

# KIC 010418797

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010418797-01	OBS	0741.01	23.355342	146.478562	38442.4	4.611	1094.5	1079.5	0.91	5754	21.66	31.00
010418797-02	OBS	No	23.355168	138.838252	777.5	4.224	21.5	24.8	0.91	5754	3.24	31.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010418797-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
010418797-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

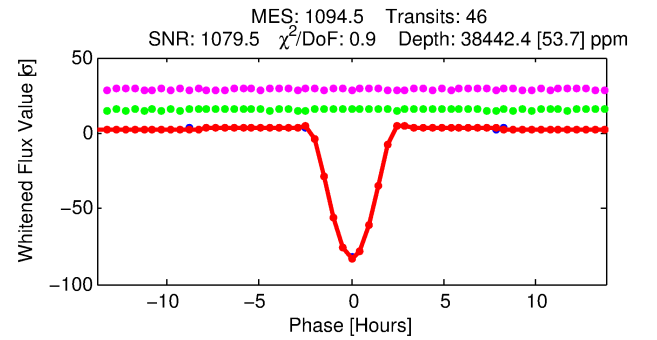
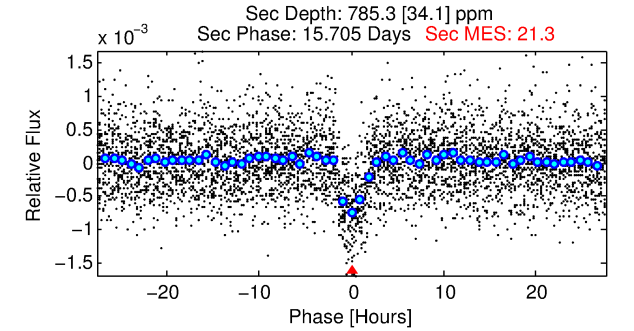
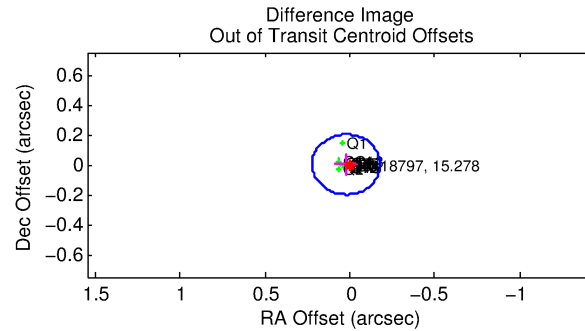
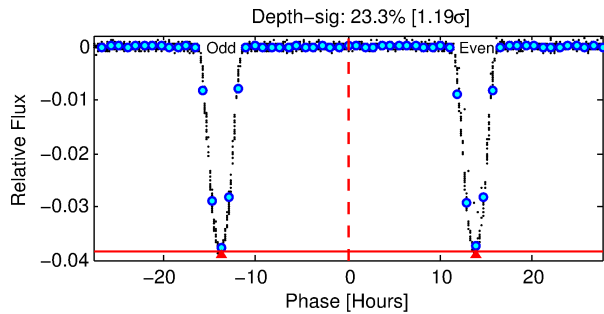
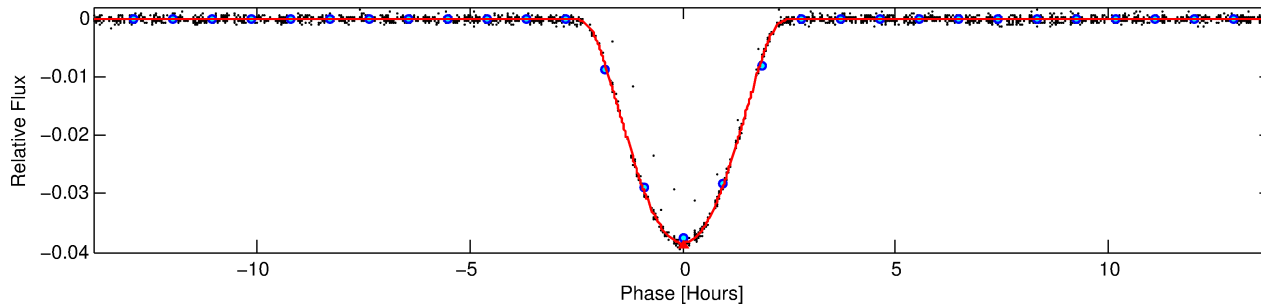
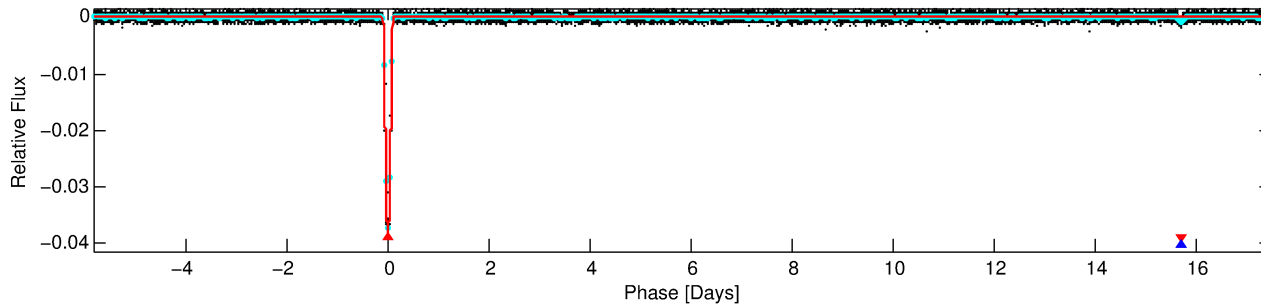
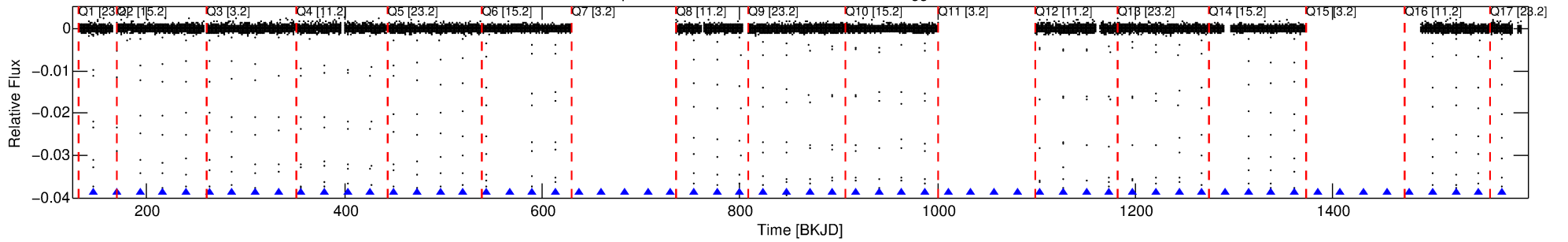
## Ephemeris Match Information For 010418797-01

No Significant Match Found

# DV One-Page Summary

KIC: 10418797 Candidate: 1 of 2 Period: 23.355 d  
KOI: K00741.01 Corr: 1.000

Kp: 15.28 R\*: 0.91 Rs Teff: 5754.0 K Logg: 4.53 Fe/H: 0.070



## DV Fit Results:

Period = 23.35534 [0.00000] d  
Epoch = 146.4786 [0.0001] BKJD  
Rp/R\* = 0.2194 [0.0020]  
a/R\* = 33.98 [0.10]  
b = 0.85 [0.00]  
Seff = 31.00 [11.49]  
Teq = 602 [56] K  
Rp = 21.66 [5.84] Re  
a = 0.1611 [0.0378] AU  
Ag = 23.89 [8.45] [2.71σ]  
Teffp = 2057 [66] K [16.78σ]

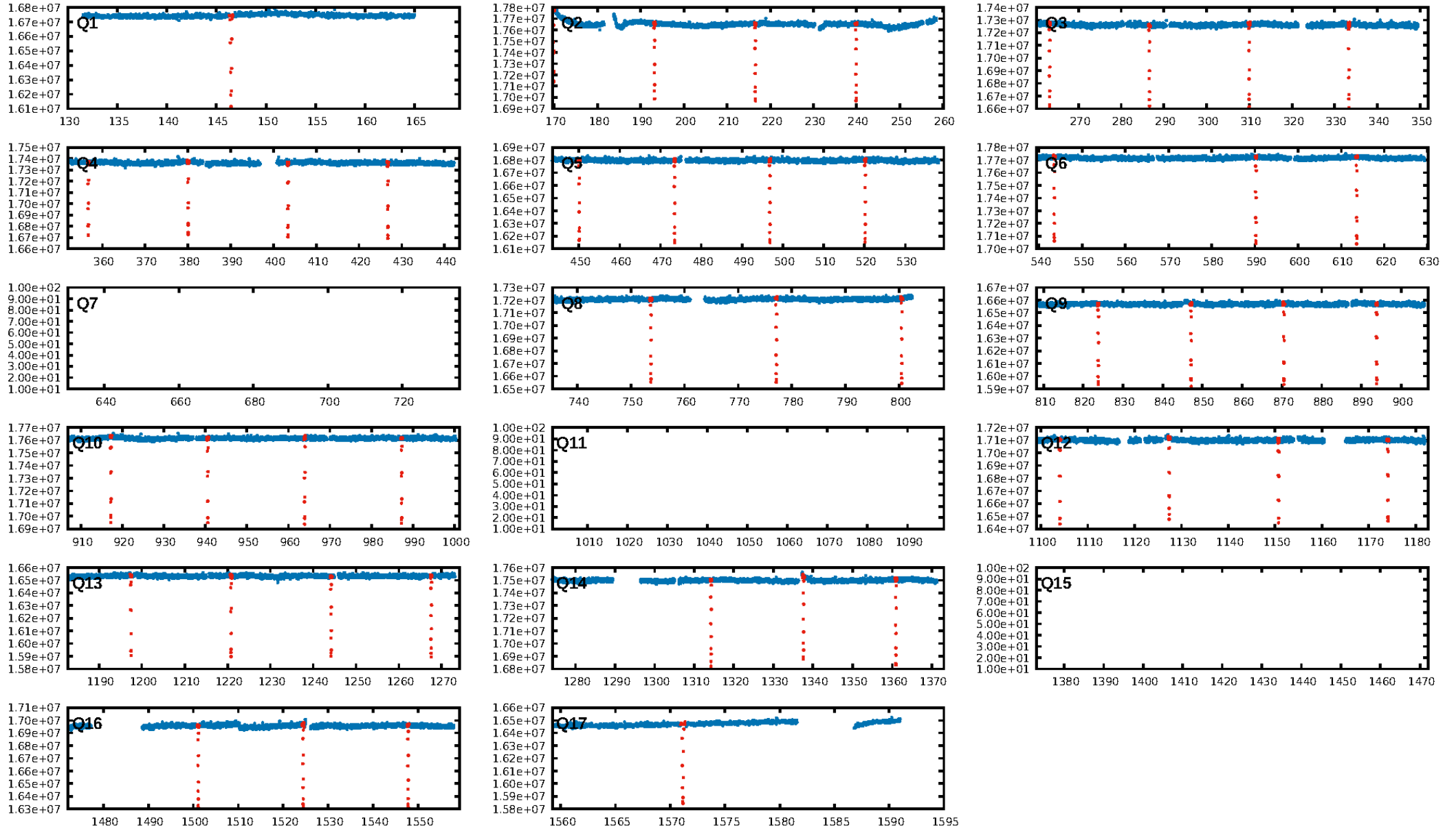
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [44/44]  
GhostDiagnostic-chr: 6.25  
Centroid-sig: 0.0%  
Centroid-so: 0.060 arcsec [4.69σ]  
OotOffset-rm: 0.024 arcsec [0.37σ]  
KicOffset-rm: 0.033 arcsec [0.49σ]  
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]

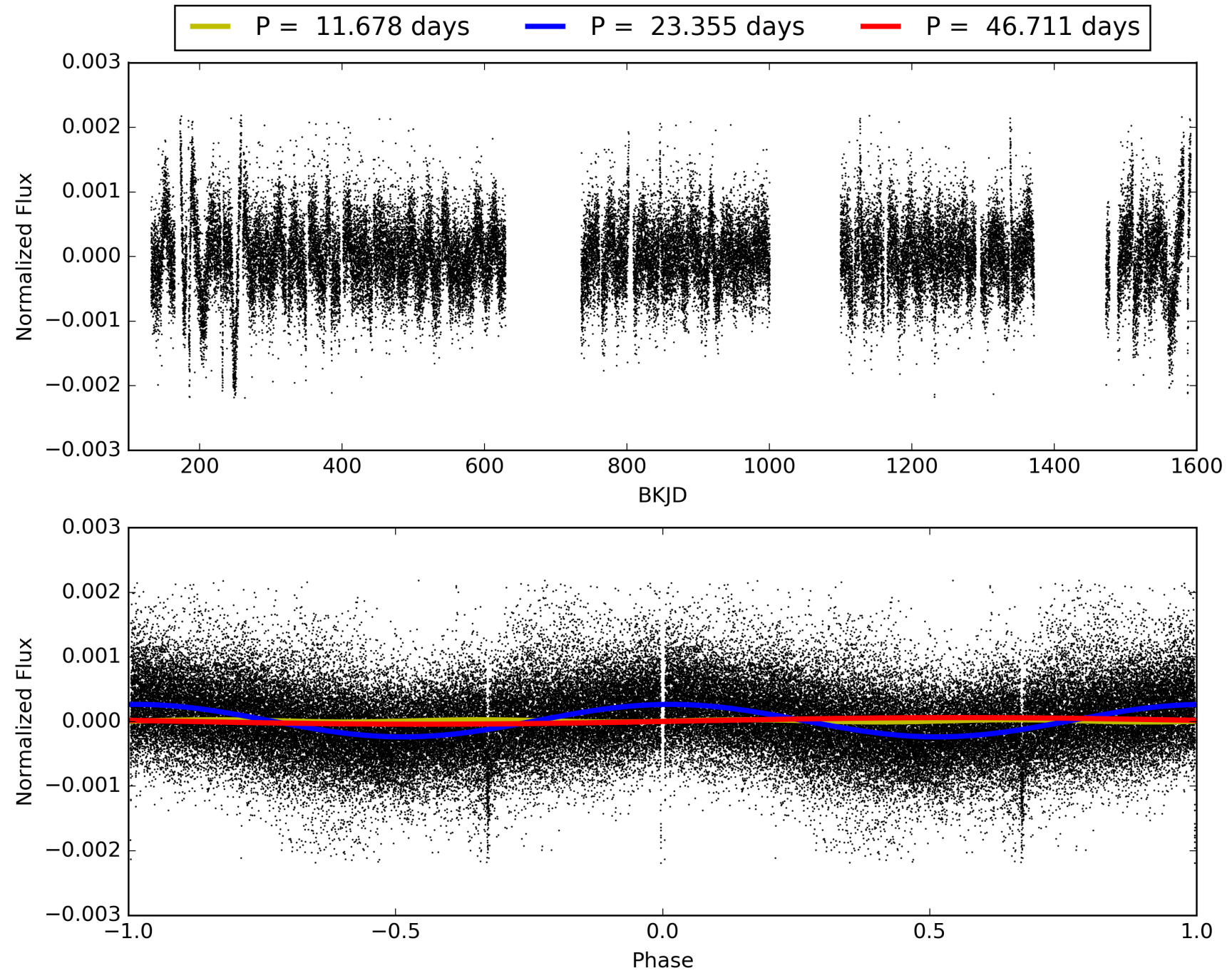
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:21:17 Z

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

# TCE 010418797-01, PDC Light Curves

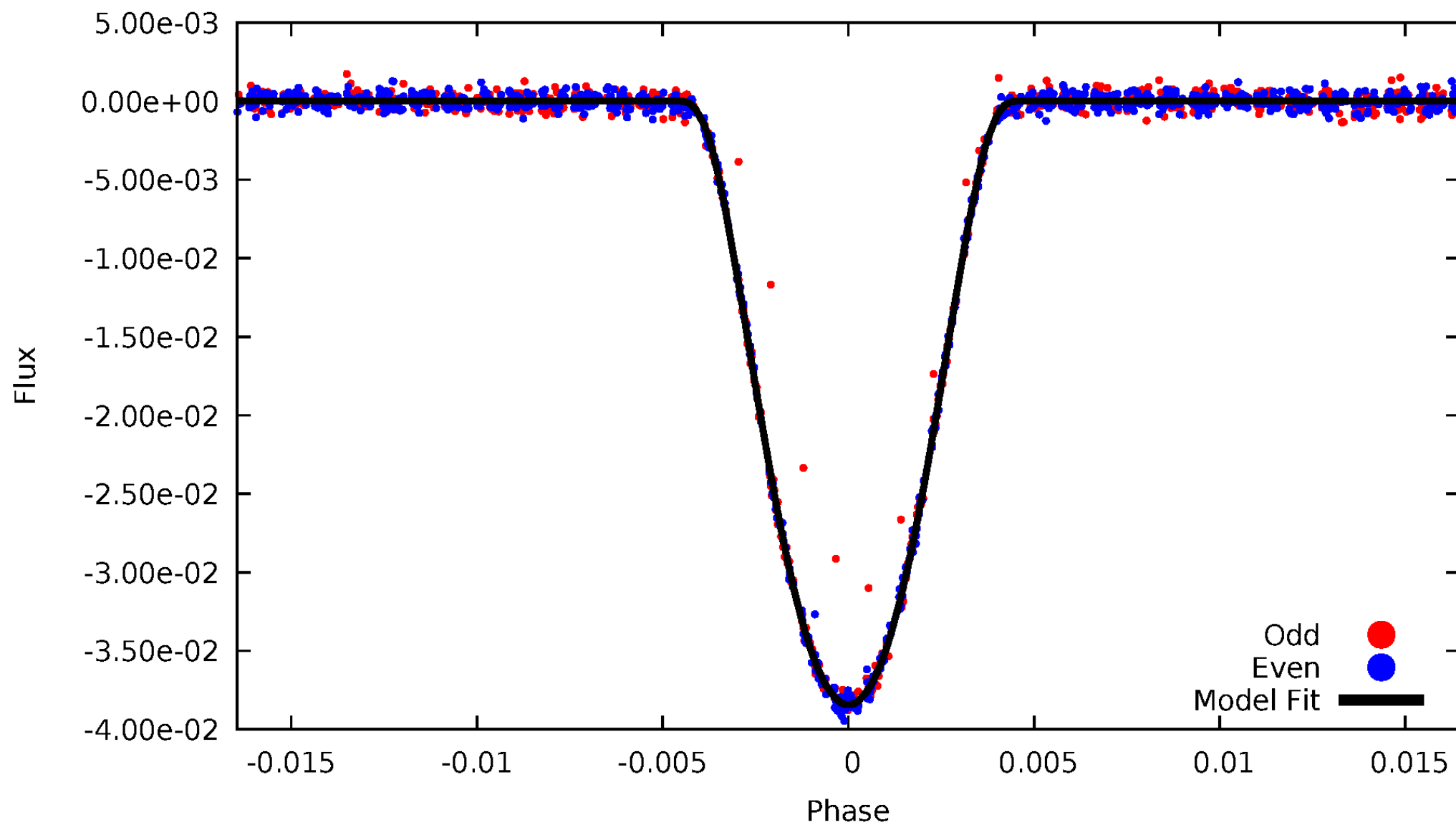


TCE 010418797-01



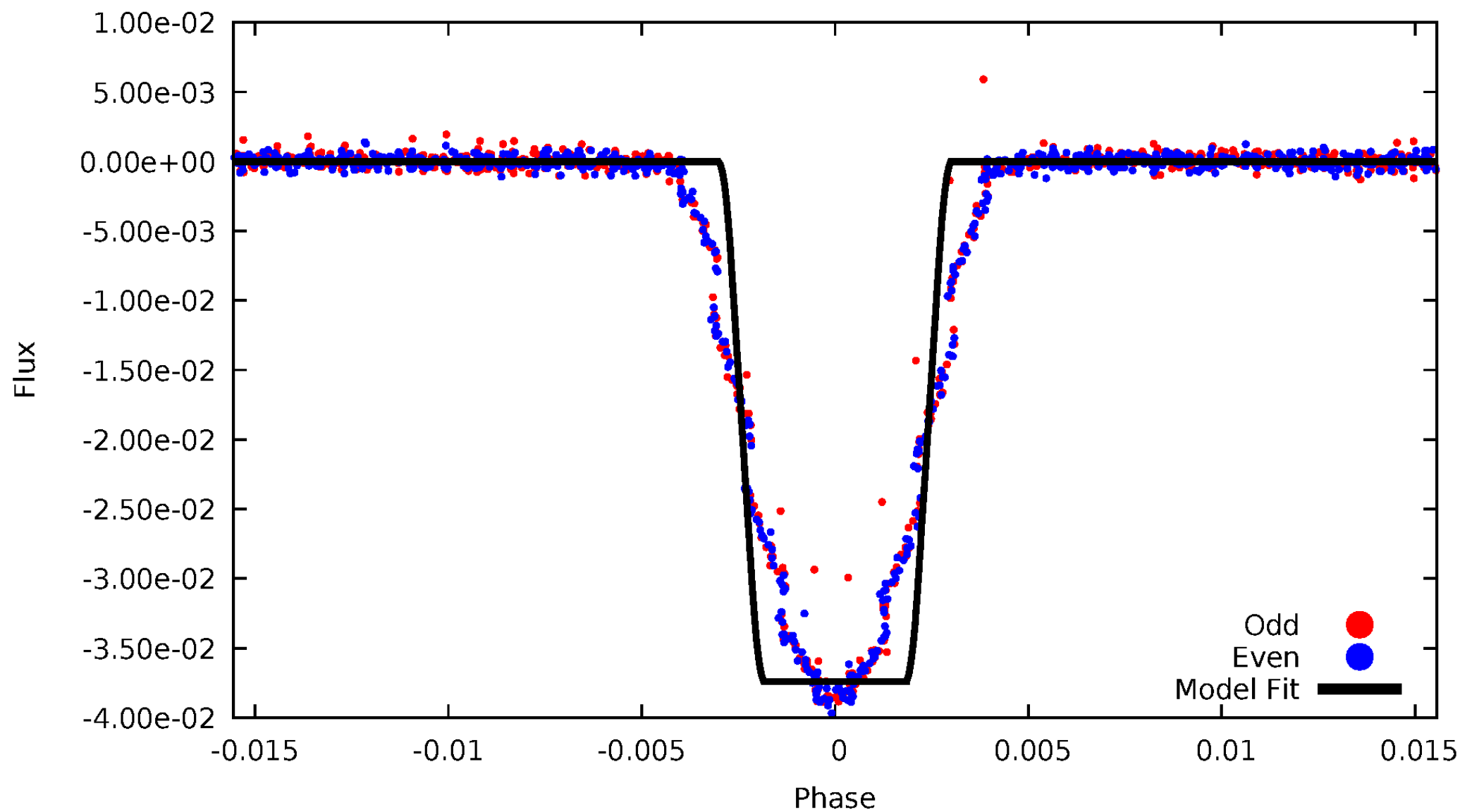
# DV Odd/Even

TCE 010418797-01



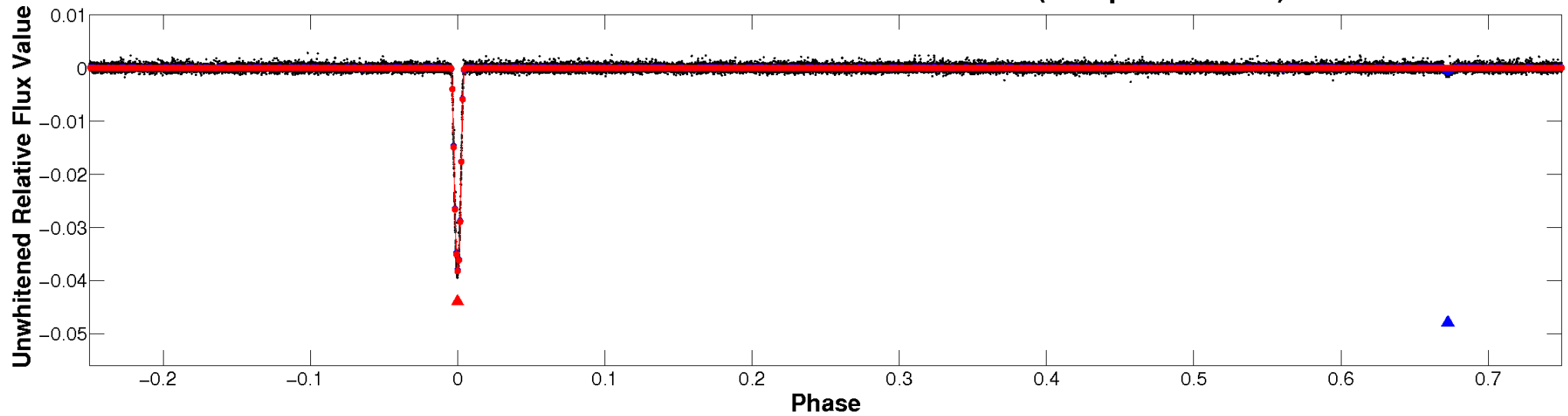
# ALT Odd/Even

TCE 010418797-01

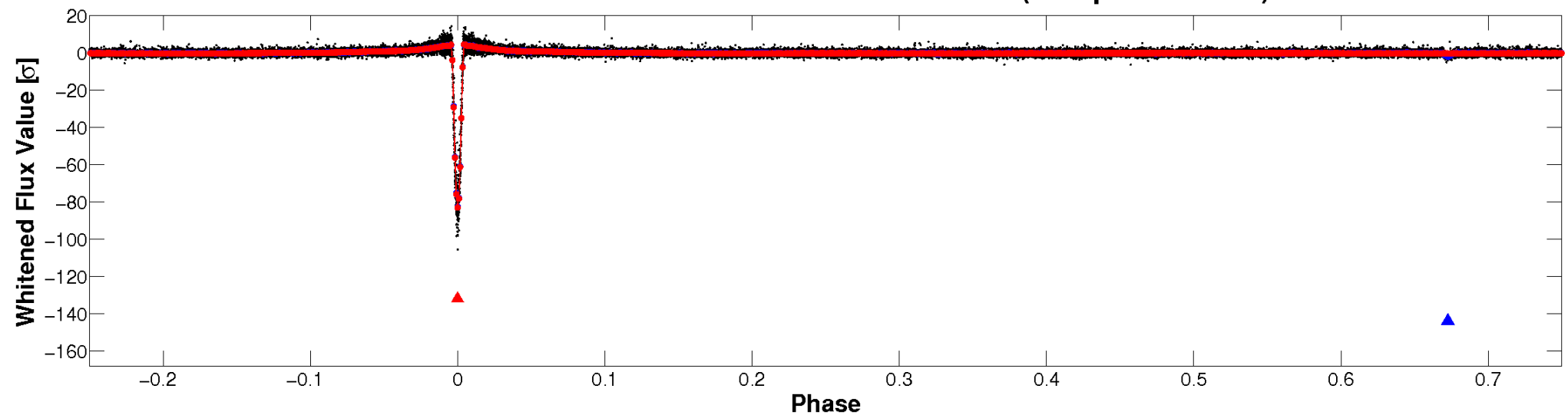


# Non-Whitened Vs. Whitened Light Curve

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

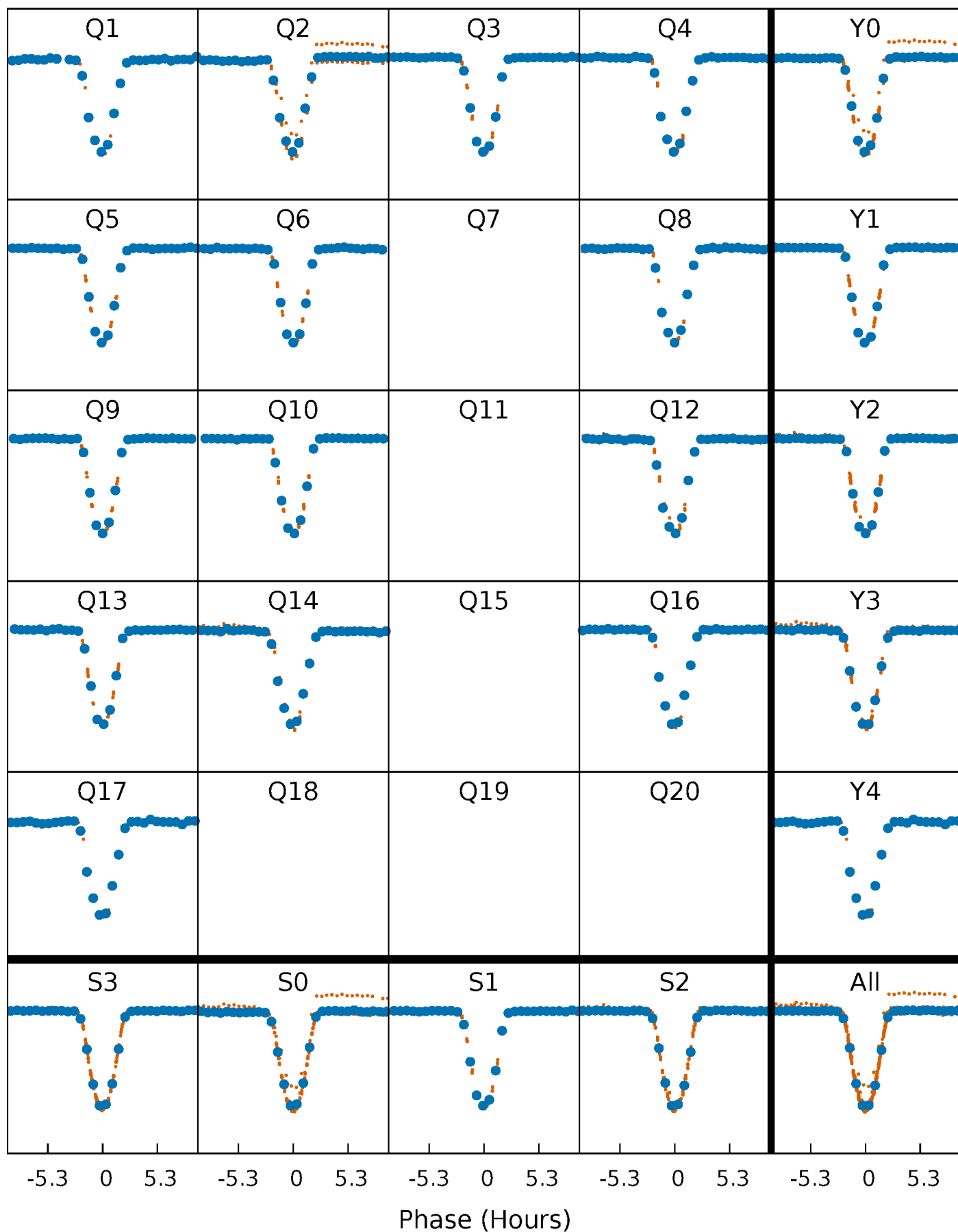


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

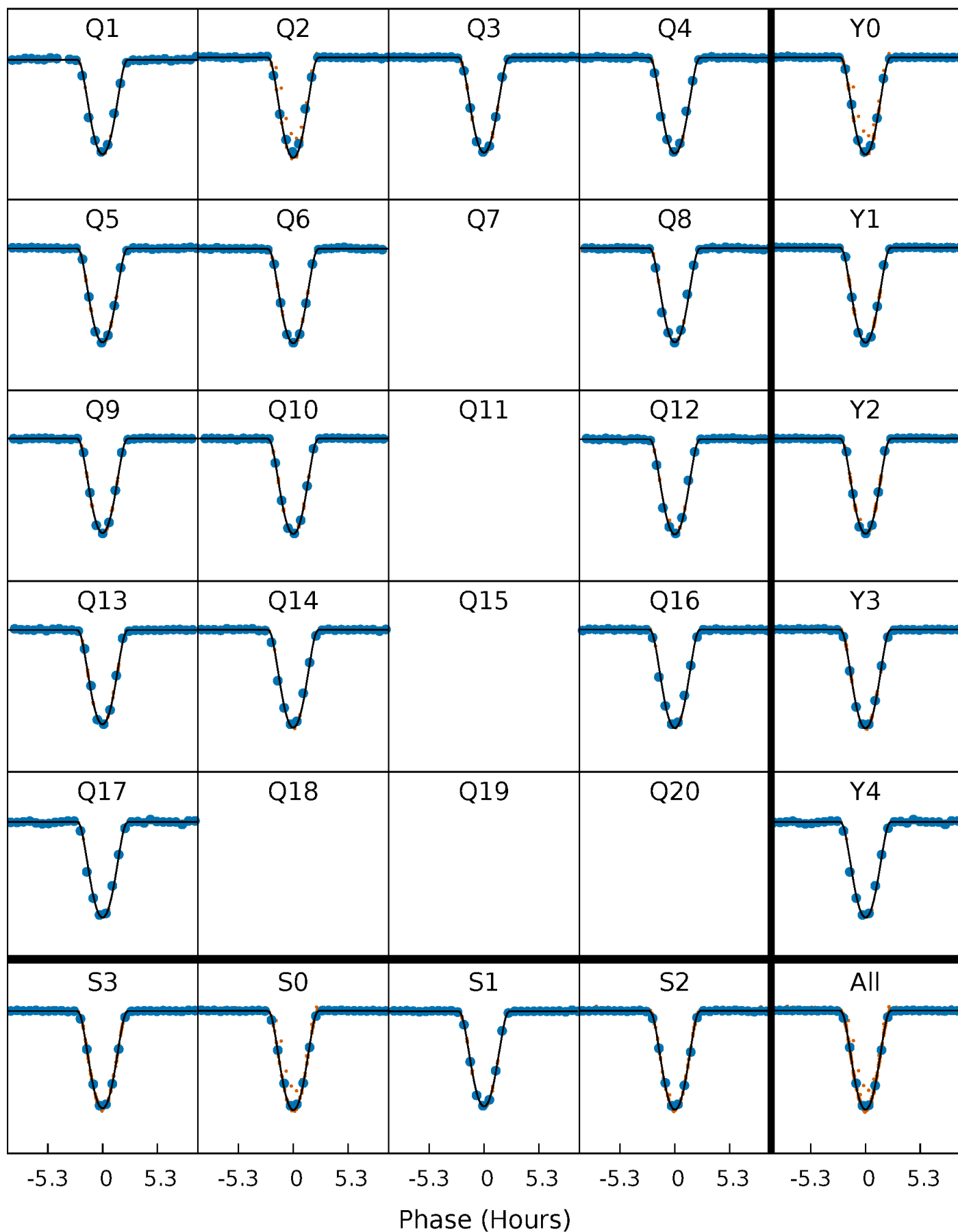
TCE 010418797-01 P= 23.355342 Days  $T_0=146.478562$  (BKJD)





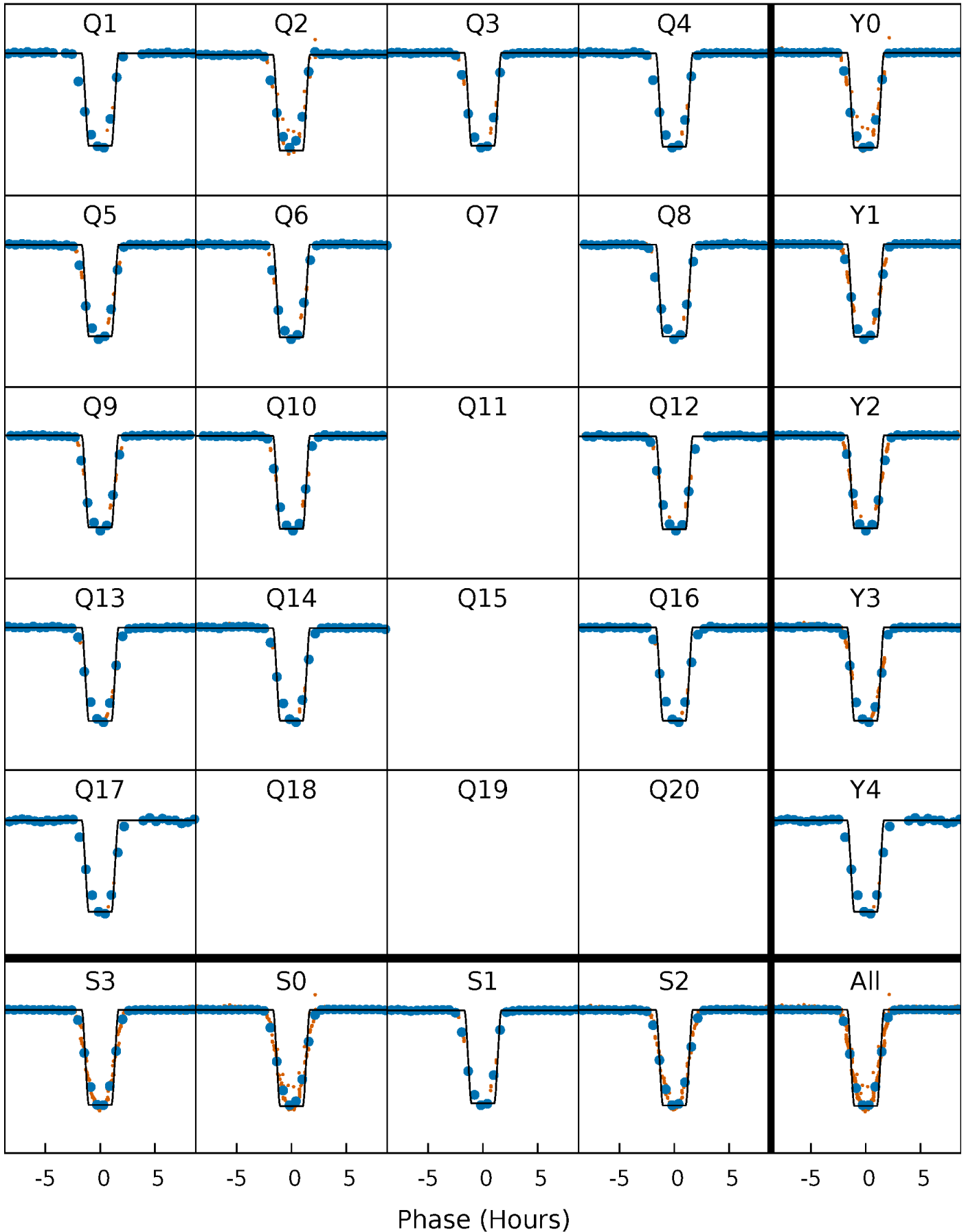
# DV Quarter-Phased Transit Curves

TCE 010418797-01 P= 23.355342 Days  $T_0=146.478562$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

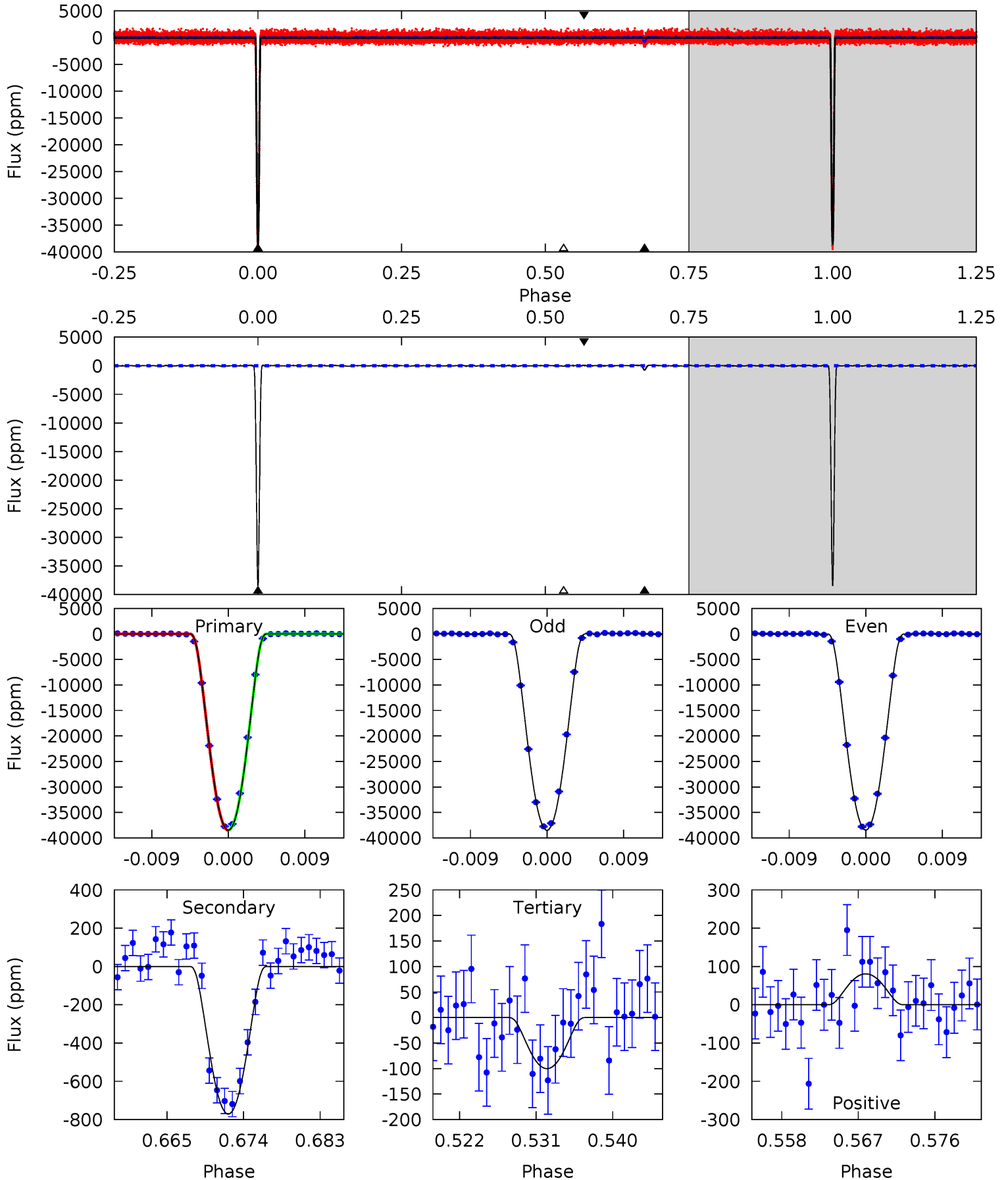
TCE 010418797-01 P= 23.355165 Days  $T_0=146.483487$  (BKJD)



# DV Model-Shift Uniqueness Test

010418797-01, P = 23.355342 Days, E = 123.123220 Days

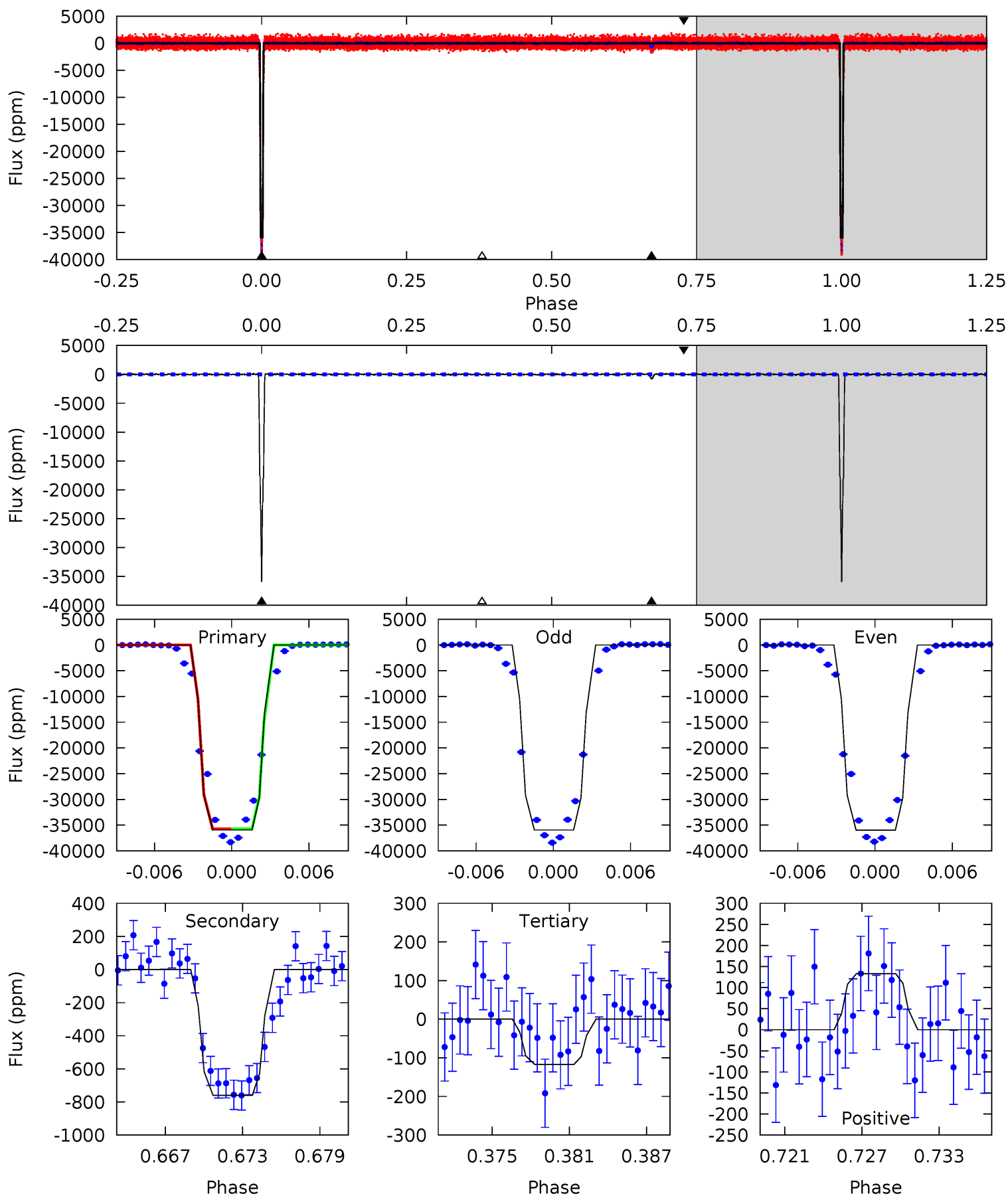
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1961	39.3	5.10	4.11	5.05	2.61	1.68	1955	1956	34.2	35.2	1.00	1.00	0.00	2.04



# Alt Model-Shift Uniqueness Test

010418797-01,  $P = 23.355165$  Days,  $E = 123.128322$  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
1156	24.5	3.77	4.27	5.12	2.75	1.14	1152	1151	20.7	20.2	0.68	0.99	0.00	0.80



### Stellar Parameters For KIC 010418797

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5754^{+156}_{-173}$	$4.534^{+0.035}_{-0.196}$	$0.070^{+0.250}_{-0.300}$	$0.905^{+0.244}_{-0.081}$	$1.021^{+0.099}_{-0.124}$	$1.938^{+0.371}_{-0.978}$
	+3%/-3%	+1%/-4%	+357%/-429%	+27%/-9%	+10%/-12%	+19%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010418797-01 / KOI 0741.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-771 \pm 20$	$22.32^{+3.37}_{-1.59}$	$861^{+57}_{-38}$	$2788^{+45}_{-47}$	$22^{+3}_{-5}$
Alt.	$-760 \pm 31$	$19.68^{+3.03}_{-1.34}$	$860^{+60}_{-38}$	$2876^{+49}_{-52}$	$27^{+4}_{-6}$

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

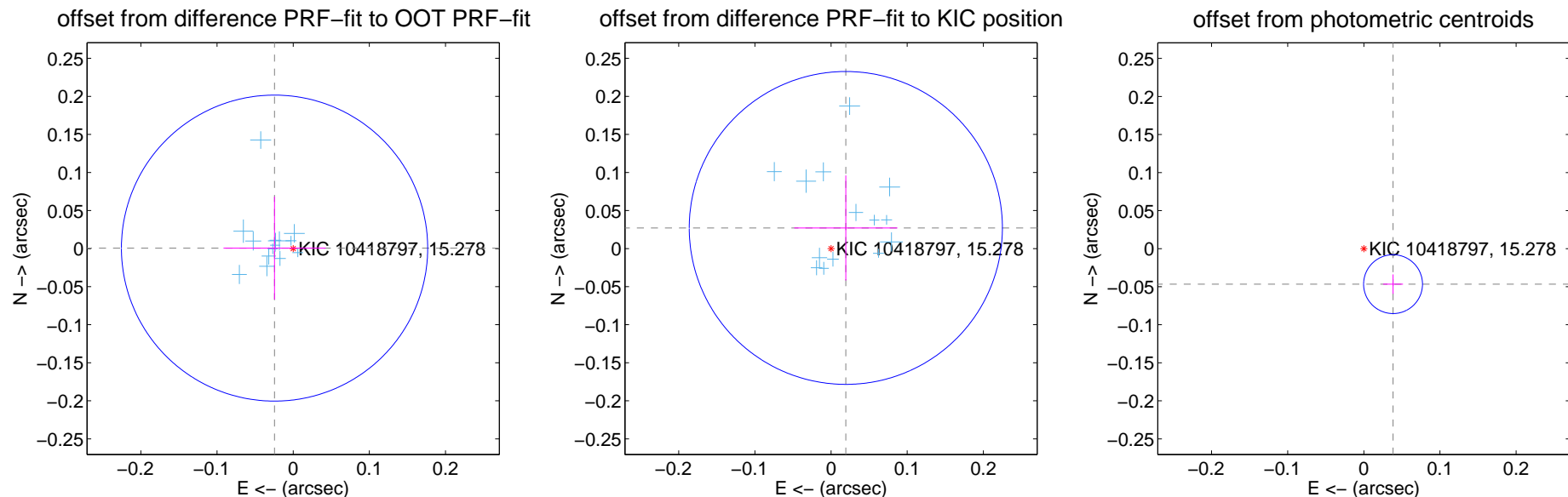
## DV Centroid Data

Supplemental centroid analysis for 010418797-01. Kepler magnitude: 15.28. Transit SNR 1079.52

There are 14 quarters with good PRF difference image offsets

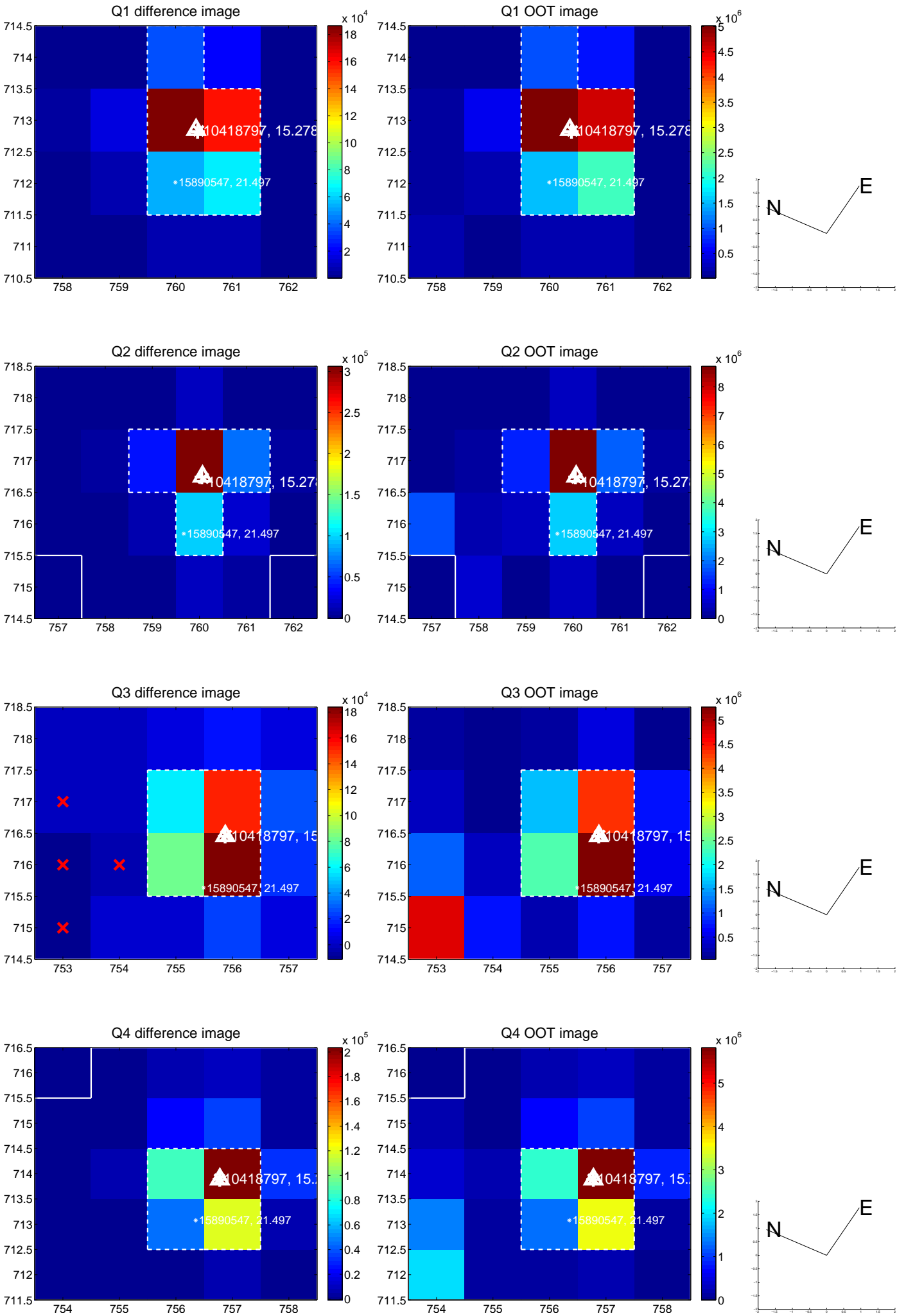
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.024 \pm 0.067$	0.37	$0.024 \pm 0.067$	$0.001 \pm 0.068$
PRF-fit source offset from KIC position	$0.033 \pm 0.069$	0.49	$-0.019 \pm 0.068$	$0.027 \pm 0.069$
photometric centroid source offset	$0.06 \pm 0.01$	4.69	$-0.04 \pm 0.01$	$-0.05 \pm 0.01$

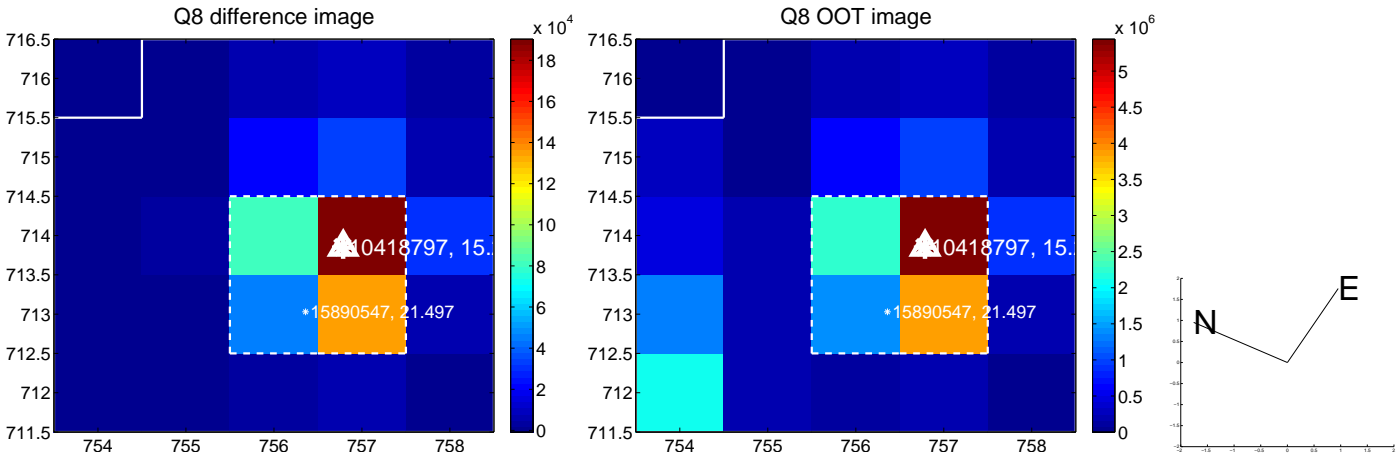
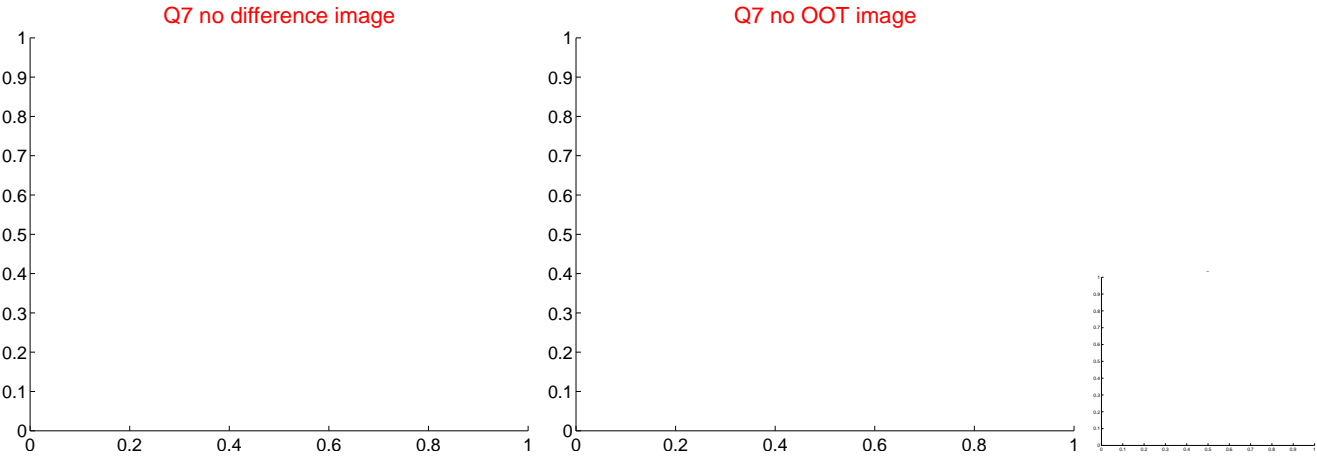
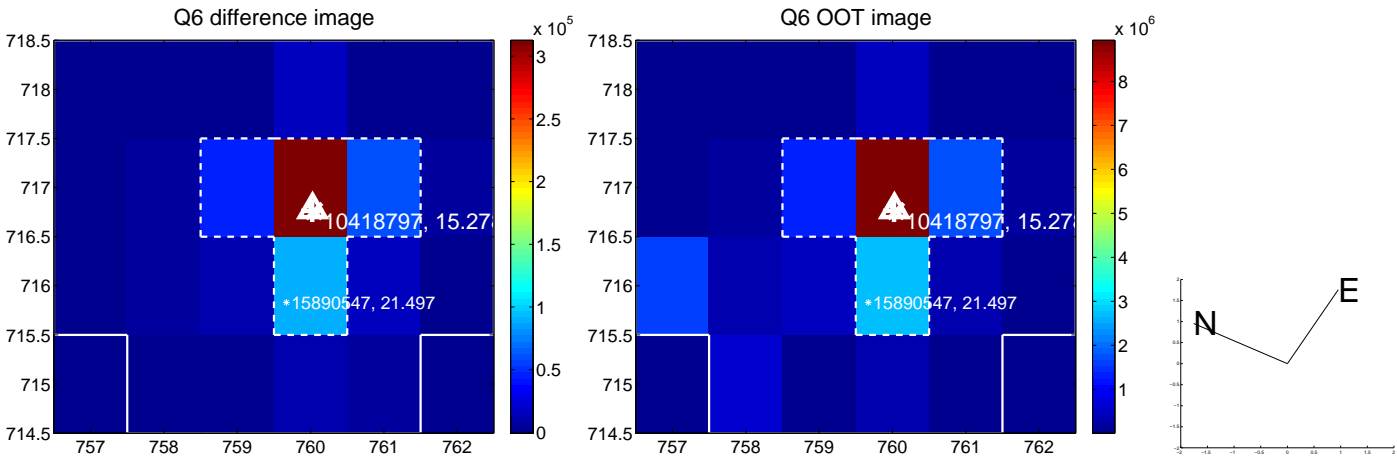
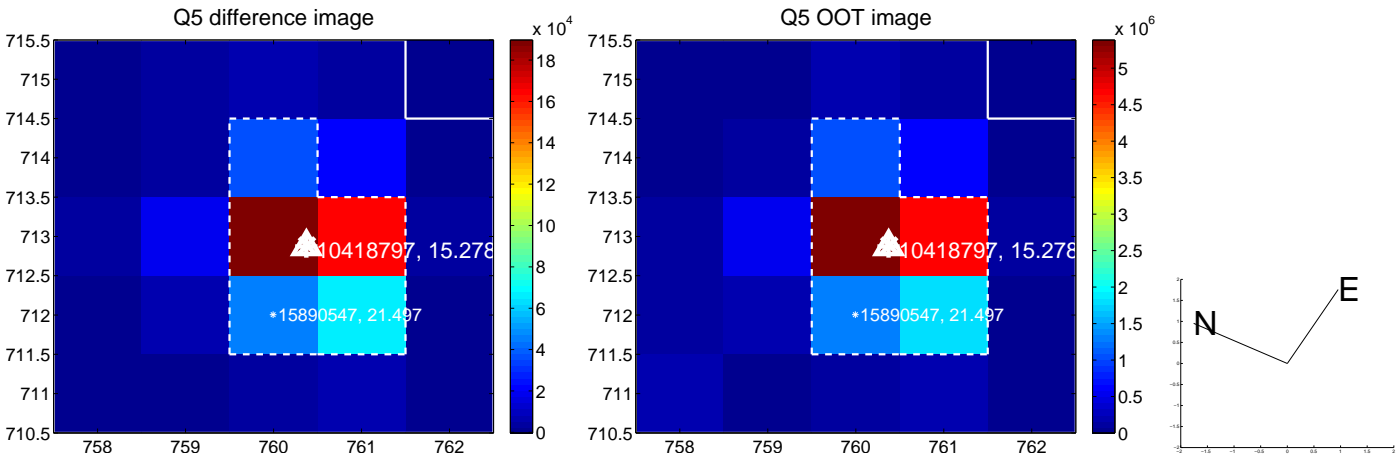


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

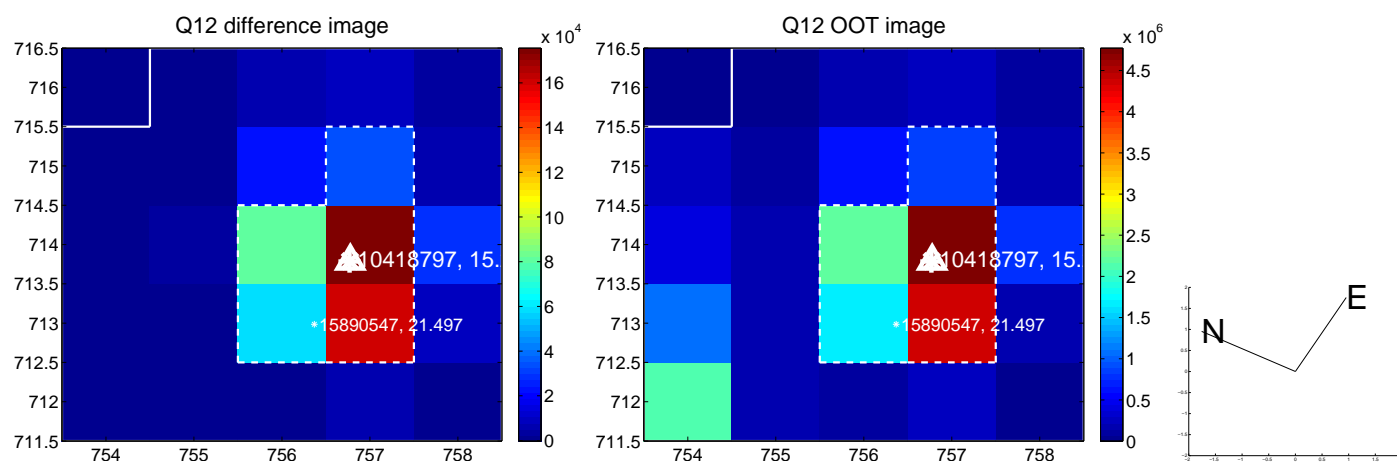
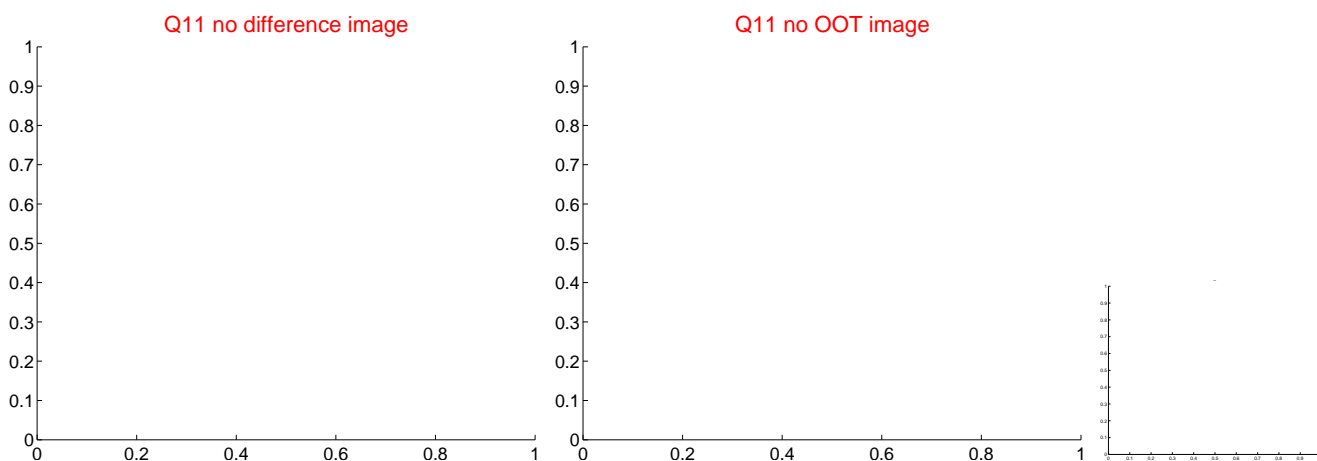
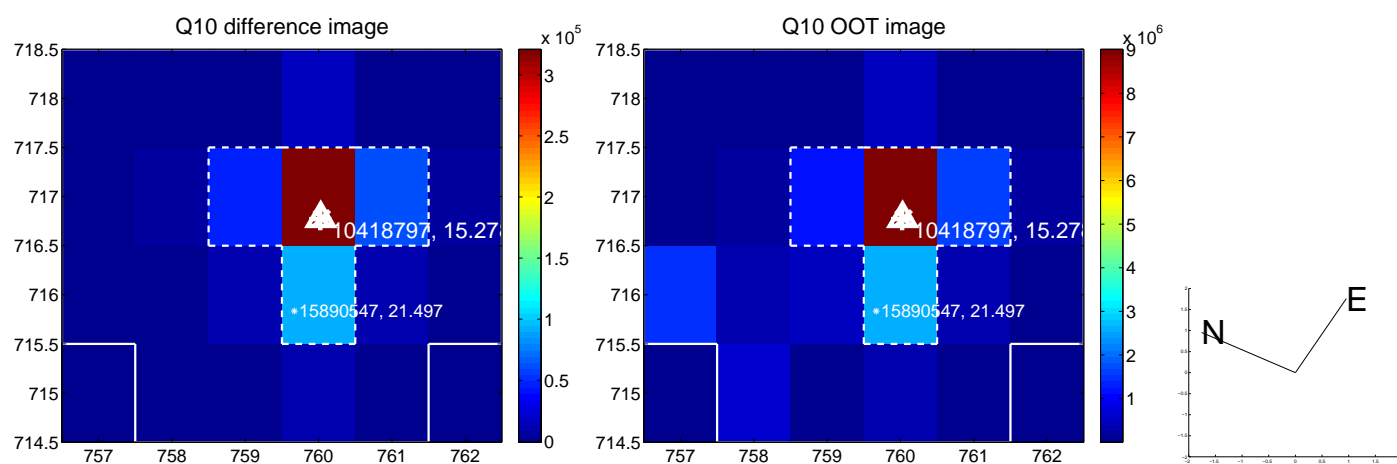
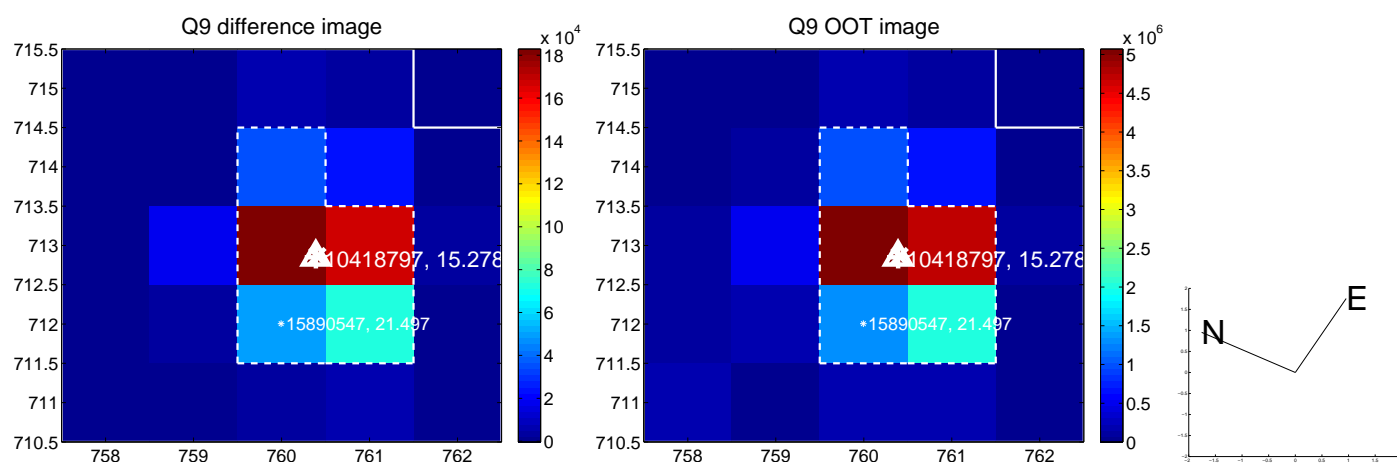


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

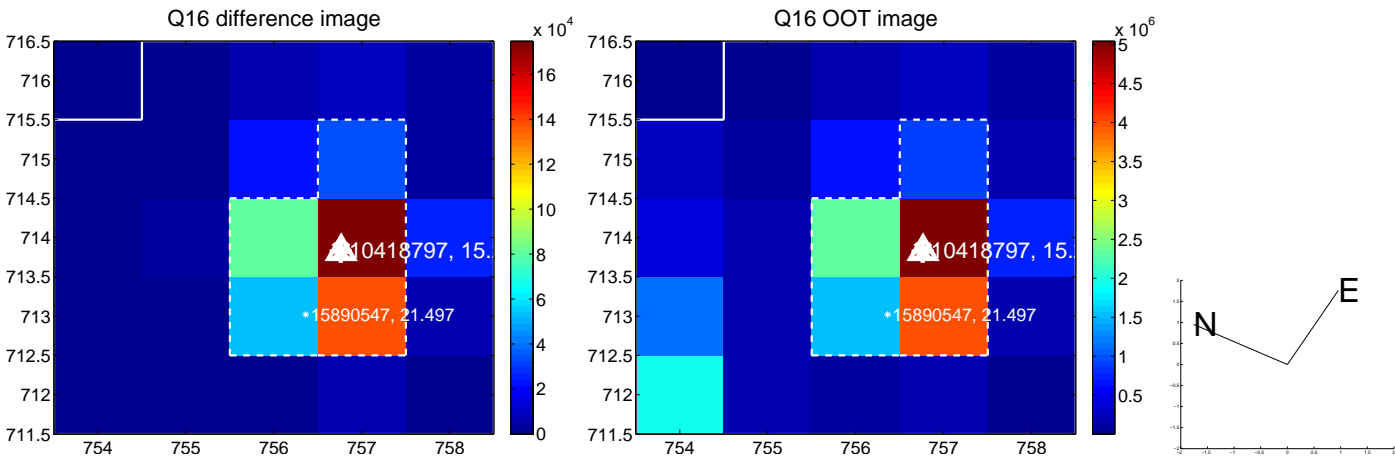
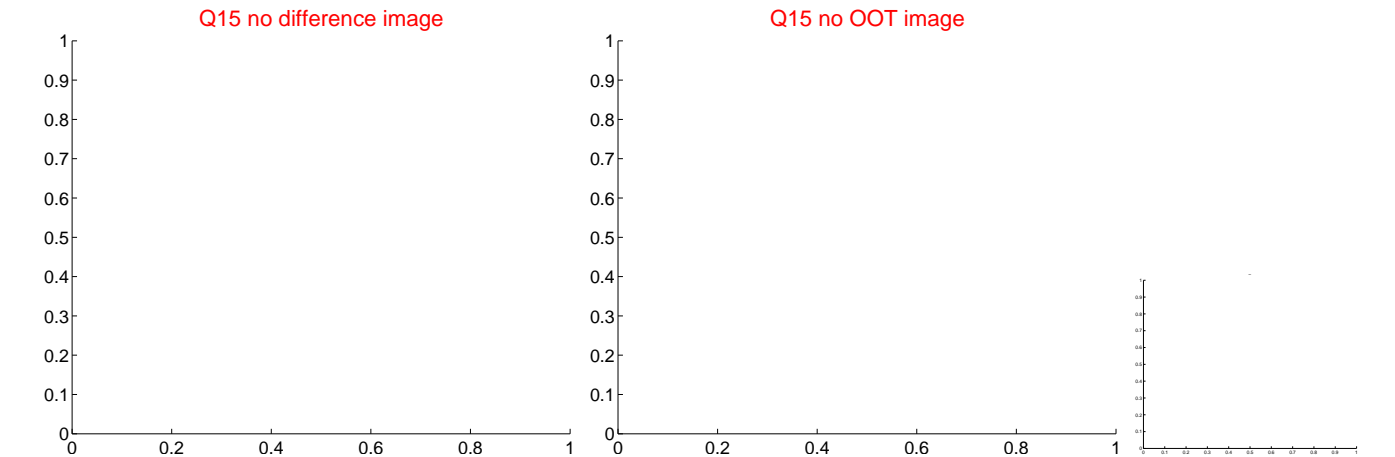
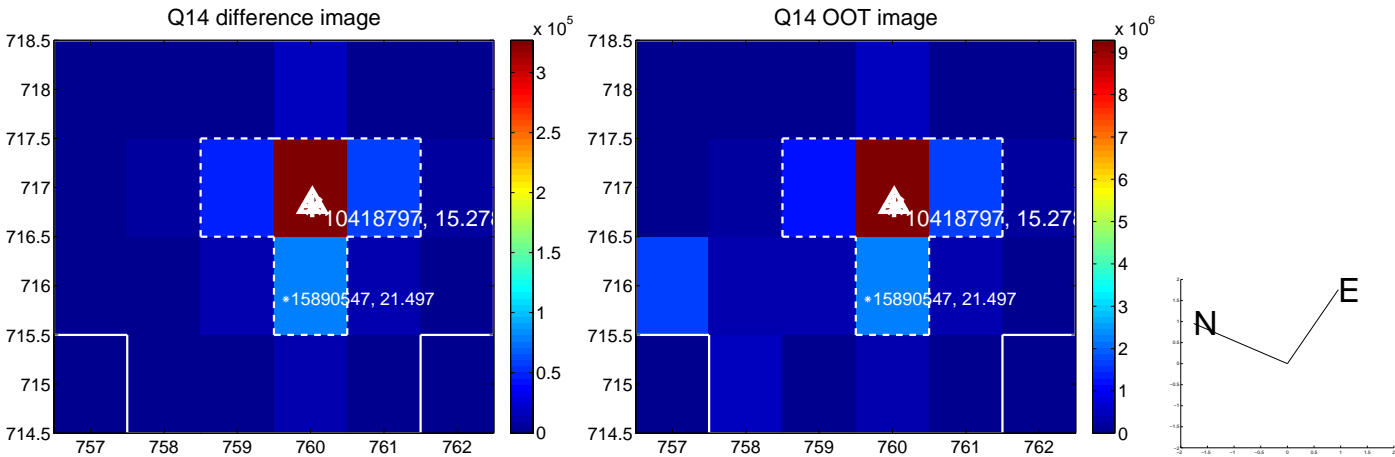
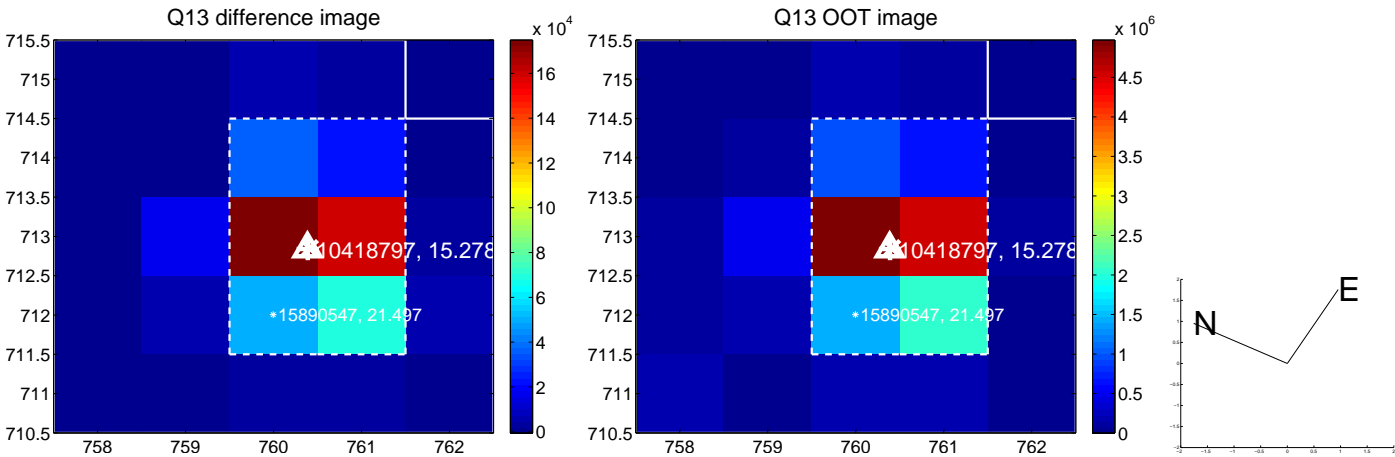




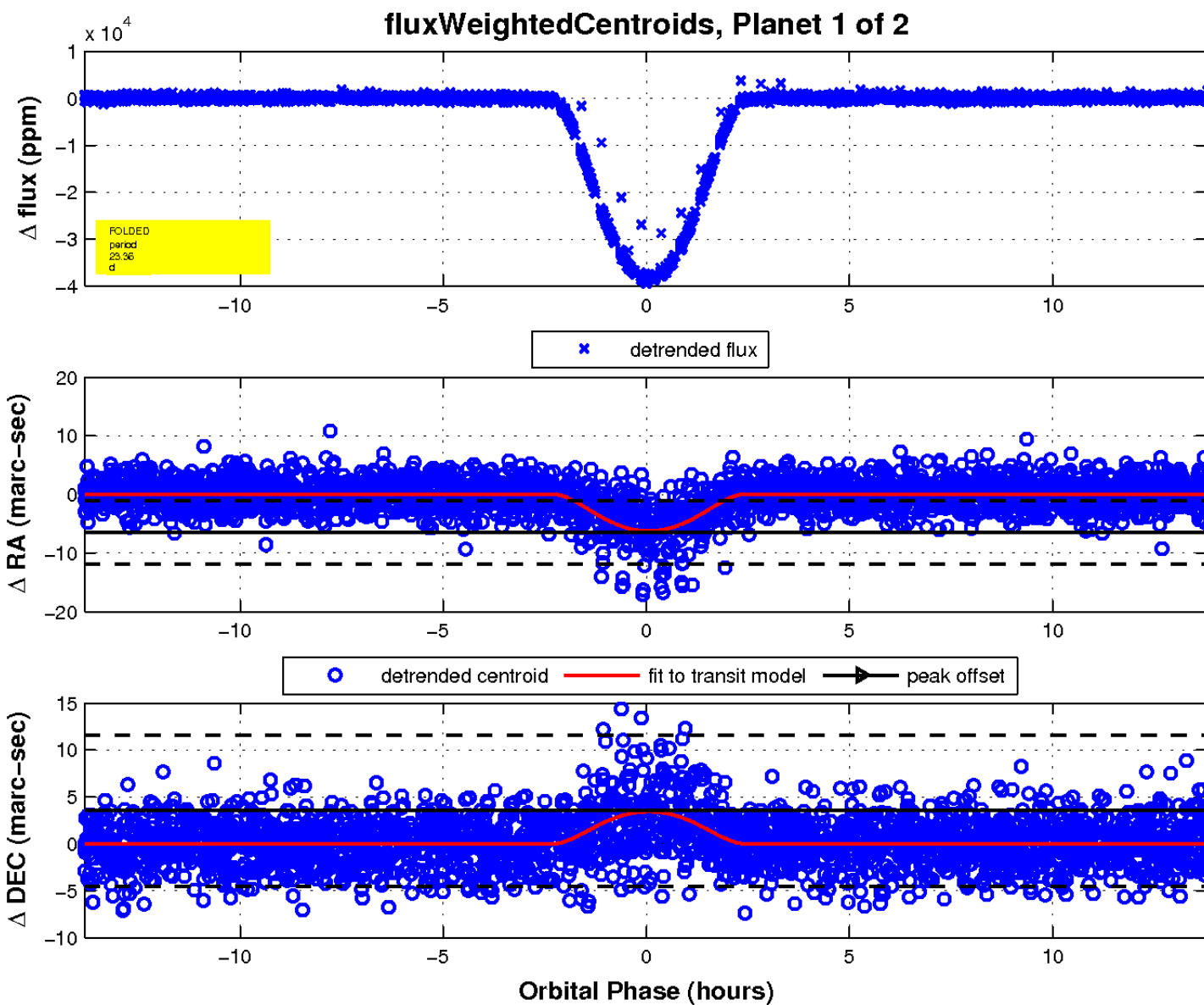
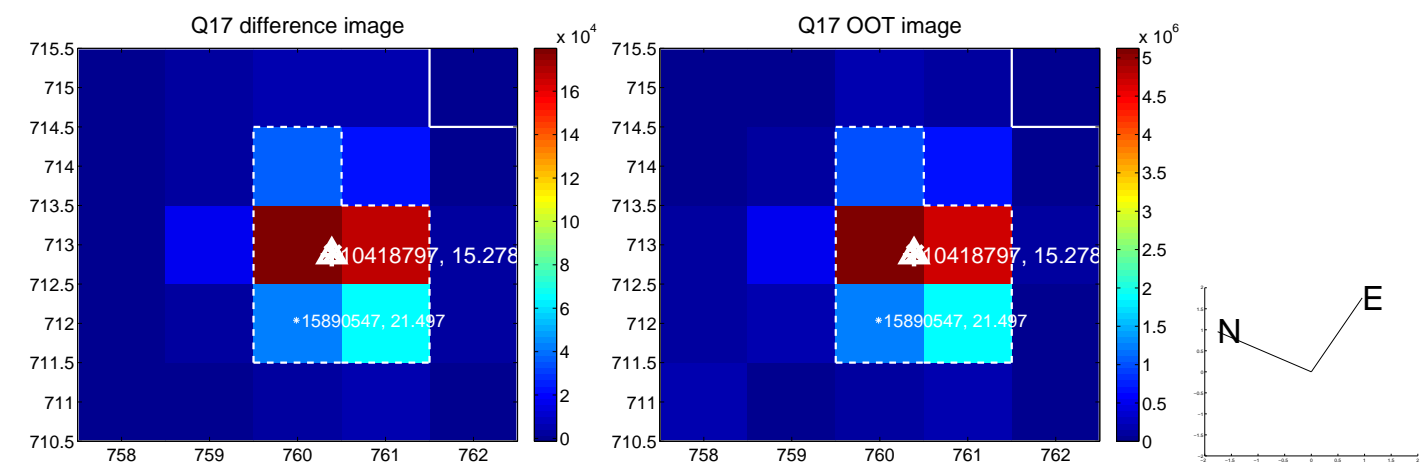
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

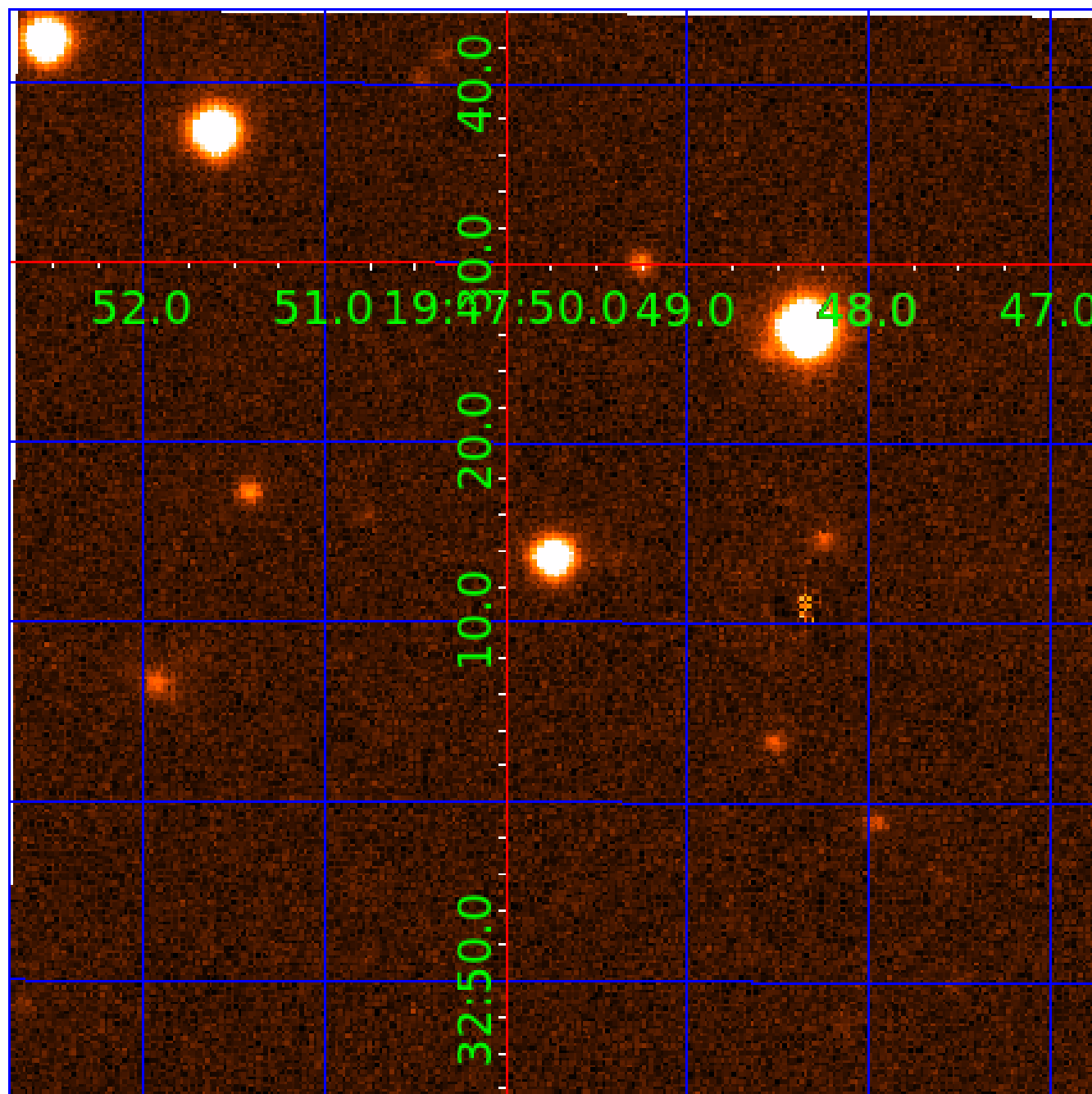


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010418797

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010418797-01	OBS	0741.01	23.355342	146.478562	38442.4	4.611	1094.5	1079.5	0.91	5754	21.66	31.00
010418797-02	OBS	No	23.355168	138.838252	777.5	4.224	21.5	24.8	0.91	5754	3.24	31.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010418797-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
010418797-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

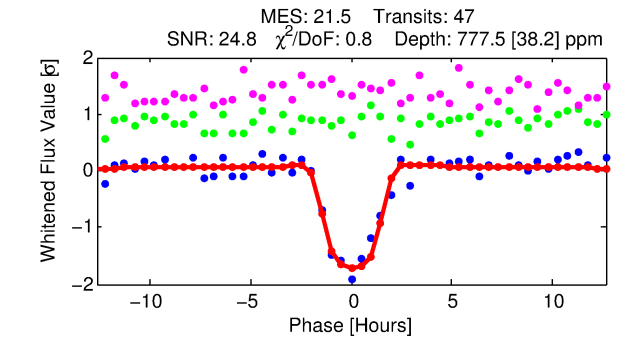
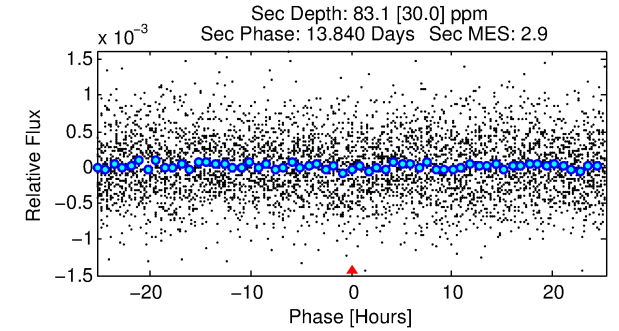
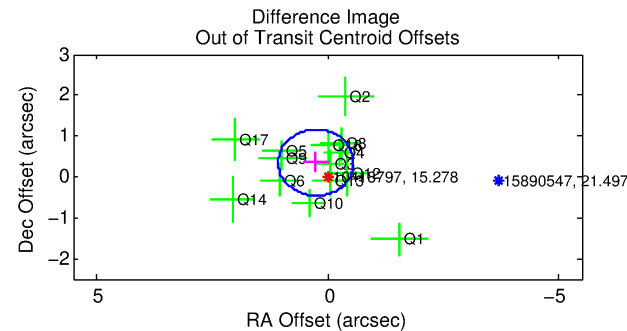
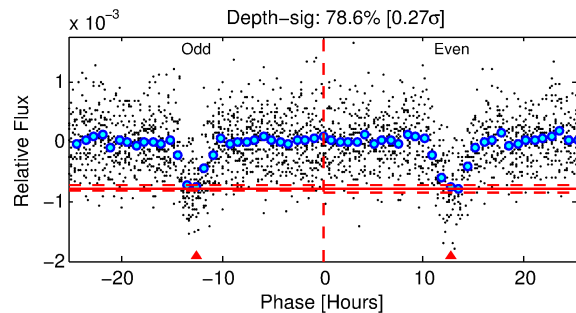
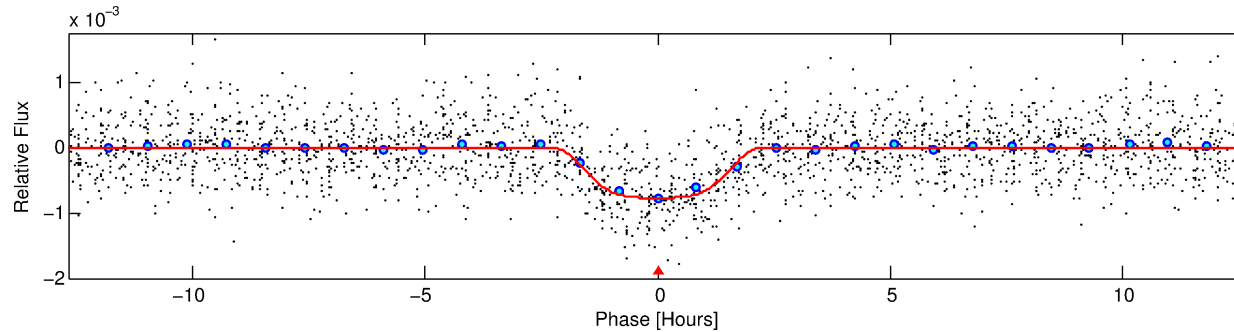
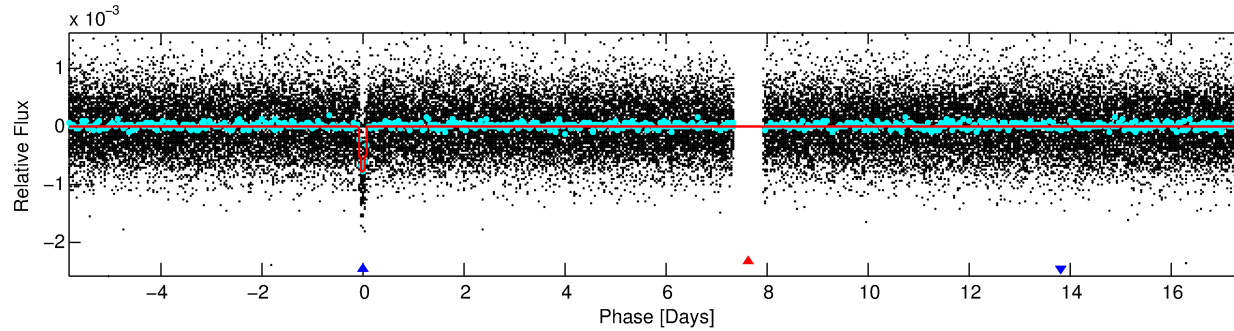
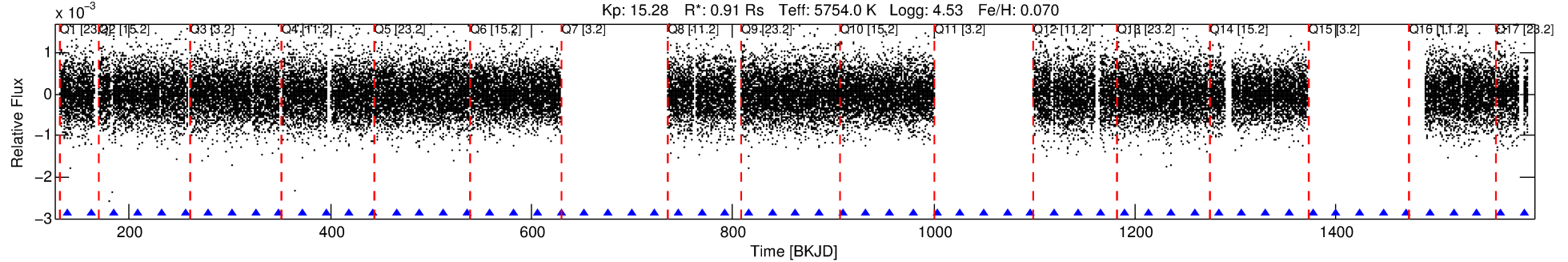
## Ephemeris Match Information For 010418797-02

No Significant Match Found

# DV One-Page Summary

KIC: 10418797 Candidate: 2 of 2 Period: 23.355 d  
KOI: K00741 Corr: No Ephemeris Match

Kp: 15.28 R\*: 0.91 Rs Teff: 5754.0 K Logg: 4.53 Fe/H: 0.070



## DV Fit Results:

Period = 23.35517 [0.00011] d  
Epoch = 138.8383 [0.0038] BKJD  
Rp/R\* = 0.0328 [0.0014]  
a/R\* = 16.86 [1.94]  
b = 0.95 [0.01]  
Seff = 31.00 [11.49]  
Teq = 602 [56] K  
Rp = 3.24 [0.88] Re  
a = 0.1611 [0.0378] AU  
Ag = 112.88 [57.61] [1.94σ]  
Teffp = 3032 [296] K [8.08σ]

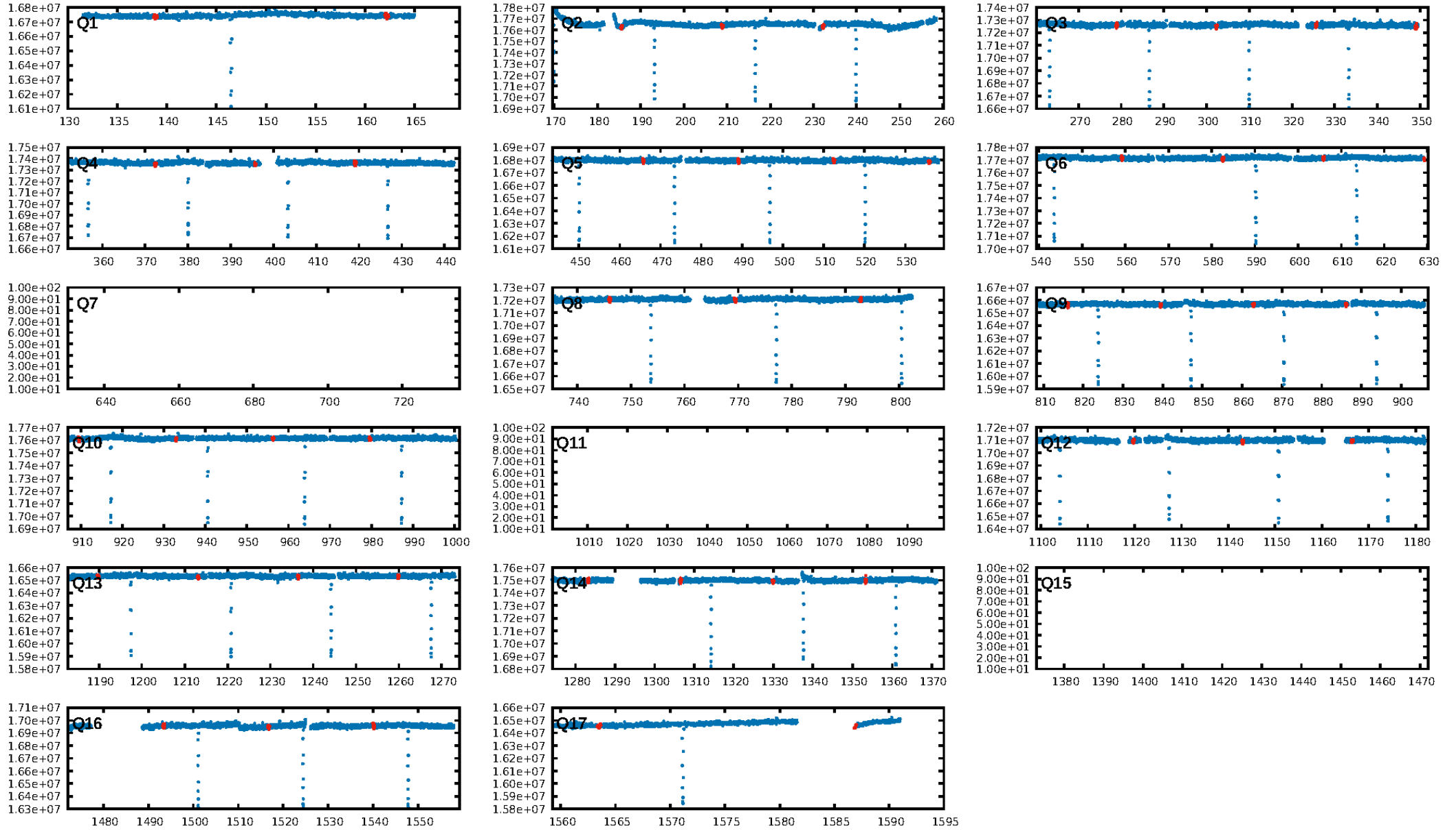
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 99.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.46e-97  
RollingBand-fgt: 1.00 [43/43]  
GhostDiagnostic-chr: -12.78  
Centroid-sig: 51.8%  
Centroid-so: 0.330 arcsec [0.57σ]  
OotOffset-rm: 0.431 arcsec [1.59σ]  
KicOffset-rm: 0.425 arcsec [1.59σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.86 [12/14]  
DiffImageOverlap-fno: 1.00 [14/14]

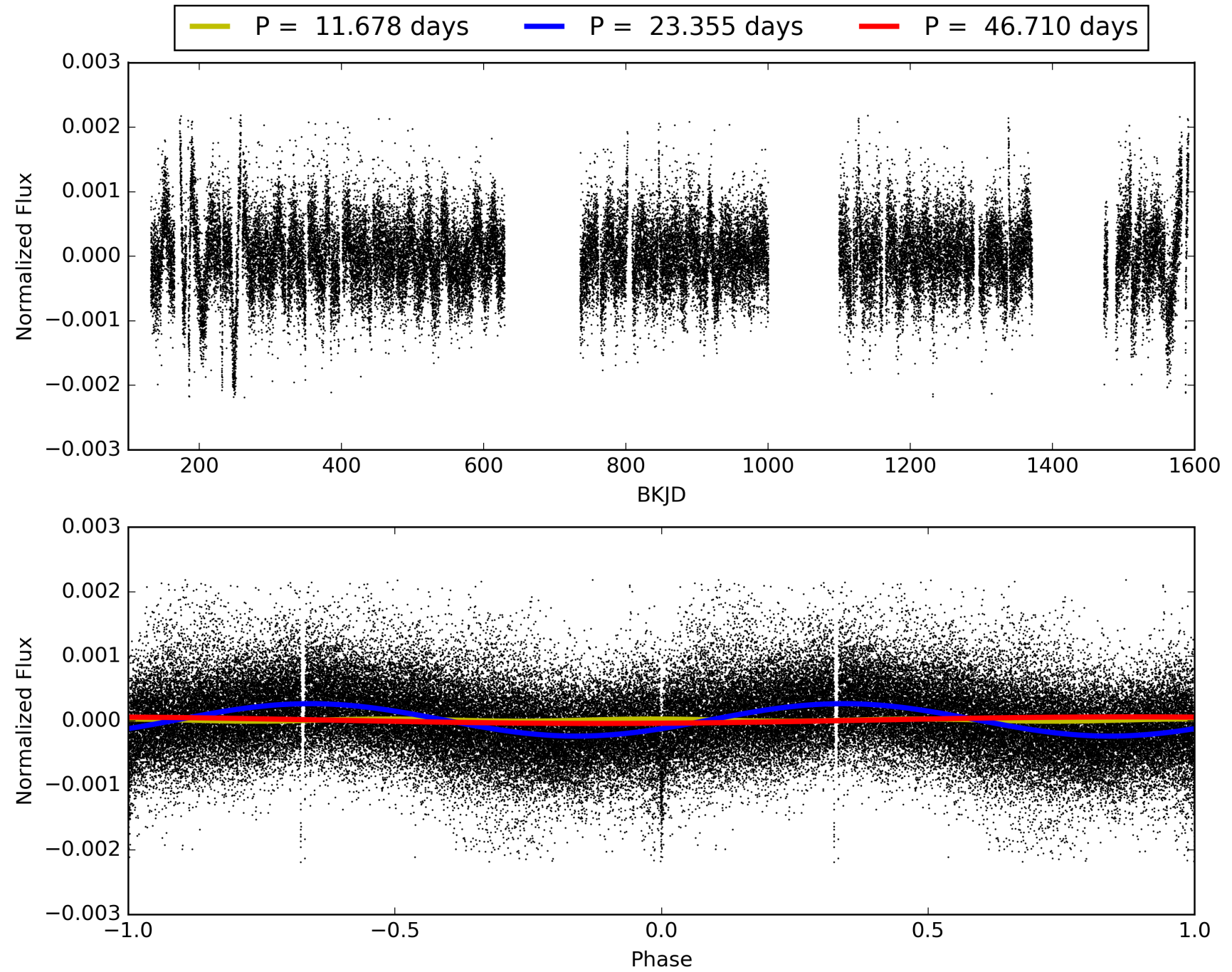
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:21:22 Z

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

# TCE 010418797-02, PDC Light Curves



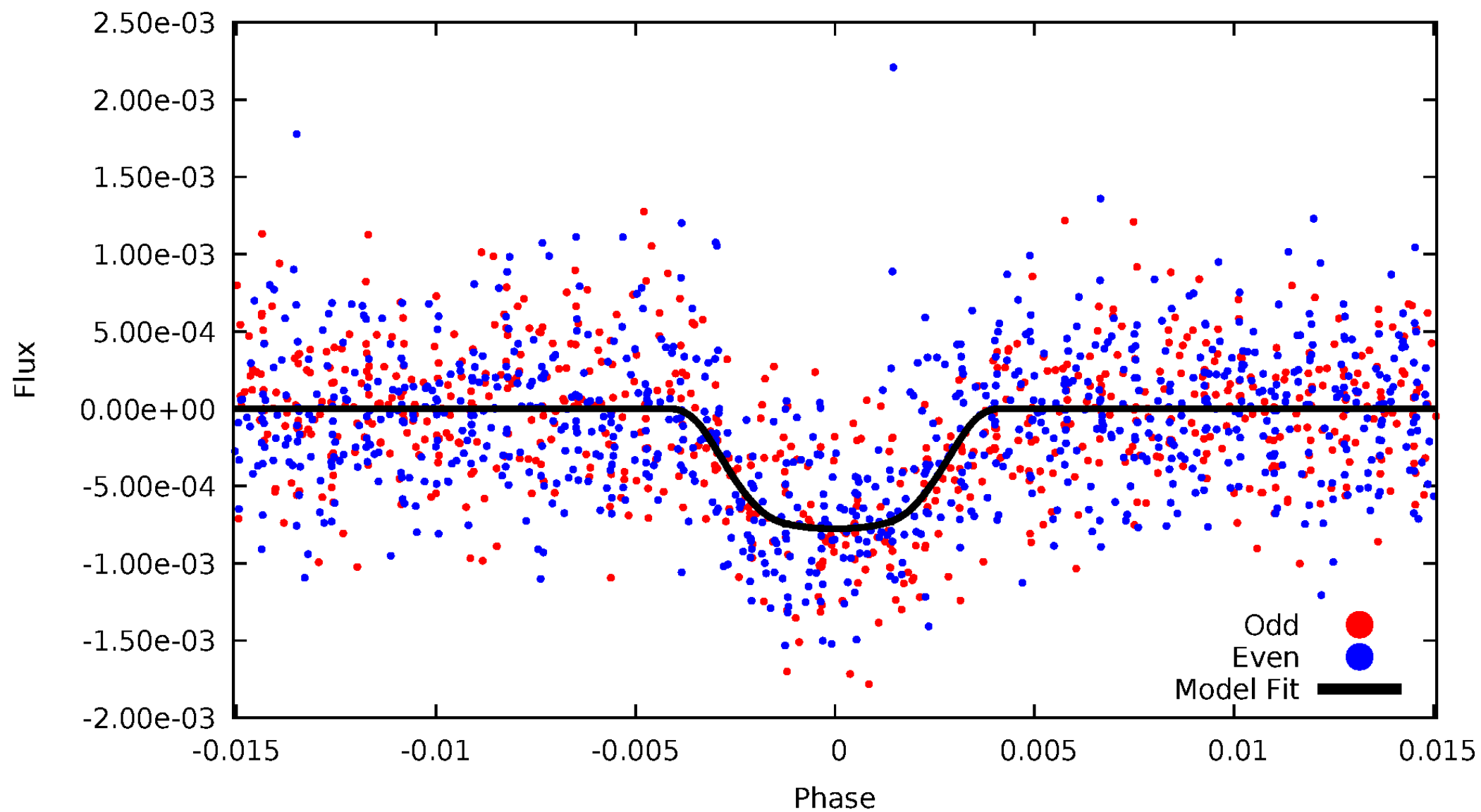
# TCE 010418797-02





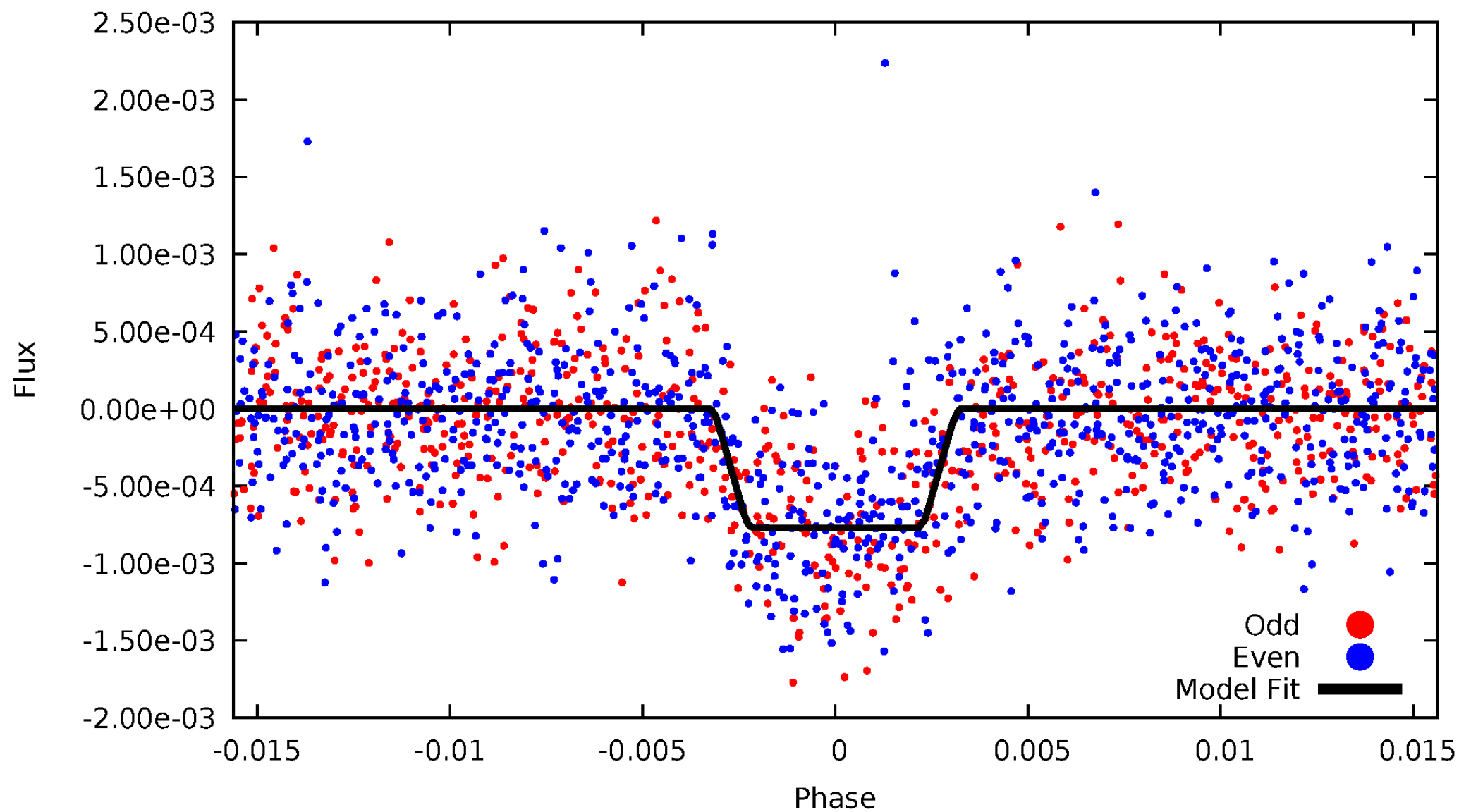
# DV Odd/Even

TCE 010418797-02



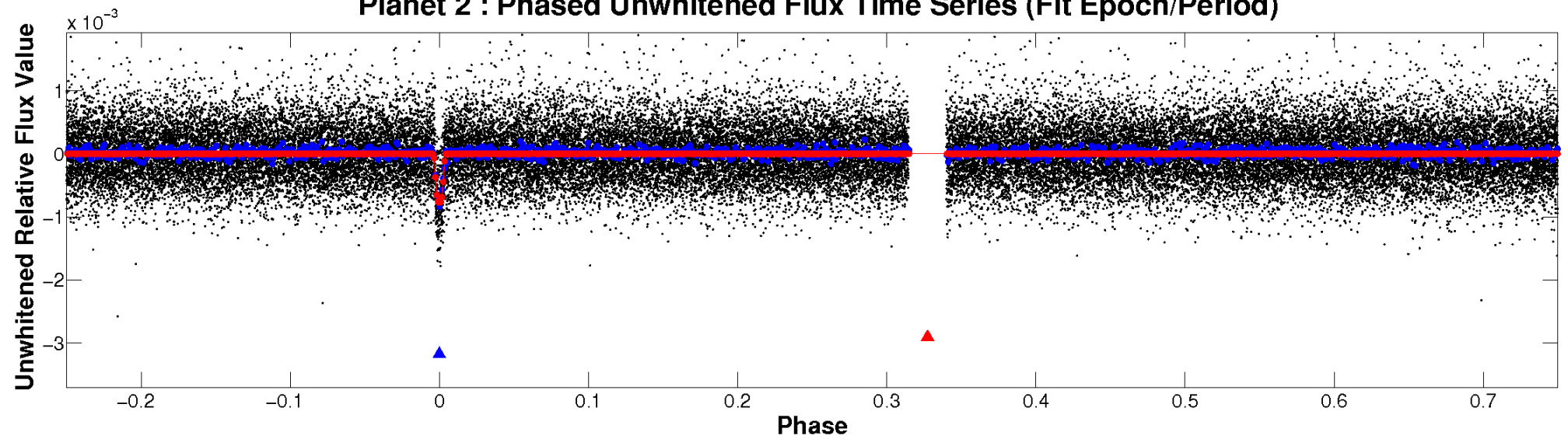
# ALT Odd/Even

TCE 010418797-02

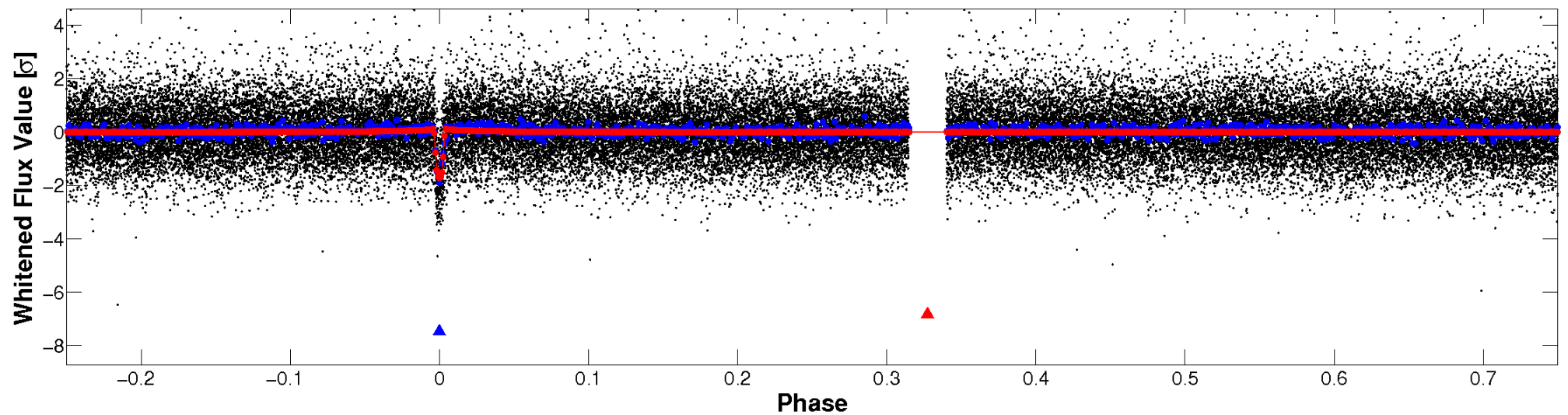


# Non-Whitened Vs. Whitened Light Curve

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

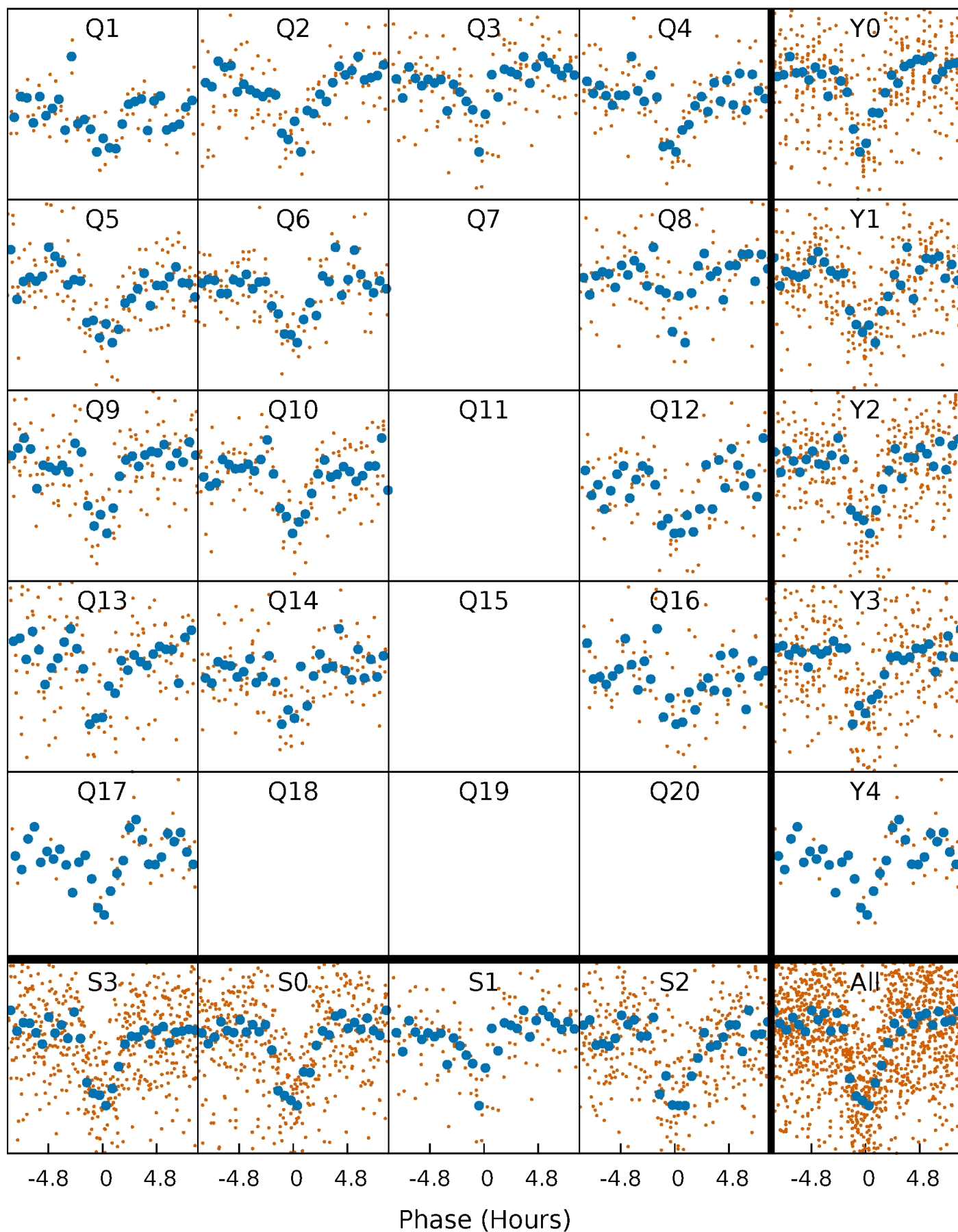


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



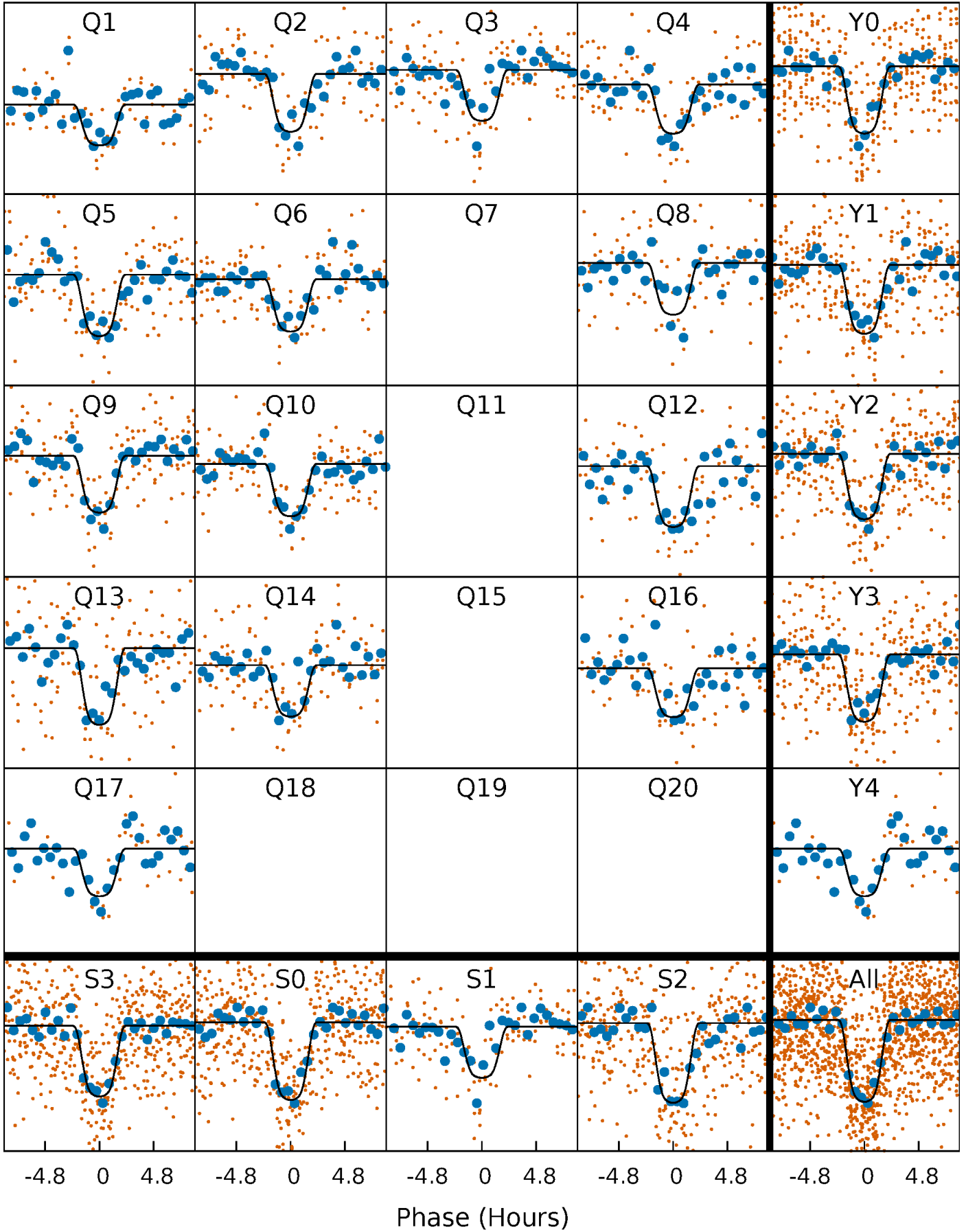
# PDC Quarter-Phased Transit Curves

TCE 010418797-02   P= 23.355168 Days    $T_0=138.838252$  (BKJD)



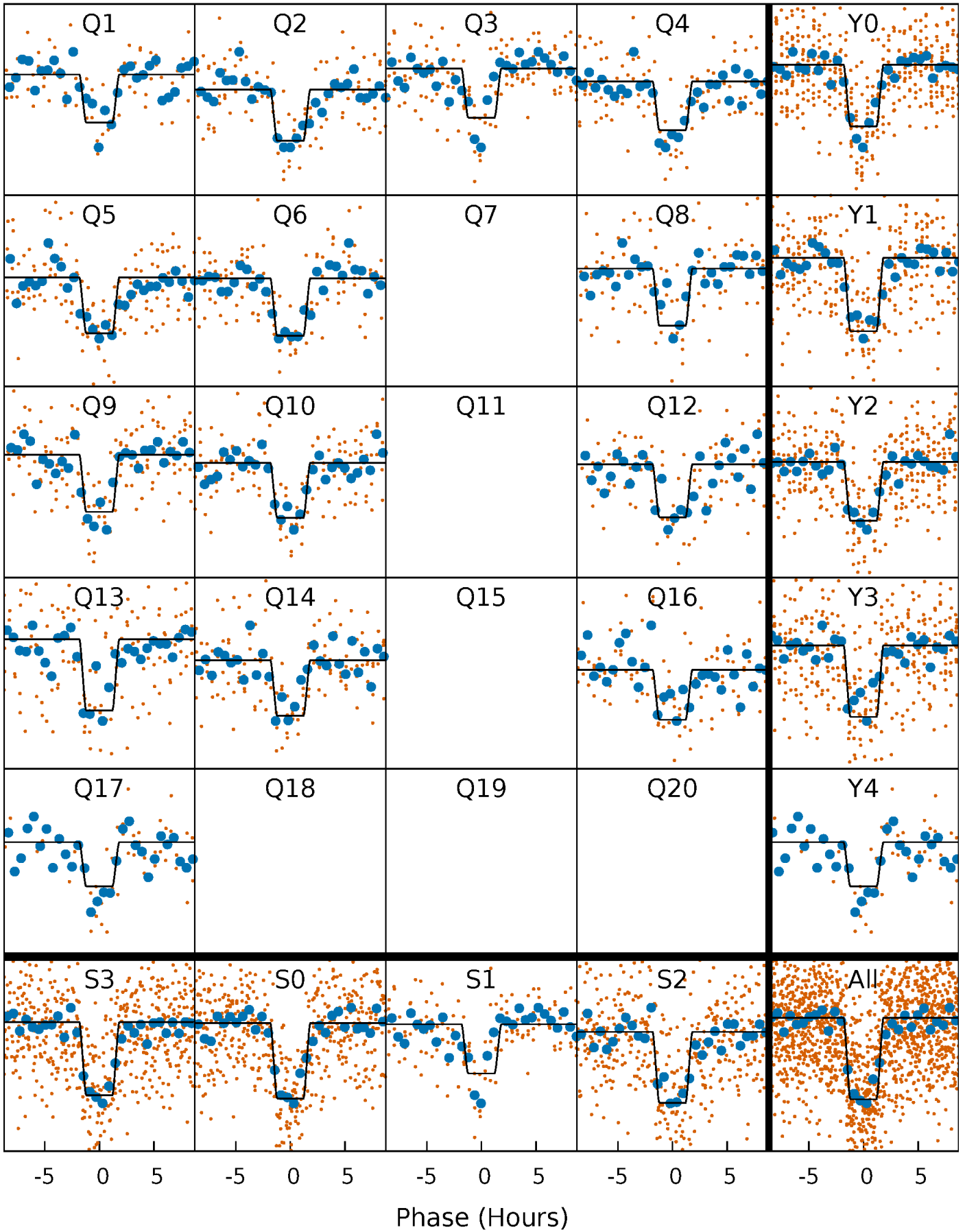
# DV Quarter-Phased Transit Curves

TCE 010418797-02   P= 23.355168 Days    $T_0=138.838252$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

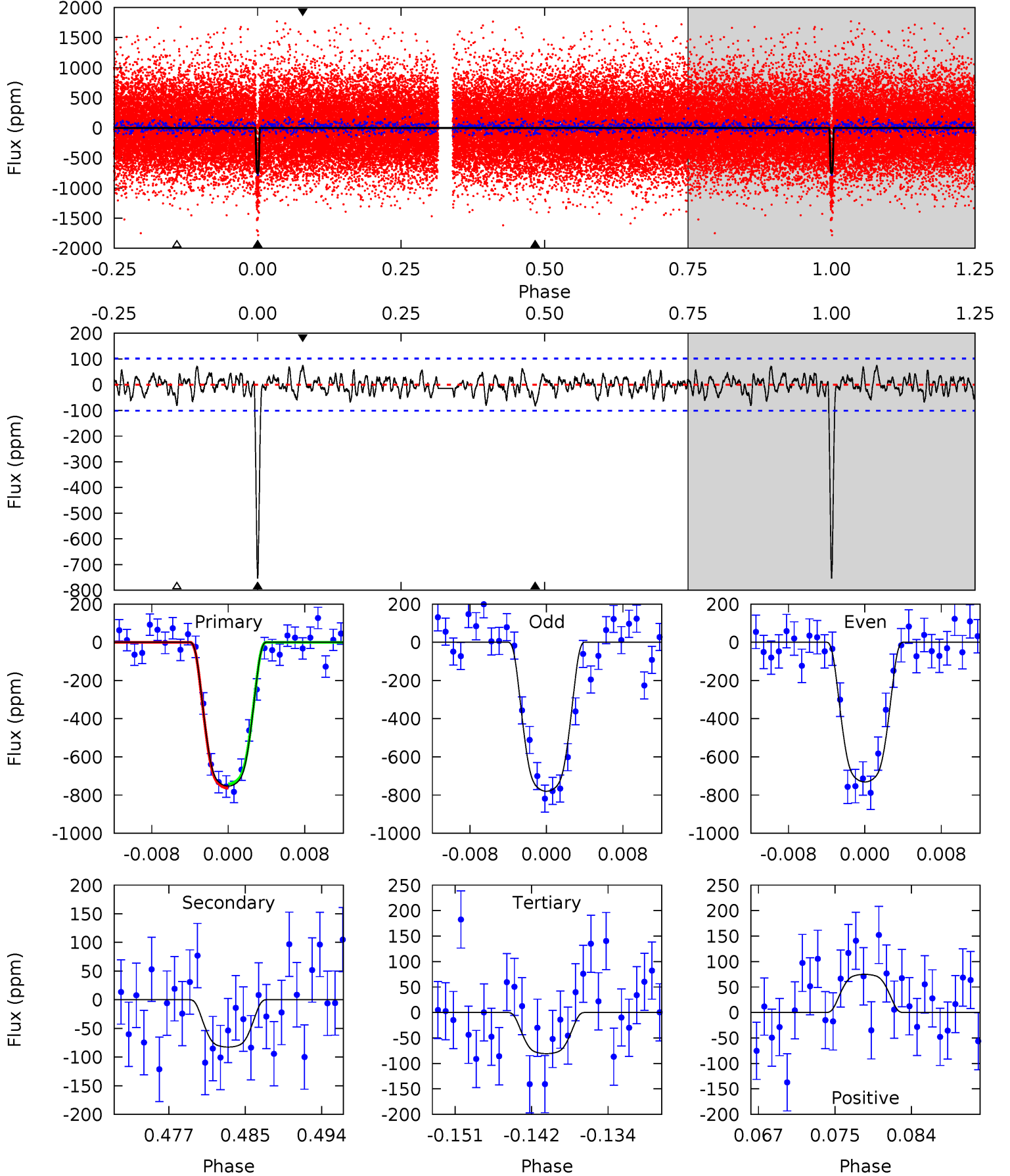
TCE 010418797-02     $P = 23.355308$  Days     $T_0 = 138.834918$  (BKJD)



# DV Model-Shift Uniqueness Test

010418797-02,  $P = 23.355168$  Days,  $E = 115.483084$  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
37.5	4.12	4.03	3.73	5.06	2.64	1.30	33.5	33.8	0.09	0.39	1.21	0.98	0.09	0.55

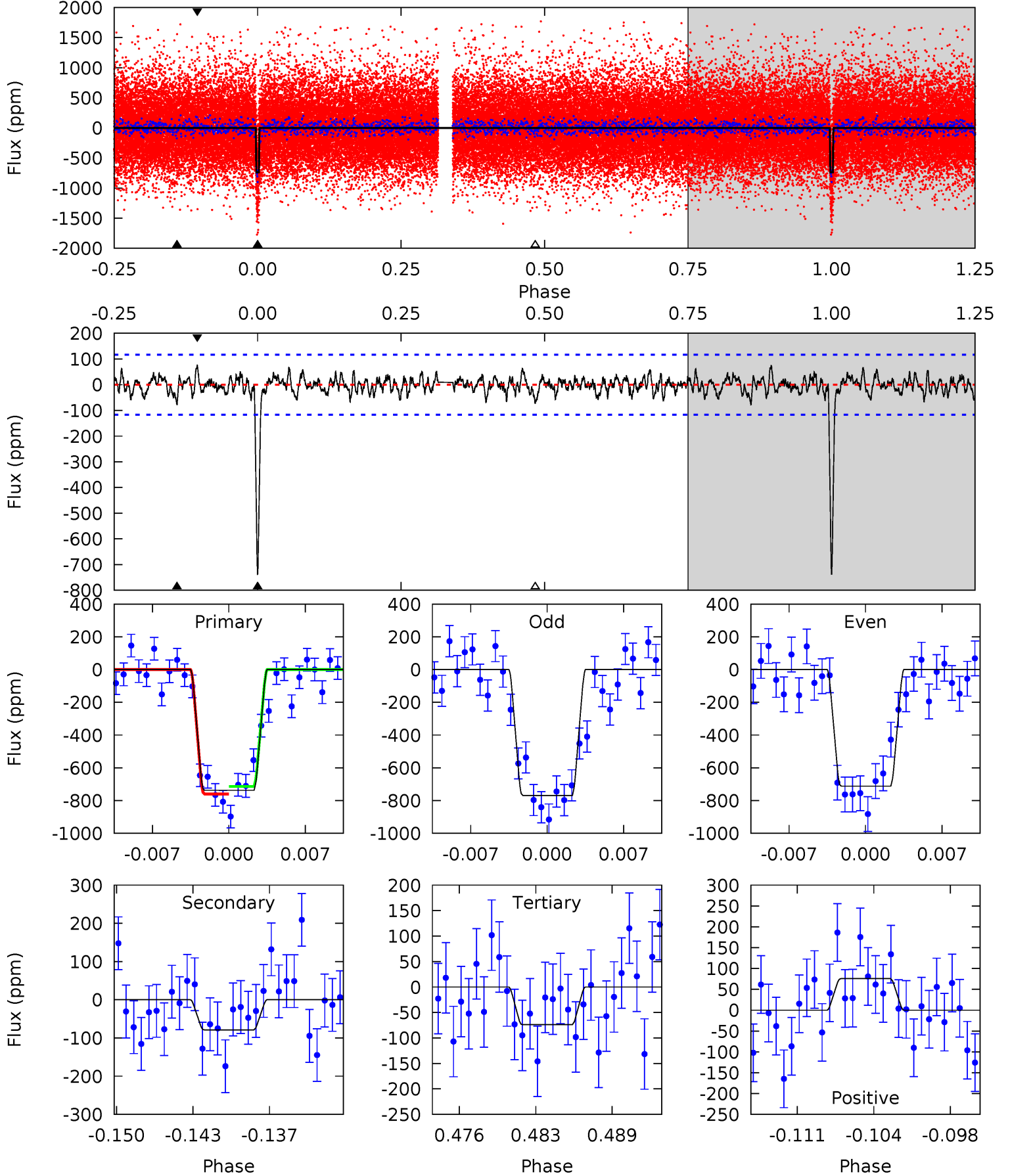




# Alt Model-Shift Uniqueness Test

010418797-02,  $P = 23.355308$  Days,  $E = 115.479610$  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
32.2	3.45	3.23	3.30	5.11	2.72	1.07	29.0	28.9	0.21	0.14	1.24	0.98	0.09	1.01





### Stellar Parameters For KIC 010418797

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5754^{+156}_{-173}$	$4.534^{+0.035}_{-0.196}$	$0.070^{+0.250}_{-0.300}$	$0.905^{+0.244}_{-0.081}$	$1.021^{+0.099}_{-0.124}$	$1.938^{+0.371}_{-0.978}$
	+3%/-3%	+1%/-4%	+357%/-429%	+27%/-9%	+10%/-12%	+19%/-50%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010418797-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-83 \pm 20$	$3.36^{+0.47}_{-0.30}$	$863^{+51}_{-39}$	$3498^{+159}_{-168}$	$99^{+35}_{-30}$
Alt.	$-79 \pm 23$	$2.85^{+0.43}_{-0.27}$	$861^{+58}_{-37}$	$3663^{+197}_{-216}$	$131^{+49}_{-46}$

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

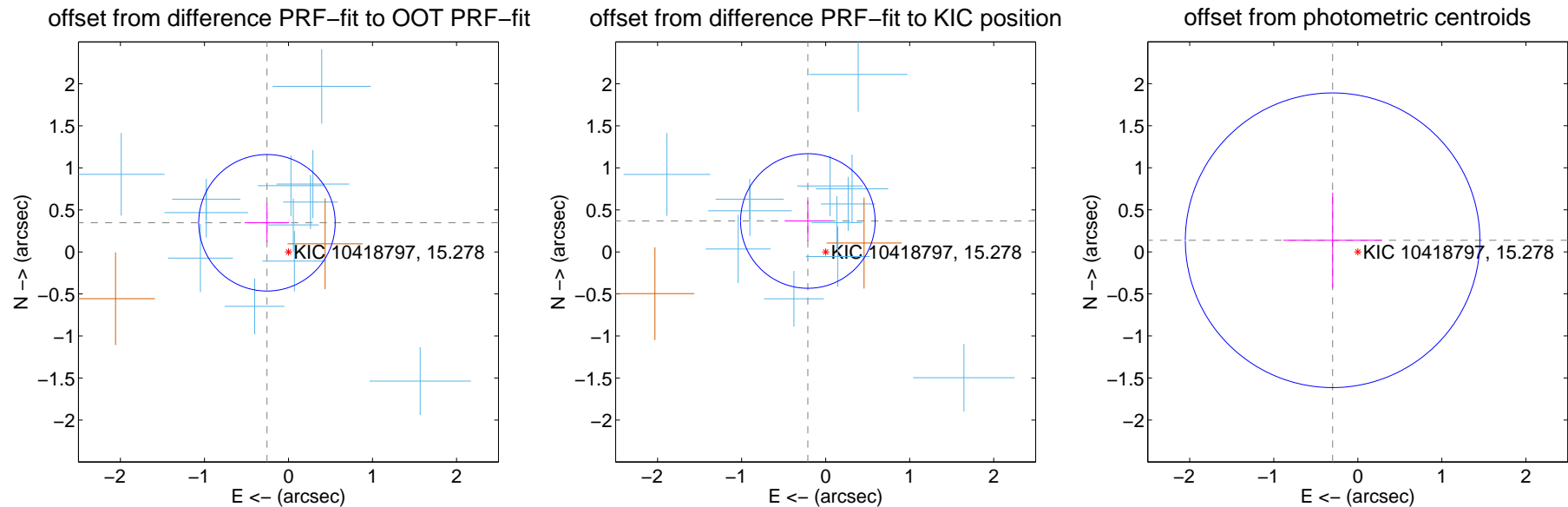
## DV Centroid Data

Supplemental centroid analysis for 010418797-02. Kepler magnitude: 15.28. Transit SNR 24.84

There are 12 quarters with good PRF difference image offsets

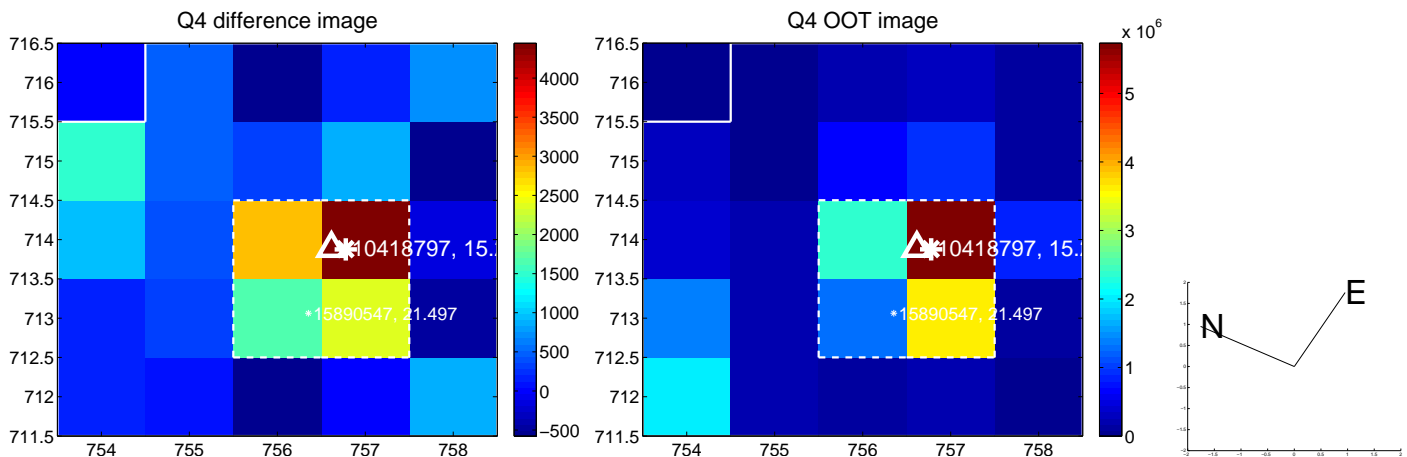
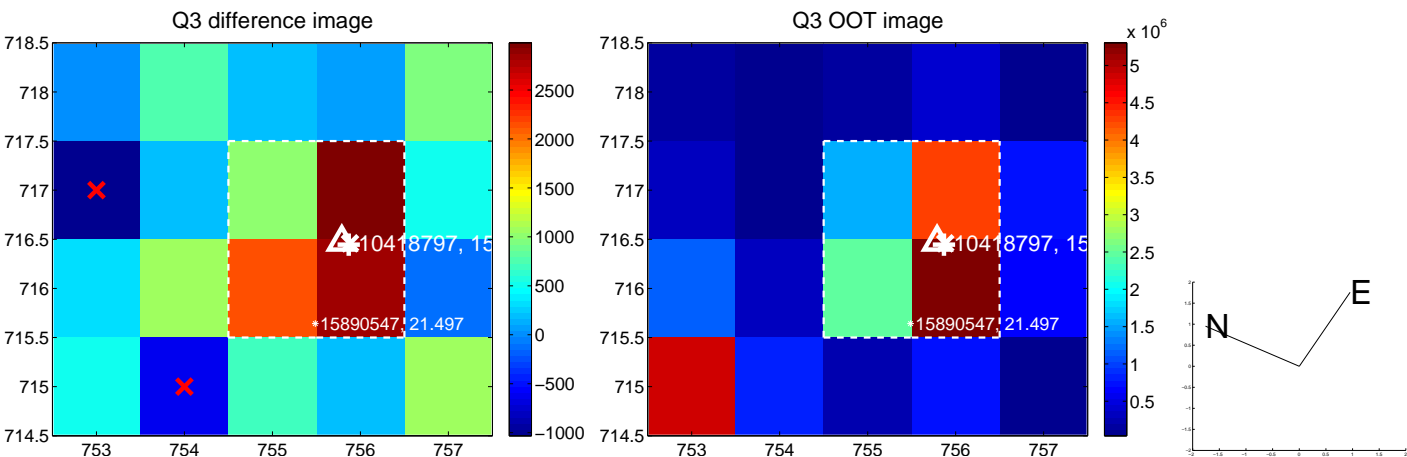
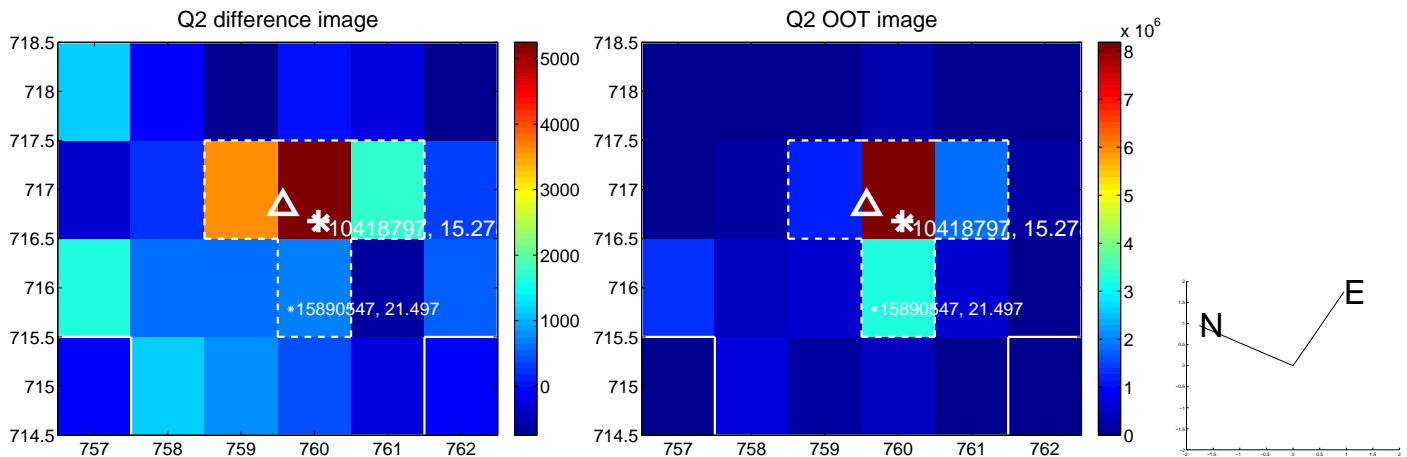
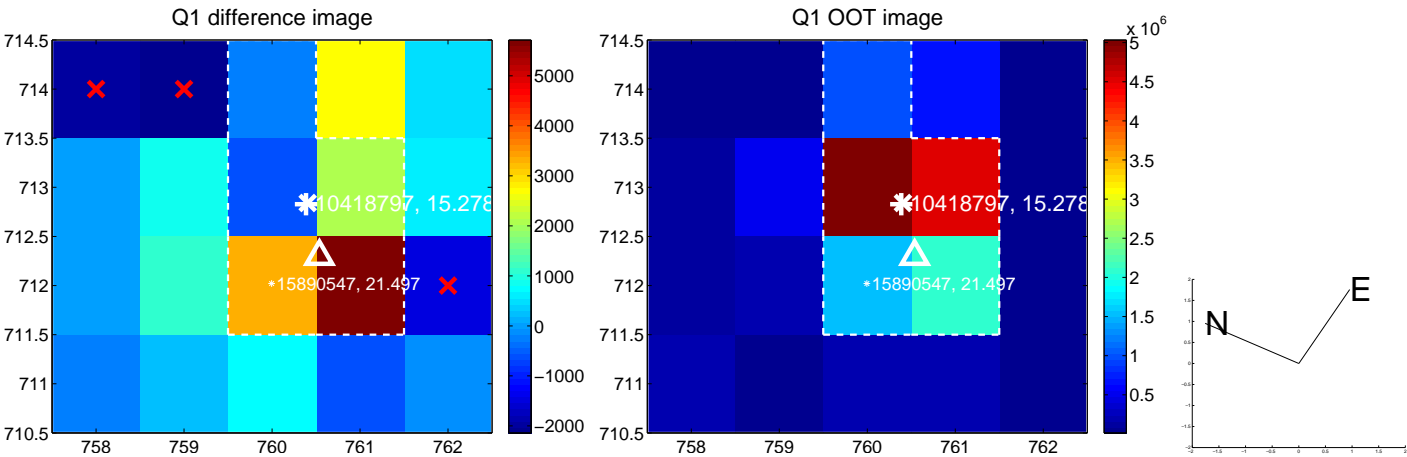
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.431 \pm 0.271$	1.59	$0.256 \pm 0.264$	$0.347 \pm 0.230$
PRF-fit source offset from KIC position	$0.425 \pm 0.267$	1.59	$0.212 \pm 0.275$	$0.368 \pm 0.238$
photometric centroid source offset	$0.33 \pm 0.58$	0.57	$0.30 \pm 0.59$	$0.14 \pm 0.56$

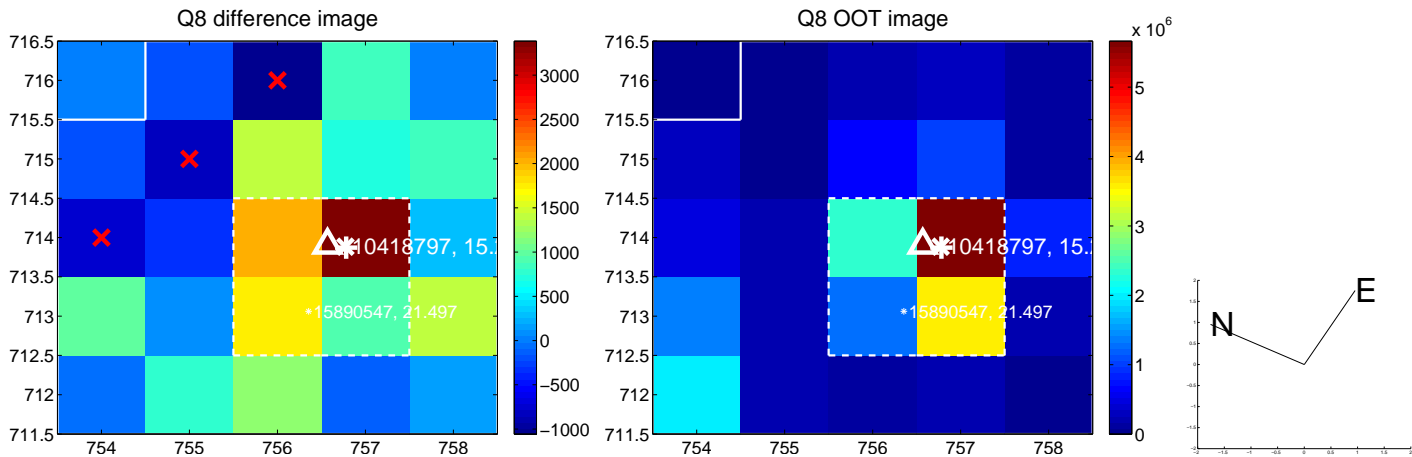
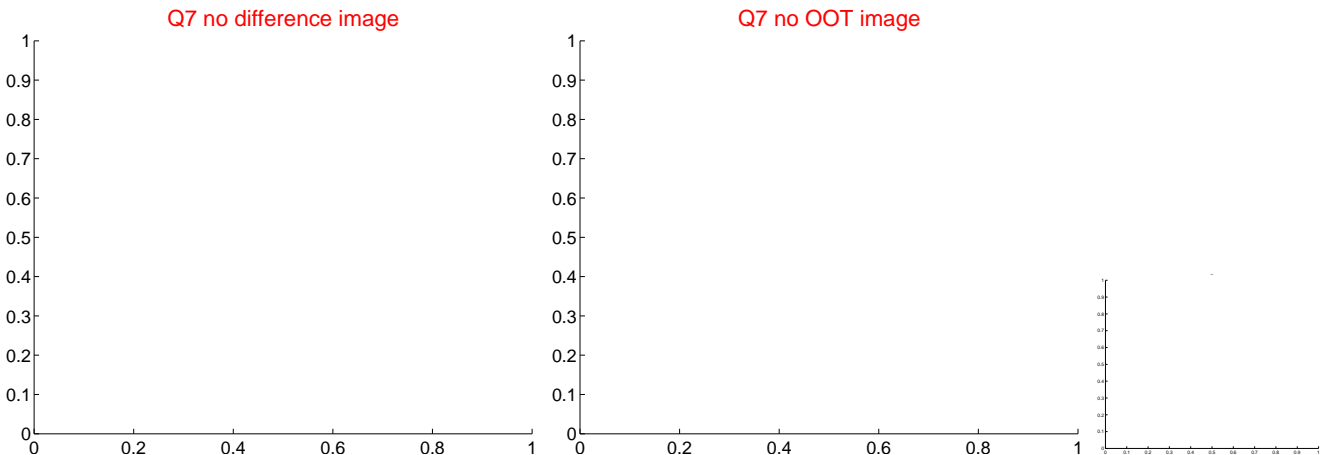
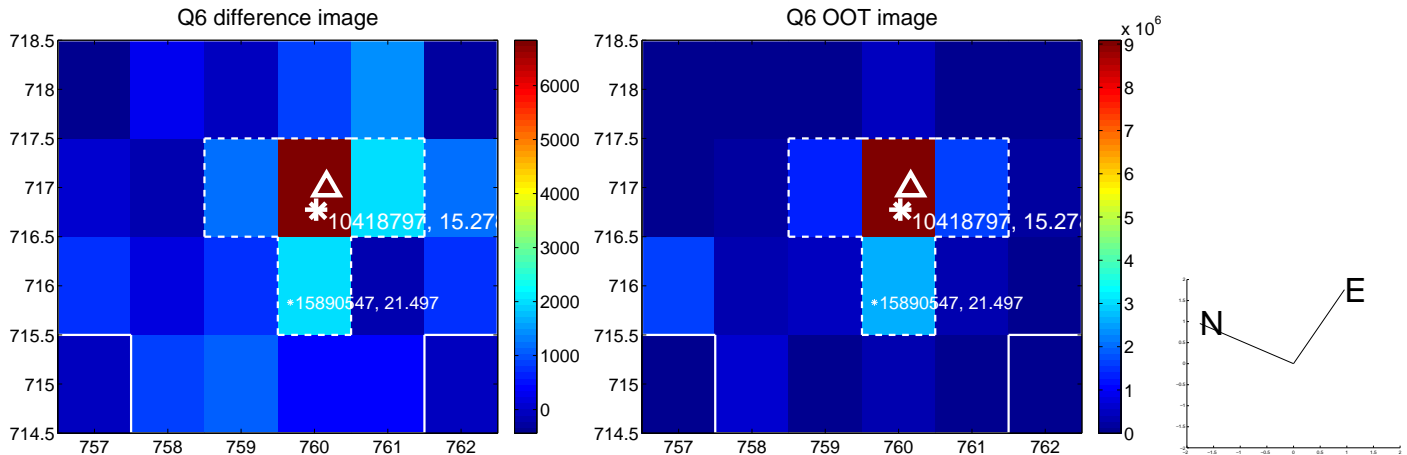
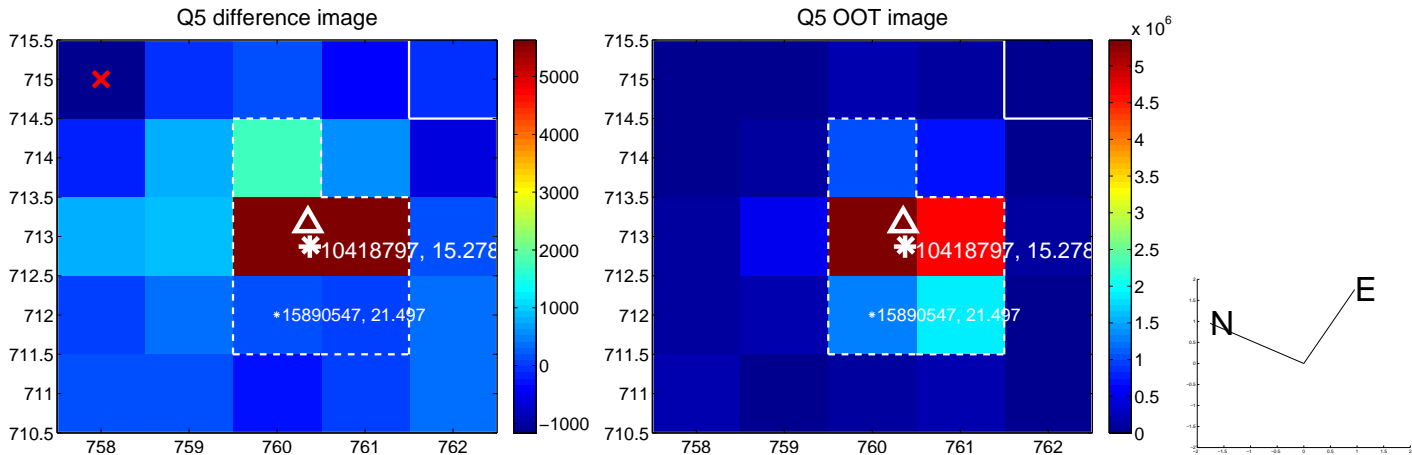


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

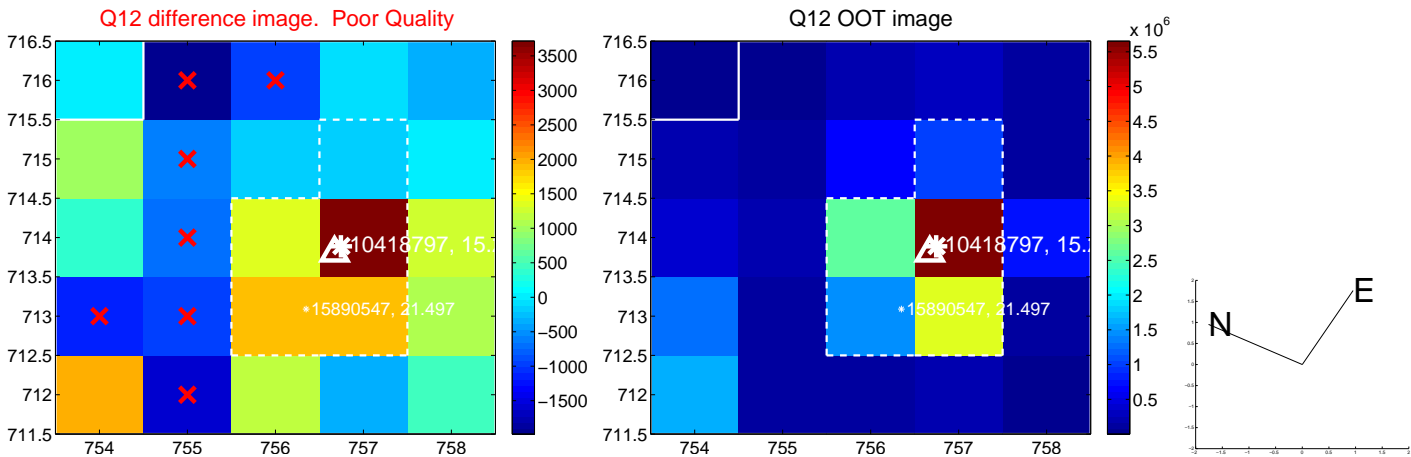
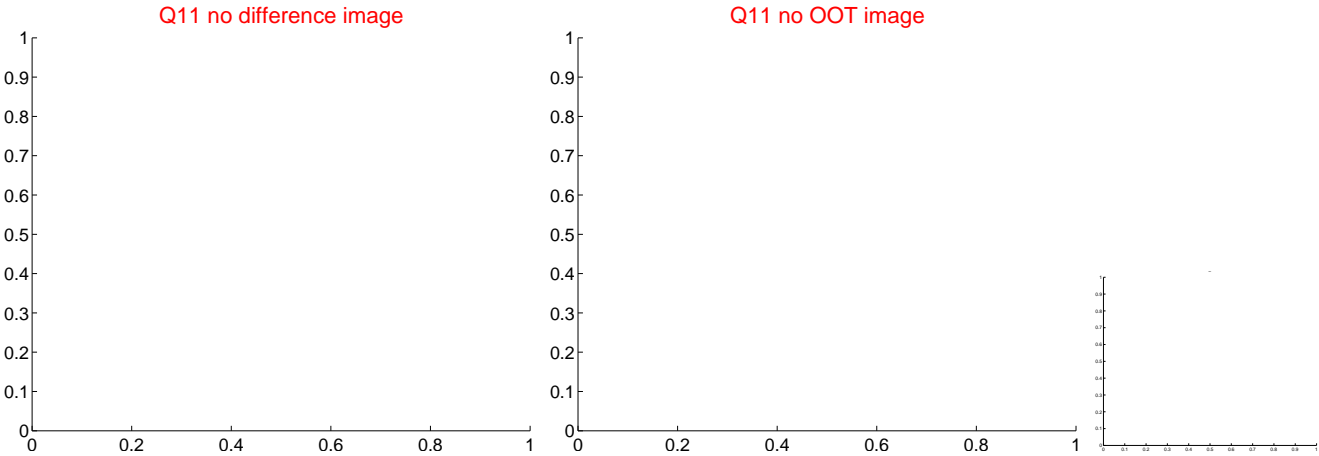
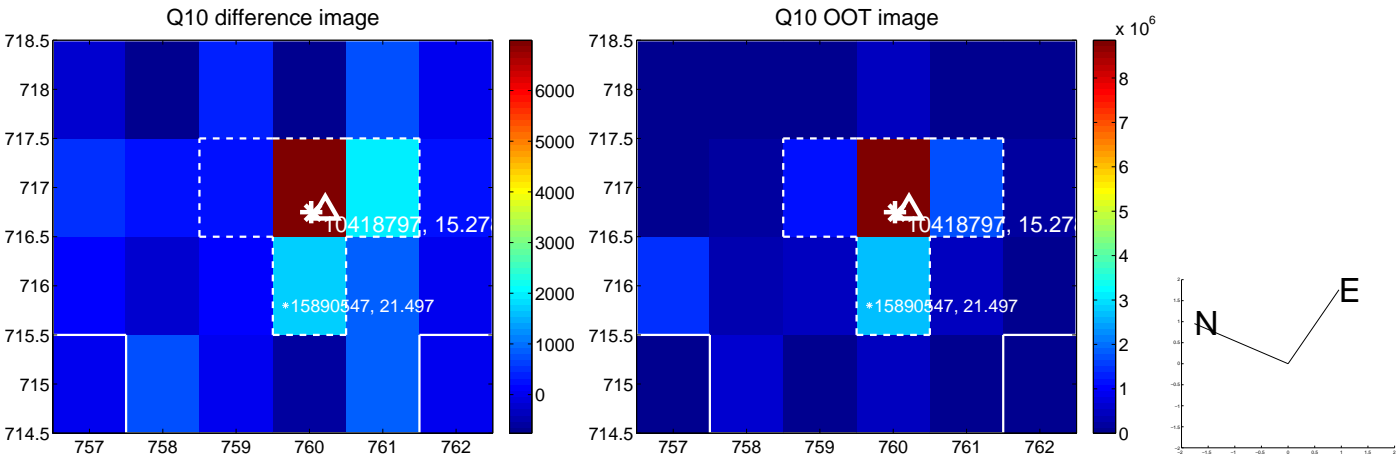
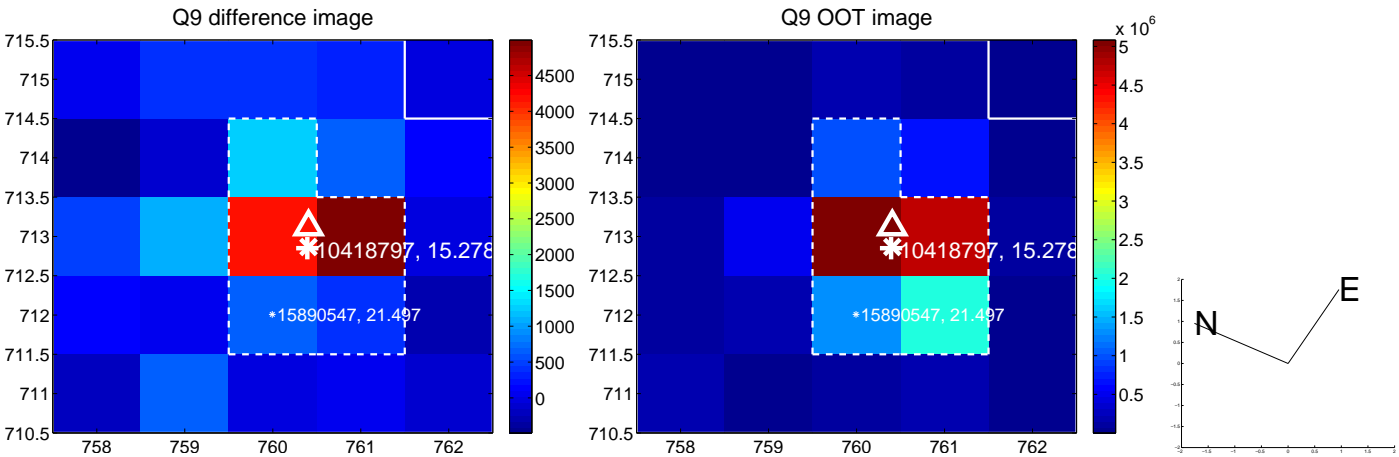
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



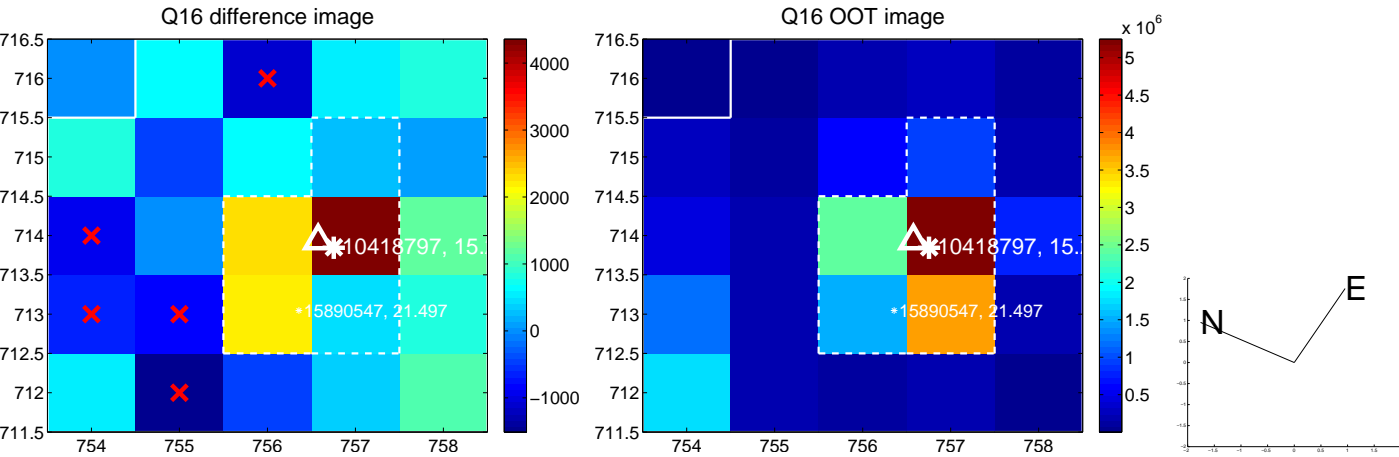
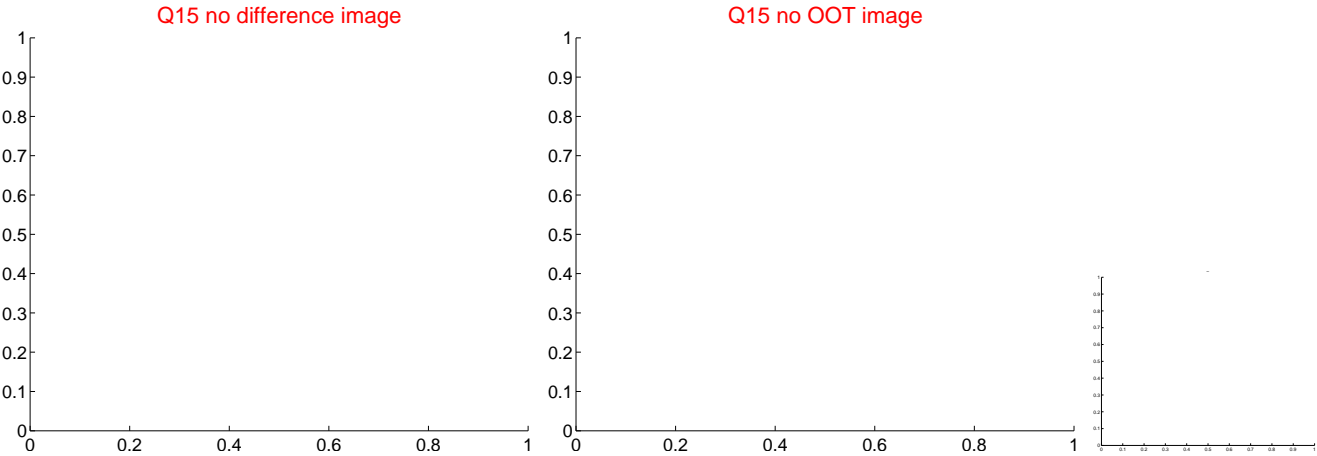
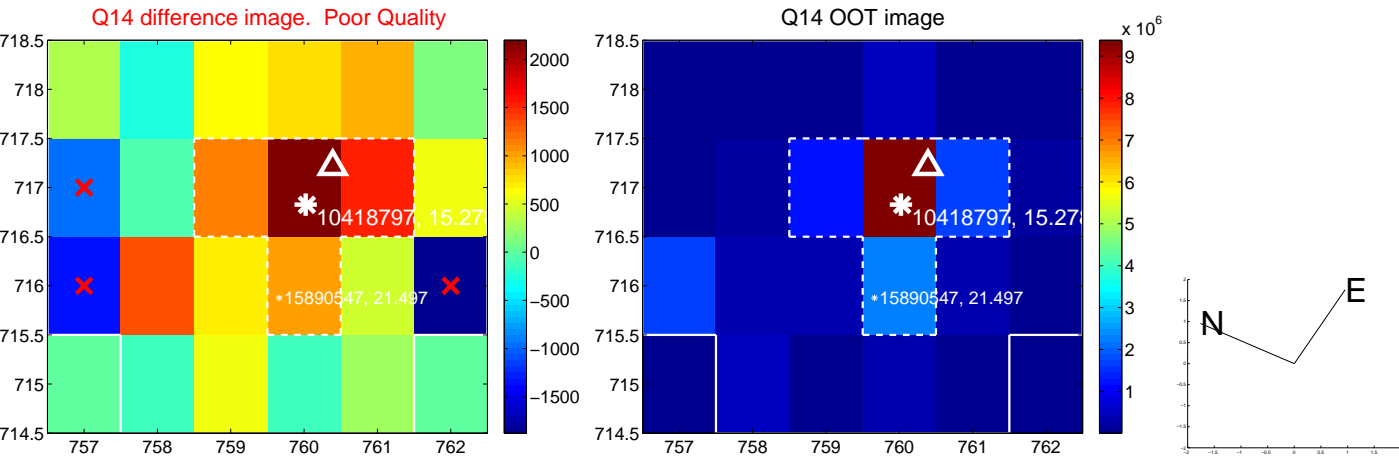
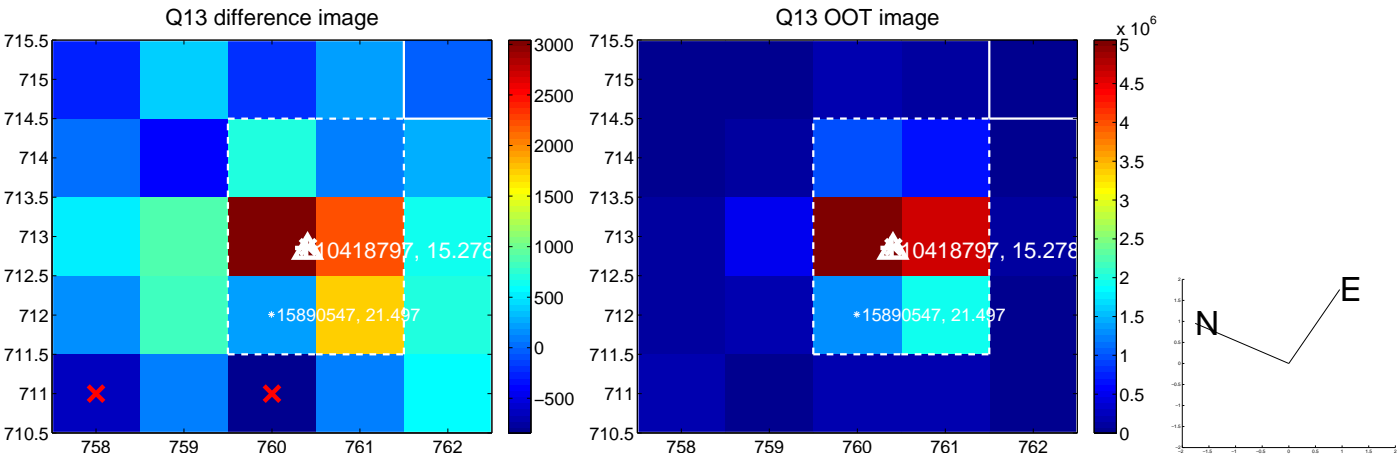
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.





UKIRT Image

Declination

