

# KIC 003765917

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003765917-01	OBS	4526.01	30.537831	156.733325	467.9	9.471	11.2	12.3	1.33	5803	4.60	47.55
003765917-02	OBS	4526.02	11.819587	132.447201	220.7	5.650	8.6	9.2	1.33	5803	2.14	168.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003765917-01	OBS	PC	0.92	0	0	0	0	NO_COMMENT
003765917-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

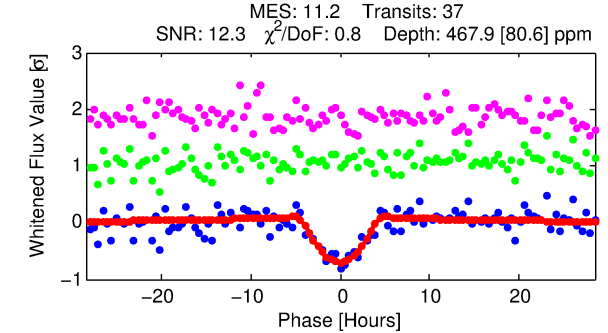
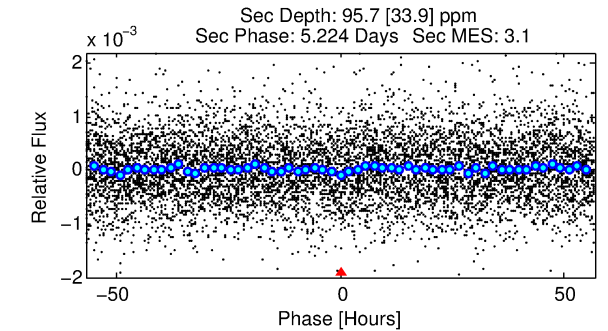
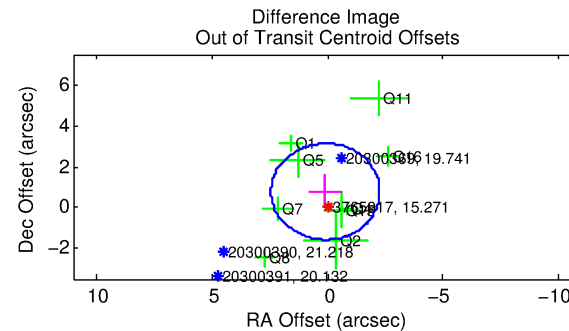
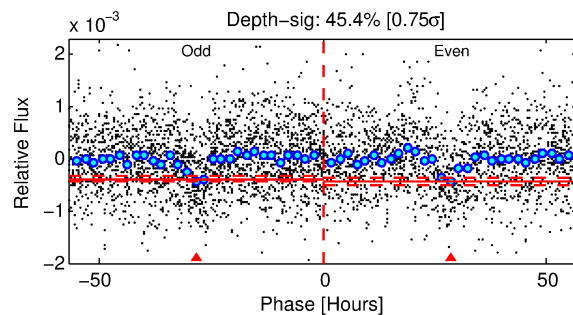
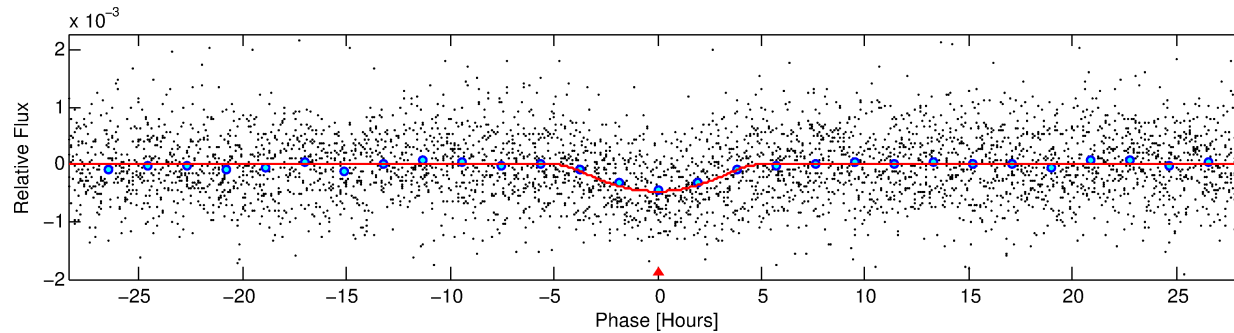
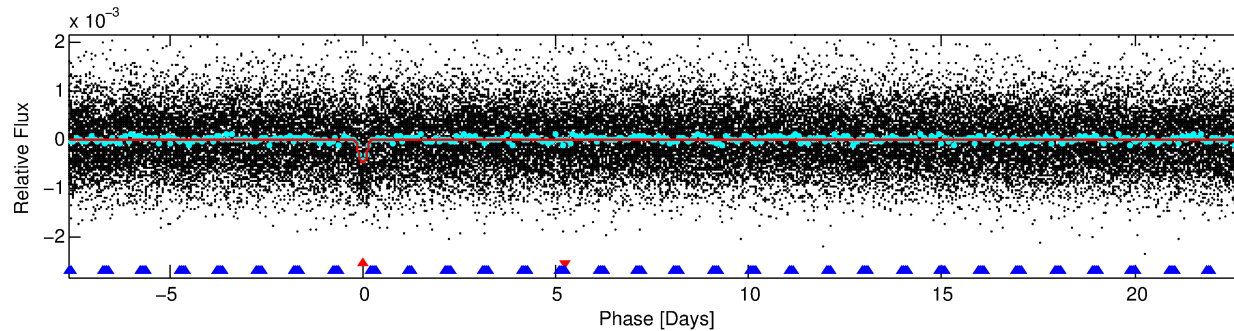
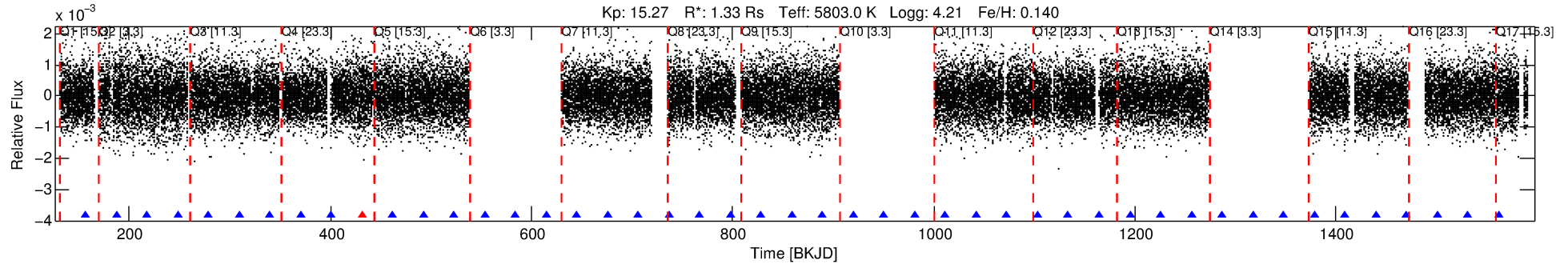
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003765917-01

No Significant Match Found

# DV One-Page Summary

KIC: 3765917 Candidate: 1 of 2 Period: 30.538 d  
KOI: K04526.01 Corr: 0.843



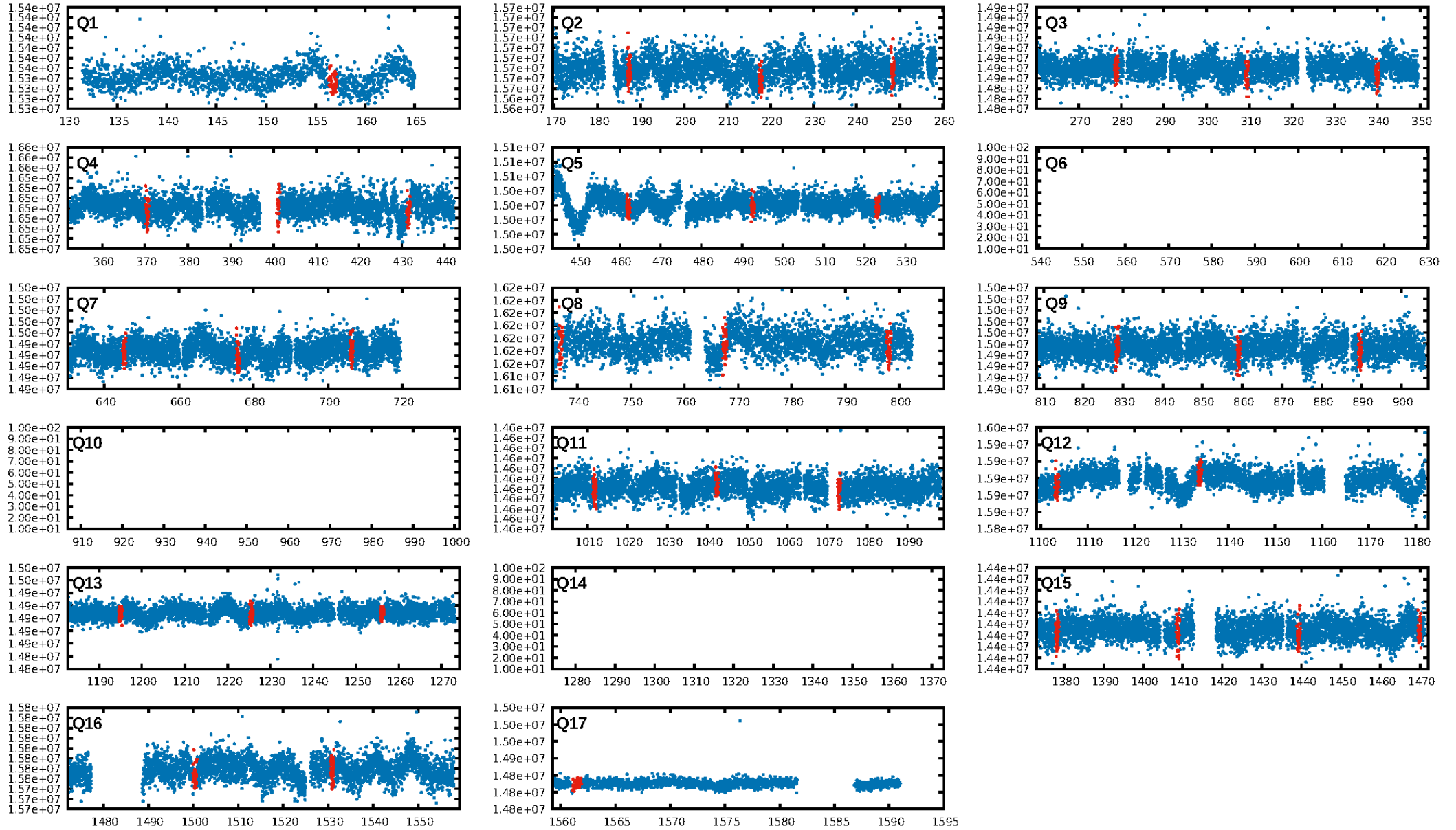
## DV Fit Results:

Period = 30.53783 [0.00060] d  
Epoch = 156.7333 [0.0158] BKJD  
Rp/R\* = 0.0317 [0.0342]  
a/R\* = 7.50 [3.08]  
b = 0.99 [0.06]  
Seff = 47.55 [13.43]  
Teq = 670 [47] K  
Rp = 4.60 [5.03] Re  
a = 0.1941 [0.0339] AU  
Ag = 93.78 [206.56] [0.45 $\sigma$ ]  
Teffp = 3222 [1760] K [1.45 $\sigma$ ]

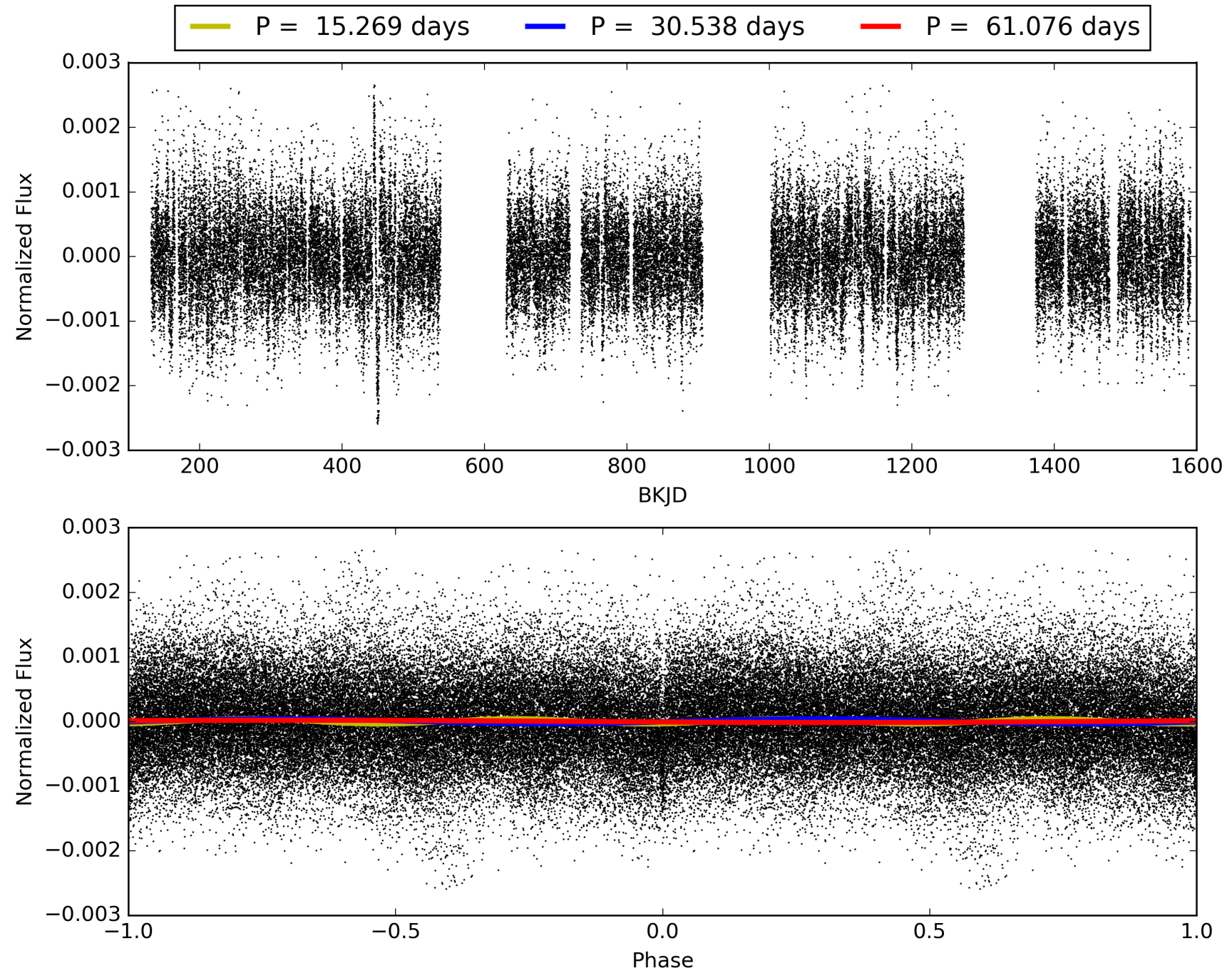
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [40.74 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 91.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.11e-29  
RollingBand-fgt: 0.97 [34/35]  
GhostDiagnostic-chr: 4.89  
Centroid-sig: 0.2%  
Centroid-so: 1.570 arcsec [1.39 $\sigma$ ]  
OotOffset-rm: 0.779 arcsec [0.99 $\sigma$ ]  
KicOffset-rm: 0.714 arcsec [0.90 $\sigma$ ]  
OotOffset-st: 1/3/3/2 [9]  
KicOffset-st: 1/3/3/2 [9]  
DiffImageQuality-fgm: 0.67 [6/9]  
DiffImageOverlap-fno: 0.92 [12/13]

# TCE 003765917-01, PDC Light Curves

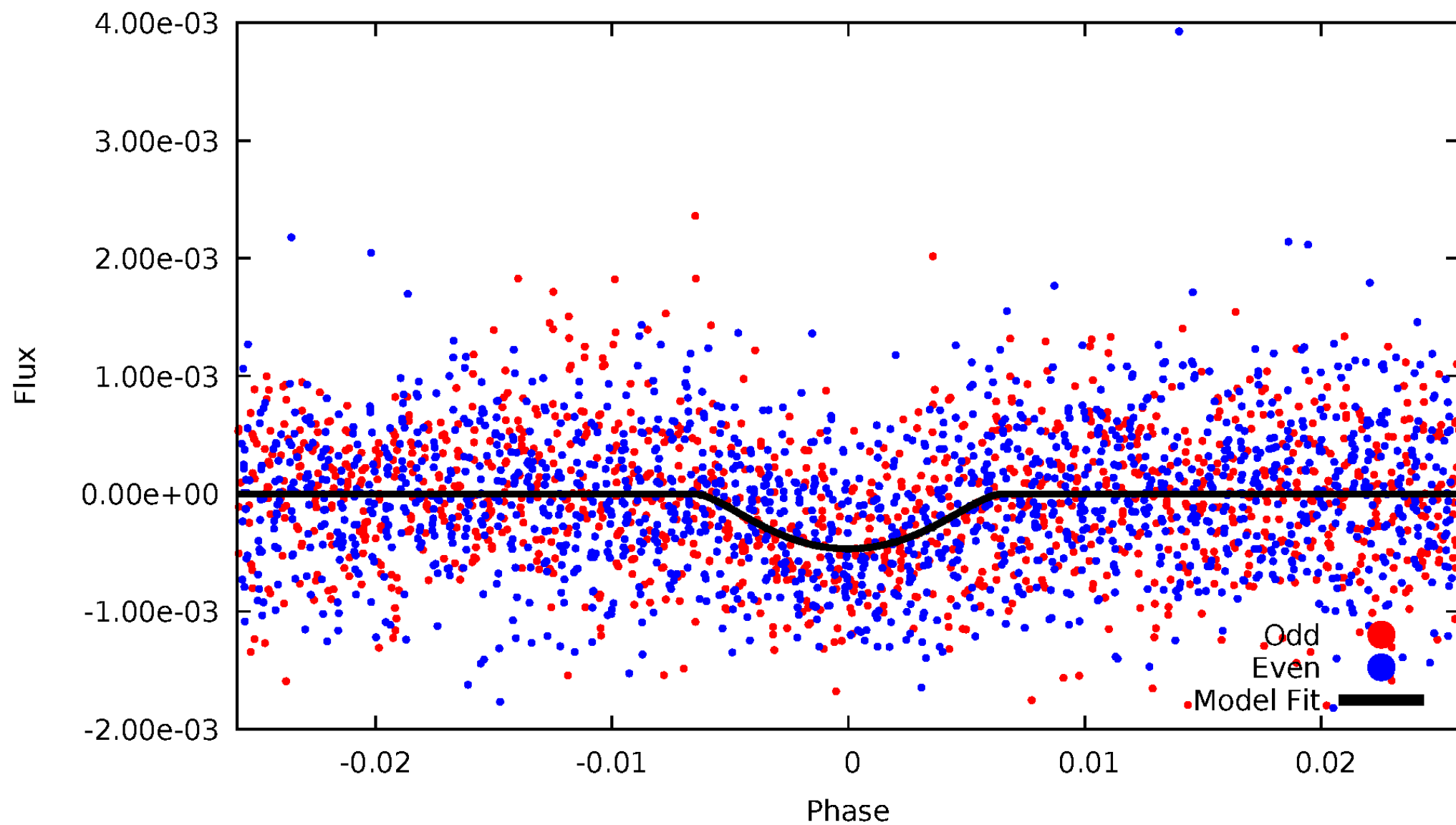


TCE 003765917-01



# DV Odd/Even

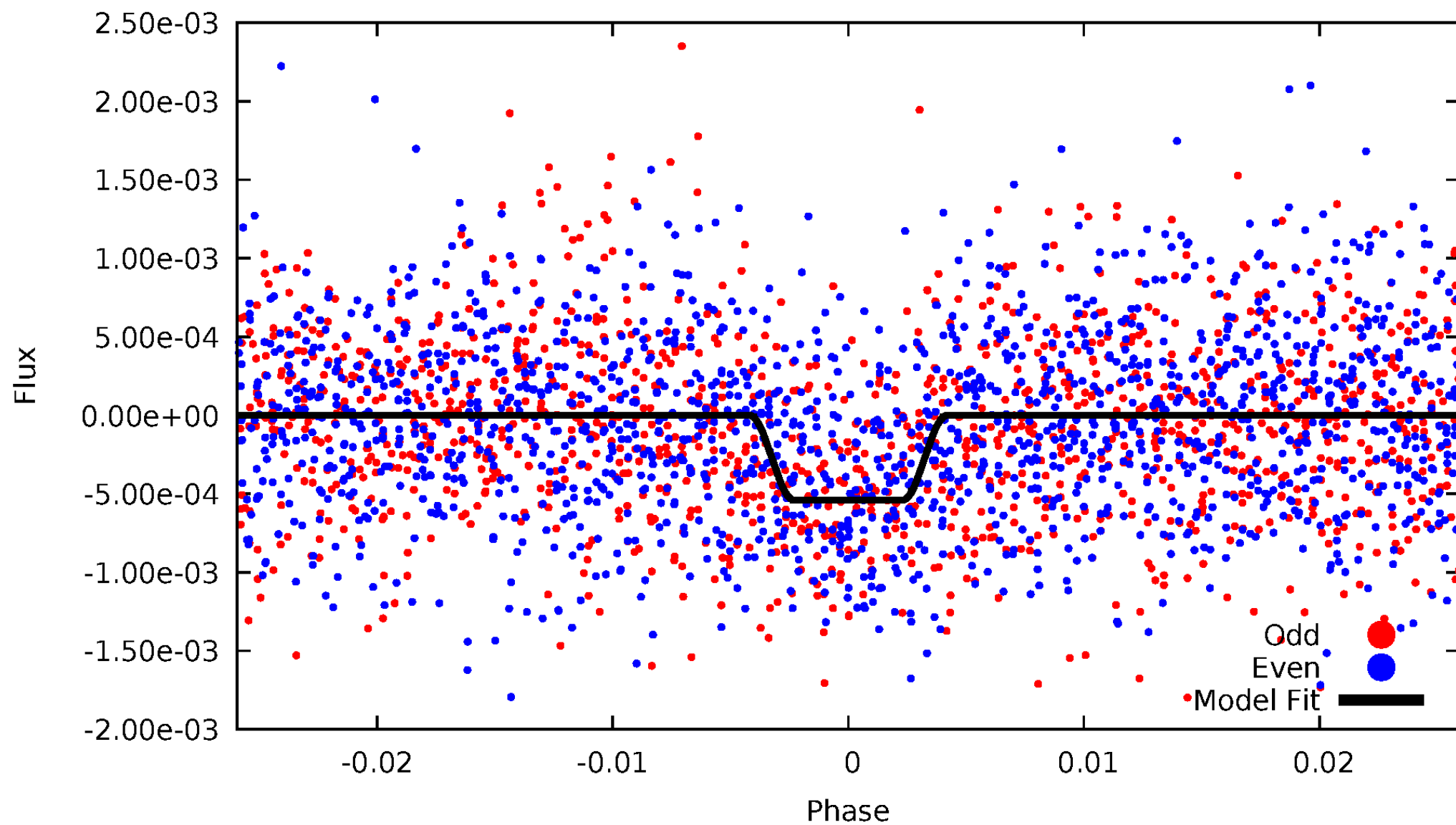
TCE 003765917-01



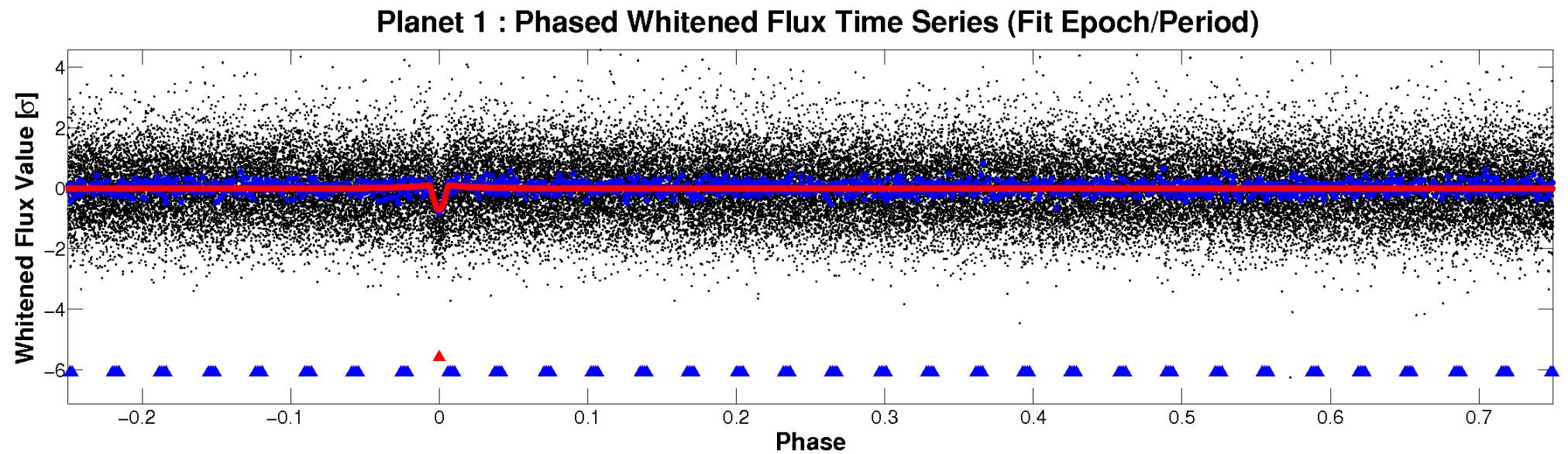
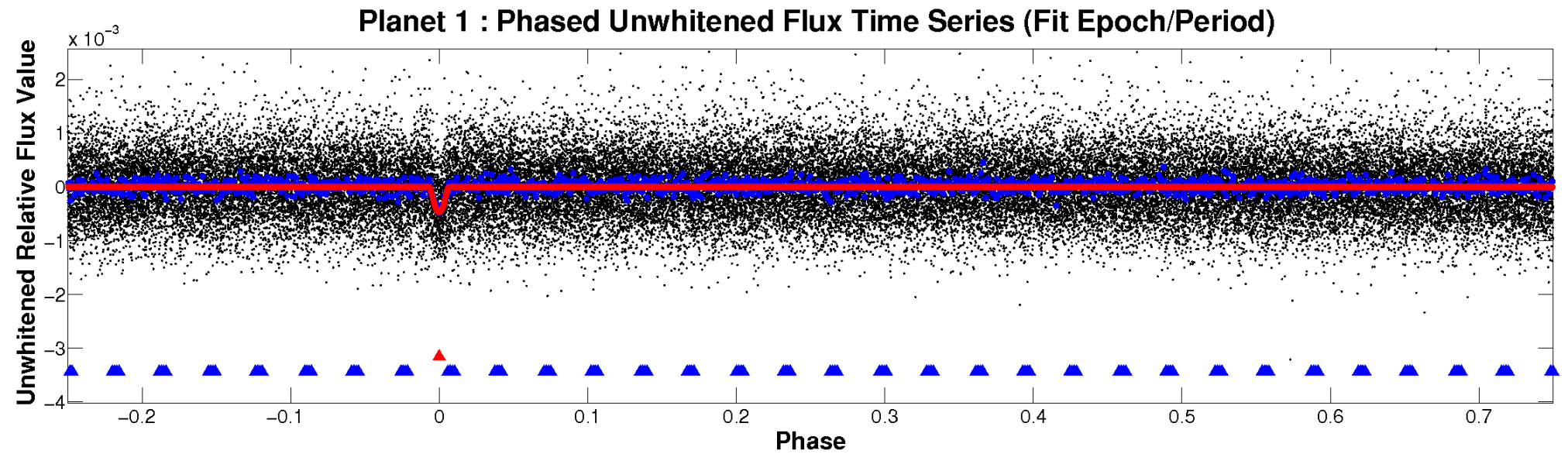


# ALT Odd/Even

TCE 003765917-01

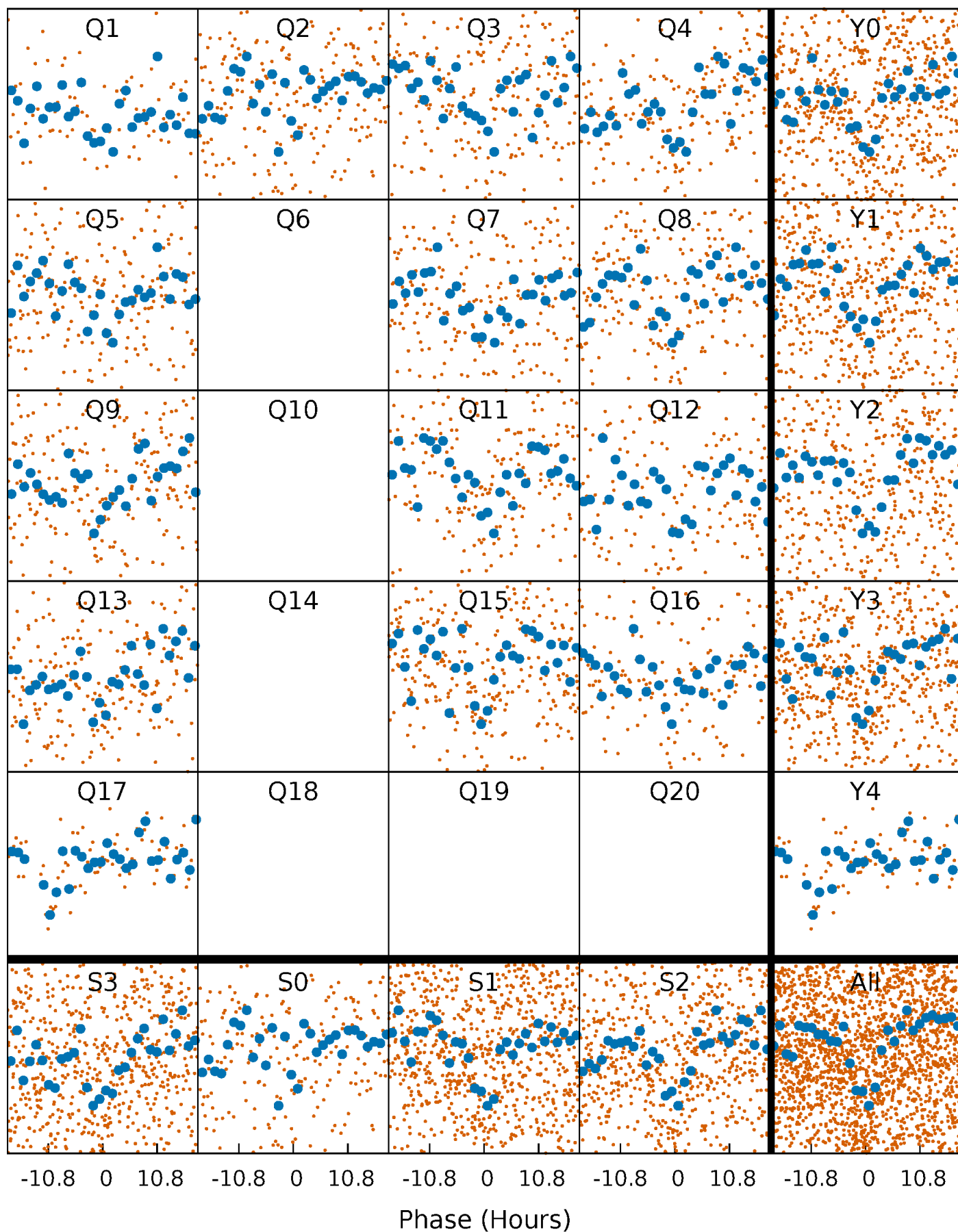


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

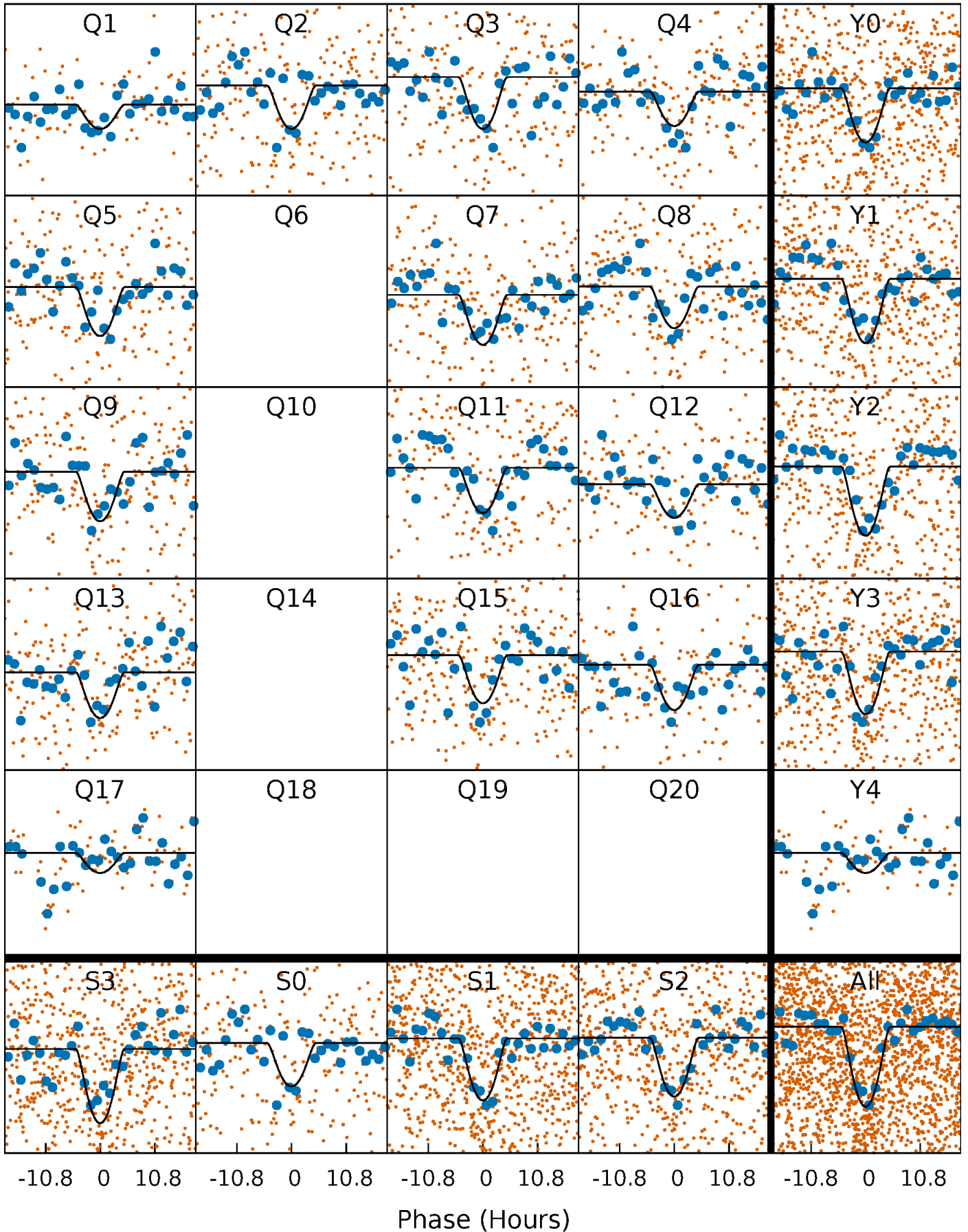
TCE 003765917-01 P= 30.537831 Days  $T_0=156.733325$  (BKJD)





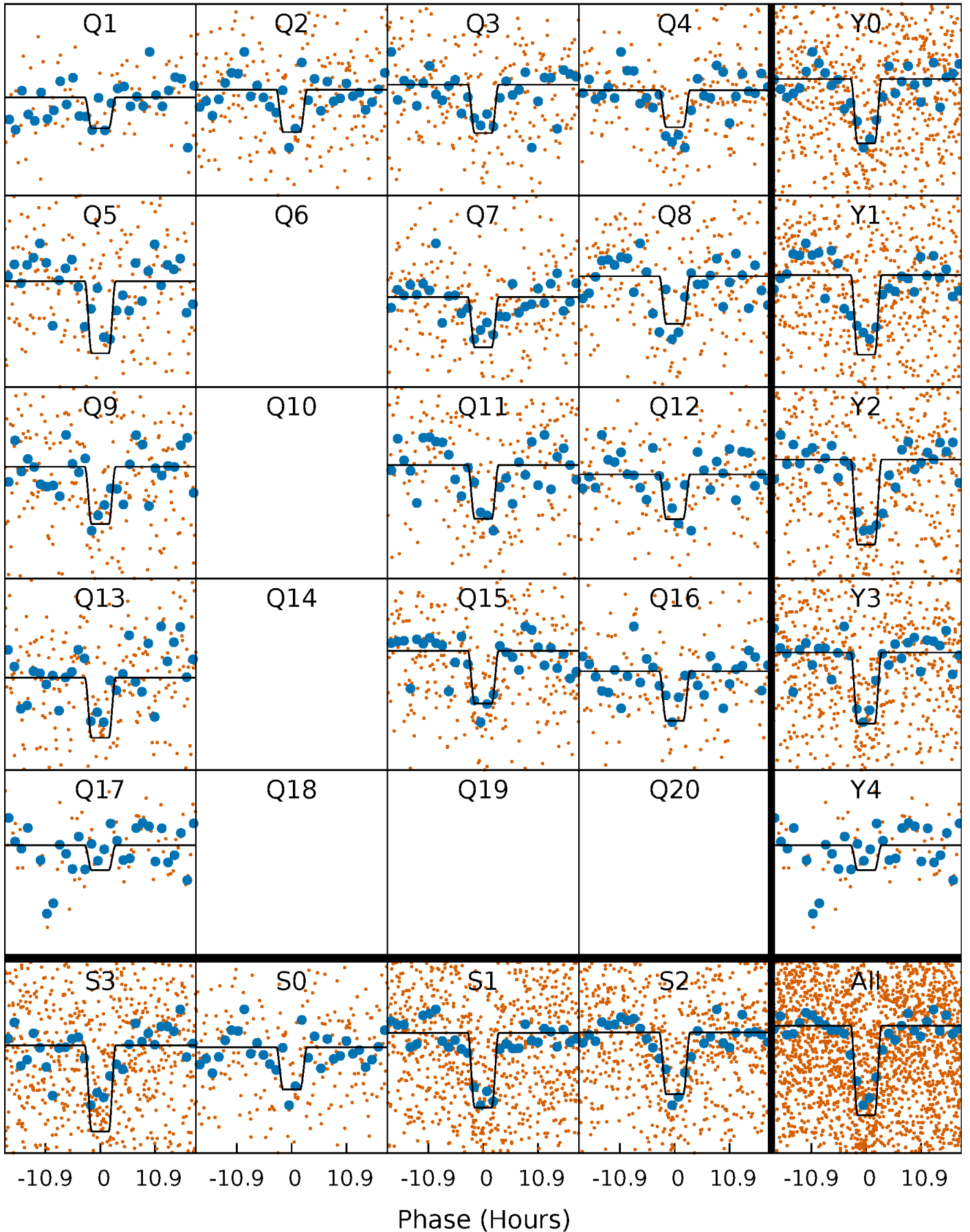
# DV Quarter-Phased Transit Curves

TCE 003765917-01 P= 30.537831 Days  $T_0=156.733325$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

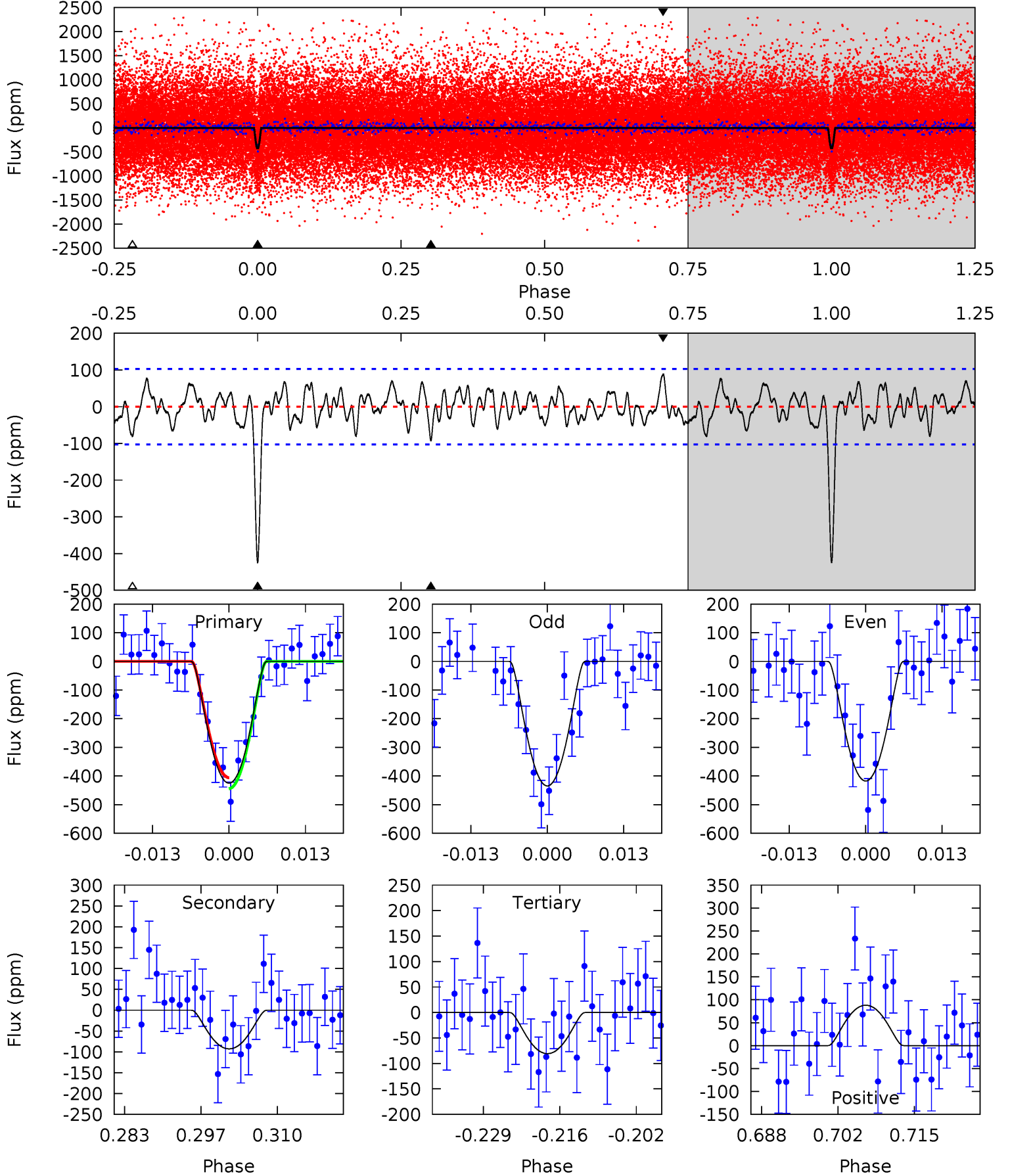
TCE 003765917-01 P= 30.537150 Days  $T_0=156.752032$  (BKJD)



# DV Model-Shift Uniqueness Test

003765917-01, P = 30.537831 Days, E = 126.195494 Days

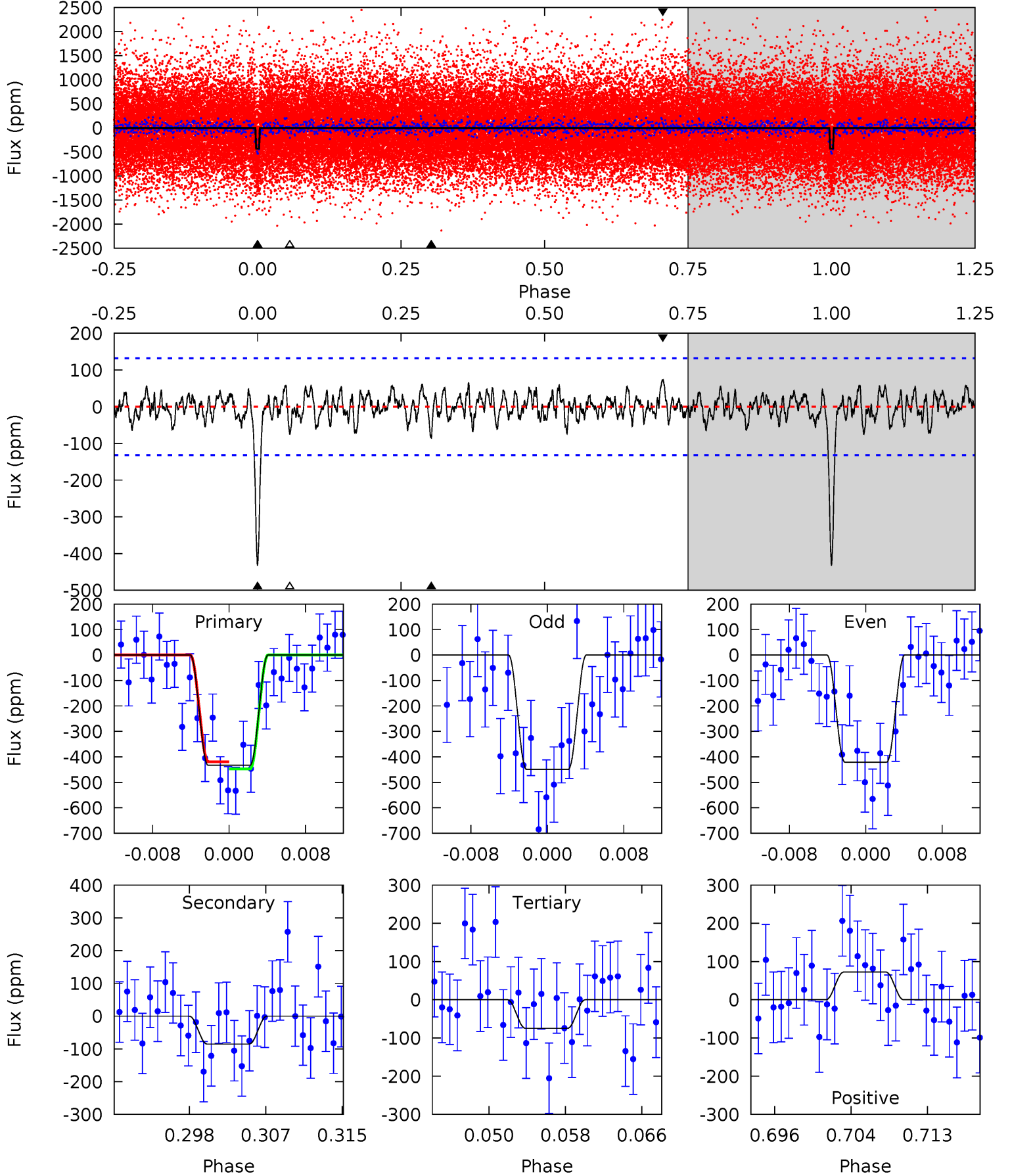
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.5	4.48	3.90	4.25	4.97	2.47	1.59	16.6	16.3	0.58	0.23	0.41	1.02	0.17	0.92



# Alt Model-Shift Uniqueness Test

003765917-01,  $P = 30.537150$  Days,  $E = 126.214882$  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
16.6	3.28	2.87	2.78	5.06	2.64	1.05	13.8	13.9	0.40	0.49	0.54	1.19	0.14	0.54



### Stellar Parameters For KIC 003765917

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5803^{+78}_{-78}$	$4.211^{+0.162}_{-0.108}$	$0.140^{+0.150}_{-0.150}$	$1.328^{+0.222}_{-0.244}$	$1.046^{+0.094}_{-0.071}$	$0.629^{+0.474}_{-0.196}$
	+1%/-1%	+4%/-3%	+107%/-107%	+17%/-18%	+9%/-7%	+75%/-31%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 003765917-01 / KOI 4526.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-93 \pm 21$	$5.43^{+4.90}_{-3.53}$	$932^{+46}_{-48}$	$3397^{+1628}_{-564}$	$63^{+470}_{-46}$
Alt.	$-85 \pm 26$	$4.89^{+4.38}_{-3.21}$	$932^{+42}_{-44}$	$3465^{+1723}_{-580}$	$71^{+548}_{-51}$

$T_{\text{max}}$  = 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

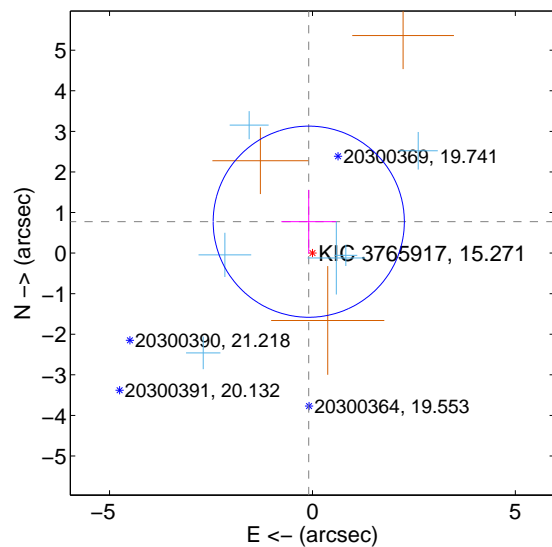
Supplemental centroid analysis for 003765917-01. Kepler magnitude: 15.27. Transit SNR 12.35

There are 6 quarters with good PRF difference image offsets

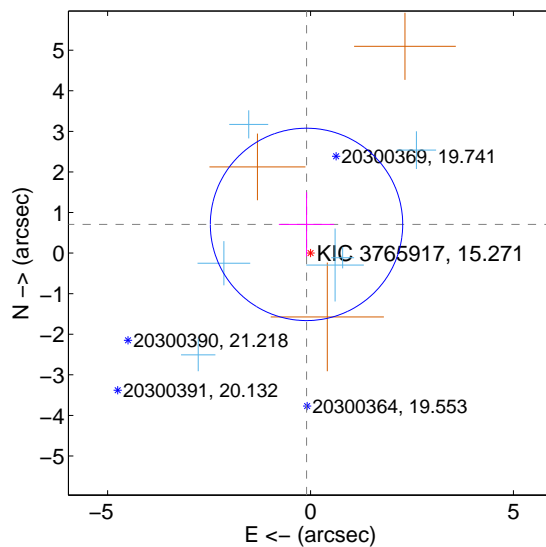
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.779 \pm 0.785$	0.99	$0.091 \pm 0.675$	$0.774 \pm 0.786$
PRF-fit source offset from KIC position	$0.714 \pm 0.790$	0.90	$0.099 \pm 0.681$	$0.707 \pm 0.792$
photometric centroid source offset	$1.57 \pm 1.13$	1.39	$-0.10 \pm 1.08$	$1.57 \pm 1.13$

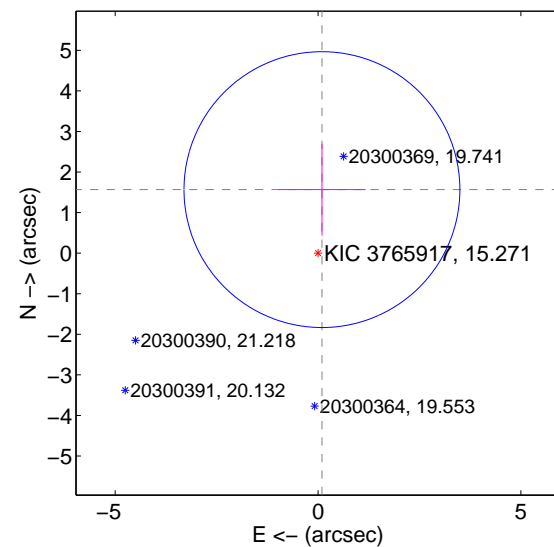
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

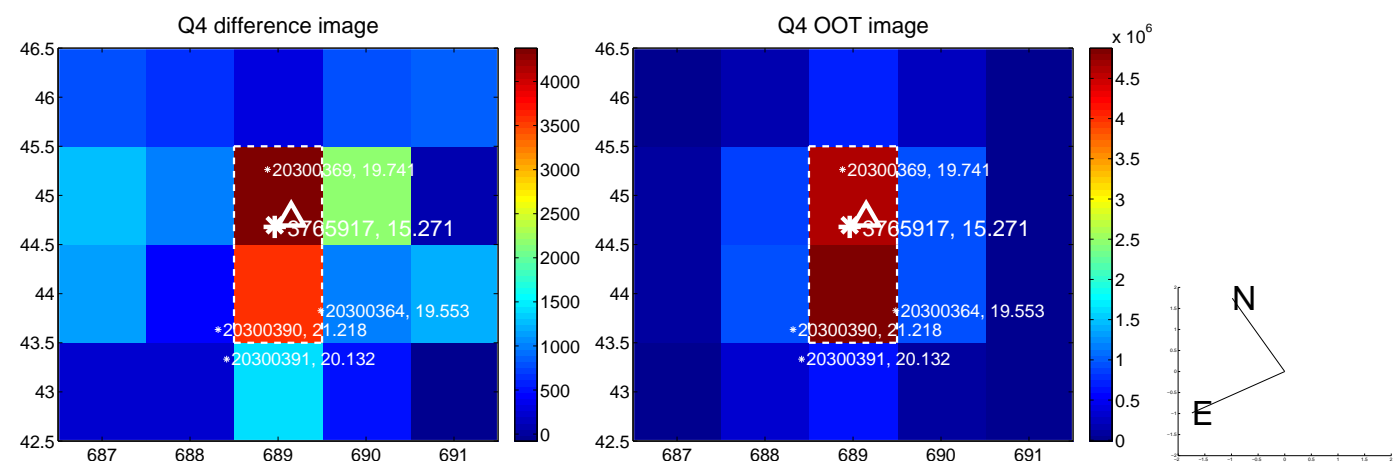
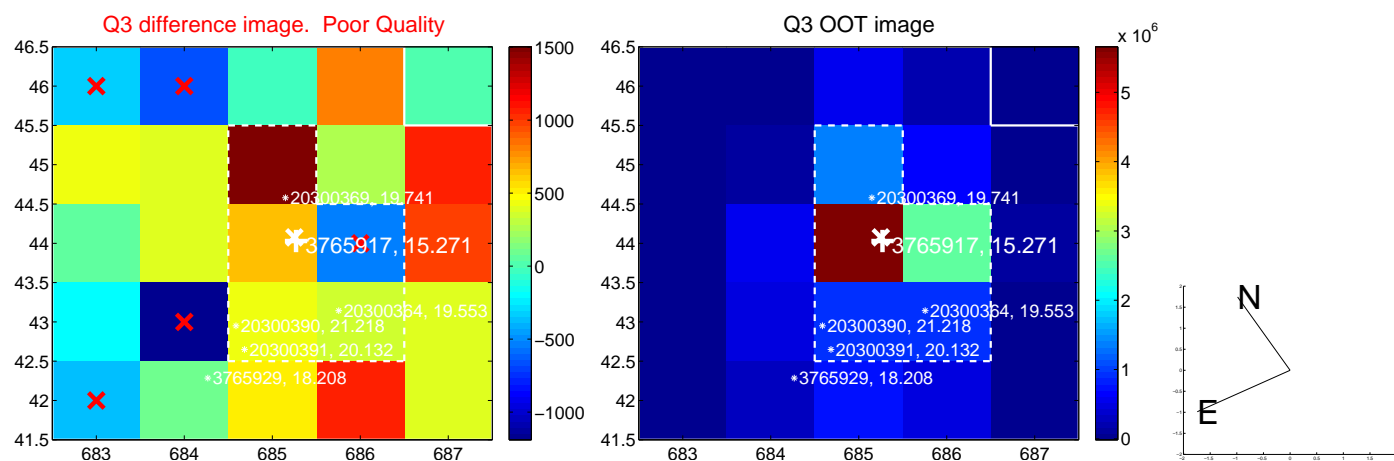
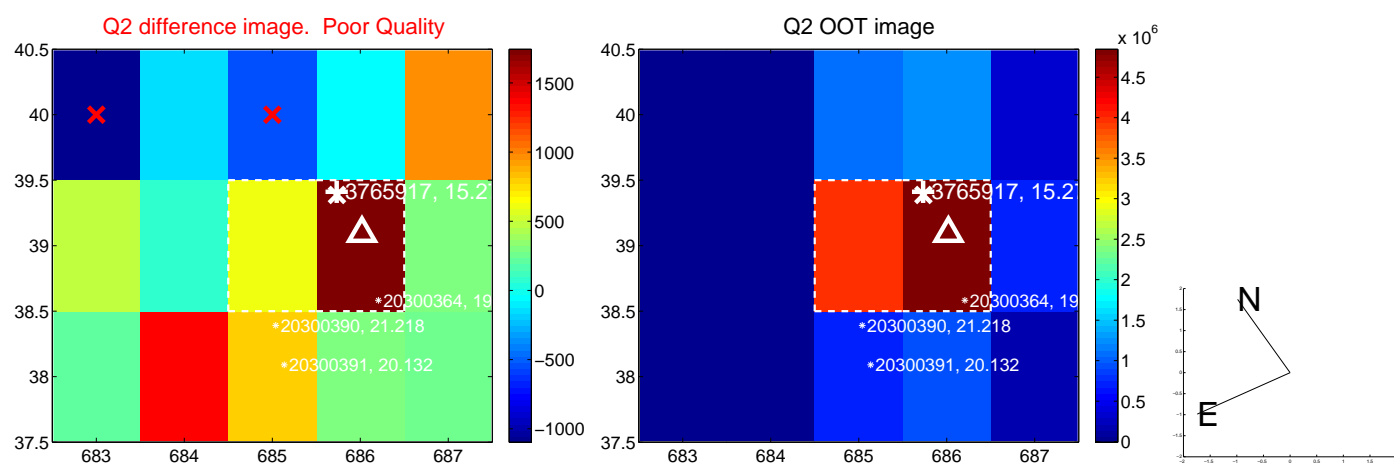
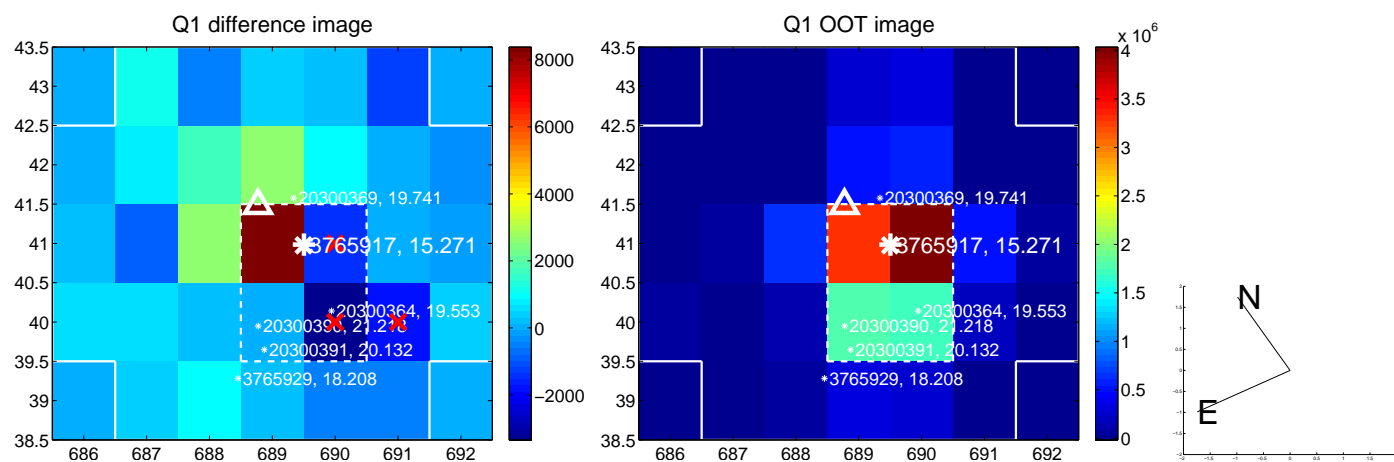


offset from photometric centroids

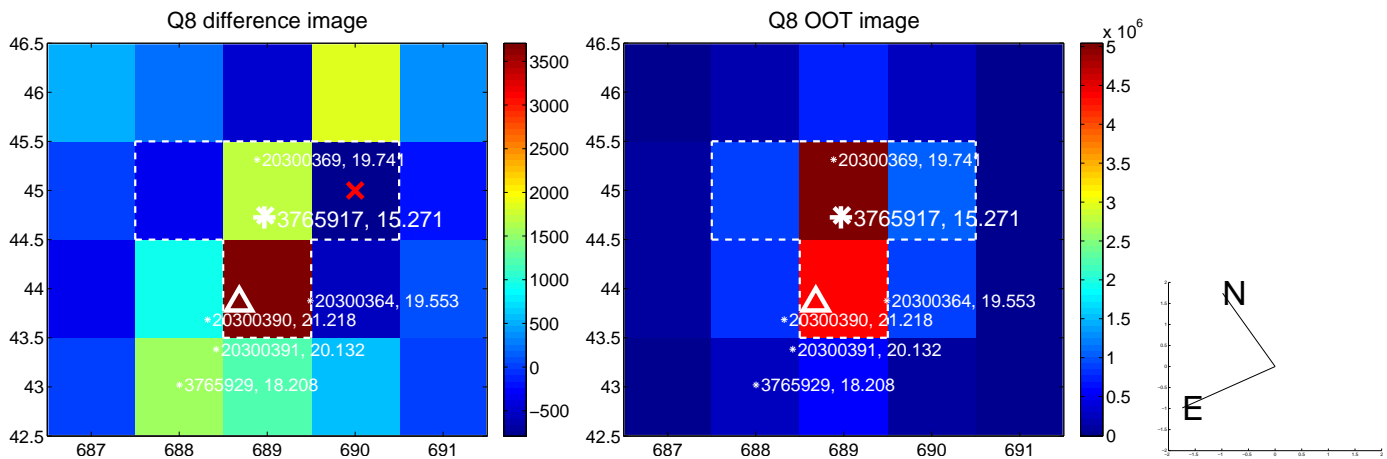
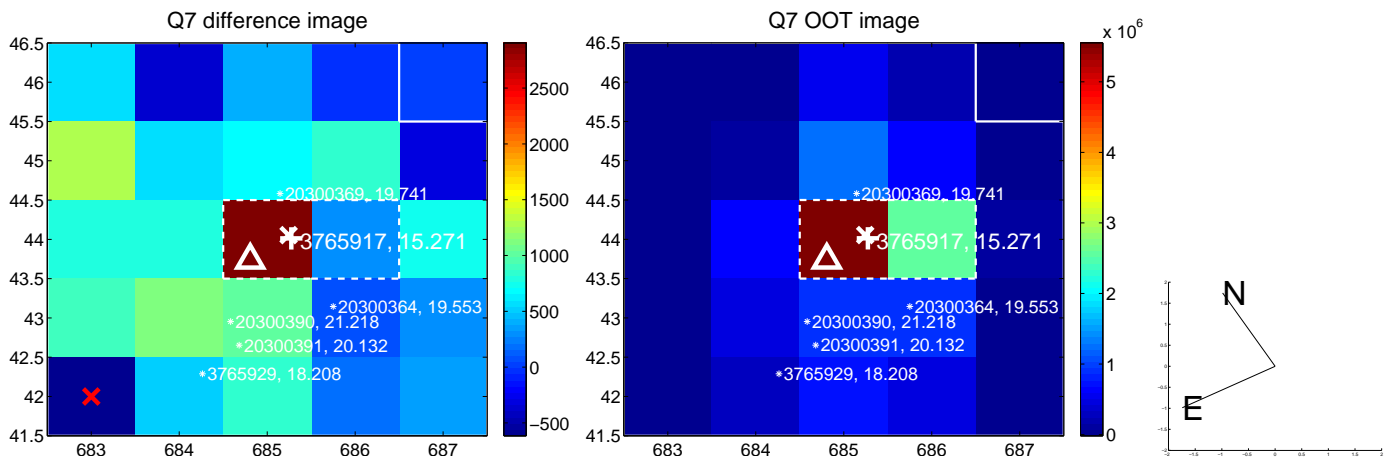
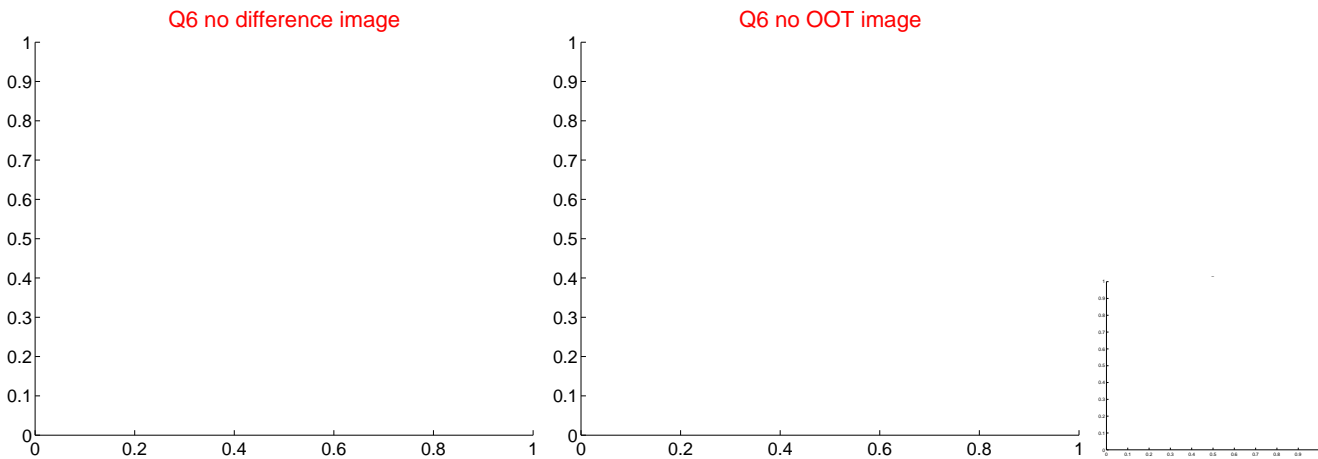
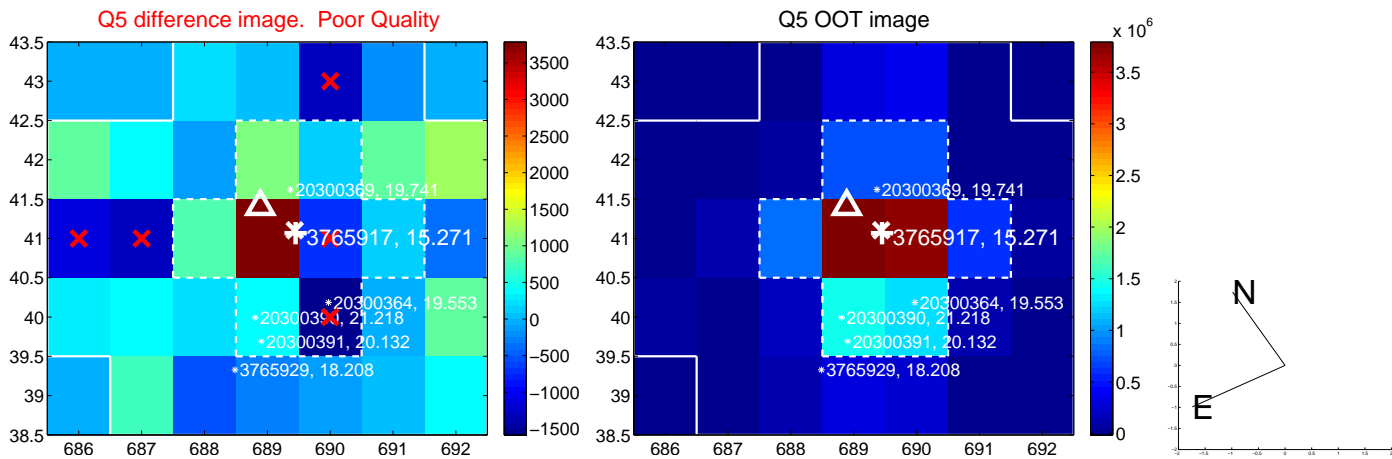


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

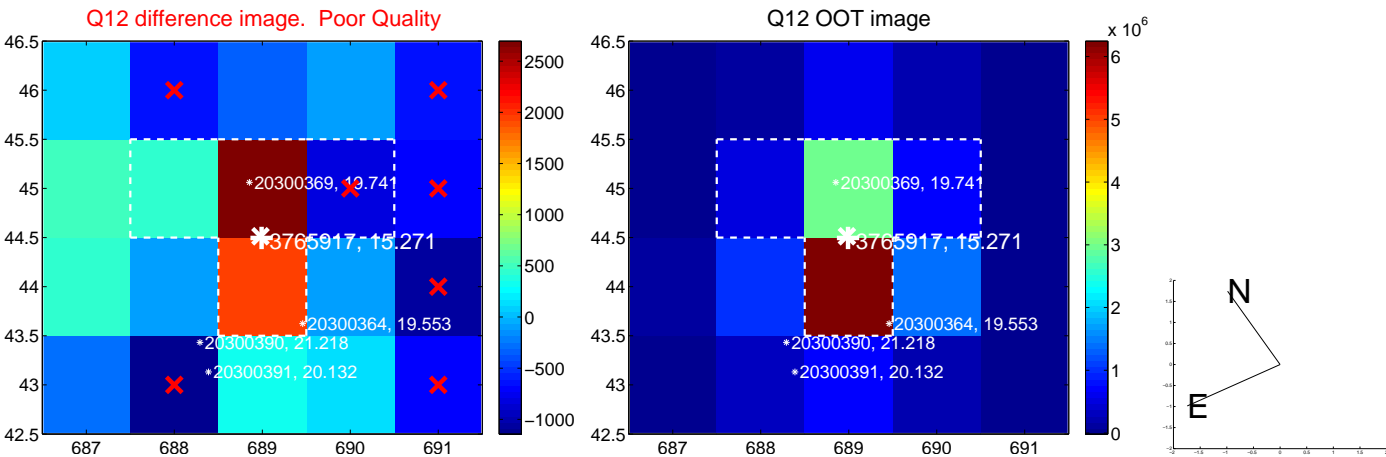
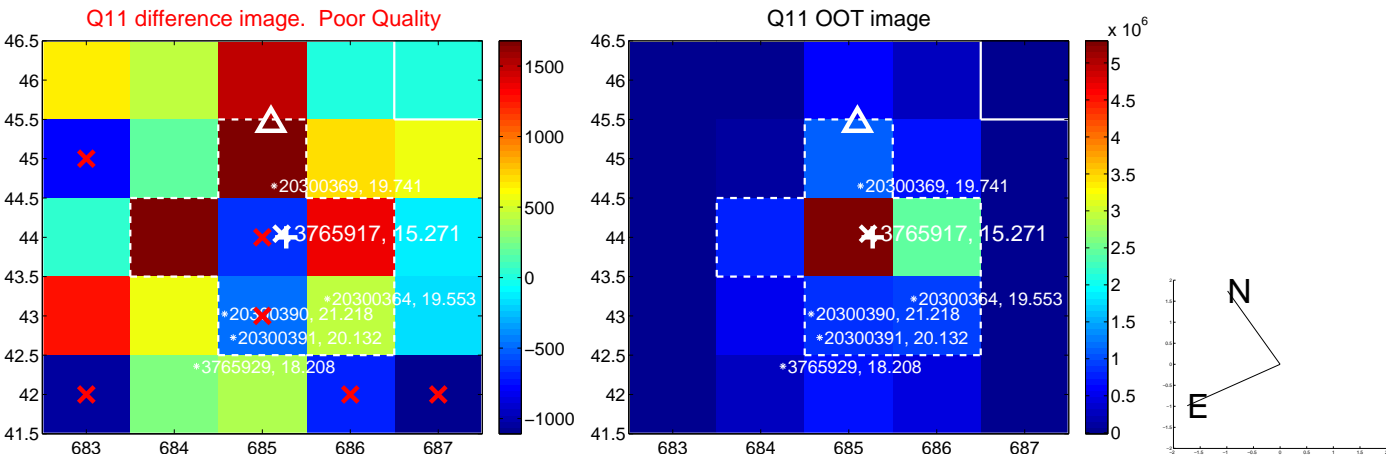
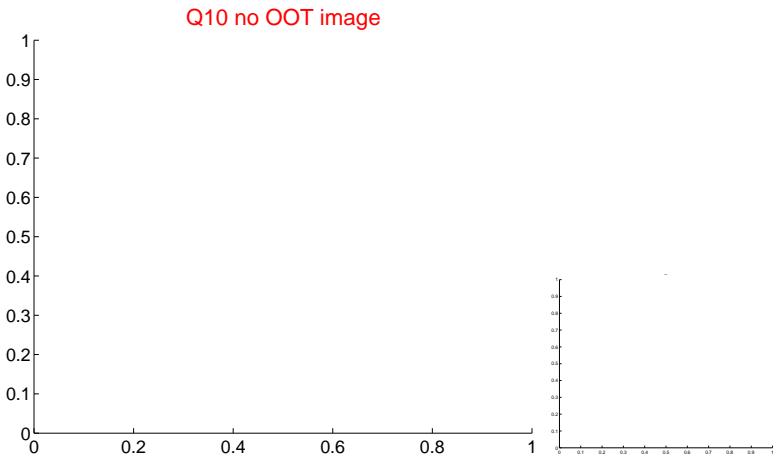
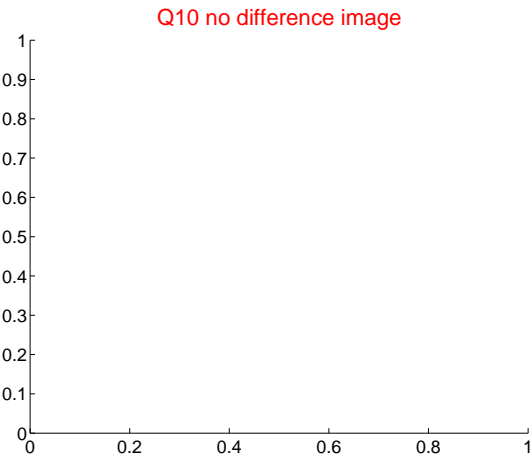
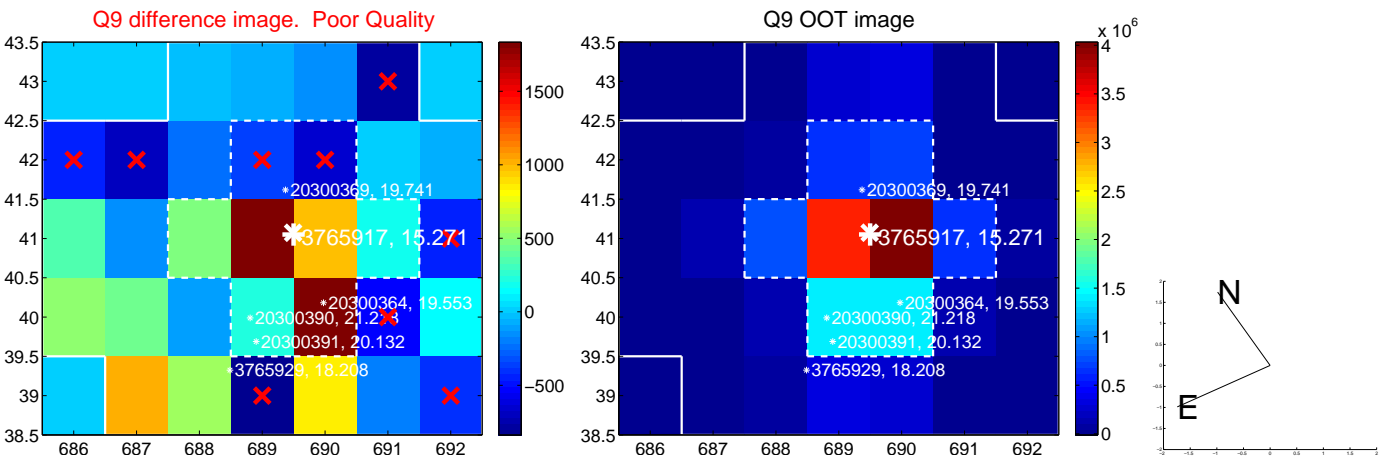
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



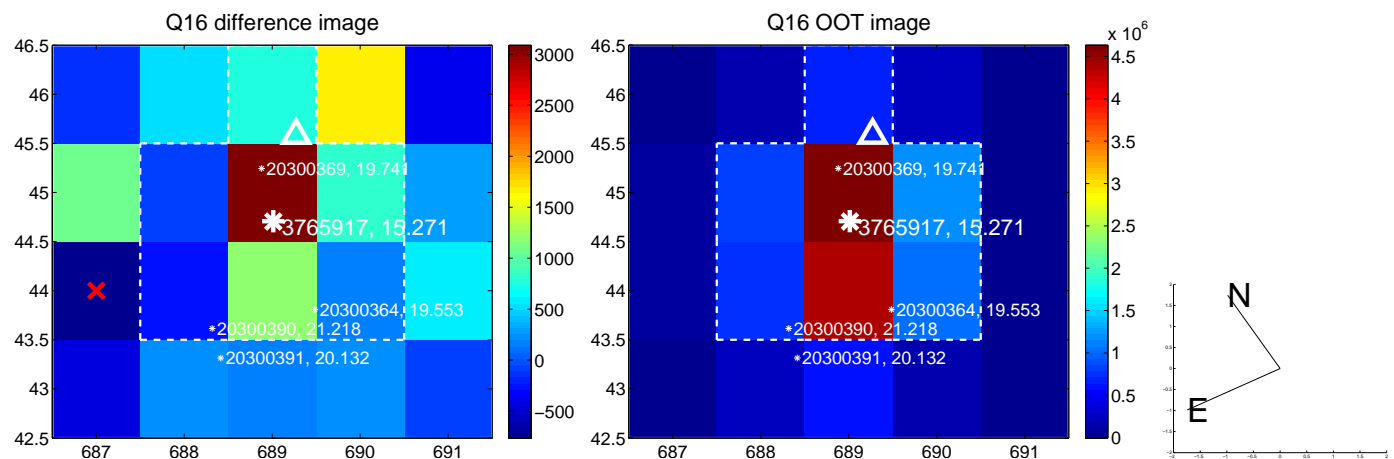
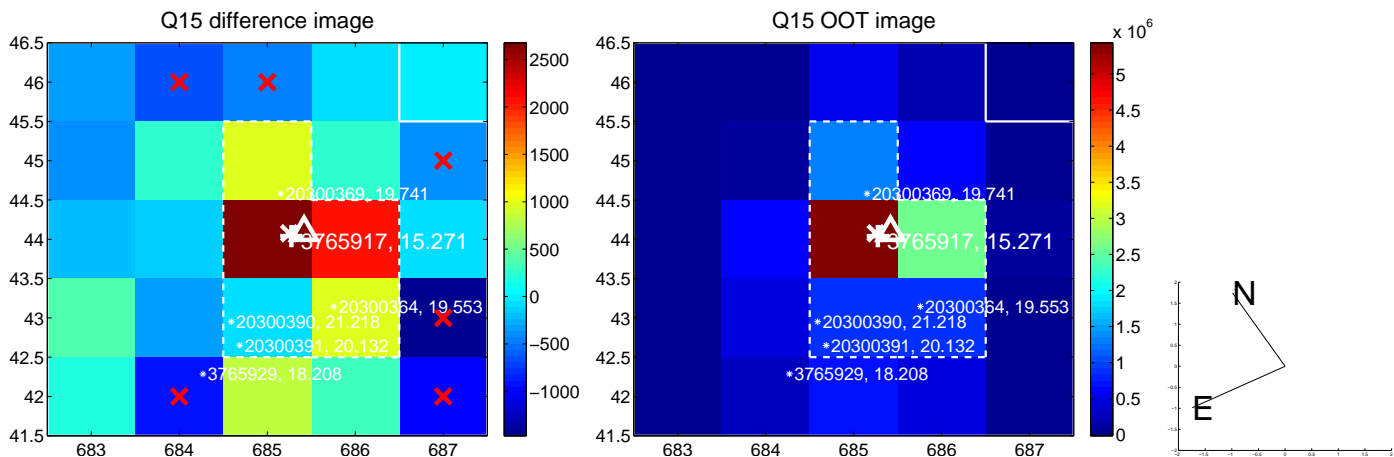
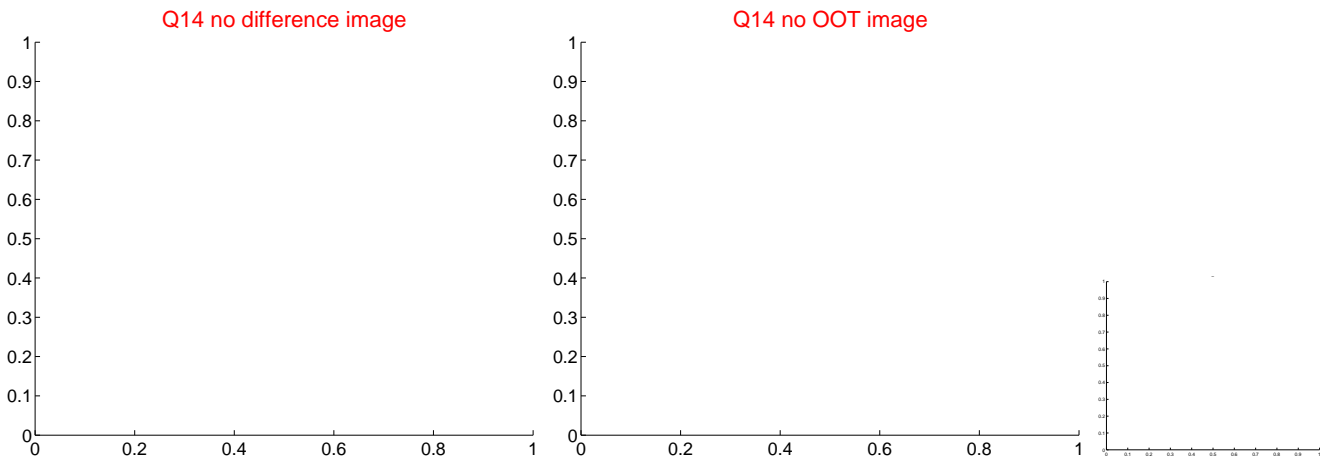
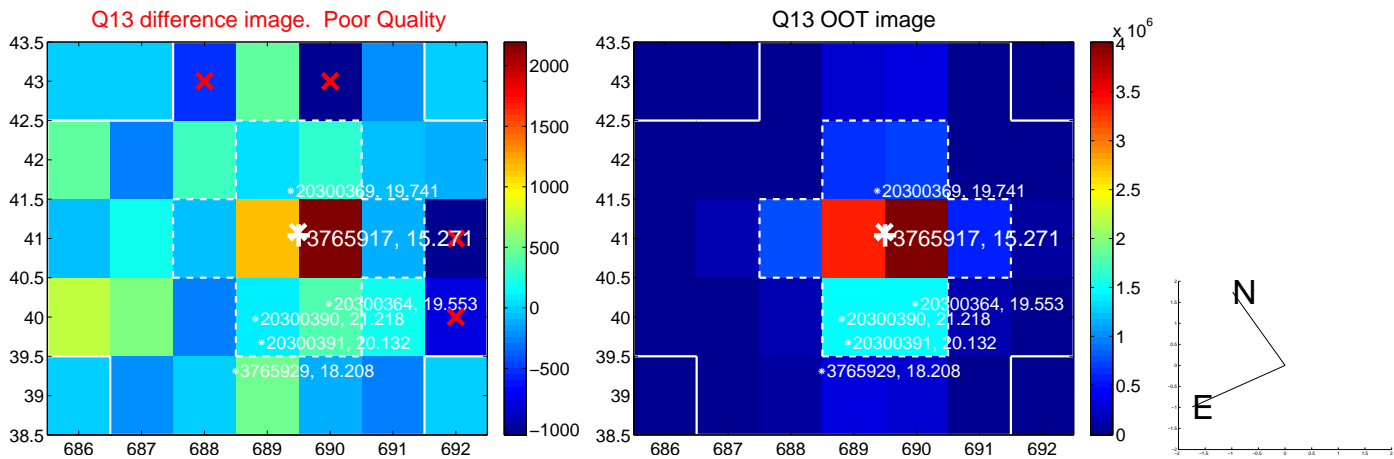
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

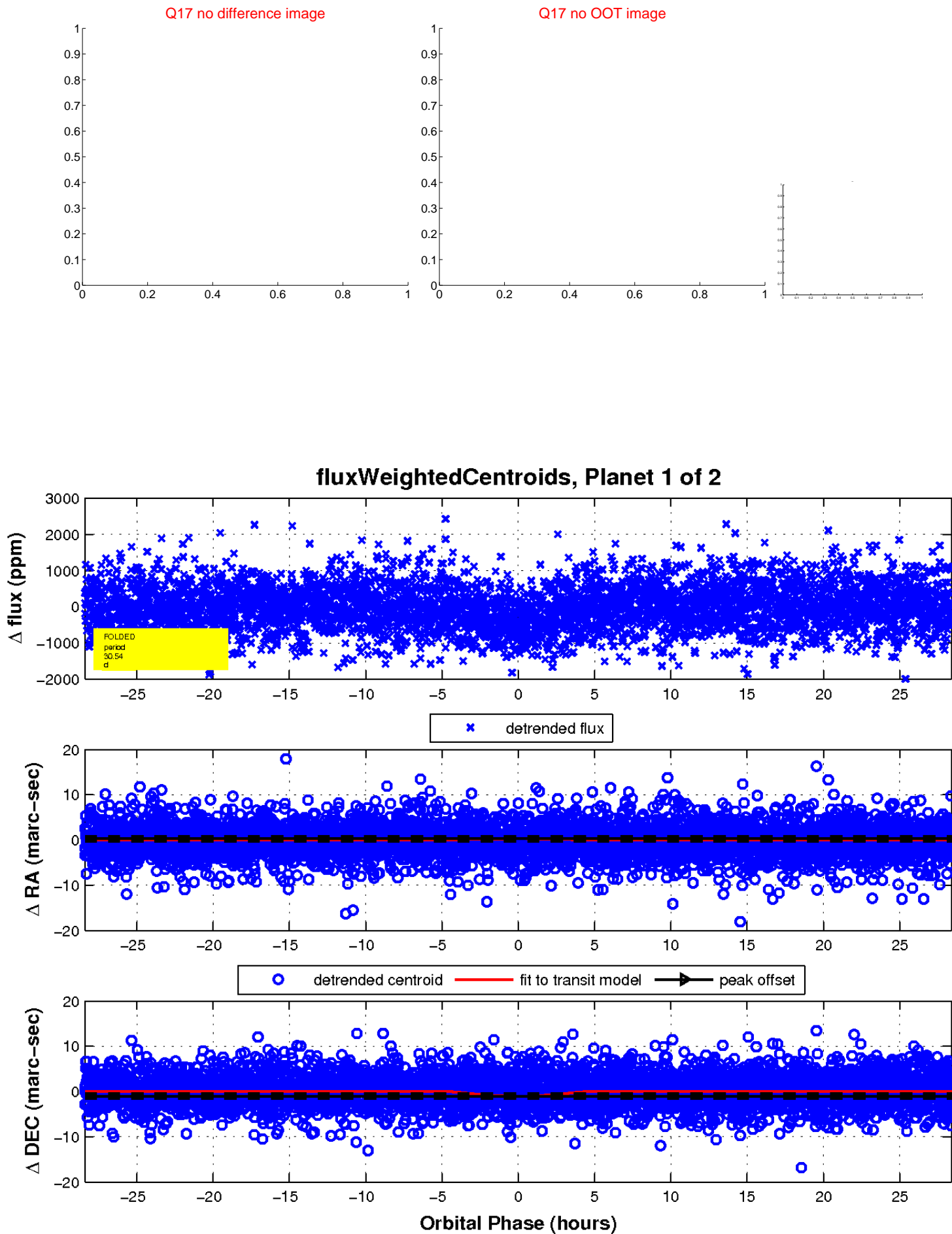


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



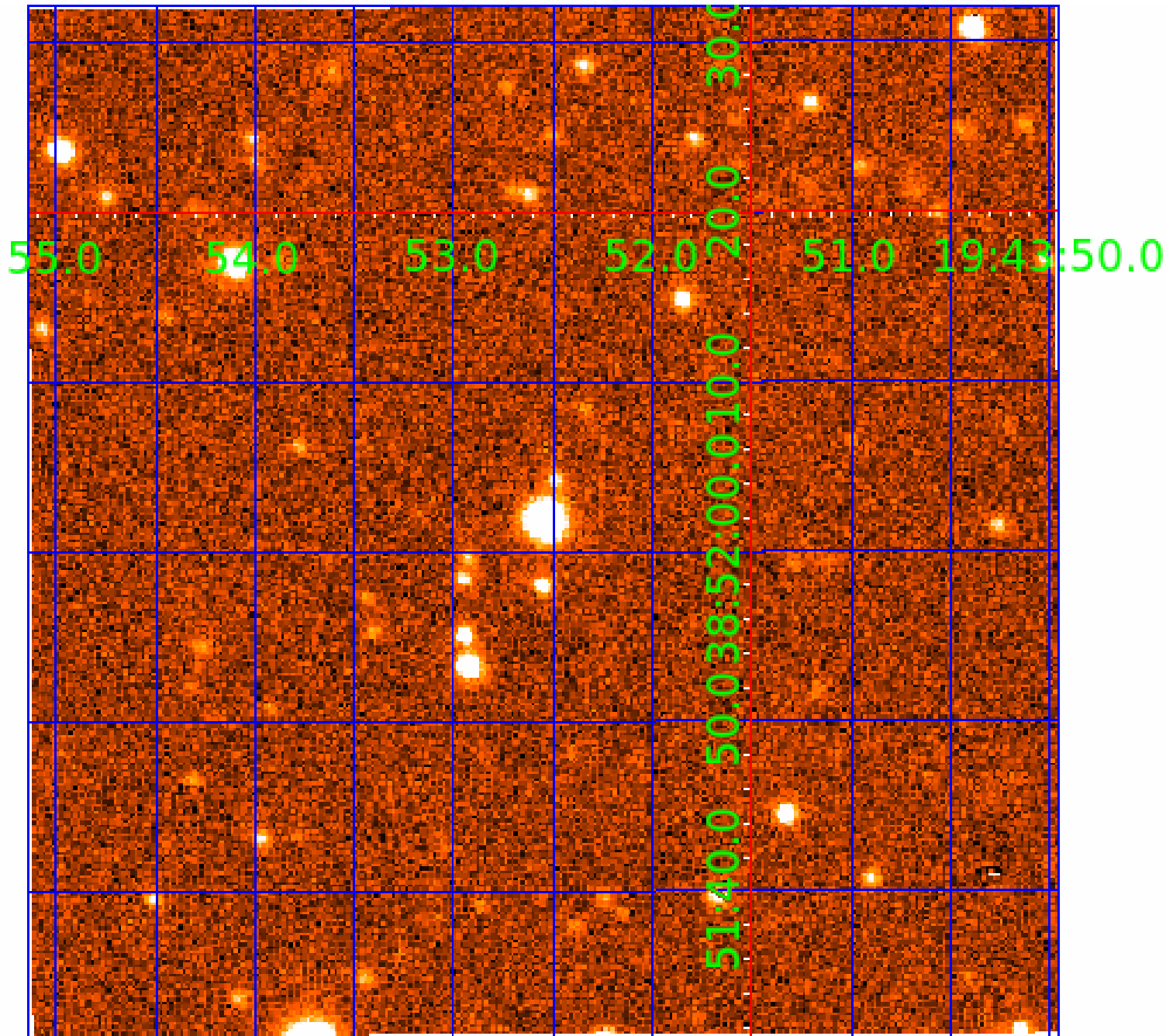


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003765917

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003765917-01	OBS	4526.01	30.537831	156.733325	467.9	9.471	11.2	12.3	1.33	5803	4.60	47.55
003765917-02	OBS	4526.02	11.819587	132.447201	220.7	5.650	8.6	9.2	1.33	5803	2.14	168.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003765917-01	OBS	PC	0.92	0	0	0	0	NO_COMMENT
003765917-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

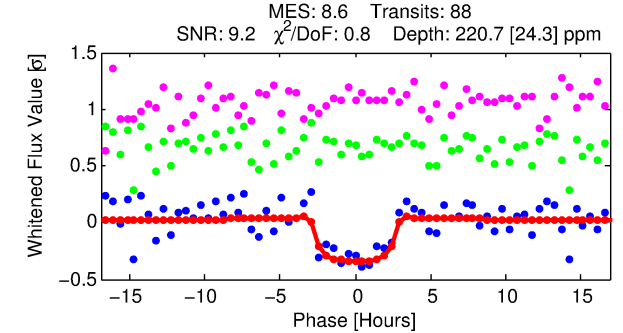
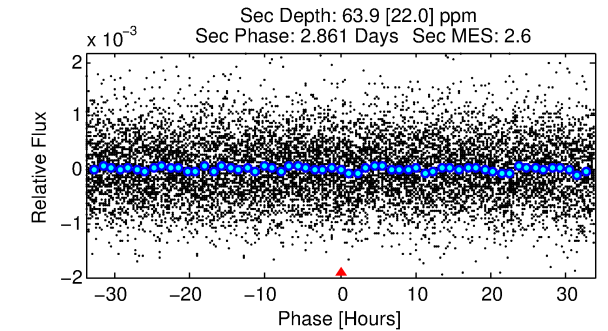
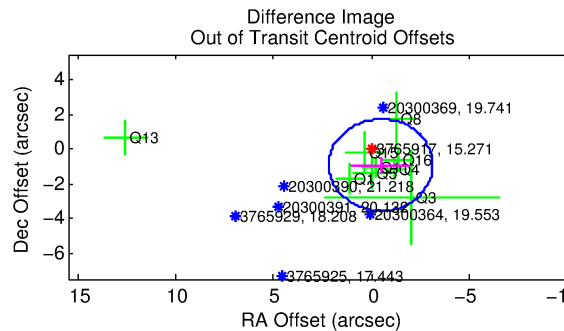
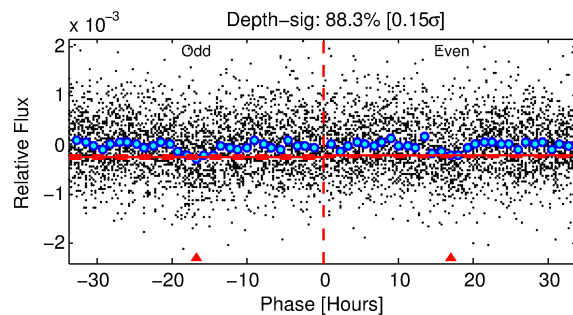
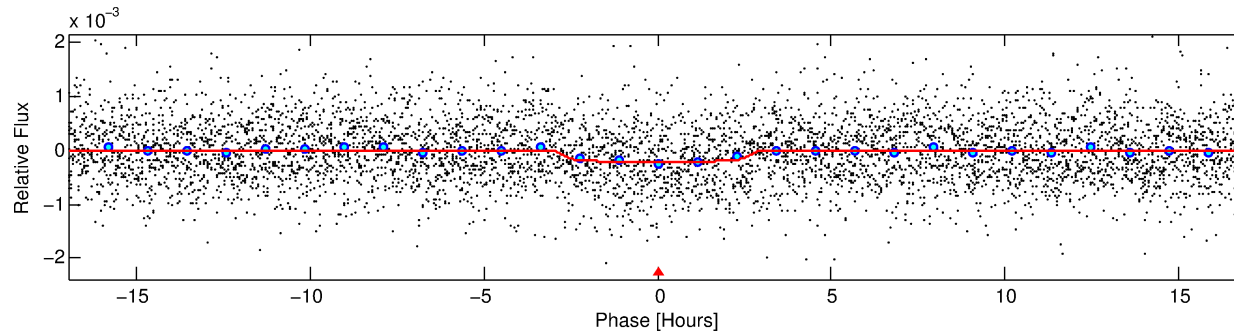
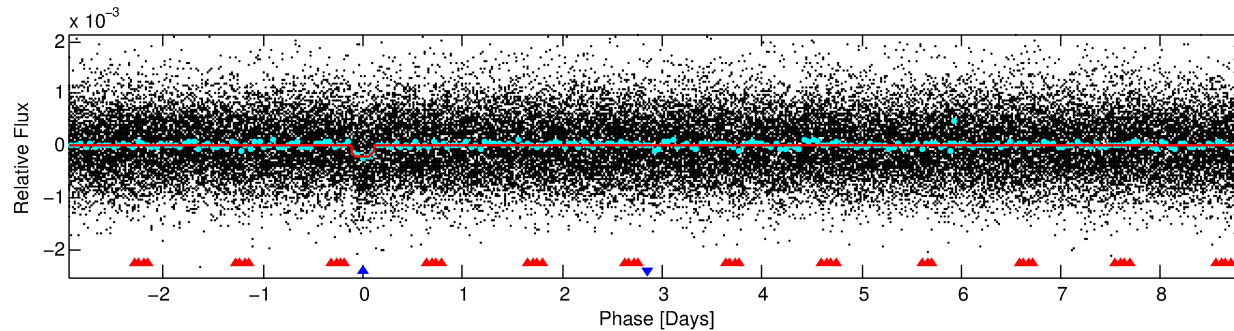
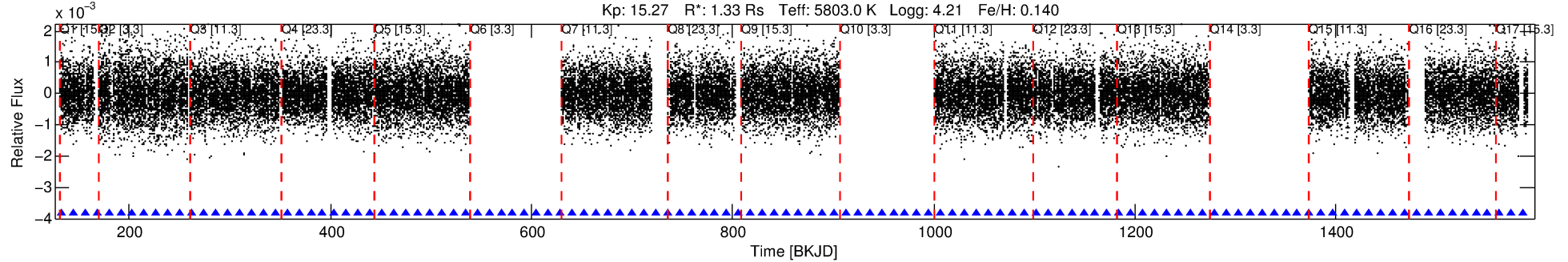
## Ephemeris Match Information For 003765917-02

No Significant Match Found

# DV One-Page Summary

KIC: 3765917 Candidate: 2 of 2 Period: 11.820 d  
KOI: K04526.02 Corr: 0.877

Kp: 15.27 R\*: 1.33 Rs Teff: 5803.0 K Logg: 4.21 Fe/H: 0.140



## DV Fit Results:

Period = 11.81959 [0.00016] d  
Epoch = 132.4472 [0.0106] BKJD  
Rp/R\* = 0.0148 [0.0142]  
a/R\* = 11.06 [46.75]  
b = 0.74 [2.59]  
Seff = 168.59 [47.61]  
Teq = 919 [65] K  
Rp = 2.14 [2.09] Re  
a = 0.1031 [0.0180] AU  
Ag = 81.72 [161.16] [0.50σ]  
Teffp = 4271 [2086] K [1.61σ]

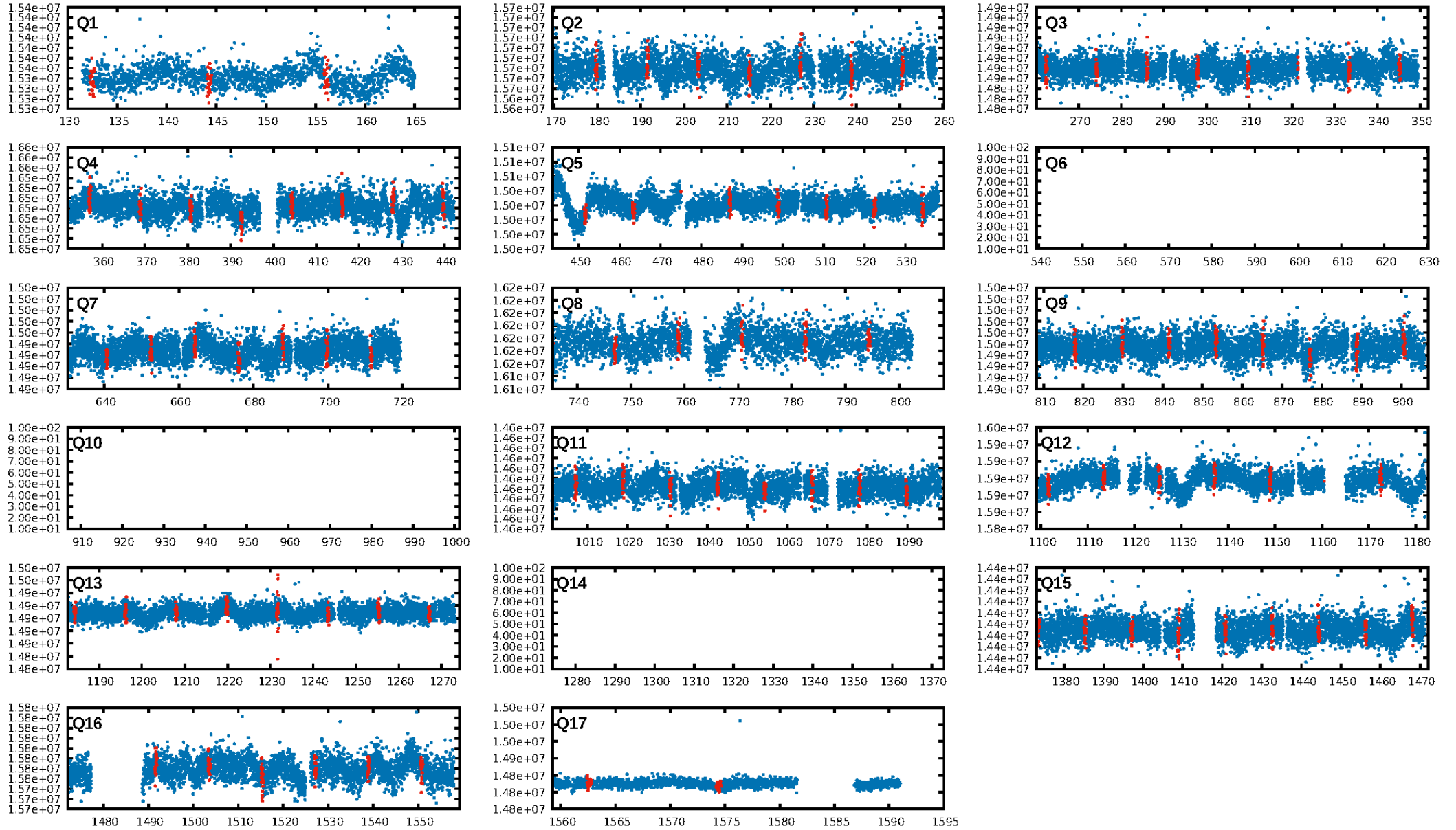
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [40.74σ]  
ModelChiSquare2-sig: 86.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.51e-18  
RollingBand-fgt: 1.00 [83/83]  
GhostDiagnostic-chr: 1.937  
Centroid-sig: 0.5%  
Centroid-so: 3.311 arcsec [2.18σ]  
OotOffset-rm: 1.021 arcsec [1.15σ]  
KicOffset-rm: 1.107 arcsec [1.36σ]  
OotOffset-st: 0/3/3/3 [9]  
KicOffset-st: 0/3/3/3 [9]  
DiffImageQuality-fgm: 0.33 [3/9]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:14:53 Z

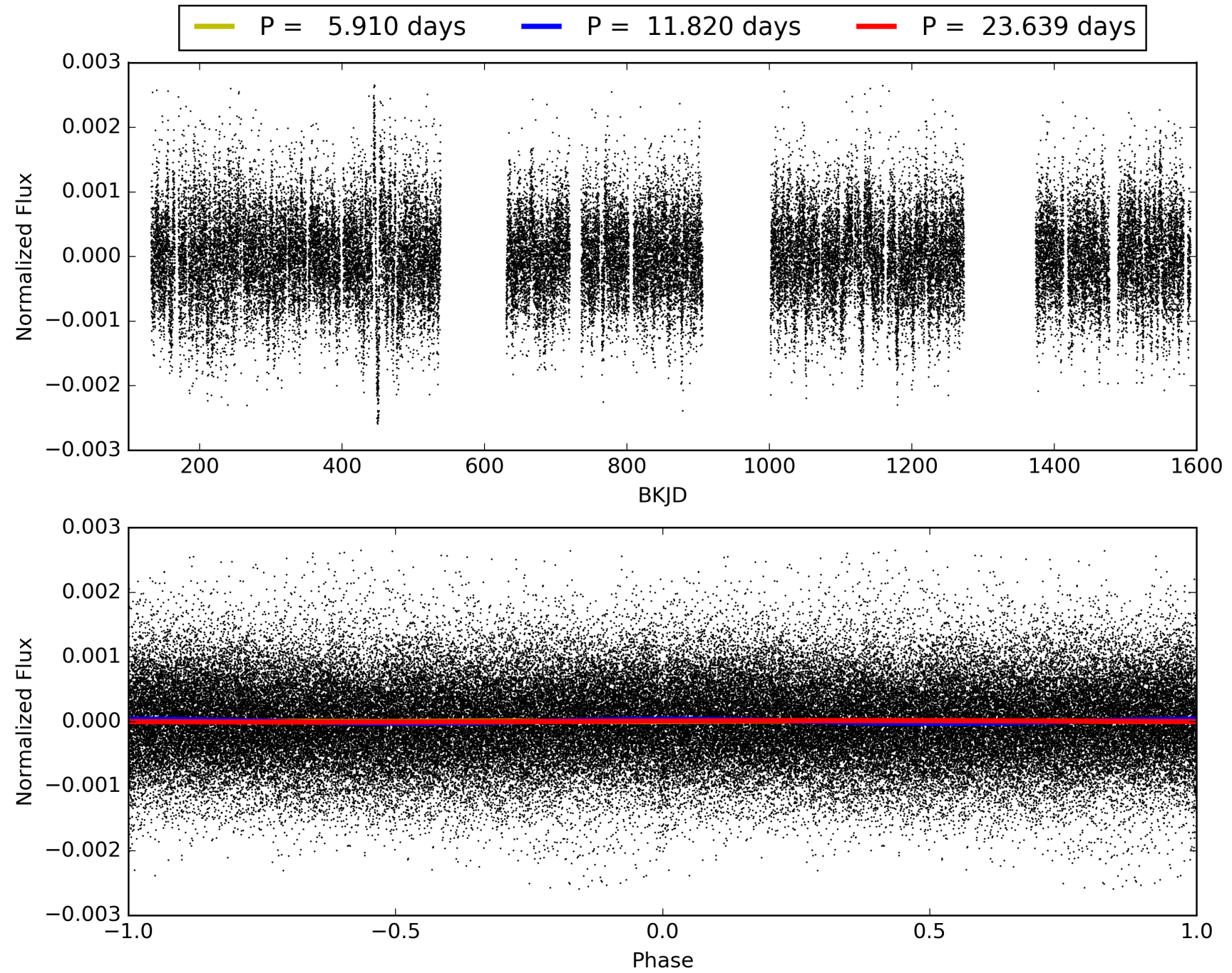
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003765917-02, PDC Light Curves



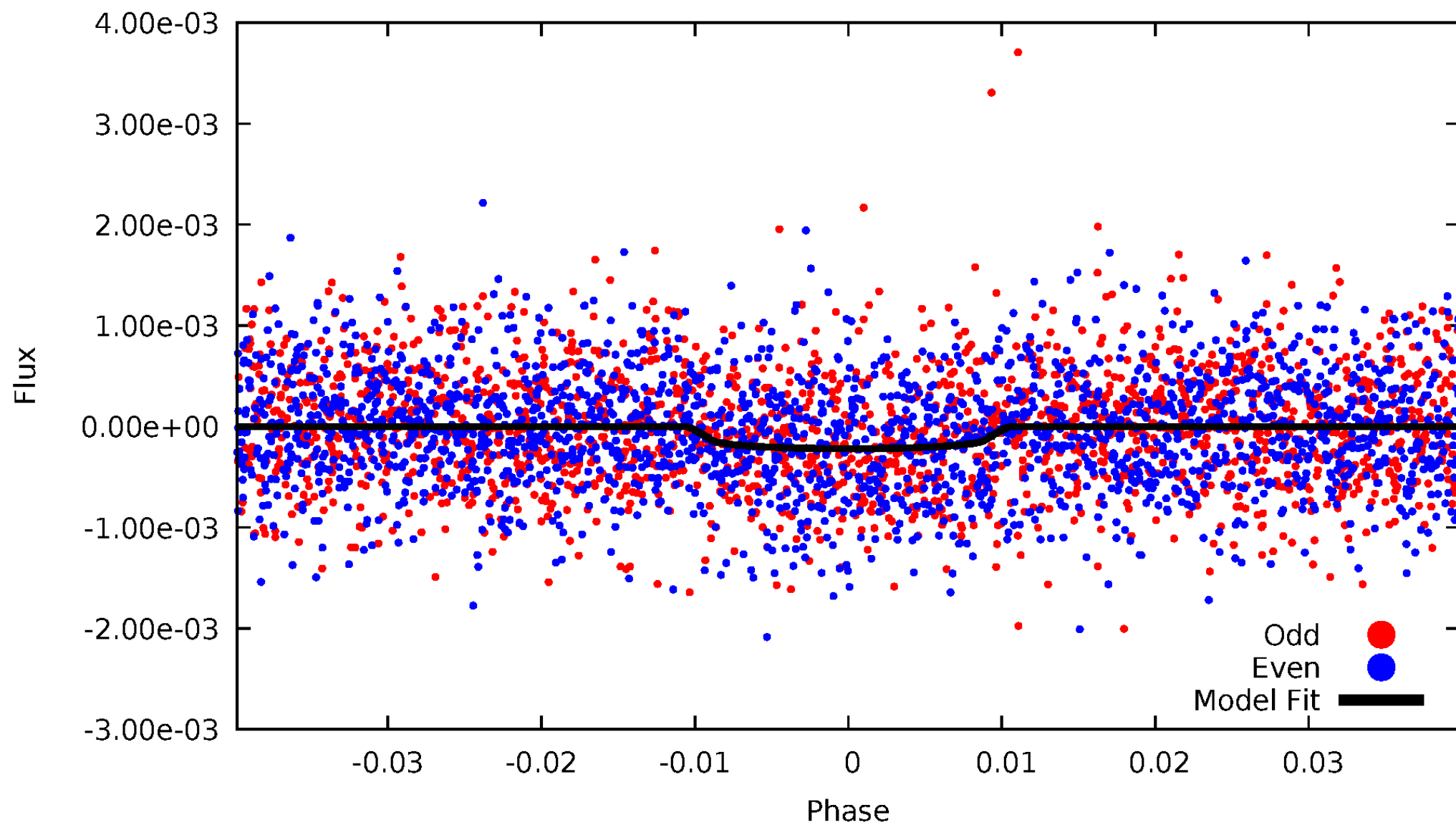


TCE 003765917-02



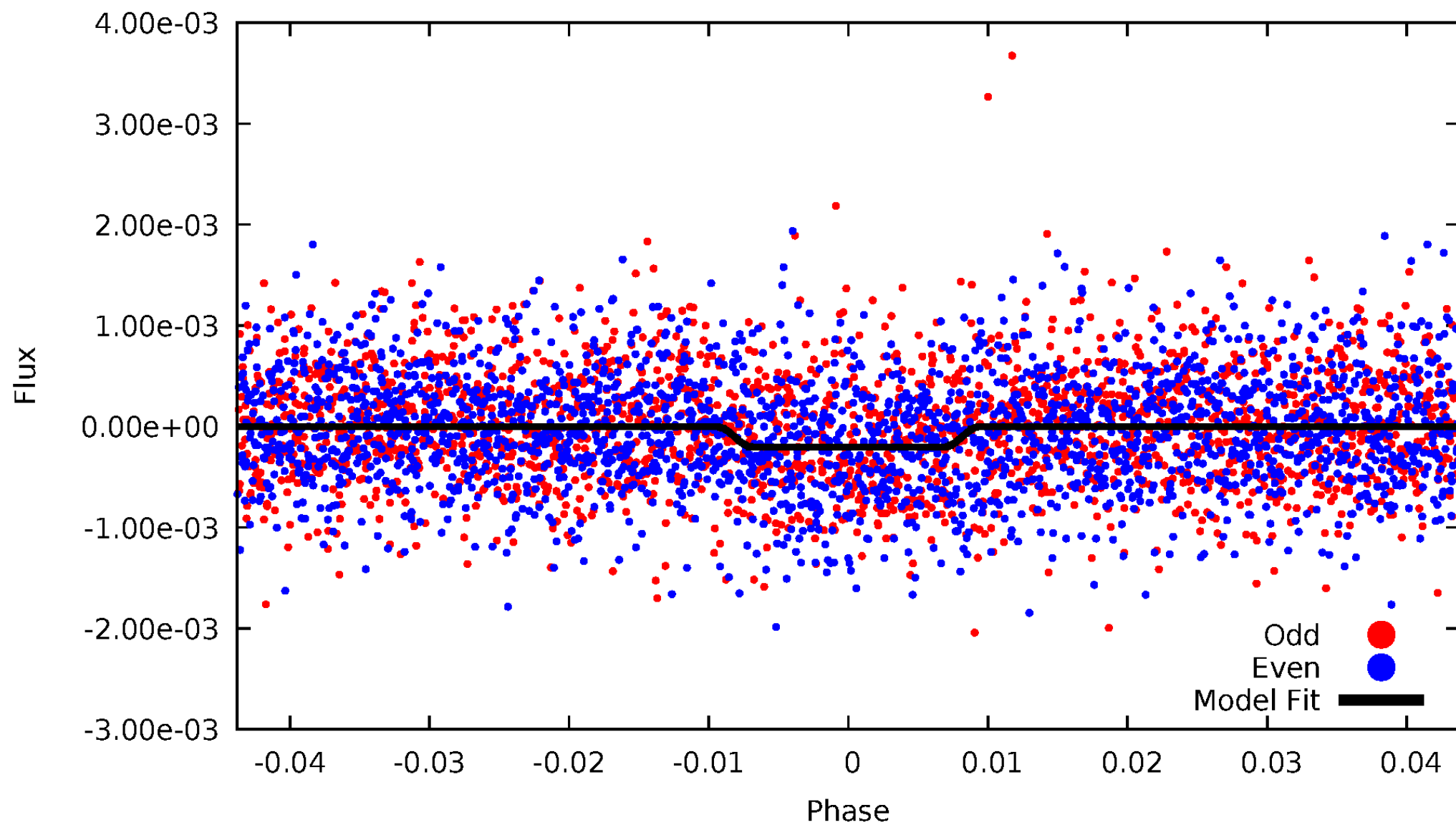
DV Odd/Even

TCE 003765917-02



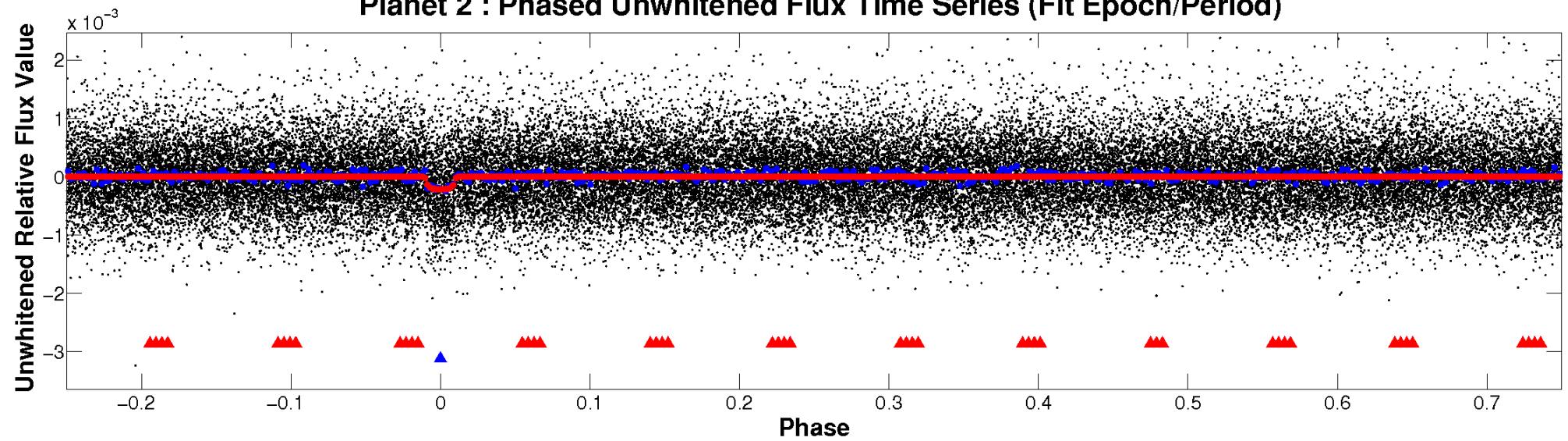
# ALT Odd/Even

TCE 003765917-02

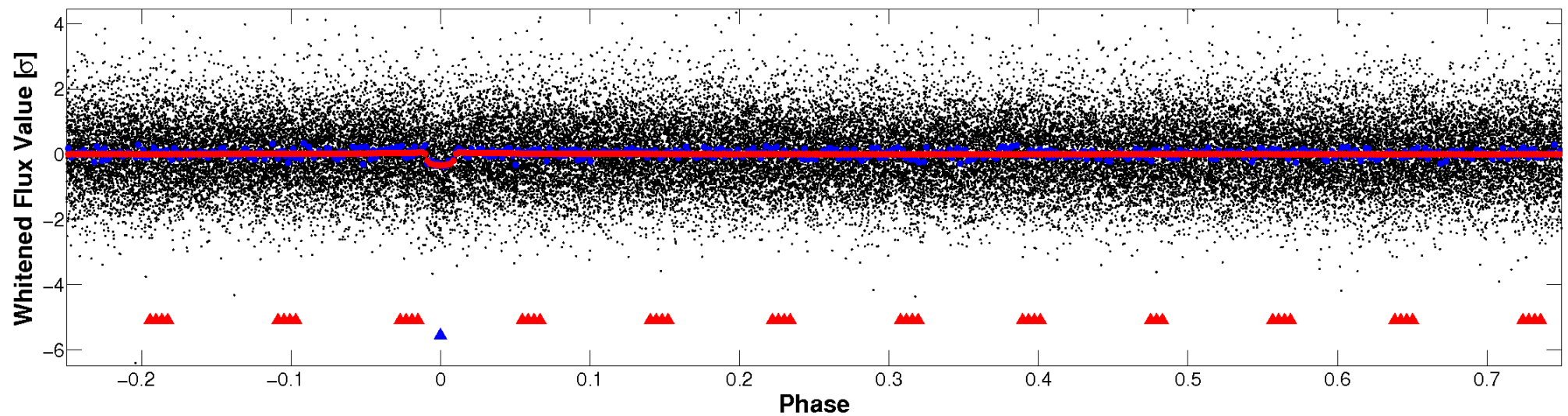


# Non-Whitened Vs. Whitened Light Curve

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



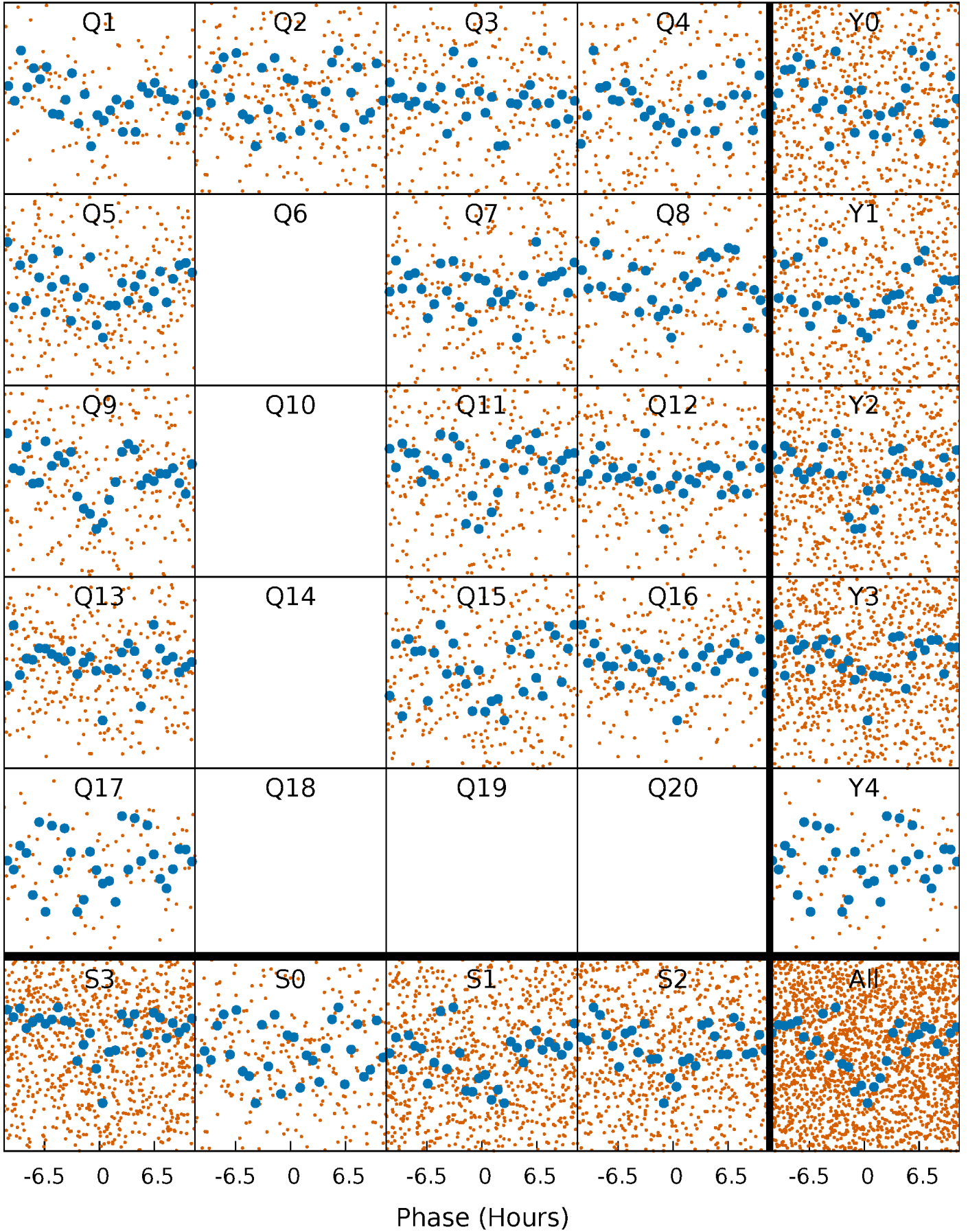
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

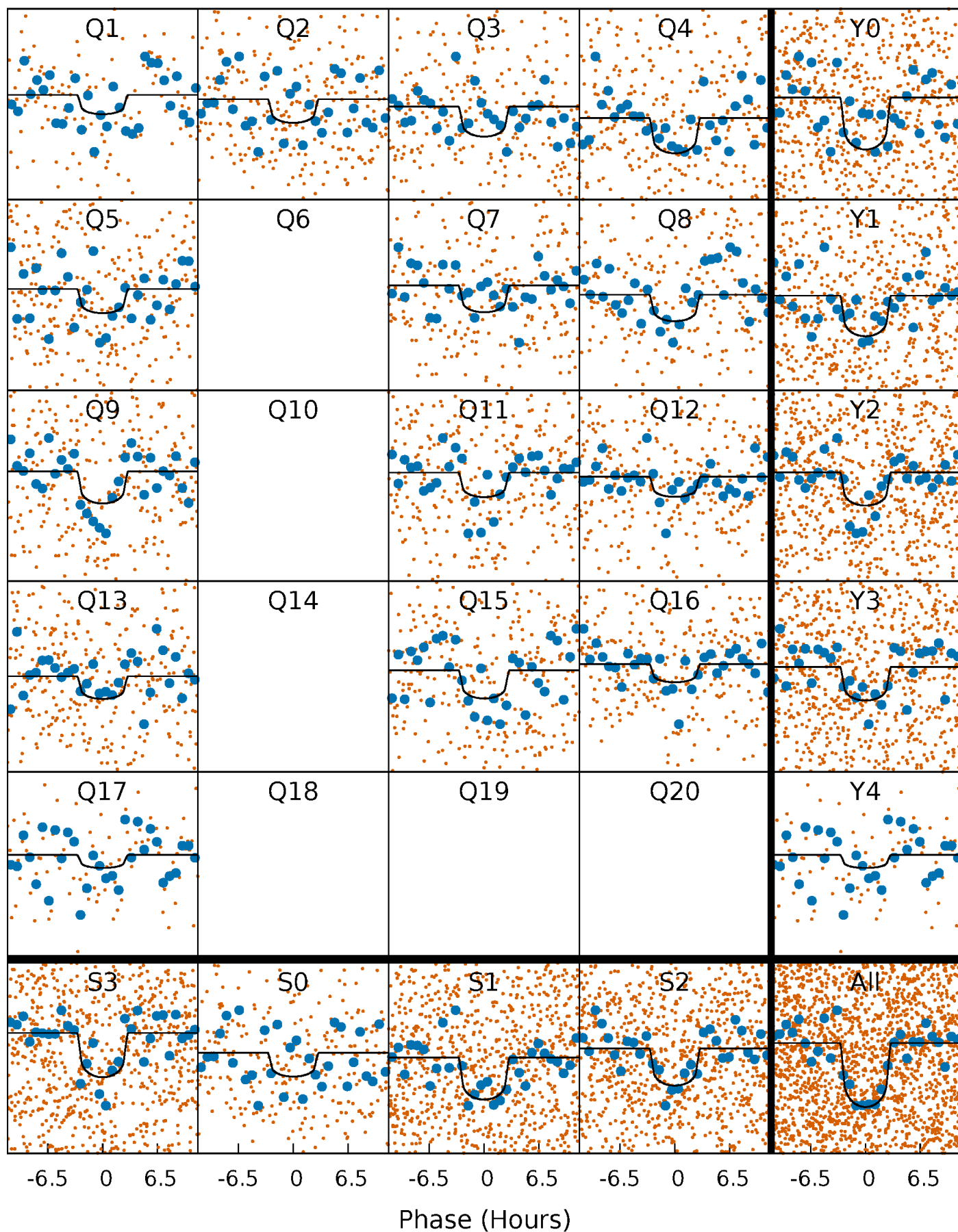
TCE 003765917-02     $P = 11.819587$  Days     $T_0 = 132.447201$  (BKJD)





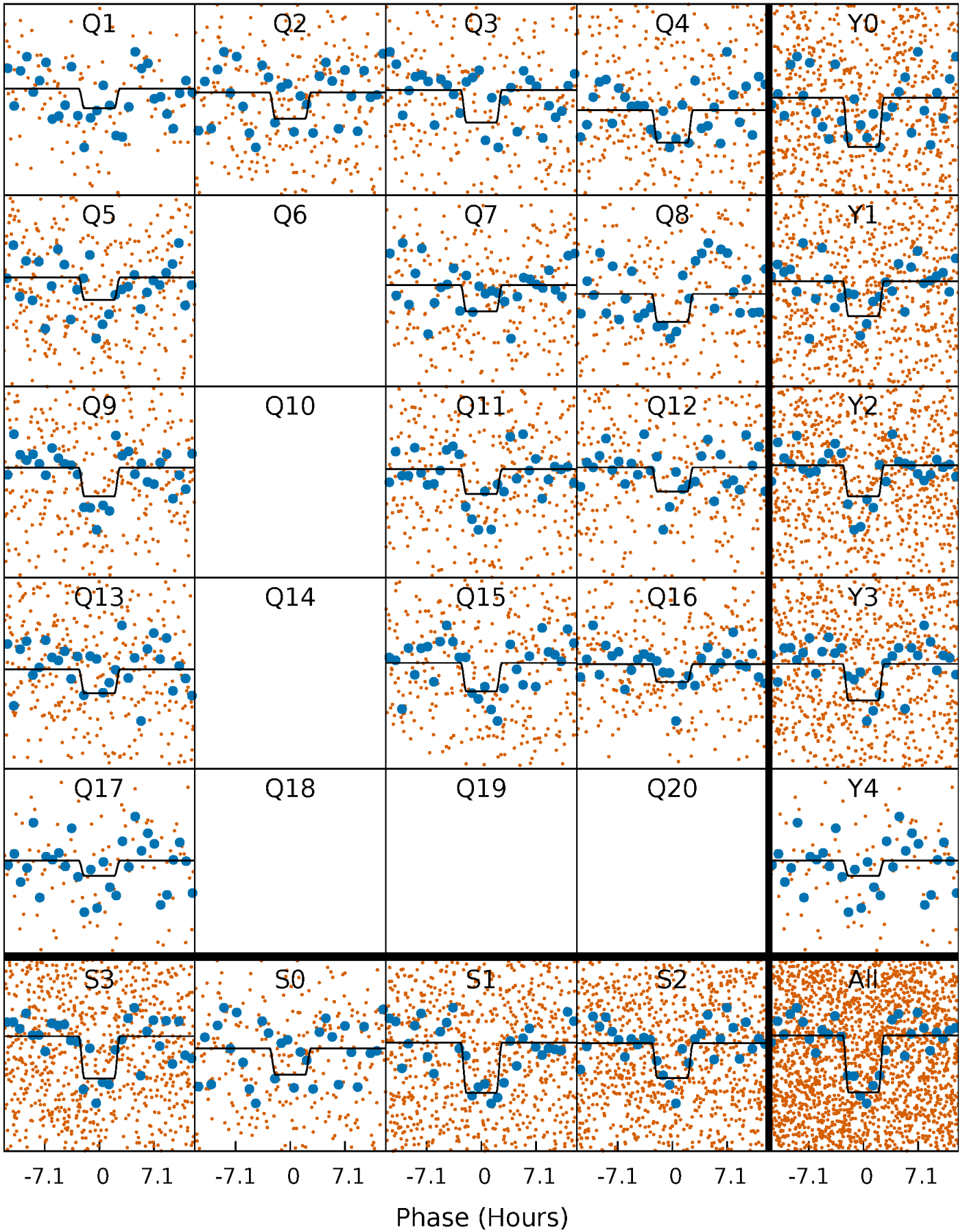
# DV Quarter-Phased Transit Curves

TCE 003765917-02   P= 11.819587 Days    $T_0=132.447201$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

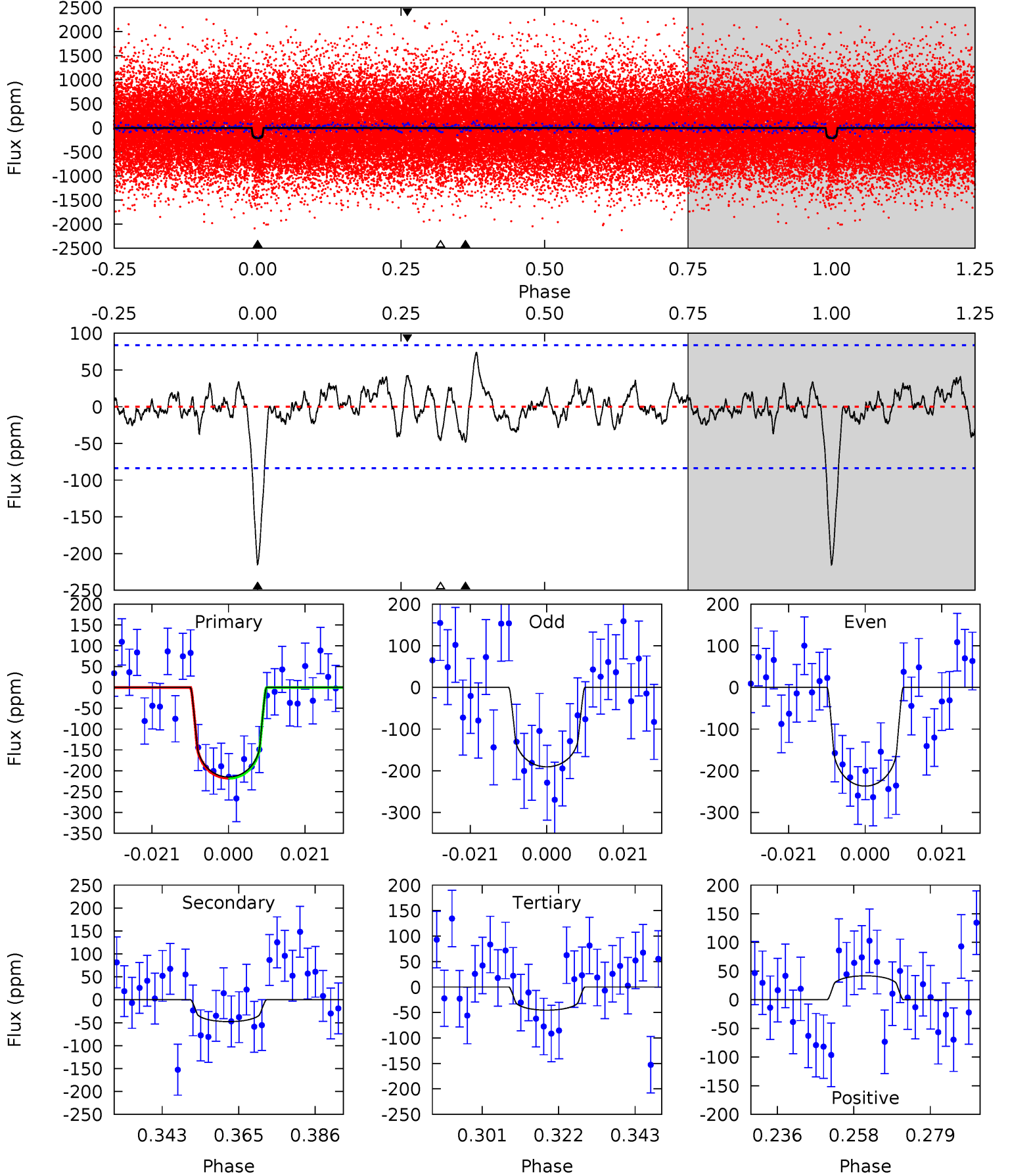
TCE 003765917-02   P= 11.819206 Days    $T_0=132.474604$  (BKJD)



# DV Model-Shift Uniqueness Test

003765917-02,  $P = 11.819587$  Days,  $E = 120.627614$  Days

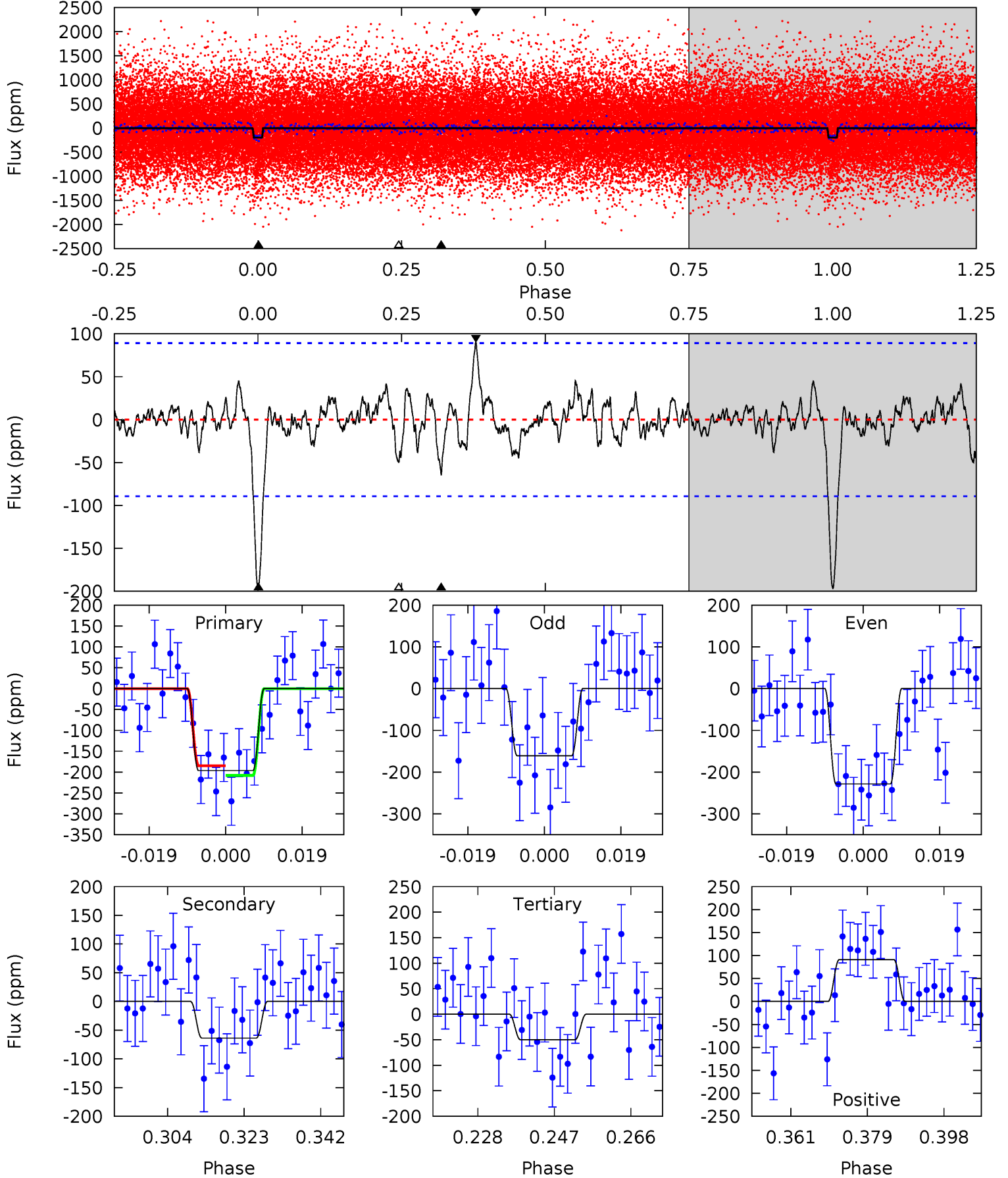
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	2.78	2.65	2.44	4.88	2.30	0.99	9.87	10.1	0.13	0.34	1.34	0.84	0.25	0.01



# Alt Model-Shift Uniqueness Test

003765917-02, P = 11.819206 Days, E = 120.655398 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	3.51	2.75	5.01	4.90	2.35	1.03	8.04	5.78	0.76	-1.50	1.86	1.01	0.32	0.65



### Stellar Parameters For KIC 003765917

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5803^{+78}_{-78}$	$4.211^{+0.162}_{-0.108}$	$0.140^{+0.150}_{-0.150}$	$1.328^{+0.222}_{-0.244}$	$1.046^{+0.094}_{-0.071}$	$0.629^{+0.474}_{-0.196}$
	+1%/-1%	+4%/-3%	+107%/-107%	+17%/-18%	+9%/-7%	+75%/-31%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 003765917-02 / KOI 4526.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-48 \pm 17$	$2.47^{+1.90}_{-1.50}$	$1274^{+60}_{-69}$	$4003^{+1693}_{-745}$	$46^{+233}_{-32}$
Alt.	$-64 \pm 18$	$2.47^{+1.96}_{-1.49}$	$1277^{+58}_{-68}$	$4150^{+2030}_{-735}$	$60^{+317}_{-41}$

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

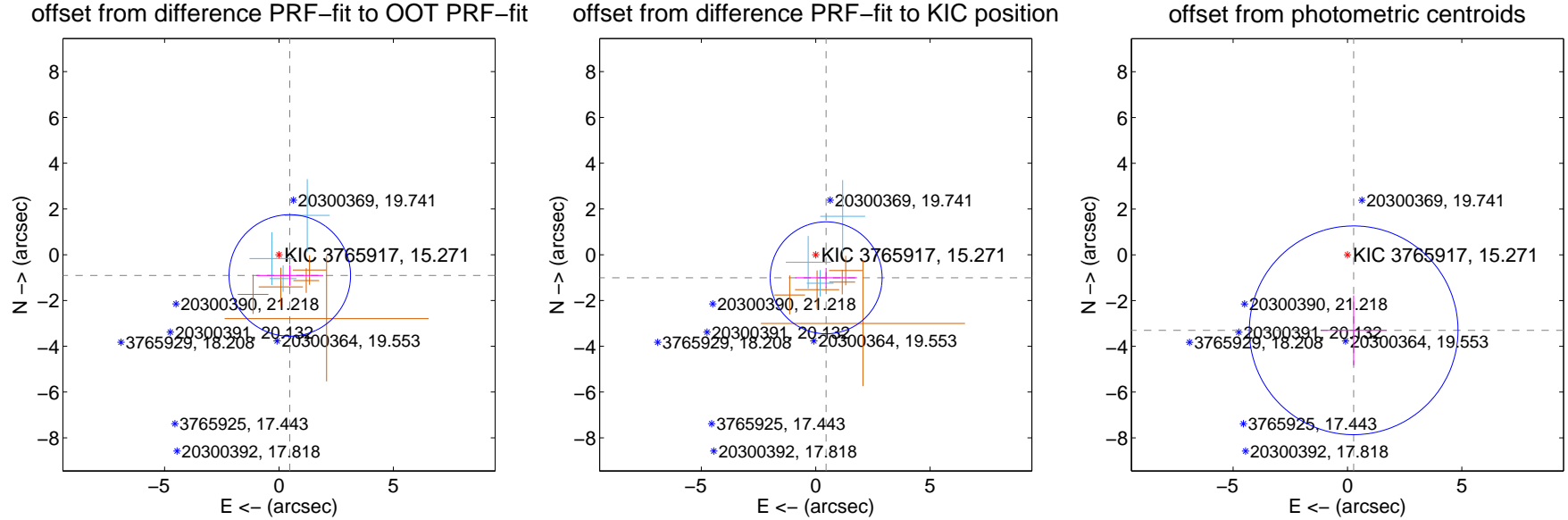
## DV Centroid Data

Supplemental centroid analysis for 003765917-02. Kepler magnitude: 15.27. Transit SNR 9.16

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

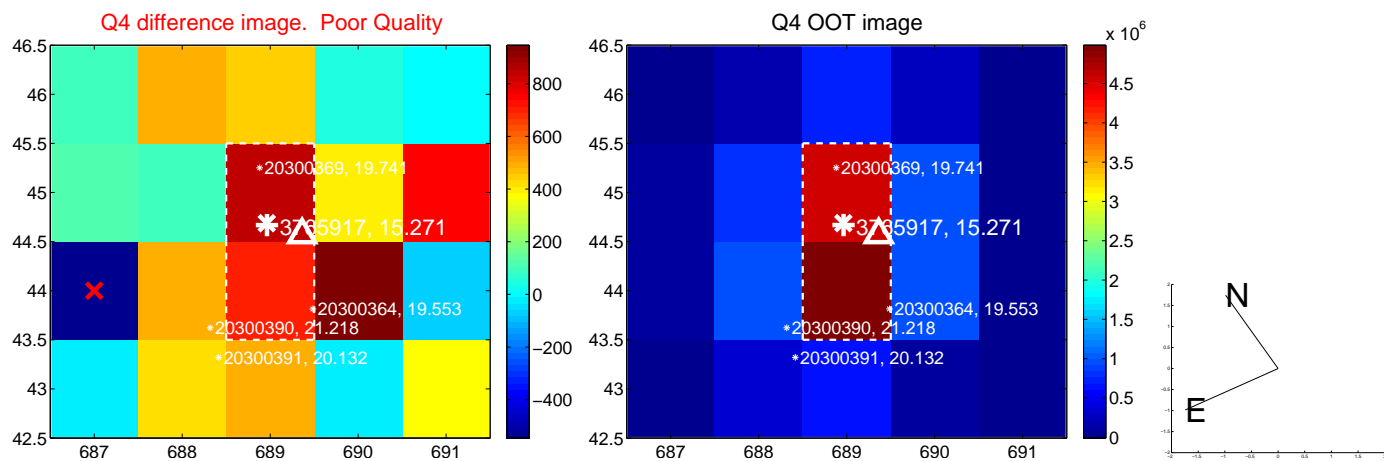
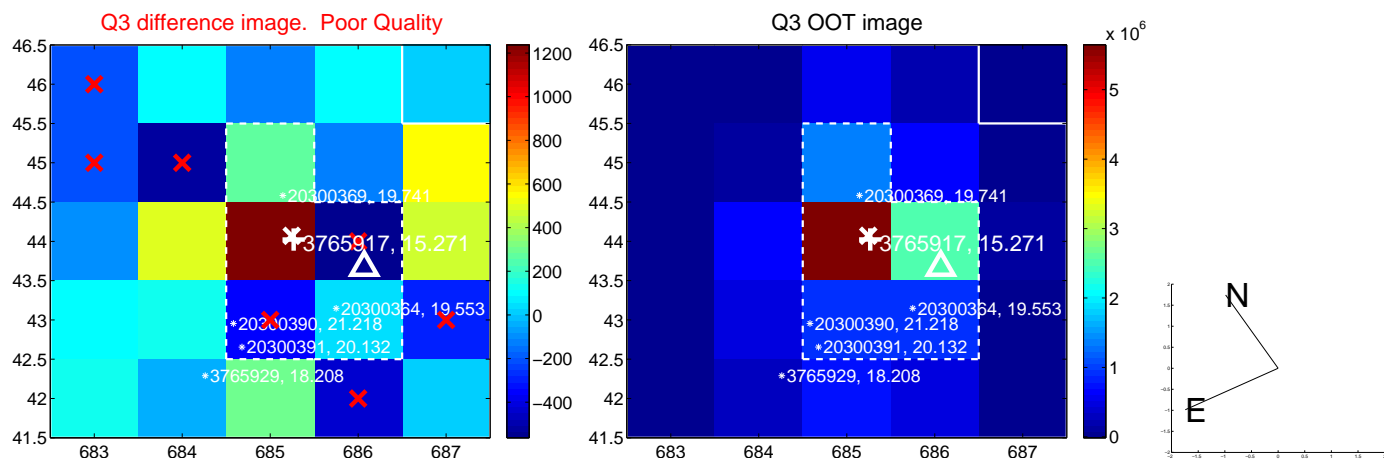
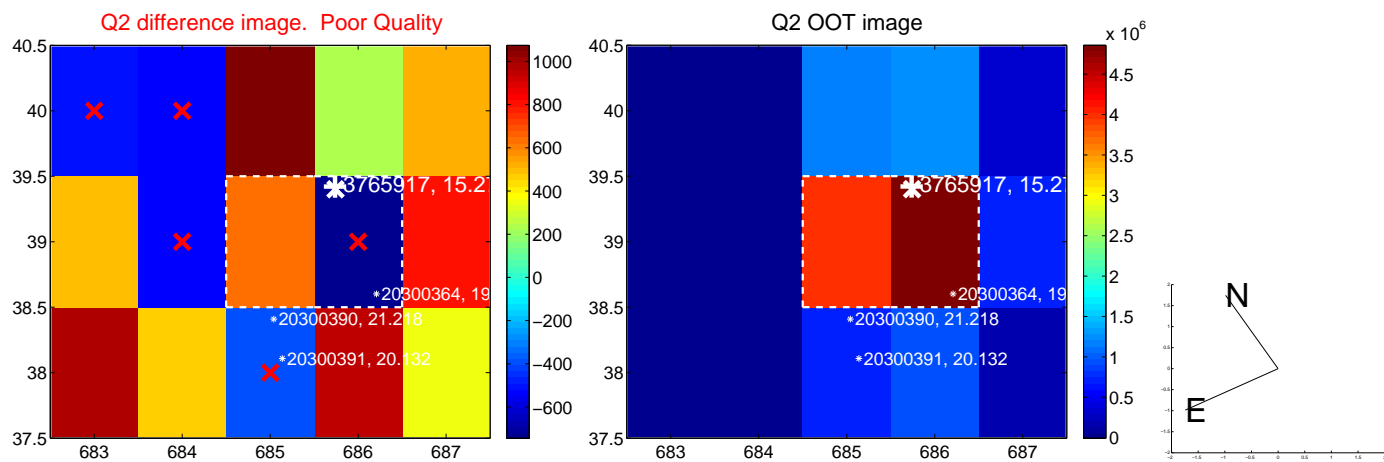
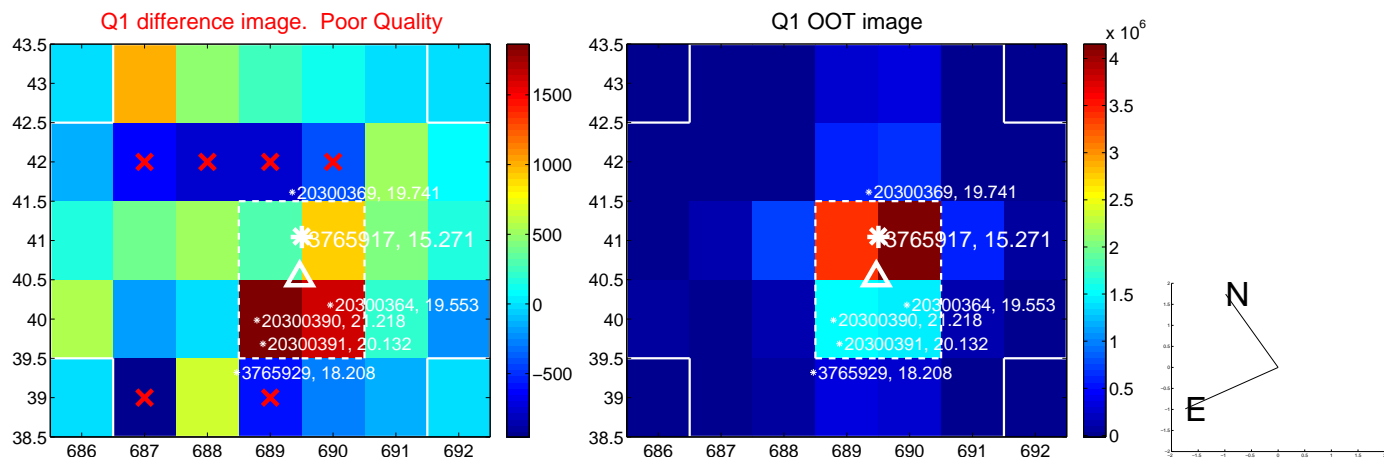
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.021 \pm 0.885$	1.15	$-0.472 \pm 1.463$	$-0.906 \pm 0.447$
PRF-fit source offset from KIC position	$1.107 \pm 0.815$	1.36	$-0.456 \pm 1.349$	$-1.008 \pm 0.429$
photometric centroid source offset	$3.31 \pm 1.52$	2.18	$-0.27 \pm 1.45$	$-3.30 \pm 1.52$



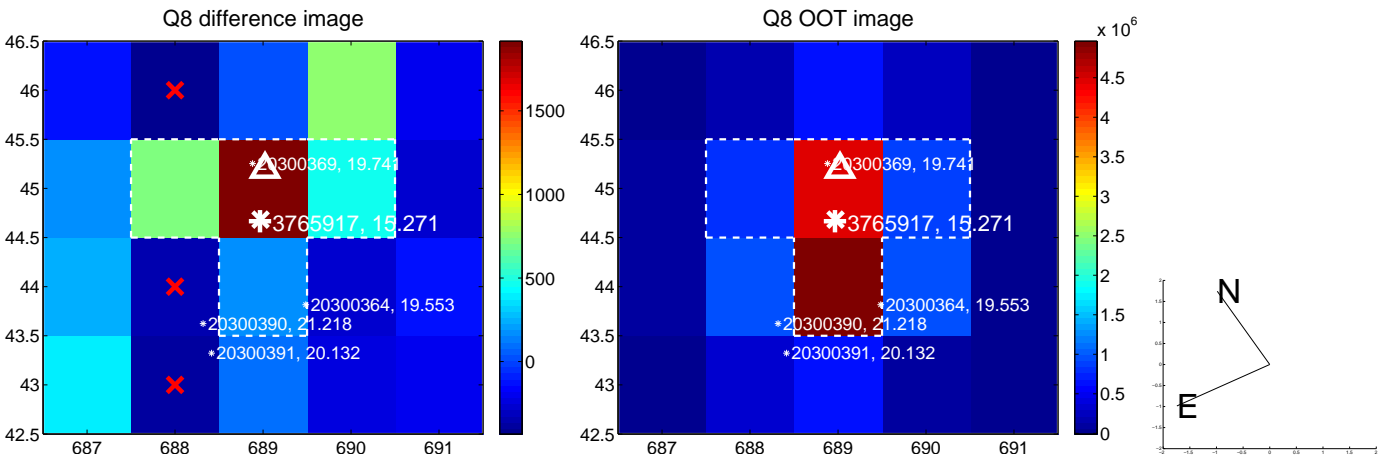
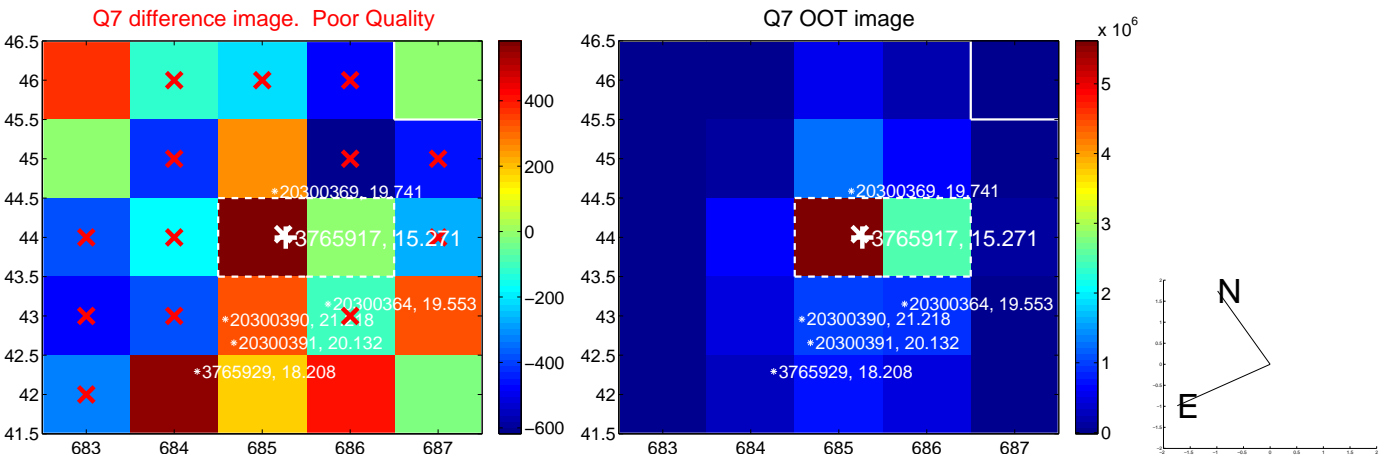
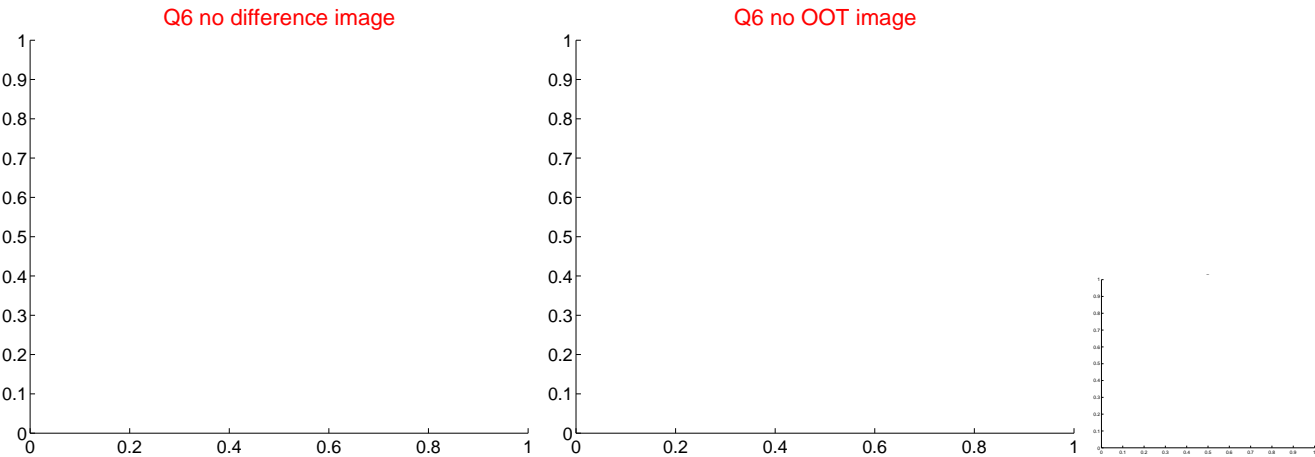
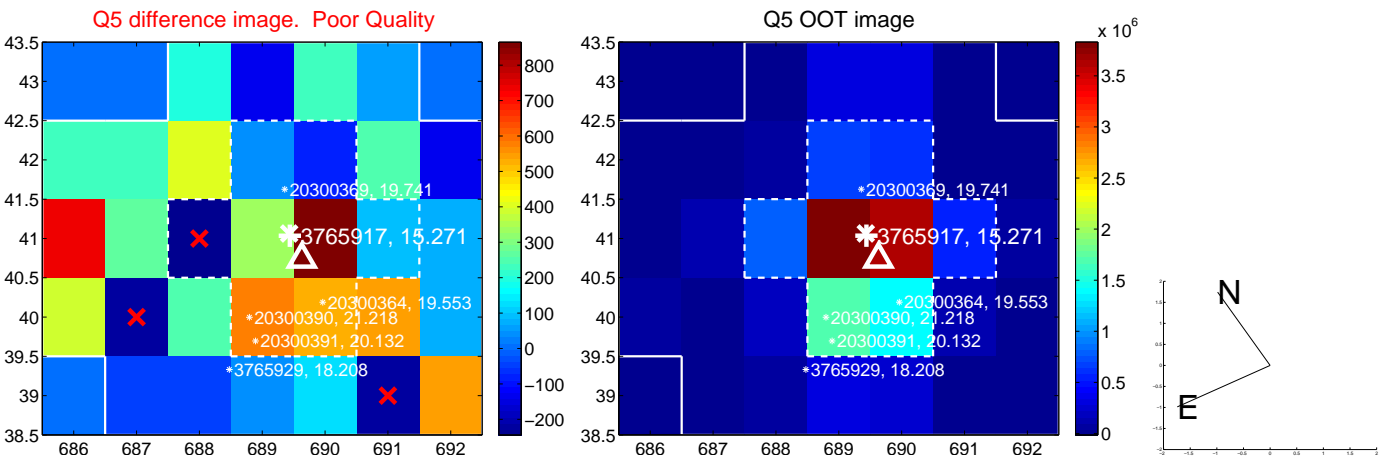
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



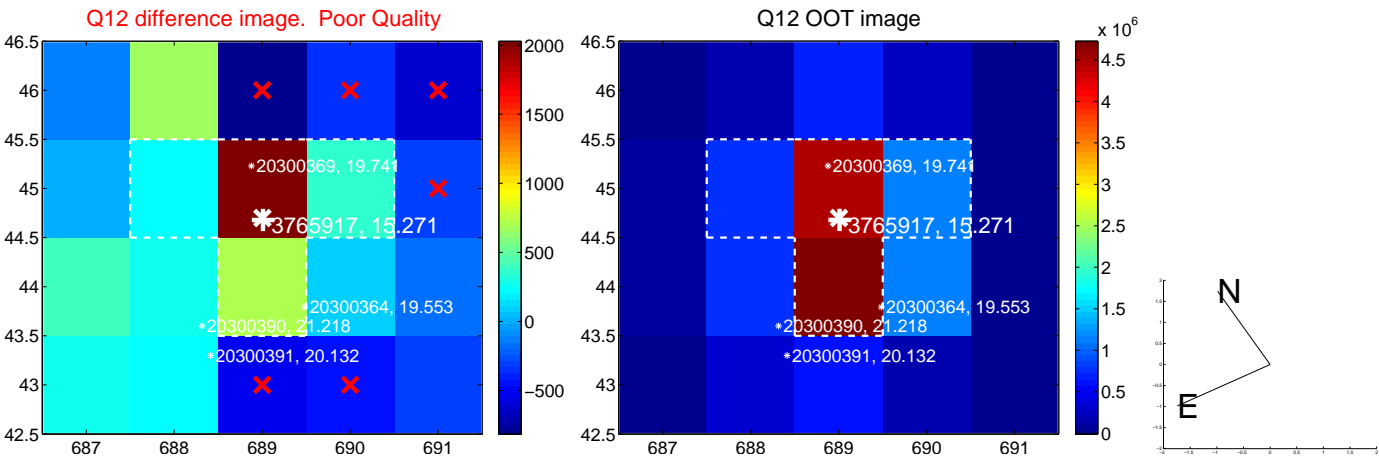
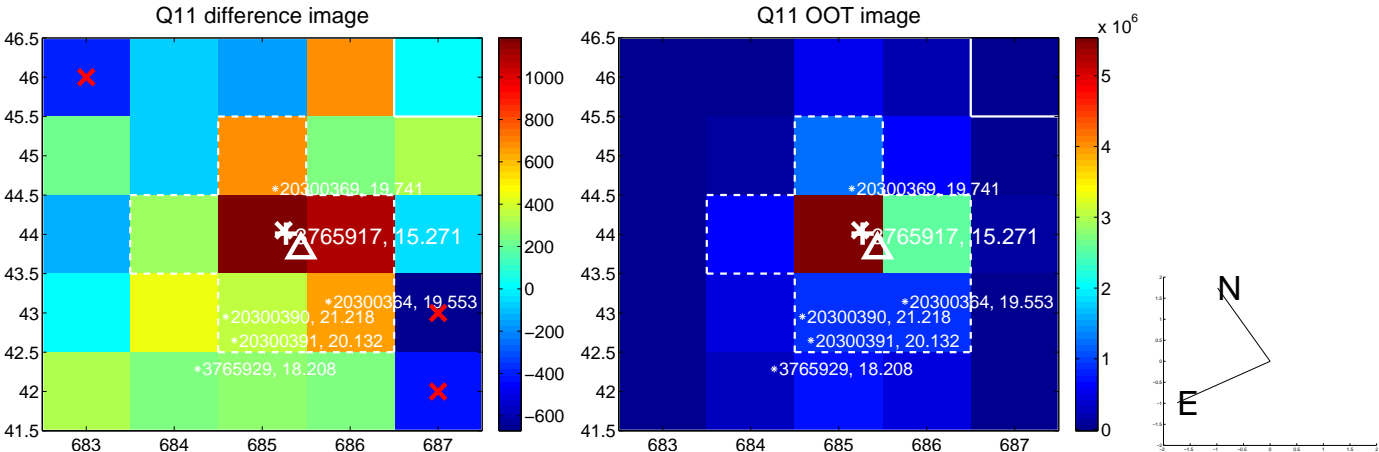
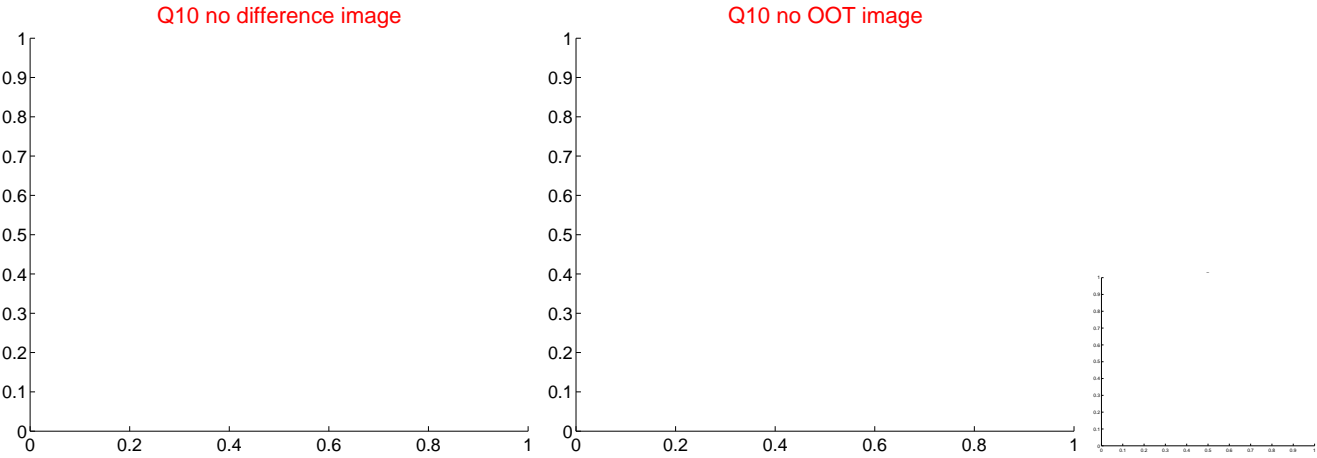
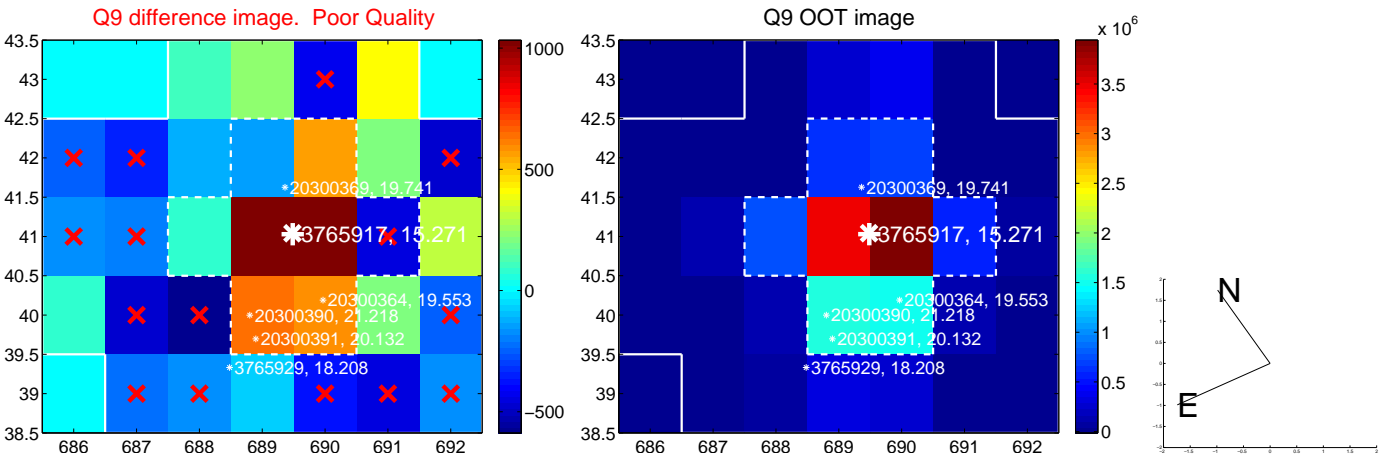
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



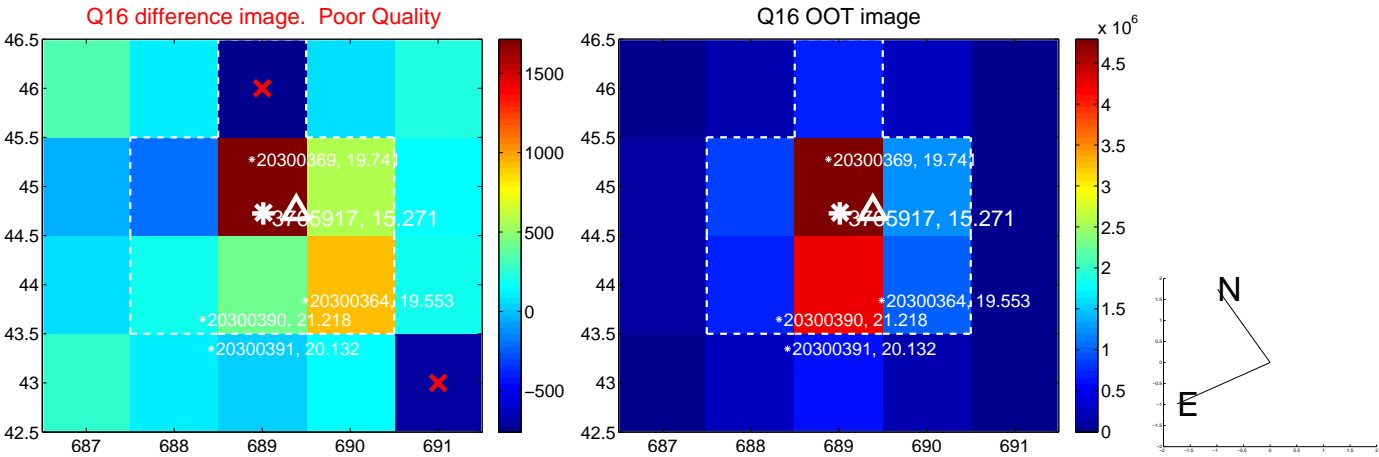
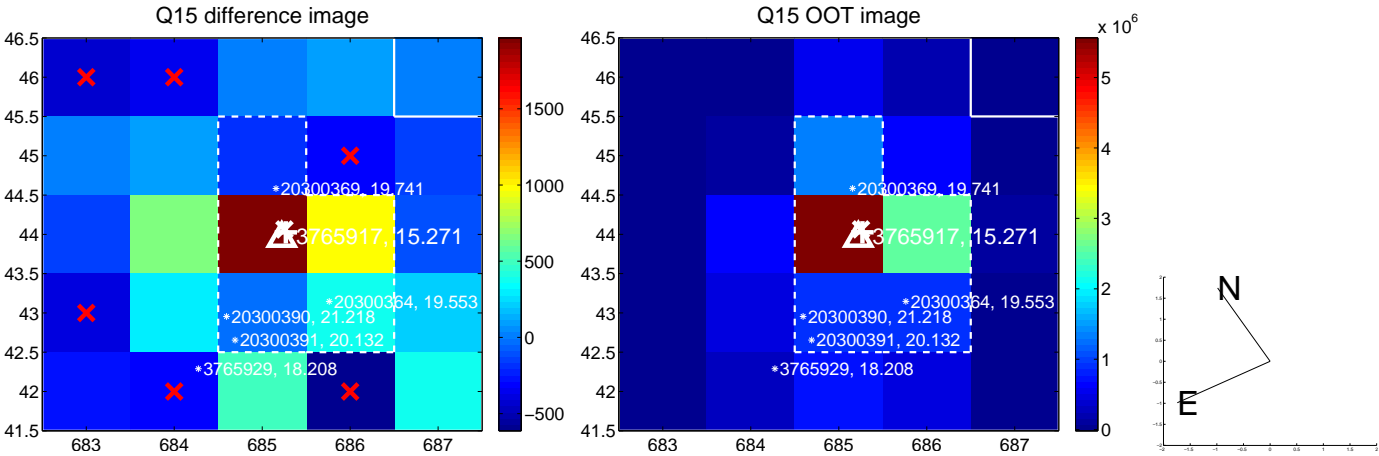
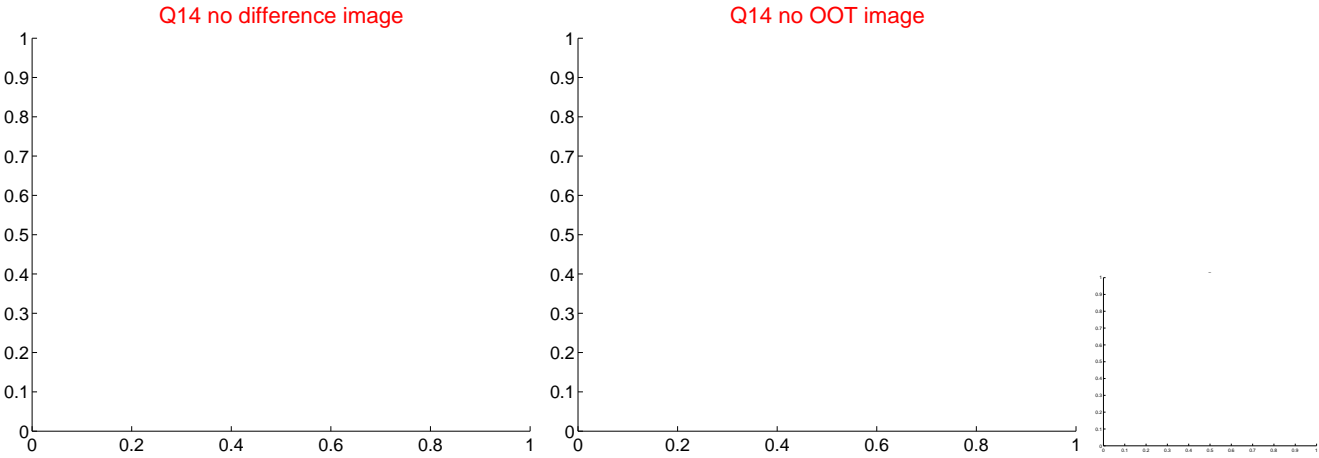
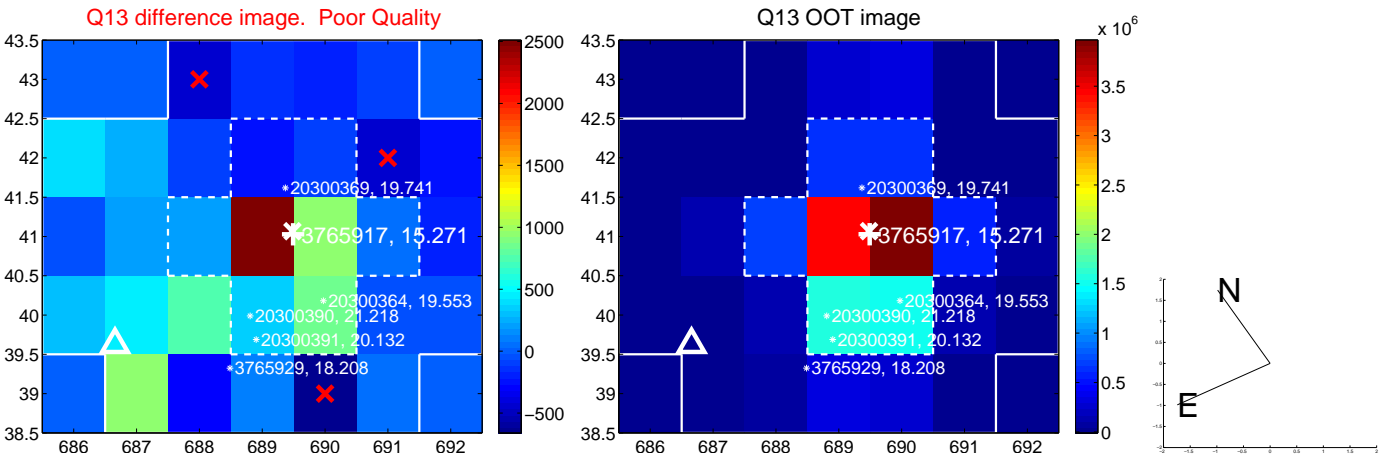
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



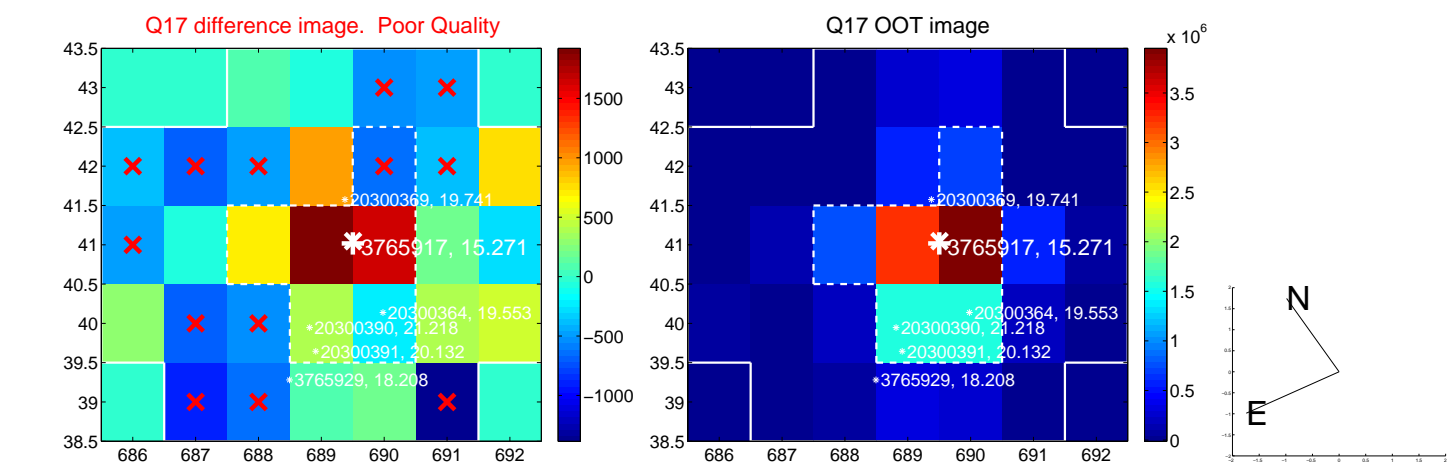
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



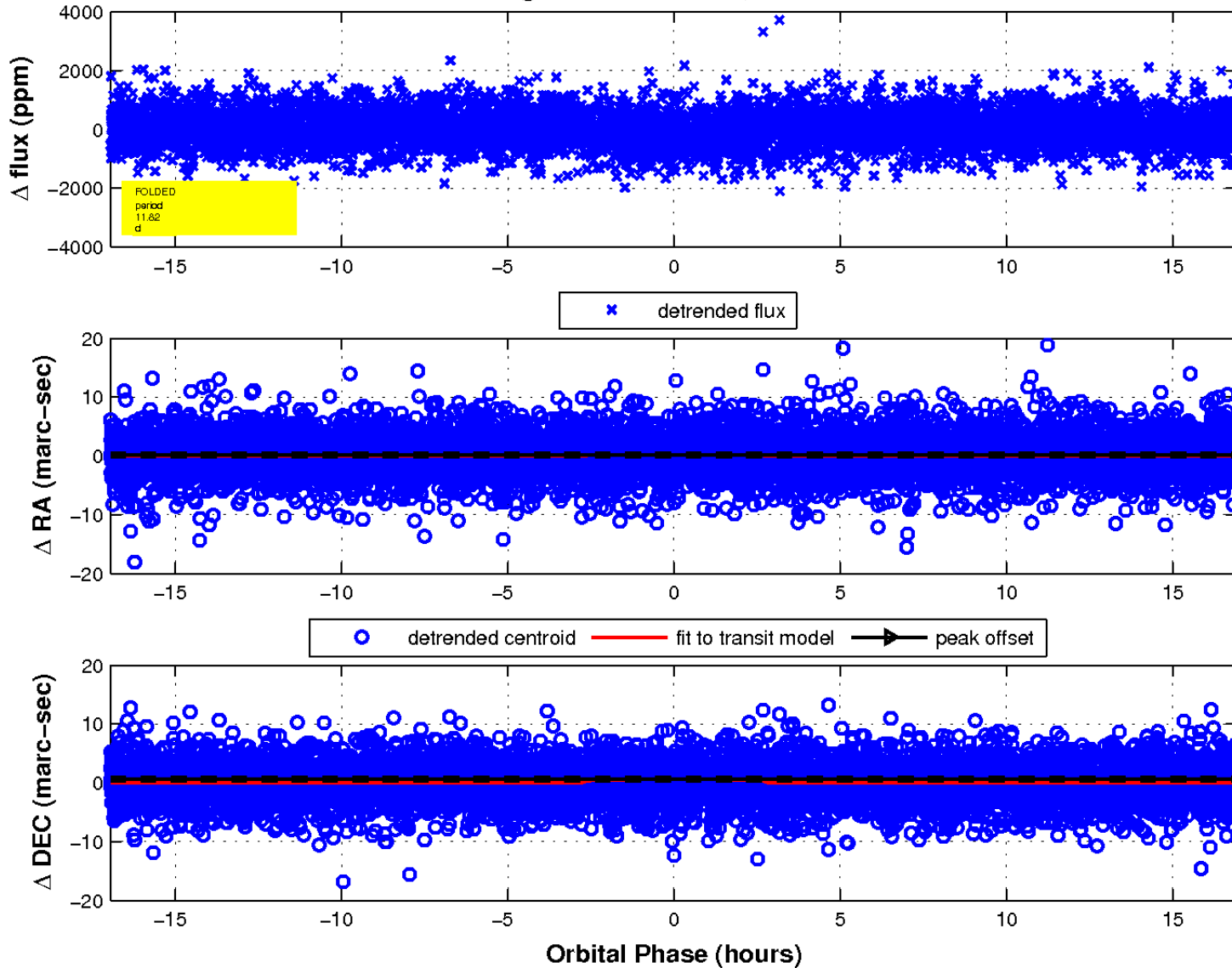
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### fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

