

# KIC 006443392

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006443392-01	OBS	No	1.553940	132.279048	20477.8	1.875	2041.5	2532.7	1.04	5999	19.61	1769.60
006443392-02	OBS	6710.01	1.553948	133.053467	20572.4	1.912	4295.0	2651.5	1.04	5999	22.46	1769.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006443392-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006443392-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

**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 006443392-01

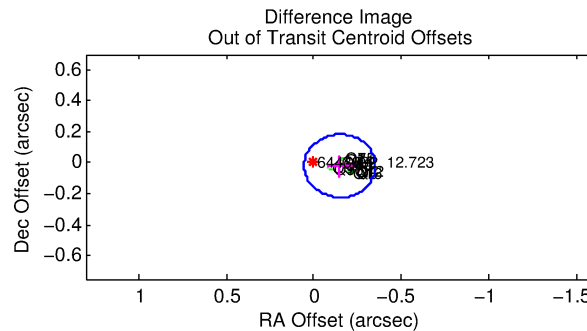
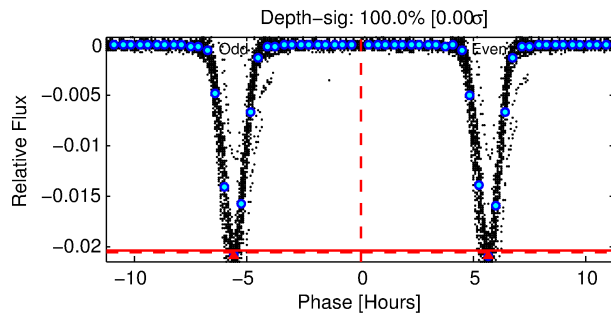
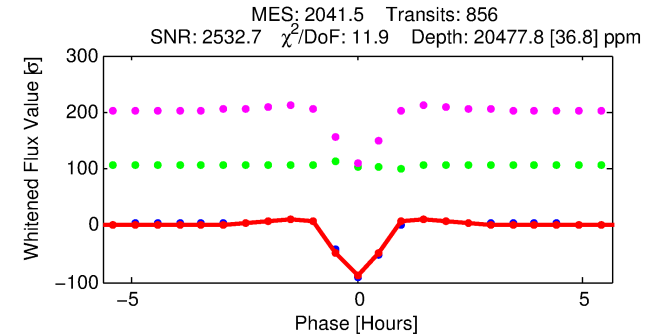
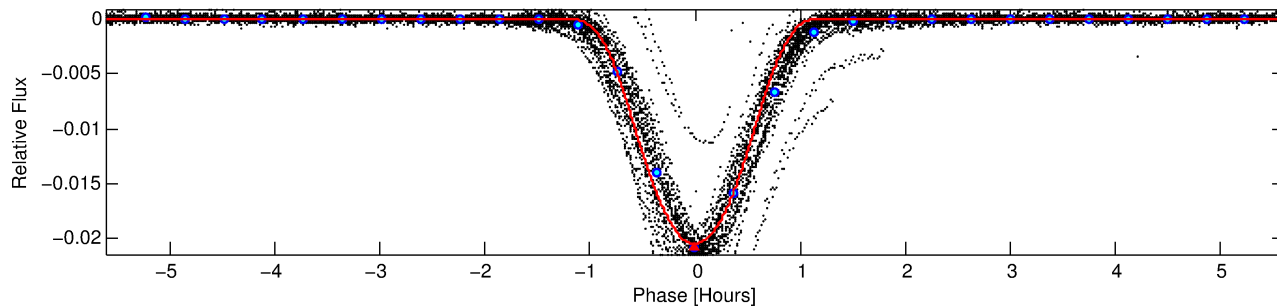
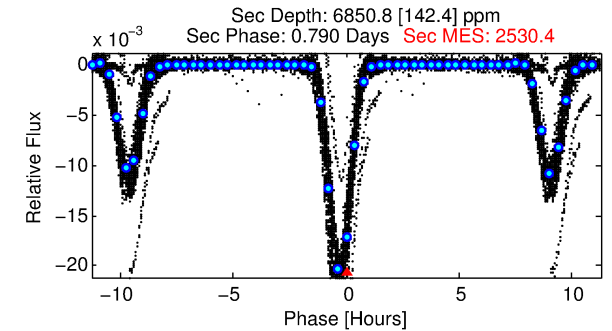
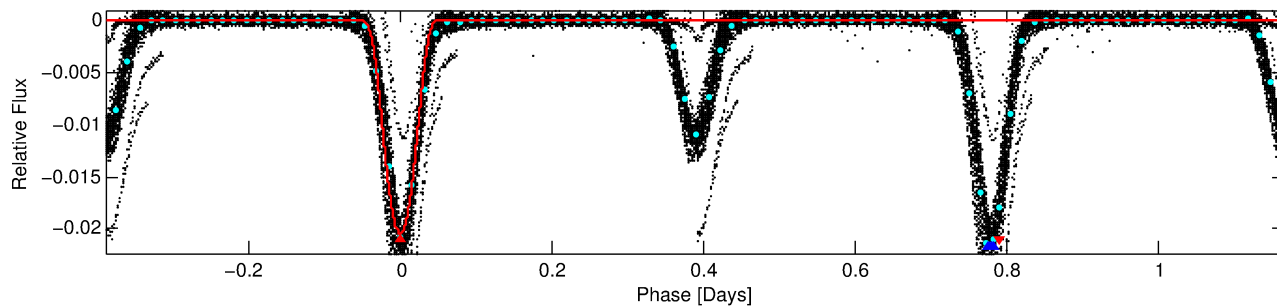
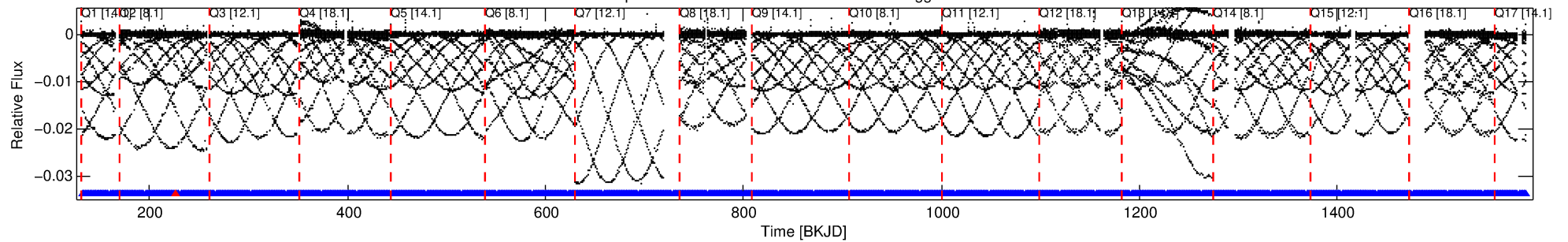
No Significant Match Found

# DV One-Page Summary

KIC: 6443392 Candidate: 1 of 2 Period: 1.554 d

KOI: K06710 Corr: No Ephemeris Match

Kp: 12.72 R\*: 1.04 Rs Teff: 5999.0 K Logg: 4.42 Fe/H: 0.020



## DV Fit Results:

Period = 1.55394 [0.00000] d  
Epoch = 132.2790 [0.0000] BKJD  
Rp/R\* = 0.1724 [0.0037]  
a/R\* = 4.86 [0.03]  
b = 0.90 [0.01]  
Seff = 1769.60 [732.52]  
Teq = 1654 [171] K  
Rp = 19.61 [6.15] Re  
a = 0.0267 [0.0070] AU  
Ag = 6.98 [2.70] [2.21σ]  
Teffp = 4156 [168] K [10.43σ]

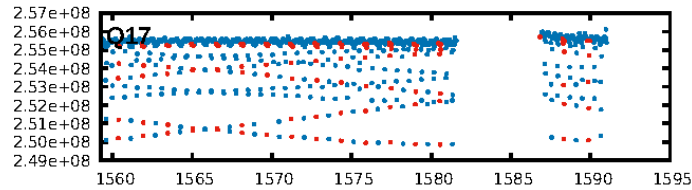
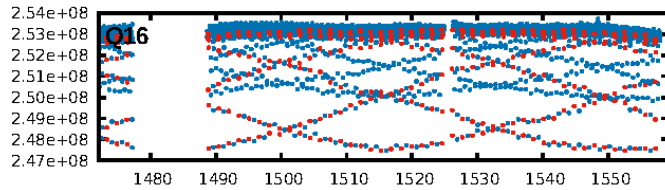
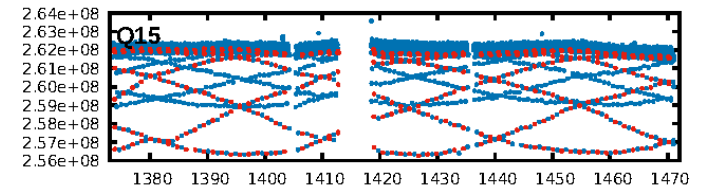
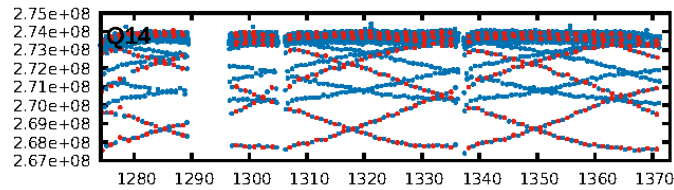
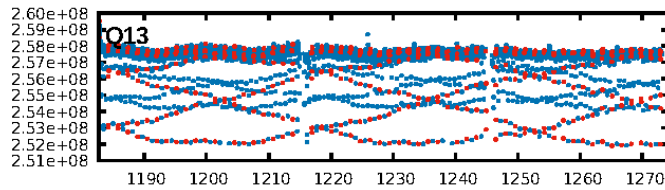
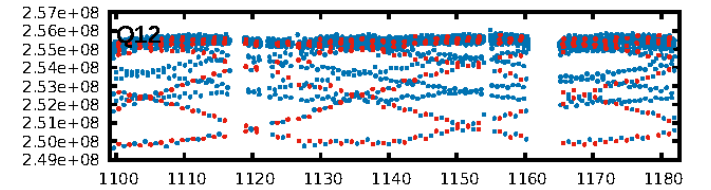
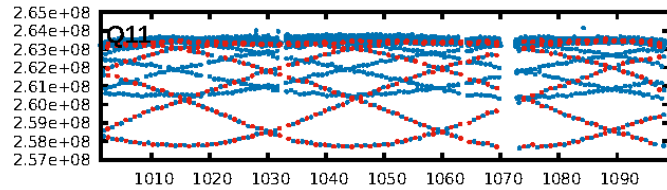
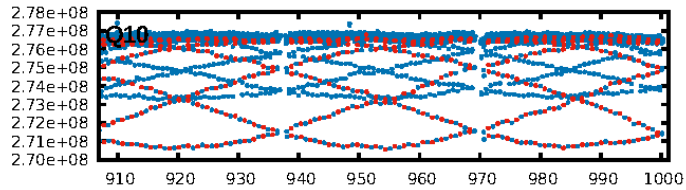
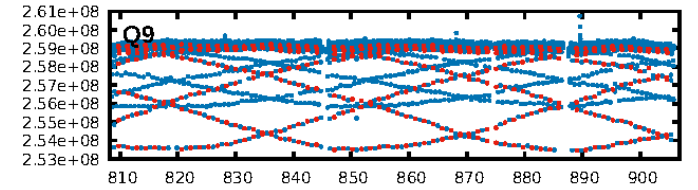
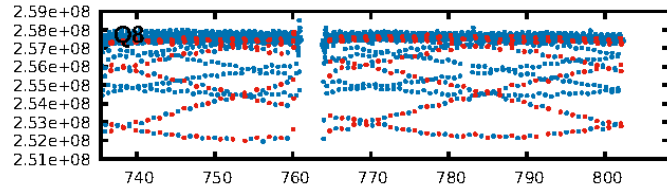
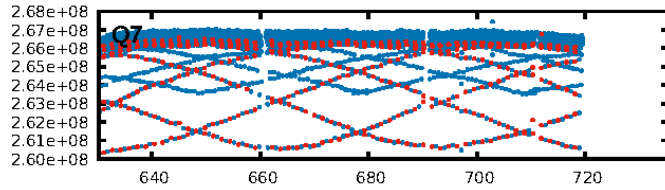
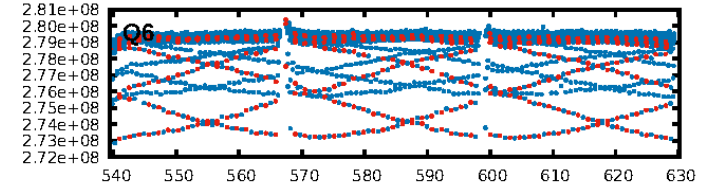
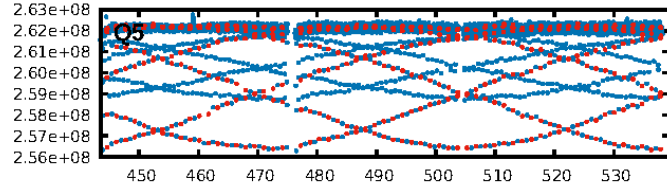
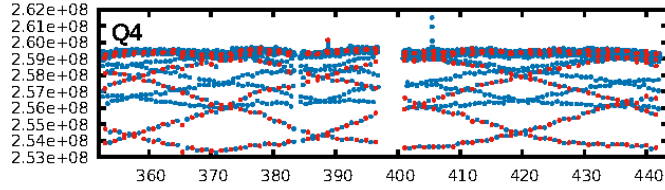
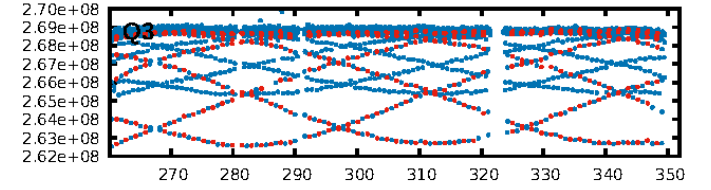
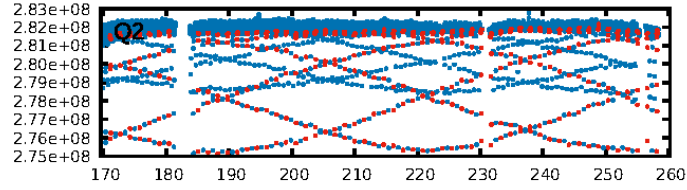
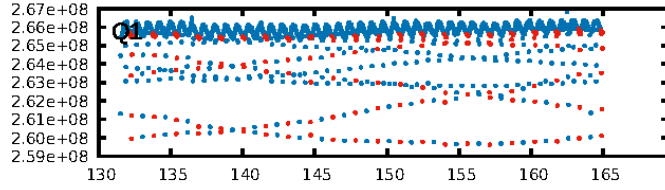
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [817/818]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 0.115 arcsec [85.06σ]  
OotOffset-rm: 0.149 arcsec [2.20σ]  
KicOffset-rm: 0.212 arcsec [3.07σ]  
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]

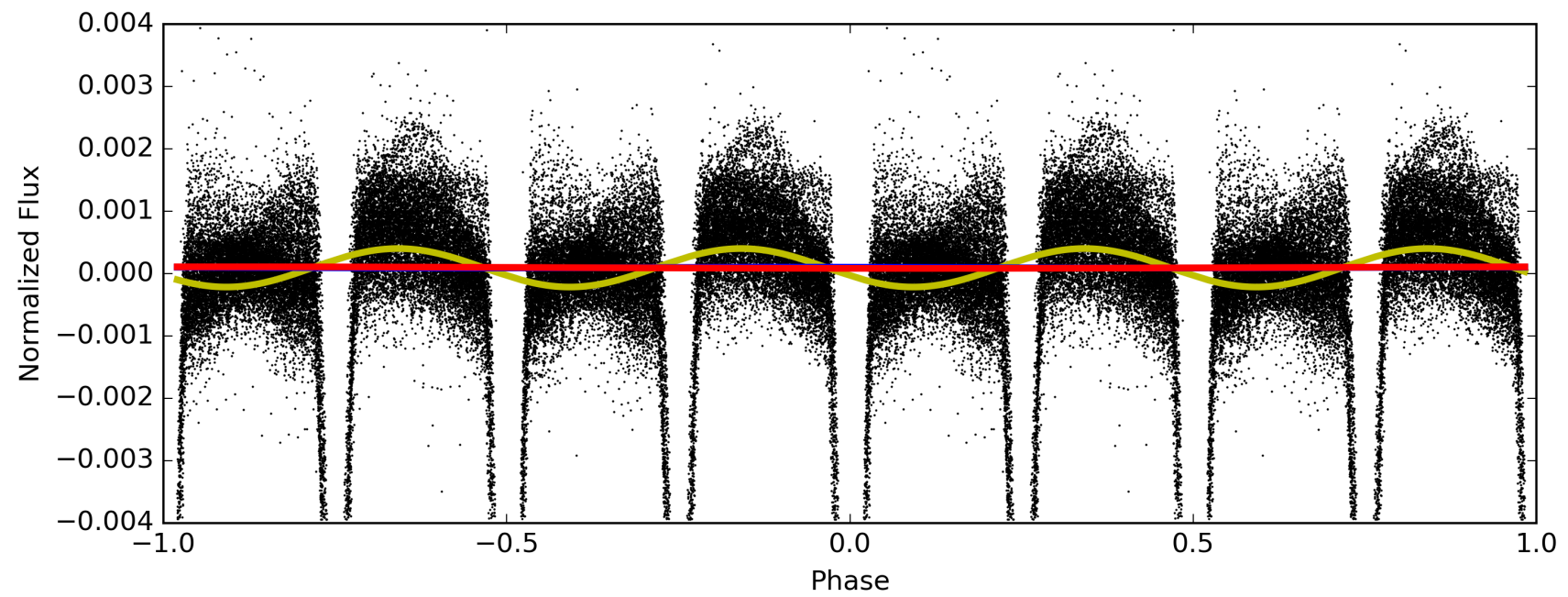
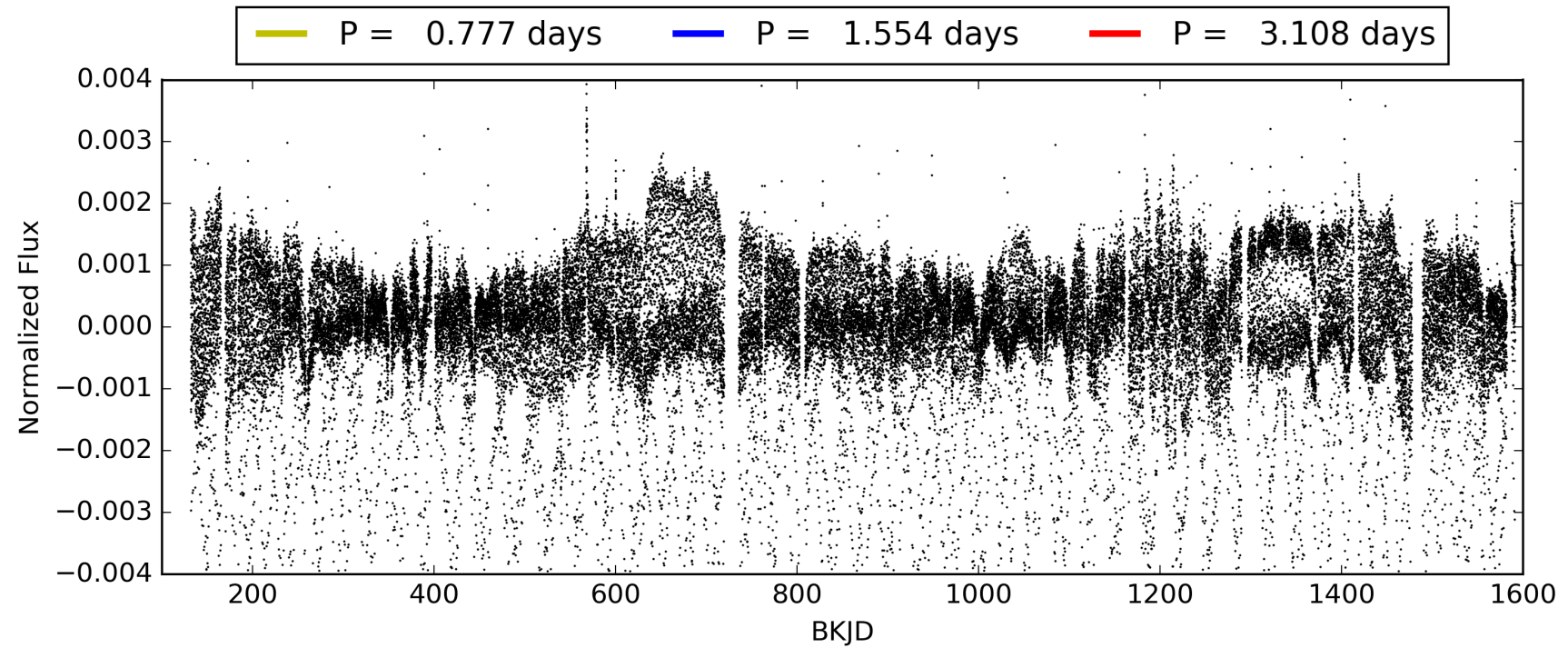
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006443392-01, PDC Light Curves

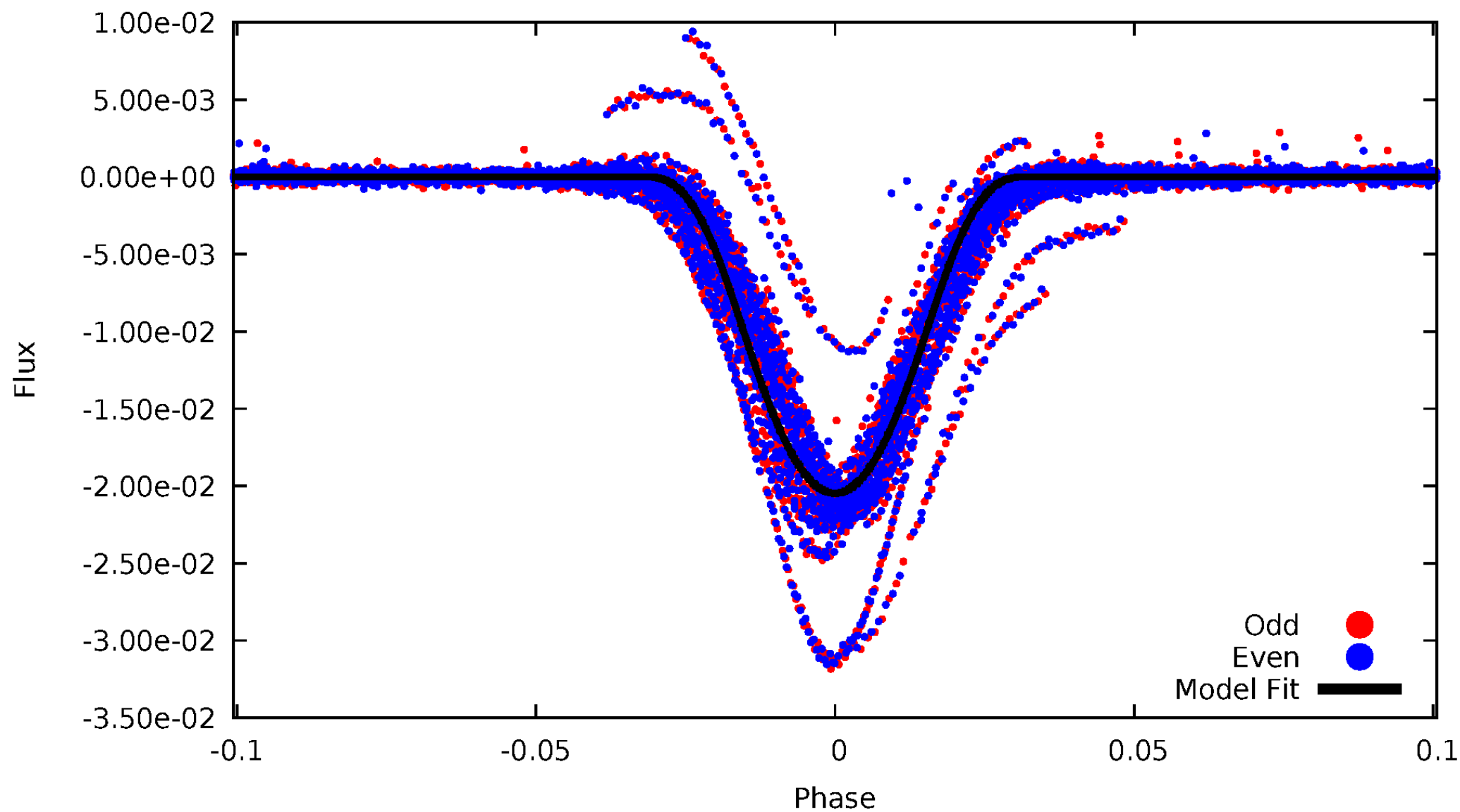


TCE 006443392-01



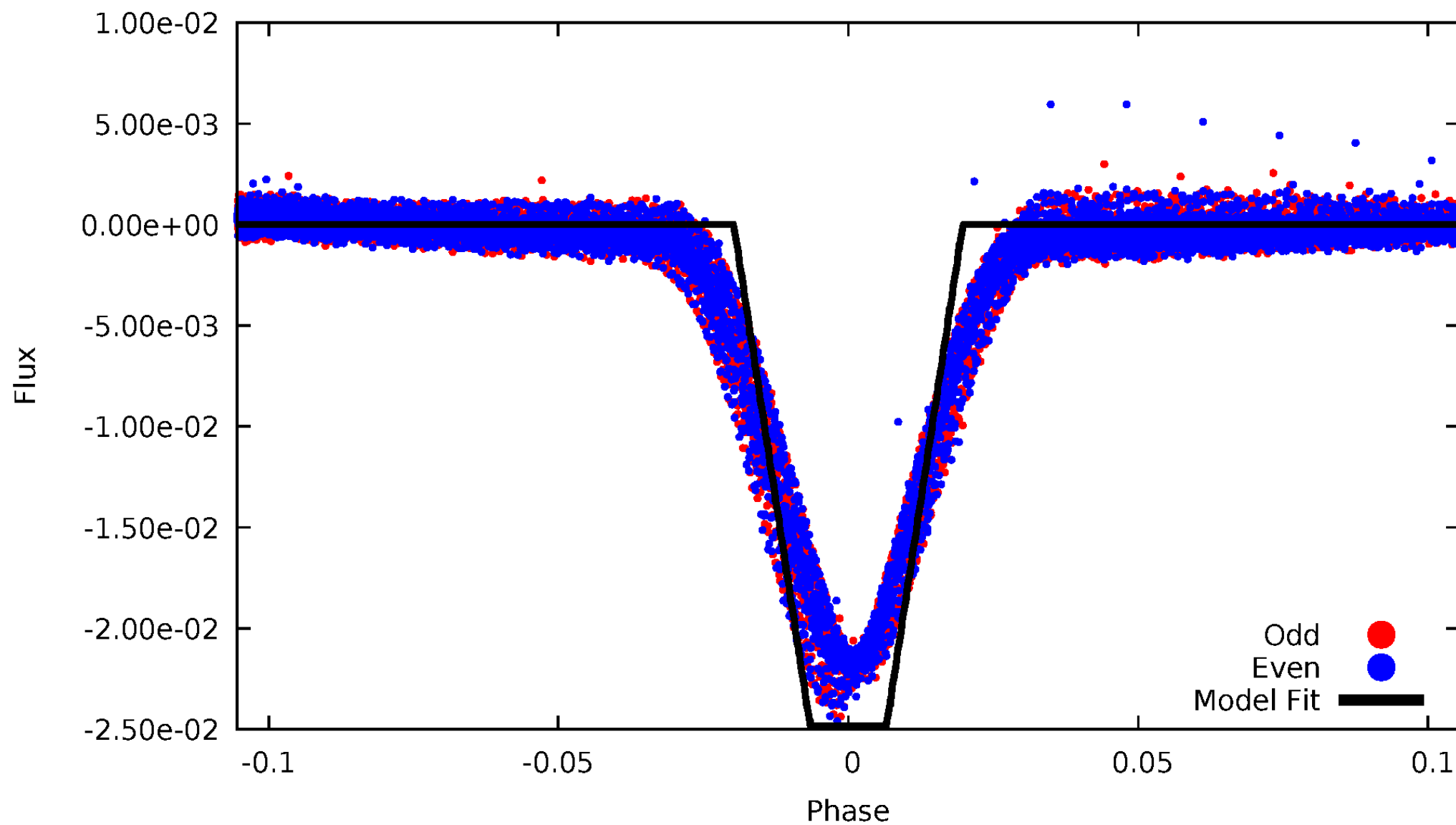
# DV Odd/Even

TCE 006443392-01



# ALT Odd/Even

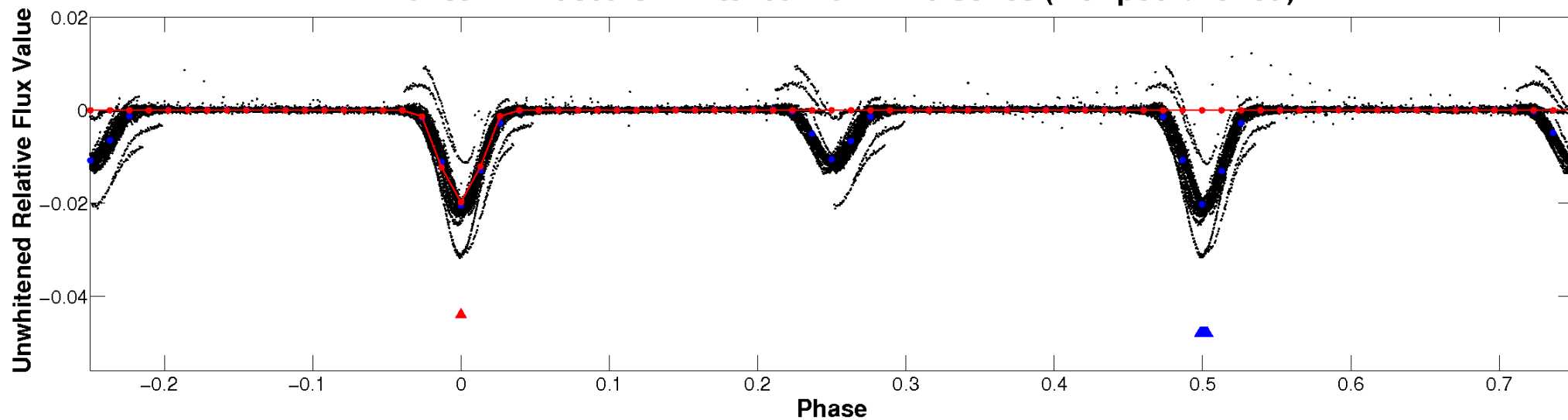
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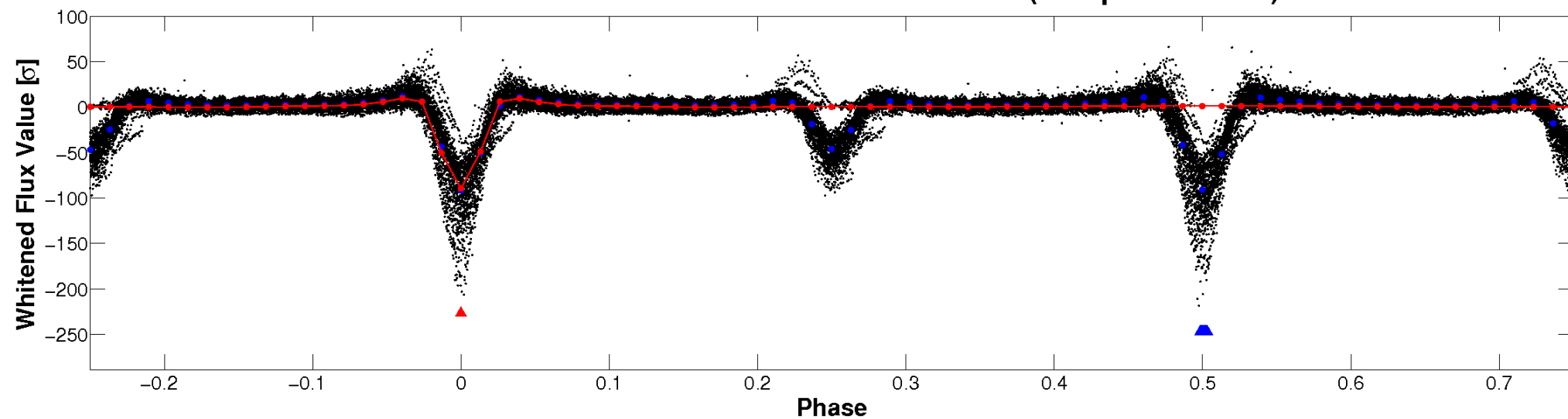


# Non-Whitened Vs. Whitened Light Curve

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

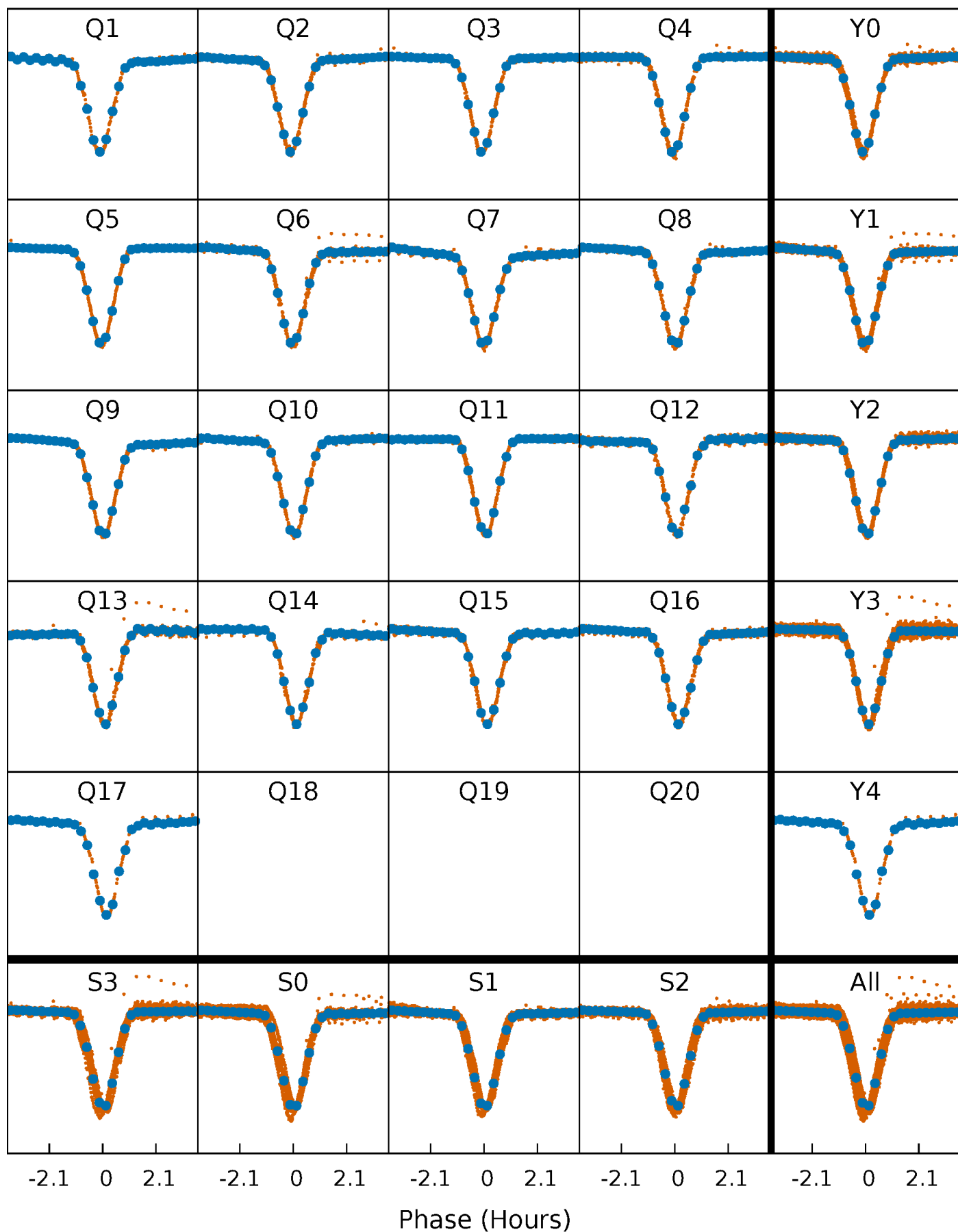


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

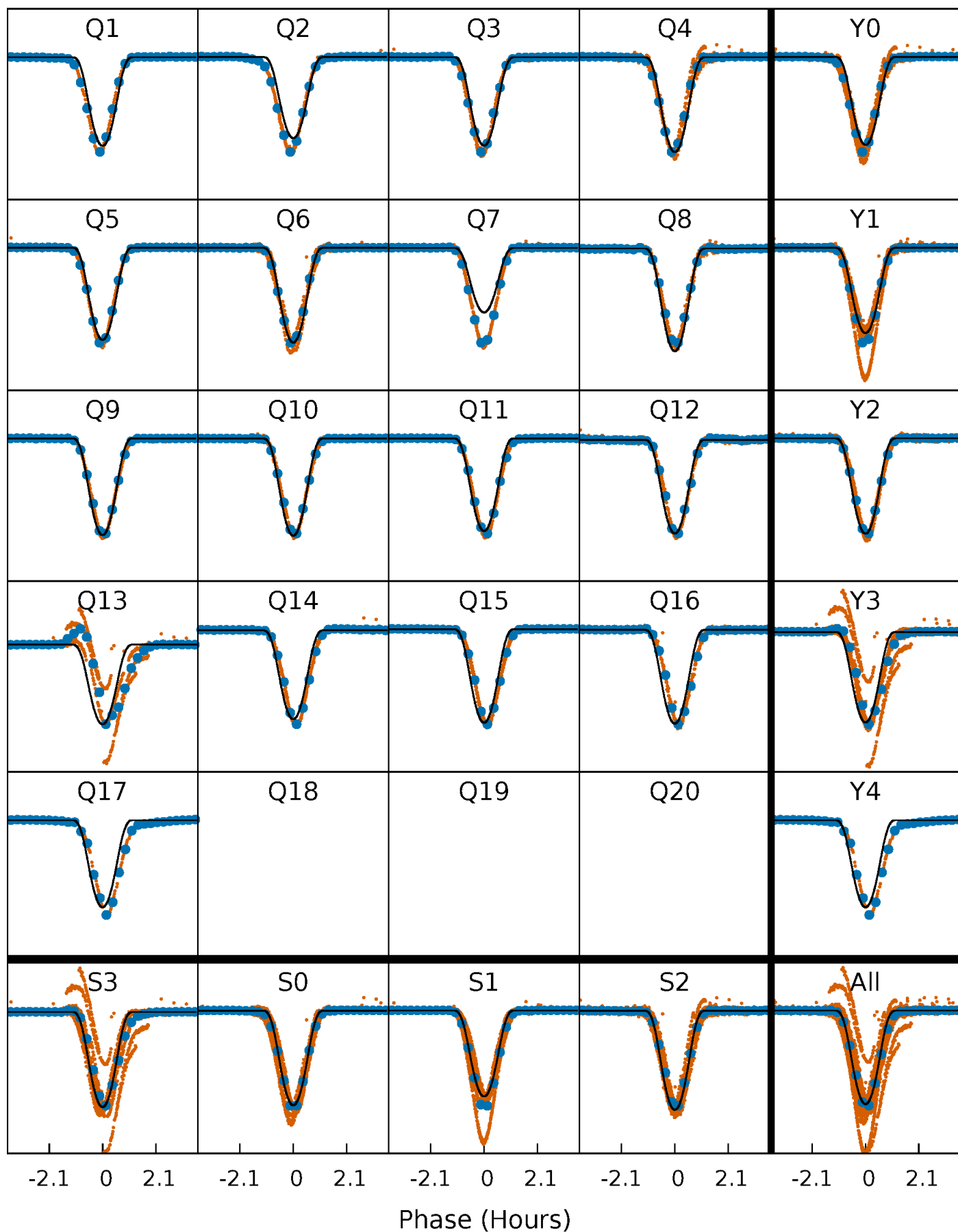
TCE 006443392-01 P= 1.553940 Days  $T_0=132.279048$  (BKJD)





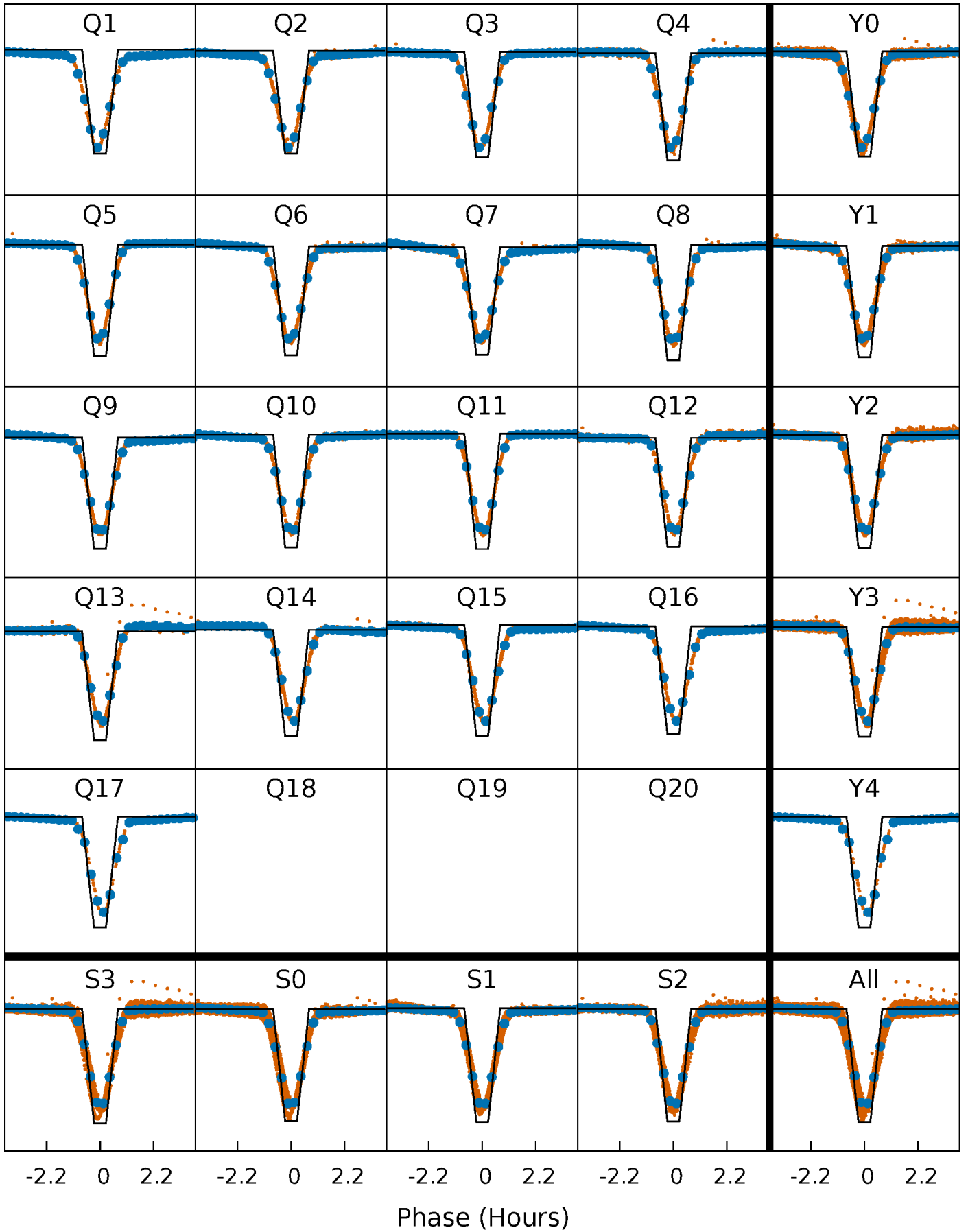
# DV Quarter-Phased Transit Curves

TCE 006443392-01 P= 1.553940 Days  $T_0=132.279048$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

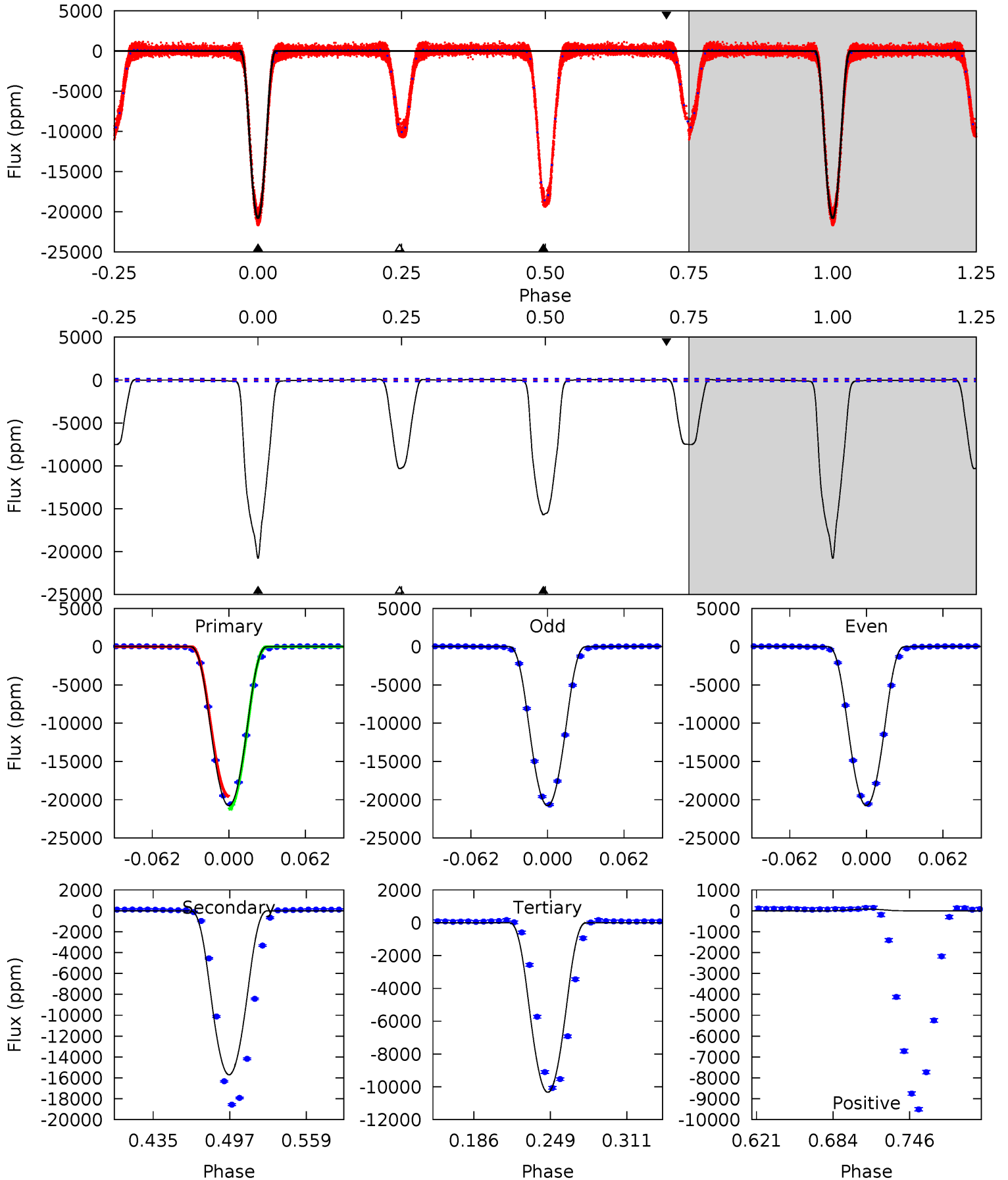
TCE 006443392-01 P= 1.553943 Days  $T_0=132.278523$  (BKJD)



# DV Model-Shift Uniqueness Test

006443392-01, P = 1.553940 Days, E = 130.725108 Days

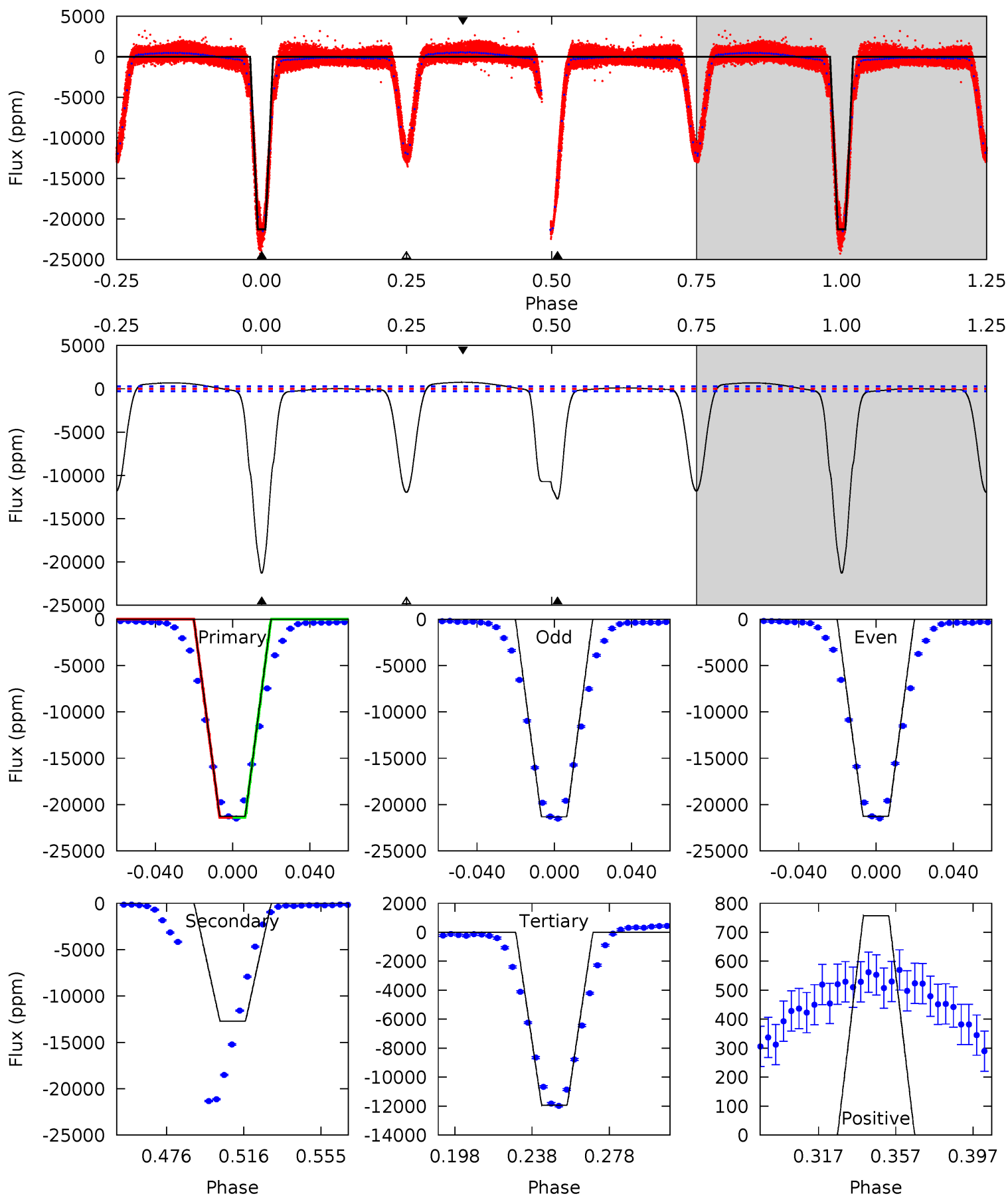
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
581.3	439.7	289.4	2.29	4.66	1.87	44.0	291.9	579.0	150.3	437.4	0.24	1.02	0.00	0



# Alt Model-Shift Uniqueness Test

006443392-01, P = 1.553943 Days, E = 130.724580 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
360.4	215.5	202.4	12.8	4.76	2.06	47.6	158.0	347.6	13.0	202.6	0.34	0.99	0.03	0.16



### Stellar Parameters For KIC 006443392

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5999^{+190}_{-232}$	$4.423^{+0.070}_{-0.210}$	$0.020^{+0.250}_{-0.300}$	$1.042^{+0.326}_{-0.140}$	$1.046^{+0.145}_{-0.130}$	$1.303^{+0.496}_{-0.694}$
	+3%/-4%	+2%/-5%	+1250%/-1500%	+31%/-13%	+14%/-12%	+38%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 006443392-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-15707 \pm 36$	$20.04^{+3.42}_{-1.89}$	$2346^{+191}_{-127}$	$5172^{+160}_{-180}$	$15^{+3}_{-4}$
Alt.	$-12718 \pm 59$	$18.45^{+2.96}_{-1.59}$	$2358^{+165}_{-126}$	$5132^{+167}_{-175}$	$15^{+3}_{-3}$

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

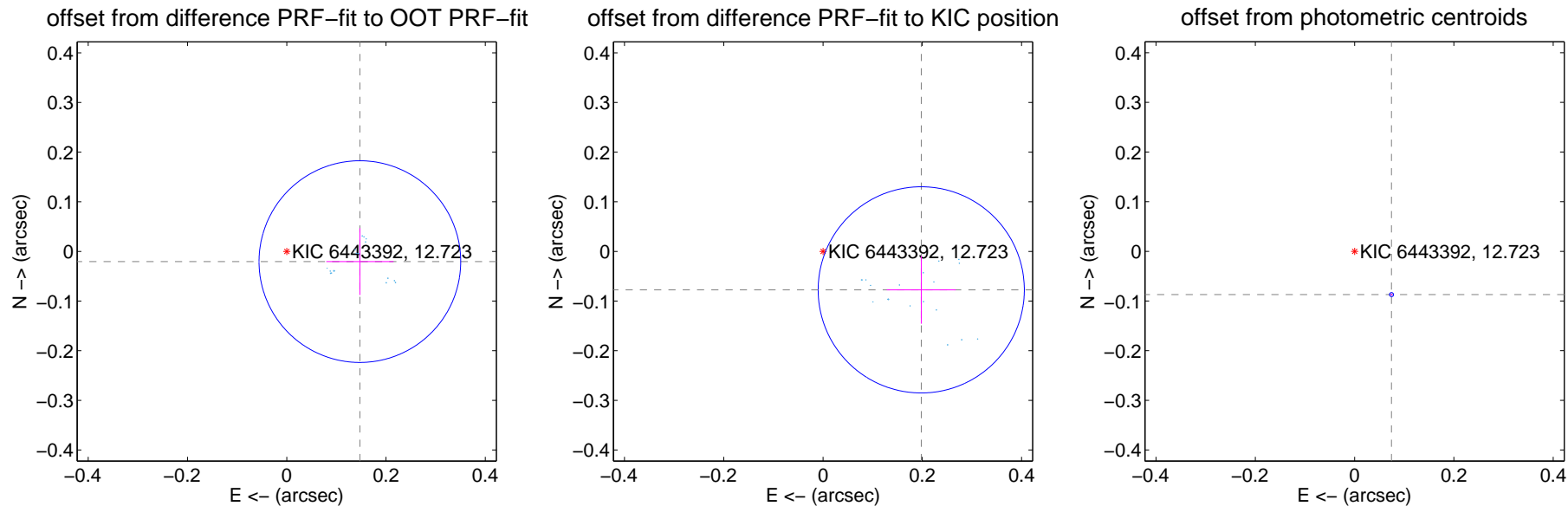
## DV Centroid Data

Supplemental centroid analysis for 006443392-01. Kepler magnitude: 12.72. Transit SNR 2532.67

There are 17 quarters with good PRF difference image offsets

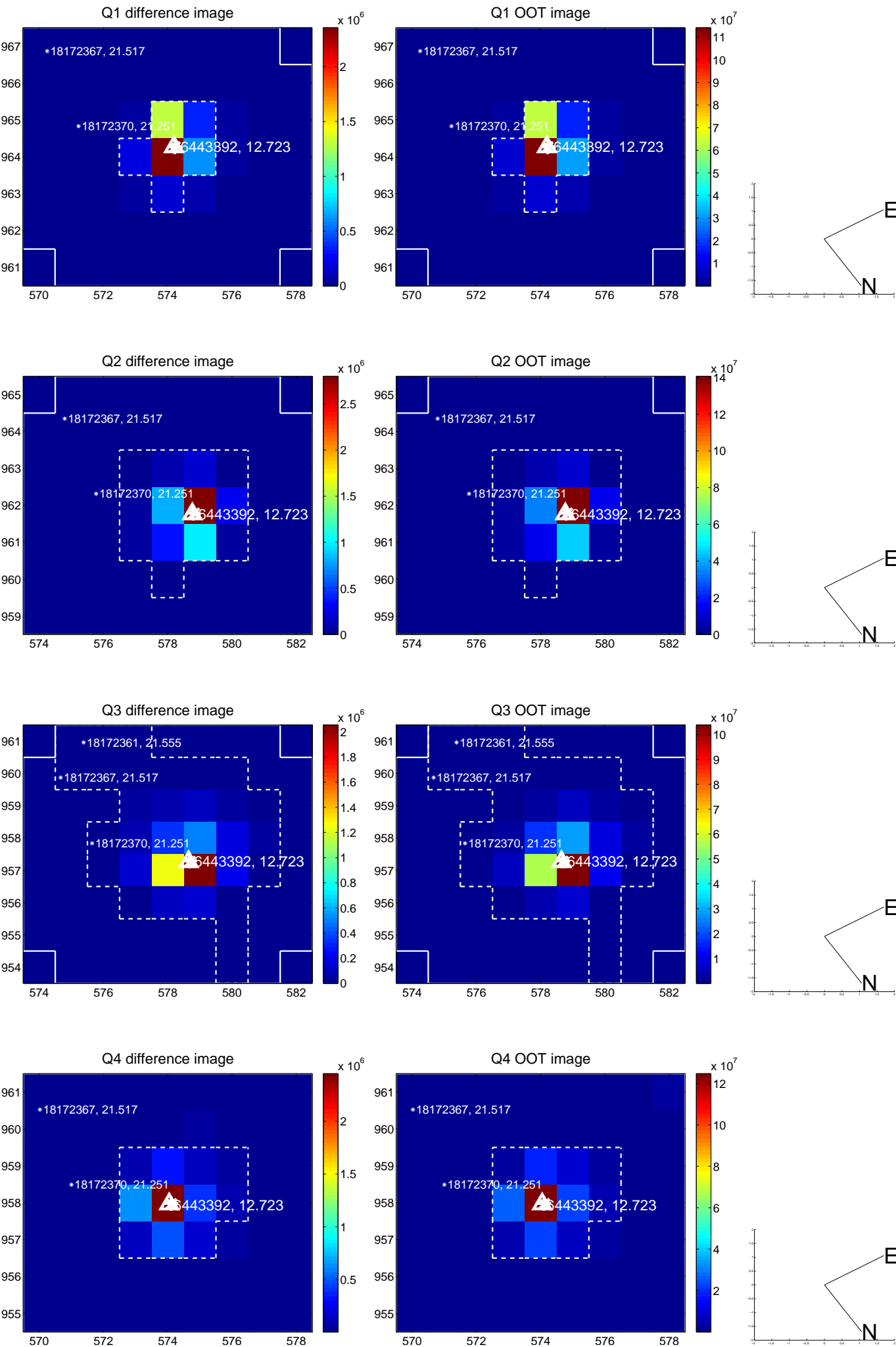
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.149 \pm 0.068$	2.20	$-0.147 \pm 0.068$	$-0.021 \pm 0.067$
PRF-fit source offset from KIC position	$0.212 \pm 0.069$	3.07	$-0.198 \pm 0.069$	$-0.077 \pm 0.068$
photometric centroid source offset	$0.11 \pm 0.00$	85.06	$-0.07 \pm 0.00$	$-0.09 \pm 0.00$



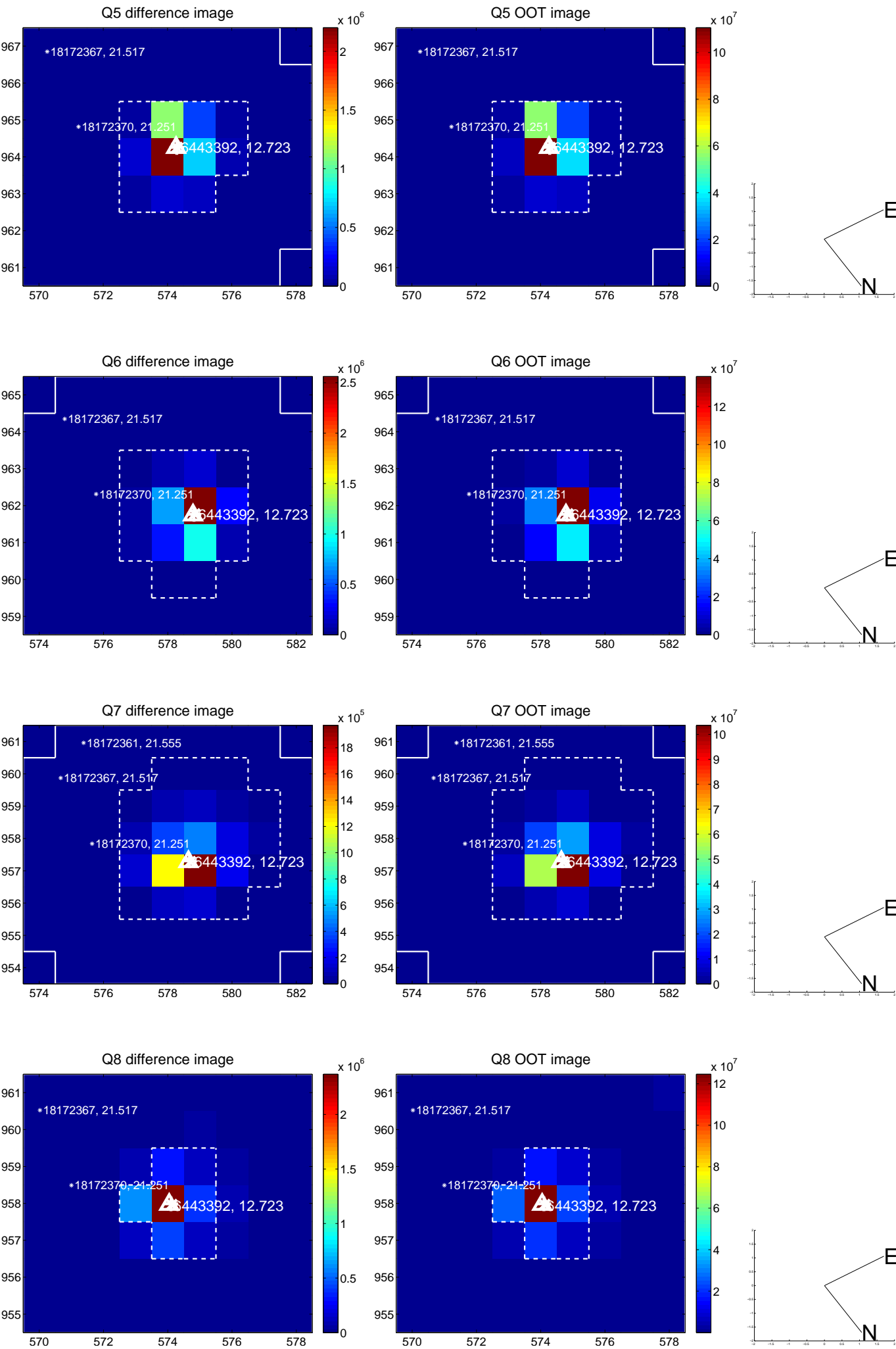
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

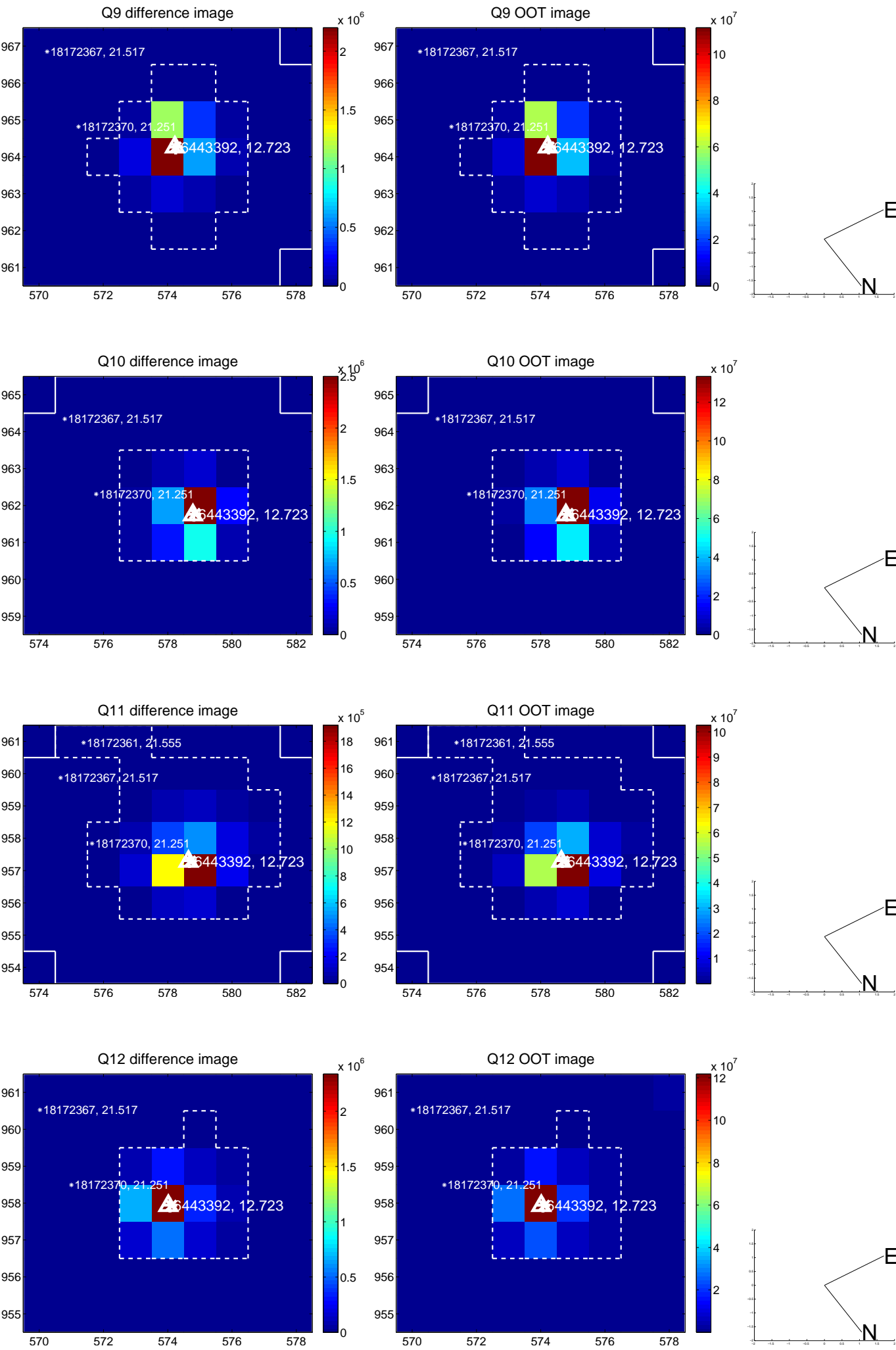




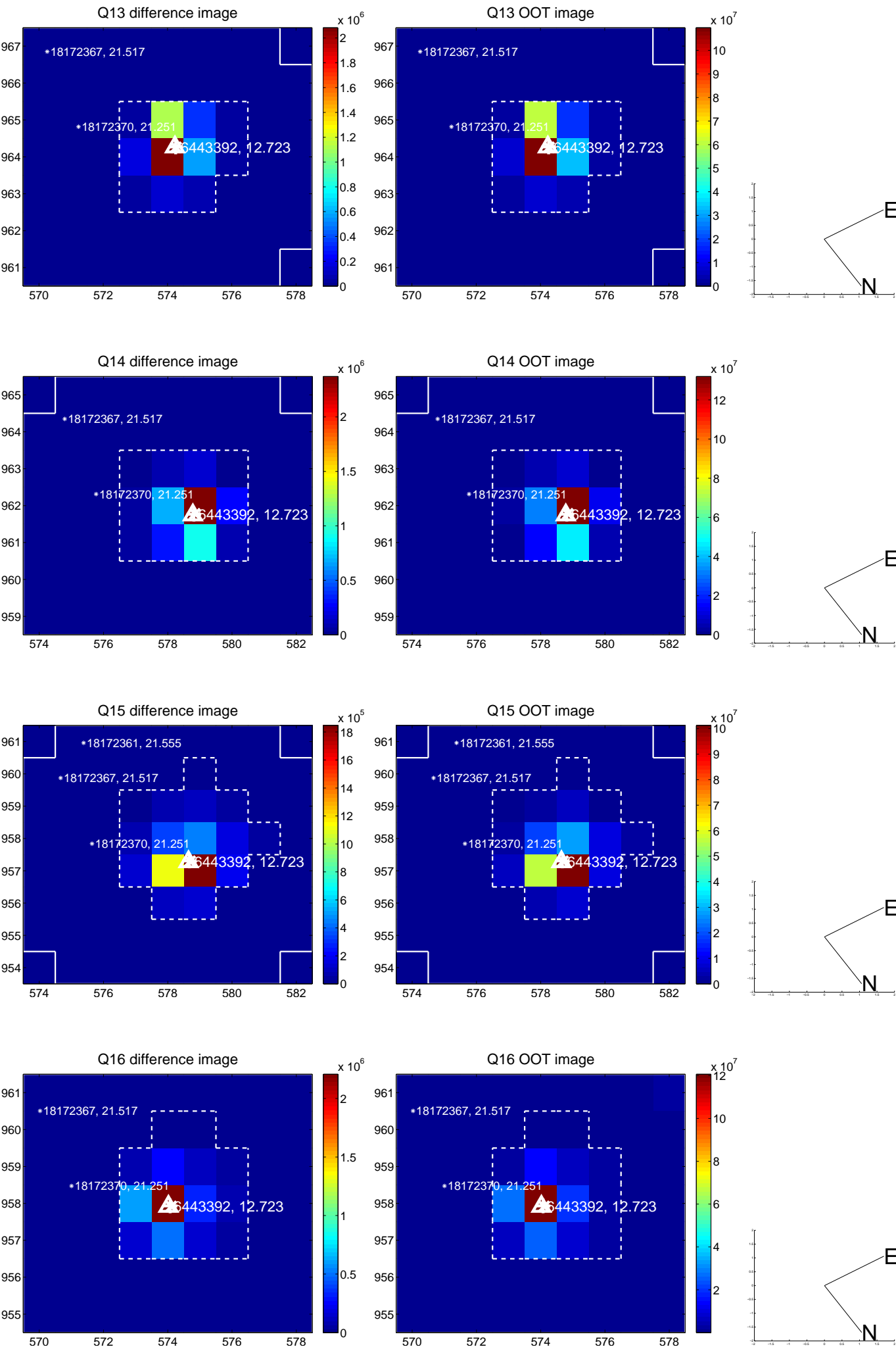
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



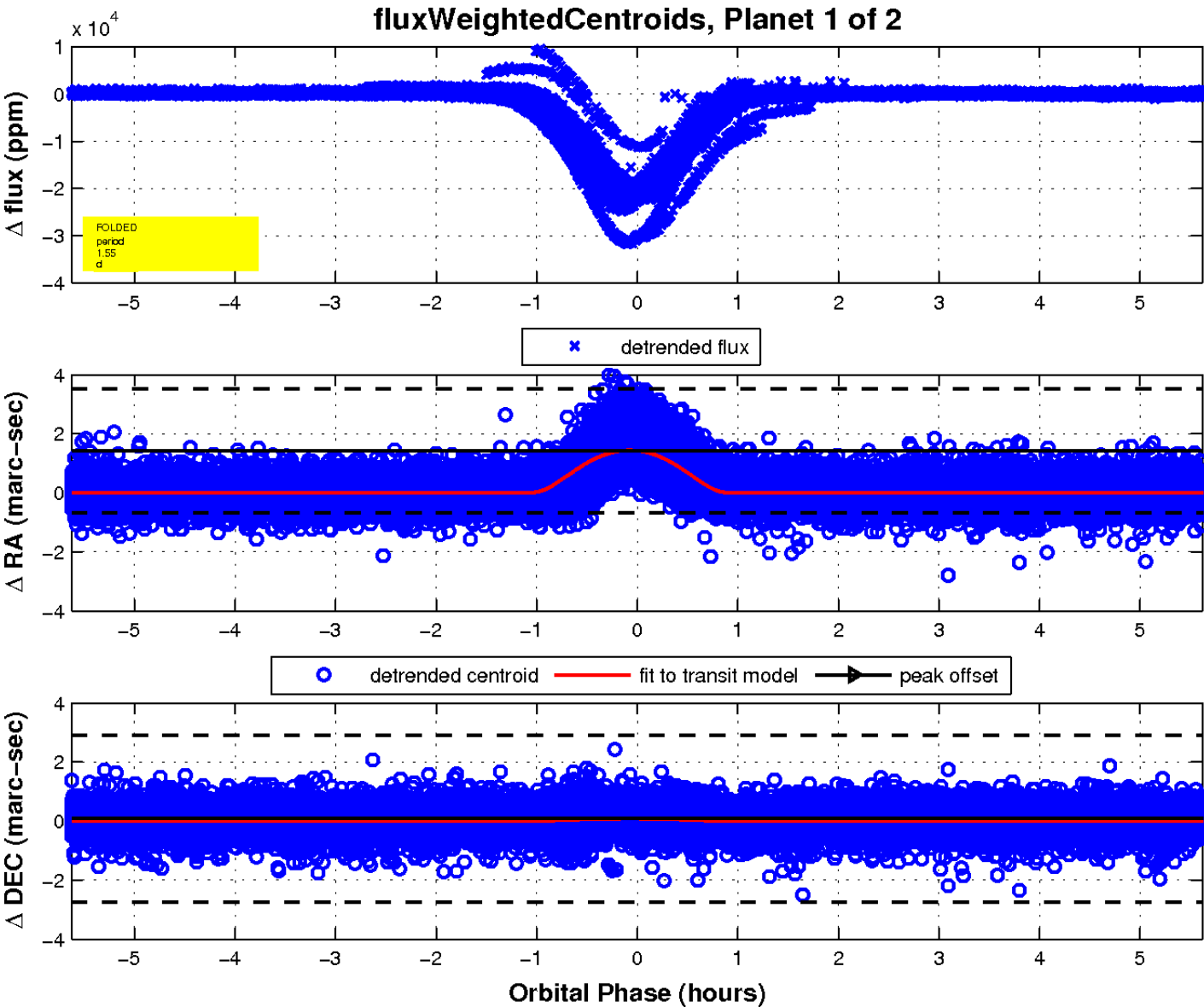
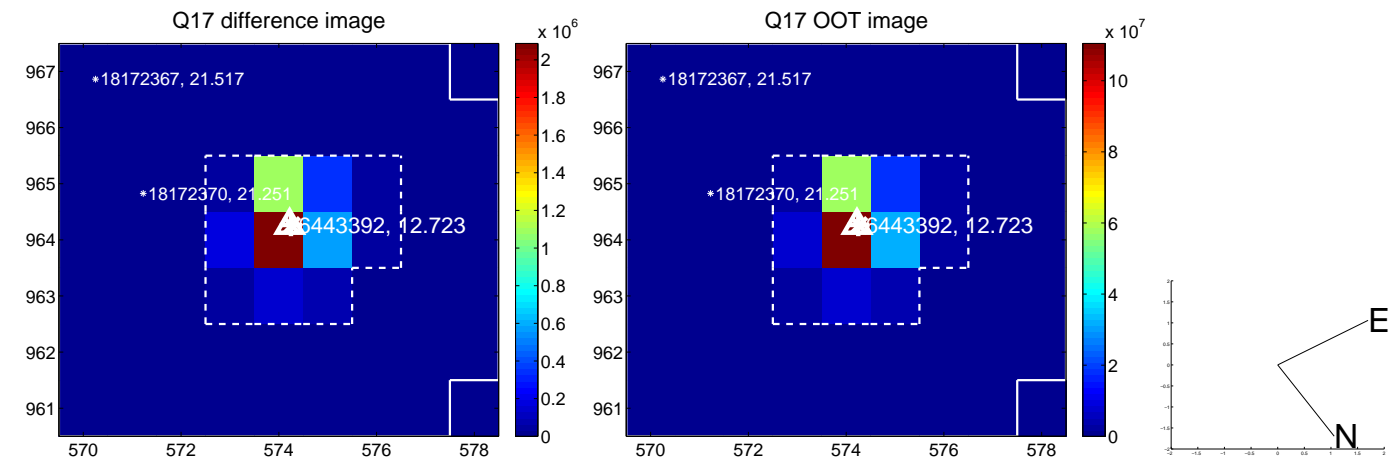
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

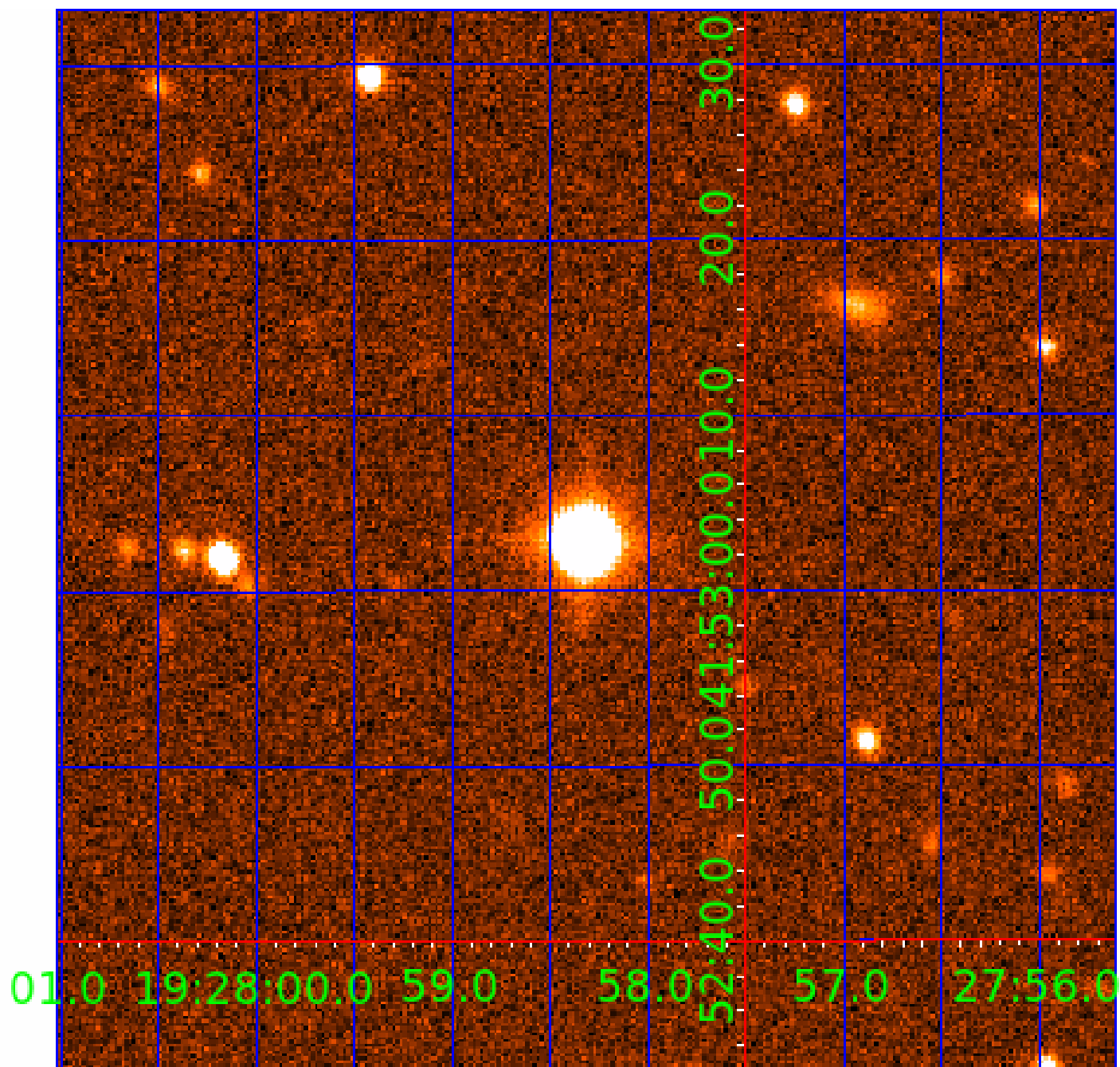


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006443392

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006443392-01	OBS	No	1.553940	132.279048	20477.8	1.875	2041.5	2532.7	1.04	5999	19.61	1769.60
006443392-02	OBS	6710.01	1.553948	133.053467	20572.4	1.912	4295.0	2651.5	1.04	5999	22.46	1769.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006443392-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006443392-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

**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 006443392-02

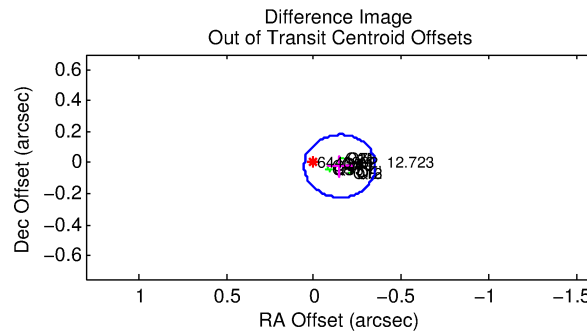
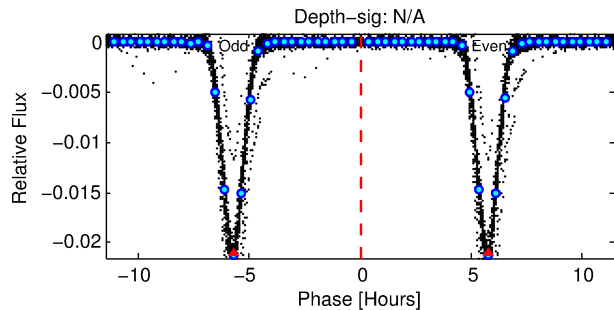
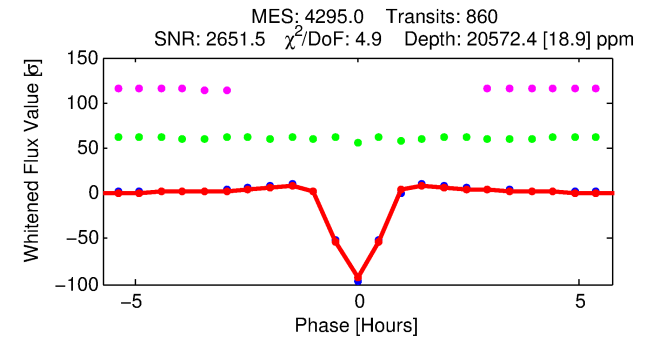
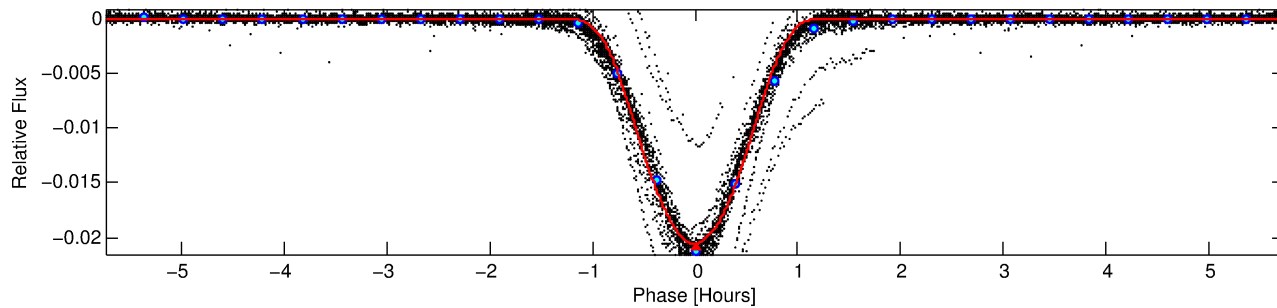
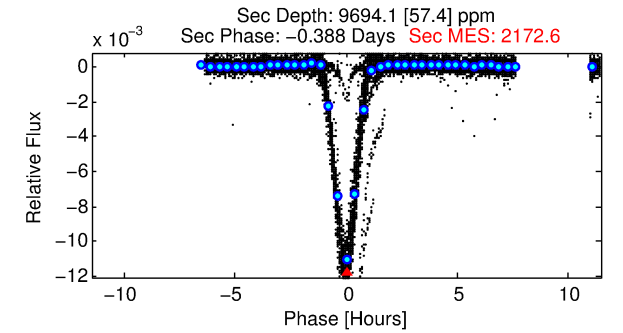
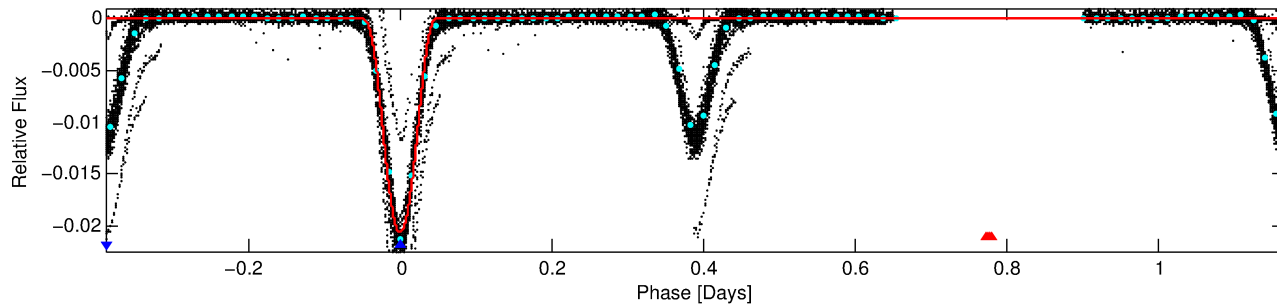
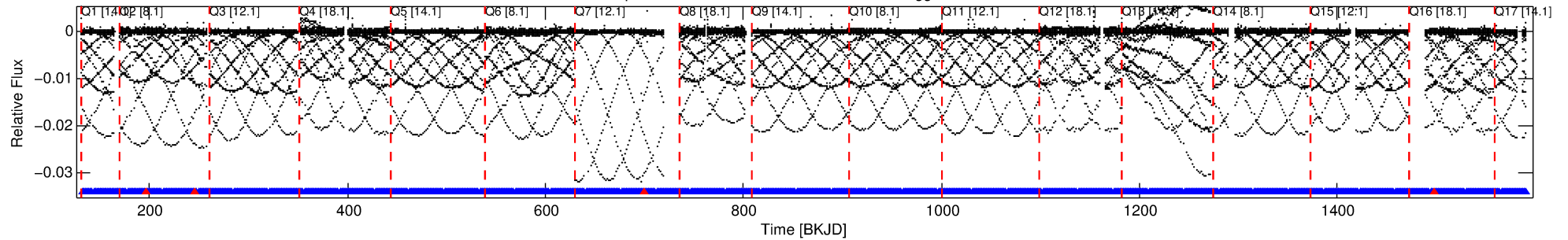
No Significant Match Found

# DV One-Page Summary

KIC: 6443392 Candidate: 2 of 2 Period: 1.554 d

KOI: K06710 Corr: No Ephemeris Match

Kp: 12.72 R\*: 1.04 Rs Teff: 5999.0 K Logg: 4.42 Fe/H: 0.020



## DV Fit Results:

Period = 1.55395 [0.00000] d  
Epoch = 133.0535 [0.0000] BKJD  
Rp/R\* = 0.1976 [0.0060]  
a/R\* = 4.68 [0.02]  
b = 0.94 [0.01]  
Seff = 1769.59 [732.51]  
Teq = 1654 [171] K  
Rp = 22.46 [7.06] Re  
a = 0.0267 [0.0070] AU  
Ag = 7.52 [2.93] [2.23σ]  
Teffp = 4235 [176] K [10.51σ]

## DV Diagnostic Results:

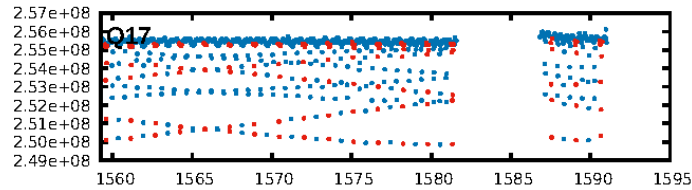
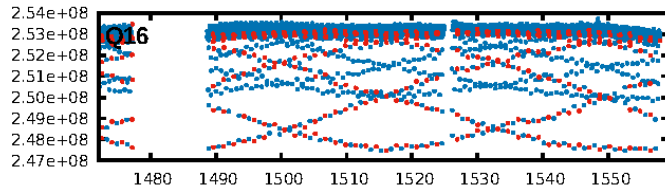
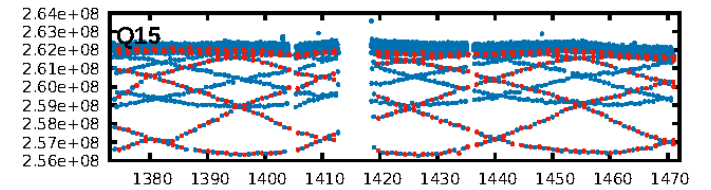
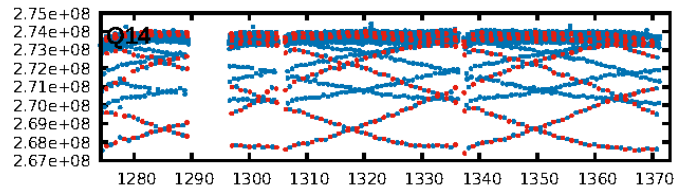
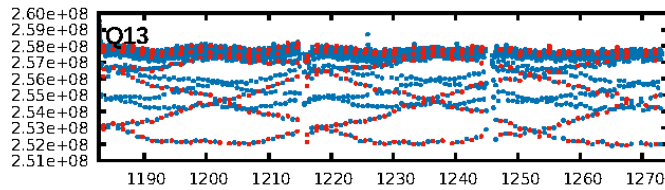
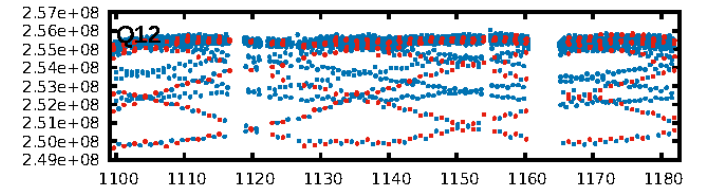
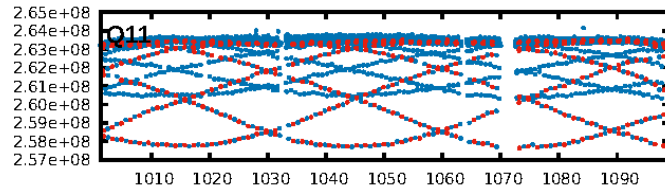
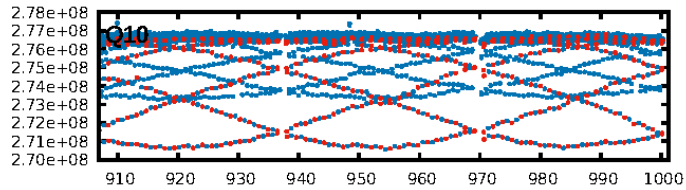
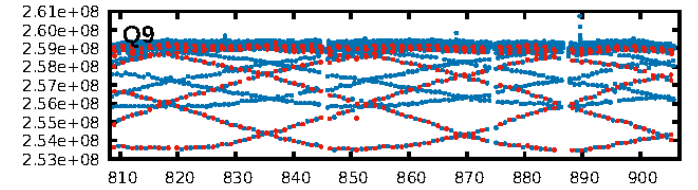
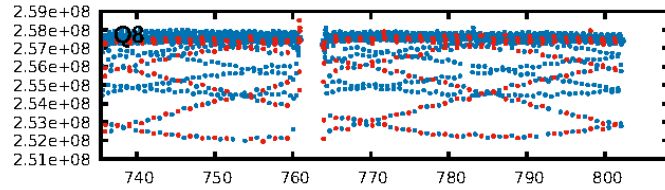
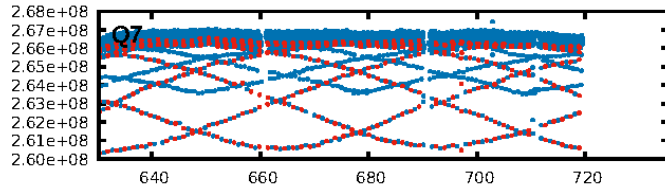
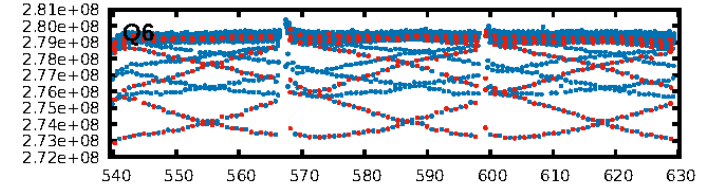
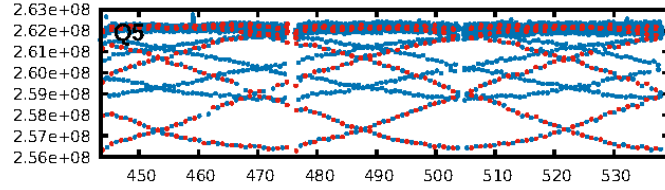
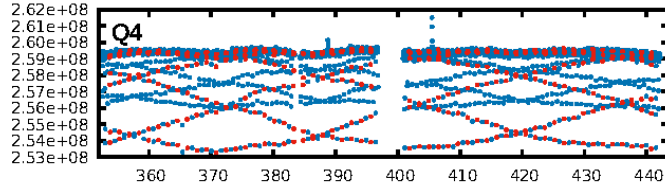
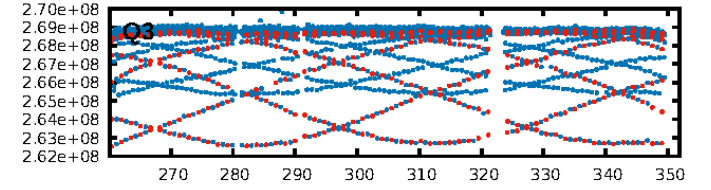
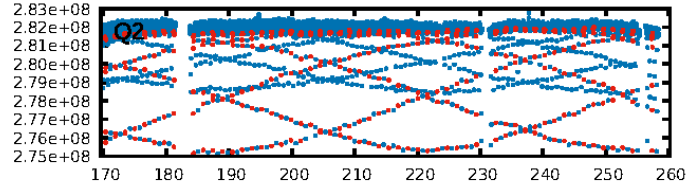
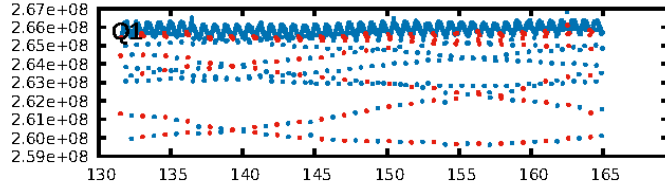
ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [816/820]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 0.115 arcsec [86.02σ]  
OotOffset-rm: 0.150 arcsec [2.21σ]  
KicOffset-rm: 0.214 arcsec [3.08σ]  
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 16:01:06 Z

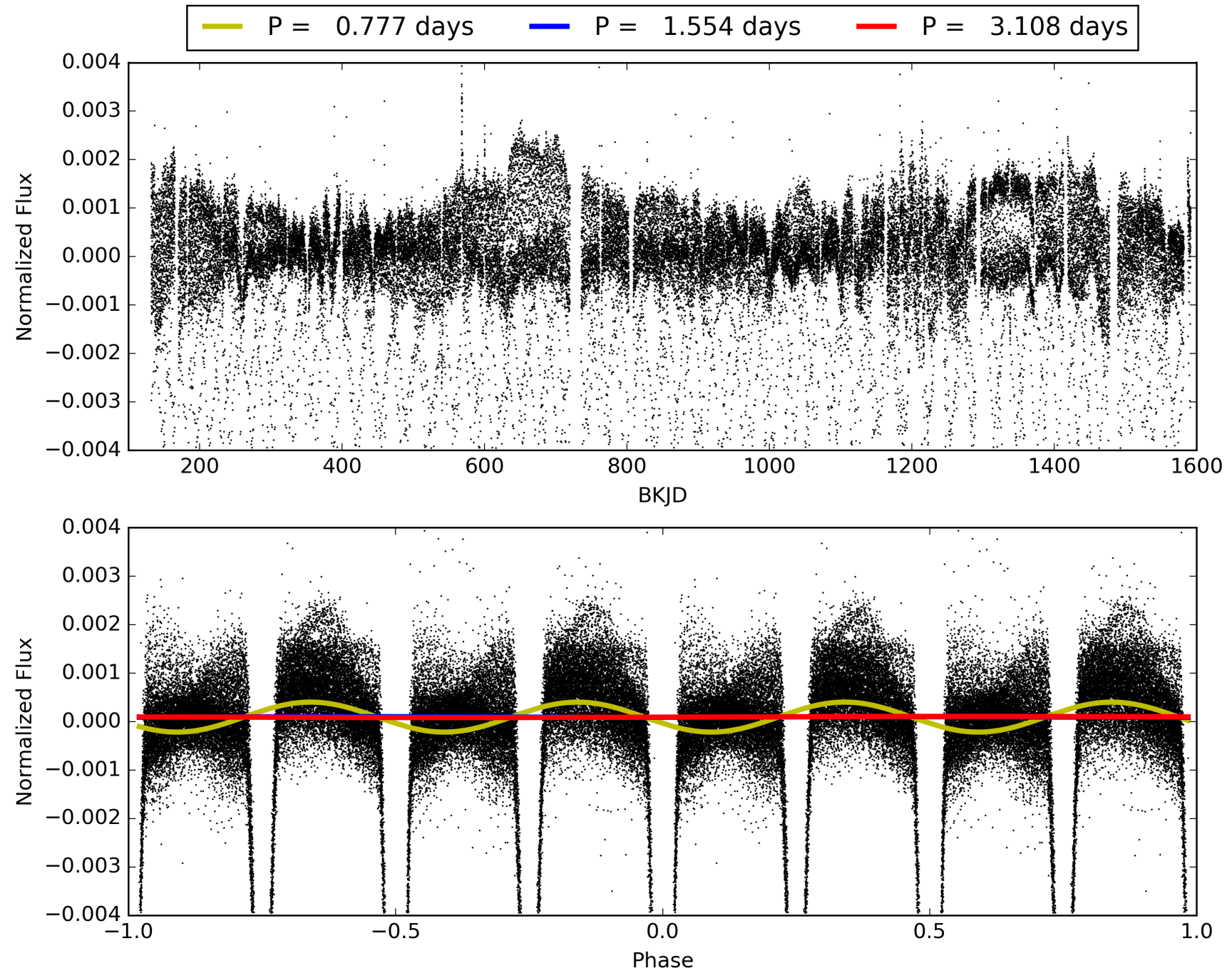
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006443392-02, PDC Light Curves

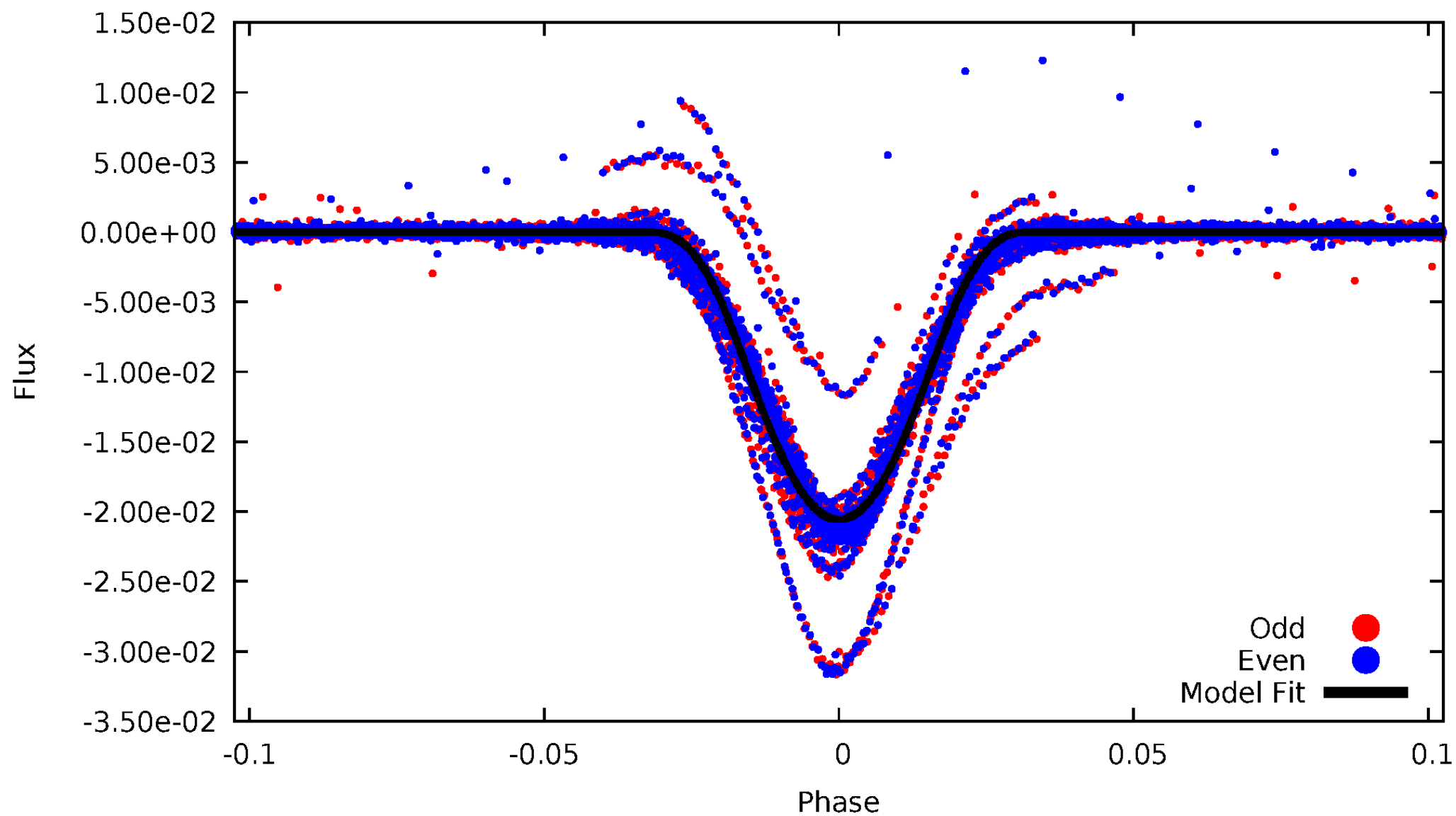


TCE 006443392-02



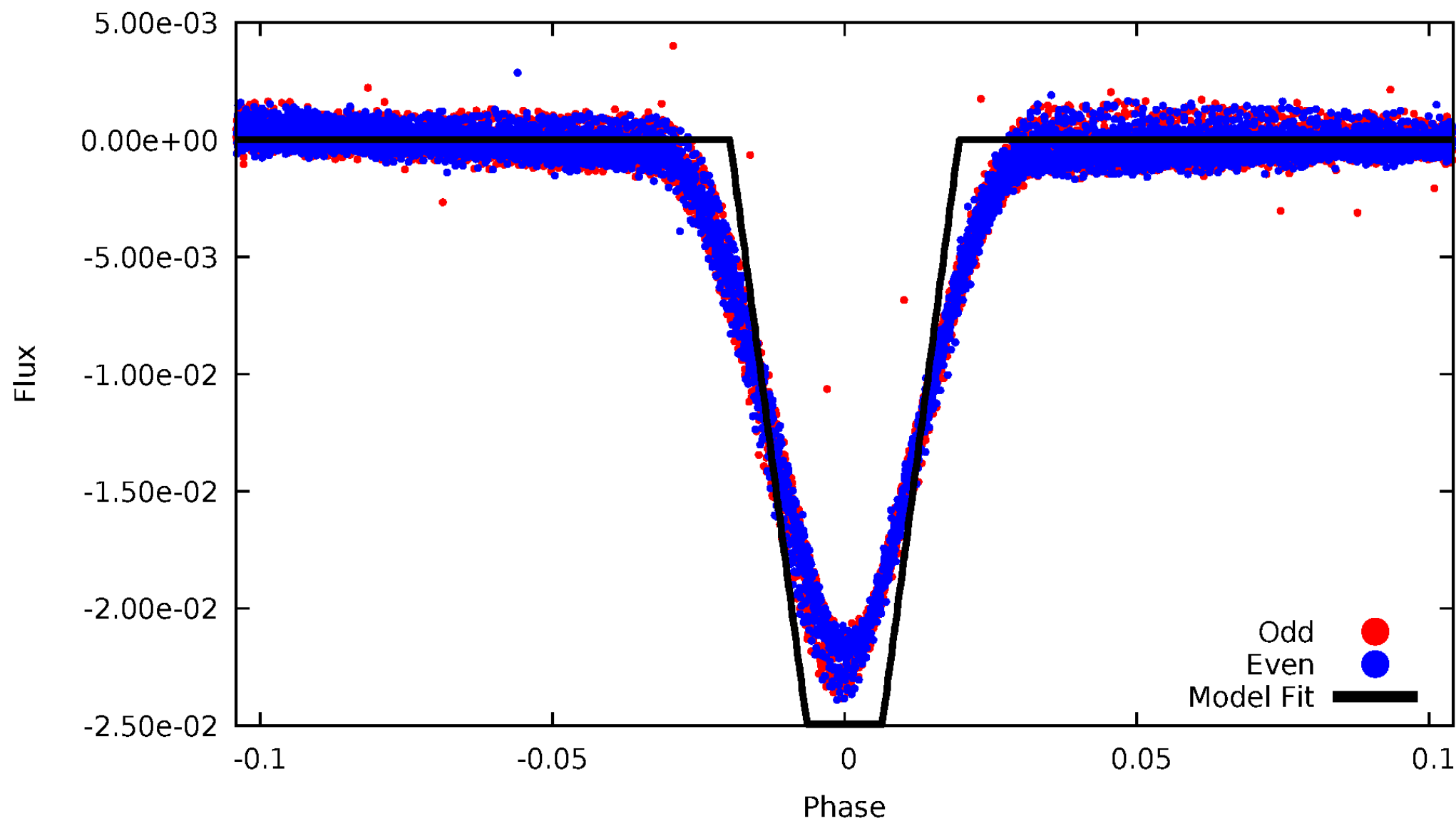
# DV Odd/Even

TCE 006443392-02



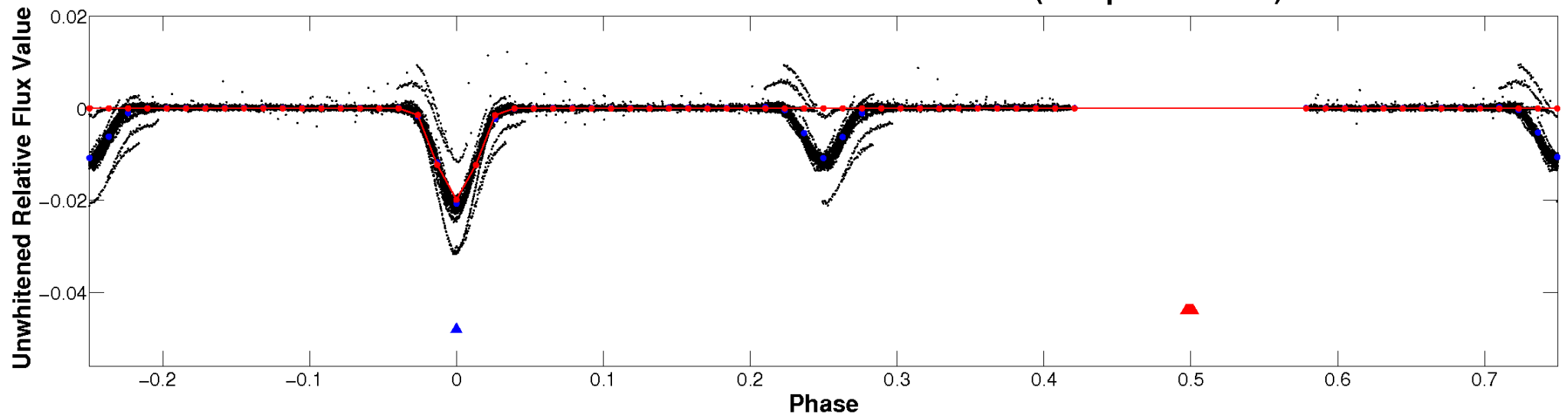
# ALT Odd/Even

TCE 006443392-02

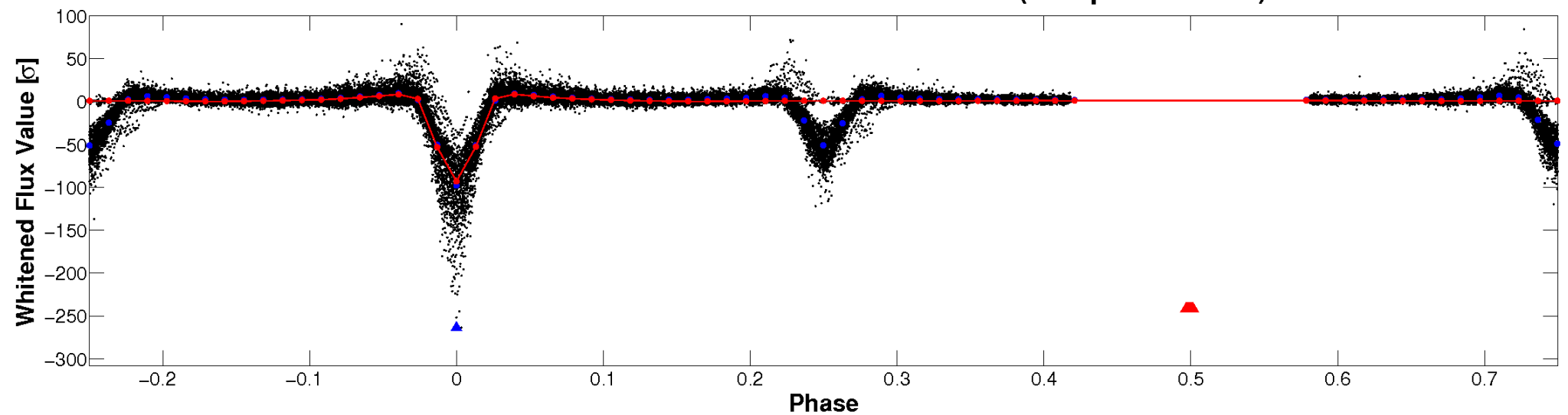


# Non-Whitened Vs. Whitened Light Curve

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

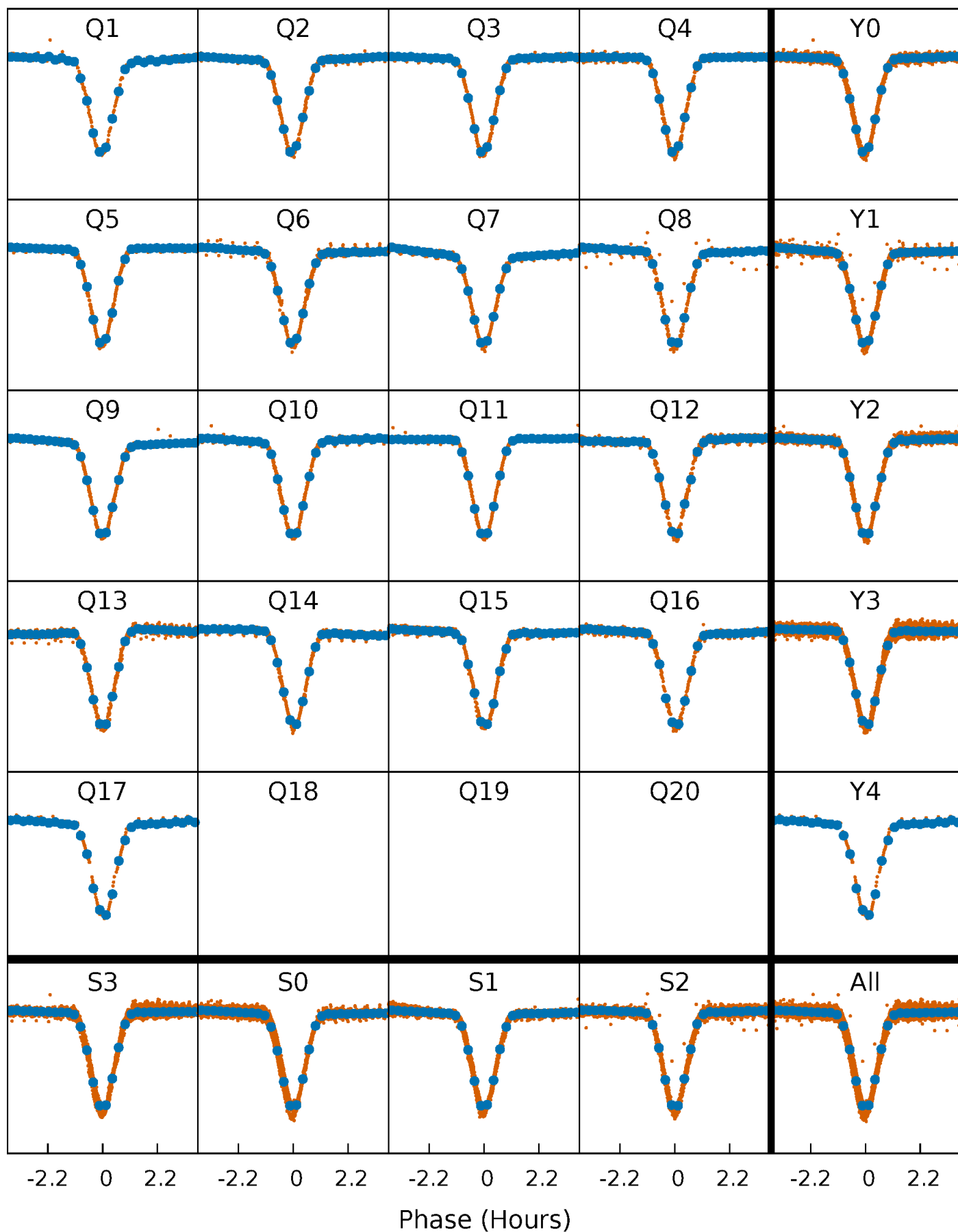


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



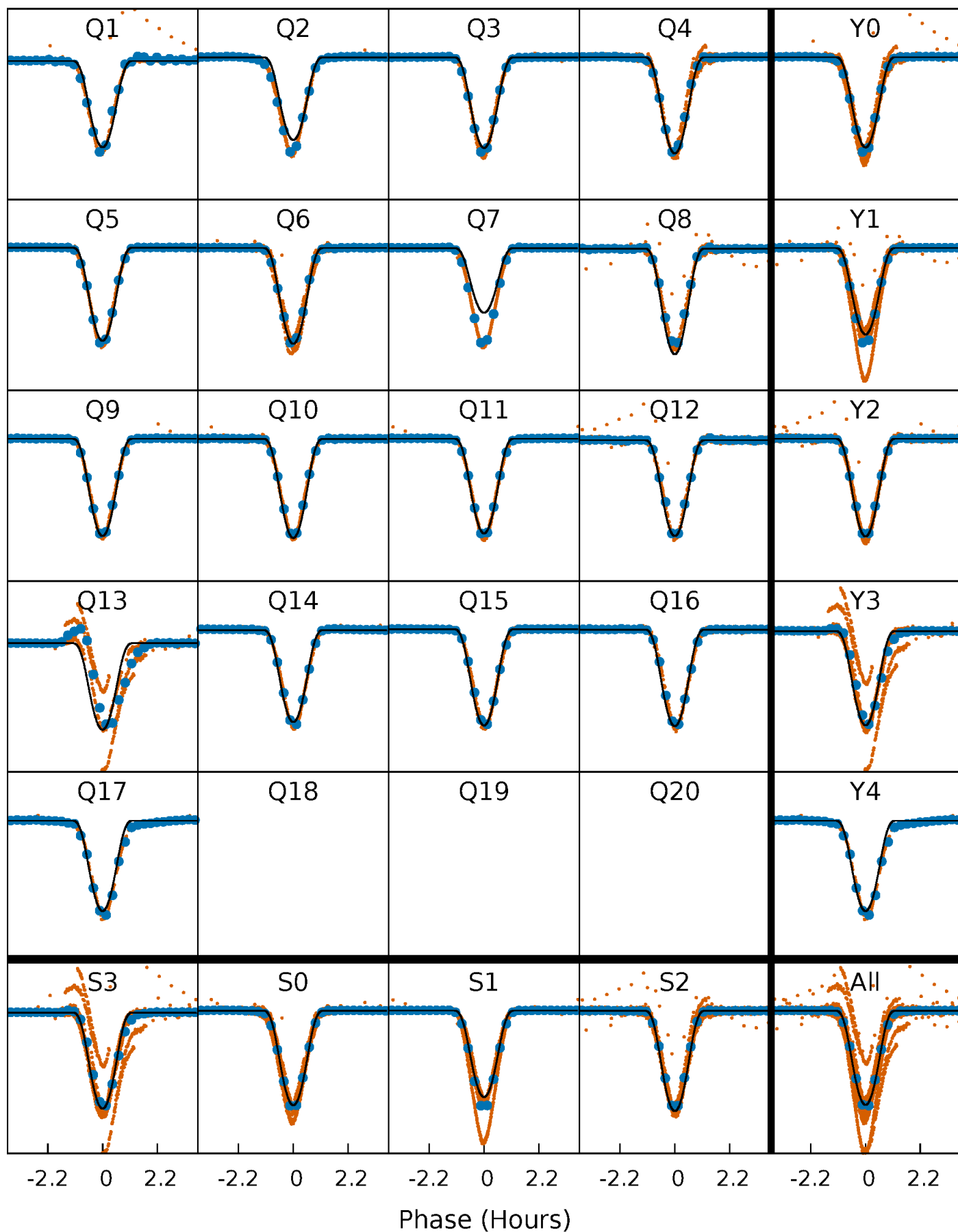
# PDC Quarter-Phased Transit Curves

TCE 006443392-02 P= 1.553948 Days  $T_0=133.053467$  (BKJD)



# DV Quarter-Phased Transit Curves

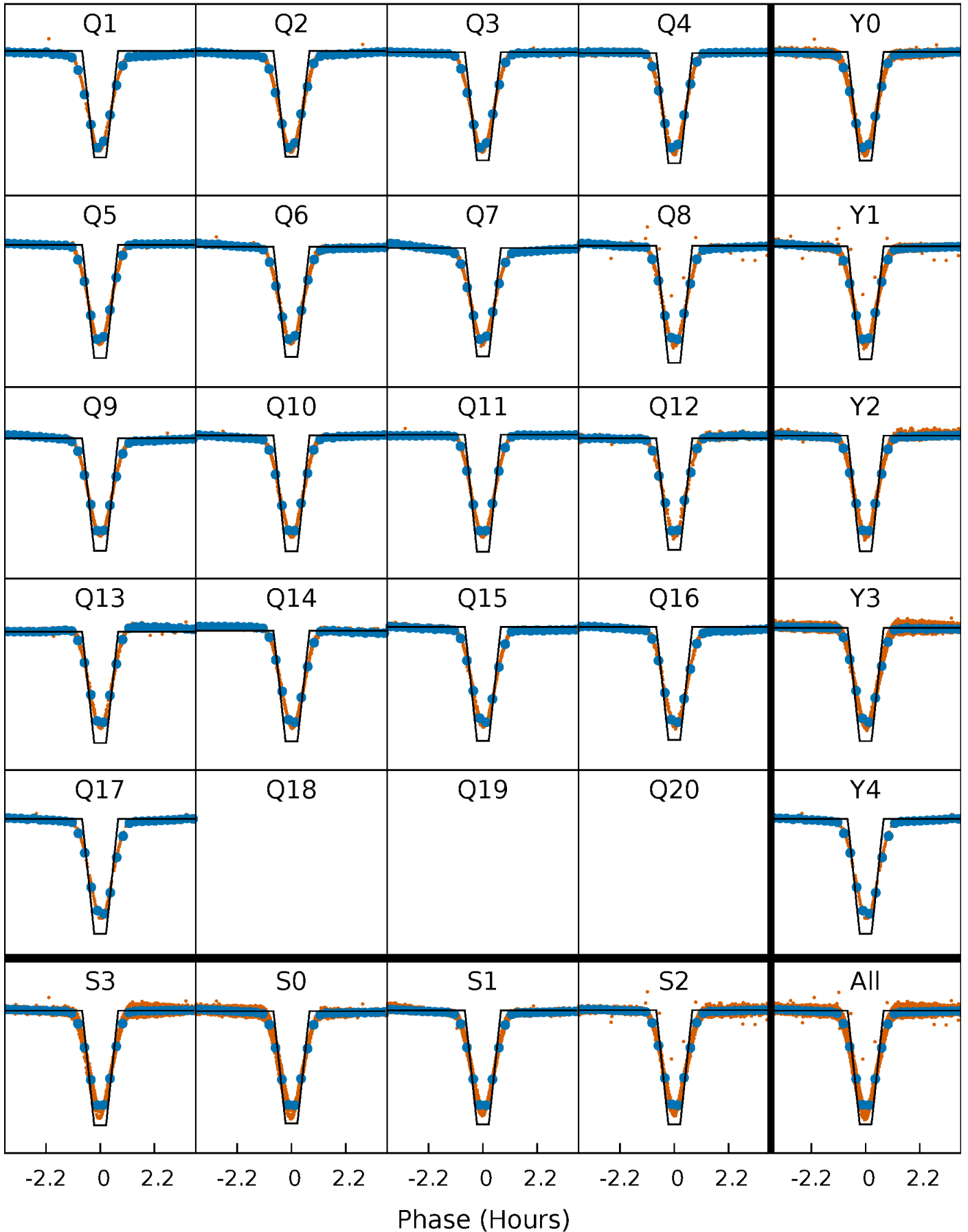
TCE 006443392-02 P= 1.553948 Days  $T_0=133.053467$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

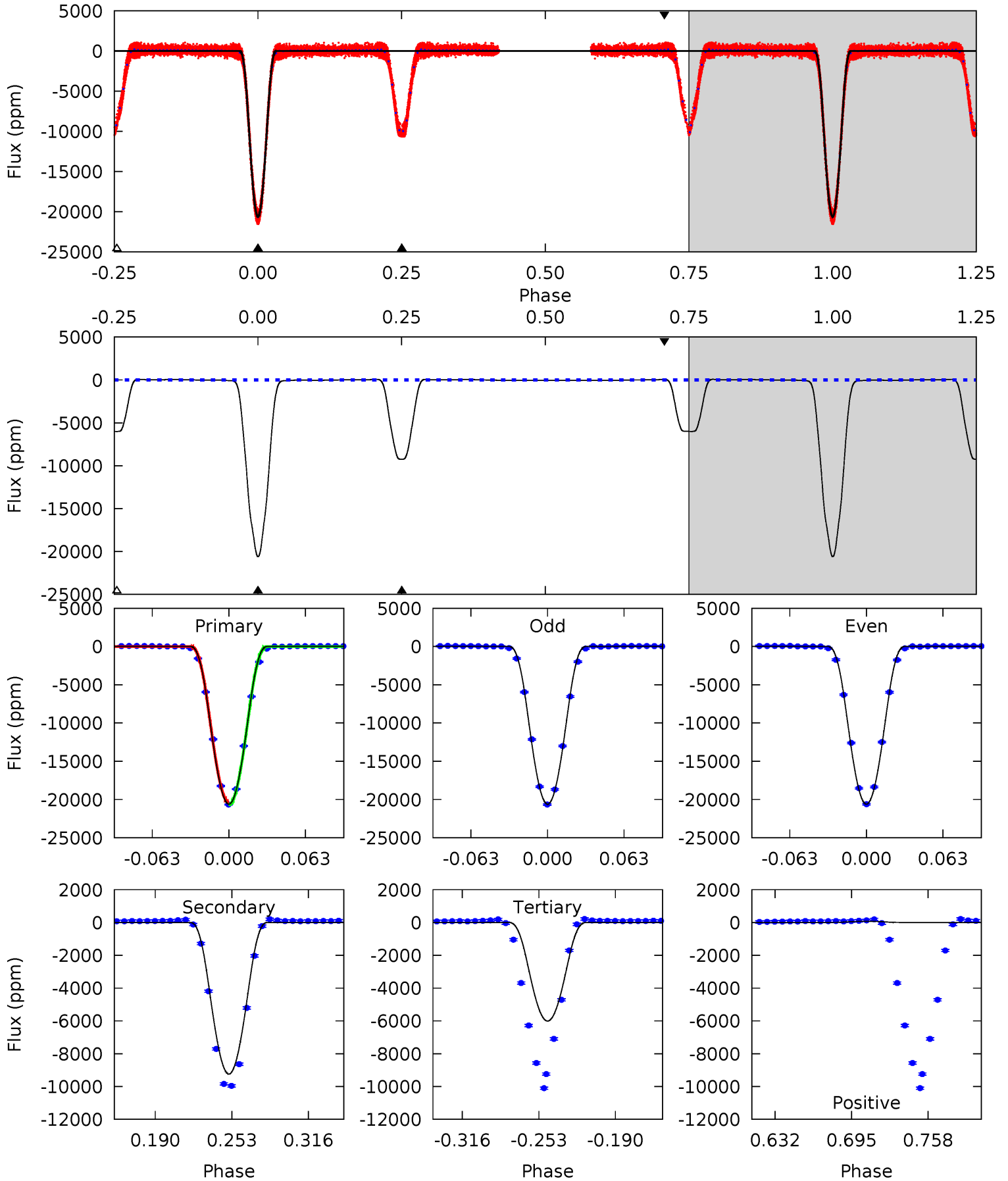
TCE 006443392-02   P= 1.553949 Days    $T_0=133.052858$  (BKJD)



# DV Model-Shift Uniqueness Test

006443392-02, P = 1.553948 Days, E = 131.499519 Days

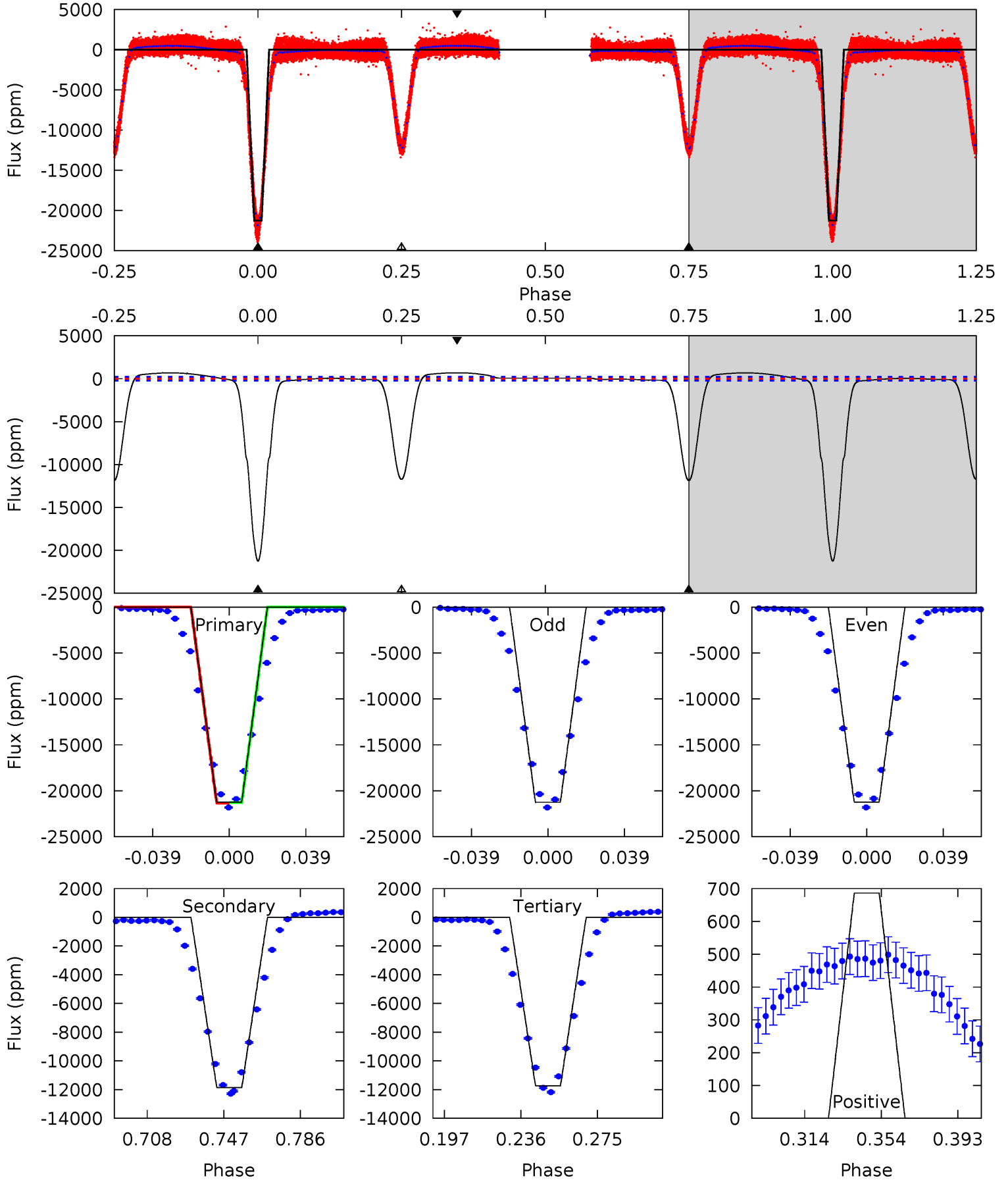
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1089	488.7	317.7	3.90	4.66	1.86	48.6	771.6	1085	171.0	484.8	0.02	1.02	0.00	4.29



# Alt Model-Shift Uniqueness Test

006443392-02, P = 1.553949 Days, E = 131.498909 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
464.6	259.4	256.5	15.0	4.76	2.06	49.3	208.1	449.6	2.91	244.4	0.01	0.99	0.03	0.39



### Stellar Parameters For KIC 006443392

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5999^{+190}_{-232}$	$4.423^{+0.070}_{-0.210}$	$0.020^{+0.250}_{-0.300}$	$1.042^{+0.326}_{-0.140}$	$1.046^{+0.145}_{-0.130}$	$1.303^{+0.496}_{-0.694}$
	+3%/-4%	+2%/-5%	+1250%/-1500%	+31%/-13%	+14%/-12%	+38%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 006443392-02 / KOI 6710.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-9244 \pm 19$	$23.11^{+4.02}_{-2.35}$	$2350^{+191}_{-133}$	$4361^{+122}_{-132}$	$6.792^{+1.335}_{-1.701}$
Alt.	$-11861 \pm 46$	$18.47^{+3.16}_{-1.73}$	$2351^{+172}_{-130}$	$5035^{+177}_{-182}$	$14^{+3}_{-3}$

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

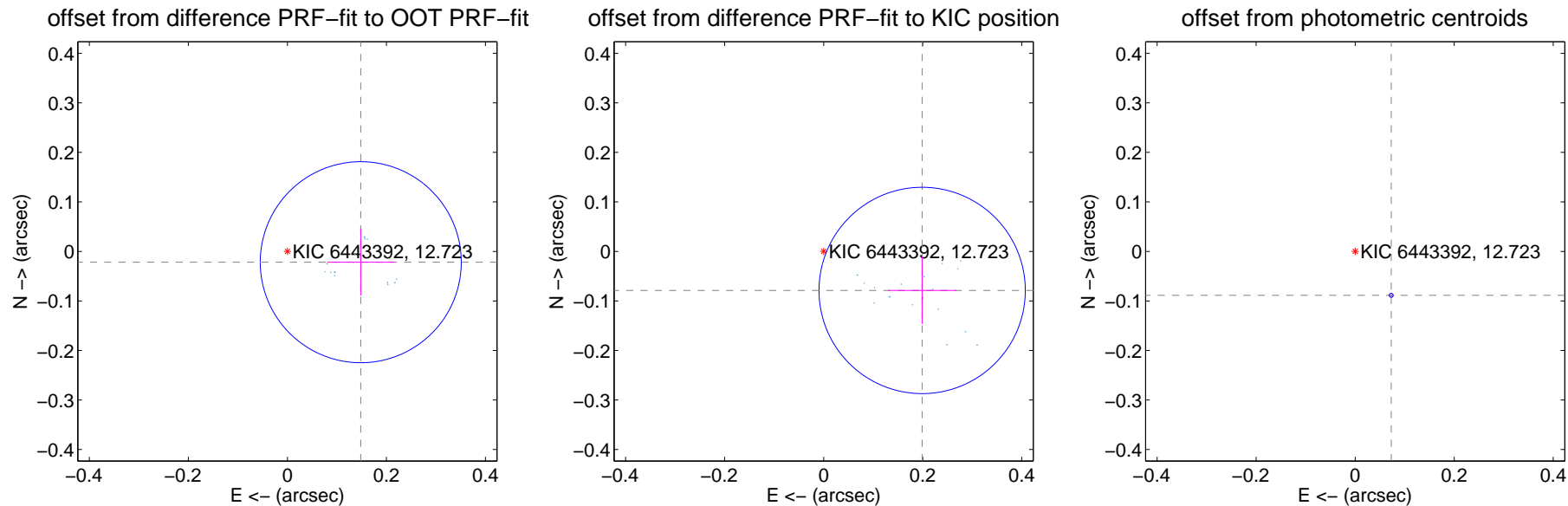
## DV Centroid Data

Supplemental centroid analysis for 006443392-02. Kepler magnitude: 12.72. Transit SNR 2651.53

There are 17 quarters with good PRF difference image offsets

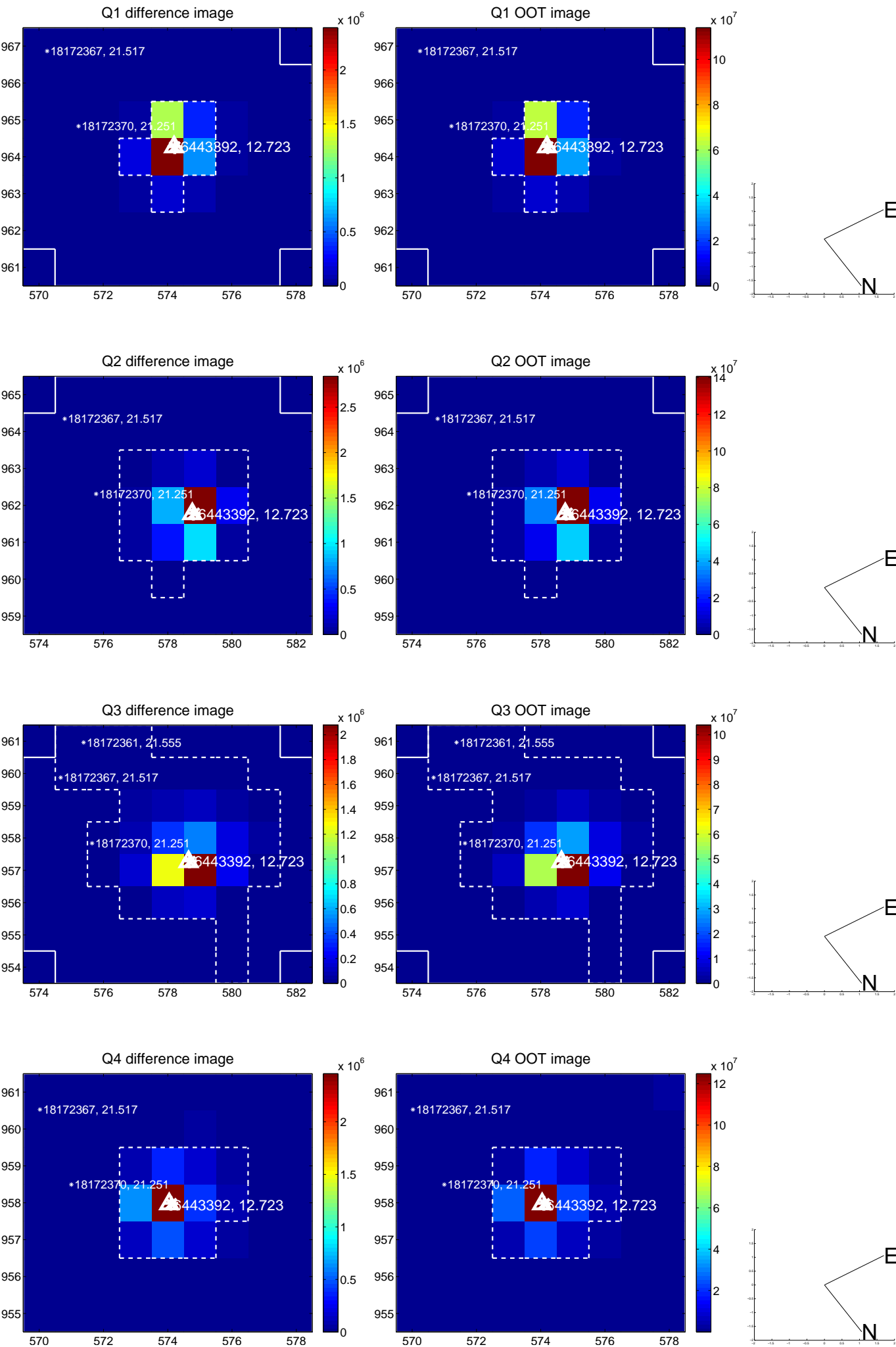
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.150 \pm 0.068$	2.21	$-0.148 \pm 0.068$	$-0.022 \pm 0.067$
PRF-fit source offset from KIC position	$0.214 \pm 0.069$	3.08	$-0.199 \pm 0.069$	$-0.079 \pm 0.068$
photometric centroid source offset	$0.11 \pm 0.00$	86.02	$-0.07 \pm 0.00$	$-0.09 \pm 0.00$

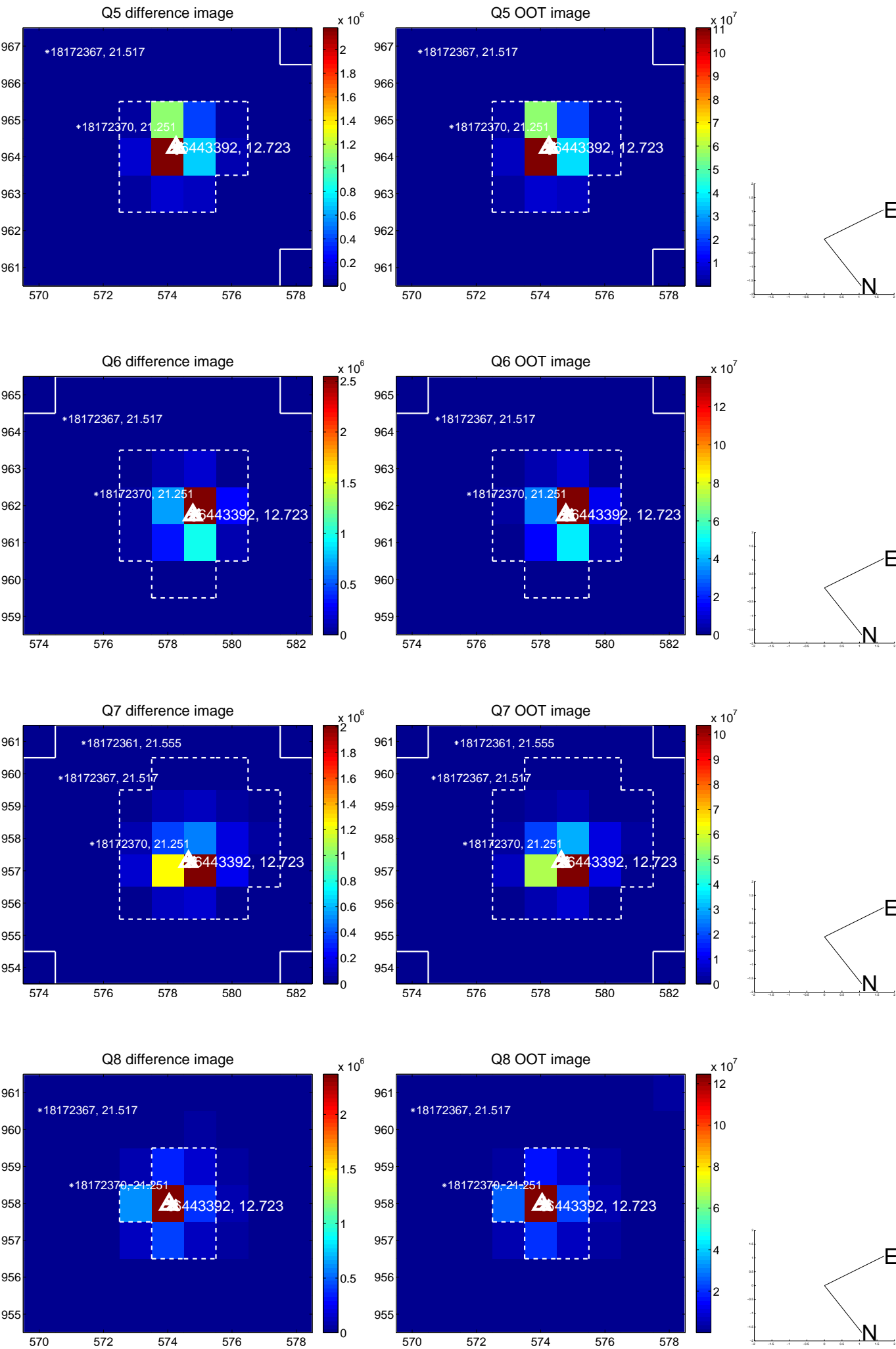


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

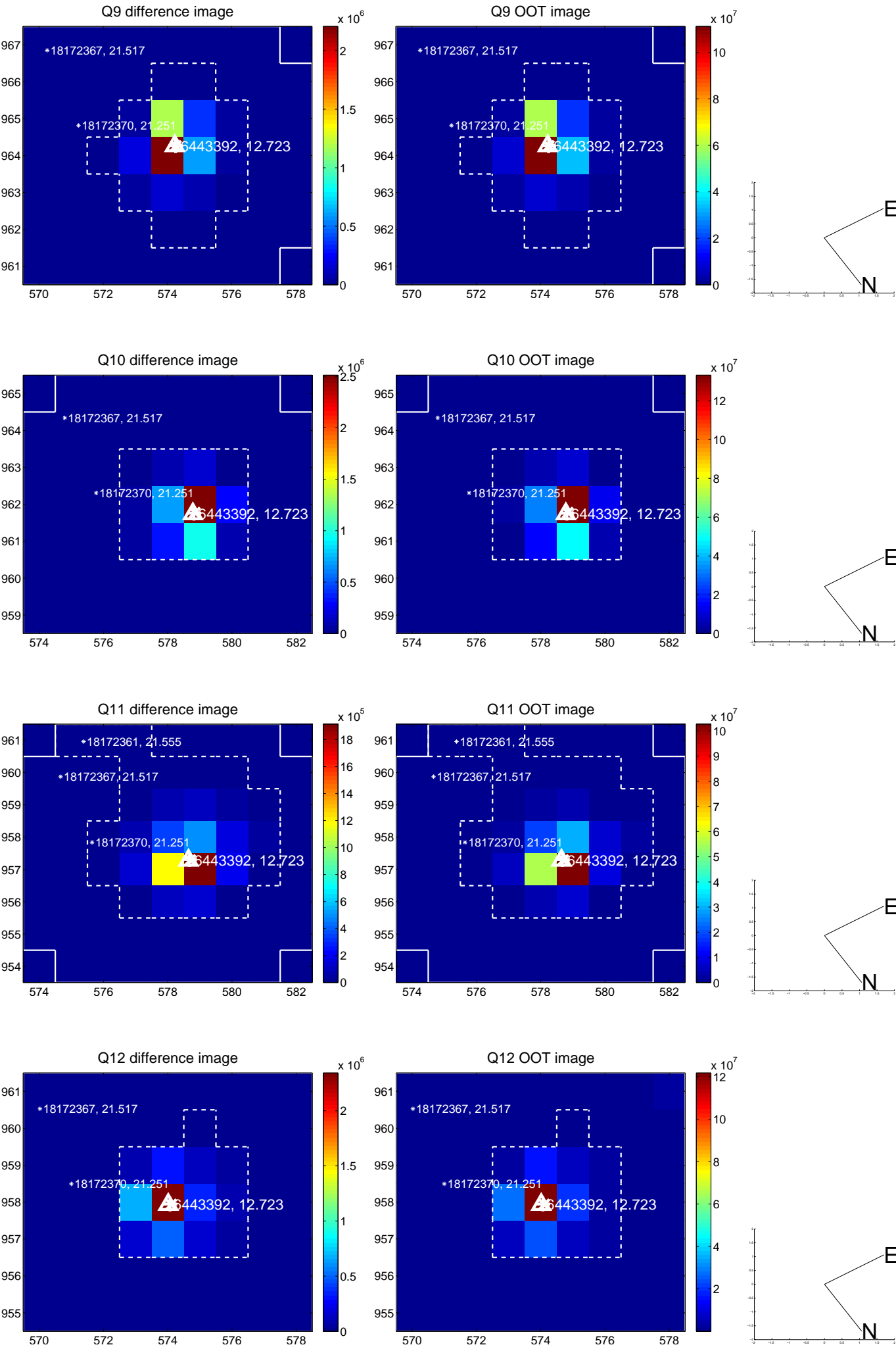


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

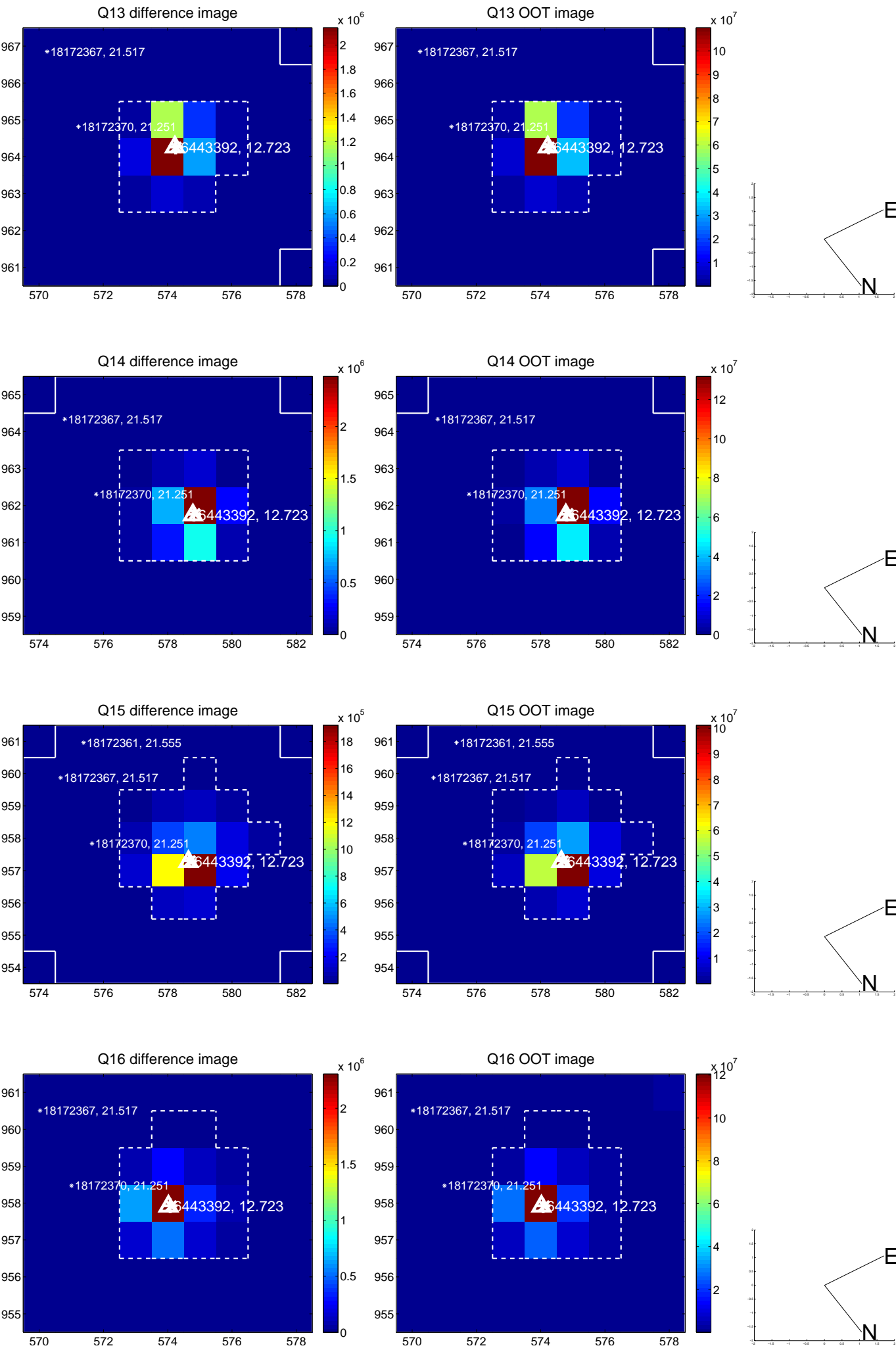




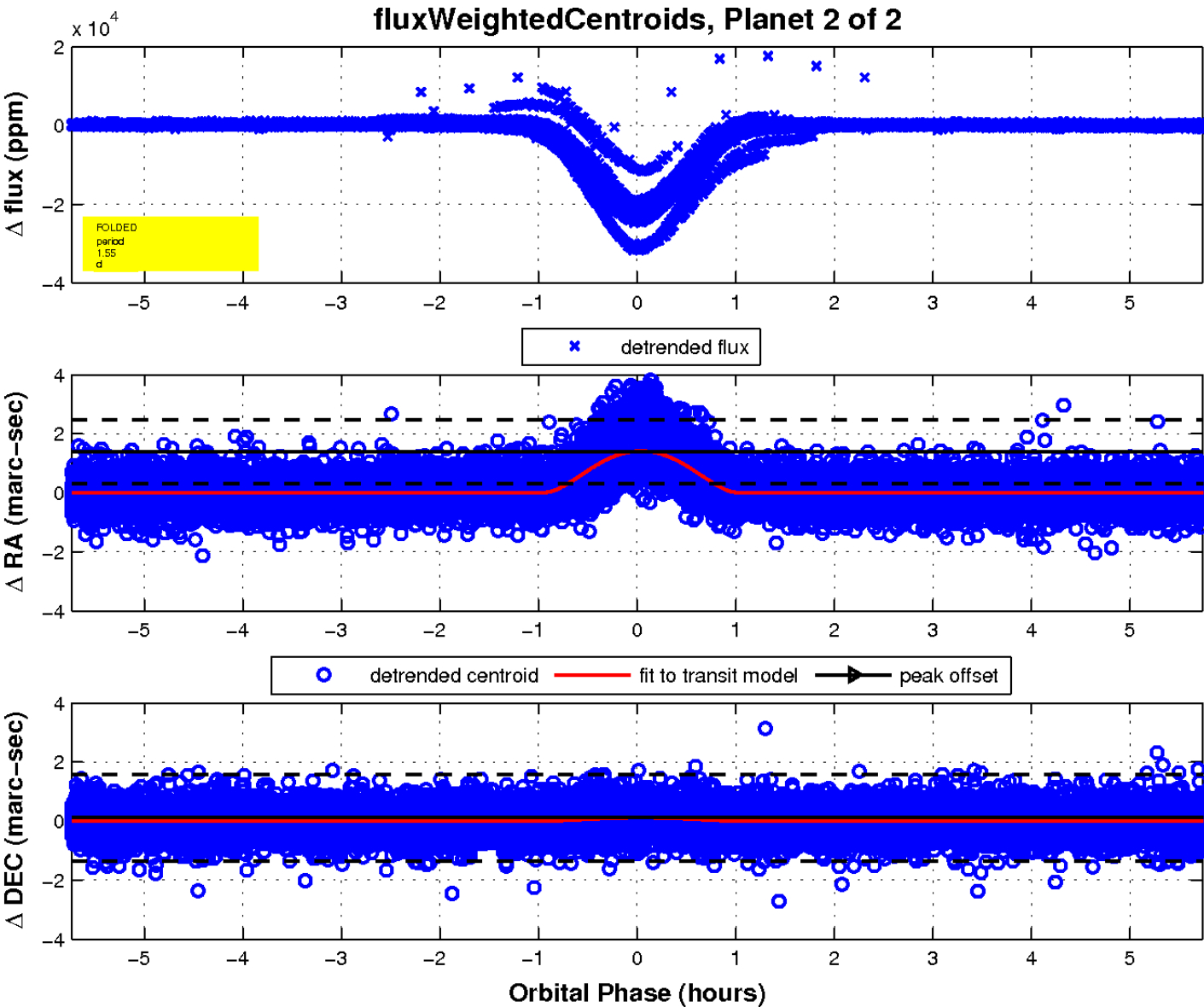
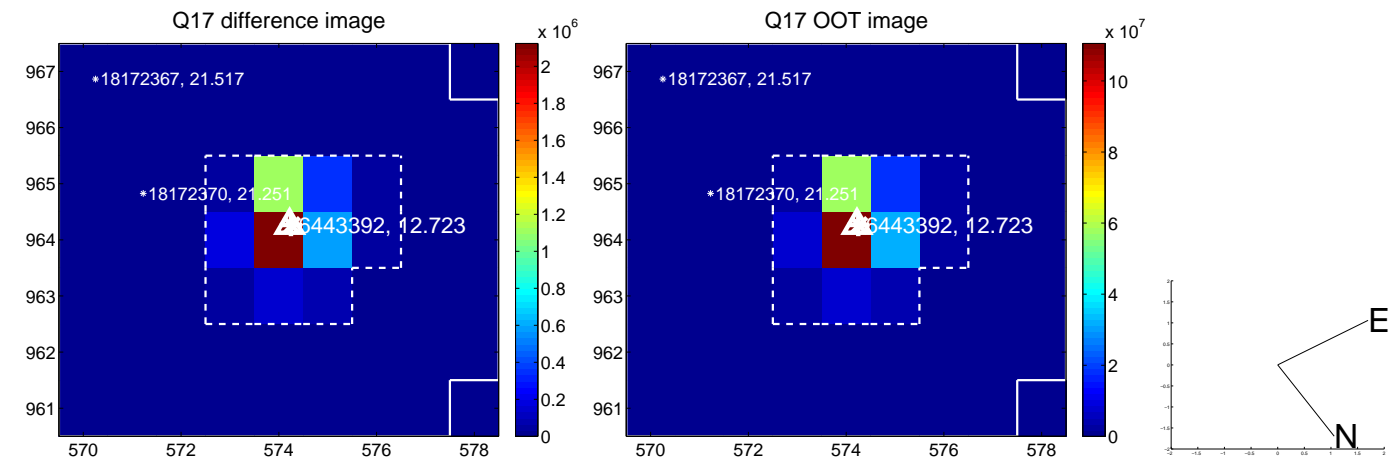
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

