

# KIC 009699848

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009699848-01	OBS	No	317.337310	436.118982	82.8	5.685	20.2	8.3	2.31	9113	2.37	23.34
009699848-02	OBS	No	495.474494	244.629247	69.4	18.191	11.5	10.6	2.31	9113	2.13	12.88
009699848-03	OBS	No	317.369648	436.596744	64.1	24.984	10.9	9.4	2.31	9113	2.02	23.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009699848-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
009699848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
009699848-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_SATURATED

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

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

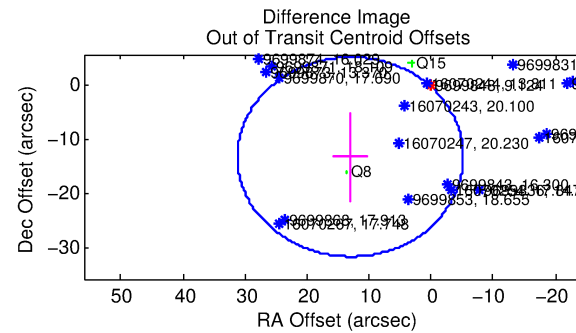
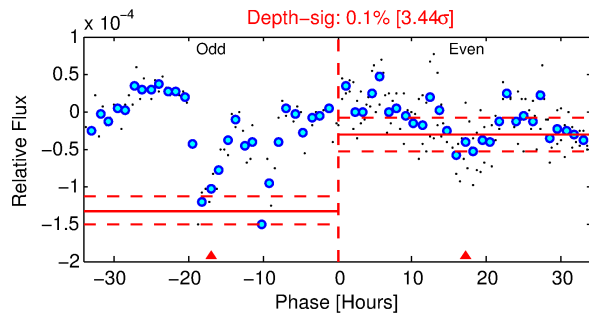
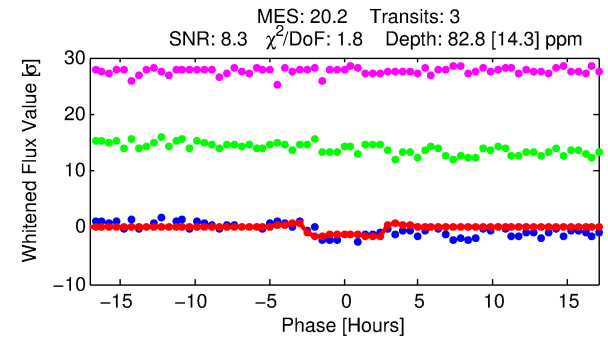
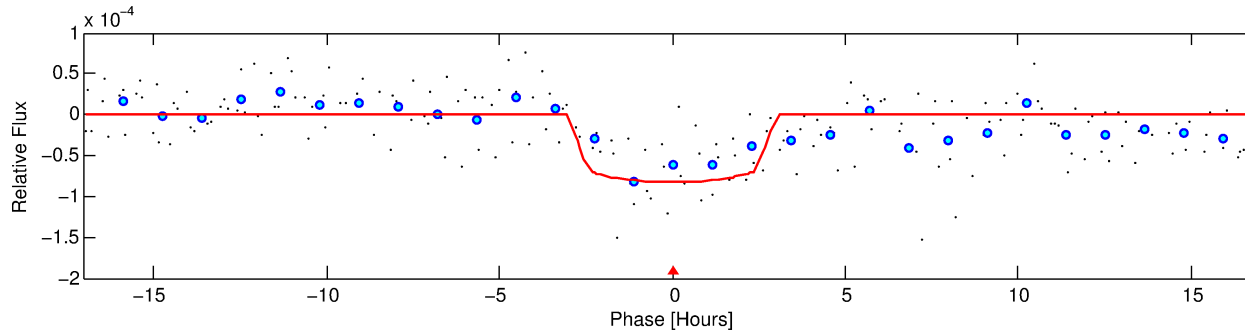
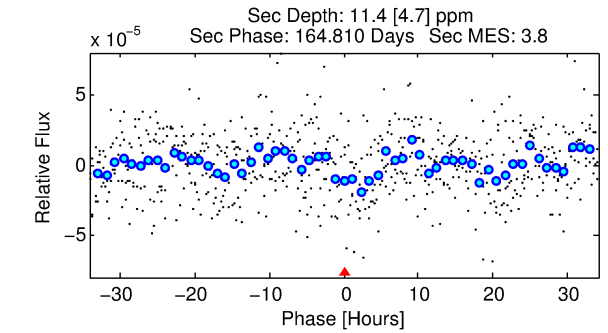
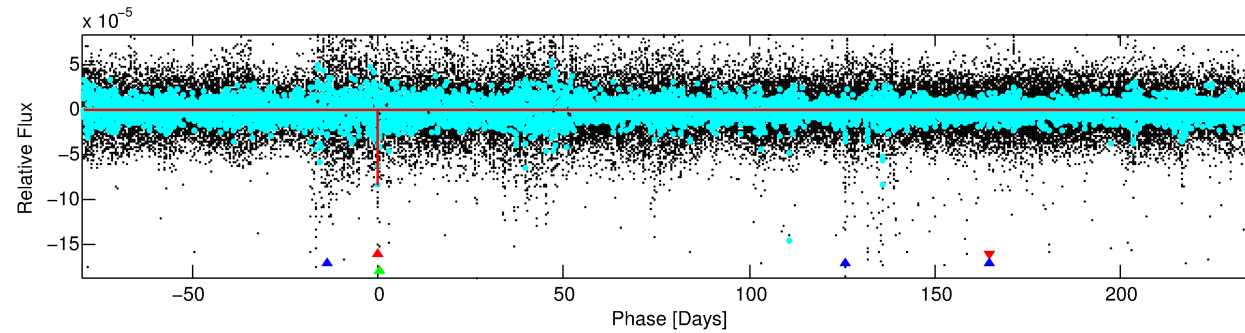
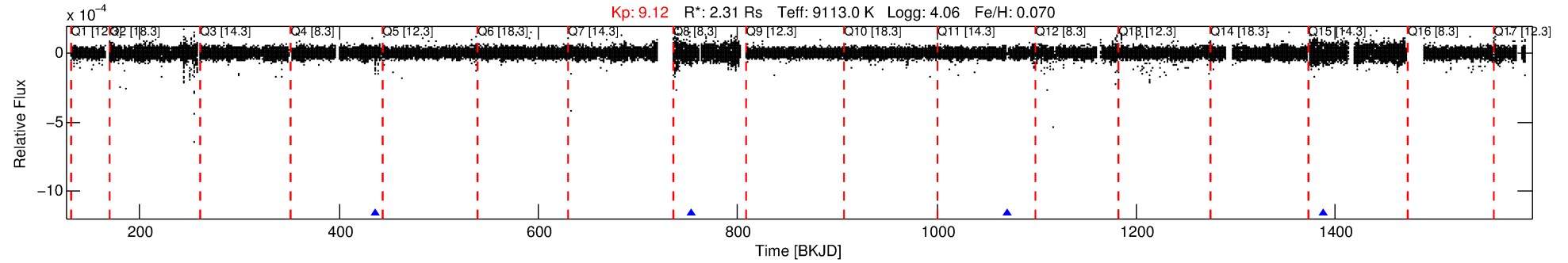
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009699848-01

No Significant Match Found

# DV One-Page Summary

KIC: 9699848 Candidate: 1 of 3 Period: 317.337 d



## DV Fit Results:

Period = 317.33731 [0.00471] d  
Epoch = 436.1190 [0.0095] BKJD  
 $R_p/R^* = 0.0094$  [0.0053]  
 $a/R^* = 223.78$  [924.40]  
 $b = 0.86$  [1.23]  
 $S_{\text{eff}} = 23.34$  [9.50]  
 $T_{\text{eq}} = 560$  [57] K  
 $R_p = 2.37$  [1.52]  $R_e$   
 $a = 1.1892$  [0.2960] AU  
 $A_g = 1573.31$  [1964.64] [0.80σ]  
 $T_{\text{eff}} = 5457$  [1658] K [2.95σ]

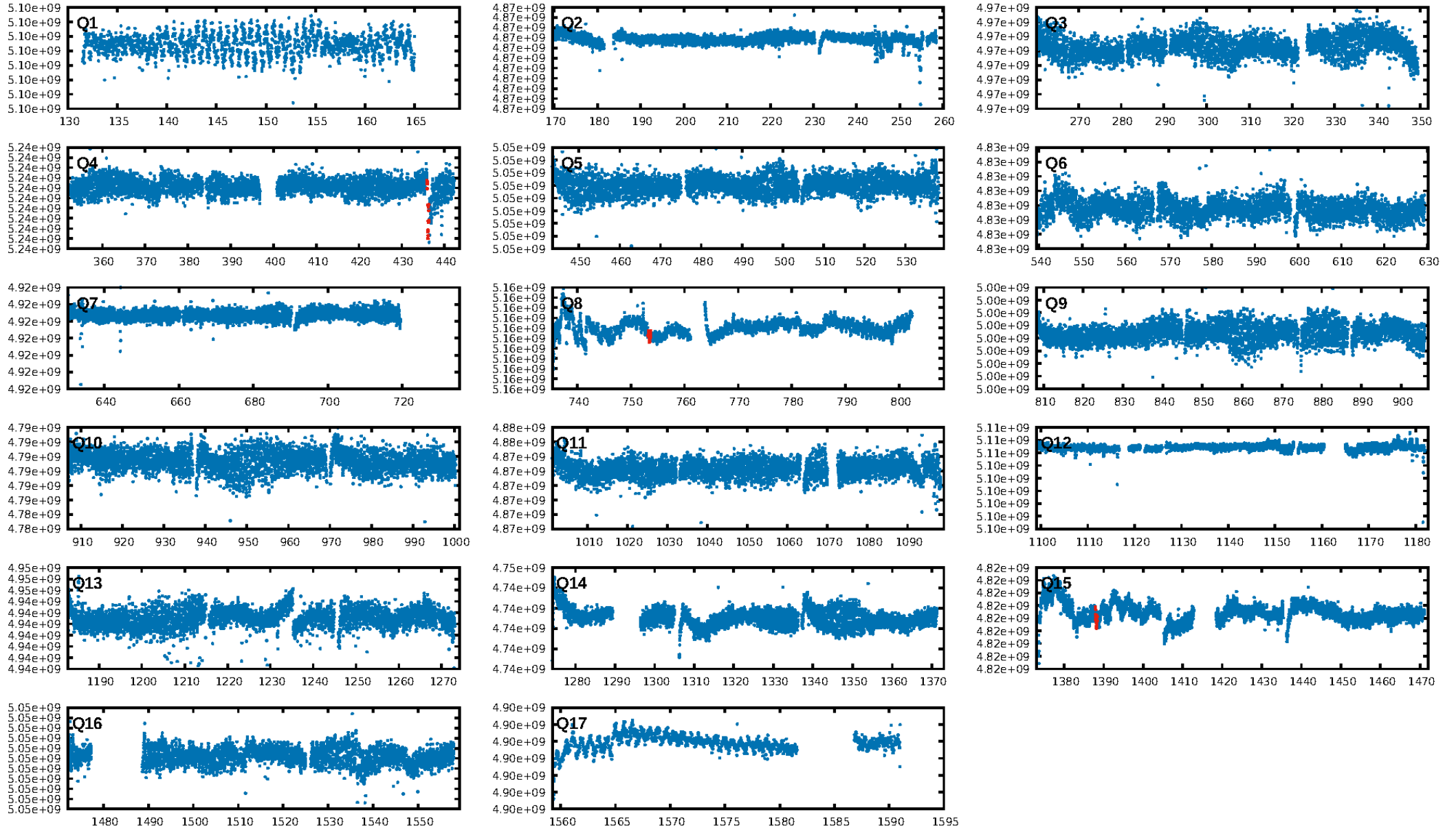
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 2.4% [0.03σ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 27.4%  
Bootstrap-pfa: 5.68e-25  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 25.7%  
Centroid-so: 1.640 arcsec [0.95σ]  
OotOffset-rm: 18.569 arcsec [3.06σ]  
KicOffset-rm: 18.147 arcsec [1.67σ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/2]

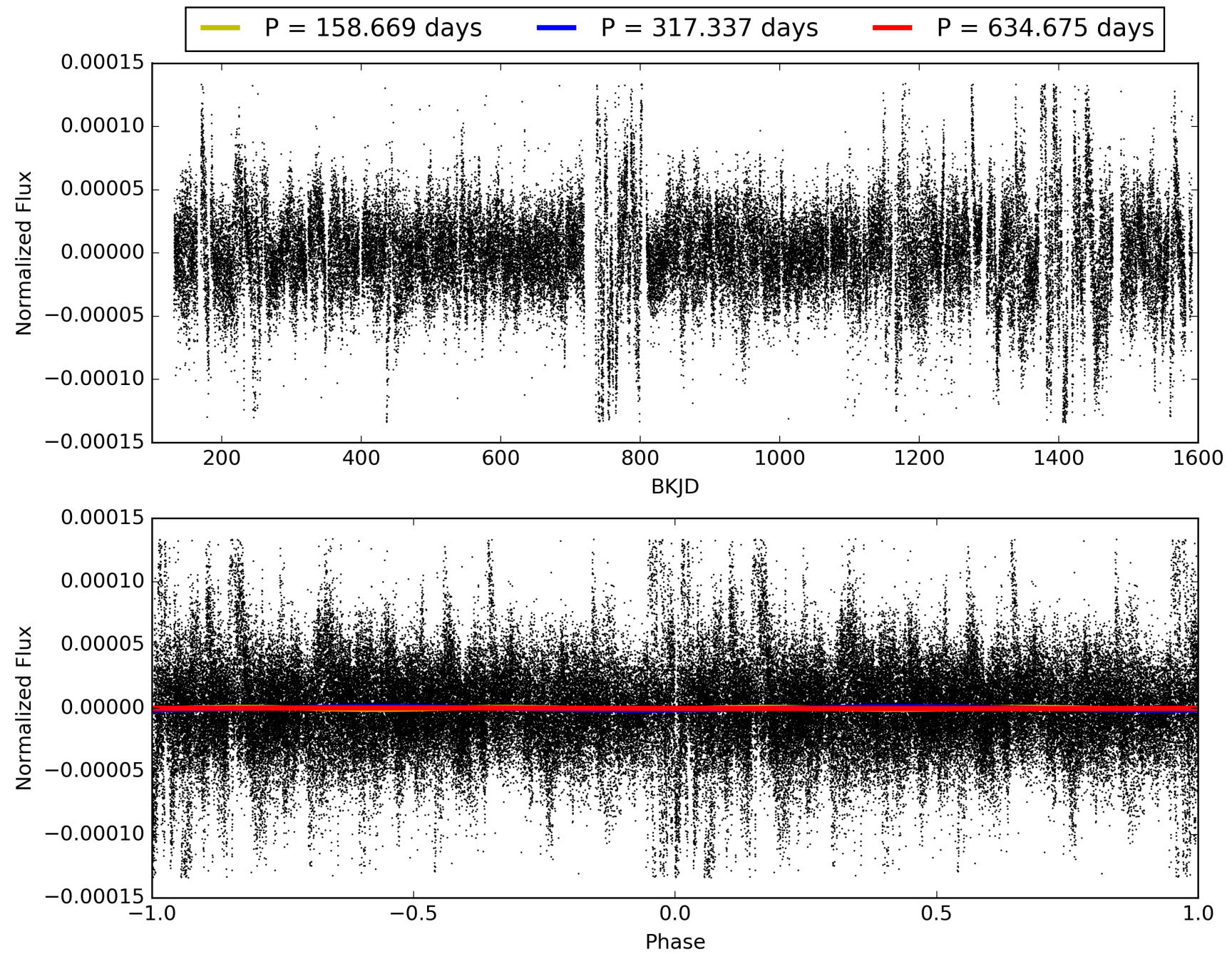
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:32:29 Z

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

# TCE 009699848-01, PDC Light Curves

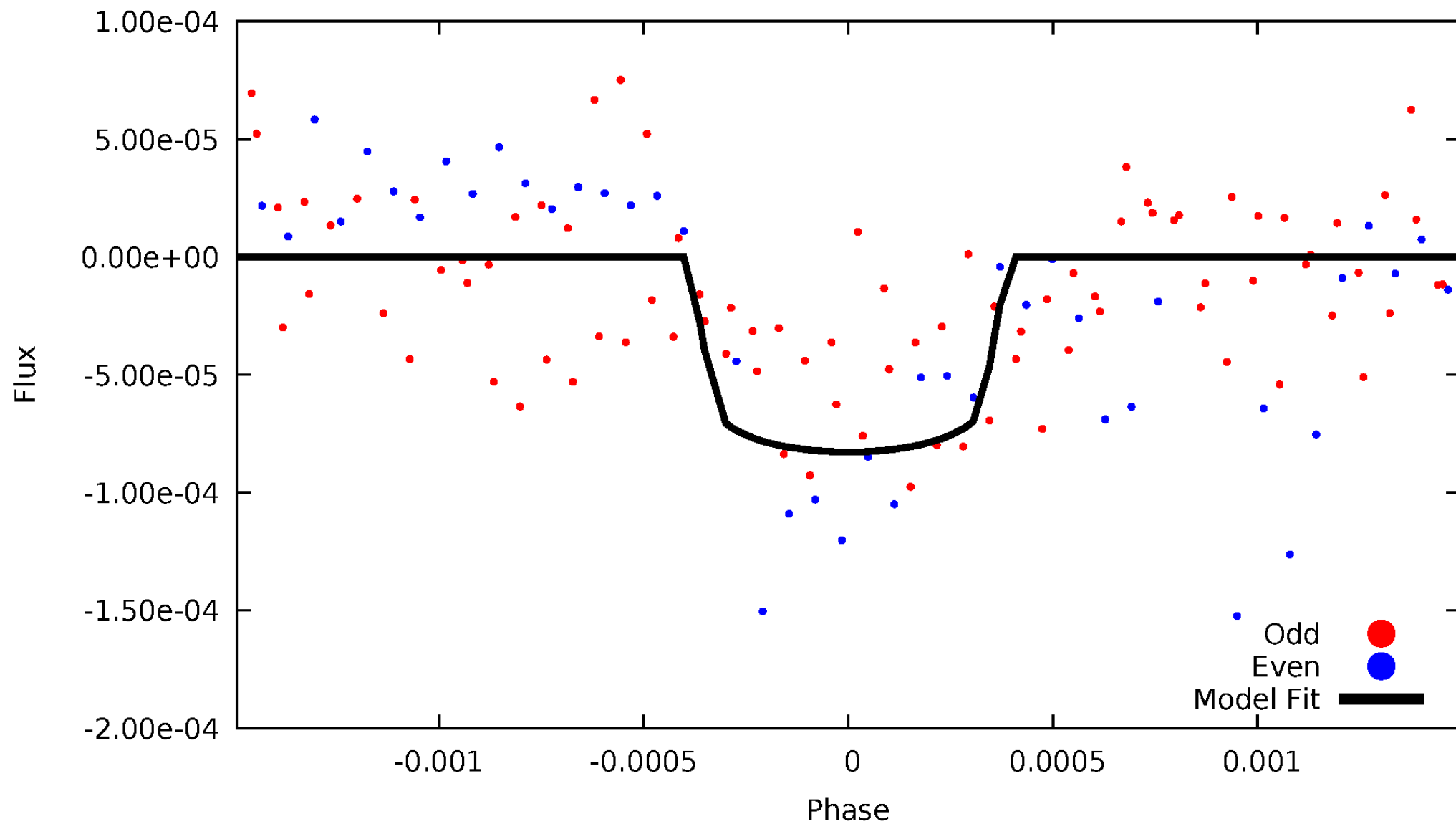


# TCE 009699848-01



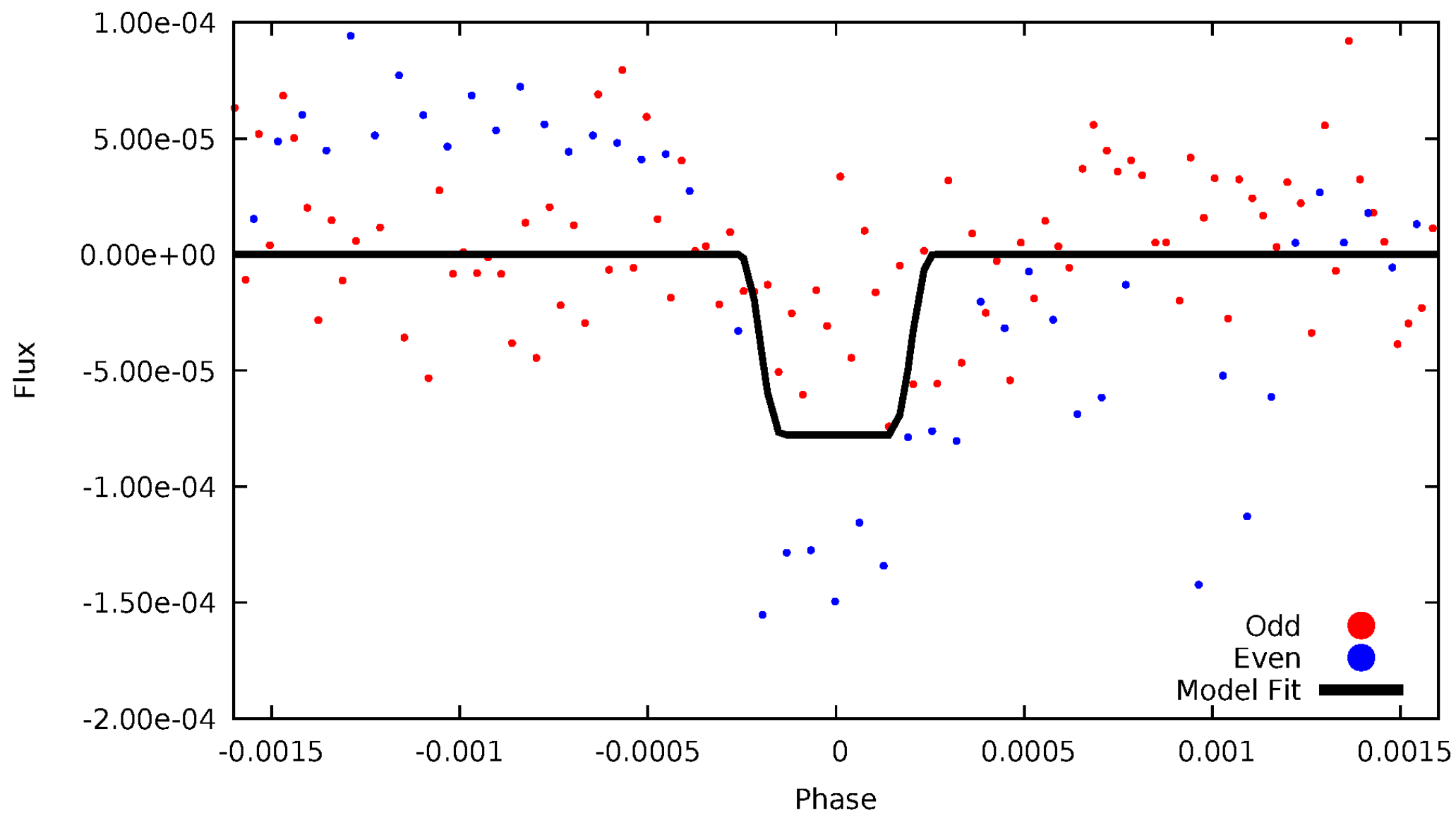
# DV Odd/Even

TCE 009699848-01



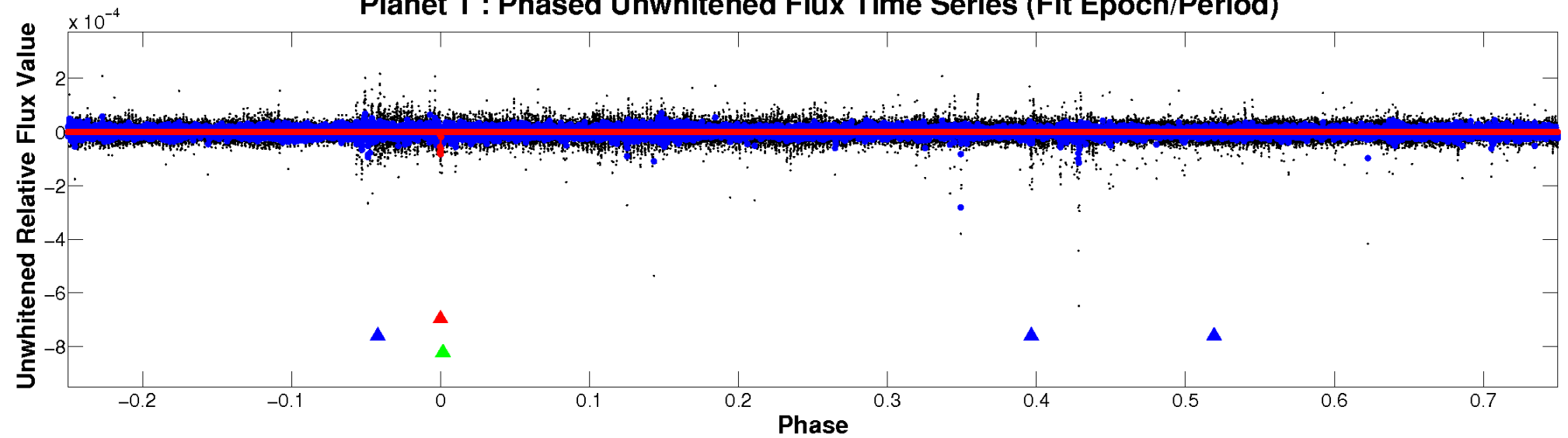
# ALT Odd/Even

TCE 009699848-01

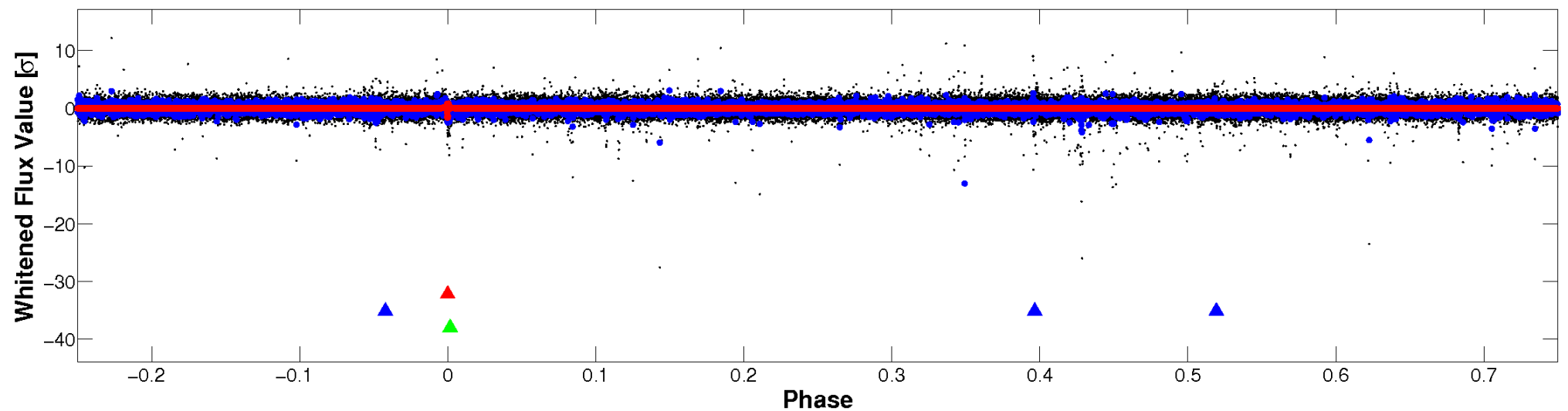


# Non-Whitened Vs. Whitened Light Curve

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

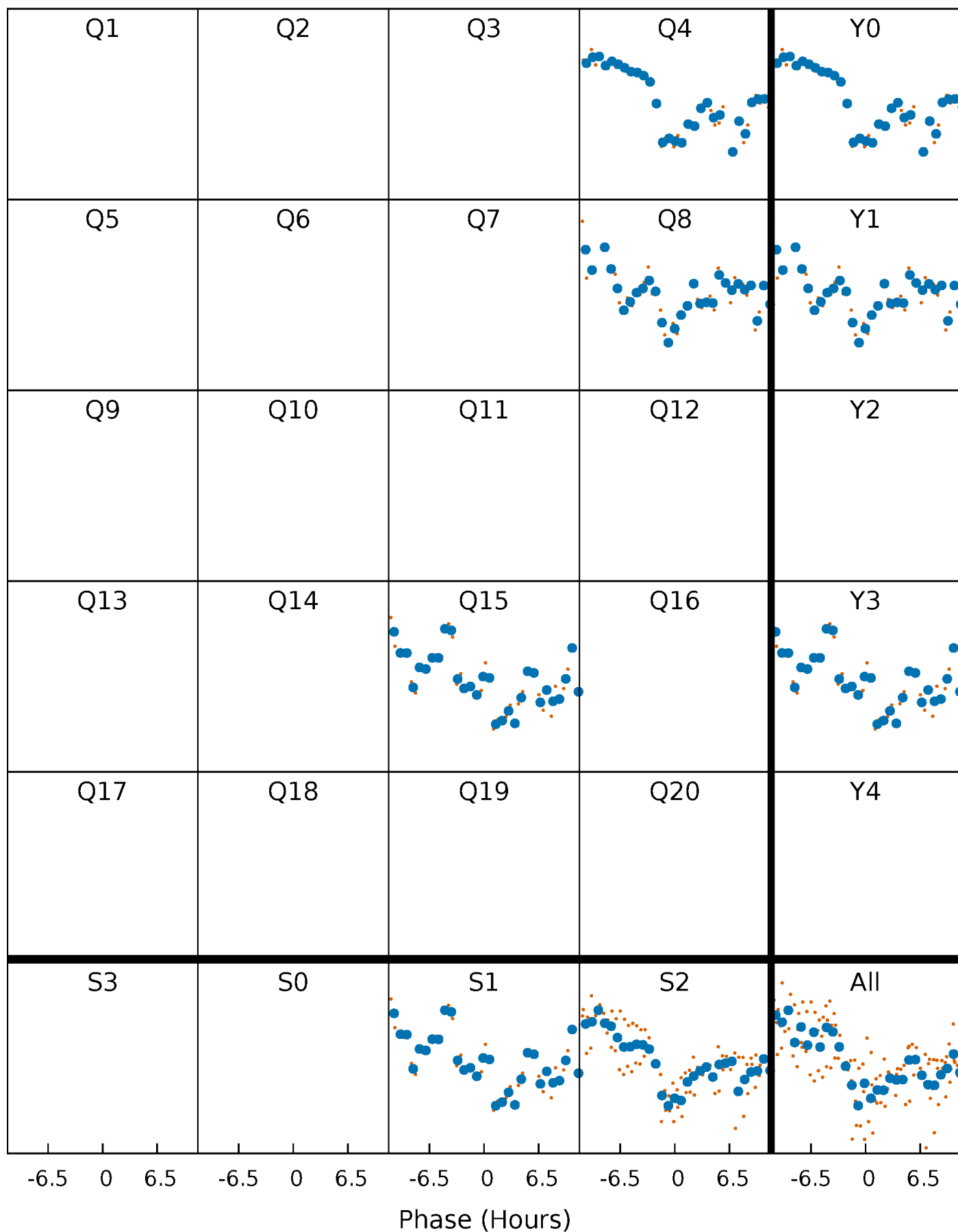


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

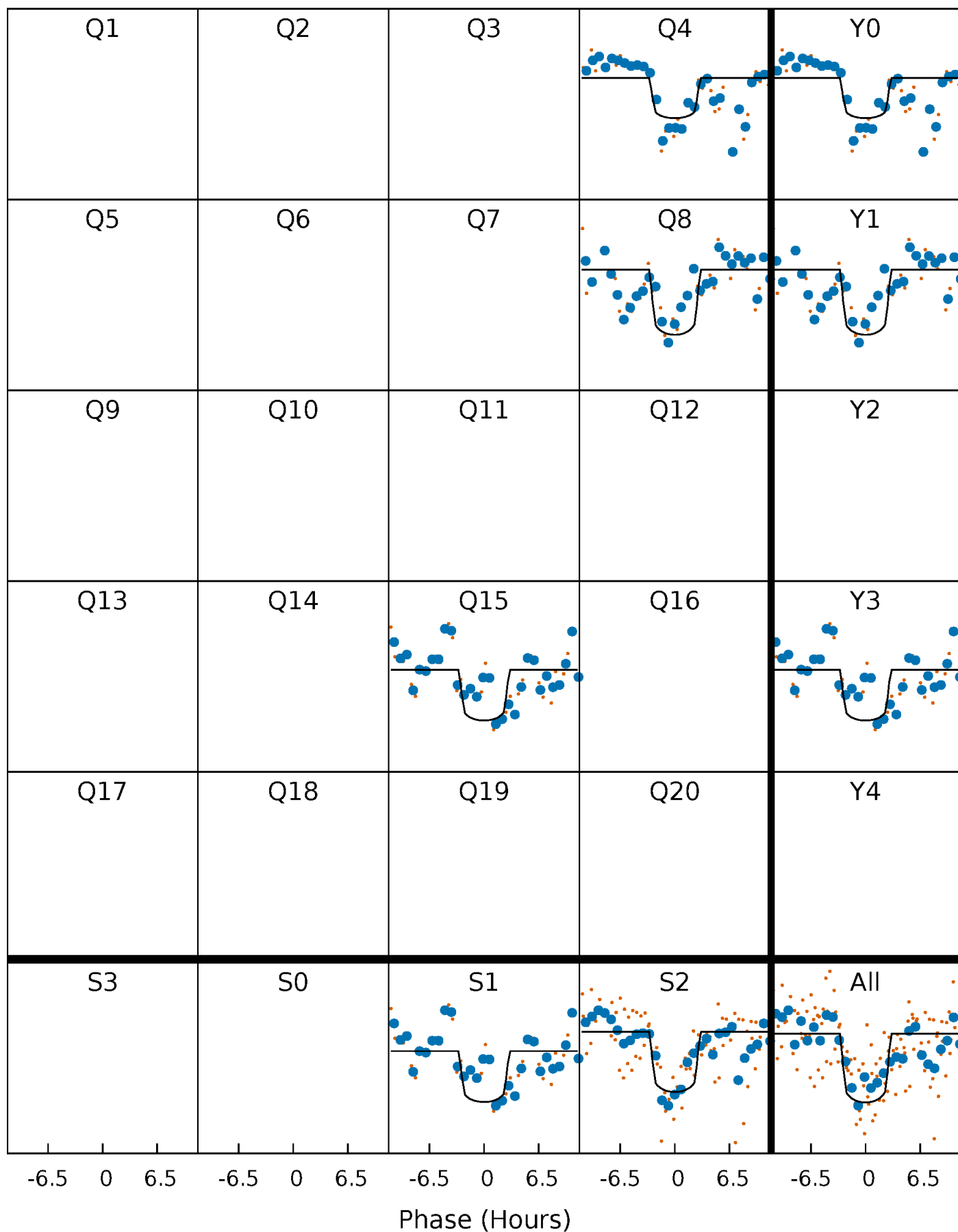
TCE 009699848-01 P=317.337310 Days  $T_0=436.118982$  (BKJD)





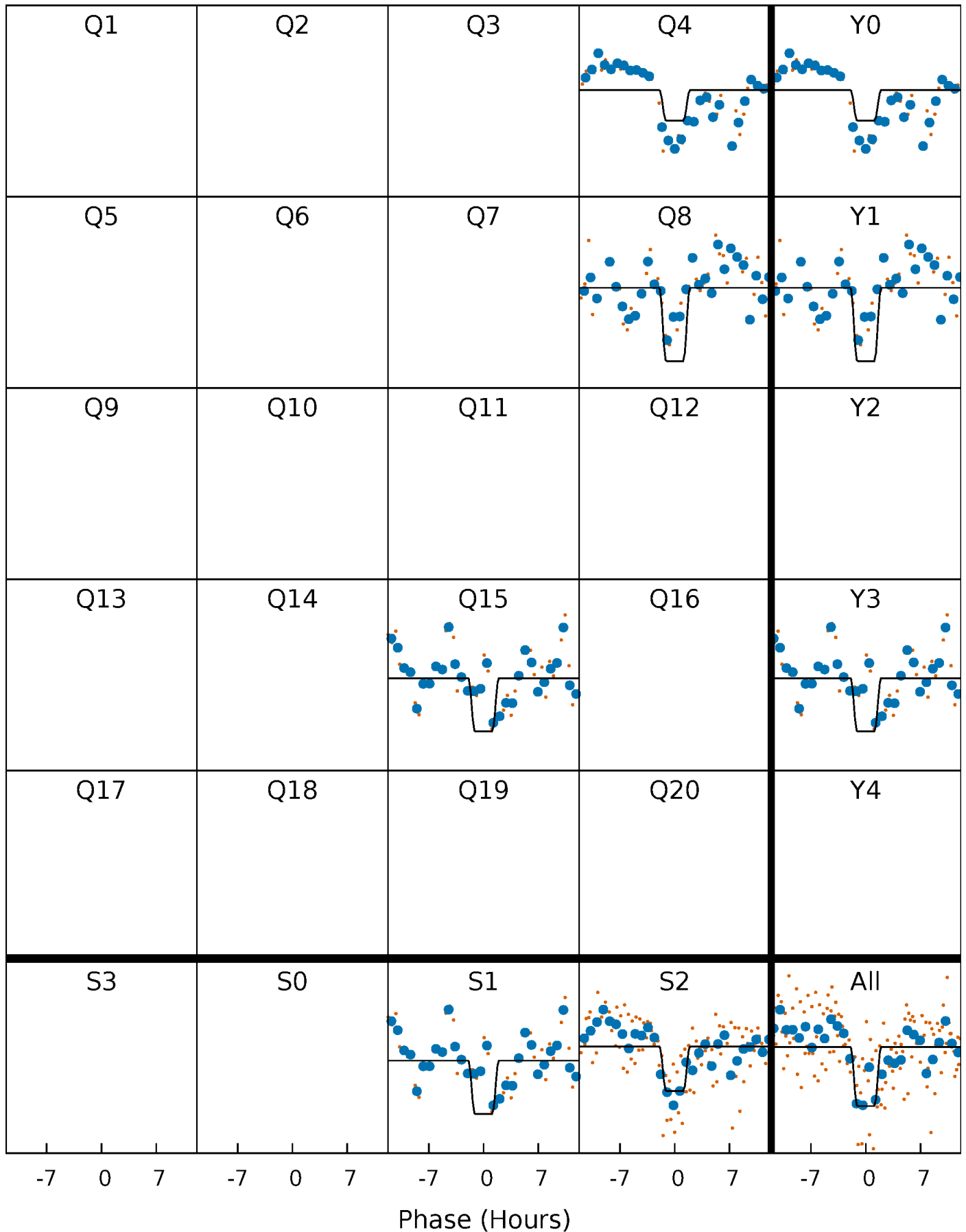
# DV Quarter-Phased Transit Curves

TCE 009699848-01 P=317.337310 Days  $T_0=436.118982$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

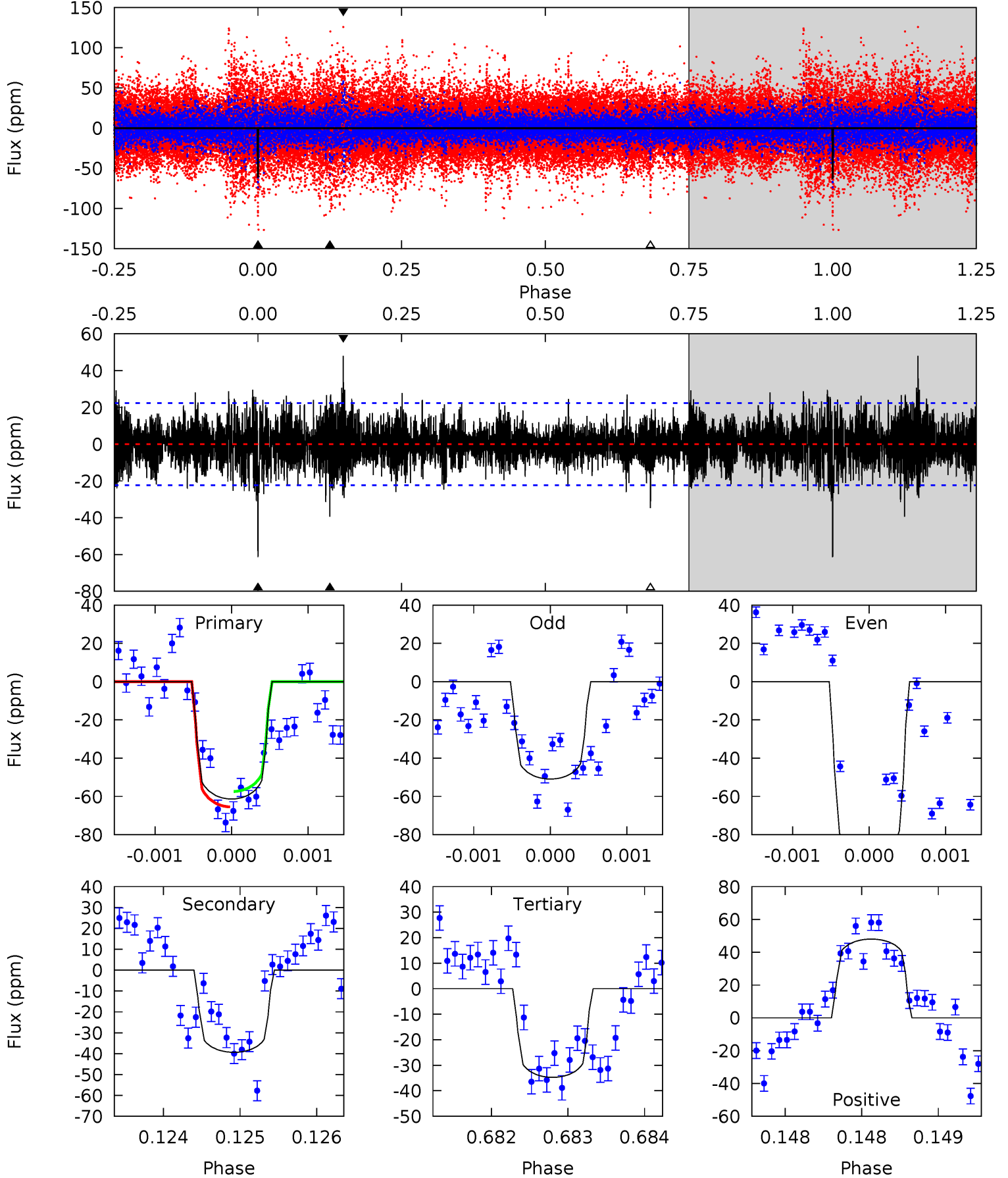
TCE 009699848-01 P=317.339998 Days  $T_0=436.114569$  (BKJD)



# DV Model-Shift Uniqueness Test

009699848-01, P = 317.337310 Days, E = 118.781672 Days

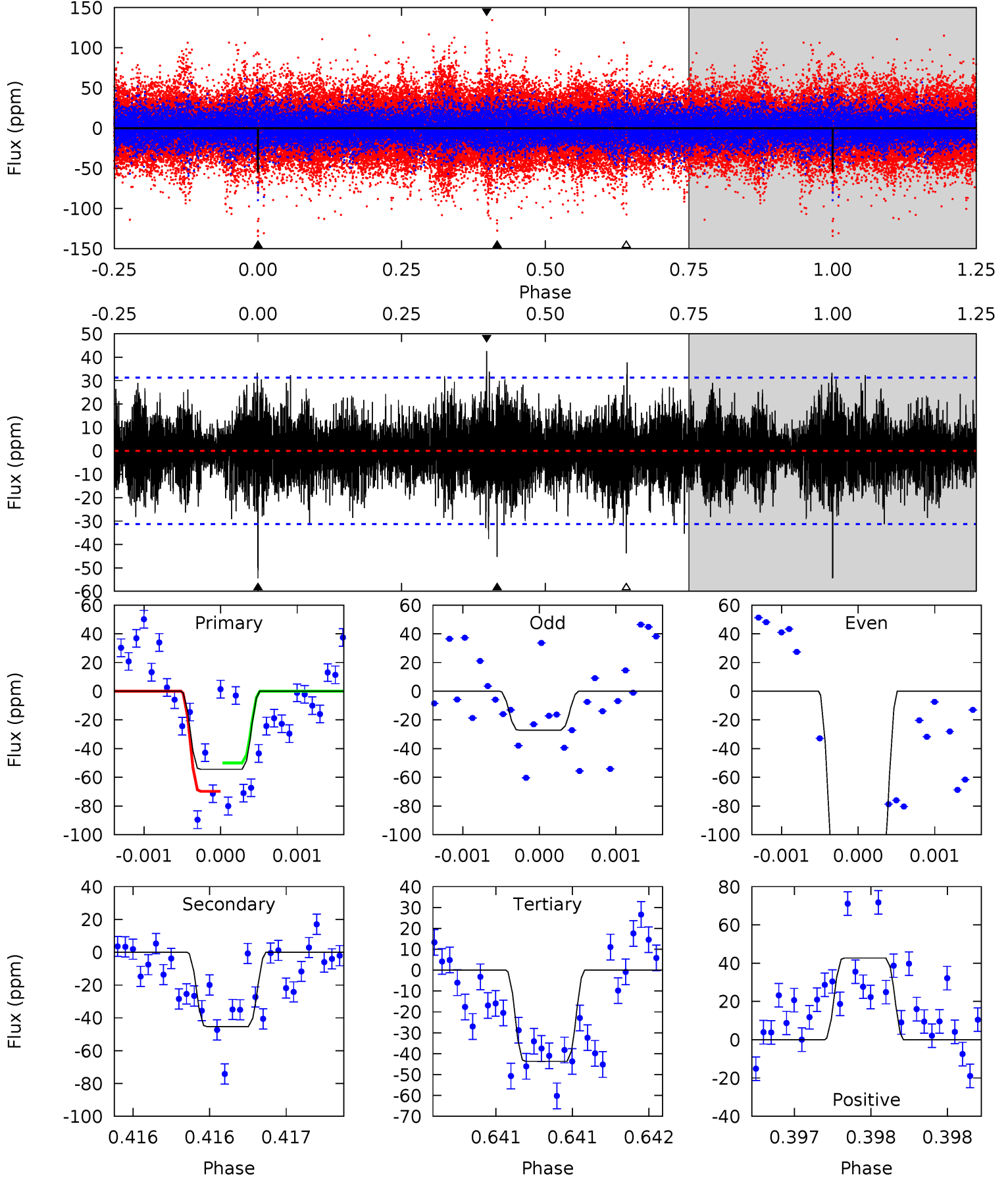
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.1	9.69	8.55	11.8	5.50	3.36	2.17	6.55	3.28	1.13	-2.14	4.93	1.21	0.44	0.99



# Alt Model-Shift Uniqueness Test

009699848-01, P = 317.339998 Days, E = 118.774571 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
9.69	8.07	7.78	7.60	5.57	3.48	1.78	1.92	2.09	0.29	0.47	10.2	1.78	0.44	1.81



### Stellar Parameters For KIC 009699848

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9113^{+251}_{-466}$	$4.058^{+0.187}_{-0.153}$	$0.070^{+0.150}_{-0.700}$	$2.311^{+0.705}_{-0.705}$	$2.222^{+0.349}_{-0.598}$	$0.254^{+0.292}_{-0.119}$
	+3%/-5%	+5%/-4%	+214%/-1000%	+31%/-31%	+16%/-27%	+115%/-47%
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 009699848-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-39 \pm 4$	$2.44^{+1.39}_{-1.29}$	$772^{+65}_{-62}$	$6828^{+4148}_{-1325}$	$4985^{+16641}_{-2910}$
Alt.	$-45 \pm 6$	$2.21^{+1.37}_{-1.20}$	$775^{+58}_{-64}$	$7400^{+5578}_{-1479}$	$6978^{+27140}_{-4296}$

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

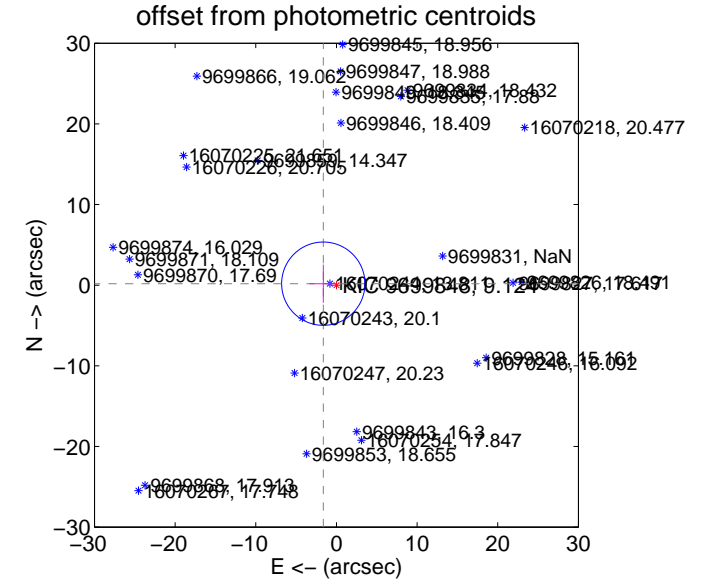
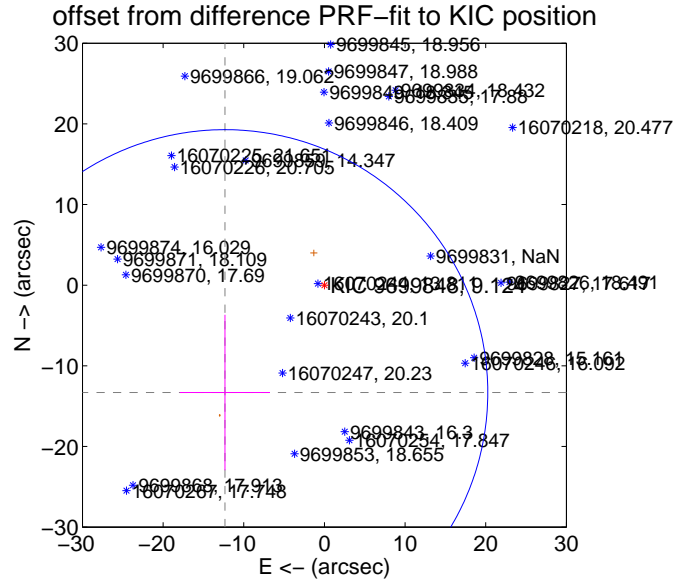
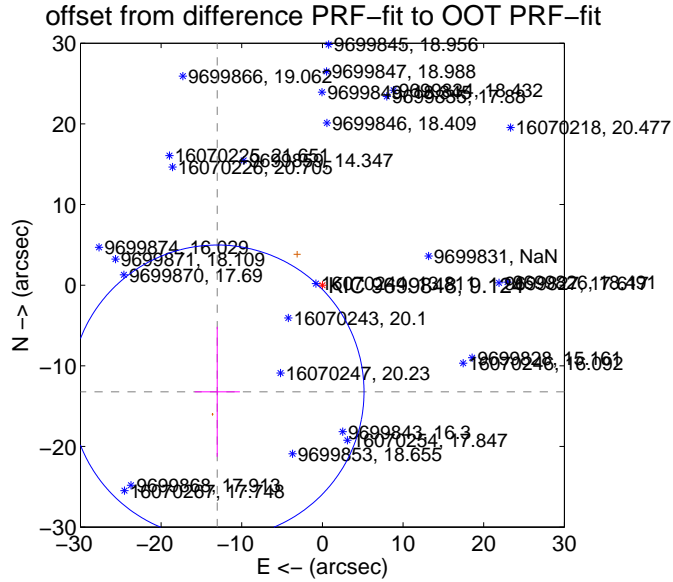
## DV Centroid Data

Supplemental centroid analysis for 009699848-01. **Kepler magnitude: 9.12.** Transit SNR 8.34

**There are 0 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 1.82 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>18.569 <math>\pm</math> 6.066</b>	<b>3.06</b>	13.039 $\pm$ 2.803	-13.220 $\pm$ 8.059
PRF-fit source offset from KIC position	18.147 $\pm$ 10.863	1.67	12.336 $\pm$ 5.585	-13.310 $\pm$ 9.636
photometric centroid source offset	1.64 $\pm$ 1.72	0.95	1.63 $\pm$ 1.71	0.18 $\pm$ 2.36

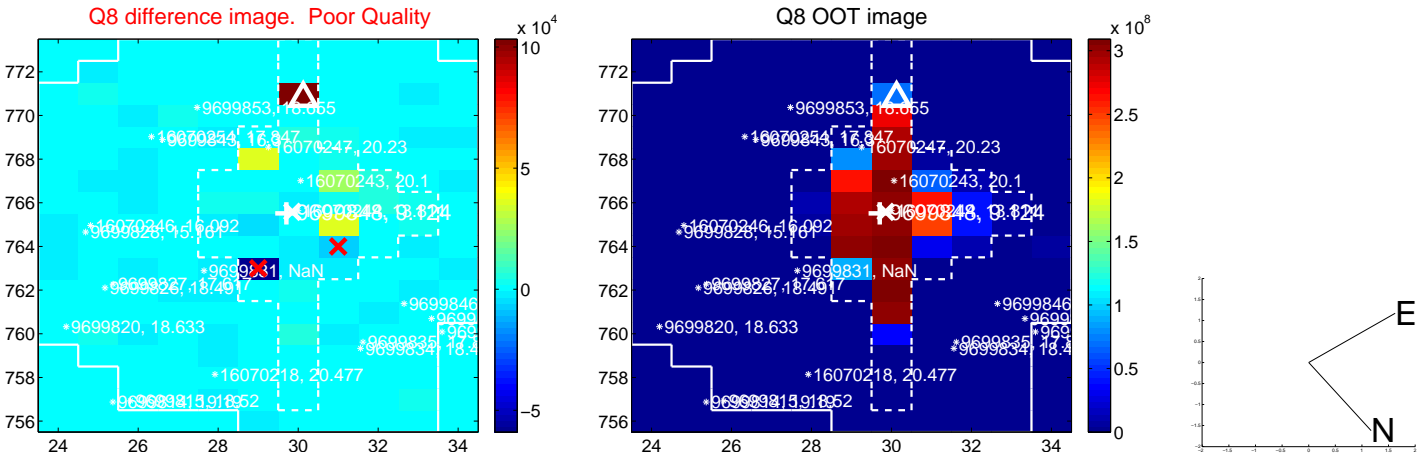


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

Q13 no difference image



Q13 no OOT image



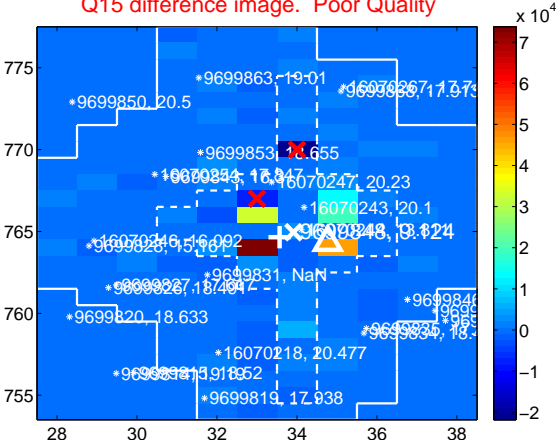
Q14 no difference image



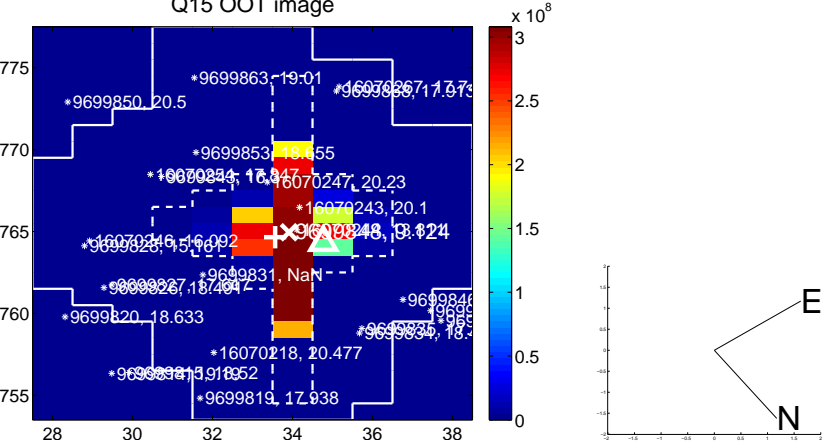
Q14 no OOT image



Q15 difference image. Poor Quality



Q15 OOT image



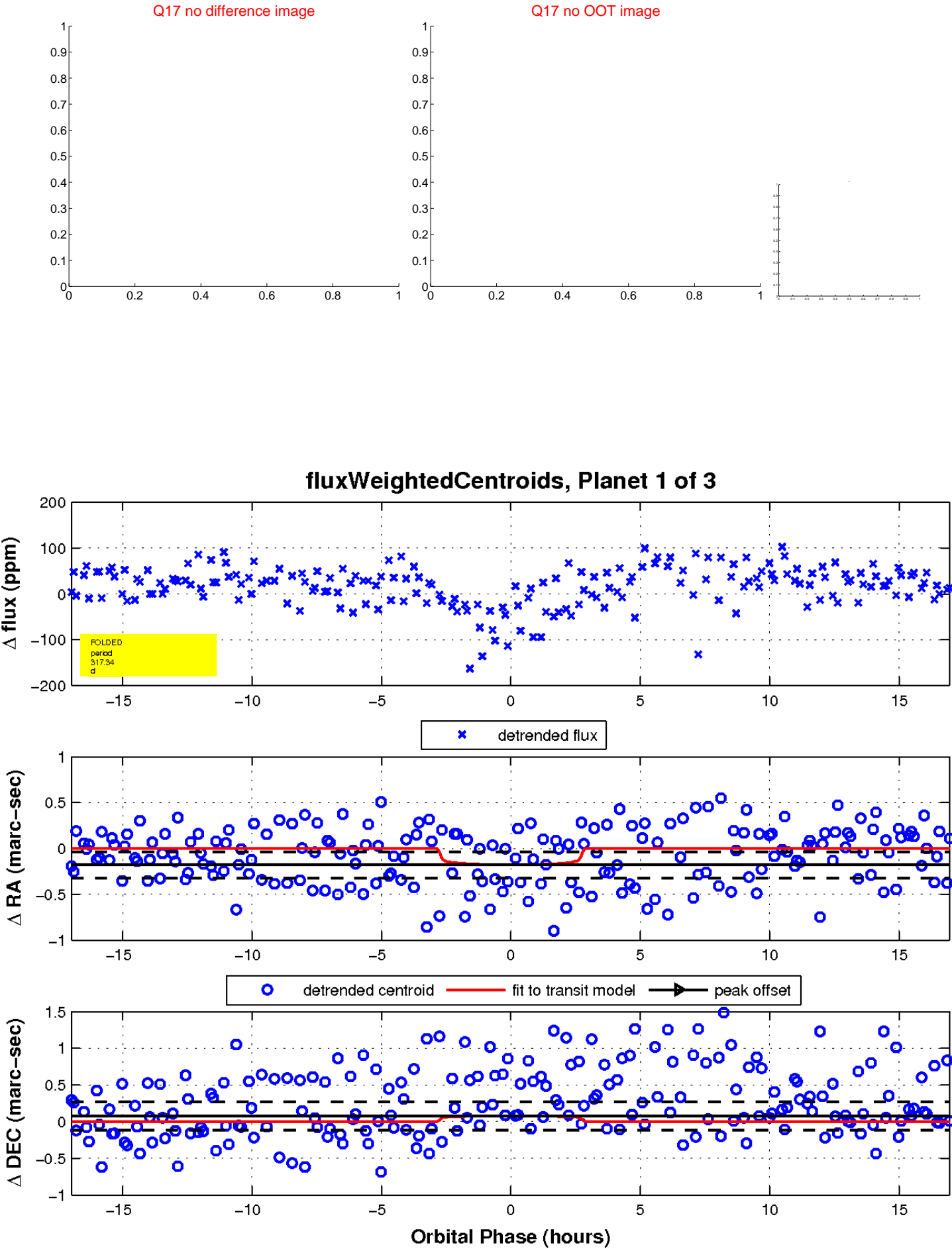
Q16 no difference image



Q16 no OOT image

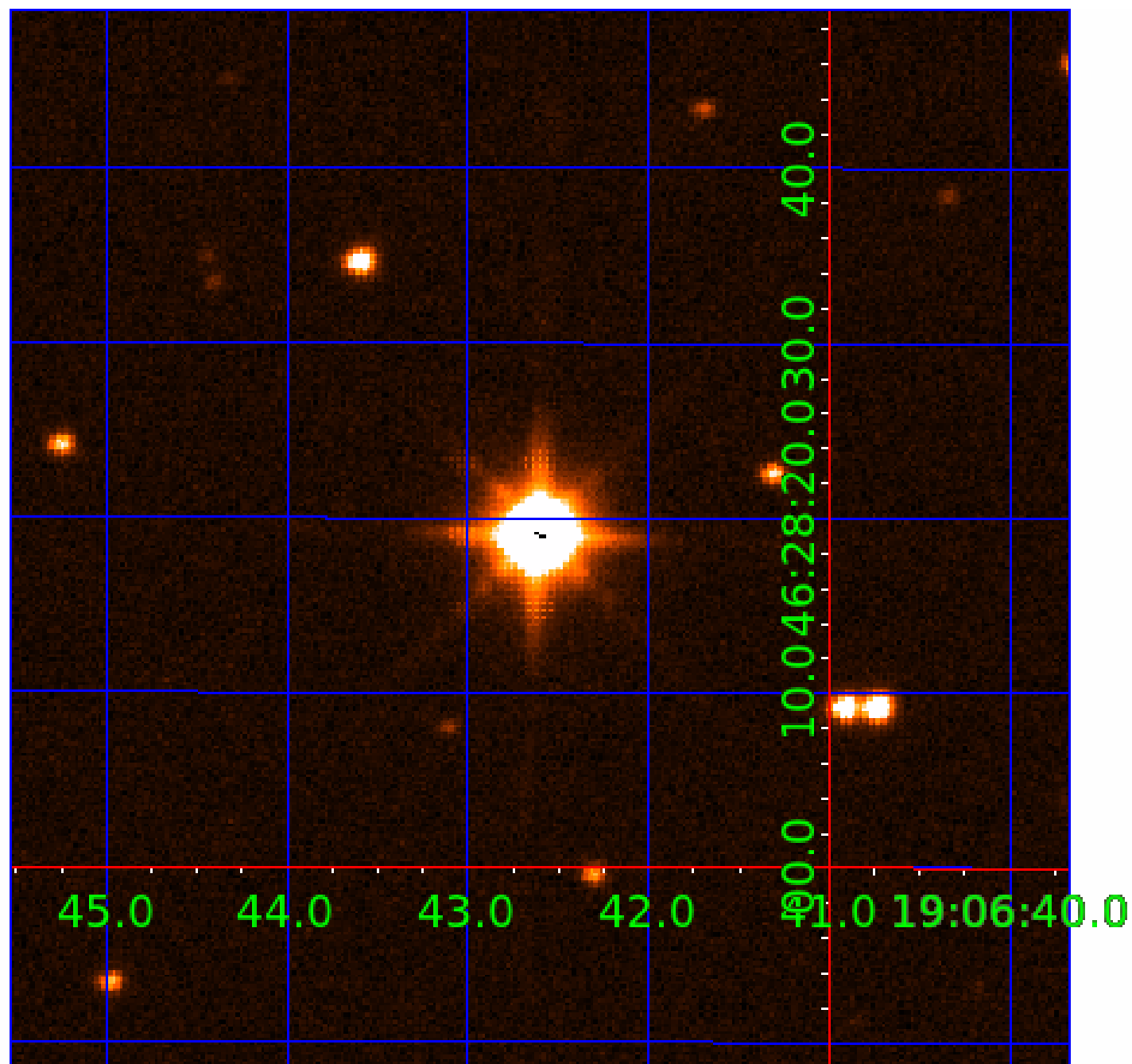


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009699848

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009699848-01	OBS	No	317.337310	436.118982	82.8	5.685	20.2	8.3	2.31	9113	2.37	23.34
009699848-02	OBS	No	495.474494	244.629247	69.4	18.191	11.5	10.6	2.31	9113	2.13	12.88
009699848-03	OBS	No	317.369648	436.596744	64.1	24.984	10.9	9.4	2.31	9113	2.02	23.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009699848-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
009699848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
009699848-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_SATURATED

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

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

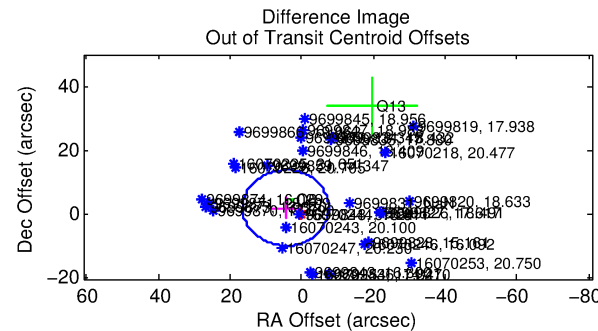
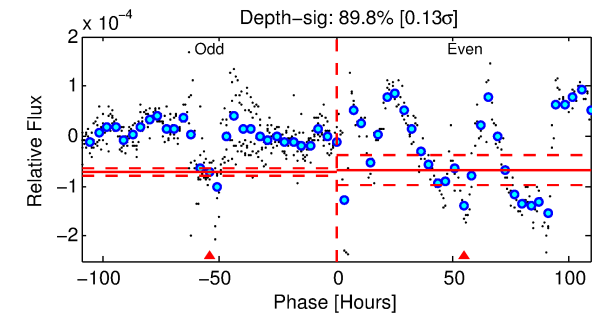
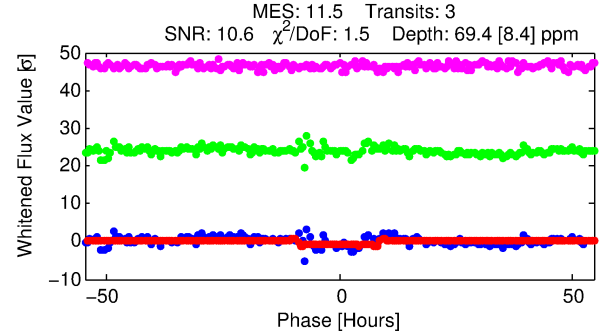
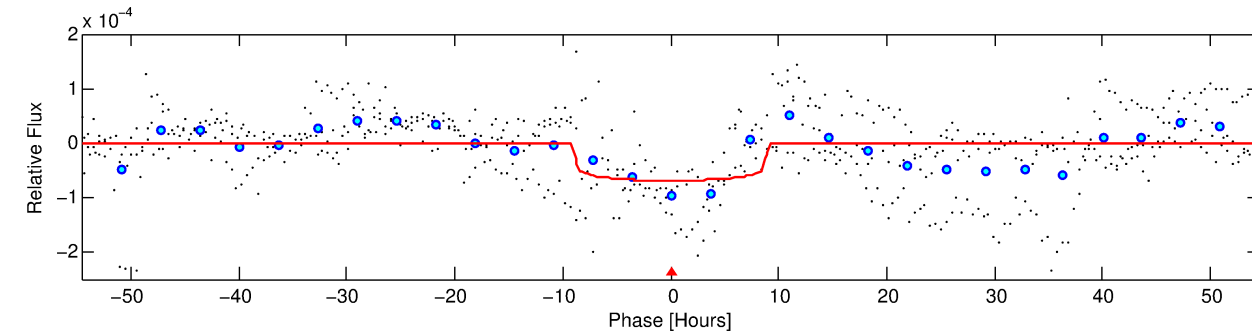
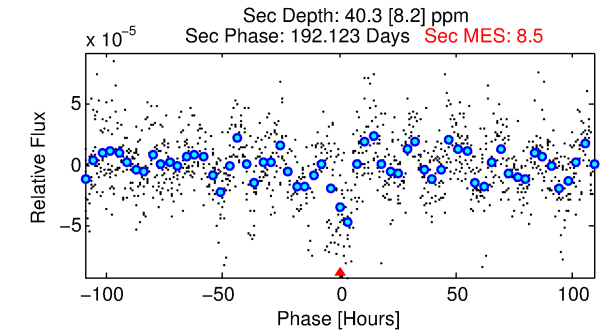
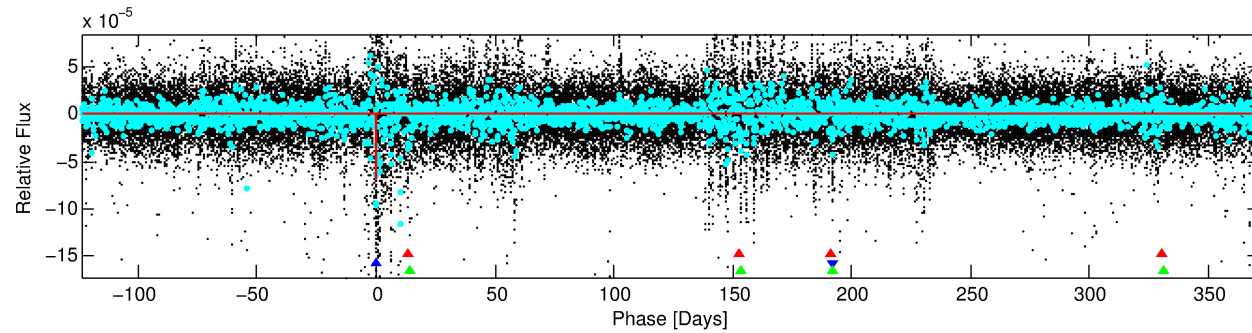
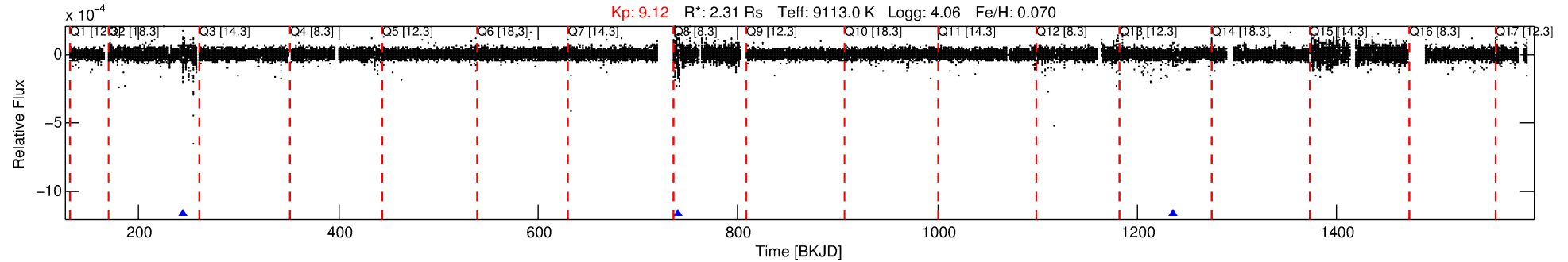
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009699848-02

No Significant Match Found

# DV One-Page Summary

KIC: 9699848 Candidate: 2 of 3 Period: 495.474 d



## DV Fit Results:

Period = 495.47449 [0.00712] d  
Epoch = 244.6292 [0.0105] BKJD  
Rp/R\* = 0.0085 [0.0012]  
a/R\* = 123.55 [107.16]  
b = 0.82 [0.36]  
Seff = 12.88 [5.24]  
Teq = 483 [49] K  
Rp = 2.13 [0.72] Re  
a = 1.6005 [0.3984] AU  
Ag = 12491.89 [6187.77] [2.02 sigma]  
Teffp = 7897 [798] K [9.27 sigma]

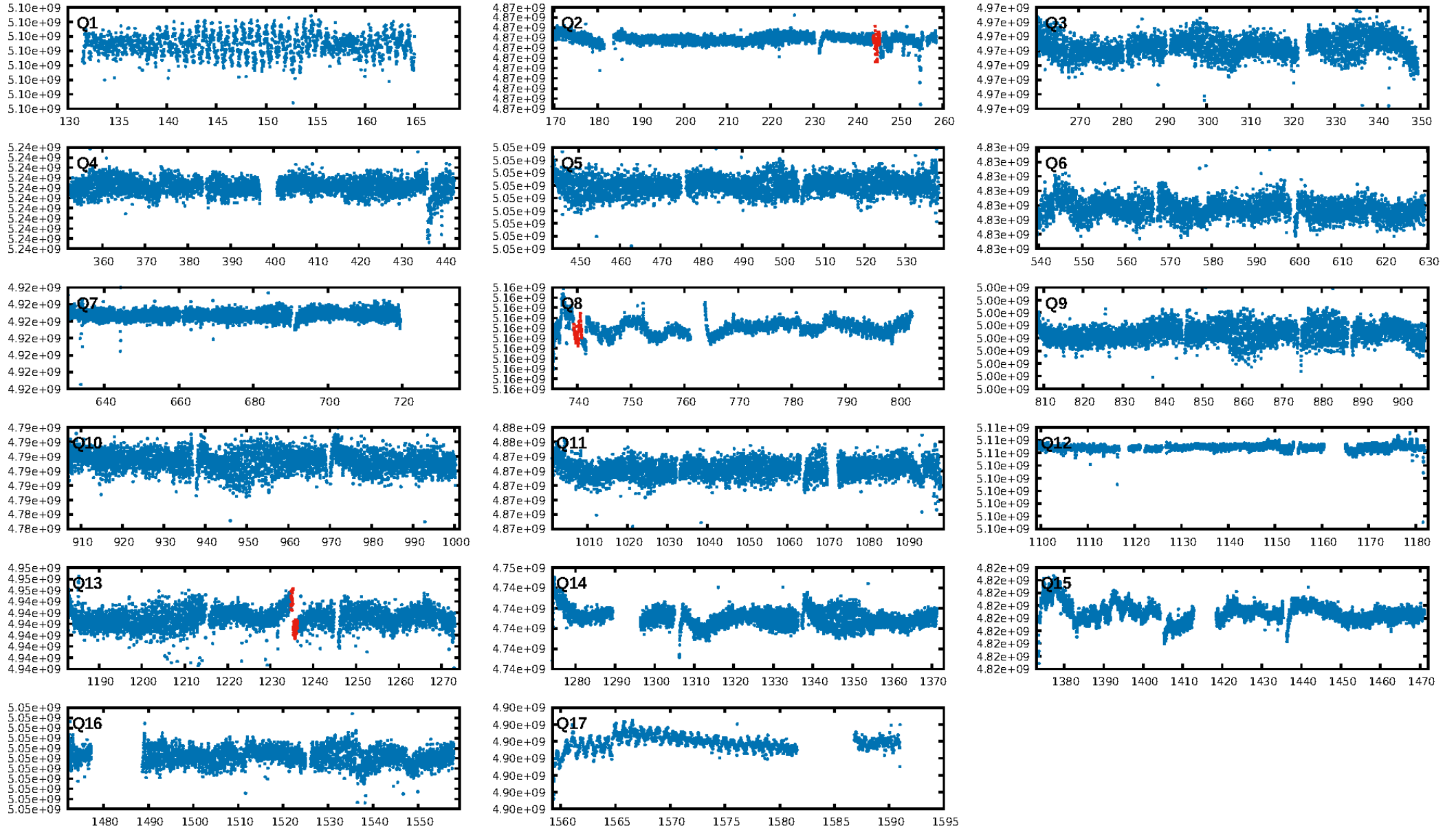
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [138.31 sigma]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.1%  
ModelChiSquareGof-sig: 92.4%  
Bootstrap-pfa: 3.93e-11  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 45.9%  
Centroid-so: 0.950 arcsec [0.33 sigma]  
OotOffset-rm: 4.890 arcsec [1.22 sigma]  
KicOffset-rm: 3.811 arcsec [1.05 sigma]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:32:37 Z

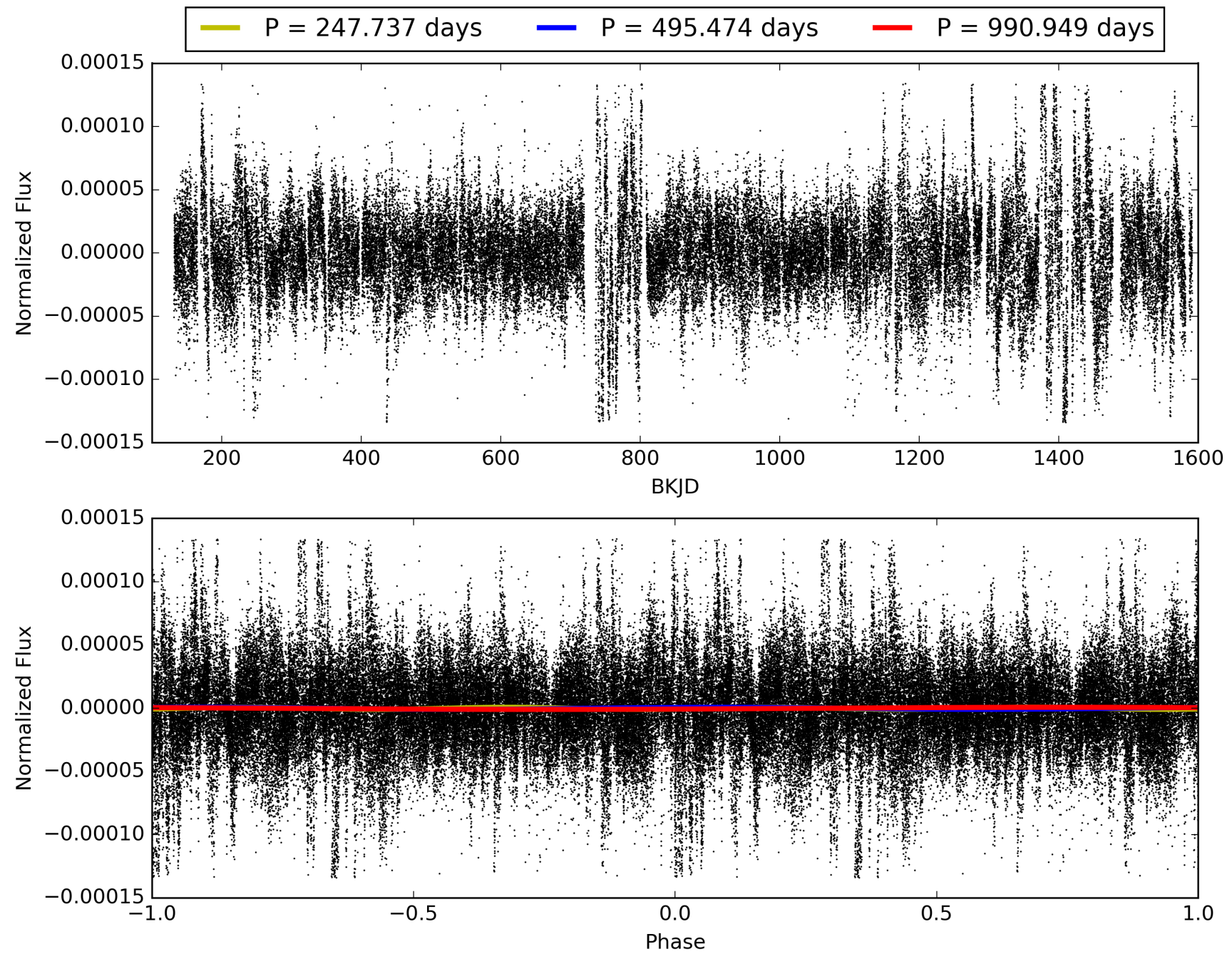
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009699848-02, PDC Light Curves





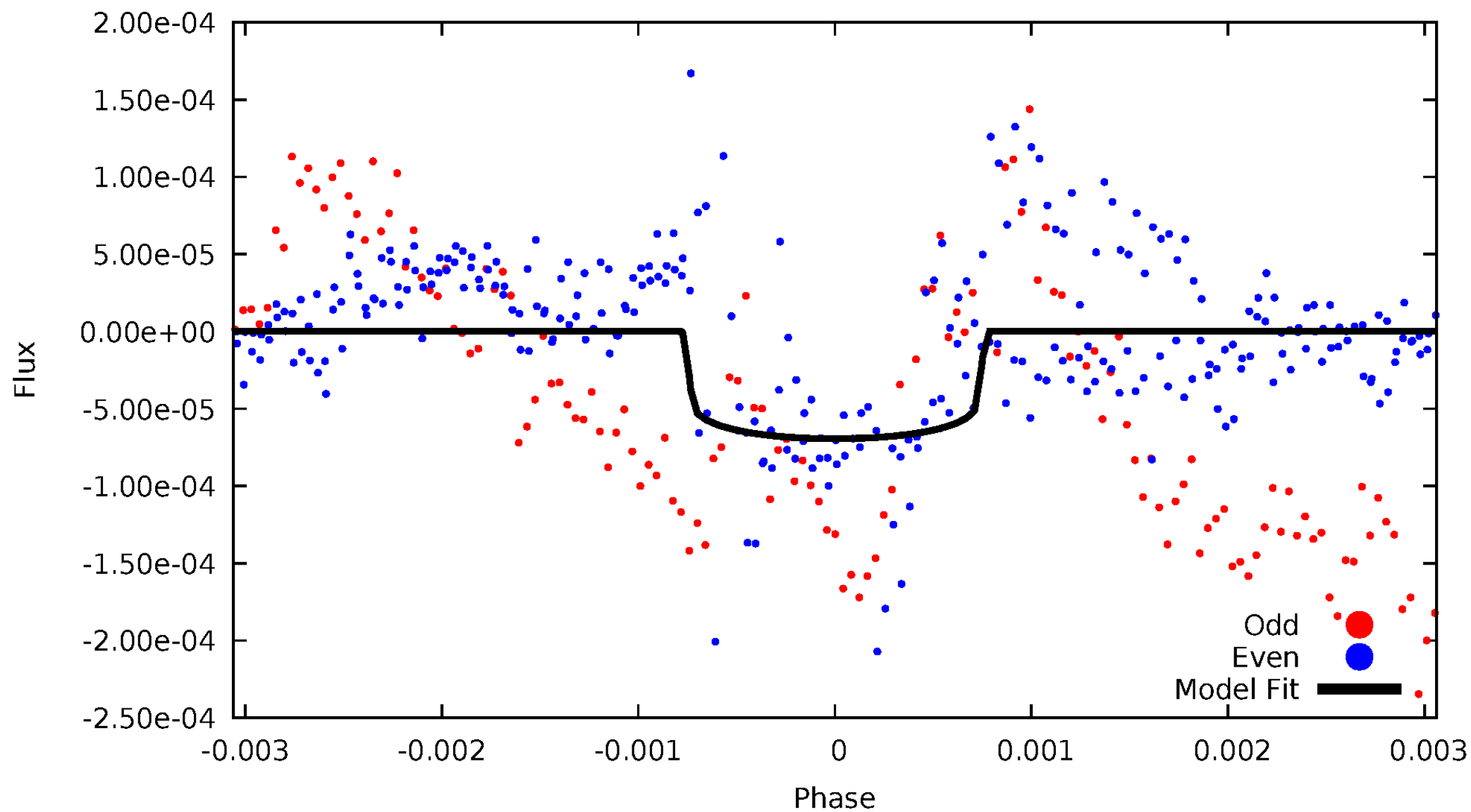
# TCE 009699848-02





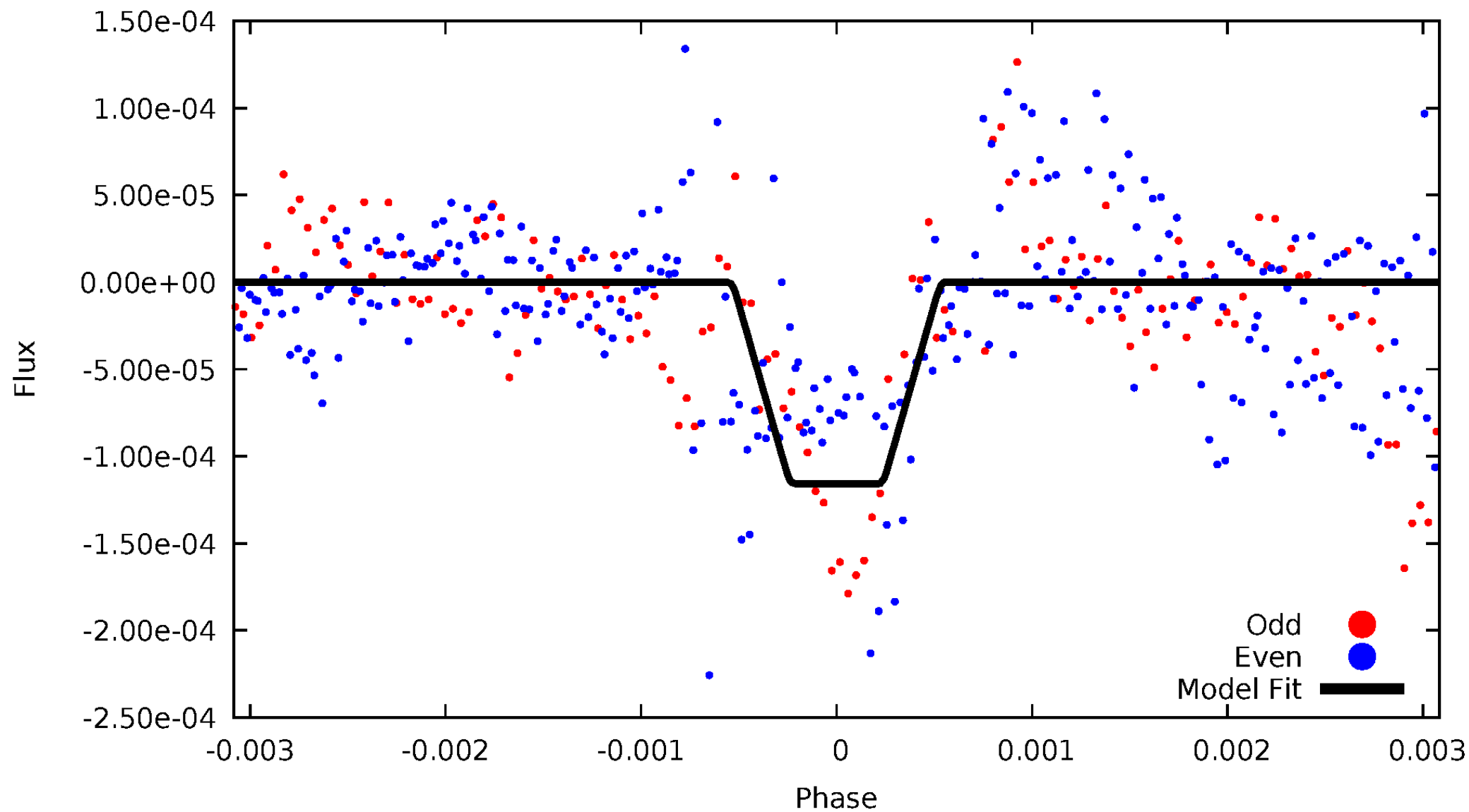
# DV Odd/Even

TCE 009699848-02



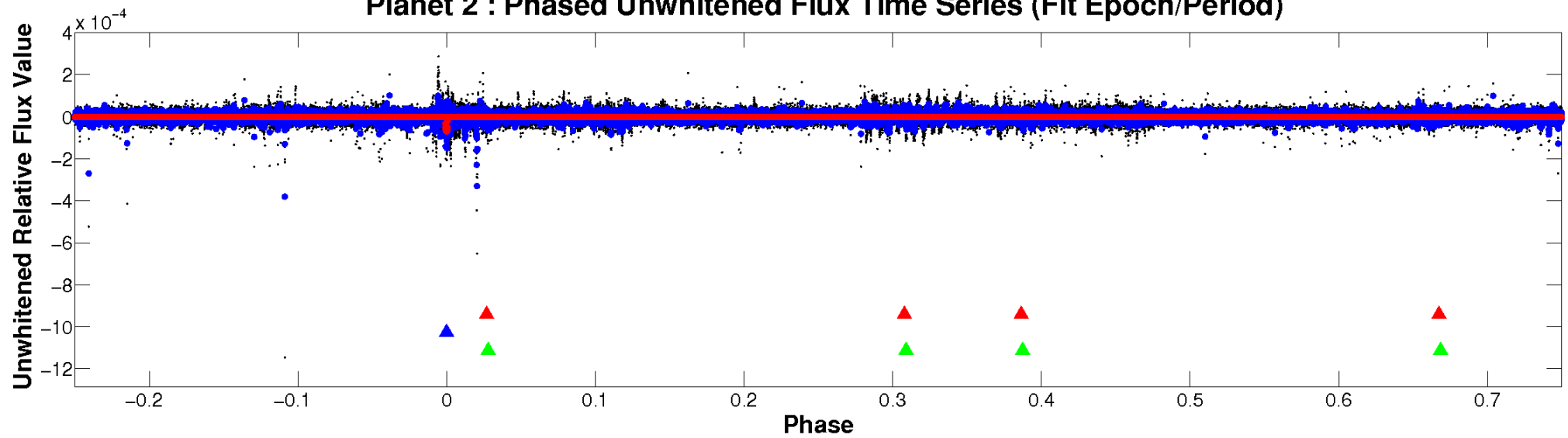
# ALT Odd/Even

TCE 009699848-02

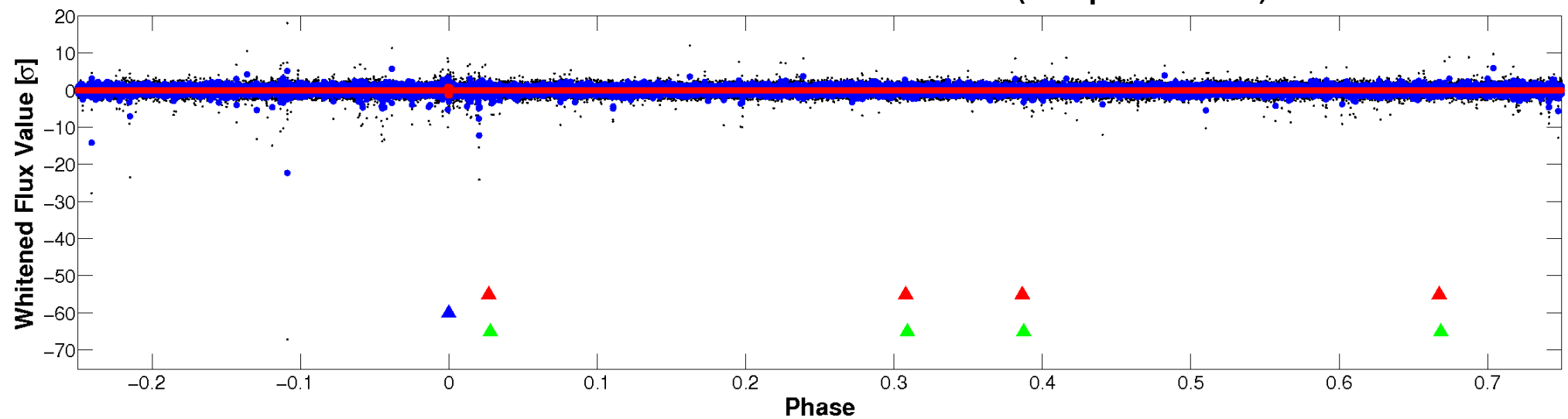


# Non-Whitened Vs. Whitened Light Curve

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

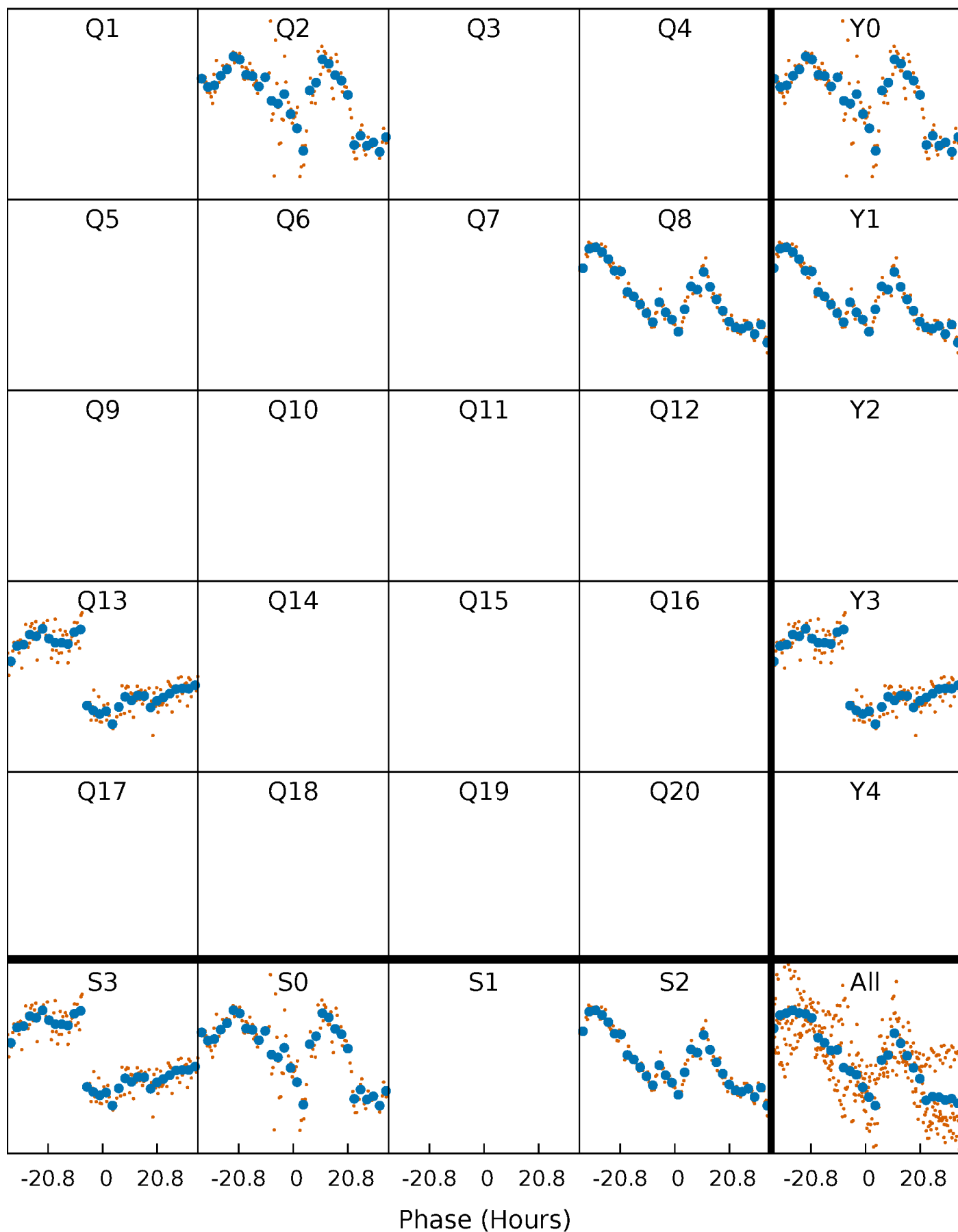


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



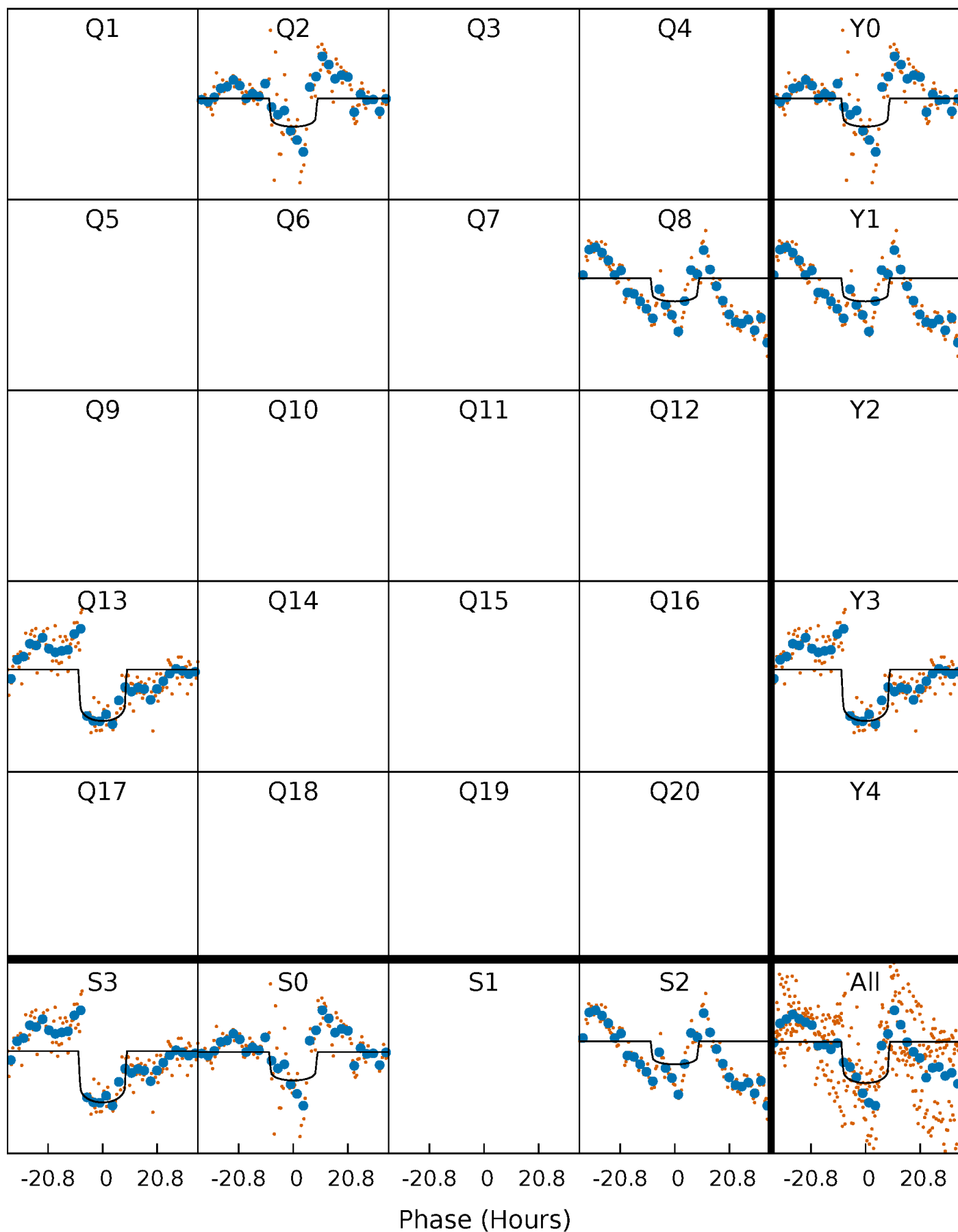
# PDC Quarter-Phased Transit Curves

TCE 009699848-02     $P=495.474494$  Days     $T_0=244.629247$  (BKJD)



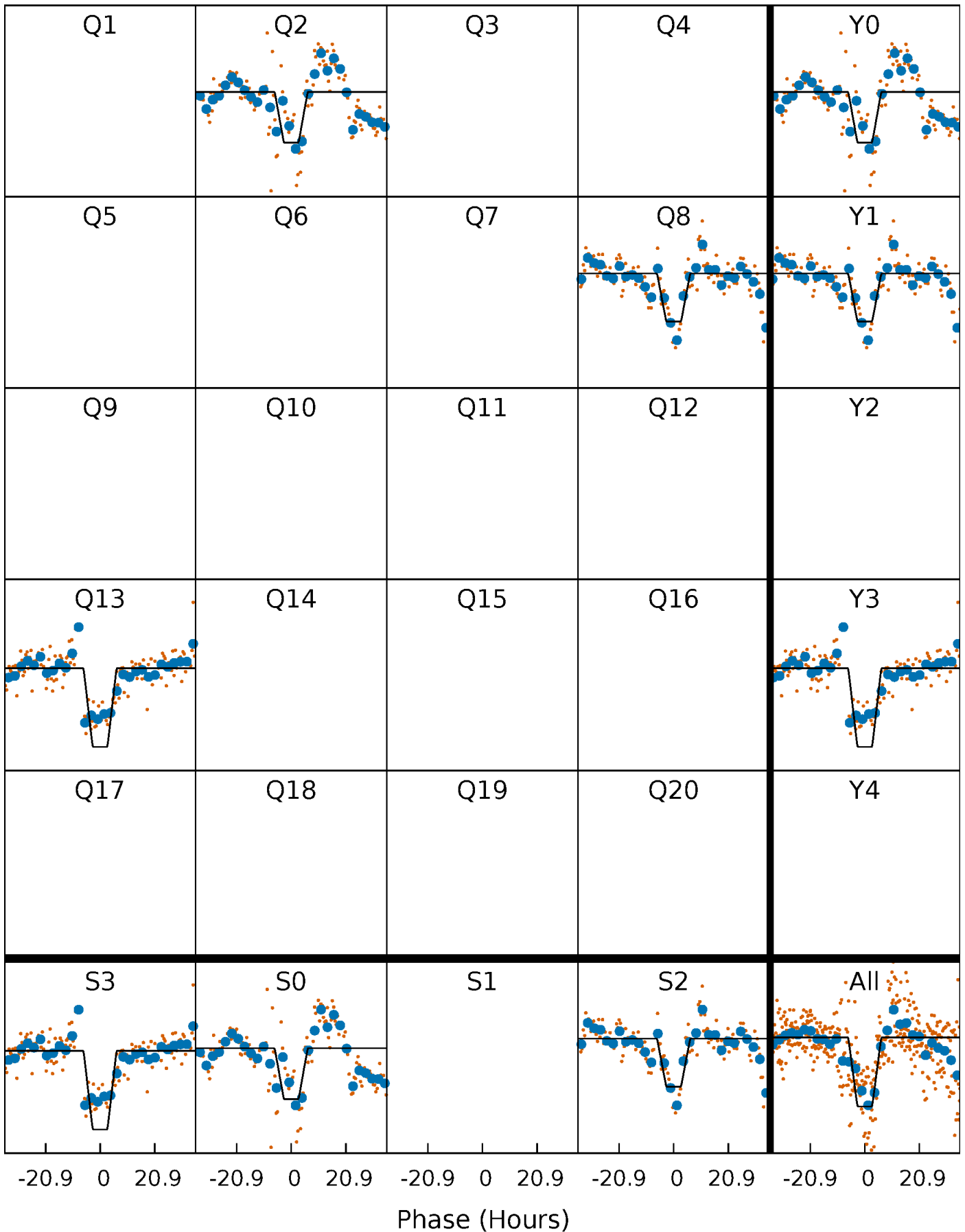
# DV Quarter-Phased Transit Curves

TCE 009699848-02     $P=495.474494$  Days     $T_0=244.629247$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

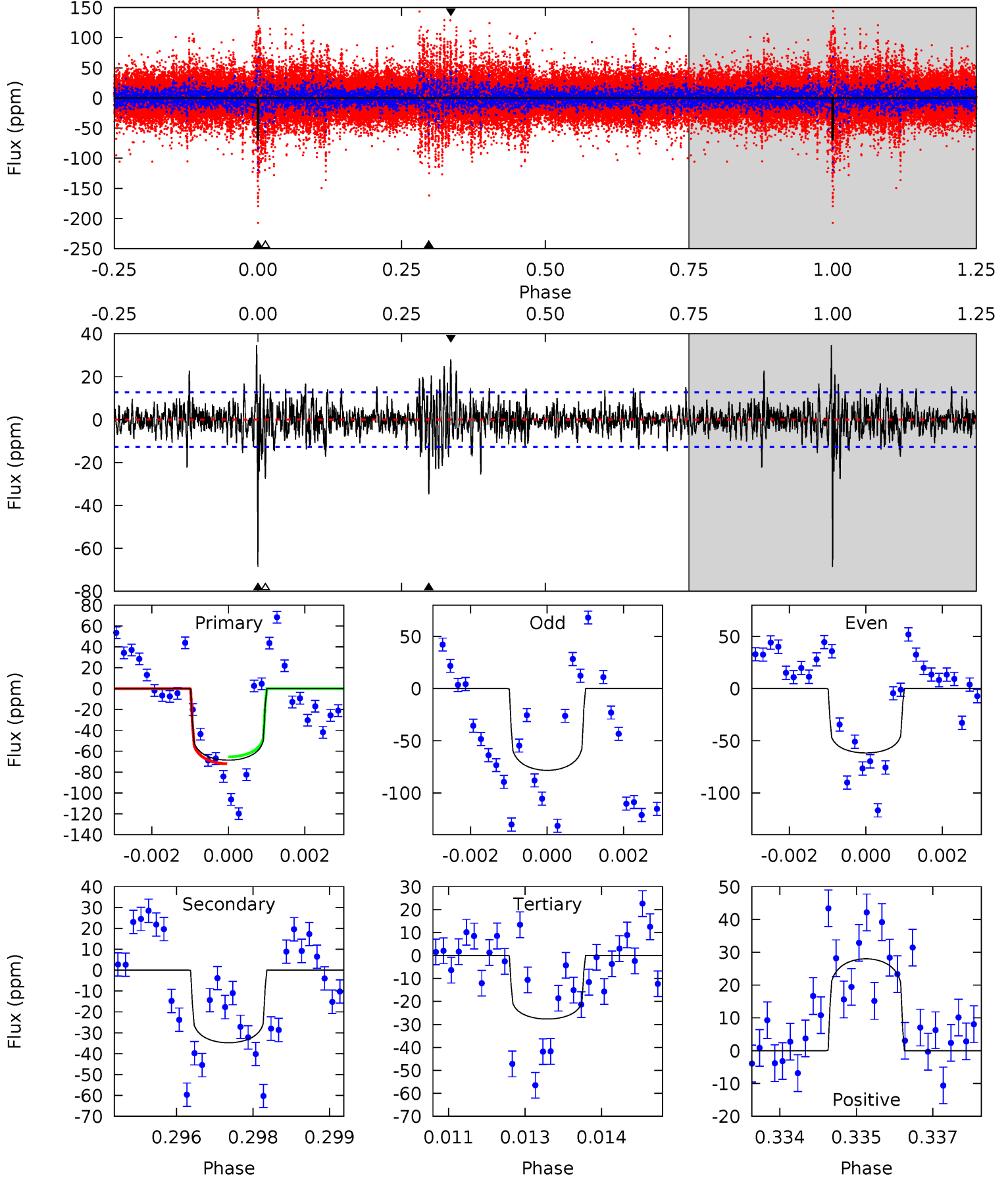
TCE 009699848-02     $P=495.486585$  Days     $T_0=244.649940$  (BKJD)



# DV Model-Shift Uniqueness Test

009699848-02, P = 495.474494 Days, E = 244.629247 Days

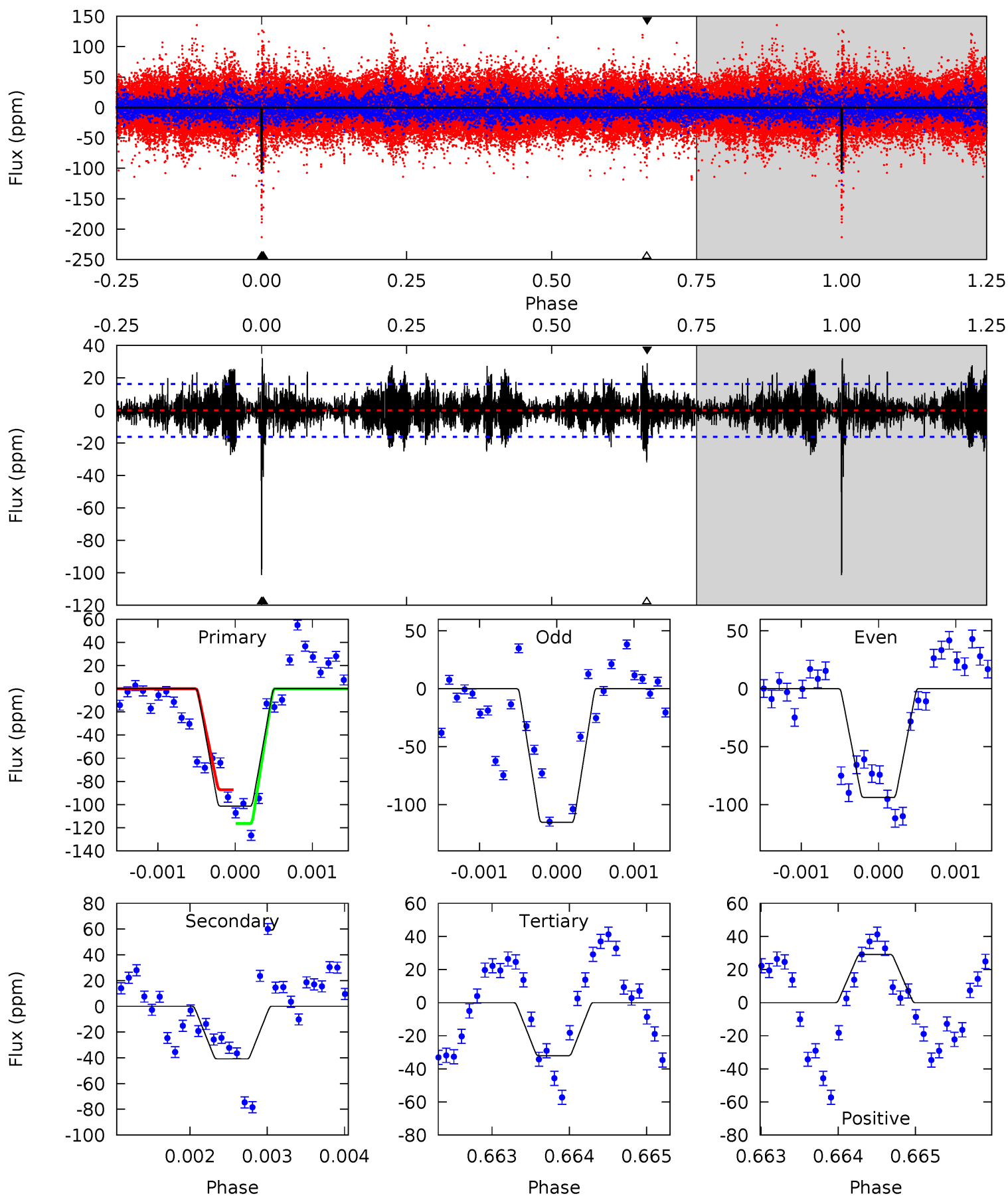
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.9	14.6	11.6	11.8	5.37	3.16	2.44	17.2	17.1	3.00	2.85	3.31	1.09	0.34	1.41



# Alt Model-Shift Uniqueness Test

009699848-02, P = 495.486585 Days, E = 244.649940 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
33.9	13.7	10.7	9.72	5.44	3.27	2.58	23.2	24.2	2.96	3.95	3.46	1.00	0.24	4.88





### Stellar Parameters For KIC 009699848

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9113^{+251}_{-466}$	$4.058^{+0.187}_{-0.153}$	$0.070^{+0.150}_{-0.700}$	$2.311^{+0.705}_{-0.705}$	$2.222^{+0.349}_{-0.598}$	$0.254^{+0.292}_{-0.119}$
	+3%/-5%	+5%/-4%	+214%/-1000%	+31%/-31%	+16%/-27%	+115%/-47%
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 009699848-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-35 \pm 2$	$2.12^{+0.45}_{-0.44}$	$667^{+55}_{-54}$	$7195^{+774}_{-585}$	$10839^{+5610}_{-3445}$
Alt.	$-41 \pm 3$	$2.70^{+0.54}_{-0.54}$	$668^{+55}_{-51}$	$6611^{+509}_{-417}$	$7861^{+3815}_{-2317}$

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

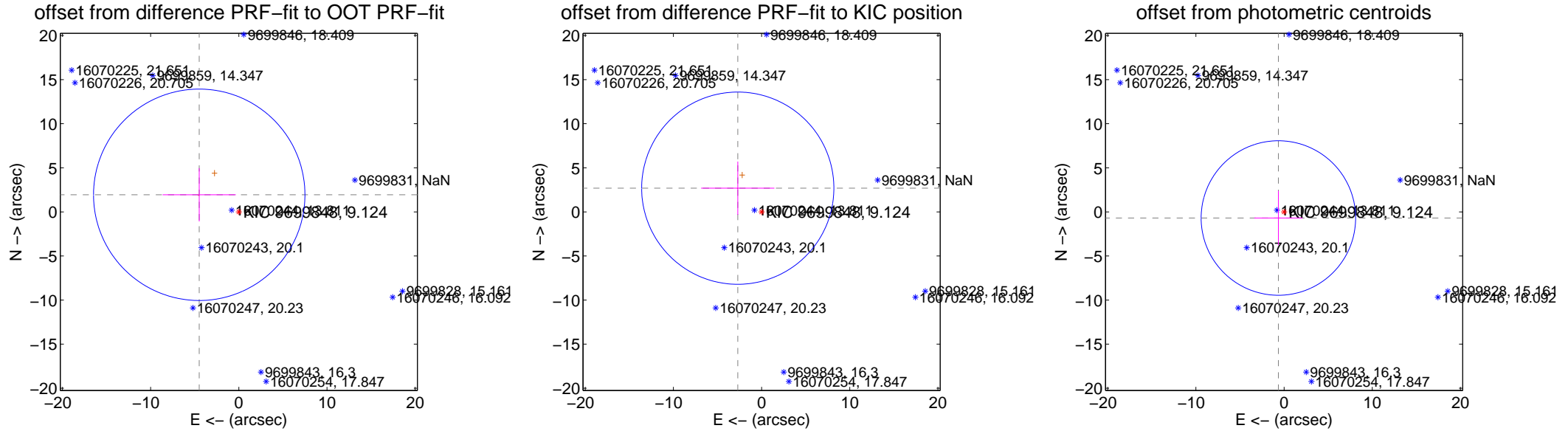
## DV Centroid Data

Supplemental centroid analysis for 009699848-02. **Kepler magnitude: 9.12.** Transit SNR 10.59

There are 0 quarters with good PRF difference image offsets

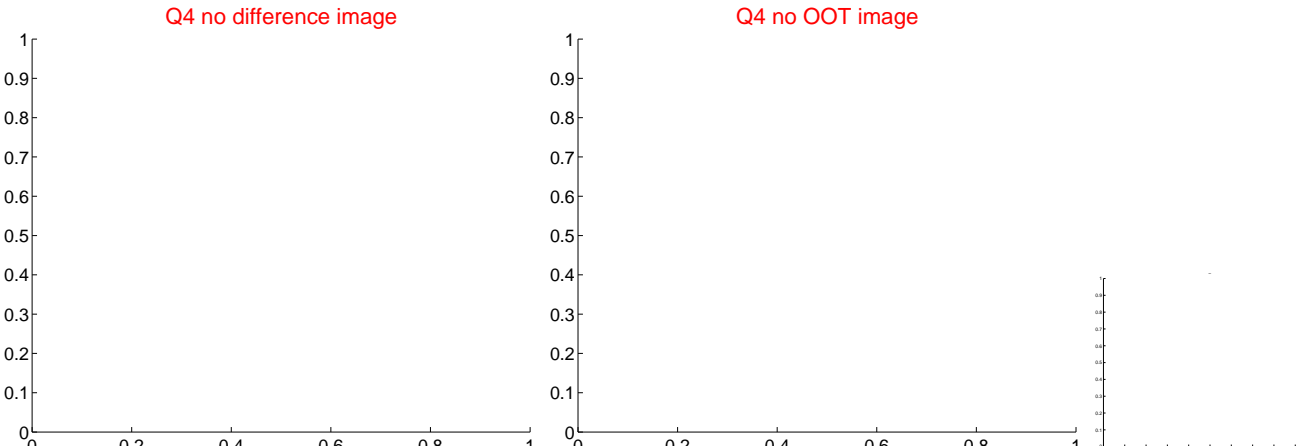
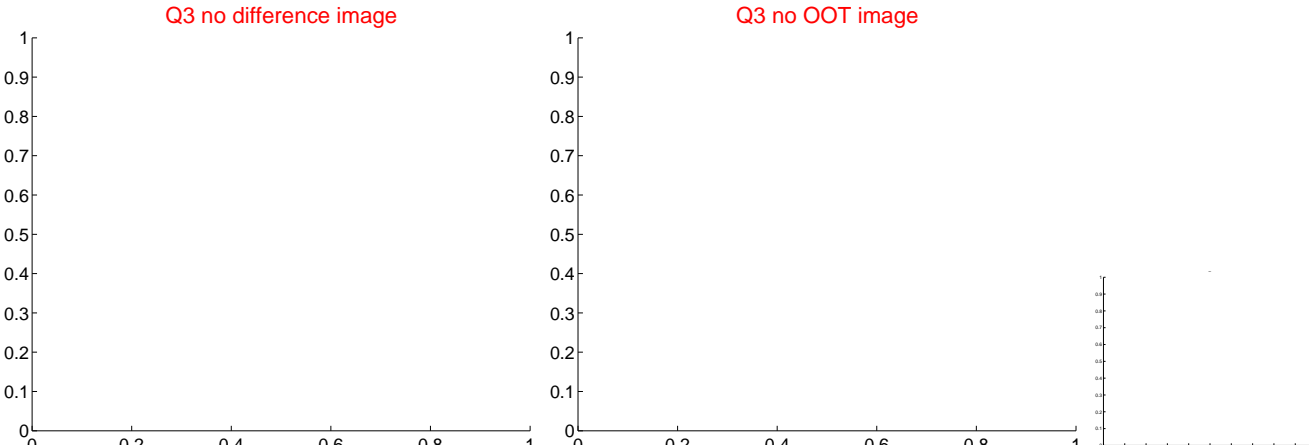
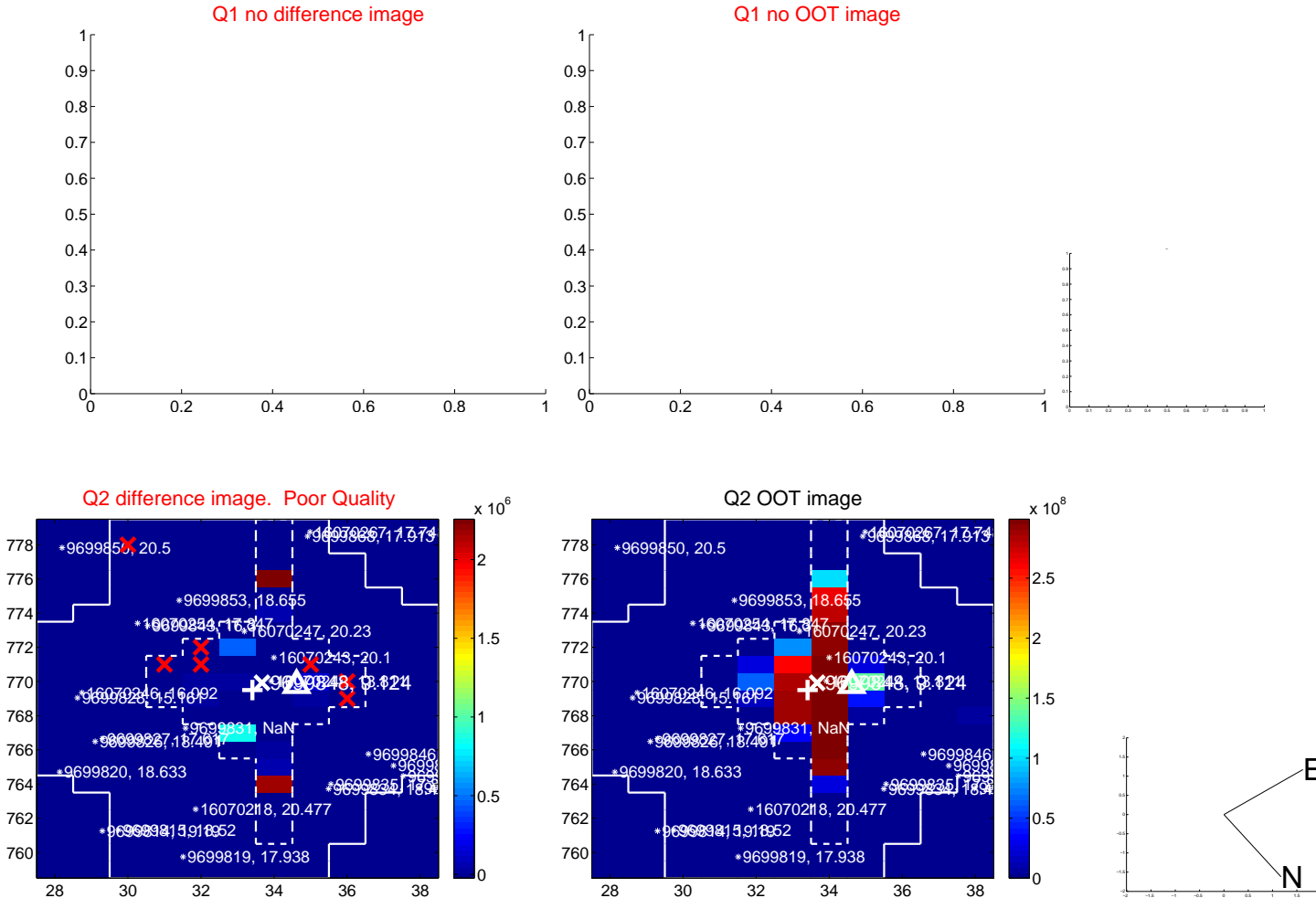
The OOT PRF centroid is offset from the target star catalog position by about 3.00 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.890 \pm 3.996$	1.22	$4.489 \pm 4.152$	$1.938 \pm 3.019$
PRF-fit source offset from KIC position	$3.811 \pm 3.633$	1.05	$2.702 \pm 4.152$	$2.688 \pm 3.019$
photometric centroid source offset	$0.95 \pm 2.92$	0.33	$0.65 \pm 2.73$	$-0.70 \pm 3.07$



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

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



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

Q5 no difference image



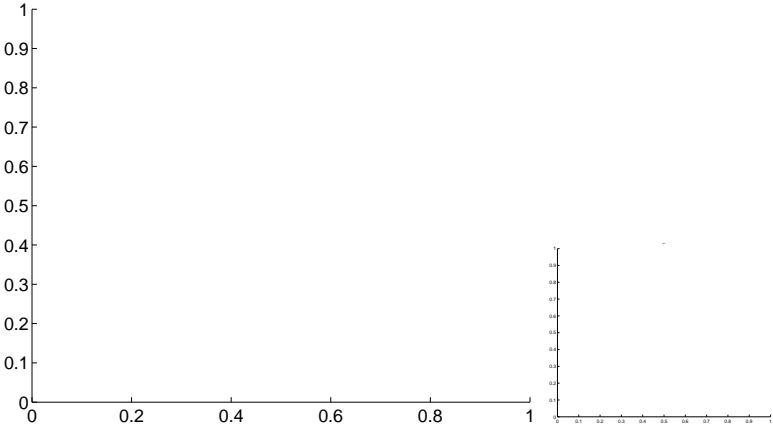
Q5 no OOT image



Q6 no difference image



Q6 no OOT image



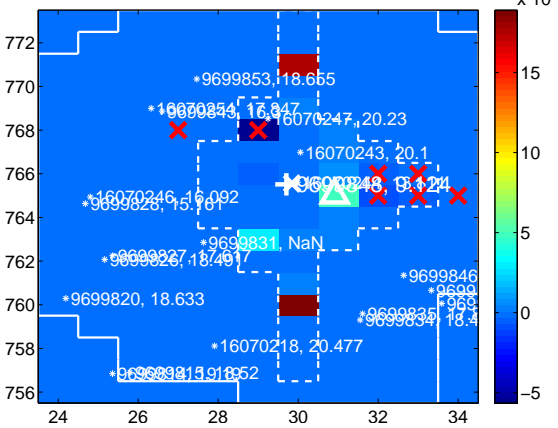
Q7 no difference image



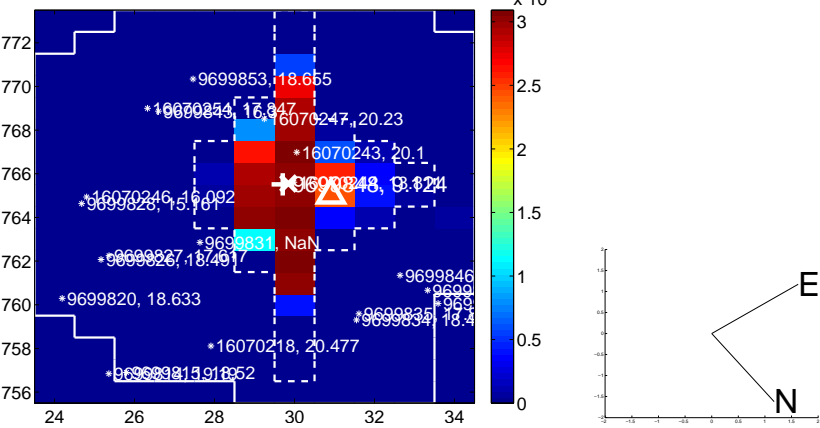
Q7 no OOT image



Q8 difference image. Poor Quality



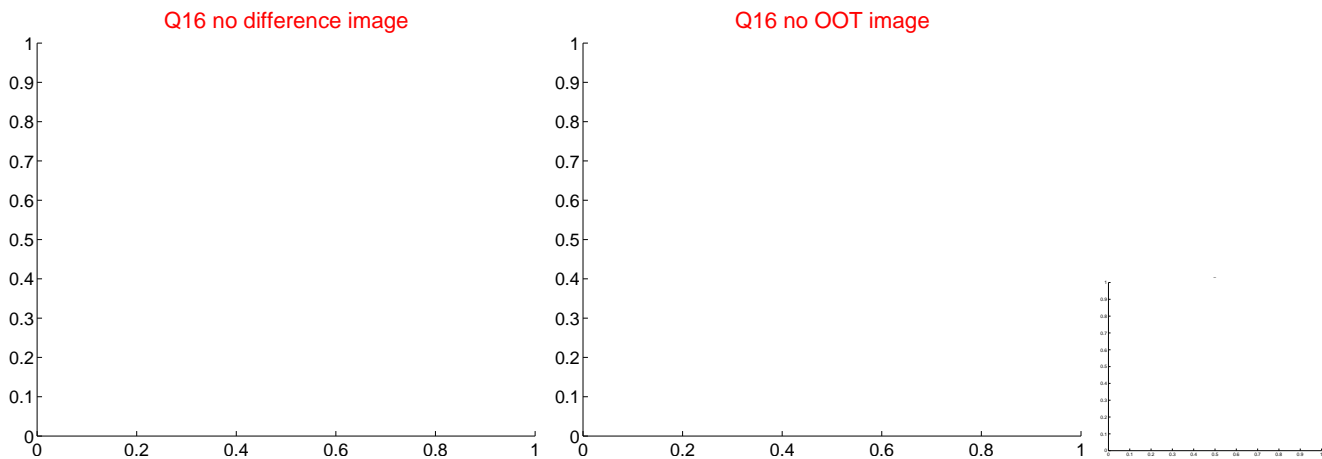
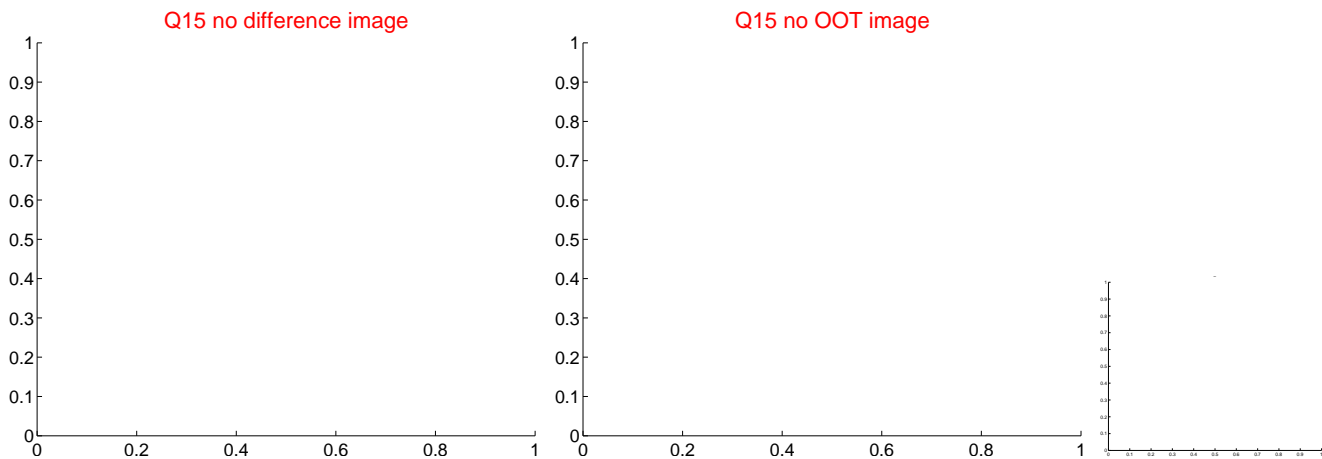
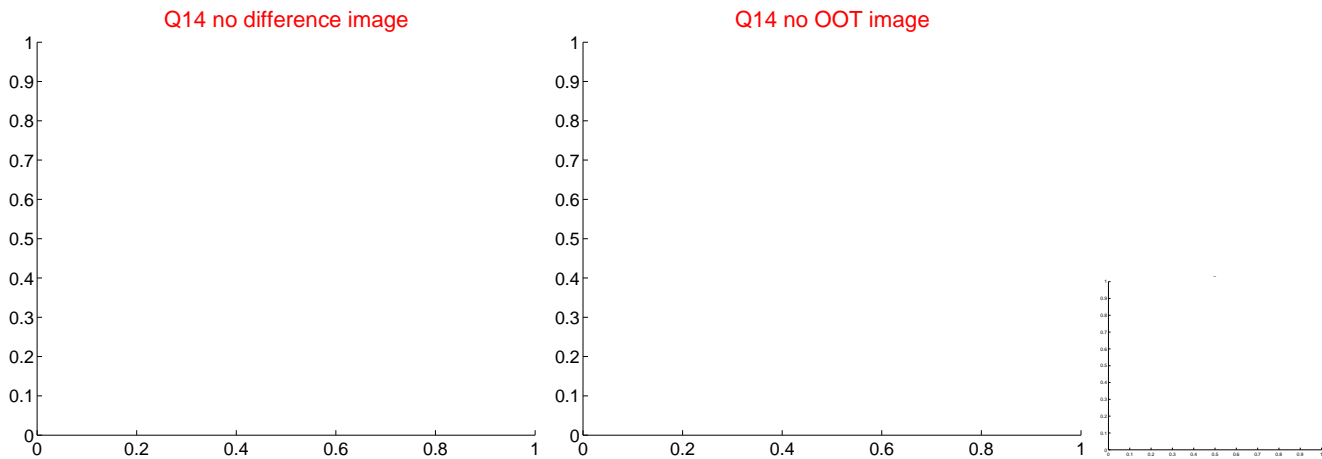
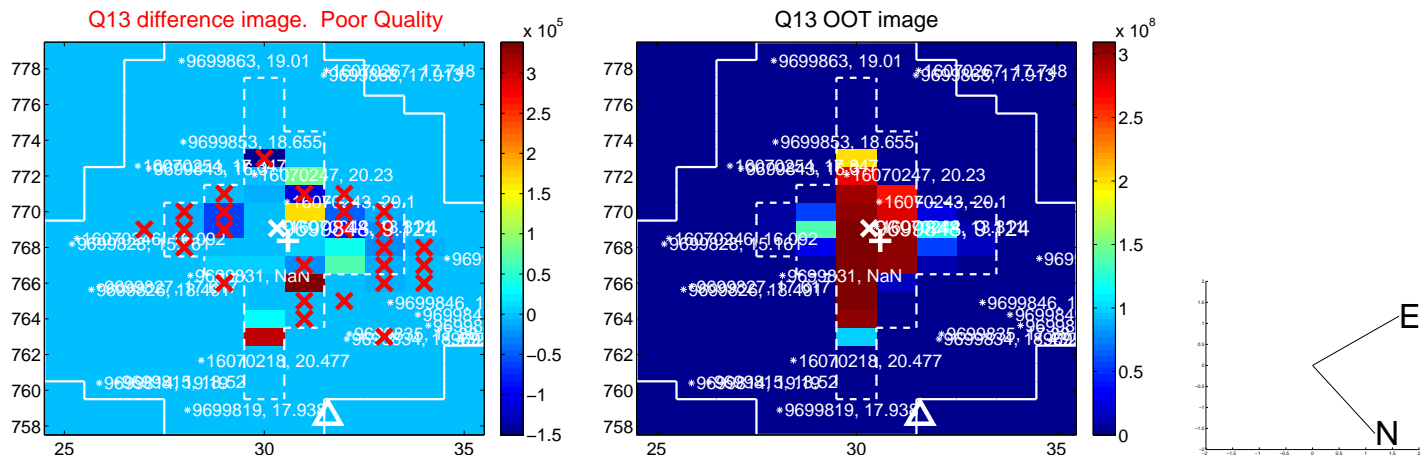
Q8 OOT image



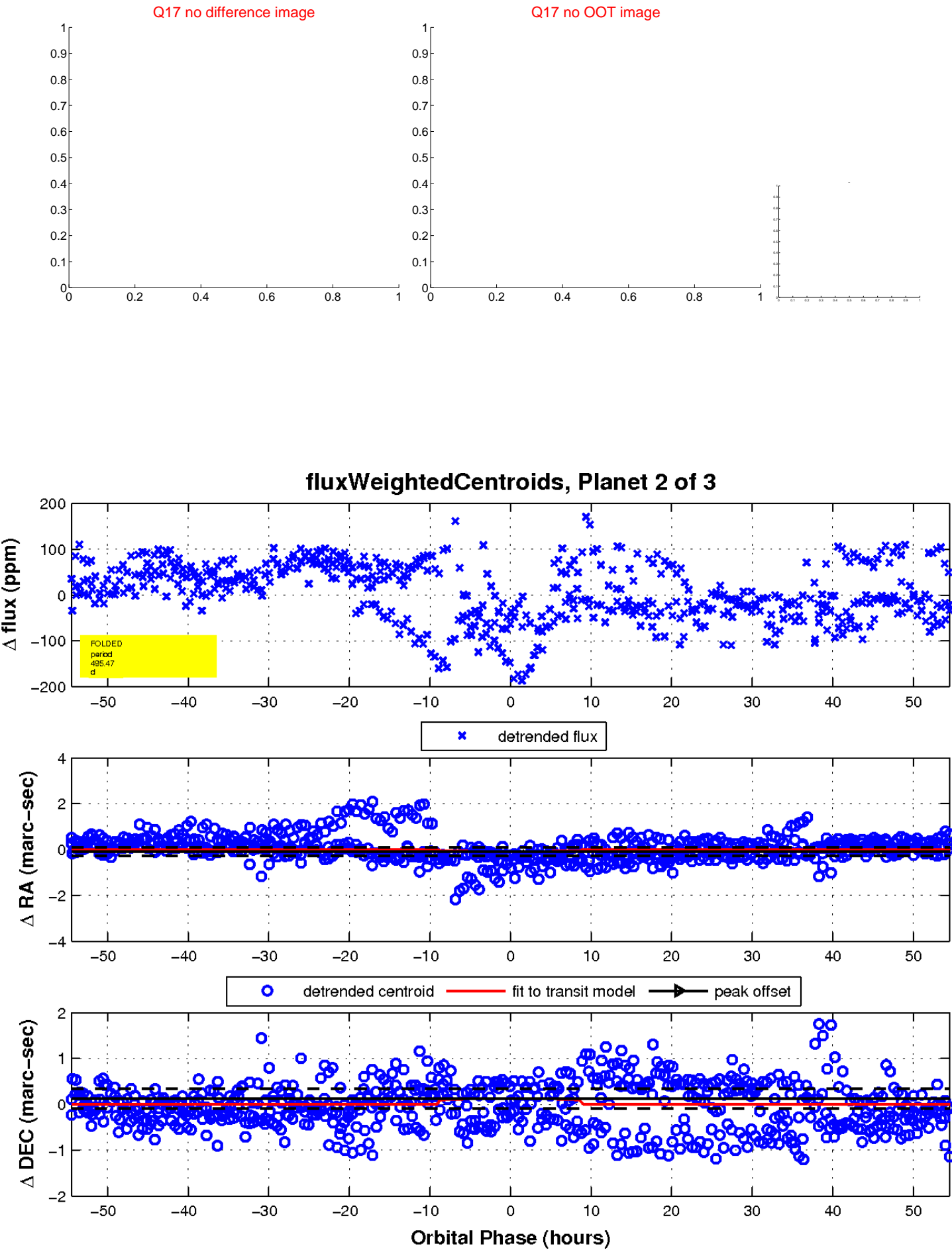
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

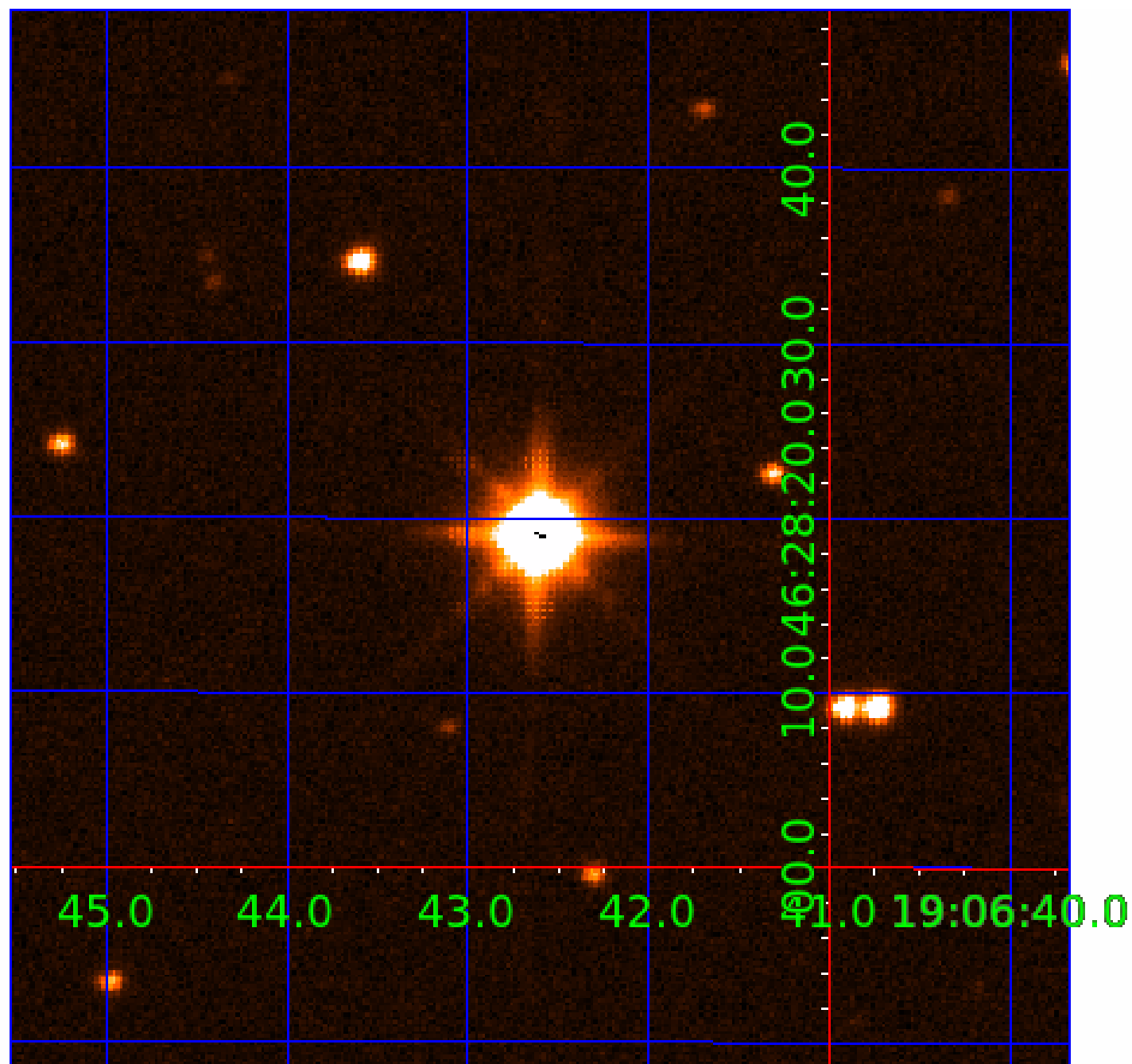


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009699848

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009699848-01	OBS	No	317.337310	436.118982	82.8	5.685	20.2	8.3	2.31	9113	2.37	23.34
009699848-02	OBS	No	495.474494	244.629247	69.4	18.191	11.5	10.6	2.31	9113	2.13	12.88
009699848-03	OBS	No	317.369648	436.596744	64.1	24.984	10.9	9.4	2.31	9113	2.02	23.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009699848-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
009699848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
009699848-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_SATURATED

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

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

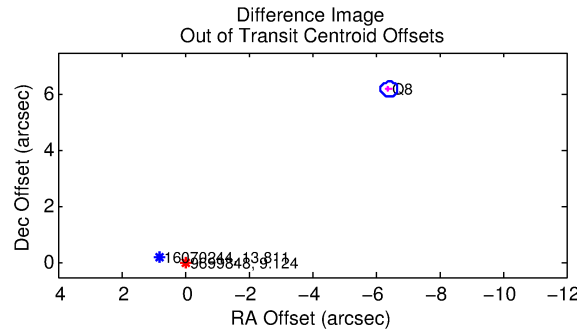
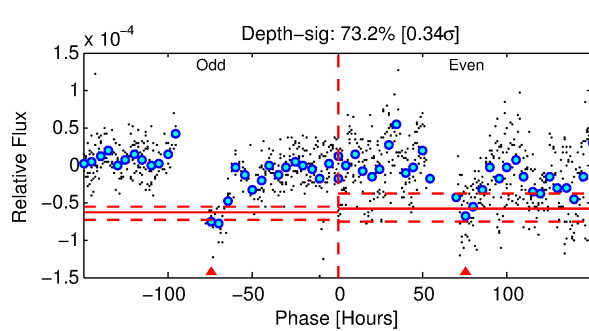
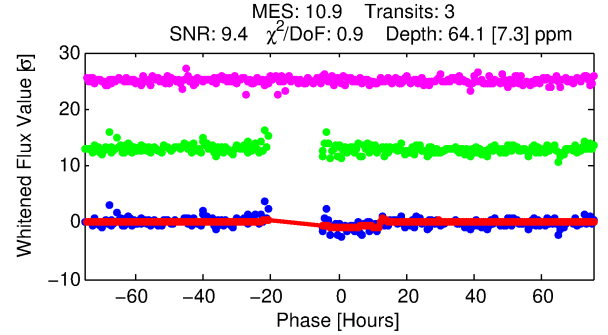
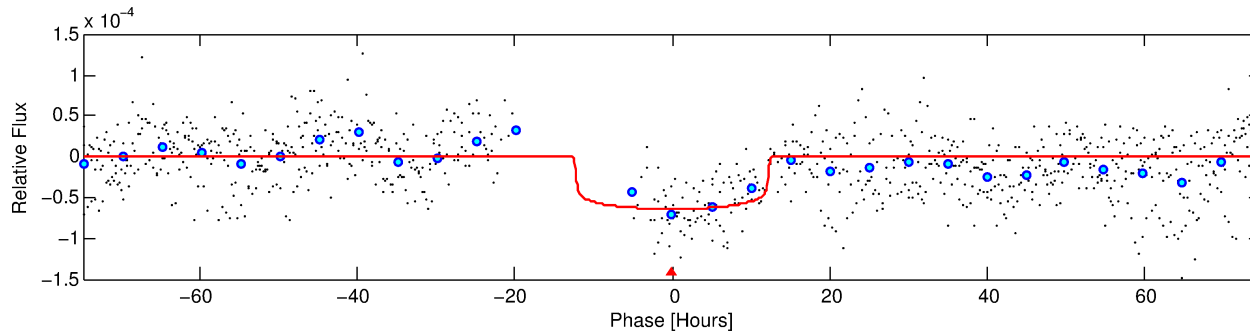
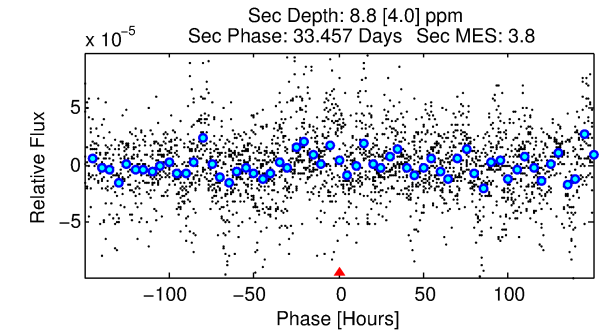
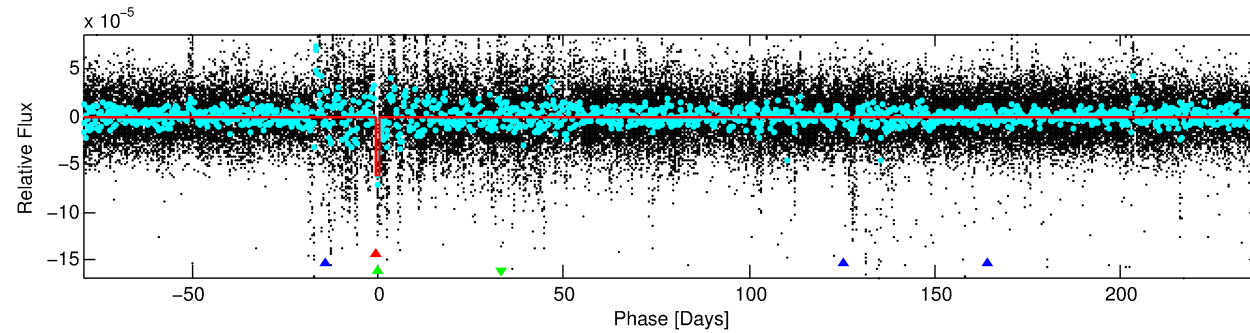
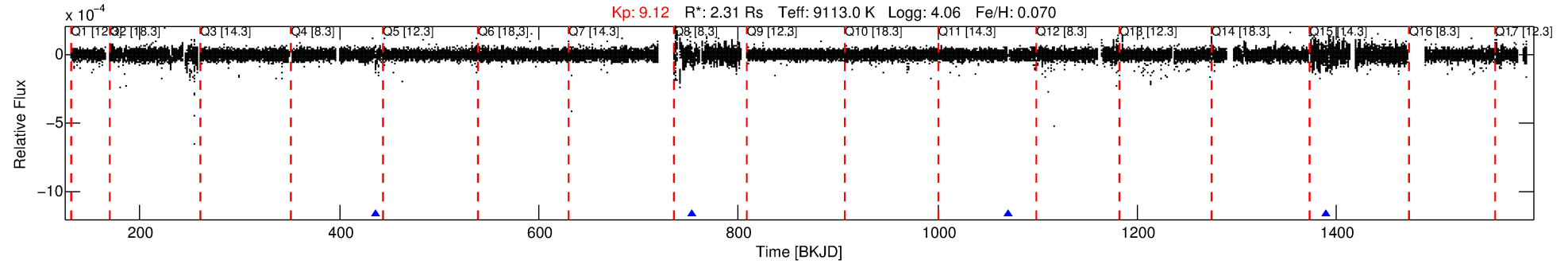
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009699848-03

No Significant Match Found

# DV One-Page Summary

KIC: 9699848 Candidate: 3 of 3 Period: 317.370 d



## DV Fit Results:

Period = 317.36965 [0.00778] d  
Epoch = 436.5967 [0.0827] BKJD  
Rp/R\* = 0.0080 [0.0012]  
a/R\* = 62.77 [62.23]  
b = 0.77 [0.44]  
Seff = 23.33 [9.50]  
Teq = 560 [57] K  
Rp = 2.02 [0.68] Re  
a = 1.1893 [0.2960] AU  
Ag = 1675.17 [1086.49] [1.54σ]  
Teffp = 5543 [807] K [6.16σ]

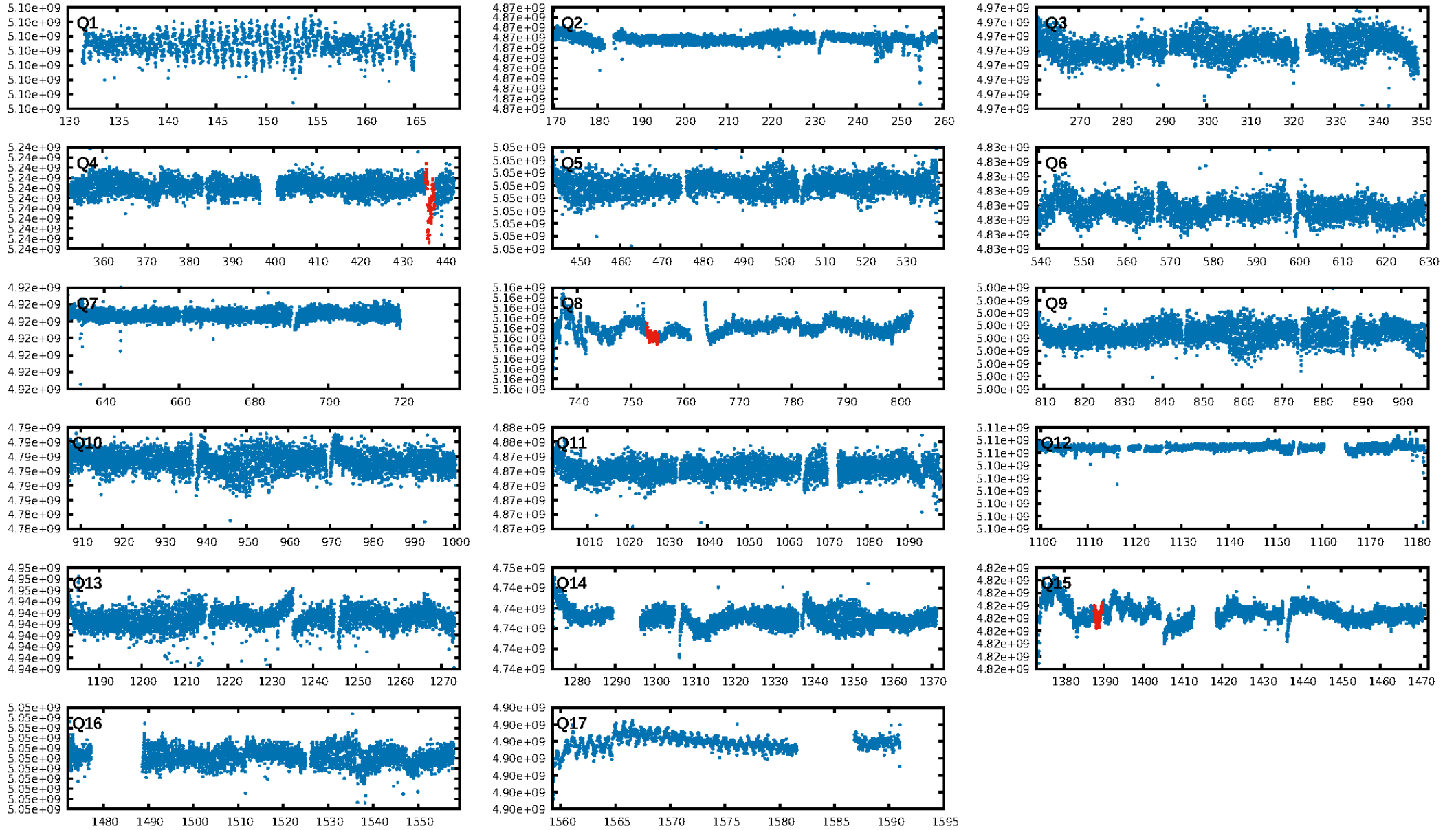
## DV Diagnostic Results:

ShortPeriod-sig: 2.4% [0.03σ]  
LongPeriod-sig: 100.0% [138.31σ]  
ModelChiSquare2-sig: 81.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.34e-15  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 17.1%  
Centroid-so: 1.996 arcsec [1.12σ]  
OotOffset-rm: 8.911 arcsec [100.97σ]  
KicOffset-rm: 9.300 arcsec [104.75σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 0.00 [0/1]

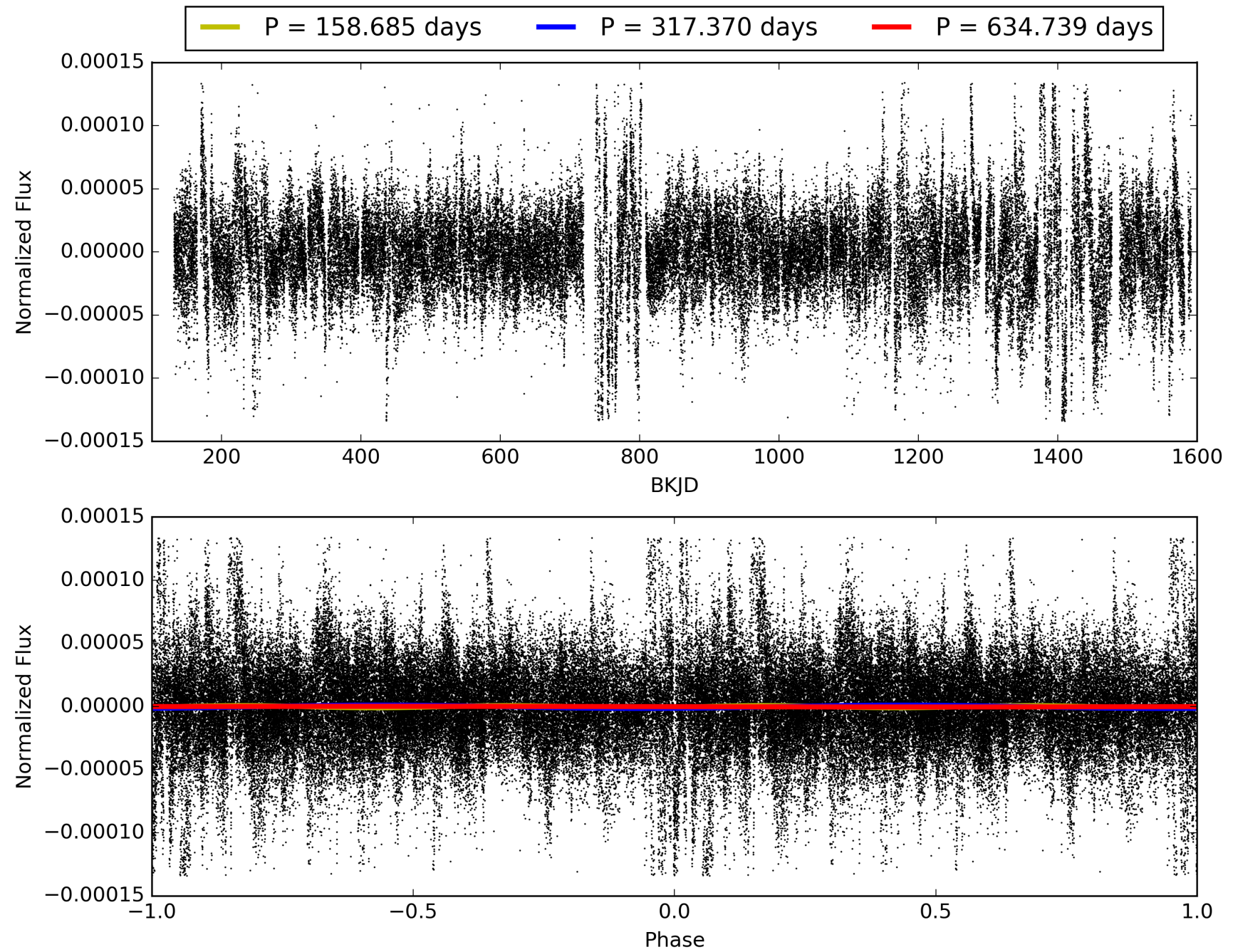
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:32:45 Z

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

# TCE 009699848-03, PDC Light Curves

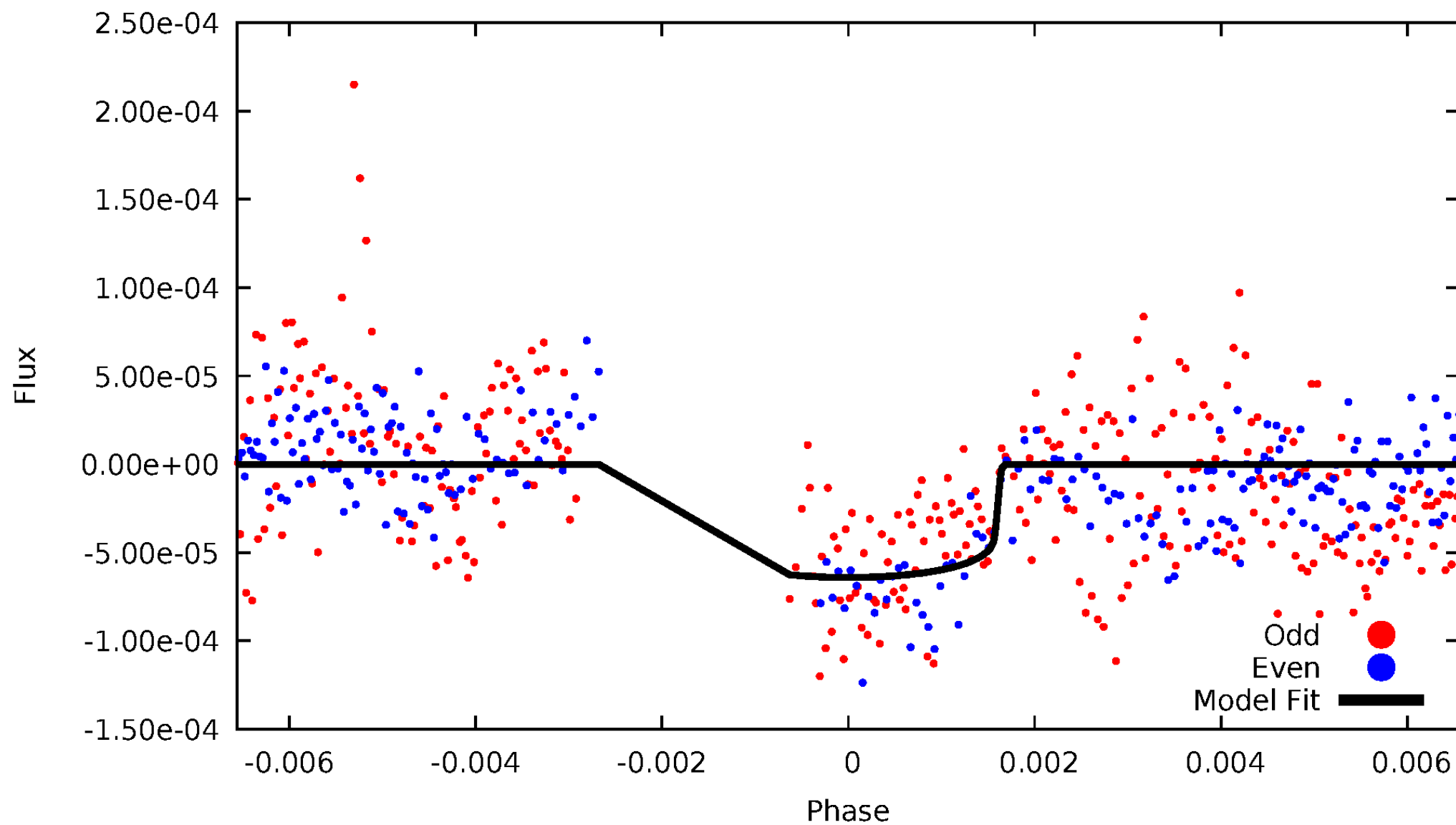


TCE 009699848-03



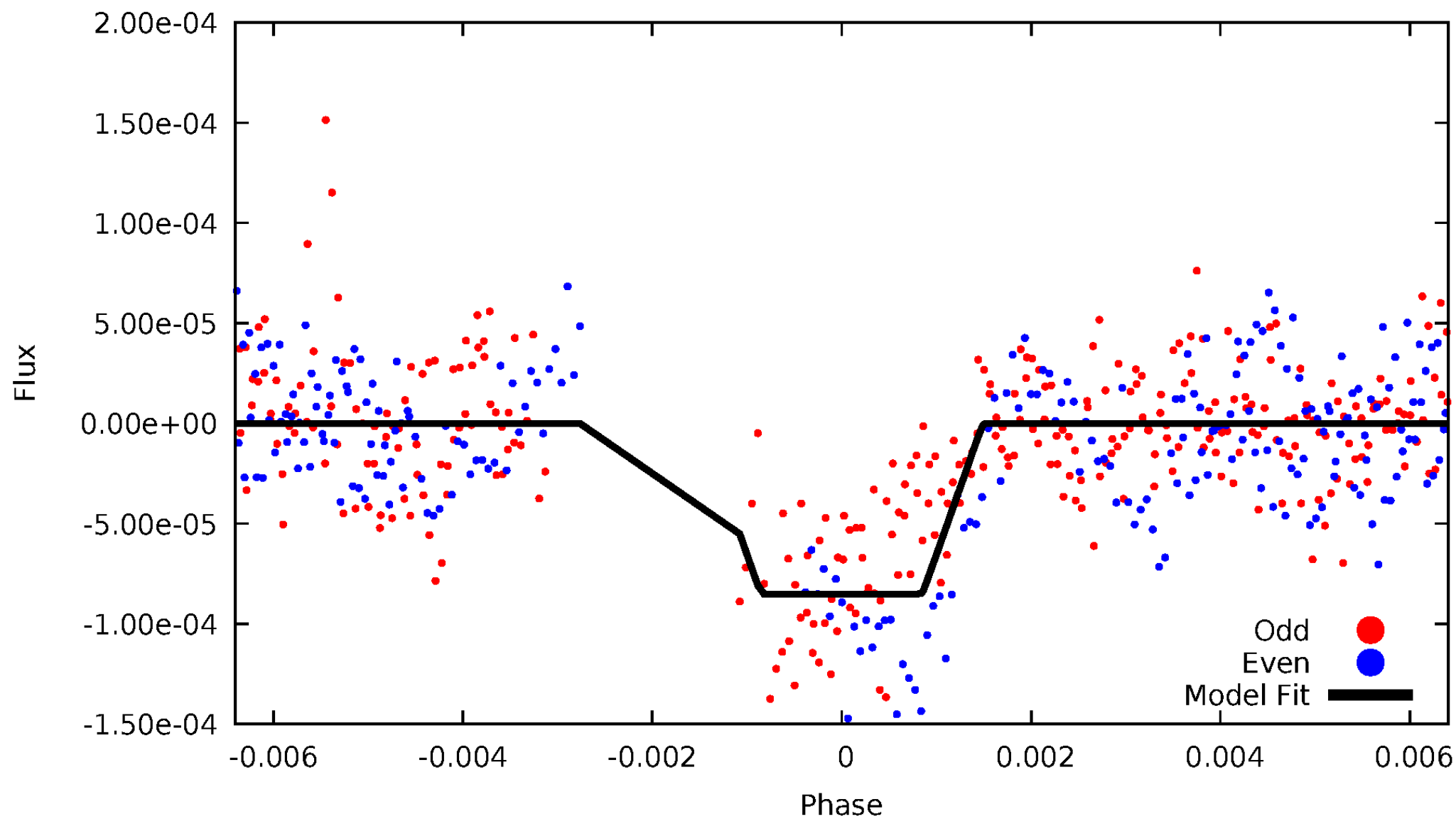
# DV Odd/Even

TCE 009699848-03



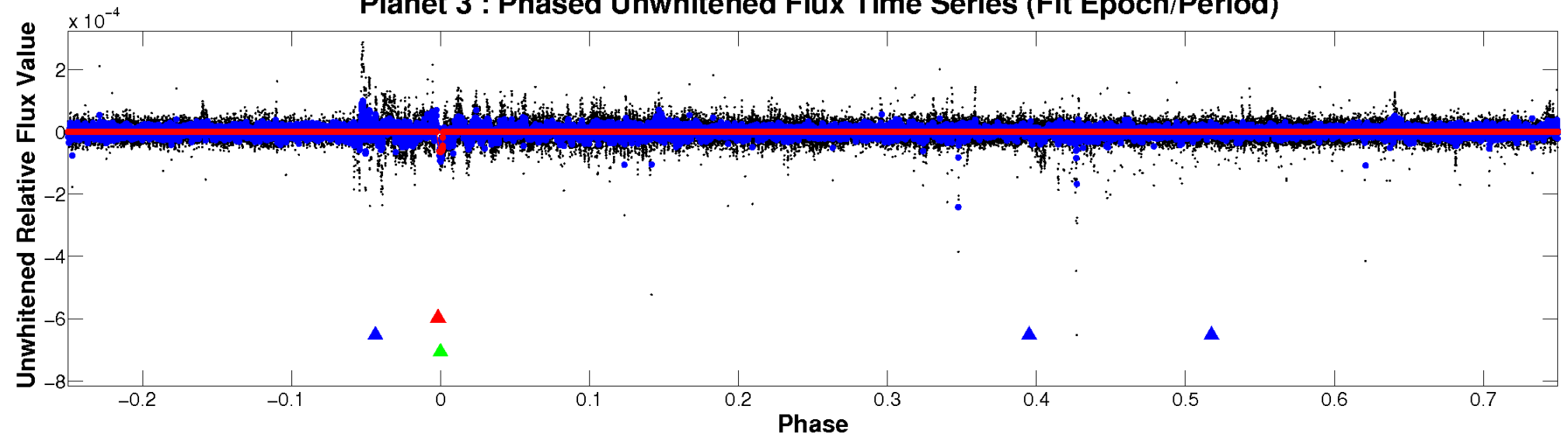
# ALT Odd/Even

TCE 009699848-03

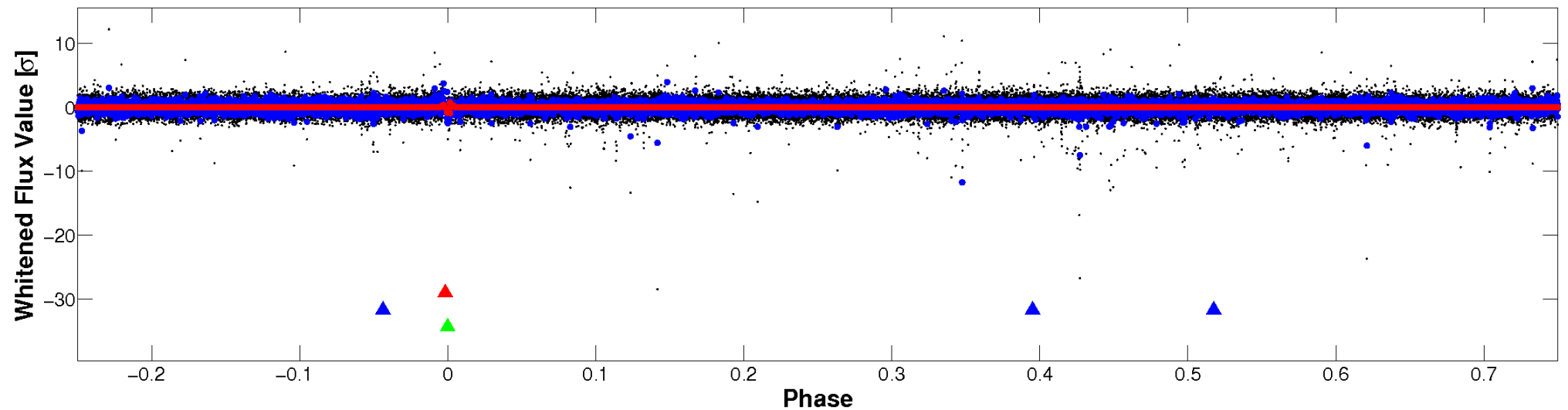


# Non-Whitened Vs. Whitened Light Curve

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



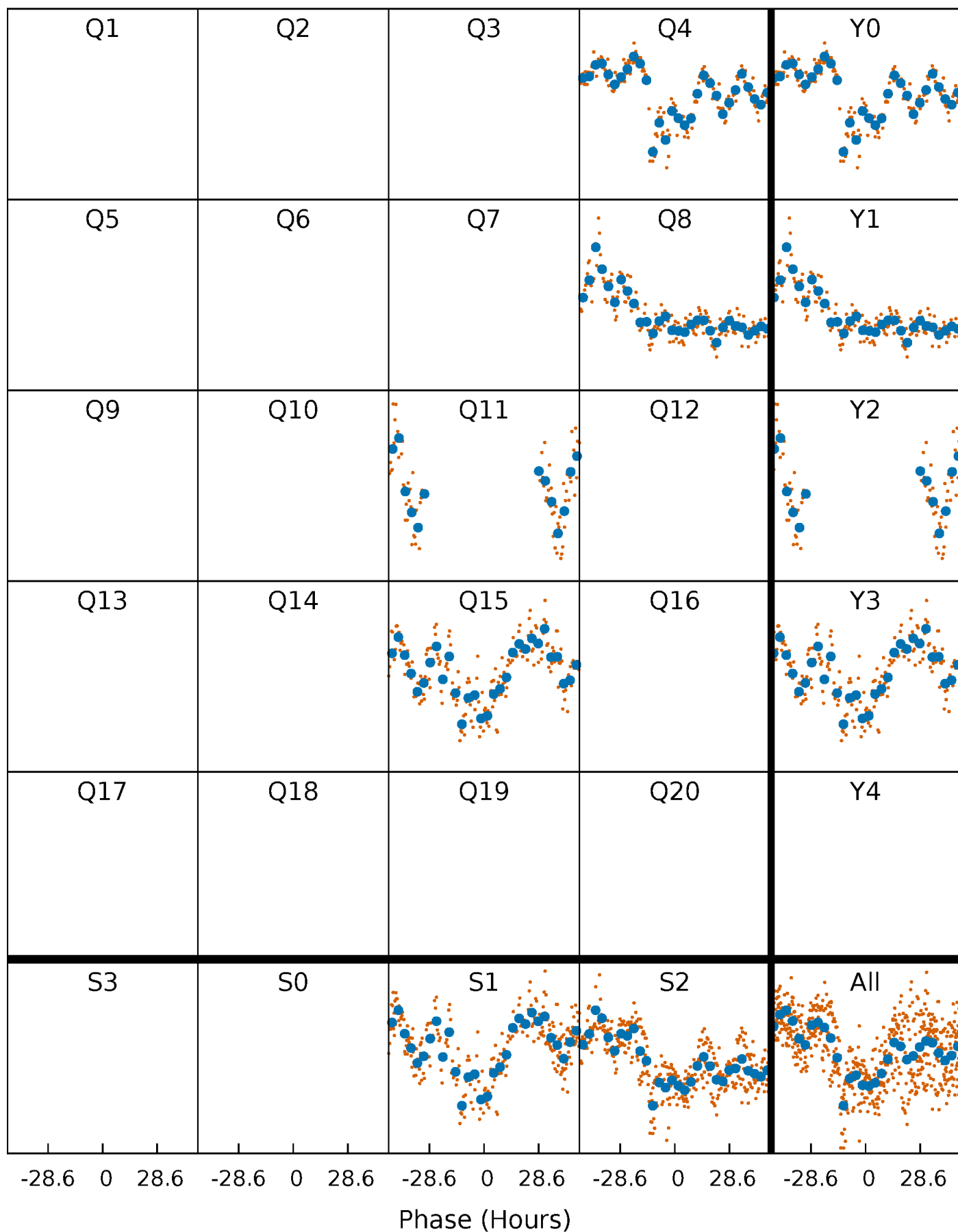
**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

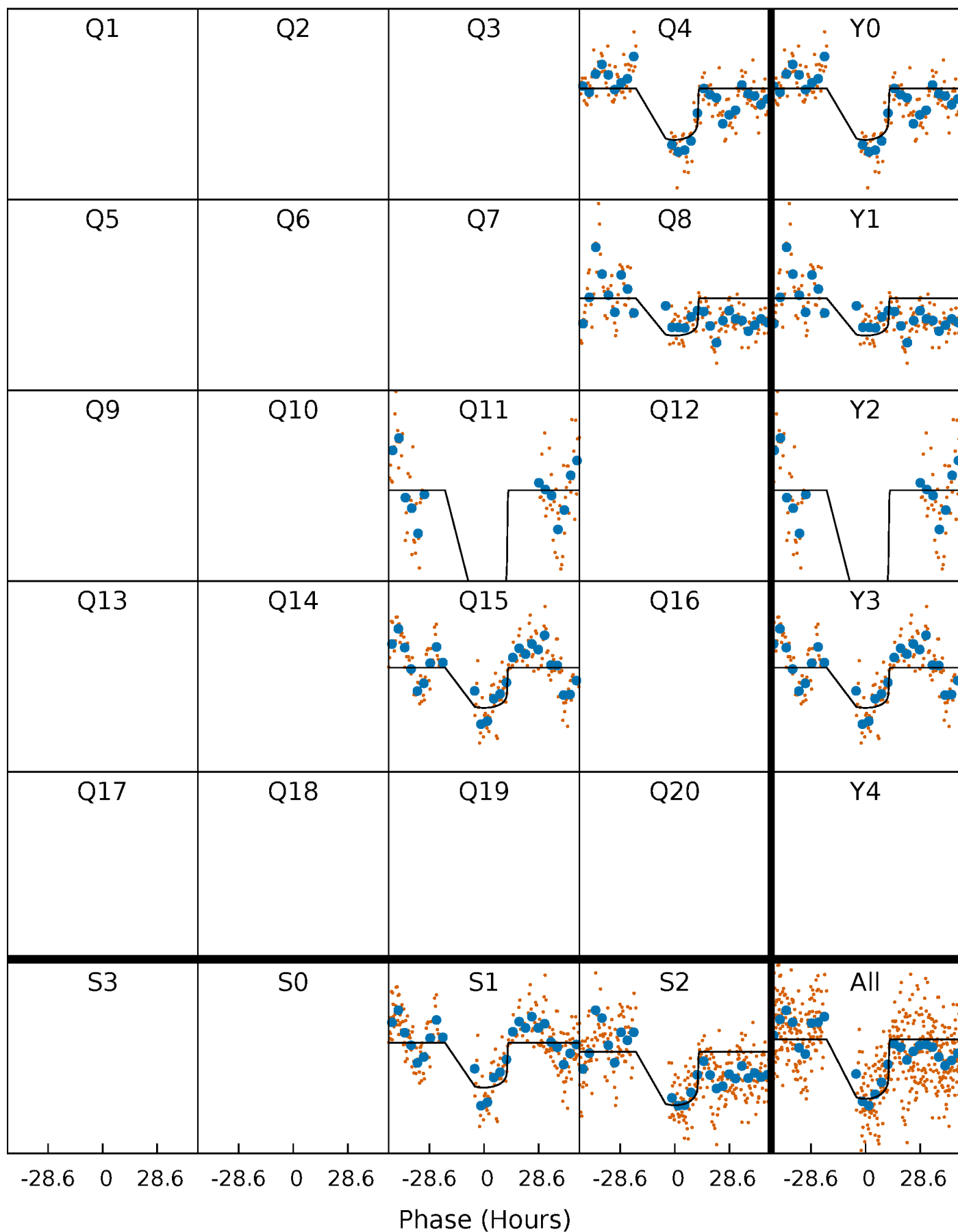
TCE 009699848-03     $P=317.369648$  Days     $T_0=436.596744$  (BKJD)





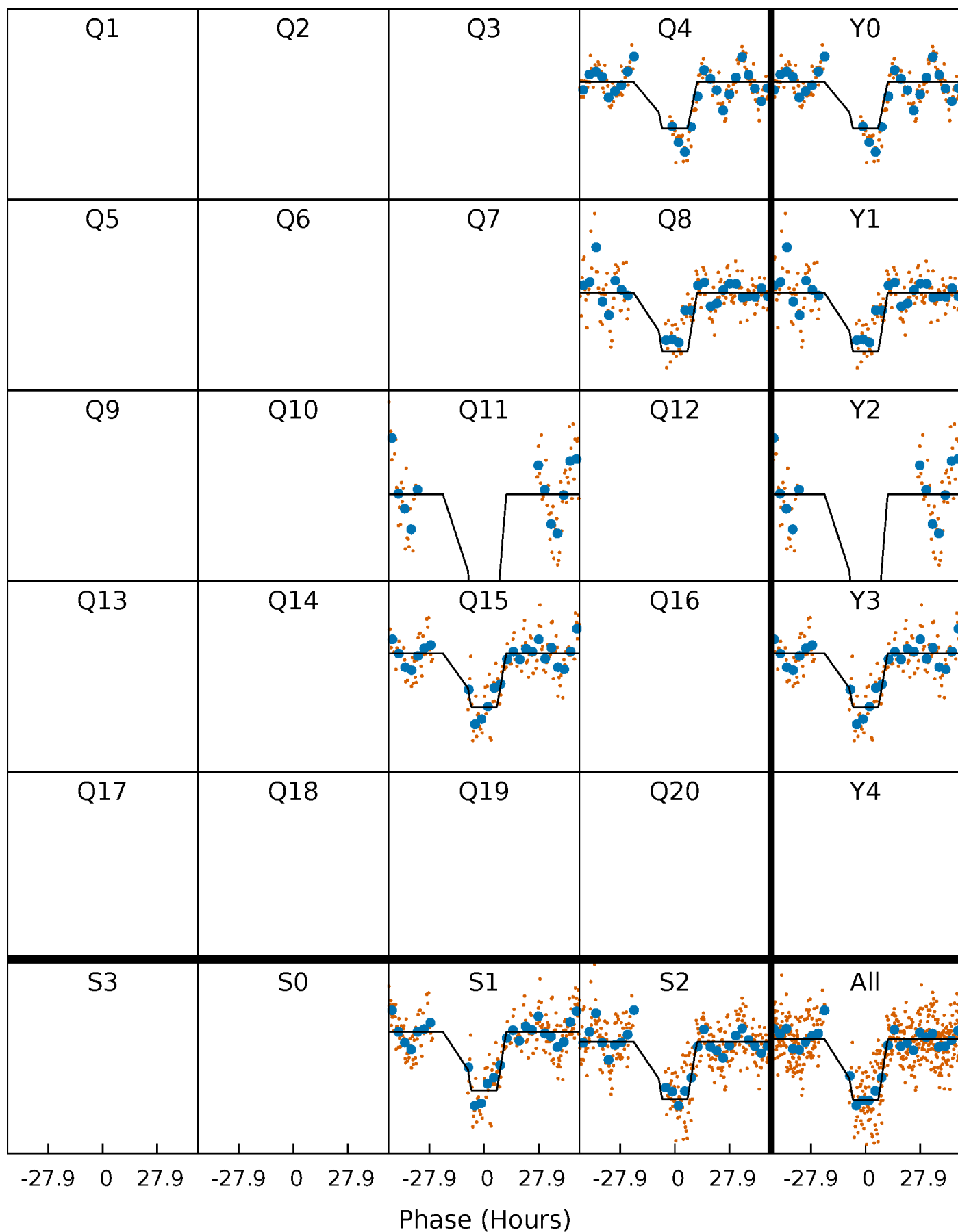
# DV Quarter-Phased Transit Curves

TCE 009699848-03     $P=317.369648$  Days     $T_0=436.596744$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

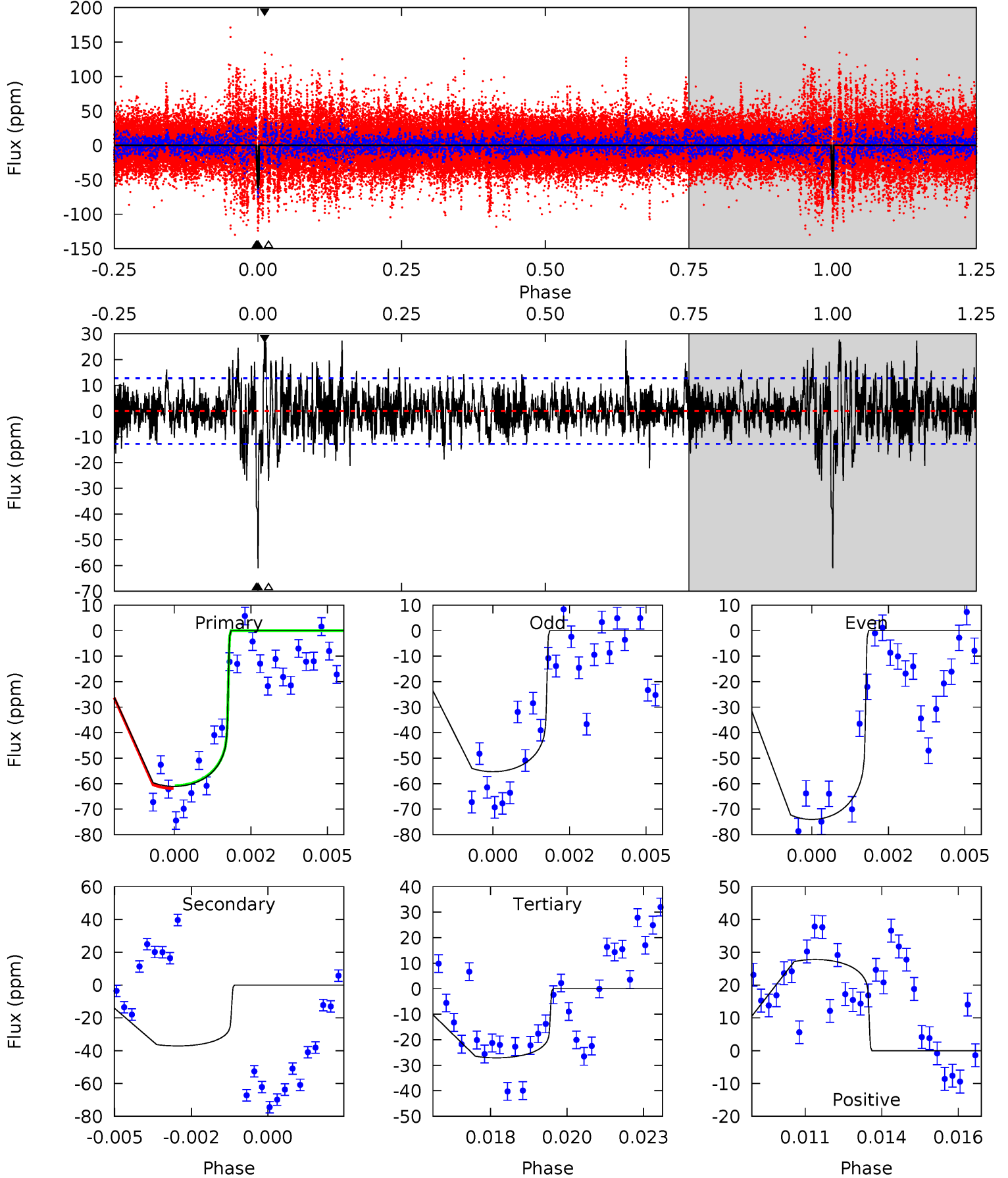
TCE 009699848-03     $P=317.408110$  Days     $T_0=436.623883$  (BKJD)



# DV Model-Shift Uniqueness Test

009699848-03, P = 317.369648 Days, E = 119.227096 Days

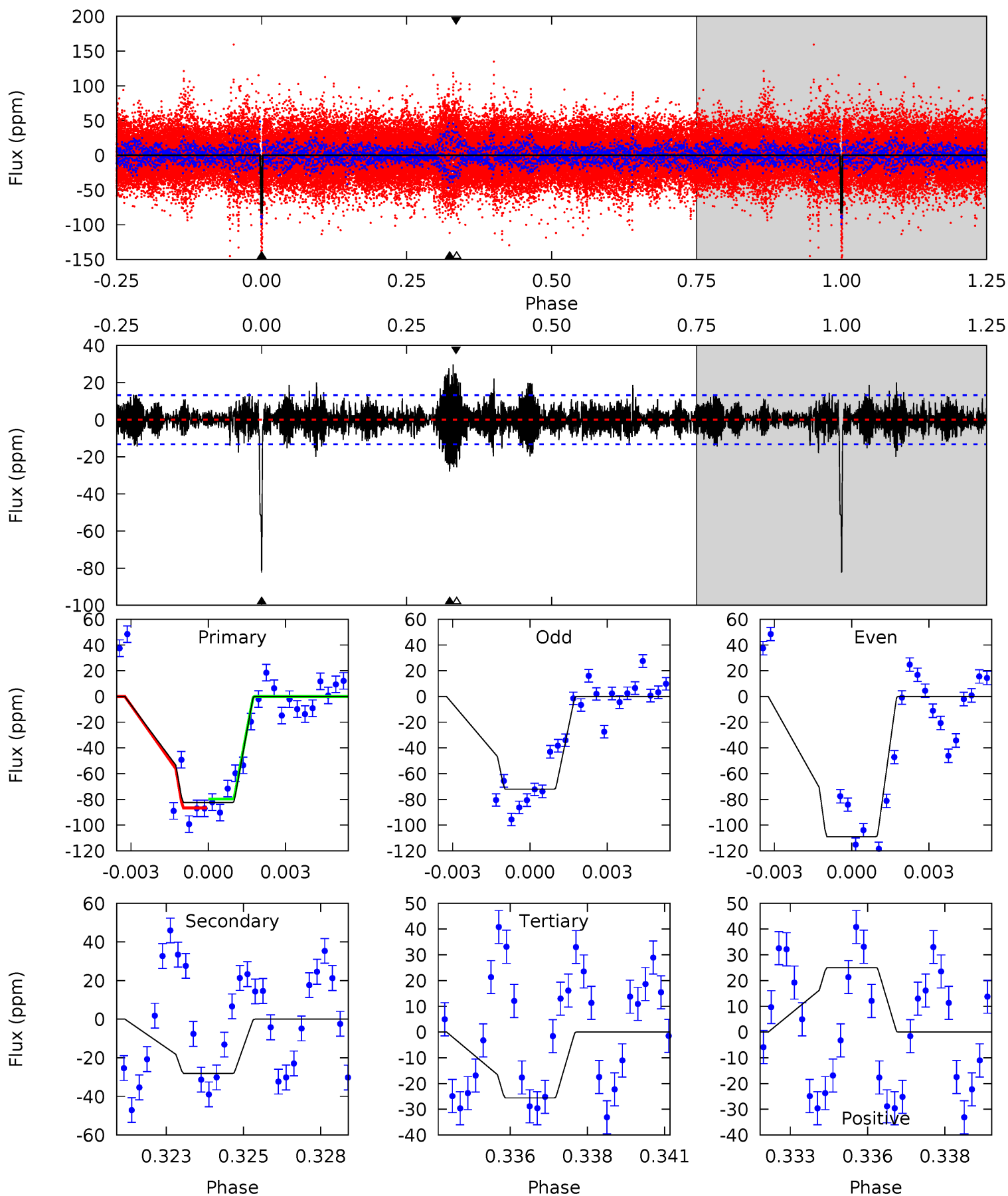
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.4	15.4	11.3	11.6	5.30	3.05	2.71	14.1	13.8	4.17	3.89	3.71	0.97	0.31	0.19



# Alt Model-Shift Uniqueness Test

009699848-03, P = 317.408110 Days, E = 119.215773 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
32.9	11.2	10.2	9.98	5.28	3.02	2.46	22.7	22.9	1.00	1.22	6.85	0.98	0.27	1.27



### Stellar Parameters For KIC 009699848

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$9113^{+251}_{-466}$	$4.058^{+0.187}_{-0.153}$	$0.070^{+0.150}_{-0.700}$	$2.311^{+0.705}_{-0.705}$	$2.222^{+0.349}_{-0.598}$	$0.254^{+0.292}_{-0.119}$
	+3%/-5%	+5%/-4%	+214%/-1000%	+31%/-31%	+16%/-27%	+115%/-47%
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 009699848-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-37 \pm 2$	$1.99^{+0.45}_{-0.40}$	$775^{+59}_{-57}$	$7574^{+867}_{-634}$	$7190^{+3747}_{-2336}$
Alt.	$-28 \pm 3$	$2.29^{+0.49}_{-0.42}$	$776^{+58}_{-58}$	$6497^{+521}_{-466}$	$4102^{+1845}_{-1265}$

$T_{max}$  = 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

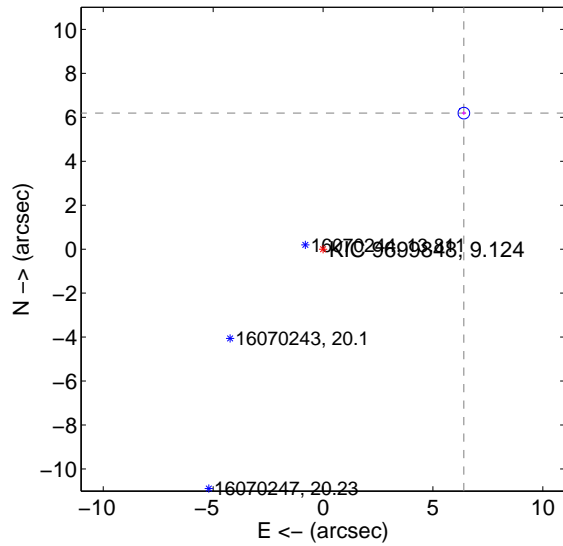
Supplemental centroid analysis for 009699848-03. **Kepler magnitude: 9.12.** Transit SNR 9.44

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

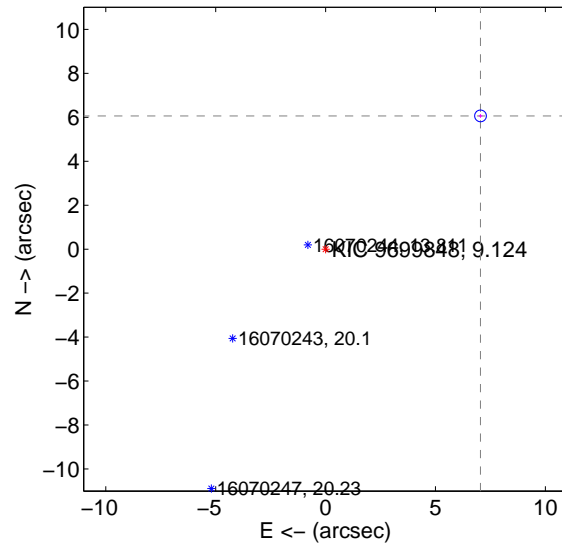
The direct PRF centroid is offset from the target star catalog position by about 0.65 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>8.911 <math>\pm</math> 0.088</b>	<b>100.97</b>	-6.409 $\pm$ 0.093	6.192 $\pm$ 0.083
PRF-fit source offset from KIC position	<b>9.300 <math>\pm</math> 0.089</b>	<b>104.75</b>	-7.050 $\pm$ 0.093	6.065 $\pm$ 0.083
photometric centroid source offset	2.00 $\pm$ 1.78	1.12	1.99 $\pm$ 1.78	-0.10 $\pm$ 2.47

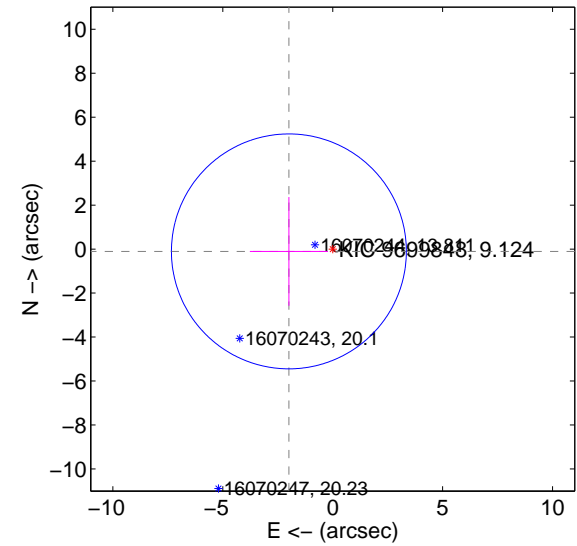
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

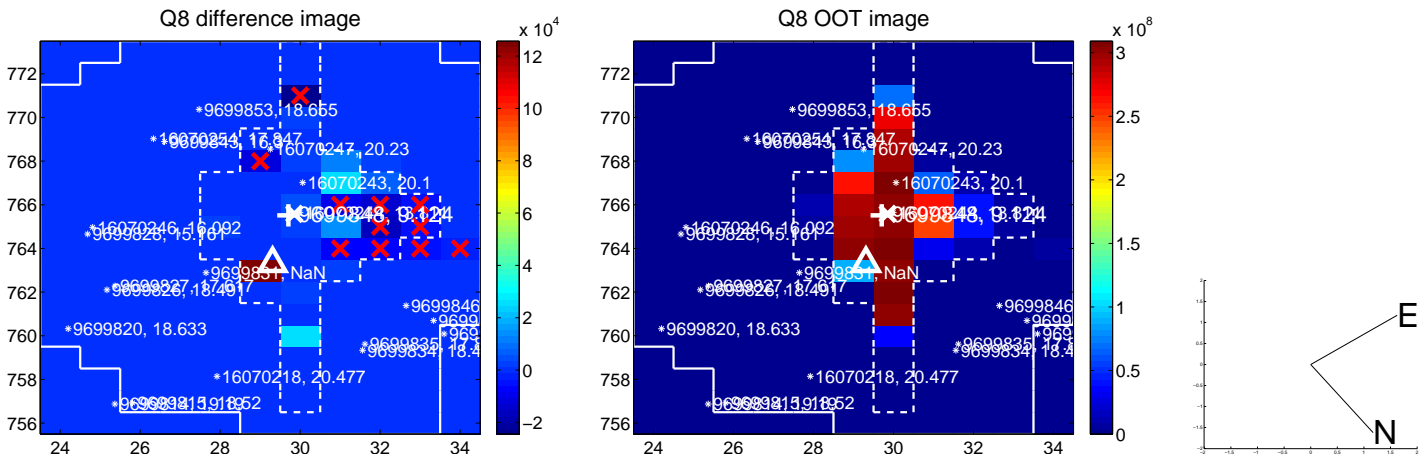
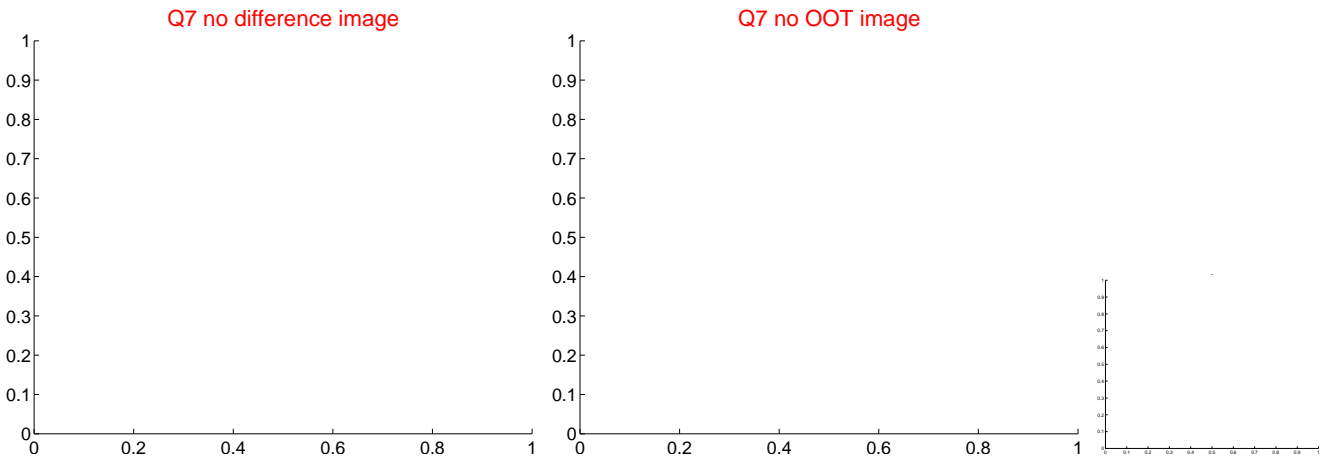
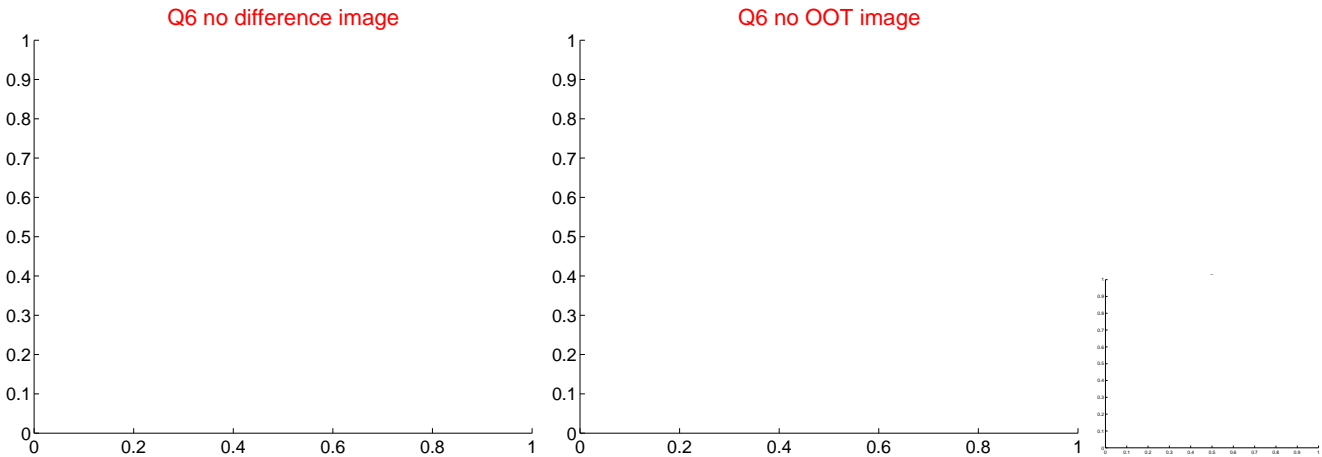
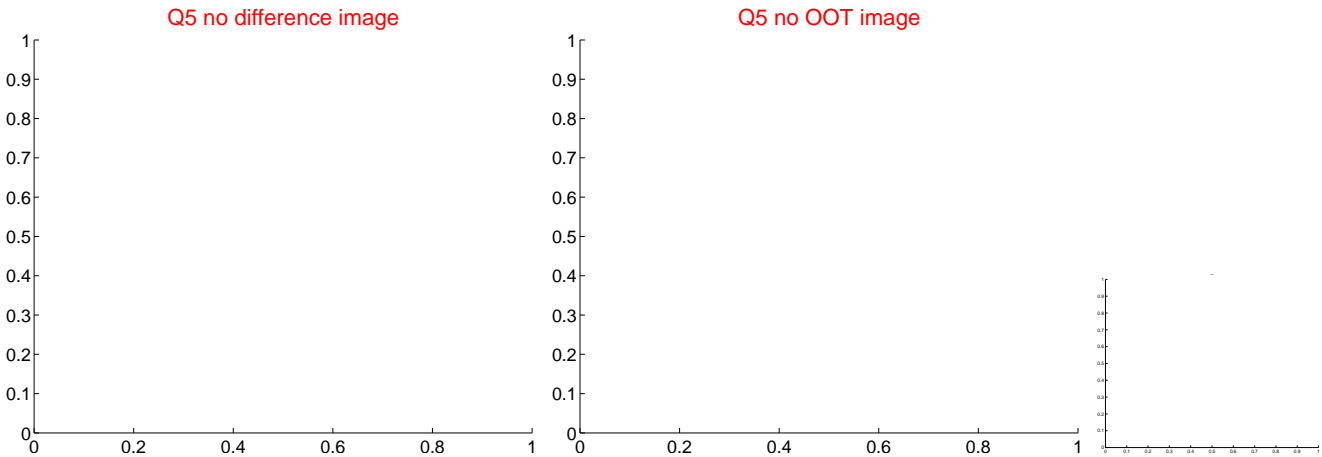


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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





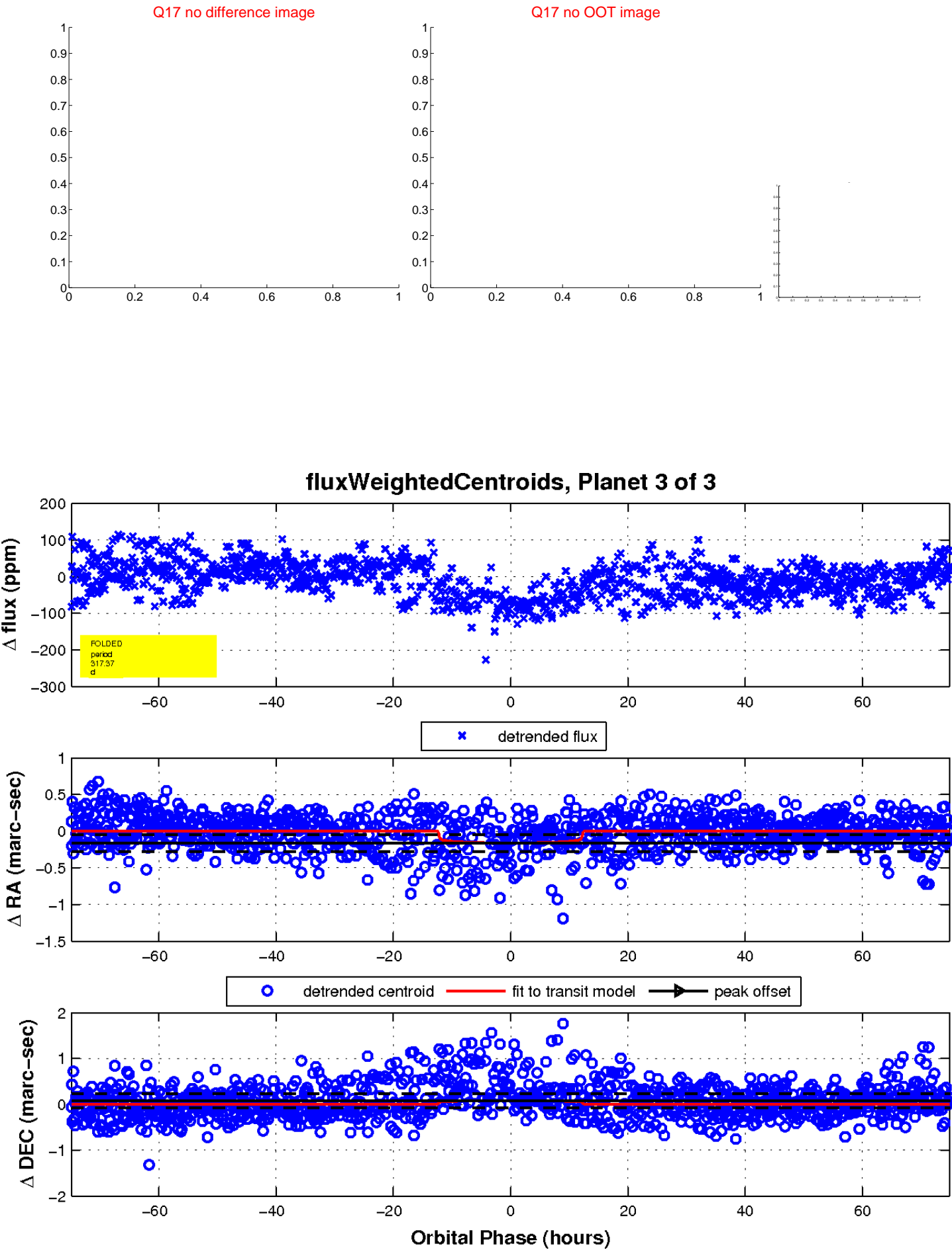
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

