

# KIC 005478766

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005478766-01	OBS	No	3.132372	133.400553	907.3	3.465	8.7	9.0	4.53	10767	14.37	64097.48
005478766-02	OBS	No	1.565612	132.498535	516.7	8.354	8.9	9.2	4.53	10767	12.45	161594.43

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005478766-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_FEW_DIFFS
005478766-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS

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

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

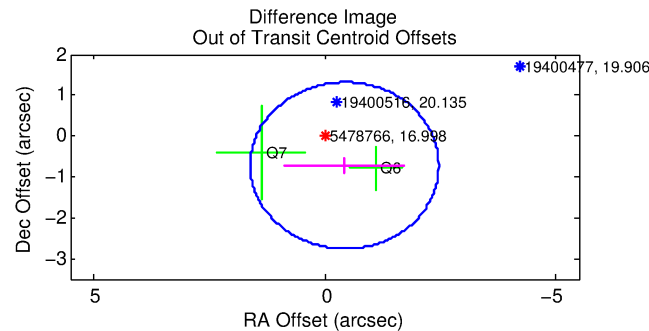
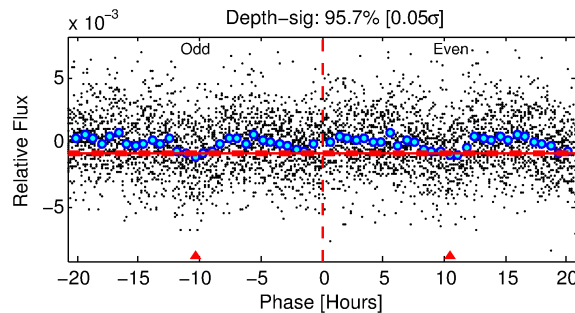
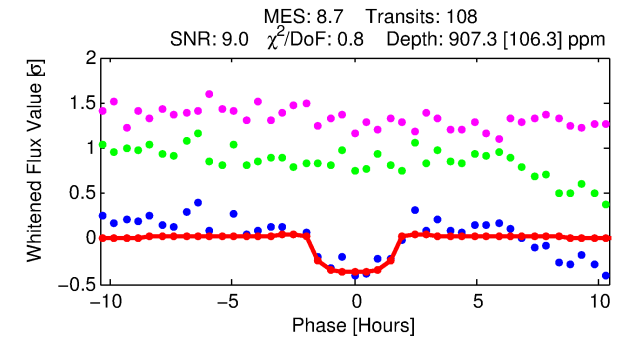
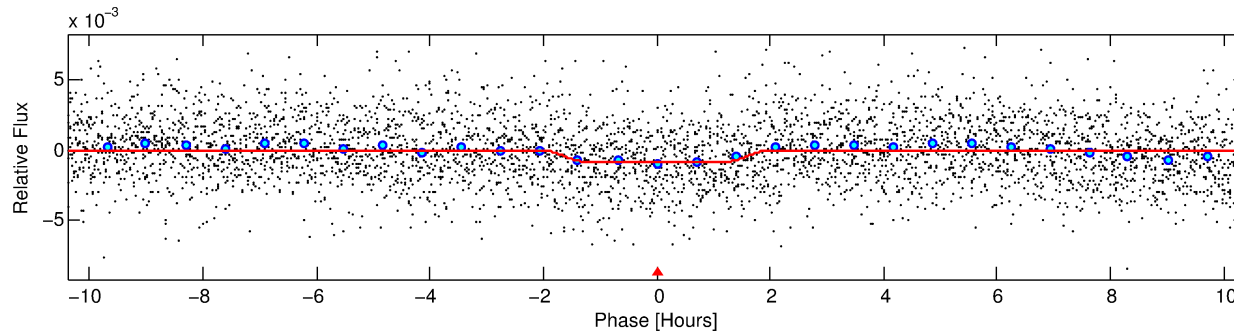
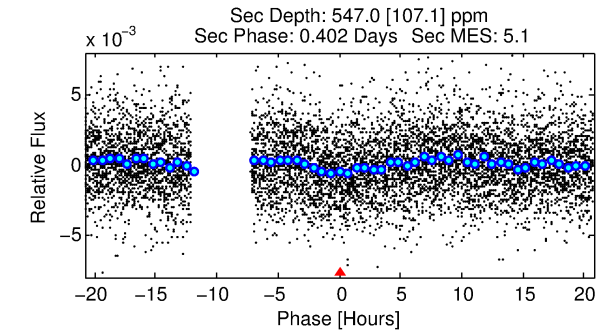
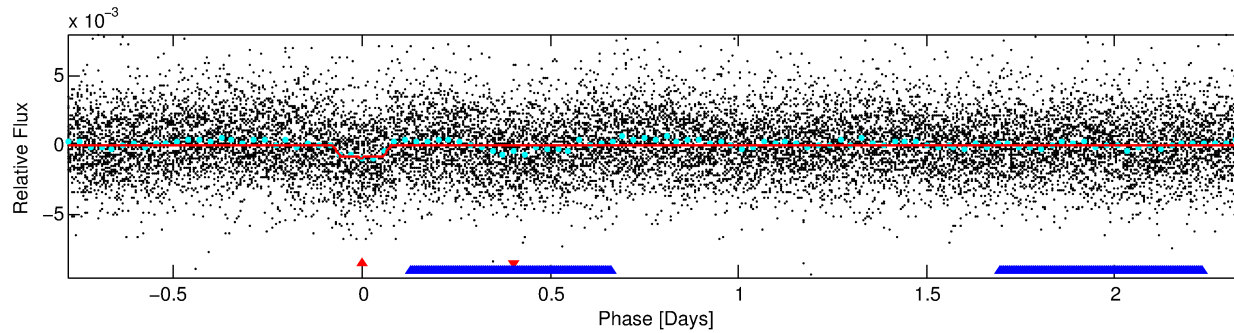
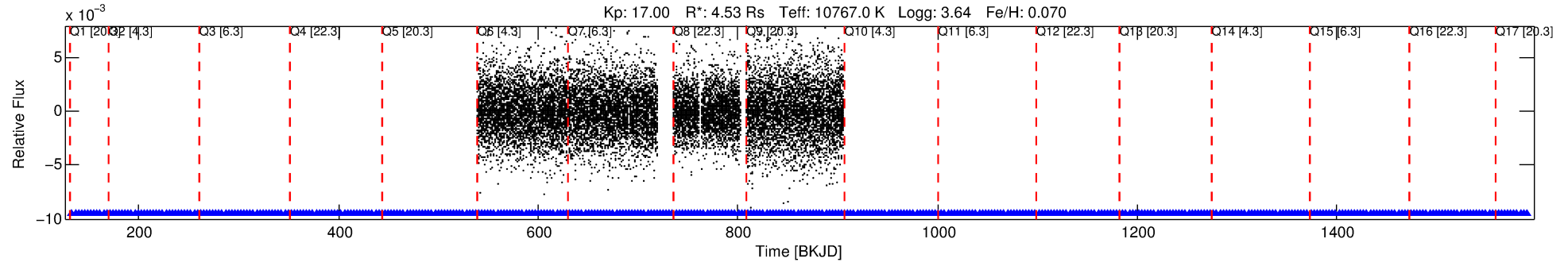
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005478766-01

No Significant Match Found

# DV One-Page Summary

KIC: 5478766 Candidate: 1 of 2 Period: 3.132 d



## DV Fit Results:

Period = 3.13237 [0.00004] d  
Epoch = 133.4006 [0.0067] BKJD  
Rp/R\* = 0.0291 [0.0219]  
a/R\* = 6.07 [33.41]  
b = 0.55 [7.31]  
Seff = 64097.48 [50387.22]  
Teq = 4057 [797] K  
Rp = 14.37 [12.99] Re  
a = 0.0621 [0.0299] AU  
Ag = 5.61 [9.55] [0.48σ]  
Teffp = 9656 [3683] K [1.49σ]

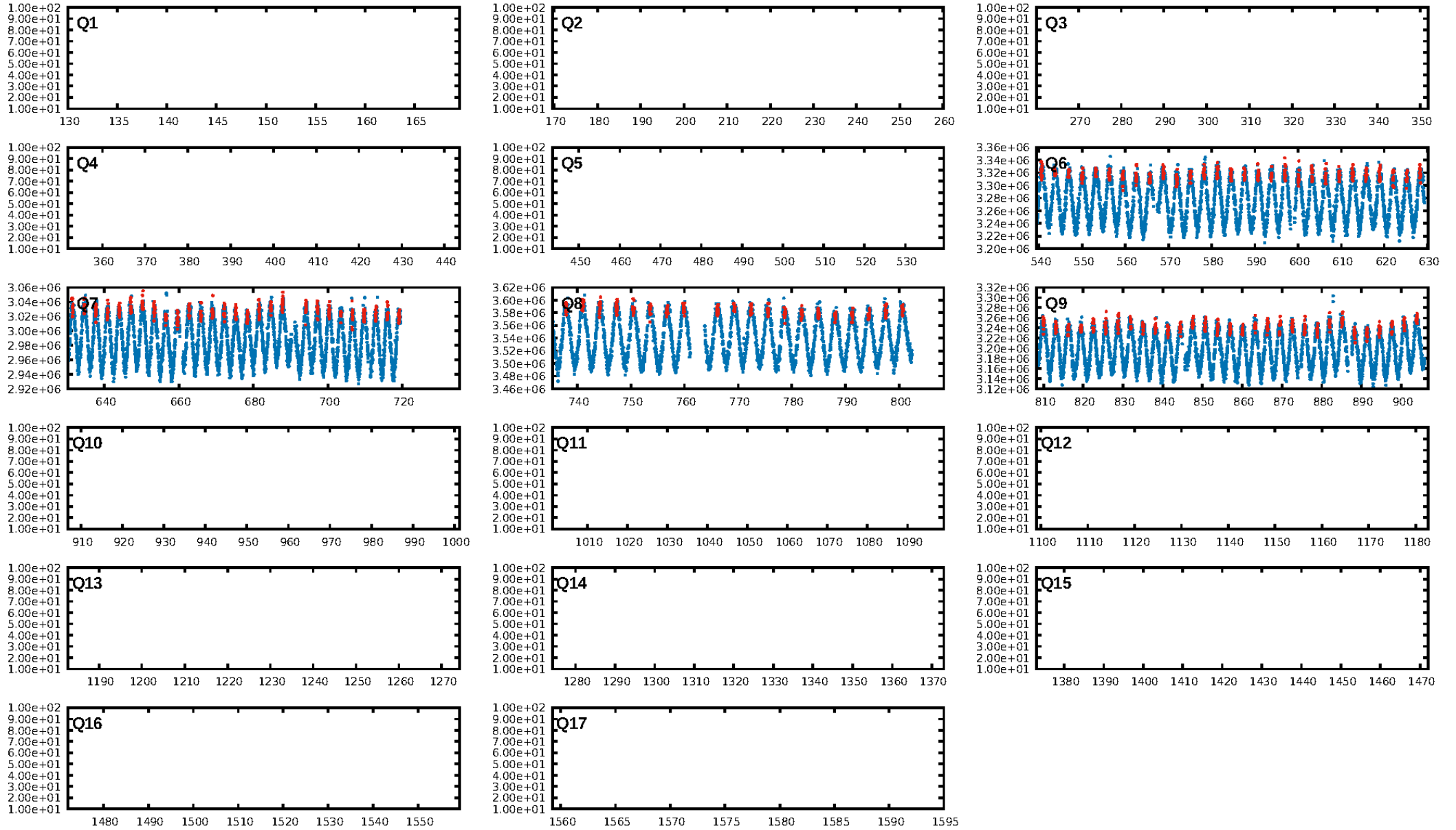
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.16σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.39e-16  
RollingBand-fgt: 1.00 [108/108]  
GhostDiagnostic-chr: 2.731  
Centroid-sig: 0.1%  
Centroid-so: 0.438 arcsec [0.43σ]  
OotOffset-rm: 0.841 arcsec [1.24σ]  
KicOffset-rm: 2.026 arcsec [2.20σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/4]

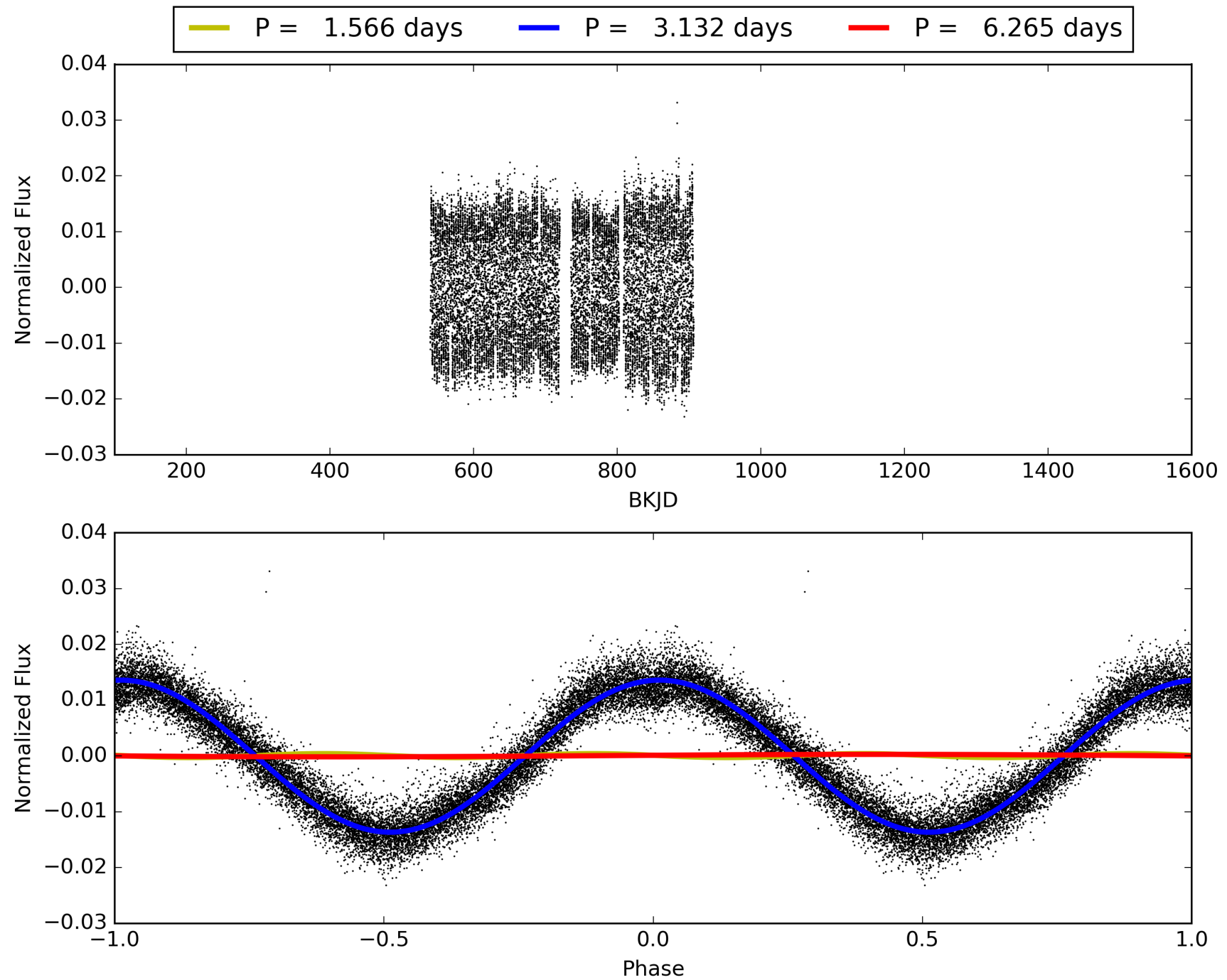
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:00:01 Z

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

# TCE 005478766-01, PDC Light Curves

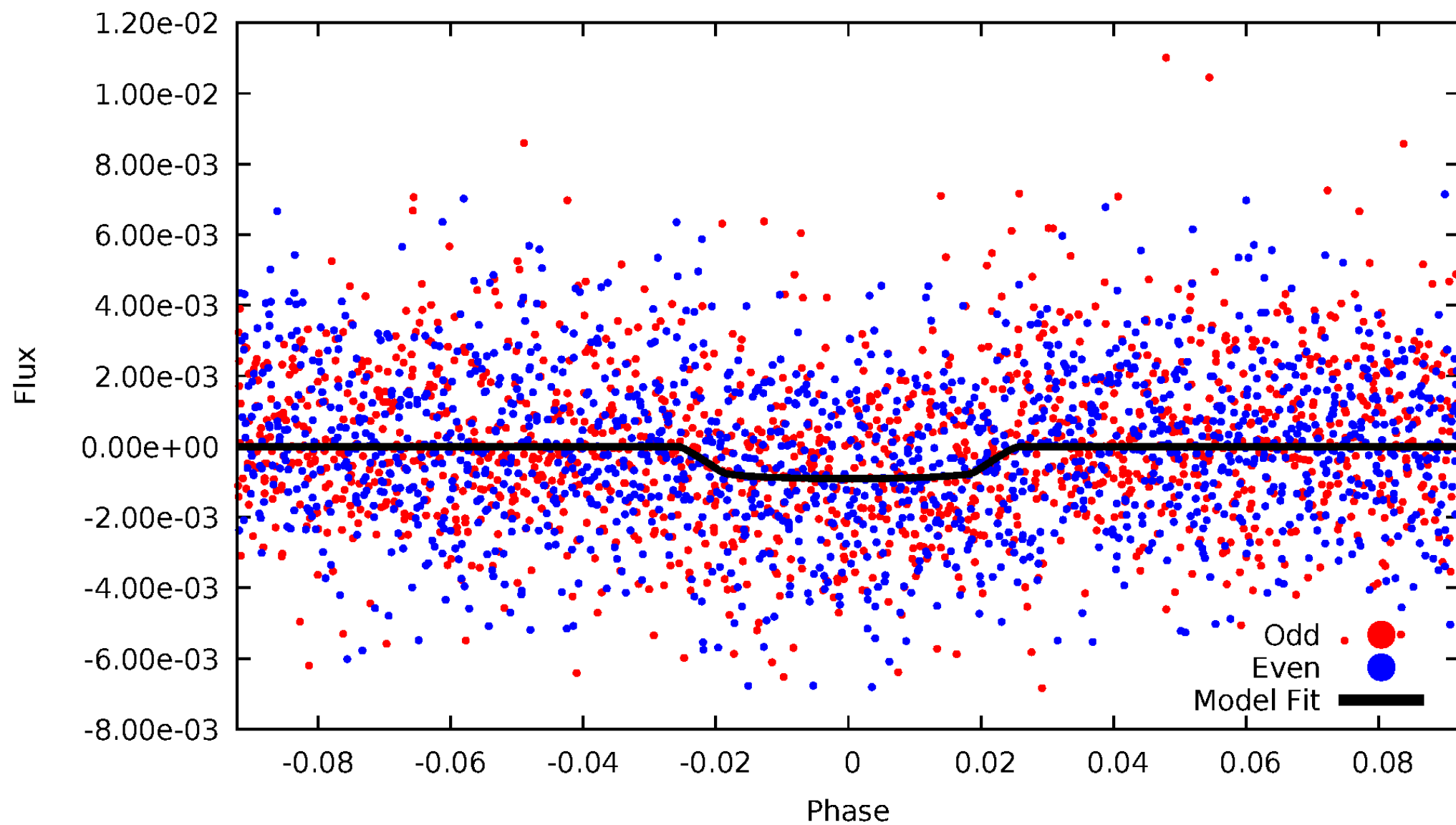


TCE 005478766-01



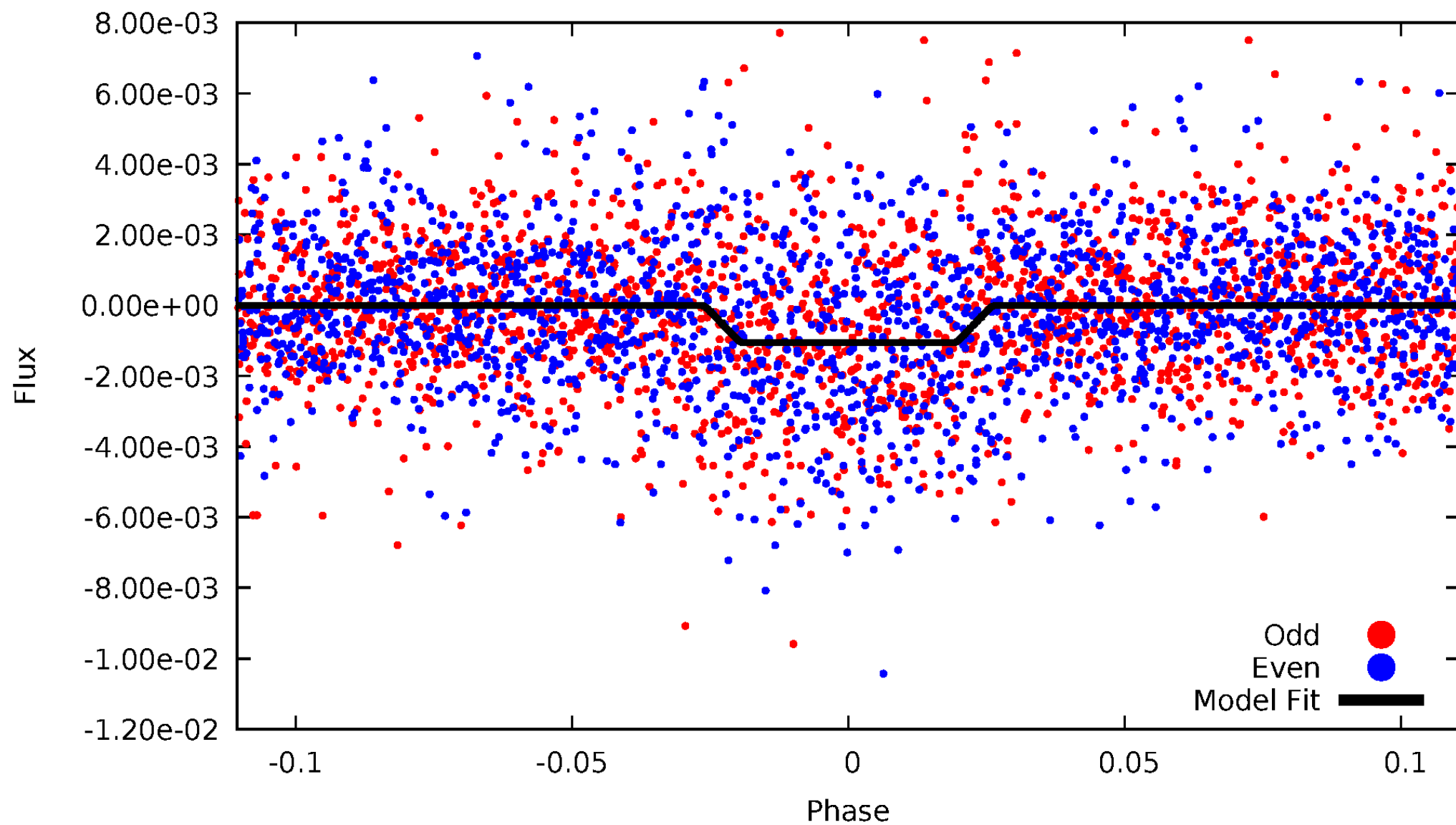
# DV Odd/Even

TCE 005478766-01

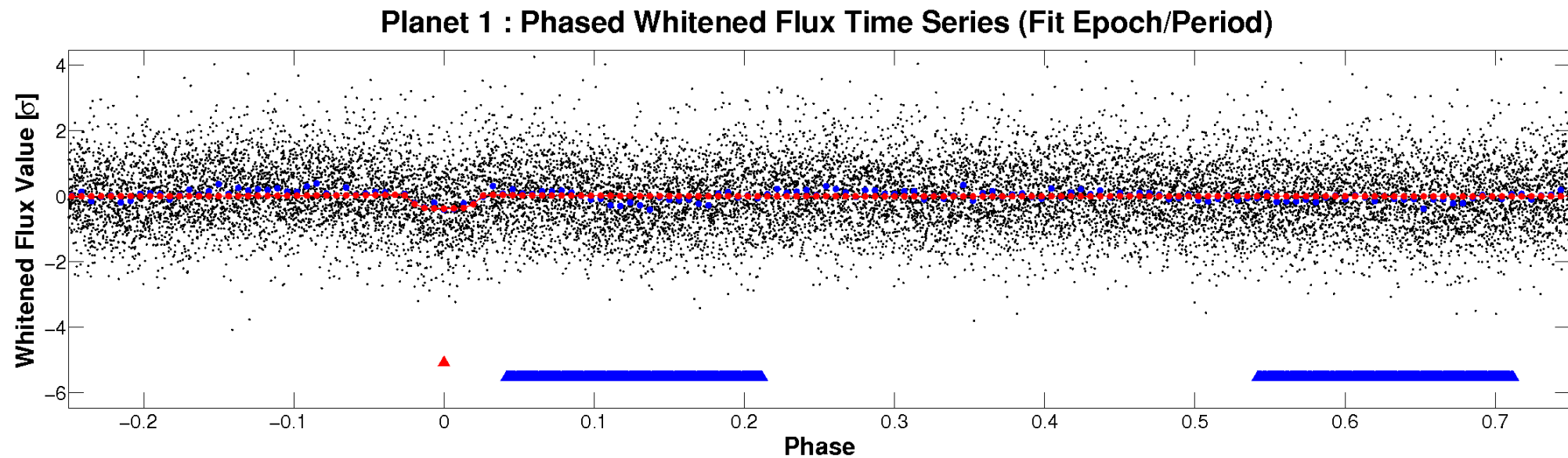
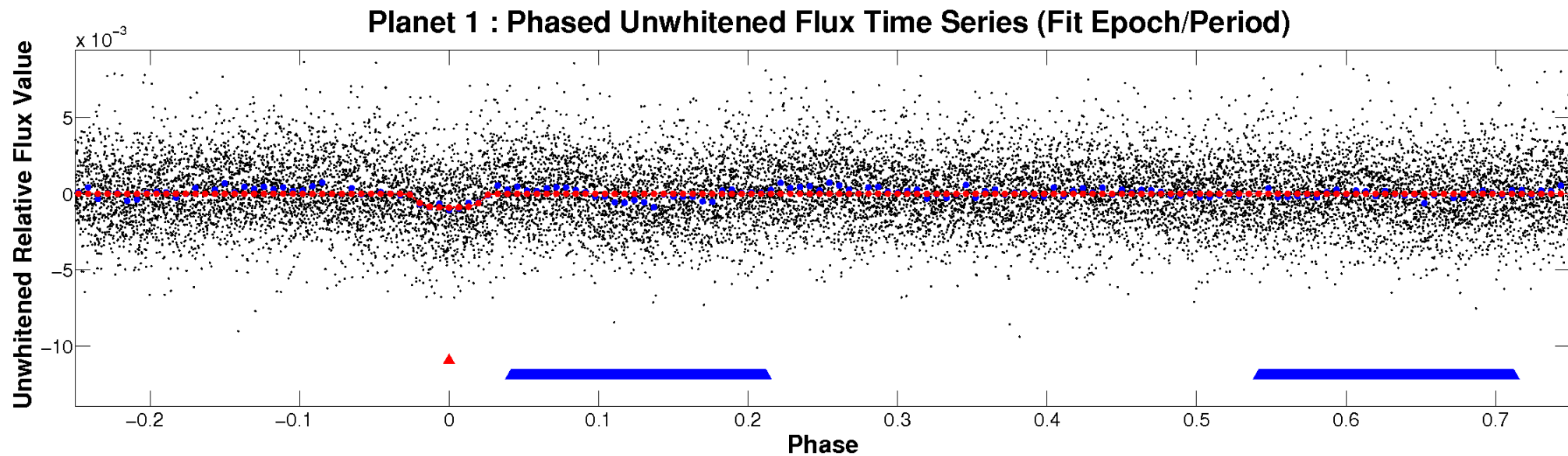


# ALT Odd/Even

TCE 005478766-01



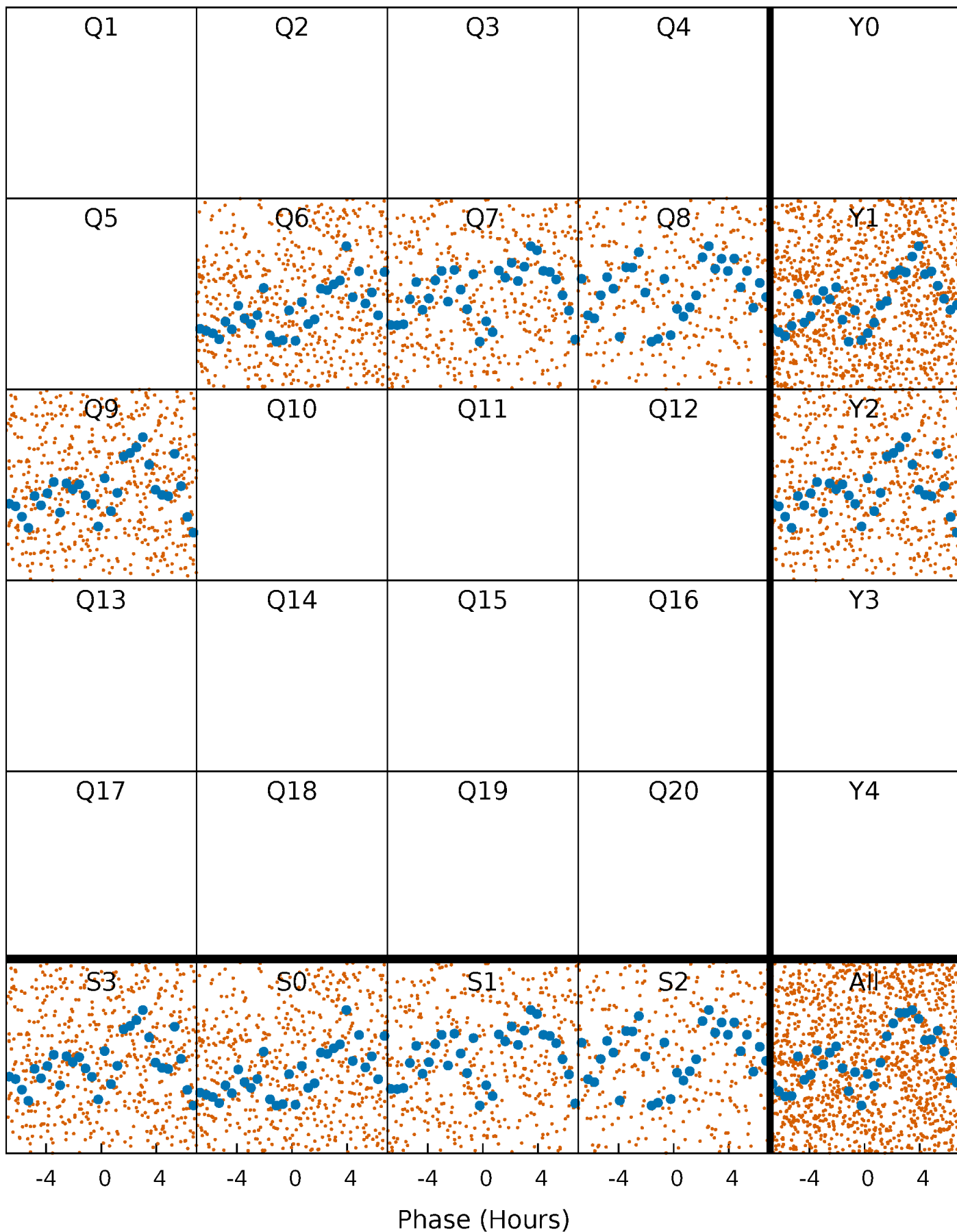
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

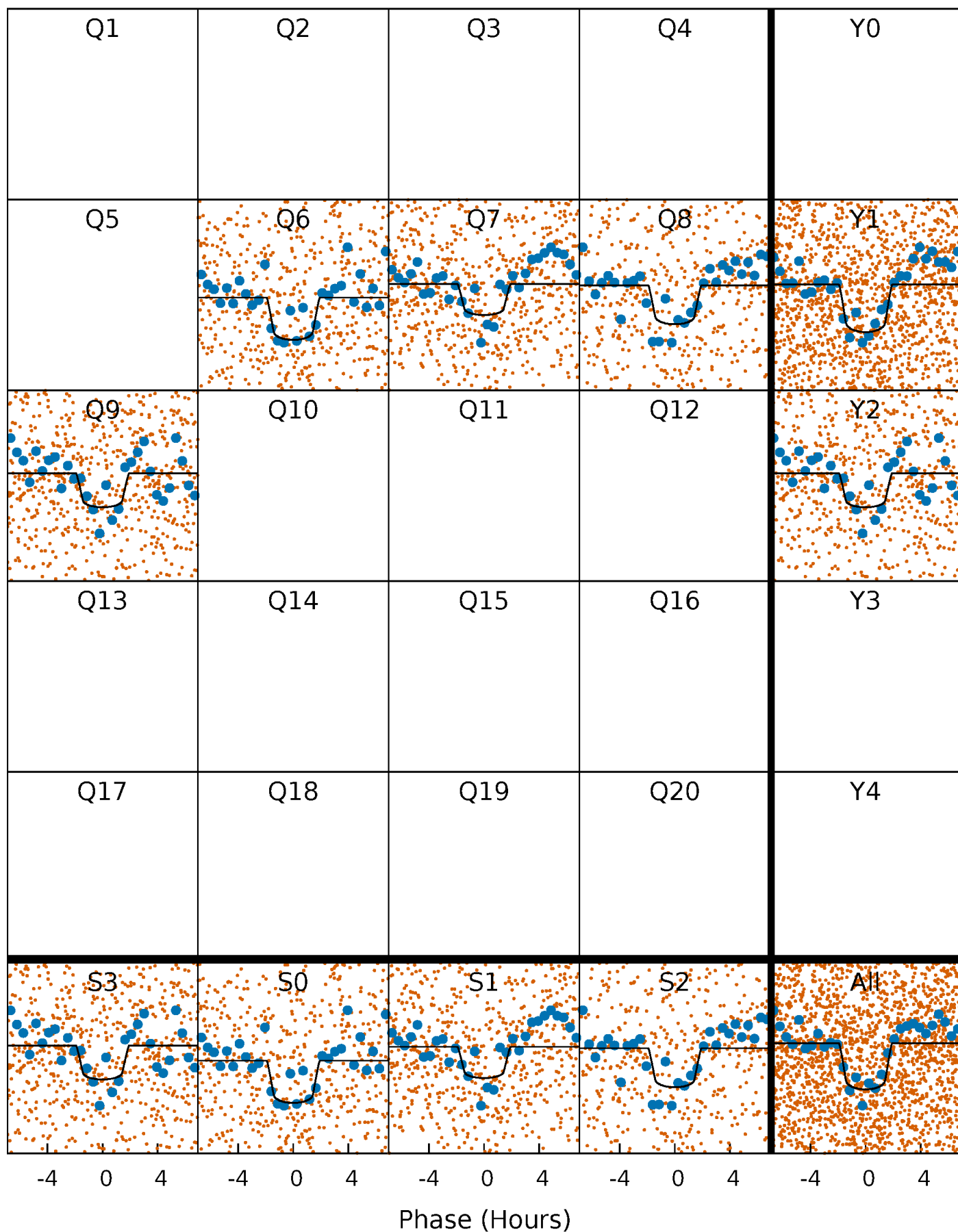
TCE 005478766-01 P= 3.132372 Days  $T_0=133.400553$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 005478766-01 P= 3.132372 Days  $T_0=133.400553$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

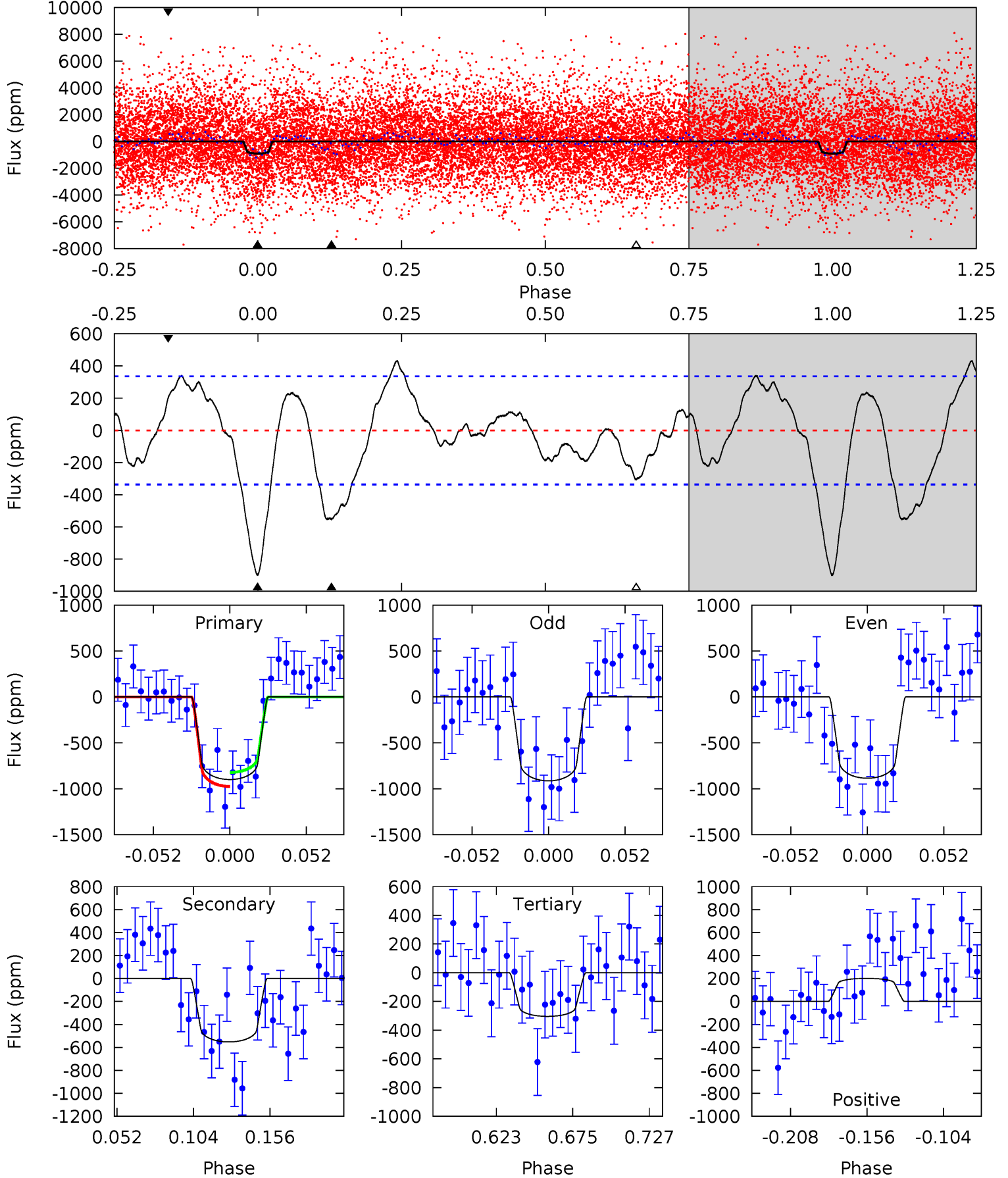
TCE 005478766-01 P= 3.132347 Days  $T_0=133.405623$  (BKJD)



# DV Model-Shift Uniqueness Test

005478766-01, P = 3.132372 Days, E = 133.400553 Days

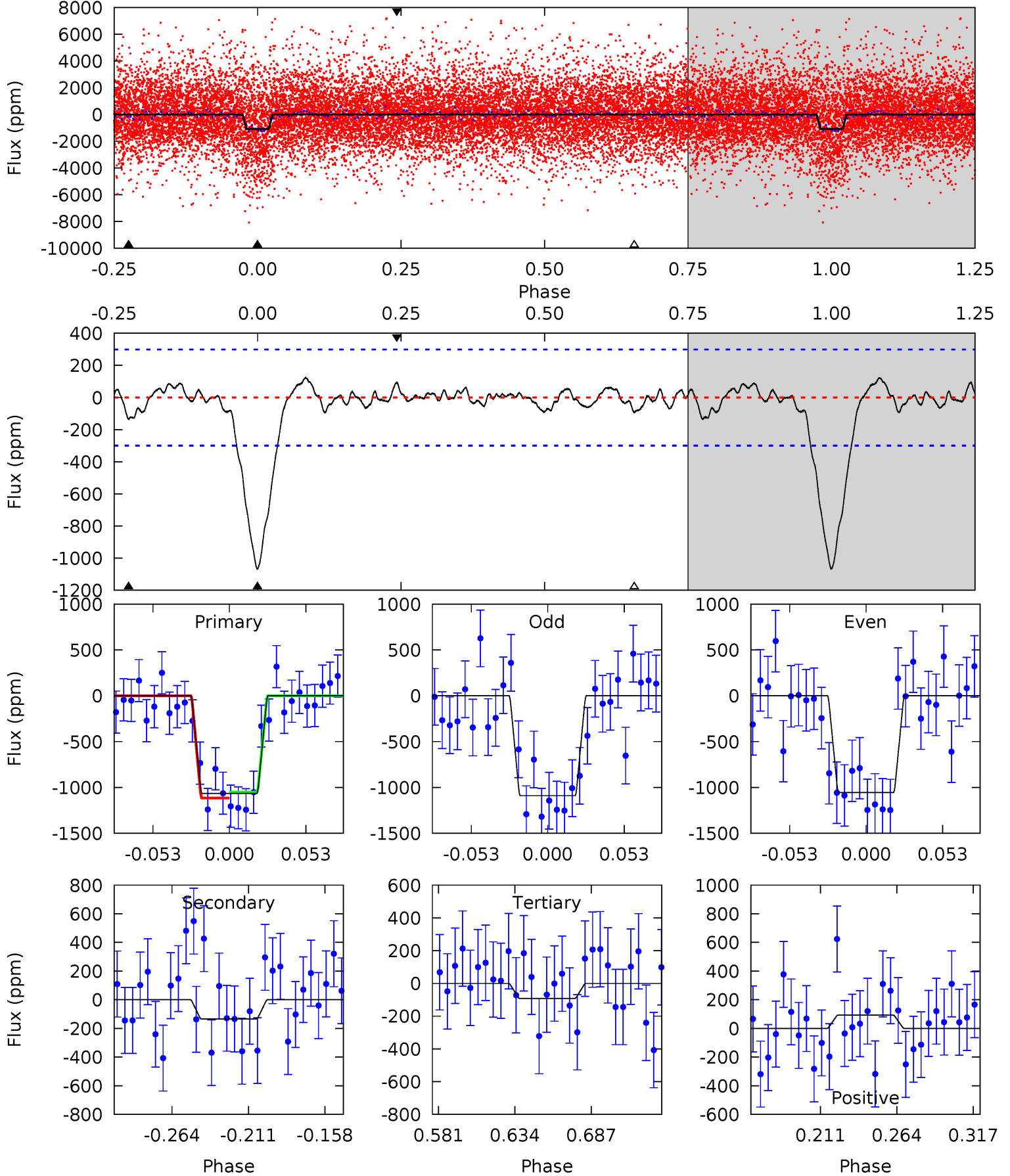
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	7.72	4.25	2.81	4.70	1.94	2.32	8.32	9.76	3.47	4.91	0.20	1.01	0.32	1.07



# Alt Model-Shift Uniqueness Test

005478766-01, P = 3.132347 Days, E = 133.405623 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
16.7	2.11	1.45	1.46	4.70	1.94	0.68	15.3	15.3	0.66	0.65	0.26	0.94	0.10	0.52



### Stellar Parameters For KIC 005478766

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$10767^{+332}_{-442}$	$3.638^{+0.451}_{-0.080}$	$0.070^{+0.050}_{-0.600}$	$4.530^{+0.401}_{-2.271}$	$3.248^{+0.105}_{-0.949}$	$0.049^{+0.226}_{-0.013}$
	+3%/-4%	+12%/-2%	+71%/-857%	+9%/-50%	+3%/-29%	+460%/-27%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005478766-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-552 \pm 72$	$13.84^{+10.84}_{-8.53}$	$5570^{+319}_{-613}$	$8553^{+10360}_{-2388}$	$5.645^{+34.091}_{-3.770}$
Alt.	$-135 \pm 64$	$14.43^{+11.03}_{-8.14}$	$5514^{+345}_{-652}$	$5216^{+3438}_{-2195}$	$1.135^{+5.148}_{-0.805}$

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

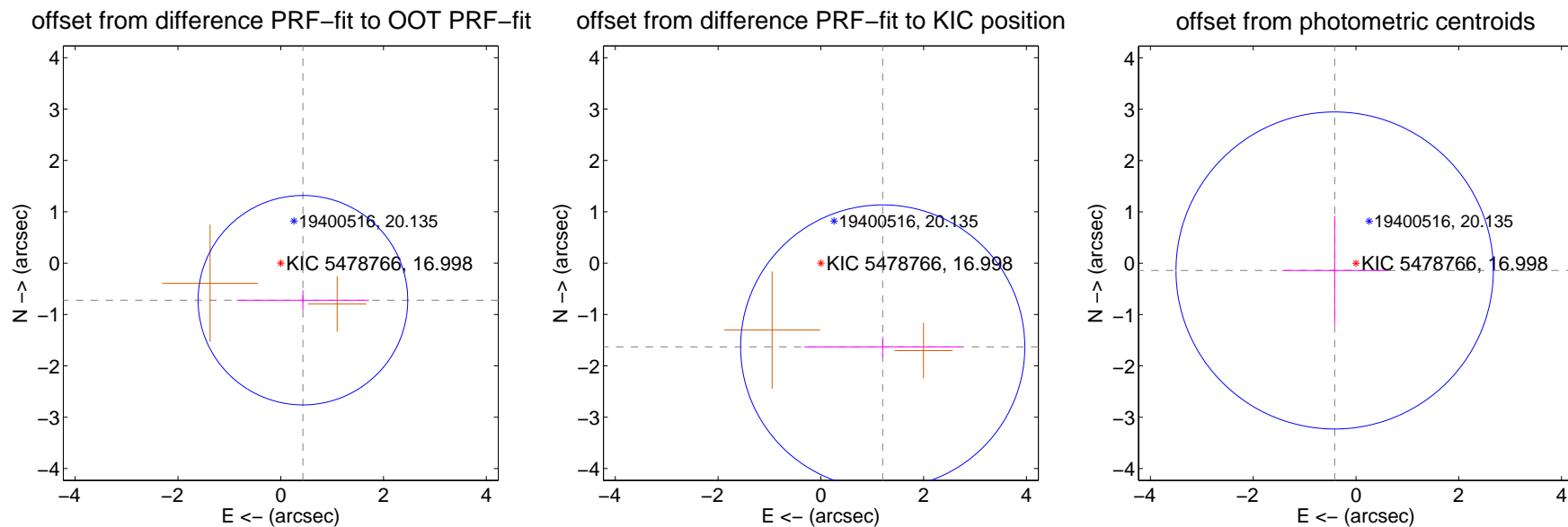
## DV Centroid Data

Supplemental centroid analysis for 005478766-01. Kepler magnitude: 17.00. Transit SNR 9.00

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.841 \pm 0.680$	1.24	$-0.431 \pm 1.285$	$-0.722 \pm 0.193$
PRF-fit source offset from KIC position	$2.026 \pm 0.921$	2.20	$-1.204 \pm 1.529$	$-1.630 \pm 0.192$
photometric centroid source offset	$0.44 \pm 1.03$	0.43	$0.41 \pm 1.03$	$-0.14 \pm 1.06$



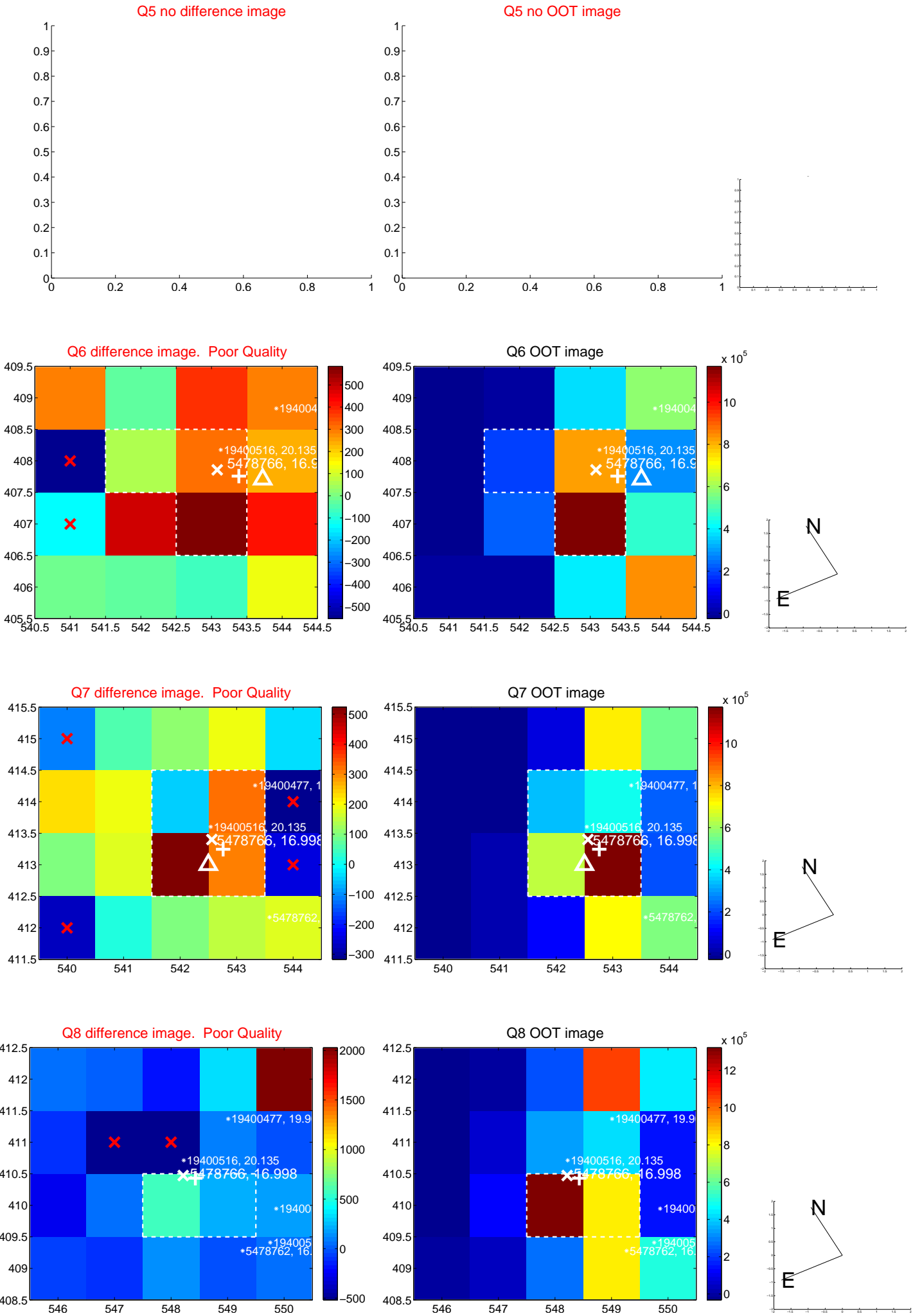
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

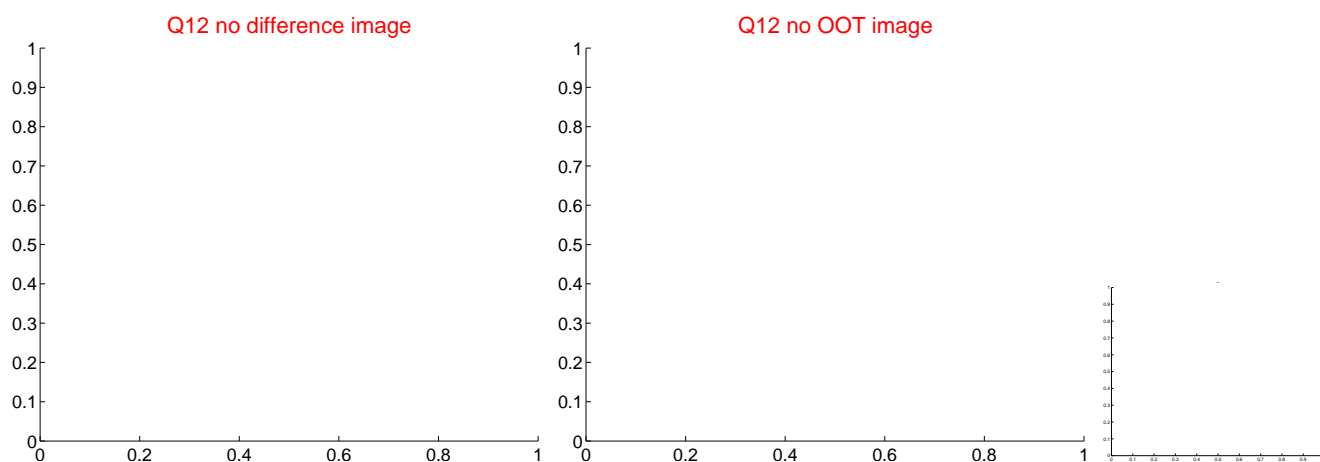
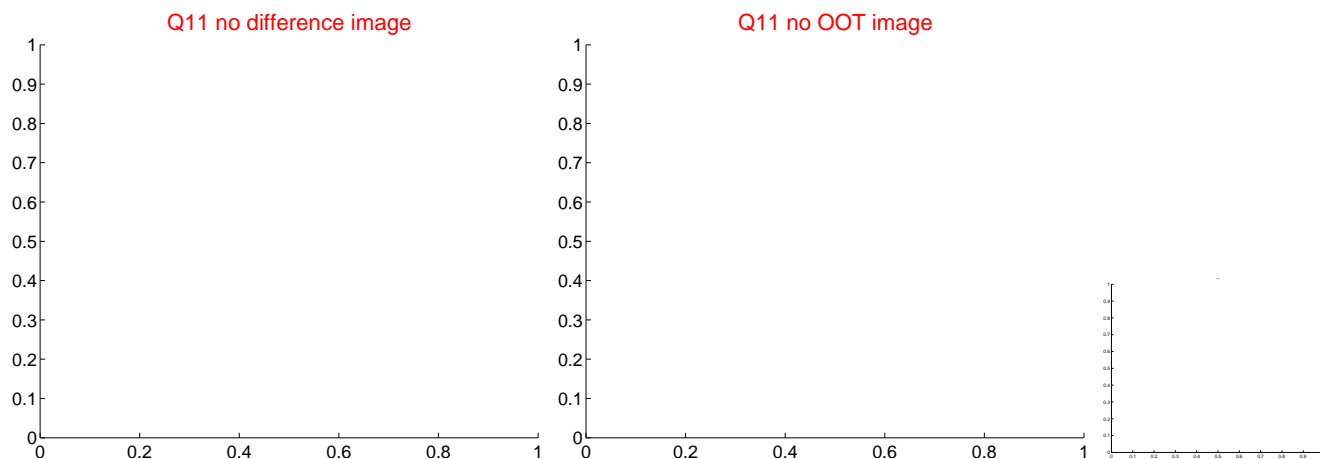
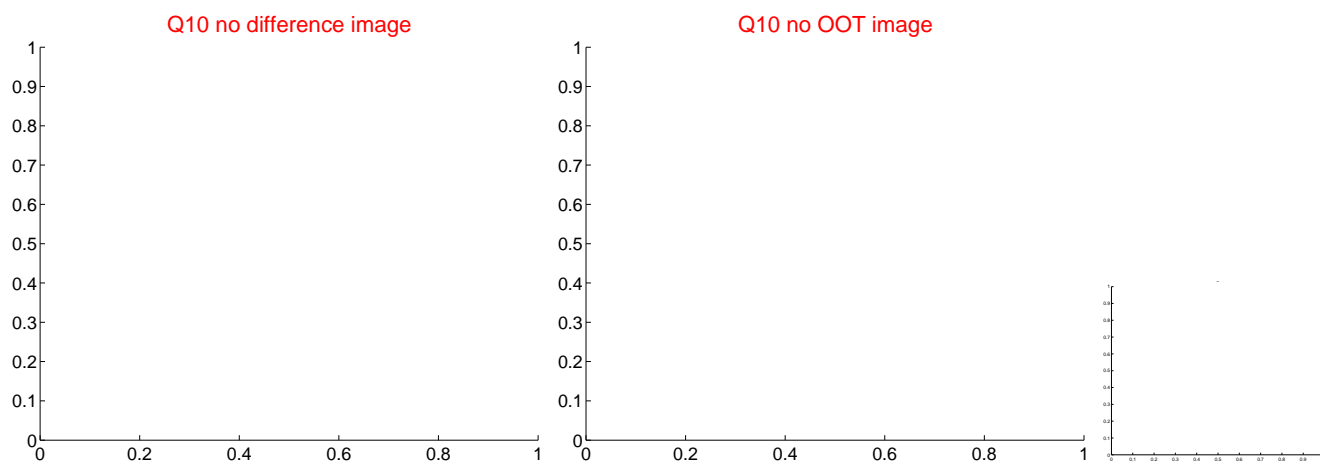
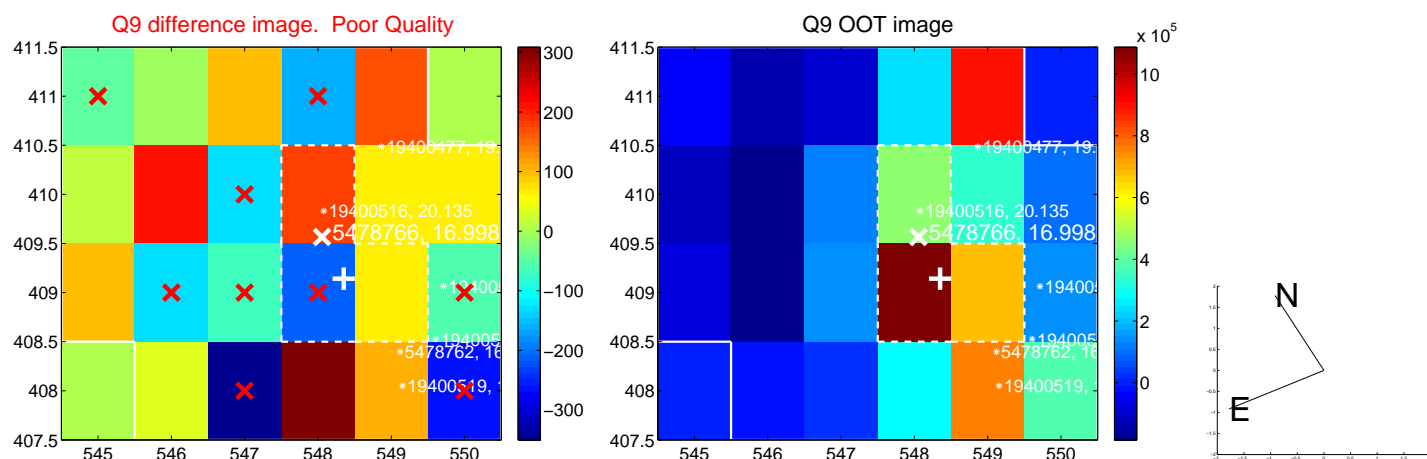




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



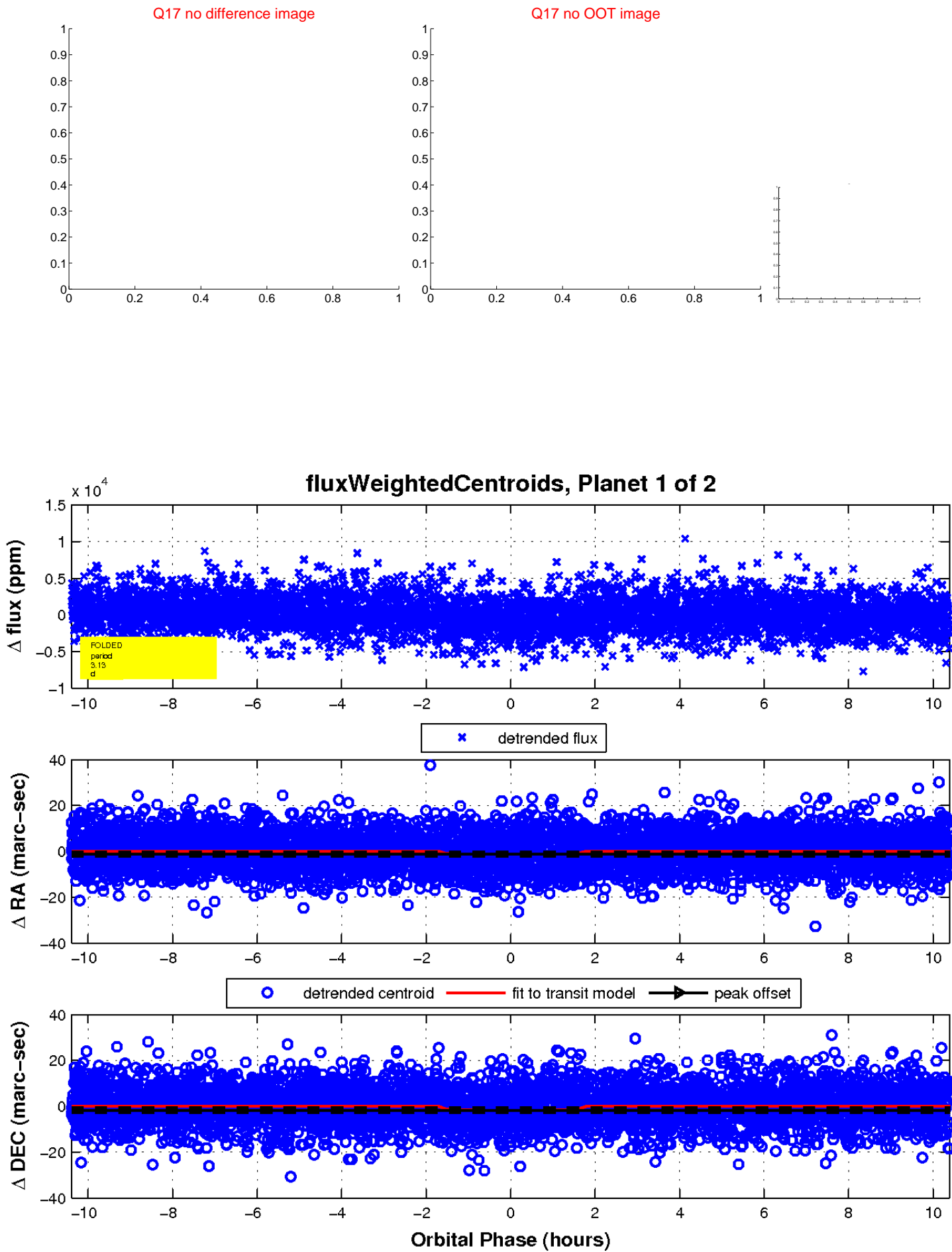
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

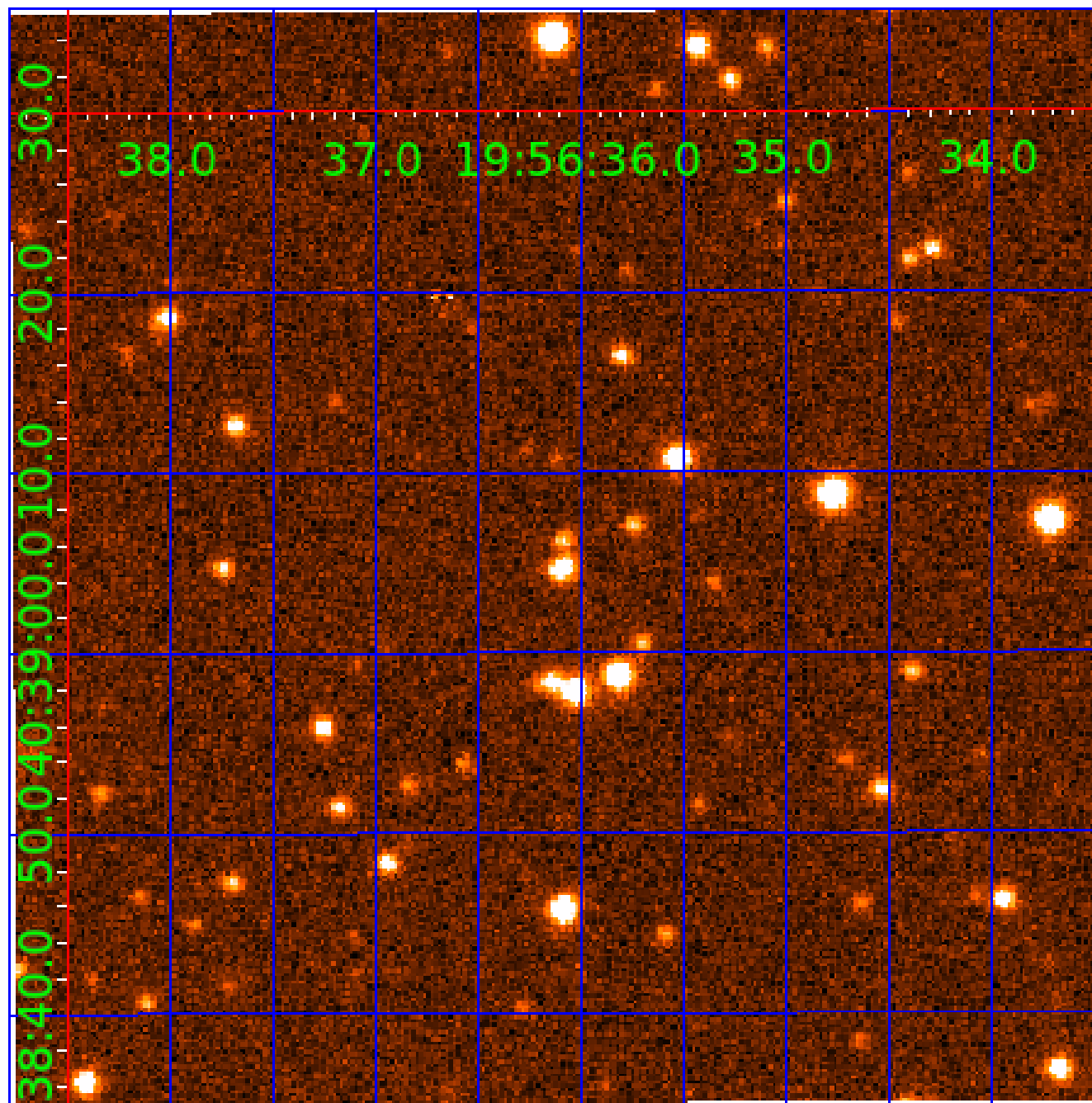


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005478766

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005478766-01	OBS	No	3.132372	133.400553	907.3	3.465	8.7	9.0	4.53	10767	14.37	64097.48
005478766-02	OBS	No	1.565612	132.498535	516.7	8.354	8.9	9.2	4.53	10767	12.45	161594.43

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005478766-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_FEW_DIFFS
005478766-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_KIC_POS

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

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

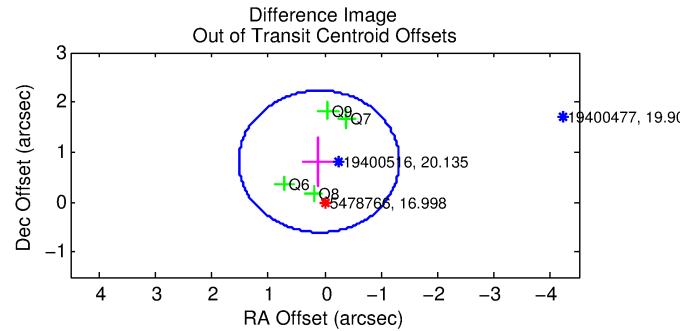
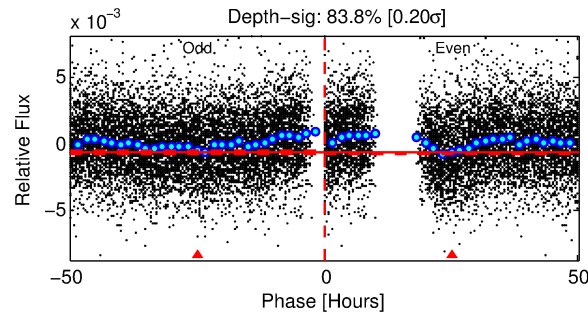
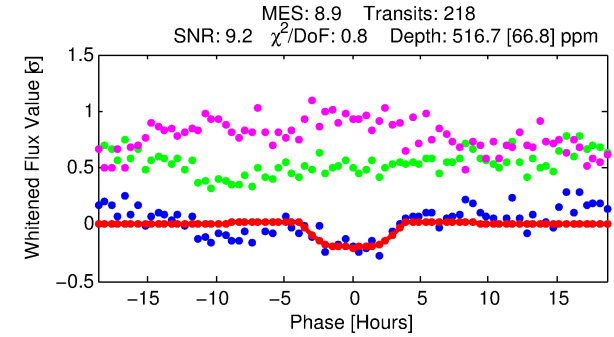
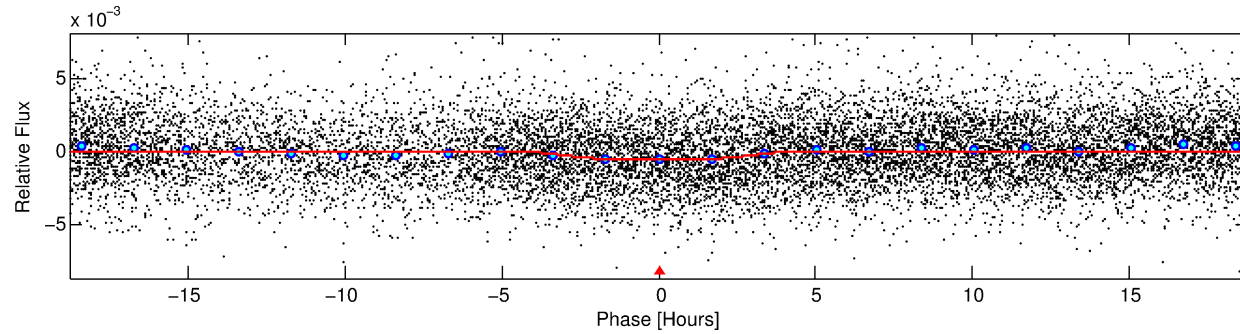
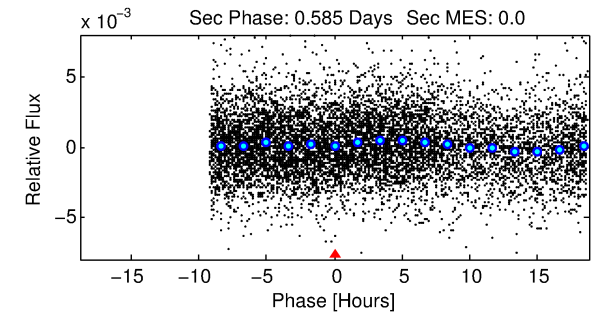
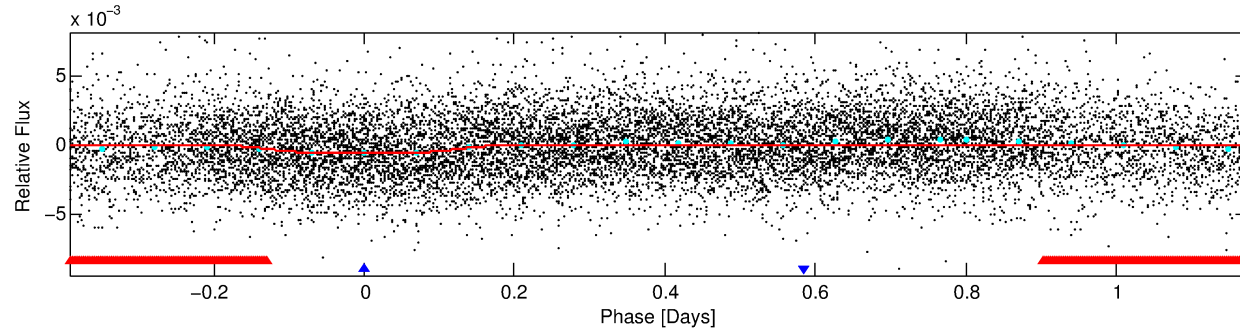
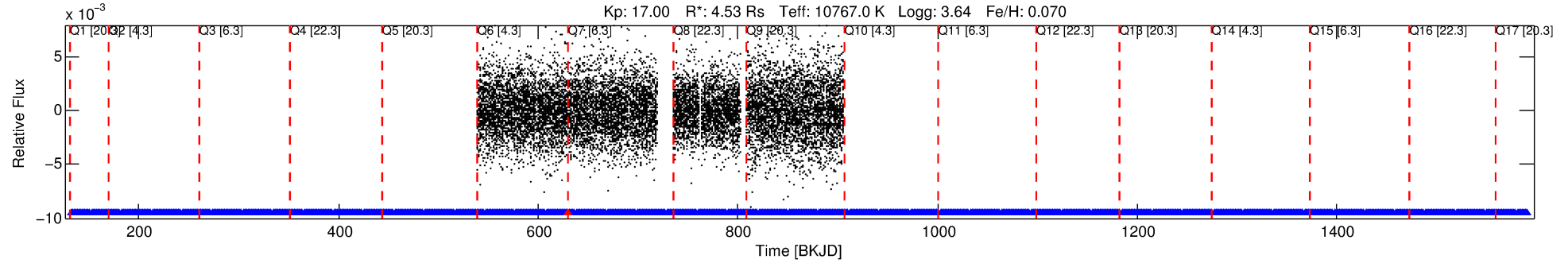
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005478766-02

No Significant Match Found

# DV One-Page Summary

KIC: 5478766 Candidate: 2 of 2 Period: 1.566 d



## DV Fit Results:

Period = 1.56561 [0.00009] d  
Epoch = 132.4985 [0.0302] BKJD  
Rp/R\* = 0.0252 [0.0020]  
a/R\* = 1.11 [0.07]  
b = 0.96 [0.03]  
Seff = 161594.43 [127029.86]  
Teq = 5112 [1005] K  
Rp = 12.45 [6.32] Re  
a = 0.0391 [0.0188] AU  
Ag = N/A  
Teffp = N/A

## DV Diagnostic Results:

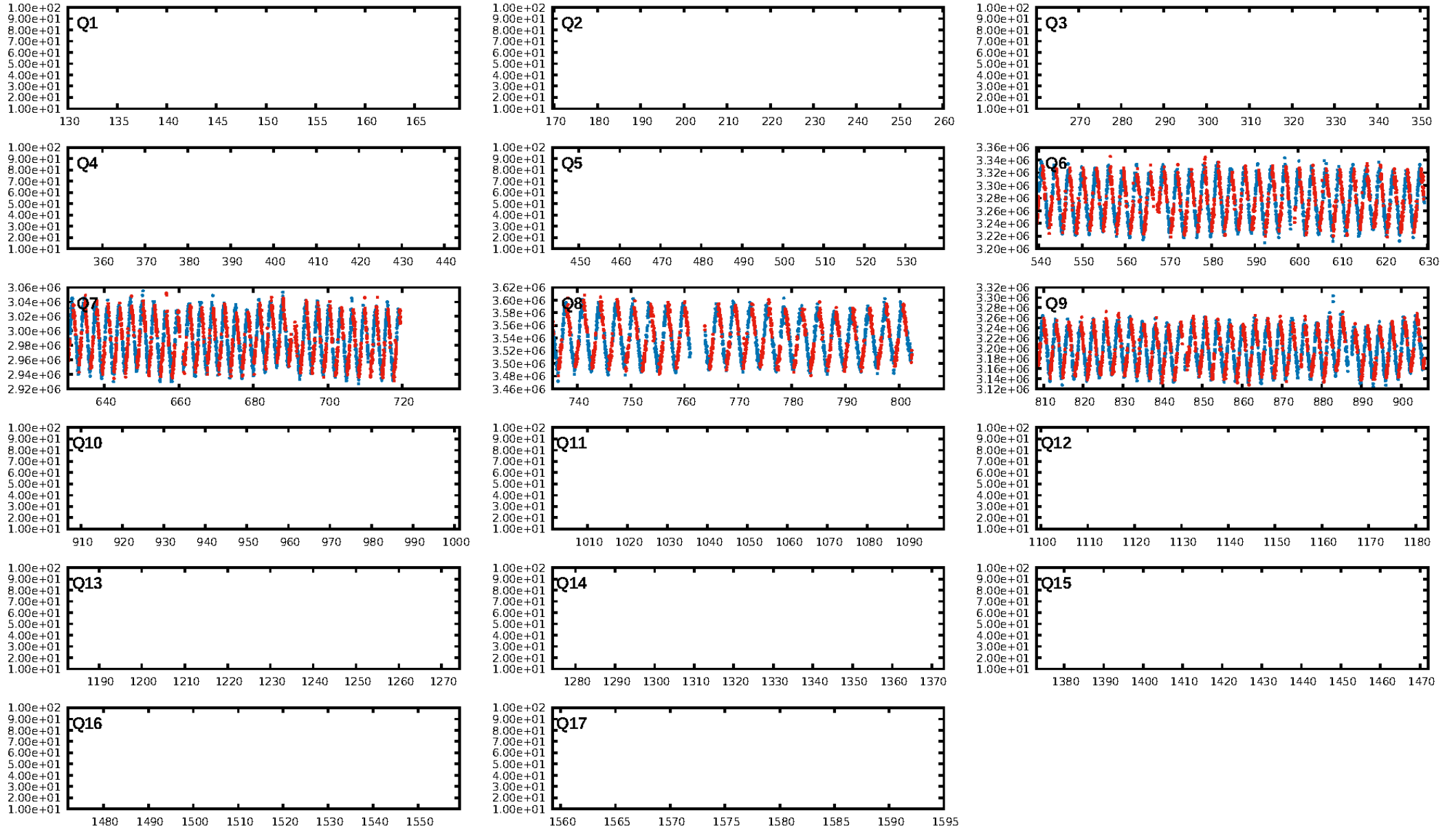
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [4.16σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.23e-16  
RollingBand-fgt: 1.00 [217/218]  
**GhostDiagnostic-chr: 0.8592**  
Centroid-sig: 65.2%  
Centroid-so: 2.042 arcsec [1.92σ]  
OotOffset-rm: 0.818 arcsec [1.73σ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-rm: **0.588 arcsec [4.73σ]**  
KicOffset-st: 1/1/1/1 [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 03:00:08 Z

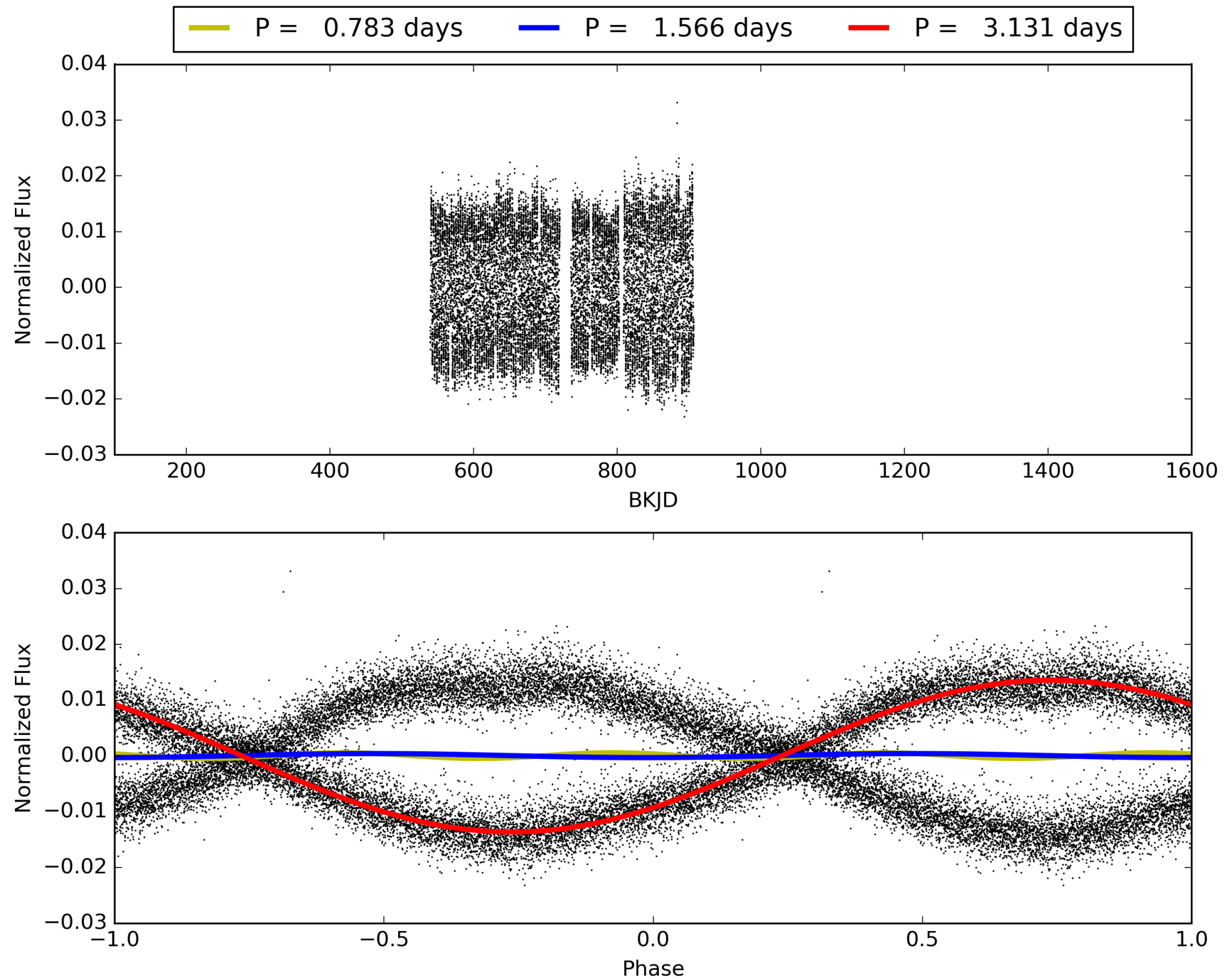
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005478766-02, PDC Light Curves

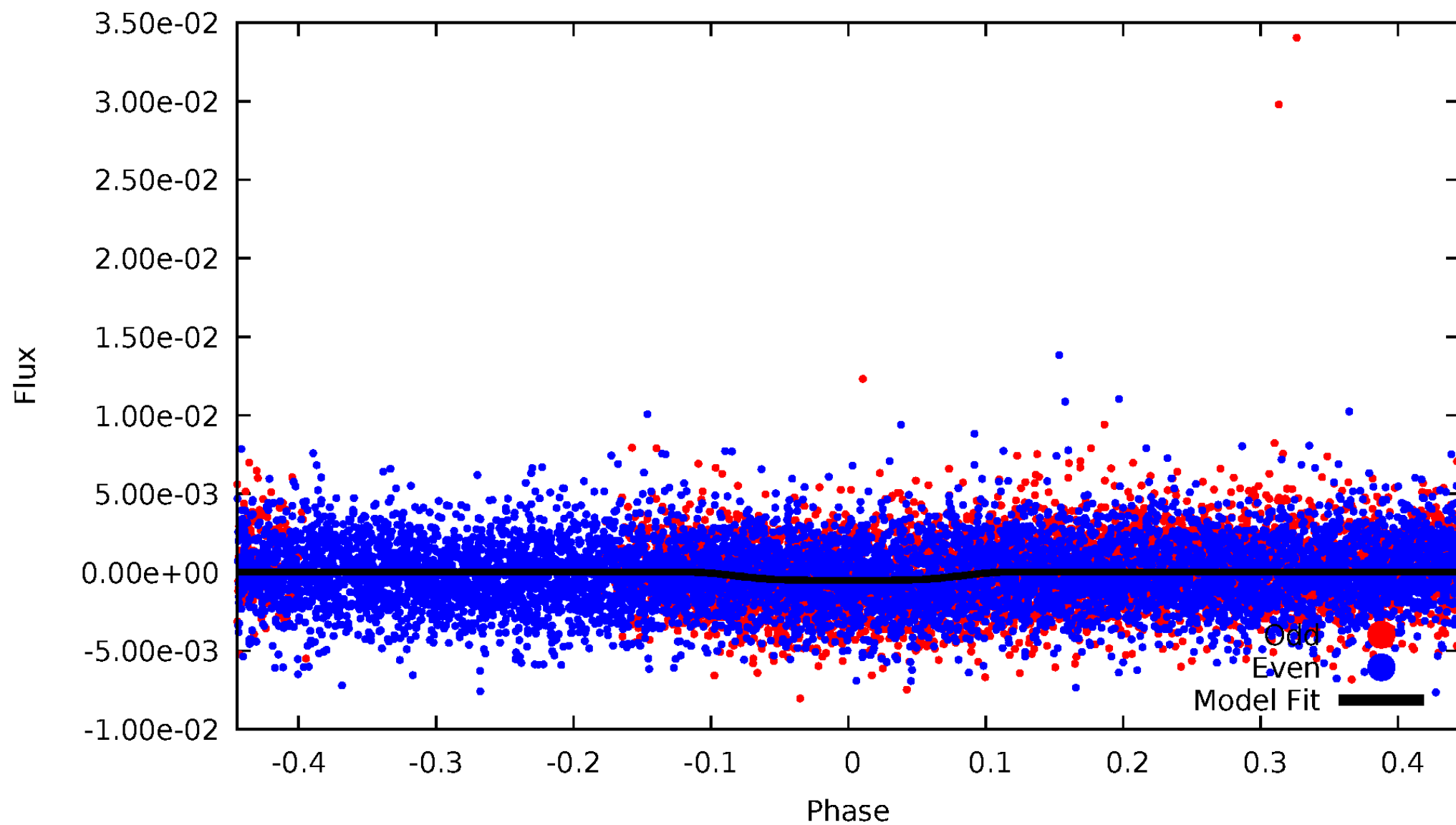


TCE 005478766-02



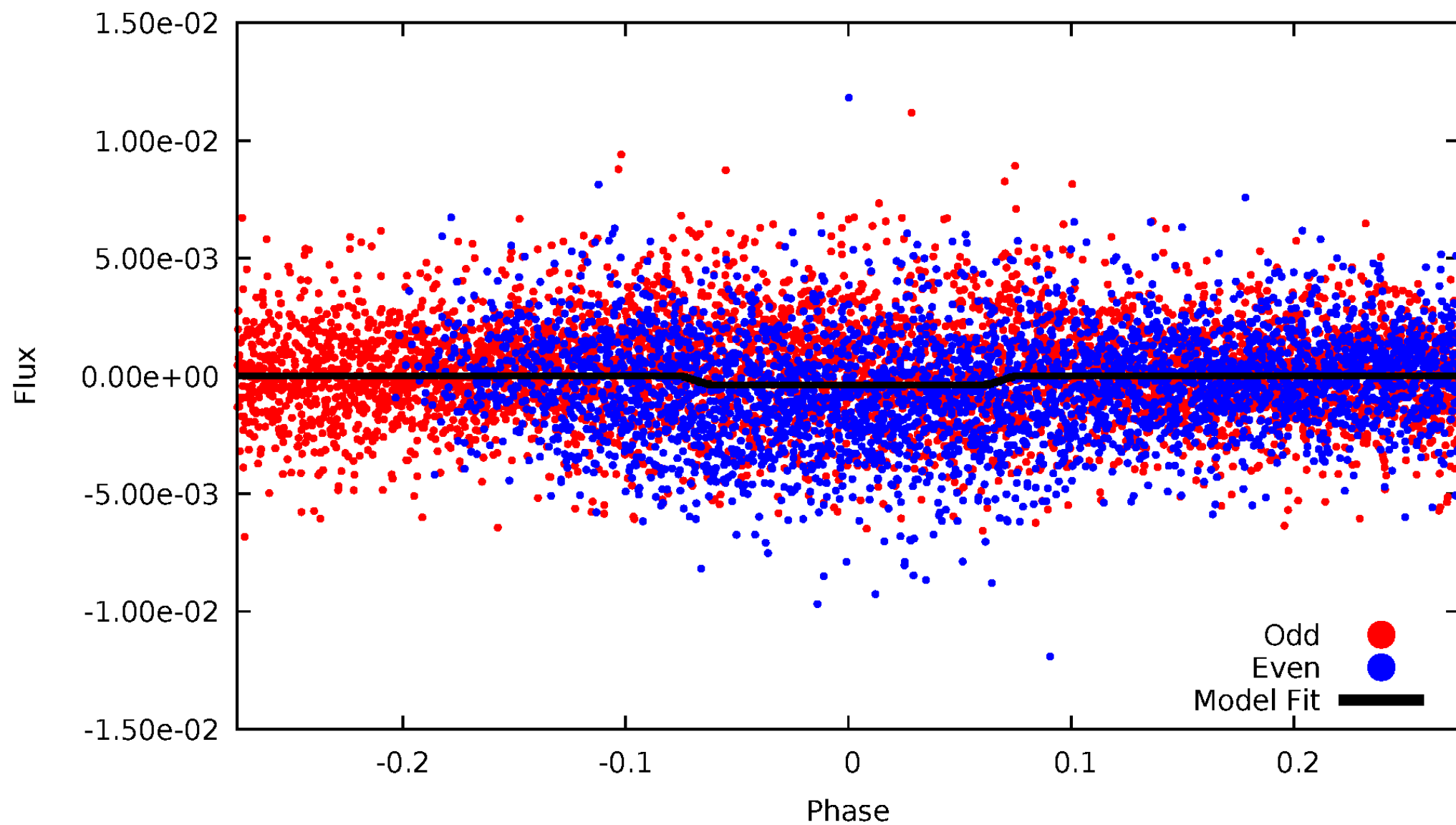
# DV Odd/Even

TCE 005478766-02



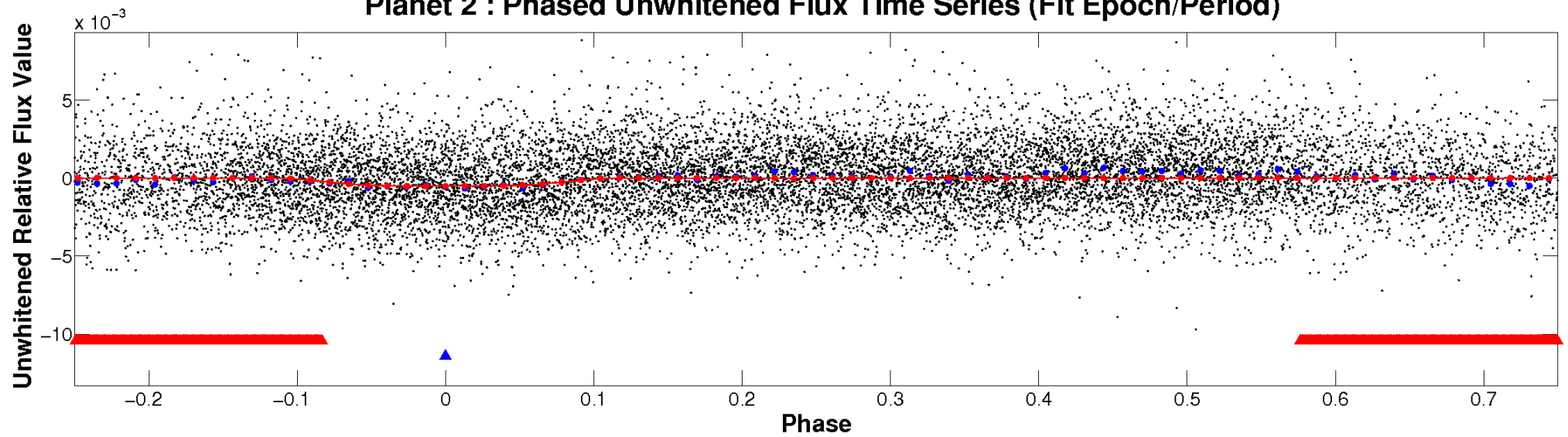
# ALT Odd/Even

TCE 005478766-02

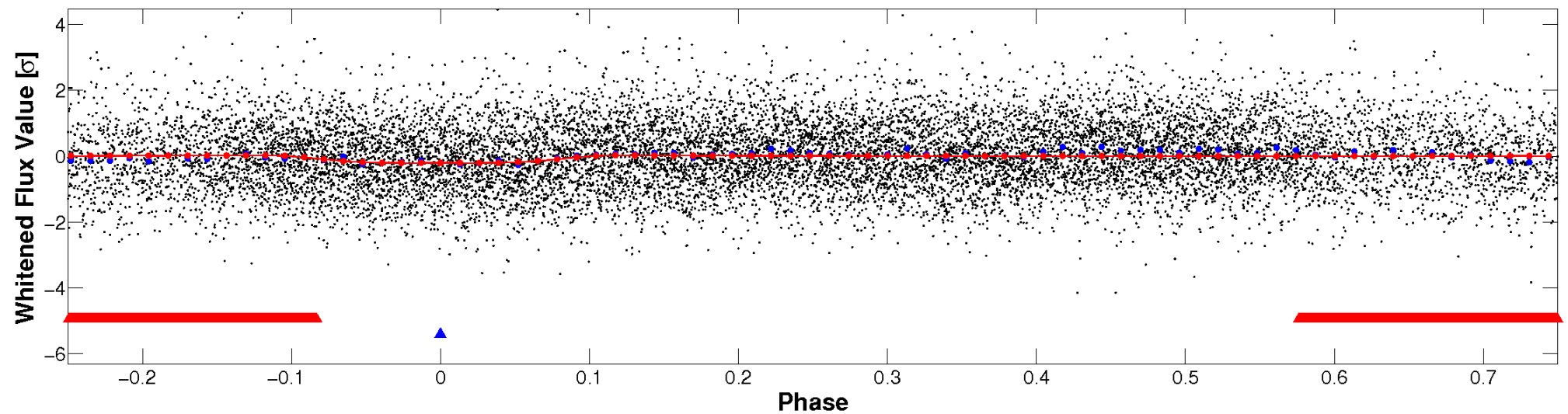


# Non-Whitened Vs. Whitened Light Curve

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

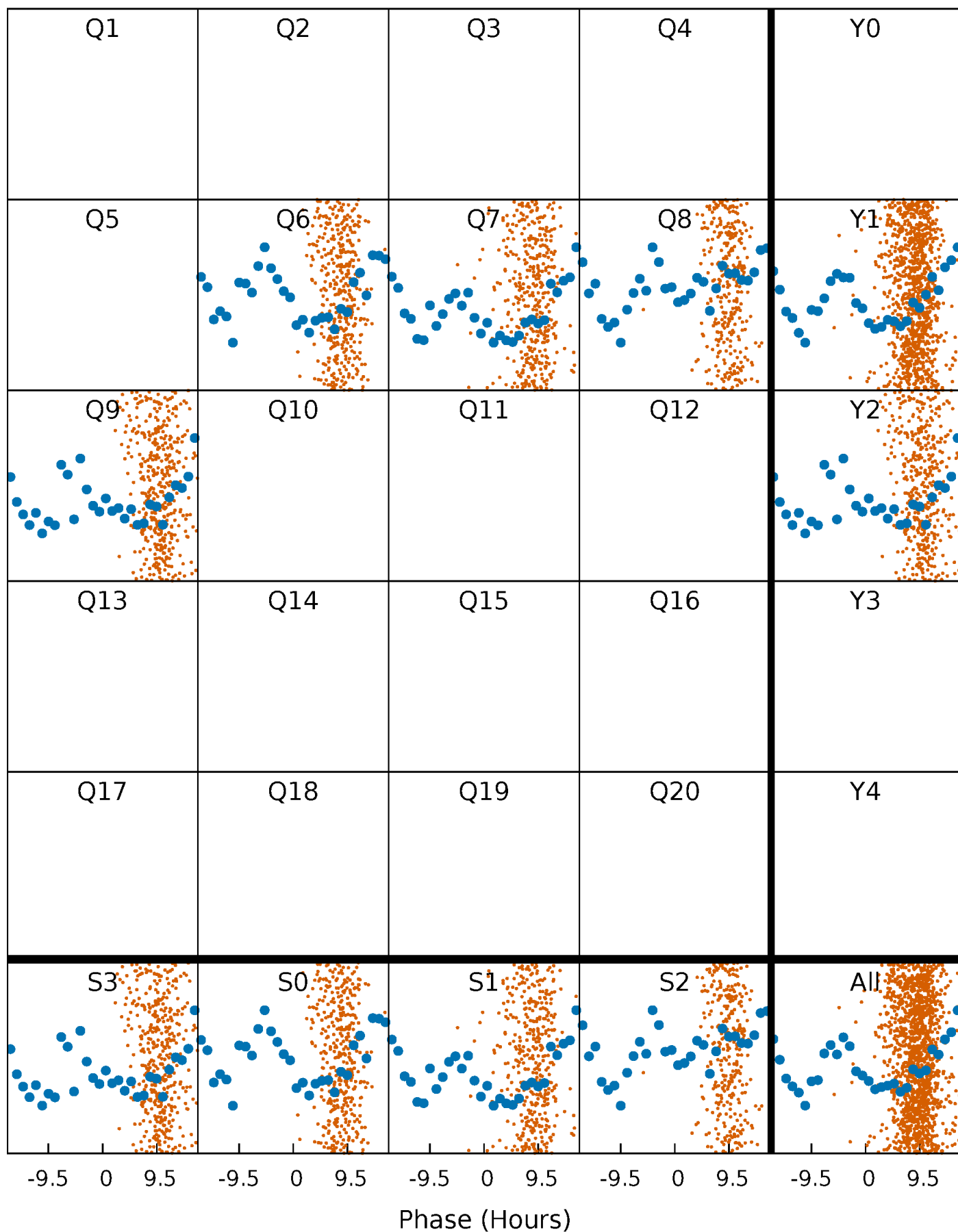


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

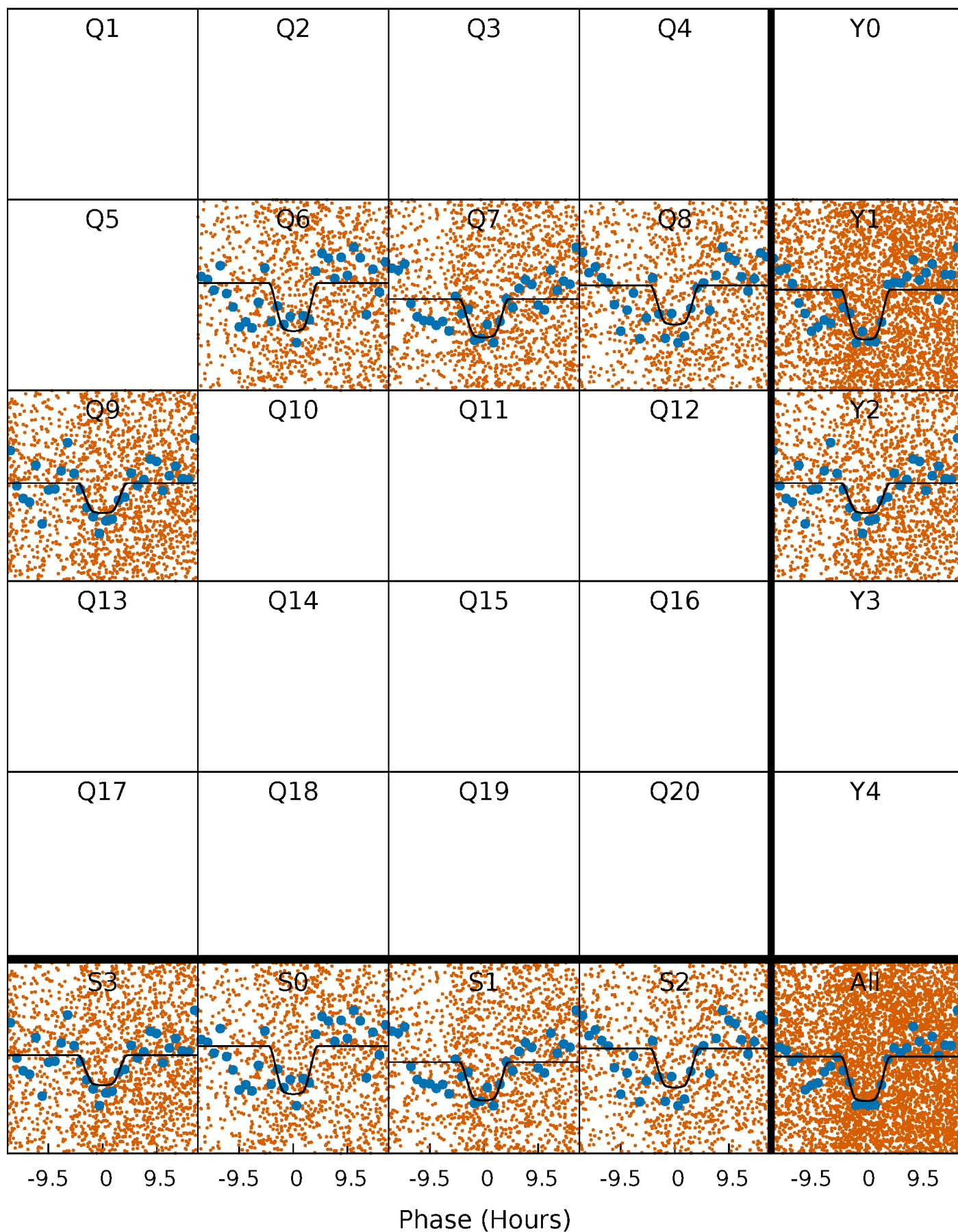
TCE 005478766-02     $P = 1.565612$  Days     $T_0 = 132.498535$  (BKJD)





# DV Quarter-Phased Transit Curves

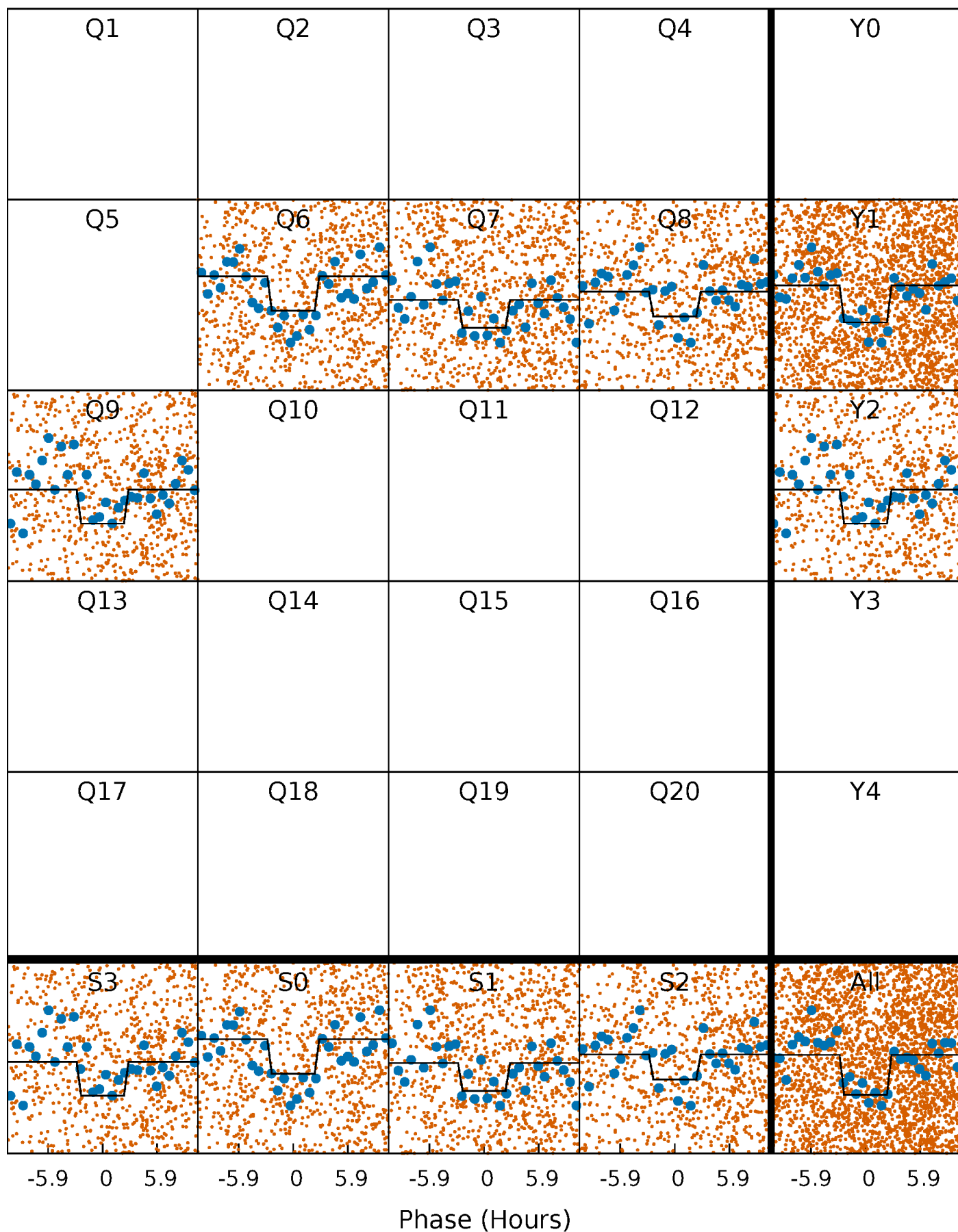
TCE 005478766-02   P= 1.565612 Days    $T_0=132.498535$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

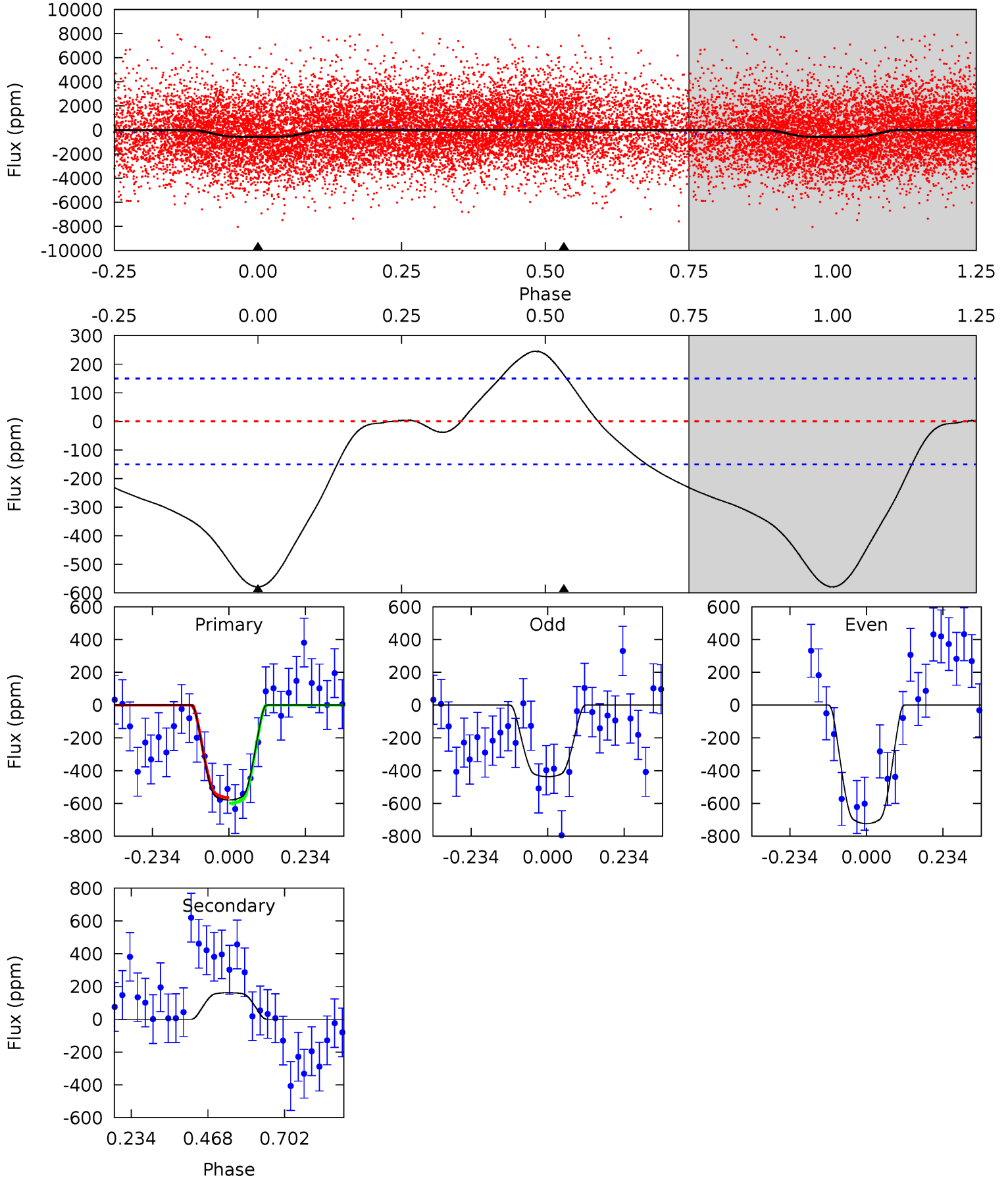
TCE 005478766-02    P= 1.565445 Days     $T_0=132.576564$  (BKJD)



# DV Model-Shift Uniqueness Test

005478766-02, P = 1.565612 Days, E = 132.498535 Days

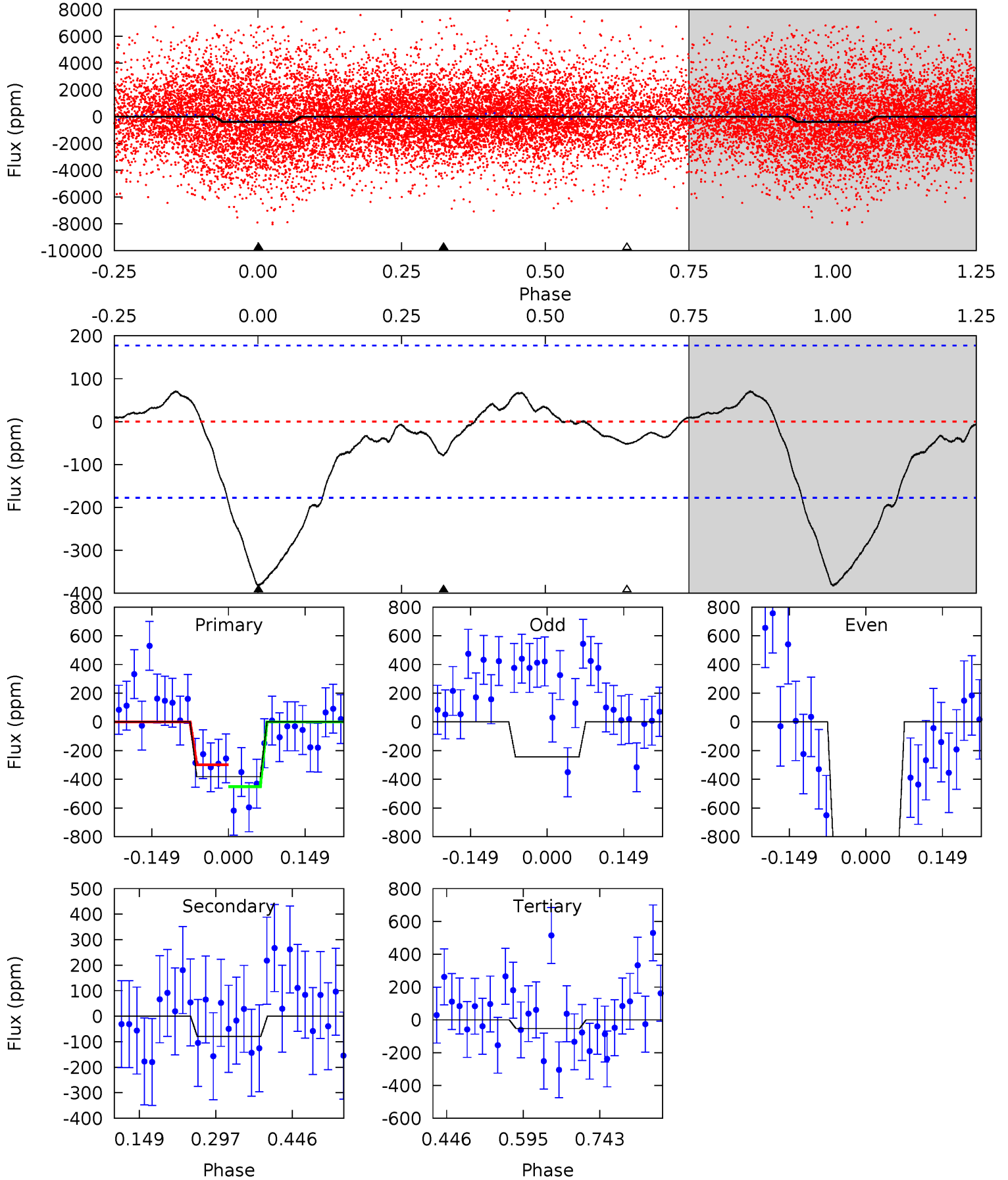
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	-4.74	0	0	4.38	1.19	1.94	16.9	16.9	-4.74	-4.74	4.16	1.11	0.30	0.50



# Alt Model-Shift Uniqueness Test

005478766-02, P = 1.565445 Days, E = 132.576564 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.64	1.98	1.33	0	4.48	1.44	0.86	8.31	9.64	0.66	1.98	9.73	1.22	0.16	1.96



### Stellar Parameters For KIC 005478766

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$10767^{+332}_{-442}$	$3.638^{+0.451}_{-0.080}$	$0.070^{+0.050}_{-0.600}$	$4.530^{+0.401}_{-2.271}$	$3.248^{+0.105}_{-0.949}$	$0.049^{+0.226}_{-0.013}$
	+3%/-4%	+12%/-2%	+71%/-857%	+9%/-50%	+3%/-29%	+460%/-27%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005478766-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$162 \pm 34$	$11.71^{+1.86}_{-2.72}$	$6988^{+433}_{-816}$	$-7416^{+493}_{-545}$	$-0.957^{+0.275}_{-0.671}$
Alt.	$-79 \pm 40$	$9.30^{+1.54}_{-2.45}$	$6948^{+439}_{-847}$	$5641^{+1129}_{-2067}$	$0.785^{+0.673}_{-0.441}$

$T_{max}$  = 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

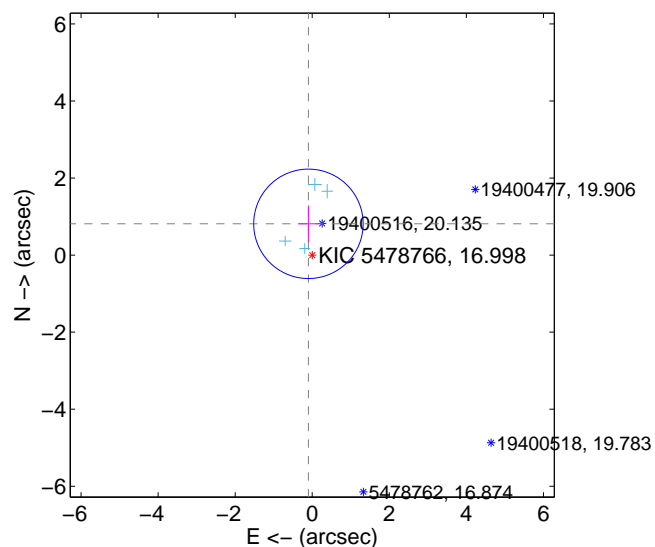
Supplemental centroid analysis for 005478766-02. Kepler magnitude: 17.00. Transit SNR 9.15

There are 4 quarters with good PRF difference image offsets

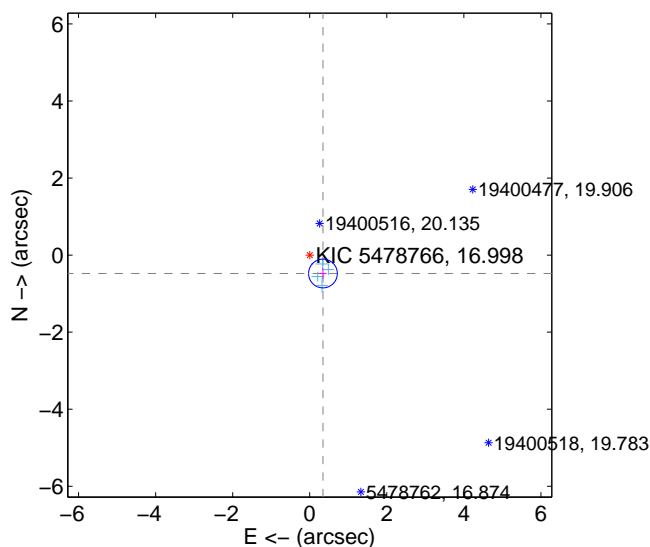
The OOT PRF centroid is offset from the target star catalog position by about 2.08 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.818 \pm 0.473$	1.73	$0.099 \pm 0.269$	$0.812 \pm 0.476$
PRF-fit source offset from KIC position	$0.588 \pm 0.124$	4.73	$-0.343 \pm 0.096$	$-0.478 \pm 0.137$
photometric centroid source offset	$2.04 \pm 1.06$	1.92	$-0.35 \pm 1.00$	$-2.01 \pm 1.07$

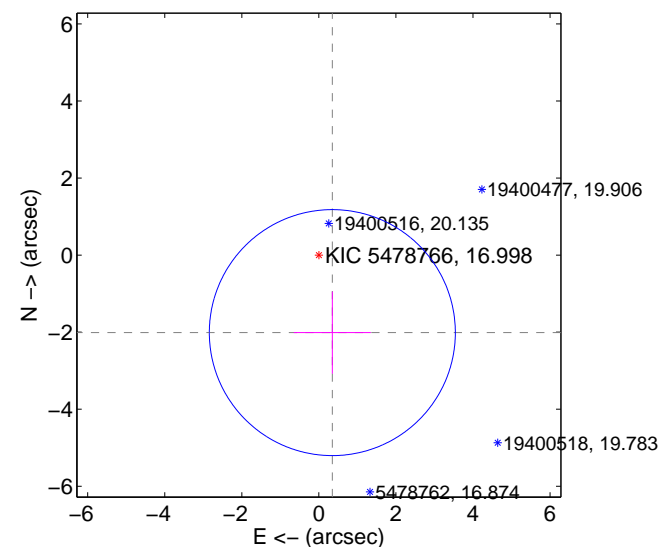
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

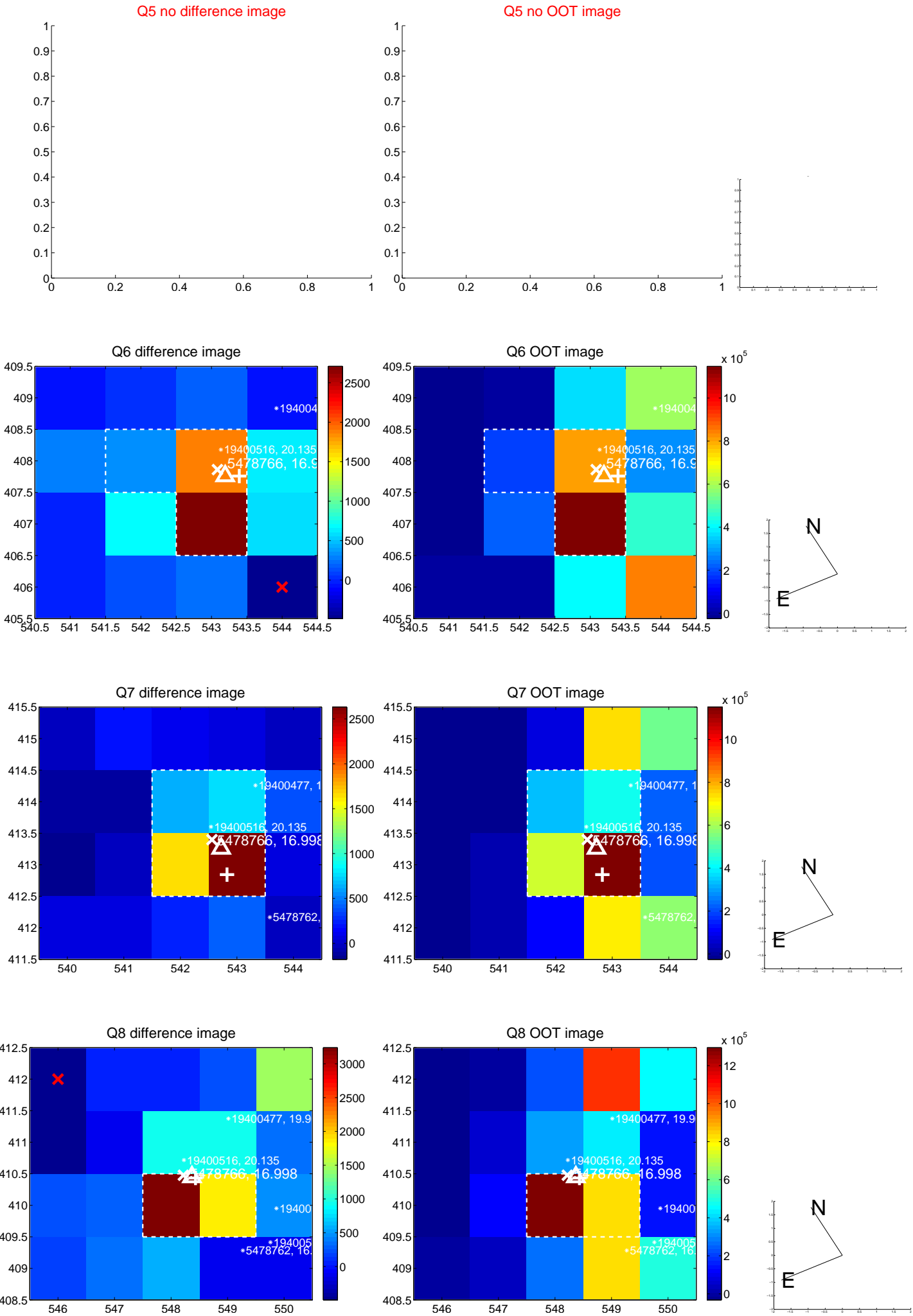


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

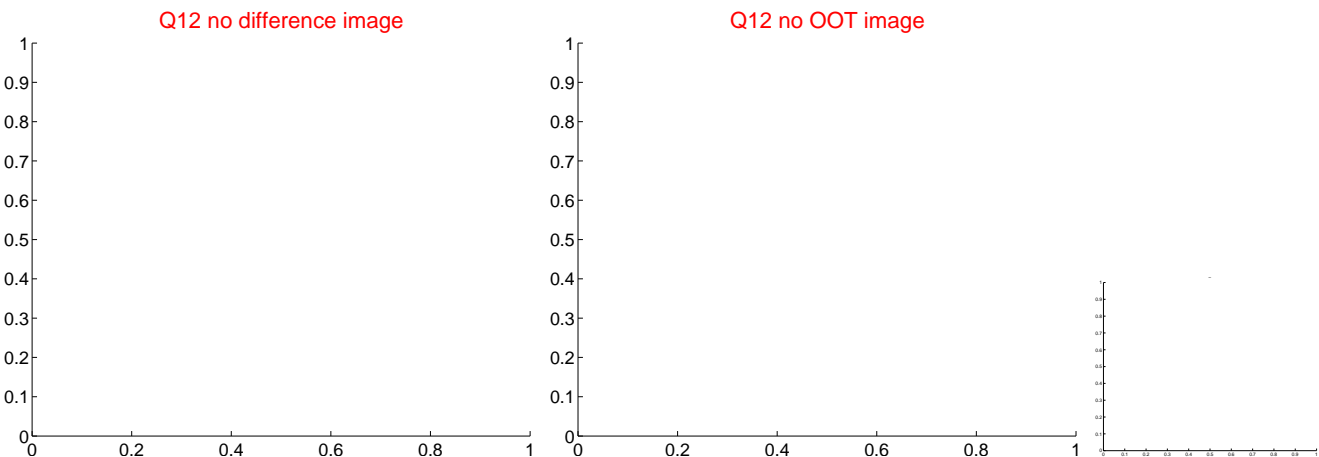
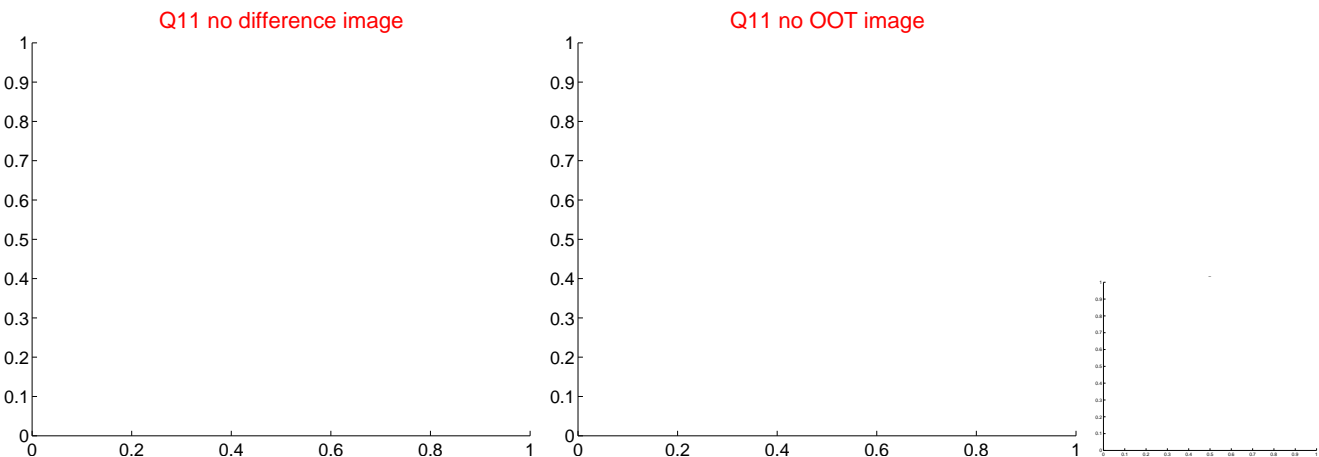
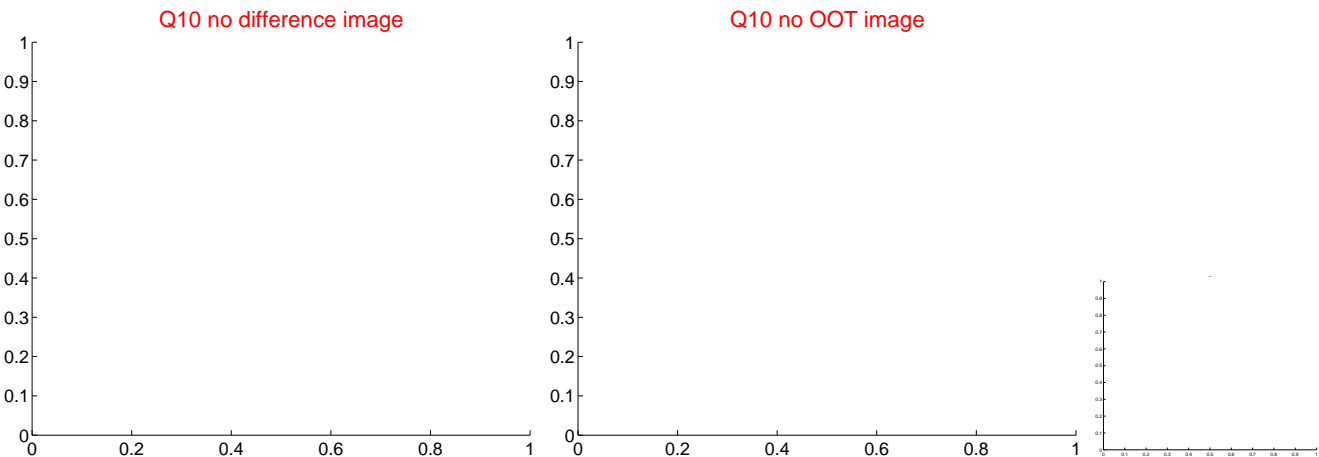
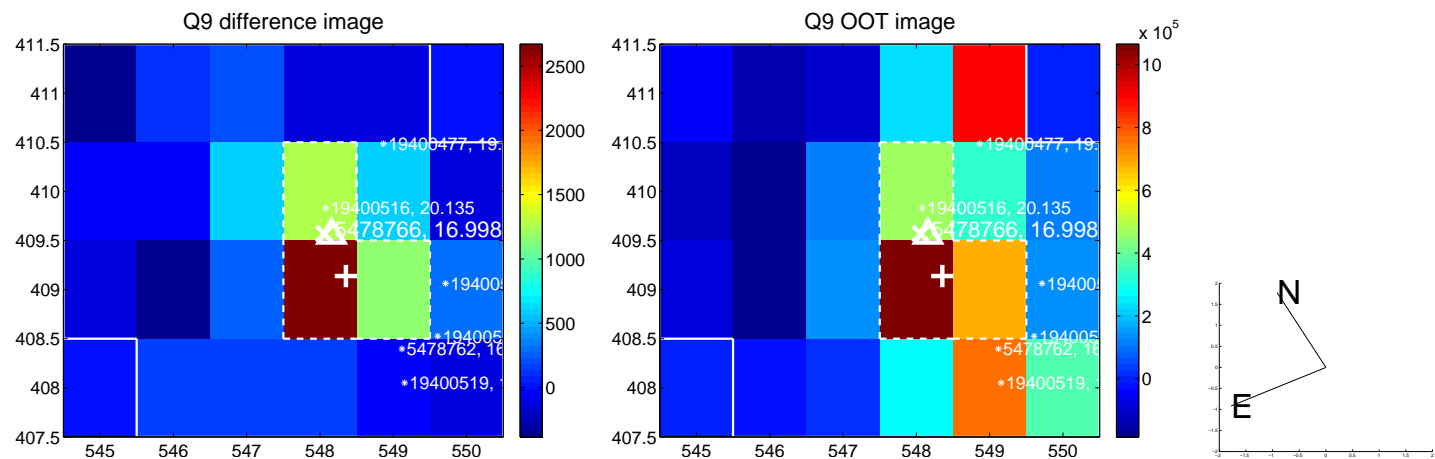


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





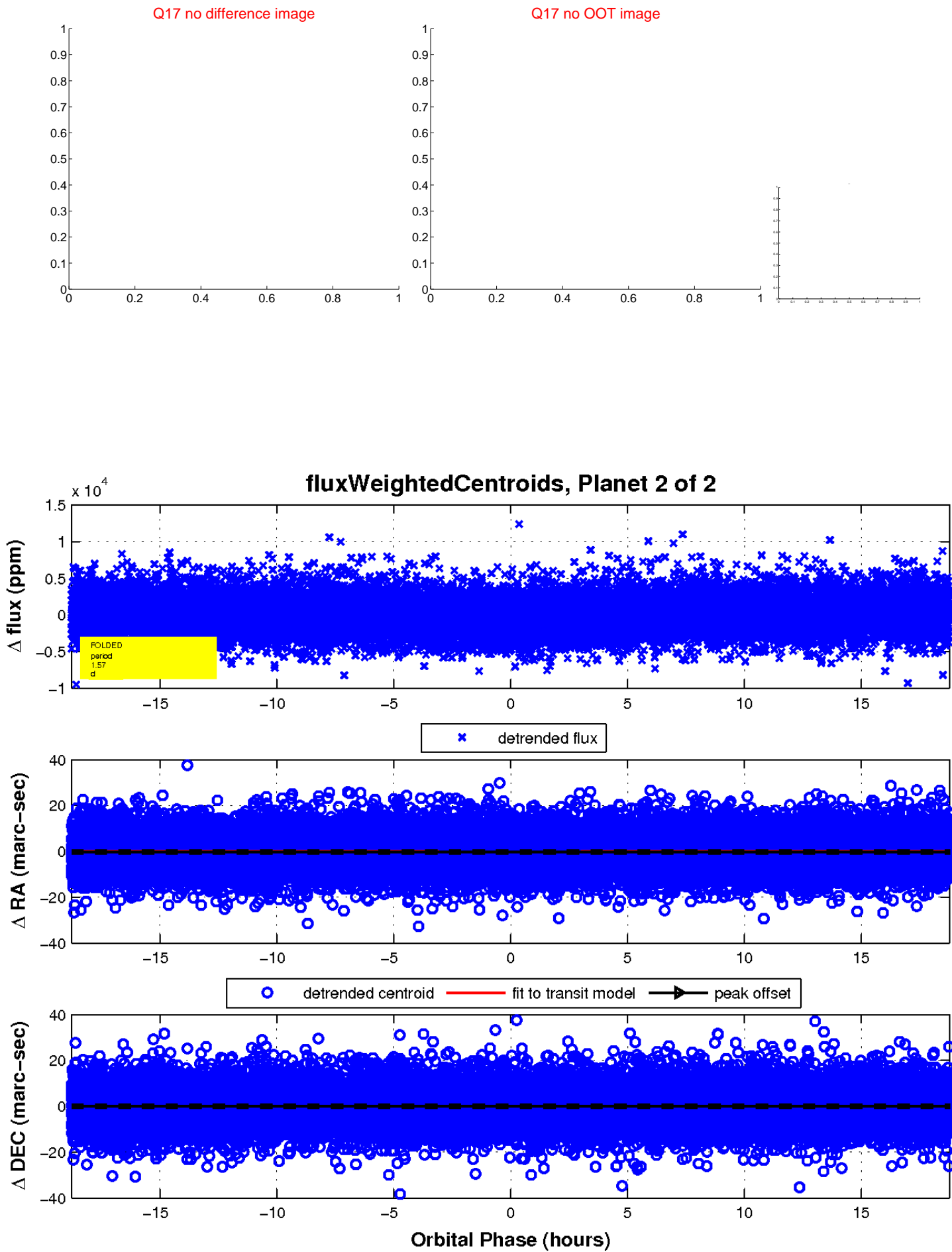
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

