

# KIC 008243283

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008243283-01	OBS	2952.01	1.759283	132.069090	138.1	3.043	12.3	13.8	0.98	5784	1.57	1260.93
008243283-02	OBS	No	249.278528	345.999299	799.9	14.161	7.9	6.9	0.98	5784	4.60	1.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008243283-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH
008243283-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—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 008243283-01

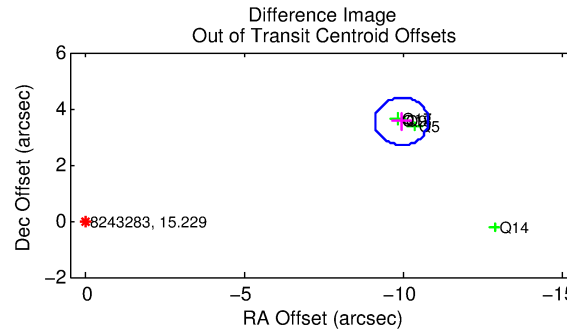
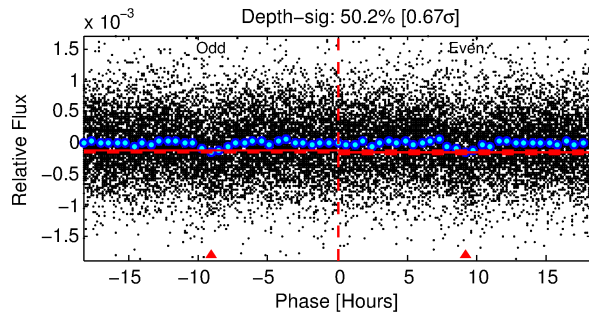
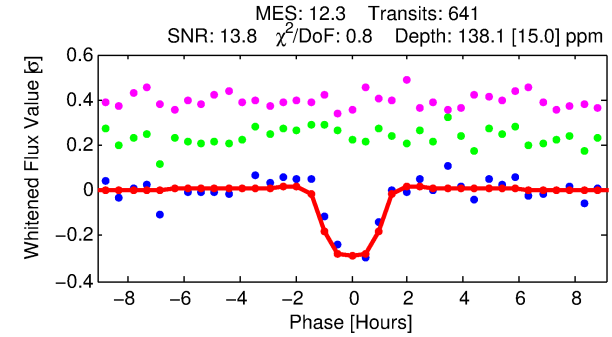
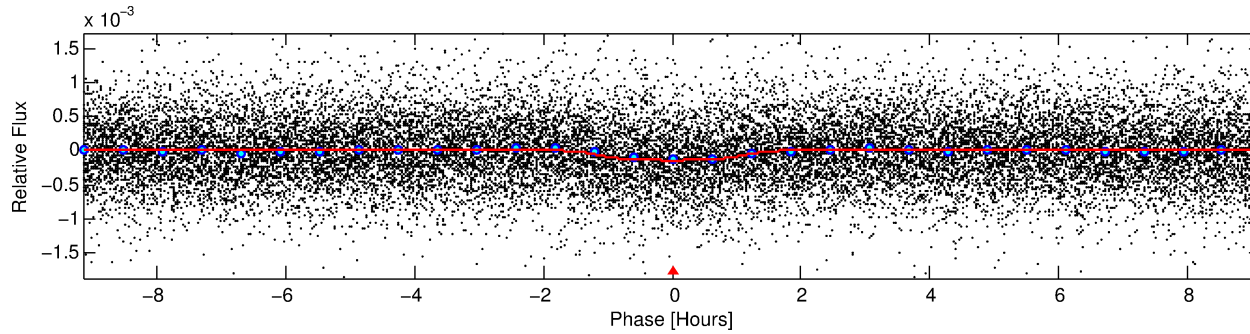
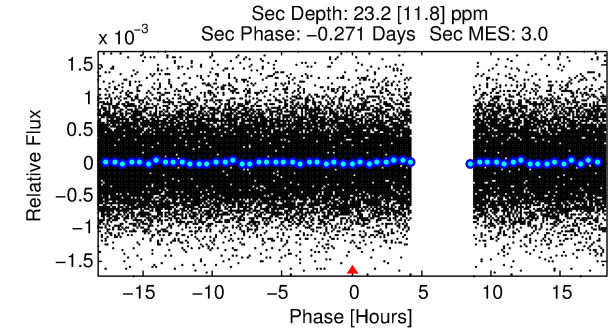
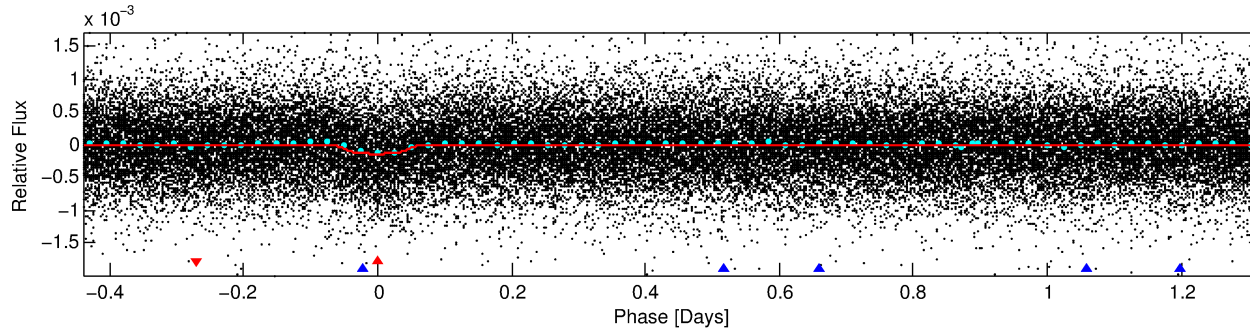
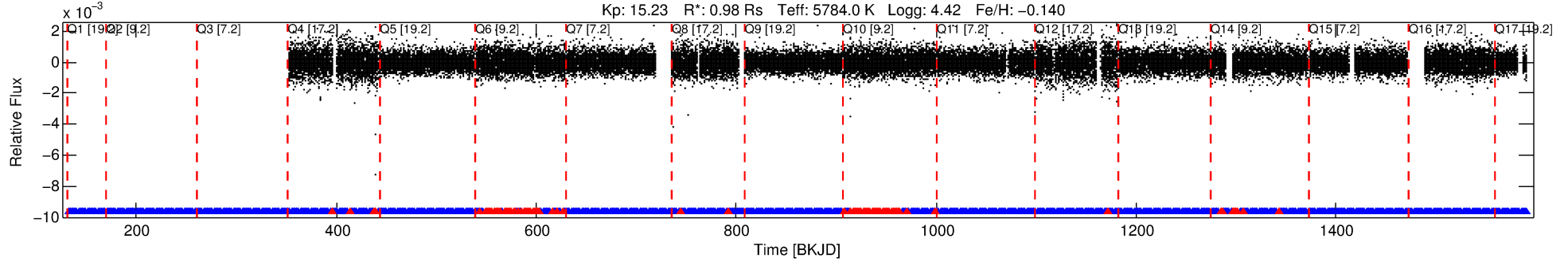
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008243283-01	8243283	008243263-pri	8243263	1:2	16.1	3	2	12.98	15.22	252.17	Direct-PRF	0	0.53	0.31

**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: 8243283 Candidate: 1 of 2 Period: 1.759 d  
KOI: K02952.01 Corr: 0.868

Kp: 15.23 R\*: 0.98 Rs Teff: 5784.0 K Logg: 4.42 Fe/H: -0.140



## DV Fit Results:

Period = 1.75928 [0.00001] d  
Epoch = 132.0691 [0.0034] BKJD  
Rp/R\* = 0.0146 [0.0012]  
a/R\* = 1.55 [0.23]  
b = 0.98 [0.01]  
Seff = 1260.93 [478.74]  
Teq = 1519 [144] K  
Rp = 1.57 [0.47] Re  
a = 0.0277 [0.0068] AU  
Ag = 3.97 [2.55] [1.17σ]  
Teffp = 3316 [455] K [3.76σ]

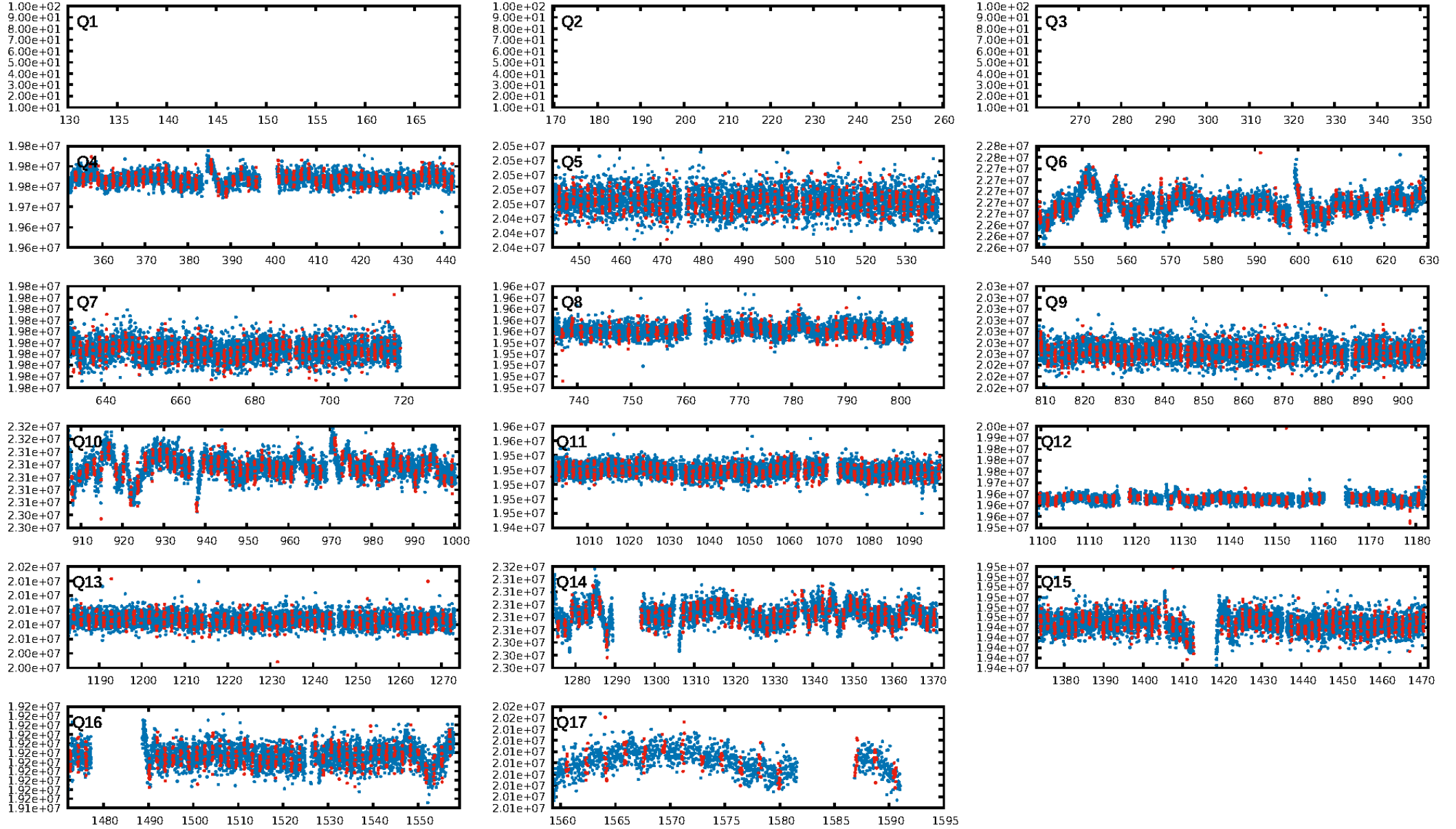
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [410.14σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.29e-33  
RollingBand-fgt: 0.87 [546/626]  
GhostDiagnostic-chr: -0.9294  
Centroid-sig: 0.0%  
Centroid-so: 3.072 arcsec [10.63σ]  
OotOffset-rm: 10.549 arcsec [37.46σ]  
KicOffset-rm: 8.072 arcsec [46.75σ]  
OotOffset-st: 1/0/0/4 [5]  
KicOffset-st: 1/0/0/4 [5]  
DiffImageQuality-fgm: 1.00 [5/5]  
DiffImageOverlap-fno: 1.00 [14/14]

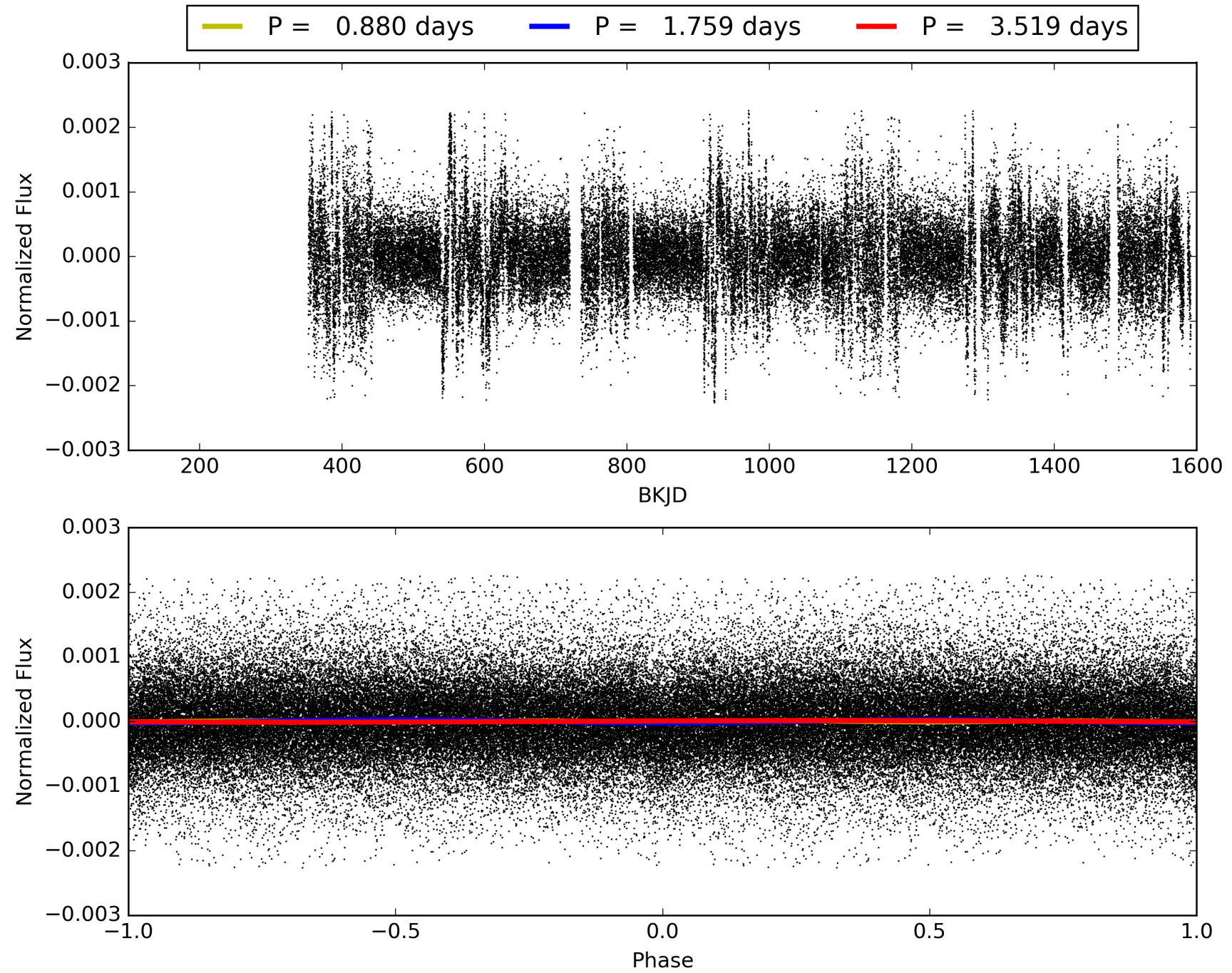
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:06:18 Z

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

# TCE 008243283-01, PDC Light Curves

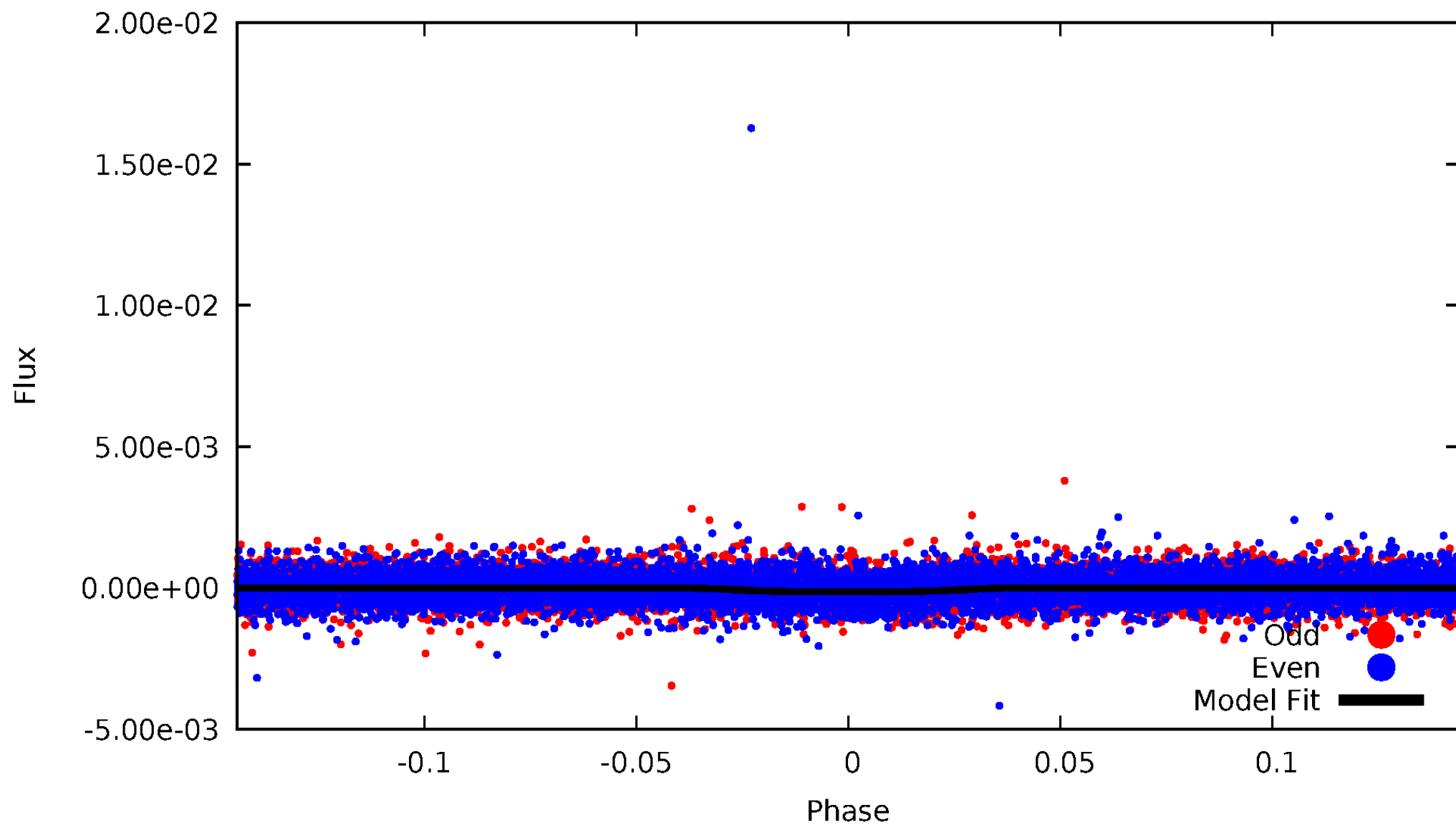


TCE 008243283-01



# DV Odd/Even

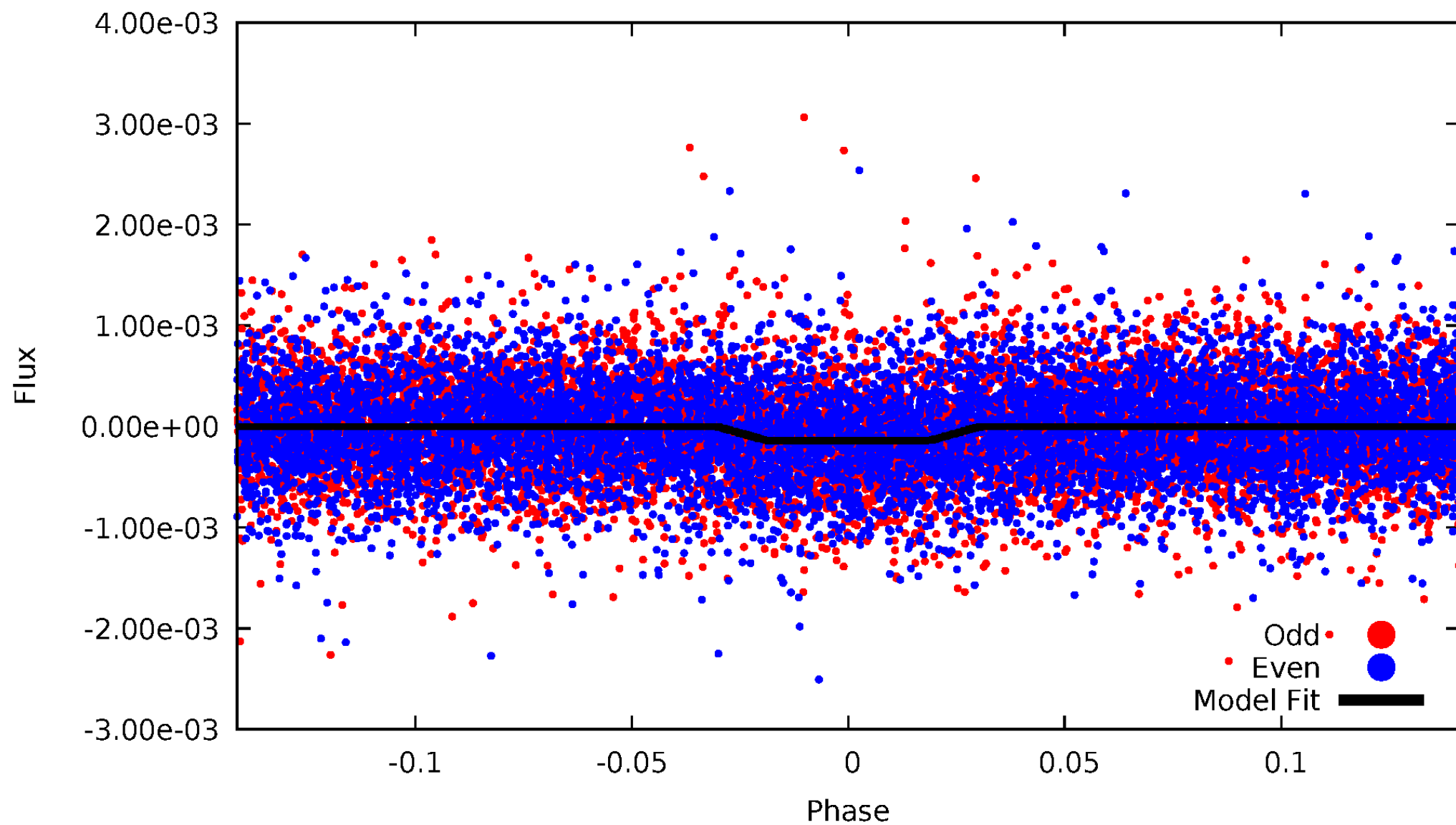
TCE 008243283-01



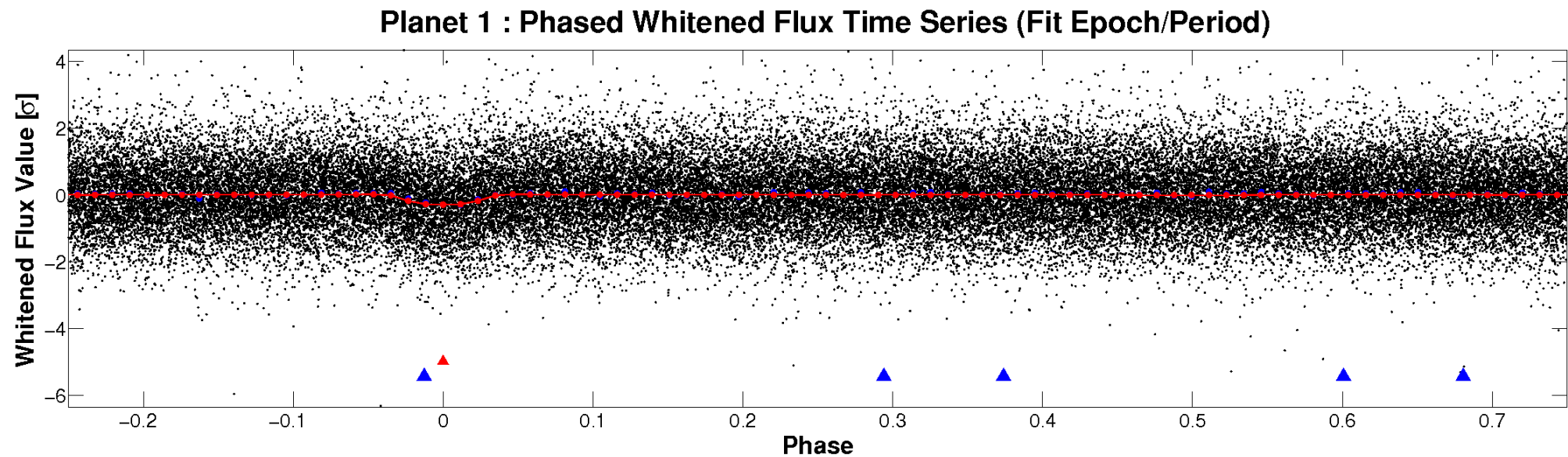
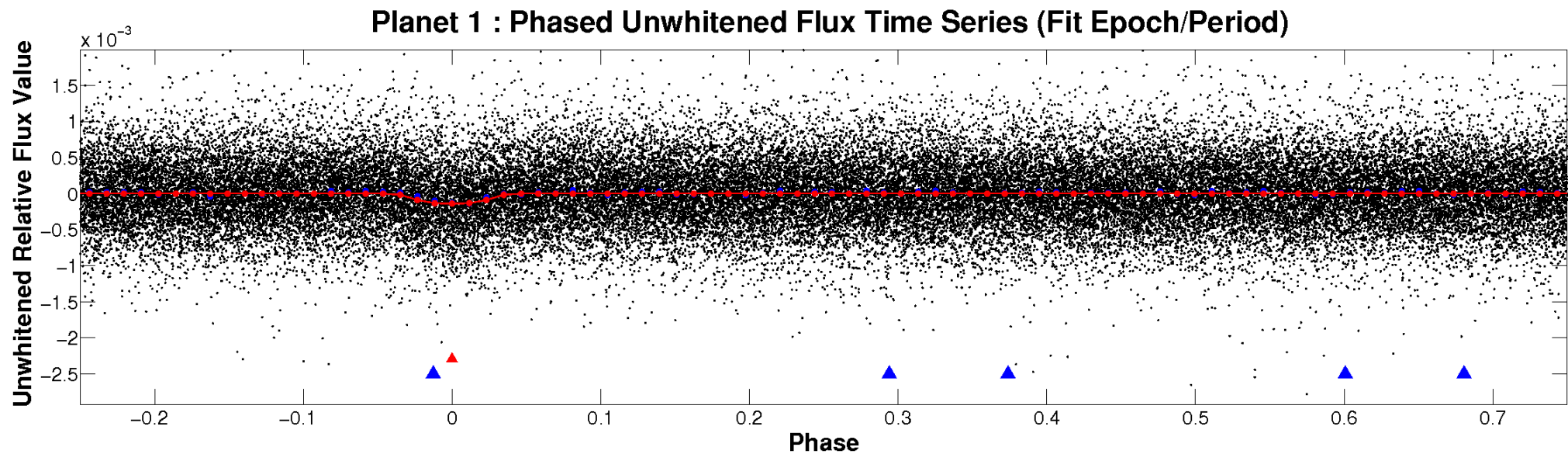


# ALT Odd/Even

TCE 008243283-01

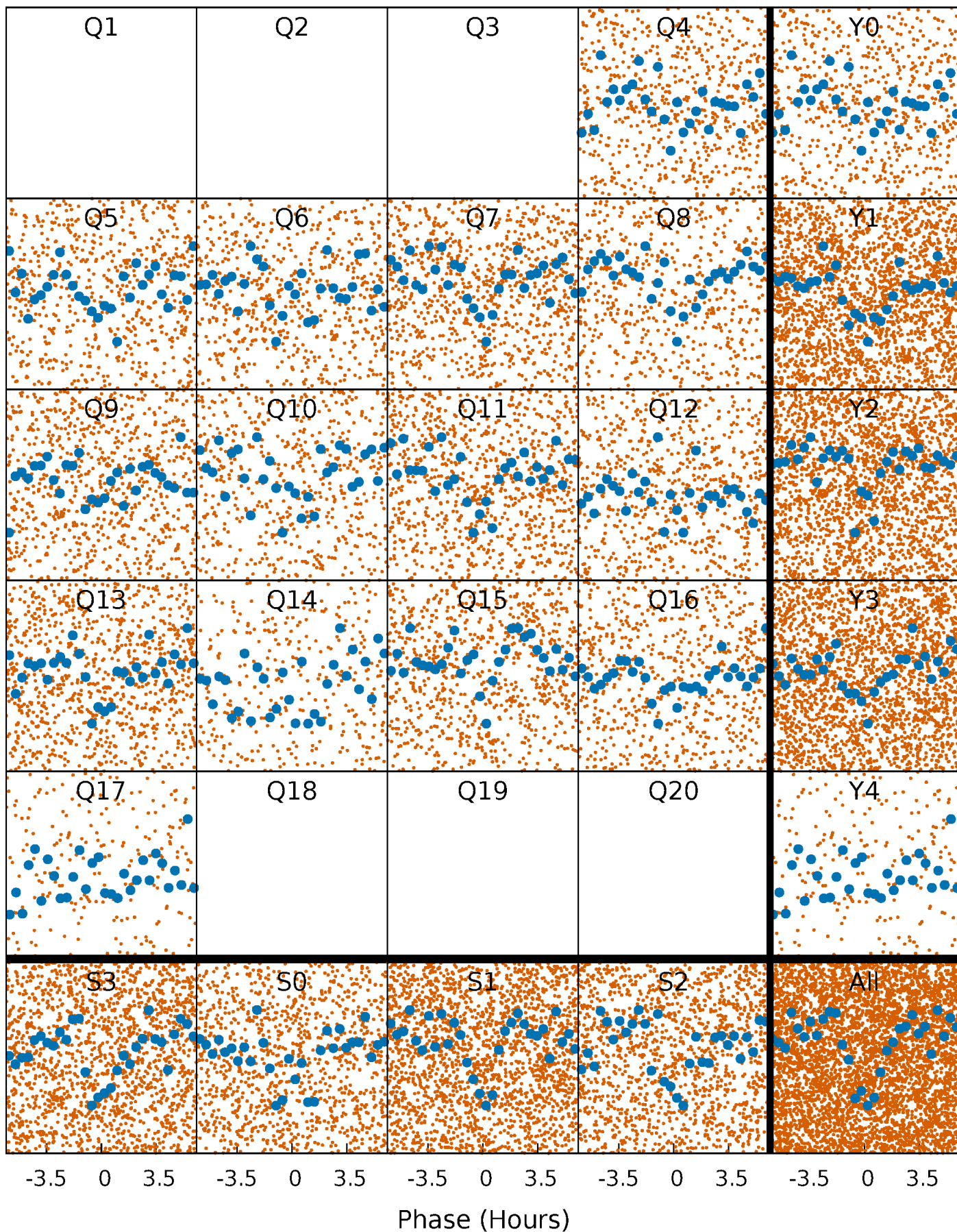


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

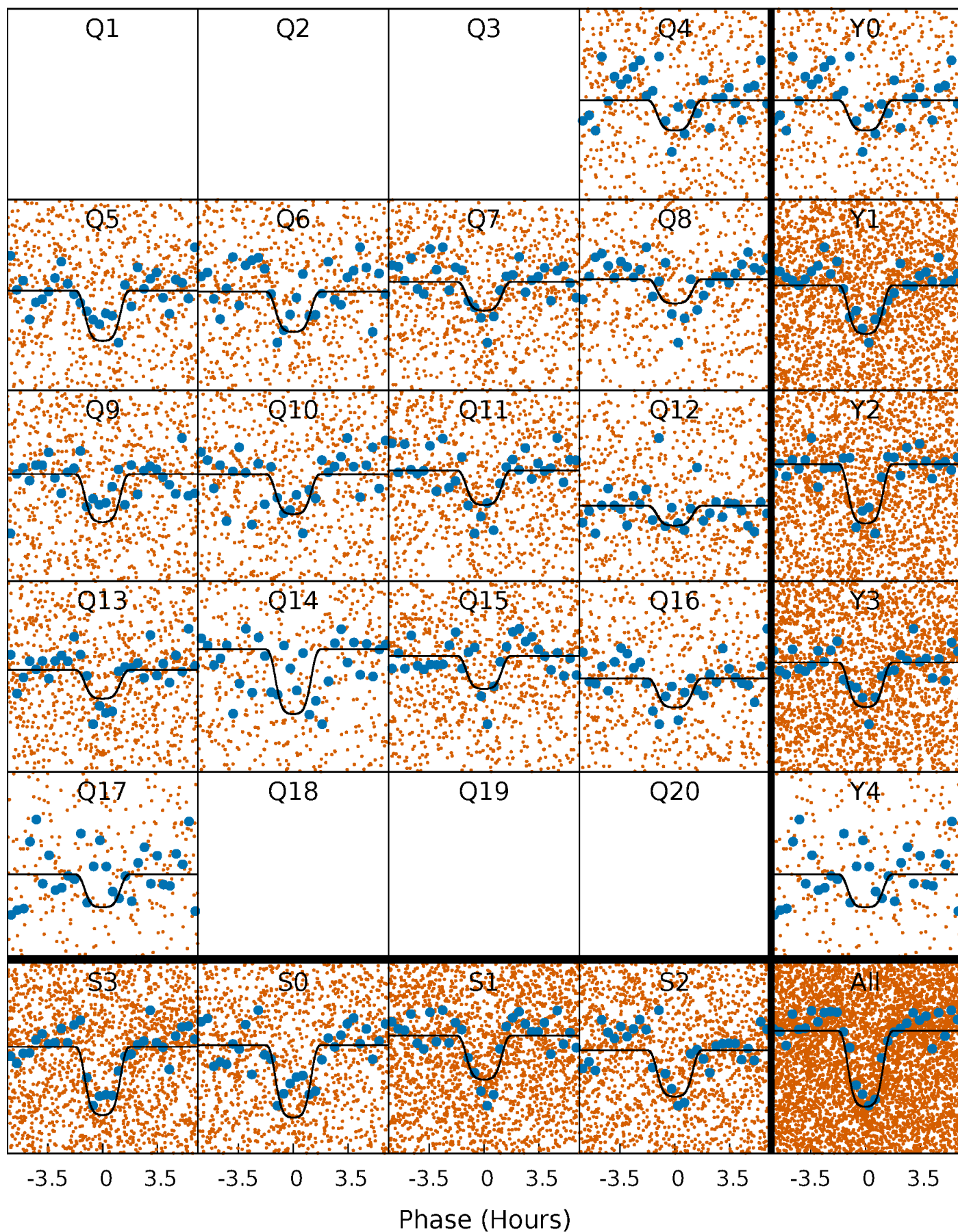
TCE 008243283-01 P= 1.759283 Days  $T_0=132.069090$  (BKJD)





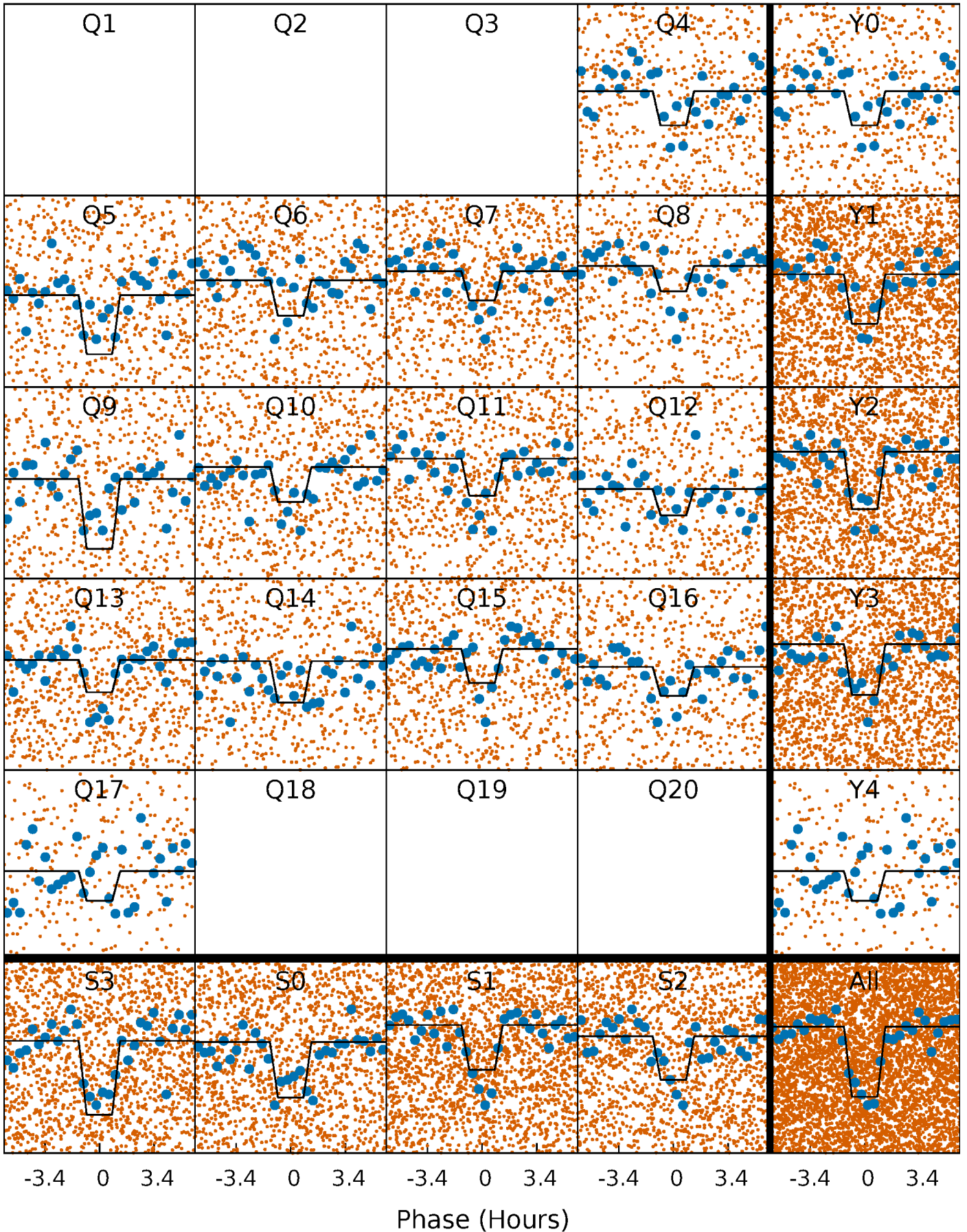
# DV Quarter-Phased Transit Curves

TCE 008243283-01 P= 1.759283 Days  $T_0=132.069090$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

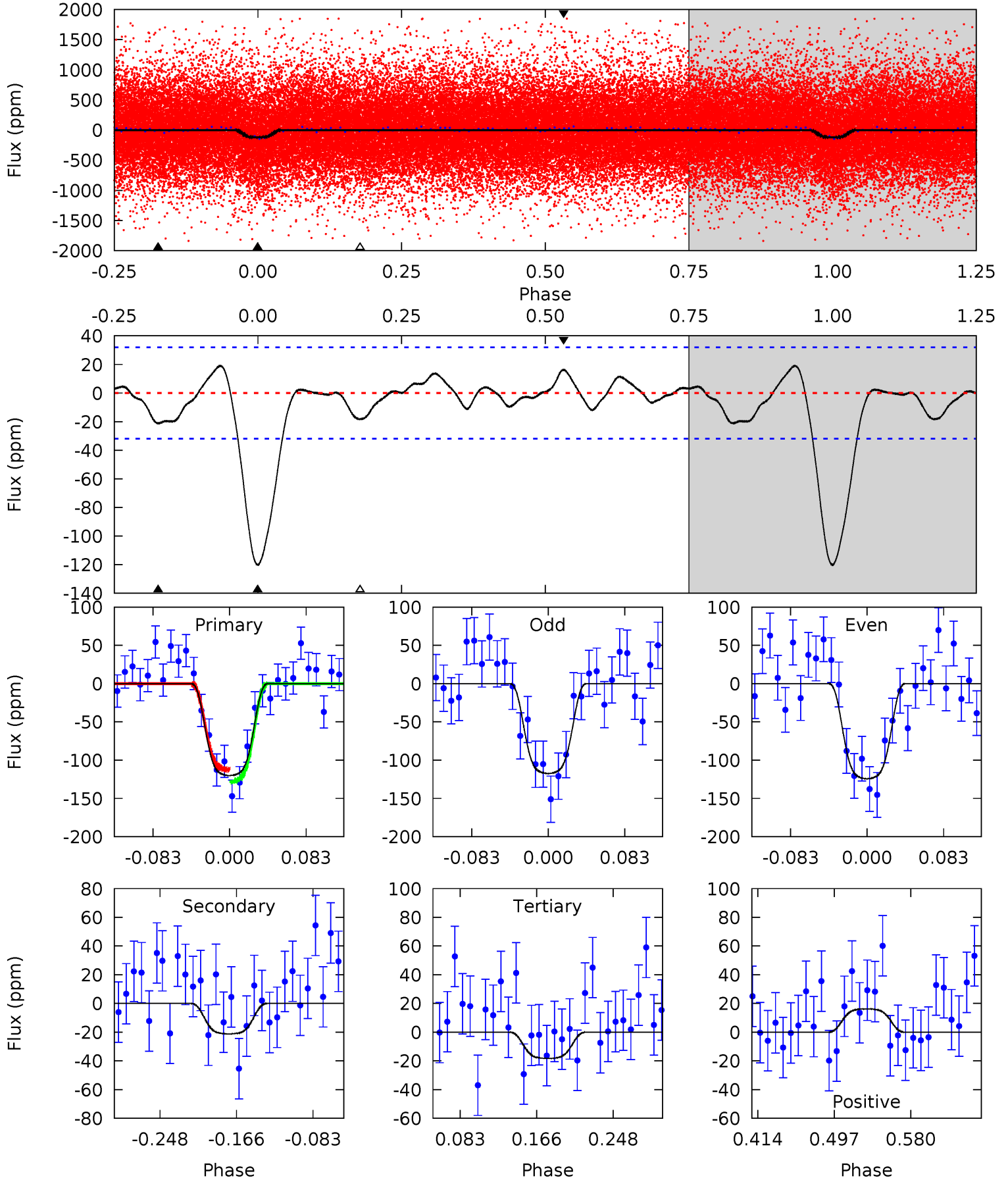
TCE 008243283-01 P= 1.759276 Days  $T_0=132.072331$  (BKJD)



# DV Model-Shift Uniqueness Test

008243283-01, P = 1.759283 Days, E = 132.069090 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
17.3	3.06	2.64	2.34	4.60	1.73	1.05	14.7	15.0	0.42	0.72	0.49	0.97	0.14	1.13

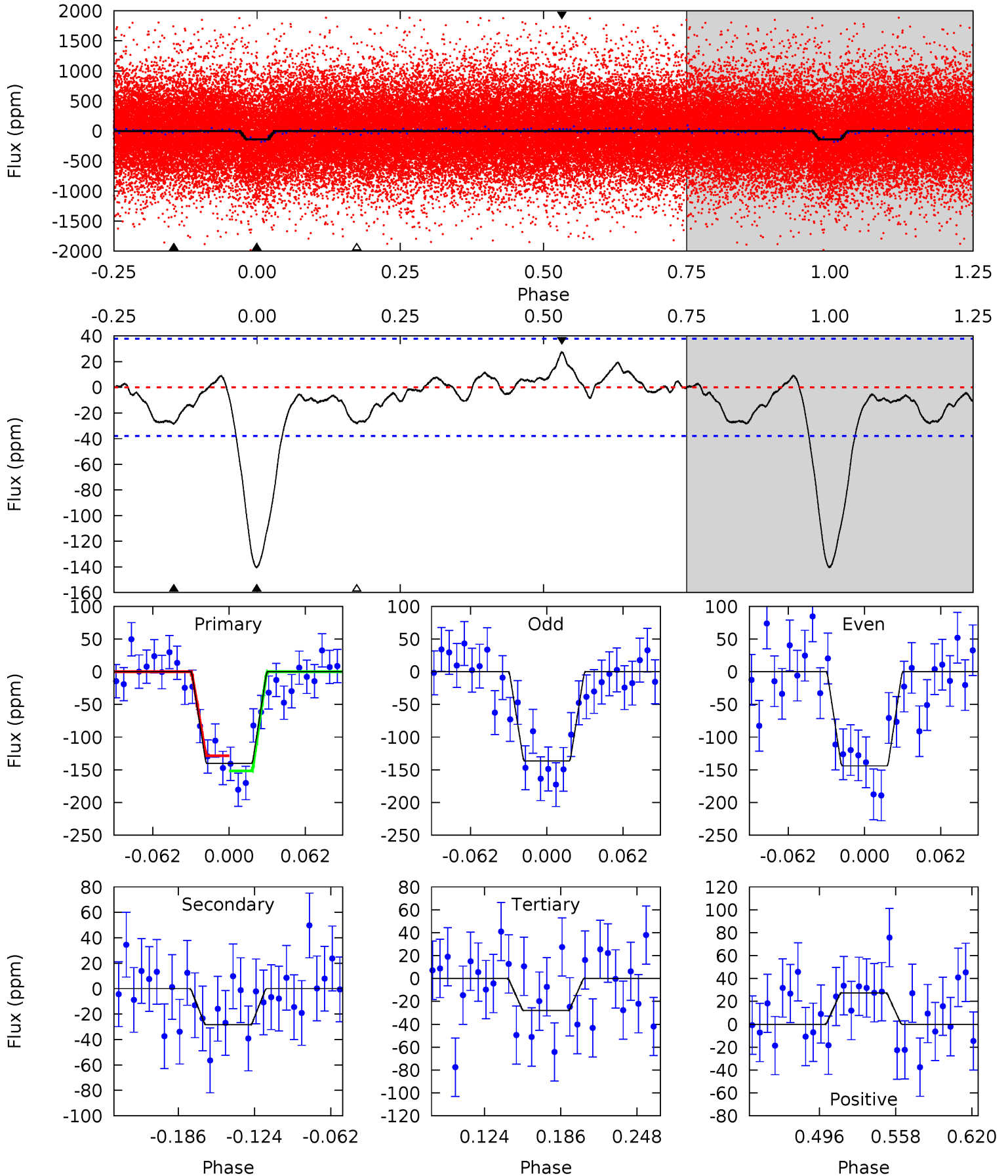




# Alt Model-Shift Uniqueness Test

008243283-01, P = 1.759276 Days, E = 132.072331 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
17.3	3.50	3.45	3.36	4.66	1.87	1.27	13.8	13.9	0.05	0.14	0.45	1.07	0.16	1.44





### Stellar Parameters For KIC 008243283

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5784^{+172}_{-190}$	$4.416^{+0.105}_{-0.195}$	$-0.140^{+0.300}_{-0.300}$	$0.984^{+0.285}_{-0.142}$	$0.921^{+0.123}_{-0.089}$	$1.362^{+0.740}_{-0.645}$
	+3%/-3%	+2%/-4%	+214%/-214%	+29%/-14%	+13%/-10%	+54%/-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 008243283-01 / KOI 2952.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-21 \pm 7$	$1.60^{+0.27}_{-0.20}$	$2141^{+152}_{-112}$	$3625^{+233}_{-282}$	$3.428^{+1.752}_{-1.297}$
Alt.	$-28 \pm 8$	$1.29^{+0.26}_{-0.18}$	$2144^{+168}_{-113}$	$4126^{+295}_{-283}$	$7.129^{+3.236}_{-2.845}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

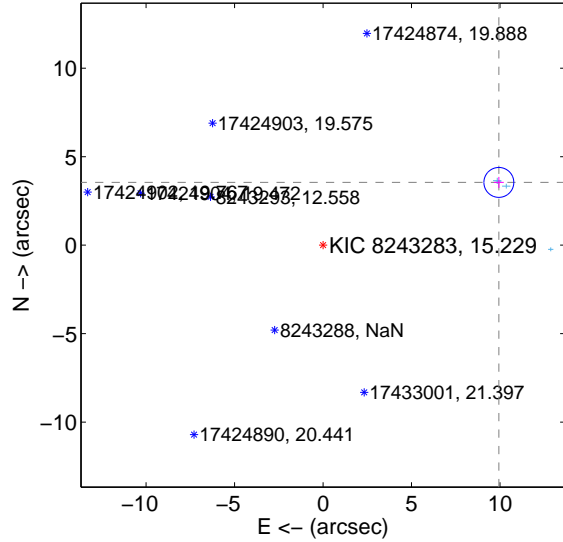
Supplemental centroid analysis for 008243283-01. Kepler magnitude: 15.23. Transit SNR 13.75

There are 5 quarters with good PRF difference image offsets

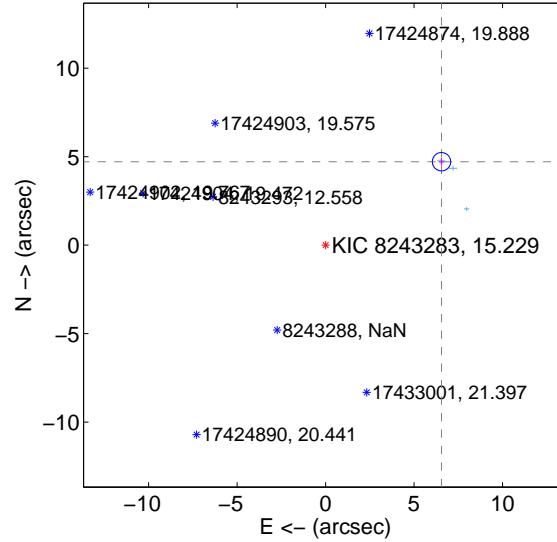
The OOT PRF centroid is offset from the target star catalog position by about 3.49 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	10.549 $\pm$ 0.282	37.46	-9.935 $\pm$ 0.277	3.547 $\pm$ 0.316
PRF-fit source offset from KIC position	8.072 $\pm$ 0.173	46.75	-6.551 $\pm$ 0.141	4.716 $\pm$ 0.221
photometric centroid source offset	3.07 $\pm$ 0.29	10.63	-3.07 $\pm$ 0.29	0.07 $\pm$ 0.25

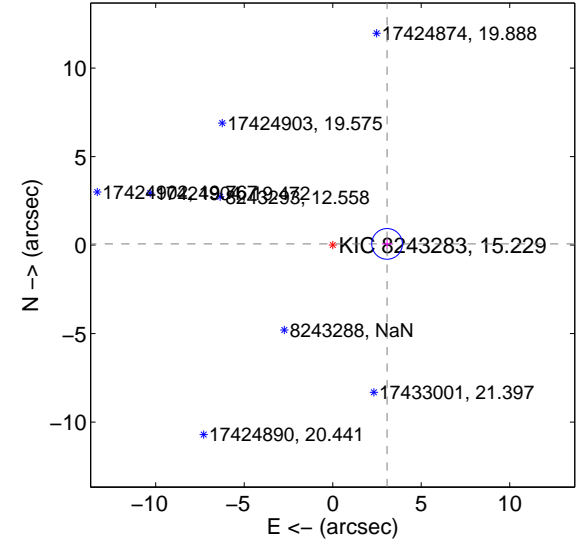
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

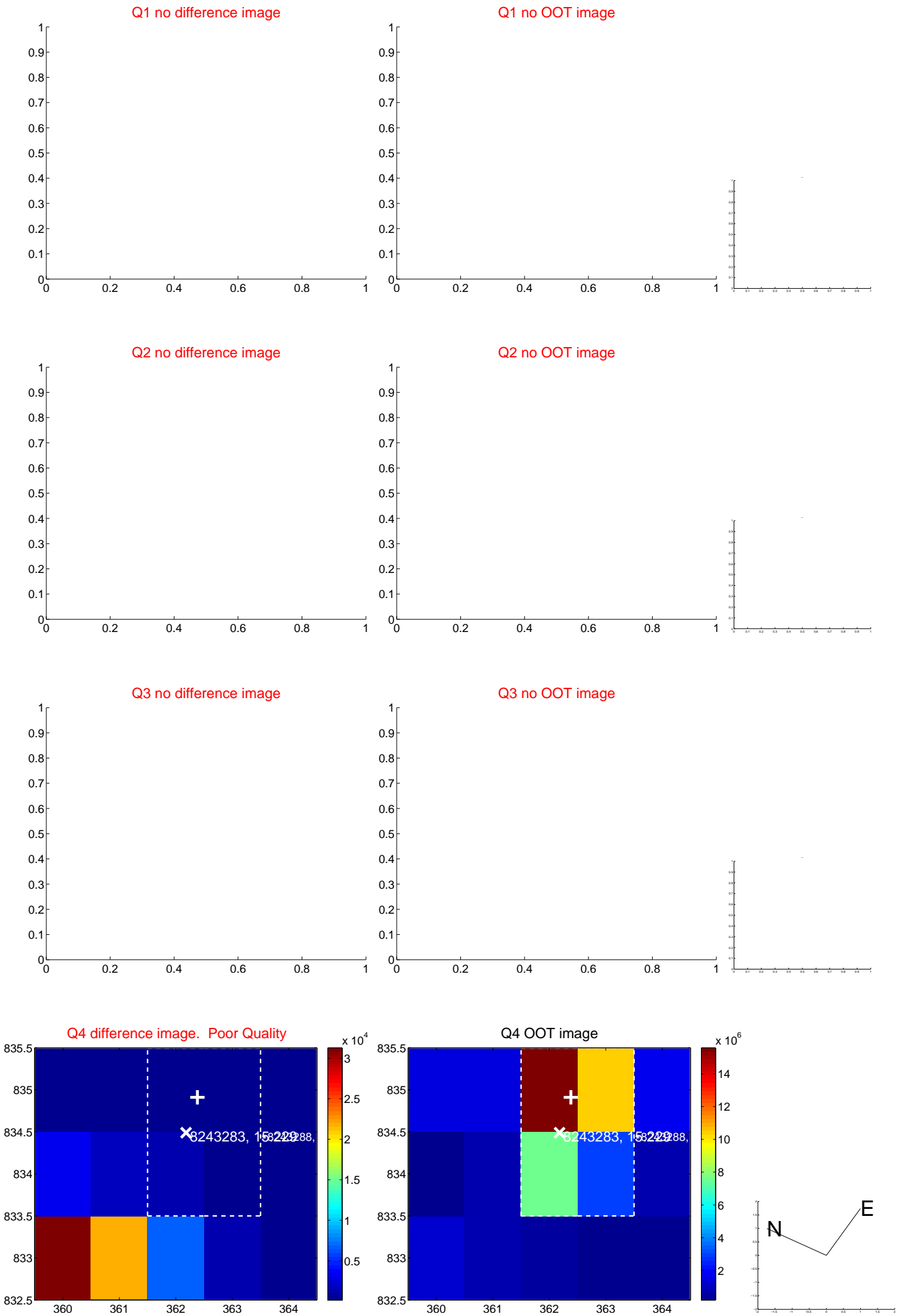


offset from photometric centroids

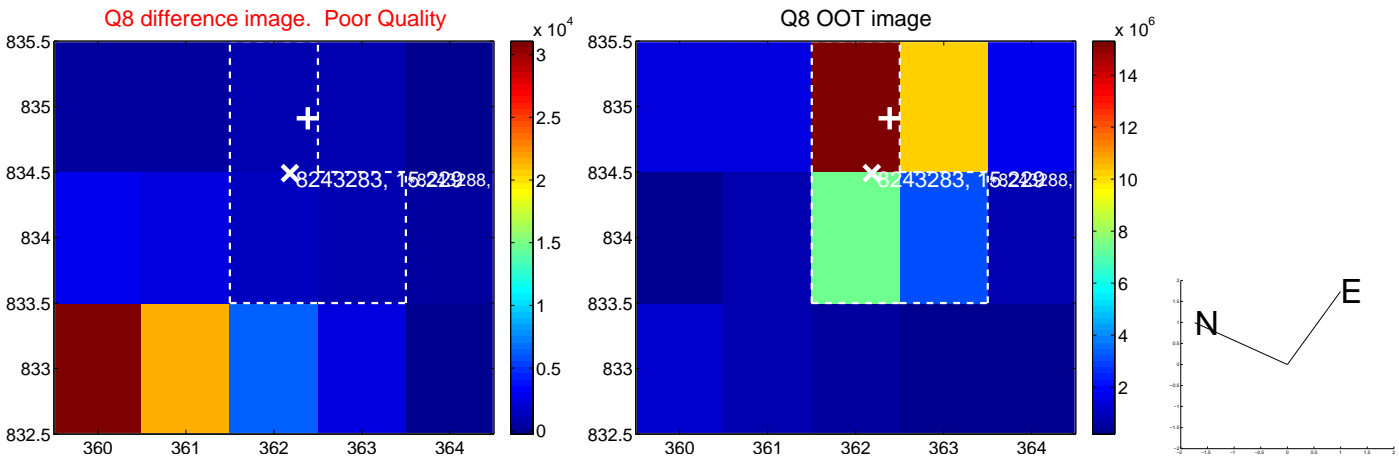
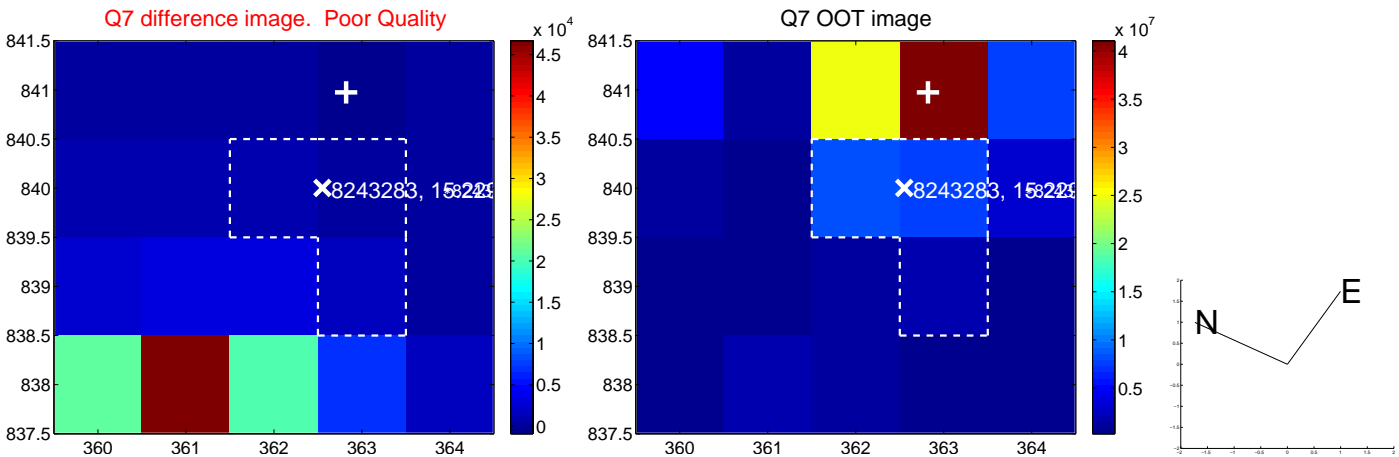
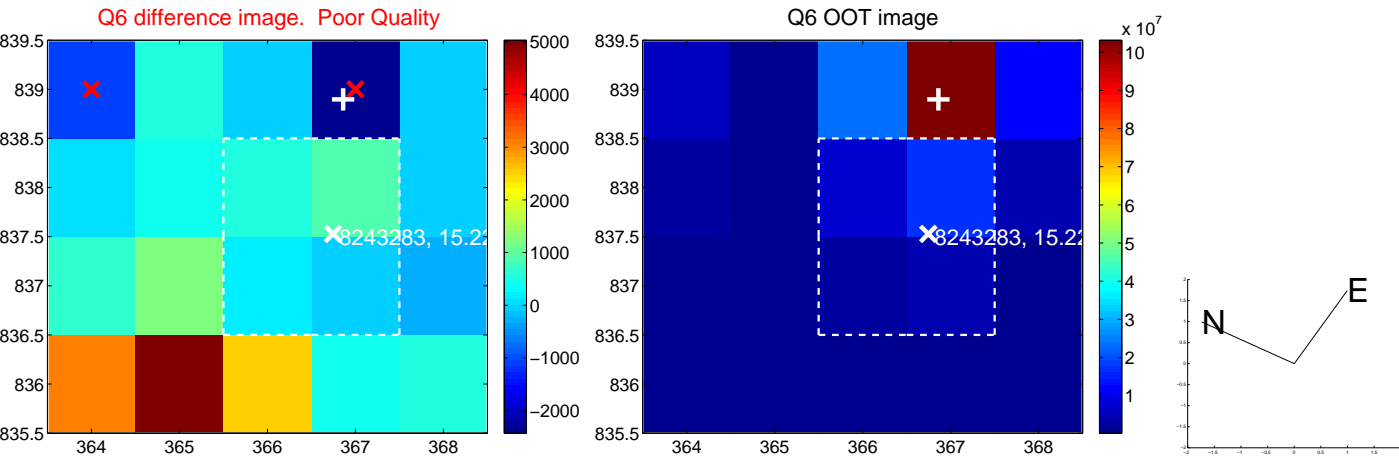
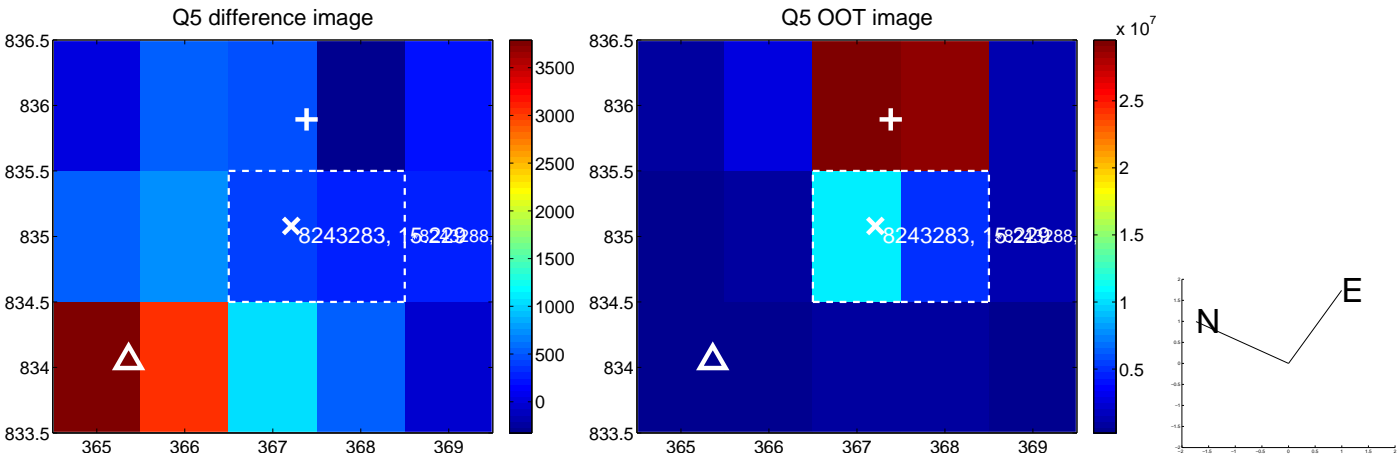


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

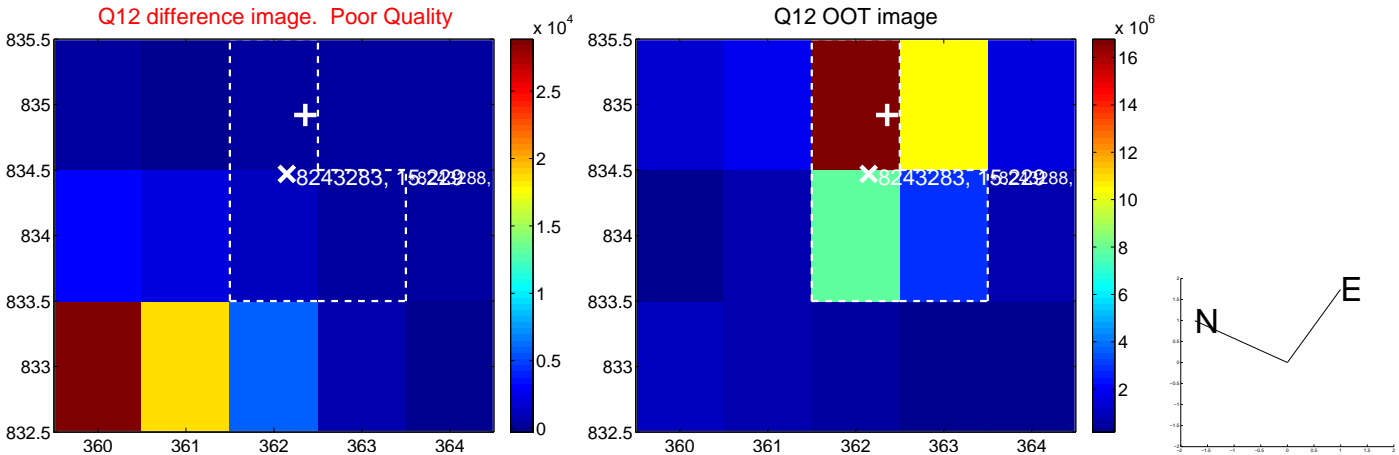
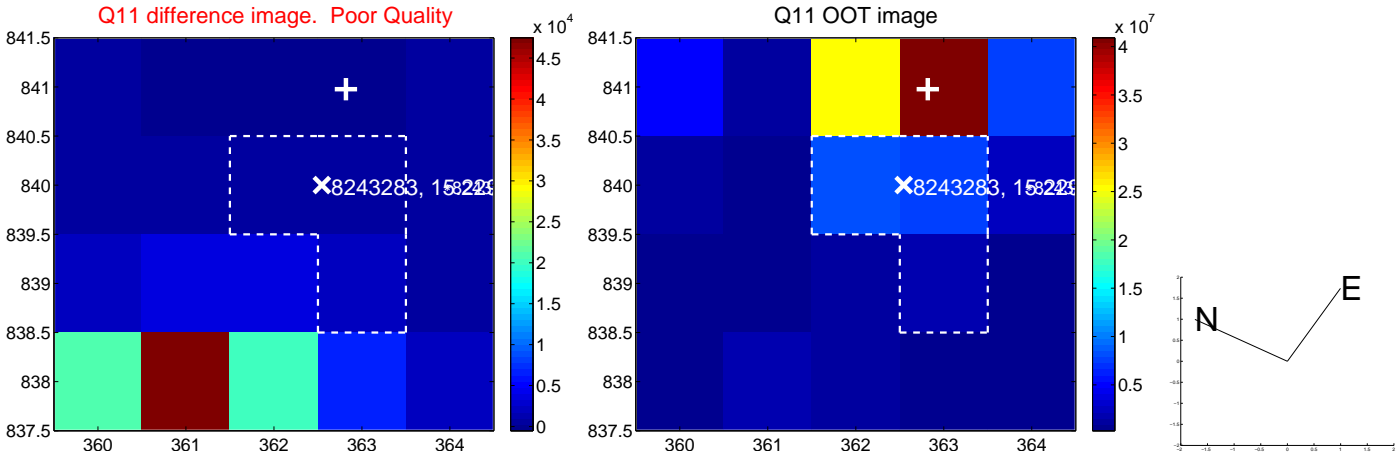
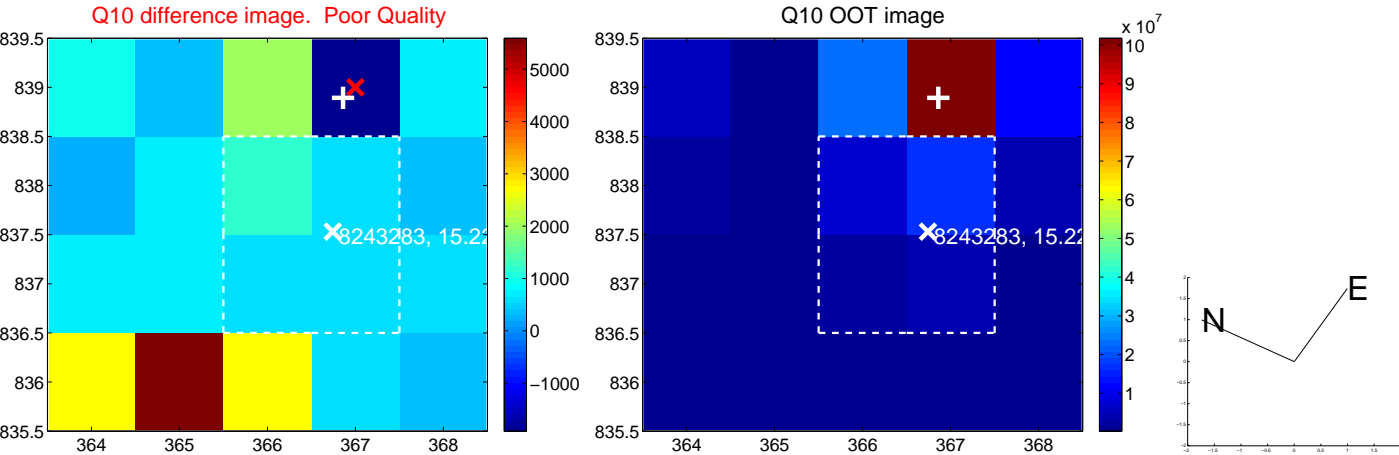
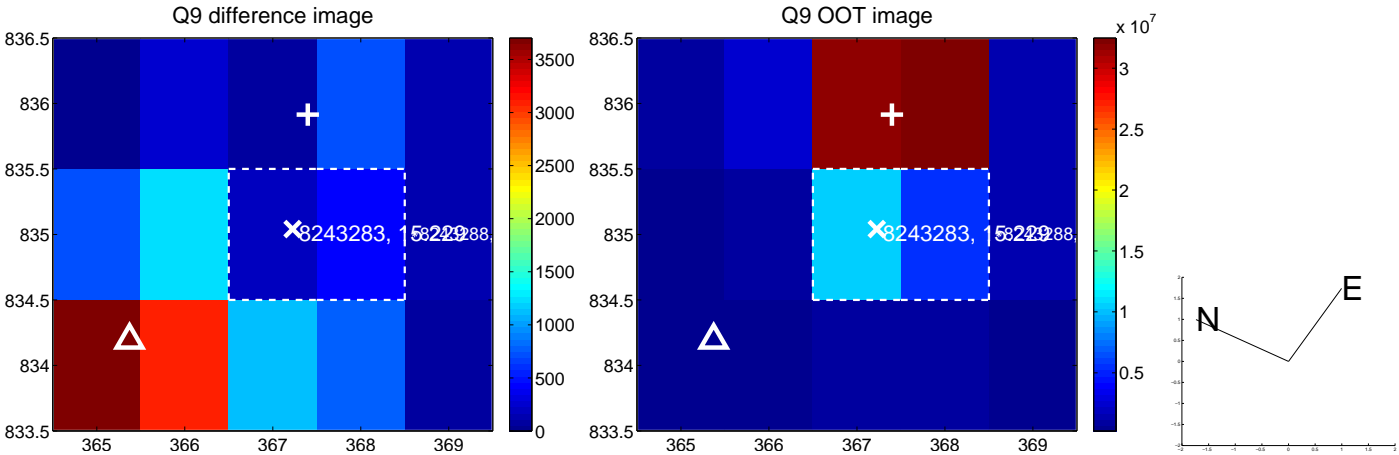


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

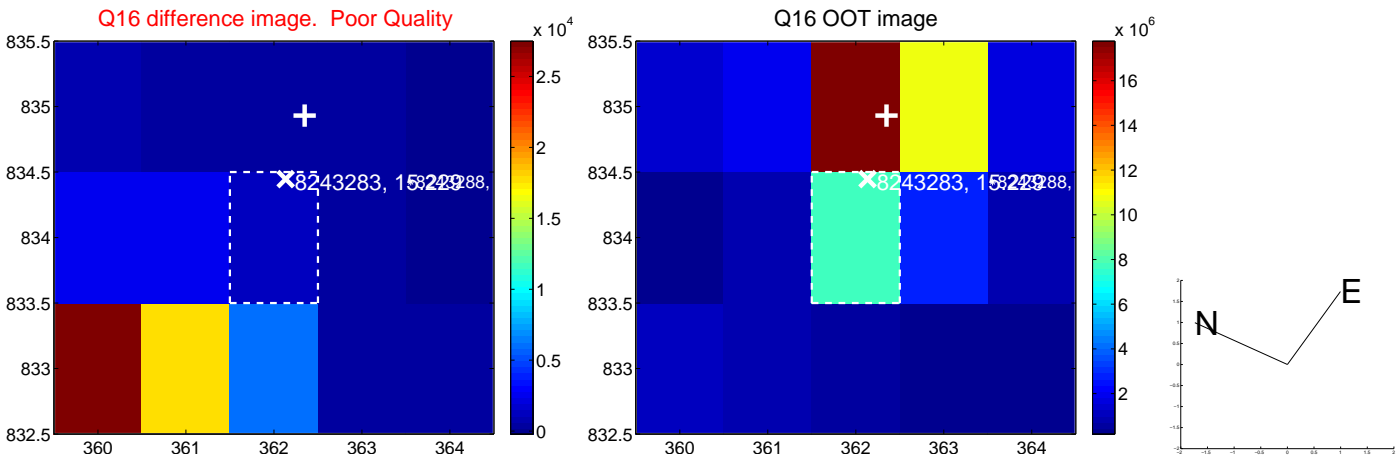
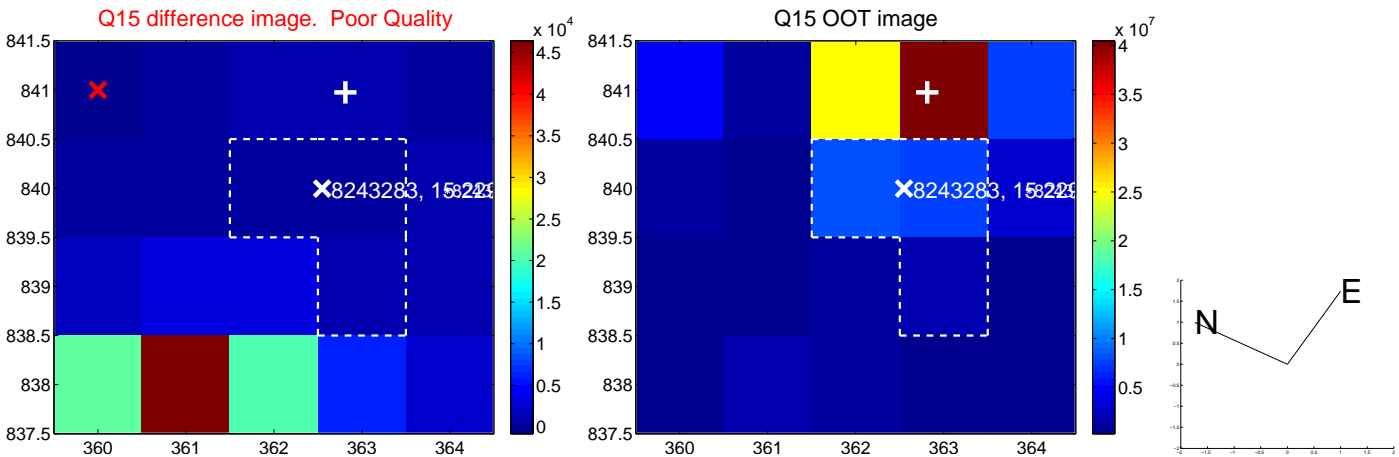
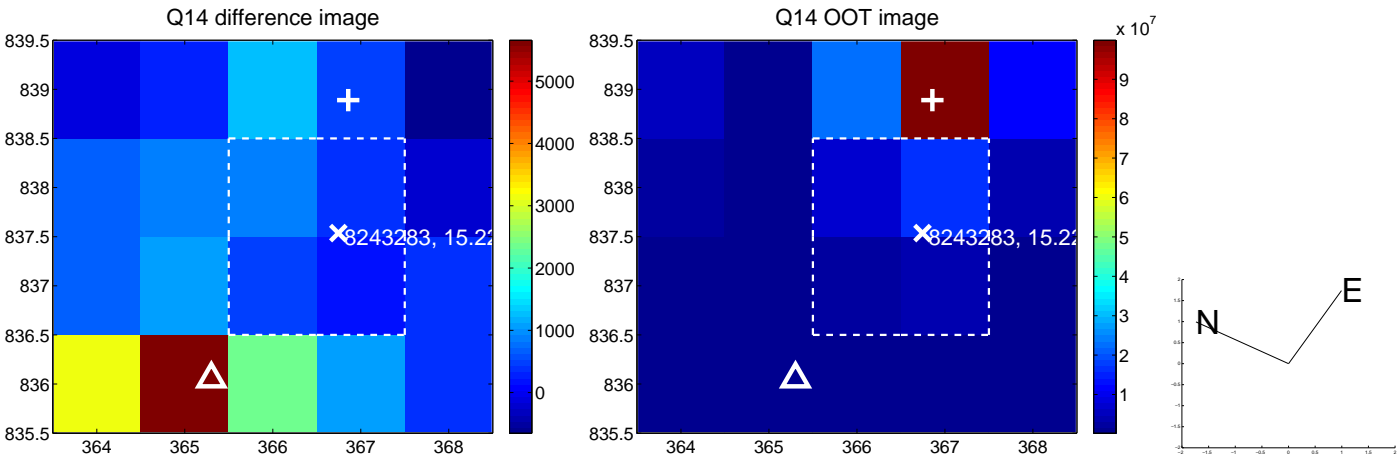
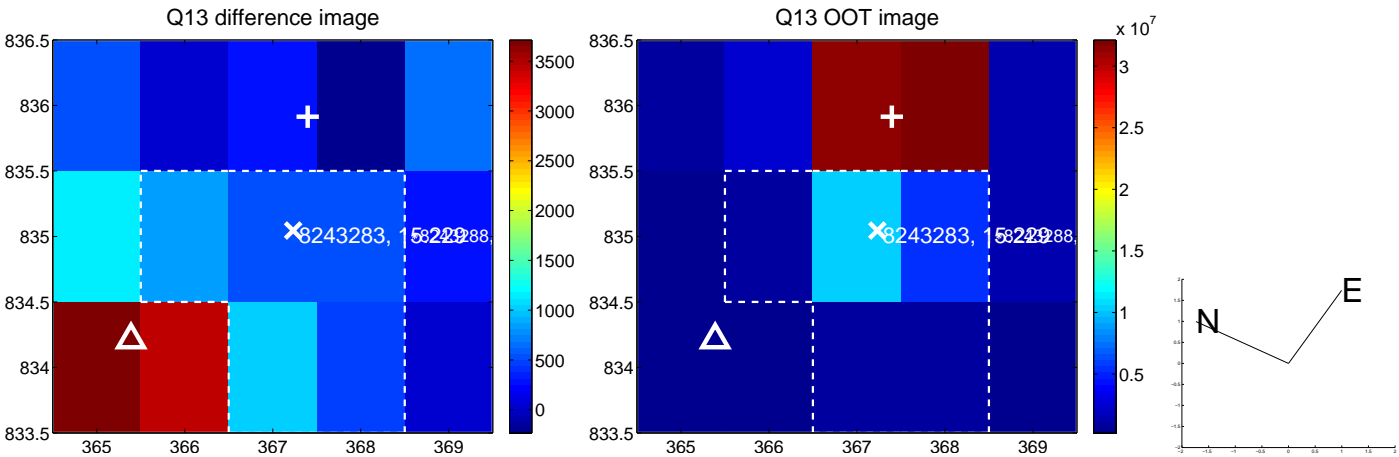




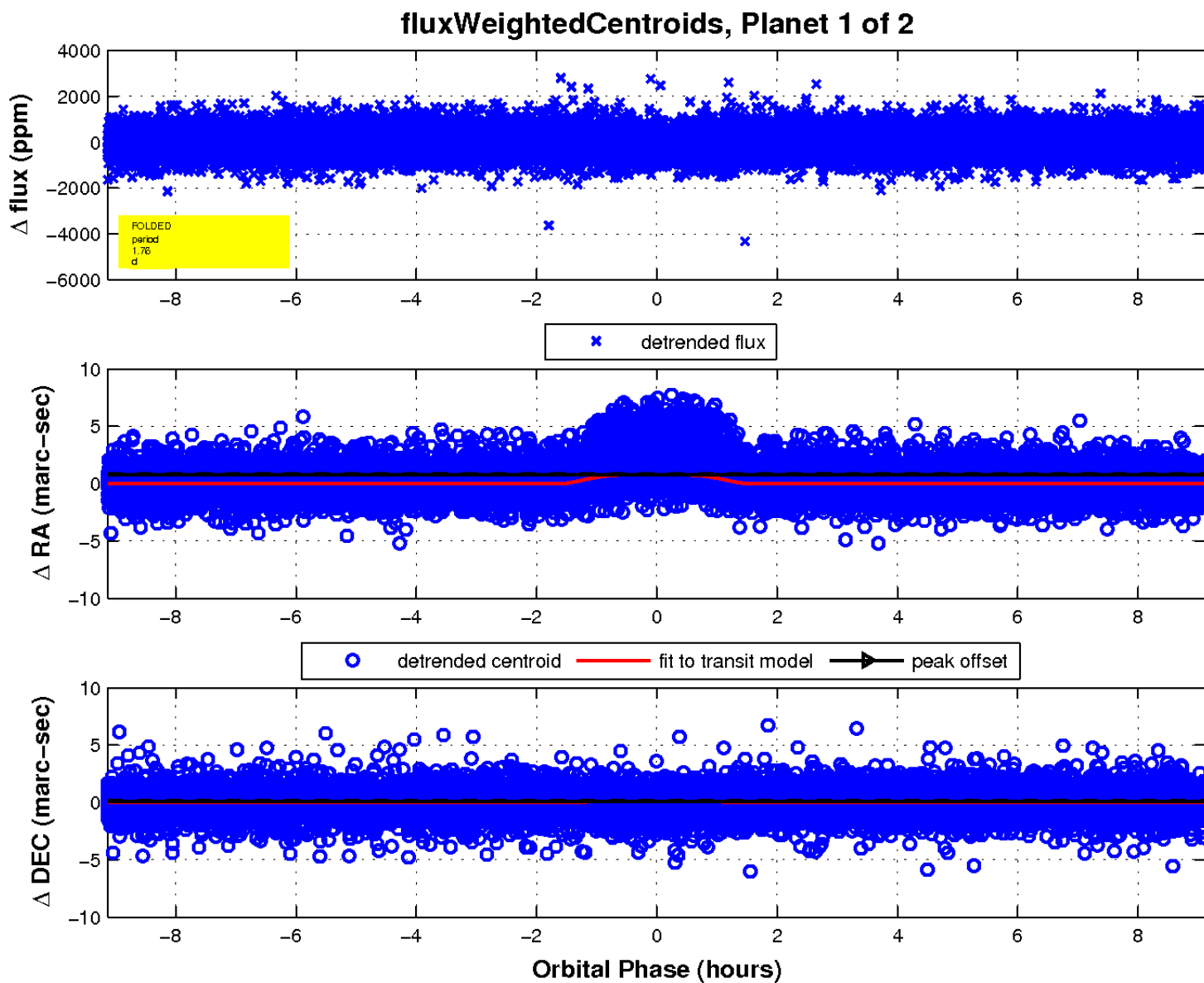
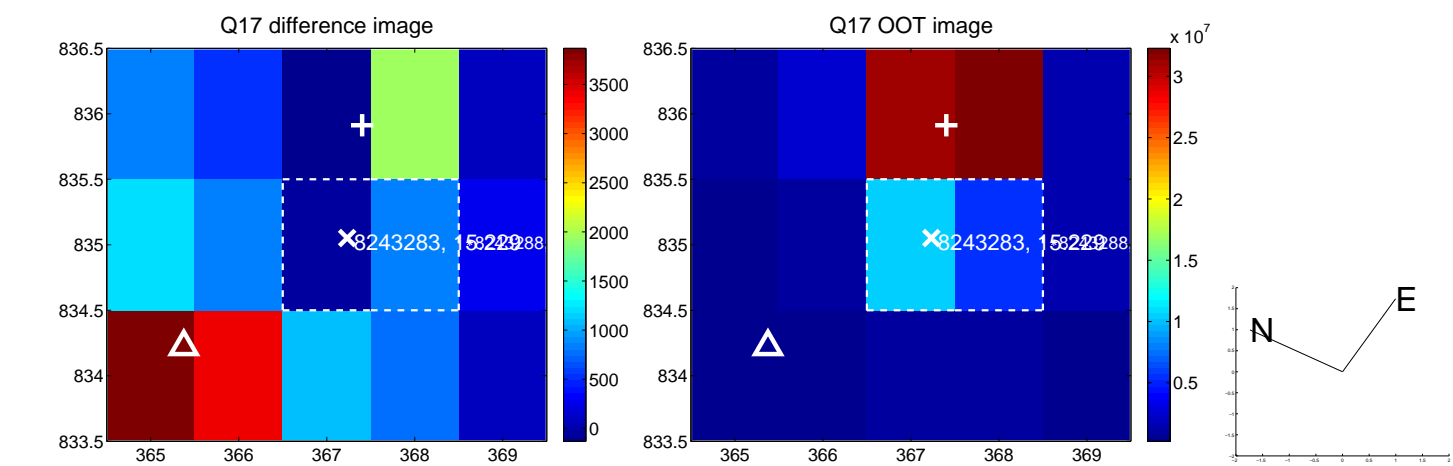
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

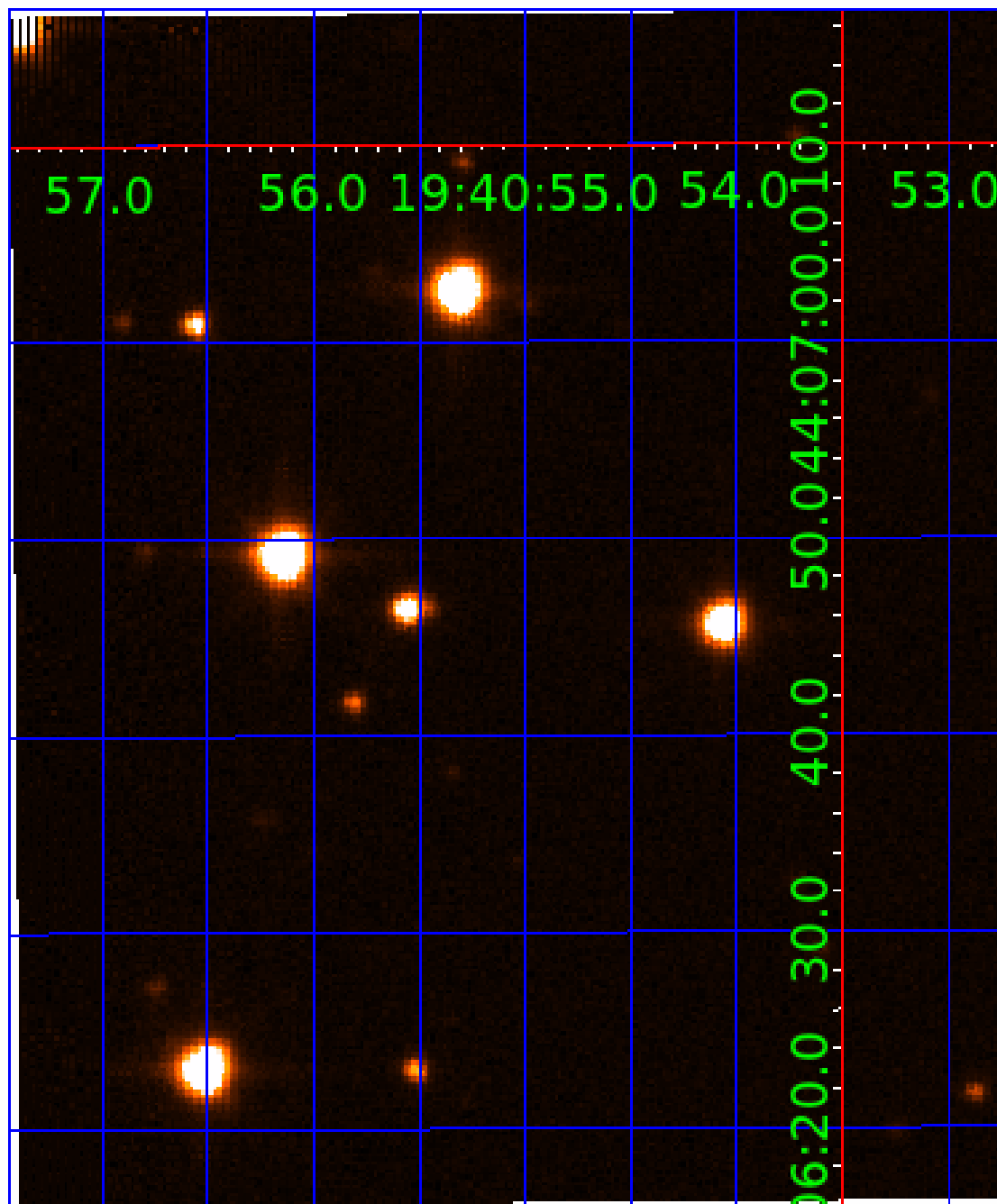


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008243283

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008243283-01	OBS	2952.01	1.759283	132.069090	138.1	3.043	12.3	13.8	0.98	5784	1.57	1260.93
008243283-02	OBS	No	249.278528	345.999299	799.9	14.161	7.9	6.9	0.98	5784	4.60	1.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008243283-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH
008243283-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—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 008243283-02

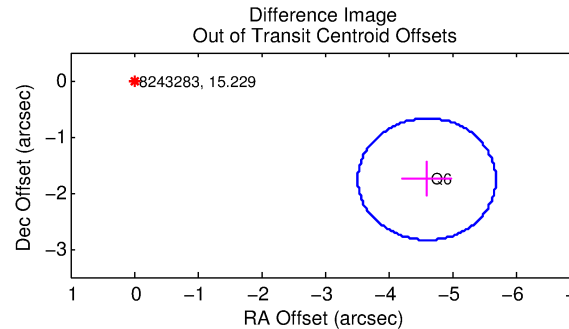
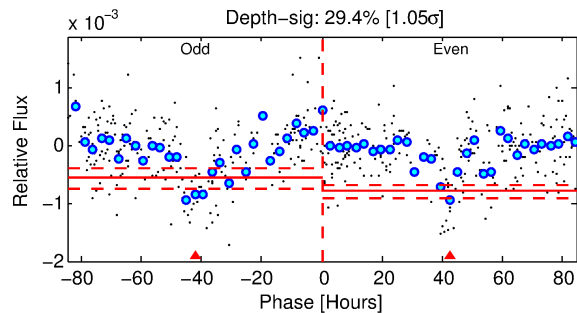
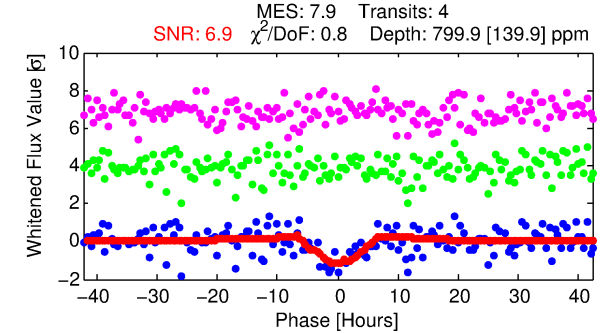
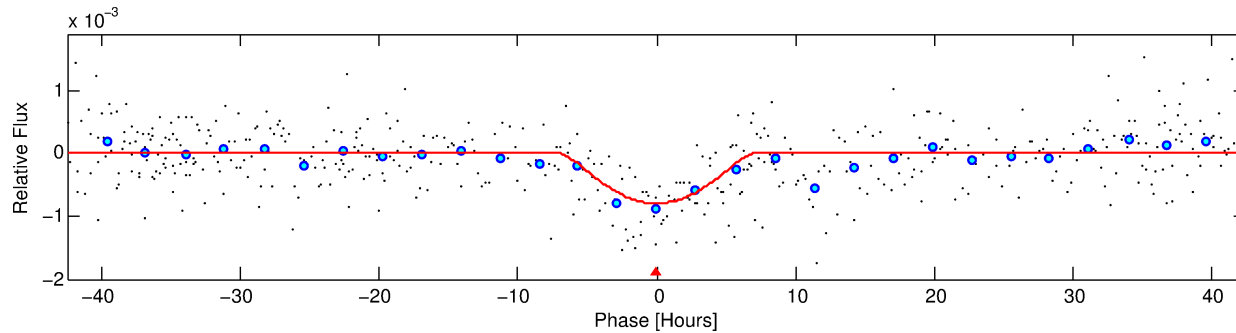
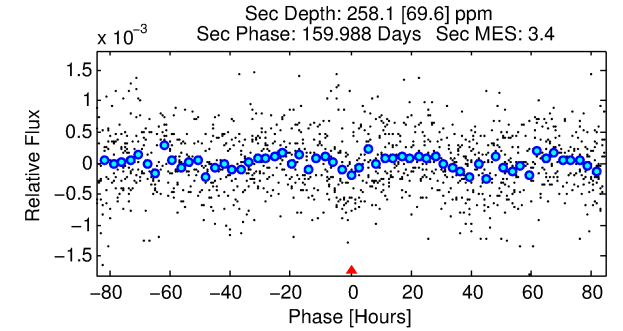
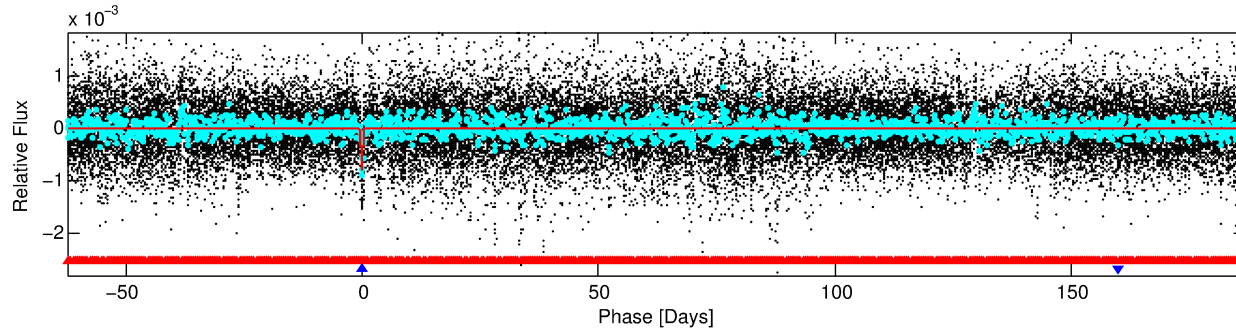
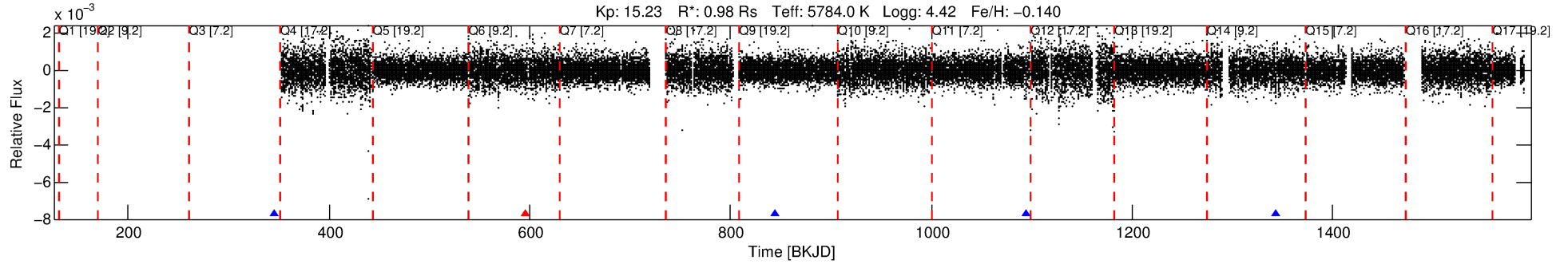
No Significant Match Found

# DV One-Page Summary

KIC: 8243283 Candidate: 2 of 2 Period: 249.279 d

KOI: K02952 Corr: No Ephemeris Match

Kp: 15.23 R\*: 0.98 Rs Teff: 5784.0 K Logg: 4.42 Fe/H: -0.140



## DV Fit Results:

Period = 249.27853 [0.01622] d  
Epoch = 345.9993 [0.0450] BKJD  
Rp/R\* = 0.0429 [0.0823]  
a/R\* = 45.14 [27.75]  
b = 0.99 [0.14]  
Seff = 1.71 [0.65]  
Teq = 291 [28] K  
Rp = 4.60 [8.94] Re  
a = 0.7542 [0.1843] AU  
Ag = 3813.69 [14754.67] [0.26σ]  
Teff = 3541 [3413] K [0.95σ]

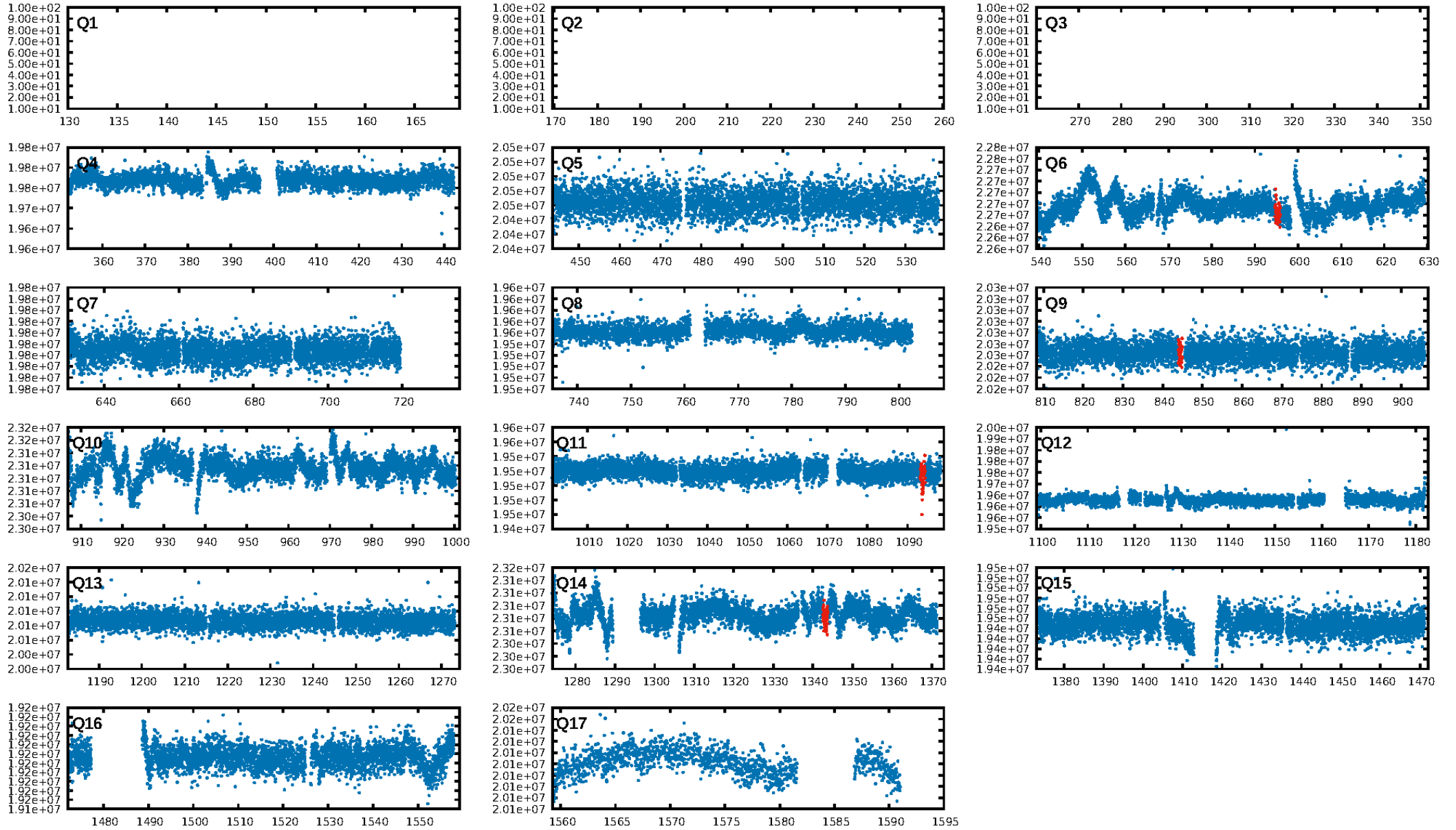
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [410.14σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 21.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.74e-10  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: -4.274  
Centroid-sig: 2.5%  
Centroid-so: 2.591 arcsec [6.11σ]  
OotOffset-rm: 4.930 arcsec [13.65σ]  
KicOffset-rm: 0.591 arcsec [1.87σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/2]

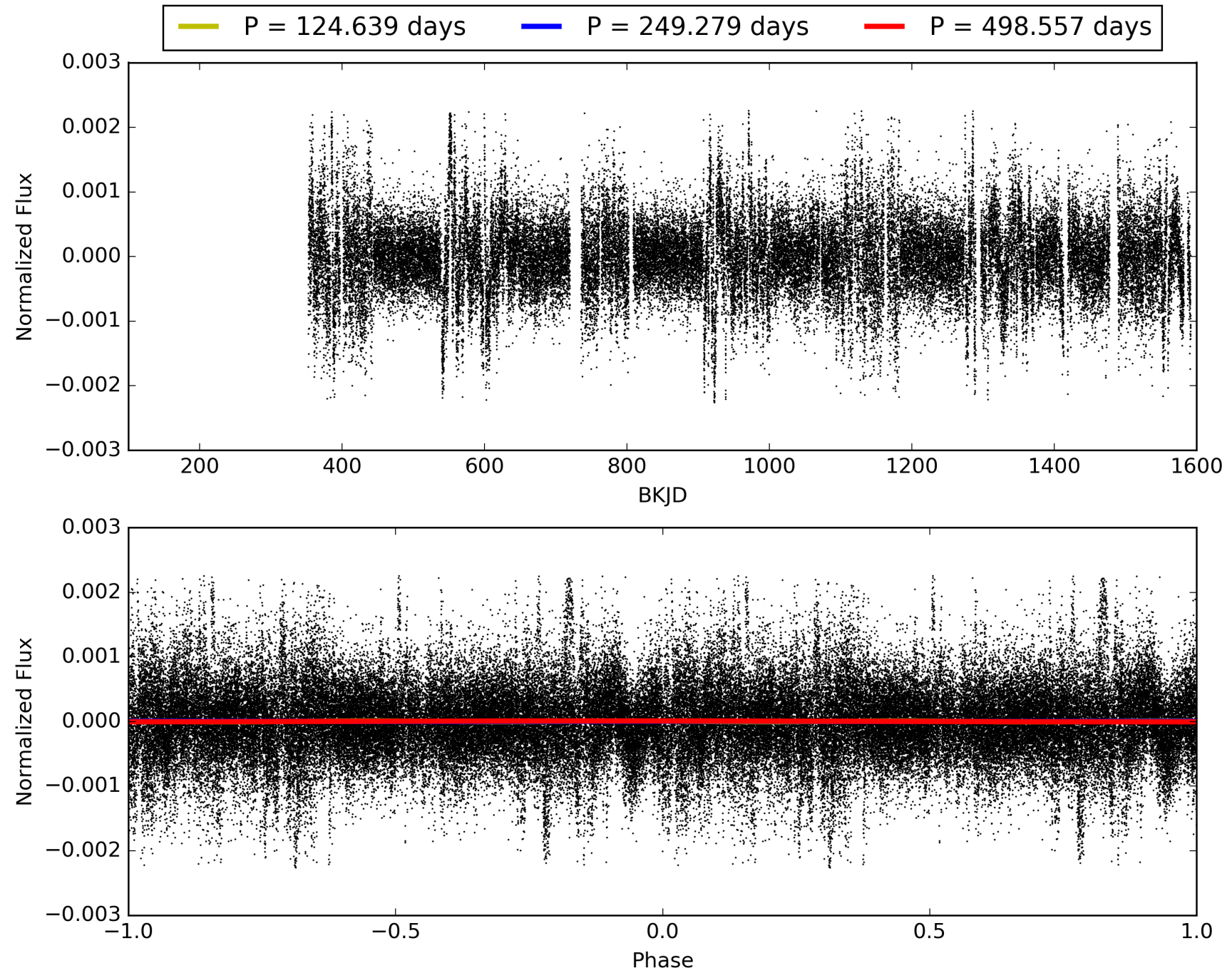
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:06:27 Z

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

# TCE 008243283-02, PDC Light Curves



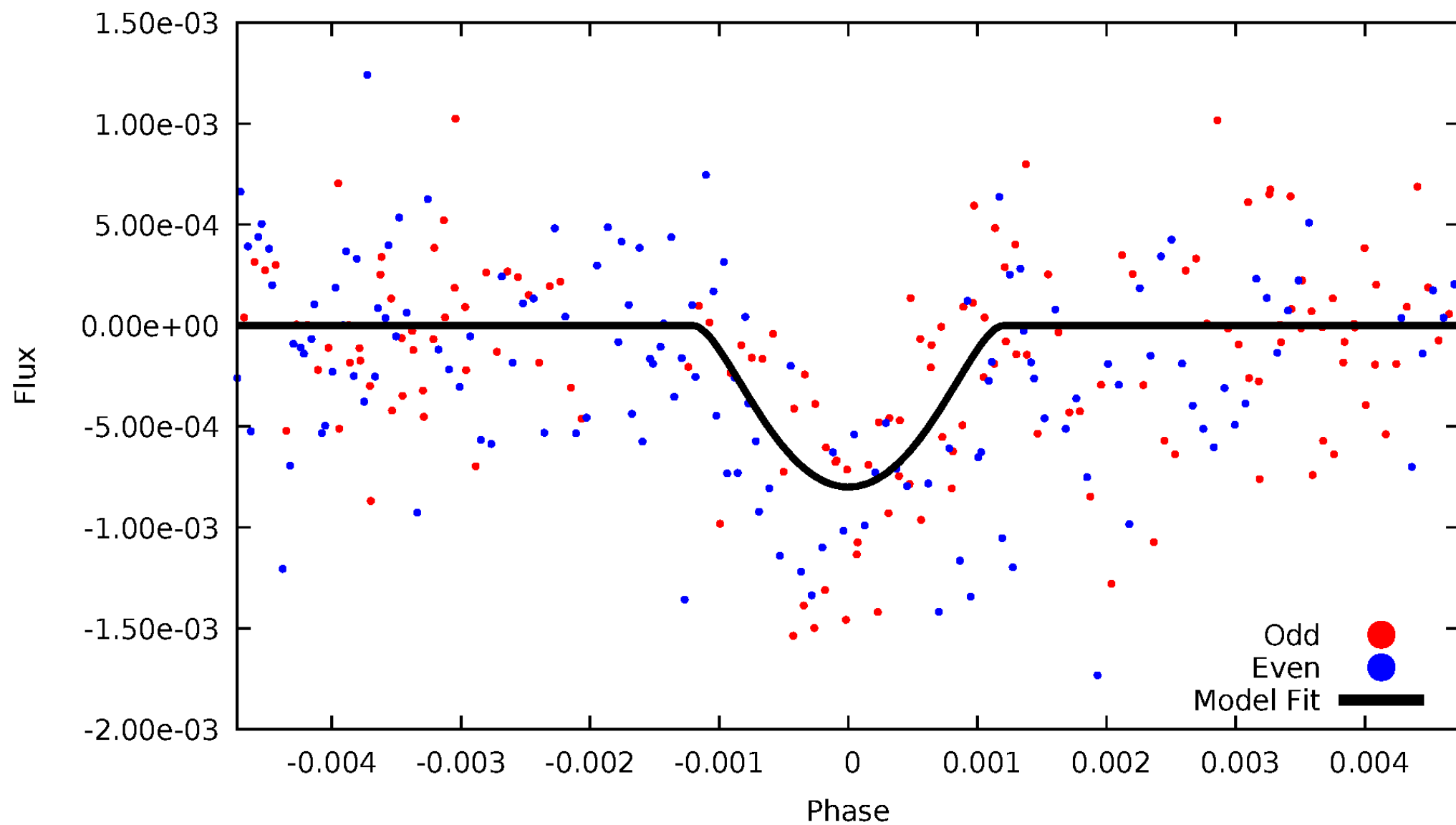
# TCE 008243283-02





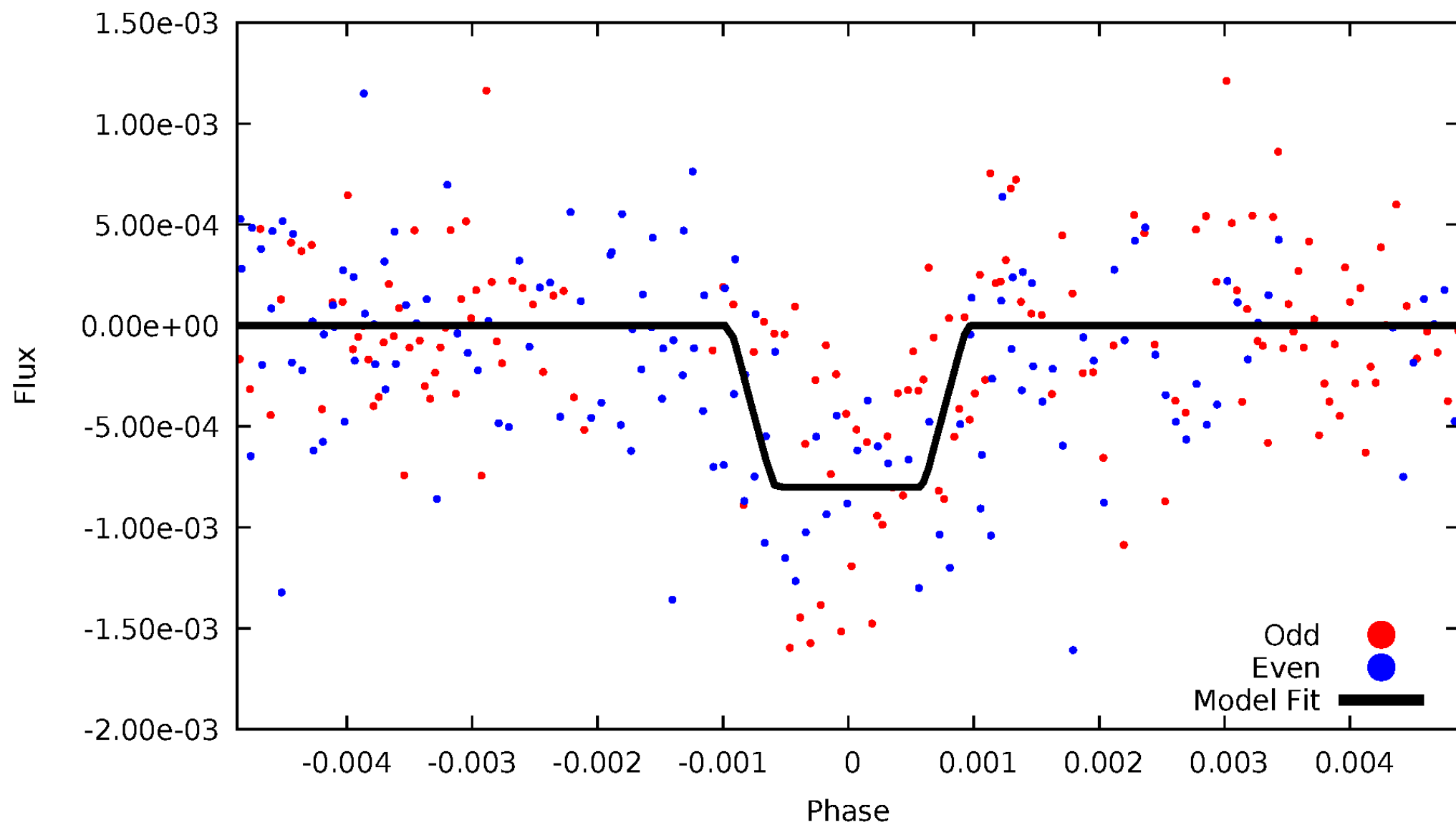
# DV Odd/Even

TCE 008243283-02



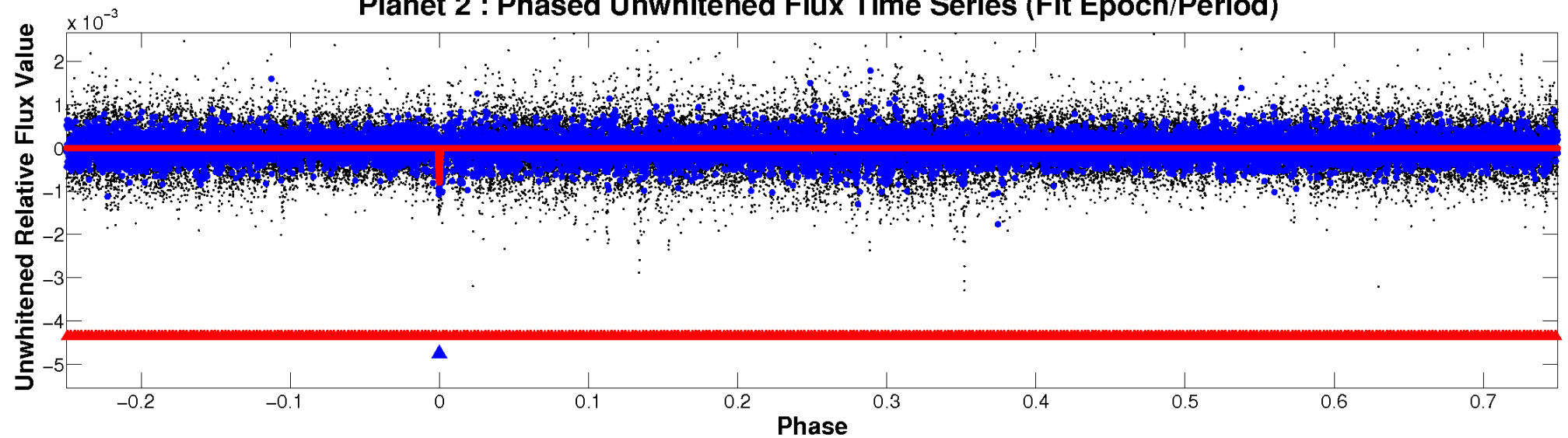
# ALT Odd/Even

TCE 008243283-02

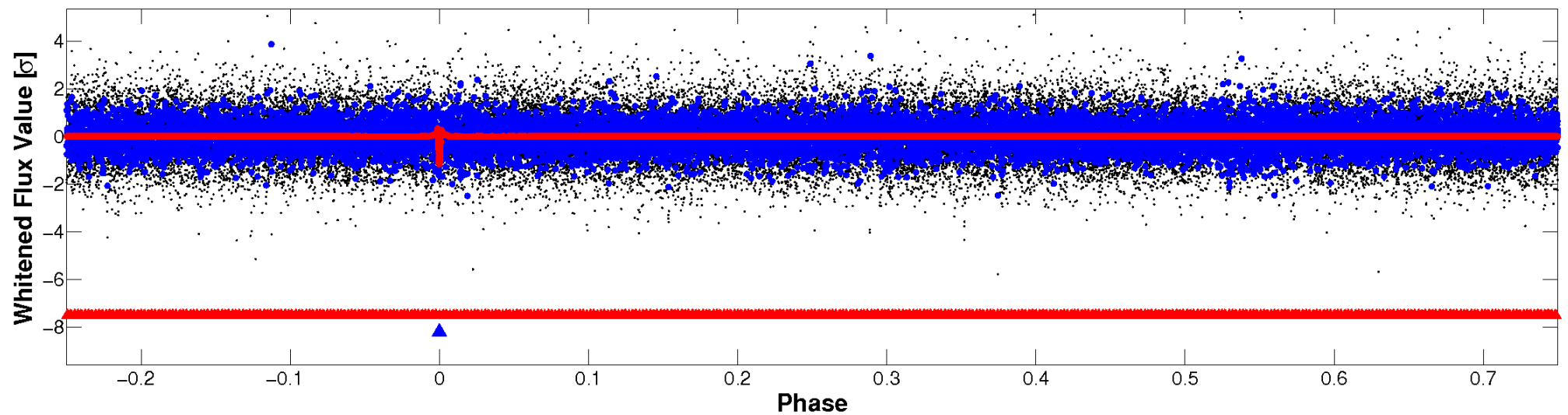


# Non-Whitened Vs. Whitened Light Curve

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

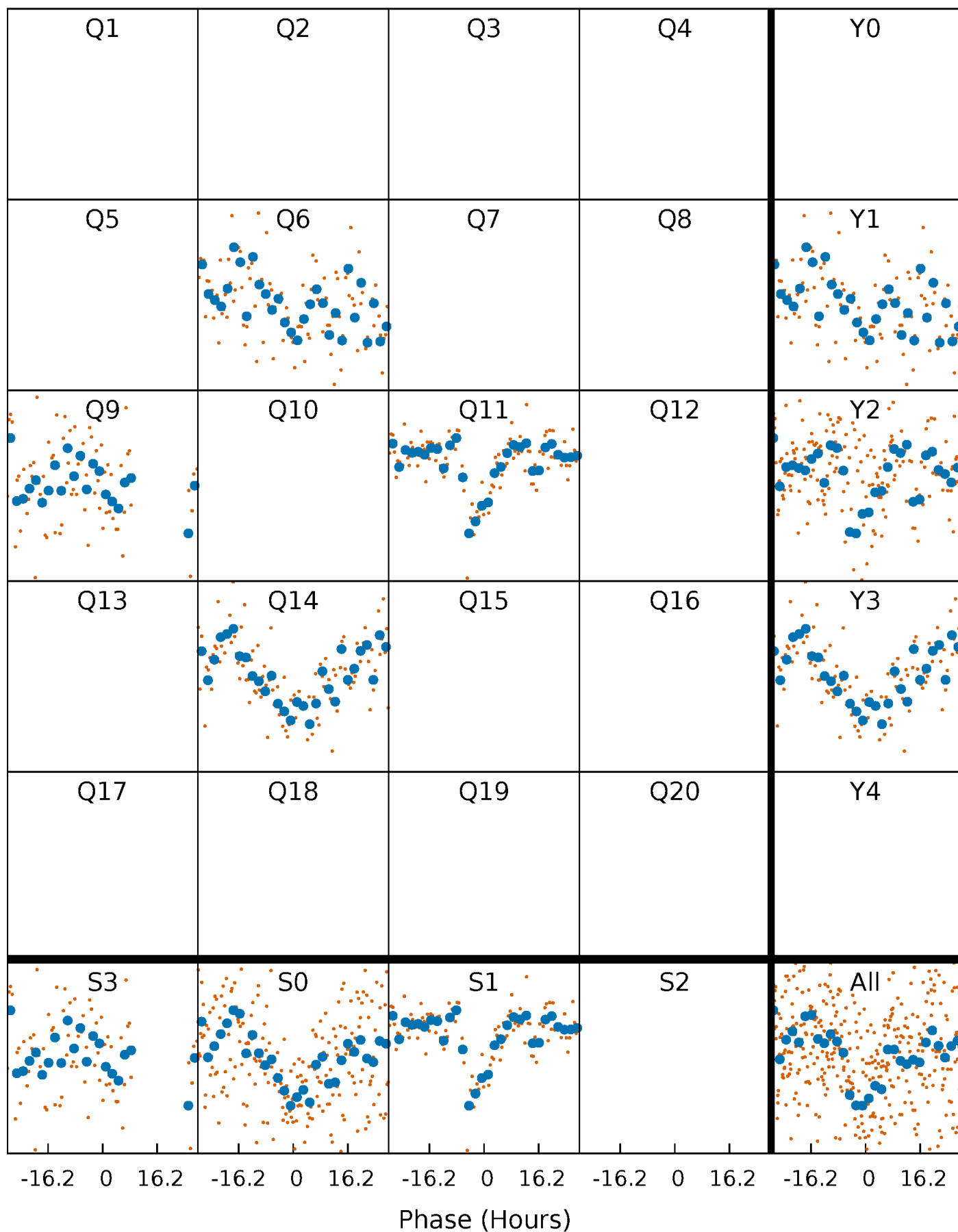


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



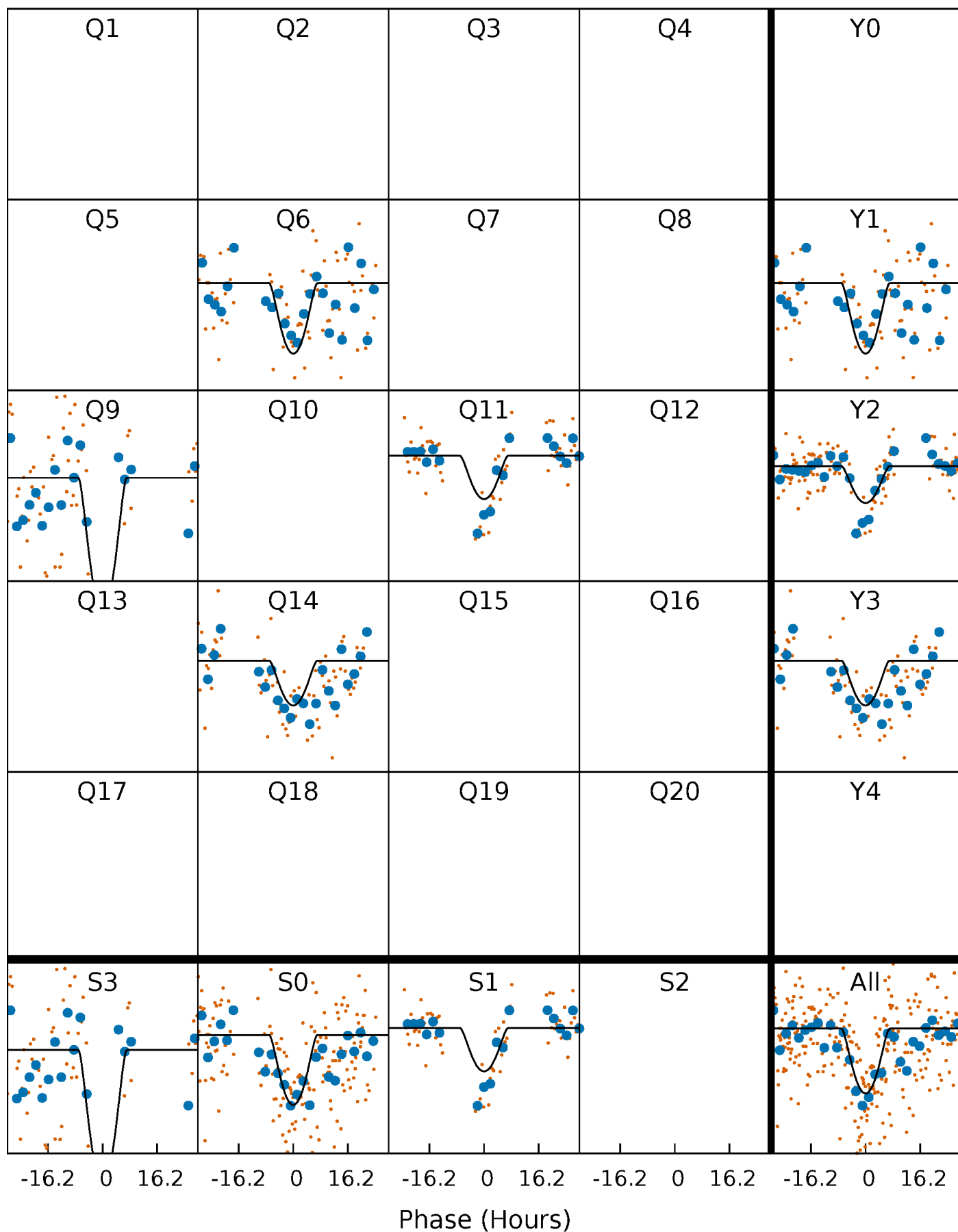
# PDC Quarter-Phased Transit Curves

TCE 008243283-02 P=249.278528 Days  $T_0=345.999299$  (BKJD)



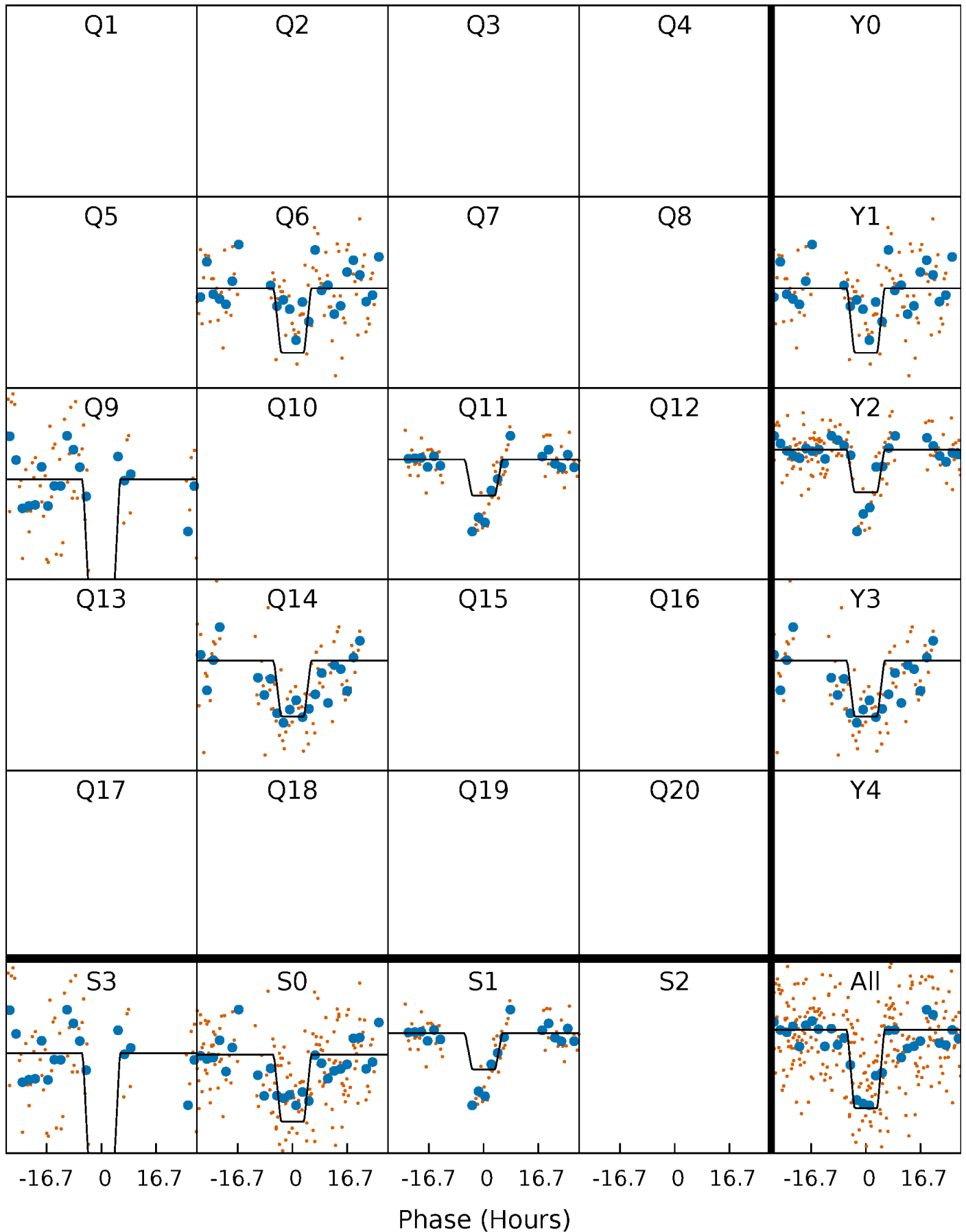
# DV Quarter-Phased Transit Curves

TCE 008243283-02     $P=249.278528$  Days     $T_0=345.999299$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

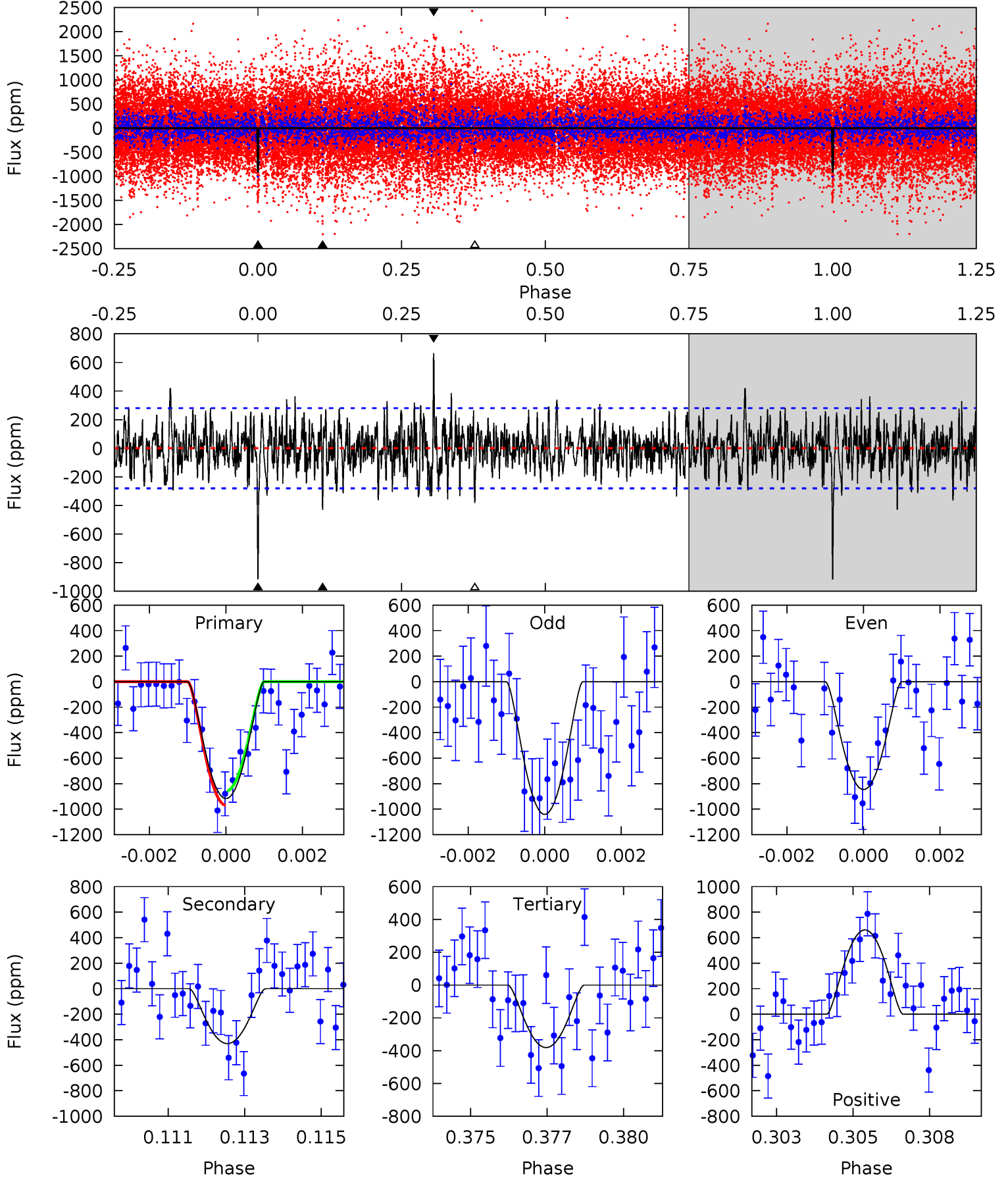
TCE 008243283-02     $P=249.303054$  Days     $T_0=345.935426$  (BKJD)



# DV Model-Shift Uniqueness Test

008243283-02, P = 249.278528 Days, E = 345.999299 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
17.3	8.12	7.19	12.5	5.29	3.04	2.24	10.1	4.83	0.92	-4.35	1.82	1.02	0.42	1.06

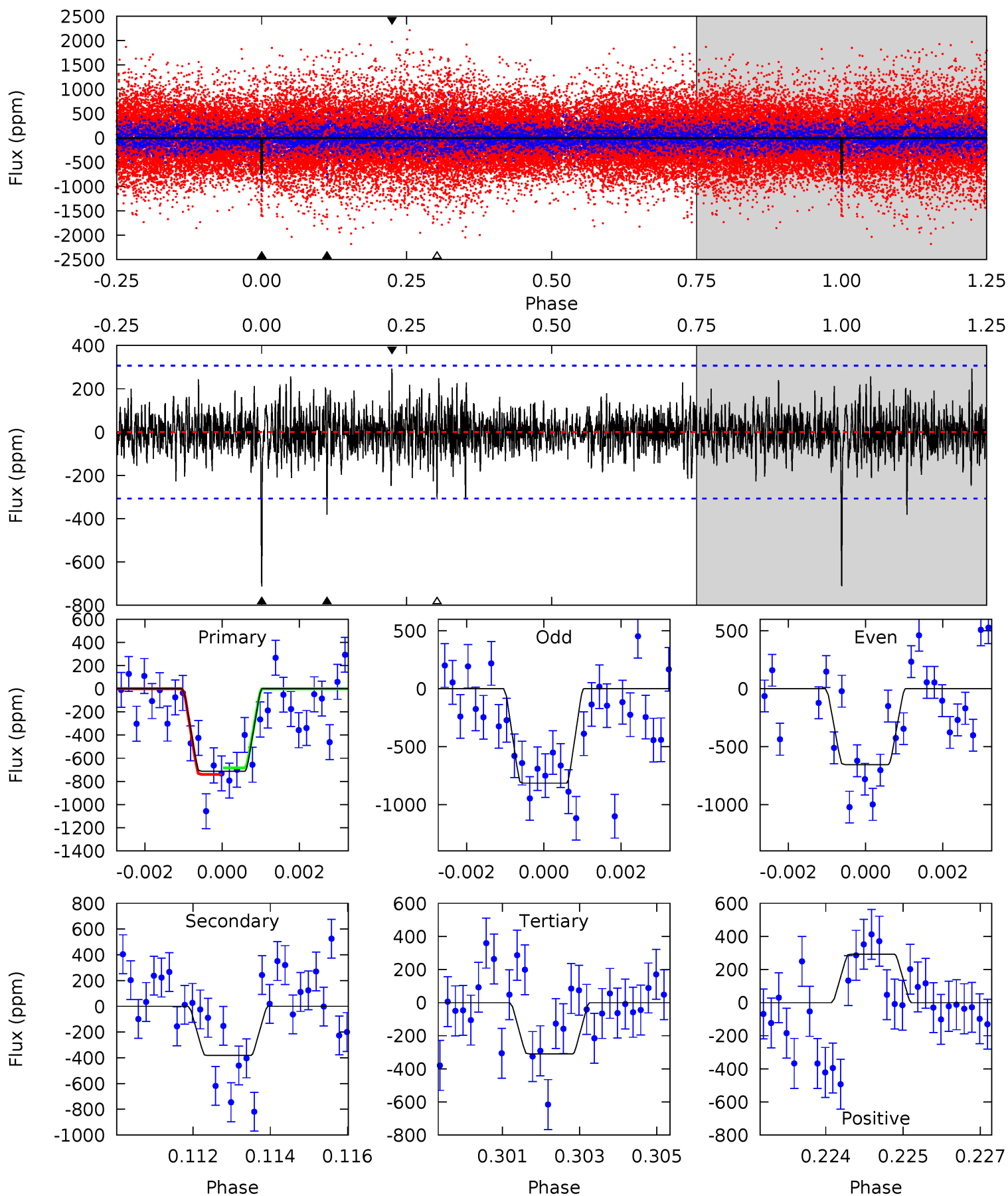




# Alt Model-Shift Uniqueness Test

008243283-02, P = 249.303054 Days, E = 345.935426 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	6.64	5.38	5.09	5.34	3.11	1.24	6.99	7.29	1.26	1.56	1.37	1.06	0.29	0.51



### Stellar Parameters For KIC 008243283

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5784^{+172}_{-190}$	$4.416^{+0.105}_{-0.195}$	$-0.140^{+0.300}_{-0.300}$	$0.984^{+0.285}_{-0.142}$	$0.921^{+0.123}_{-0.089}$	$1.362^{+0.740}_{-0.645}$
	+3%/-3%	+2%/-4%	+214%/-214%	+29%/-14%	+13%/-10%	+54%/-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 008243283-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-430 \pm 53$	$8.34^{+7.99}_{-5.74}$	$412^{+30}_{-24}$	$3501^{+1882}_{-631}$	$1922^{+18043}_{-1424}$
Alt.	$-382 \pm 58$	$7.26^{+7.77}_{-5.12}$	$411^{+29}_{-21}$	$3601^{+2095}_{-696}$	$2202^{+22844}_{-1682}$

$T_{max}$  = 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

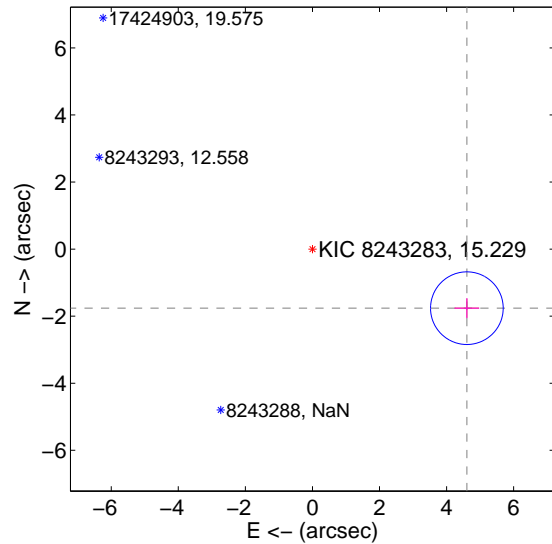
Supplemental centroid analysis for 008243283-02. Kepler magnitude: 15.23. Transit SNR 6.85

There are 0 quarters with good PRF difference image offsets

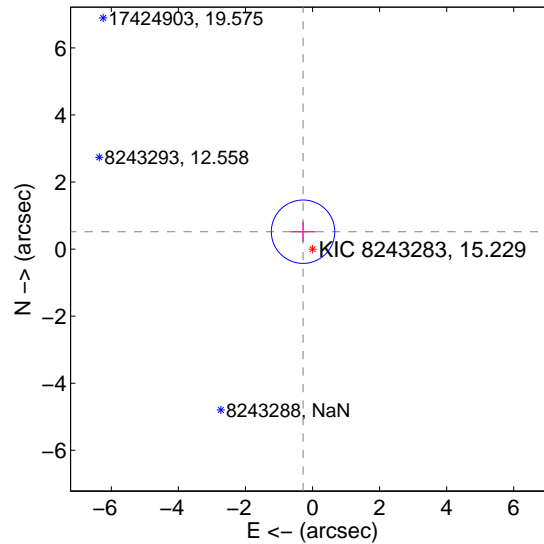
The OOT PRF centroid is offset from the target star catalog position by about 5.39 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.930 \pm 0.361$	13.65	$-4.605 \pm 0.370$	$-1.762 \pm 0.297$
PRF-fit source offset from KIC position	$0.591 \pm 0.315$	1.87	$0.283 \pm 0.370$	$0.519 \pm 0.297$
photometric centroid source offset	$2.59 \pm 0.42$	6.11	$2.29 \pm 0.44$	$1.22 \pm 0.36$

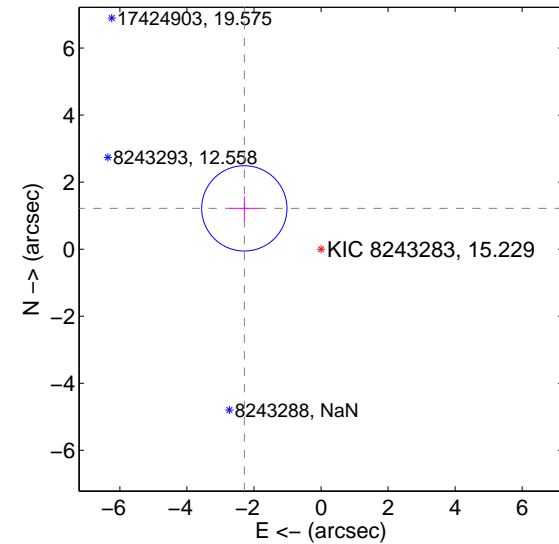
offset from difference PRF-fit to OOT PRF-fit



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.

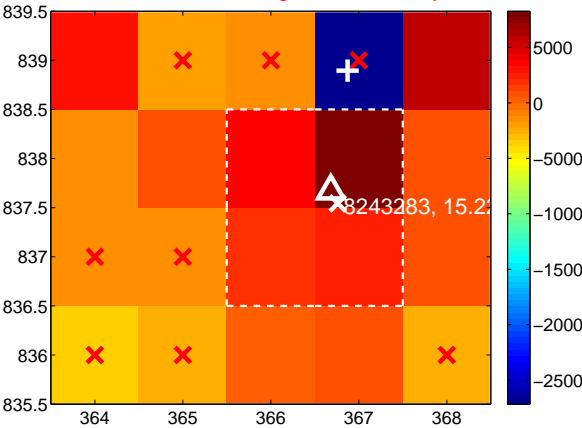
Q5 no difference image



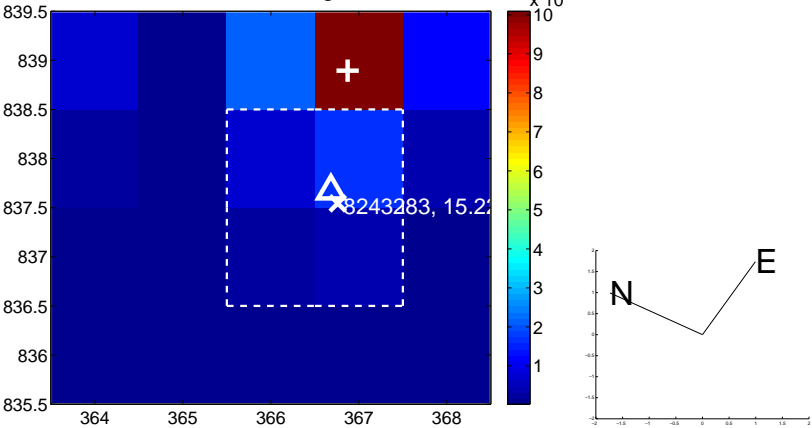
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



Q8 no difference image



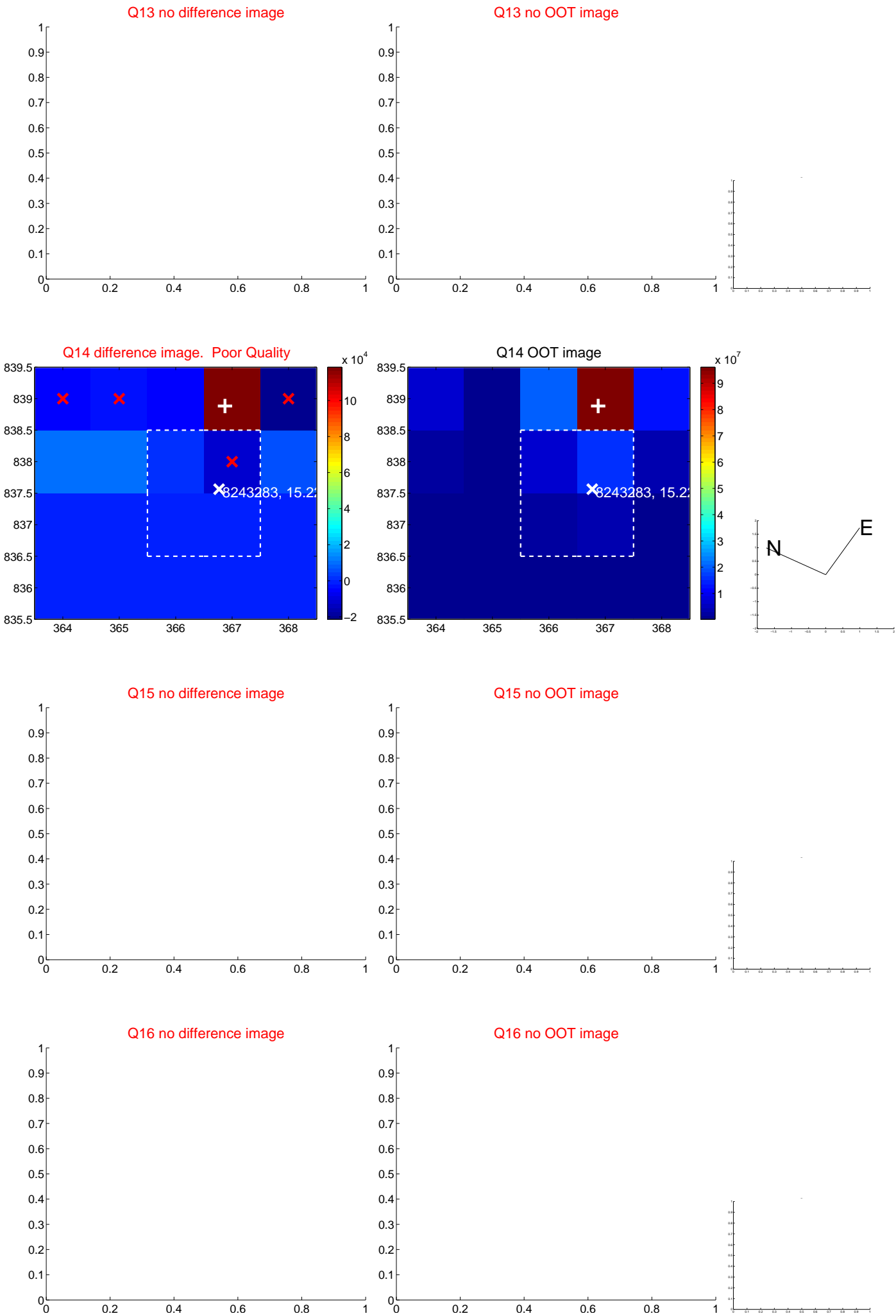
Q8 no OOT image



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

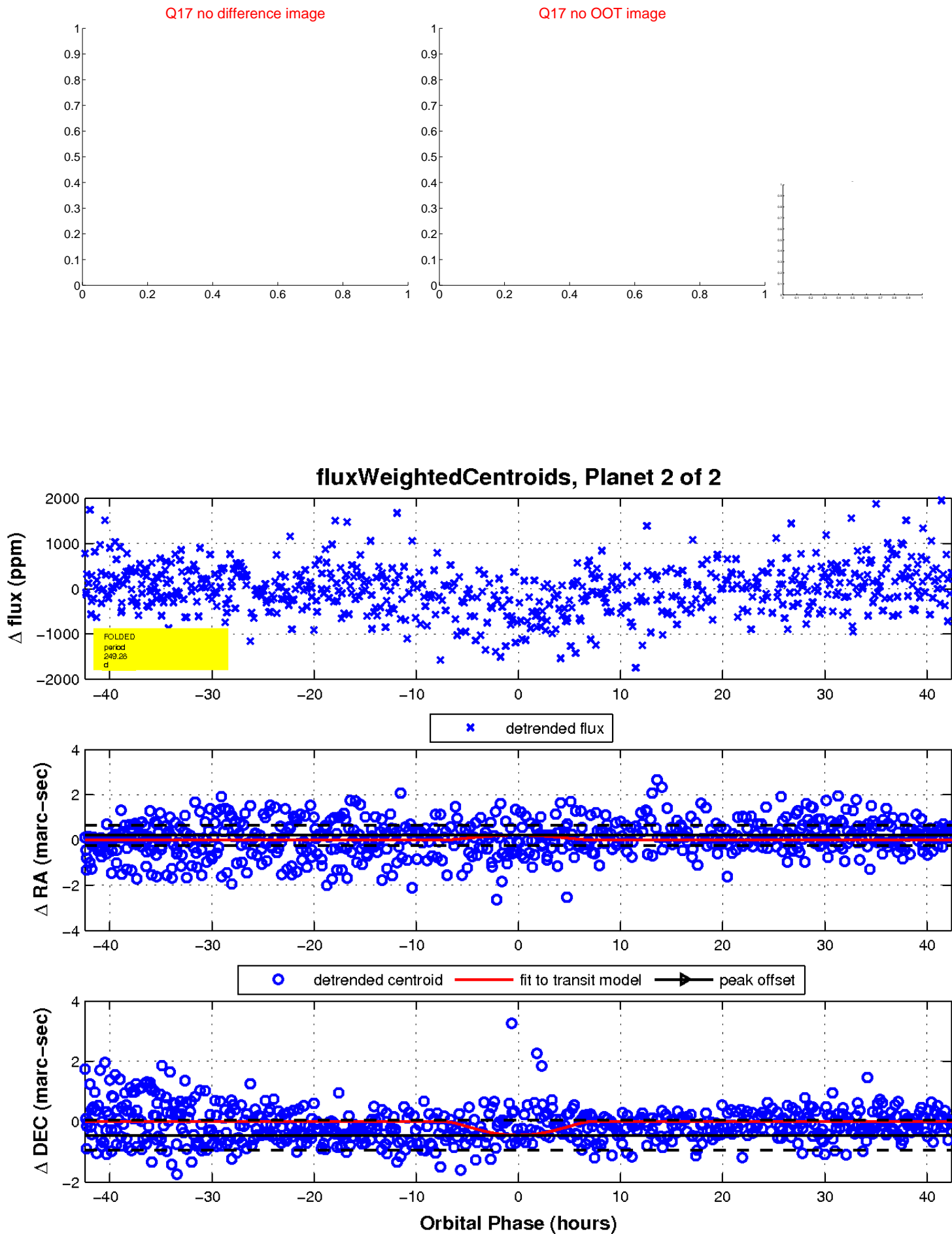


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

