

# KIC 008197358

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008197358-01	OBS	No	321.587792	206.598456	1526.6	9.512	10.5	6.8	0.65	4171	3.07	0.18
008197358-02	OBS	No	241.355225	283.817285	671.3	8.358	9.6	3.1	0.65	4171	1.94	0.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008197358-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008197358-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_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.

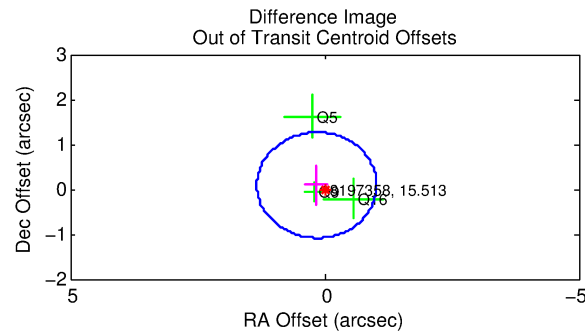
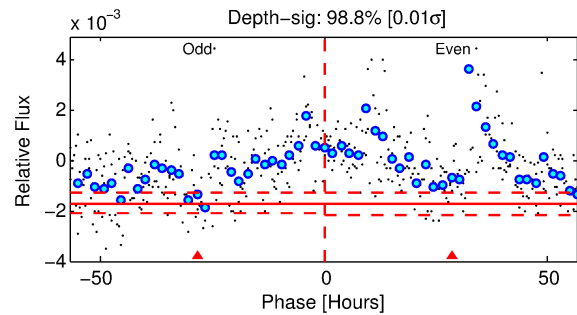
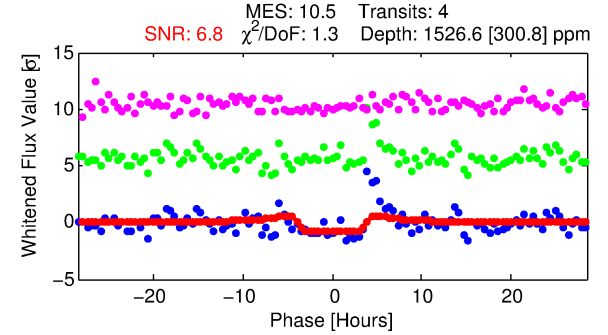
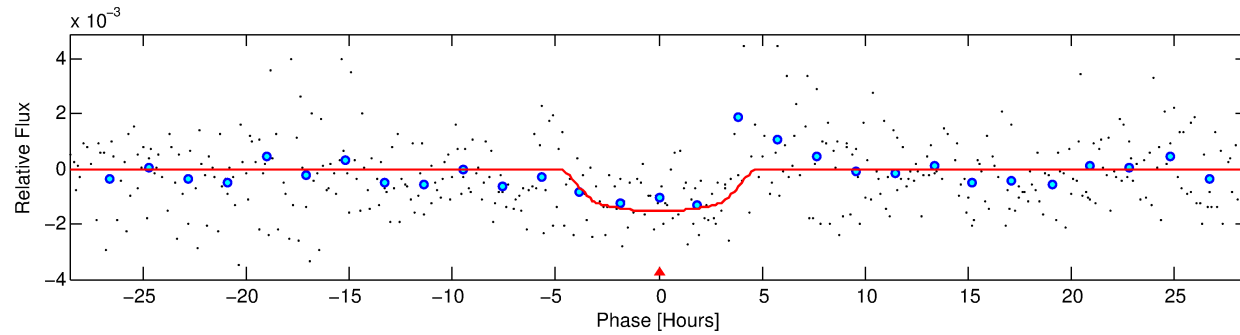
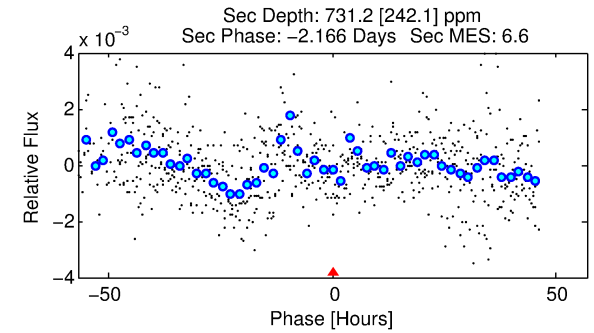
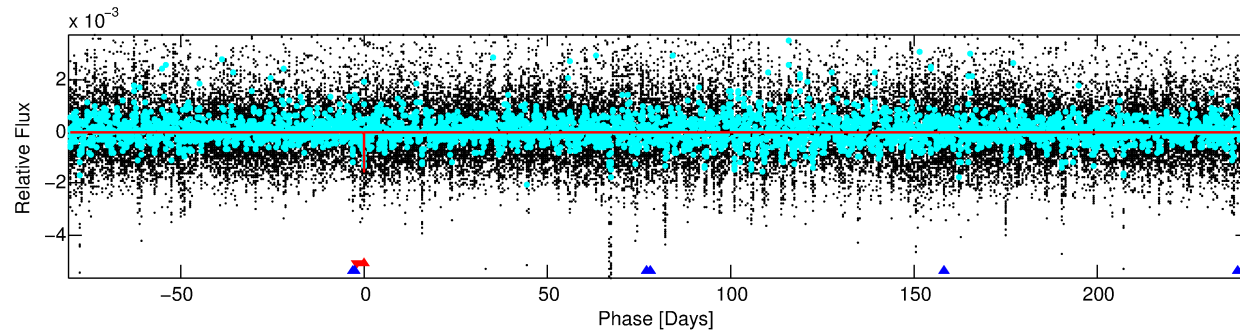
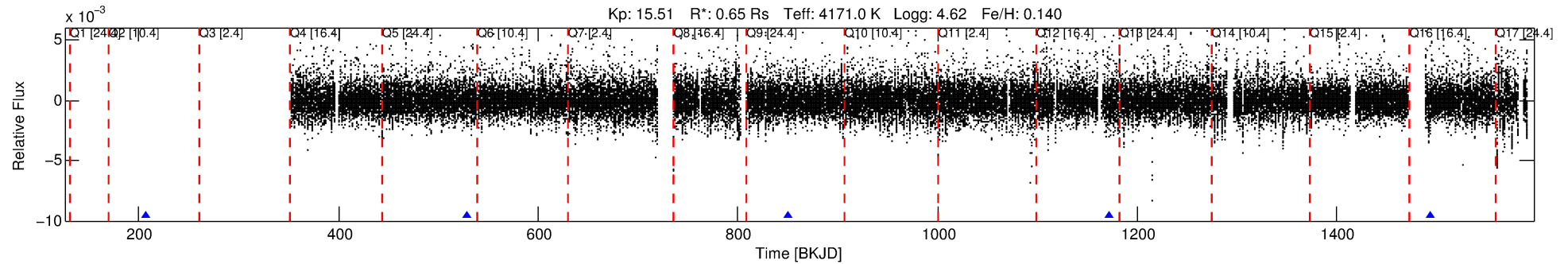
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008197358-01

No Significant Match Found

# DV One-Page Summary

KIC: 8197358 Candidate: 1 of 2 Period: 321.588 d



## DV Fit Results:

Period = 321.58779 [0.01188] d  
Epoch = 206.5985 [0.0310] BKJD  
Rp/R\* = 0.0432 [0.0078]  
a/R\* = 143.48 [69.28]  
b = 0.88 [0.12]  
Seff = 0.18 [0.03]  
Teq = 167 [8] K  
Rp = 3.07 [0.63] Re  
a = 0.7944 [0.0612] AU  
Ag = 26900.98 [13514.69] [1.99σ]  
Teffp = 3301 [425] K [7.37σ]

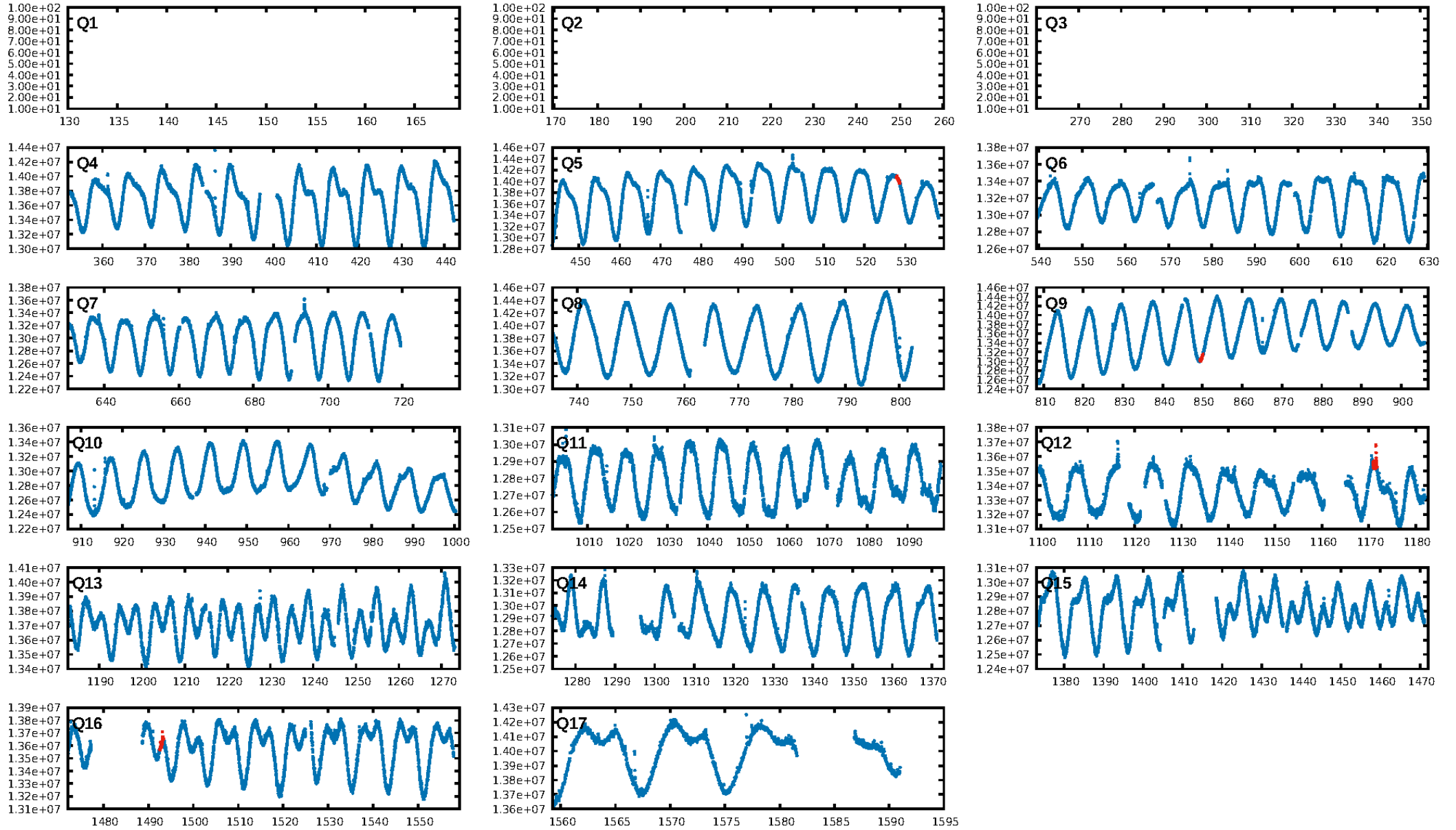
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [152.07σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 9.3%  
ModelChiSquareGof-sig: 91.0%  
**Bootstrap-pfa: 7.61e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.297  
Centroid-sig: 4.9%  
Centroid-so: 1.876 arcsec [1.53σ]  
OotOffset-rm: 0.179 arcsec [0.46σ]  
OotOffset-st: 0/0/1/2 [3]  
KicOffset-rm: 0.547 arcsec [2.02σ]  
KicOffset-st: 0/0/1/2 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

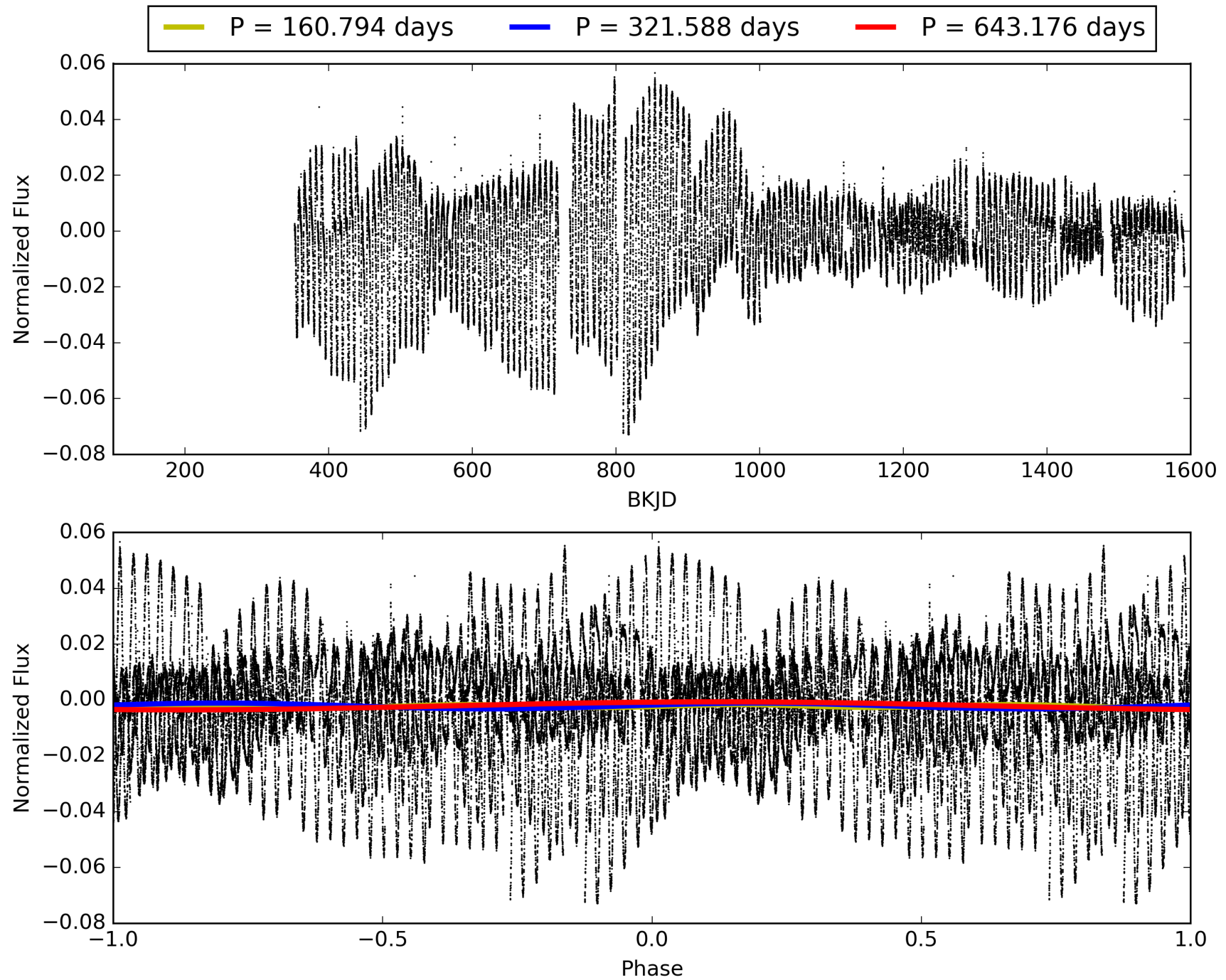
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:54:29 Z

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

# TCE 008197358-01, PDC Light Curves

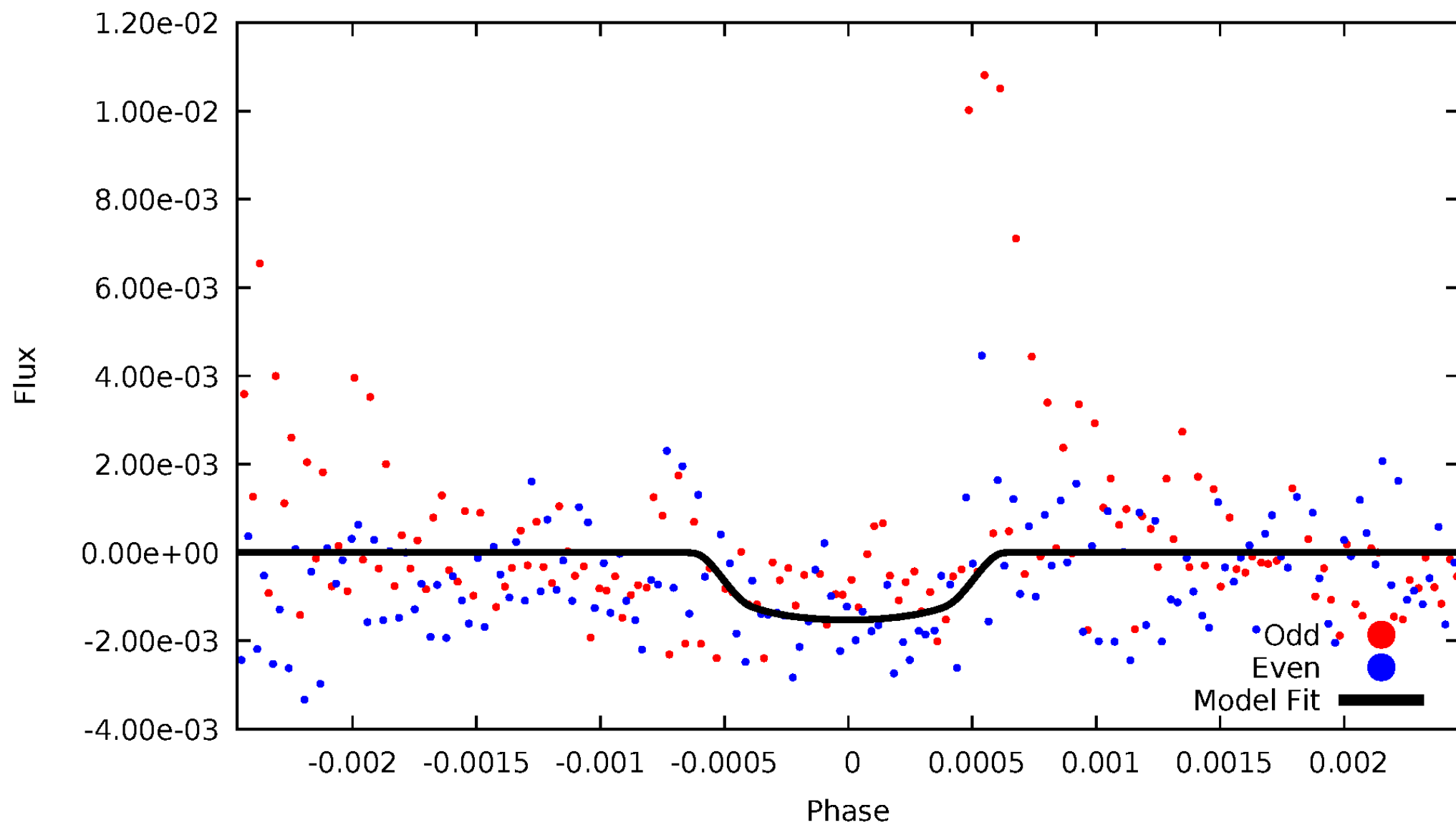


TCE 008197358-01



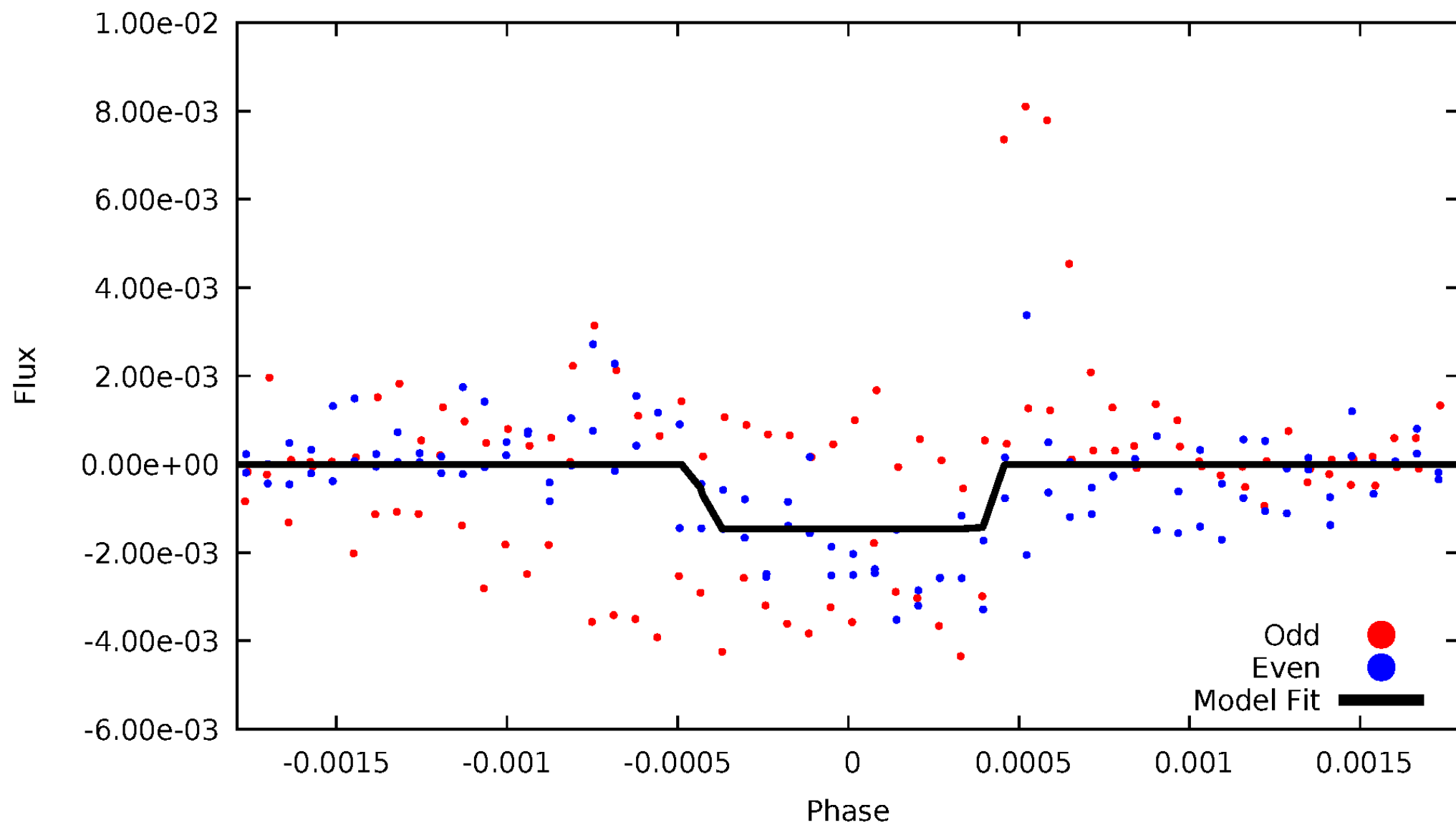
# DV Odd/Even

TCE 008197358-01



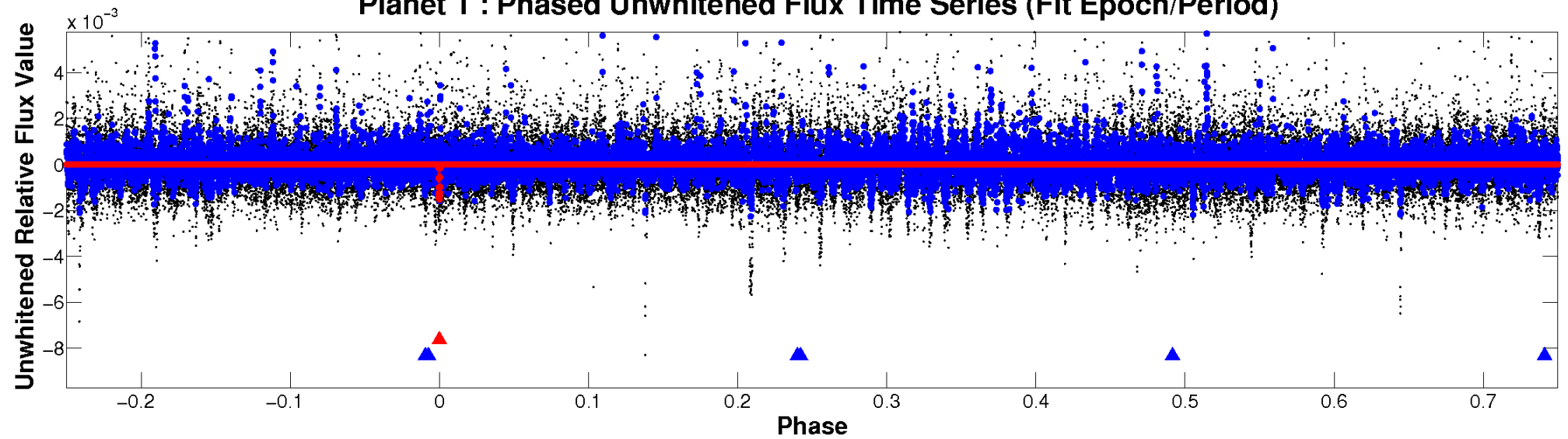
# ALT Odd/Even

TCE 008197358-01

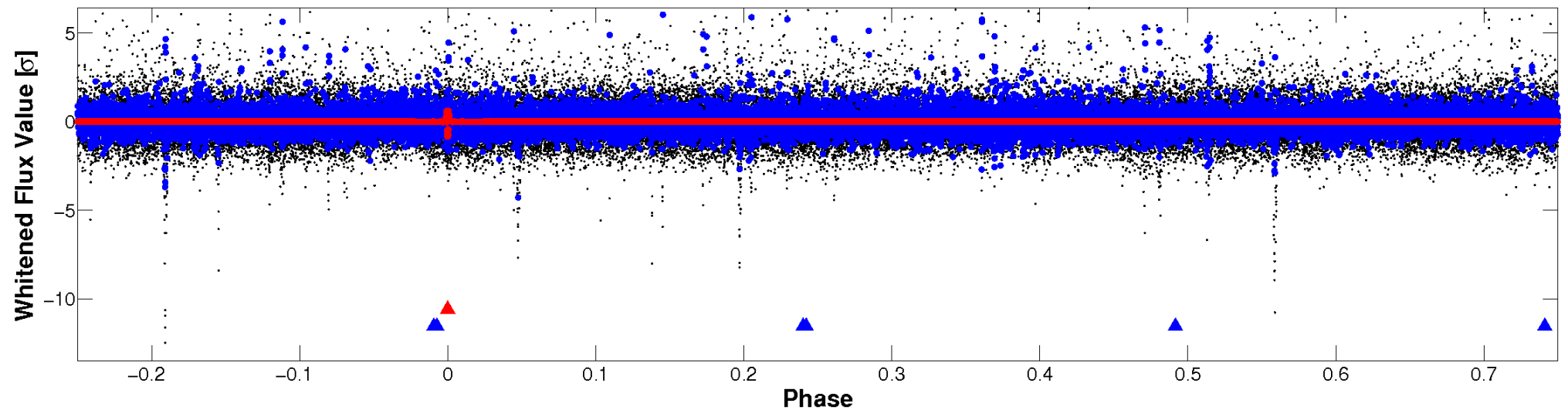


# Non-Whitened Vs. Whitened Light Curve

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

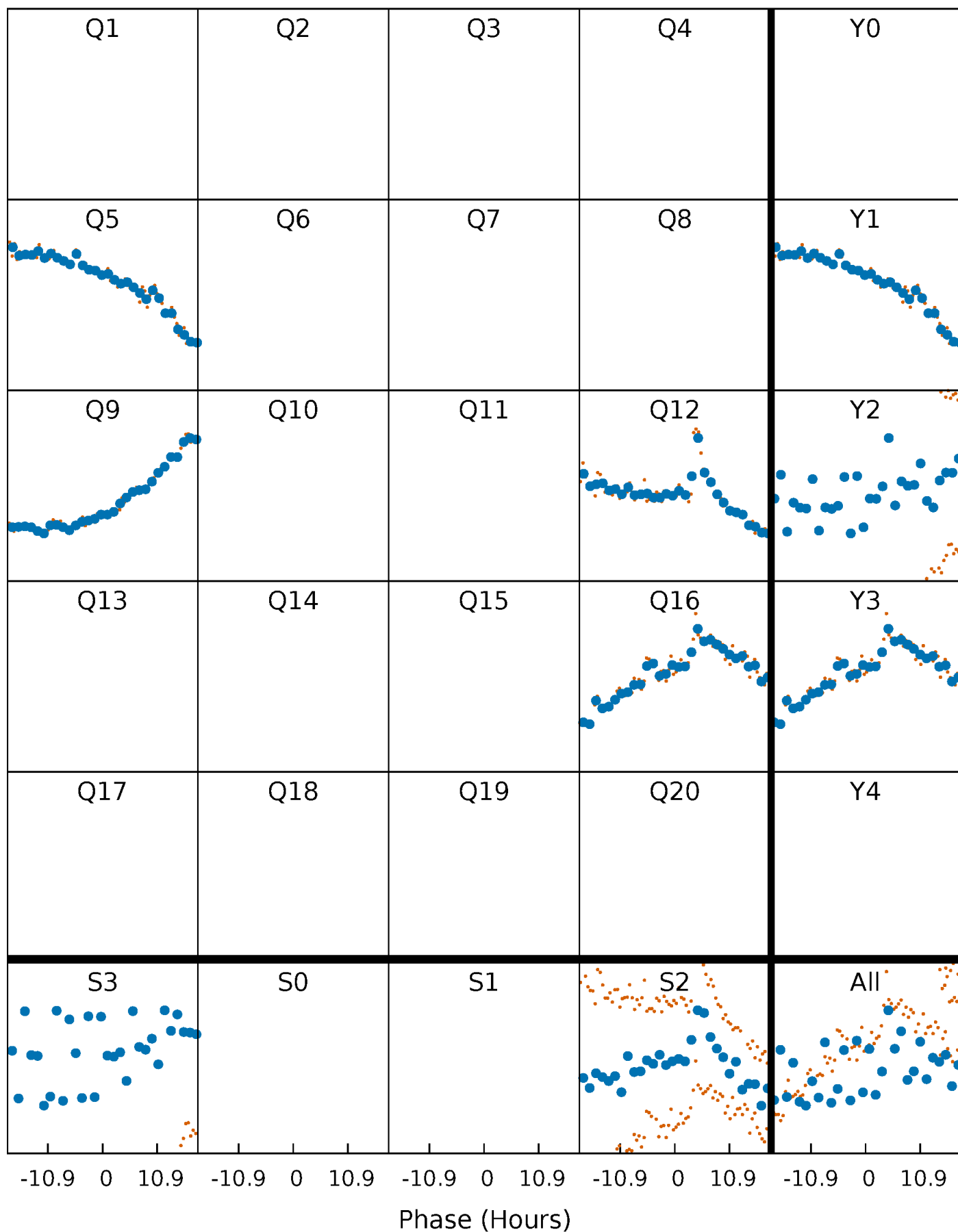


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

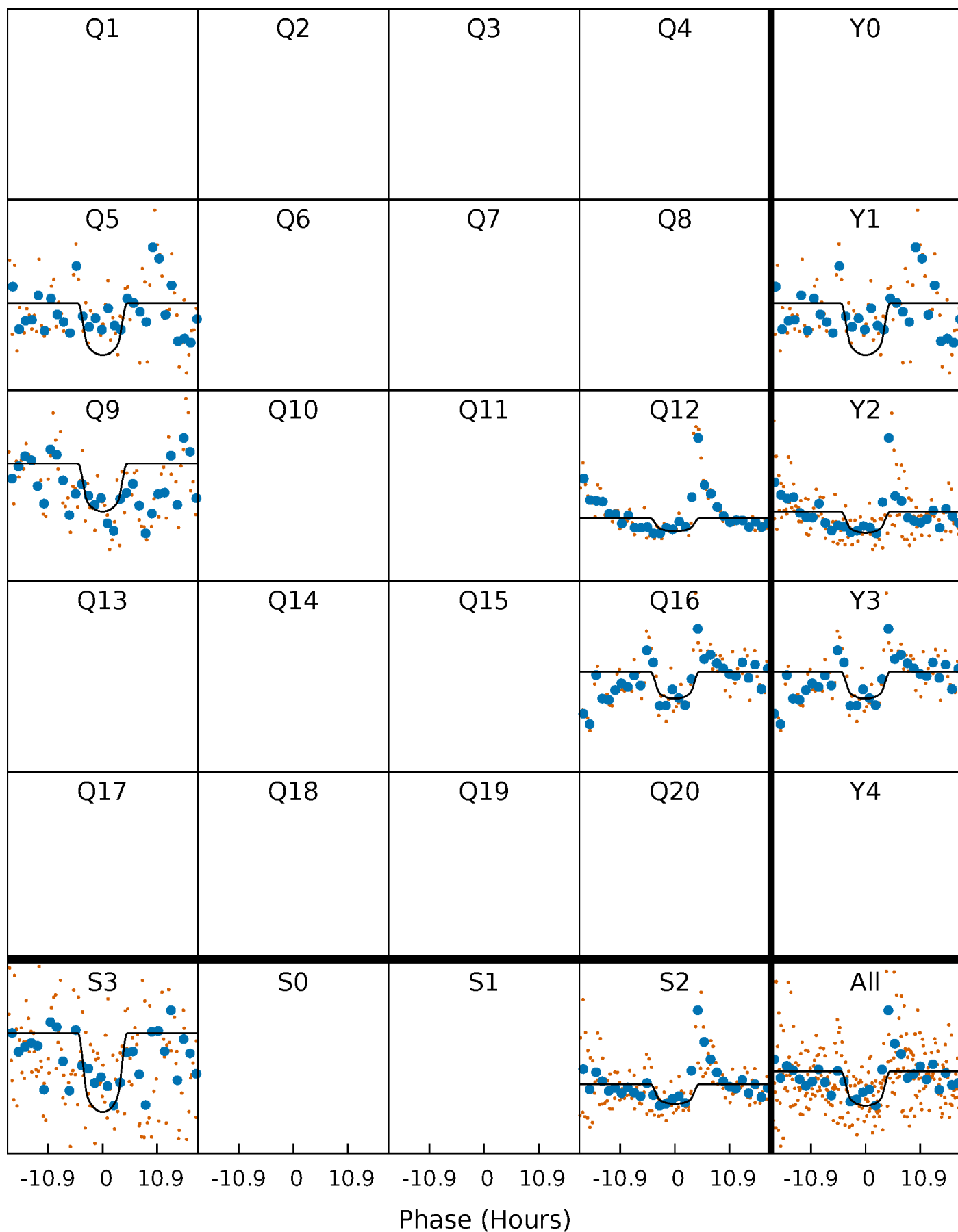
TCE 008197358-01     $P=321.587792$  Days     $T_0=206.598456$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 008197358-01   P=321.587792 Days    $T_0=206.598456$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

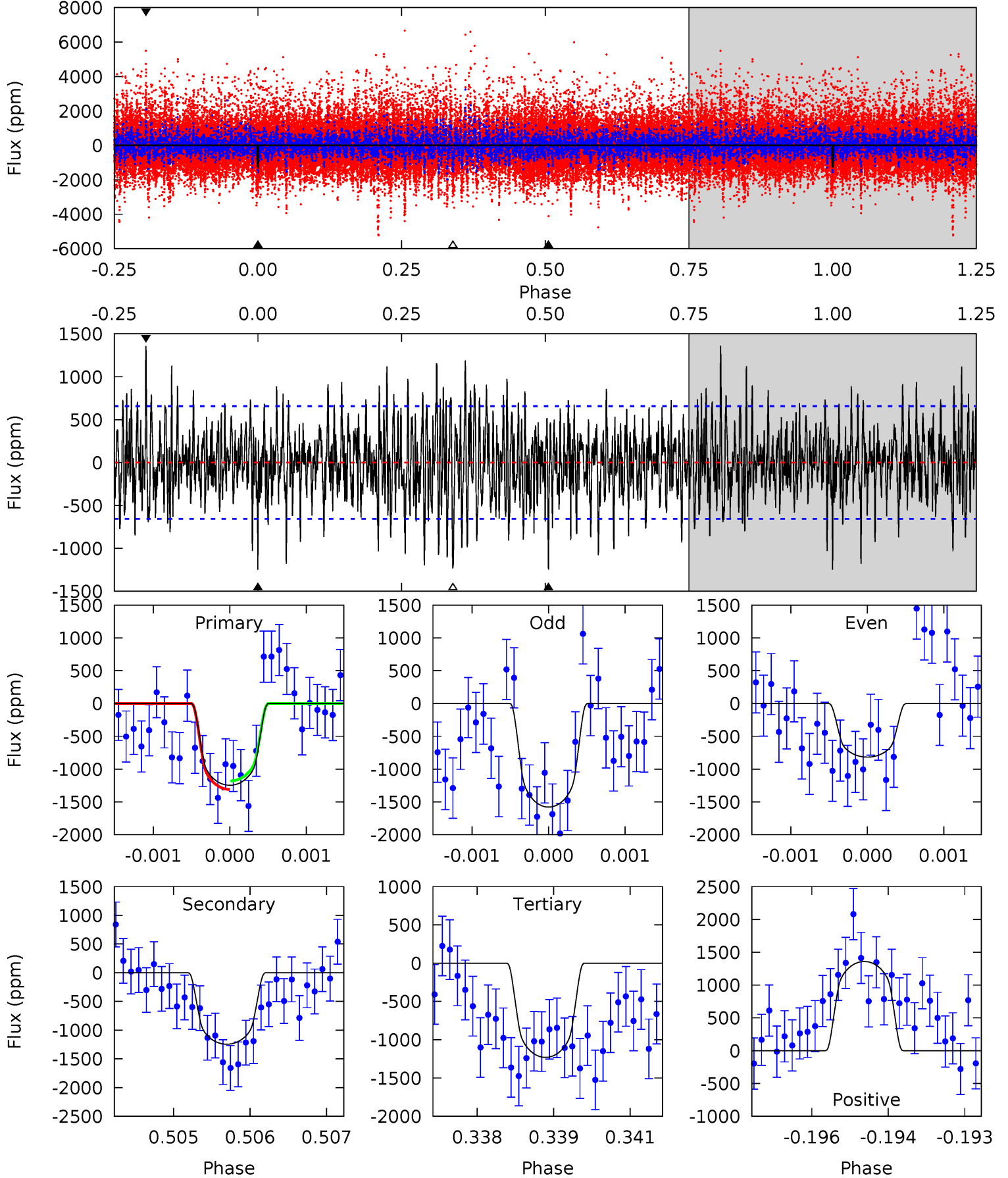
TCE 008197358-01 P=321.583367 Days  $T_0=206.621237$  (BKJD)



# DV Model-Shift Uniqueness Test

008197358-01, P = 321.587792 Days, E = 206.598456 Days

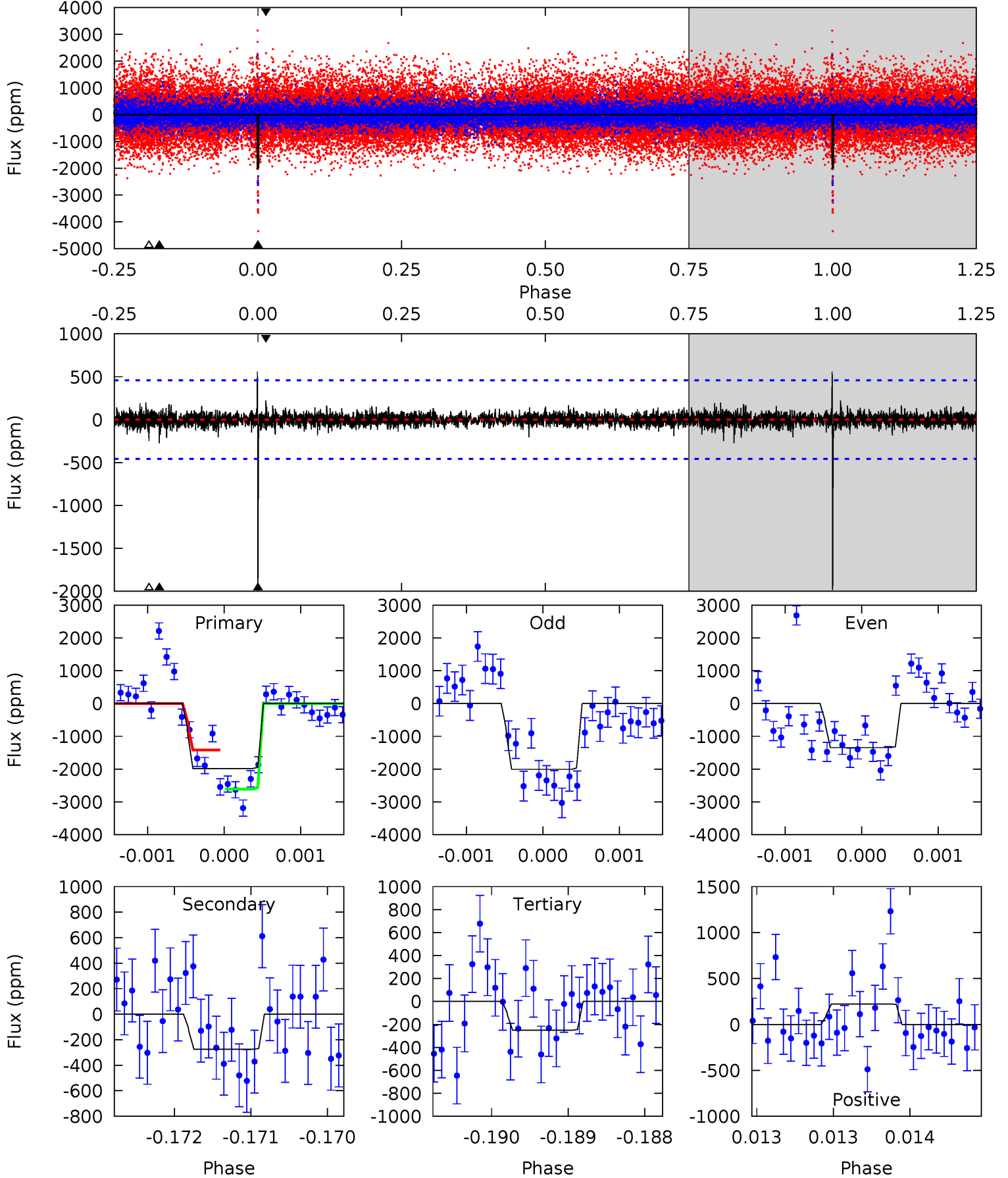
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	10.3	10.1	11.2	5.41	3.22	3.00	0.13	-0.92	0.12	-0.94	3.00	1.03	0.52	0.53



# Alt Model-Shift Uniqueness Test

008197358-01, P = 321.583367 Days, E = 206.621237 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
23.7	3.28	2.99	2.66	5.47	3.32	0.53	20.7	21.0	0.29	0.62	4.25	0.85	0.22	0



### Stellar Parameters For KIC 008197358

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4171^{+146}_{-161}$	$4.620^{+0.053}_{-0.018}$	$0.140^{+0.250}_{-0.300}$	$0.652^{+0.032}_{-0.064}$	$0.647^{+0.051}_{-0.057}$	$3.287^{+0.824}_{-0.281}$
	+4%/-4%	+1%/-0%	+179%/-214%	+5%/-10%	+8%/-9%	+25%/-9%
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 008197358-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1245 \pm 121$	$3.07^{+0.60}_{-0.60}$	$231^{+8}_{-9}$	$3871^{+358}_{-264}$	$46228^{+26211}_{-13731}$
Alt.	$-274 \pm 84$	$2.67^{+0.60}_{-0.55}$	$231^{+9}_{-10}$	$3163^{+283}_{-244}$	$13101^{+9616}_{-5506}$

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

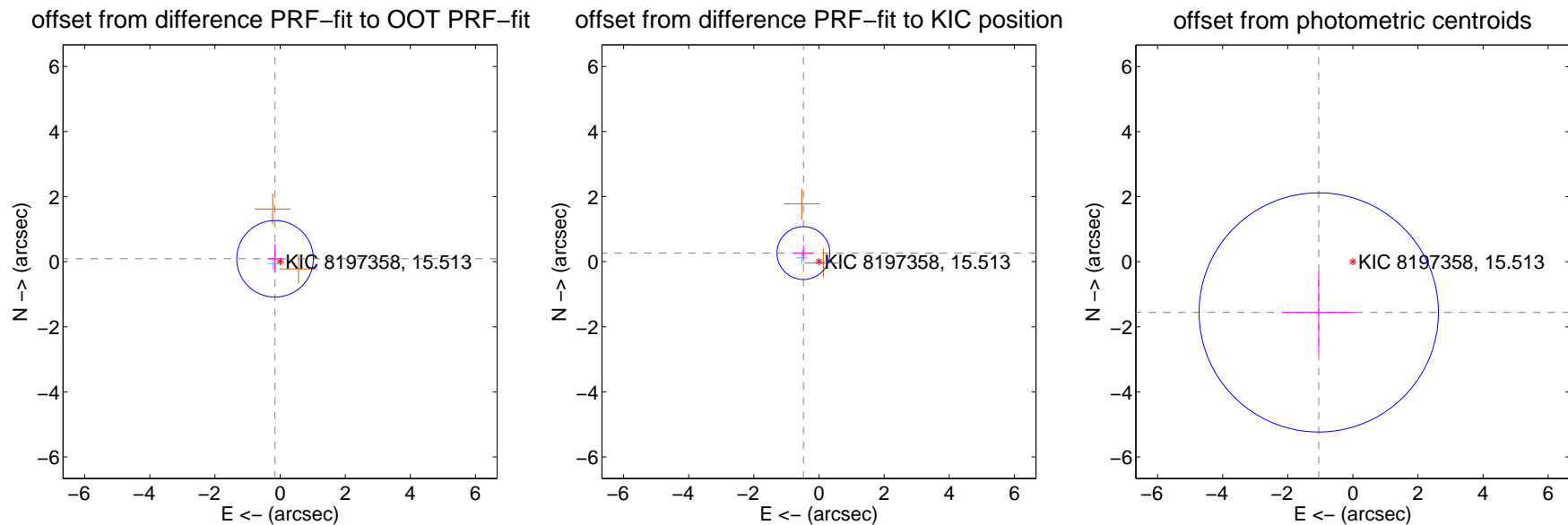
## DV Centroid Data

Supplemental centroid analysis for 008197358-01. Kepler magnitude: 15.51. Transit SNR 6.81

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.47 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.179 \pm 0.392$	0.46	$0.155 \pm 0.228$	$0.089 \pm 0.437$
PRF-fit source offset from KIC position	$0.547 \pm 0.271$	2.02	$0.478 \pm 0.281$	$0.266 \pm 0.235$
photometric centroid source offset	$1.88 \pm 1.23$	1.53	$1.05 \pm 1.12$	$-1.56 \pm 1.27$

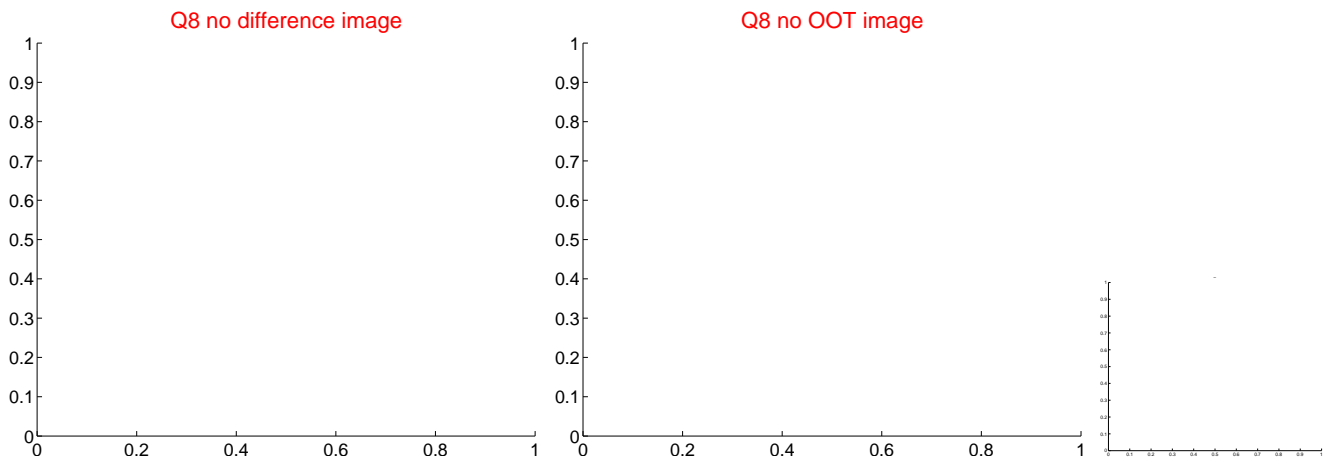
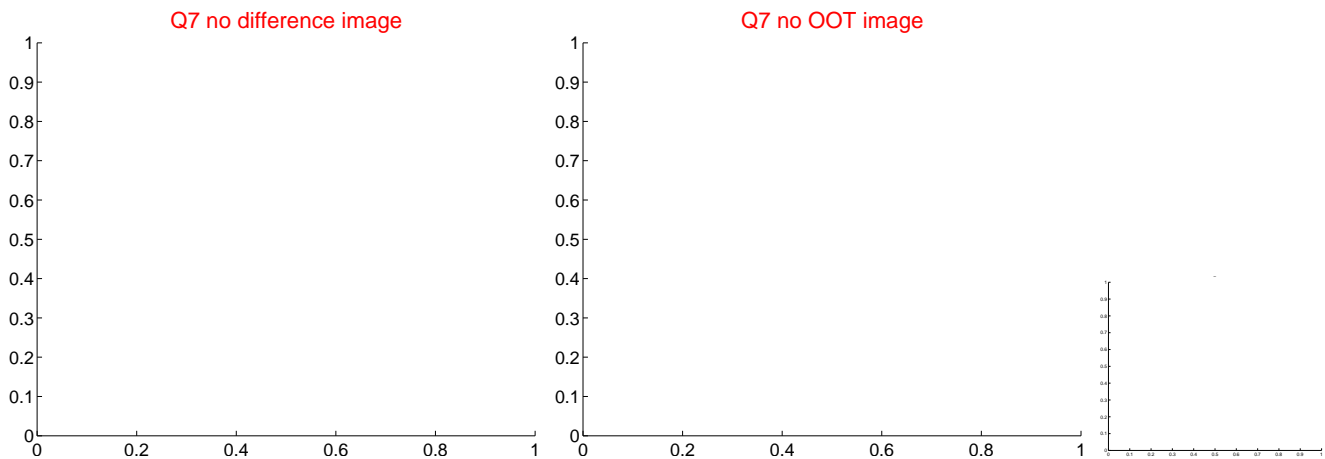
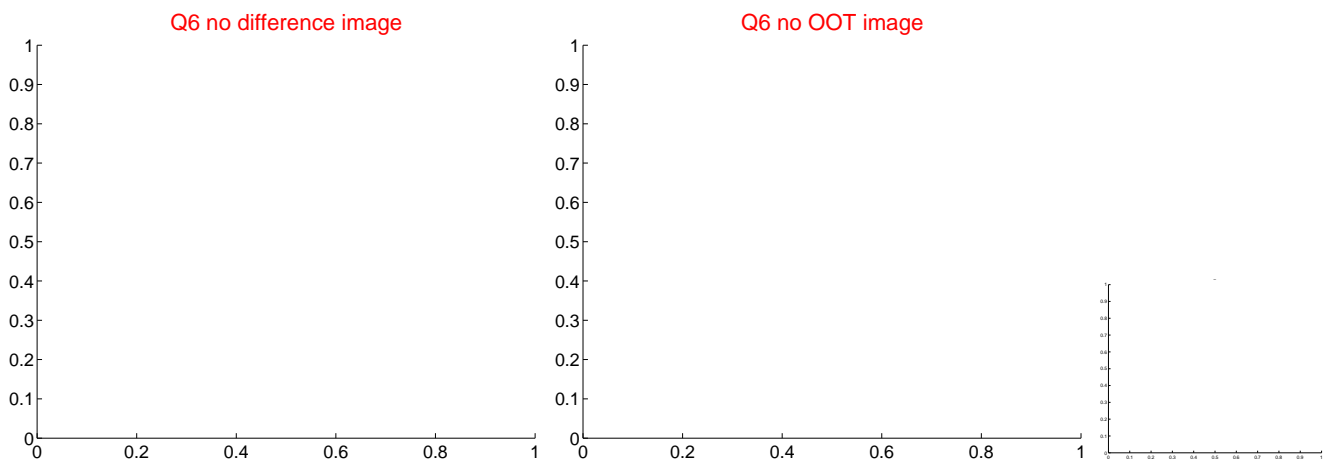
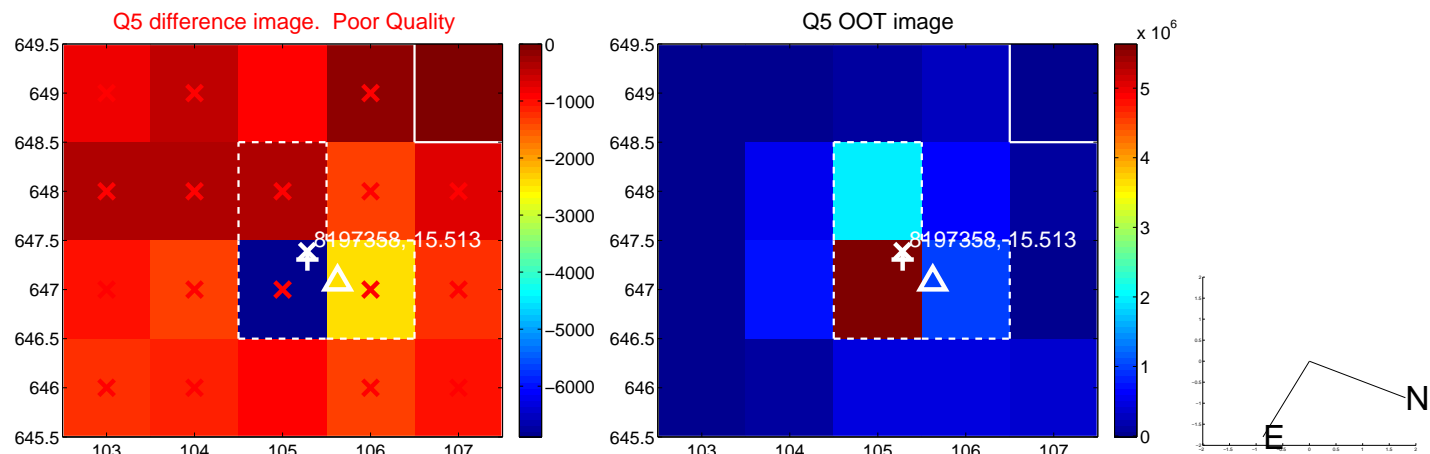


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

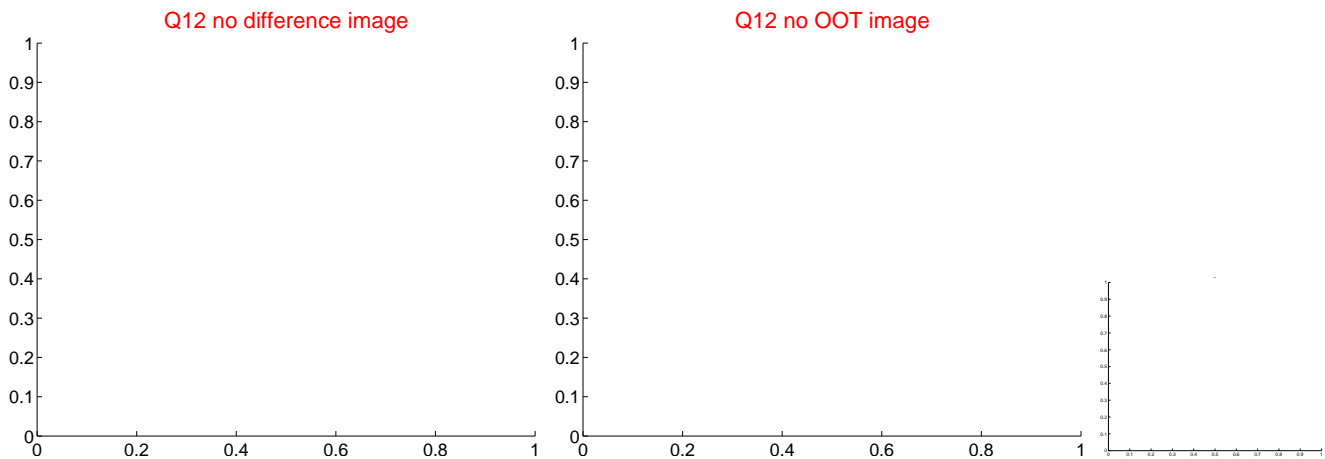
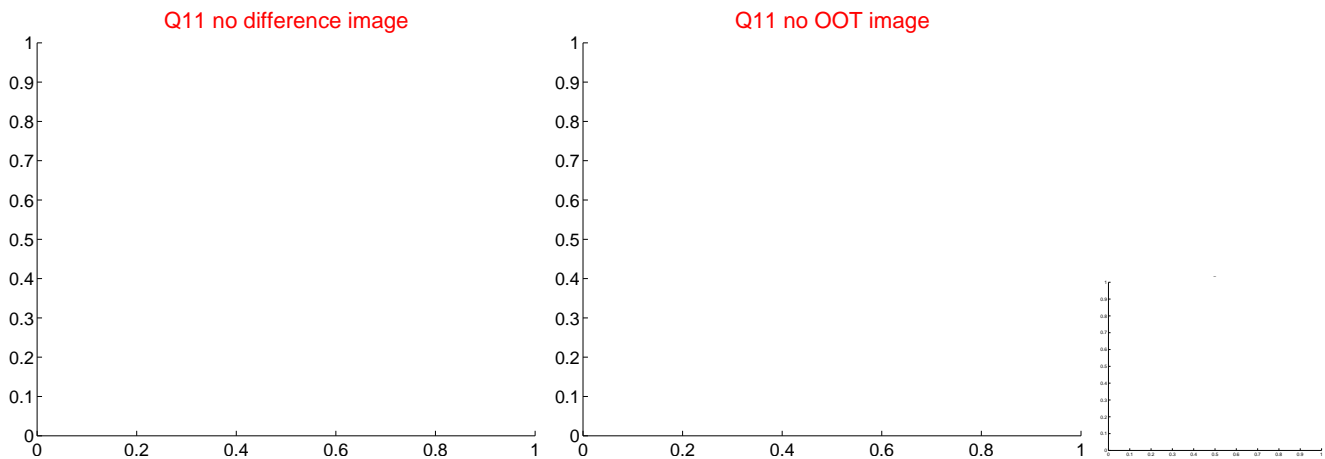
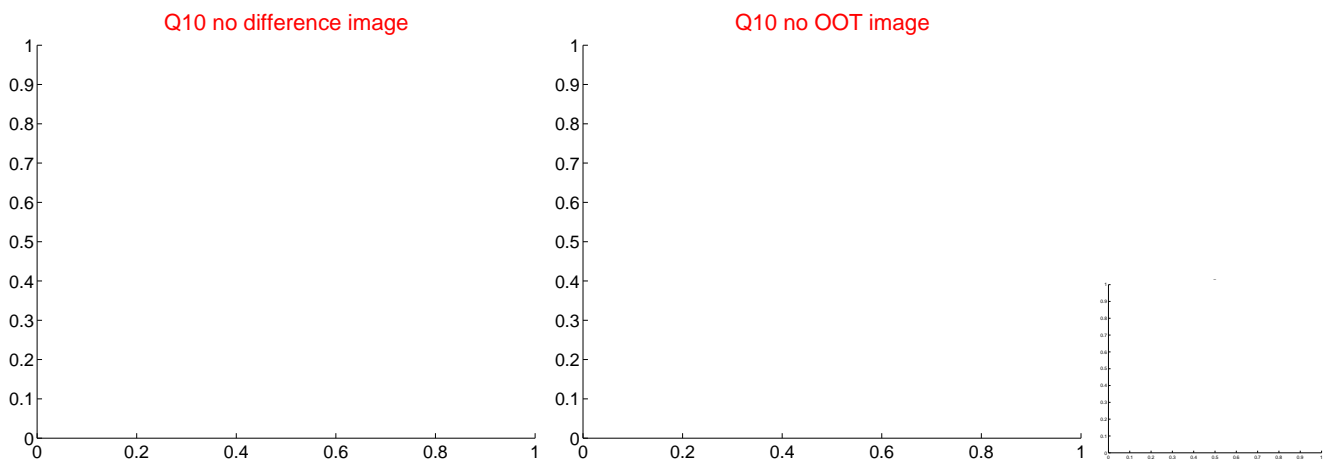
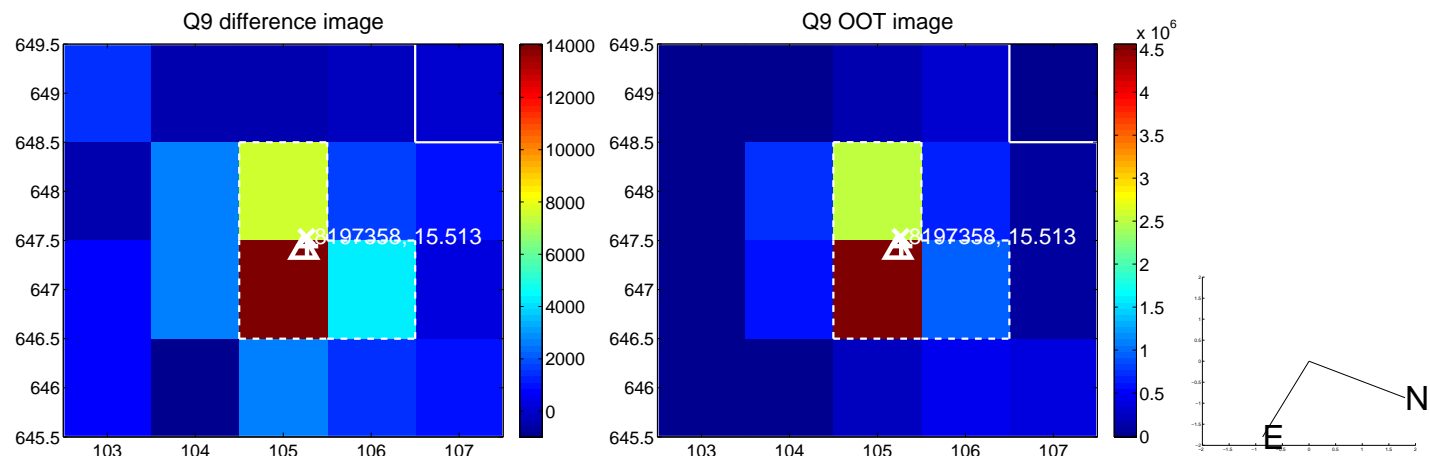


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

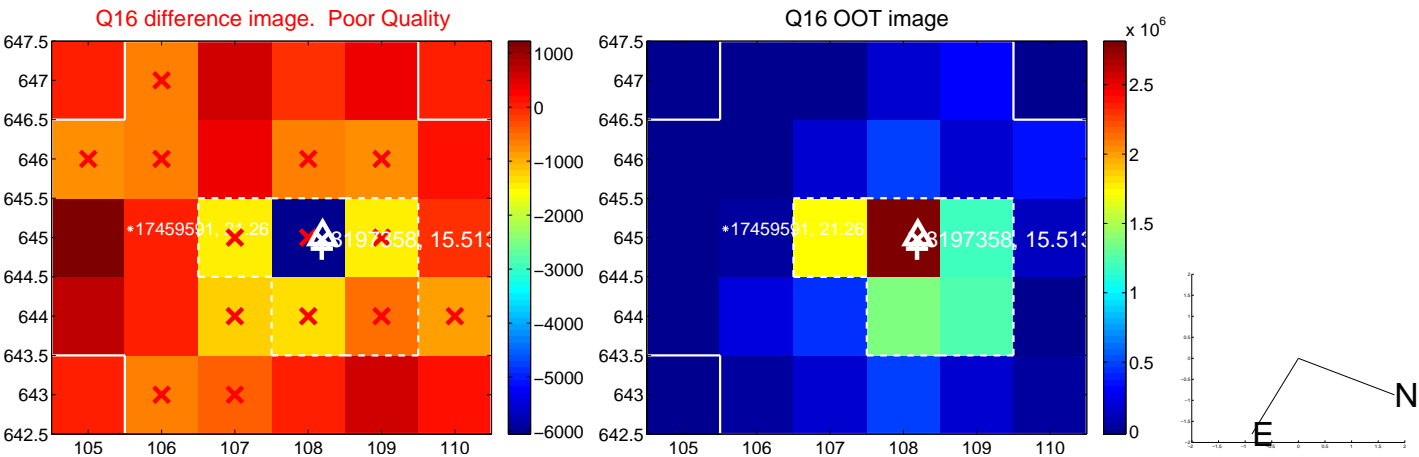




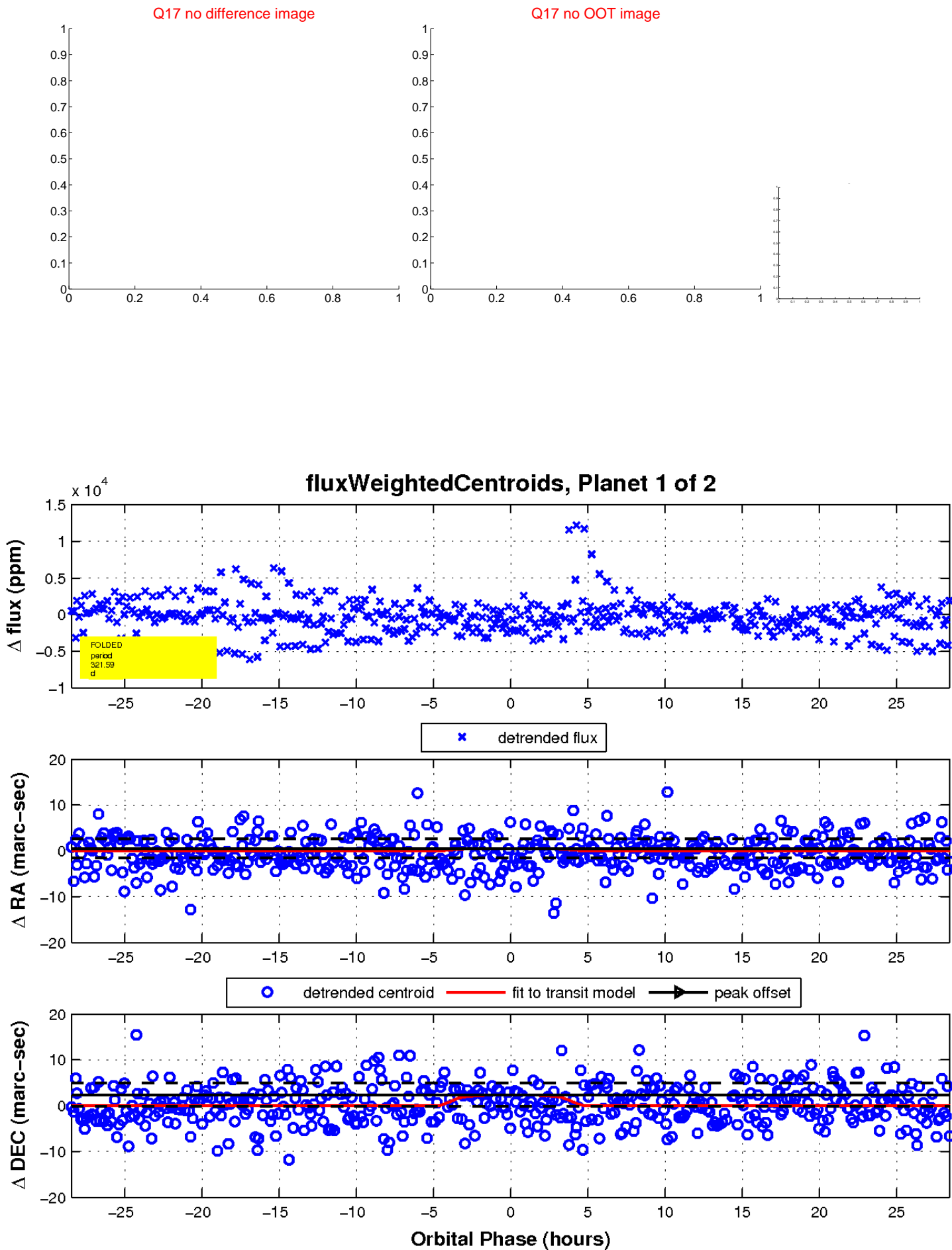
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



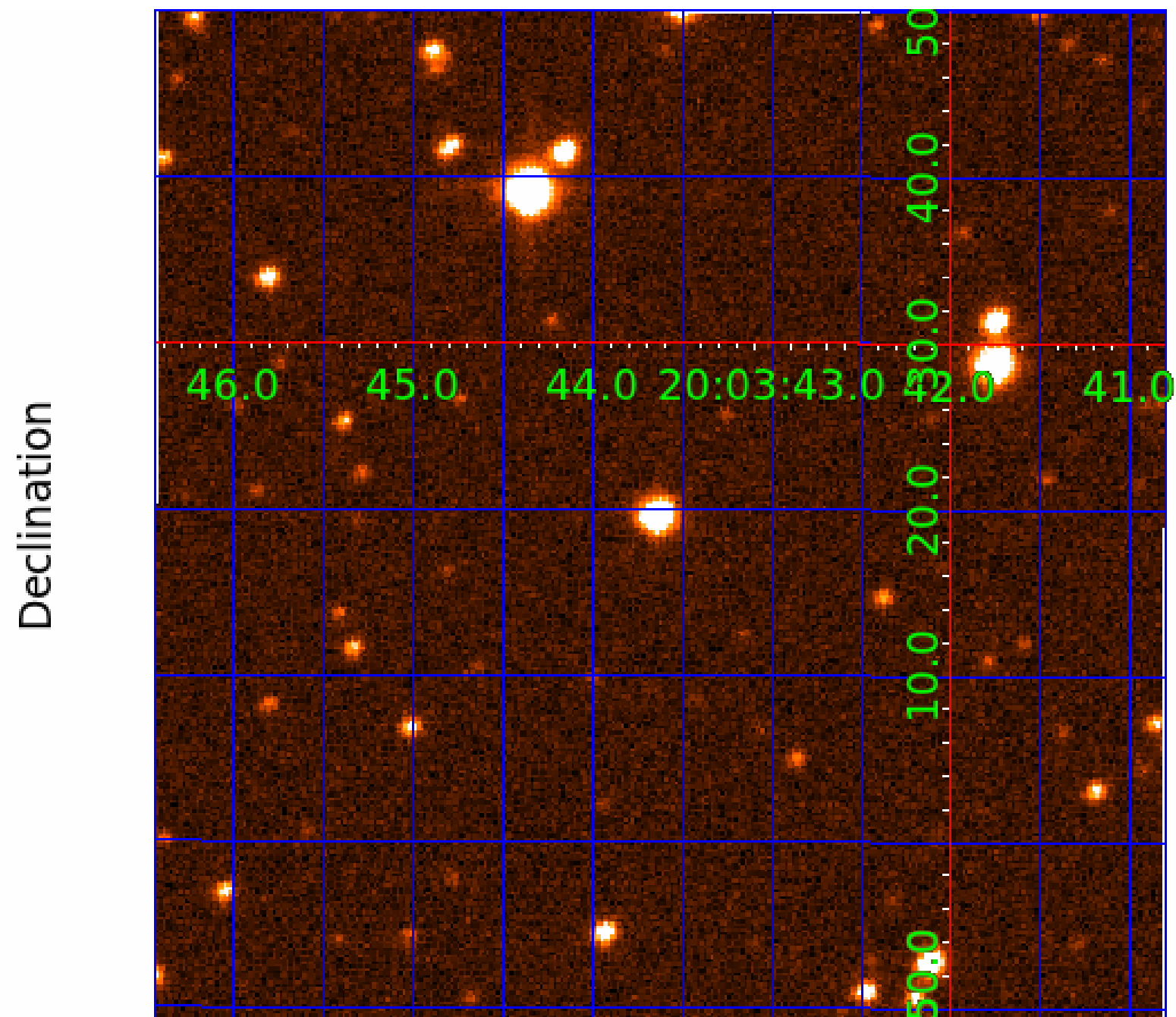
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



# KIC 008197358

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008197358-01	OBS	No	321.587792	206.598456	1526.6	9.512	10.5	6.8	0.65	4171	3.07	0.18
008197358-02	OBS	No	241.355225	283.817285	671.3	8.358	9.6	3.1	0.65	4171	1.94	0.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008197358-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008197358-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_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.

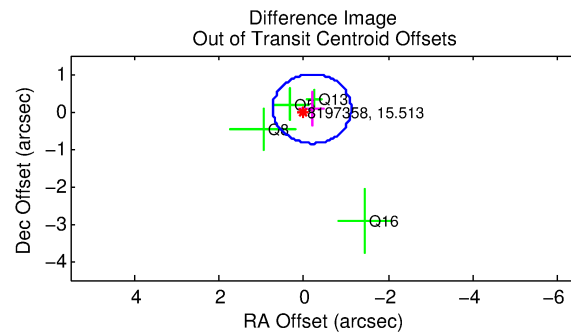
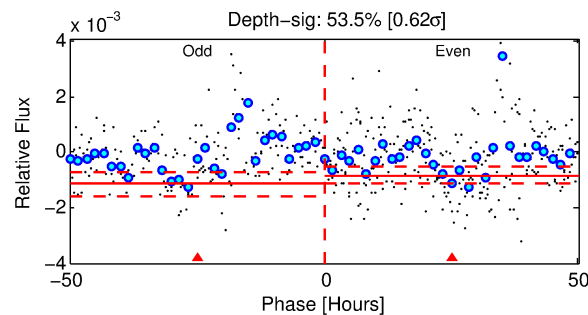
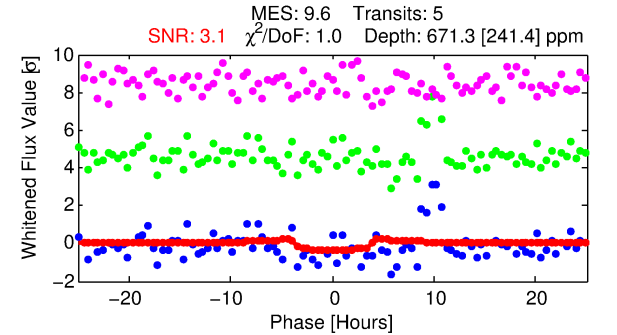
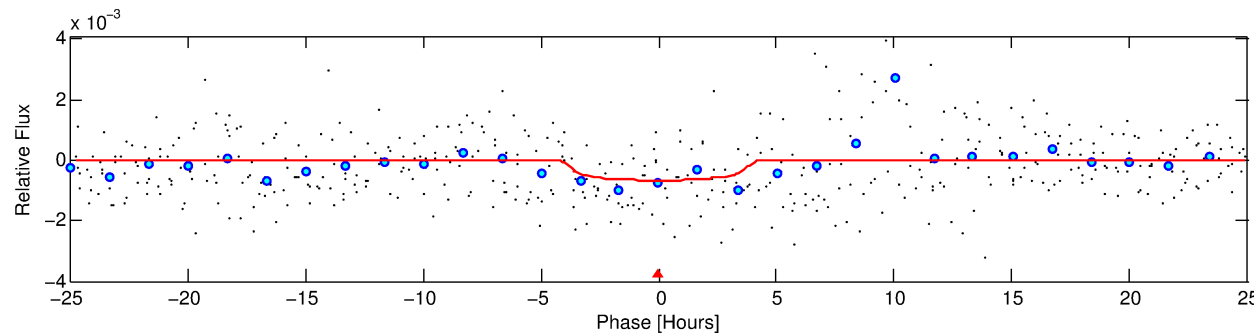
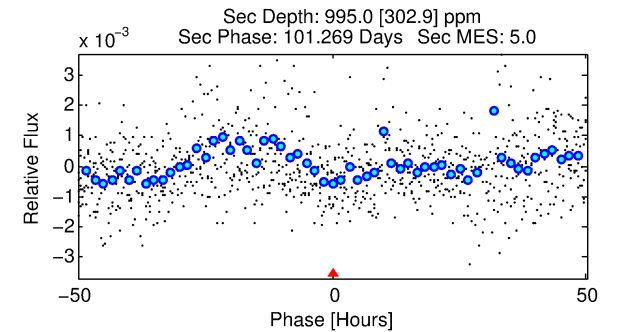
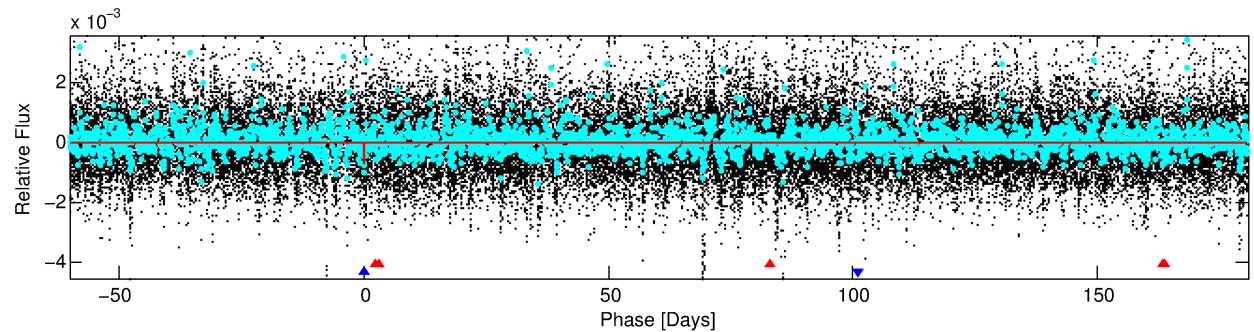
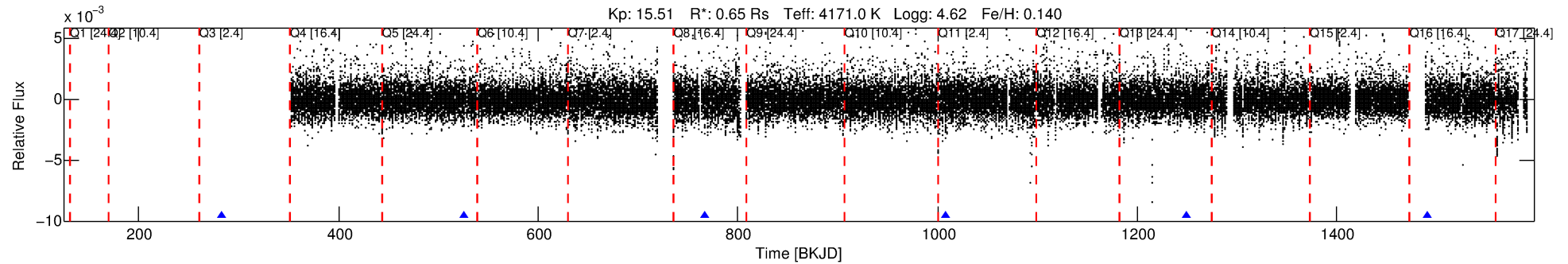
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008197358-02

No Significant Match Found

# DV One-Page Summary

KIC: 8197358 Candidate: 2 of 2 Period: 241.355 d



## DV Fit Results:

Period = 241.35522 [0.01236] d  
Epoch = 283.8173 [0.0422] BKJD  
Rp/R\* = 0.0273 [0.0169]  
a/R\* = 133.53 [270.18]  
b = 0.83 [0.77]  
Seff = 0.27 [0.05]  
Teq = 183 [9] K  
Rp = 1.94 [1.22] Re  
a = 0.6561 [0.0506] AU  
Ag = 62593.38 [80232.66] [0.78σ]  
Teffp = 4486 [1443] K [2.98σ]

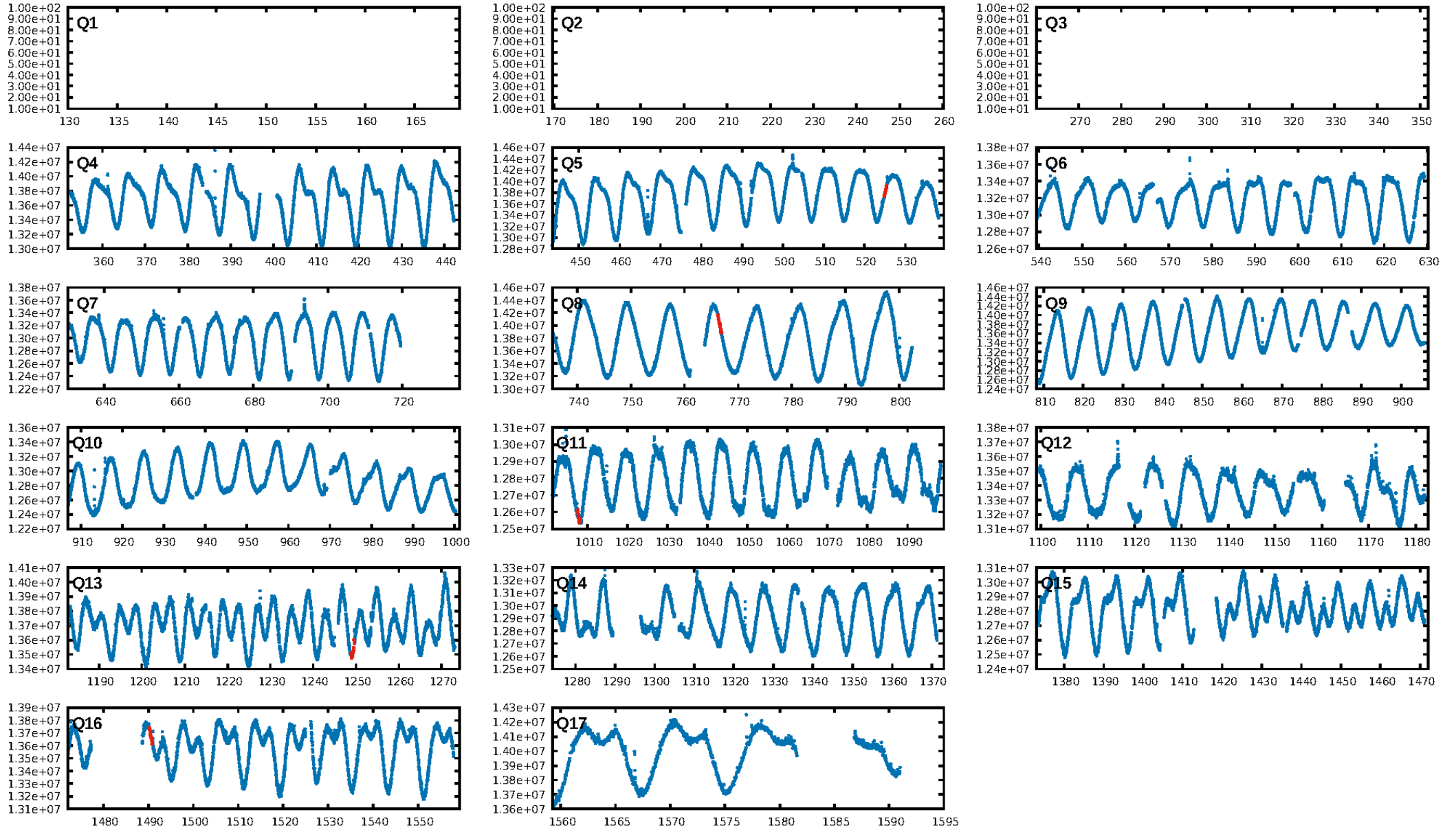
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [152.07σ]  
ModelChiSquare2-sig: 67.4%  
ModelChiSquareGof-sig: 99.8%  
**Bootstrap-pfa: 2.92e-09**  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: 0.9598**  
Centroid-sig: 43.6%  
Centroid-so: 1.211 arcsec [0.51σ]  
OotOffset-rm: 0.213 arcsec [0.69σ]  
OotOffset-st: 0/0/2/2 [4]  
KicOffset-rm: 0.281 arcsec [0.41σ]  
KicOffset-st: 0/0/2/2 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:54:37 Z

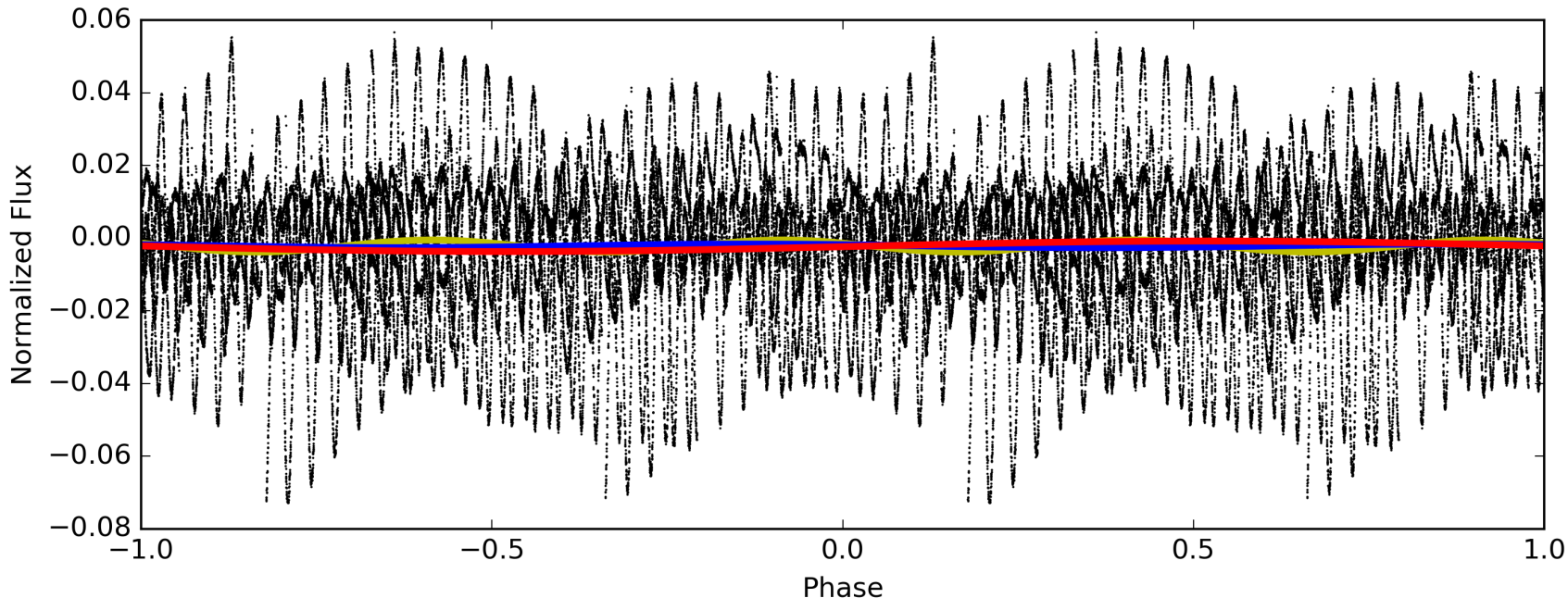
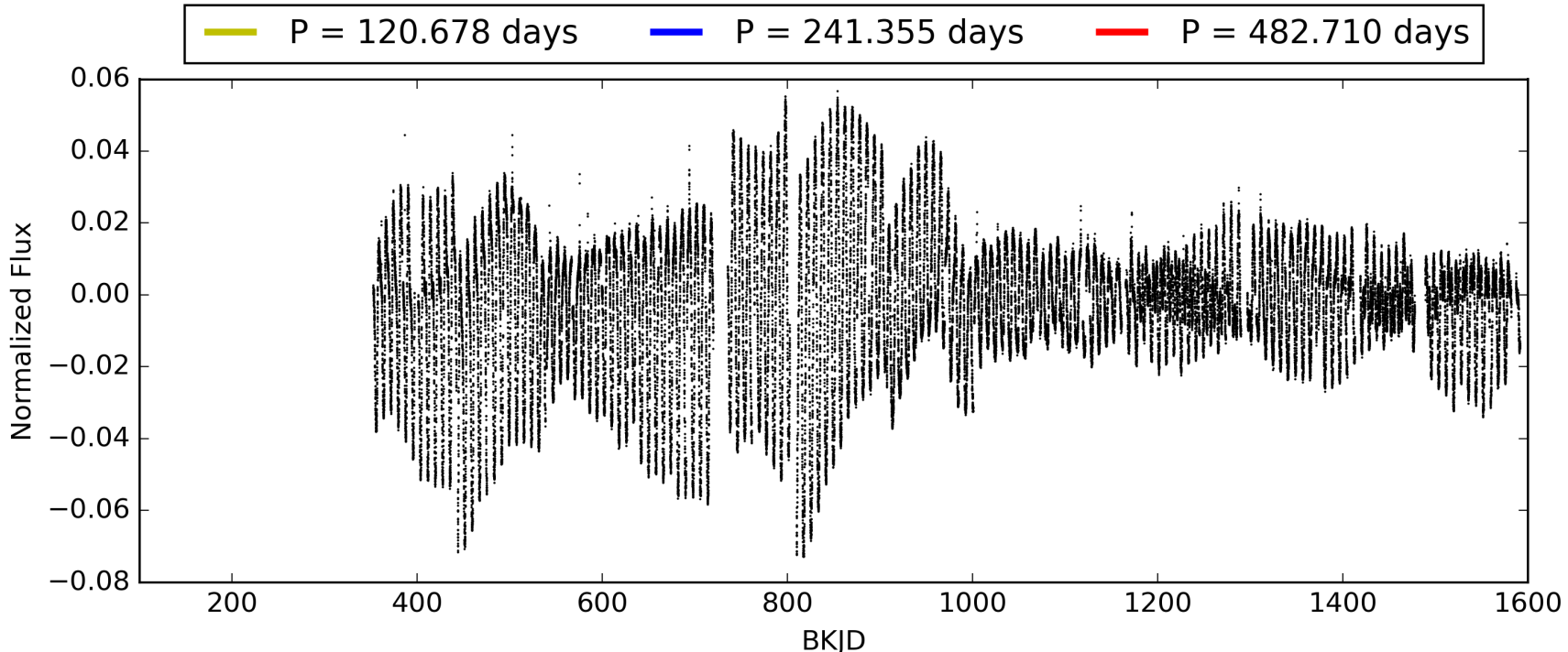
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008197358-02, PDC Light Curves





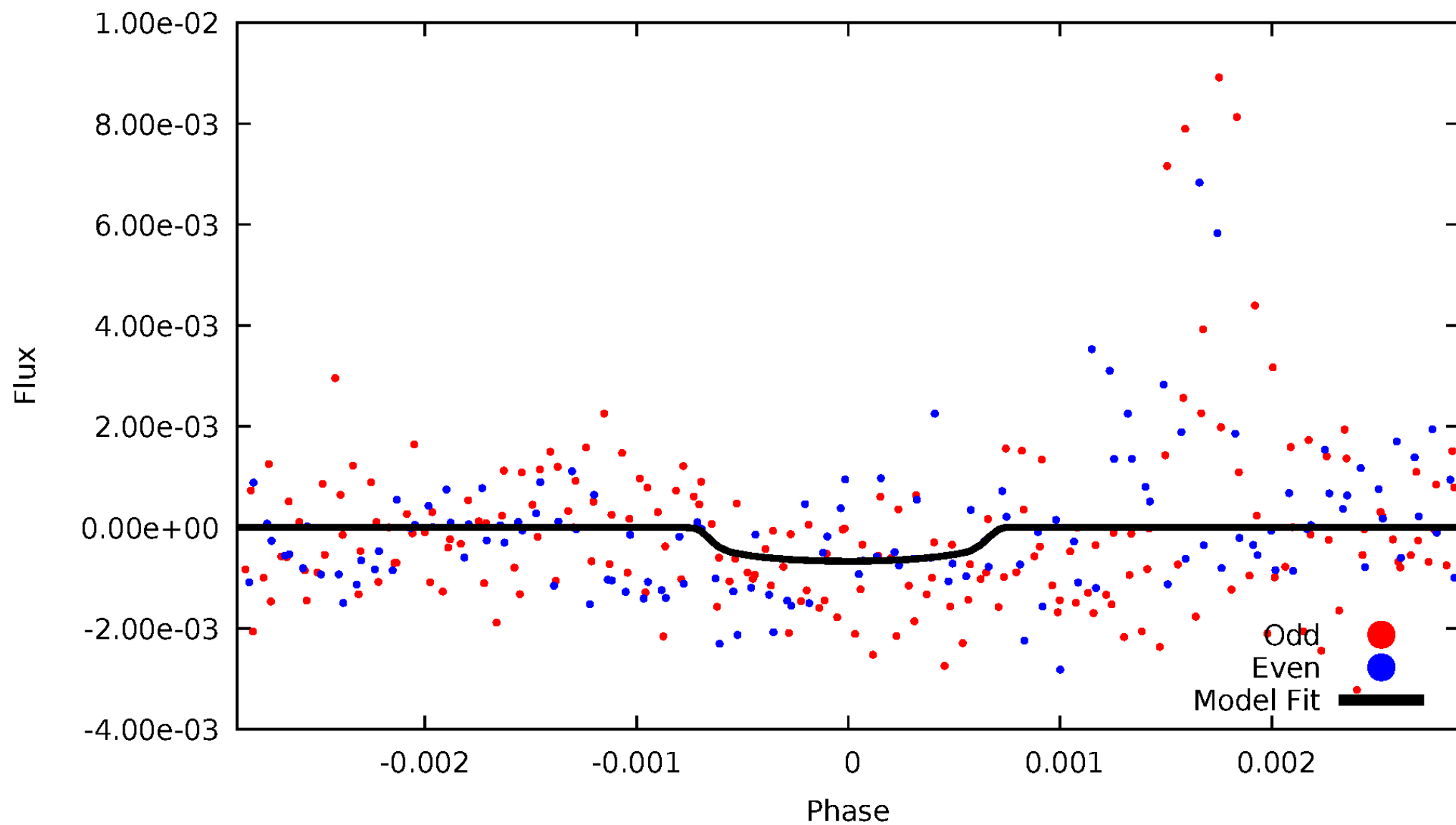
TCE 008197358-02





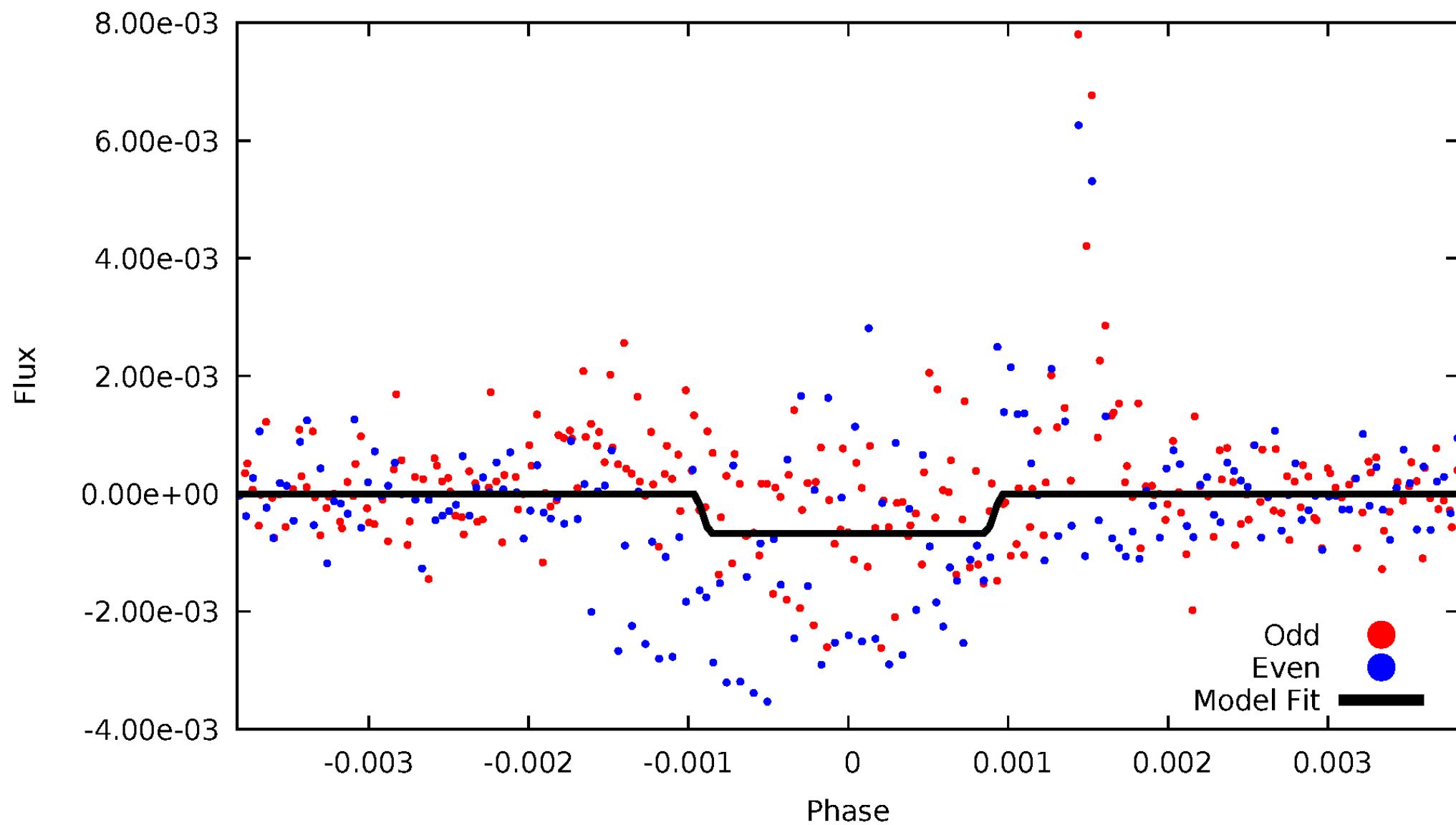
# DV Odd/Even

TCE 008197358-02



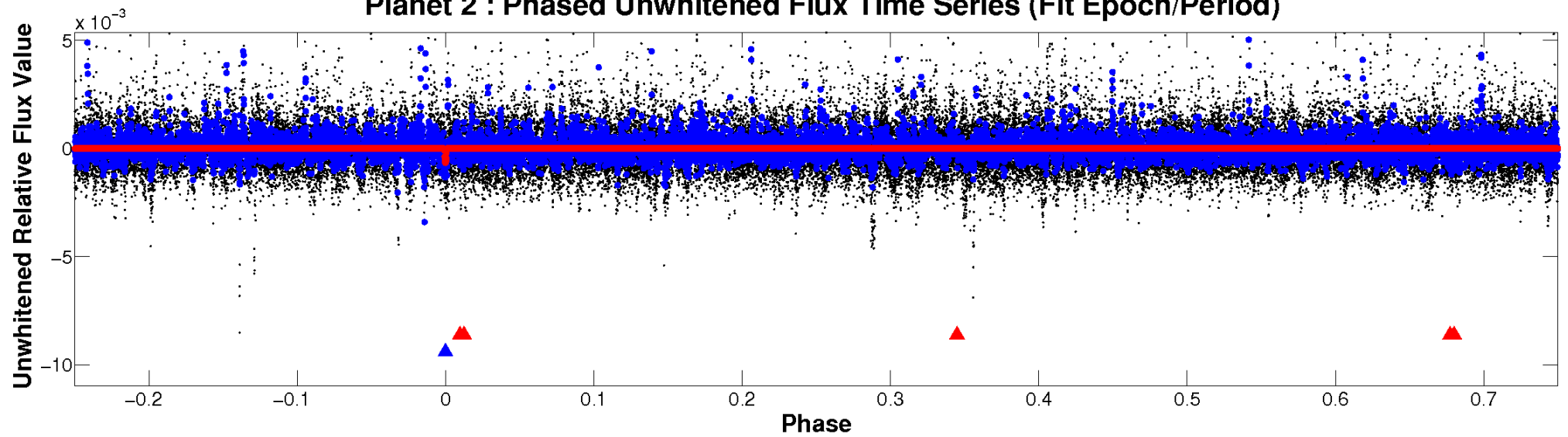
# ALT Odd/Even

TCE 008197358-02

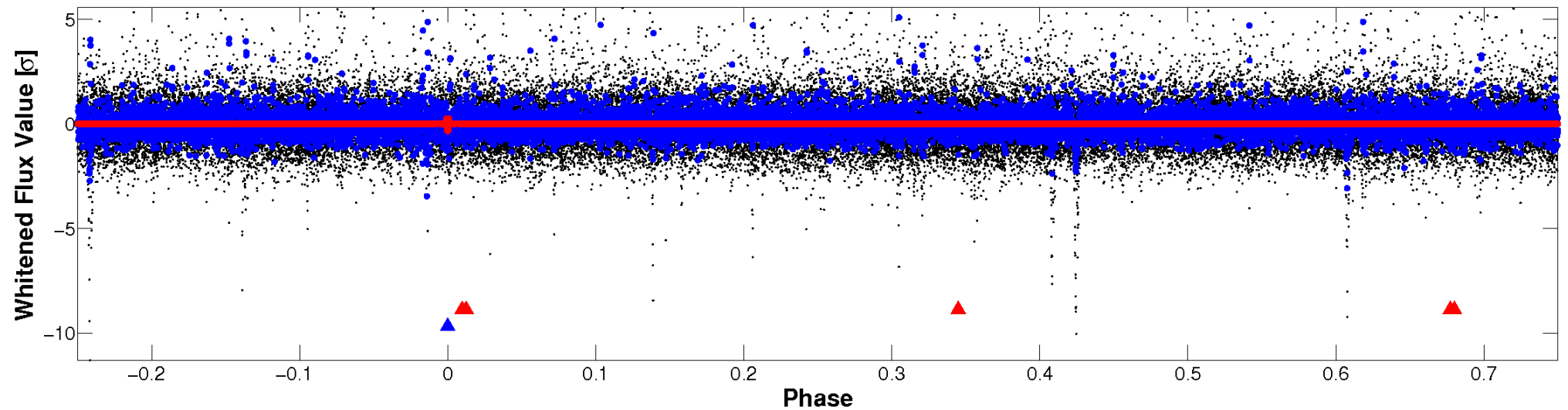


# Non-Whitened Vs. Whitened Light Curve

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

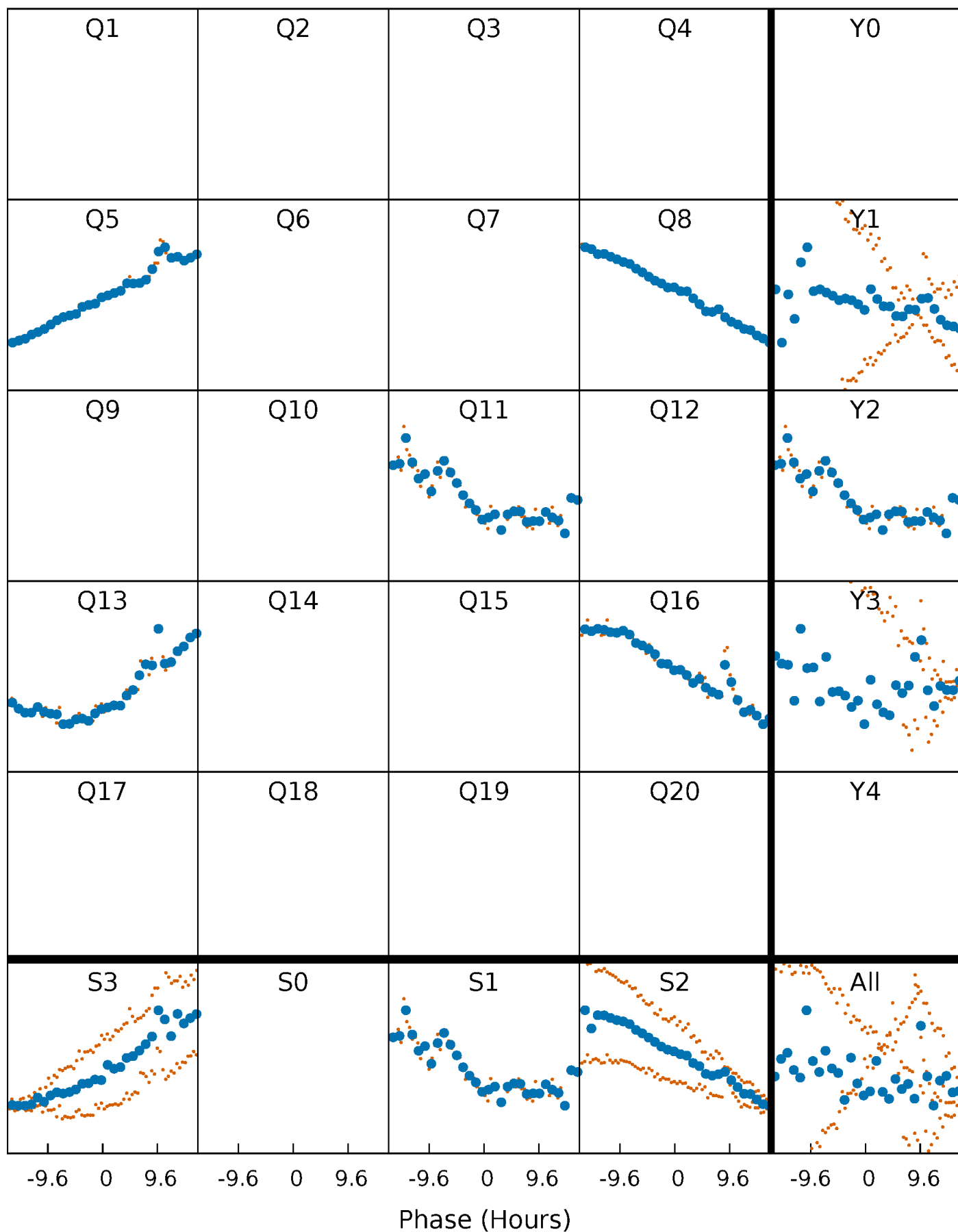


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



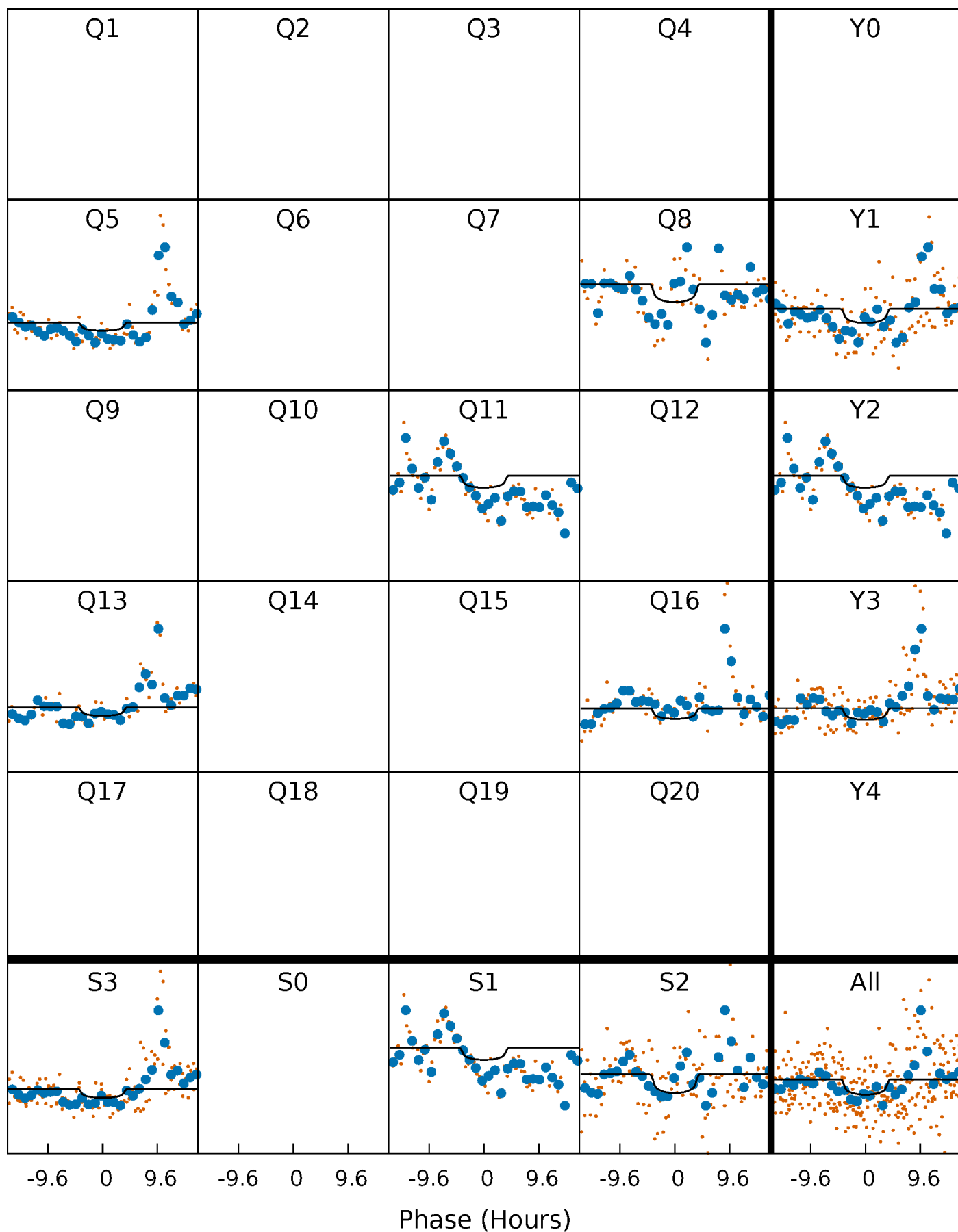
# PDC Quarter-Phased Transit Curves

TCE 008197358-02   P=241.355225 Days    $T_0=283.817286$  (BKJD)



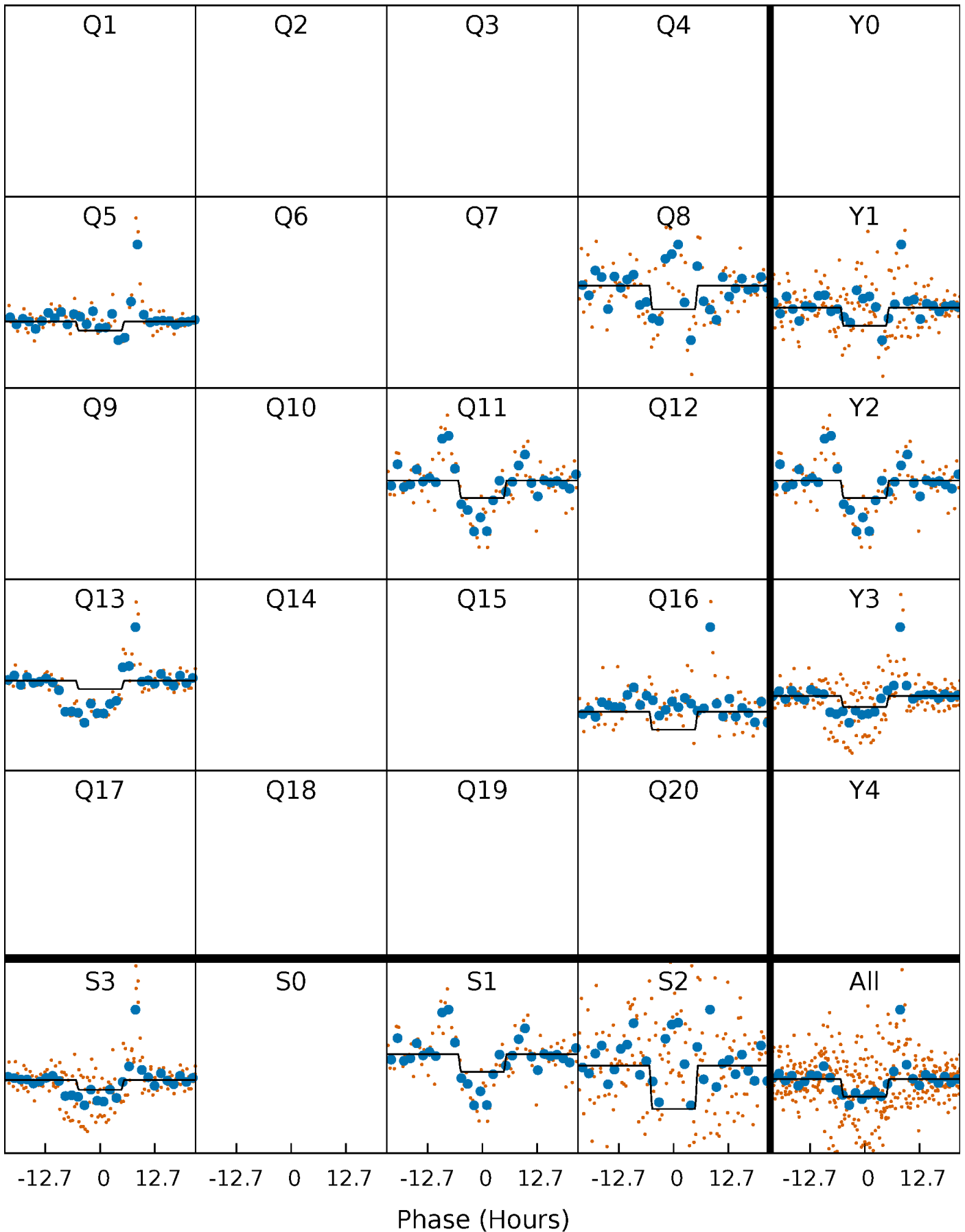
# DV Quarter-Phased Transit Curves

TCE 008197358-02     $P=241.355225$  Days     $T_0=283.817286$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

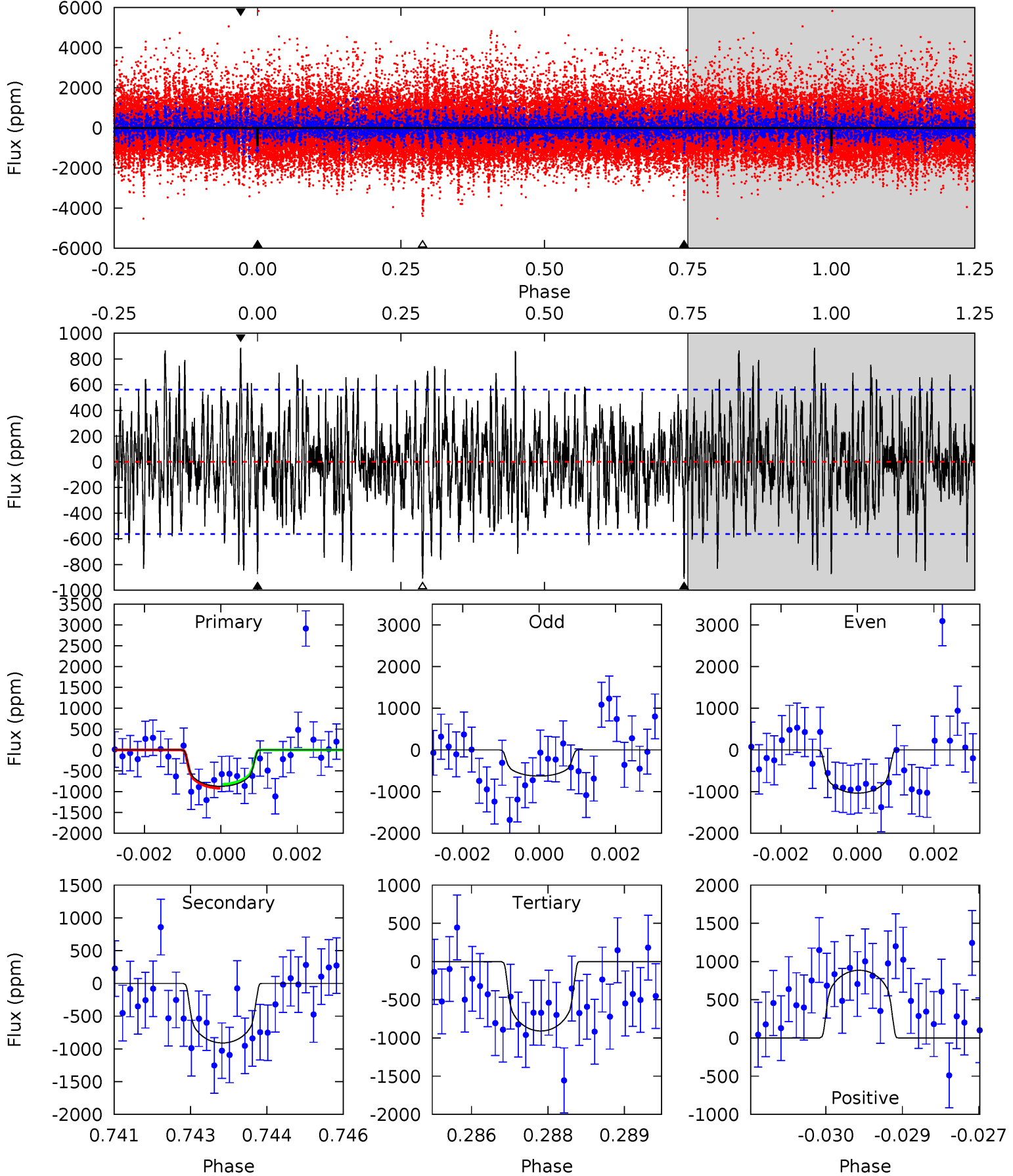
TCE 008197358-02     $P=241.347588$  Days     $T_0=283.900391$  (BKJD)



# DV Model-Shift Uniqueness Test

008197358-02, P = 241.355225 Days, E = 283.817286 Days

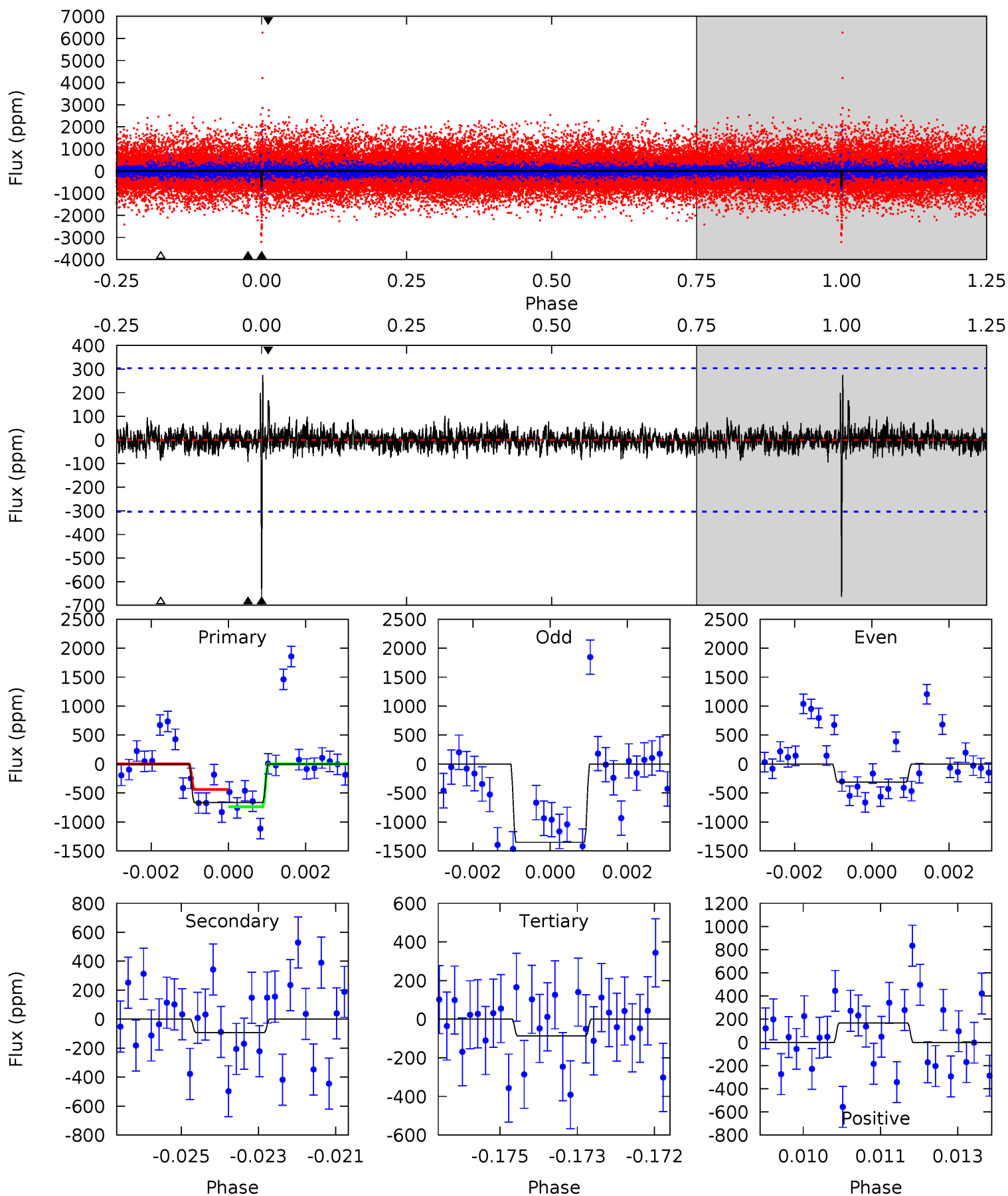
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.36	8.70	8.70	8.48	5.38	3.17	2.62	-0.34	-0.12	0.01	0.23	1.84	1.12	0.49	0.44



# Alt Model-Shift Uniqueness Test

008197358-02, P = 241.347588 Days, E = 283.900391 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	1.63	1.53	2.94	5.34	3.10	0.47	10.1	8.70	0.10	-1.31	9.21	3.91	0.29	2.58





### Stellar Parameters For KIC 008197358

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4171^{+146}_{-161}$	$4.620^{+0.053}_{-0.018}$	$0.140^{+0.250}_{-0.300}$	$0.652^{+0.032}_{-0.064}$	$0.647^{+0.051}_{-0.057}$	$3.287^{+0.824}_{-0.281}$
	+4%/-4%	+1%/-0%	+179%/-214%	+5%/-10%	+8%/-9%	+25%/-9%
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 008197358-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-910 \pm 105$	$1.94^{+1.21}_{-1.02}$	$253^{+10}_{-10}$	$4258^{+1638}_{-638}$	$56617^{+197069}_{-34974}$
Alt.	$-93 \pm 57$	$1.89^{+1.19}_{-1.11}$	$255^{+9}_{-10}$	$2934^{+921}_{-471}$	$5405^{+24256}_{-4027}$

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

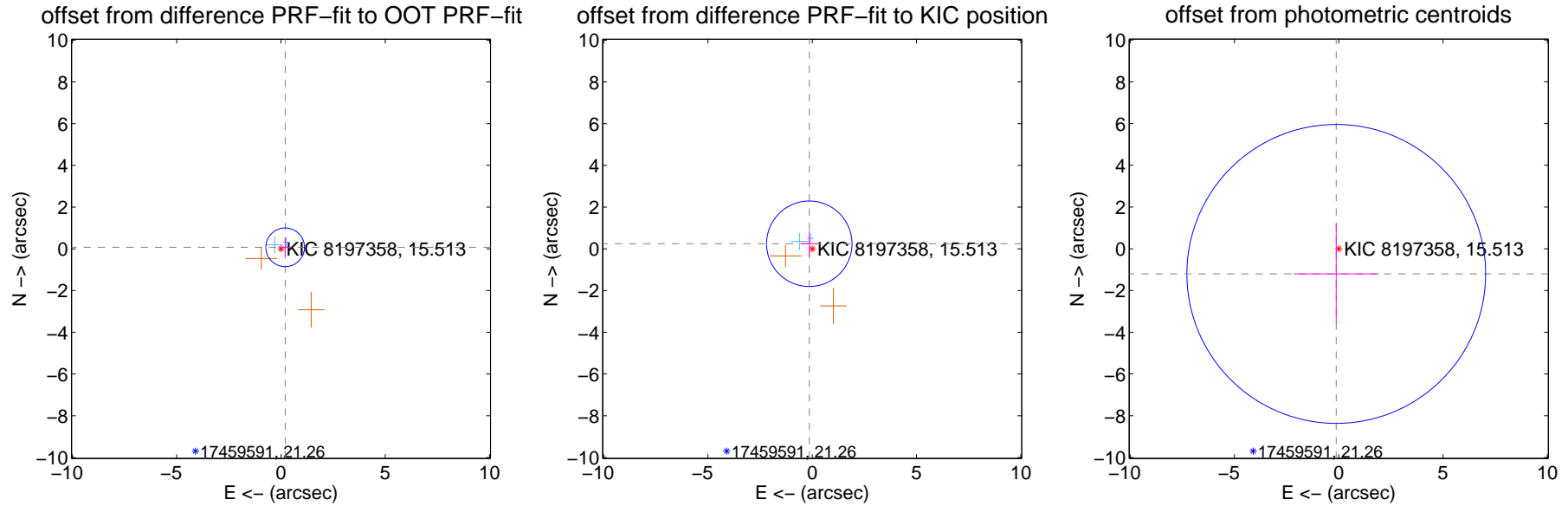
## DV Centroid Data

Supplemental centroid analysis for 008197358-02. Kepler magnitude: 15.51. Transit SNR 3.12

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.47 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.213 \pm 0.309$	0.69	$-0.200 \pm 0.281$	$0.073 \pm 0.465$
PRF-fit source offset from KIC position	$0.281 \pm 0.683$	0.41	$0.140 \pm 0.400$	$0.243 \pm 0.613$
photometric centroid source offset	$1.21 \pm 2.39$	0.51	$0.12 \pm 2.04$	$-1.21 \pm 2.39$

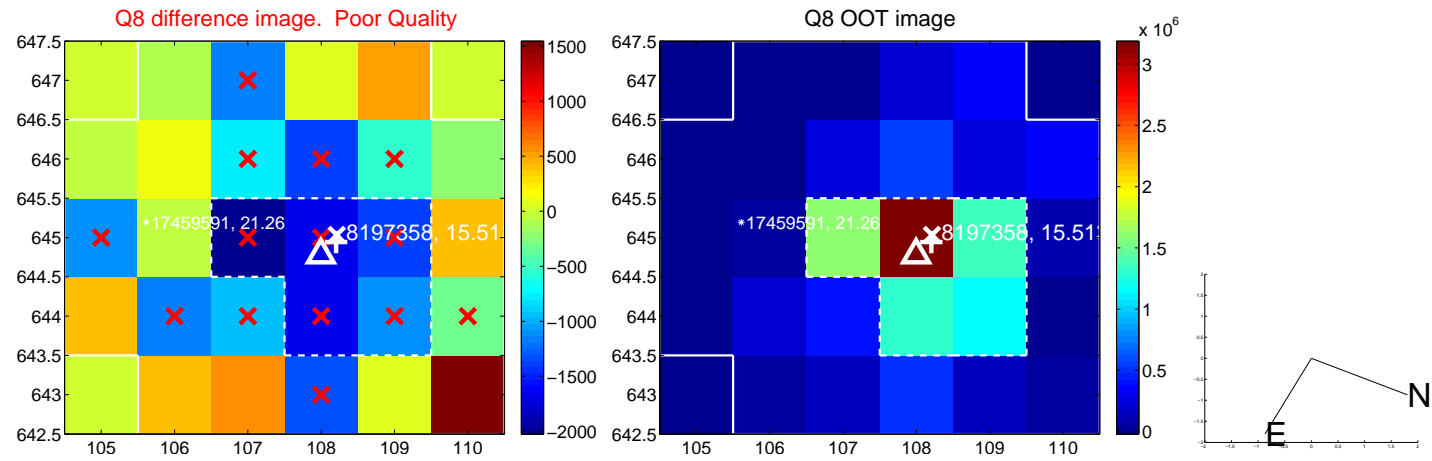
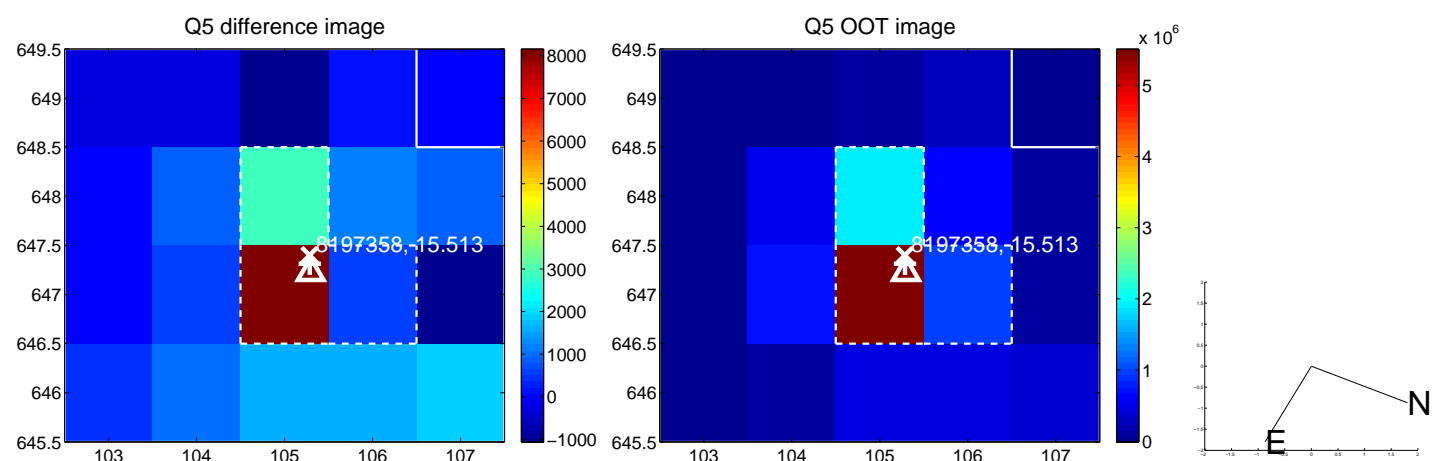


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



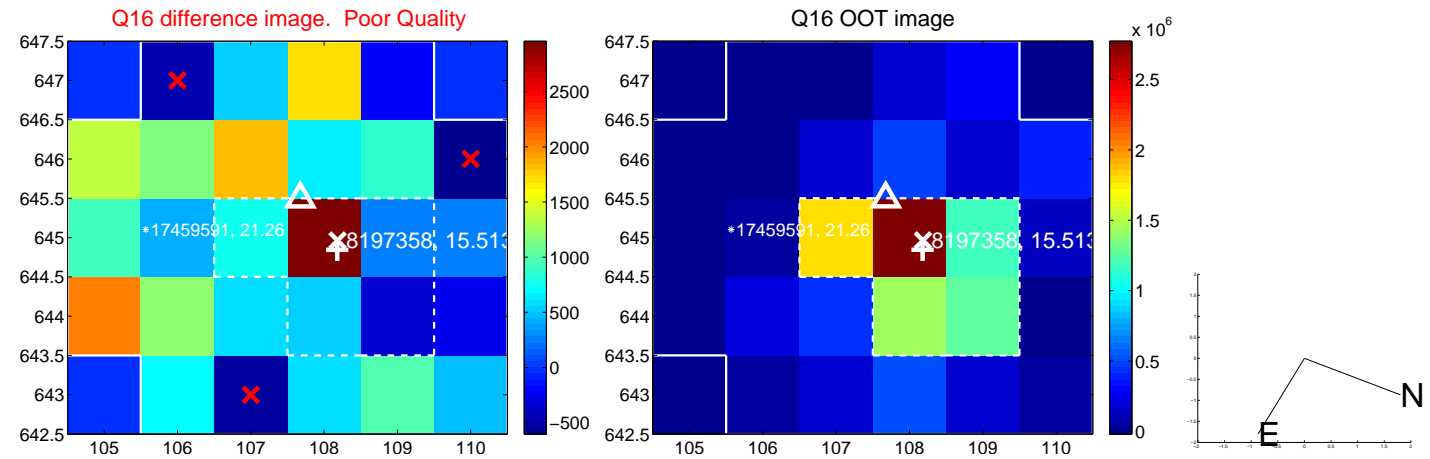
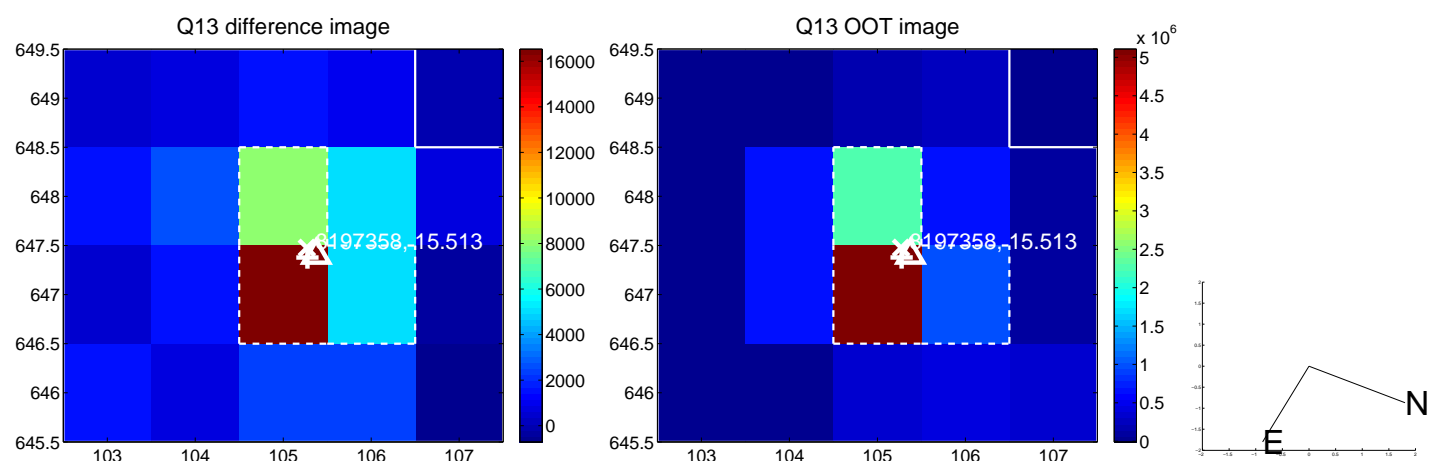
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



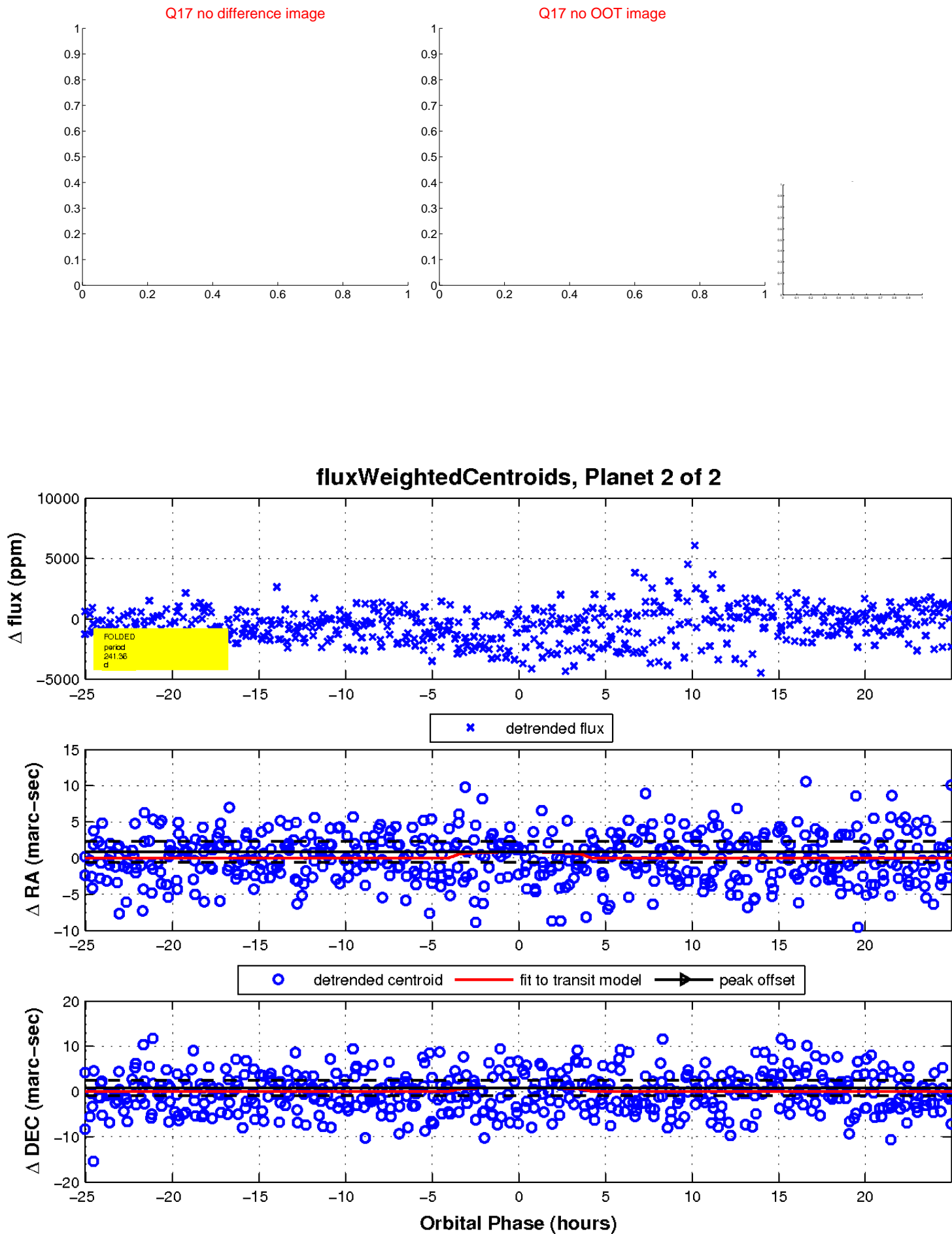
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

