

# KIC 011550428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011550428-01	OBS	No	392.423603	468.898906	2869.0	19.787	12.4	13.2	0.32	3407	3.31	0.03
011550428-02	OBS	No	199.961122	294.014550	1587.6	11.365	11.2	9.5	0.32	3407	1.33	0.06
011550428-03	OBS	No	122.770348	187.047846	837.5	4.052	9.7	5.5	0.32	3407	1.09	0.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011550428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS
011550428-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011550428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—ALL_TRANS_CHASES

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

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

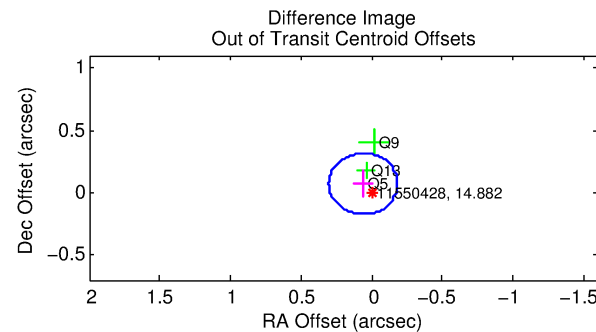
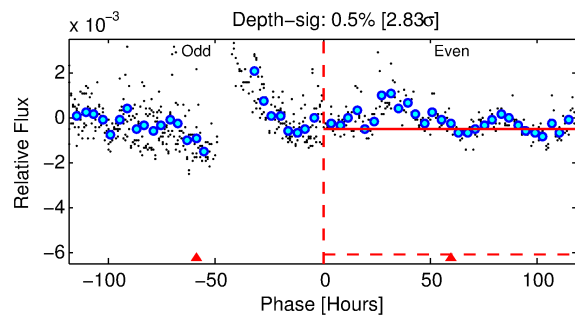
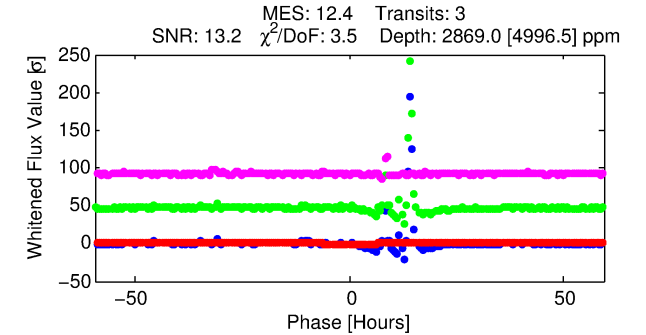
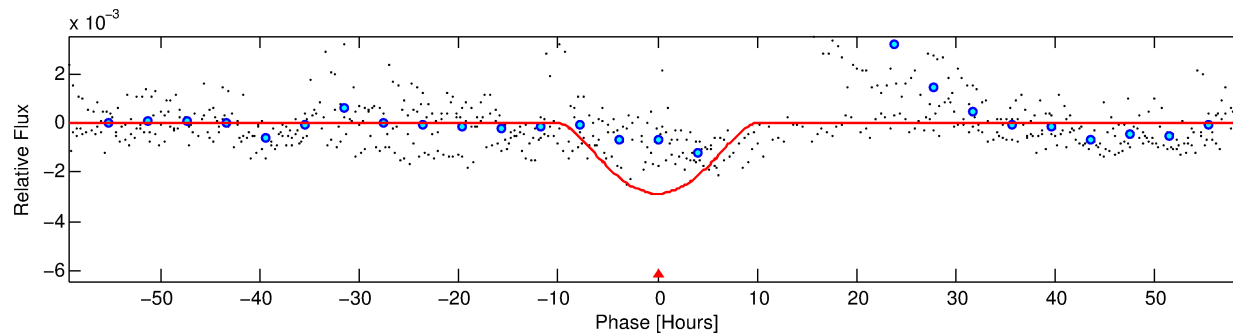
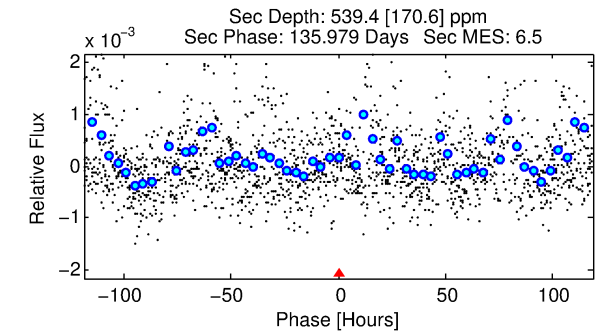
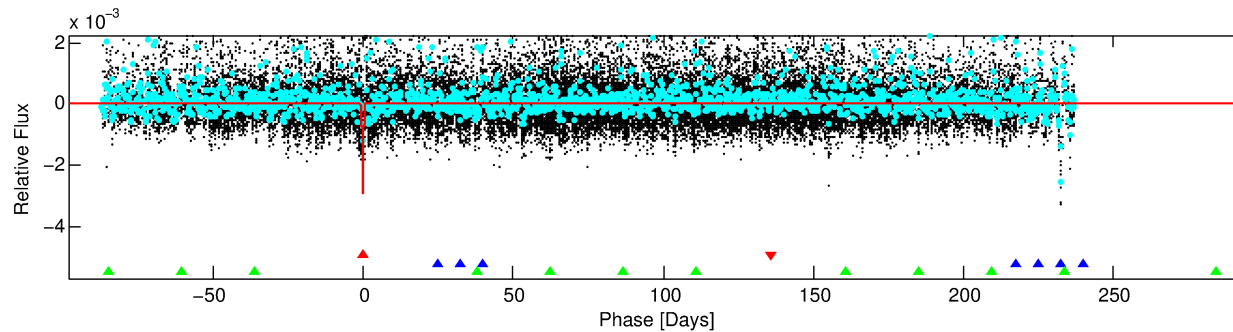
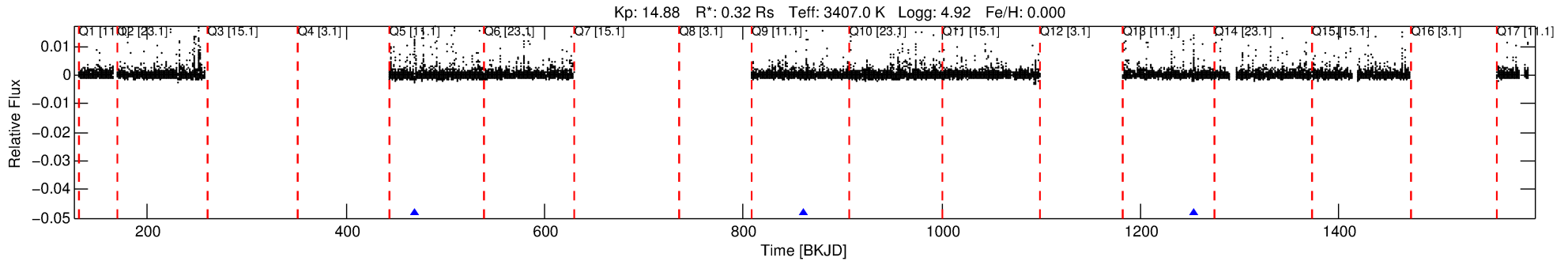
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011550428-01

No Significant Match Found

# DV One-Page Summary

KIC: 11550428 Candidate: 1 of 3 Period: 392.424 d



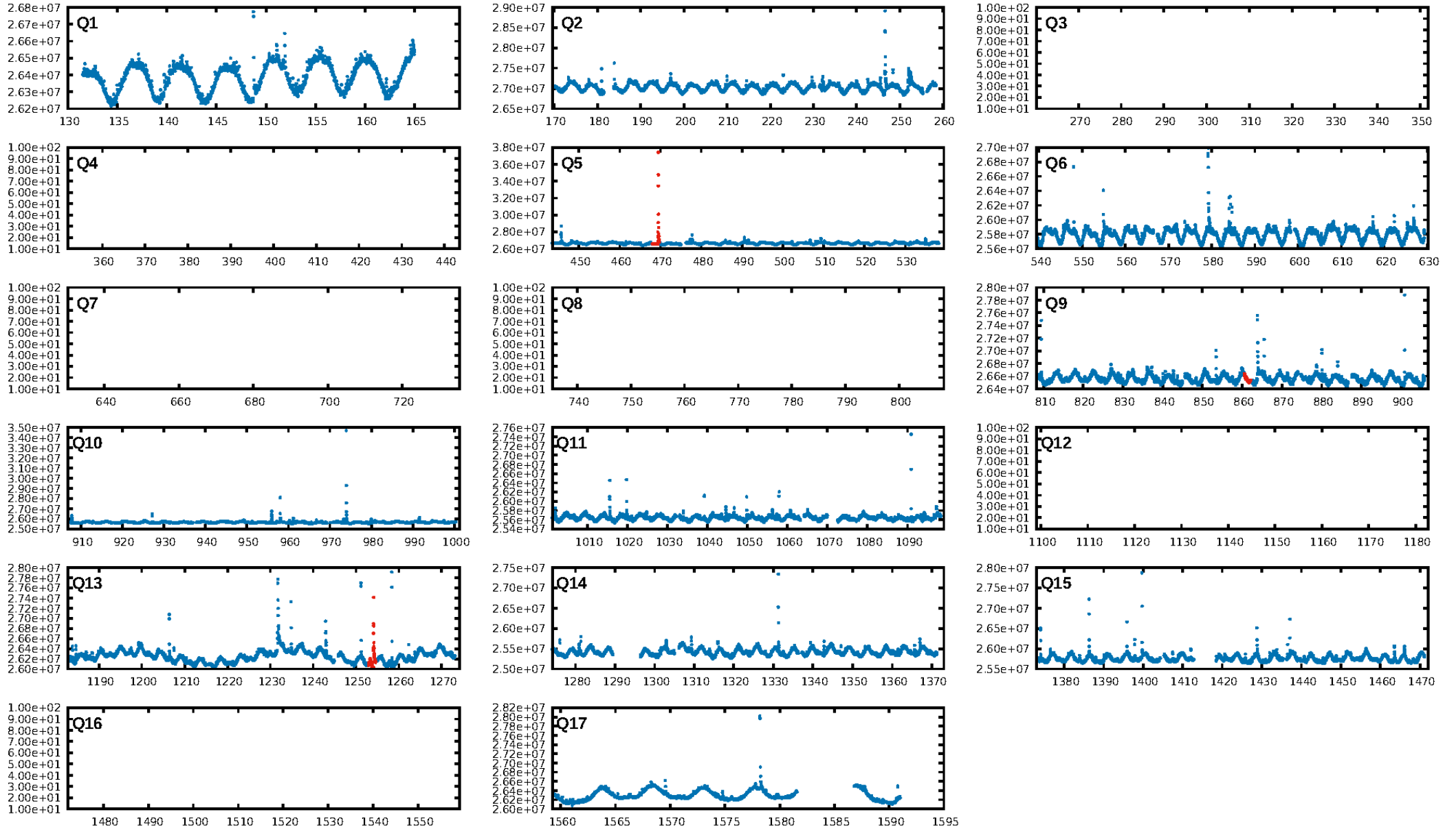
## DV Fit Results:

Period = 392.42360 [0.19154] d  
Epoch = 468.8989 [0.2746] BKJD  
Rp/R\* = 0.0938 [1.8146]  
a/R\* = 67.33 [254.31]  
b = 1.00 [2.65]  
Seff = 0.02 [0.00]  
Teq = 101 [4] K  
Rp = 3.32 [64.16] Re  
a = 0.7182 [0.0796] AU  
Ag = 13927.16 [539056.50] [0.03σ]  
Teffp = 1696 [16408] K [0.10σ]

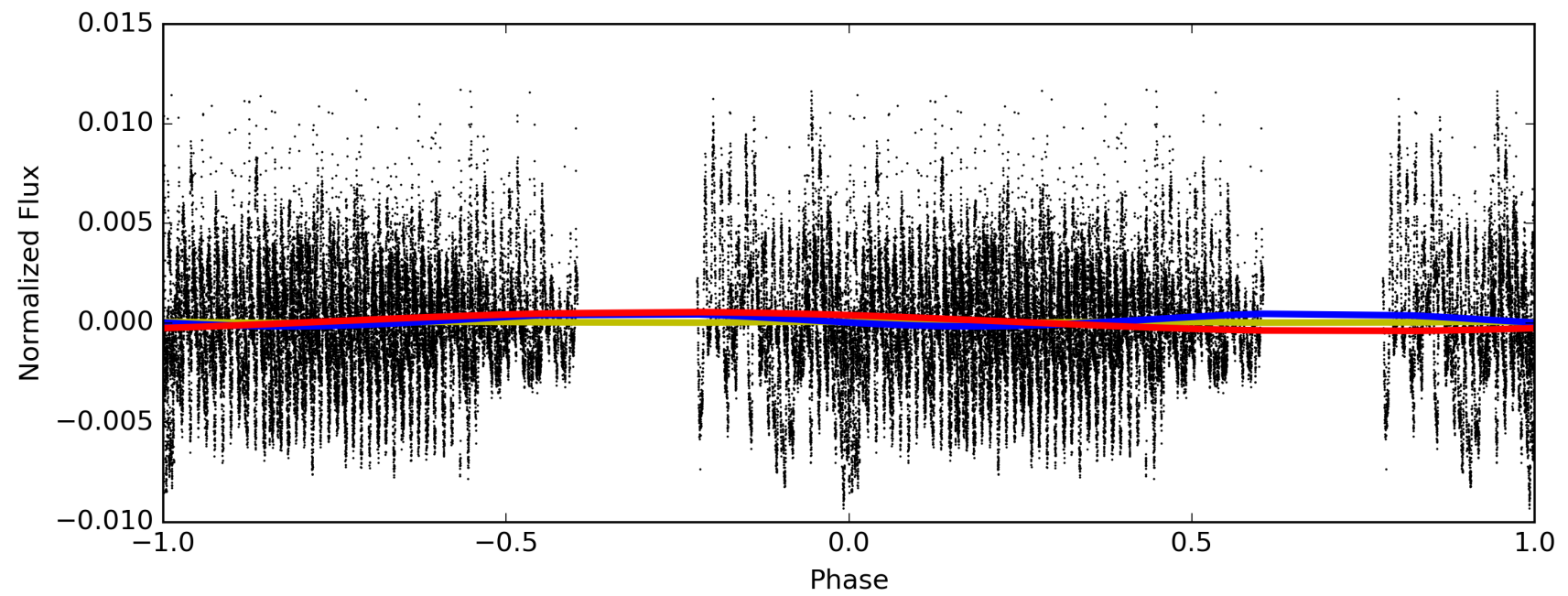
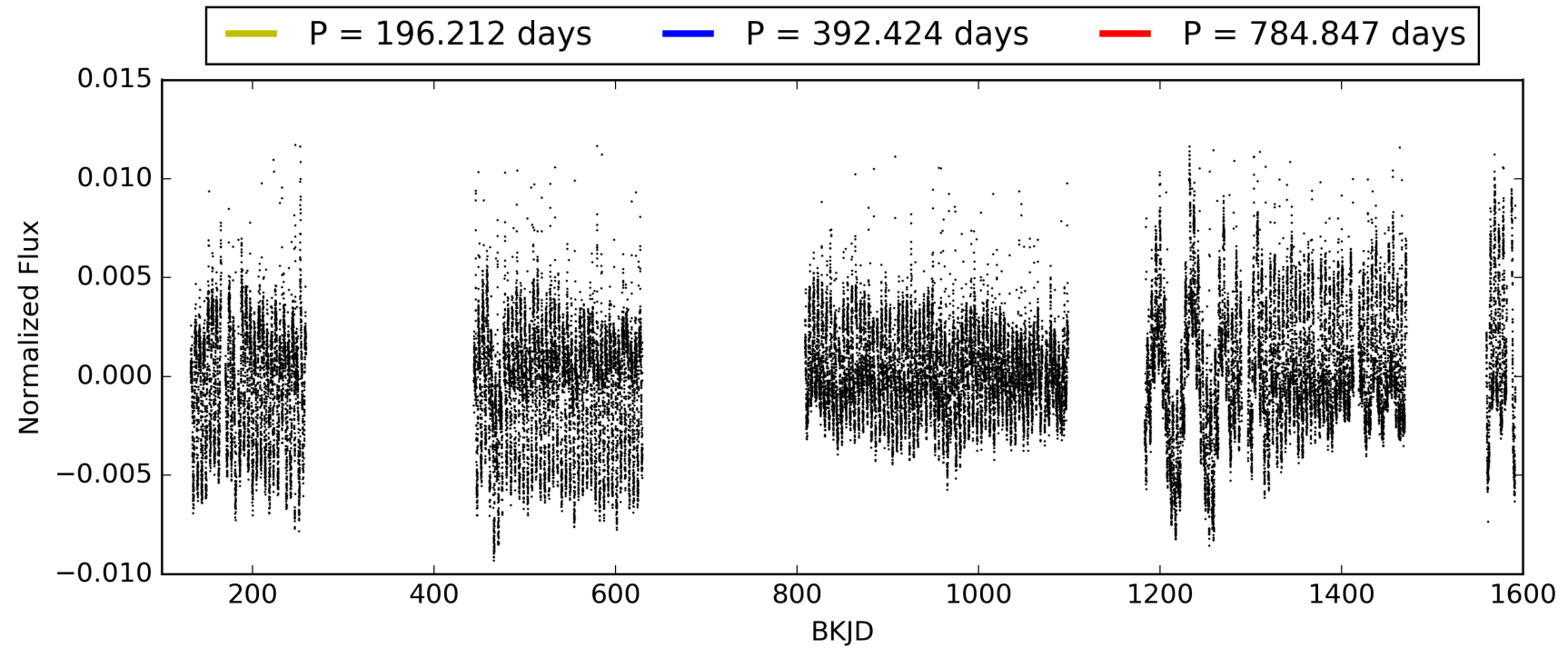
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [202.43σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 5.28e-12  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 3.663  
Centroid-sig: 6.2%  
Centroid-so: 0.465 arcsec [1.77σ]  
OotOffset-rm: 0.094 arcsec [1.15σ]  
KicOffset-rm: 0.242 arcsec [1.99σ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011550428-01, PDC Light Curves

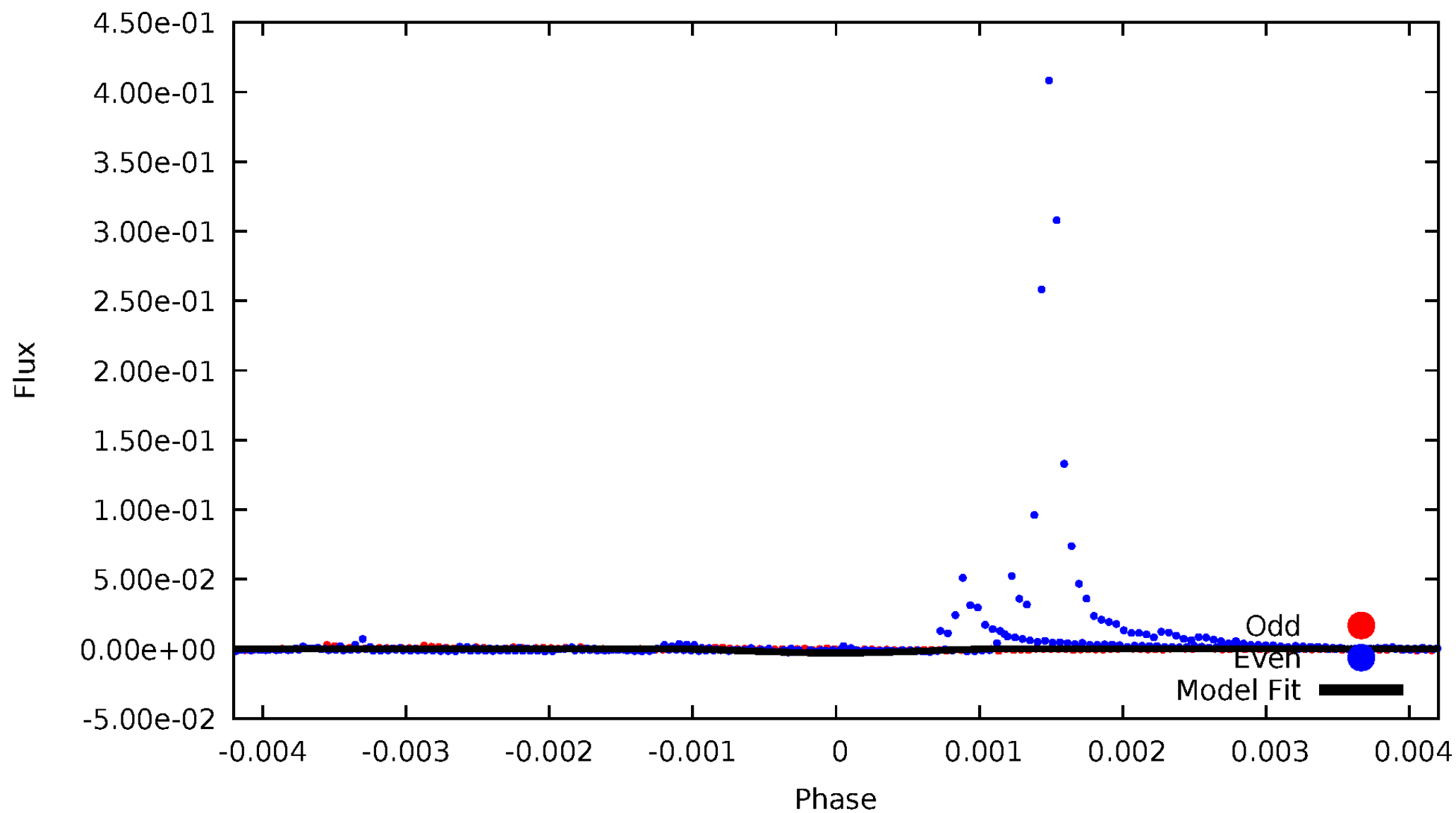


TCE 011550428-01



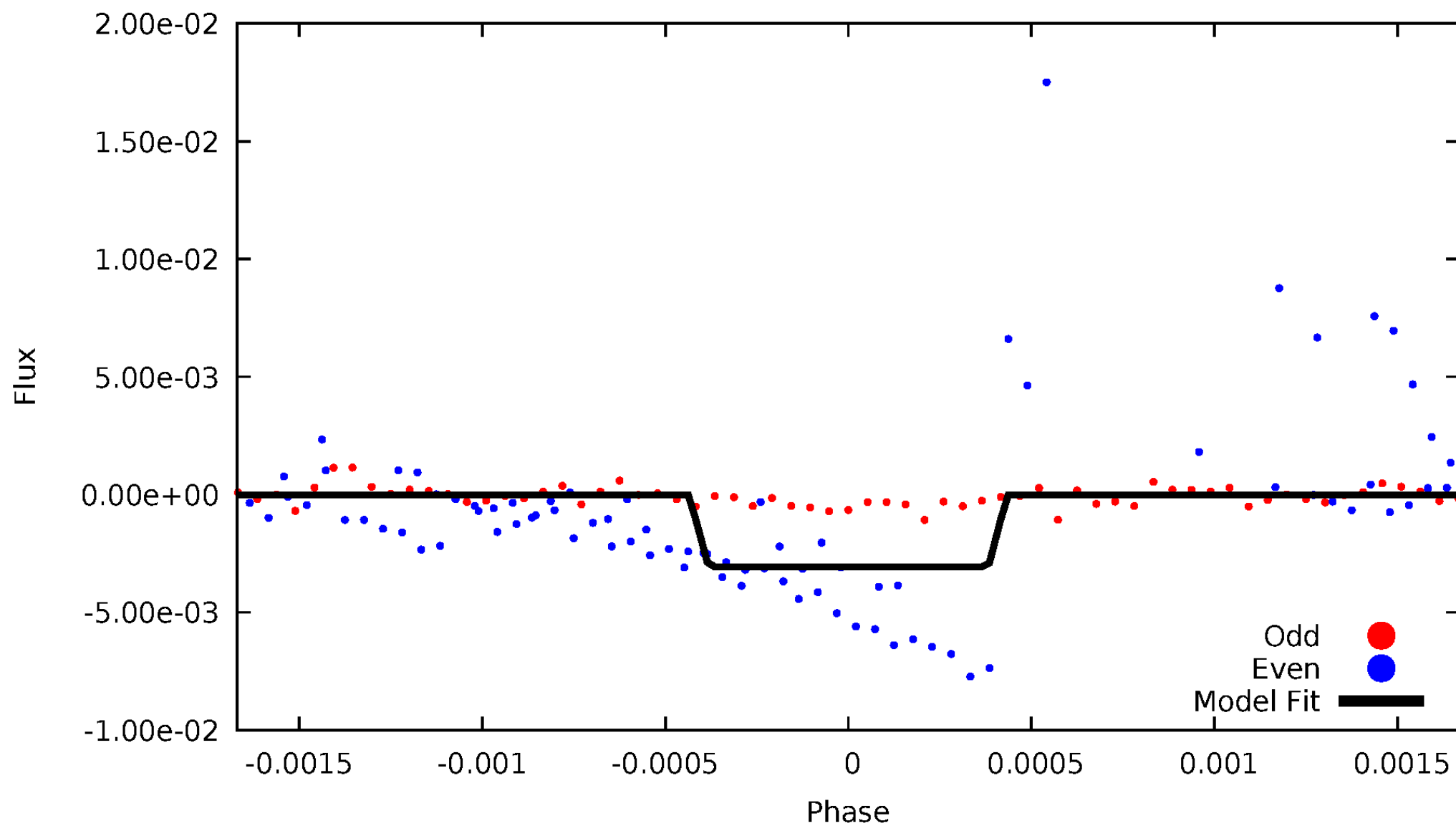
# DV Odd/Even

TCE 011550428-01



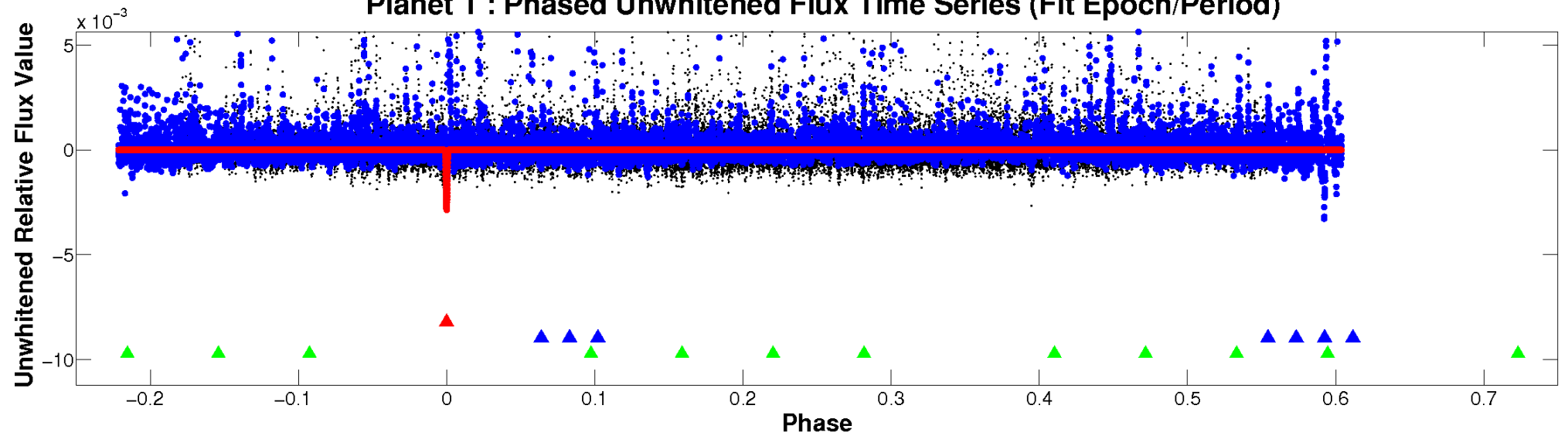
# ALT Odd/Even

TCE 011550428-01

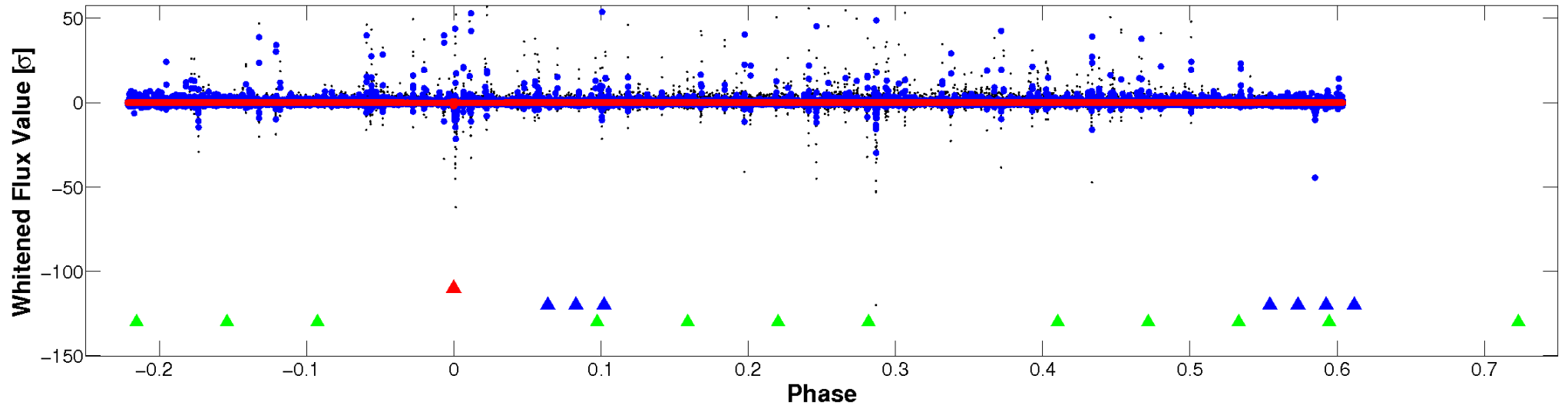


# Non-Whitened Vs. Whitened Light Curve

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

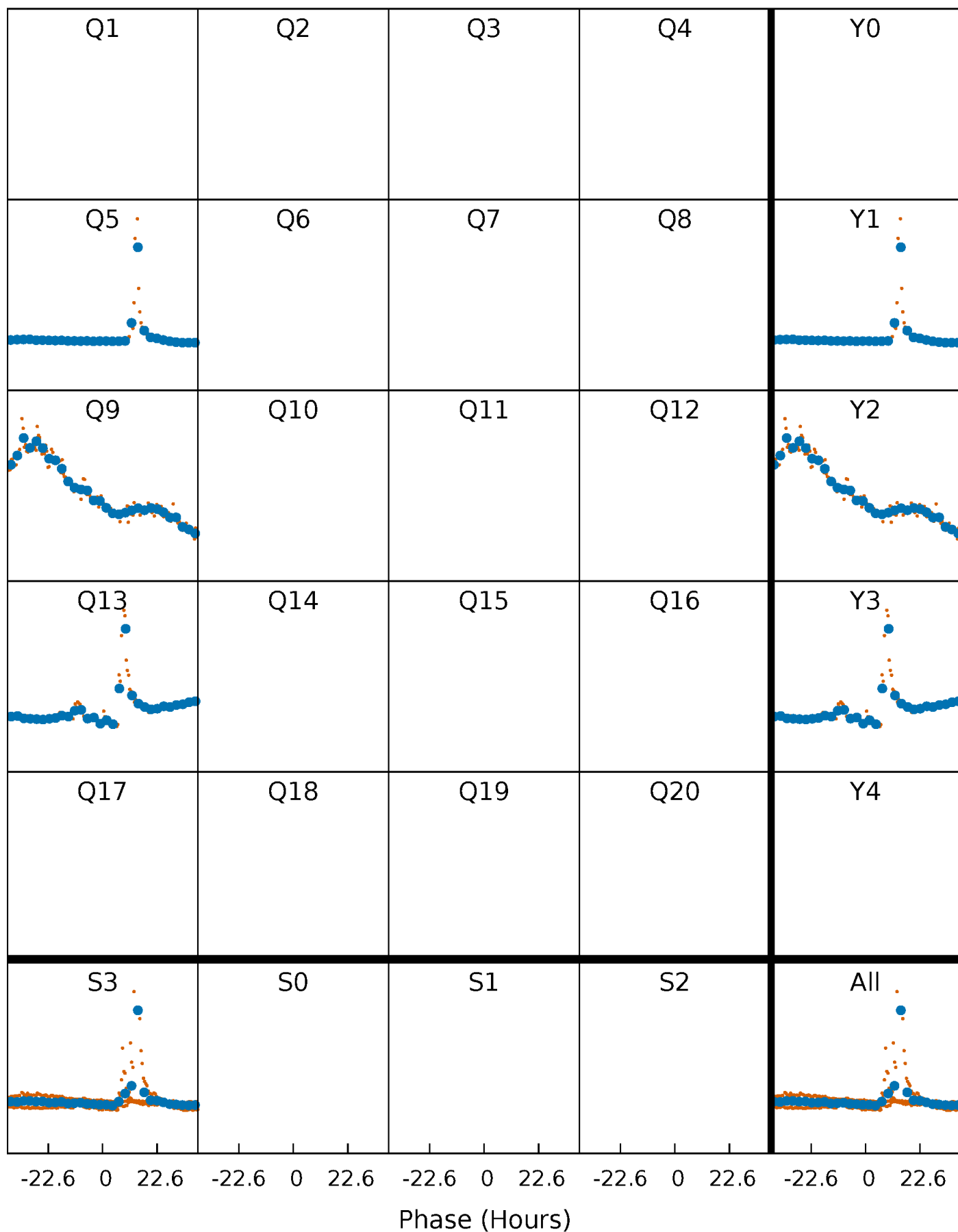


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

TCE 011550428-01     $P=392.423603$  Days     $T_0=468.898907$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 011550428-01 P=392.423603 Days  $T_0=468.898907$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

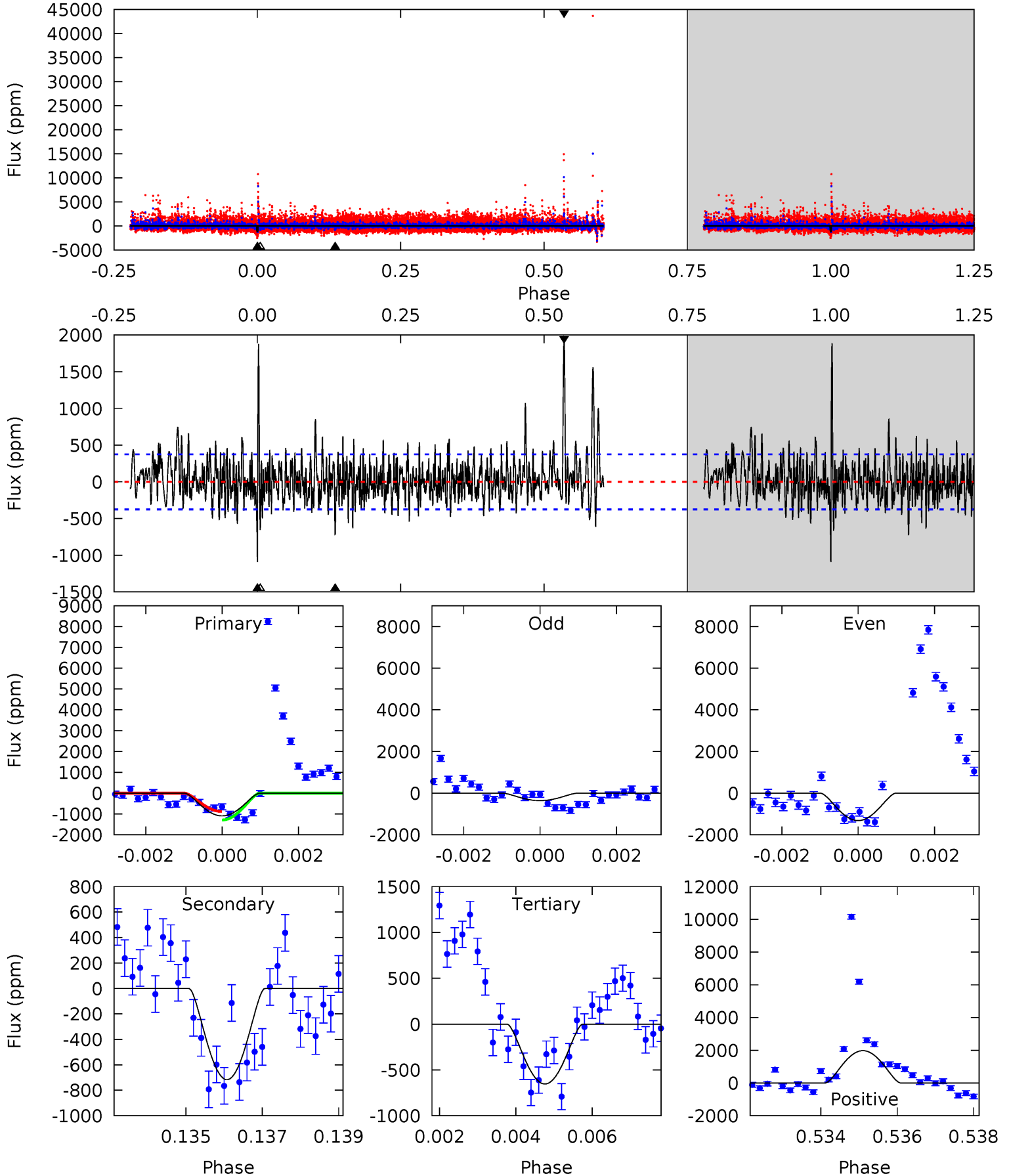
TCE 011550428-01 P=392.317541 Days  $T_0=469.225597$  (BKJD)



# DV Model-Shift Uniqueness Test

011550428-01, P = 392.423603 Days, E = 76.475304 Days

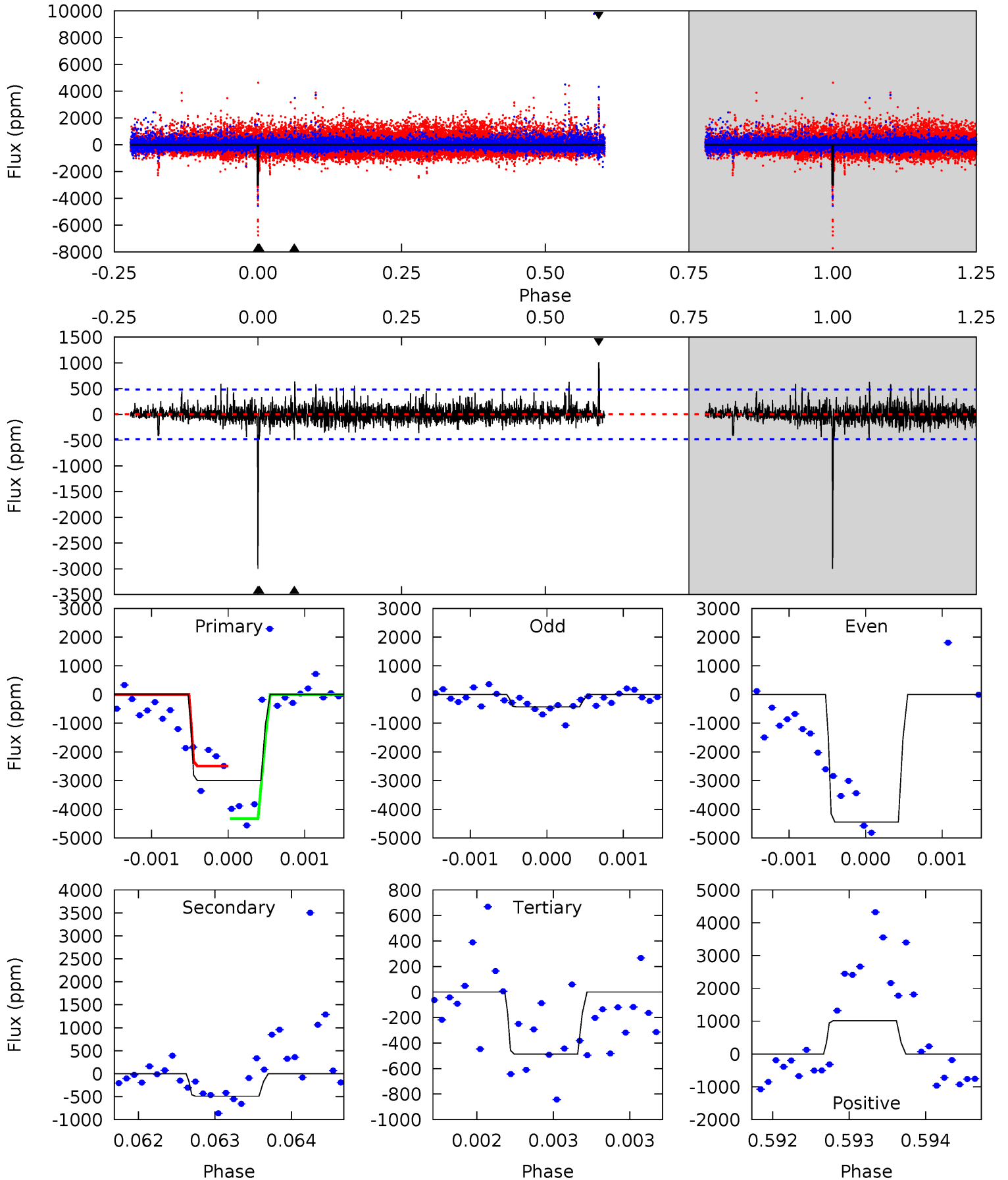
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	10.2	9.27	28.0	5.31	3.07	3.43	6.23	-12.5	0.89	-17.8	4.19	1.63	0.64	2.74



# Alt Model-Shift Uniqueness Test

011550428-01, P = 392.317541 Days, E = 76.908056 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
34.1	5.57	5.53	11.5	5.48	3.33	1.32	28.5	22.6	0.04	-5.91	23.5	0.90	0.25	9.87



### Stellar Parameters For KIC 011550428

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3407^{+54}_{-54}$	$4.923^{+0.060}_{-0.040}$	$0.000^{+0.100}_{-0.100}$	$0.324^{+0.040}_{-0.049}$	$0.320^{+0.053}_{-0.053}$	$13.280^{+4.913}_{-2.340}$
	+2%/-2%	+1%/-1%	+inf%/-inf%	+12%/-15%	+17%/-17%	+37%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011550428-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-716 \pm 71$	$40.80^{+53.73}_{-28.69}$	$141^{+4}_{-4}$	$1481^{+351}_{-171}$	$115^{+1199}_{-92}$
Alt.	$-490 \pm 88$	$44.76^{+47.33}_{-32.99}$	$141^{+4}_{-5}$	$1432^{+353}_{-153}$	$73^{+881}_{-57}$

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

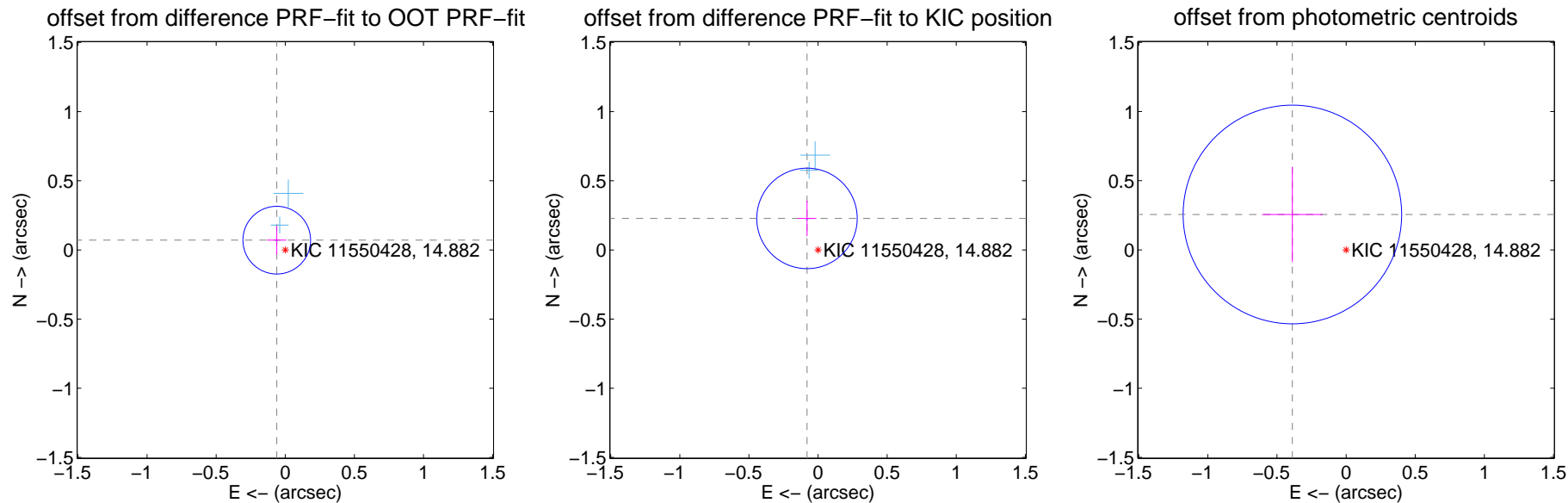
## DV Centroid Data

Supplemental centroid analysis for 011550428-01. Kepler magnitude: 14.88. Transit SNR 13.15

There are 3 quarters with good PRF difference image offsets

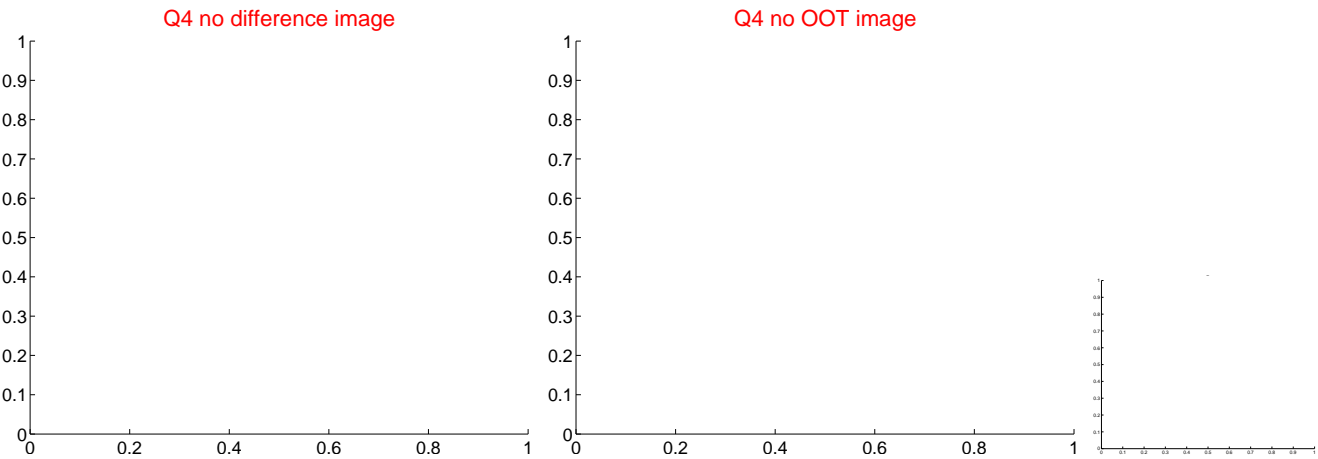
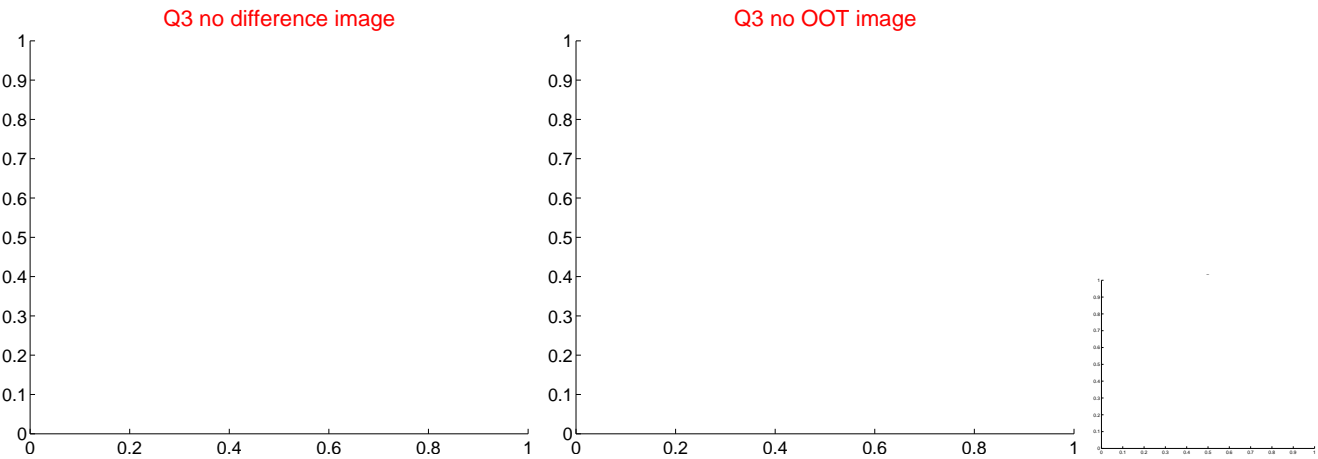
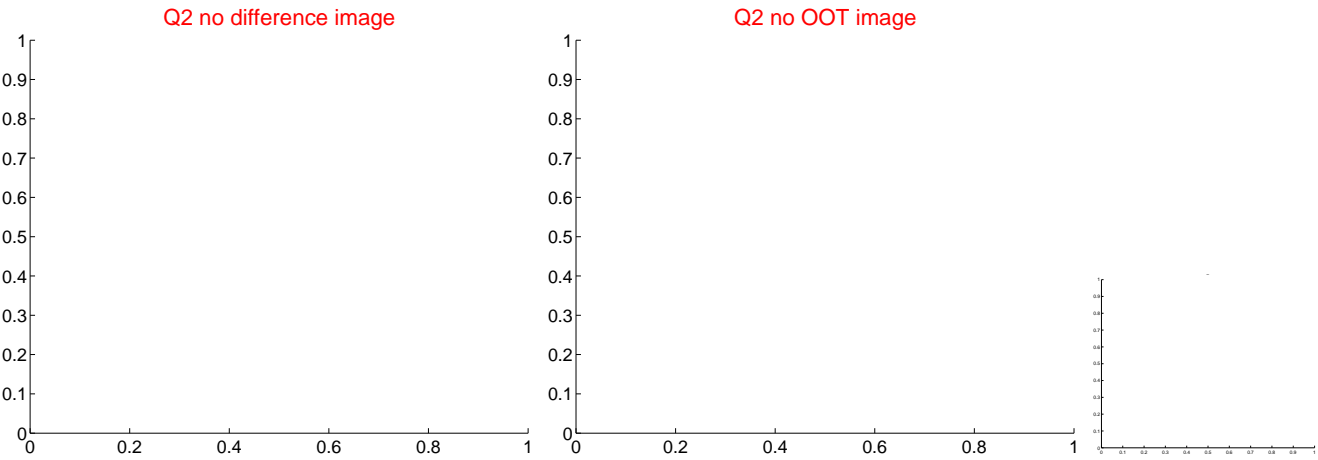
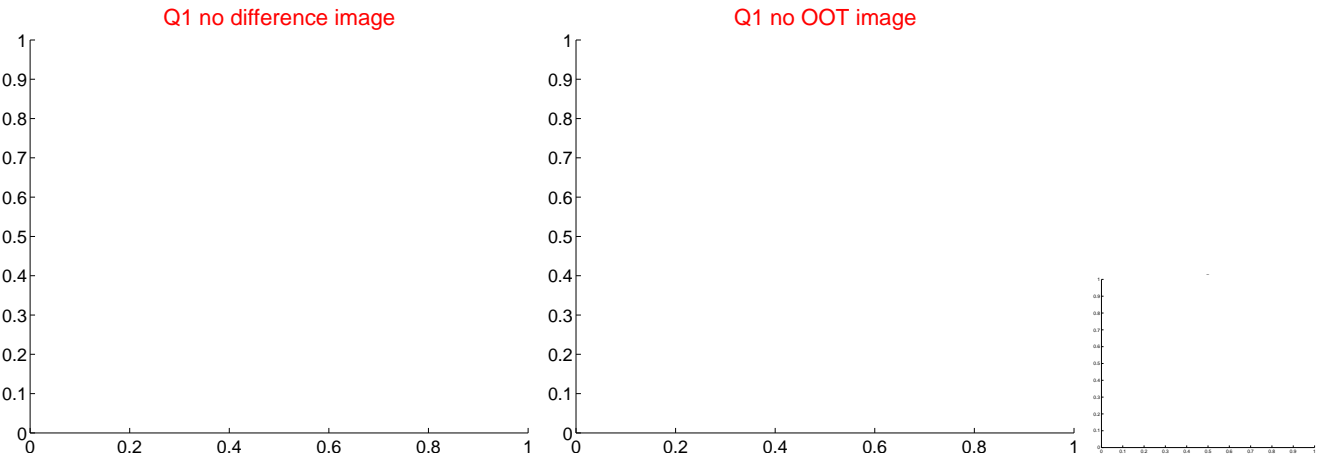
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.094 \pm 0.082$	1.15	$0.062 \pm 0.070$	$0.071 \pm 0.104$
PRF-fit source offset from KIC position	$0.242 \pm 0.121$	1.99	$0.080 \pm 0.067$	$0.228 \pm 0.129$
photometric centroid source offset	$0.47 \pm 0.26$	1.77	$0.39 \pm 0.22$	$0.26 \pm 0.34$

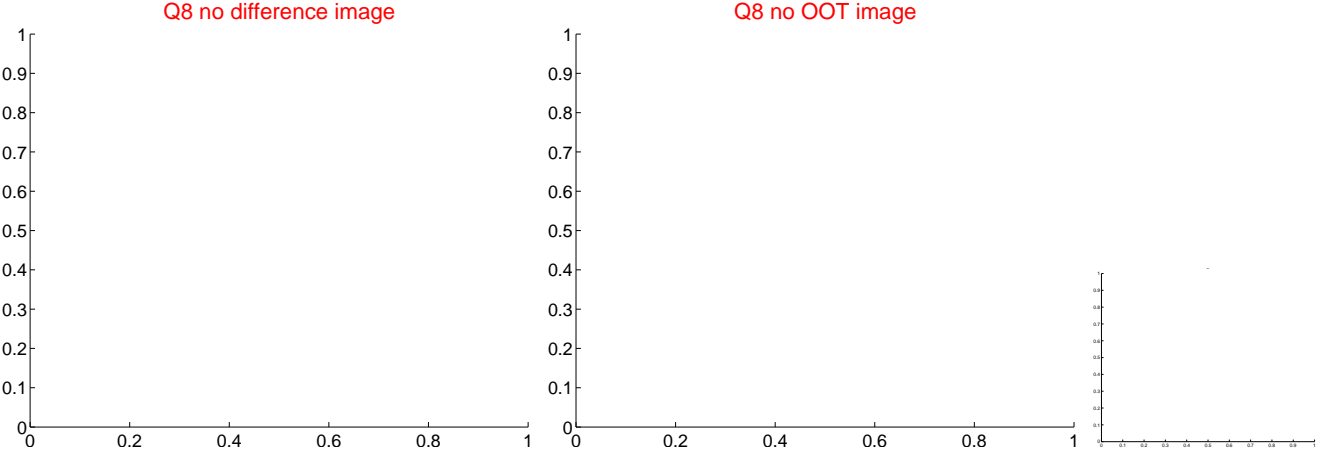
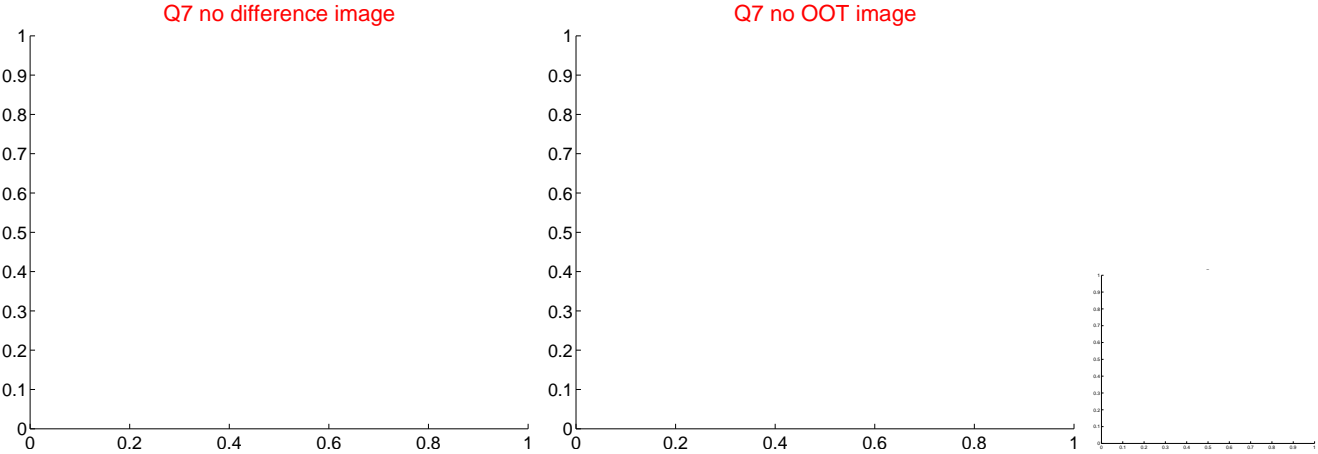
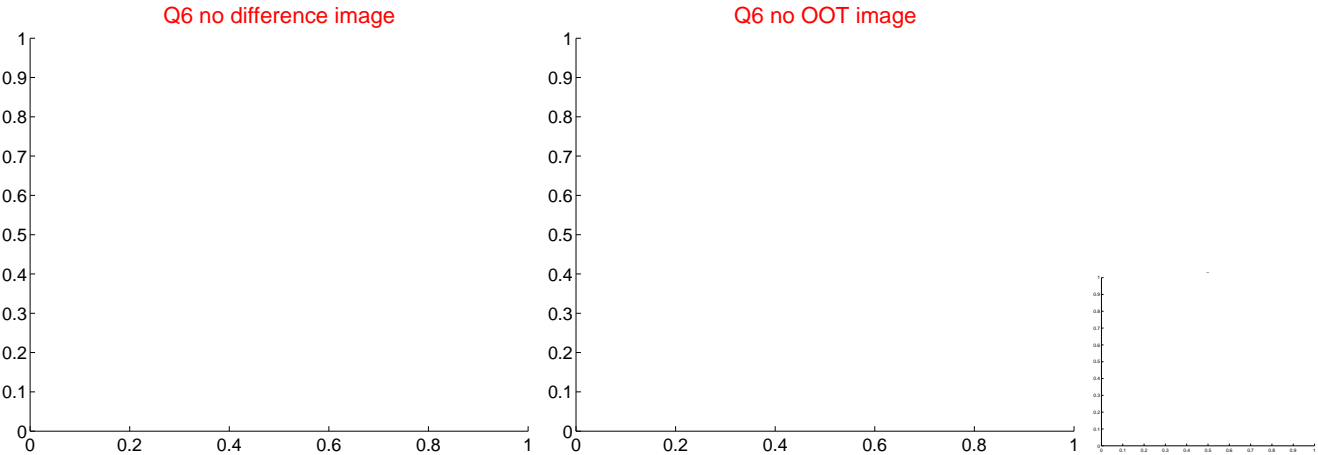
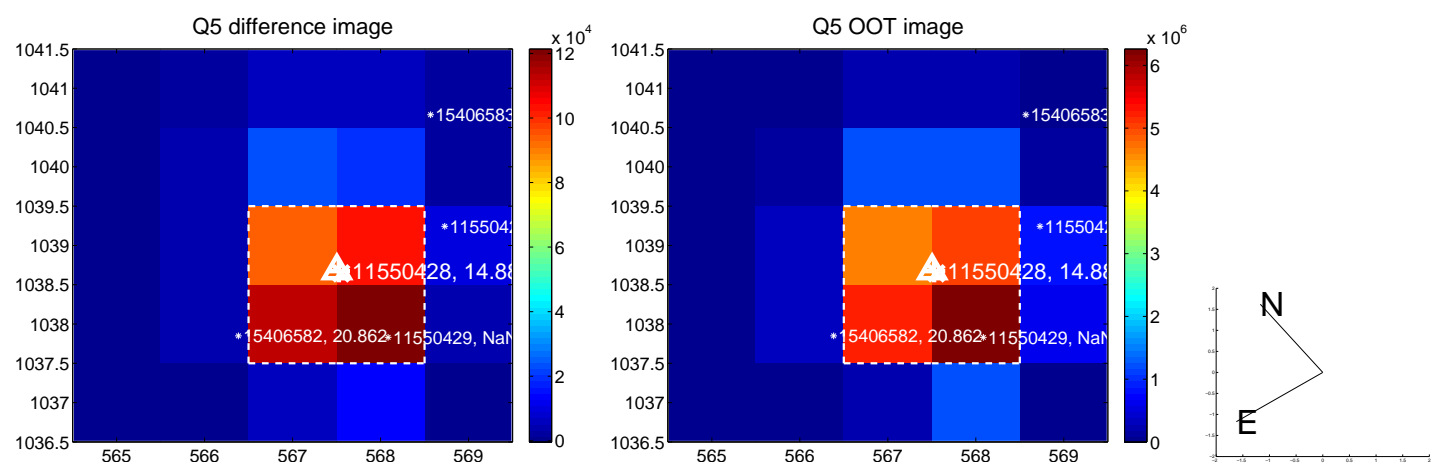


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

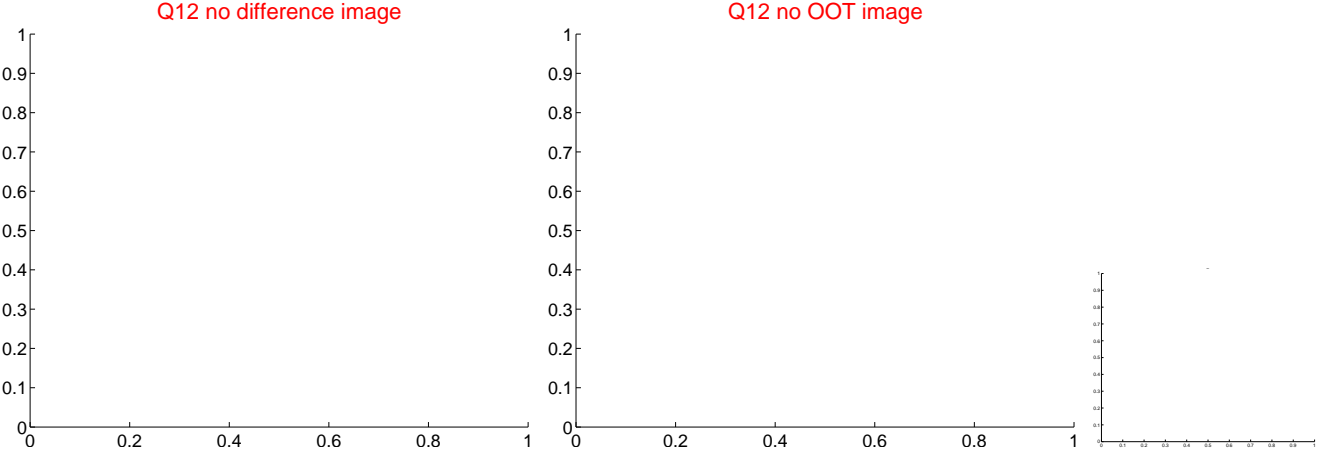
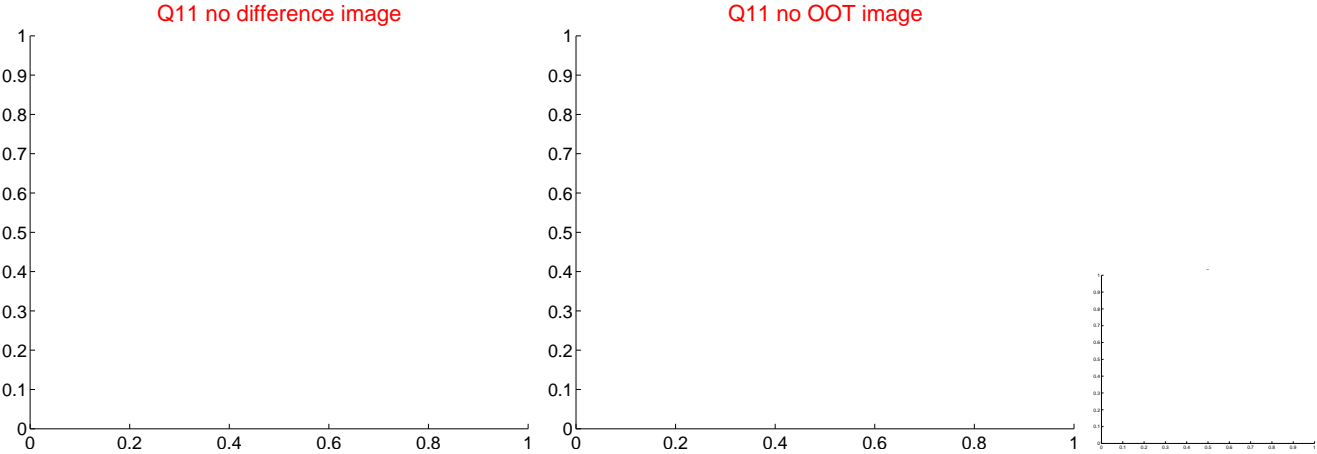
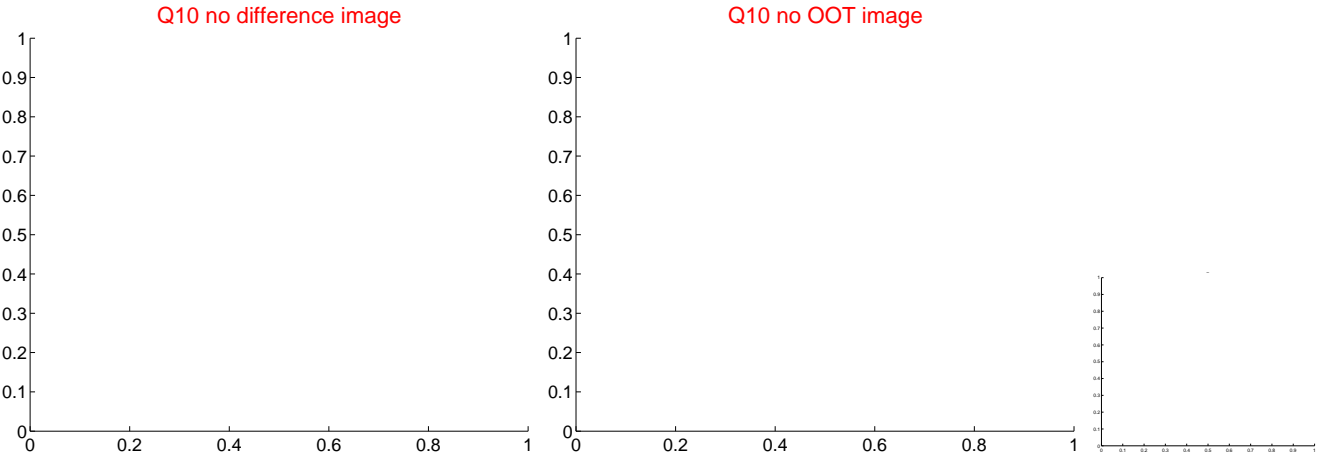
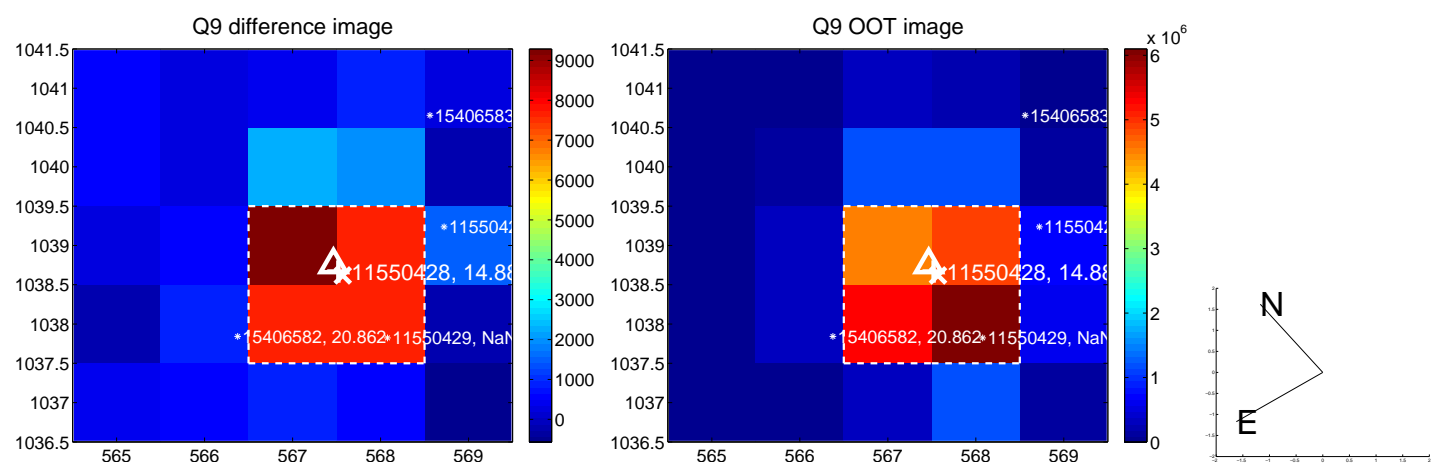


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

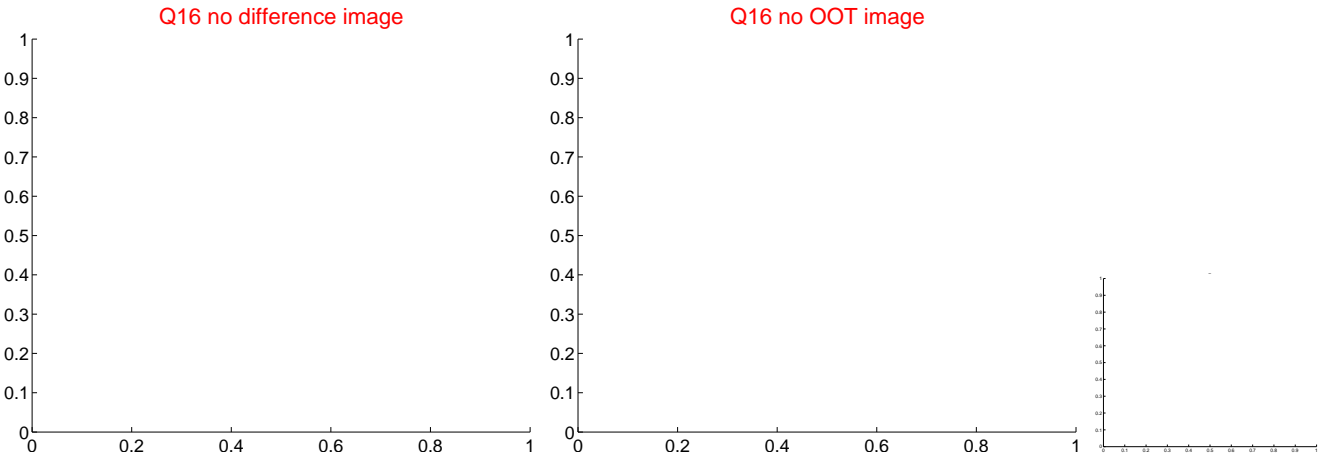
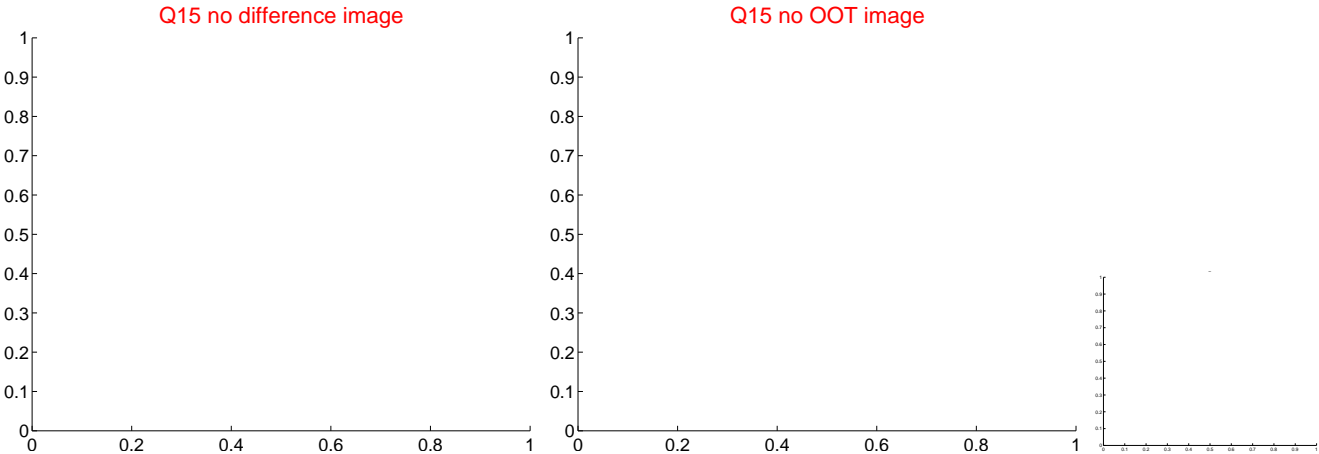
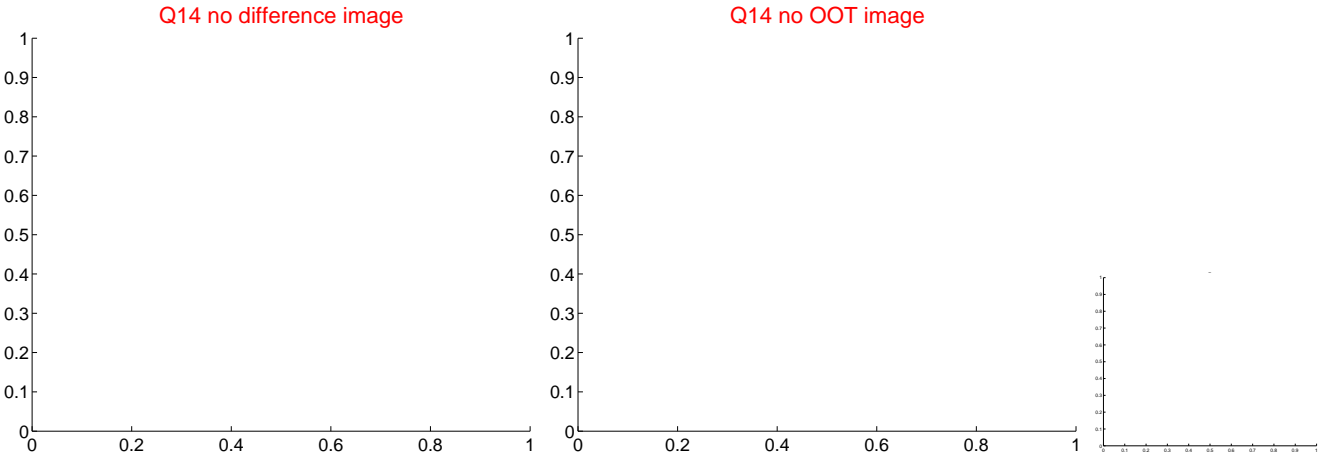
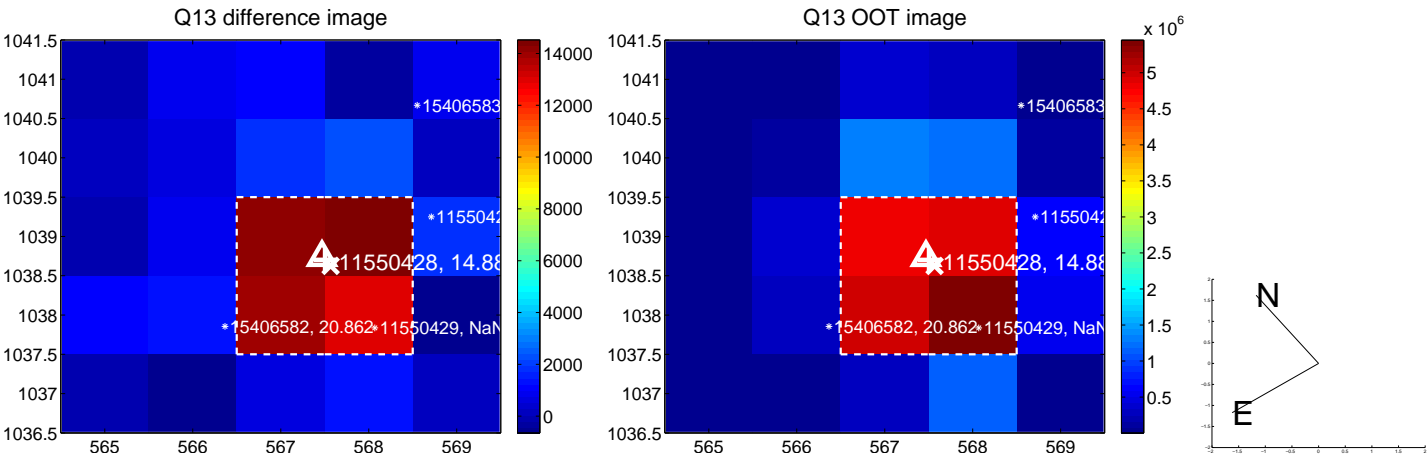




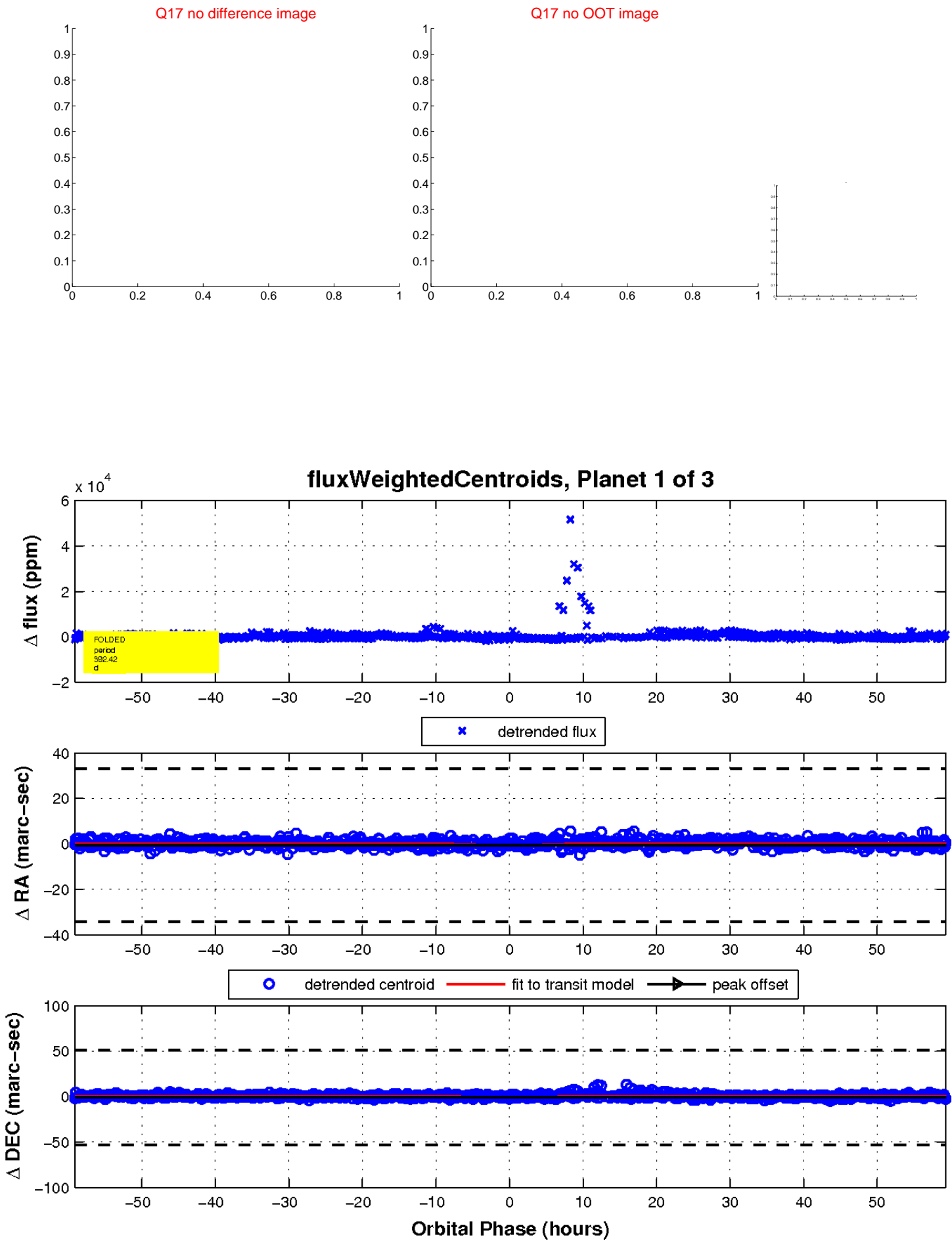
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

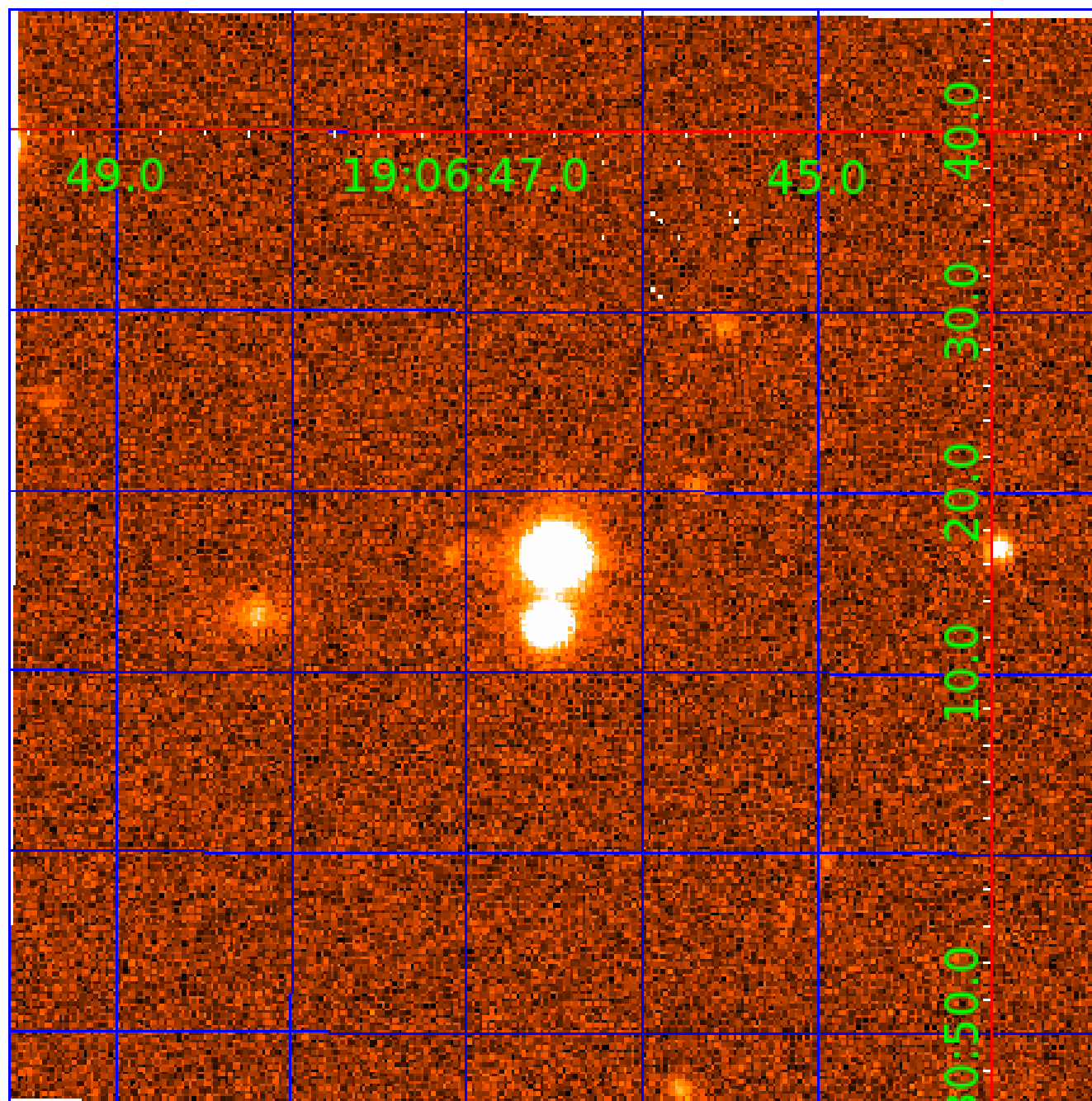


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011550428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011550428-01	OBS	No	392.423603	468.898906	2869.0	19.787	12.4	13.2	0.32	3407	3.31	0.03
011550428-02	OBS	No	199.961122	294.014550	1587.6	11.365	11.2	9.5	0.32	3407	1.33	0.06
011550428-03	OBS	No	122.770348	187.047846	837.5	4.052	9.7	5.5	0.32	3407	1.09	0.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011550428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS
011550428-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011550428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—ALL_TRANS_CHASES

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

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

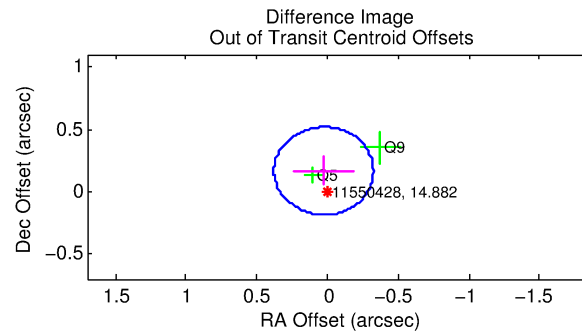
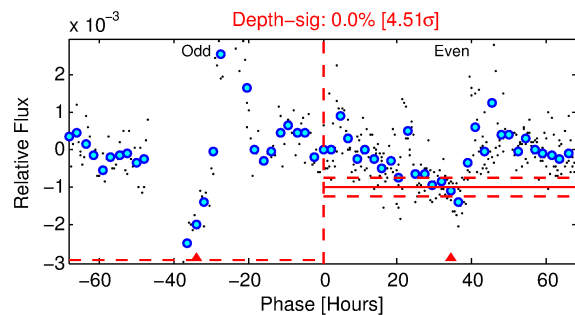
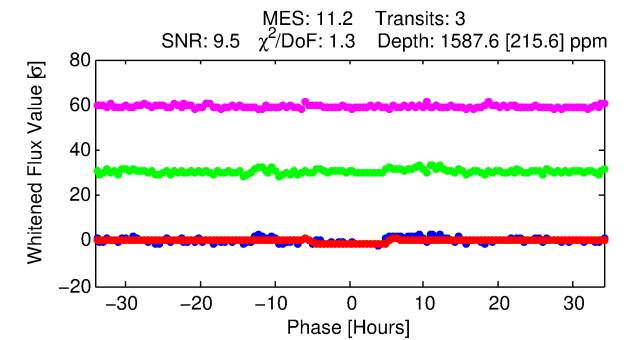
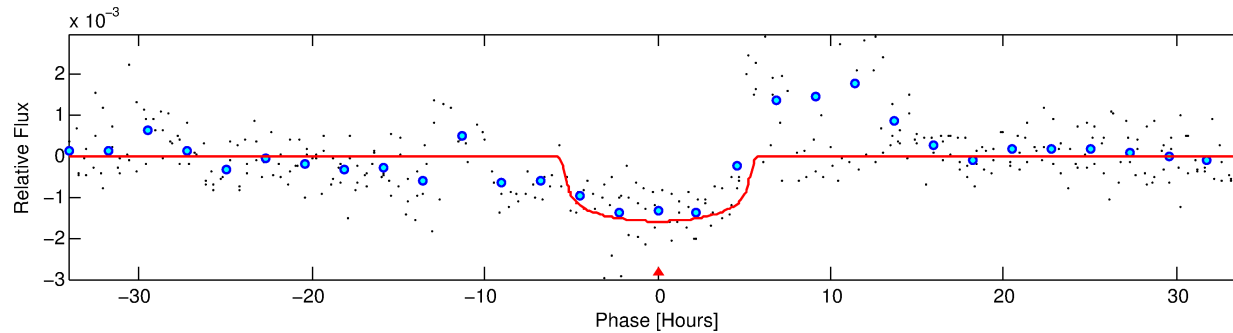
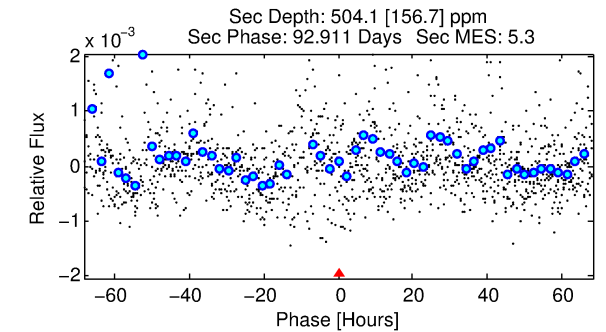
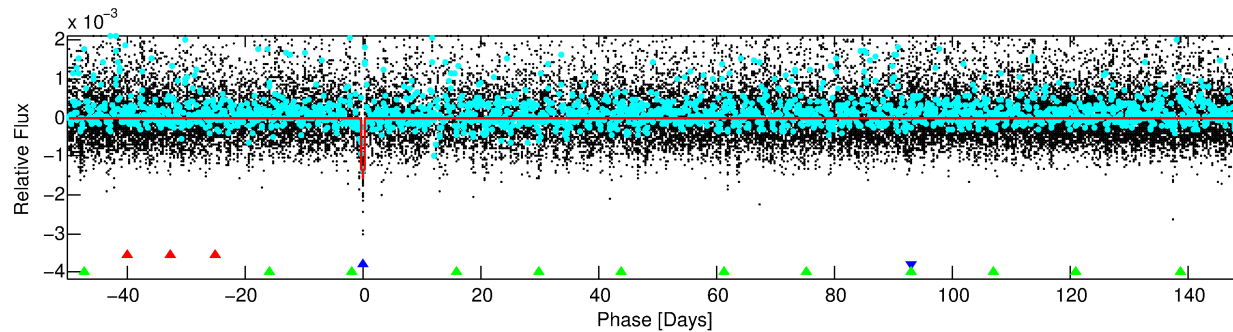
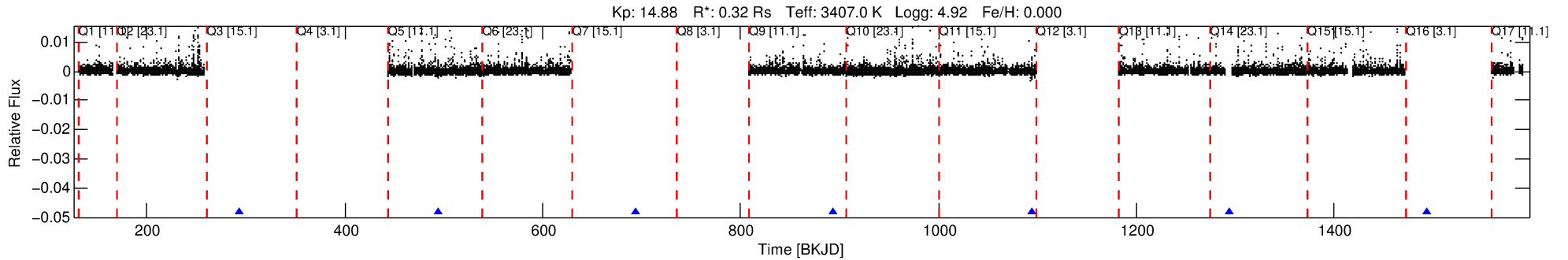
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011550428-02

No Significant Match Found

# DV One-Page Summary

KIC: 11550428 Candidate: 2 of 3 Period: 199.961 d



## DV Fit Results:

Period = 199.96112 [0.00708] d  
Epoch = 294.0145 [0.0192] BKJD  
Rp/R\* = 0.0376 [0.0083]  
a/R\* = 116.40 [100.51]  
b = 0.57 [1.02]  
Seff = 0.06 [0.01]  
Teq = 126 [5] K  
Rp = 1.33 [0.36] Re  
a = 0.4582 [0.0508] AU  
Ag = 32862.23 [18336.36] [1.79σ]  
Teffp = 2631 [358] K [6.99σ]

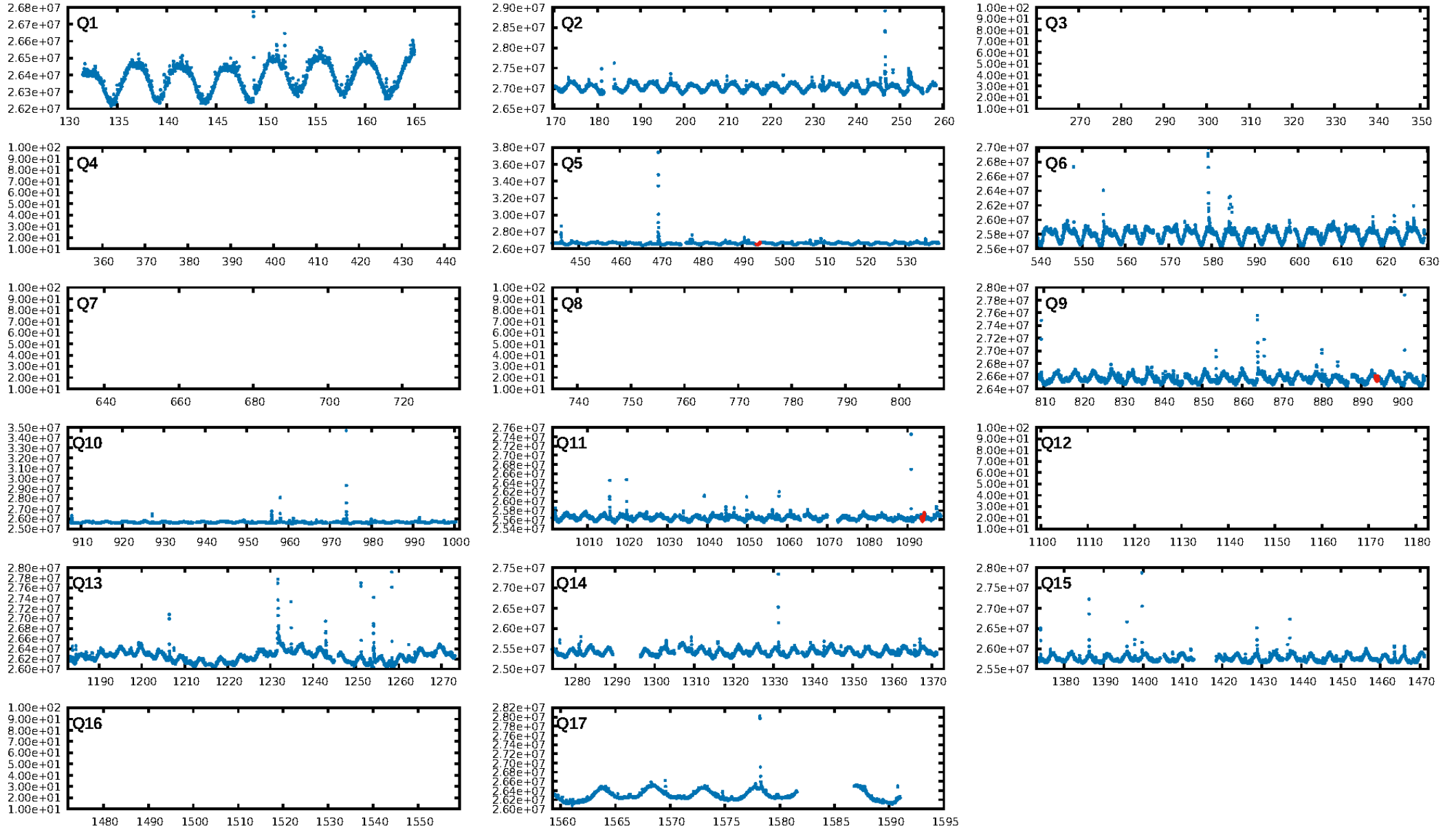
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [153.54σ]  
LongPeriod-sig: 100.0% [202.43σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 93.0%  
Bootstrap-pfa: 7.23e-12  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.24  
Centroid-sig: 6.1%  
Centroid-so: 0.662 arcsec [1.16σ]  
OotOffset-rm: 0.168 arcsec [1.43σ]  
KicOffset-rm: 0.347 arcsec [2.04σ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

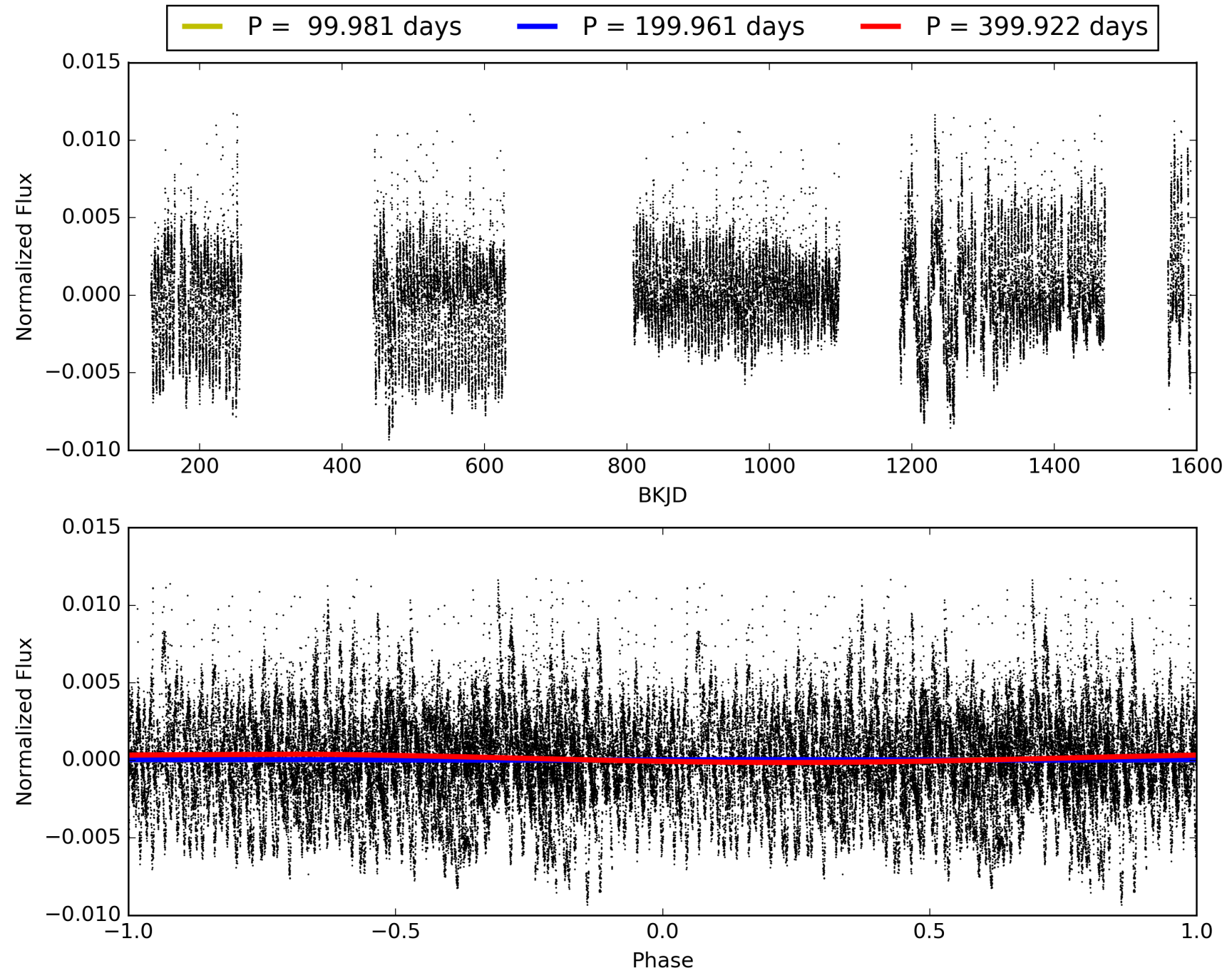
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011550428-02, PDC Light Curves



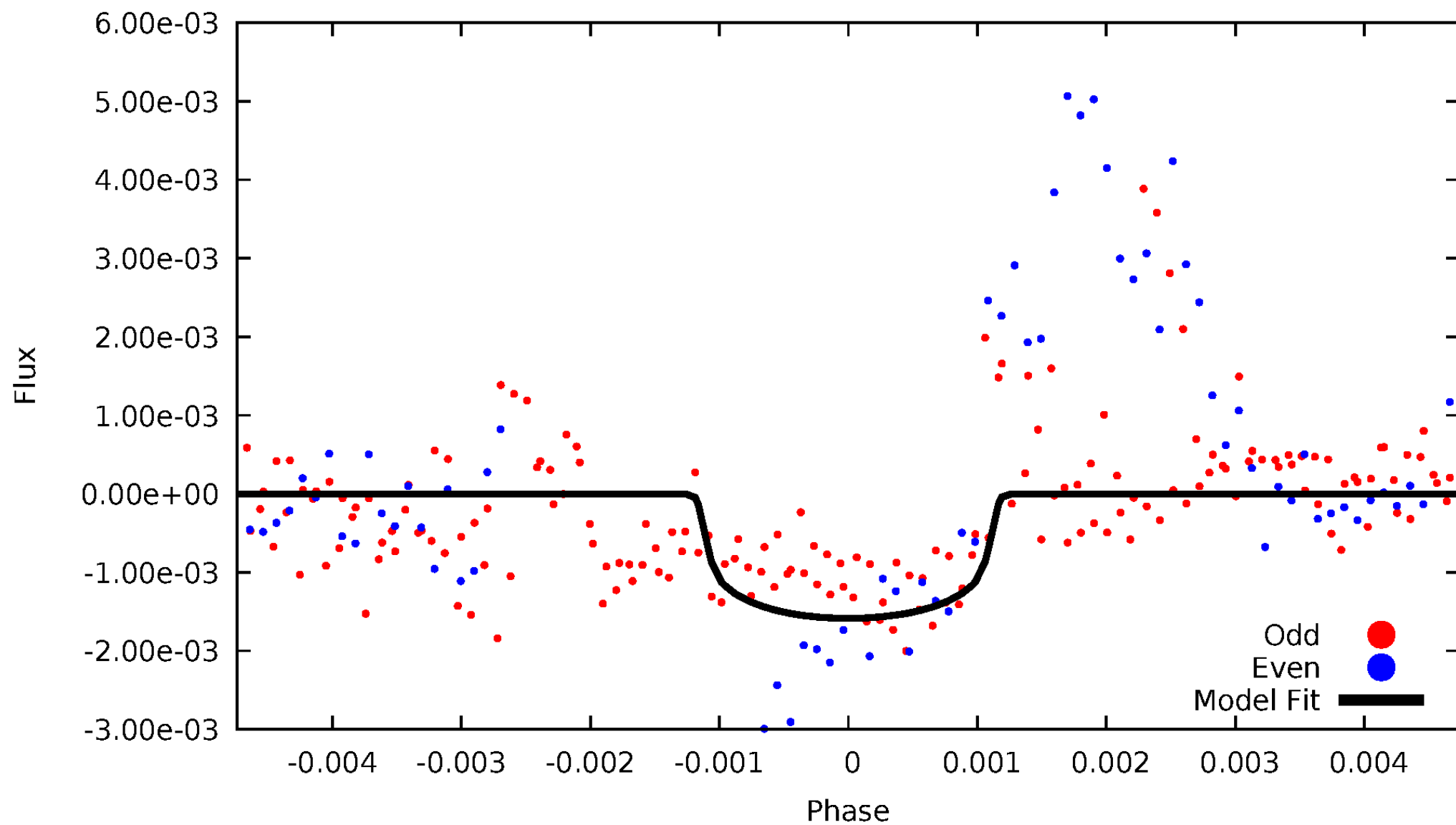
TCE 011550428-02





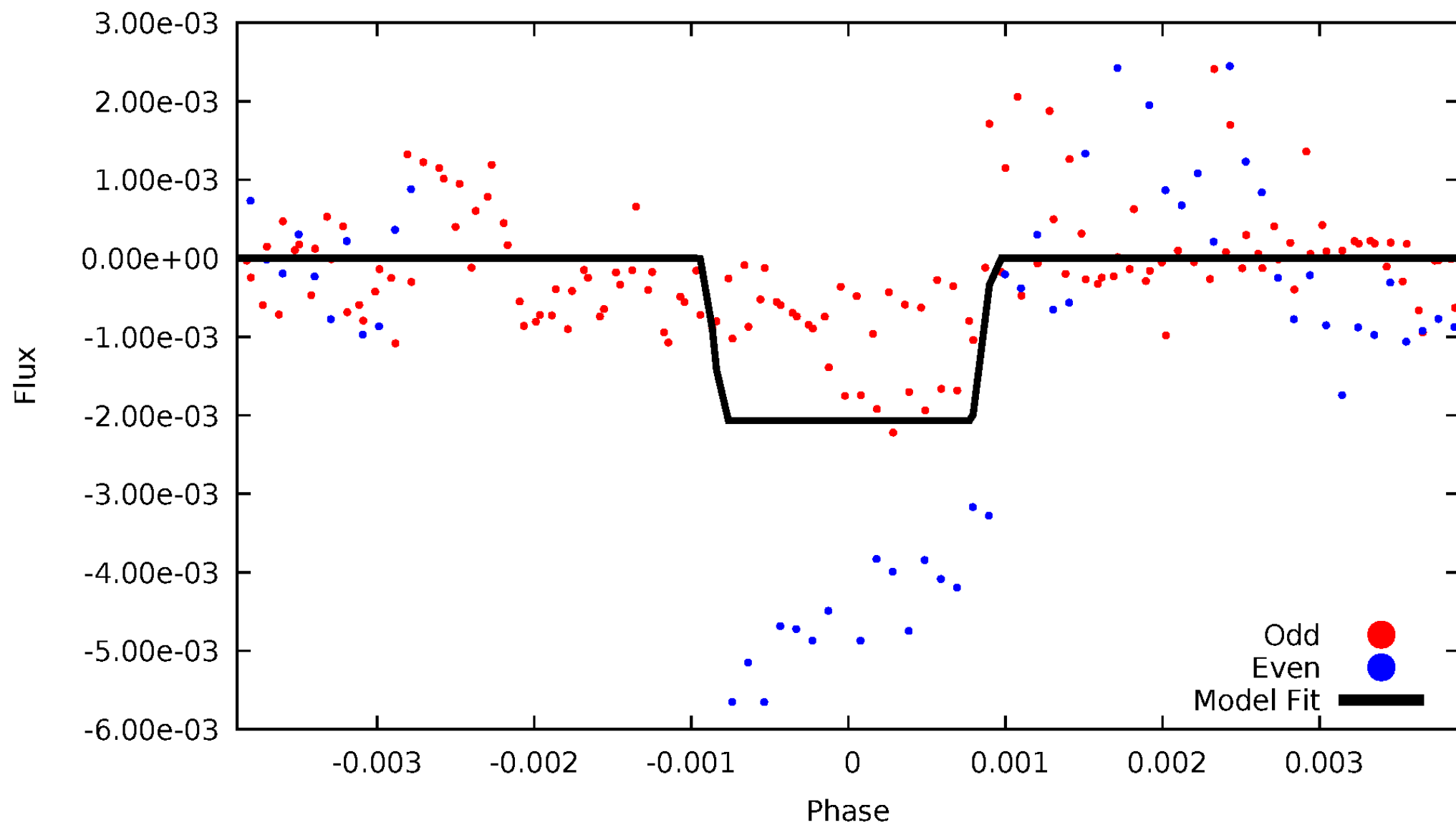
# DV Odd/Even

TCE 011550428-02



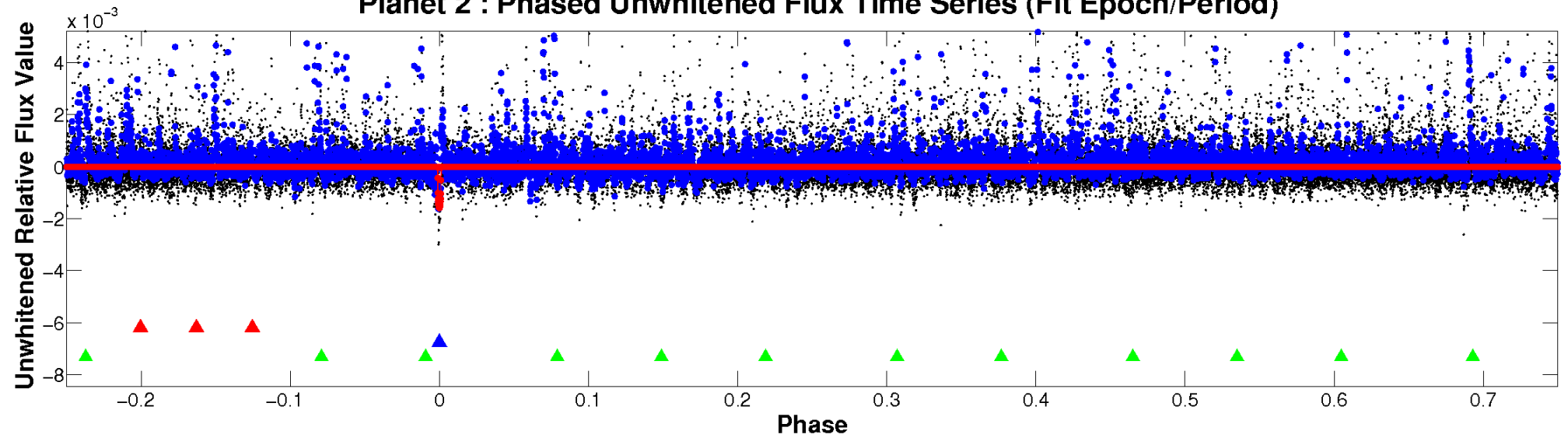
# ALT Odd/Even

TCE 011550428-02

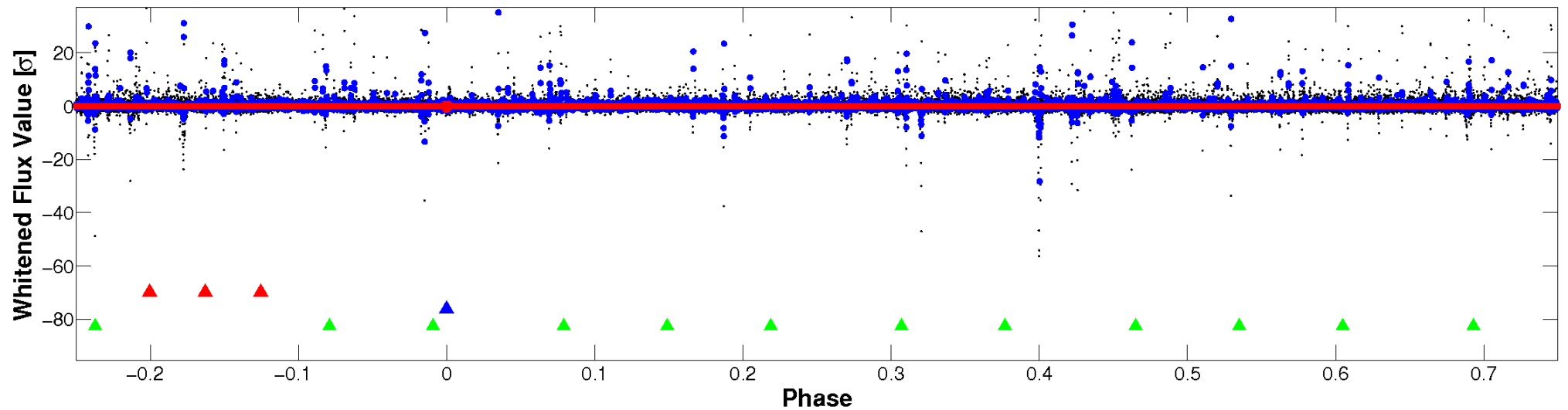


# Non-Whitened Vs. Whitened Light Curve

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

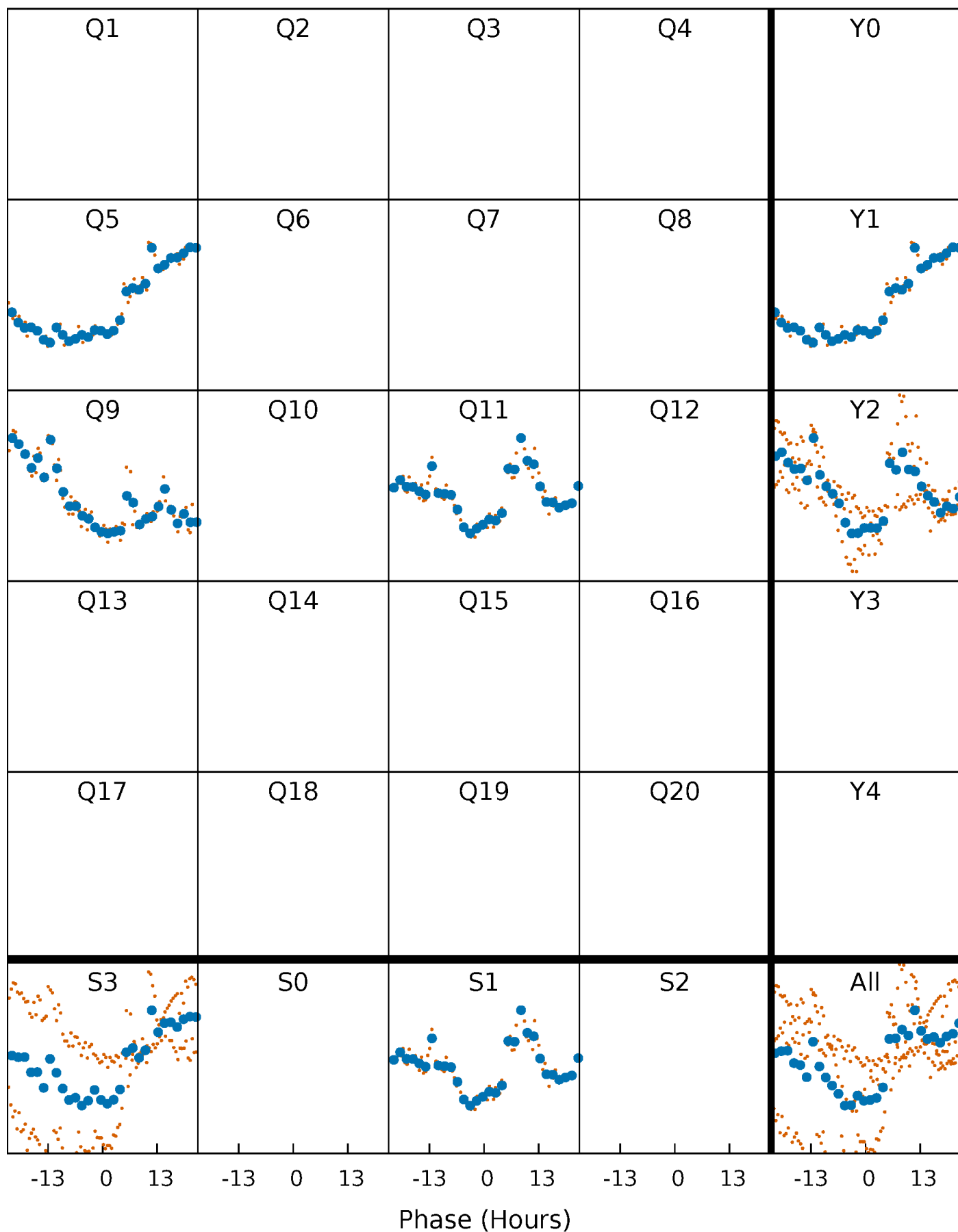


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

TCE 011550428-02     $P=199.961122$  Days     $T_0=294.014550$  (BKJD)



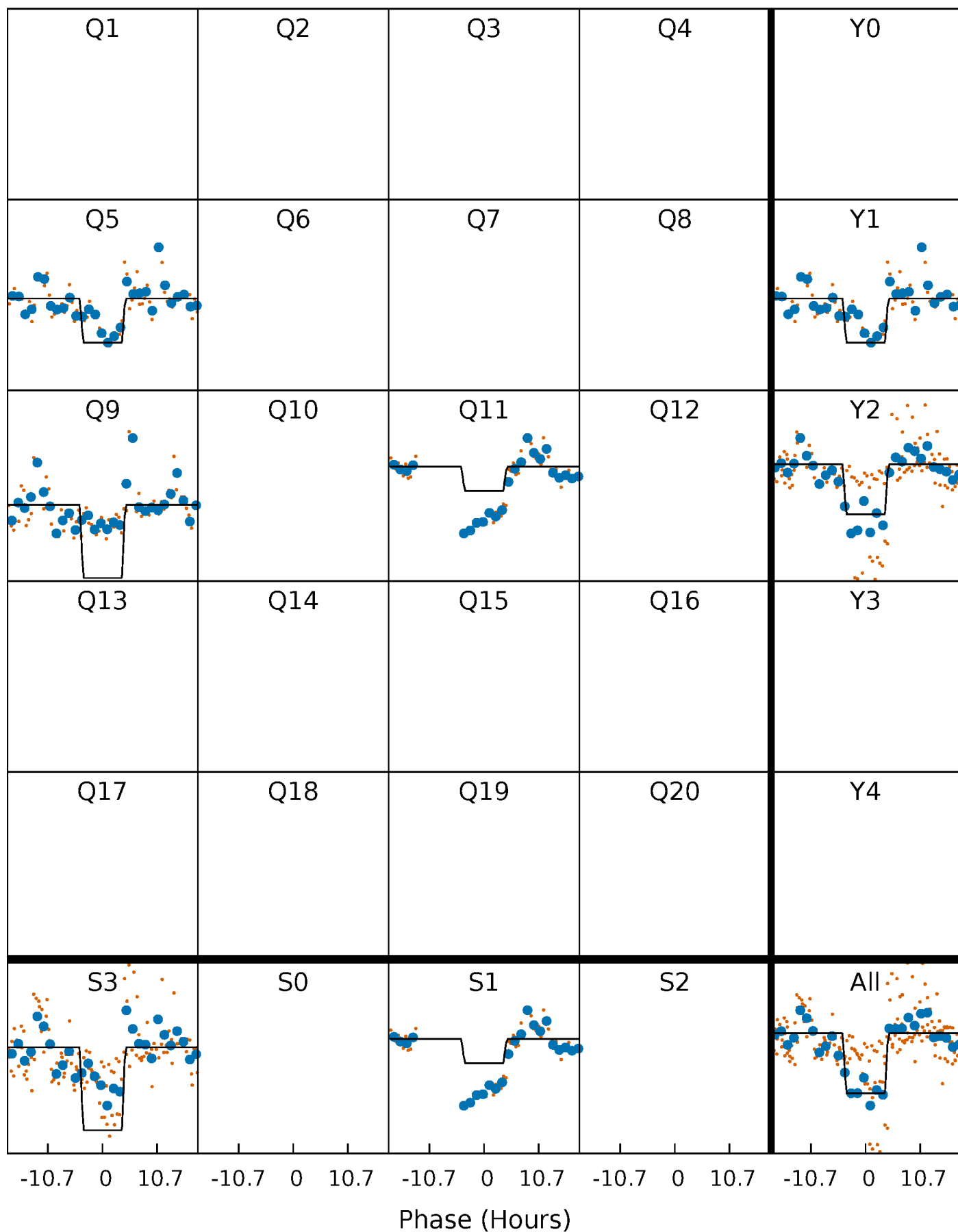
# DV Quarter-Phased Transit Curves

TCE 011550428-02     $P=199.961122$  Days     $T_0=294.014550$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

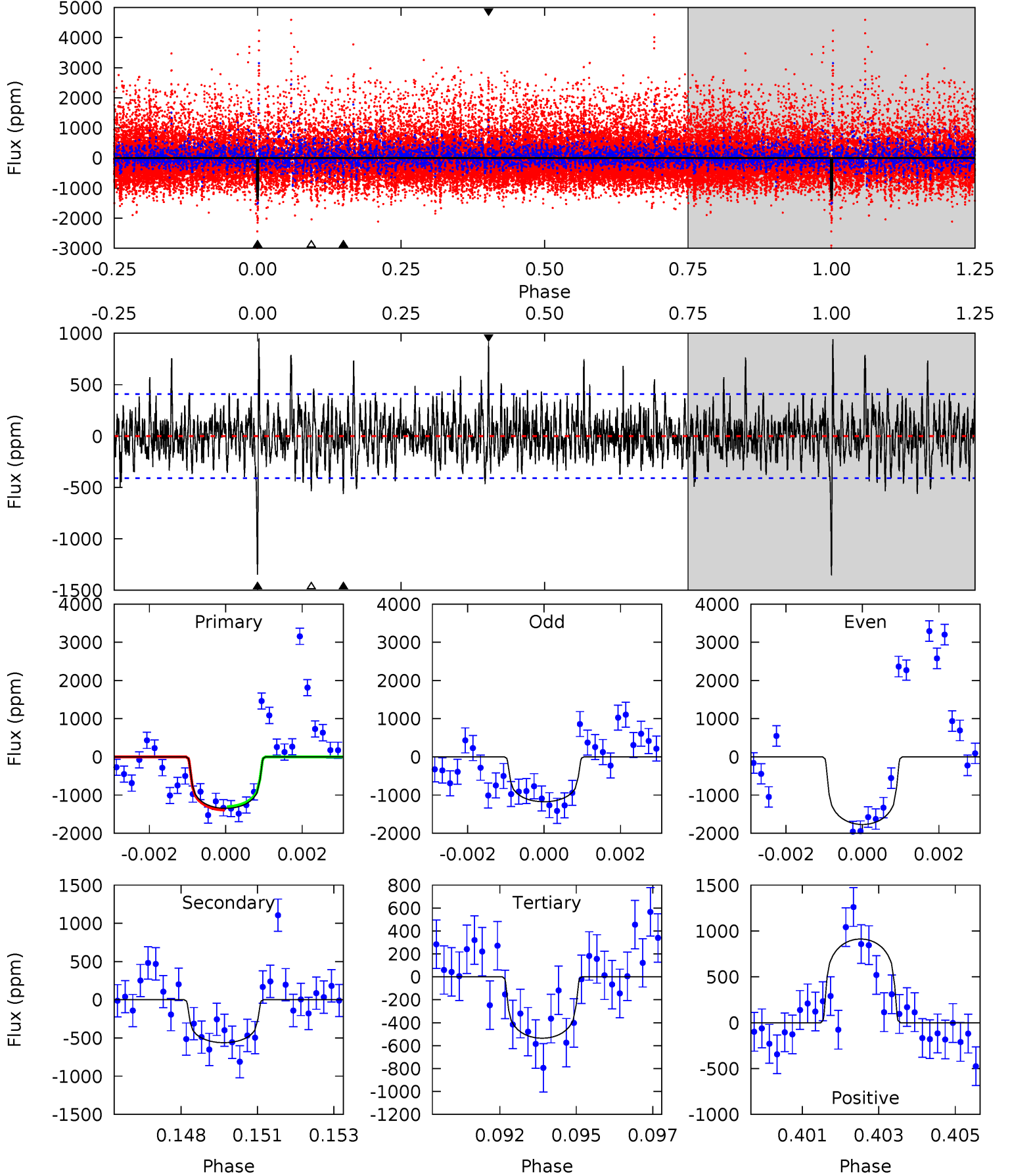
TCE 011550428-02 P=199.956007 Days  $T_0=294.052478$  (BKJD)



# DV Model-Shift Uniqueness Test

011550428-02,  $P = 199.961122$  Days,  $E = 94.053428$  Days

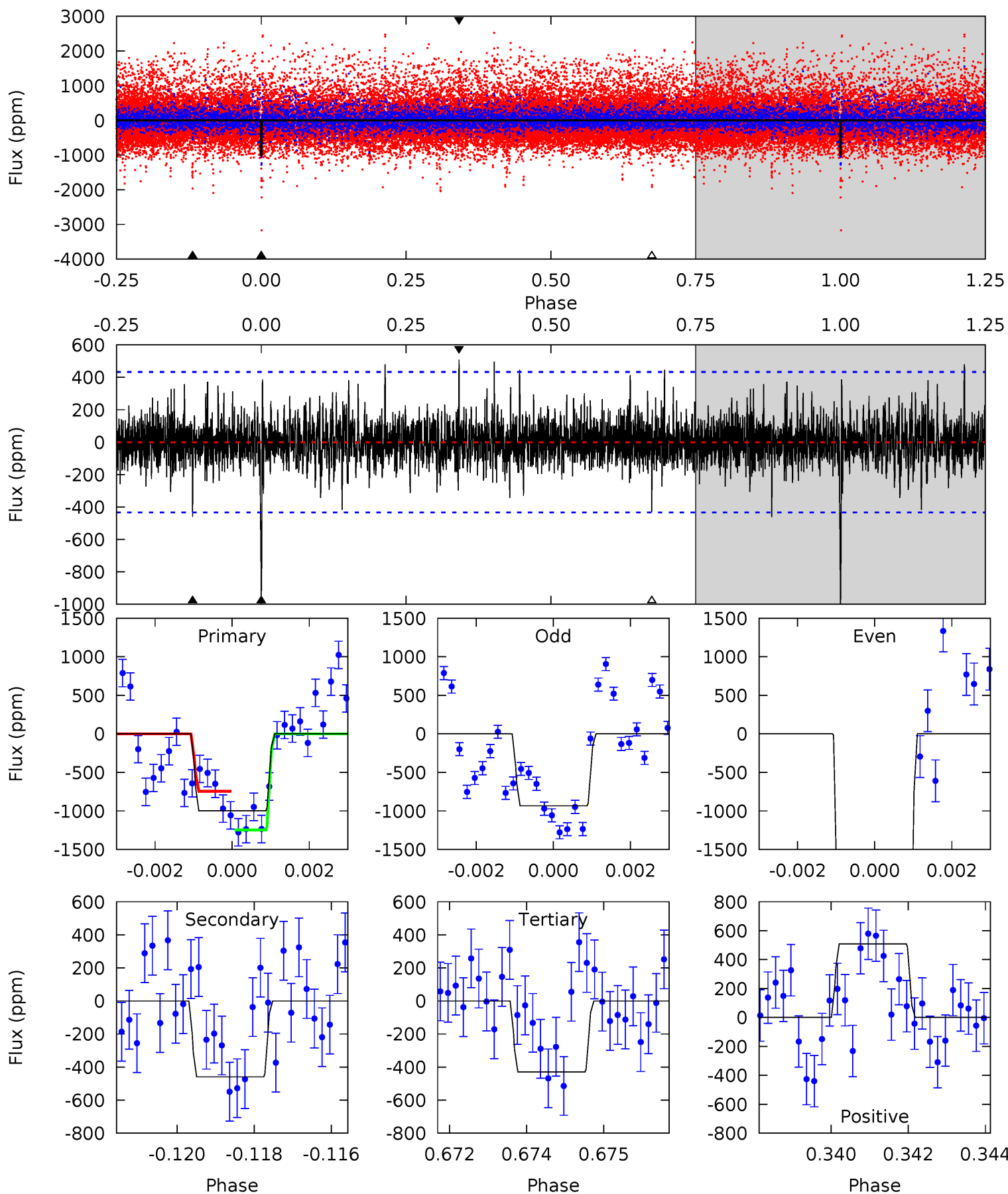
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	7.26	6.92	11.8	5.29	3.03	2.34	10.5	5.62	0.34	-4.53	2.13	1.12	0.41	0.59



# Alt Model-Shift Uniqueness Test

011550428-02, P = 199.956007 Days, E = 94.096471 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
12.3	5.67	5.31	6.29	5.35	3.13	1.24	7.02	6.05	0.36	-0.62	24.2	1.64	0.34	3.11





### Stellar Parameters For KIC 011550428

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3407^{+54}_{-54}$	$4.923^{+0.060}_{-0.040}$	$0.000^{+0.100}_{-0.100}$	$0.324^{+0.040}_{-0.049}$	$0.320^{+0.053}_{-0.053}$	$13.280^{+4.913}_{-2.340}$
	+2%/-2%	+1%/-1%	+inf%/-inf%	+12%/-15%	+17%/-17%	+37%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011550428-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-562 \pm 77$	$1.33^{+0.29}_{-0.30}$	$176^{+5}_{-5}$	$2972^{+227}_{-161}$	$37419^{+23811}_{-12763}$
Alt.	$-459 \pm 81$	$1.61^{+0.33}_{-0.32}$	$176^{+5}_{-5}$	$2752^{+160}_{-144}$	$20599^{+11248}_{-7012}$

$T_{max}$  = 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

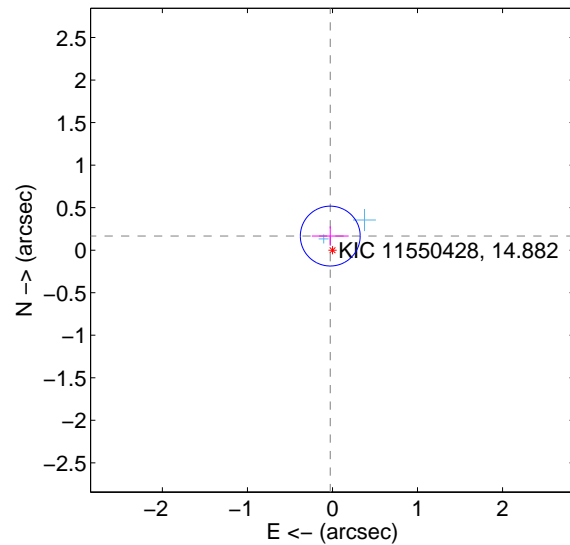
Supplemental centroid analysis for 011550428-02. Kepler magnitude: 14.88. Transit SNR 9.46

There are 2 quarters with good PRF difference image offsets

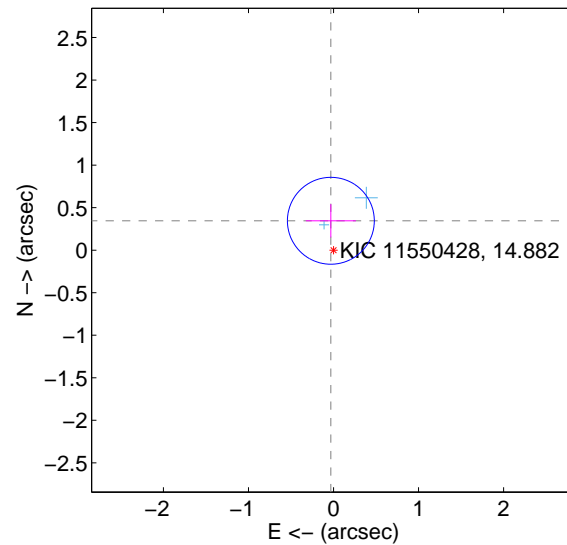
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.168 \pm 0.117$	1.43	$0.026 \pm 0.217$	$0.166 \pm 0.114$
PRF-fit source offset from KIC position	$0.347 \pm 0.170$	2.04	$0.031 \pm 0.294$	$0.346 \pm 0.195$
photometric centroid source offset	$0.66 \pm 0.57$	1.16	$0.17 \pm 0.40$	$0.64 \pm 0.58$

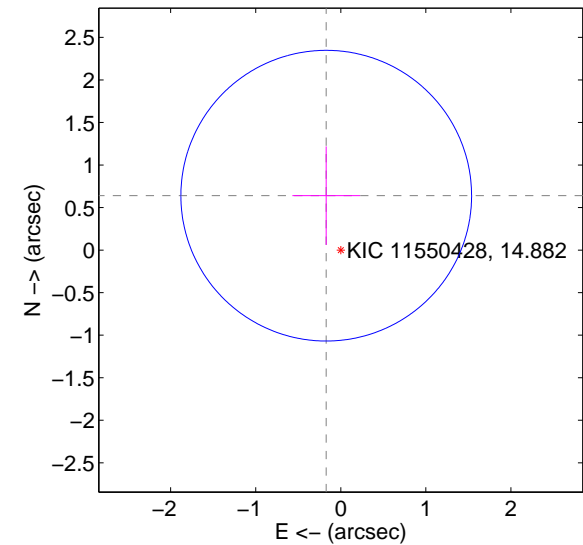
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

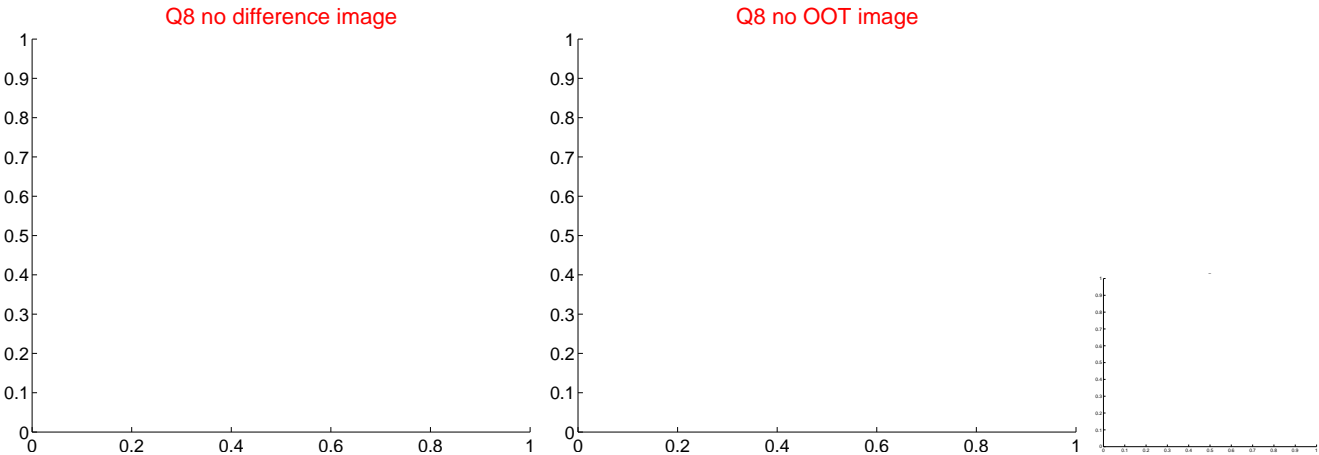
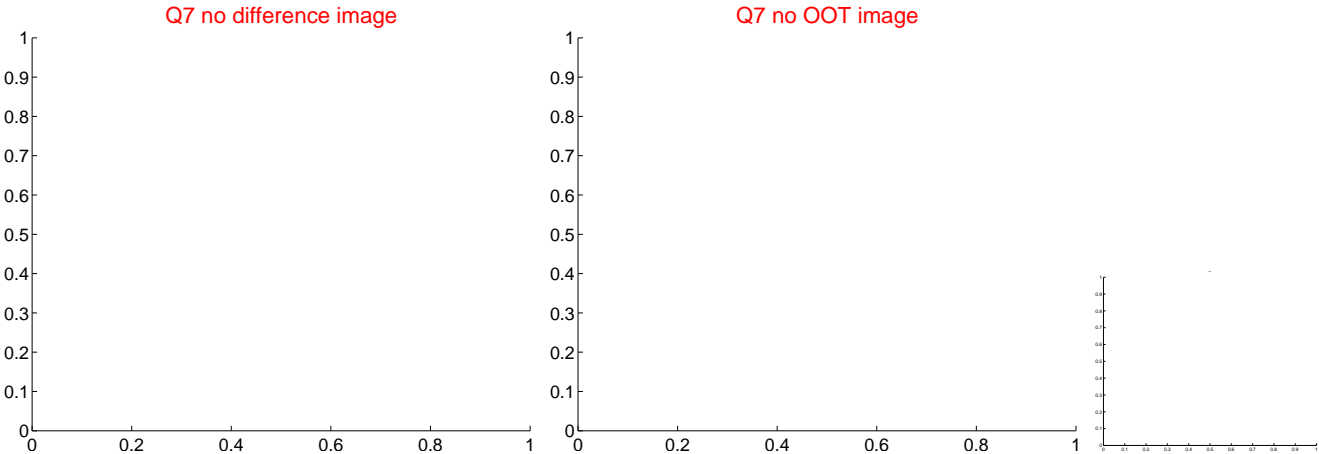
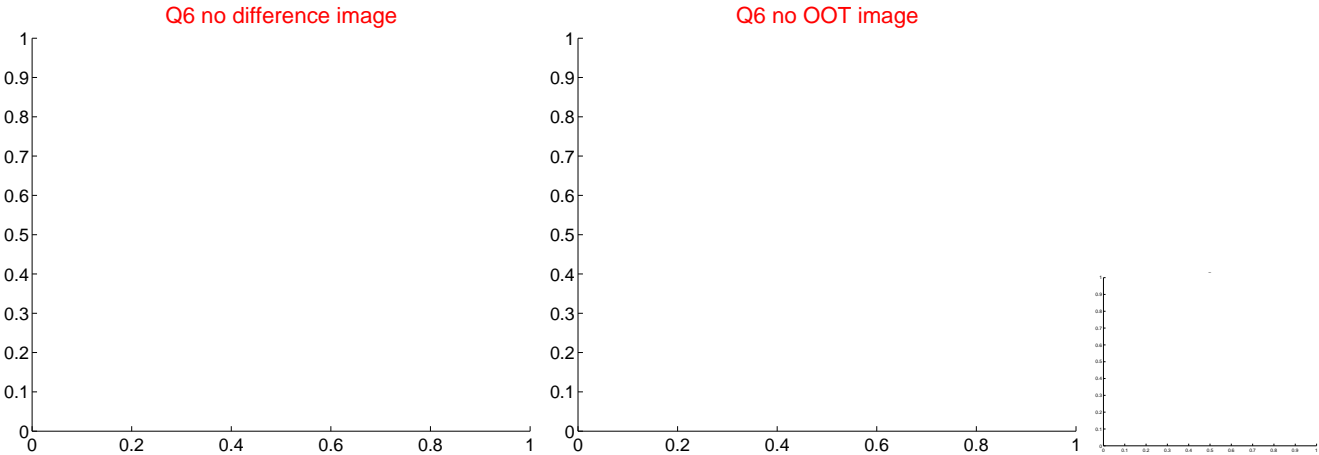
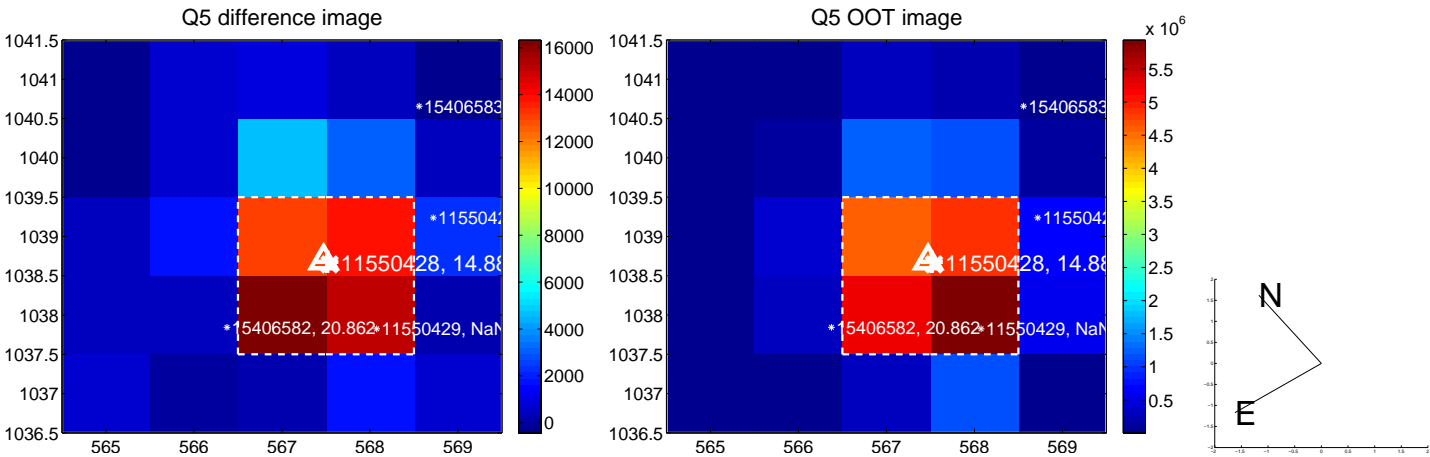


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

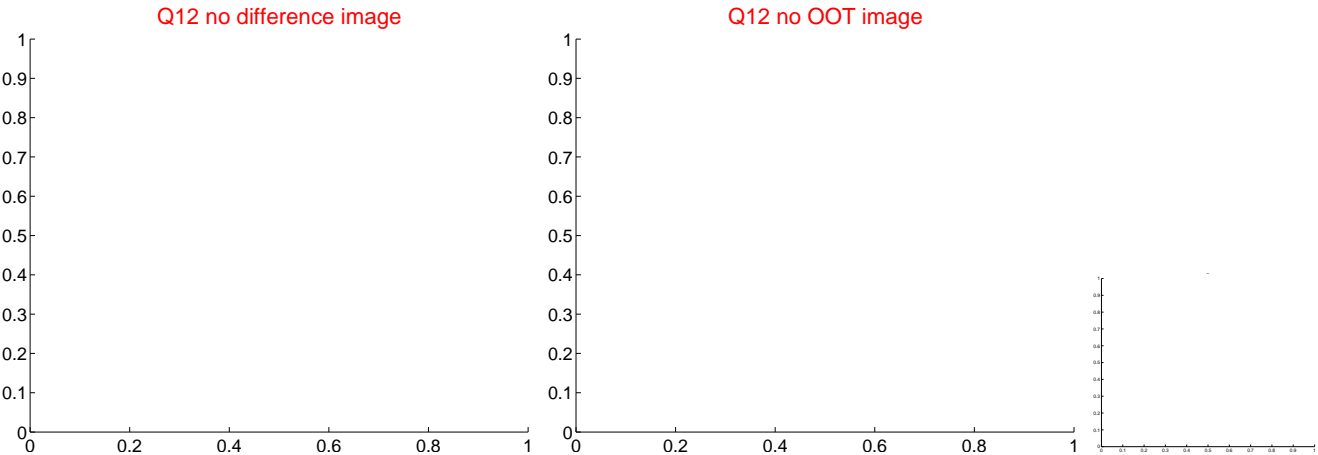
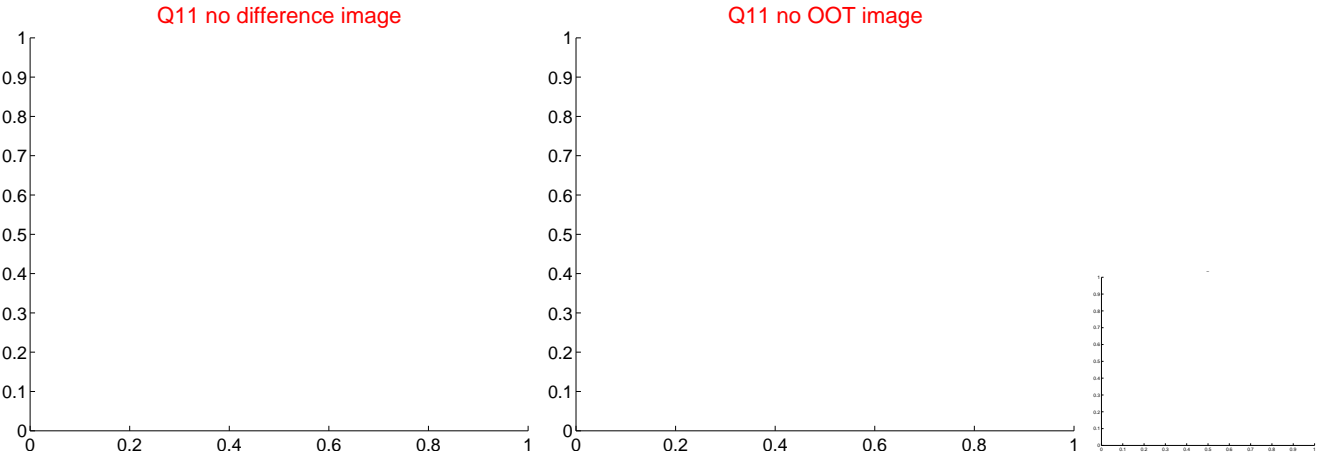
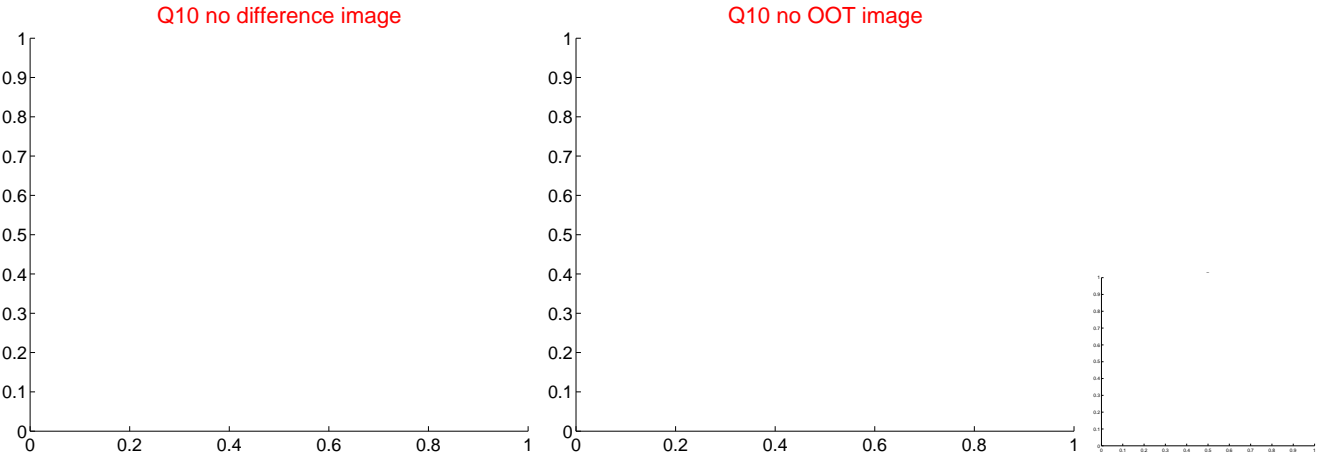
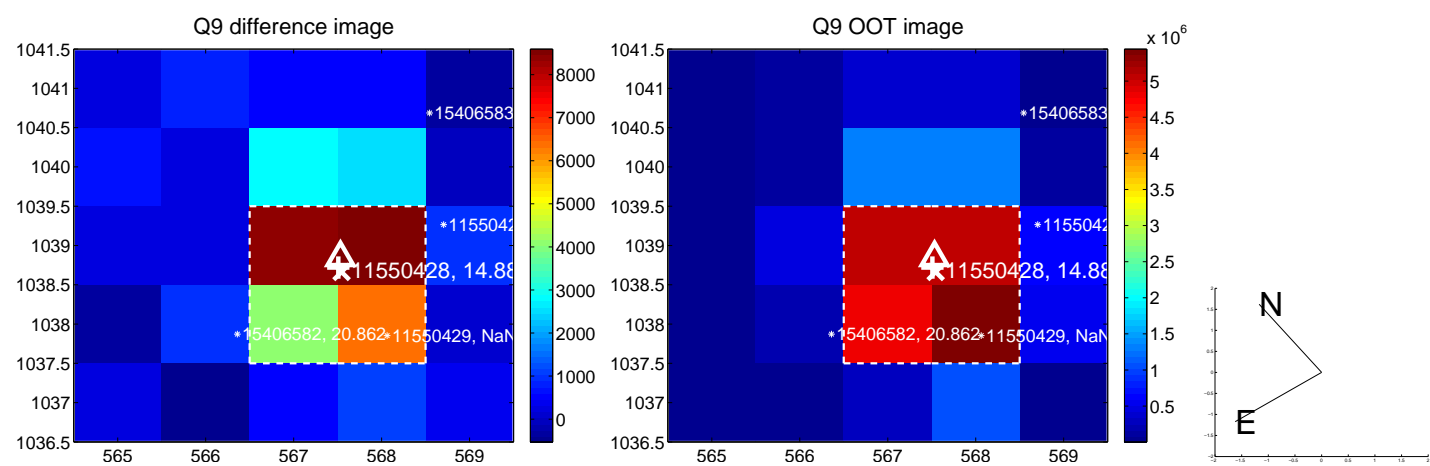
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



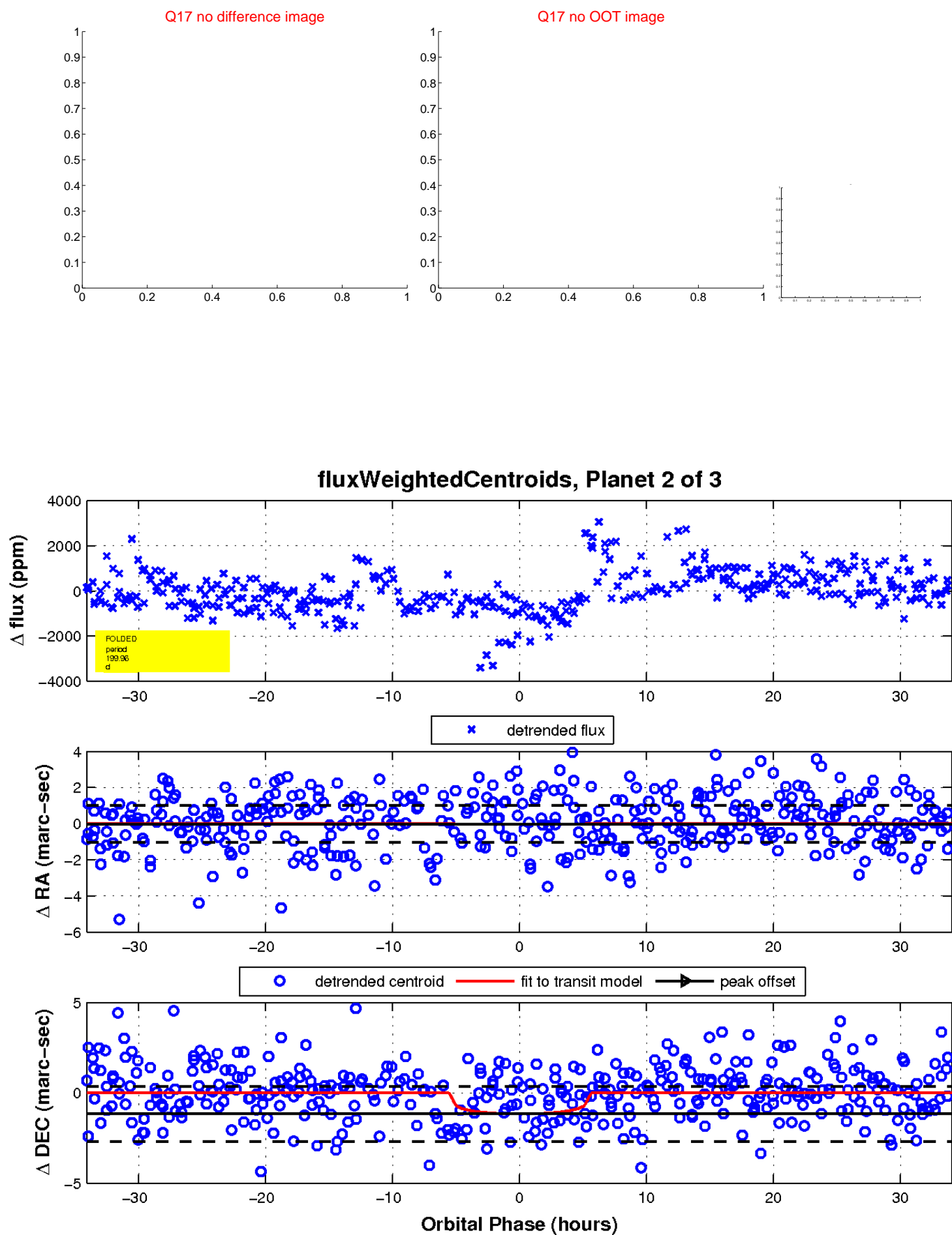
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

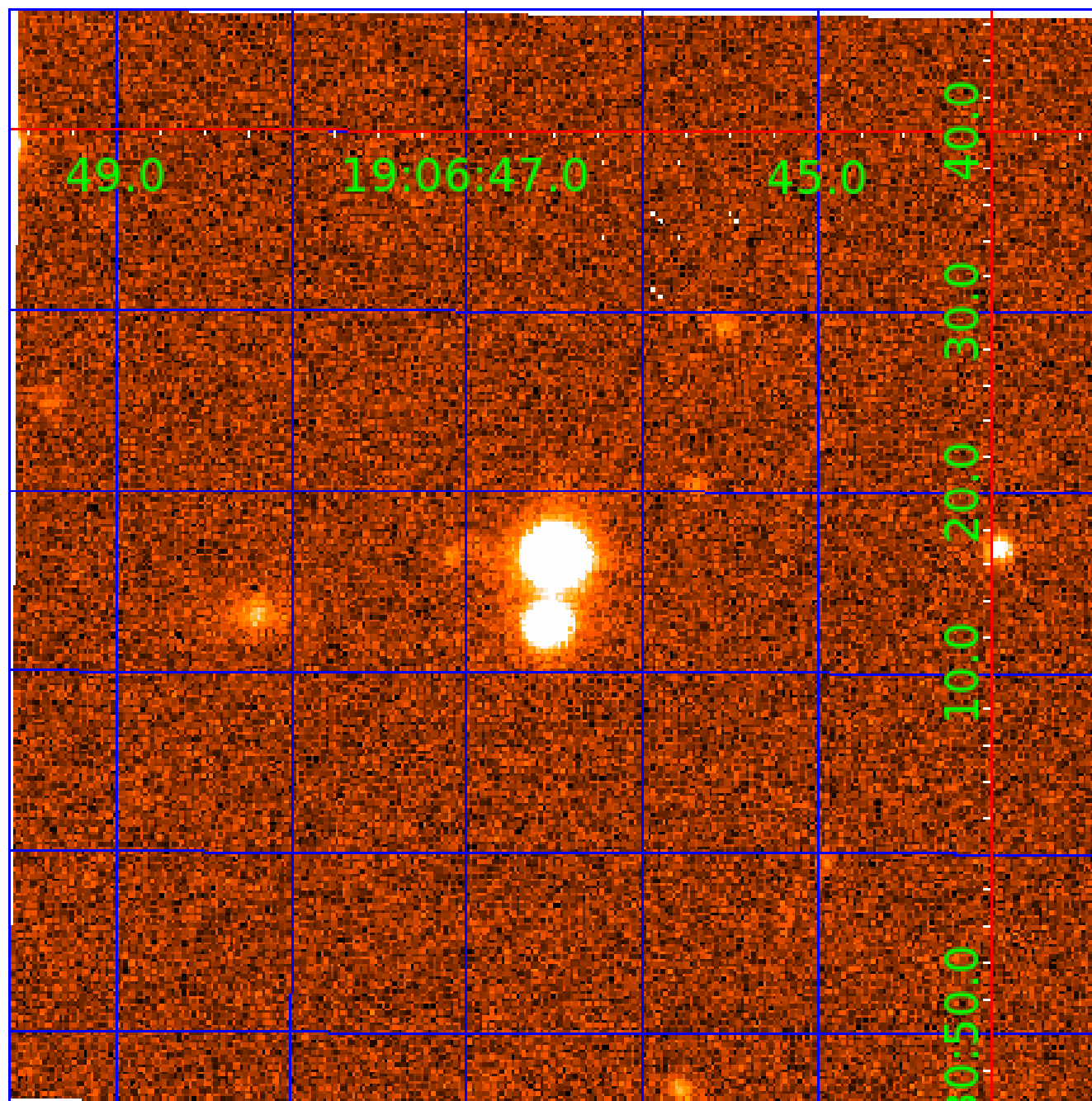


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011550428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011550428-01	OBS	No	392.423603	468.898906	2869.0	19.787	12.4	13.2	0.32	3407	3.31	0.03
011550428-02	OBS	No	199.961122	294.014550	1587.6	11.365	11.2	9.5	0.32	3407	1.33	0.06
011550428-03	OBS	No	122.770348	187.047846	837.5	4.052	9.7	5.5	0.32	3407	1.09	0.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011550428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS
011550428-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011550428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—ALL_TRANS_CHASES

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

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

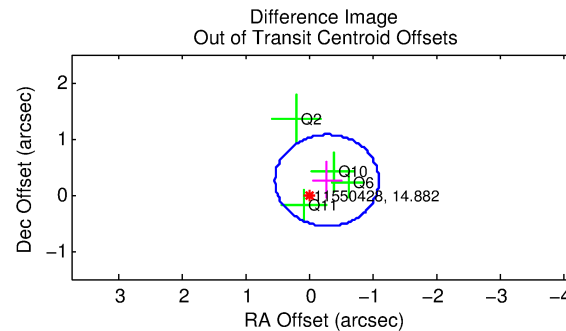
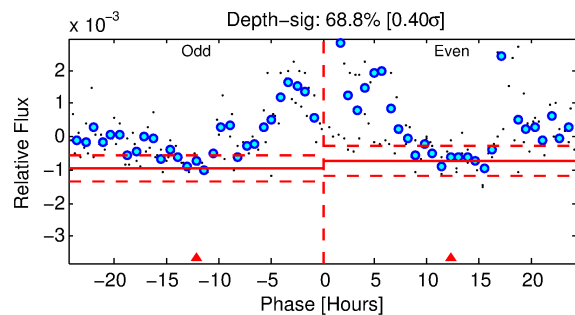
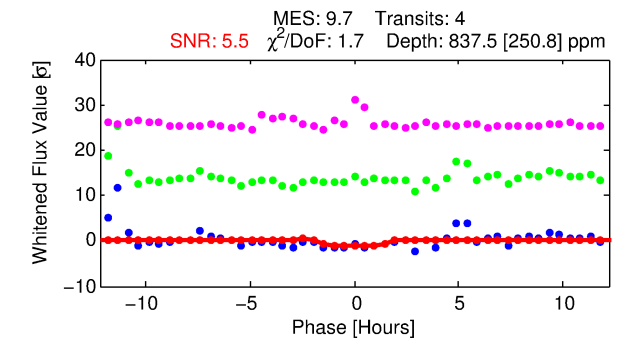
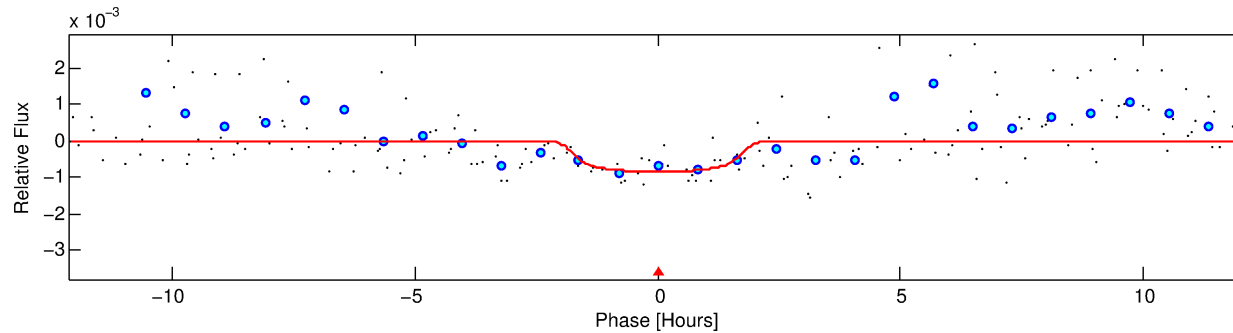
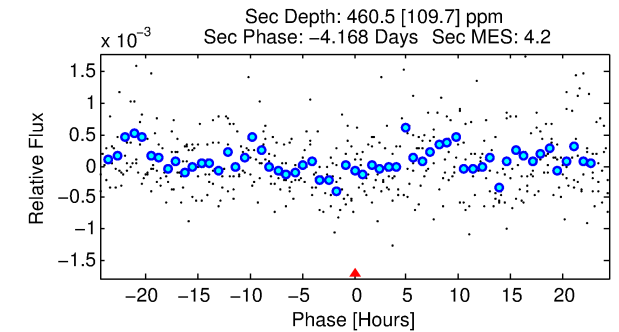
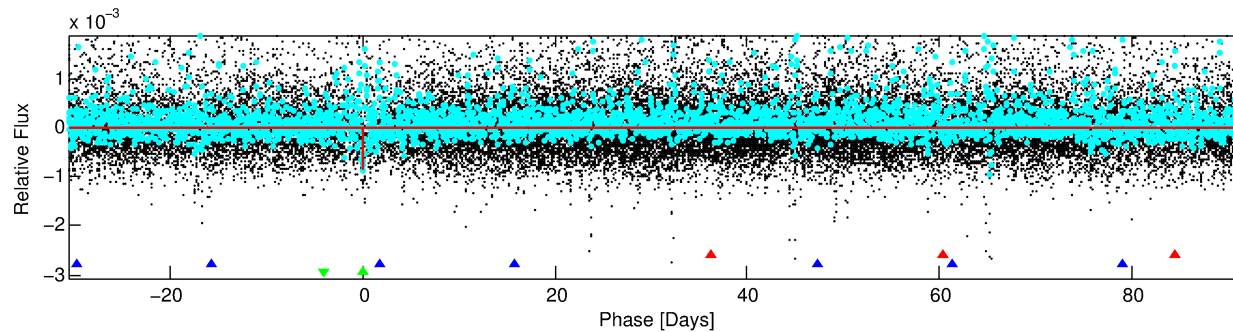
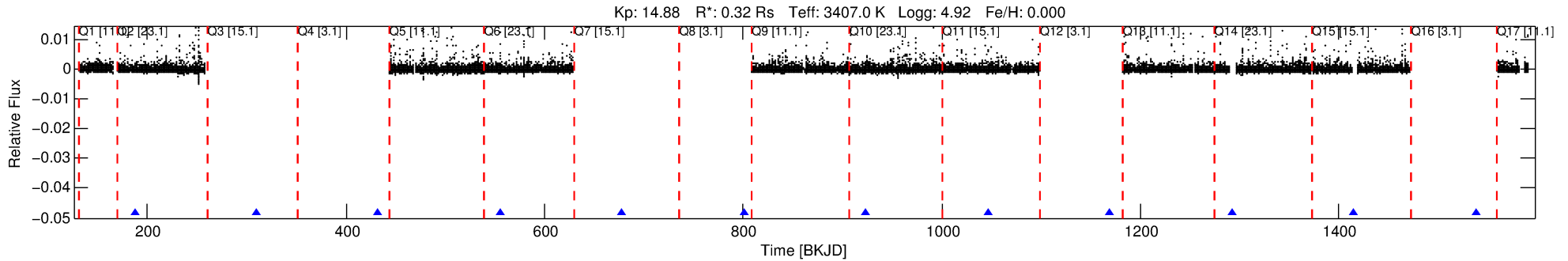
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011550428-03

No Significant Match Found

# DV One-Page Summary

KIC: 11550428 Candidate: 3 of 3 Period: 122.770 d



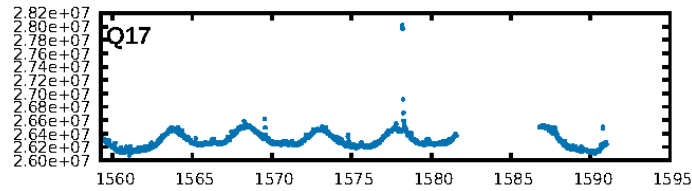
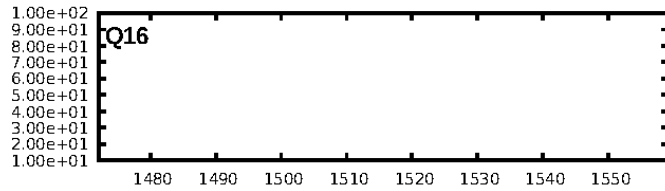
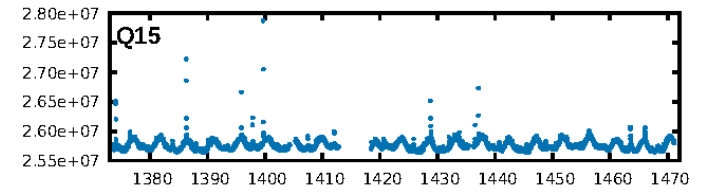
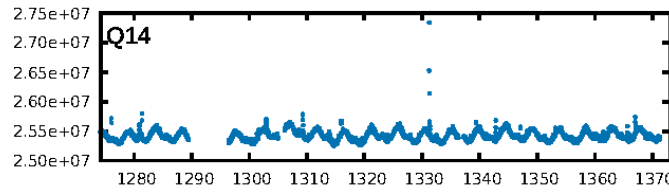
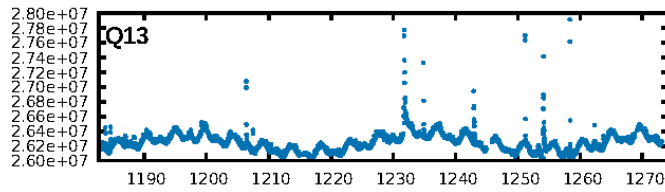
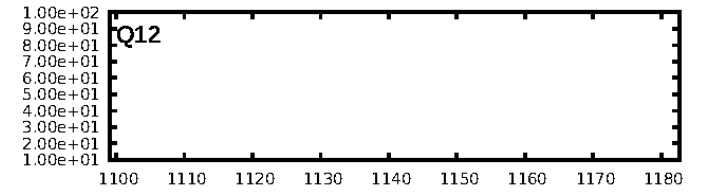
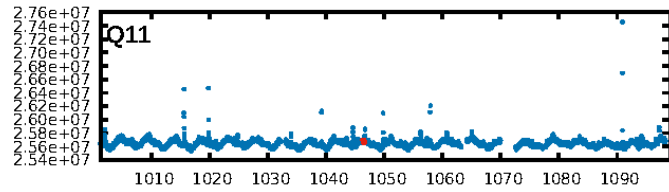
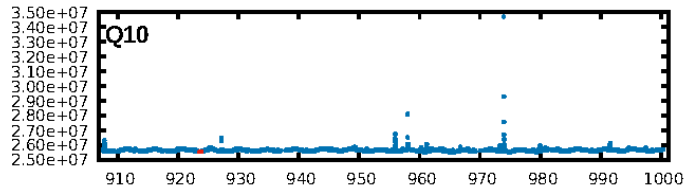
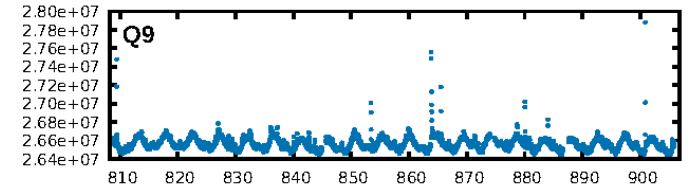
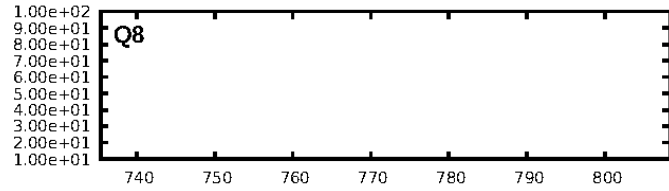
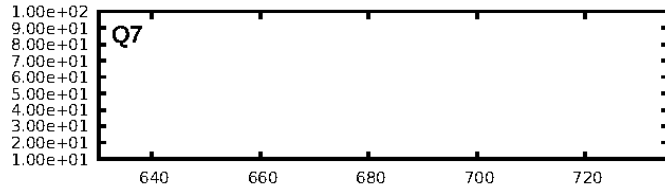
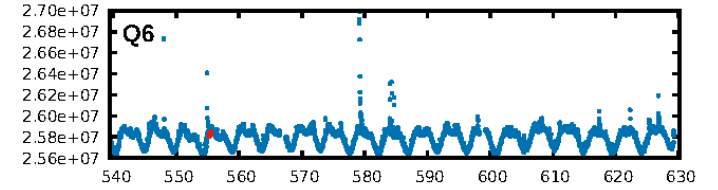
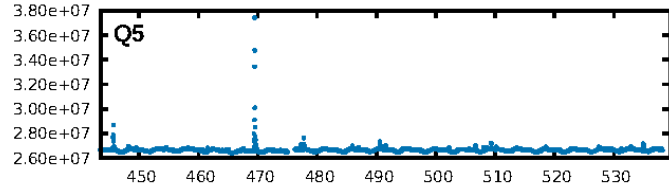
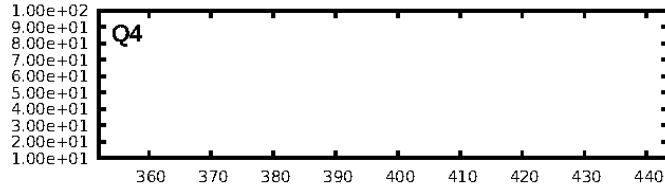
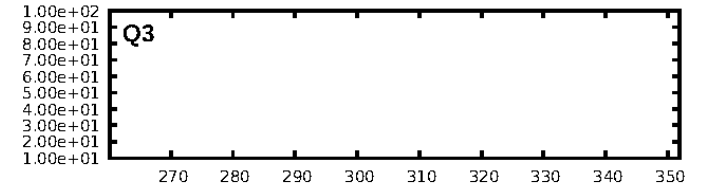
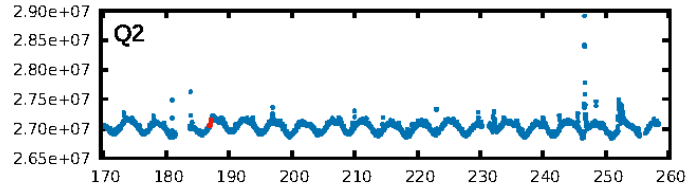
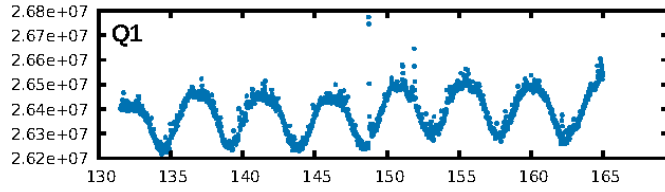
## DV Fit Results:

Period = 122.77035 [0.00340] d  
Epoch = 187.0478 [0.0173] BKJD  
Rp/R\* = 0.0309 [0.0182]  
a/R\* = 125.90 [289.50]  
b = 0.88 [0.62]  
Seff = 0.12 [0.02]  
Teq = 149 [6] K  
Rp = 1.09 [0.66] Re  
a = 0.3310 [0.0367] AU  
Ag = 23194.55 [27958.03] [0.83 $\sigma$ ]  
Teffp = 2837 [851] K [3.16 $\sigma$ ]

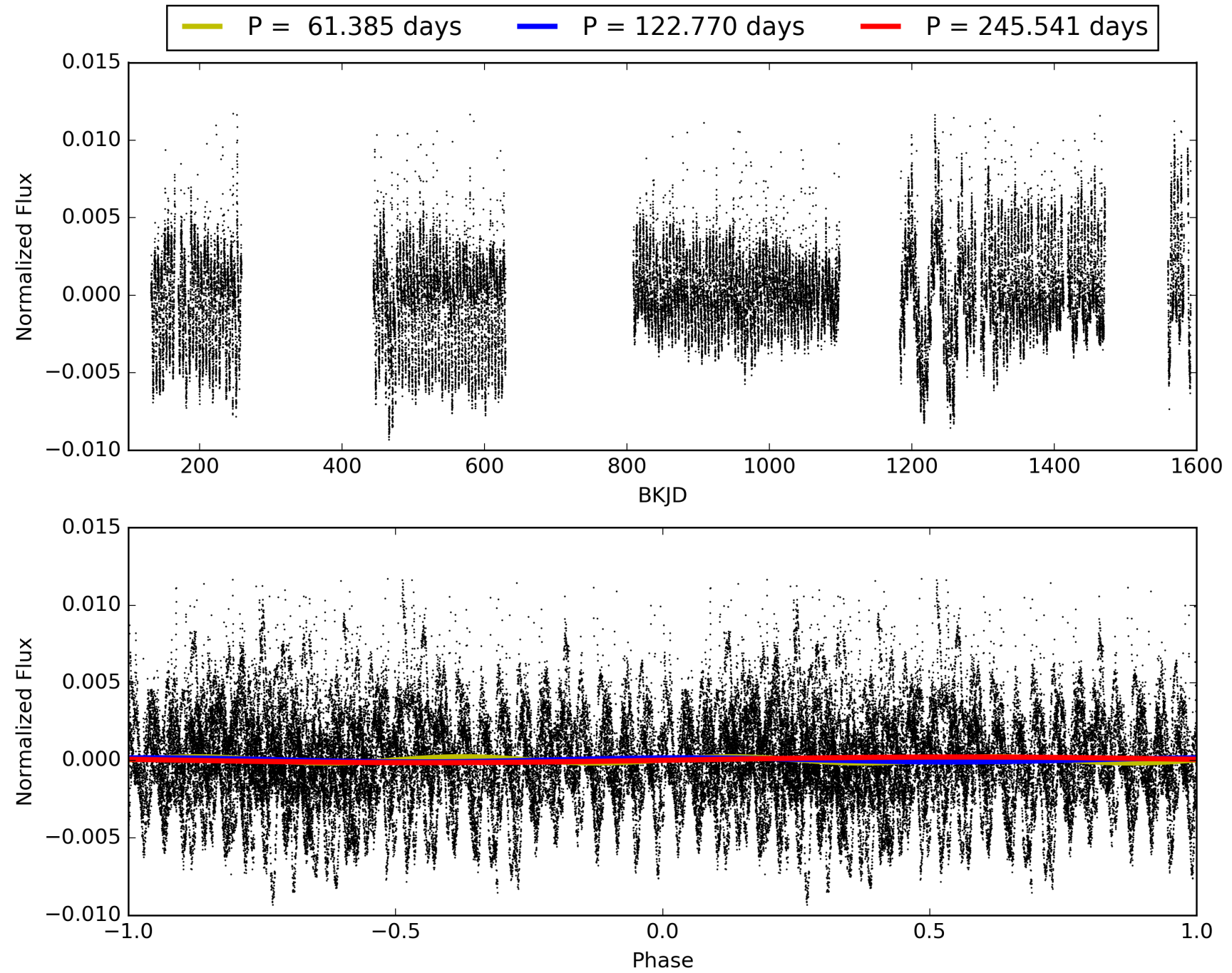
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [153.54 $\sigma$ ]  
ModelChiSquare2-sig: 65.3%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 2.34e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.061  
Centroid-sig: 31.3%  
Centroid-so: 0.965 arcsec [0.75 $\sigma$ ]  
OotOffset-rm: 0.371 arcsec [1.36 $\sigma$ ]  
KicOffset-rm: 0.607 arcsec [1.88 $\sigma$ ]  
OotOffset-st: 3/1/0/0 [4]  
KicOffset-st: 3/1/0/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [4/4]

# TCE 011550428-03, PDC Light Curves

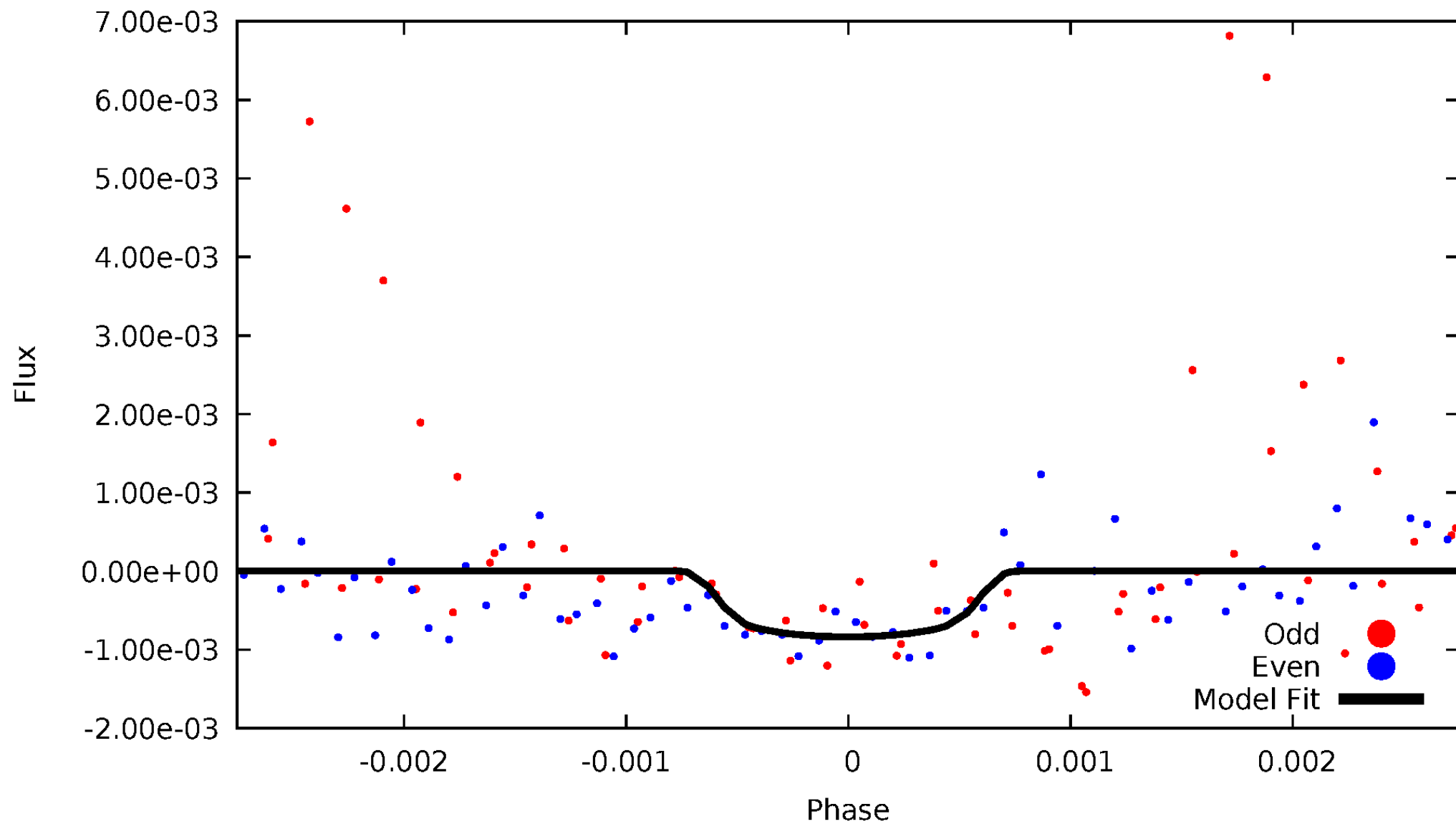


TCE 011550428-03



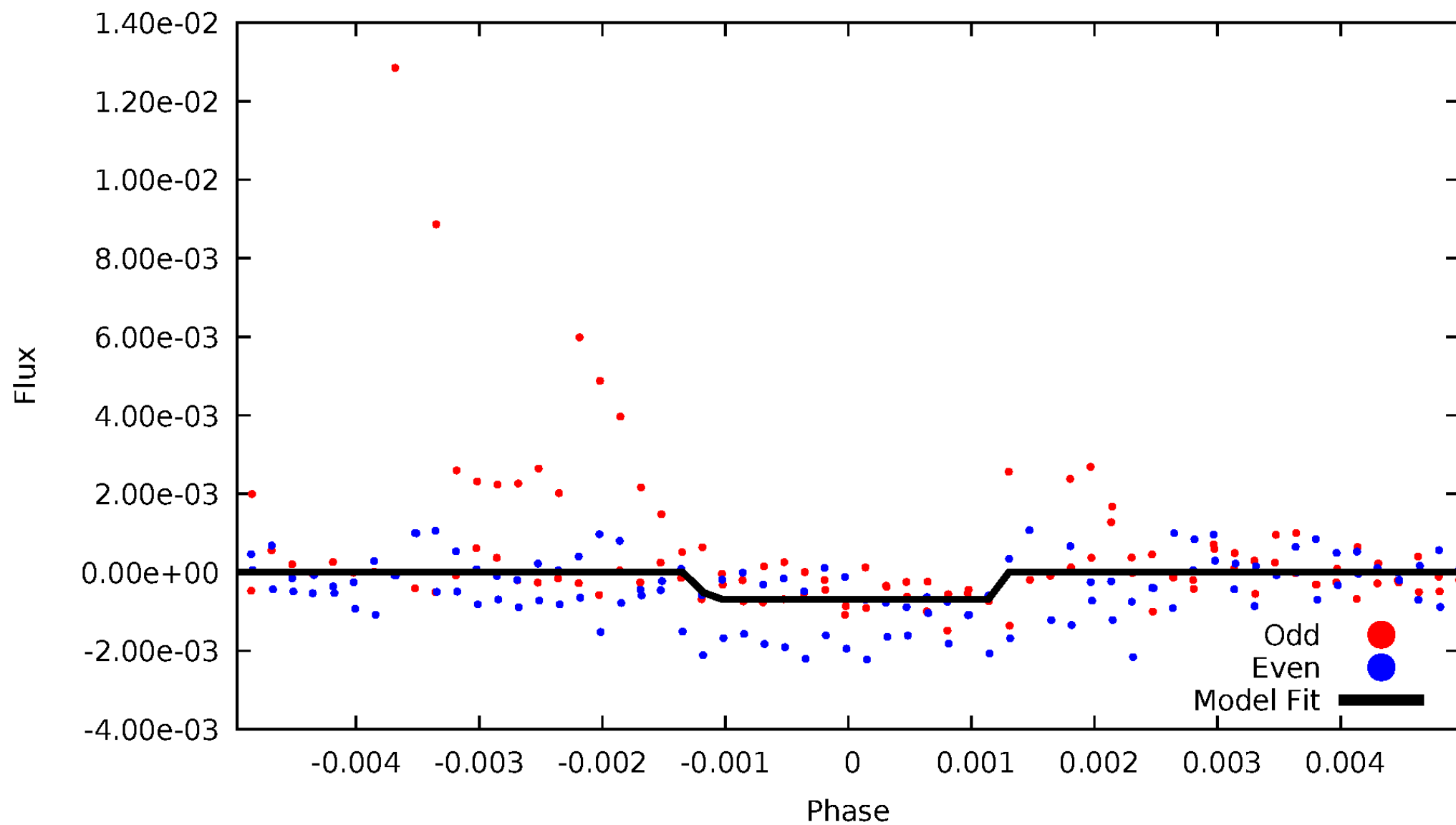
# DV Odd/Even

TCE 011550428-03



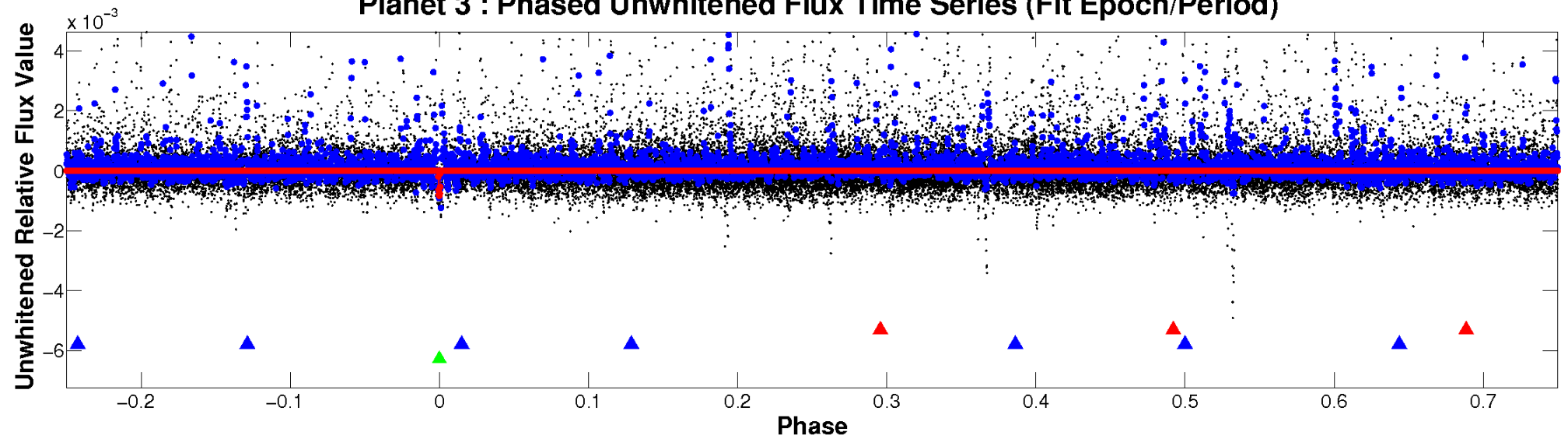
# ALT Odd/Even

TCE 011550428-03

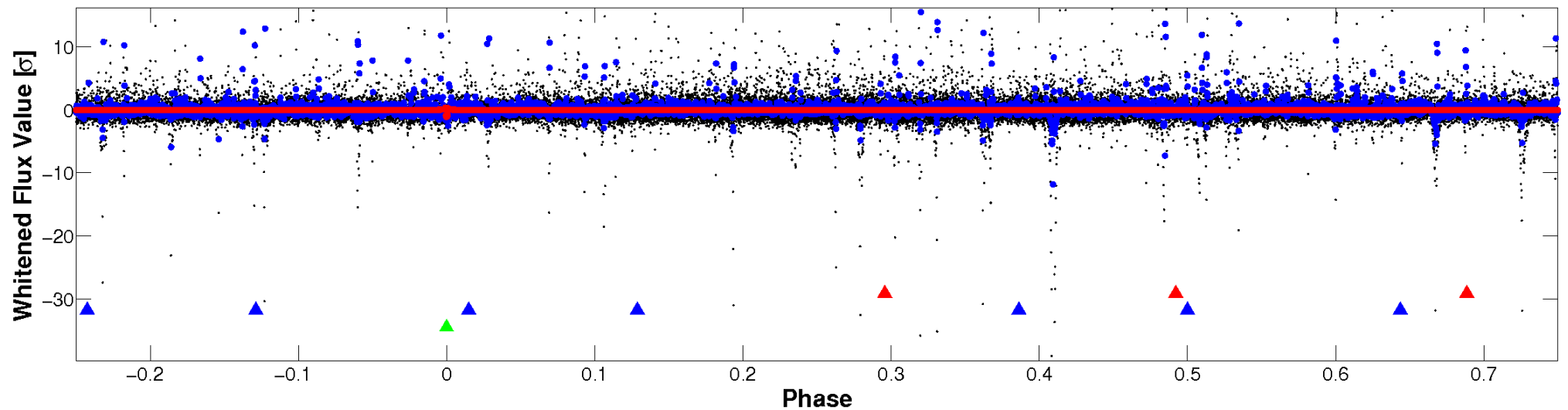


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

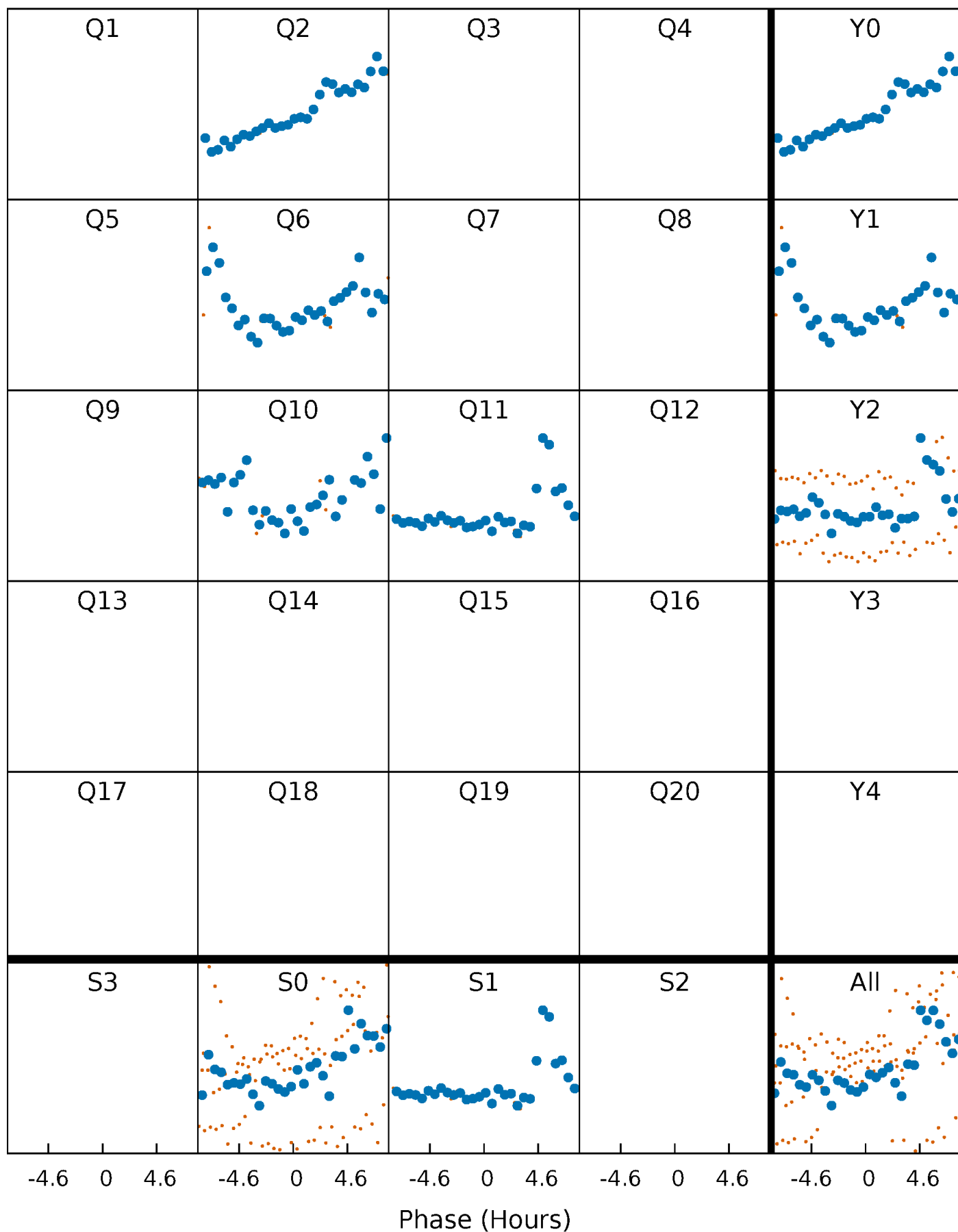


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

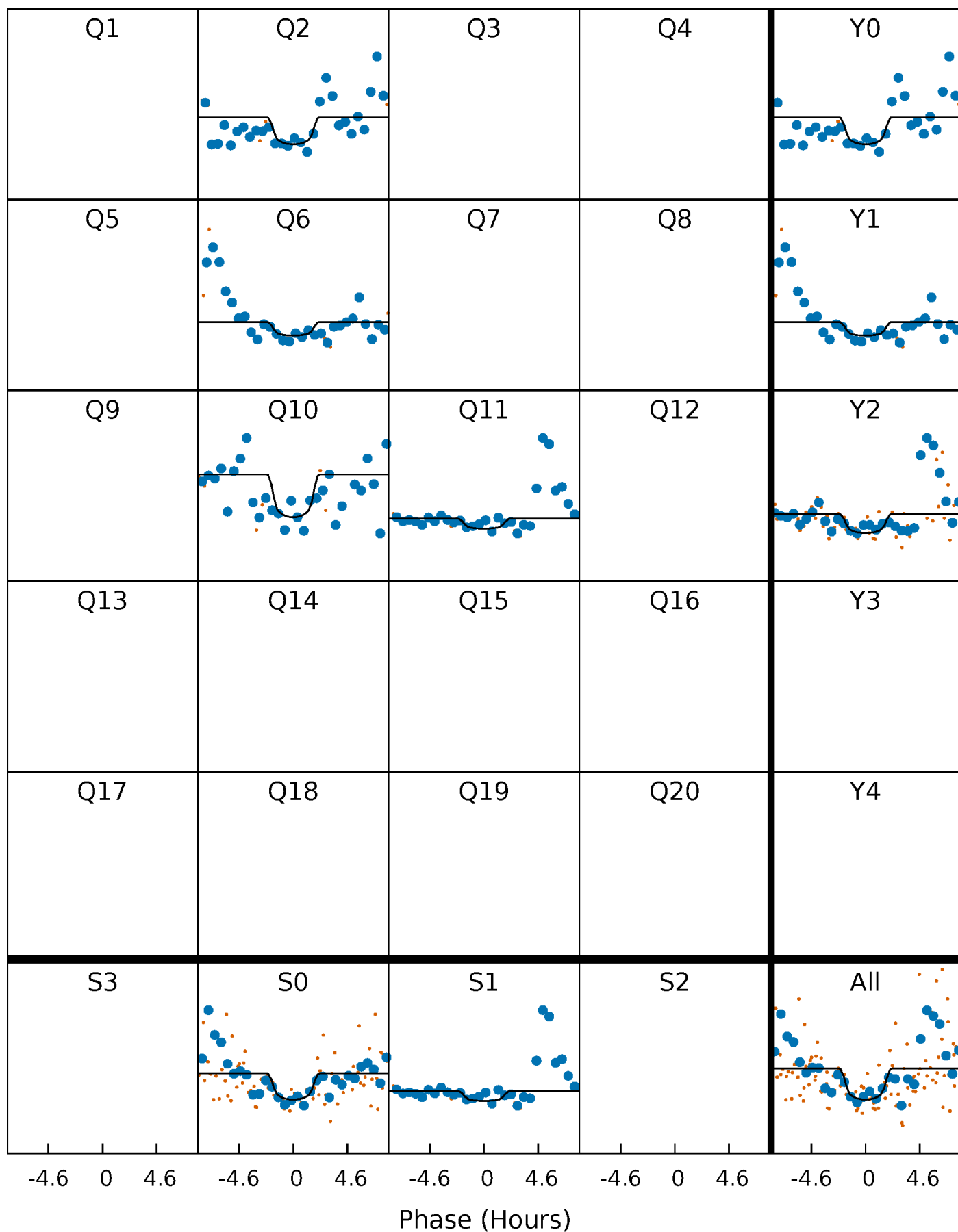
TCE 011550428-03 P=122.770348 Days  $T_0=187.047846$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 011550428-03 P=122.770348 Days  $T_0=187.047846$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

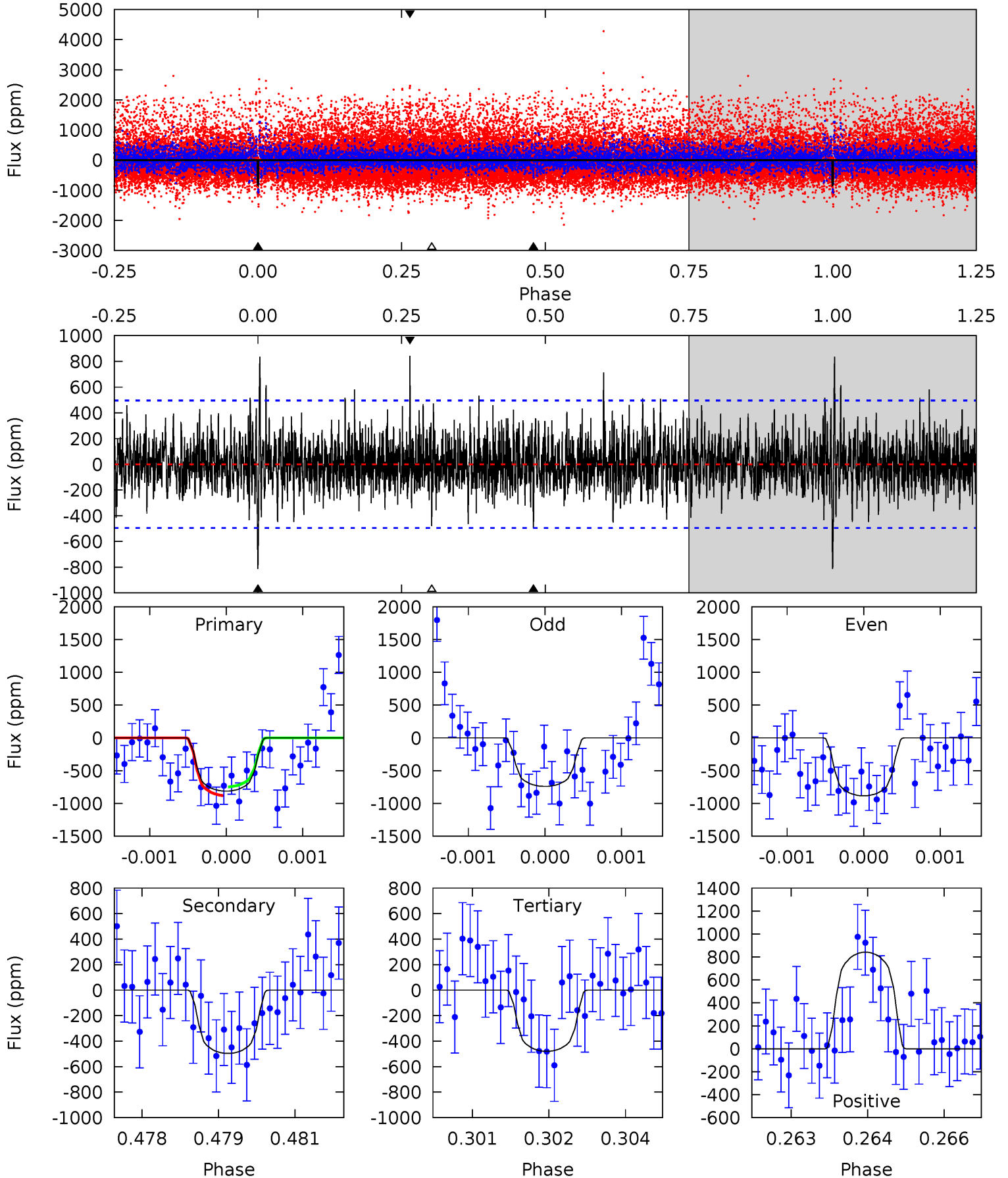
TCE 011550428-03     $P=122.785262$  Days     $T_0=186.973611$  (BKJD)



# DV Model-Shift Uniqueness Test

011550428-03, P = 122.770348 Days, E = 64.277498 Days

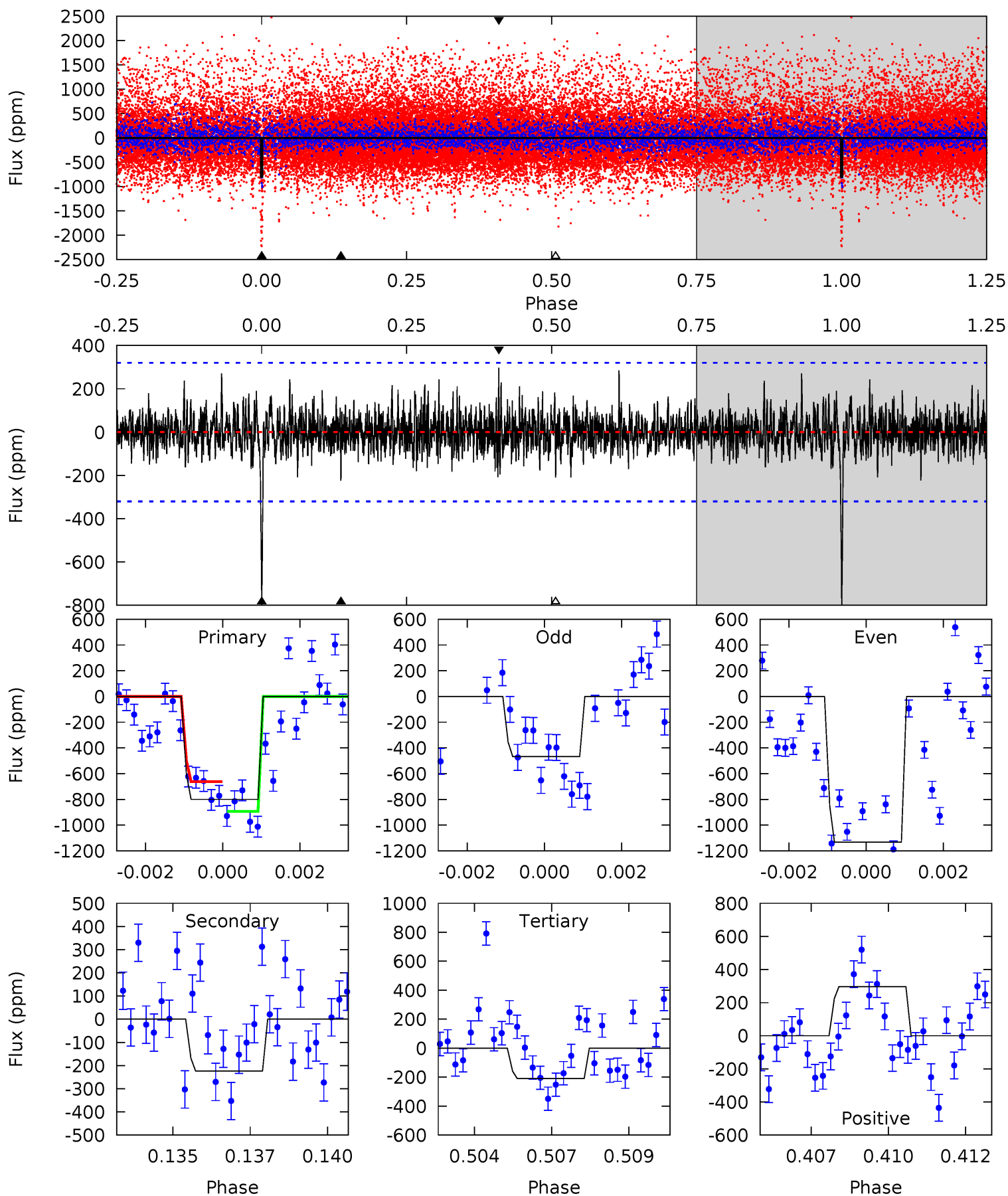
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.83	5.40	5.22	9.15	5.38	3.18	1.62	3.62	-0.32	0.18	-3.75	0.76	0.92	0.51	0.73



# Alt Model-Shift Uniqueness Test

011550428-03, P = 122.785262 Days, E = 64.188349 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
13.2	3.69	3.46	4.90	5.29	3.02	1.07	9.73	8.29	0.23	-1.21	5.45	1.53	0.27	1.90



### Stellar Parameters For KIC 011550428

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3407^{+54}_{-54}$	$4.923^{+0.060}_{-0.040}$	$0.000^{+0.100}_{-0.100}$	$0.324^{+0.040}_{-0.049}$	$0.320^{+0.053}_{-0.053}$	$13.280^{+4.913}_{-2.340}$
	+2%/-2%	+1%/-1%	+inf%/-inf%	+12%/-15%	+17%/-17%	+37%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 011550428-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-496 \pm 92$	$1.09^{+0.60}_{-0.56}$	$207^{+6}_{-6}$	$3077^{+781}_{-346}$	$25231^{+83188}_{-14955}$
Alt.	$-224 \pm 61$	$0.95^{+0.63}_{-0.53}$	$208^{+6}_{-7}$	$2868^{+751}_{-360}$	$14797^{+58999}_{-9580}$

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

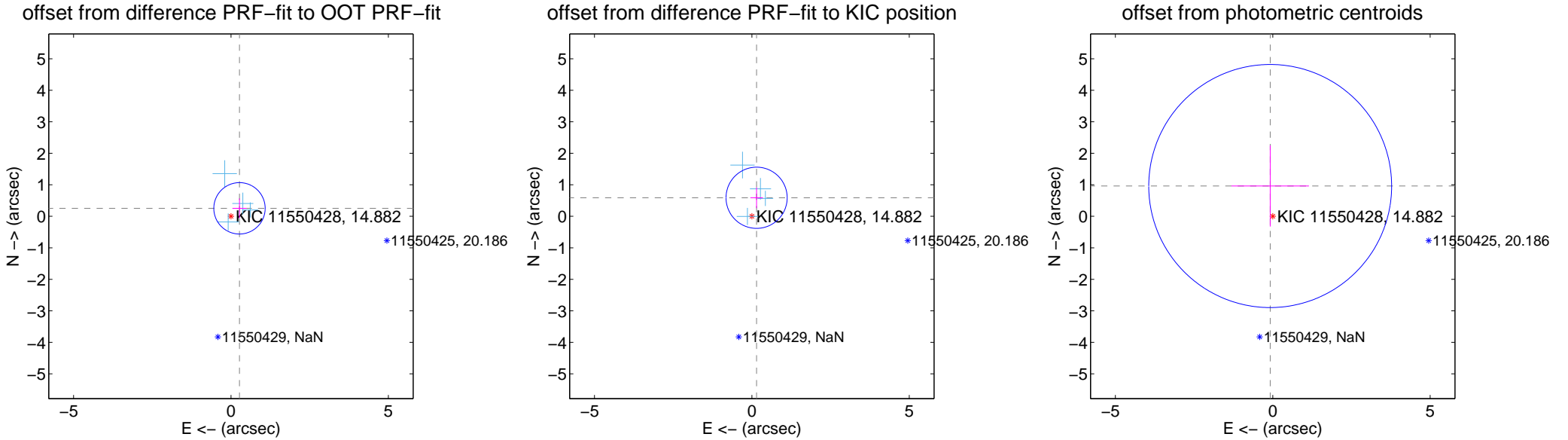
## DV Centroid Data

Supplemental centroid analysis for 011550428-03. Kepler magnitude: 14.88. Transit SNR 5.52

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

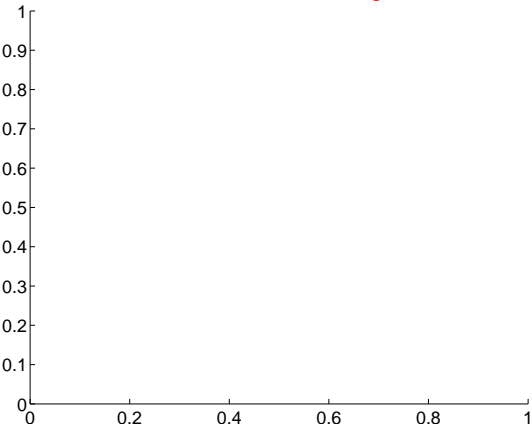
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.371 \pm 0.272$	1.36	$-0.270 \pm 0.226$	$0.253 \pm 0.316$
PRF-fit source offset from KIC position	$0.607 \pm 0.324$	1.88	$-0.150 \pm 0.199$	$0.589 \pm 0.330$
photometric centroid source offset	$0.96 \pm 1.29$	0.75	$0.08 \pm 1.23$	$0.96 \pm 1.29$



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.

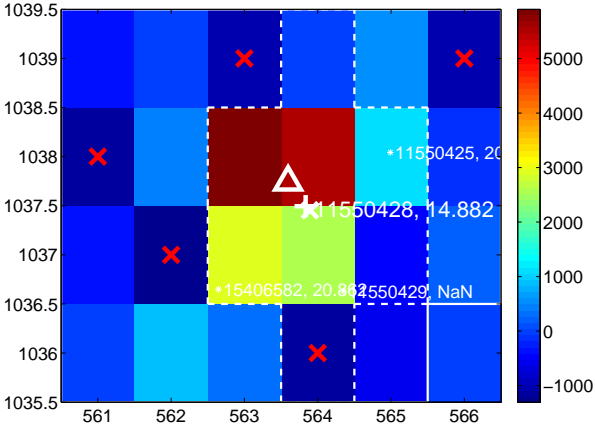
Q1 no difference image



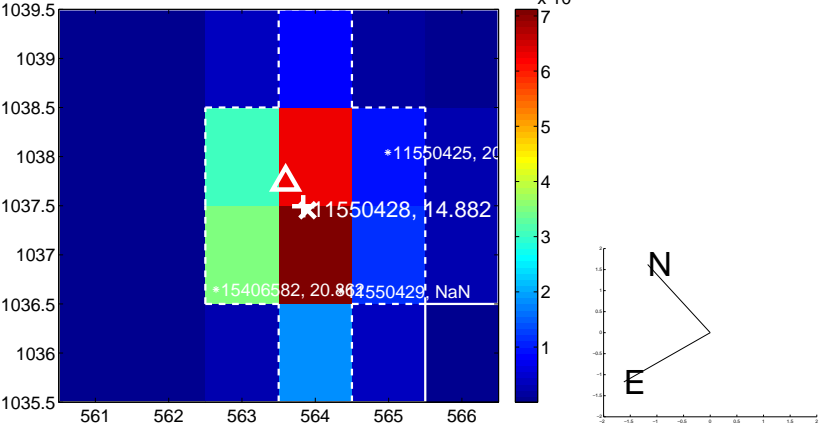
Q1 no OOT image



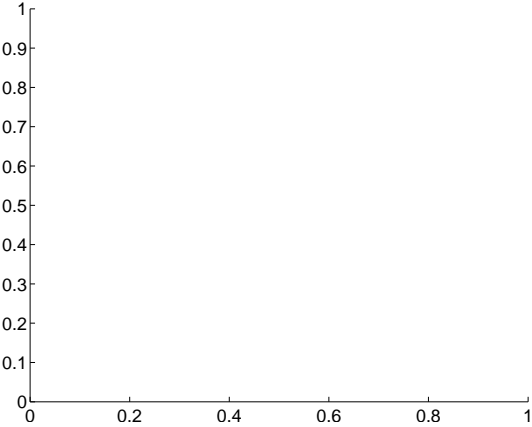
Q2 difference image



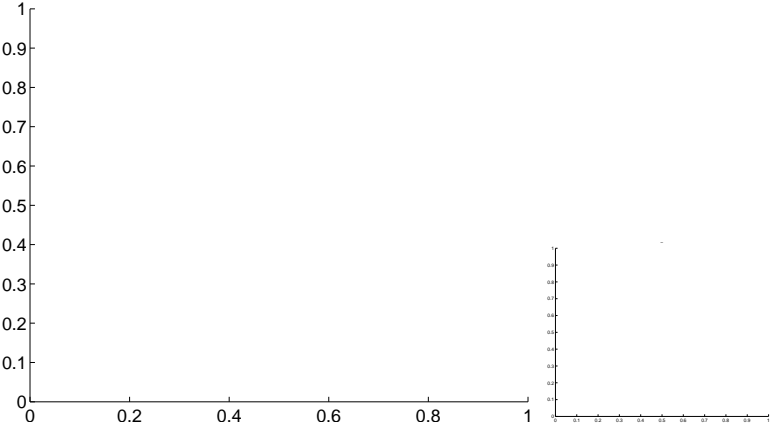
Q2 OOT image



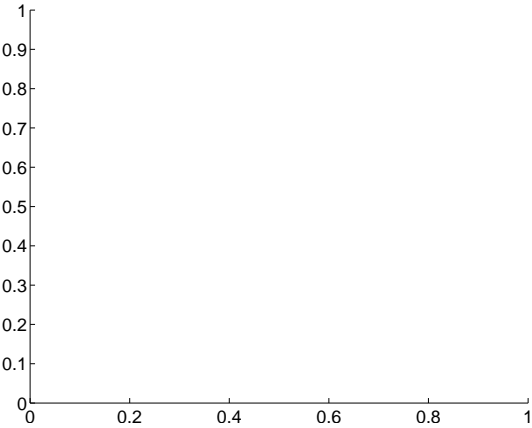
Q3 no difference image



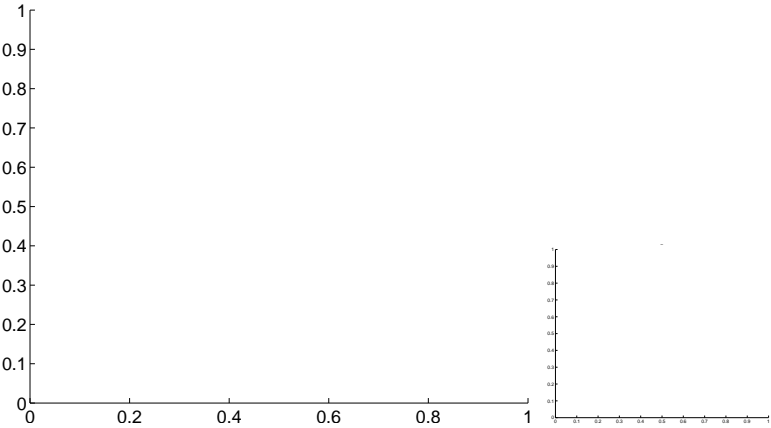
Q3 no OOT image



Q4 no difference image

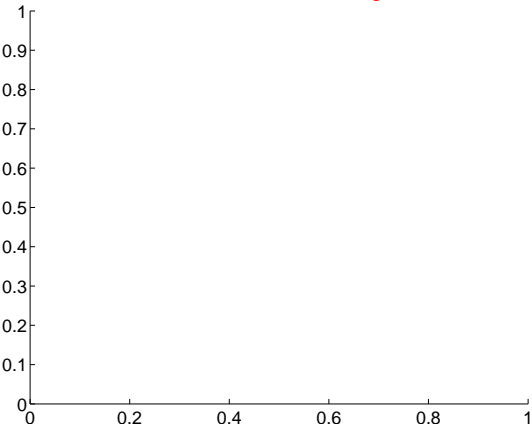


Q4 no OOT image

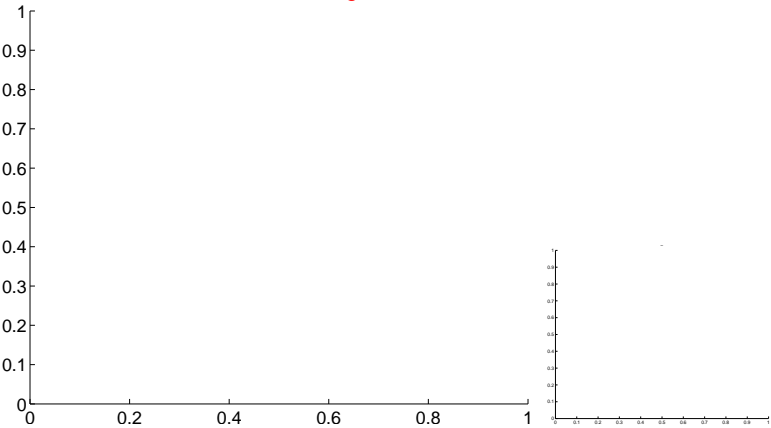


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

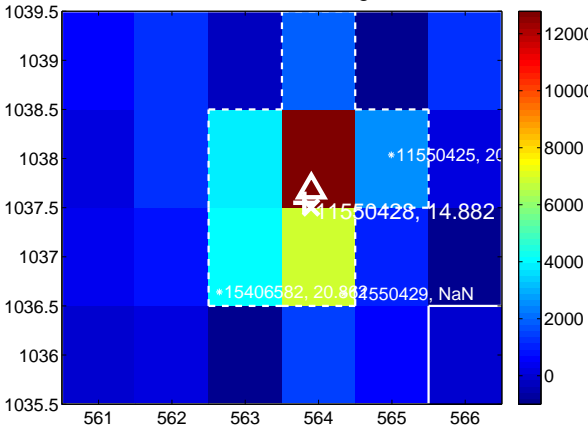
Q5 no difference image



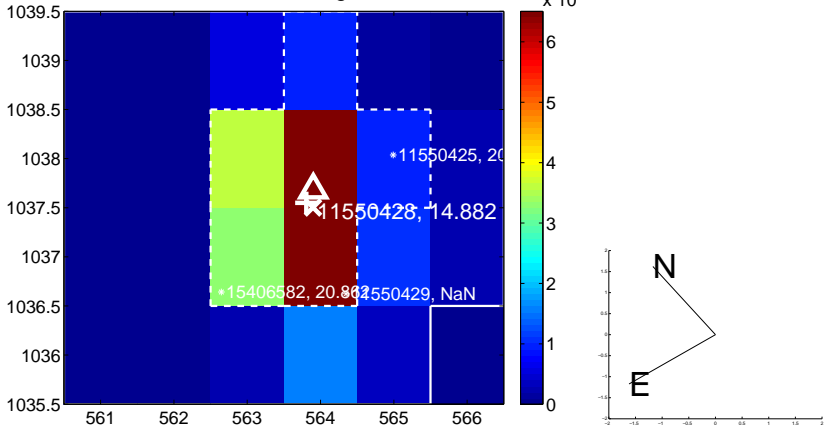
Q5 no OOT image



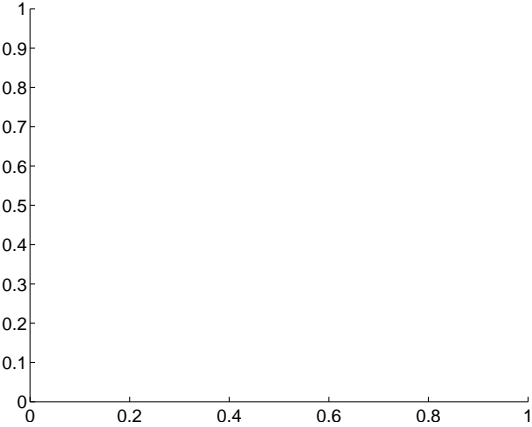
Q6 difference image



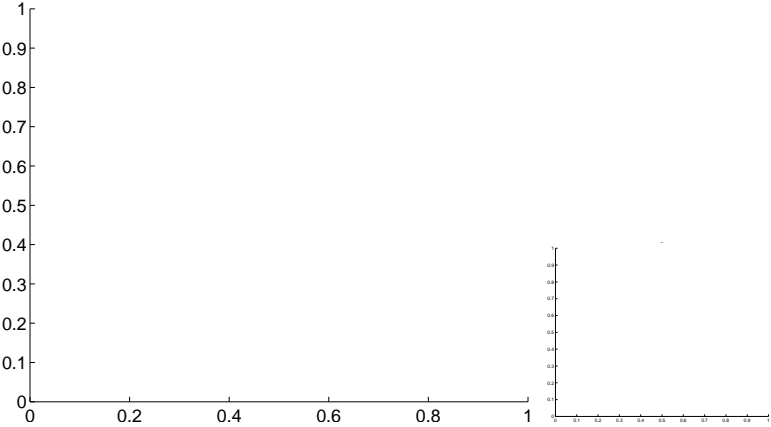
Q6 OOT image



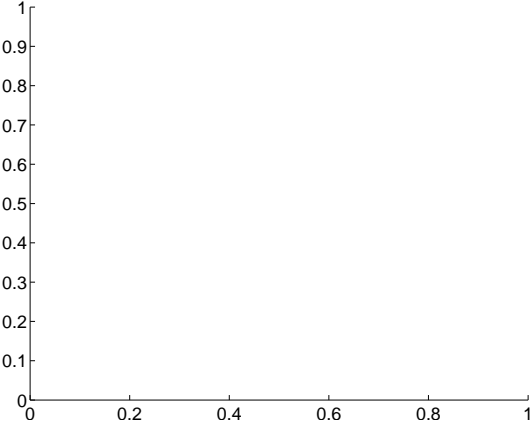
Q7 no difference image



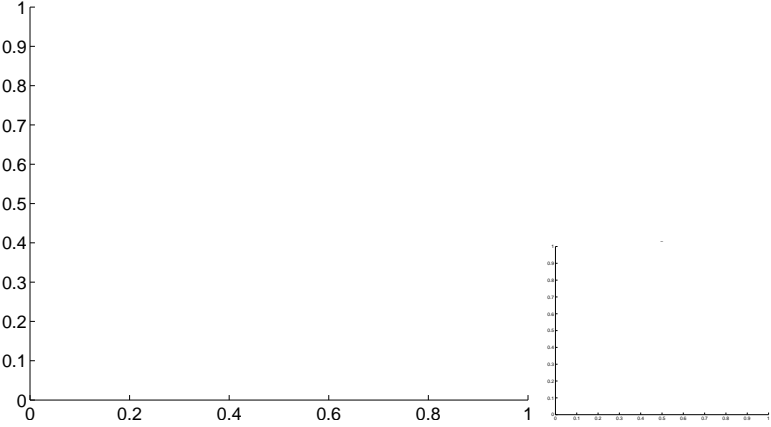
Q7 no OOT image



Q8 no difference image



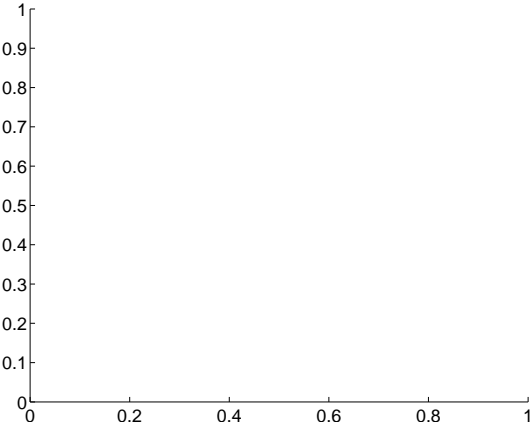
Q8 no OOT image



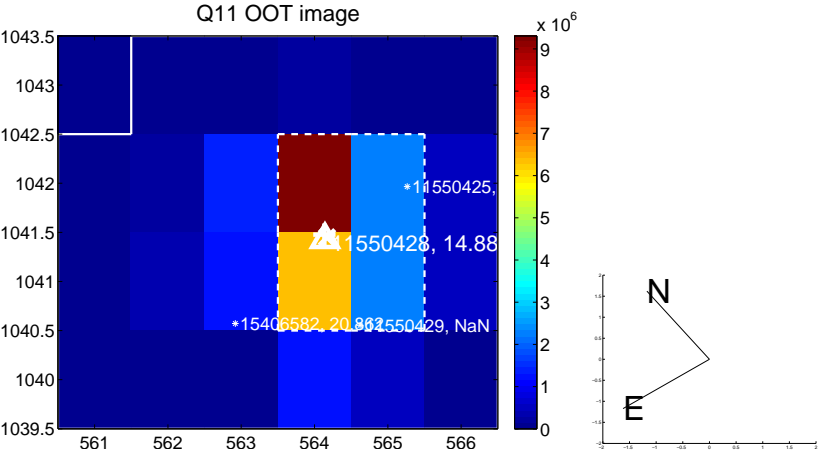
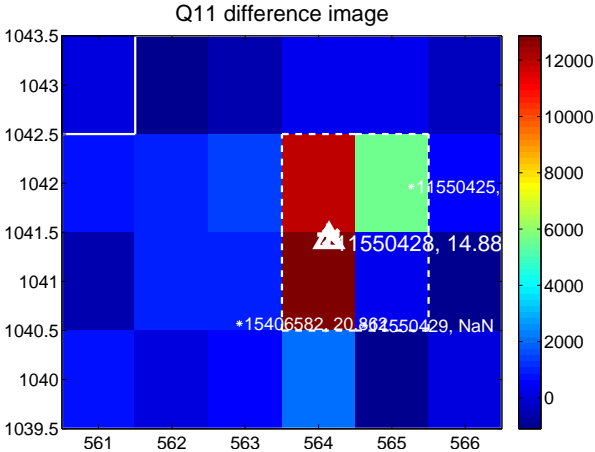
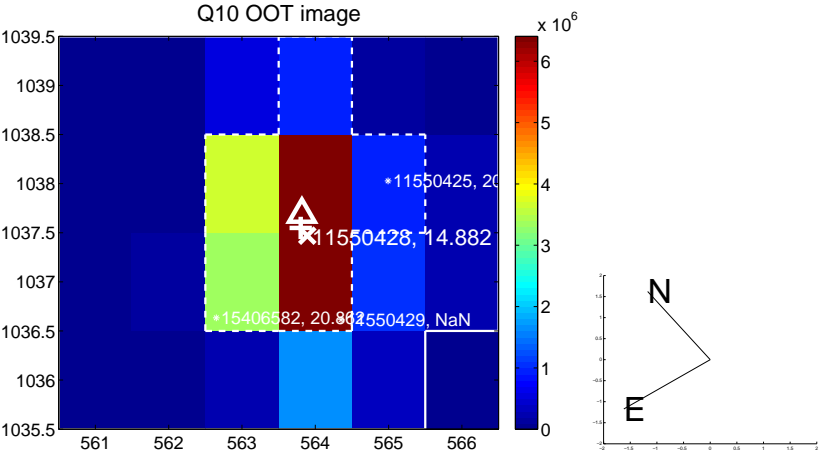
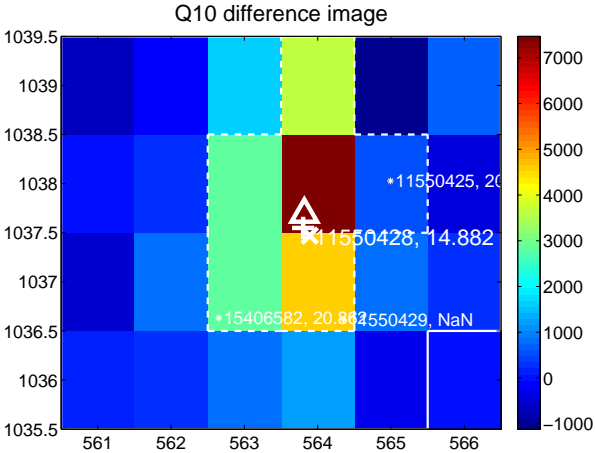
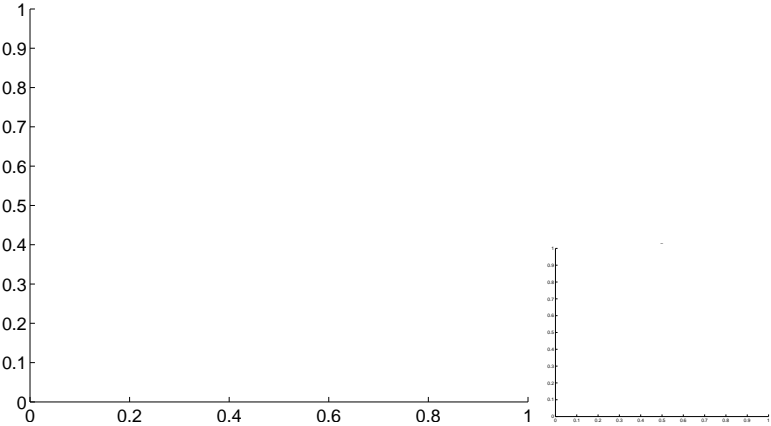


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

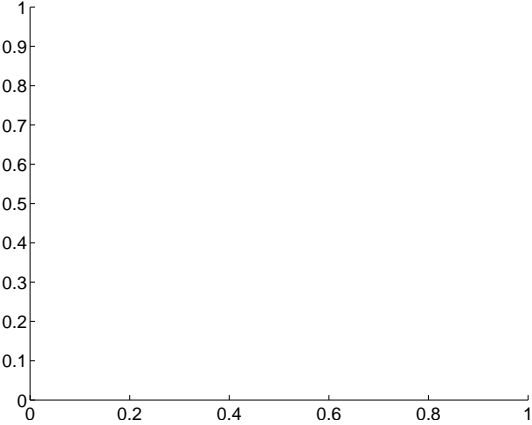
Q9 no difference image



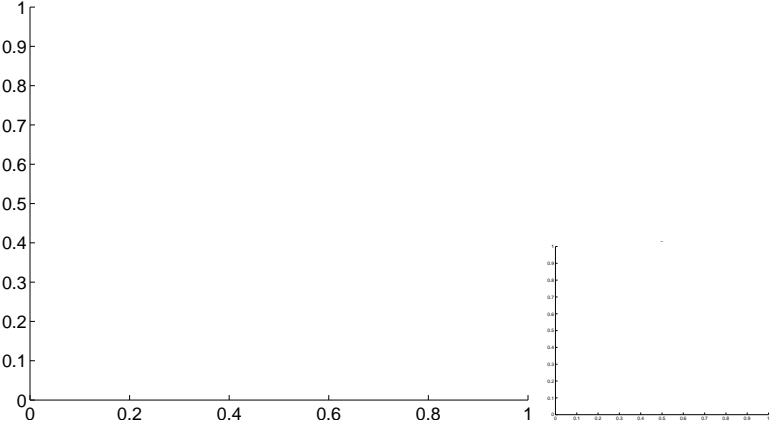
Q9 no OOT image



Q12 no difference image



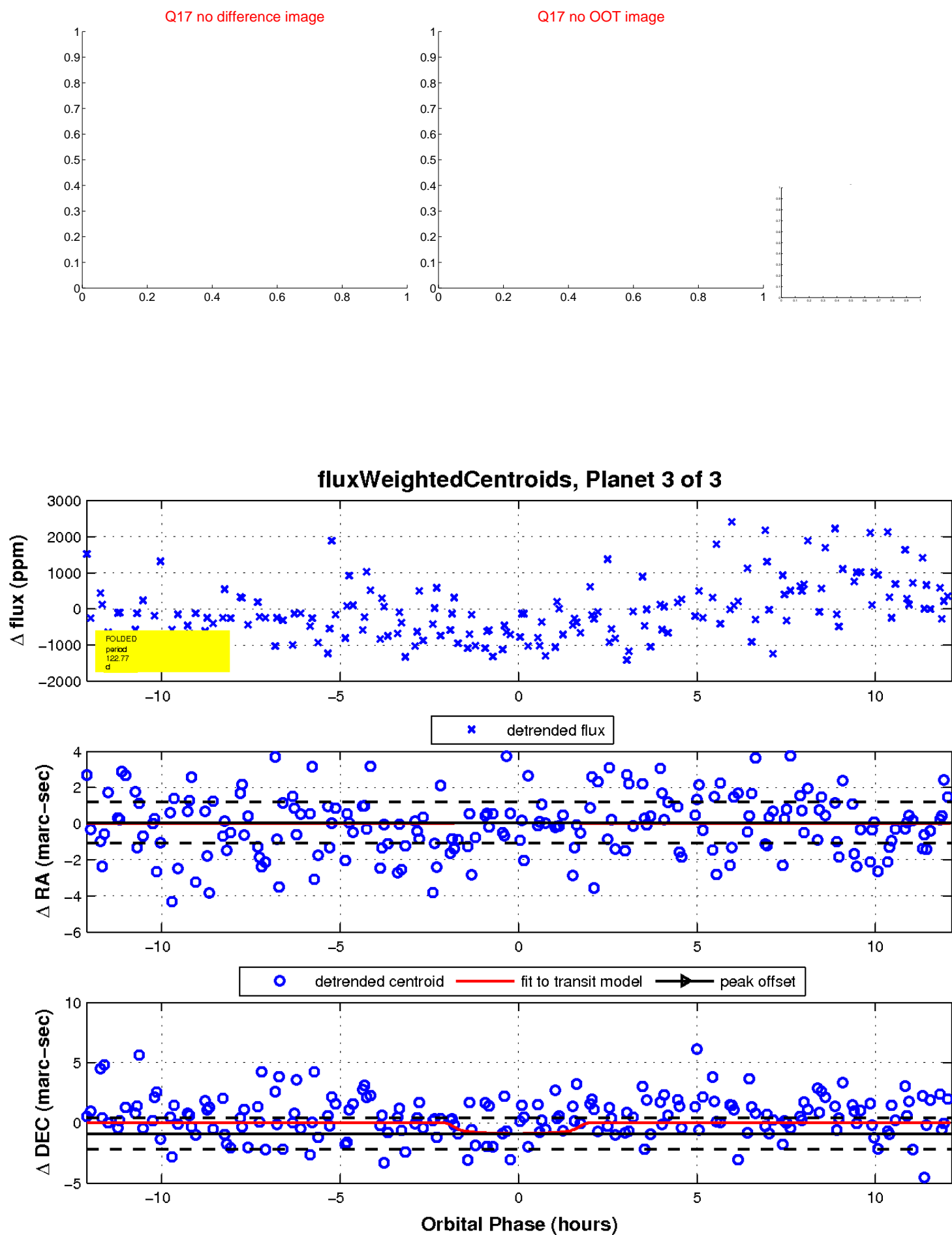
Q12 no OOT image



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

