

# KIC 010232123

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010232123-01	OBS	1075.01	1.343756	131.936249	4557.3	1.955	1166.5	907.0	2.31	6324	18.41	11742.47
010232123-02	OBS	No	1.343754	132.606576	153.5	1.451	33.1	40.0	2.31	6324	3.37	11742.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010232123-01	OBS	PC	0.96	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV—HAS_SEC_TCE—CENT_KIC_POS
010232123-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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

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

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

## Ephemeris Match Information For 010232123-01

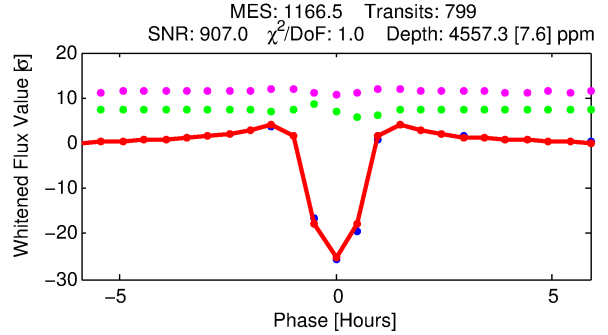
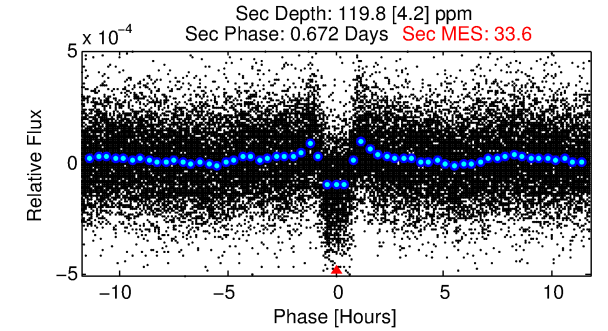
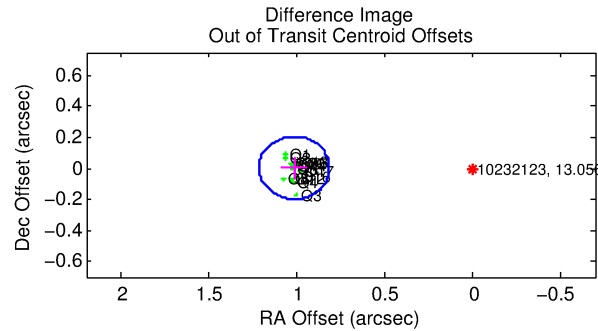
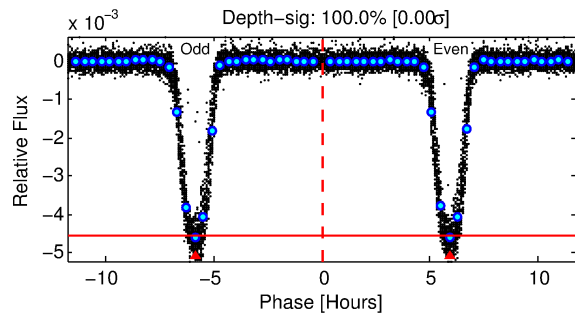
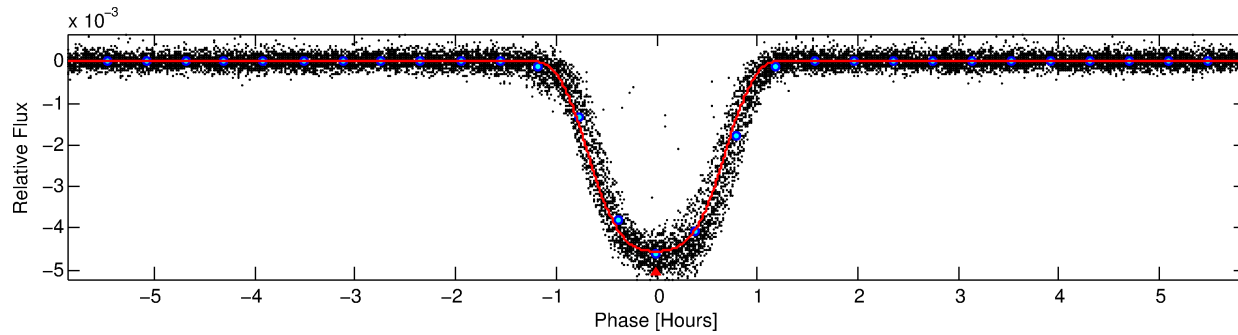
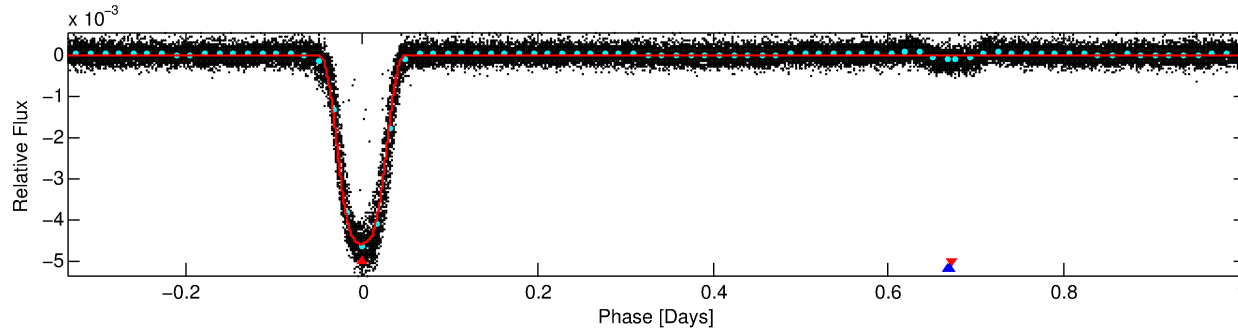
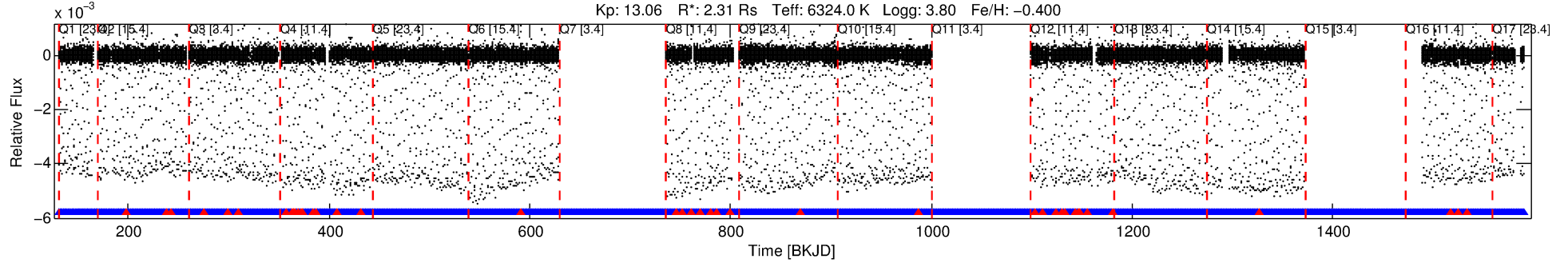
No Significant Match Found

# DV One-Page Summary

KIC: 10232123 Candidate: 1 of 2 Period: 1.344 d

KOI: K01075.01 Corr: 0.958

Kp: 13.06 R\*: 2.31 Rs Teff: 6324.0 K Logg: 3.80 Fe/H: -0.400



## DV Fit Results:

Period = 1.34376 [0.00000] d  
Epoch = 131.9362 [0.0000] BKJD  
Rp/R\* = 0.0730 [0.0001]  
a/R\* = 3.22 [0.01]  
b = 0.90 [0.00]  
Seff = 11742.47 [10291.45]  
Teq = 2654 [582] K  
Rp = 18.42 [9.18] Re  
a = 0.0255 [0.0133] AU  
Ag = 0.13 [0.11] [-7.96σ]  
Teffp = 2449 [90] K [-0.35σ]

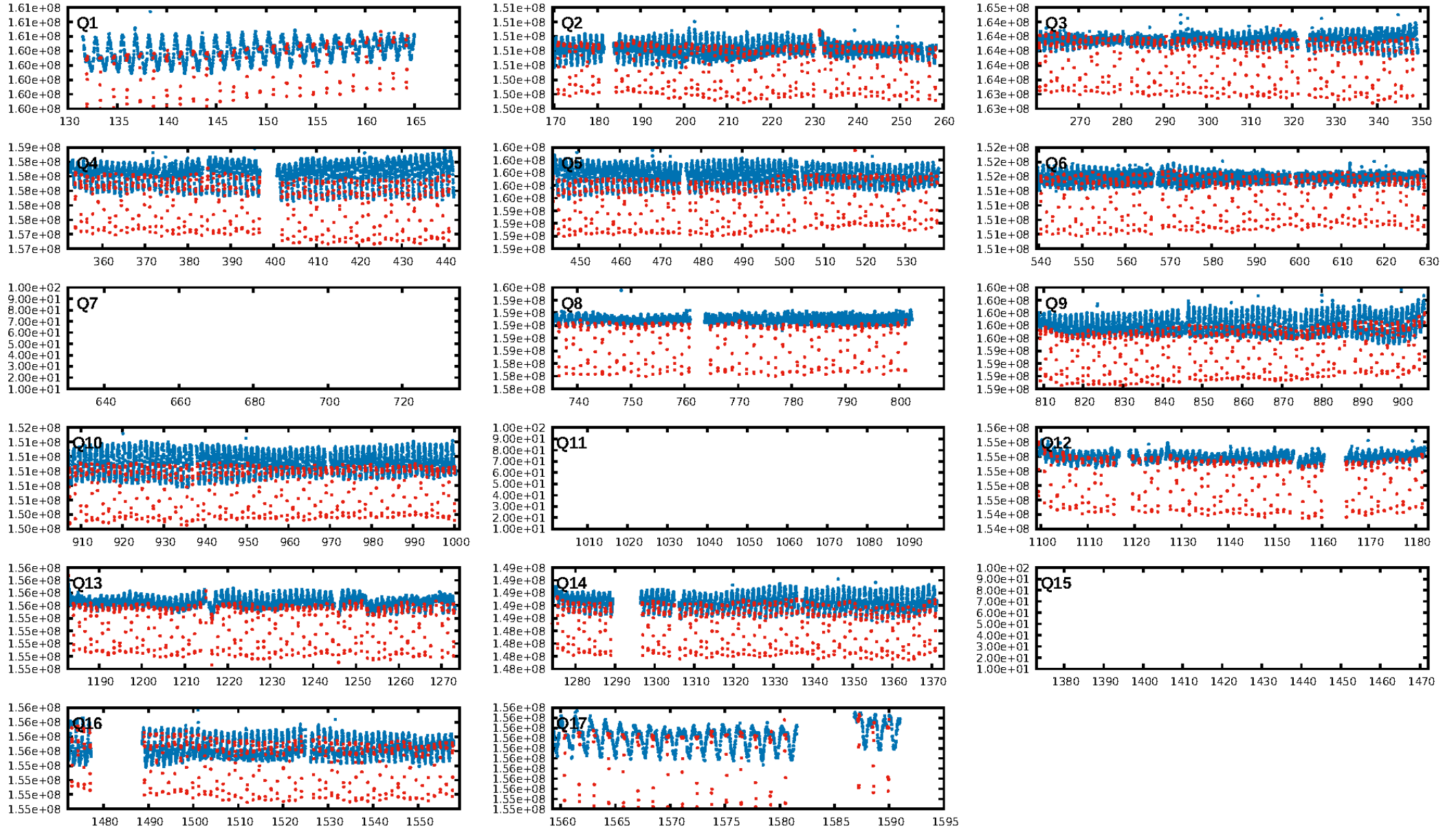
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.95 [714/755]  
GhostDiagnostic-chr: 15.21  
Centroid-sig: 0.0%  
Centroid-so: 0.539 arcsec [47.61σ]  
OotOffset-rm: 1.016 arcsec [15.13σ]  
KicOffset-rm: 0.787 arcsec [11.61σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

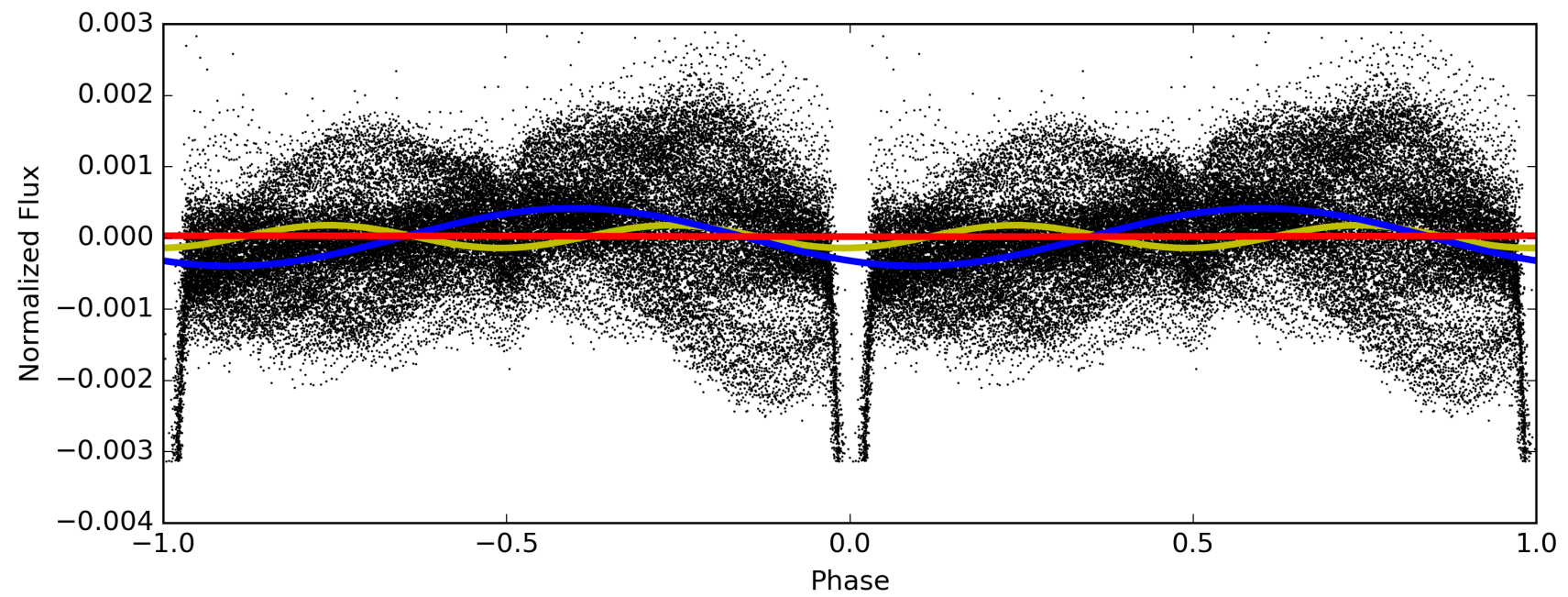
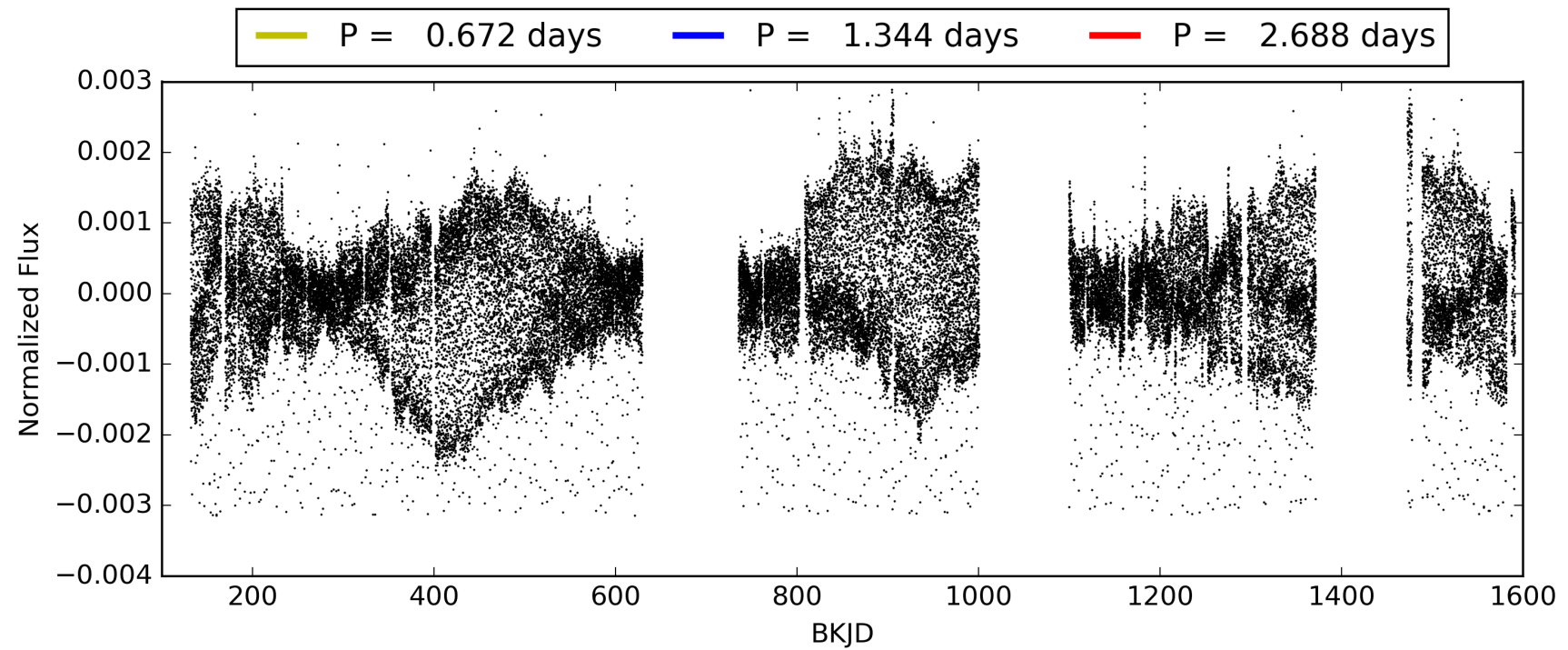
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:39:11 Z

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

# TCE 010232123-01, PDC Light Curves

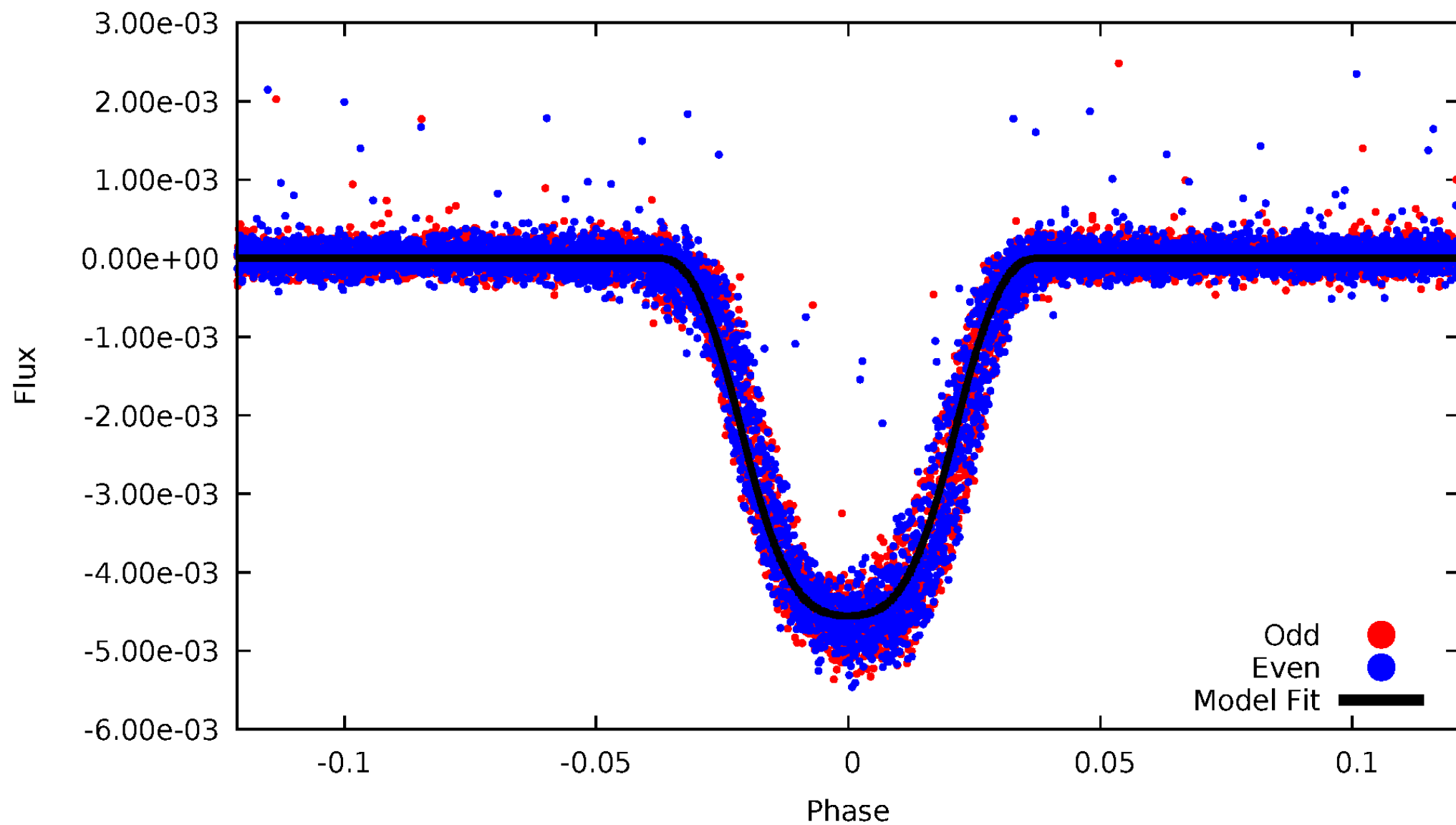


TCE 010232123-01



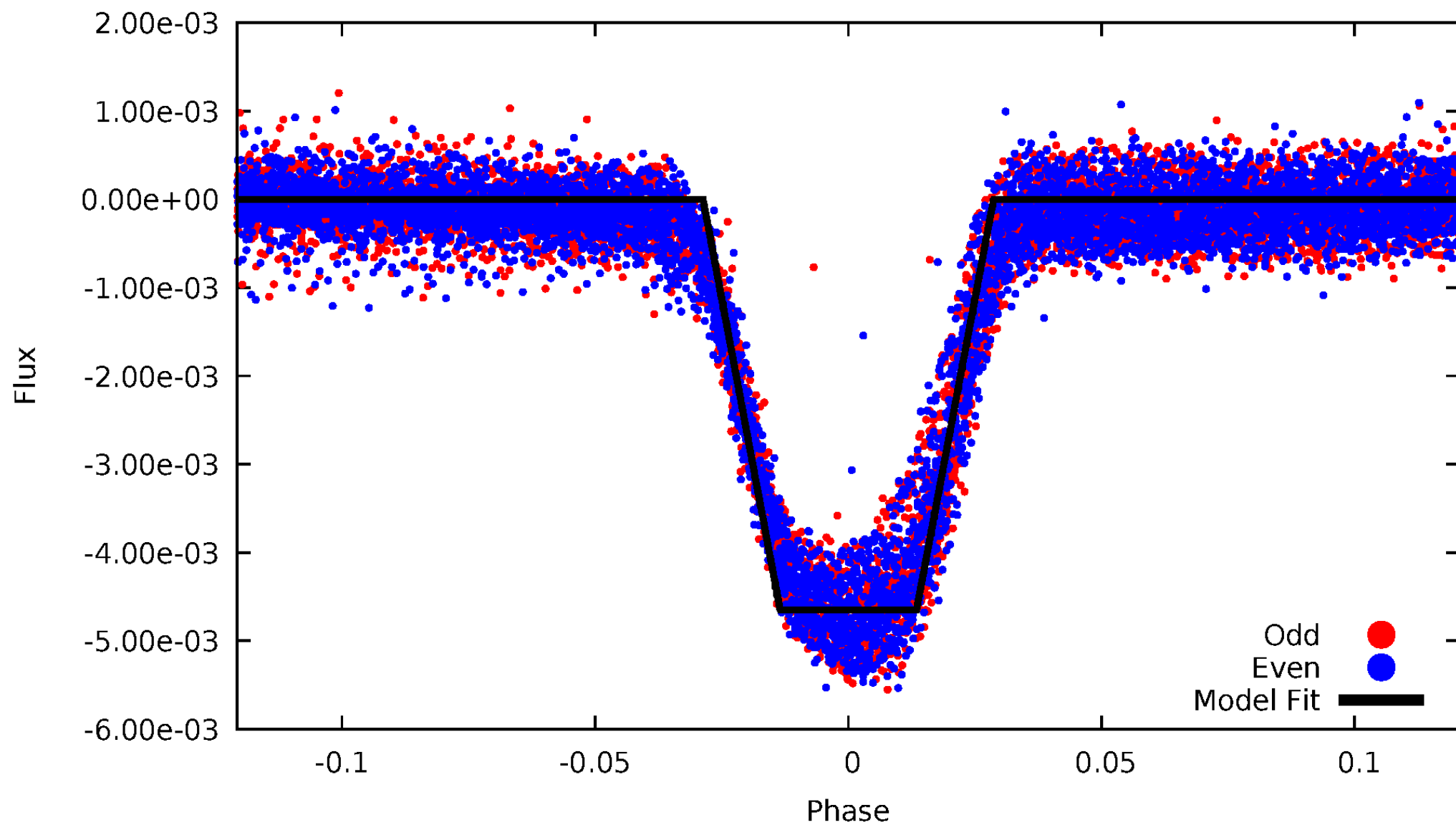
# DV Odd/Even

TCE 010232123-01



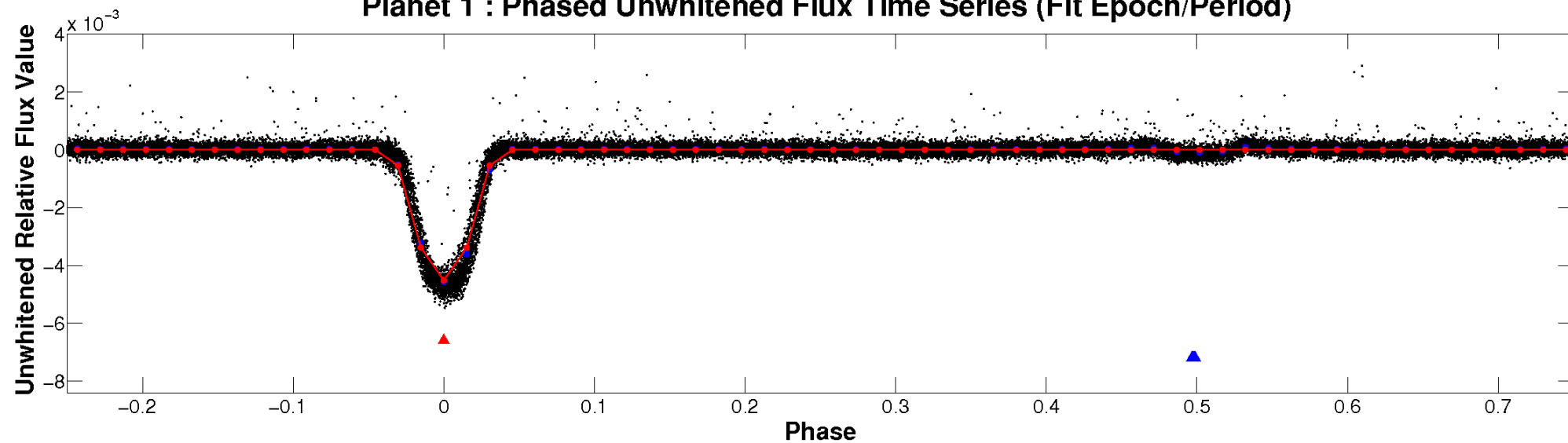
# ALT Odd/Even

TCE 010232123-01

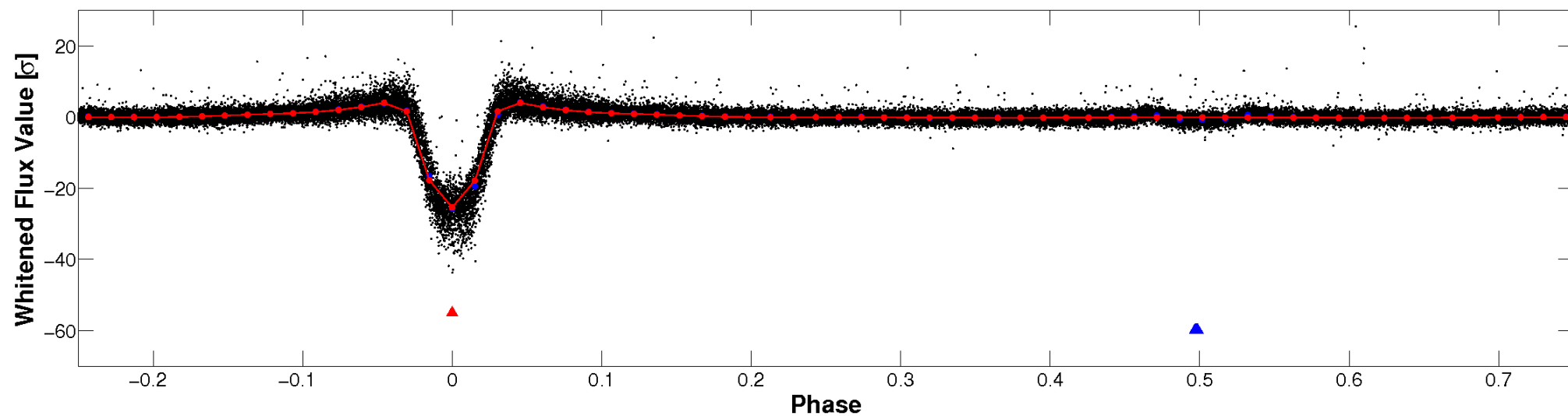


# Non-Whitened Vs. Whitened Light Curve

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



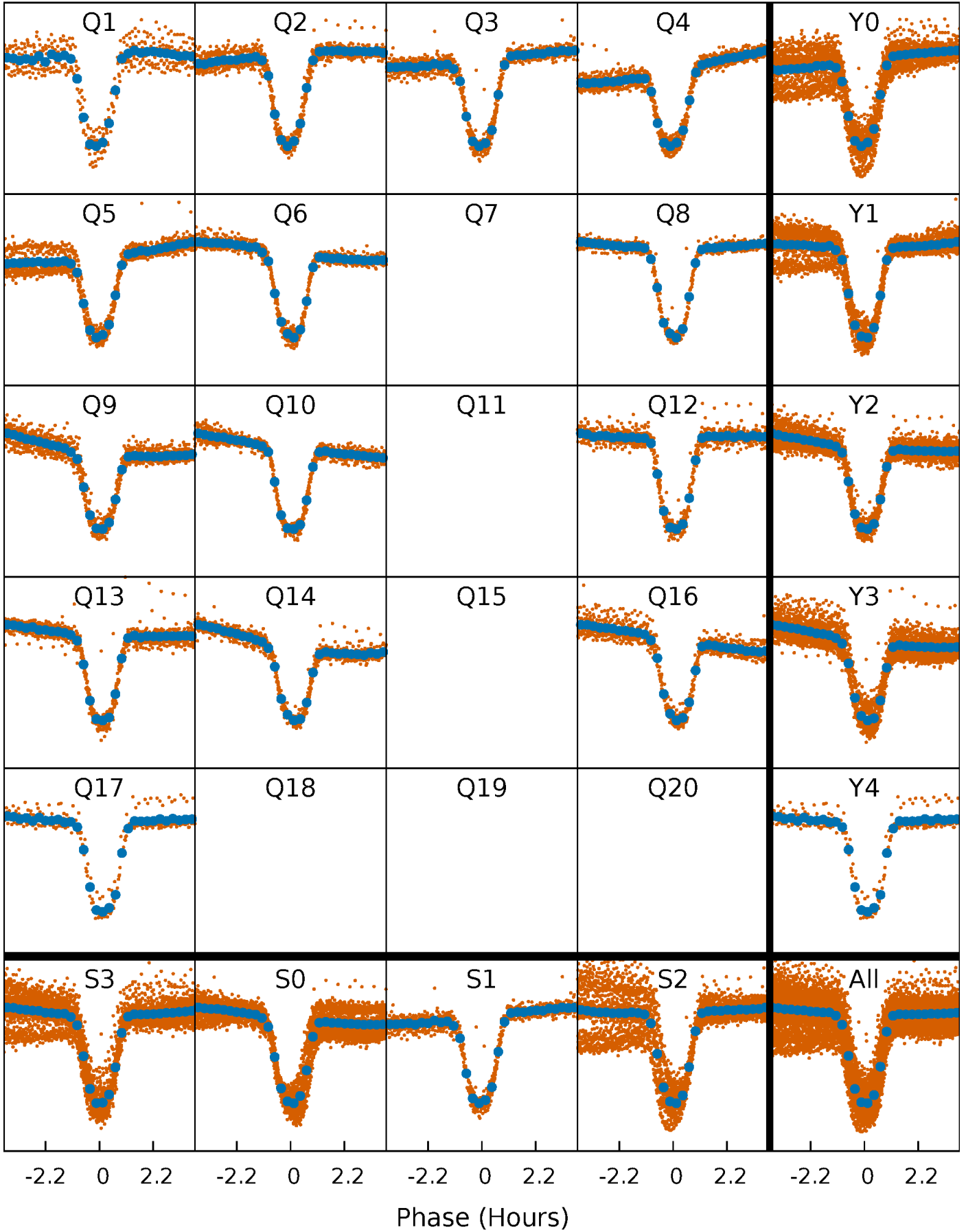
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

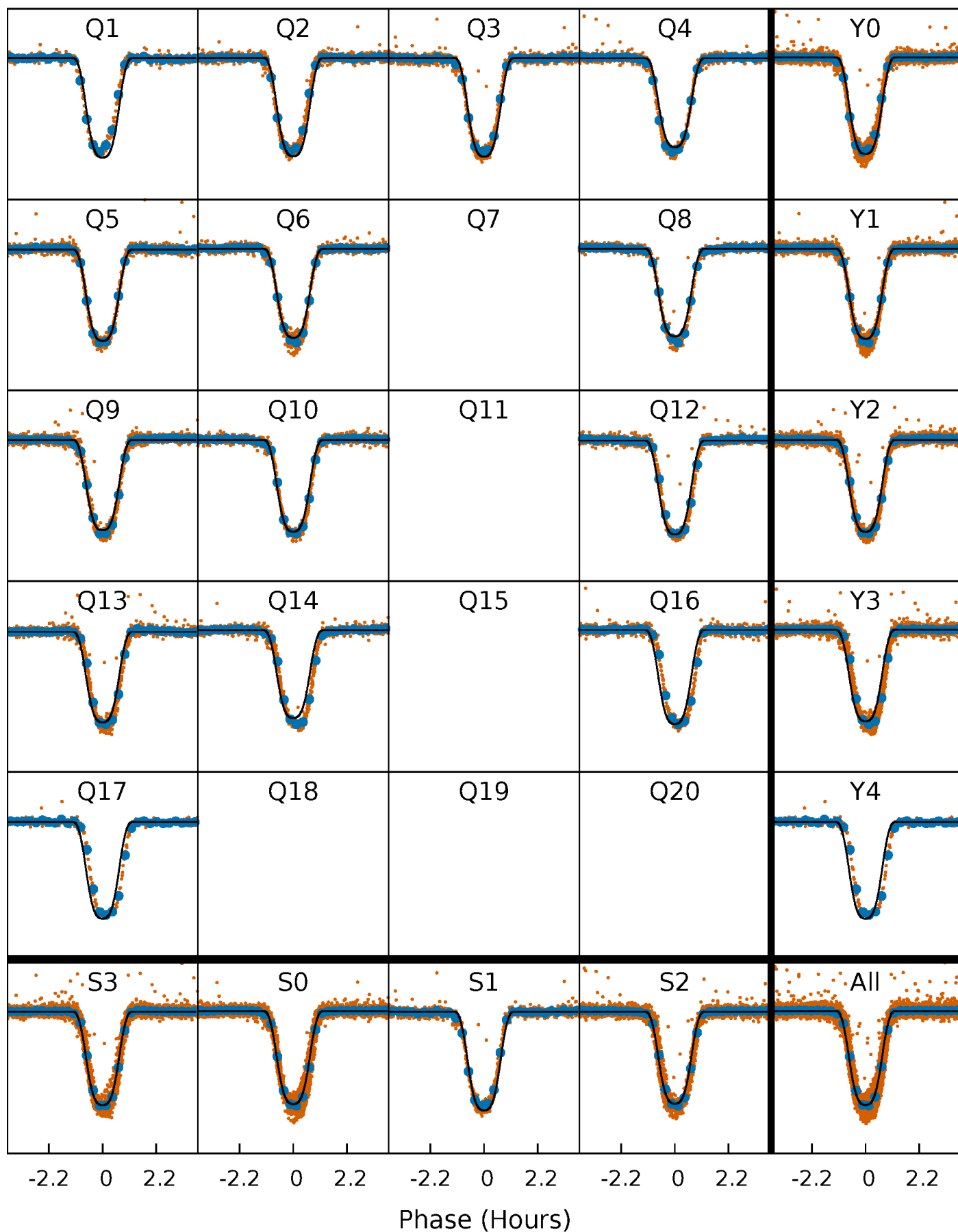
TCE 010232123-01 P= 1.343756 Days  $T_0=131.936249$  (BKJD)





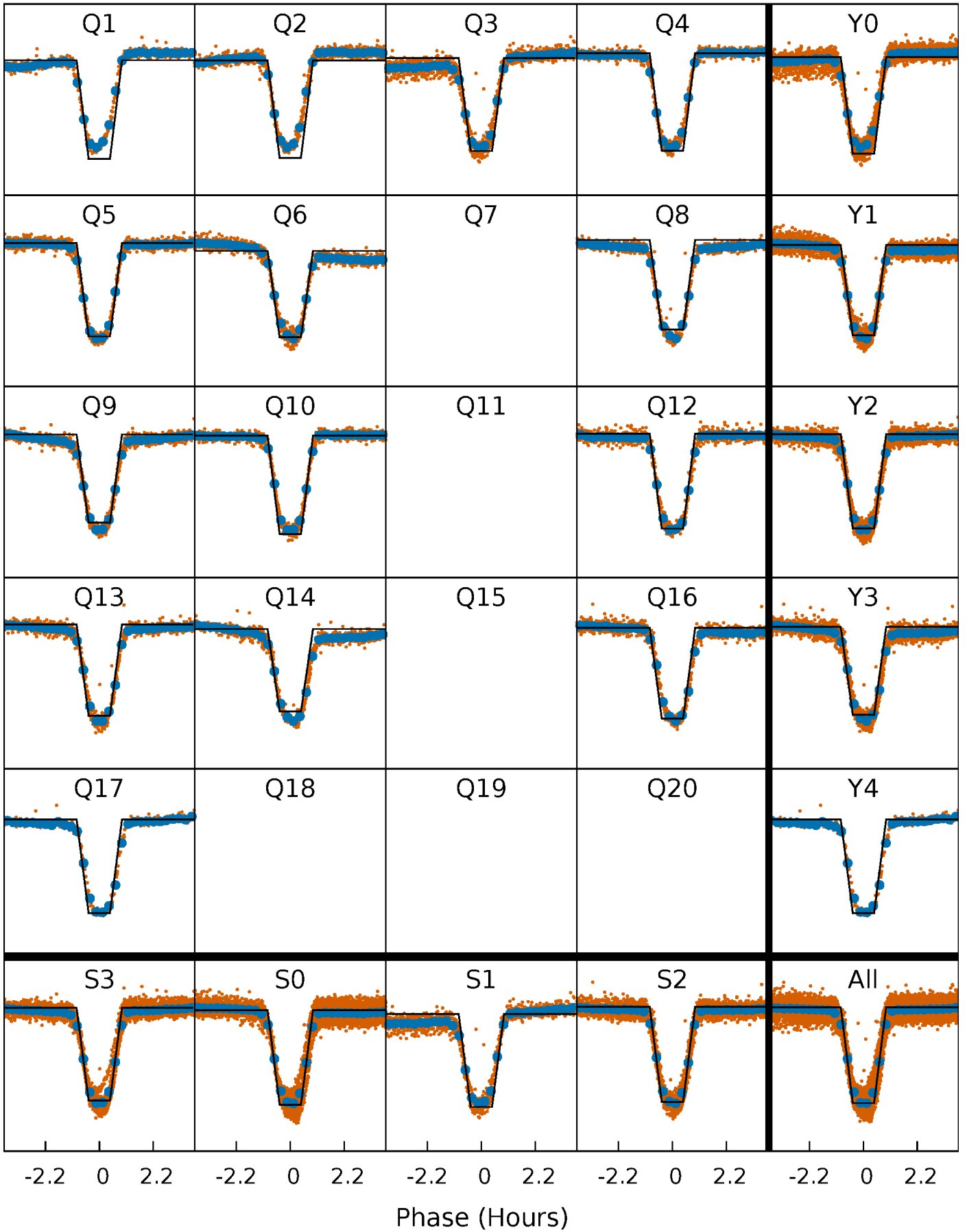
# DV Quarter-Phased Transit Curves

TCE 010232123-01 P= 1.343756 Days  $T_0=131.936249$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

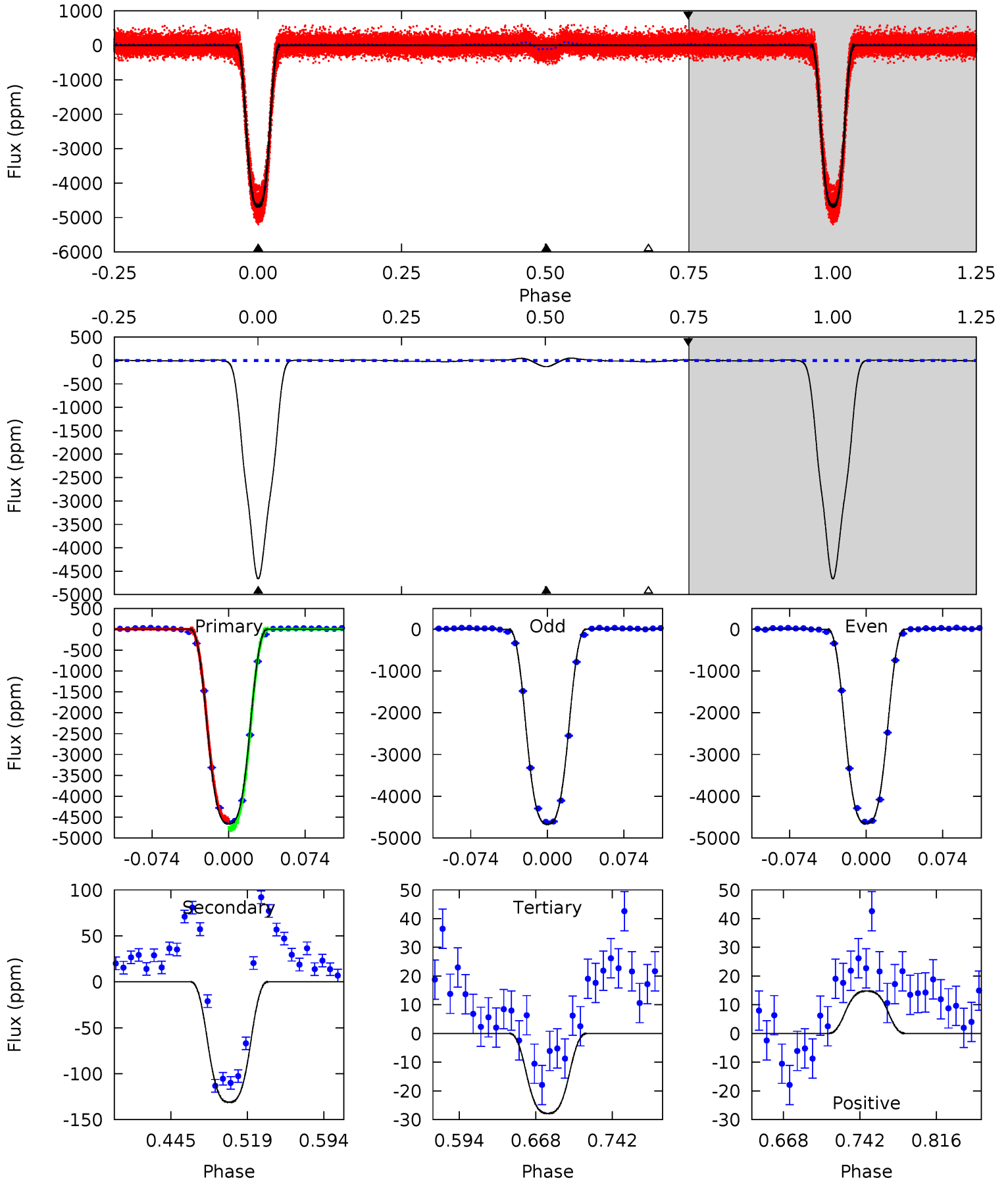
TCE 010232123-01   P= 1.343760 Days    $T_0=131.935543$  (BKJD)



# DV Model-Shift Uniqueness Test

010232123-01, P = 1.343756 Days, E = 130.592493 Days

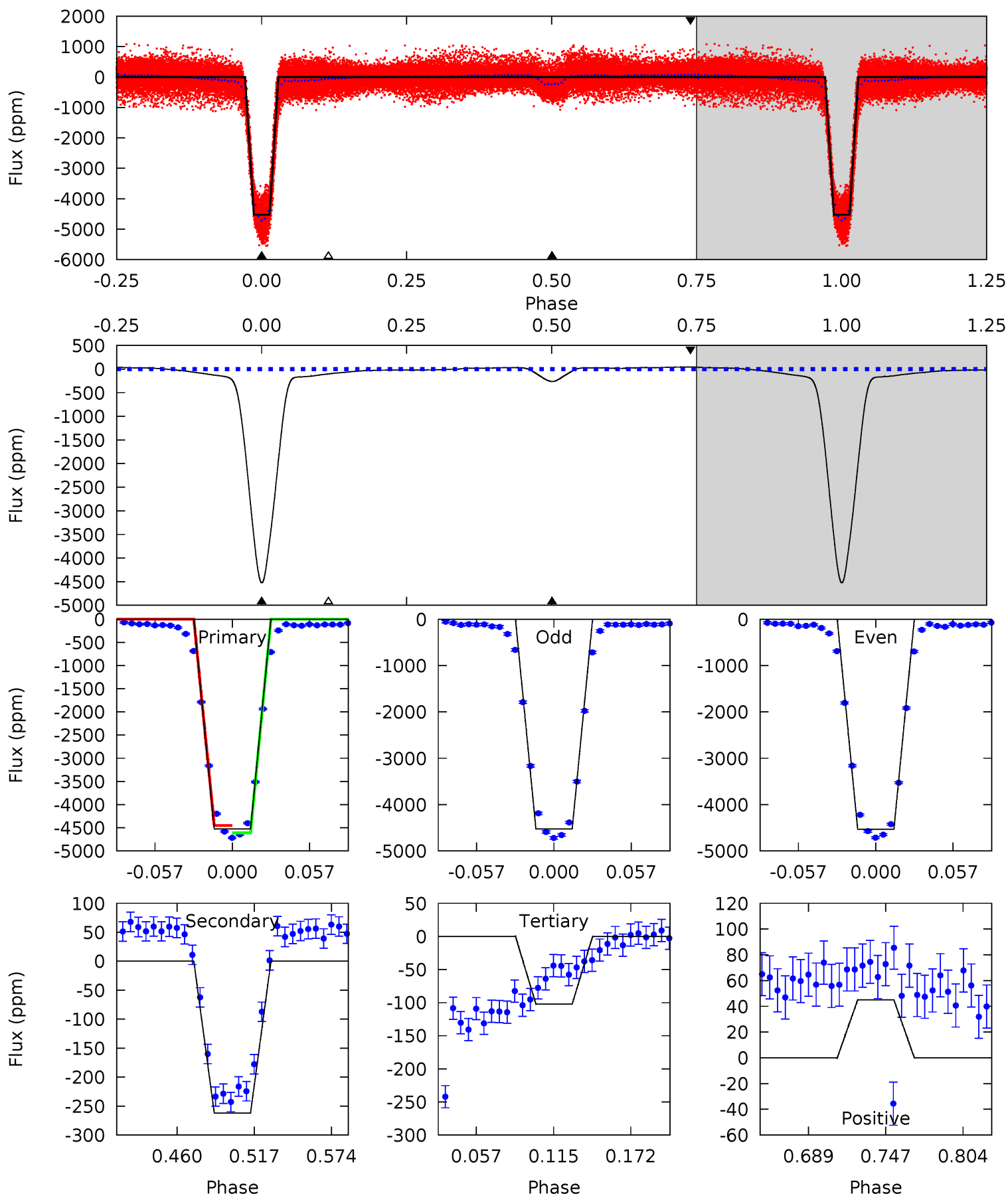
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1989	56.0	11.9	6.31	4.63	1.79	4.82	1978	1983	44.1	49.7	2.86	0.99	0.01	48.3



# Alt Model-Shift Uniqueness Test

010232123-01, P = 1.343760 Days, E = 130.591783 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
941.8	54.5	21.3	9.35	4.68	1.90	11.9	920.5	932.4	33.3	45.2	0.12	0.99	0.01	16.6



### Stellar Parameters For KIC 010232123

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6324^{+204}_{-227}$	$3.800^{+0.520}_{-0.130}$	$-0.400^{+0.300}_{-0.300}$	$2.312^{+0.494}_{-1.152}$	$1.230^{+0.193}_{-0.289}$	$0.140^{+0.832}_{-0.055}$
	+3%/-4%	+14%/-3%	+75%/-75%	+21%/-50%	+16%/-23%	+594%/-39%
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 010232123-01 / KOI 1075.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-131 \pm 2$	$17.79^{+2.65}_{-4.83}$	$3604^{+299}_{-486}$	$-3119^{+772}_{-238}$	$0.151^{+0.119}_{-0.034}$
Alt.	$-262 \pm 5$	$16.64^{+2.49}_{-4.21}$	$3608^{+309}_{-435}$	$2621^{+563}_{-5279}$	$0.343^{+0.244}_{-0.079}$

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

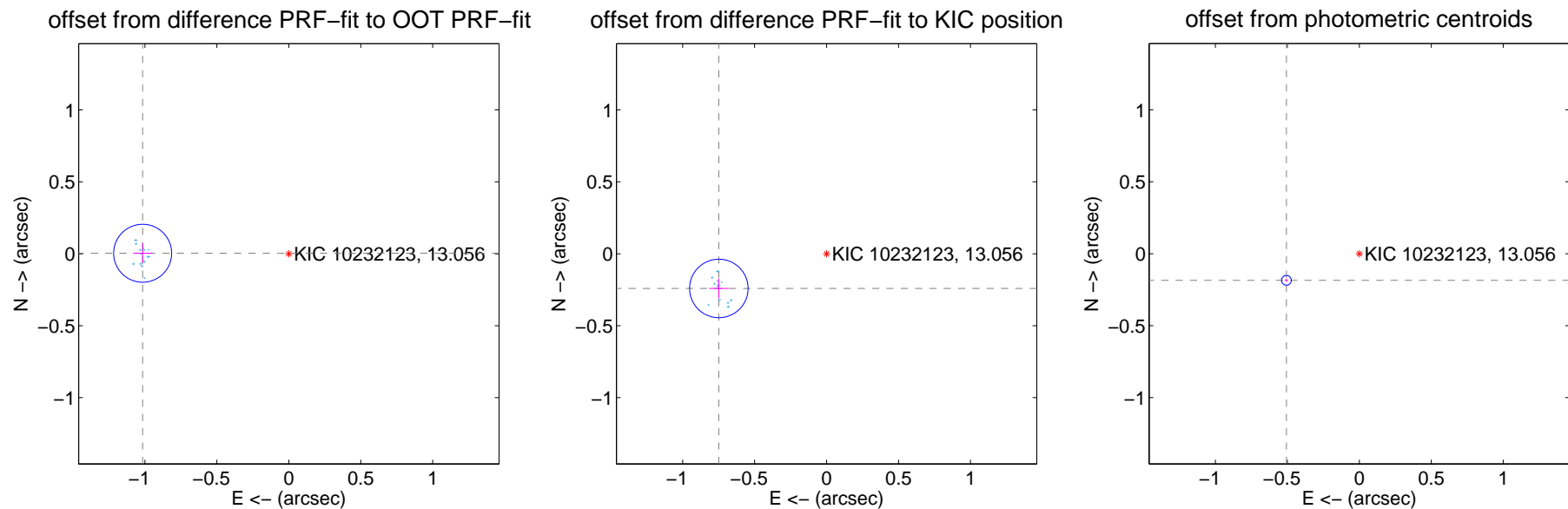
## DV Centroid Data

Supplemental centroid analysis for 010232123-01. Kepler magnitude: 13.06. Transit SNR 907.04

There are 14 quarters with good PRF difference image offsets

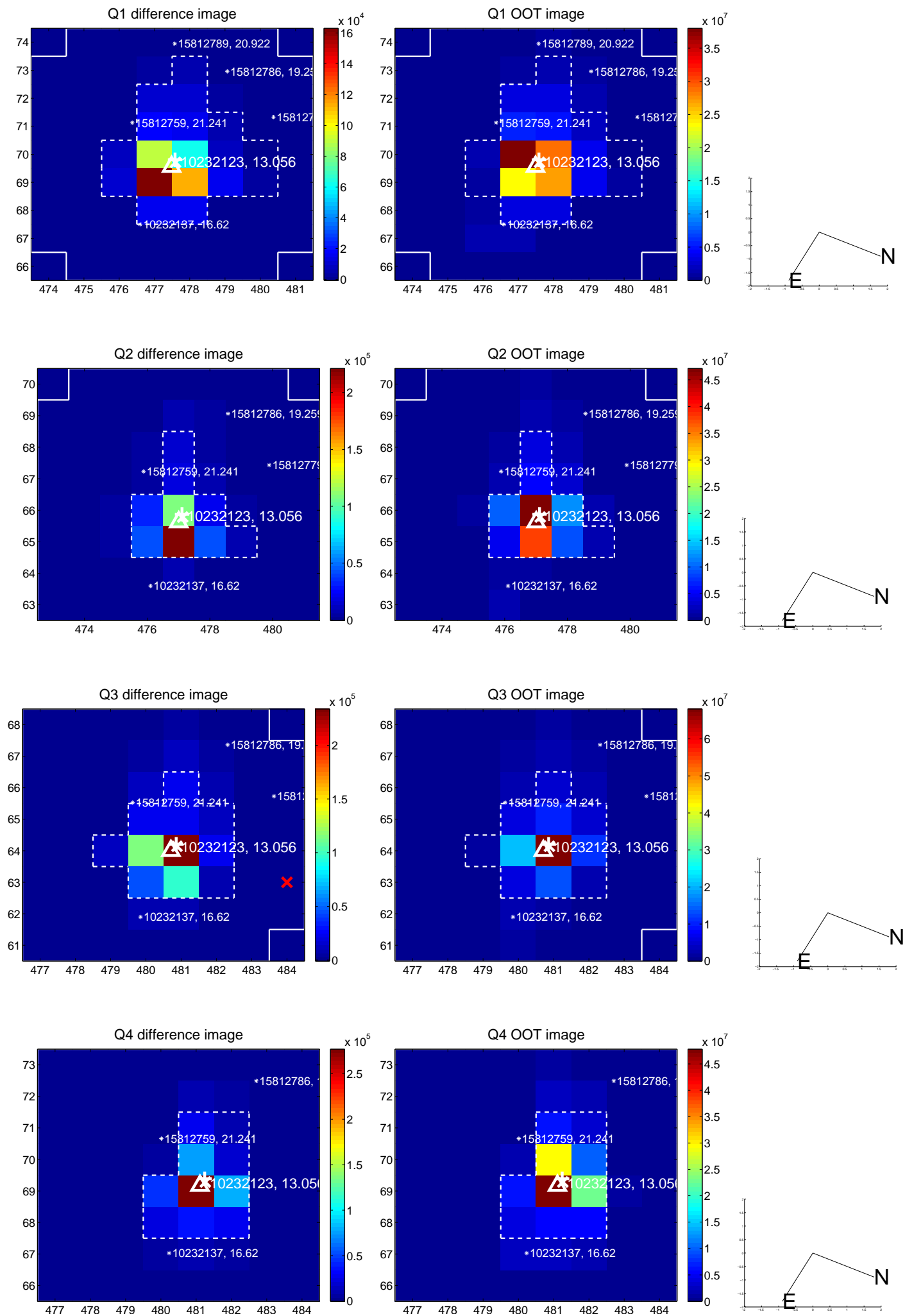
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.016 \pm 0.067$	15.13	$1.016 \pm 0.067$	$0.004 \pm 0.069$
PRF-fit source offset from KIC position	$0.787 \pm 0.068$	11.61	$0.749 \pm 0.068$	$-0.241 \pm 0.069$
photometric centroid source offset	$0.54 \pm 0.01$	47.61	$0.51 \pm 0.01$	$-0.18 \pm 0.01$



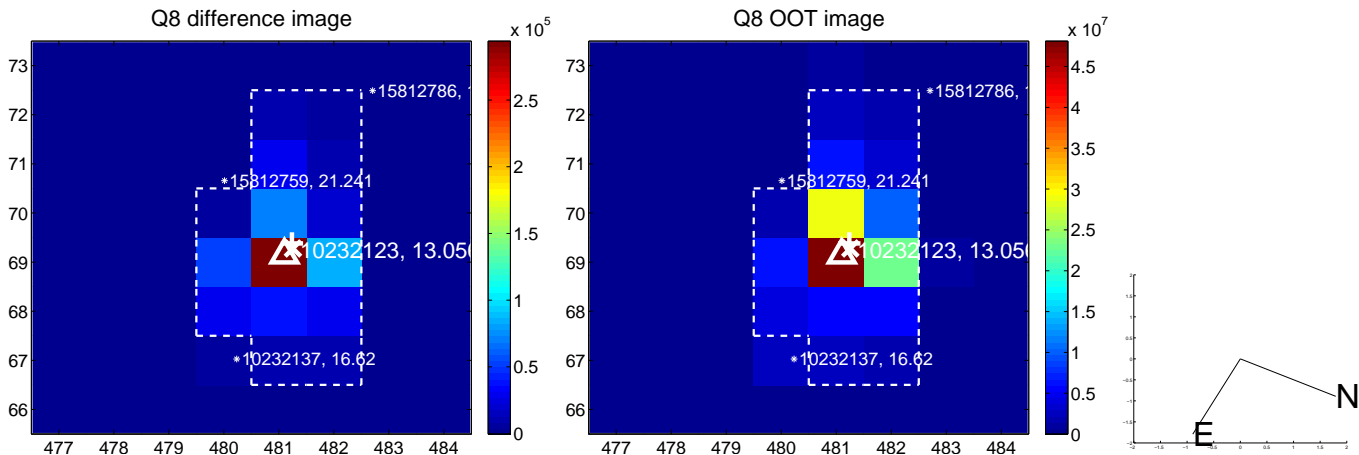
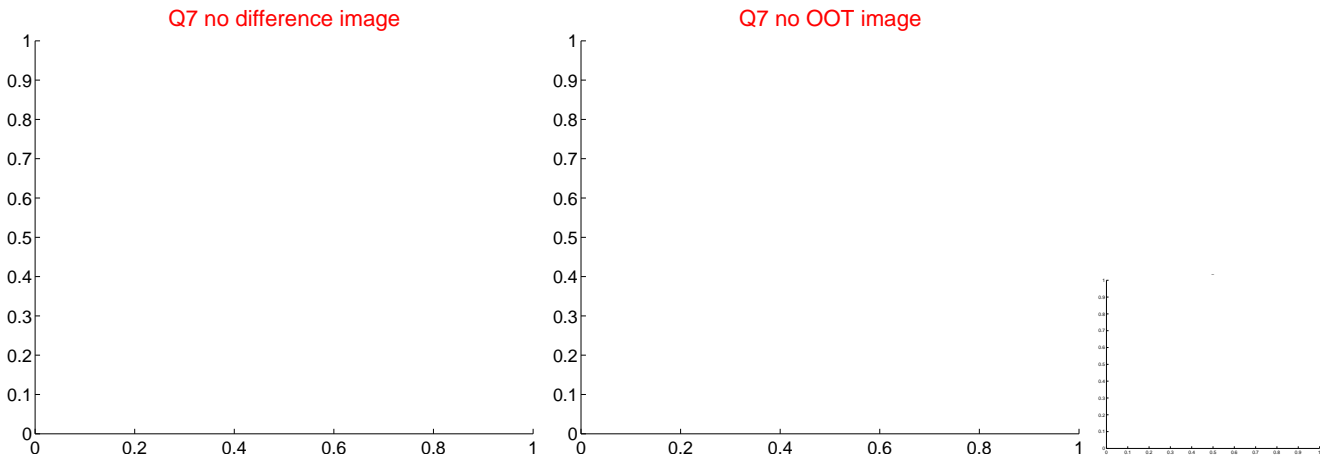
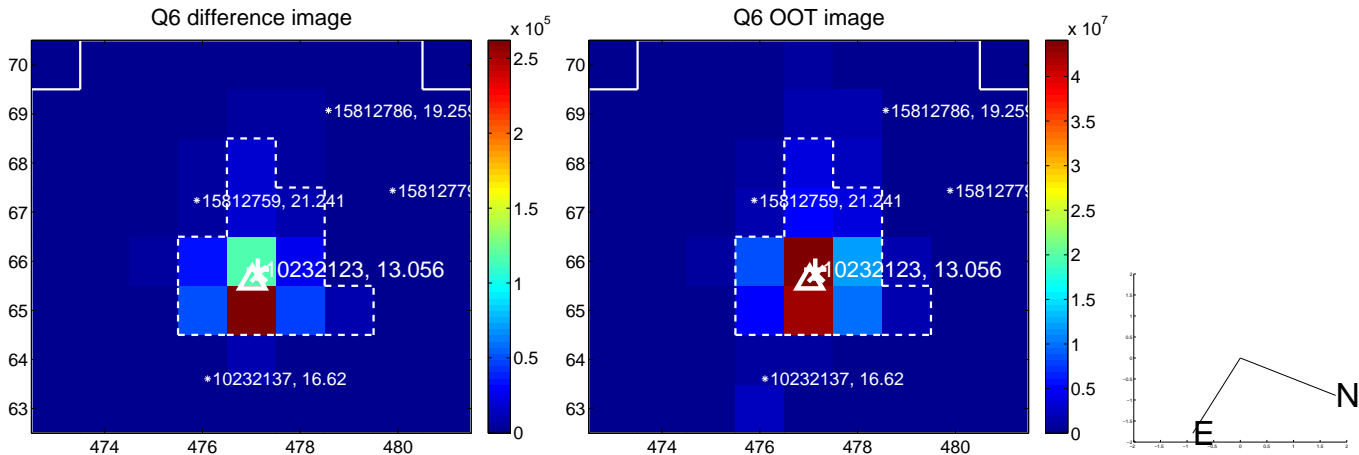
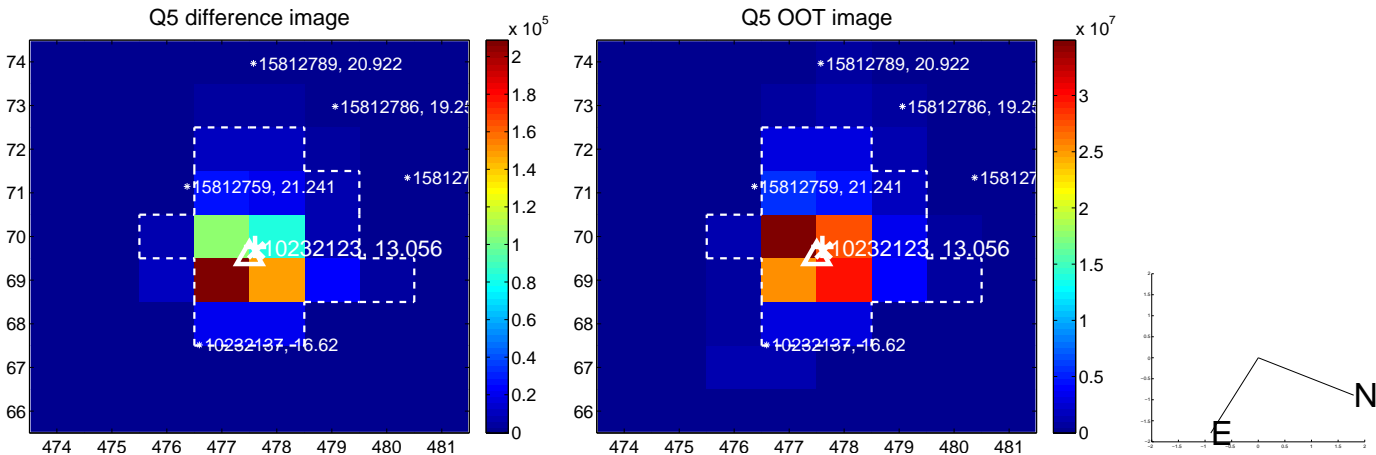
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

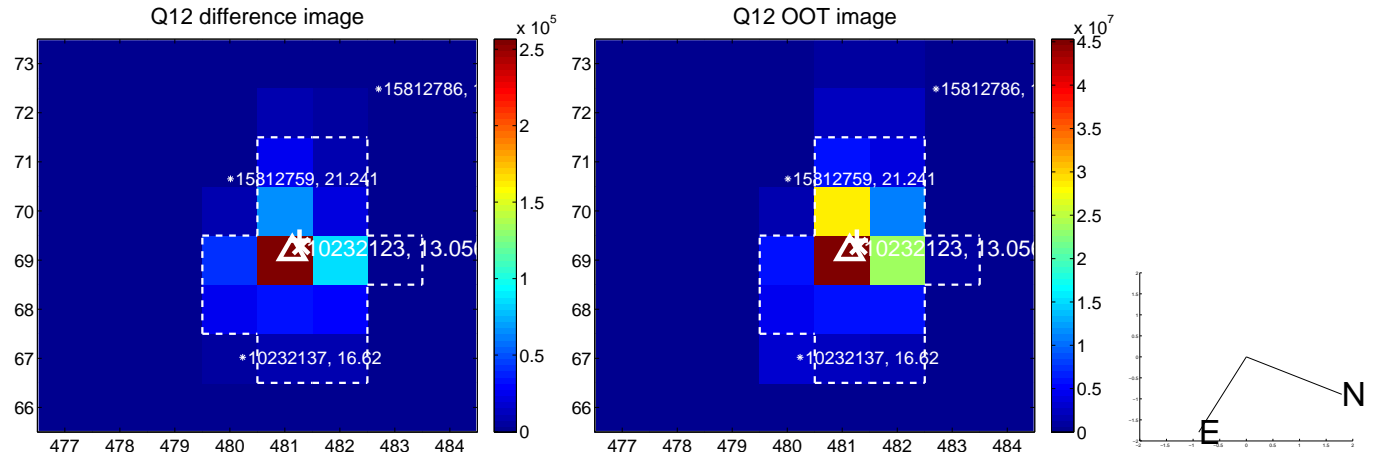
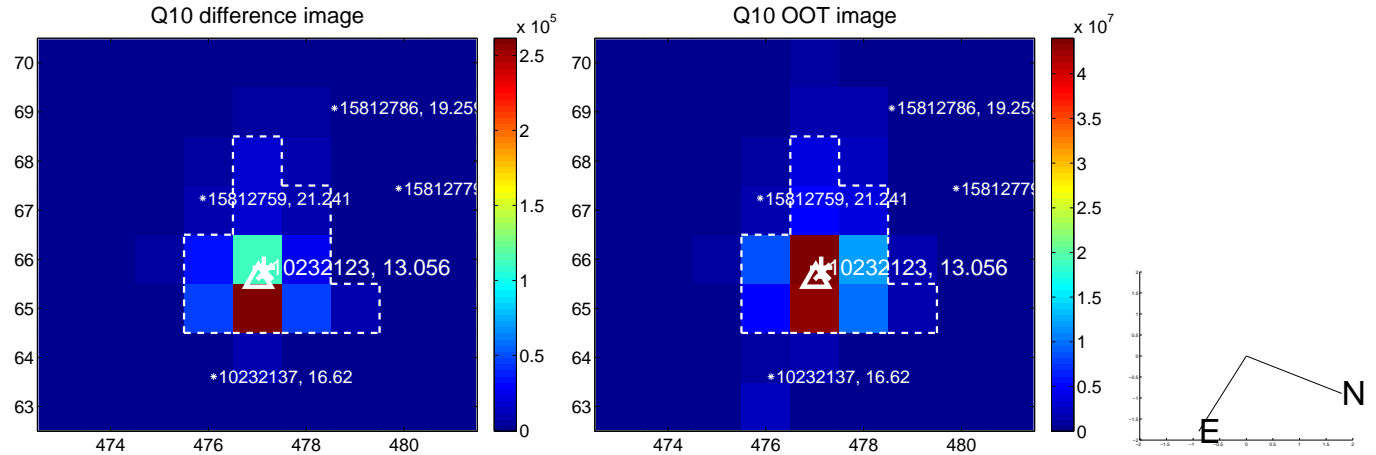
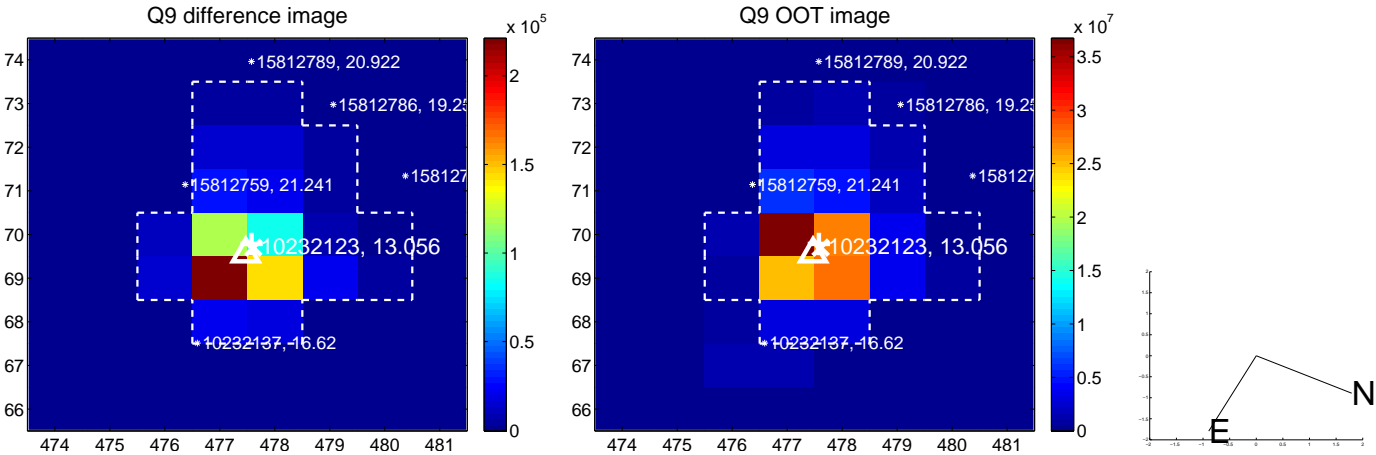




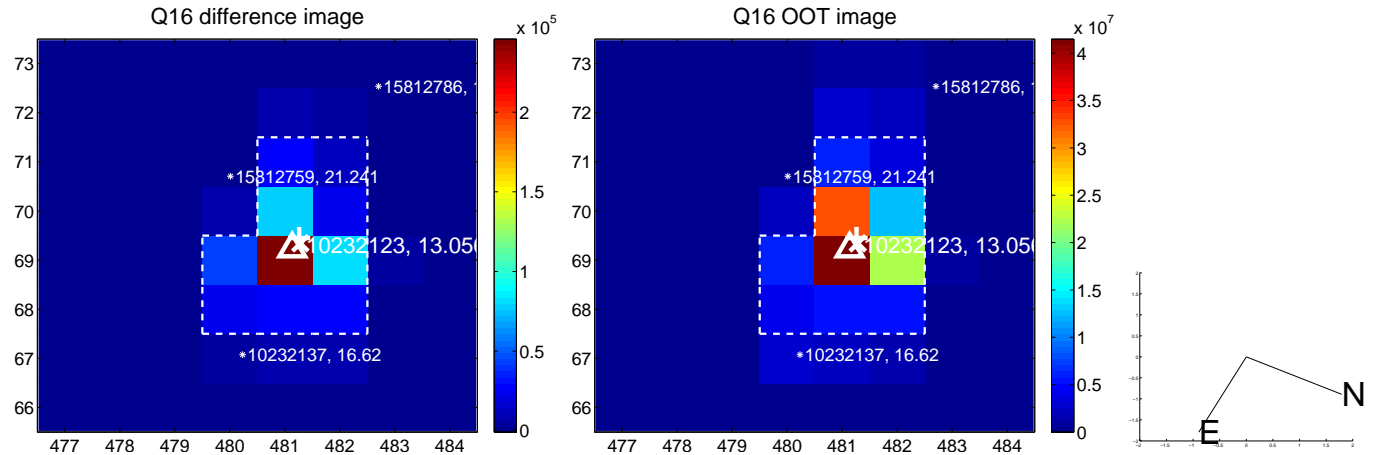
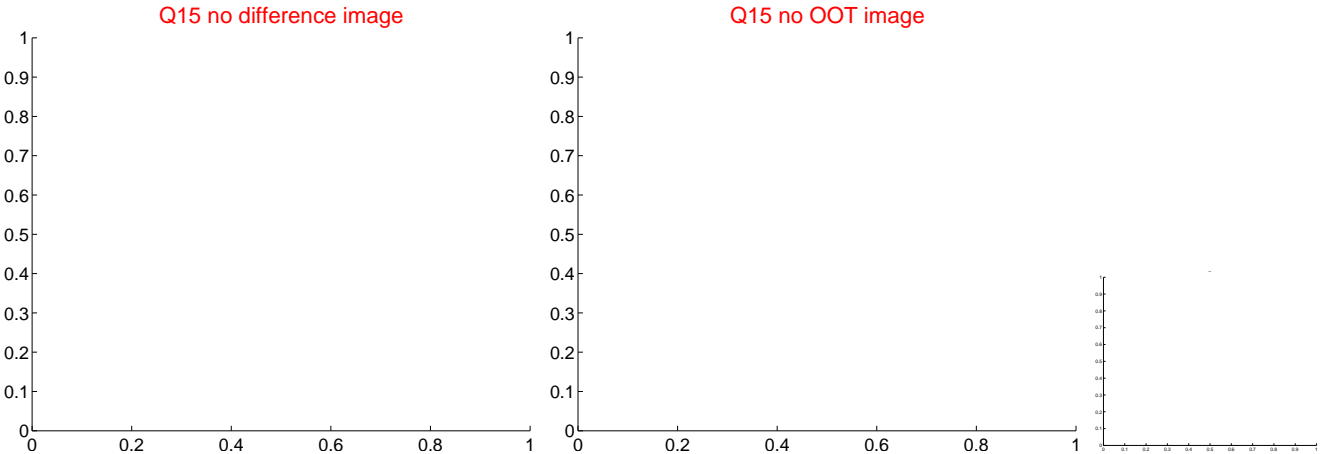
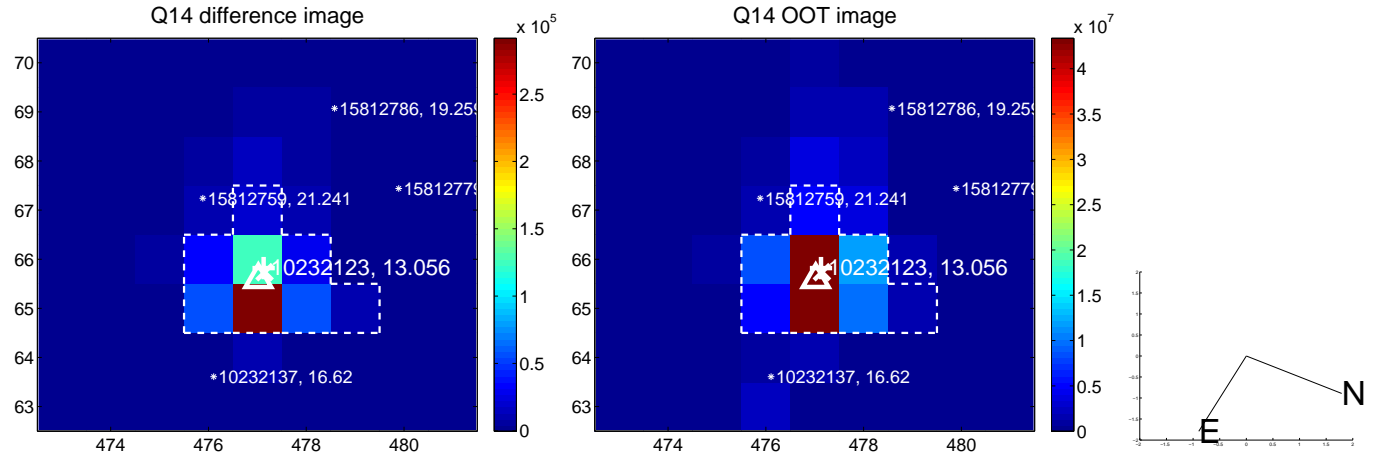
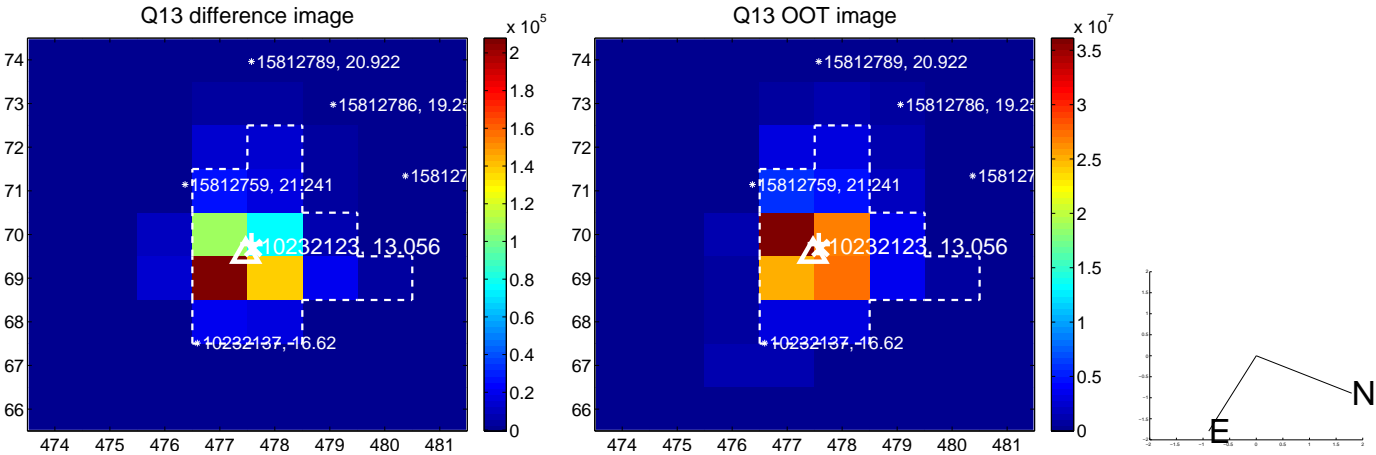
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



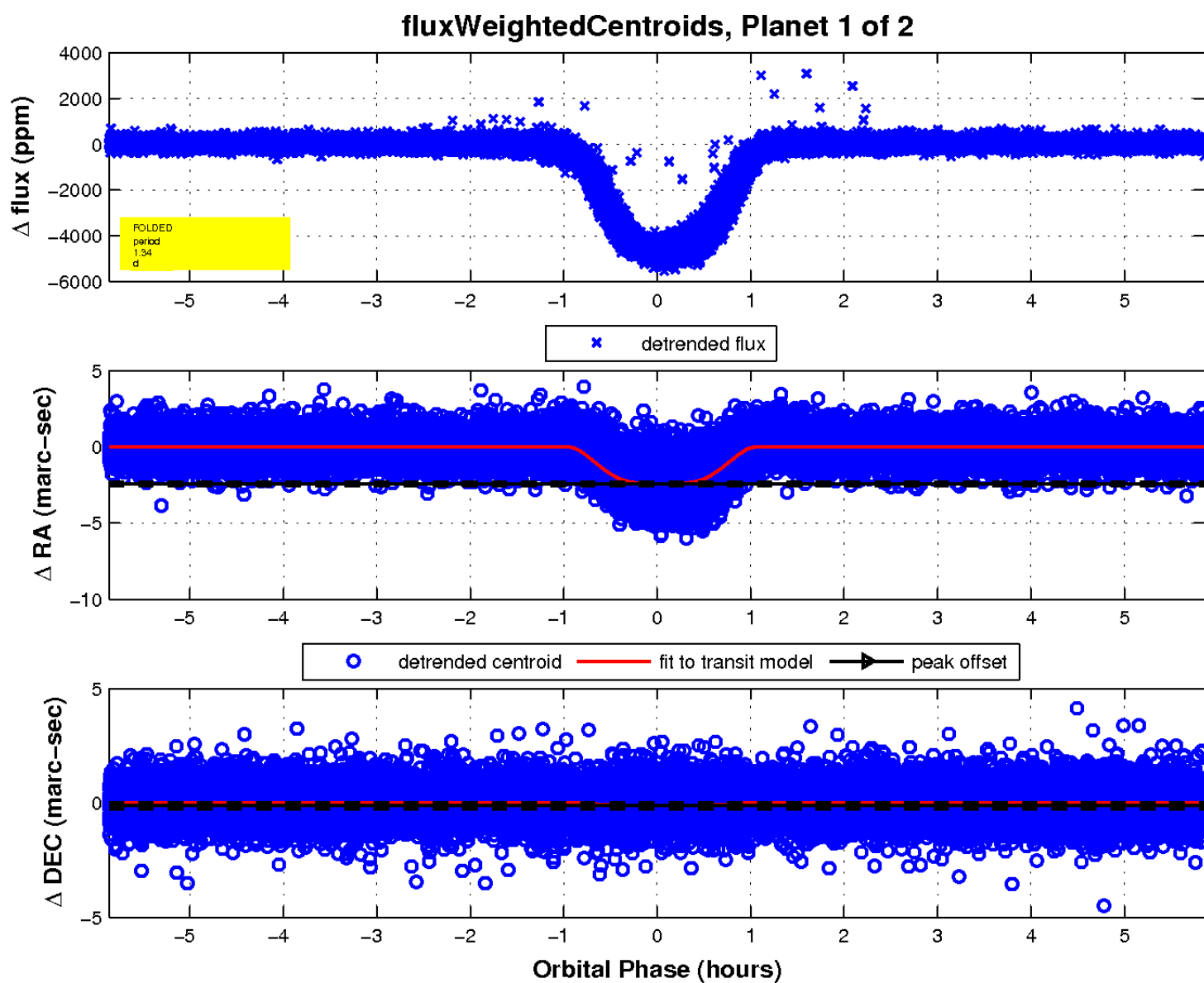
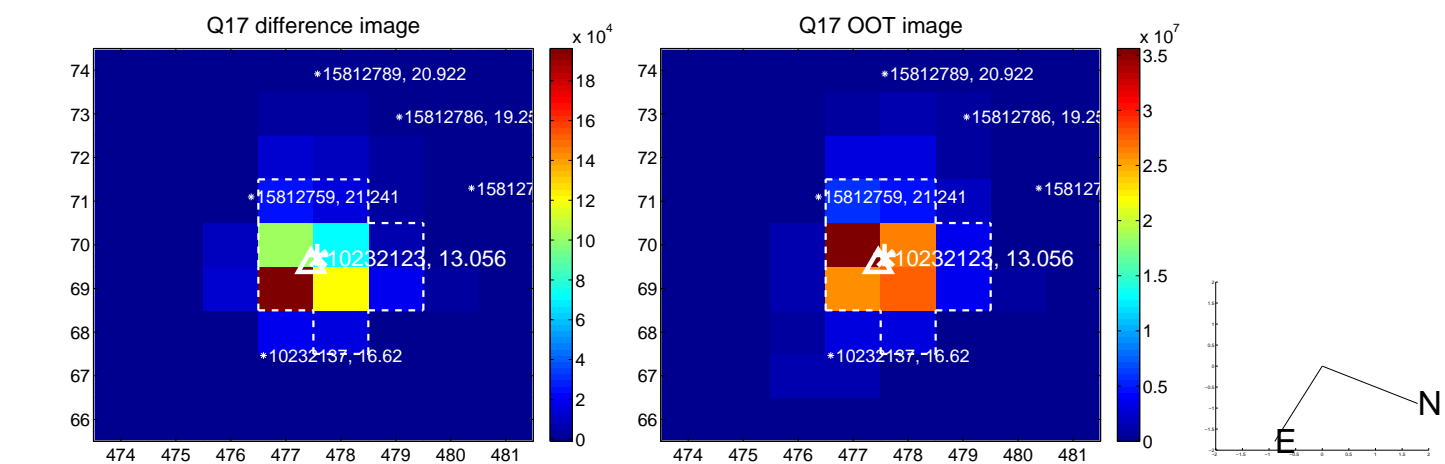
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

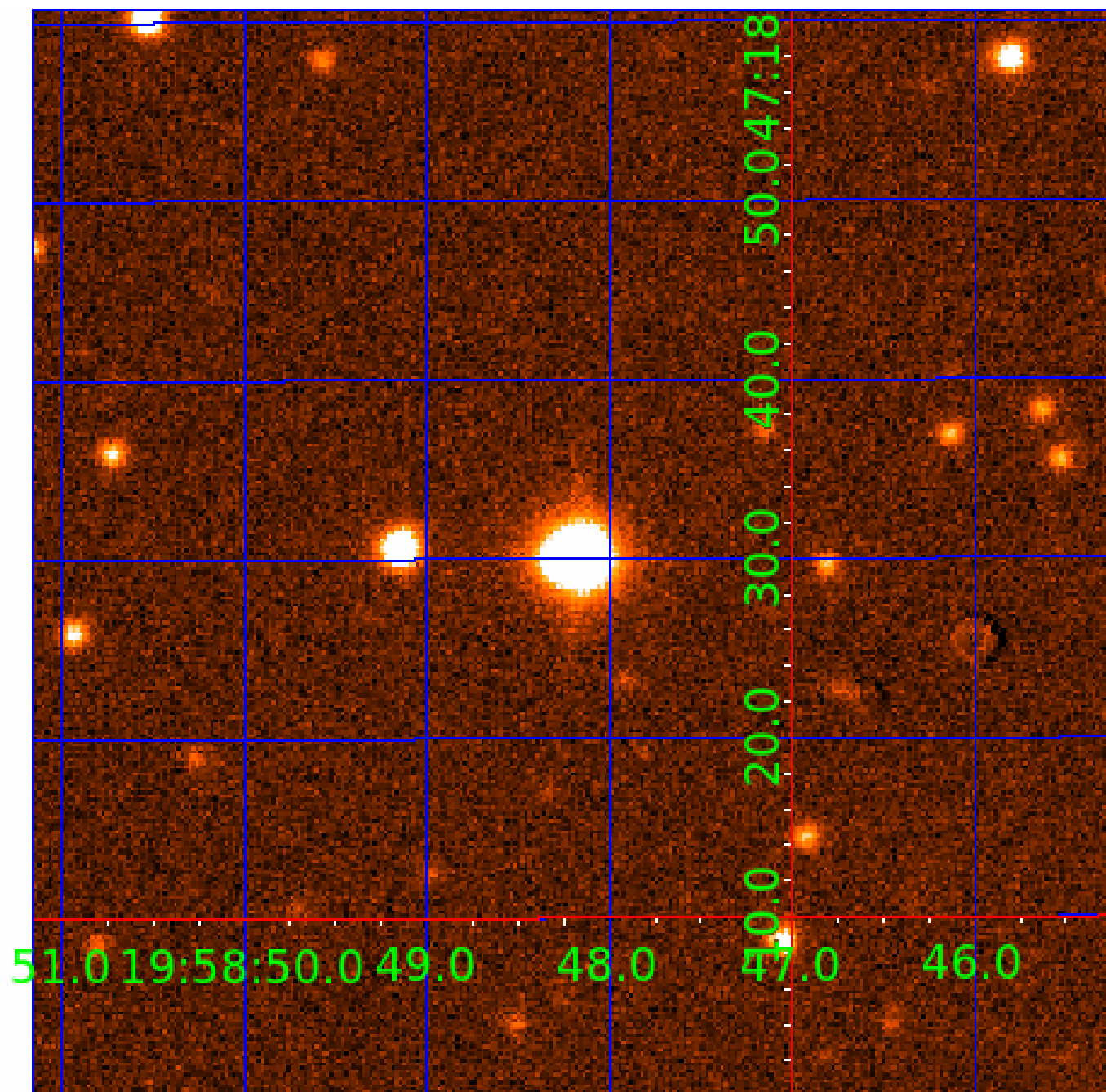


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010232123

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010232123-01	OBS	1075.01	1.343756	131.936249	4557.3	1.955	1166.5	907.0	2.31	6324	18.41	11742.47
010232123-02	OBS	No	1.343754	132.606576	153.5	1.451	33.1	40.0	2.31	6324	3.37	11742.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010232123-01	OBS	PC	0.96	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV—HAS_SEC_TCE—CENT_KIC_POS
010232123-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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

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

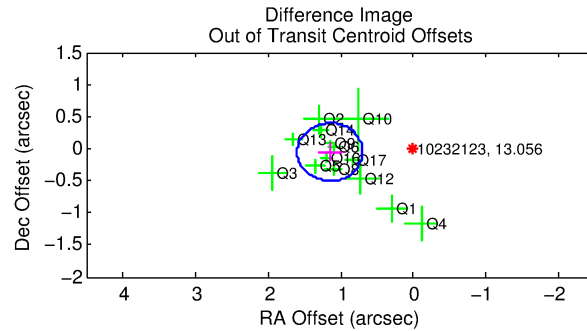
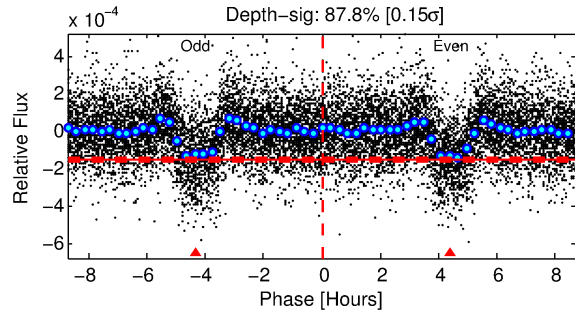
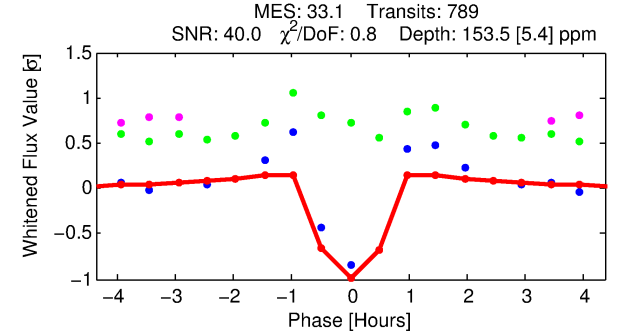
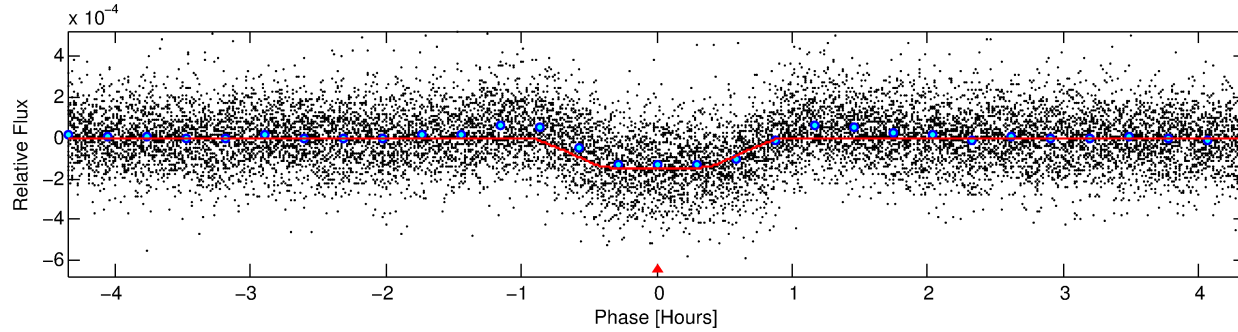
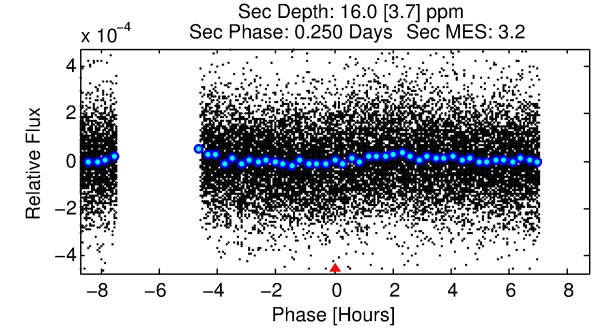
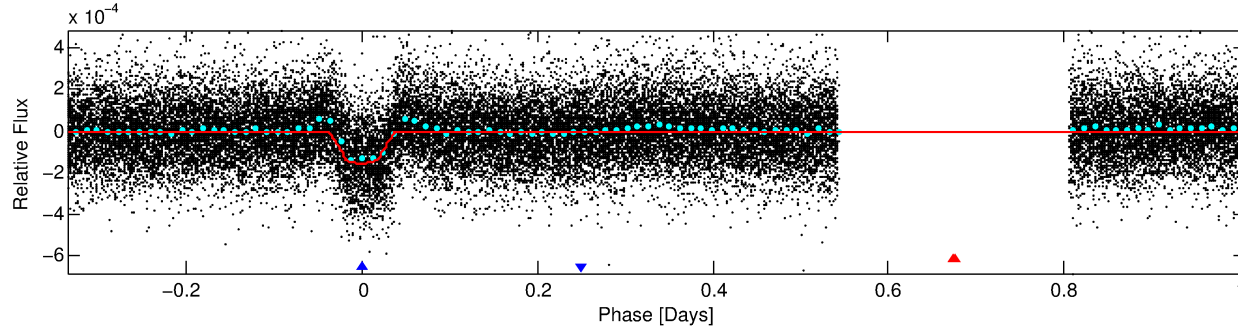
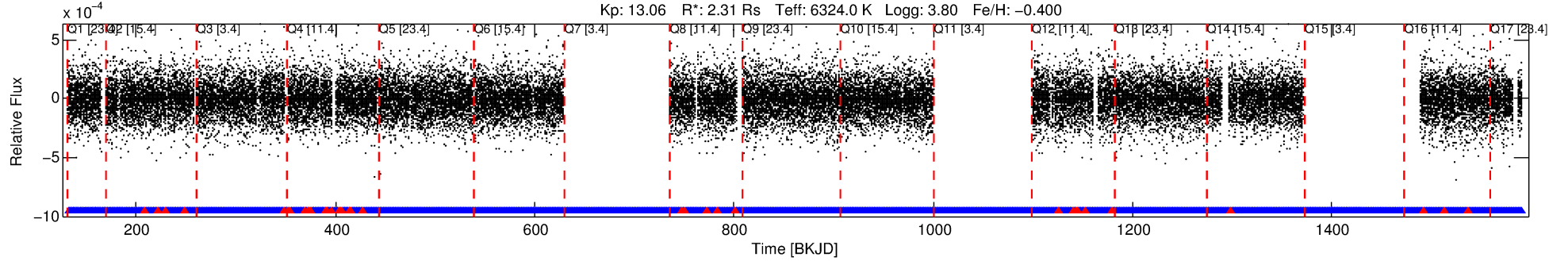
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010232123-02

No Significant Match Found

# DV One-Page Summary

KIC: 10232123 Candidate: 2 of 2 Period: 1.344 d  
KOI: K01075 Corr: No Ephemeris Match



## DV Fit Results:

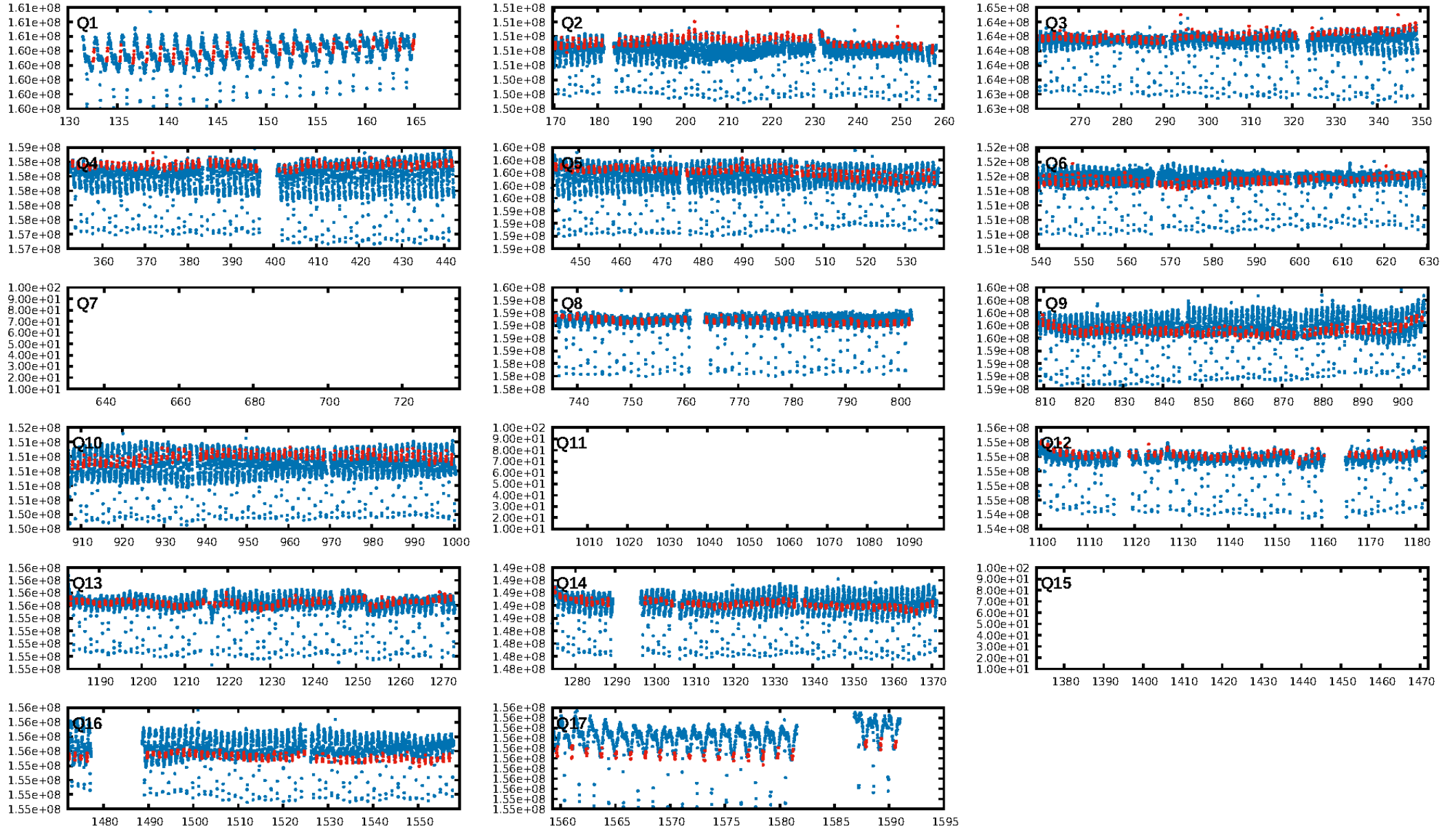
Period = 1.34375 [0.00000] d  
Epoch = 132.6066 [0.0005] BKJD  
Rp/R\* = 0.0133 [0.0019]  
a/R\* = 3.40 [2.49]  
b = 0.90 [0.17]  
Seff = 11742.50 [10291.48]  
Teq = 2654 [582] K  
Rp = 3.37 [1.75] Re  
a = 0.0255 [0.0133] AU  
Ag = 0.51 [0.48] [-1.03σ]  
Teffp = 3465 [341] K [1.20σ]

## DV Diagnostic Results:

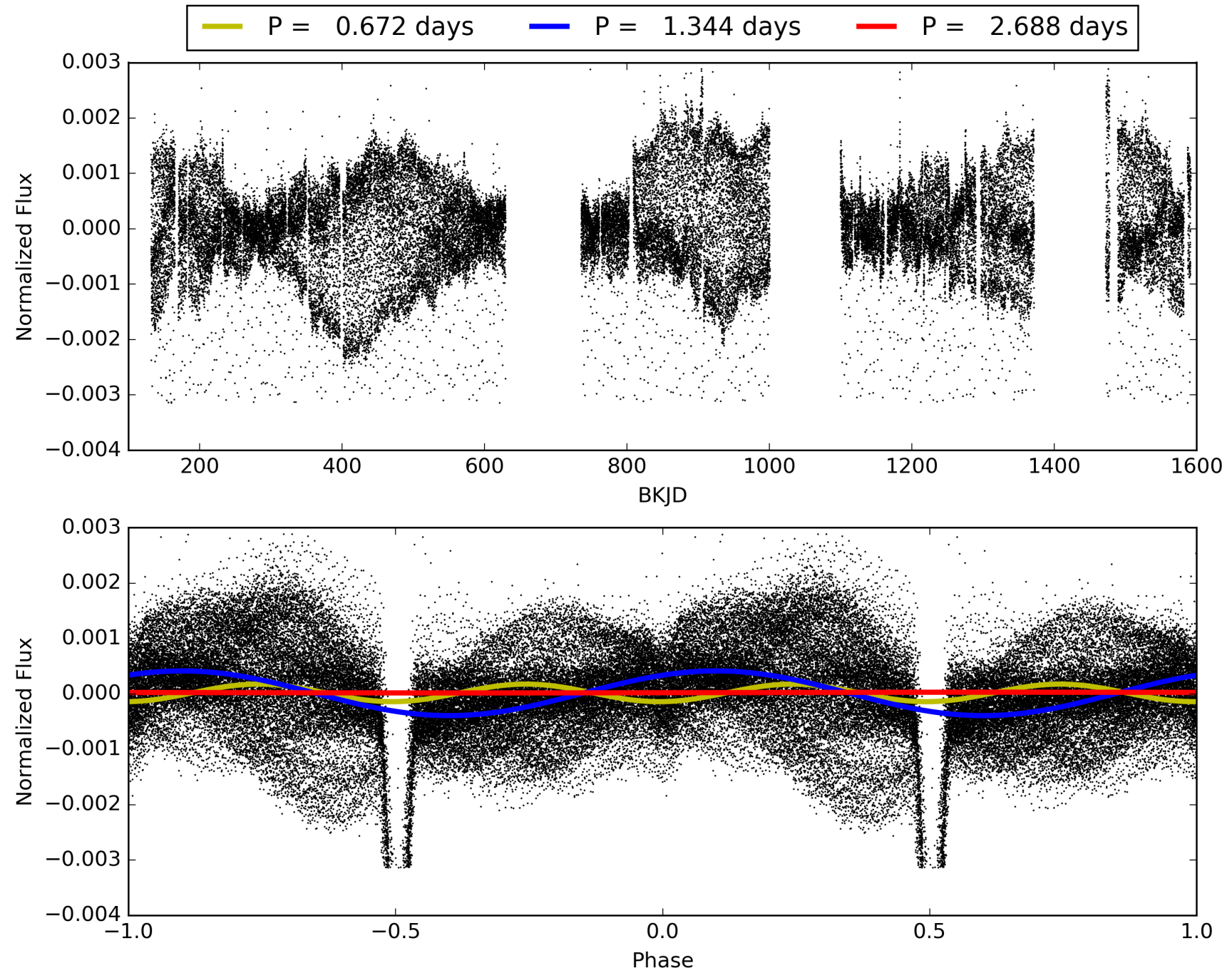
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.71e-212  
RollingBand-fgt: 0.95 [709/744]  
GhostDiagnostic-chr: -6.677  
Centroid-sig: 37.8%  
Centroid-so: 0.046 arcsec [0.14σ]  
OotOffset-rm: 1.150 arcsec [7.66σ]  
KicOffset-rm: 0.923 arcsec [7.12σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 1.00 [14/14]



# TCE 010232123-02, PDC Light Curves

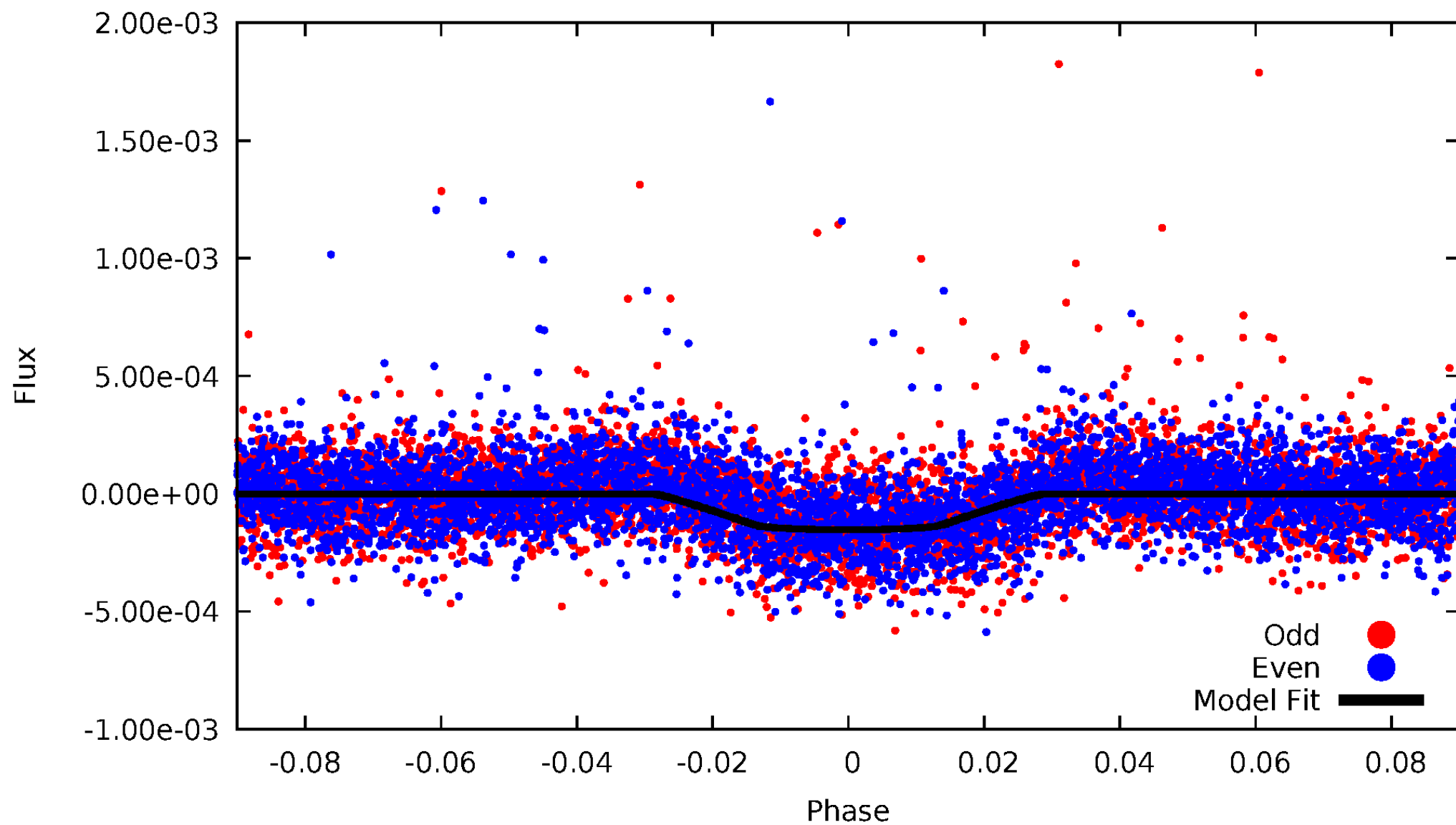


# TCE 010232123-02



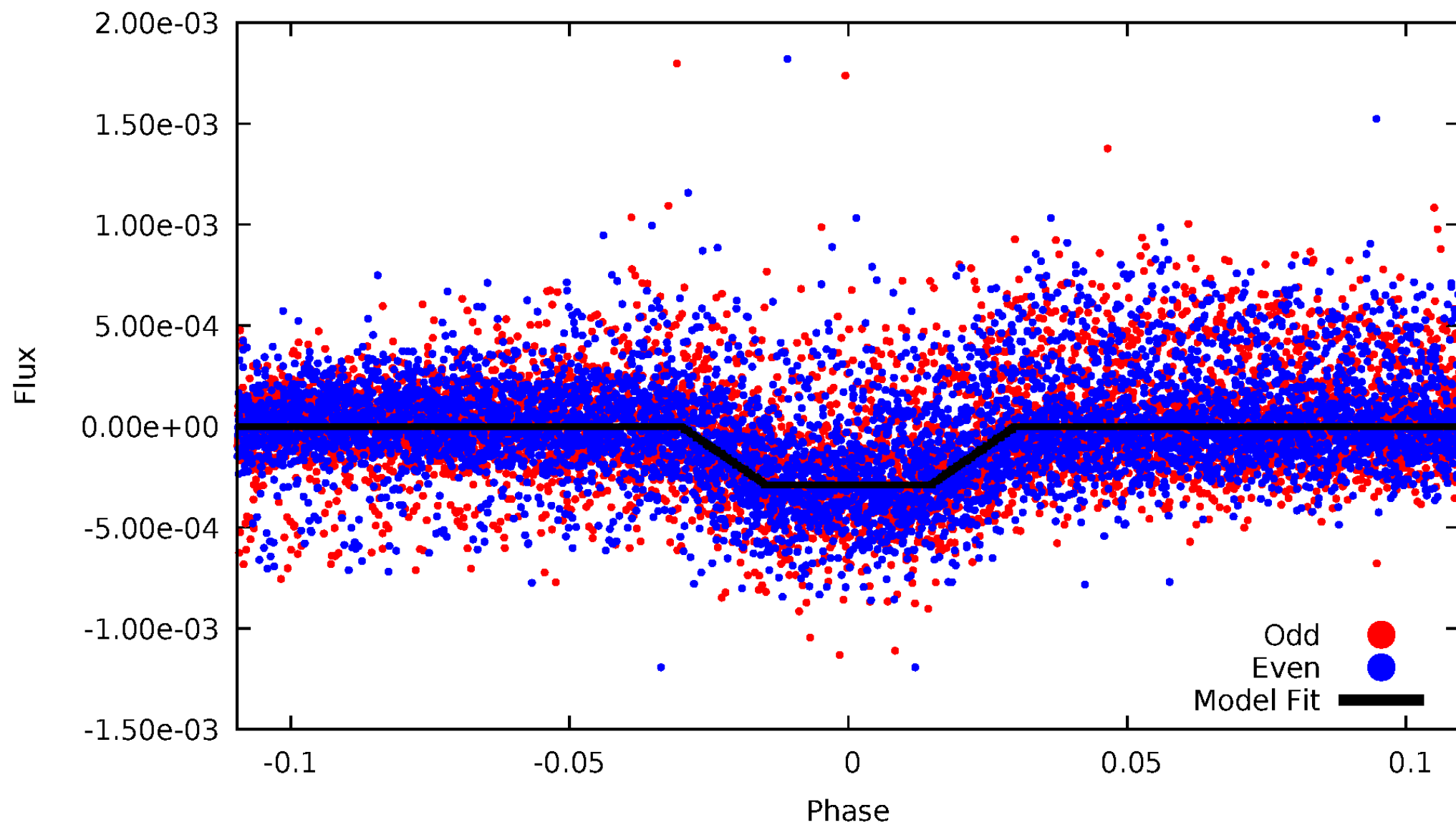
# DV Odd/Even

TCE 010232123-02



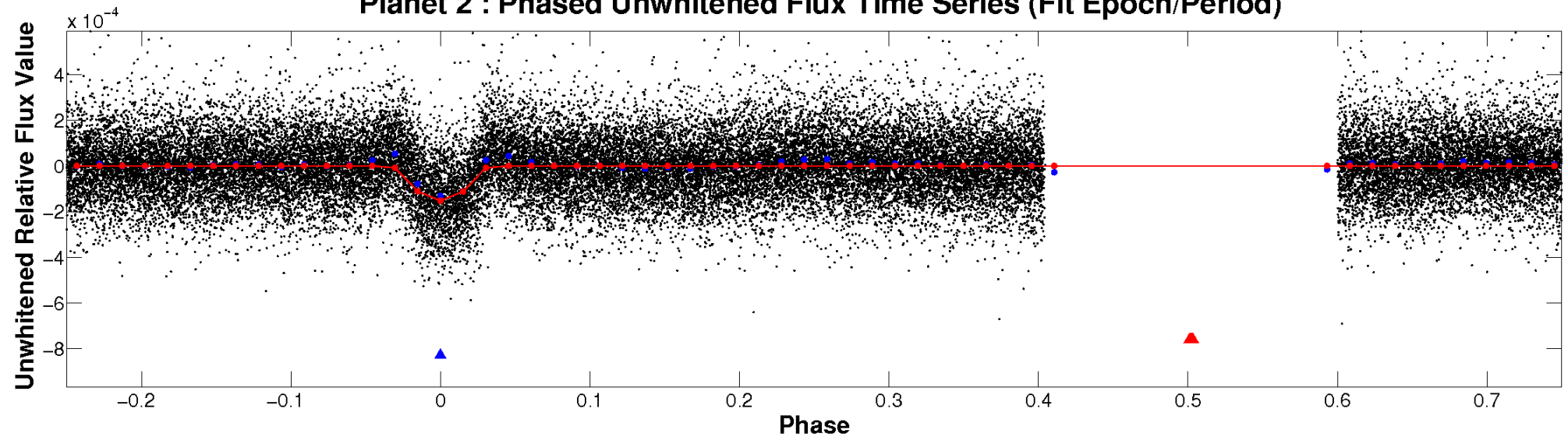
# ALT Odd/Even

TCE 010232123-02

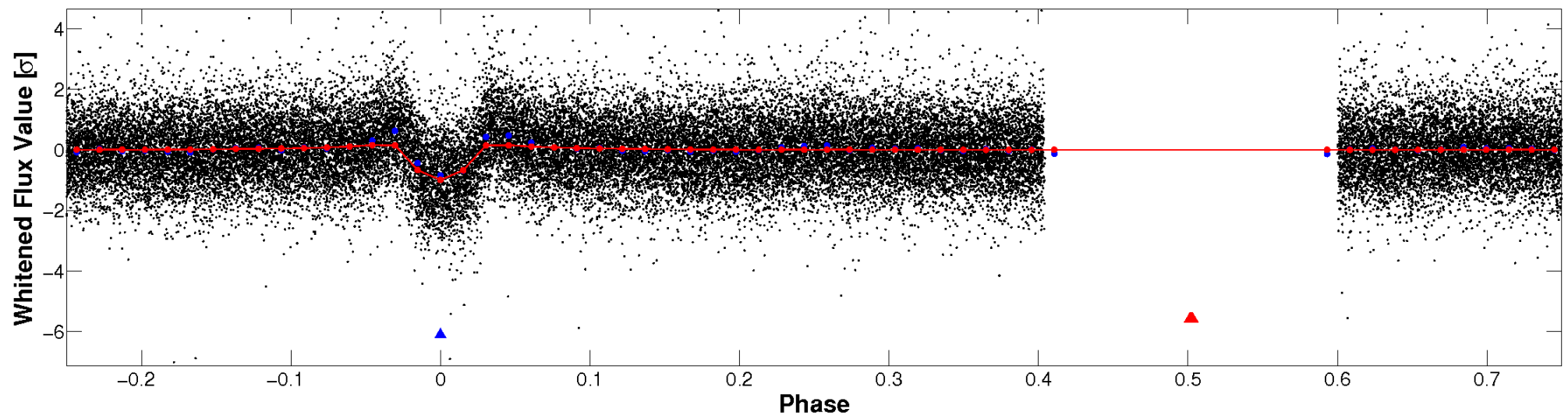


# Non-Whitened Vs. Whitened Light Curve

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



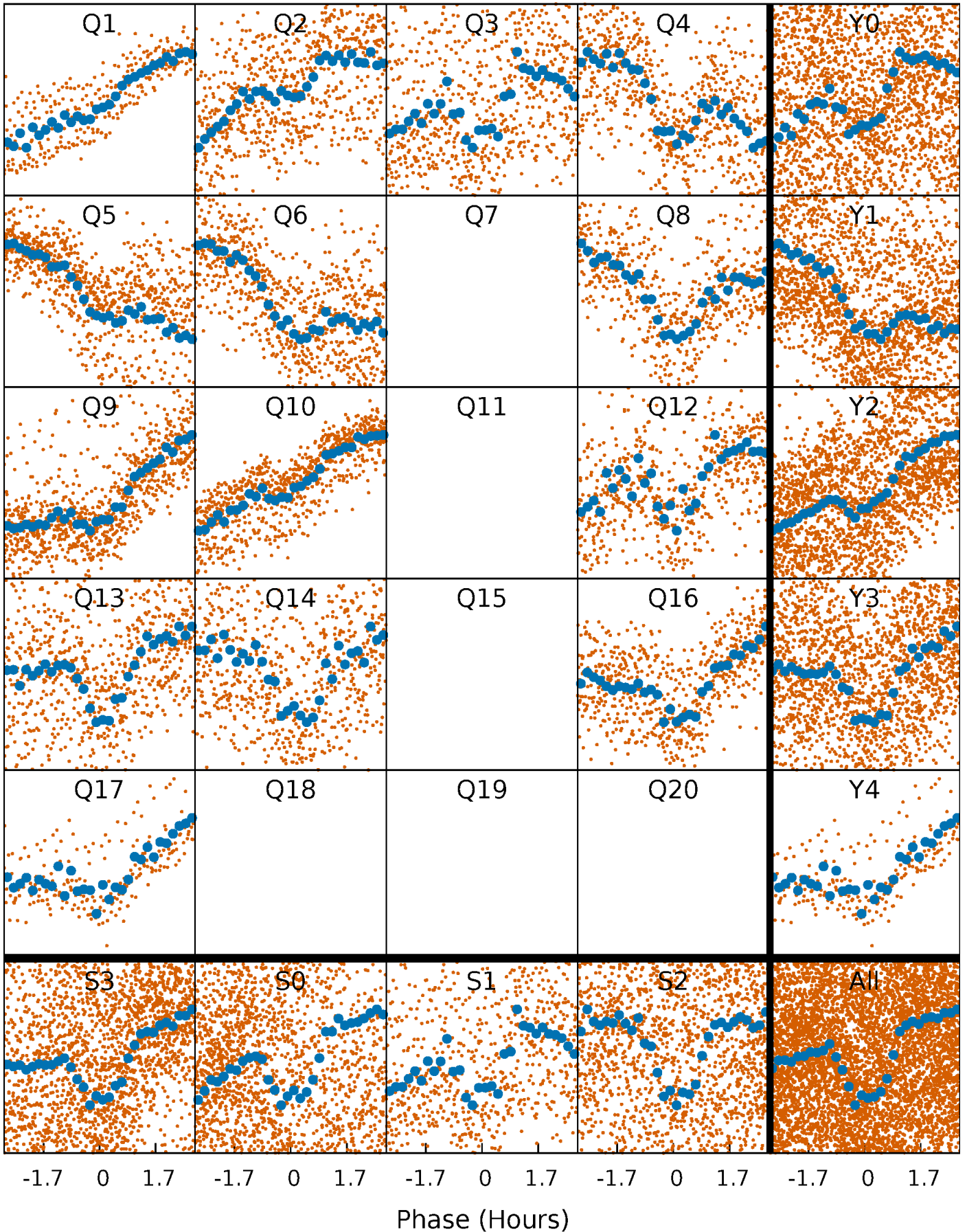
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





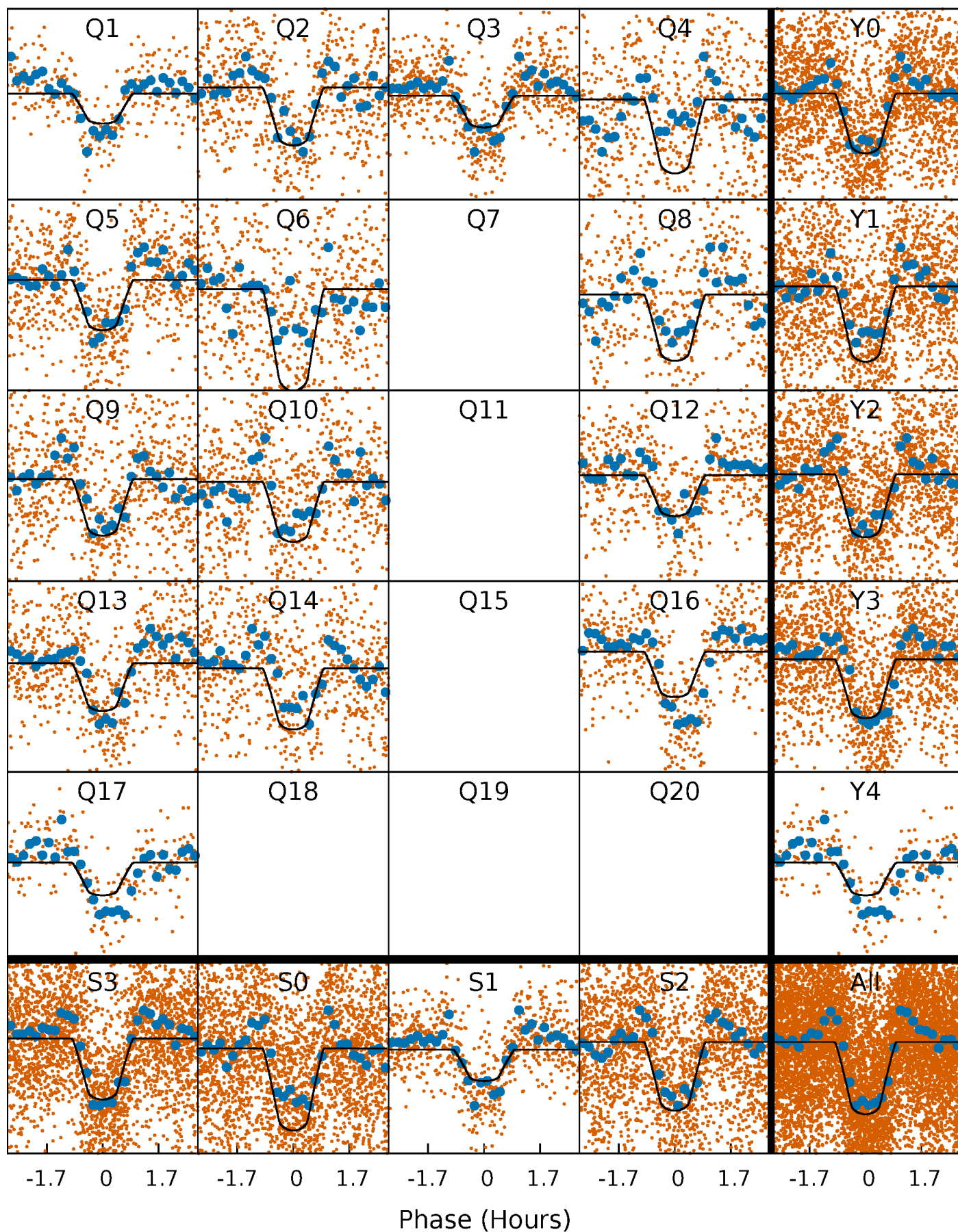
# PDC Quarter-Phased Transit Curves

TCE 010232123-02   P= 1.343754 Days    $T_0=132.606576$  (BKJD)



# DV Quarter-Phased Transit Curves

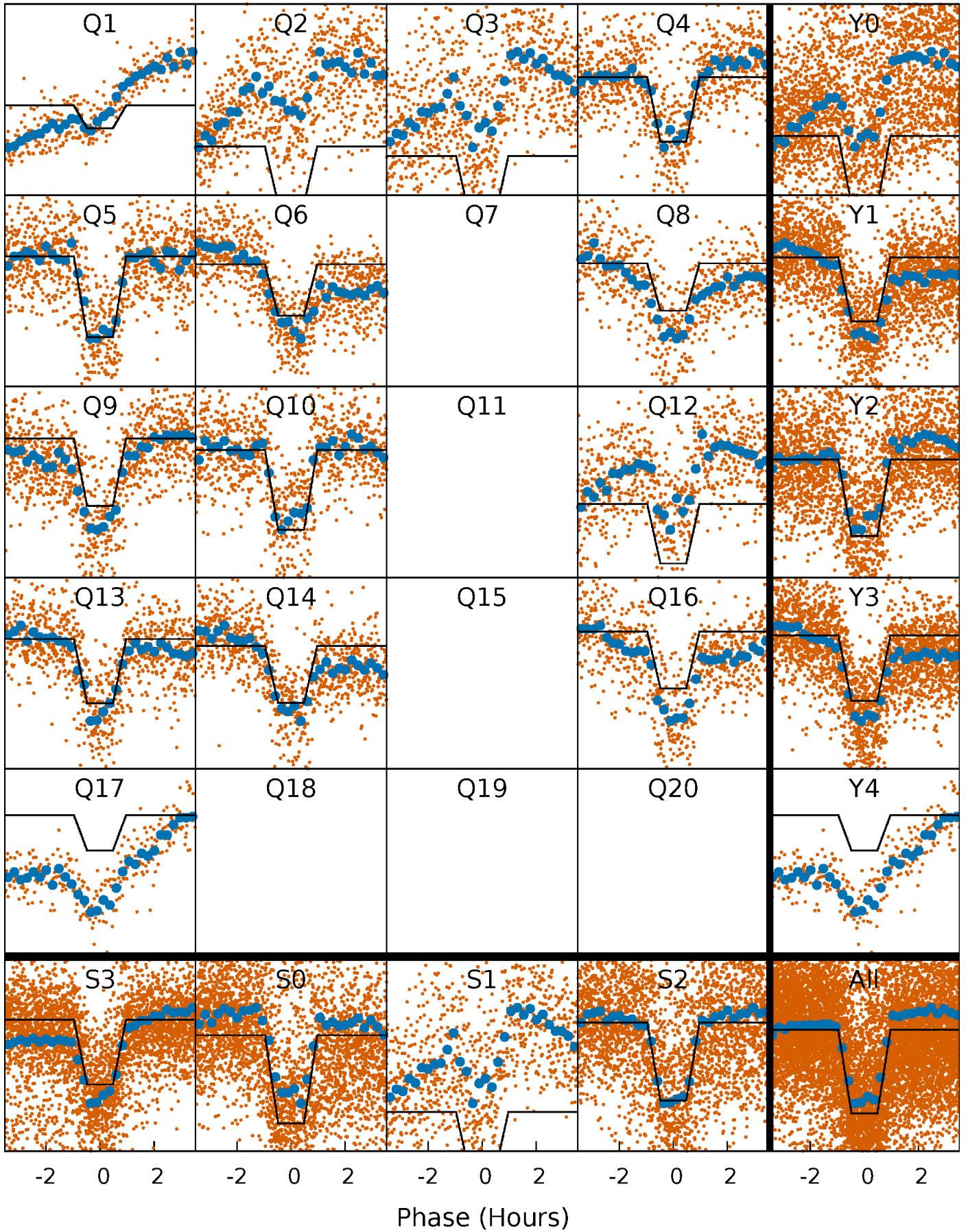
TCE 010232123-02 P= 1.343754 Days  $T_0=132.606576$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

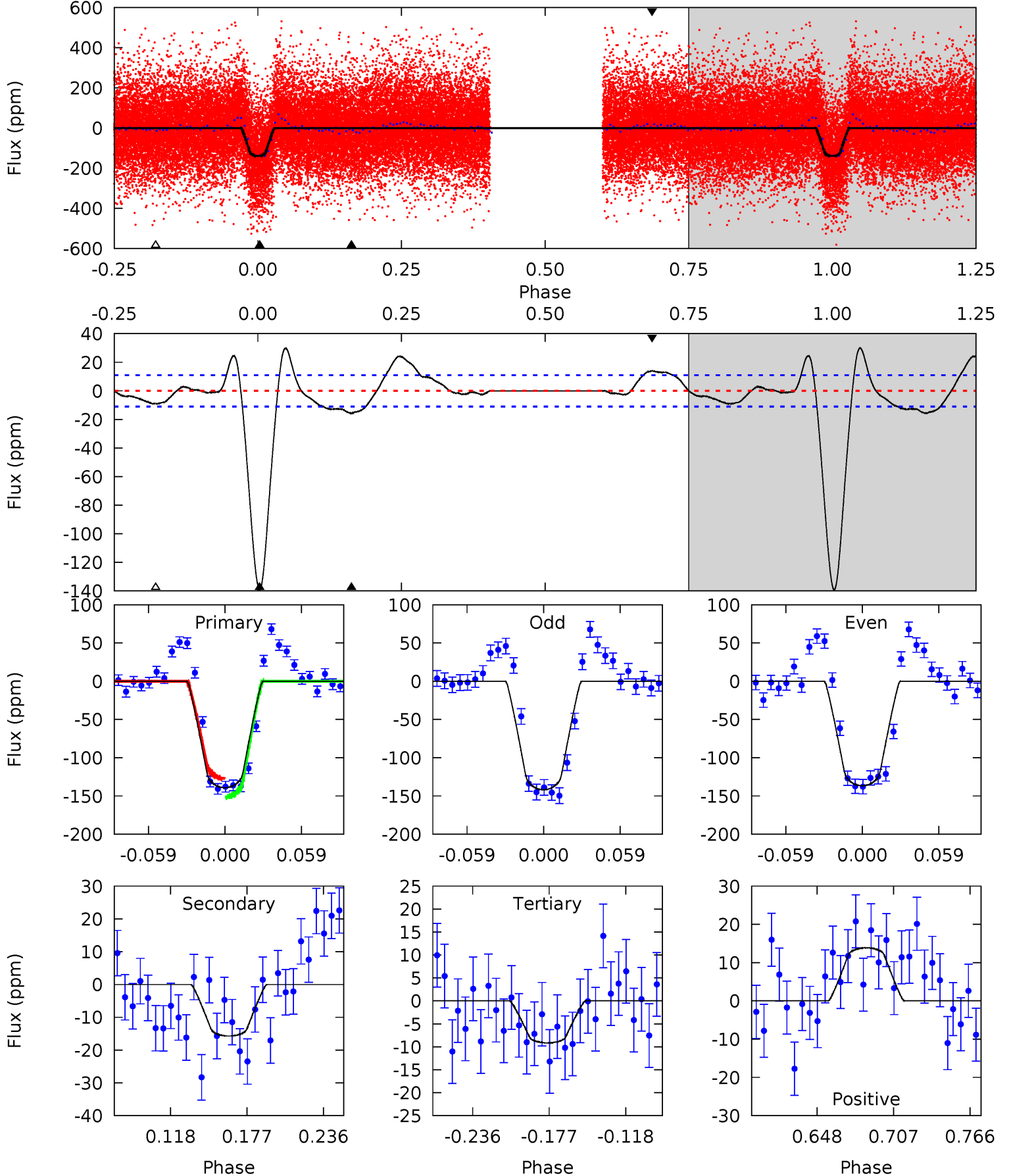
TCE 010232123-02   P= 1.343766 Days    $T_0=132.604707$  (BKJD)



# DV Model-Shift Uniqueness Test

010232123-02, P = 1.343754 Days, E = 131.262822 Days

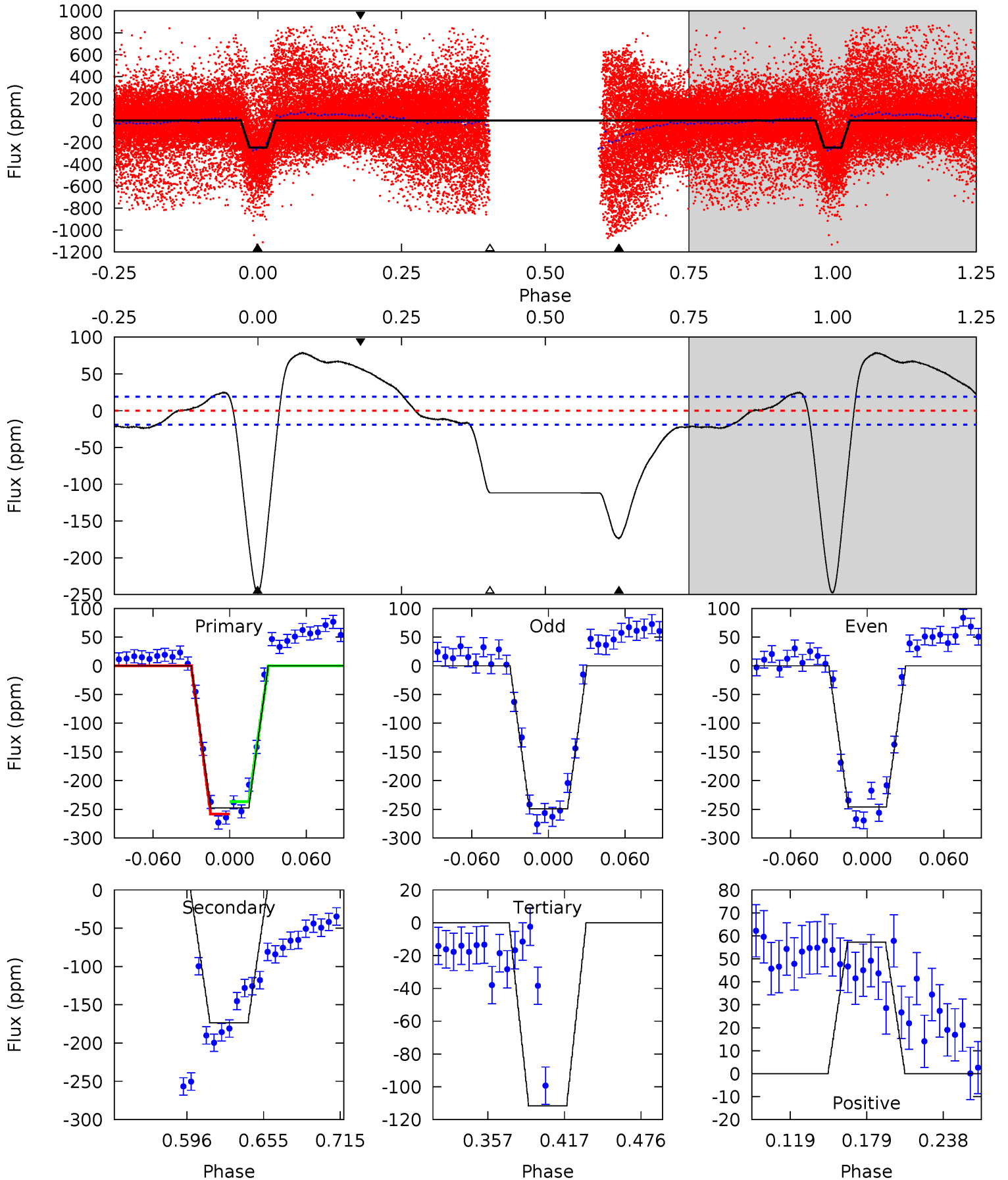
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.4	6.71	3.91	5.92	4.67	1.89	3.46	55.5	53.5	2.80	0.79	1.12	0.97	0.18	5.25



# Alt Model-Shift Uniqueness Test

010232123-02, P = 1.343766 Days, E = 131.260941 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
61.0	42.8	27.5	14.1	4.67	1.88	9.70	33.5	46.9	15.2	28.7	0.41	0.84	0.24	2.75



### Stellar Parameters For KIC 010232123

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6324^{+204}_{-227}$	$3.800^{+0.520}_{-0.130}$	$-0.400^{+0.300}_{-0.300}$	$2.312^{+0.494}_{-1.152}$	$1.230^{+0.193}_{-0.289}$	$0.140^{+0.832}_{-0.055}$
	+3%/-4%	+14%/-3%	+75%/-75%	+21%/-50%	+16%/-23%	+594%/-39%
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 010232123-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-16 \pm 2$	$3.20^{+0.77}_{-0.88}$	$3618^{+290}_{-442}$	$3353^{+409}_{-573}$	$0.548^{+0.479}_{-0.187}$
Alt.	$-173 \pm 4$	$4.04^{+0.95}_{-1.07}$	$3618^{+294}_{-443}$	$5484^{+415}_{-314}$	$3.808^{+3.023}_{-1.186}$

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

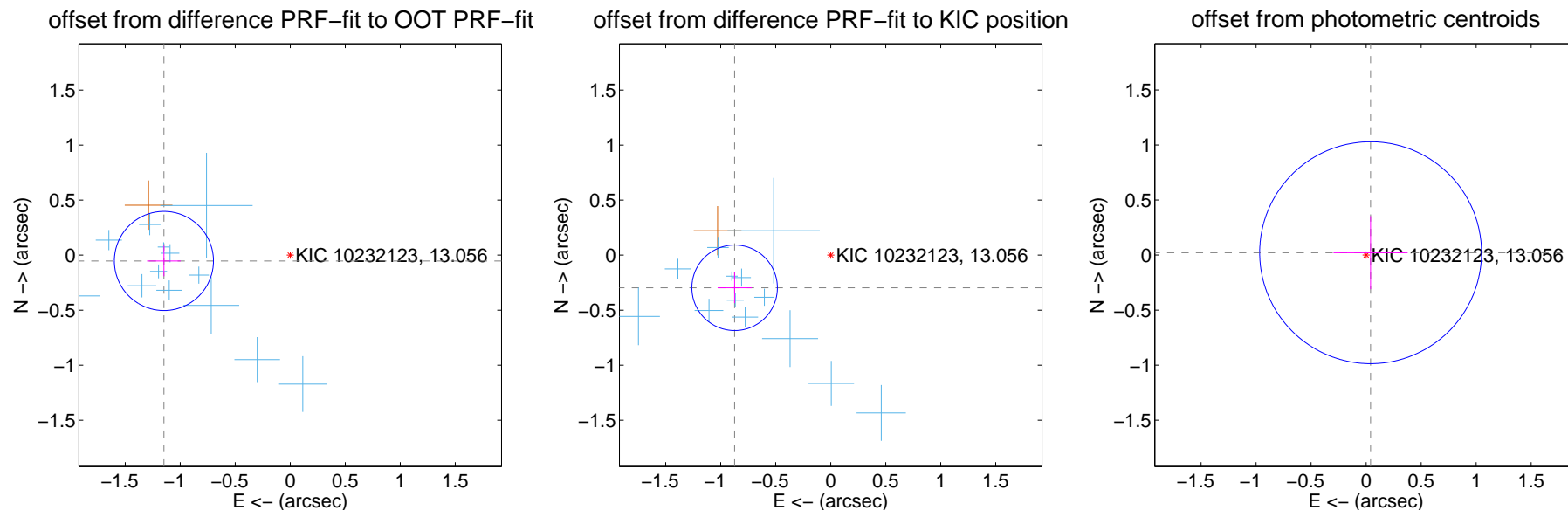
## DV Centroid Data

Supplemental centroid analysis for 010232123-02. Kepler magnitude: 13.06. Transit SNR 40.02

There are 13 quarters with good PRF difference image offsets

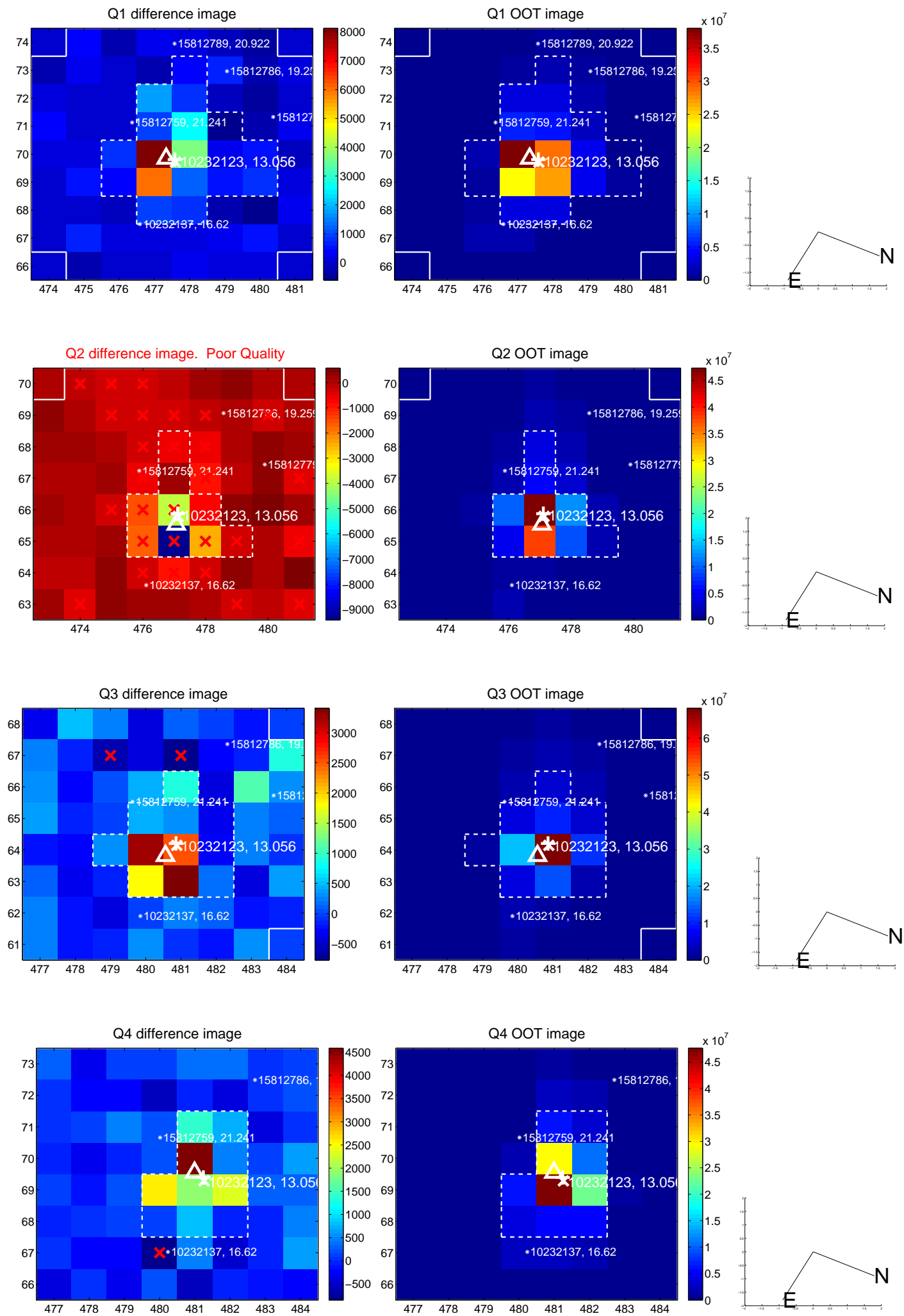
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.150 \pm 0.150$	7.66	$1.149 \pm 0.153$	$-0.053 \pm 0.139$
PRF-fit source offset from KIC position	$0.923 \pm 0.130$	7.12	$0.874 \pm 0.155$	$-0.297 \pm 0.139$
photometric centroid source offset	$0.05 \pm 0.34$	0.14	$-0.04 \pm 0.34$	$0.02 \pm 0.33$

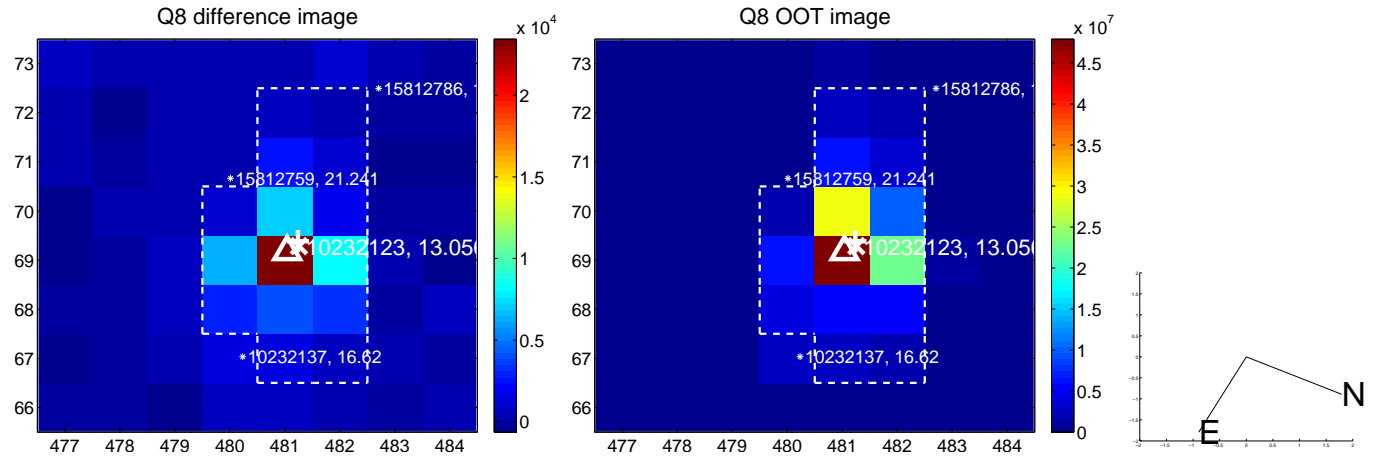
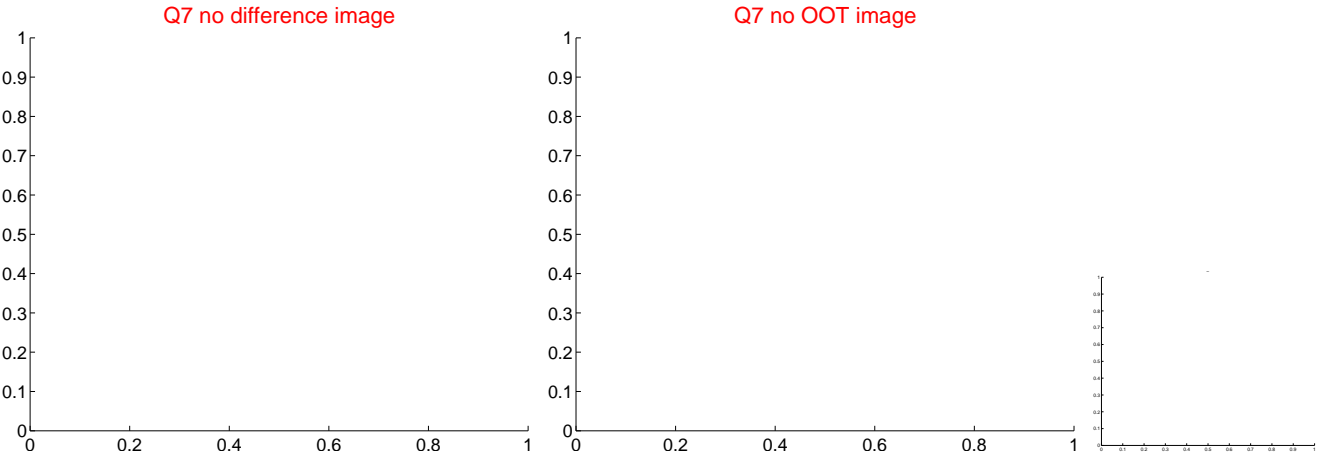
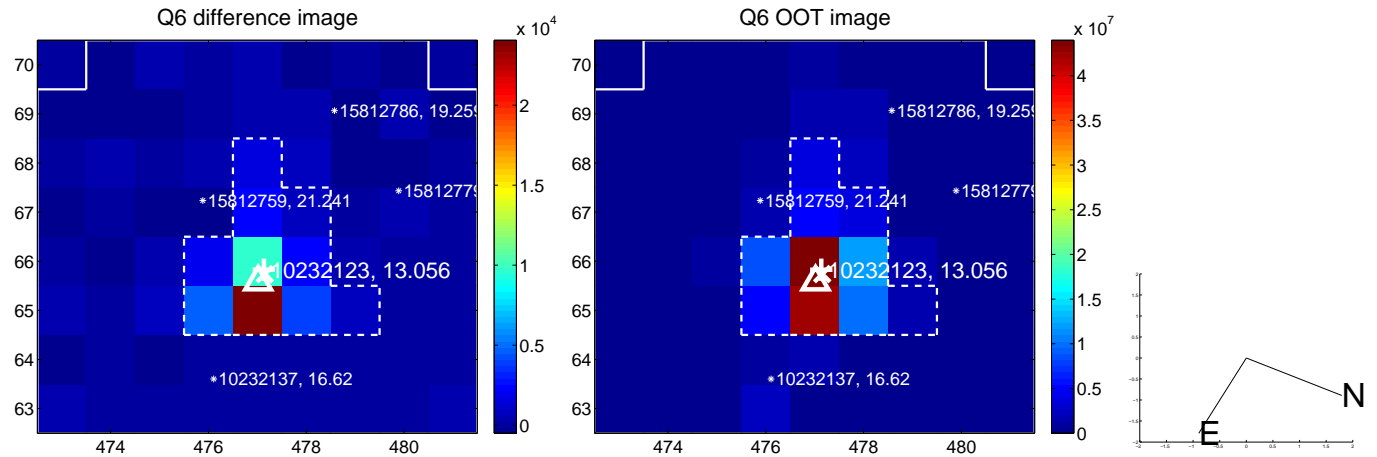
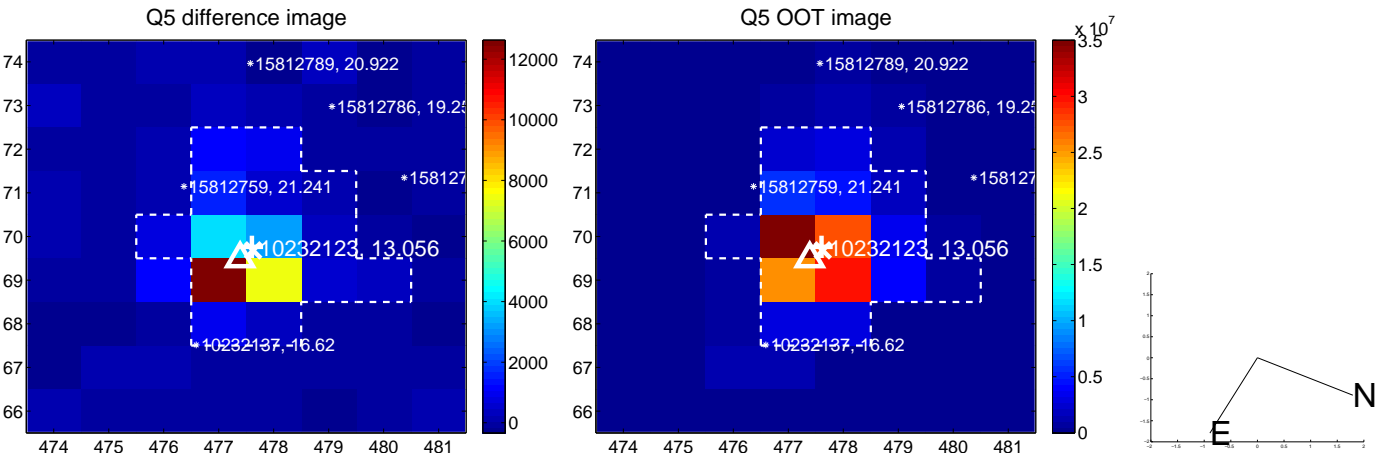


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

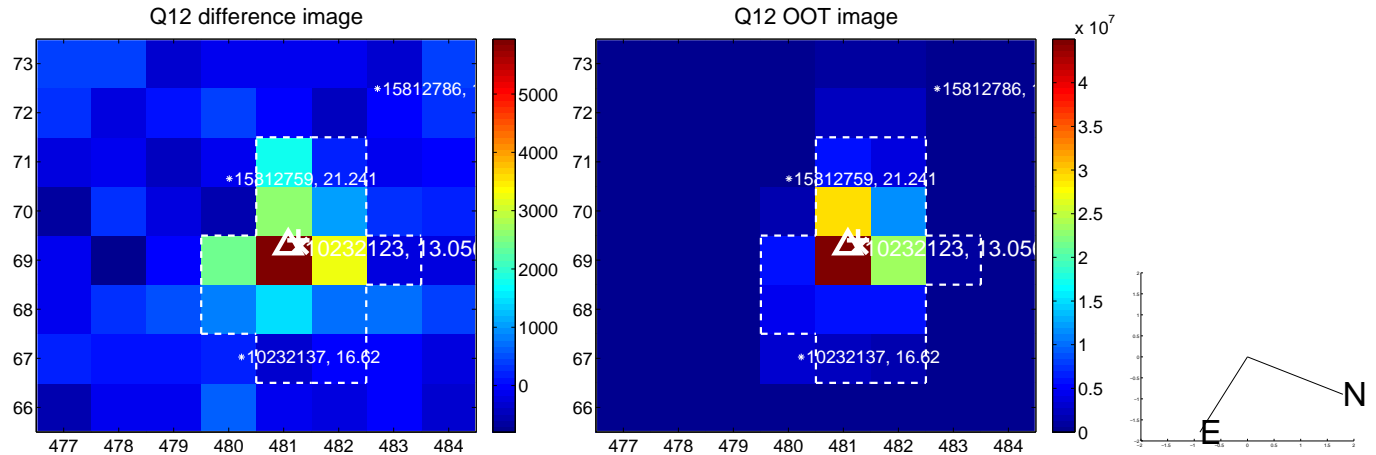
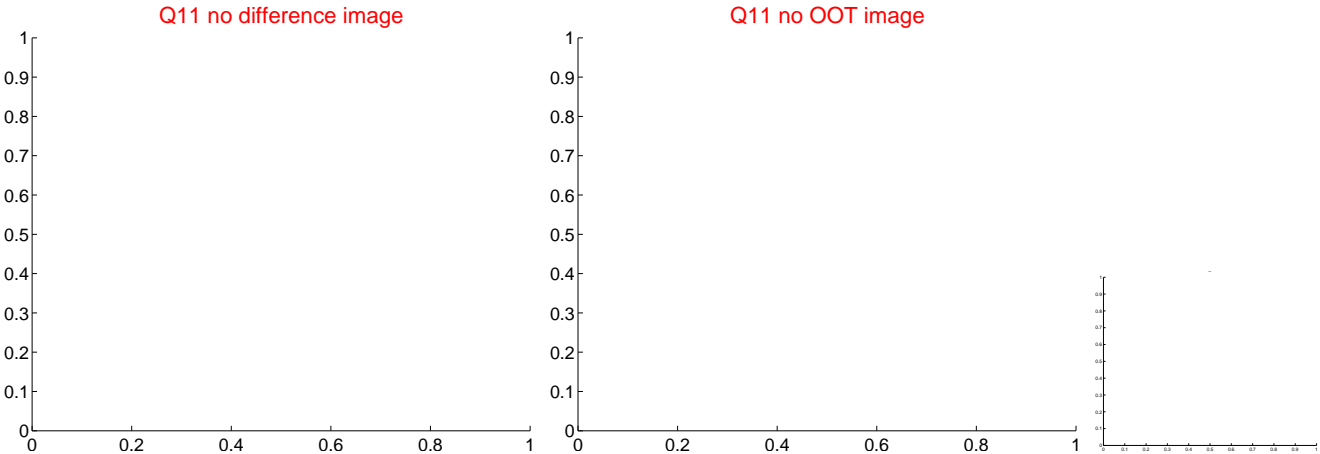
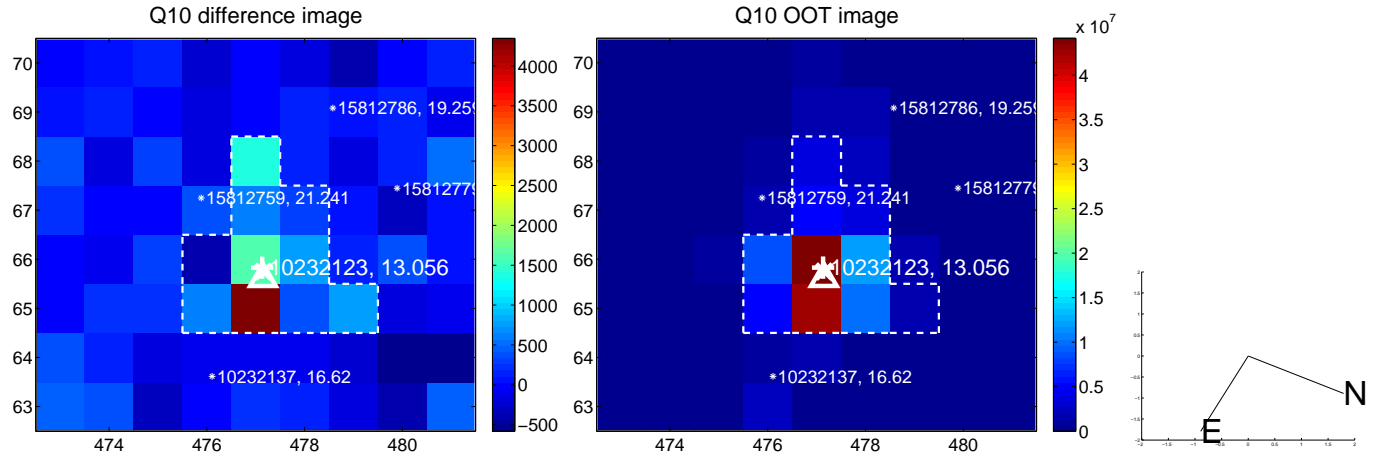
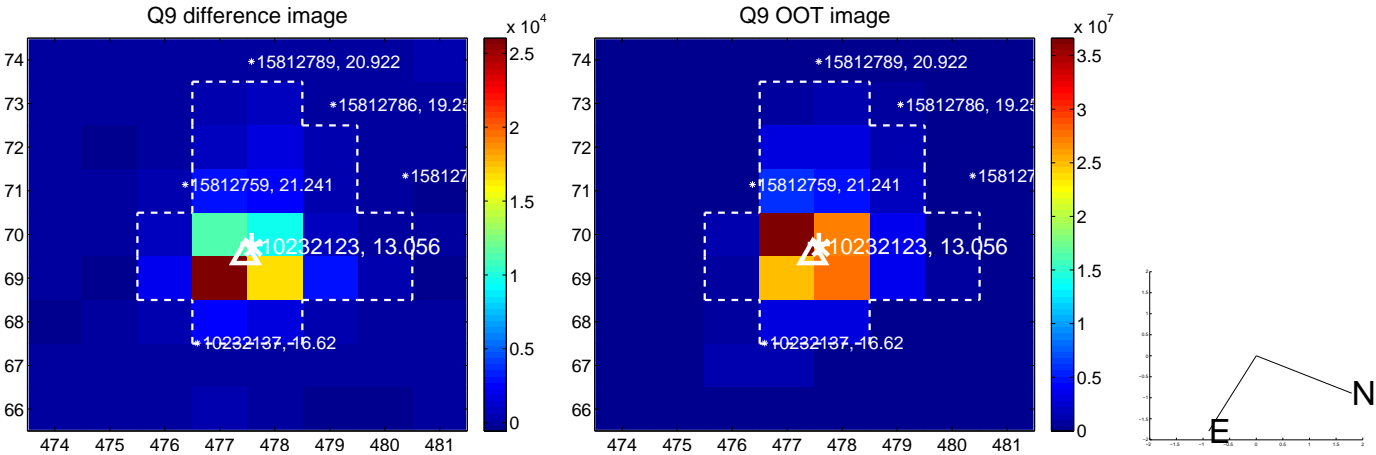


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

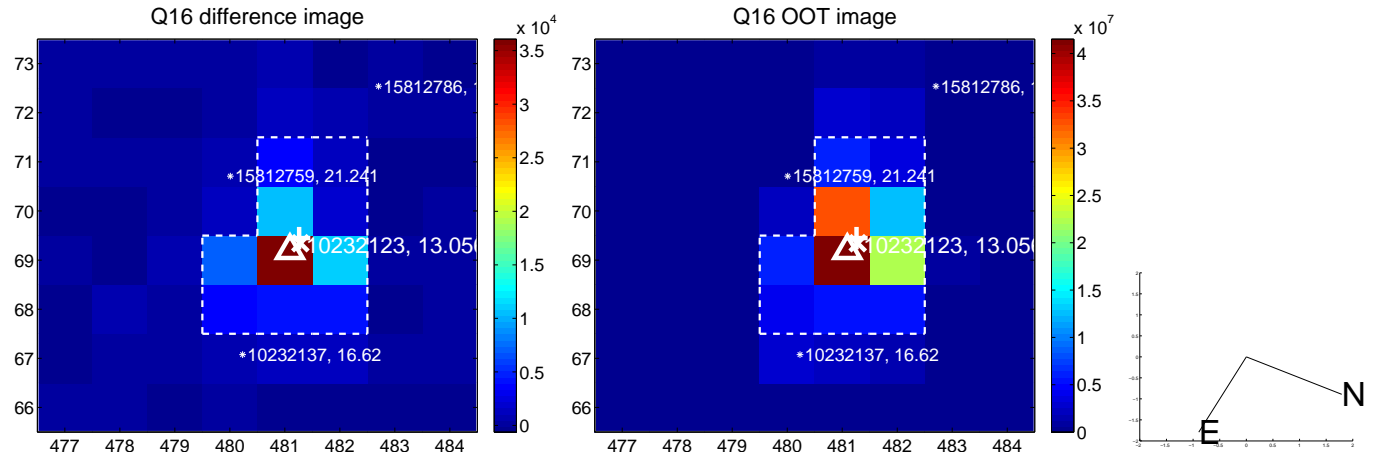
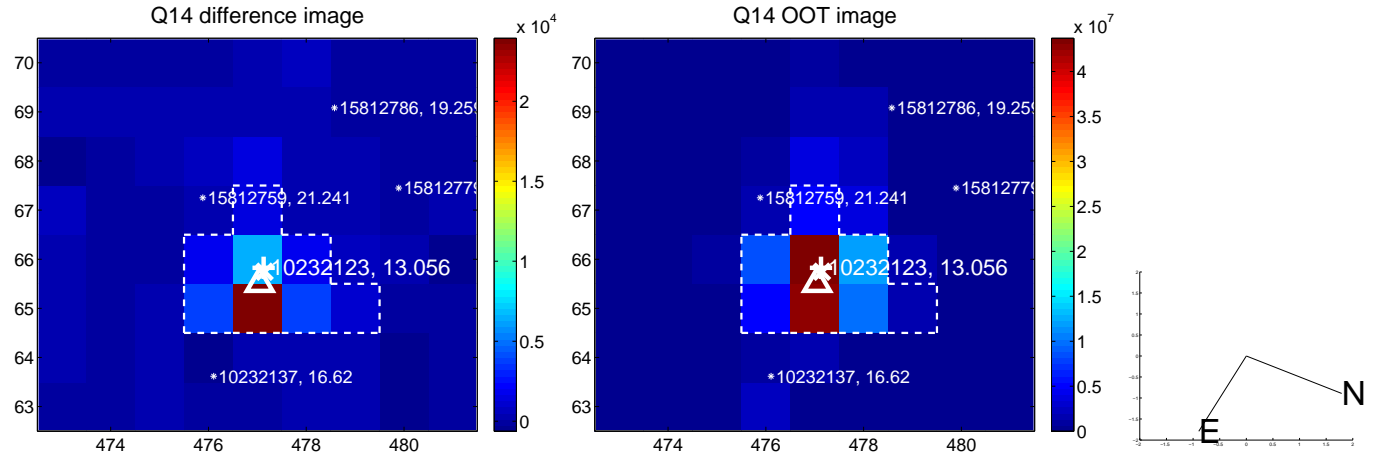
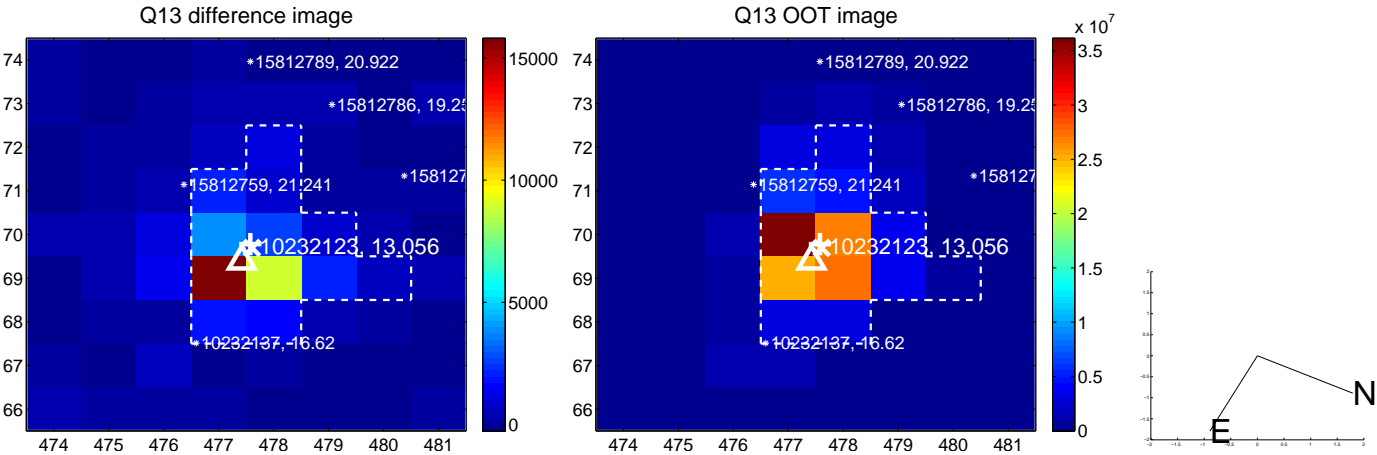




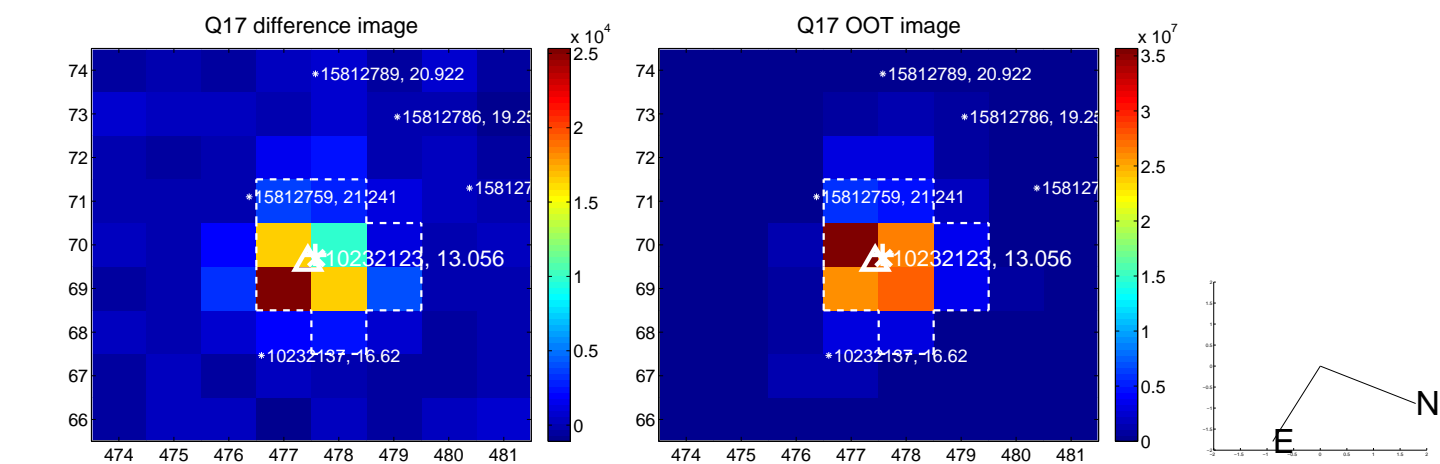
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



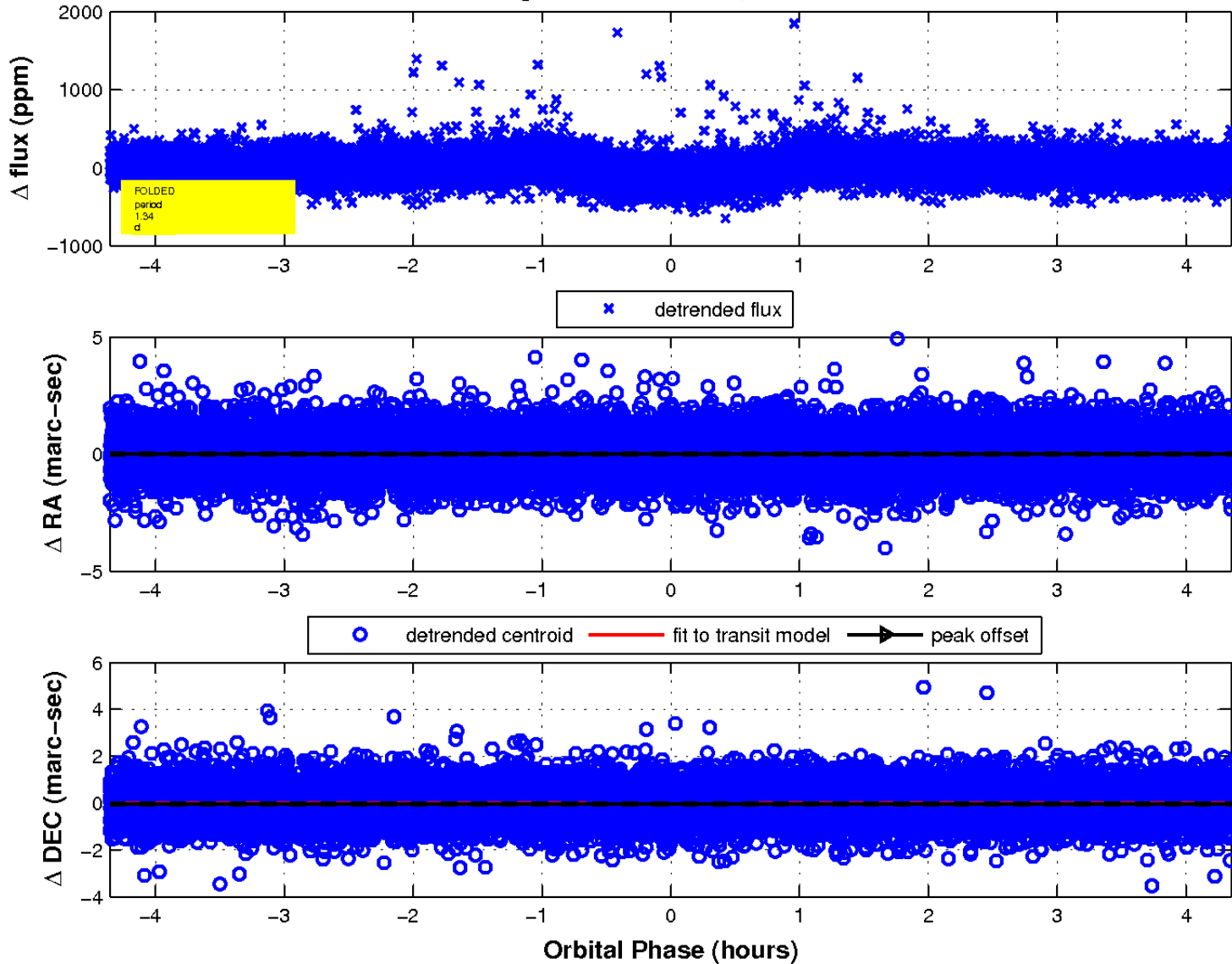
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

