

# KIC 011764567

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011764567-01	OBS	No	300.896720	338.989782	837.1	9.843	20.3	10.6	0.79	5422	2.31	0.77
011764567-02	OBS	No	421.526978	308.614063	843.3	16.242	18.0	7.8	0.79	5422	2.26	0.49
011764567-03	OBS	No	585.693639	197.916077	1194.6	9.240	18.4	10.0	0.79	5422	3.41	0.32
011764567-04	OBS	No	482.320887	300.262011	644.6	6.346	16.9	5.8	0.79	5422	2.06	0.41
011764567-05	OBS	No	714.441536	146.348287	886.1	5.547	15.8	9.2	0.79	5422	2.84	0.24
011764567-06	OBS	No	533.703540	389.157677	905.3	8.926	15.4	9.0	0.79	5422	2.74	0.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011764567-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
011764567-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-06	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

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

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

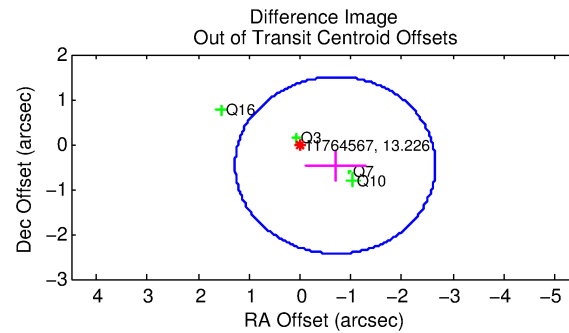
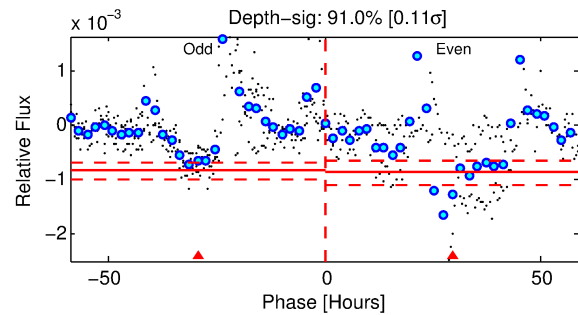
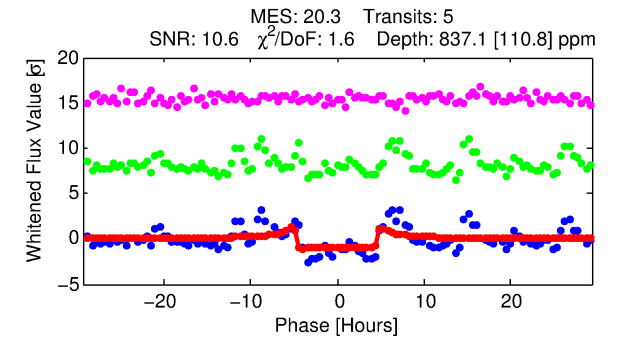
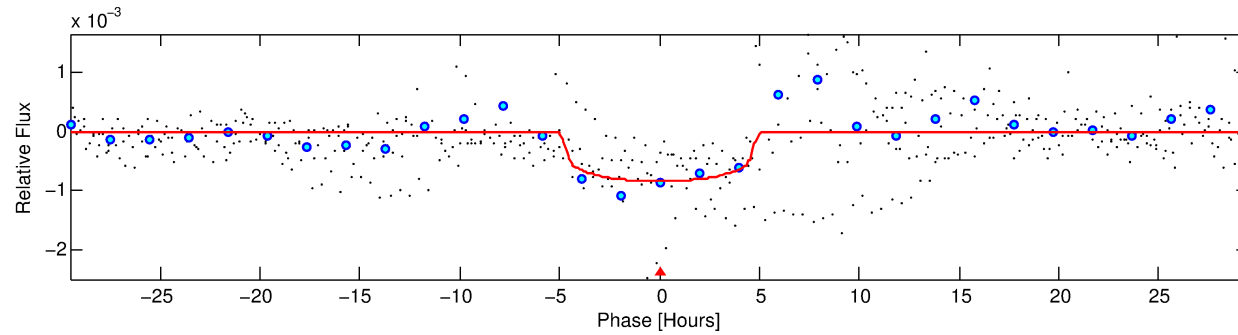
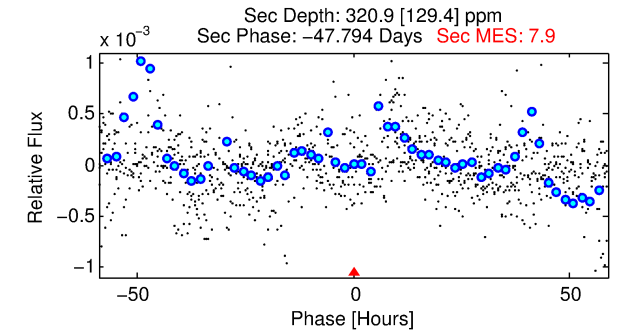
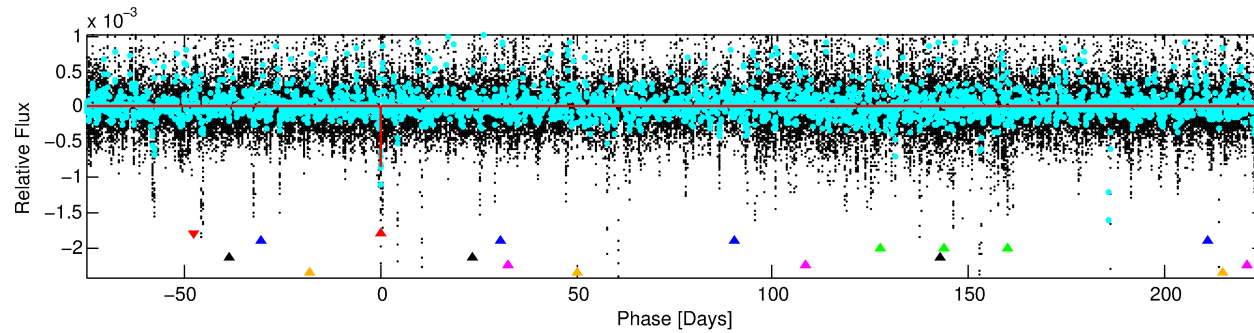
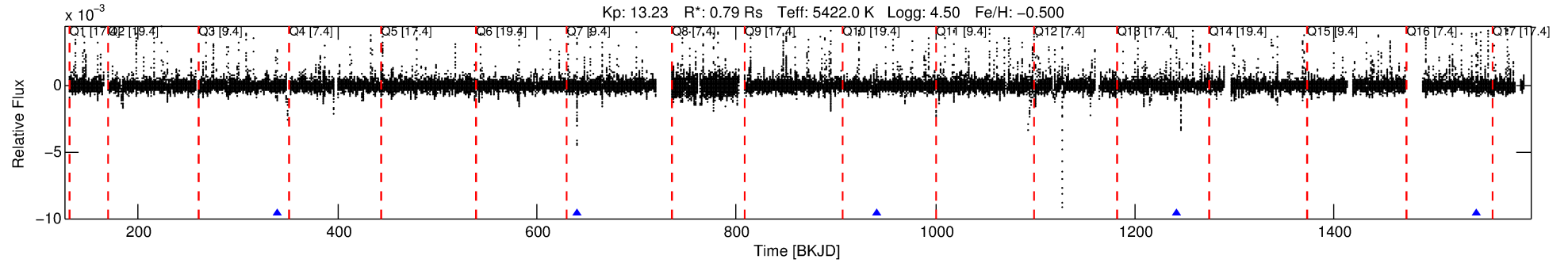
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011764567-01

No Significant Match Found

# DV One-Page Summary

KIC: 11764567 Candidate: 1 of 6 Period: 300.897 d



## DV Fit Results:

Period = 300.89672 [0.00290] d  
Epoch = 338.9898 [0.0076] BKJD  
Rp/R\* = 0.0270 [0.0089]  
a/R\* = 210.53 [281.85]  
b = 0.49 [2.07]  
Seff = 0.77 [0.18]  
Teq = 239 [14] K  
Rp = 2.31 [0.85] Re  
a = 0.7868 [0.1067] AU  
Ag = 20416.09 [16320.33] [1.25σ]  
Teffp = 4416 [865] K [4.83σ]

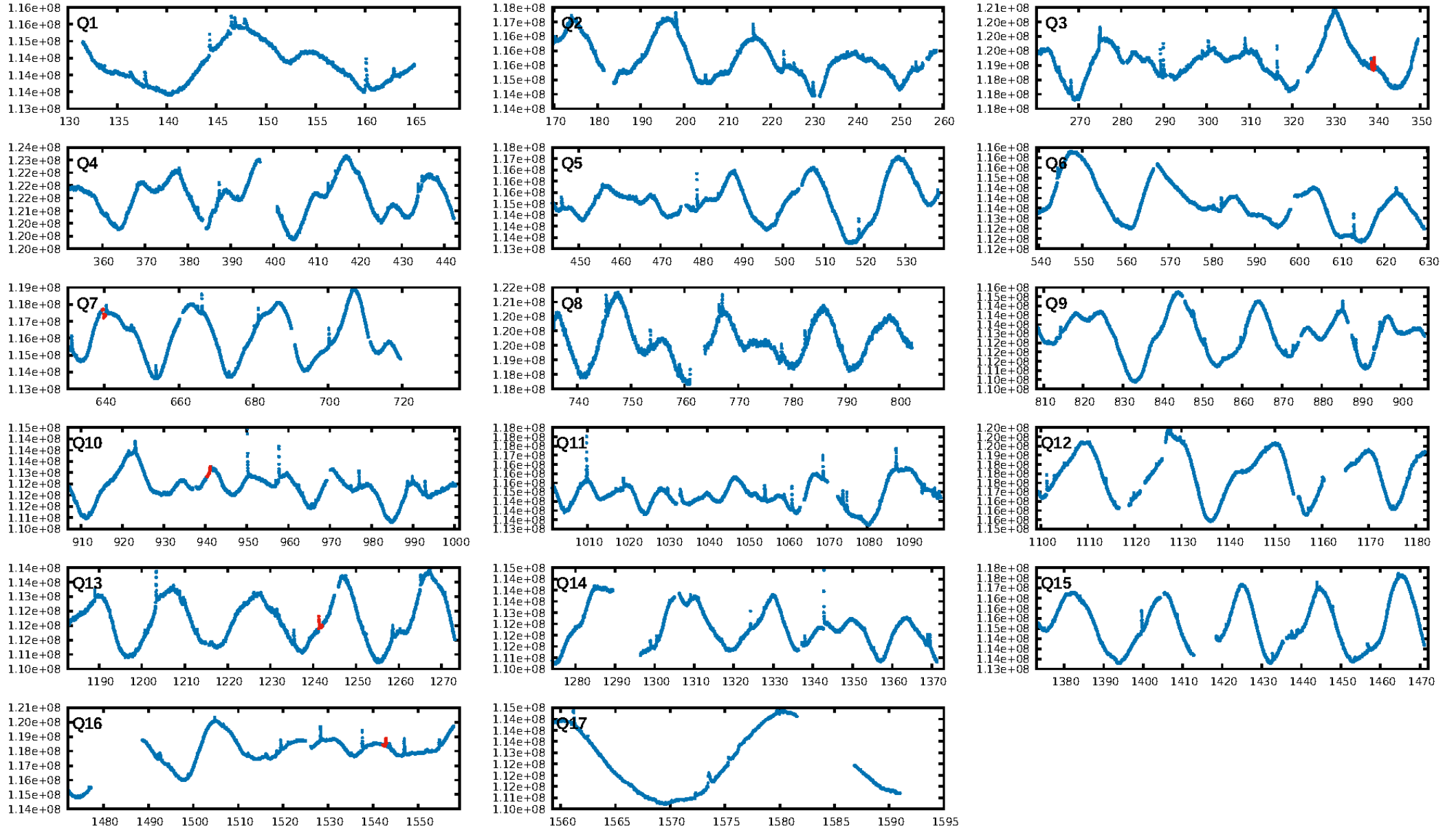
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [152.44σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 86.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 2.552  
Centroid-sig: 32.0%  
Centroid-so: 0.305 arcsec [1.10σ]  
OotOffset-rm: 0.838 arcsec [1.28σ]  
OotOffset-st: 1/2/1/0 [4]  
KicOffset-rm: 0.777 arcsec [1.65σ]  
KicOffset-st: 1/2/1/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [4/4]

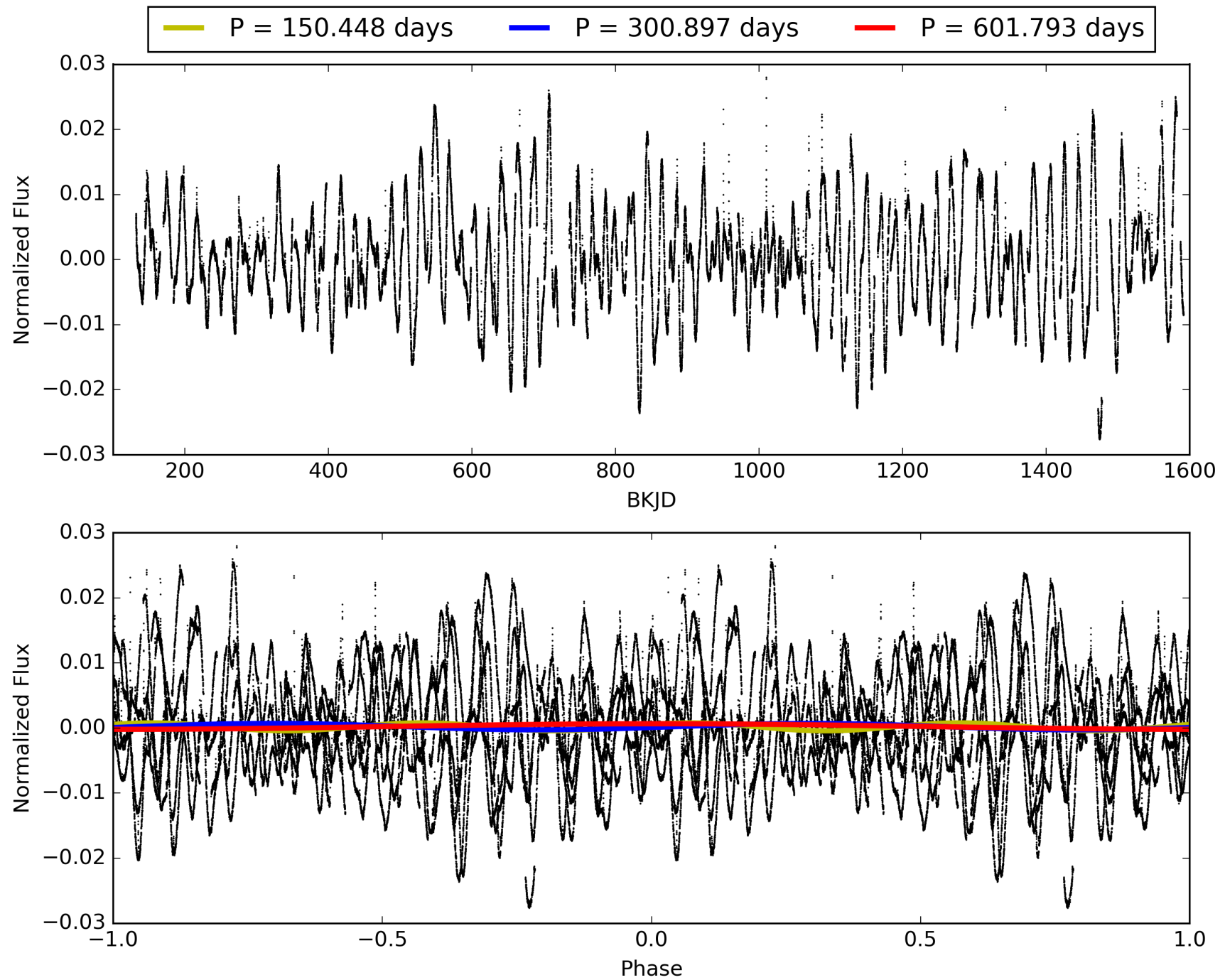
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:32:42 Z

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

# TCE 011764567-01, PDC Light Curves



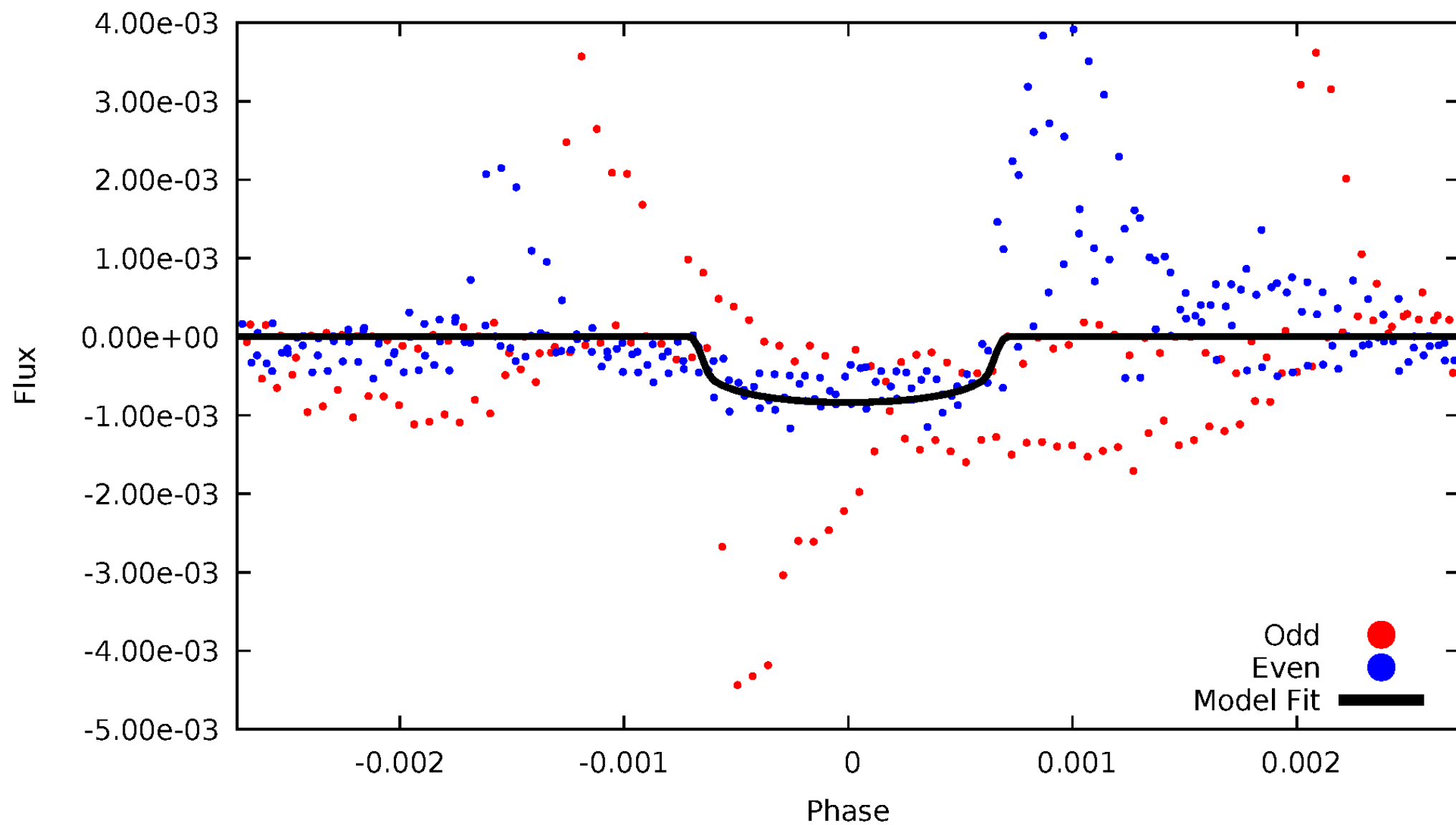
TCE 011764567-01





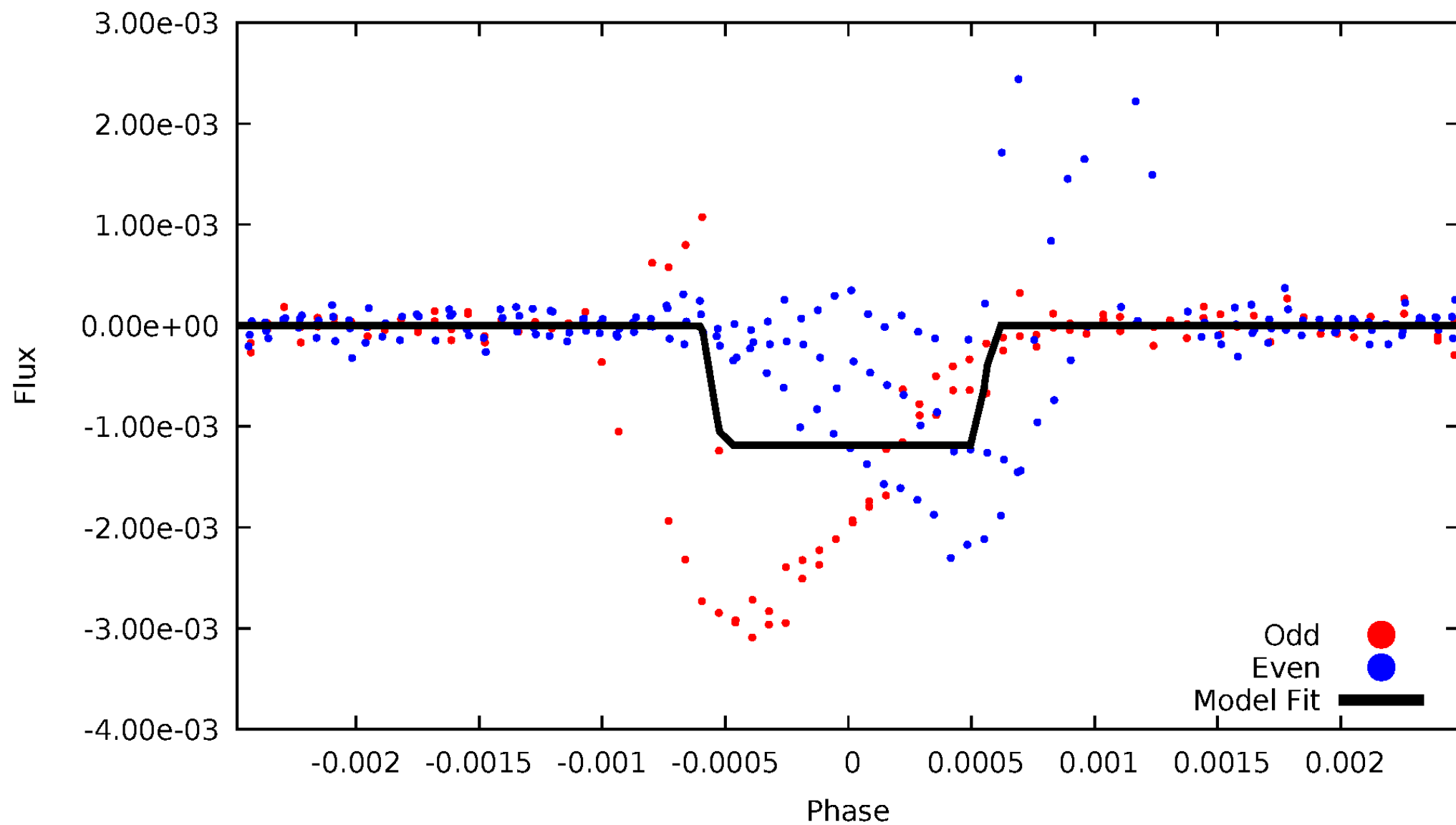
# DV Odd/Even

TCE 011764567-01



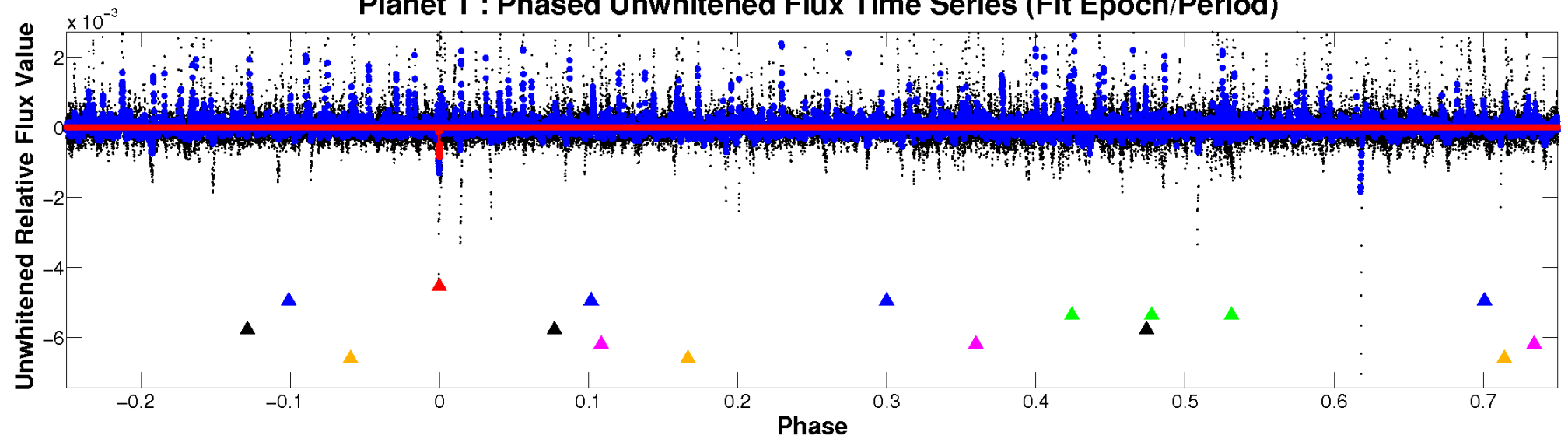
# ALT Odd/Even

TCE 011764567-01

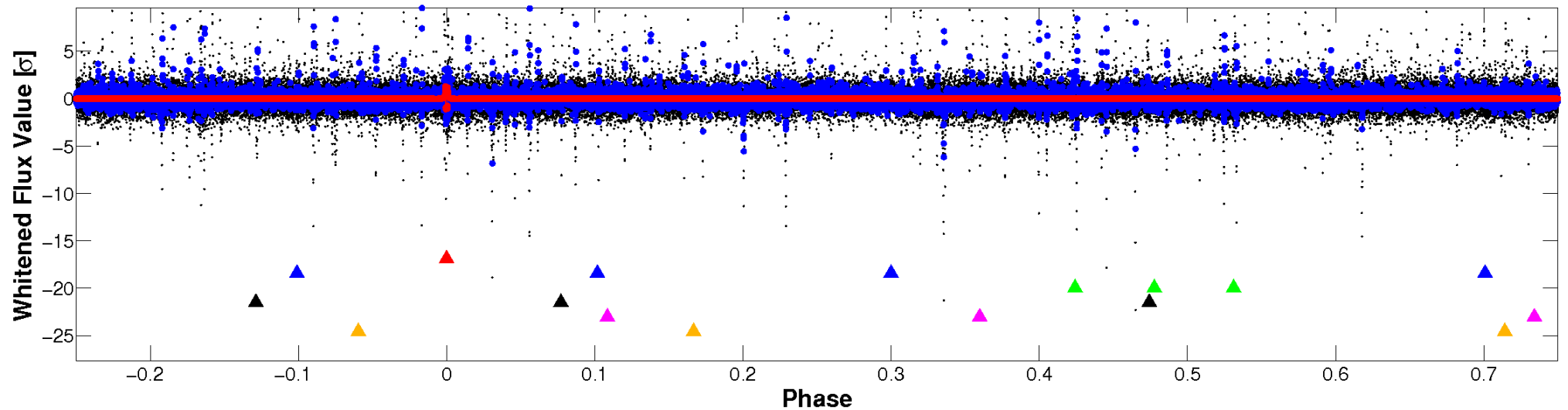


# Non-Whitened Vs. Whitened Light Curve

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

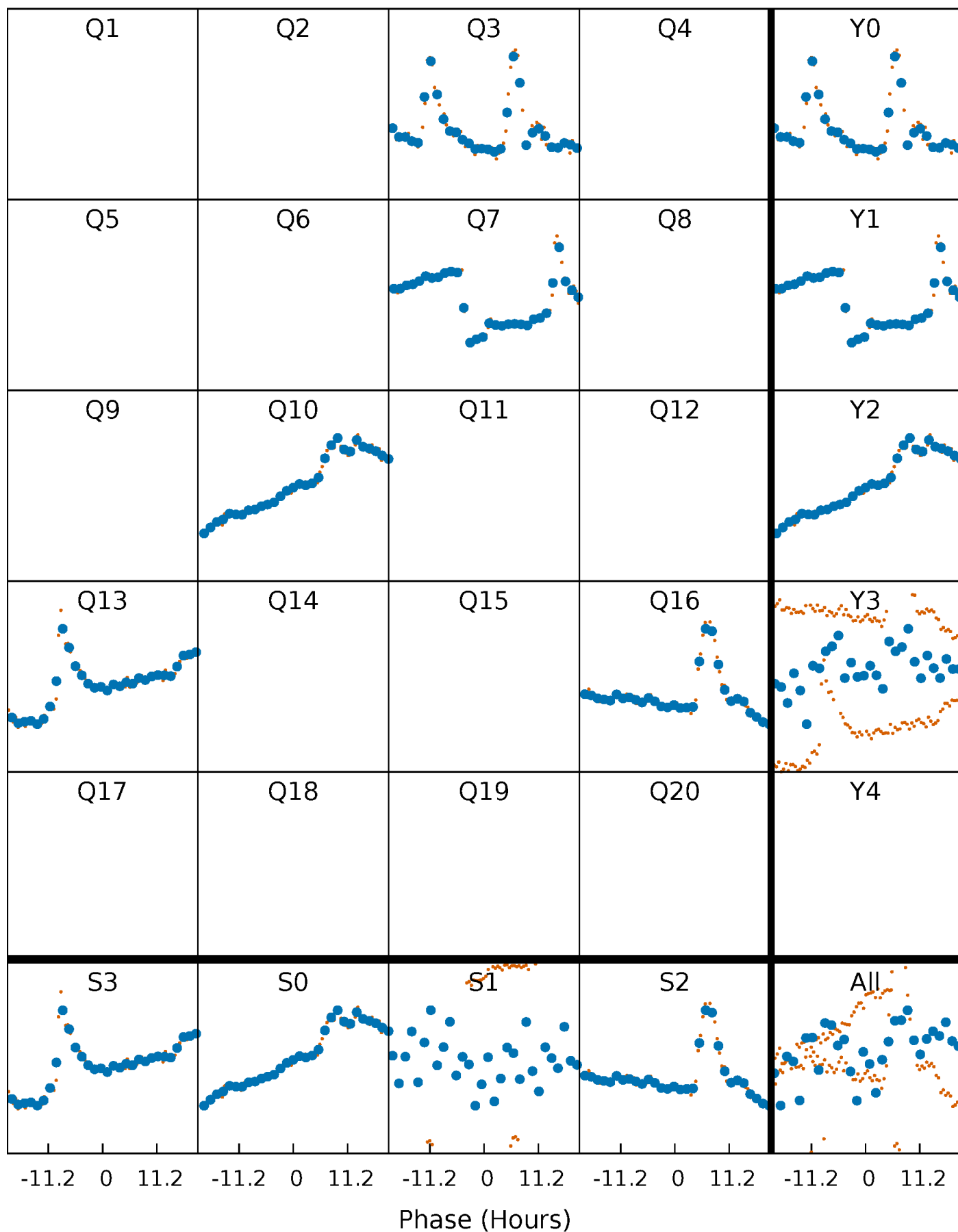


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



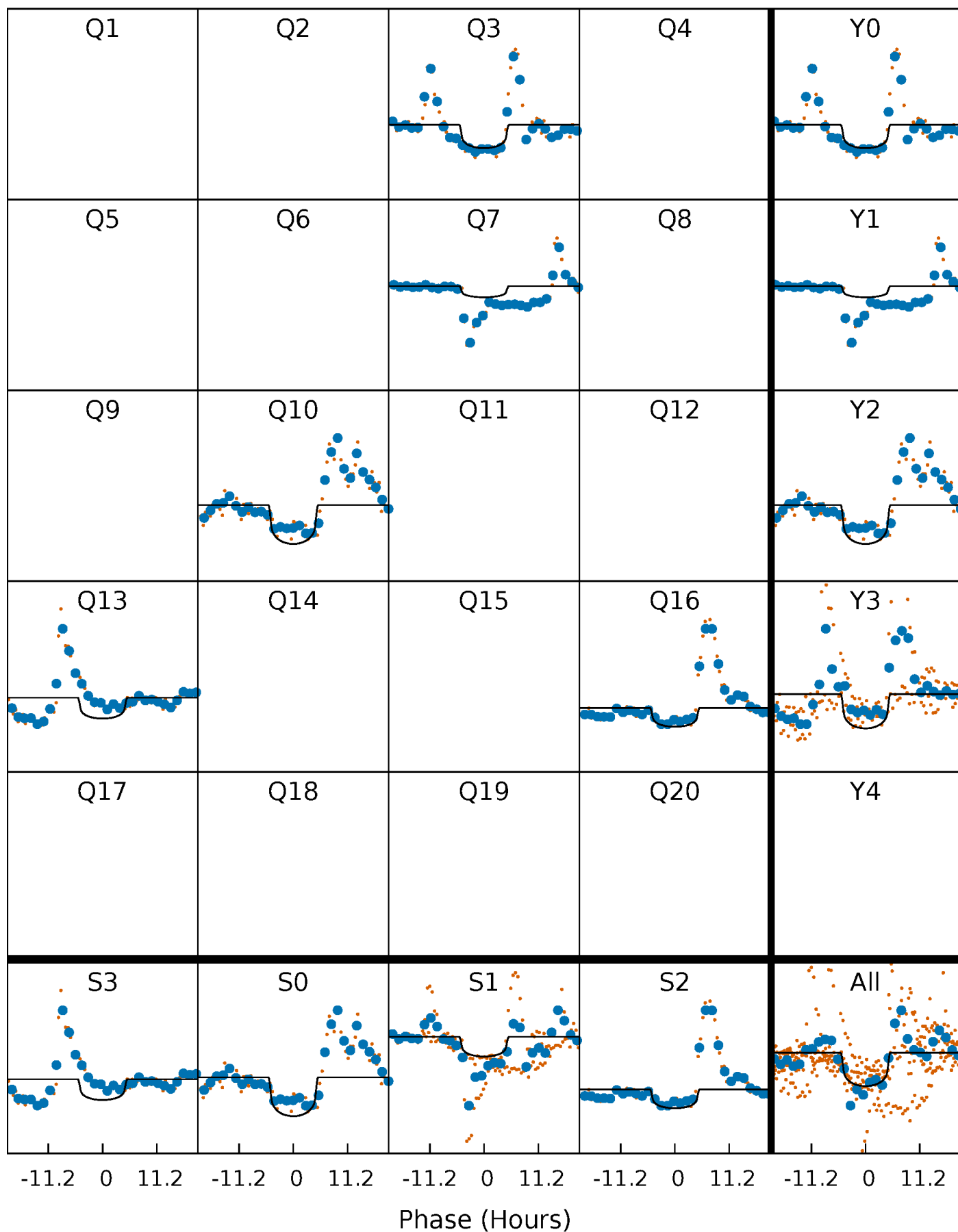
# PDC Quarter-Phased Transit Curves

TCE 011764567-01 P=300.896720 Days  $T_0=338.989782$  (BKJD)



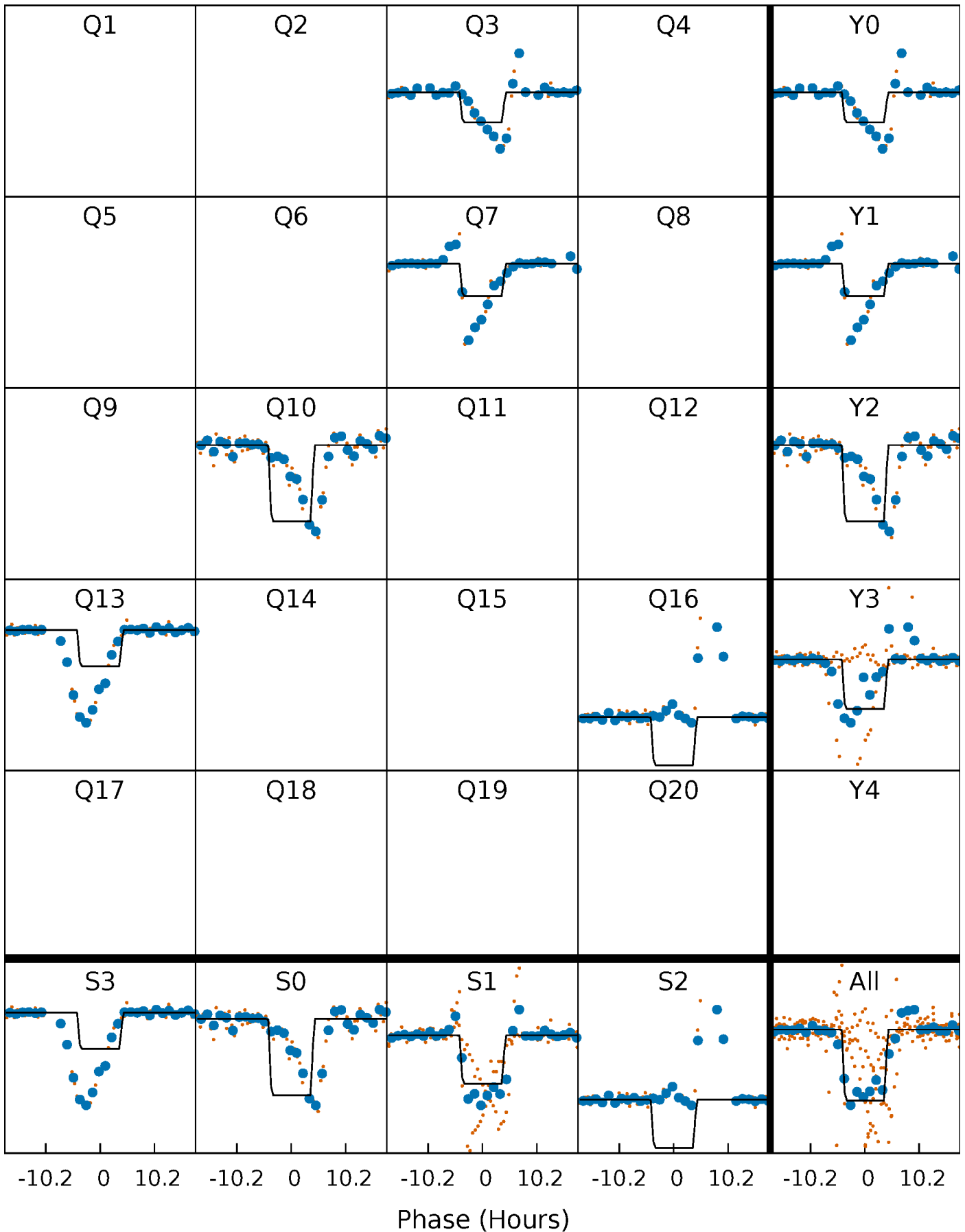
# DV Quarter-Phased Transit Curves

TCE 011764567-01 P=300.896720 Days  $T_0=338.989782$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011764567-01   P=300.904605 Days    $T_0=338.970776$  (BKJD)

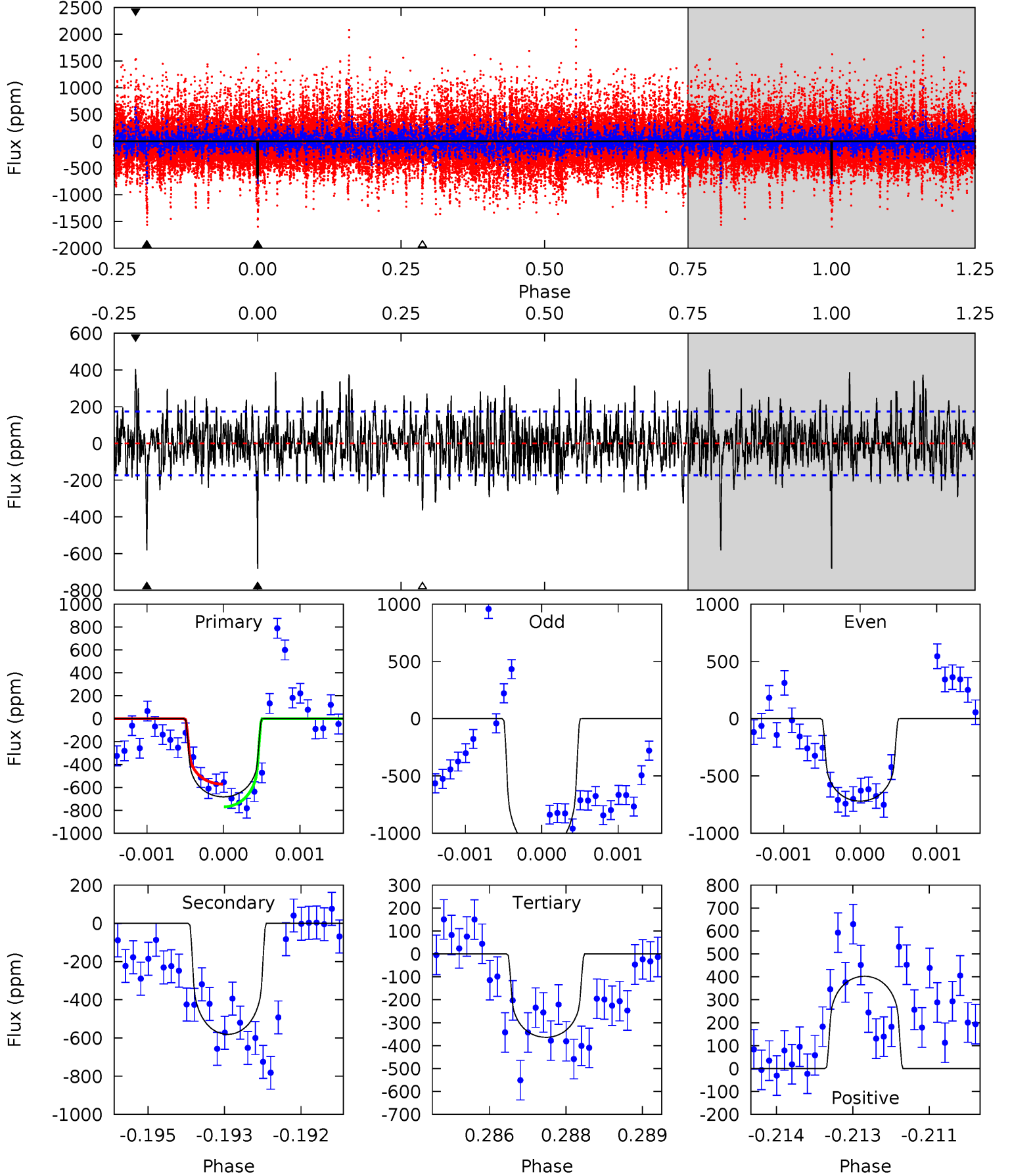




# DV Model-Shift Uniqueness Test

011764567-01,  $P = 300.896720$  Days,  $E = 38.093062$  Days

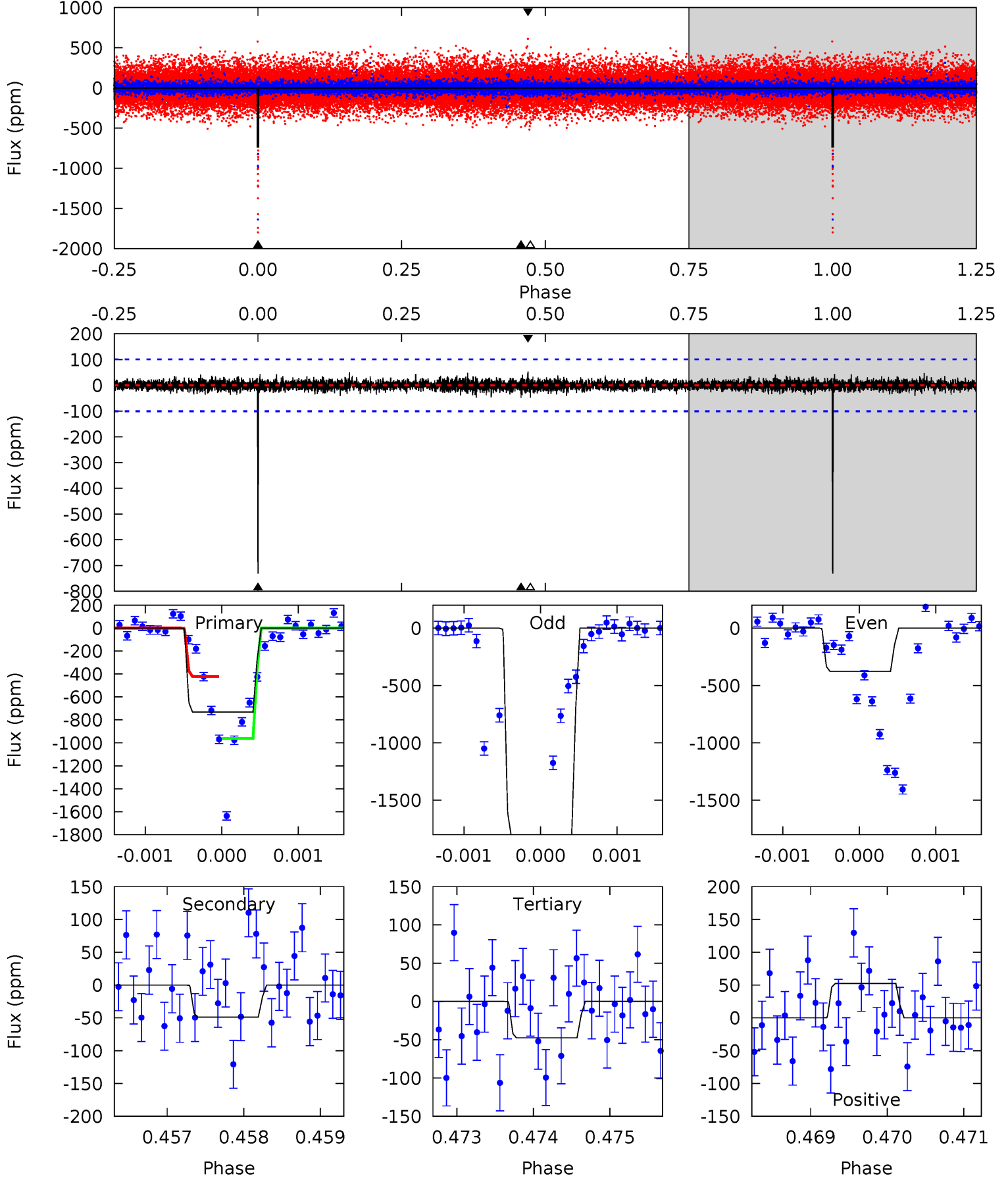
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.1	18.0	11.3	12.5	5.39	3.19	3.28	9.86	8.67	6.72	5.53	5.27	1.58	0.37	3.07



# Alt Model-Shift Uniqueness Test

011764567-01, P = 300.904605 Days, E = 38.066171 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
39.3	2.61	2.55	2.82	5.42	3.23	0.56	36.8	36.5	0.06	-0.21	47.9	0.86	0.07	14.2



### Stellar Parameters For KIC 011764567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5422^{+162}_{-146}$	$4.504^{+0.110}_{-0.110}$	$-0.500^{+0.350}_{-0.300}$	$0.785^{+0.125}_{-0.102}$	$0.718^{+0.105}_{-0.045}$	$2.088^{+1.006}_{-0.680}$
	+3%/-3%	+2%/-2%	+70%/-60%	+16%/-13%	+15%/-6%	+48%/-33%
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 011764567-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-581 \pm 32$	$2.37^{+0.83}_{-0.76}$	$335^{+17}_{-16}$	$5154^{+1013}_{-606}$	$35154^{+42136}_{-14887}$
Alt.	$-49 \pm 19$	$3.00^{+0.78}_{-0.79}$	$334^{+18}_{-16}$	$3062^{+310}_{-271}$	$1885^{+1748}_{-908}$

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

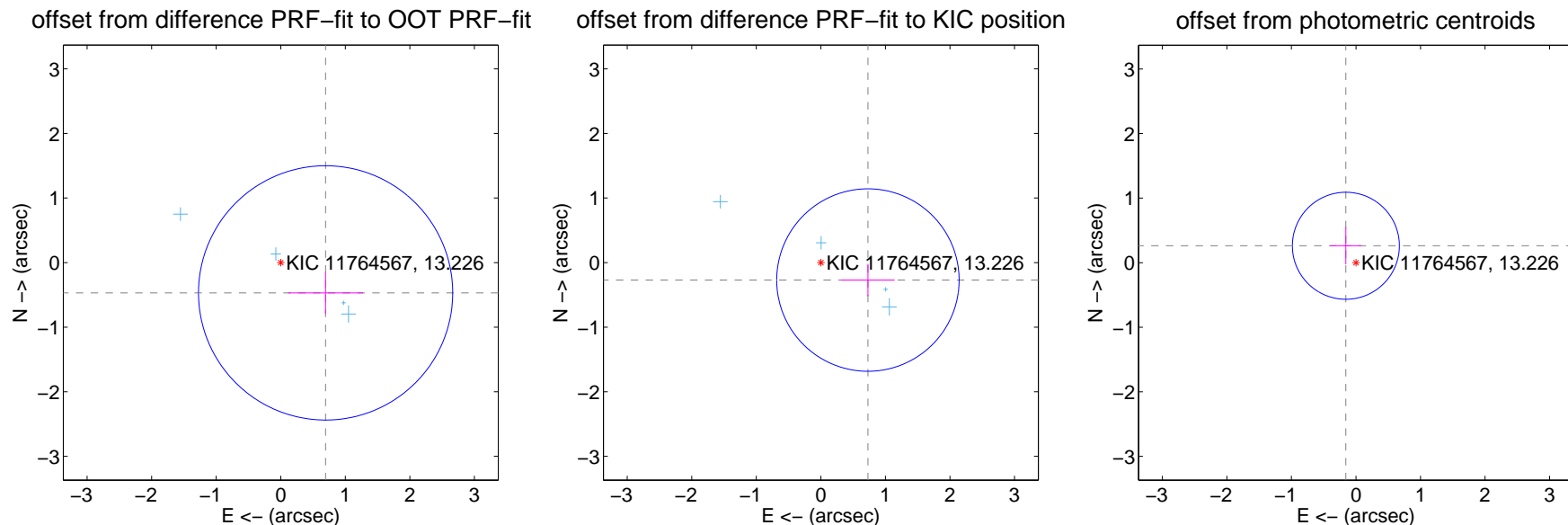
## DV Centroid Data

Supplemental centroid analysis for 011764567-01. Kepler magnitude: 13.23. Transit SNR 10.62

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

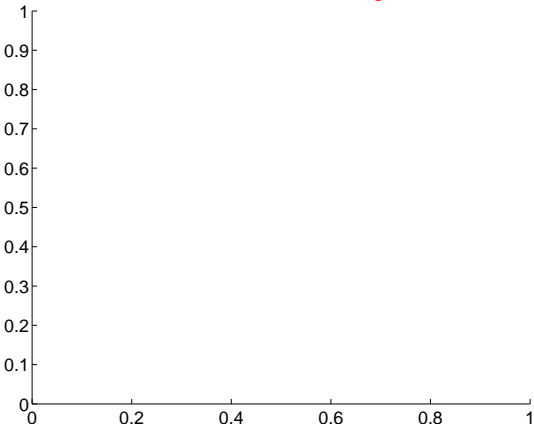
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.838 \pm 0.656$	1.28	$-0.695 \pm 0.579$	$-0.469 \pm 0.325$
PRF-fit source offset from KIC position	$0.777 \pm 0.471$	1.65	$-0.729 \pm 0.414$	$-0.270 \pm 0.250$
photometric centroid source offset	$0.30 \pm 0.28$	1.10	$0.16 \pm 0.24$	$0.26 \pm 0.29$



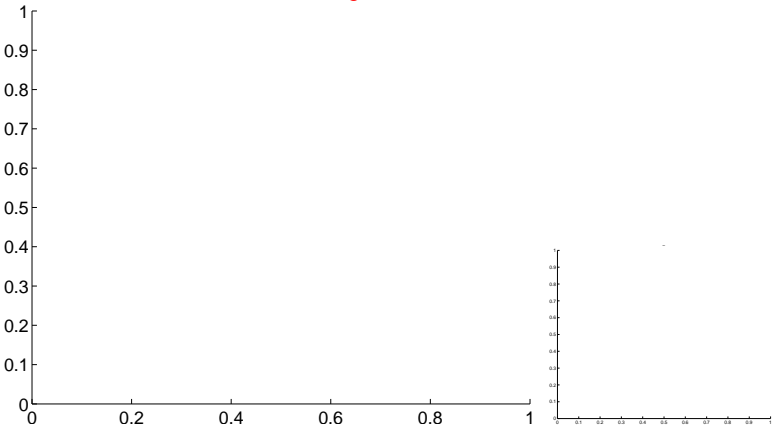
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

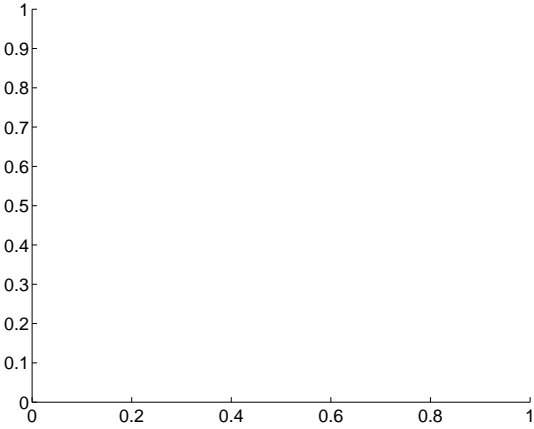
Q1 no difference image



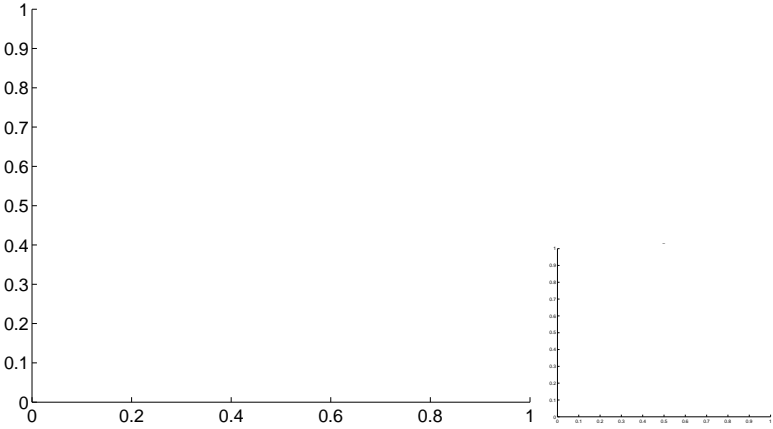
Q1 no OOT image



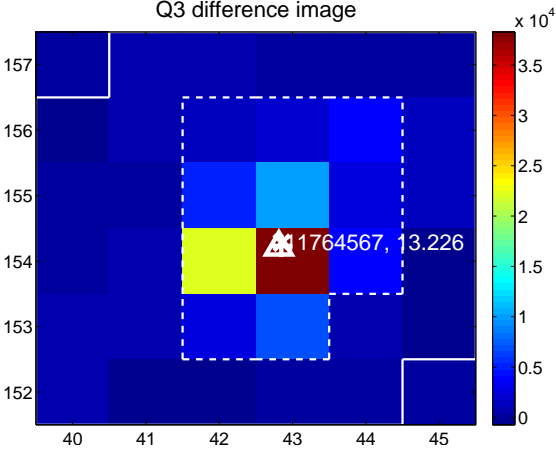
Q2 no difference image



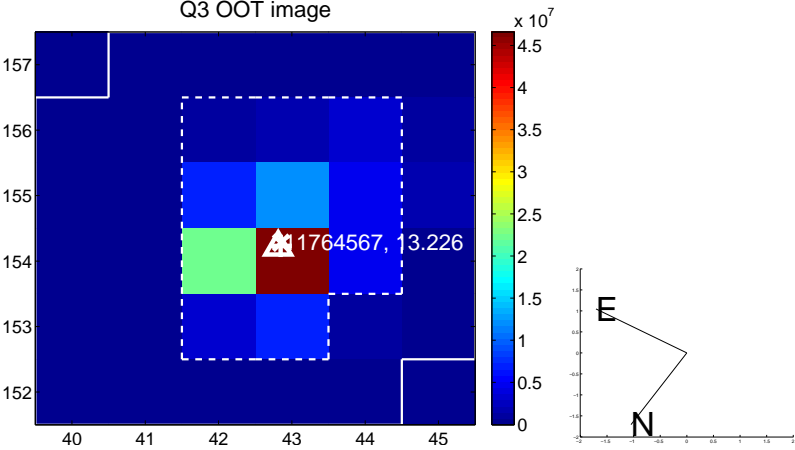
Q2 no OOT image



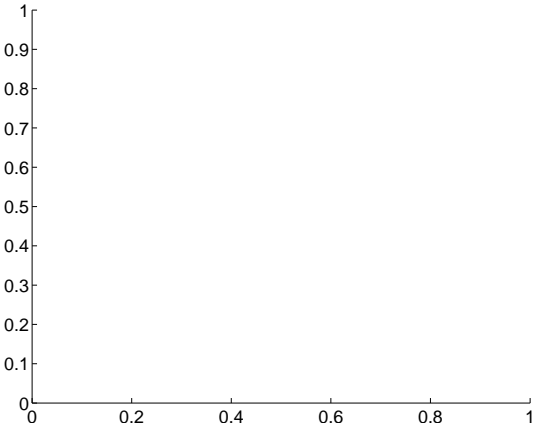
Q3 difference image



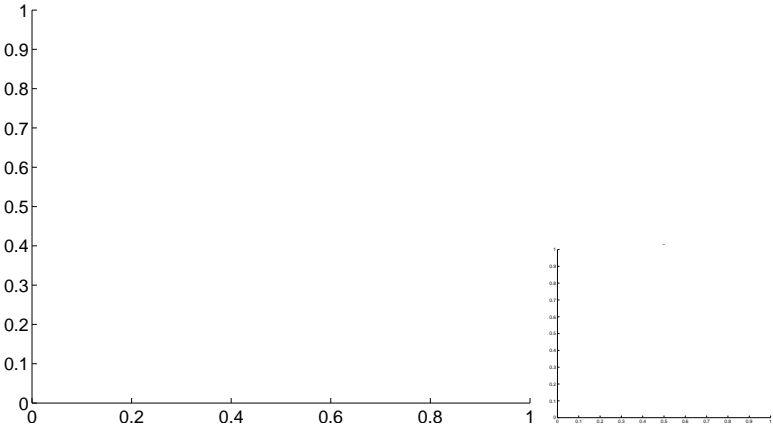
Q3 OOT image



Q4 no difference image

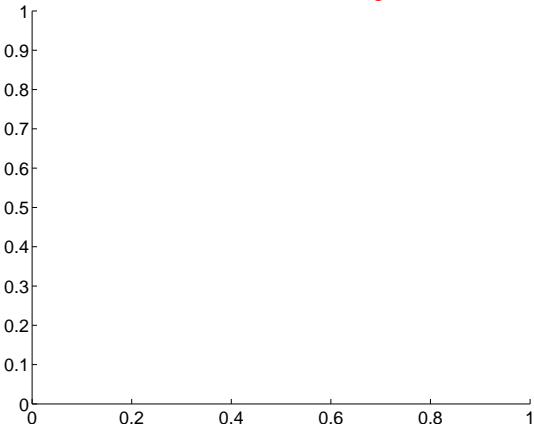


Q4 no OOT image

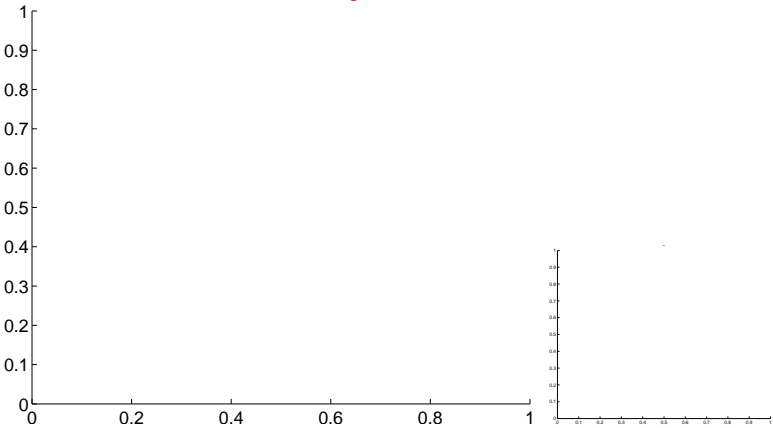


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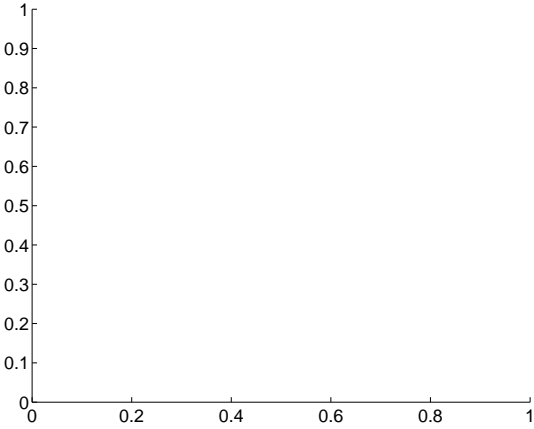
Q5 no difference image



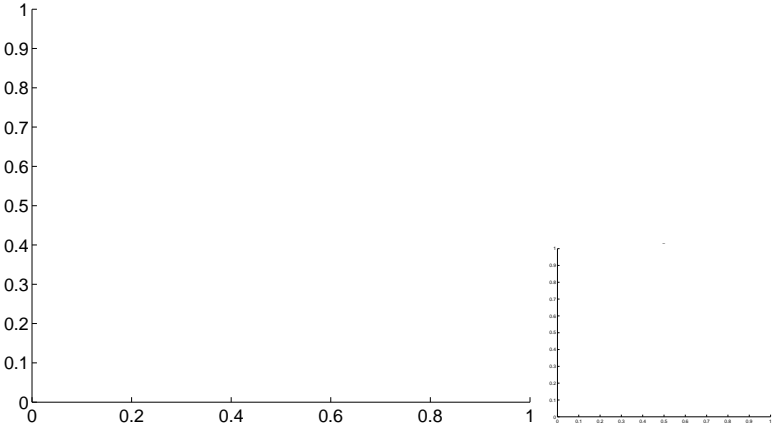
Q5 no OOT image



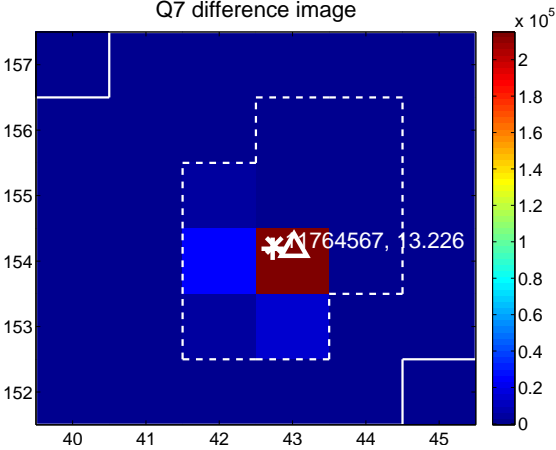
Q6 no difference image



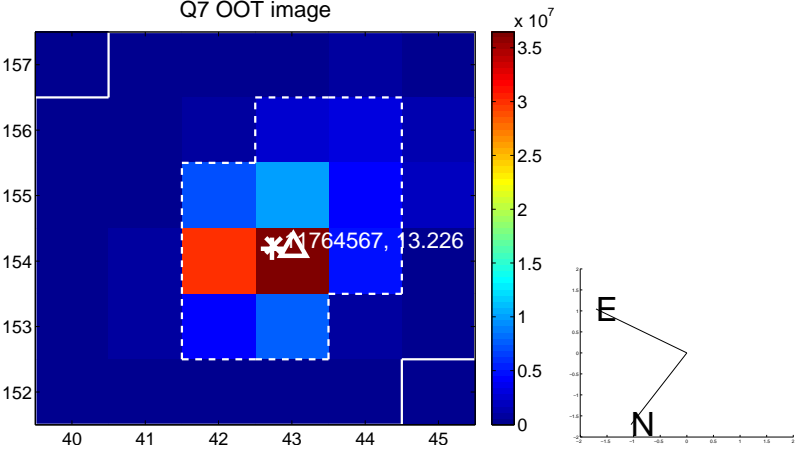
Q6 no OOT image



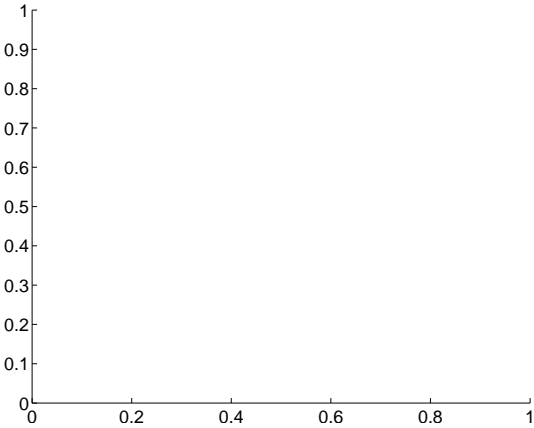
Q7 difference image



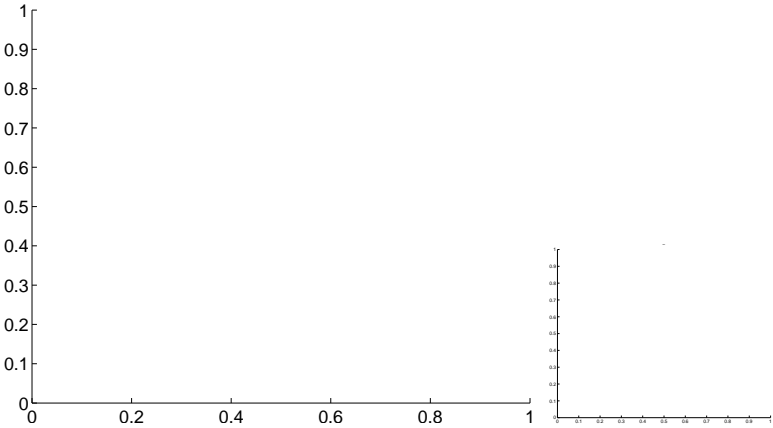
Q7 OOT image



Q8 no difference image

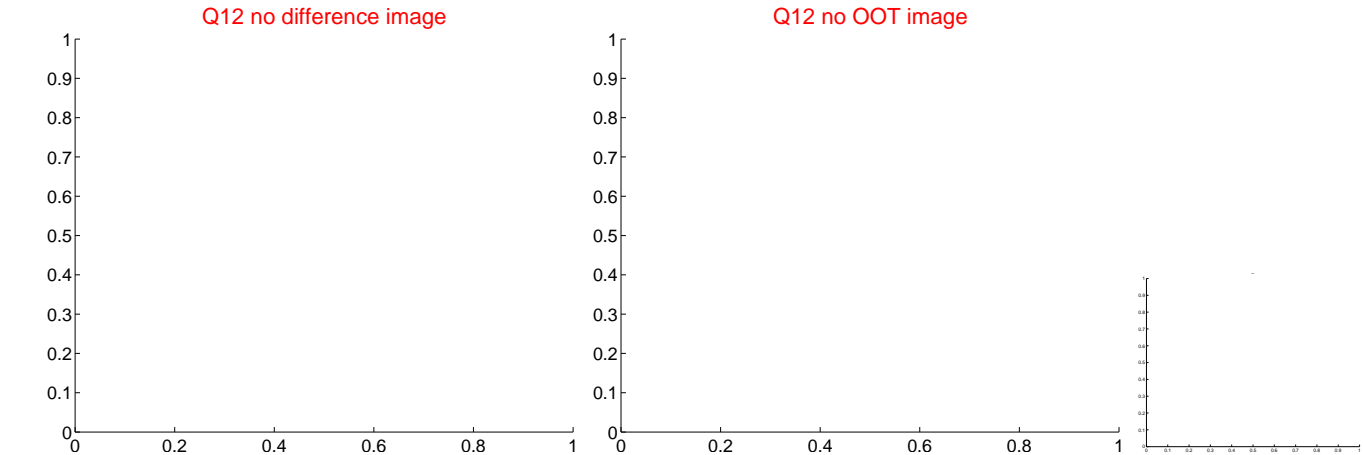
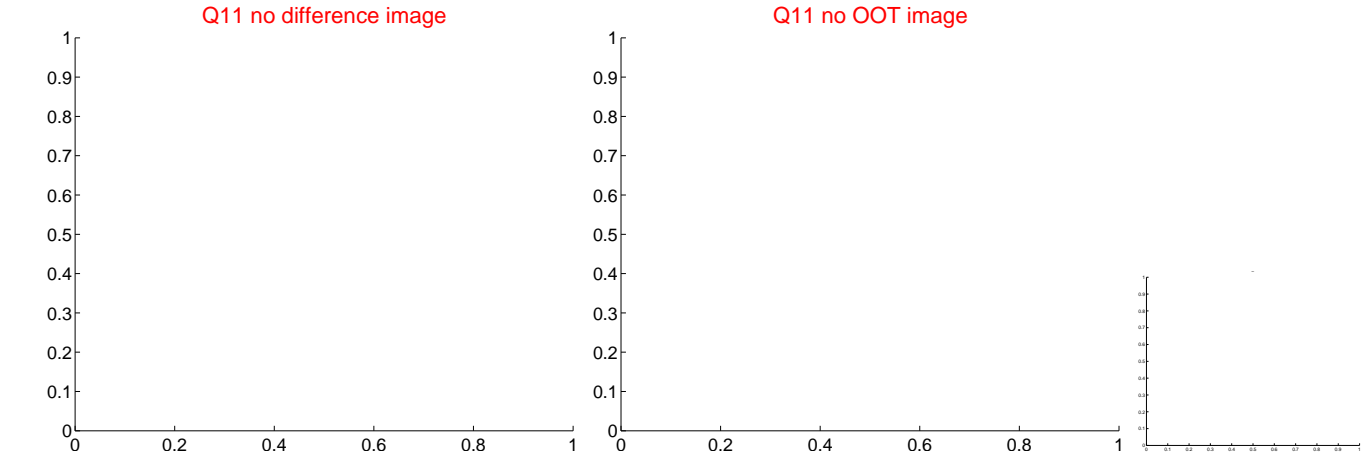
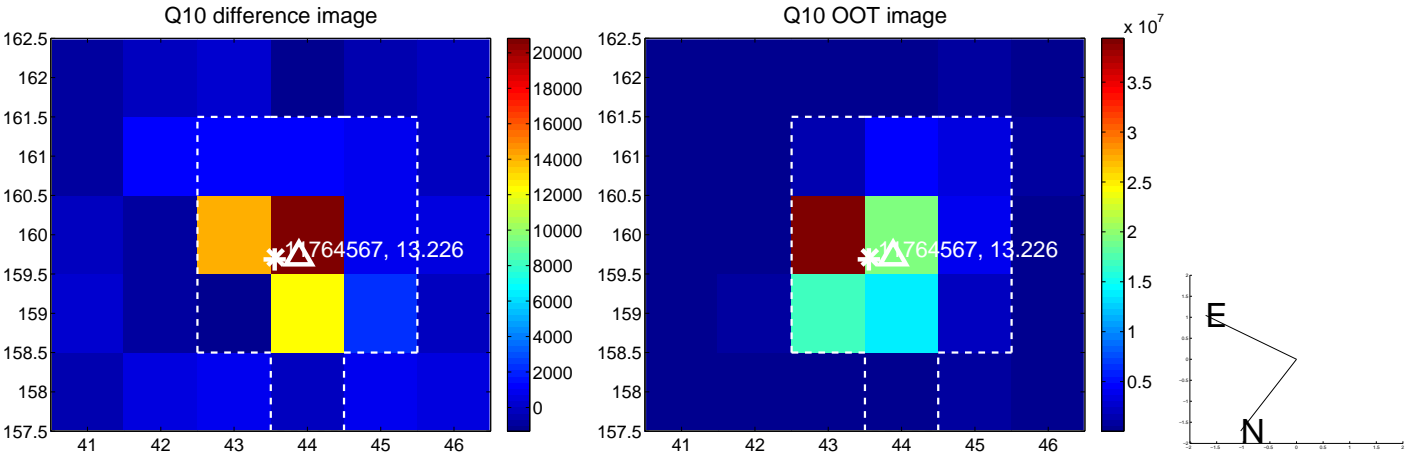
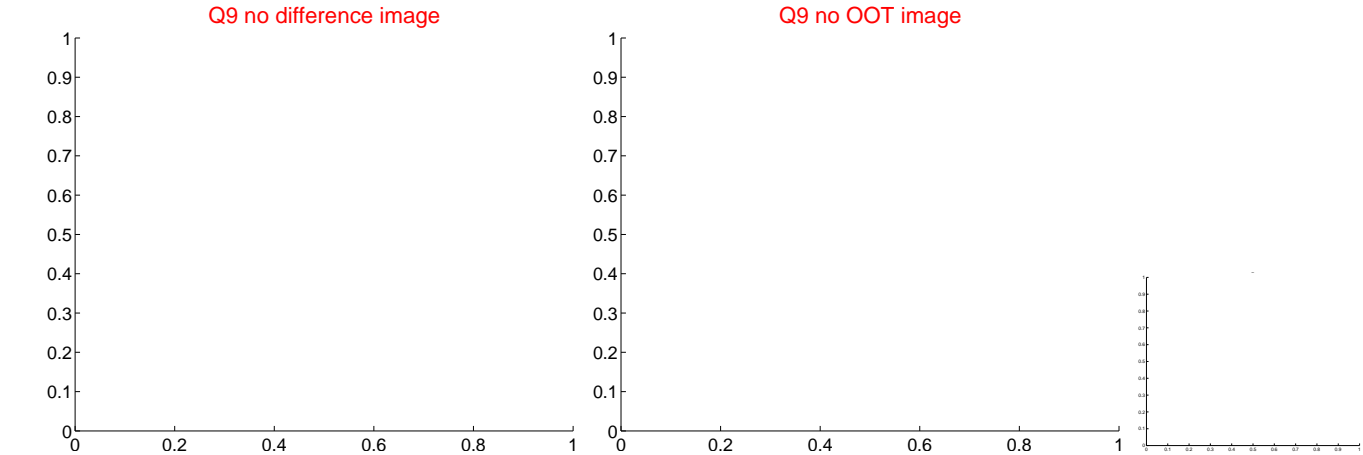


Q8 no OOT image

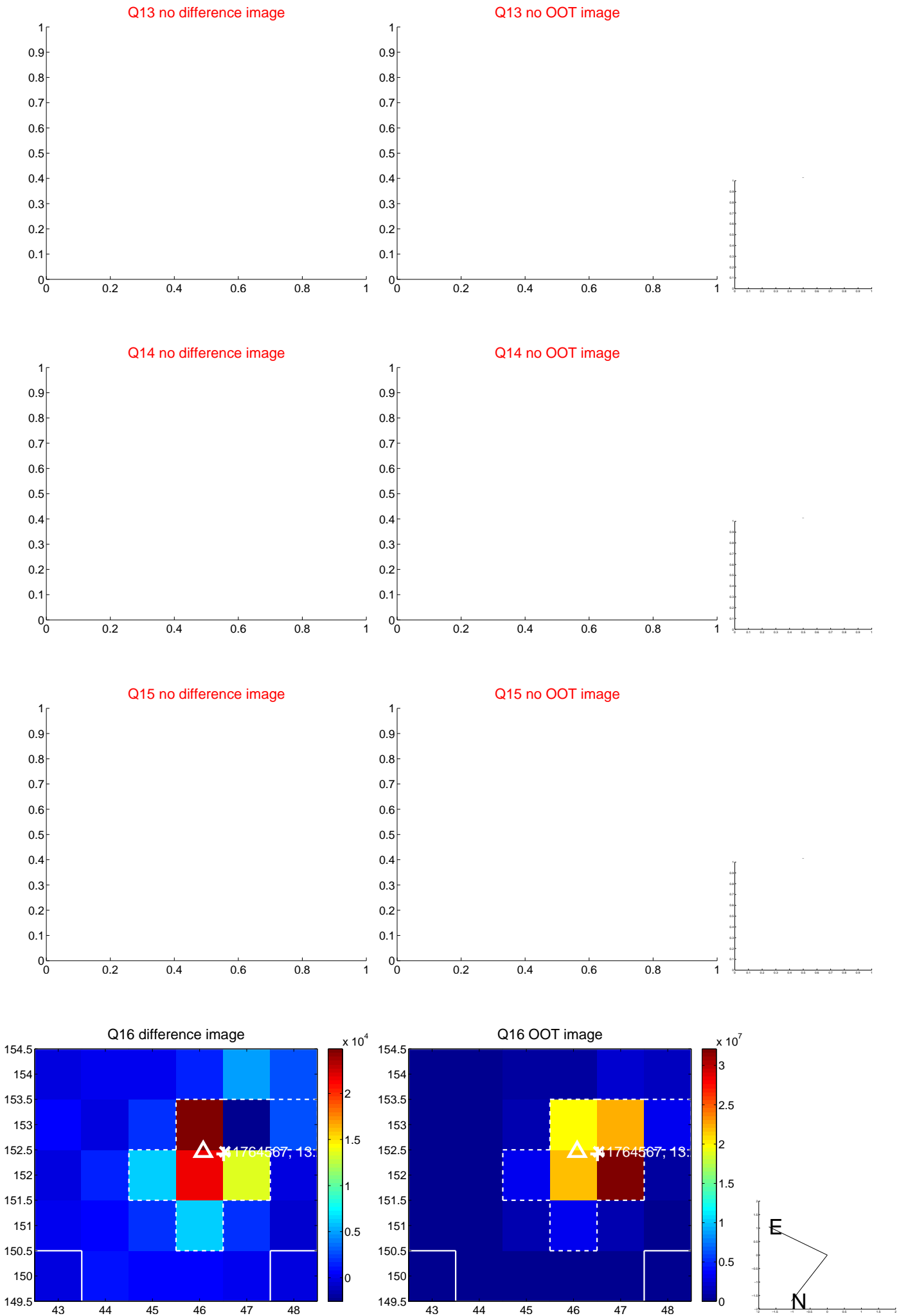




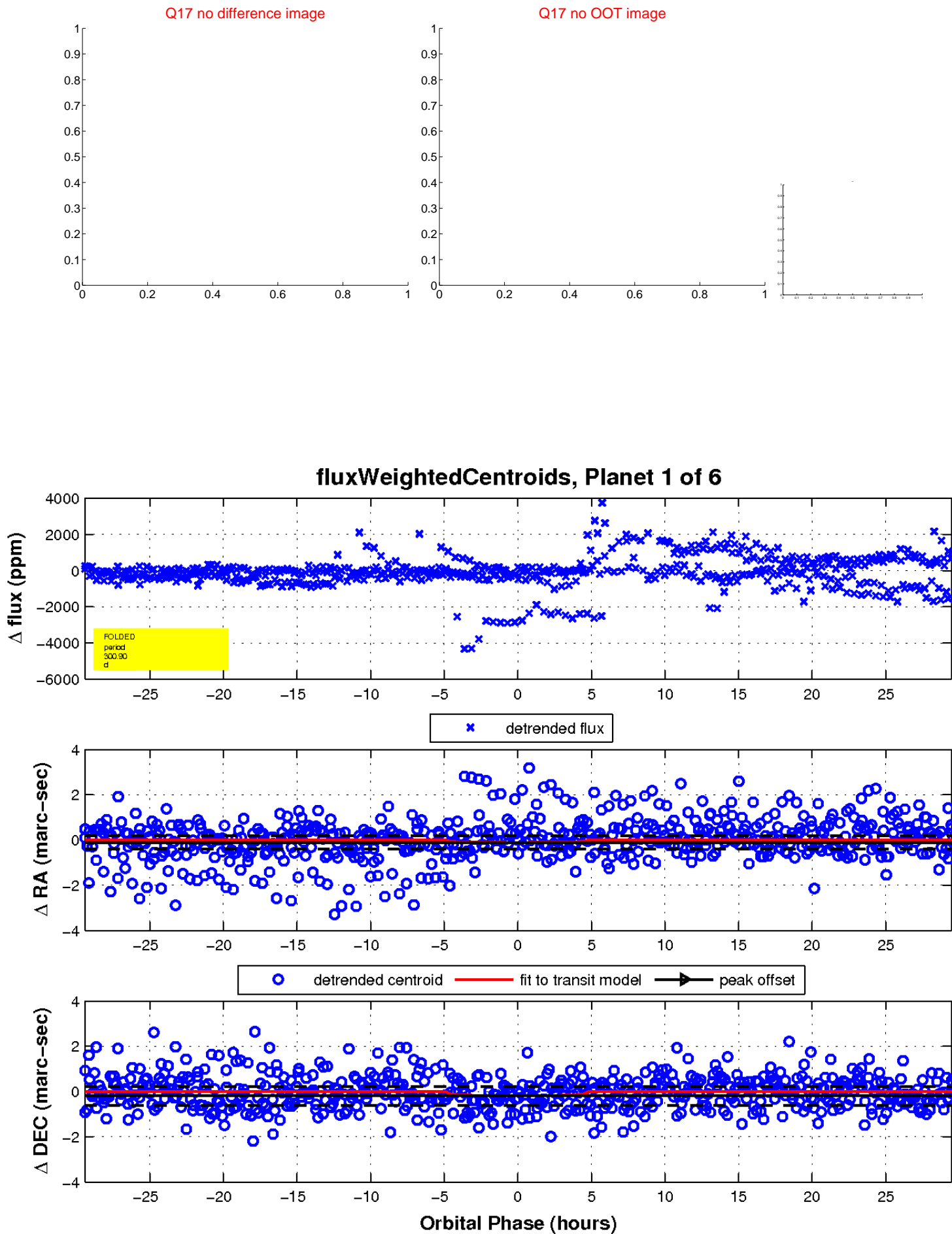
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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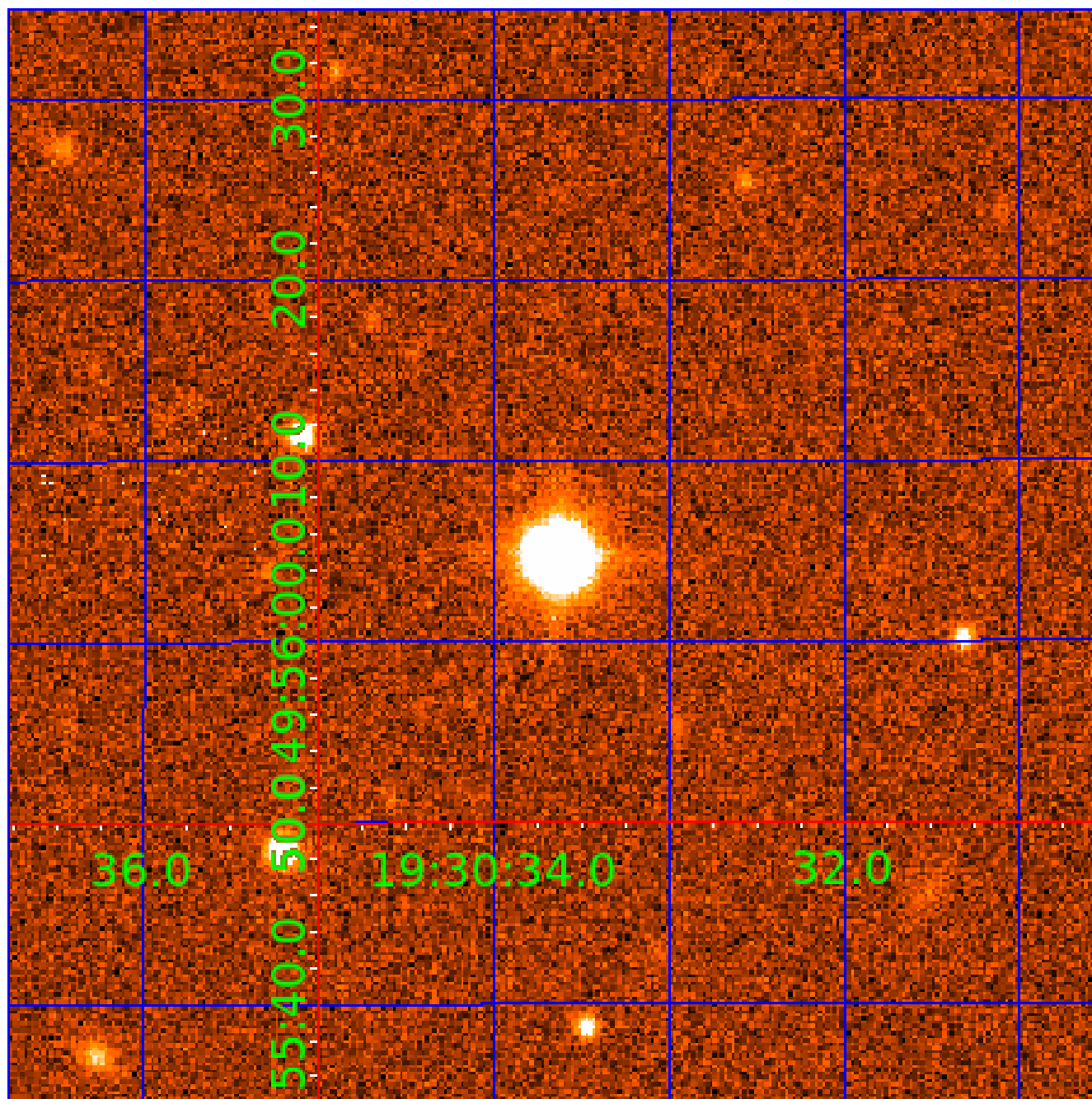


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UKIRT Image

Declination



# KIC 011764567

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

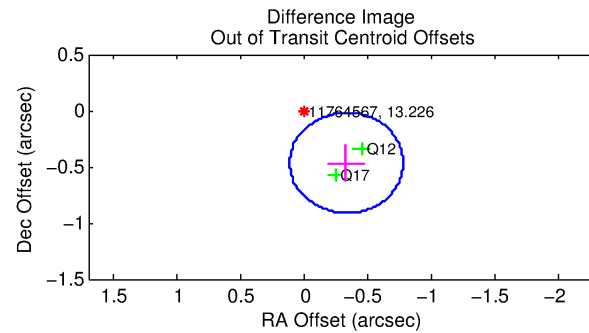
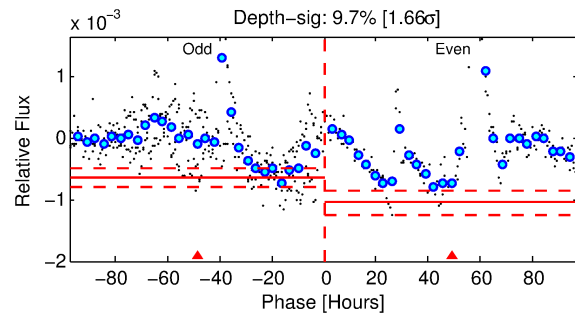
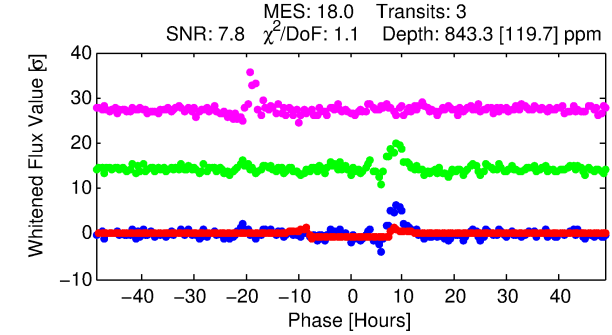
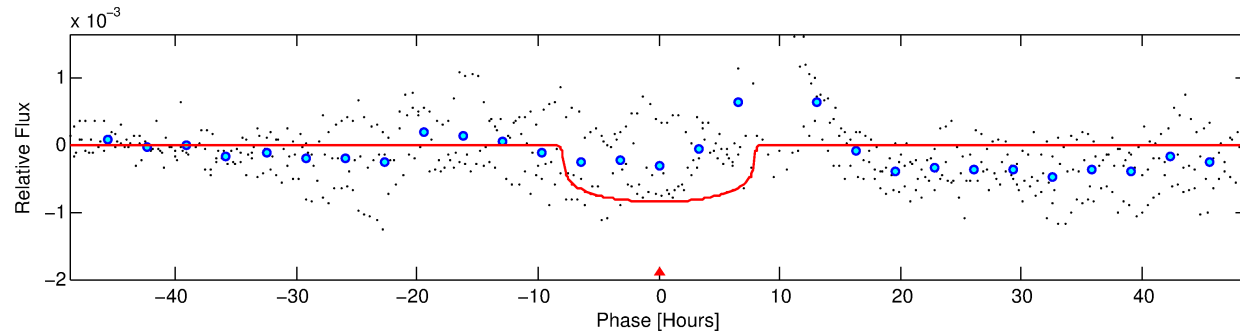
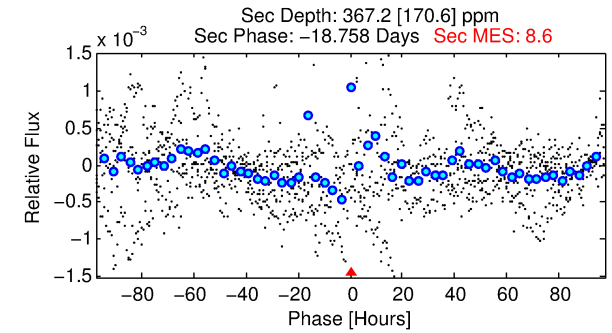
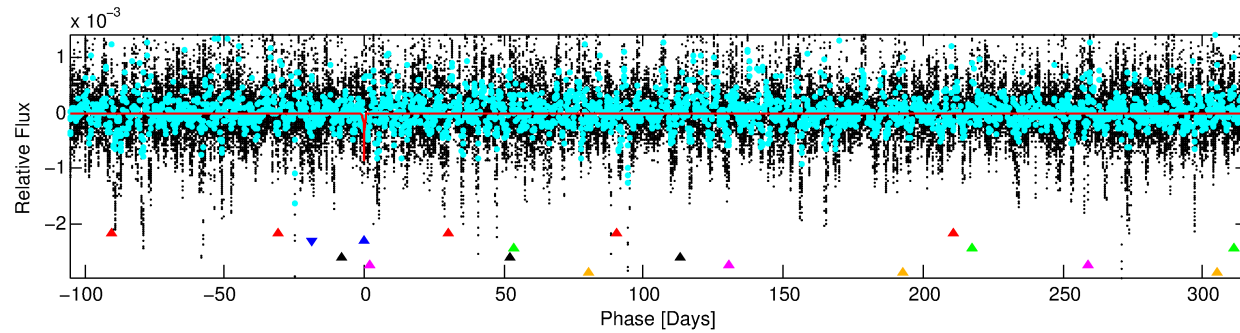
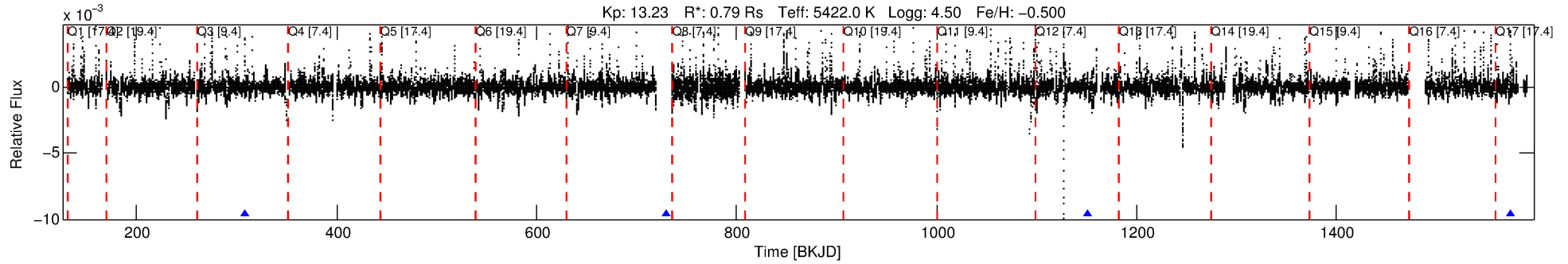
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011764567-02

No Significant Match Found

# DV One-Page Summary

KIC: 11764567 Candidate: 2 of 6 Period: 421.527 d



## DV Fit Results:

Period = 421.52698 [0.00388] d  
Epoch = 308.6141 [0.0072] BKJD  
Rp/R\* = 0.0264 [0.0062]  
a/R\* = 198.60 [177.09]  
b = 0.22 [3.80]  
Seff = 0.49 [0.11]  
Teq = 214 [12] K  
Rp = 2.26 [0.64] Re  
a = 0.9851 [0.1336] AU  
Ag = 38311.24 [26427.65] [1.45 $\sigma$ ]  
Teffp = 4619 [775] K [5.68 $\sigma$ ]

## DV Diagnostic Results:

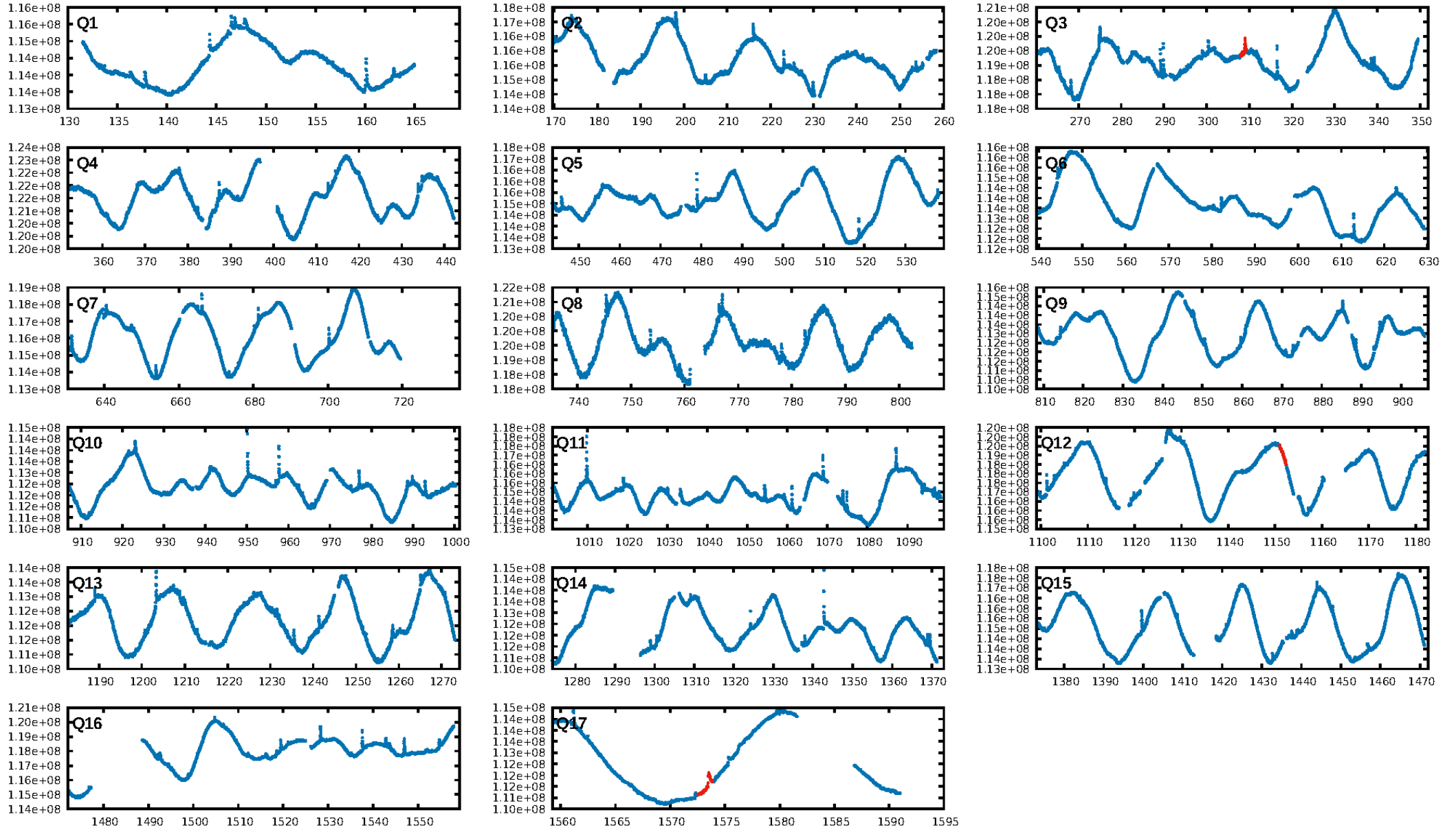
ShortPeriod-sig: 100.0% [152.44 $\sigma$ ]  
LongPeriod-sig: 100.0% [83.67 $\sigma$ ]  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 85.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -0.6671  
Centroid-sig: 50.8%  
Centroid-so: 0.172 arcsec [0.68 $\sigma$ ]  
OotOffset-rm: 0.571 arcsec [3.84 $\sigma$ ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-rm: 0.444 arcsec [3.09 $\sigma$ ]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:32:51 Z

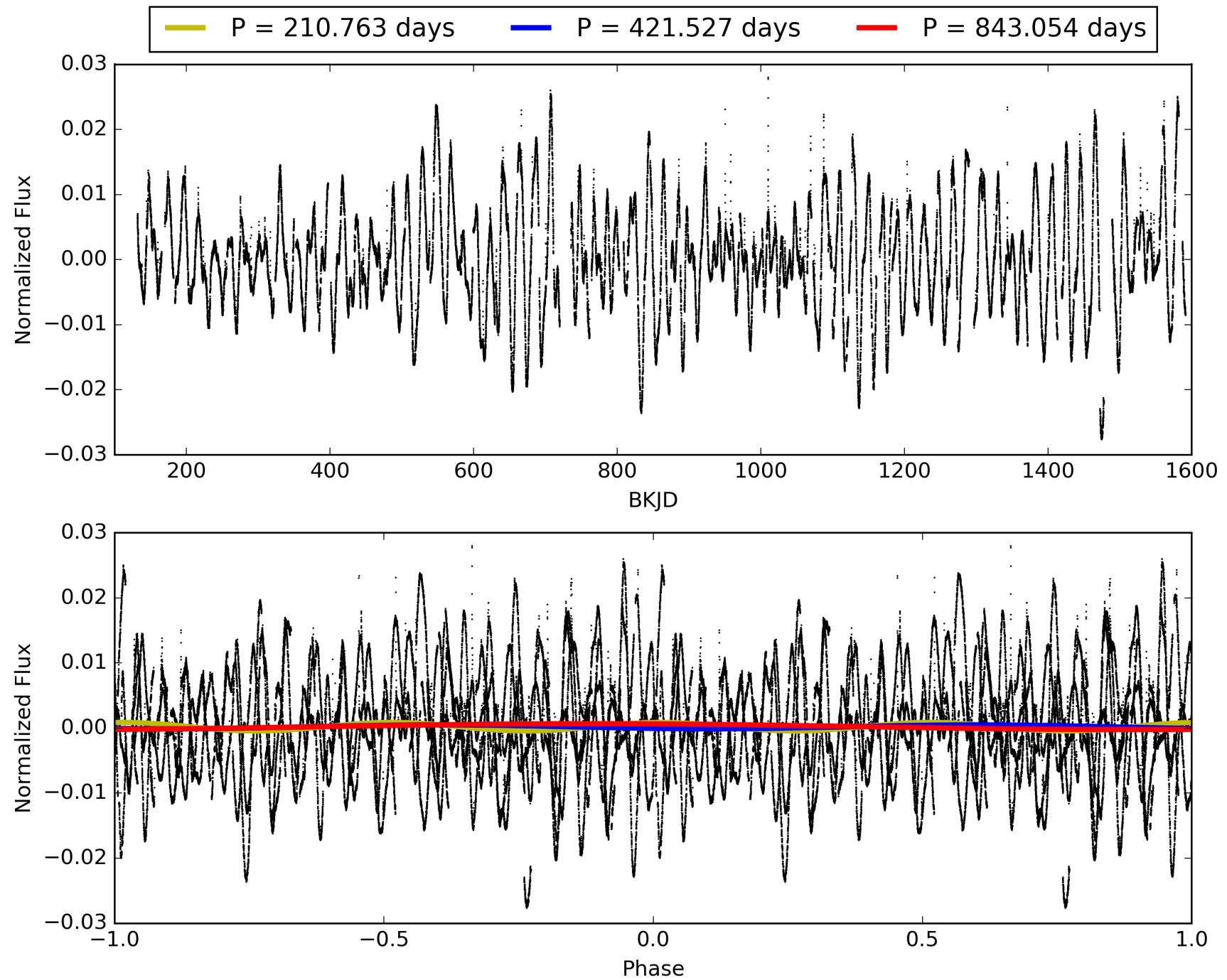
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011764567-02, PDC Light Curves

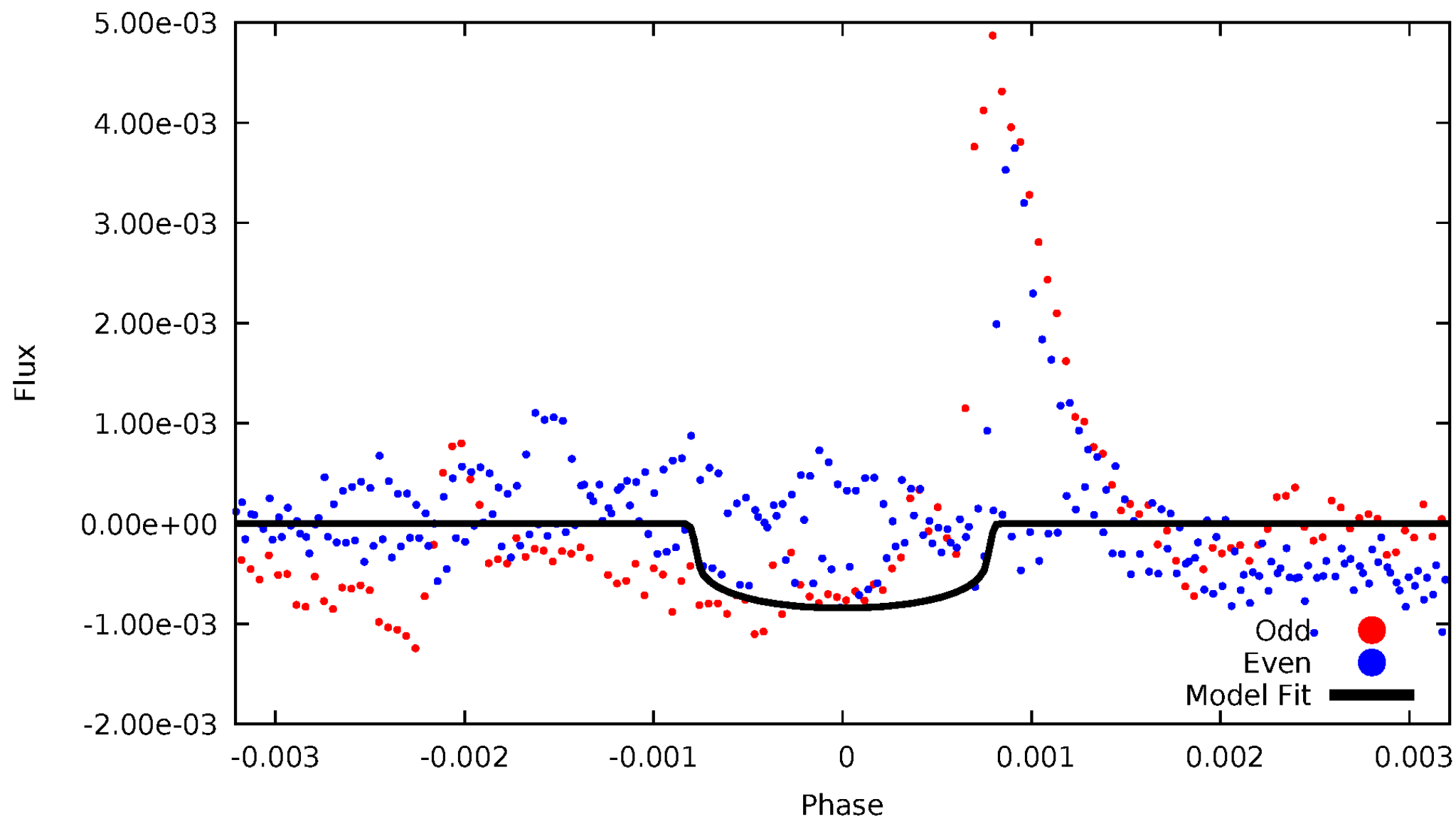


# TCE 011764567-02



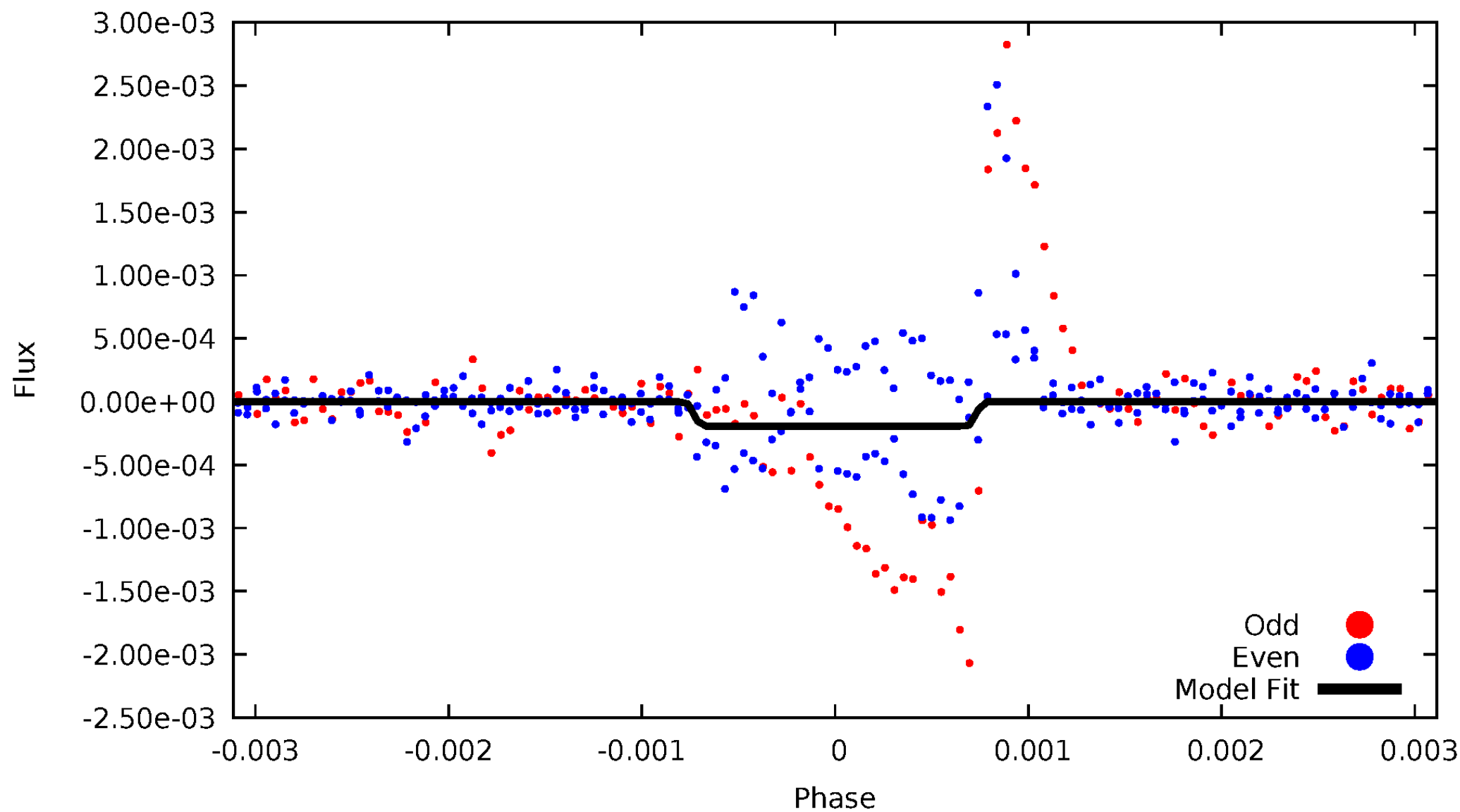
# DV Odd/Even

TCE 011764567-02



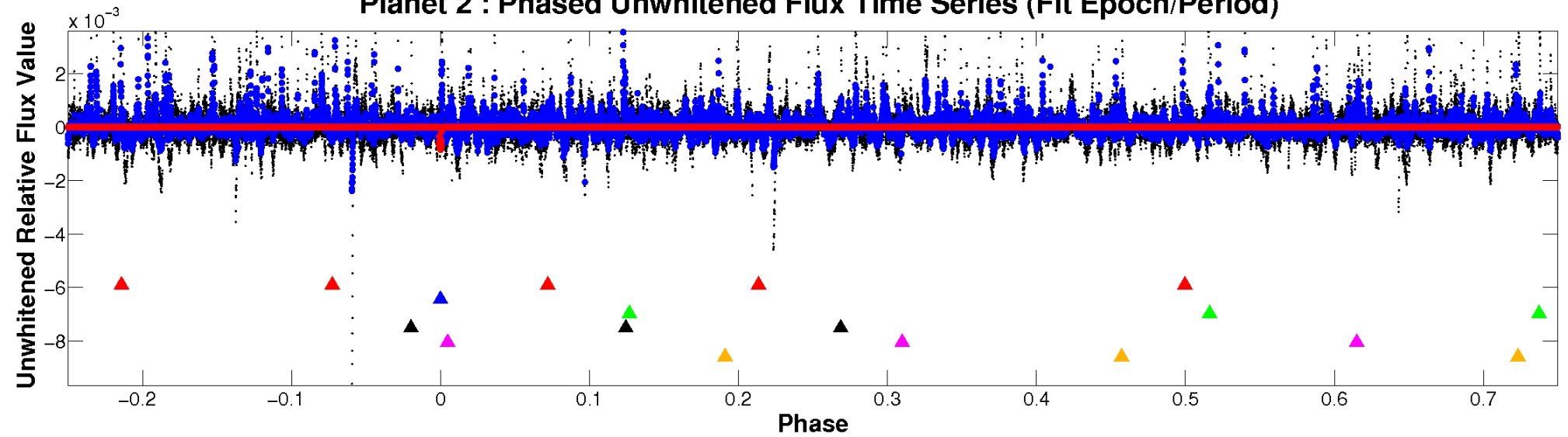
# ALT Odd/Even

TCE 011764567-02

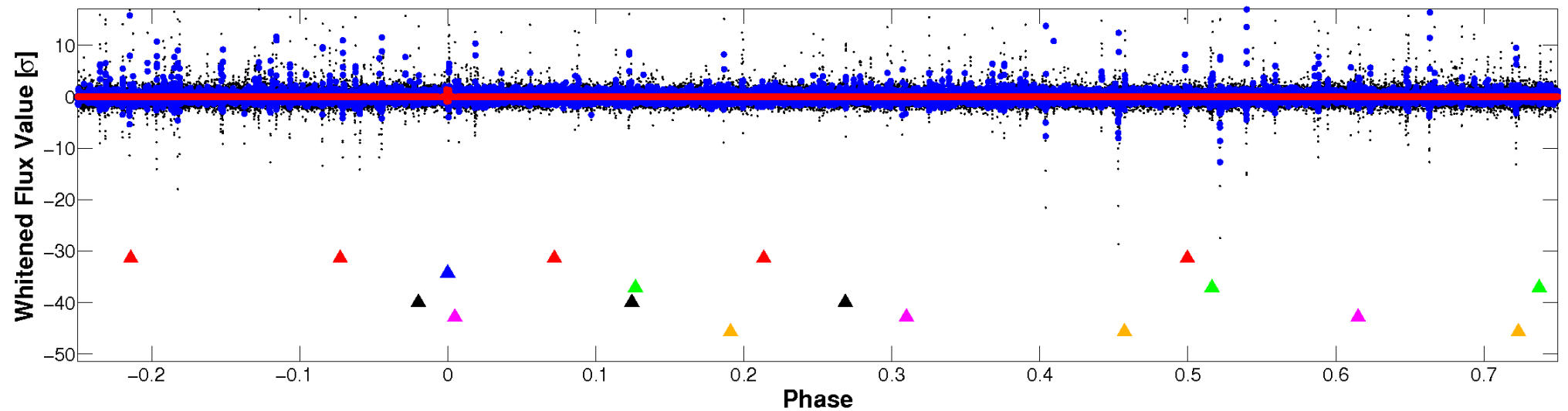


# Non-Whitened Vs. Whitened Light Curve

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

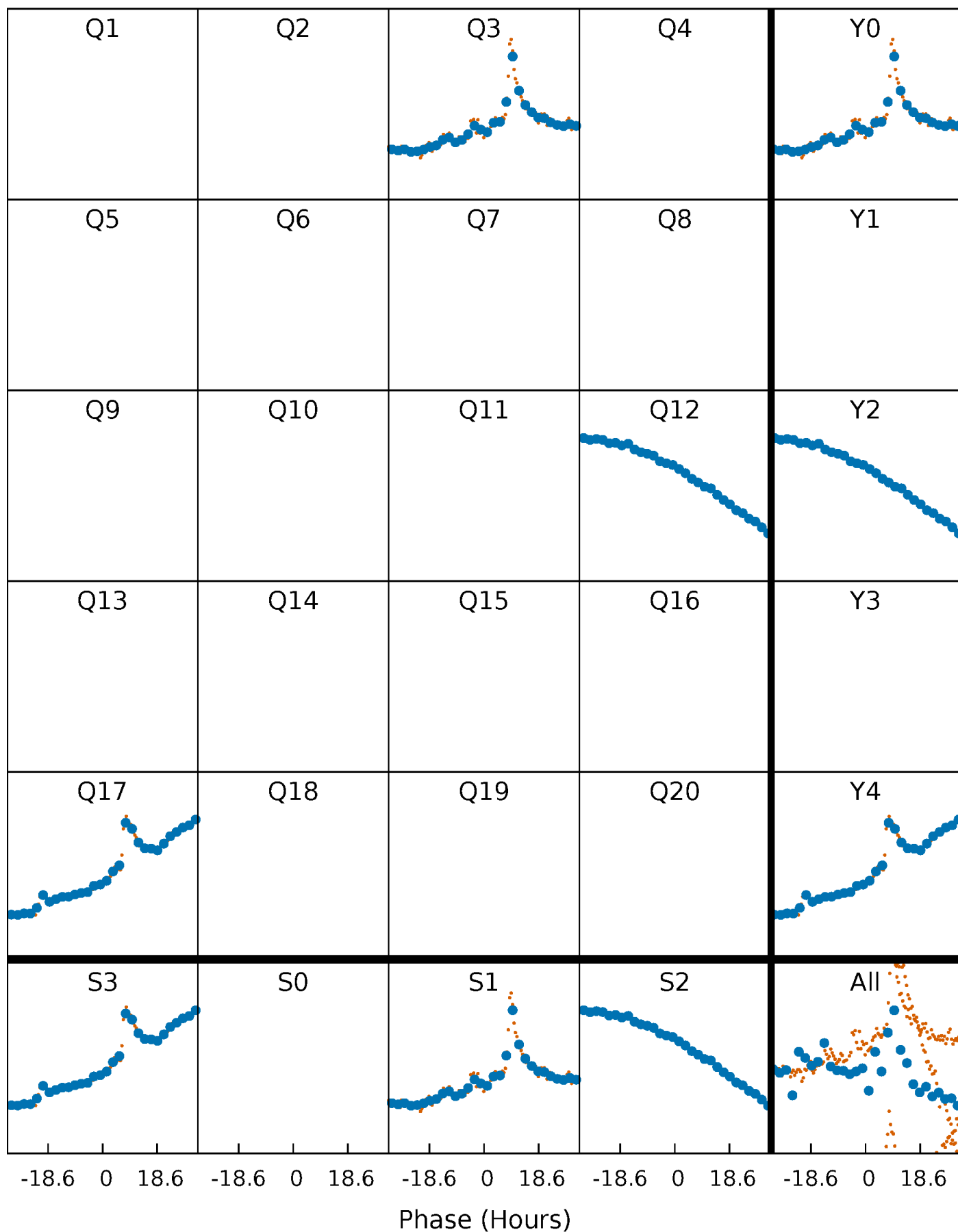


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

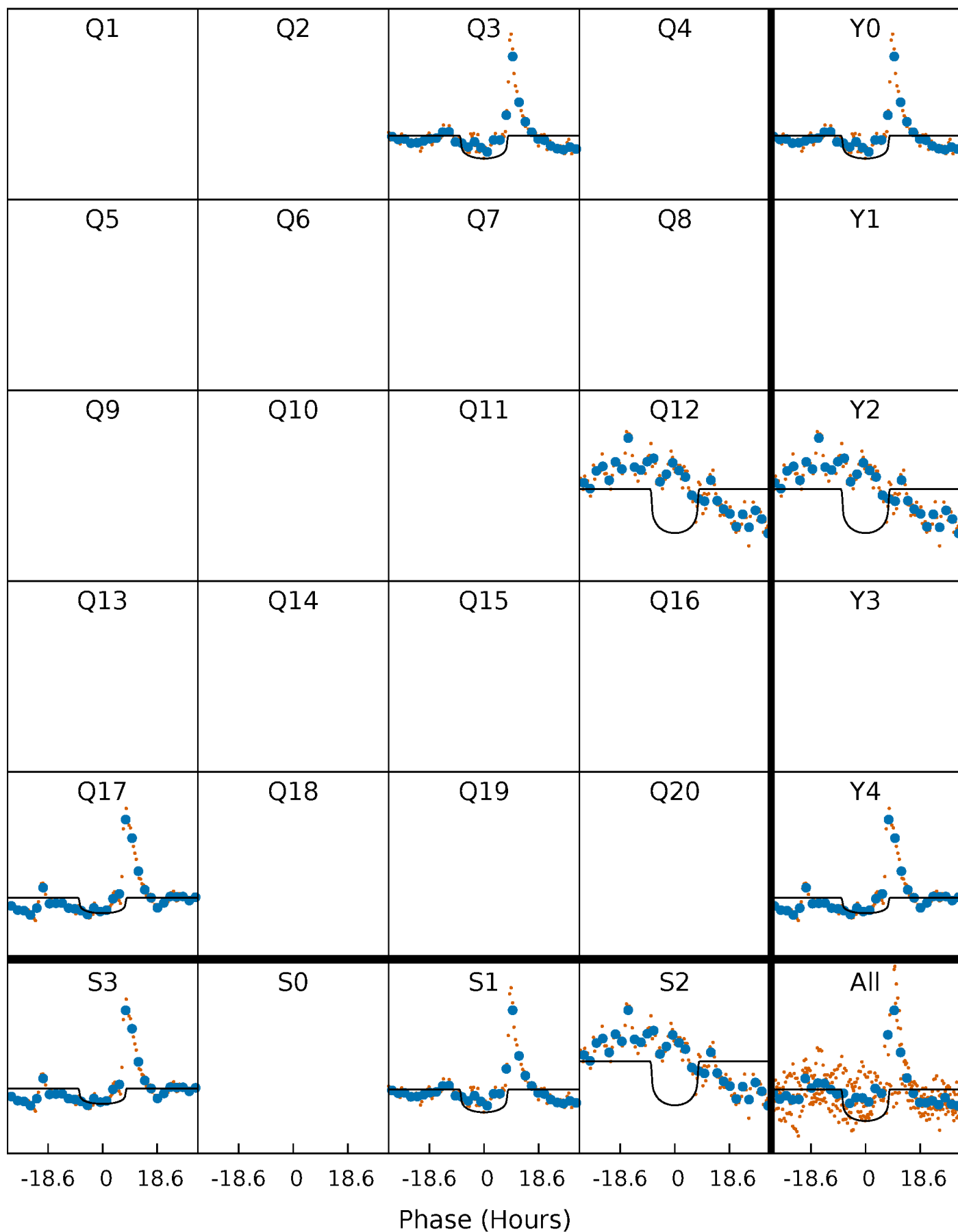
TCE 011764567-02 P=421.526978 Days  $T_0=308.614063$  (BKJD)





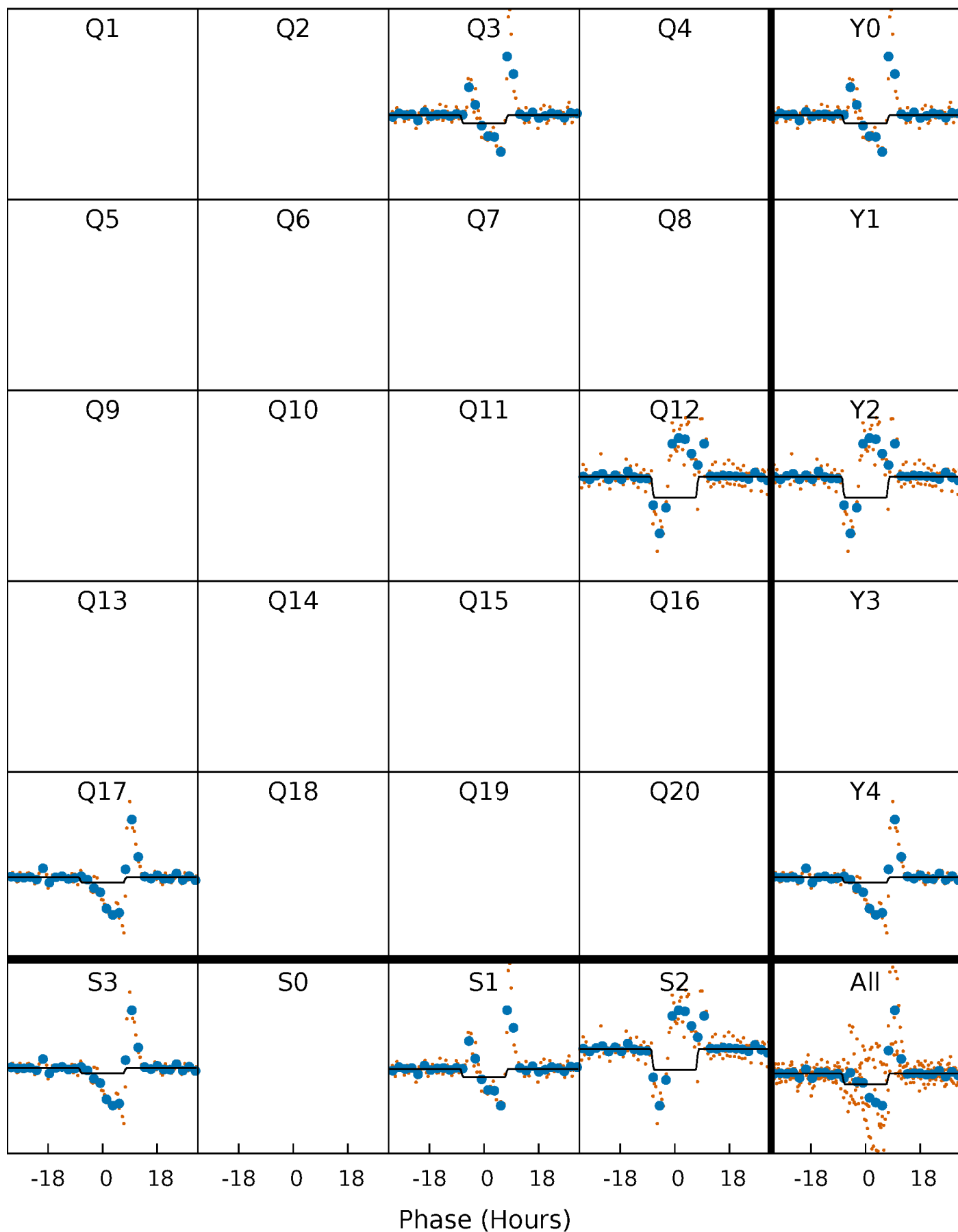
# DV Quarter-Phased Transit Curves

TCE 011764567-02     $P=421.526978$  Days     $T_0=308.614063$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

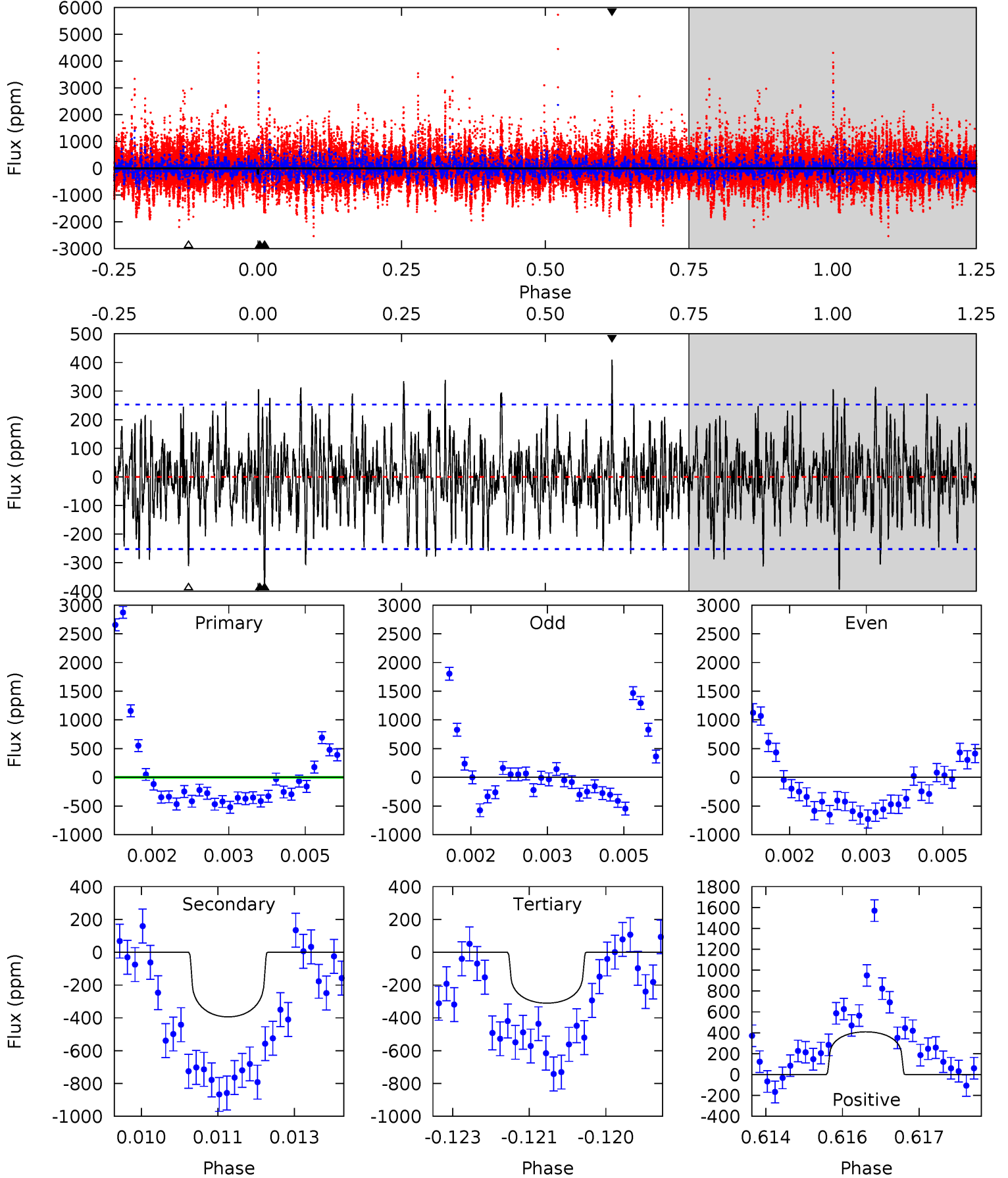
TCE 011764567-02     $P=421.503476$  Days     $T_0=308.644977$  (BKJD)



# DV Model-Shift Uniqueness Test

011764567-02, P = 421.526978 Days, E = 308.614063 Days

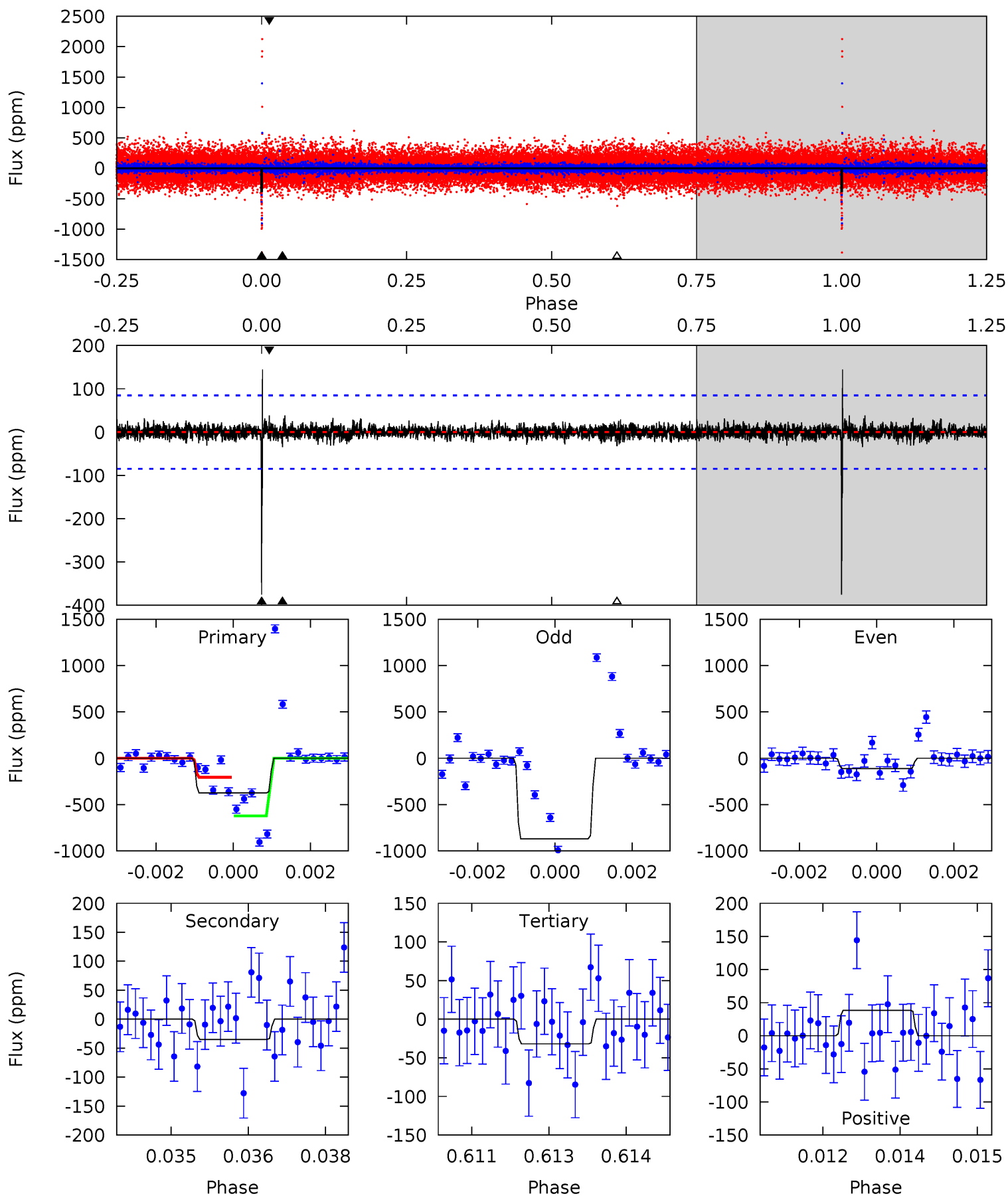
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.28	8.37	6.59	8.69	5.37	3.15	2.13	-2.31	-4.40	1.77	-0.32	2.31	0.40	0.51	1.76



# Alt Model-Shift Uniqueness Test

011764567-02, P = 421.503476 Days, E = 308.644977 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.8	2.21	2.02	2.44	5.38	3.17	0.50	21.8	21.3	0.18	-0.23	26.6	1.57	0.28	12.6



### Stellar Parameters For KIC 011764567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5422^{+162}_{-146}$	$4.504^{+0.110}_{-0.110}$	$-0.500^{+0.350}_{-0.300}$	$0.785^{+0.125}_{-0.102}$	$0.718^{+0.105}_{-0.045}$	$2.088^{+1.006}_{-0.680}$
	+3%/-3%	+2%/-2%	+70%/-60%	+16%/-13%	+15%/-6%	+48%/-33%
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 011764567-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-394 \pm 47$	$2.27^{+0.60}_{-0.58}$	$298^{+15}_{-13}$	$4791^{+632}_{-423}$	$41404^{+33603}_{-16370}$
Alt.	$-35 \pm 16$	$1.22^{+0.57}_{-0.54}$	$299^{+15}_{-16}$	$3814^{+987}_{-583}$	$12108^{+28838}_{-7829}$

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

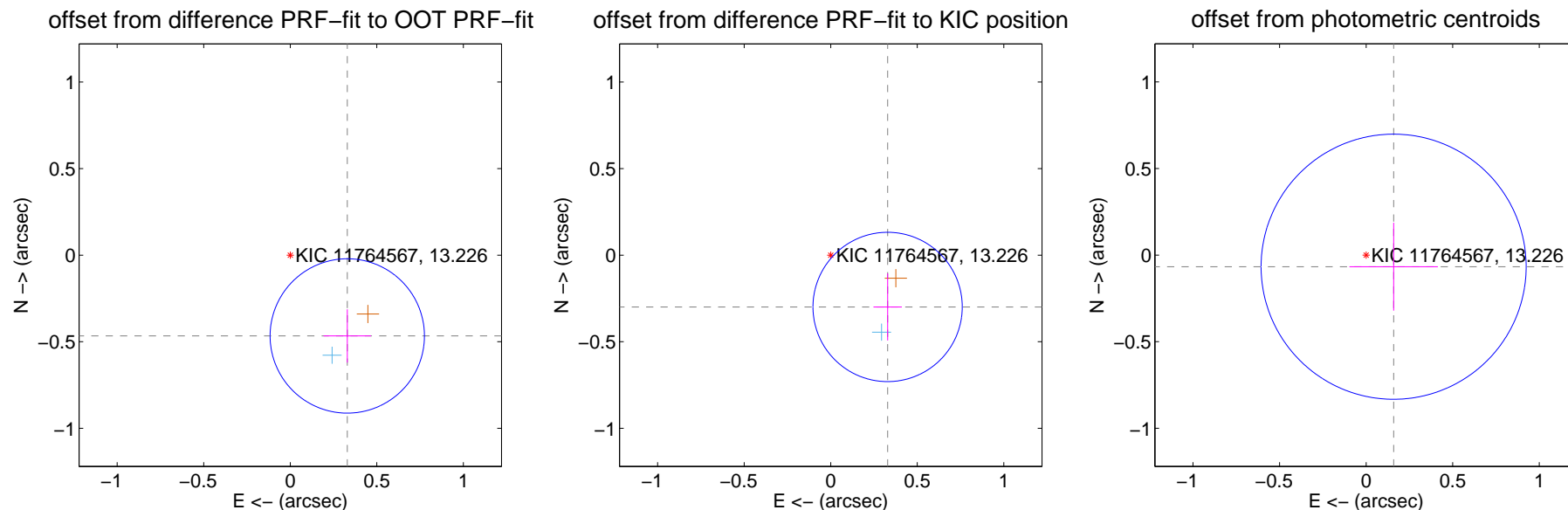
## DV Centroid Data

Supplemental centroid analysis for 011764567-02. Kepler magnitude: 13.23. Transit SNR 7.80

There are 1 quarters with good PRF difference image offsets

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

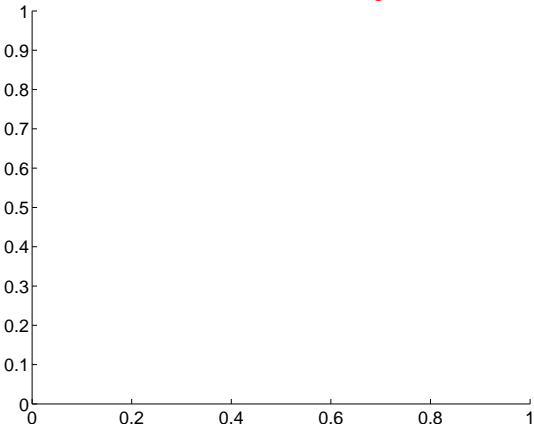
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.571 \pm 0.149$	3.84	$-0.329 \pm 0.137$	$-0.467 \pm 0.154$
PRF-fit source offset from KIC position	$0.444 \pm 0.144$	3.09	$-0.329 \pm 0.082$	$-0.299 \pm 0.194$
photometric centroid source offset	$0.17 \pm 0.26$	0.68	$-0.16 \pm 0.26$	$-0.07 \pm 0.25$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

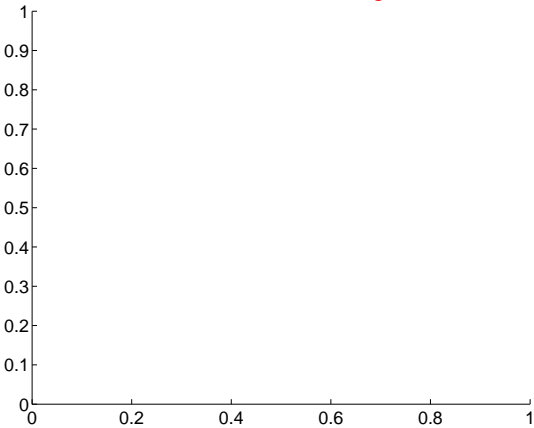
Q1 no difference image



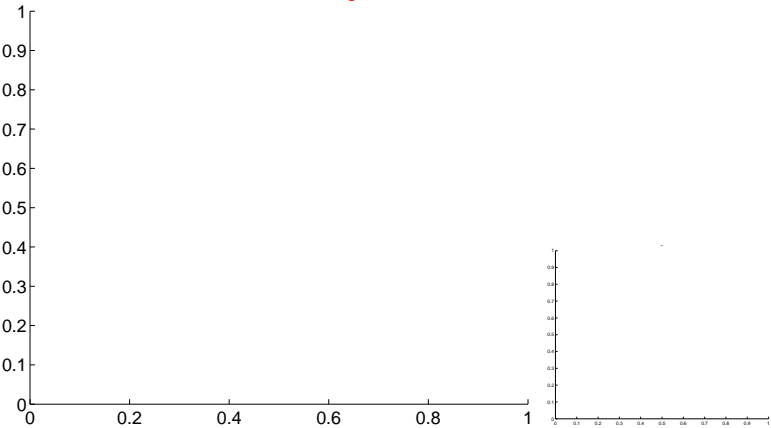
Q1 no OOT image



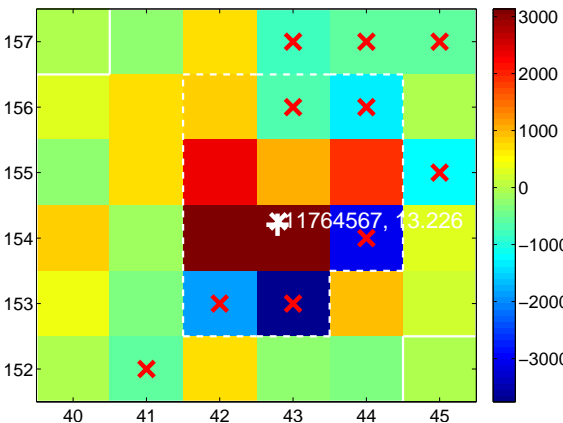
Q2 no difference image



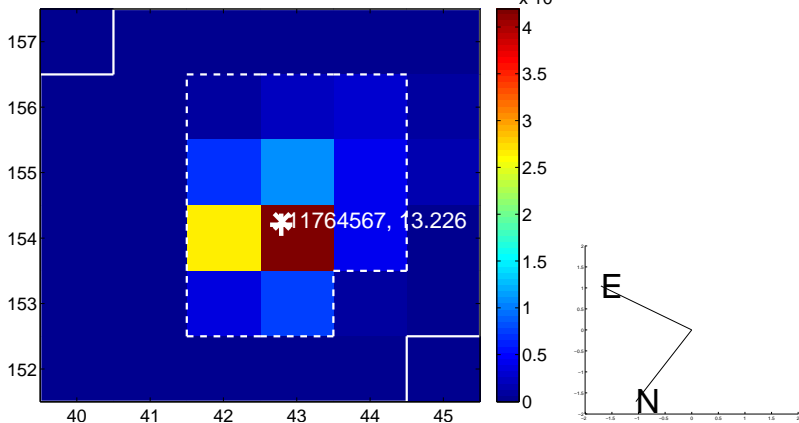
Q2 no OOT image



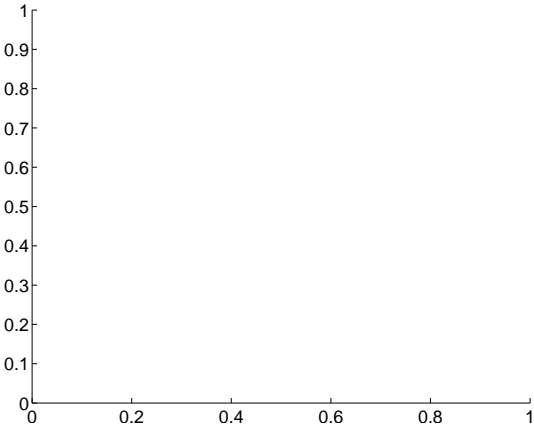
Q3 difference image. Poor Quality



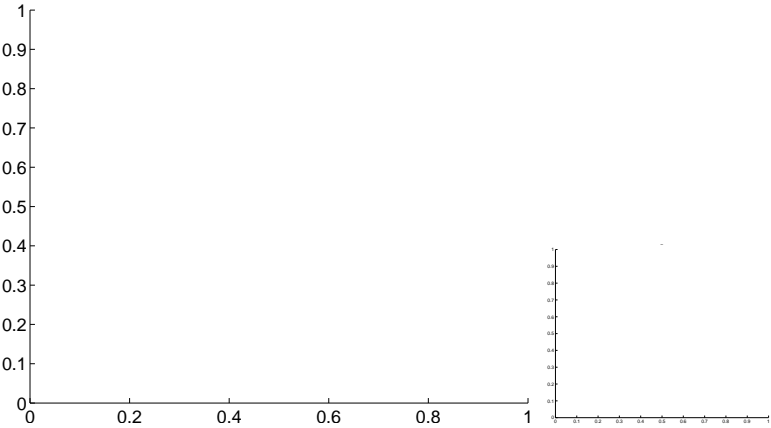
Q3 OOT image



Q4 no difference image



Q4 no OOT image

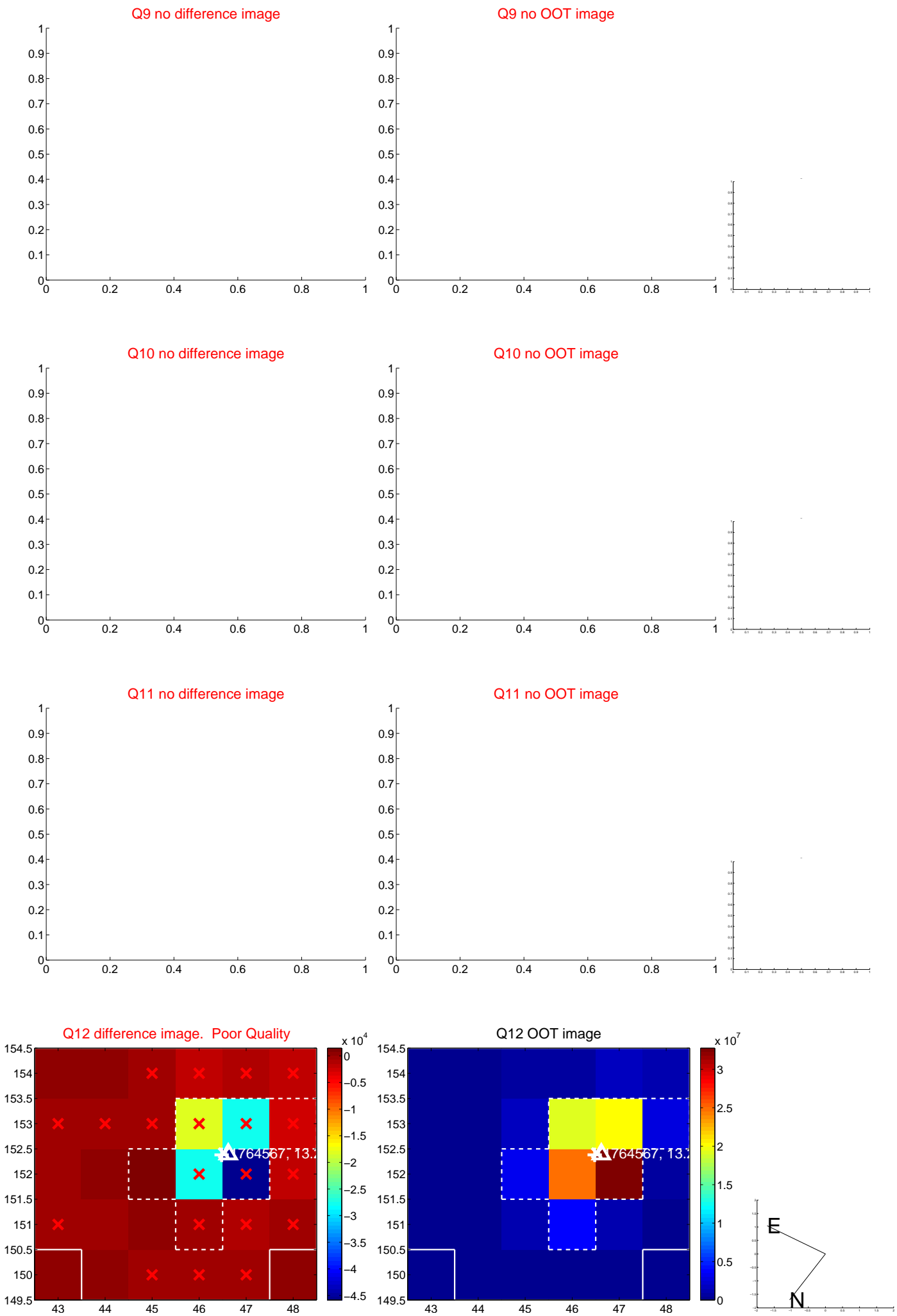


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





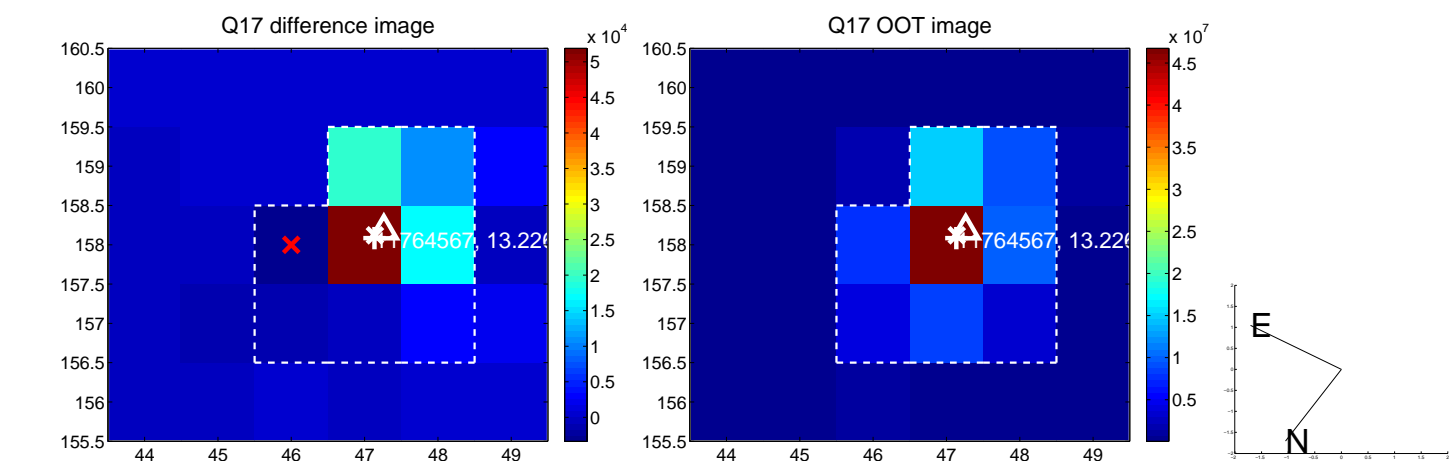
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



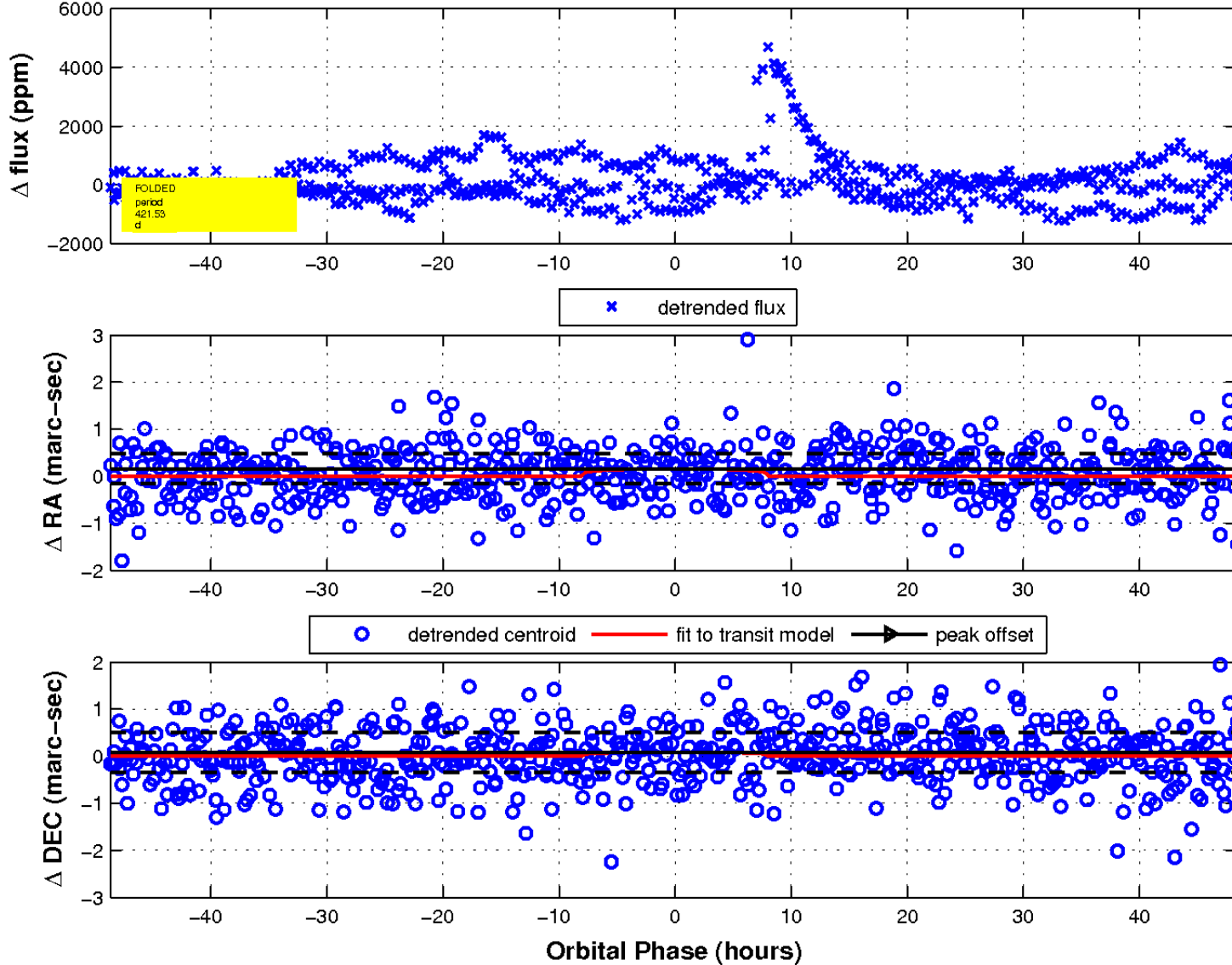
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

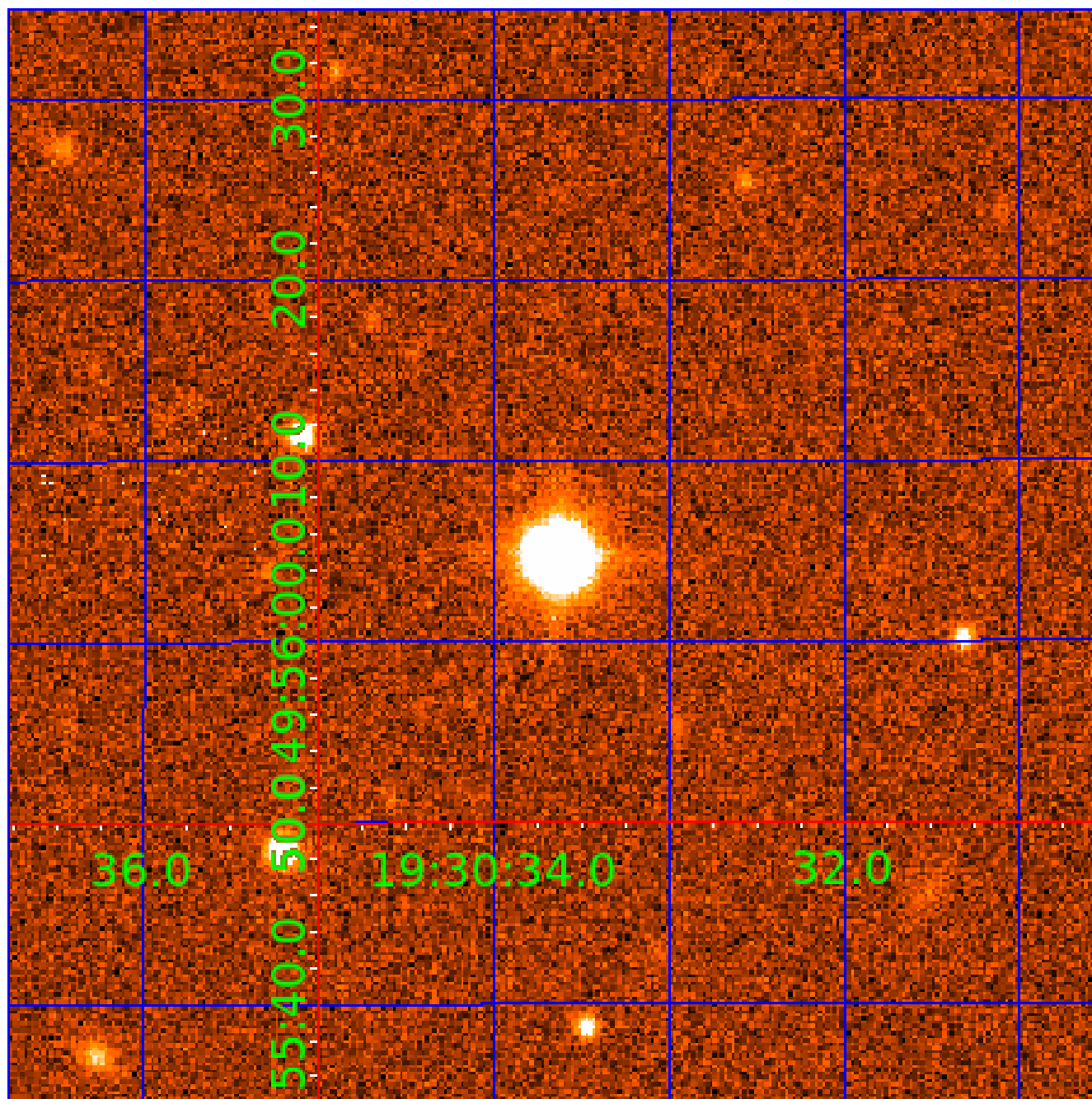


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



# KIC 011764567

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011764567-01	OBS	No	300.896720	338.989782	837.1	9.843	20.3	10.6	0.79	5422	2.31	0.77
011764567-02	OBS	No	421.526978	308.614063	843.3	16.242	18.0	7.8	0.79	5422	2.26	0.49
011764567-03	OBS	No	585.693639	197.916077	1194.6	9.240	18.4	10.0	0.79	5422	3.41	0.32
011764567-04	OBS	No	482.320887	300.262011	644.6	6.346	16.9	5.8	0.79	5422	2.06	0.41
011764567-05	OBS	No	714.441536	146.348287	886.1	5.547	15.8	9.2	0.79	5422	2.84	0.24
011764567-06	OBS	No	533.703540	389.157677	905.3	8.926	15.4	9.0	0.79	5422	2.74	0.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011764567-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
011764567-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-06	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

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

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

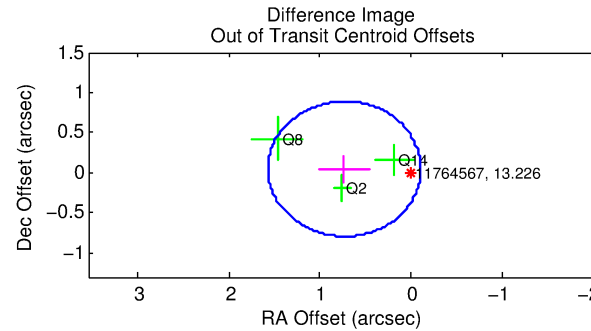
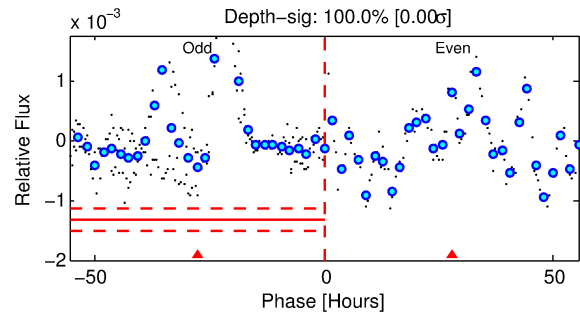
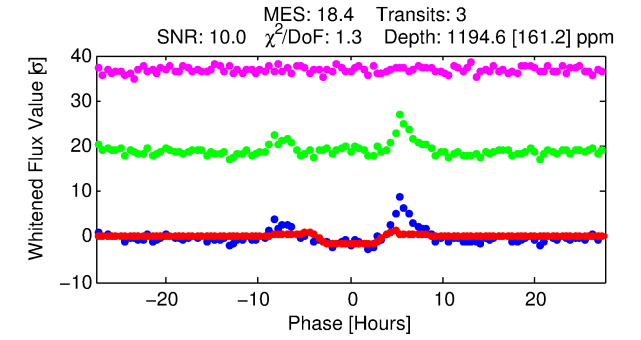
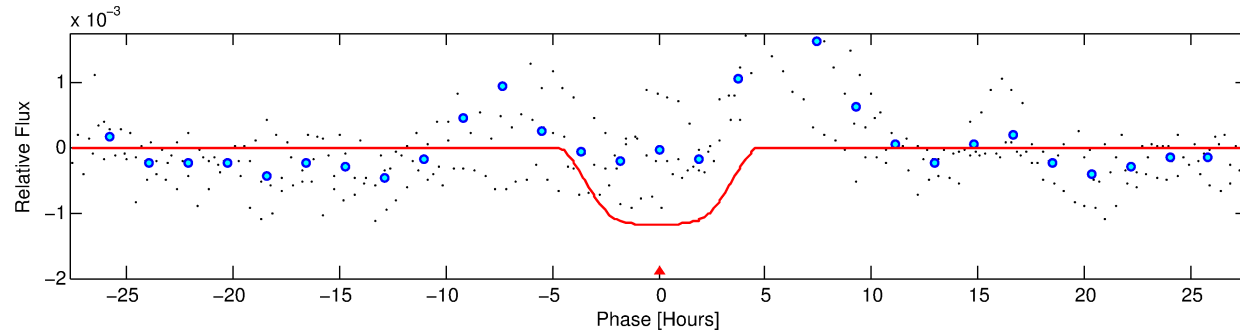
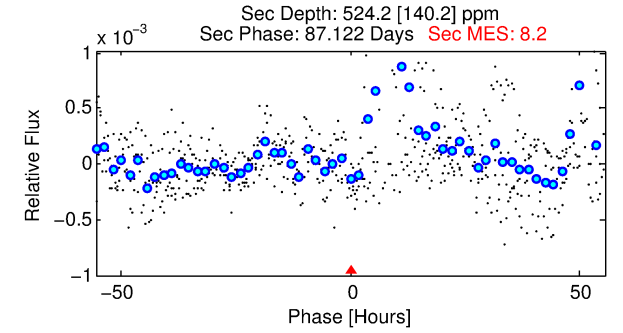
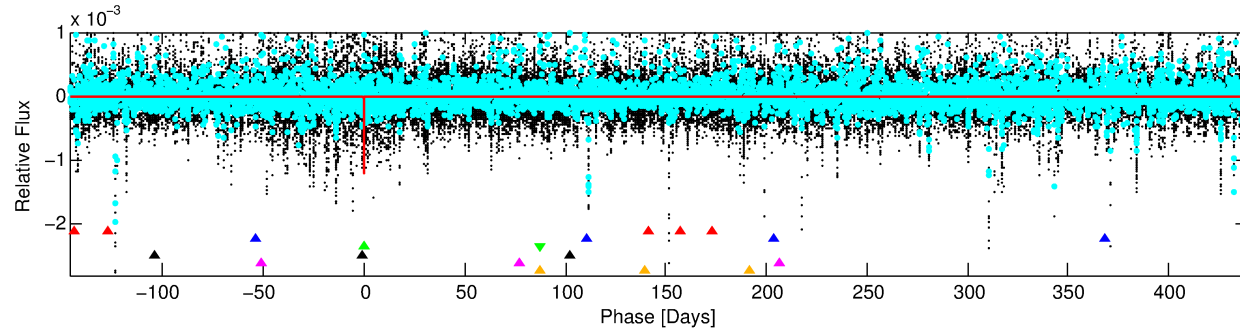
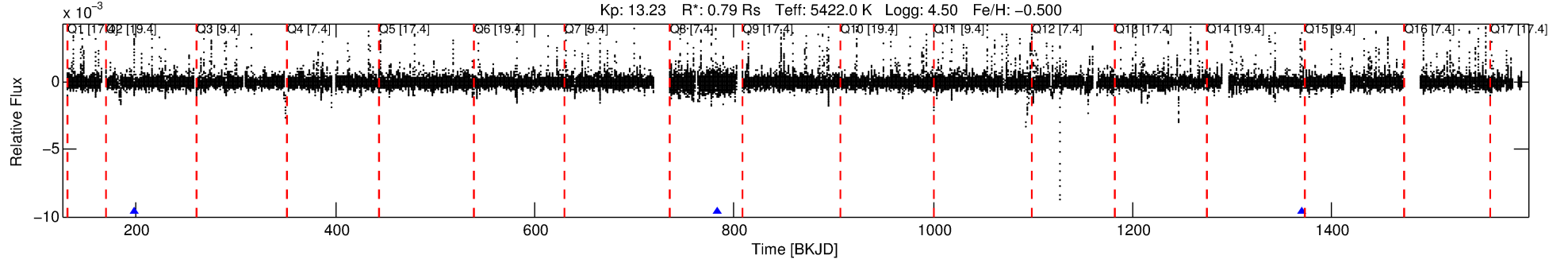
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011764567-03

No Significant Match Found

# DV One-Page Summary

KIC: 11764567 Candidate: 3 of 6 Period: 585.694 d



## DV Fit Results:

Period = 585.69364 [0.00932] d  
Epoch = 197.9161 [0.0124] BKJD  
Rp/R\* = 0.0398 [0.0031]  
a/R\* = 215.64 [27.41]  
b = 0.94 [0.02]  
Seff = 0.32 [0.07]  
Teq = 191 [11] K  
Rp = 3.41 [0.61] Re  
a = 1.2267 [0.1664] AU  
Ag = 37275.59 [13758.74] [2.71 $\sigma$ ]  
**Teffp = 4111 [342] K [11.45 $\sigma$ ]**

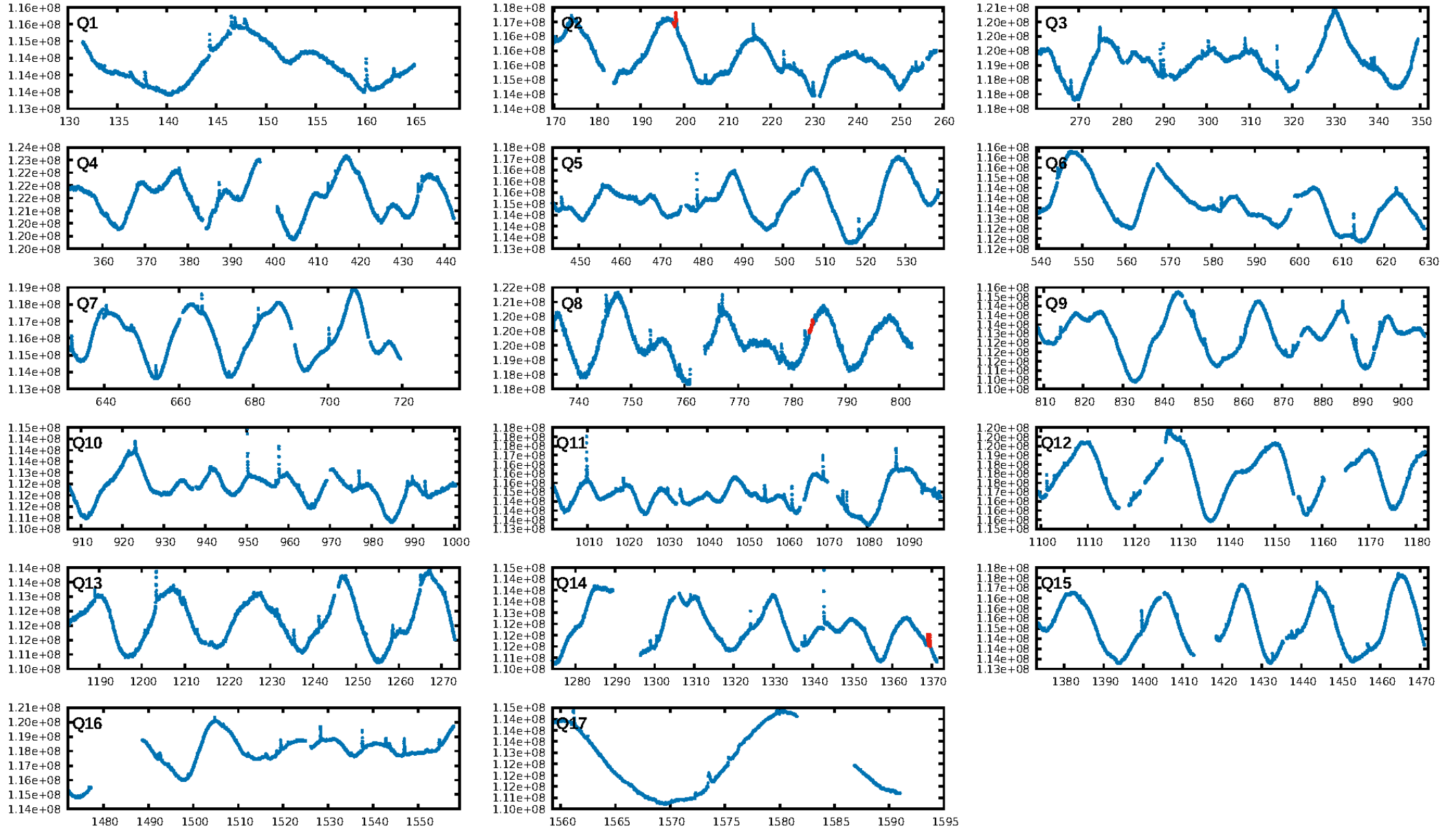
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [97.12 $\sigma$ ]  
LongPeriod-sig: 100.0% [286.72 $\sigma$ ]  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 56.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.03727**  
Centroid-sig: 73.9%  
Centroid-so: 0.081 arcsec [0.30 $\sigma$ ]  
OotOffset-rm: 0.732 arcsec [2.61 $\sigma$ ]  
KicOffset-rm: 0.817 arcsec [2.42 $\sigma$ ]  
OotOffset-st: 2/0/1/0 [3]  
KicOffset-st: 2/0/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

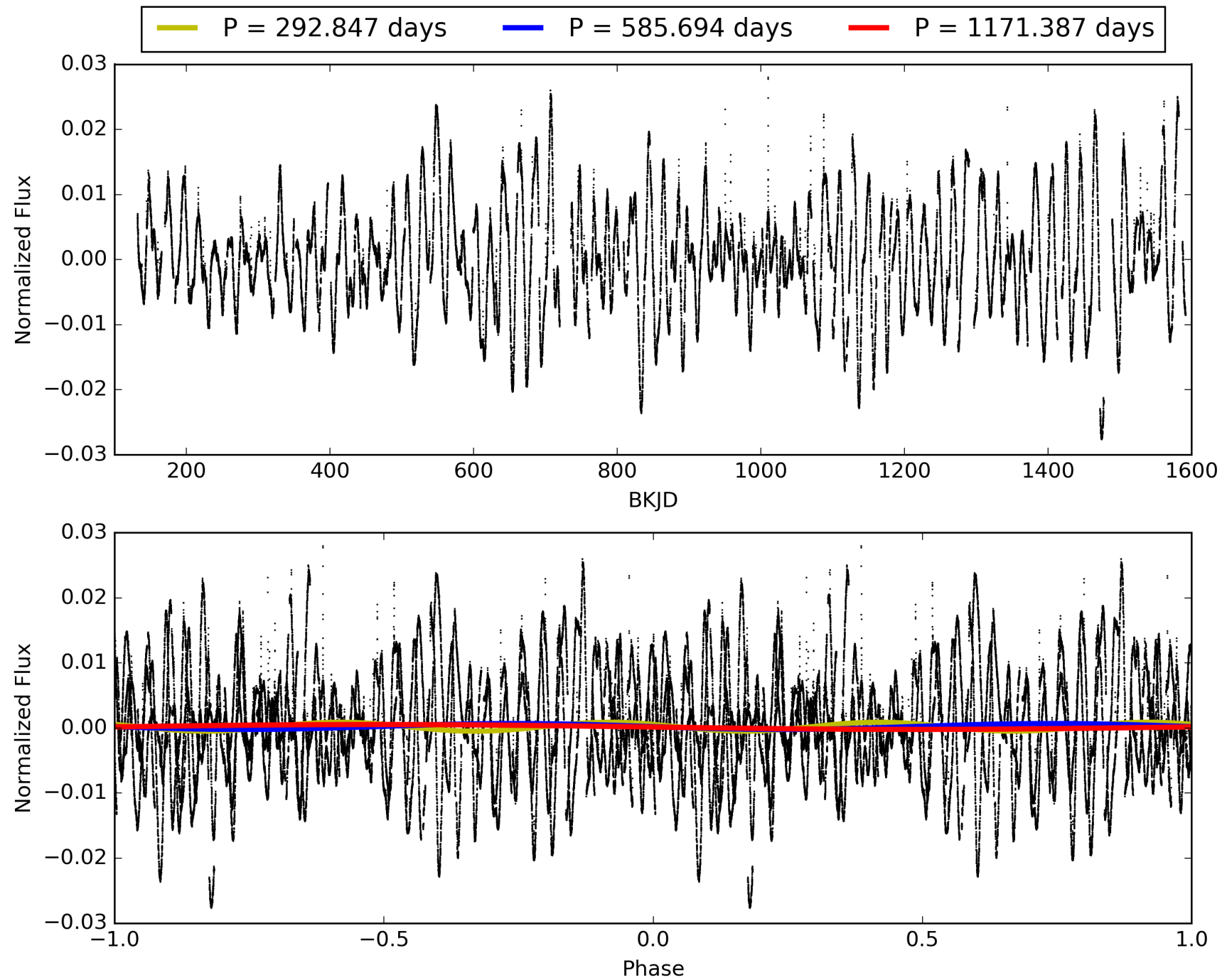
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:33:03 Z

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

# TCE 011764567-03, PDC Light Curves



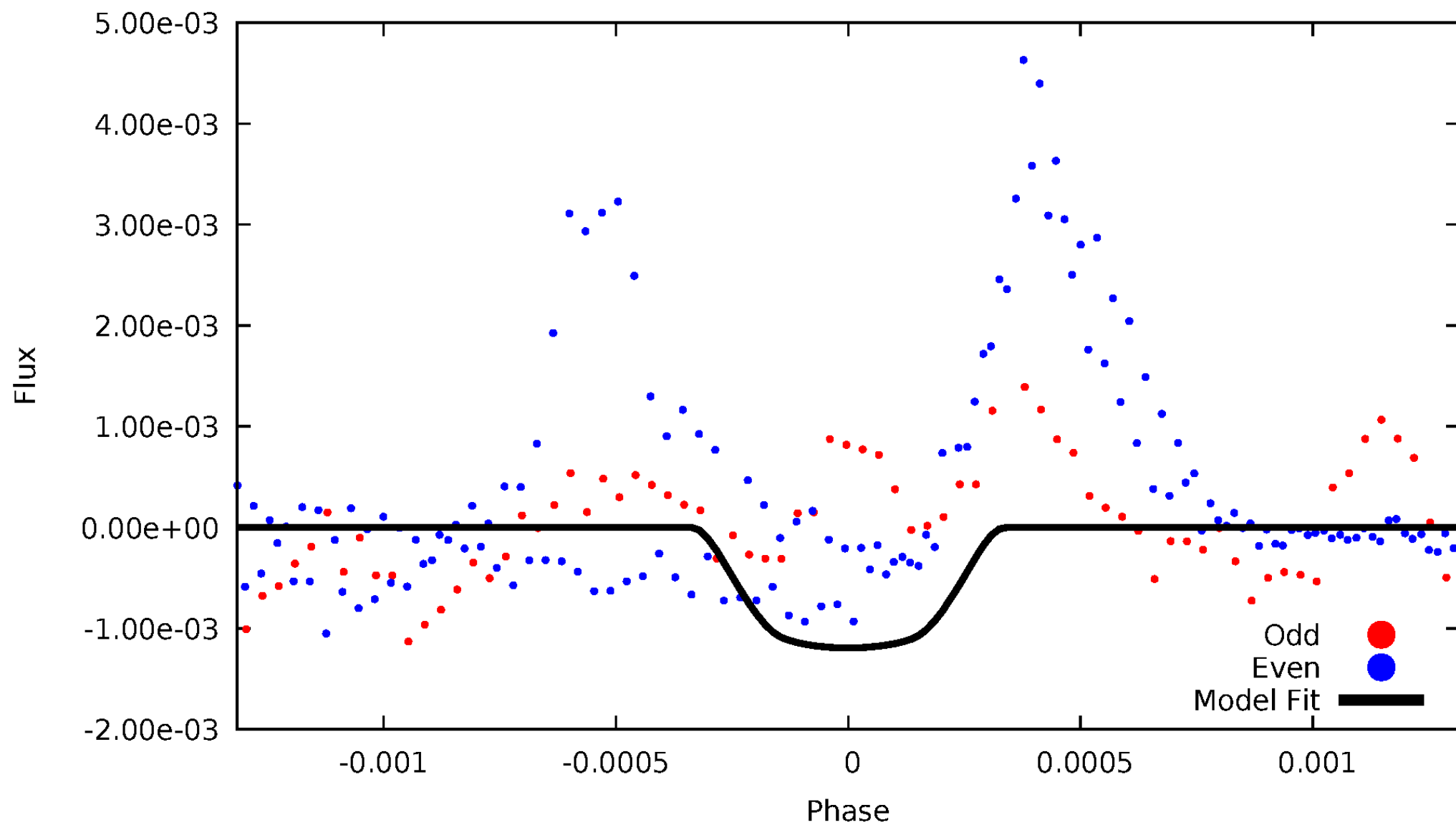
# TCE 011764567-03





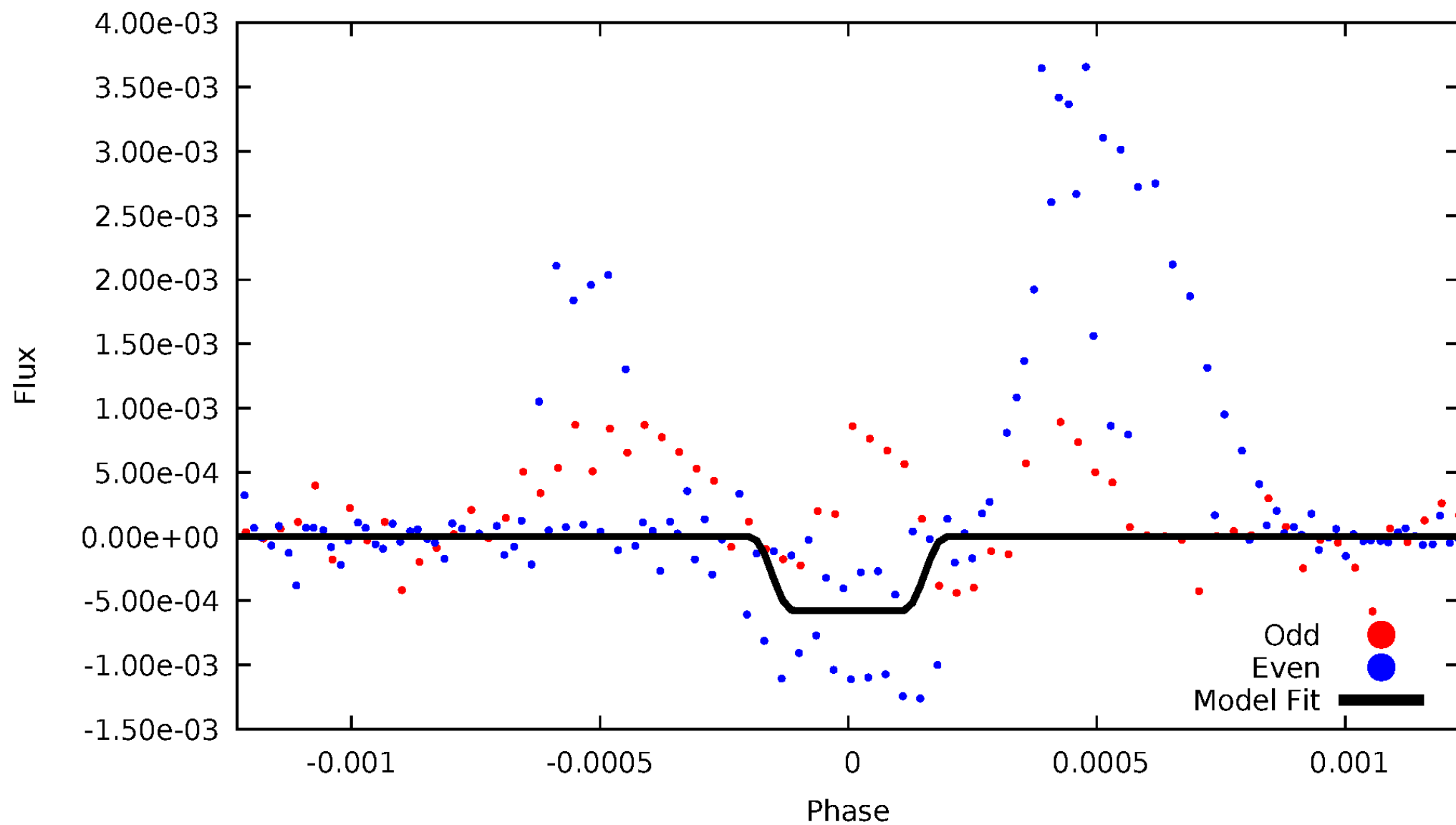
# DV Odd/Even

TCE 011764567-03



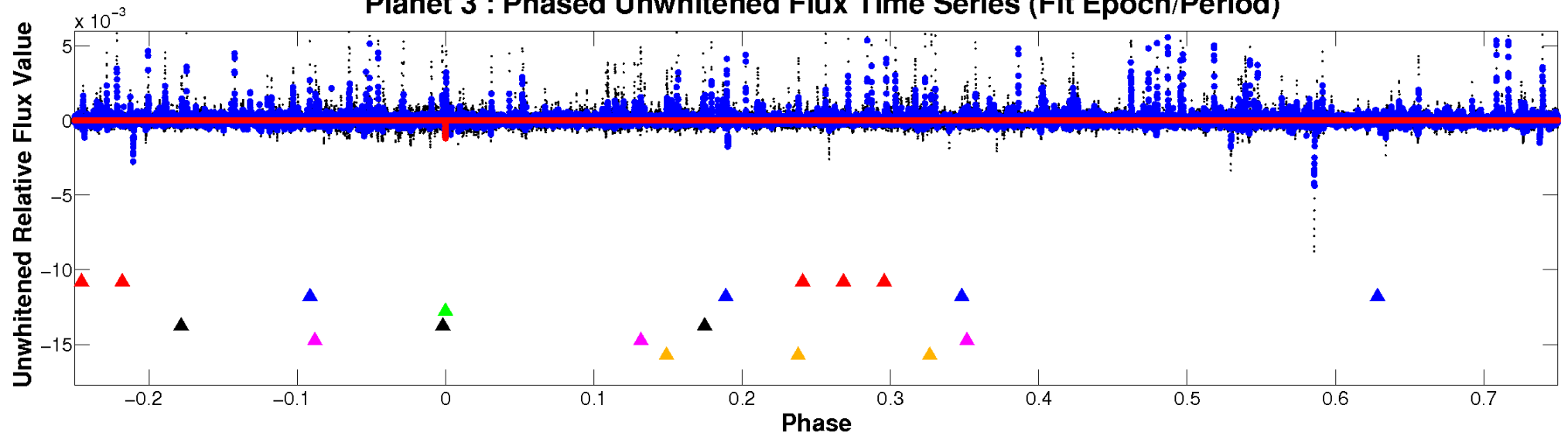
# ALT Odd/Even

TCE 011764567-03

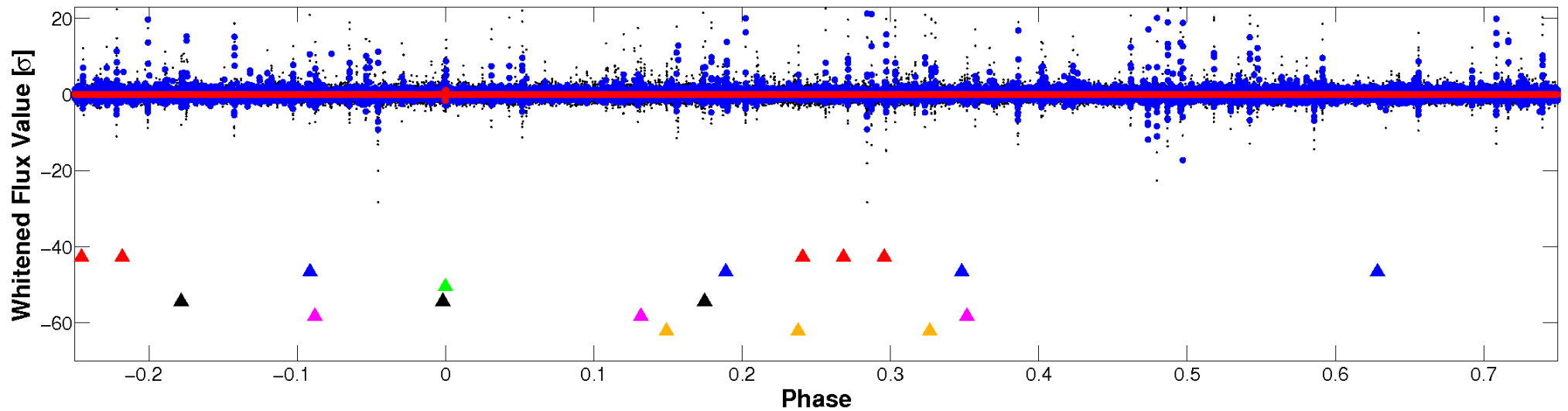


# Non-Whitened Vs. Whitened Light Curve

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

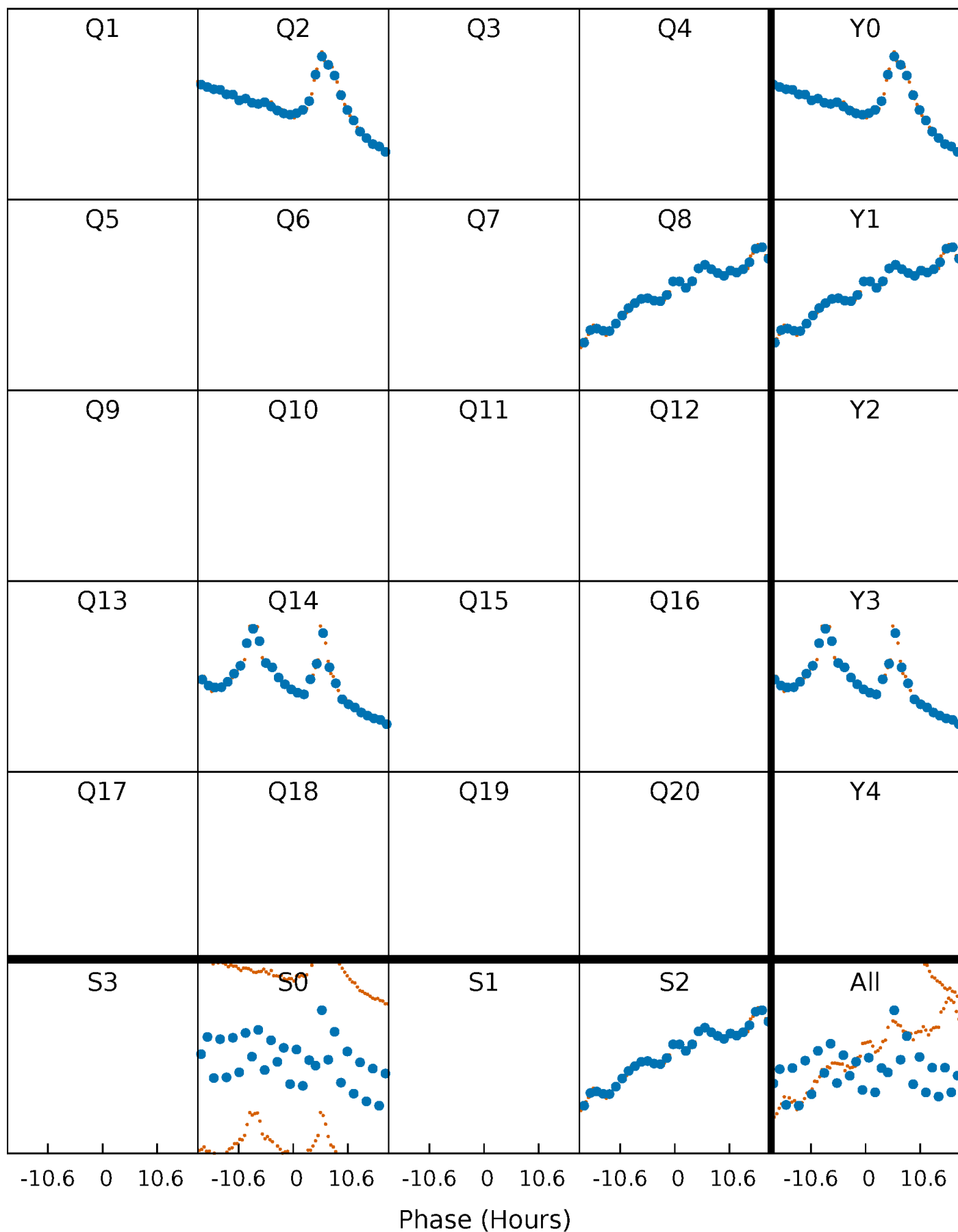


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



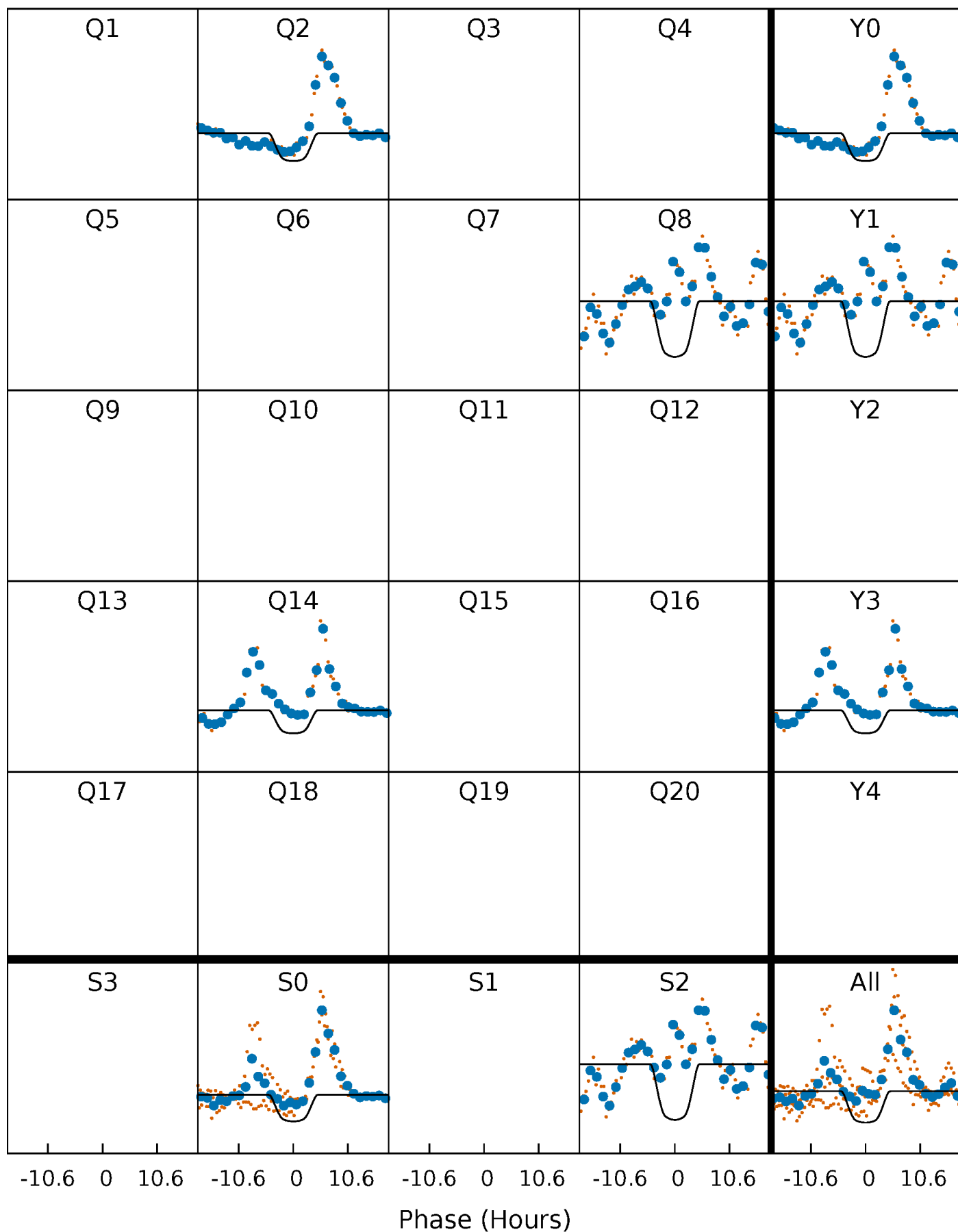
# PDC Quarter-Phased Transit Curves

TCE 011764567-03   P=585.693639 Days    $T_0=197.916077$  (BKJD)



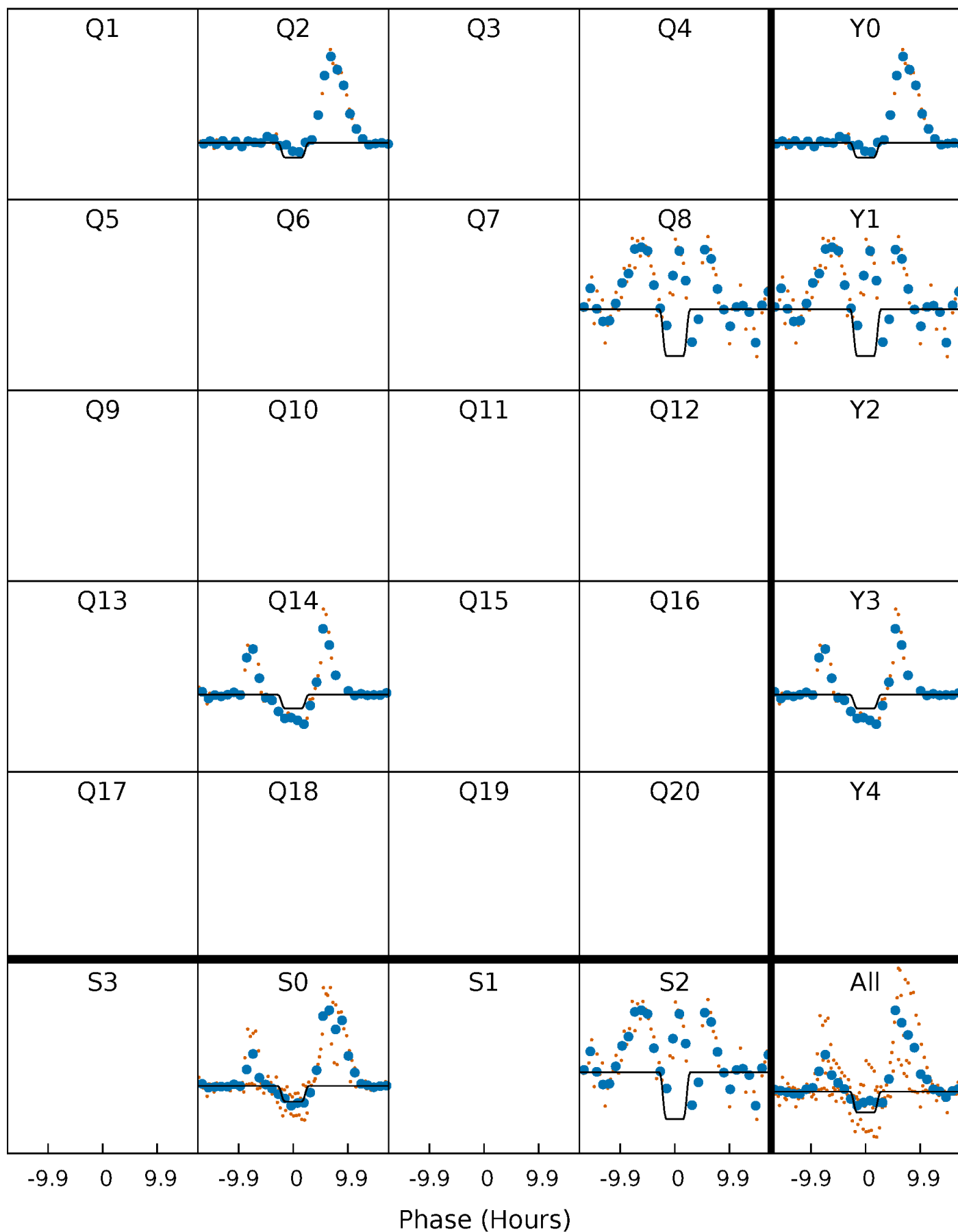
# DV Quarter-Phased Transit Curves

TCE 011764567-03 P=585.693639 Days  $T_0=197.916077$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

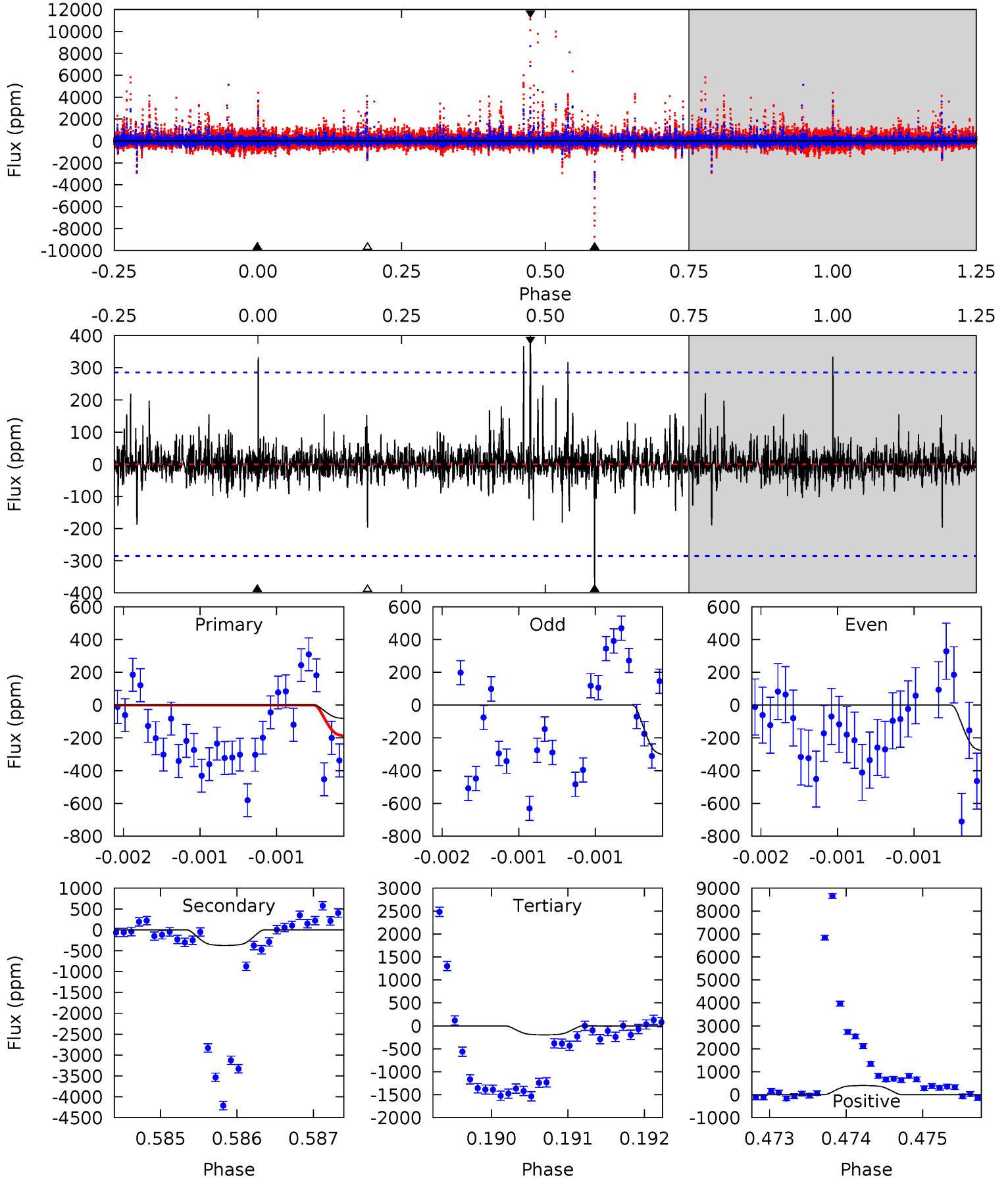
TCE 011764567-03 P=585.714375 Days  $T_0=197.867419$  (BKJD)



# DV Model-Shift Uniqueness Test

011764567-03, P = 585.693639 Days, E = 197.916077 Days

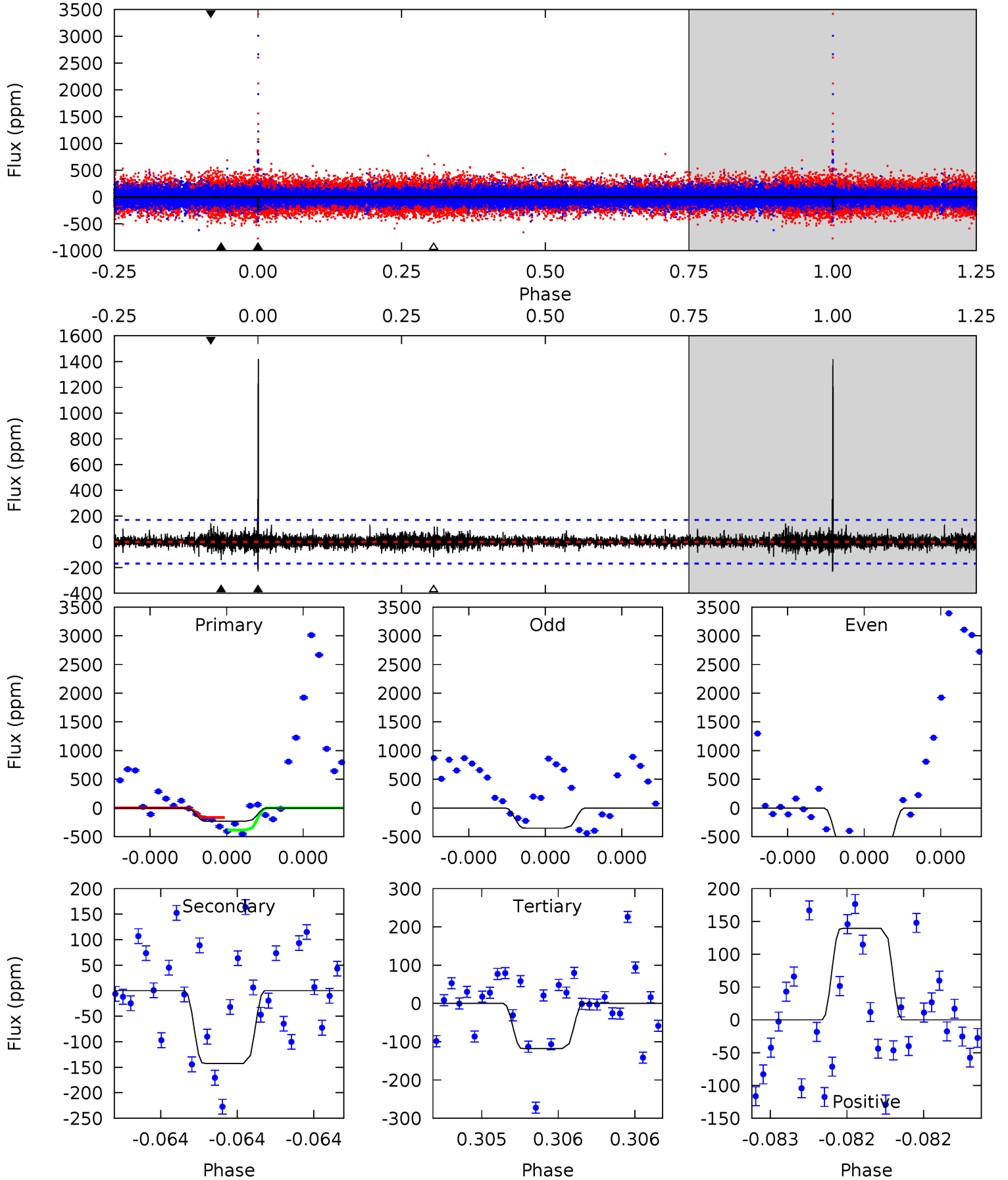
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.61	7.26	3.80	7.72	5.52	3.40	0.76	-2.19	-6.11	3.46	-0.46	0.17	-1.47	0.52	1.58



# Alt Model-Shift Uniqueness Test

011764567-03, P = 585.714375 Days, E = 197.867419 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
7.66	4.73	3.91	4.63	5.62	3.55	0.97	3.75	3.03	0.82	0.10	7.36	1.43	0.86	3.66





### Stellar Parameters For KIC 011764567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5422^{+162}_{-146}$	$4.504^{+0.110}_{-0.110}$	$-0.500^{+0.350}_{-0.300}$	$0.785^{+0.125}_{-0.102}$	$0.718^{+0.105}_{-0.045}$	$2.088^{+1.006}_{-0.680}$
	+3%/-3%	+2%/-2%	+70%/-60%	+16%/-13%	+15%/-6%	+48%/-33%
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 011764567-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-376 \pm 52$	$3.40^{+0.42}_{-0.36}$	$269^{+13}_{-13}$	$4079^{+192}_{-178}$	$27229^{+7678}_{-6475}$
Alt.	$-142 \pm 30$	$2.08^{+0.34}_{-0.33}$	$268^{+13}_{-13}$	$4105^{+292}_{-263}$	$27534^{+13165}_{-8419}$

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

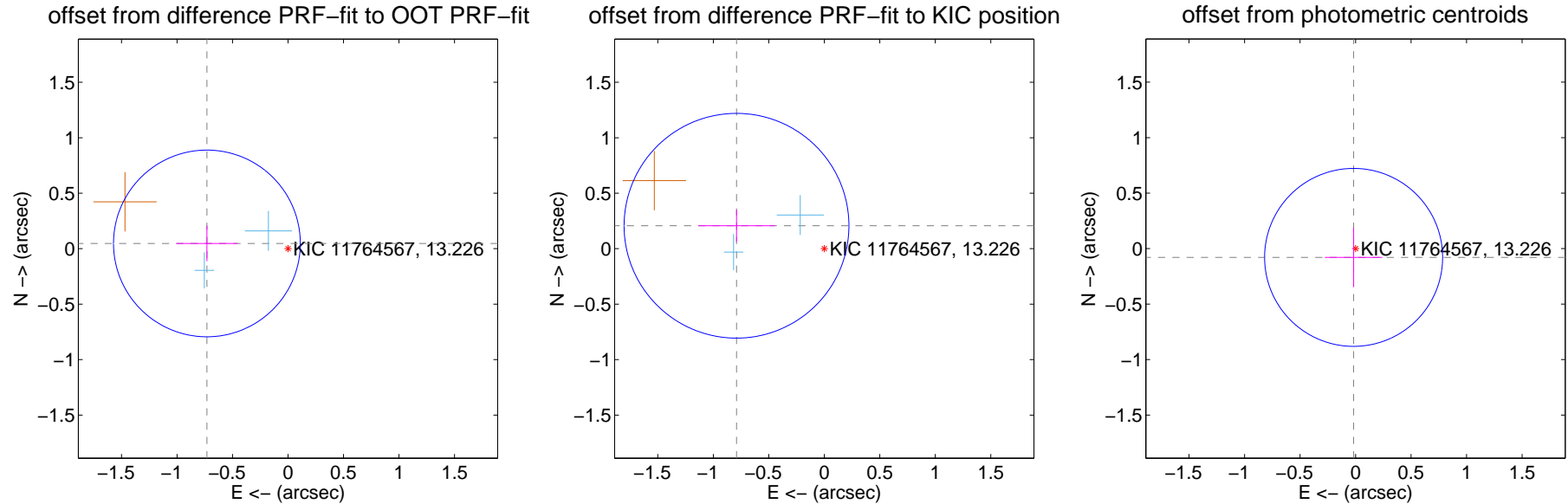
## DV Centroid Data

Supplemental centroid analysis for 011764567-03. Kepler magnitude: 13.23. Transit SNR 9.99

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

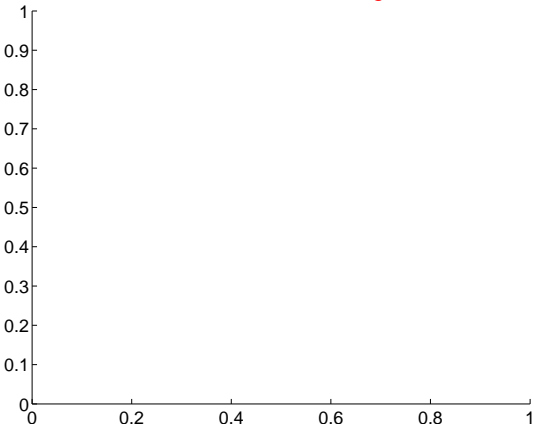
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.732 \pm 0.280$	2.61	$0.731 \pm 0.276$	$0.047 \pm 0.160$
PRF-fit source offset from KIC position	$0.817 \pm 0.338$	2.42	$0.791 \pm 0.346$	$0.207 \pm 0.143$
photometric centroid source offset	$0.08 \pm 0.27$	0.30	$0.02 \pm 0.26$	$-0.08 \pm 0.27$



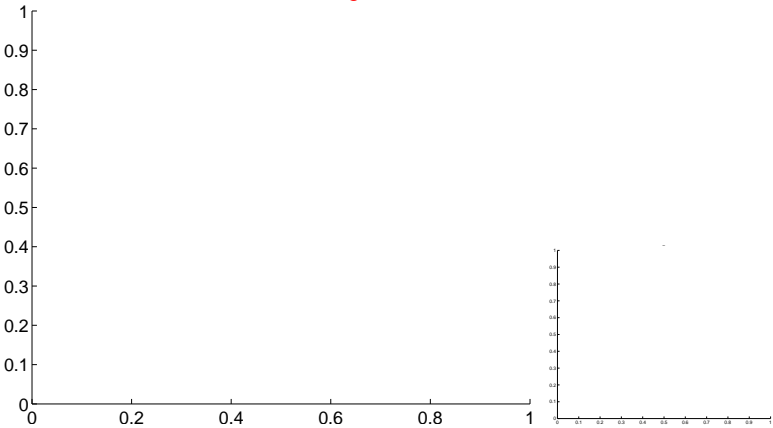
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

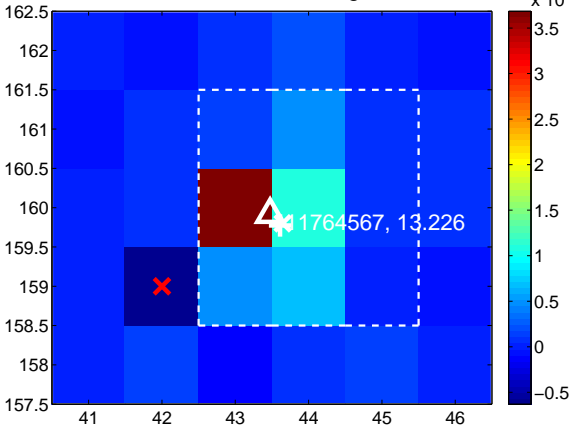
Q1 no difference image



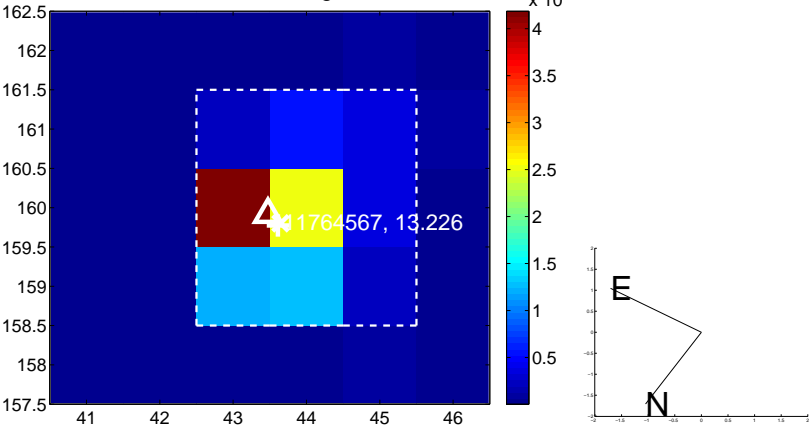
Q1 no OOT image



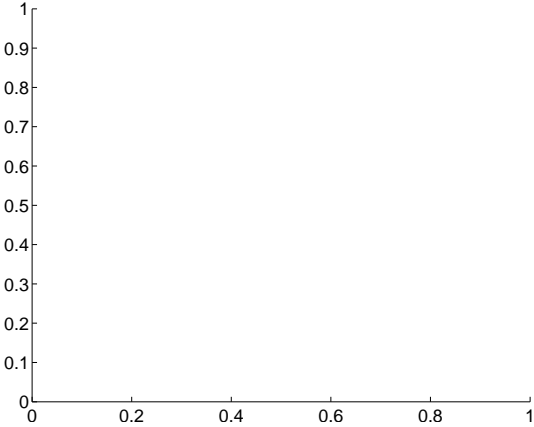
Q2 difference image



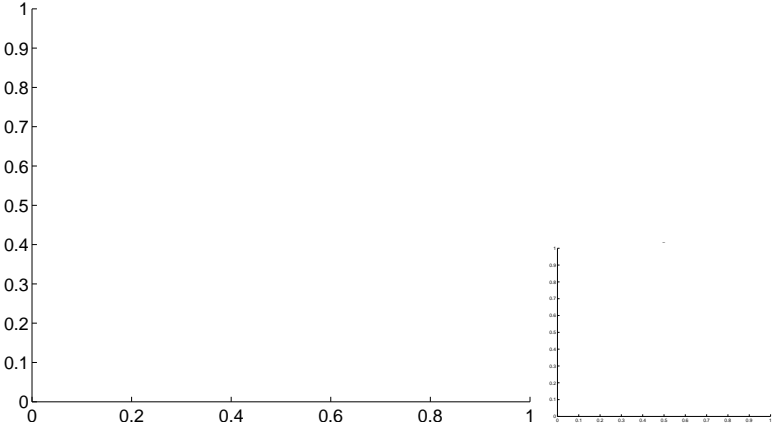
Q2 OOT image



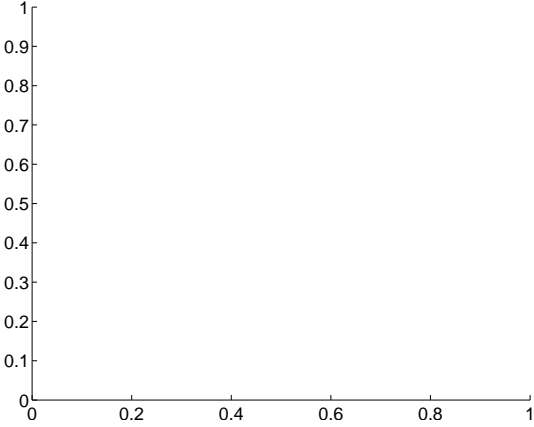
Q3 no difference image



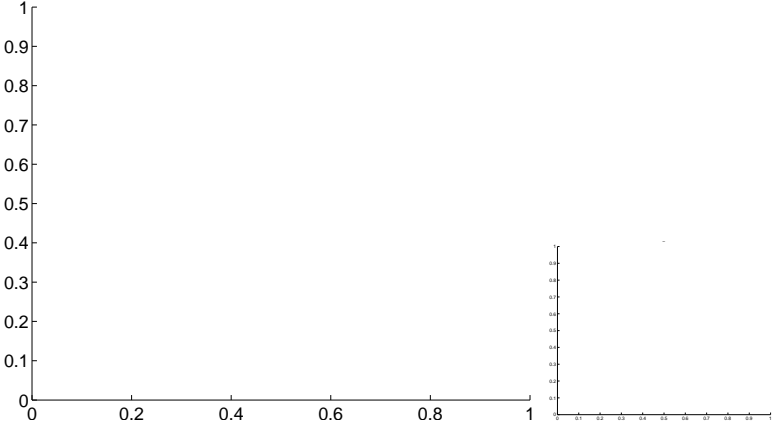
Q3 no OOT image



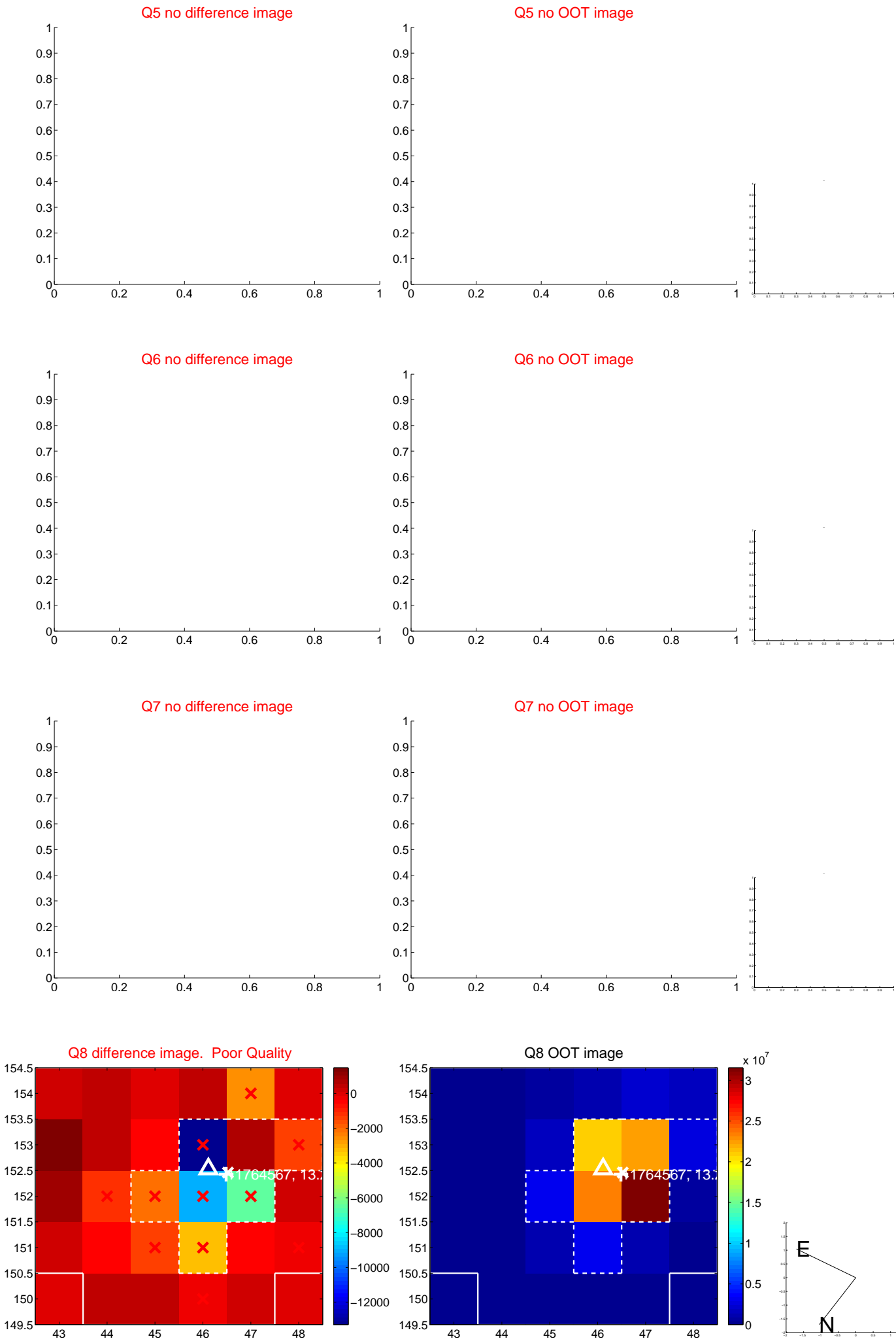
Q4 no difference image



Q4 no OOT image



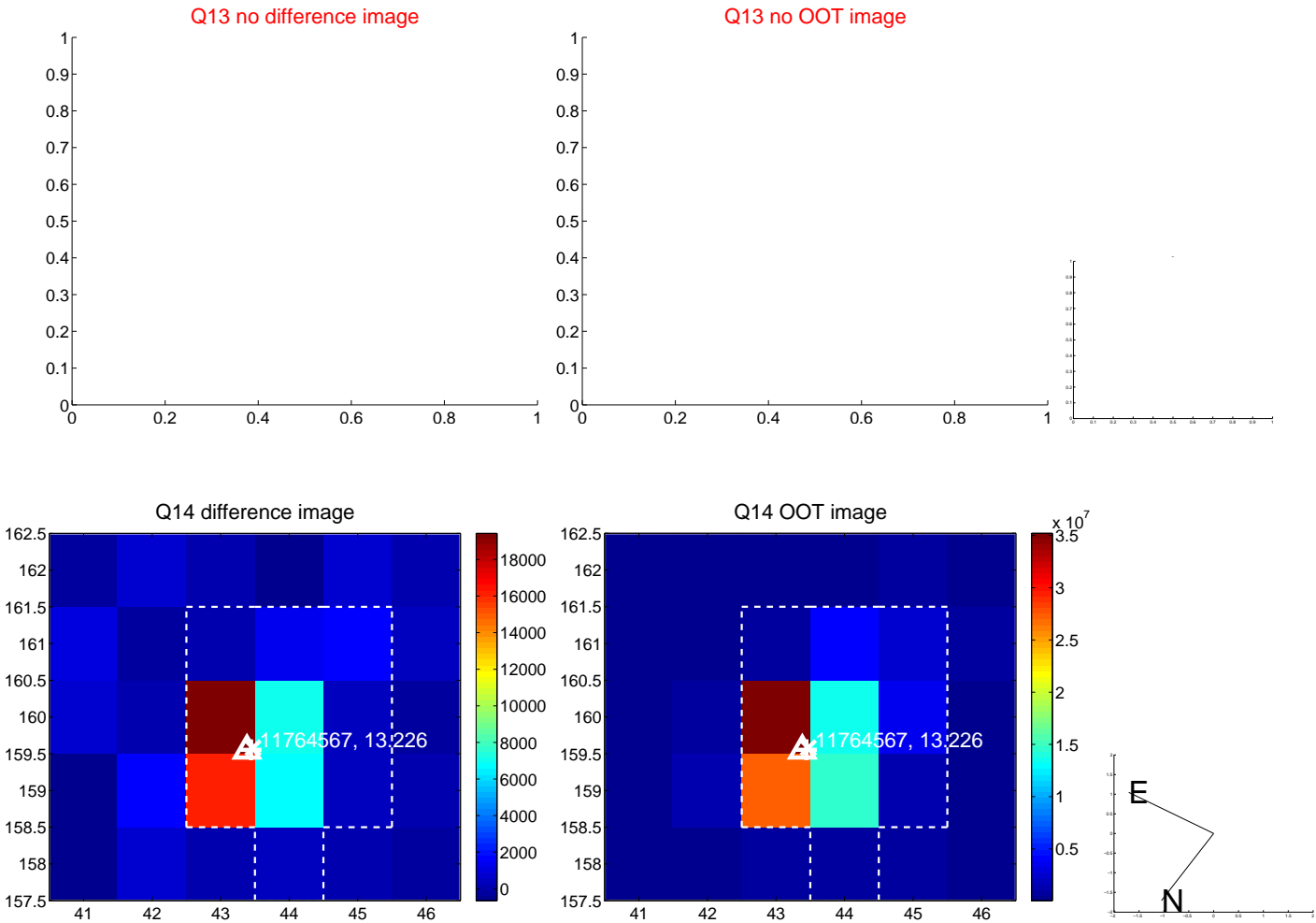
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



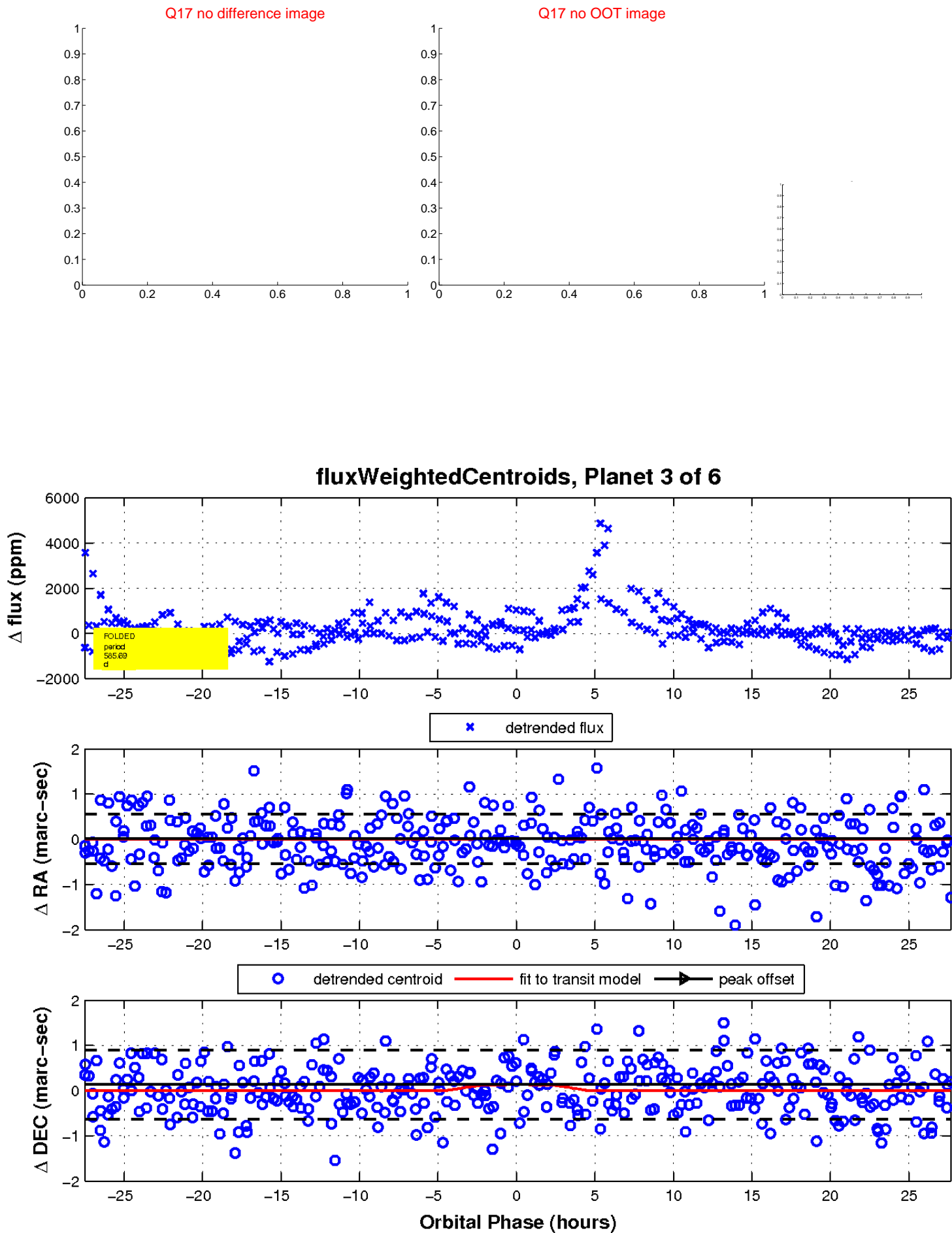
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

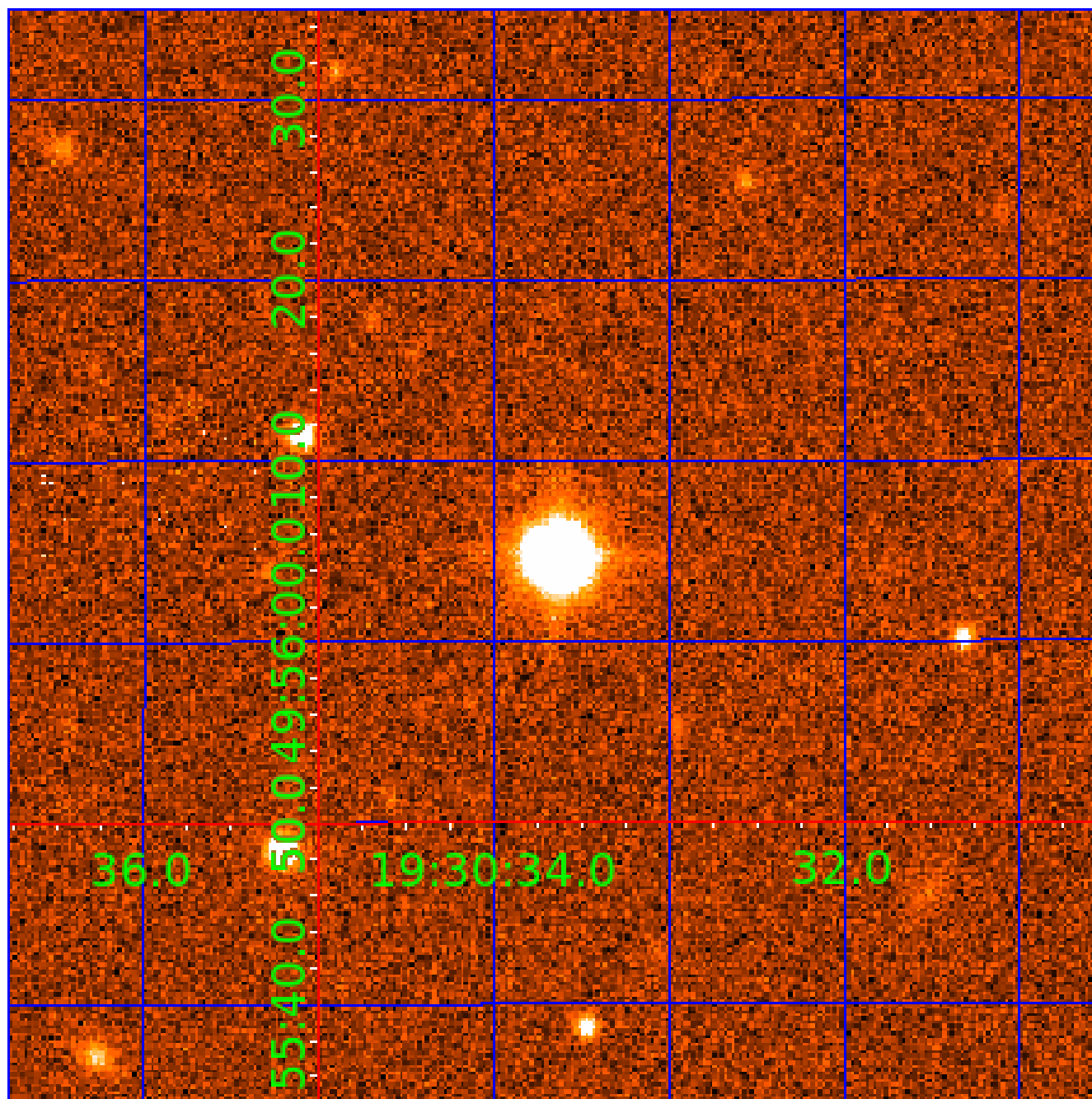


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011764567

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011764567-01	OBS	No	300.896720	338.989782	837.1	9.843	20.3	10.6	0.79	5422	2.31	0.77
011764567-02	OBS	No	421.526978	308.614063	843.3	16.242	18.0	7.8	0.79	5422	2.26	0.49
011764567-03	OBS	No	585.693639	197.916077	1194.6	9.240	18.4	10.0	0.79	5422	3.41	0.32
011764567-04	OBS	No	482.320887	300.262011	644.6	6.346	16.9	5.8	0.79	5422	2.06	0.41
011764567-05	OBS	No	714.441536	146.348287	886.1	5.547	15.8	9.2	0.79	5422	2.84	0.24
011764567-06	OBS	No	533.703540	389.157677	905.3	8.926	15.4	9.0	0.79	5422	2.74	0.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011764567-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
011764567-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-06	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

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

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

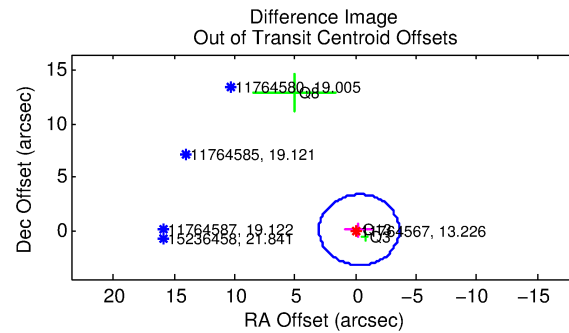
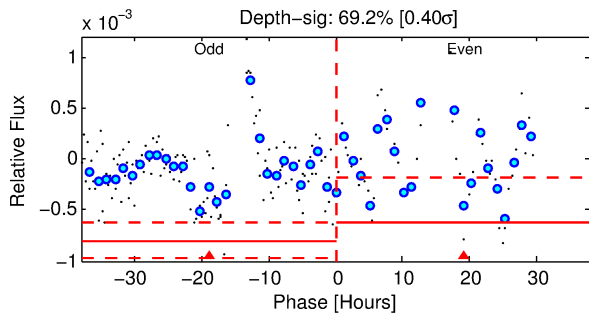
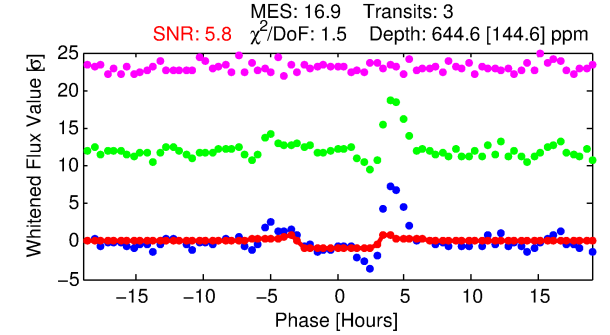
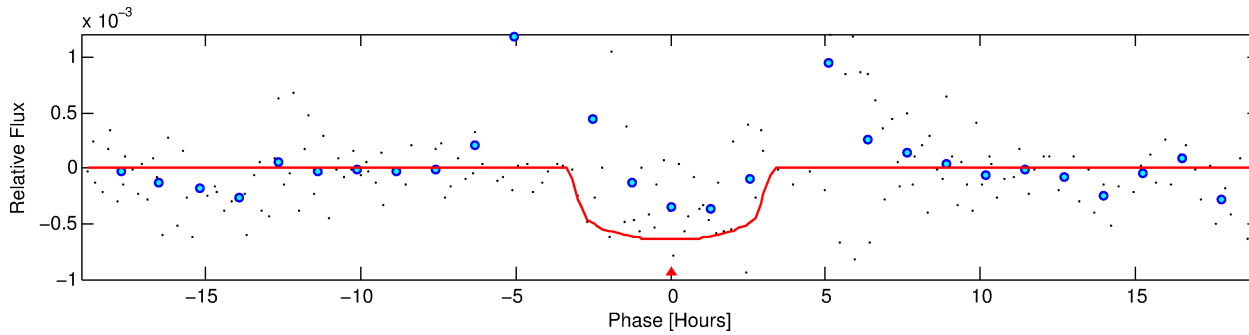
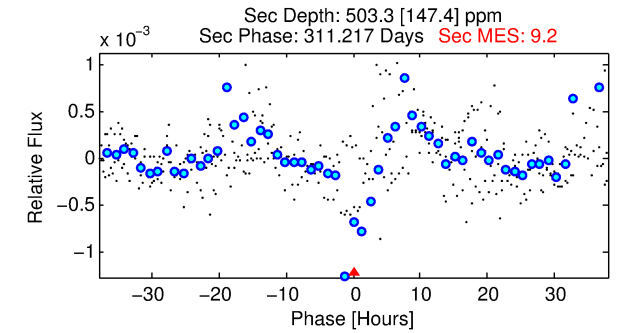
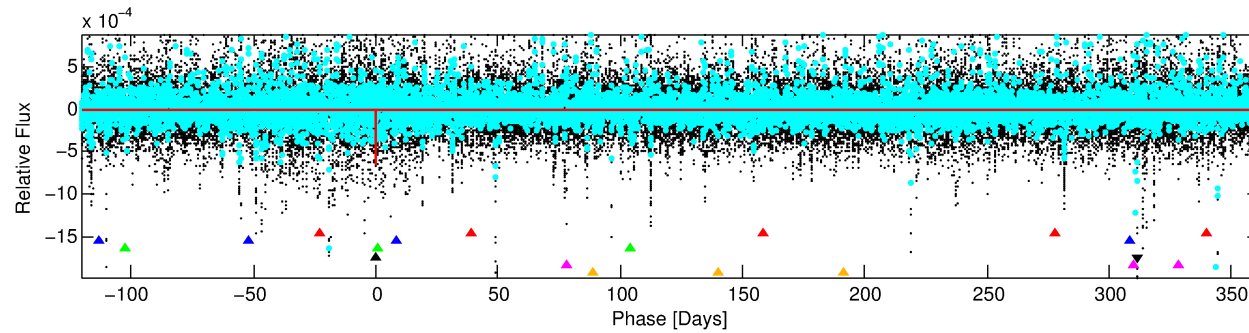
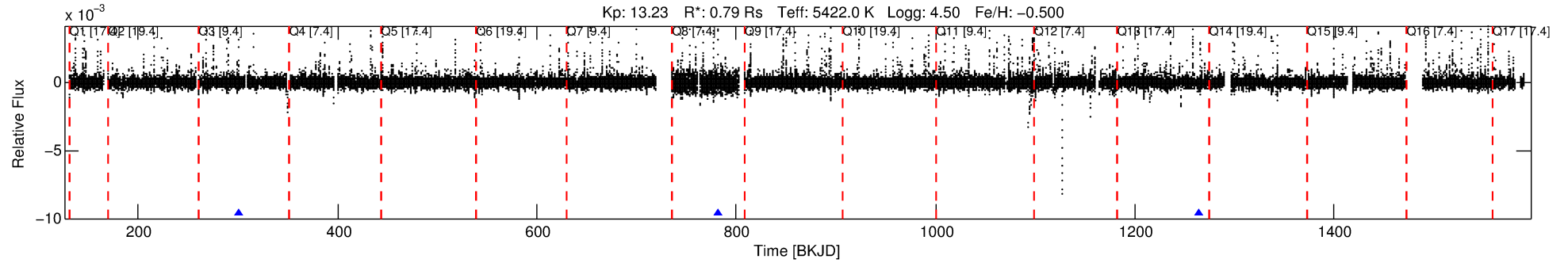
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011764567-04

No Significant Match Found

# DV One-Page Summary

KIC: 11764567 Candidate: 4 of 6 Period: 482.321 d



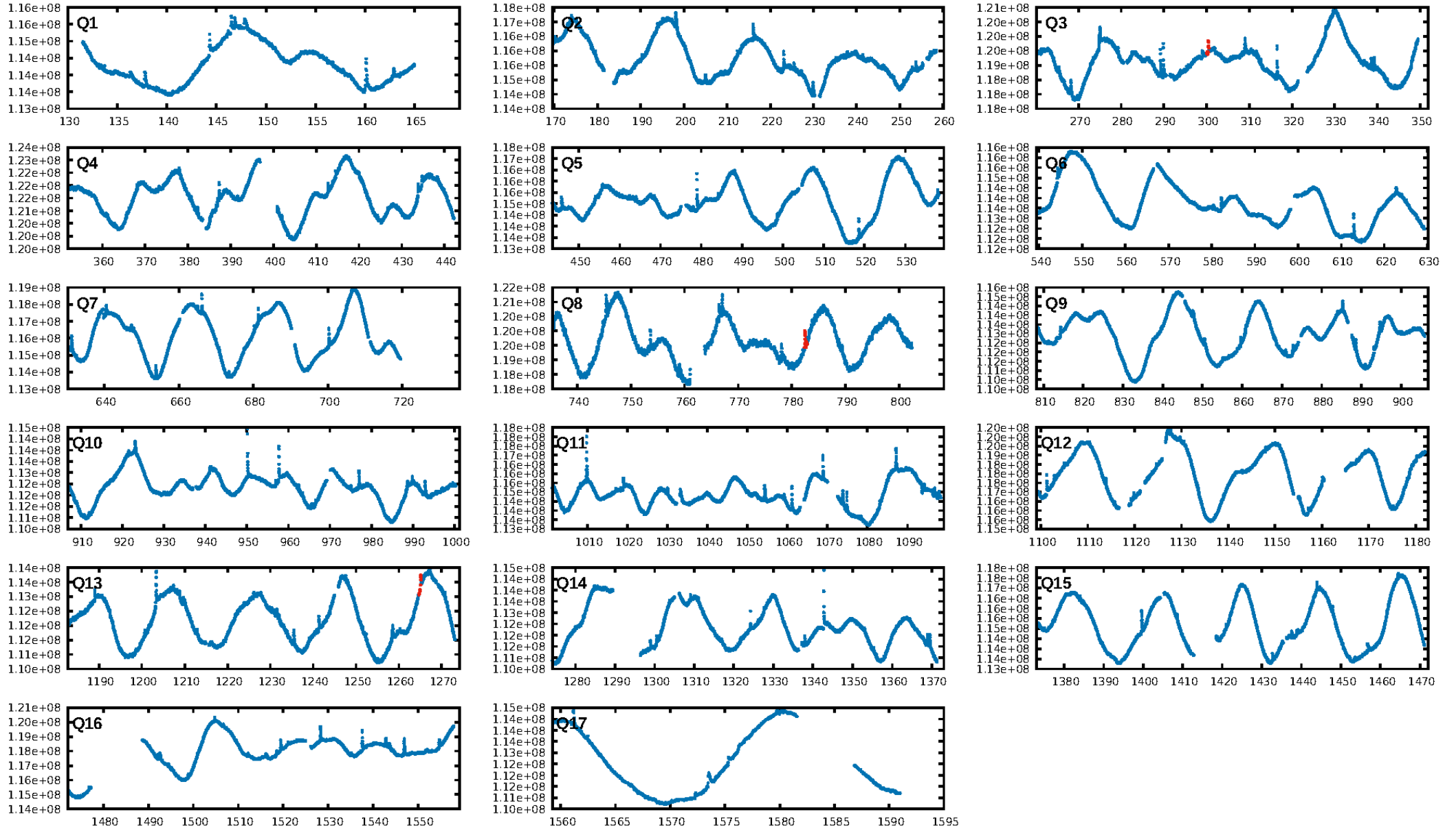
## DV Fit Results:

Period = 482.32089 [0.00680] d  
Epoch = 300.2620 [0.0105] BKJD  
 $R_p/R^* = 0.0241$  [0.0465]  
 $a/R^* = 487.69$  [3986.65]  
 $b = 0.59$  [9.26]  
 $S_{\text{eff}} = 0.41$  [0.10]  
 $T_{\text{eq}} = 204$  [12] K  
 $R_p = 2.06$  [3.99]  $R_e$   
 $a = 1.0777$  [0.1462] AU  
 $A_g = 75423.24$  [291999.19] [0.26 $\sigma$ ]  
 $T_{\text{eff}} = 5231$  [5058] K [0.99 $\sigma$ ]

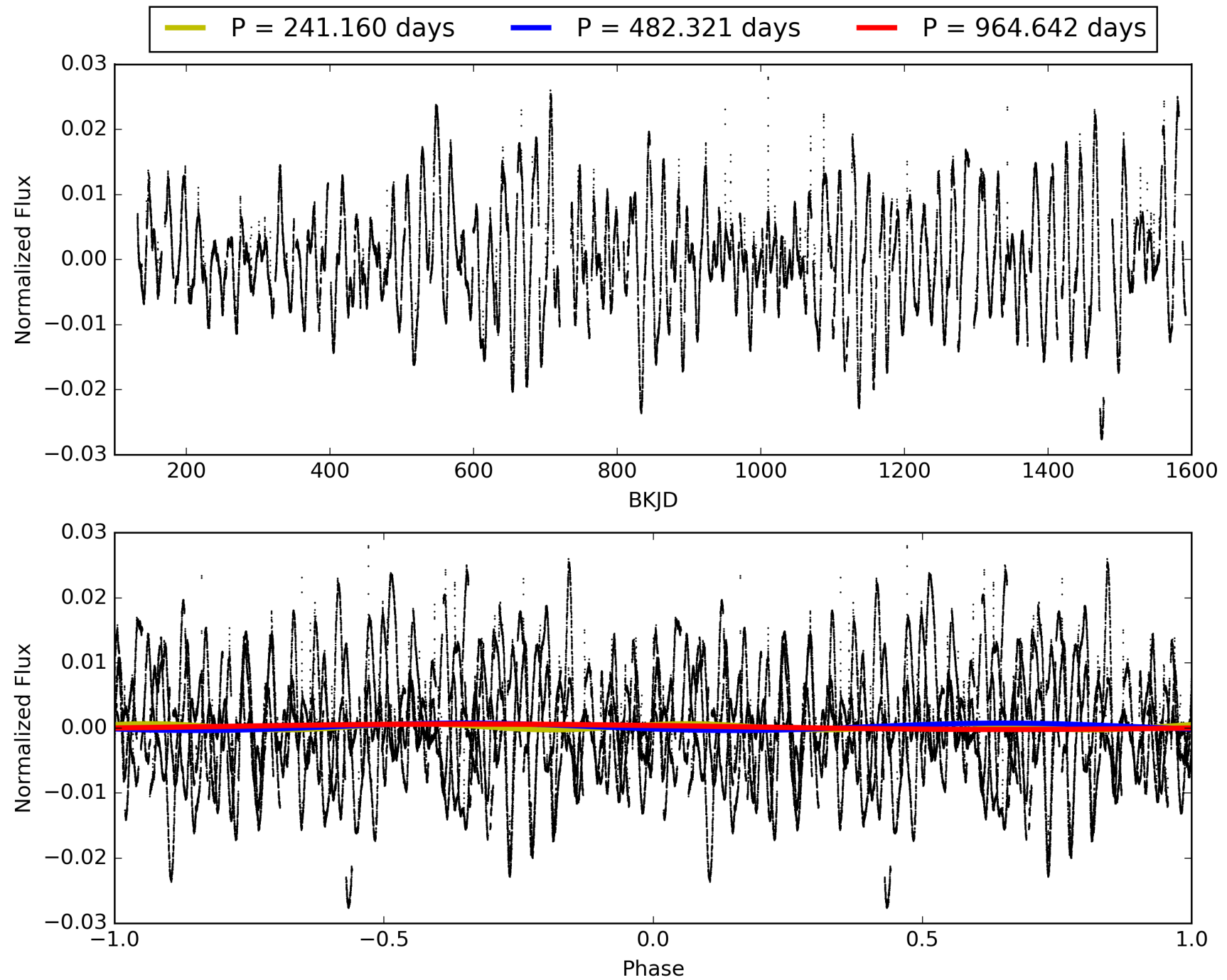
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [83.67 $\sigma$ ]  
LongPeriod-sig: 100.0% [112.60 $\sigma$ ]  
ModelChiSquare2-sig: 13.2%  
ModelChiSquareGof-sig: 20.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.1781  
Centroid-sig: 30.2%  
Centroid-so: 0.606 arcsec [1.35 $\sigma$ ]  
OotOffset-rm: 0.286 arcsec [0.26 $\sigma$ ]  
KicOffset-rm: 0.397 arcsec [0.37 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 011764567-04, PDC Light Curves

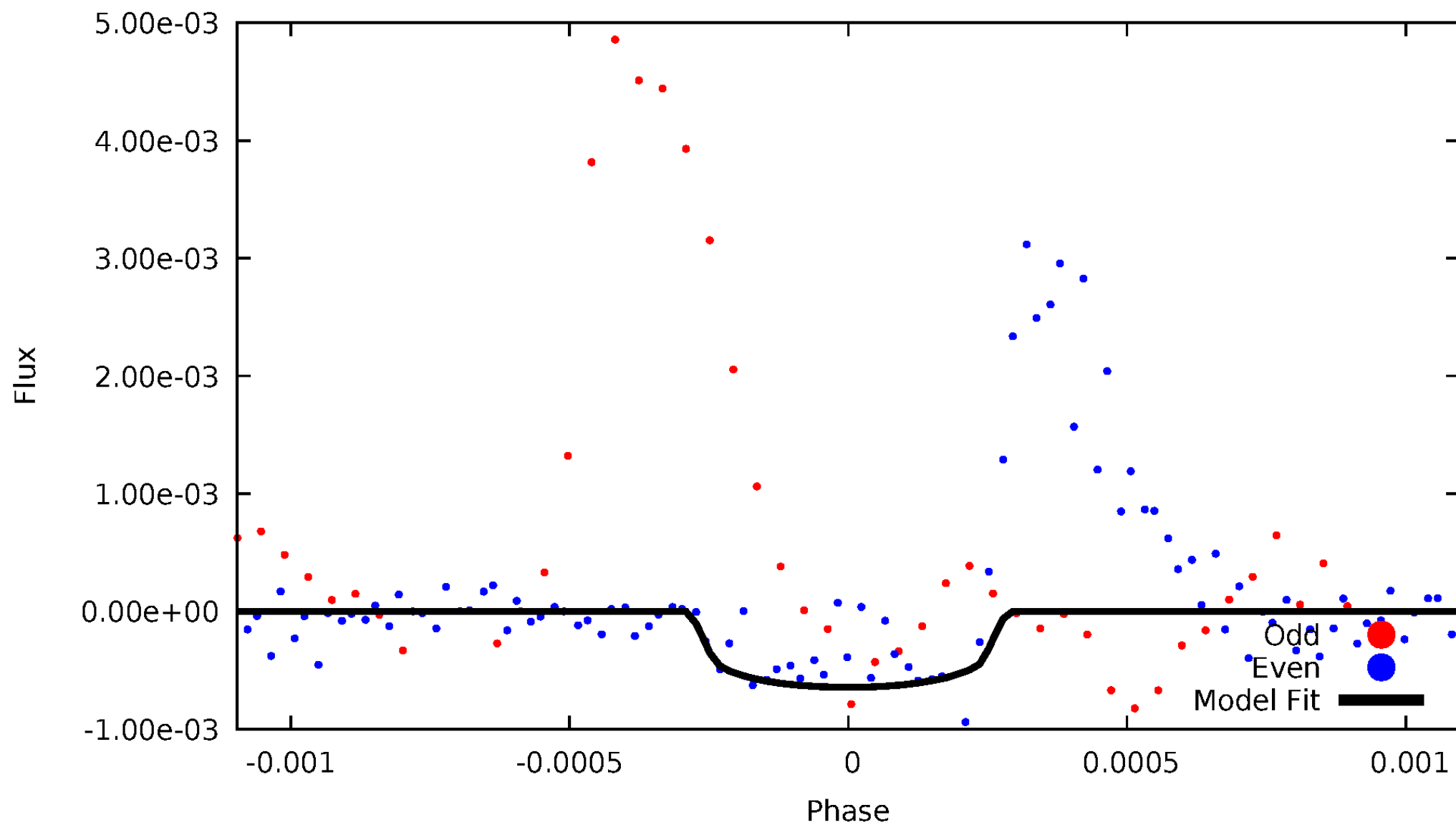


# TCE 011764567-04



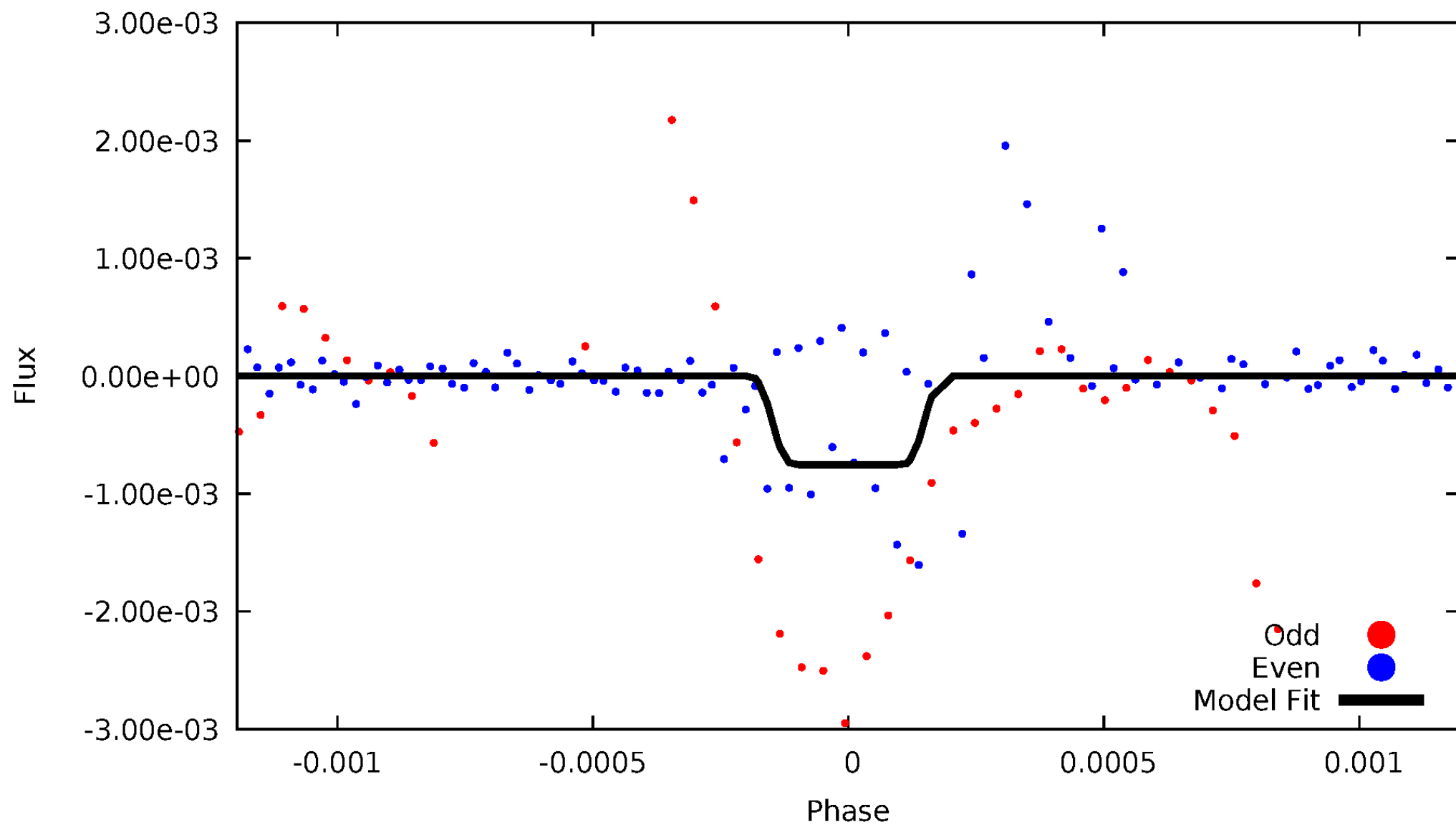
# DV Odd/Even

TCE 011764567-04



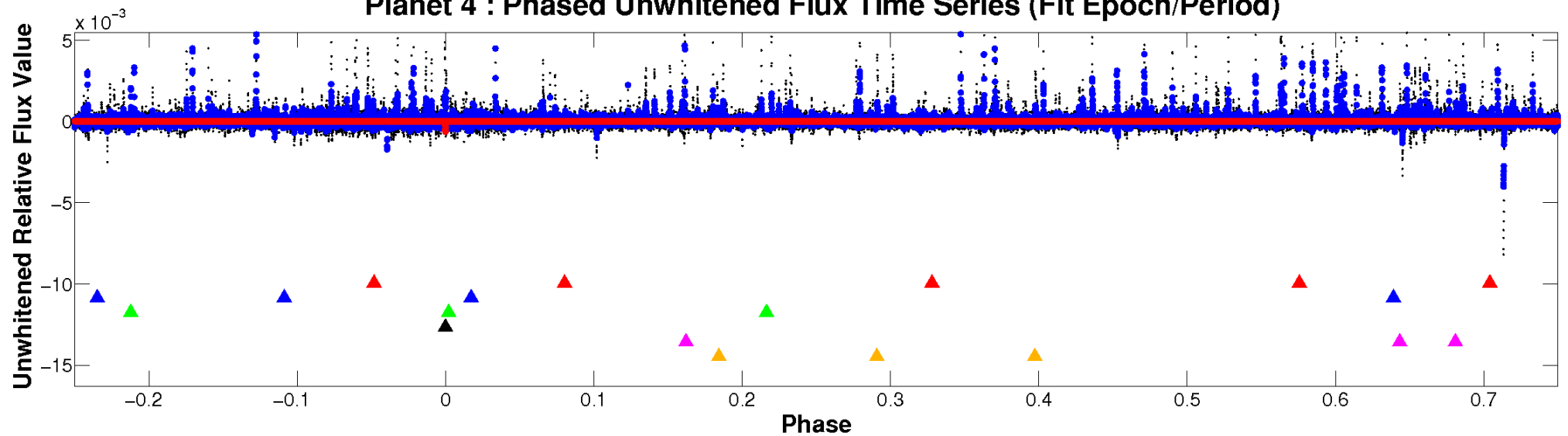
# ALT Odd/Even

TCE 011764567-04

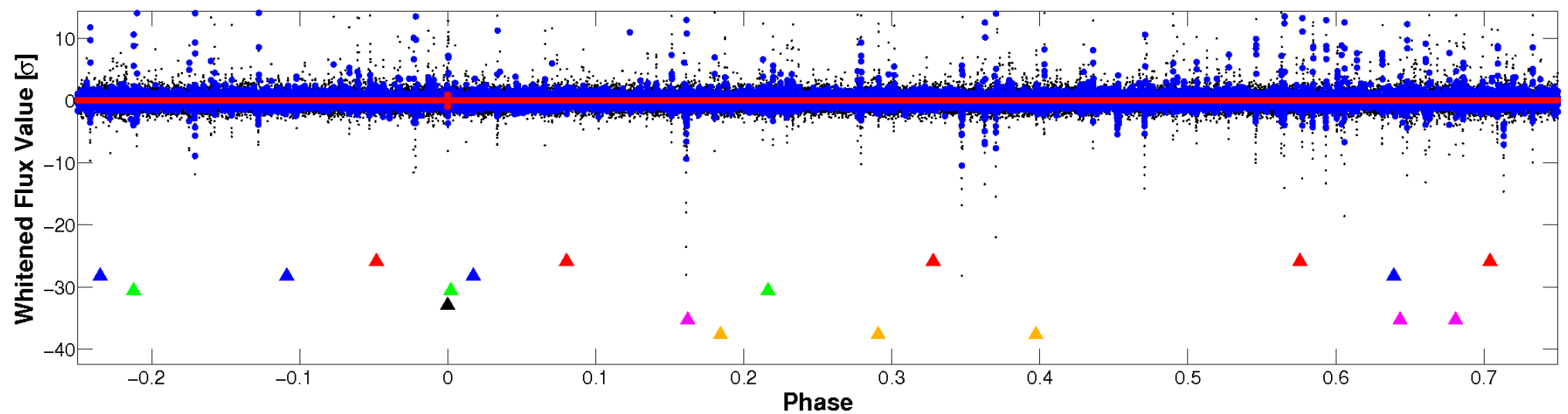


# Non-Whitened Vs. Whitened Light Curve

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

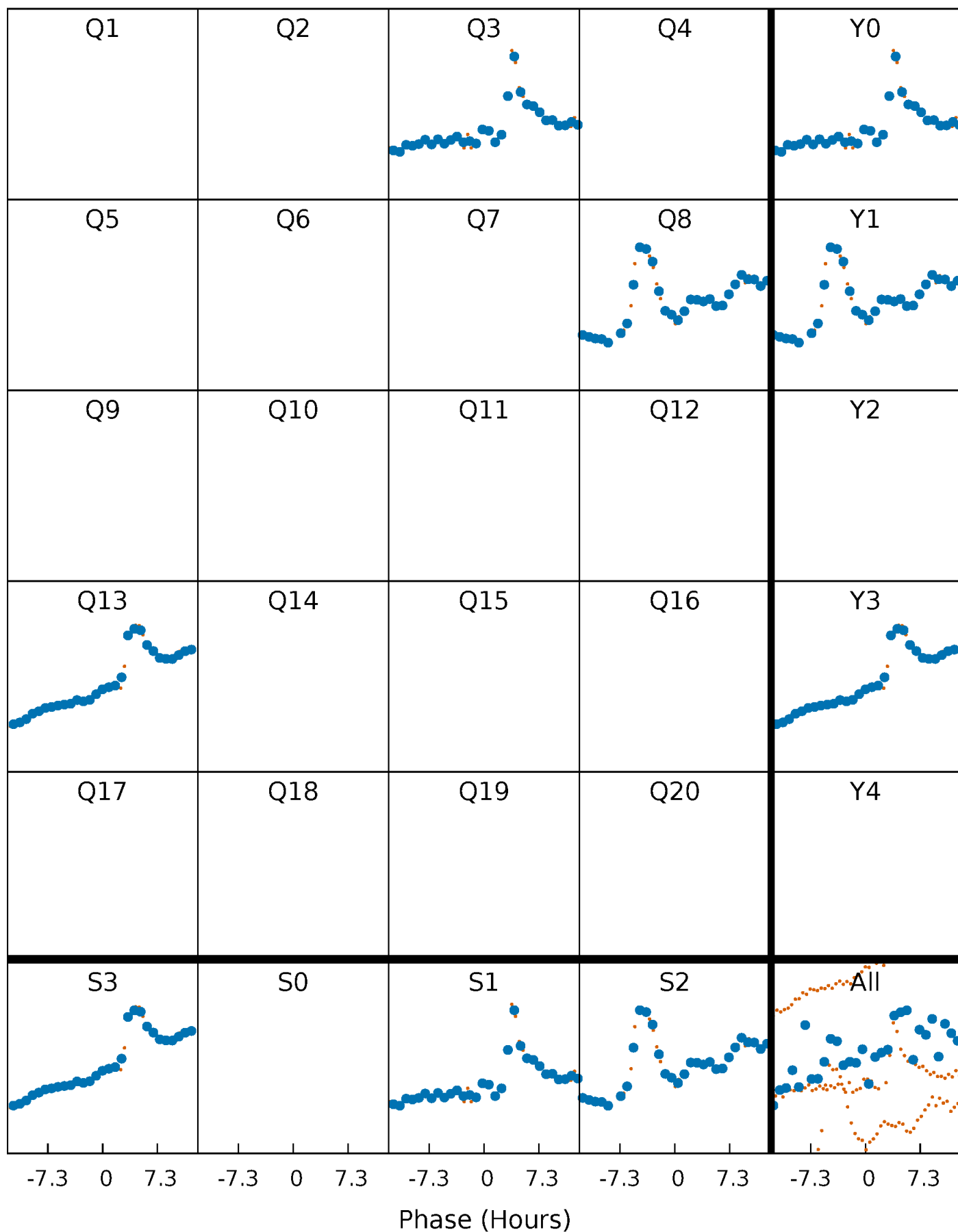


**Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

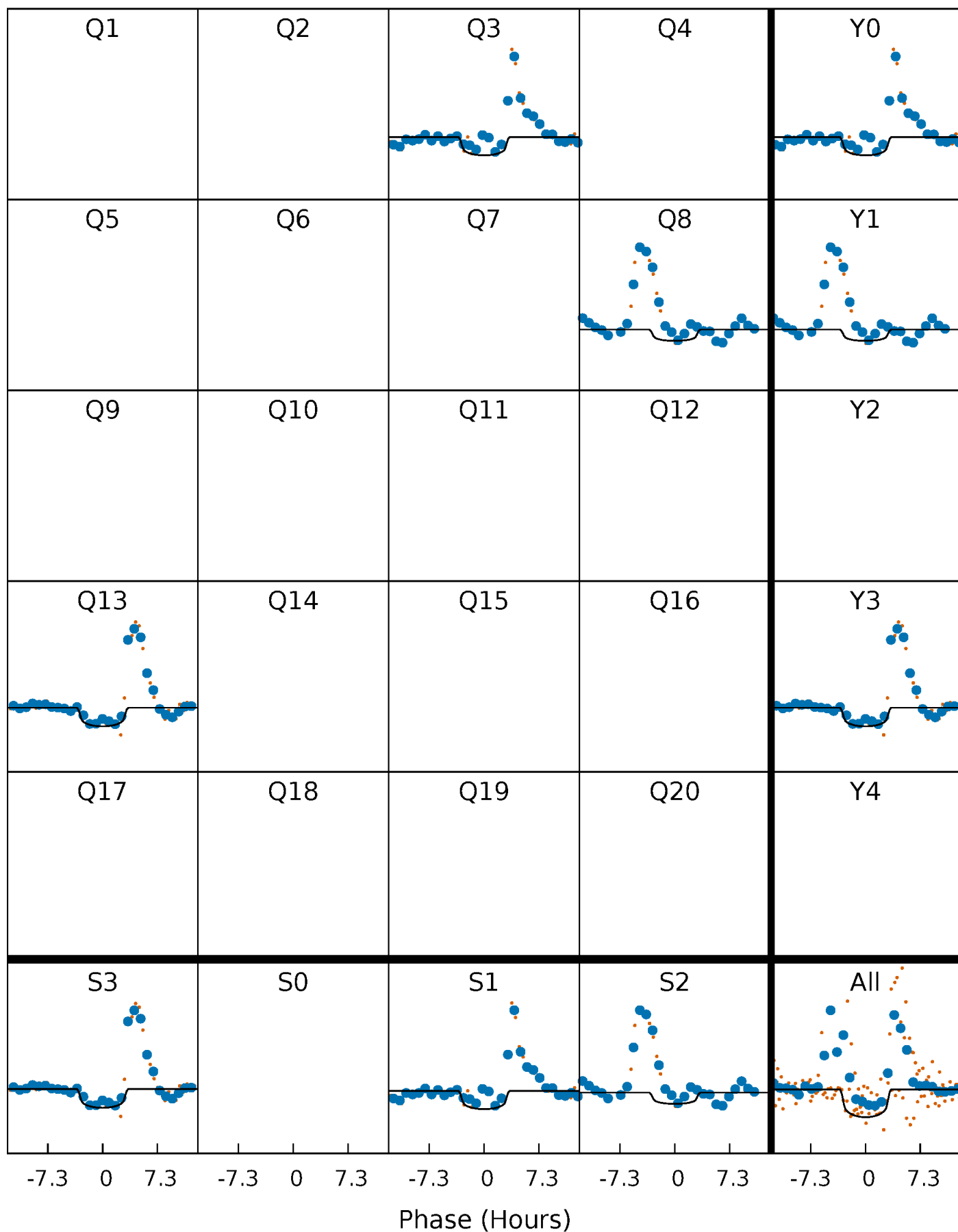
TCE 011764567-04     $P=482.320887$  Days     $T_0=300.262010$  (BKJD)





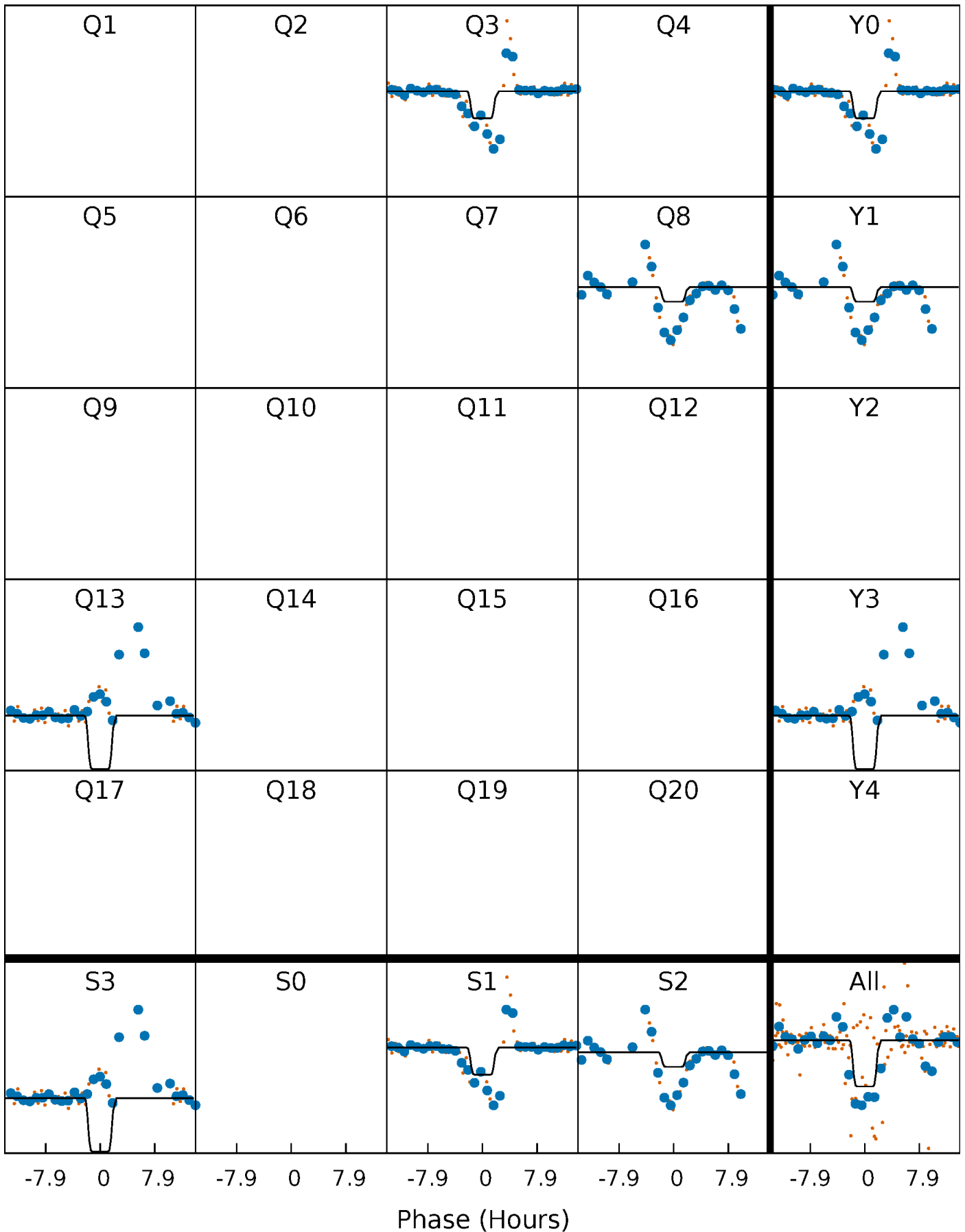
# DV Quarter-Phased Transit Curves

TCE 011764567-04     $P=482.320887$  Days     $T_0=300.262010$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

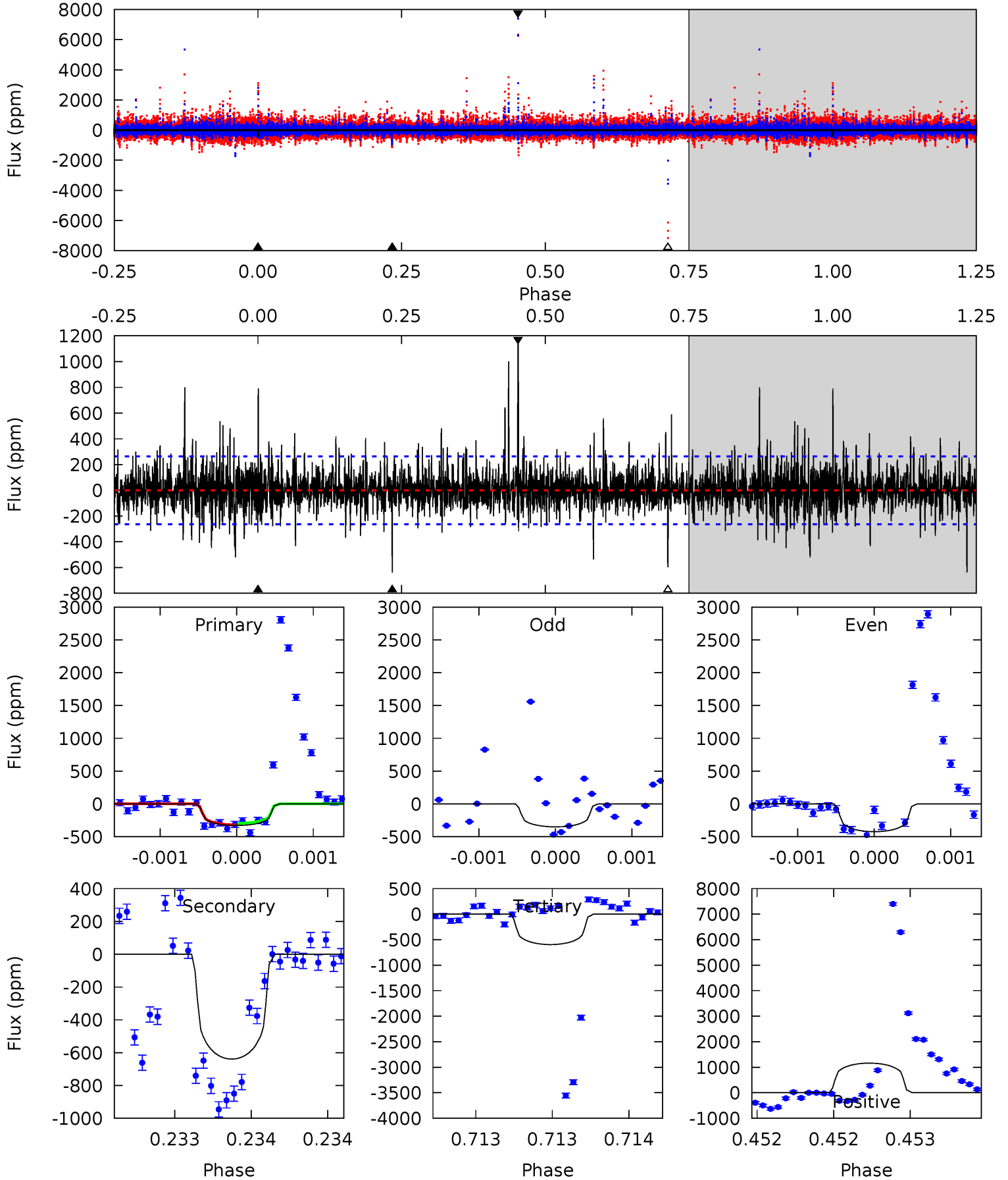
TCE 011764567-04     $P=482.320561$  Days     $T_0=300.268095$  (BKJD)



# DV Model-Shift Uniqueness Test

011764567-04, P = 482.320887 Days, E = 300.262010 Days

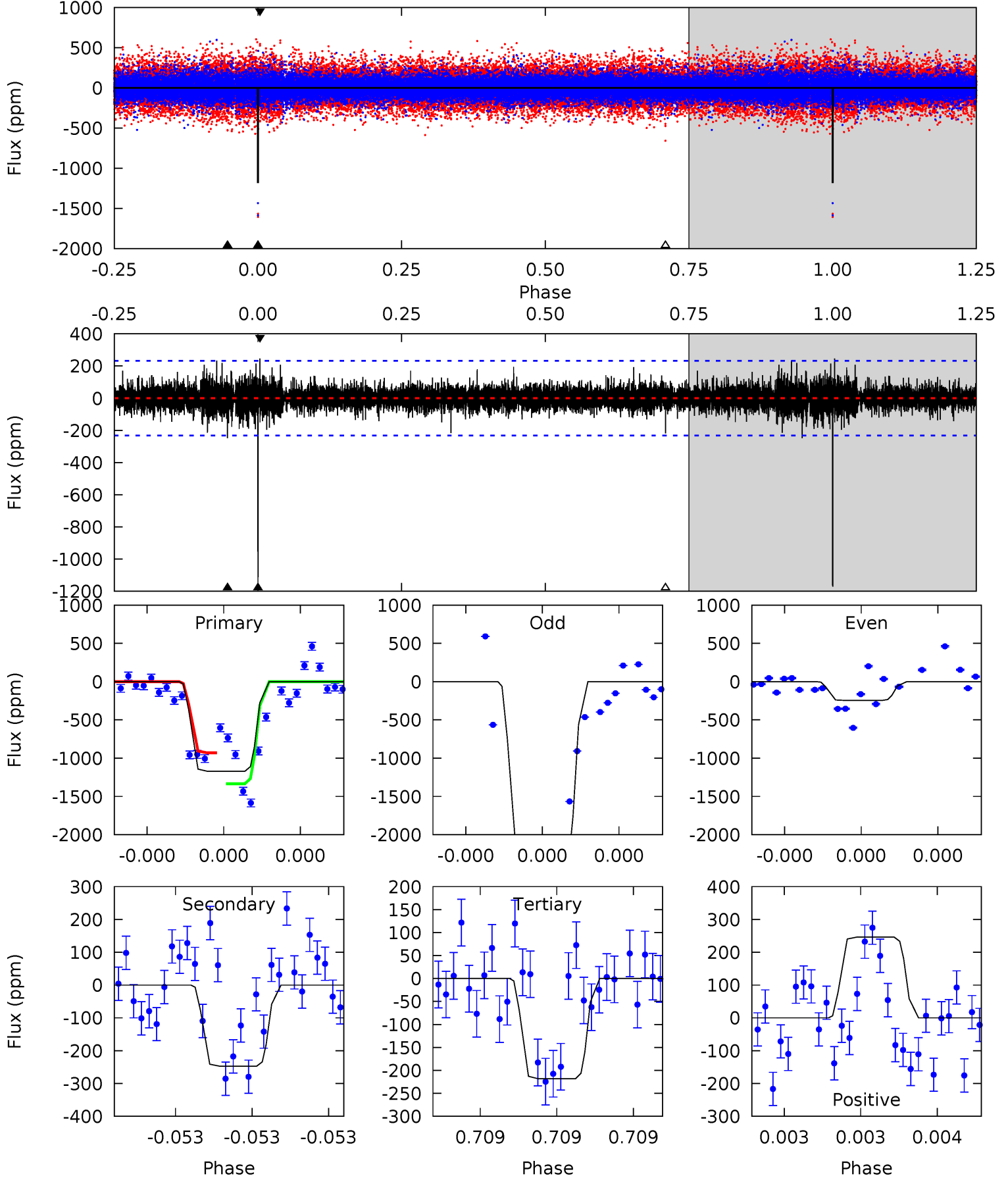
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.93	13.5	12.6	24.5	5.55	3.45	2.41	-5.63	-17.5	0.89	-11.0	0.48	0.55	0.65	0.26



# Alt Model-Shift Uniqueness Test

011764567-04, P = 482.320561 Days, E = 300.268095 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
28.5	6.00	5.30	5.98	5.64	3.58	0.95	23.2	22.5	0.71	0.02	33.9	1.00	0.17	0



### Stellar Parameters For KIC 011764567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5422^{+162}_{-146}$	$4.504^{+0.110}_{-0.110}$	$-0.500^{+0.350}_{-0.300}$	$0.785^{+0.125}_{-0.102}$	$0.718^{+0.105}_{-0.045}$	$2.088^{+1.006}_{-0.680}$
	+3%/-3%	+2%/-2%	+70%/-60%	+16%/-13%	+15%/-6%	+48%/-33%
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 011764567-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-639 \pm 47$	$3.85^{+3.36}_{-2.70}$	$285^{+16}_{-13}$	$4355^{+2995}_{-871}$	$28351^{+275306}_{-20389}$
Alt.	$-247 \pm 41$	$3.63^{+3.48}_{-2.44}$	$285^{+15}_{-13}$	$3700^{+2117}_{-686}$	$11716^{+103424}_{-8520}$

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

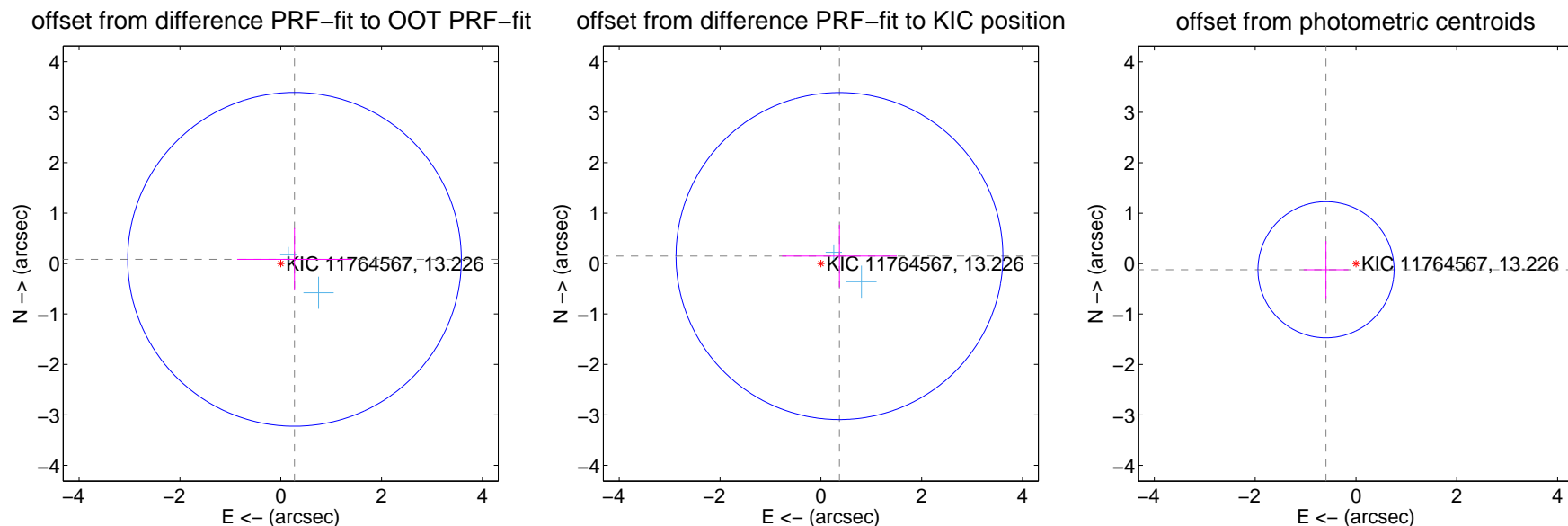
## DV Centroid Data

Supplemental centroid analysis for 011764567-04. Kepler magnitude: 13.23. Transit SNR 5.84

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

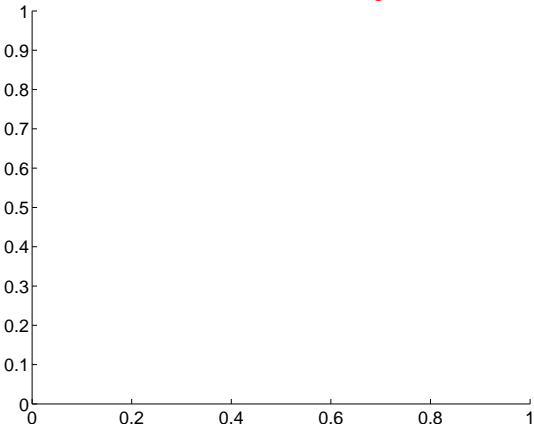
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.286 \pm 1.103$	0.26	$-0.273 \pm 1.138$	$0.084 \pm 0.618$
PRF-fit source offset from KIC position	$0.397 \pm 1.080$	0.37	$-0.369 \pm 1.138$	$0.148 \pm 0.618$
photometric centroid source offset	$0.61 \pm 0.45$	1.35	$0.59 \pm 0.44$	$-0.12 \pm 0.57$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

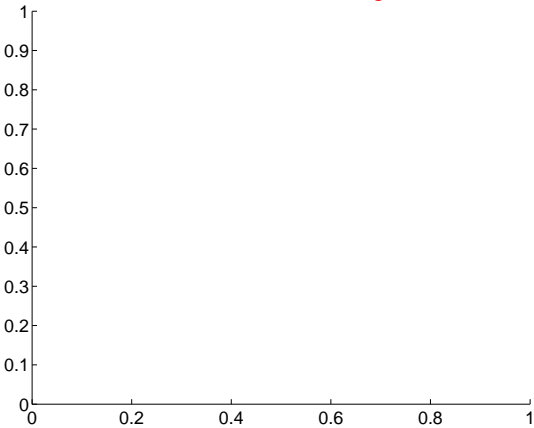
Q1 no difference image



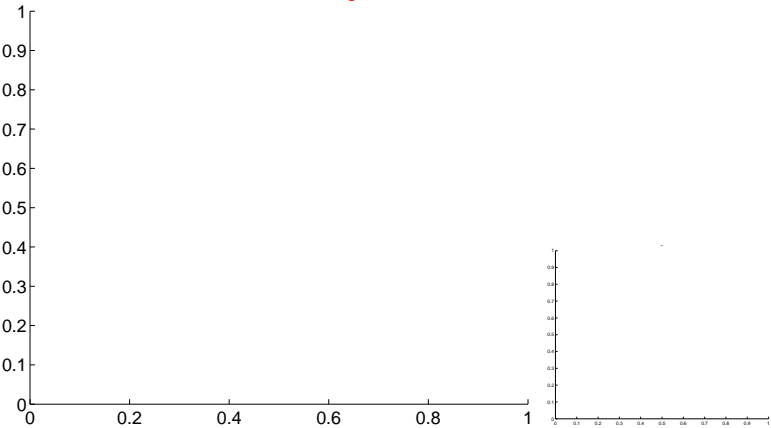
Q1 no OOT image



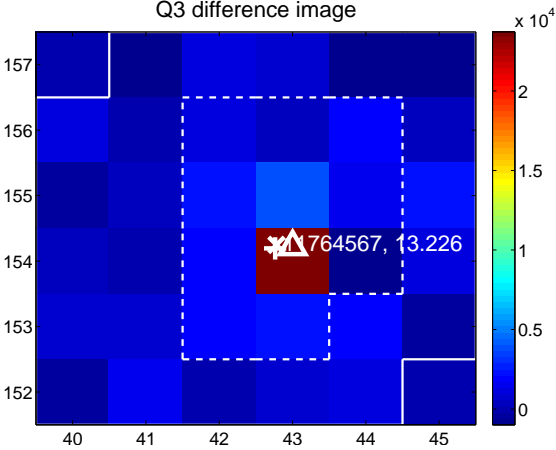
Q2 no difference image



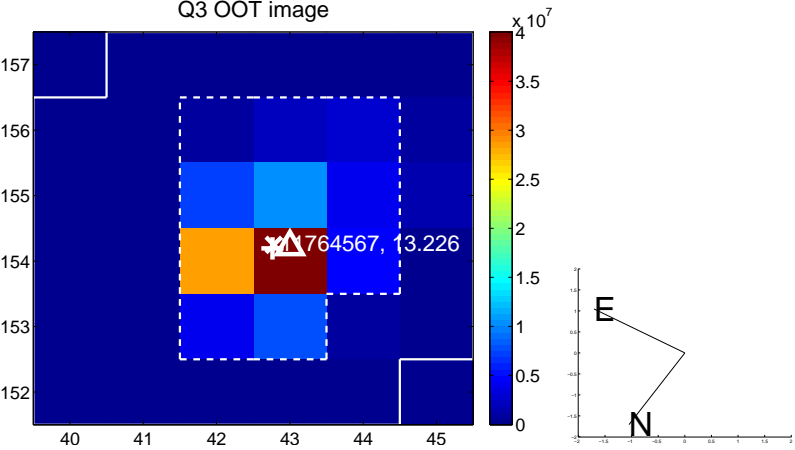
Q2 no OOT image



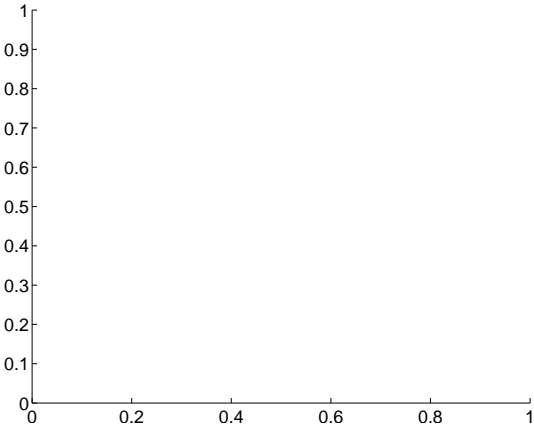
Q3 difference image



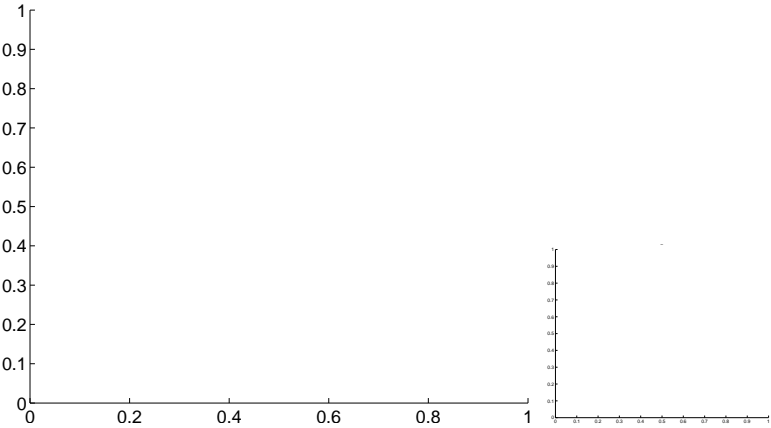
Q3 OOT image



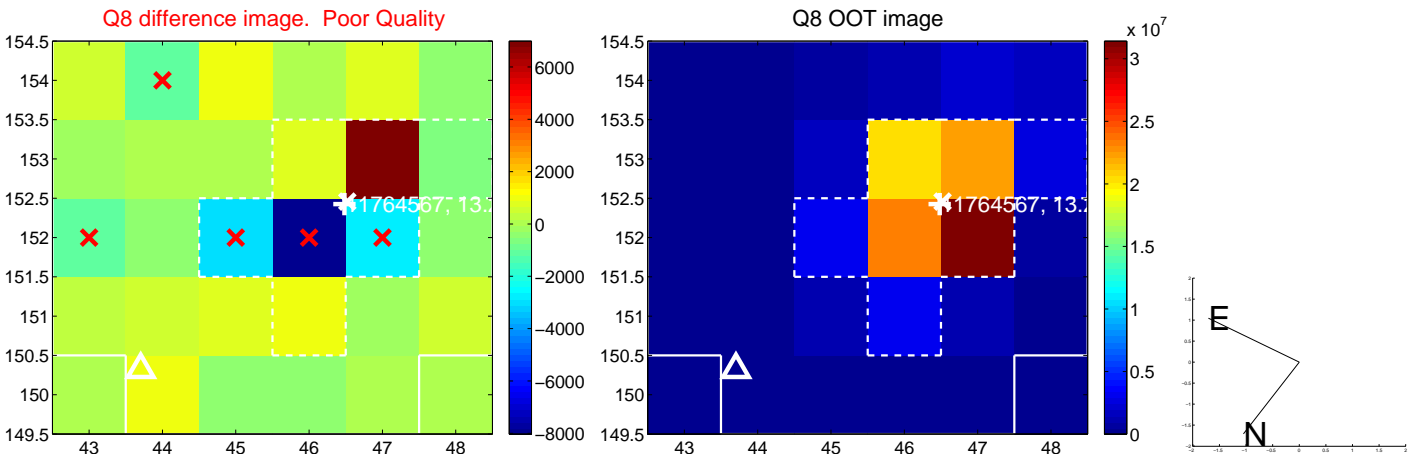
Q4 no difference image



Q4 no OOT image

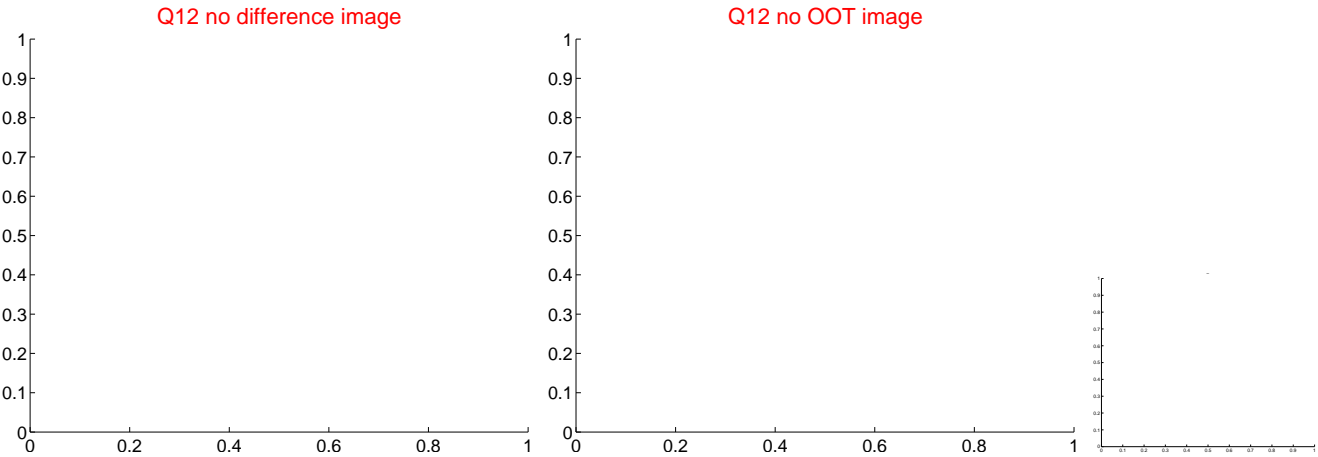
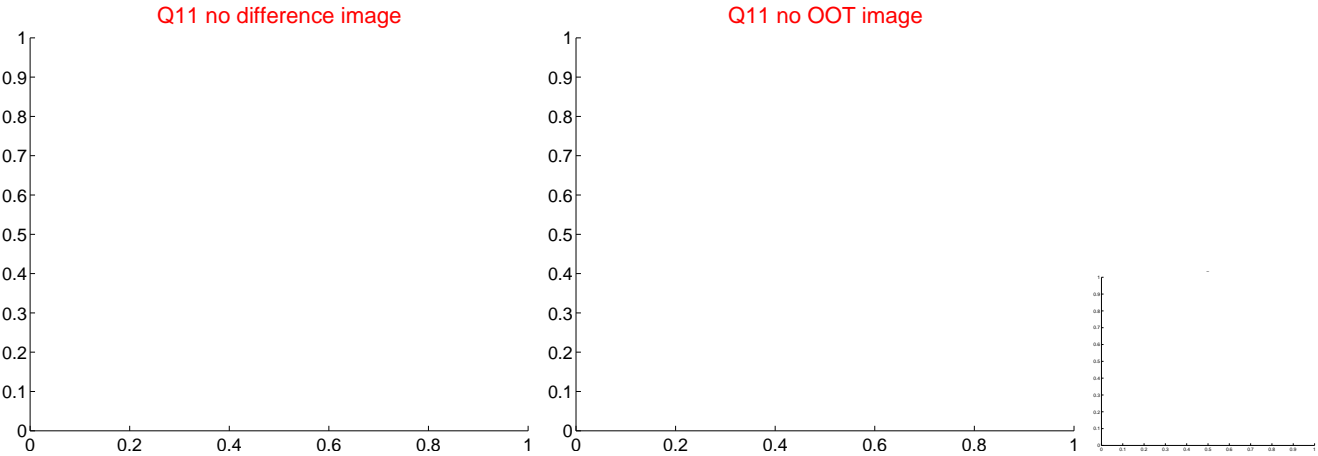
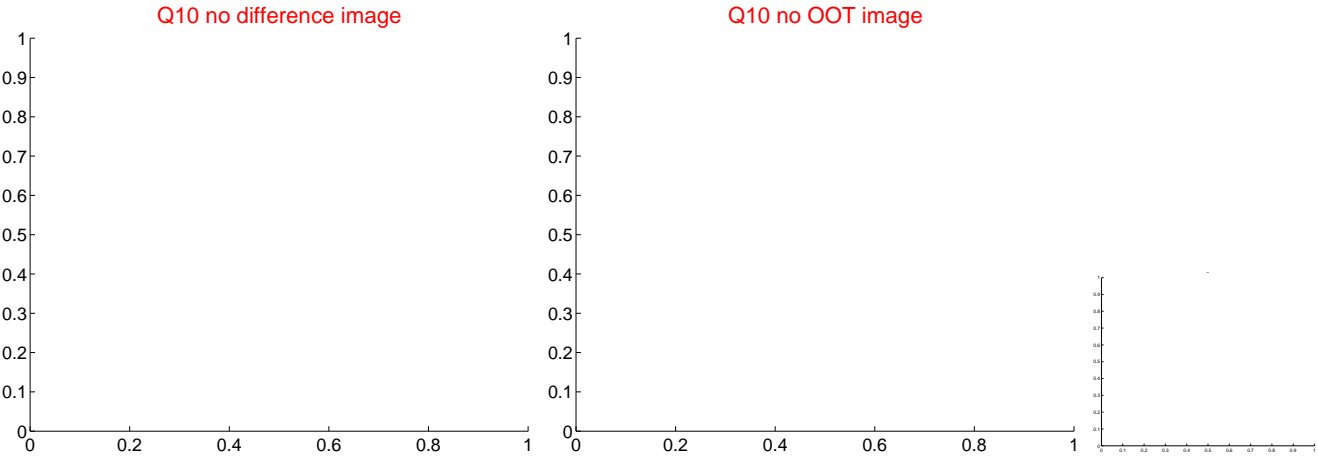
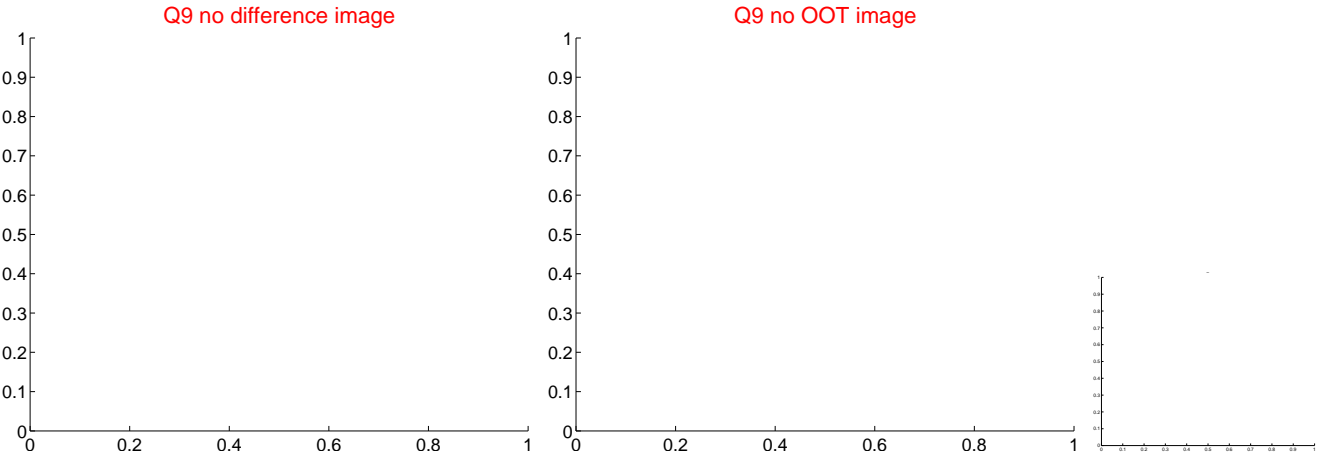


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

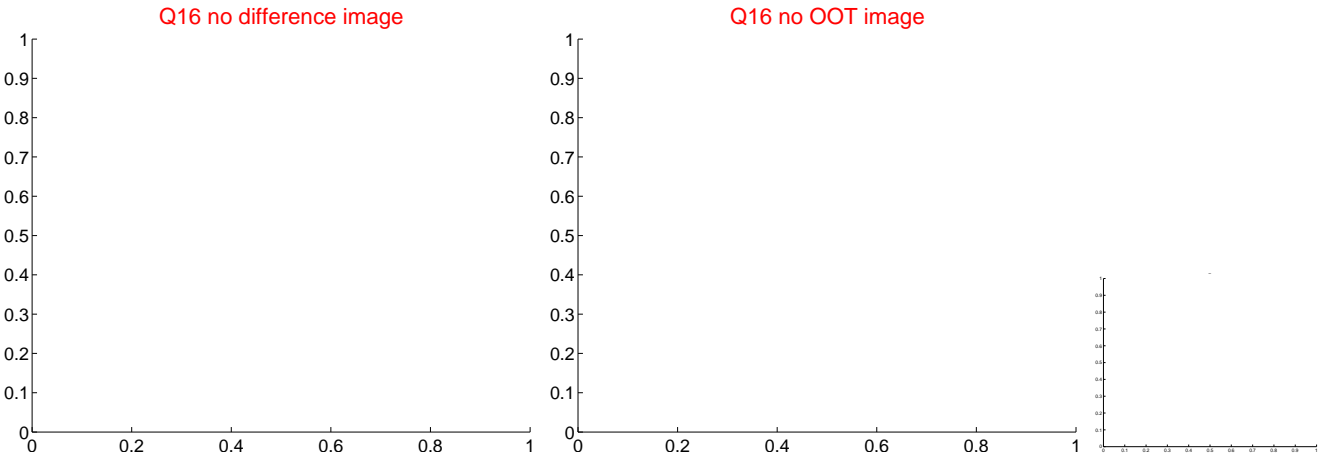
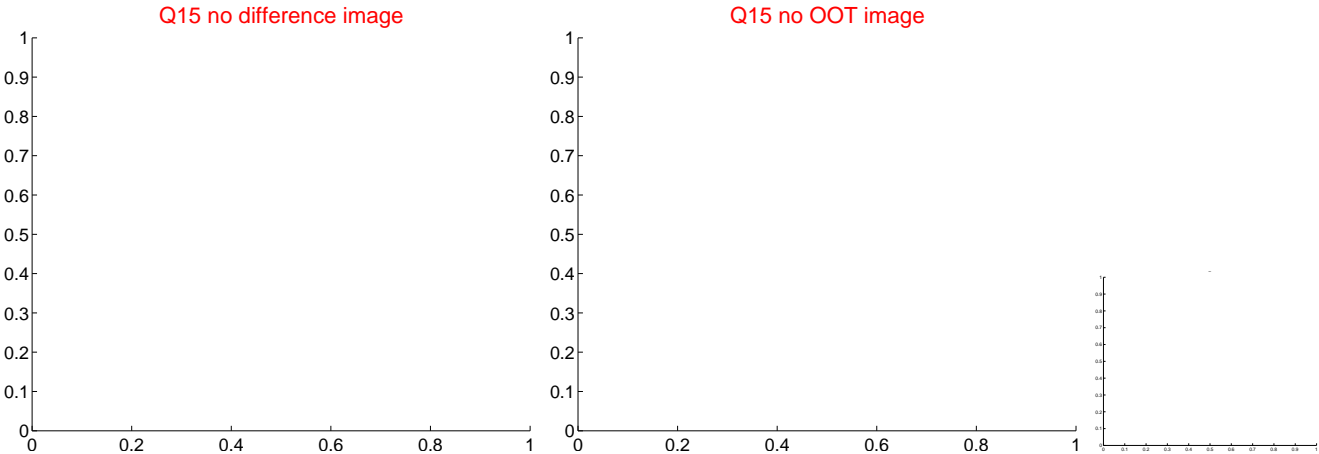
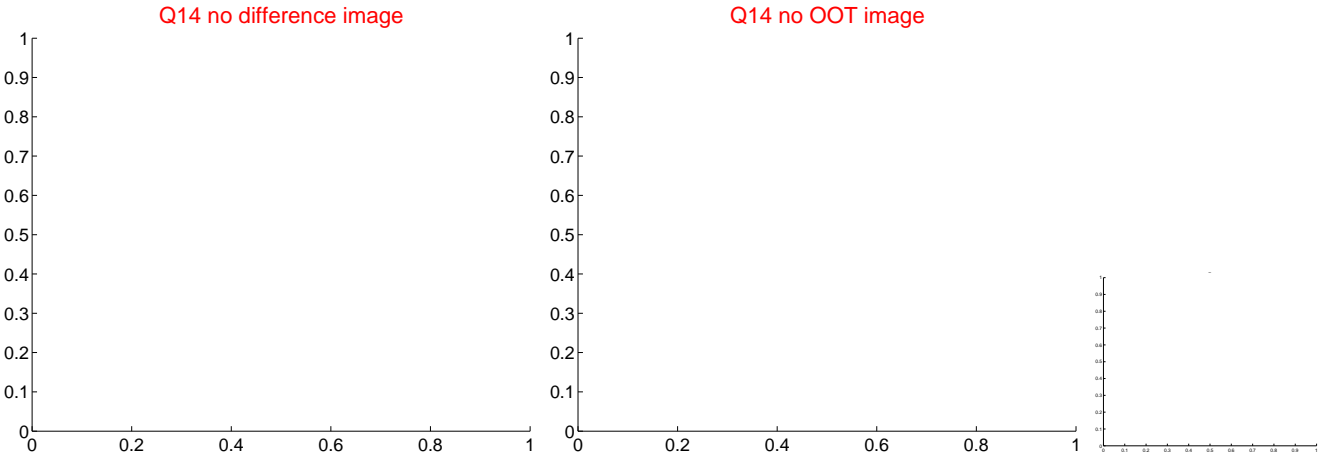
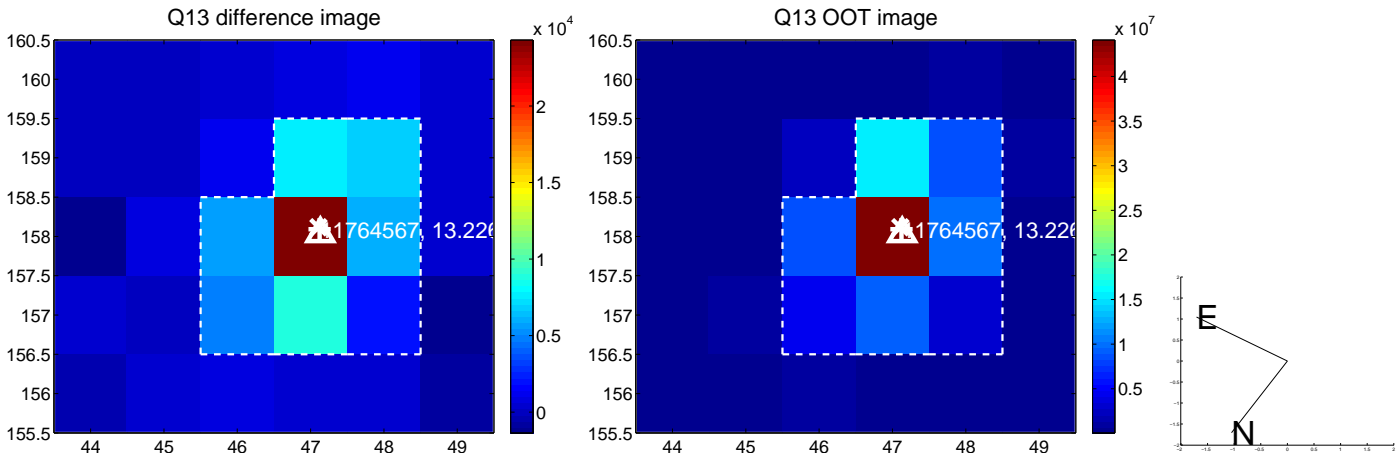




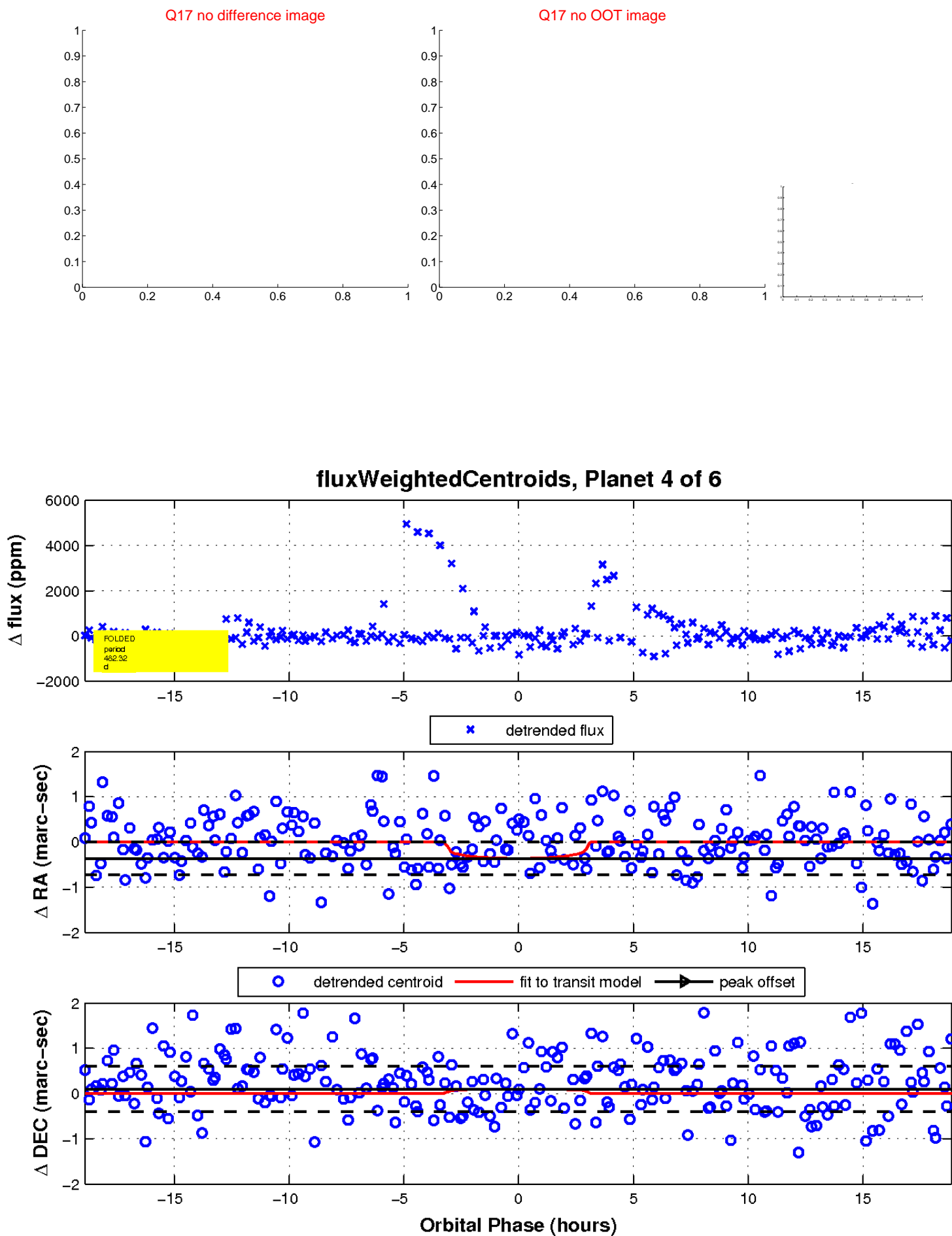
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

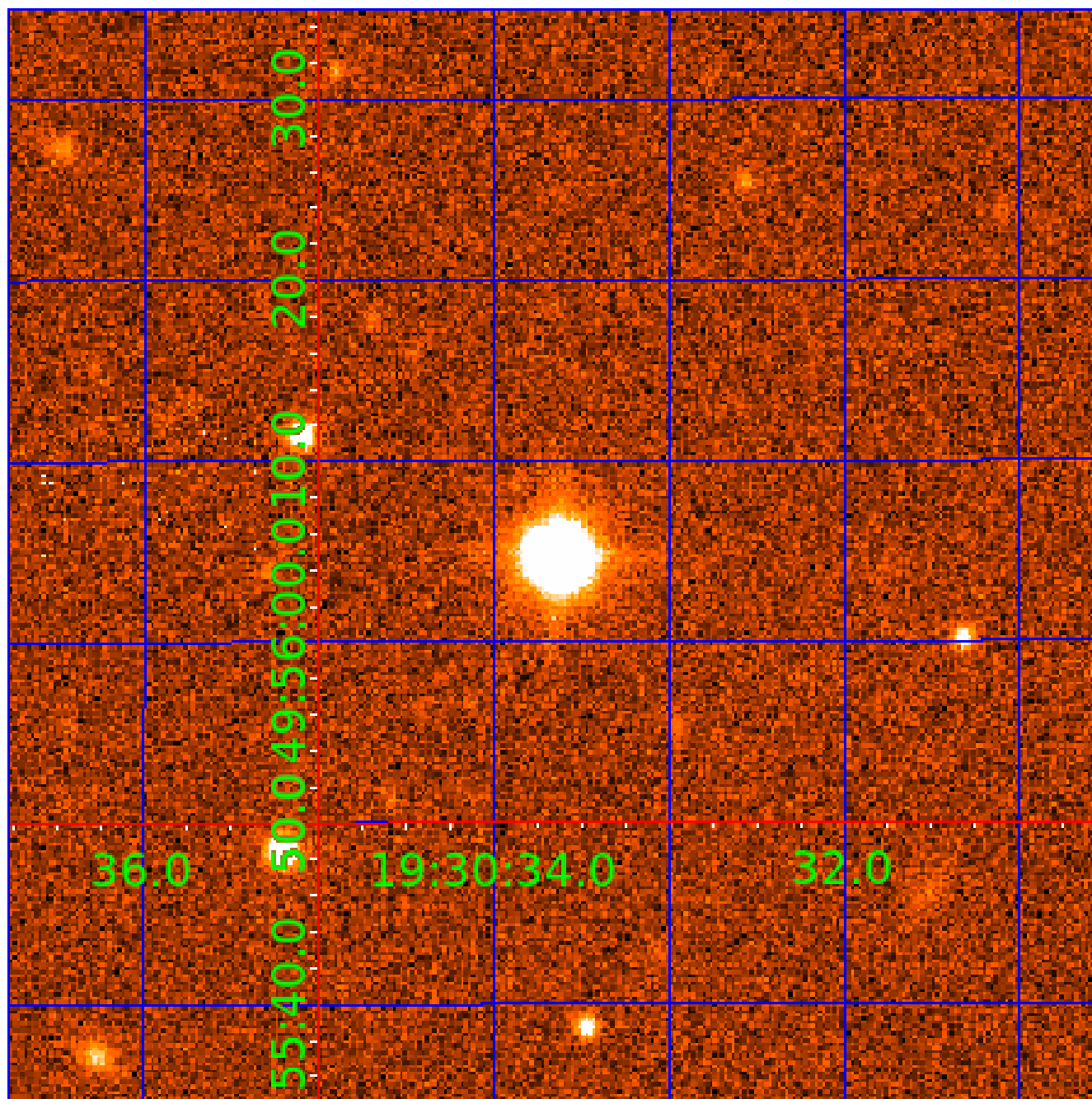


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011764567

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011764567-01	OBS	No	300.896720	338.989782	837.1	9.843	20.3	10.6	0.79	5422	2.31	0.77
011764567-02	OBS	No	421.526978	308.614063	843.3	16.242	18.0	7.8	0.79	5422	2.26	0.49
011764567-03	OBS	No	585.693639	197.916077	1194.6	9.240	18.4	10.0	0.79	5422	3.41	0.32
011764567-04	OBS	No	482.320887	300.262011	644.6	6.346	16.9	5.8	0.79	5422	2.06	0.41
011764567-05	OBS	No	714.441536	146.348287	886.1	5.547	15.8	9.2	0.79	5422	2.84	0.24
011764567-06	OBS	No	533.703540	389.157677	905.3	8.926	15.4	9.0	0.79	5422	2.74	0.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011764567-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
011764567-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-06	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

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

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

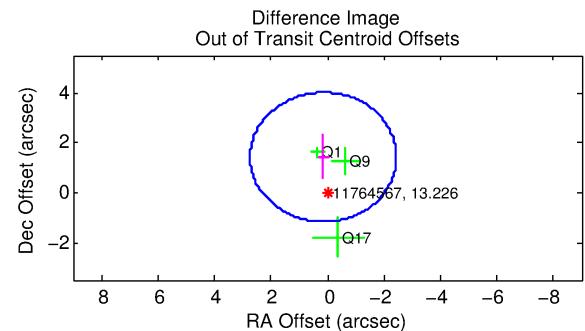
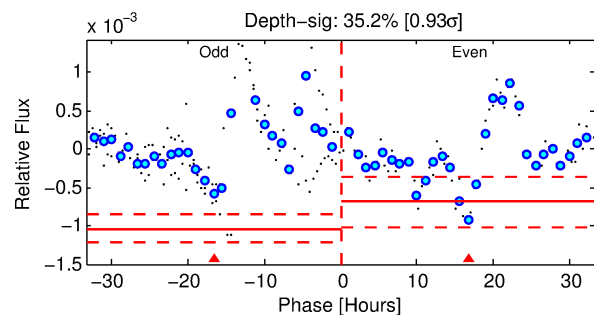
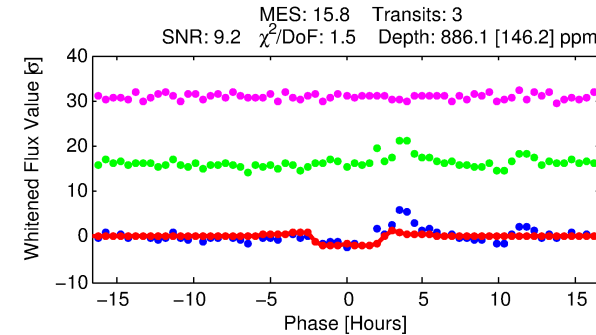
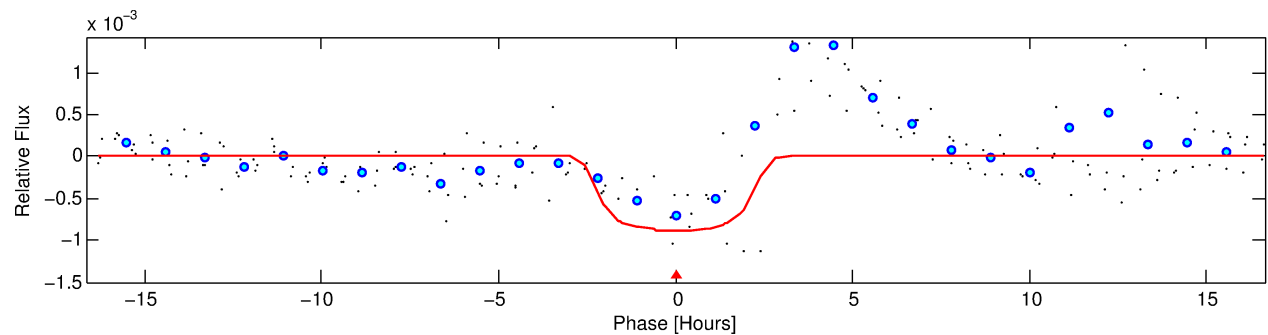
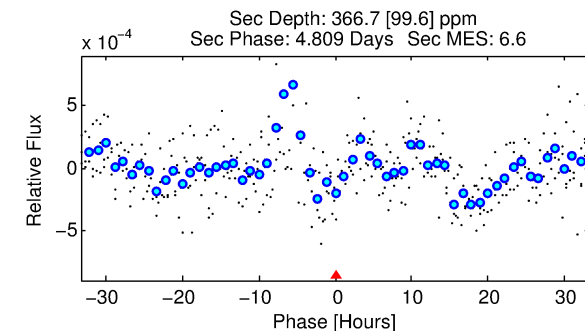
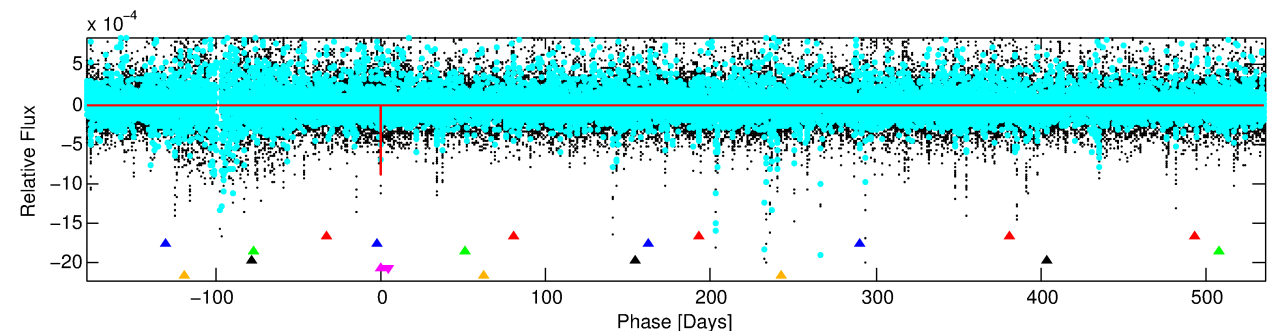
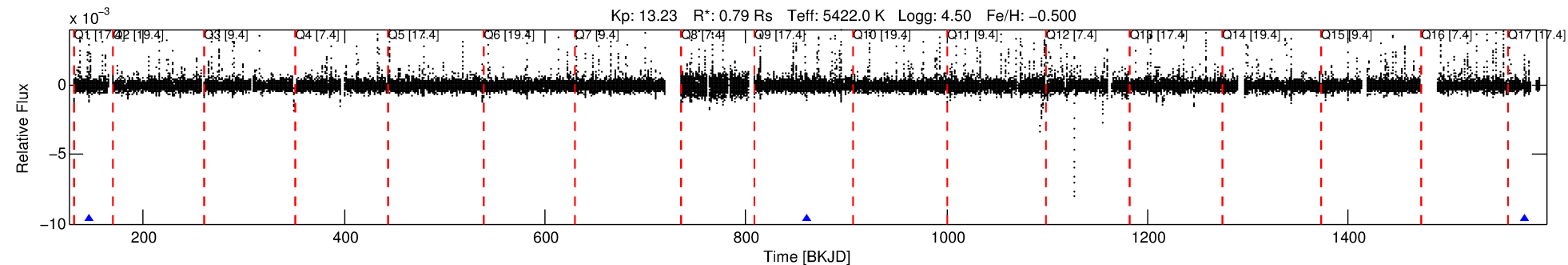
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011764567-05

No Significant Match Found

# DV One-Page Summary

KIC: 11764567 Candidate: 5 of 6 Period: 714.442 d



## DV Fit Results:

Period = 714.44154 [0.00679] d  
Epoch = 146.3483 [0.0095] BKJD  
Rp/R\* = 0.0332 [0.0038]  
a/R\* = 468.37 [138.02]  
b = 0.92 [0.05]  
Seff = 0.24 [0.06]  
Teff = 179 [10] K  
Rp = 2.84 [0.56] Re  
a = 1.4004 [0.1899] AU  
Ag = 48997.52 [19973.25] [2.45 sigma]  
Teffp = 4120 [386] K [10.20 sigma]

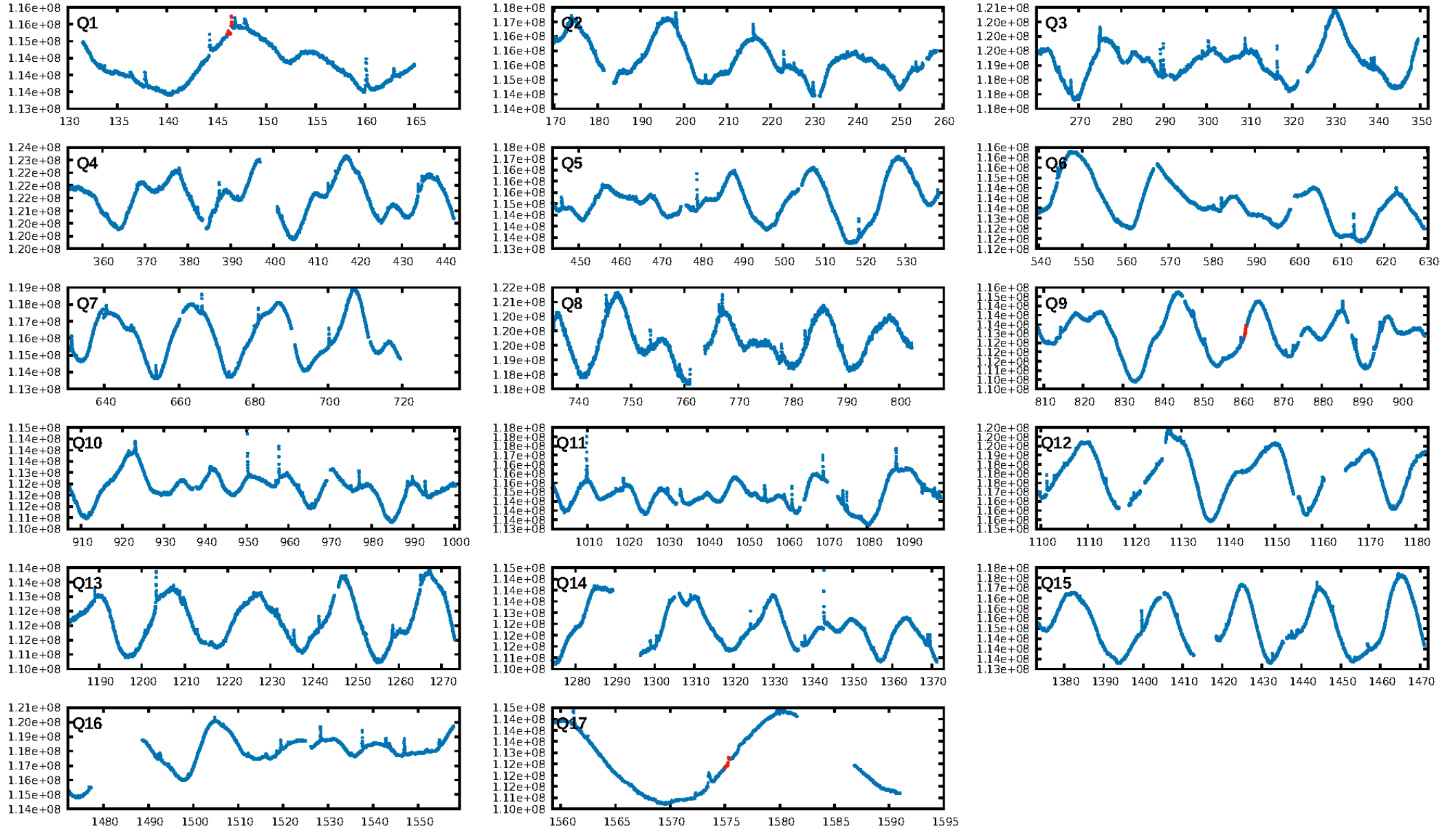
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [286.72 sigma]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 37.9%  
ModelChiSquareGof-sig: 49.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1/1]  
GhostDiagnostic-chr: 1.578  
Centroid-sig: 31.6%  
Centroid-so: 0.341 arcsec [0.83 sigma]  
OotOffset-rm: 1.432 arcsec [1.66 sigma]  
KicOffset-rm: 1.530 arcsec [2.01 sigma]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

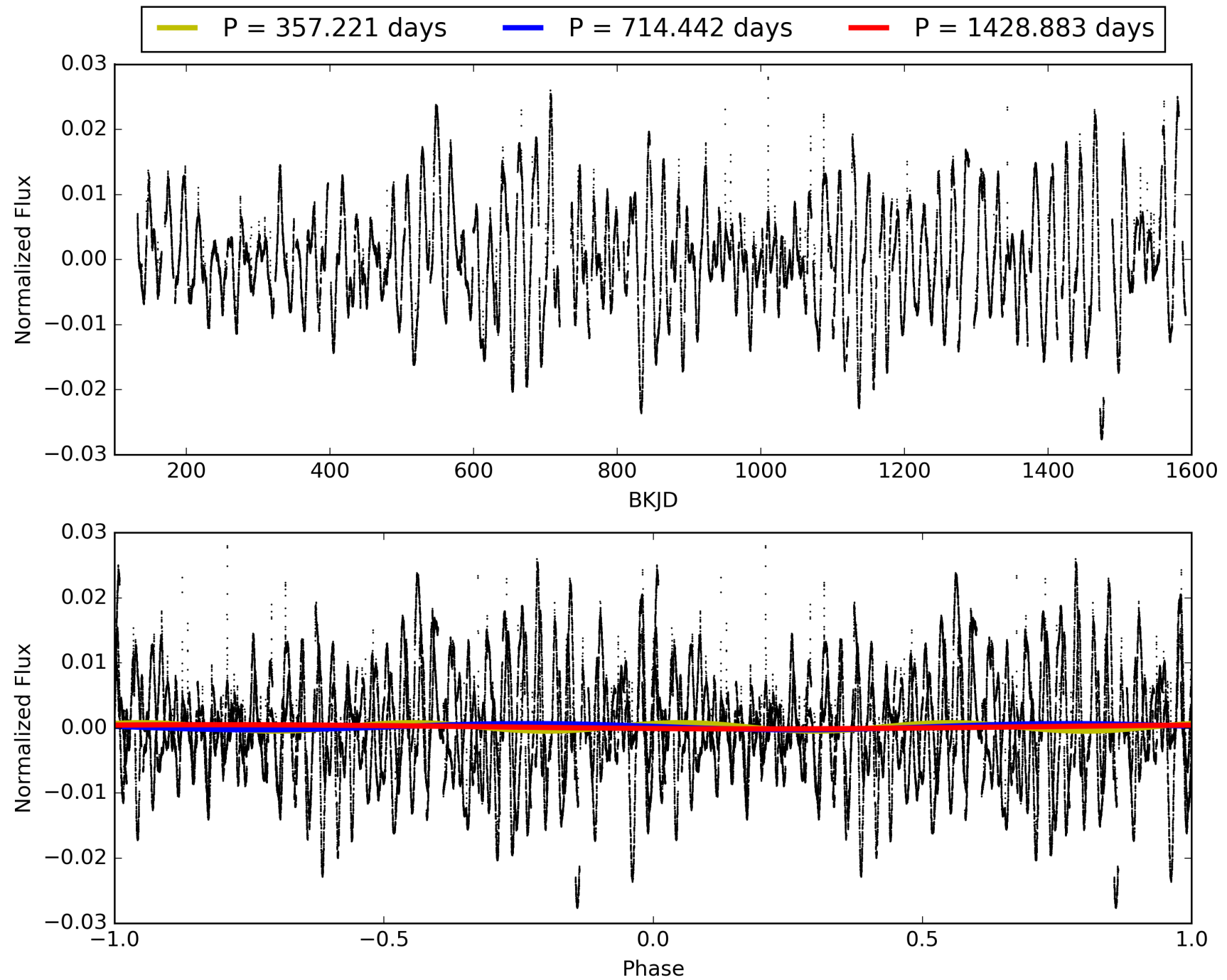
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:33:34 Z

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

# TCE 011764567-05, PDC Light Curves



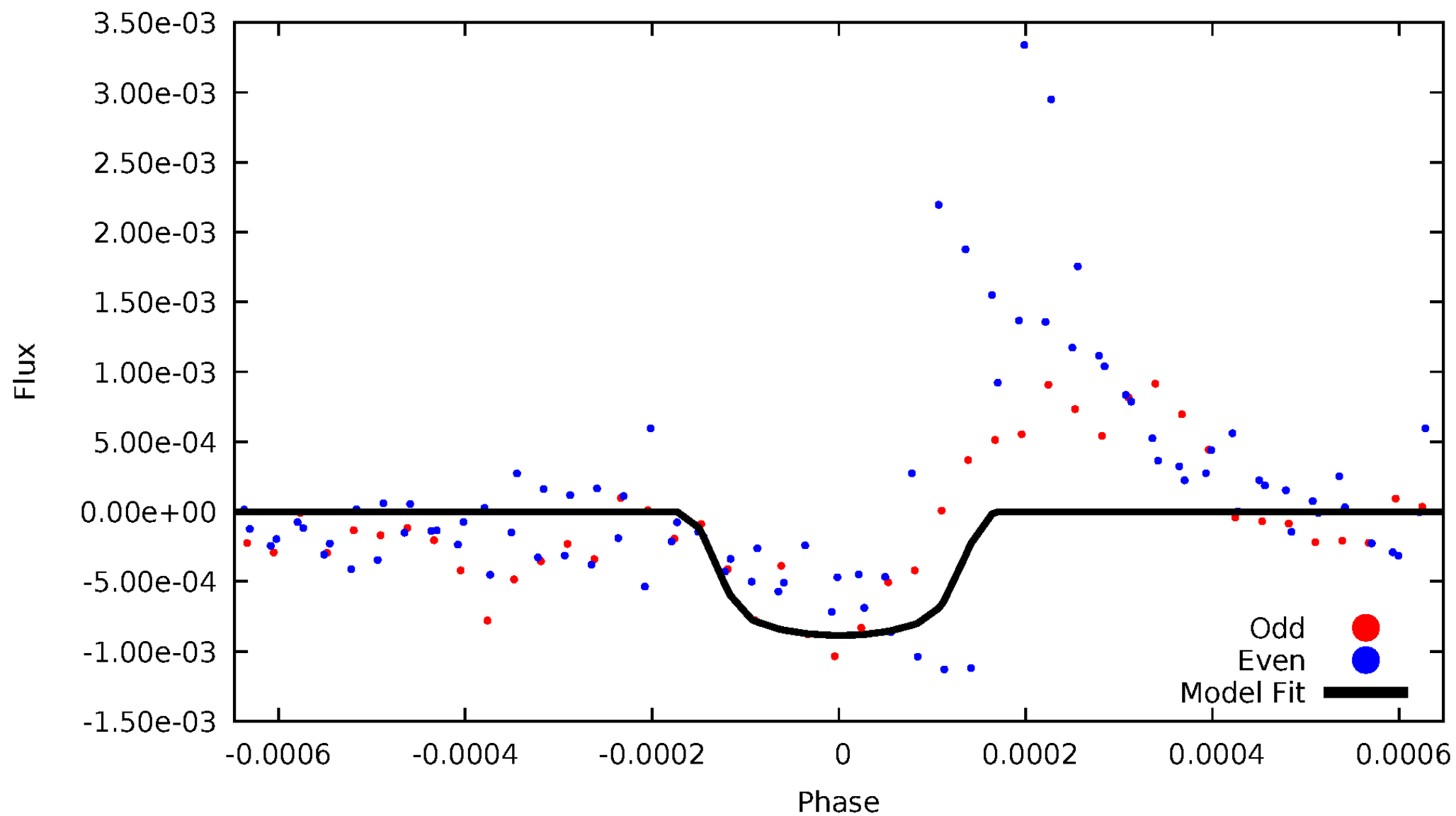
# TCE 011764567-05





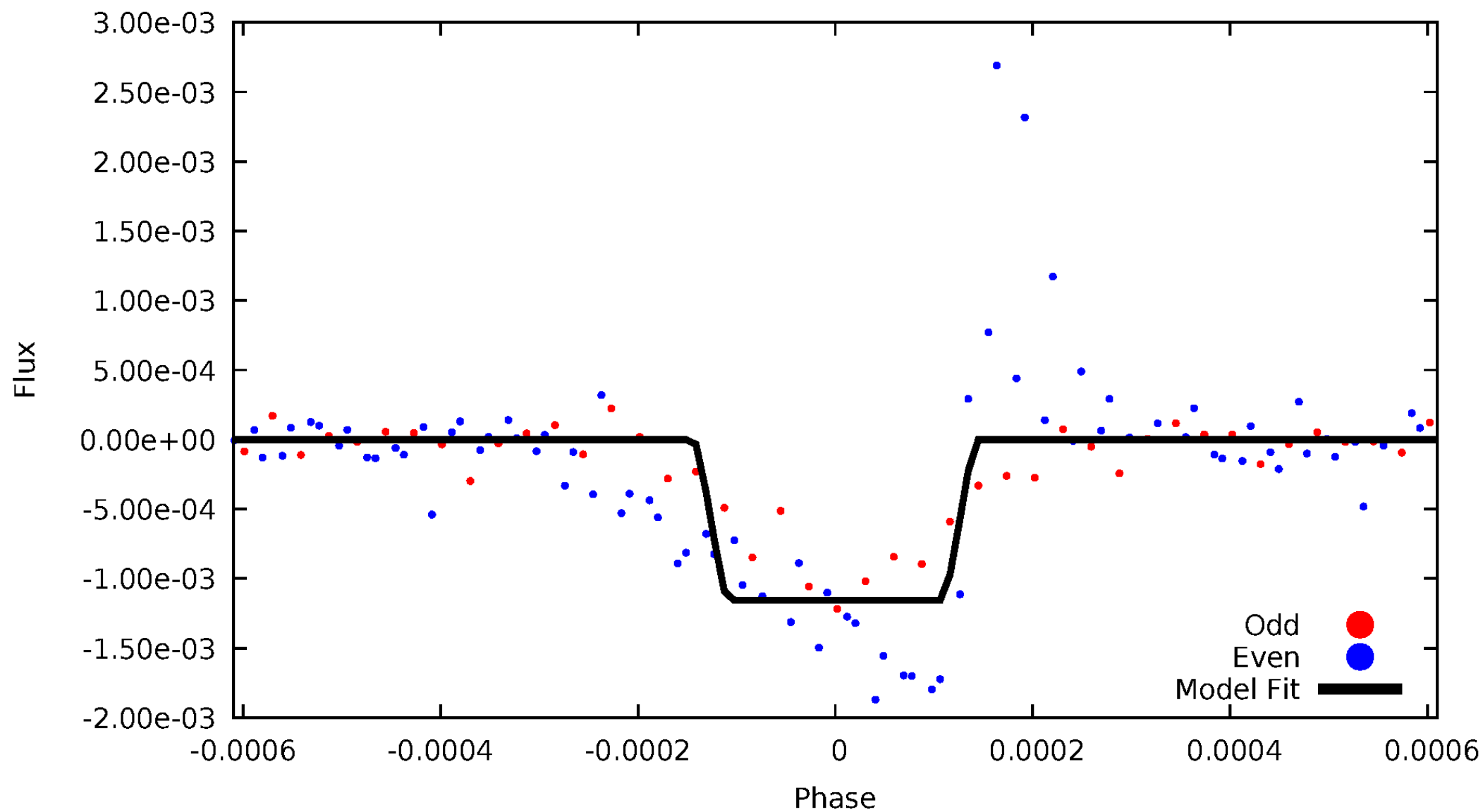
# DV Odd/Even

TCE 011764567-05



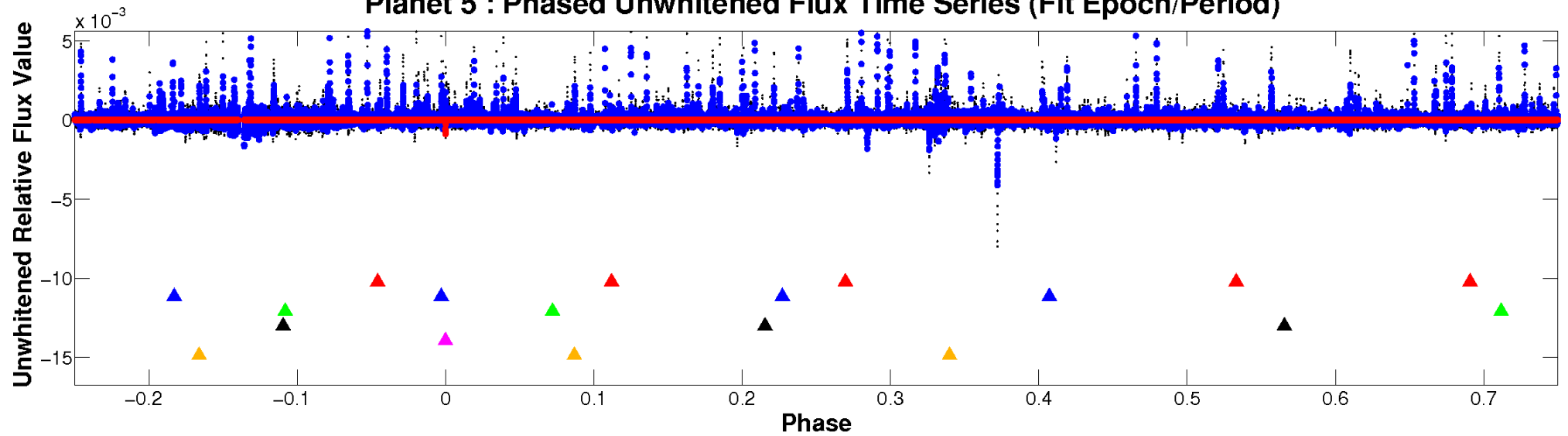
# ALT Odd/Even

TCE 011764567-05

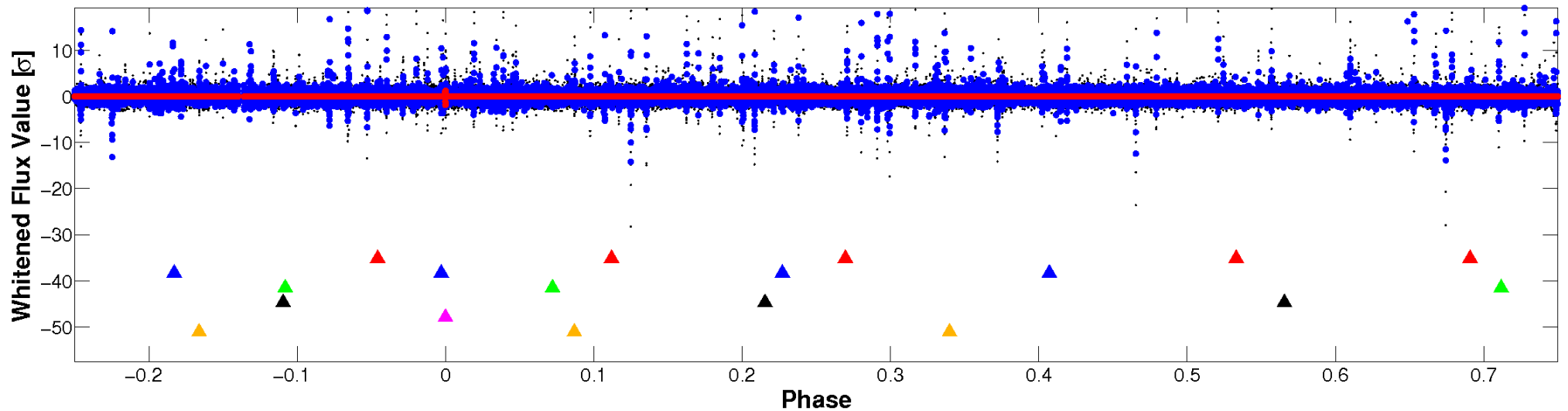


# Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

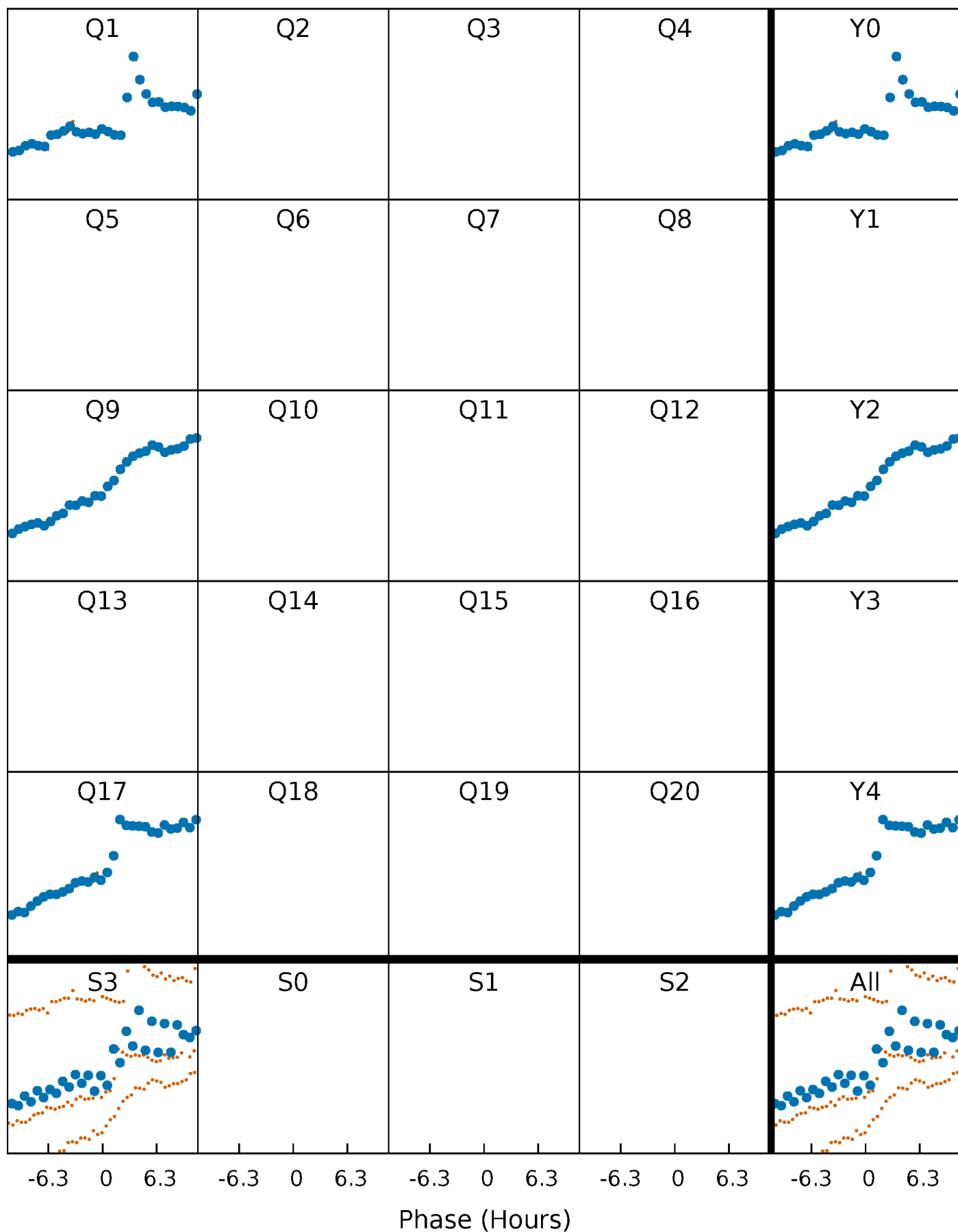


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



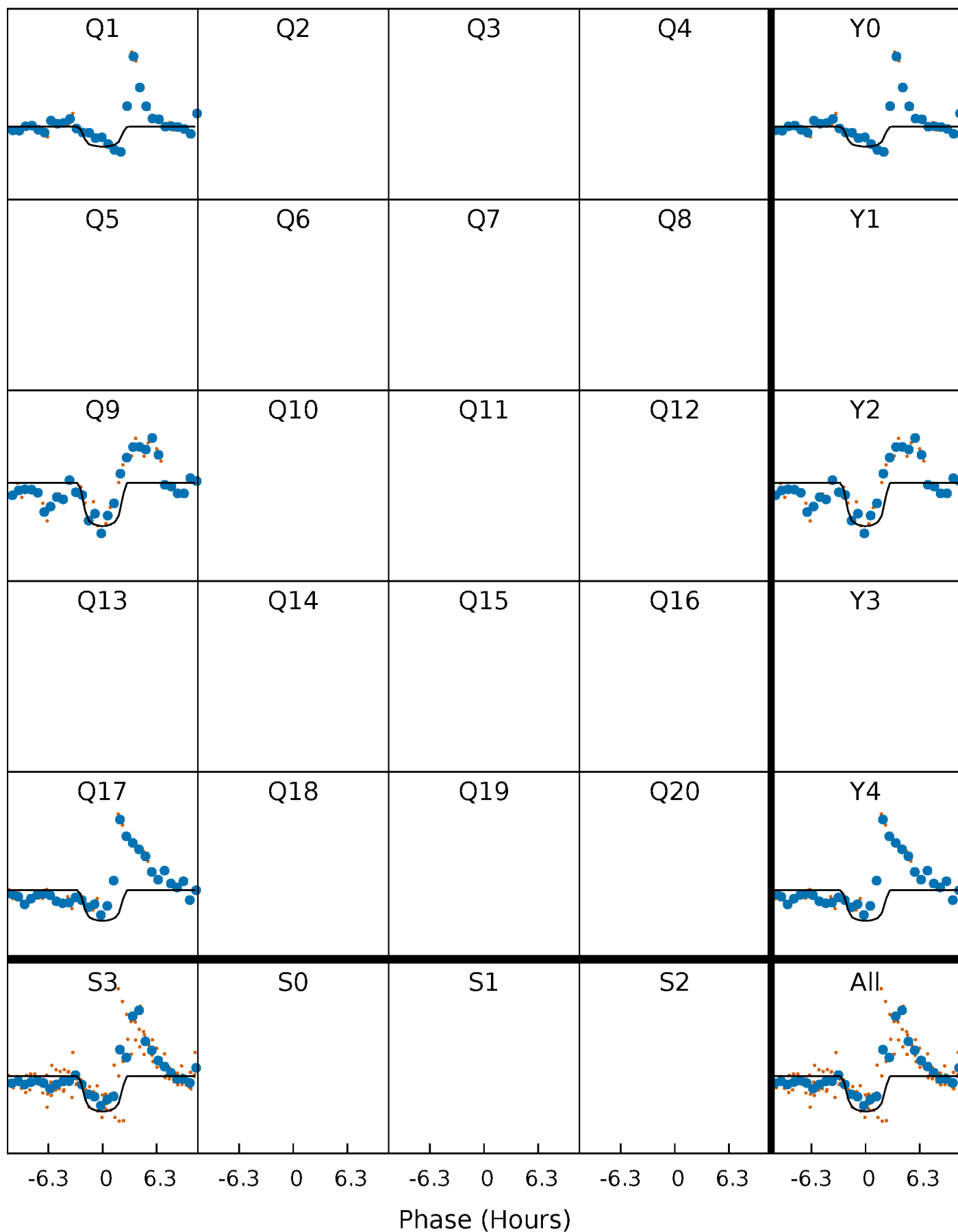
# PDC Quarter-Phased Transit Curves

TCE 011764567-05     $P=714.441536$  Days     $T_0=146.348287$  (BKJD)



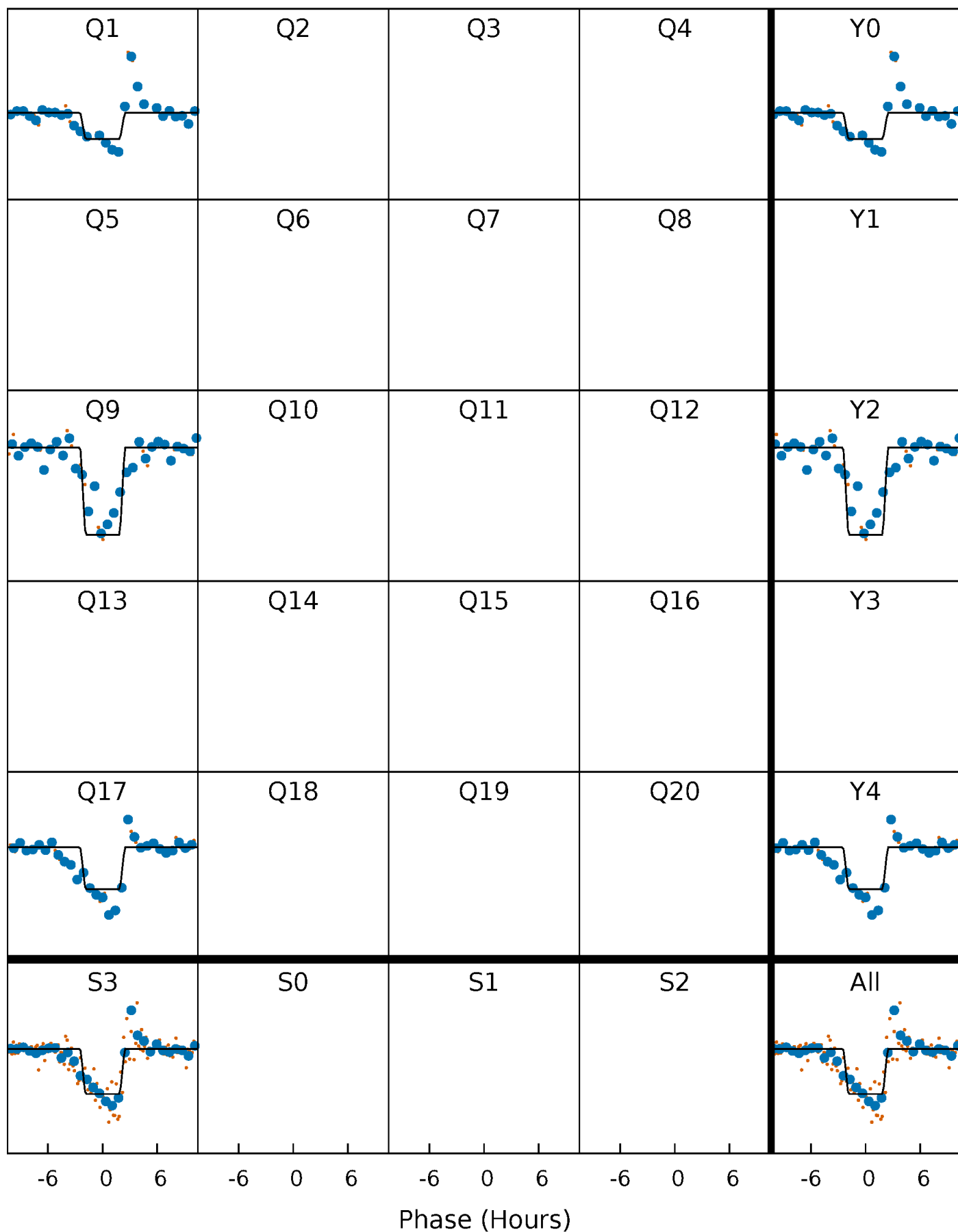
# DV Quarter-Phased Transit Curves

TCE 011764567-05     $P=714.441536$  Days     $T_0=146.348287$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

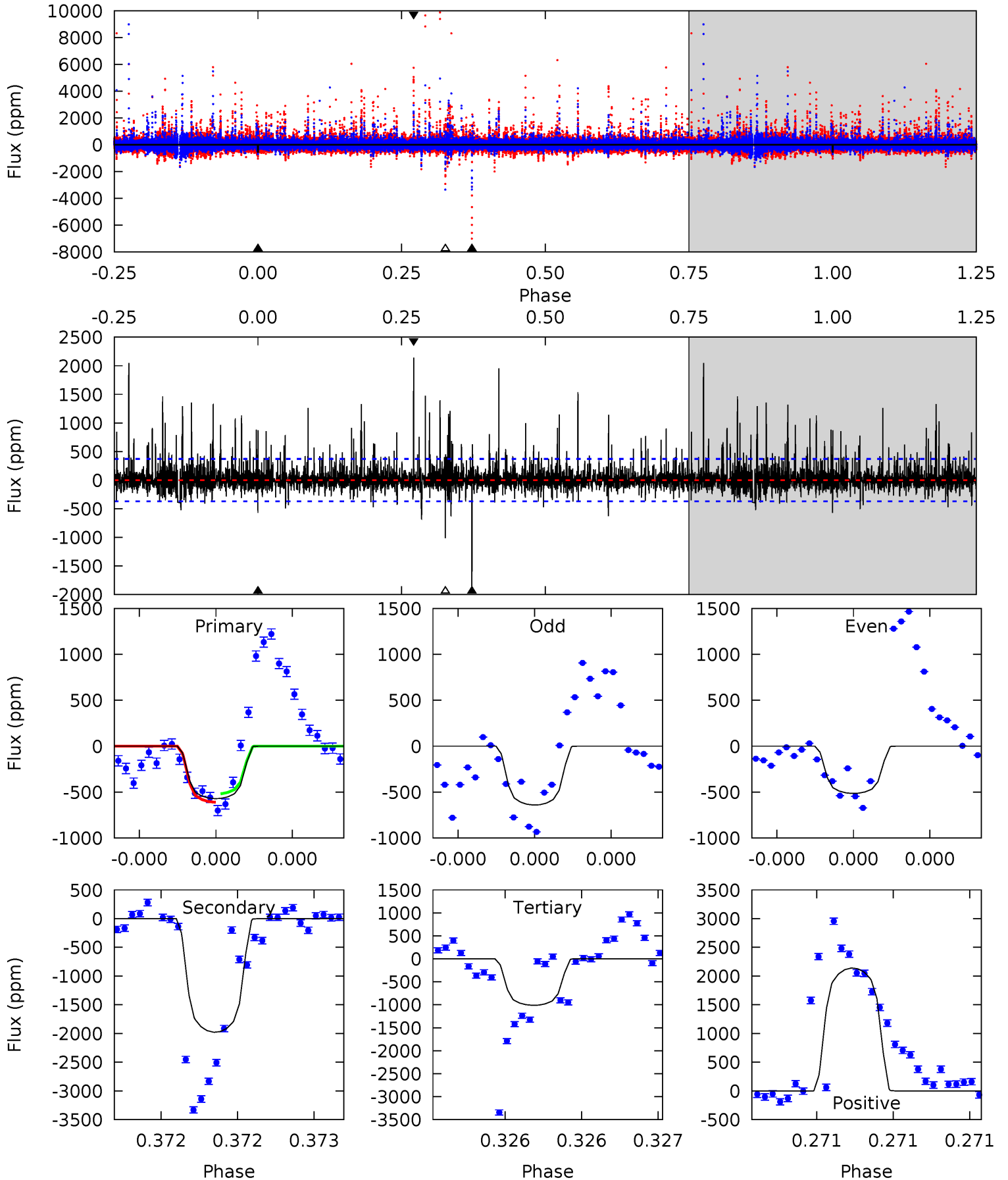
TCE 011764567-05     $P=714.411747$  Days     $T_0=146.373513$  (BKJD)



# DV Model-Shift Uniqueness Test

011764567-05, P = 714.441536 Days, E = 146.348287 Days

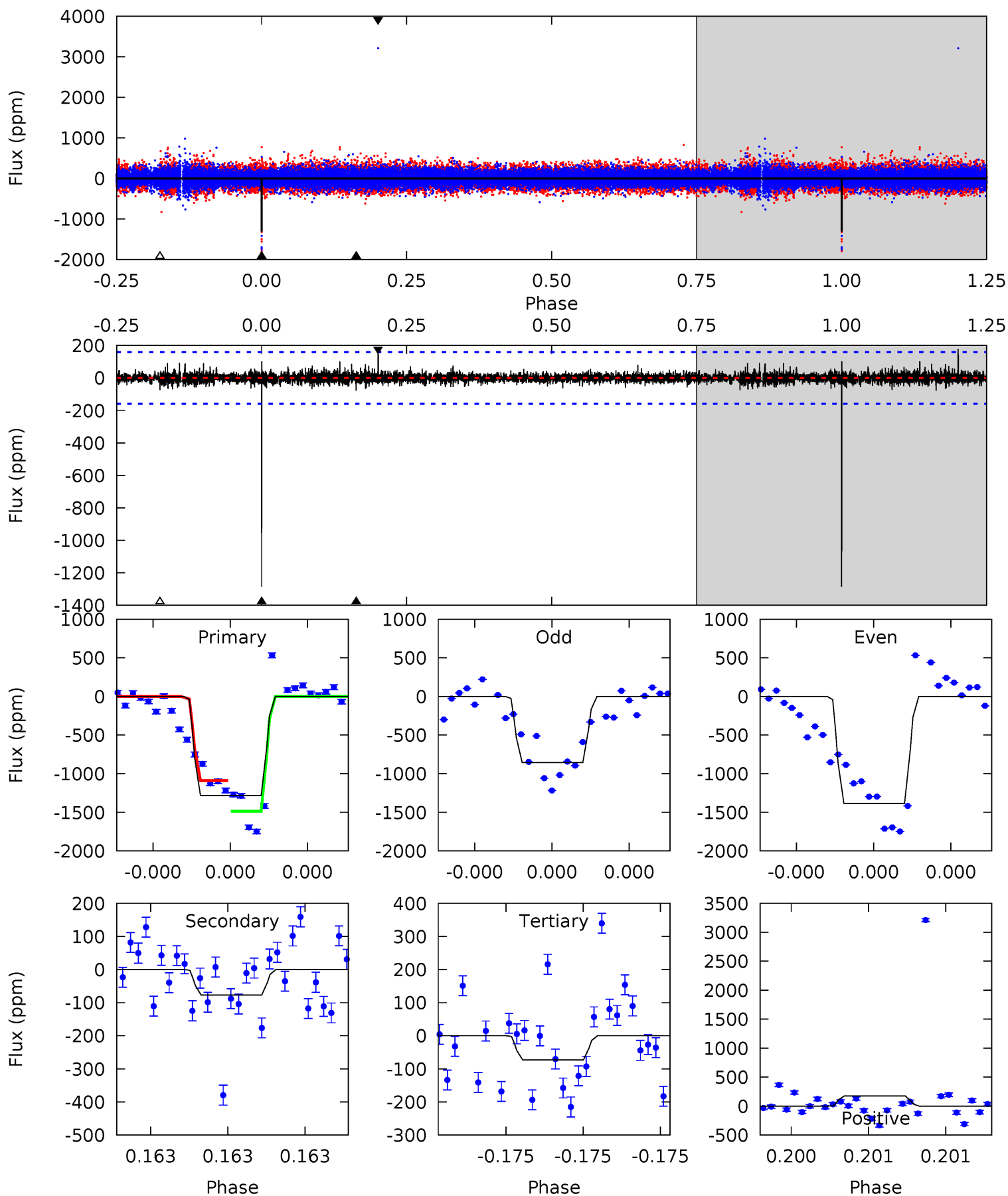
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.70	30.1	15.4	32.6	5.64	3.58	2.77	-6.71	-23.9	14.7	-2.46	0.67	0.76	0.52	0.71



# Alt Model-Shift Uniqueness Test

011764567-05, P = 714.411747 Days, E = 146.373513 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
46.0	2.76	2.62	6.35	5.68	3.65	0.55	43.4	39.7	0.14	-3.59	9.59	0.91	0.12	7.14





### Stellar Parameters For KIC 011764567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5422^{+162}_{-146}$	$4.504^{+0.110}_{-0.110}$	$-0.500^{+0.350}_{-0.300}$	$0.785^{+0.125}_{-0.102}$	$0.718^{+0.105}_{-0.045}$	$2.088^{+1.006}_{-0.680}$
	+3%/-3%	+2%/-2%	+70%/-60%	+16%/-13%	+15%/-6%	+48%/-33%
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 011764567-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1978 \pm 66$	$2.85^{+0.42}_{-0.35}$	$250^{+12}_{-11}$	$6238^{+457}_{-371}$	$267561^{+78952}_{-64532}$
Alt.	$-77 \pm 28$	$2.92^{+0.40}_{-0.36}$	$250^{+12}_{-12}$	$3300^{+217}_{-230}$	$9812^{+4827}_{-3850}$

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

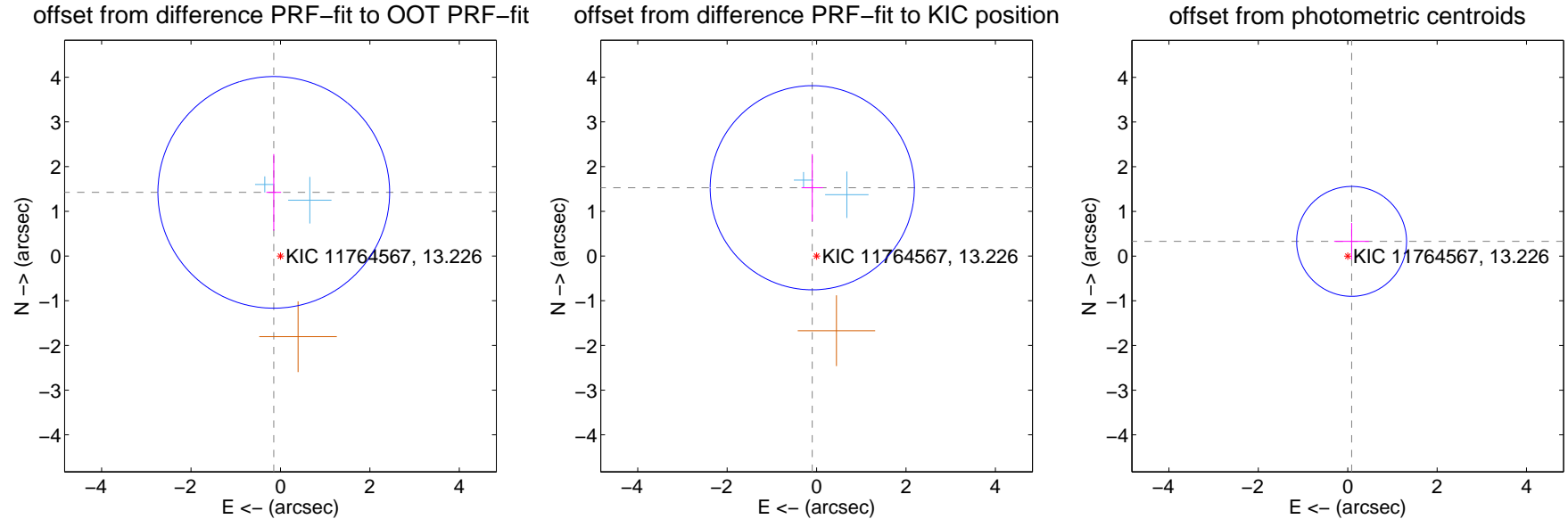
## DV Centroid Data

Supplemental centroid analysis for 011764567-05. Kepler magnitude: 13.23. Transit SNR 9.23

There are 2 quarters with good PRF difference image offsets

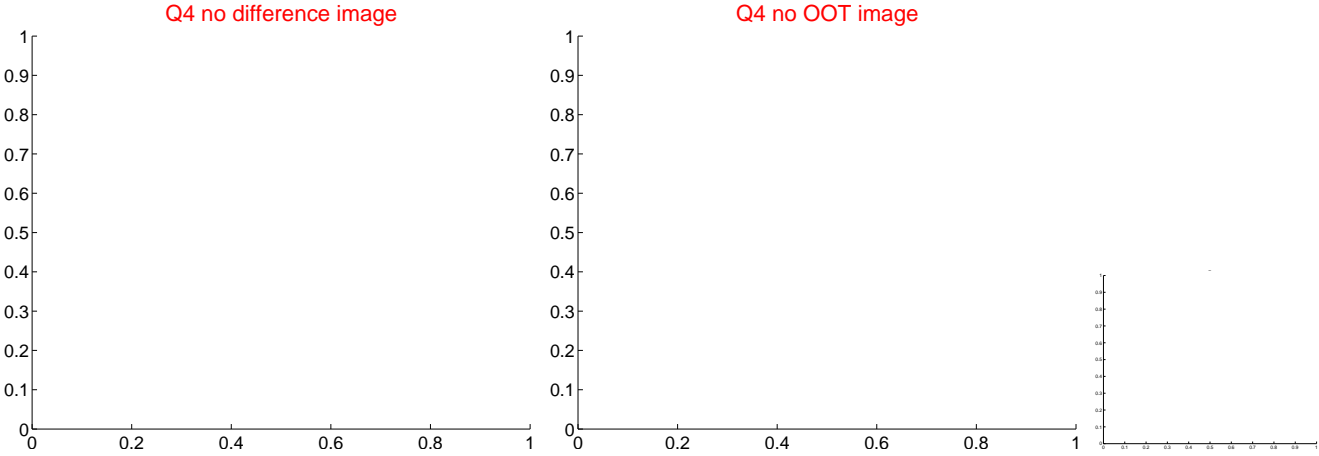
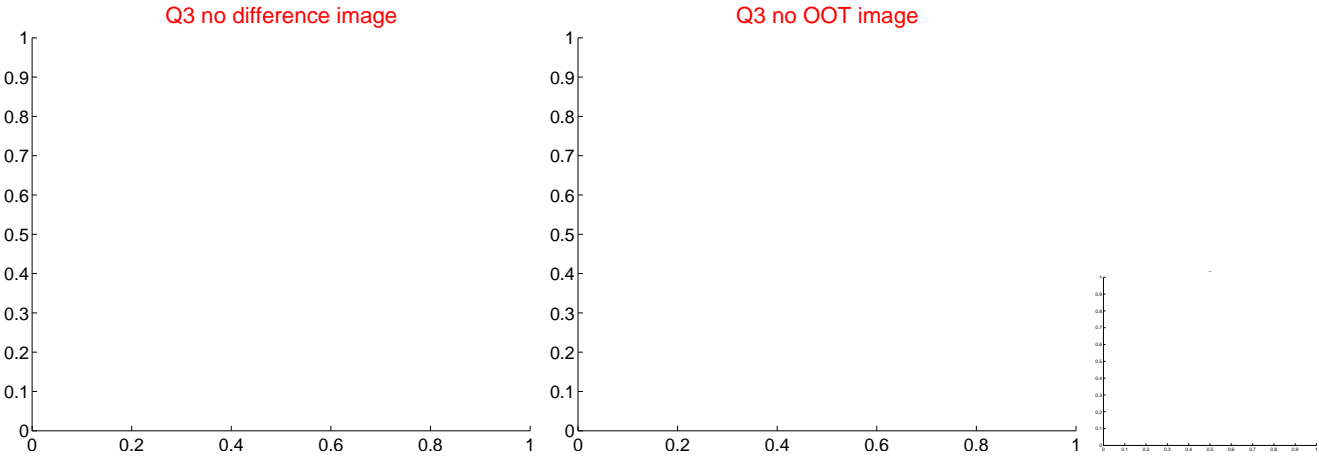
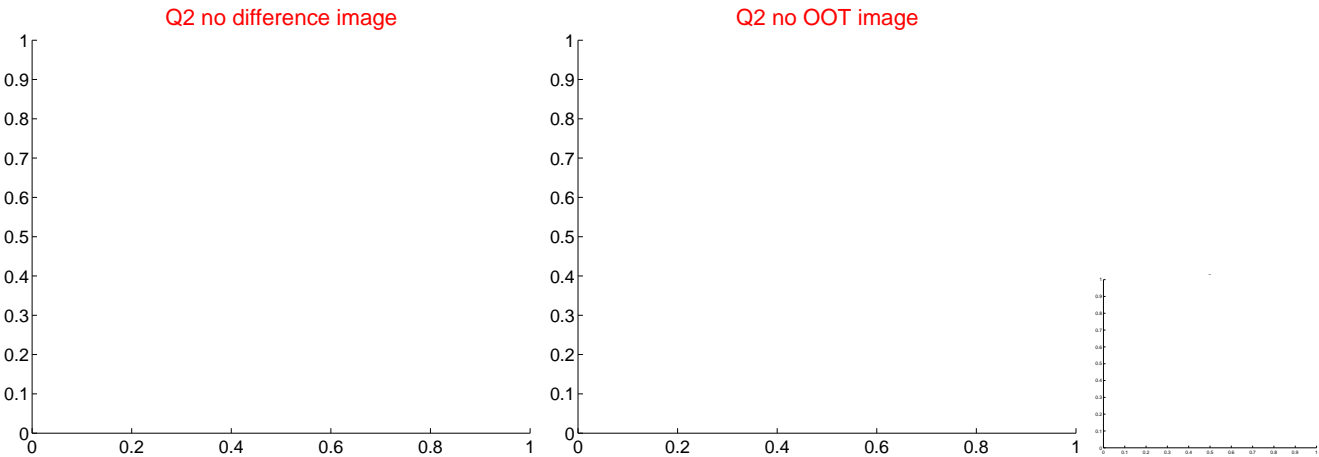
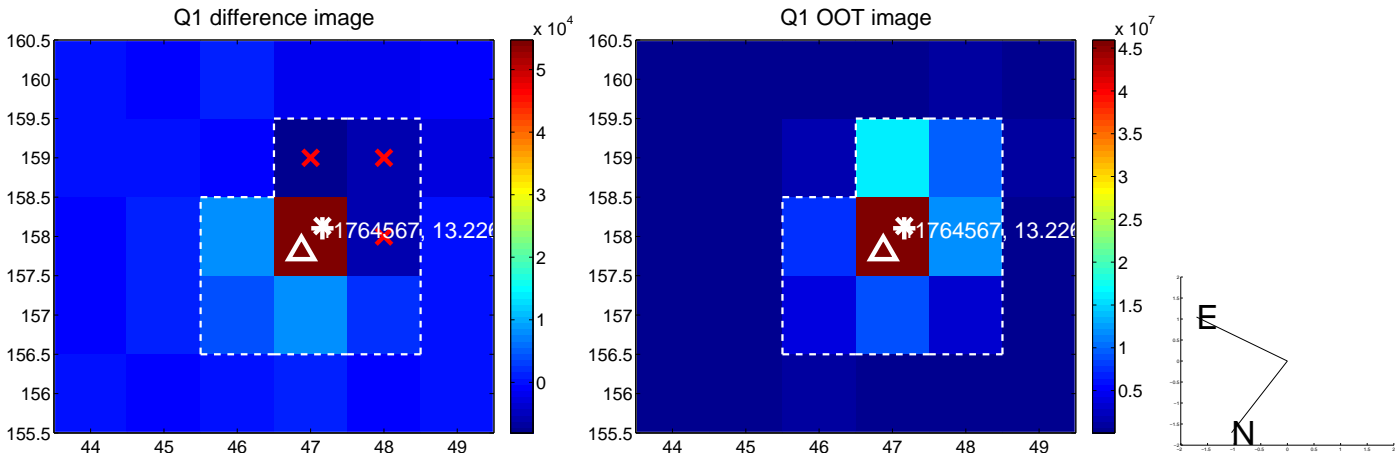
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.432 \pm 0.864$	1.66	$0.150 \pm 0.164$	$1.424 \pm 0.858$
PRF-fit source offset from KIC position	$1.530 \pm 0.761$	2.01	$0.097 \pm 0.240$	$1.527 \pm 0.752$
photometric centroid source offset	$0.34 \pm 0.41$	0.83	$-0.09 \pm 0.39$	$0.33 \pm 0.41$

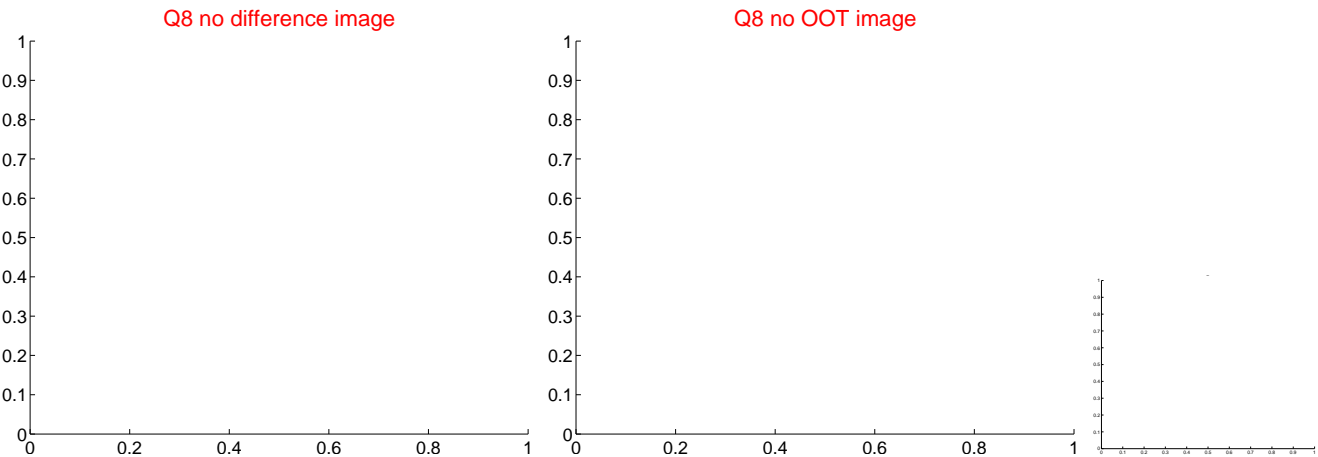
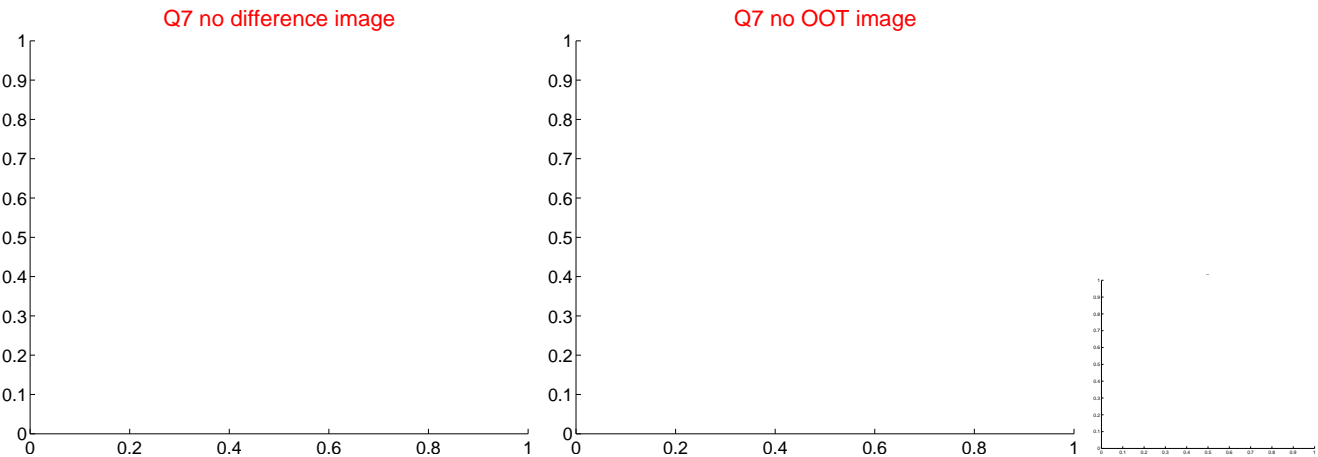
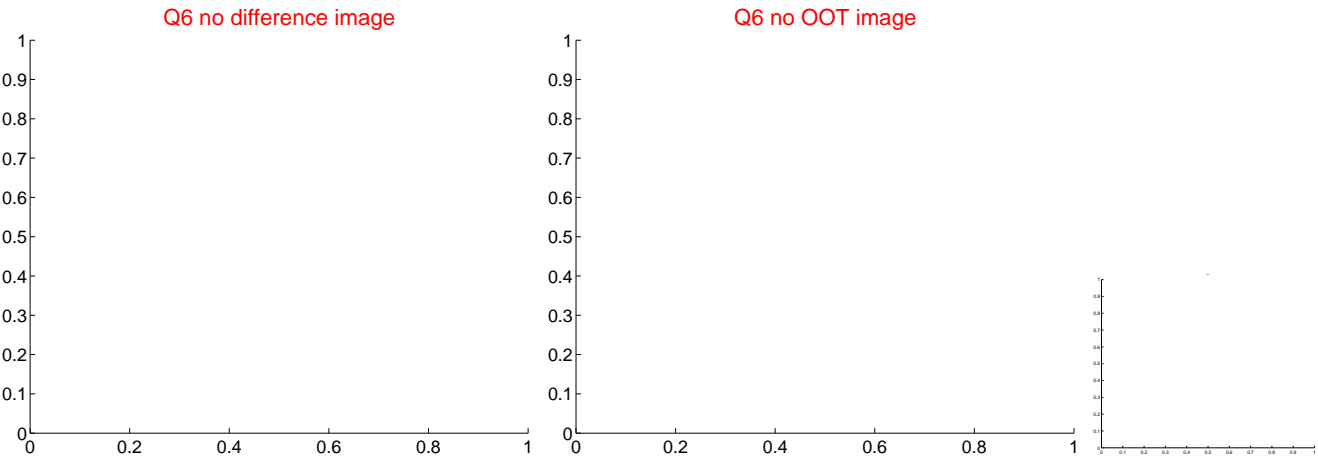
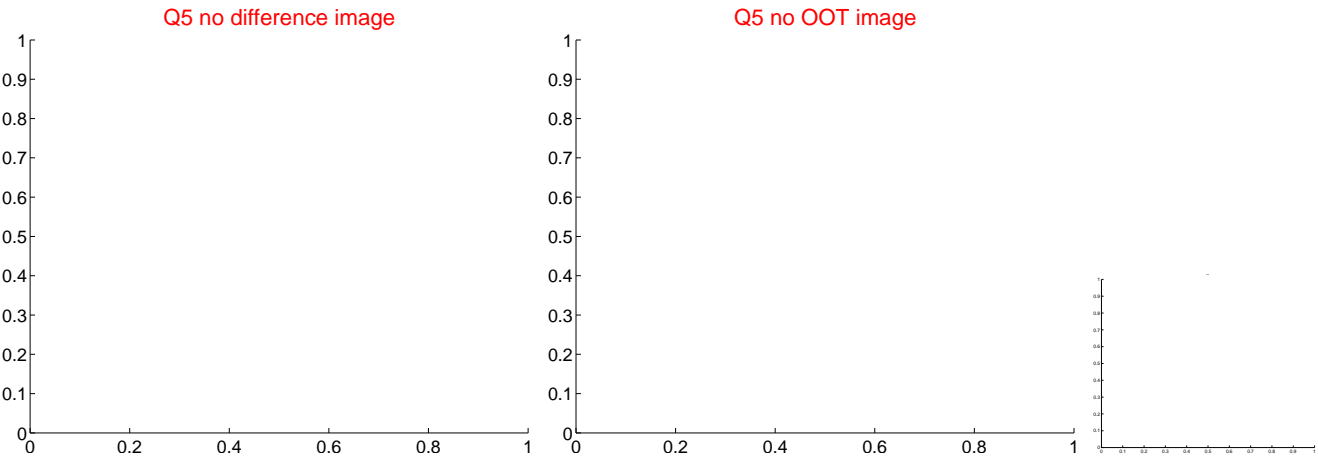


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

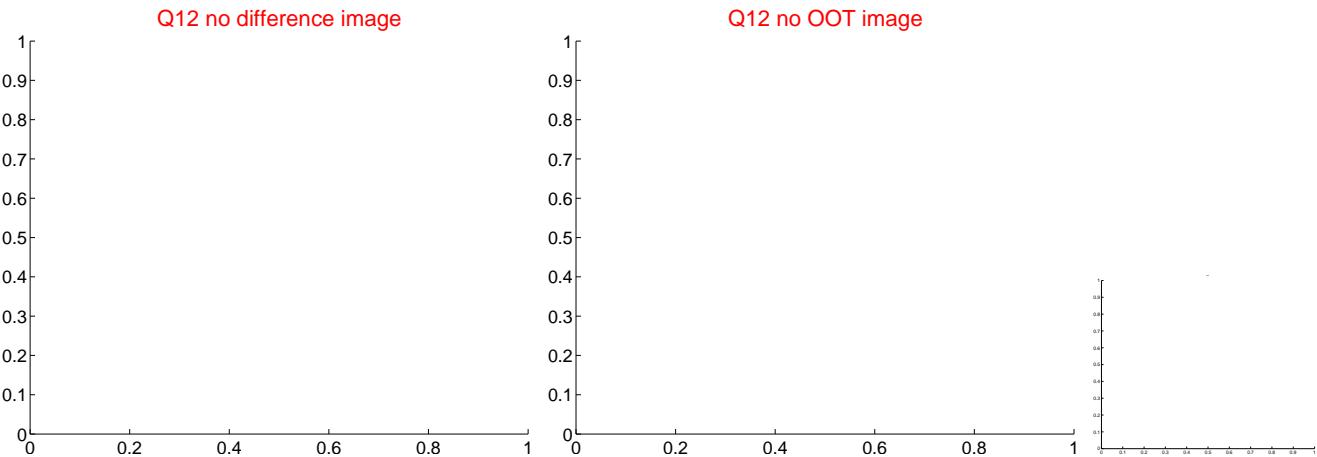
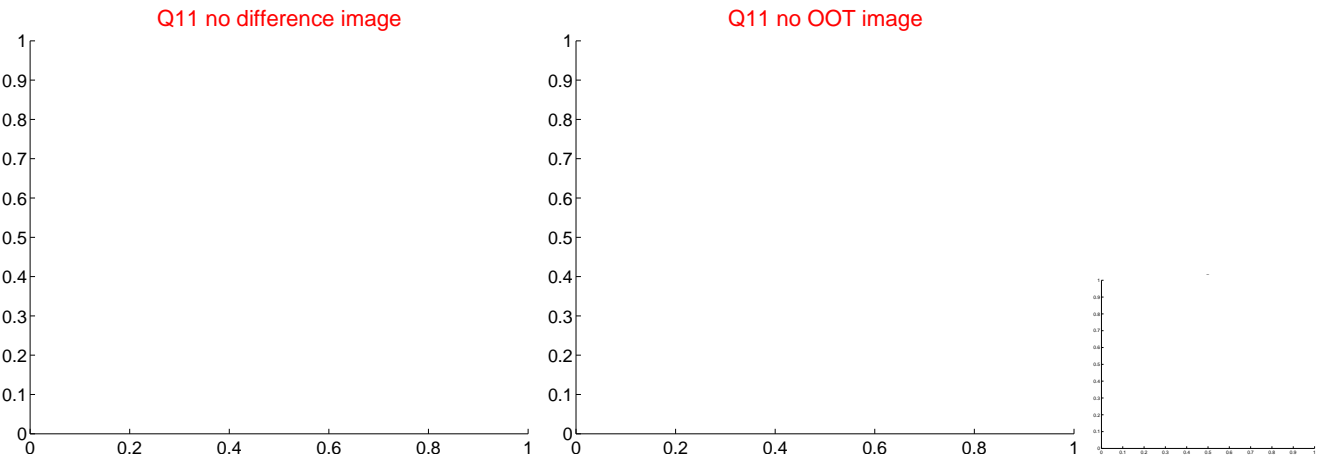
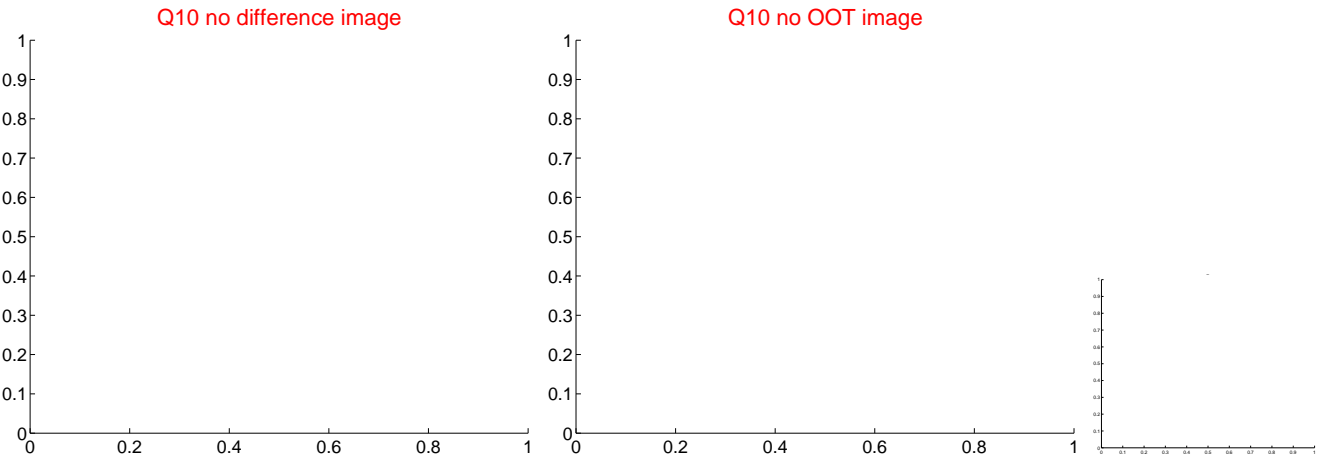
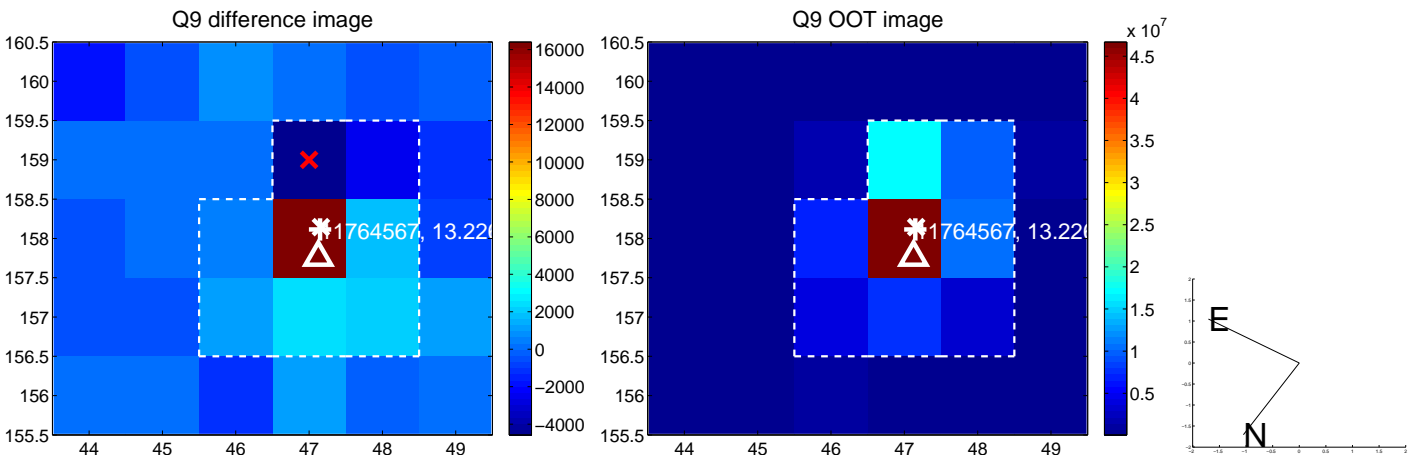
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



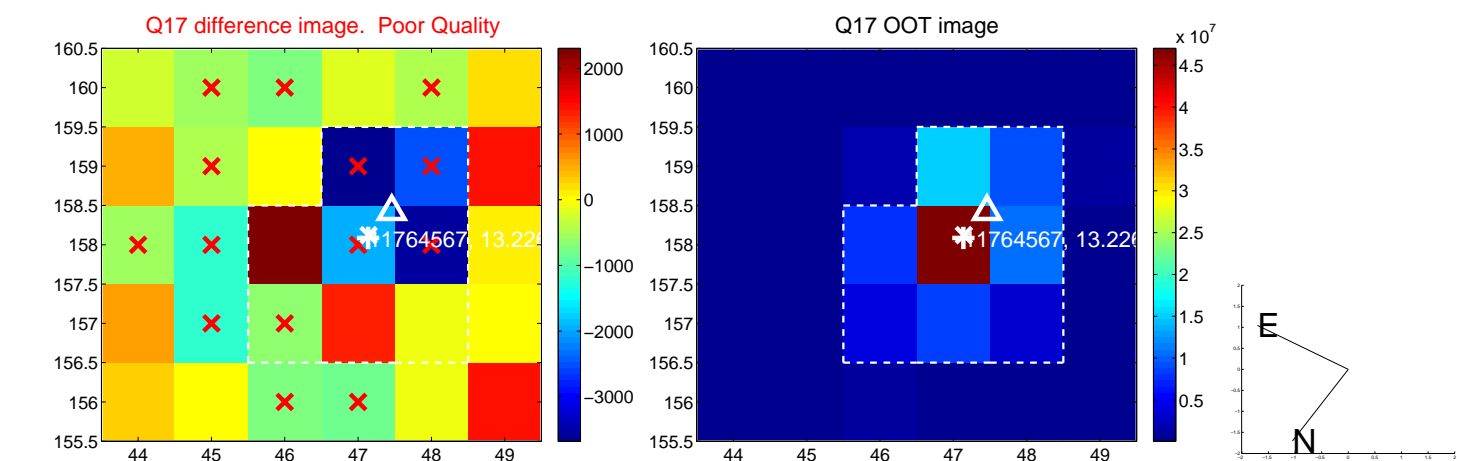
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



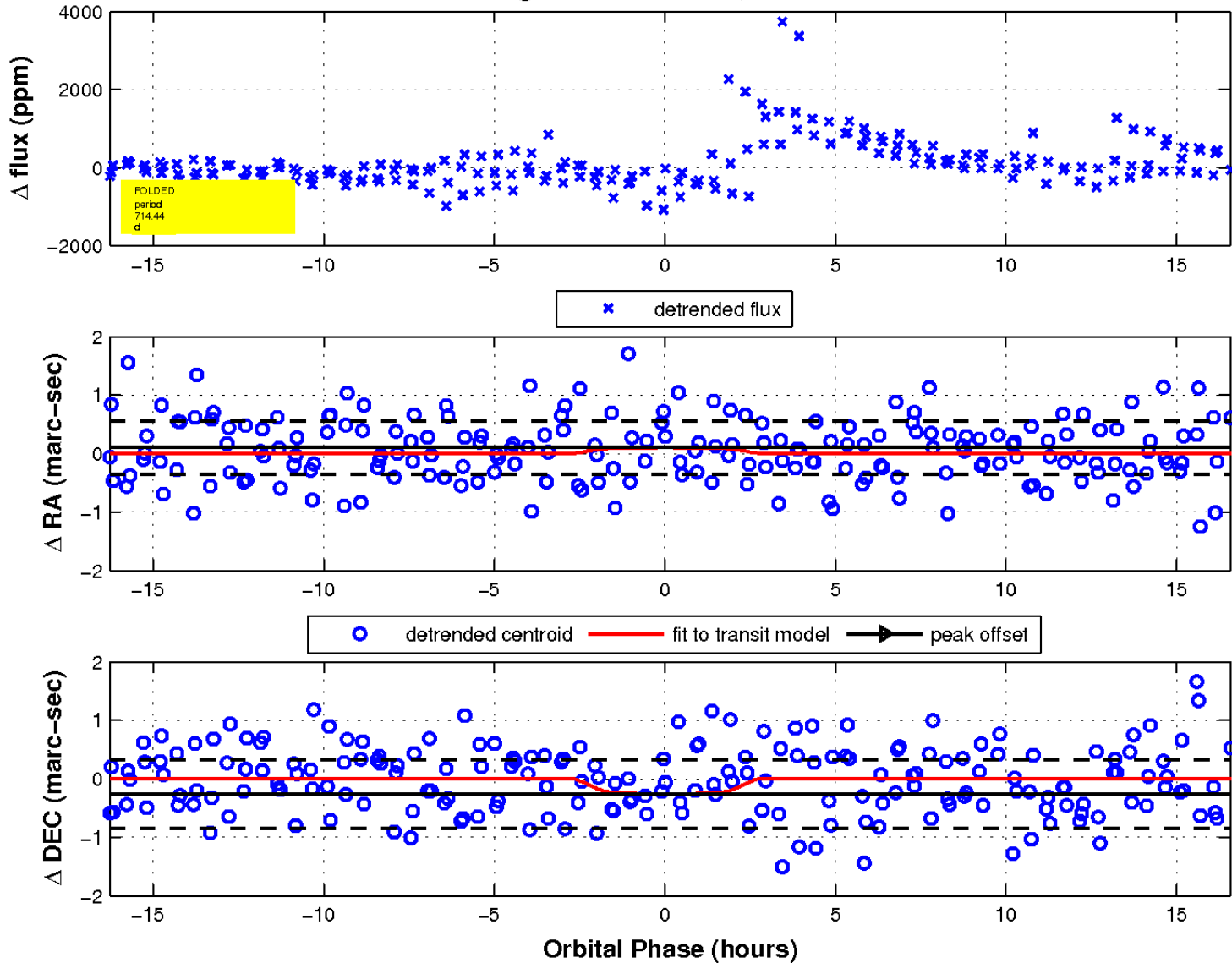
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

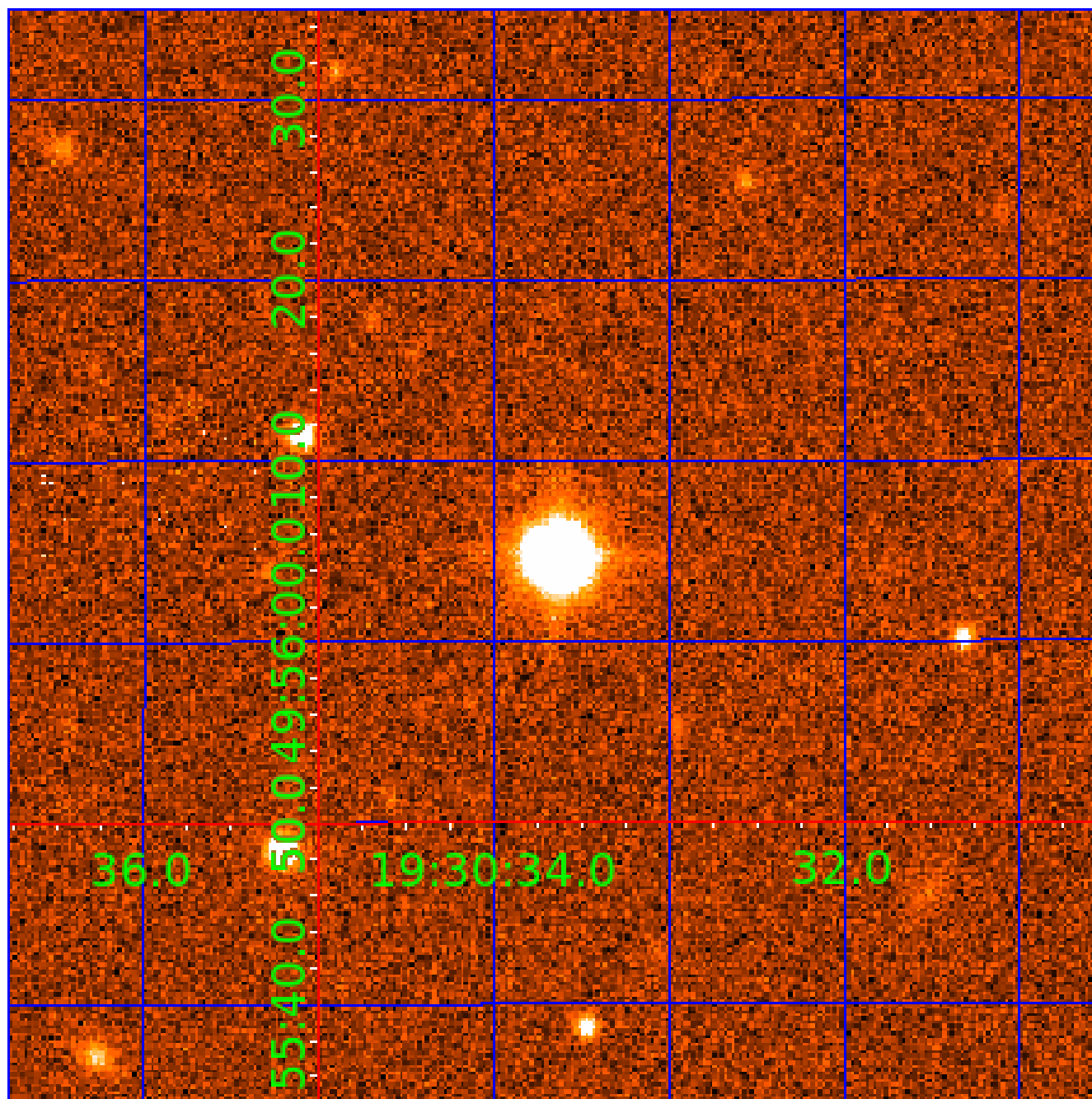


fluxWeightedCentroids, Planet 5 of 6



UKIRT Image

Declination





# KIC 011764567

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011764567-01	OBS	No	300.896720	338.989782	837.1	9.843	20.3	10.6	0.79	5422	2.31	0.77
011764567-02	OBS	No	421.526978	308.614063	843.3	16.242	18.0	7.8	0.79	5422	2.26	0.49
011764567-03	OBS	No	585.693639	197.916077	1194.6	9.240	18.4	10.0	0.79	5422	3.41	0.32
011764567-04	OBS	No	482.320887	300.262011	644.6	6.346	16.9	5.8	0.79	5422	2.06	0.41
011764567-05	OBS	No	714.441536	146.348287	886.1	5.547	15.8	9.2	0.79	5422	2.84	0.24
011764567-06	OBS	No	533.703540	389.157677	905.3	8.926	15.4	9.0	0.79	5422	2.74	0.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011764567-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
011764567-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011764567-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
011764567-06	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

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

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

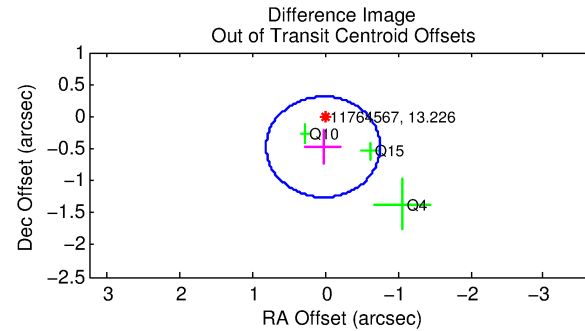
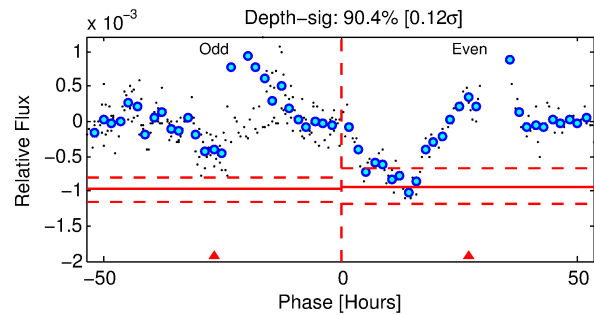
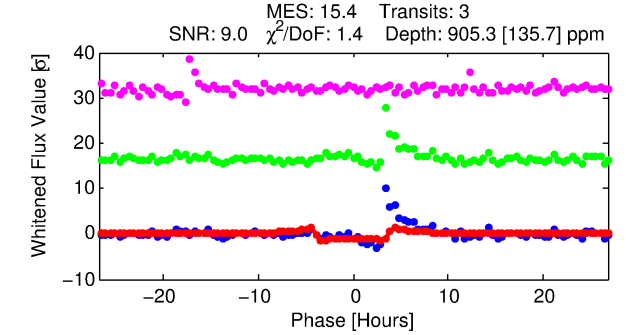
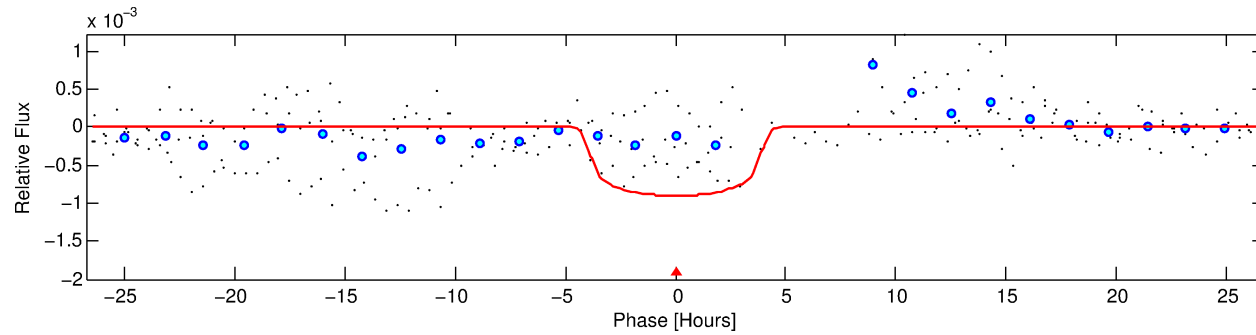
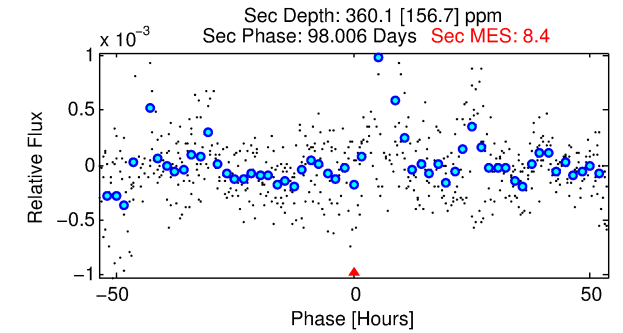
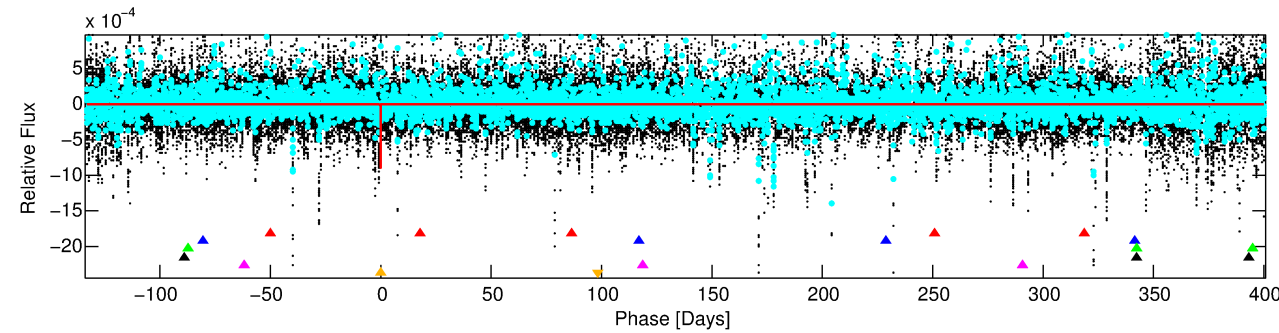
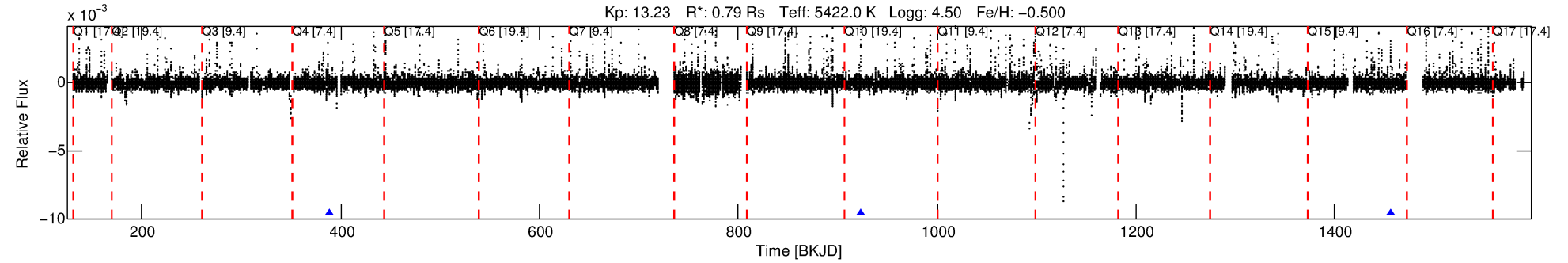
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011764567-06

No Significant Match Found

# DV One-Page Summary

KIC: 11764567 Candidate: 6 of 6 Period: 533.704 d



## DV Fit Results:

Period = 533.70354 [0.00666] d  
Epoch = 389.1577 [0.0082] BKJD  
Rp/R\* = 0.0320 [0.0036]  
a/R\* = 254.36 [77.40]  
b = 0.87 [0.09]  
Seff = 0.36 [0.08]  
Teq = 197 [11] K  
Rp = 2.74 [0.53] Re  
a = 1.1529 [0.1564] AU  
Ag = 35085.25 [18538.88] [1.89σ]  
**Teffp = 4176 [526] K [7.56σ]**

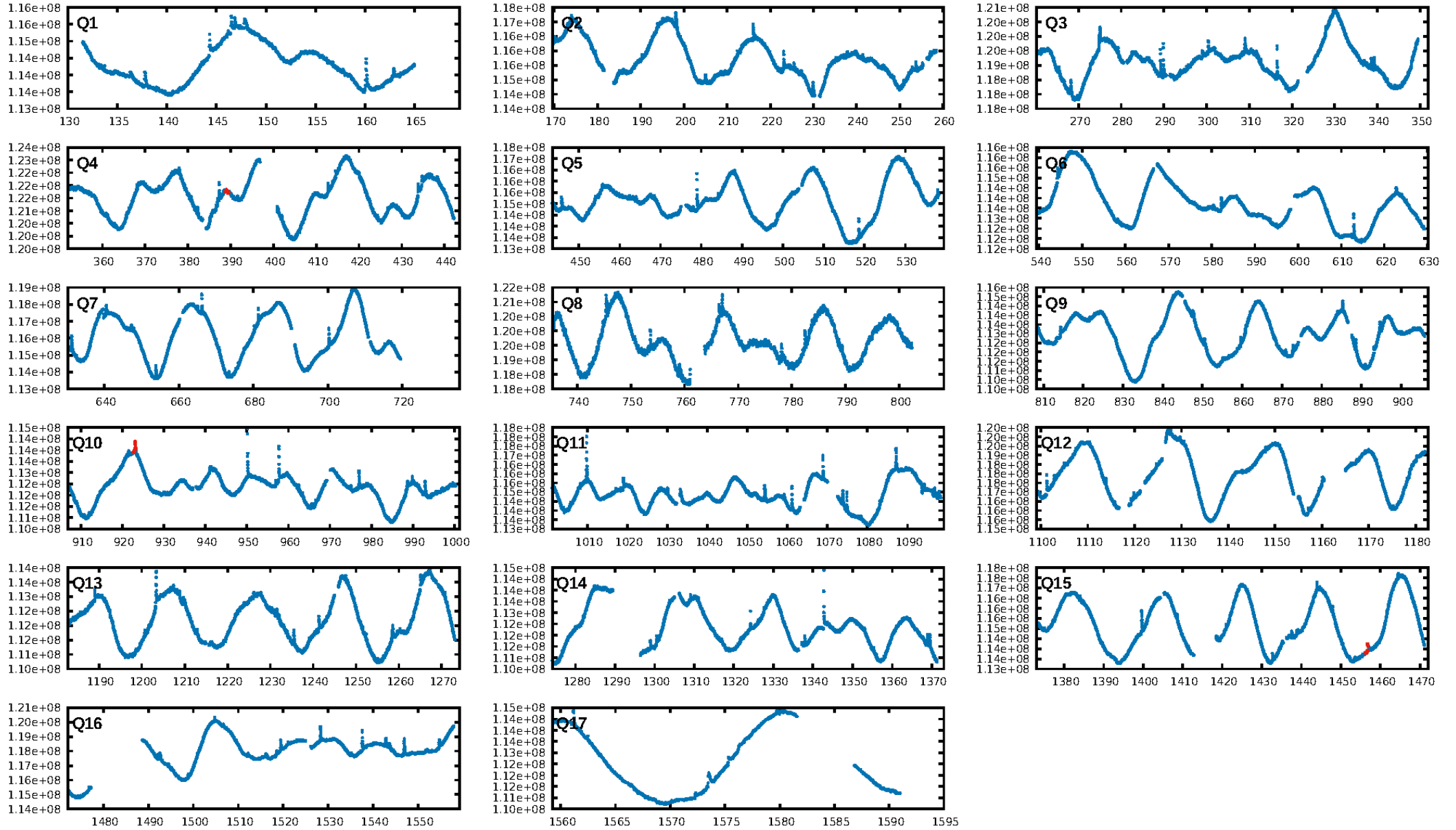
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [112.60σ]  
LongPeriod-sig: 100.0% [97.12σ]  
**ModelChiSquare2-sig: 0.2%**  
ModelChiSquareGof-sig: 41.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.4416**  
Centroid-sig: 13.1%  
Centroid-so: 0.384 arcsec [1.13σ]  
OotOffset-rm: 0.474 arcsec [1.81σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-rm: 0.357 arcsec [1.17σ]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

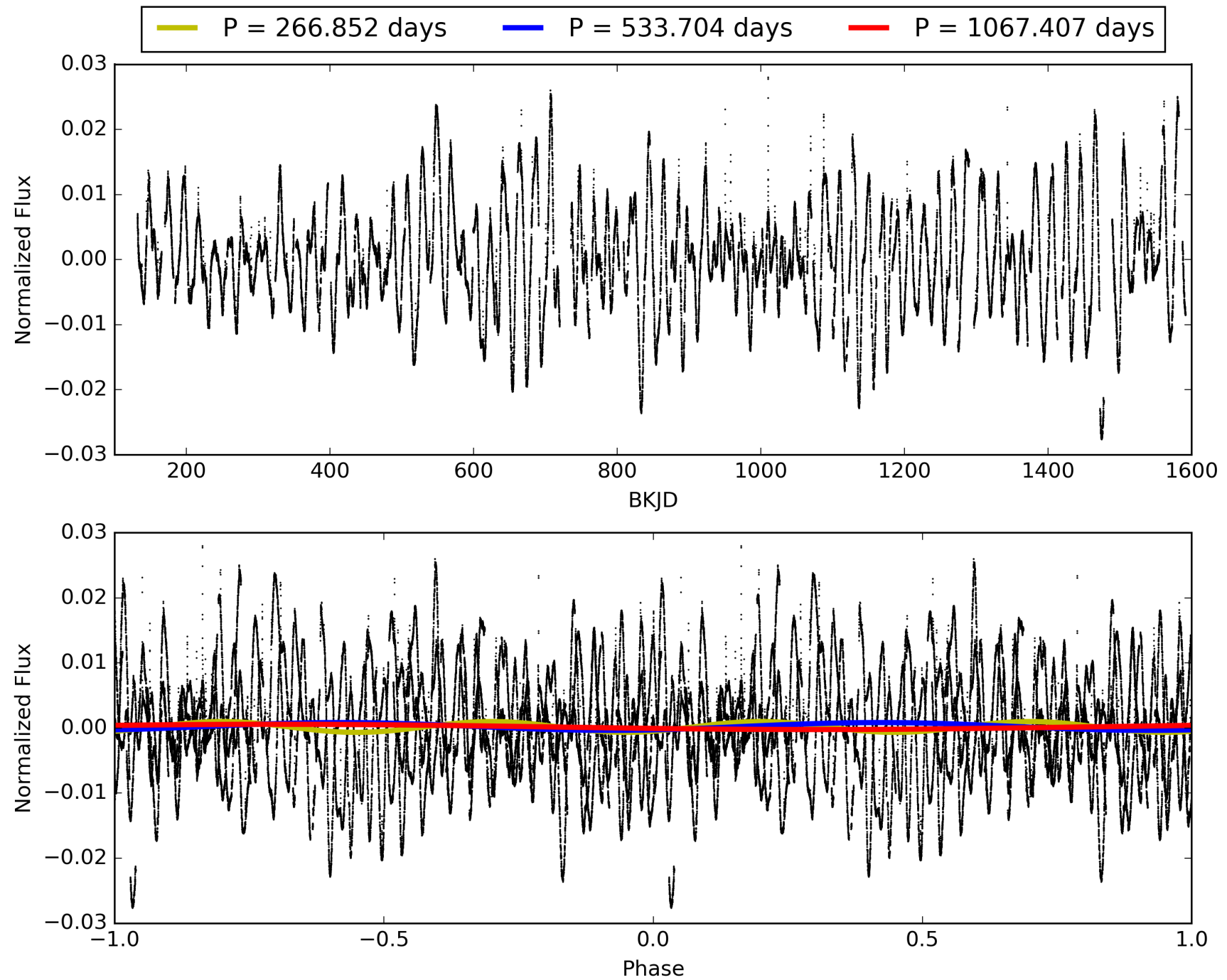
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:33:46 Z

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

# TCE 011764567-06, PDC Light Curves

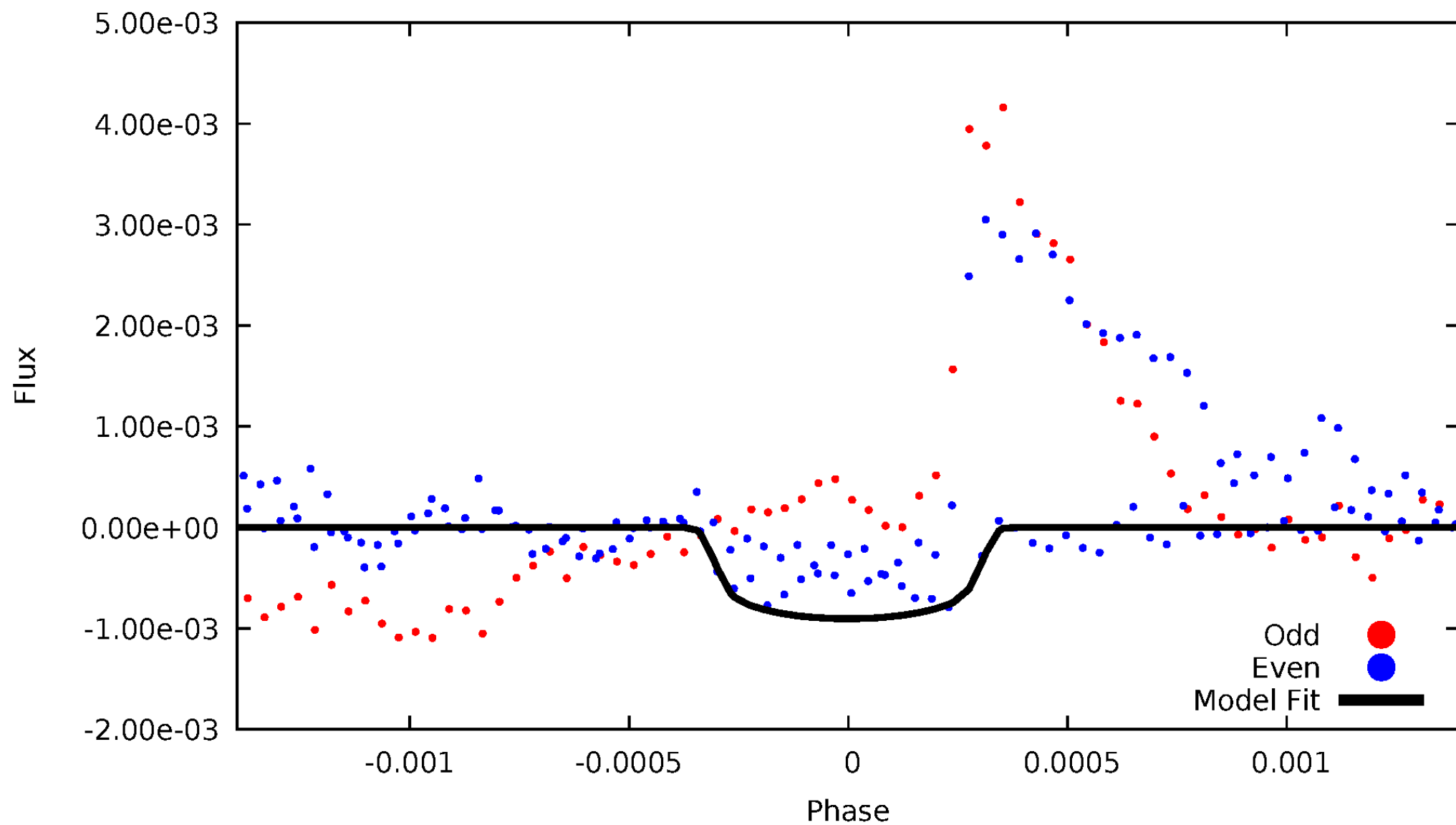


# TCE 011764567-06



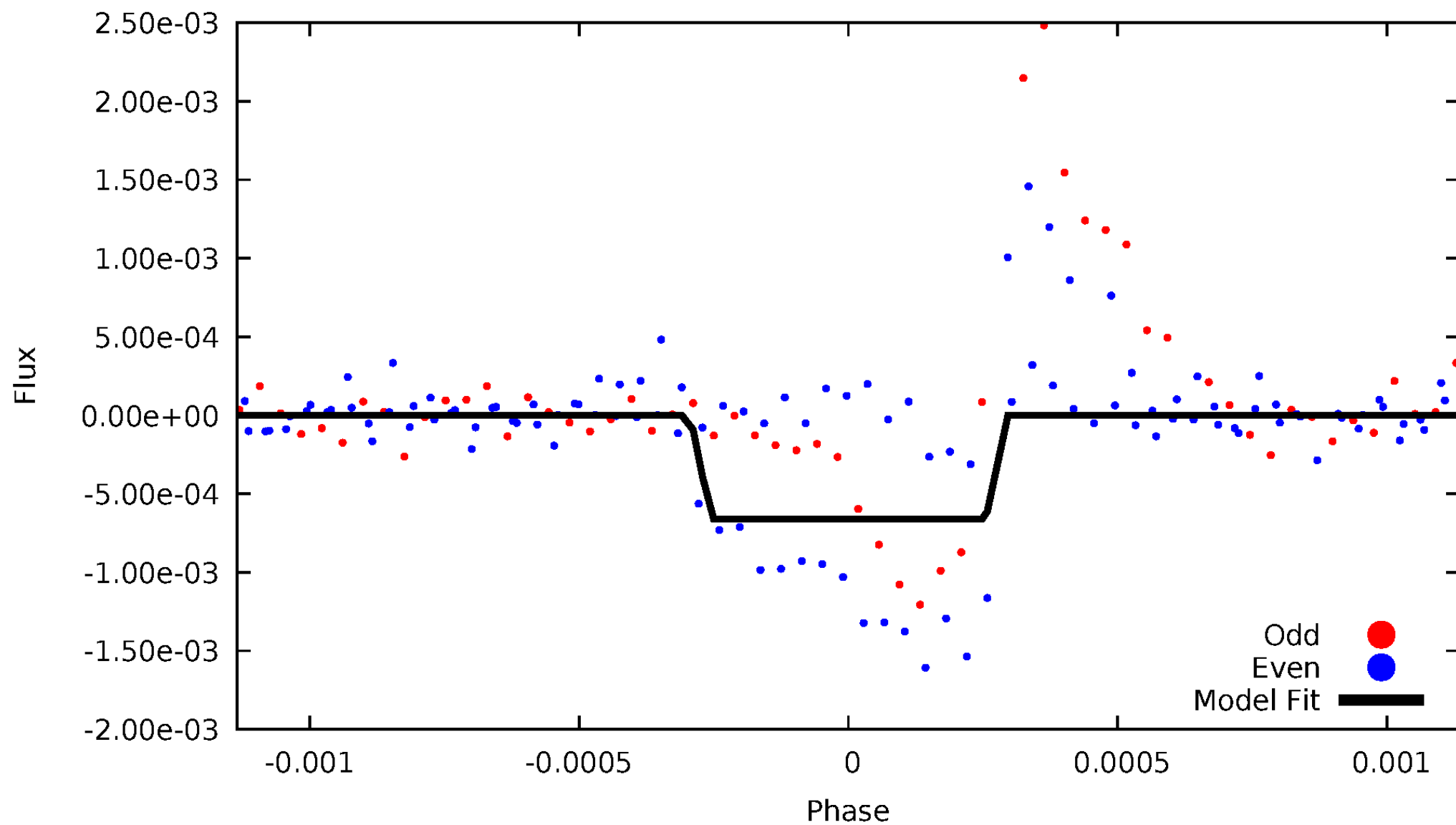
# DV Odd/Even

TCE 011764567-06



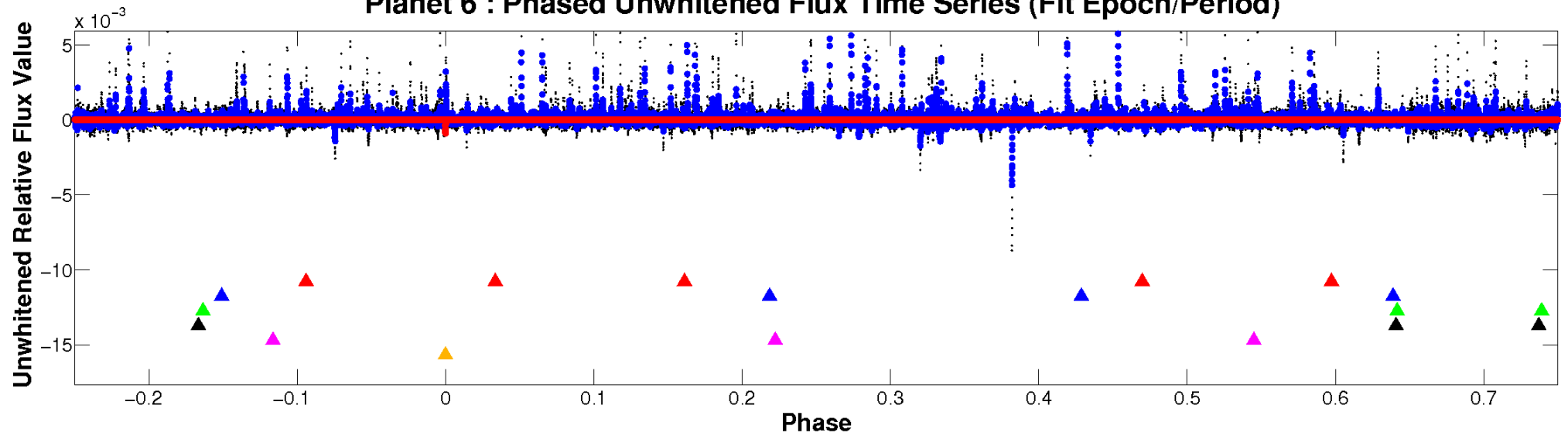
# ALT Odd/Even

TCE 011764567-06

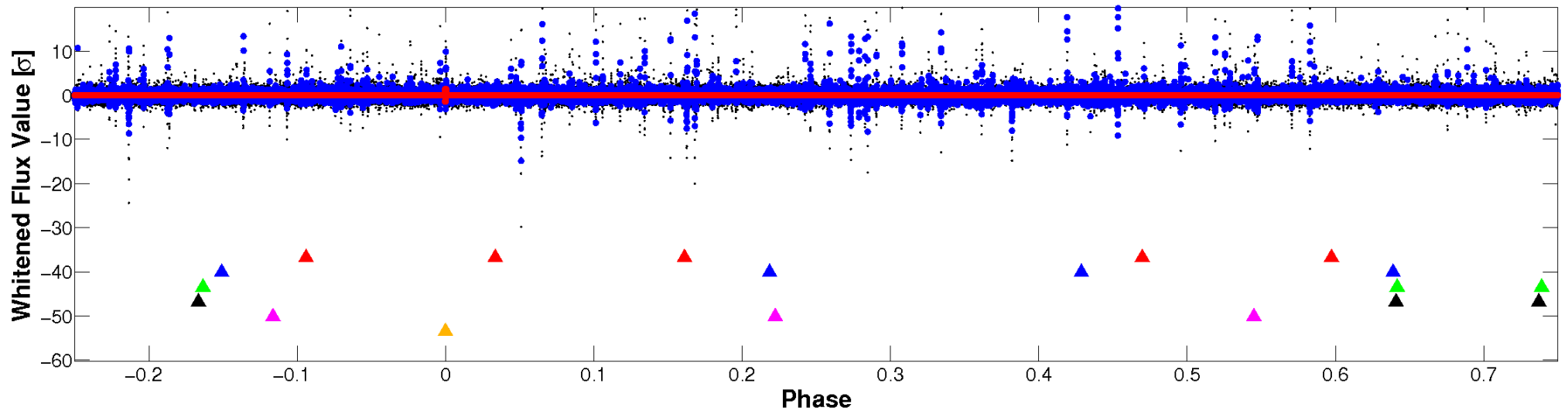


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

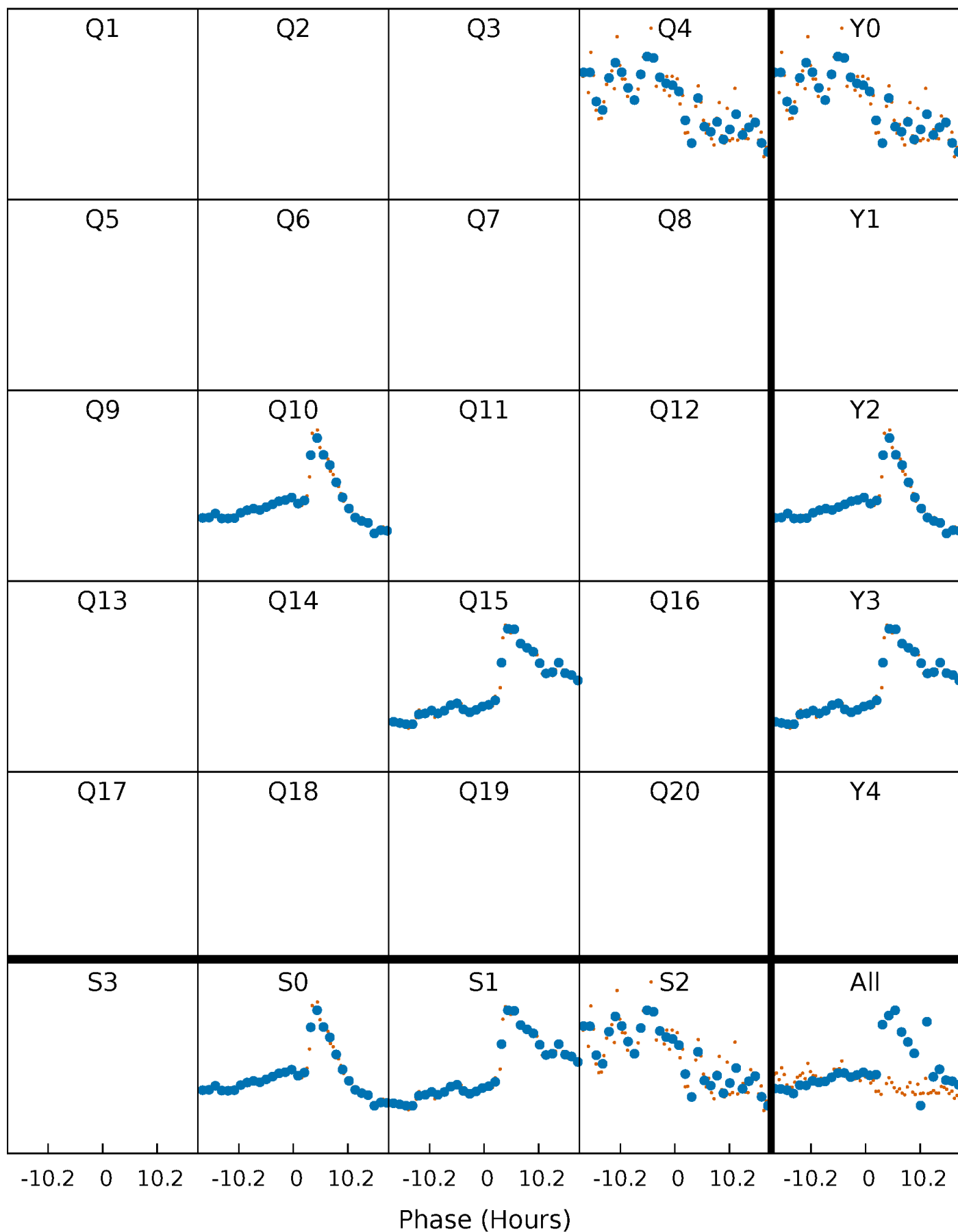


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

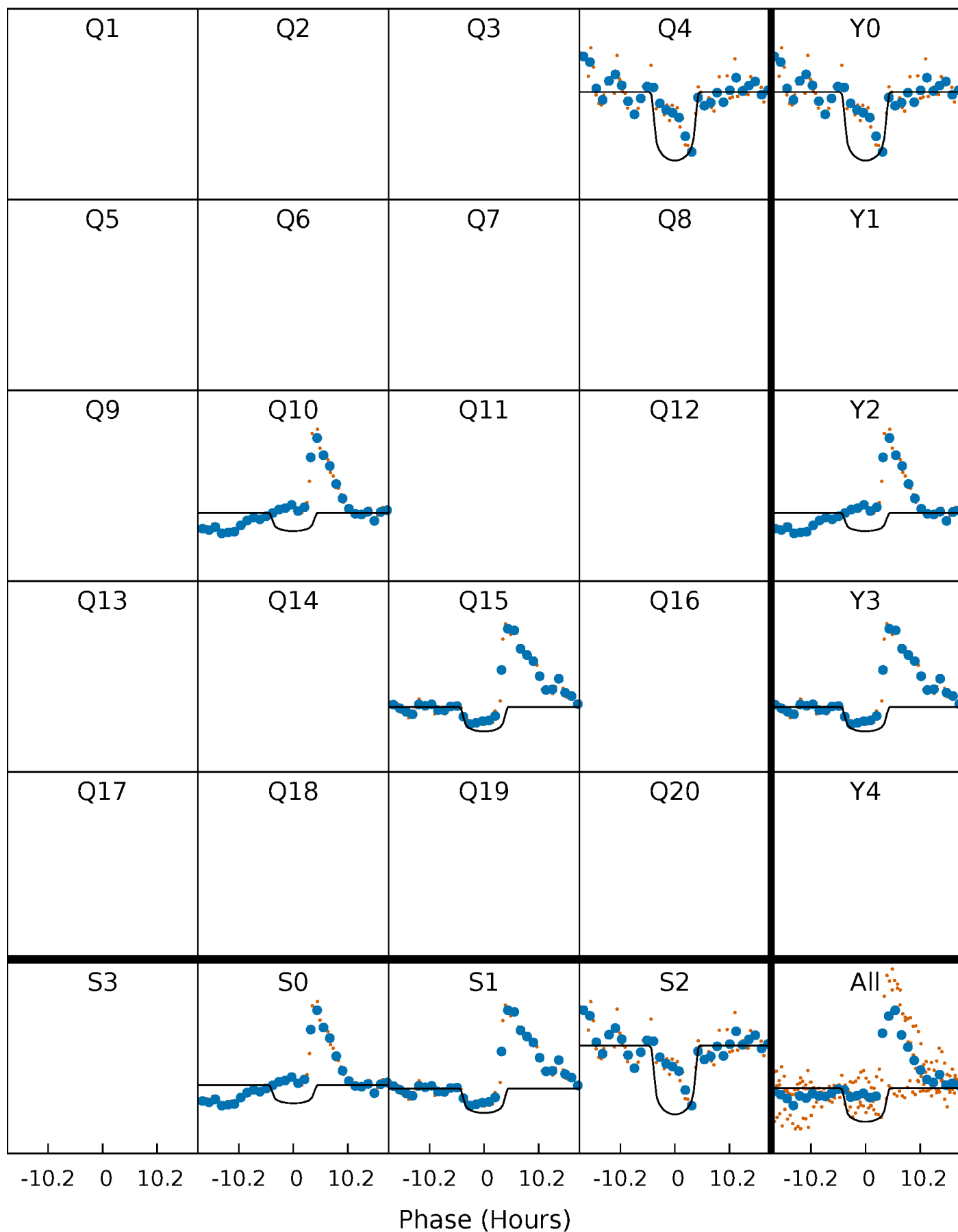
TCE 011764567-06 P=533.703540 Days  $T_0=389.157677$  (BKJD)





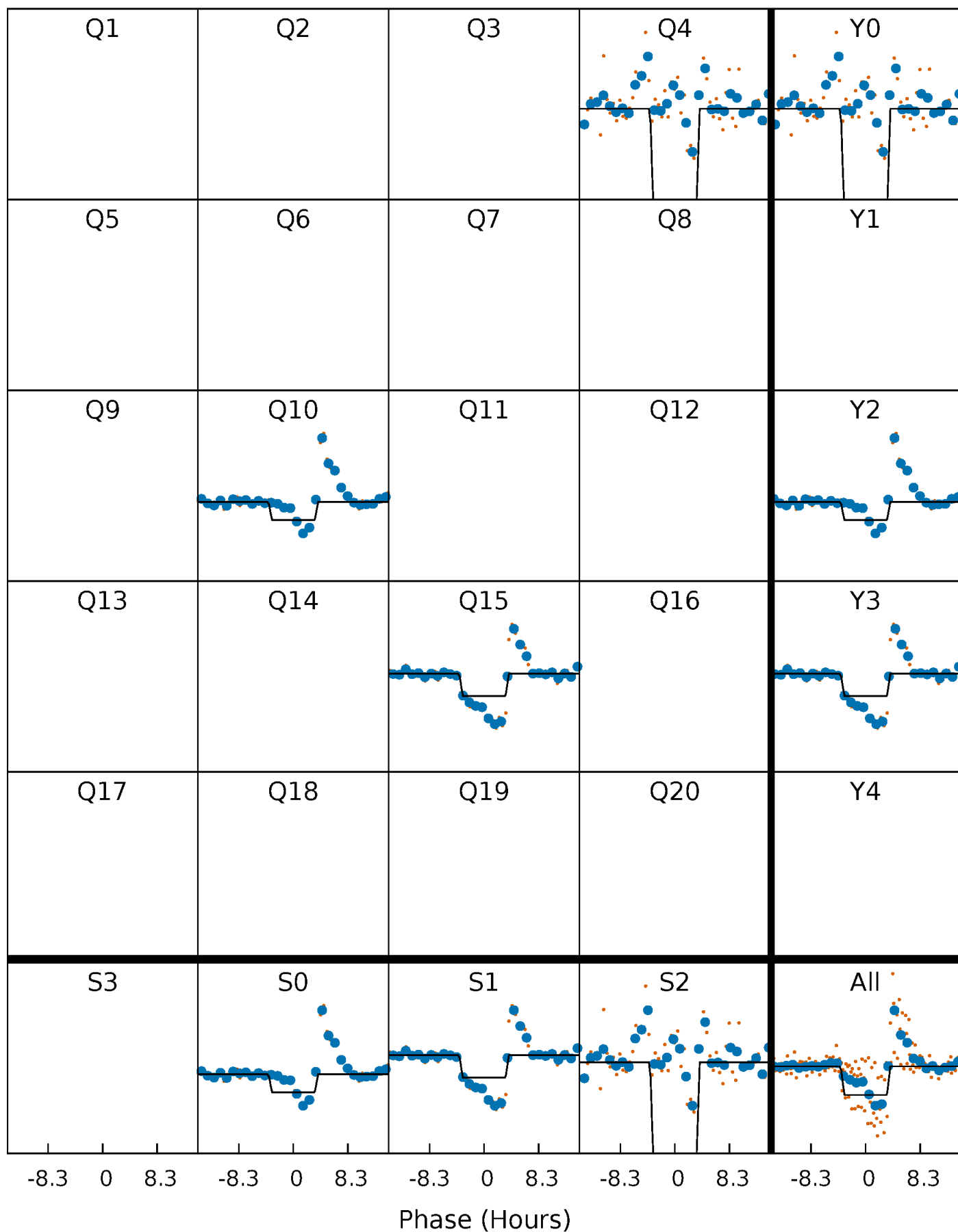
# DV Quarter-Phased Transit Curves

TCE 011764567-06 P=533.703540 Days  $T_0=389.157677$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

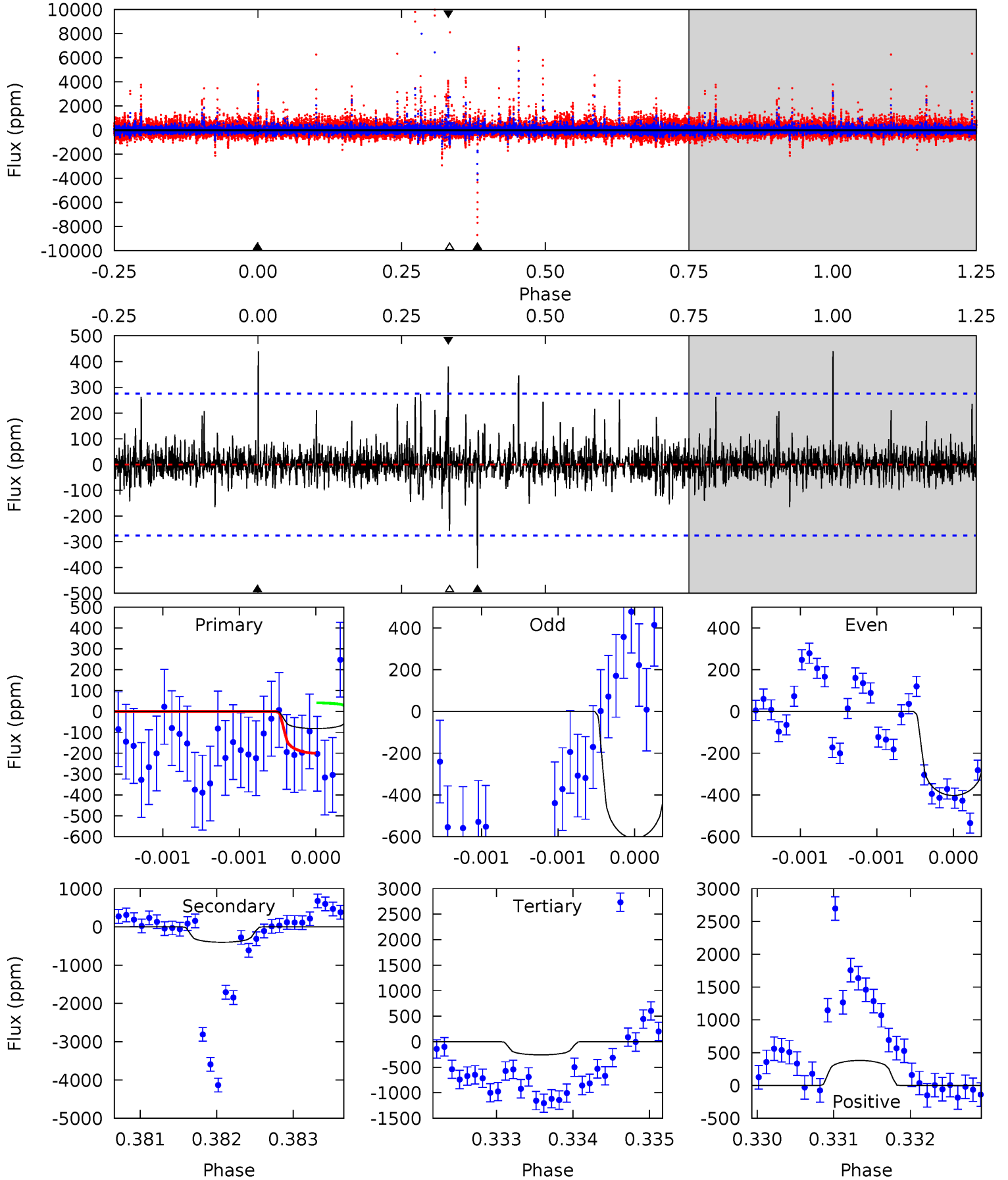
TCE 011764567-06 P=533.697342 Days  $T_0=389.158638$  (BKJD)



# DV Model-Shift Uniqueness Test

011764567-06, P = 533.703540 Days, E = 389.157677 Days

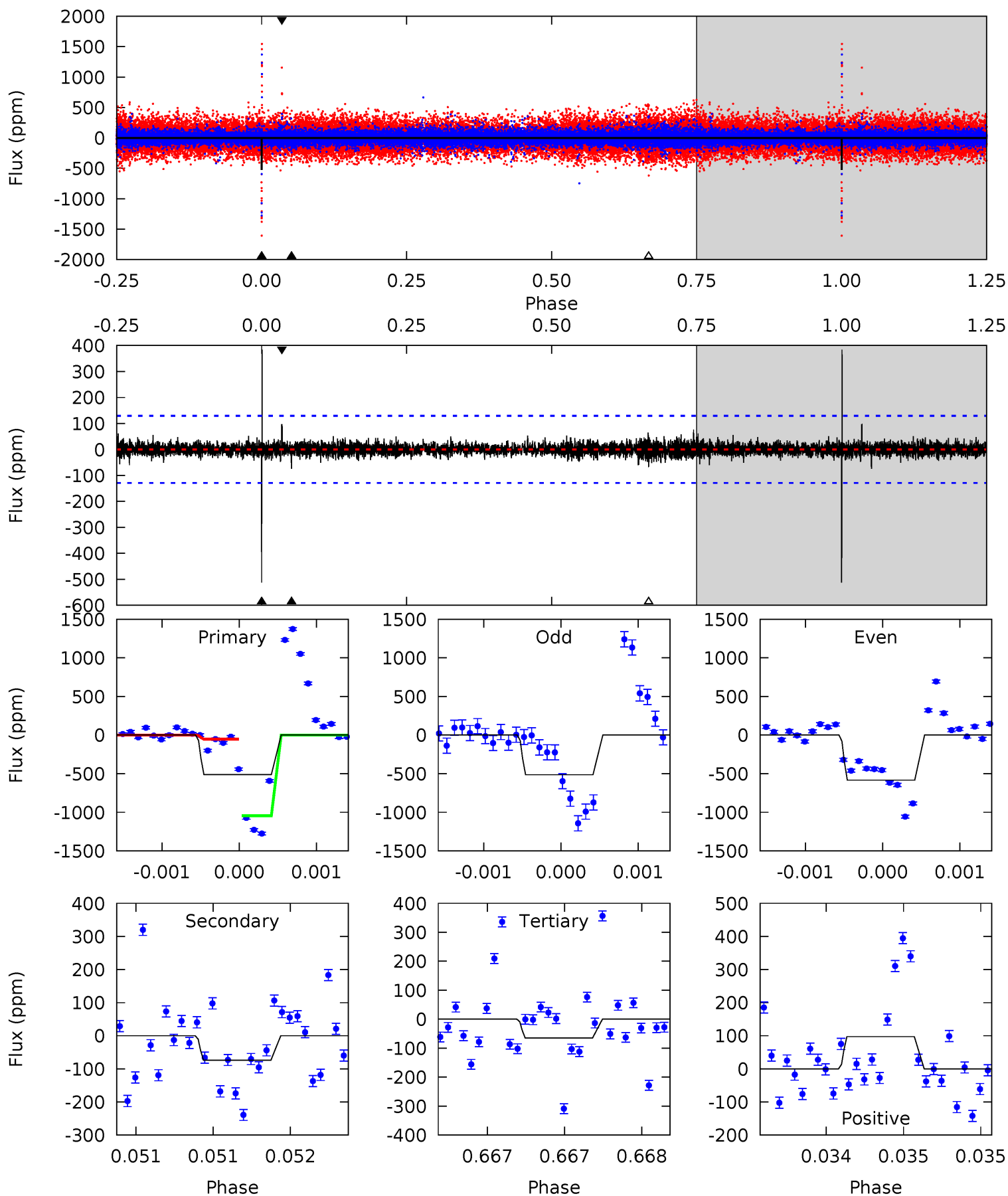
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.64	8.03	5.14	7.61	5.51	3.38	0.93	-3.49	-5.96	2.89	0.42	1.31	0.07	0.52	1.59



# Alt Model-Shift Uniqueness Test

011764567-06, P = 533.697342 Days, E = 389.158638 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
22.1	3.19	2.79	4.18	5.56	3.46	0.58	19.3	17.9	0.40	-1.00	1.57	1.16	0.43	20.6



### Stellar Parameters For KIC 011764567

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5422^{+162}_{-146}$	$4.504^{+0.110}_{-0.110}$	$-0.500^{+0.350}_{-0.300}$	$0.785^{+0.125}_{-0.102}$	$0.718^{+0.105}_{-0.045}$	$2.088^{+1.006}_{-0.680}$
	+3%/-3%	+2%/-2%	+70%/-60%	+16%/-13%	+15%/-6%	+48%/-33%
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 011764567-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-402 \pm 50$	$2.76^{+0.43}_{-0.37}$	$276^{+14}_{-13}$	$4462^{+263}_{-244}$	$38641^{+14535}_{-9880}$
Alt.	$-74 \pm 23$	$2.23^{+0.37}_{-0.36}$	$277^{+14}_{-13}$	$3557^{+266}_{-226}$	$10702^{+5910}_{-3796}$

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

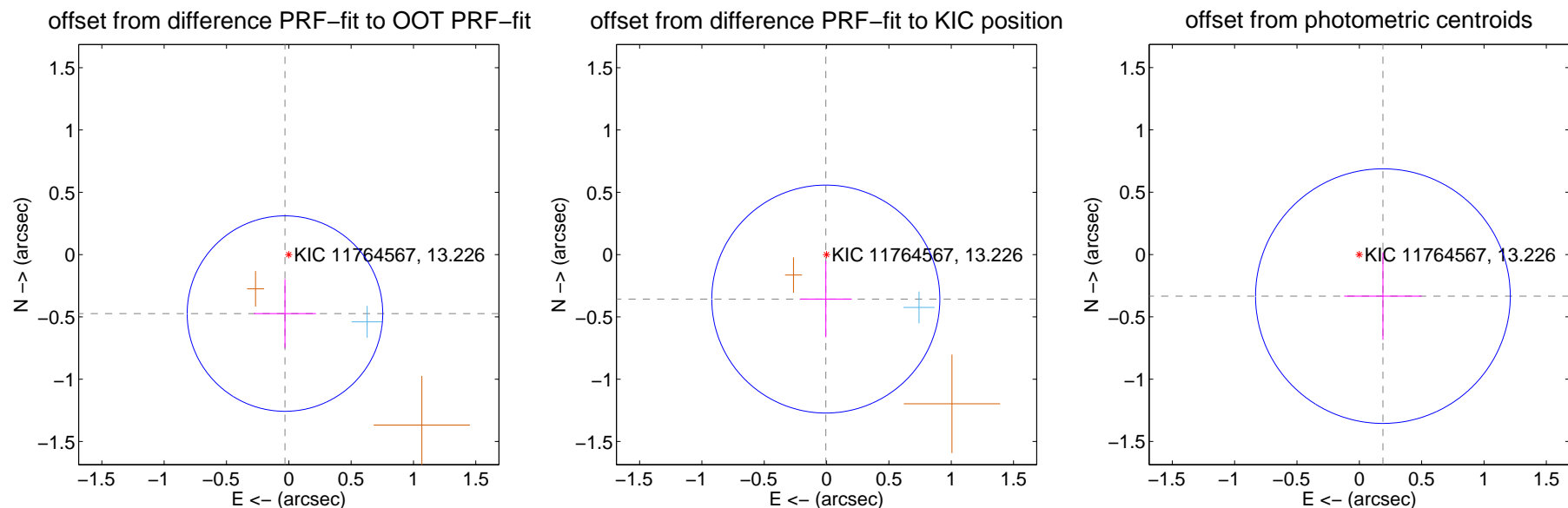
## DV Centroid Data

Supplemental centroid analysis for 011764567-06. Kepler magnitude: 13.23. Transit SNR 9.00

There are 1 quarters with good PRF difference image offsets

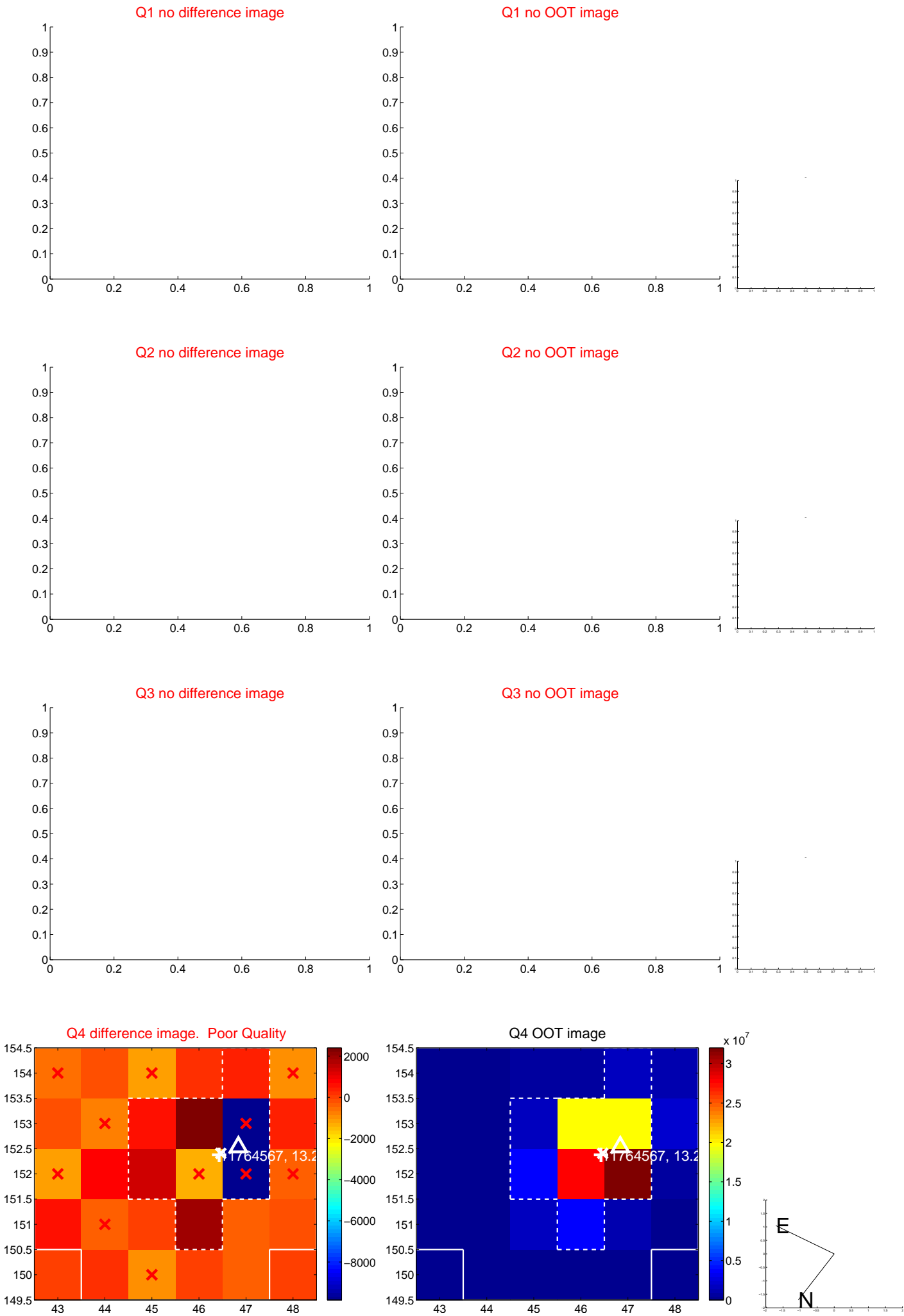
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.474 \pm 0.261$	1.81	$0.031 \pm 0.248$	$-0.473 \pm 0.276$
PRF-fit source offset from KIC position	$0.357 \pm 0.305$	1.17	$0.006 \pm 0.208$	$-0.357 \pm 0.307$
photometric centroid source offset	$0.38 \pm 0.34$	1.13	$-0.19 \pm 0.31$	$-0.33 \pm 0.35$

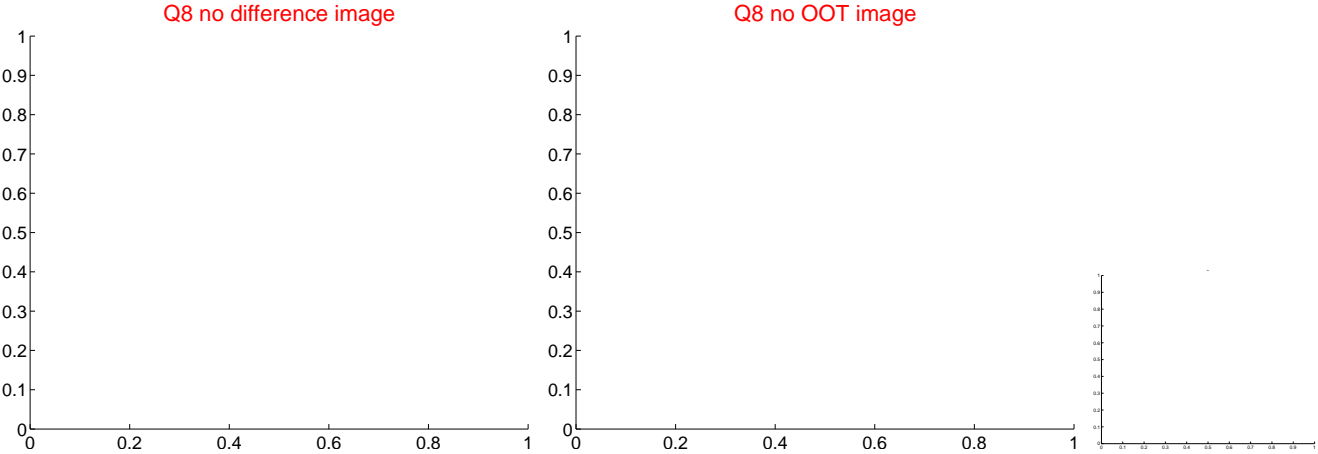
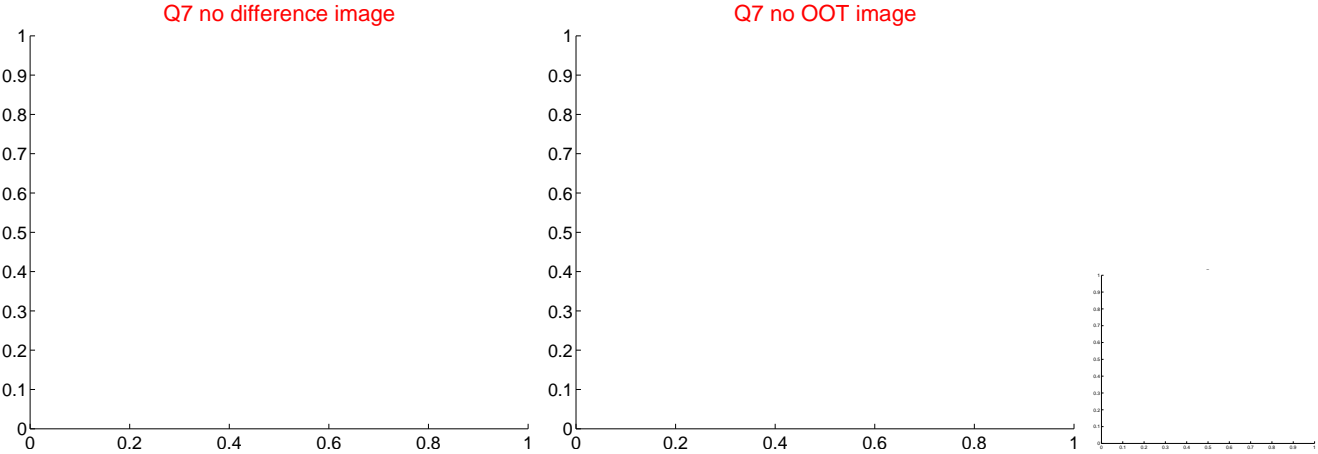
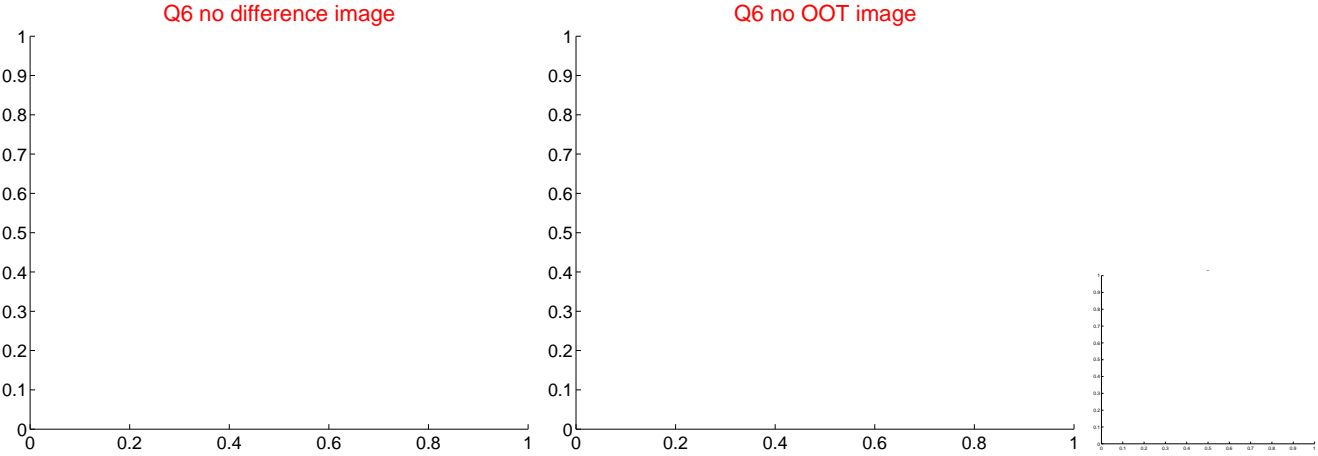
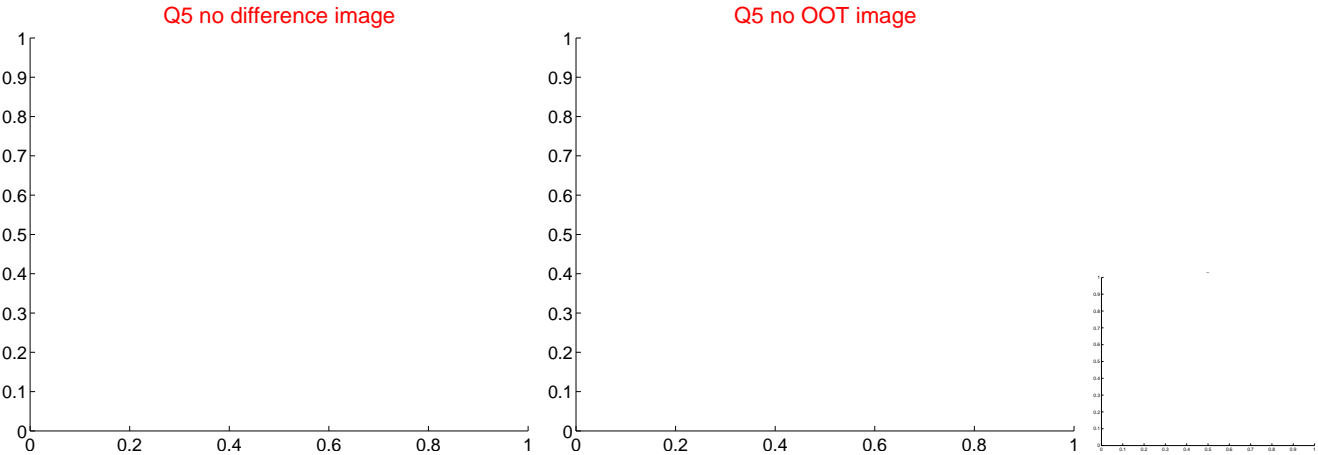


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



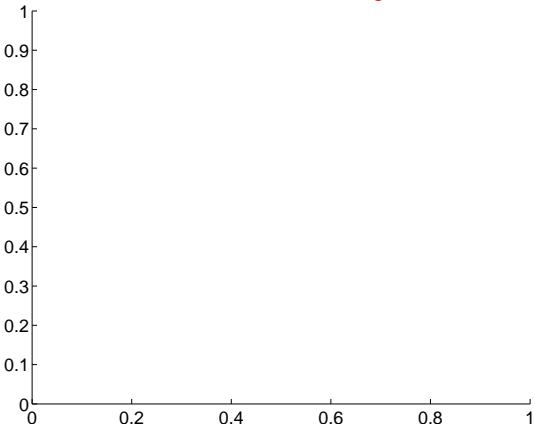
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



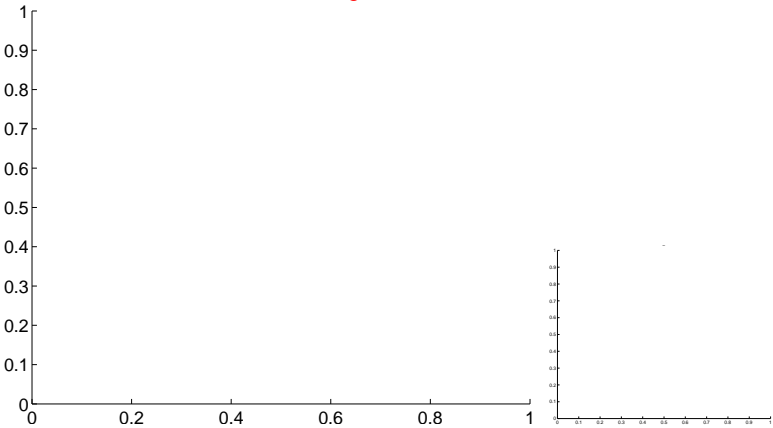


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

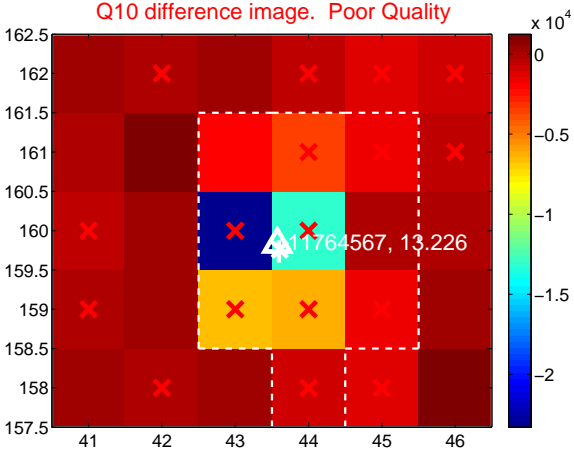
Q9 no difference image



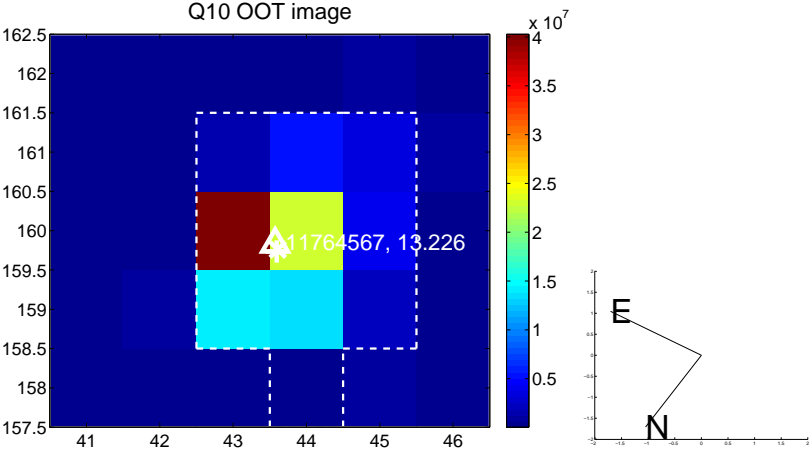
Q9 no OOT image



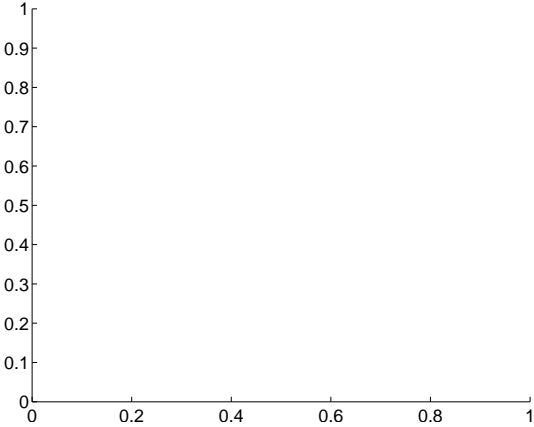
Q10 difference image. Poor Quality



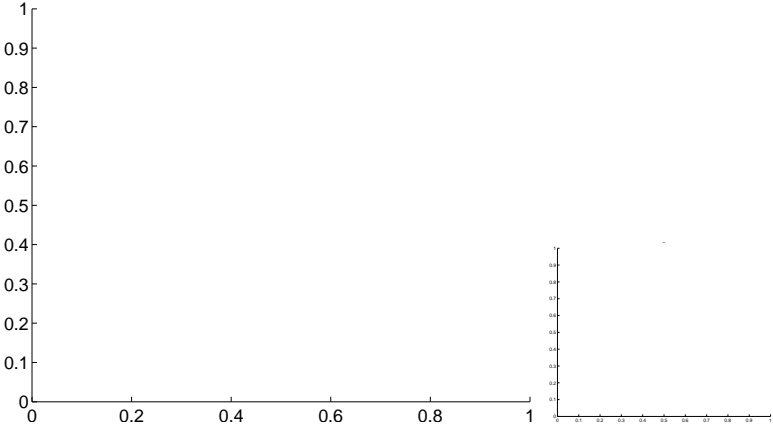
Q10 OOT image



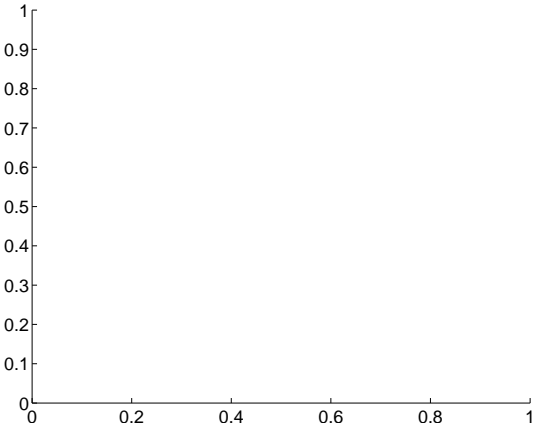
Q11 no difference image



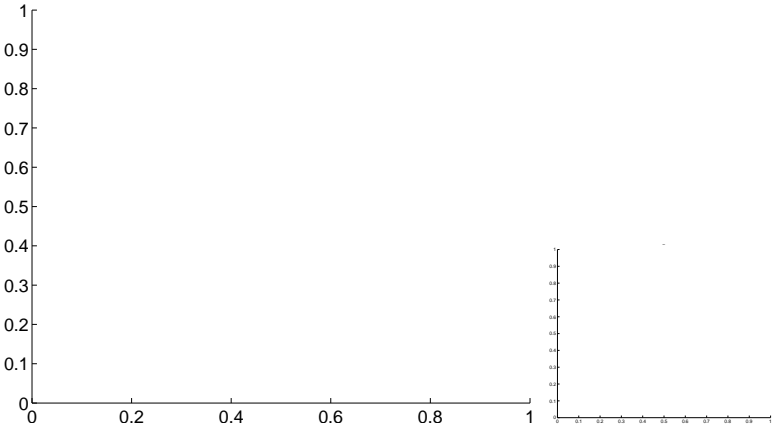
Q11 no OOT image



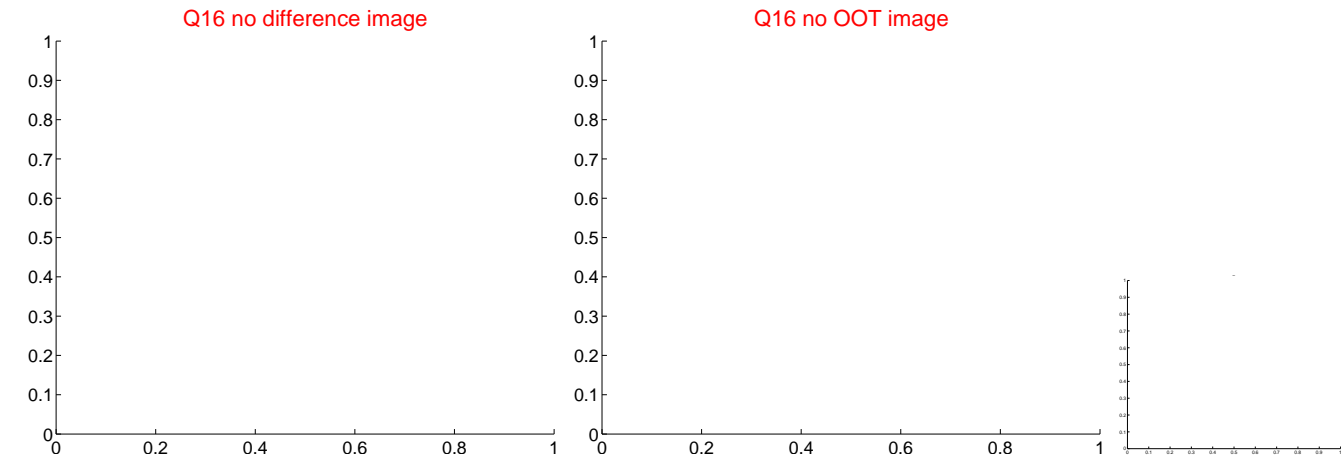
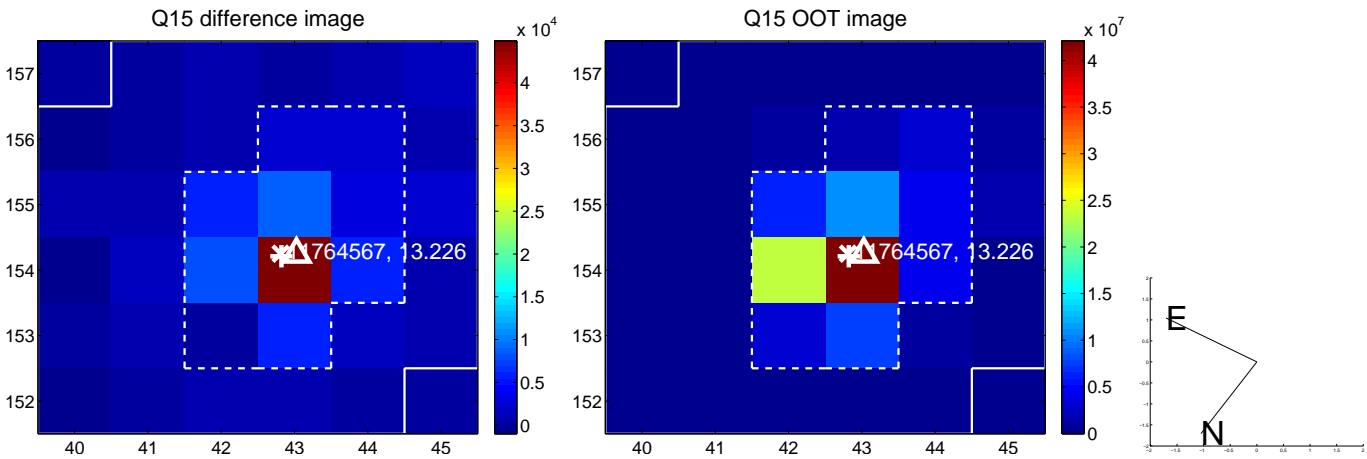
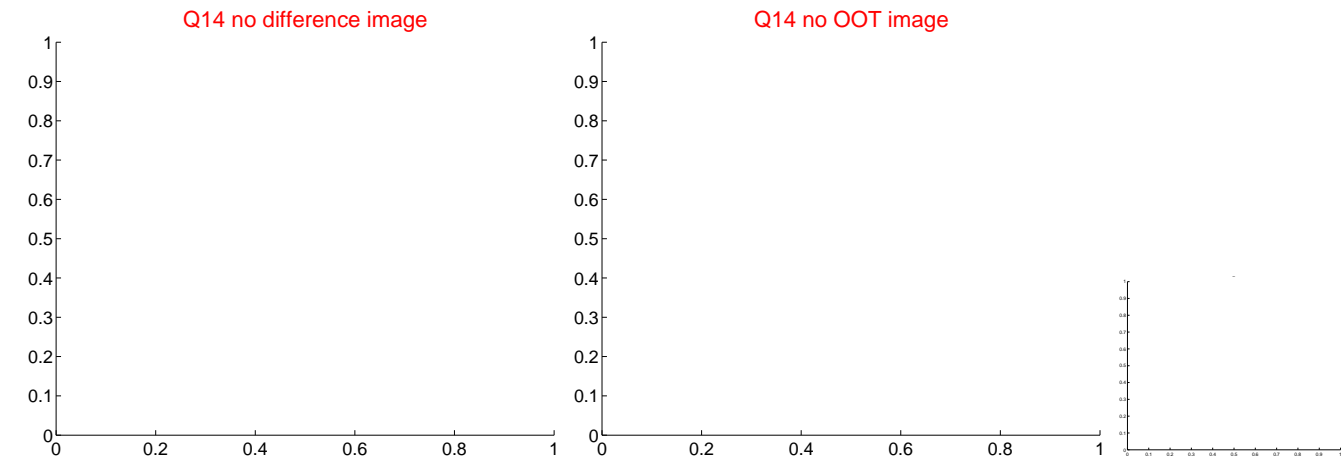
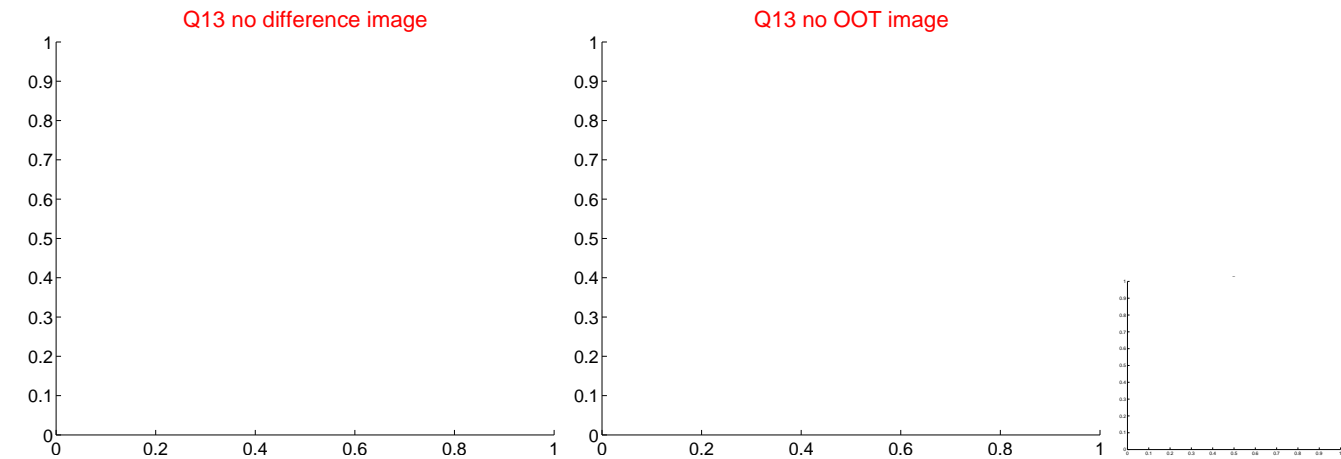
Q12 no difference image



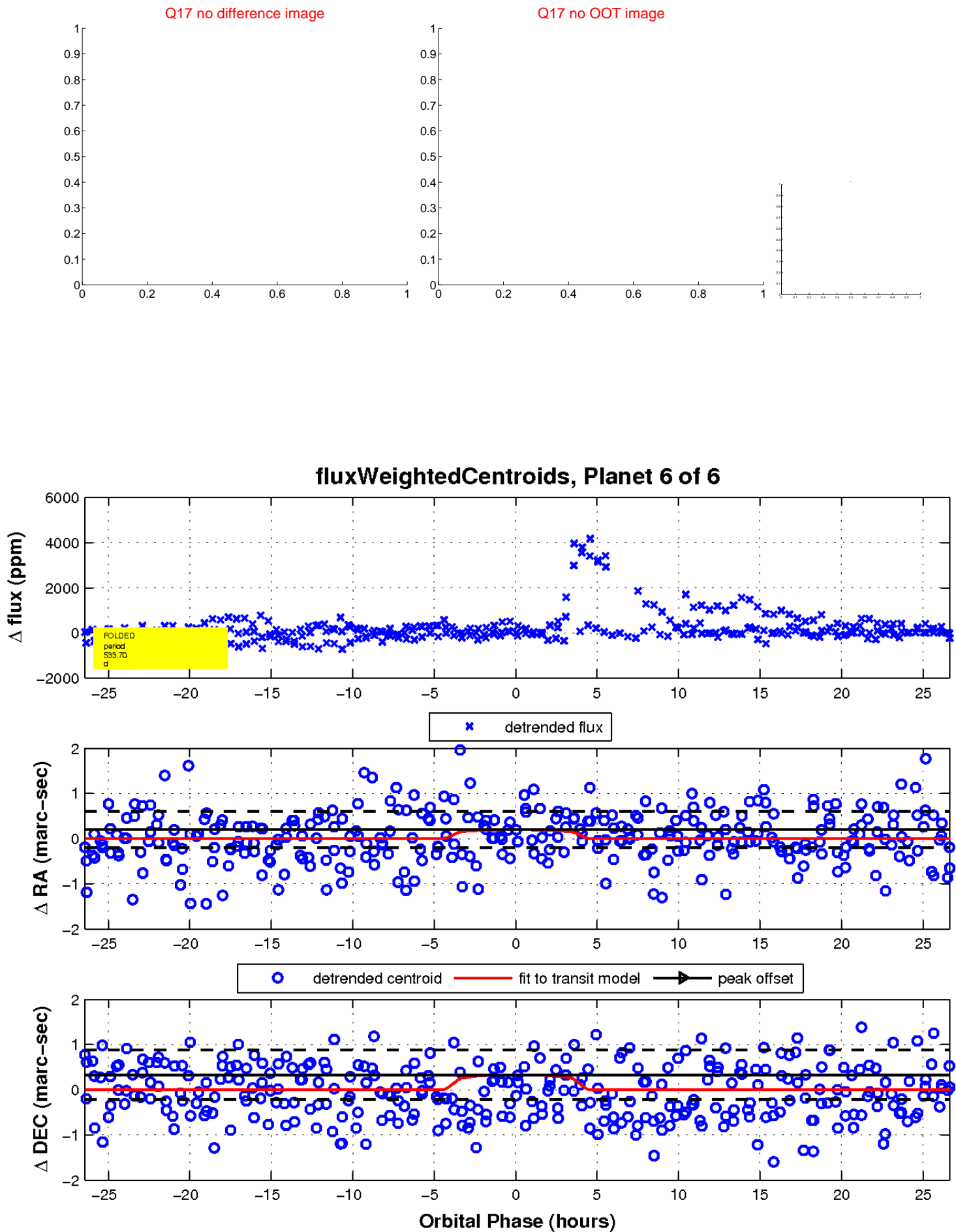
Q12 no OOT image



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

