

# KIC 010467338

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010467338-01	OBS	No	366.420266	165.180064	1201.7	26.426	7.4	7.8	0.89	5697	3.89	0.74
010467338-02	OBS	No	247.585921	170.541436	414.7	16.022	7.3	4.6	0.89	5697	1.96	1.26

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010467338-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_MEAS
010467338-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

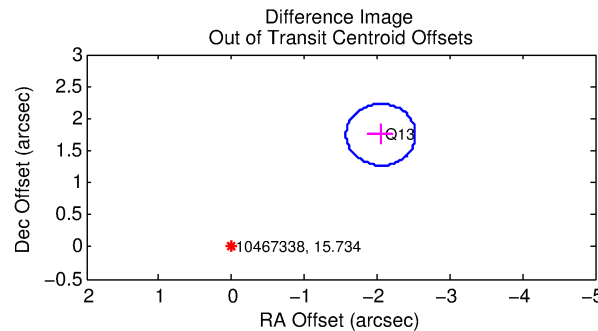
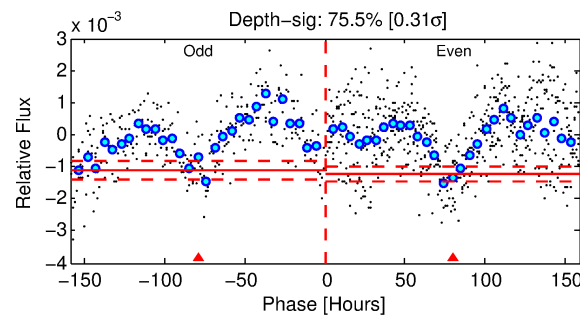
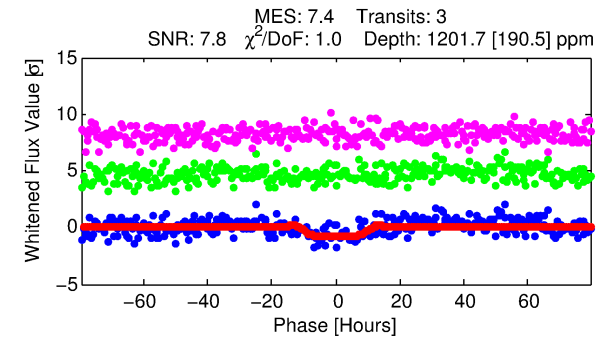
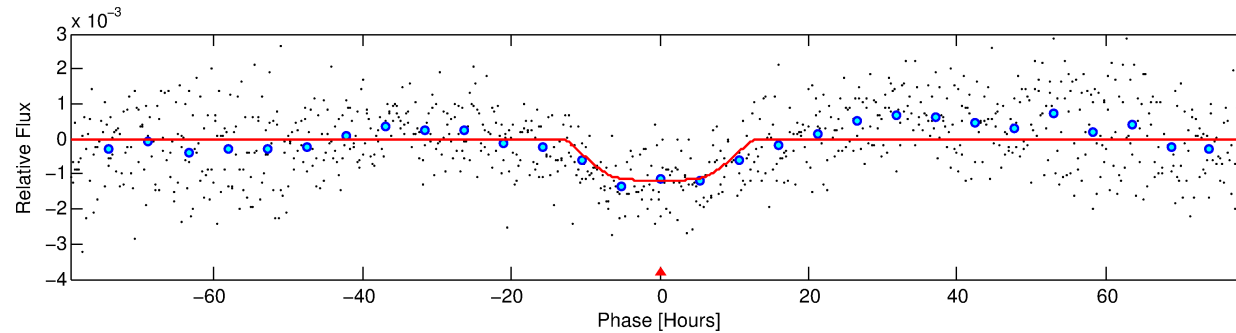
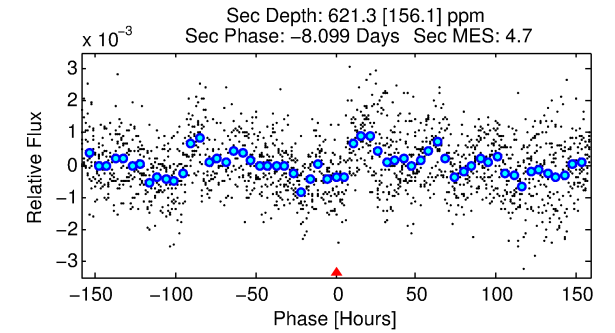
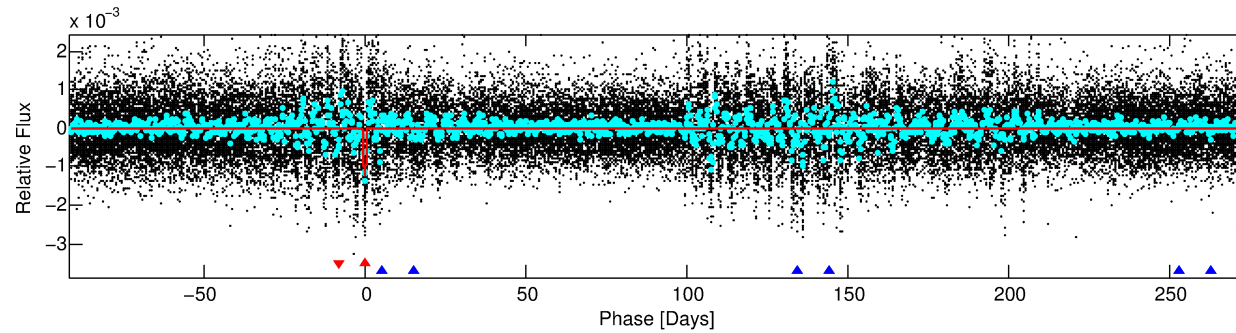
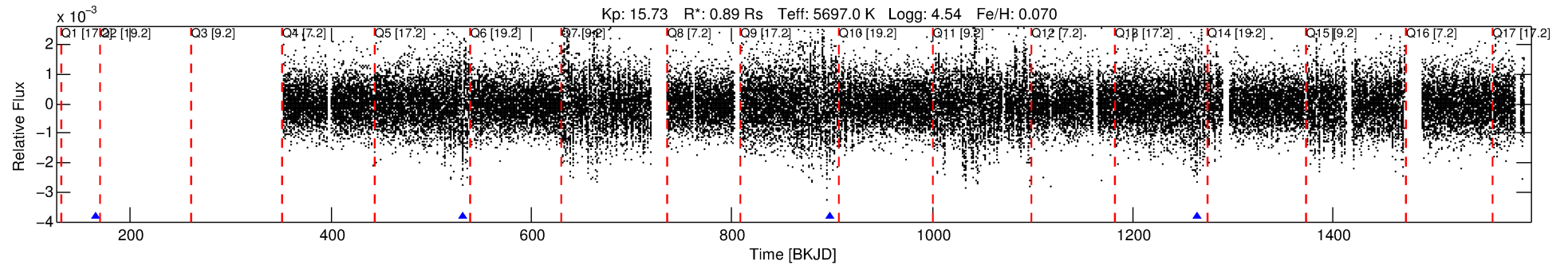
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010467338-01

No Significant Match Found

# DV One-Page Summary

KIC: 10467338 Candidate: 1 of 2 Period: 366.420 d



## DV Fit Results:

Period = 366.42027 [0.04172] d  
Epoch = 165.1801 [0.0906] BKJD  
Rp/R\* = 0.0399 [0.0042]  
a/R\* = 47.28 [10.19]  
b = 0.94 [0.03]  
Seff = 0.75 [0.30]  
Teq = 237 [24] K  
Rp = 3.89 [1.22] Re  
a = 1.0037 [0.2567] AU  
Ag = 22805.35 [11467.14] [1.99σ]  
Teff = 4502 [399] K [10.68σ]

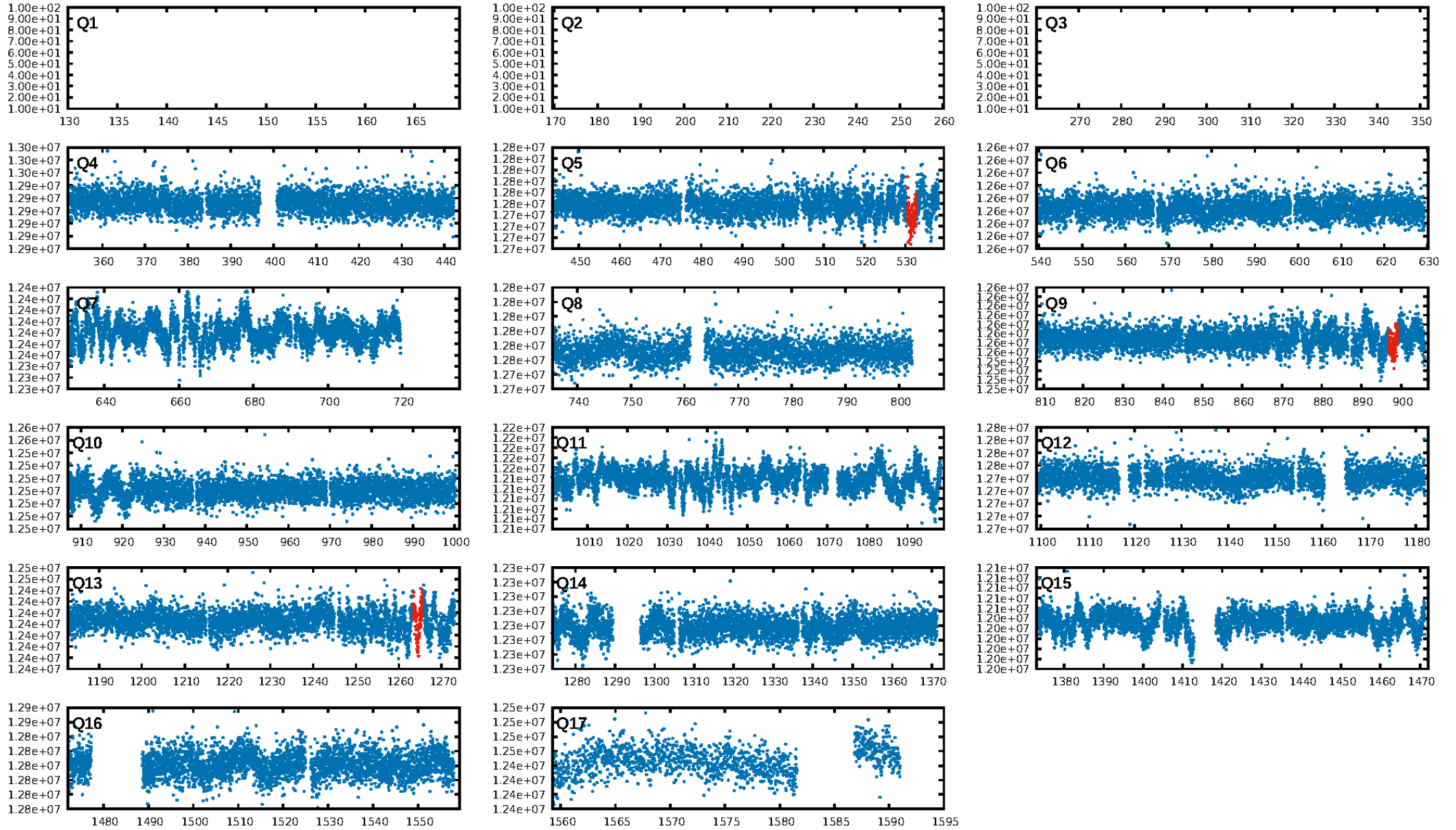
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [92.29σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.0%  
ModelChiSquareGoF-sig: 100.0%  
**Bootstrap-pfa: 2.11e-08**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.3932**  
Centroid-sig: 75.3%  
Centroid-so: 0.937 arcsec [0.63σ]  
**OotOffset-rm: 2.693 arcsec [16.89σ]**  
**KicOffset-rm: 2.830 arcsec [17.97σ]**  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

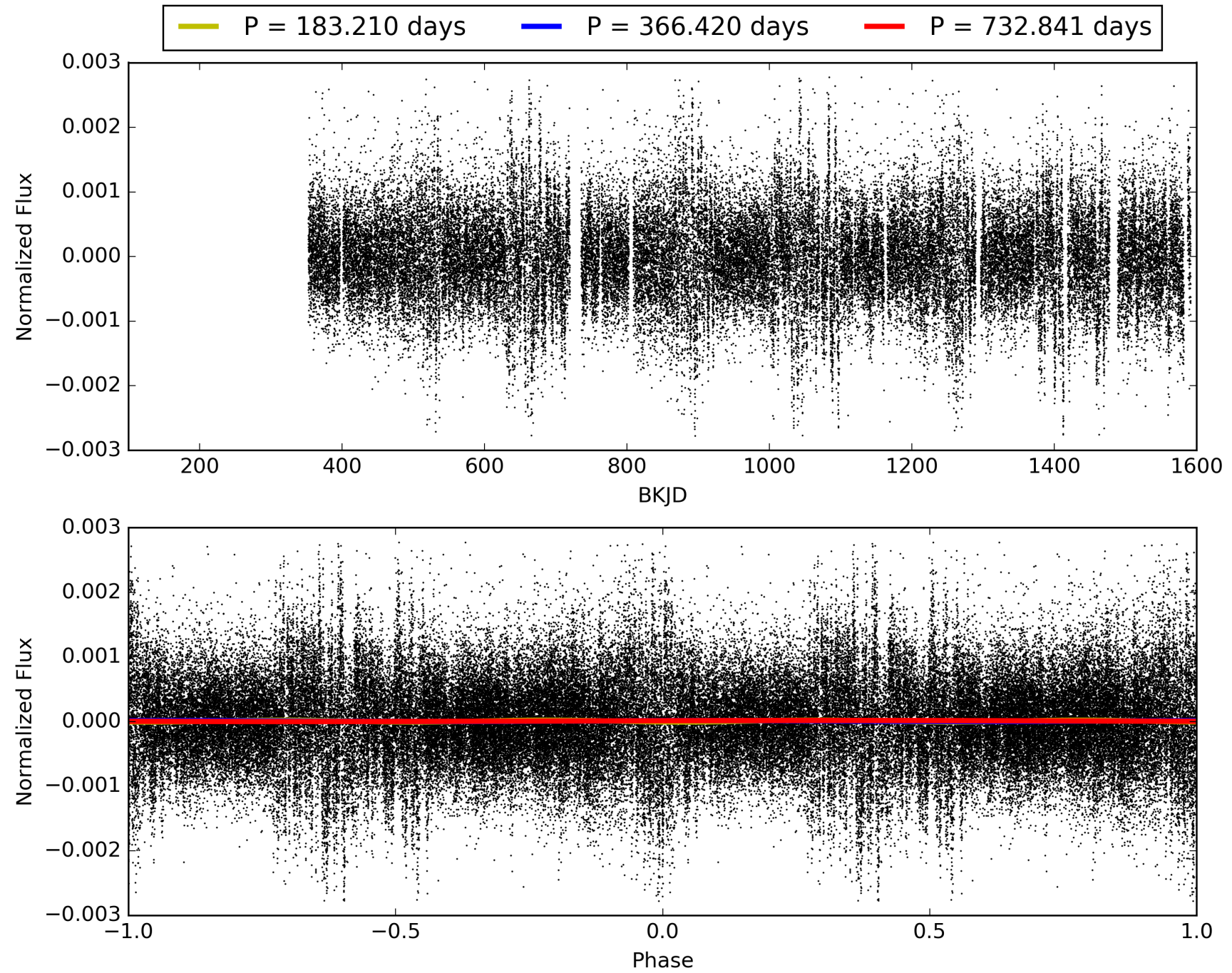
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:36:56 Z

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

# TCE 010467338-01, PDC Light Curves

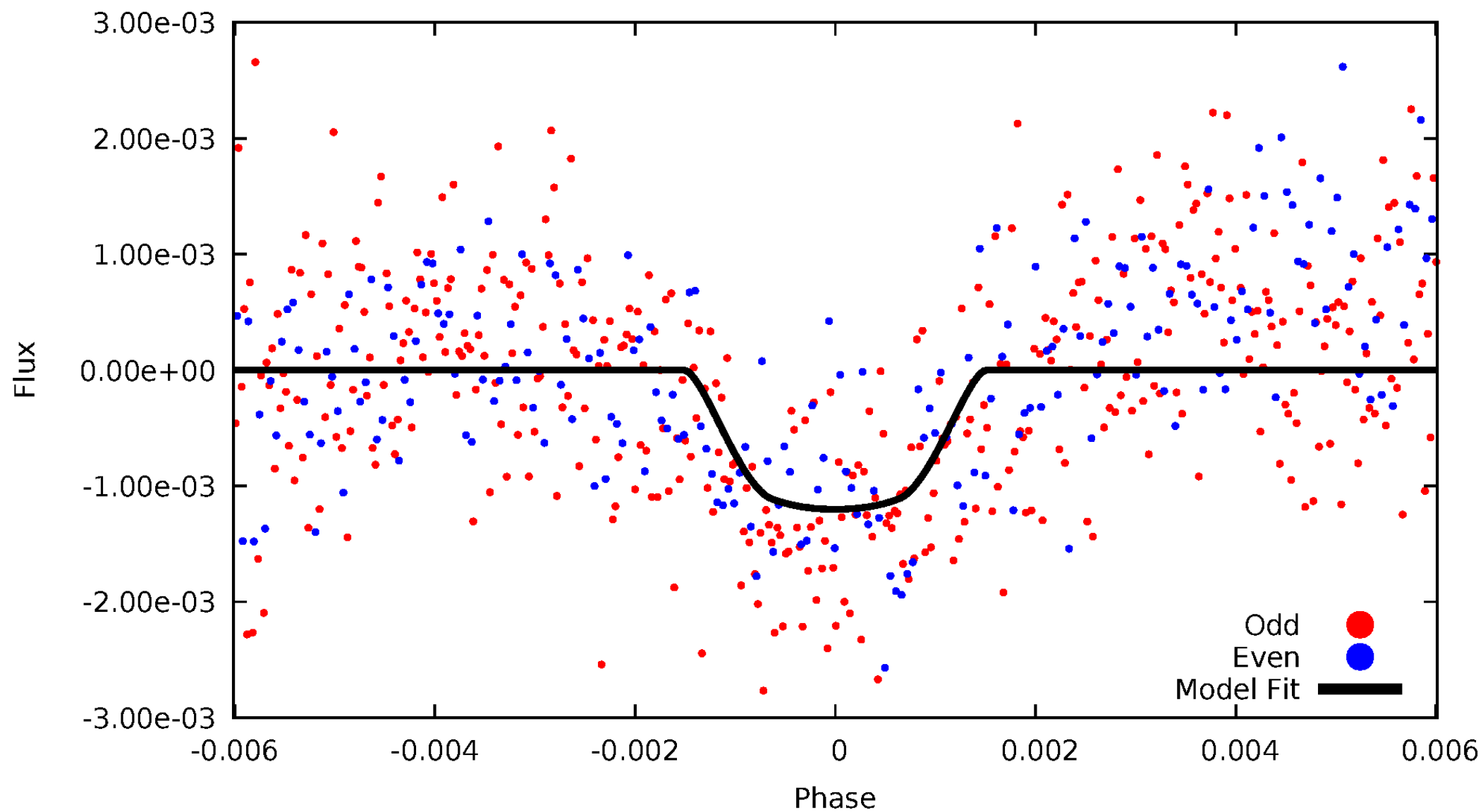


TCE 010467338-01



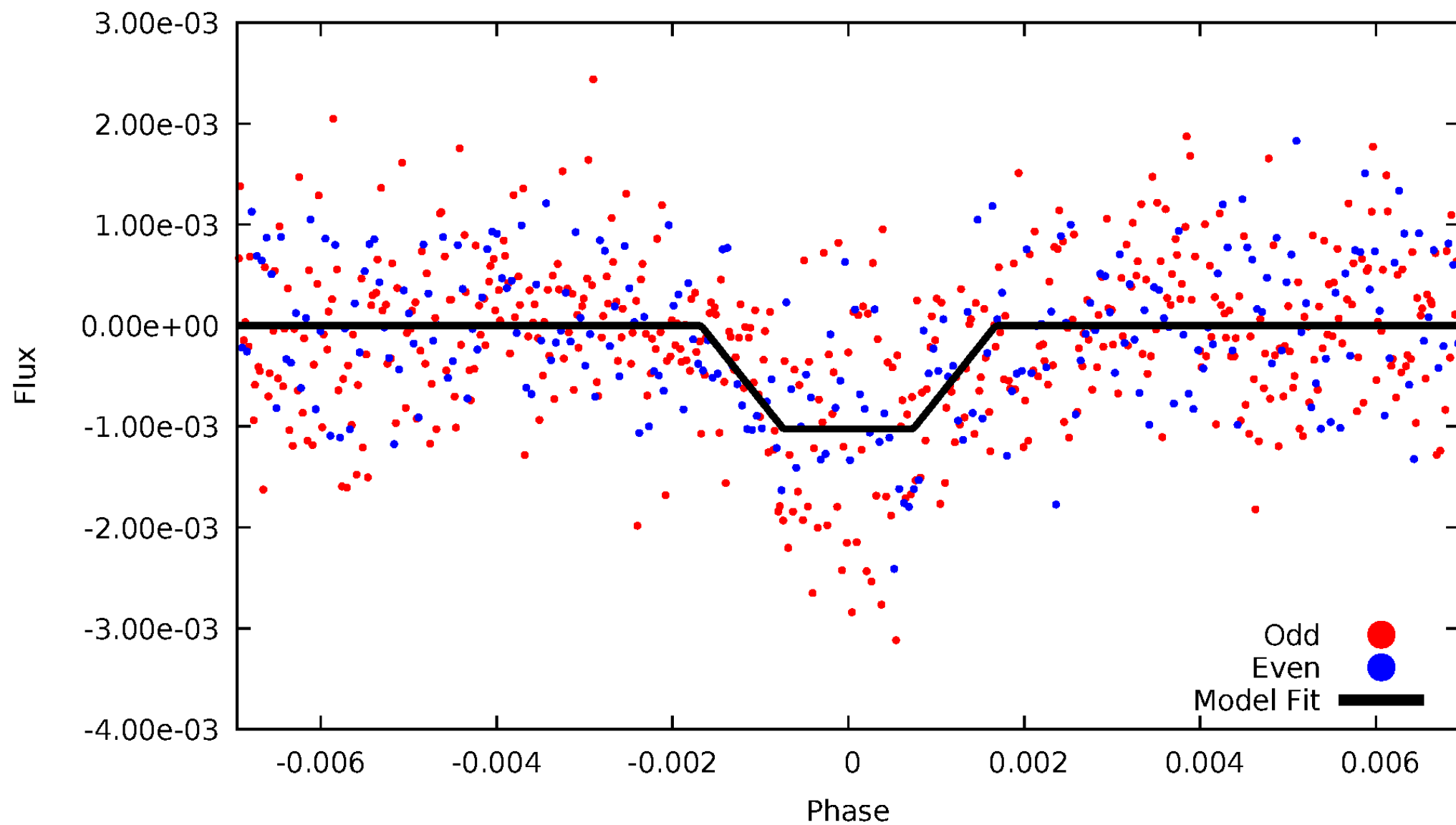
# DV Odd/Even

TCE 010467338-01



# ALT Odd/Even

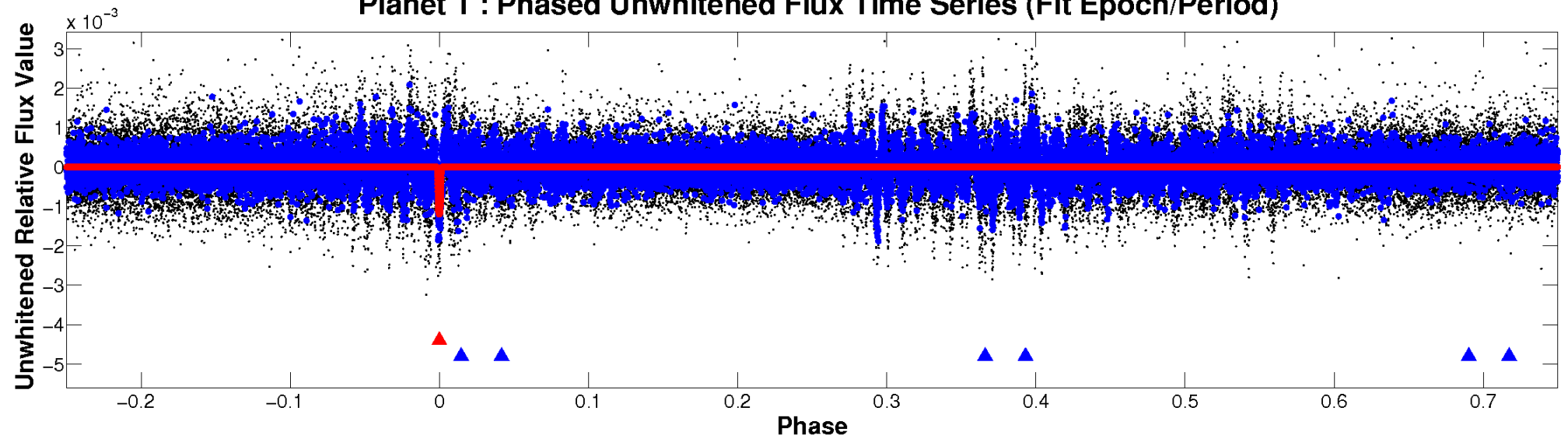
TCE 010467338-01



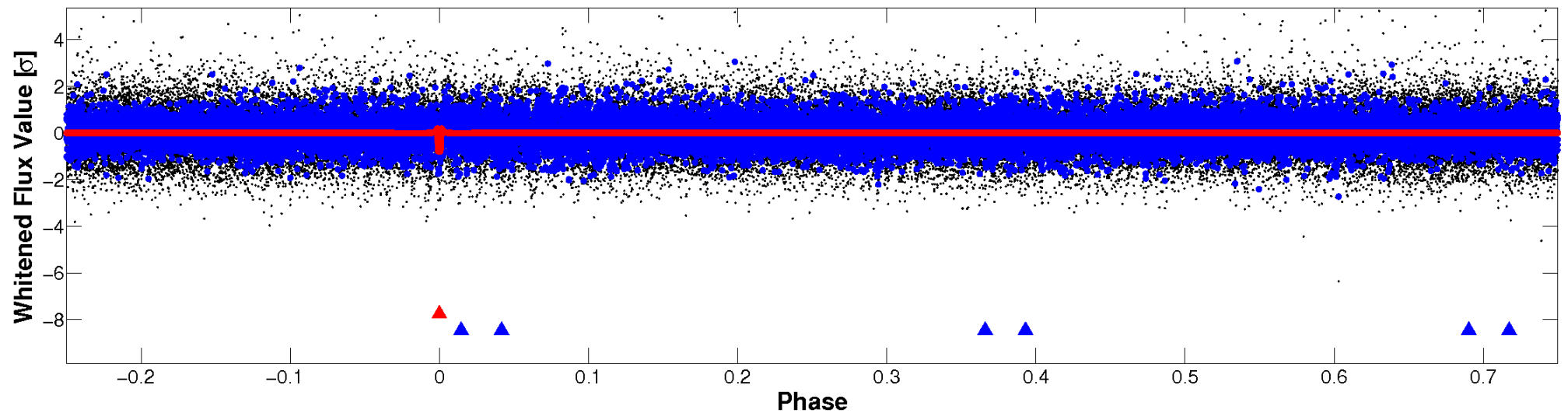


# Non-Whitened Vs. Whitened Light Curve

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

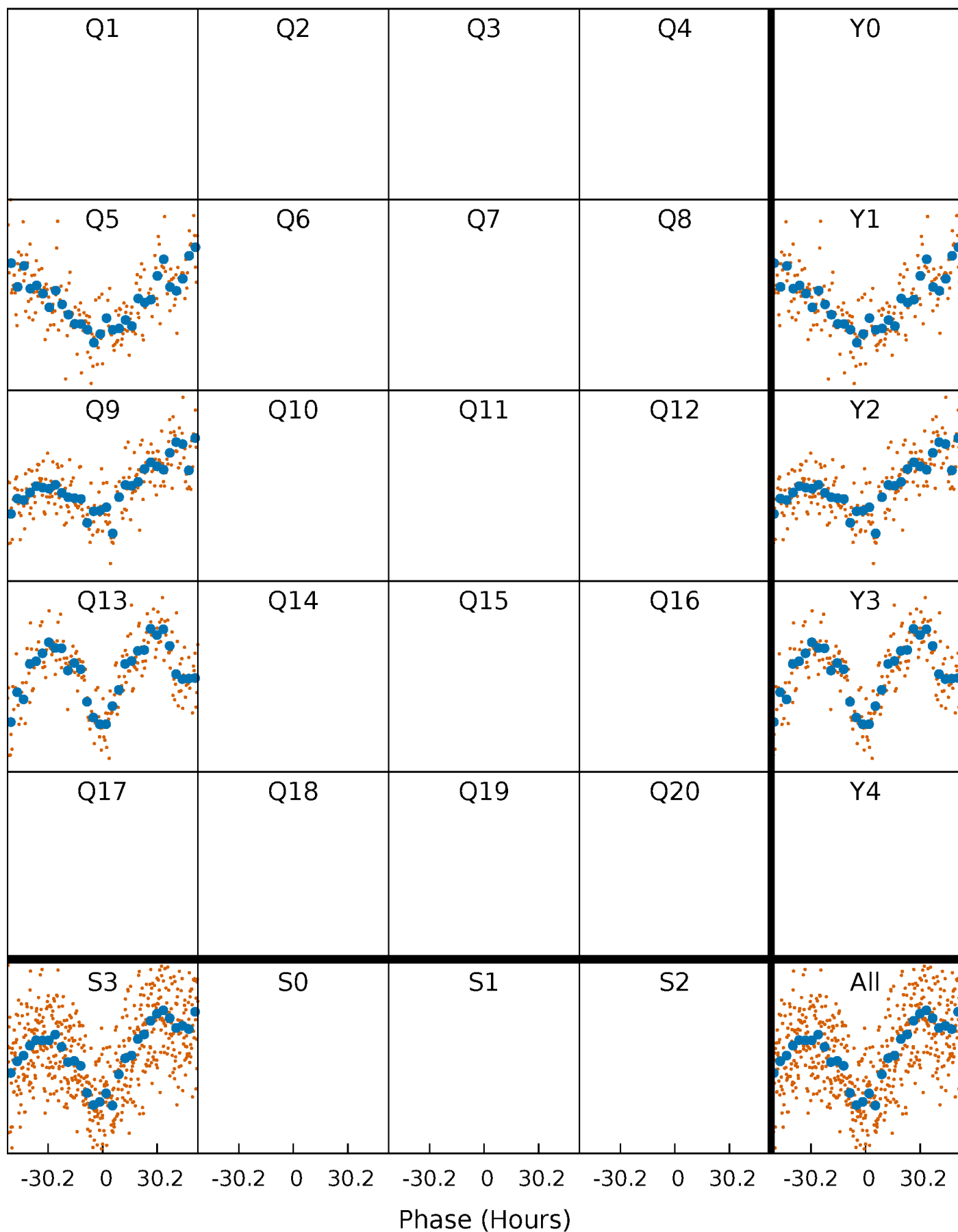


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

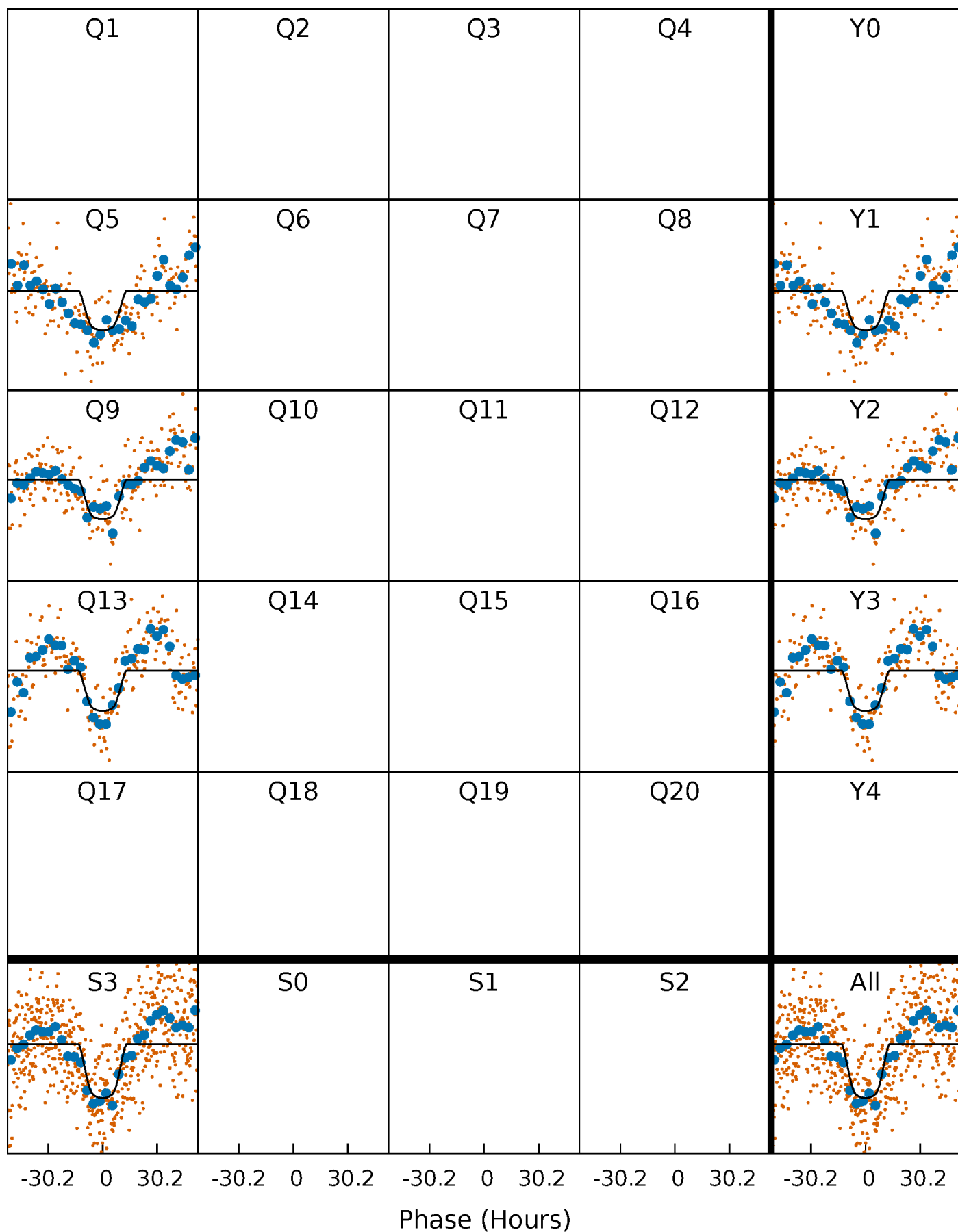
TCE 010467338-01 P=366.420266 Days  $T_0=165.180064$  (BKJD)





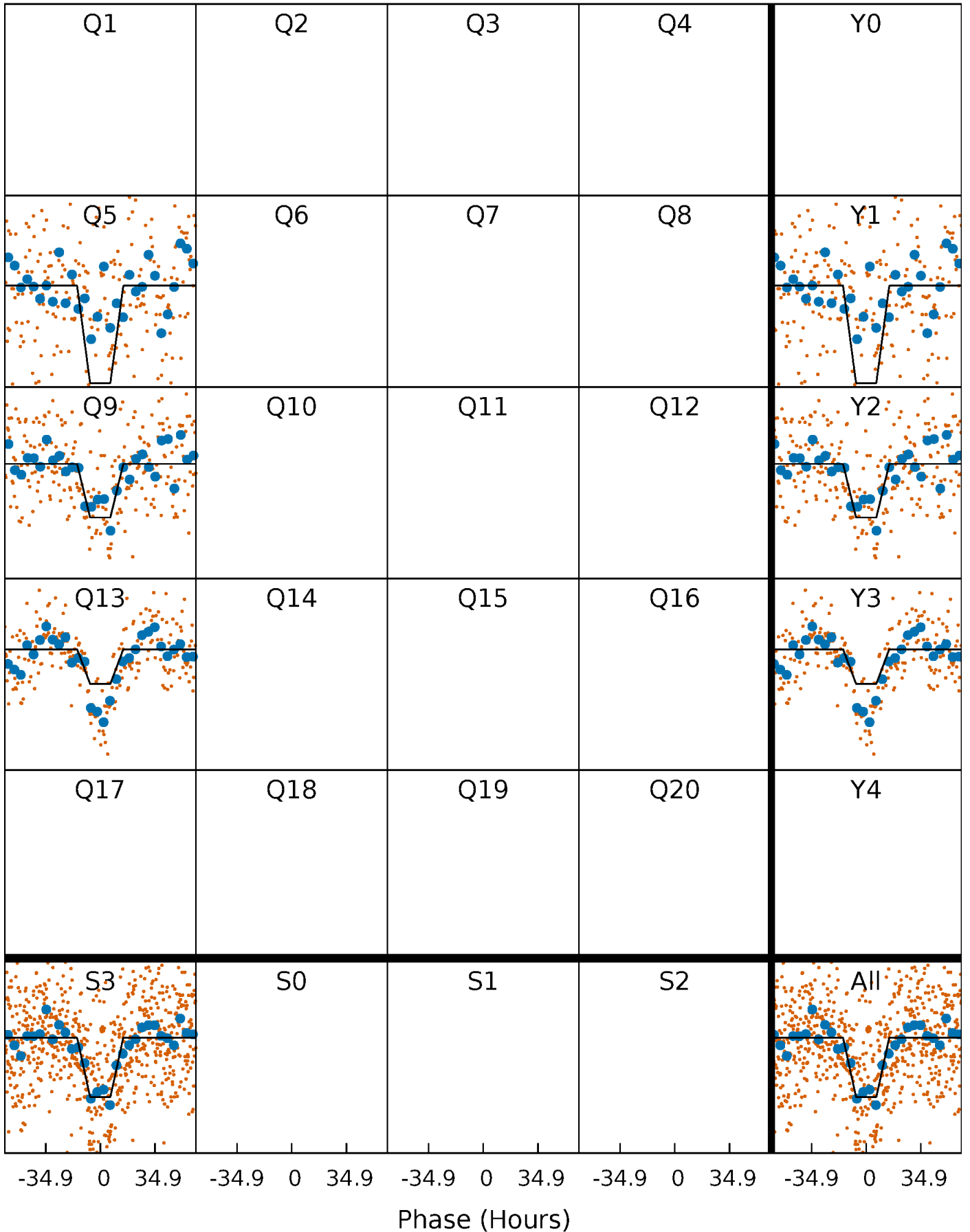
# DV Quarter-Phased Transit Curves

TCE 010467338-01     $P=366.420266$  Days     $T_0=165.180064$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

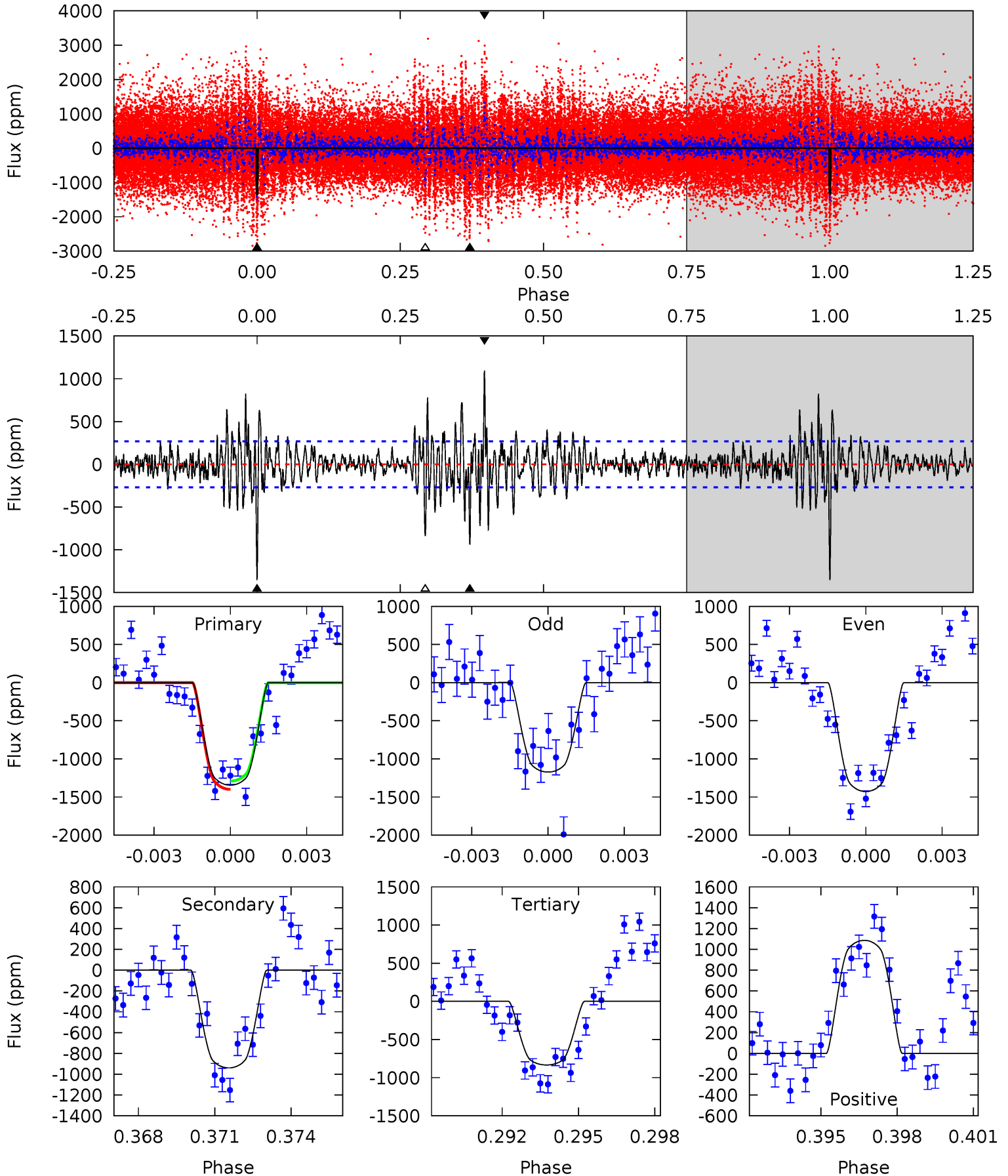
TCE 010467338-01 P=366.387353 Days  $T_0=165.236010$  (BKJD)



# DV Model-Shift Uniqueness Test

010467338-01, P = 366.420266 Days, E = 165.180064 Days

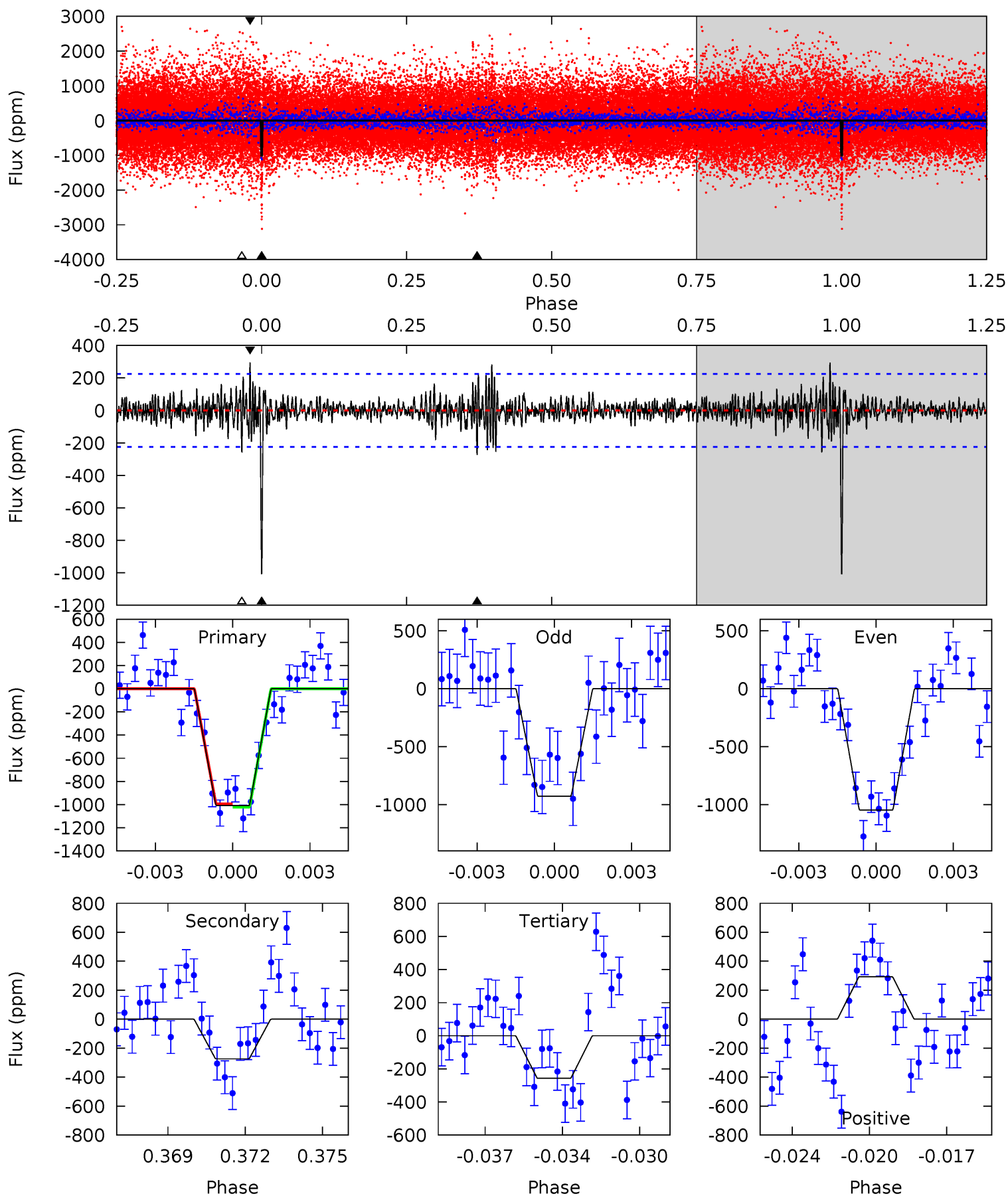
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.3	18.4	16.3	21.2	5.25	2.96	3.54	9.99	5.05	2.06	-2.88	2.32	0.95	0.45	1.06



# Alt Model-Shift Uniqueness Test

010467338-01, P = 366.387353 Days, E = 165.236010 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
23.4	6.37	5.98	6.82	5.23	2.93	1.22	17.5	16.6	0.39	-0.46	1.29	1.09	0.23	0.33



### Stellar Parameters For KIC 010467338

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5697^{+171}_{-188}$	$4.539^{+0.038}_{-0.212}$	$0.070^{+0.250}_{-0.300}$	$0.892^{+0.264}_{-0.088}$	$1.004^{+0.100}_{-0.122}$	$1.990^{+0.408}_{-1.051}$
	+3%/-3%	+1%/-5%	+357%/-429%	+30%/-10%	+10%/-12%	+20%/-53%
Source	KIC0	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 010467338-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-939 \pm 51$	$4.07^{+0.77}_{-0.54}$	$340^{+23}_{-18}$	$5070^{+293}_{-284}$	$30598^{+10830}_{-8109}$
Alt.	$-274 \pm 43$	$3.27^{+0.64}_{-0.50}$	$340^{+23}_{-17}$	$4313^{+305}_{-266}$	$13295^{+6949}_{-3799}$

$T_{max}$  = 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

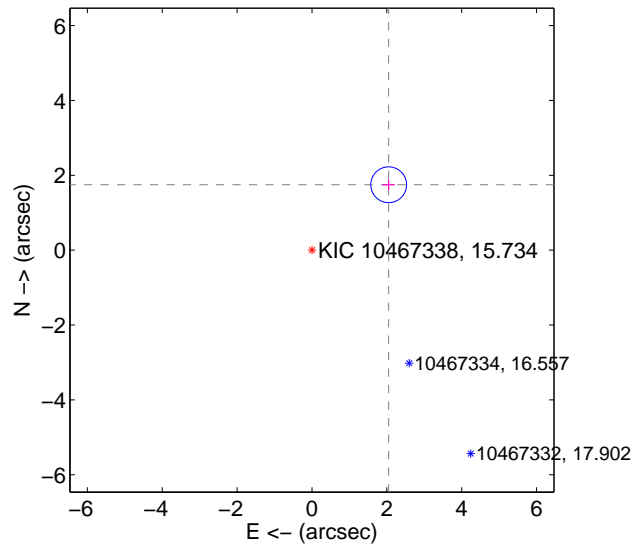
Supplemental centroid analysis for 010467338-01. Kepler magnitude: 15.73. Transit SNR 7.75

There are 0 quarters with good PRF difference image offsets

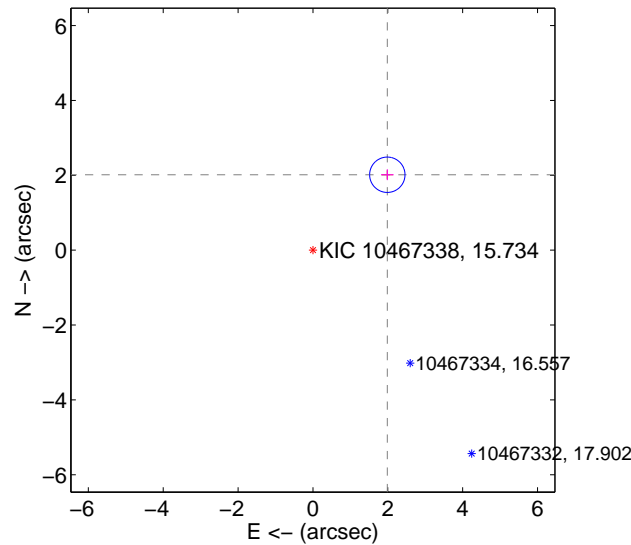
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.693 \pm 0.159$	16.89	$-2.049 \pm 0.169$	$1.748 \pm 0.146$
PRF-fit source offset from KIC position	$2.830 \pm 0.157$	17.97	$-1.987 \pm 0.169$	$2.015 \pm 0.146$
photometric centroid source offset	$0.94 \pm 1.48$	0.63	$-0.36 \pm 1.88$	$-0.87 \pm 1.40$

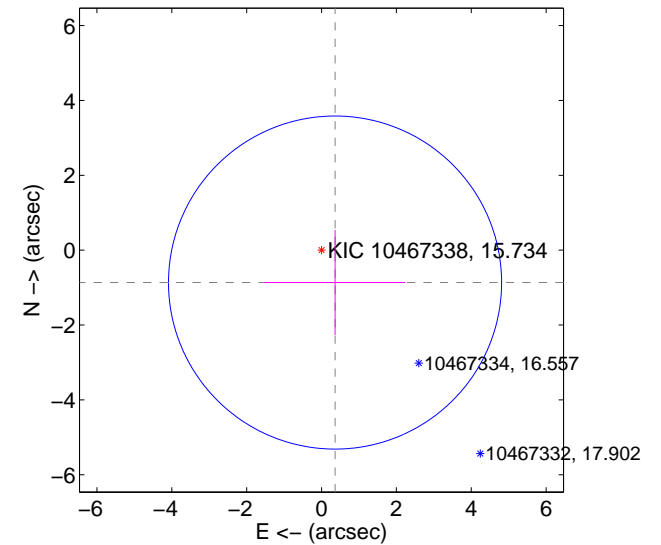
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



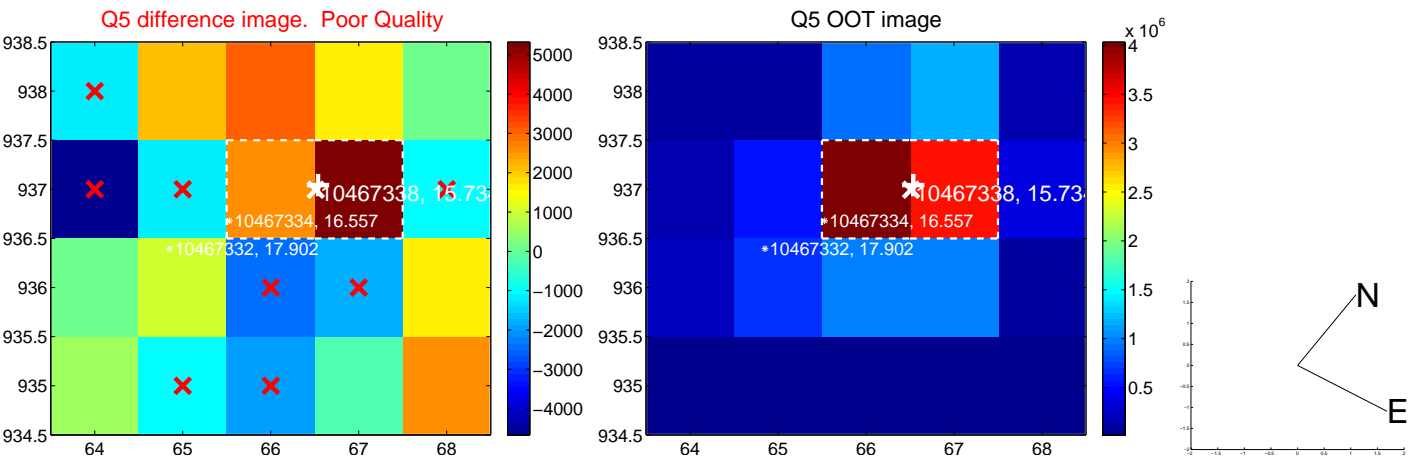
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



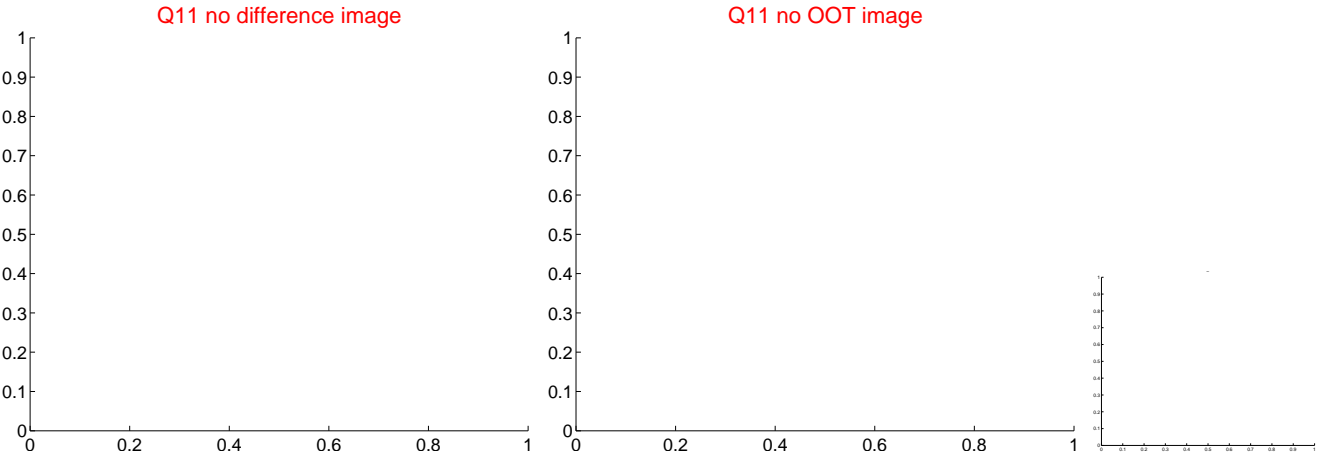
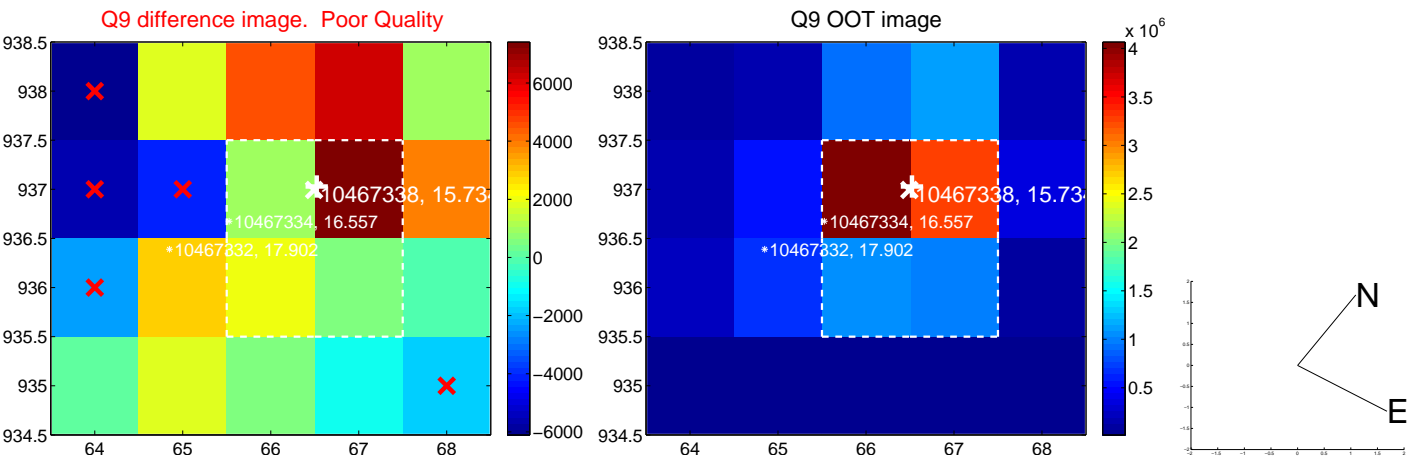
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



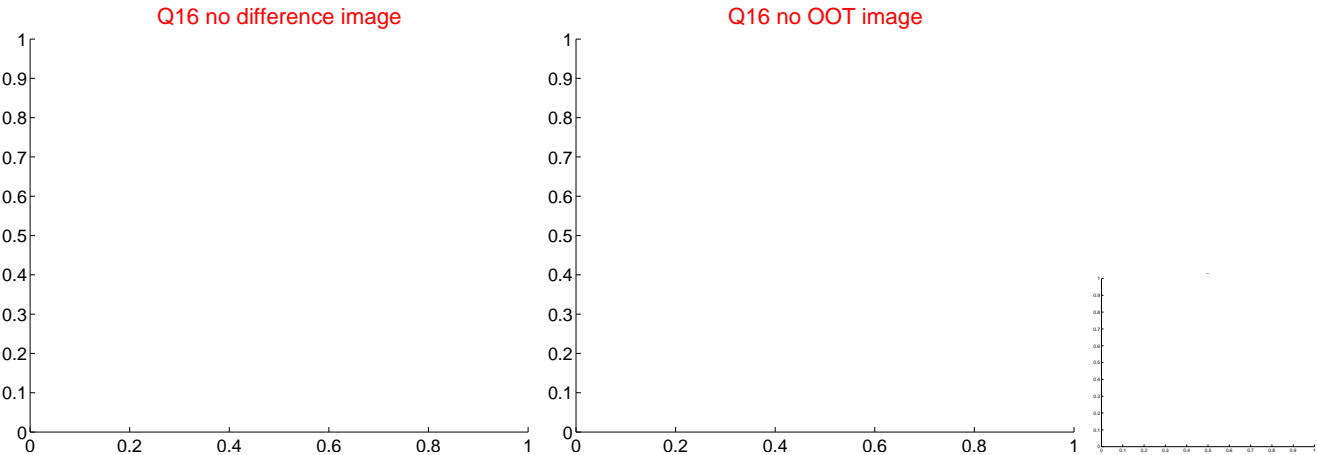
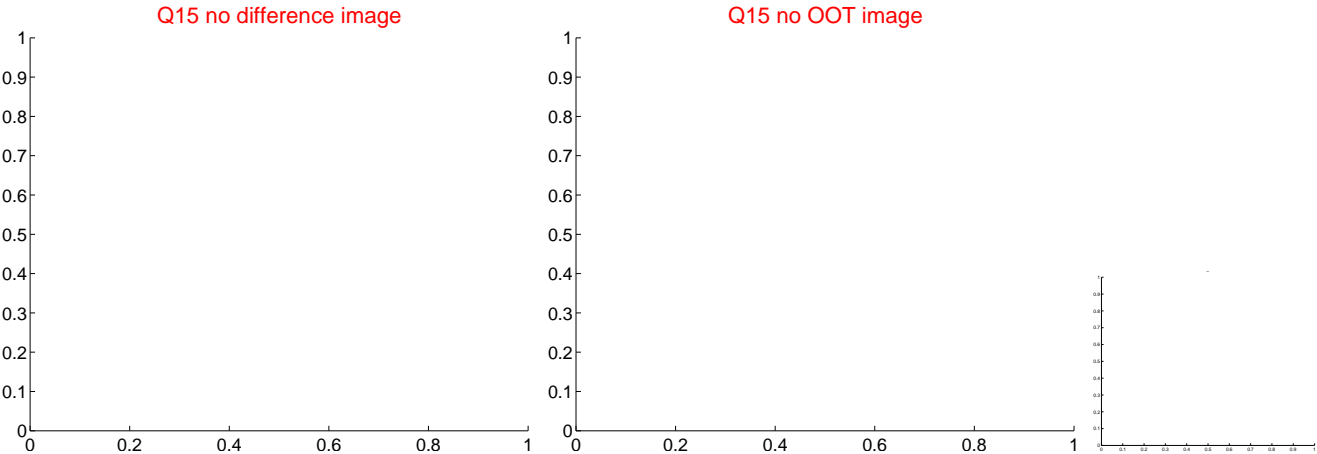
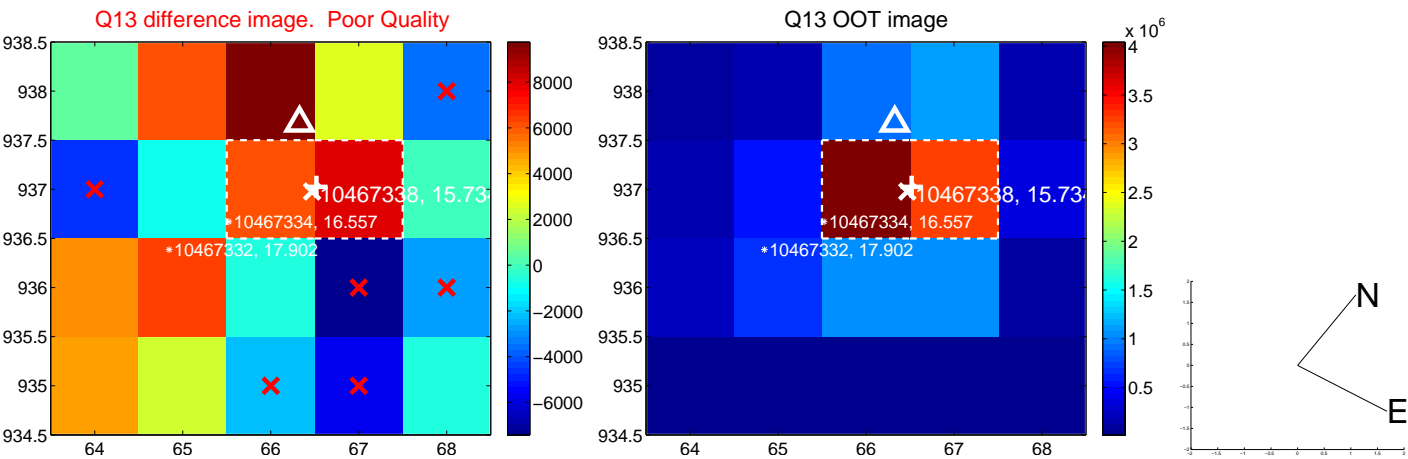
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



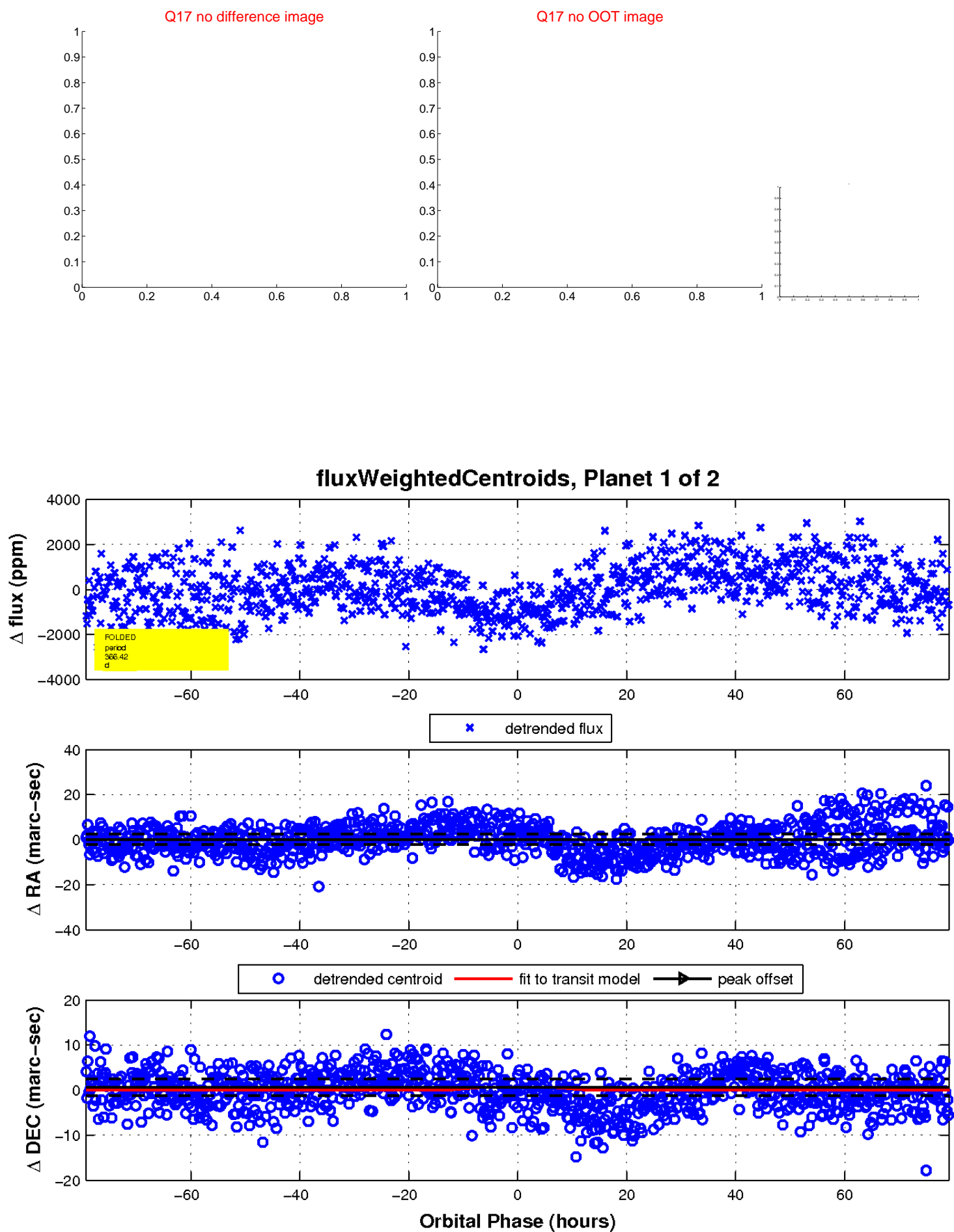
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

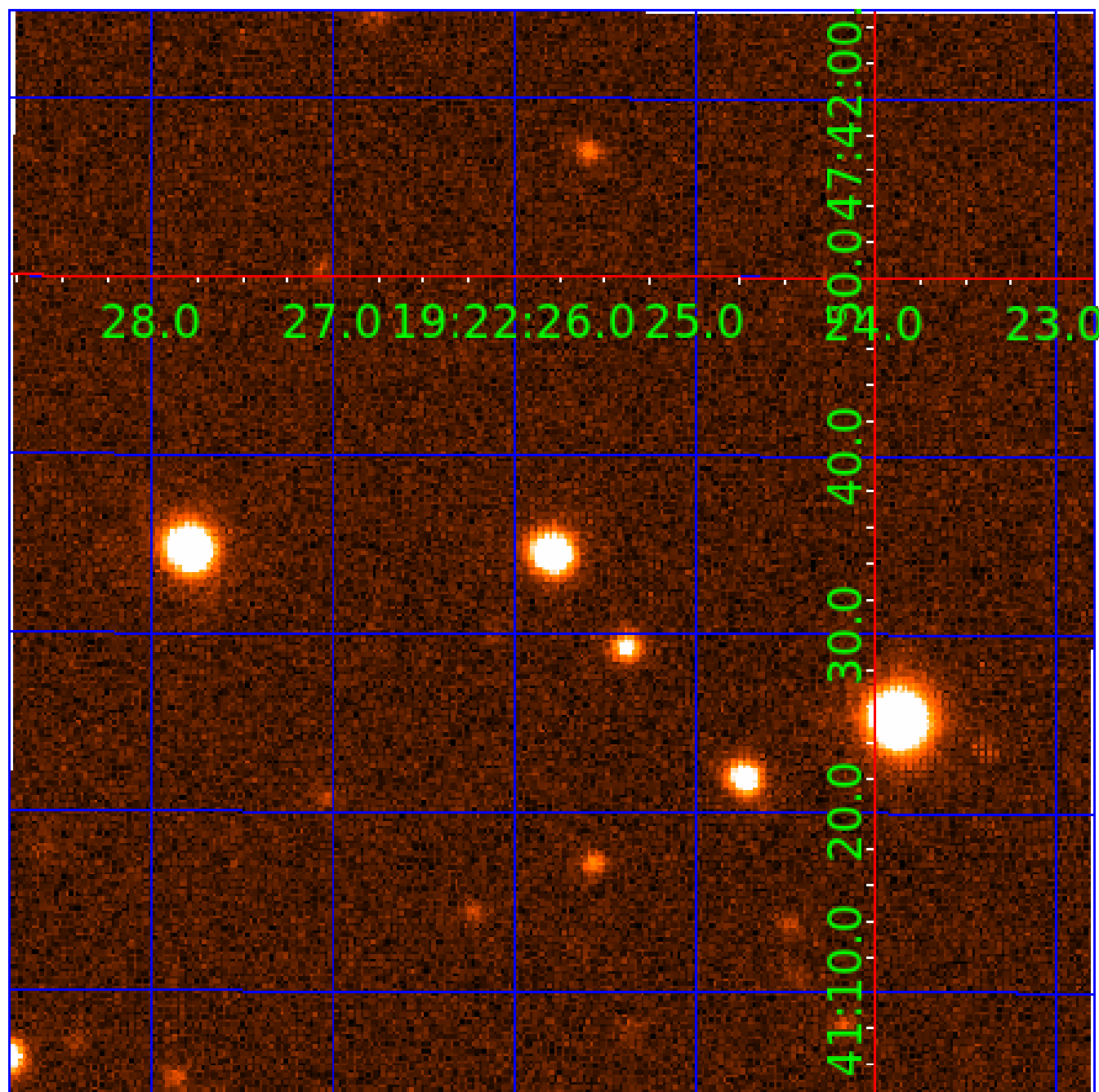


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010467338

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010467338-01	OBS	No	366.420266	165.180064	1201.7	26.426	7.4	7.8	0.89	5697	3.89	0.74
010467338-02	OBS	No	247.585921	170.541436	414.7	16.022	7.3	4.6	0.89	5697	1.96	1.26

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010467338-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_MEAS
010467338-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—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.

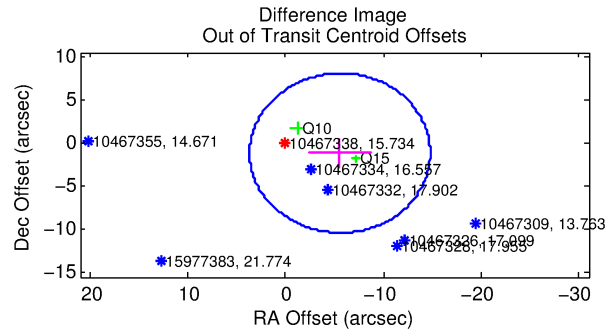
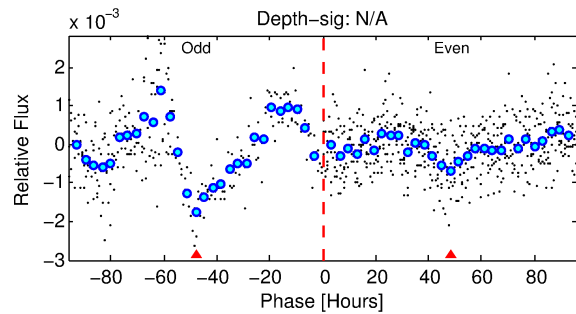
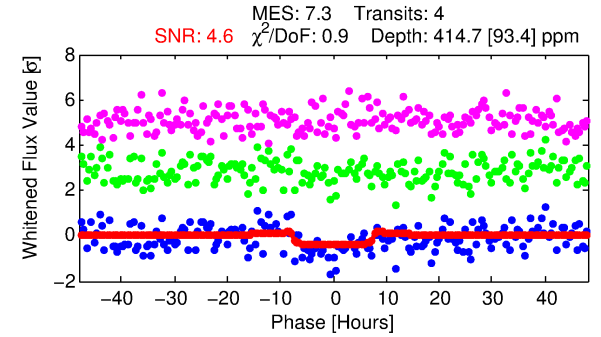
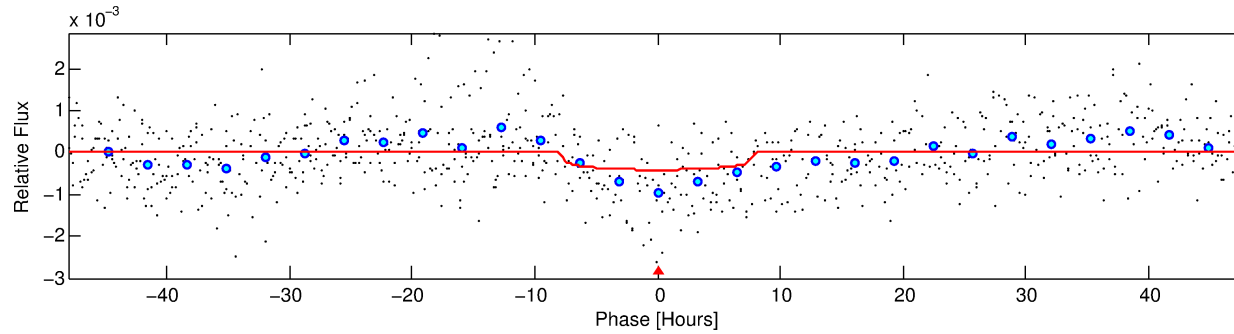
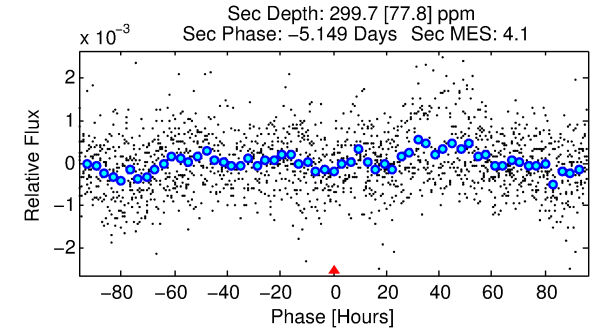
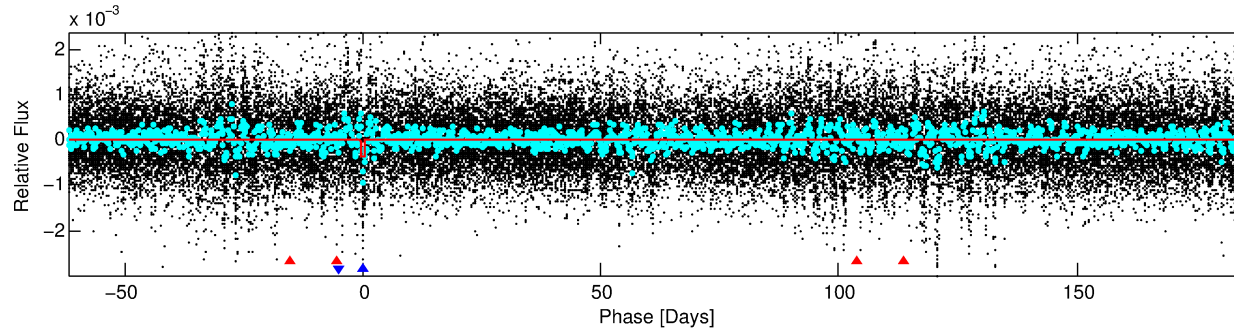
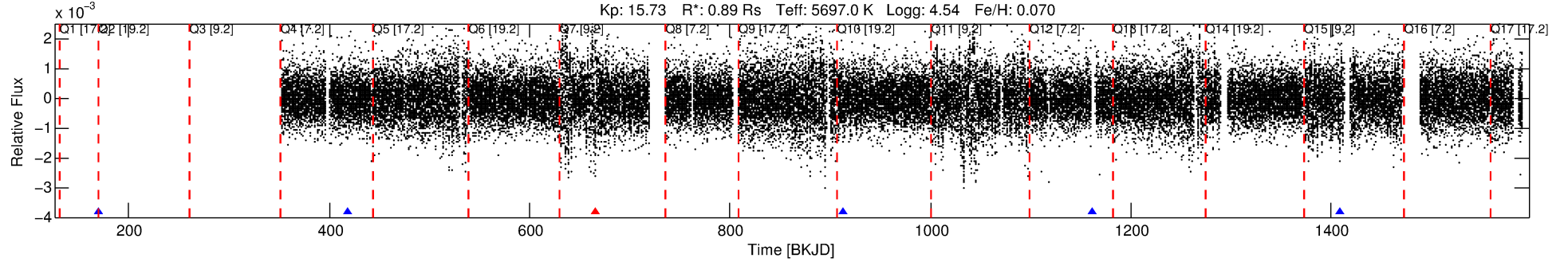
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010467338-02

No Significant Match Found

# DV One-Page Summary

KIC: 10467338 Candidate: 2 of 2 Period: 247.586 d



## DV Fit Results:

Period = 247.58592 [0.01539] d  
Epoch = 170.5414 [0.0447] BKJD  
Rp/R\* = 0.0201 [0.0105]  
a/R\* = 84.70 [183.81]  
b = 0.73 [1.44]  
Seff = 1.26 [0.51]  
Teq = 270 [27] K  
Rp = 1.95 [1.18] Re  
a = 0.7728 [0.1977] AU  
Ag = 25771.32 [29559.26] [0.87σ]  
Teffp = 5289 [1441] K [3.48σ]

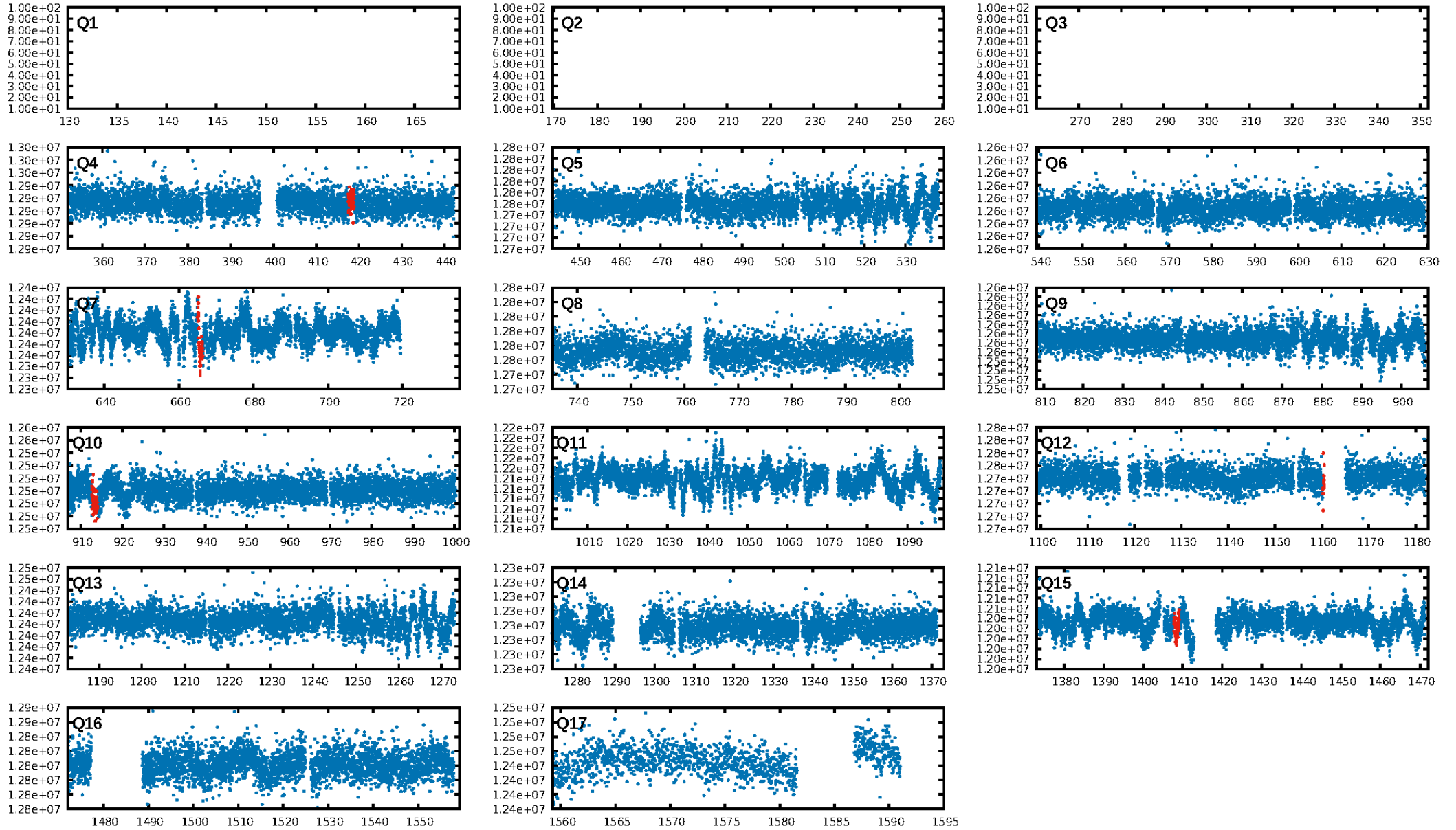
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [92.29σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 9.49e-09  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: 0.3097  
Centroid-sig: 8.2%  
Centroid-so: 5.612 arcsec [1.66σ]  
OotOffset-rm: 5.673 arcsec [1.84σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-rm: 5.709 arcsec [1.86σ]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [4/4]

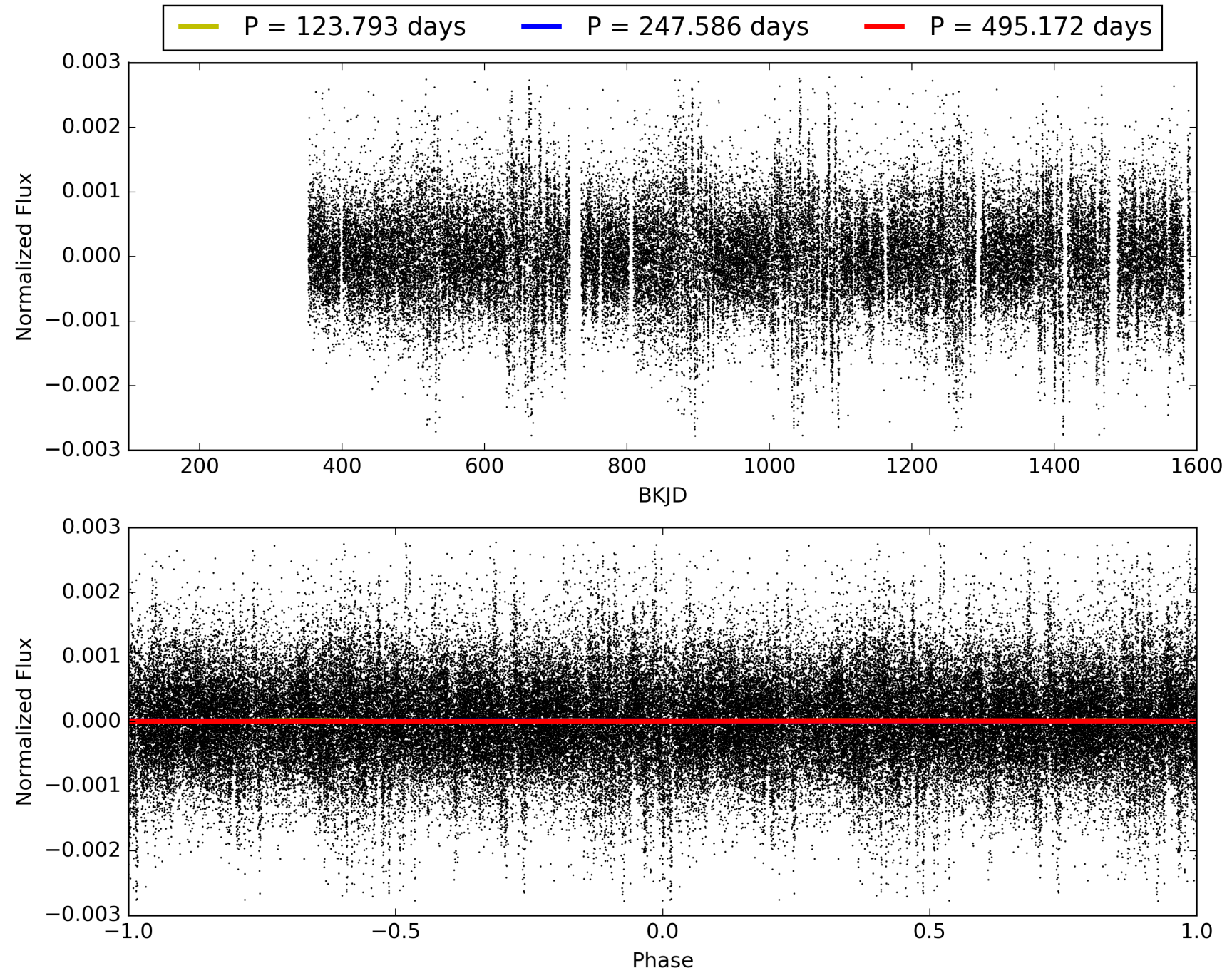
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:37:03 Z

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

# TCE 010467338-02, PDC Light Curves

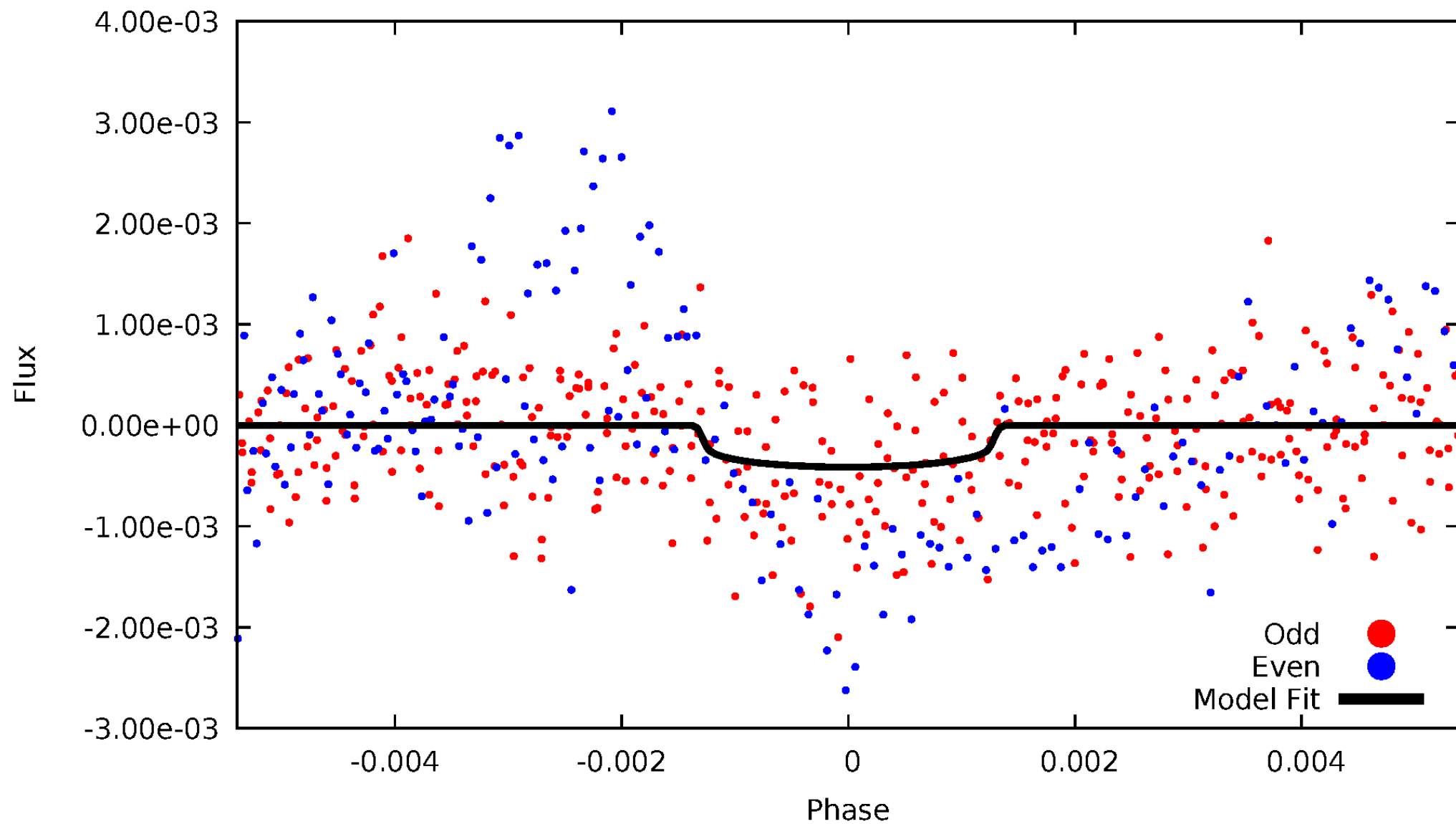


TCE 010467338-02



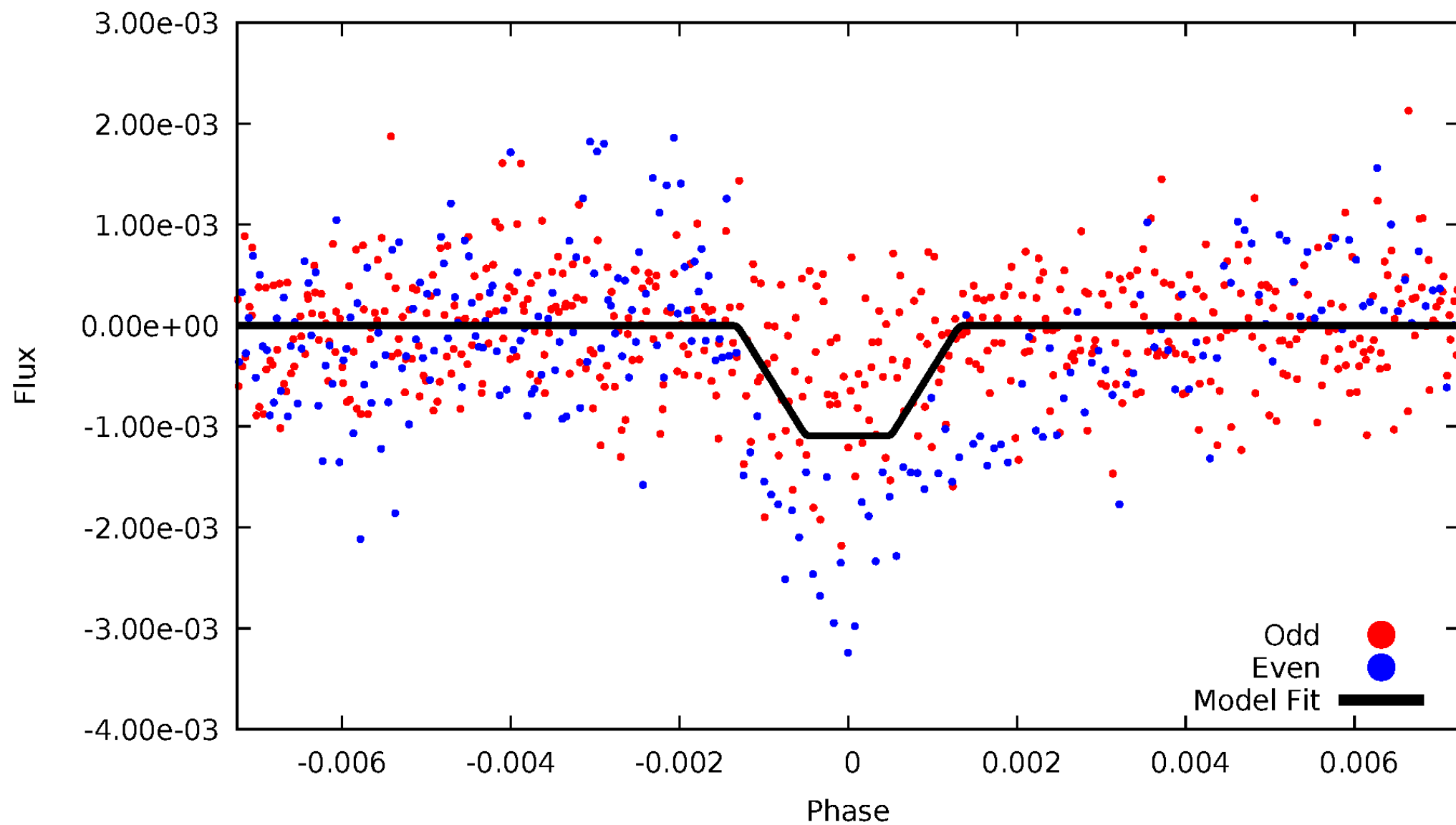
# DV Odd/Even

TCE 010467338-02



# ALT Odd/Even

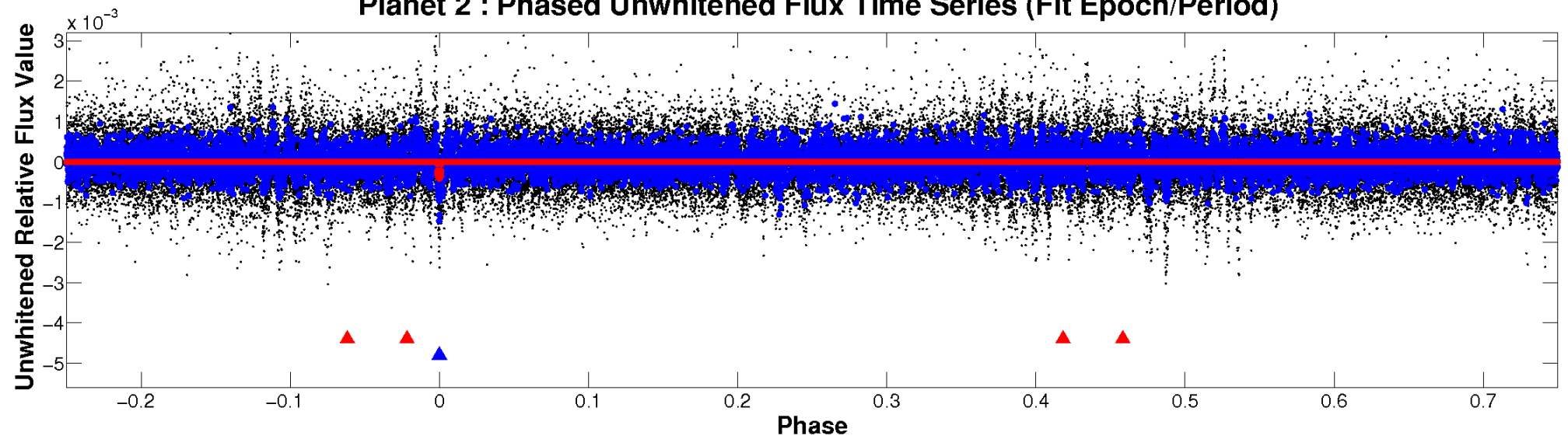
TCE 010467338-02



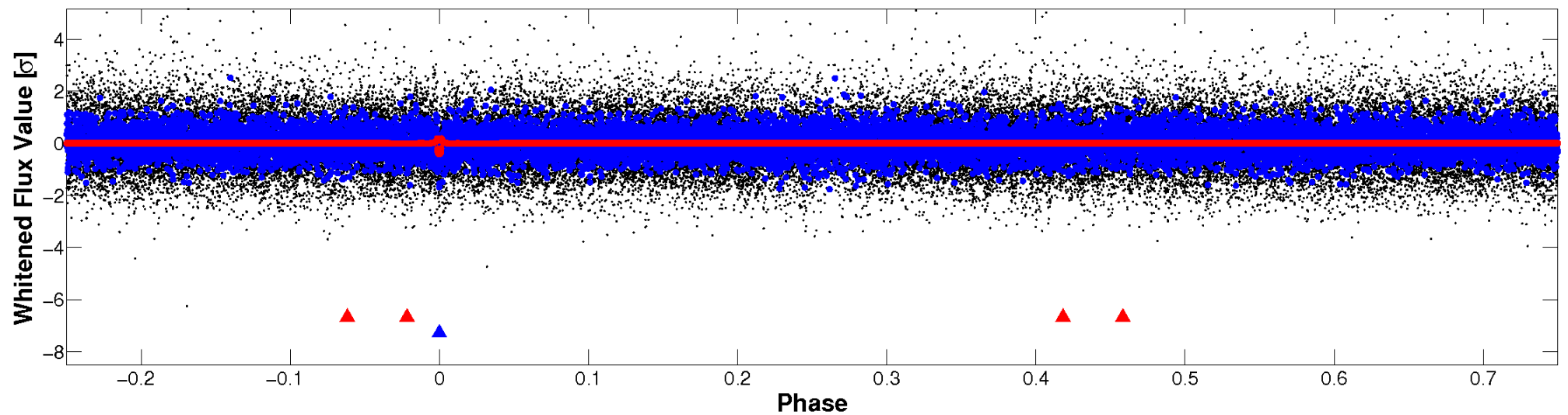


# Non-Whitened Vs. Whitened Light Curve

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

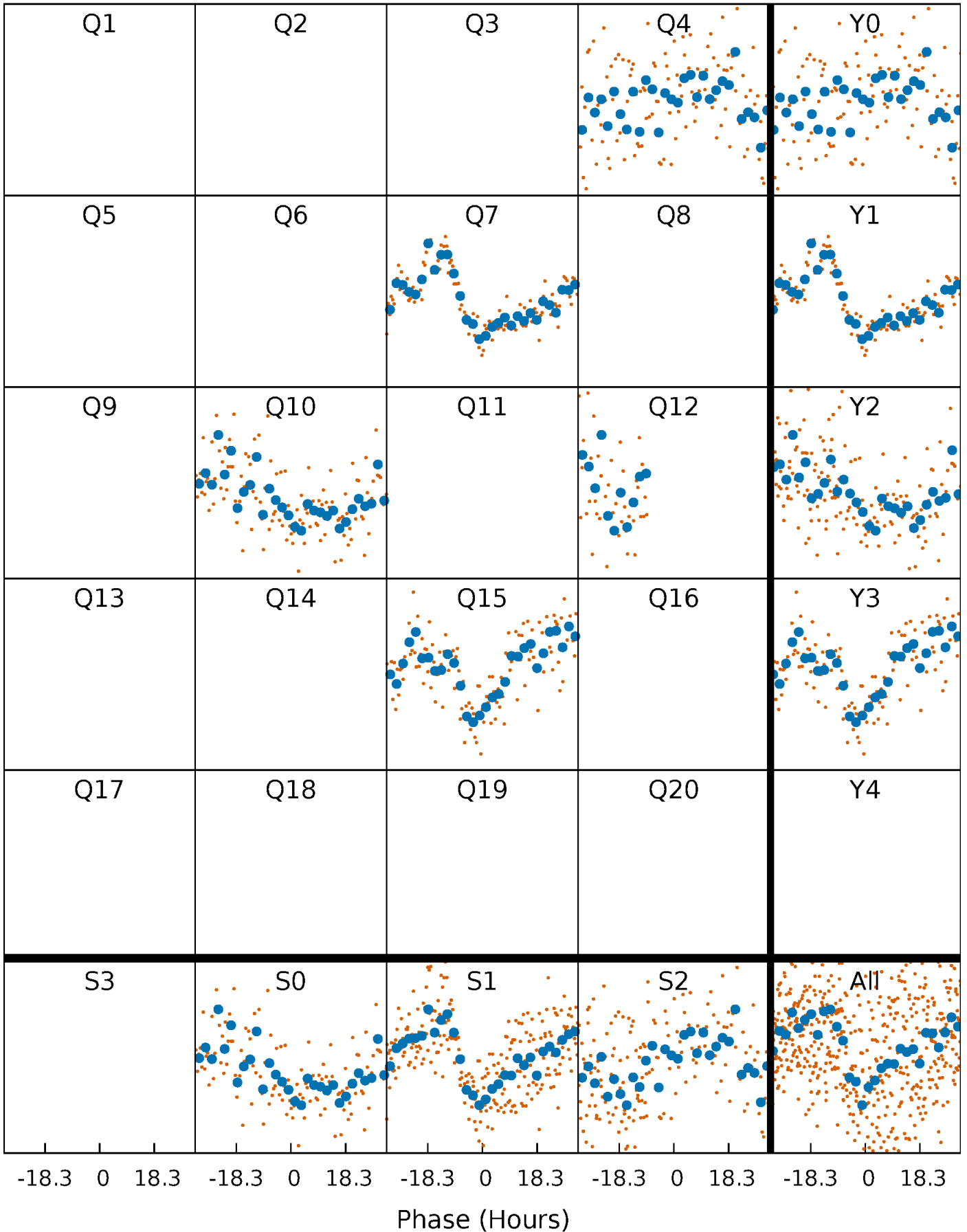


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



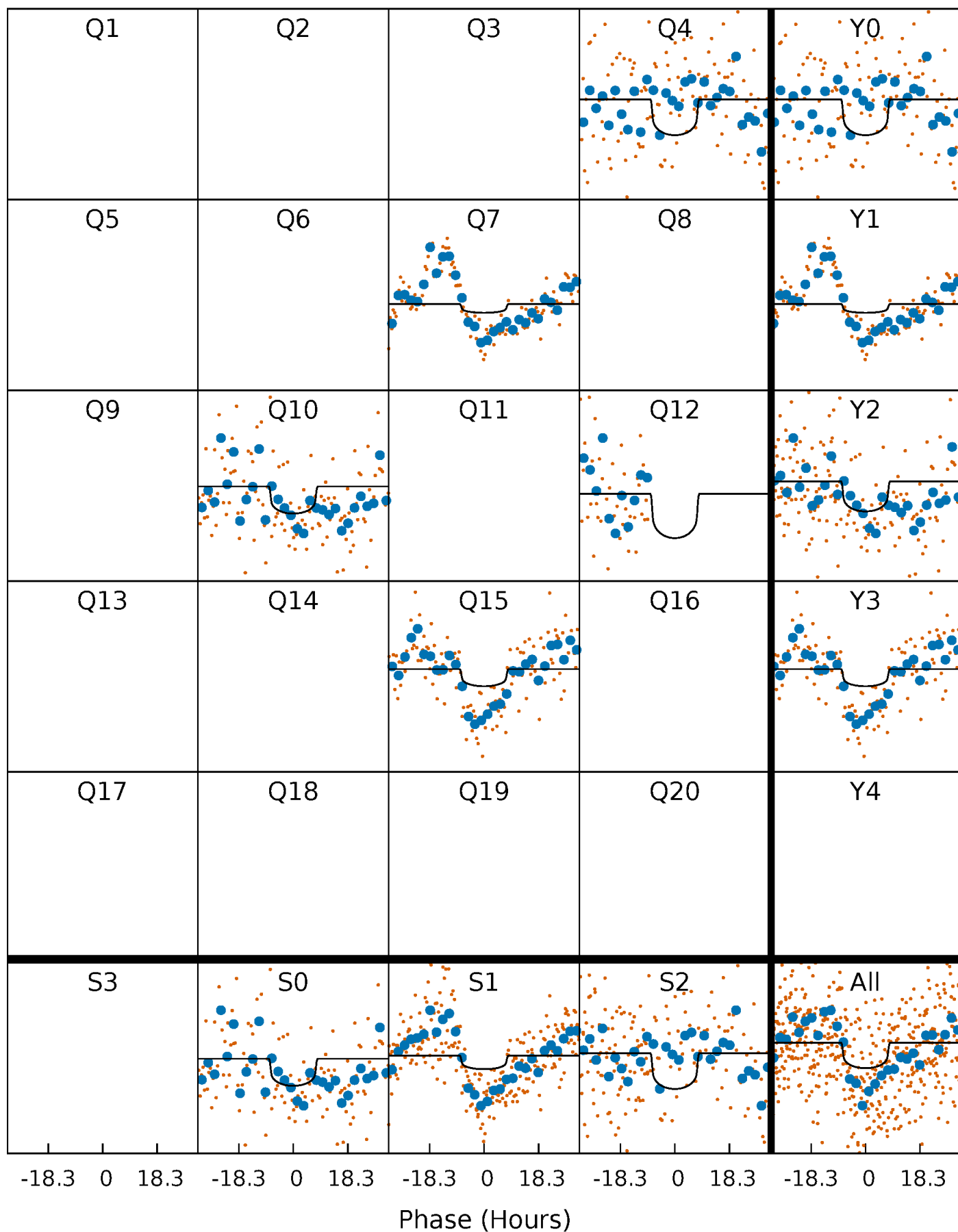
# PDC Quarter-Phased Transit Curves

TCE 010467338-02     $P=247.585921$  Days     $T_0=170.541437$  (BKJD)



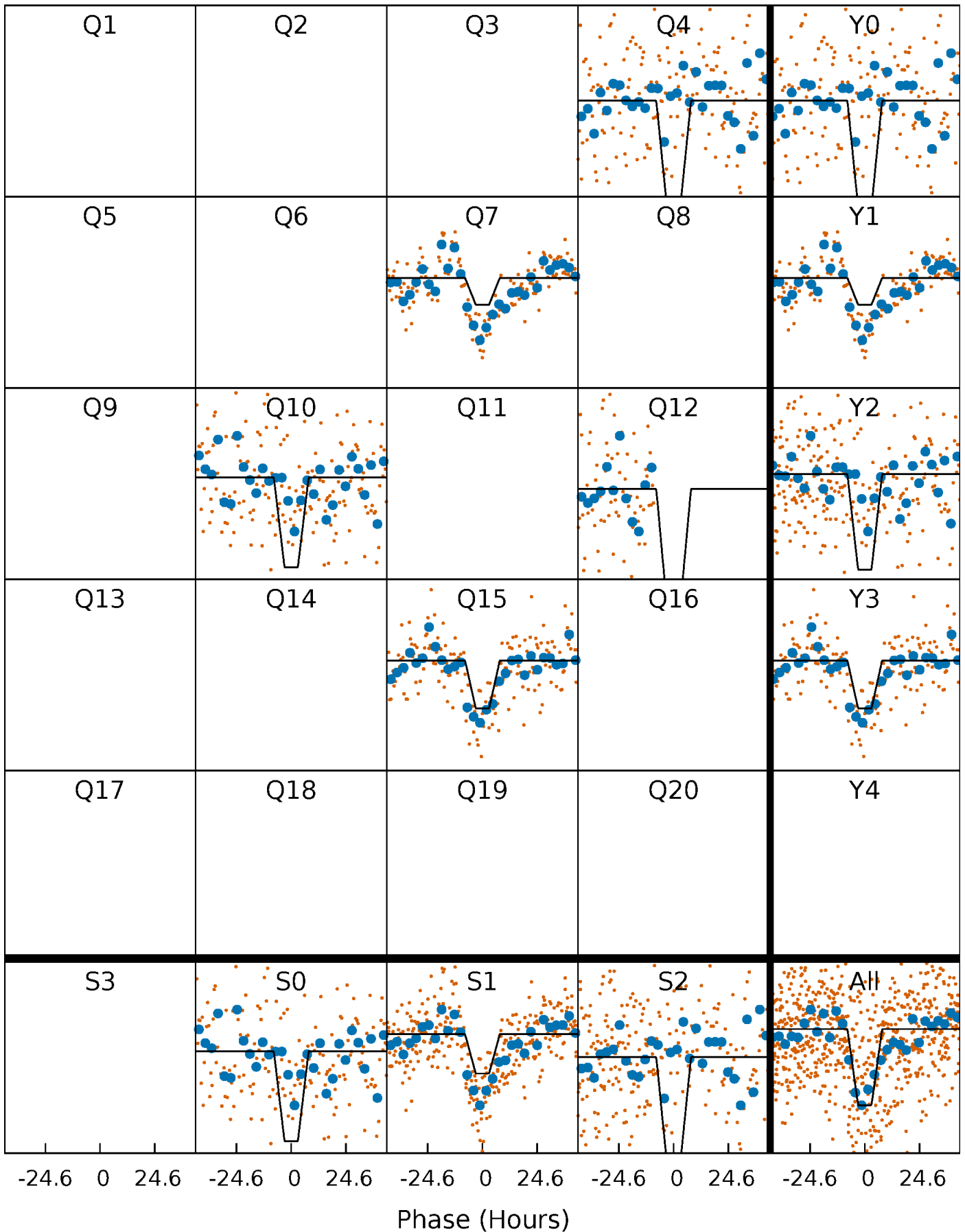
# DV Quarter-Phased Transit Curves

TCE 010467338-02 P=247.585921 Days  $T_0=170.541437$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

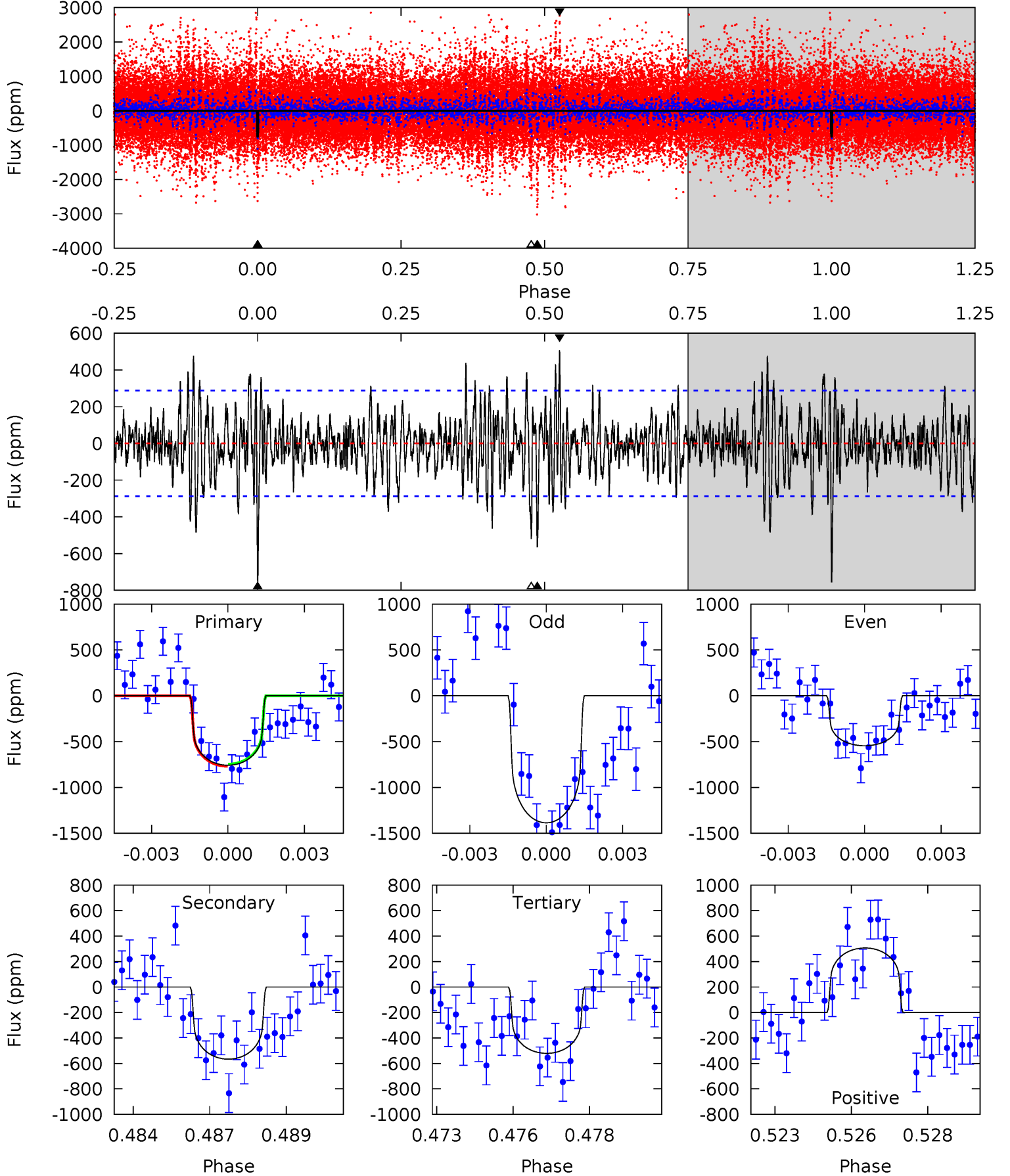
TCE 010467338-02     $P=247.586635$  Days     $T_0=170.536145$  (BKJD)



# DV Model-Shift Uniqueness Test

010467338-02, P = 247.585921 Days, E = 170.541437 Days

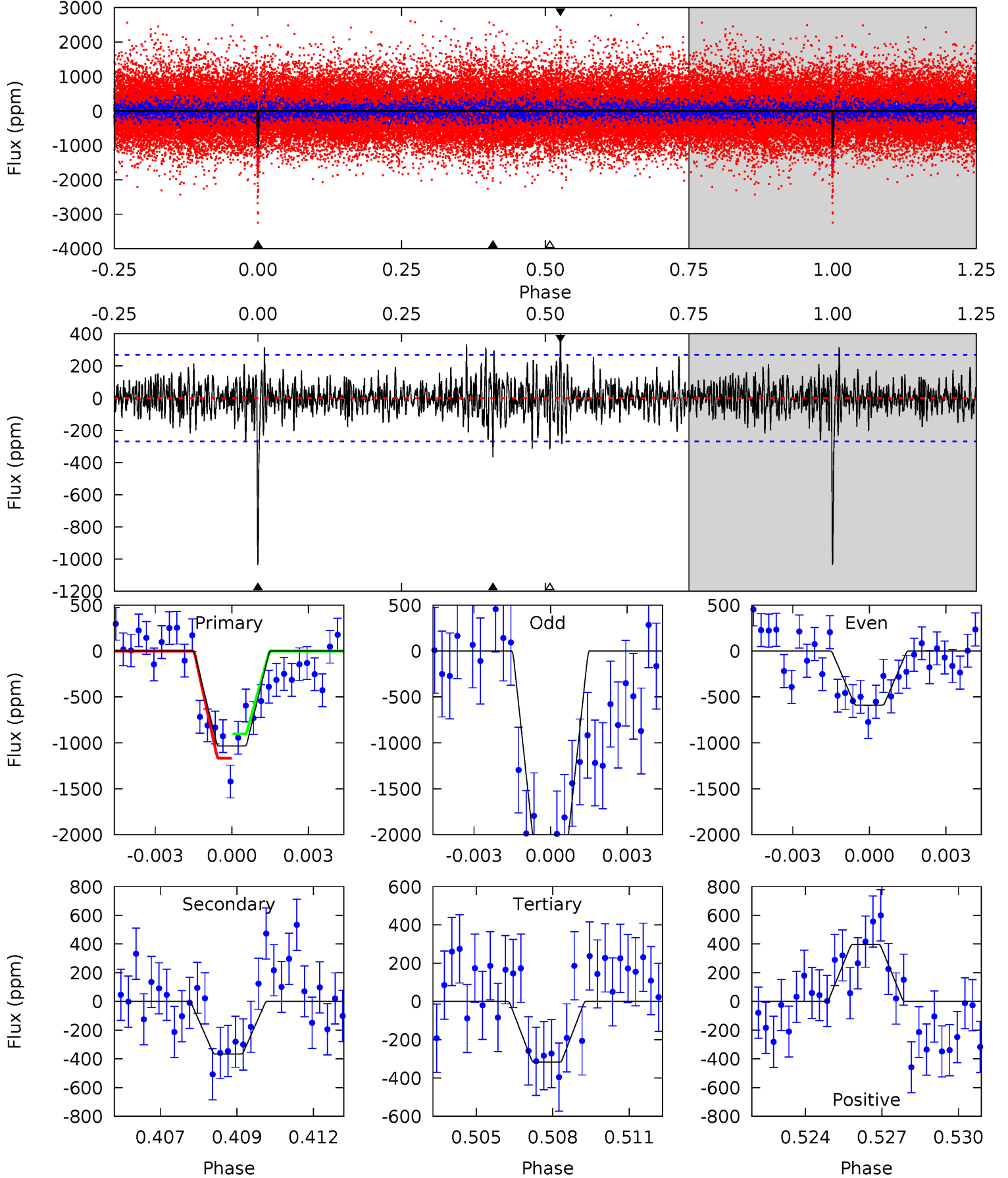
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	10.3	9.50	9.24	5.27	2.99	2.50	4.32	4.58	0.83	1.09	6.66	0.92	0.40	0.20



# Alt Model-Shift Uniqueness Test

010467338-02, P = 247.586635 Days, E = 170.536145 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
20.3	7.18	6.21	7.78	5.27	3.00	1.59	14.1	12.5	0.97	-0.60	15.0	1.15	0.28	2.59



### Stellar Parameters For KIC 010467338

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5697^{+171}_{-188}$	$4.539^{+0.038}_{-0.212}$	$0.070^{+0.250}_{-0.300}$	$0.892^{+0.264}_{-0.088}$	$1.004^{+0.100}_{-0.122}$	$1.990^{+0.408}_{-1.051}$
	+3%/-3%	+1%/-5%	+357%/-429%	+30%/-10%	+10%/-12%	+20%/-53%
Source	KIC0	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 010467338-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-566 \pm 55$	$2.05^{+1.09}_{-0.97}$	$387^{+26}_{-20}$	$6166^{+2842}_{-1096}$	$41889^{+112220}_{-23730}$
Alt.	$-366 \pm 51$	$3.28^{+1.28}_{-0.99}$	$387^{+28}_{-18}$	$4545^{+742}_{-491}$	$10764^{+11809}_{-5204}$

$T_{\text{max}}$  = 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

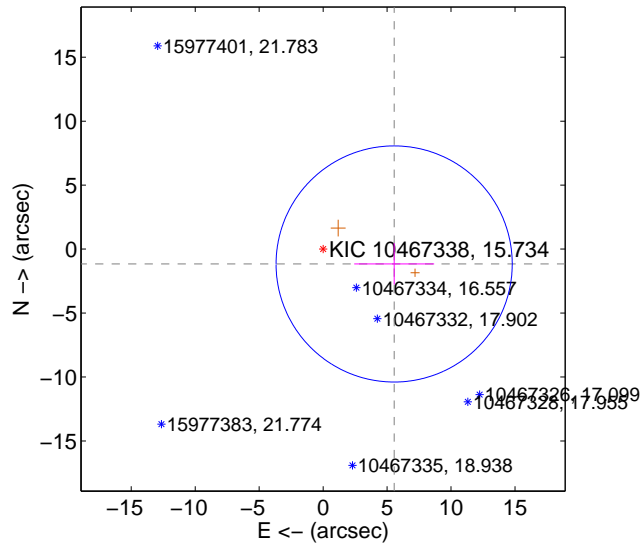
Supplemental centroid analysis for 010467338-02. Kepler magnitude: 15.73. Transit SNR 4.61

There are 0 quarters with good PRF difference image offsets

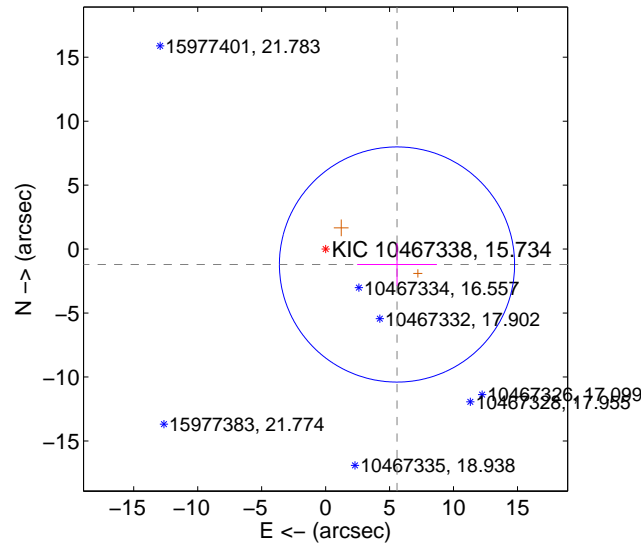
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.673 \pm 3.076$	1.84	$-5.553 \pm 3.125$	$-1.162 \pm 1.620$
PRF-fit source offset from KIC position	$5.709 \pm 3.064$	1.86	$-5.580 \pm 3.114$	$-1.204 \pm 1.654$
photometric centroid source offset	$5.61 \pm 3.38$	1.66	$-4.97 \pm 3.49$	$-2.60 \pm 2.96$

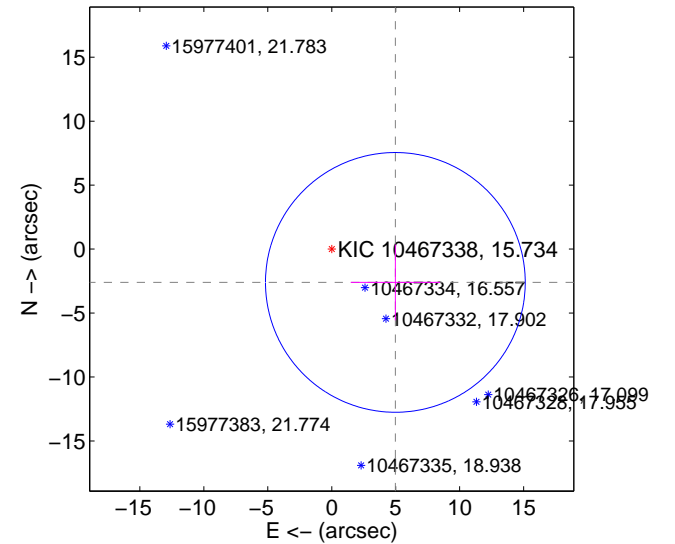
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



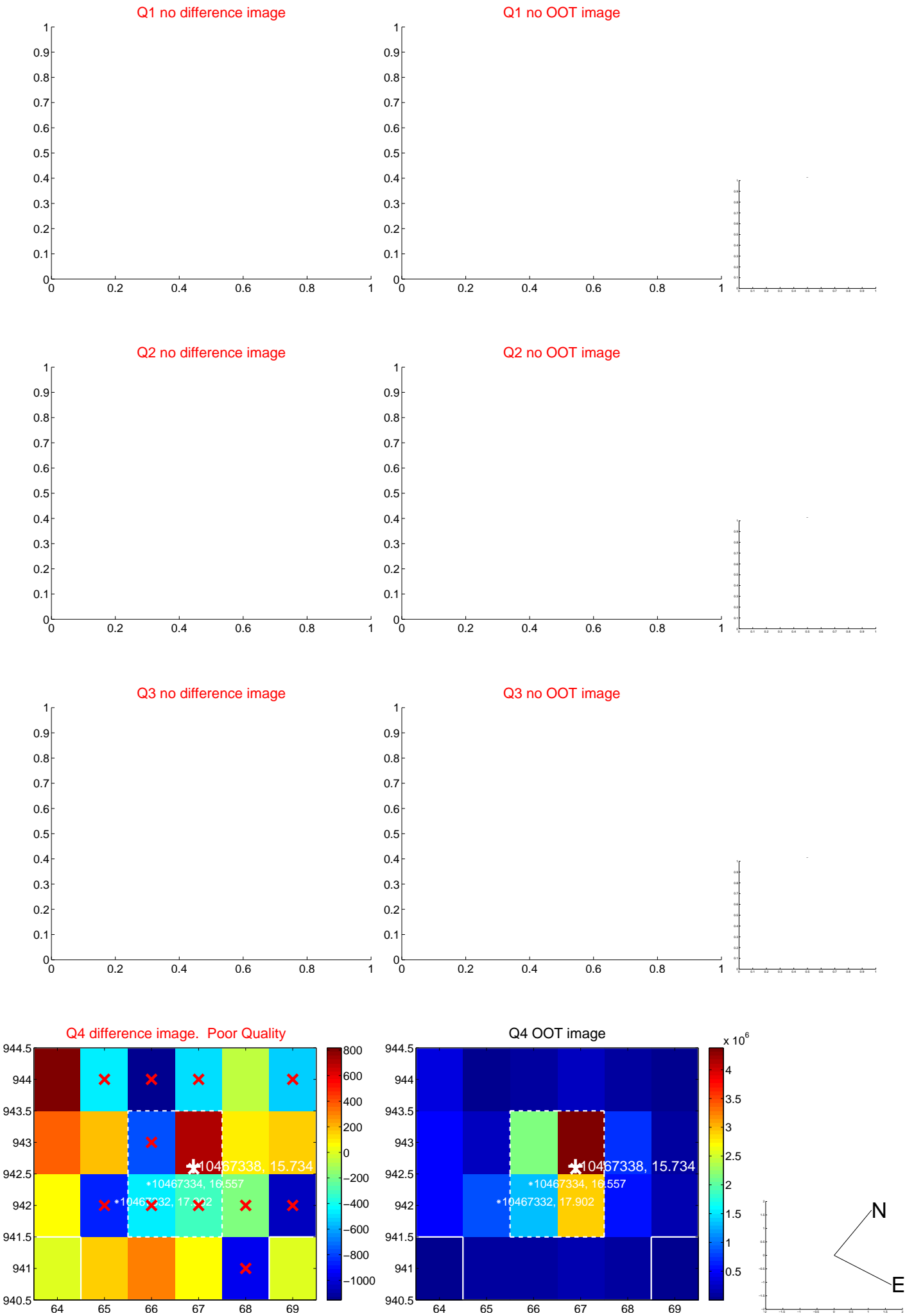
offset from photometric centroids



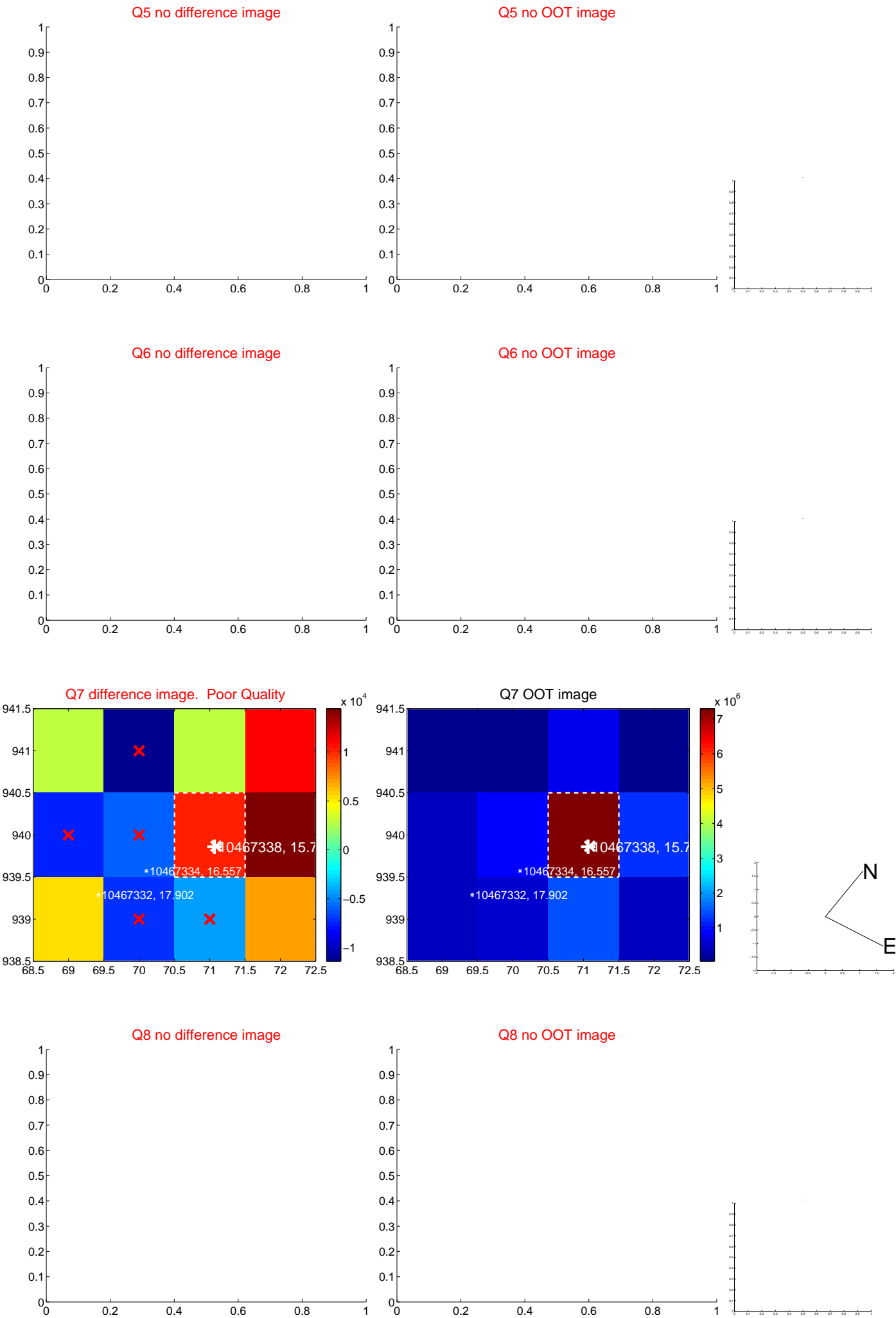
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



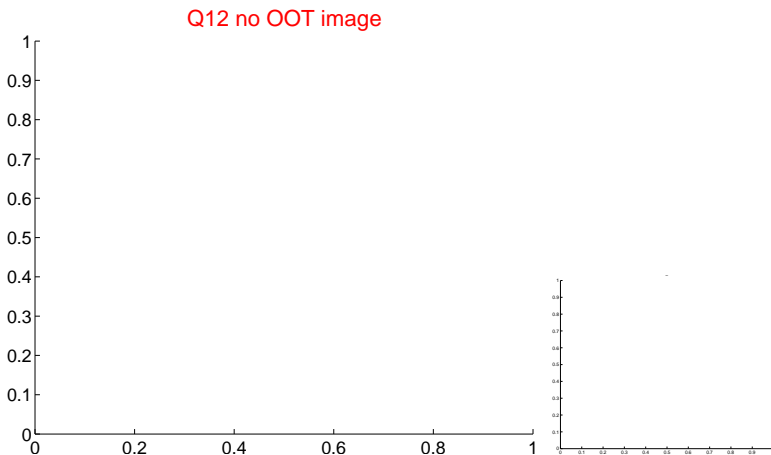
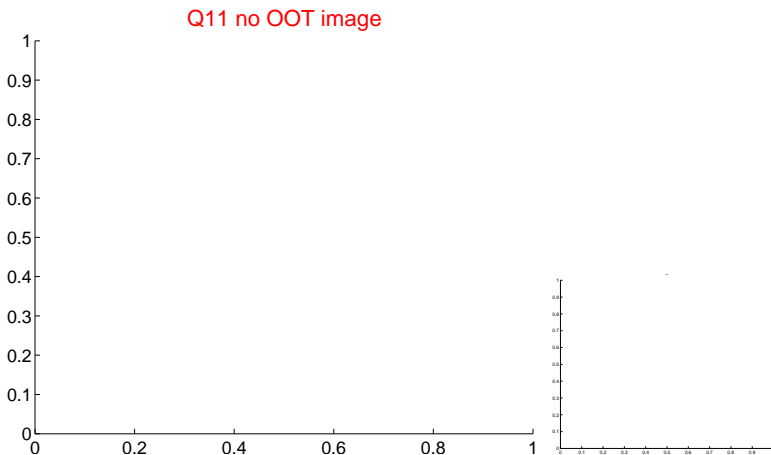
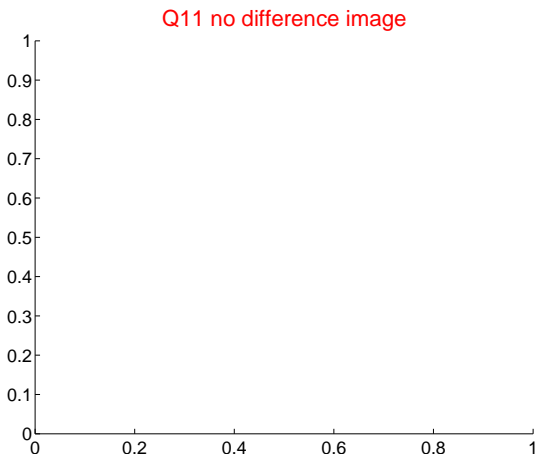
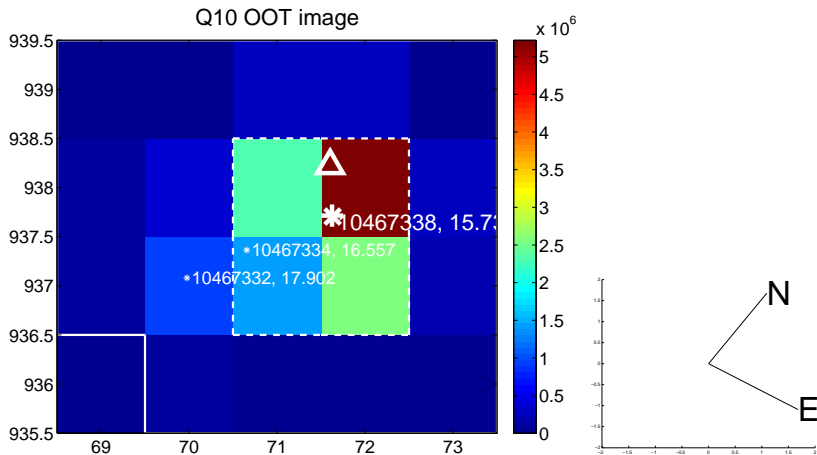
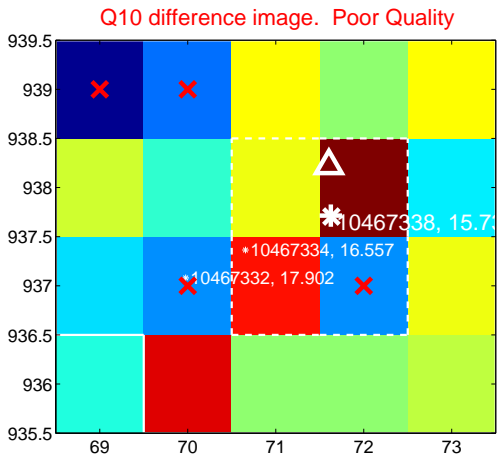
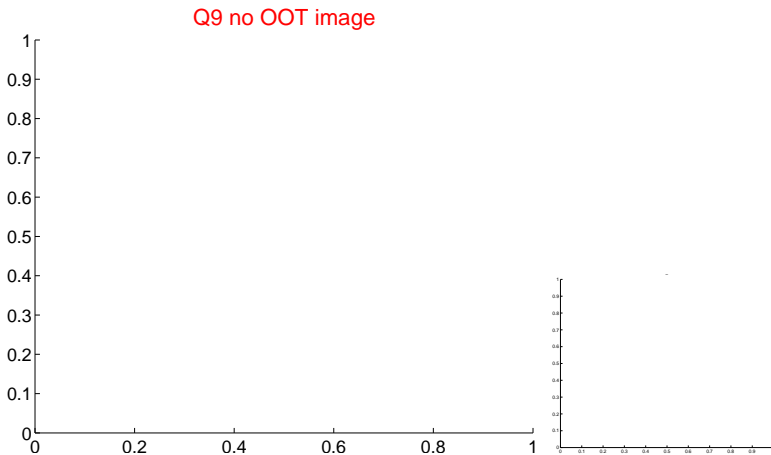
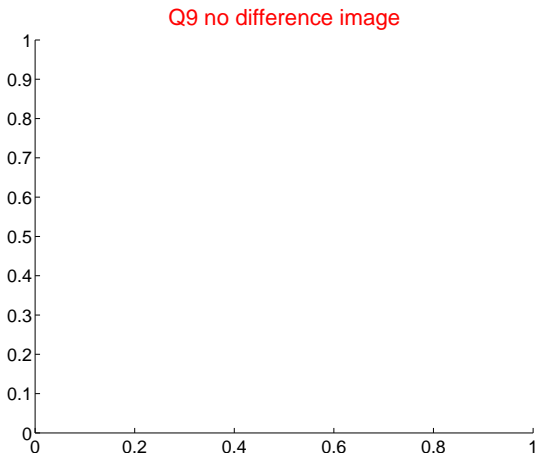
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



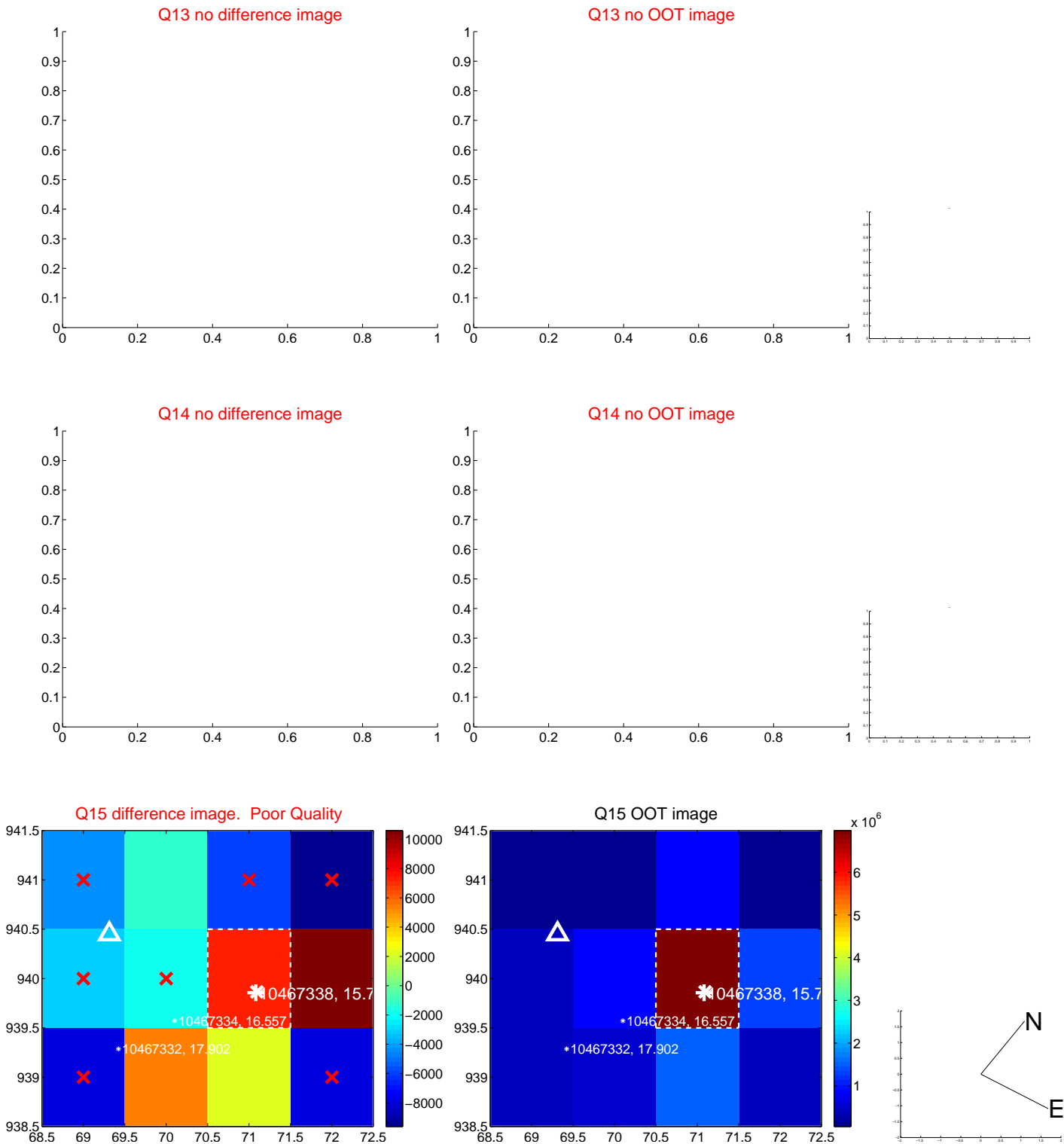
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



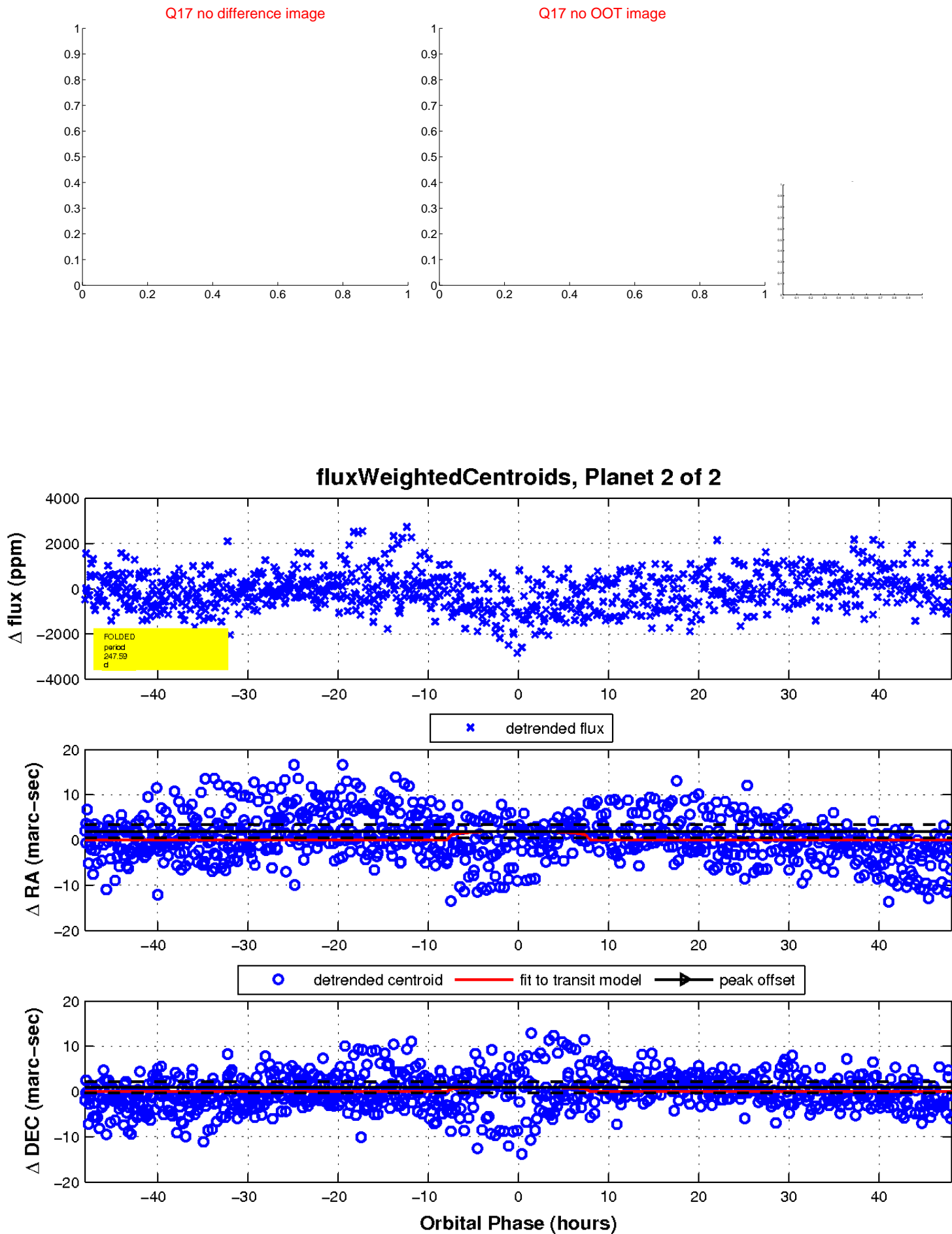
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

