

# KIC 010274086

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010274086-01	OBS	No	690.328163	187.043697	1130.6	28.571	8.0	9.6	1.07	6090	4.34	0.54
010274086-02	OBS	No	363.246471	137.885090	863.9	22.929	7.5	6.9	1.07	6090	3.21	1.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010274086-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010274086-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

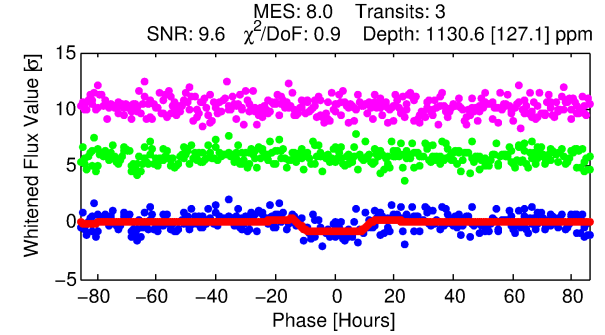
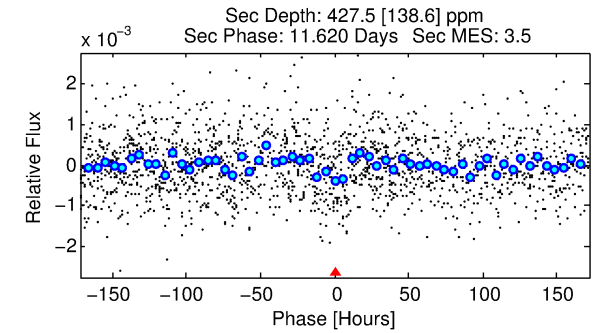
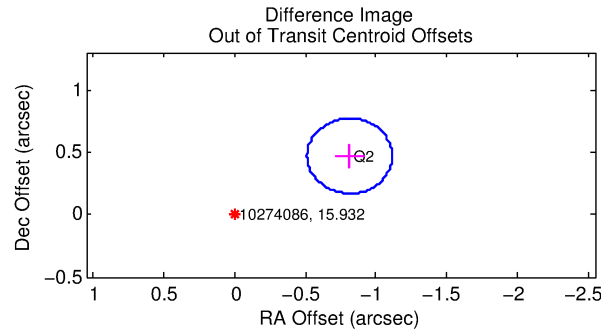
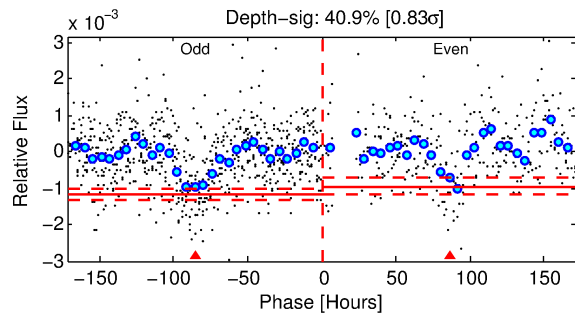
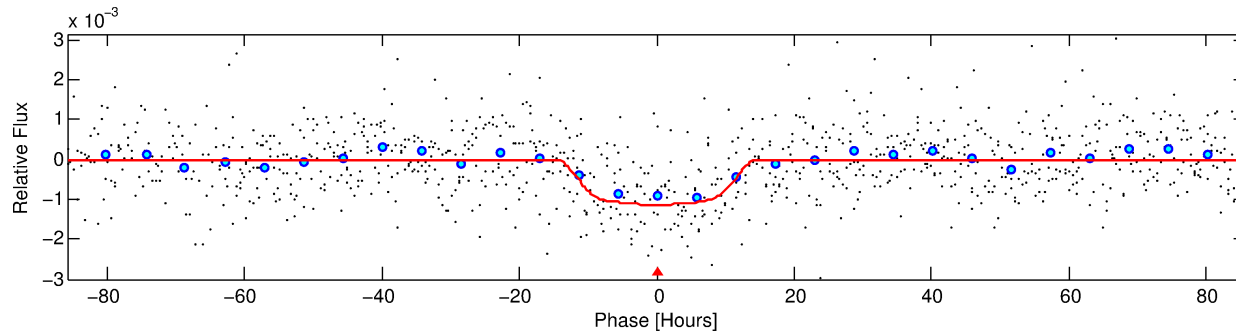
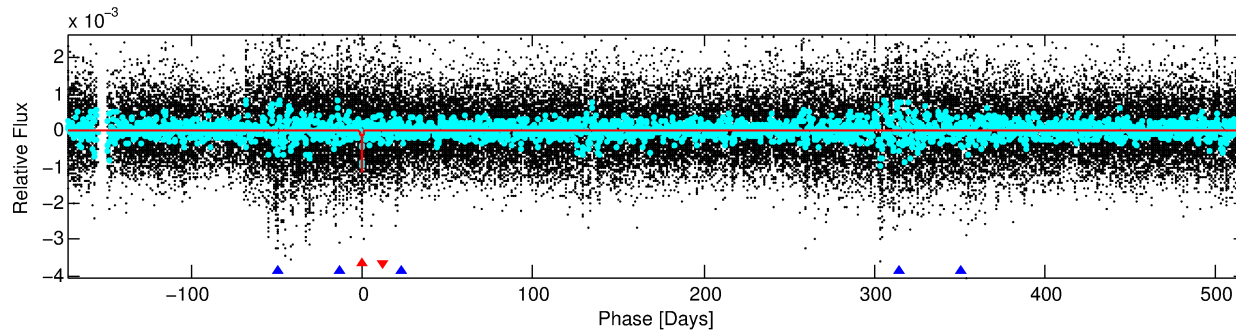
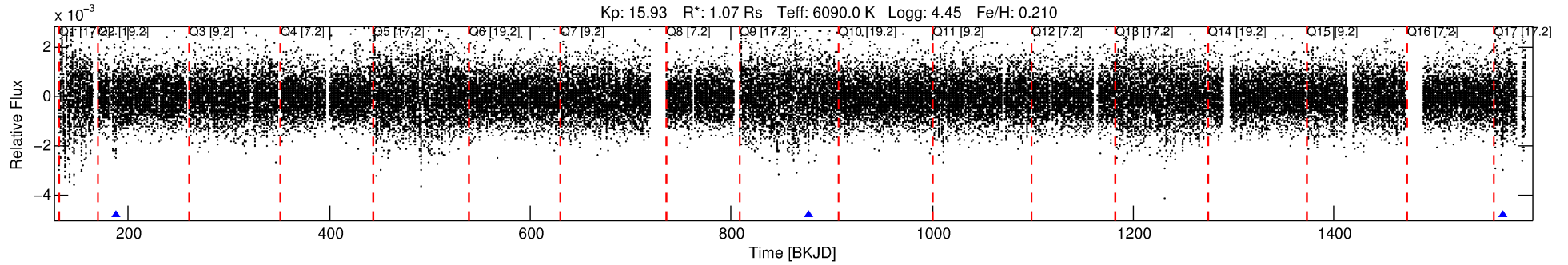
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010274086-01

No Significant Match Found

# DV One-Page Summary

KIC: 10274086 Candidate: 1 of 2 Period: 690.328 d



## DV Fit Results:

Period = 690.32816 [0.03277] d  
Epoch = 187.0437 [0.0344] BKJD  
Rp/R\* = 0.0371 [0.0030]  
a/R\* = 89.25 [20.44]  
b = 0.92 [0.04]  
Seff = 0.54 [0.21]  
Teq = 219 [22] K  
Rp = 4.34 [1.31] Re  
a = 1.6116 [0.3997] AU  
Ag = 32439.47 [16631.57] [1.95 $\sigma$ ]  
Teff = 4545 [446] K [9.69 $\sigma$ ]

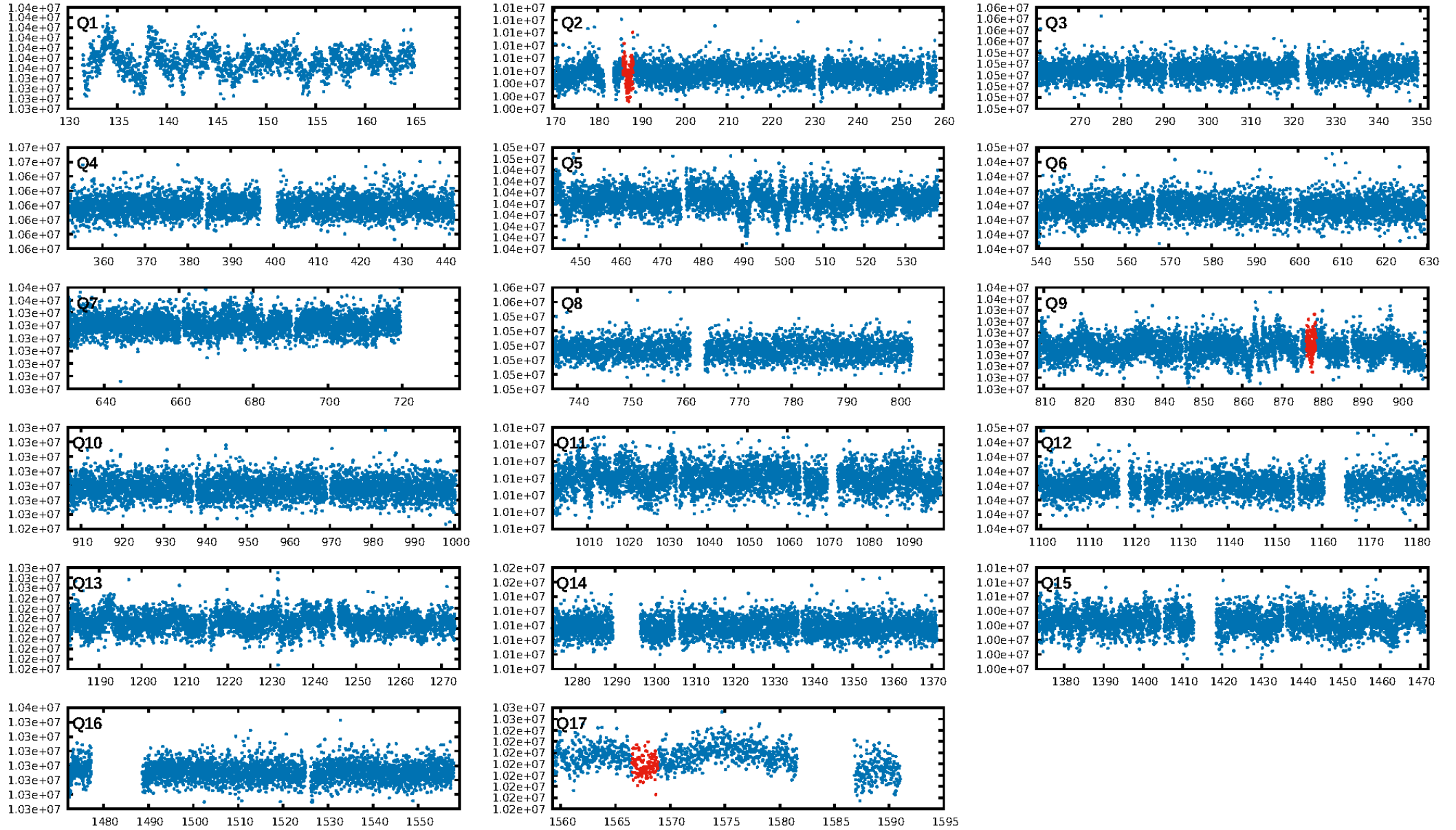
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [214.28 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 38.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.51e-08**  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: 0.5567**  
Centroid-sig: N/A  
Centroid-so: 0.235 arcsec [0.16 $\sigma$ ]  
**OotOffset-rm: 0.938 arcsec [9.36 $\sigma$ ]**  
**KicOffset-rm: 1.069 arcsec [10.70 $\sigma$ ]**  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

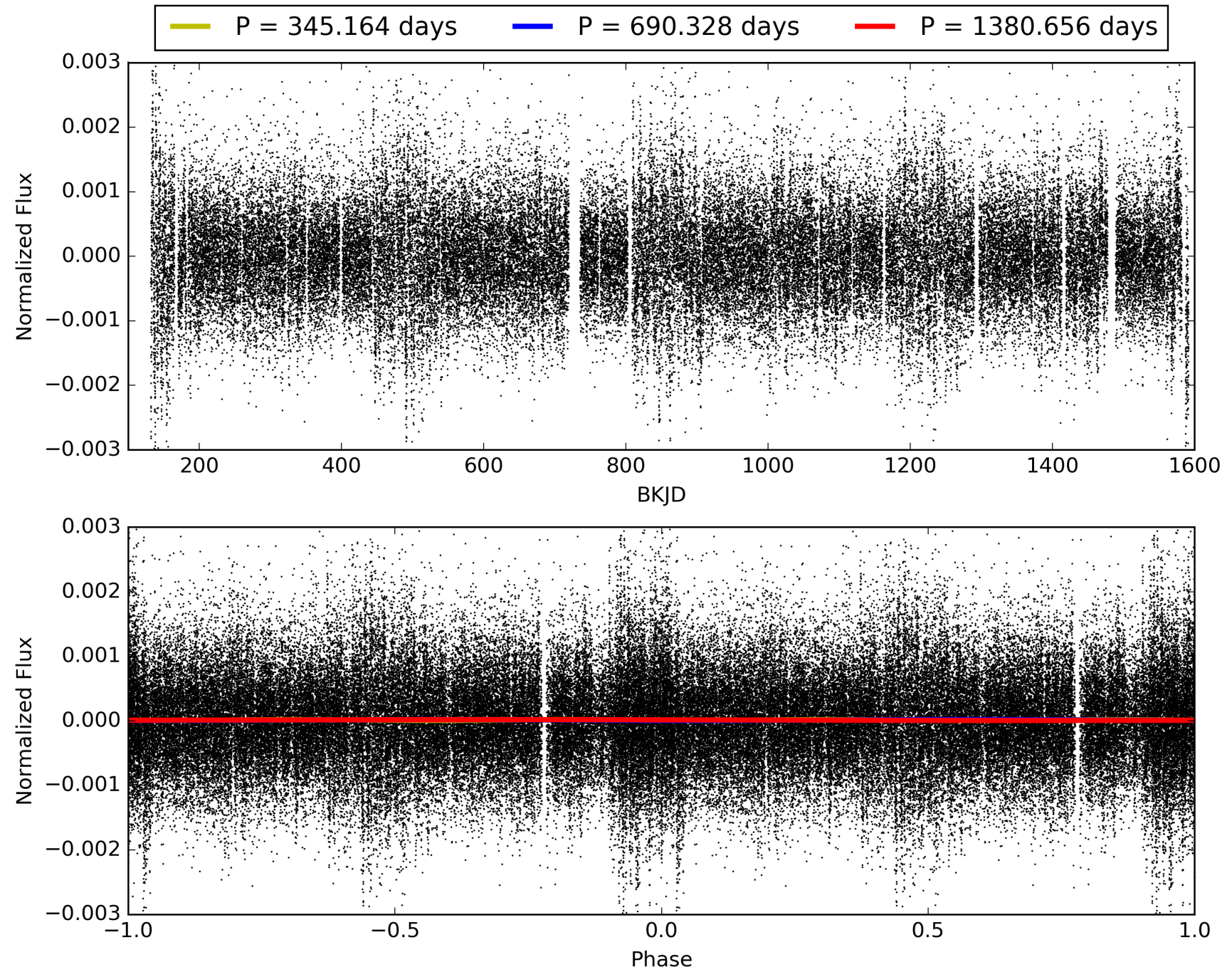
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:48:49 Z

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

# TCE 010274086-01, PDC Light Curves

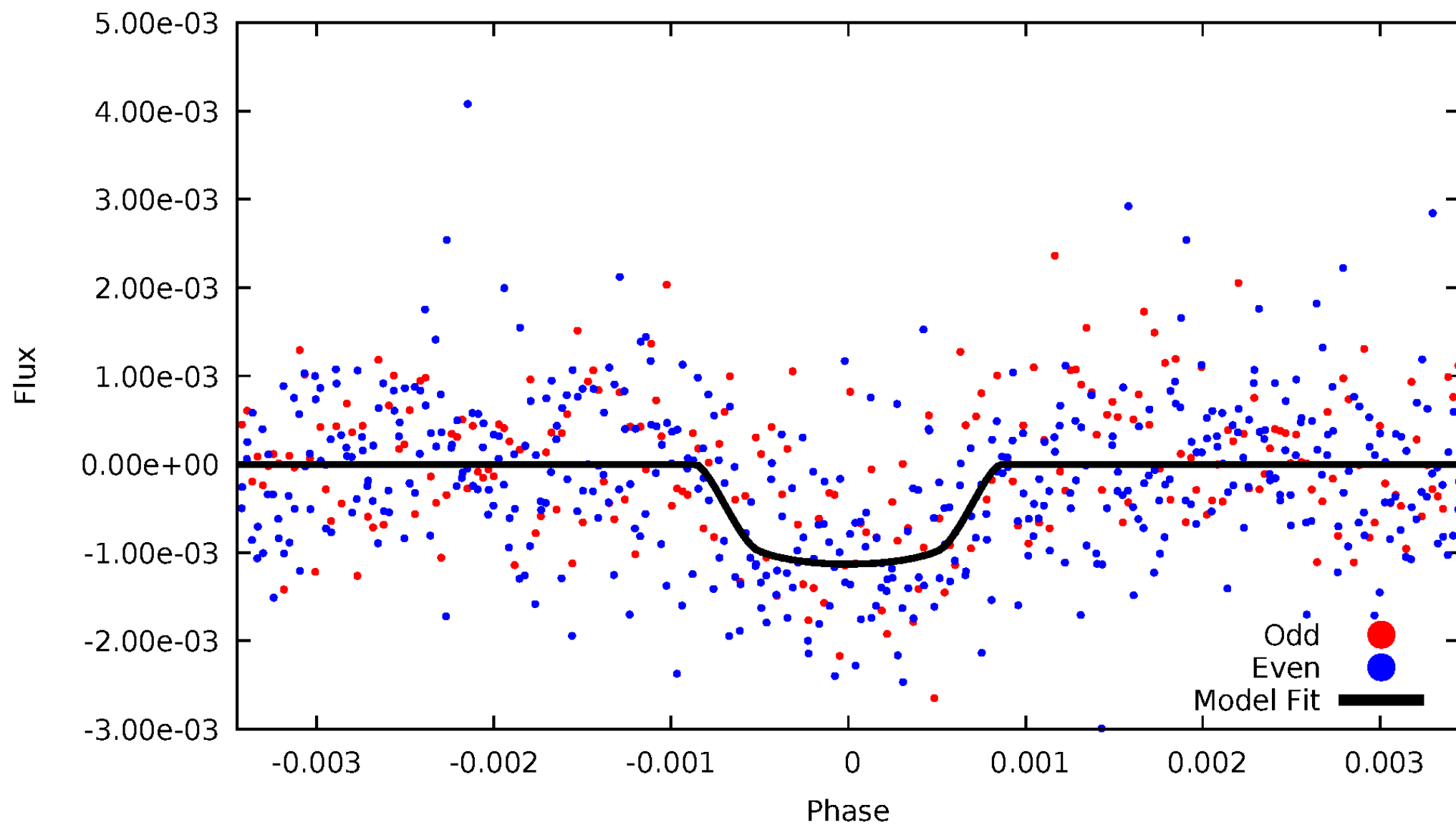


# TCE 010274086-01



# DV Odd/Even

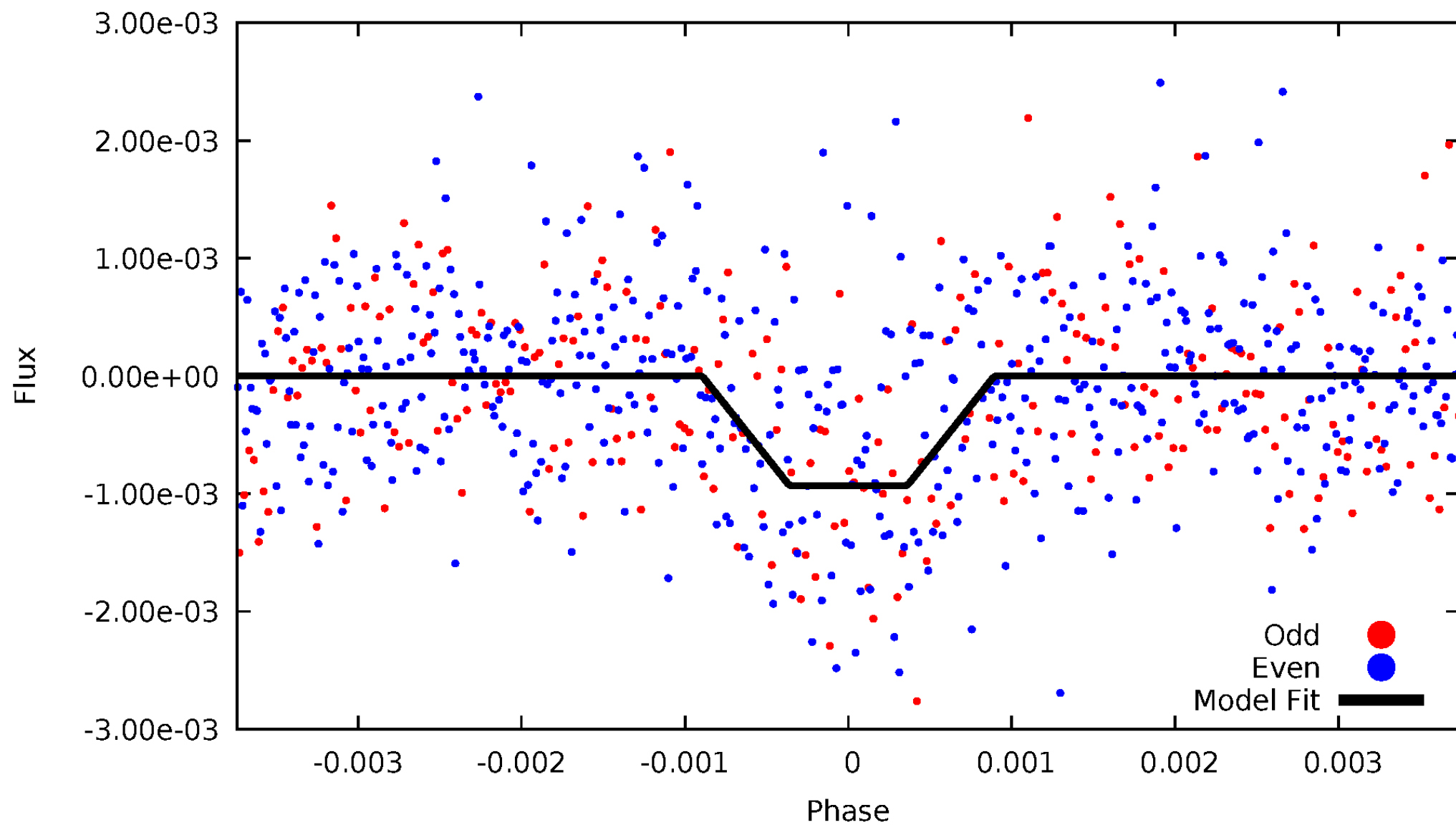
TCE 010274086-01





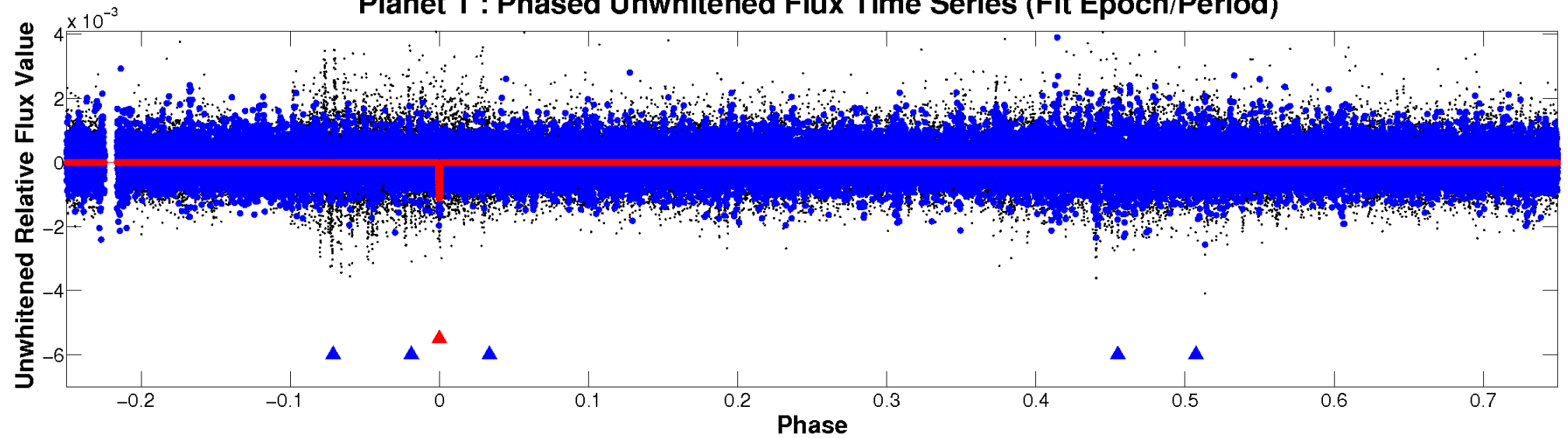
# ALT Odd/Even

TCE 010274086-01

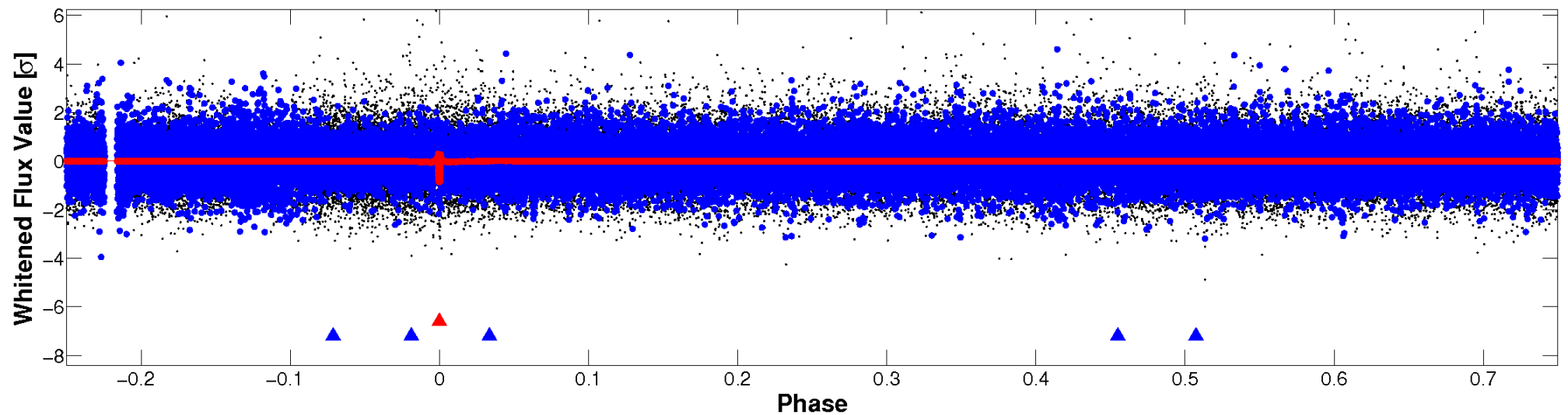


# Non-Whitened Vs. Whitened Light Curve

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

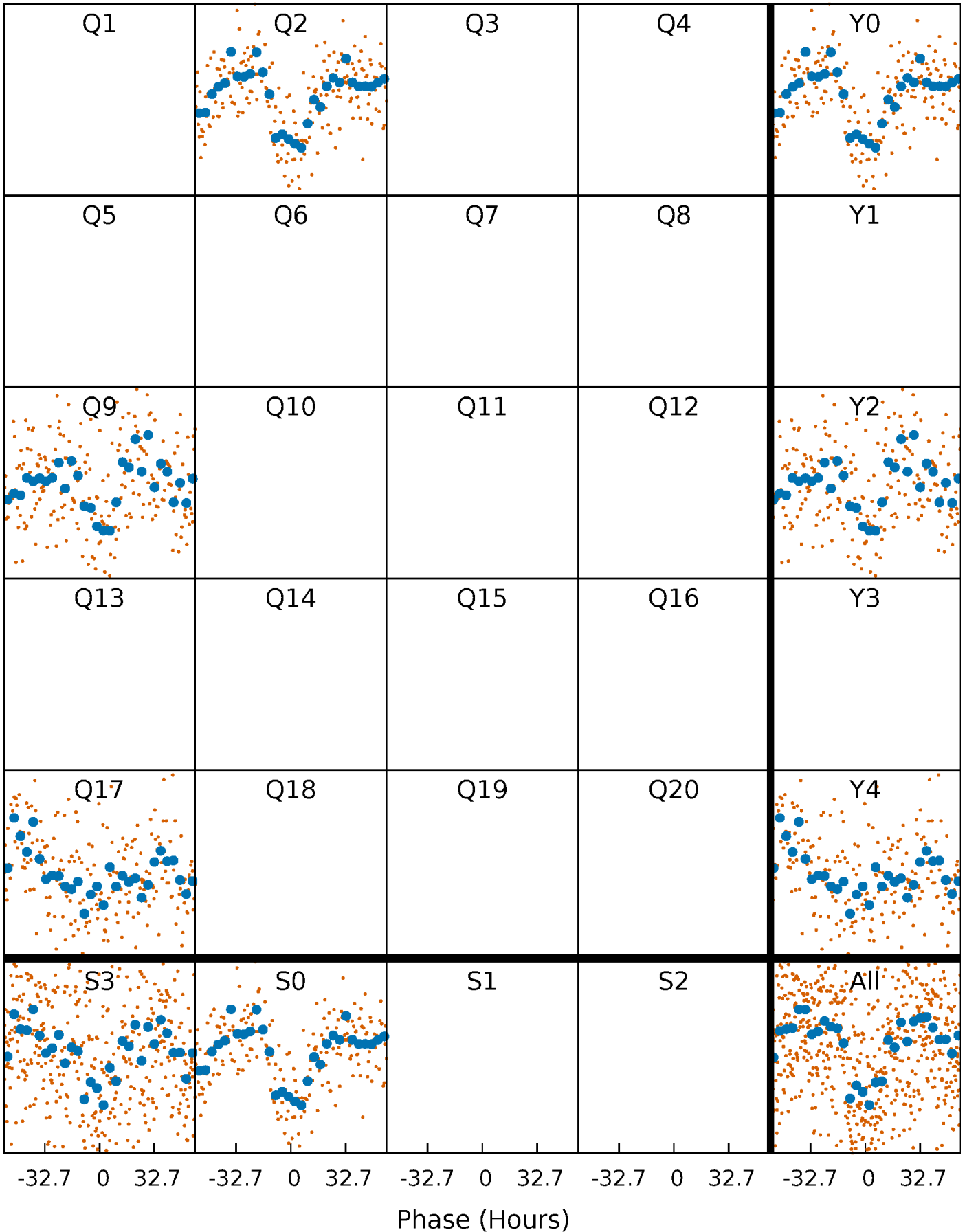


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

TCE 010274086-01 P=690.328163 Days  $T_0=187.043697$  (BKJD)





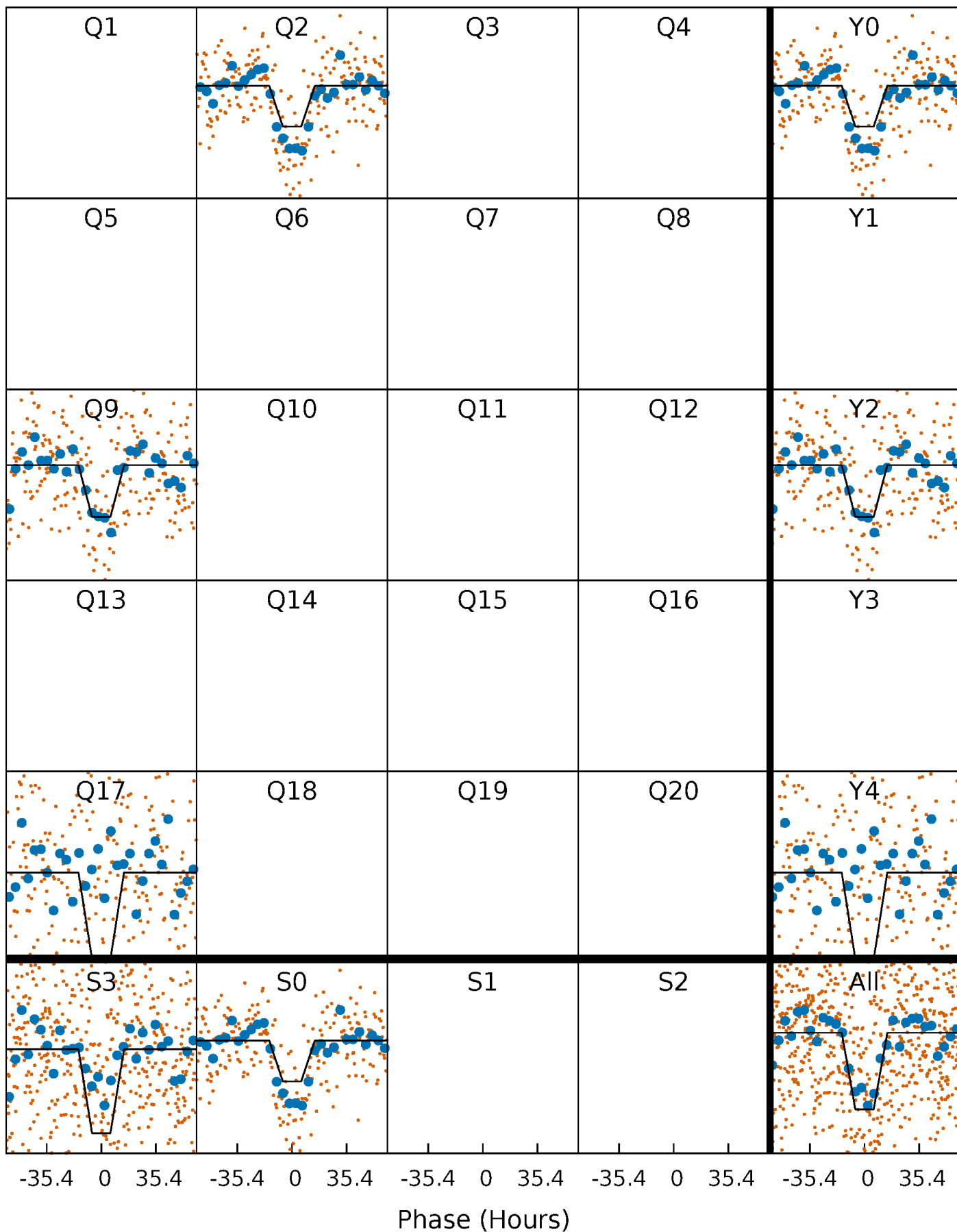
# DV Quarter-Phased Transit Curves

TCE 010274086-01     $P=690.328163$  Days     $T_0=187.043697$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

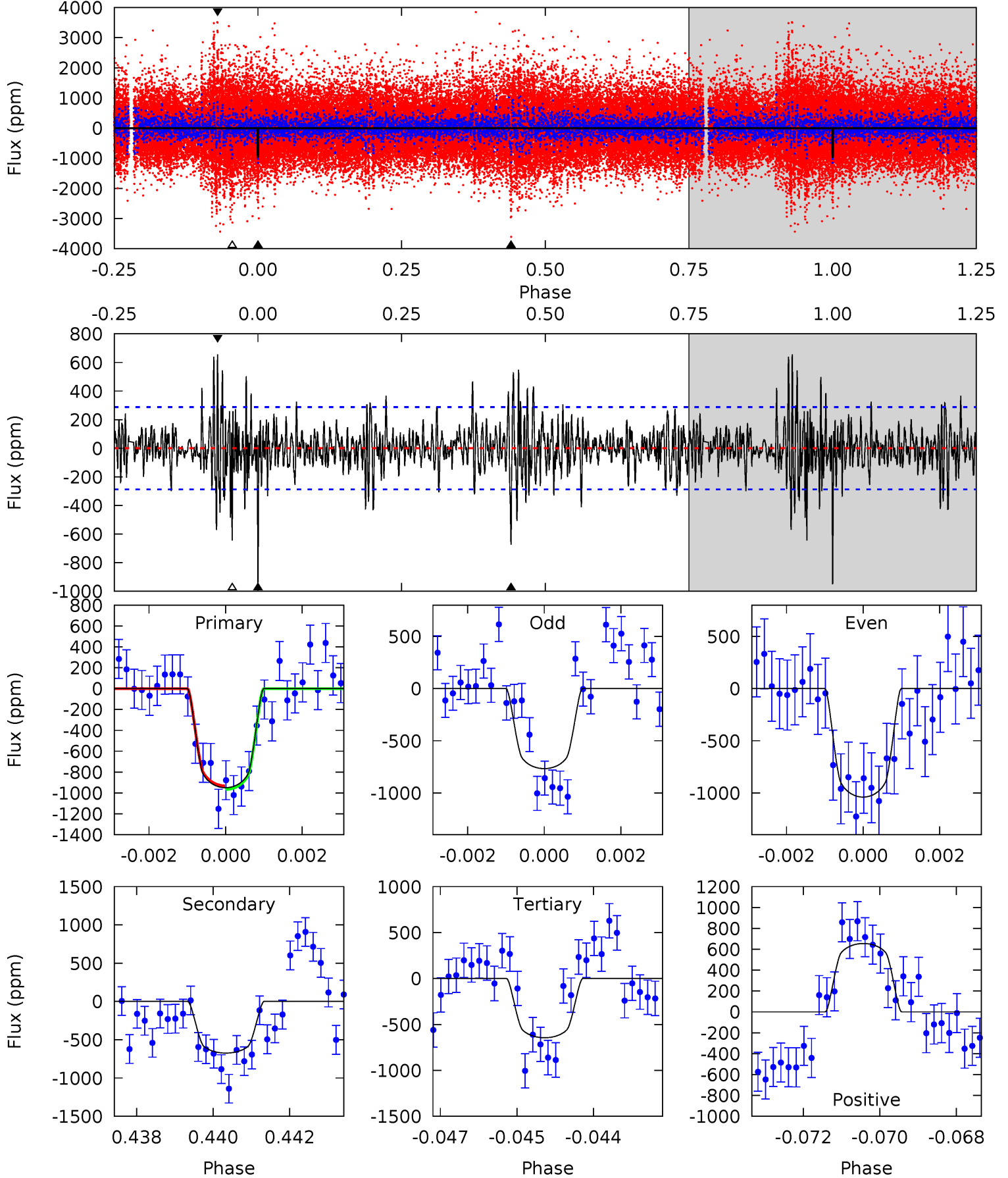
TCE 010274086-01 P=690.375069 Days  $T_0=187.041922$  (BKJD)



# DV Model-Shift Uniqueness Test

010274086-01, P = 690.328163 Days, E = 187.043697 Days

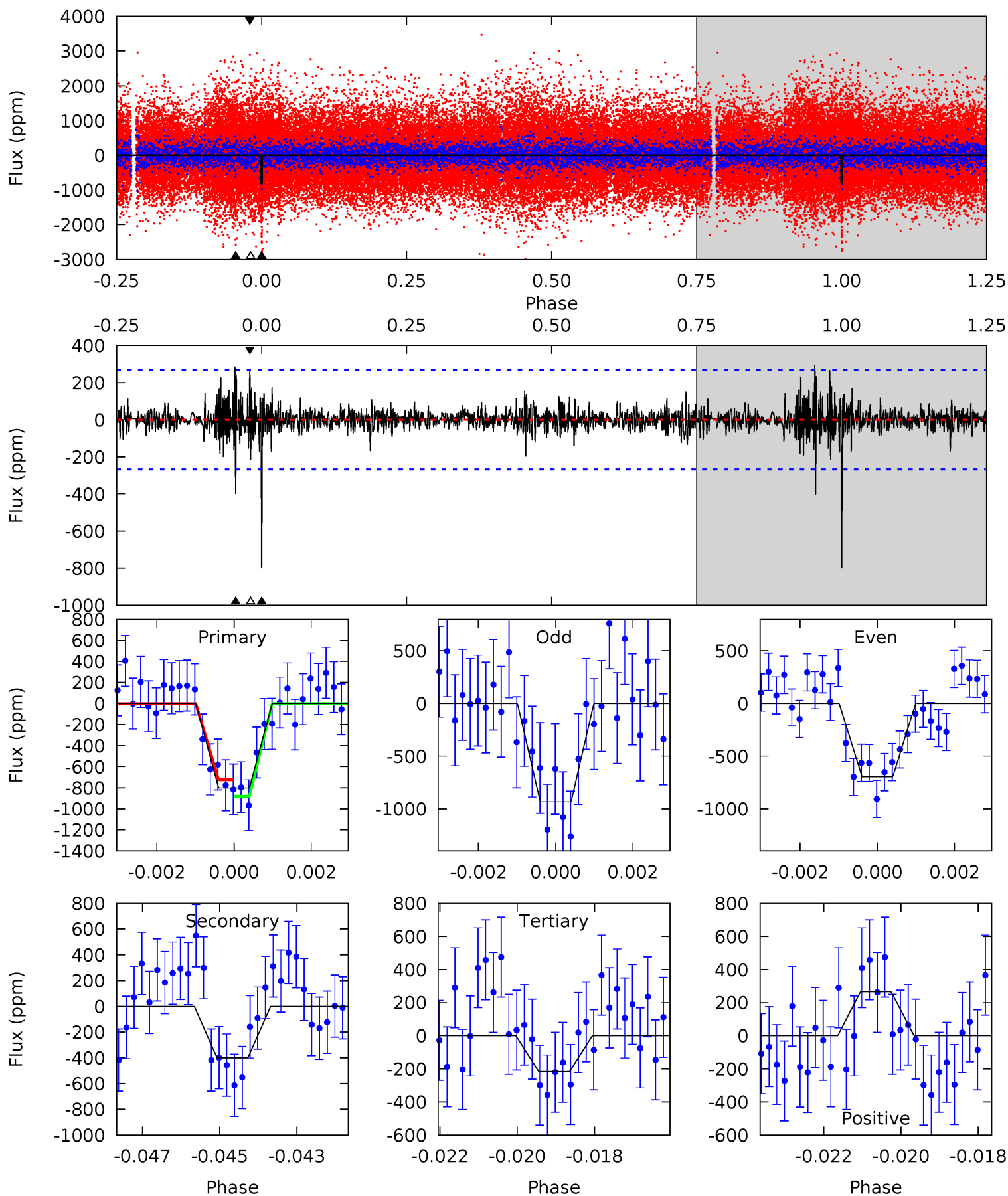
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	12.5	12.0	12.2	5.35	3.13	2.62	5.67	5.47	0.55	0.35	2.40	1.24	0.41	0.31



# Alt Model-Shift Uniqueness Test

010274086-01, P = 690.375069 Days, E = 187.041922 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
16.0	7.99	4.34	5.30	5.35	3.12	0.95	11.7	10.7	3.66	2.69	2.26	0.83	0.26	1.57



### Stellar Parameters For KIC 010274086

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6090^{+190}_{-232}$	$4.447^{+0.050}_{-0.200}$	$0.210^{+0.150}_{-0.300}$	$1.071^{+0.313}_{-0.104}$	$1.173^{+0.125}_{-0.166}$	$1.345^{+0.358}_{-0.683}$
	+3%/-4%	+1%/-4%	+71%/-143%	+29%/-10%	+11%/-14%	+27%/-51%
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 010274086-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-674 \pm 54$	$4.49^{+0.71}_{-0.54}$	$313^{+22}_{-16}$	$5146^{+279}_{-228}$	$46154^{+12943}_{-10943}$
Alt.	$-400 \pm 50$	$3.62^{+0.68}_{-0.44}$	$311^{+22}_{-15}$	$5023^{+312}_{-294}$	$41360^{+15161}_{-11443}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

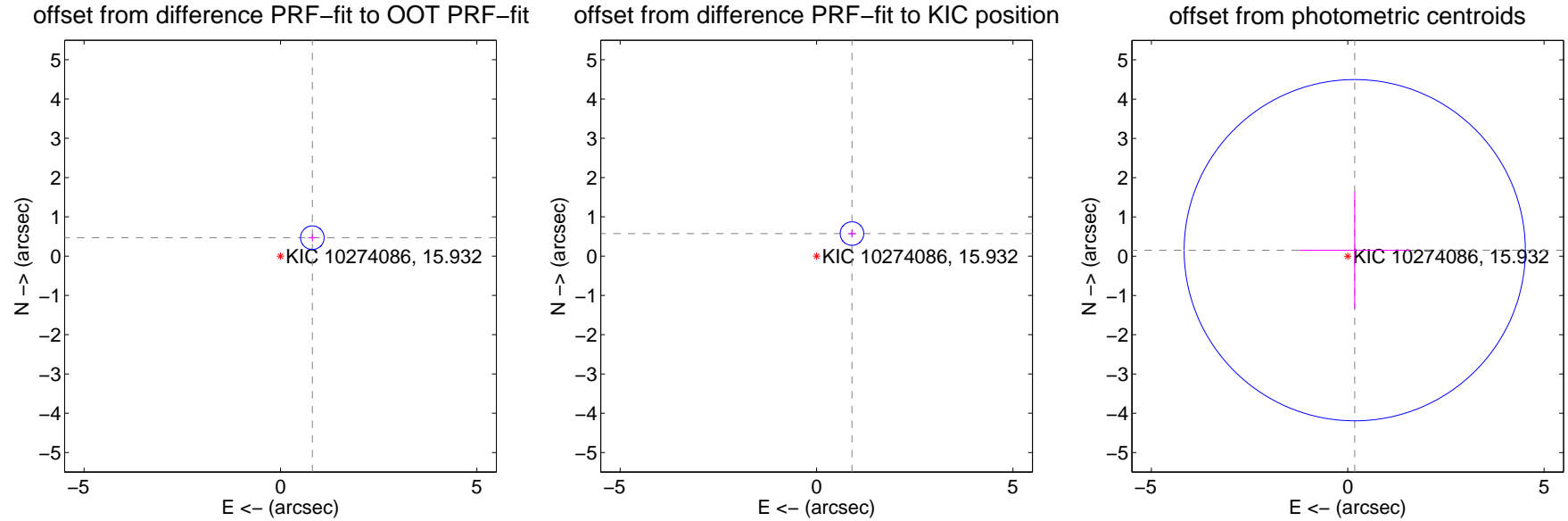
## DV Centroid Data

Supplemental centroid analysis for 010274086-01. Kepler magnitude: 15.93. Transit SNR 9.59

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

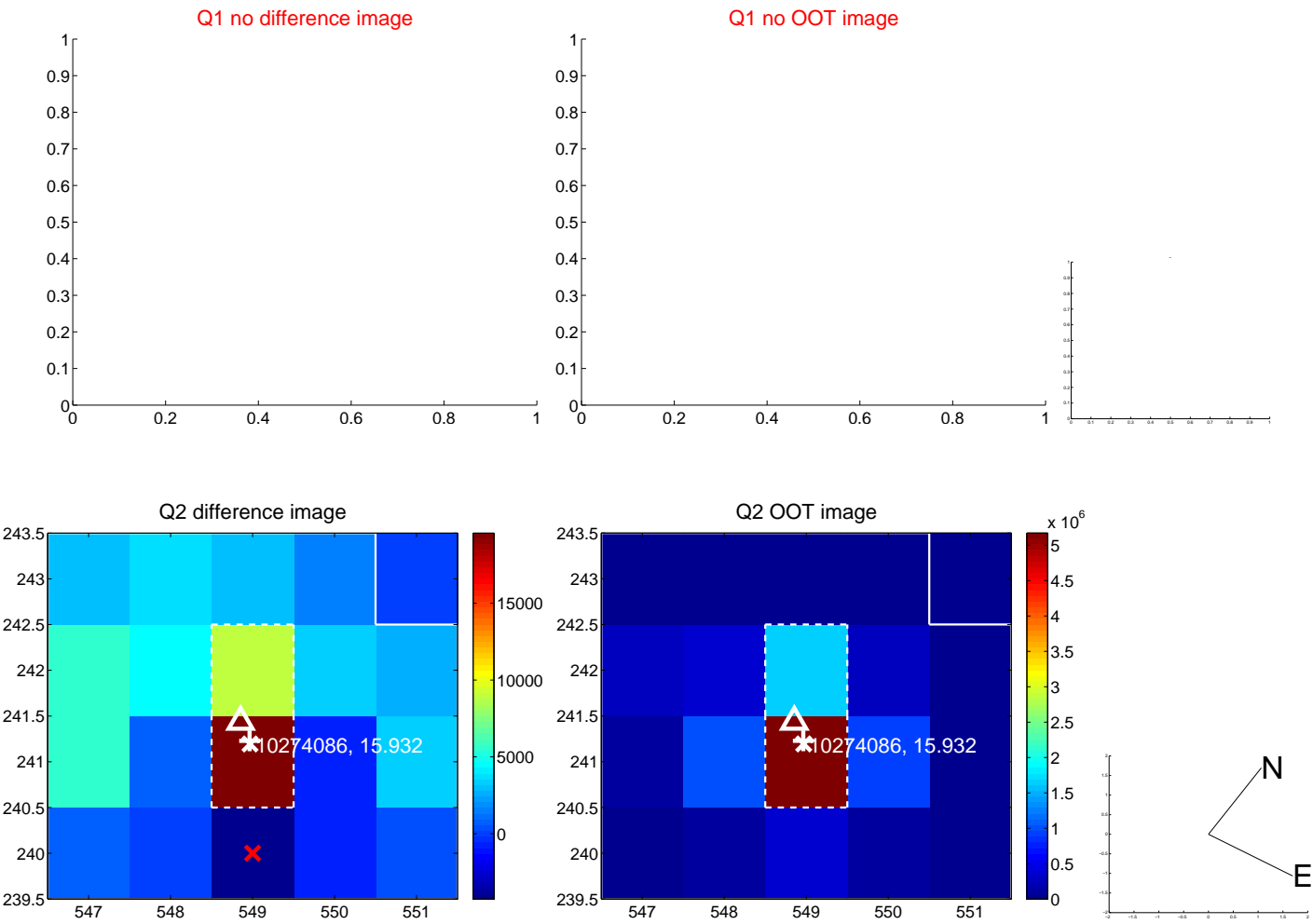
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.938 \pm 0.100$	9.36	$-0.812 \pm 0.102$	$0.469 \pm 0.095$
PRF-fit source offset from KIC position	$1.069 \pm 0.100$	10.70	$-0.902 \pm 0.102$	$0.574 \pm 0.095$
photometric centroid source offset	$0.24 \pm 1.45$	0.16	$-0.18 \pm 1.42$	$0.15 \pm 1.49$



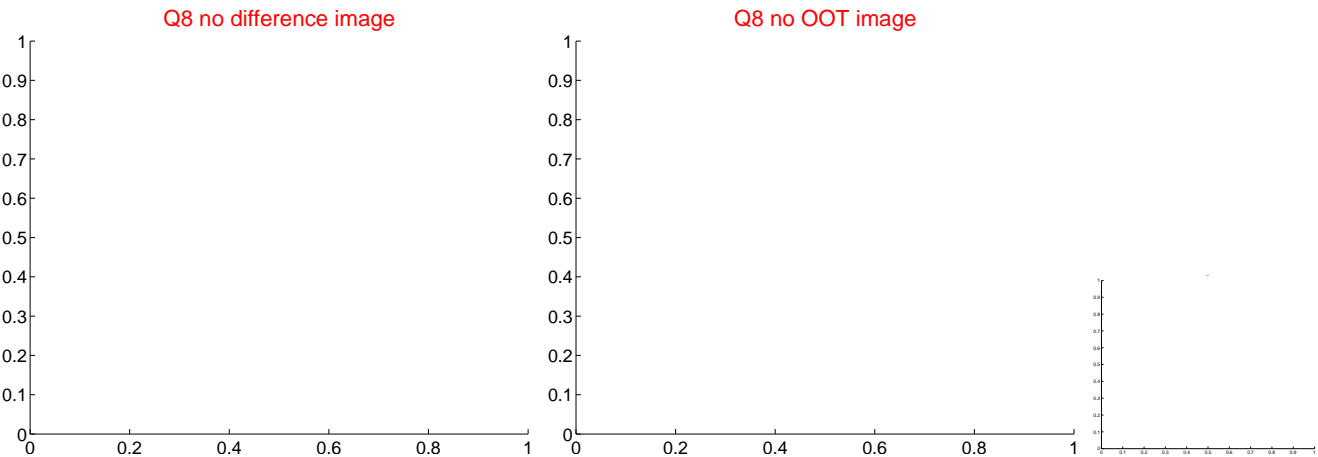
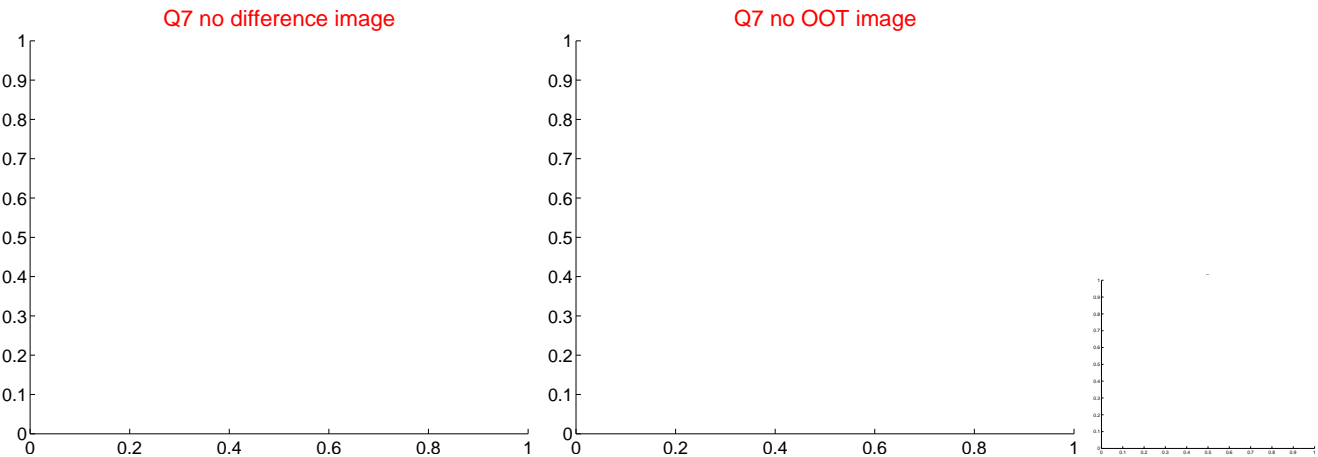
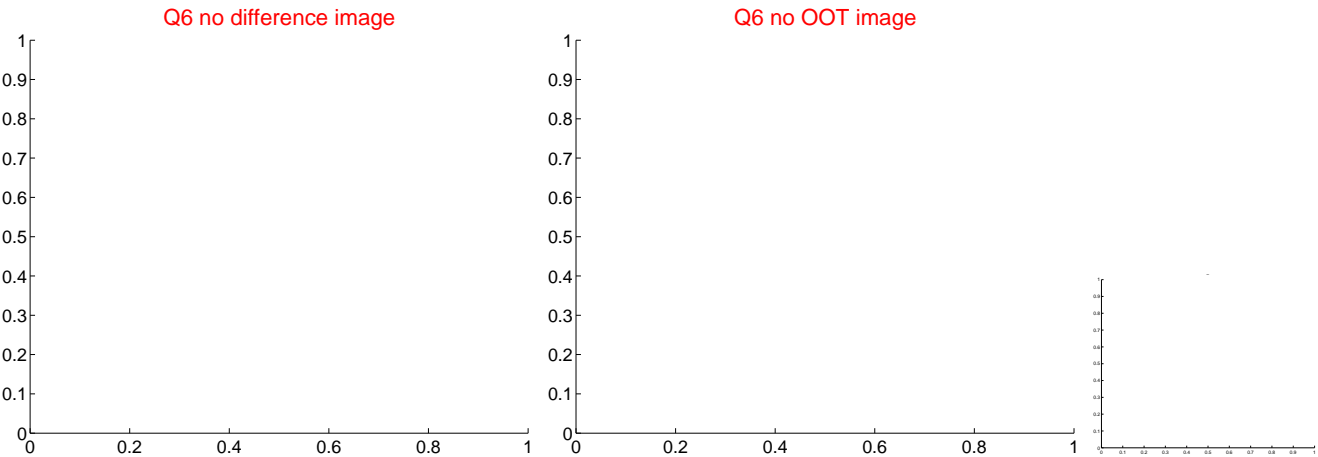
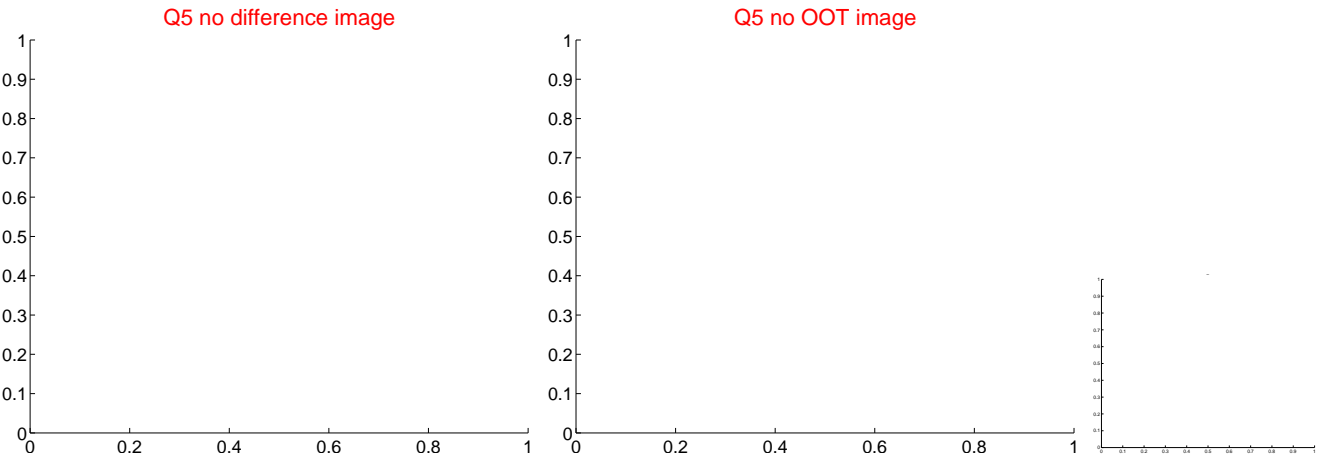
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



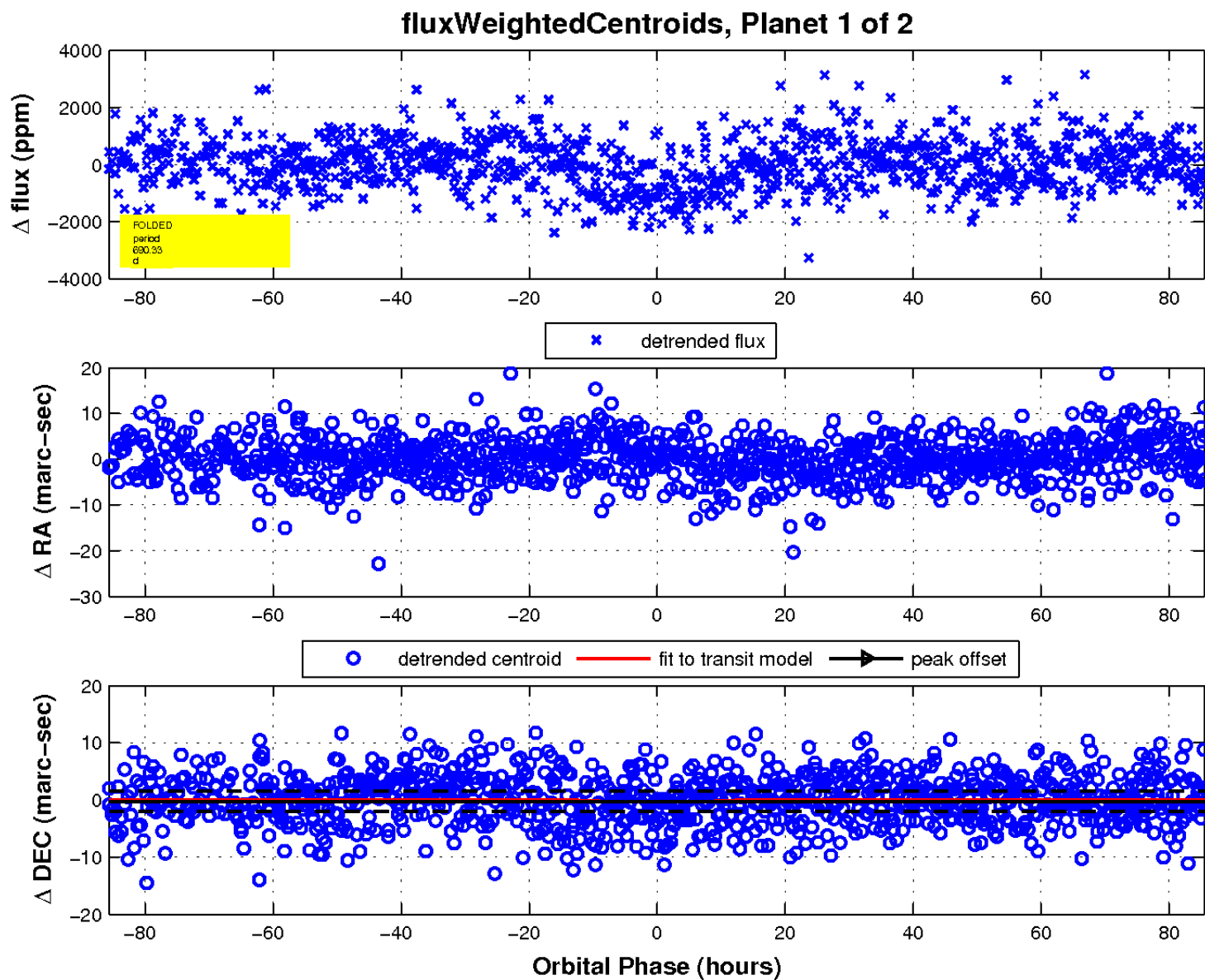
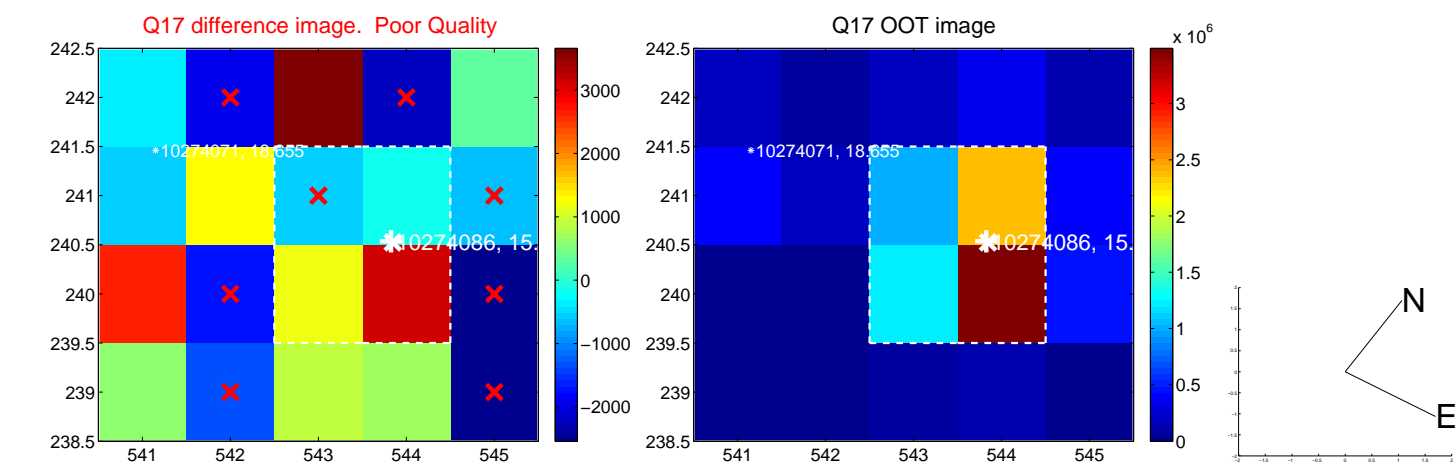
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

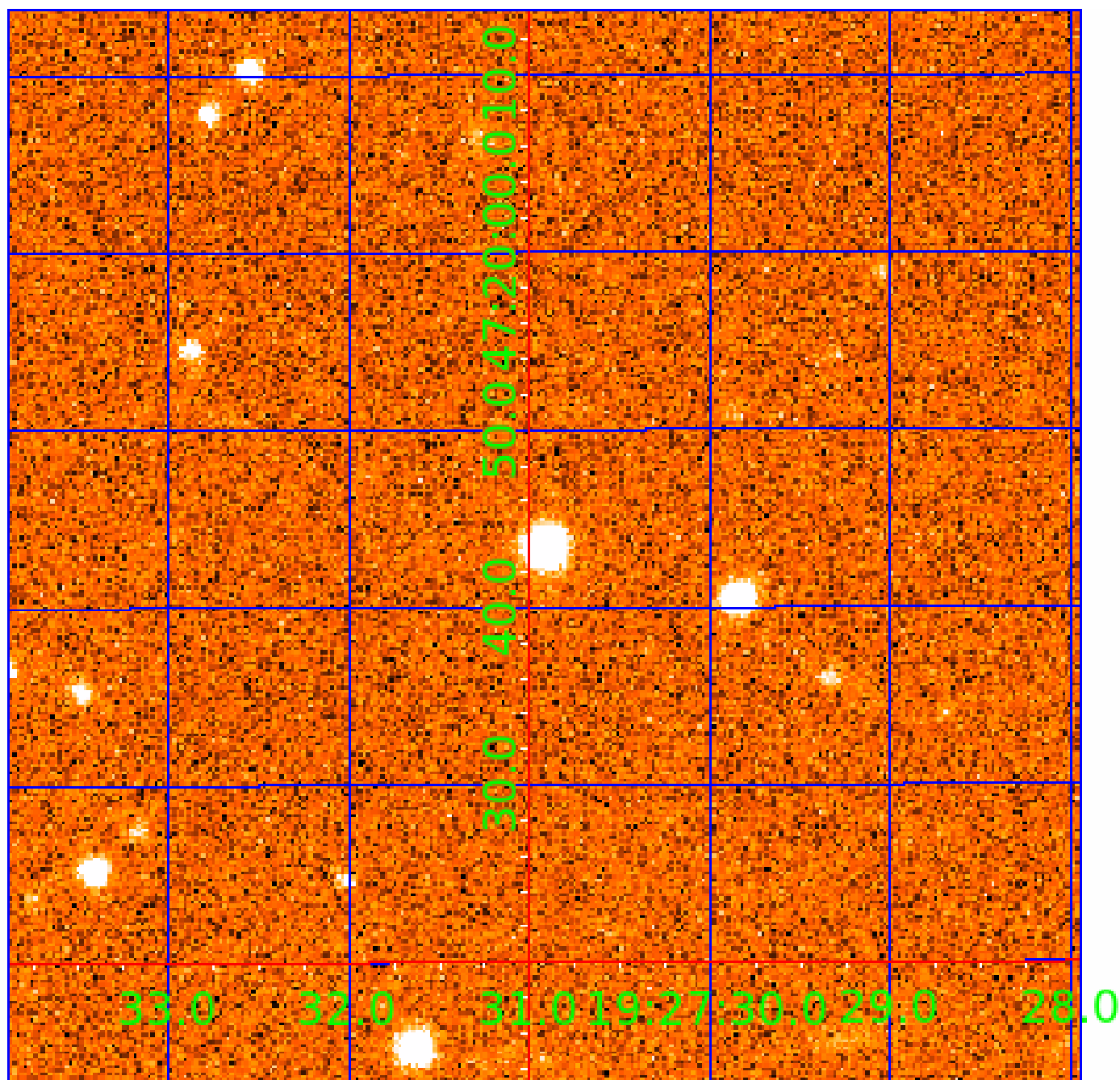


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 010274086

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010274086-01	OBS	No	690.328163	187.043697	1130.6	28.571	8.0	9.6	1.07	6090	4.34	0.54
010274086-02	OBS	No	363.246471	137.885090	863.9	22.929	7.5	6.9	1.07	6090	3.21	1.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010274086-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010274086-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

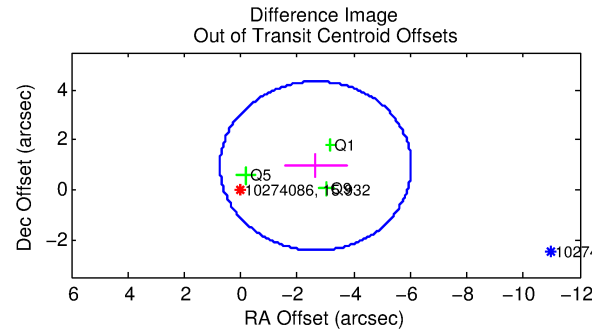
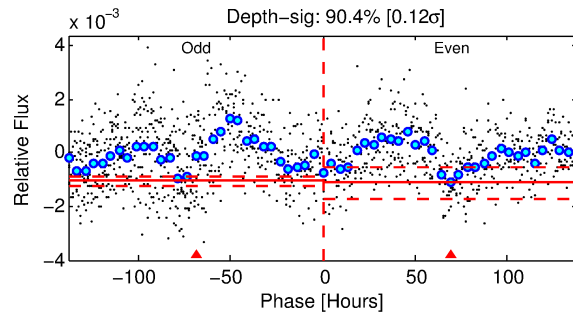
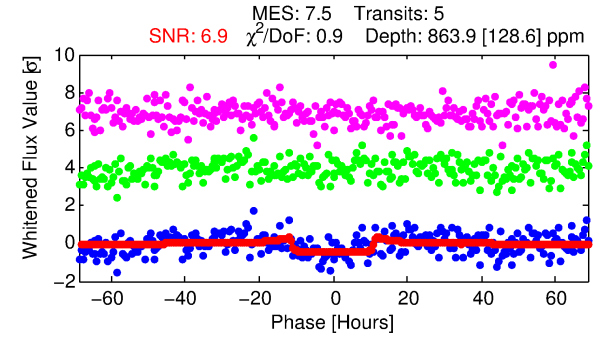
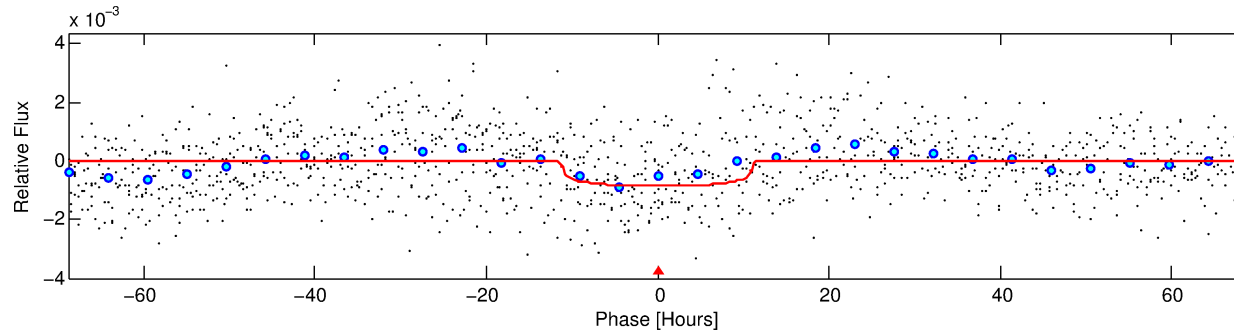
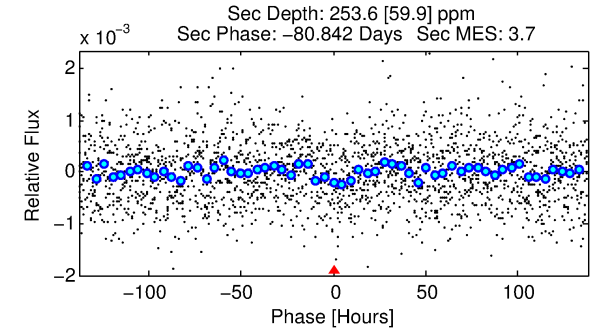
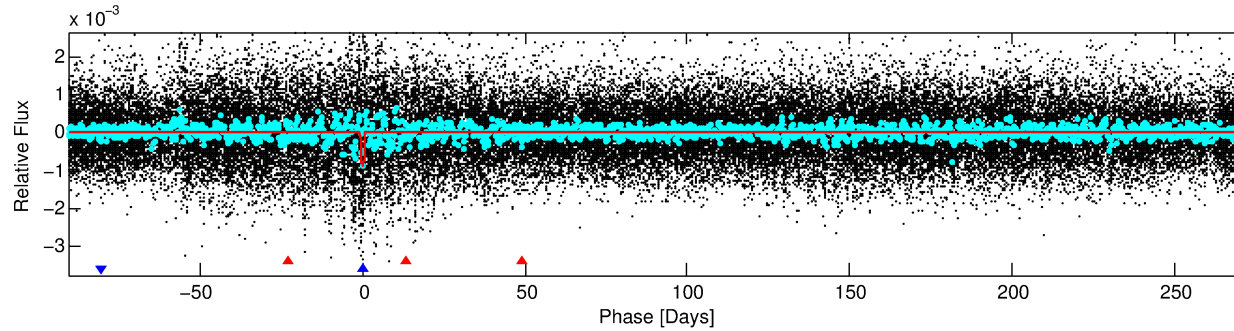
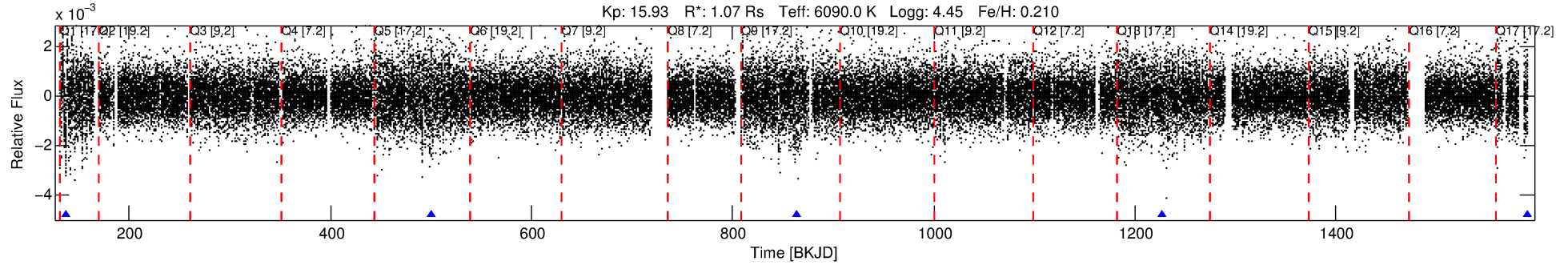
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010274086-02

No Significant Match Found

# DV One-Page Summary

KIC: 10274086 Candidate: 2 of 2 Period: 363.246 d



## DV Fit Results:

Period = 363.24647 [0.01259] d  
Epoch = 137.8851 [0.0279] BKJD  
Rp/R\* = 0.0274 [0.0091]  
a/R\* = 111.58 [164.13]  
b = 0.45 [2.59]  
Seff = 1.28 [0.51]  
Teq = 271 [27] K  
Rp = 3.21 [1.41] Re  
a = 1.0504 [0.2605] AU  
Ag = 14971.30 [11827.33] [1.27σ]  
Teffp = 4640 [832] K [5.24σ]

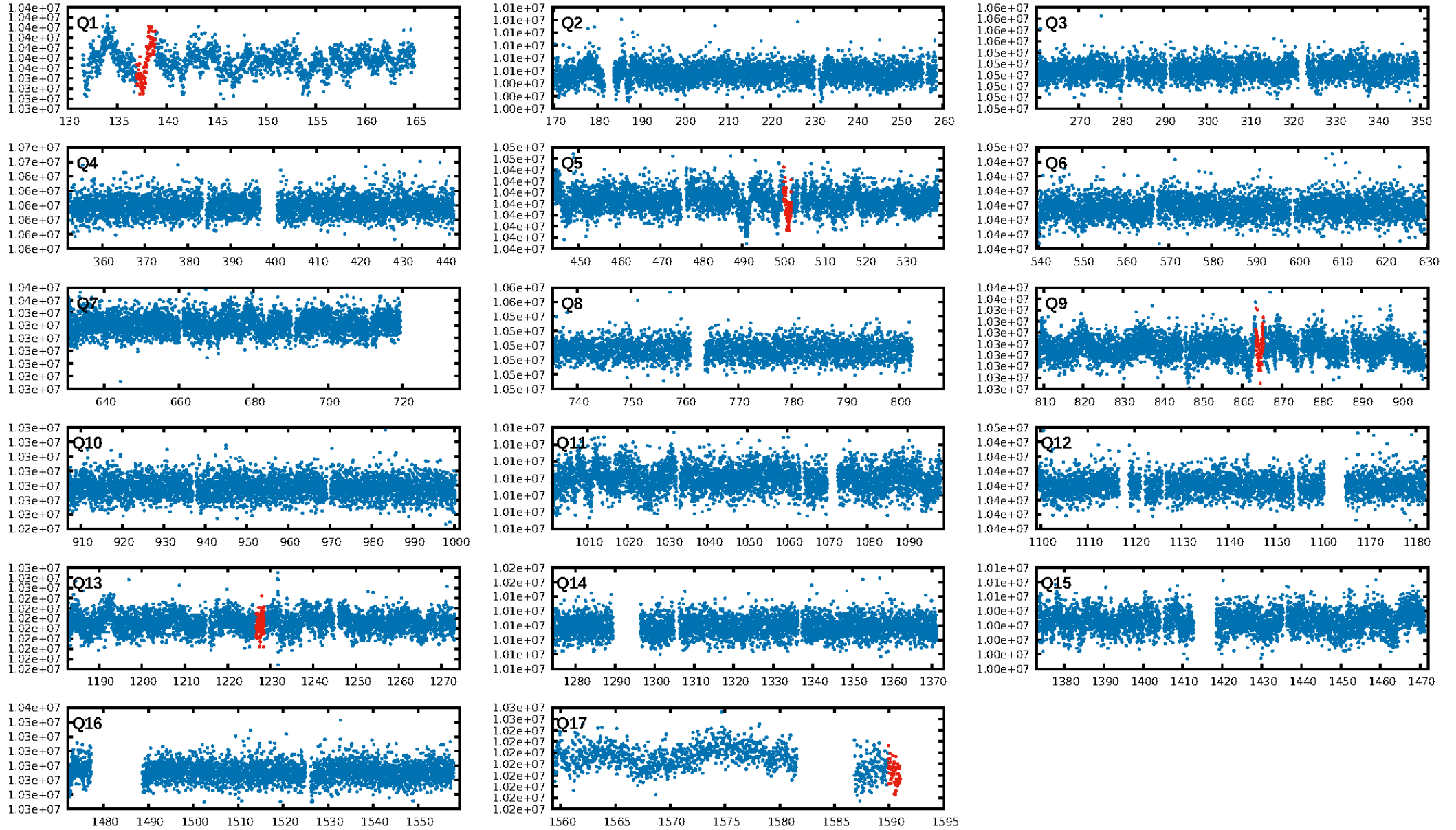
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [214.28σ]  
ModelChiSquare2-sig: 0.7%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 7.06e-10**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -4.281  
Centroid-sig: N/A  
Centroid-so: 1.006 arcsec [0.47σ]  
OotOffset-rm: 2.817 arcsec [2.50σ]  
**KicOffset-rm: 2.885 arcsec [3.24σ]**  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

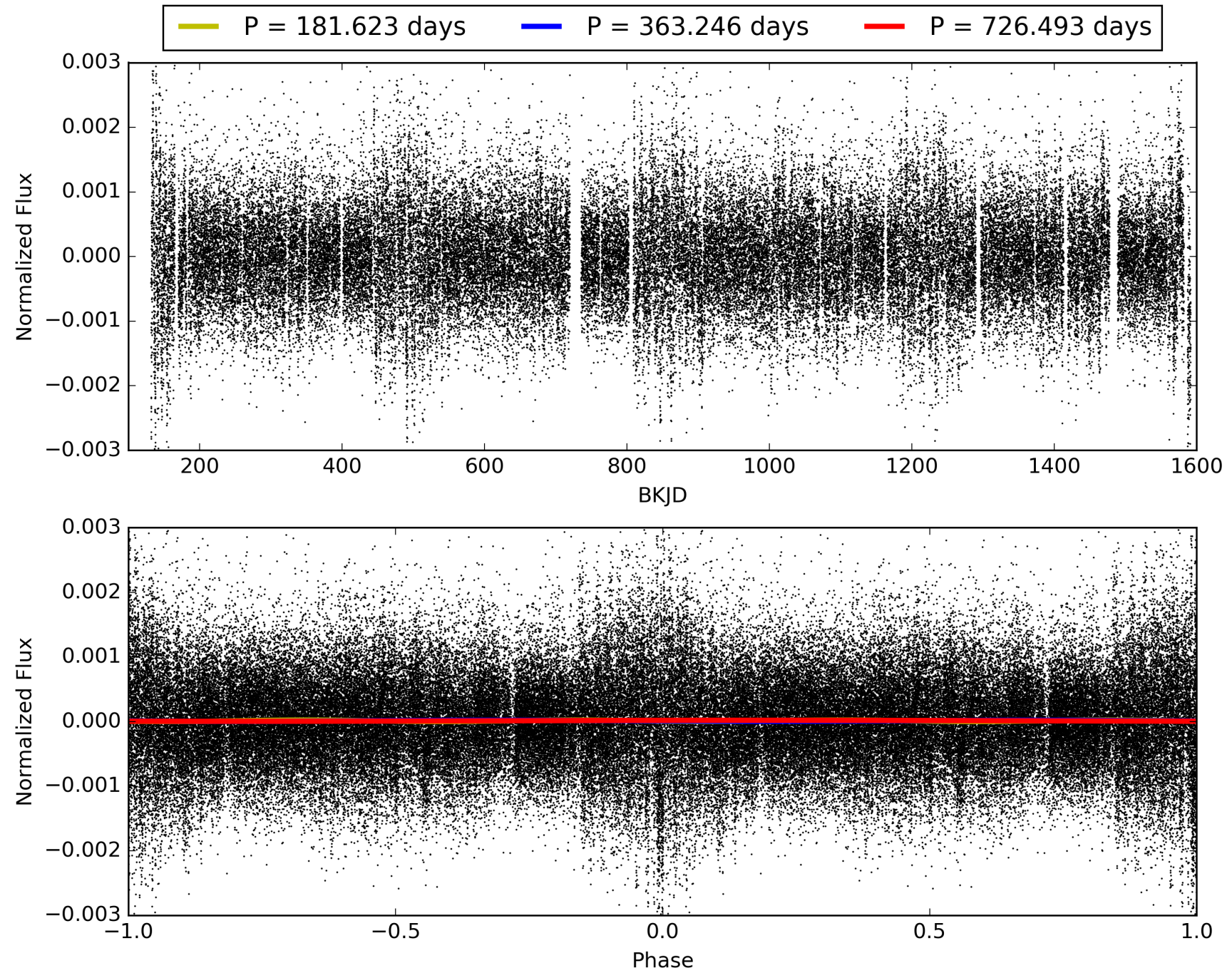
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:48:57 Z

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

# TCE 010274086-02, PDC Light Curves

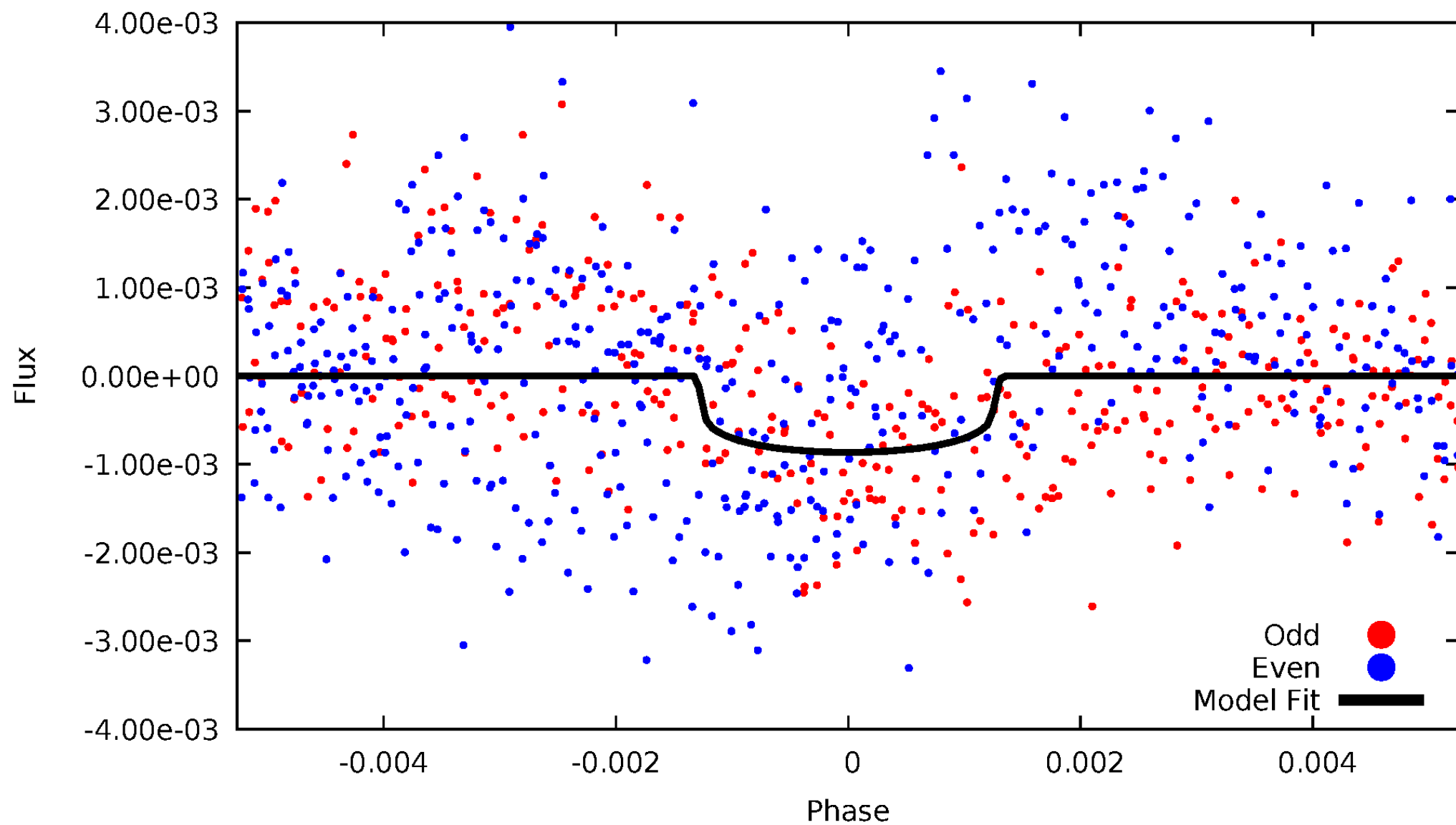


TCE 010274086-02



# DV Odd/Even

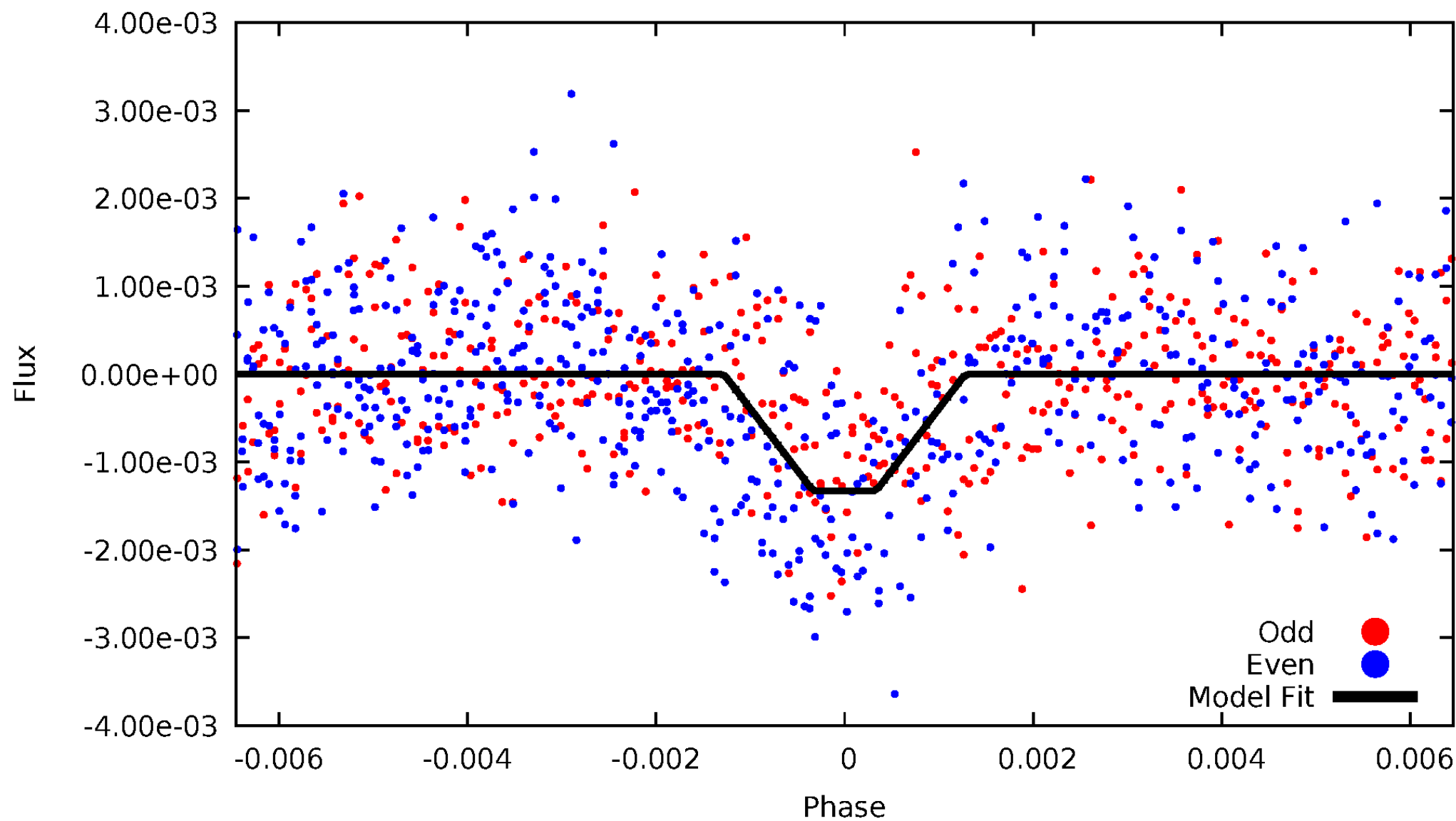
TCE 010274086-02





# ALT Odd/Even

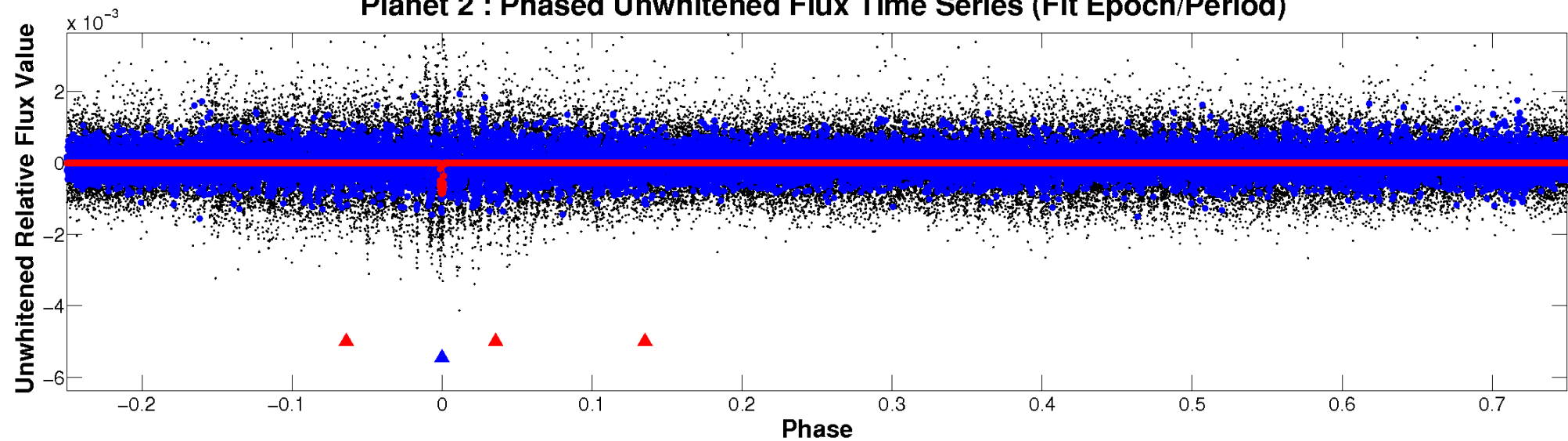
TCE 010274086-02



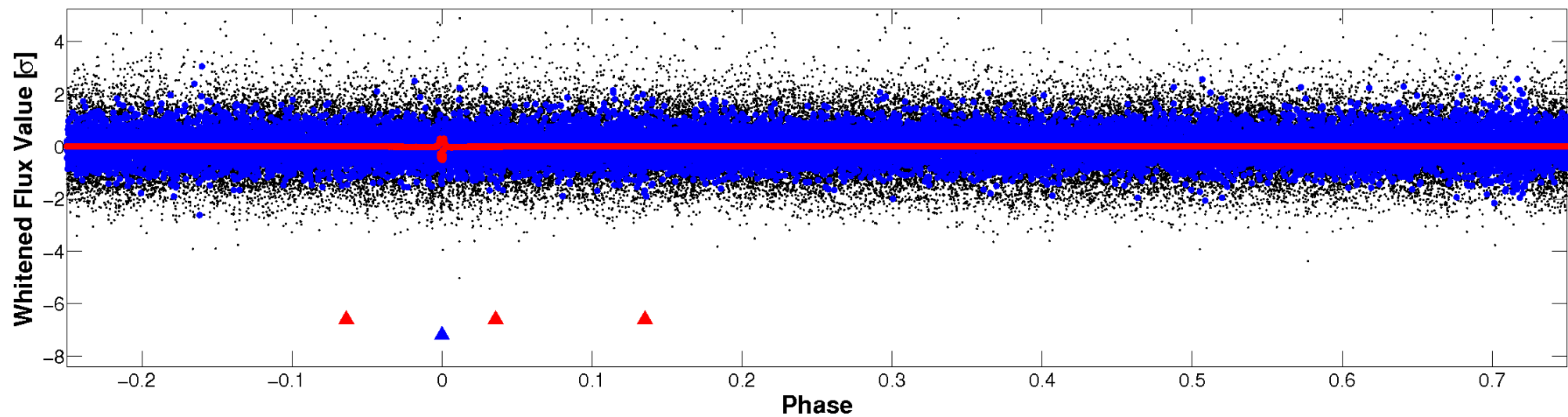


# Non-Whitened Vs. Whitened Light Curve

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

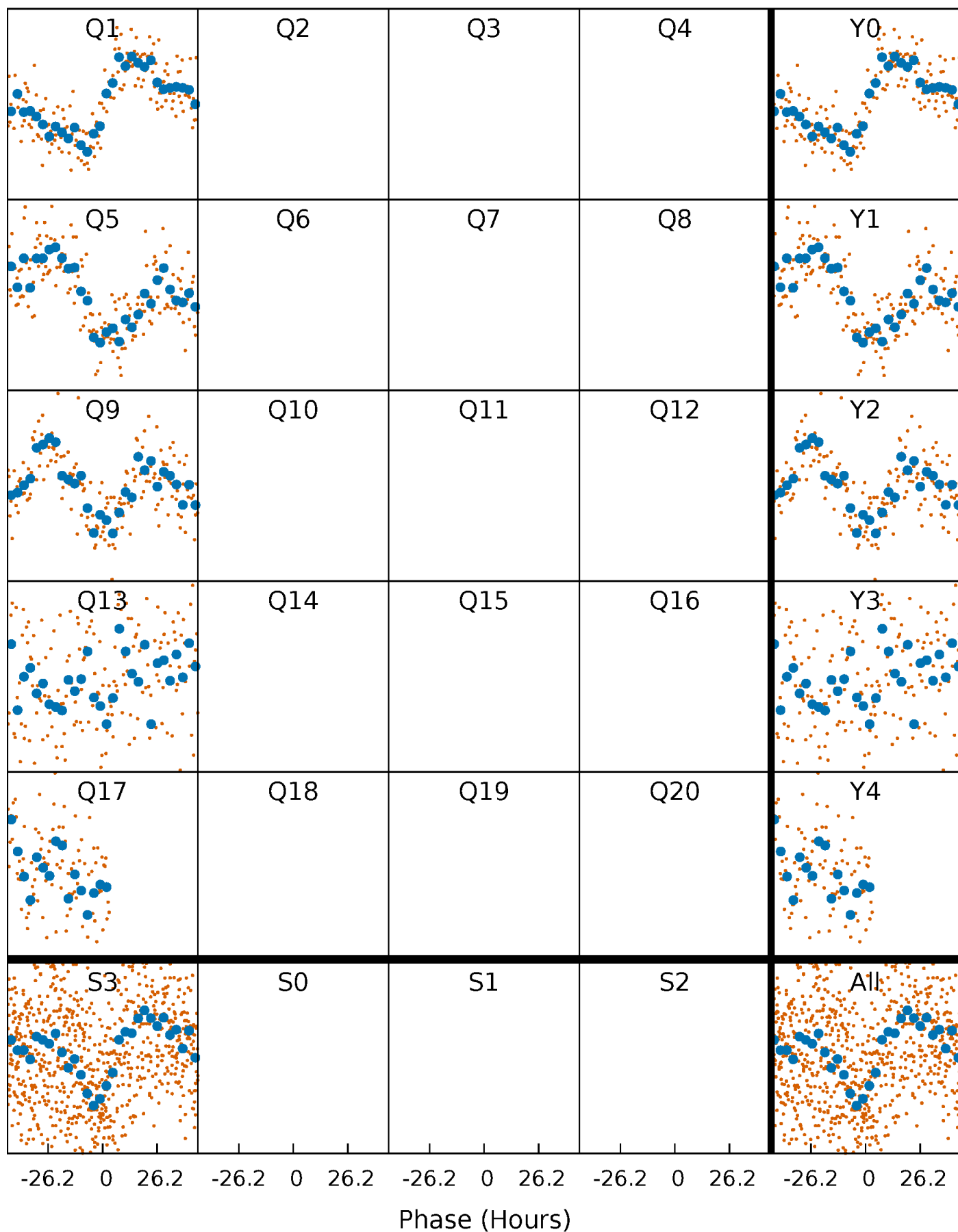


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



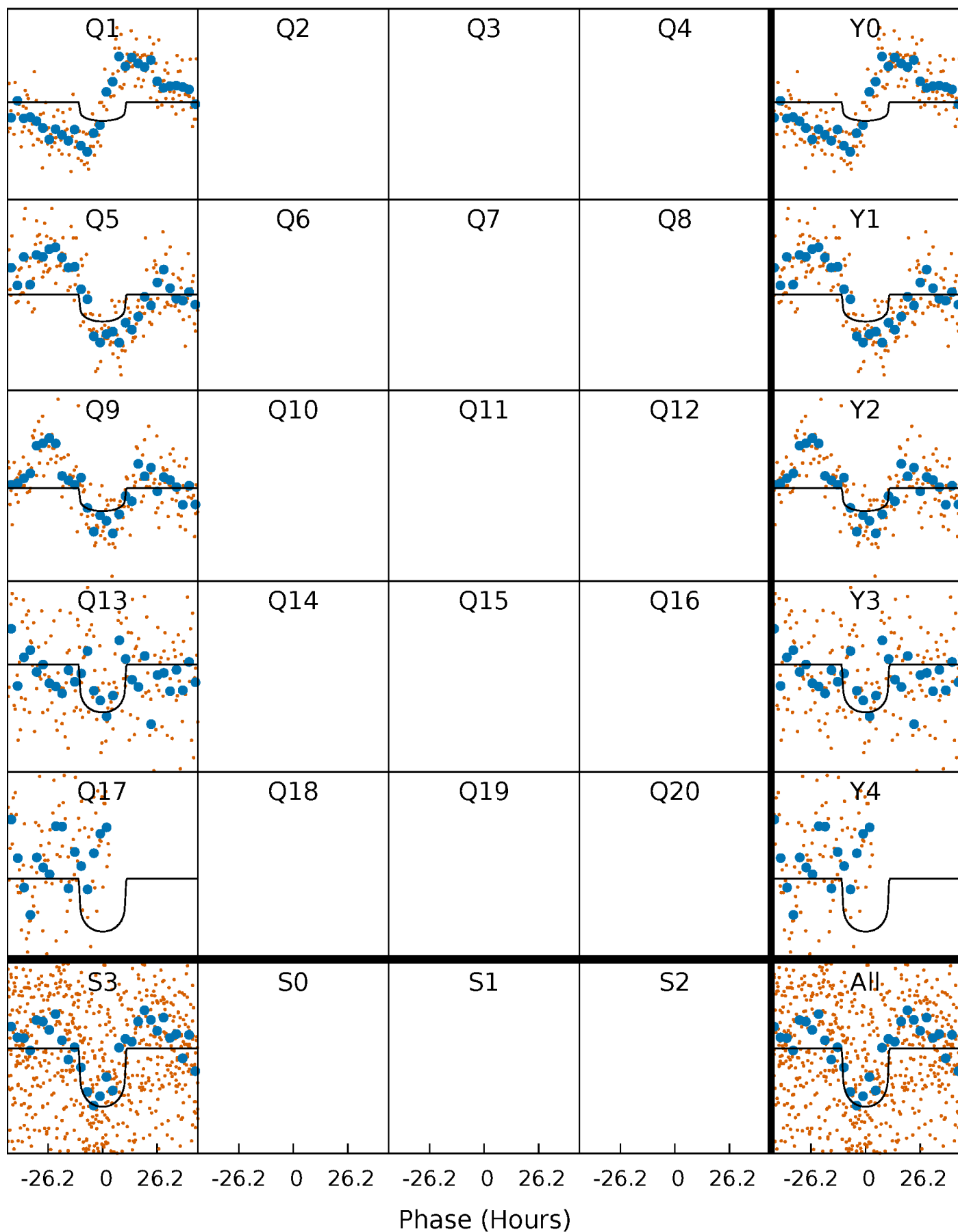
# PDC Quarter-Phased Transit Curves

TCE 010274086-02     $P=363.246471$  Days     $T_0=137.885090$  (BKJD)



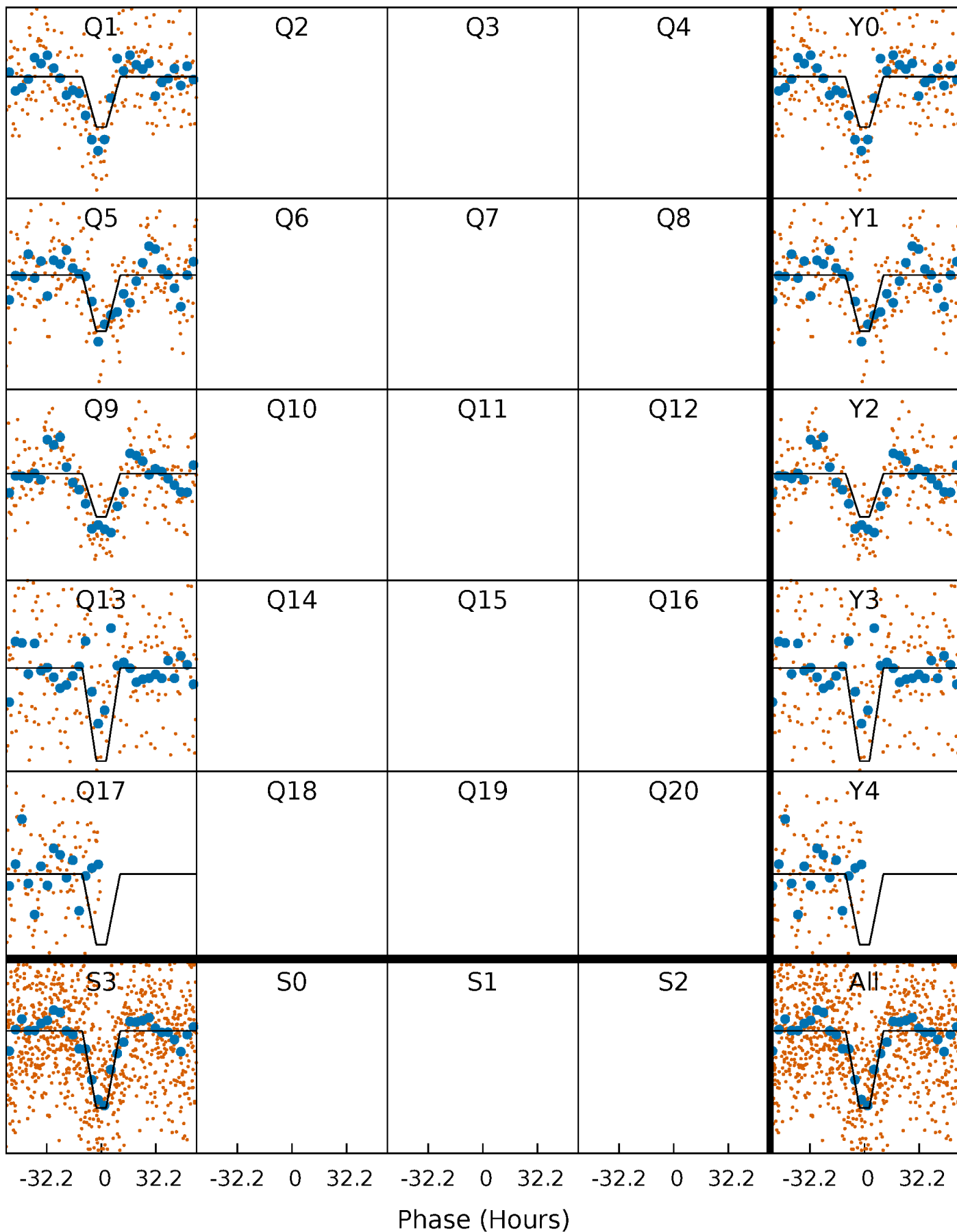
# DV Quarter-Phased Transit Curves

TCE 010274086-02     $P=363.246471$  Days     $T_0=137.885090$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

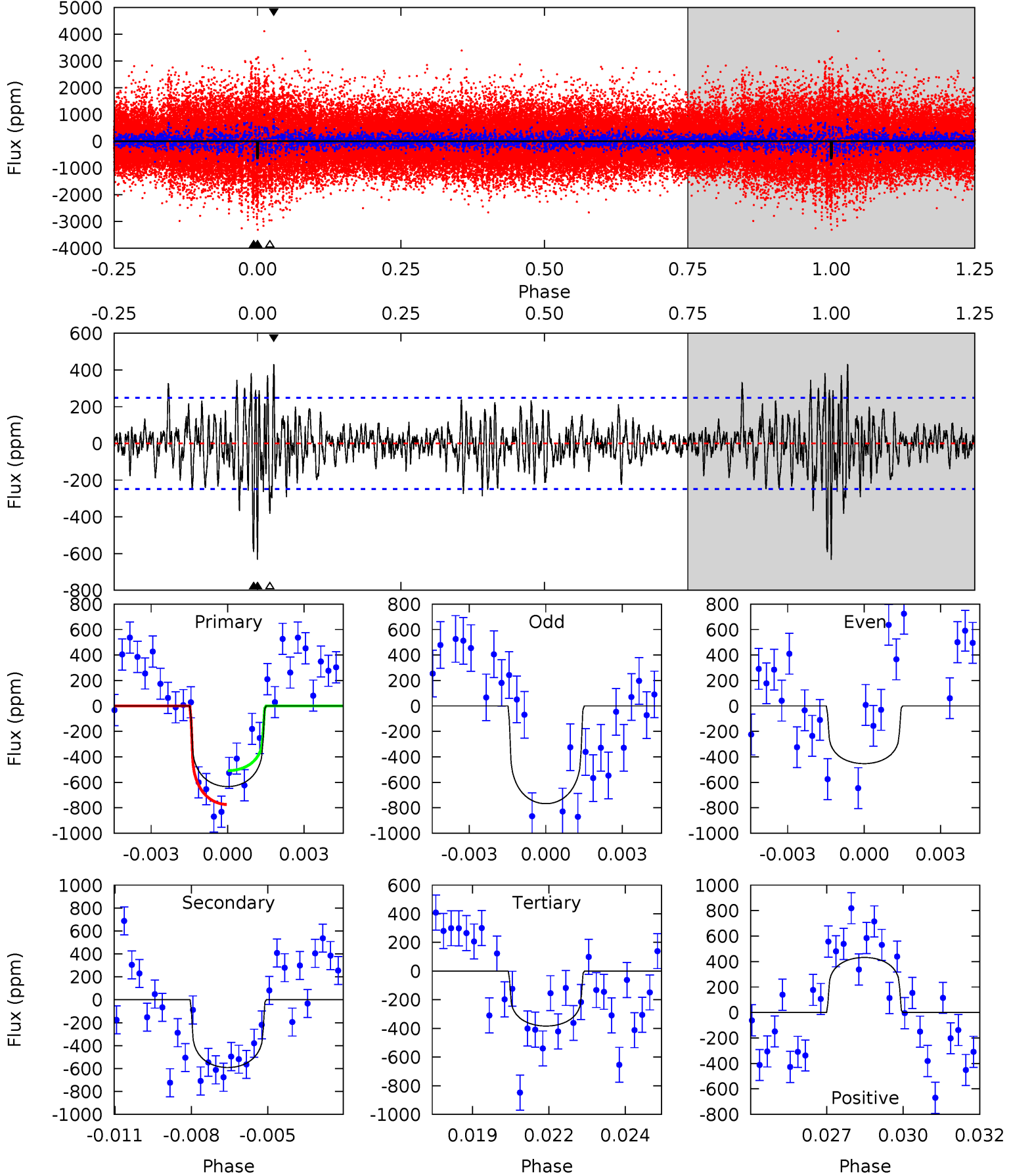
TCE 010274086-02     $P=363.329130$  Days     $T_0=137.715476$  (BKJD)



# DV Model-Shift Uniqueness Test

010274086-02, P = 363.246471 Days, E = 137.885090 Days

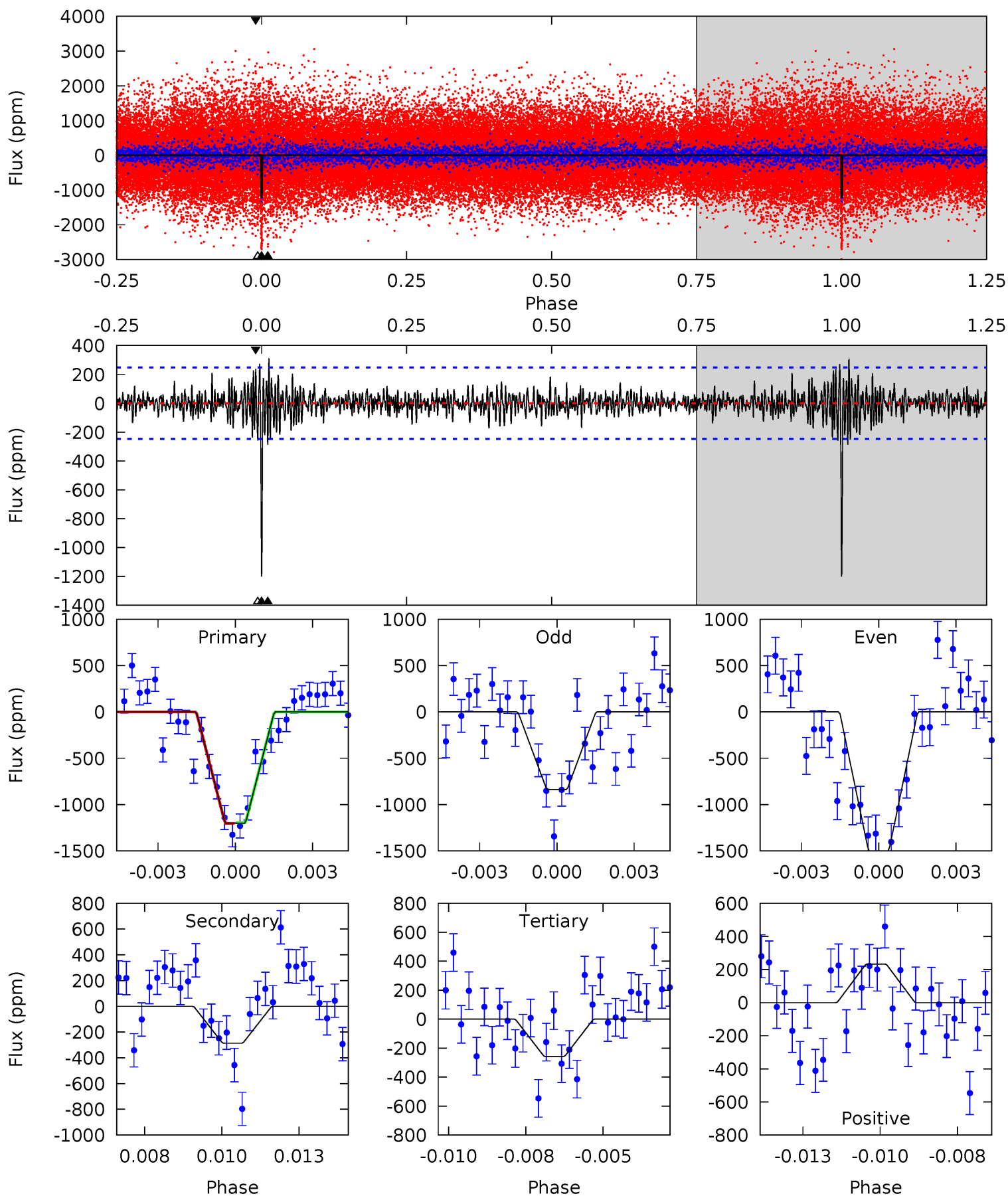
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	12.5	8.14	9.16	5.27	3.00	2.04	5.30	4.27	4.40	3.37	3.30	1.49	0.41	2.80



# Alt Model-Shift Uniqueness Test

010274086-02, P = 363.329130 Days, E = 137.715476 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
25.6	6.10	5.50	4.96	5.28	3.02	1.31	20.1	20.6	0.60	1.14	7.01	0.90	0.20	0.06





### Stellar Parameters For KIC 010274086

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6090^{+190}_{-232}$	$4.447^{+0.050}_{-0.200}$	$0.210^{+0.150}_{-0.300}$	$1.071^{+0.313}_{-0.104}$	$1.173^{+0.125}_{-0.166}$	$1.345^{+0.358}_{-0.683}$
	+3%/-4%	+1%/-4%	+71%/-143%	+29%/-10%	+11%/-14%	+27%/-51%
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 010274086-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-591 \pm 47$	$3.31^{+1.24}_{-1.08}$	$388^{+28}_{-20}$	$5797^{+1220}_{-750}$	$31763^{+39005}_{-14761}$
Alt.	$-286 \pm 47$	$4.47^{+1.19}_{-1.12}$	$387^{+27}_{-19}$	$4340^{+522}_{-354}$	$8396^{+6710}_{-3124}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

## DV Centroid Data

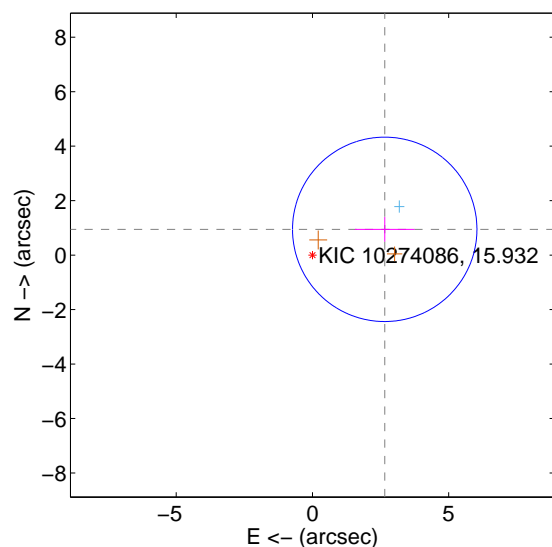
Supplemental centroid analysis for 010274086-02. Kepler magnitude: 15.93. Transit SNR 6.87

There are 1 quarters with good PRF difference image offsets

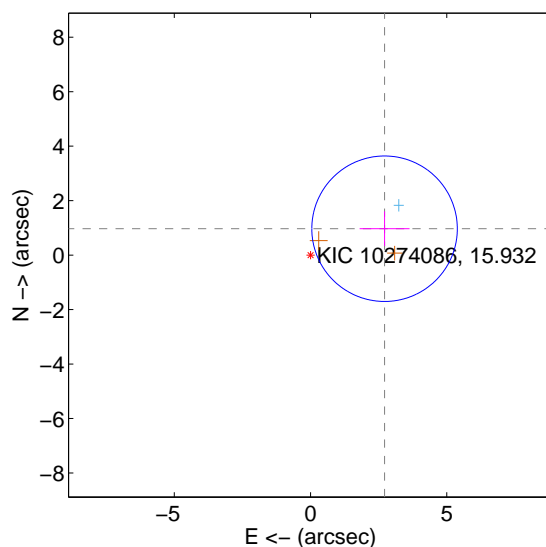
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.817 \pm 1.128$	2.50	$-2.654 \pm 1.093$	$0.946 \pm 0.451$
PRF-fit source offset from KIC position	<b><math>2.885 \pm 0.890</math></b>	<b>3.24</b>	$-2.718 \pm 0.918$	$0.968 \pm 0.636$
photometric centroid source offset	$1.01 \pm 2.13$	0.47	$0.56 \pm 2.31$	$0.84 \pm 2.05$

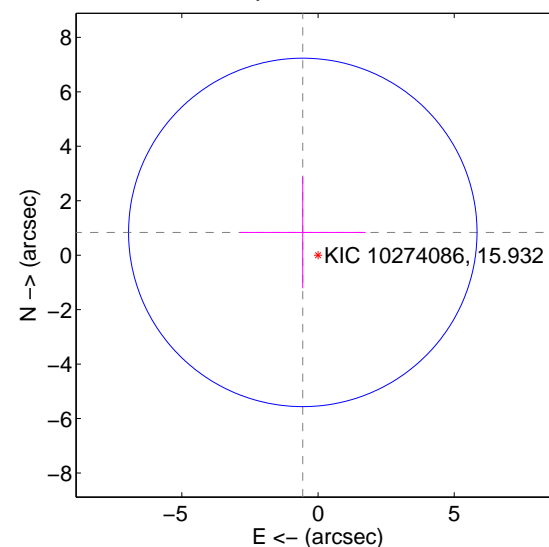
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

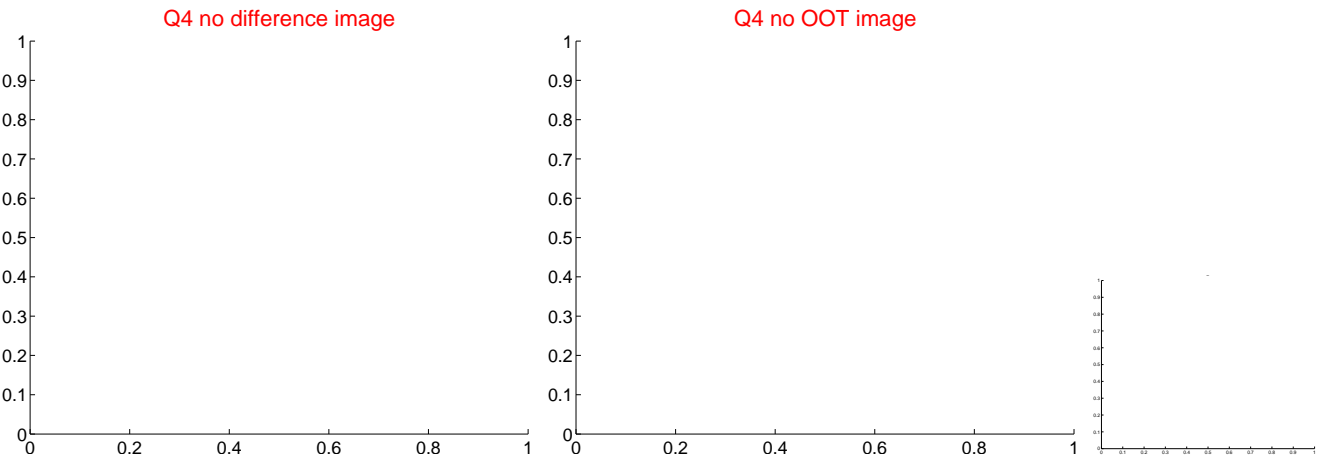
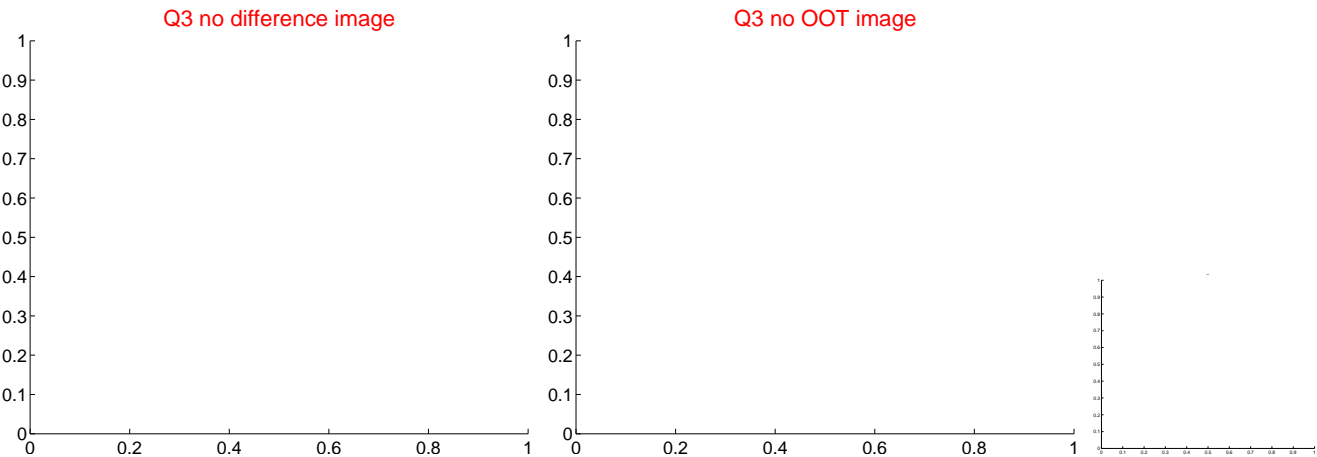
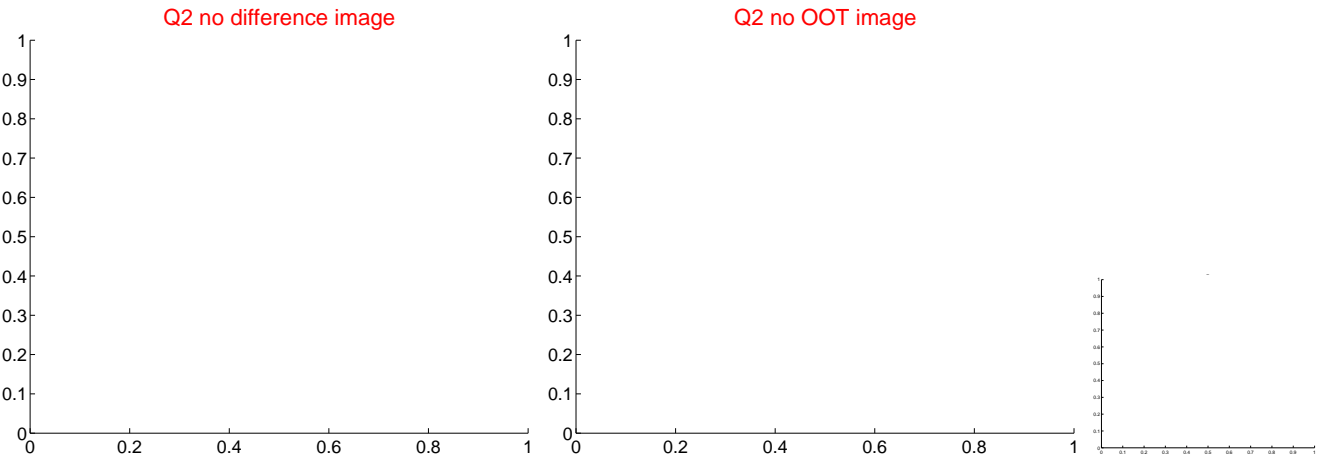
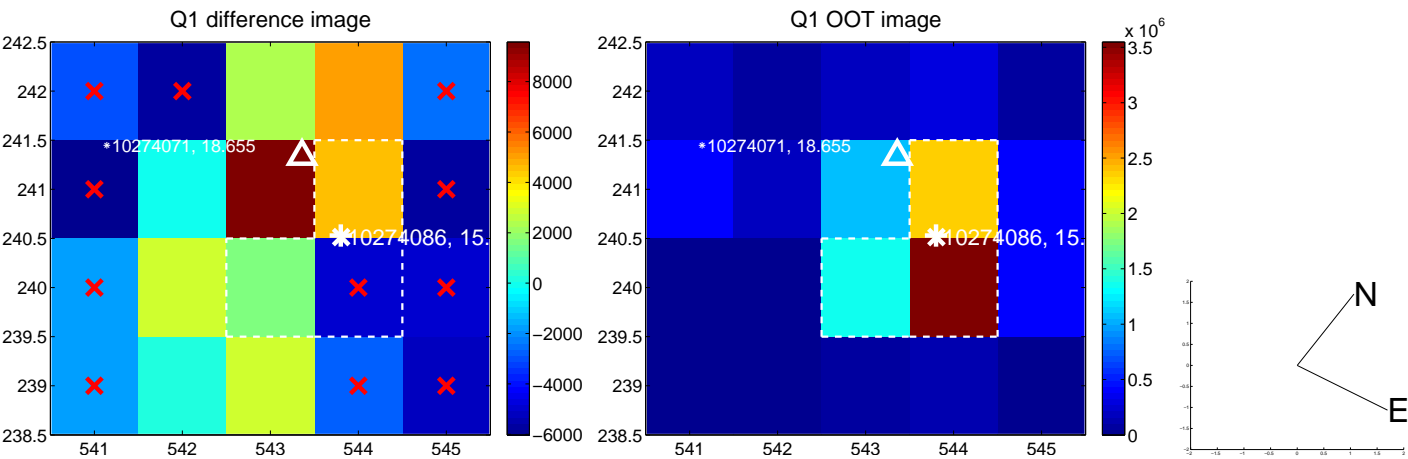


offset from photometric centroids

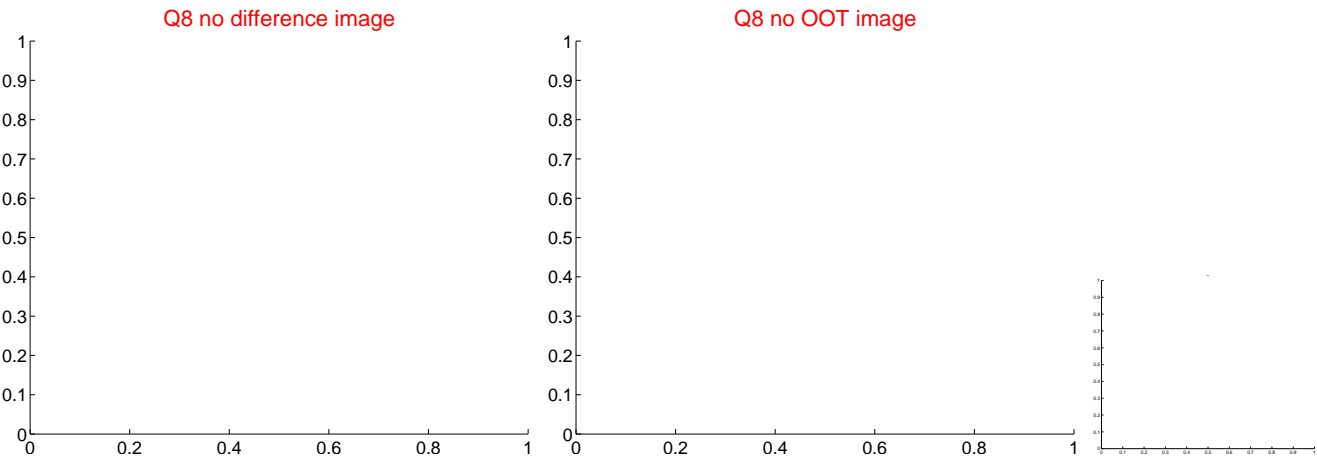
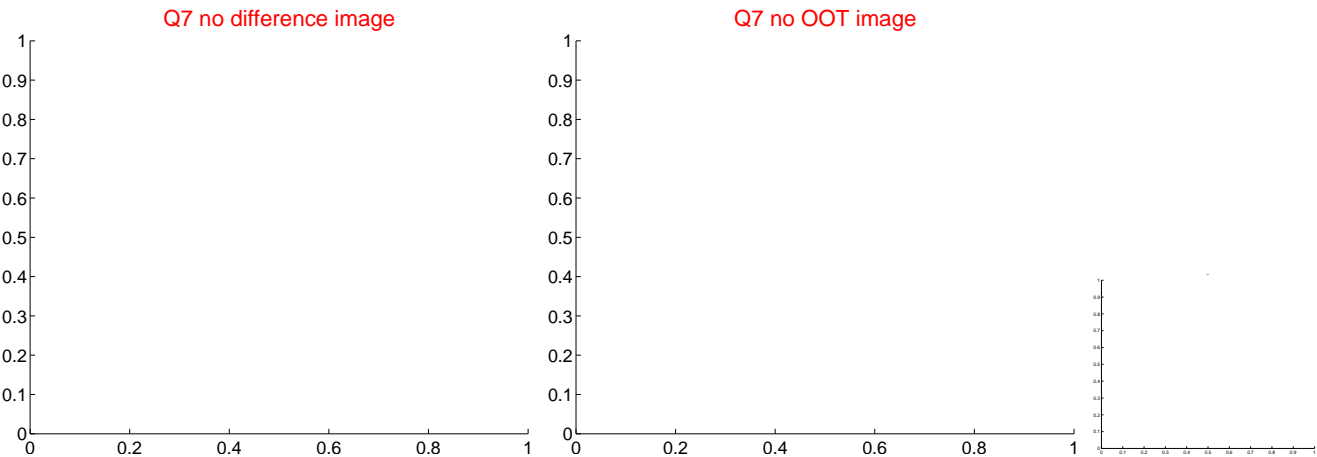
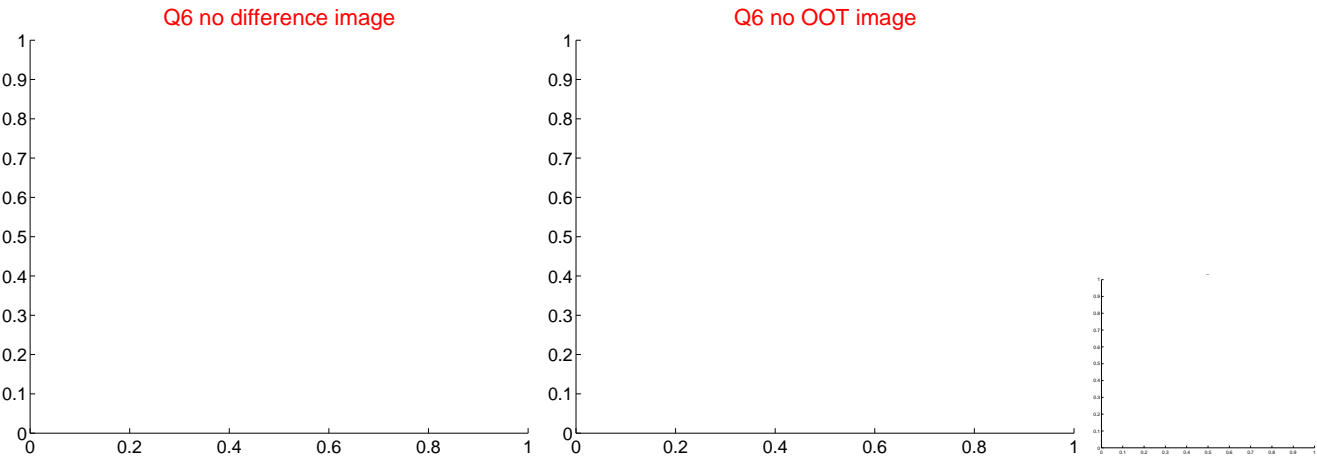
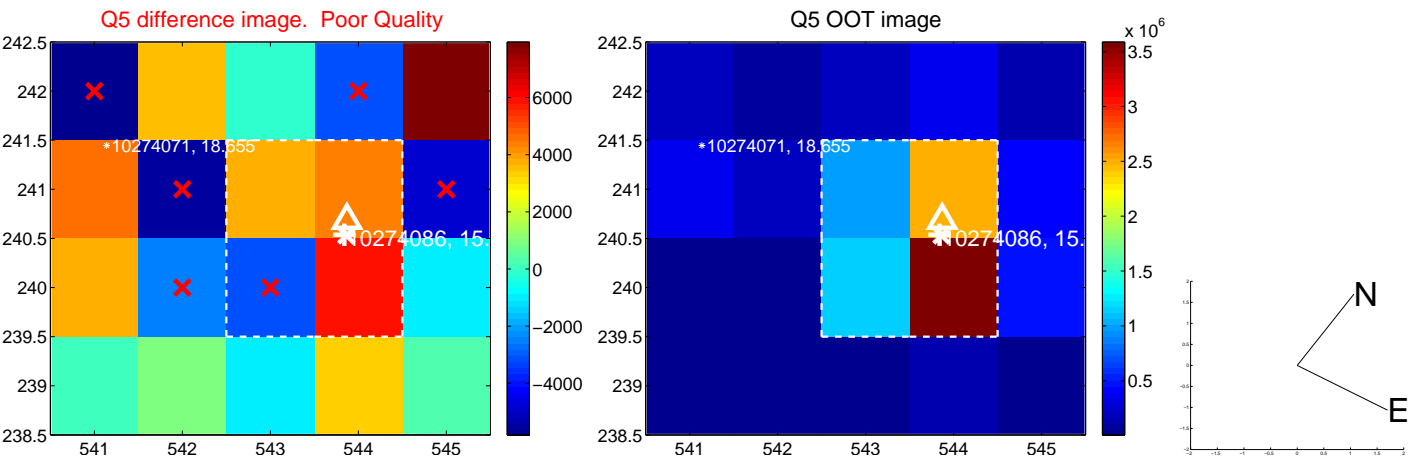


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

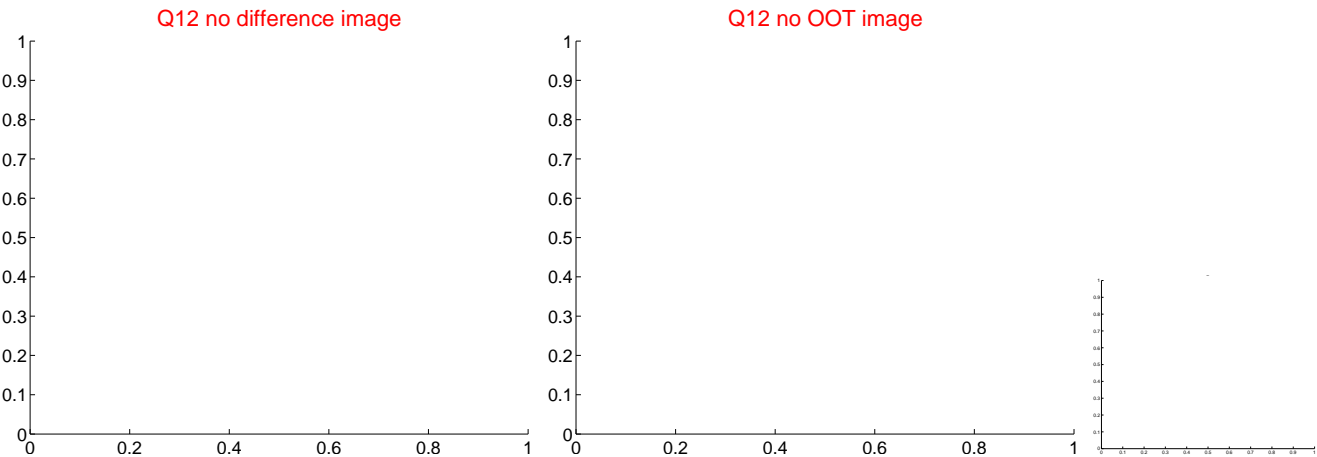
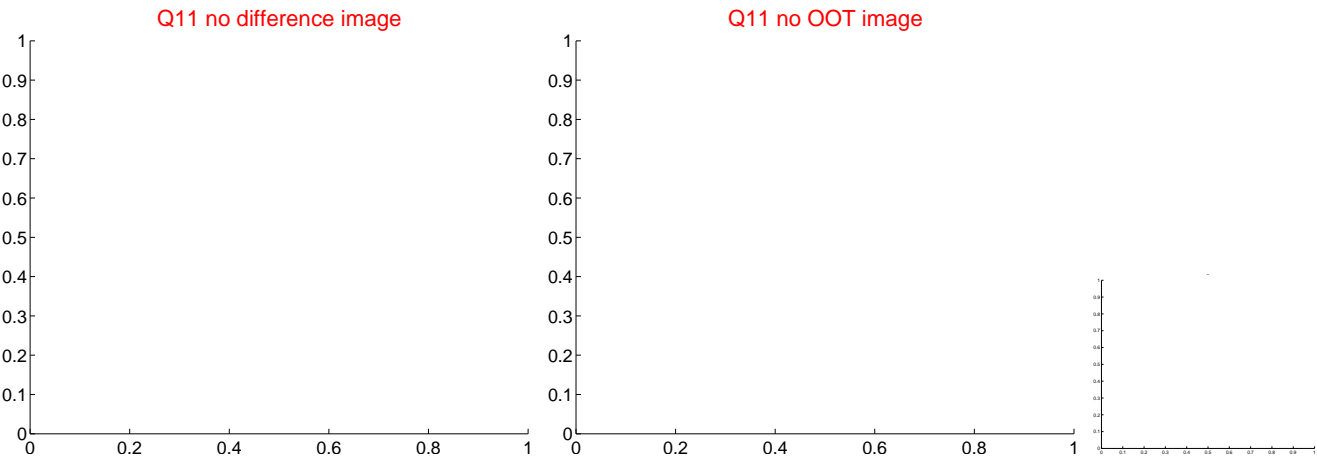
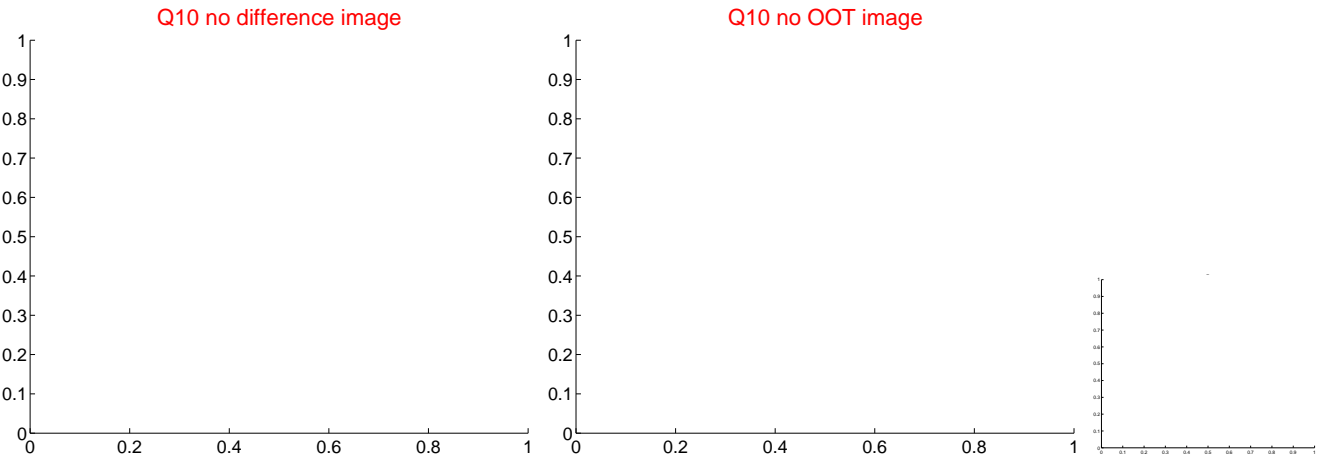
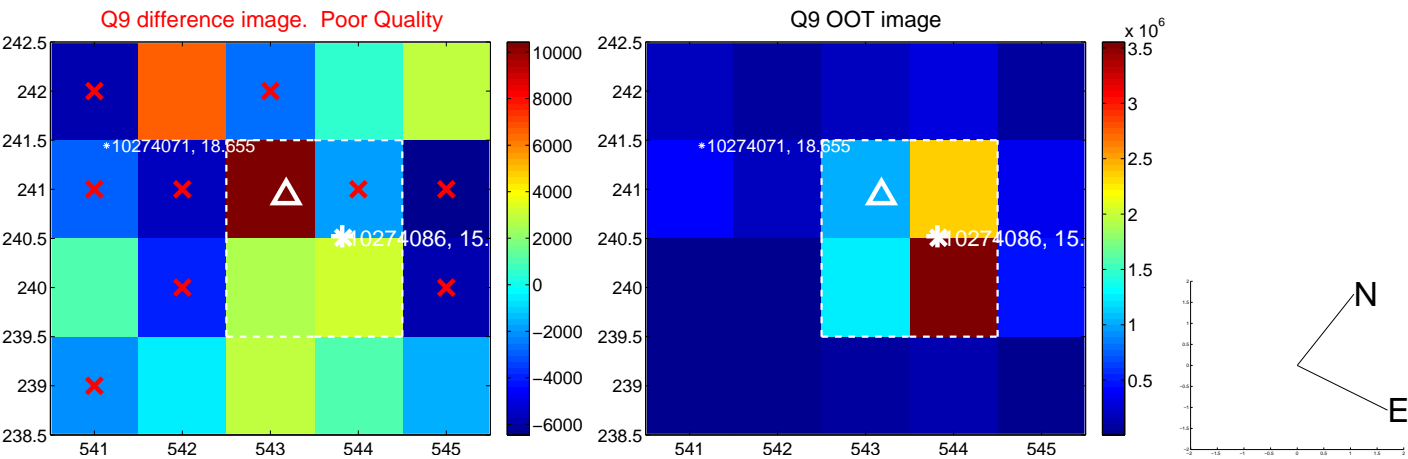
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



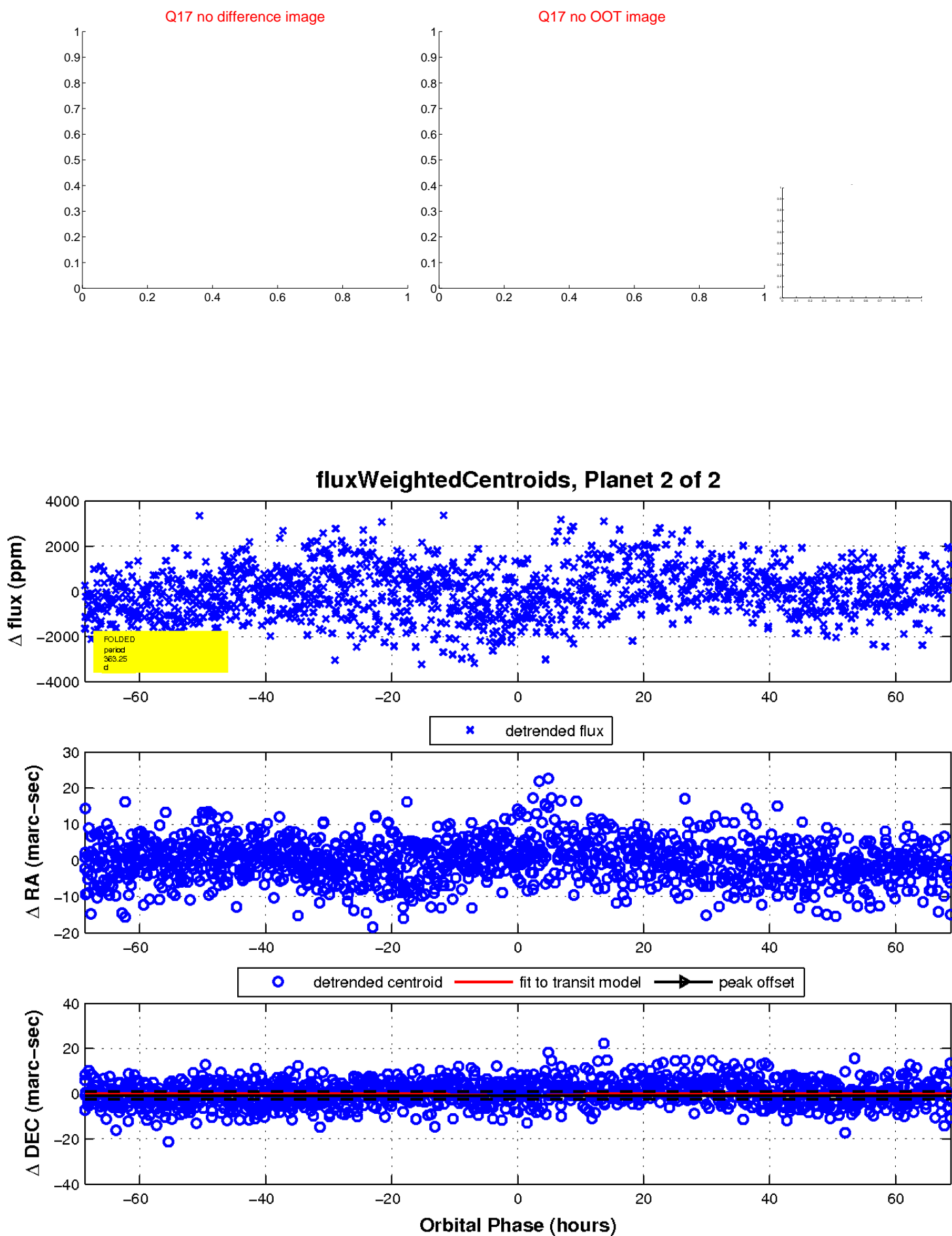
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

