

# KIC 010468794

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010468794-01	OBS	No	447.337189	557.169521	158.5	14.000	18.8	15.6	2.40	9649	3.25	19.02
010468794-02	OBS	No	419.069621	184.992185	76.3	16.233	11.1	10.6	2.40	9649	2.28	20.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010468794-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_SATURATED
010468794-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_SATURATED

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

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

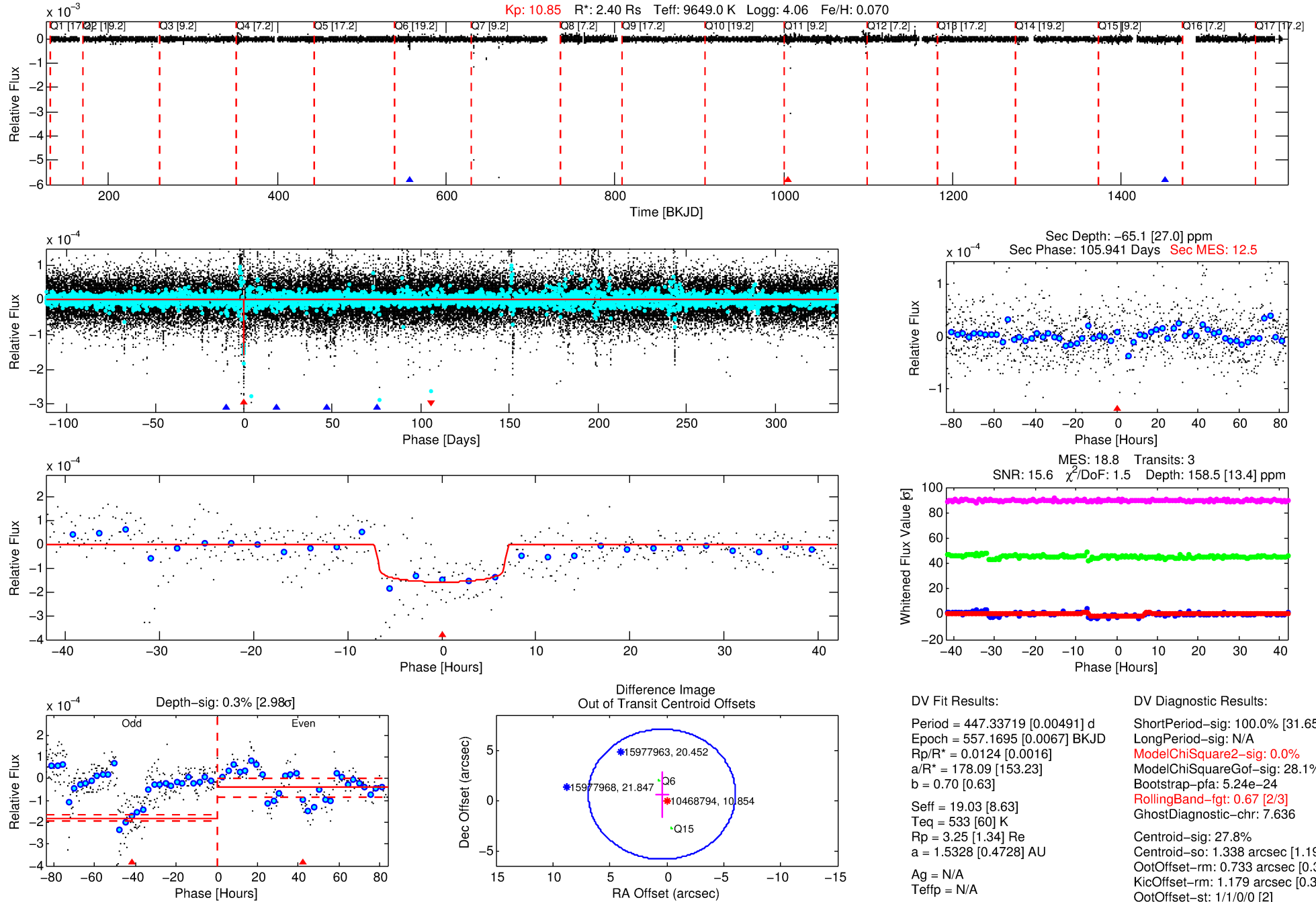
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010468794-01

No Significant Match Found

# DV One-Page Summary

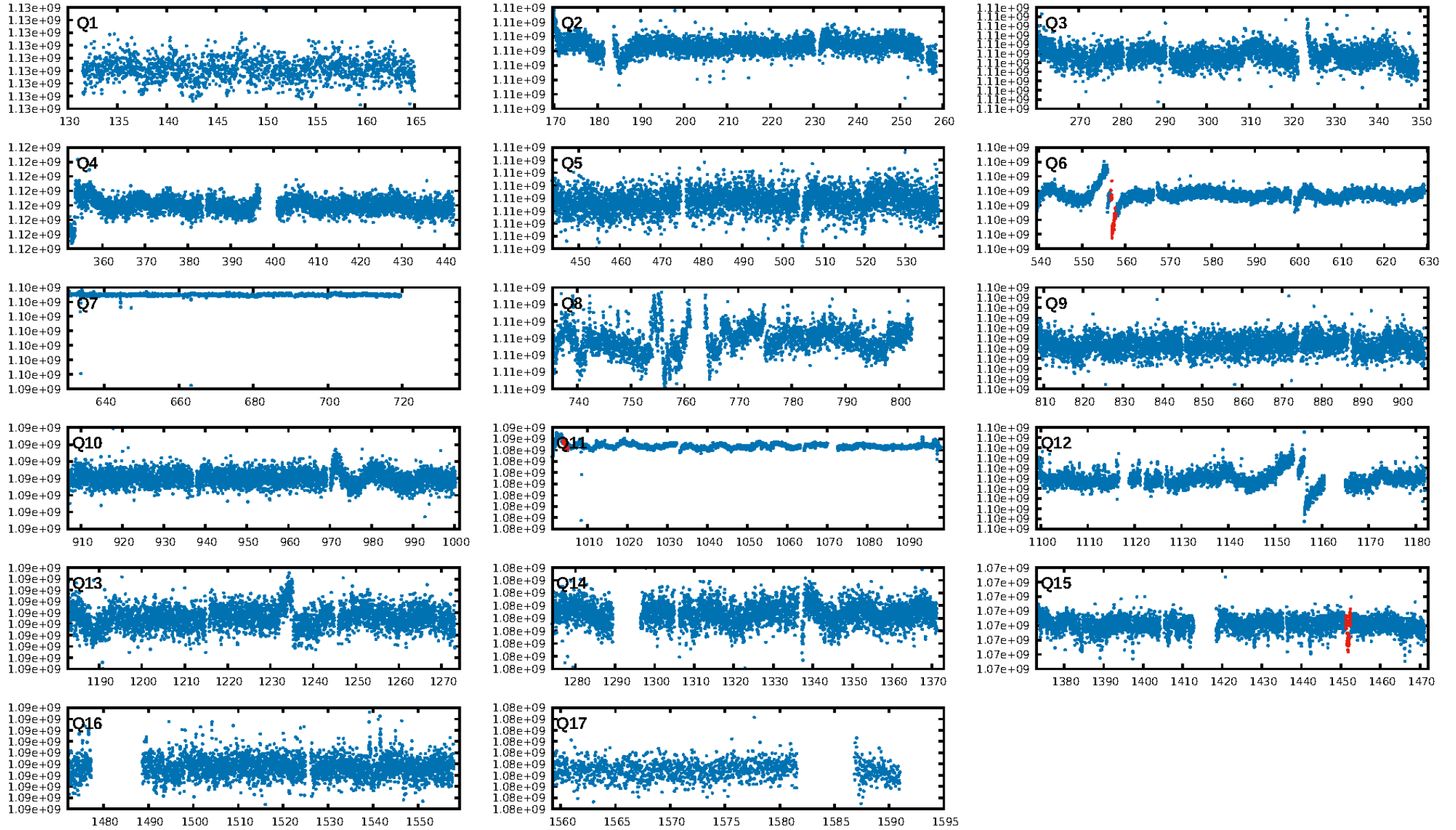
KIC: 10468794 Candidate: 1 of 2 Period: 447.337 d



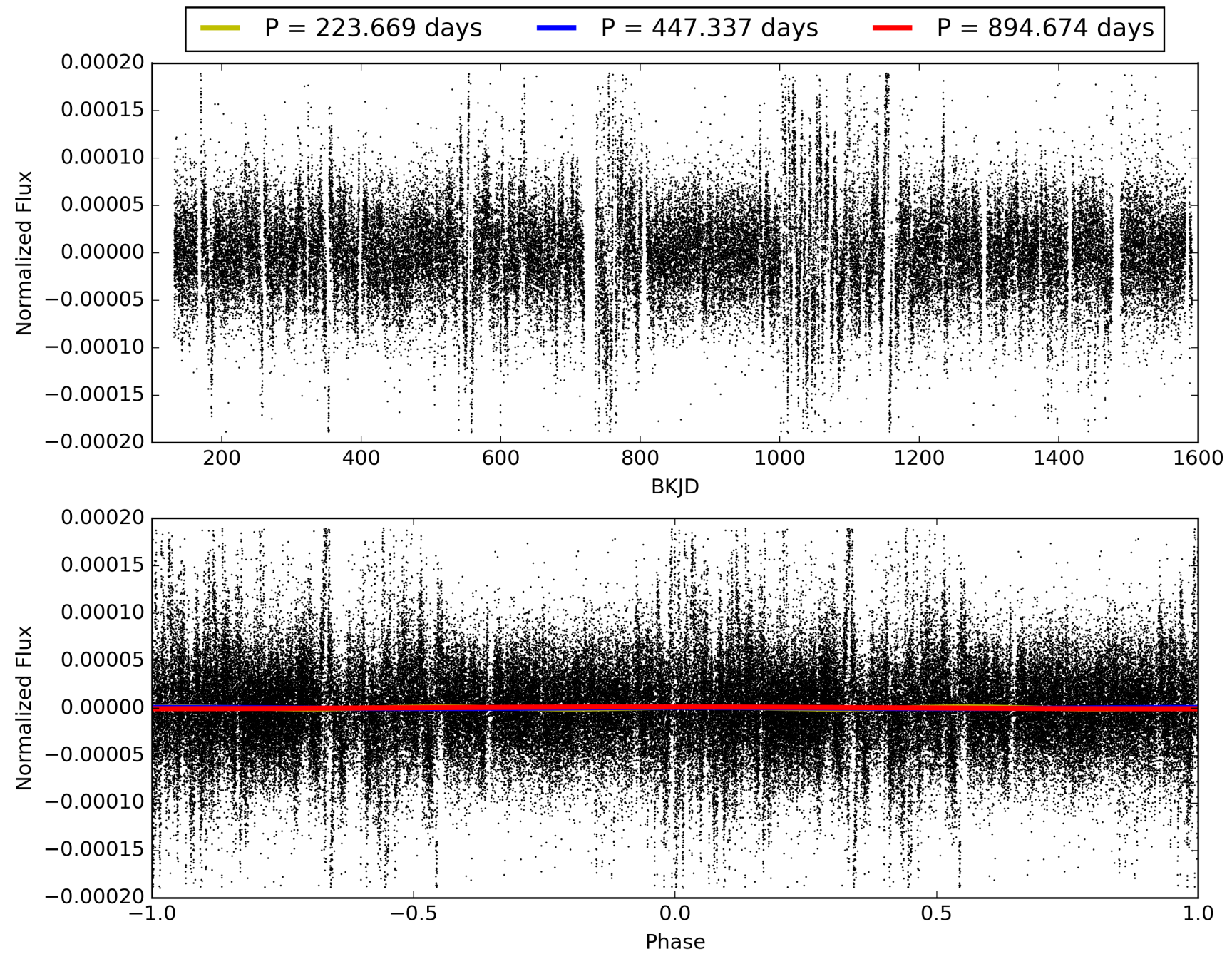
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 00:44:08 Z

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

# TCE 010468794-01, PDC Light Curves

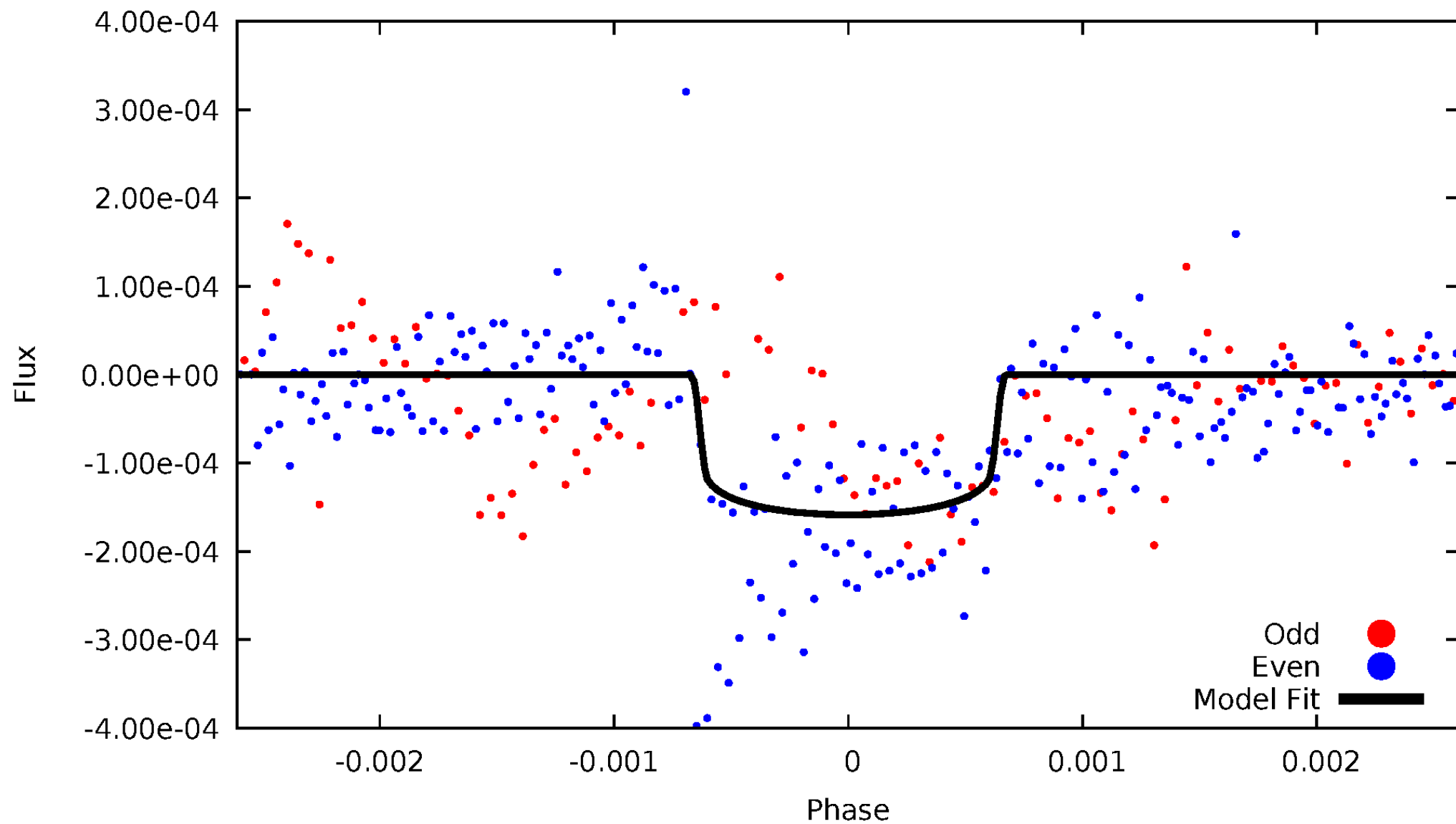


# TCE 010468794-01



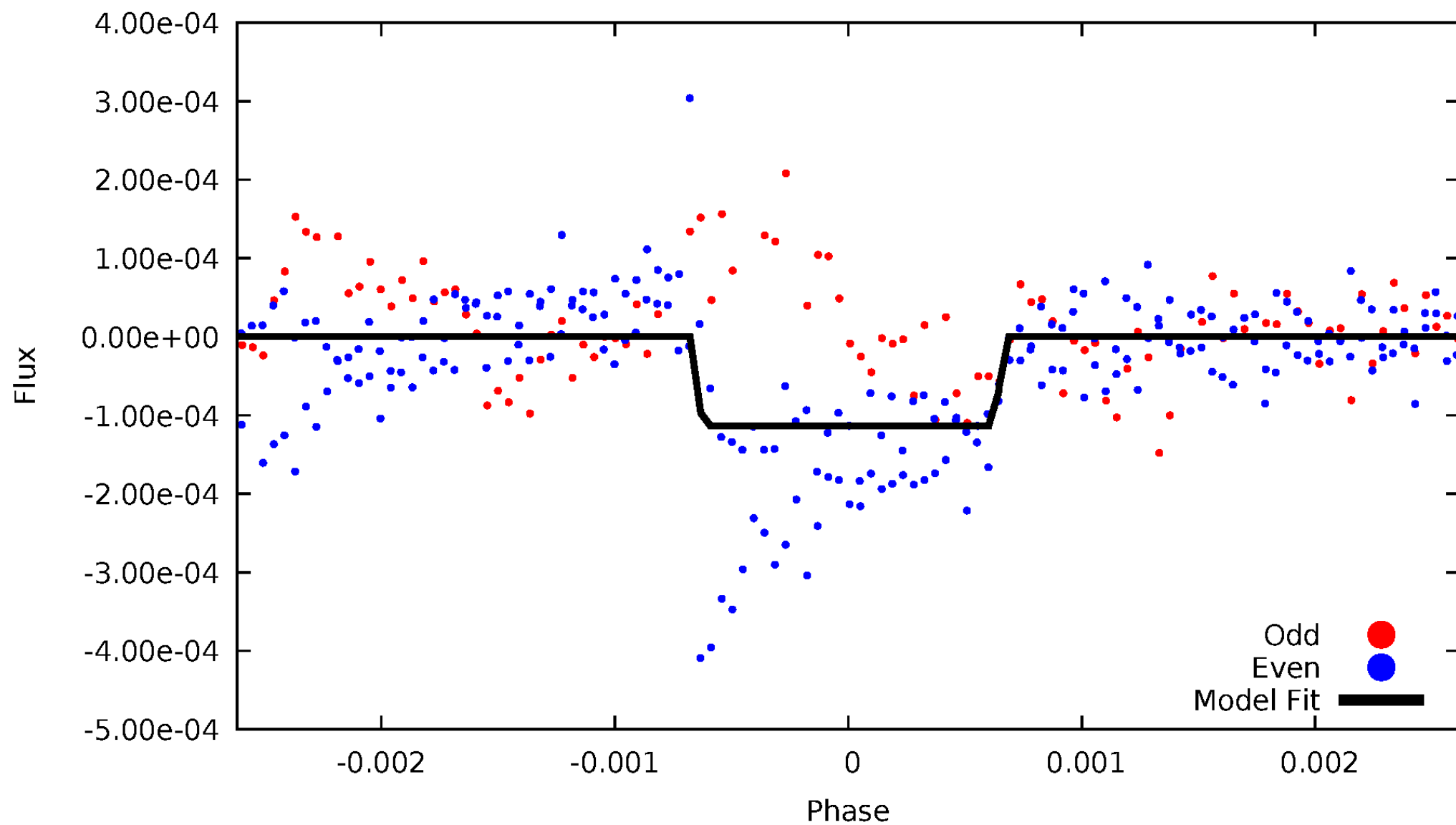
# DV Odd/Even

TCE 010468794-01



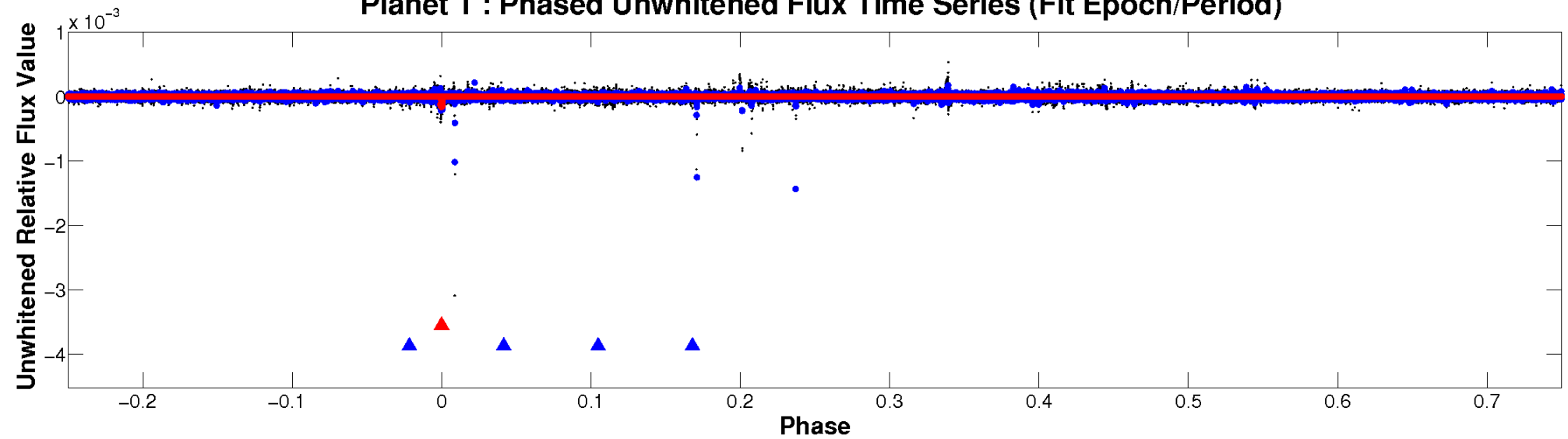
# ALT Odd/Even

TCE 010468794-01

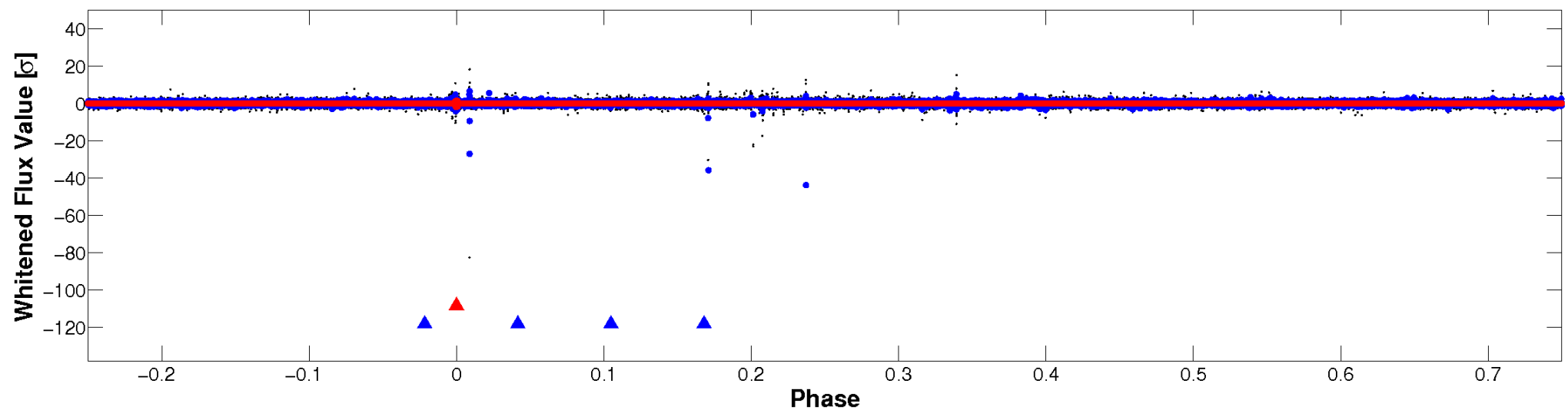


# Non-Whitened Vs. Whitened Light Curve

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

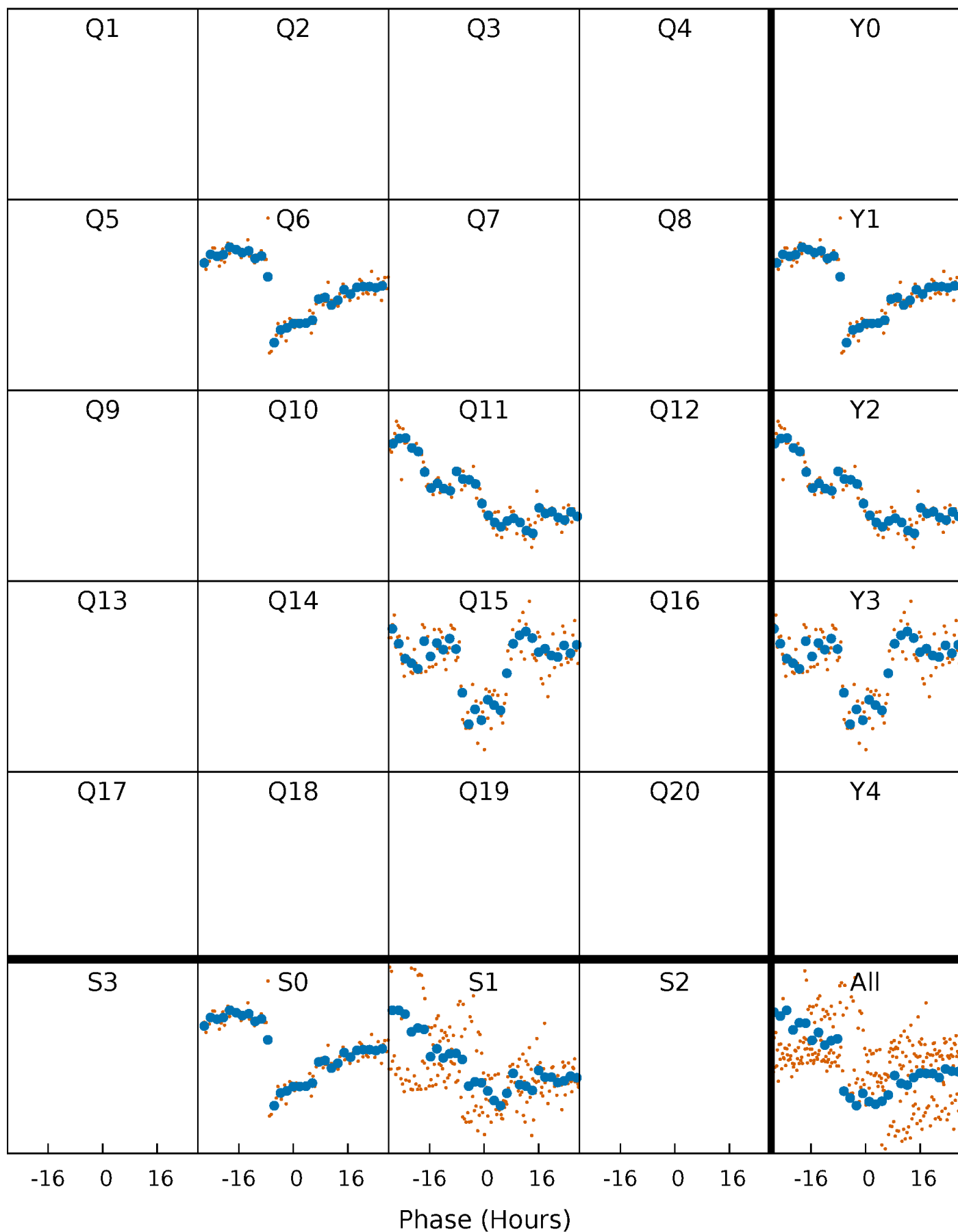


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

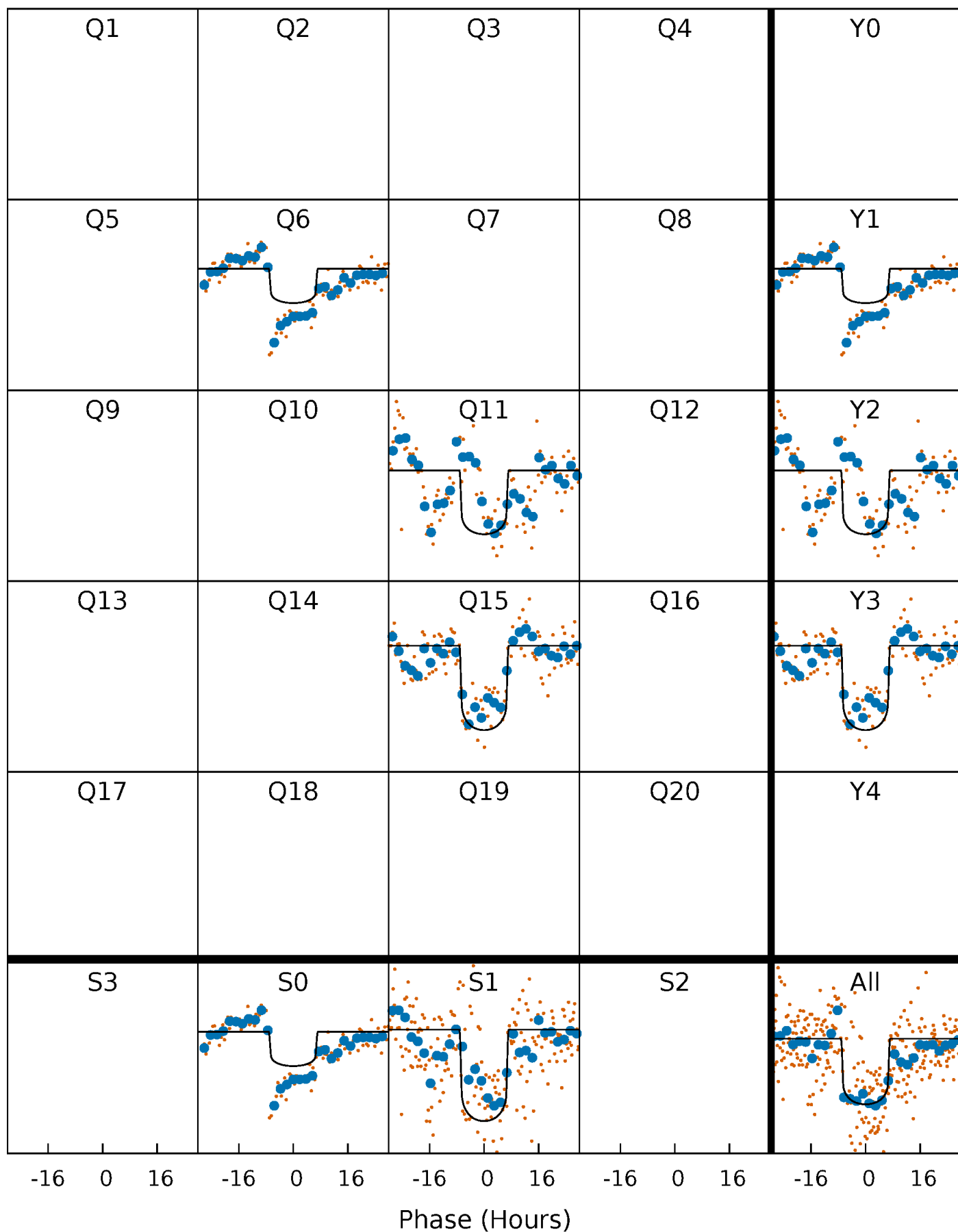
TCE 010468794-01 P=447.337189 Days  $T_0=557.169521$  (BKJD)





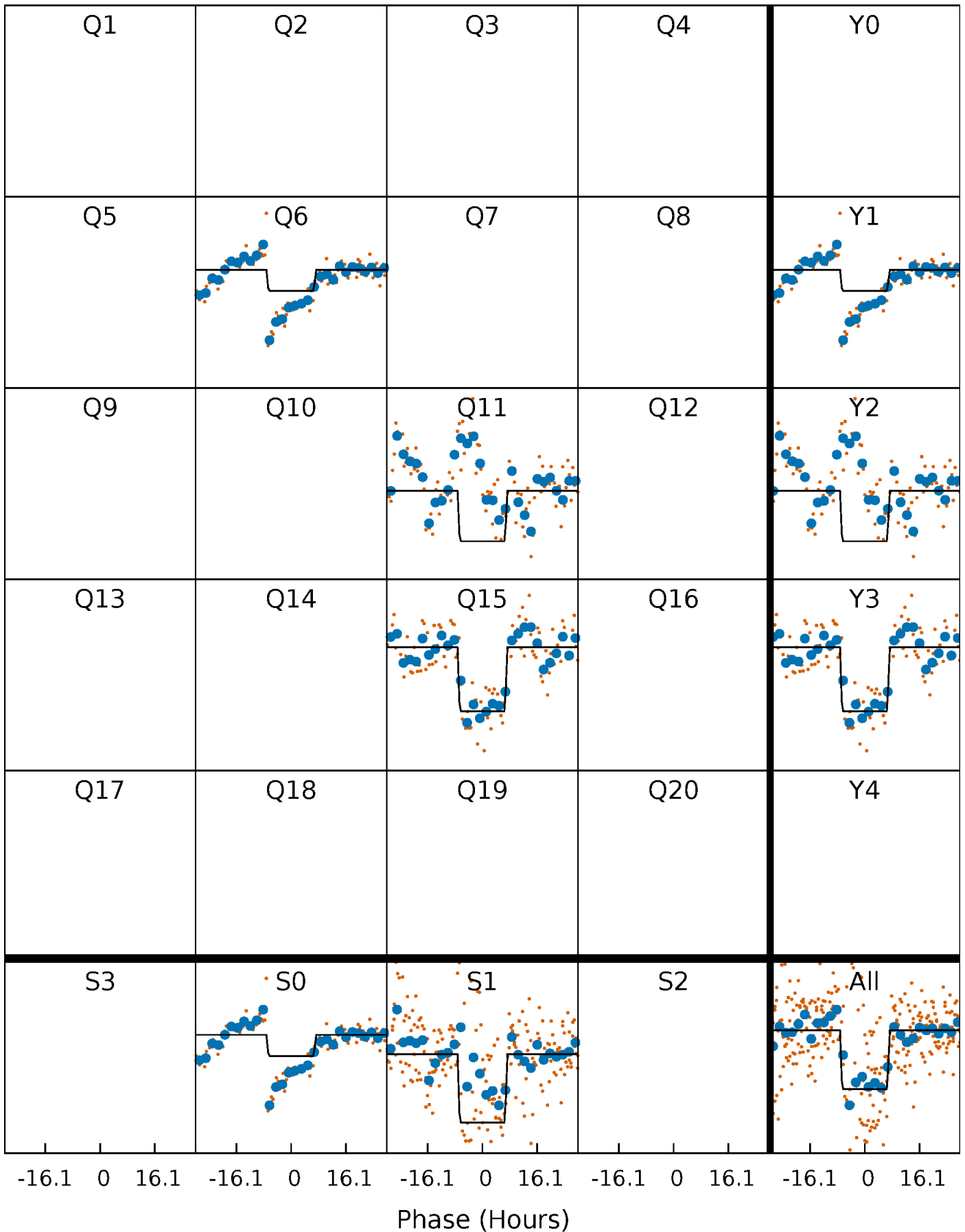
# DV Quarter-Phased Transit Curves

TCE 010468794-01 P=447.337189 Days  $T_0=557.169521$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

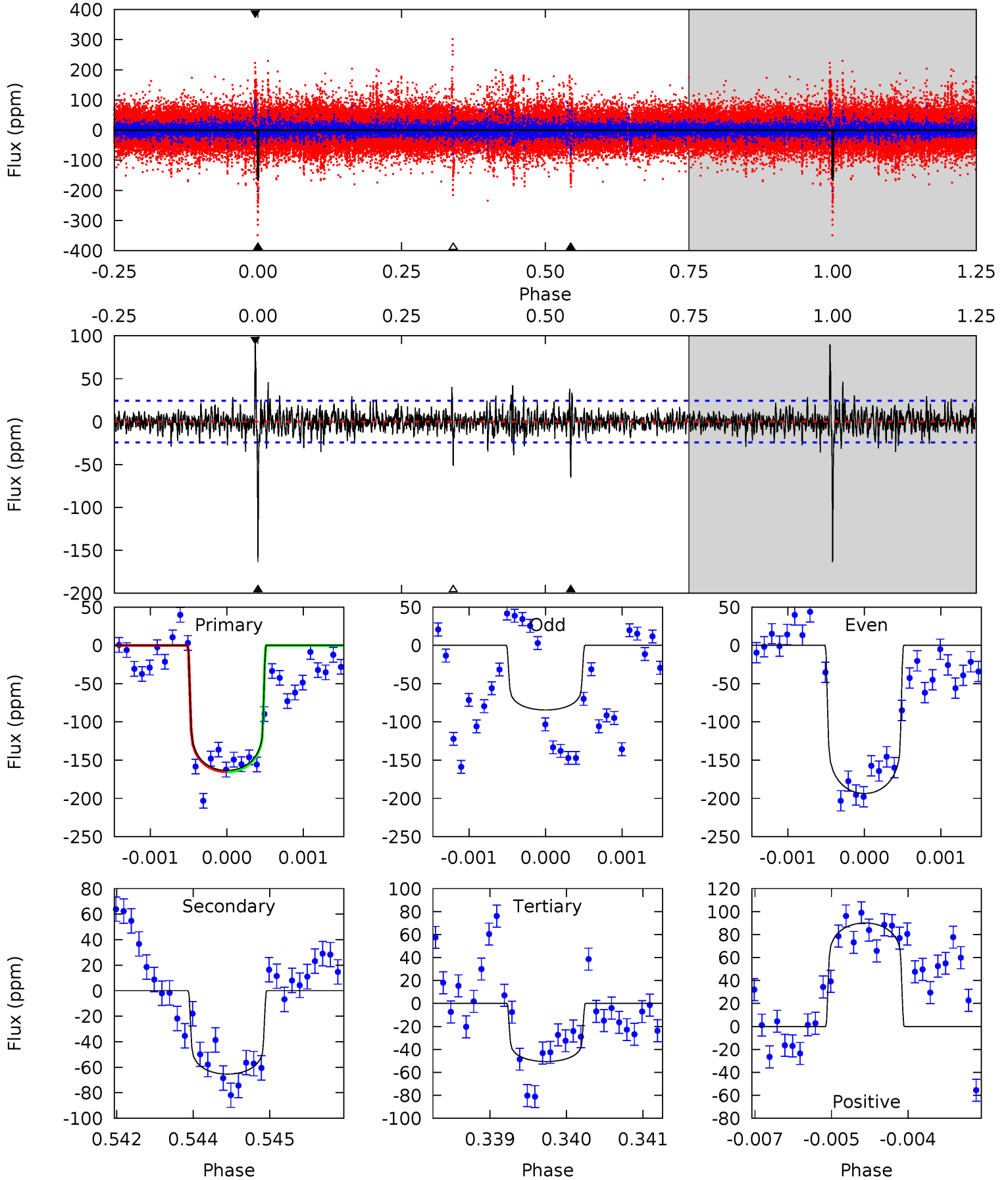
TCE 010468794-01 P=447.331496 Days  $T_0=557.163358$  (BKJD)



# DV Model-Shift Uniqueness Test

010468794-01, P = 447.337189 Days, E = 109.832332 Days

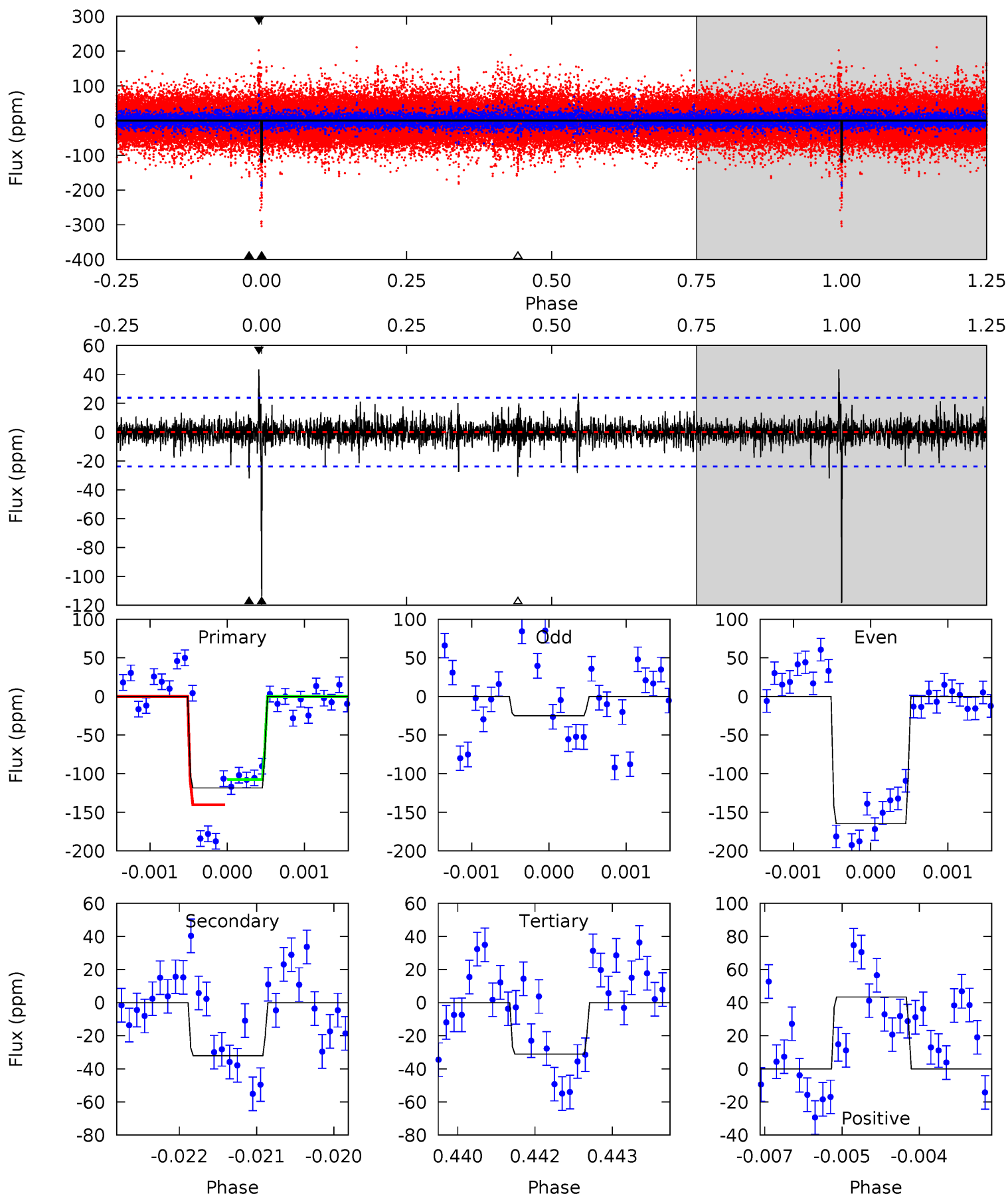
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.3	14.5	11.2	20.0	5.40	3.21	2.07	25.1	16.3	3.29	-5.48	11.4	1.23	0.36	0.04



# Alt Model-Shift Uniqueness Test

010468794-01, P = 447.331496 Days, E = 109.831862 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
27.0	7.30	7.07	9.88	5.40	3.21	1.20	19.9	17.1	0.23	-2.58	16.0	0.94	0.27	3.52



### Stellar Parameters For KIC 010468794

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9649^{+236}_{-405}$	$4.058^{+0.144}_{-0.216}$	$0.070^{+0.150}_{-0.550}$	$2.399^{+0.936}_{-0.576}$	$2.398^{+0.428}_{-0.571}$	$0.245^{+0.180}_{-0.136}$
	+2%/-4%	+4%/-5%	+214%/-786%	+39%/-24%	+18%/-24%	+74%/-56%
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 010468794-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-65 \pm 4$	$3.28^{+0.81}_{-0.62}$	$746^{+68}_{-52}$	$7286^{+644}_{-522}$	$7634^{+3664}_{-2552}$
Alt.	$-32 \pm 4$	$2.83^{+0.71}_{-0.59}$	$747^{+65}_{-50}$	$6508^{+712}_{-547}$	$5054^{+2791}_{-1732}$

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

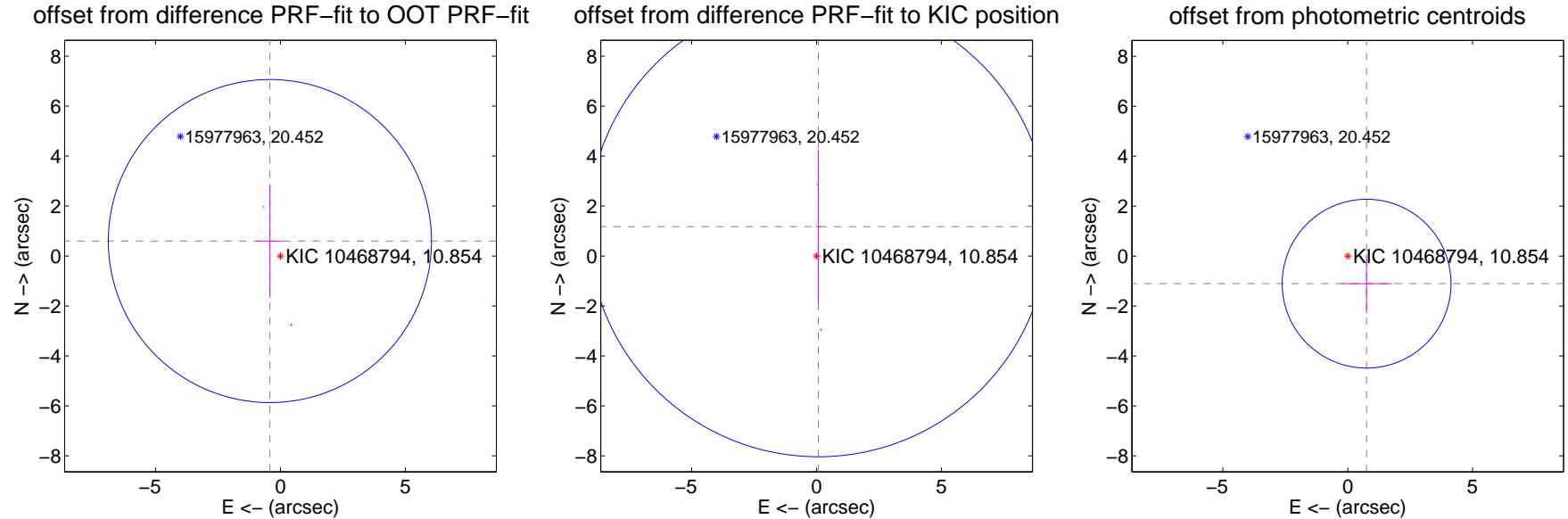
## DV Centroid Data

Supplemental centroid analysis for 010468794-01. **Kepler magnitude: 10.85.** Transit SNR 15.64

**There are 2 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.733 \pm 2.155$	0.34	$0.421 \pm 0.533$	$0.600 \pm 2.262$
PRF-fit source offset from KIC position	$1.179 \pm 3.071$	0.38	$-0.072 \pm 0.095$	$1.176 \pm 3.076$
photometric centroid source offset	$1.34 \pm 1.13$	1.19	$-0.76 \pm 1.02$	$-1.10 \pm 1.17$



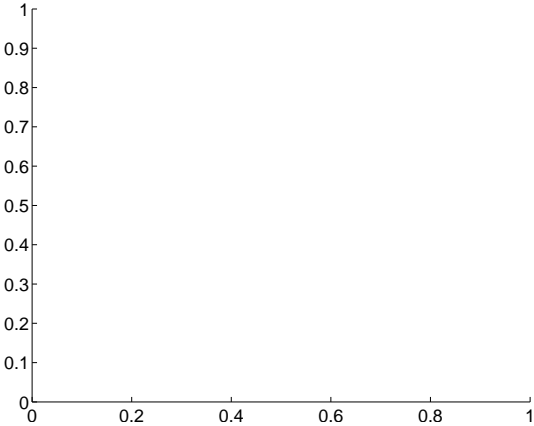
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

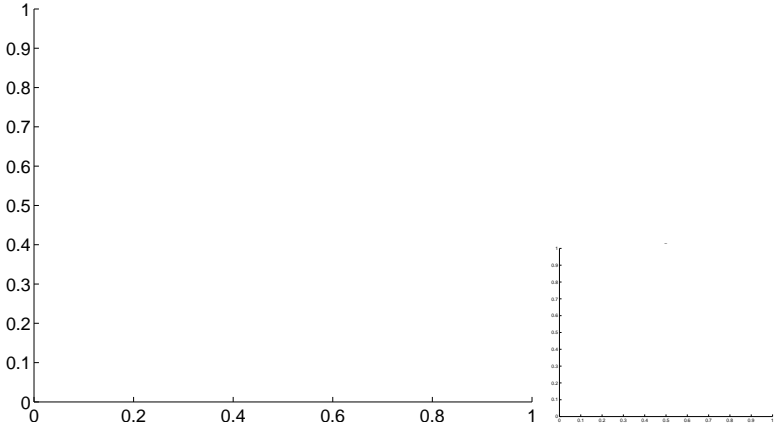


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

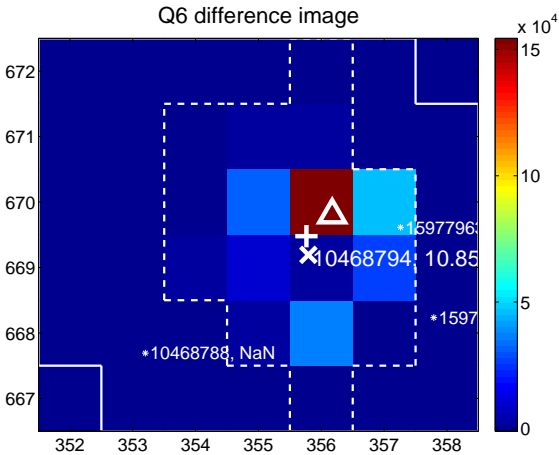
Q5 no difference image



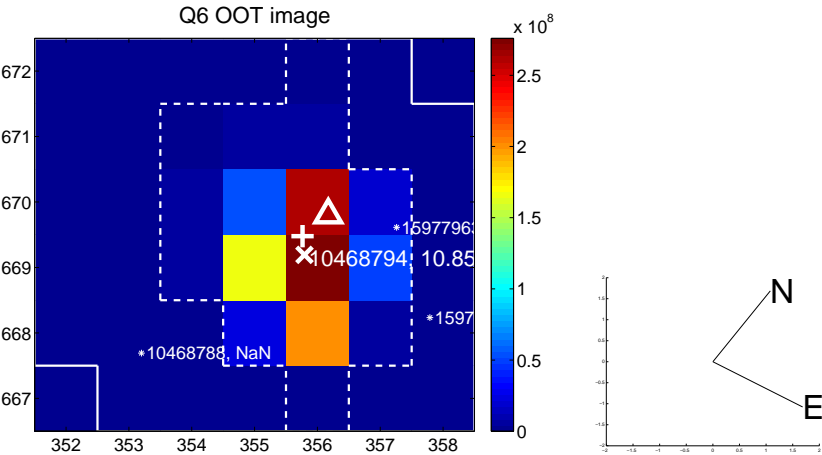
Q5 no OOT image



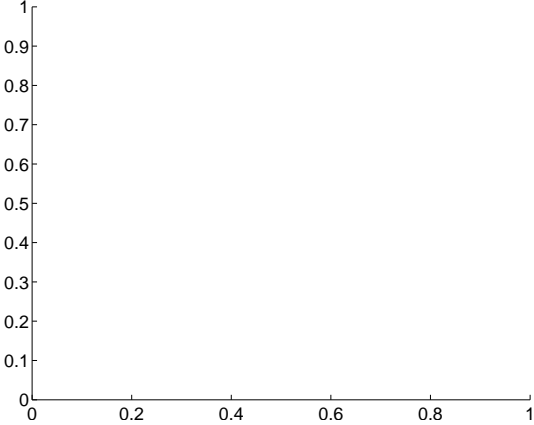
Q6 difference image



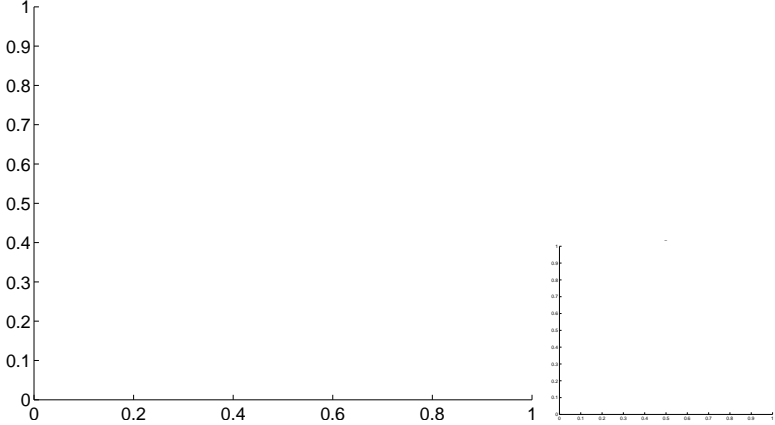
Q6 OOT image



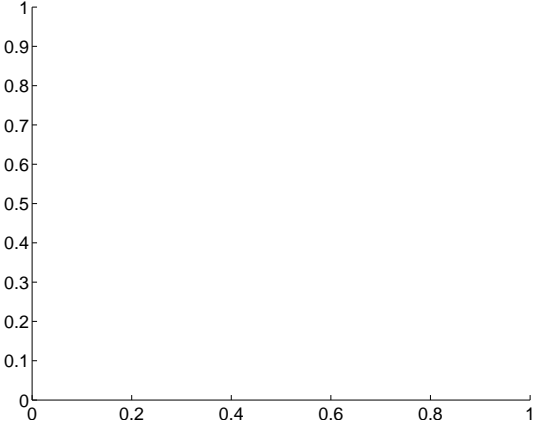
Q7 no difference image



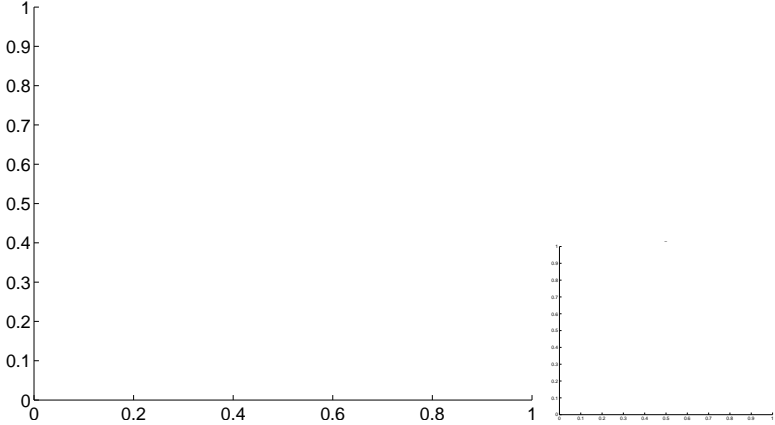
Q7 no OOT image



Q8 no difference image



Q8 no OOT image





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



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

Q13 no difference image



Q13 no OOT image



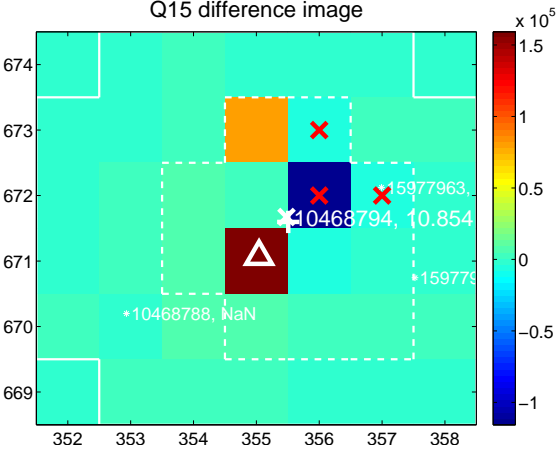
Q14 no difference image



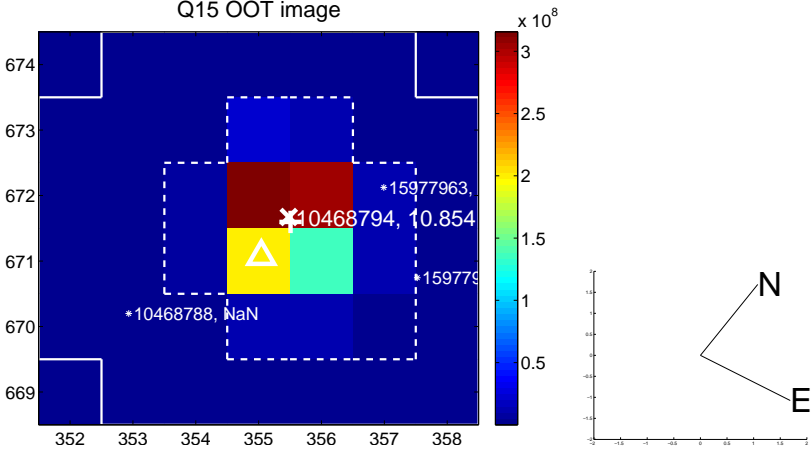
Q14 no OOT image



Q15 difference image



Q15 OOT image



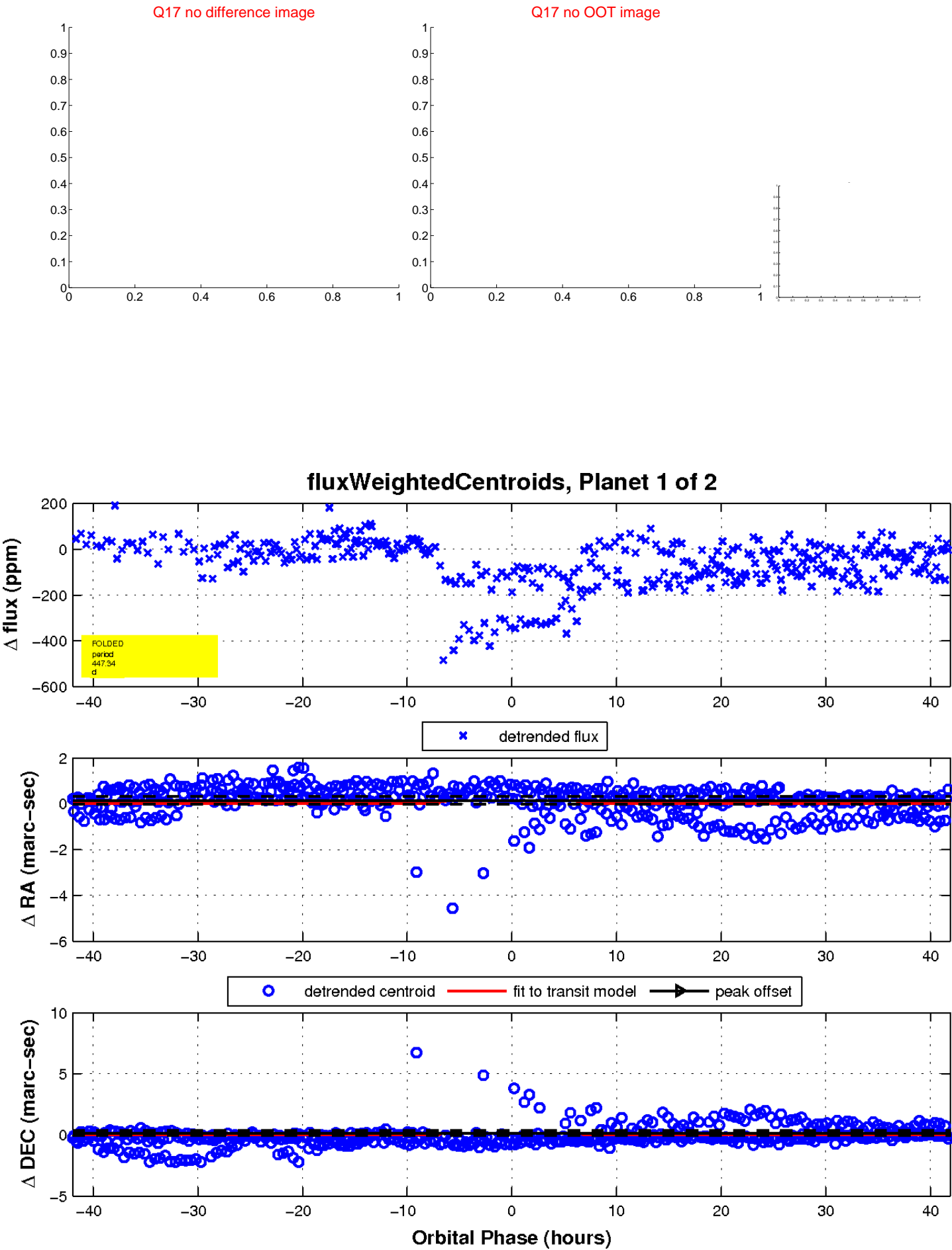
Q16 no difference image



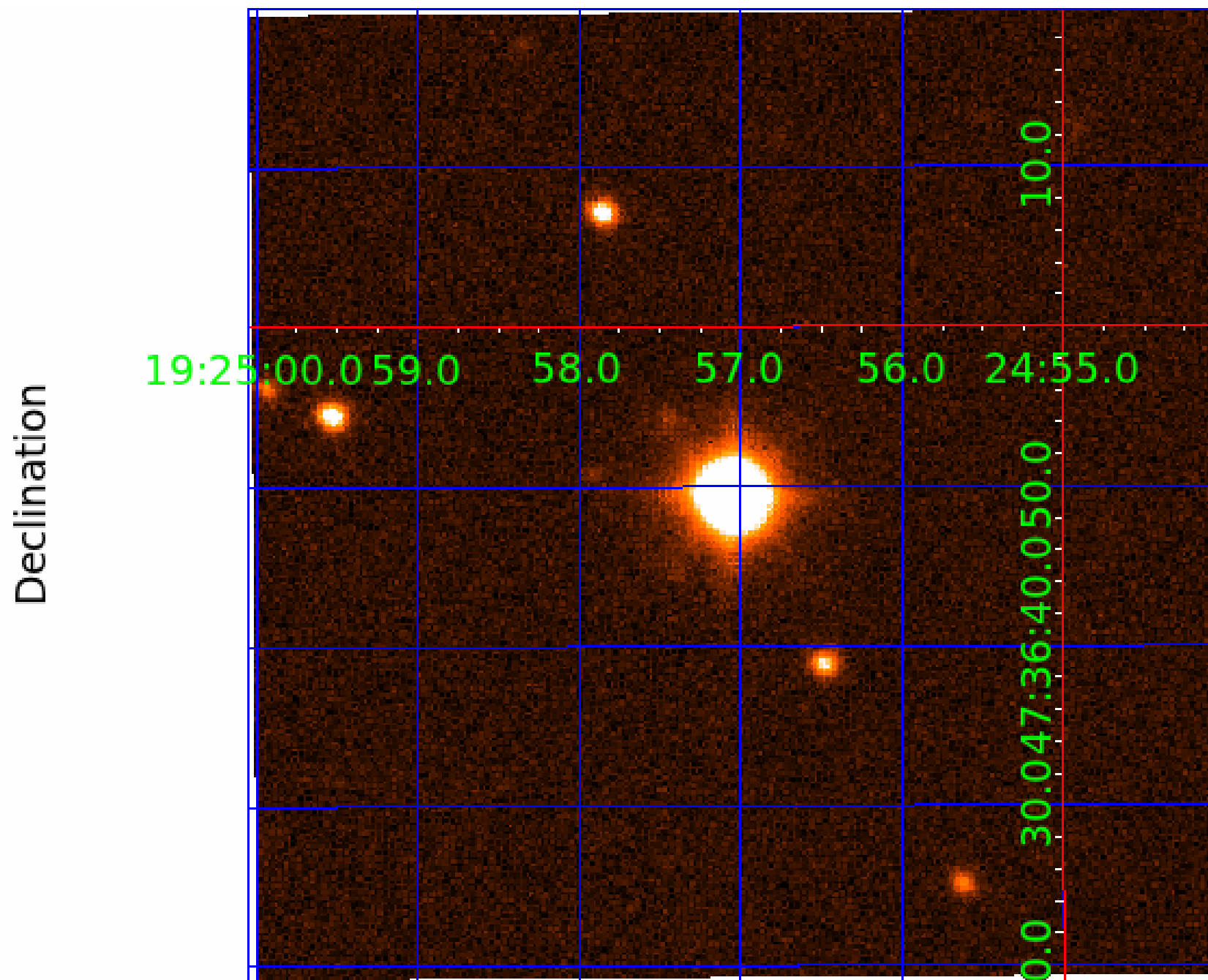
Q16 no OOT image



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



UKIRT Image



# KIC 010468794

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010468794-01	OBS	No	447.337189	557.169521	158.5	14.000	18.8	15.6	2.40	9649	3.25	19.02
010468794-02	OBS	No	419.069621	184.992185	76.3	16.233	11.1	10.6	2.40	9649	2.28	20.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010468794-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—INCONSISTENT_TRANS—CENT_SATURATED
010468794-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_SATURATED

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

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

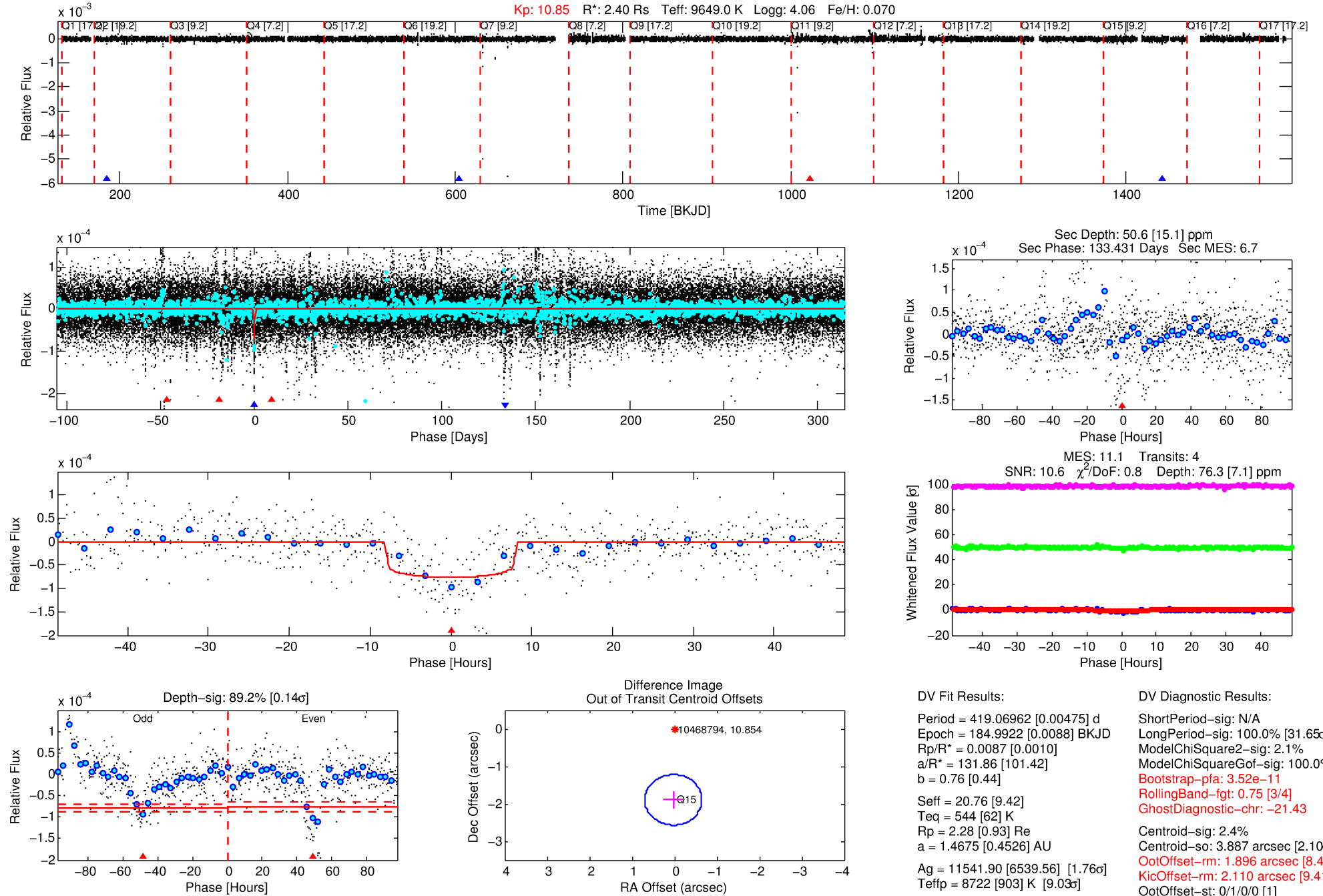
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010468794-02

No Significant Match Found

# DV One-Page Summary

KIC: 10468794 Candidate: 2 of 2 Period: 419.070 d



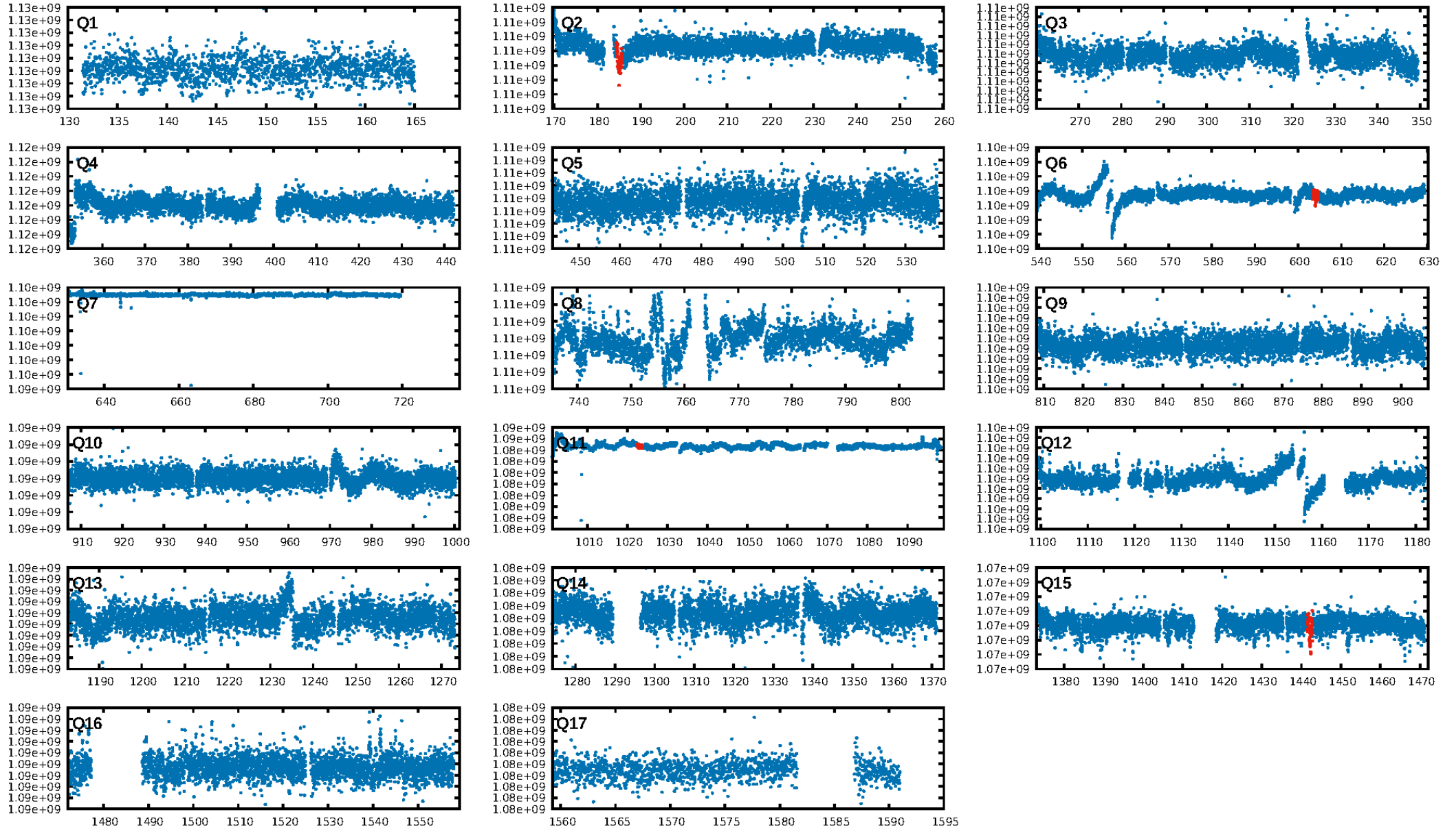
## DV Fit Results:

Period = 419.06962 [0.00475] d  
Epoch = 184.9922 [0.0088] BKJD  
 $R_p/R^* = 0.0087$  [0.0010]  
 $a/R^* = 131.86$  [101.42]  
 $b = 0.76$  [0.44]  
 $T_{\text{eff}} = 20.76$  [9.42]  
 $T_{\text{eq}} = 544$  [62] K  
 $R_p = 2.28$  [0.93]  $R_{\text{eq}}$   
 $a = 1.4675$  [0.4526] AU  
 $A_g = 11541.90$  [6539.56] [1.76 $\sigma$ ]  
 $T_{\text{eff}} = 8722$  [903] K [9.03 $\sigma$ ]

## DV Diagnostic Results:

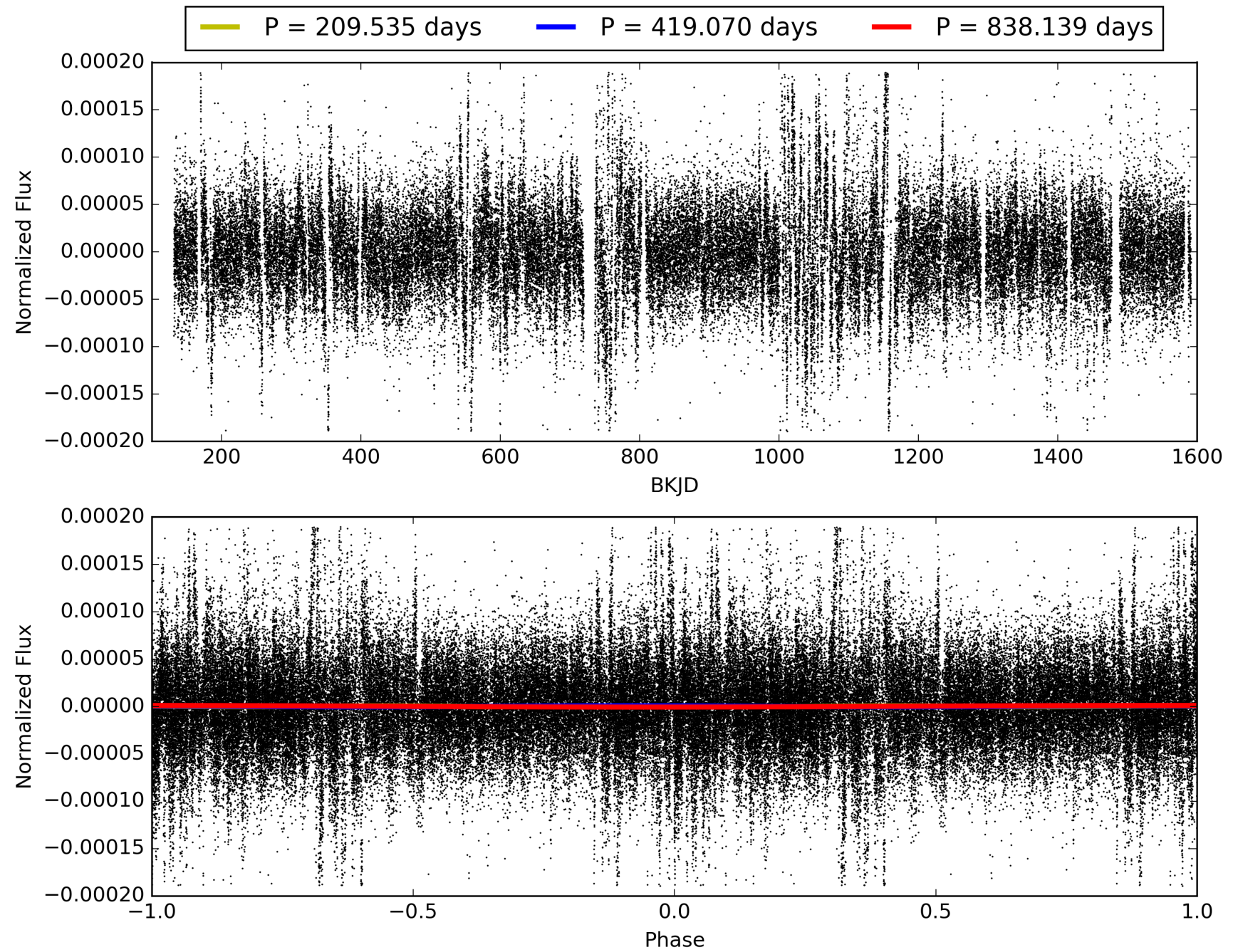
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [31.65 $\sigma$ ]  
ModelChiSquare2-sig: 2.1%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: 3.52e-11  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: -21.43  
Centroid-sig: 2.4%  
Centroid-so: 3.887 arcsec [2.10 $\sigma$ ]  
OotOffset-rm: 1.896 arcsec [8.45 $\sigma$ ]  
KicOffset-rm: 2.110 arcsec [9.41 $\sigma$ ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 010468794-02, PDC Light Curves





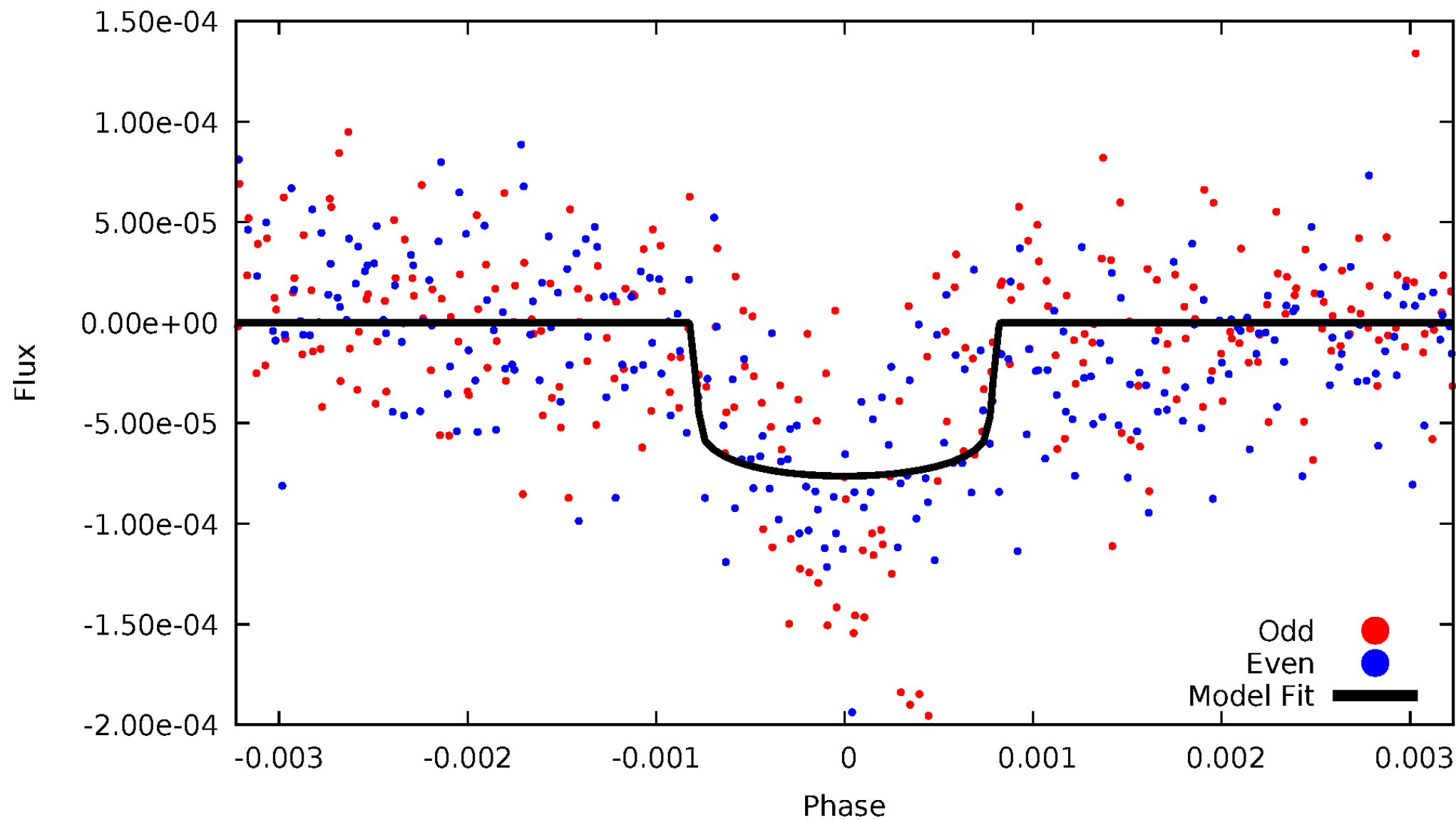
TCE 010468794-02





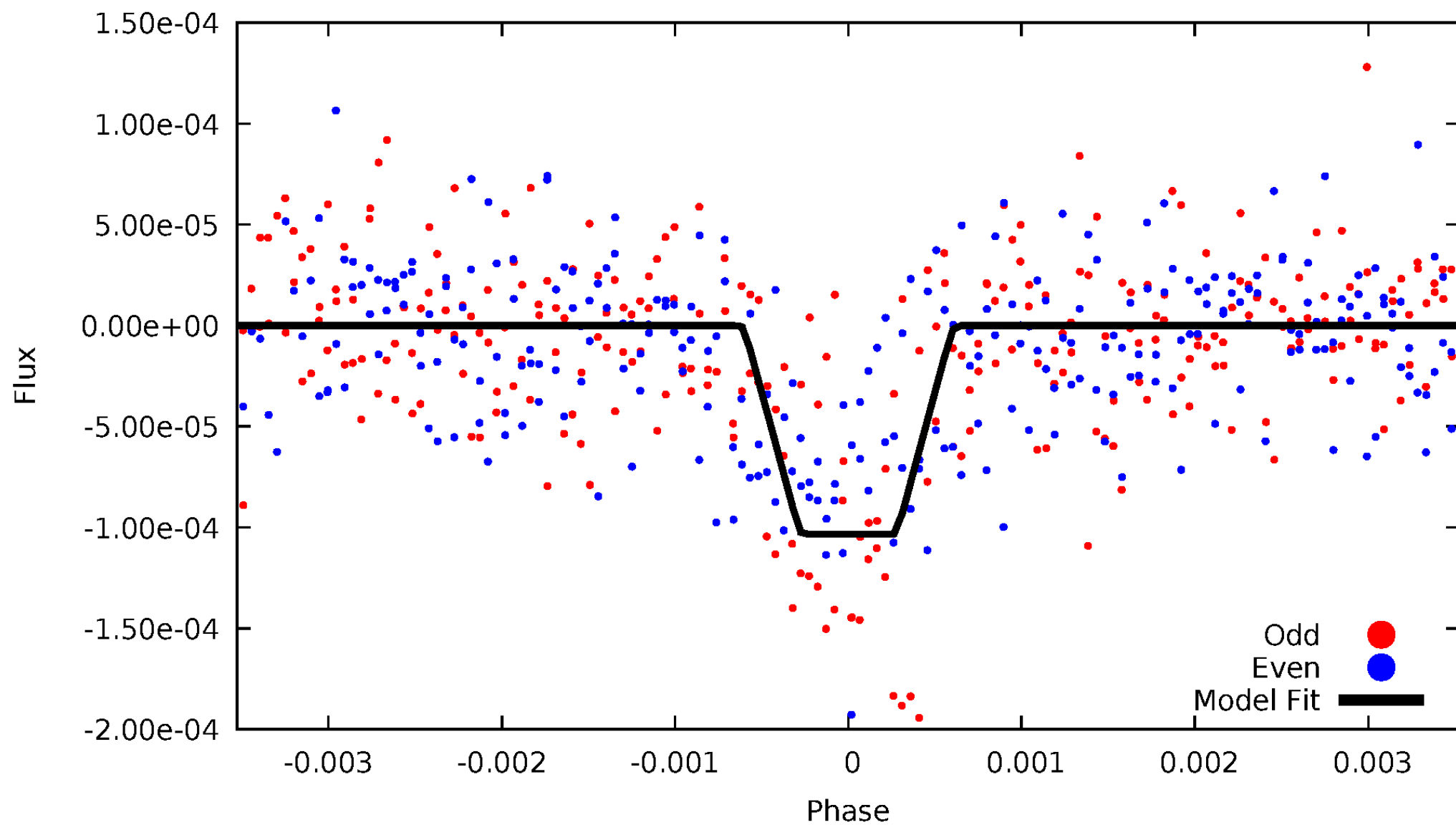
# DV Odd/Even

TCE 010468794-02



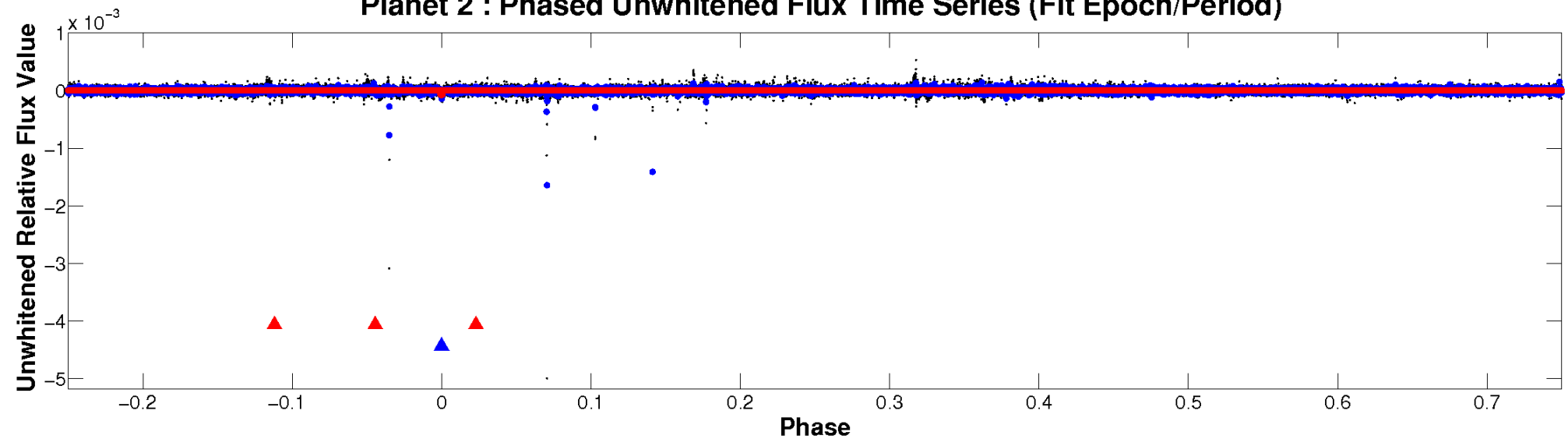
# ALT Odd/Even

TCE 010468794-02

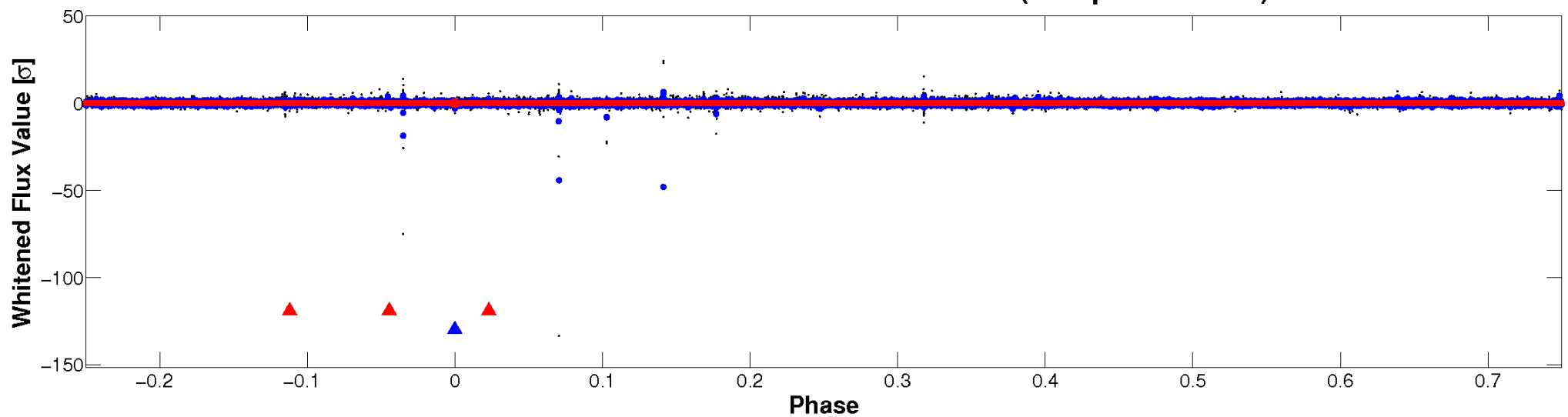


# Non-Whitened Vs. Whitened Light Curve

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

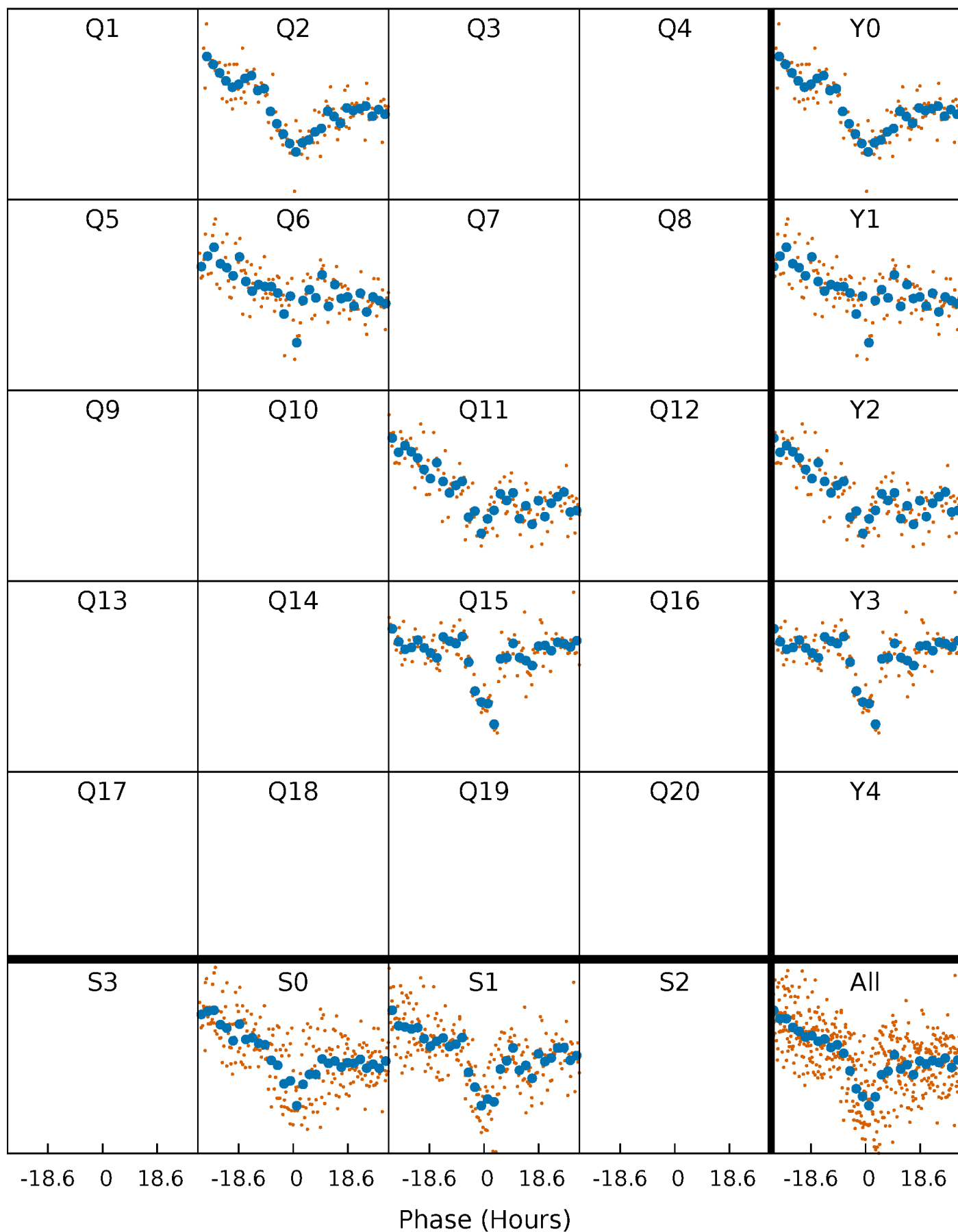


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



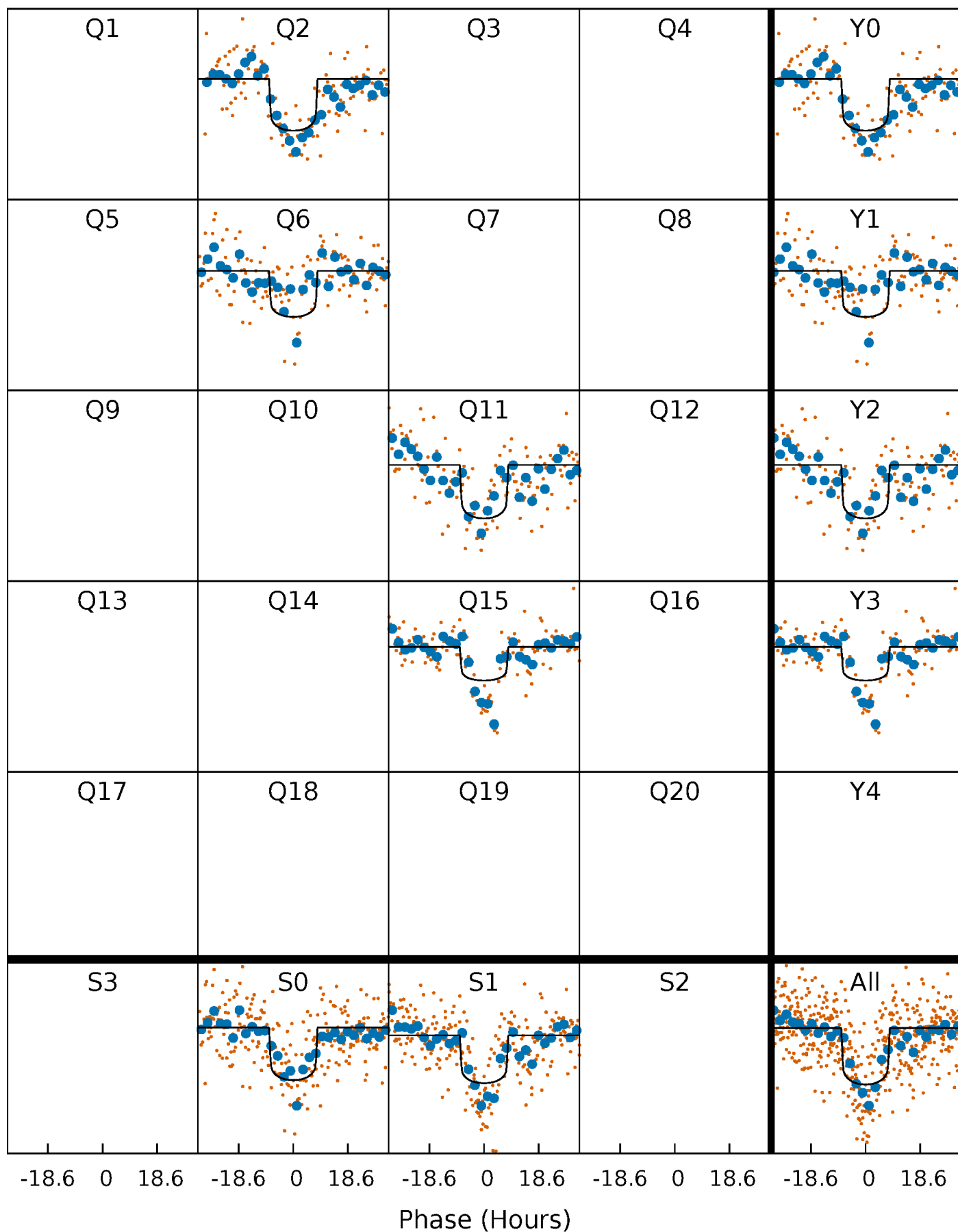
# PDC Quarter-Phased Transit Curves

TCE 010468794-02 P=419.069621 Days  $T_0=184.992185$  (BKJD)



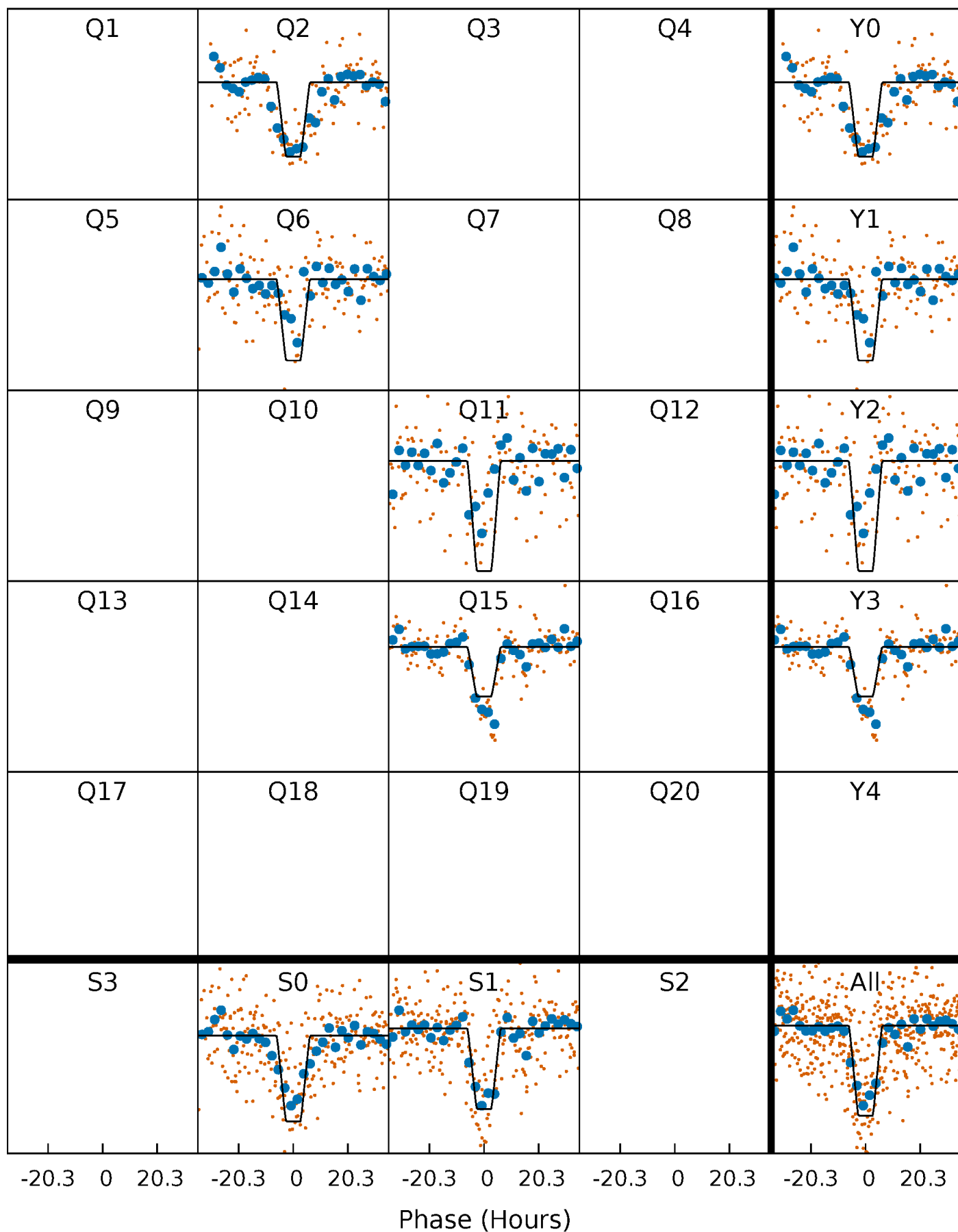
# DV Quarter-Phased Transit Curves

TCE 010468794-02 P=419.069621 Days  $T_0=184.992185$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

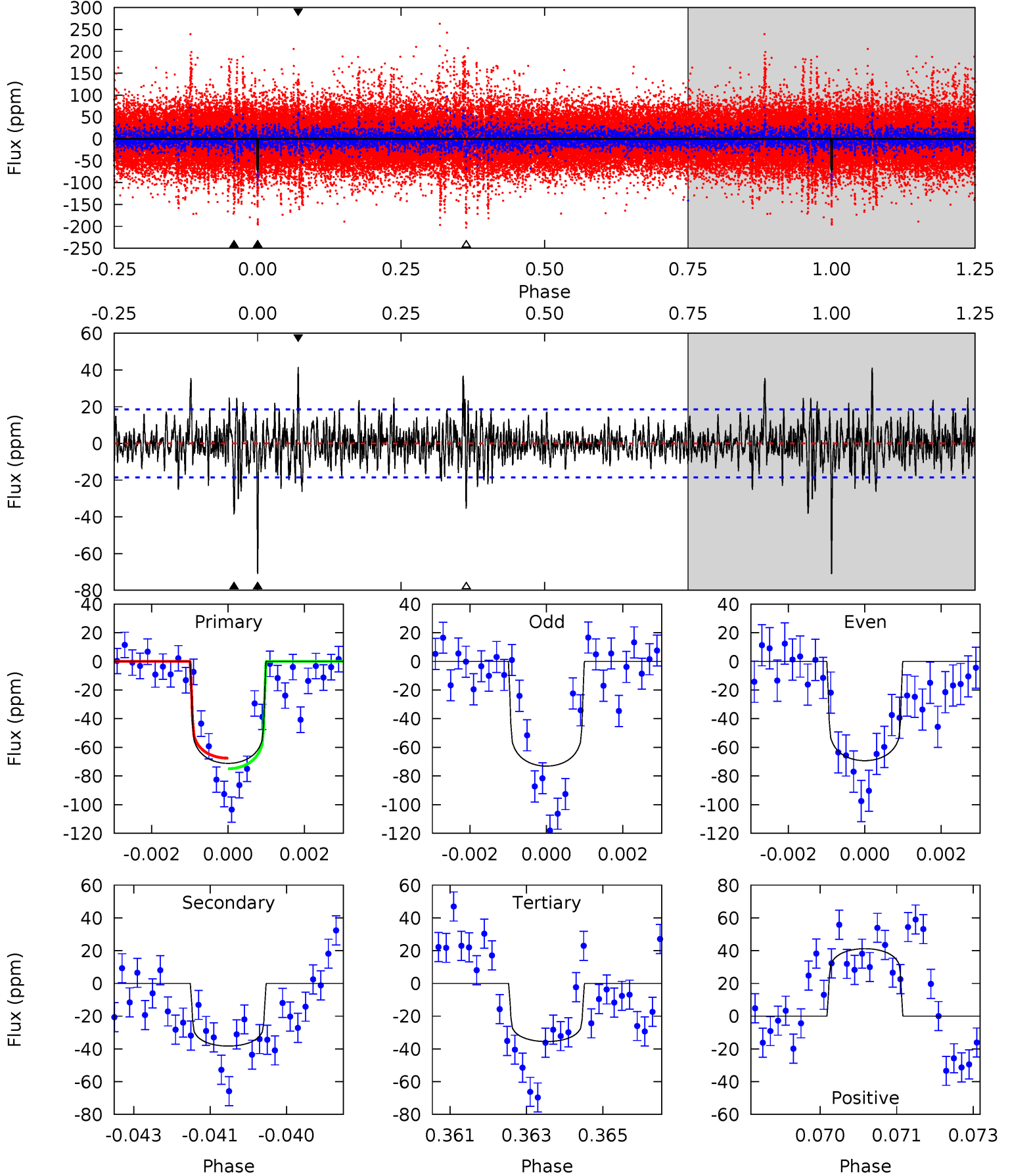
TCE 010468794-02     $P=419.071882$  Days     $T_0=185.001416$  (BKJD)



# DV Model-Shift Uniqueness Test

010468794-02, P = 419.069621 Days, E = 184.992185 Days

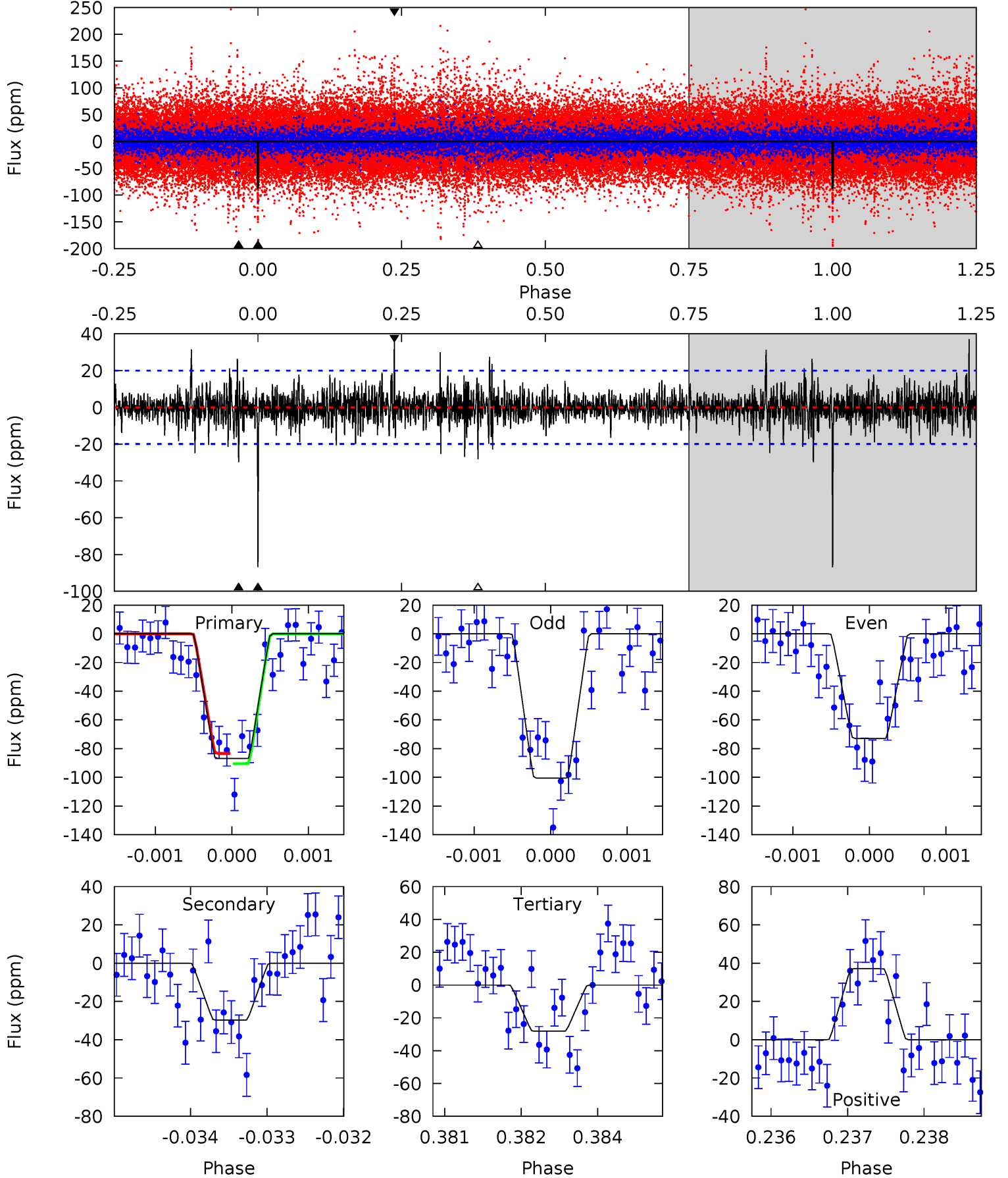
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.6	11.1	10.3	11.9	5.36	3.15	2.31	10.3	8.70	0.80	-0.84	0.54	1.02	0.37	1.07



# Alt Model-Shift Uniqueness Test

010468794-02, P = 419.071882 Days, E = 185.001416 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
23.6	8.07	7.65	10.1	5.42	3.23	1.66	16.0	13.5	0.42	-2.00	3.71	1.11	0.30	0.97





### Stellar Parameters For KIC 010468794

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9649^{+236}_{-405}$	$4.058^{+0.144}_{-0.216}$	$0.070^{+0.150}_{-0.550}$	$2.399^{+0.936}_{-0.576}$	$2.398^{+0.428}_{-0.571}$	$0.245^{+0.180}_{-0.136}$
	+2%/-4%	+4%/-5%	+214%/-786%	+39%/-24%	+18%/-24%	+74%/-56%
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 010468794-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-38 \pm 3$	$2.29^{+0.52}_{-0.42}$	$761^{+66}_{-48}$	$7706^{+704}_{-566}$	$8528^{+3825}_{-2840}$
Alt.	$-30 \pm 4$	$2.70^{+0.58}_{-0.43}$	$768^{+63}_{-56}$	$6547^{+520}_{-415}$	$4654^{+2040}_{-1401}$

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

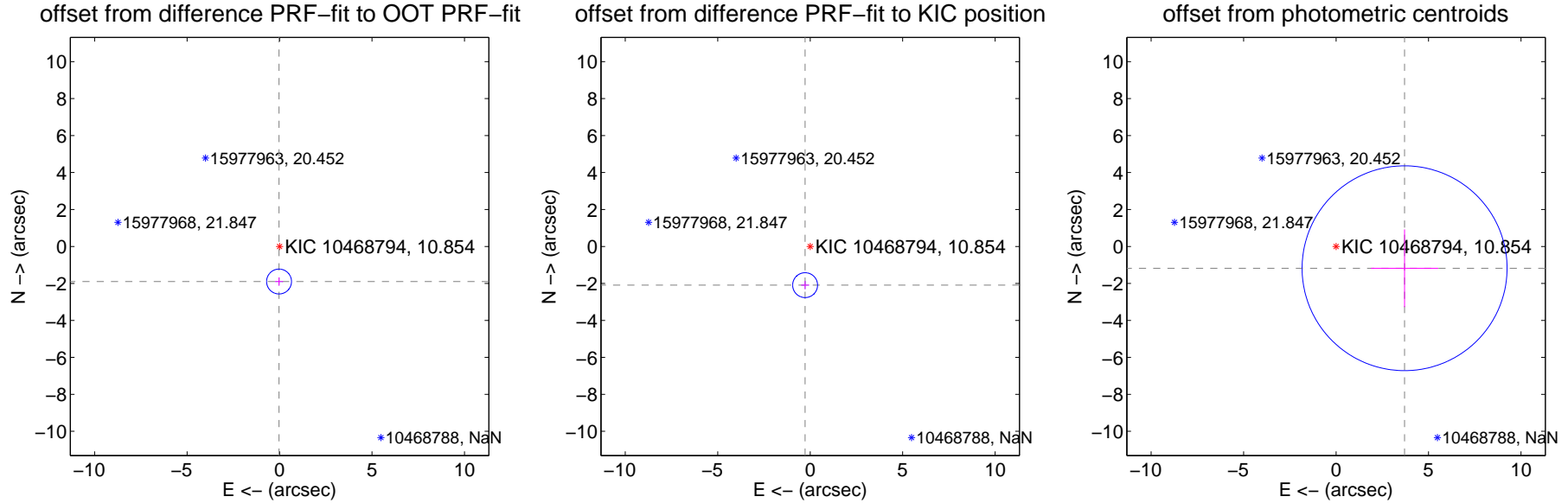
## DV Centroid Data

Supplemental centroid analysis for 010468794-02. **Kepler magnitude: 10.85.** Transit SNR 10.63

**There are 1 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>1.896 \pm 0.224</math></b>	<b>8.45</b>	$0.028 \pm 0.217$	$-1.896 \pm 0.224$
PRF-fit source offset from KIC position	<b><math>2.110 \pm 0.224</math></b>	<b>9.41</b>	$0.275 \pm 0.217$	$-2.092 \pm 0.224$
photometric centroid source offset	$3.89 \pm 1.85$	2.10	$-3.70 \pm 1.82$	$-1.18 \pm 2.10$



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

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



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

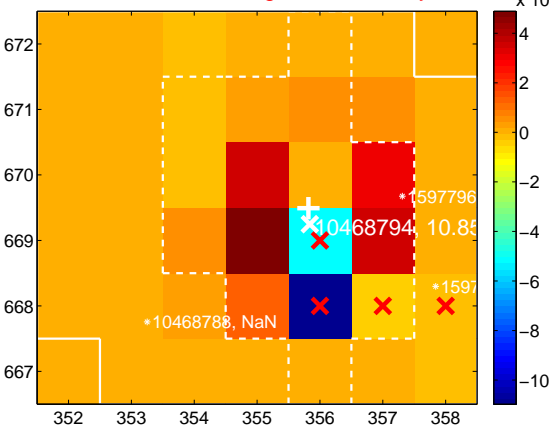
Q5 no difference image



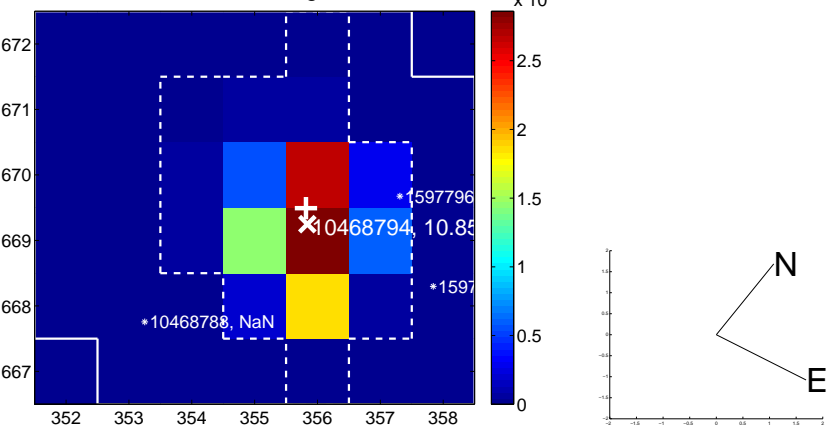
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



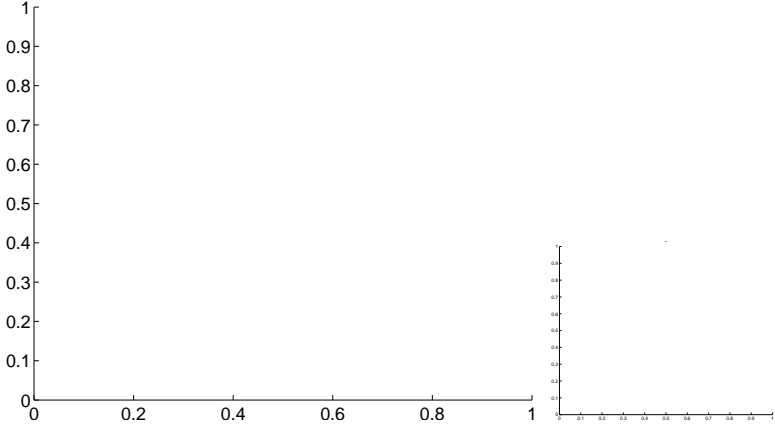
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



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

Q9 no difference image



Q9 no OOT image



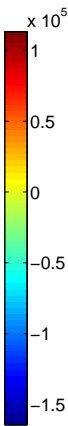
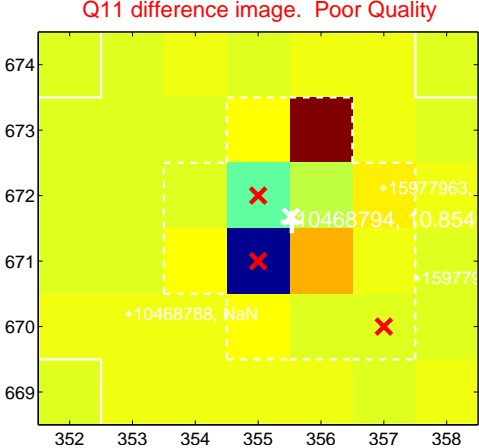
Q10 no difference image



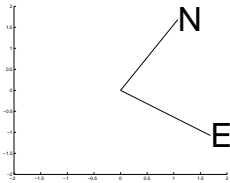
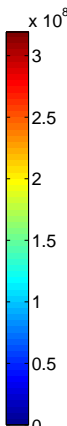
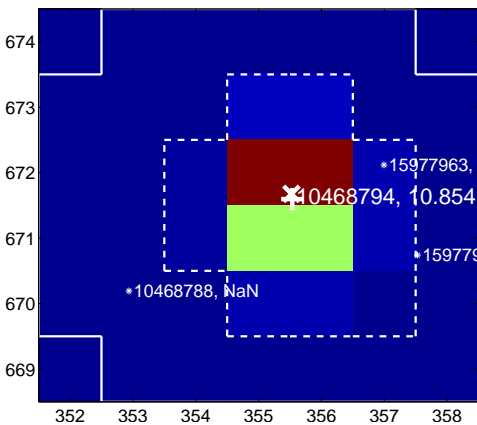
Q10 no OOT image



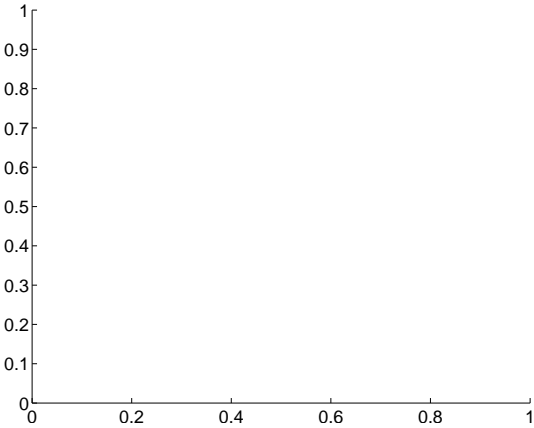
Q11 difference image. Poor Quality



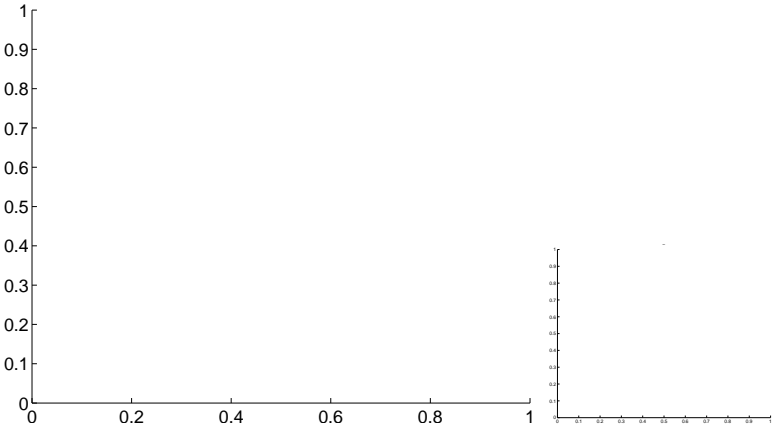
Q11 OOT image



Q12 no difference image



Q12 no OOT image



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

Q13 no difference image



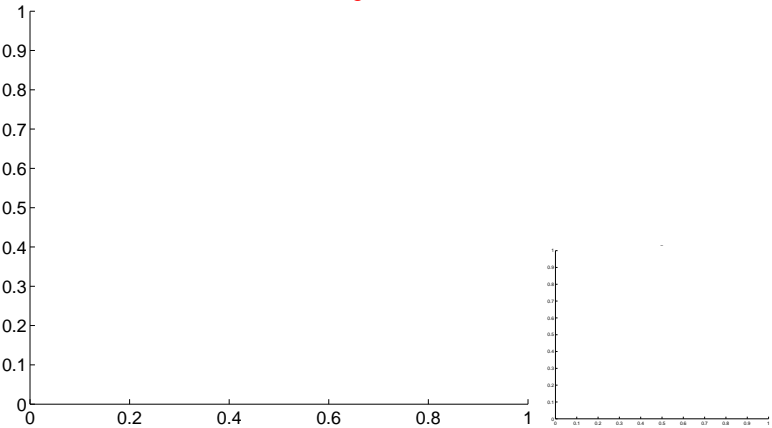
Q13 no OOT image



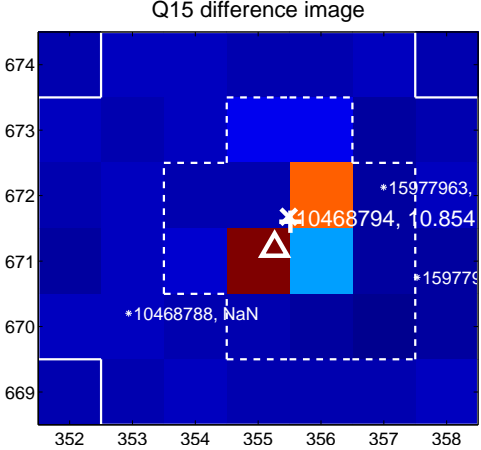
Q14 no difference image



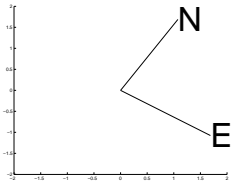
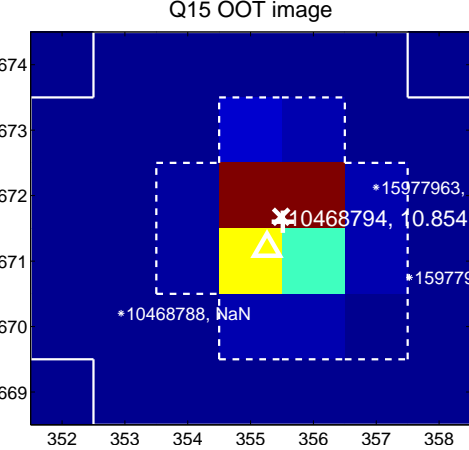
Q14 no OOT image



Q15 difference image



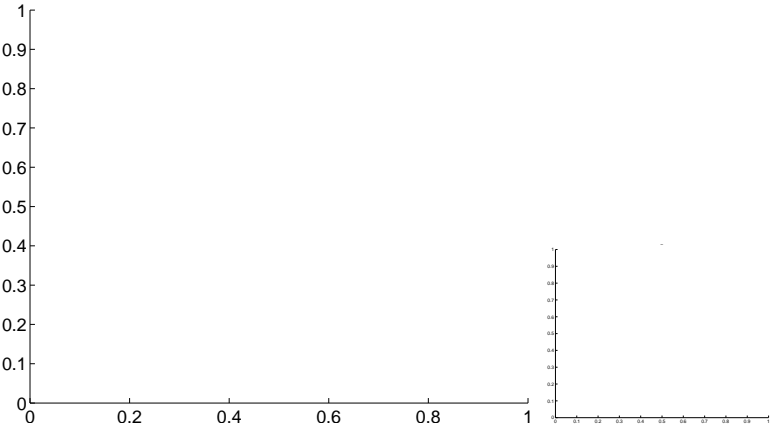
Q15 OOT image



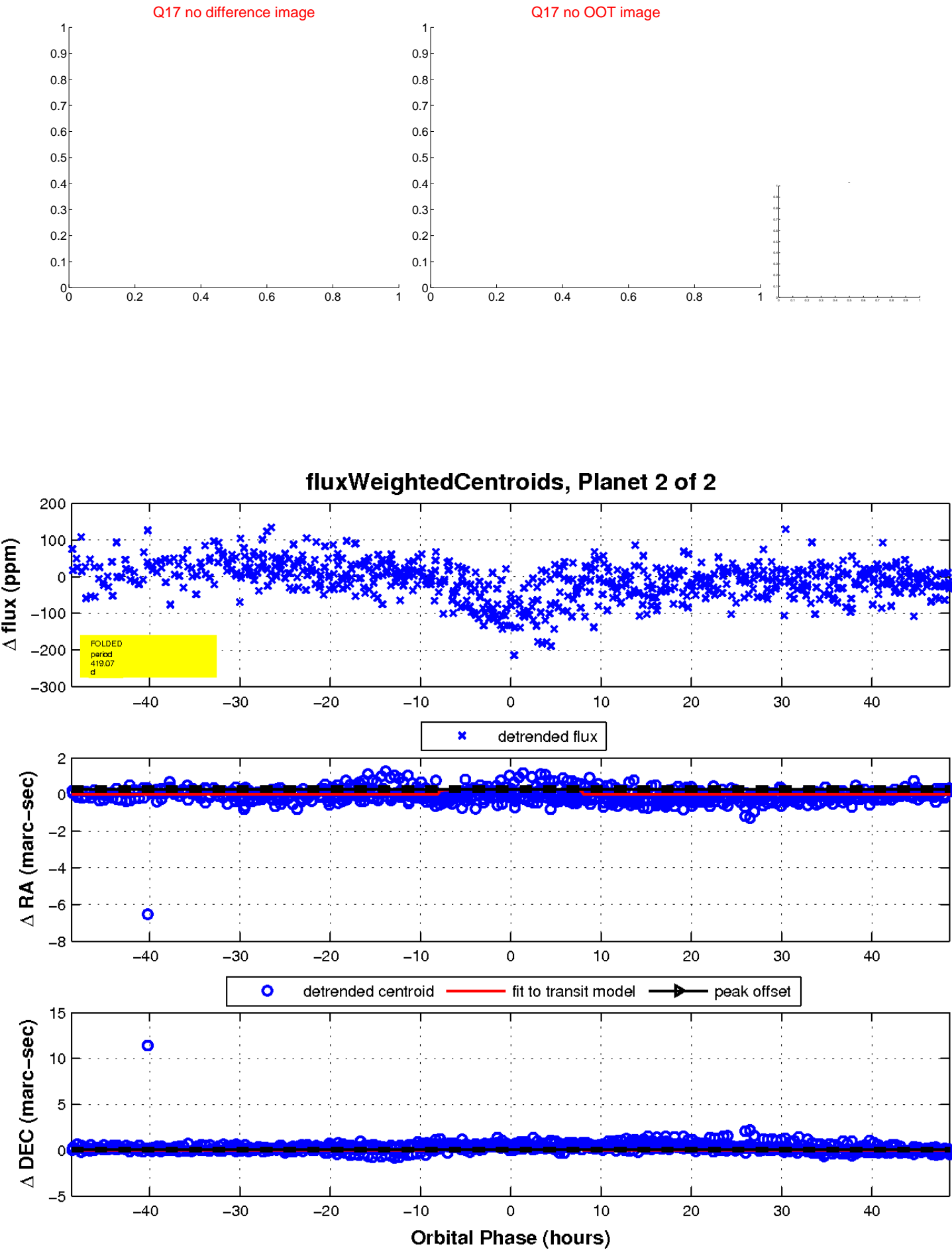
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

