

# KIC 005003117

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005003117-01	OBS	0405.01	37.607687	153.150739	26652.3	7.183	2048.8	1403.5	0.90	5600	15.84	15.83
005003117-02	OBS	No	37.608203	132.127509	719.4	7.154	55.3	56.1	0.90	5600	3.02	15.83

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005003117-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
005003117-02	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.

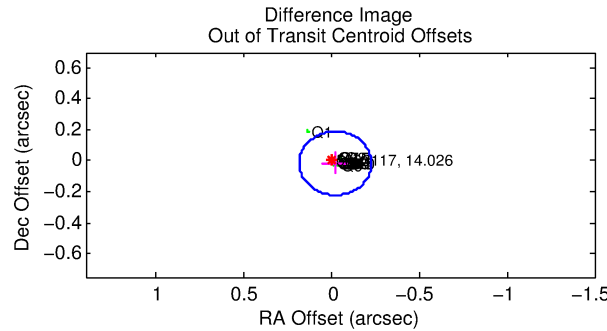
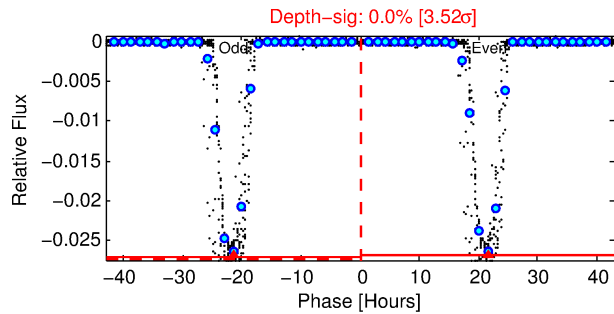
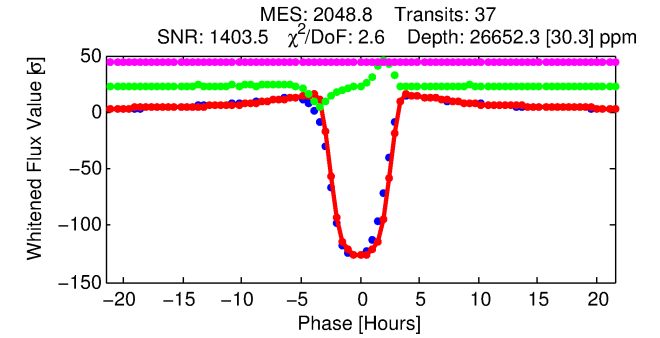
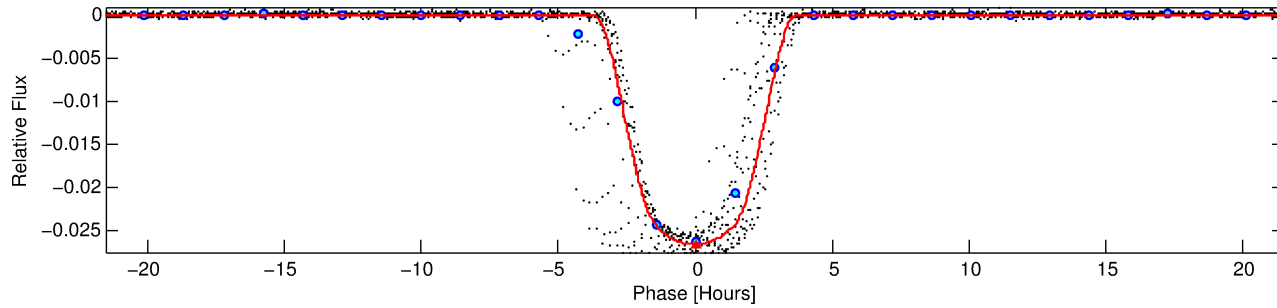
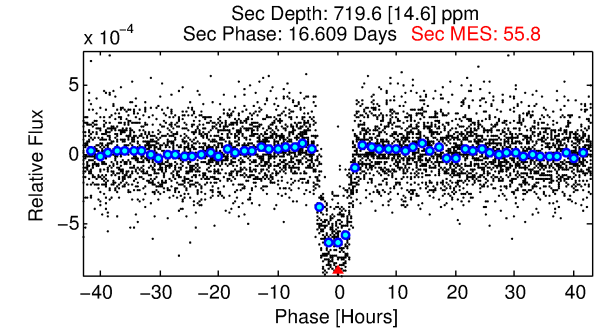
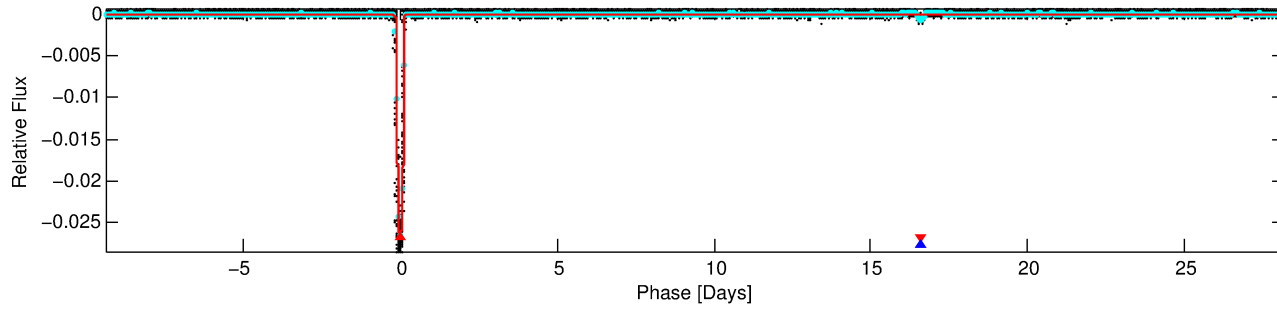
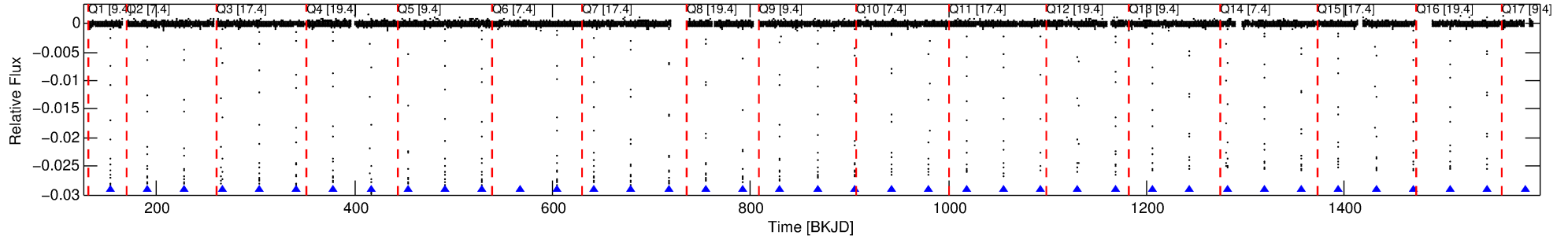
## Ephemeris Match Information For 005003117-01

No Significant Match Found

# DV One-Page Summary

KIC: 5003117 Candidate: 1 of 2 Period: 37.608 d  
KOI: K00405.01 Corr: 0.947

Kp: 14.03 R\*: 0.90 Rs Teff: 5600.0 K Logg: 4.48 Fe/H: -0.100



## DV Fit Results:

Period = 37.60769 [0.00001] d  
Epoch = 153.1507 [0.0002] BKJD  
Rp/R\* = 0.1620 [0.0002]  
a/R\* = 36.35 [0.10]  
b = 0.72 [0.00]  
Seff = 15.83 [5.07]  
Teq = 509 [41] K  
Rp = 15.84 [4.05] Re  
a = 0.2114 [0.0446] AU  
Ag = 70.53 [21.31] [3.26σ]  
Teffp = 2279 [63] K [23.61σ]

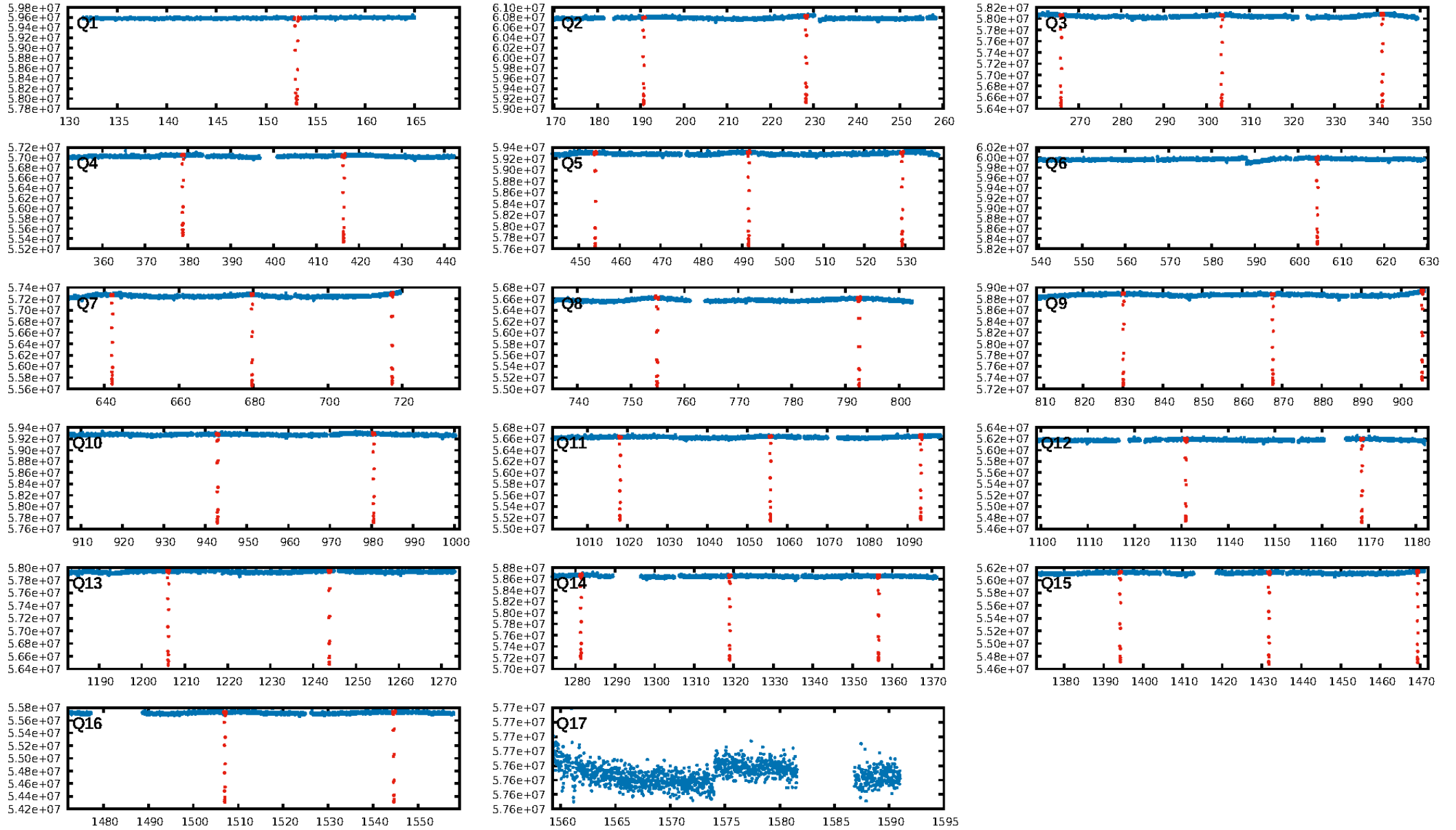
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [36/36]  
GhostDiagnostic-chr: 3.249  
Centroid-sig: 0.0%  
Centroid-so: 0.144 arcsec [29.01σ]  
OotOffset-rm: 0.027 arcsec [0.39σ]  
KicOffset-rm: 0.016 arcsec [0.24σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [16/16]

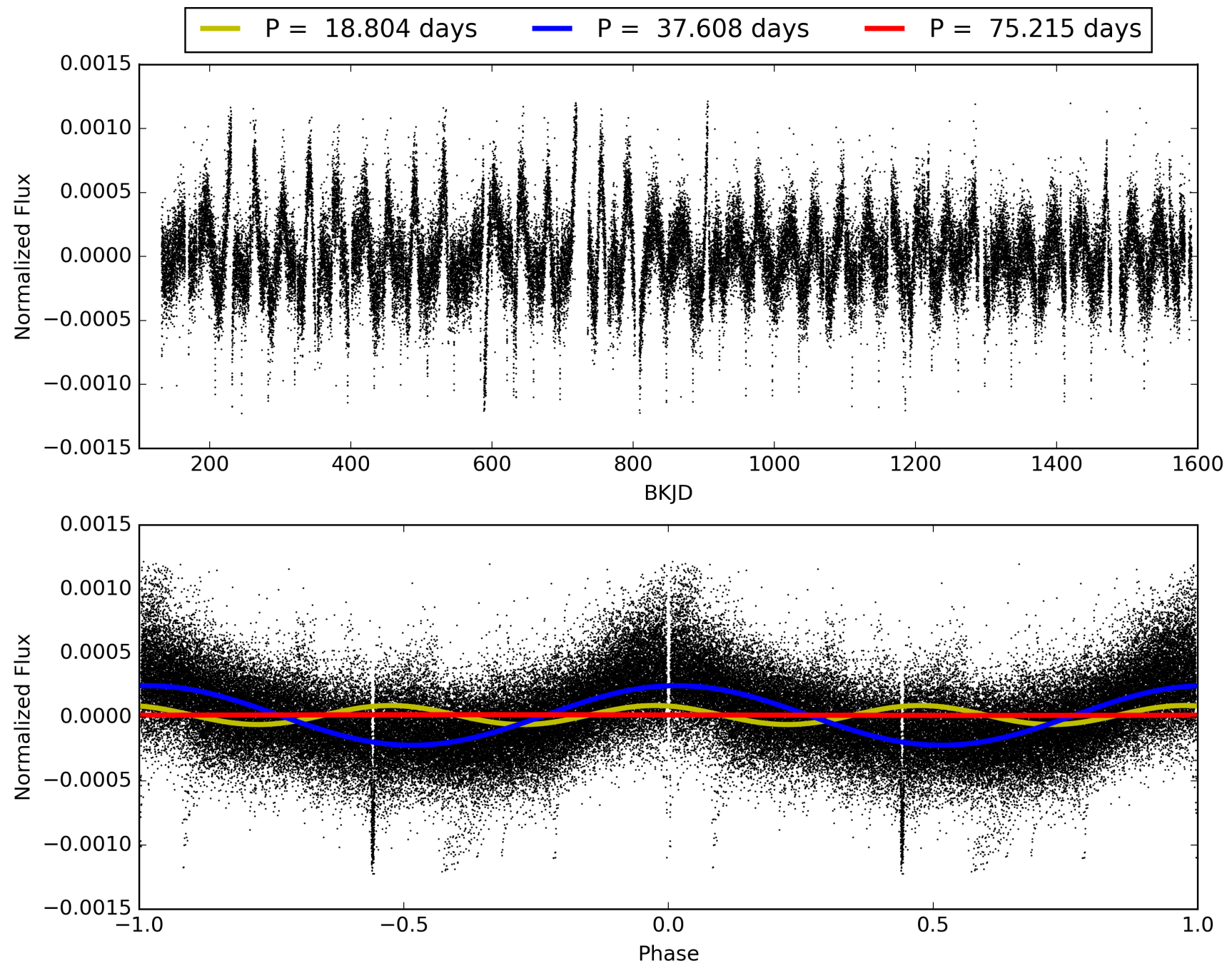
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:31:02 Z

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

# TCE 005003117-01, PDC Light Curves

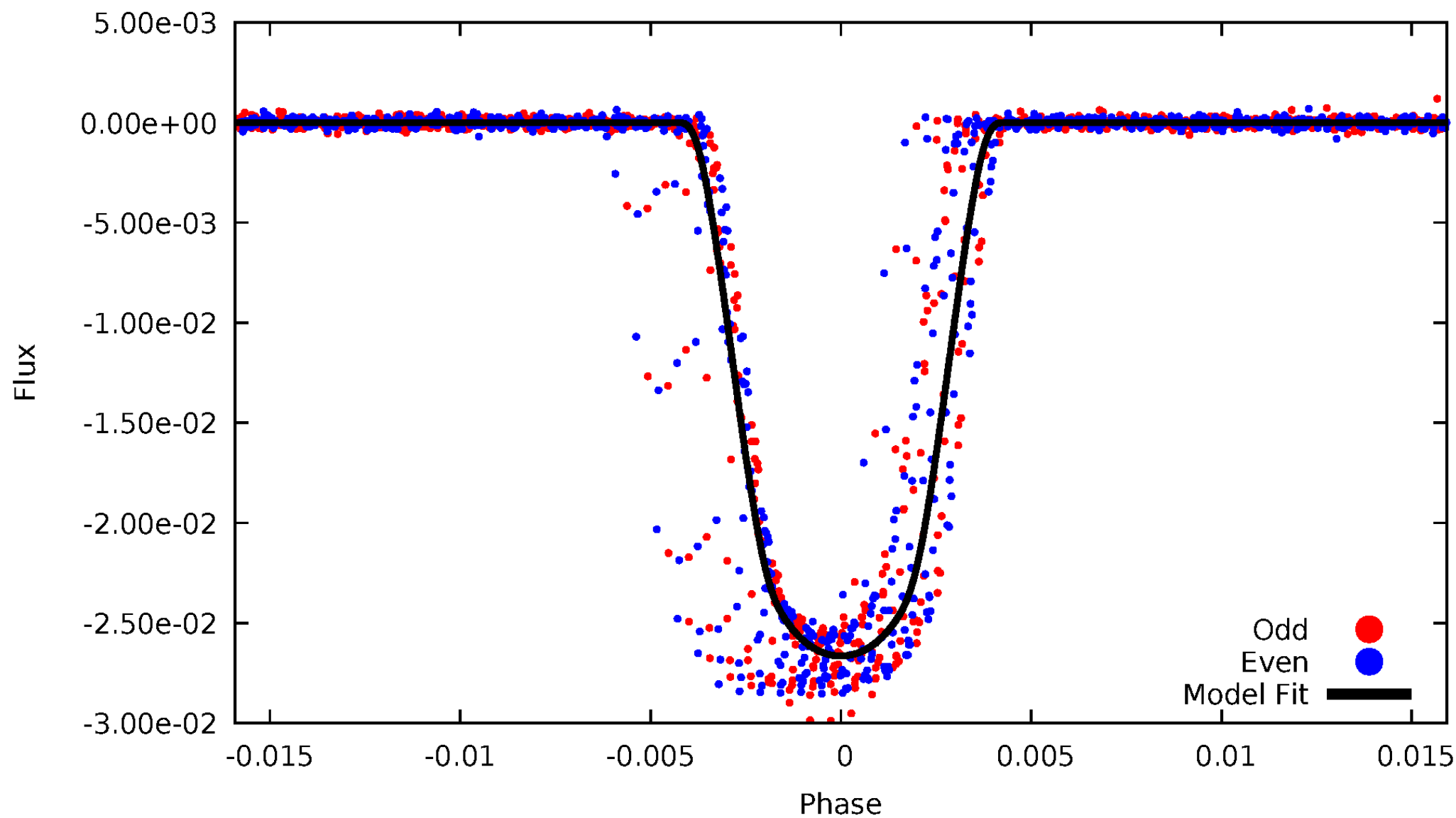


TCE 005003117-01



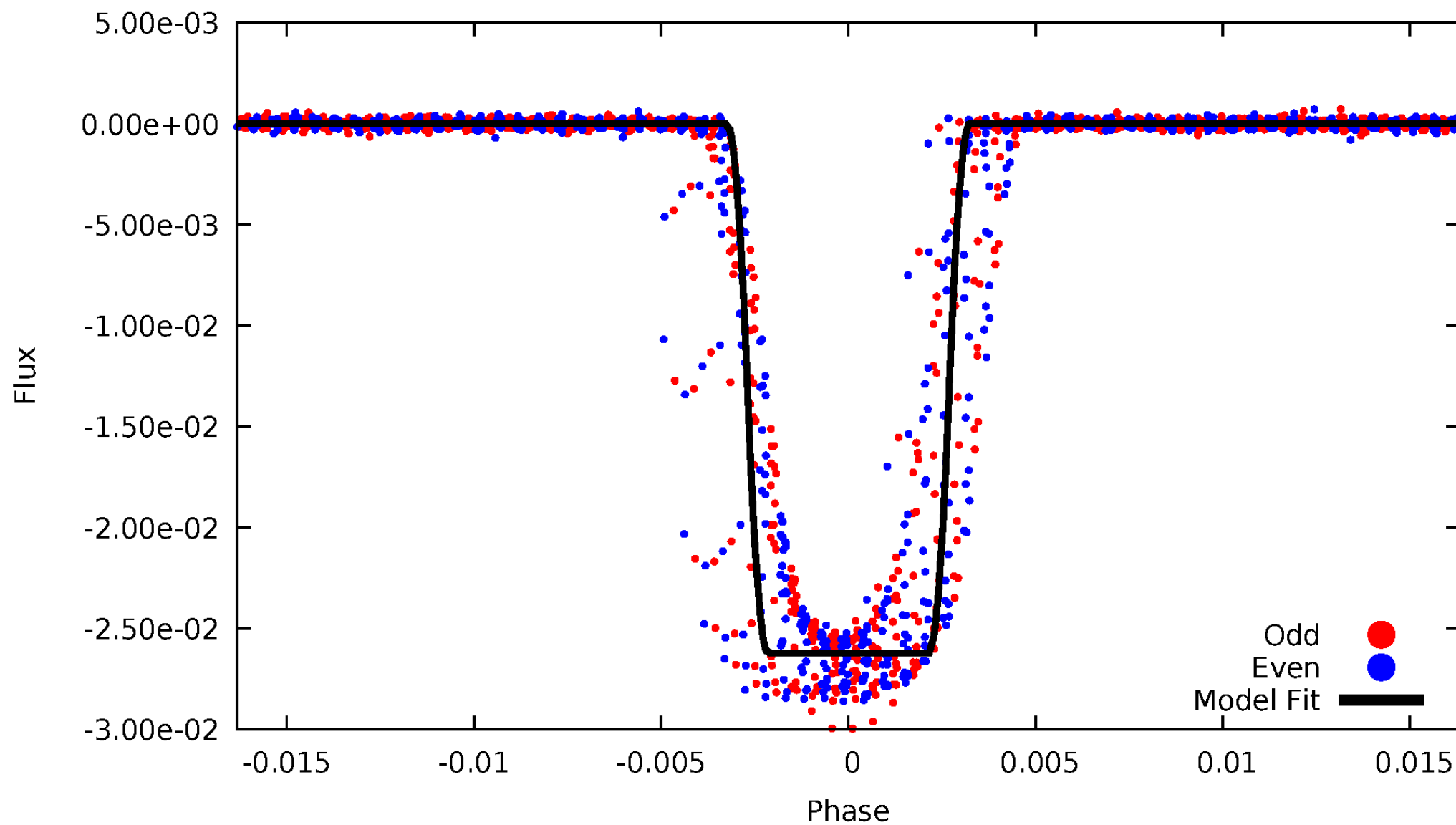
# DV Odd/Even

TCE 005003117-01



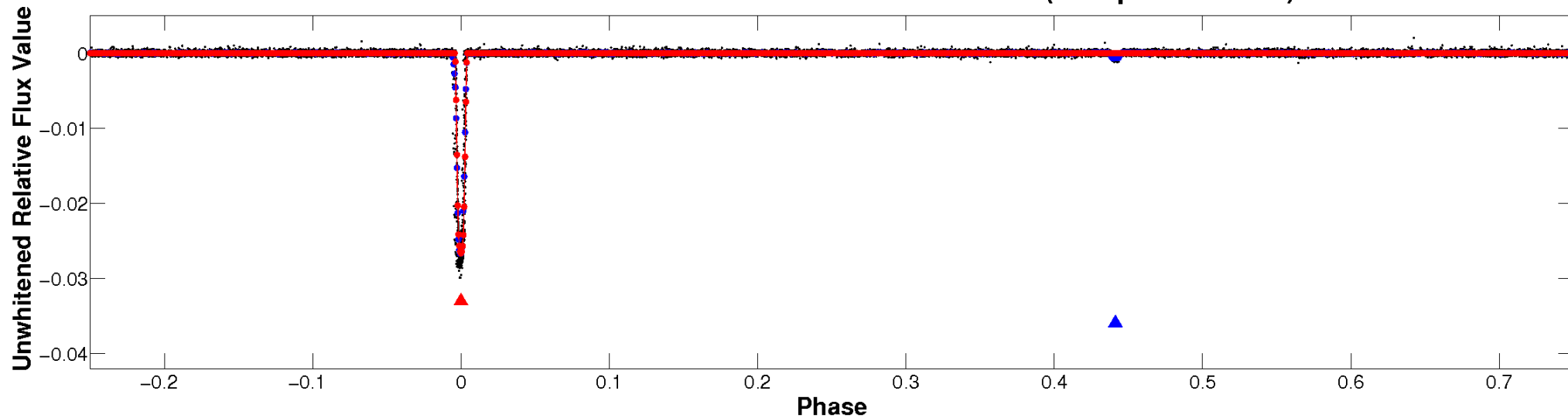
# ALT Odd/Even

TCE 005003117-01

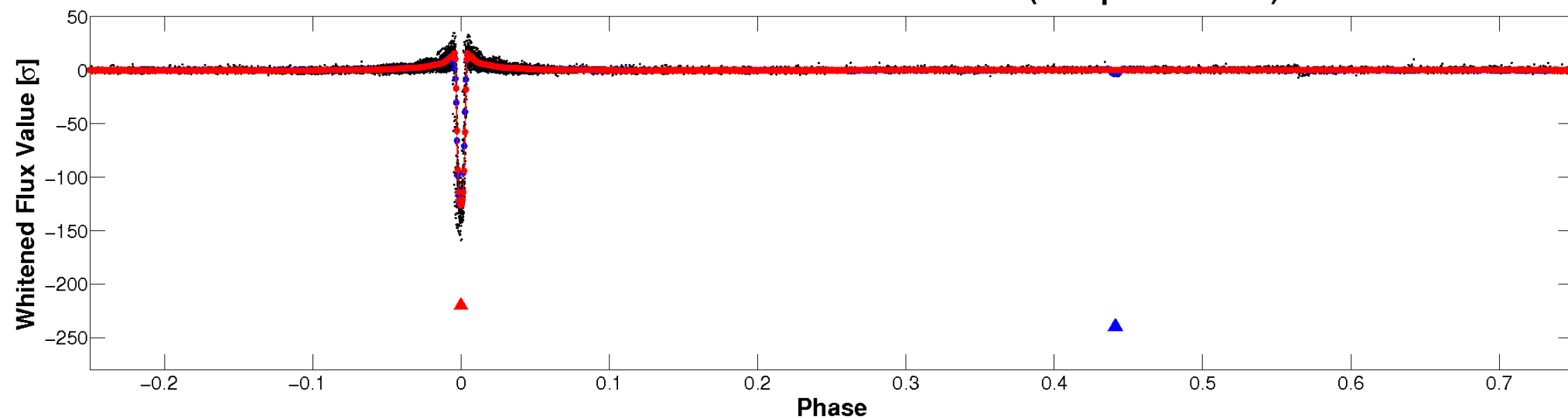


# Non-Whitened Vs. Whitened Light Curve

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

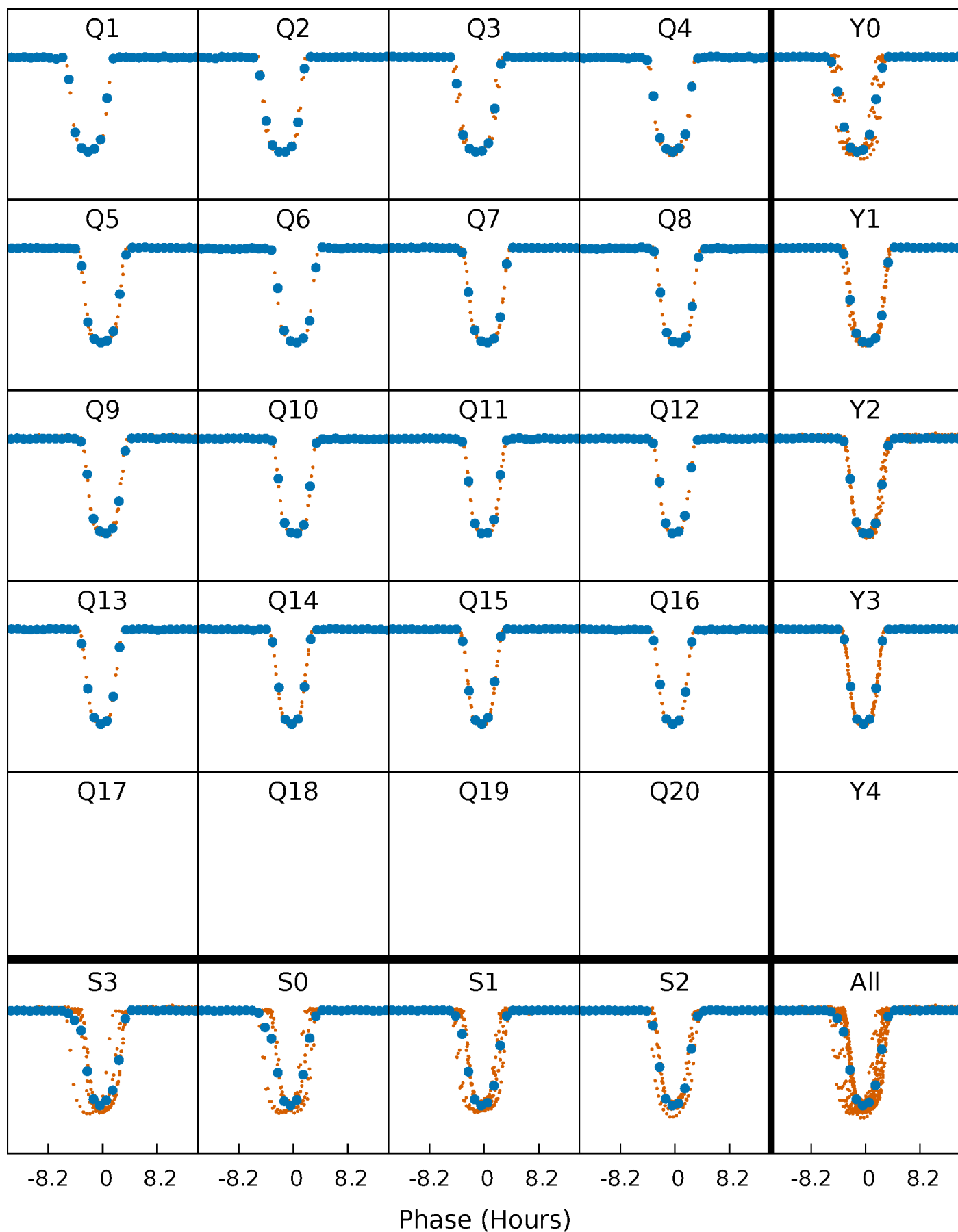


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

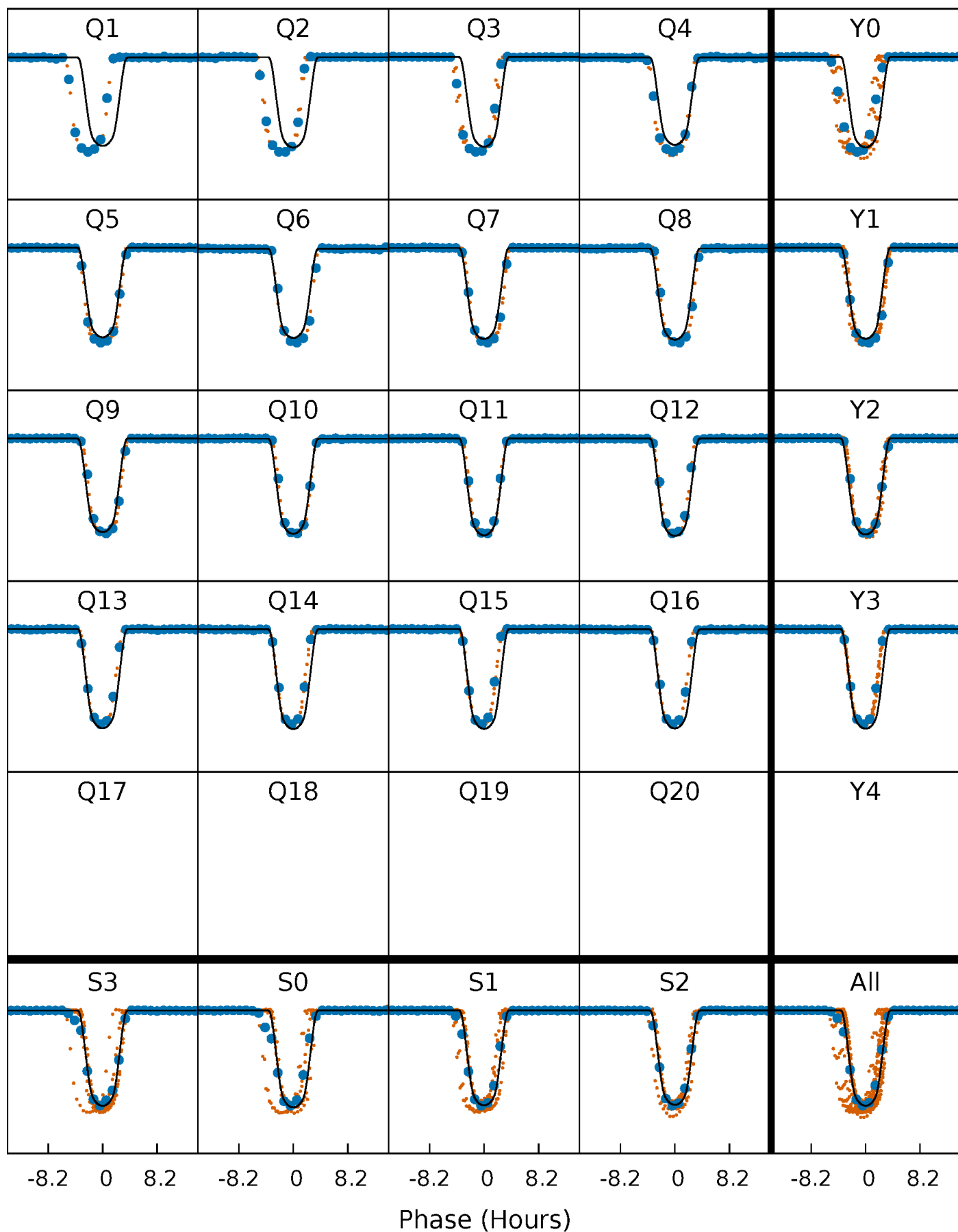
TCE 005003117-01 P= 37.607687 Days  $T_0=153.150739$  (BKJD)





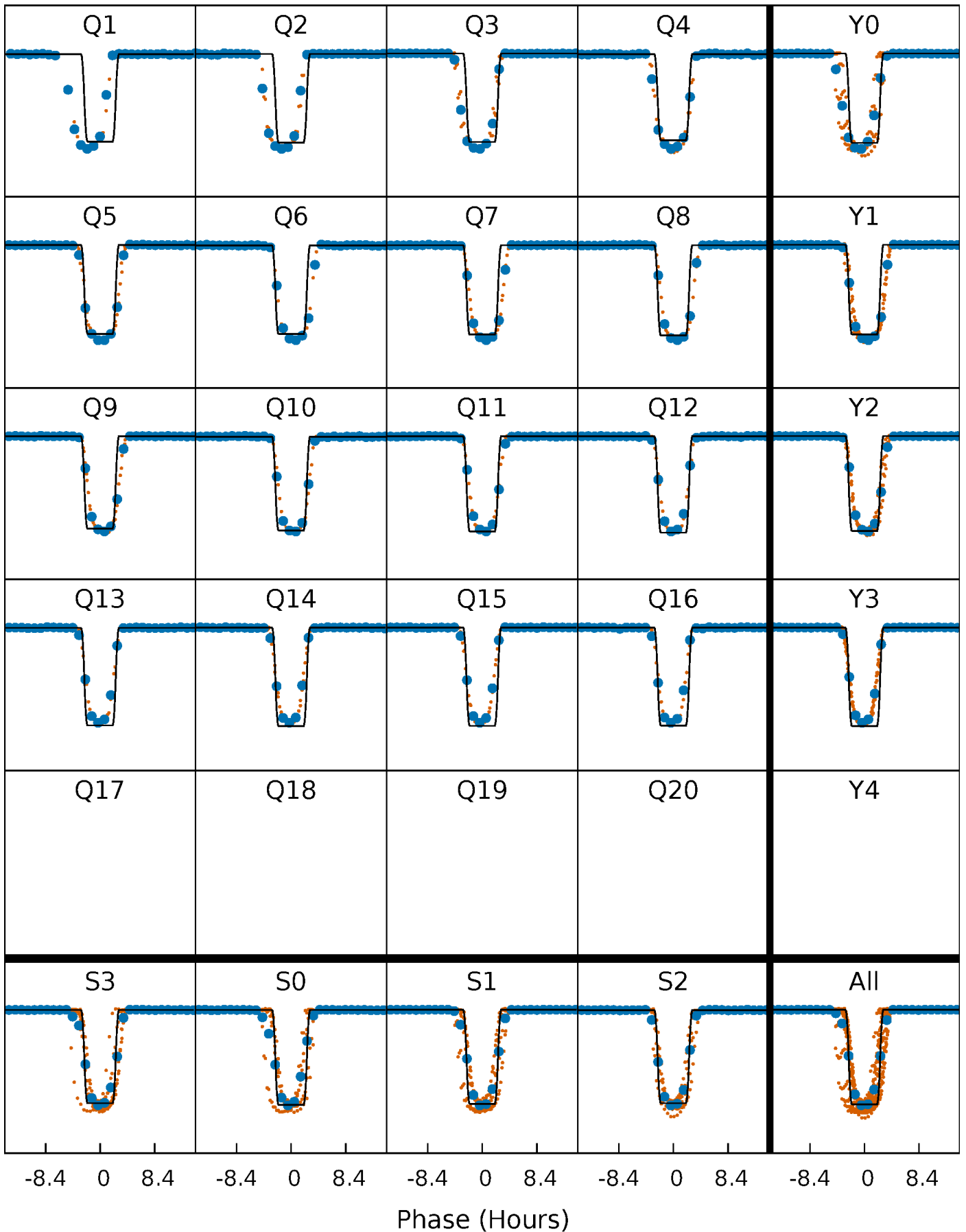
# DV Quarter-Phased Transit Curves

TCE 005003117-01 P= 37.607687 Days  $T_0=153.150739$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

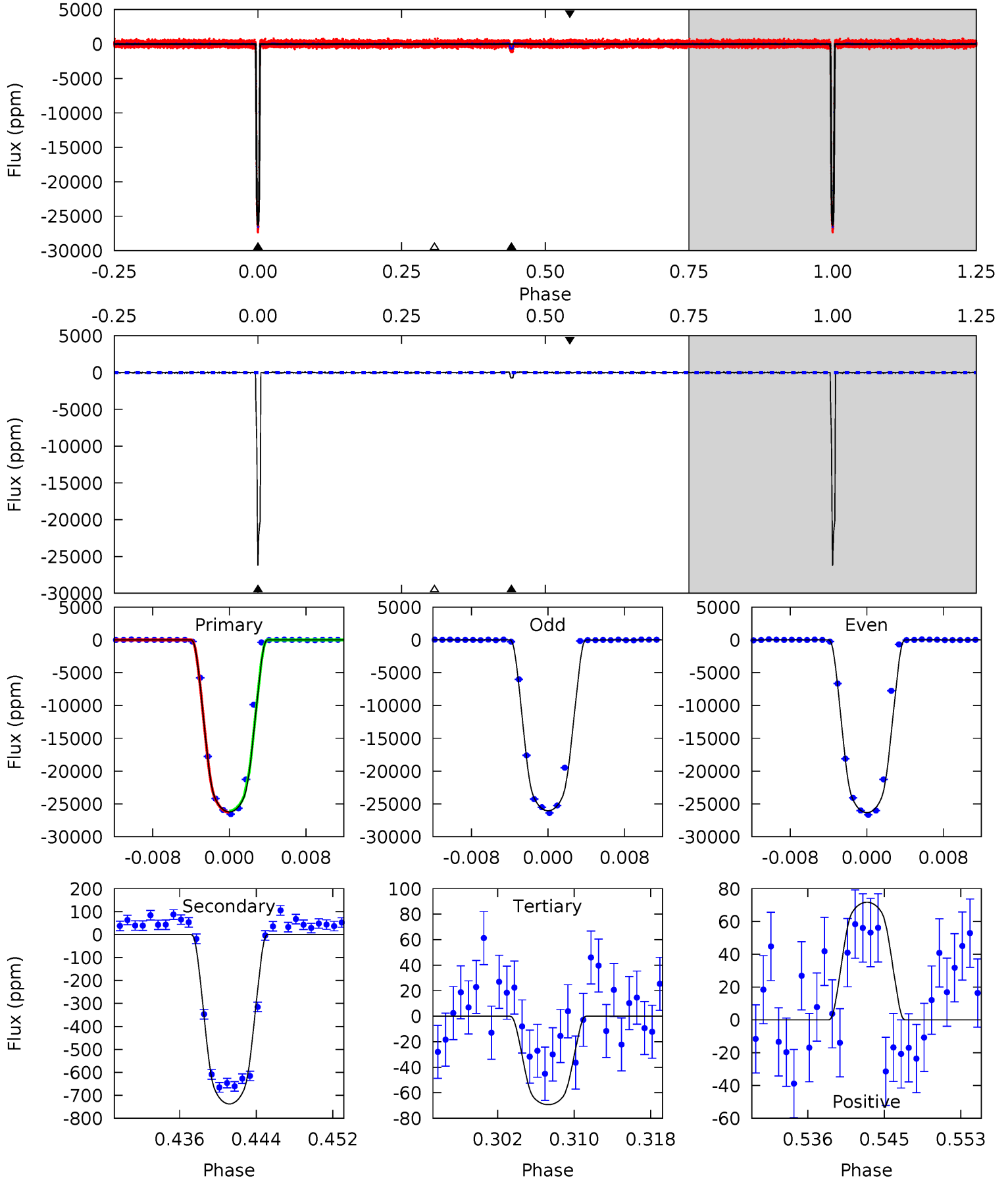
TCE 005003117-01 P= 37.608062 Days  $T_0=153.133843$  (BKJD)



# DV Model-Shift Uniqueness Test

005003117-01, P = 37.607687 Days, E = 115.543052 Days

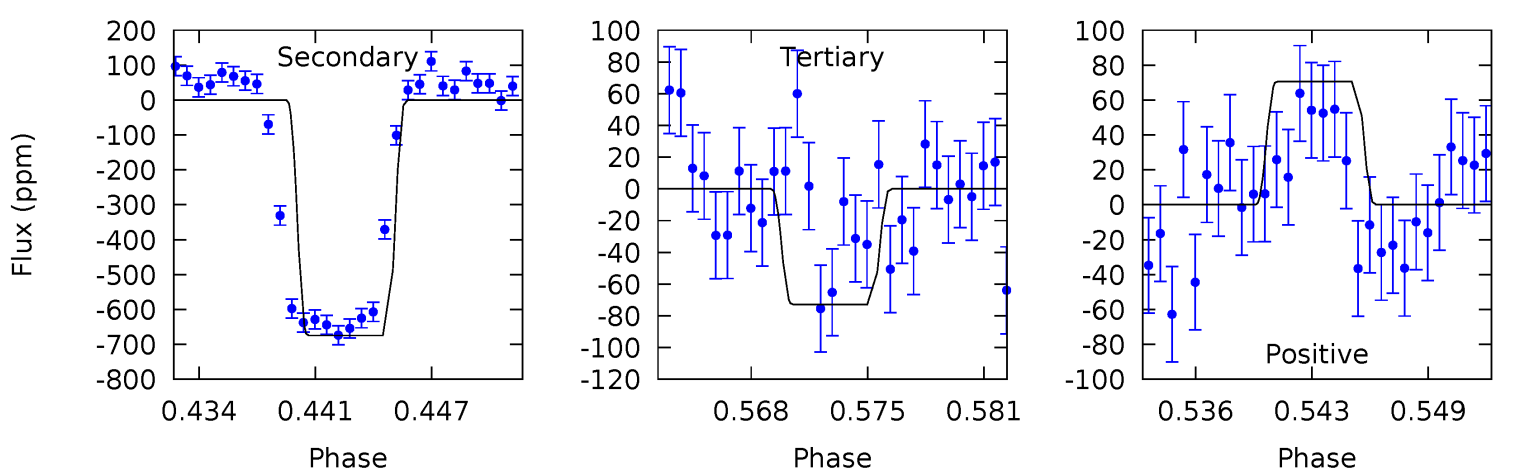
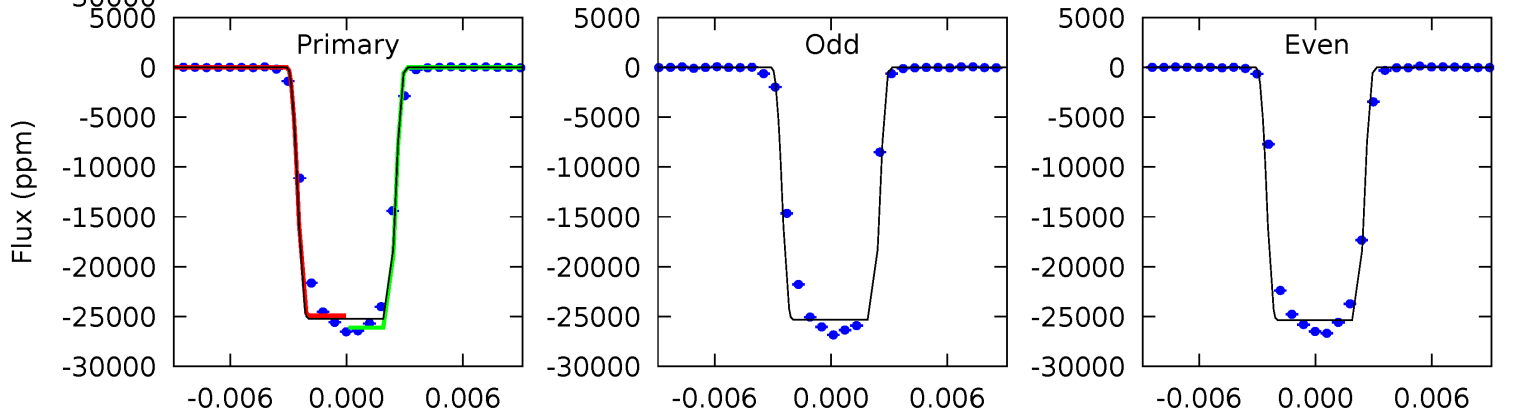
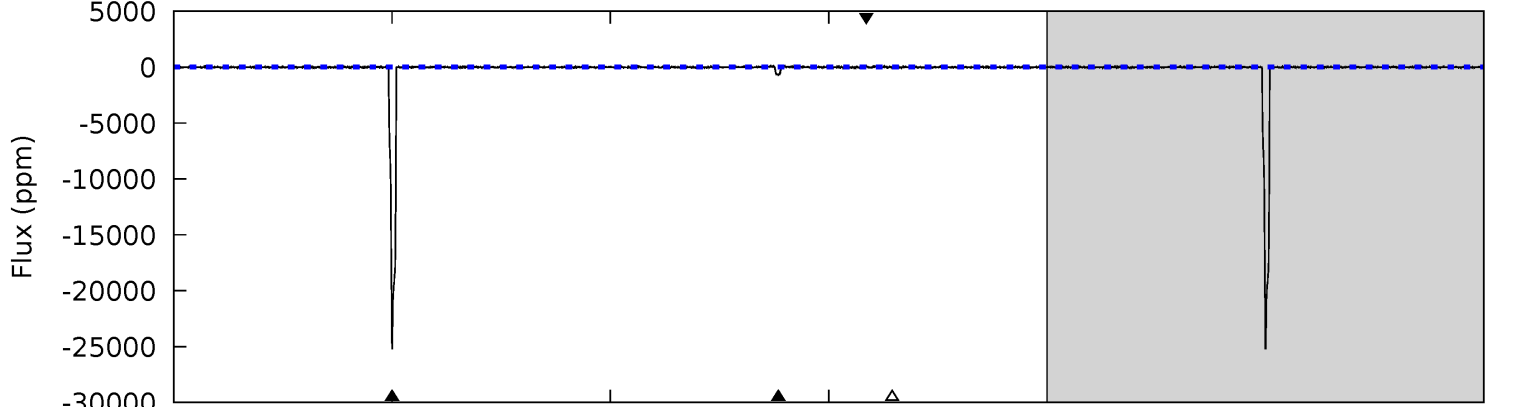
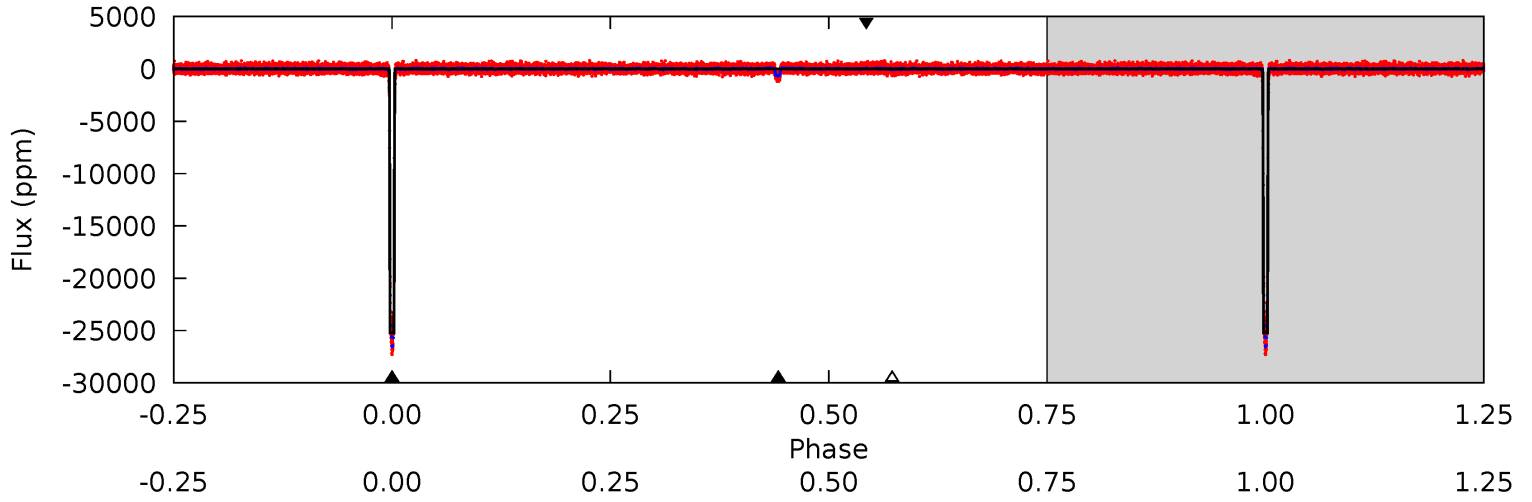
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1913	53.8	5.06	5.23	5.06	2.64	1.51	1907	1907	48.7	48.6	10.2	1.01	0.00	0



# Alt Model-Shift Uniqueness Test

005003117-01, P = 37.608062 Days, E = 115.525781 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
1438	38.5	4.15	4.02	5.11	2.73	1.15	1434	1434	34.3	34.5	1.38	1.01	0.00	0



### Stellar Parameters For KIC 005003117

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5600^{+152}_{-152}$	$4.483^{+0.075}_{-0.162}$	$-0.100^{+0.300}_{-0.300}$	$0.896^{+0.229}_{-0.098}$	$0.889^{+0.104}_{-0.085}$	$1.742^{+0.616}_{-0.787}$
	+3%/-3%	+2%/-4%	+300%/-300%	+26%/-11%	+12%/-10%	+35%/-45%
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 005003117-01 / KOI 0405.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-737 \pm 14$	$16.09^{+2.32}_{-1.20}$	$720^{+47}_{-34}$	$2966^{+52}_{-50}$	$70^{+10}_{-15}$
Alt.	$-675 \pm 18$	$15.91^{+2.23}_{-1.05}$	$719^{+45}_{-32}$	$2934^{+49}_{-52}$	$64^{+9}_{-14}$

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

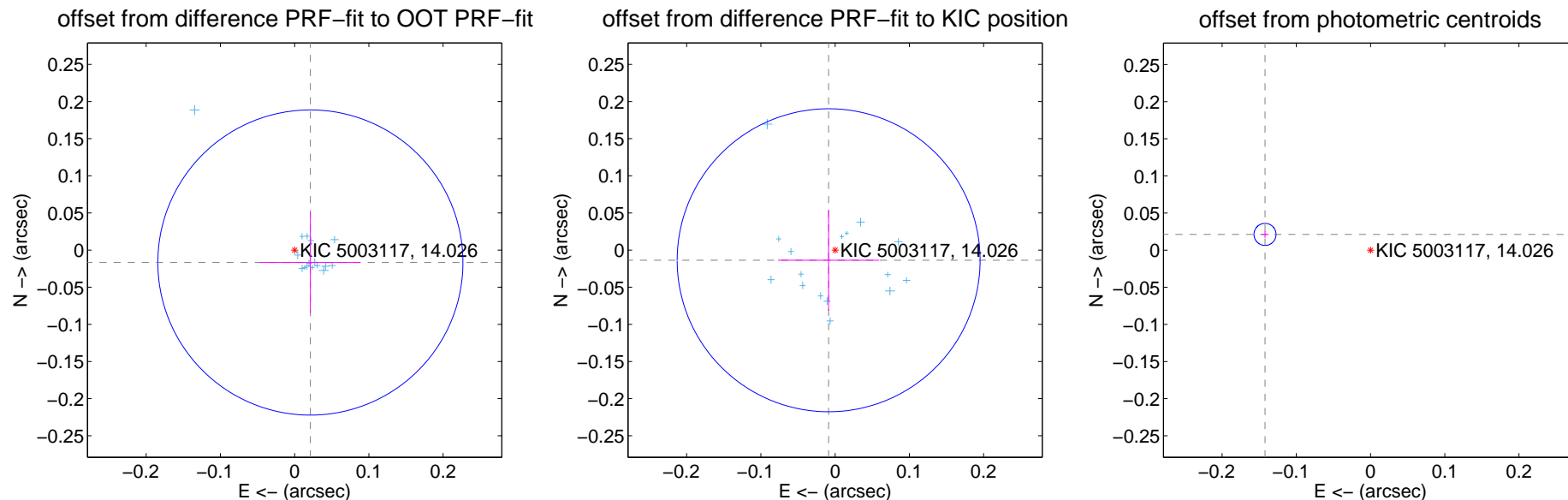
## DV Centroid Data

Supplemental centroid analysis for 005003117-01. Kepler magnitude: 14.03. Transit SNR 1403.51

There are 16 quarters with good PRF difference image offsets

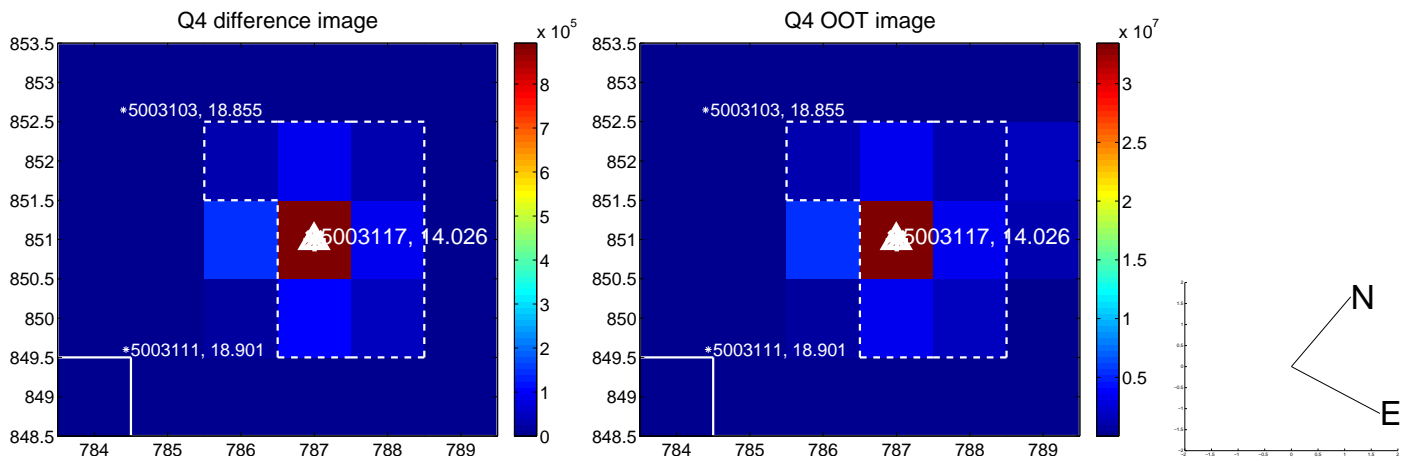
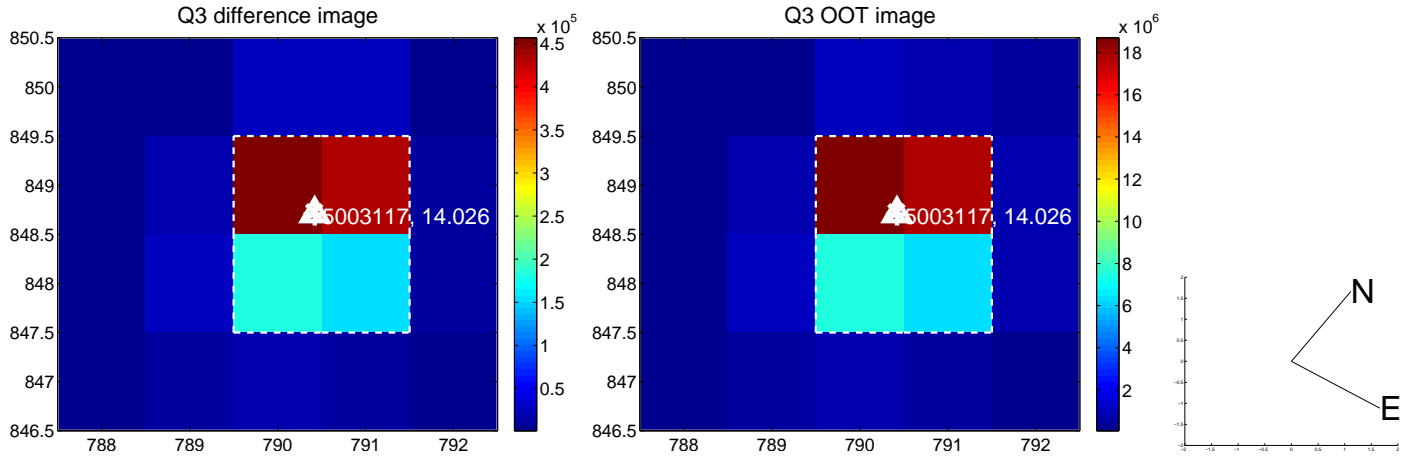
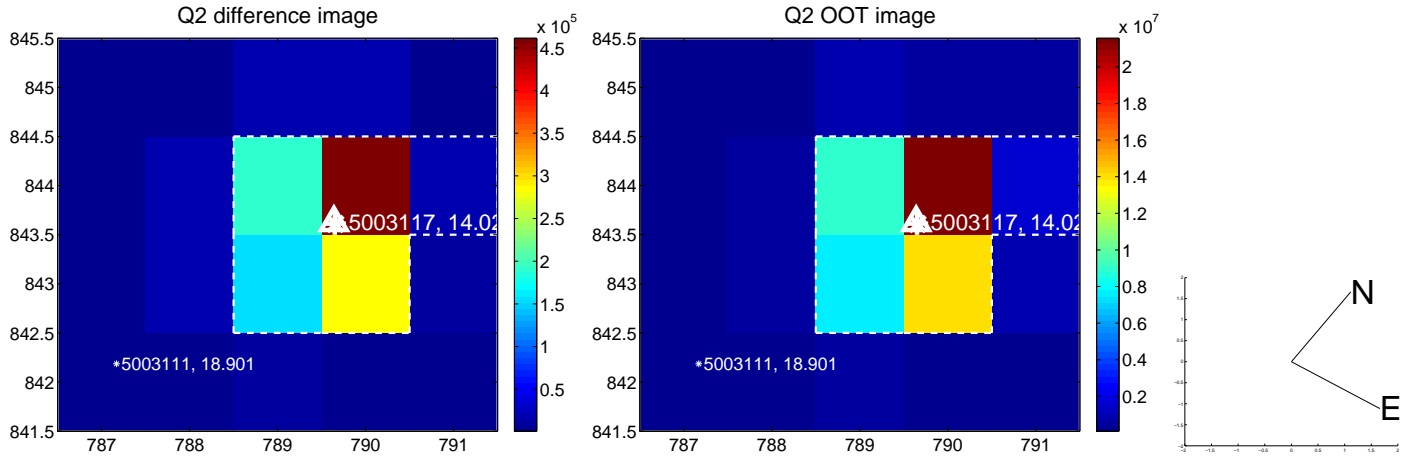
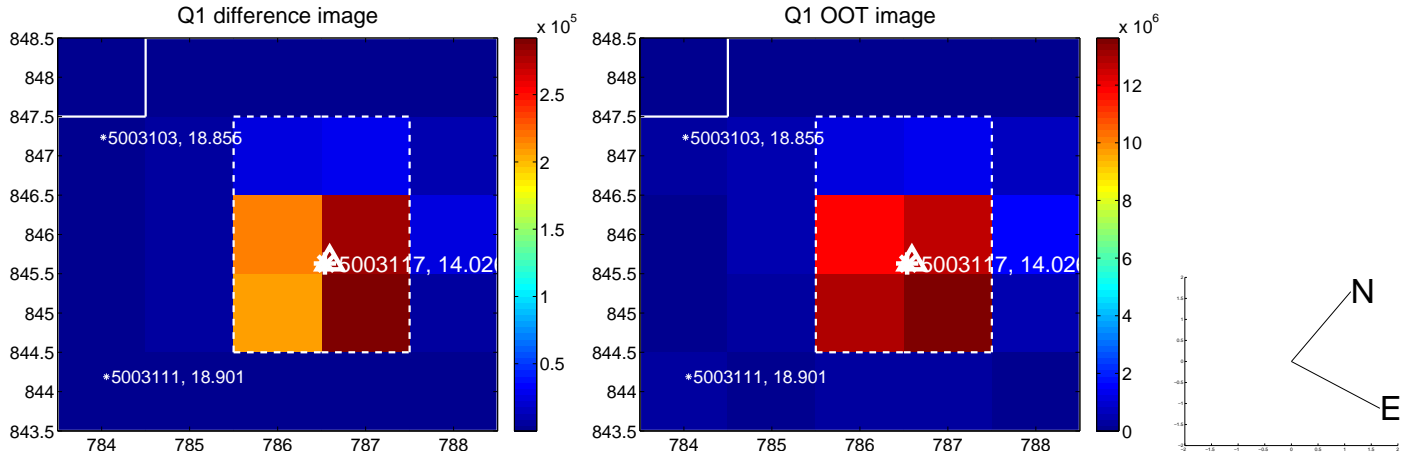
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.027 \pm 0.068$	0.39	$-0.021 \pm 0.067$	$-0.017 \pm 0.068$
PRF-fit source offset from KIC position	$0.016 \pm 0.068$	0.24	$0.009 \pm 0.068$	$-0.014 \pm 0.068$
photometric centroid source offset	$0.14 \pm 0.00$	29.01	$0.14 \pm 0.00$	$0.02 \pm 0.00$

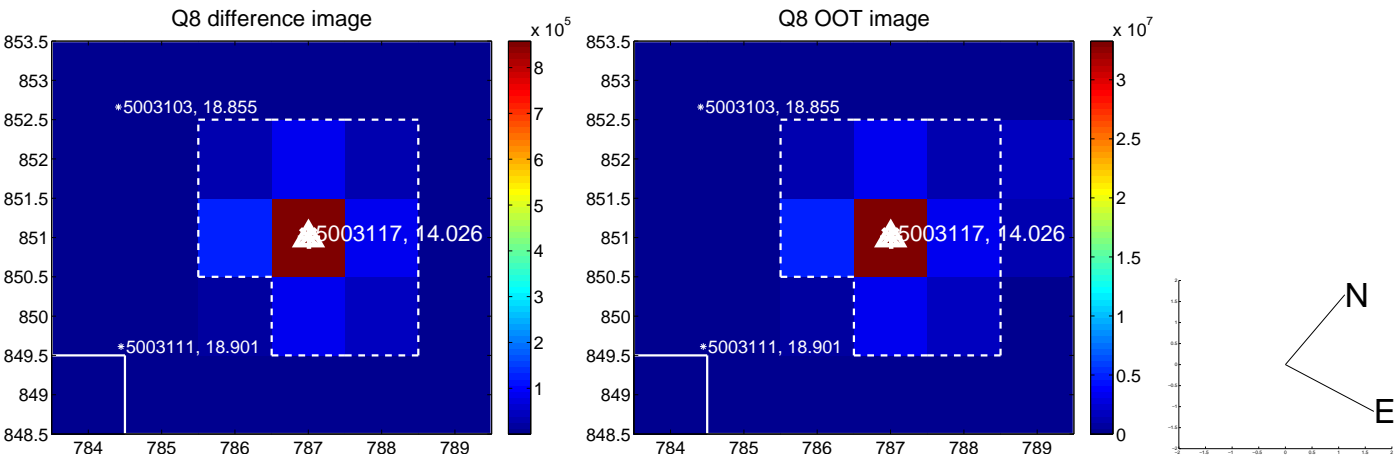
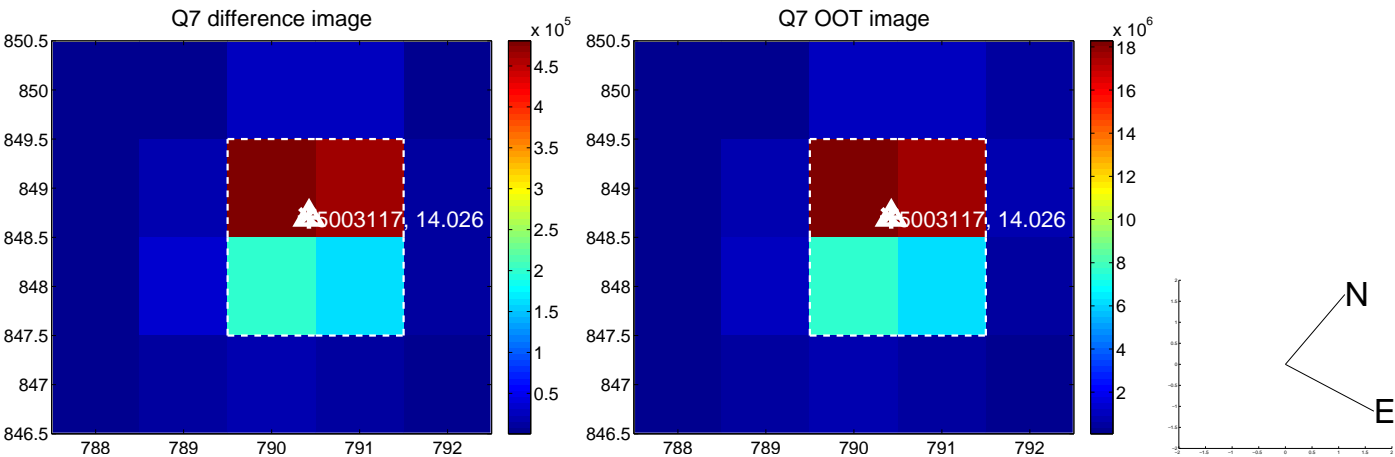
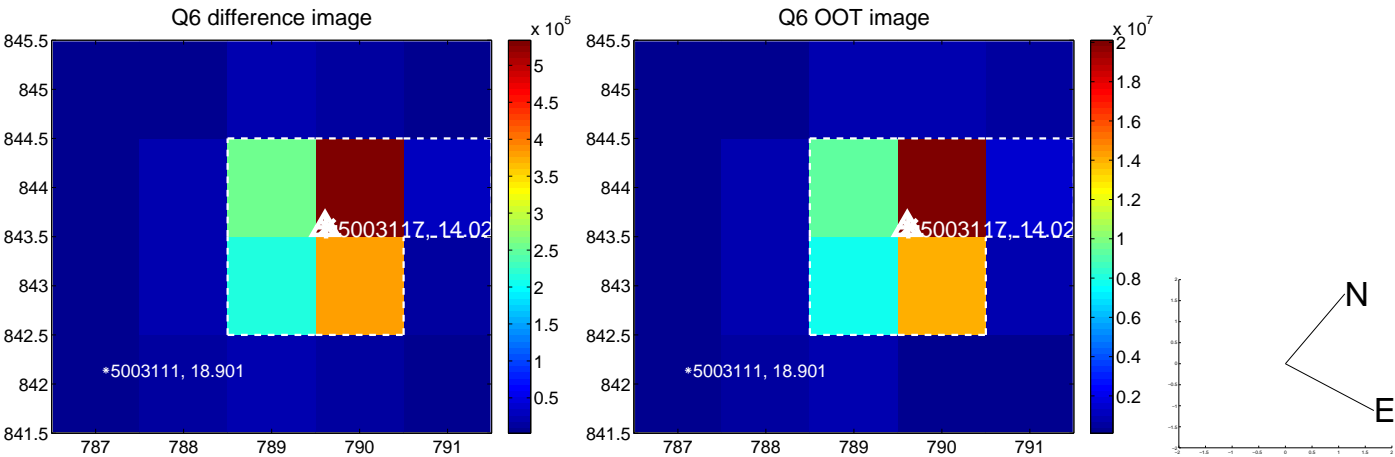
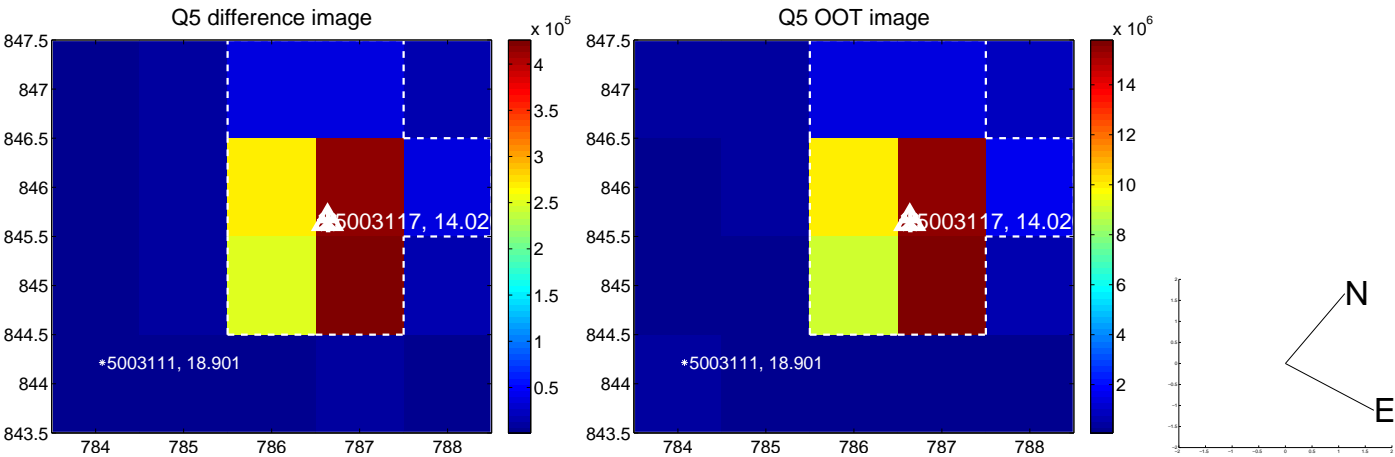


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

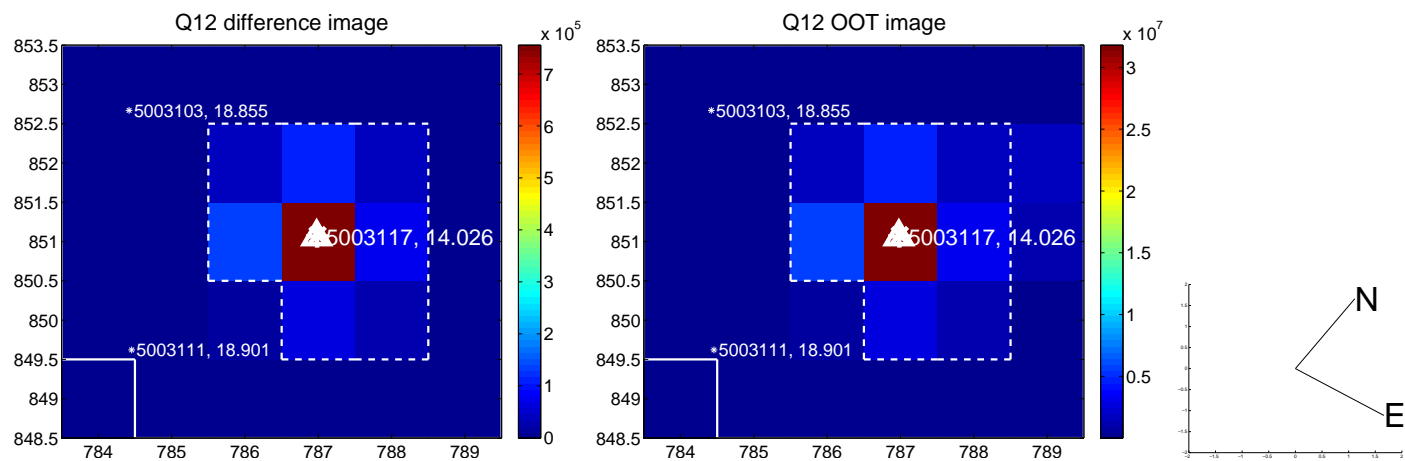
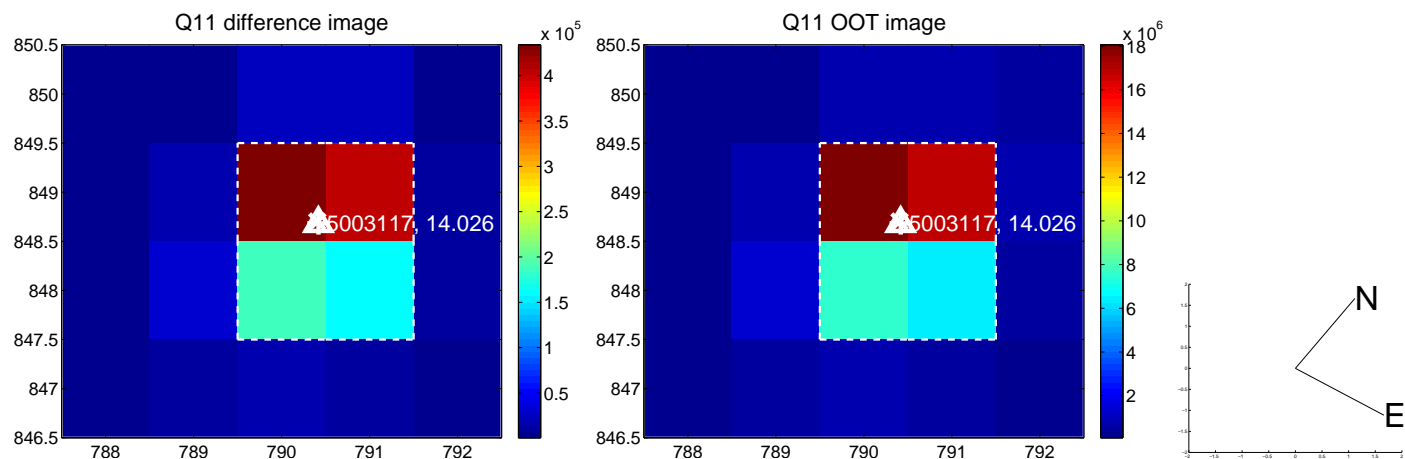
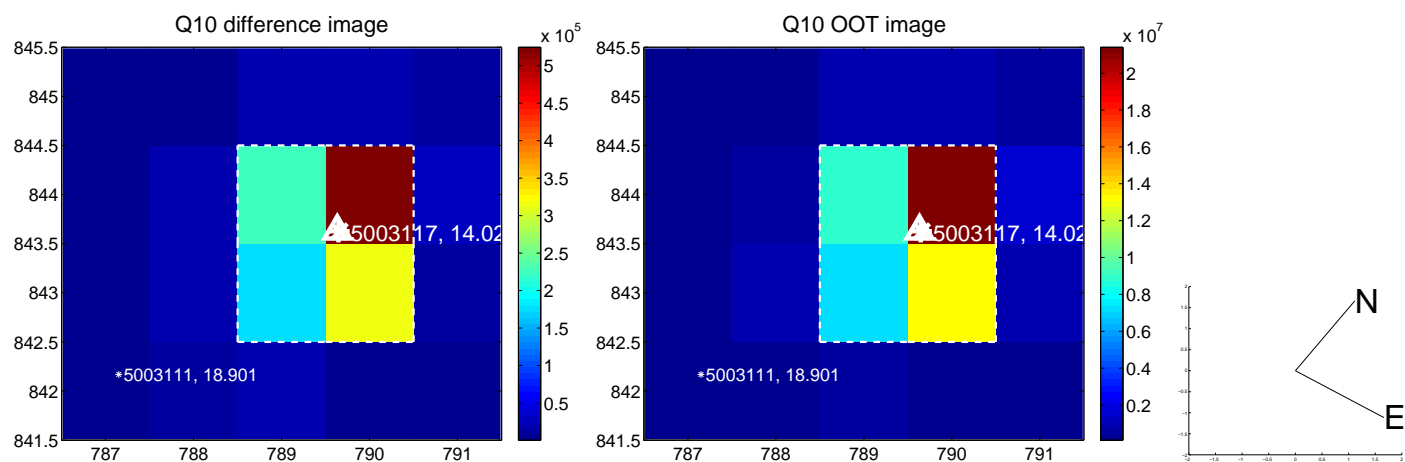
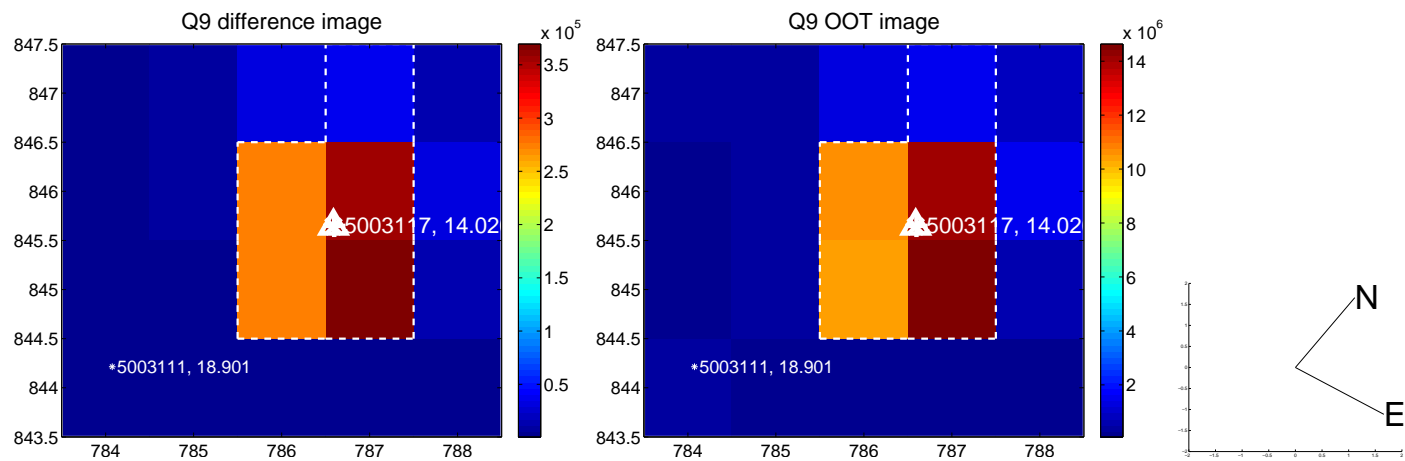


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

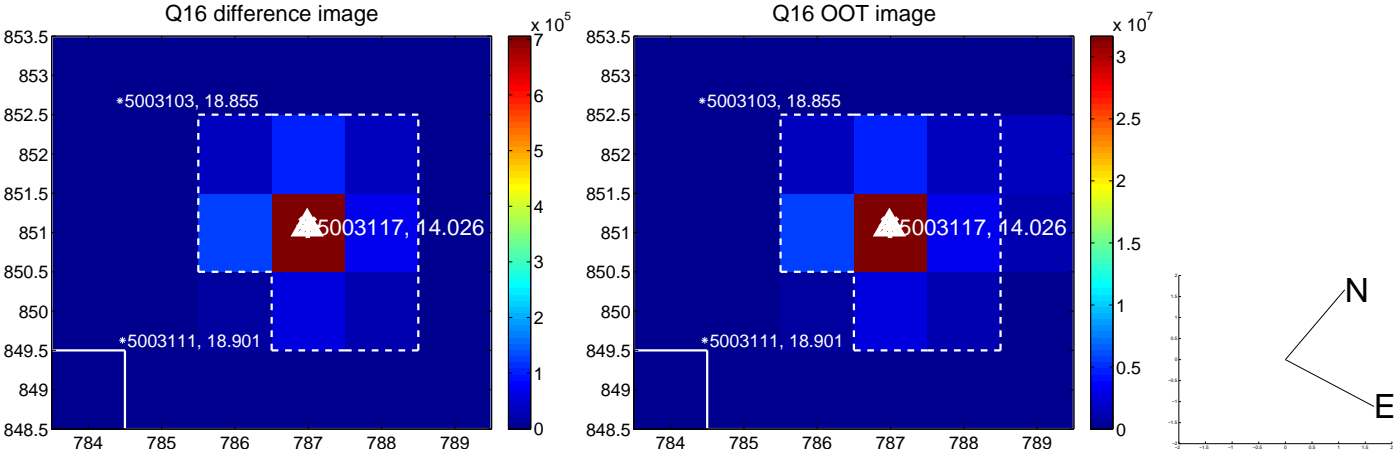
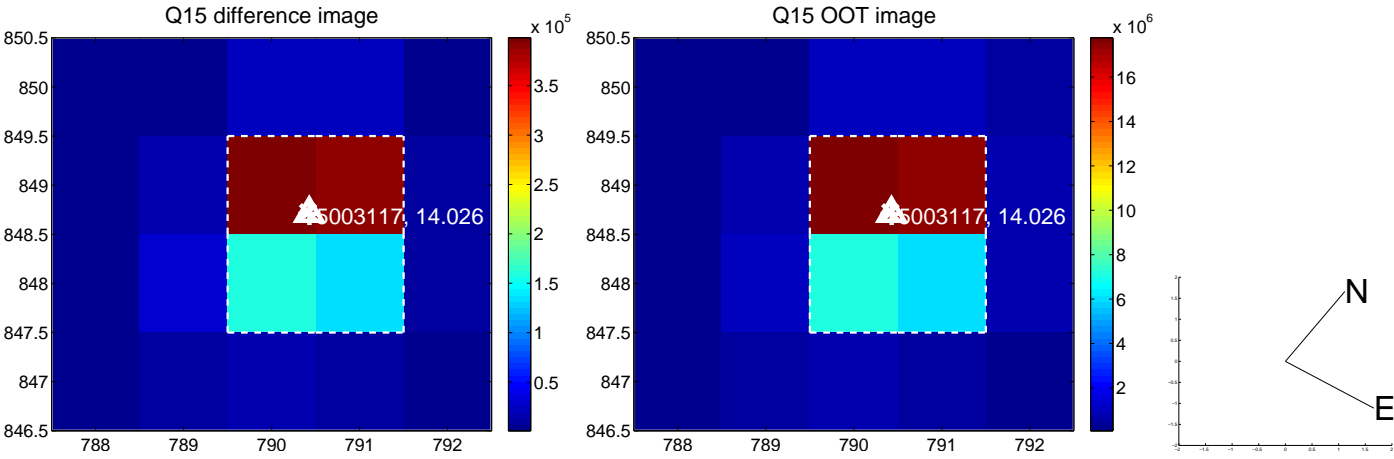
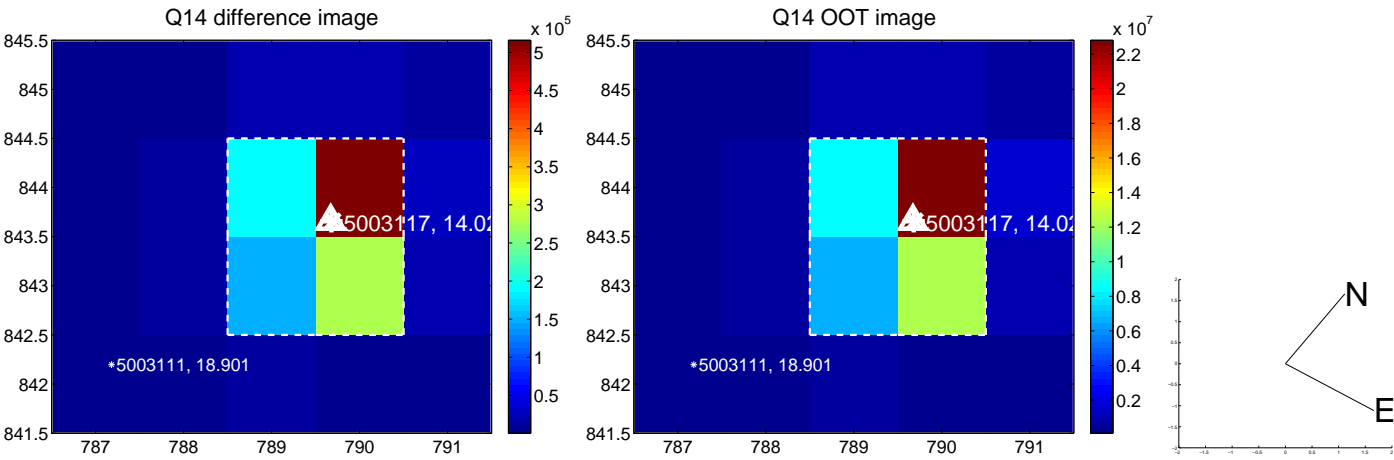
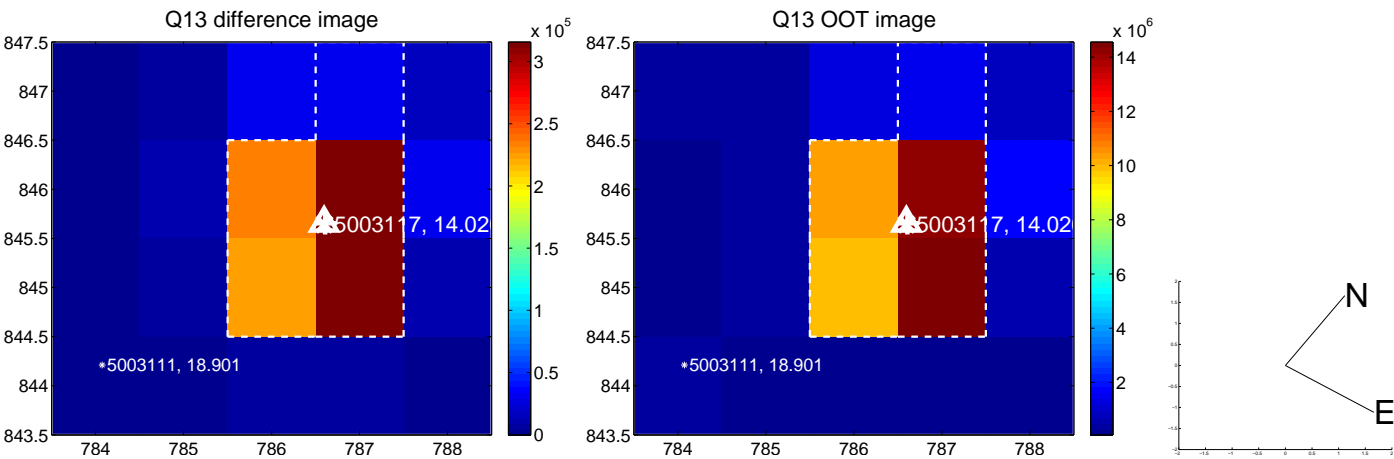




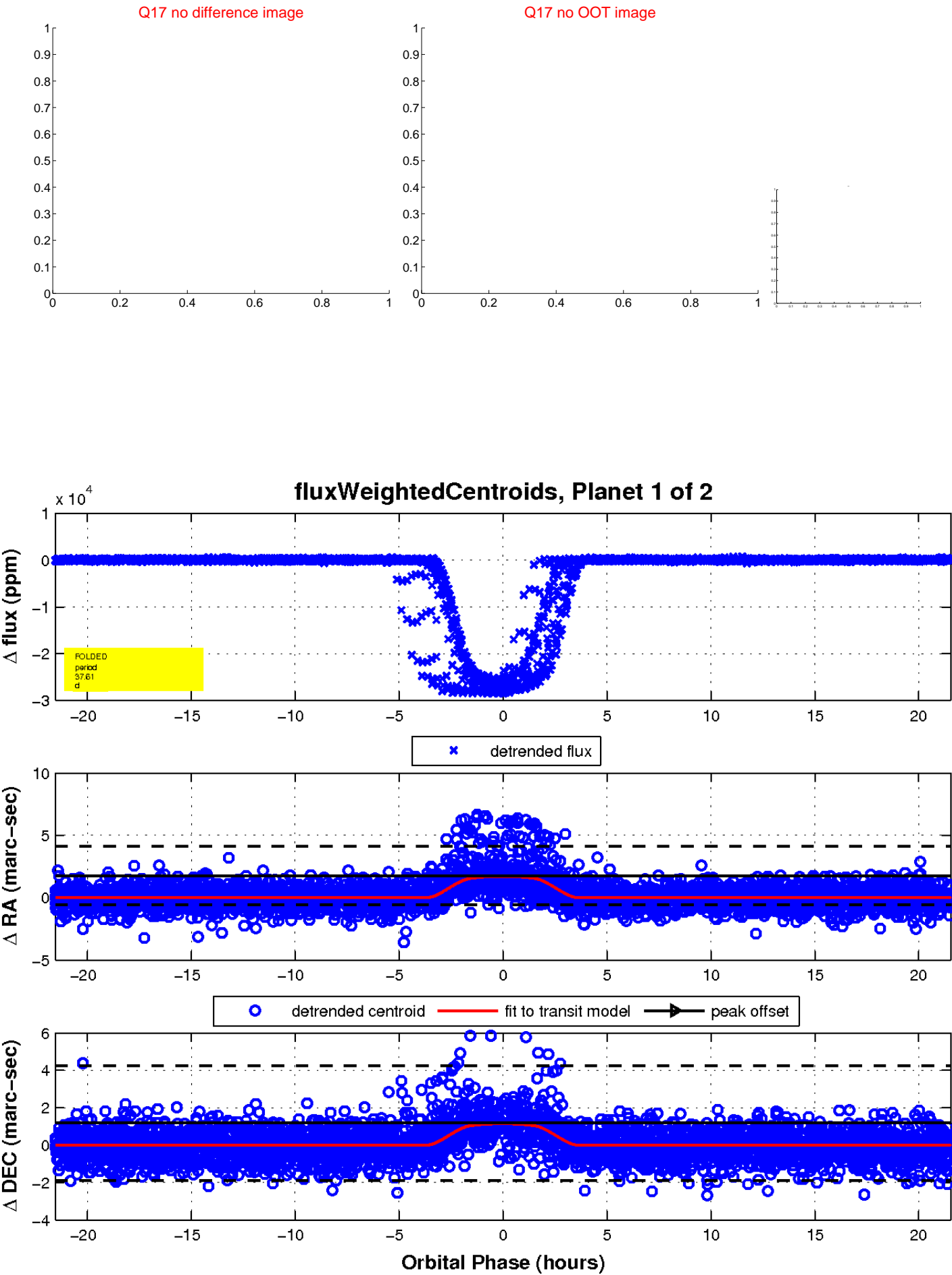
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

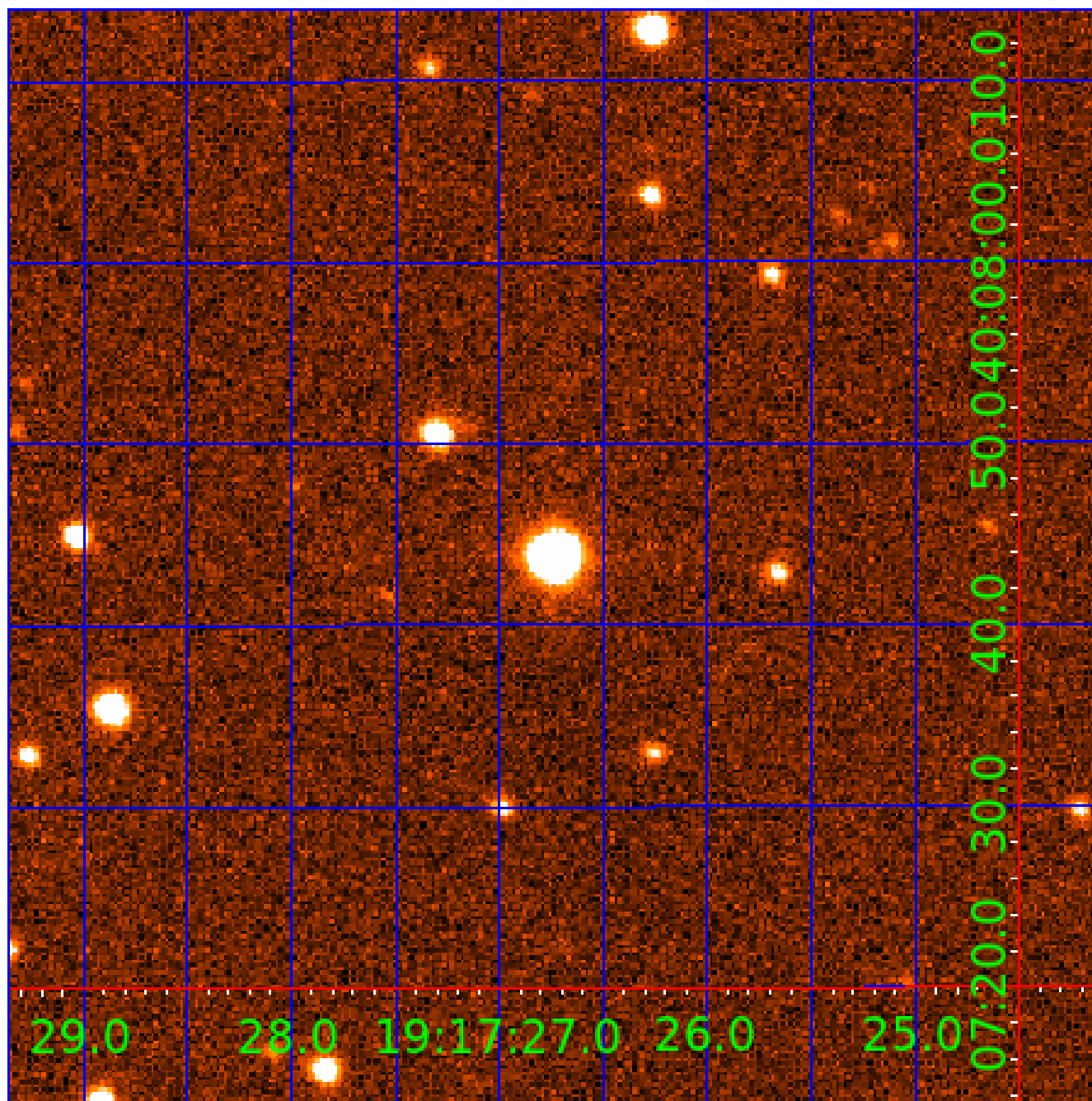


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005003117

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005003117-01	OBS	0405.01	37.607687	153.150739	26652.3	7.183	2048.8	1403.5	0.90	5600	15.84	15.83
005003117-02	OBS	No	37.608203	132.127509	719.4	7.154	55.3	56.1	0.90	5600	3.02	15.83

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005003117-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
005003117-02	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.

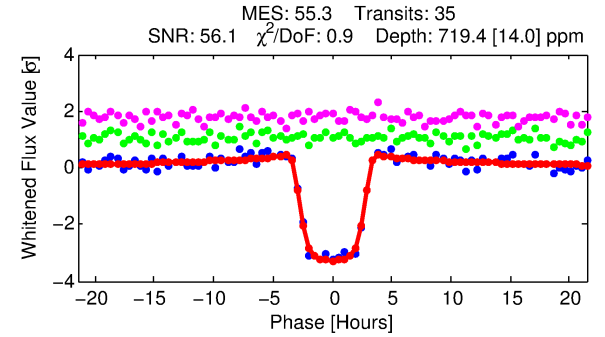
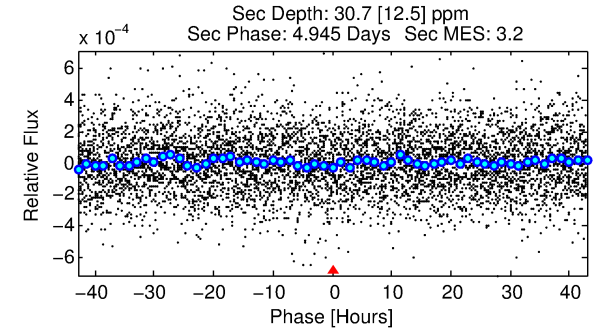
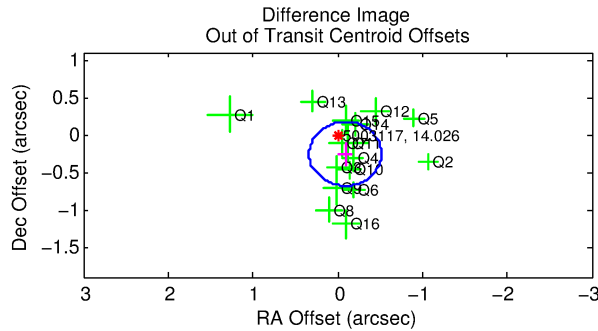
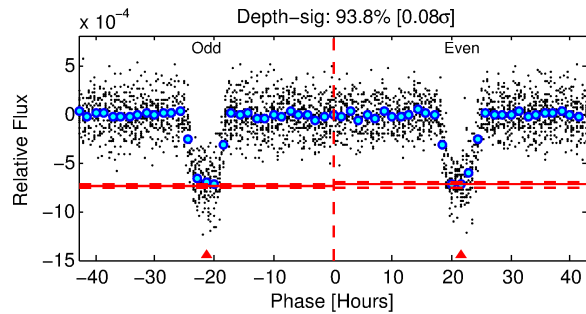
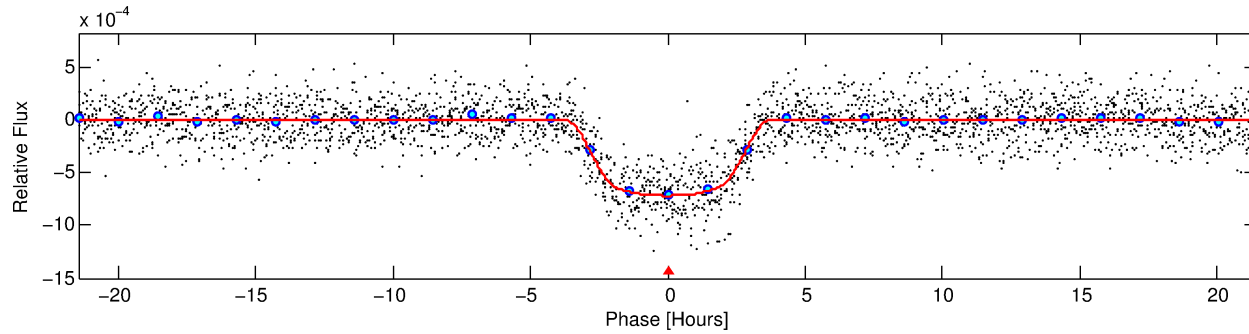
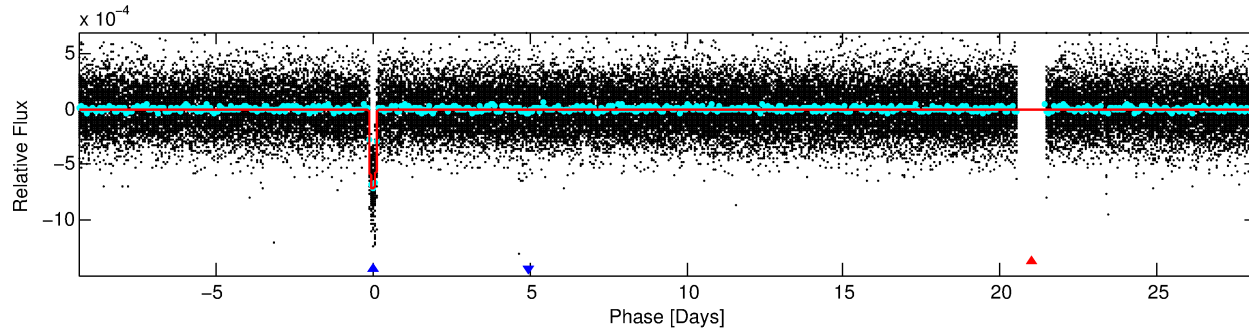
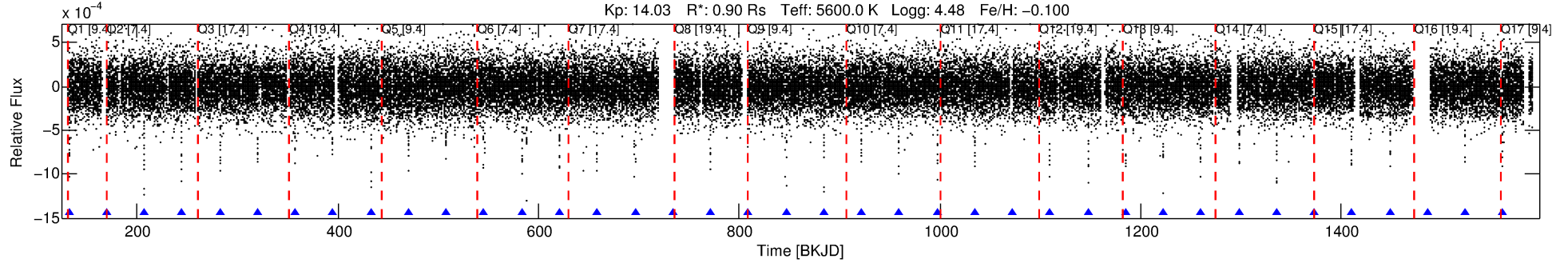
## Ephemeris Match Information For 005003117-02

No Significant Match Found

# DV One-Page Summary

KIC: 5003117 Candidate: 2 of 2 Period: 37.608 d  
KOI: K00405 Corr: No Ephemeris Match

Kp: 14.03 R\*: 0.90 Rs Teff: 5600.0 K Logg: 4.48 Fe/H: -0.100



## DV Fit Results:

Period = 37.60820 [0.00012] d  
Epoch = 132.1275 [0.0026] BKJD  
Rp/R\* = 0.0309 [0.0005]  
a/R\* = 16.96 [0.89]  
b = 0.94 [0.01]  
Seff = 15.83 [5.07]  
Teff = 509 [41] K  
Rp = 3.02 [0.77] Re  
a = 0.2114 [0.0446] AU  
Ag = 82.52 [41.91] [1.95σ]  
Teffp = 2370 [251] K [7.33σ]

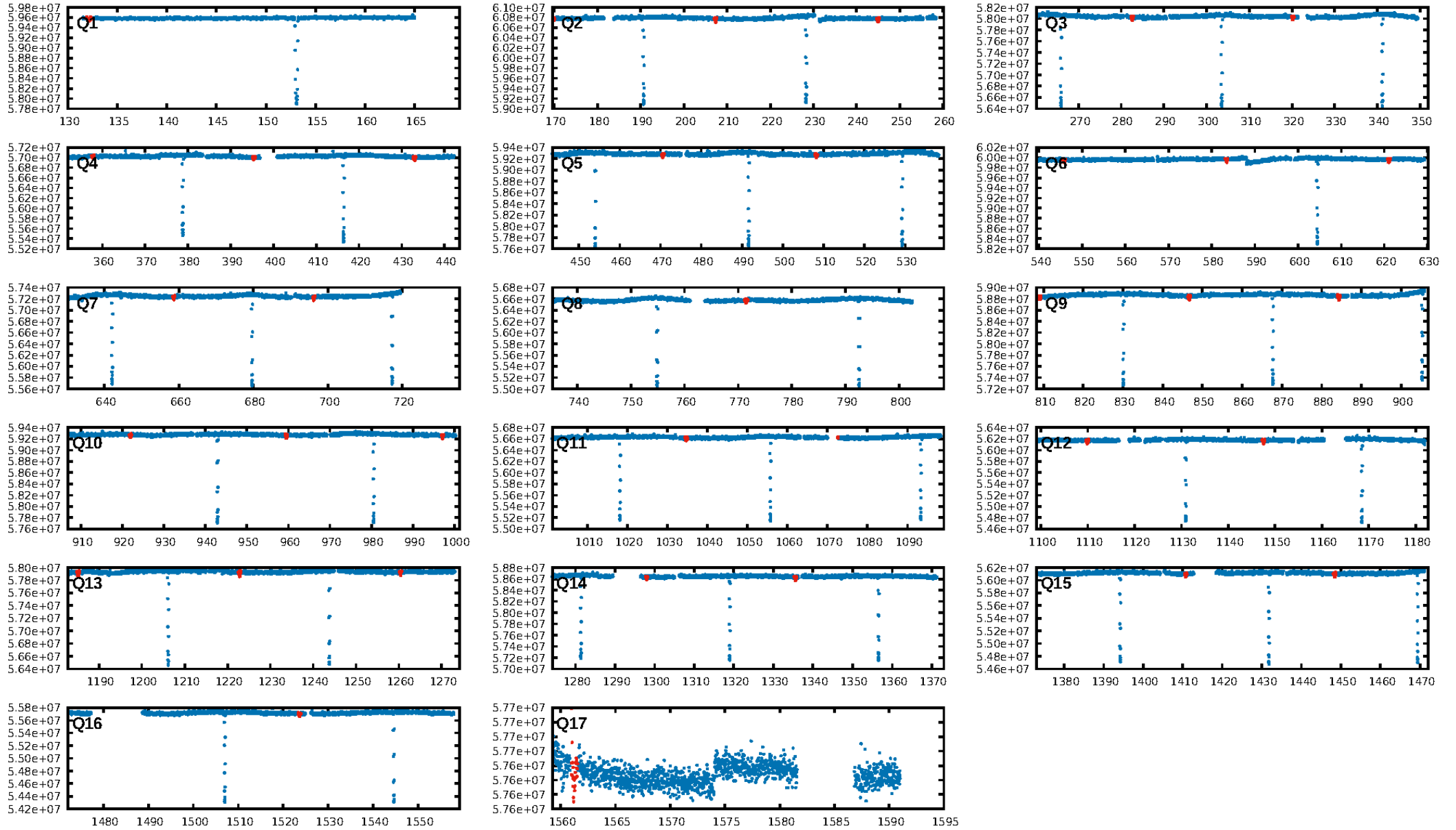
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00e]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 45.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [33/33]  
GhostDiagnostic-chr: 4.116  
Centroid-sig: 0.4%  
Centroid-so: 0.196 arcsec [1.10σ]  
OotOffset-rm: 0.270 arcsec [1.90σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.270 arcsec [1.80σ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:31:07 Z

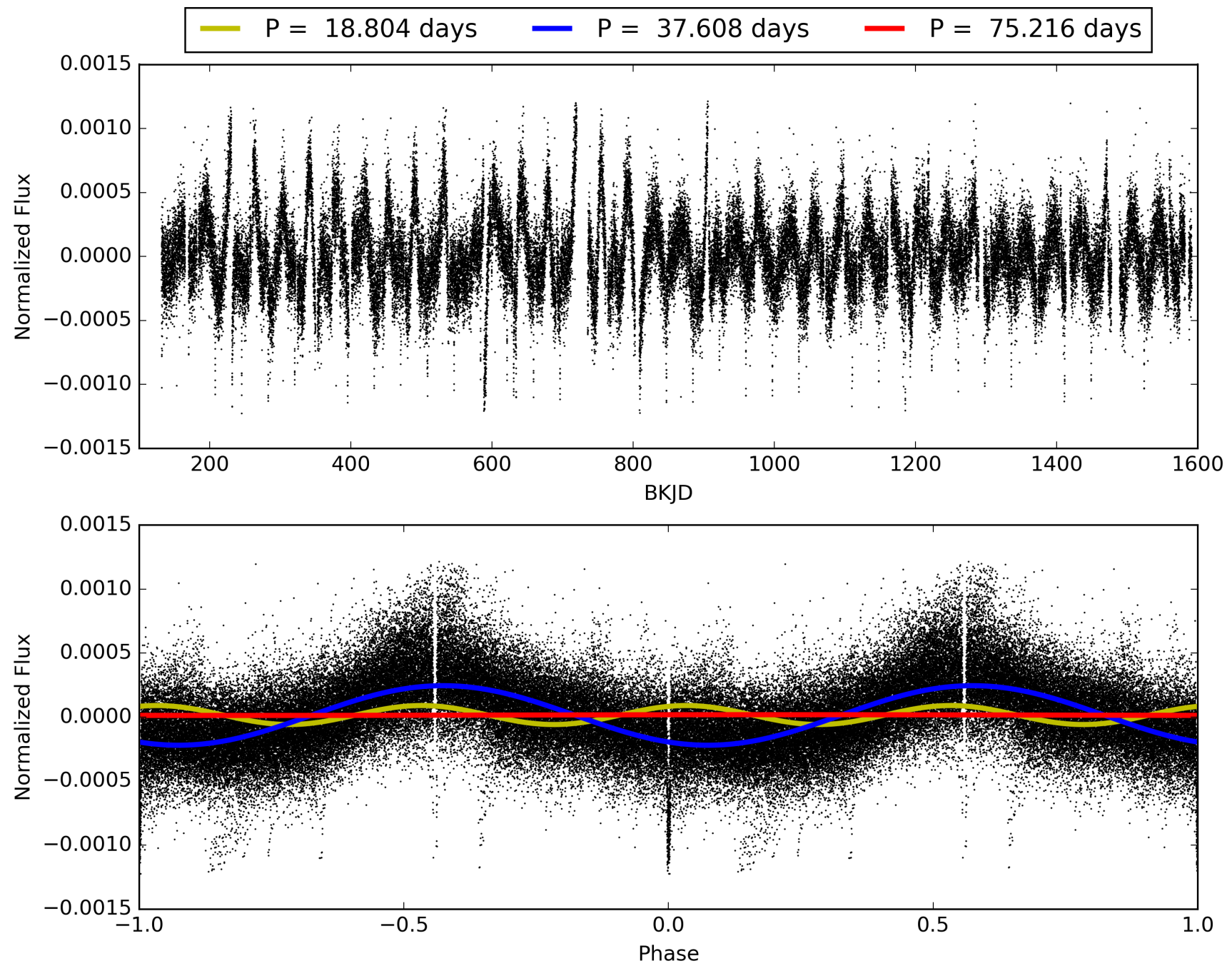
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005003117-02, PDC Light Curves





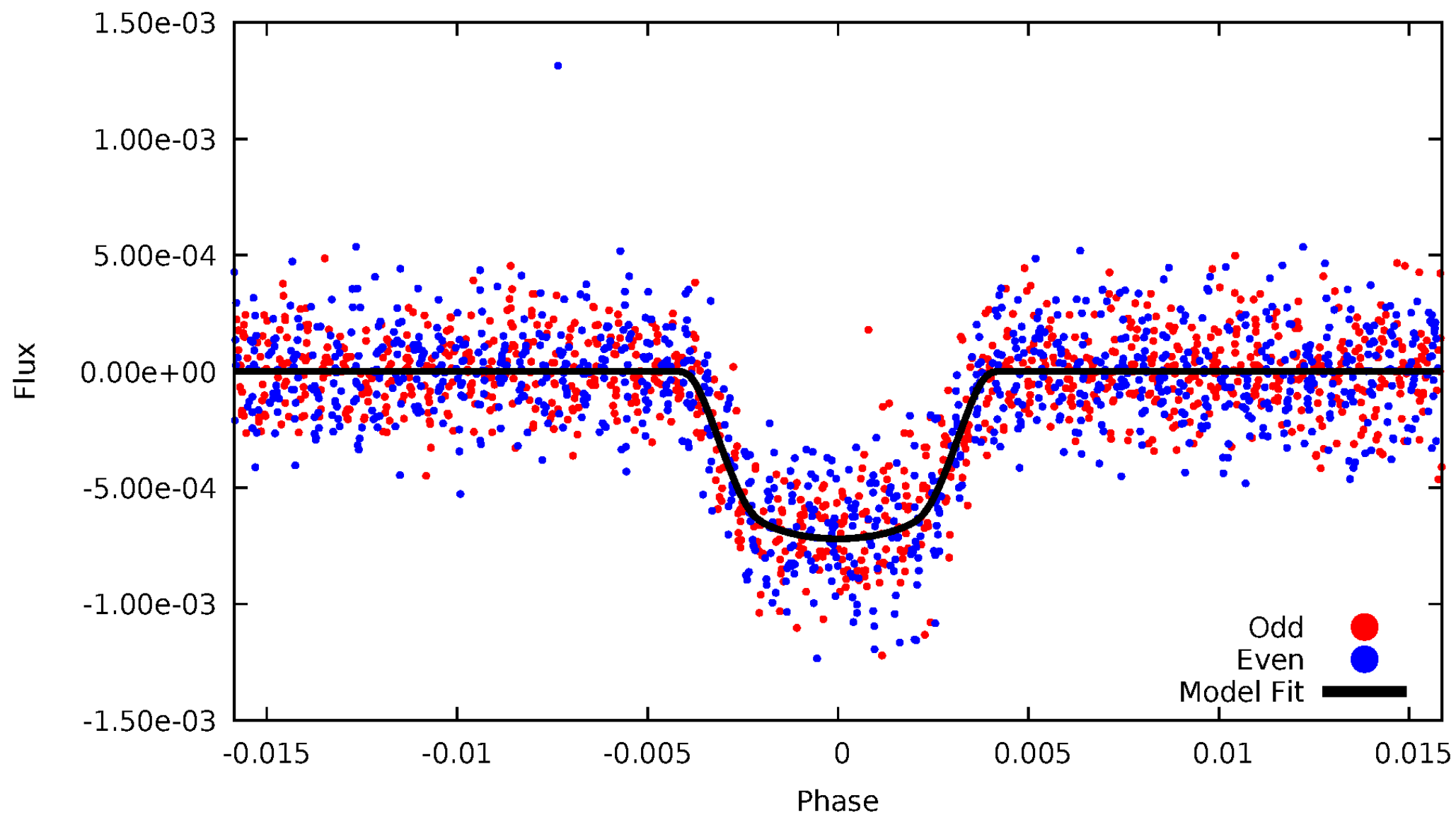
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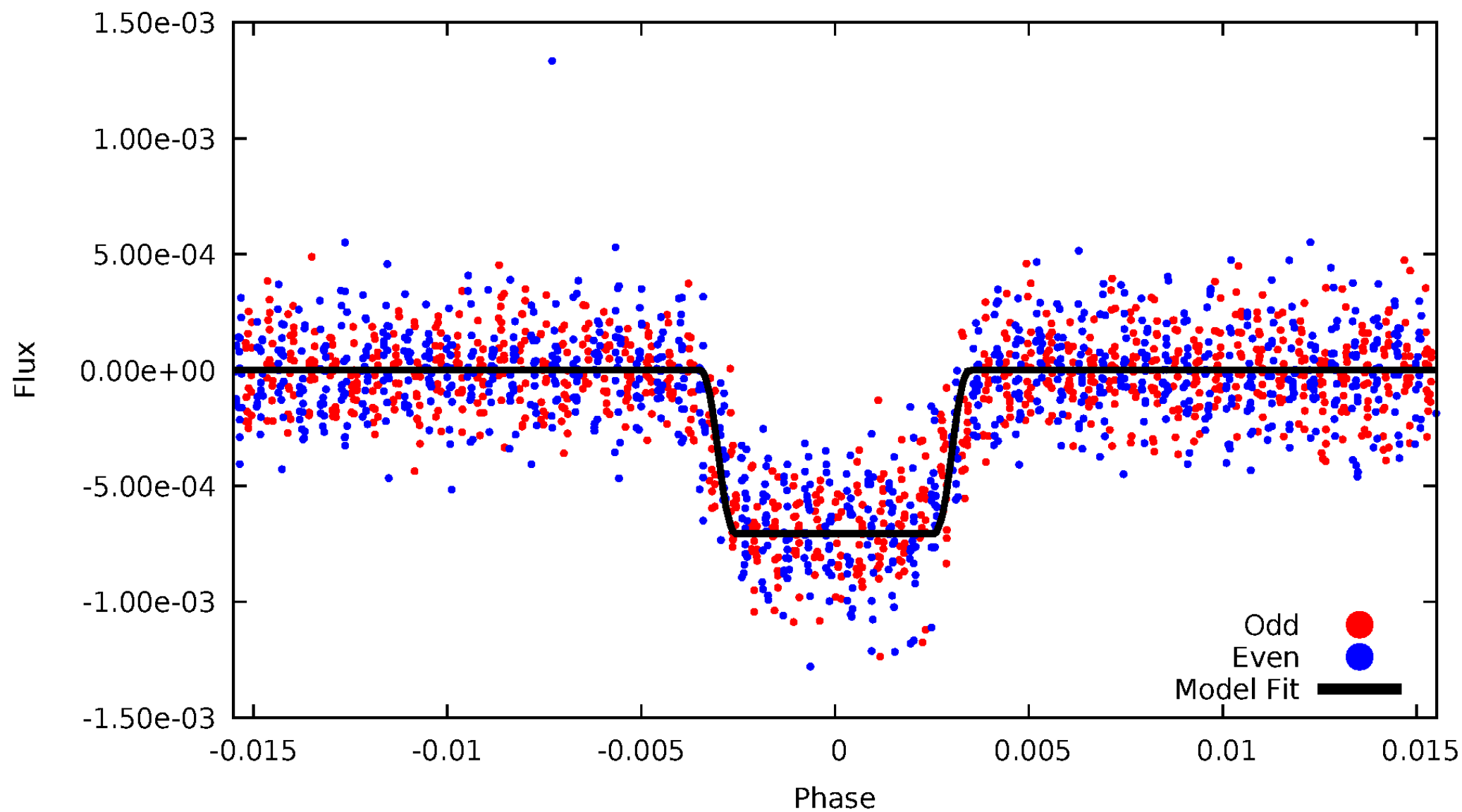
DV Odd/Even

TCE 005003117-02



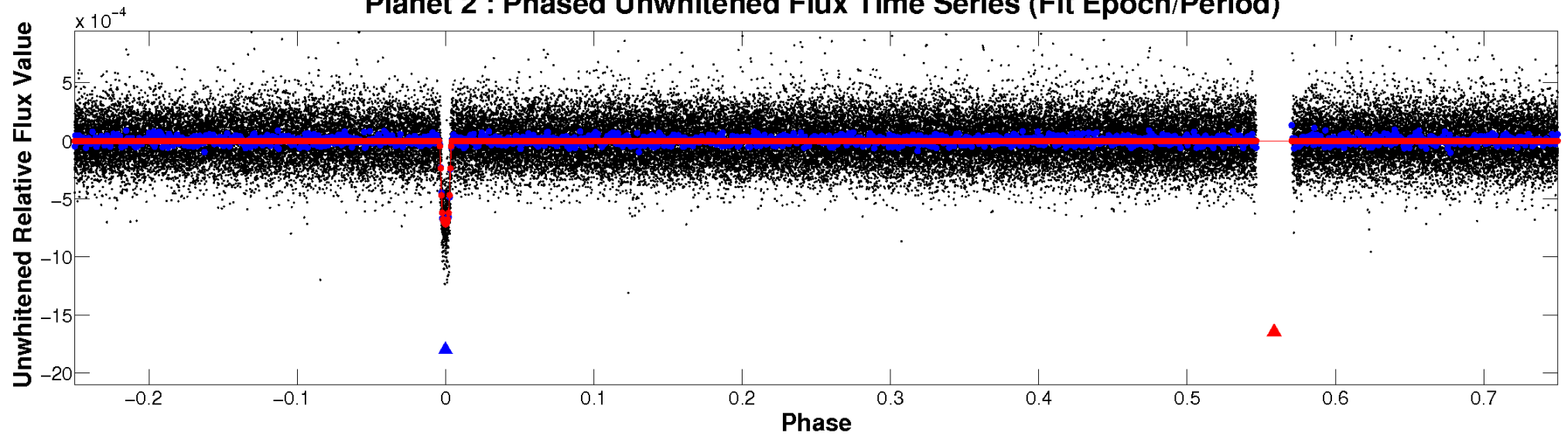
# ALT Odd/Even

TCE 005003117-02

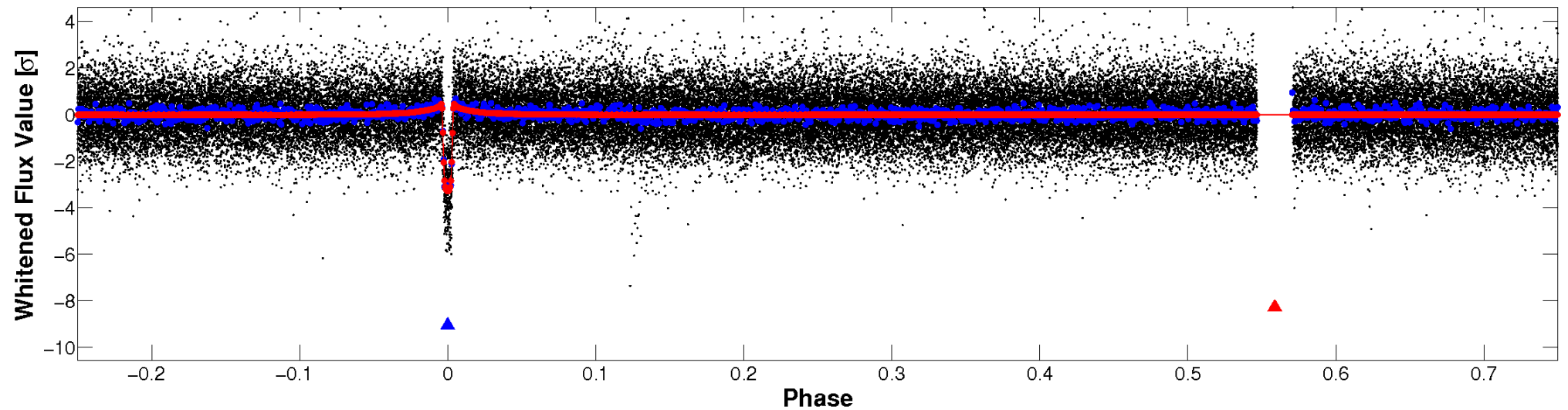


# Non-Whitened Vs. Whitened Light Curve

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

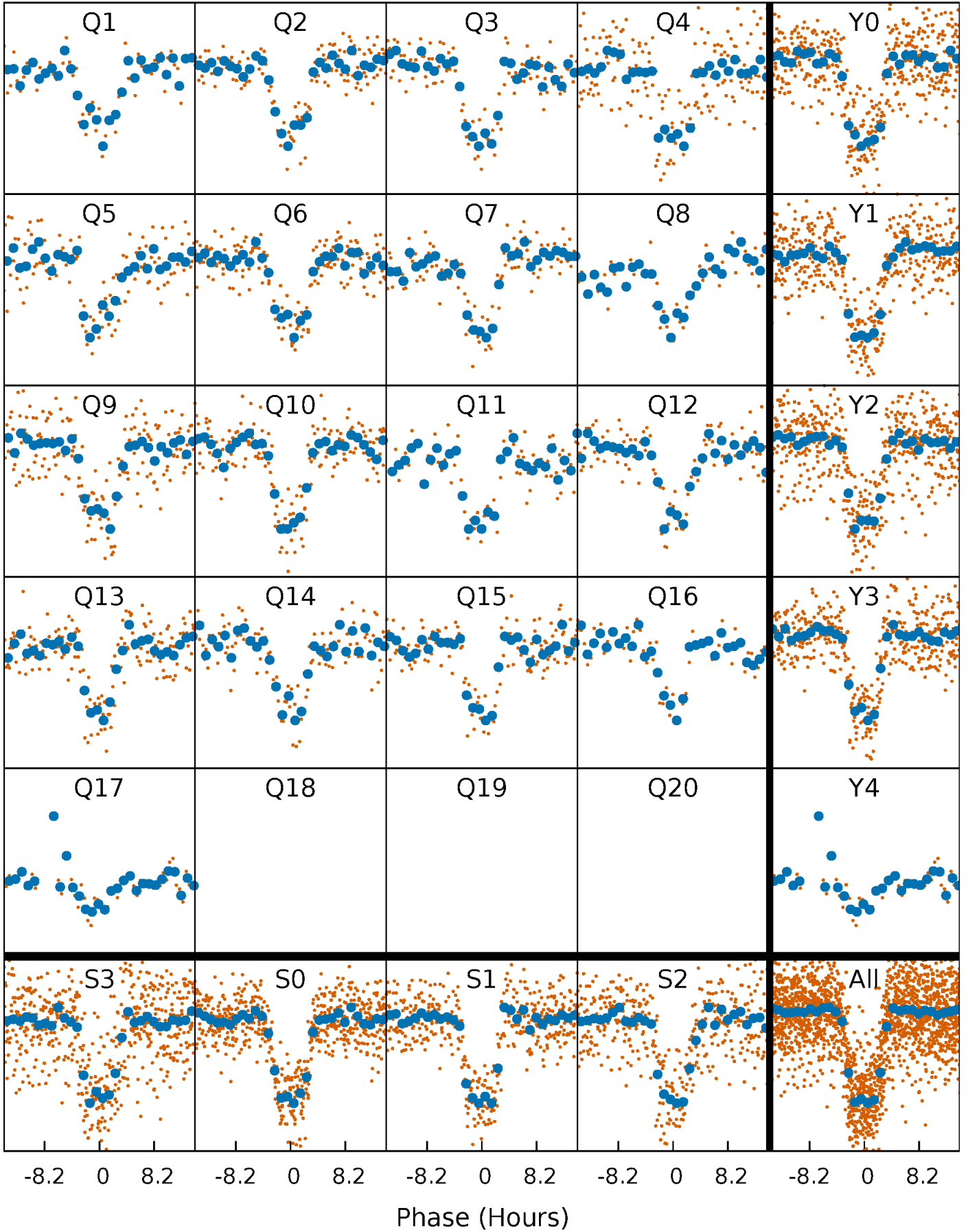


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



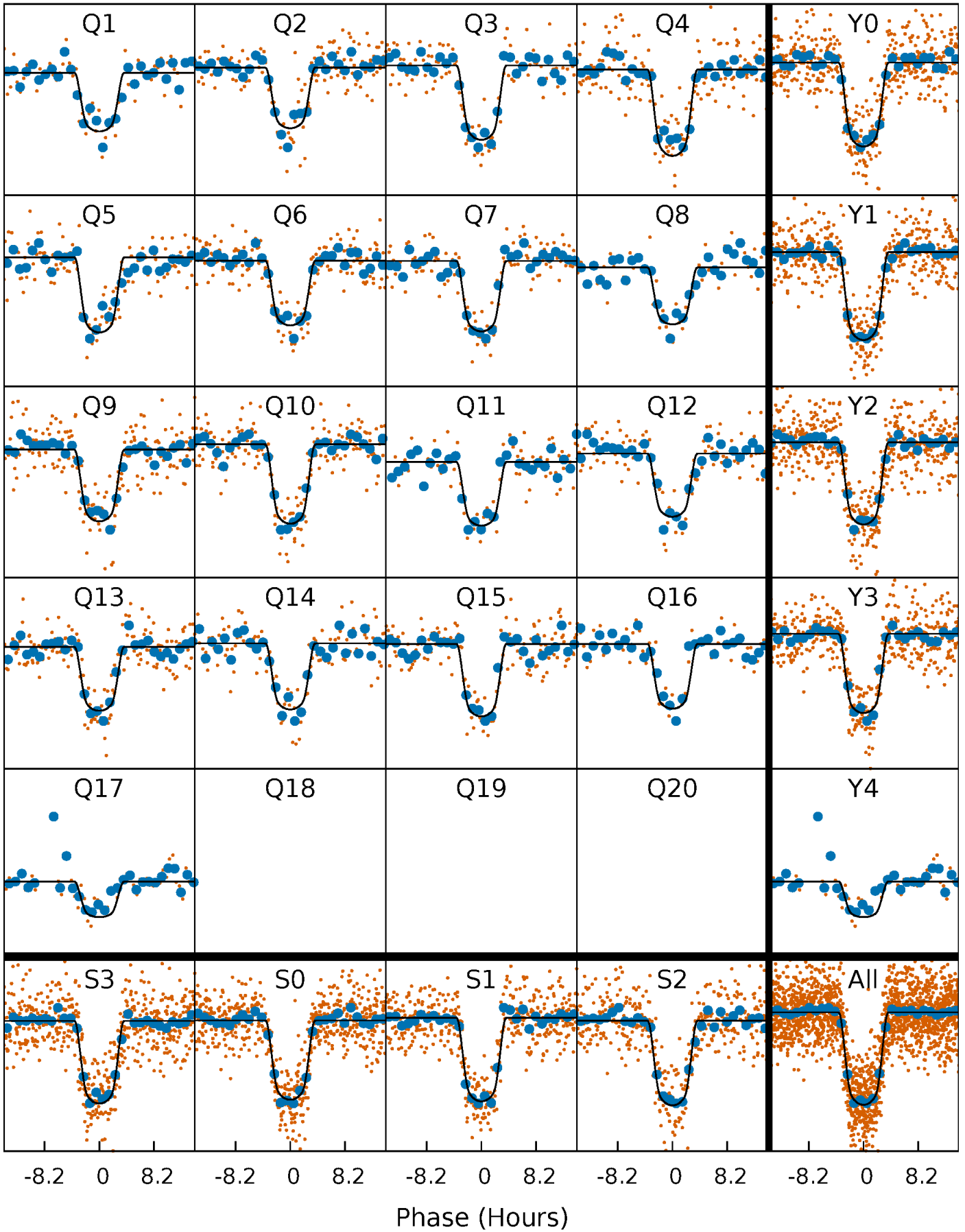
# PDC Quarter-Phased Transit Curves

TCE 005003117-02 P= 37.608203 Days  $T_0=132.127509$  (BKJD)



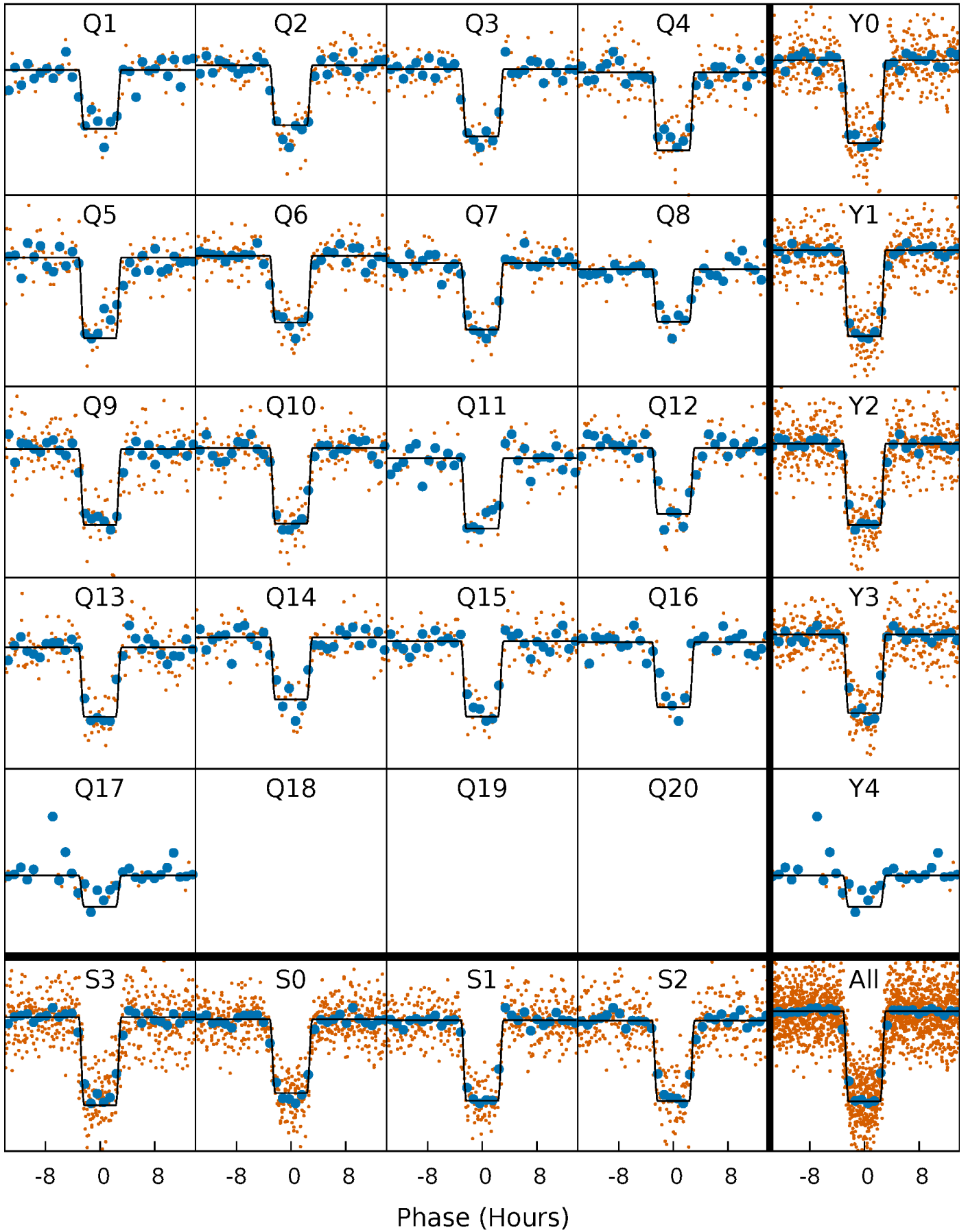
# DV Quarter-Phased Transit Curves

TCE 005003117-02 P= 37.608203 Days  $T_0=132.127509$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

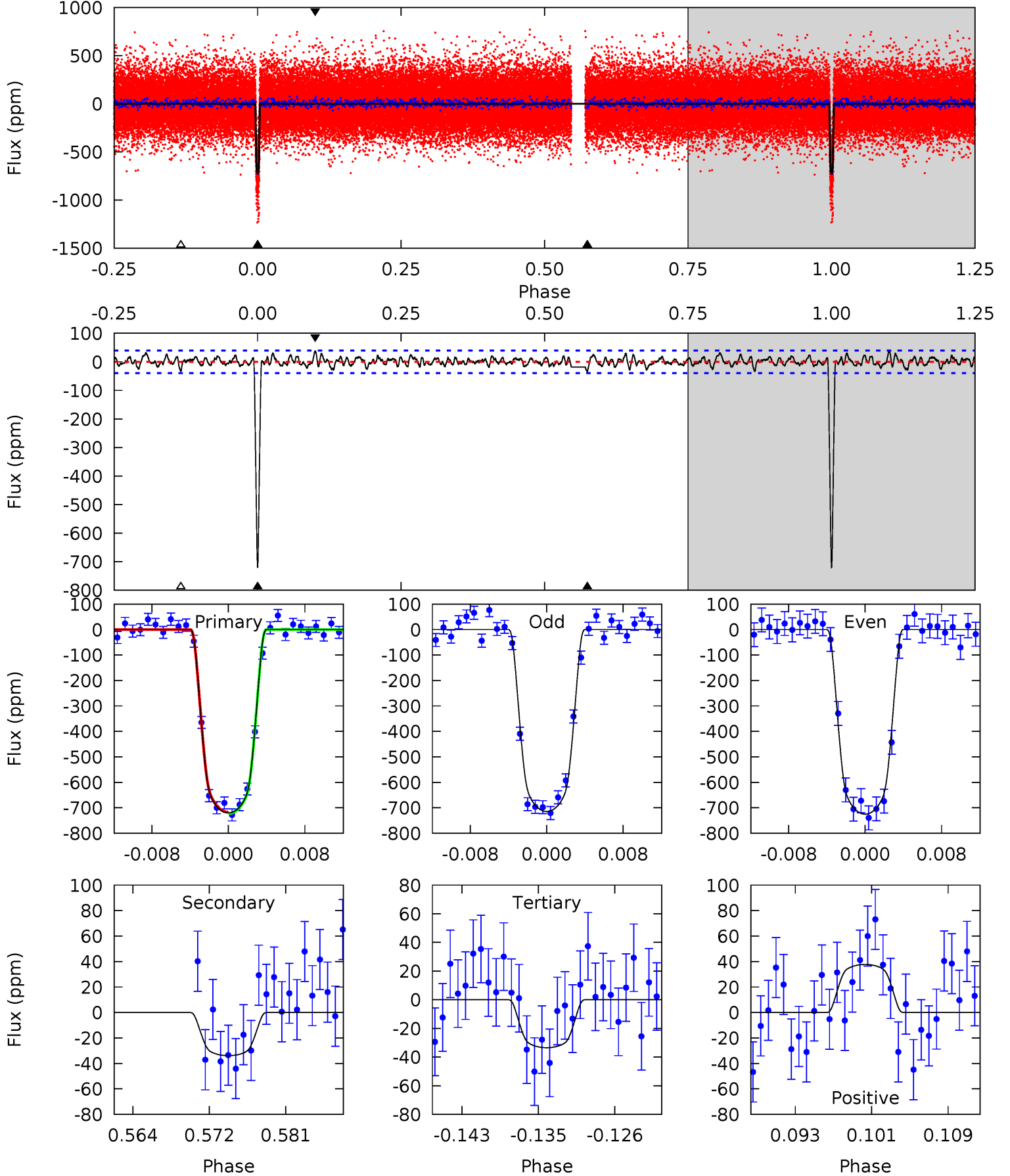
TCE 005003117-02 P= 37.608062 Days  $T_0=132.130942$  (BKJD)



# DV Model-Shift Uniqueness Test

005003117-02, P = 37.608203 Days, E = 94.519306 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
92.2	4.34	4.29	4.83	5.06	2.63	1.42	87.9	87.4	0.06	-0.49	0.67	0.96	0.05	0.32

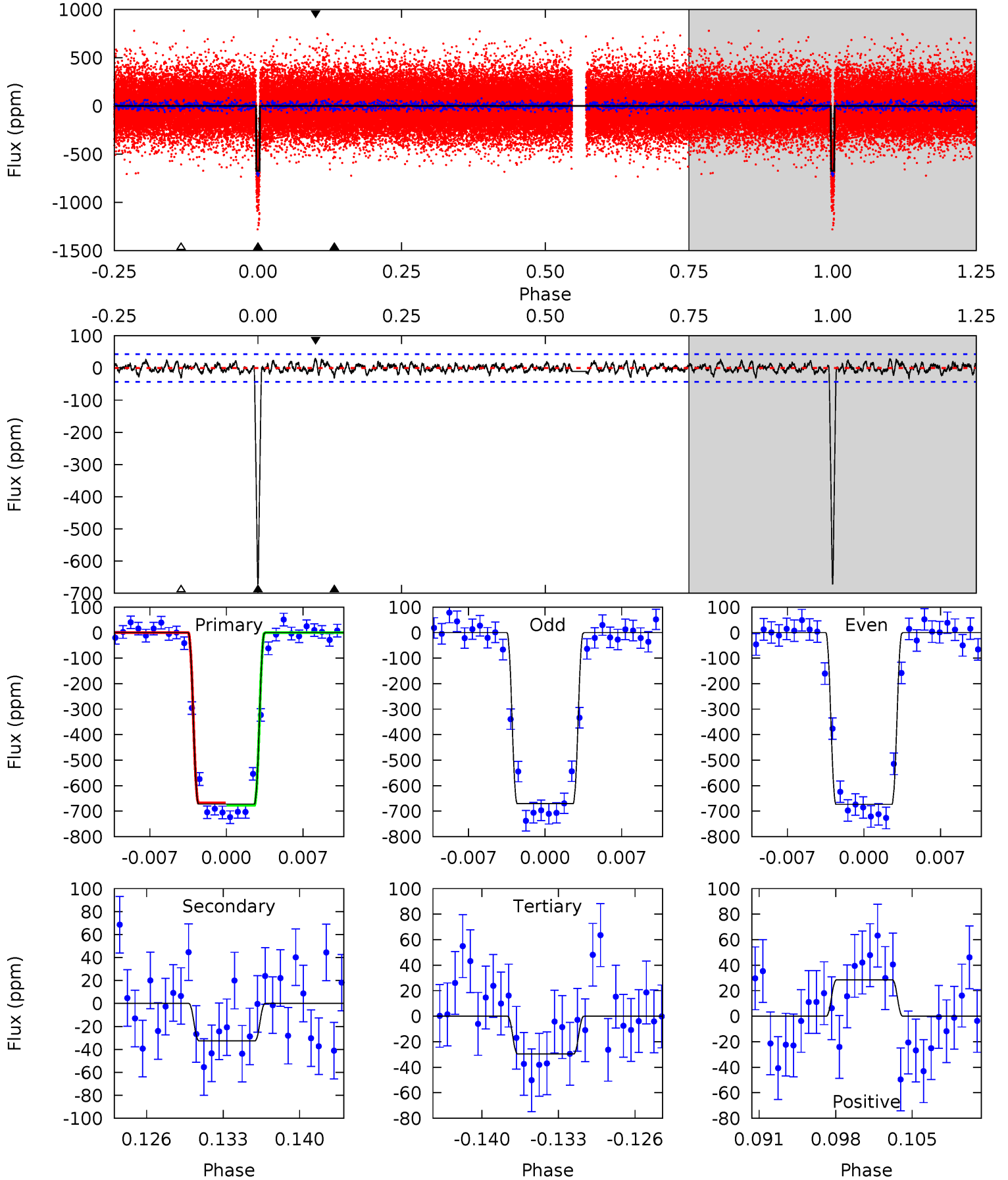




# Alt Model-Shift Uniqueness Test

005003117-02, P = 37.608062 Days, E = 94.522880 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
79.5	3.85	3.50	3.36	5.09	2.70	1.10	76.0	76.1	0.35	0.49	0.16	0.98	0.04	0.53





### Stellar Parameters For KIC 005003117

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5600^{+152}_{-152}$	$4.483^{+0.075}_{-0.162}$	$-0.100^{+0.300}_{-0.300}$	$0.896^{+0.229}_{-0.098}$	$0.889^{+0.104}_{-0.085}$	$1.742^{+0.616}_{-0.787}$
	+3%/-3%	+2%/-4%	+300%/-300%	+26%/-11%	+12%/-10%	+35%/-45%
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 005003117-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-34 \pm 8$	$3.06^{+0.41}_{-0.21}$	$719^{+44}_{-33}$	$3068^{+108}_{-123}$	$86^{+29}_{-25}$
Alt.	$-33 \pm 8$	$2.63^{+0.37}_{-0.20}$	$720^{+44}_{-33}$	$3184^{+133}_{-139}$	$111^{+38}_{-33}$

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

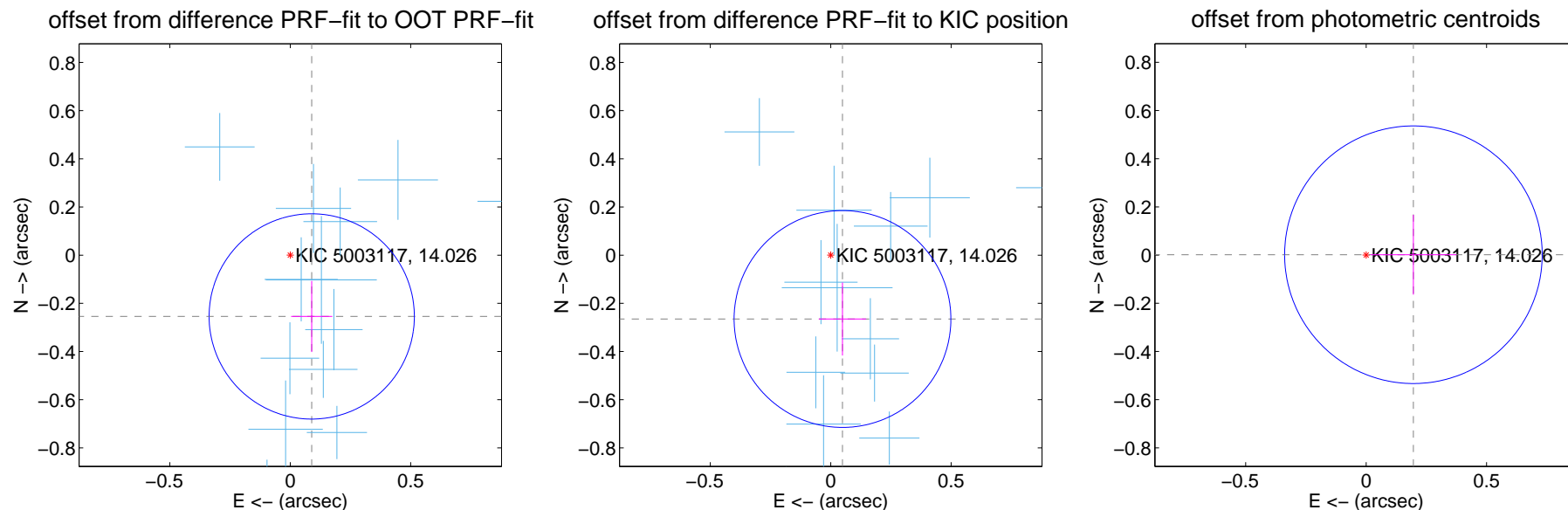
## DV Centroid Data

Supplemental centroid analysis for 005003117-02. Kepler magnitude: 14.03. Transit SNR 56.09

There are 16 quarters with good PRF difference image offsets

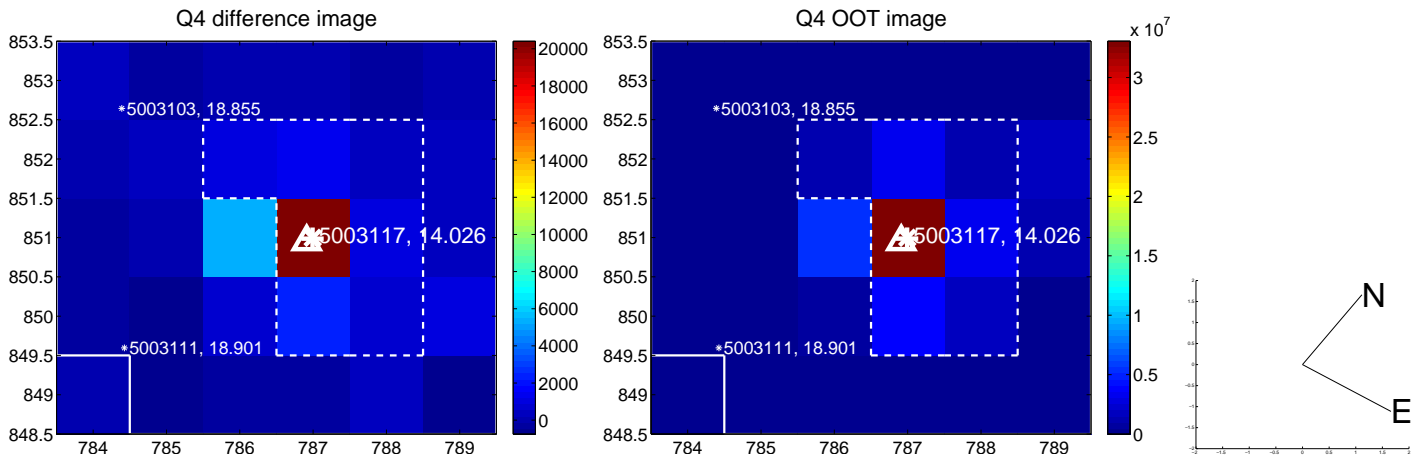
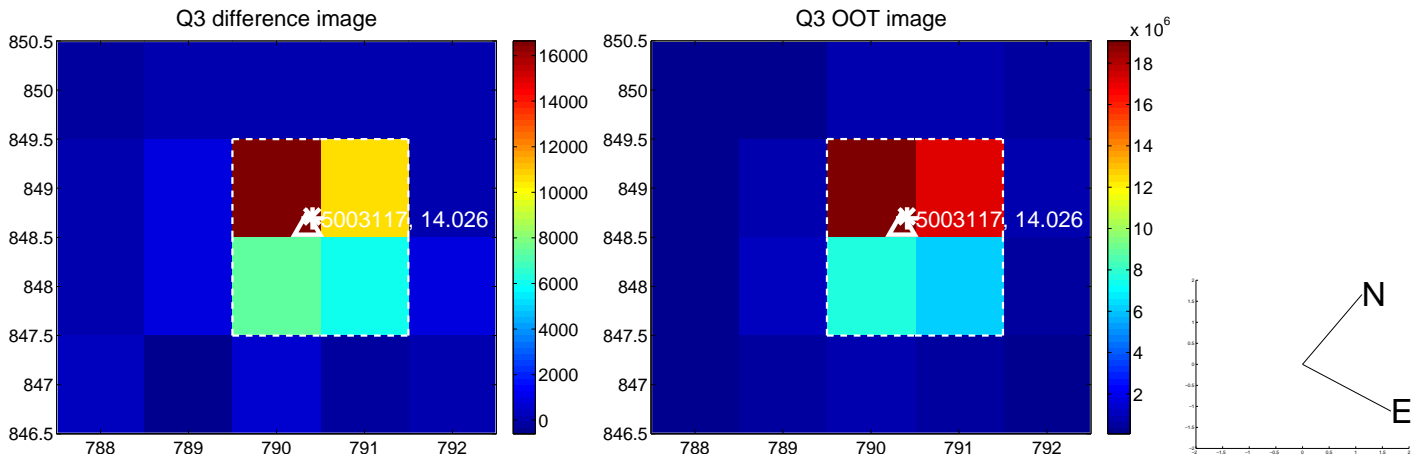
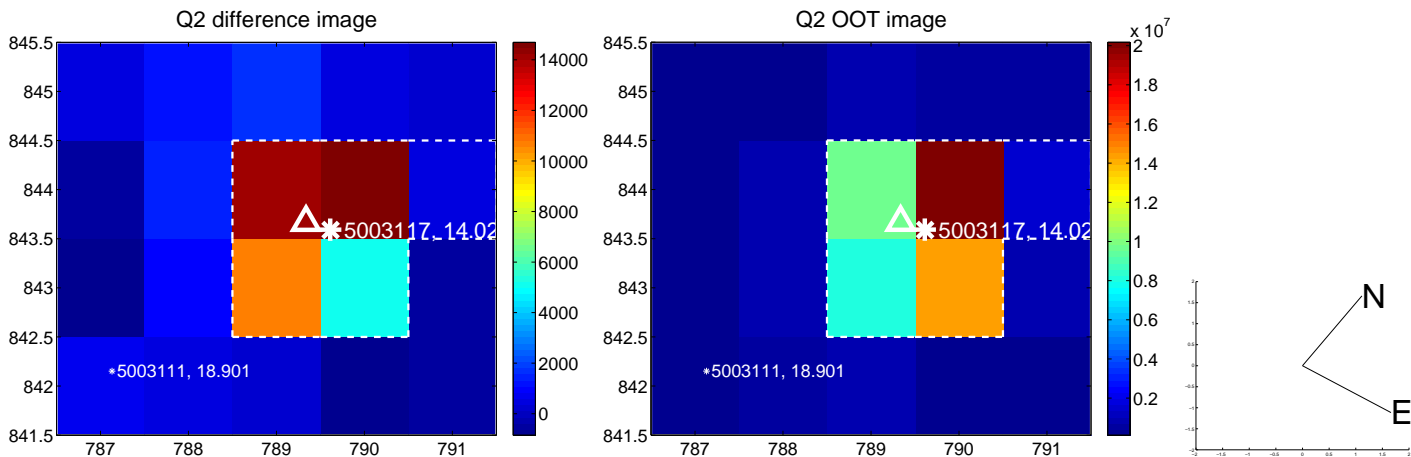
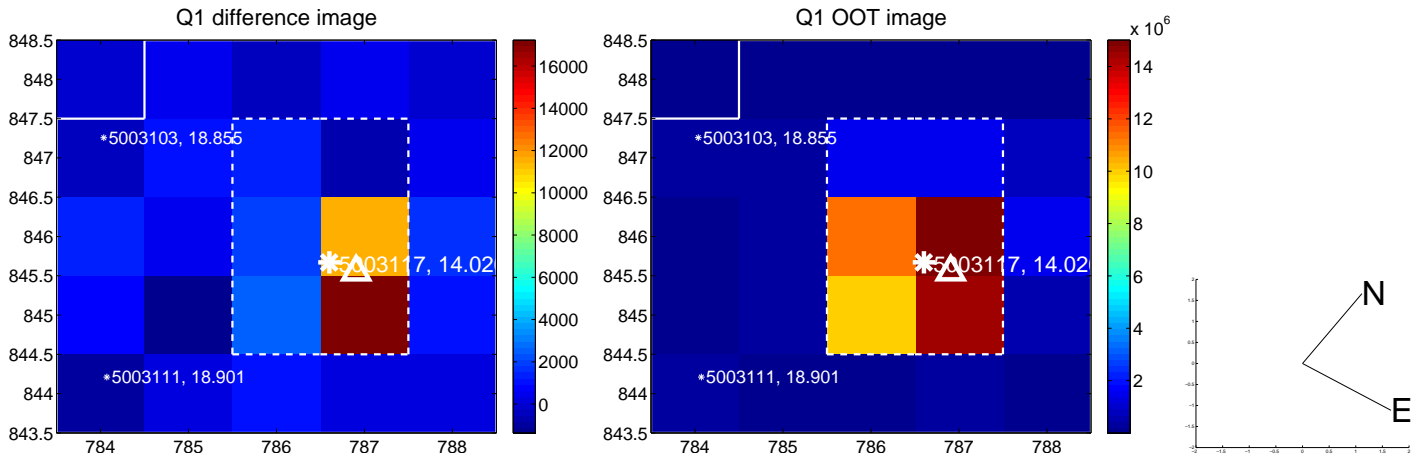
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.270 \pm 0.142$	1.90	$-0.089 \pm 0.086$	$-0.254 \pm 0.147$
PRF-fit source offset from KIC position	$0.270 \pm 0.150$	1.80	$-0.049 \pm 0.098$	$-0.265 \pm 0.151$
photometric centroid source offset	$0.20 \pm 0.18$	1.10	$-0.20 \pm 0.18$	$0.00 \pm 0.17$

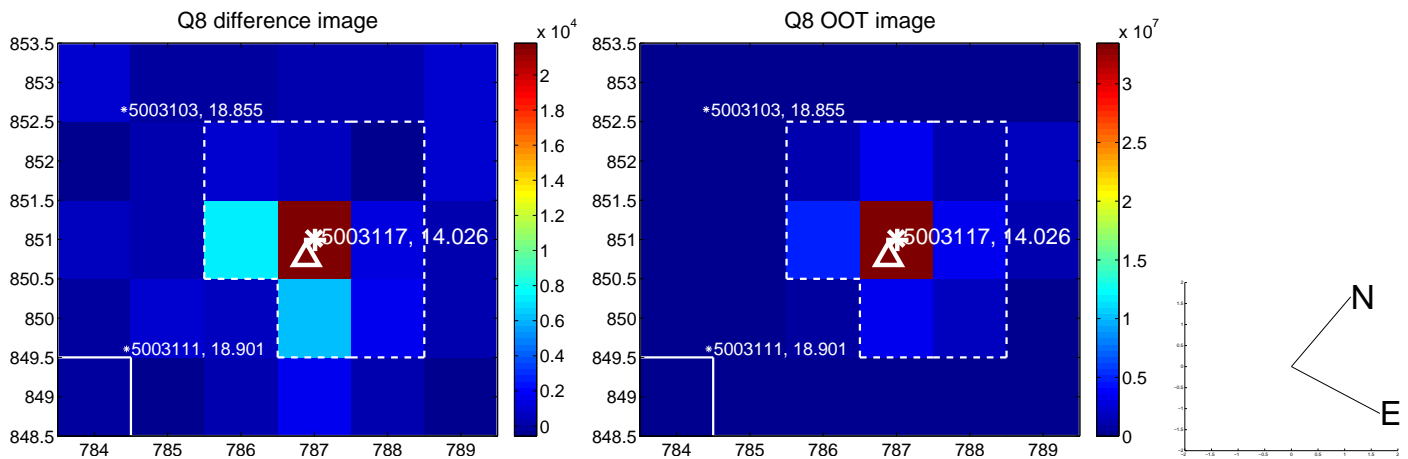
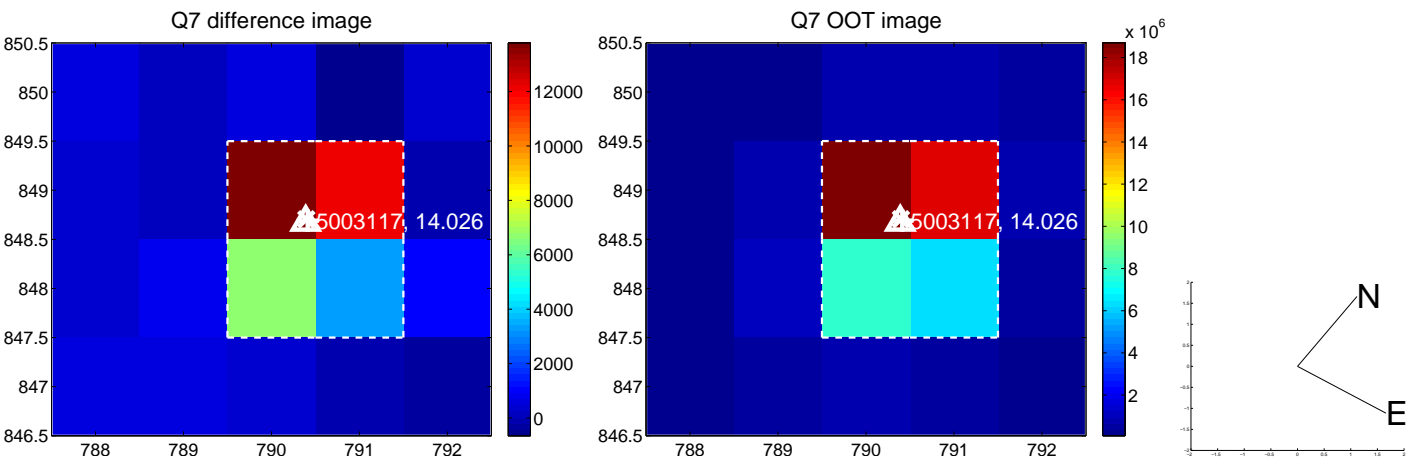
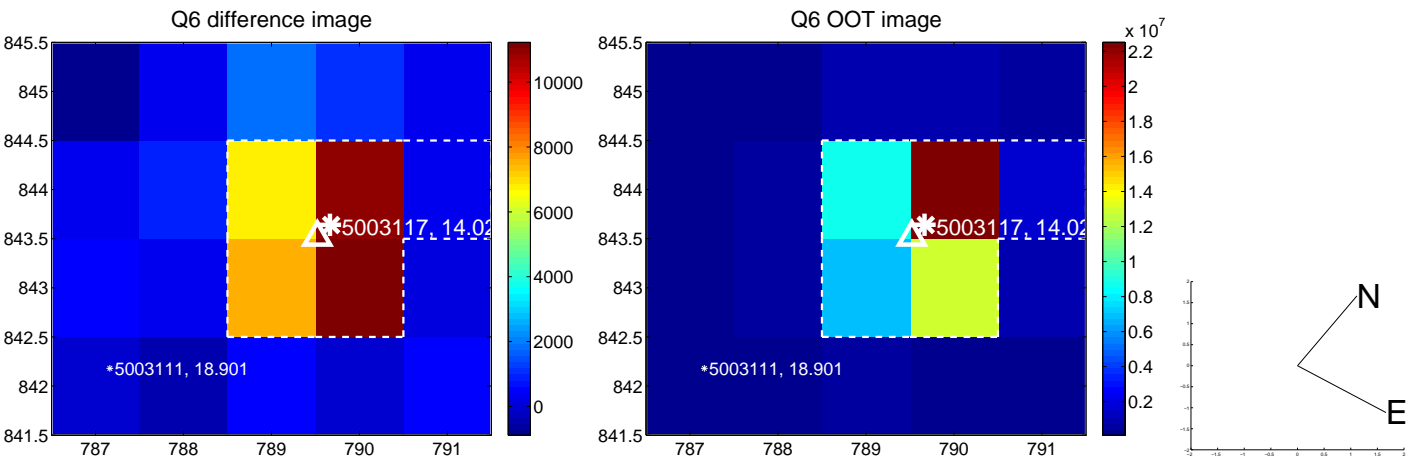
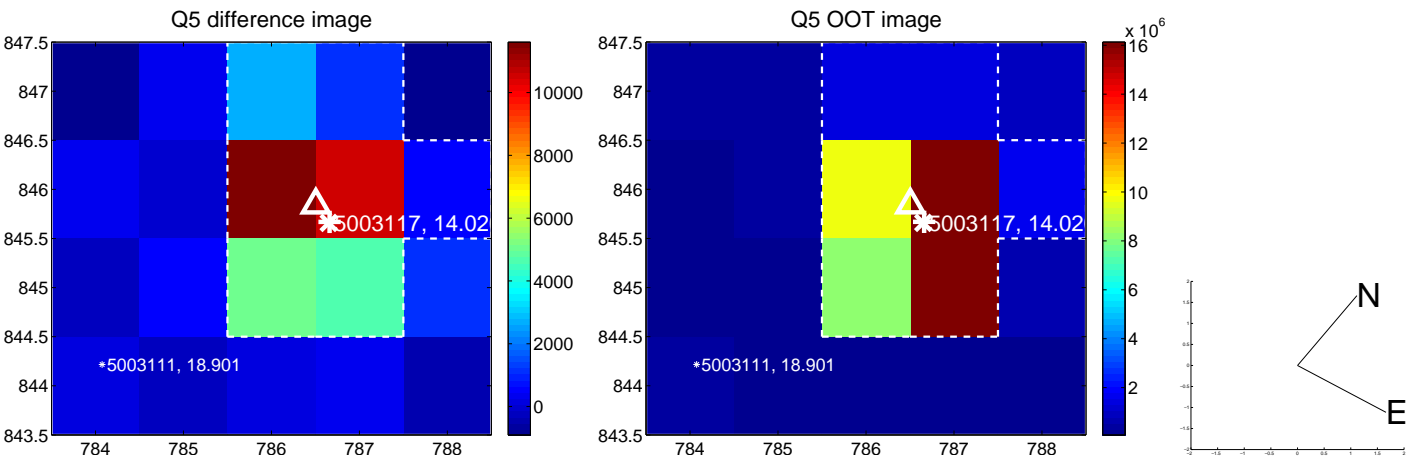


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

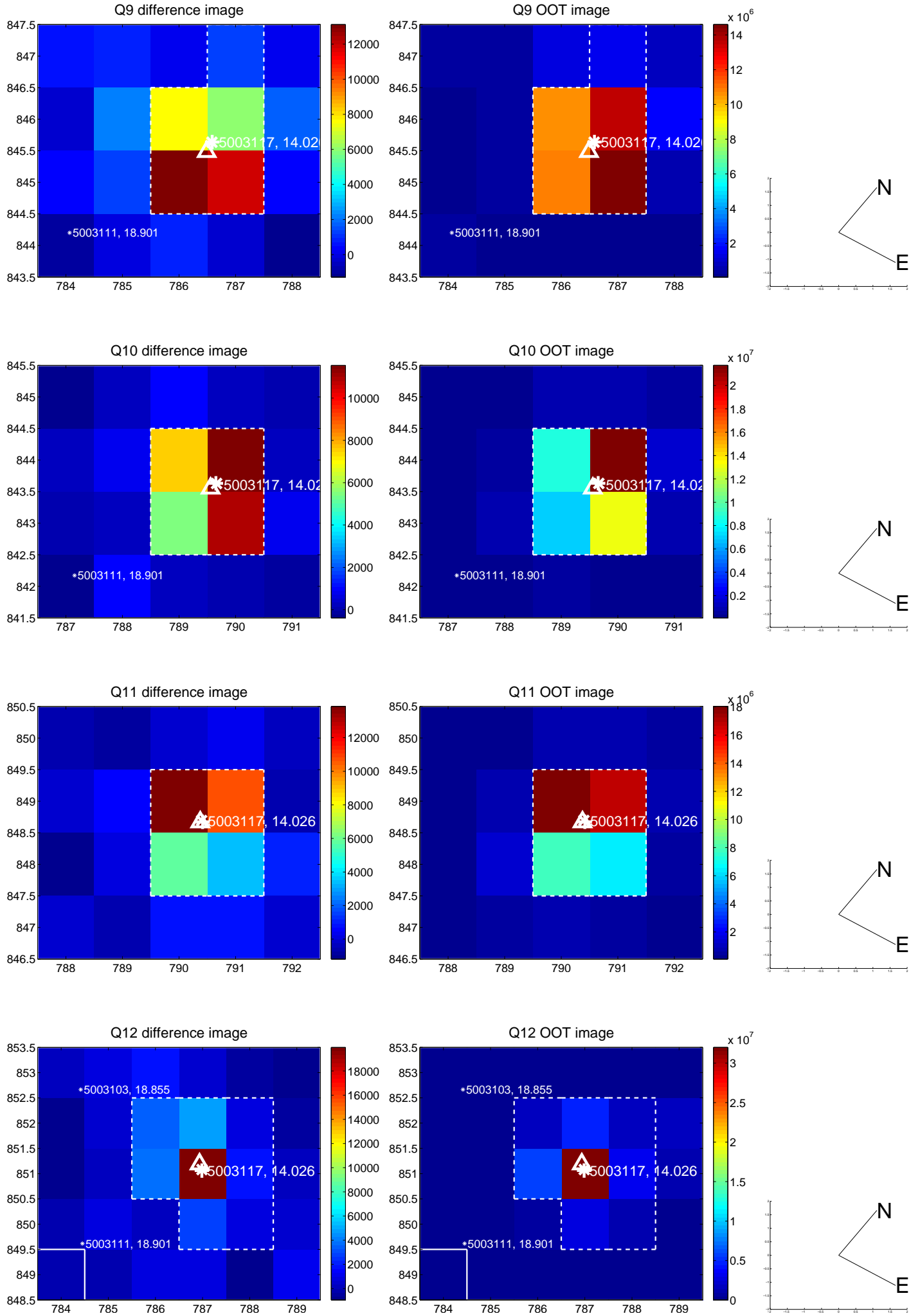
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



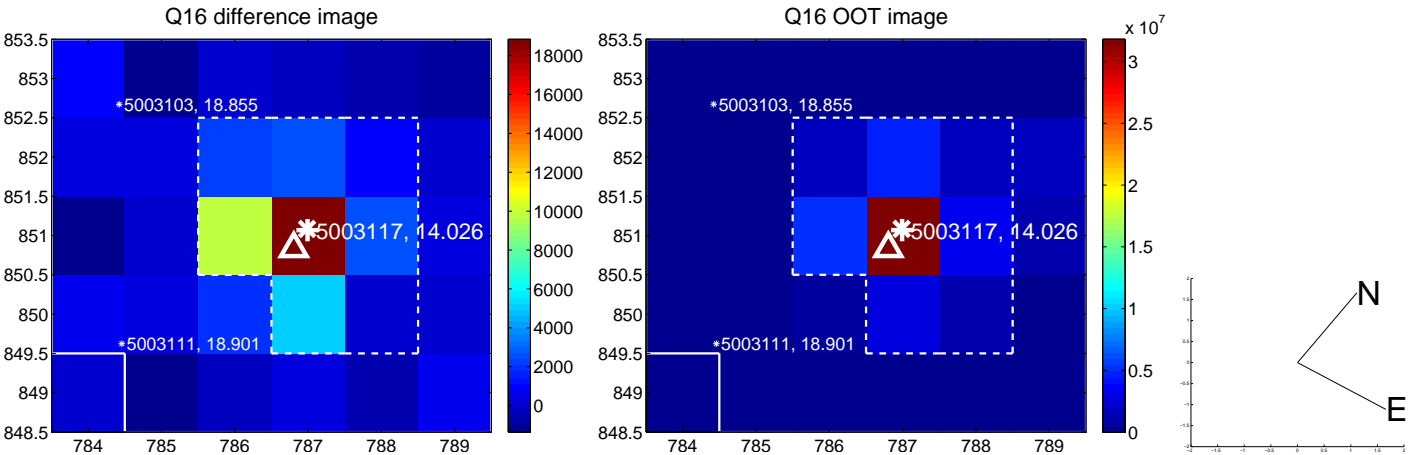
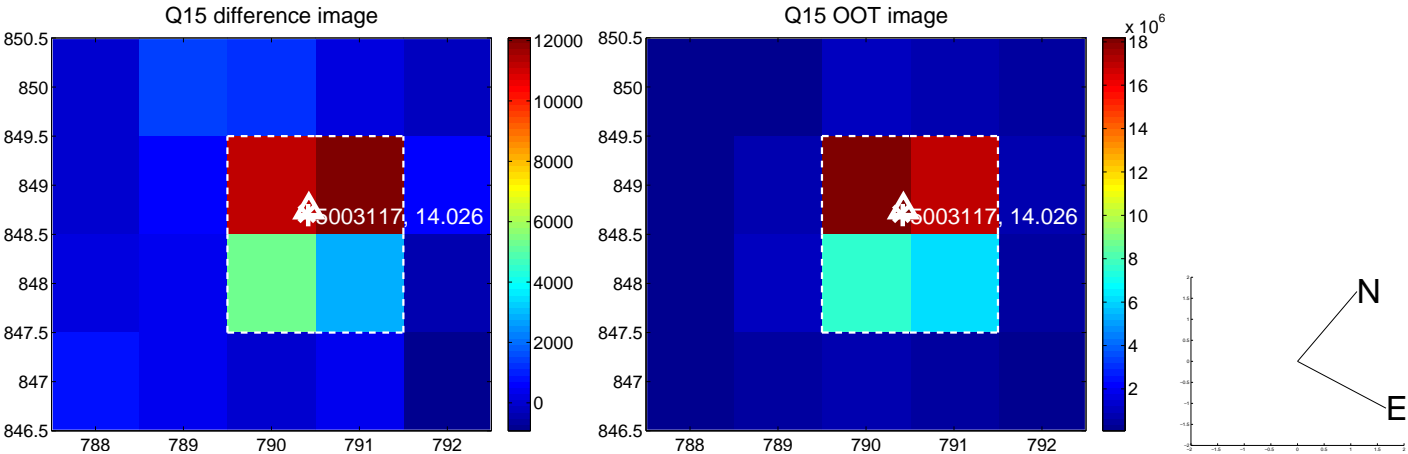
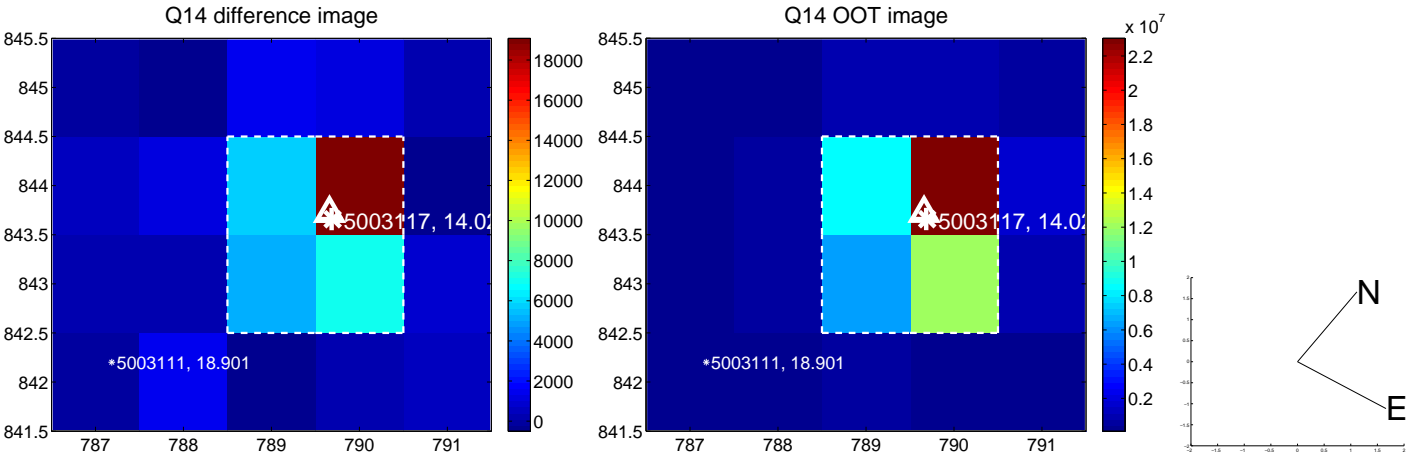
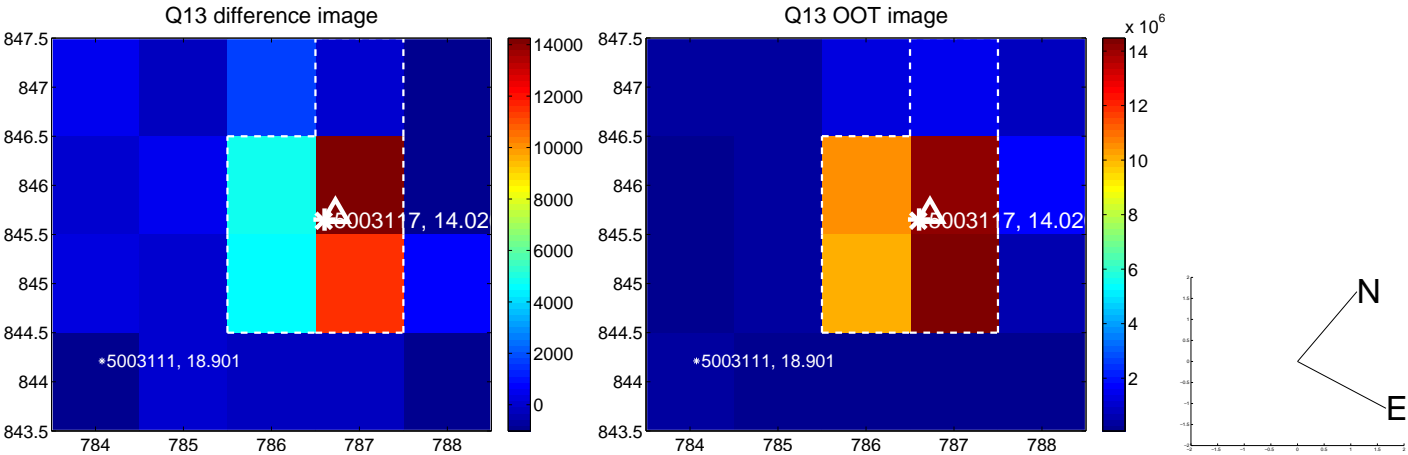
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



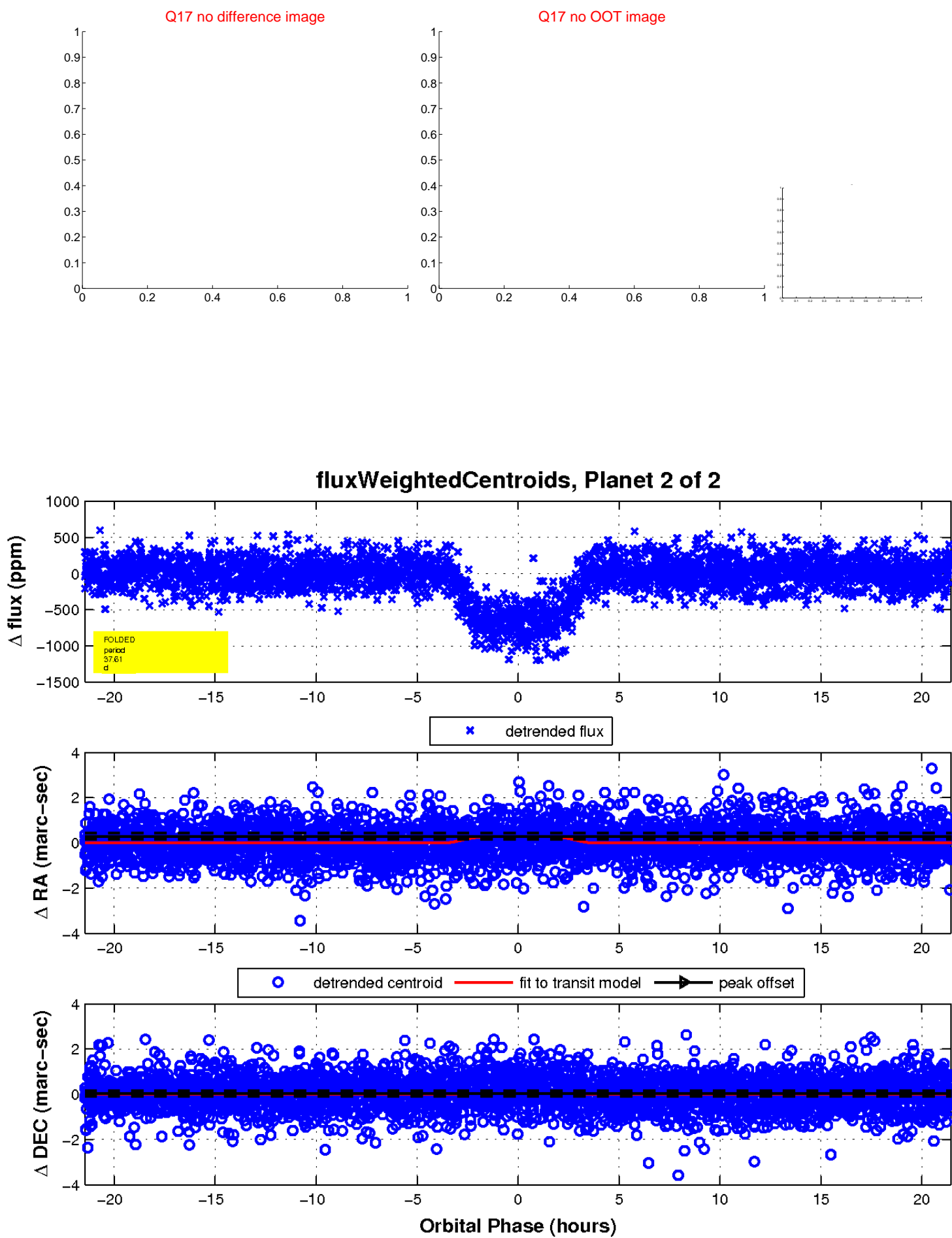
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

