

# KIC 003938354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003938354-01	OBS	No	508.771168	432.319580	2504.1	3.684	14.5	10.5	0.78	5665	3.96	0.40
003938354-02	OBS	No	398.374141	182.477111	1472.8	7.990	13.4	5.4	0.78	5665	3.07	0.56
003938354-03	OBS	No	688.453771	139.638434	1827.3	4.734	11.6	6.2	0.78	5665	3.29	0.27
003938354-04	OBS	No	403.054353	148.085342	1609.0	3.521	14.3	8.1	0.78	5665	3.09	0.55
003938354-05	OBS	No	250.665292	364.773704	486.6	15.000	12.1	-1.0	0.78	5665	1.70	1.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003938354-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
003938354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
003938354-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS

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

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

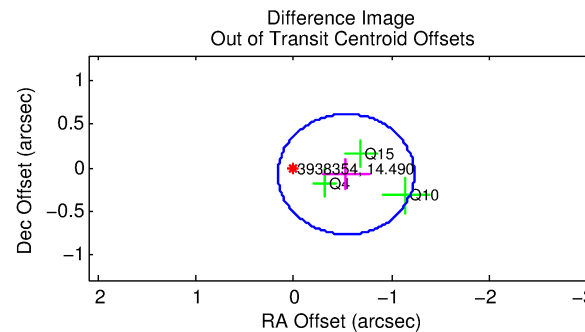
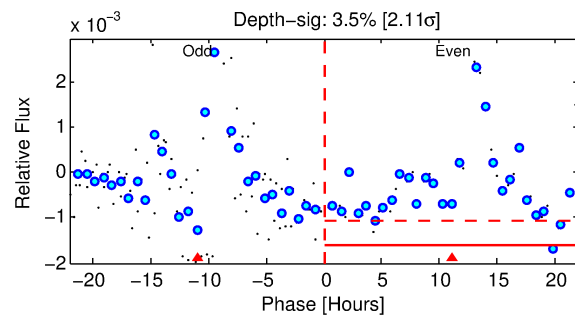
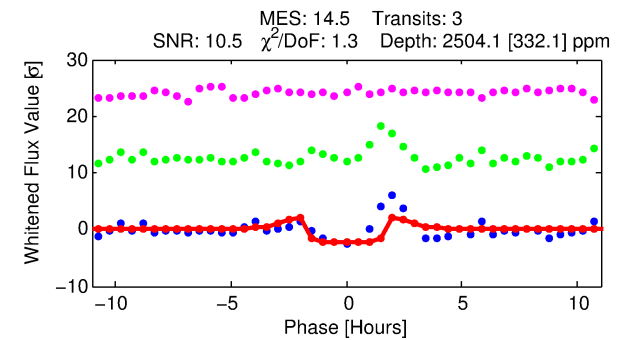
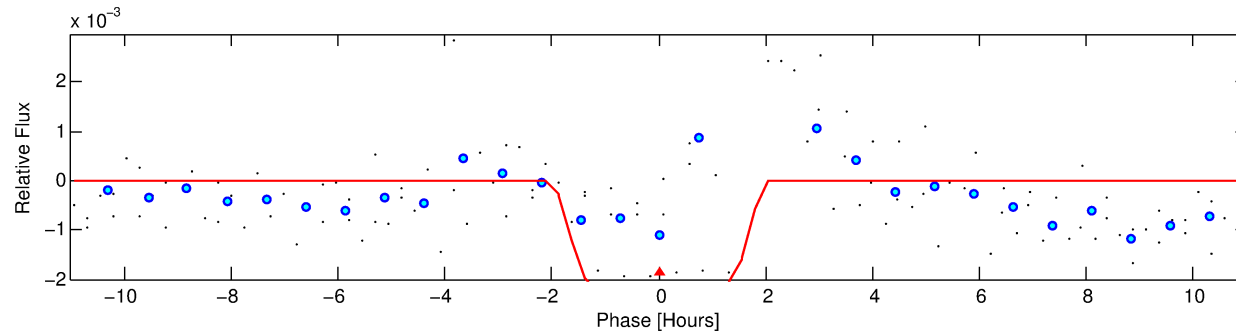
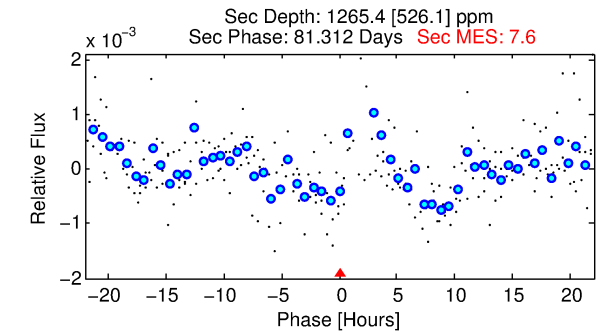
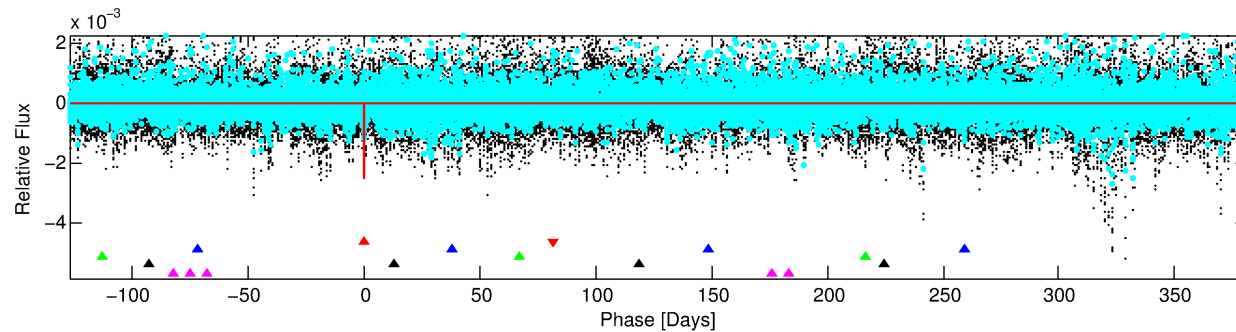
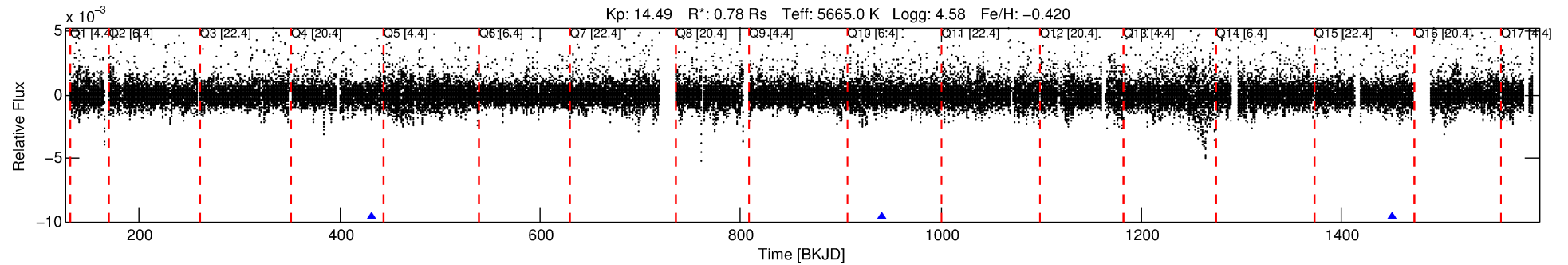
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003938354-01

No Significant Match Found

# DV One-Page Summary

KIC: 3938354 Candidate: 1 of 5 Period: 508.771 d



## DV Fit Results:

Period = 508.77117 [0.00396] d  
Epoch = 432.3196 [0.0040] BKJD  
Rp/R\* = 0.0467 [0.0507]  
a/R\* = 992.09 [4767.72]  
b = 0.46 [8.31]  
Seff = 0.40 [0.12]  
Teq = 203 [16] K  
Rp = 3.96 [4.40] Re  
a = 1.1739 [0.2290] AU  
Ag = 61287.71 [136633.07] [0.45 $\sigma$ ]  
Teffp = 4943 [2737] K [1.73 $\sigma$ ]

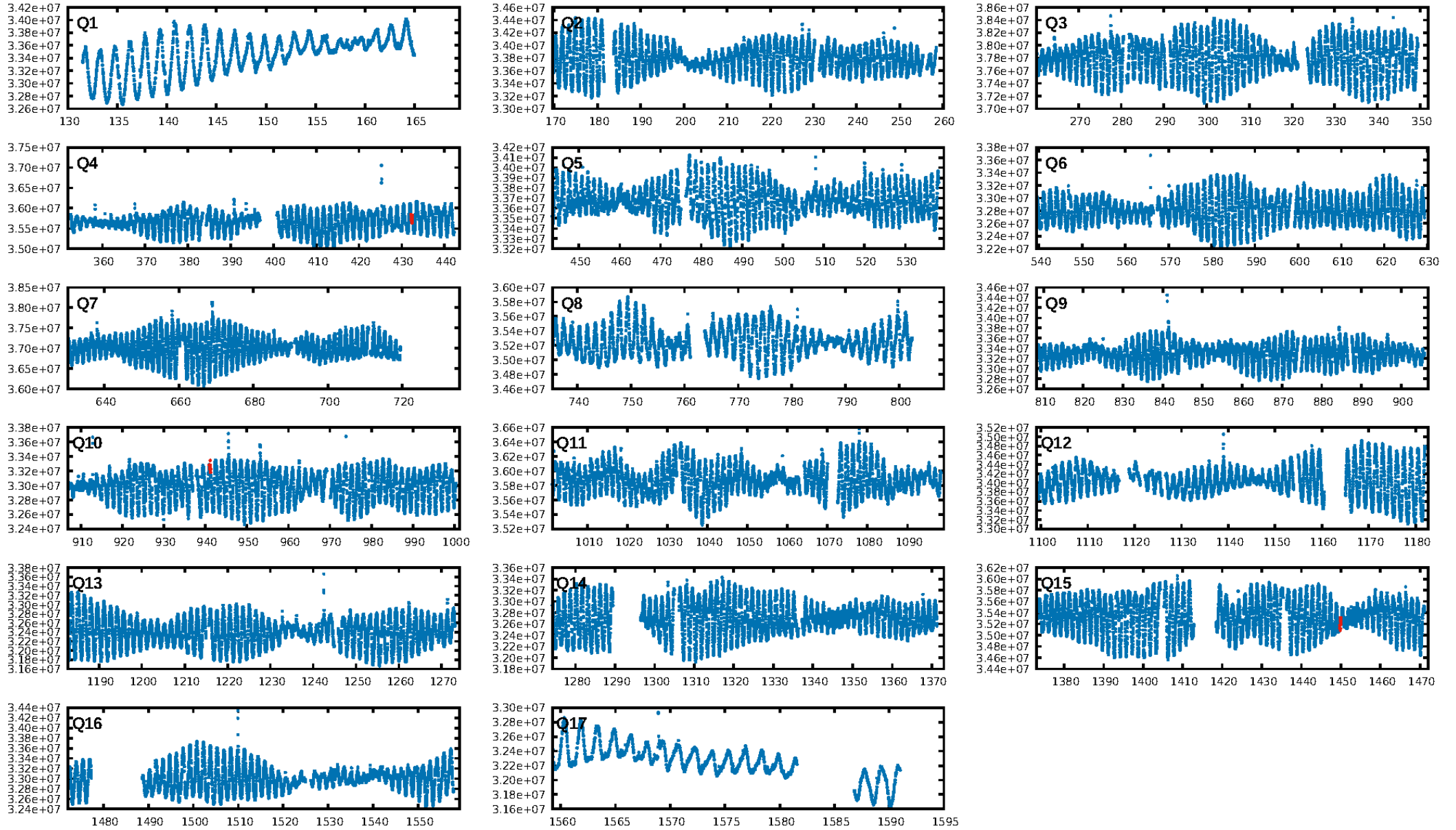
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [497.91 $\sigma$ ]  
LongPeriod-sig: 100.0% [718.91 $\sigma$ ]  
ModelChiSquare2-sig: 4.8%  
ModelChiSquareGof-sig: 82.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.5774**  
Centroid-sig: 34.9%  
Centroid-so: 0.742 arcsec [1.42 $\sigma$ ]  
OotOffset-rm: 0.542 arcsec [2.33 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-rm: 0.425 arcsec [2.22 $\sigma$ ]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

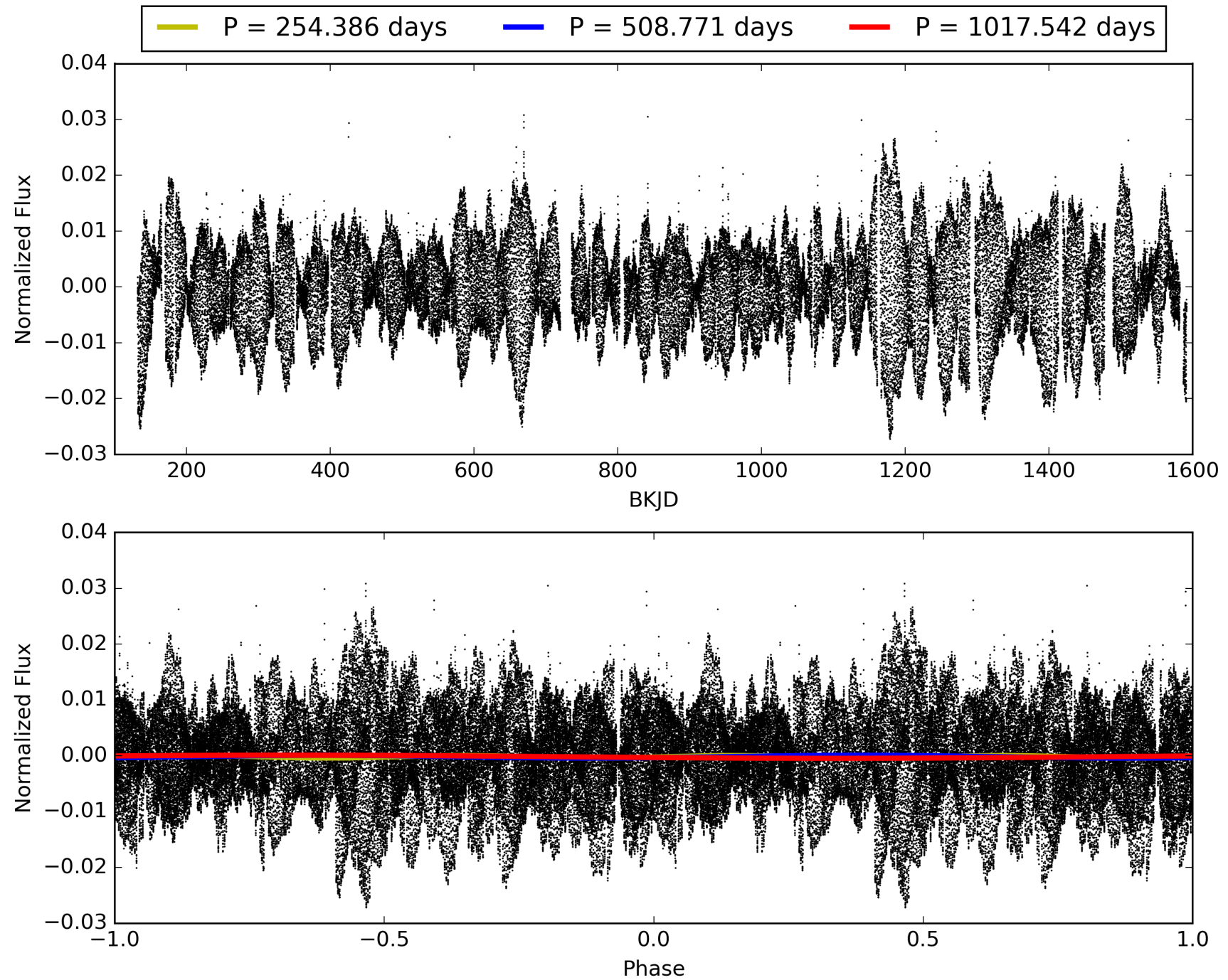
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:49:07 Z

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

# TCE 003938354-01, PDC Light Curves



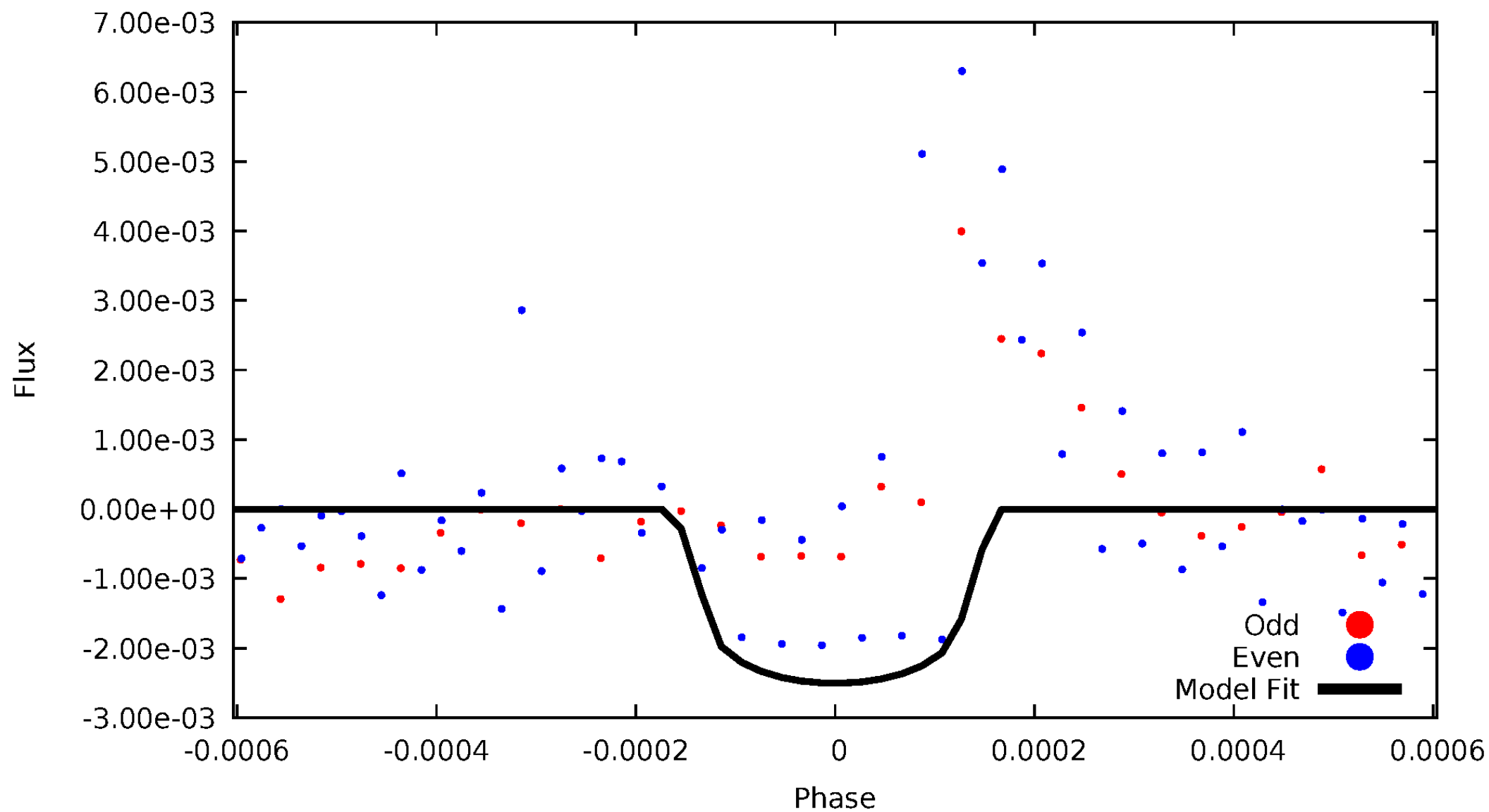
TCE 003938354-01





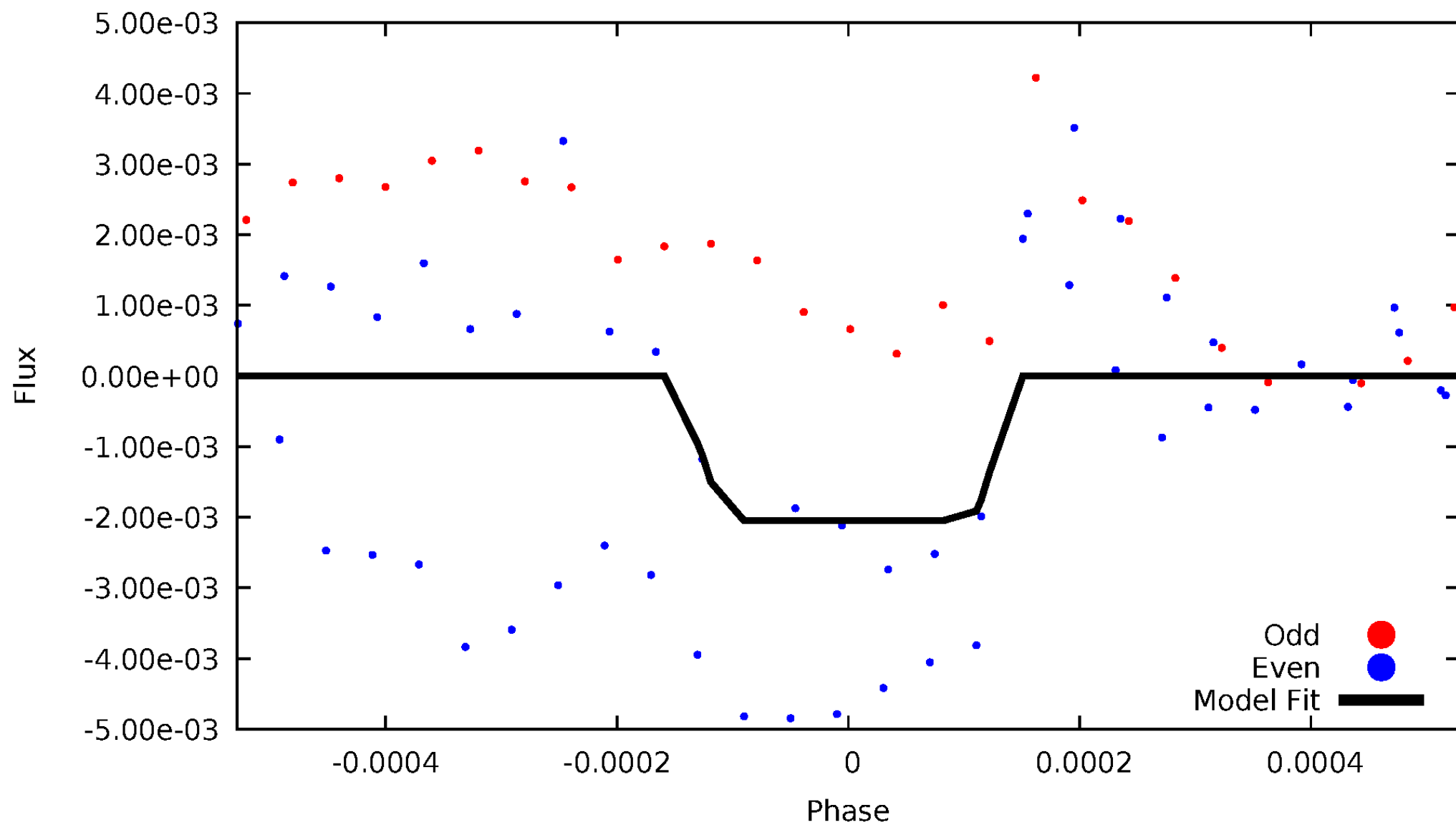
# DV Odd/Even

TCE 003938354-01



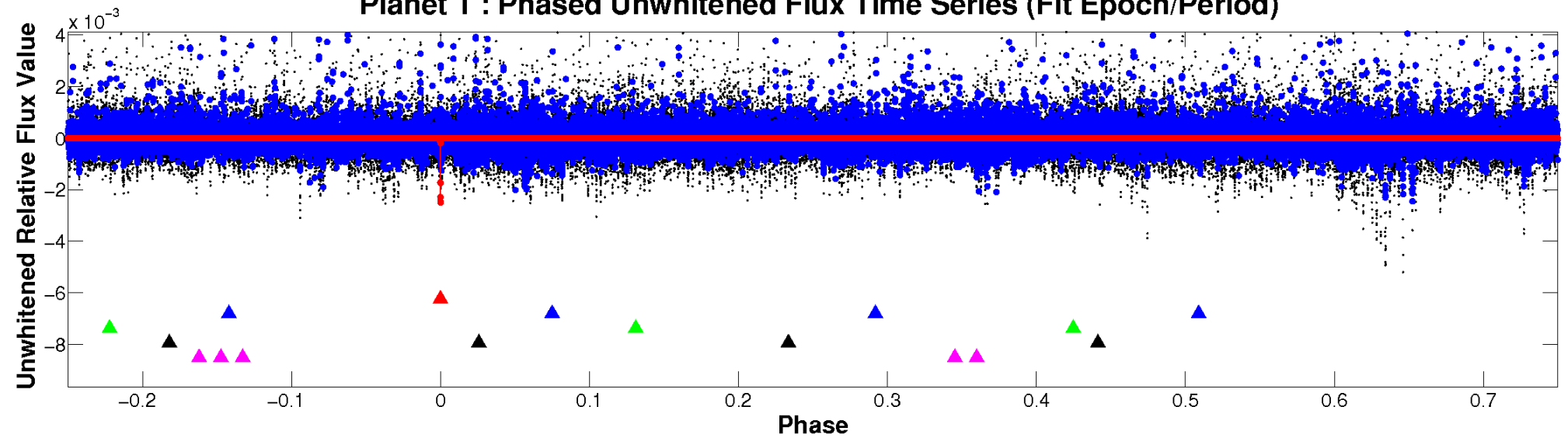
# ALT Odd/Even

TCE 003938354-01

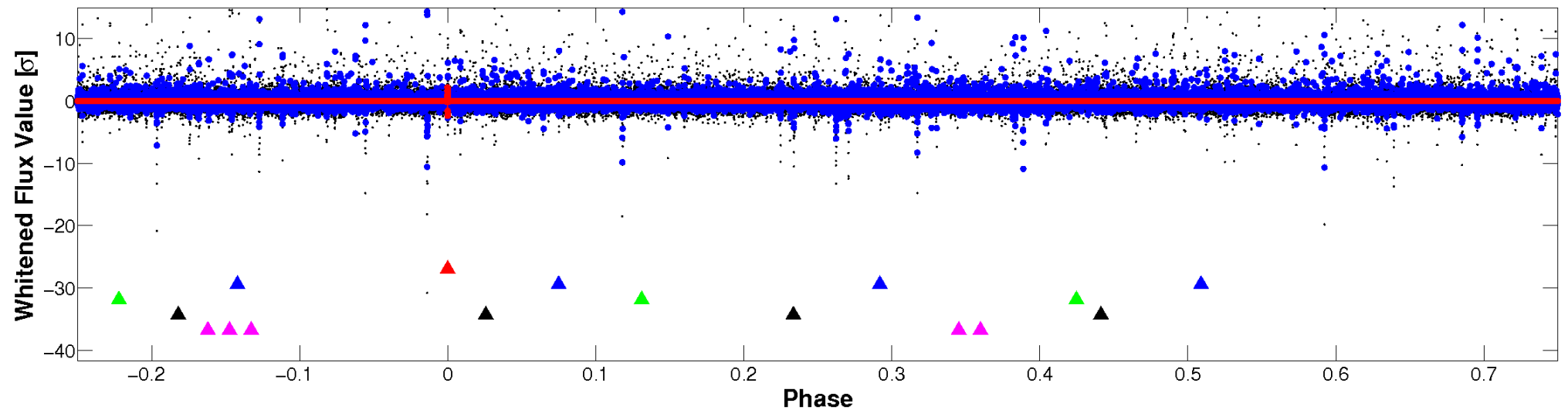


# Non-Whitened Vs. Whitened Light Curve

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

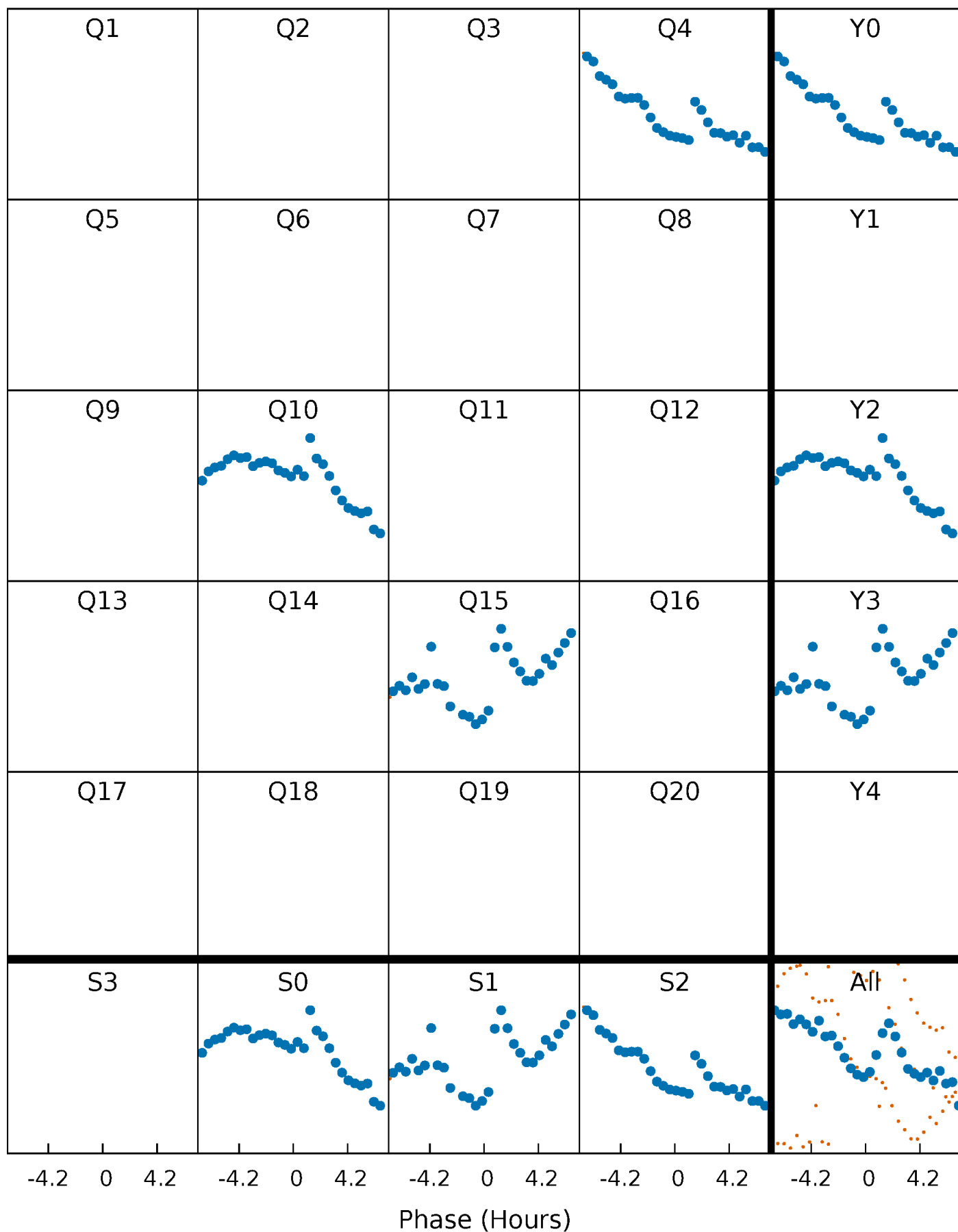


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



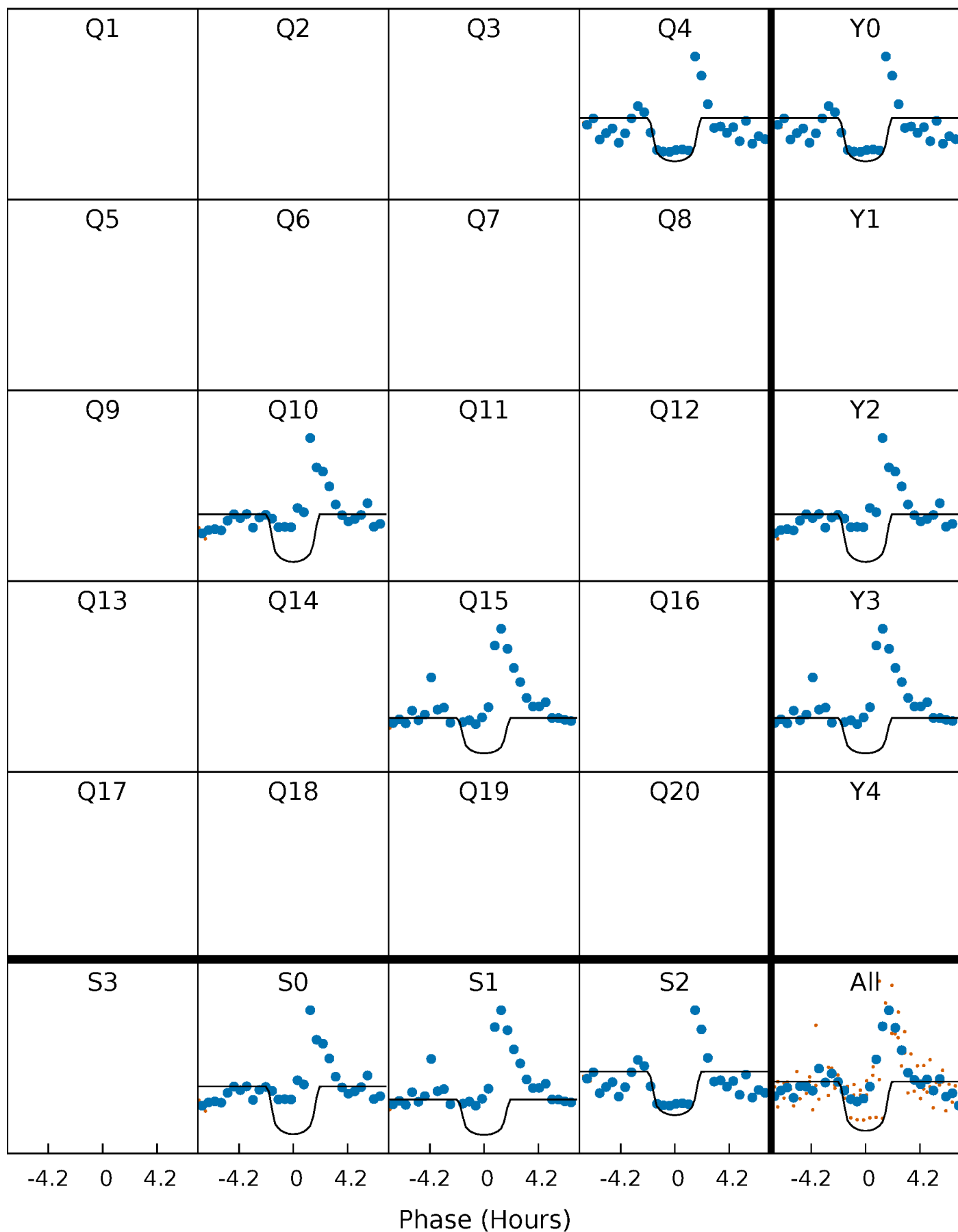
# PDC Quarter-Phased Transit Curves

TCE 003938354-01 P=508.771168 Days  $T_0=432.319580$  (BKJD)



# DV Quarter-Phased Transit Curves

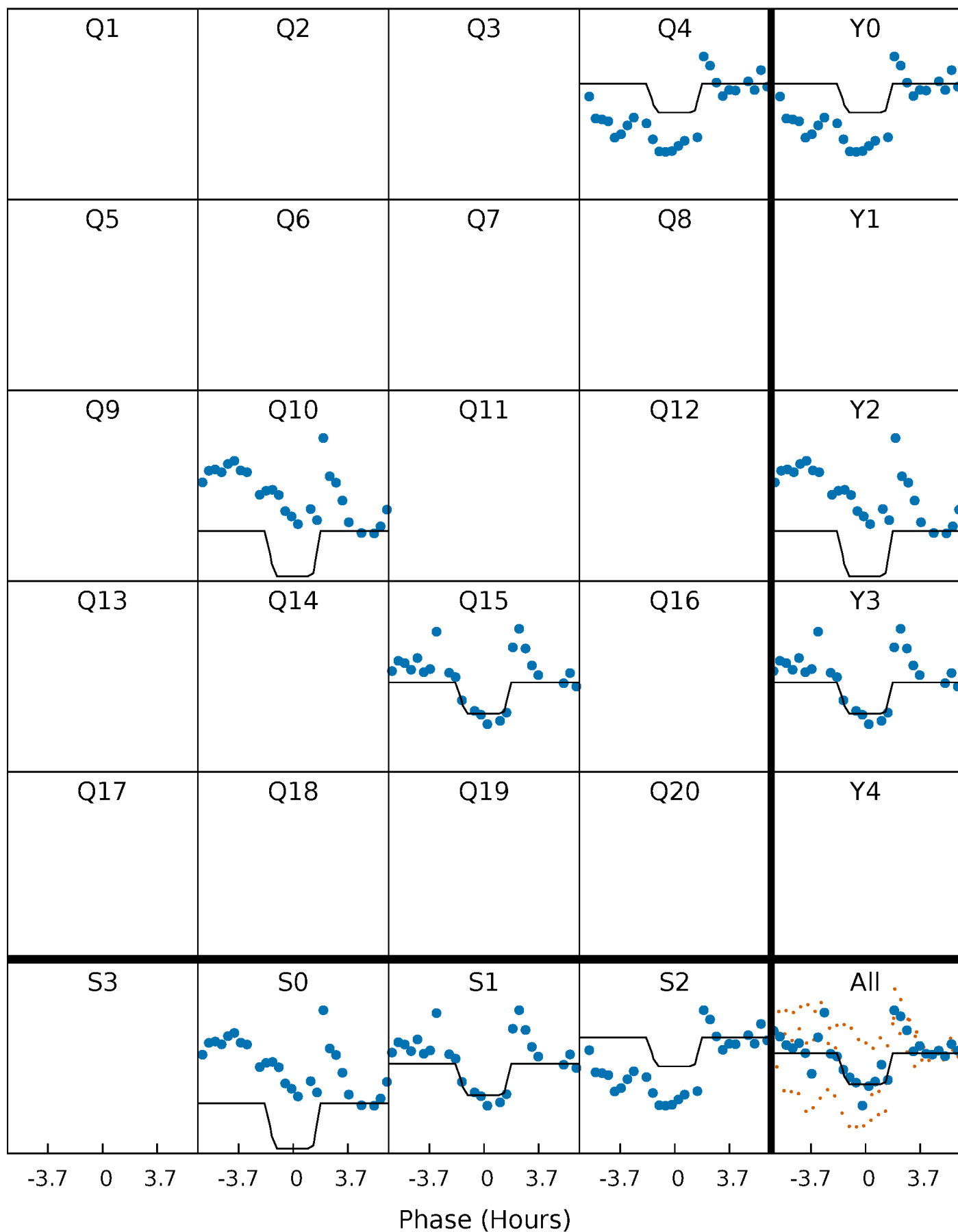
TCE 003938354-01 P=508.771168 Days  $T_0=432.319580$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

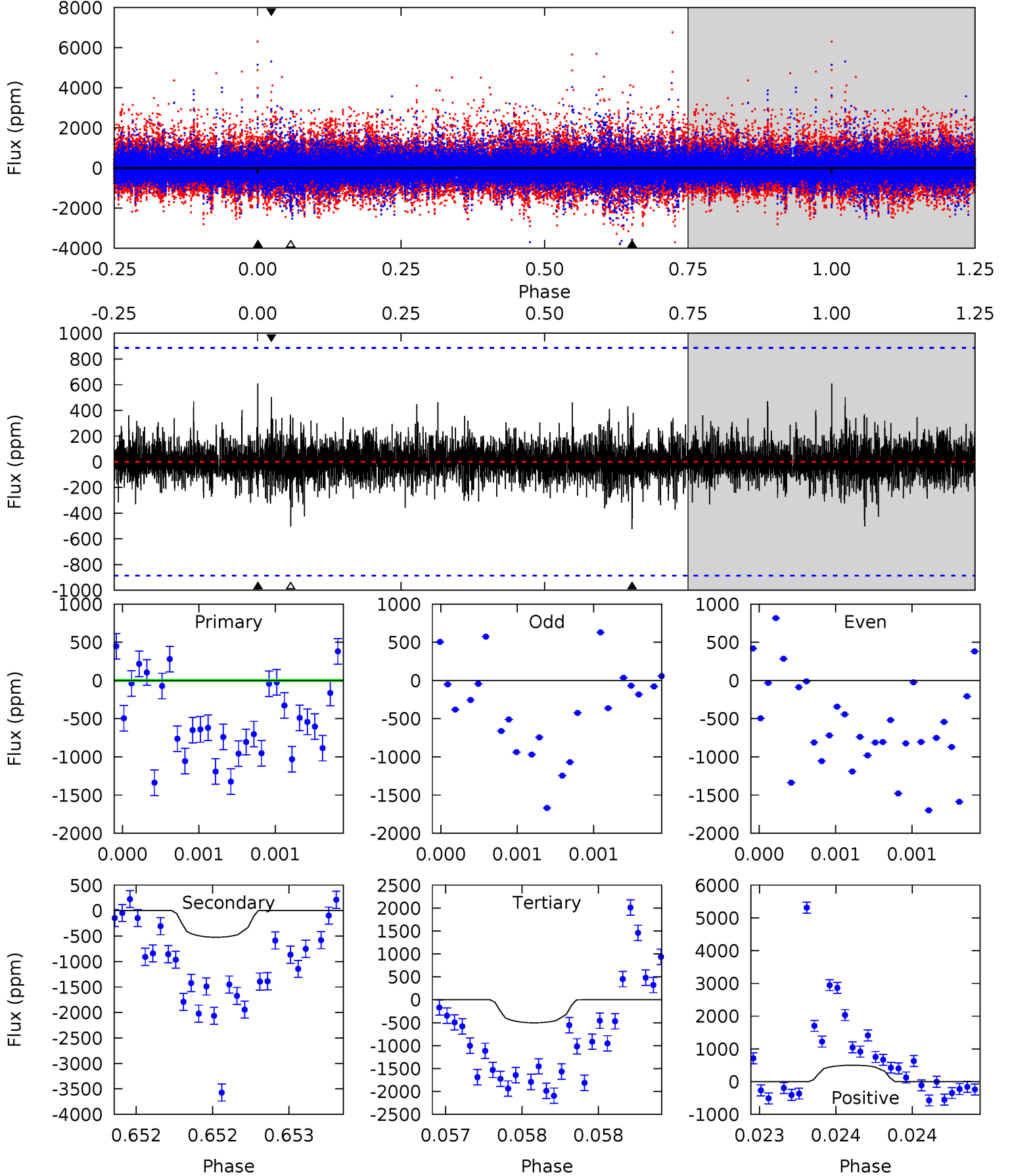
TCE 003938354-01 P=508.754777 Days  $T_0=432.317836$  (BKJD)



# DV Model-Shift Uniqueness Test

003938354-01, P = 508.771168 Days, E = 432.319580 Days

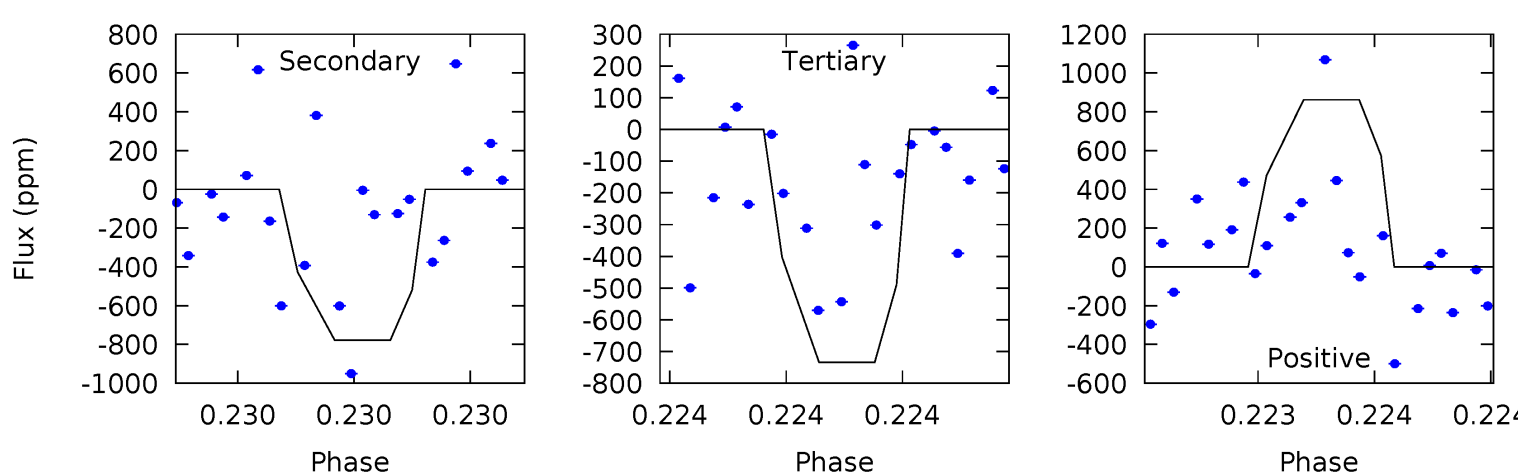
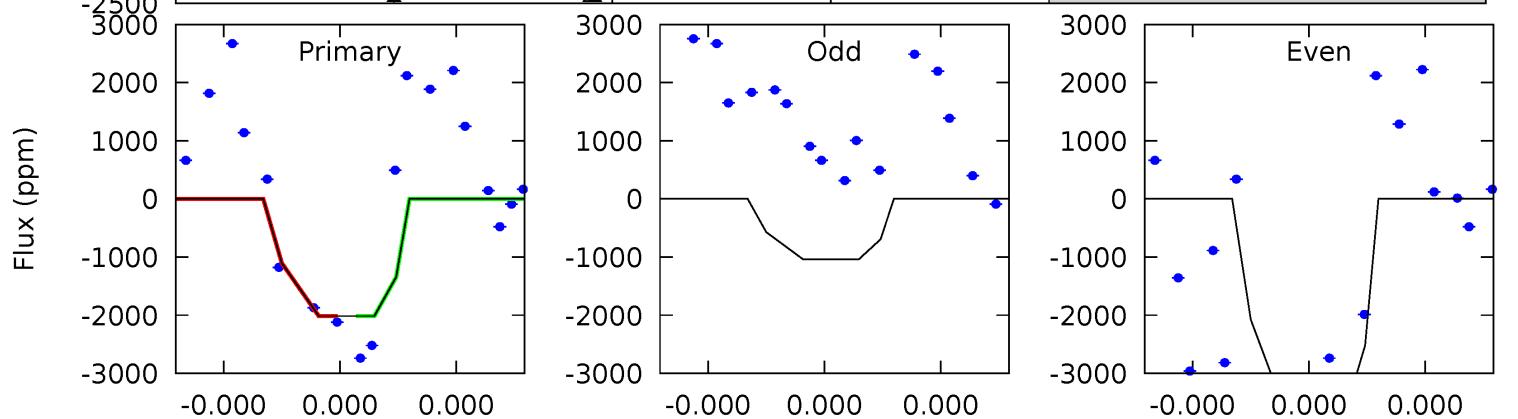
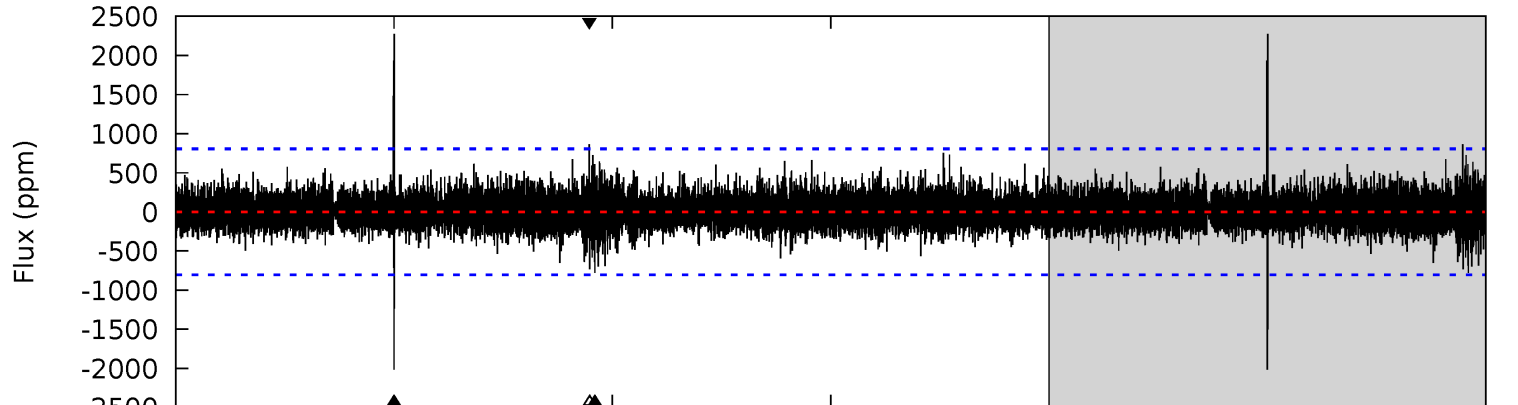
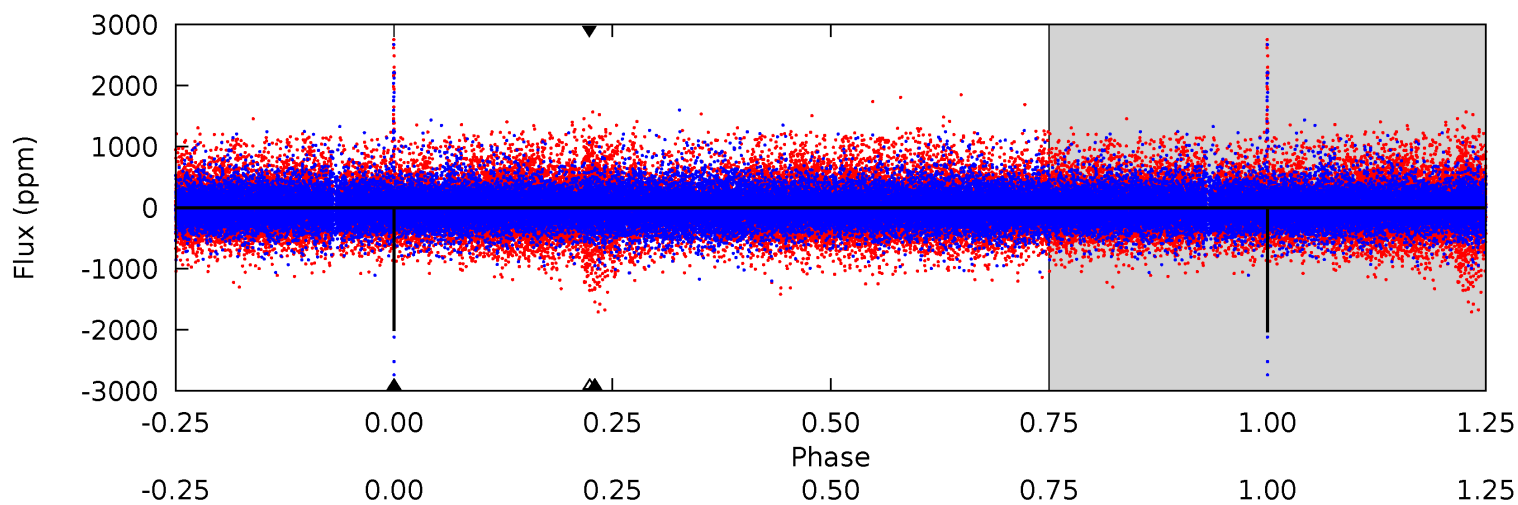
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.65	3.34	3.21	3.20	5.66	3.61	0.66	-1.55	-1.55	0.13	0.14	0.96	-0.44	0.54	1.50



# Alt Model-Shift Uniqueness Test

003938354-01, P = 508.754777 Days, E = 432.317836 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
14.3	5.50	5.19	6.09	5.69	3.66	1.00	9.06	8.16	0.31	-0.59	16.3	0.86	0.53	0.00



### Stellar Parameters For KIC 003938354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5665^{+169}_{-152}$	$4.579^{+0.038}_{-0.152}$	$-0.420^{+0.300}_{-0.300}$	$0.776^{+0.182}_{-0.073}$	$0.834^{+0.088}_{-0.080}$	$2.510^{+0.516}_{-1.083}$
	+3%/-3%	+1%/-3%	+71%/-71%	+23%/-9%	+11%/-10%	+21%/-43%
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 003938354-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-523 \pm 157$	$5.19^{+3.99}_{-3.20}$	$291^{+15}_{-13}$	$3870^{+1808}_{-645}$	$14445^{+78831}_{-10061}$
Alt.	$-778 \pm 141$	$4.97^{+4.35}_{-3.10}$	$290^{+17}_{-12}$	$4221^{+2294}_{-787}$	$23386^{+139259}_{-16690}$

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

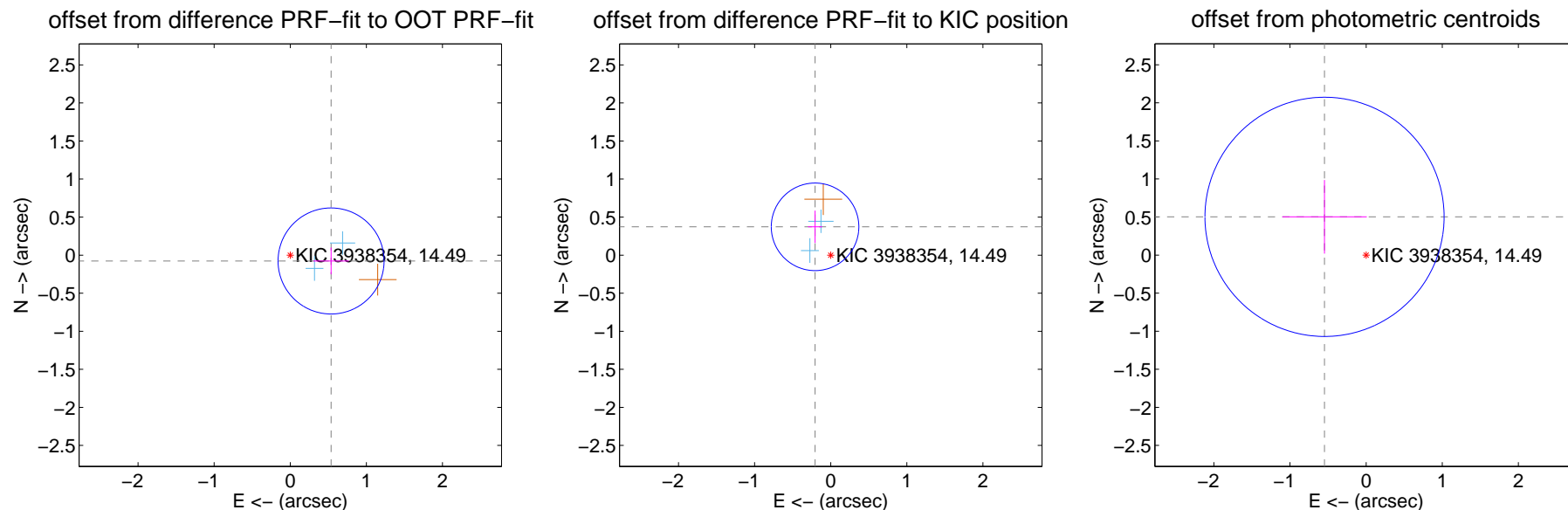
## DV Centroid Data

Supplemental centroid analysis for 003938354-01. Kepler magnitude: 14.49. Transit SNR 10.45

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

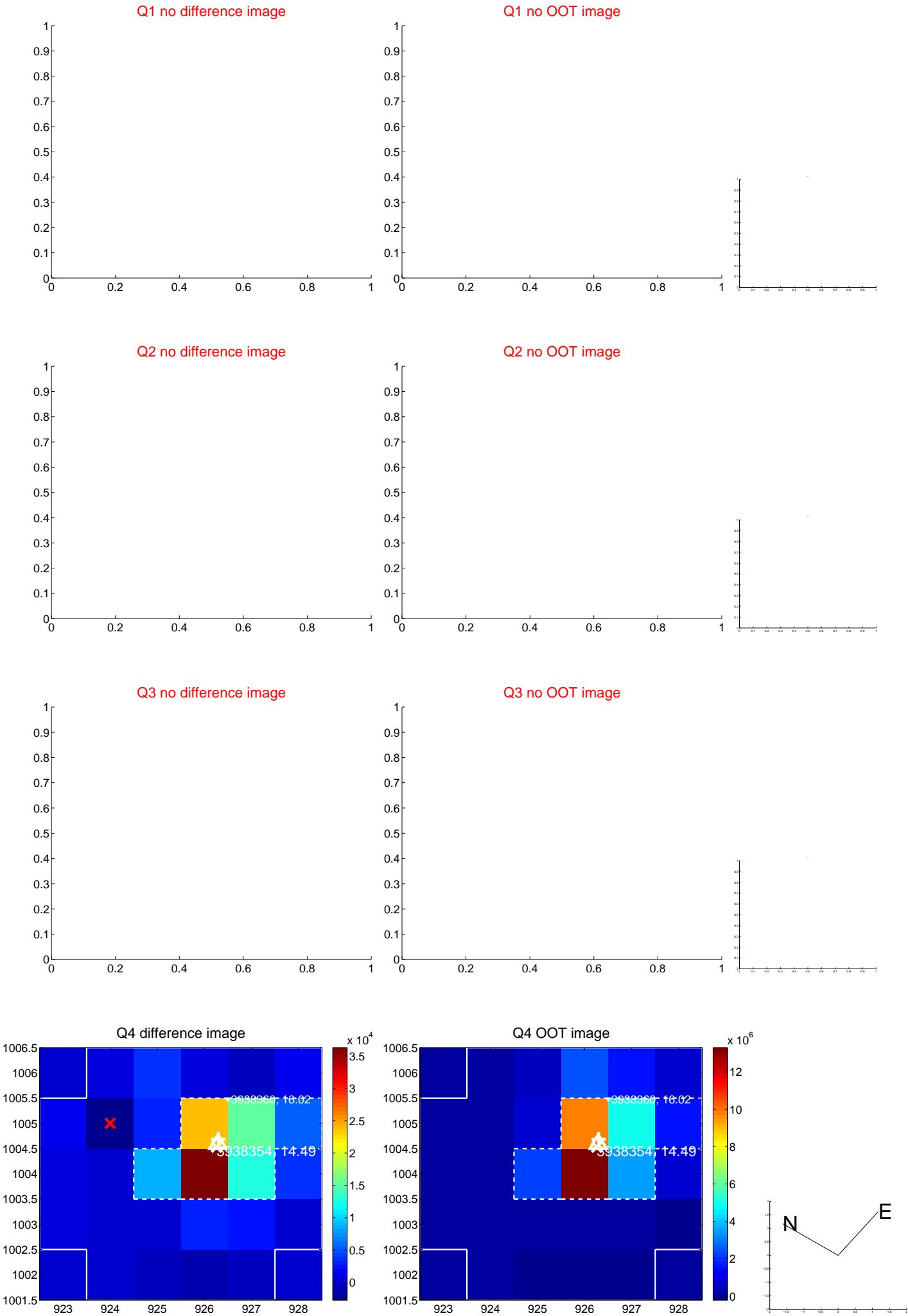
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.542 \pm 0.232$	2.33	$-0.536 \pm 0.233$	$-0.076 \pm 0.175$
PRF-fit source offset from KIC position	$0.425 \pm 0.192$	2.22	$0.206 \pm 0.094$	$0.372 \pm 0.213$
photometric centroid source offset	$0.74 \pm 0.52$	1.42	$0.55 \pm 0.56$	$0.50 \pm 0.48$



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

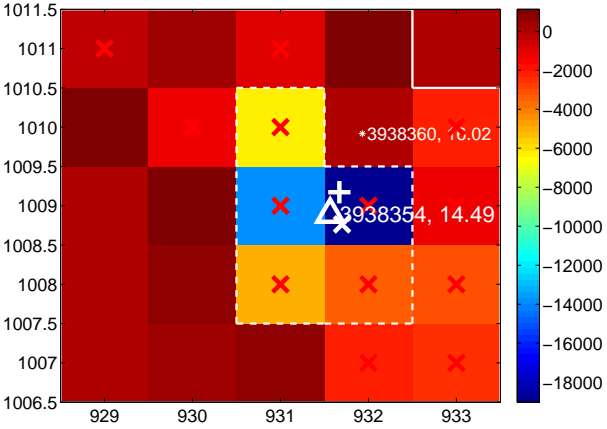
Q9 no difference image



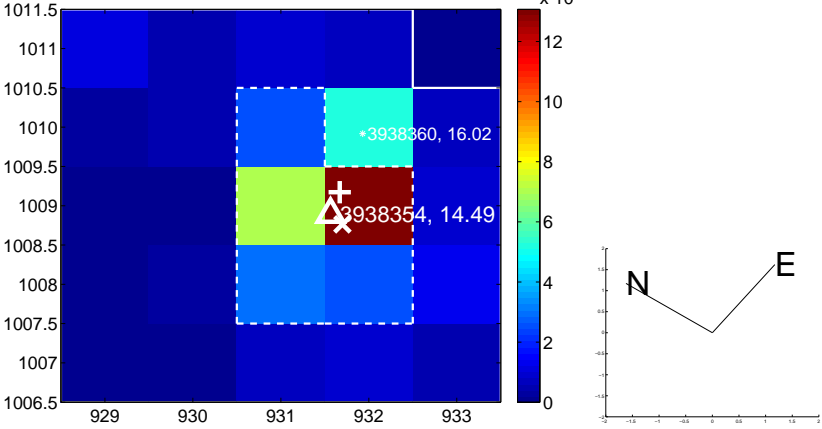
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



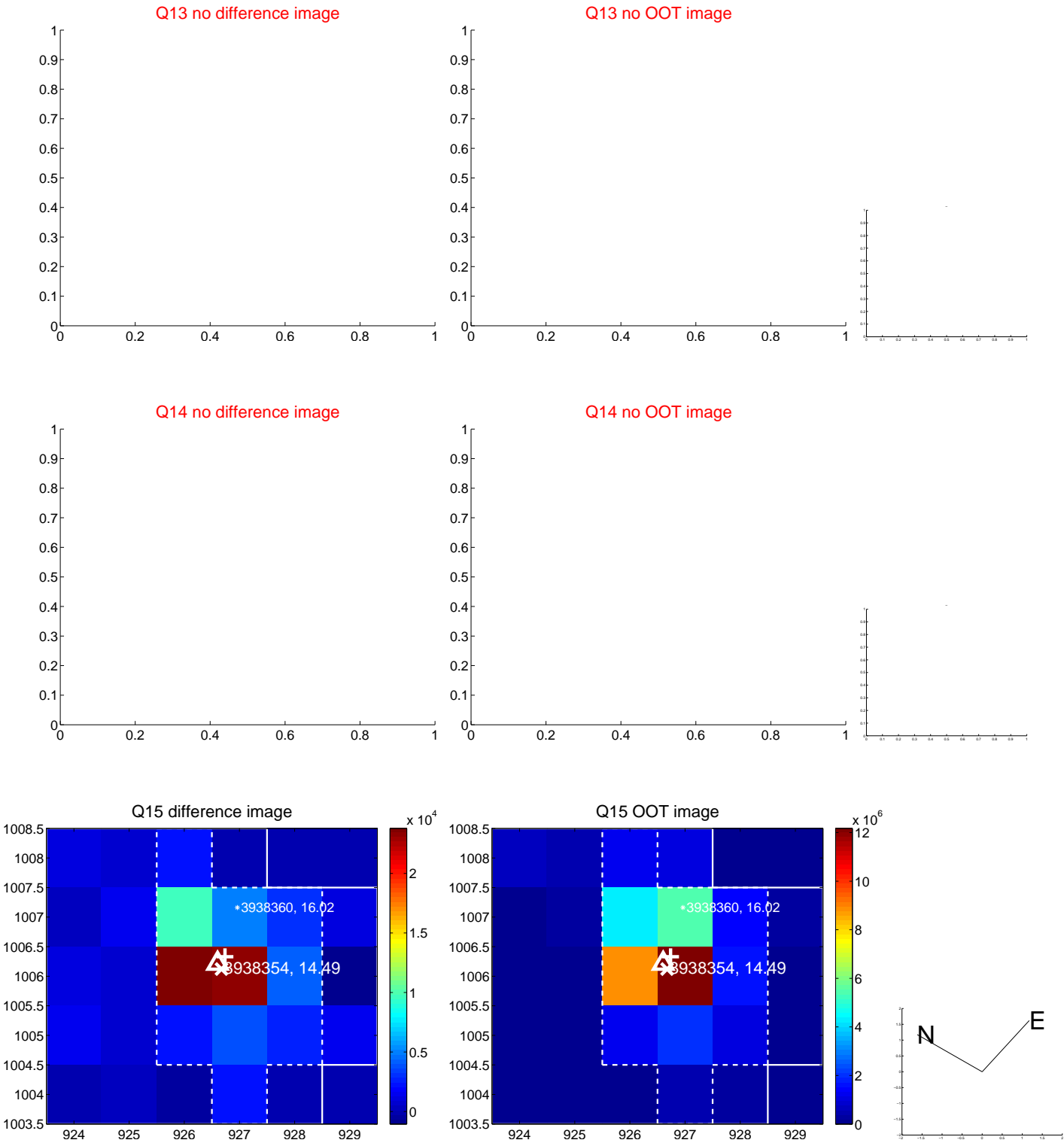
Q12 no difference image



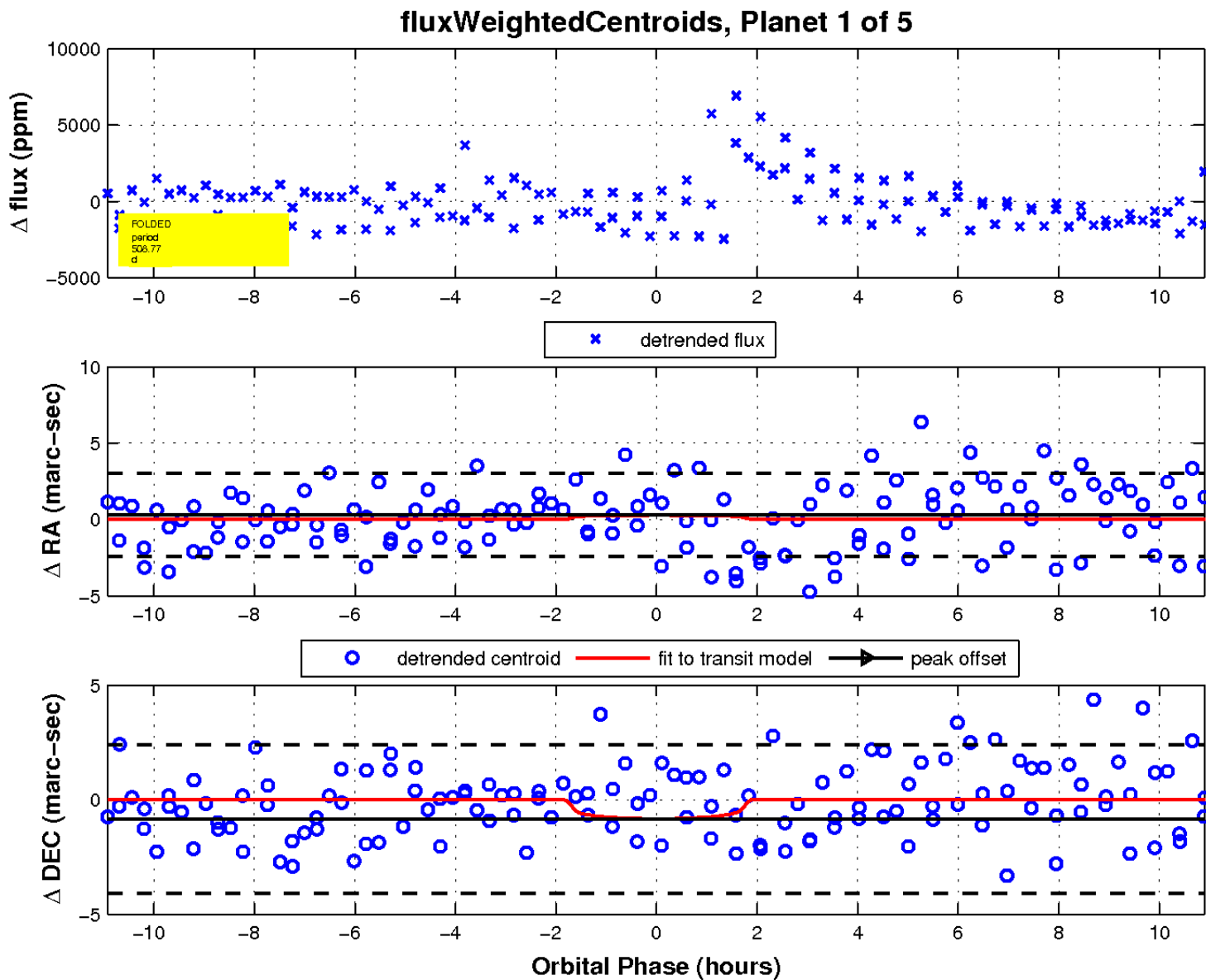
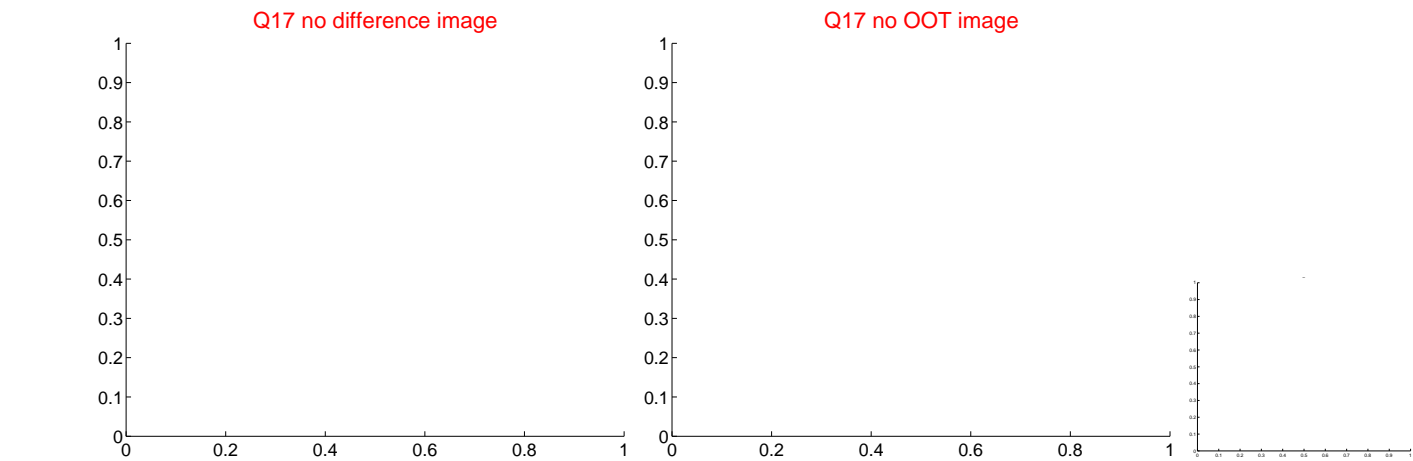
Q12 no OOT image



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



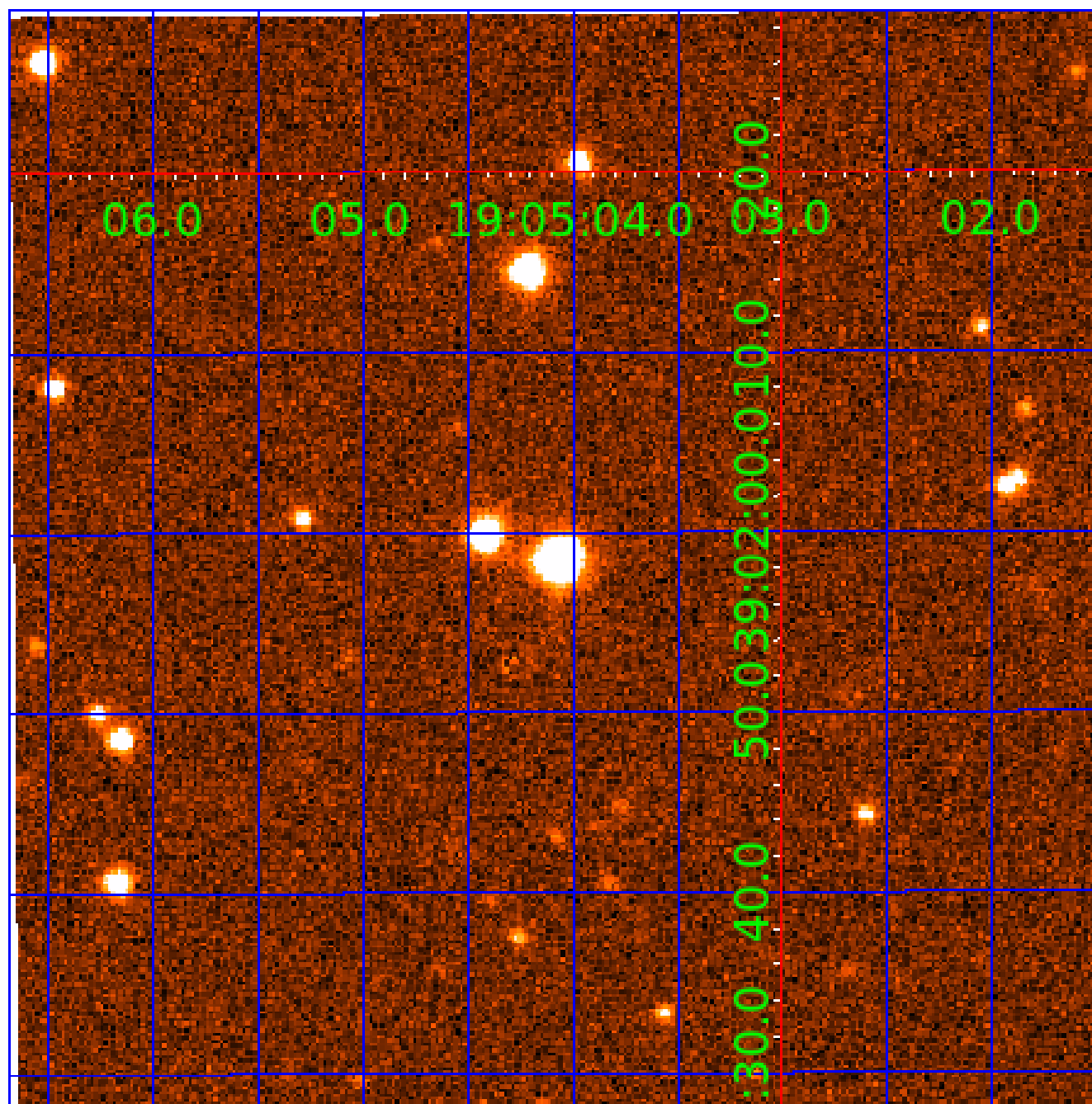
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 003938354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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003938354-03	OBS	No	688.453771	139.638434	1827.3	4.734	11.6	6.2	0.78	5665	3.29	0.27
003938354-04	OBS	No	403.054353	148.085342	1609.0	3.521	14.3	8.1	0.78	5665	3.09	0.55
003938354-05	OBS	No	250.665292	364.773704	486.6	15.000	12.1	-1.0	0.78	5665	1.70	1.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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003938354-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
003938354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
003938354-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS

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

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

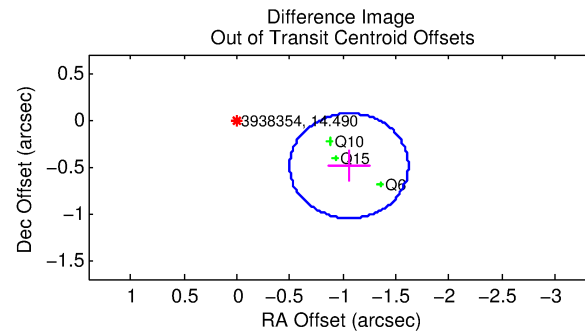
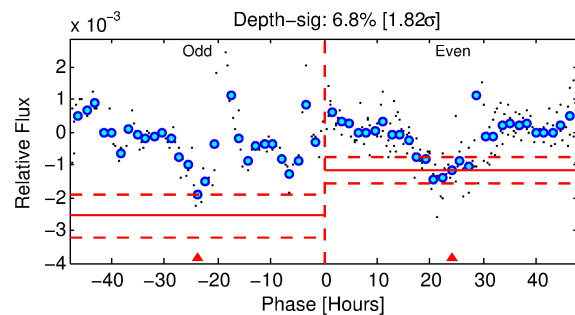
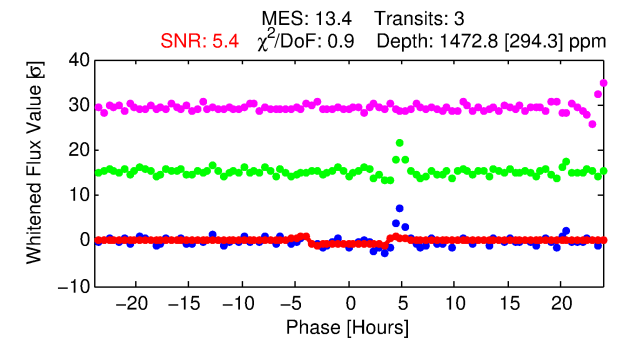
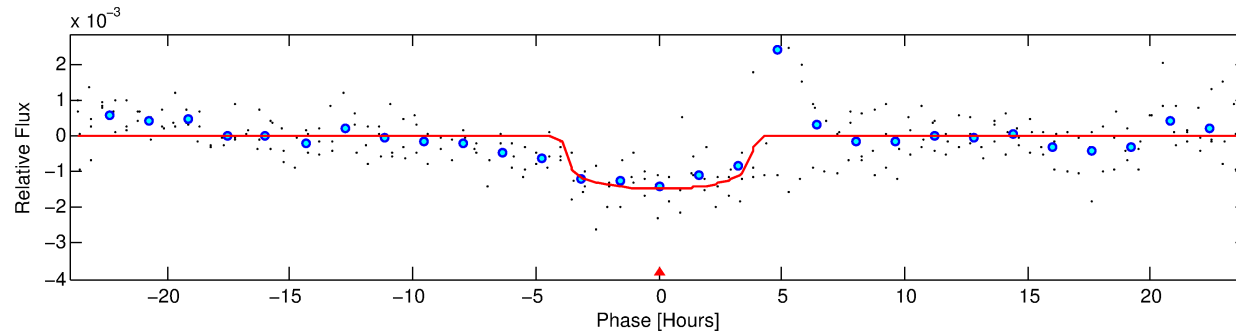
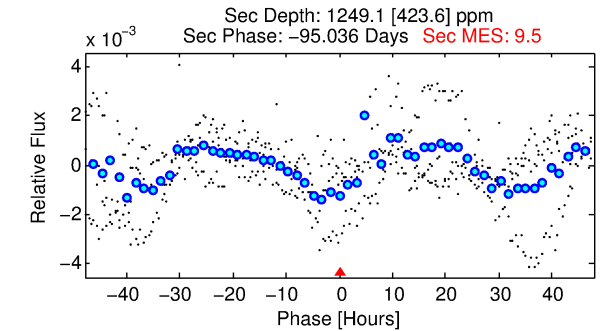
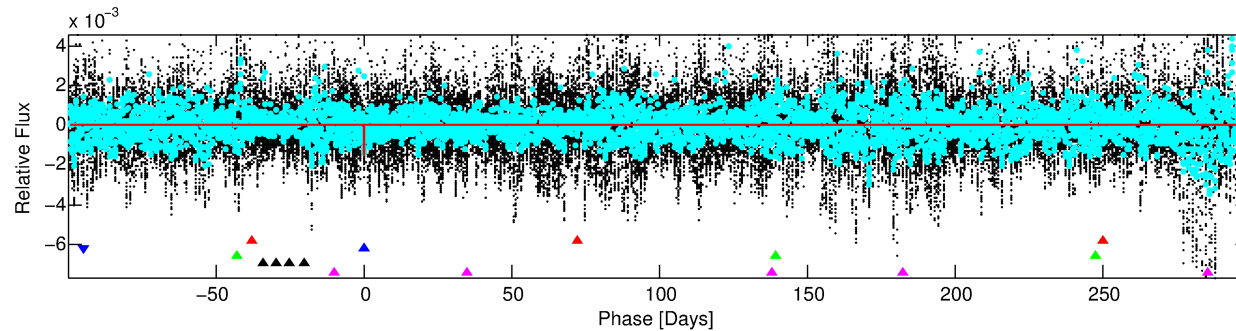
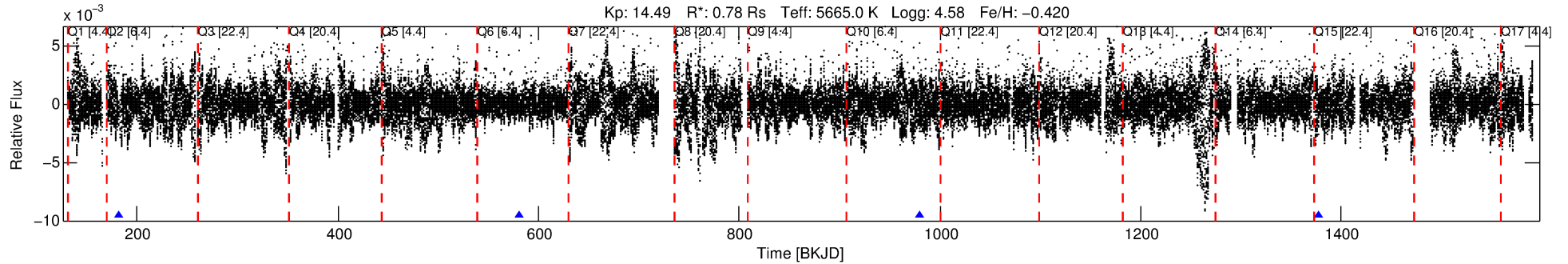
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003938354-02

No Significant Match Found

# DV One-Page Summary

KIC: 3938354 Candidate: 2 of 5 Period: 398.374 d



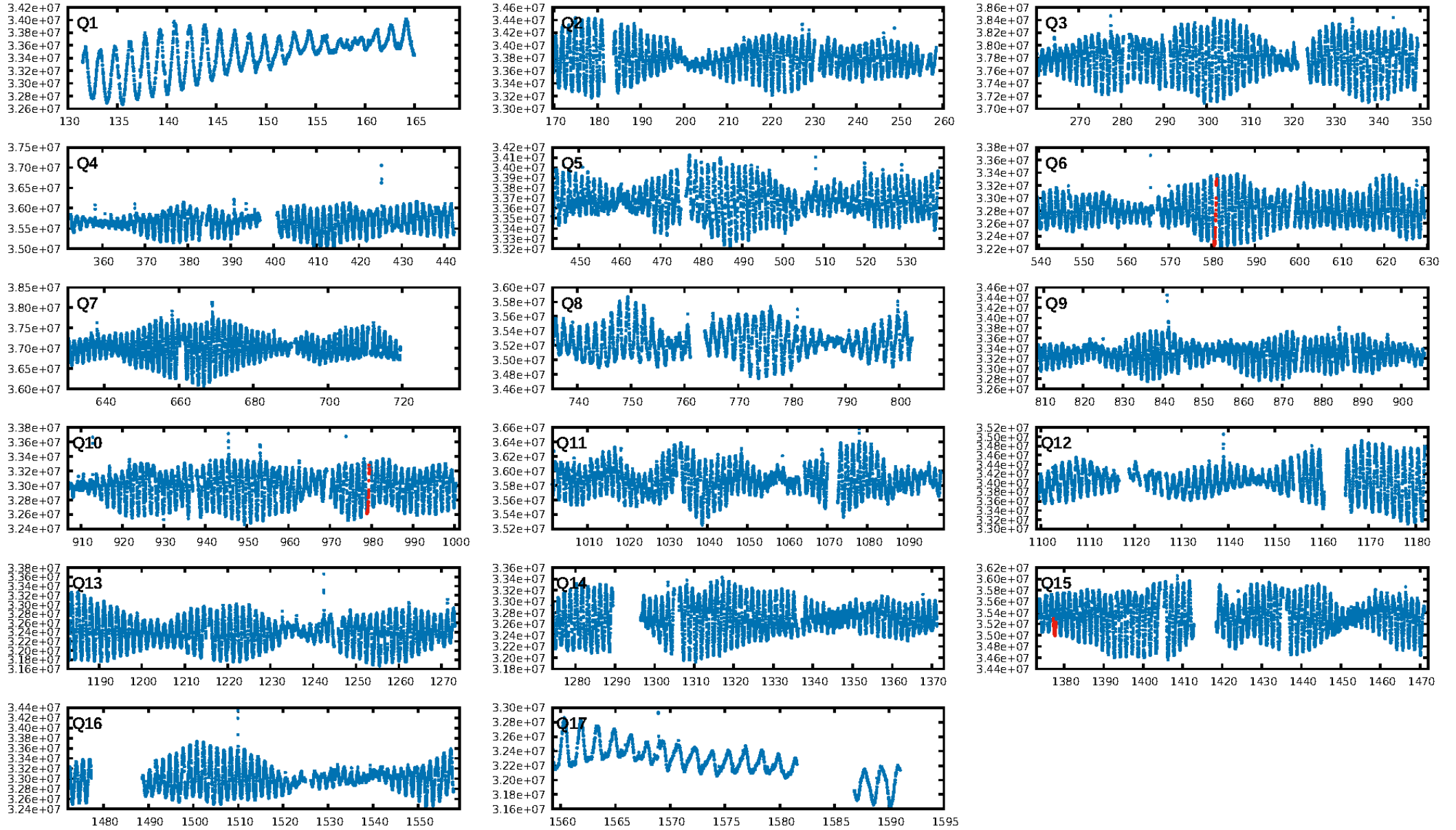
## DV Fit Results:

Period = 398.37414 [0.00536] d  
Epoch = 182.4771 [0.0119] BKJD  
Rp/R\* = 0.0362 [0.0109]  
a/R\* = 336.50 [391.43]  
b = 0.54 [1.53]  
Seff = 0.56 [0.17]  
Teq = 220 [17] K  
Rp = 3.07 [1.17] Re  
a = 0.9972 [0.1945] AU  
Ag = 72589.80 [54058.91] [1.34 $\sigma$ ]  
**Teffp = 5595 [979] K [5.49 $\sigma$ ]**

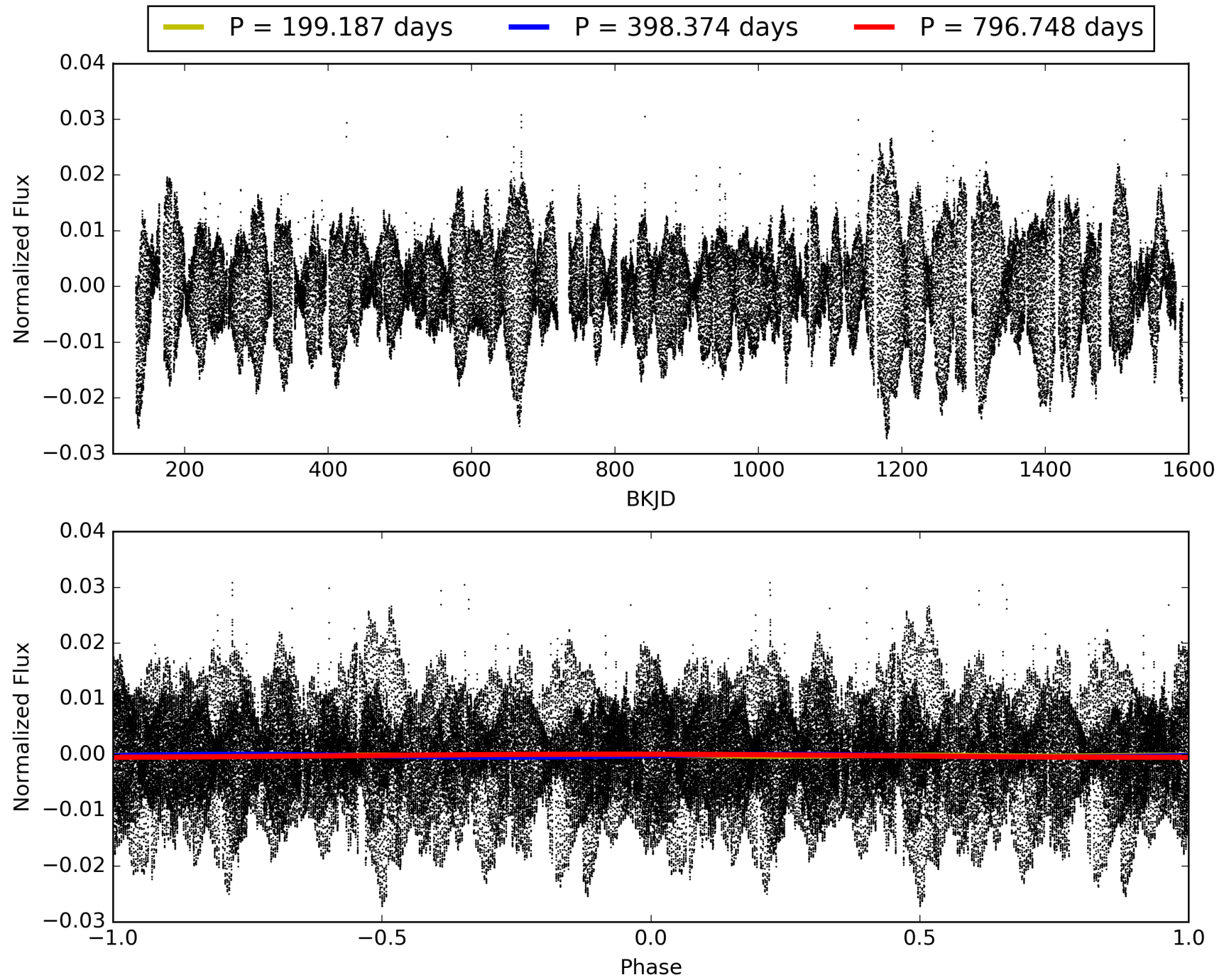
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [208.59 $\sigma$ ]  
LongPeriod-sig: 100.0% [12.86 $\sigma$ ]  
ModelChiSquare2-sig: 78.1%  
ModelChiSquareGof-sig: 95.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.8481**  
Centroid-sig: 47.9%  
Centroid-so: 0.506 arcsec [0.74 $\sigma$ ]  
**OotOffset-rm: 1.169 arcsec [6.26 $\sigma$ ]**  
OotOffset-st: 2/1/0/0 [3]  
KicOffset-rm: 0.147 arcsec [1.00 $\sigma$ ]  
KicOffset-st: 2/1/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 003938354-02, PDC Light Curves



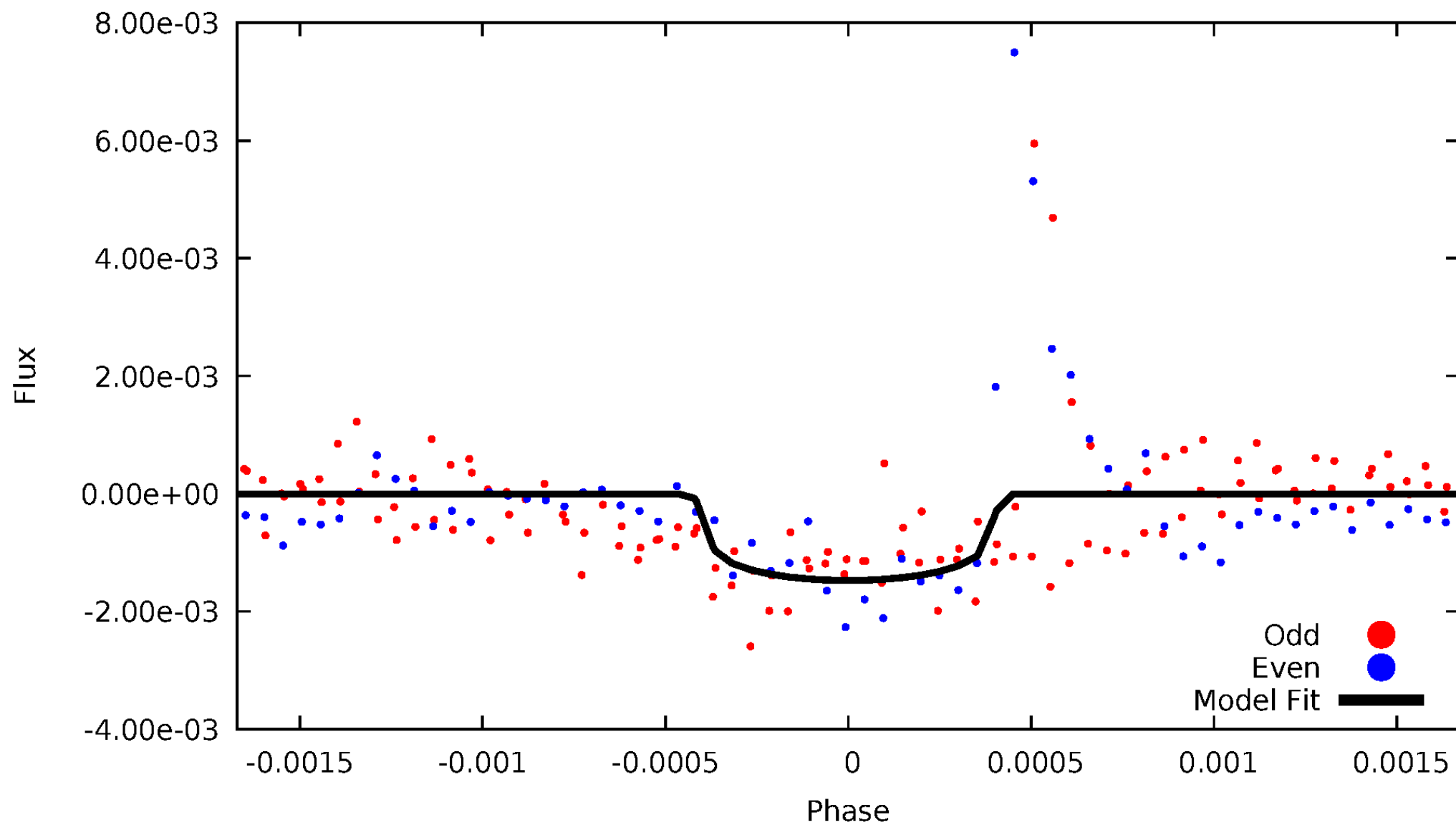
TCE 003938354-02





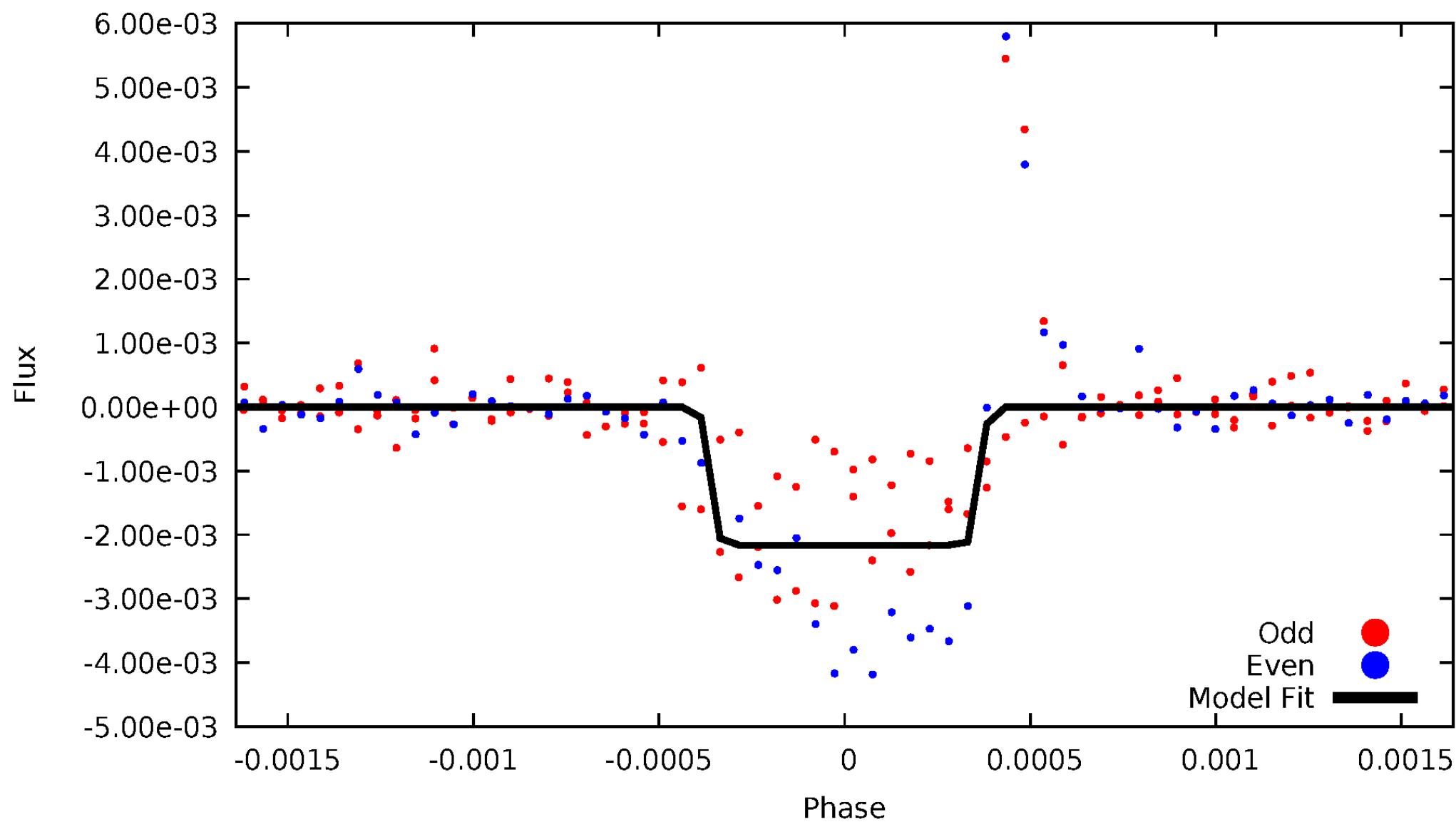
# DV Odd/Even

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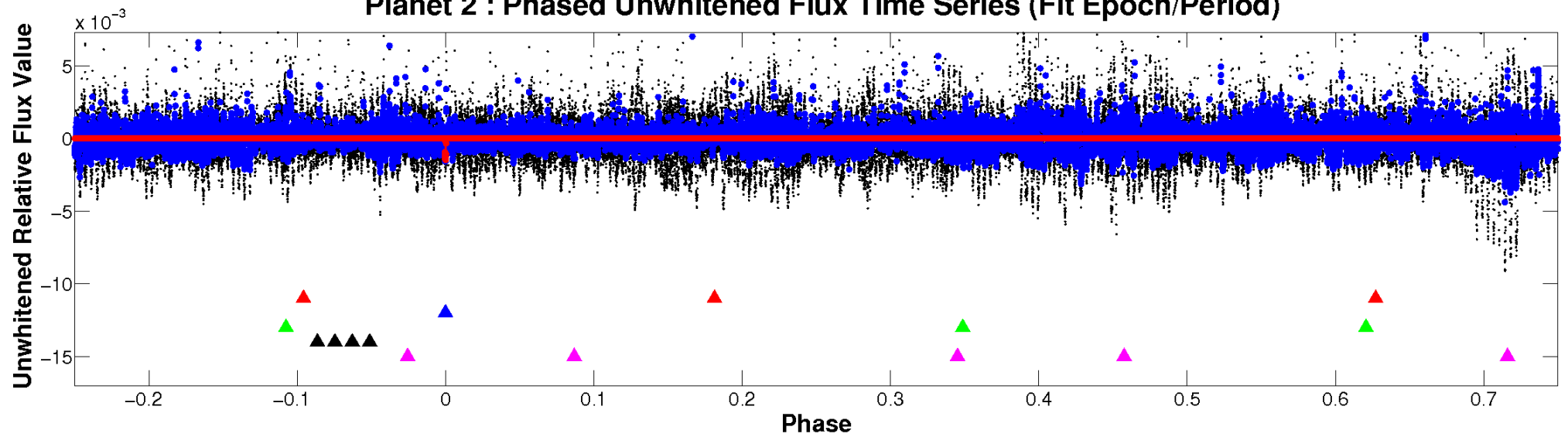
# ALT Odd/Even

TCE 003938354-02

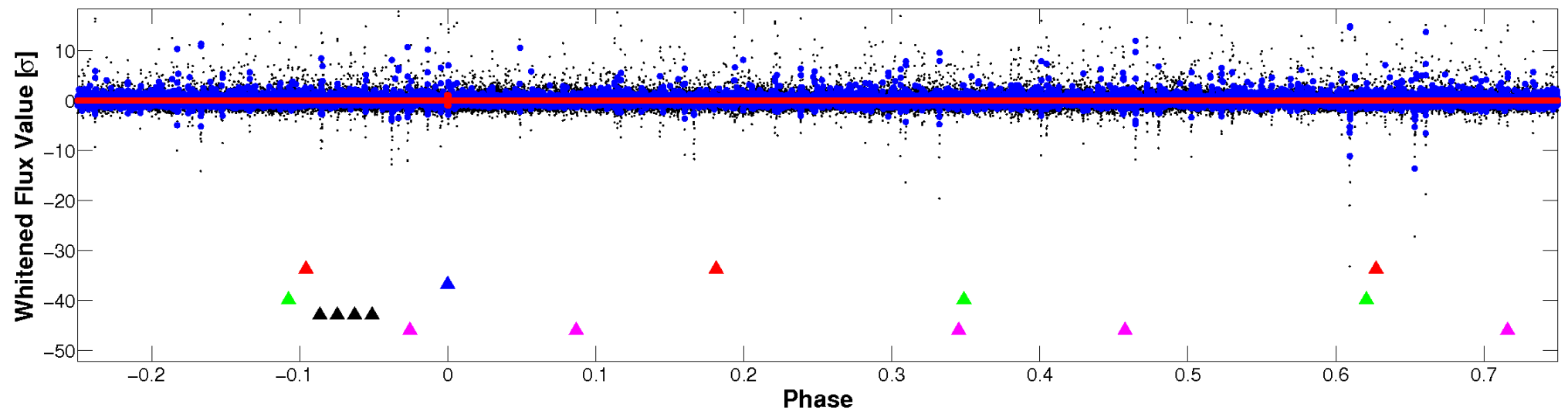


# Non-Whitened Vs. Whitened Light Curve

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

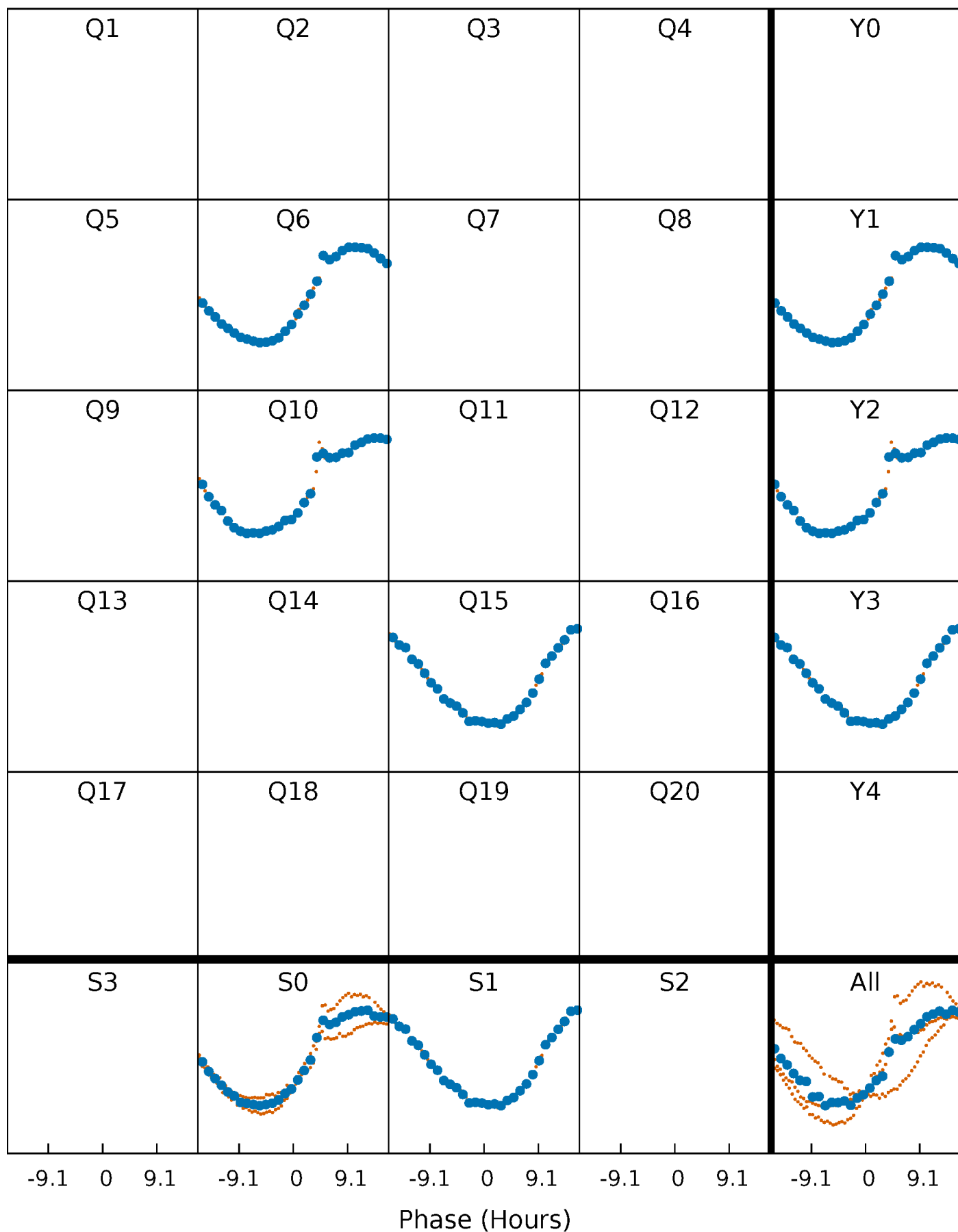


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



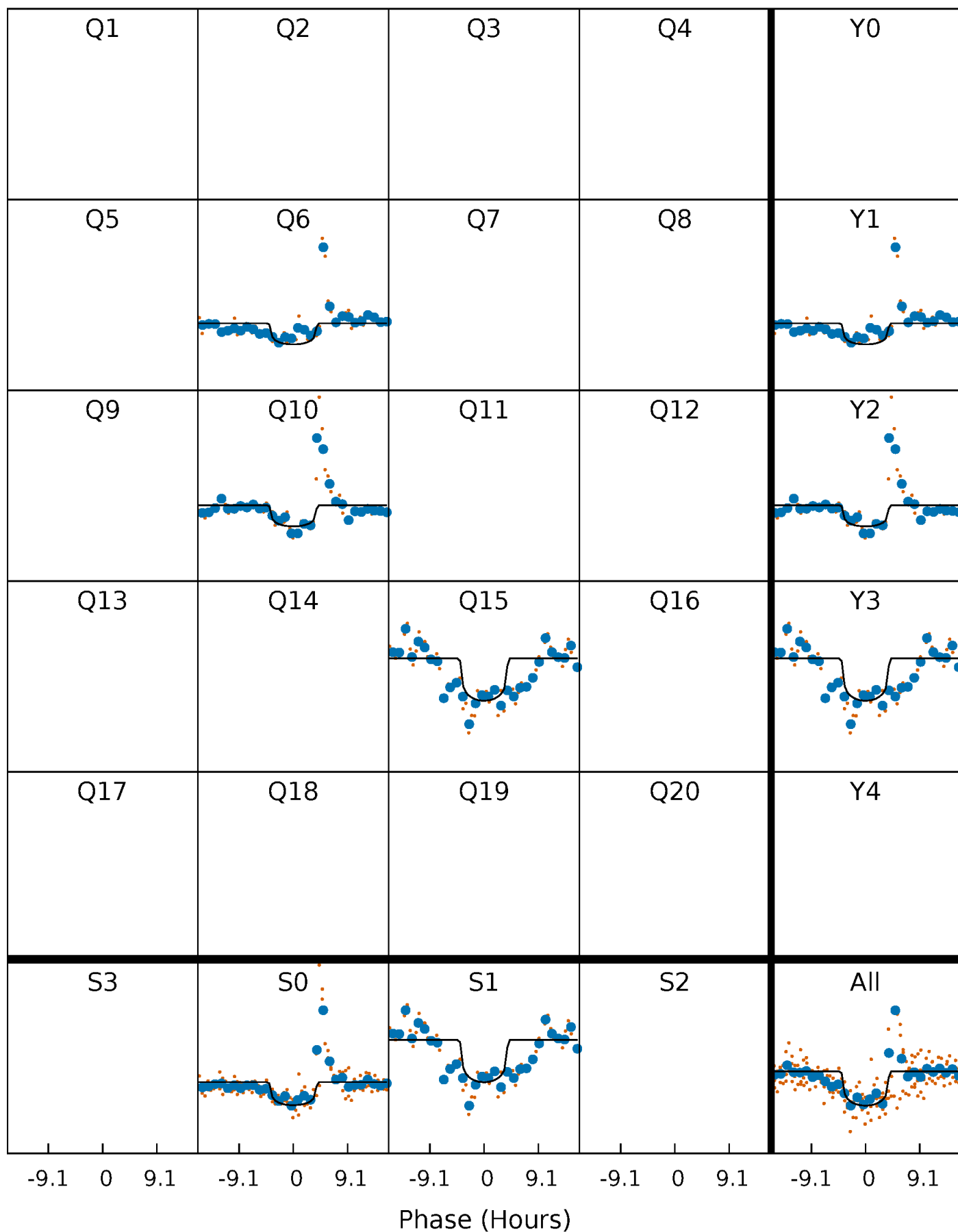
# PDC Quarter-Phased Transit Curves

TCE 003938354-02 P=398.374141 Days  $T_0=182.477111$  (BKJD)



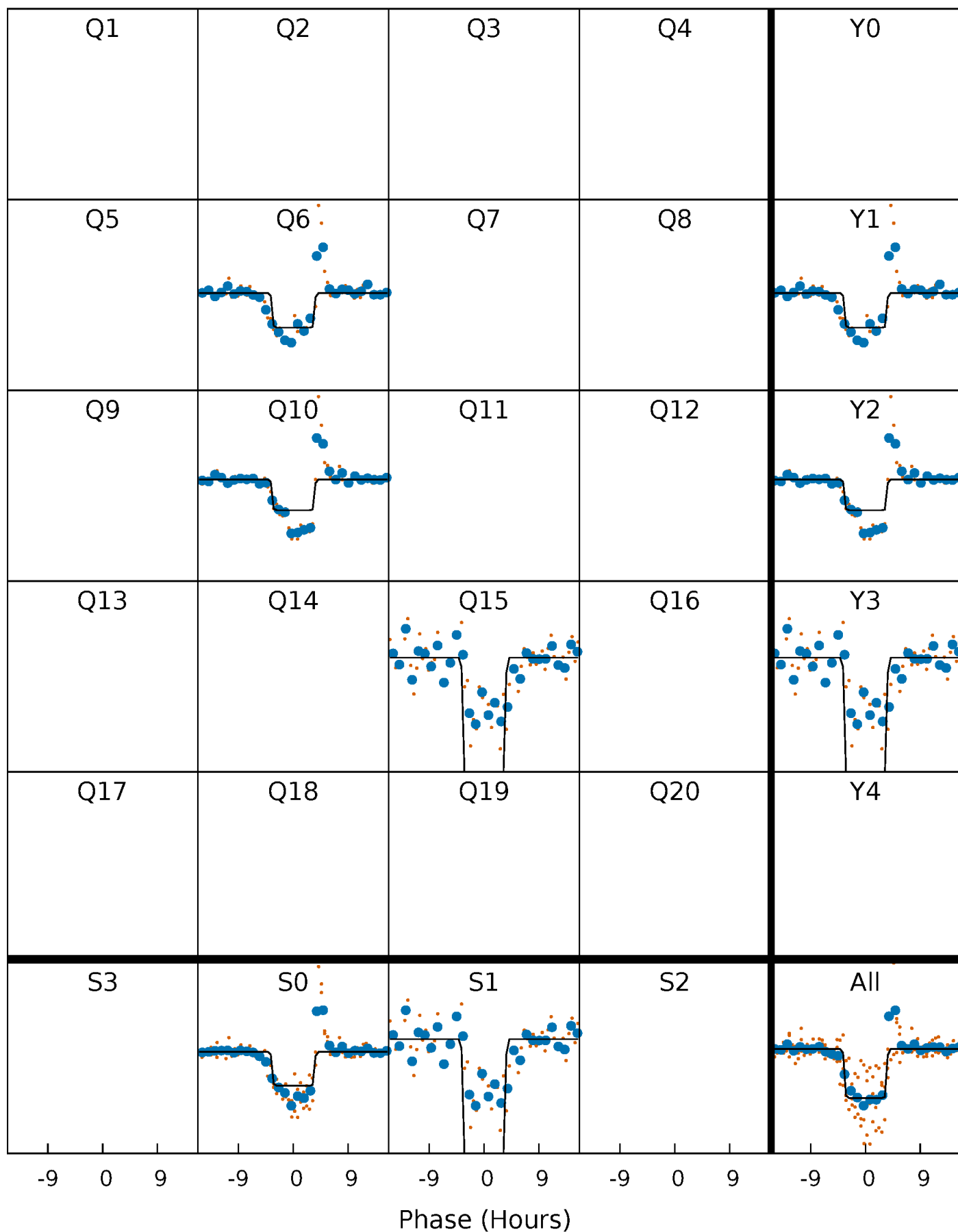
# DV Quarter-Phased Transit Curves

TCE 003938354-02 P=398.374141 Days  $T_0=182.477111$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

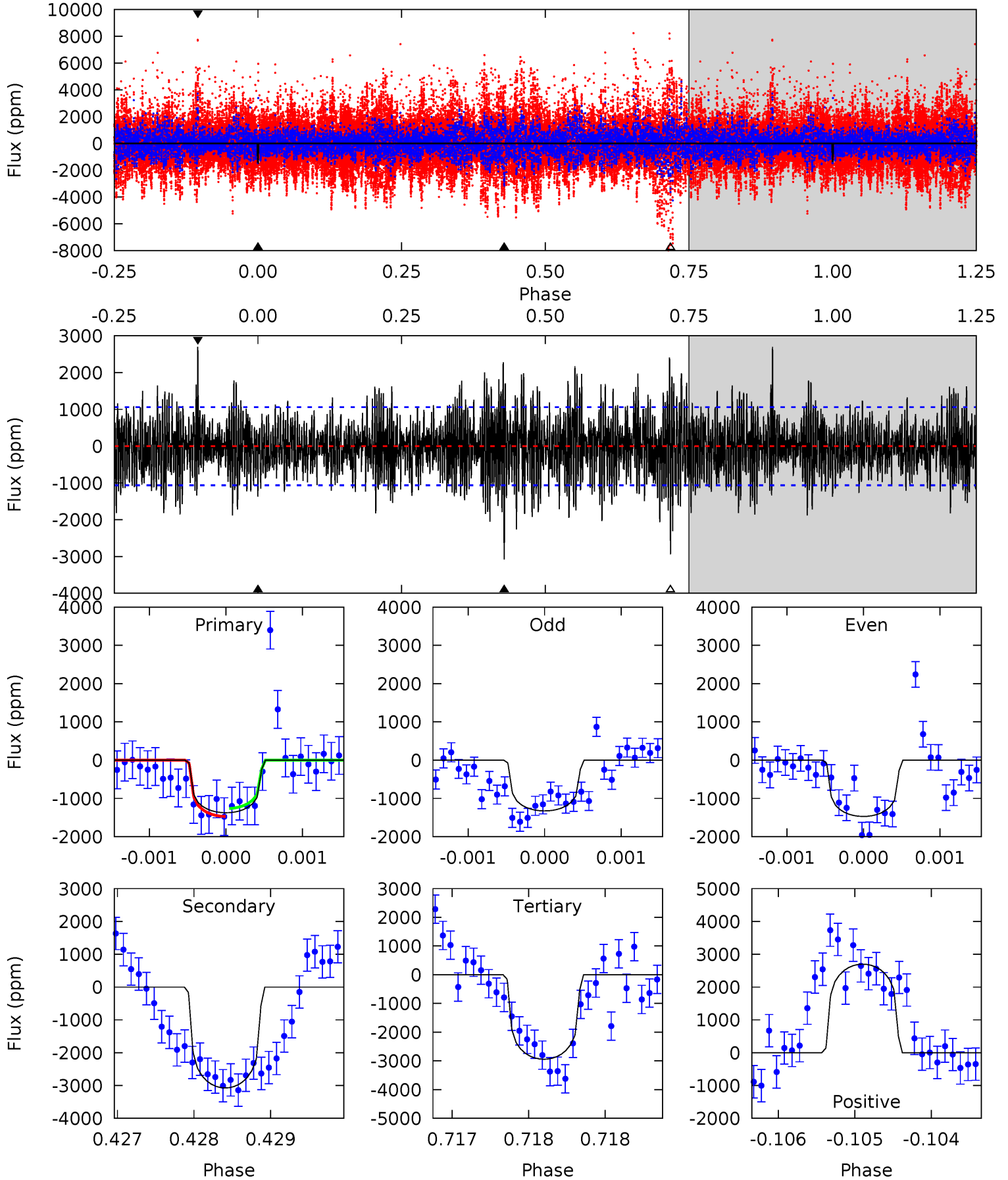
TCE 003938354-02 P=398.352252 Days  $T_0=182.528824$  (BKJD)



# DV Model-Shift Uniqueness Test

003938354-02,  $P = 398.374141$  Days,  $E = 182.477111$  Days

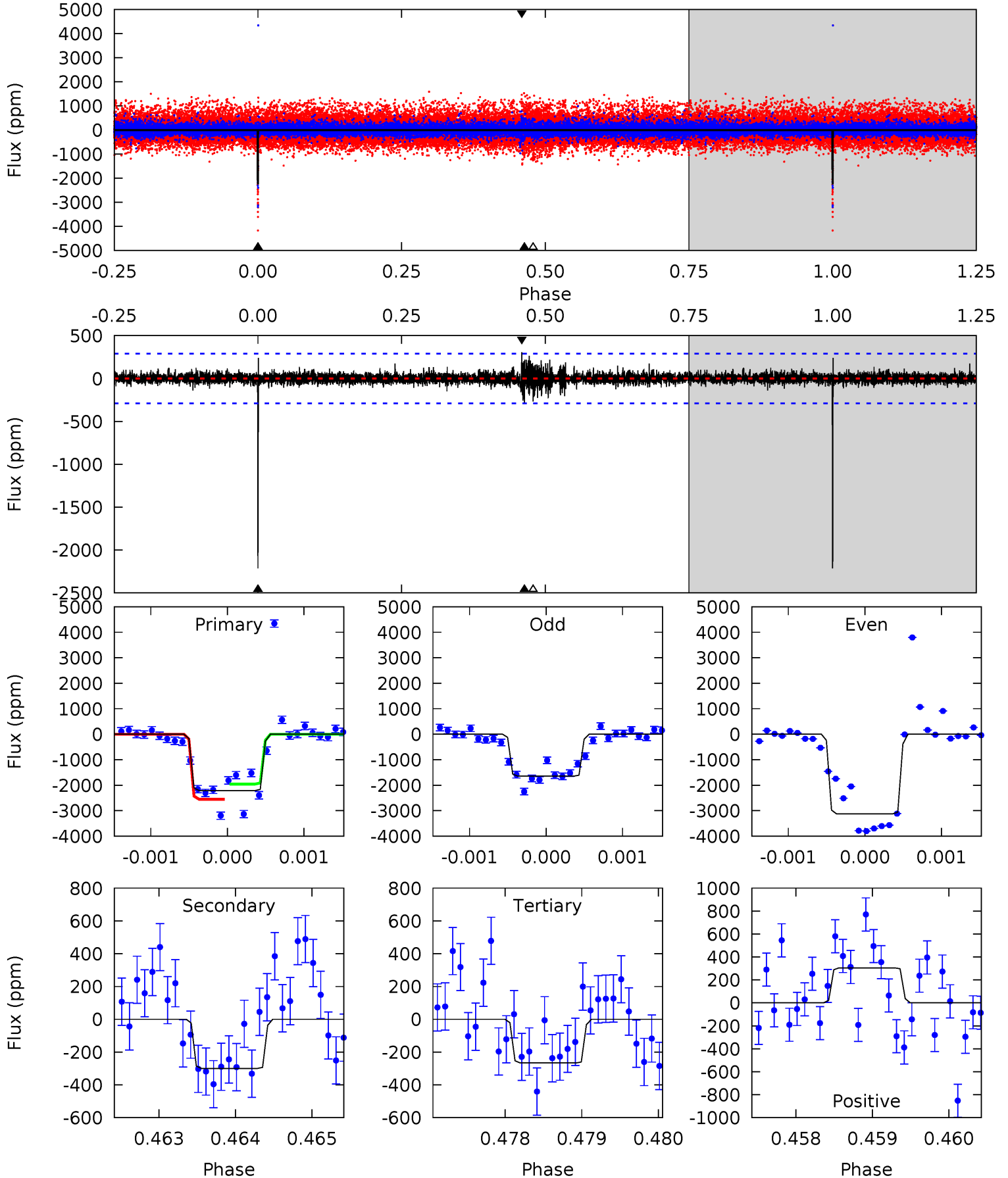
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.08	15.8	15.2	13.9	5.48	3.33	3.56	-8.08	-6.81	0.67	1.94	0.34	0.93	0.47	0.54



# Alt Model-Shift Uniqueness Test

003938354-02, P = 398.352252 Days, E = 182.528824 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
42.1	5.71	5.08	5.80	5.50	3.36	0.75	37.1	36.3	0.64	-0.08	14.5	0.90	0.12	5.64





### Stellar Parameters For KIC 003938354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5665^{+169}_{-152}$	$4.579^{+0.038}_{-0.152}$	$-0.420^{+0.300}_{-0.300}$	$0.776^{+0.182}_{-0.073}$	$0.834^{+0.088}_{-0.080}$	$2.510^{+0.516}_{-1.083}$
	+3%/-3%	+1%/-3%	+71%/-71%	+23%/-9%	+11%/-10%	+21%/-43%
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 003938354-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3075 \pm 194$	$3.24^{+1.02}_{-1.02}$	$314^{+17}_{-12}$	$6986^{+1878}_{-898}$	$157955^{+183914}_{-66434}$
Alt.	$-300 \pm 52$	$4.12^{+1.05}_{-1.00}$	$315^{+19}_{-13}$	$3823^{+399}_{-297}$	$9591^{+7587}_{-3807}$

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

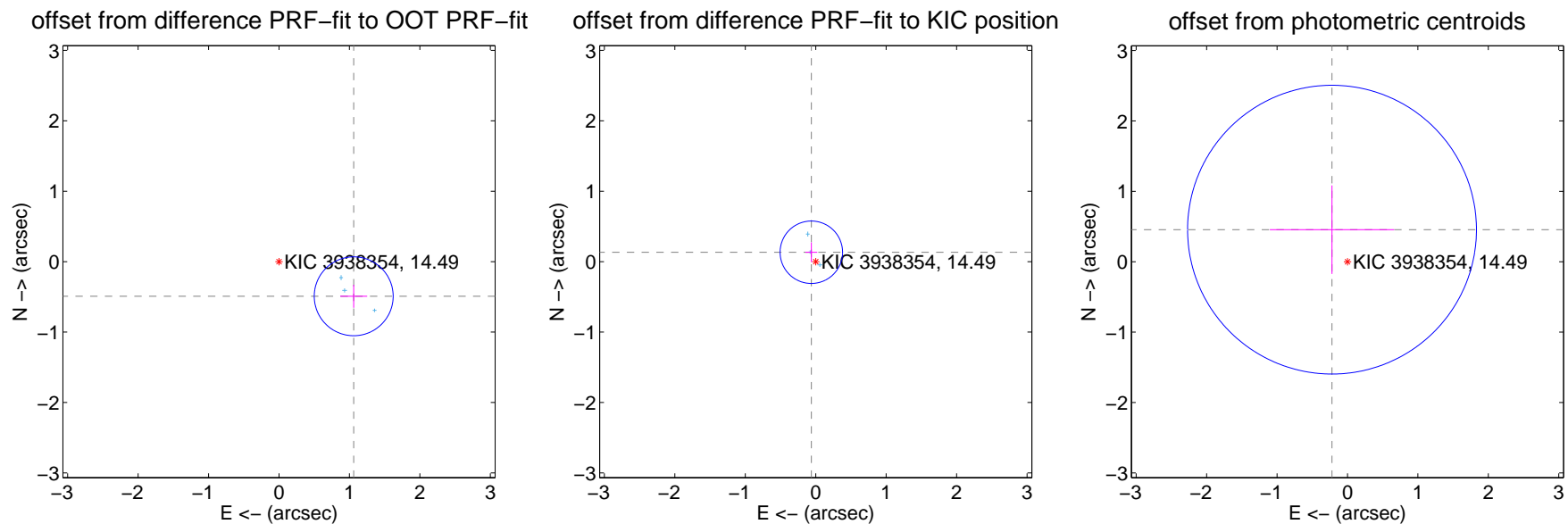
## DV Centroid Data

Supplemental centroid analysis for 003938354-02. Kepler magnitude: 14.49. Transit SNR 5.42

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.95 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.169 \pm 0.187$	<b>6.26</b>	$-1.061 \pm 0.191$	$-0.492 \pm 0.164$
PRF-fit source offset from KIC position	$0.147 \pm 0.148$	1.00	$0.062 \pm 0.085$	$0.133 \pm 0.140$
photometric centroid source offset	$0.51 \pm 0.68$	0.74	$0.22 \pm 0.88$	$0.46 \pm 0.63$



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.

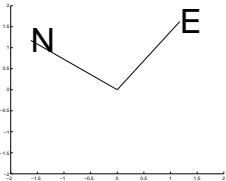
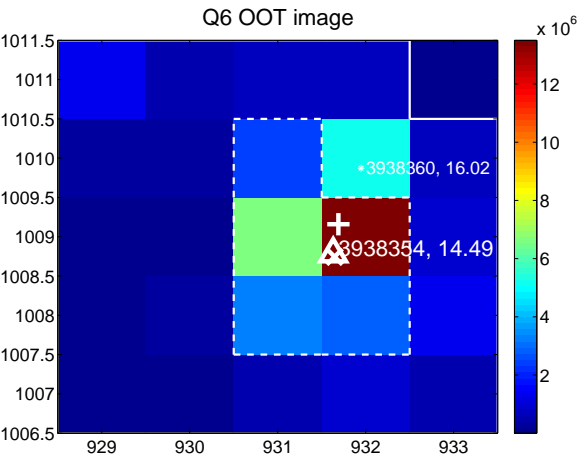
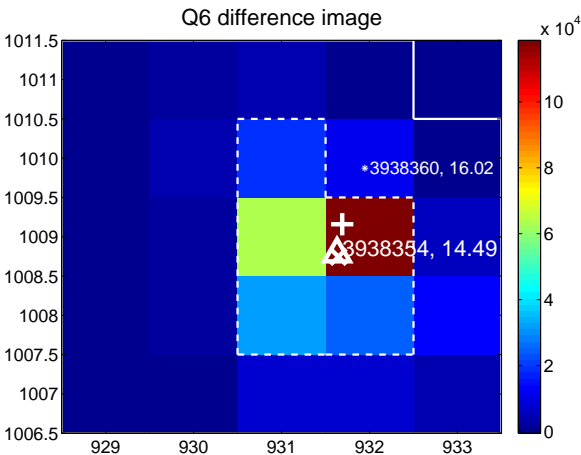


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

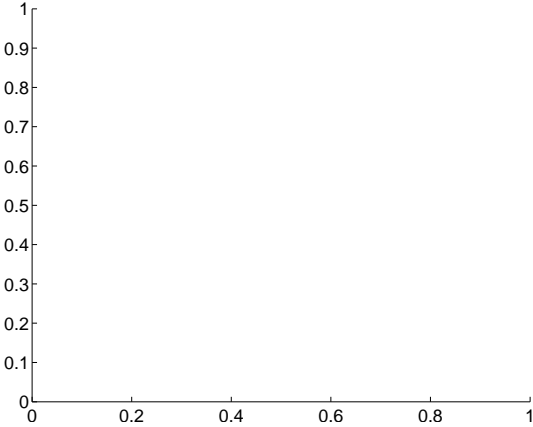
Q5 no difference image



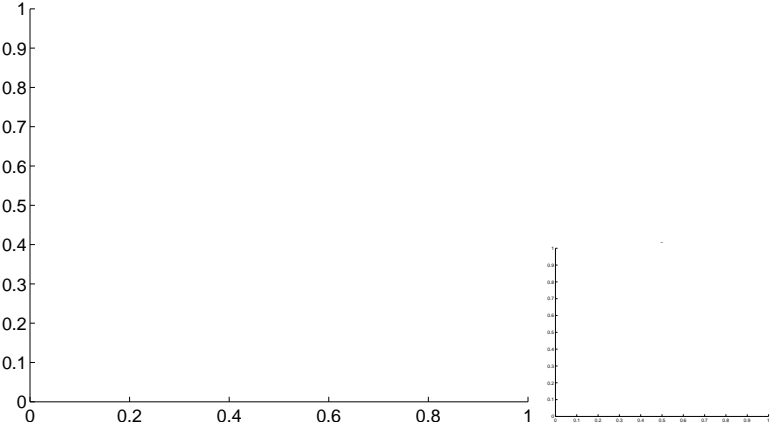
Q5 no OOT image



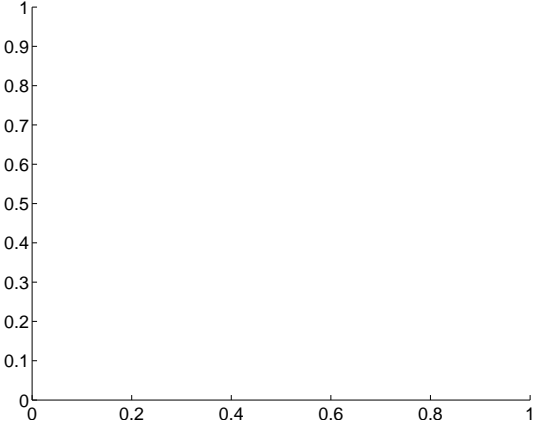
Q7 no difference image



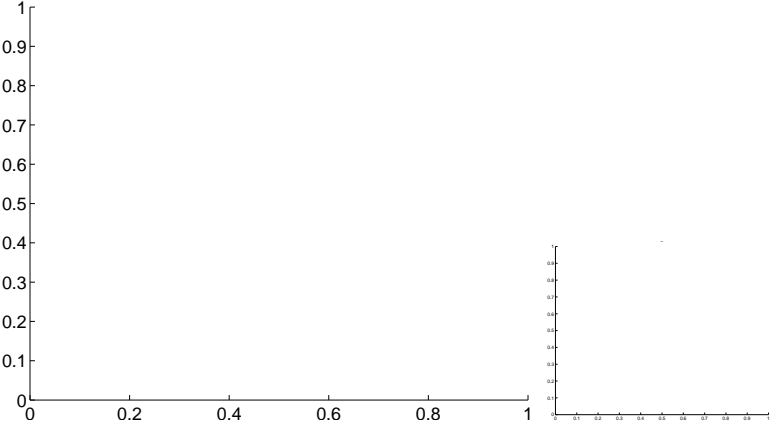
Q7 no OOT image



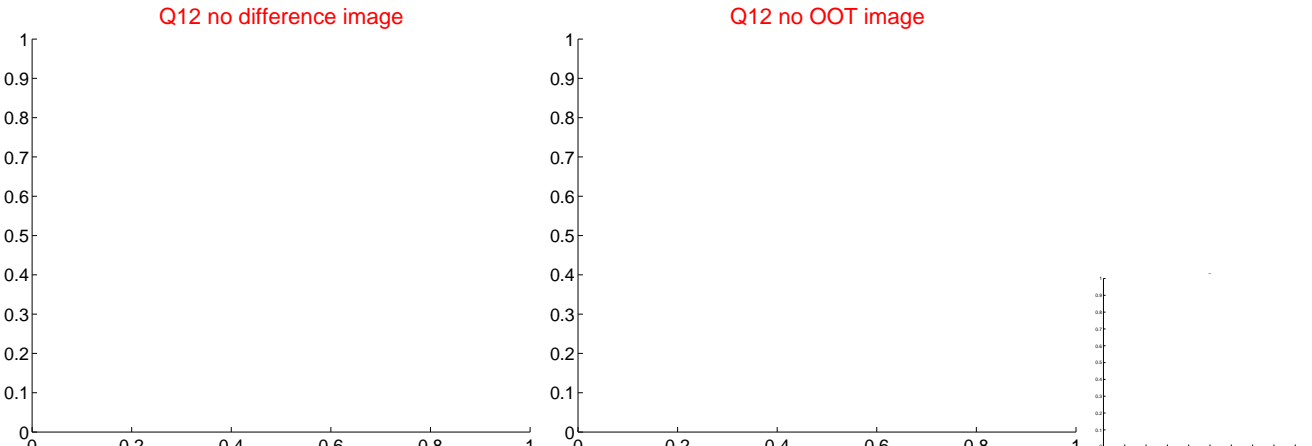
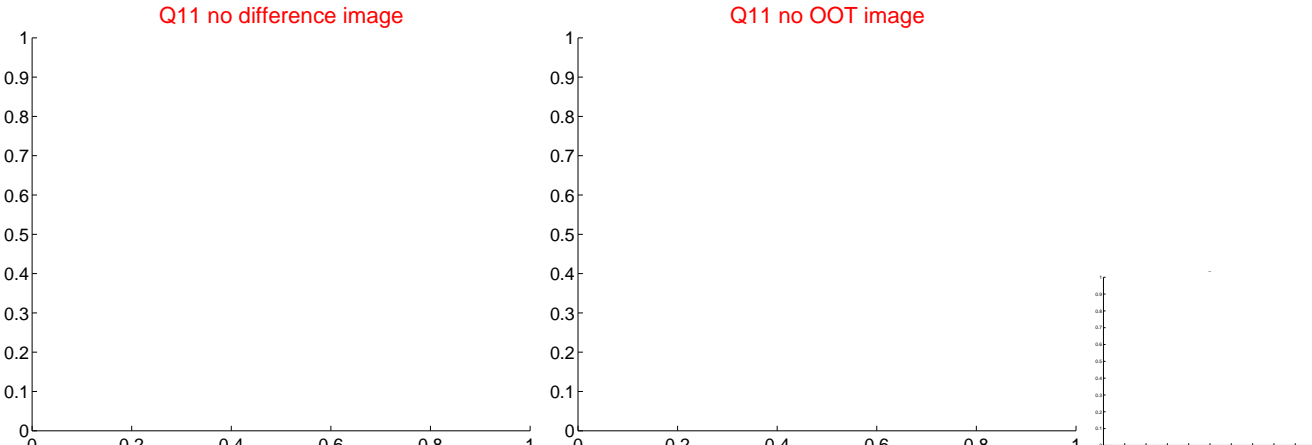
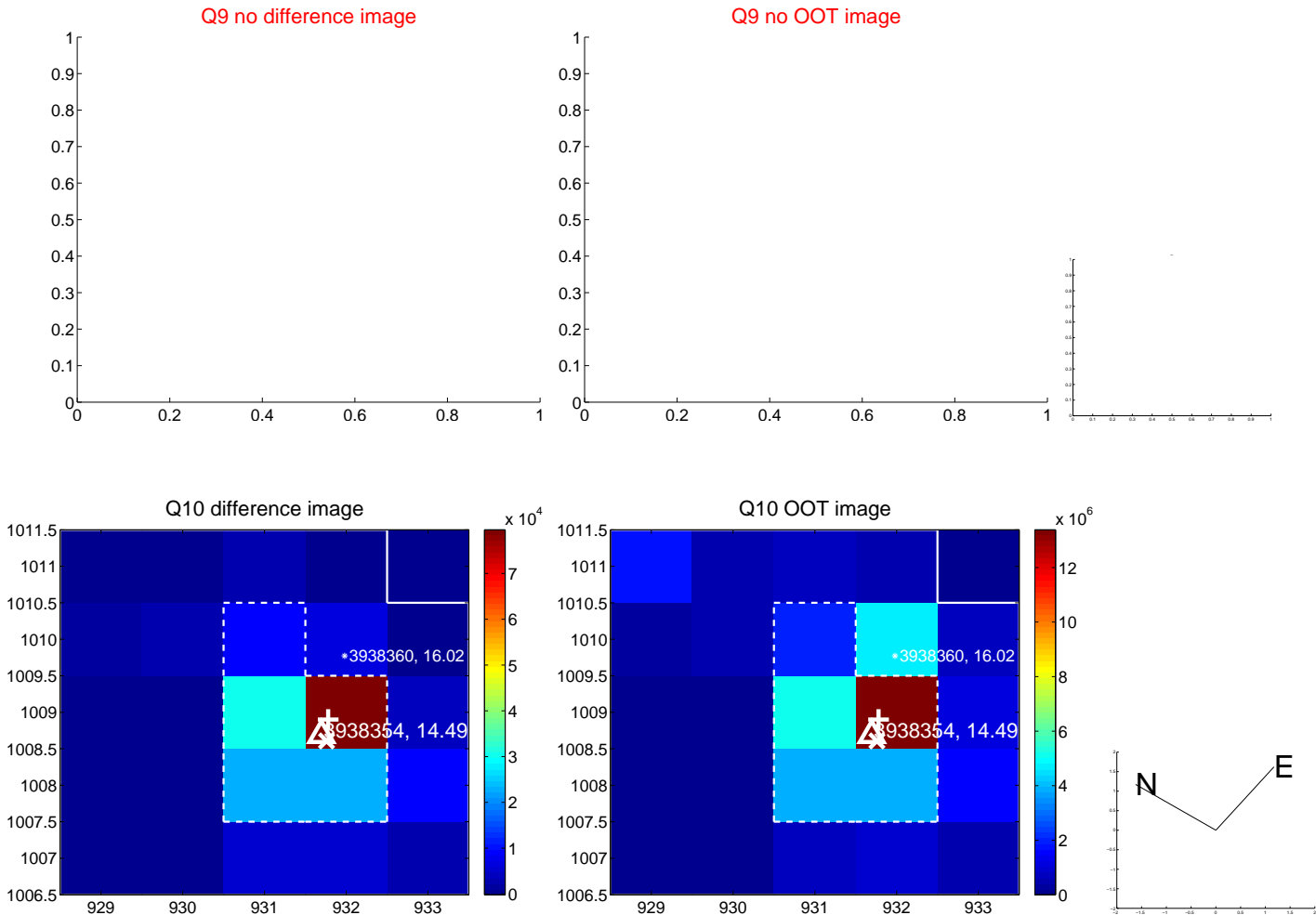
Q8 no difference image



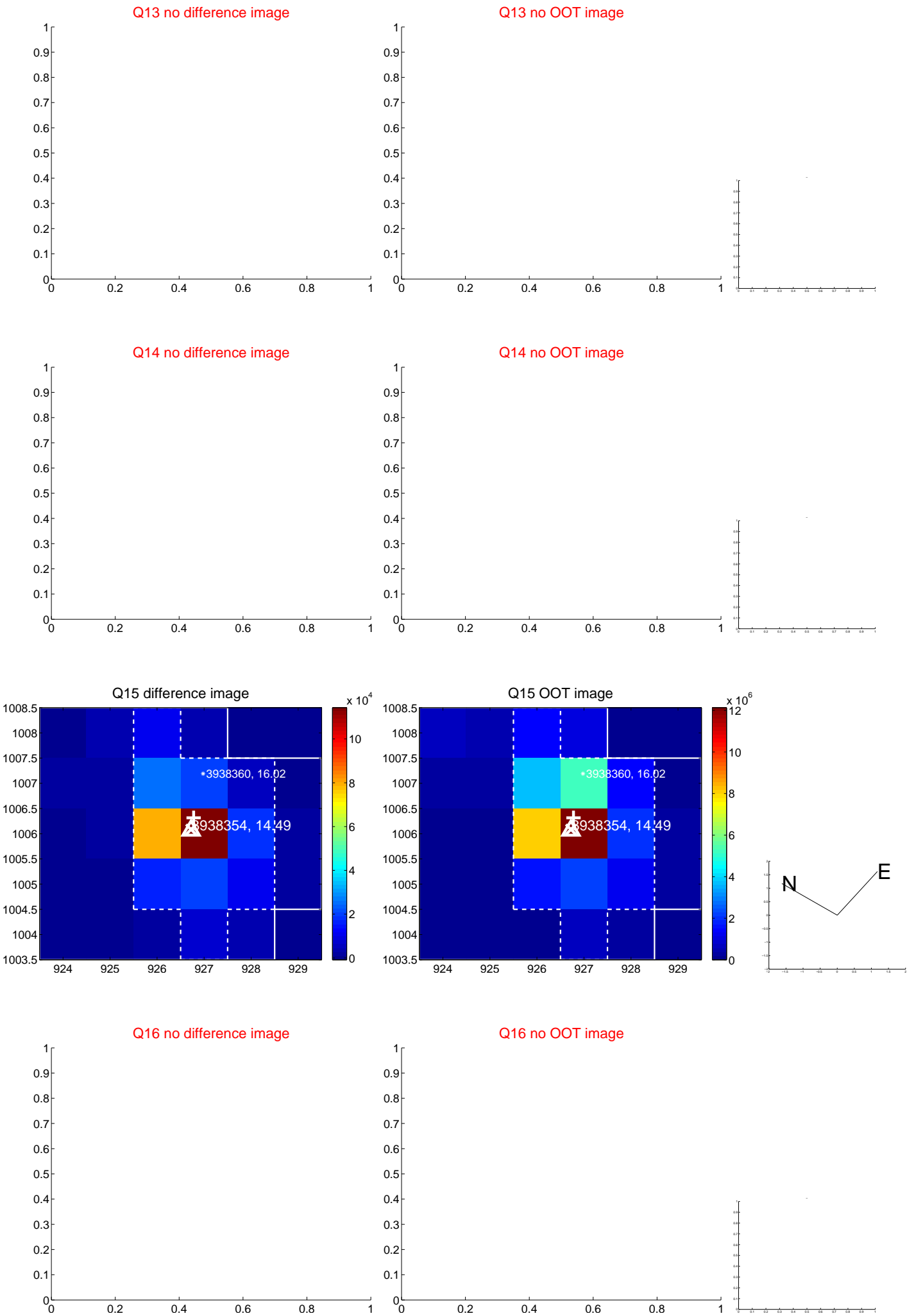
Q8 no OOT image



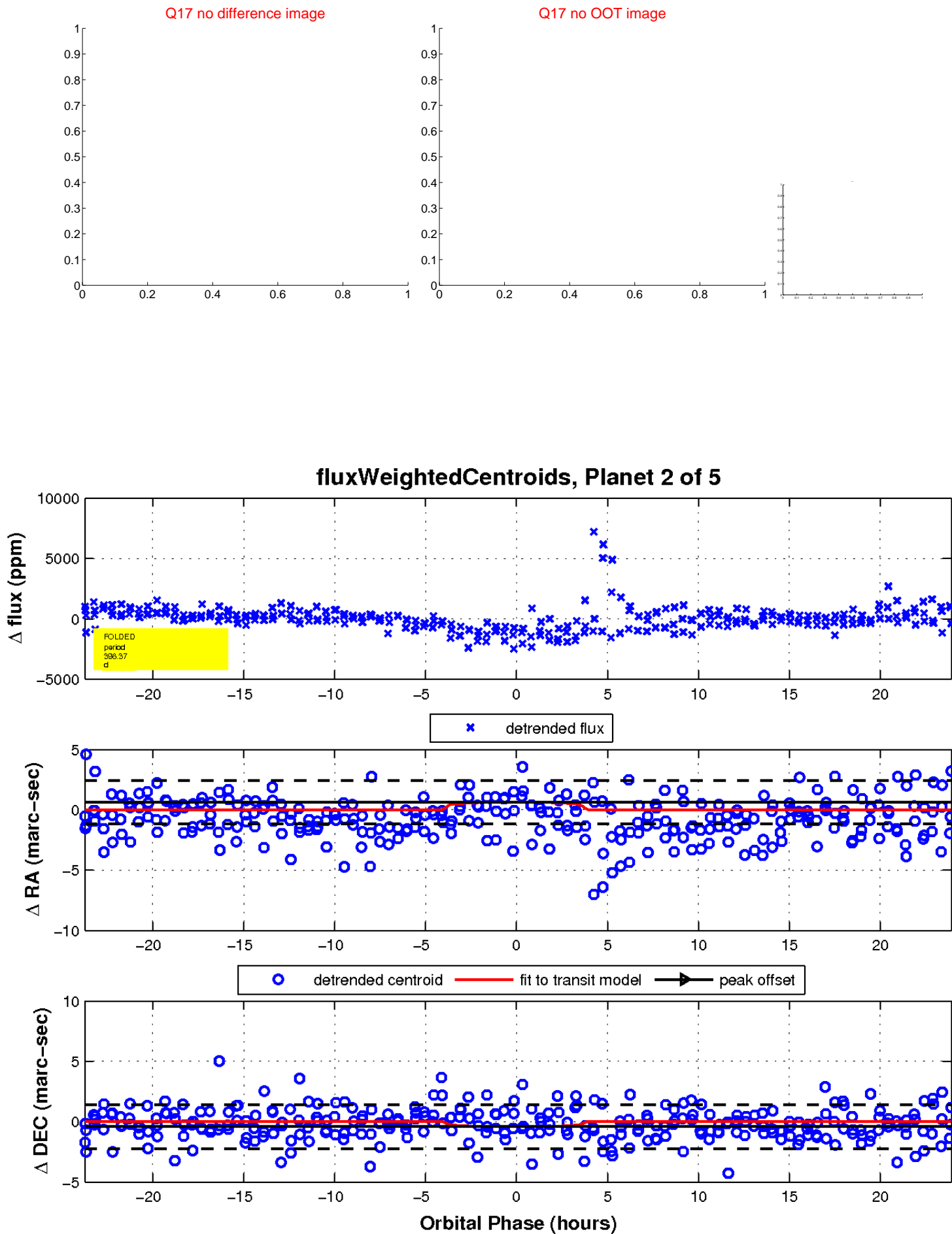
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

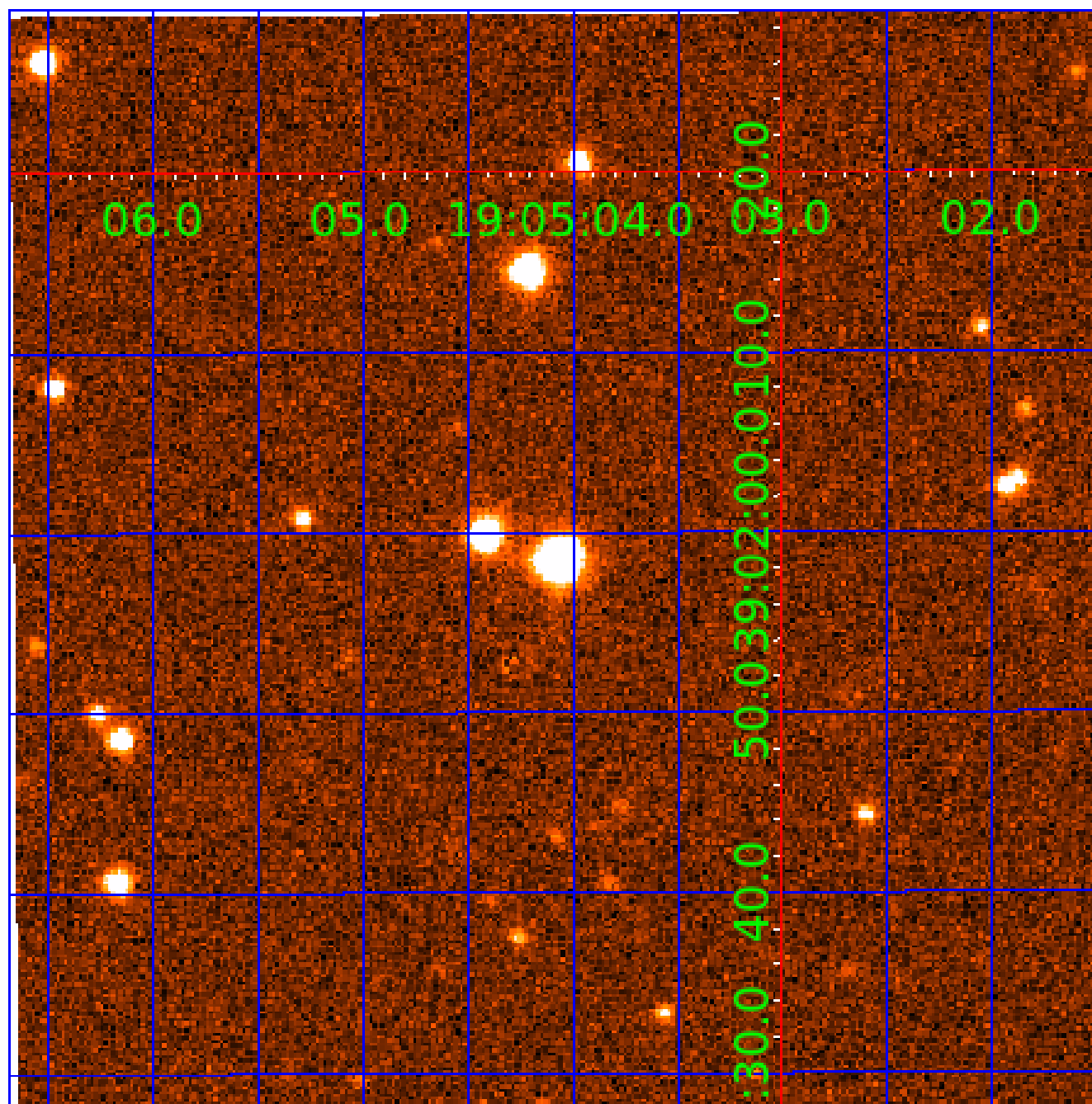


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003938354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003938354-01	OBS	No	508.771168	432.319580	2504.1	3.684	14.5	10.5	0.78	5665	3.96	0.40
003938354-02	OBS	No	398.374141	182.477111	1472.8	7.990	13.4	5.4	0.78	5665	3.07	0.56
003938354-03	OBS	No	688.453771	139.638434	1827.3	4.734	11.6	6.2	0.78	5665	3.29	0.27
003938354-04	OBS	No	403.054353	148.085342	1609.0	3.521	14.3	8.1	0.78	5665	3.09	0.55
003938354-05	OBS	No	250.665292	364.773704	486.6	15.000	12.1	-1.0	0.78	5665	1.70	1.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003938354-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
003938354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
003938354-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS

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

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

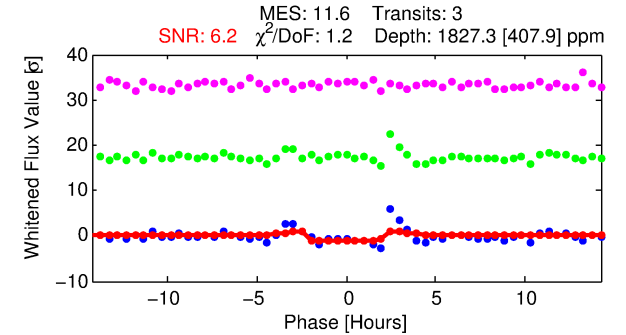
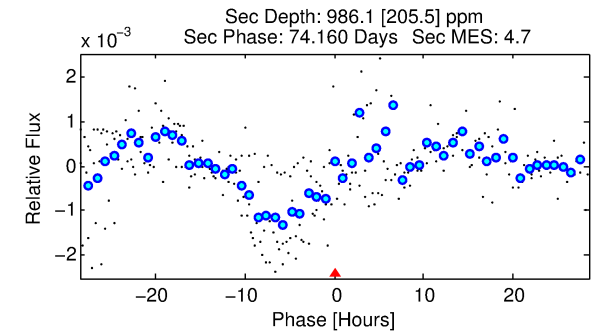
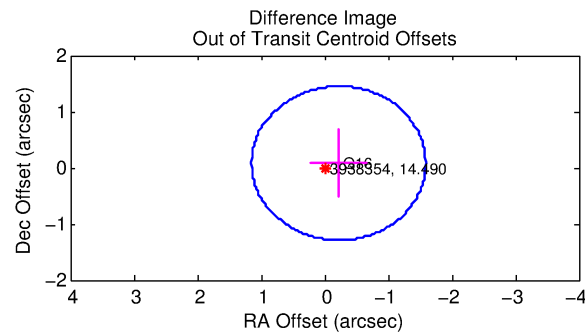
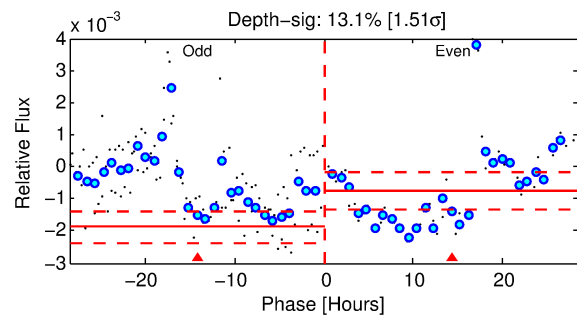
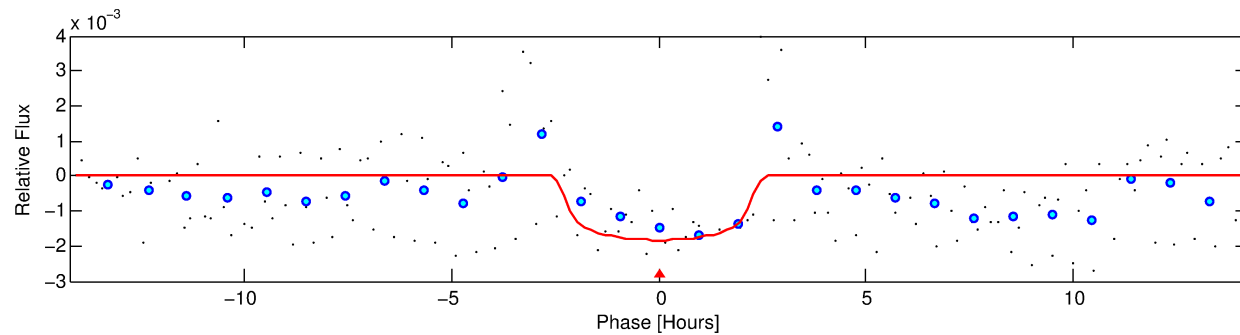
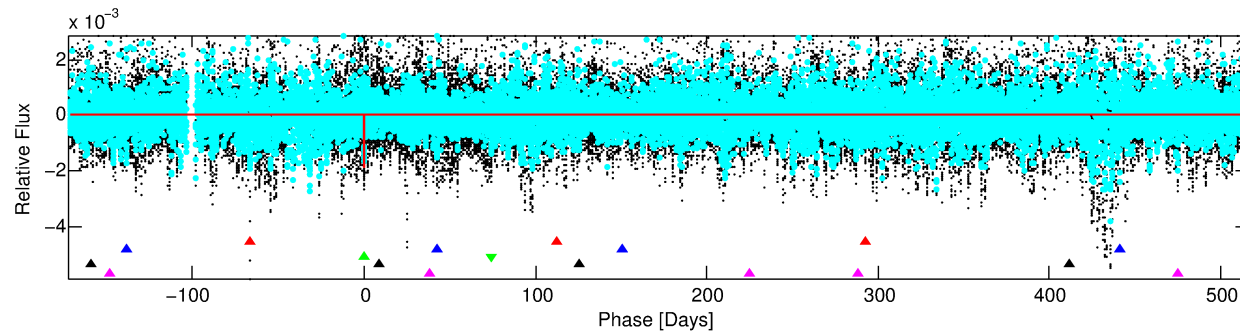
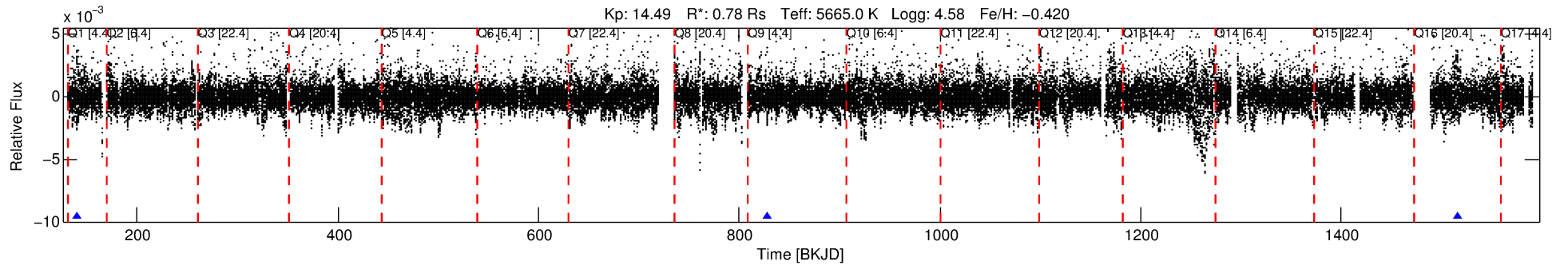
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003938354-03

No Significant Match Found

# DV One-Page Summary

KIC: 3938354 Candidate: 3 of 5 Period: 688.454 d



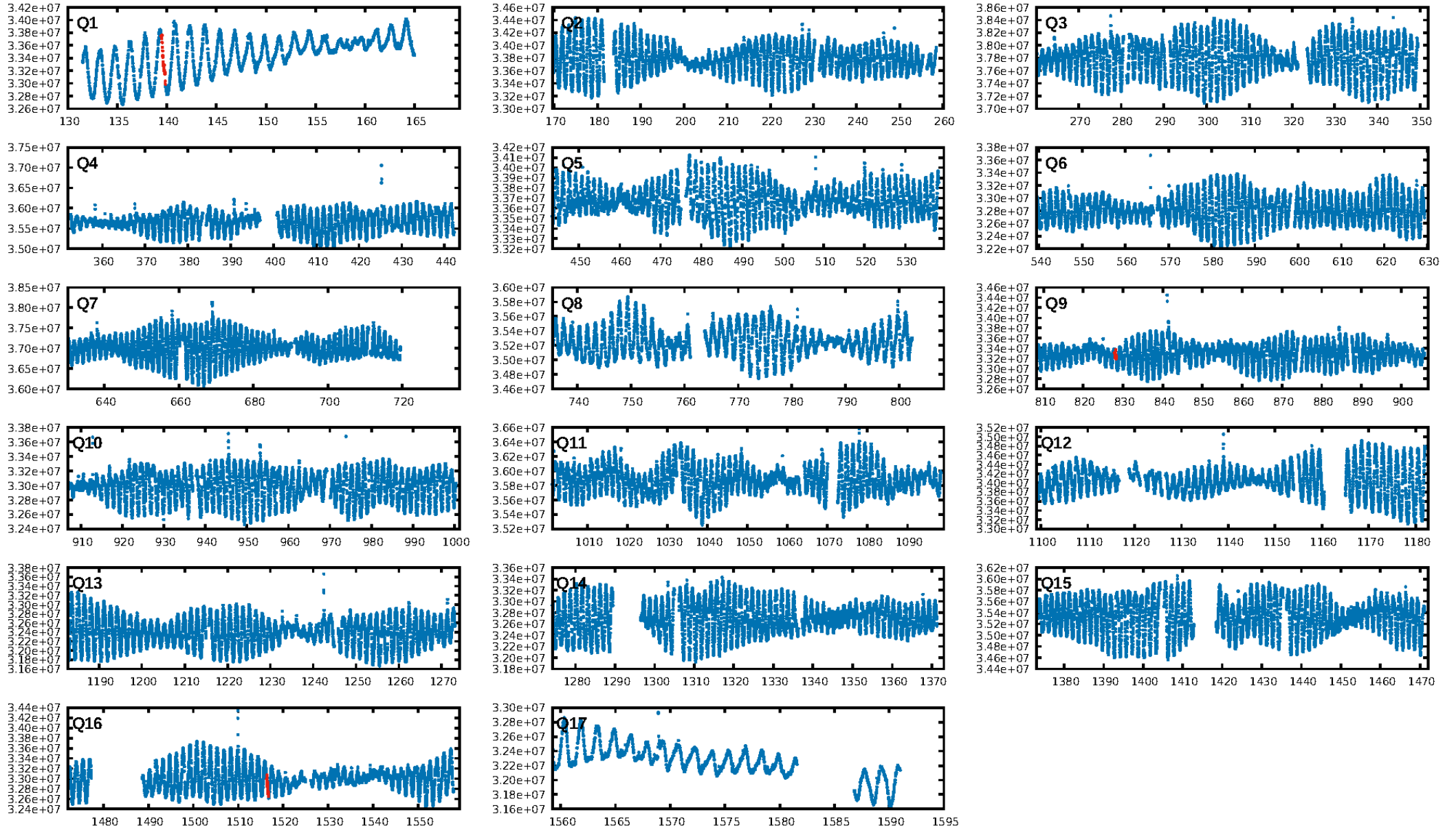
## DV Fit Results:

Period = 688.45377 [0.00503] d  
Epoch = 139.6384 [0.0068] BKJD  
Rp/R\* = 0.0389 [0.1481]  
a/R\* = 1154.15 [19699.64]  
b = 0.00 [9523.67]  
Seff = 0.27 [0.08]  
Teq = 184 [14] K  
Rp = 3.29 [12.56] Re  
a = 1.4361 [0.2802] AU  
Ag = 103303.56 [787958.58] [0.13 $\sigma$ ]  
Teffp = 5092 [9705] K [0.51 $\sigma$ ]

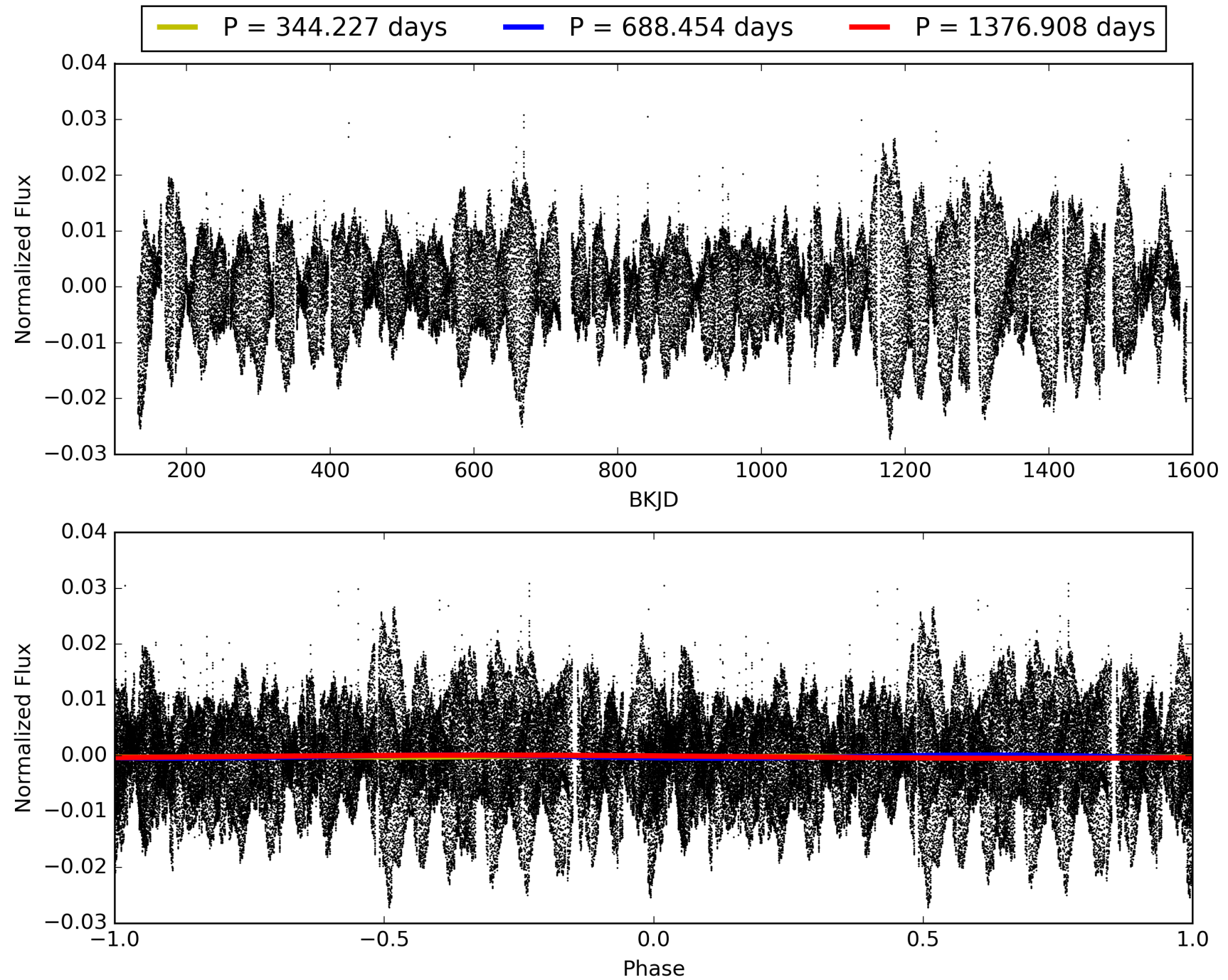
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [718.91 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 39.8%  
ModelChiSquareGof-sig: 95.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.5519  
Centroid-sig: 87.1%  
Centroid-so: 1.025 arcsec [1.13 $\sigma$ ]  
OotOffset-rm: 0.233 arcsec [0.51 $\sigma$ ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-rm: 0.972 arcsec [2.02 $\sigma$ ]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 003938354-03, PDC Light Curves

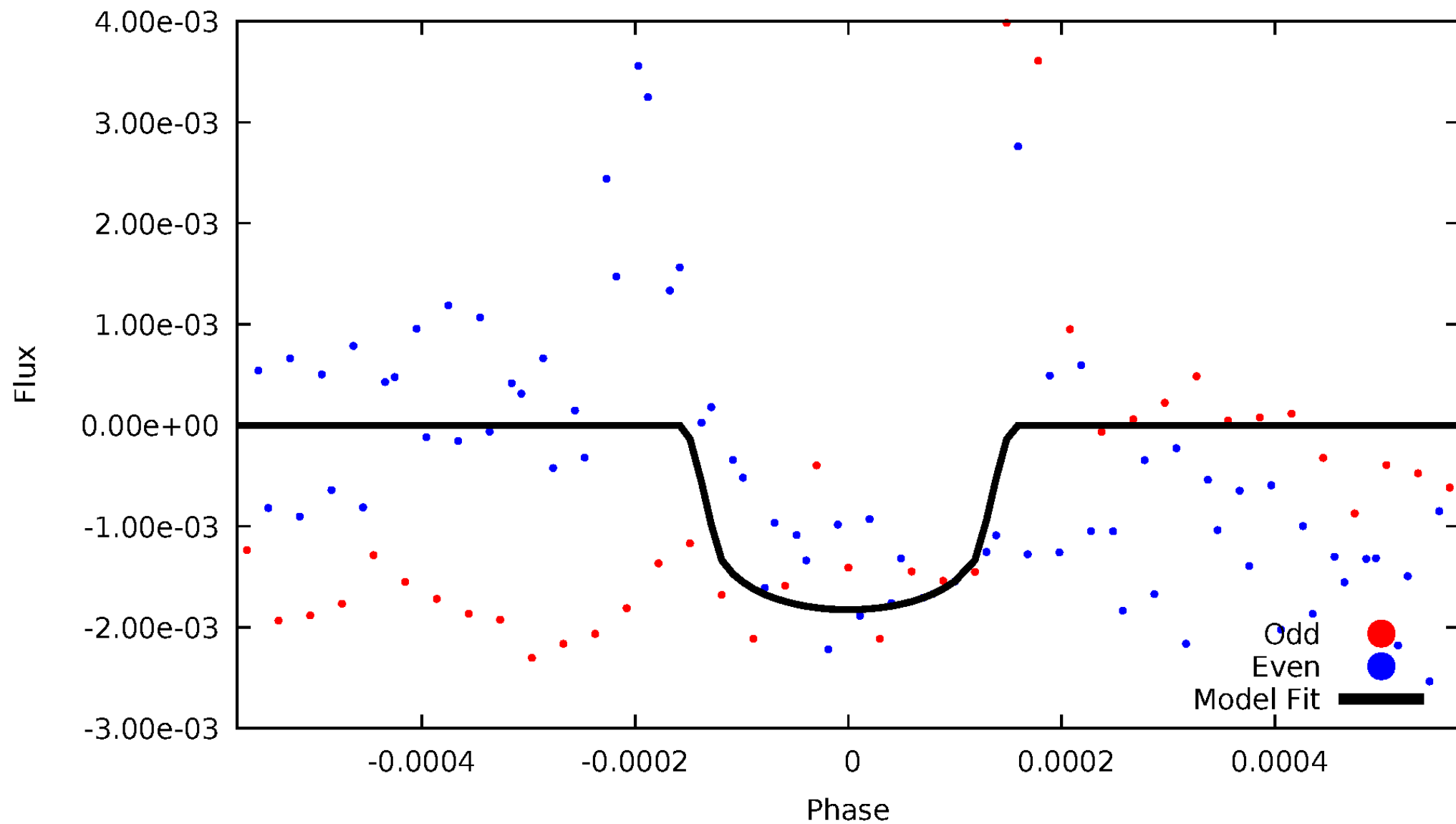


TCE 003938354-03



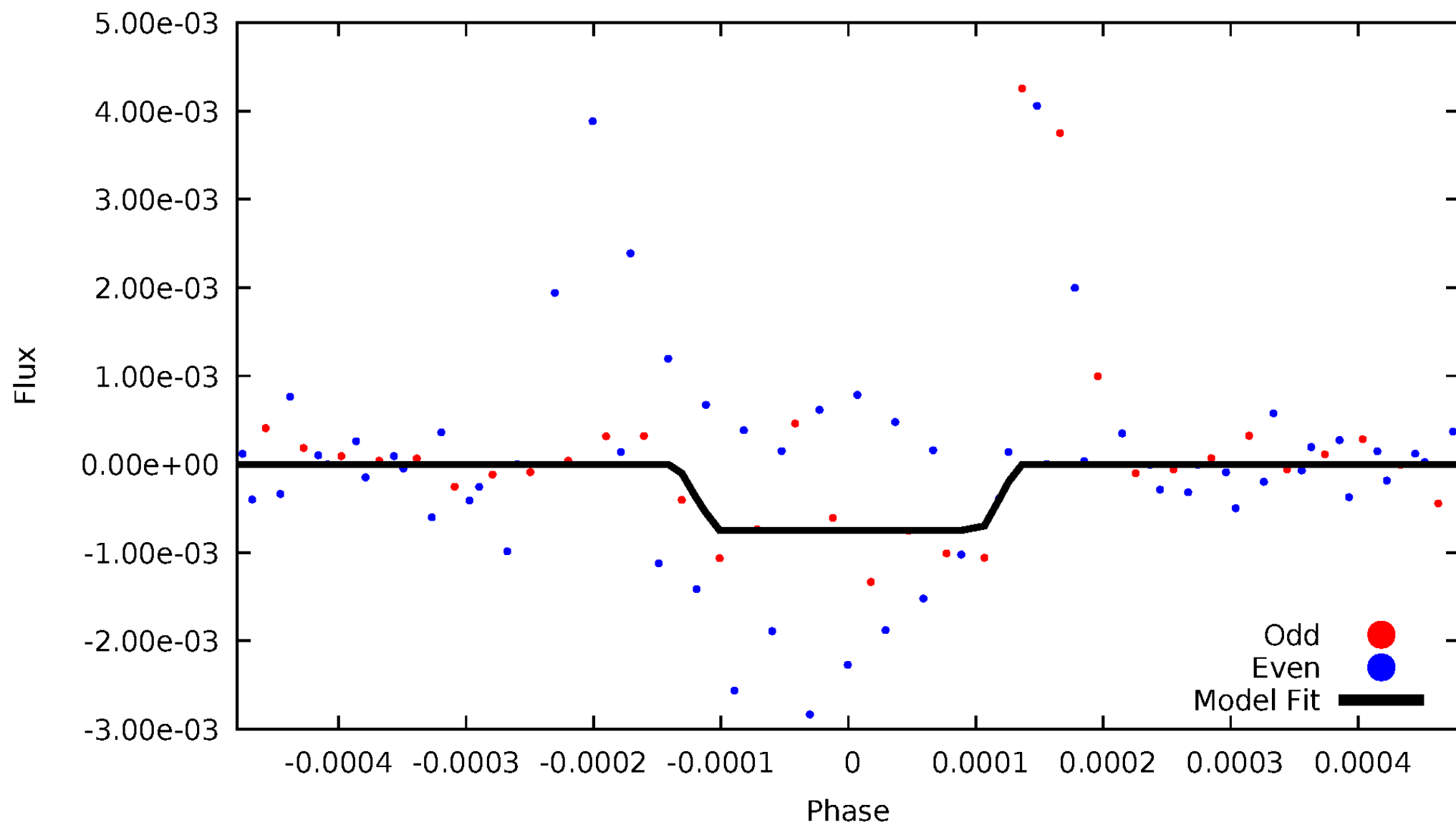
# DV Odd/Even

TCE 003938354-03



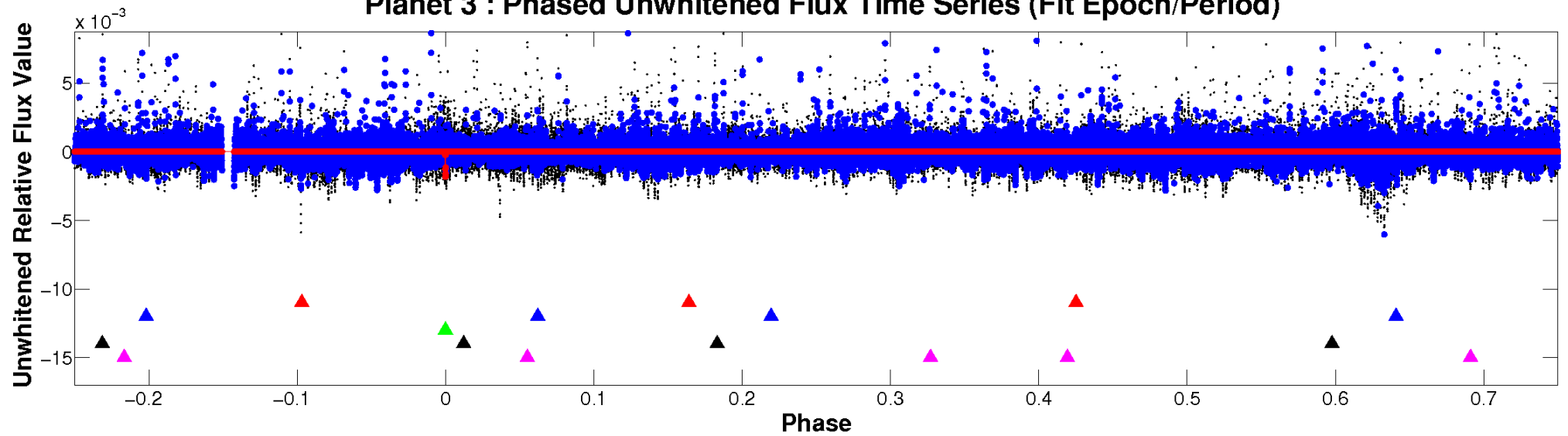
# ALT Odd/Even

TCE 003938354-03

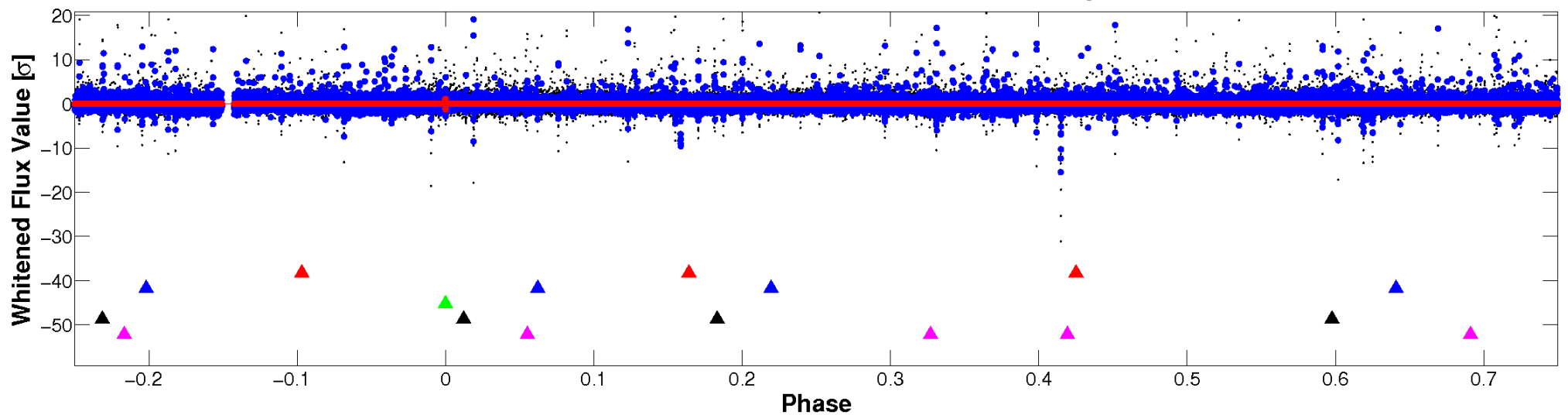


# Non-Whitened Vs. Whitened Light Curve

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

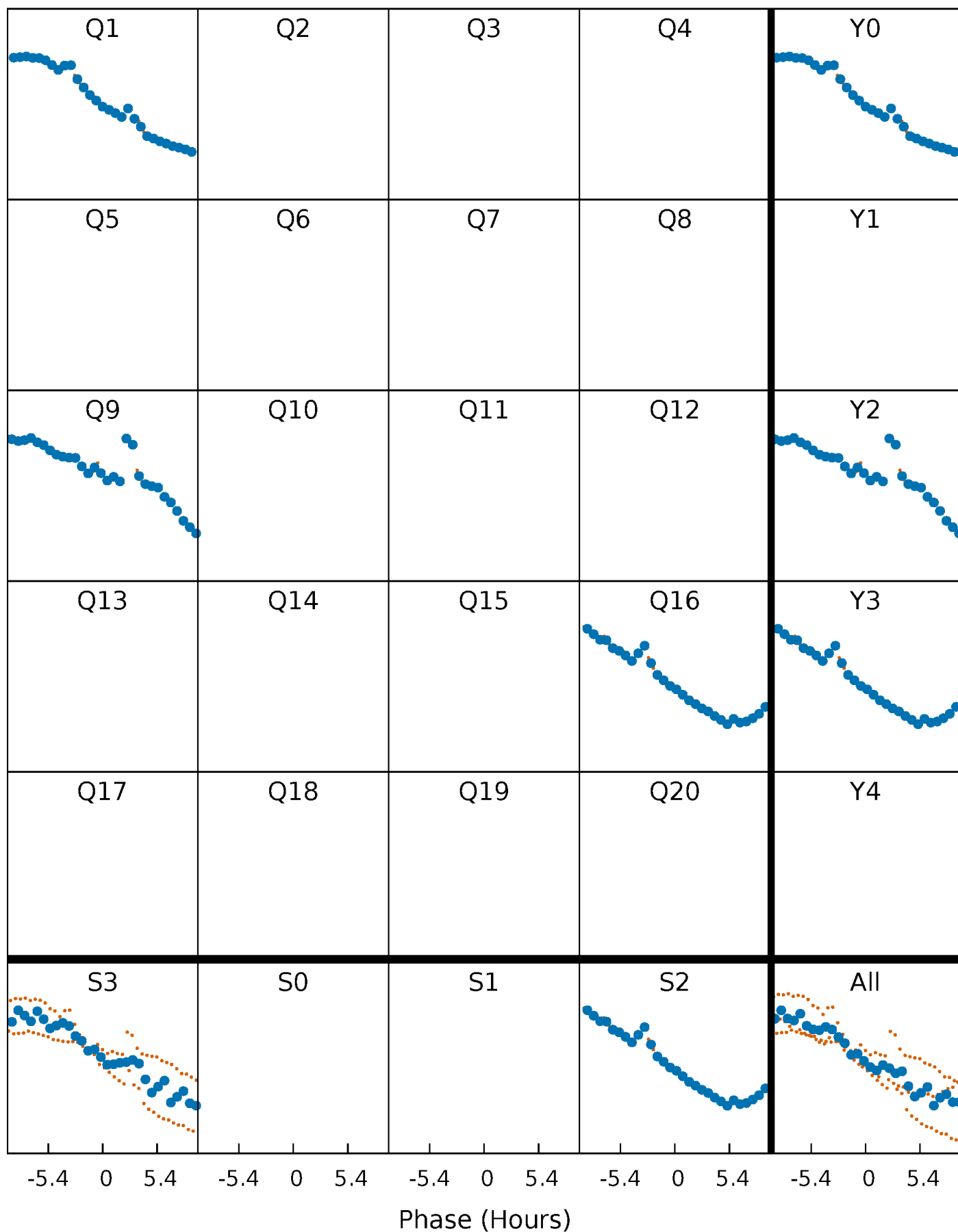


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

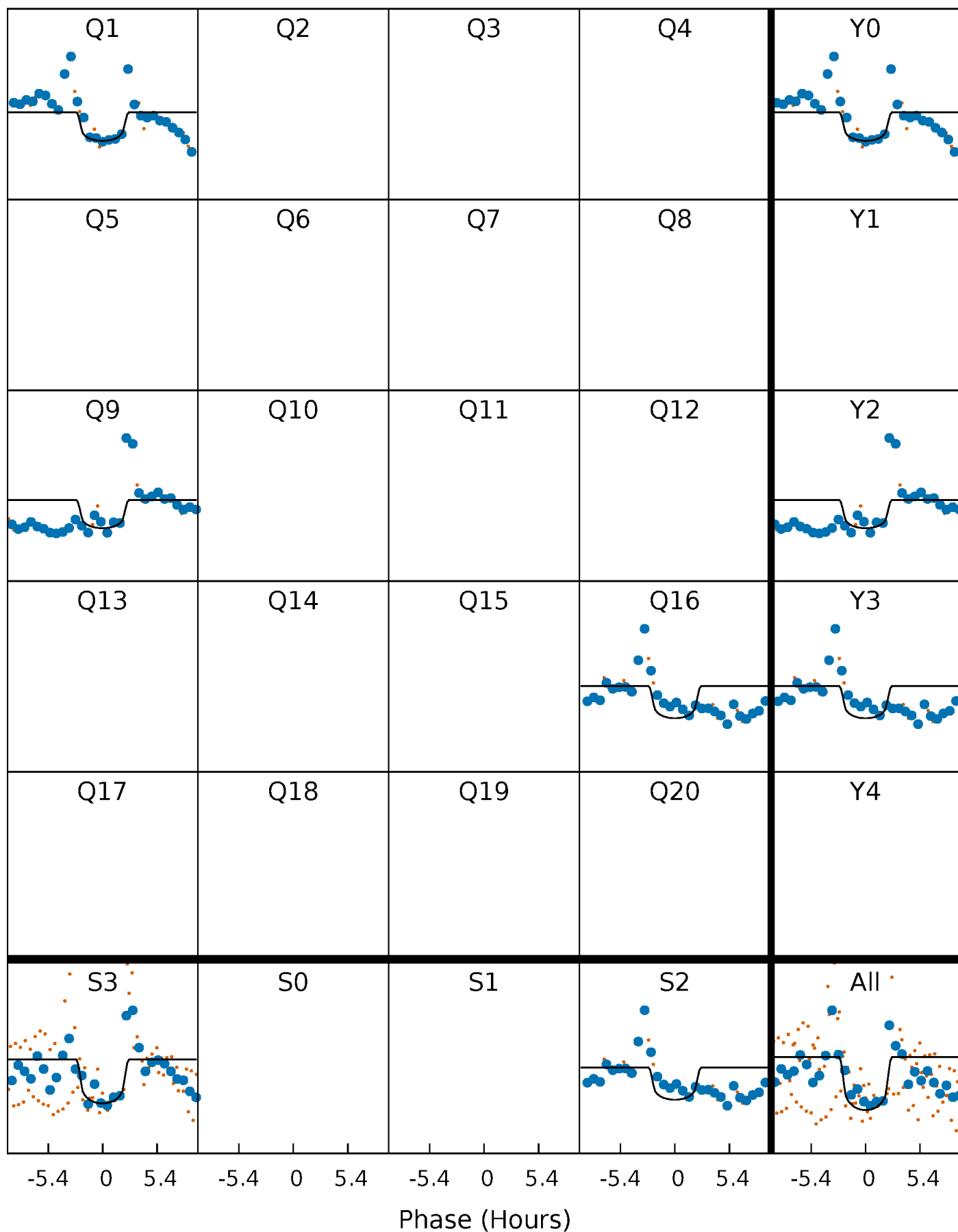
TCE 003938354-03 P=688.453771 Days  $T_0=139.638434$  (BKJD)





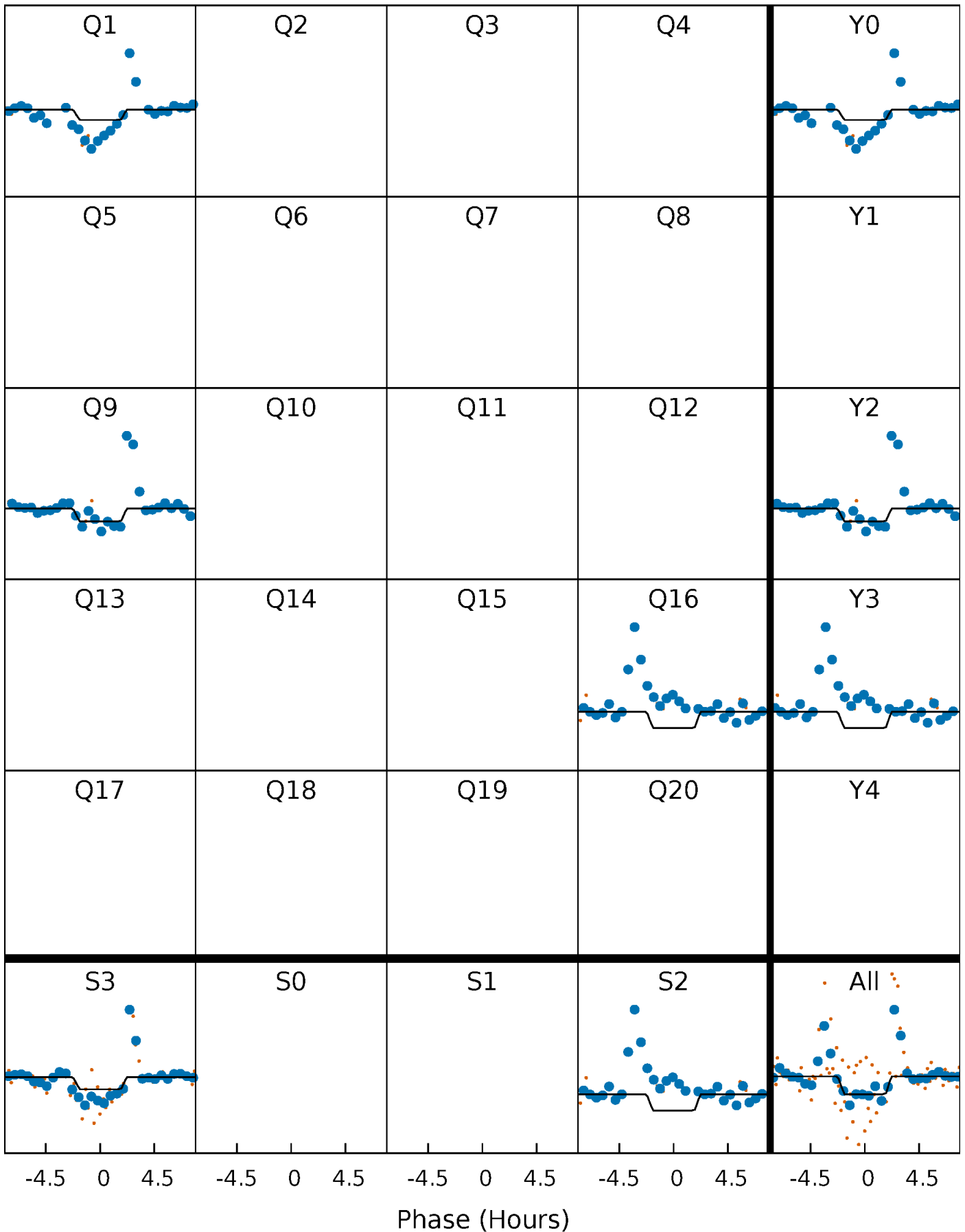
# DV Quarter-Phased Transit Curves

TCE 003938354-03     $P=688.453771$  Days     $T_0=139.638434$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

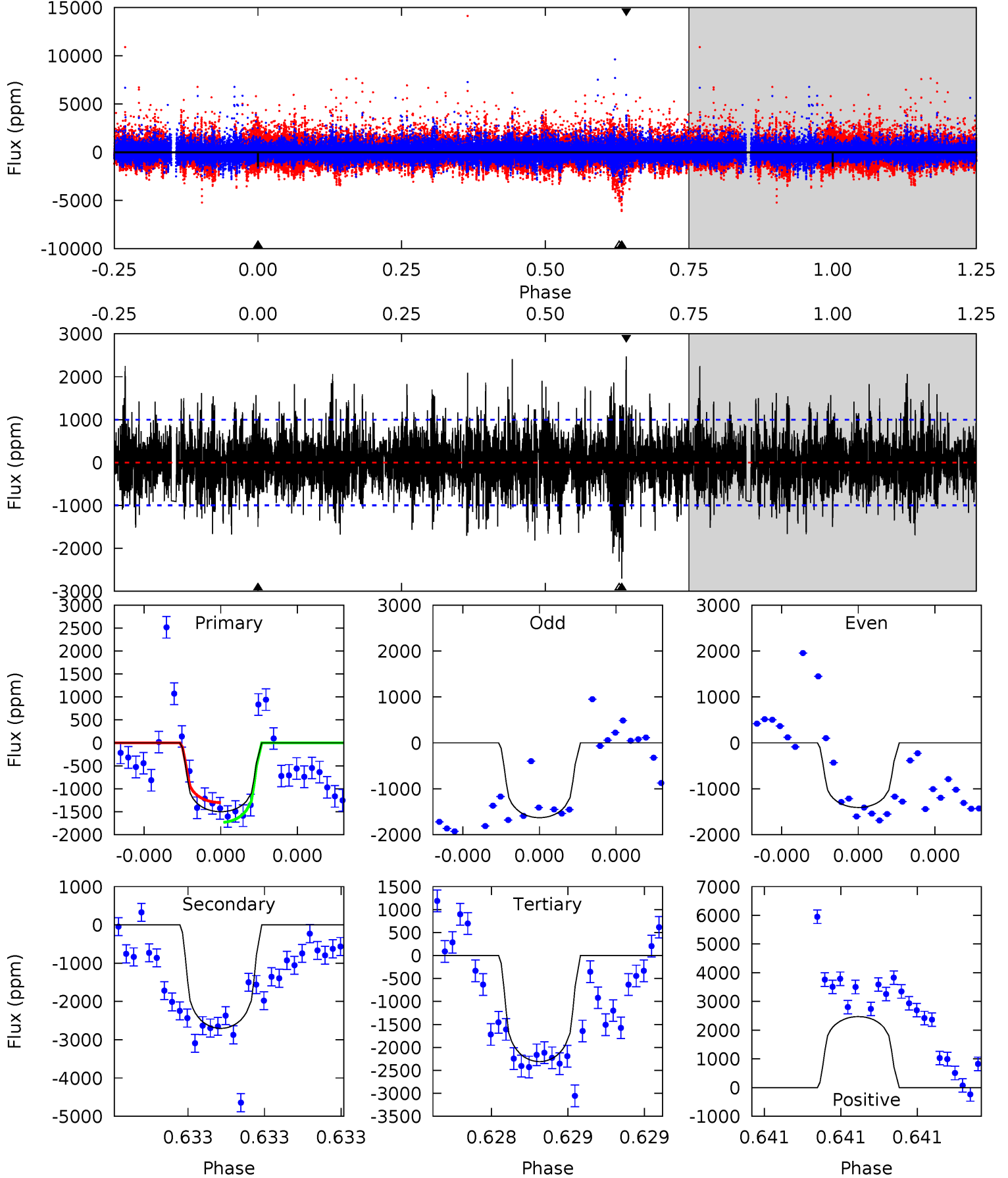
TCE 003938354-03 P=688.454315 Days  $T_0=139.646149$  (BKJD)



# DV Model-Shift Uniqueness Test

003938354-03, P = 688.453771 Days, E = 139.638434 Days

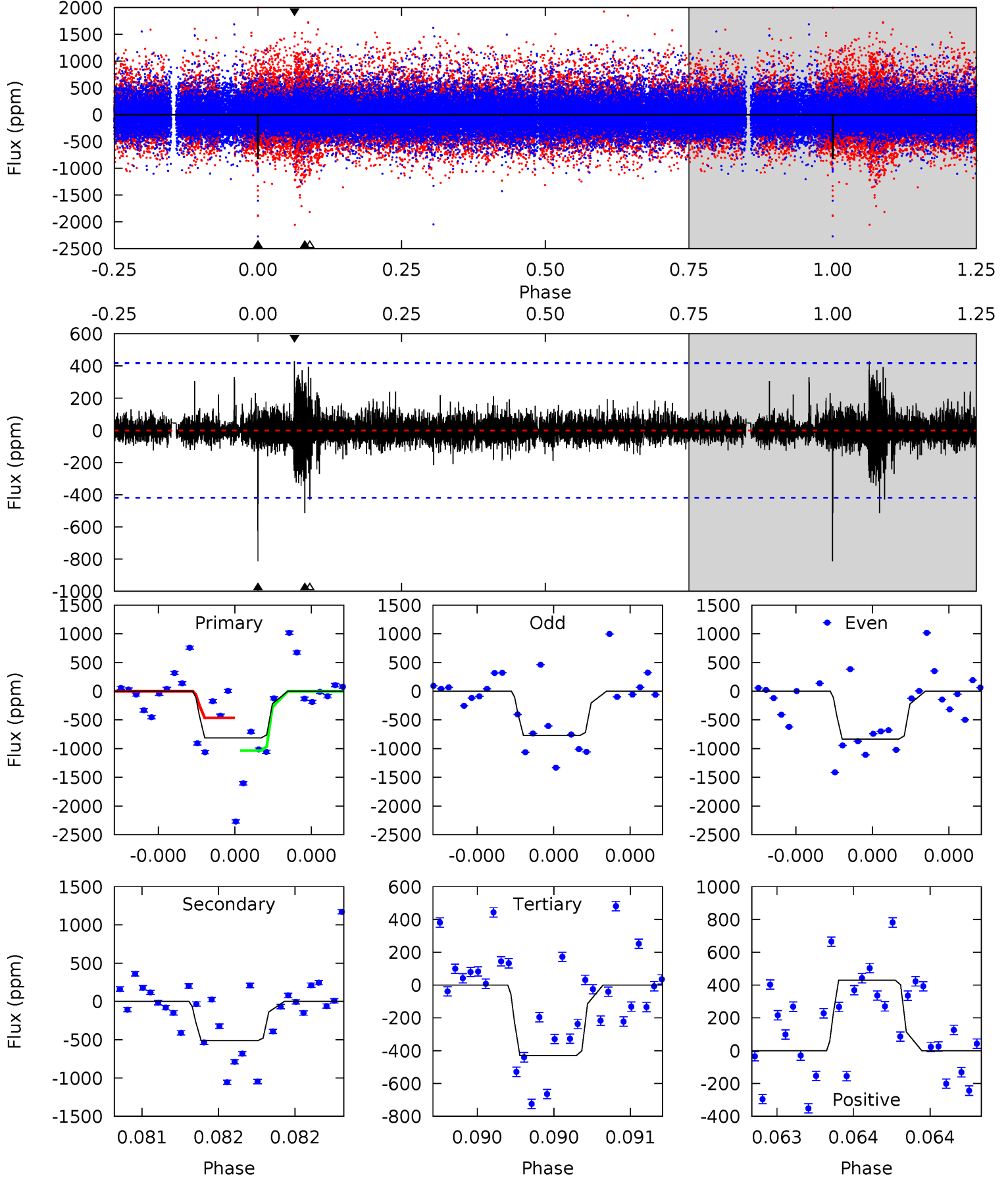
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.51	15.3	13.1	14.0	5.66	3.62	2.94	-4.60	-5.52	2.23	1.31	0.56	0.90	0.48	1.23



# Alt Model-Shift Uniqueness Test

003938354-03, P = 688.454315 Days, E = 139.646149 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
11.1	6.98	5.84	5.85	5.69	3.66	0.75	5.23	5.22	1.14	1.13	0.44	0.98	0.35	3.79



### Stellar Parameters For KIC 003938354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5665^{+169}_{-152}$	$4.579^{+0.038}_{-0.152}$	$-0.420^{+0.300}_{-0.300}$	$0.776^{+0.182}_{-0.073}$	$0.834^{+0.088}_{-0.080}$	$2.510^{+0.516}_{-1.083}$
	+3%/-3%	+1%/-3%	+71%/-71%	+23%/-9%	+11%/-10%	+21%/-43%
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 003938354-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2703 \pm 176$	$10.60^{+10.72}_{-6.85}$	$263^{+15}_{-12}$	$4059^{+2164}_{-821}$	$26930^{+198447}_{-19988}$
Alt.	$-513 \pm 74$	$9.63^{+9.87}_{-6.53}$	$263^{+14}_{-11}$	$3194^{+1510}_{-567}$	$6268^{+54749}_{-4767}$

$T_{\text{max}}$  = 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

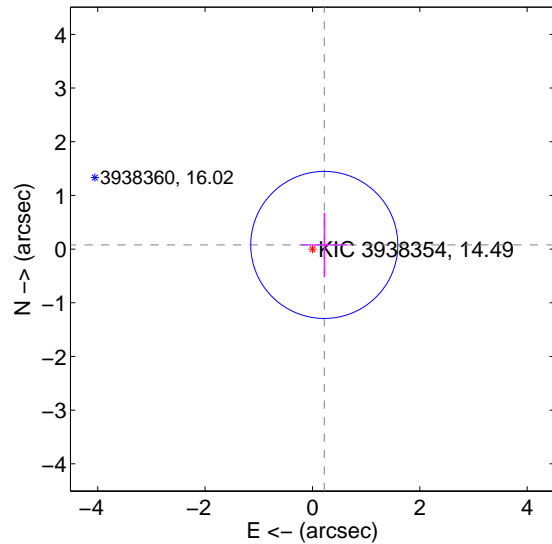
Supplemental centroid analysis for 003938354-03. Kepler magnitude: 14.49. Transit SNR 6.20

There are 1 quarters with good PRF difference image offsets

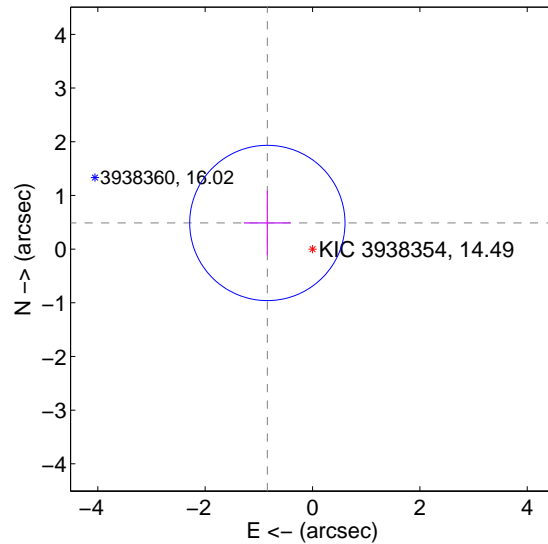
The direct PRF centroid is offset from the target star catalog position by about 1.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.233 \pm 0.457$	0.51	$-0.220 \pm 0.435$	$0.078 \pm 0.601$
PRF-fit source offset from KIC position	$0.972 \pm 0.482$	2.02	$0.841 \pm 0.435$	$0.487 \pm 0.601$
photometric centroid source offset	$1.02 \pm 0.91$	1.13	$1.01 \pm 0.92$	$0.18 \pm 0.63$

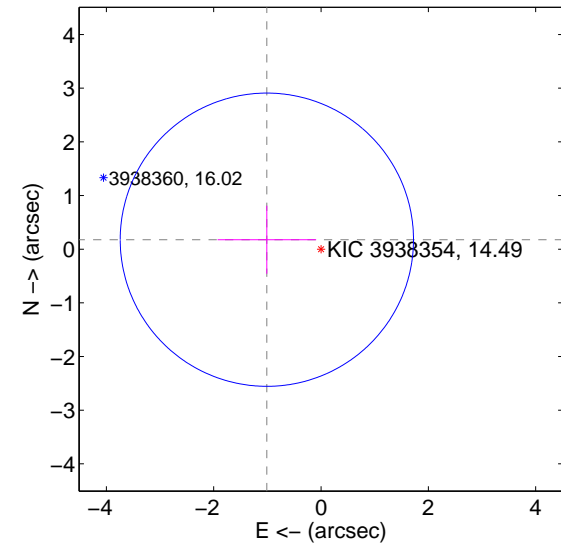
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

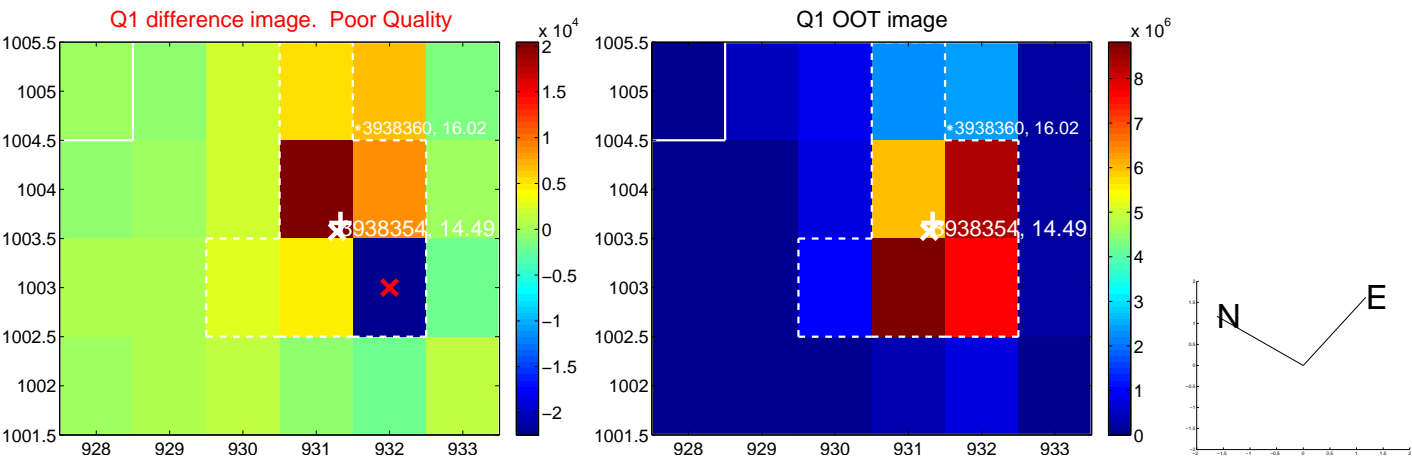


offset from photometric centroids



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.

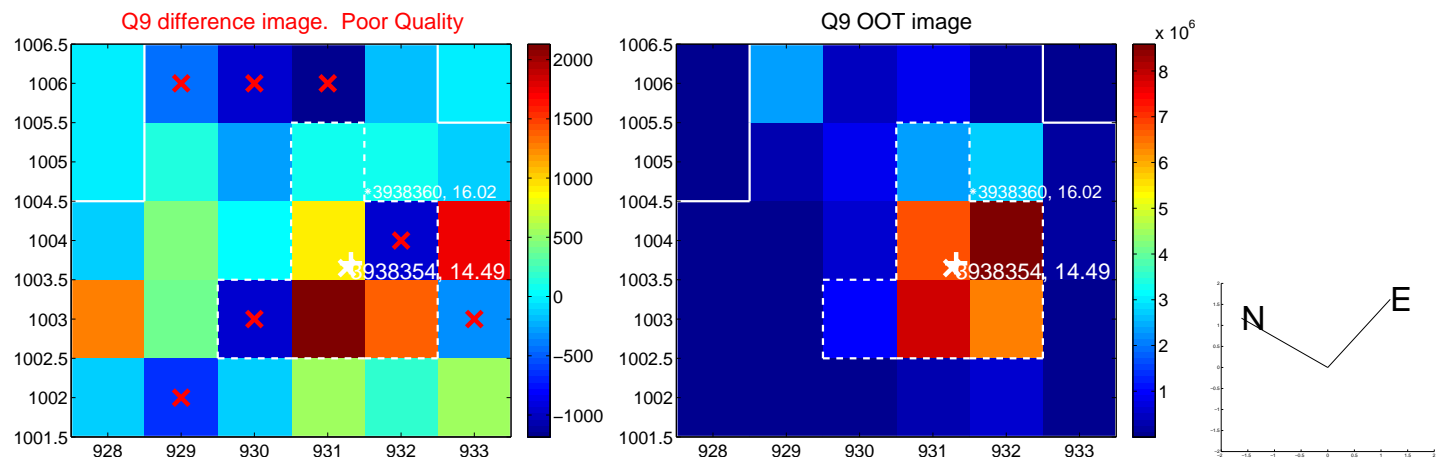


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



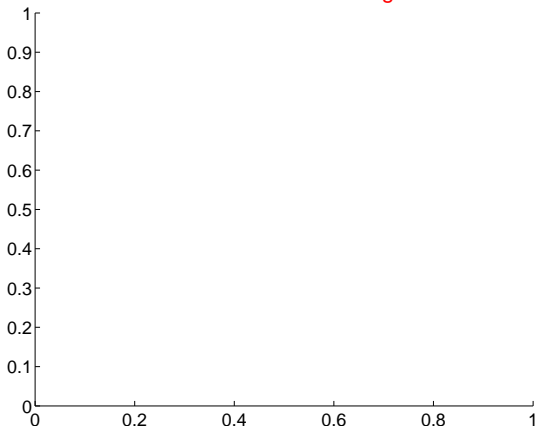


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

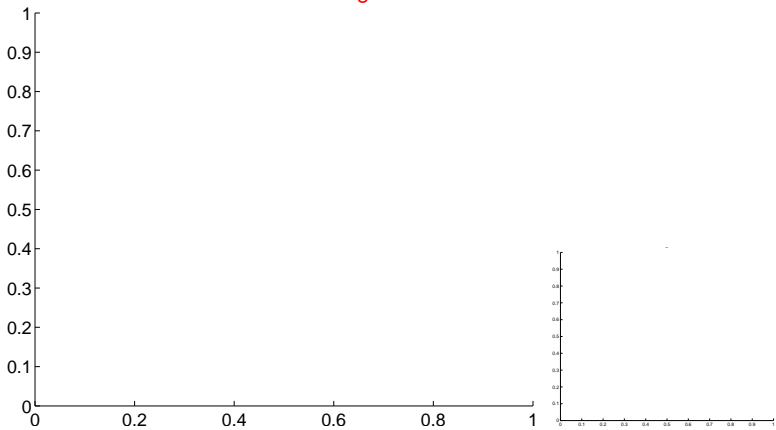


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

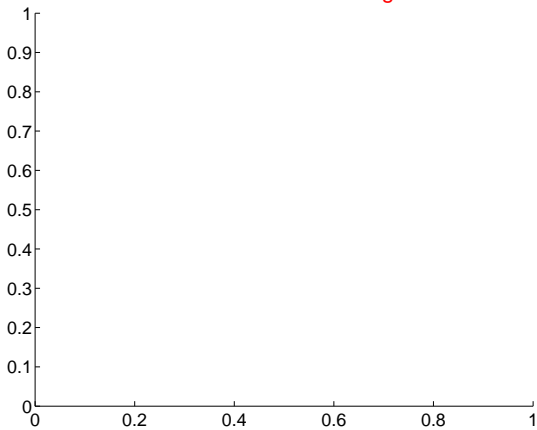
Q13 no difference image



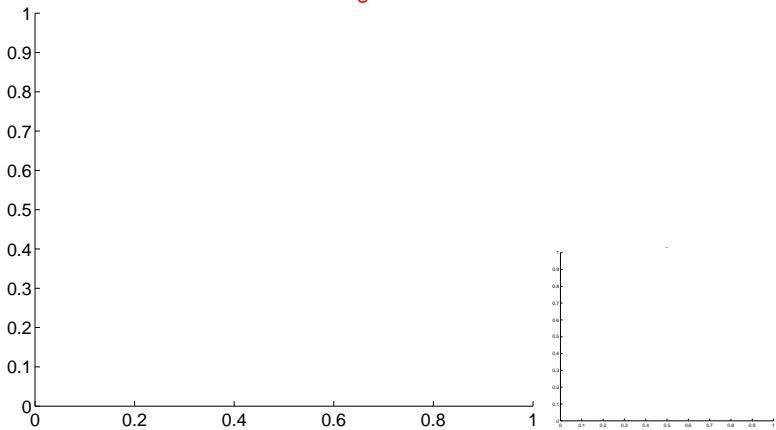
Q13 no OOT image



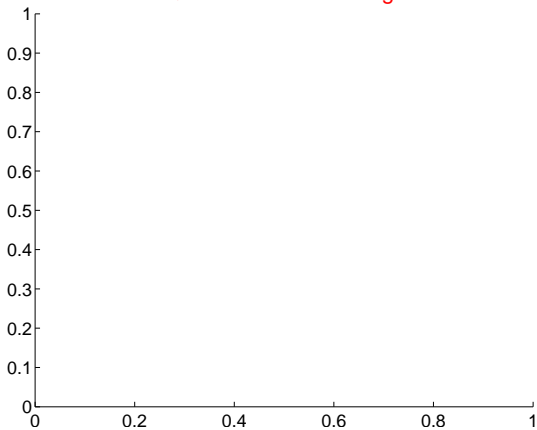
Q14 no difference image



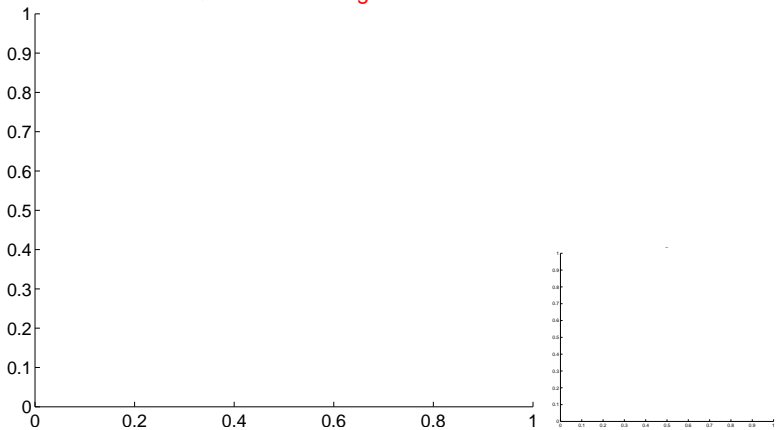
Q14 no OOT image



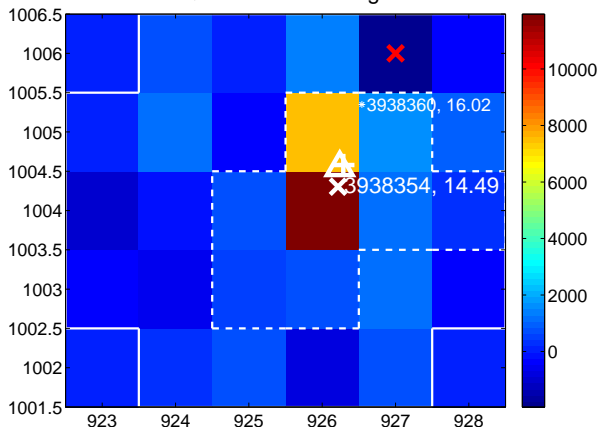
Q15 no difference image



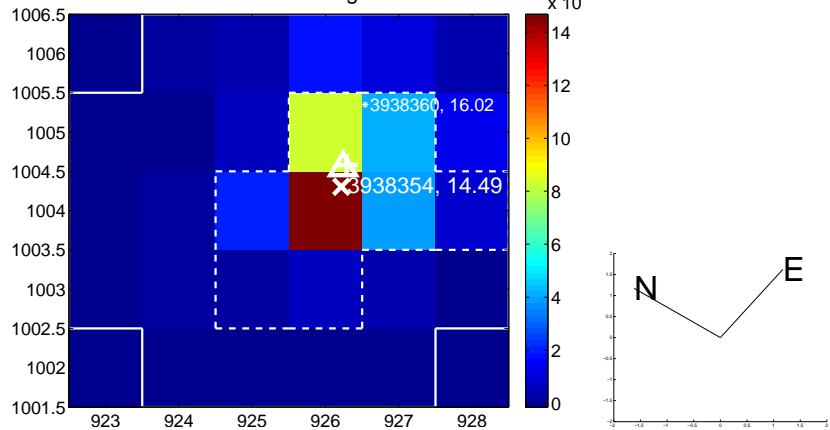
Q15 no OOT image



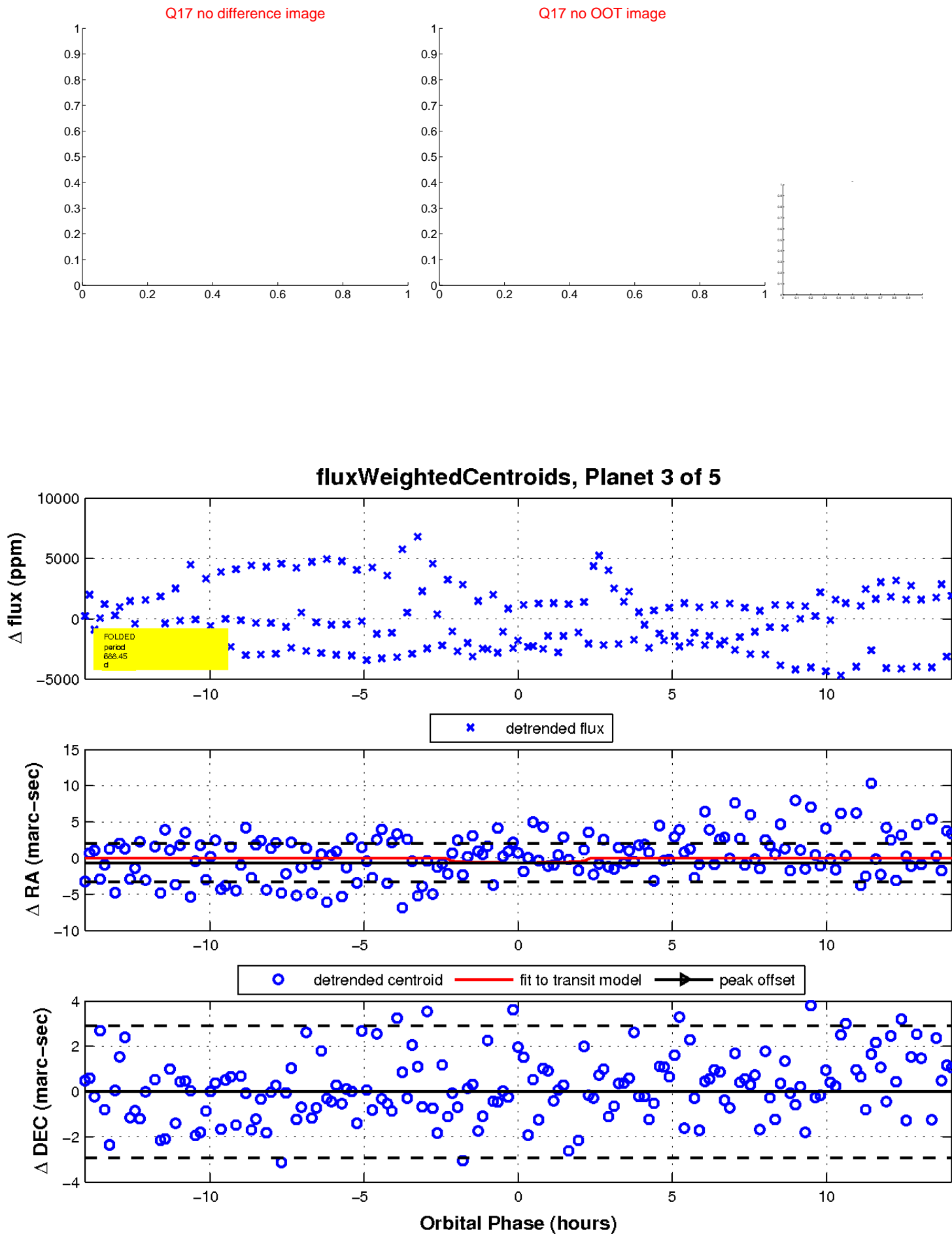
Q16 difference image



Q16 OOT image

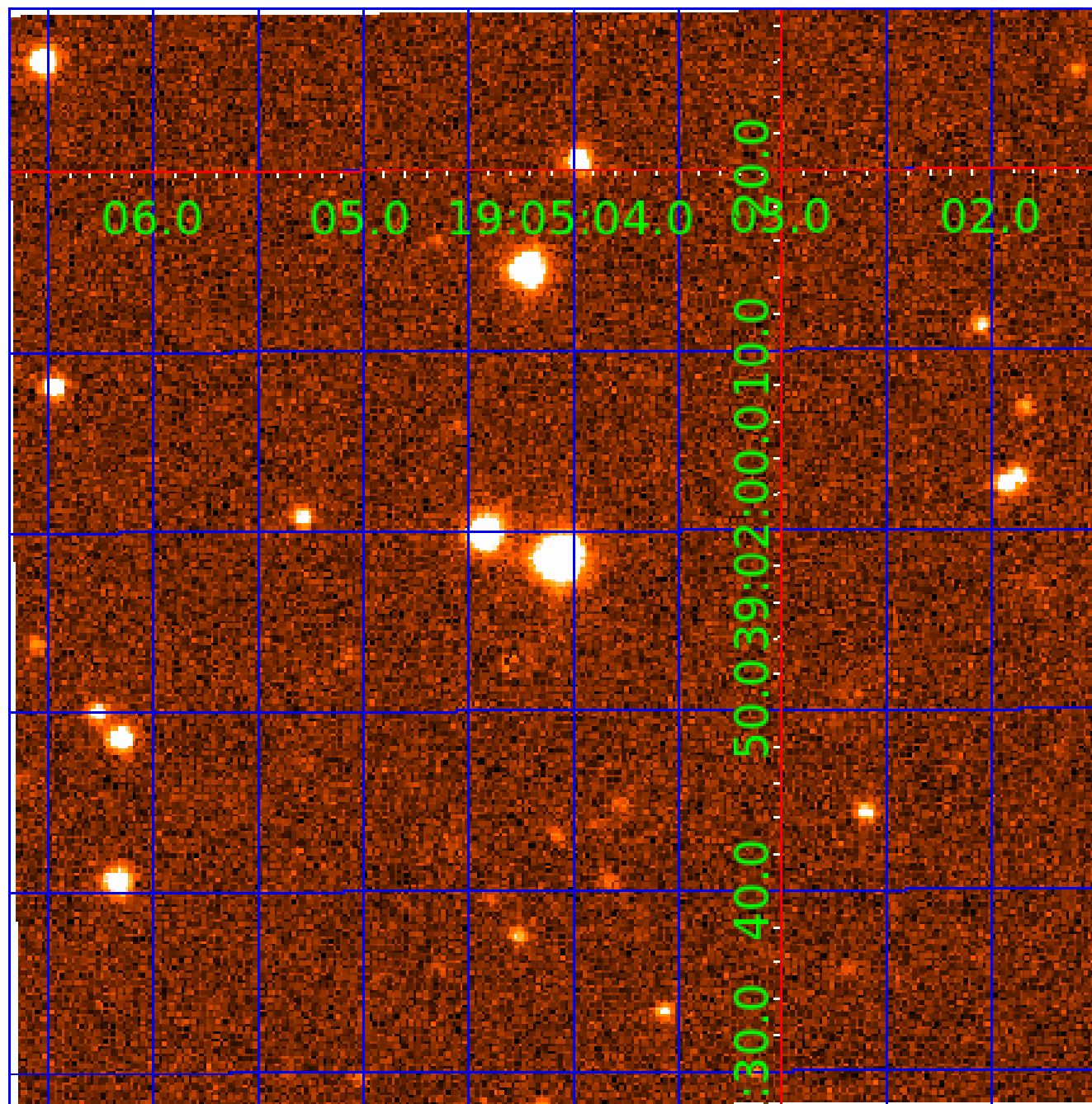


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003938354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003938354-01	OBS	No	508.771168	432.319580	2504.1	3.684	14.5	10.5	0.78	5665	3.96	0.40
003938354-02	OBS	No	398.374141	182.477111	1472.8	7.990	13.4	5.4	0.78	5665	3.07	0.56
003938354-03	OBS	No	688.453771	139.638434	1827.3	4.734	11.6	6.2	0.78	5665	3.29	0.27
003938354-04	OBS	No	403.054353	148.085342	1609.0	3.521	14.3	8.1	0.78	5665	3.09	0.55
003938354-05	OBS	No	250.665292	364.773704	486.6	15.000	12.1	-1.0	0.78	5665	1.70	1.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003938354-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
003938354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
003938354-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS

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

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

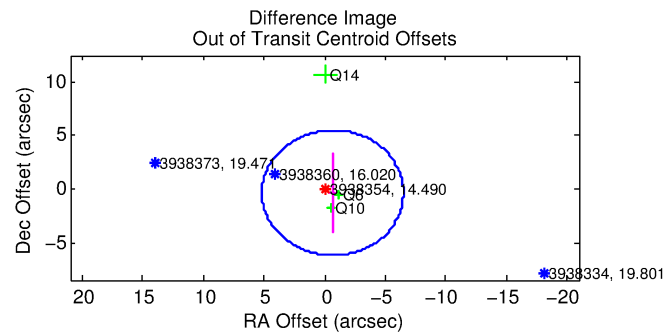
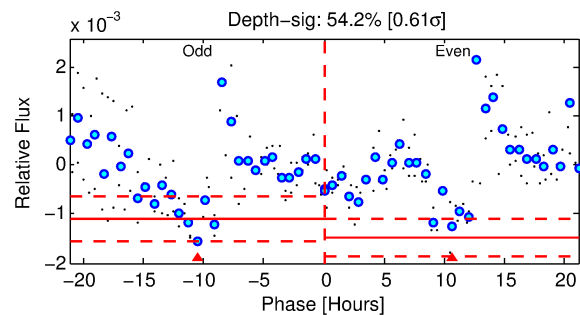
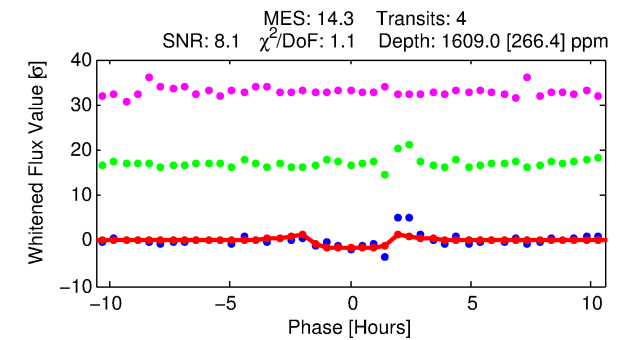
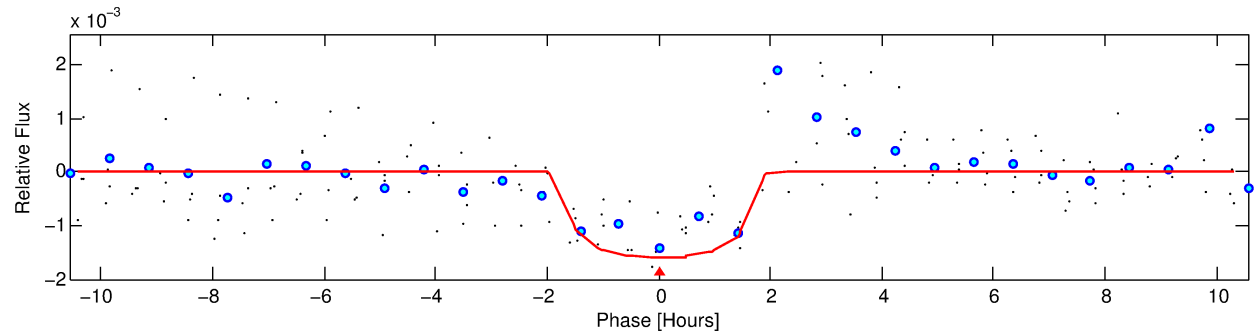
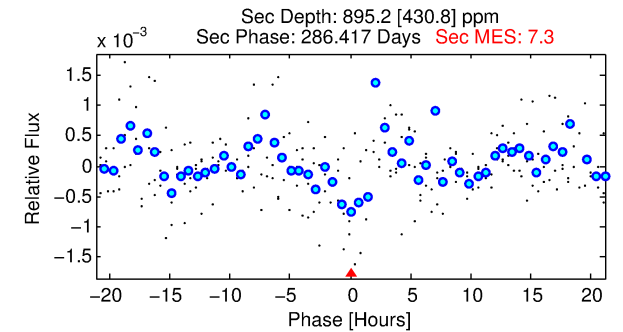
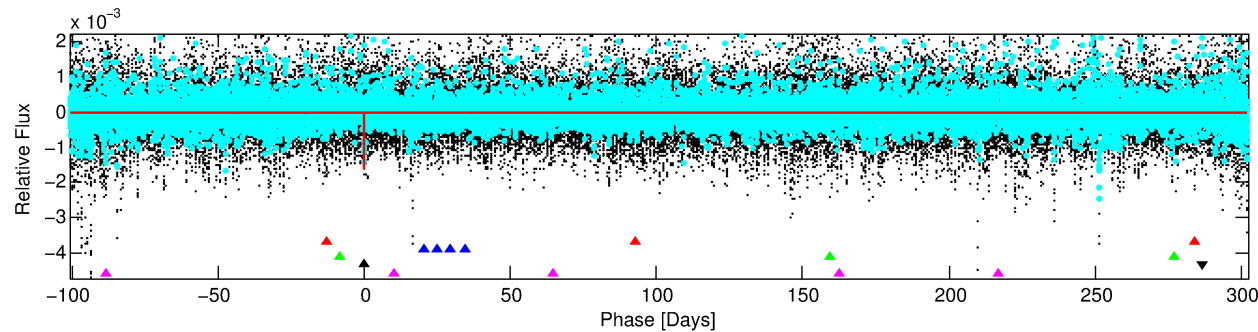
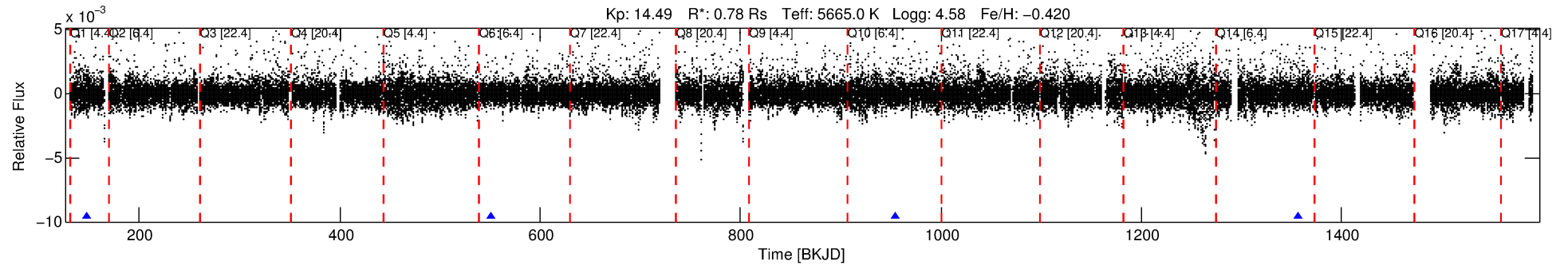
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003938354-04

No Significant Match Found

# DV One-Page Summary

KIC: 3938354 Candidate: 4 of 5 Period: 403.054 d



## DV Fit Results:

Period = 403.05435 [0.00411] d  
Epoch = 148.0853 [0.0066] BKJD  
Rp/R\* = 0.0365 [0.0452]  
a/R\* = 906.38 [4974.89]  
b = 0.02 [322.30]  
Seff = 0.55 [0.17]  
Teq = 220 [17] K  
Rp = 3.09 [3.89] Re  
a = 1.0050 [0.1961] AU  
Ag = 52123.05 [132362.44] [0.39 $\sigma$ ]  
Teffp = 5130 [3241] K [1.52 $\sigma$ ]

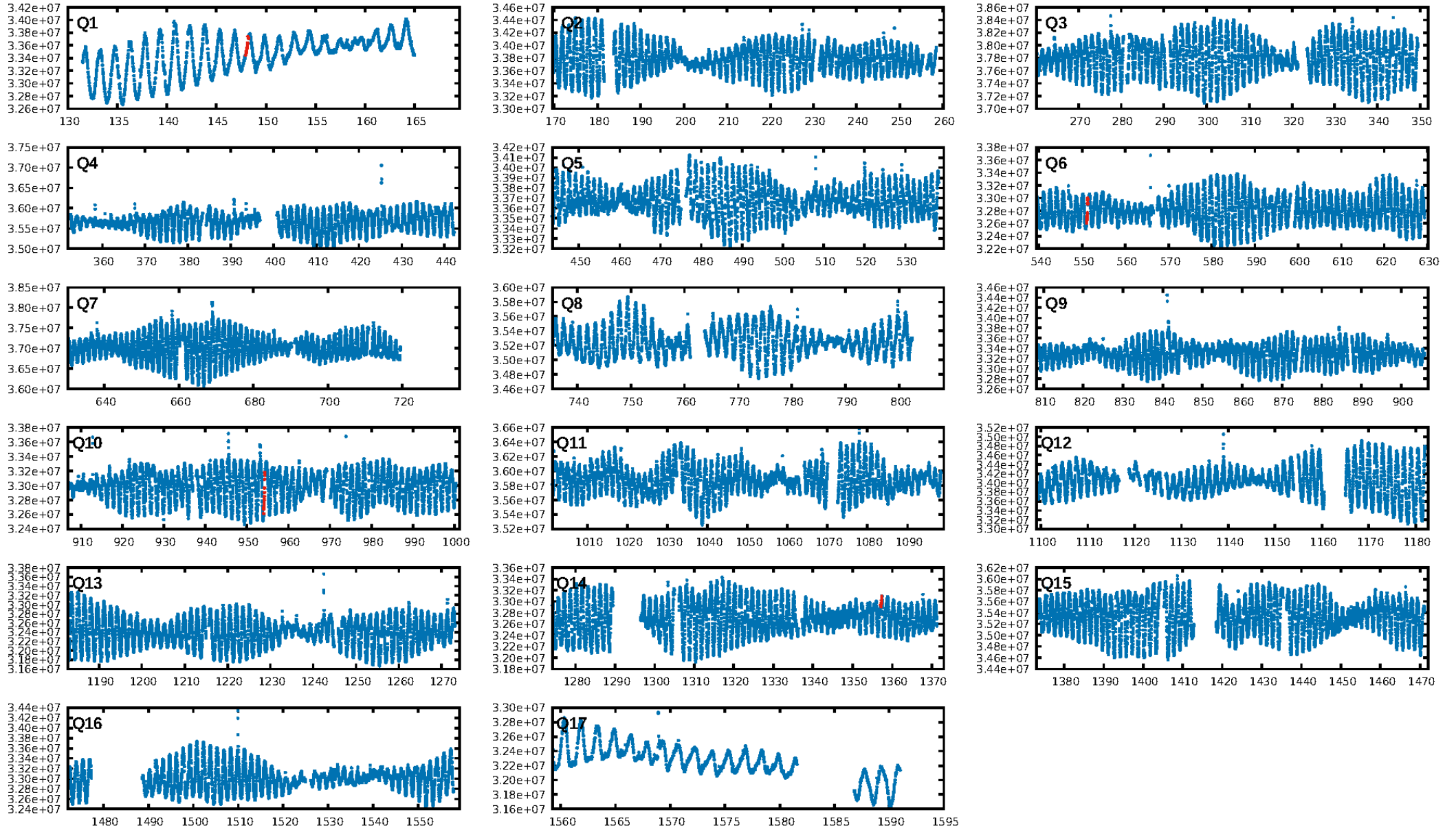
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.86 $\sigma$ ]  
LongPeriod-sig: 100.0% [497.91 $\sigma$ ]  
ModelChiSquare2-sig: 68.1%  
ModelChiSquareGof-sig: 80.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.8376**  
Centroid-sig: 1.1%  
Centroid-so: 0.970 arcsec [1.19 $\sigma$ ]  
OotOffset-rm: 0.755 arcsec [0.39 $\sigma$ ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 0.674 arcsec [0.74 $\sigma$ ]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:49:55 Z

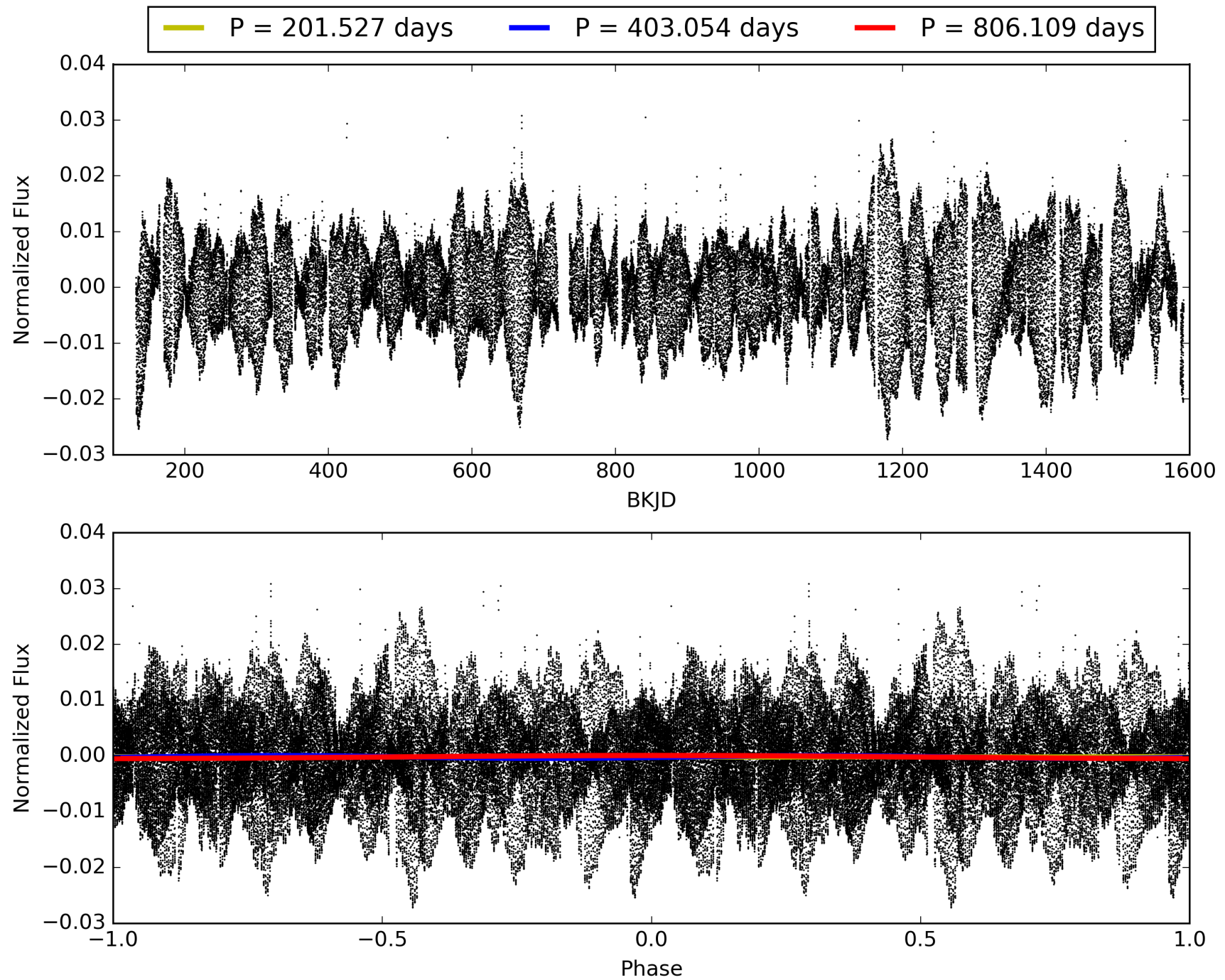
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003938354-04, PDC Light Curves





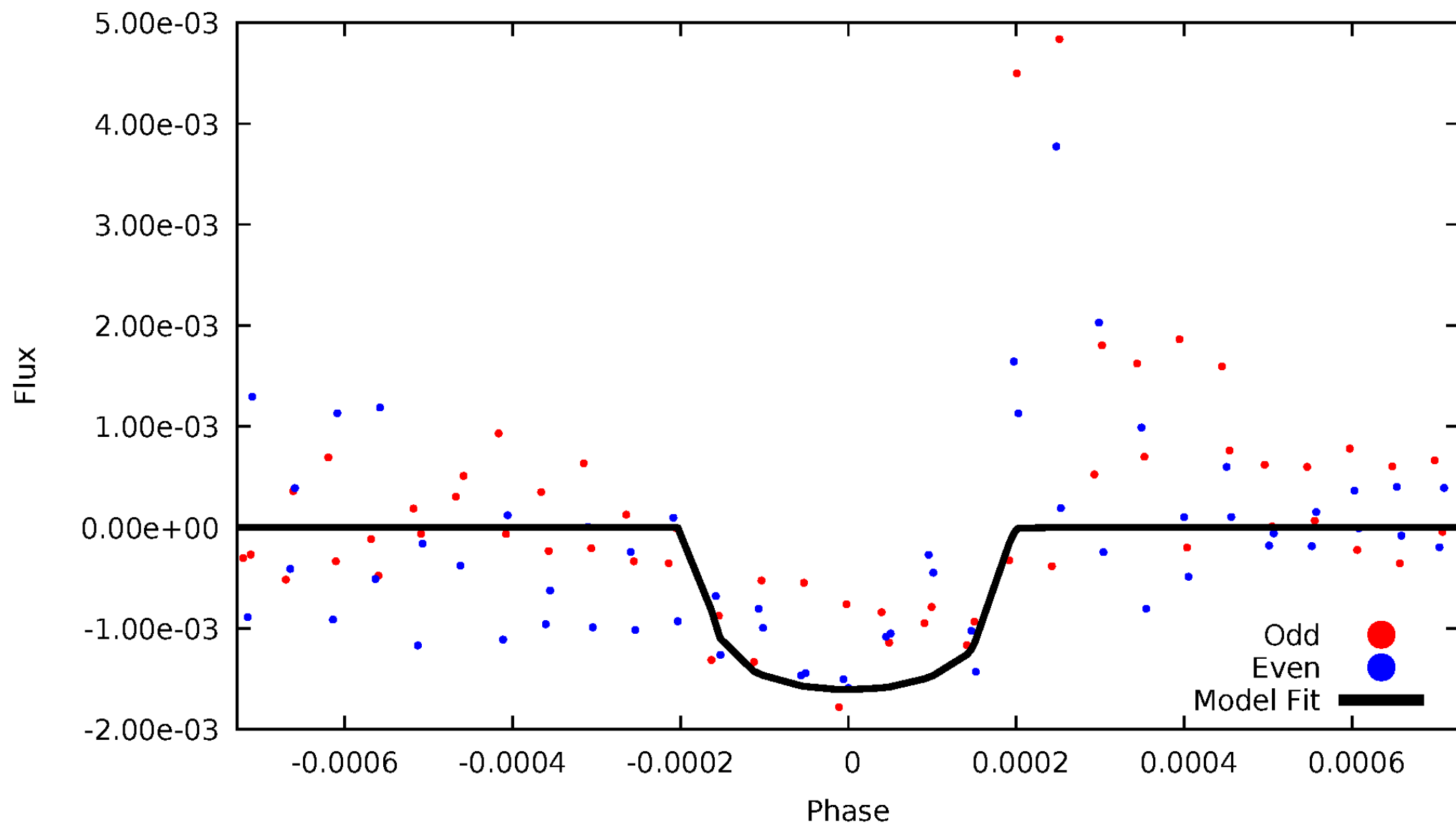
TCE 003938354-04





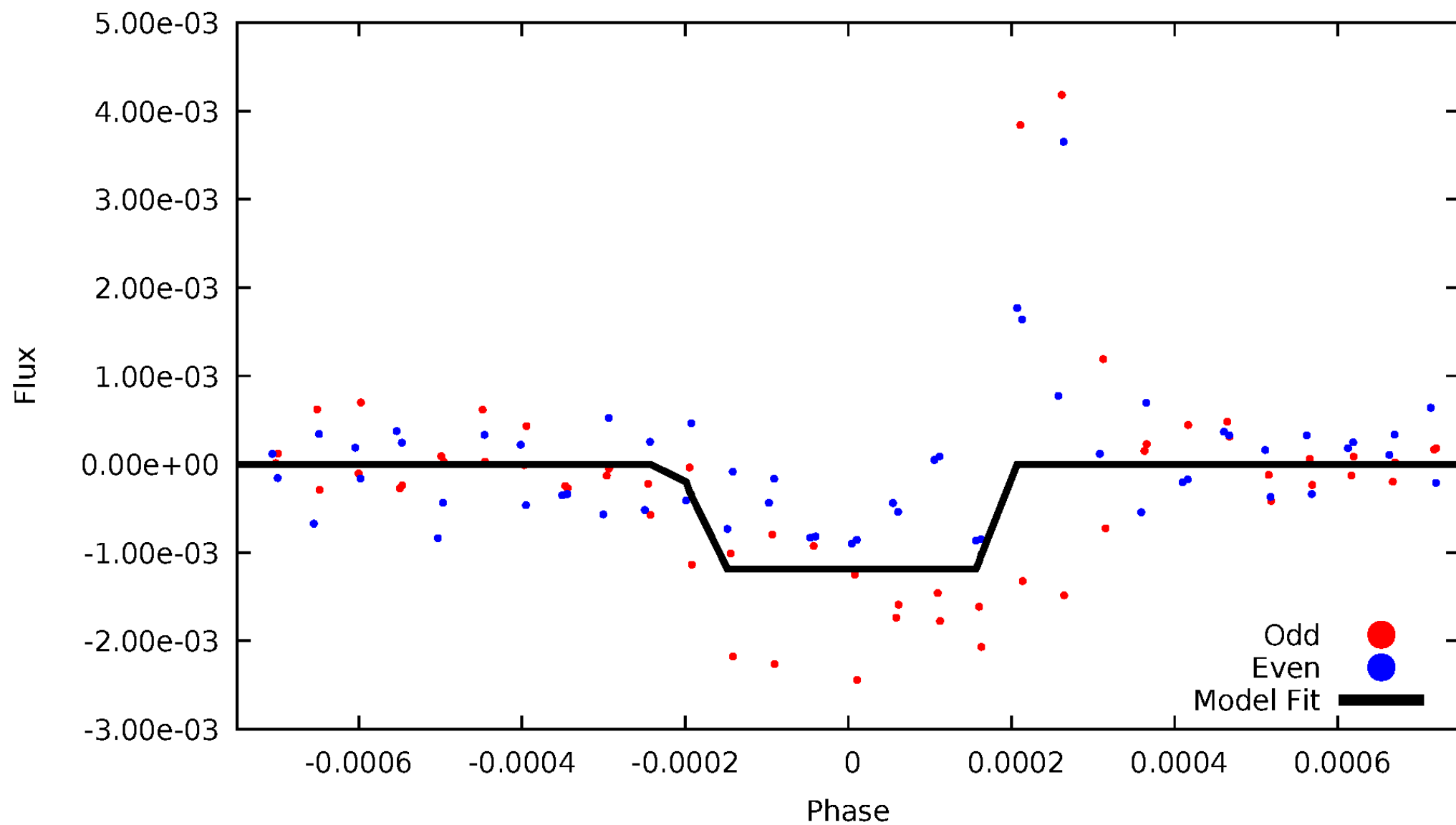
# DV Odd/Even

TCE 003938354-04



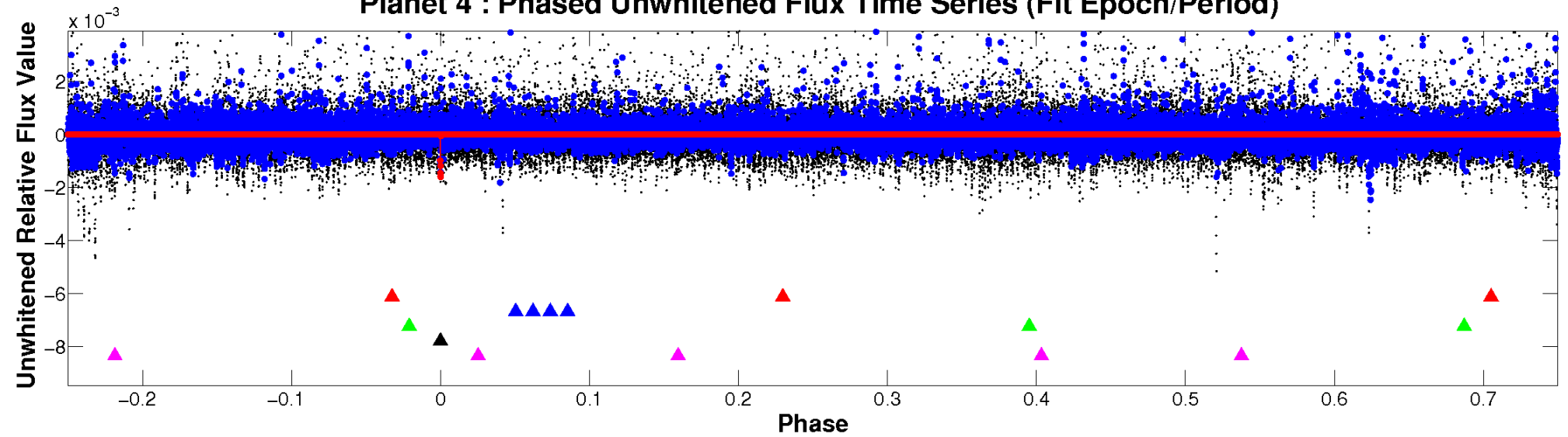
# ALT Odd/Even

TCE 003938354-04

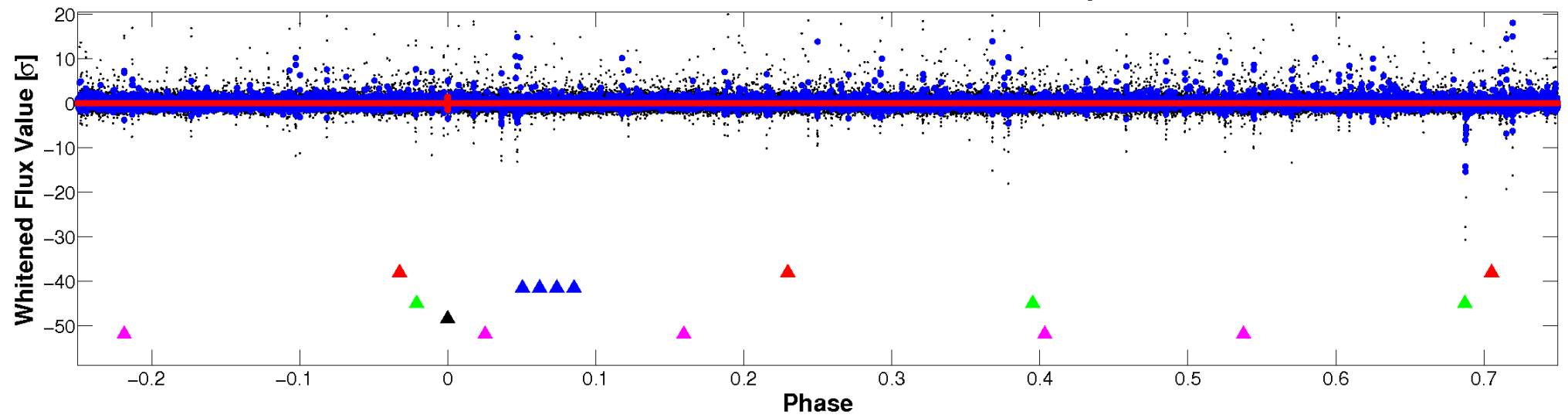


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

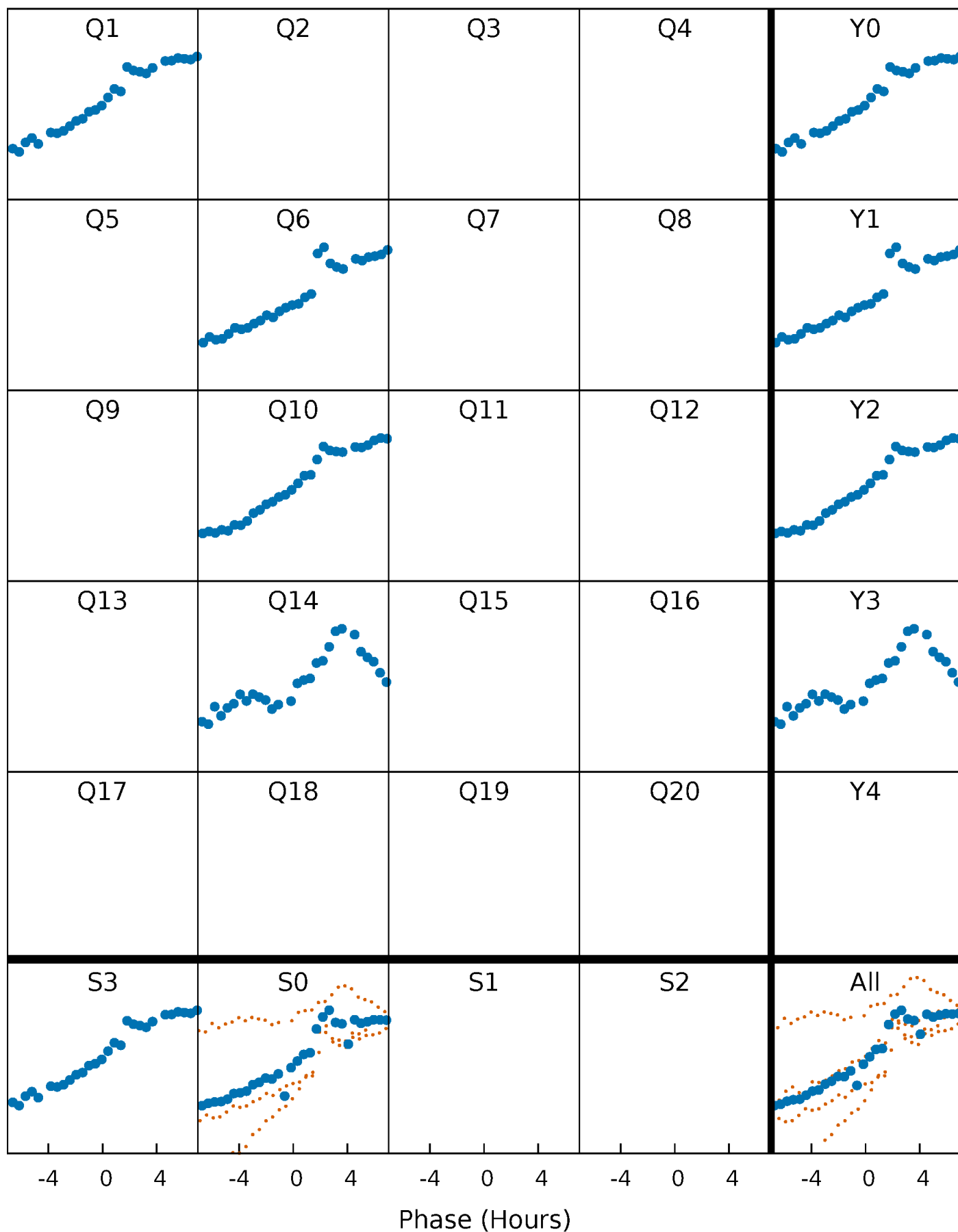


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



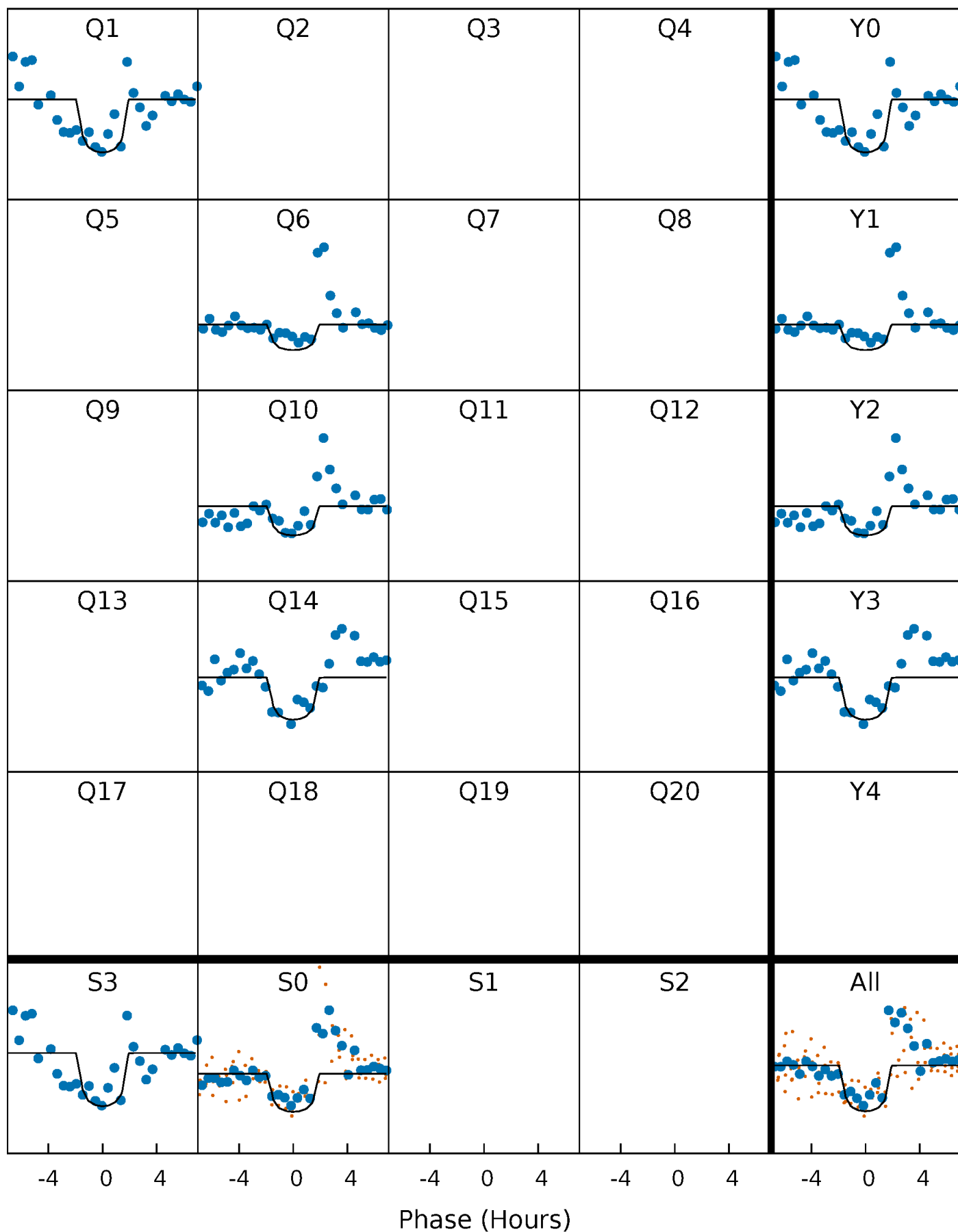
# PDC Quarter-Phased Transit Curves

TCE 003938354-04 P=403.054353 Days  $T_0=148.085342$  (BKJD)



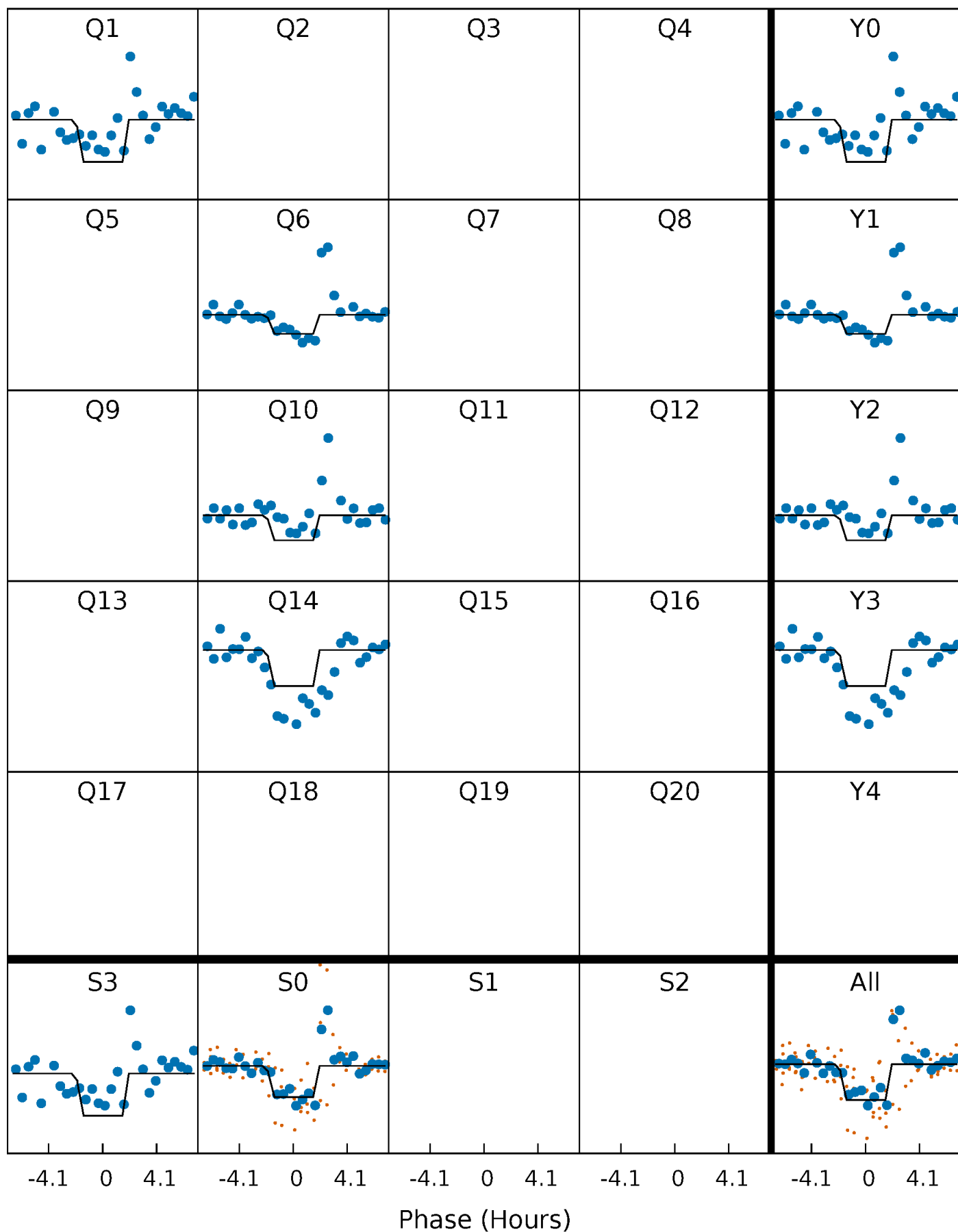
# DV Quarter-Phased Transit Curves

TCE 003938354-04 P=403.054353 Days  $T_0=148.085342$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

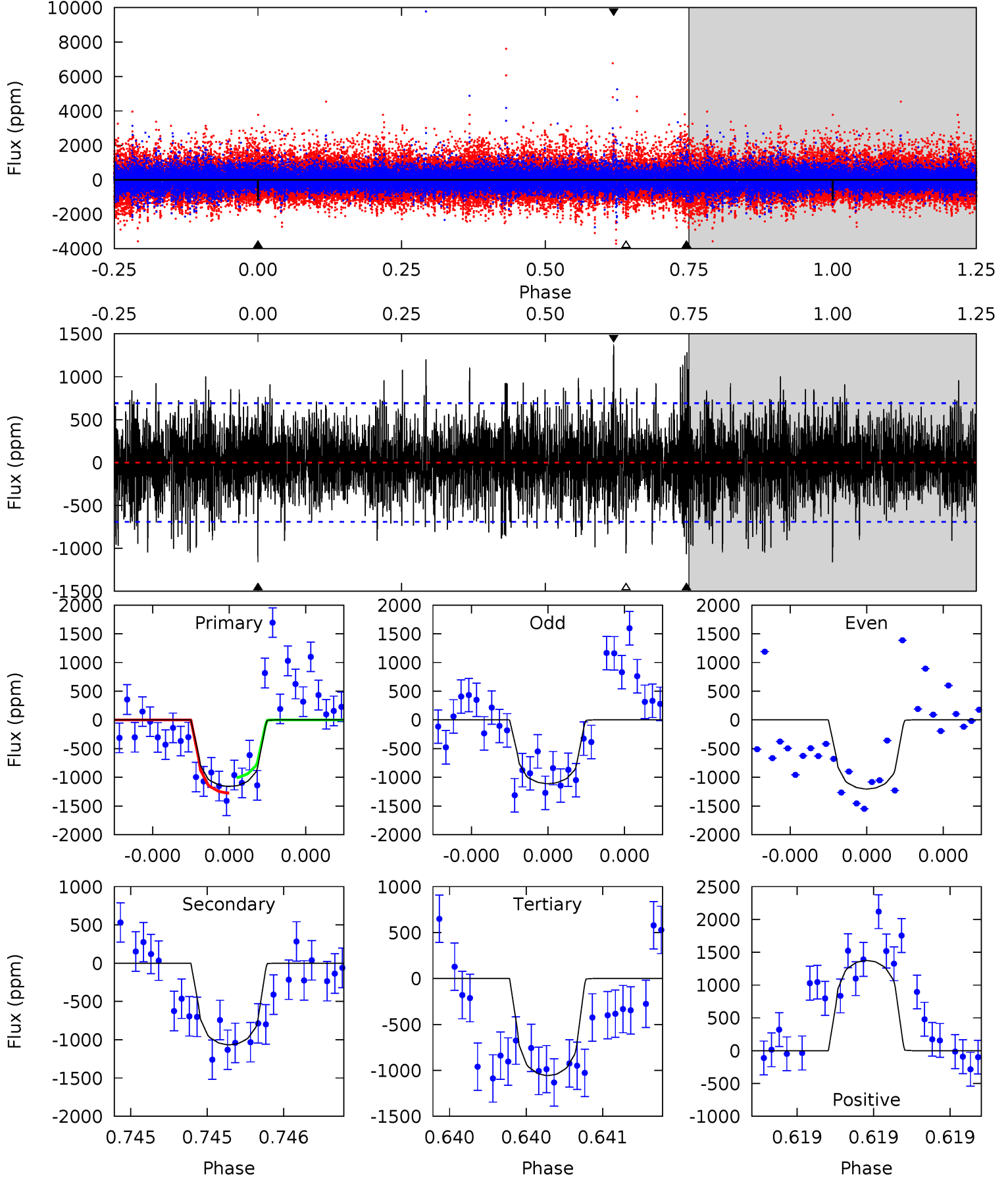
TCE 003938354-04 P=403.051971 Days  $T_0=148.083619$  (BKJD)



# DV Model-Shift Uniqueness Test

003938354-04, P = 403.054353 Days, E = 148.085342 Days

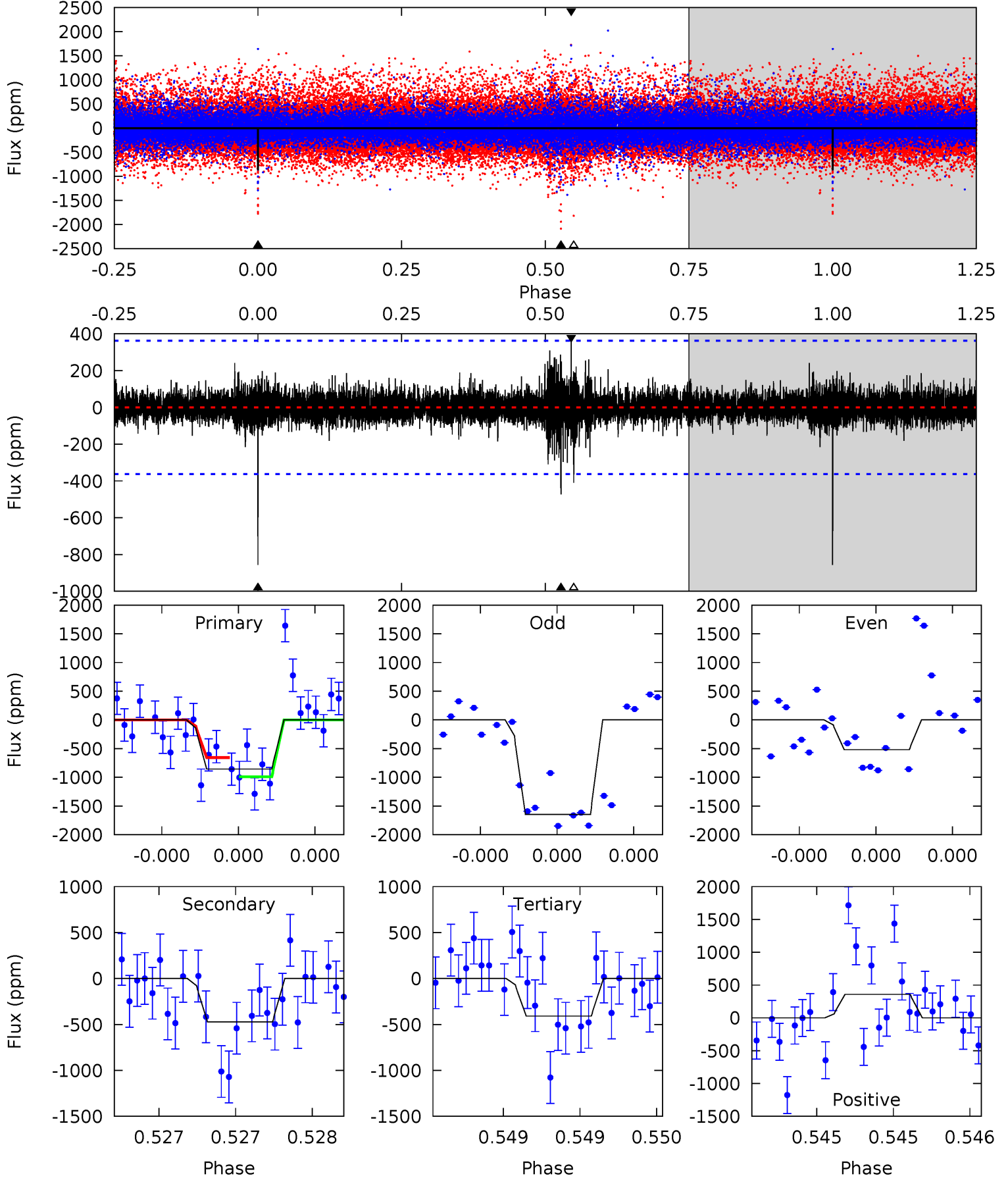
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.42	8.66	8.59	11.2	5.61	3.54	2.42	0.83	-1.75	0.07	-2.50	0.35	0.97	0.54	1.09



# Alt Model-Shift Uniqueness Test

003938354-04, P = 403.051971 Days, E = 148.083619 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
13.3	7.34	6.35	5.57	5.63	3.57	0.82	6.95	7.72	1.00	1.77	9.09	1.19	0.30	2.58





### Stellar Parameters For KIC 003938354

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5665^{+169}_{-152}$	$4.579^{+0.038}_{-0.152}$	$-0.420^{+0.300}_{-0.300}$	$0.776^{+0.182}_{-0.073}$	$0.834^{+0.088}_{-0.080}$	$2.510^{+0.516}_{-1.083}$
	+3%/-3%	+1%/-3%	+71%/-71%	+23%/-9%	+11%/-10%	+21%/-43%
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 003938354-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1067 \pm 123$	$4.53^{+3.52}_{-2.83}$	$313^{+17}_{-12}$	$4699^{+2786}_{-899}$	$29161^{+183211}_{-20145}$
Alt.	$-473 \pm 64$	$4.03^{+3.47}_{-2.64}$	$314^{+16}_{-14}$	$4175^{+2308}_{-759}$	$15990^{+111329}_{-11180}$

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

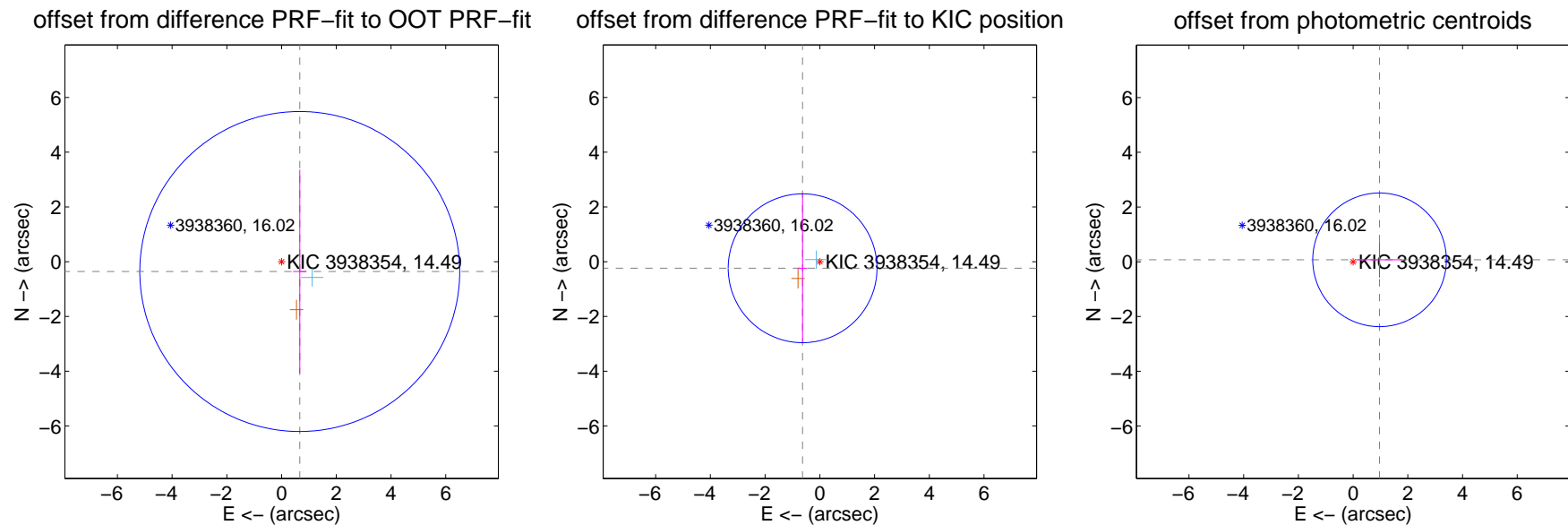
## DV Centroid Data

Supplemental centroid analysis for 003938354-04. Kepler magnitude: 14.49. Transit SNR 8.12

There are 1 quarters with good PRF difference image offsets

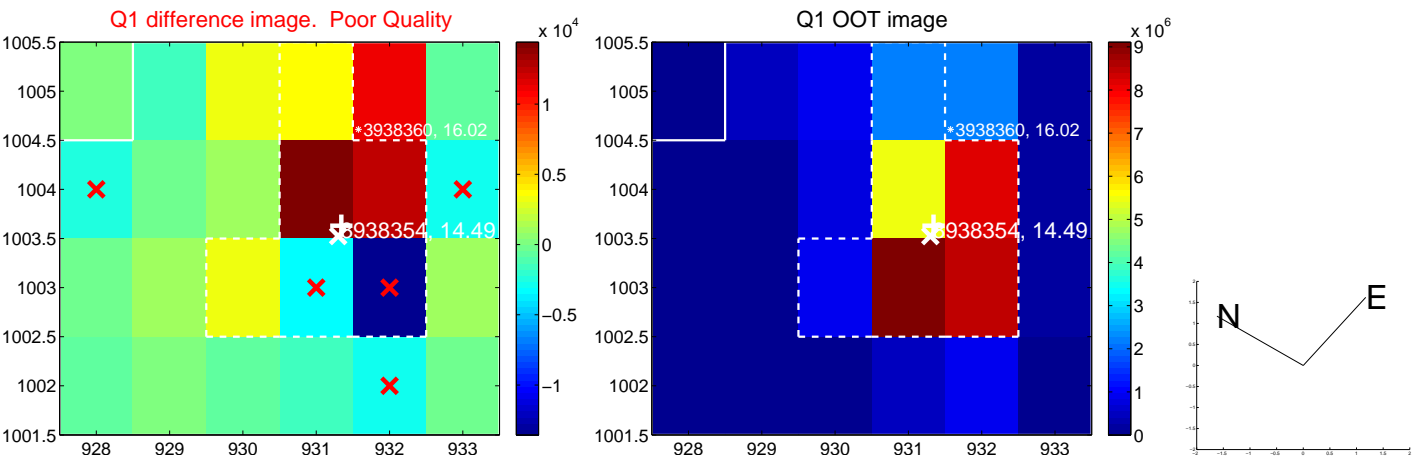
The direct PRF centroid is offset from the target star catalog position by about 1.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.755 \pm 1.948$	0.39	$-0.664 \pm 0.245$	$-0.358 \pm 3.718$
PRF-fit source offset from KIC position	$0.674 \pm 0.906$	0.74	$0.630 \pm 0.175$	$-0.240 \pm 2.729$
photometric centroid source offset	$0.97 \pm 0.81$	1.19	$-0.97 \pm 0.81$	$0.07 \pm 0.65$



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.

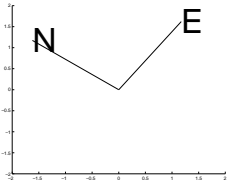
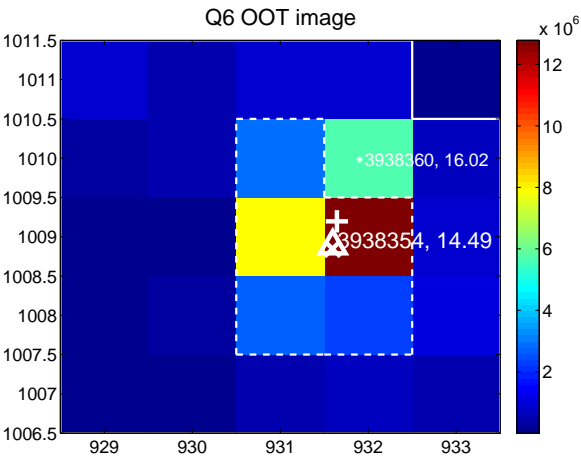
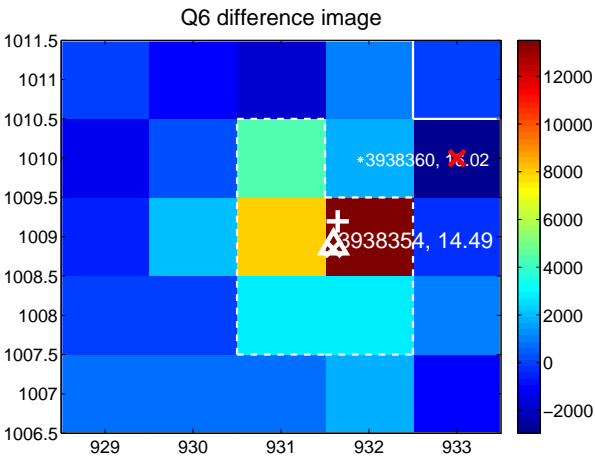


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

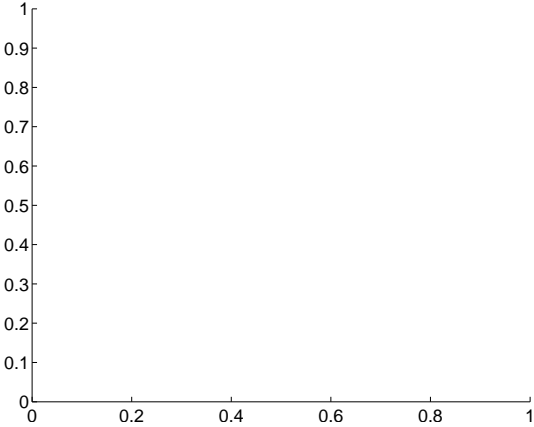
Q5 no difference image



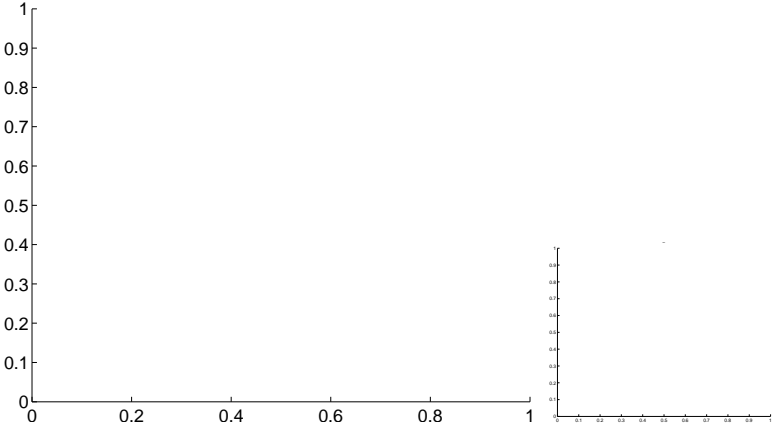
Q5 no OOT image



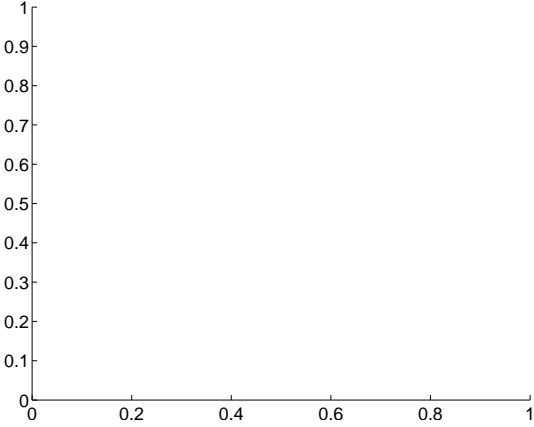
Q7 no difference image



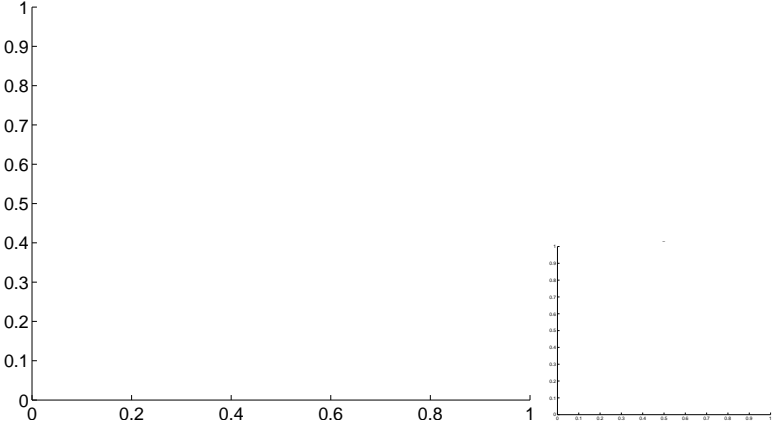
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



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

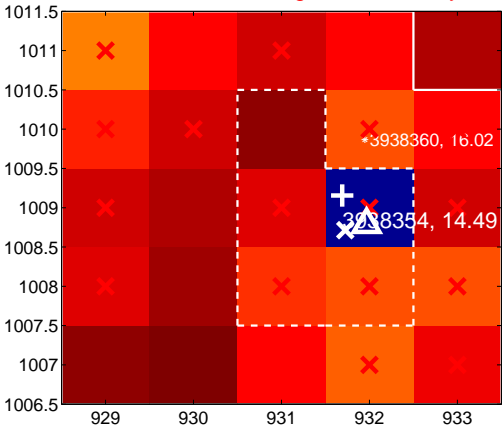
Q9 no difference image



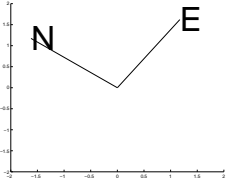
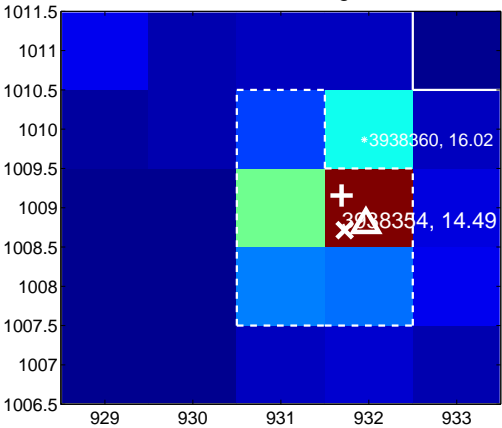
Q9 no OOT image



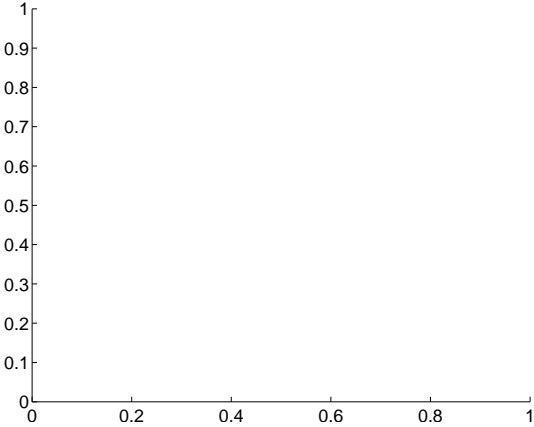
Q10 difference image. Poor Quality



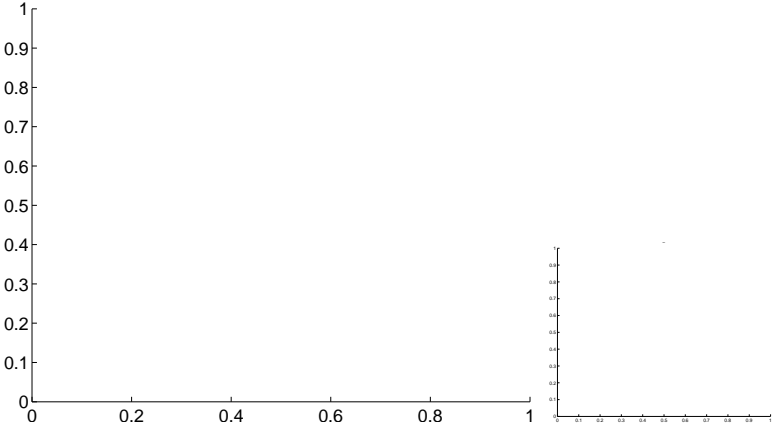
Q10 OOT image



Q11 no difference image



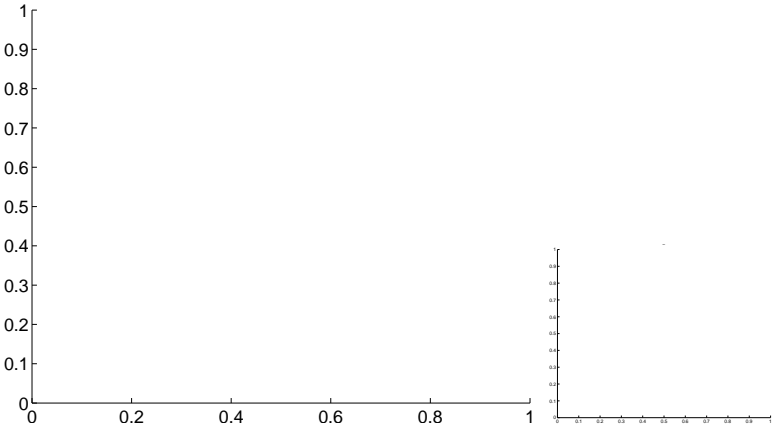
Q11 no OOT image



Q12 no difference image



Q12 no OOT image

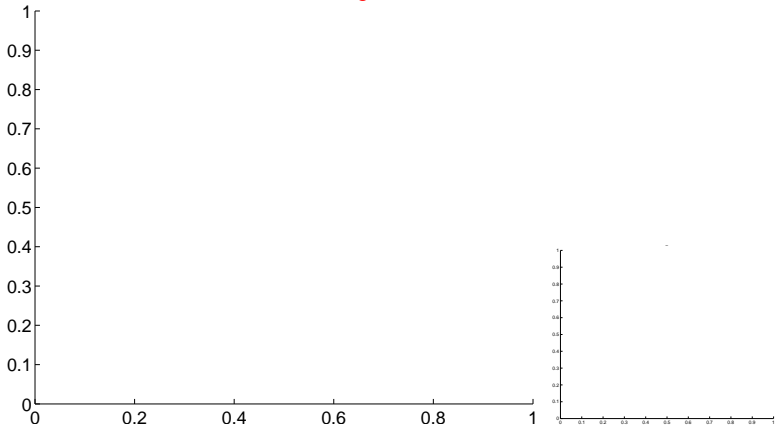


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

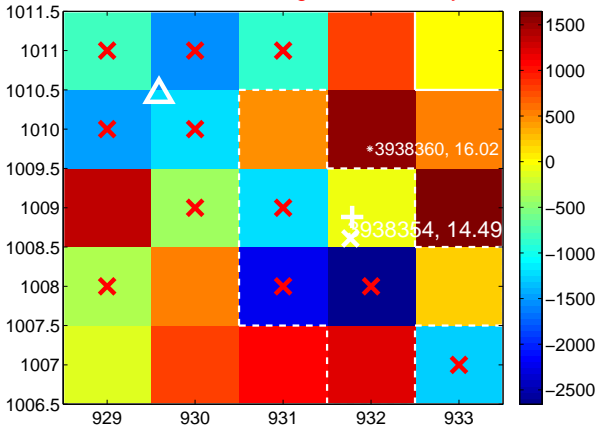
Q13 no difference image



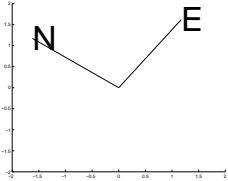
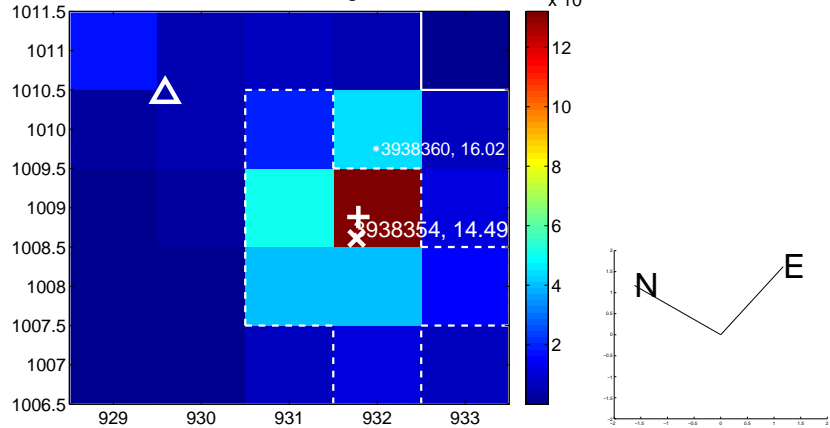
Q13 no OOT image



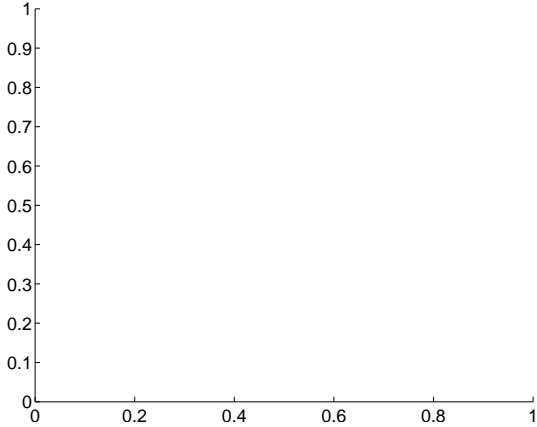
Q14 difference image. Poor Quality



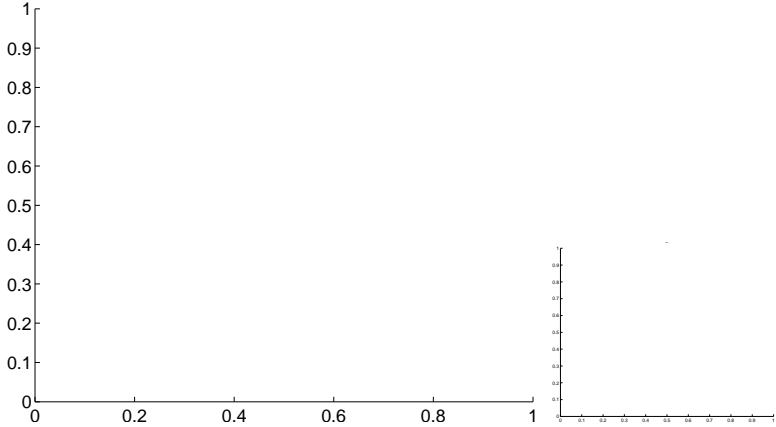
Q14 OOT image



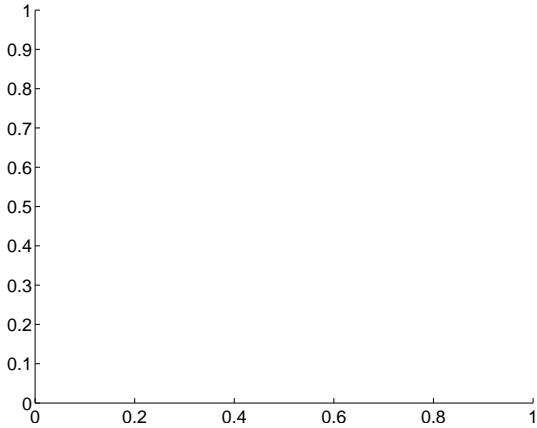
Q15 no difference image



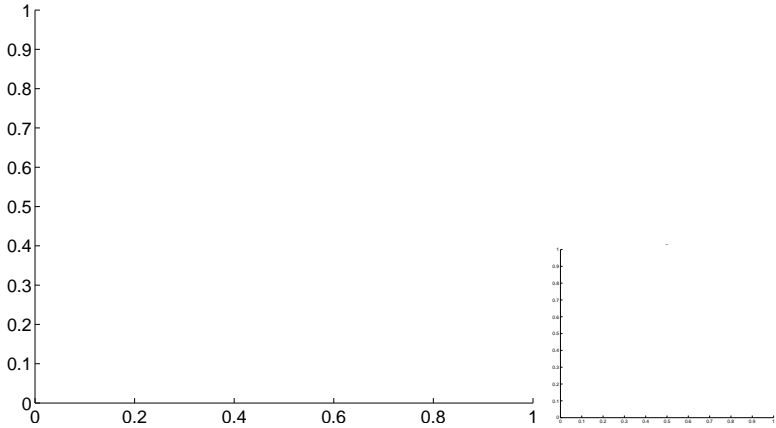
Q15 no OOT image



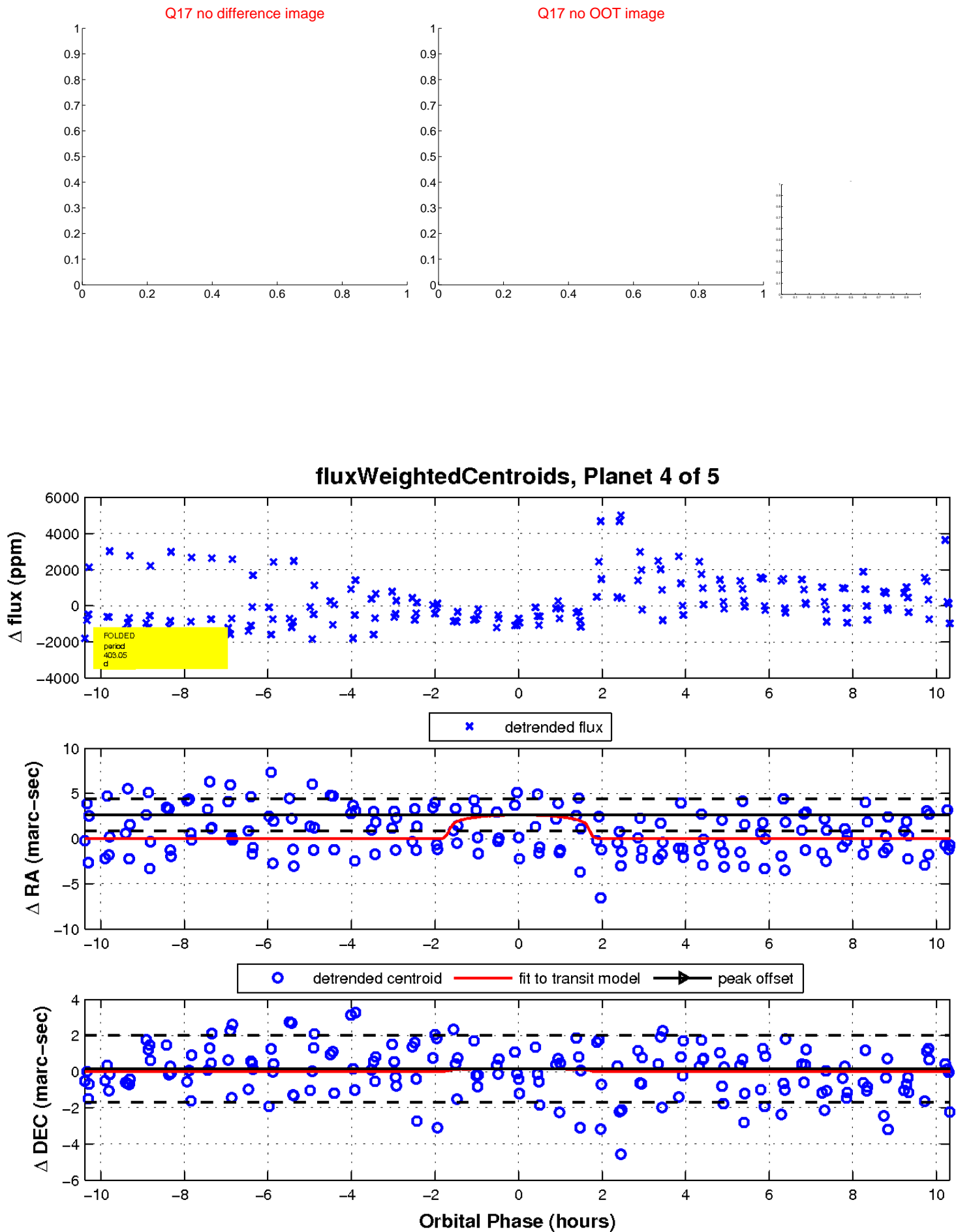
Q16 no difference image



Q16 no OOT image

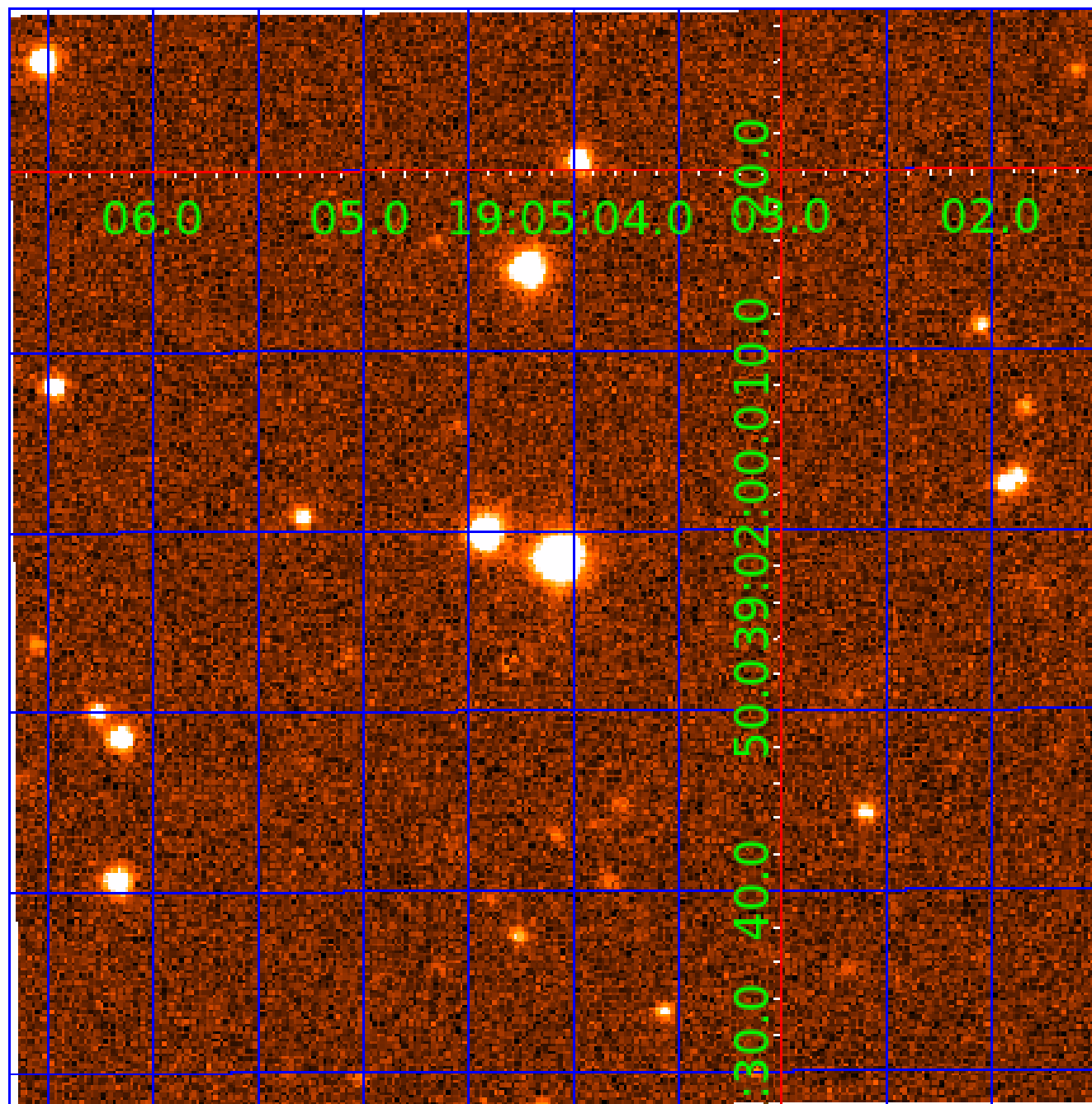


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003938354

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003938354-01	OBS	No	508.771168	432.319580	2504.1	3.684	14.5	10.5	0.78	5665	3.96	0.40
003938354-02	OBS	No	398.374141	182.477111	1472.8	7.990	13.4	5.4	0.78	5665	3.07	0.56
003938354-03	OBS	No	688.453771	139.638434	1827.3	4.734	11.6	6.2	0.78	5665	3.29	0.27
003938354-04	OBS	No	403.054353	148.085342	1609.0	3.521	14.3	8.1	0.78	5665	3.09	0.55
003938354-05	OBS	No	250.665292	364.773704	486.6	15.000	12.1	-1.0	0.78	5665	1.70	1.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003938354-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
003938354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
003938354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
003938354-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS

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

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

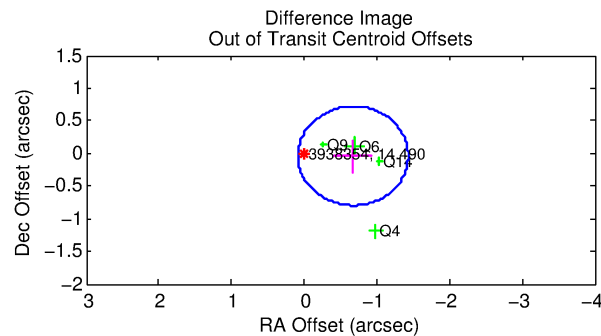
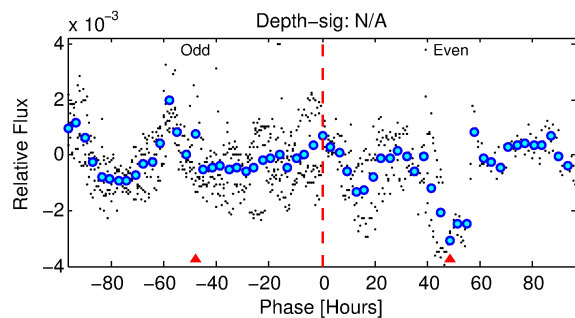
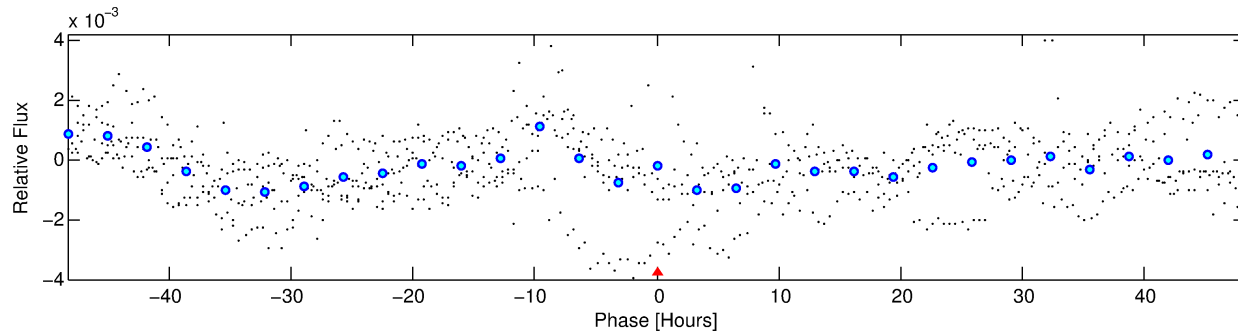
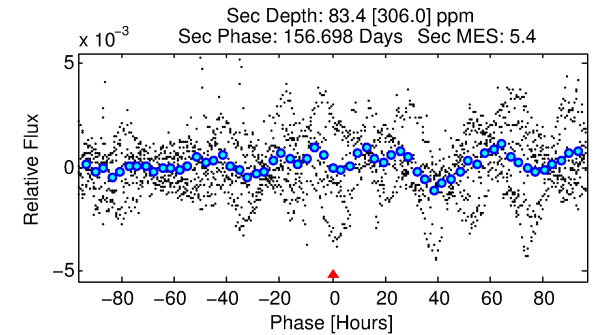
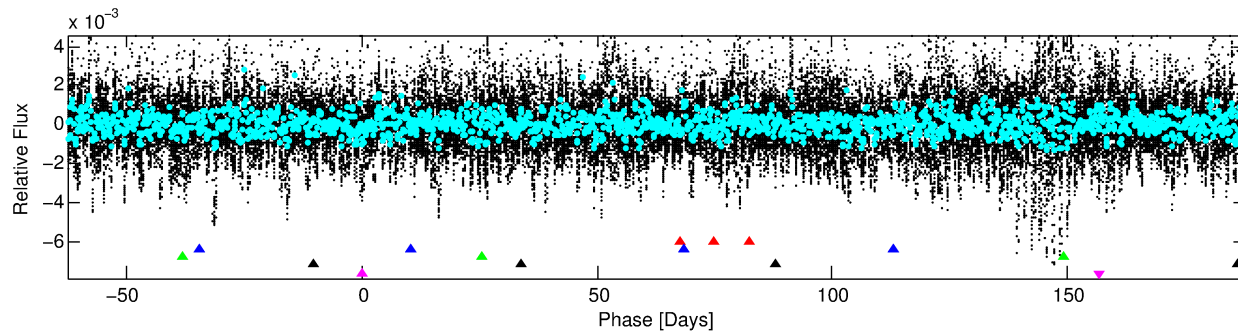
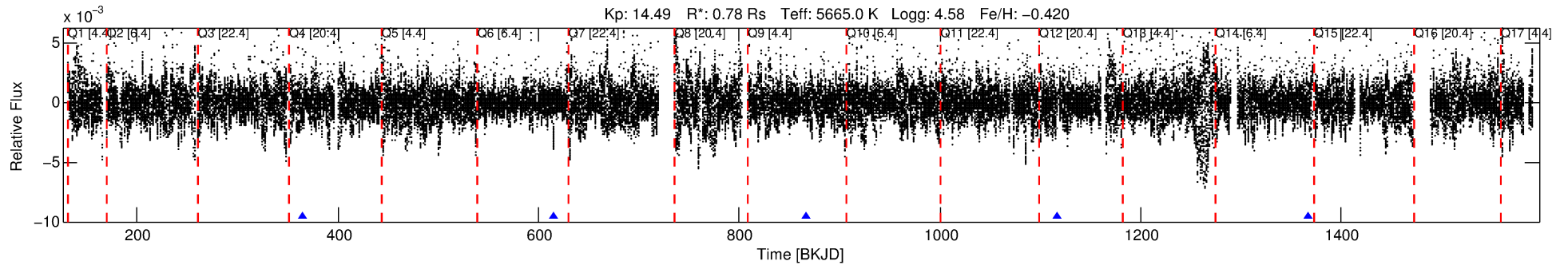
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003938354-05

No Significant Match Found

# DV One-Page Summary

KIC: 3938354 Candidate: 5 of 5 Period: 250.665 d



## TPS TCE Results:

Period = 250.66529 d  
Epoch = 364.7737 BKJD

DV fit results are unavailable

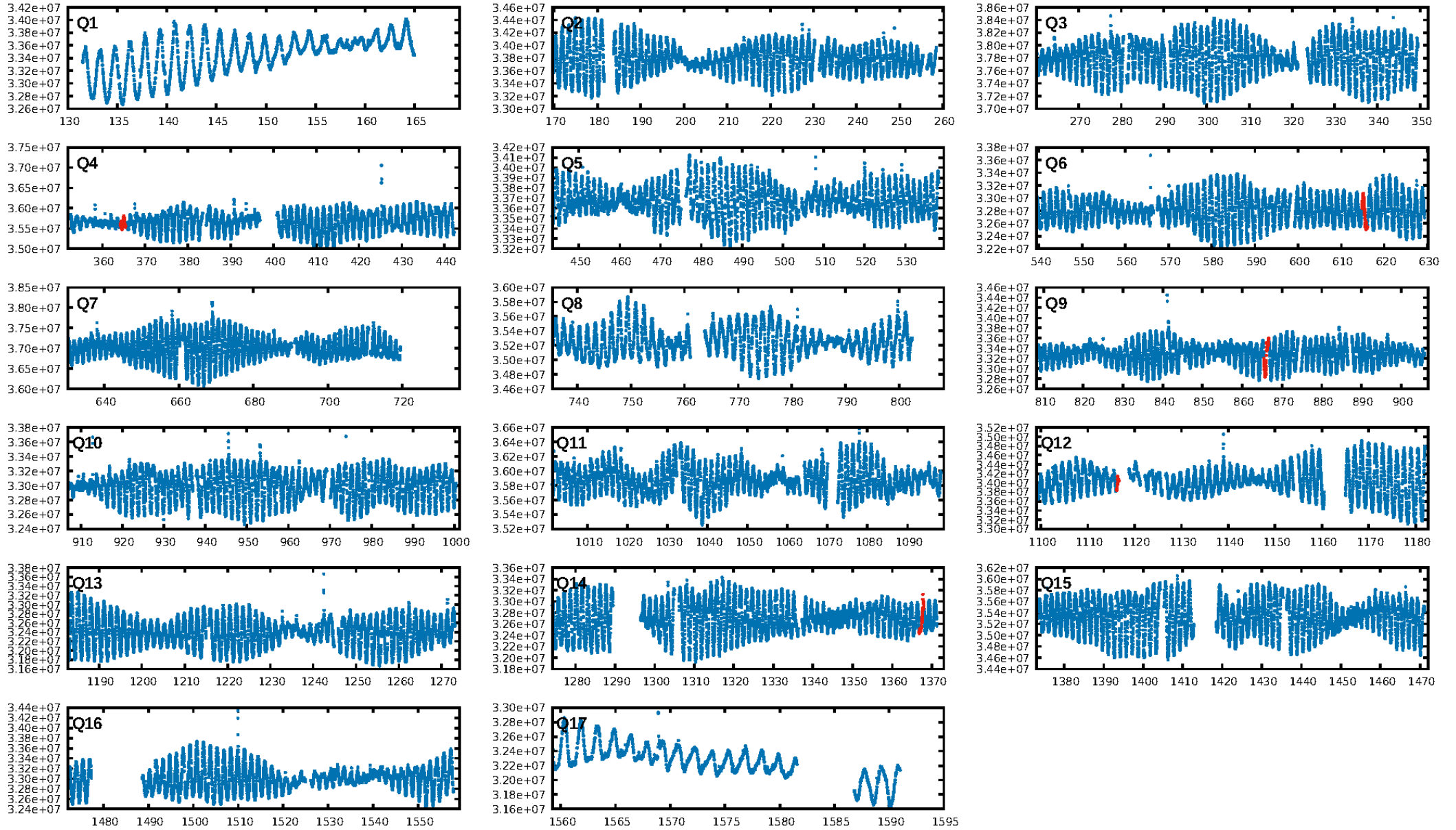
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [208.59 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 0.9546  
Centroid-sig: 23.5%  
Centroid-so: 0.745 arcsec [1.22 $\sigma$ ]  
OotOffset-rm: 0.671 arcsec [2.65 $\sigma$ ]  
KicOffset-rm: 0.202 arcsec [0.79 $\sigma$ ]  
OotOffset-st: 2/0/1/1 [4]  
KicOffset-st: 2/0/1/1 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

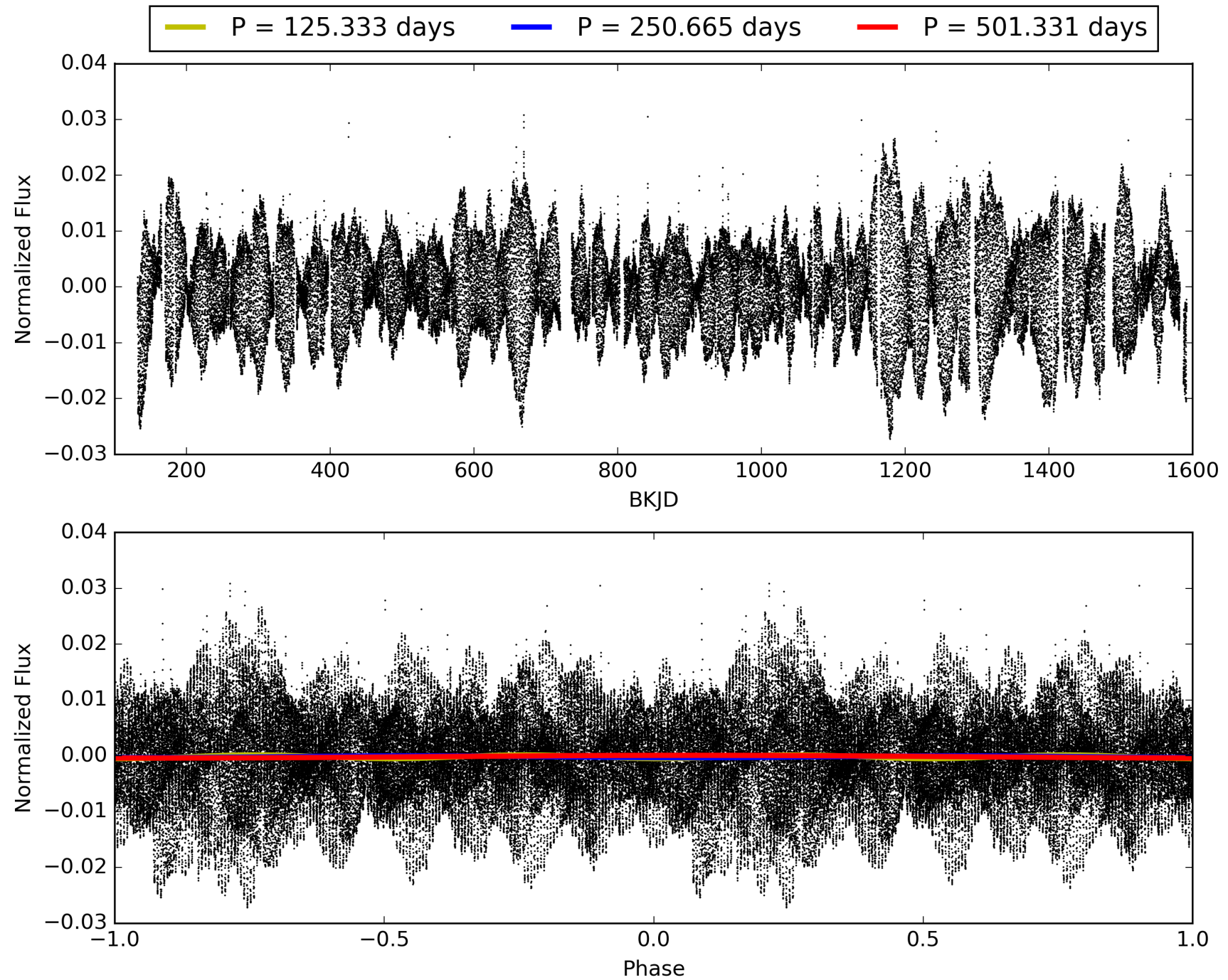
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:50:03 Z

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

# TCE 003938354-05, PDC Light Curves

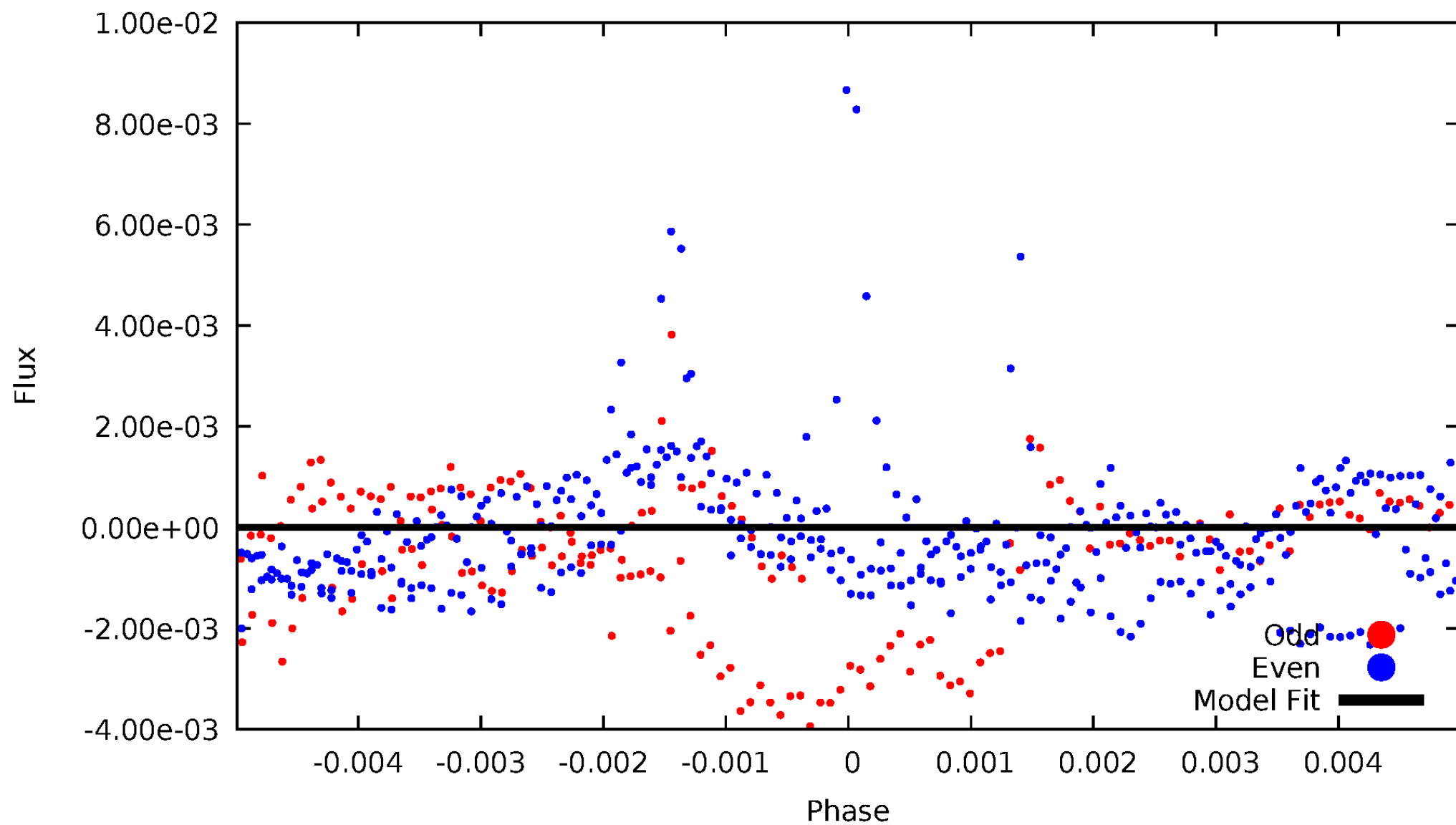


TCE 003938354-05



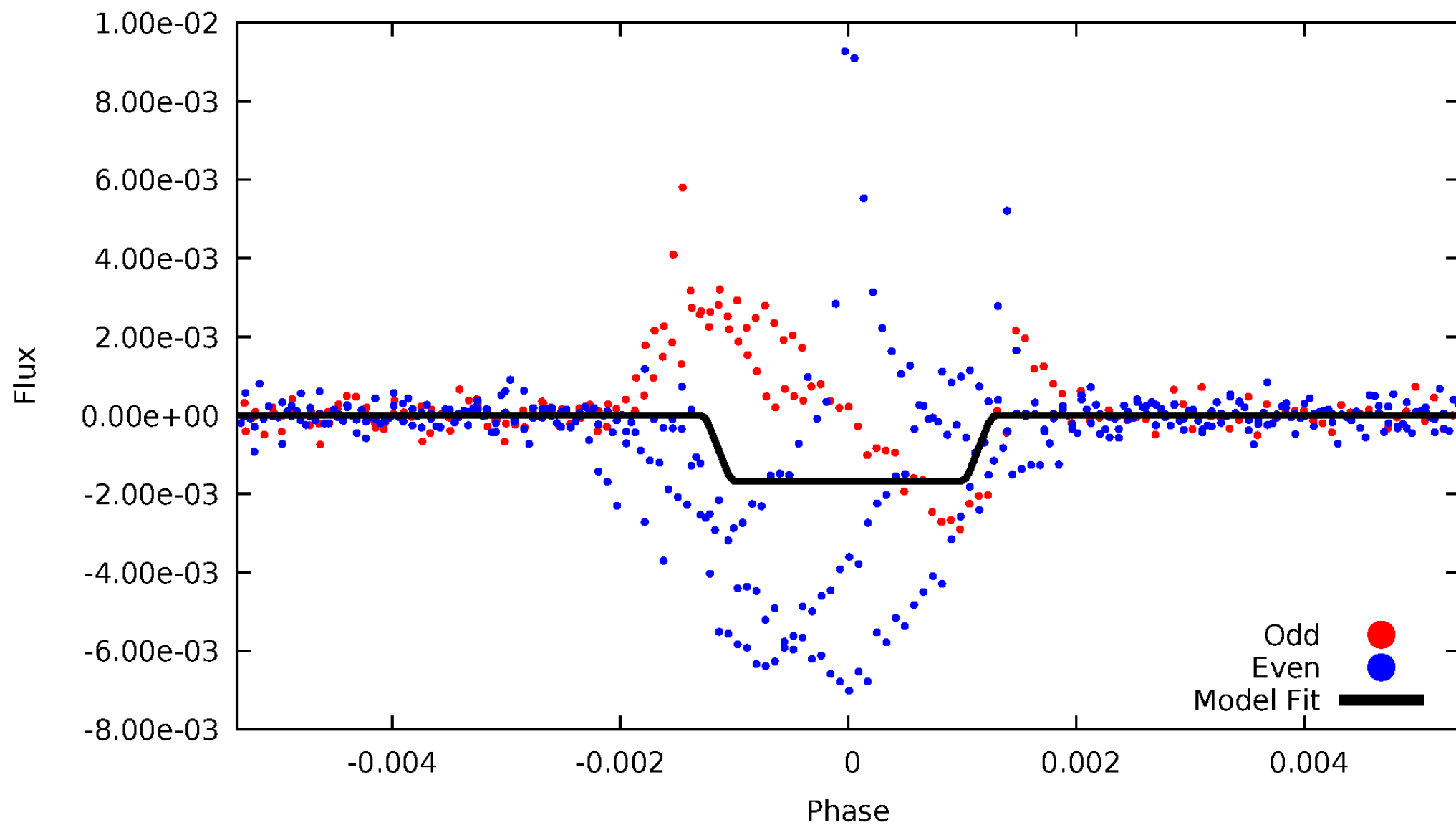
# DV Odd/Even

TCE 003938354-05



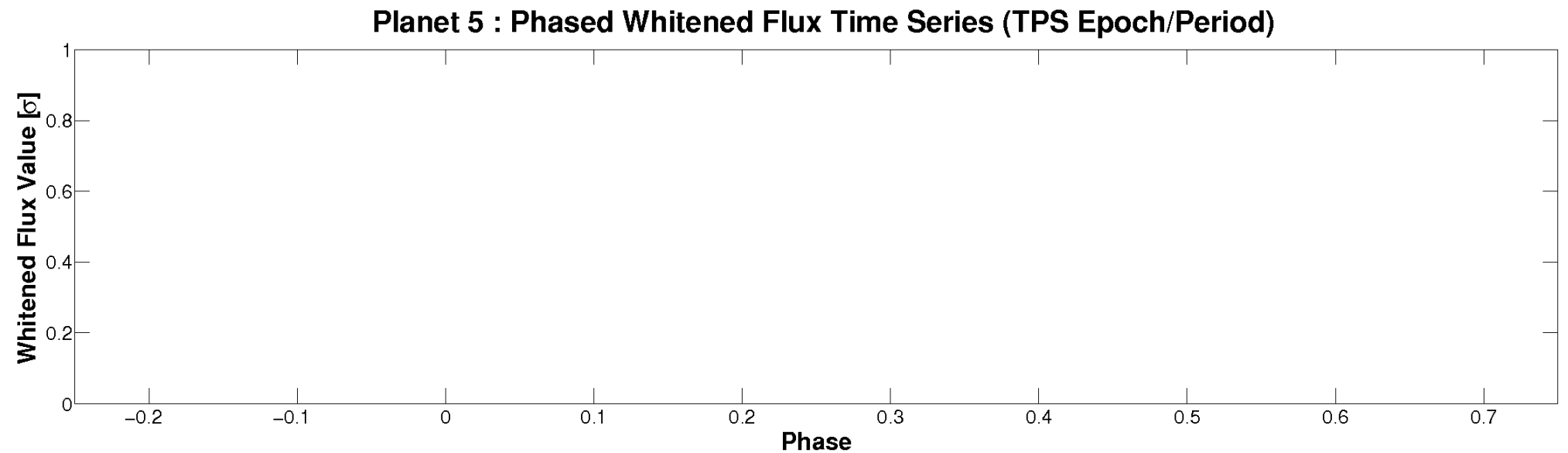
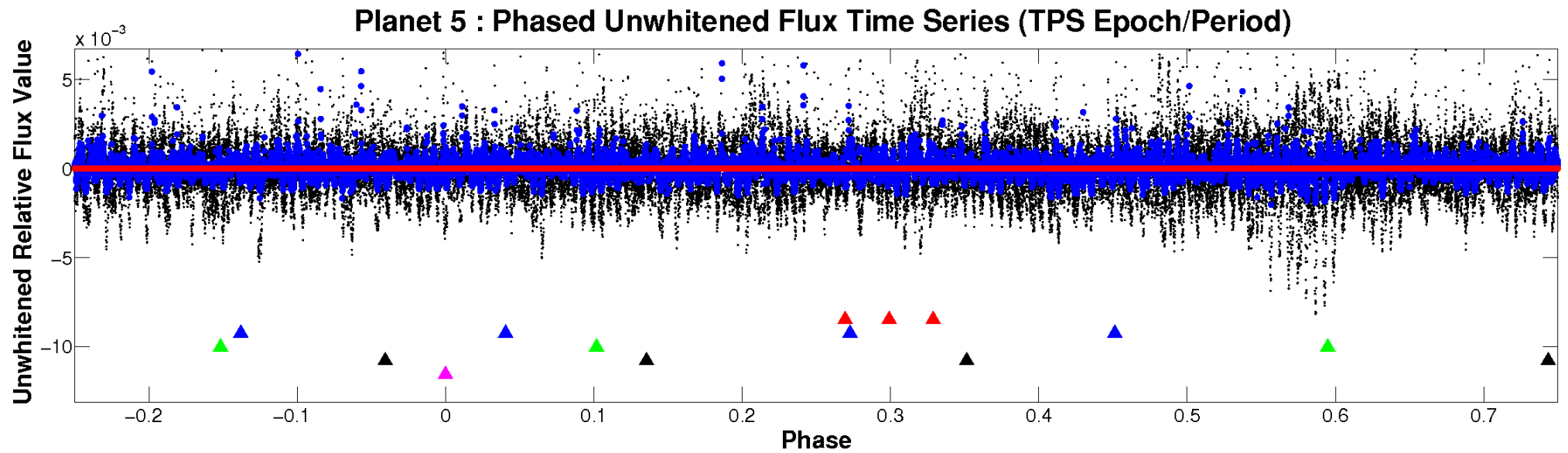
# ALT Odd/Even

TCE 003938354-05



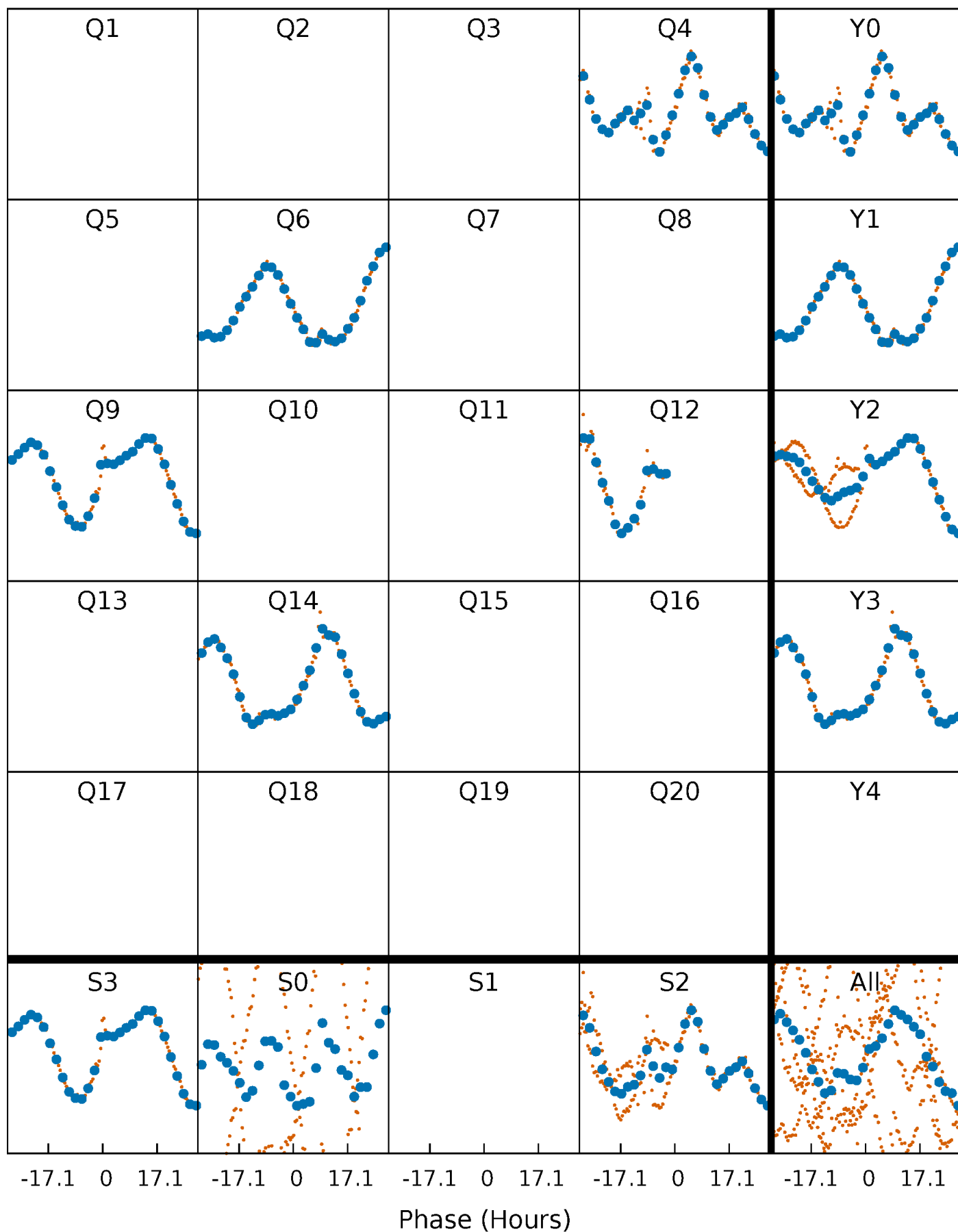


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

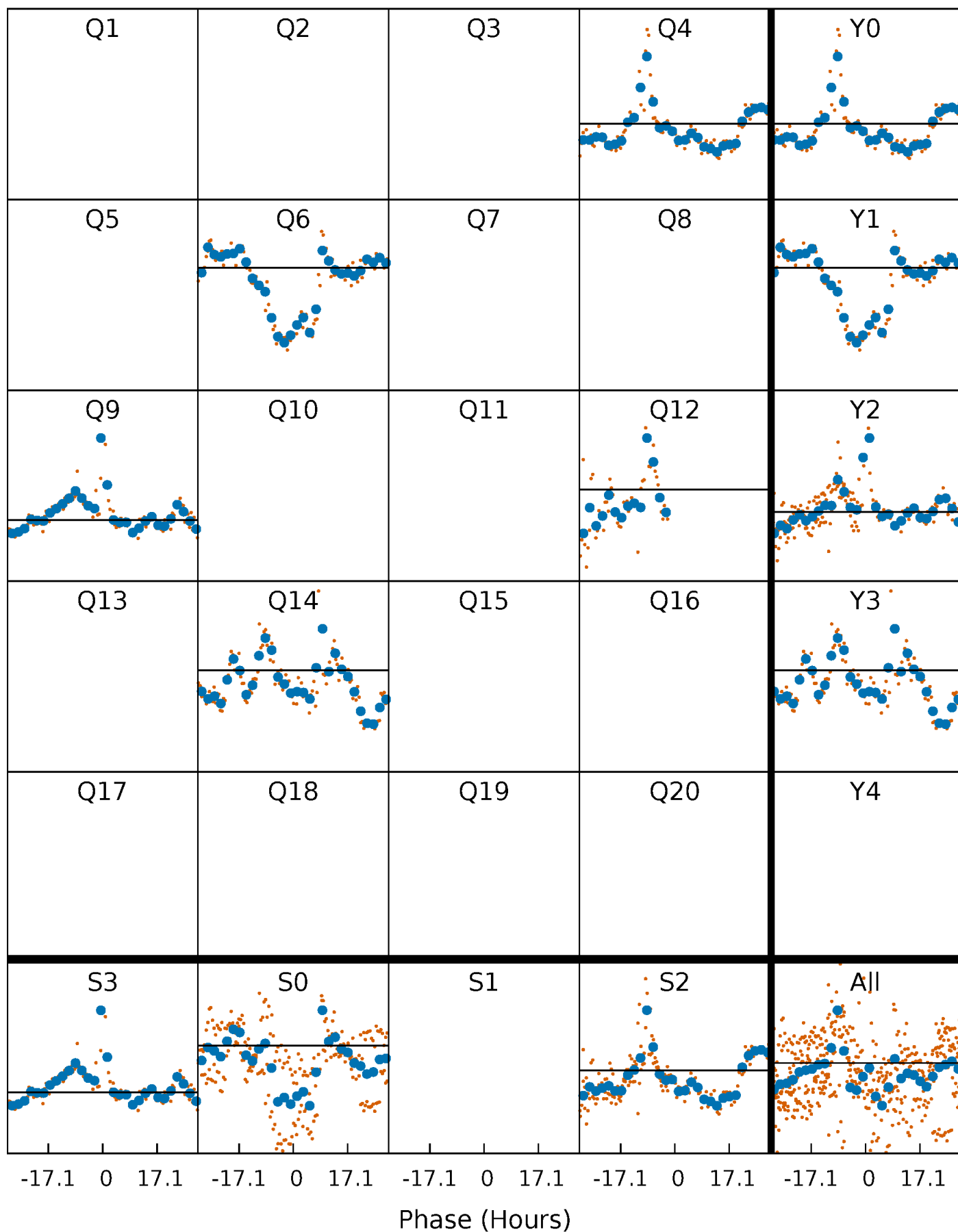
TCE 003938354-05     $P=250.665292$  Days     $T_0=364.773704$  (BKJD)





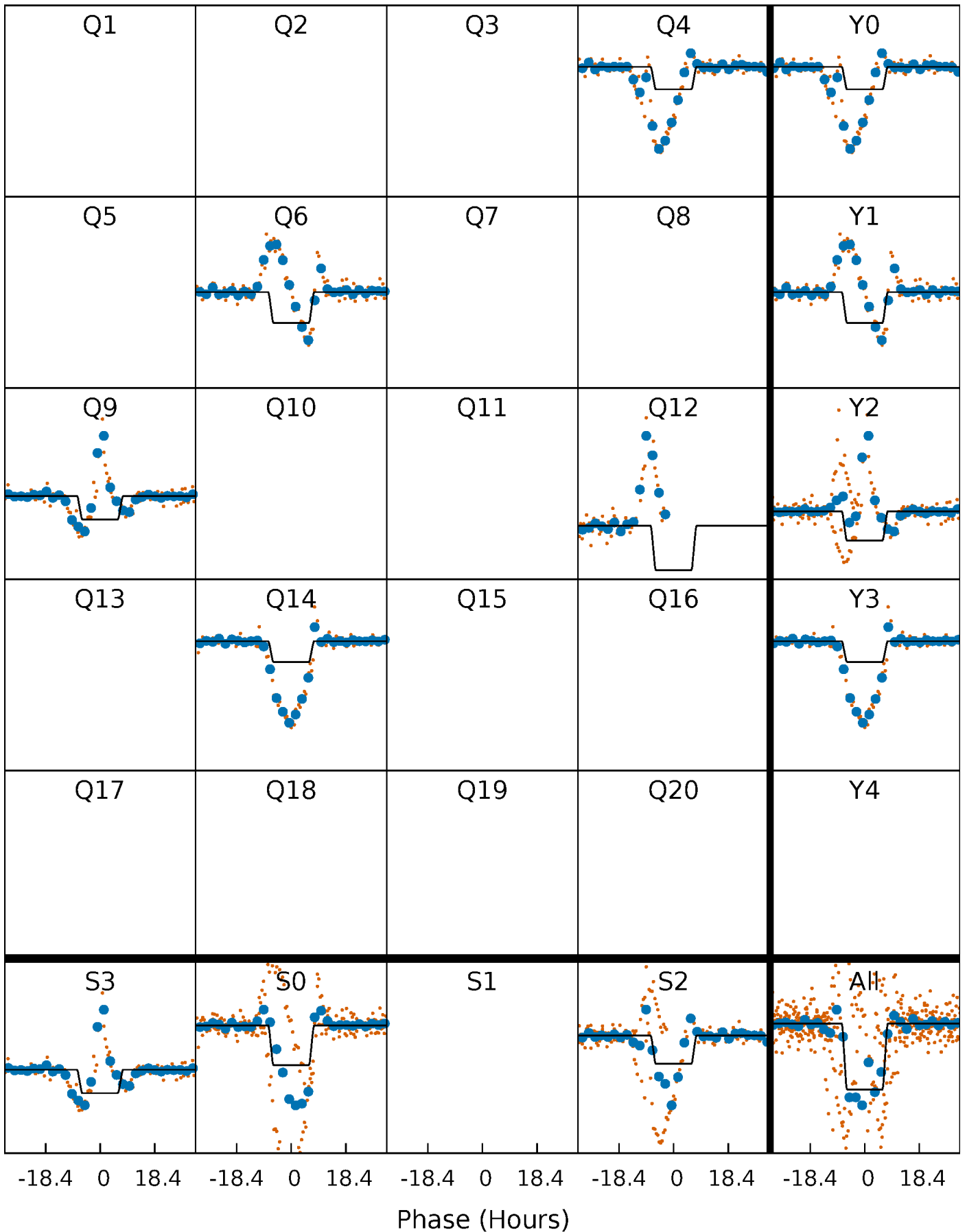
# DV Quarter-Phased Transit Curves

TCE 003938354-05     $P=250.665292$  Days     $T_0=364.773704$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

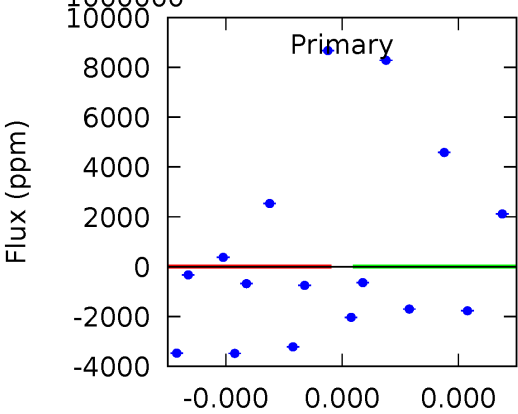
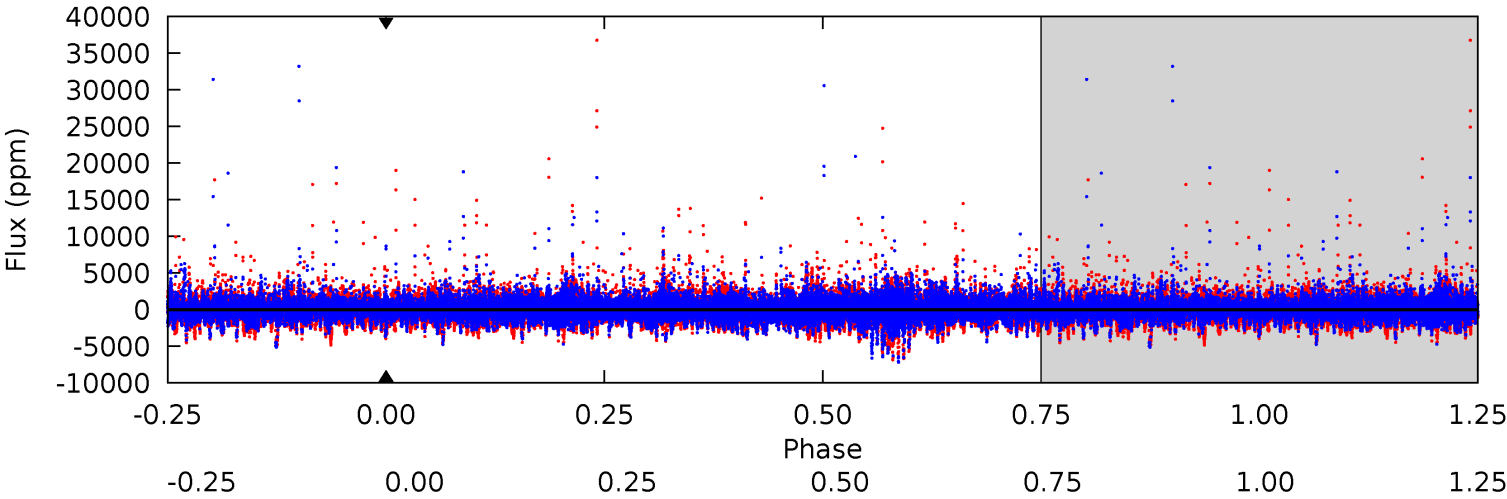
TCE 003938354-05     $P=250.665292$  Days     $T_0=364.777020$  (BKJD)



# DV Model-Shift Uniqueness Test

003938354-05, P = 250.665292 Days, E = 114.108412 Days

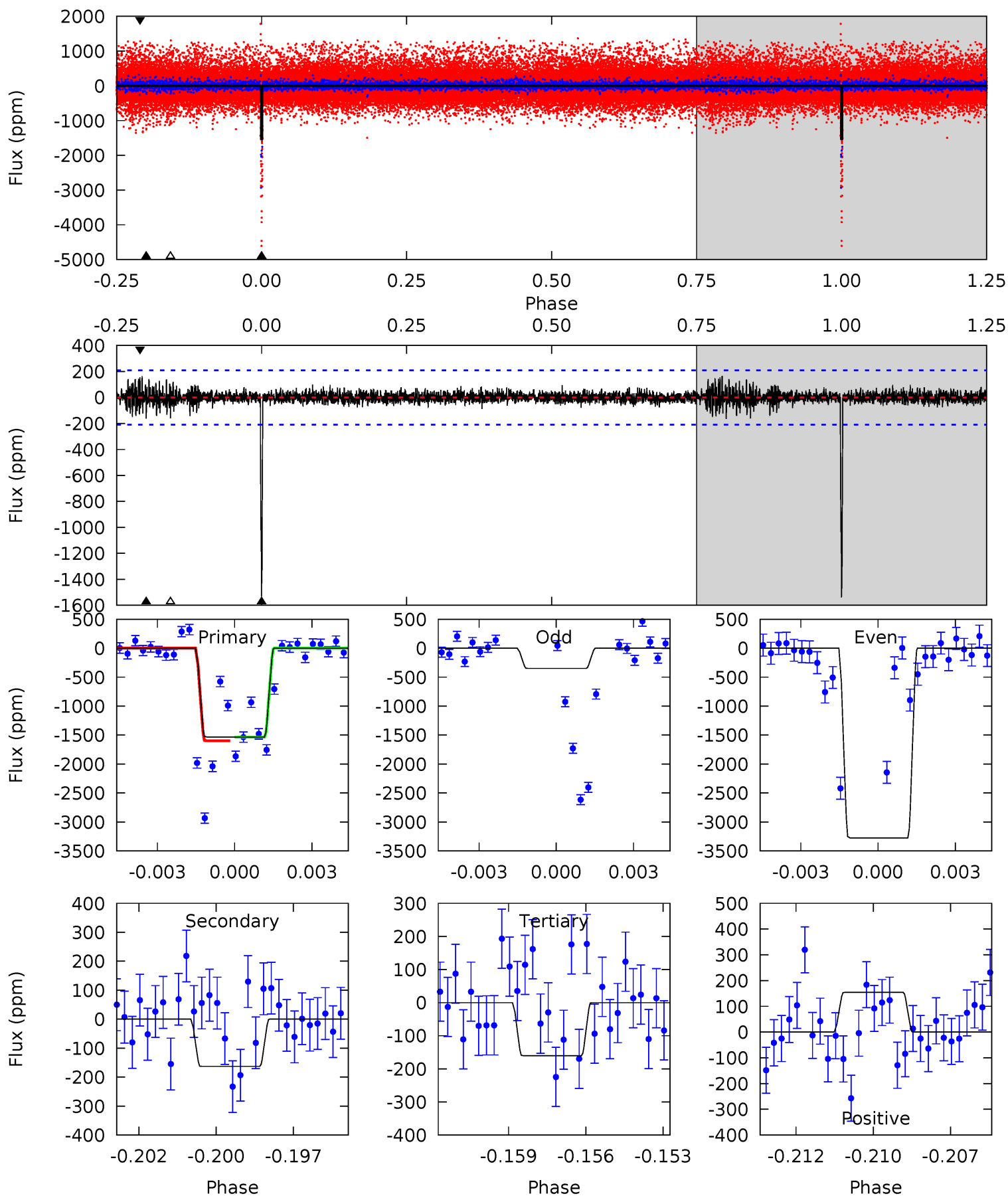
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003938354-05, P = 250.665292 Days, E = 114.111728 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
38.6	4.11	4.04	3.89	5.28	3.02	0.74	34.6	34.8	0.07	0.22	43.0	-21.8	0.10	0



### Stellar Parameters For KIC 003938354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5665^{+169}_{-152}$	$4.579^{+0.038}_{-0.152}$	$-0.420^{+0.300}_{-0.300}$	$0.776^{+0.182}_{-0.073}$	$0.834^{+0.088}_{-0.080}$	$2.510^{+0.516}_{-1.083}$
	+3%/-3%	+1%/-3%	+71%/-71%	+23%/-9%	+11%/-10%	+21%/-43%
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 003938354-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$6.74^{+7.40}_{-4.70}$	$366^{+20}_{-14}$	$4299^{+16592}_{-22132}$	$9363^{+1255158}_{-1005210}$
Alt.	$-163 \pm 40$	$7.19^{+7.47}_{-4.84}$	$366^{+20}_{-16}$	$2926^{+1246}_{-504}$	$900^{+7696}_{-689}$

$T_{max}$  = 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

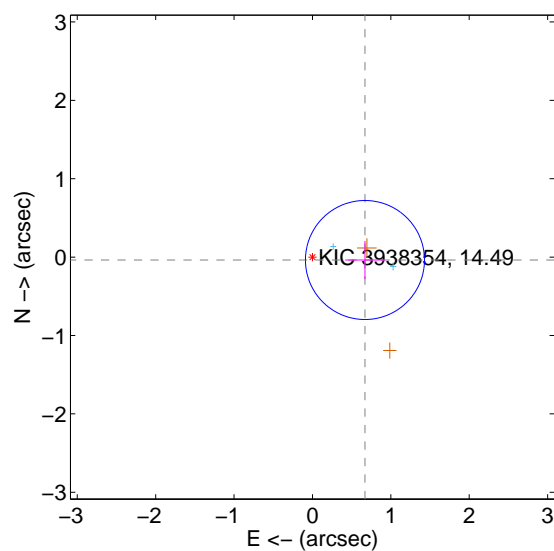
Supplemental centroid analysis for 003938354-05. Kepler magnitude: 14.49. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

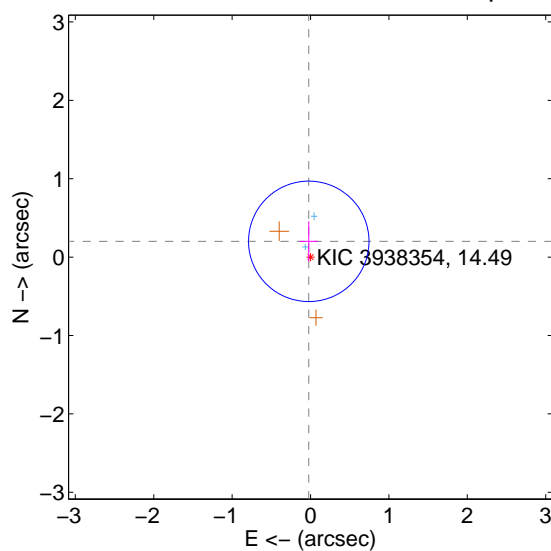
The direct PRF centroid is offset from the target star catalog position by about 1.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.671 \pm 0.253$	2.65	$-0.670 \pm 0.253$	$-0.037 \pm 0.243$
PRF-fit source offset from KIC position	$0.202 \pm 0.256$	0.79	$0.022 \pm 0.117$	$0.201 \pm 0.256$
photometric centroid source offset	$0.75 \pm 0.61$	1.22	$0.73 \pm 0.62$	$-0.17 \pm 0.40$

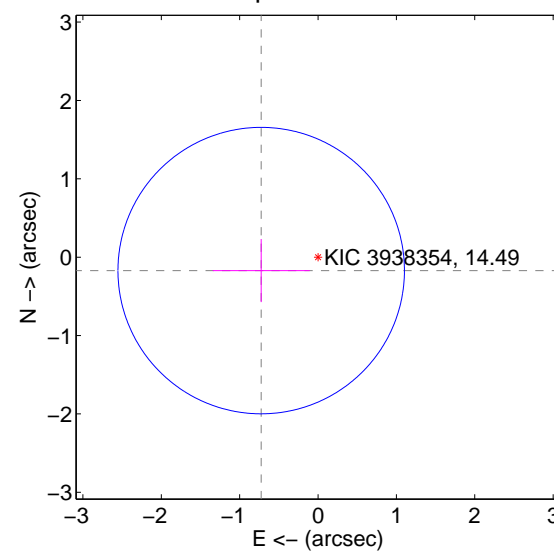
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

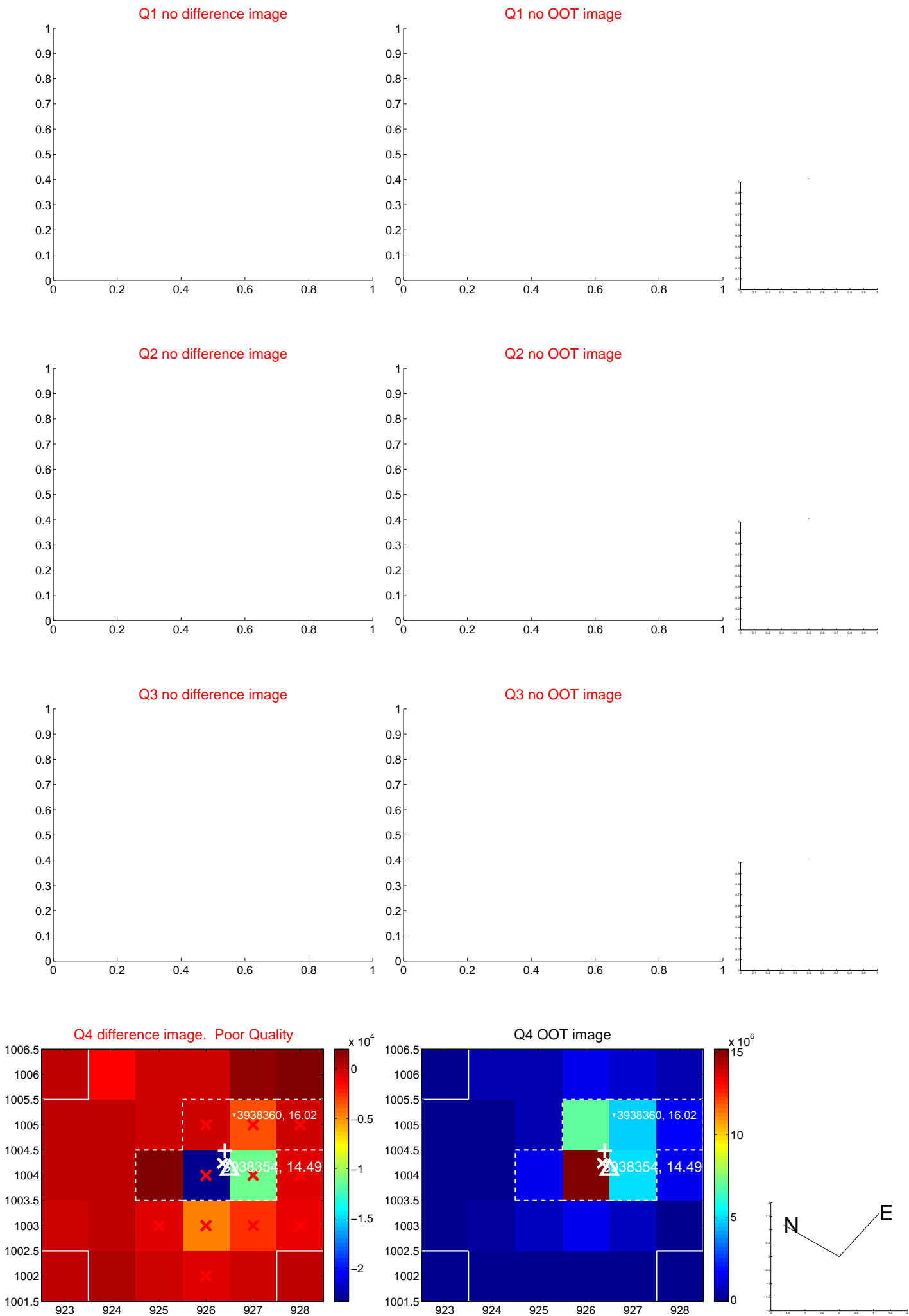


offset from photometric centroids

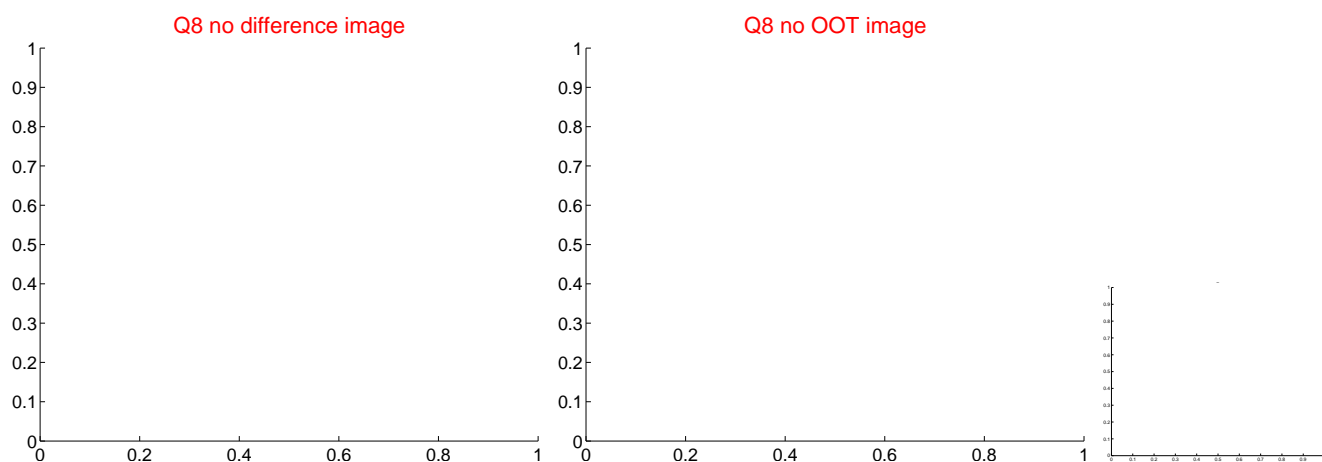
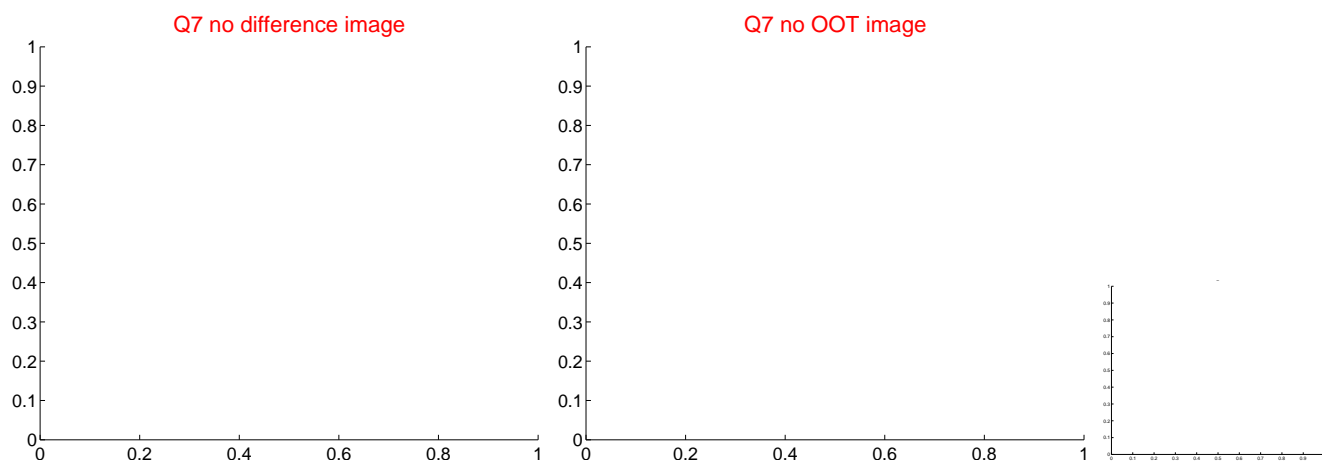
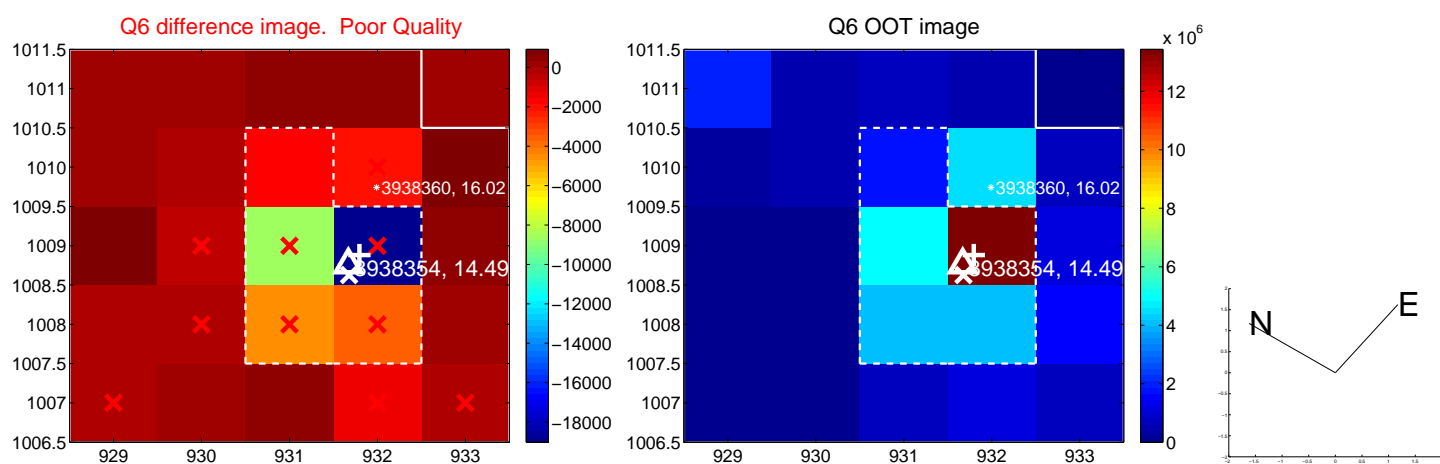
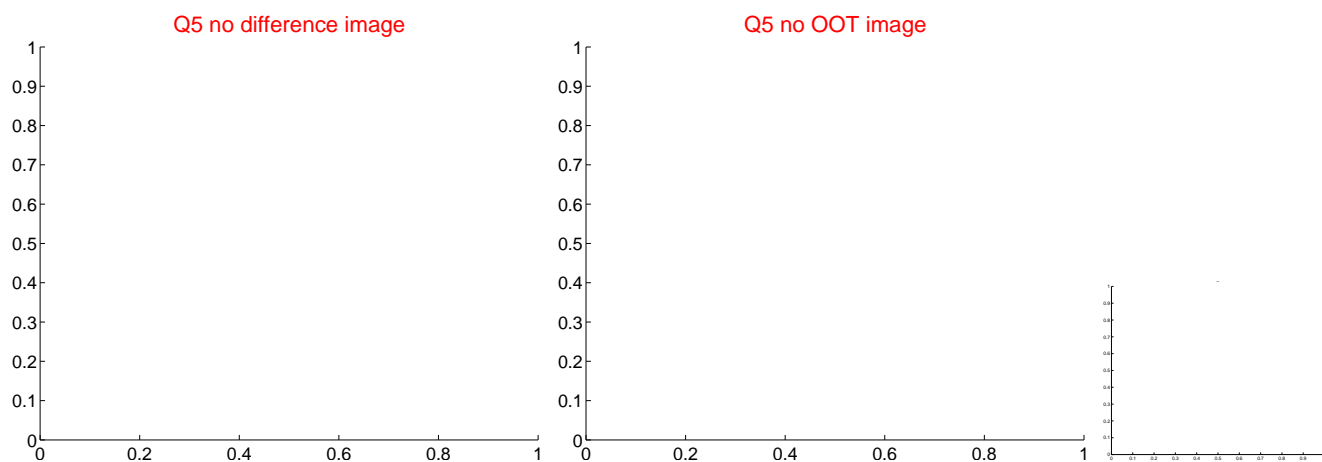


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

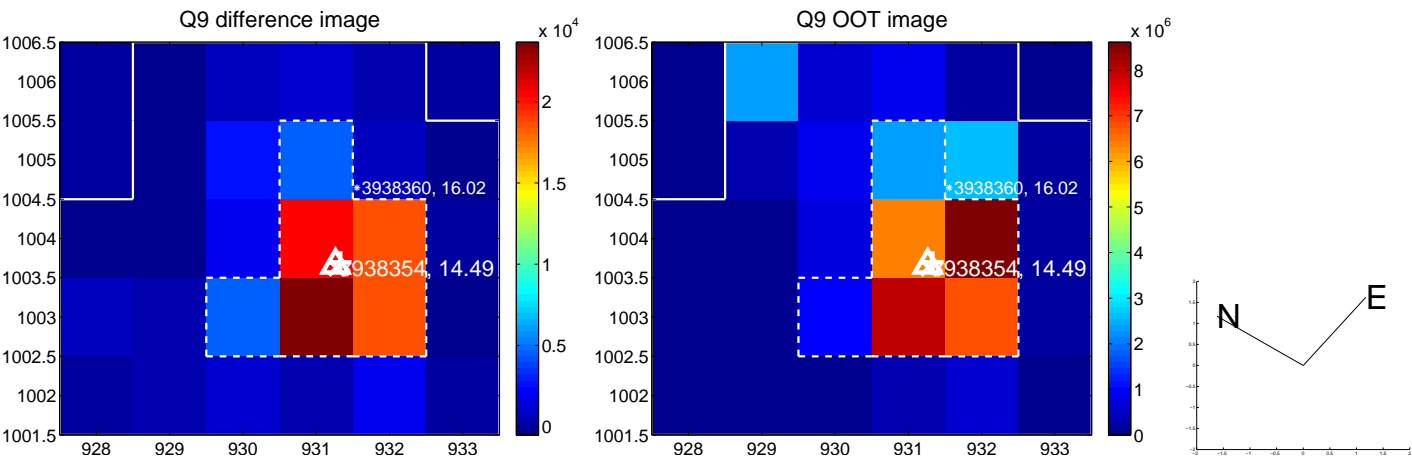


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

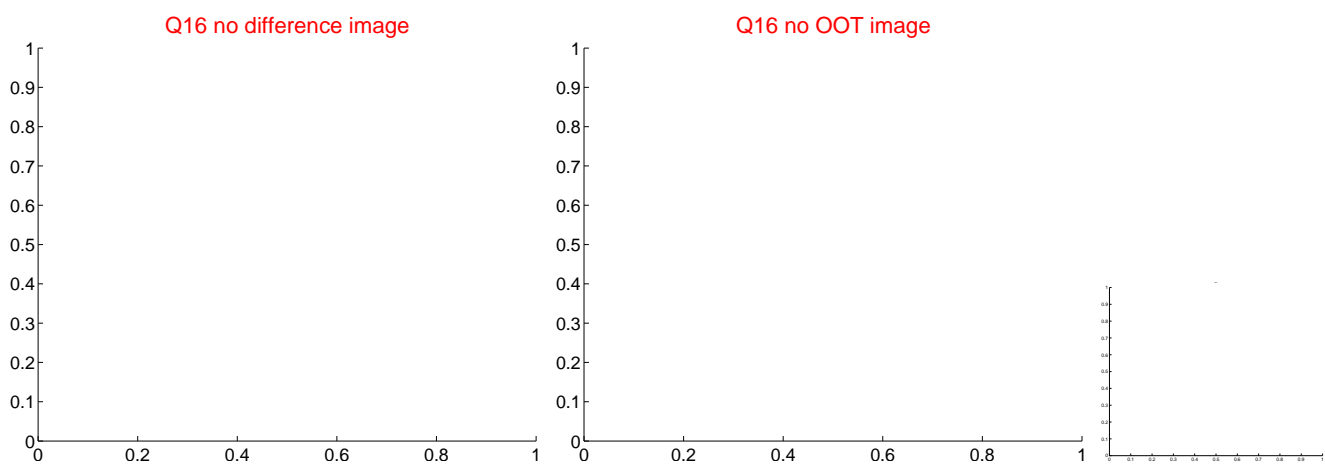
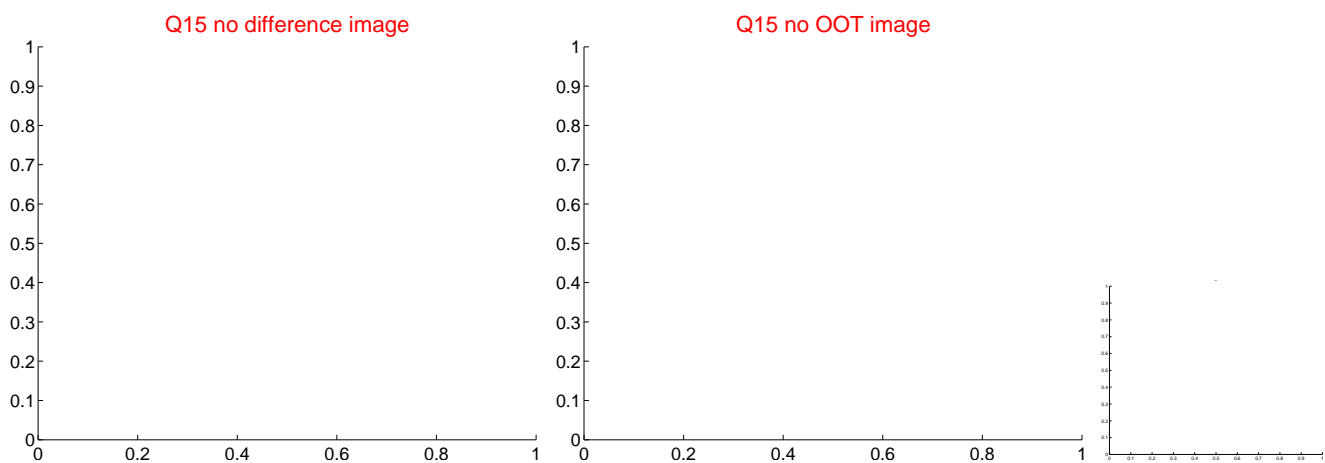
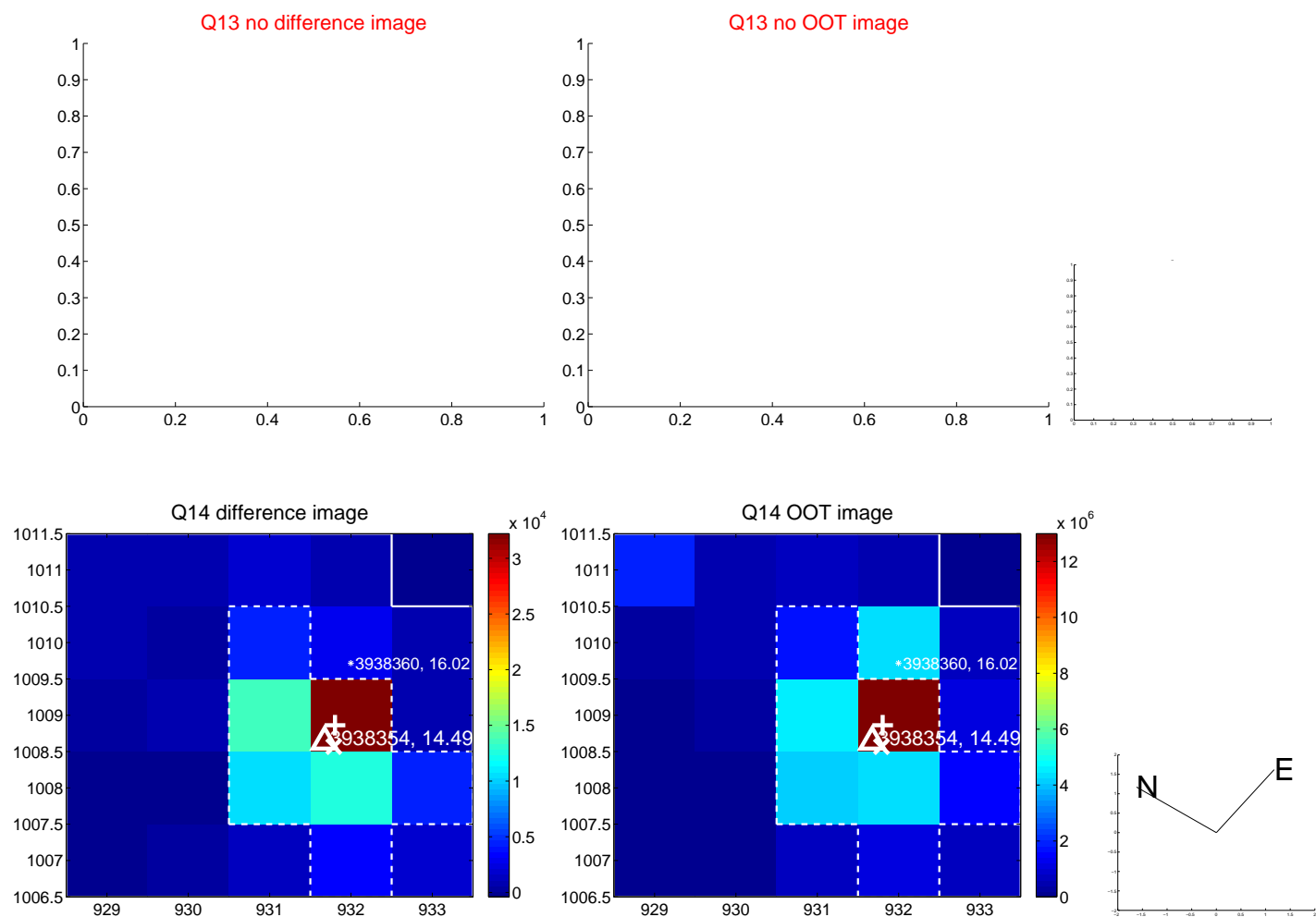




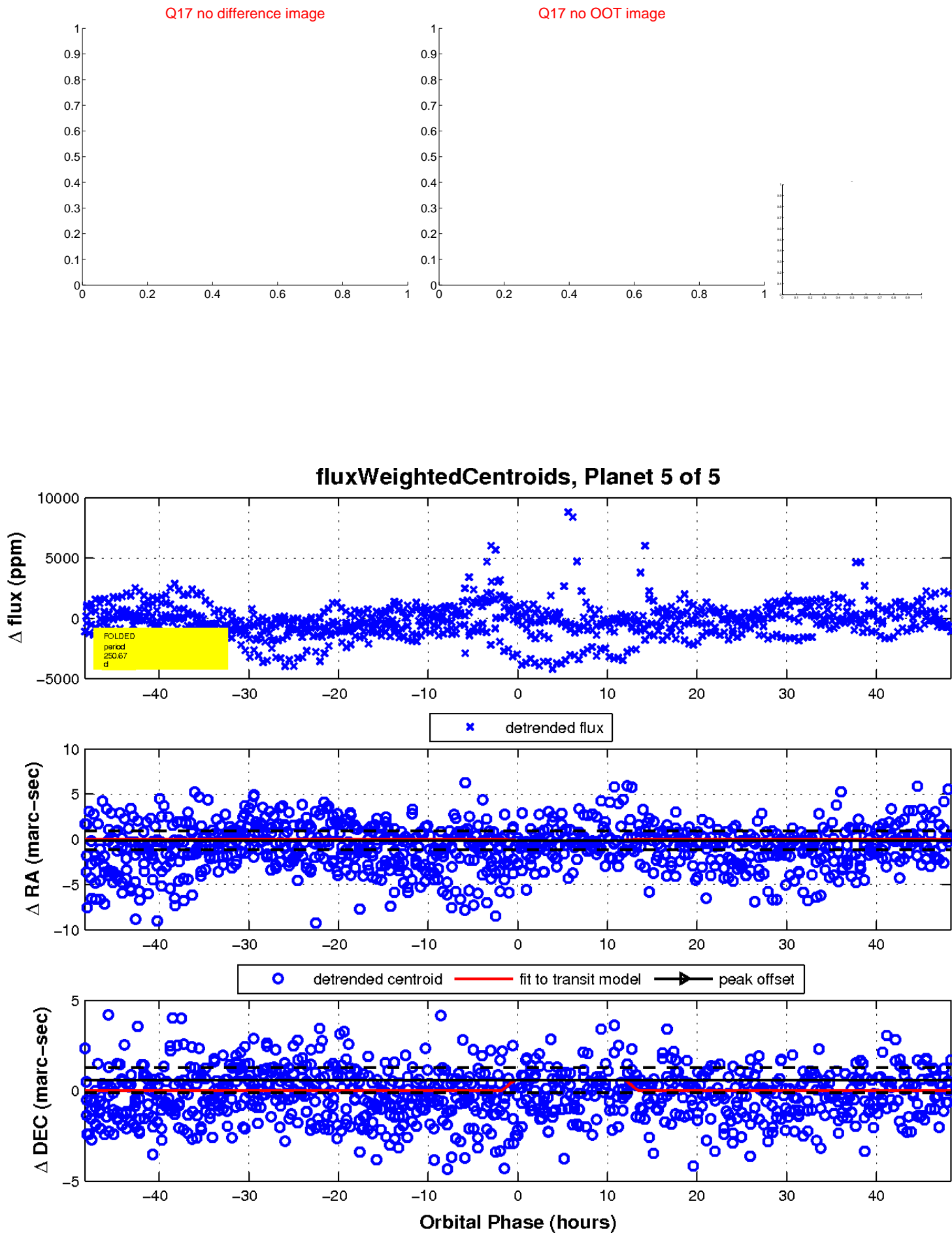
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

