

# KIC 005546767

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005546767-01	OBS	No	2.977980	132.293323	53.2	10.358	8.5	5.9	2.10	6987	1.63	4270.18
005546767-02	OBS	No	388.623340	249.226040	860.3	8.120	9.1	7.4	2.10	6987	7.37	6.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005546767-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005546767-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT

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

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

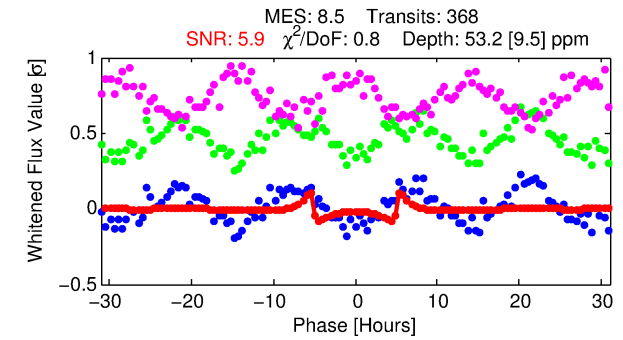
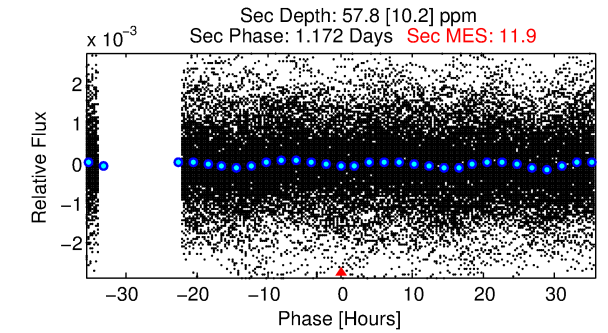
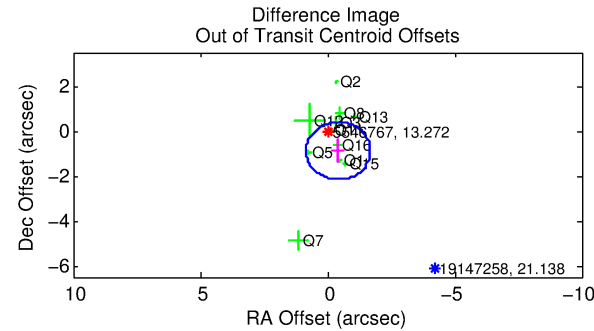
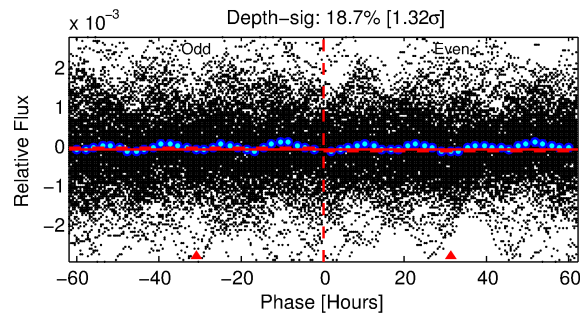
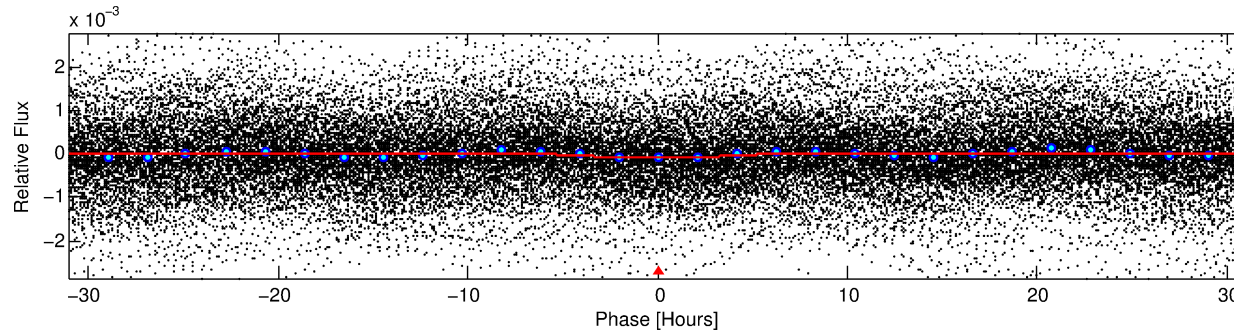
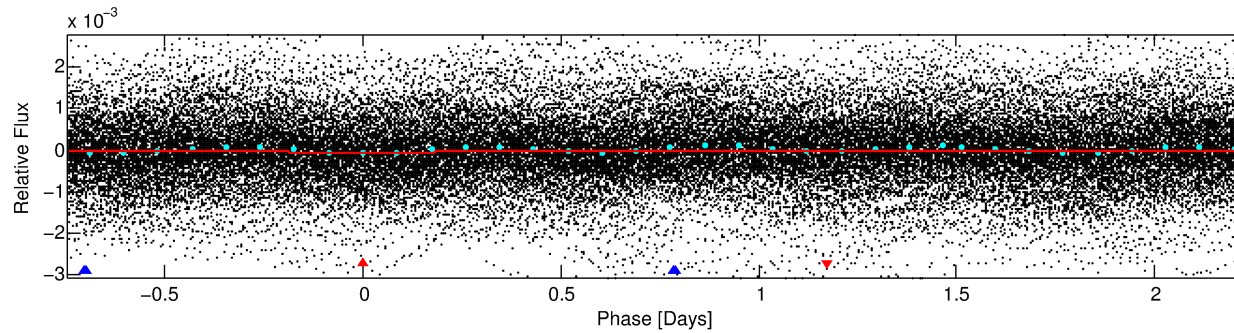
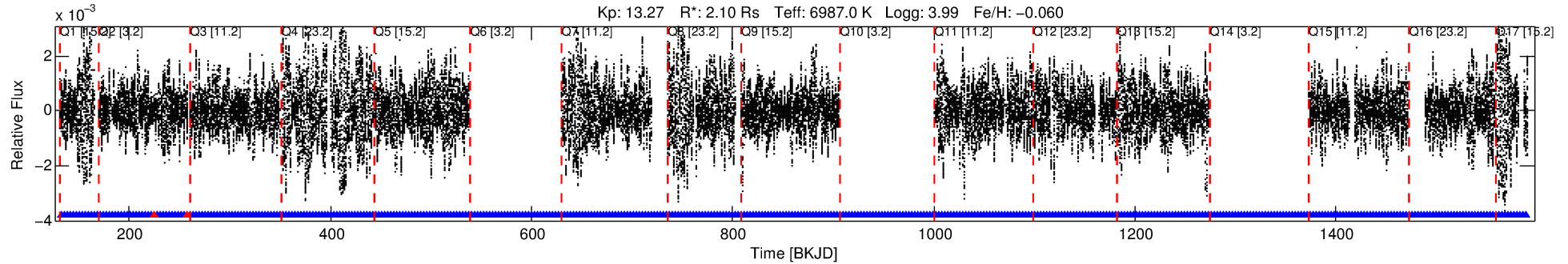
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005546767-01

No Significant Match Found

# DV One-Page Summary

KIC: 5546767 Candidate: 1 of 2 Period: 2.978 d



## DV Fit Results:

Period = 2.97798 [0.00002] d  
Epoch = 132.2933 [0.0041] BKJD  
Rp/R\* = 0.0071 [0.0016]  
a/R\* = 1.84 [1.59]  
b = 0.67 [1.02]  
Seff = 4270.17 [1331.88]  
Teq = 2061 [161] K  
Rp = 1.63 [0.53] Re  
a = 0.0470 [0.0096] AU  
Ag = 26.38 [15.28] [1.66 $\sigma$ ]  
Teffp = 7223 [890] K [5.71 $\sigma$ ]

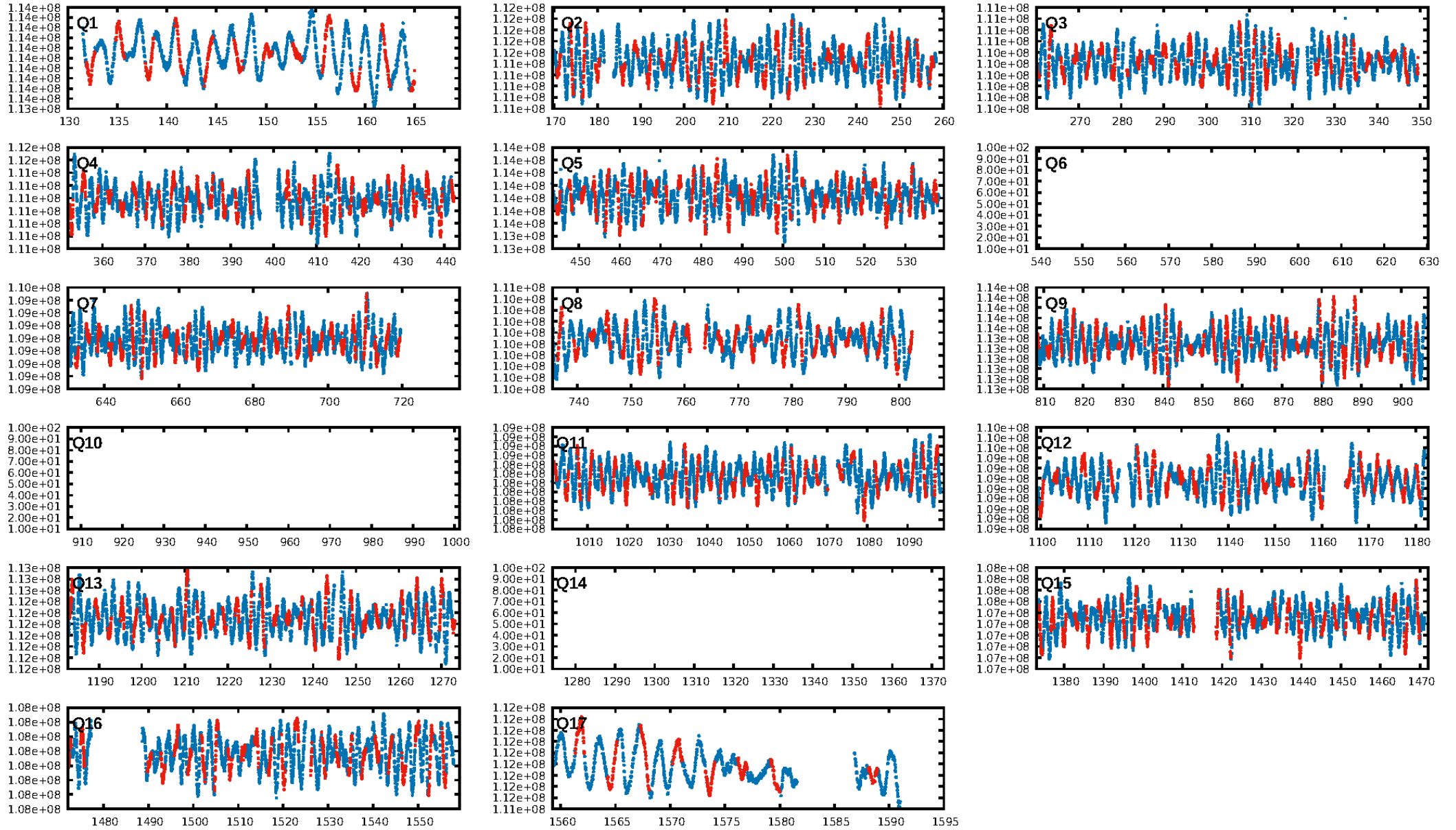
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [703.23 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.75e-14  
RollingBand-fgt: 0.99 [346/348]  
GhostDiagnostic-chr: 1.325  
Centroid-sig: 61.5%  
Centroid-so: 0.153 arcsec [0.30 $\sigma$ ]  
OotOffset-rm: 0.983 arcsec [2.32 $\sigma$ ]  
OotOffset-st: 1/4/3/3 [11]  
KicOffset-rm: 0.982 arcsec [2.26 $\sigma$ ]  
KicOffset-st: 1/4/3/3 [11]  
DiffImageQuality-fgm: 0.64 [7/11]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:42:02 Z

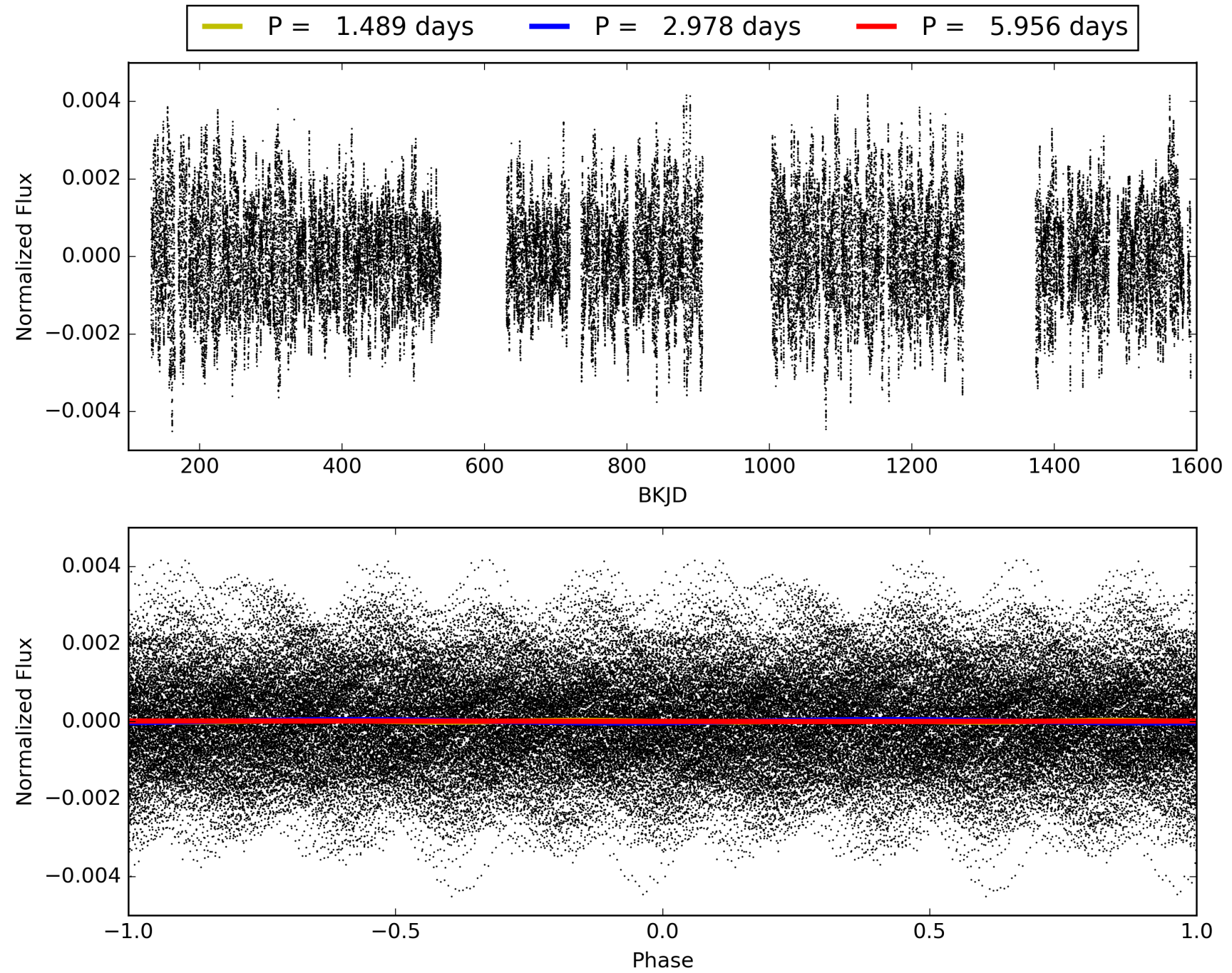
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005546767-01, PDC Light Curves



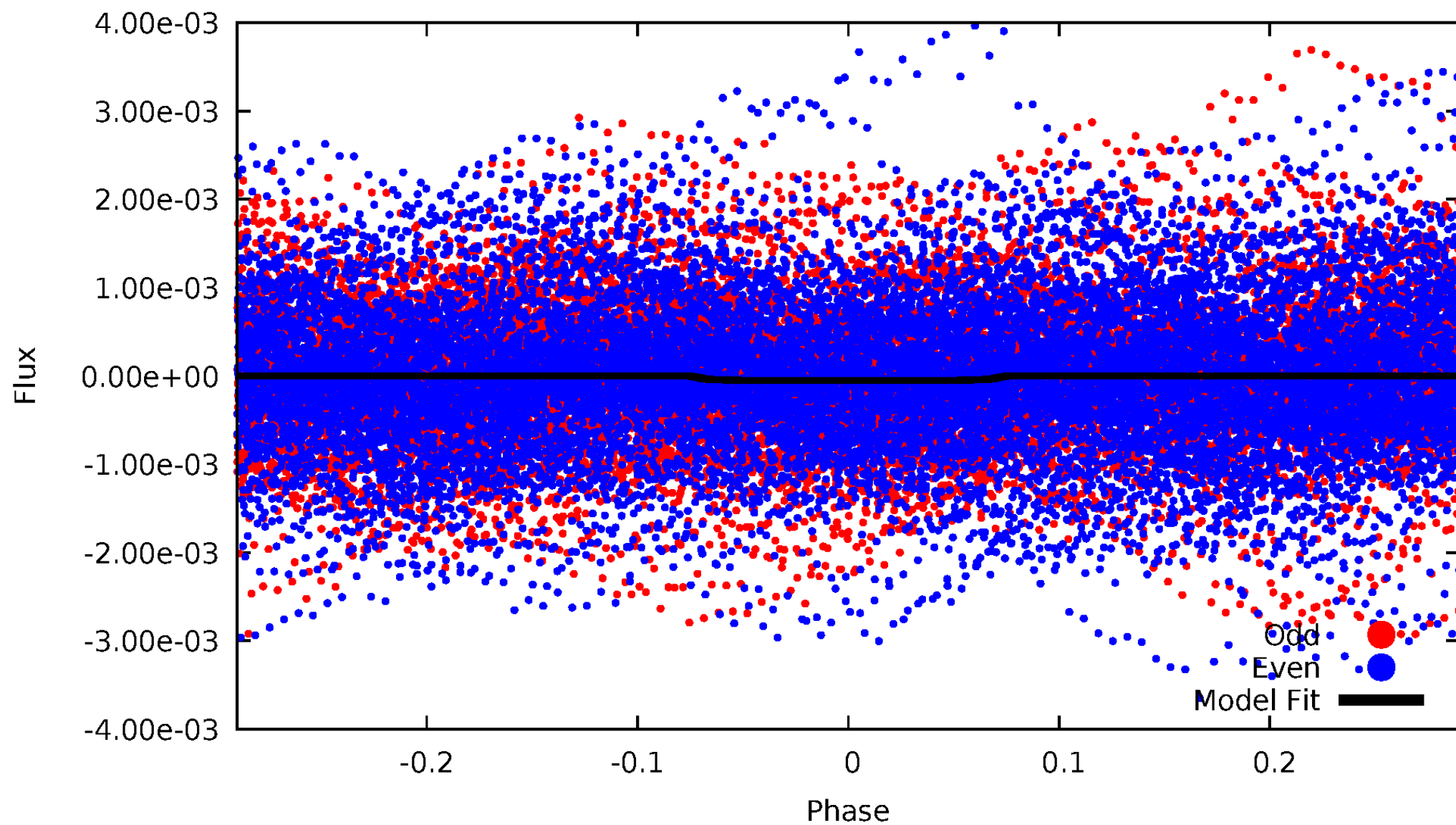


TCE 005546767-01



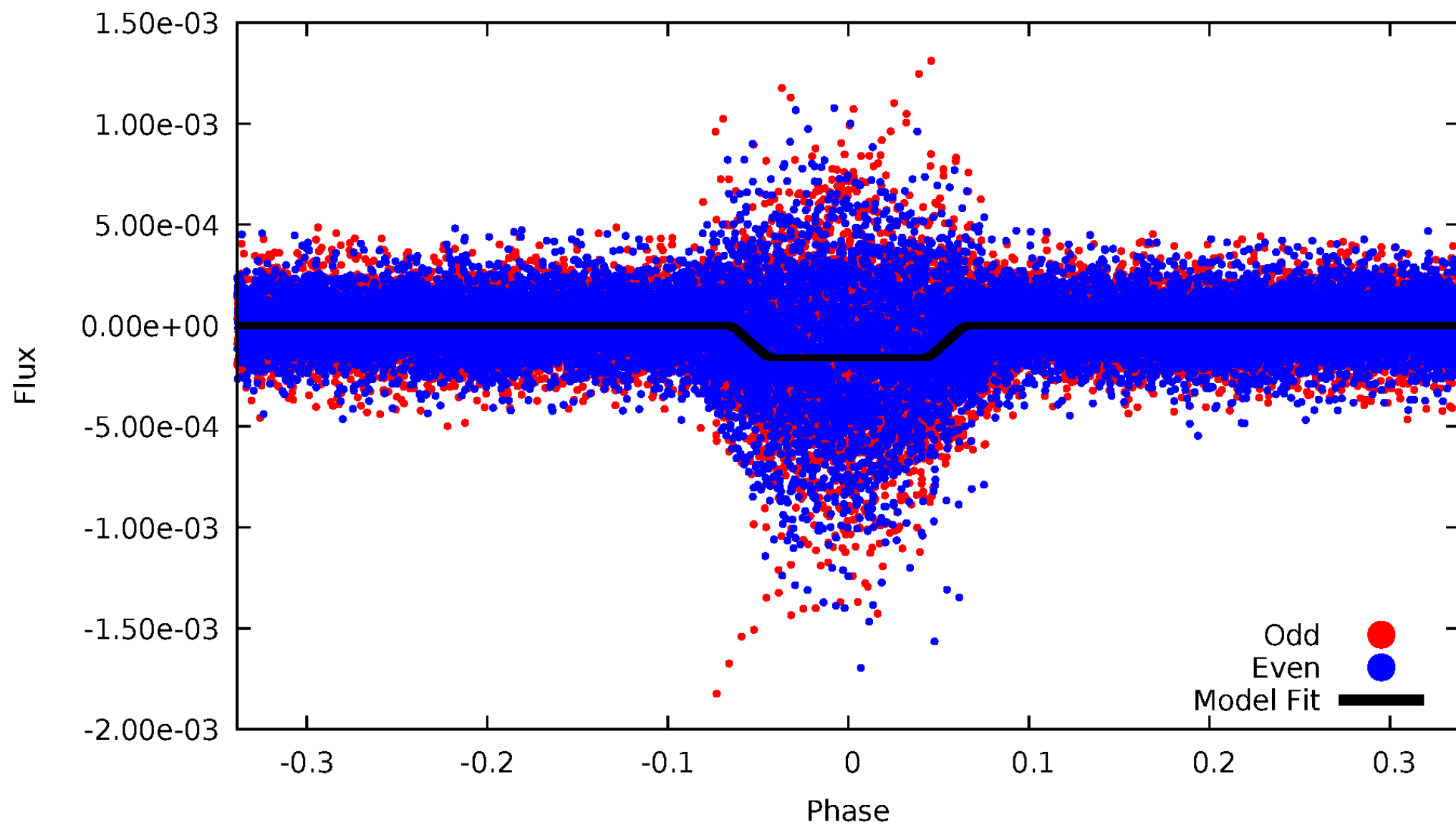
# DV Odd/Even

TCE 005546767-01

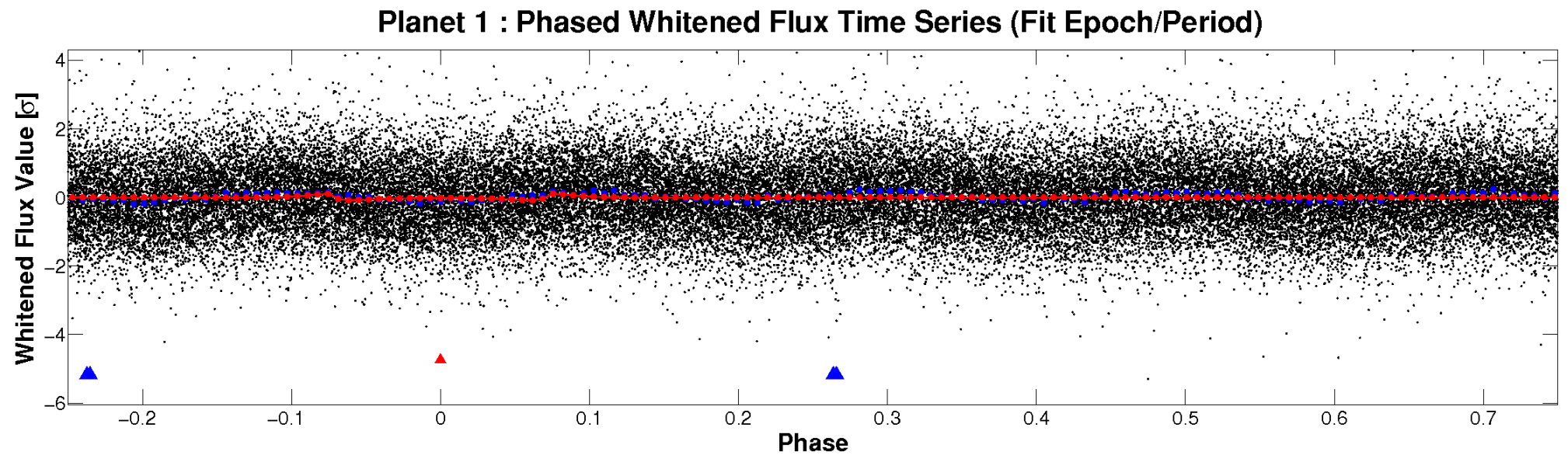
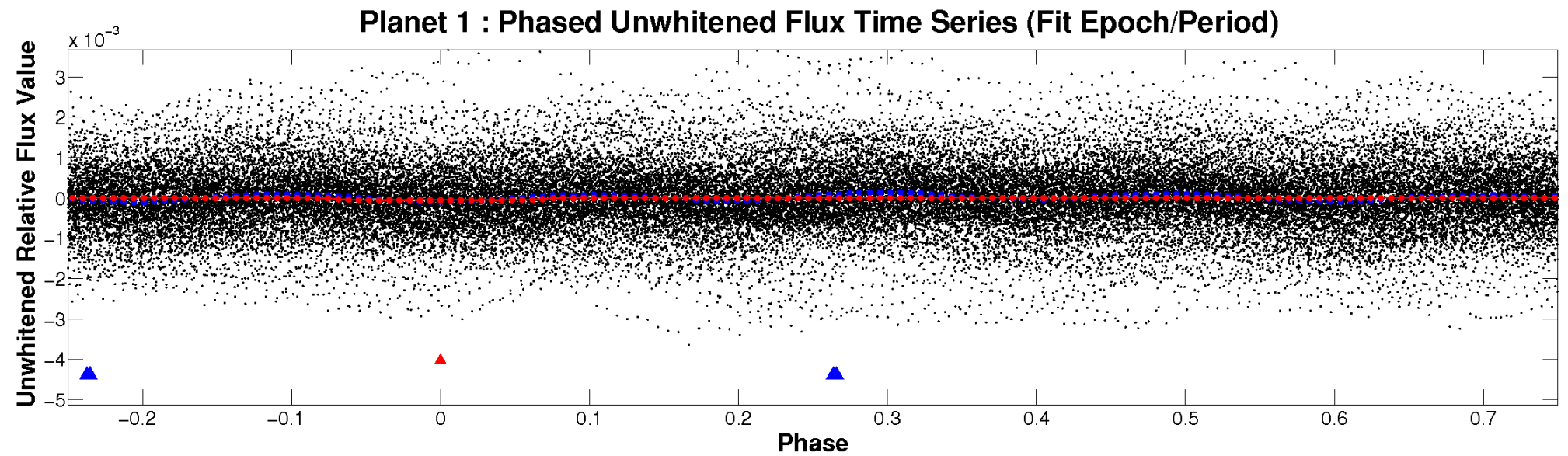


# ALT Odd/Even

TCE 005546767-01



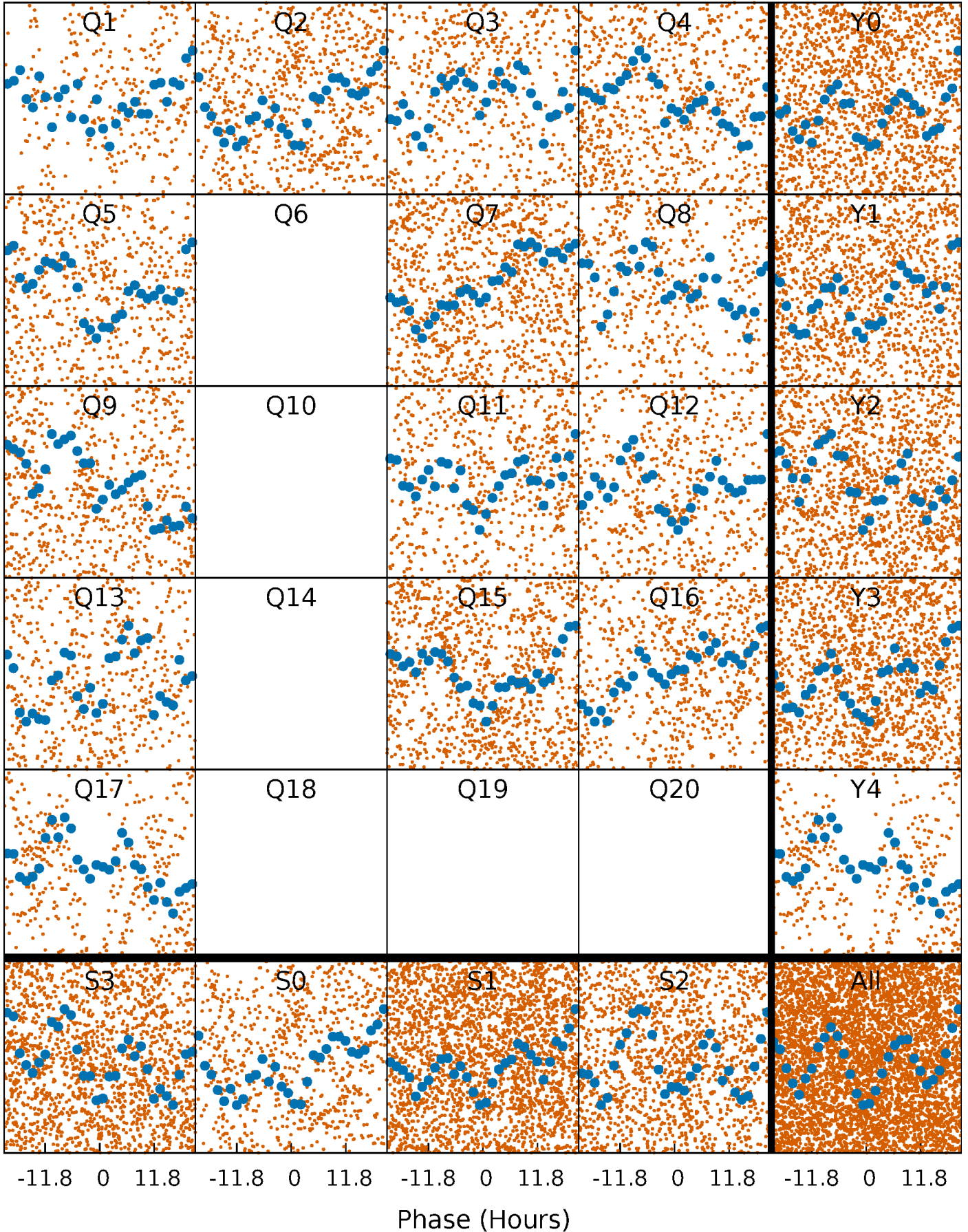
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

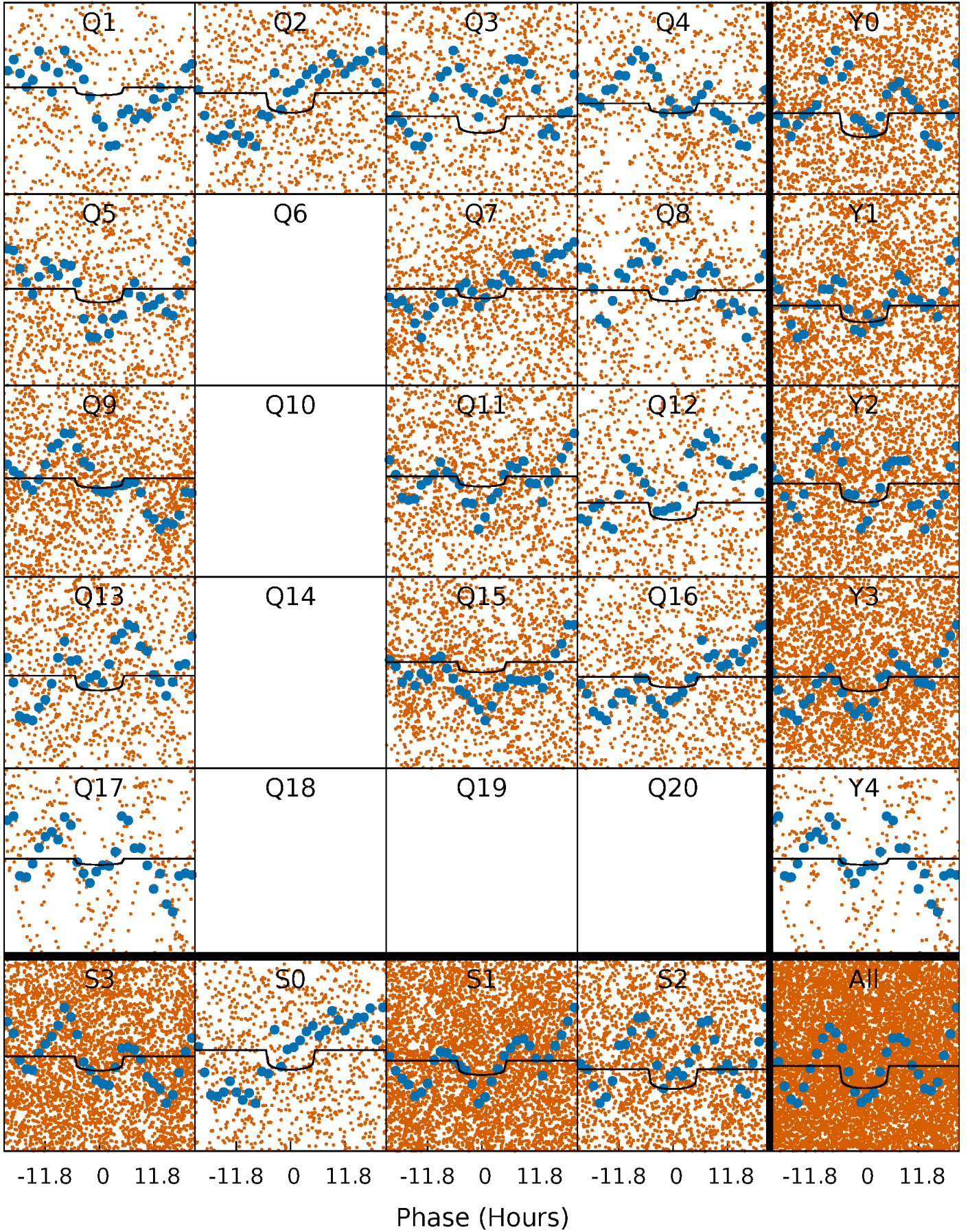
TCE 005546767-01   P= 2.977980 Days    $T_0=132.293322$  (BKJD)





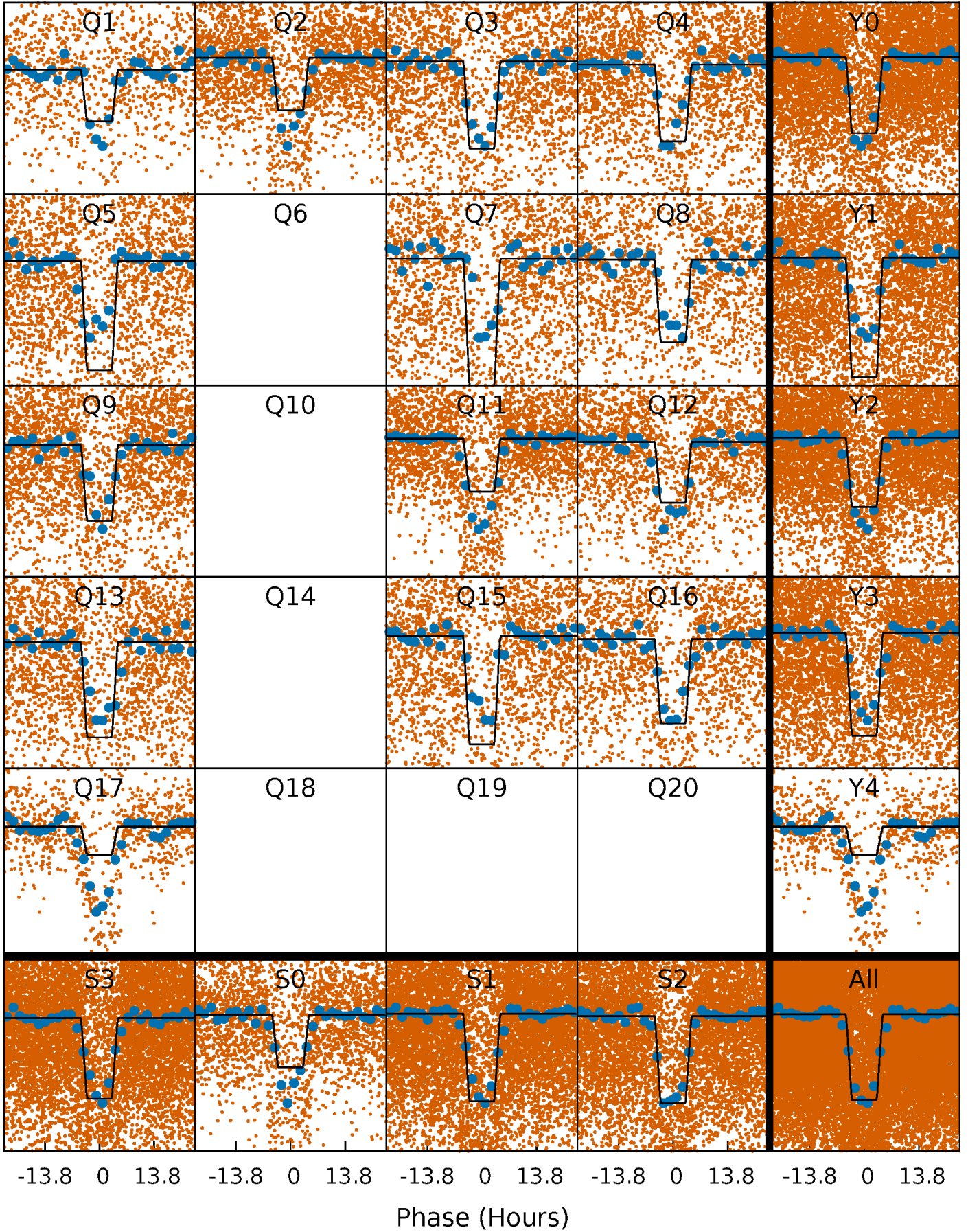
# DV Quarter-Phased Transit Curves

TCE 005546767-01 P= 2.977980 Days  $T_0=132.293322$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

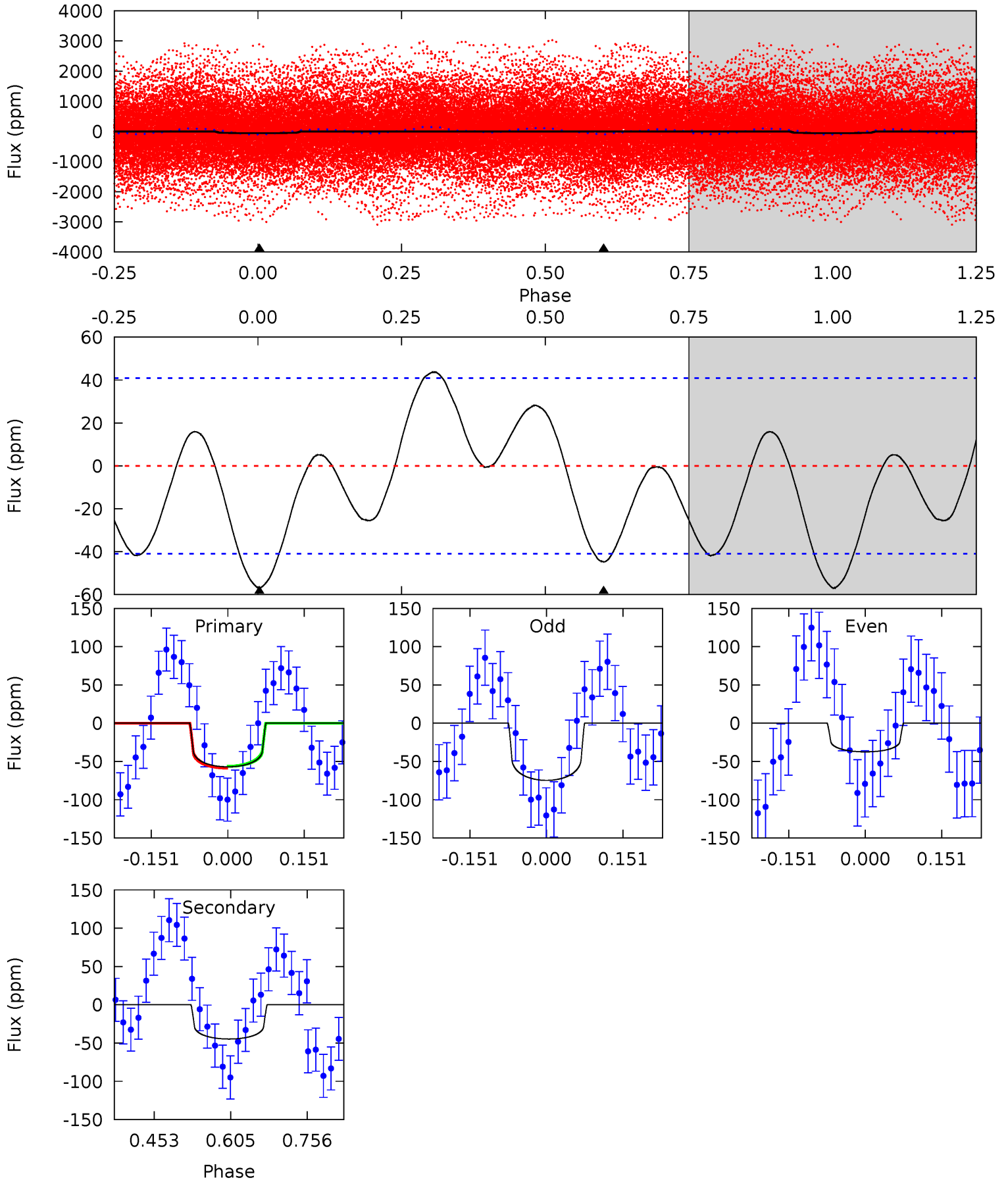
TCE 005546767-01 P= 2.977767 Days  $T_0=132.337929$  (BKJD)



# DV Model-Shift Uniqueness Test

005546767-01, P = 2.977980 Days, E = 129.315342 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
6.24	4.90	0	0	4.48	1.44	2.90	6.24	6.24	4.90	4.90	2.06	0.75	0.43	0.13

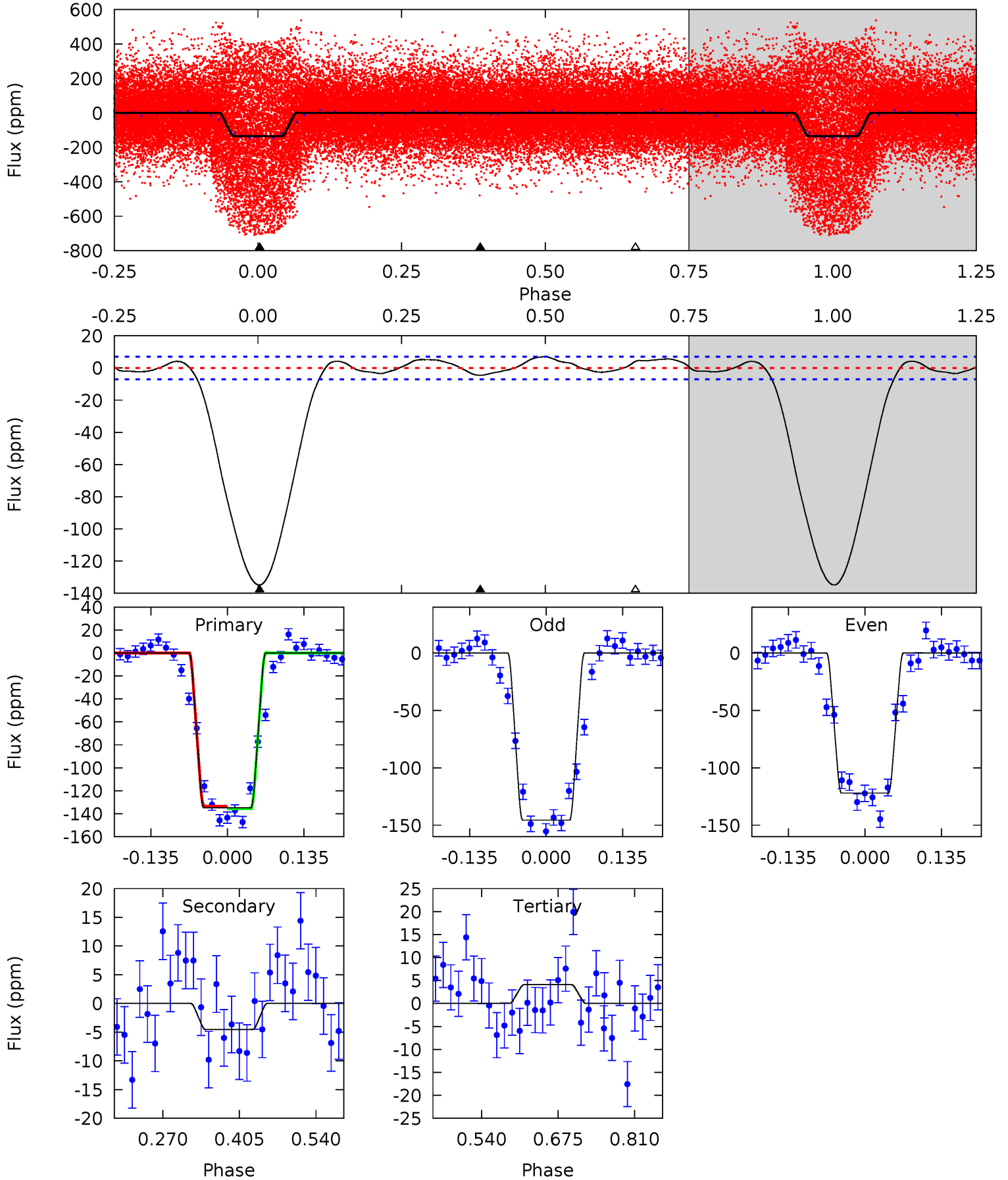




# Alt Model-Shift Uniqueness Test

005546767-01, P = 2.977767 Days, E = 129.360162 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
85.9	2.89	-2.61	0	4.50	1.49	1.82	88.5	85.9	5.50	2.89	7.52	1.05	0.05	0.72





### Stellar Parameters For KIC 005546767

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6987^{+73}_{-83}$	$3.986^{+0.174}_{-0.102}$	$-0.060^{+0.150}_{-0.150}$	$2.101^{+0.364}_{-0.485}$	$1.556^{+0.117}_{-0.161}$	$0.236^{+0.221}_{-0.085}$
	+1%/-1%	+4%/-3%	+250%/-250%	+17%/-23%	+8%/-10%	+94%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005546767-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-45 \pm 9$	$1.58^{+0.41}_{-0.39}$	$2873^{+116}_{-148}$	$6762^{+1183}_{-759}$	$22^{+15}_{-9}$
Alt.	$-5 \pm 2$	$2.86^{+0.49}_{-0.48}$	$2866^{+132}_{-165}$	$3095^{+287}_{-473}$	$0.670^{+0.388}_{-0.272}$

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

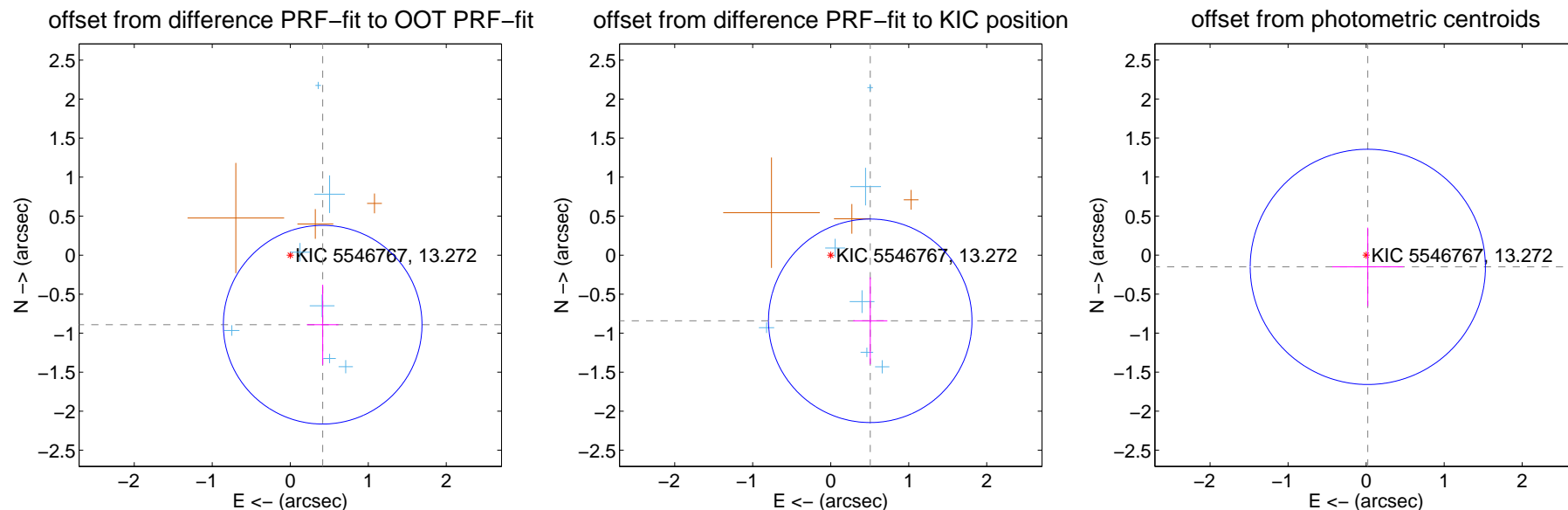
## DV Centroid Data

Supplemental centroid analysis for 005546767-01. Kepler magnitude: 13.27. Transit SNR 5.93

There are 7 quarters with good PRF difference image offsets

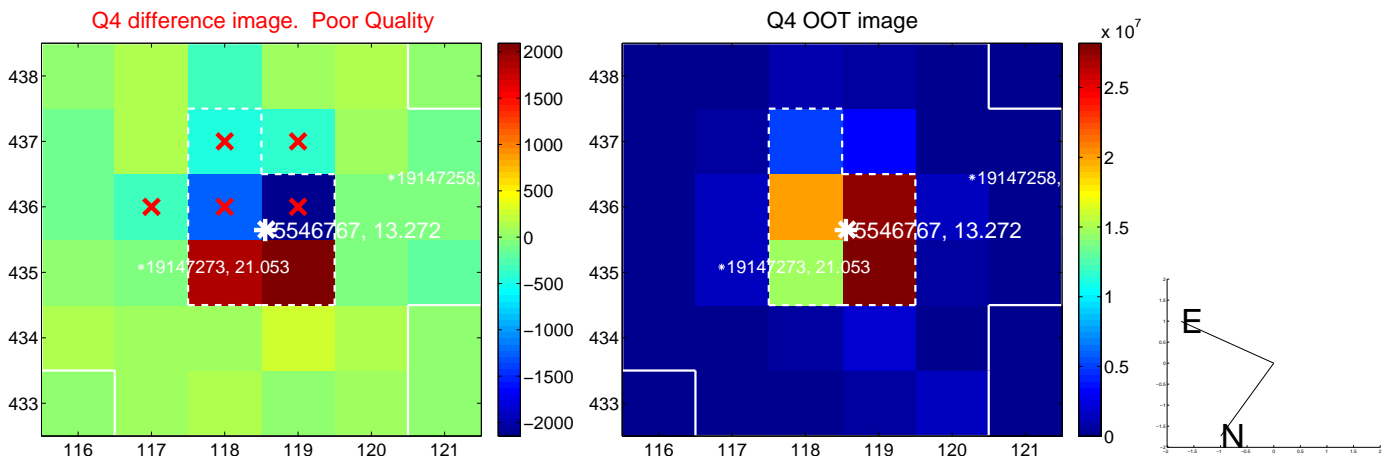
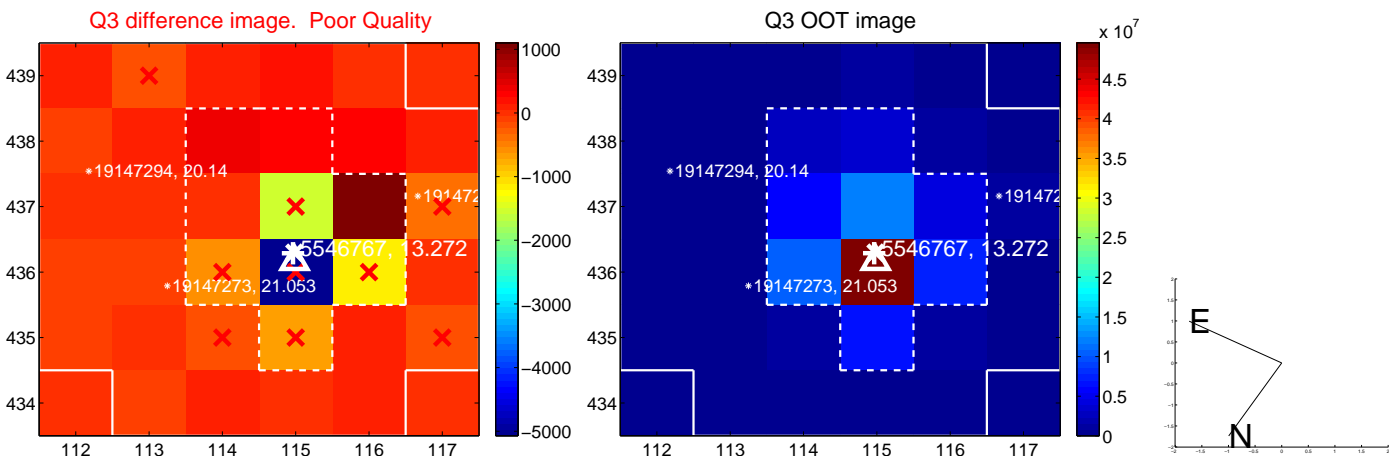
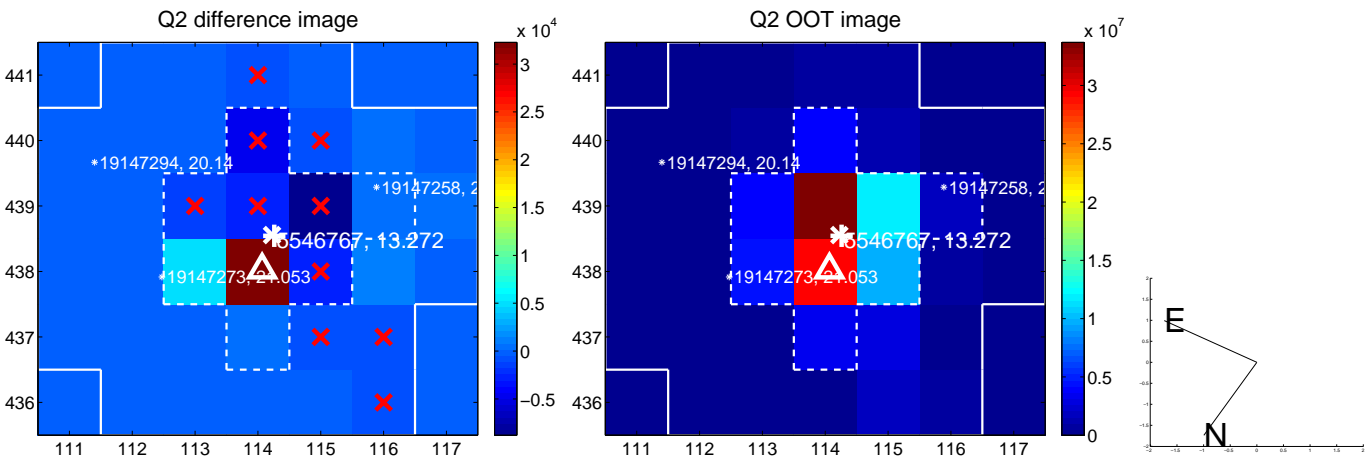
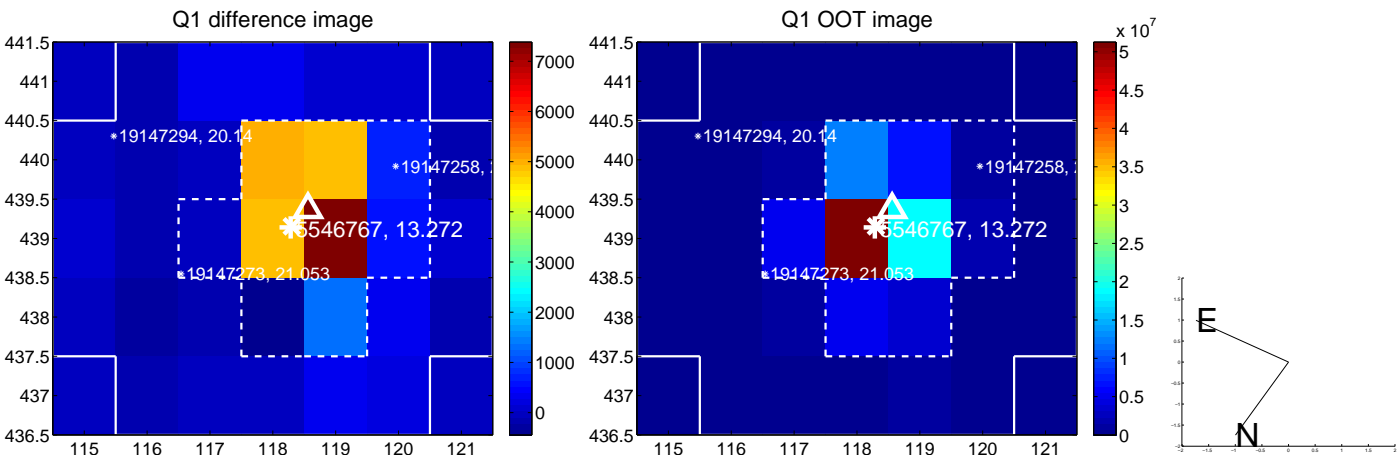
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.983 \pm 0.424$	2.32	$-0.416 \pm 0.203$	$-0.891 \pm 0.513$
PRF-fit source offset from KIC position	$0.982 \pm 0.435$	2.26	$-0.507 \pm 0.219$	$-0.841 \pm 0.557$
photometric centroid source offset	$0.15 \pm 0.50$	0.30	$-0.02 \pm 0.46$	$-0.15 \pm 0.50$

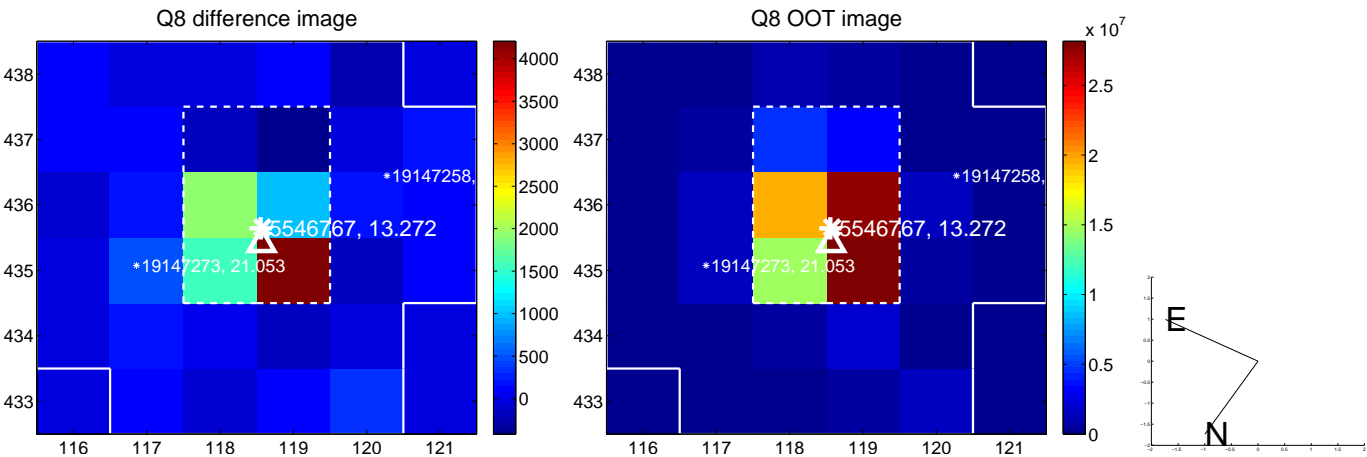
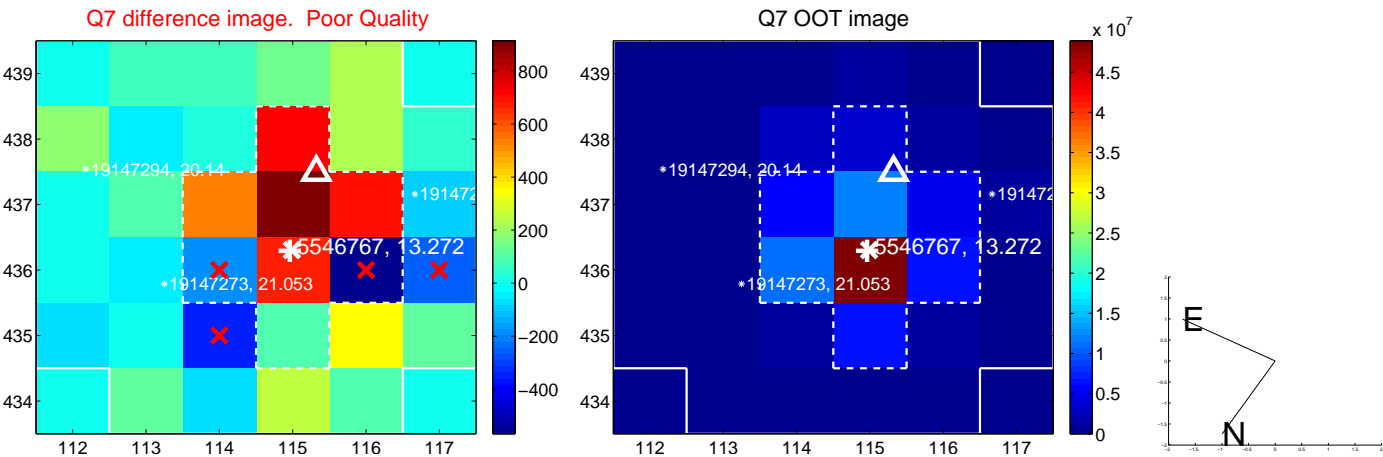
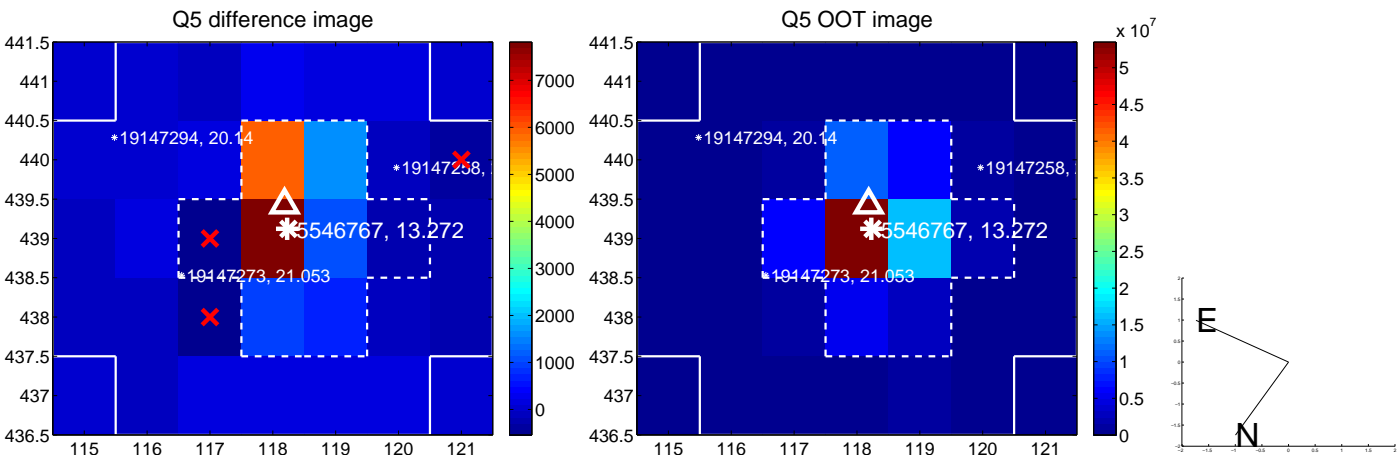


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

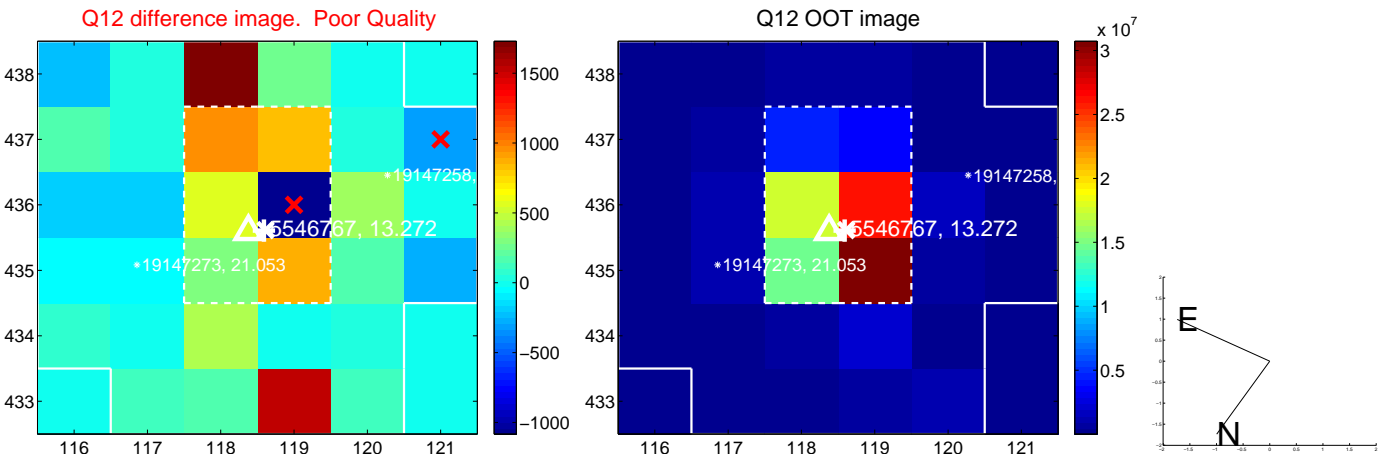
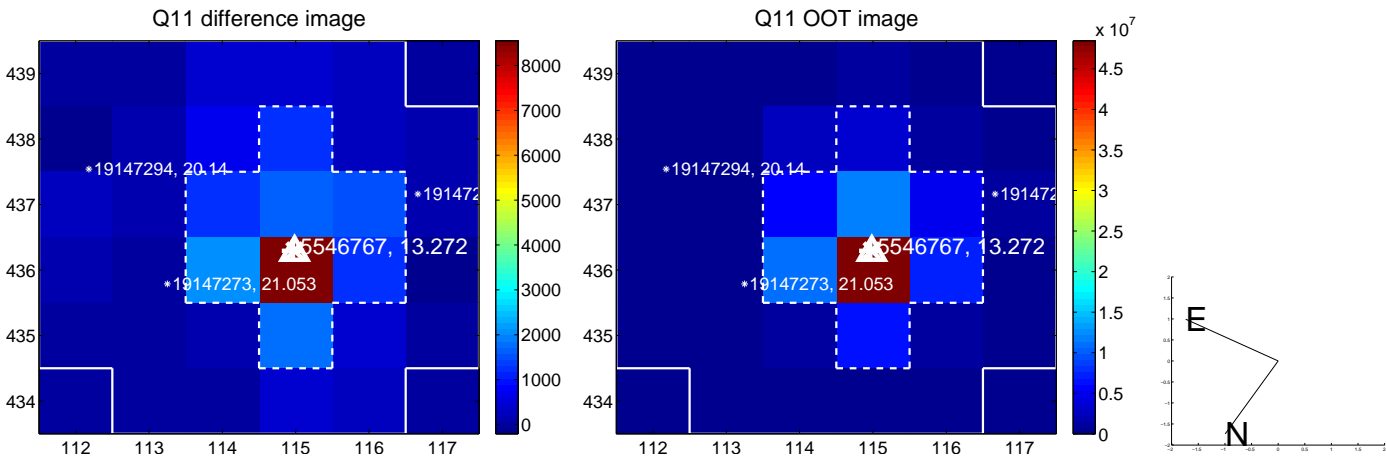
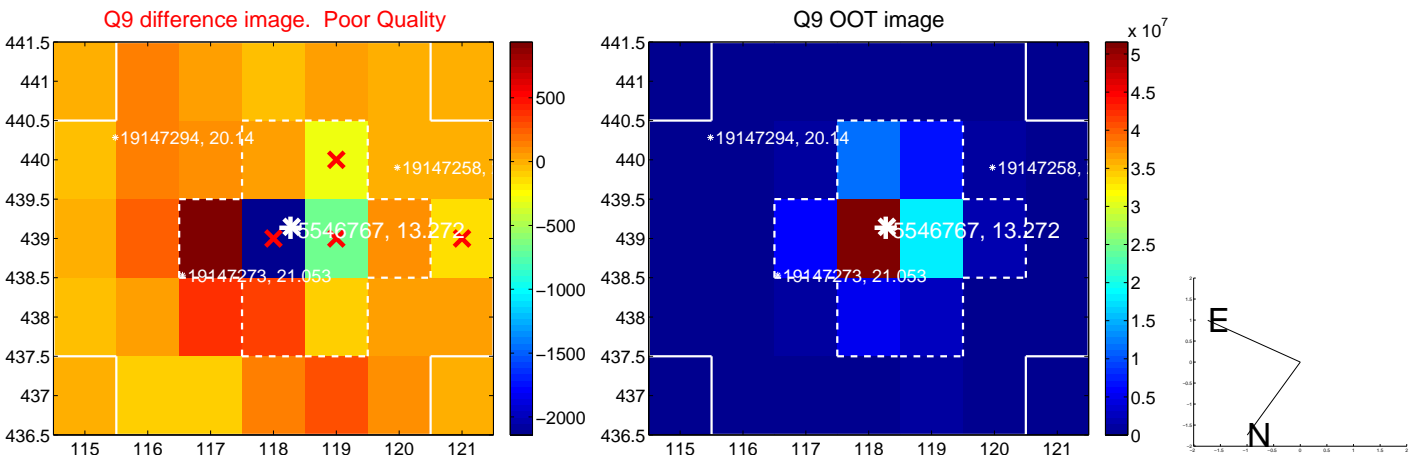


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

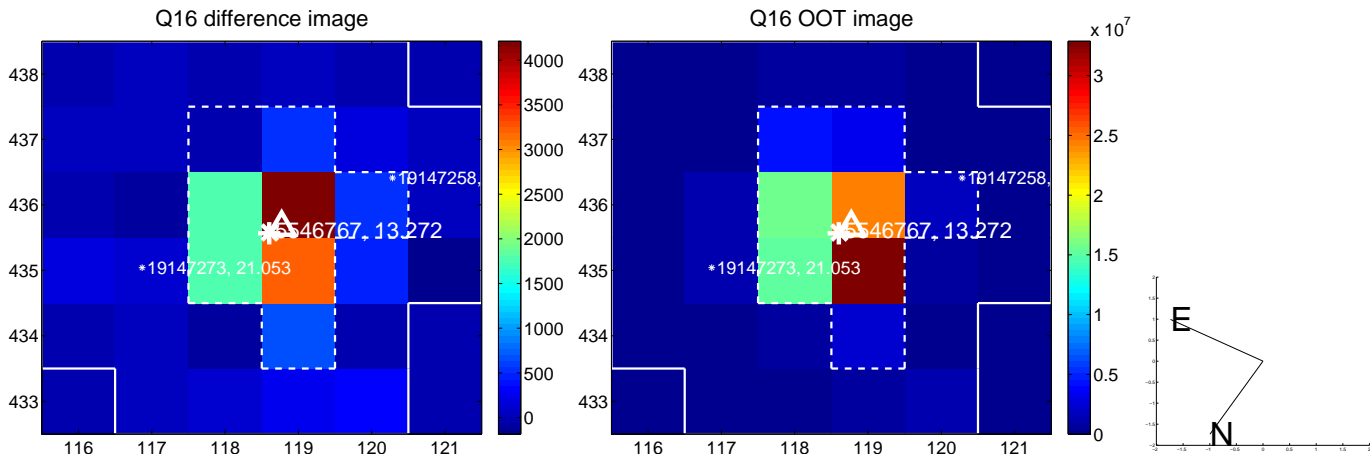
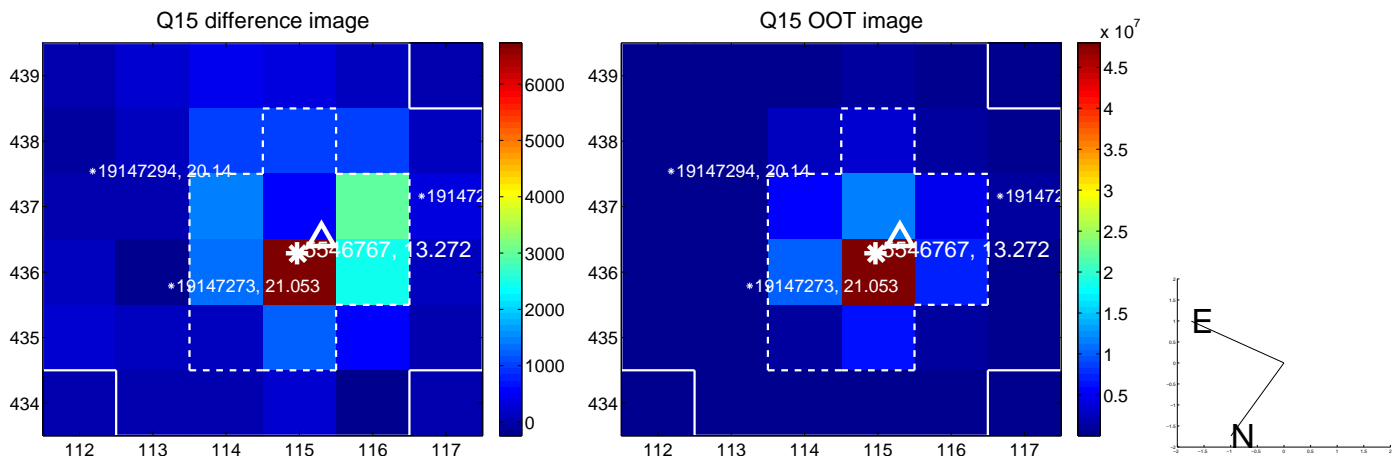
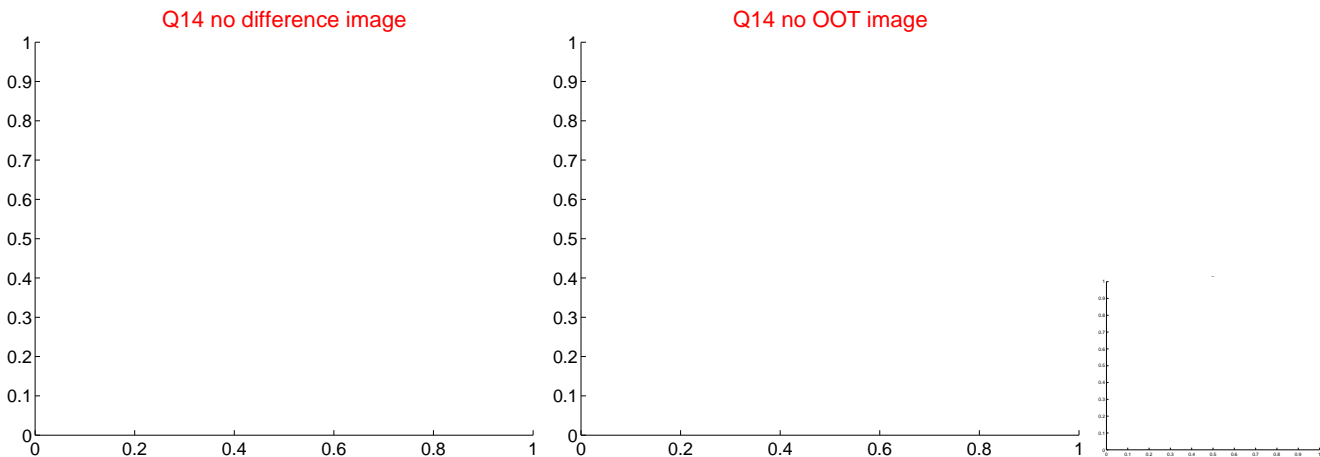
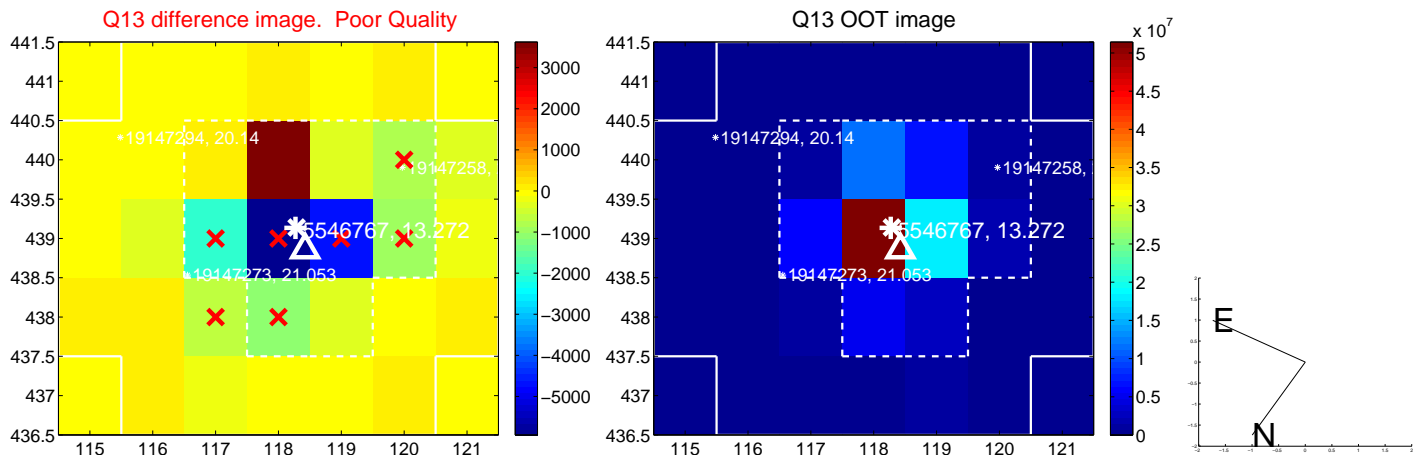




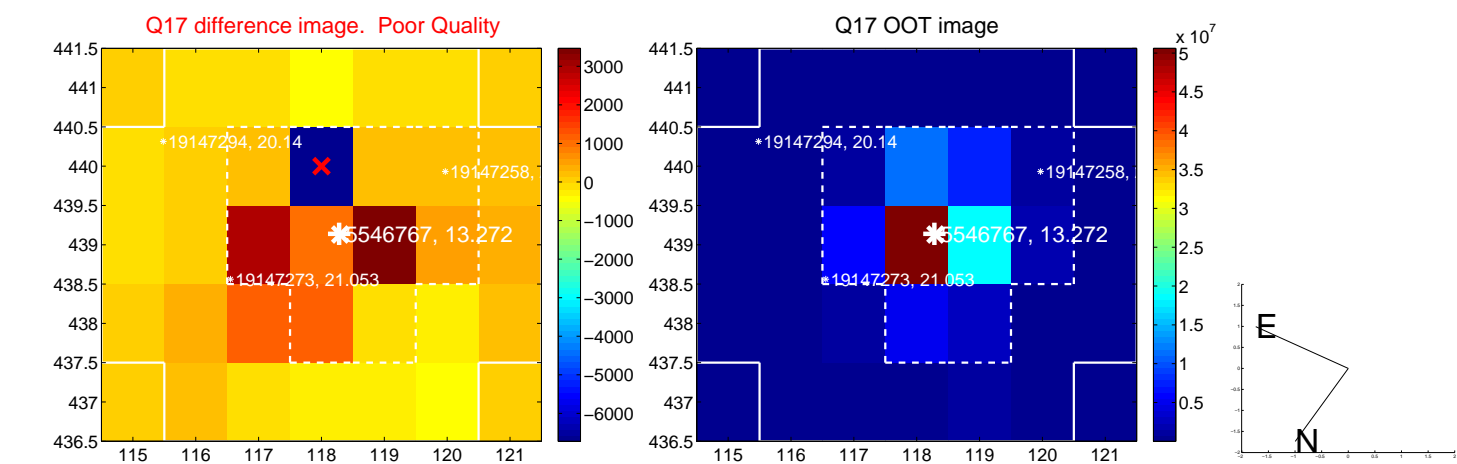
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



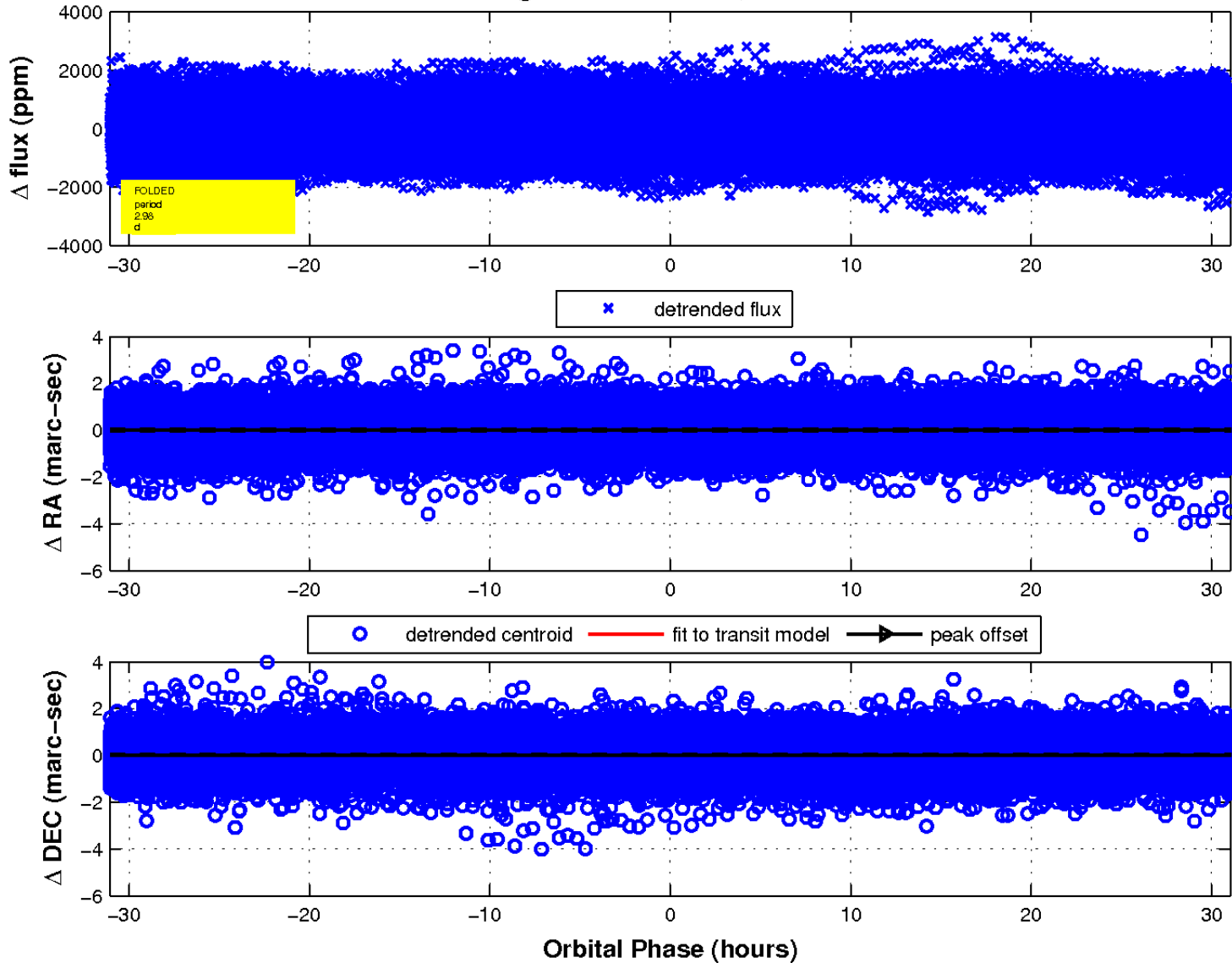
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

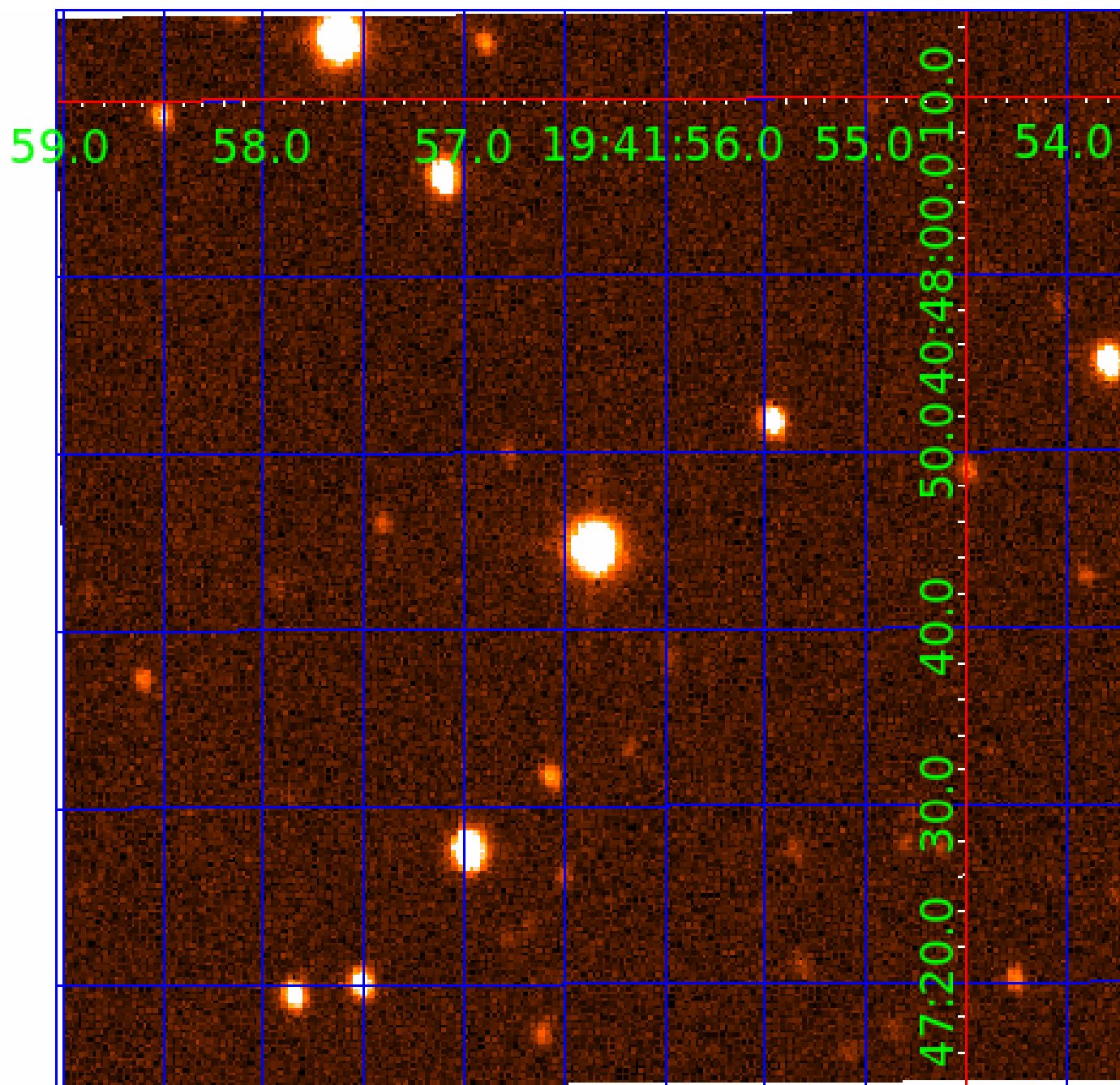


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005546767

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005546767-01	OBS	No	2.977980	132.293323	53.2	10.358	8.5	5.9	2.10	6987	1.63	4270.18
005546767-02	OBS	No	388.623340	249.226040	860.3	8.120	9.1	7.4	2.10	6987	7.37	6.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005546767-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005546767-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT

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

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

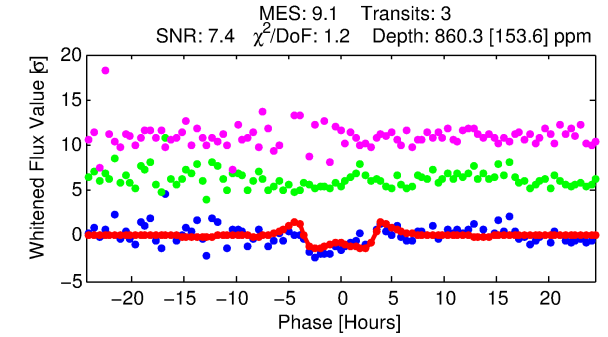
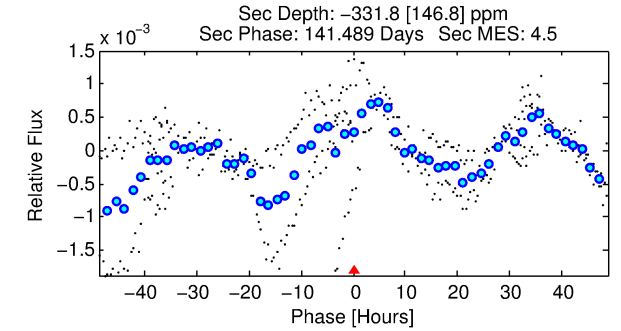
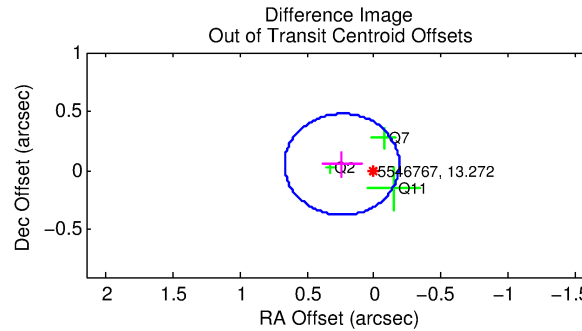
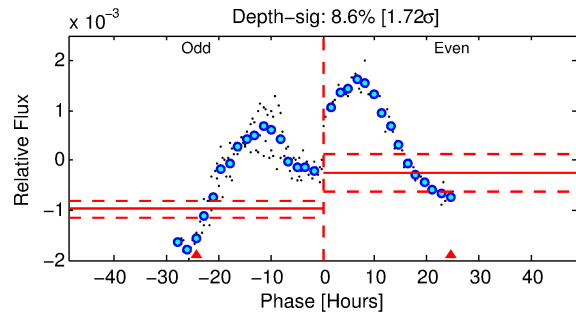
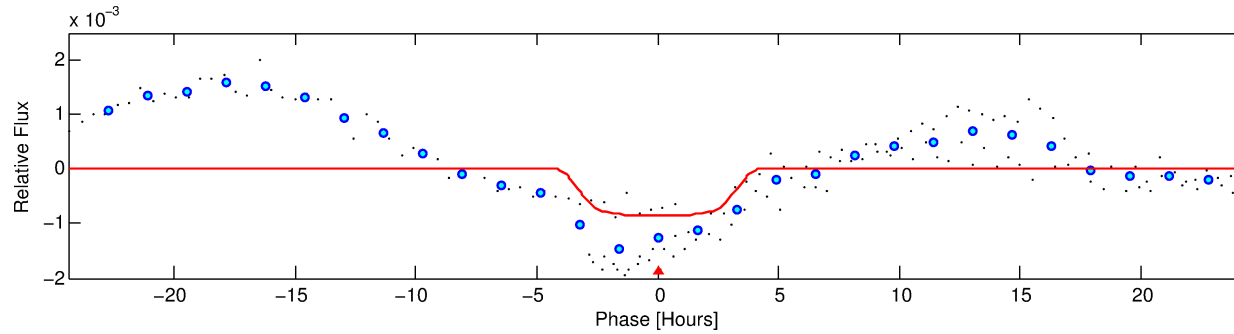
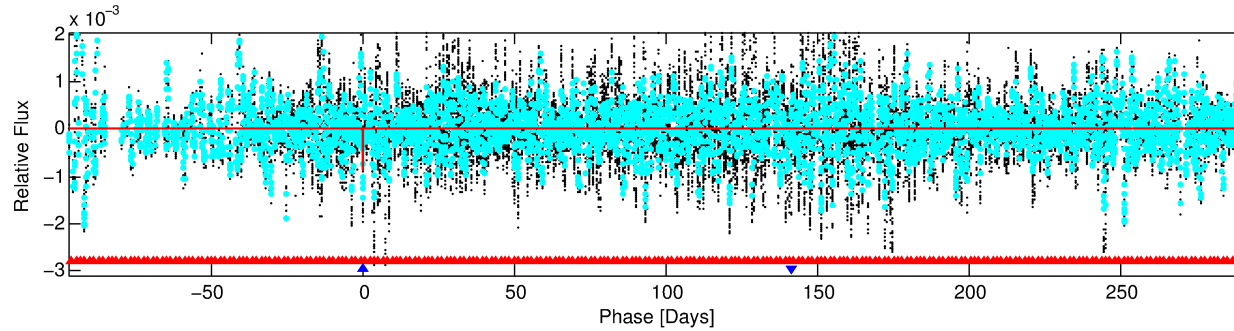
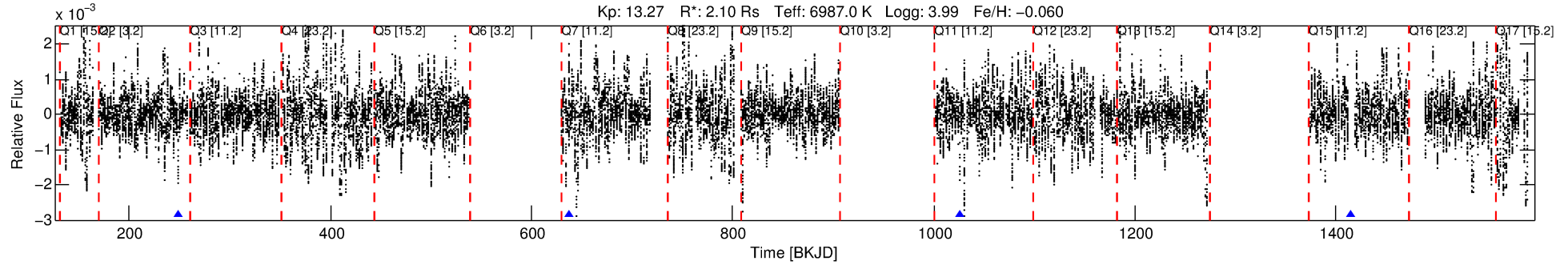
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005546767-02

No Significant Match Found

# DV One-Page Summary

KIC: 5546767 Candidate: 2 of 2 Period: 388.623 d



## DV Fit Results:

Period = 388.62334 [0.00799] d  
Epoch = 249.2260 [0.0103] BKJD  
Rp/R\* = 0.0322 [0.0033]  
a/R\* = 163.06 [30.89]  
b = 0.93 [0.03]  
Seff = 6.45 [2.01]  
Teq = 406 [32] K  
Rp = 7.37 [1.86] Re  
a = 1.2087 [0.2463] AU  
Ag = N/A  
Teffp = N/A

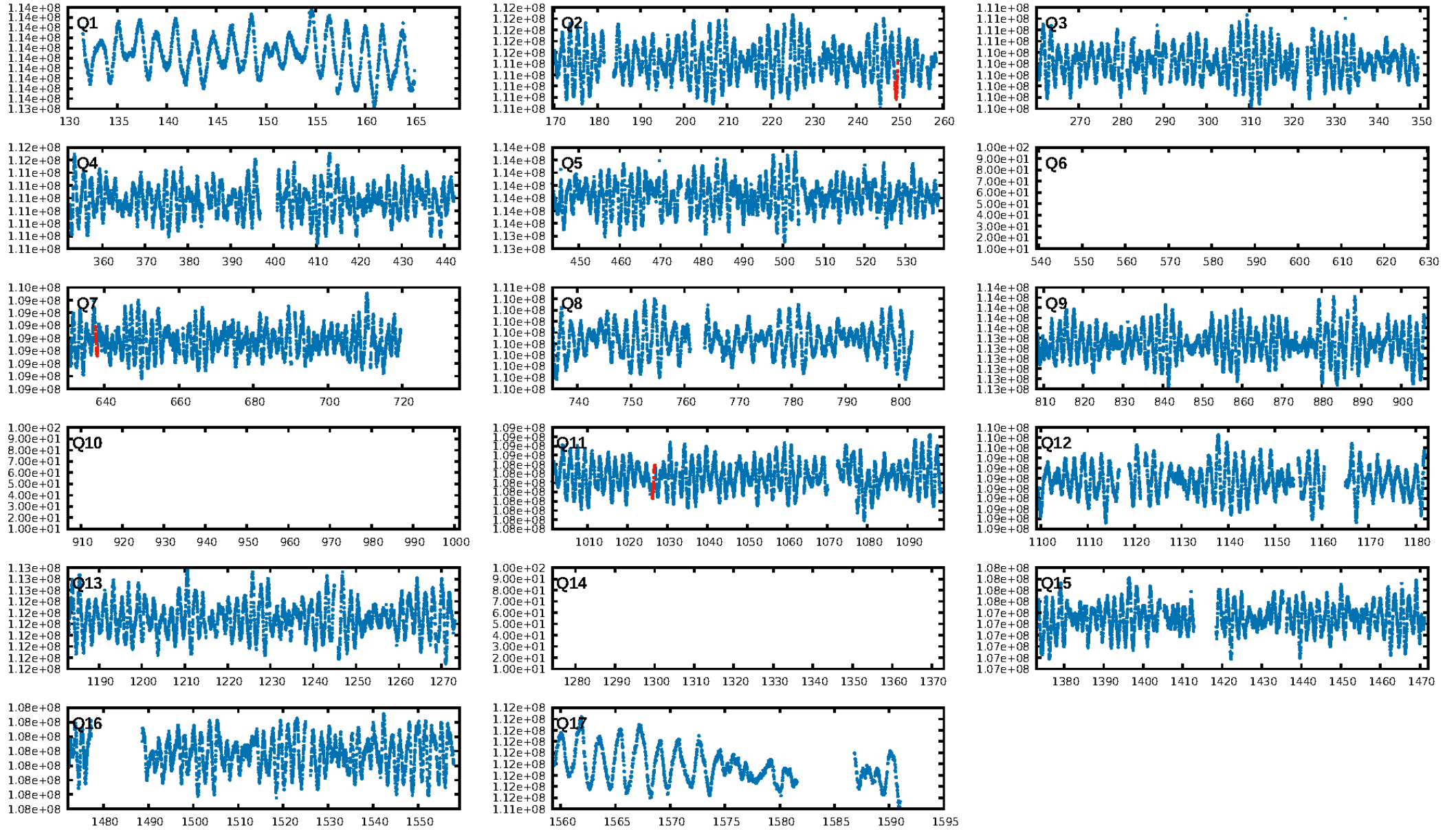
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [703.23 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 7.2%  
ModelChiSquareGof-sig: 98.1%  
**Bootstrap-pfa: 4.61e-10**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.6171**  
Centroid-sig: 57.5%  
Centroid-so: 0.372 arcsec [0.80 $\sigma$ ]  
OotOffset-rm: 0.246 arcsec [1.72 $\sigma$ ]  
KicOffset-rm: 0.182 arcsec [1.48 $\sigma$ ]  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
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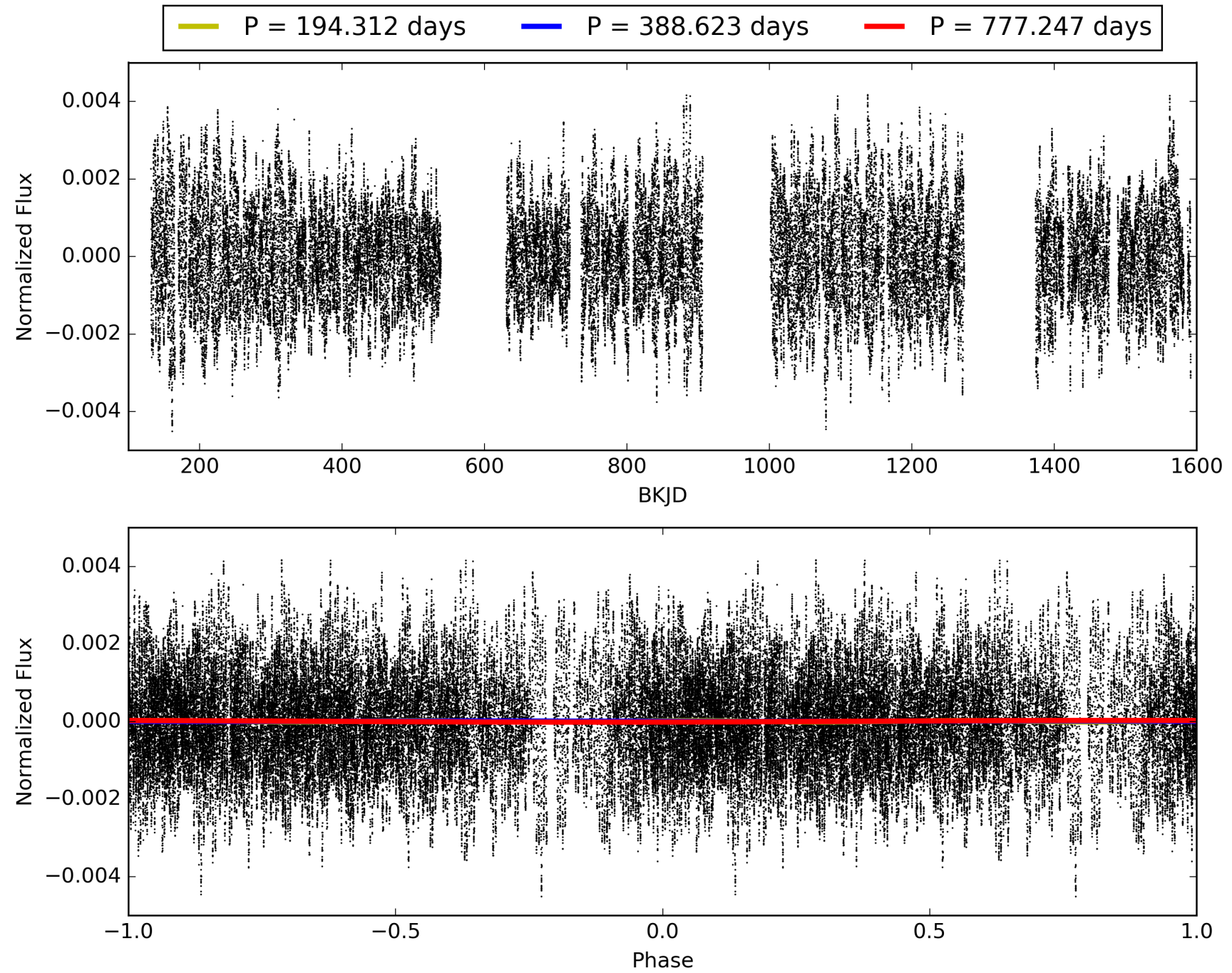
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:42:13 Z

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

# TCE 005546767-02, PDC Light Curves

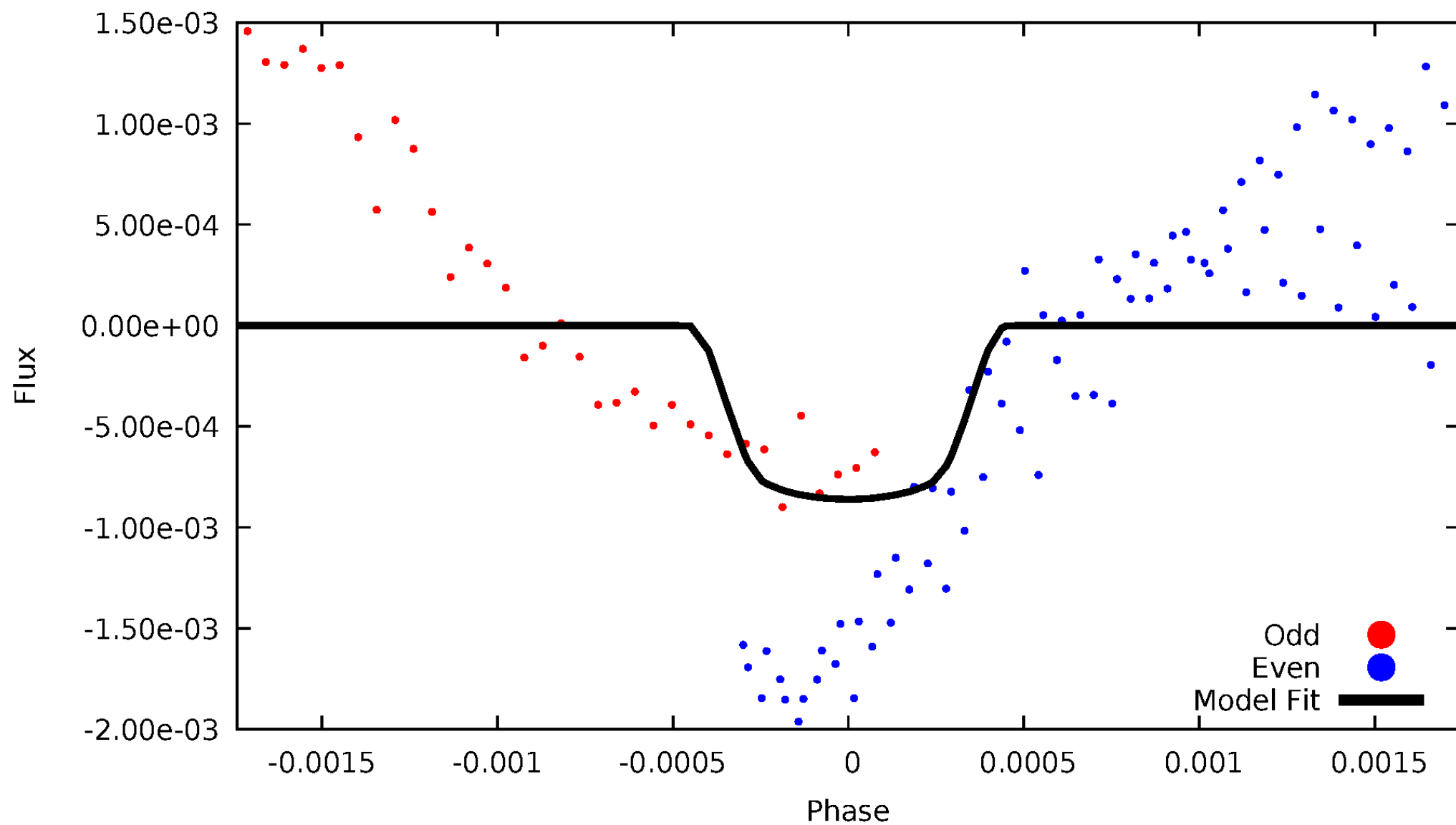


TCE 005546767-02



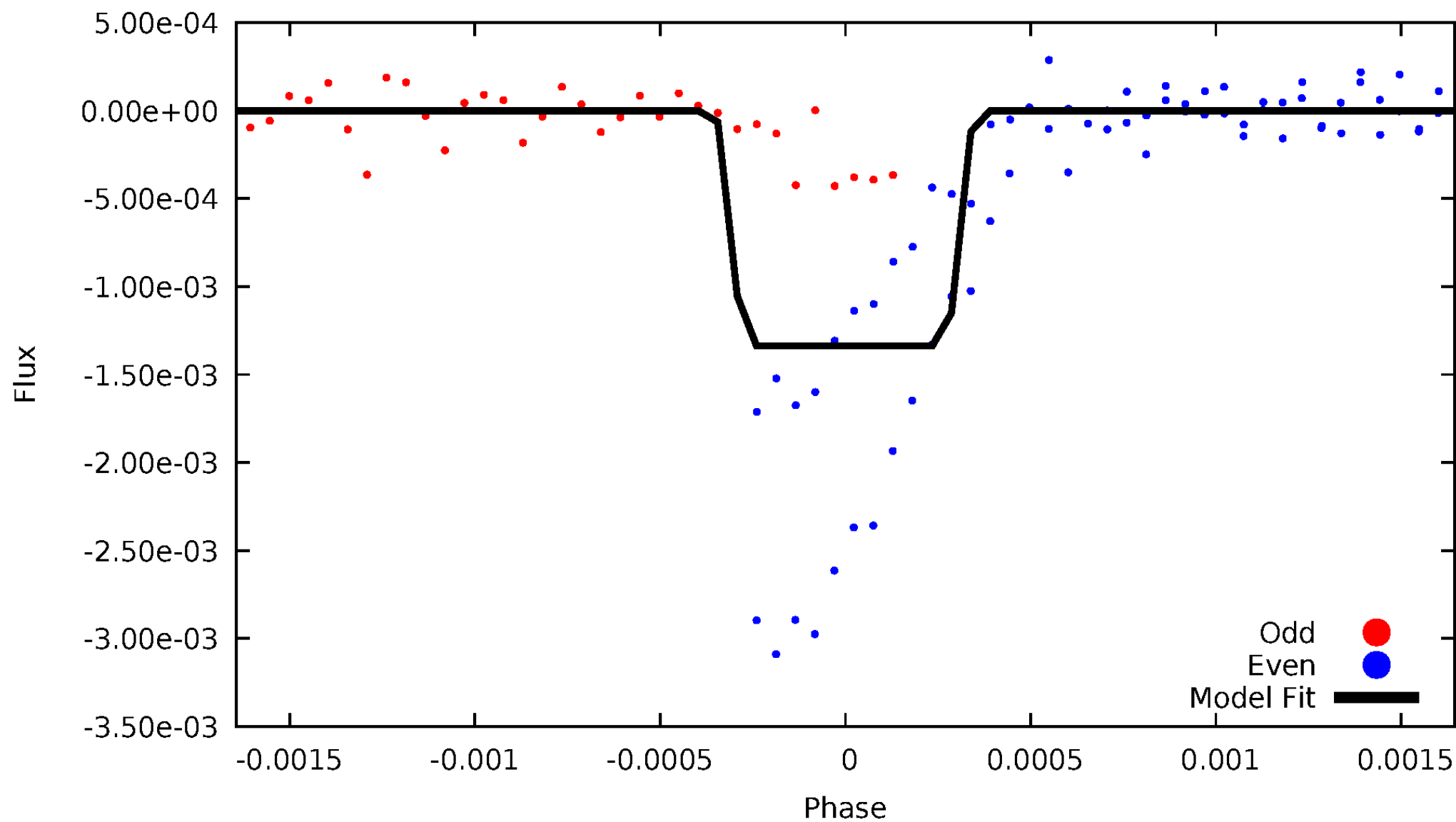
# DV Odd/Even

TCE 005546767-02



# ALT Odd/Even

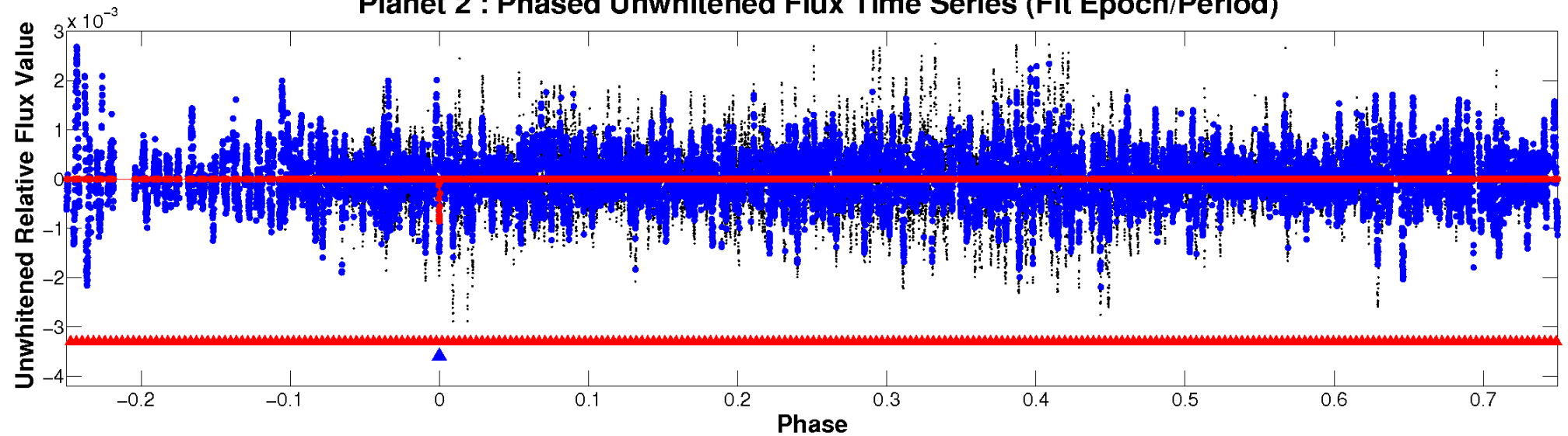
TCE 005546767-02



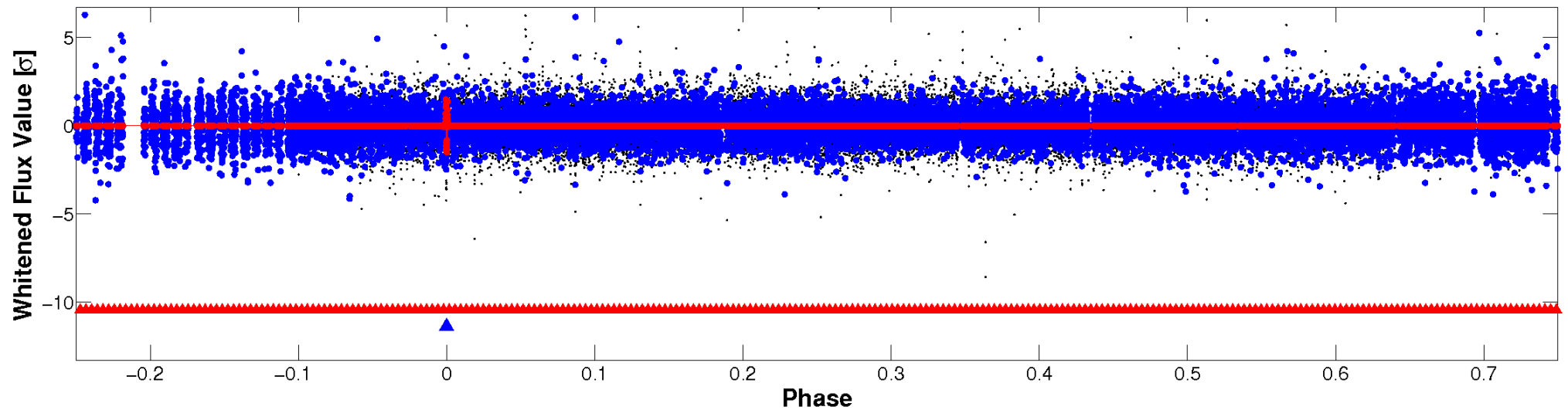


# Non-Whitened Vs. Whitened Light Curve

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

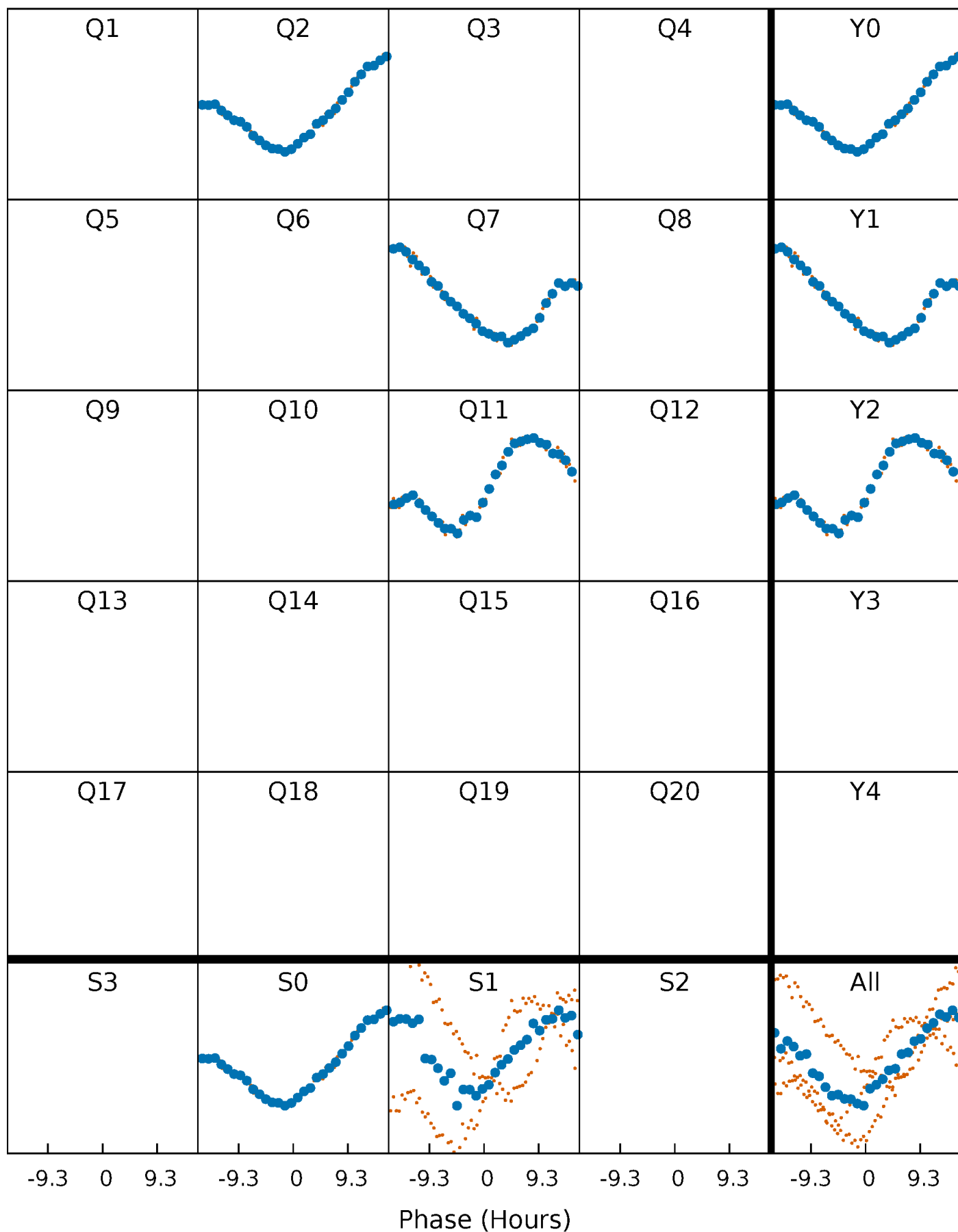


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



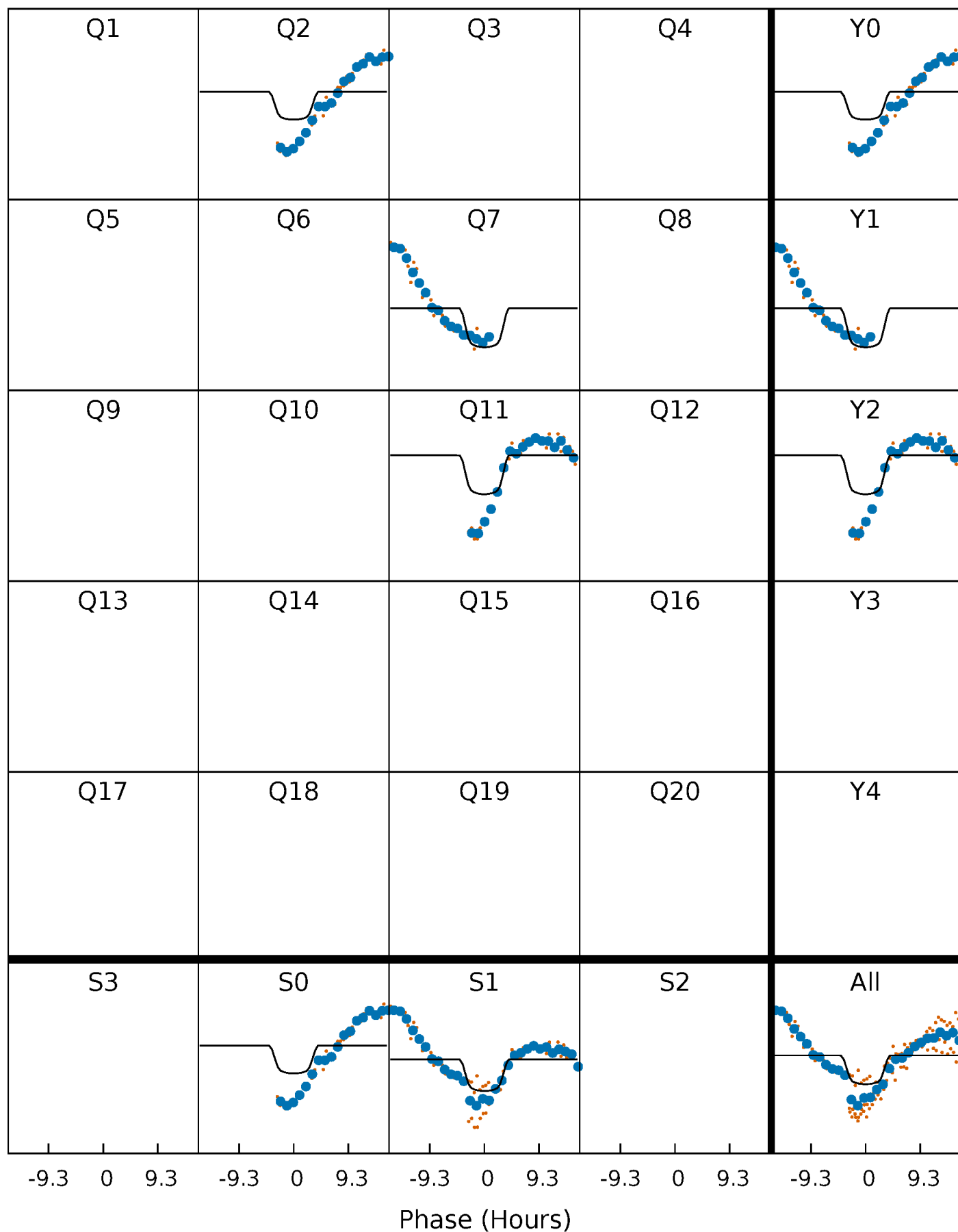
# PDC Quarter-Phased Transit Curves

TCE 005546767-02 P=388.623340 Days  $T_0=249.226040$  (BKJD)



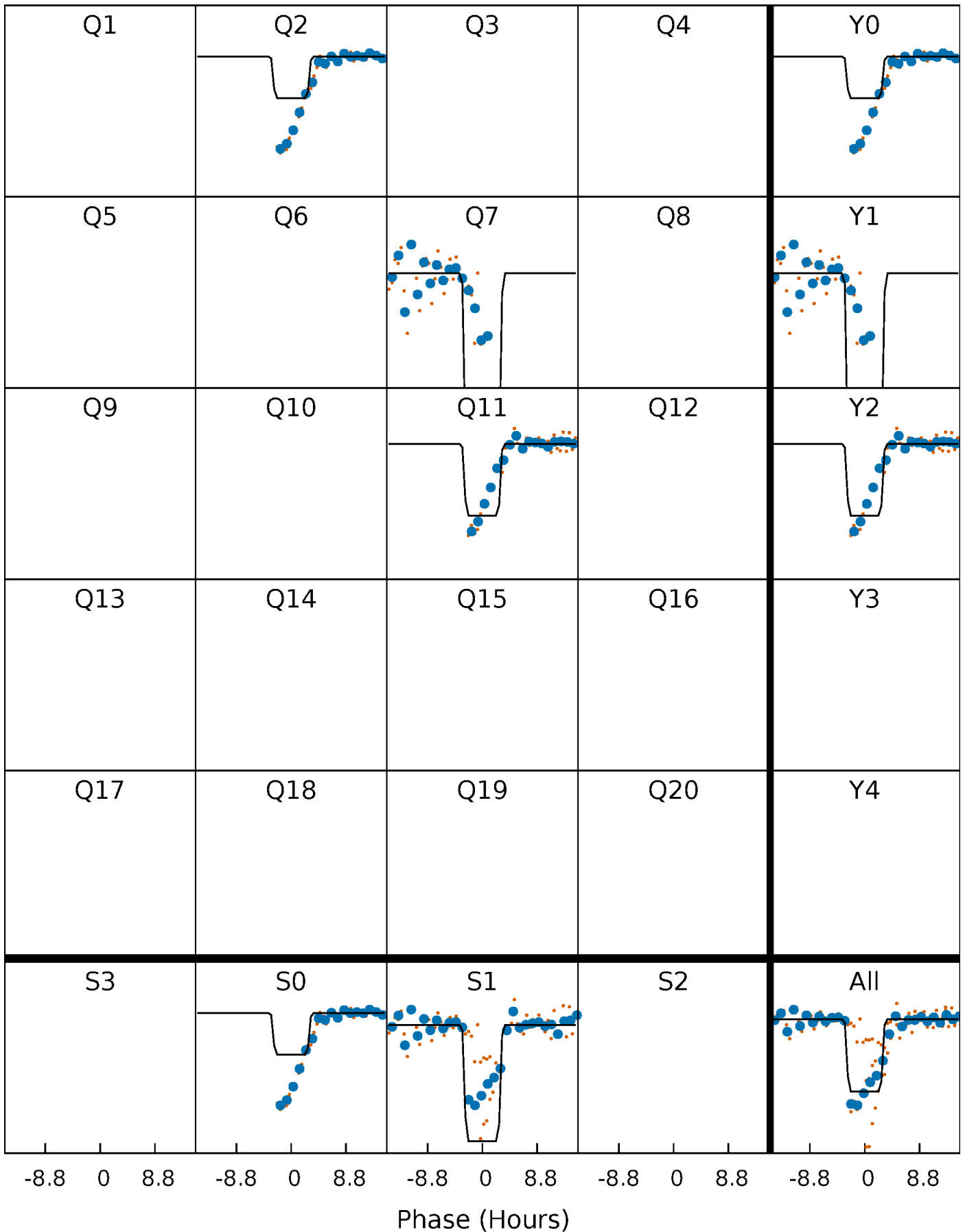
# DV Quarter-Phased Transit Curves

TCE 005546767-02     $P=388.623340$  Days     $T_0=249.226040$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

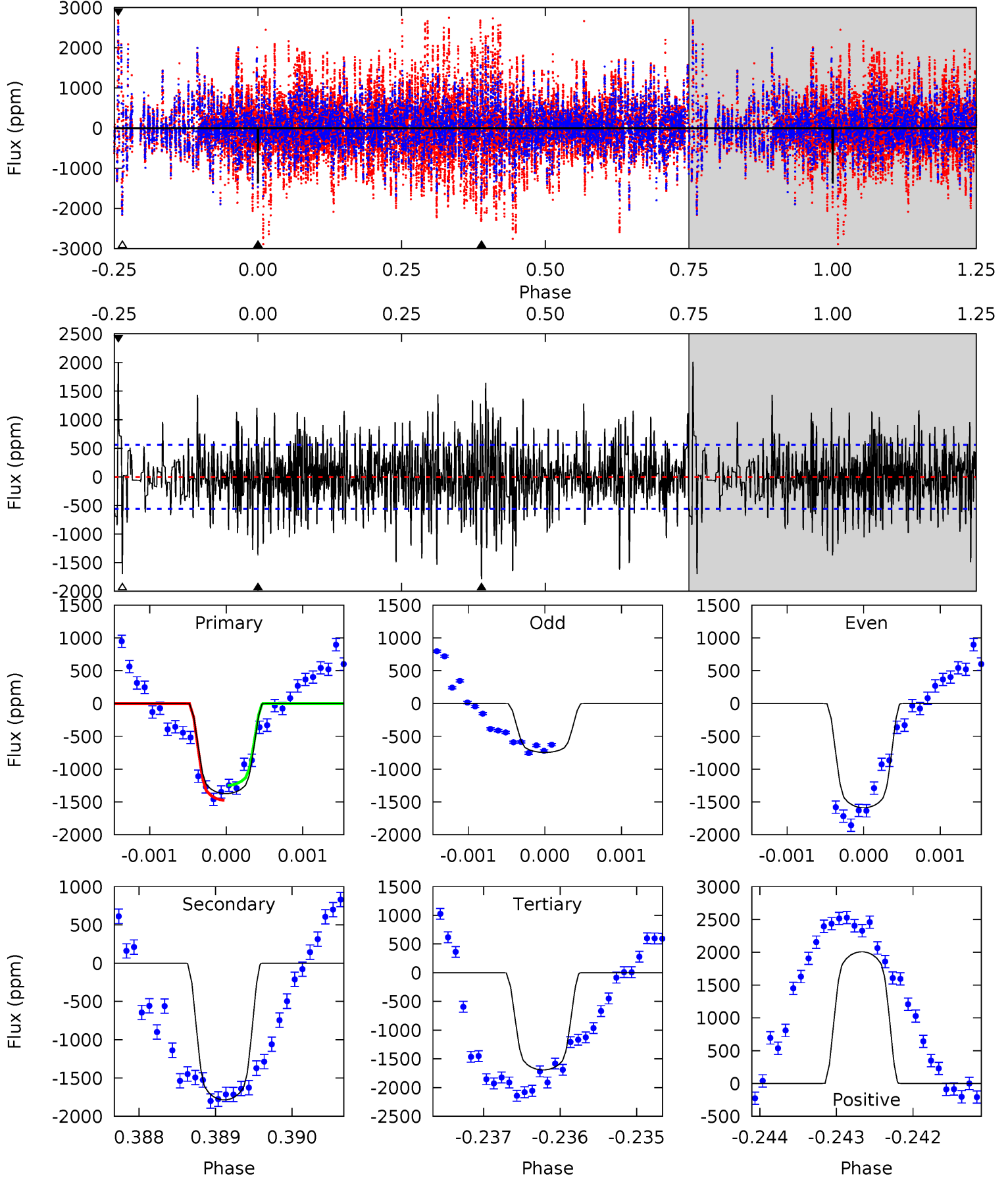
TCE 005546767-02     $P=388.625878$  Days     $T_0=249.202917$  (BKJD)



# DV Model-Shift Uniqueness Test

005546767-02, P = 388.623340 Days, E = 249.226040 Days

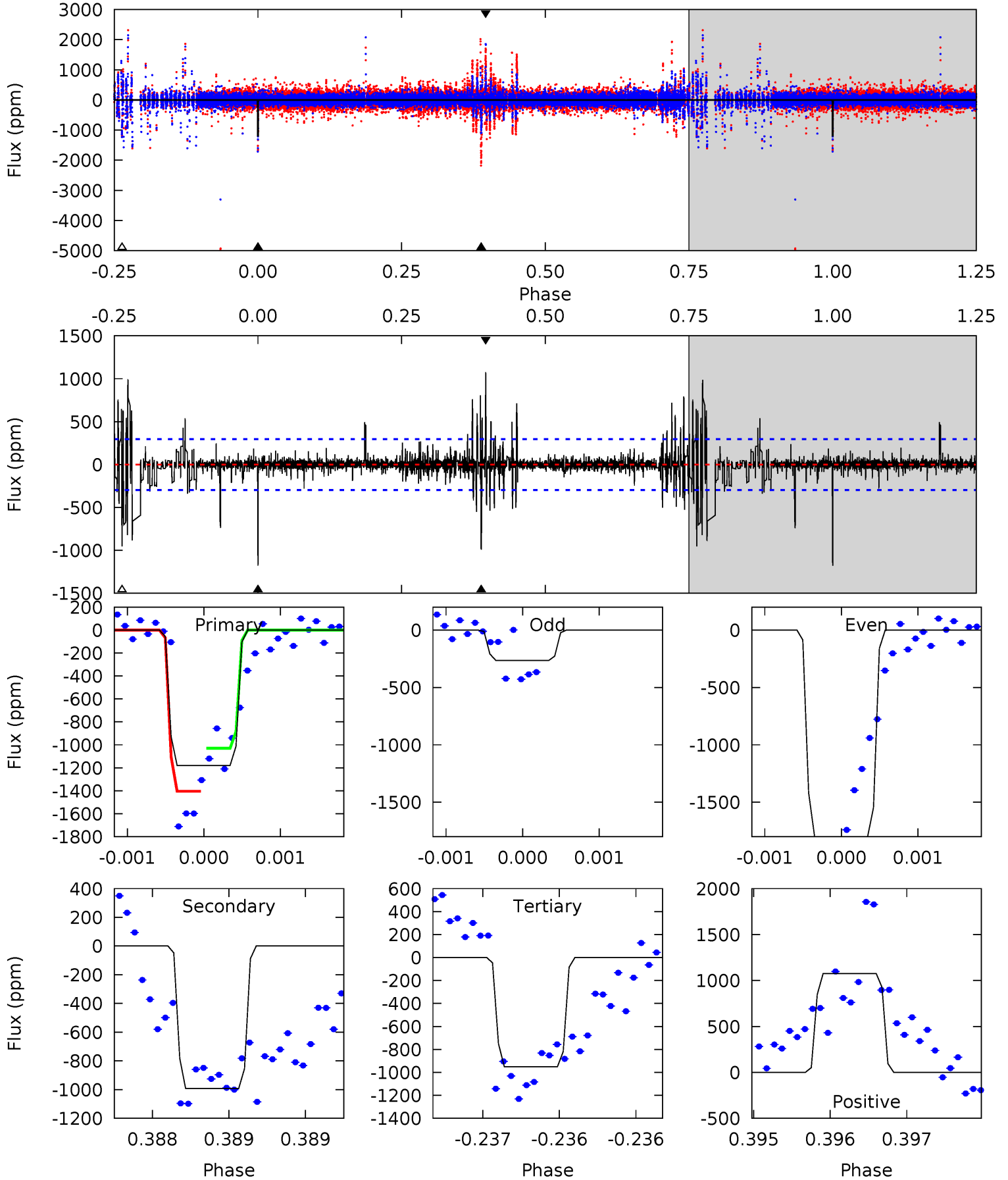
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	17.4	16.5	19.6	5.46	3.31	4.42	-3.12	-6.18	0.91	-2.16	3.48	0.90	0.53	1.14



# Alt Model-Shift Uniqueness Test

005546767-02, P = 388.625878 Days, E = 249.202917 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
21.9	18.4	17.7	20.0	5.52	3.40	2.05	4.23	1.91	0.76	-1.55	15.0	1.07	0.48	3.23





### Stellar Parameters For KIC 005546767

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6987^{+73}_{-83}$	$3.986^{+0.174}_{-0.102}$	$-0.060^{+0.150}_{-0.150}$	$2.101^{+0.364}_{-0.485}$	$1.556^{+0.117}_{-0.161}$	$0.236^{+0.221}_{-0.085}$
	+1%/-1%	+4%/-3%	+250%/-250%	+17%/-23%	+8%/-10%	+94%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005546767-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1785 \pm 103$	$7.20^{+1.10}_{-1.03}$	$565^{+25}_{-33}$	$8222^{+602}_{-502}$	$27249^{+9950}_{-6405}$
Alt.	$-993 \pm 54$	$8.22^{+1.09}_{-1.15}$	$564^{+25}_{-33}$	$6459^{+347}_{-301}$	$11737^{+4039}_{-2636}$

$T_{\text{max}}$  = 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

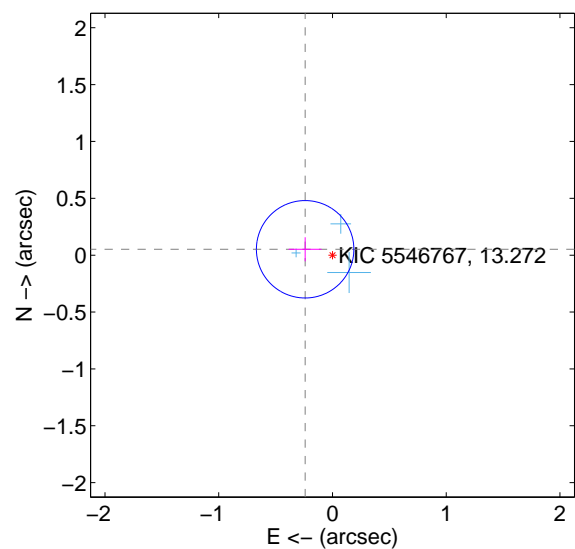
Supplemental centroid analysis for 005546767-02. Kepler magnitude: 13.27. Transit SNR 7.37

There are 3 quarters with good PRF difference image offsets

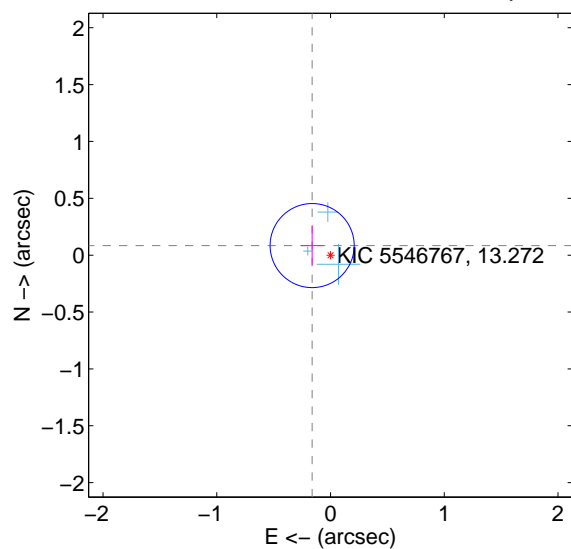
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.246 \pm 0.143$	1.72	$0.240 \pm 0.144$	$0.052 \pm 0.105$
PRF-fit source offset from KIC position	$0.182 \pm 0.123$	1.48	$0.161 \pm 0.099$	$0.084 \pm 0.170$
photometric centroid source offset	$0.37 \pm 0.47$	0.80	$0.28 \pm 0.44$	$0.24 \pm 0.51$

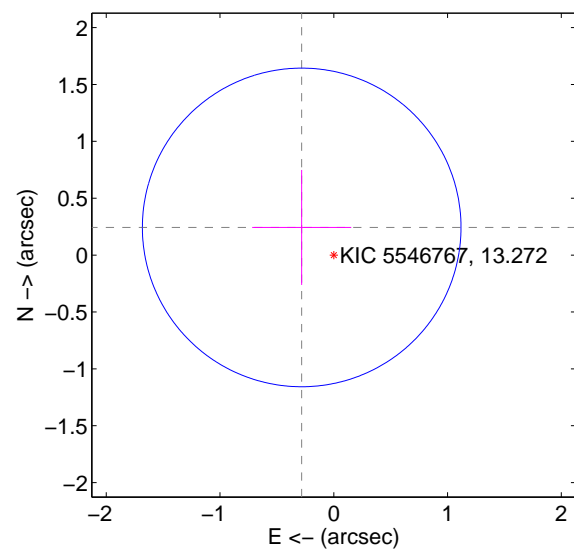
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

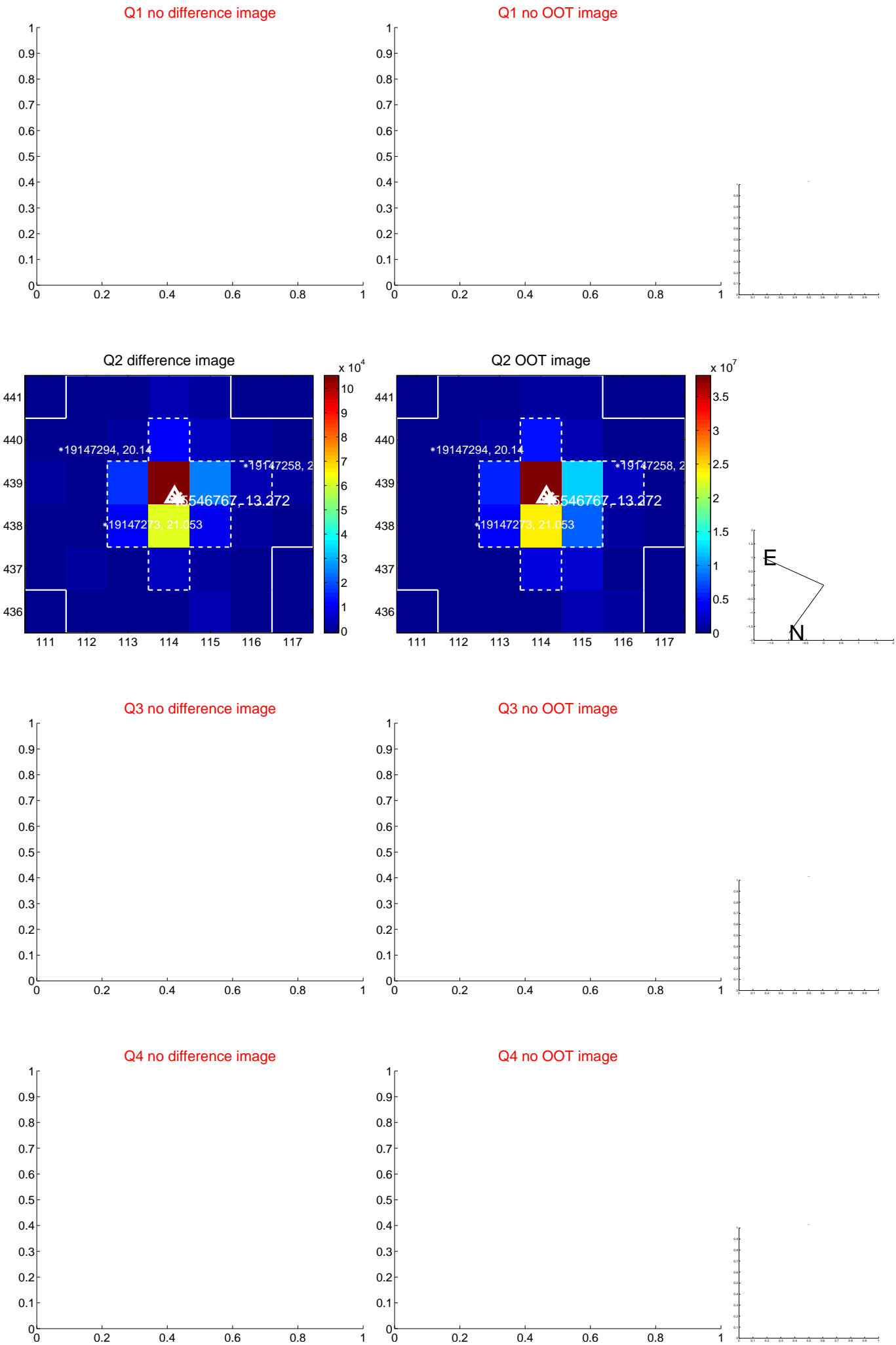


offset from photometric centroids



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.

Q5 no difference image



Q5 no OOT image



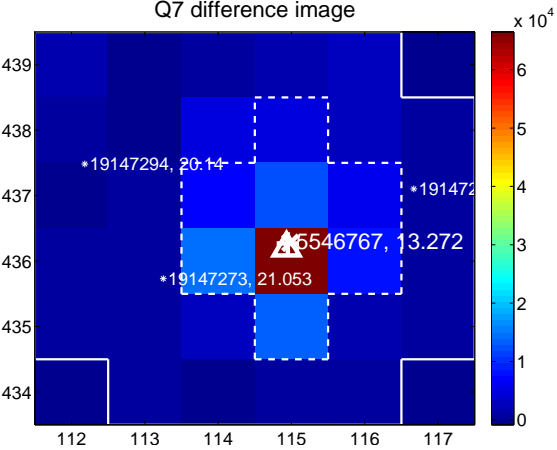
Q6 no difference image



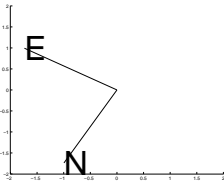
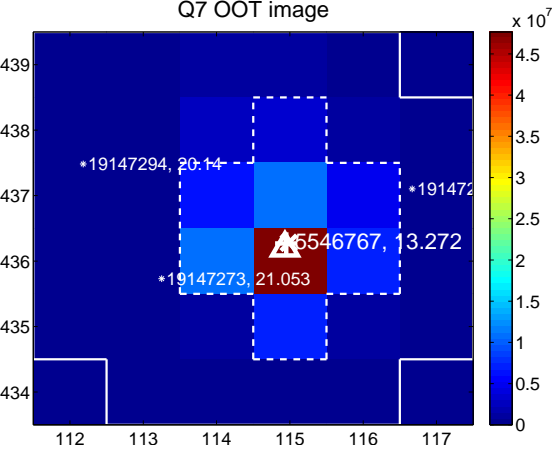
Q6 no OOT image



Q7 difference image



Q7 OOT image



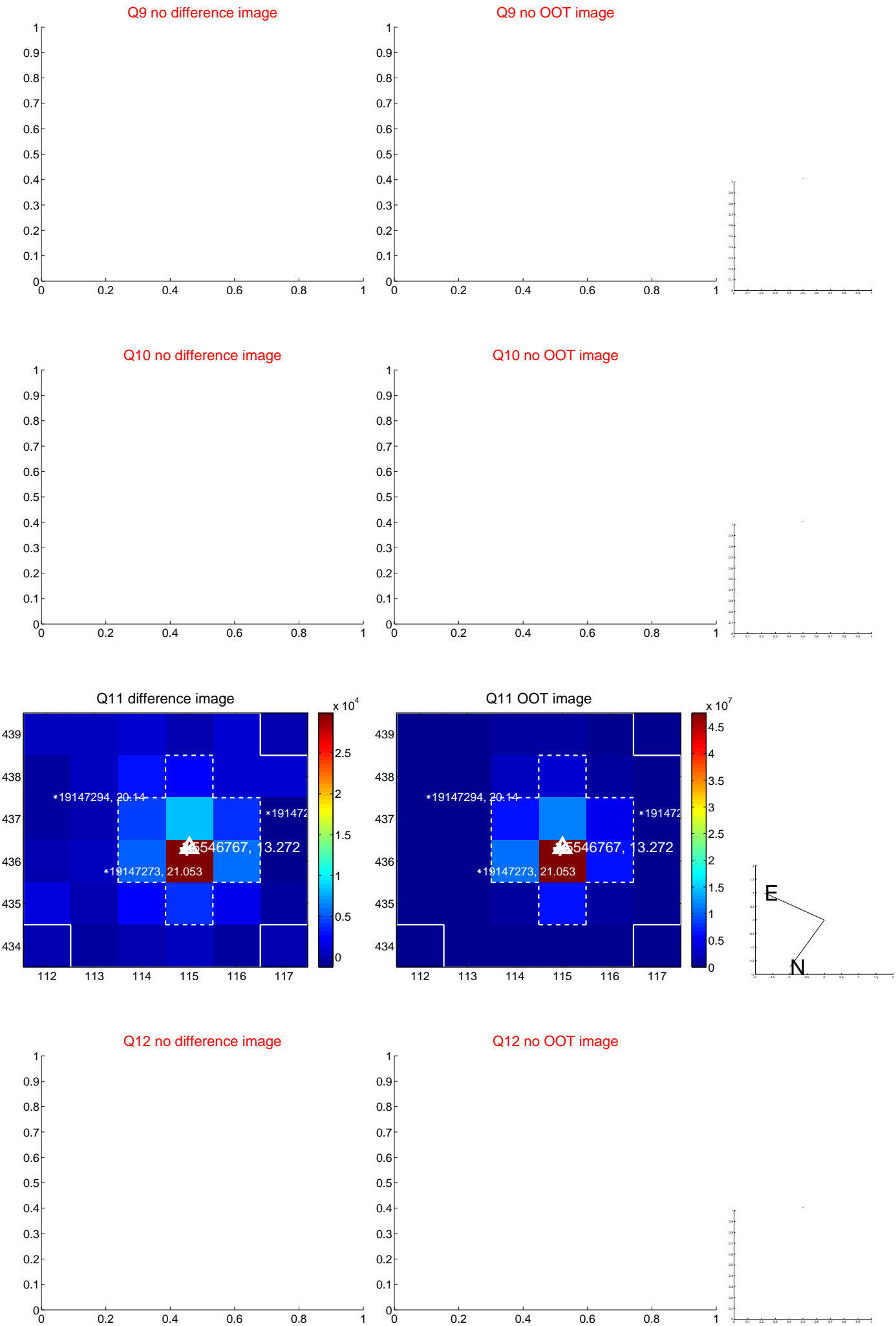
Q8 no difference image



Q8 no OOT image



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

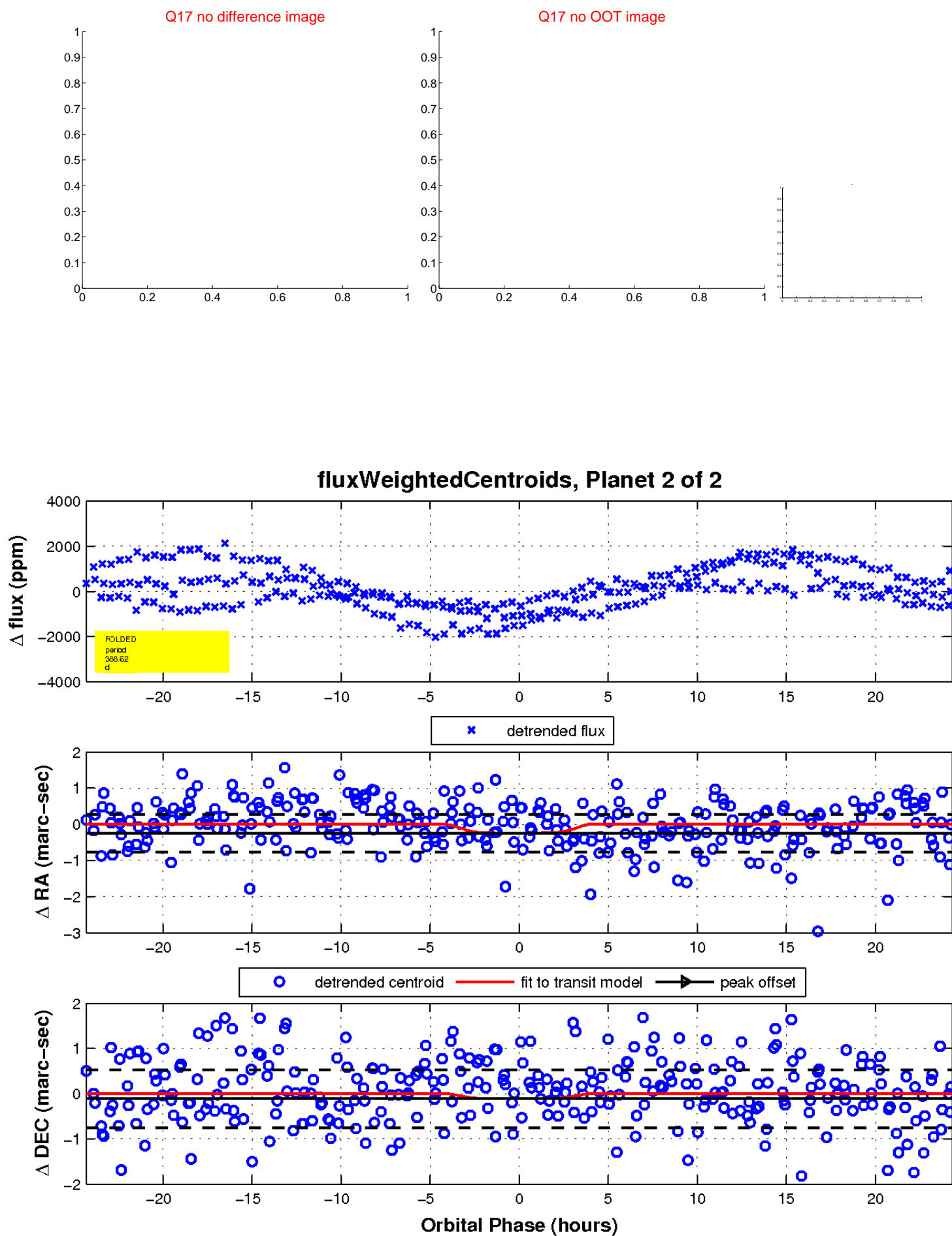


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

