

# KIC 003245638

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003245638-01	OBS	No	1.417638	132.160074	9988.3	3.071	1262.3	935.3	1.12	5851	13.48	2281.24
003245638-02	OBS	No	1.417618	132.871611	12136.5	2.000	1680.5	-1.0	1.12	5851	12.27	2281.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003245638-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—EPHEM_MATCH
003245638-02	OBS	FP	0.00	1	0	0	1	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS—EPHEM_MATCH

**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 003245638-01

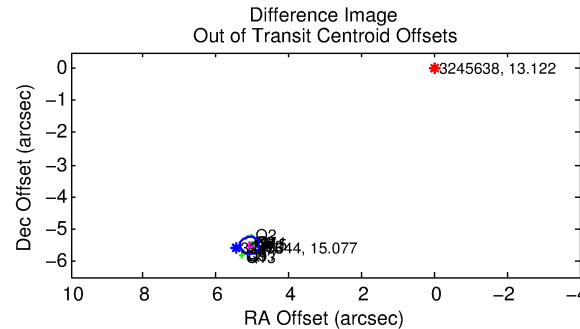
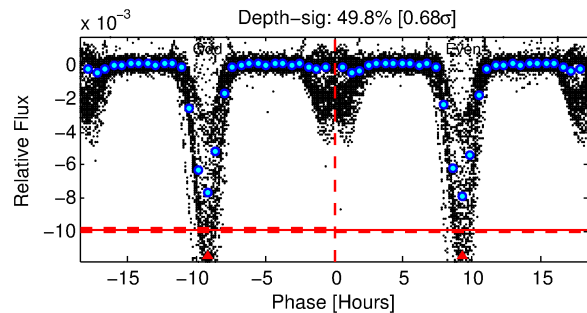
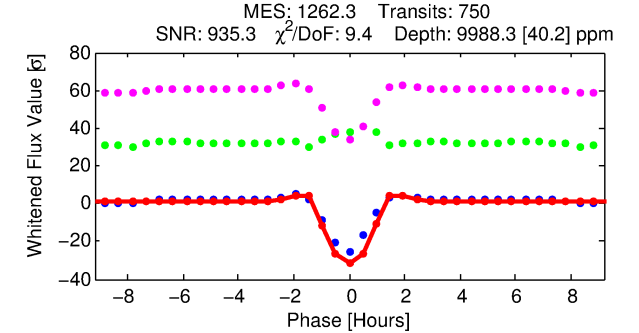
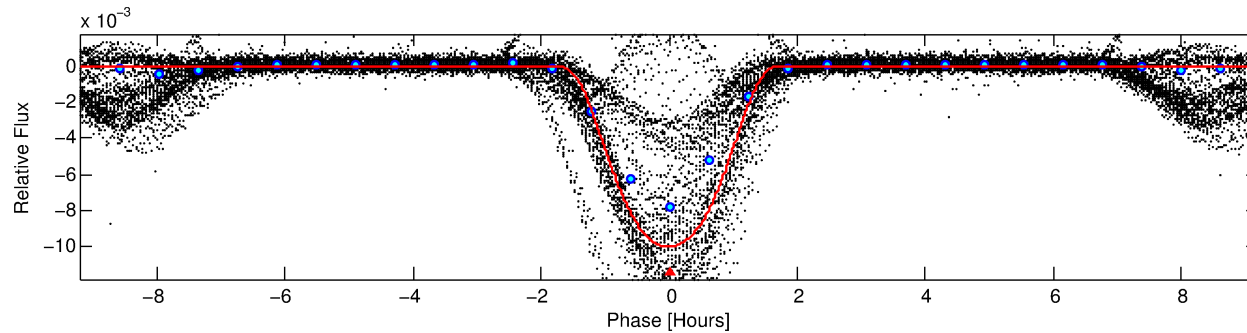
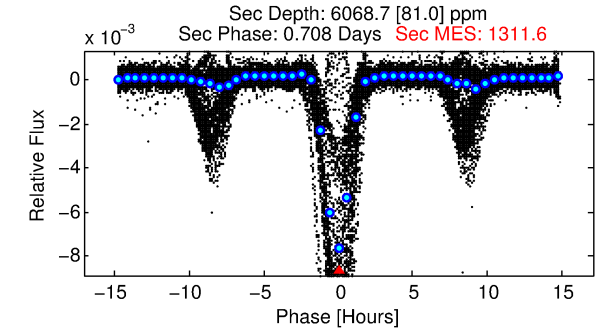
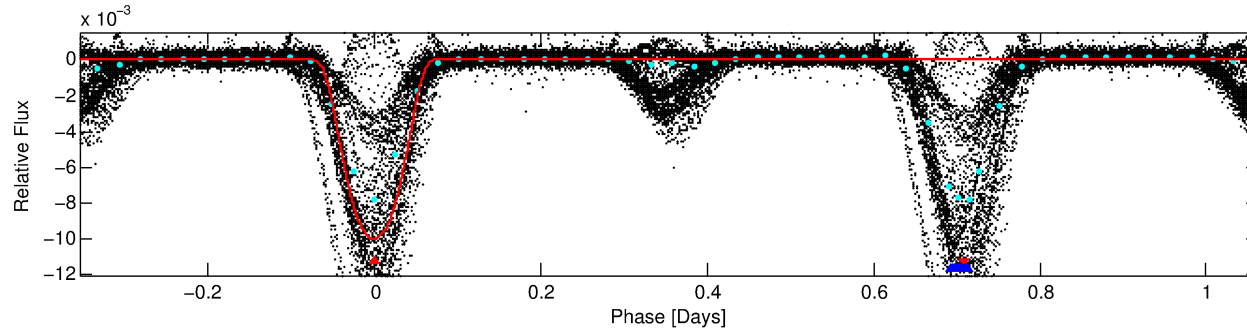
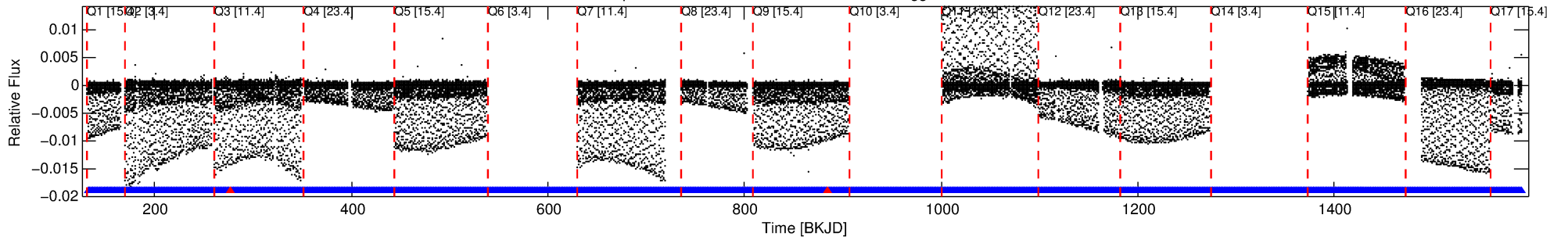
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
003245638-01	3245638	3977.01	3245661	2:1	13.2	2	-3	15.04	13.13	2.24	Direct-PRF	0	3.97	0.66

**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: 3245638 Candidate: 1 of 2 Period: 1.418 d  
KOI: K04970 Corr: No Ephemeris Match

Kp: 13.12 R\*: 1.12 Rs Teff: 5851.0 K Logg: 4.30 Fe/H: -0.220



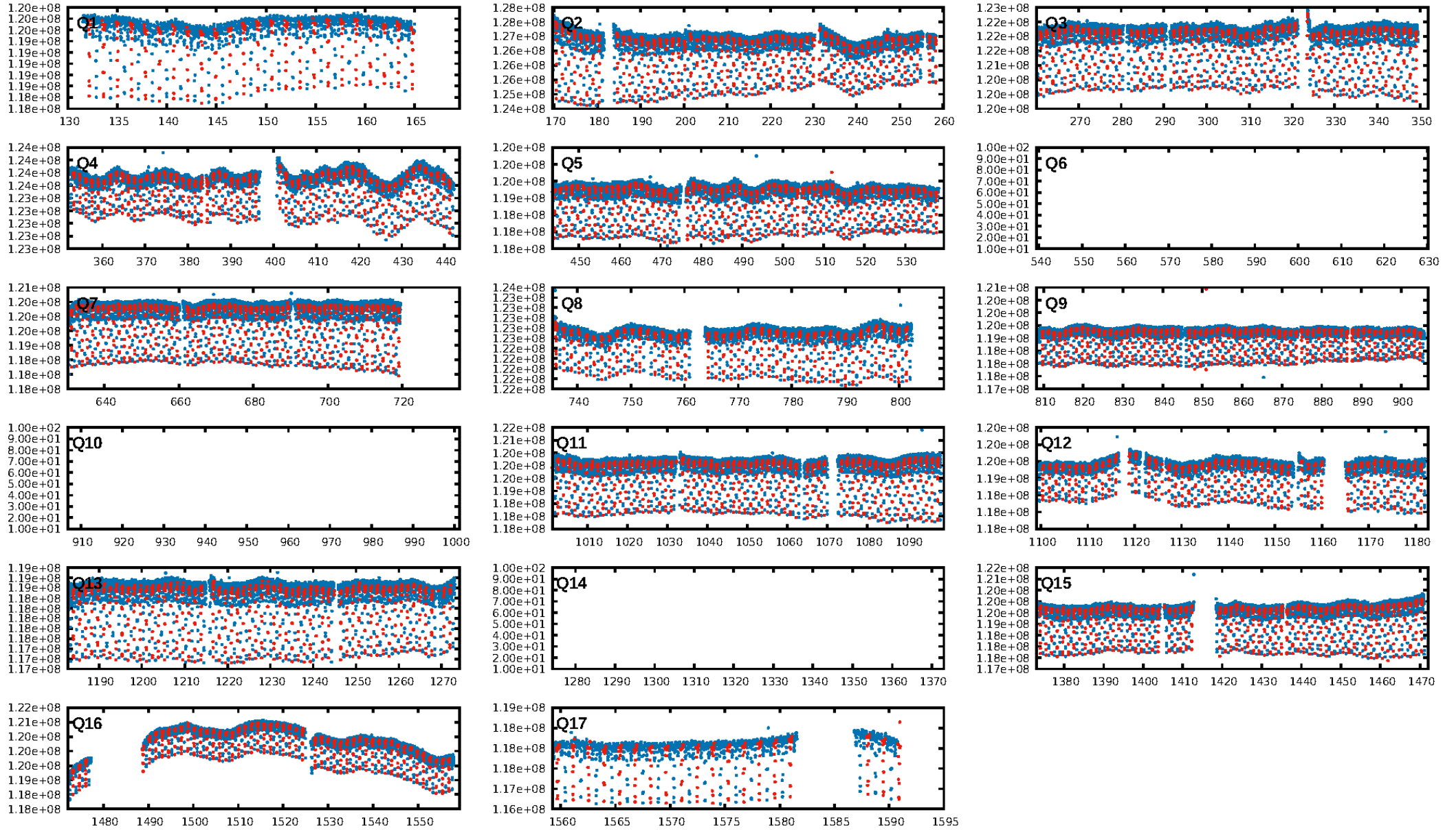
## DV Fit Results:

Period = 1.41764 [0.00000] d  
Epoch = 132.1601 [0.0001] BKJD  
Rp/R\* = 0.1107 [0.0007]  
a/R\* = 2.51 [0.01]  
b = 0.90 [0.00]  
Seff = 2281.24 [611.37]  
Teq = 1762 [118] K  
Rp = 13.48 [2.18] Re  
a = 0.0239 [0.0039] AU  
Ag = 10.54 [2.77] [3.44σ]  
Teffp = 4909 [70] K [22.94σ]

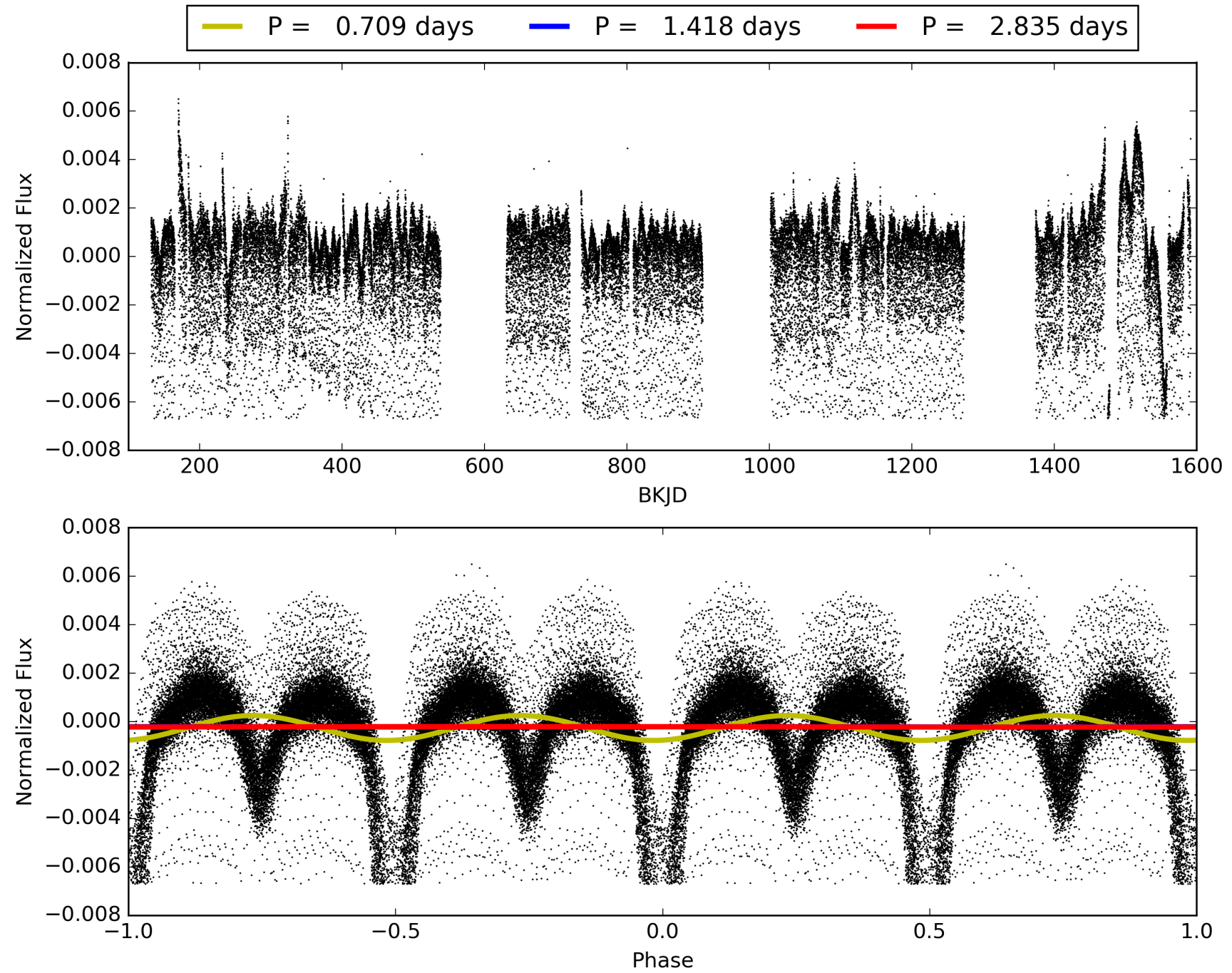
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [705/707]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 7.497 arcsec [83.82σ]  
KicOffset-rm: 7.882 arcsec [112.18σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 003245638-01, PDC Light Curves

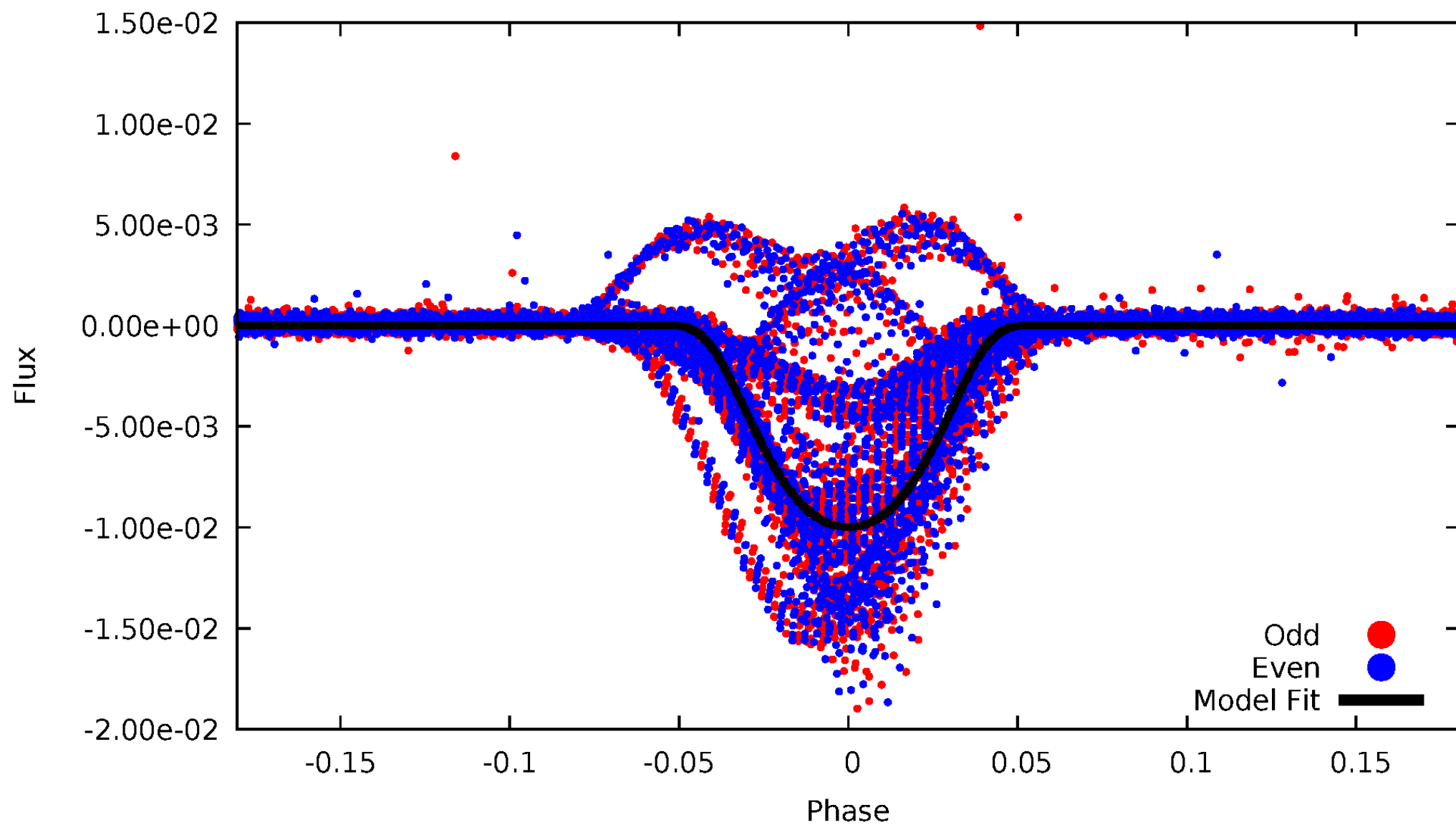


TCE 003245638-01



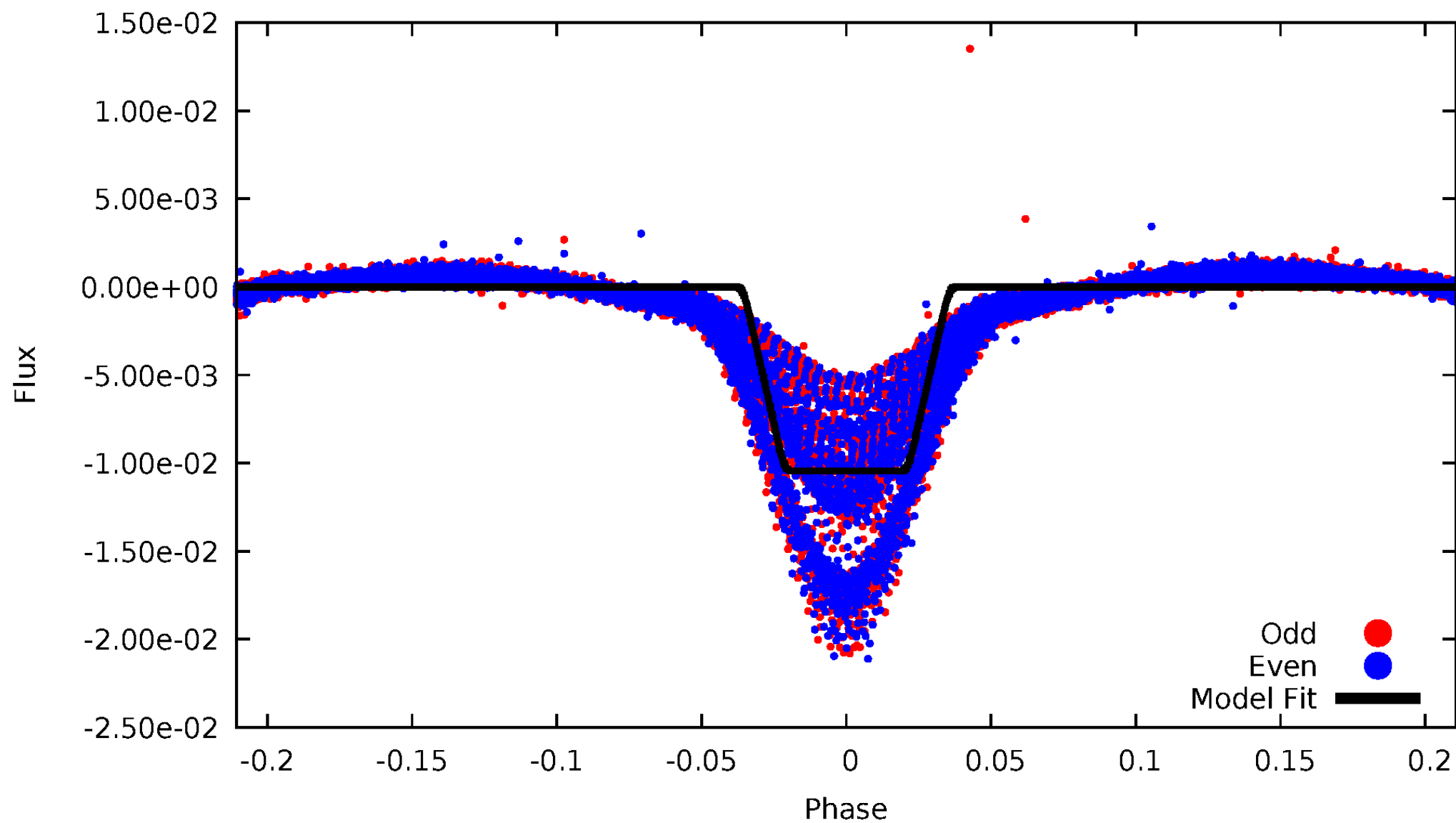
# DV Odd/Even

TCE 003245638-01



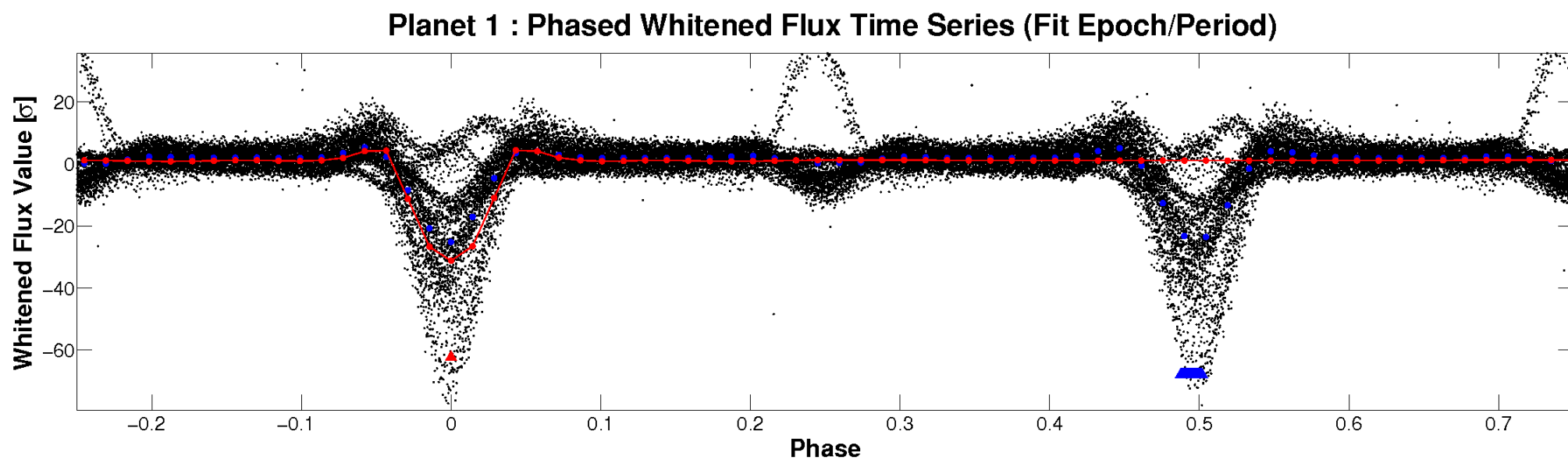
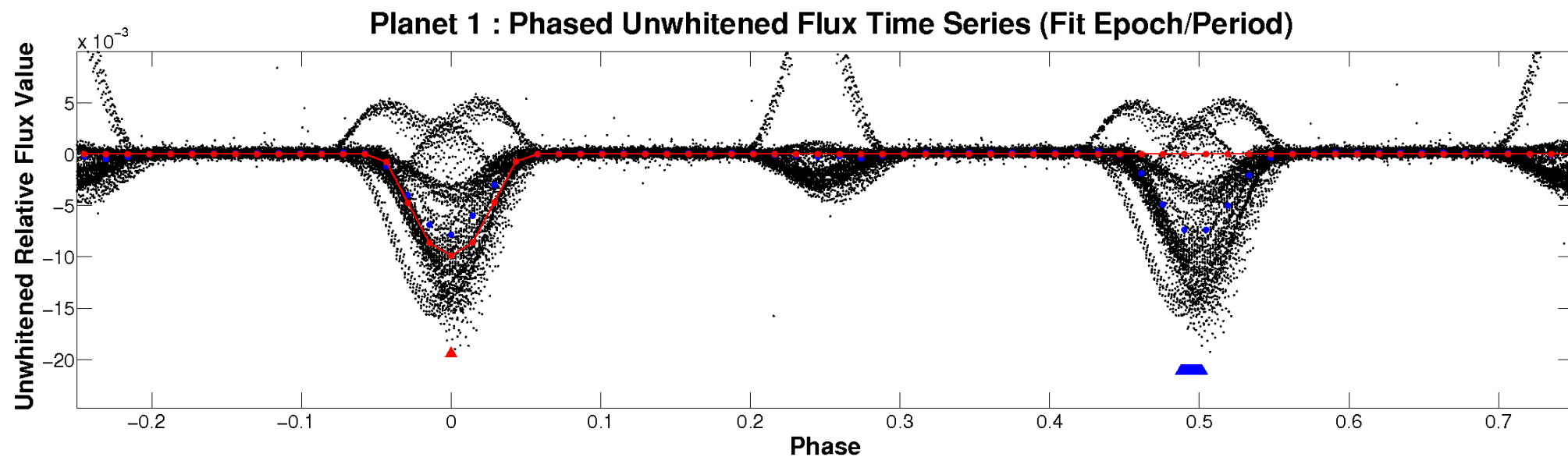
# ALT Odd/Even

TCE 003245638-01



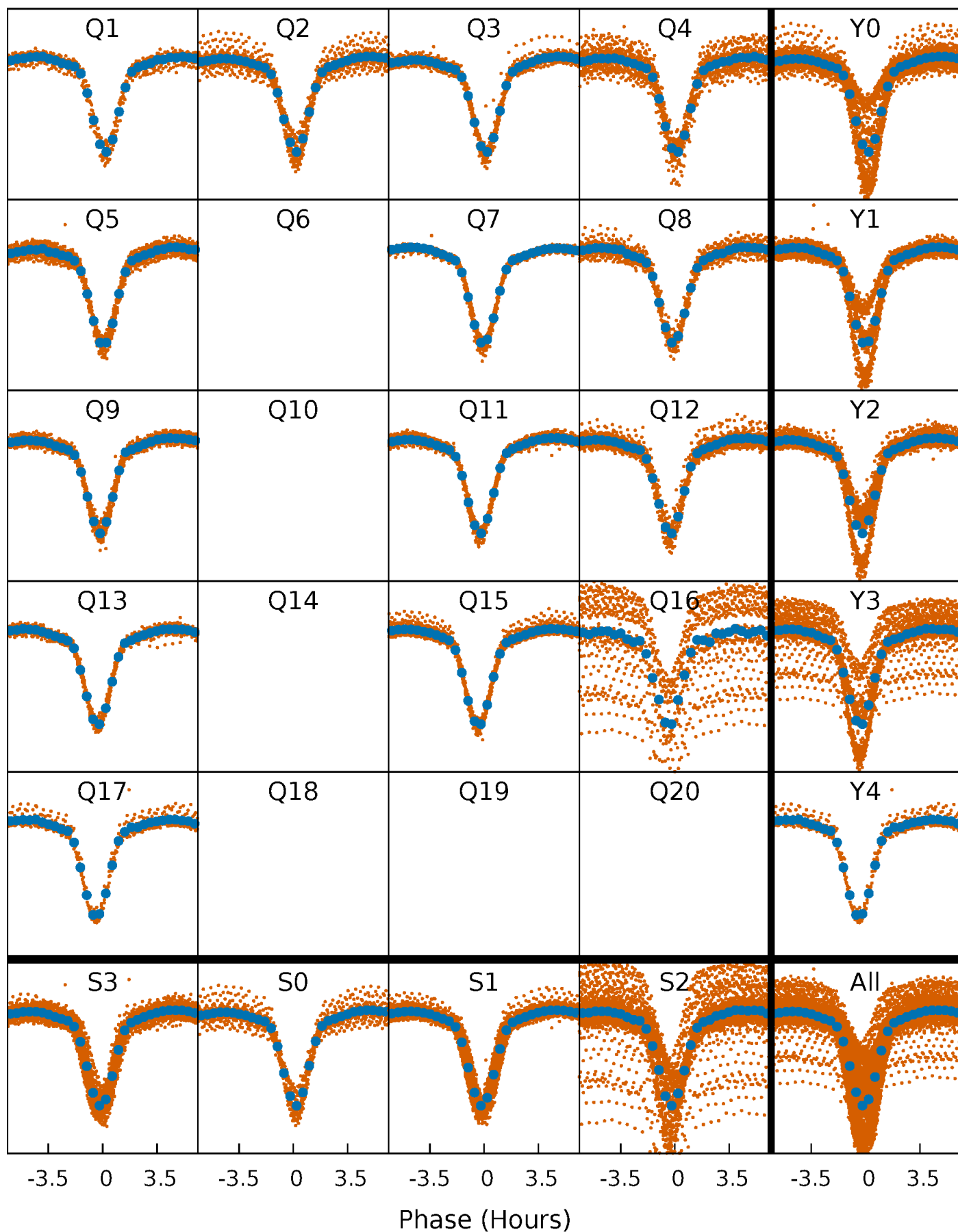


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

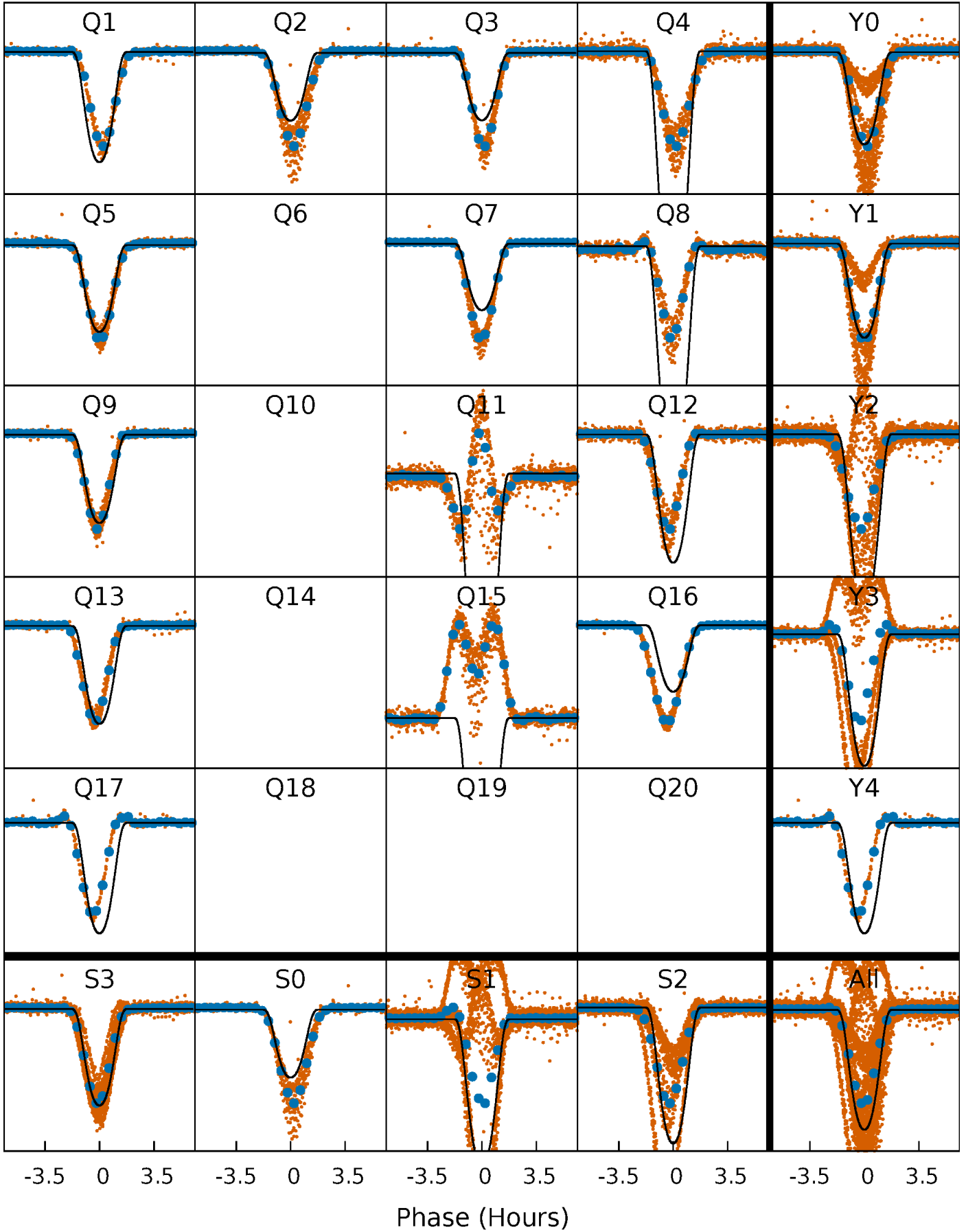
TCE 003245638-01 P= 1.417638 Days  $T_0=132.160074$  (BKJD)





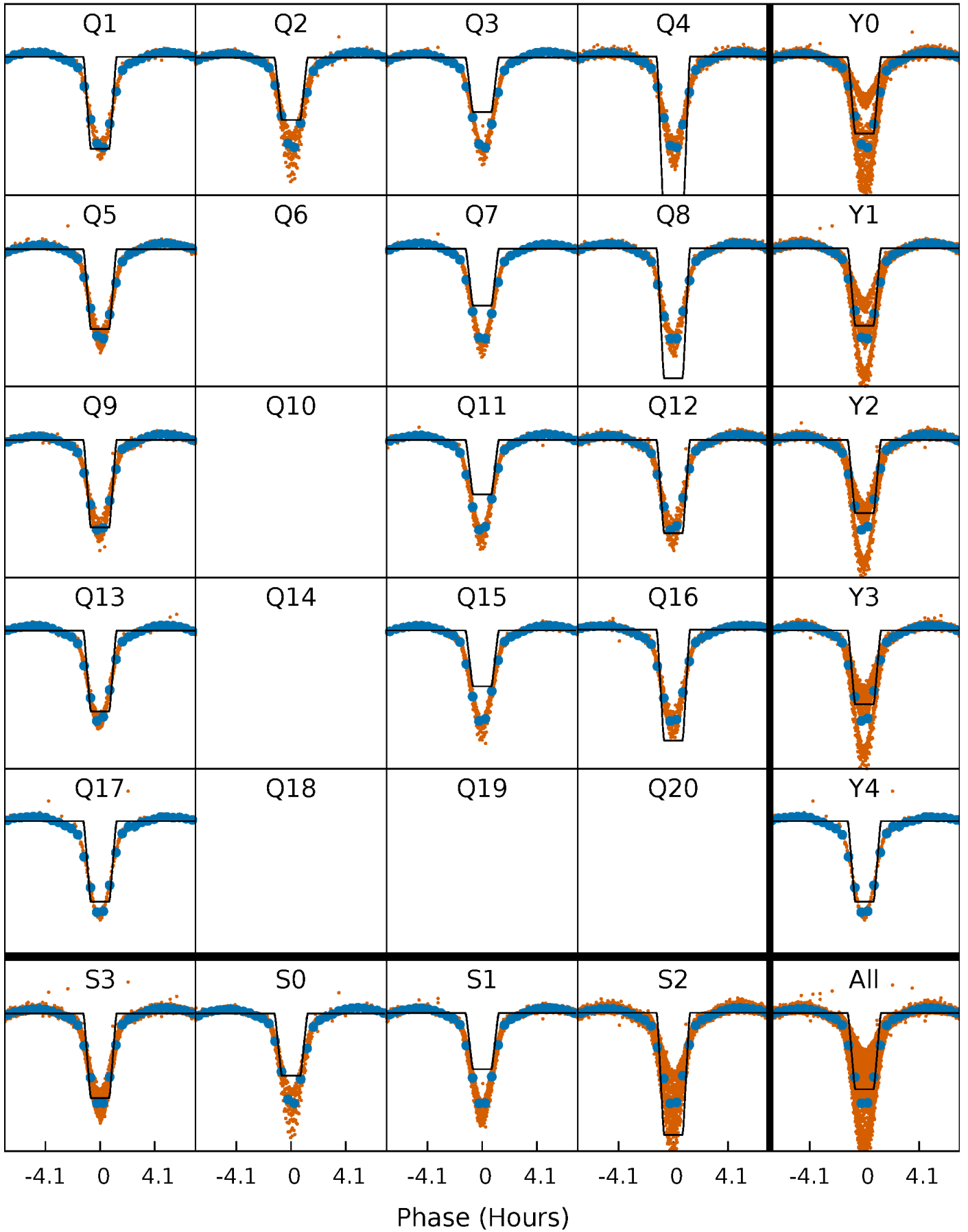
# DV Quarter-Phased Transit Curves

TCE 003245638-01 P= 1.417638 Days  $T_0=132.160074$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

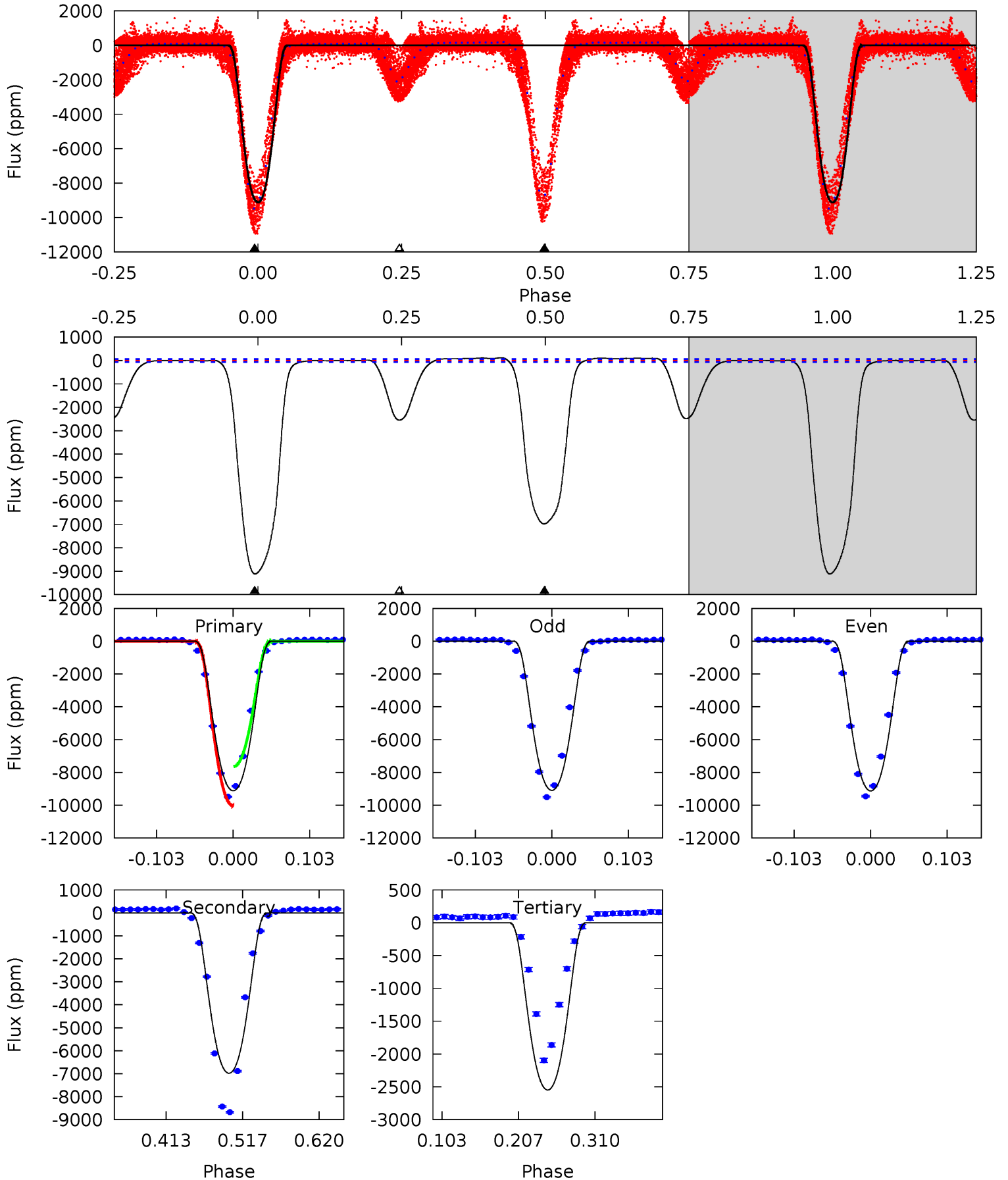
TCE 003245638-01 P= 1.417616 Days  $T_0=132.165715$  (BKJD)



# DV Model-Shift Uniqueness Test

003245638-01, P = 1.417638 Days, E = 130.742436 Days

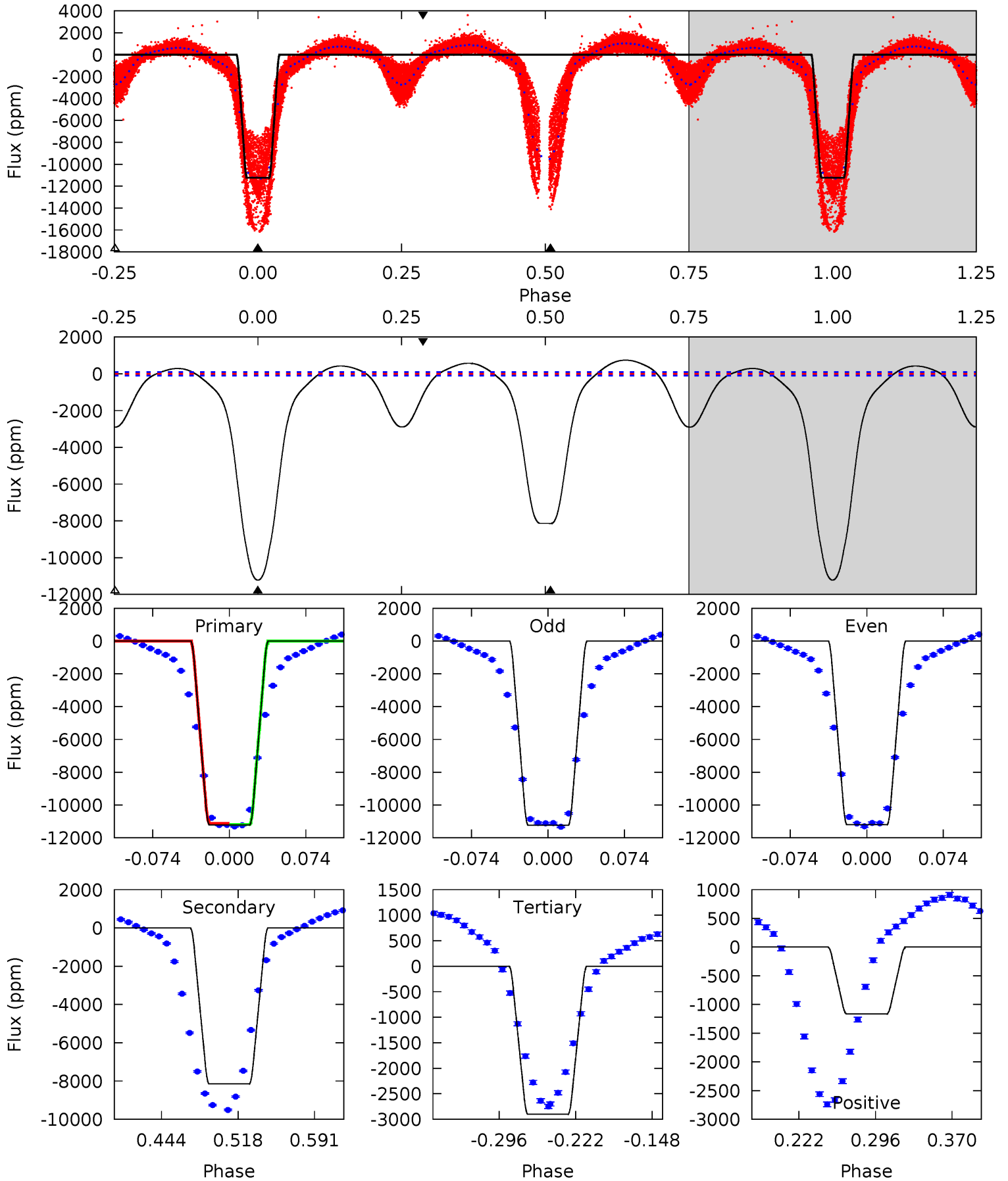
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
657.3	503.3	183.7	0	4.56	1.63	50.7	473.6	657.3	319.6	503.3	1.16	0.85	0.01	0



# Alt Model-Shift Uniqueness Test

003245638-01, P = 1.417616 Days, E = 130.748099 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
550.7	399.8	142.4	-57.0	4.63	1.79	50.4	408.4	607.8	257.4	456.8	0.89	1.06	0.06	1.67



### Stellar Parameters For KIC 003245638

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5851^{+79}_{-79}$	$4.302^{+0.156}_{-0.104}$	$-0.220^{+0.150}_{-0.150}$	$1.116^{+0.164}_{-0.180}$	$0.910^{+0.066}_{-0.053}$	$0.922^{+0.658}_{-0.278}$
	+1%/-1%	+4%/-2%	+68%/-68%	+15%/-16%	+7%/-6%	+71%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 003245638-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-6980 \pm 14$	$13.40^{+1.12}_{-1.13}$	$2454^{+99}_{-105}$	$5131^{+66}_{-68}$	$12^{+2}_{-2}$
Alt.	$-8148 \pm 20$	$12.39^{+1.09}_{-1.08}$	$2449^{+107}_{-108}$	$5503^{+73}_{-73}$	$17^{+3}_{-2}$

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

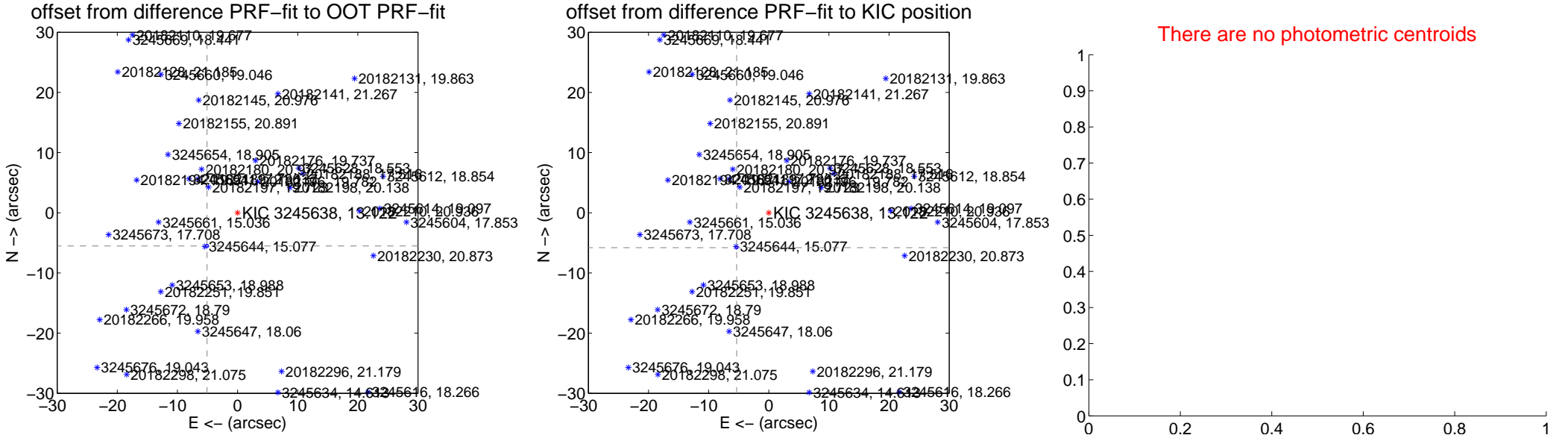
## DV Centroid Data

Supplemental centroid analysis for 003245638-01. Kepler magnitude: 13.12. Transit SNR 935.31

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

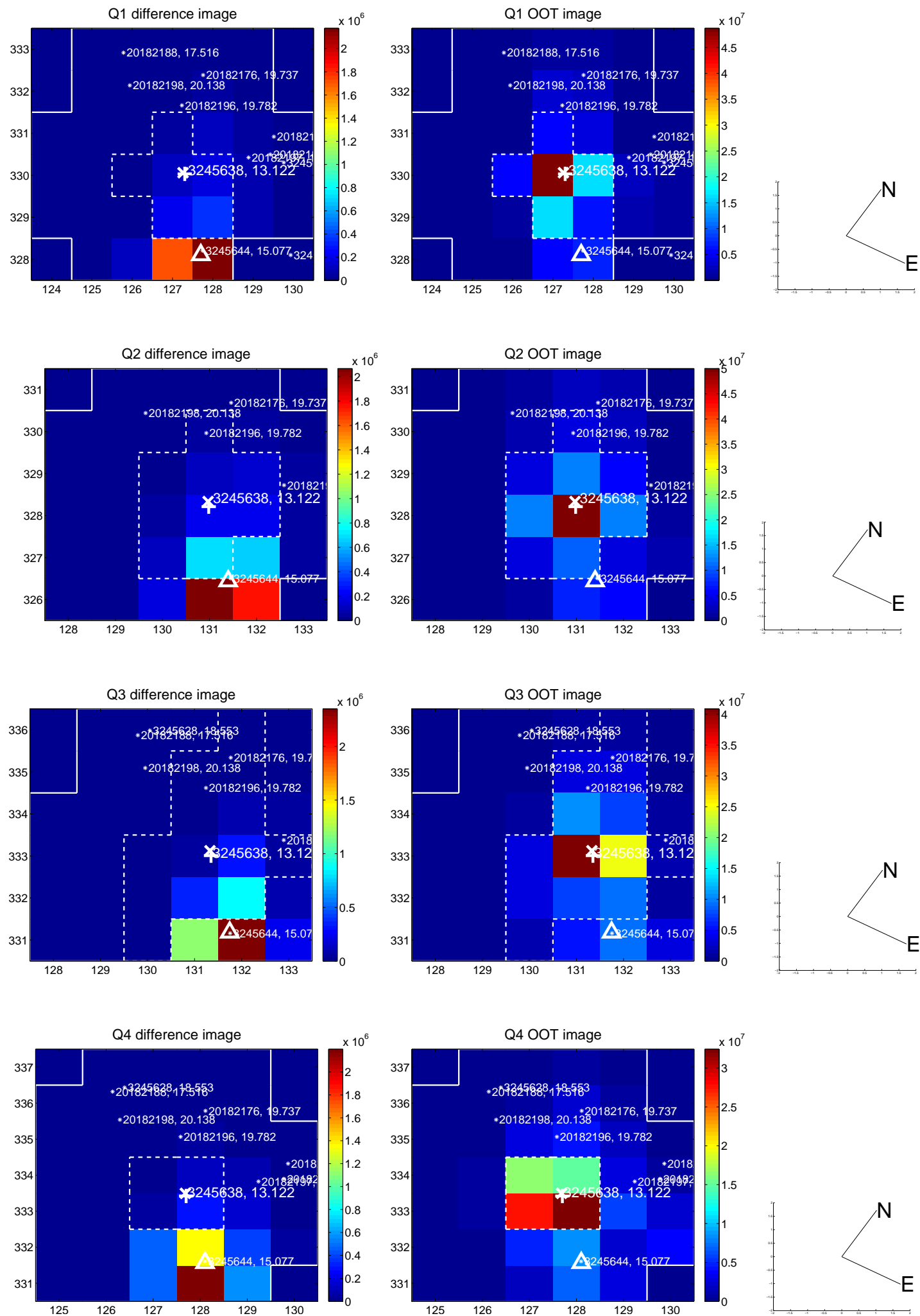
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>7.497 <math>\pm</math> 0.089</b>	<b>83.82</b>	5.079 $\pm$ 0.074	-5.515 $\pm$ 0.085
PRF-fit source offset from KIC position	<b>7.882 <math>\pm</math> 0.070</b>	<b>112.18</b>	5.341 $\pm$ 0.071	-5.797 $\pm$ 0.068
photometric centroid source offset	—	—	—	—



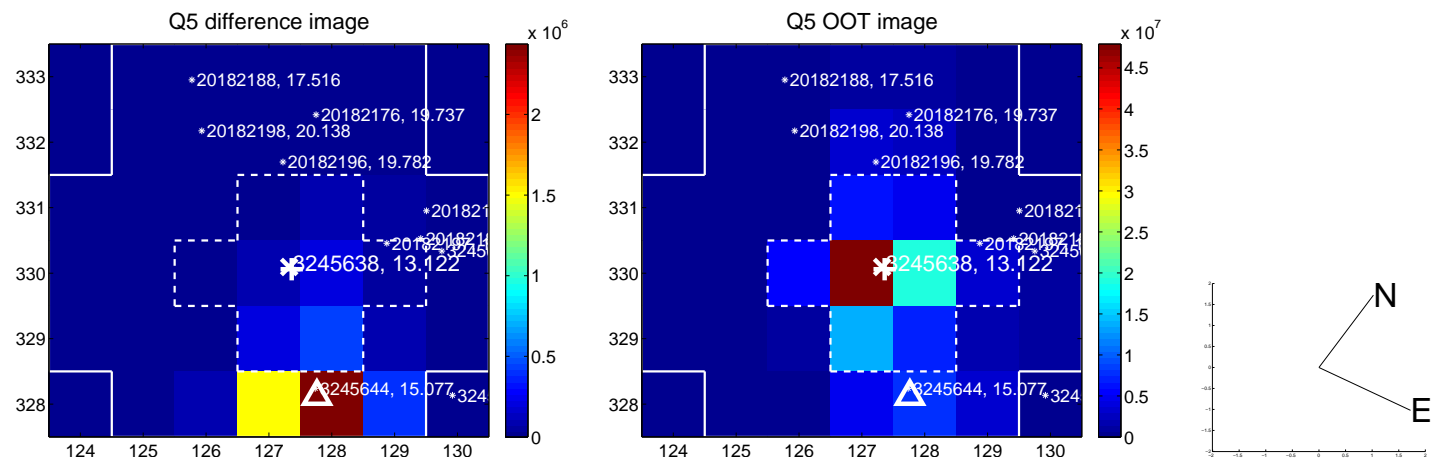
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

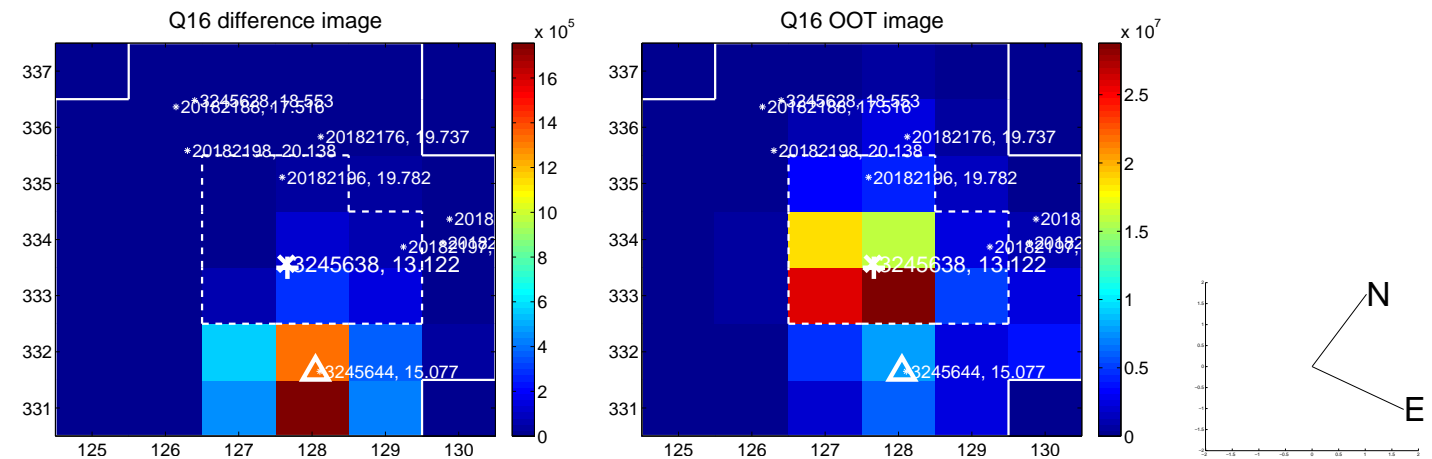
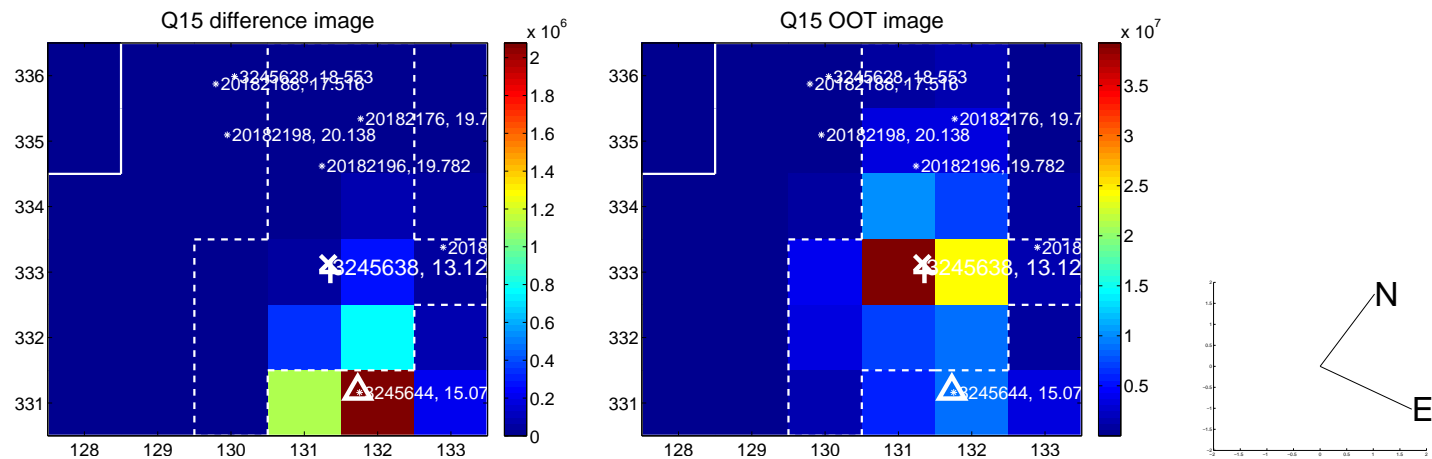
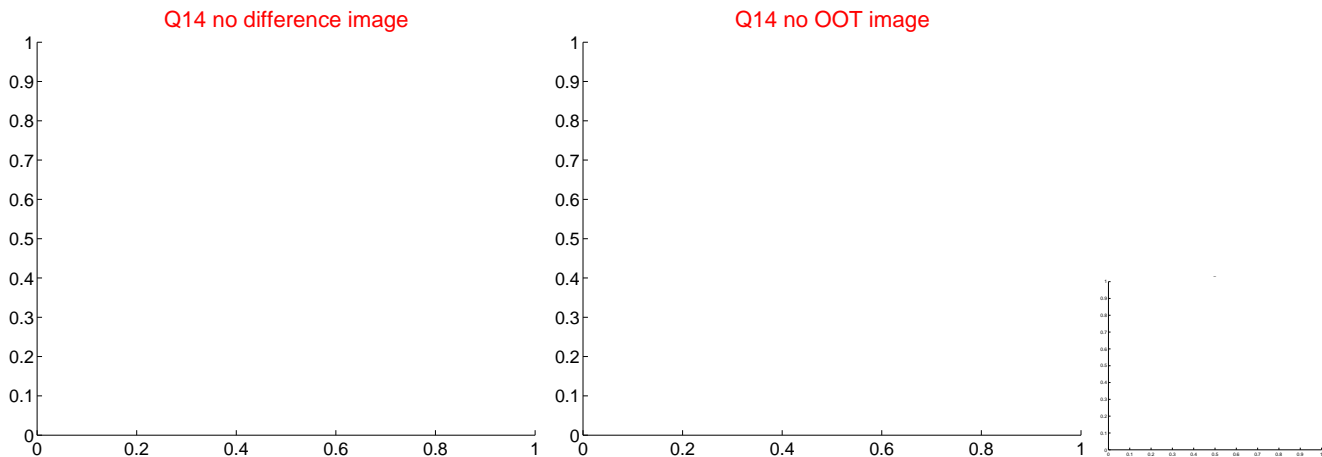
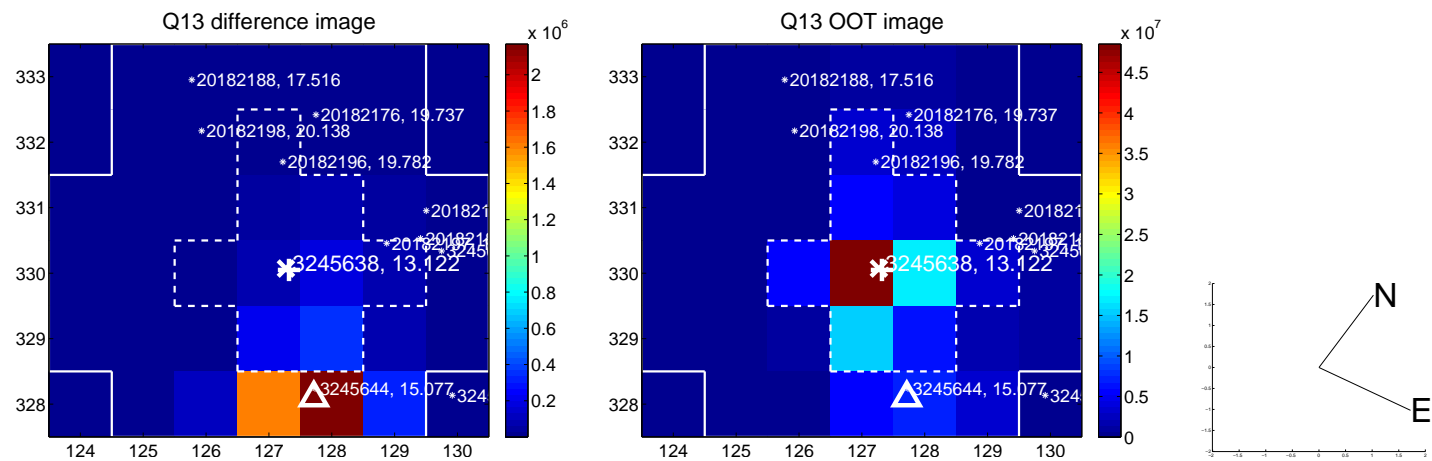


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

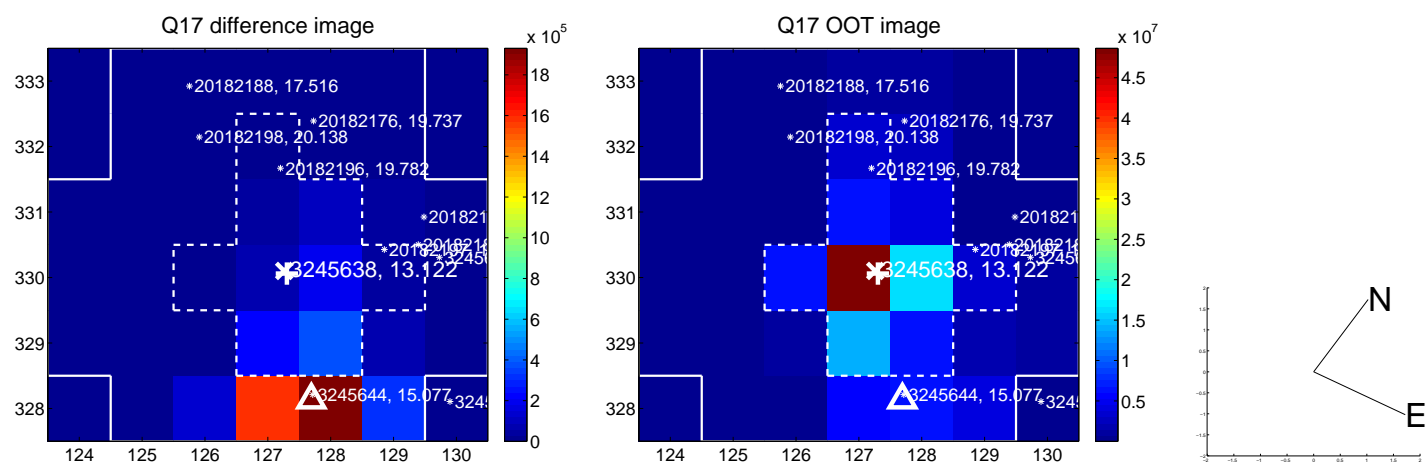




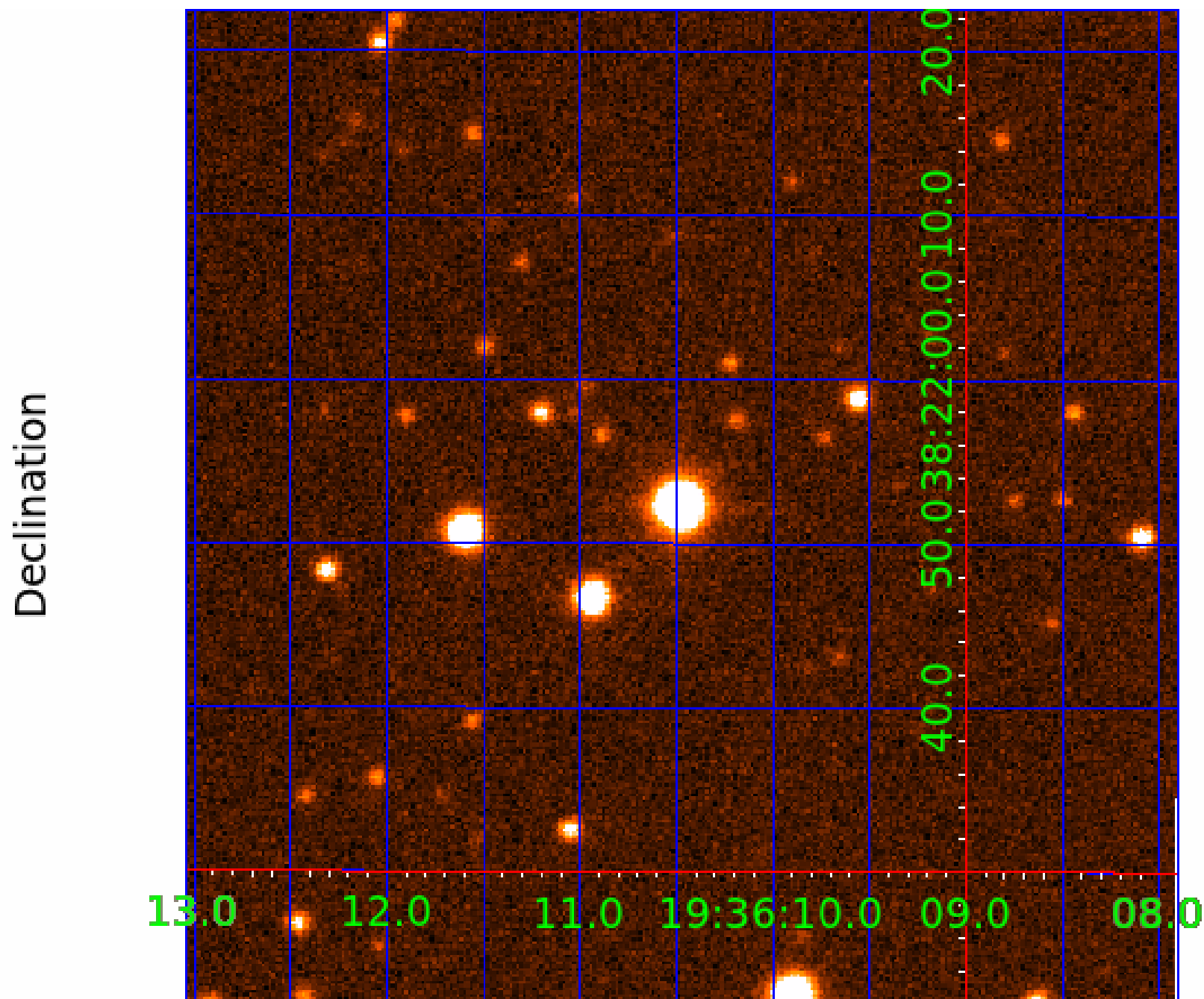
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.



UKIRT Image





# KIC 003245638

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003245638-01	OBS	No	1.417638	132.160074	9988.3	3.071	1262.3	935.3	1.12	5851	13.48	2281.24
003245638-02	OBS	No	1.417618	132.871611	12136.5	2.000	1680.5	-1.0	1.12	5851	12.27	2281.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003245638-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—EPHEM_MATCH
003245638-02	OBS	FP	0.00	1	0	0	1	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS—EPHEM_MATCH

**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 003245638-02

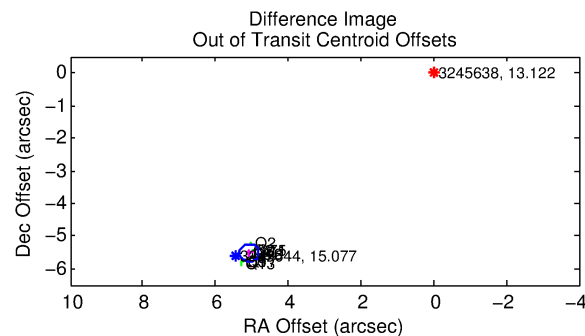
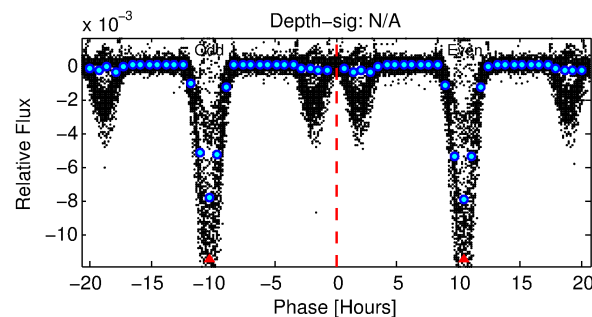
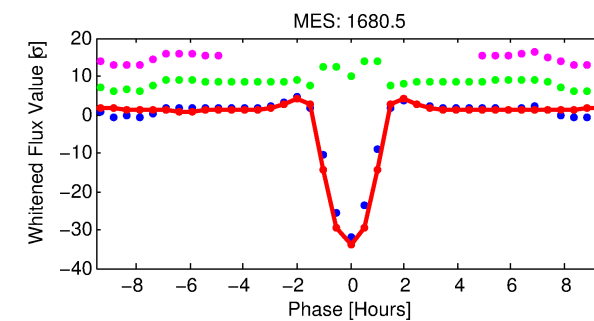
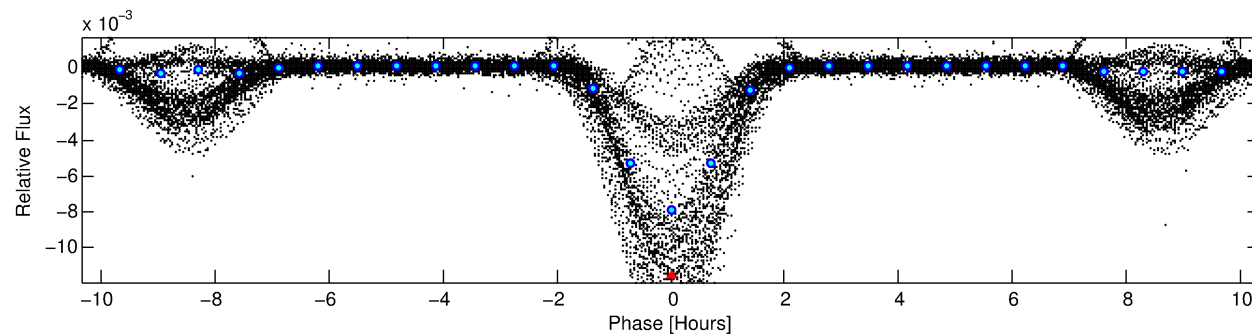
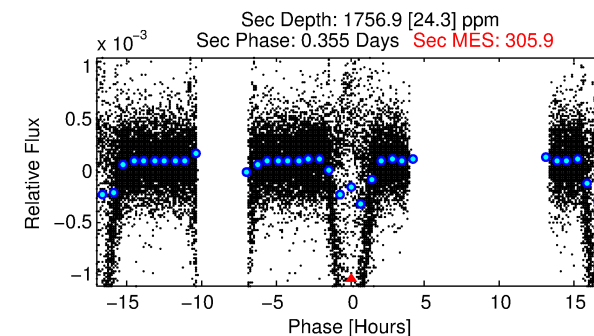
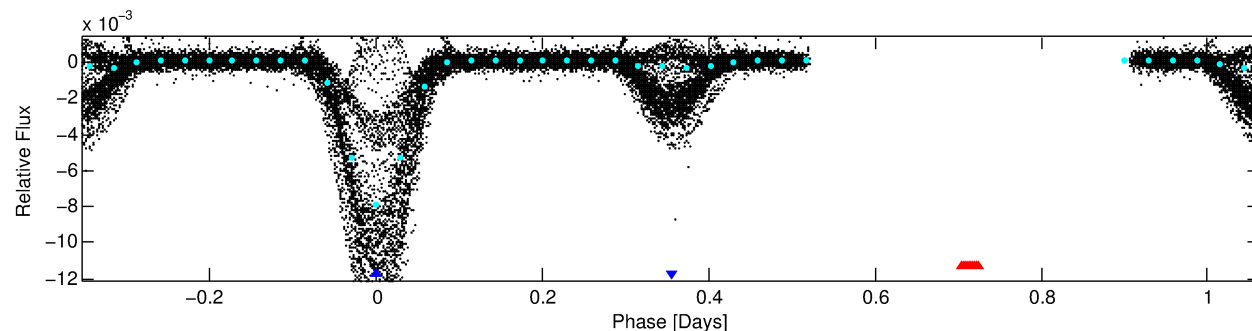
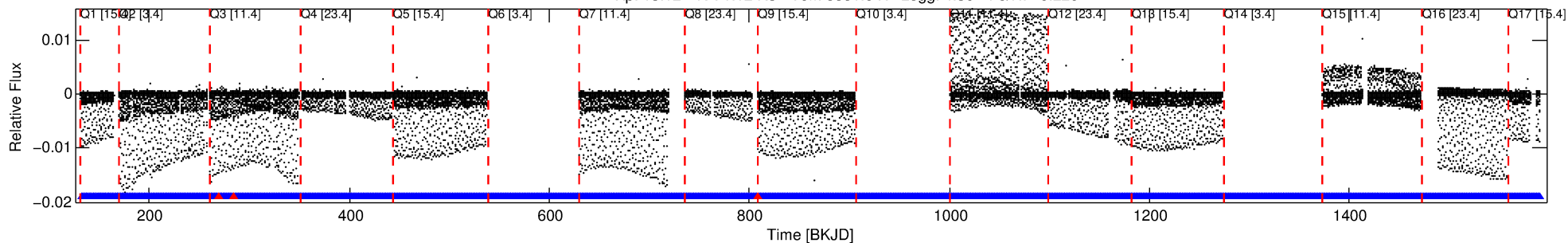
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
003245638-02	3245638	3977.01	3245661	2:1	13.2	2	-3	15.04	13.13	1.84	Direct-PRF	0	1.04	0.43

**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: 3245638 Candidate: 2 of 2 Period: 1.418 d  
KOI: K04970 Corr: No Ephemeris Match

Kp: 13.12 R\*: 1.12 Rs Teff: 5851.0 K Logg: 4.30 Fe/H: -0.220



## TPS TCE Results:

Period = 1.41762 d  
Epoch = 132.8716 BKJD

DV fit results are unavailable

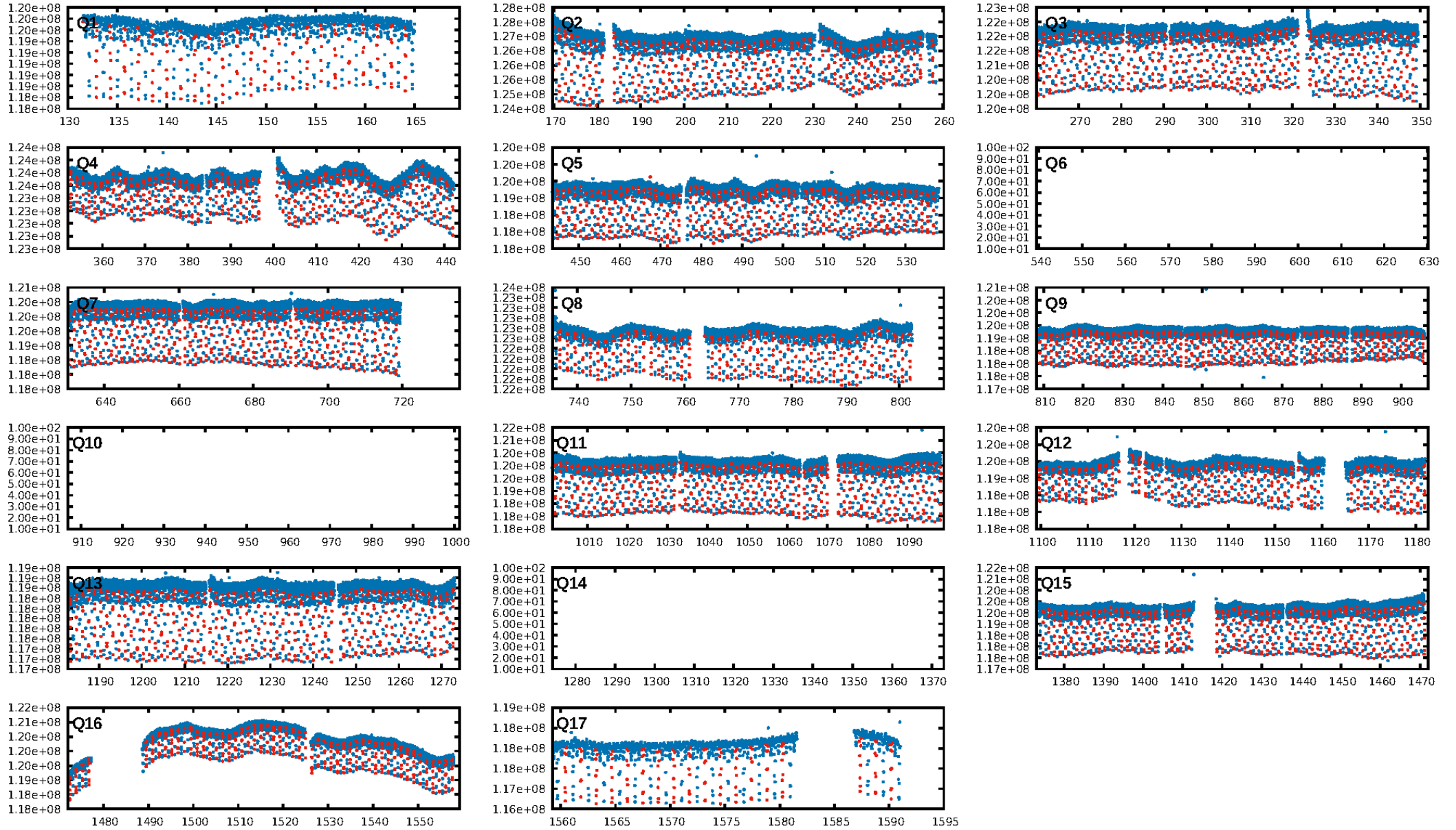
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [716/719]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 7.497 arcsec [85.17σ]  
KicOffset-rm: 7.884 arcsec [111.30σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

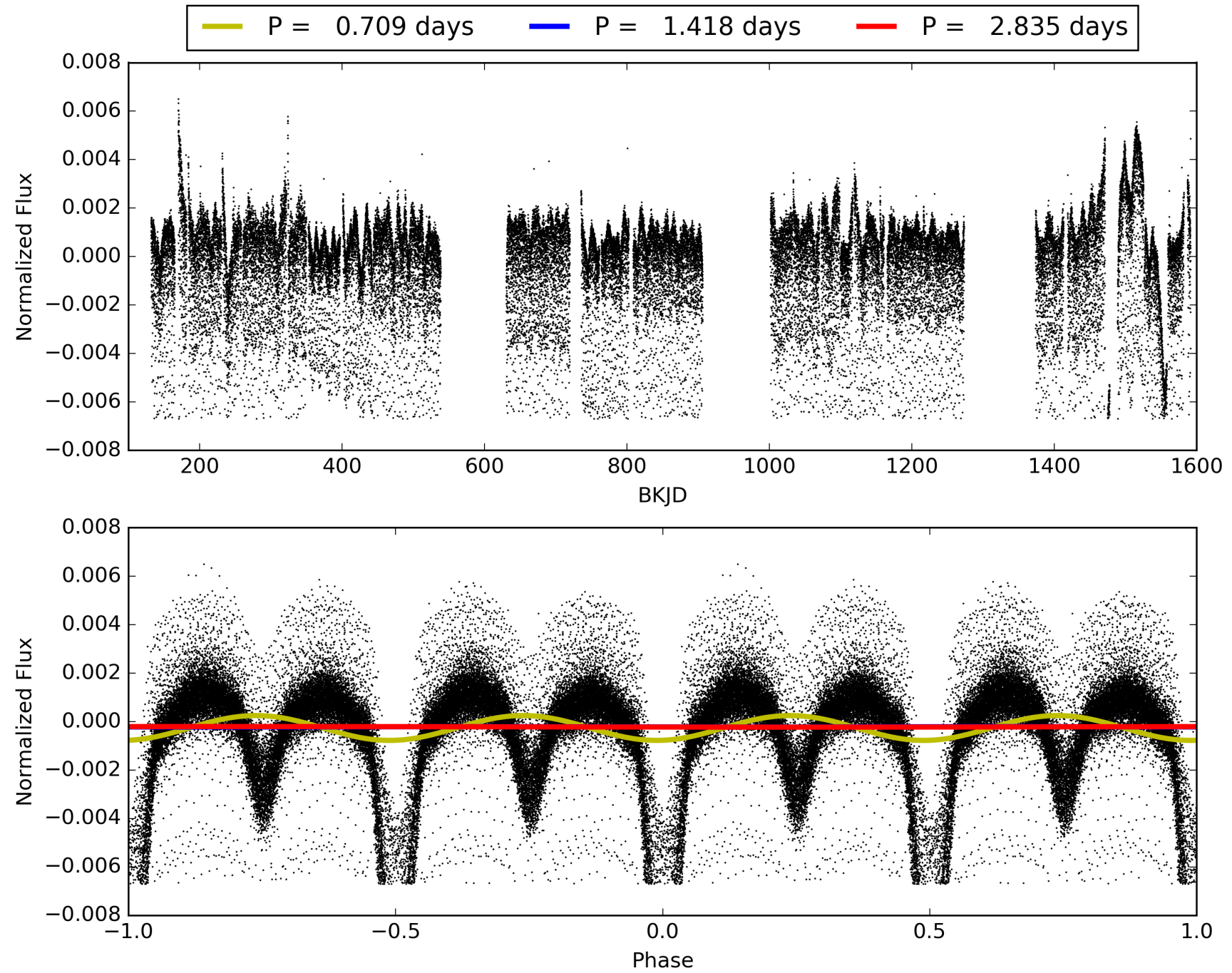
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:26:42 Z

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

# TCE 003245638-02, PDC Light Curves

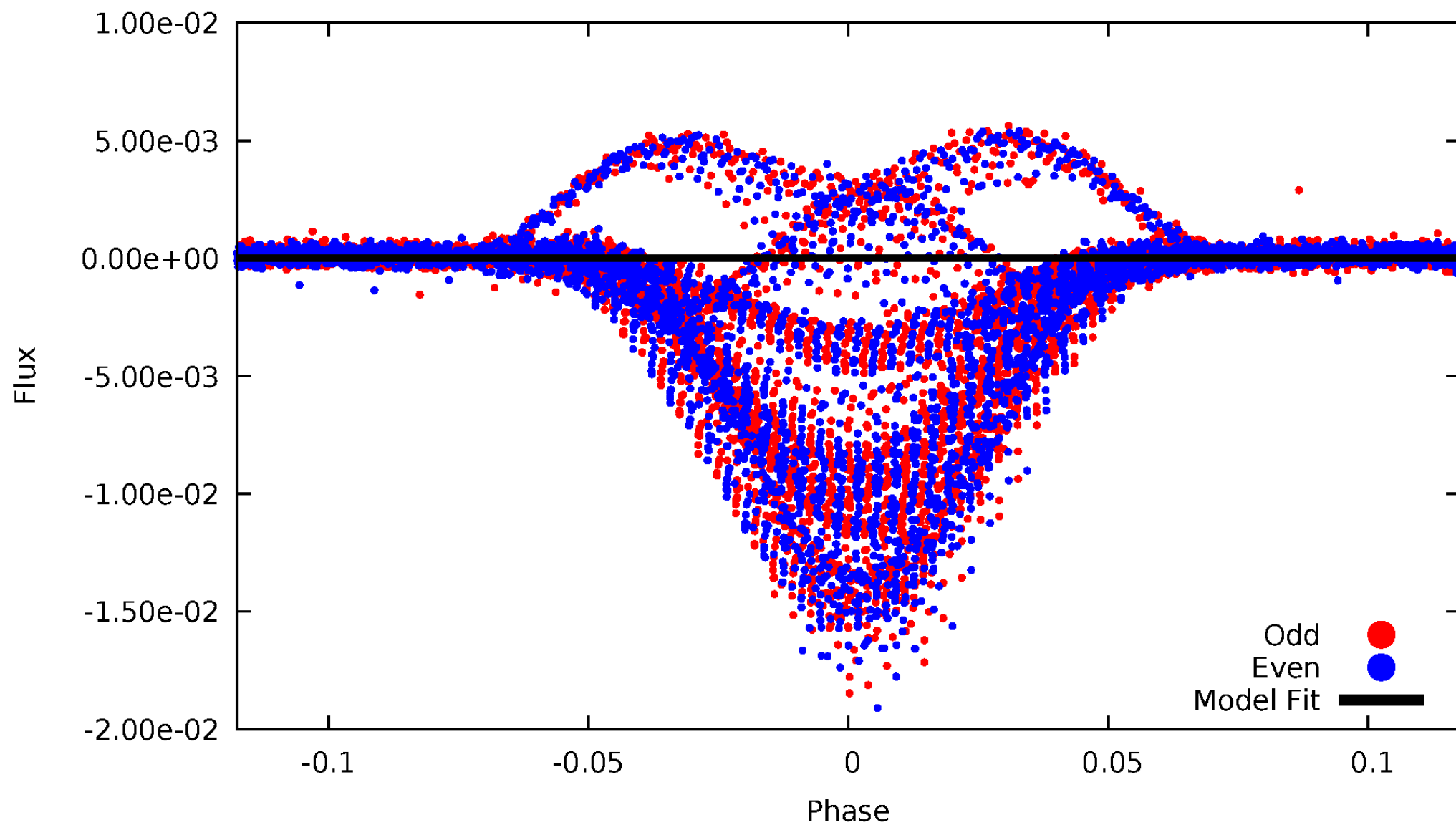


TCE 003245638-02



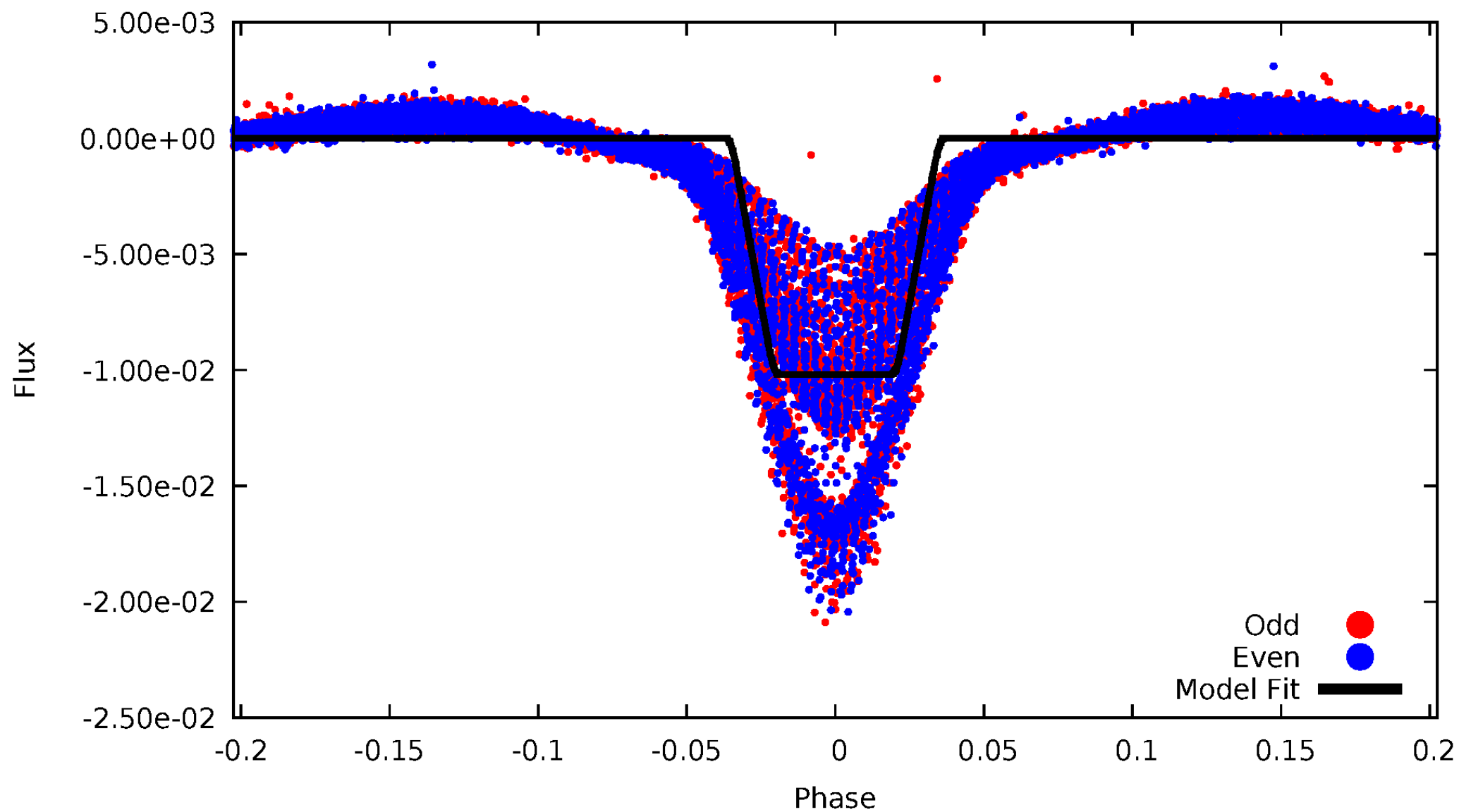
# DV Odd/Even

TCE 003245638-02



# ALT Odd/Even

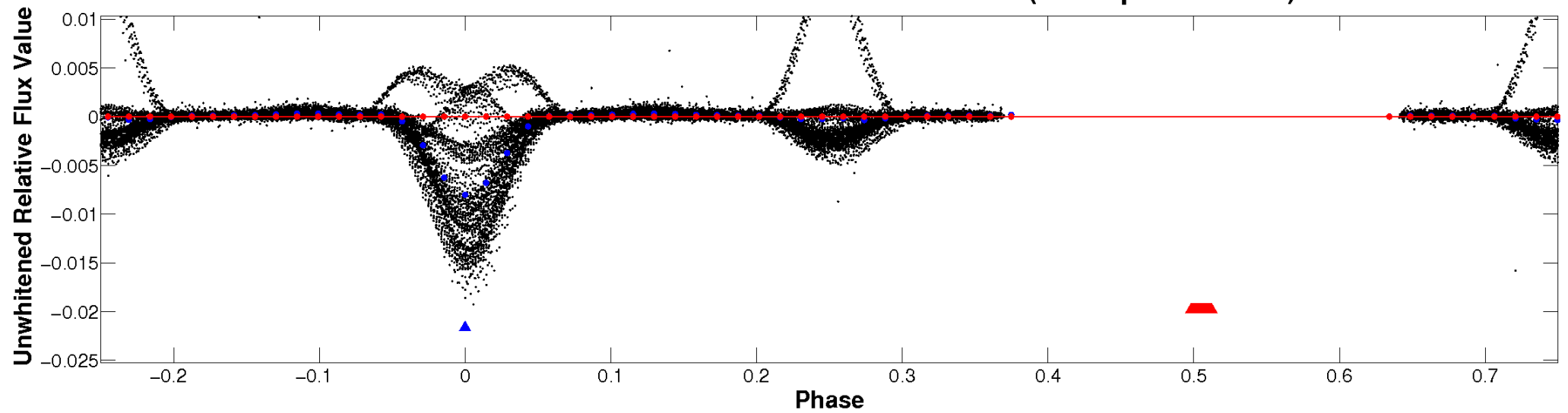
TCE 003245638-02



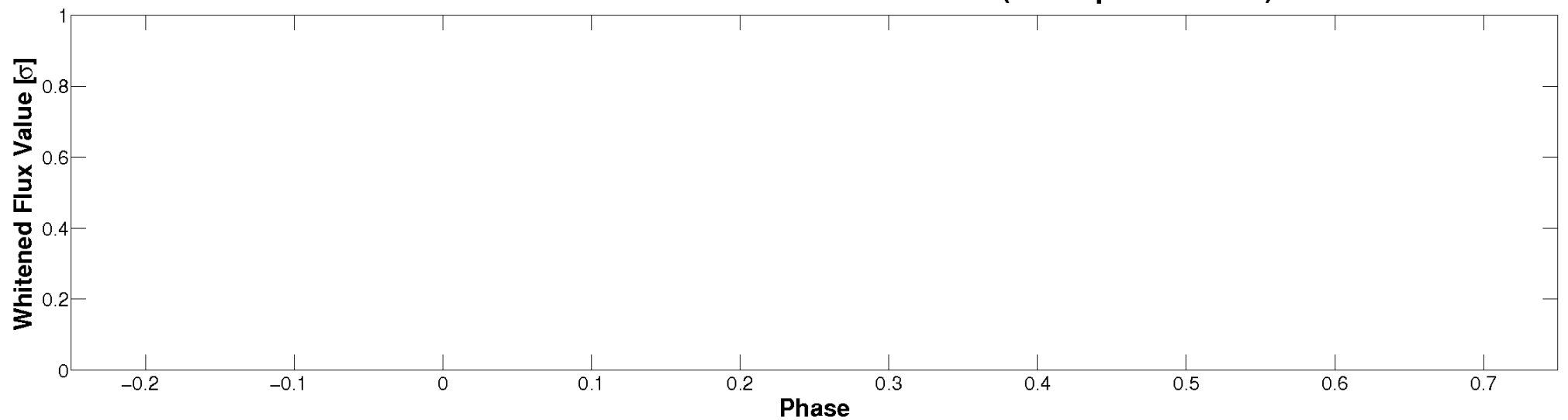


# Non-Whitened Vs. Whitened Light Curve

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

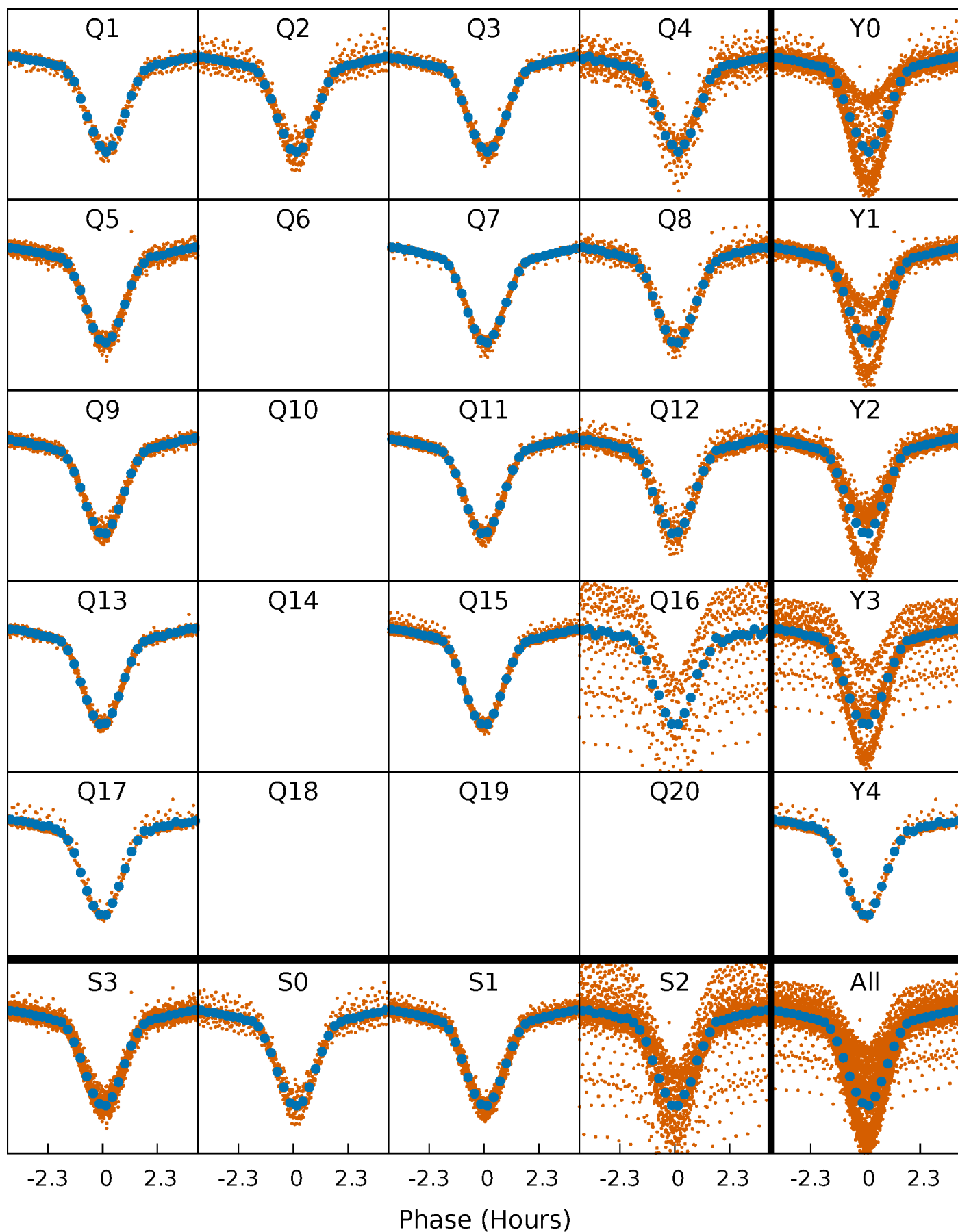


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



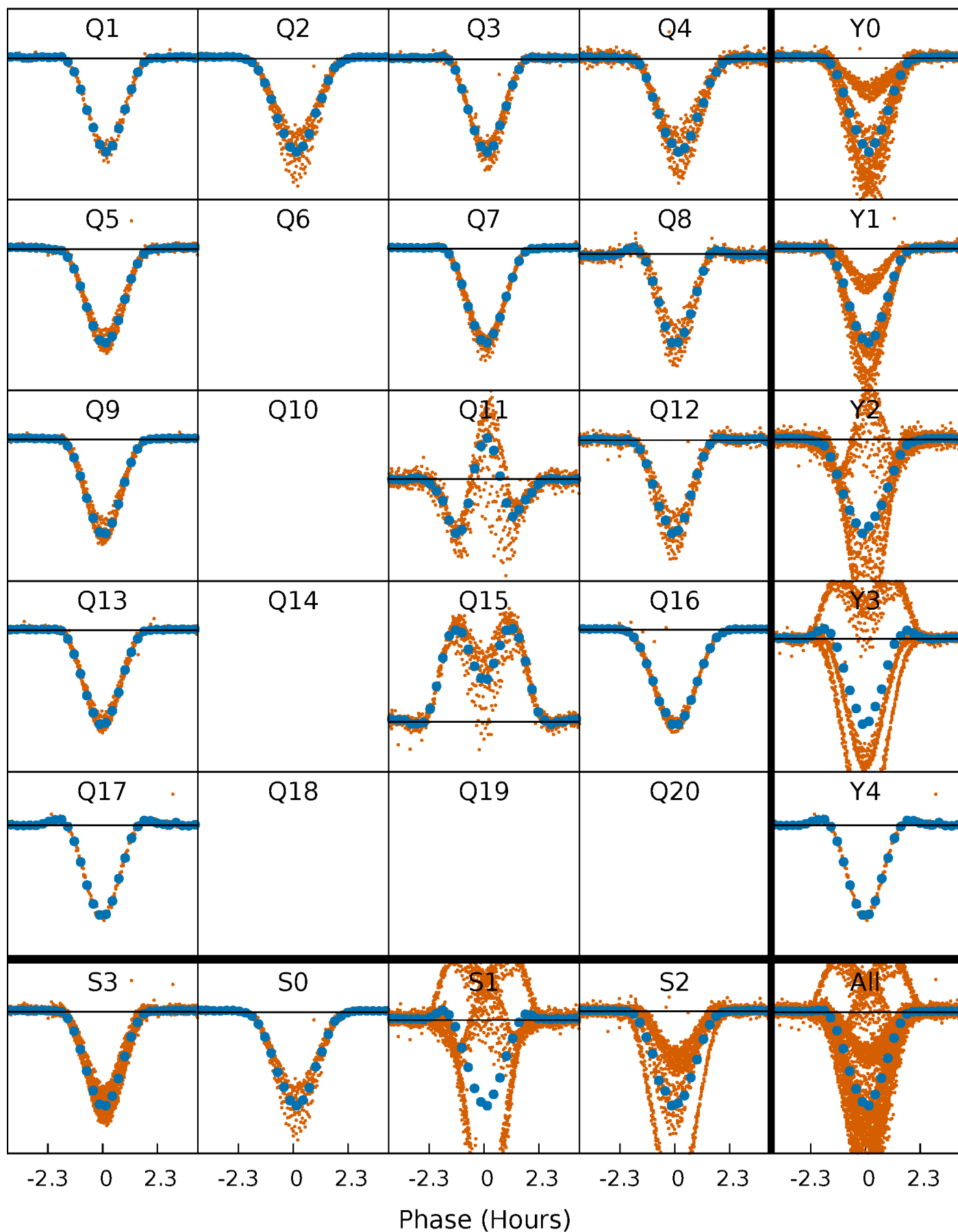
# PDC Quarter-Phased Transit Curves

TCE 003245638-02 P= 1.417618 Days  $T_0=132.871611$  (BKJD)



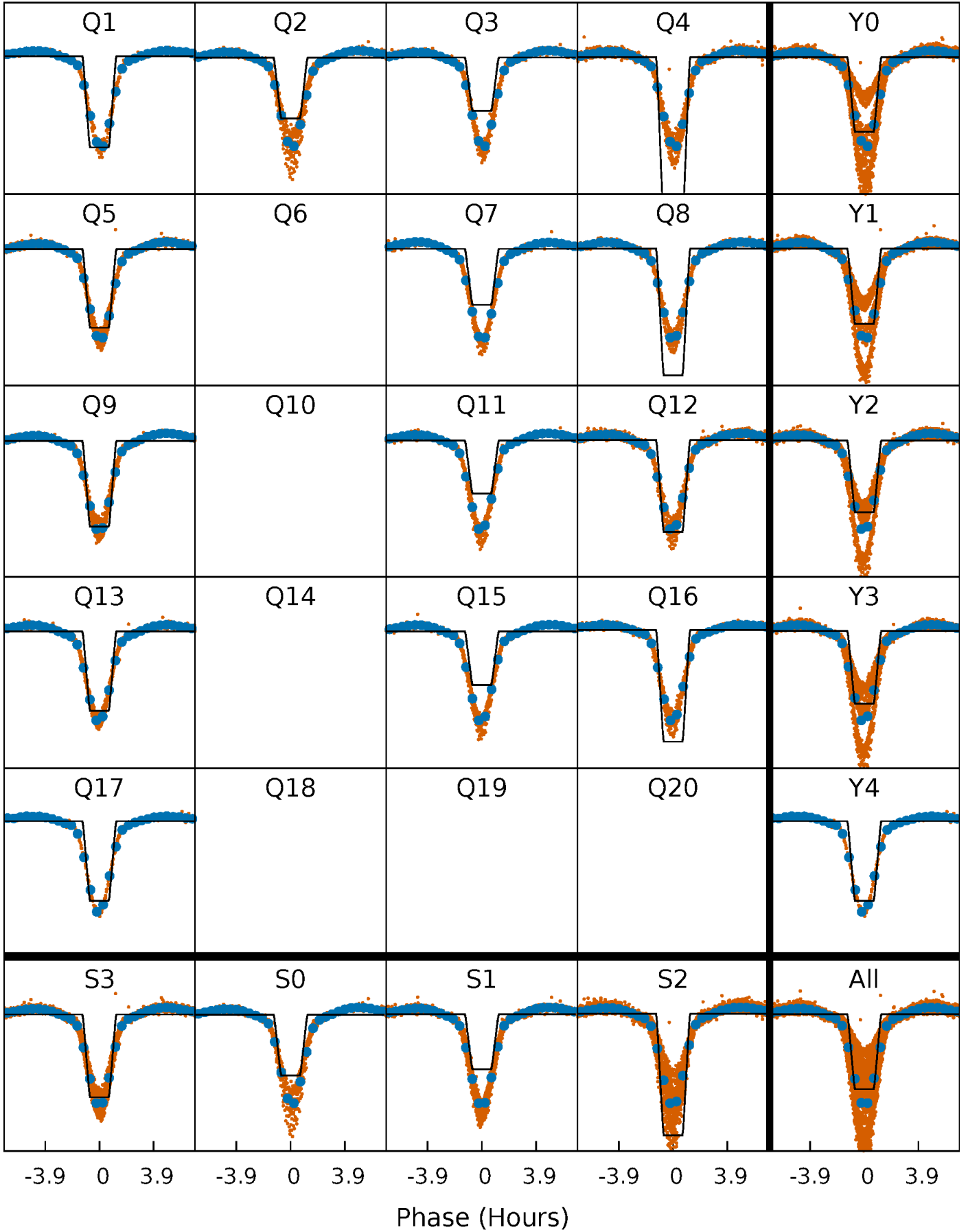
# DV Quarter-Phased Transit Curves

TCE 003245638-02 P= 1.417618 Days  $T_0=132.871611$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

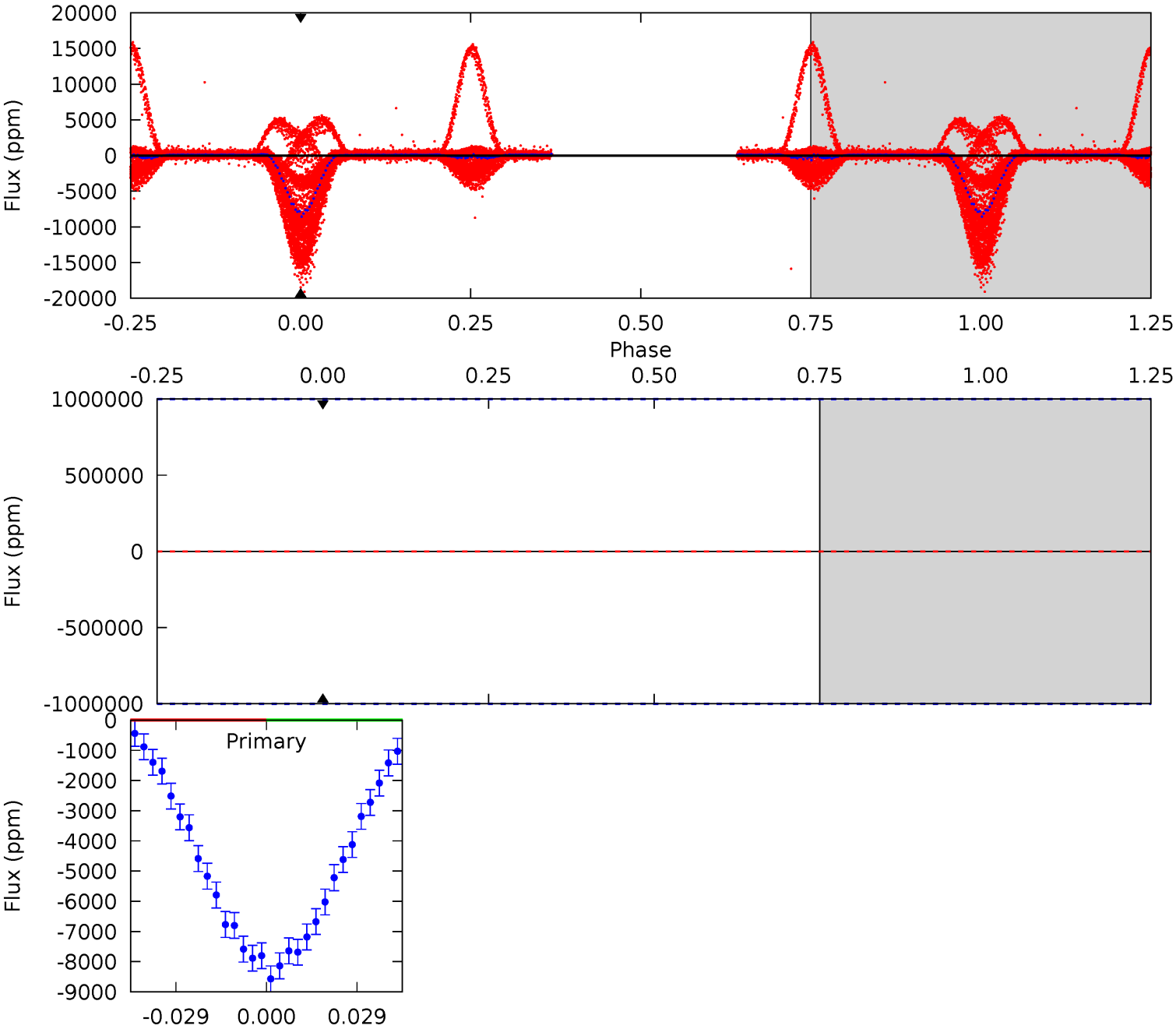
TCE 003245638-02   P= 1.417618 Days    $T_0=132.873482$  (BKJD)



# DV Model-Shift Uniqueness Test

003245638-02, P = 1.417618 Days, E = 131.453993 Days

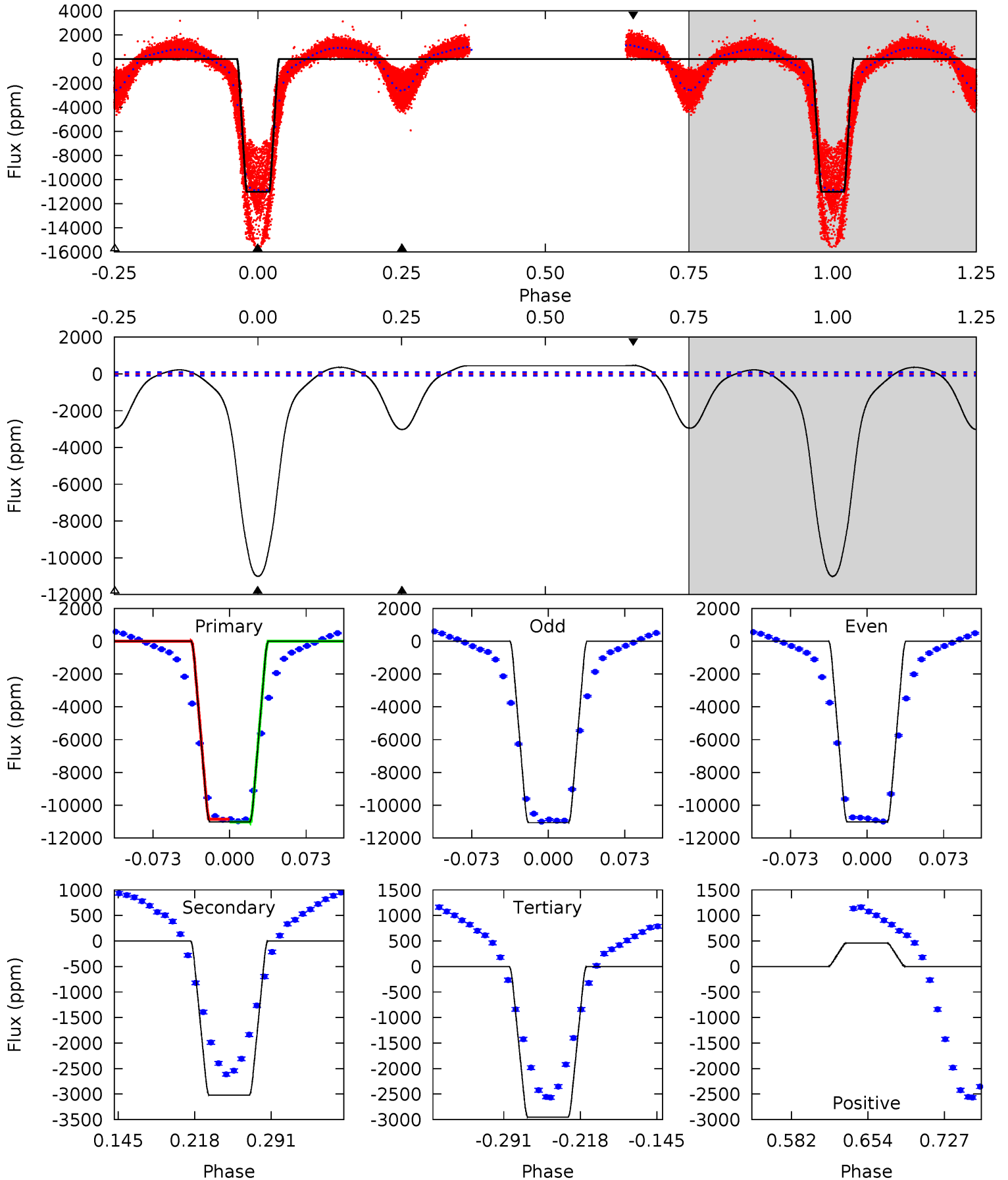
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003245638-02, P = 1.417618 Days, E = 131.455864 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
561.4	154.1	150.5	23.5	4.63	1.79	47.6	410.8	537.9	3.54	130.6	1.01	1.05	0.04	0





### Stellar Parameters For KIC 003245638

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5851^{+79}_{-79}$	$4.302^{+0.156}_{-0.104}$	$-0.220^{+0.150}_{-0.150}$	$1.116^{+0.164}_{-0.180}$	$0.910^{+0.066}_{-0.053}$	$0.922^{+0.658}_{-0.278}$
	+1%/-1%	+4%/-2%	+68%/-68%	+15%/-16%	+7%/-6%	+71%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 003245638-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$14.53^{+10.73}_{-9.27}$	$2455^{+104}_{-124}$	$4305^{+9441}_{-15589}$	$4.884^{+293.136}_{-187.044}$
Alt.	$-3022 \pm 20$	$13.95^{+11.81}_{-8.90}$	$2449^{+113}_{-118}$	$4201^{+2557}_{-835}$	$4.885^{+32.796}_{-3.417}$

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

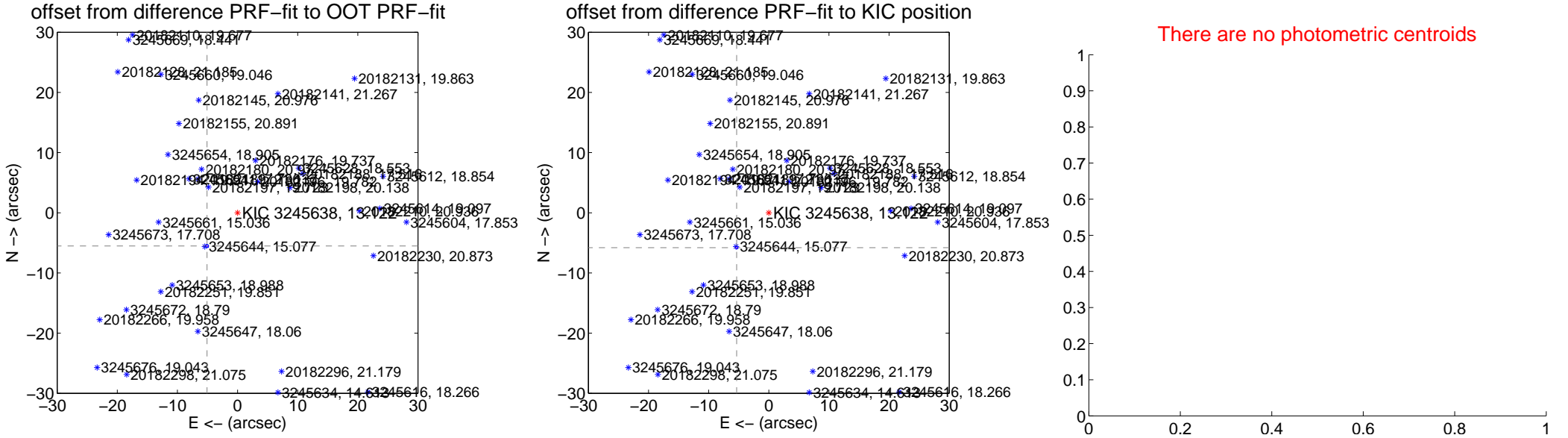
## DV Centroid Data

Supplemental centroid analysis for 003245638-02. Kepler magnitude: 13.12. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

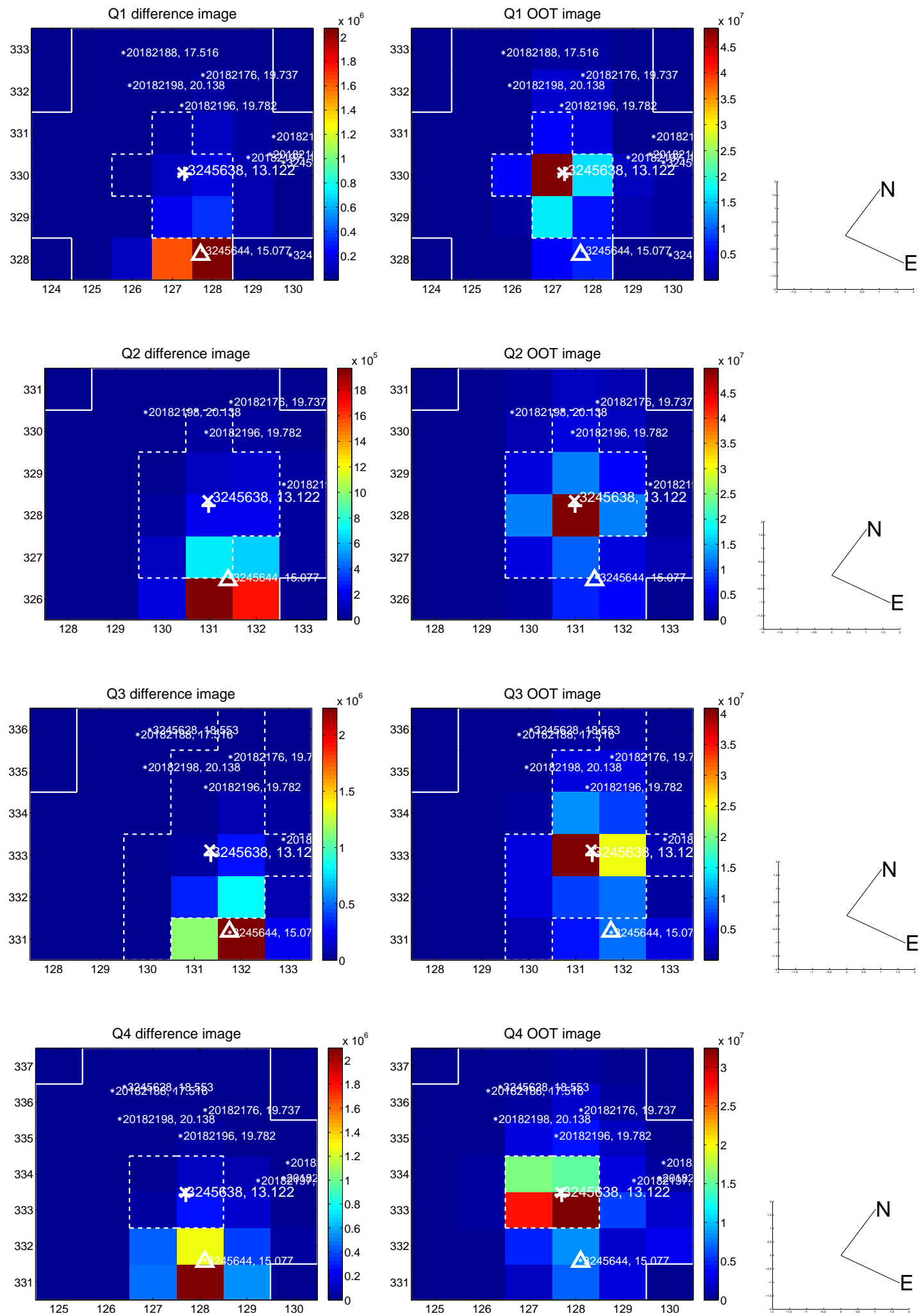
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	7.497 $\pm$ 0.088	85.17	5.079 $\pm$ 0.074	-5.515 $\pm$ 0.083
PRF-fit source offset from KIC position	7.884 $\pm$ 0.071	111.30	5.340 $\pm$ 0.071	-5.801 $\pm$ 0.069
photometric centroid source offset	—	—	—	—

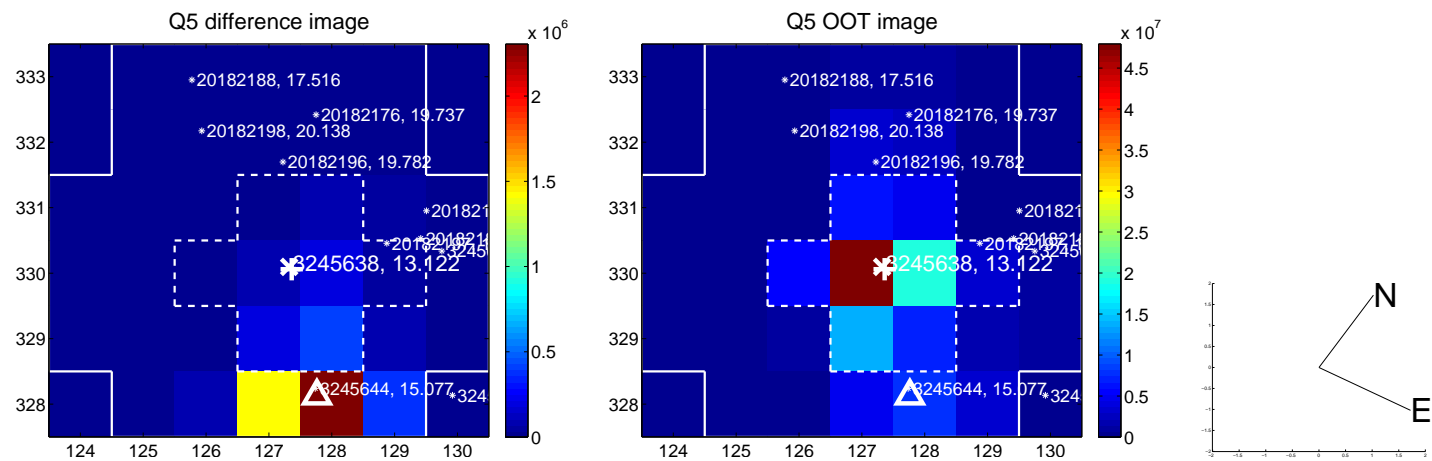


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

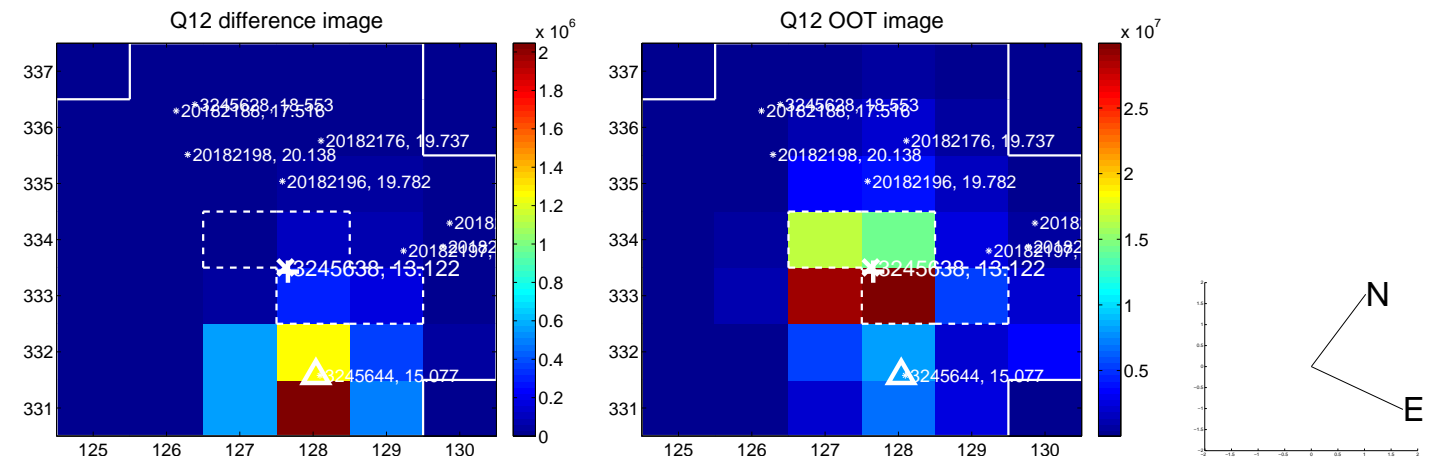
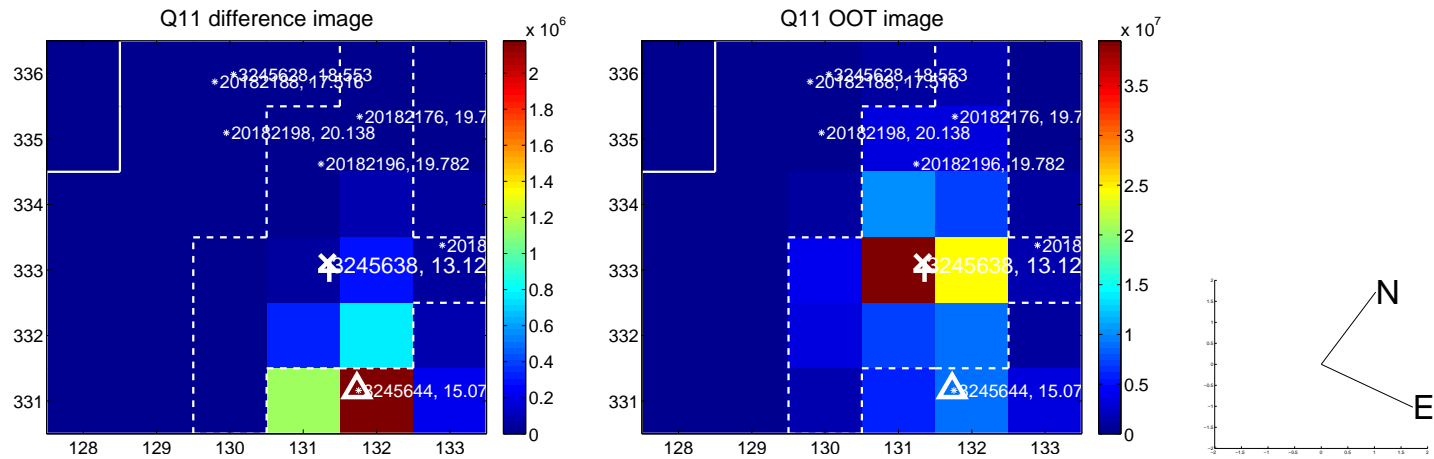
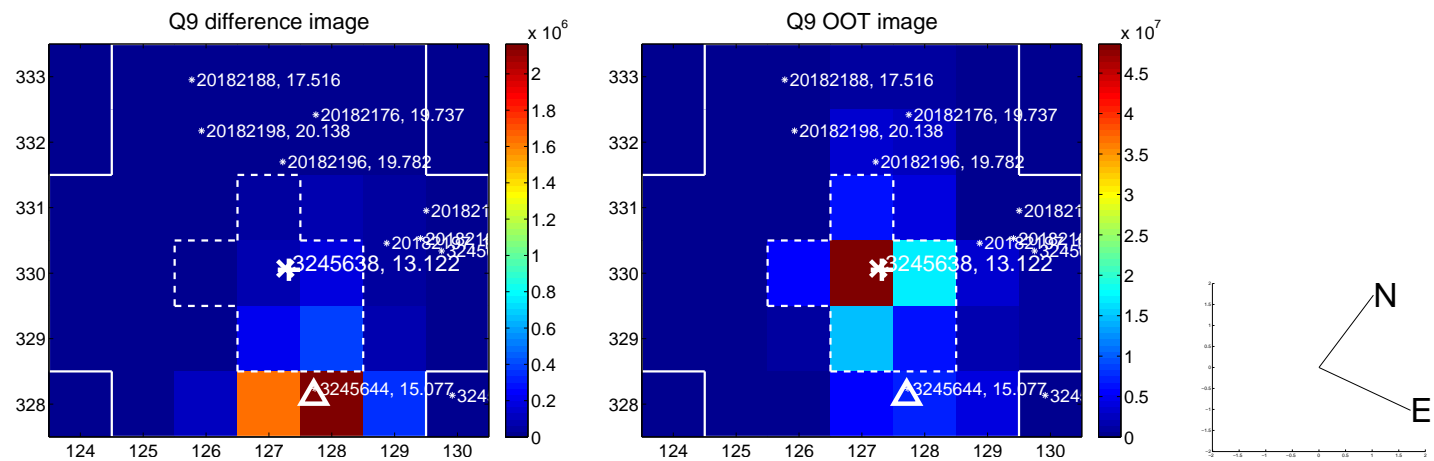
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



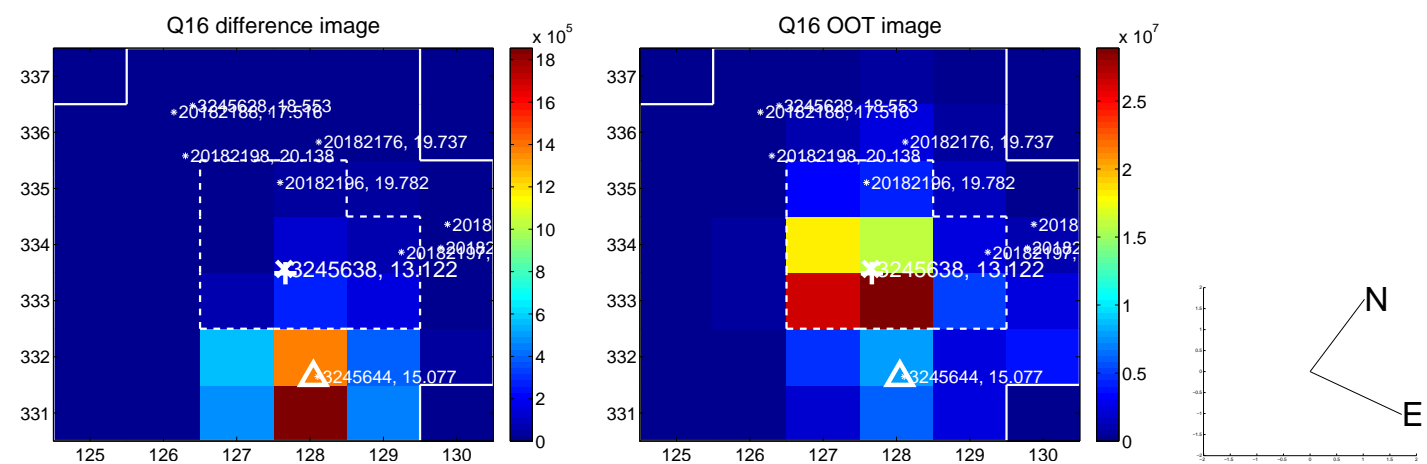
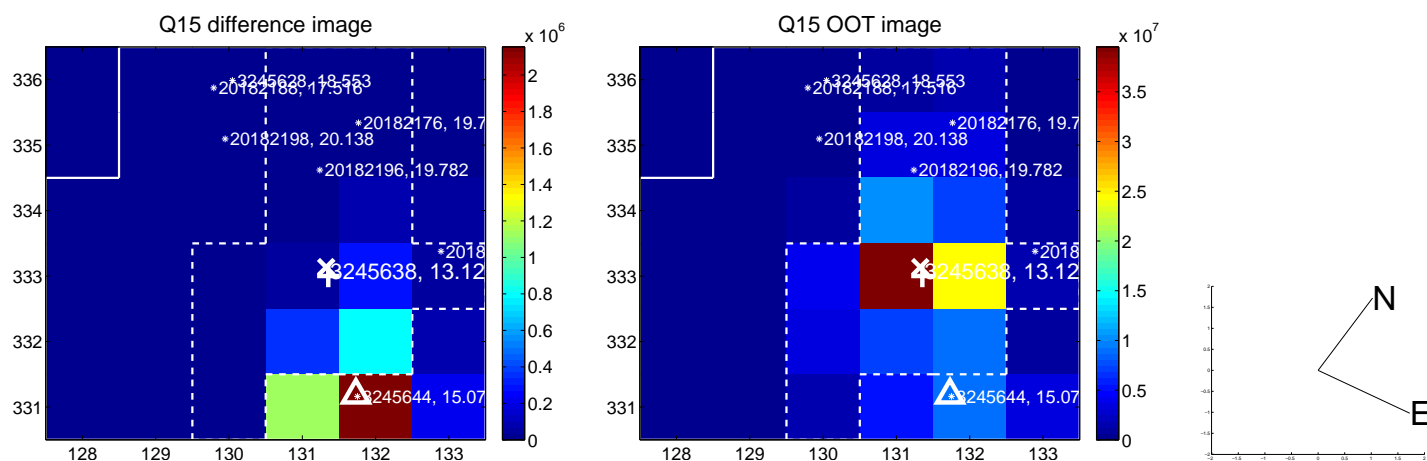
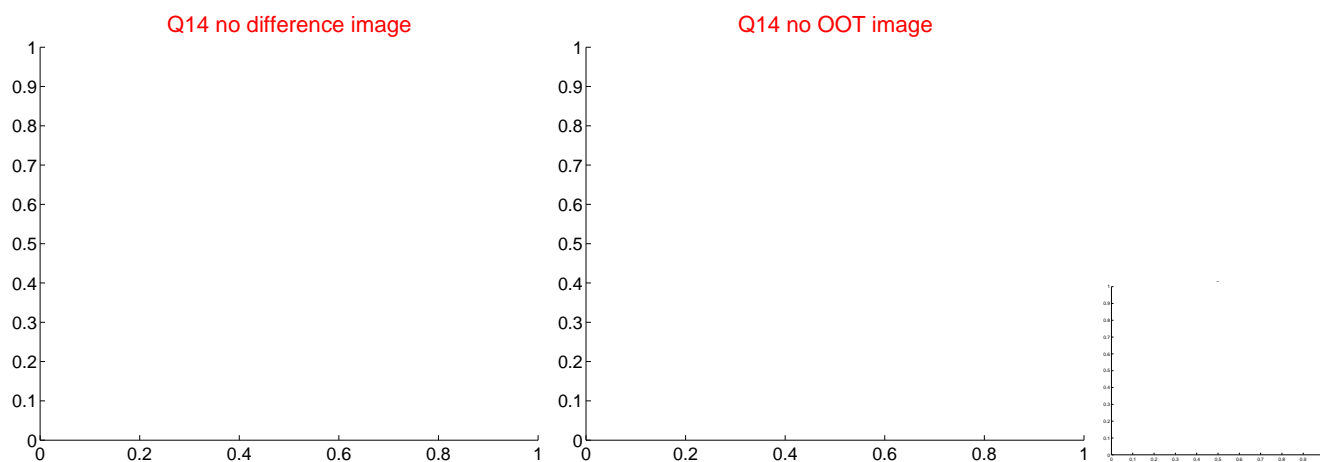
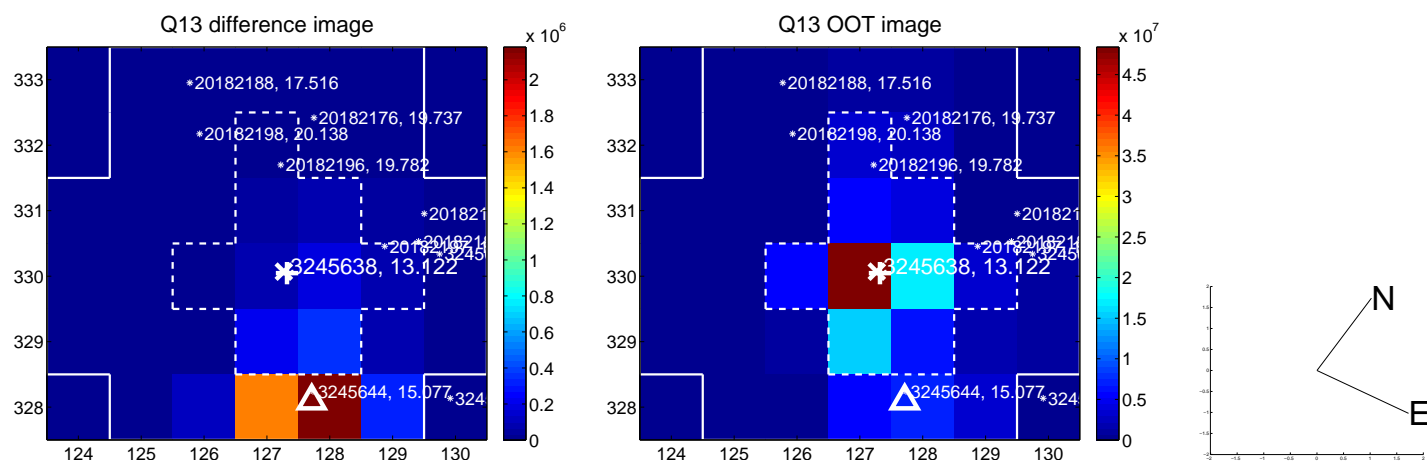
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



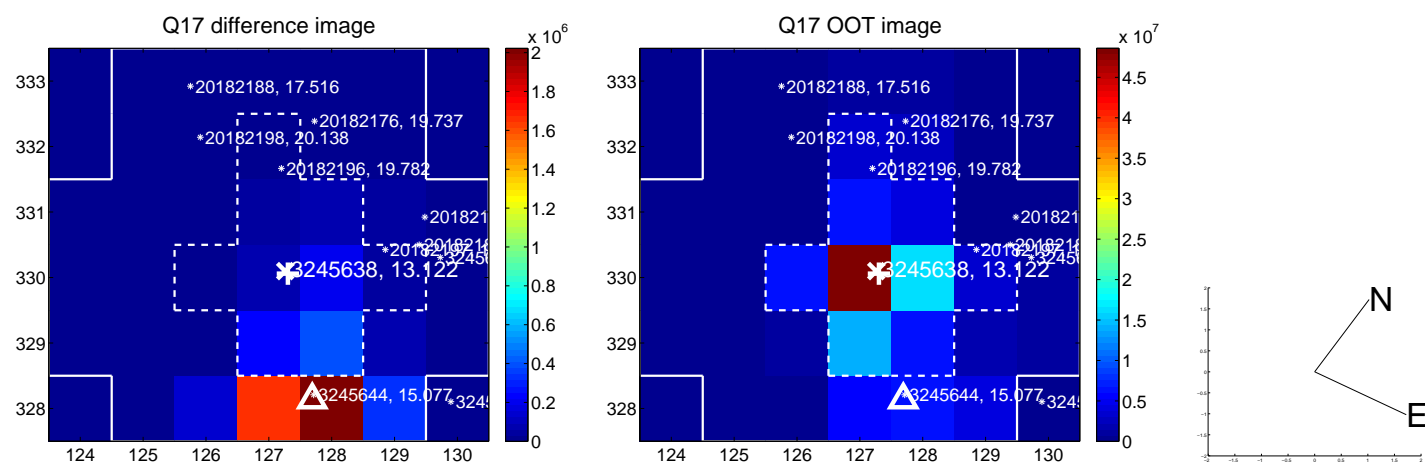
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



folded centroid time series figure for this object.

UKIRT Image

