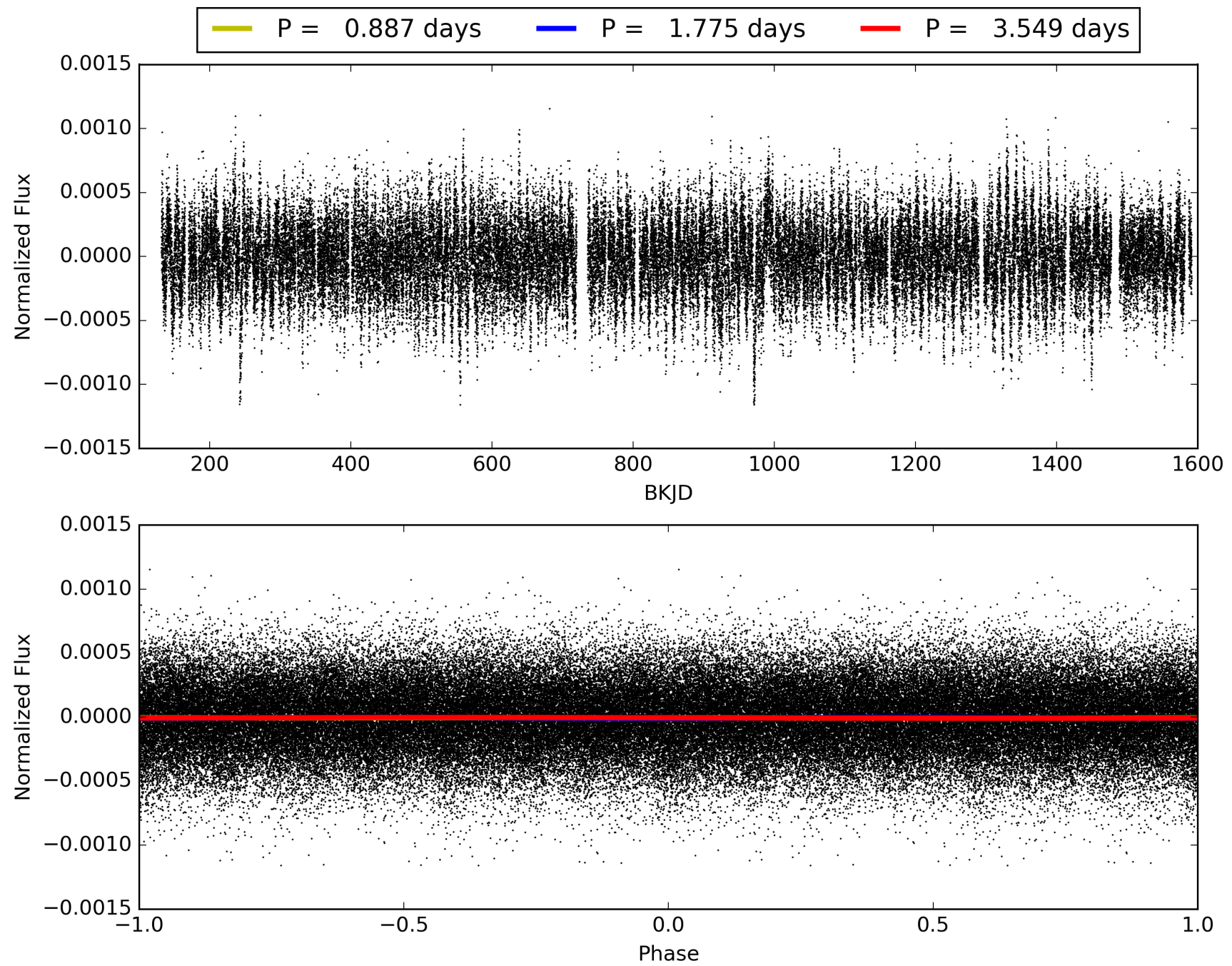
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:02:58 Z

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

# TCE 005008954-01, PDC Light Curves



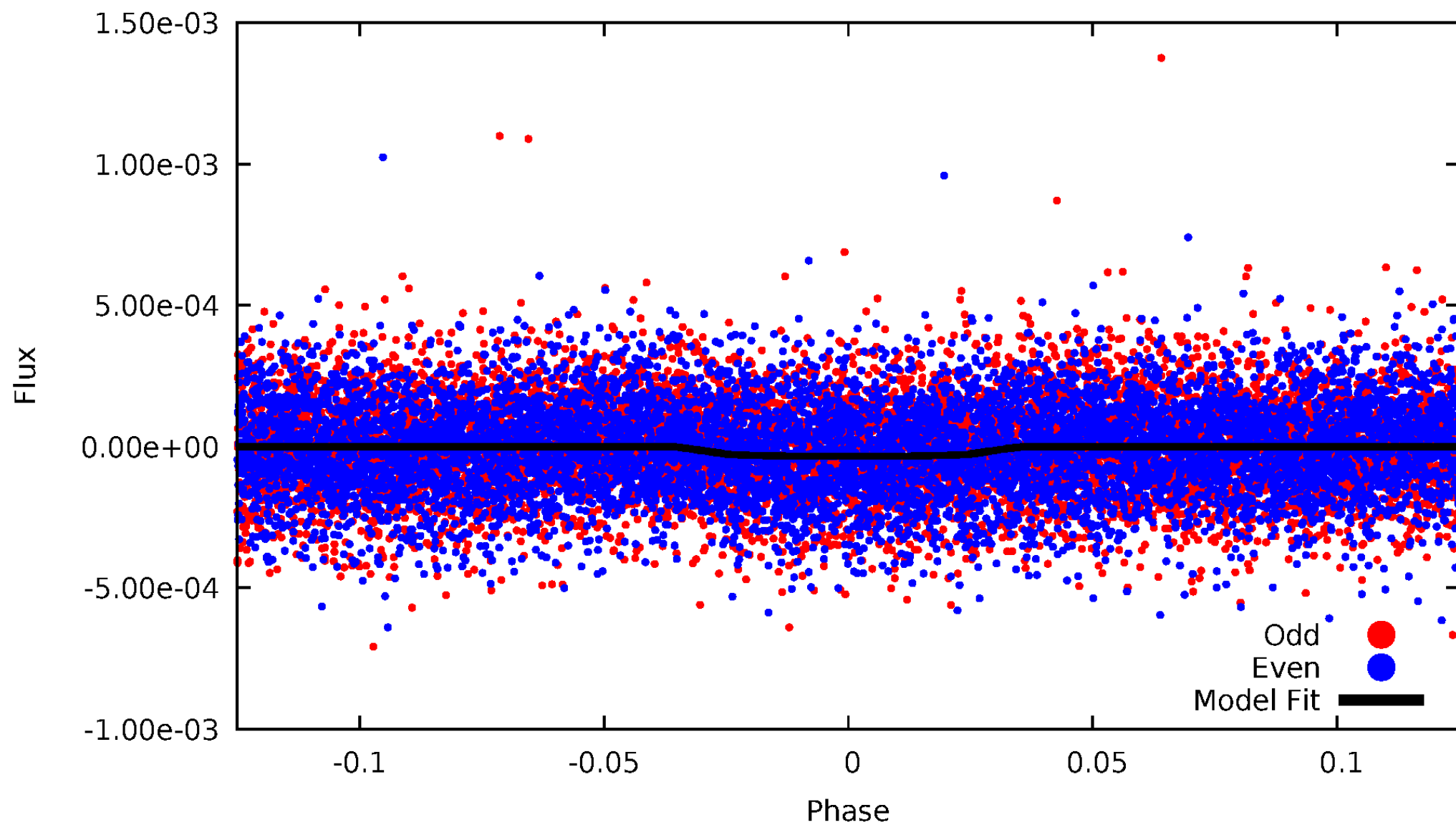
TCE 005008954-01





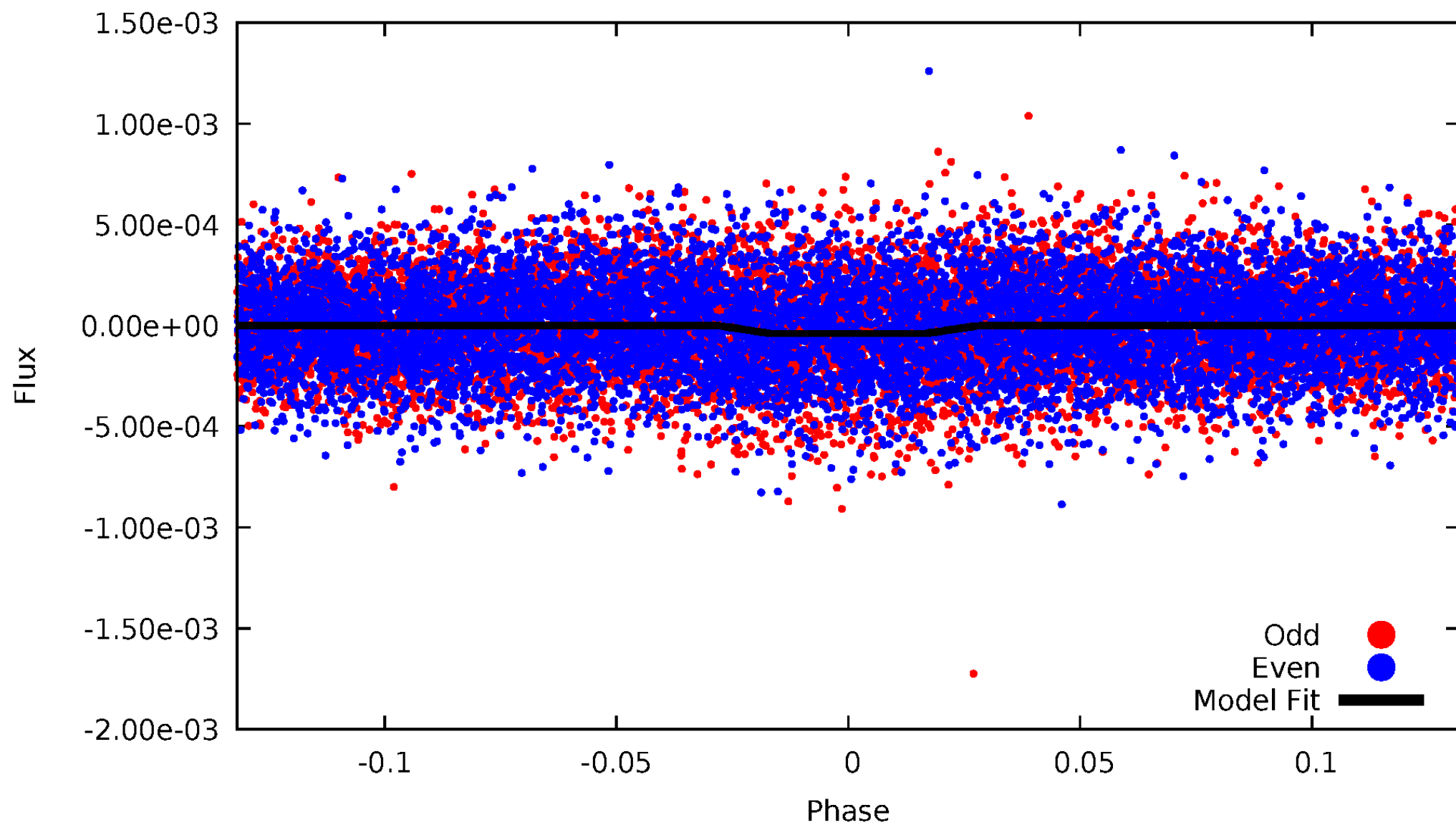
# DV Odd/Even

TCE 005008954-01



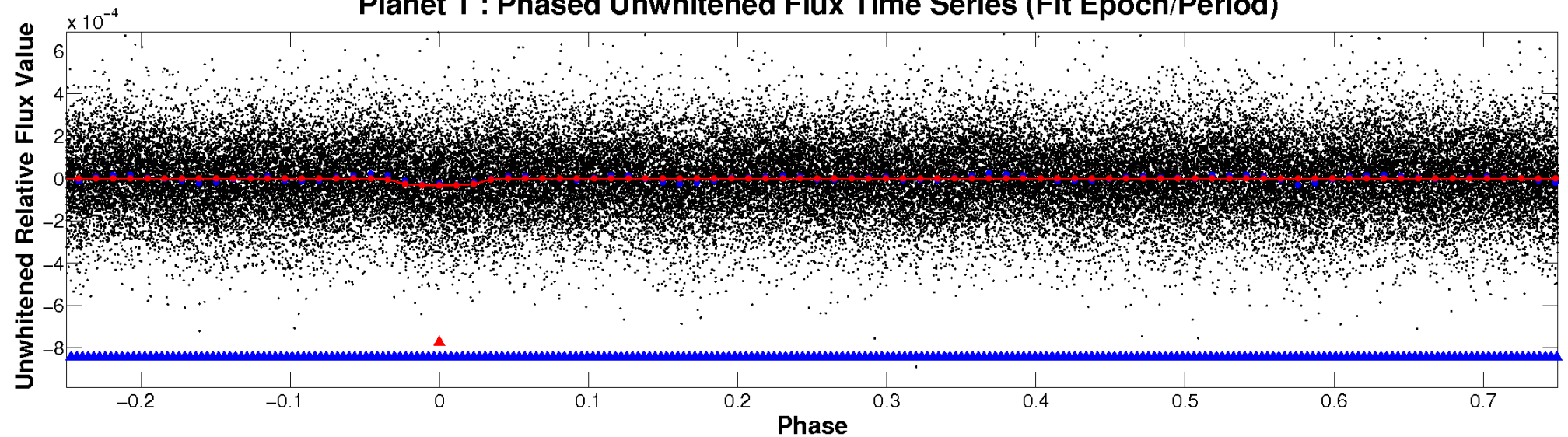
# ALT Odd/Even

TCE 005008954-01

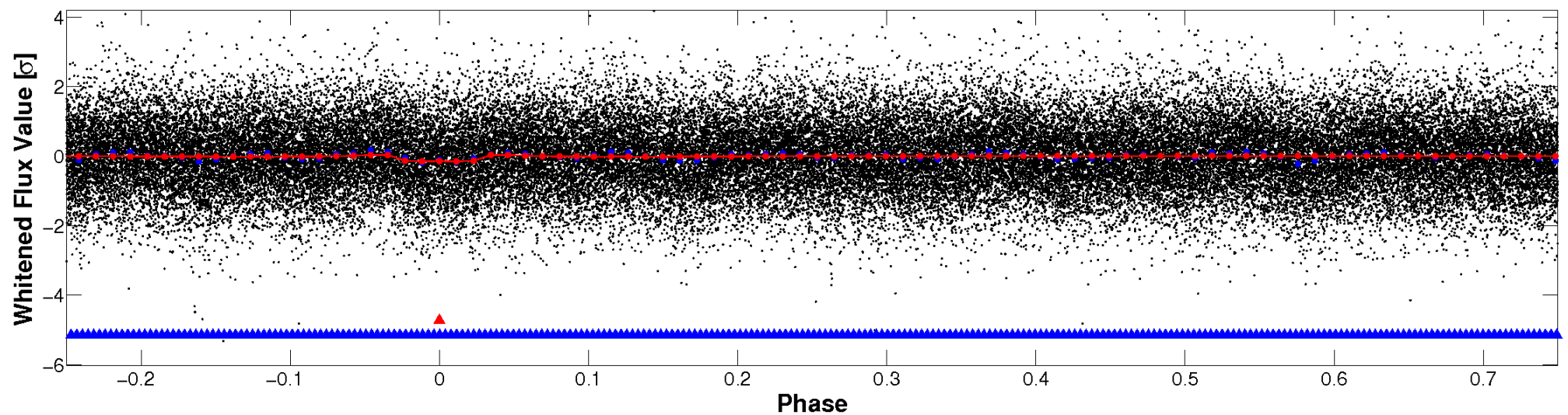


# Non-Whitened Vs. Whitened Light Curve

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

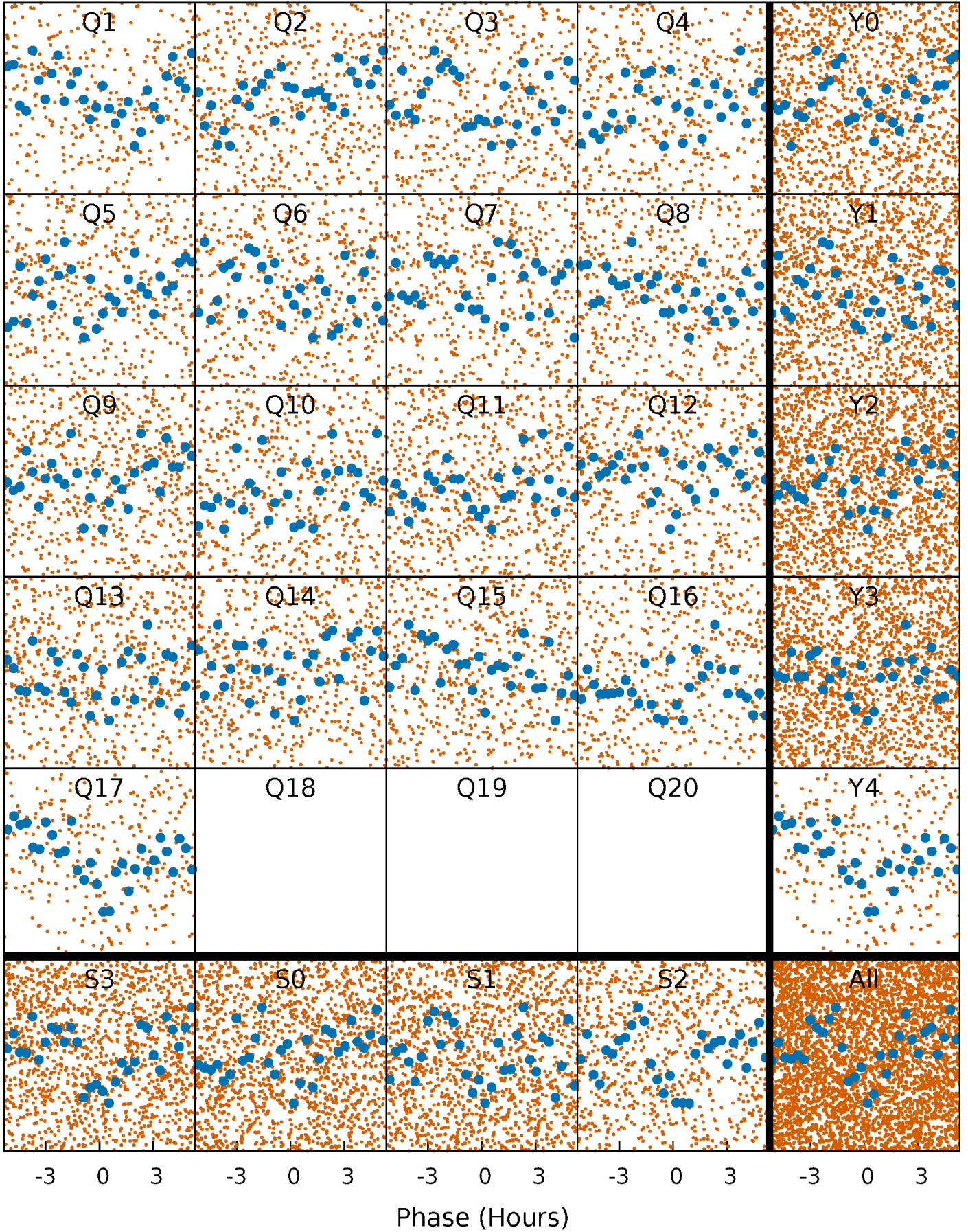


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

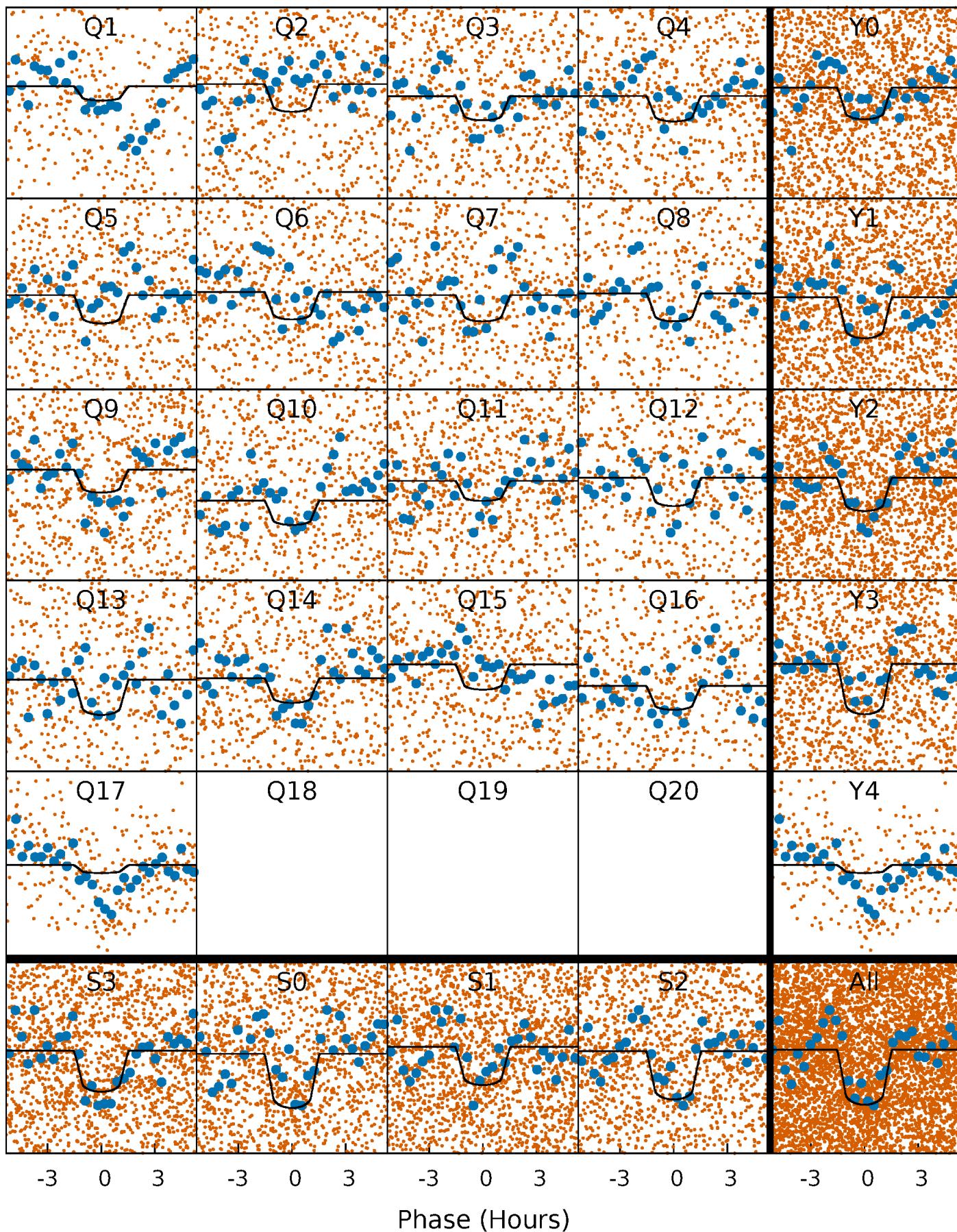
TCE 005008954-01 P= 1.774539 Days  $T_0=133.114627$  (BKJD)





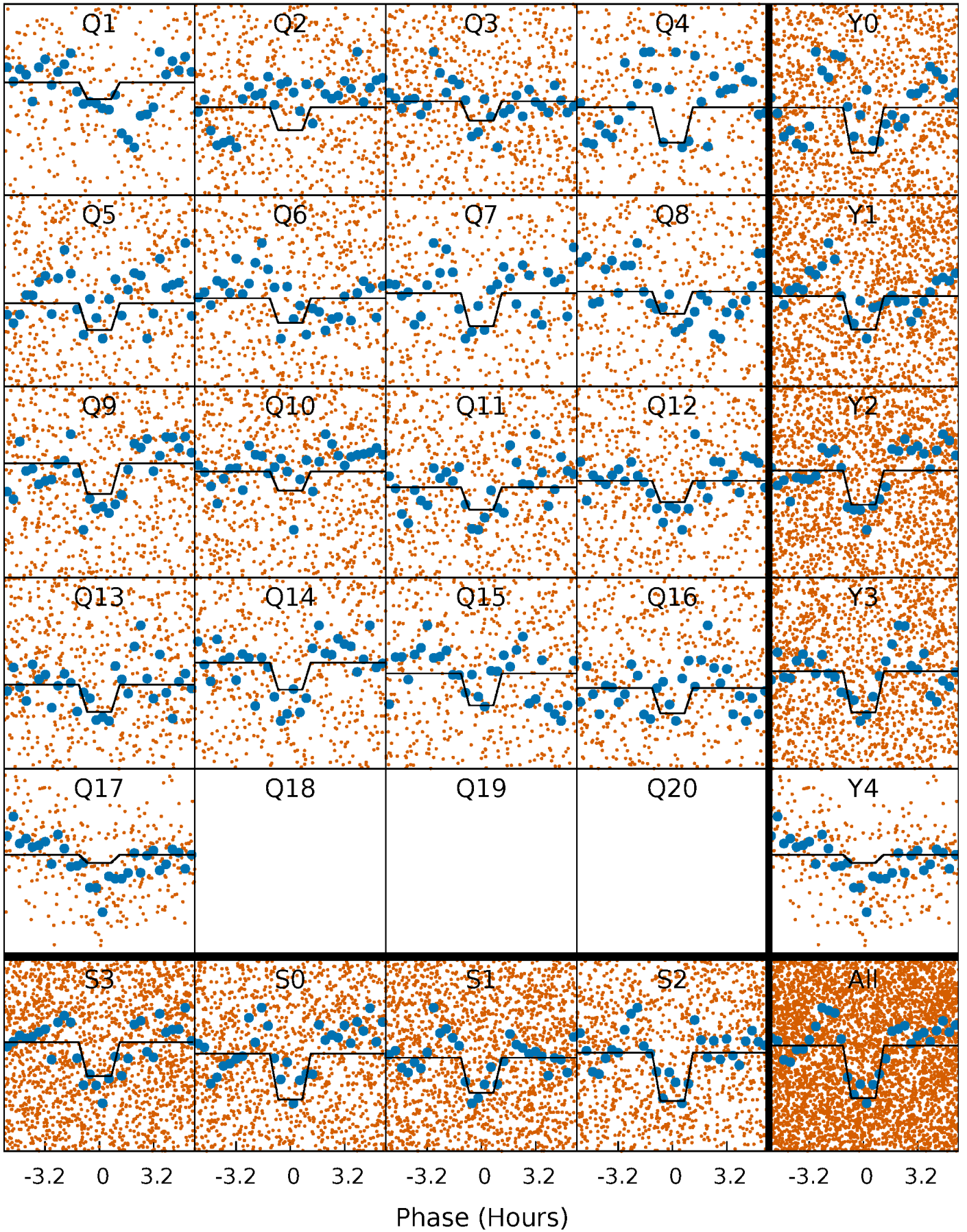
# DV Quarter-Phased Transit Curves

TCE 005008954-01 P= 1.774539 Days  $T_0=133.114627$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

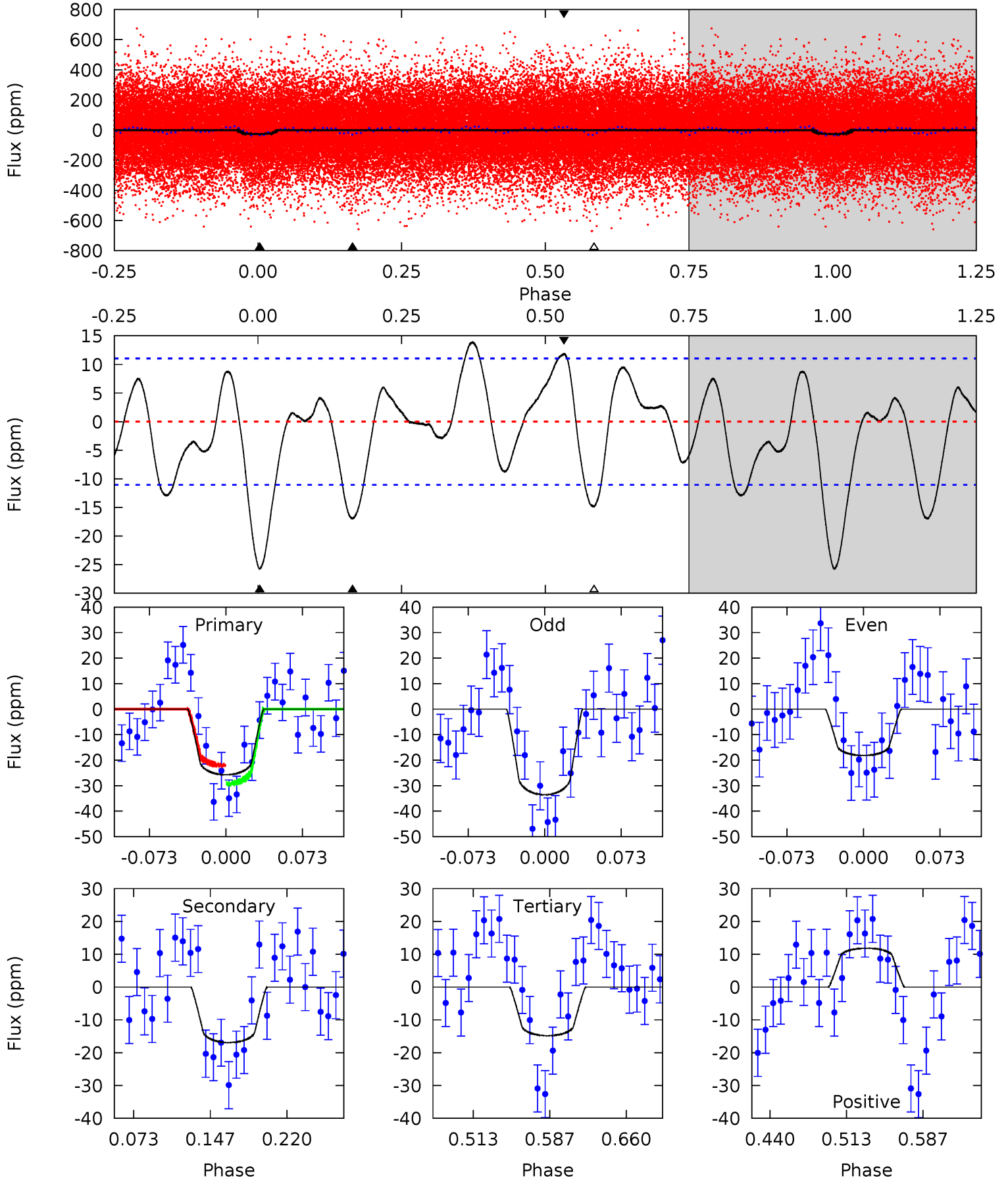
TCE 005008954-01 P= 1.774551 Days  $T_0=133.114687$  (BKJD)



# DV Model-Shift Uniqueness Test

005008954-01, P = 1.774539 Days, E = 131.340088 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
10.8	7.09	6.22	4.96	4.63	1.79	2.83	4.58	5.83	0.88	2.13	3.24	1.25	0.35	1.52

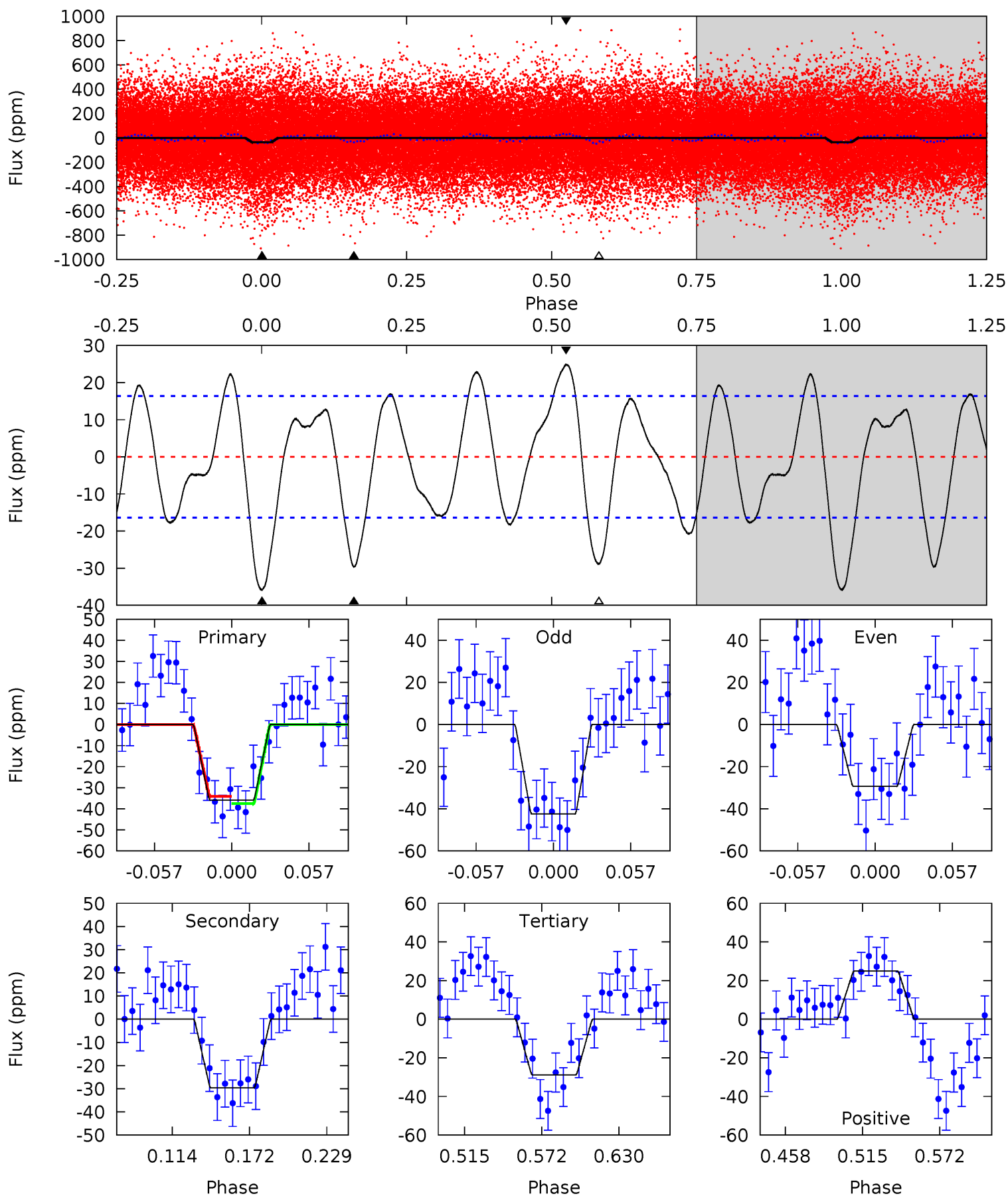




# Alt Model-Shift Uniqueness Test

005008954-01, P = 1.774551 Days, E = 131.340136 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
10.2	8.46	8.25	7.11	4.68	1.90	3.84	1.99	3.13	0.21	1.35	1.88	1.04	0.41	0.50





### Stellar Parameters For KIC 005008954

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7254^{+226}_{-327}$	$4.000^{+0.228}_{-0.152}$	$-0.080^{+0.250}_{-0.350}$	$2.103^{+0.578}_{-0.635}$	$1.613^{+0.200}_{-0.300}$	$0.244^{+0.337}_{-0.106}$
	+3%/-5%	+6%/-4%	+312%/-438%	+27%/-30%	+12%/-19%	+138%/-43%
Source	KIC0	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 005008954-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-17 \pm 2$	$1.34^{+0.42}_{-0.32}$	$3476^{+270}_{-288}$	$5728^{+785}_{-608}$	$5.538^{+4.351}_{-2.273}$
Alt.	$-30 \pm 3$	$1.40^{+0.41}_{-0.36}$	$3507^{+222}_{-295}$	$6574^{+1058}_{-701}$	$9.127^{+7.417}_{-3.400}$

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

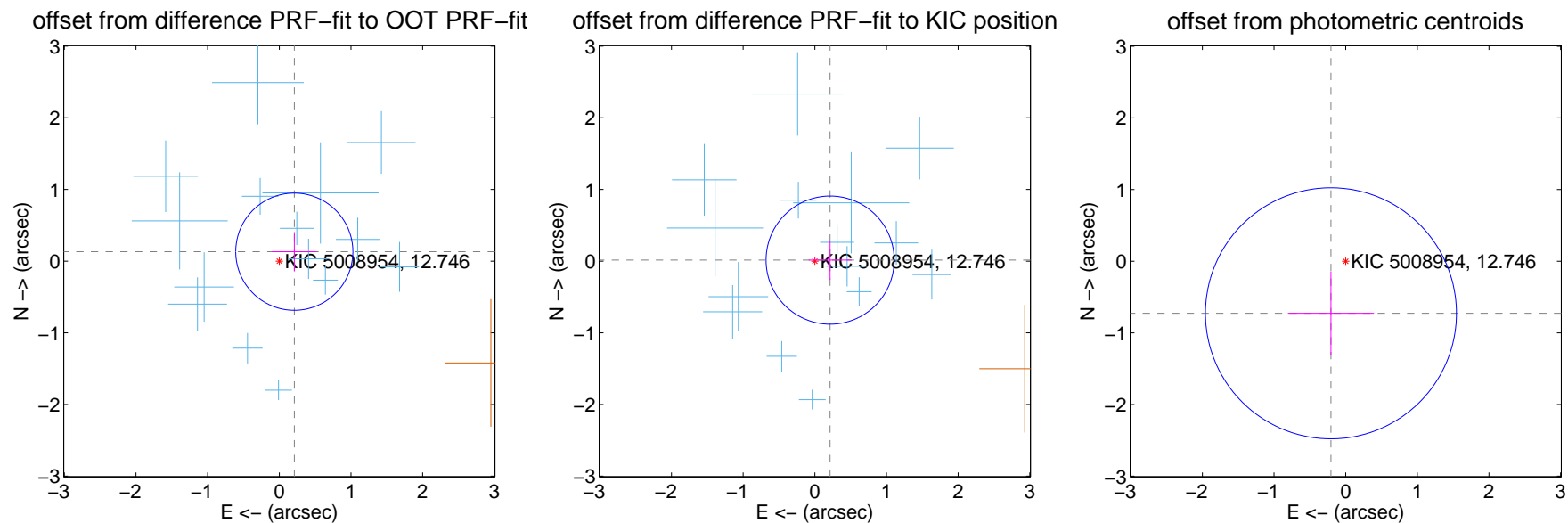
## DV Centroid Data

Supplemental centroid analysis for 005008954-01. Kepler magnitude: 12.75. Transit SNR 8.84

There are 15 quarters with good PRF difference image offsets

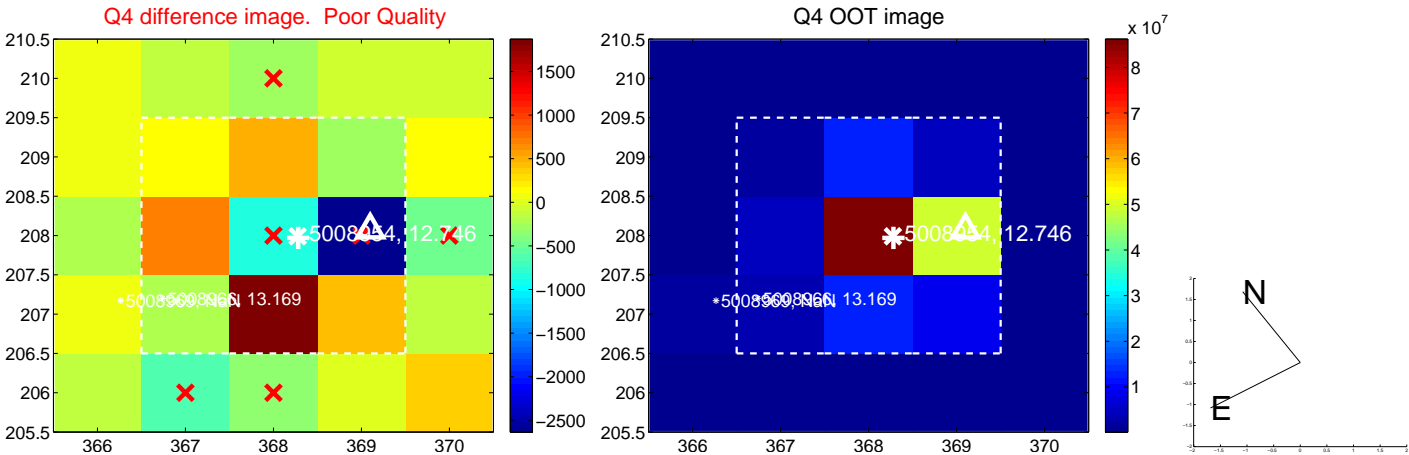
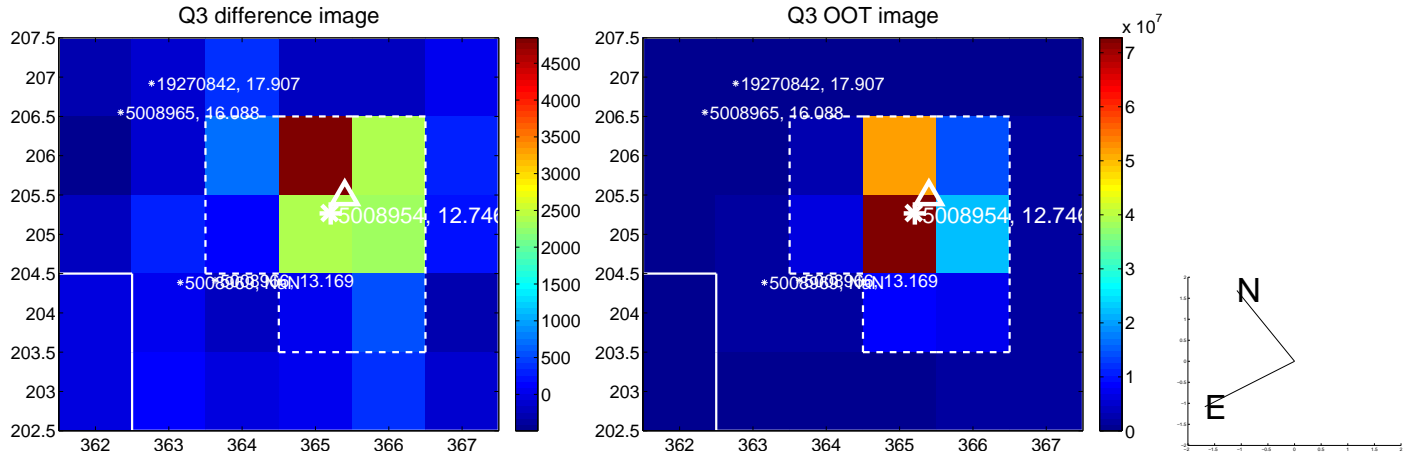
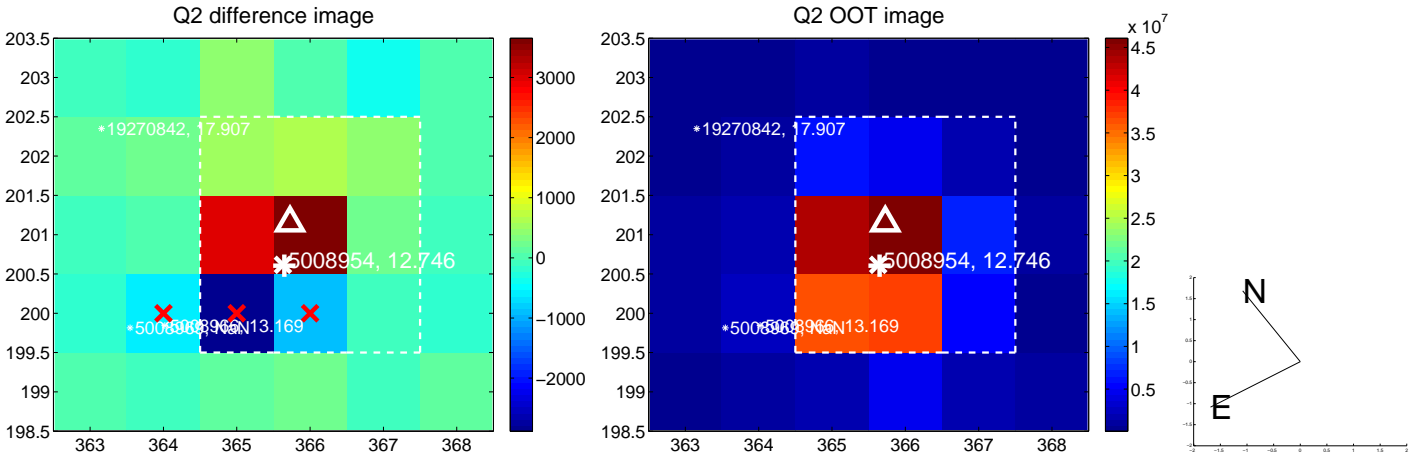
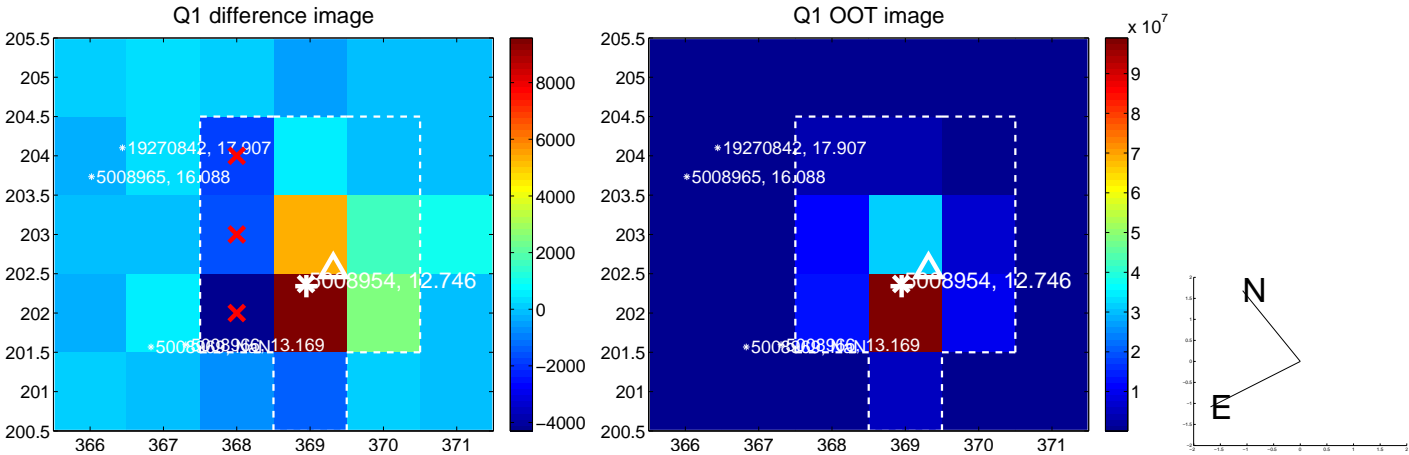
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.247 \pm 0.273$	0.91	$-0.209 \pm 0.310$	$0.132 \pm 0.274$
PRF-fit source offset from KIC position	$0.214 \pm 0.298$	0.72	$-0.214 \pm 0.300$	$0.014 \pm 0.271$
photometric centroid source offset	$0.76 \pm 0.58$	1.29	$0.21 \pm 0.60$	$-0.73 \pm 0.58$

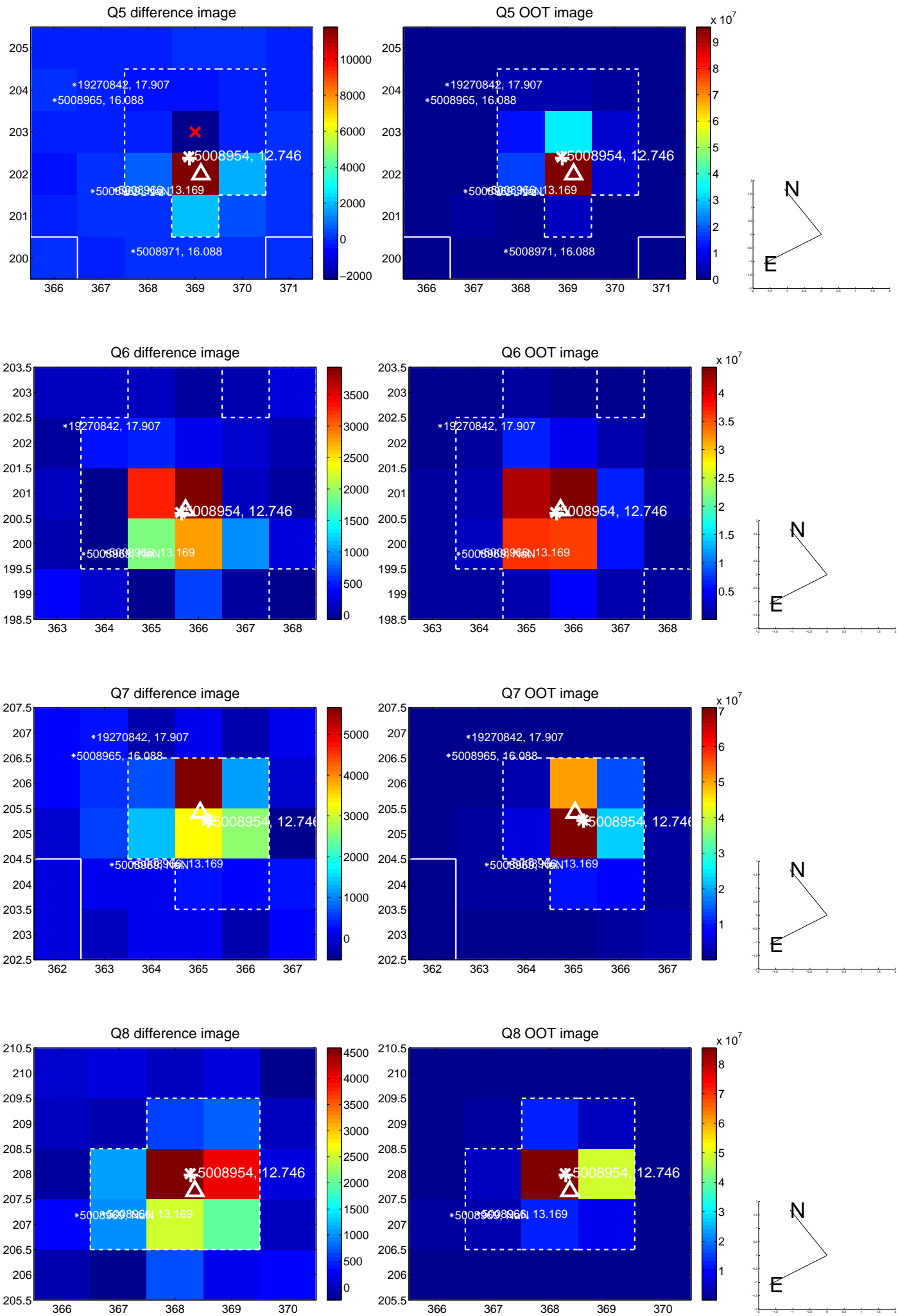


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

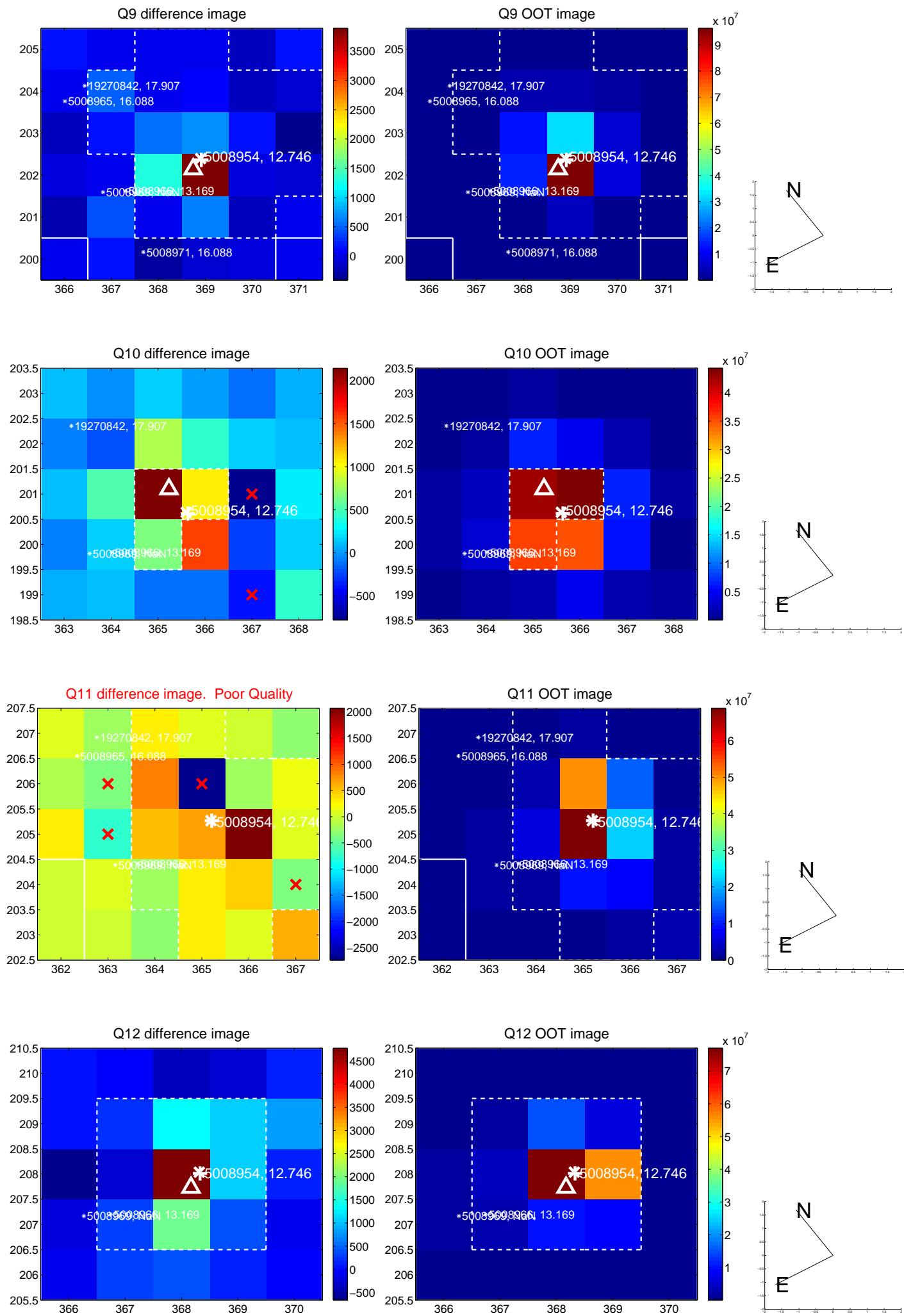


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

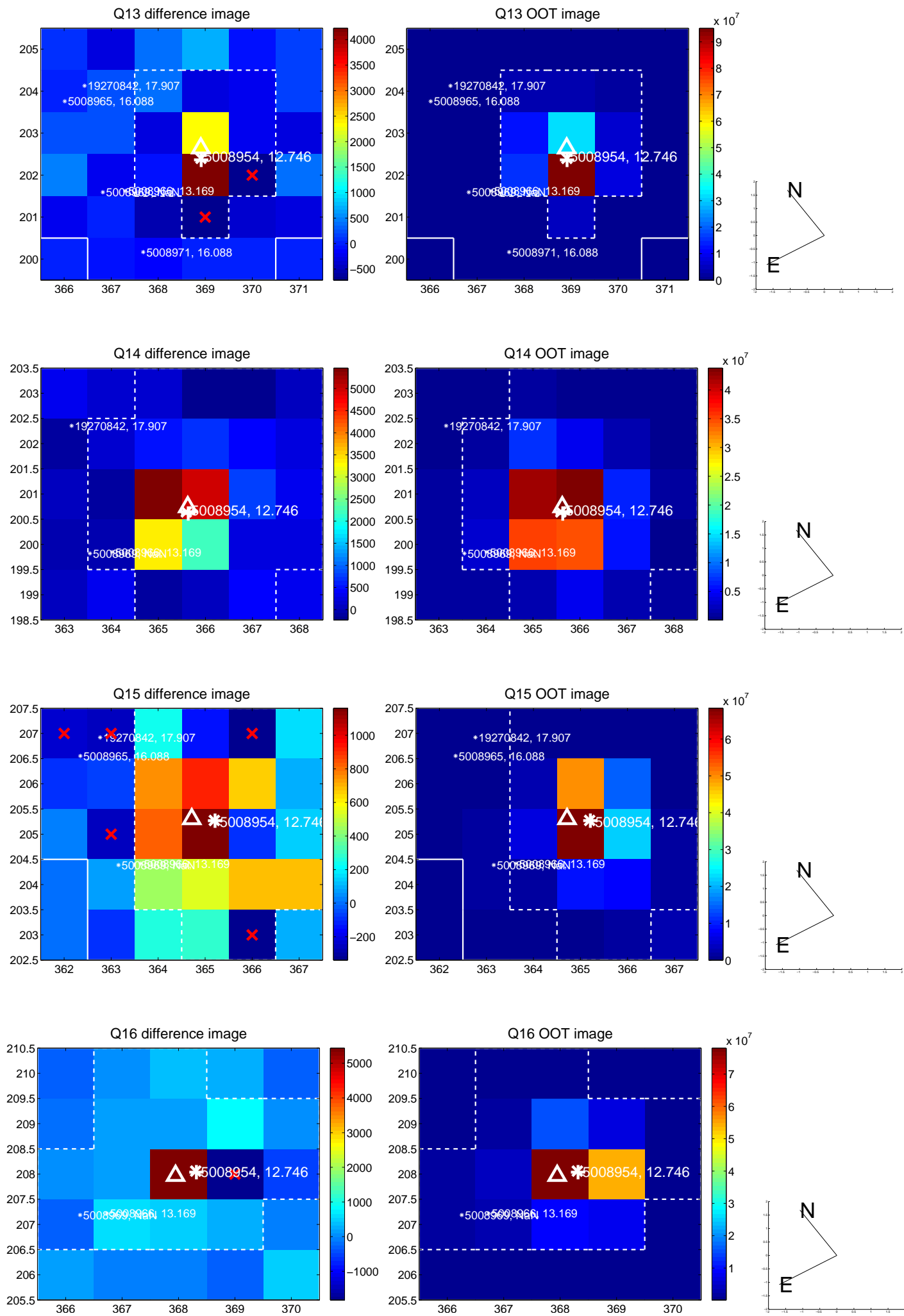




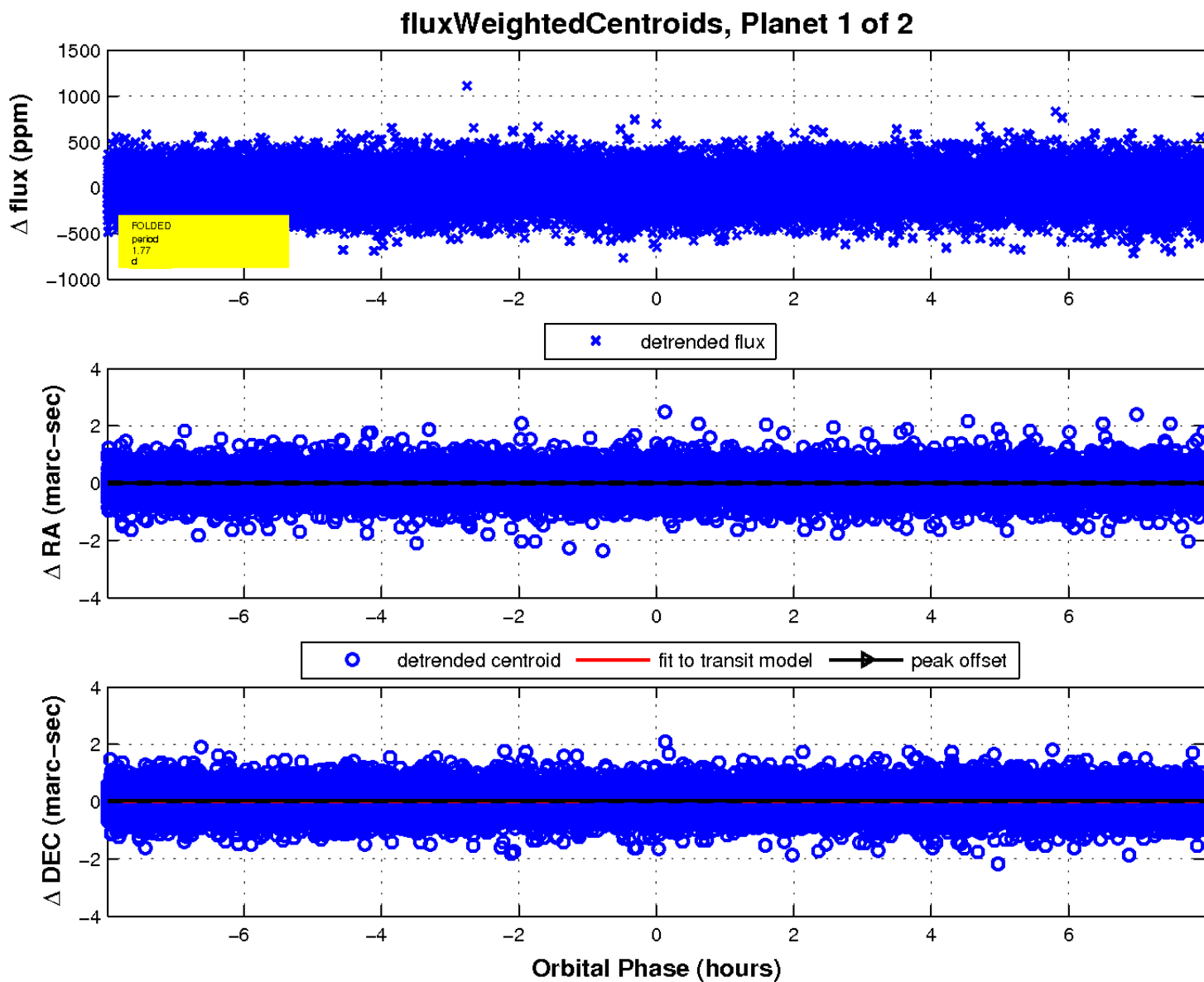
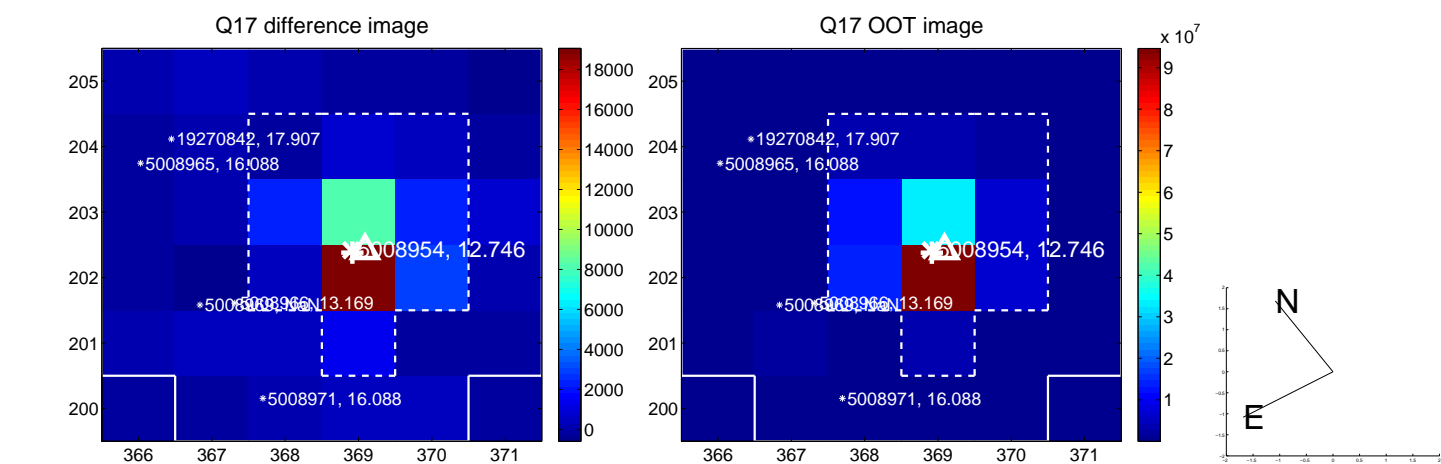
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

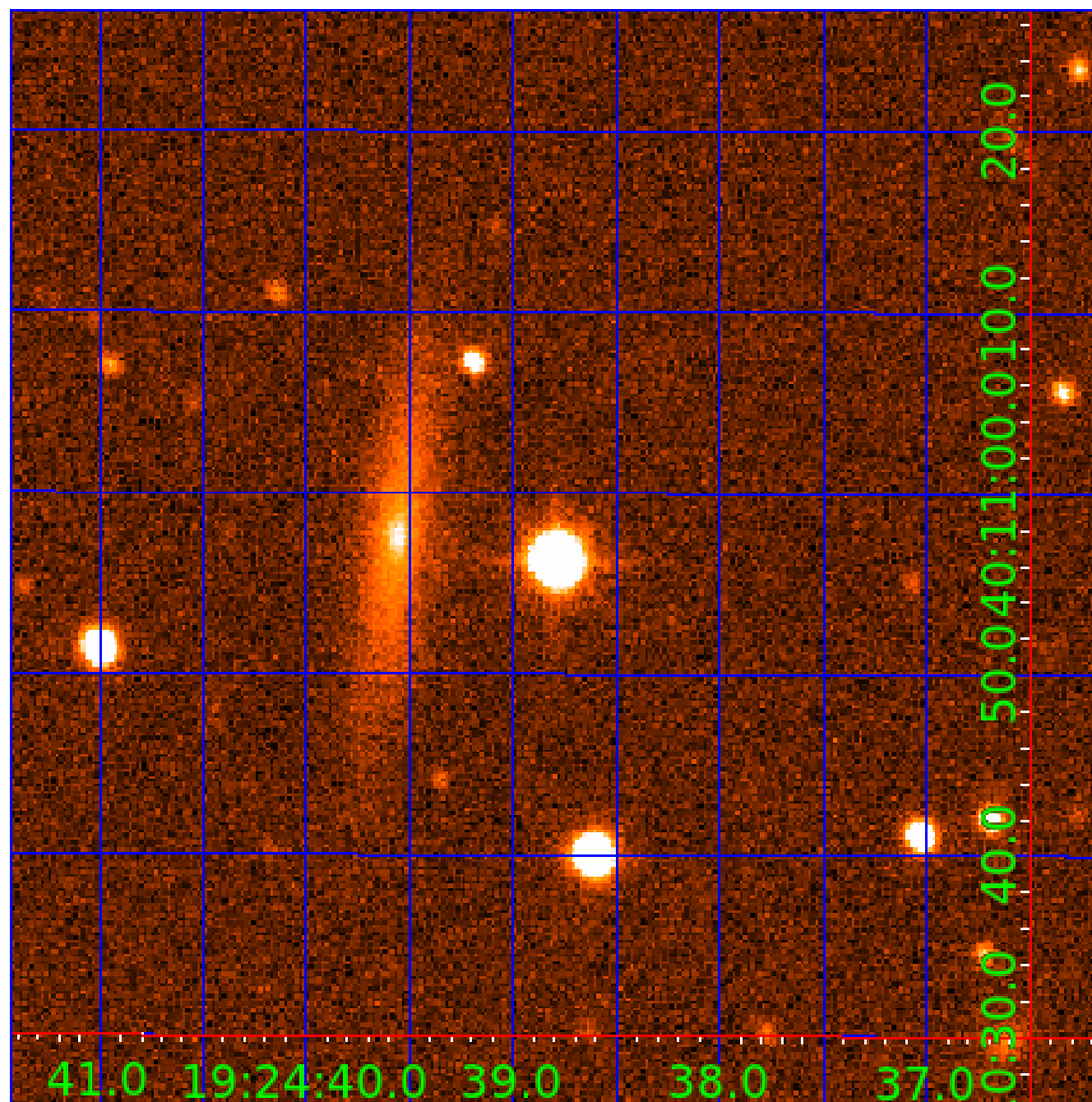


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005008954

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005008954-01	OBS	No	1.774539	133.114627	33.7	2.663	8.1	8.8	2.10	7254	1.42	9689.84
005008954-02	OBS	No	2.341311	133.486194	26.4	8.600	8.6	7.8	2.10	7254	1.27	6696.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005008954-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
005008954-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

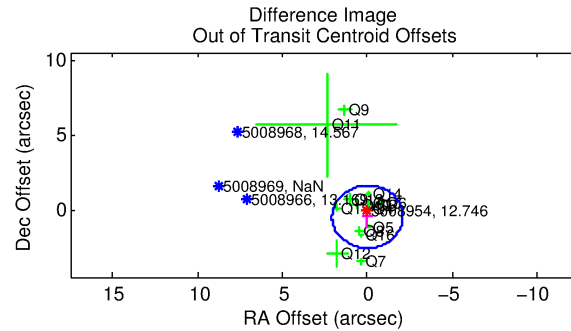
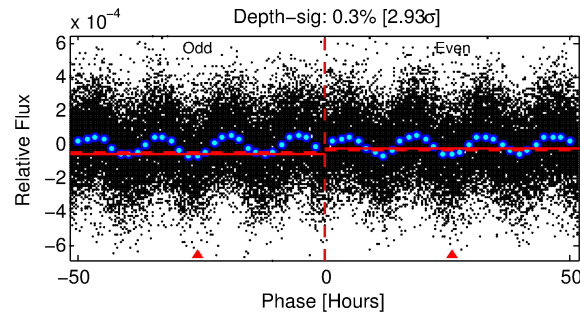
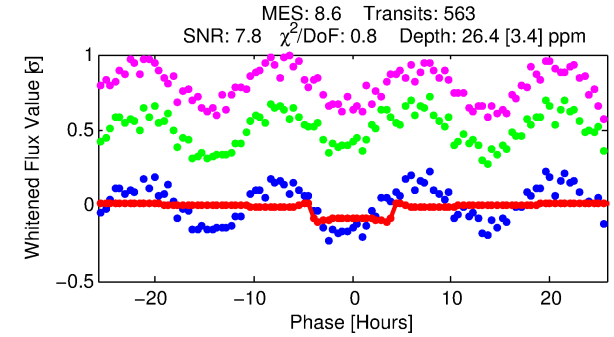
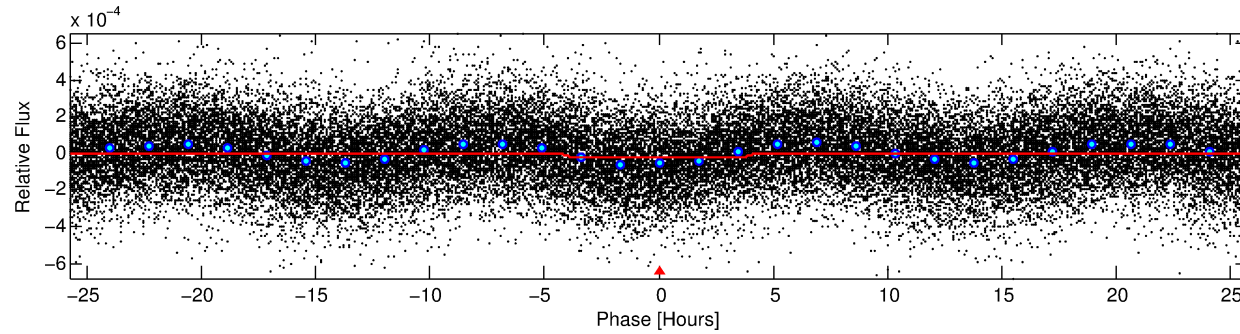
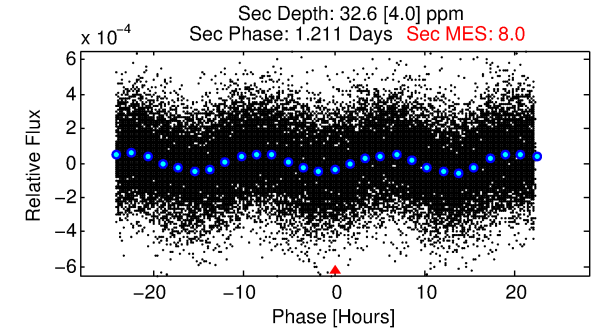
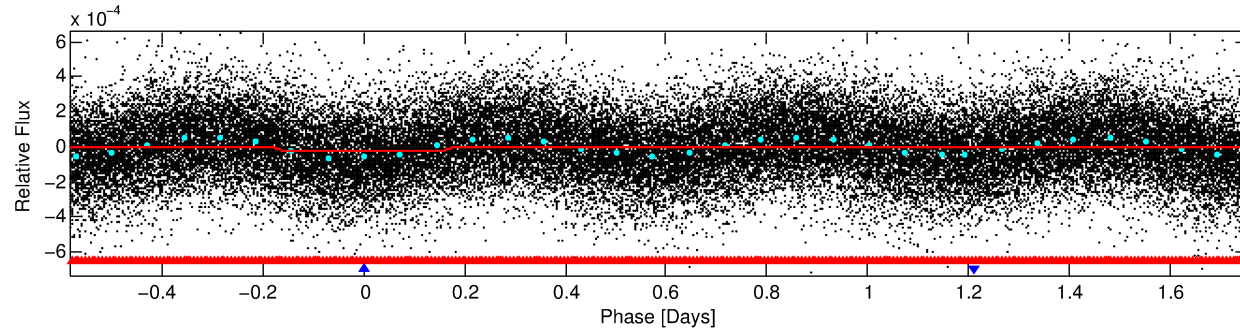
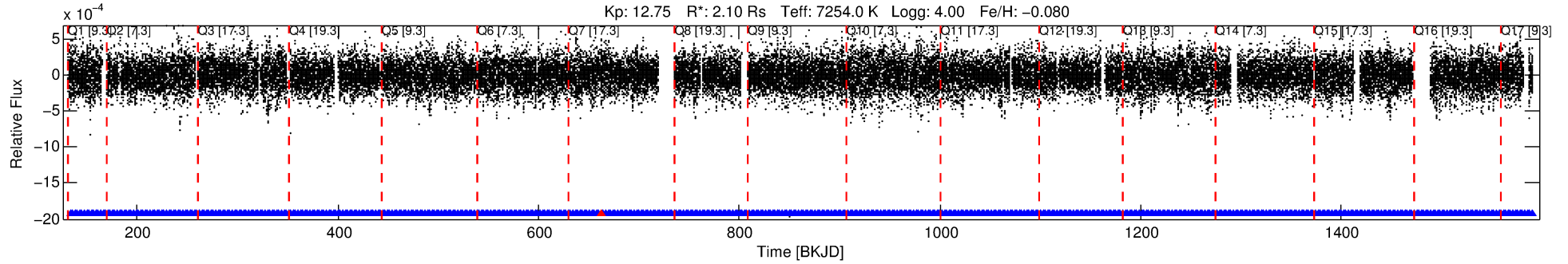
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005008954-02

No Significant Match Found

# DV One-Page Summary

KIC: 5008954 Candidate: 2 of 2 Period: 2.341 d



## DV Fit Results:

Period = 2.34131 [0.00003] d  
Epoch = 133.4862 [0.0057] BKJD  
Rp/R\* = 0.0055 [0.0009]  
a/R\* = 1.27 [0.46]  
b = 0.92 [0.16]  
Seff = 6696.05 [2960.91]  
Teff = 2307 [255] K  
Rp = 1.27 [0.44] Re  
a = 0.0405 [0.0108] AU  
Ag = 18.14 [9.64] [1.78σ]  
Teffp = 7360 [718] K [6.63σ]

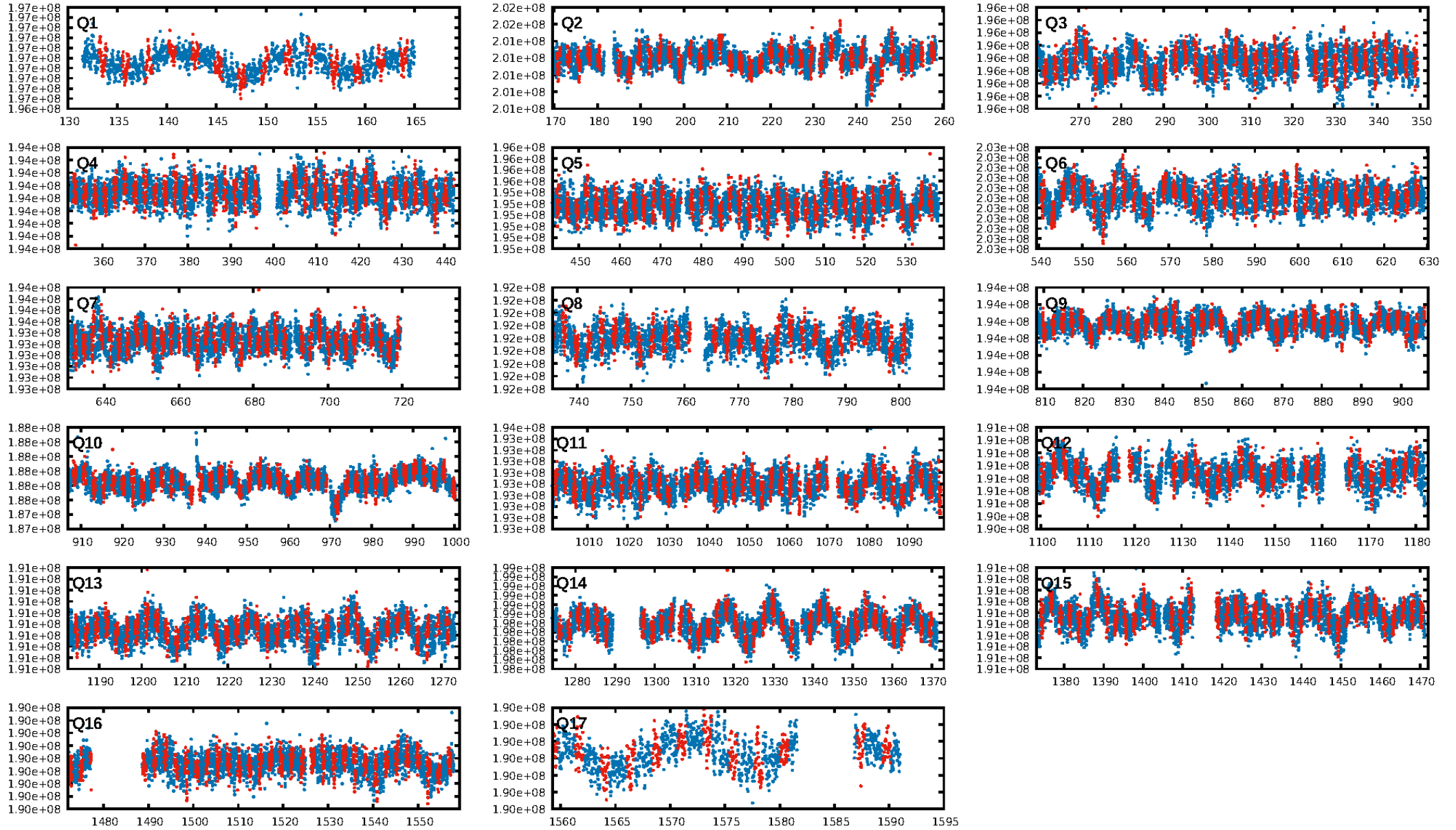
## DV Diagnostic Results:

ShortPeriod-sig: 86.9% [1.51σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.37e-16  
RollingBand-fgt: 1.00 [536/537]  
GhostDiagnostic-chr: 2.876  
Centroid-sig: 6.2%  
Centroid-so: 0.764 arcsec [1.48σ]  
OotOffset-rm: 0.485 arcsec [0.70σ]  
KicOffset-rm: 0.606 arcsec [0.88σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.80 [12/15]  
DiffImageOverlap-fno: 1.00 [17/17]

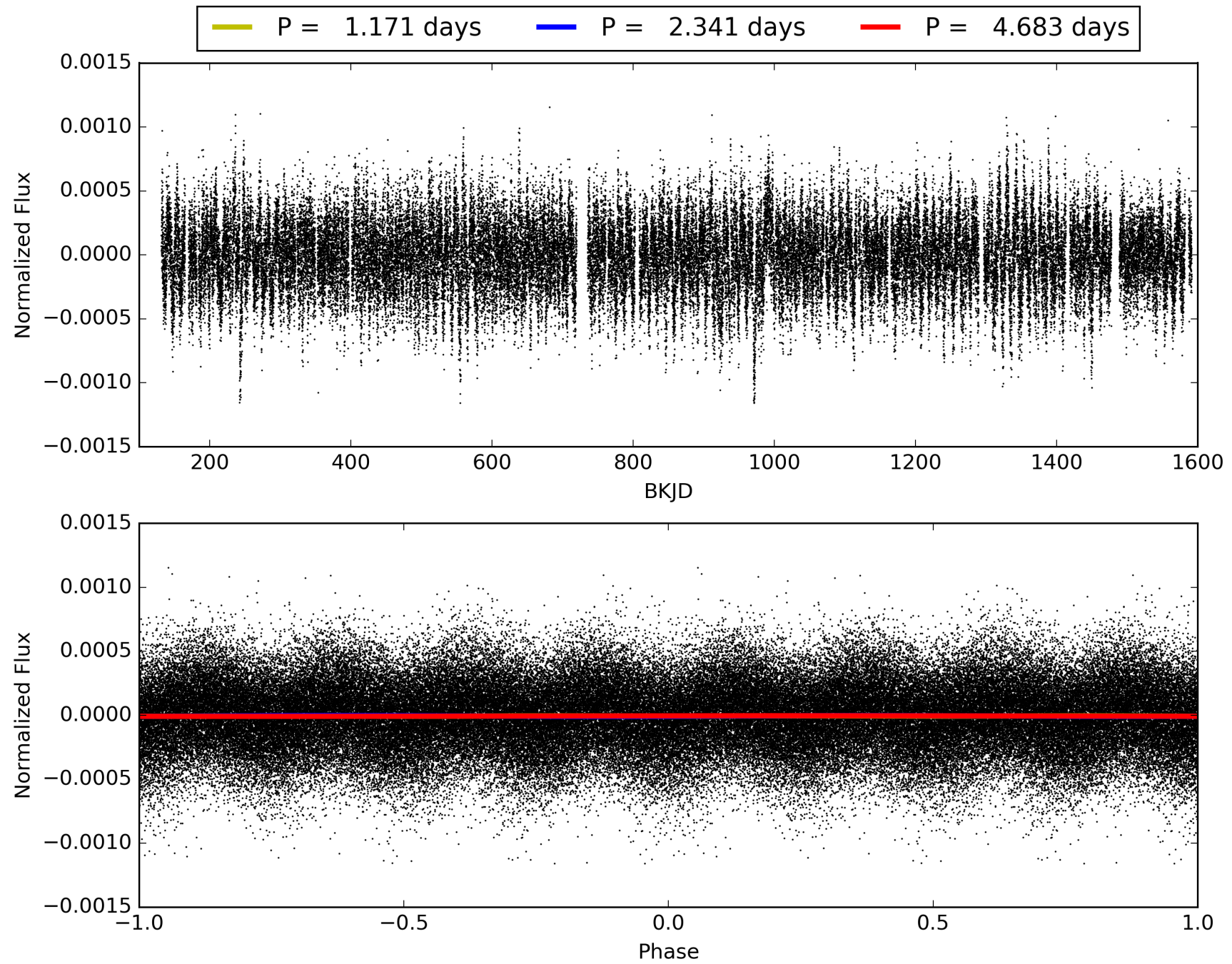
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:03:08 Z

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

# TCE 005008954-02, PDC Light Curves



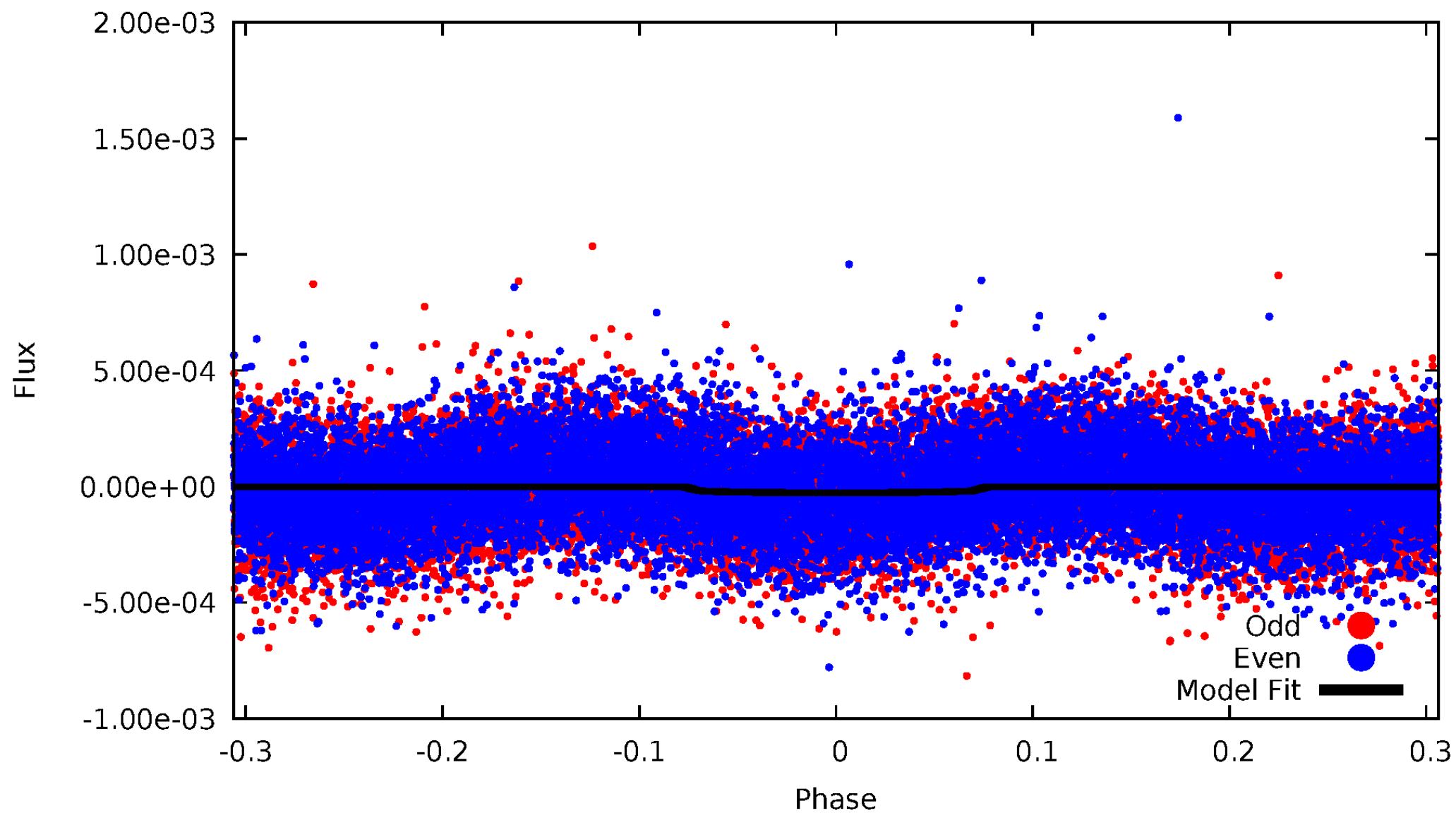
TCE 005008954-02





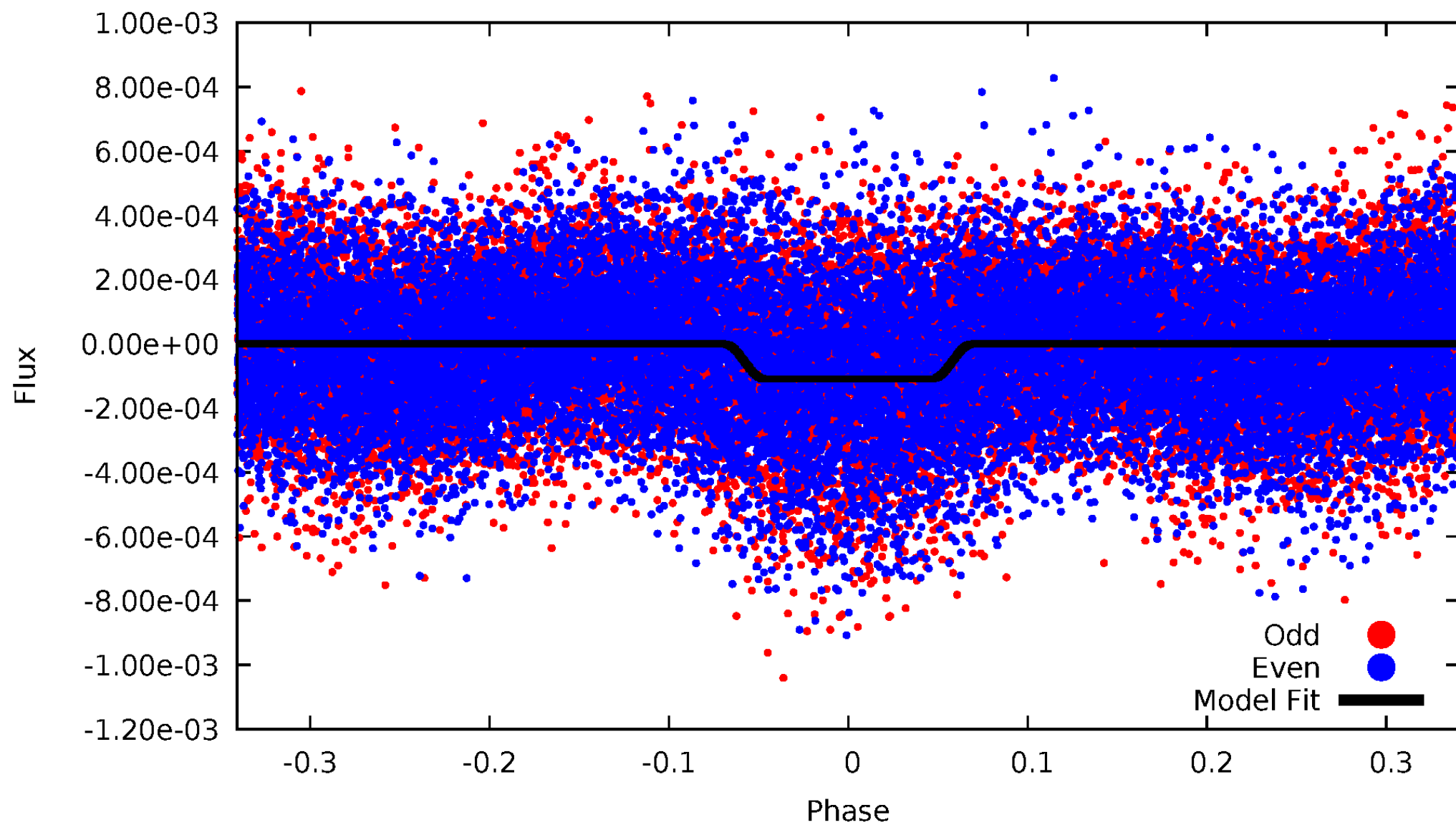
# DV Odd/Even

TCE 005008954-02



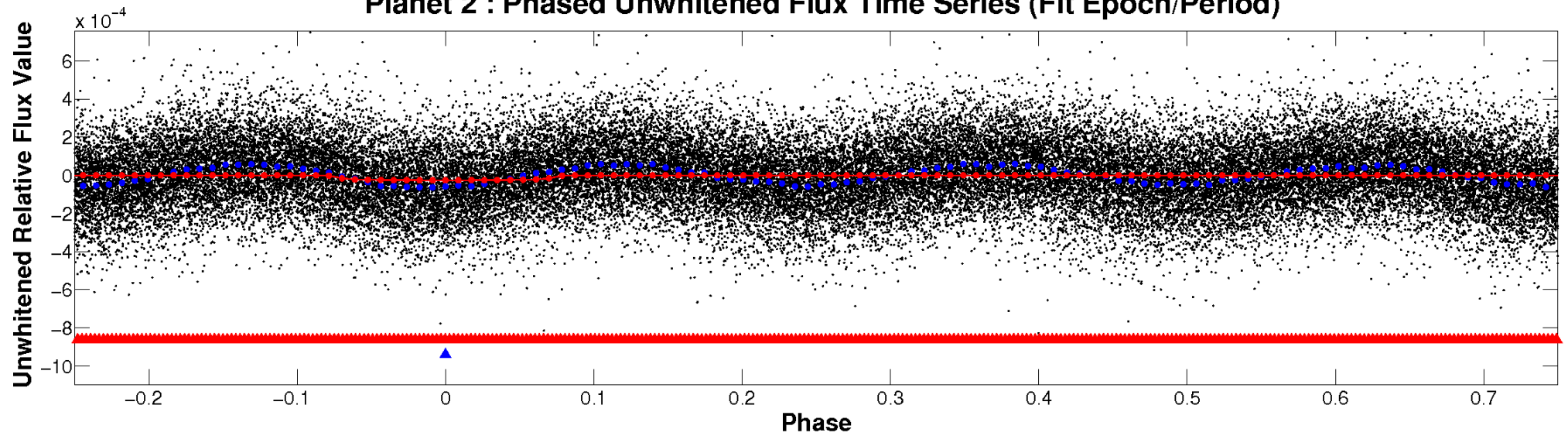
# ALT Odd/Even

TCE 005008954-02

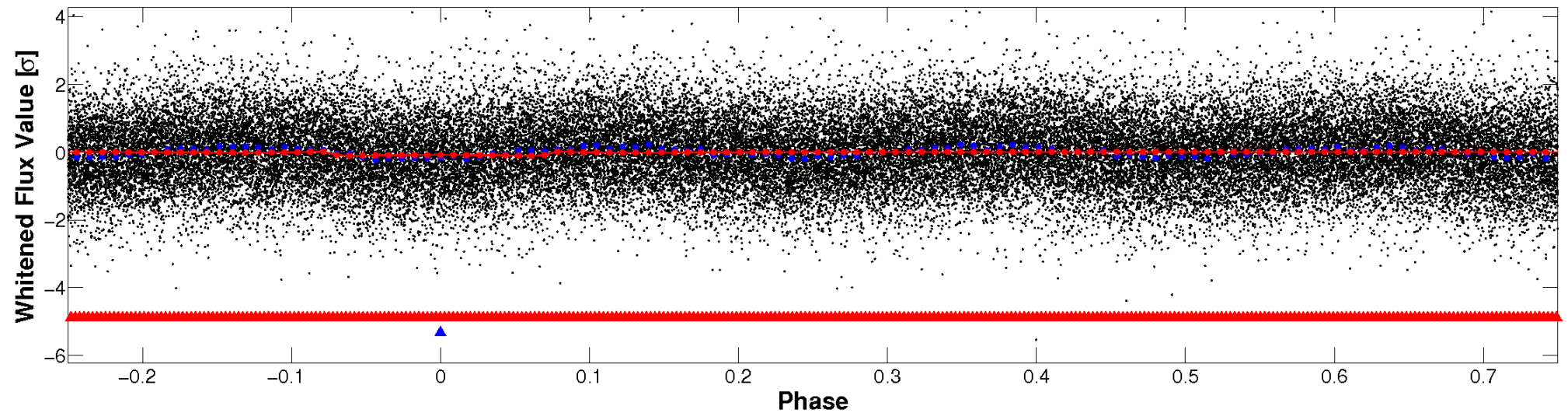


# Non-Whitened Vs. Whitened Light Curve

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

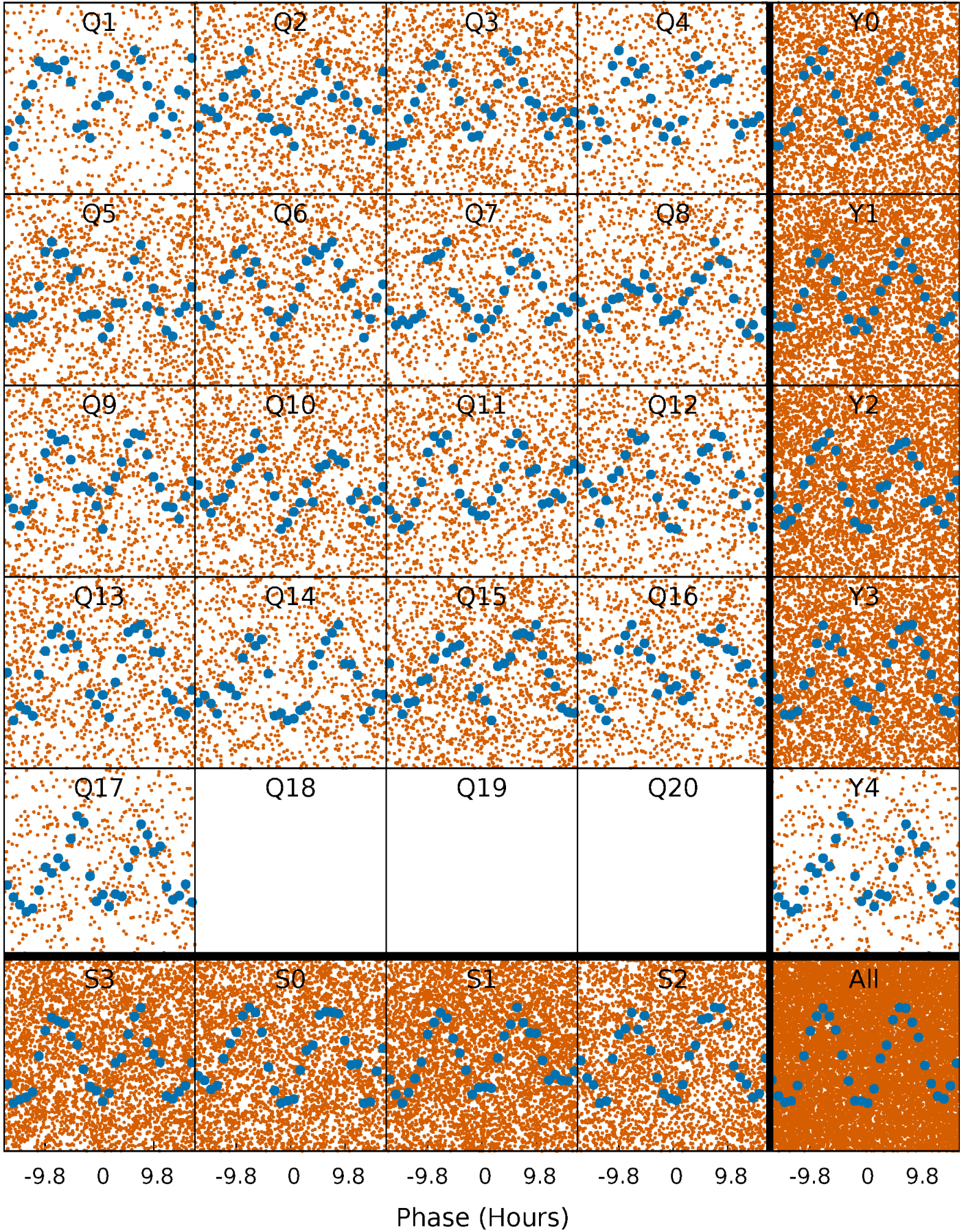


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

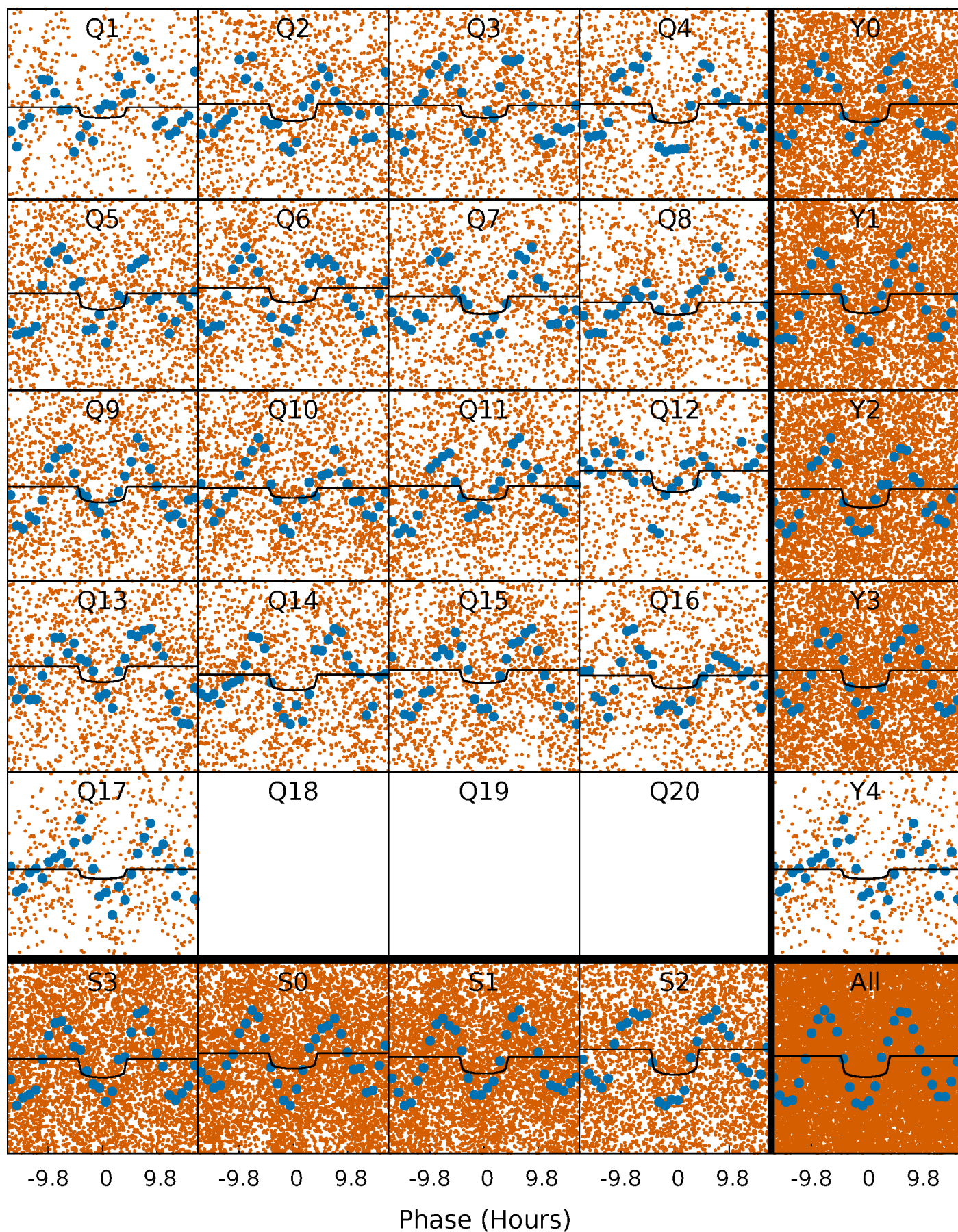
TCE 005008954-02 P= 2.341311 Days  $T_0=133.486195$  (BKJD)





# DV Quarter-Phased Transit Curves

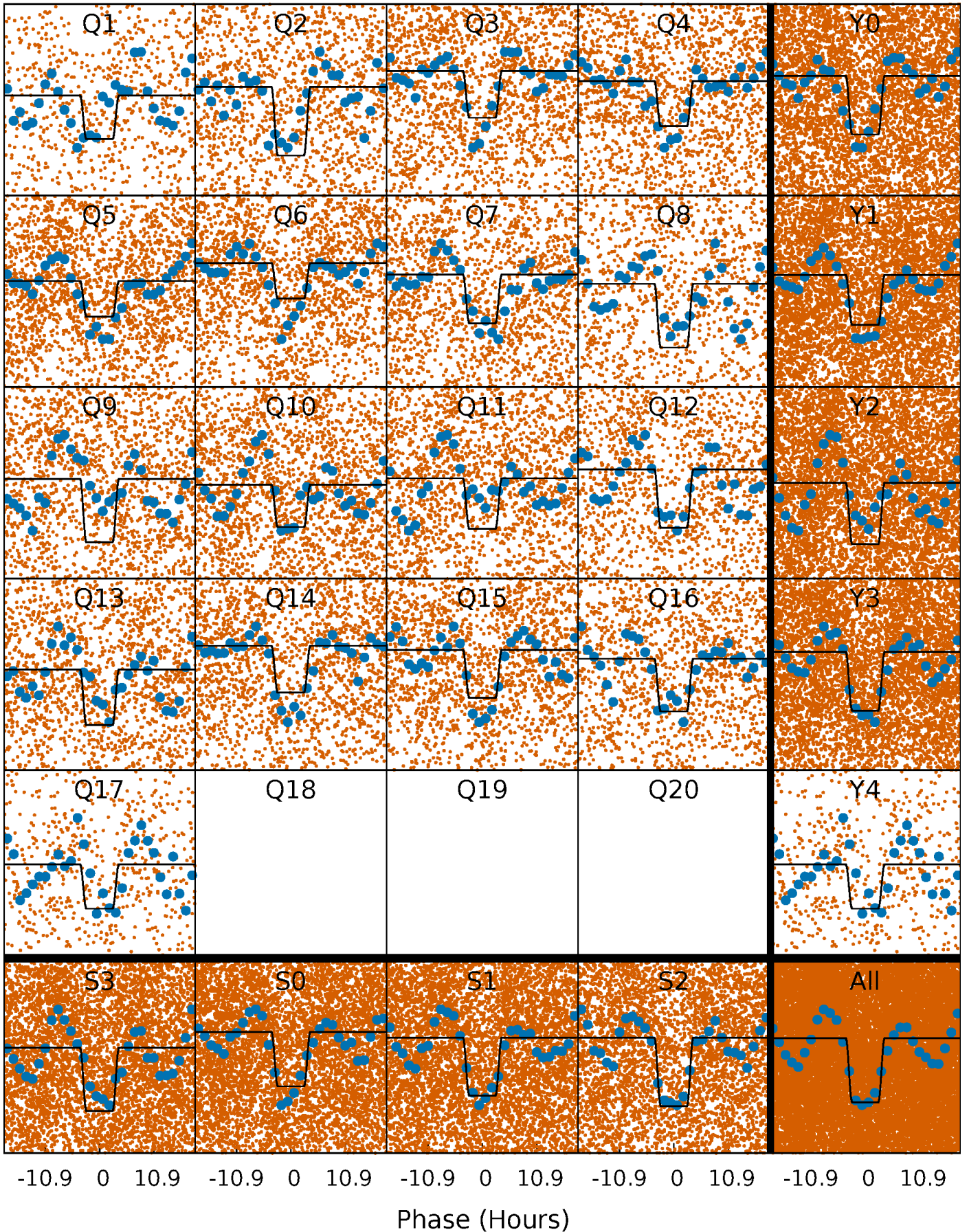
TCE 005008954-02   P= 2.341311 Days    $T_0=133.486195$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

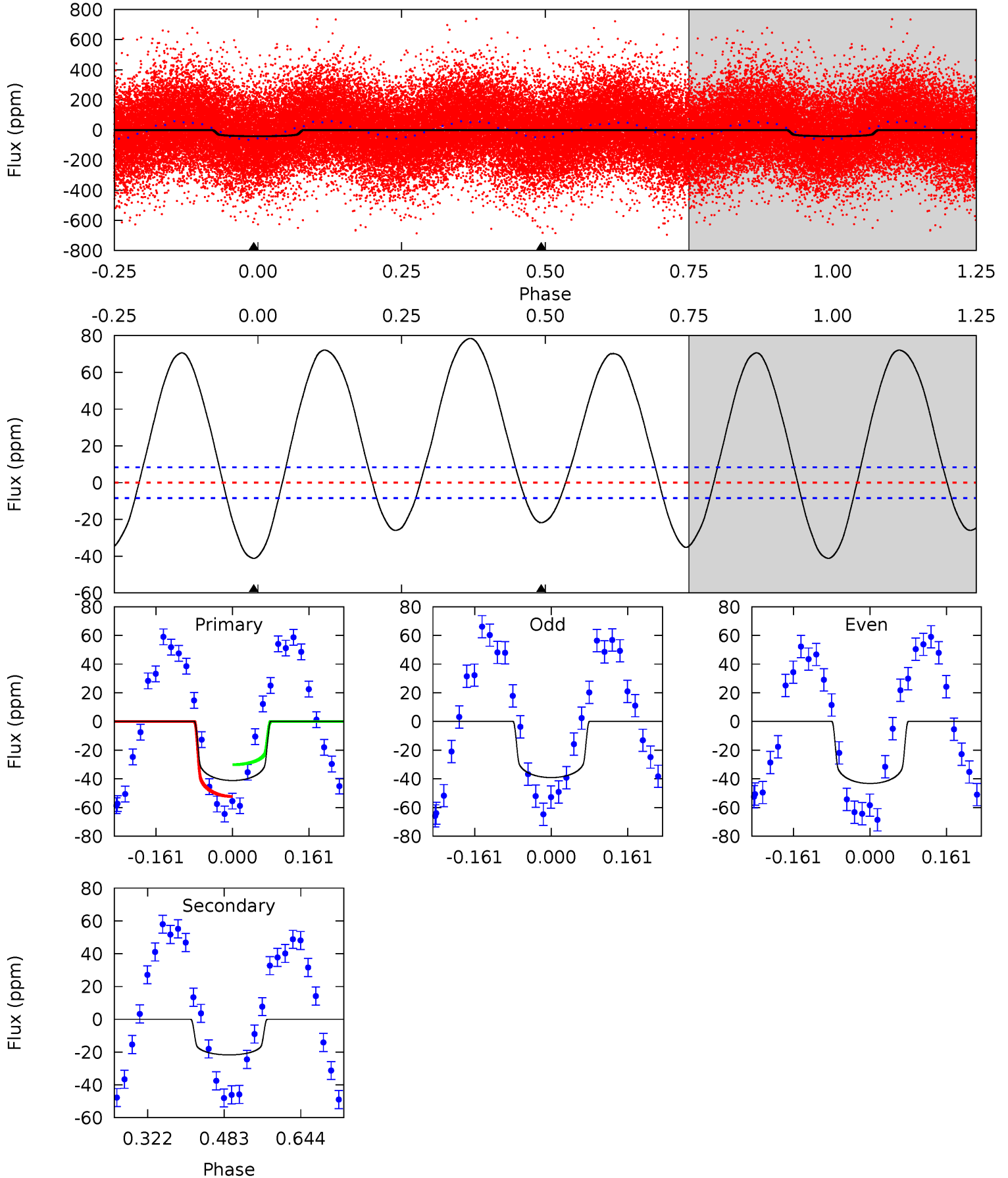
TCE 005008954-02   P= 2.341376 Days    $T_0=133.453869$  (BKJD)



# DV Model-Shift Uniqueness Test

005008954-02, P = 2.341311 Days, E = 131.144884 Days

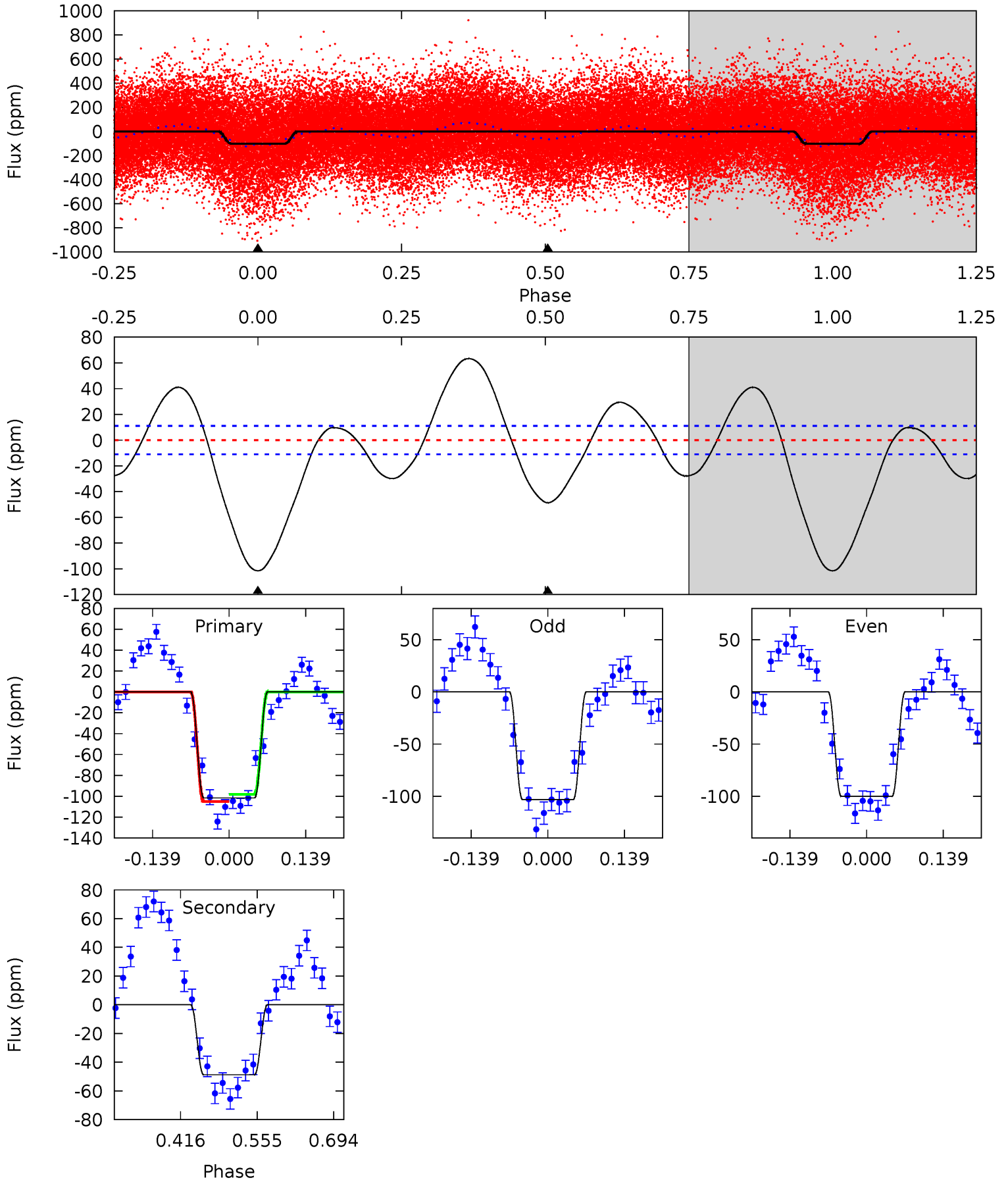
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.0	11.6	0	0	4.46	1.40	14.5	22.0	22.0	11.6	11.6	1.10	0.82	0.66	6.08



# Alt Model-Shift Uniqueness Test

005008954-02, P = 2.341376 Days, E = 131.112493 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
41.5	19.9	0	0	4.50	1.48	10.7	41.5	41.5	19.9	19.9	0.62	1.13	0.38	1.39



### Stellar Parameters For KIC 005008954

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7254^{+226}_{-327}$	$4.000^{+0.228}_{-0.152}$	$-0.080^{+0.250}_{-0.350}$	$2.103^{+0.578}_{-0.635}$	$1.613^{+0.200}_{-0.300}$	$0.244^{+0.337}_{-0.106}$
	+3%/-5%	+6%/-4%	+312%/-438%	+27%/-30%	+12%/-19%	+138%/-43%
Source	KIC0	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 005008954-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-22 \pm 2$	$1.23^{+0.30}_{-0.26}$	$3191^{+245}_{-255}$	$6544^{+725}_{-592}$	$13^{+8}_{-4}$
Alt.	$-49 \pm 2$	$2.35^{+0.45}_{-0.42}$	$3194^{+240}_{-262}$	$5805^{+315}_{-303}$	$7.876^{+3.195}_{-2.209}$

$T_{\text{max}}$  = 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

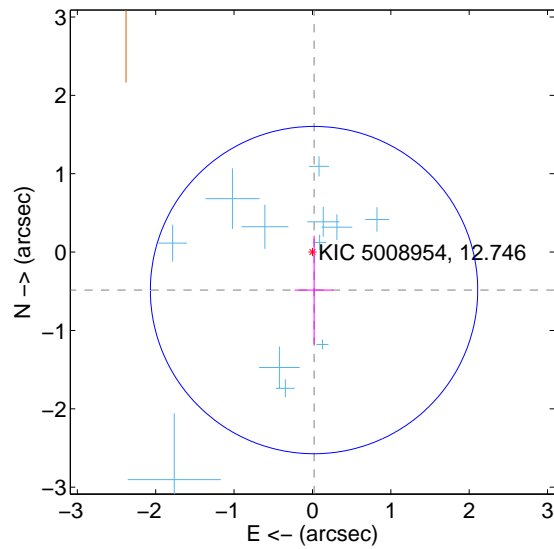
Supplemental centroid analysis for 005008954-02. Kepler magnitude: 12.75. Transit SNR 7.82

There are 12 quarters with good PRF difference image offsets

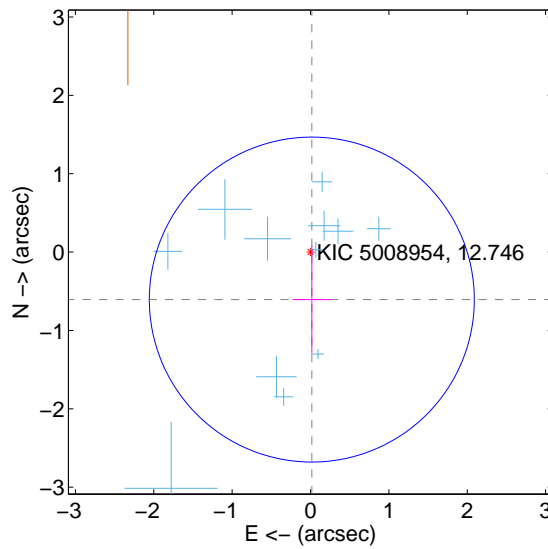
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.485 \pm 0.696$	0.70	$-0.020 \pm 0.247$	$-0.485 \pm 0.694$
PRF-fit source offset from KIC position	$0.606 \pm 0.691$	0.88	$-0.017 \pm 0.246$	$-0.606 \pm 0.689$
photometric centroid source offset	$0.76 \pm 0.52$	1.48	$-0.18 \pm 0.53$	$-0.74 \pm 0.52$

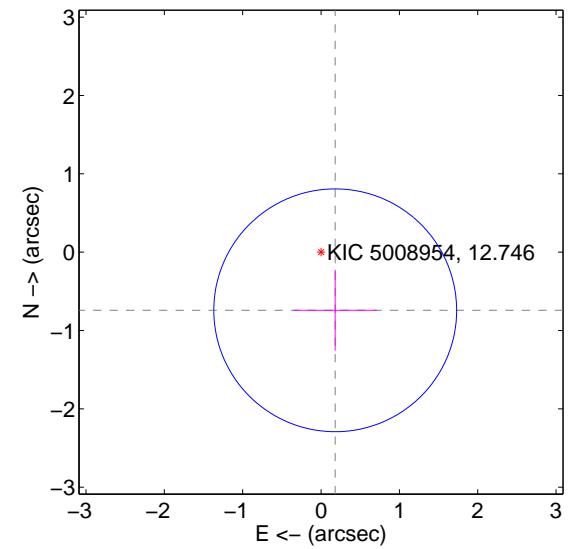
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

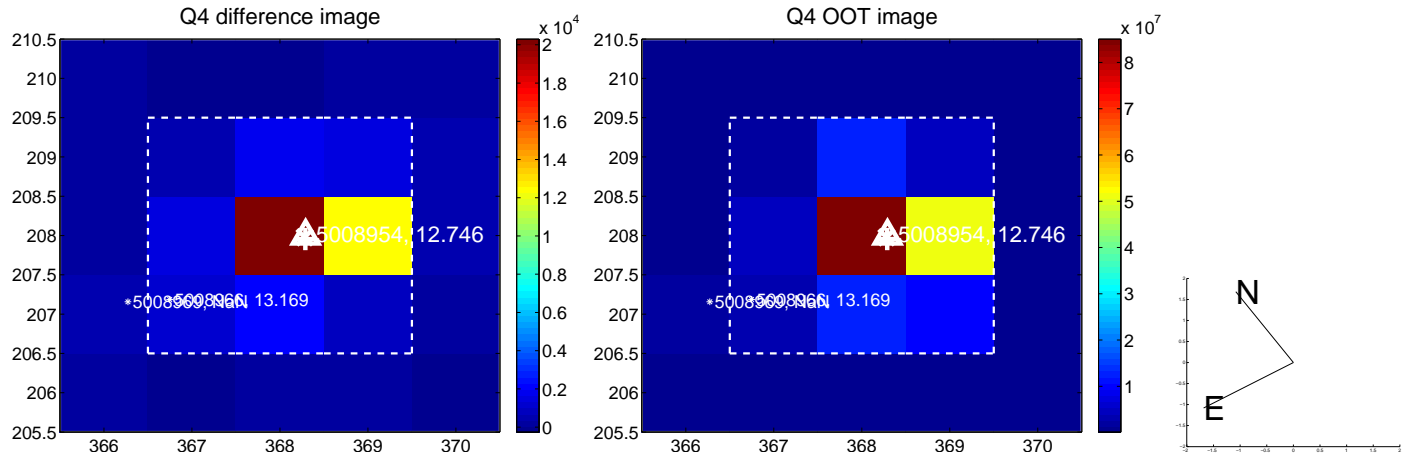
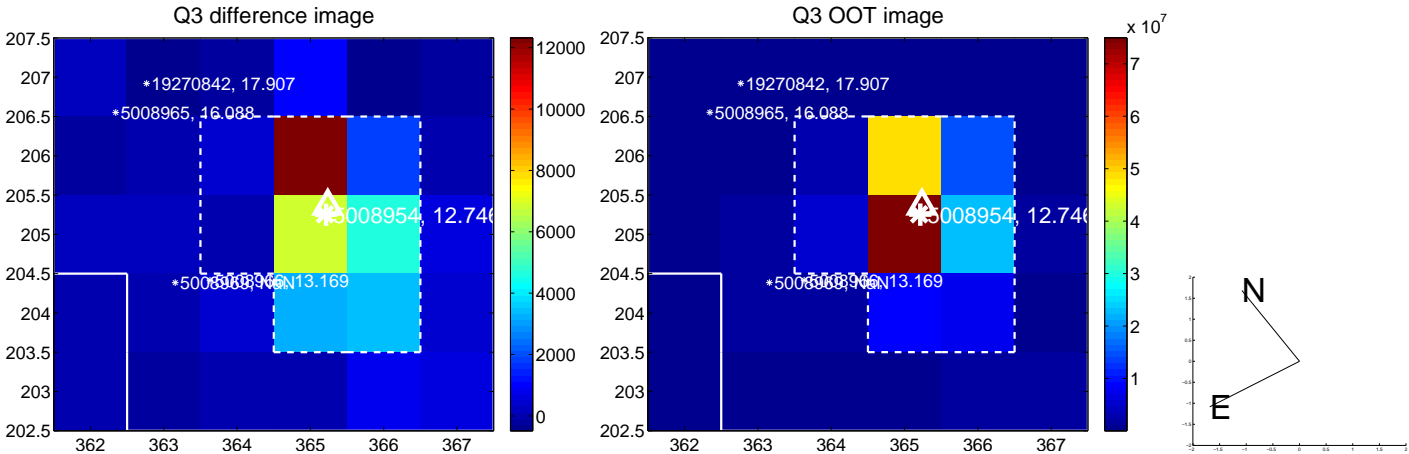
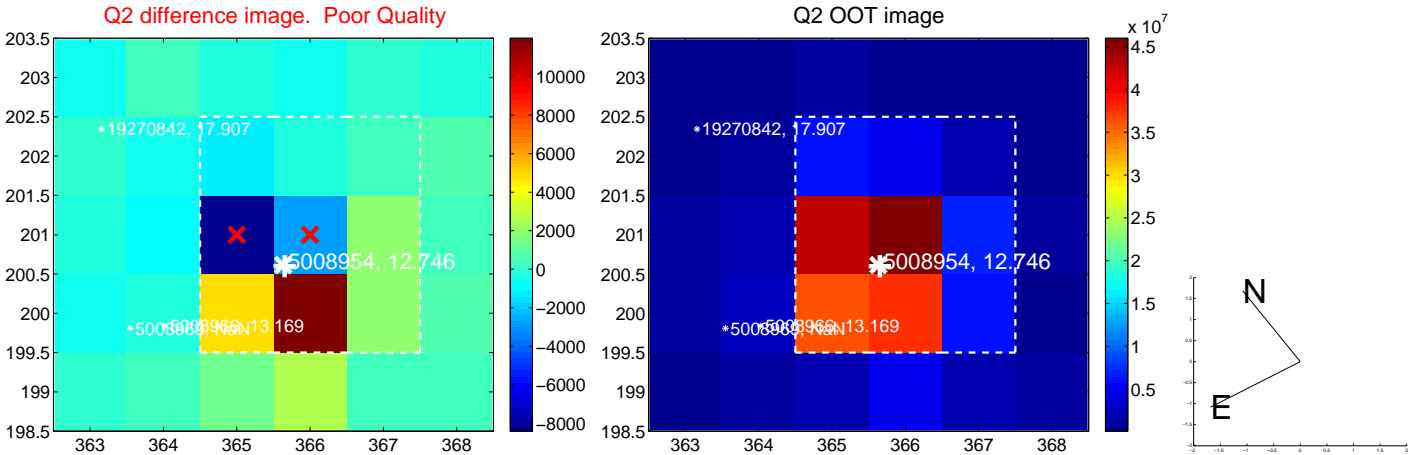
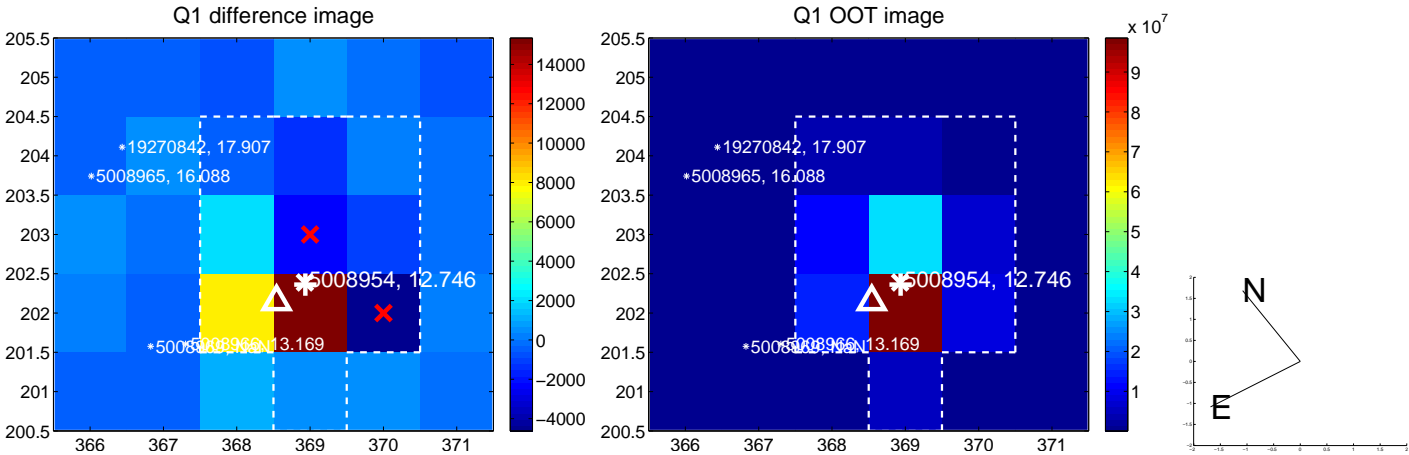


offset from photometric centroids



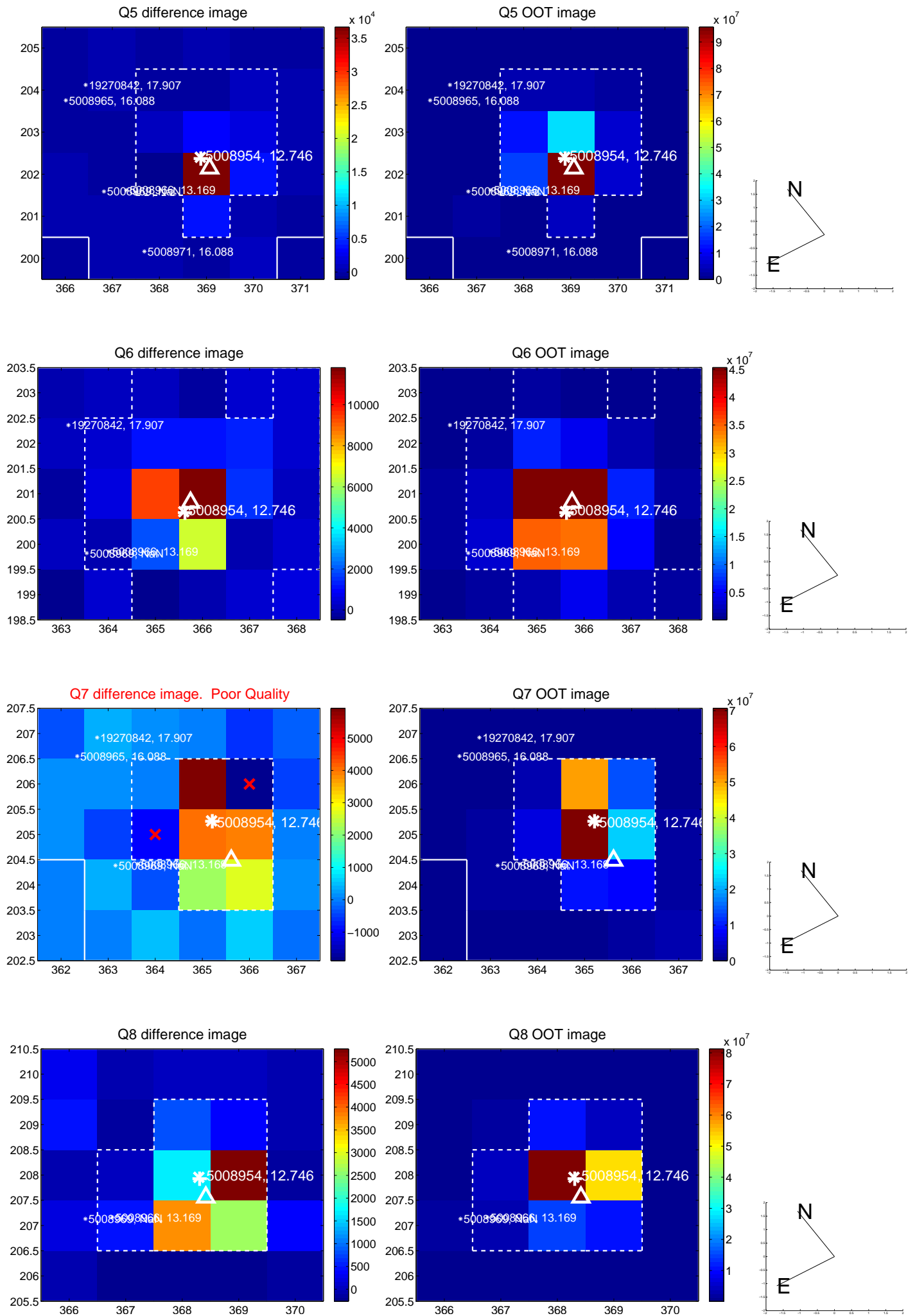
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

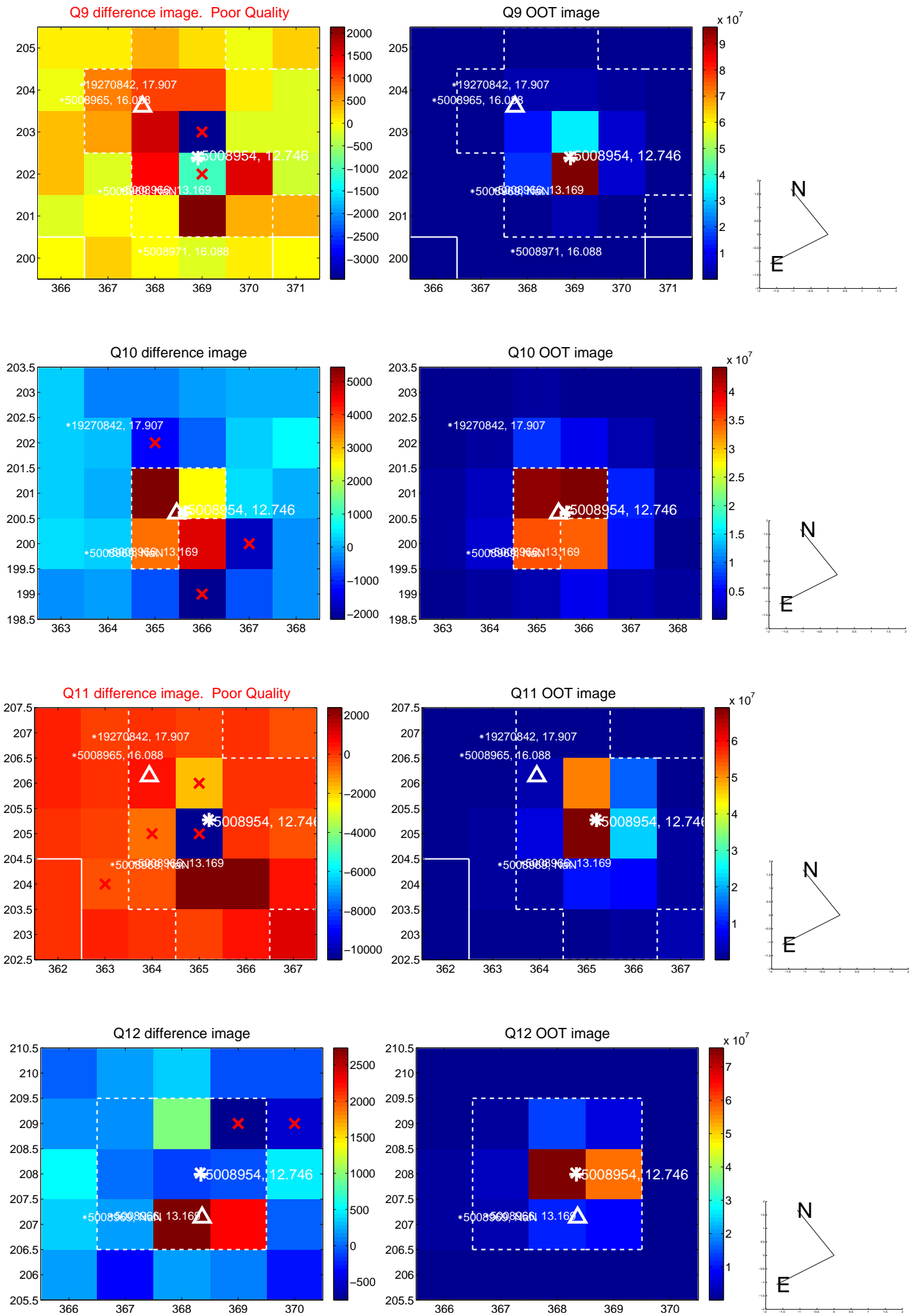




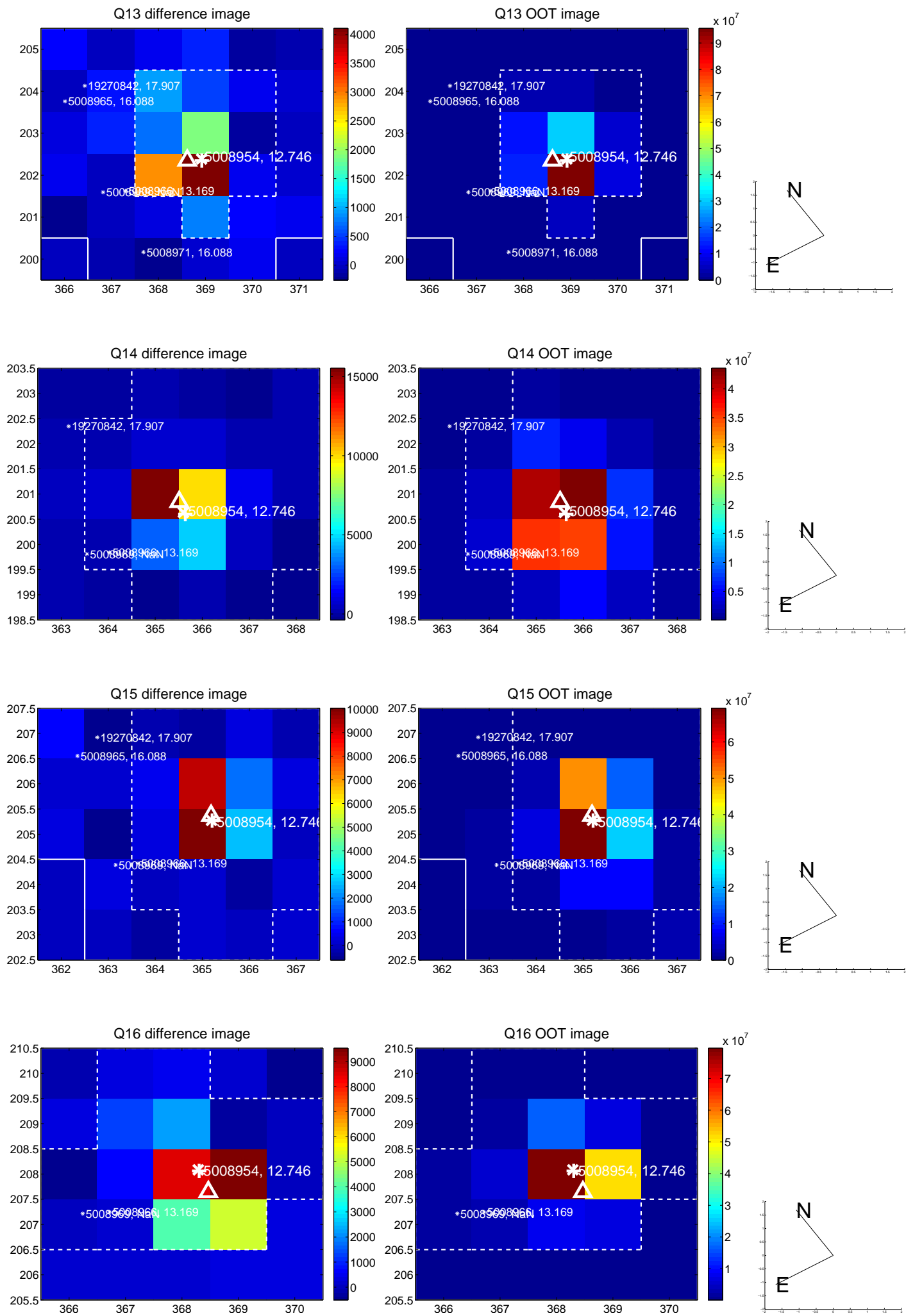
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



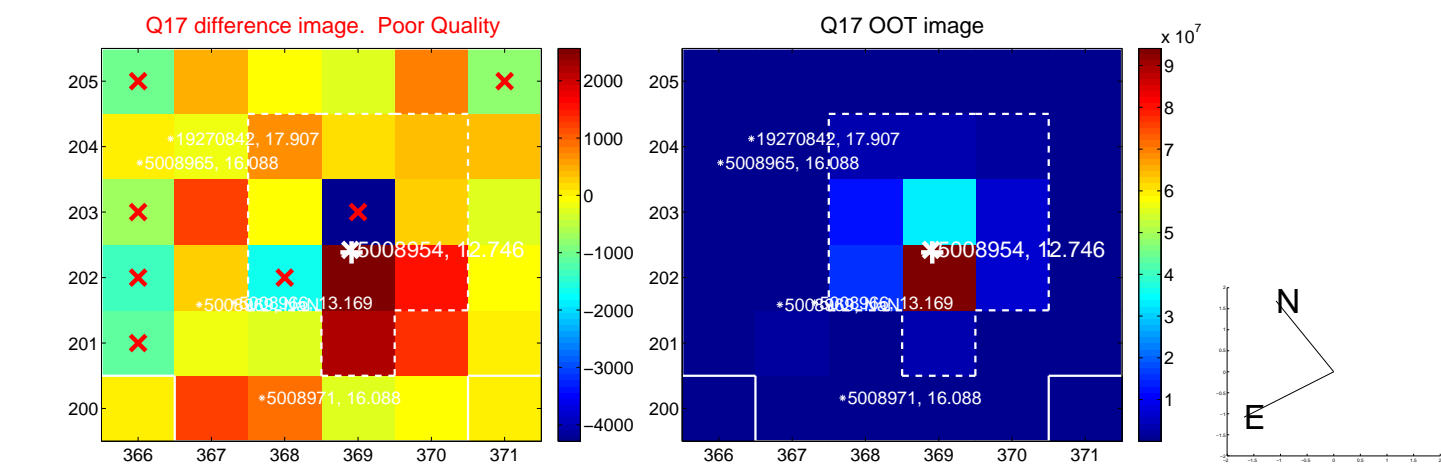
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



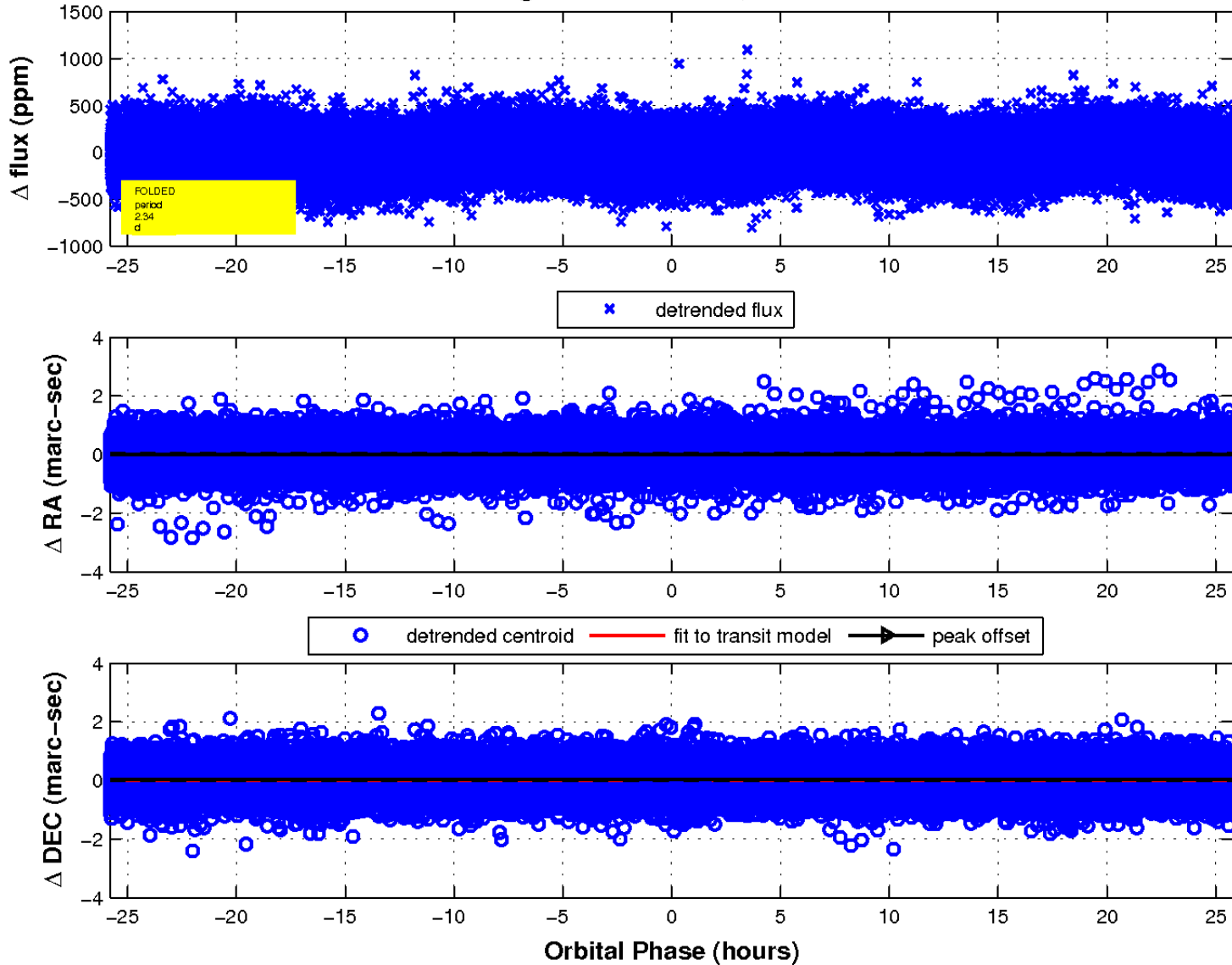
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

