

# KIC 008295843

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008295843-01	OBS	No	374.267524	259.729193	2820.0	48.962	7.9	14.6	0.75	4973	6.21	0.34
008295843-02	OBS	No	315.544469	430.018715	840.1	9.276	7.6	6.3	0.75	4973	2.25	0.43

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008295843-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—CENT_FEW_DIFFS—EPHEM_MATCH
008295843-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQU_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

**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.

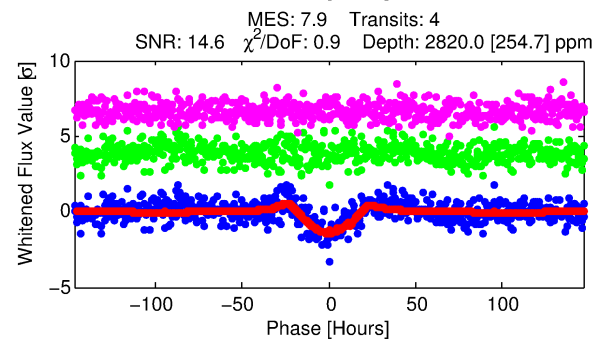
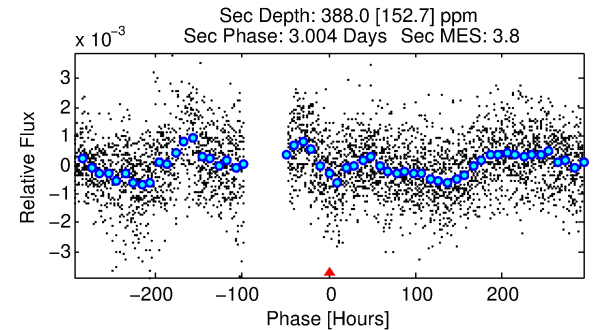
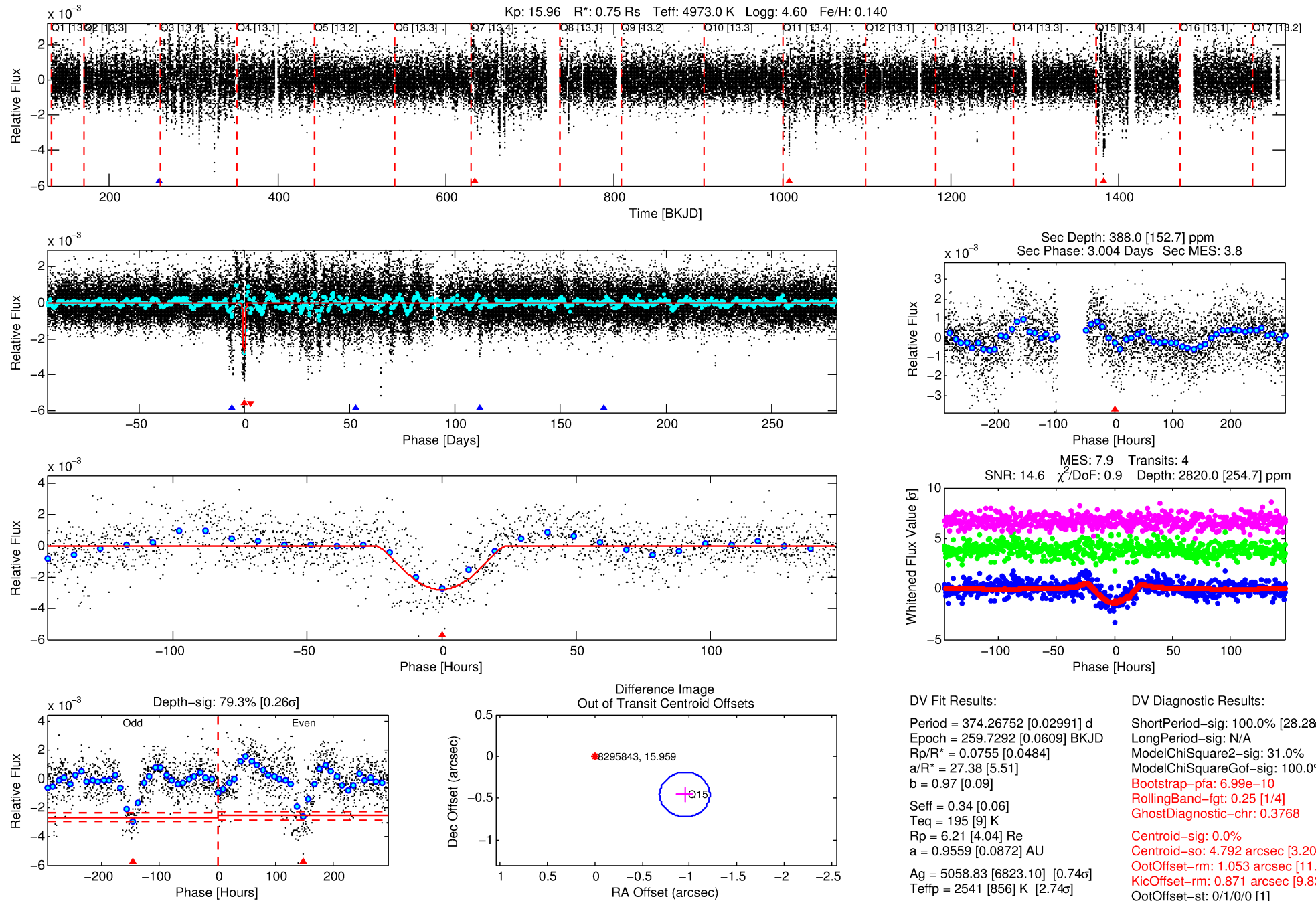
## Ephemeris Match Information For 008295843-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008295843-01	8295843	008228631-01	8228631	1:1	769.7	193	1	15.30	15.96	0.74	Col-Anomaly	1	0.93	0.35

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8295843 Candidate: 1 of 2 Period: 374.268 d



## DV Fit Results:

Period = 374.26752 [0.02991] d  
Epoch = 259.7292 [0.0609] BKJD  
Rp/R\* = 0.0755 [0.0484]  
a/R\* = 27.38 [5.51]  
b = 0.97 [0.09]  
Seff = 0.34 [0.06]  
Teq = 195 [9] K  
Rp = 6.21 [4.04] Re  
a = 0.9559 [0.0872] AU  
Ag = 5058.83 [6823.10] [0.74 $\sigma$ ]  
Teff = 2541 [856] K [2.74 $\sigma$ ]

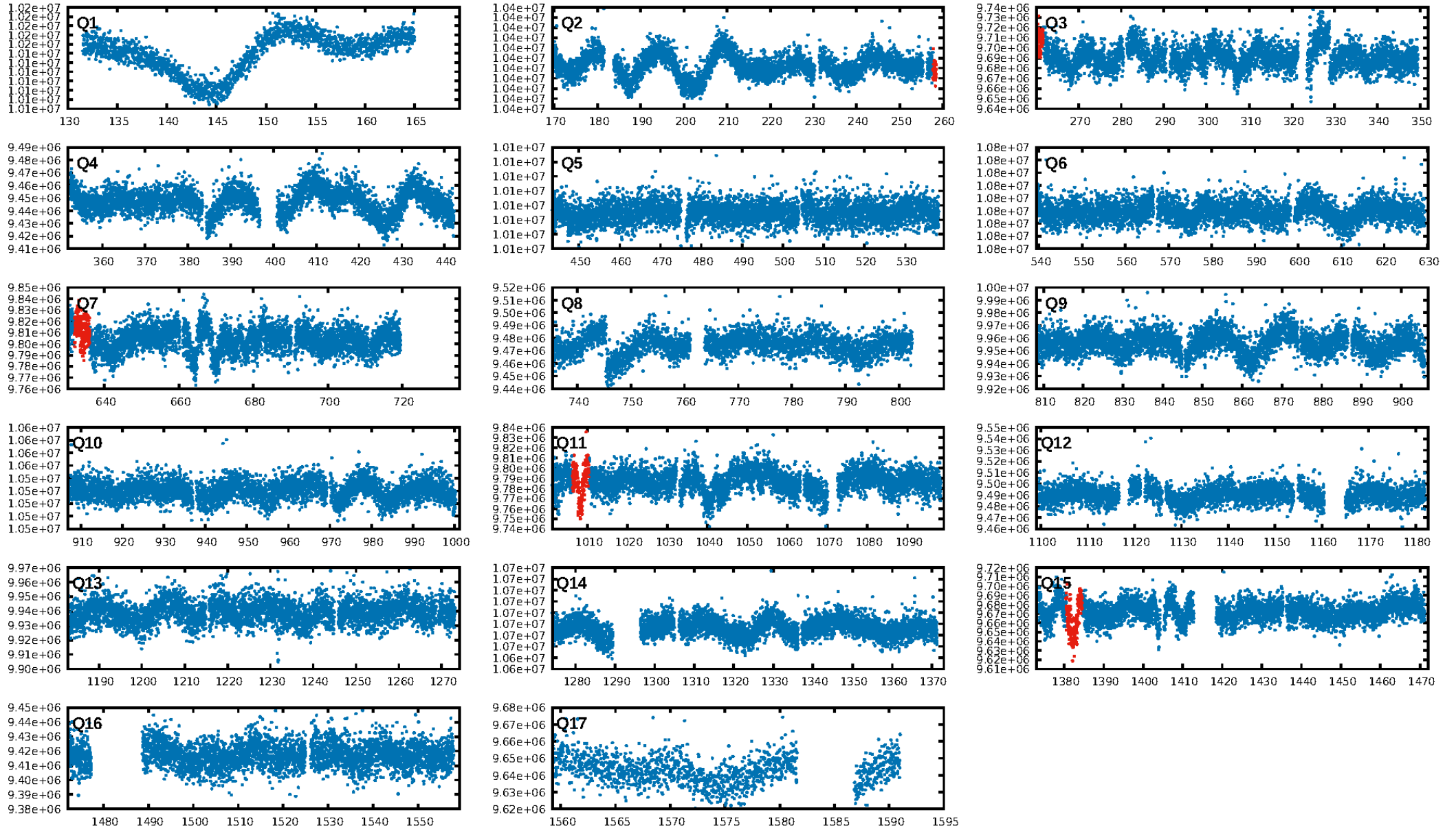
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.28 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 31.0%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: 6.99e-10  
RollingBand-fgt: 0.25 [1/4]  
GhostDiagnostic-chr: 0.3768  
Centroid-sig: 0.0%  
Centroid-so: 4.792 arcsec [3.20 $\sigma$ ]  
OotOffset-rm: 1.053 arcsec [11.90 $\sigma$ ]  
KicOffset-rm: 0.871 arcsec [9.83 $\sigma$ ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

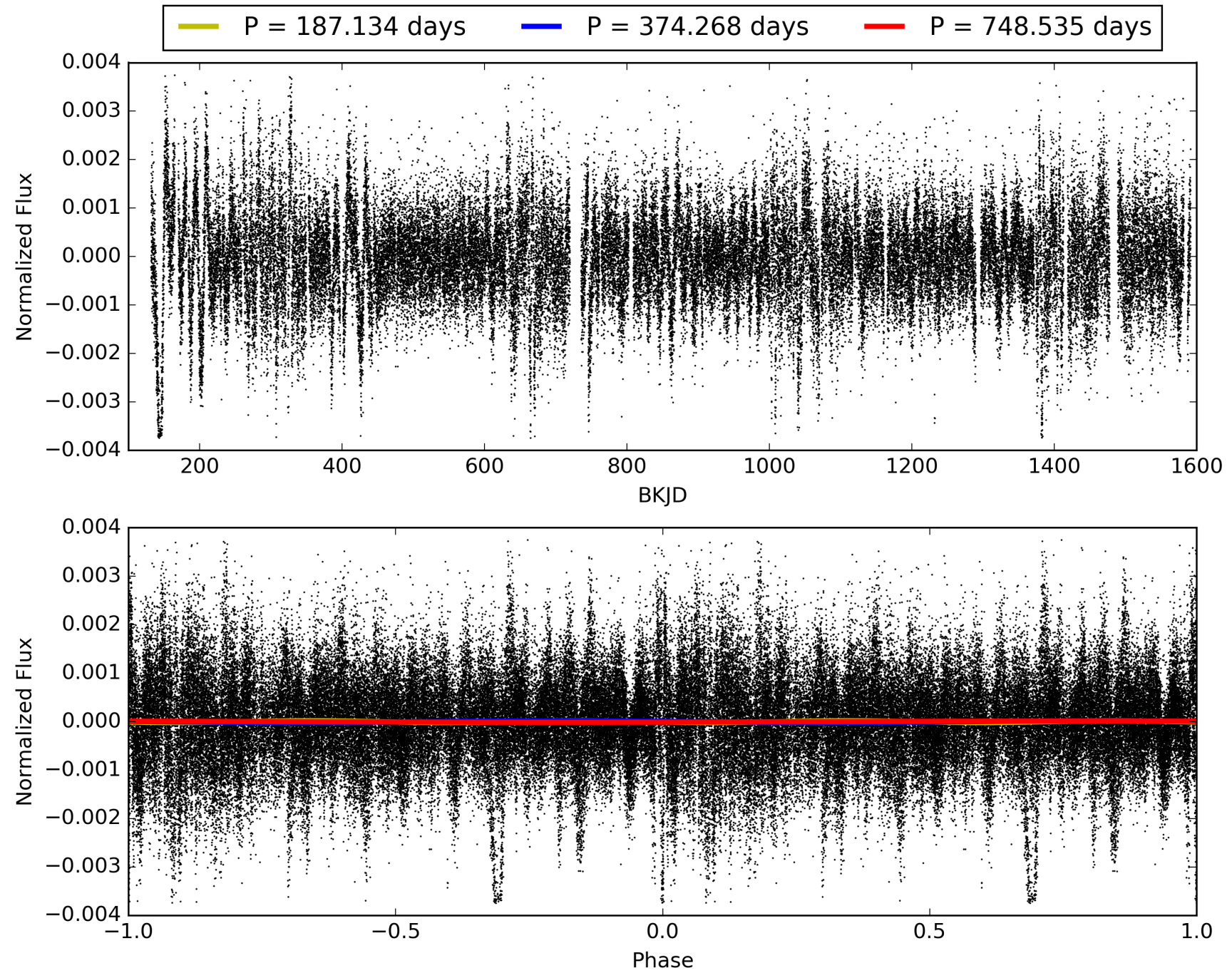
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:43:40 Z

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

# TCE 008295843-01, PDC Light Curves

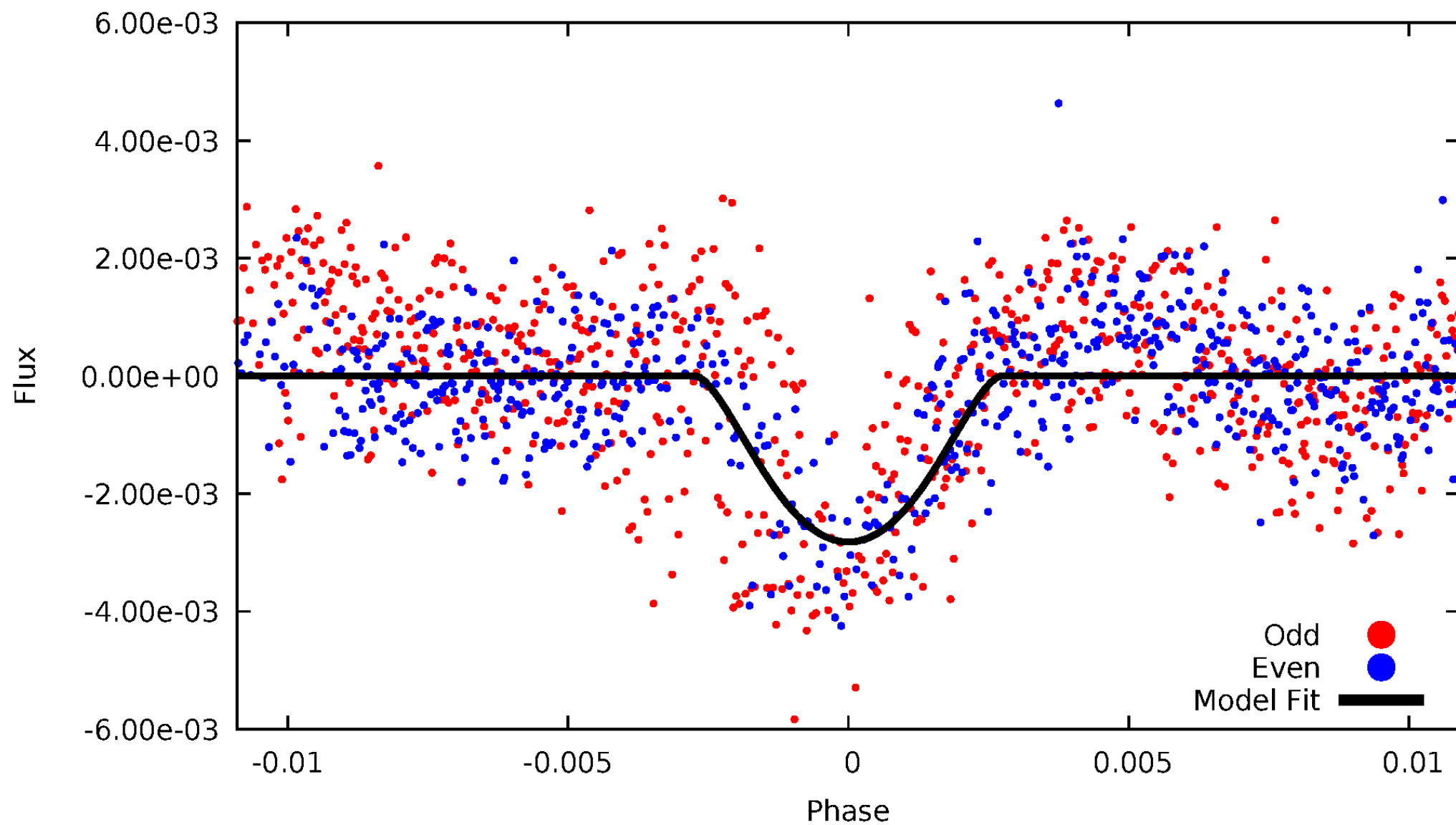


TCE 008295843-01



# DV Odd/Even

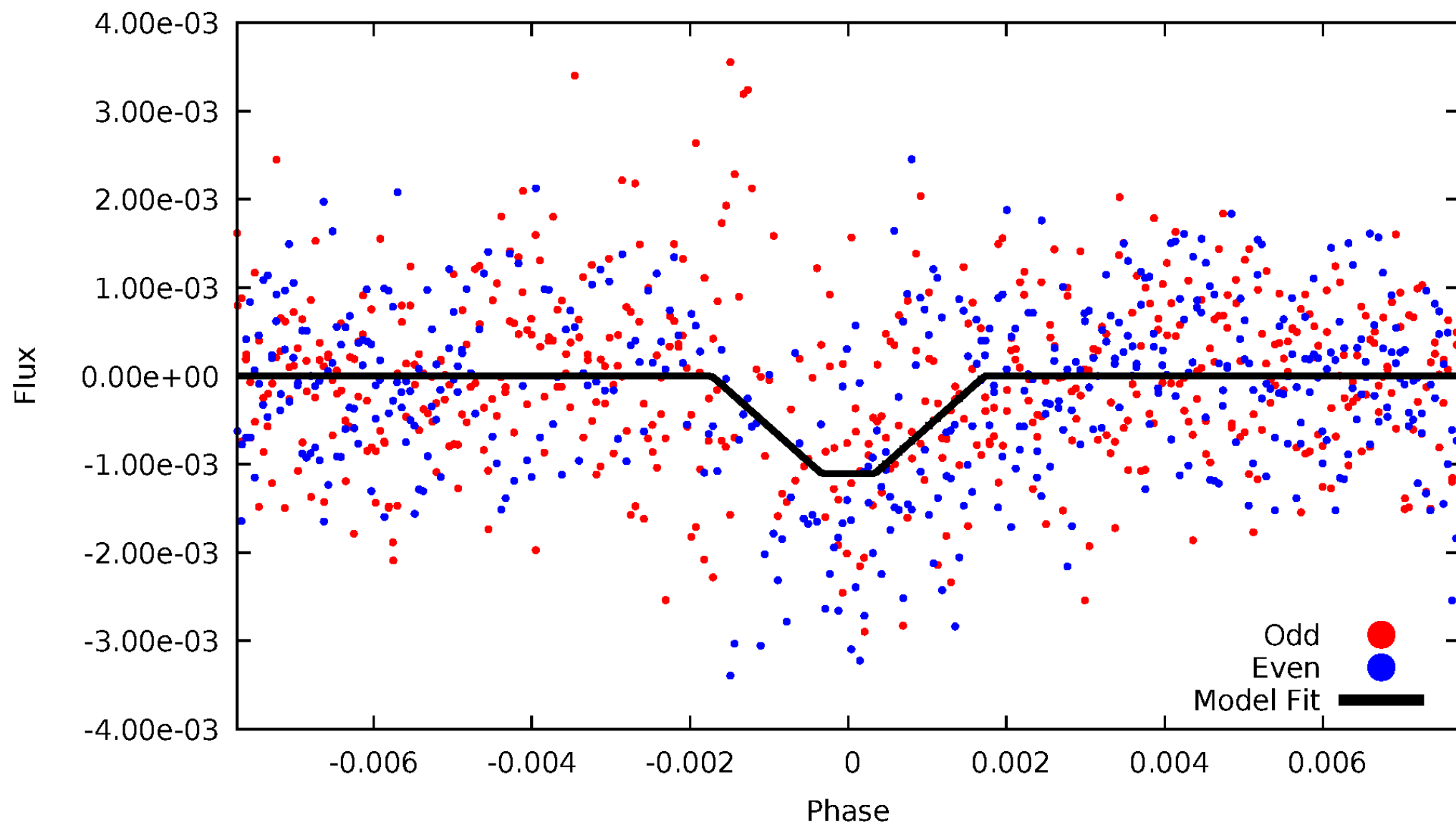
TCE 008295843-01





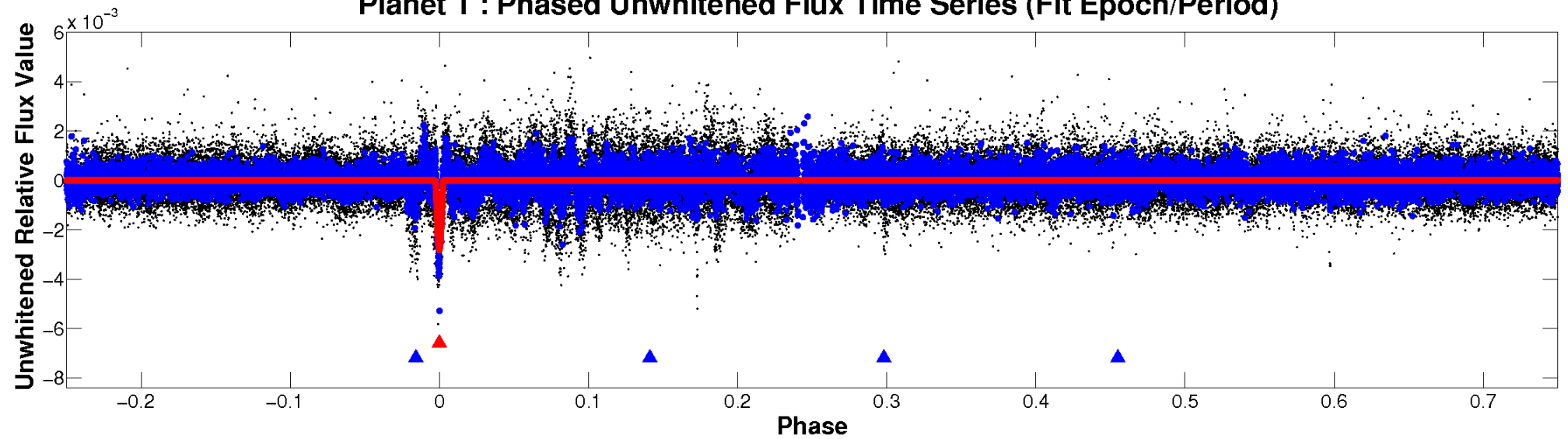
# ALT Odd/Even

TCE 008295843-01

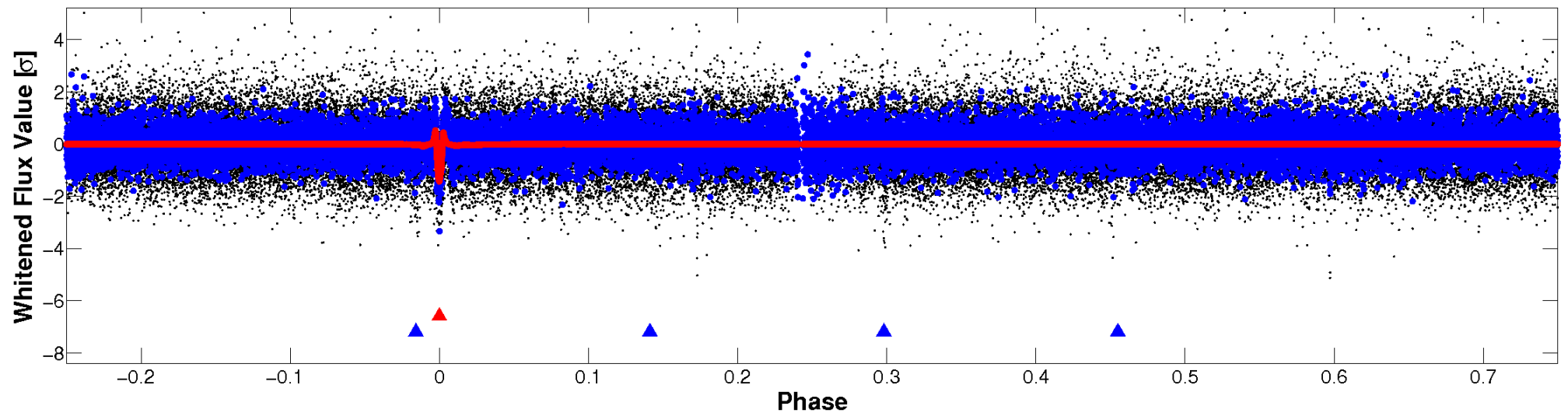


# Non-Whitened Vs. Whitened Light Curve

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

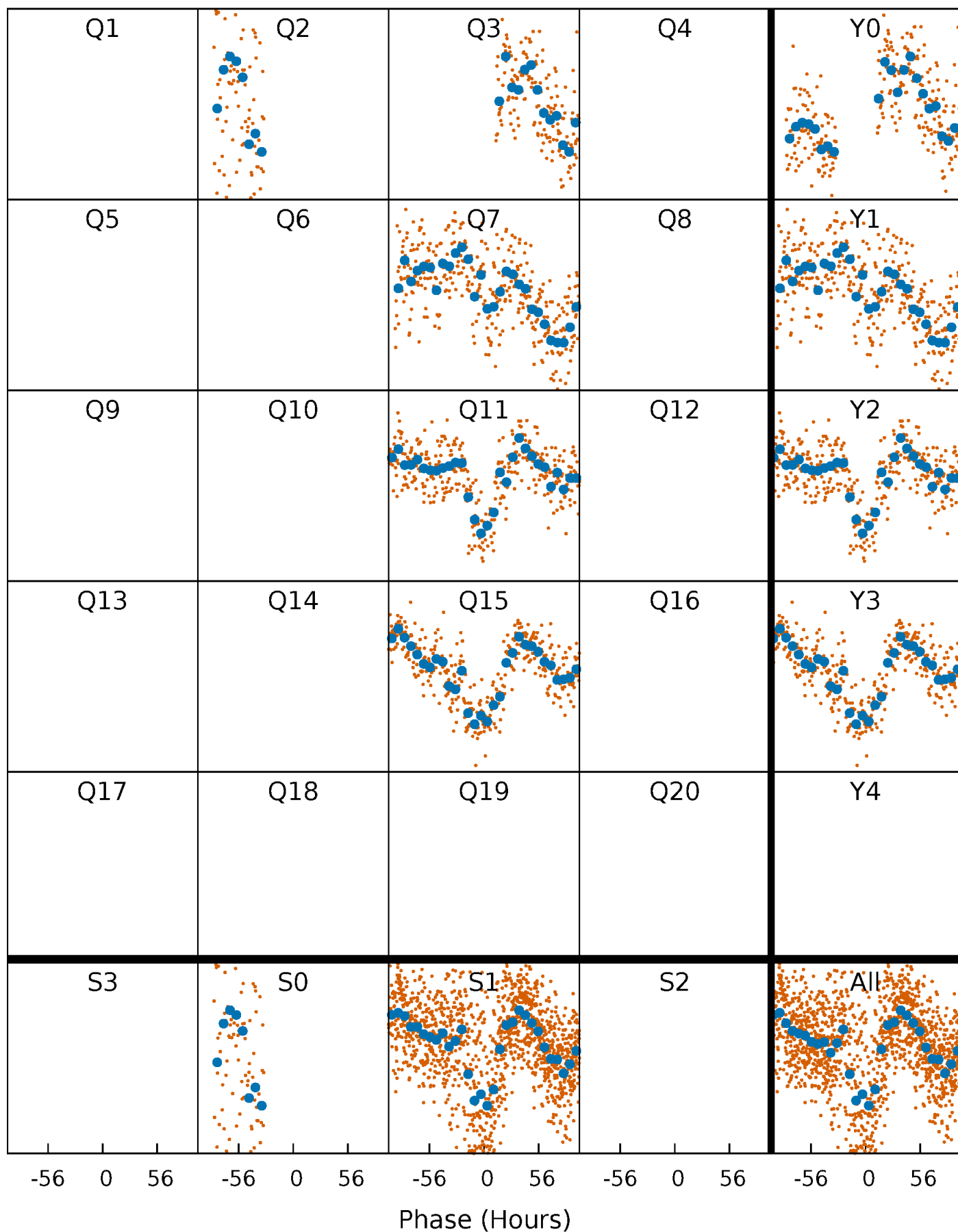


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

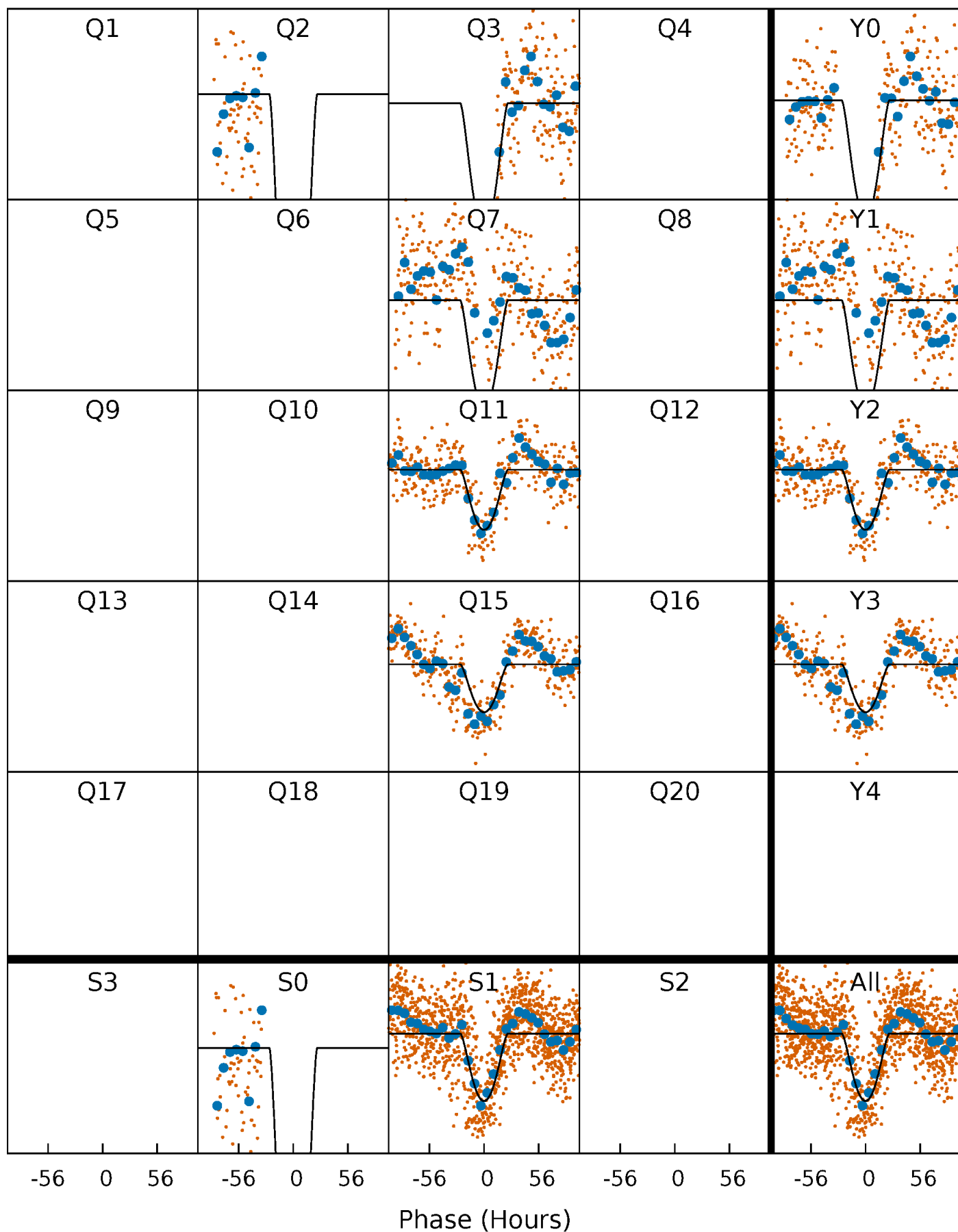
TCE 008295843-01 P=374.267524 Days  $T_0=259.729193$  (BKJD)





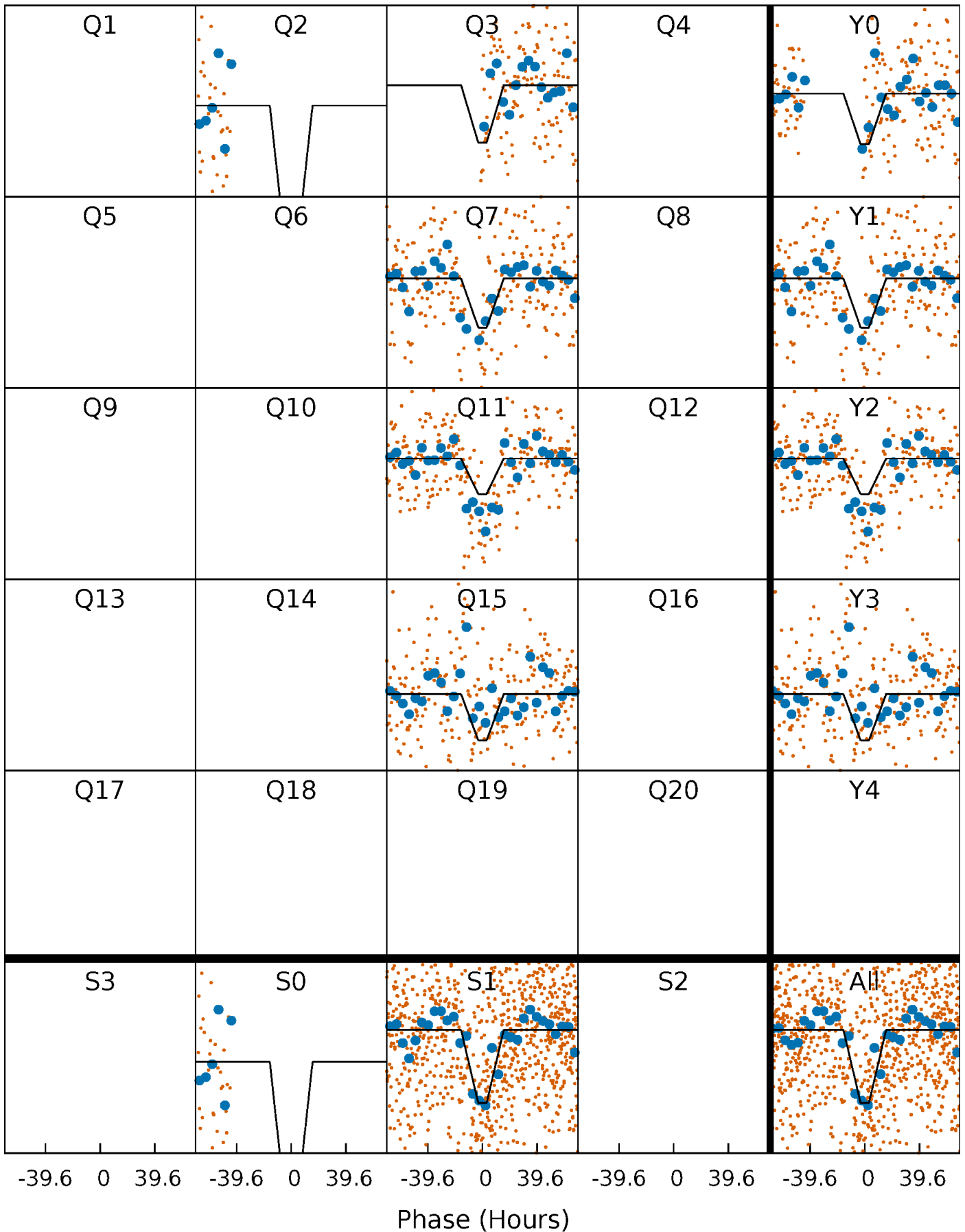
# DV Quarter-Phased Transit Curves

TCE 008295843-01 P=374.267524 Days  $T_0=259.729193$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

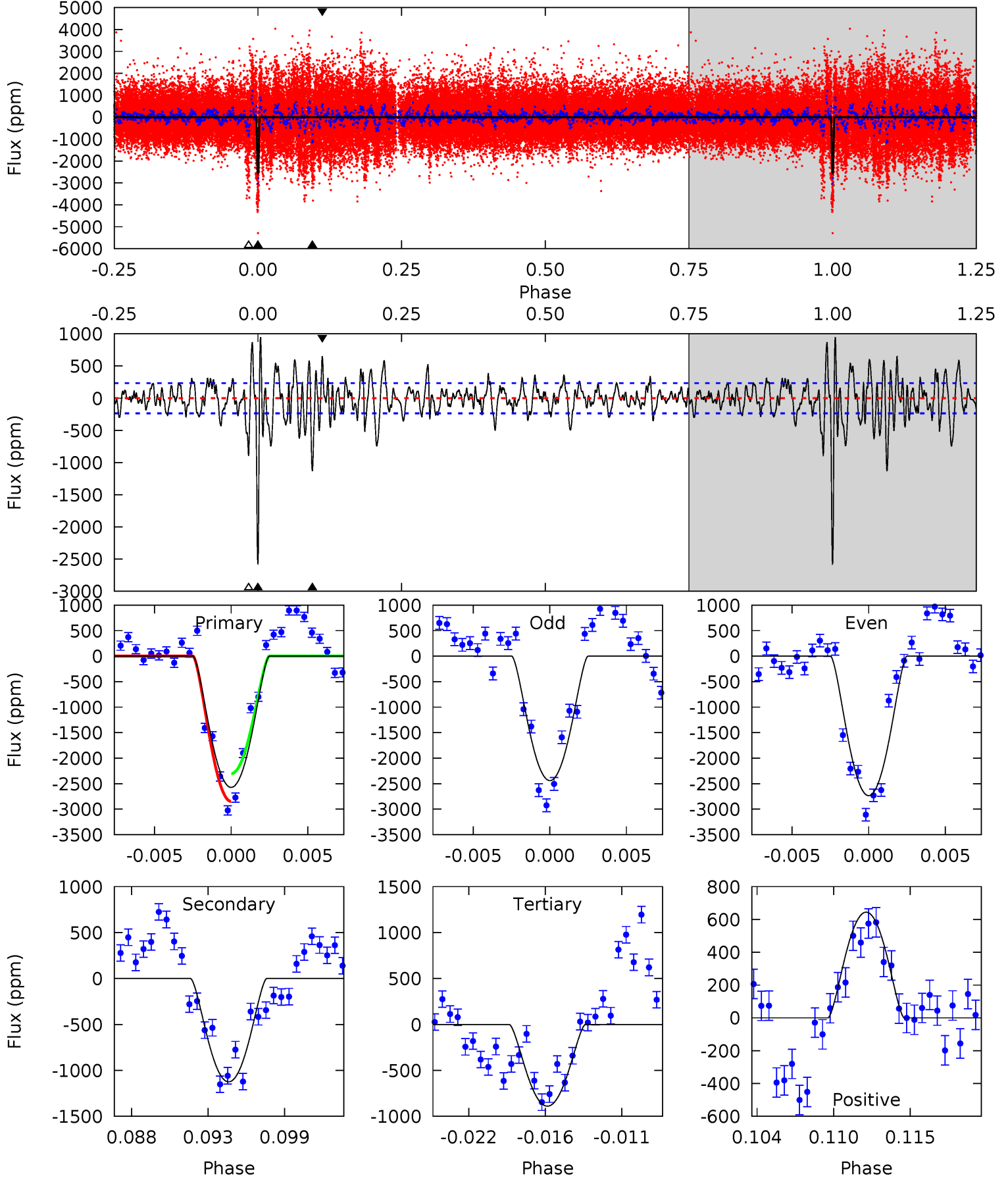
TCE 008295843-01 P=373.934148 Days  $T_0=260.293498$  (BKJD)



# DV Model-Shift Uniqueness Test

008295843-01, P = 374.267524 Days, E = 259.729193 Days

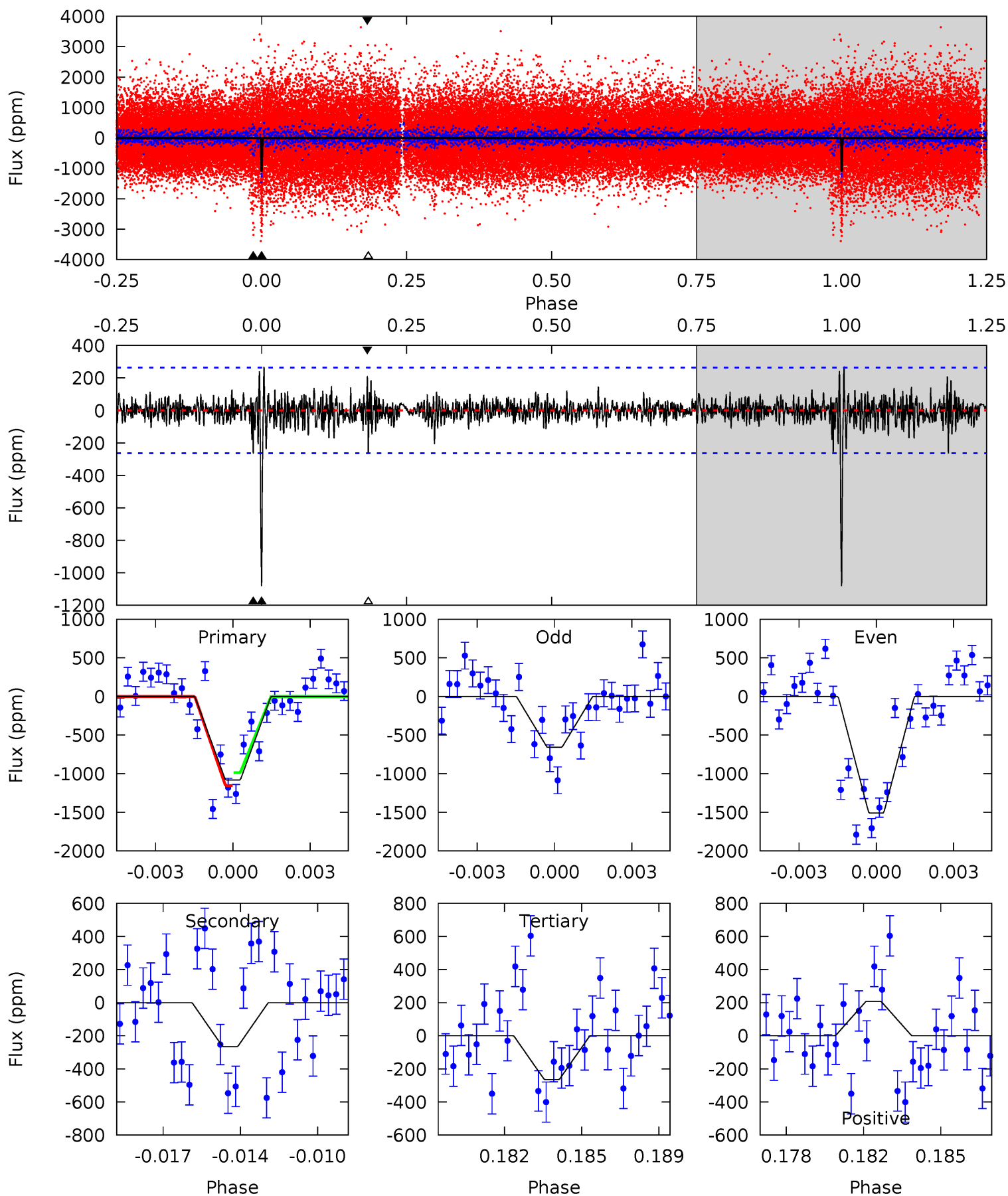
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
56.6	24.7	19.6	14.2	5.14	2.78	4.78	37.0	42.4	5.17	10.6	3.19	0.91	0.27	5.94



# Alt Model-Shift Uniqueness Test

008295843-01, P = 373.934148 Days, E = 260.293498 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.5	5.29	5.26	4.14	5.22	2.92	0.99	16.2	17.3	0.03	1.15	8.52	1.35	0.20	1.65



### Stellar Parameters For KIC 008295843

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4973^{+149}_{-149}$	$4.603^{+0.025}_{-0.075}$	$0.140^{+0.250}_{-0.300}$	$0.754^{+0.080}_{-0.053}$	$0.848^{+0.043}_{-0.080}$	$2.789^{+0.346}_{-0.665}$
	+3%/-3%	+1%/-2%	+179%/-214%	+11%/-7%	+5%/-9%	+12%/-24%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008295843-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1125 \pm 45$	$6.53^{+4.11}_{-3.37}$	$276^{+9}_{-9}$	$3628^{+1132}_{-489}$	$13085^{+41510}_{-7998}$
Alt.	$-266 \pm 50$	$4.09^{+3.14}_{-2.75}$	$275^{+10}_{-9}$	$3365^{+1654}_{-526}$	$7791^{+61435}_{-5294}$

$T_{max}$  = 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

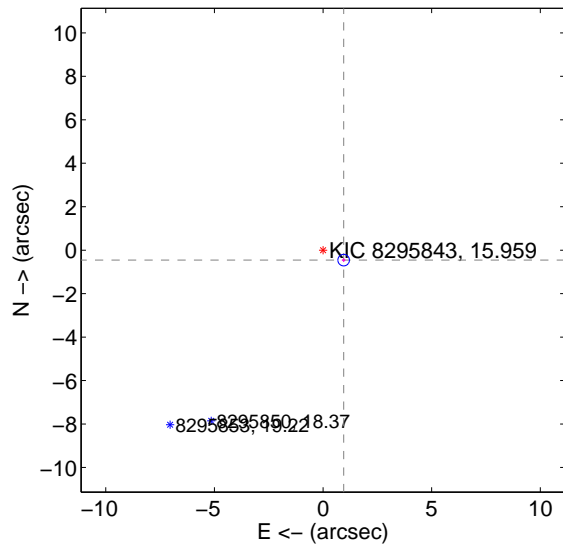
Supplemental centroid analysis for 008295843-01. Kepler magnitude: 15.96. Transit SNR 14.57

There are 0 quarters with good PRF difference image offsets

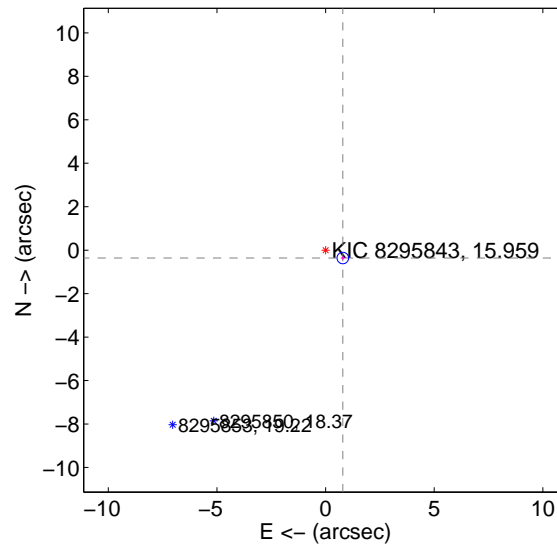
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.053 \pm 0.089$	11.90	$-0.949 \pm 0.089$	$-0.458 \pm 0.087$
PRF-fit source offset from KIC position	$0.871 \pm 0.089$	9.83	$-0.793 \pm 0.089$	$-0.361 \pm 0.087$
photometric centroid source offset	$4.79 \pm 1.50$	3.20	$-0.32 \pm 1.29$	$-4.78 \pm 1.50$

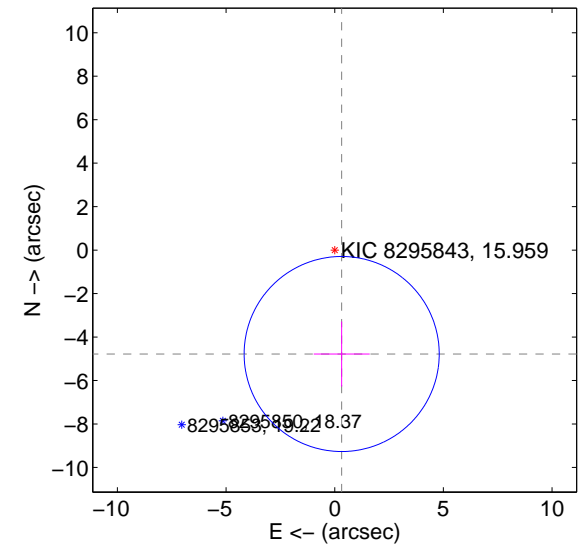
offset from difference PRF-fit to OOT PRF-fit



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.



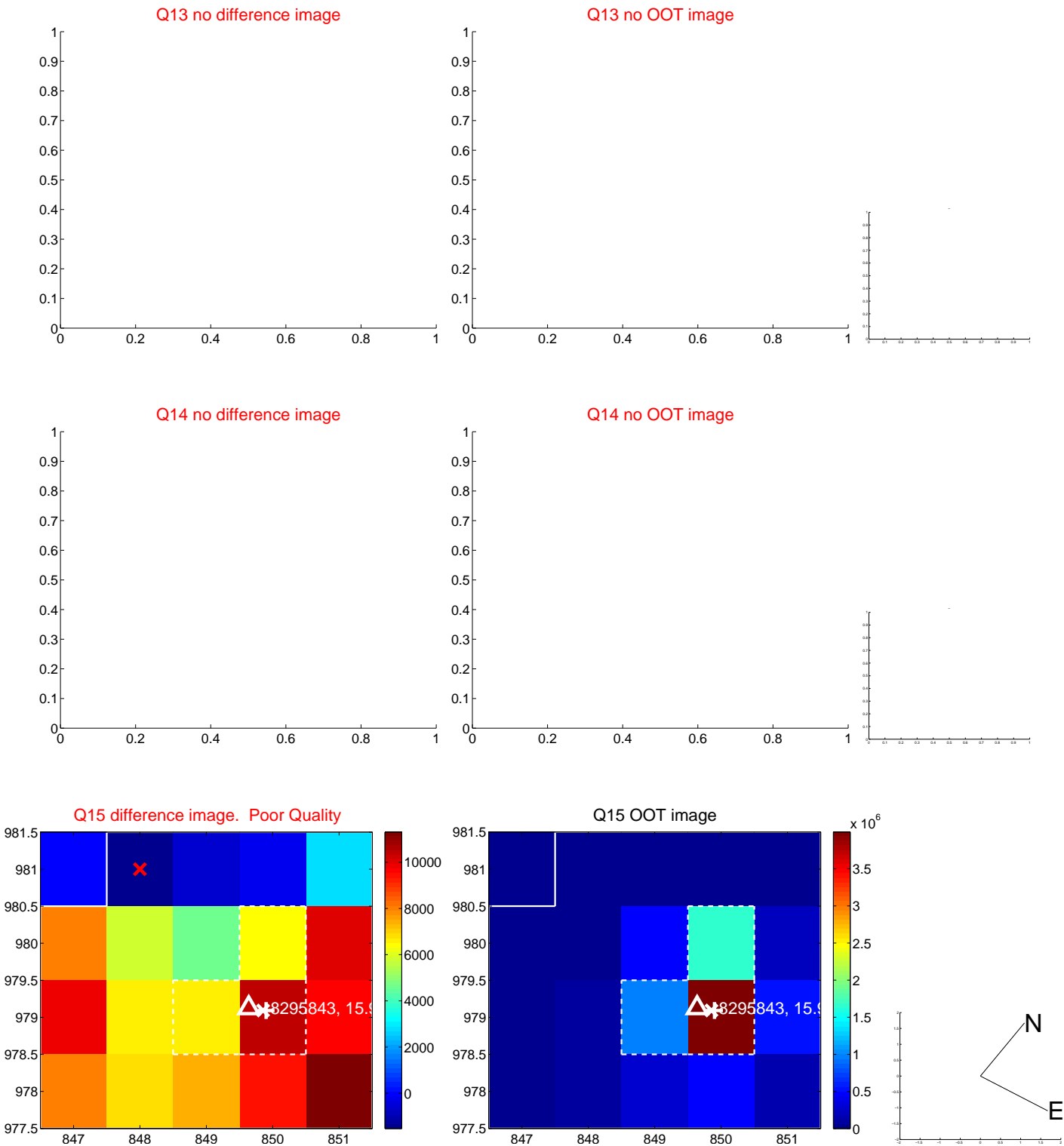
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



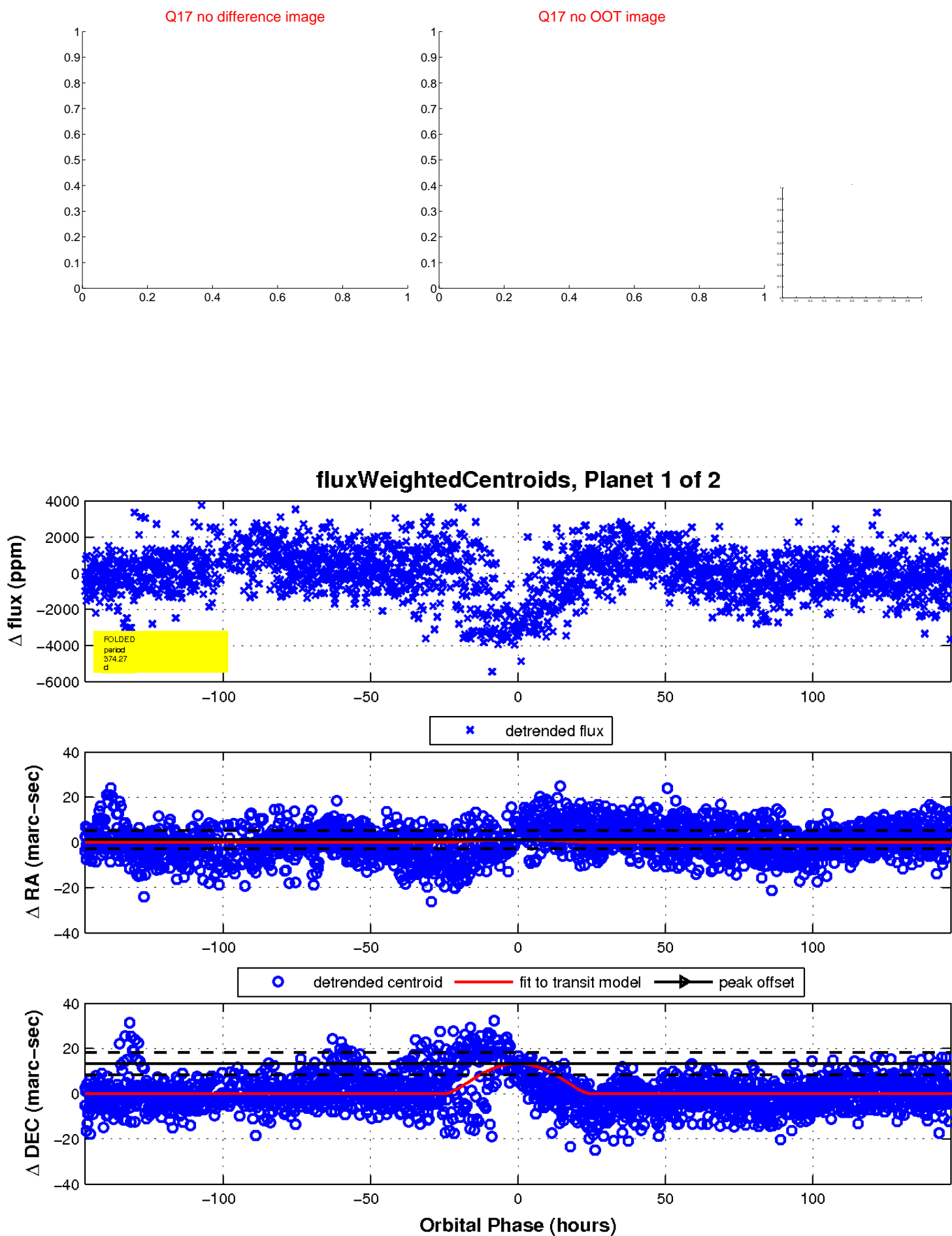
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

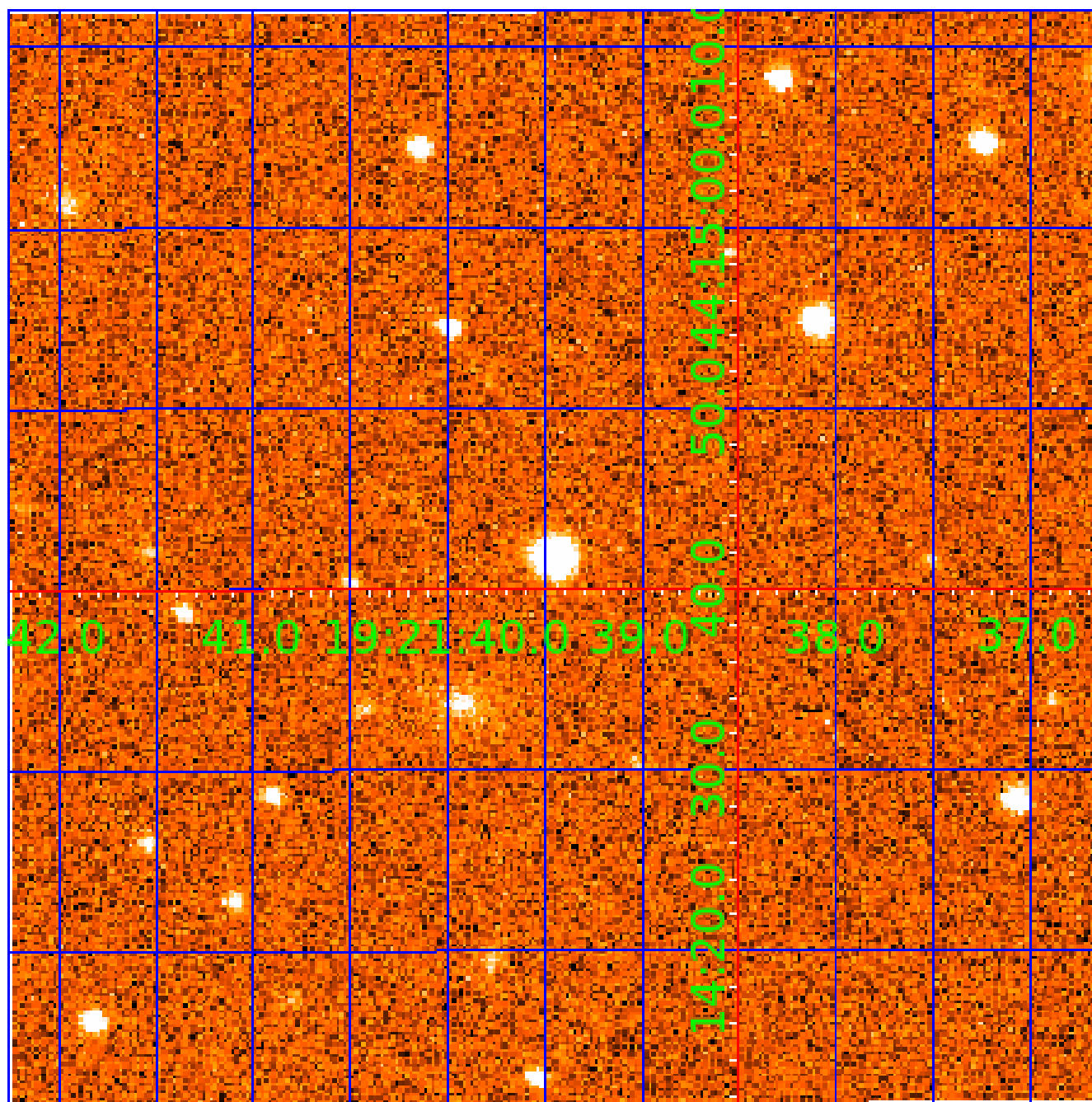


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 008295843

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008295843-01	OBS	No	374.267524	259.729193	2820.0	48.962	7.9	14.6	0.75	4973	6.21	0.34
008295843-02	OBS	No	315.544469	430.018715	840.1	9.276	7.6	6.3	0.75	4973	2.25	0.43

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008295843-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—CENT_FEW_DIFFS—EPHEM_MATCH
008295843-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQU_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

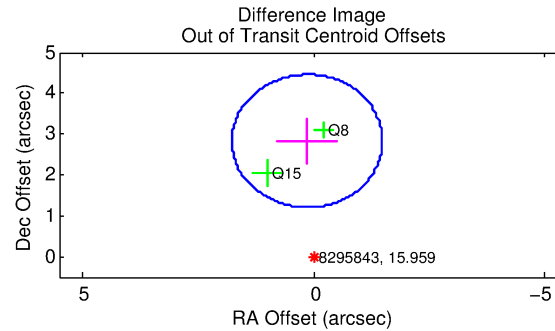
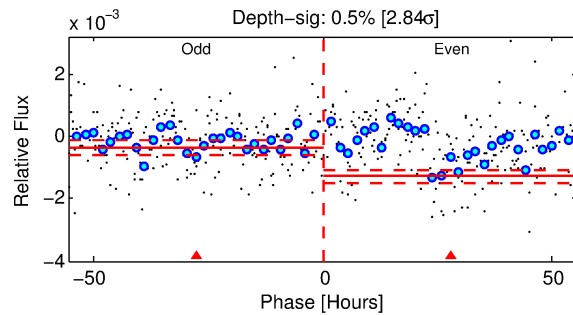
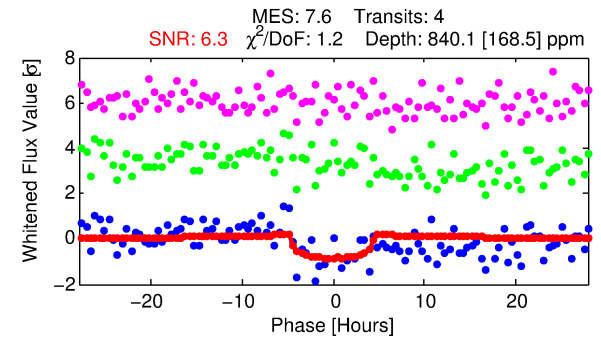
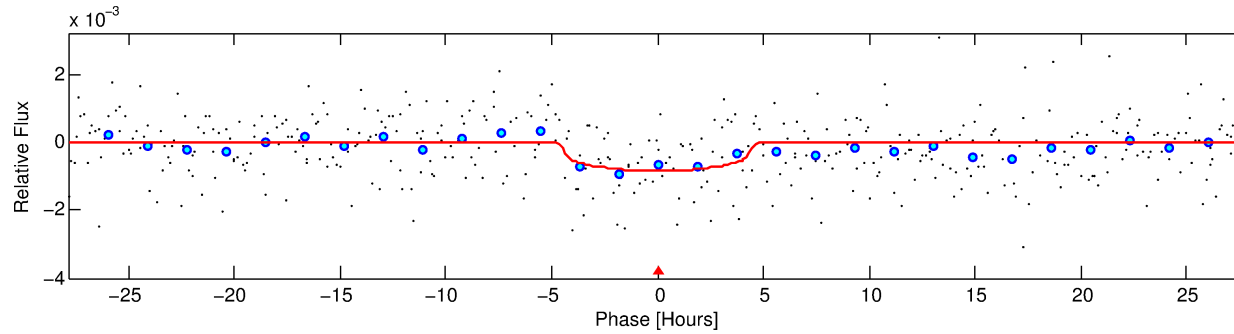
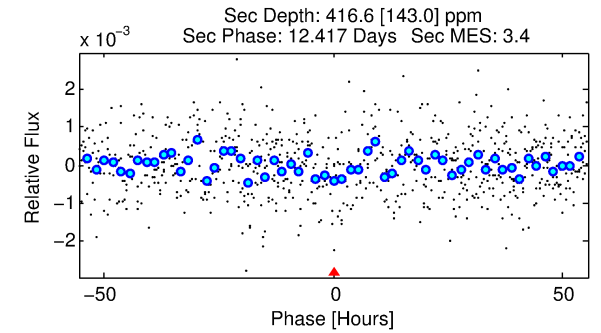
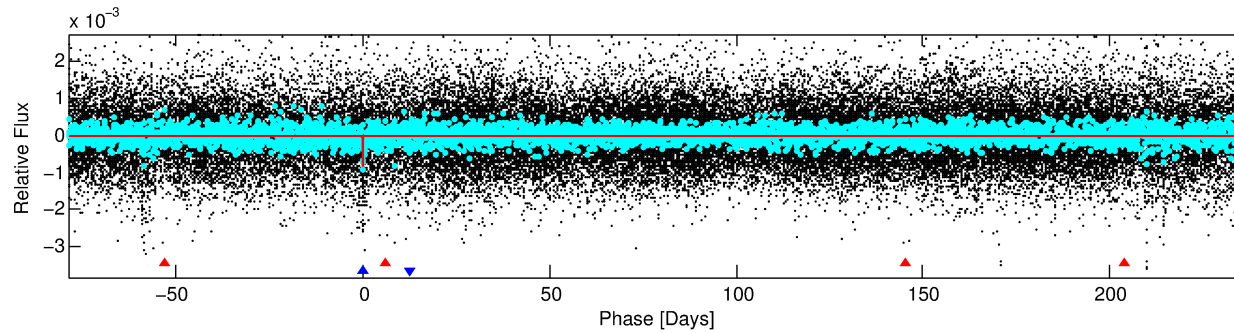
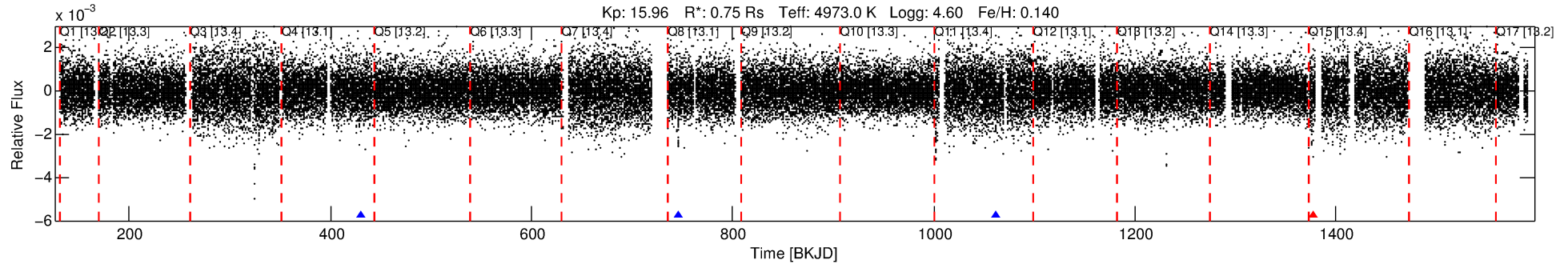
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008295843-02

No Significant Match Found

# DV One-Page Summary

KIC: 8295843 Candidate: 2 of 2 Period: 315.544 d



## DV Fit Results:

Period = 315.54447 [0.01334] d  
Epoch = 430.0187 [0.0244] BKJD  
Rp/R\* = 0.0274 [0.0435]  
a/R\* = 216.75 [1156.22]  
b = 0.60 [5.79]  
Seff = 0.43 [0.08]  
Teq = 206 [9] K  
Rp = 2.25 [3.58] Re  
a = 0.8531 [0.0778] AU  
Ag = 32847.61 [104980.57] [0.31σ]  
Teffp = 4293 [3430] K [1.19σ]

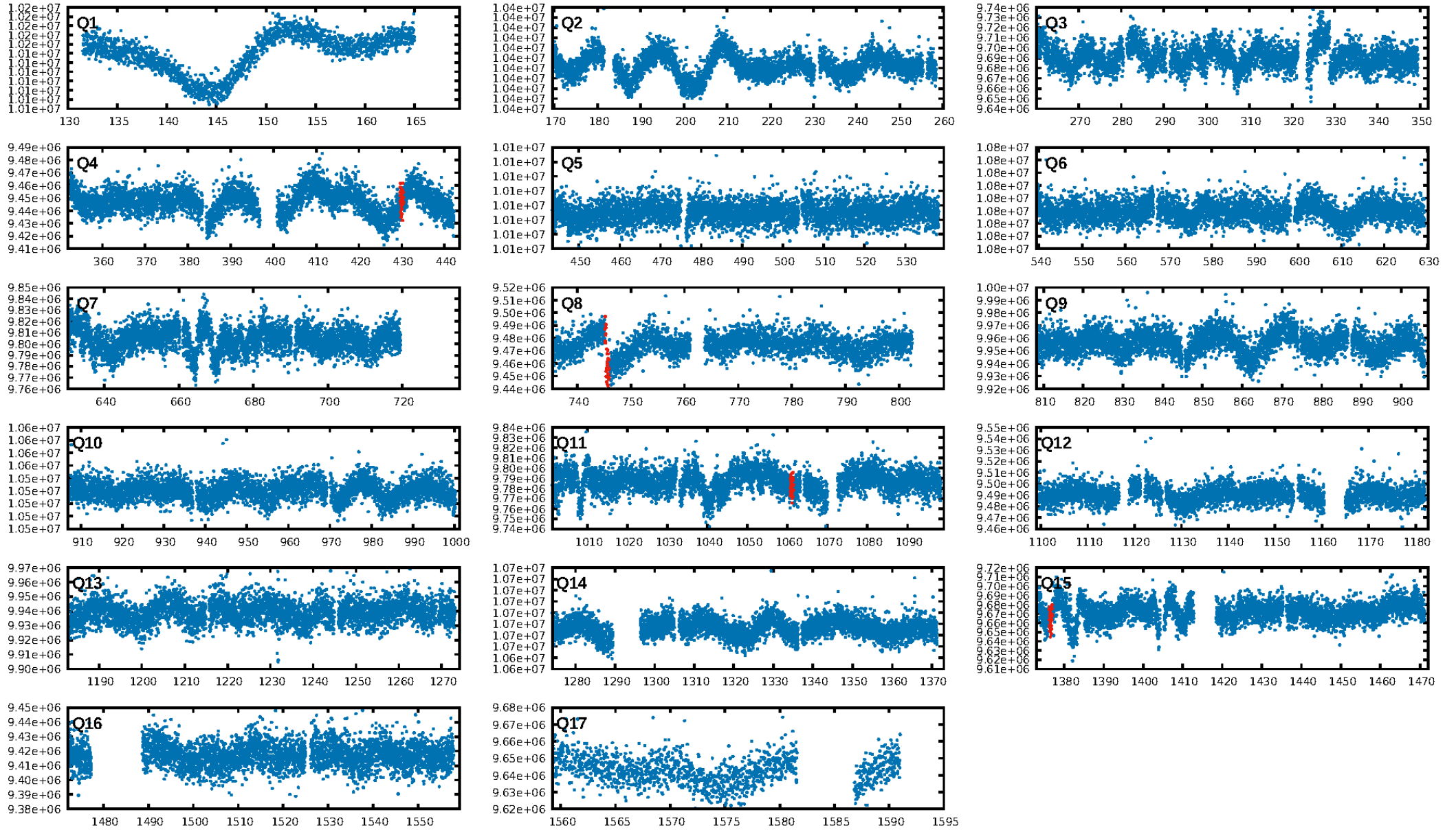
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [28.28σ]  
ModelChiSquare2-sig: 0.7%  
ModelChiSquareGof-sig: 91.1%  
Bootstrap-pfa: 2.67e-10  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: -0.09442  
Centroid-sig: 4.1%  
Centroid-so: 3.410 arcsec [1.36σ]  
OotOffset-rm: 2.832 arcsec [5.22σ]  
KicOffset-rm: 2.860 arcsec [5.74σ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [4/4]

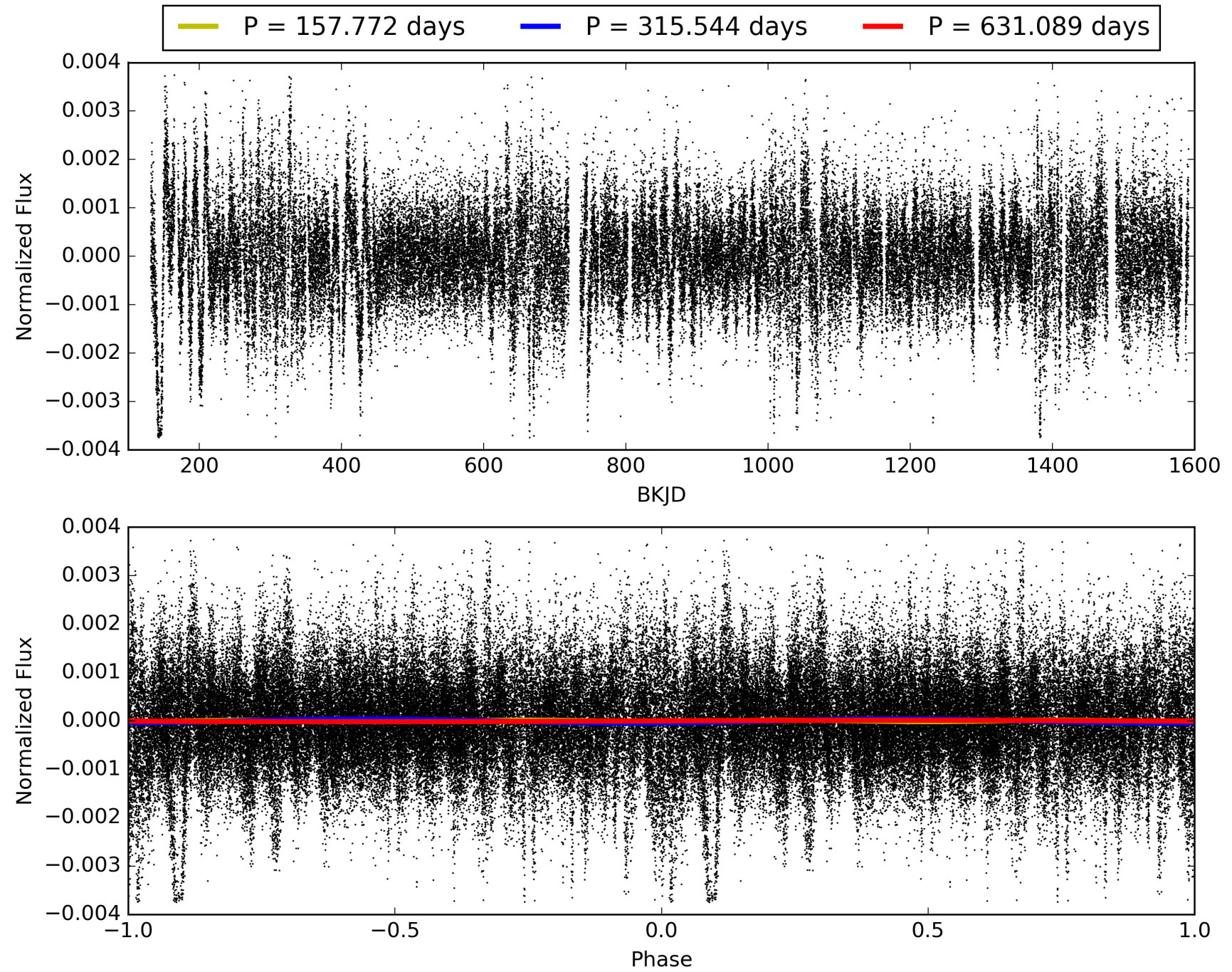
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:43:50 Z

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

# TCE 008295843-02, PDC Light Curves

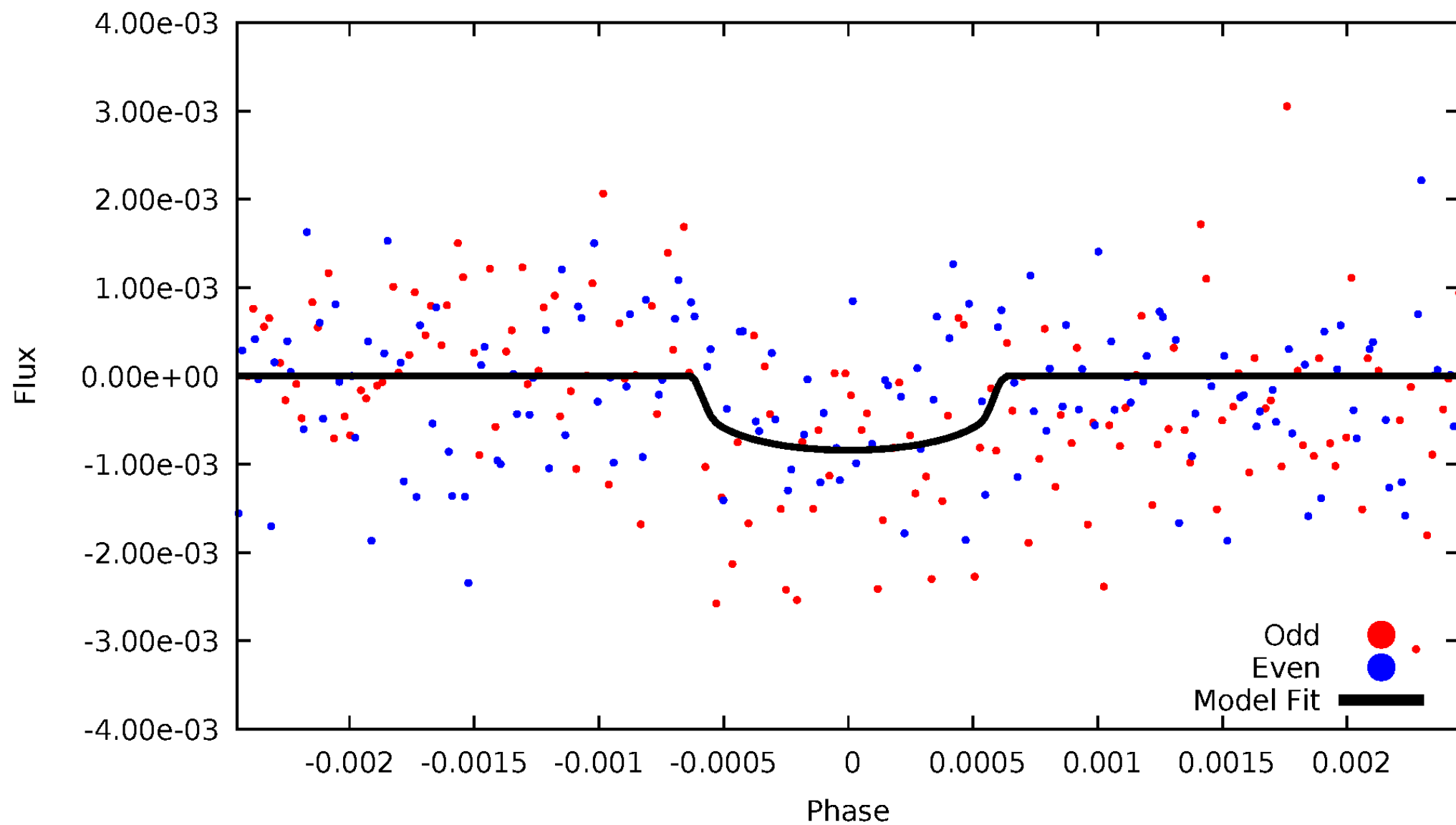


# TCE 008295843-02



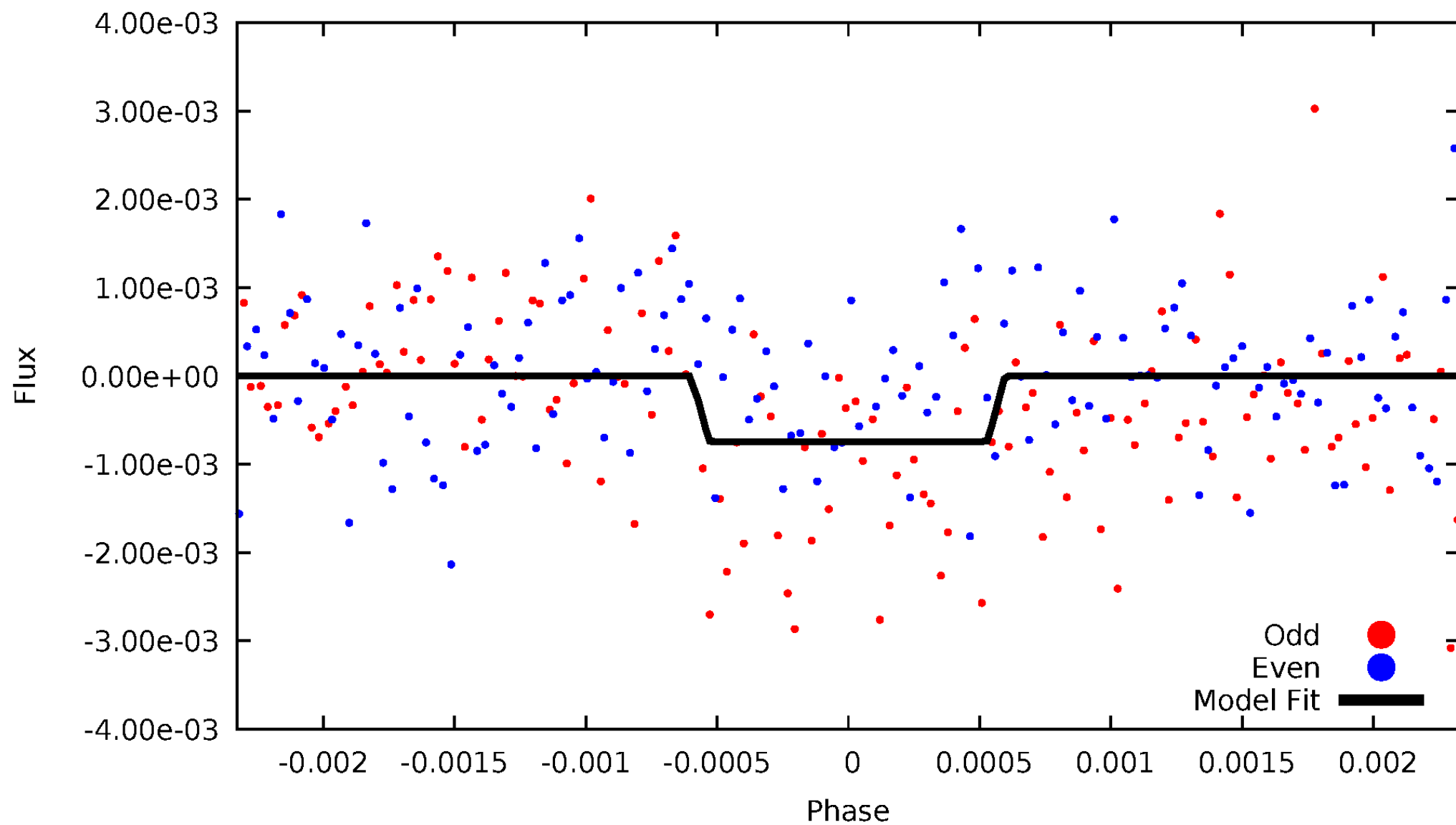
# DV Odd/Even

TCE 008295843-02



# ALT Odd/Even

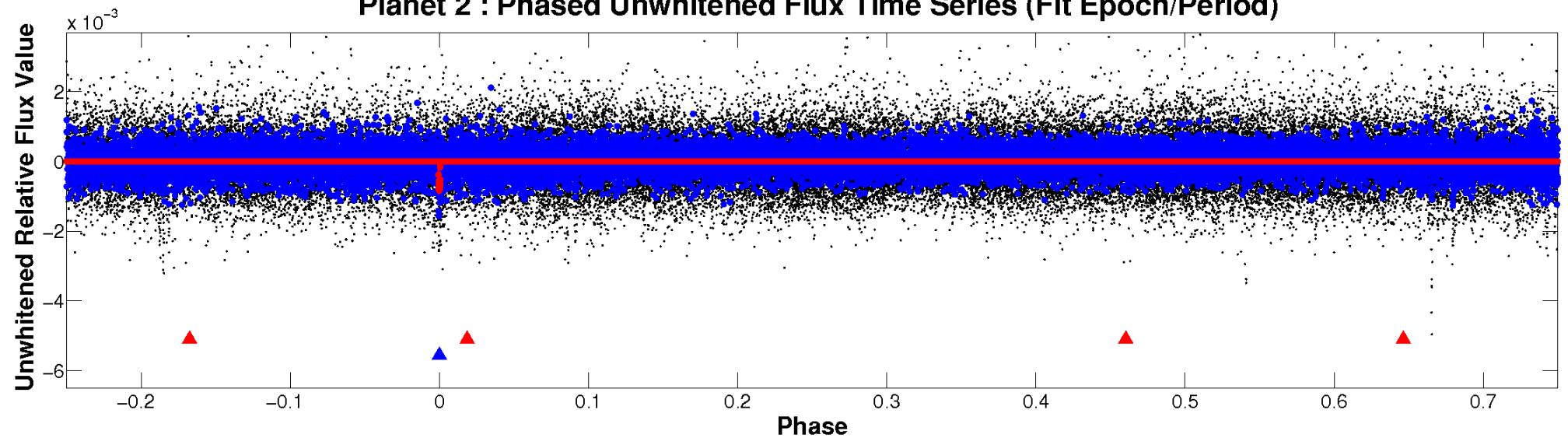
TCE 008295843-02



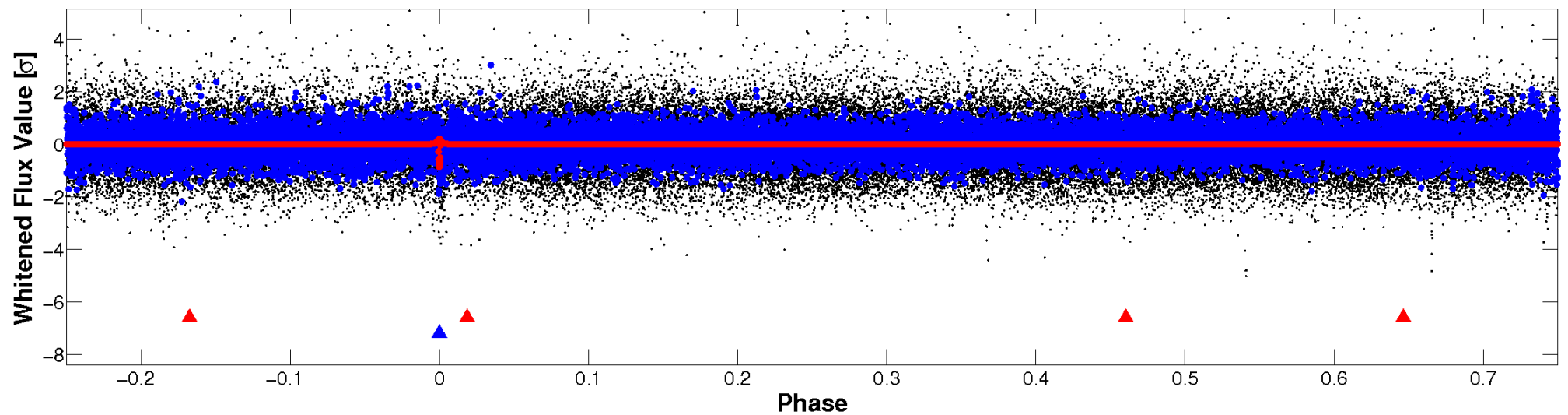


# Non-Whitened Vs. Whitened Light Curve

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 008295843-02   P=315.544469 Days    $T_0=430.018715$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 008295843-02 P=315.544469 Days  $T_0=430.018715$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

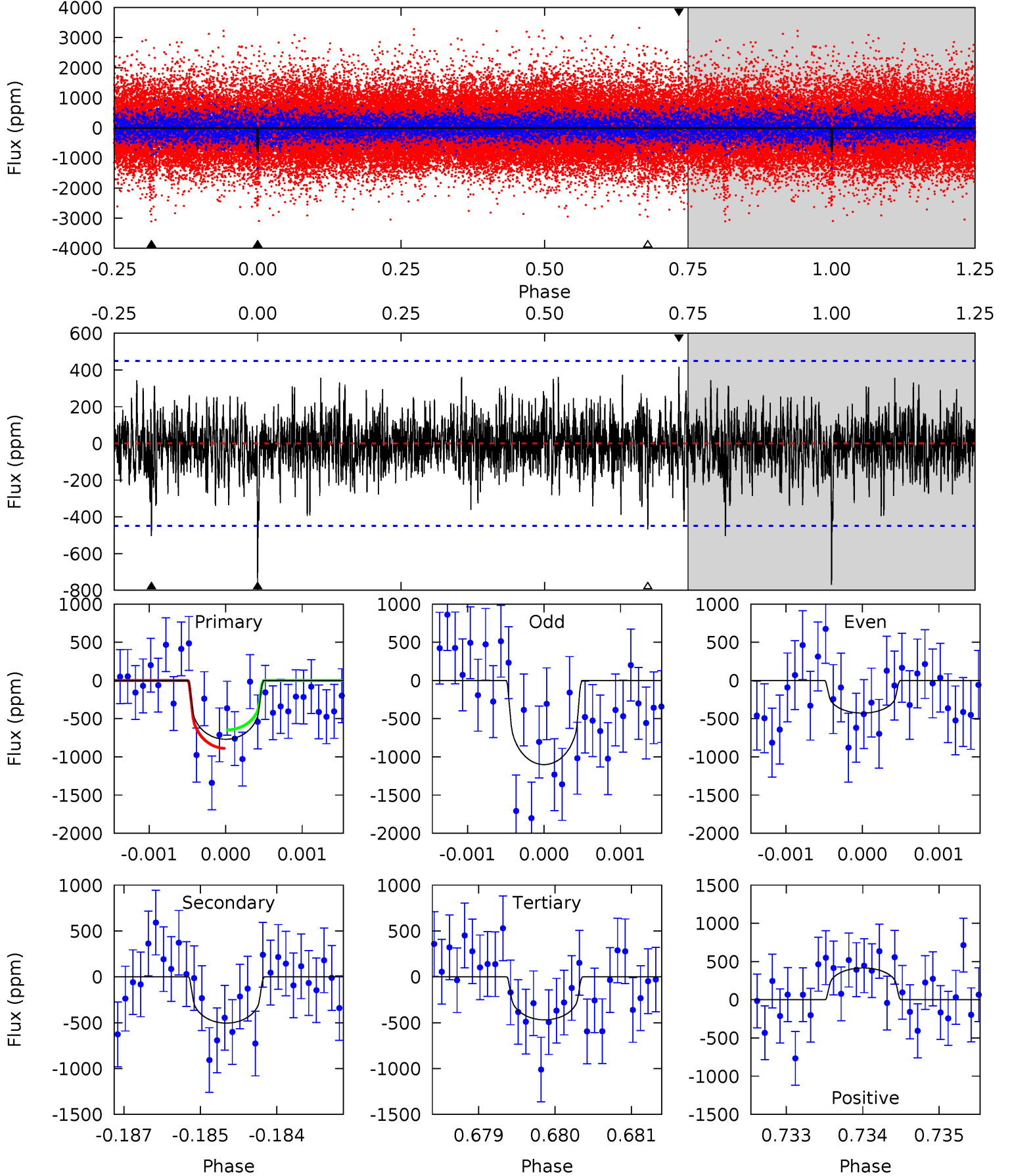
TCE 008295843-02     $P=315.541845$  Days     $T_0=430.020770$  (BKJD)



# DV Model-Shift Uniqueness Test

008295843-02,  $P = 315.544469$  Days,  $E = 114.474246$  Days

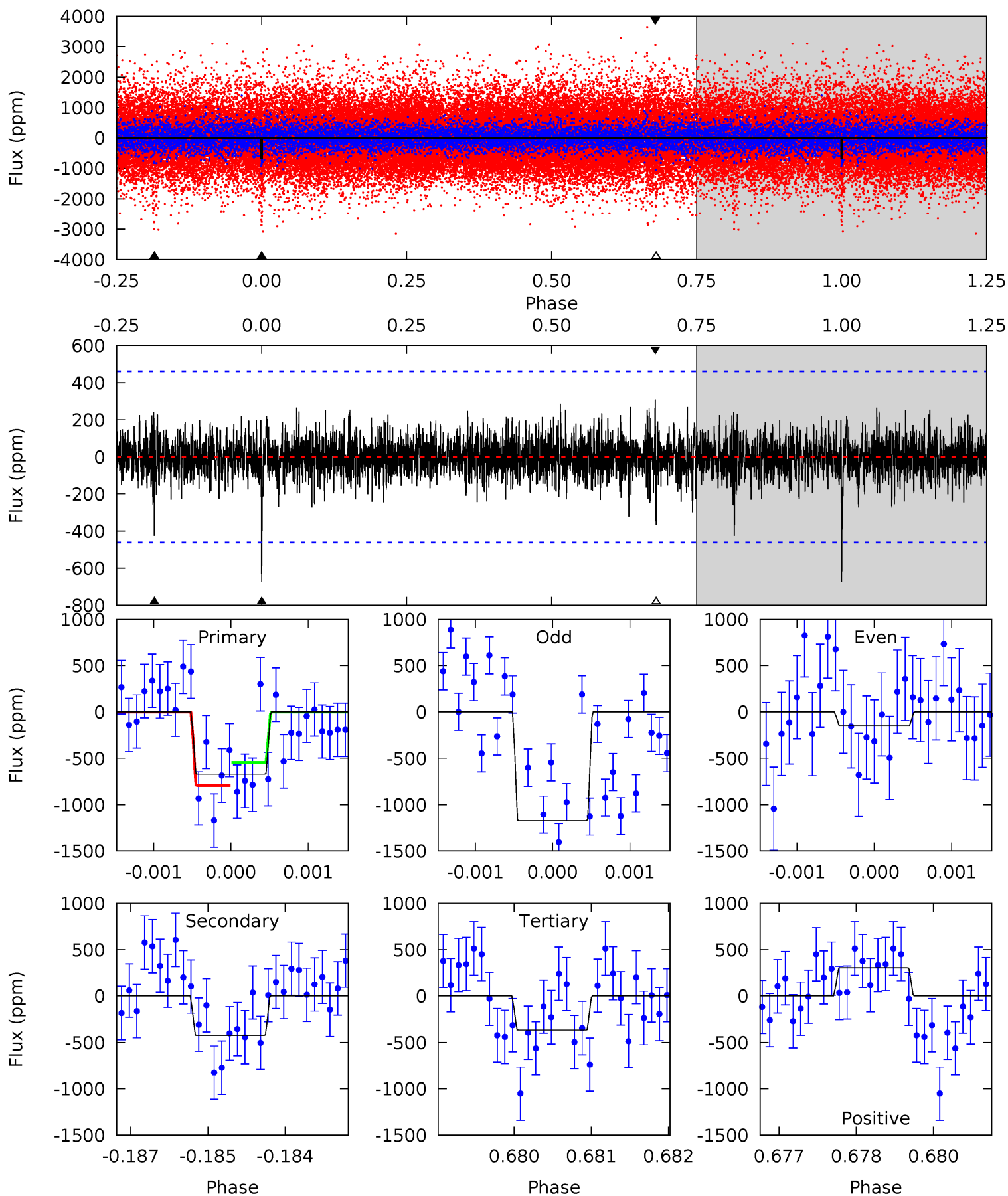
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.26	6.07	5.64	5.00	5.41	3.22	1.33	3.62	4.25	0.43	1.07	4.05	1.19	0.35	1.45



# Alt Model-Shift Uniqueness Test

008295843-02, P = 315.541845 Days, E = 114.478925 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.89	4.99	4.31	3.57	5.42	3.25	0.94	3.58	4.32	0.68	1.42	6.01	1.15	0.31	1.46





### Stellar Parameters For KIC 008295843

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4973^{+149}_{-149}$	$4.603^{+0.025}_{-0.075}$	$0.140^{+0.250}_{-0.300}$	$0.754^{+0.080}_{-0.053}$	$0.848^{+0.043}_{-0.080}$	$2.789^{+0.346}_{-0.665}$
	+3%/-3%	+1%/-2%	+179%/-214%	+11%/-7%	+5%/-9%	+12%/-24%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008295843-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-505 \pm 83$	$3.38^{+3.11}_{-2.21}$	$292^{+11}_{-10}$	$3967^{+2242}_{-769}$	$17180^{+134319}_{-12461}$
Alt.	$-424 \pm 85$	$3.37^{+3.19}_{-2.24}$	$292^{+11}_{-11}$	$3830^{+2113}_{-713}$	$14236^{+111261}_{-10326}$

$T_{max}$  = 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

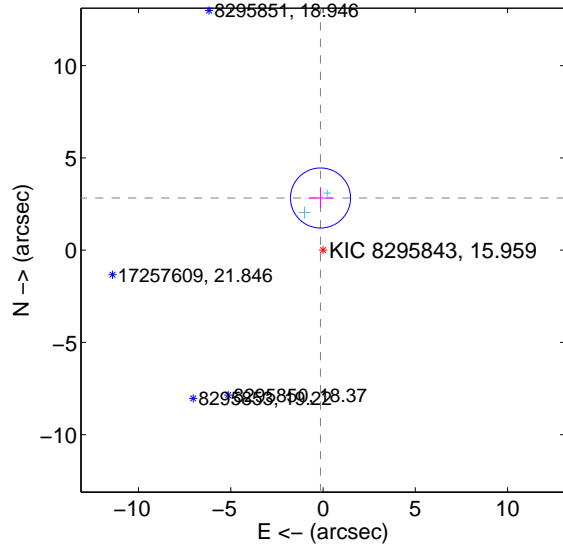
Supplemental centroid analysis for 008295843-02. Kepler magnitude: 15.96. Transit SNR 6.30

There are 2 quarters with good PRF difference image offsets

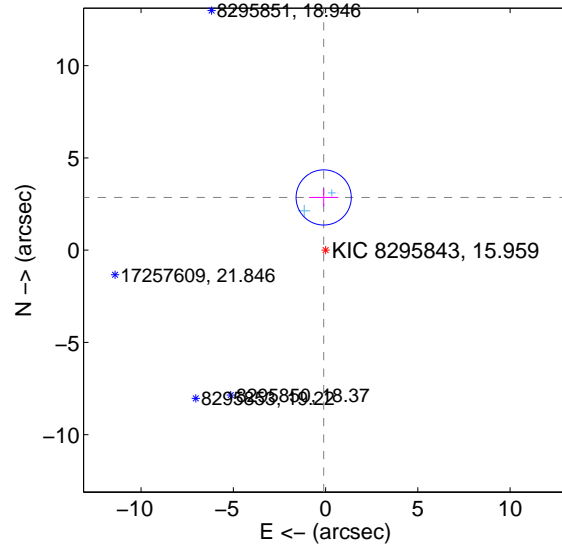
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.832 \pm 0.543$	5.22	$0.137 \pm 0.658$	$2.829 \pm 0.542$
PRF-fit source offset from KIC position	$2.860 \pm 0.499$	5.74	$0.103 \pm 0.797$	$2.858 \pm 0.498$
photometric centroid source offset	$3.41 \pm 2.51$	1.36	$-0.16 \pm 2.02$	$3.41 \pm 2.51$

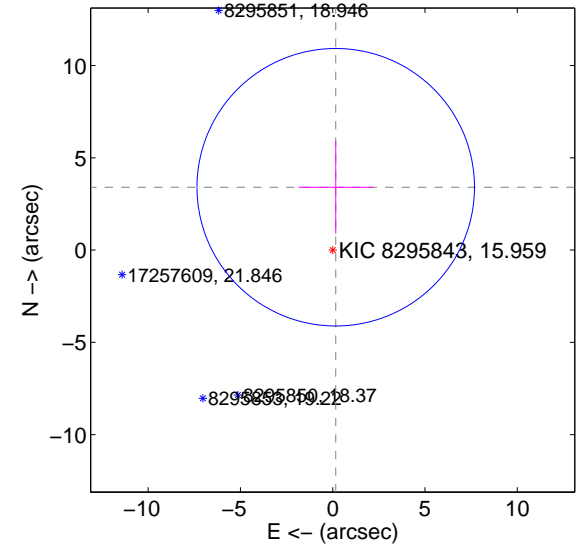
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

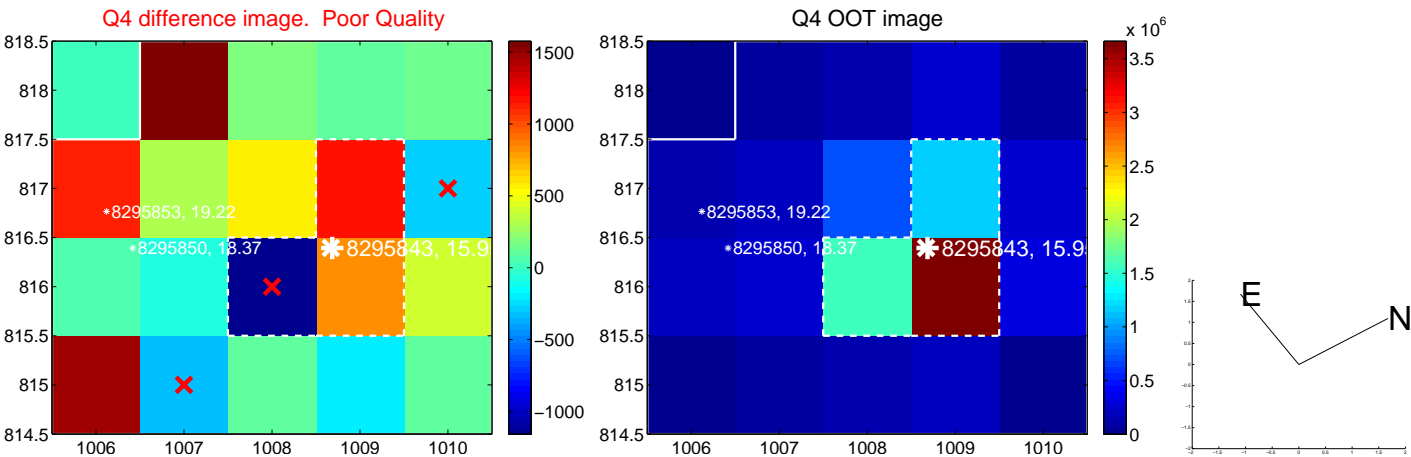


offset from photometric centroids



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.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



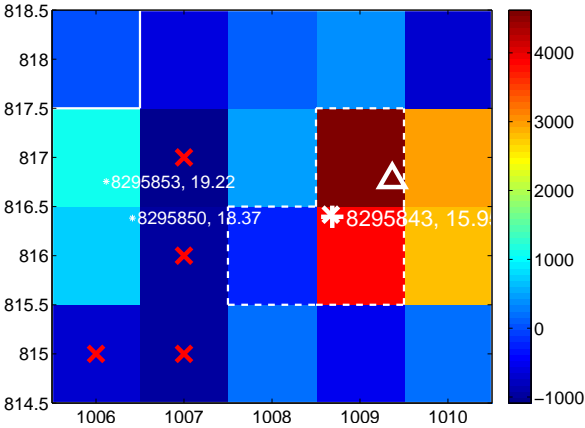
Q7 no difference image



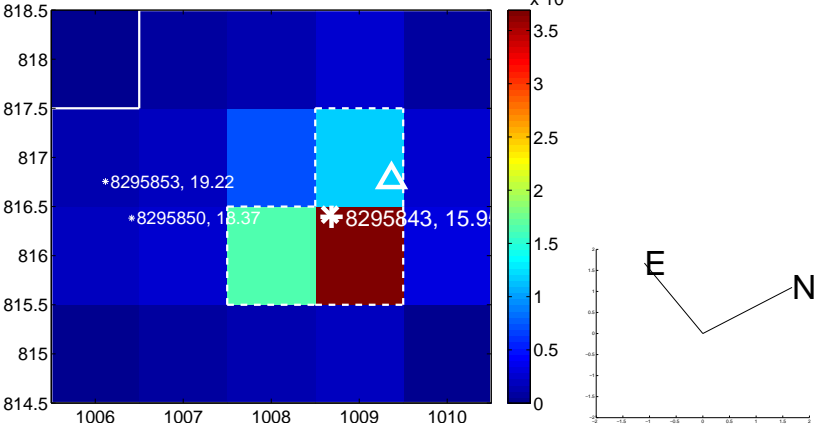
Q7 no OOT image



Q8 difference image



Q8 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



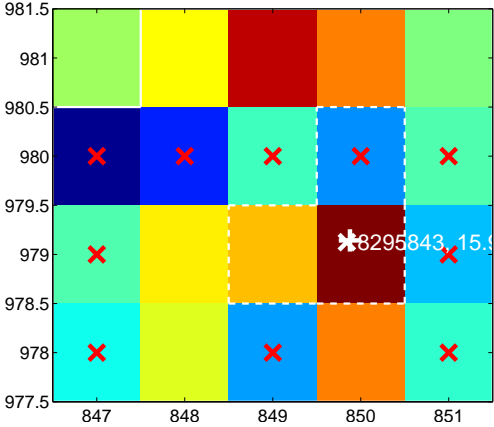
Q10 no difference image



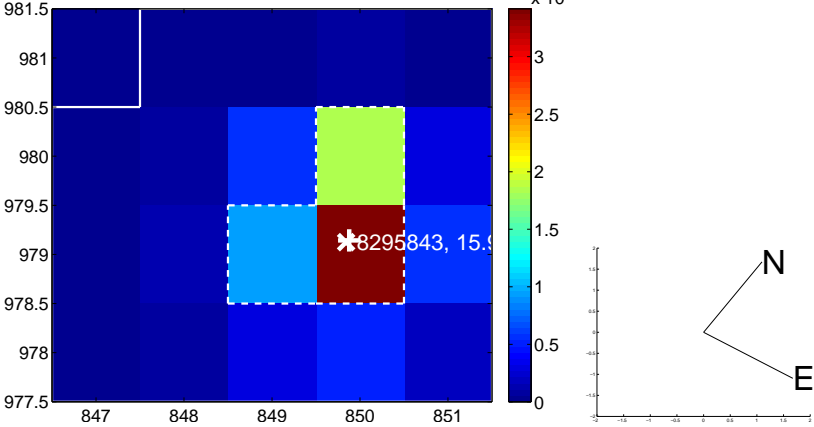
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



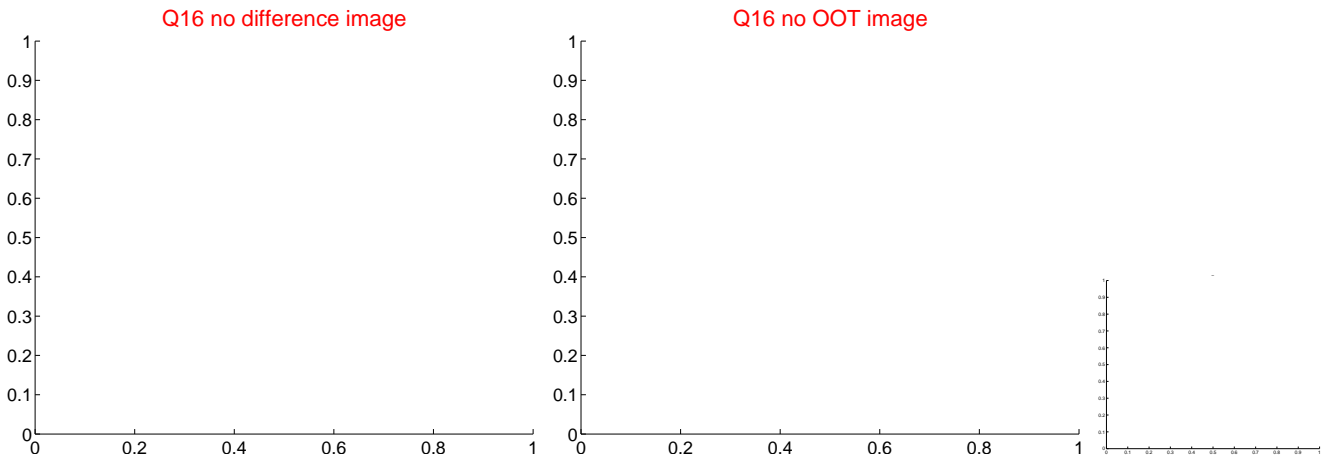
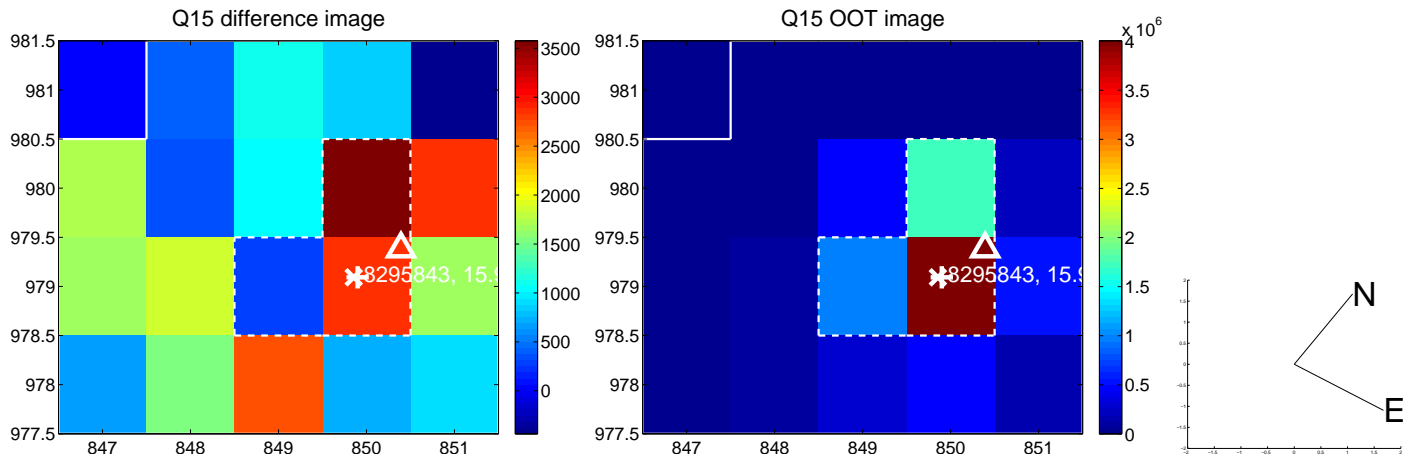
Q12 no difference image



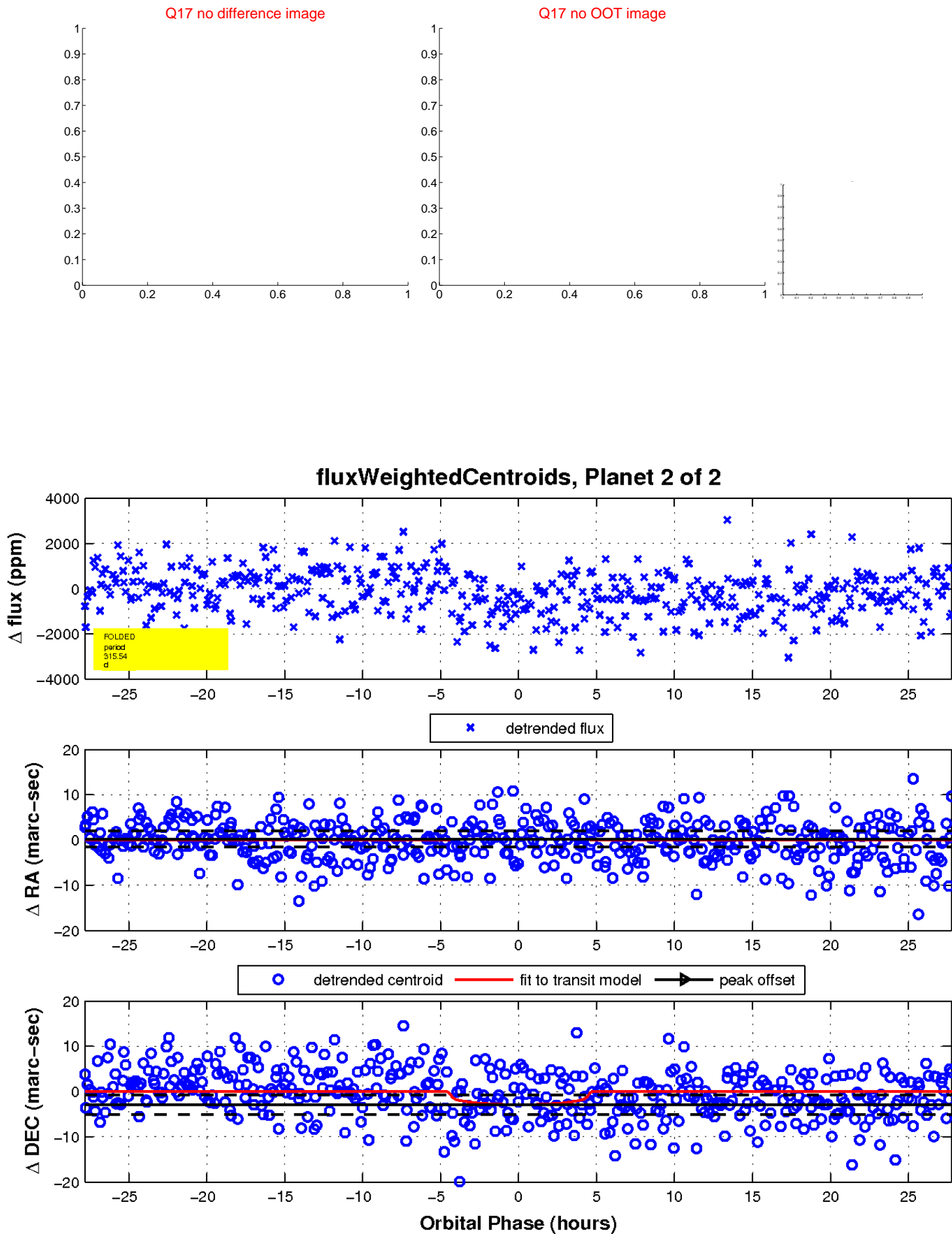
Q12 no OOT image



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



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



# UKIRT Image

Declination

