

# KIC 005392871

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005392871-01	OBS	3292.01	42.398759	142.480292	582.9	16.371	24.6	26.7	1.12	6133	3.54	26.80
005392871-02	OBS	No	42.399194	151.961758	461.7	7.050	22.5	24.2	1.12	6133	3.12	26.80

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005392871-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
005392871-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—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 005392871-01

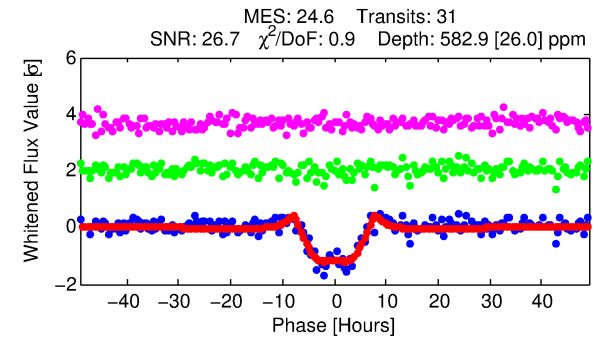
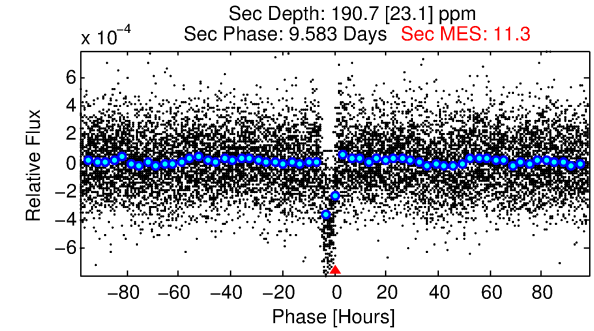
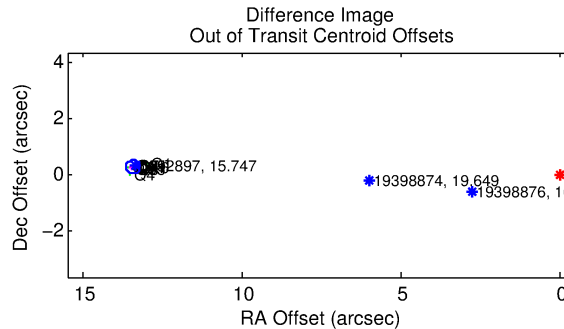
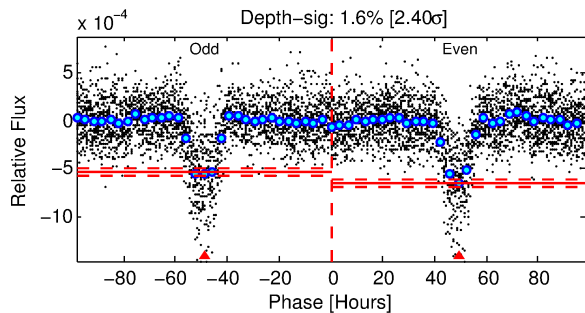
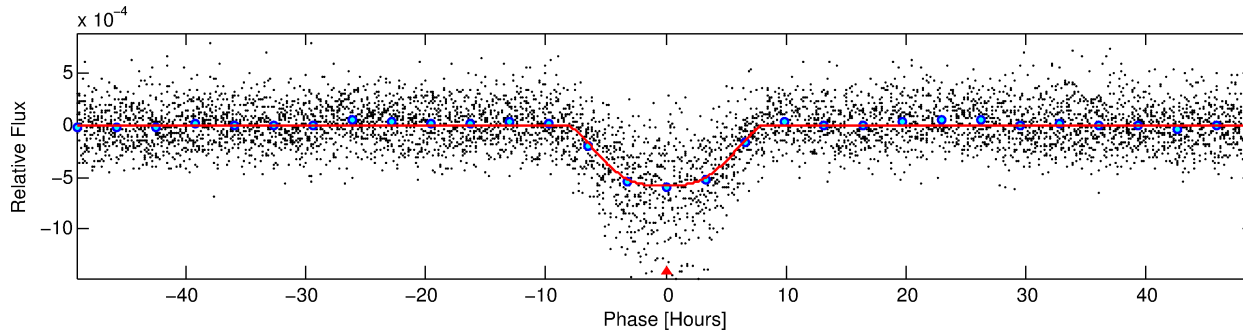
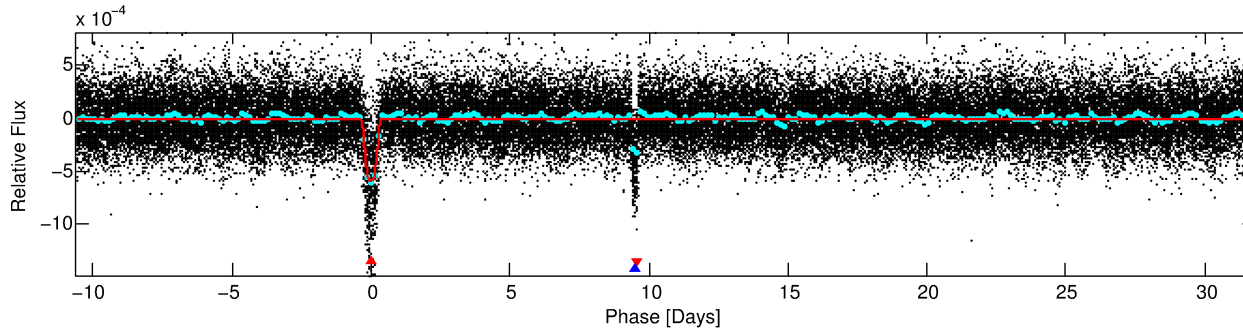
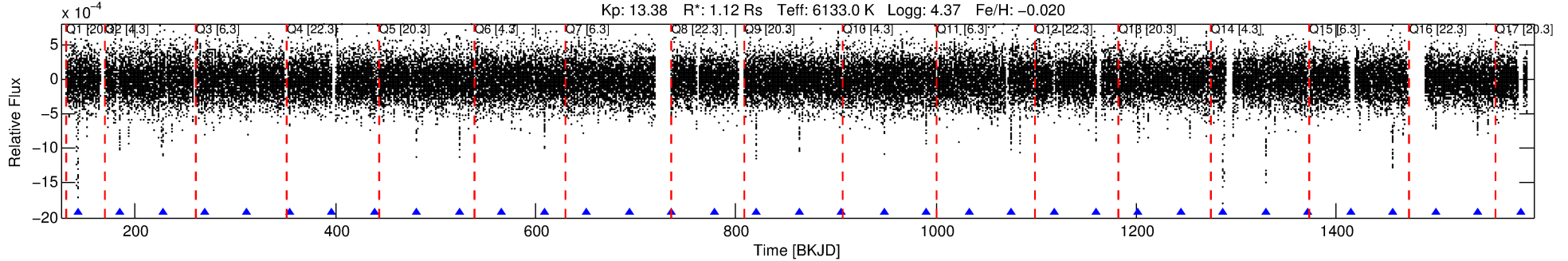
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005392871-01	5392871	3342.01	5392897	1:1	13.3	2	3	15.75	13.39	410.70	Direct-PRF	0	0.32	0.26

**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: 5392871 Candidate: 1 of 2 Period: 42.399 d  
KOI: K03292 Corr: No Ephemeris Match

Kp: 13.38 R\*: 1.12 Rs Teff: 6133.0 K Logg: 4.37 Fe/H: -0.020



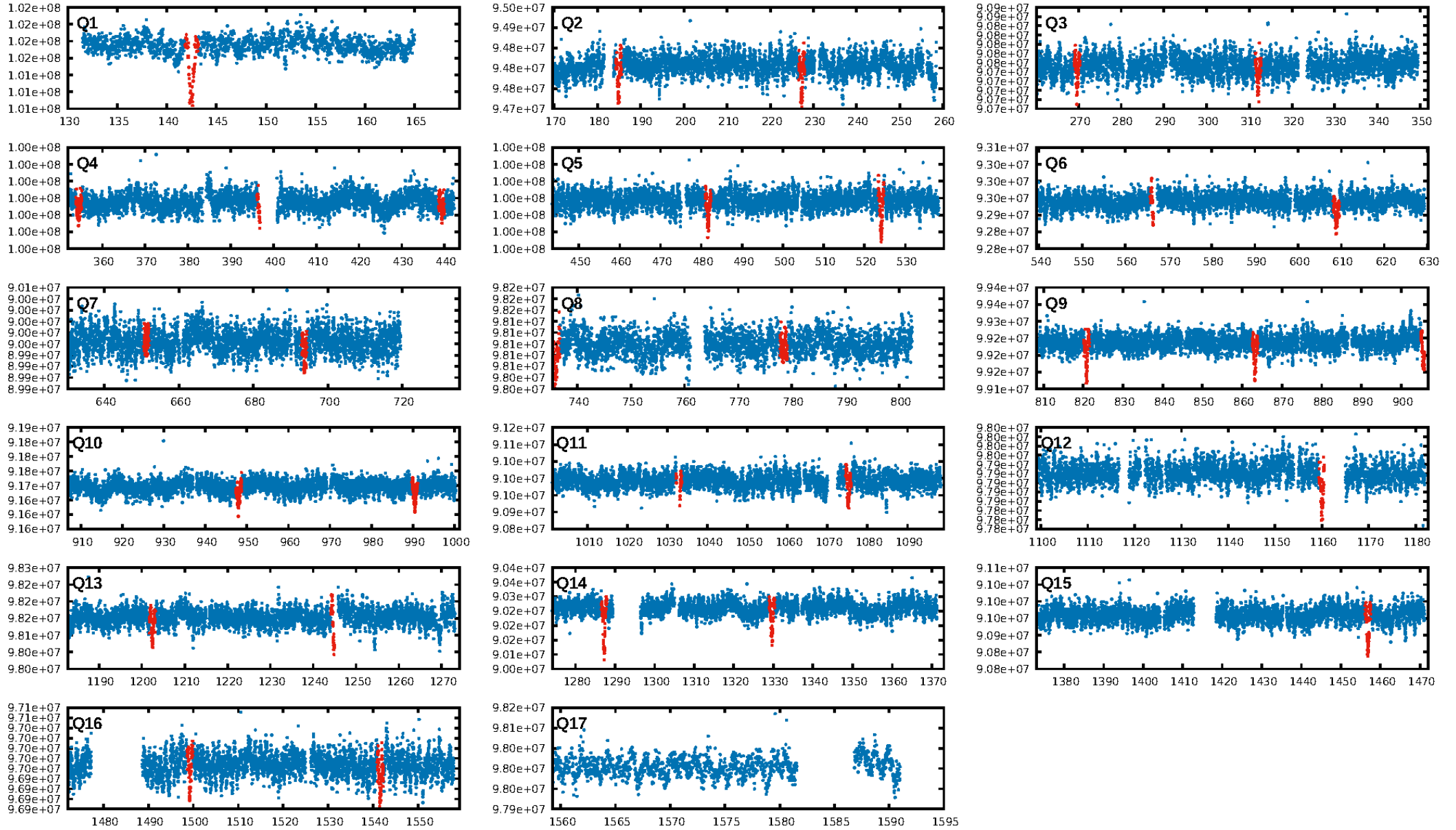
## DV Fit Results:

Period = 42.39876 [0.00052] d  
Epoch = 142.4803 [0.0097] BKJD  
Rp/R\* = 0.0290 [0.0008]  
a/R\* = 6.94 [0.24]  
b = 0.97 [0.00]  
Seff = 26.80 [11.08]  
Teq = 580 [60] K  
Rp = 3.54 [1.16] Re  
a = 0.2438 [0.0660] AU  
Ag = 496.97 [204.31] [2.43σ]  
Teff = 4235 [204] K [17.18σ]

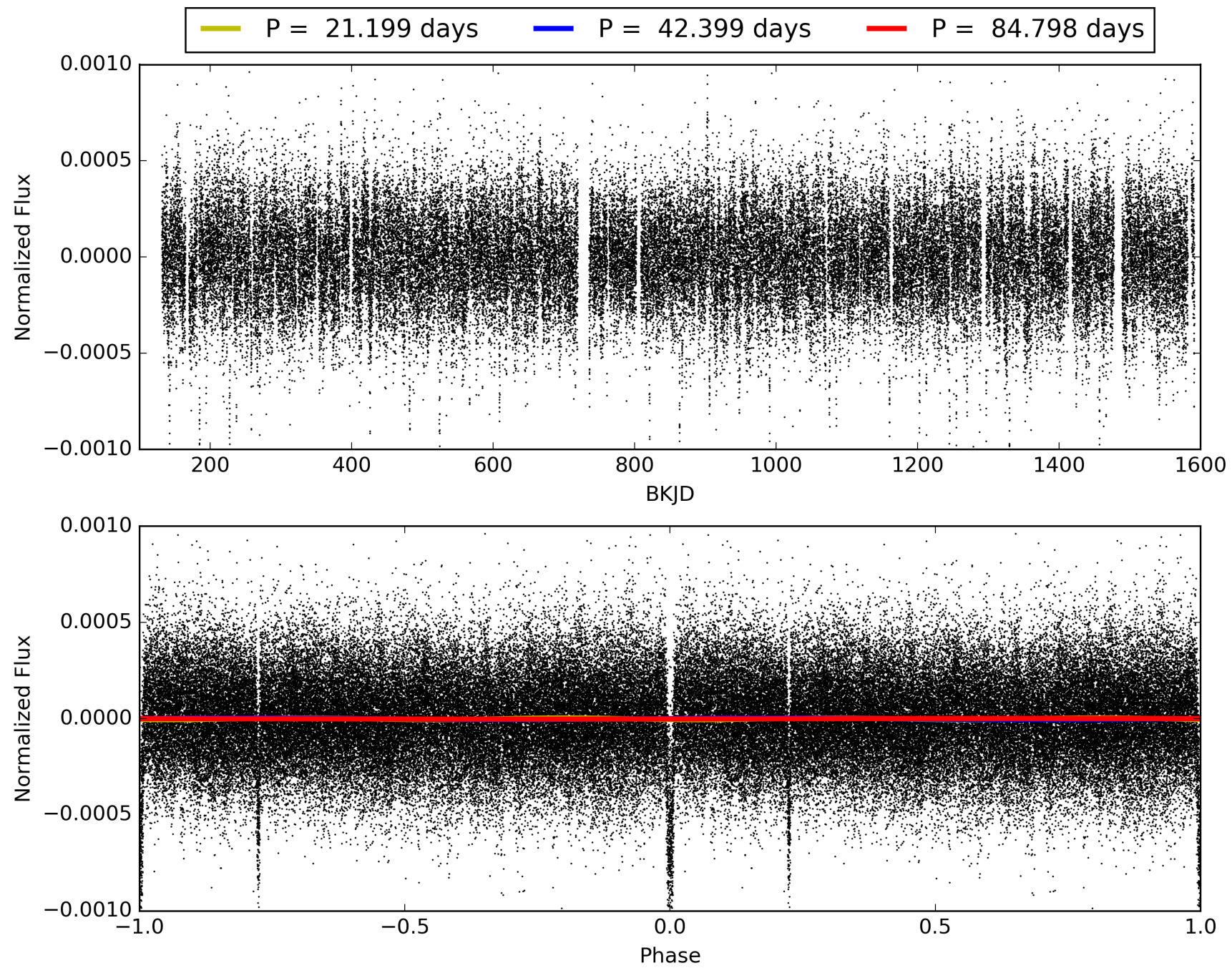
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: 1.33e-114  
RollingBand-fgt: 1.00 [30/30]  
GhostDiagnostic-chr: -0.1141  
Centroid-sig: 0.0%  
Centroid-so: 41.380 arcsec [179.84σ]  
OotOffset-rm: 13.446 arcsec [173.65σ]  
KicOffset-rm: 13.324 arcsec [170.52σ]  
OotOffset-st: 0/4/3/4 [11]  
KicOffset-st: 0/4/3/4 [11]  
DiffImageQuality-fgm: 1.00 [11/11]  
DiffImageOverlap-fno: 1.00 [15/15]

# TCE 005392871-01, PDC Light Curves



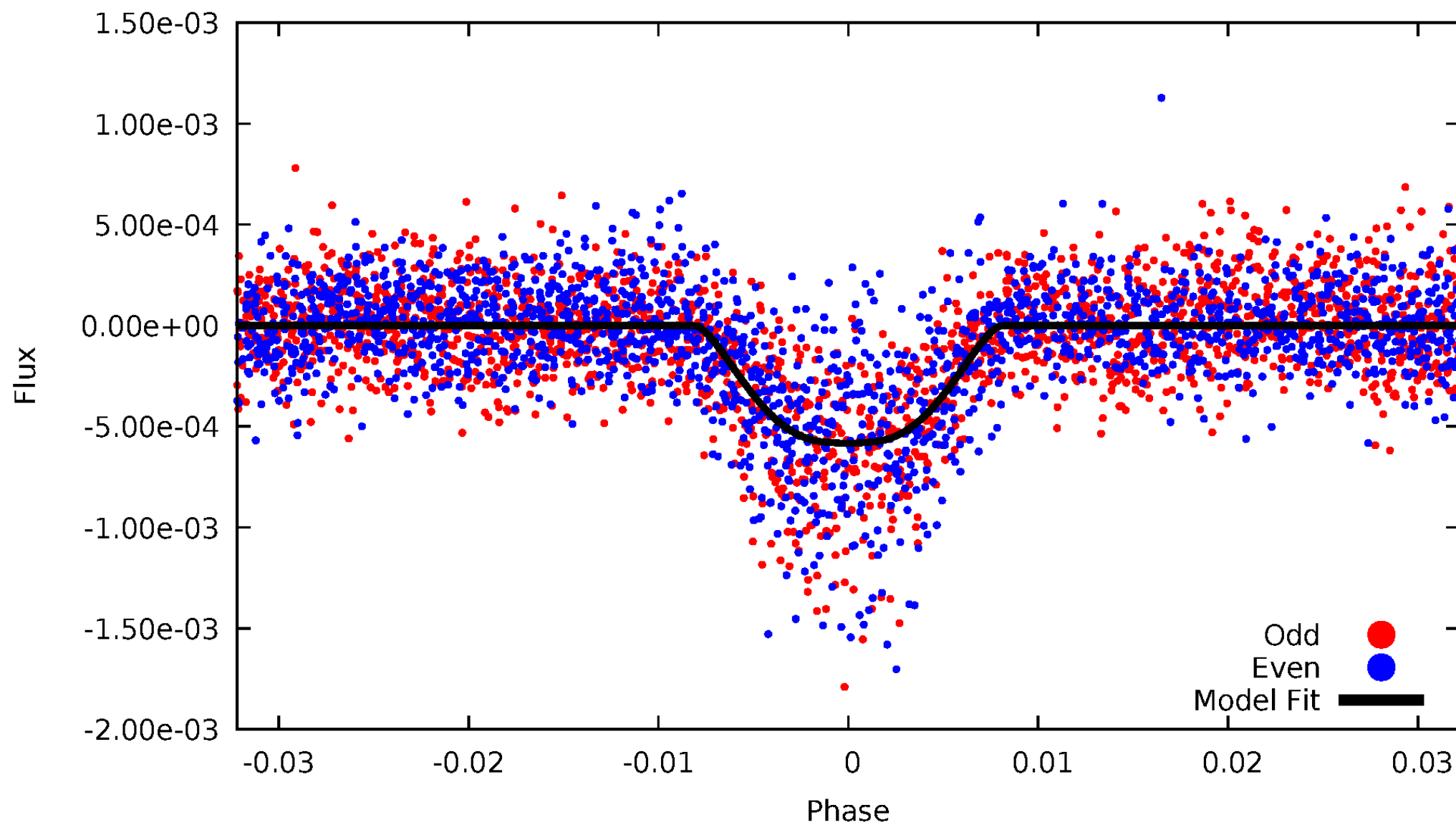
TCE 005392871-01





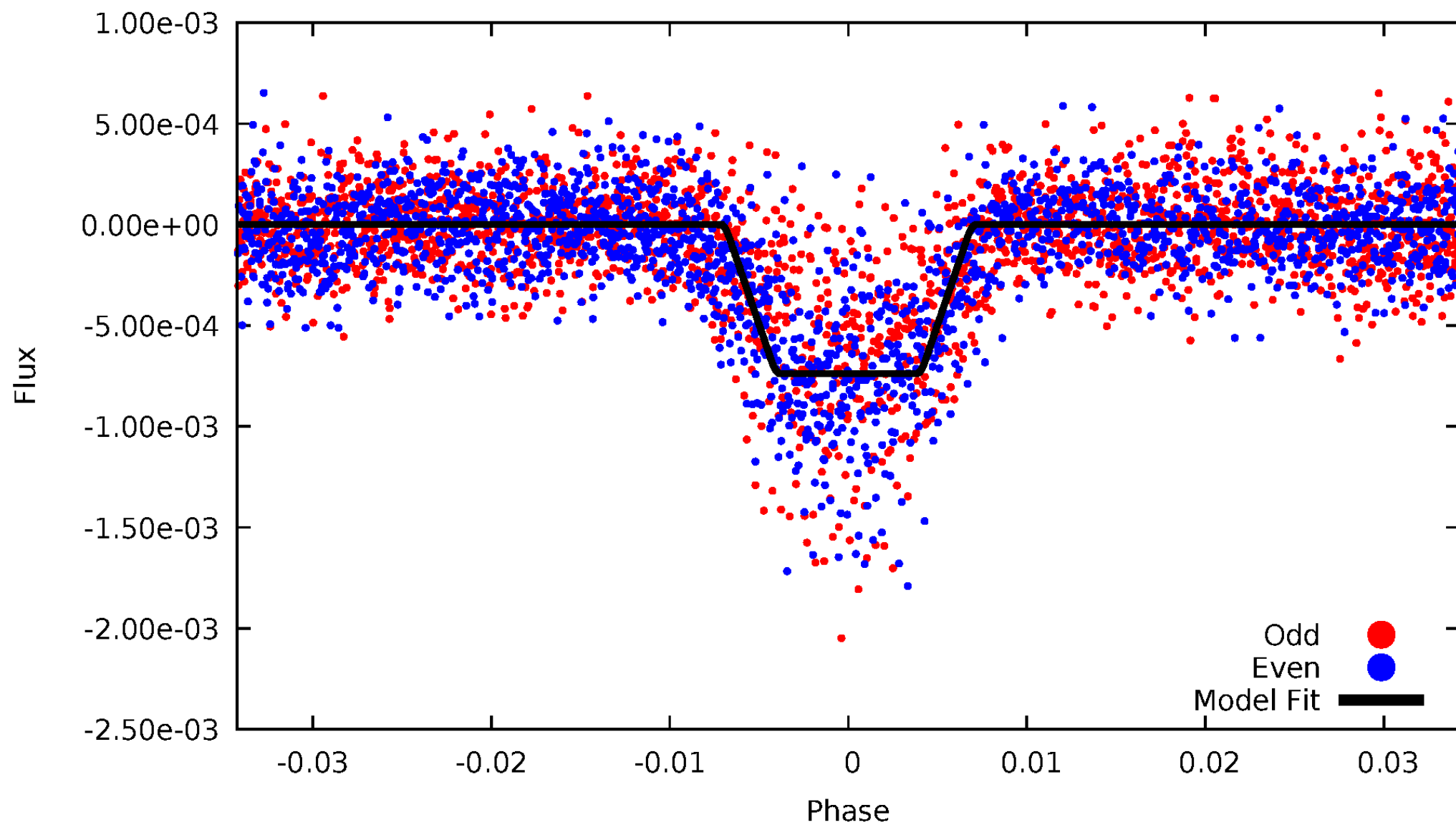
# DV Odd/Even

TCE 005392871-01



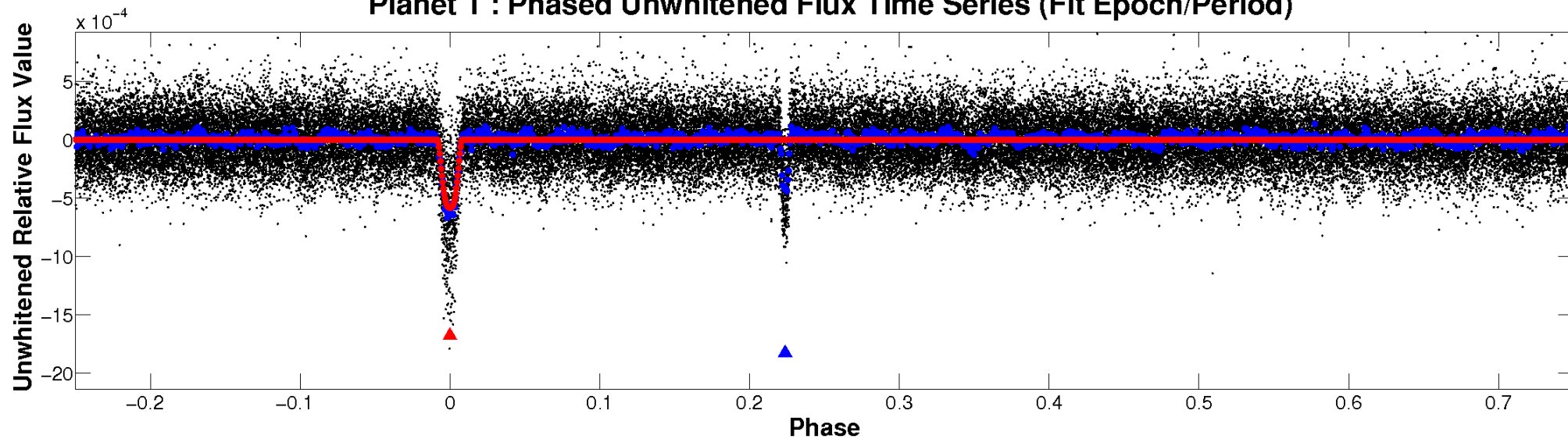
# ALT Odd/Even

TCE 005392871-01

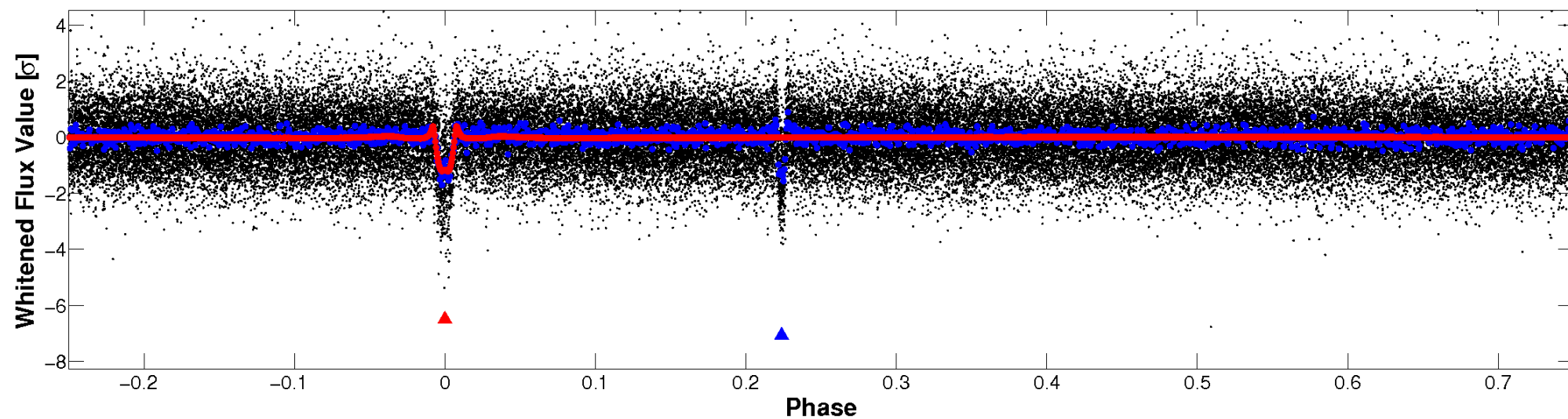


# Non-Whitened Vs. Whitened Light Curve

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

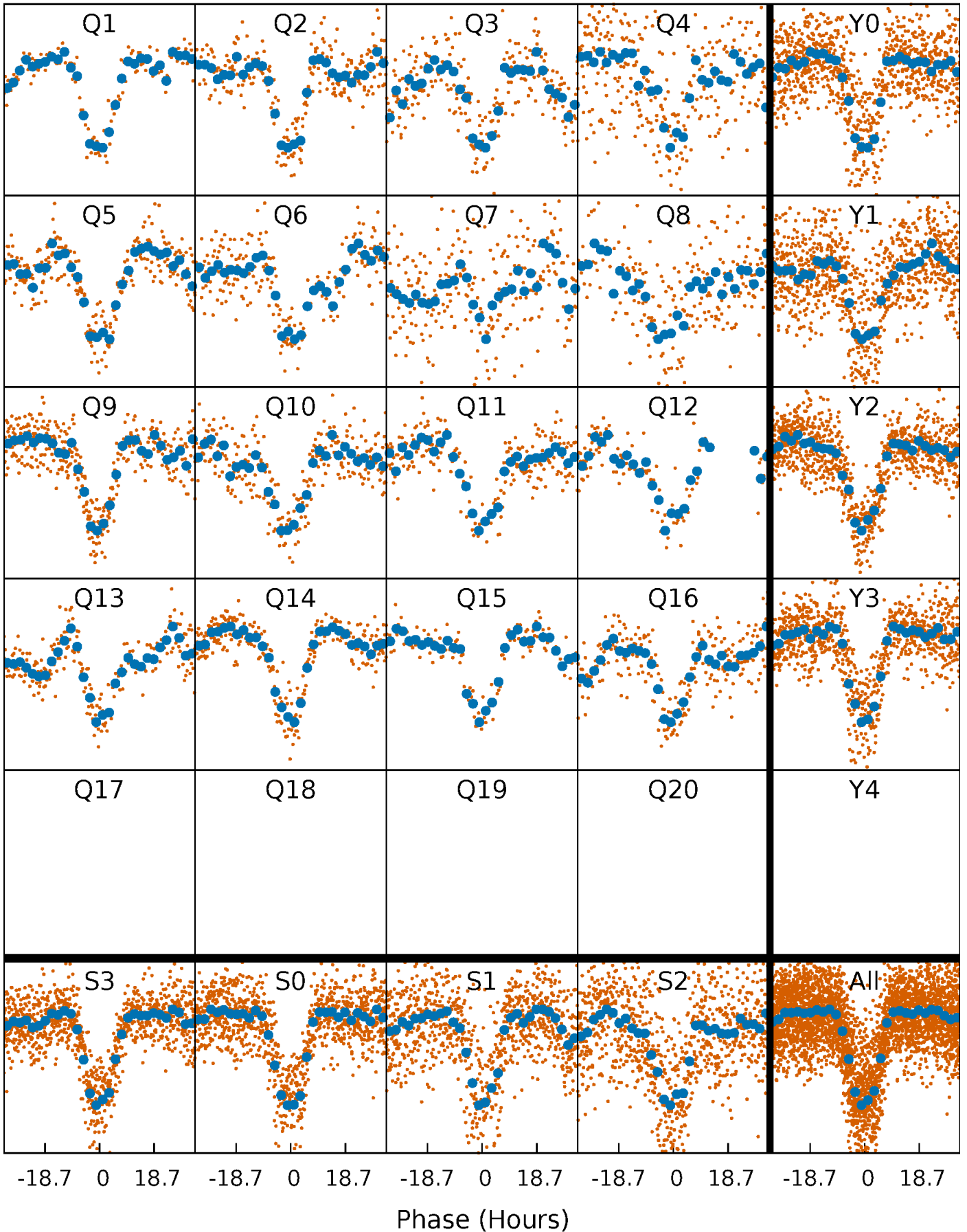


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

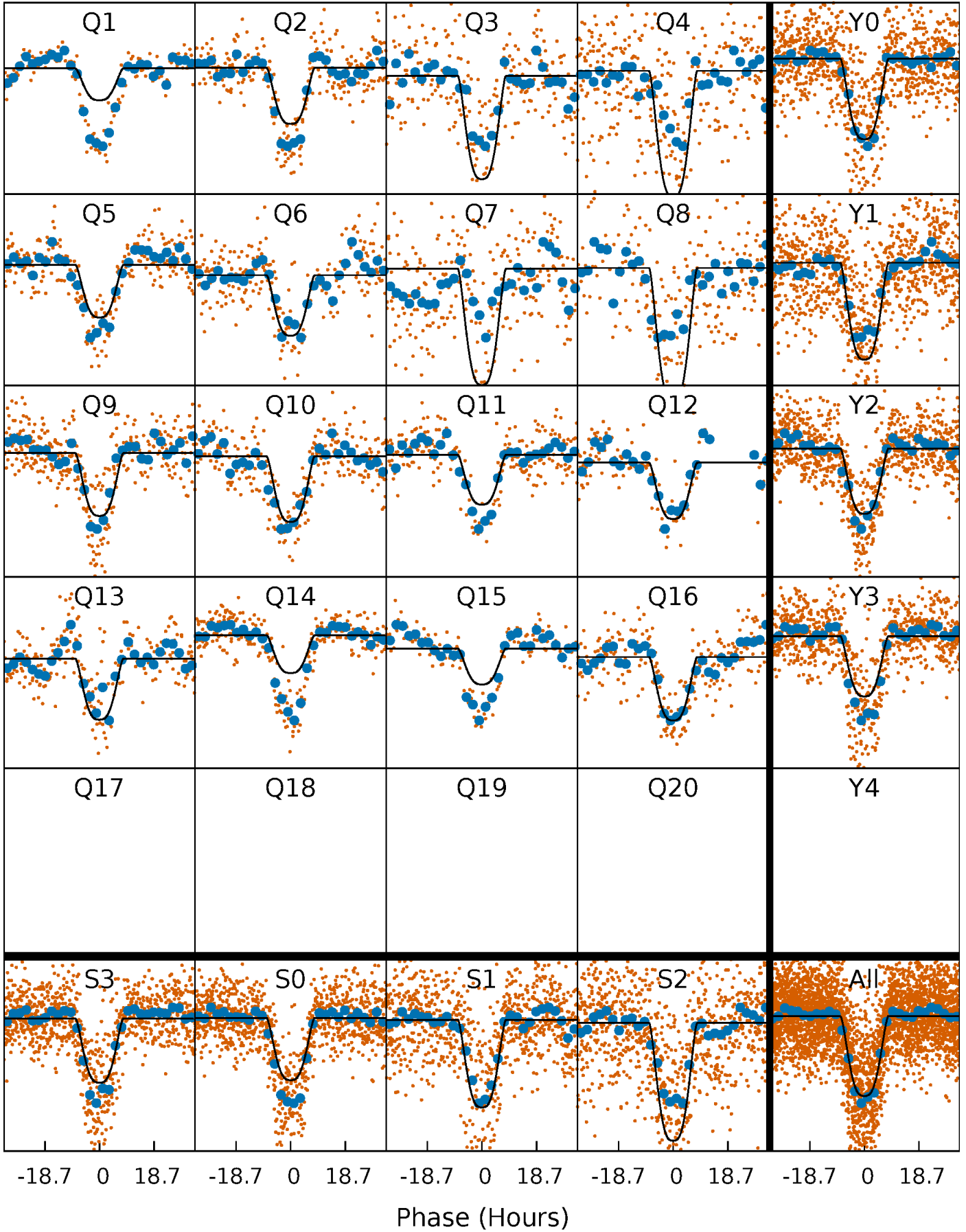
TCE 005392871-01 P= 42.398759 Days  $T_0=142.480292$  (BKJD)





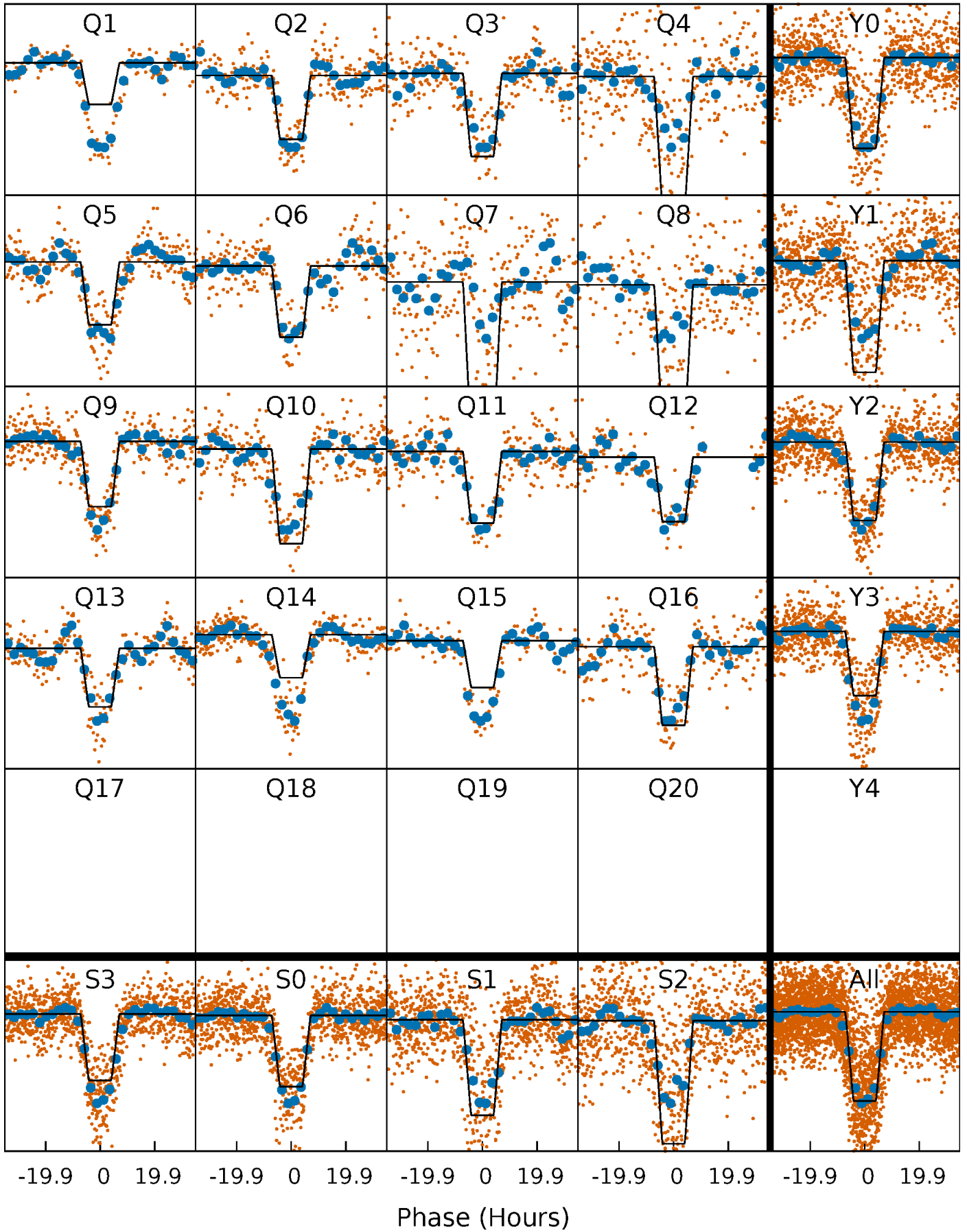
# DV Quarter-Phased Transit Curves

TCE 005392871-01 P= 42.398759 Days  $T_0=142.480292$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

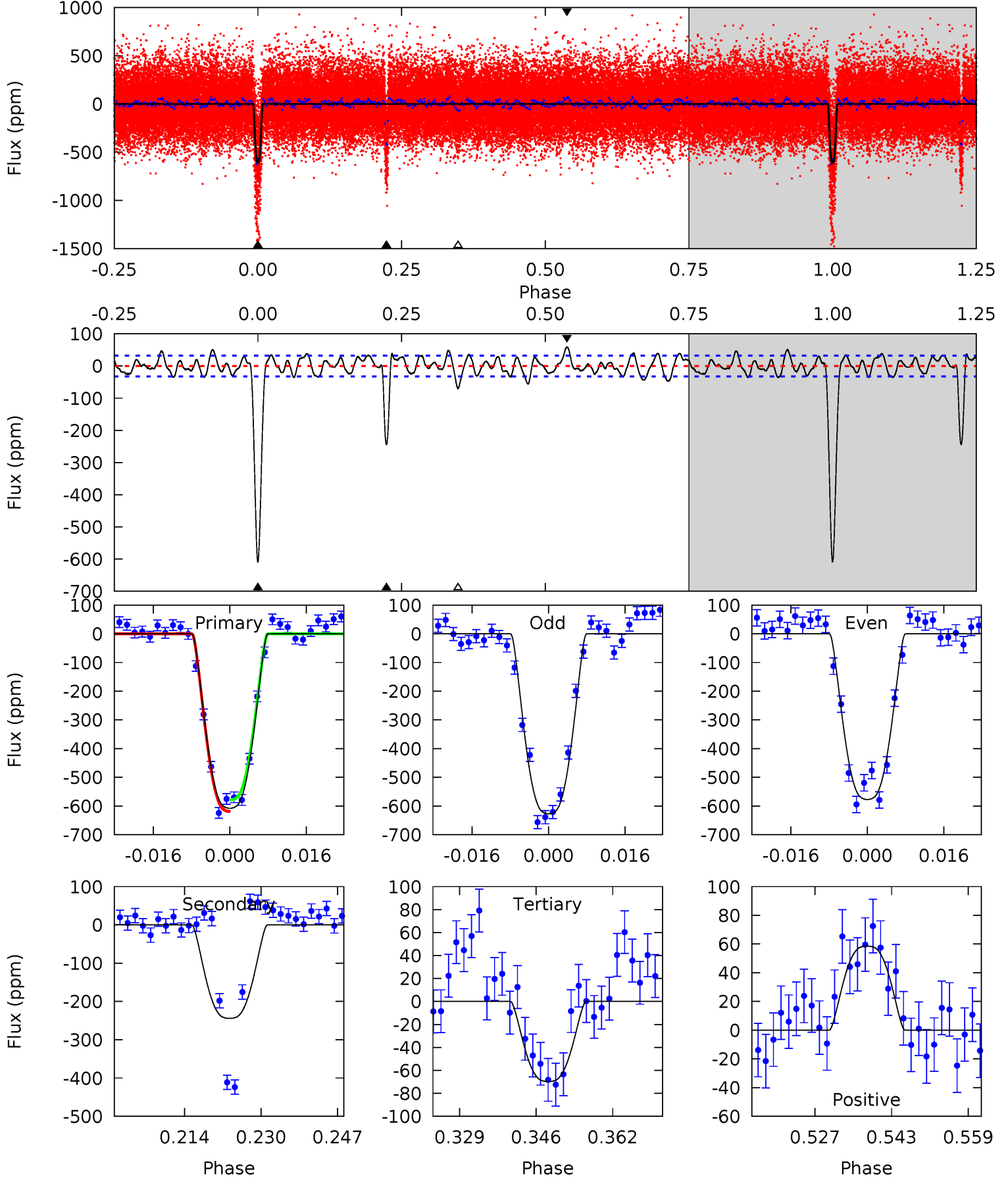
TCE 005392871-01 P= 42.400297 Days  $T_0=142.446820$  (BKJD)



# DV Model-Shift Uniqueness Test

005392871-01, P = 42.398759 Days, E = 100.081533 Days

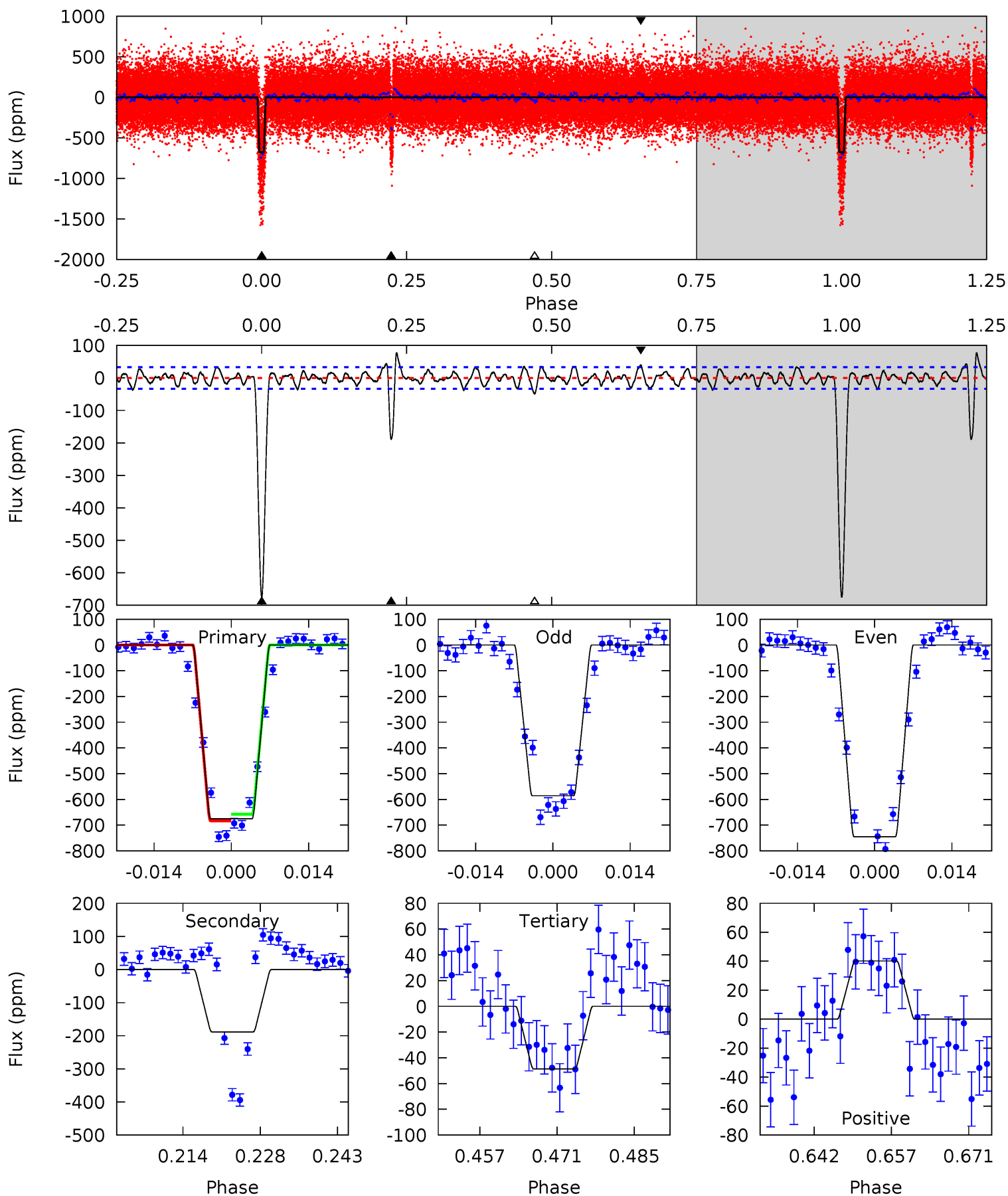
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
92.5	37.2	10.6	8.91	4.93	2.40	3.37	81.9	83.6	26.6	28.3	3.79	0.96	0.09	3.02



# Alt Model-Shift Uniqueness Test

005392871-01, P = 42.400297 Days, E = 100.046523 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
100.1	27.9	7.20	5.96	4.96	2.45	2.28	92.9	94.2	20.7	22.0	11.7	1.05	0.10	1.87



### Stellar Parameters For KIC 005392871

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6133^{+193}_{-214}$	$4.370^{+0.105}_{-0.210}$	$-0.020^{+0.250}_{-0.300}$	$1.121^{+0.366}_{-0.183}$	$1.071^{+0.166}_{-0.135}$	$1.072^{+0.500}_{-0.542}$
	+3%/-3%	+2%/-5%	+1250%/-1500%	+33%/-16%	+15%/-13%	+47%/-51%
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 005392871-01 / KOI 3292.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-244 \pm 7$	$3.61^{+0.60}_{-0.35}$	$821^{+65}_{-49}$	$4649^{+135}_{-137}$	$608^{+118}_{-154}$
Alt.	$-188 \pm 7$	$3.42^{+0.63}_{-0.34}$	$821^{+69}_{-53}$	$4529^{+129}_{-144}$	$533^{+110}_{-145}$

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



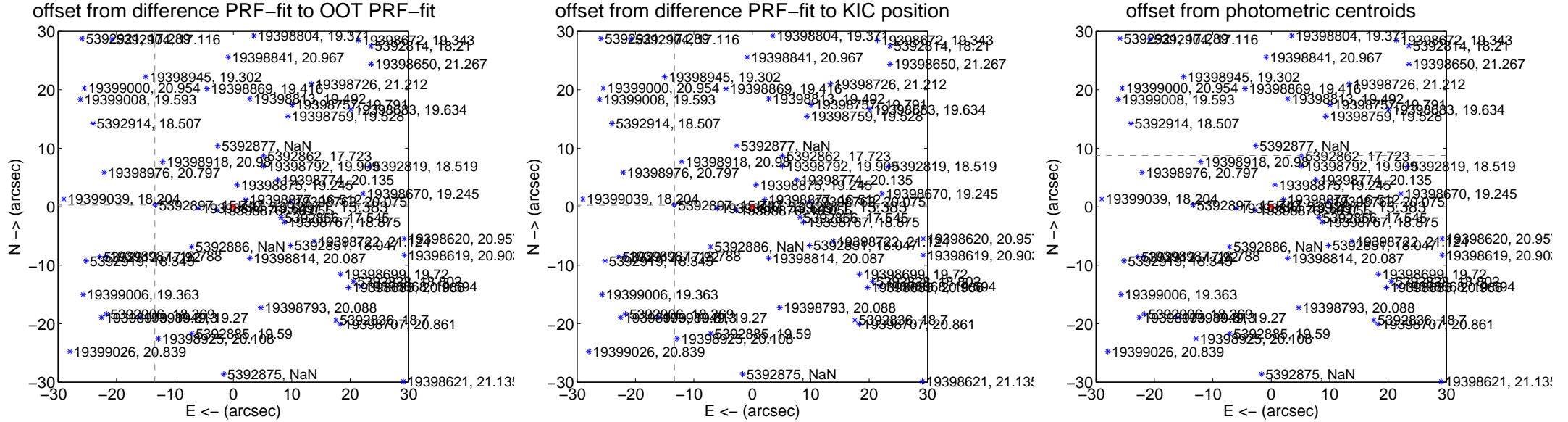
## DV Centroid Data

Supplemental centroid analysis for 005392871-01. Kepler magnitude: 13.38. Transit SNR 26.72

There are 11 quarters with good PRF difference image offsets

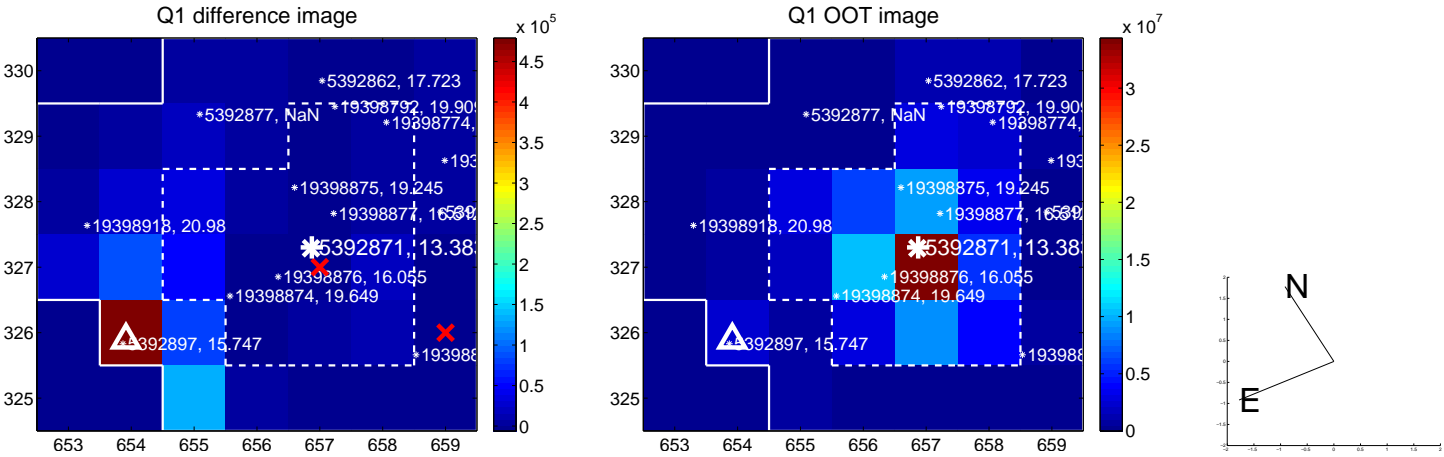
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>13.446 <math>\pm</math> 0.077</b>	<b>173.65</b>	13.443 $\pm$ 0.078	0.272 $\pm$ 0.073
PRF-fit source offset from KIC position	<b>13.324 <math>\pm</math> 0.078</b>	<b>170.52</b>	13.322 $\pm$ 0.078	0.249 $\pm$ 0.069
photometric centroid source offset	<b>41.38 <math>\pm</math> 0.23</b>	<b>179.84</b>	40.44 $\pm$ 0.23	8.75 $\pm$ 0.22

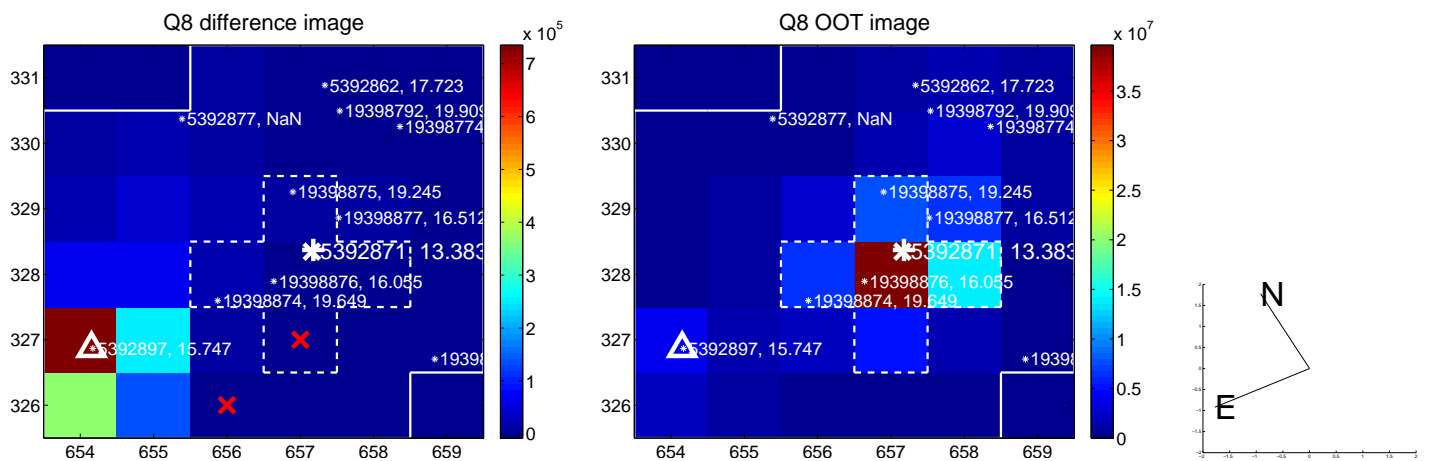
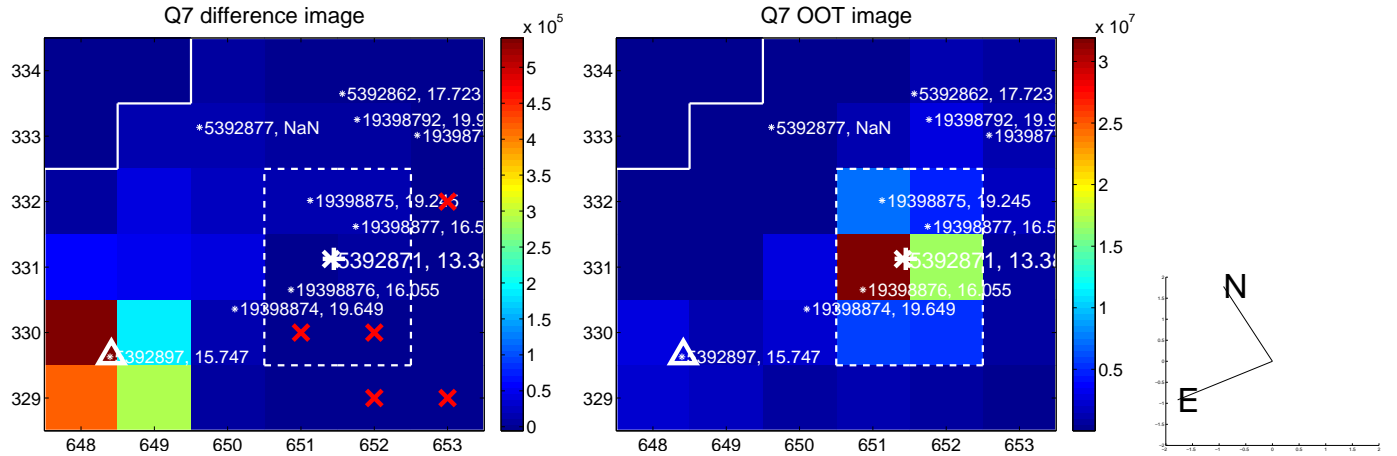
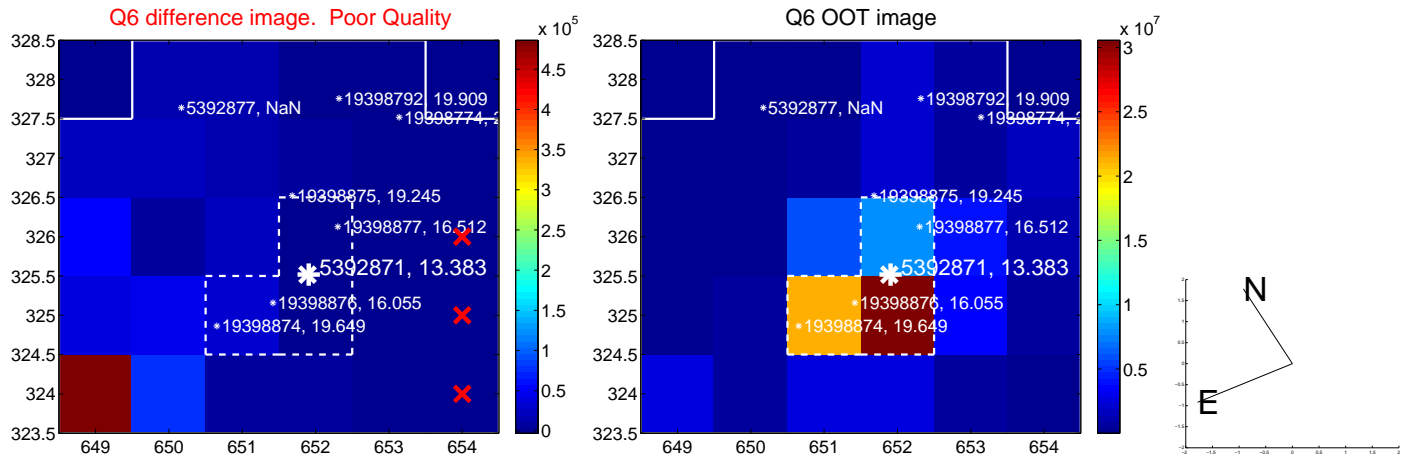
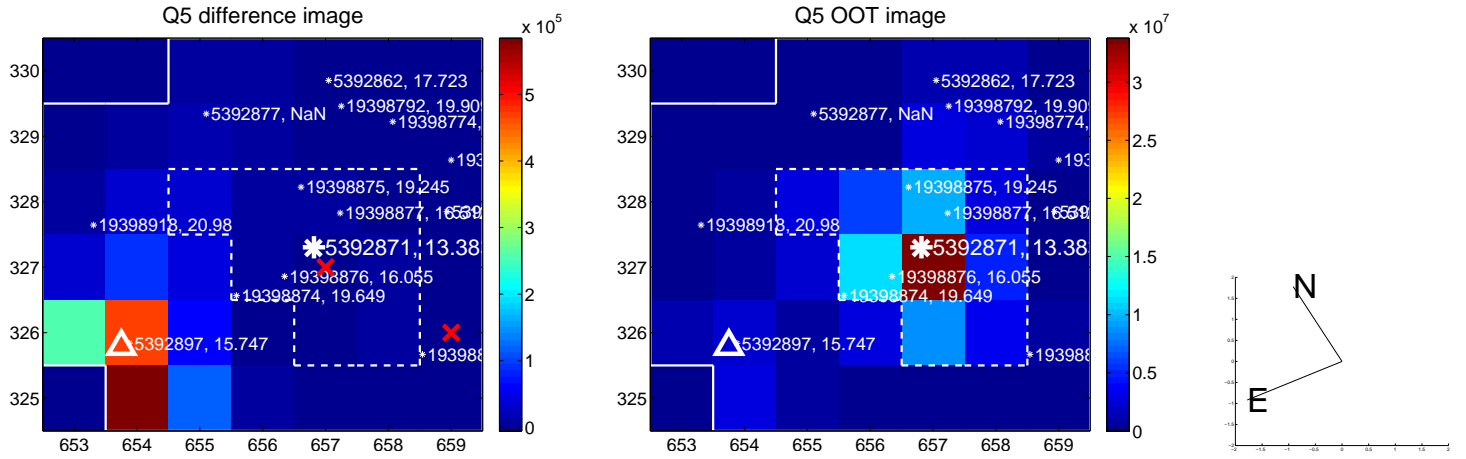


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

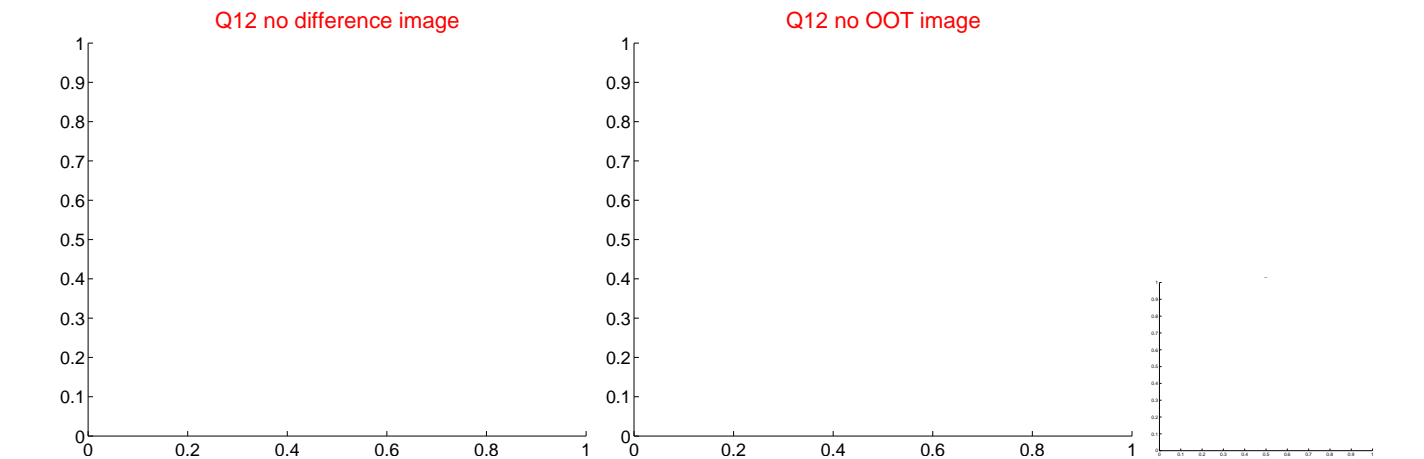
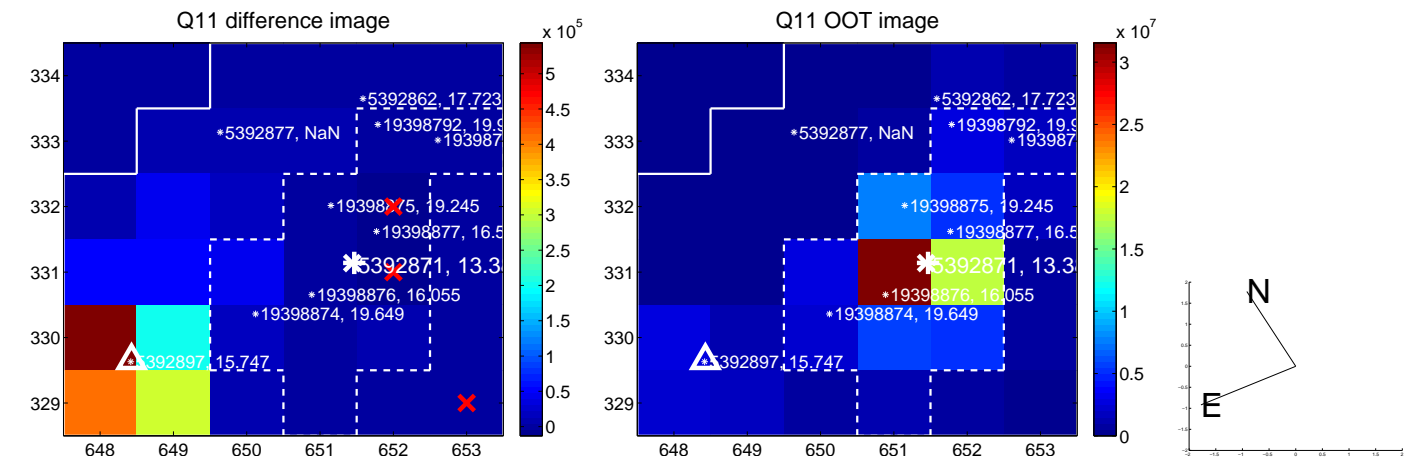
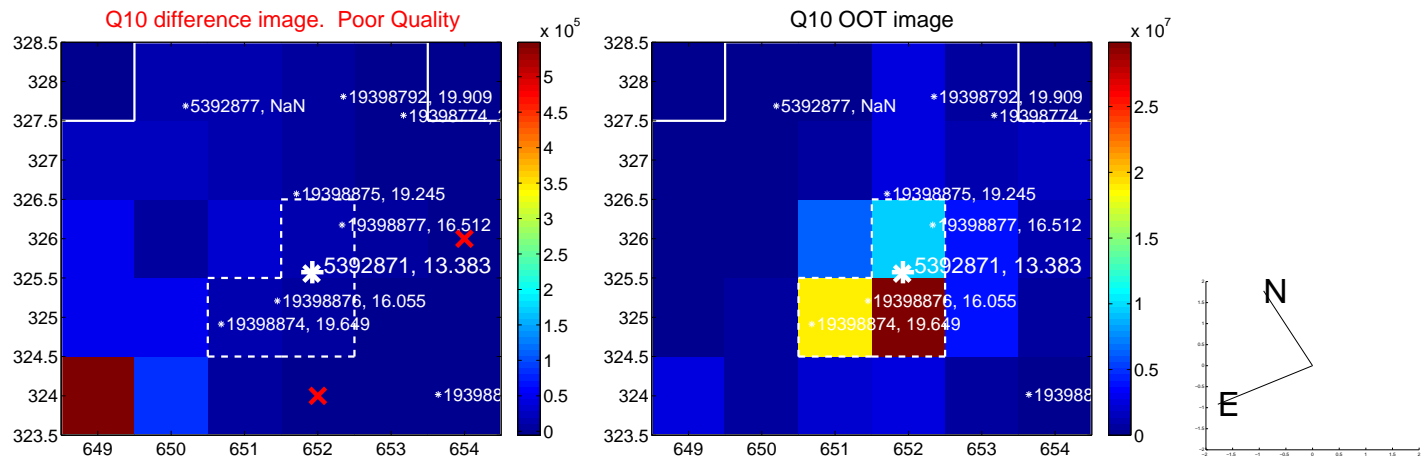
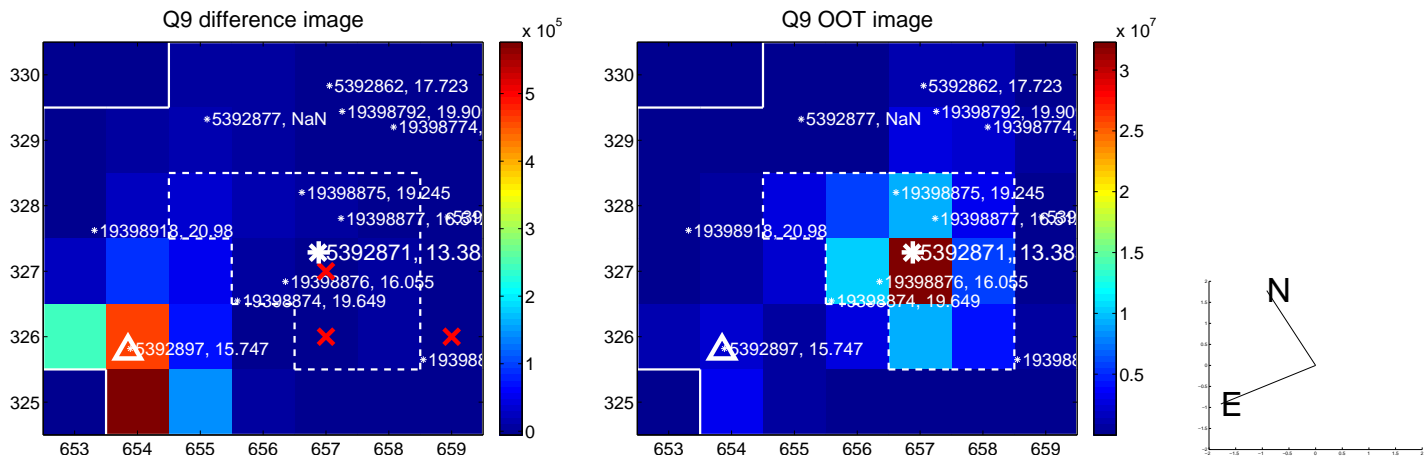
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



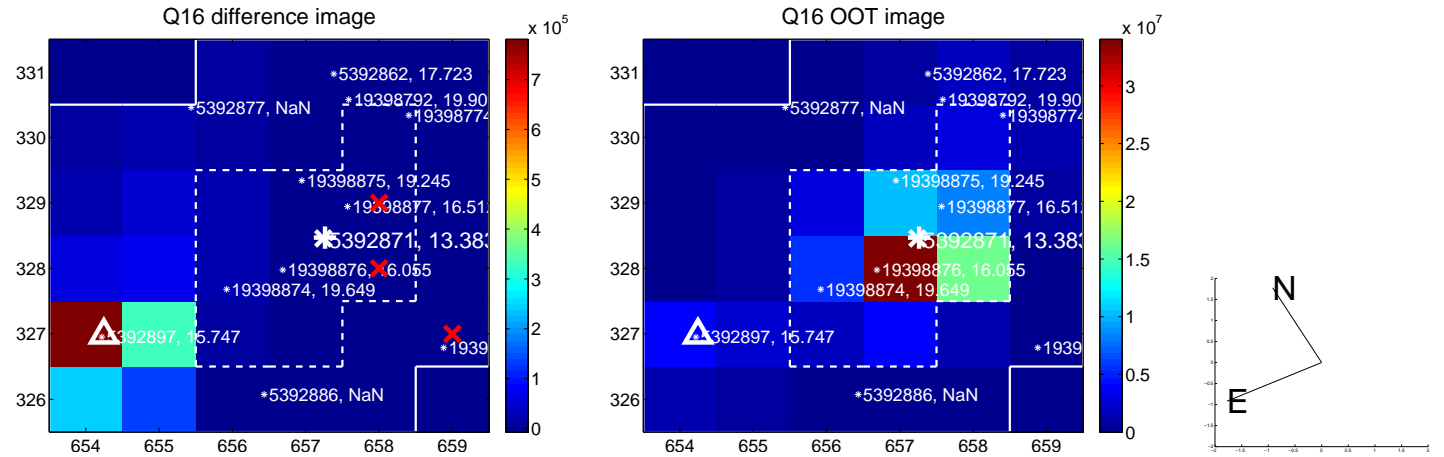
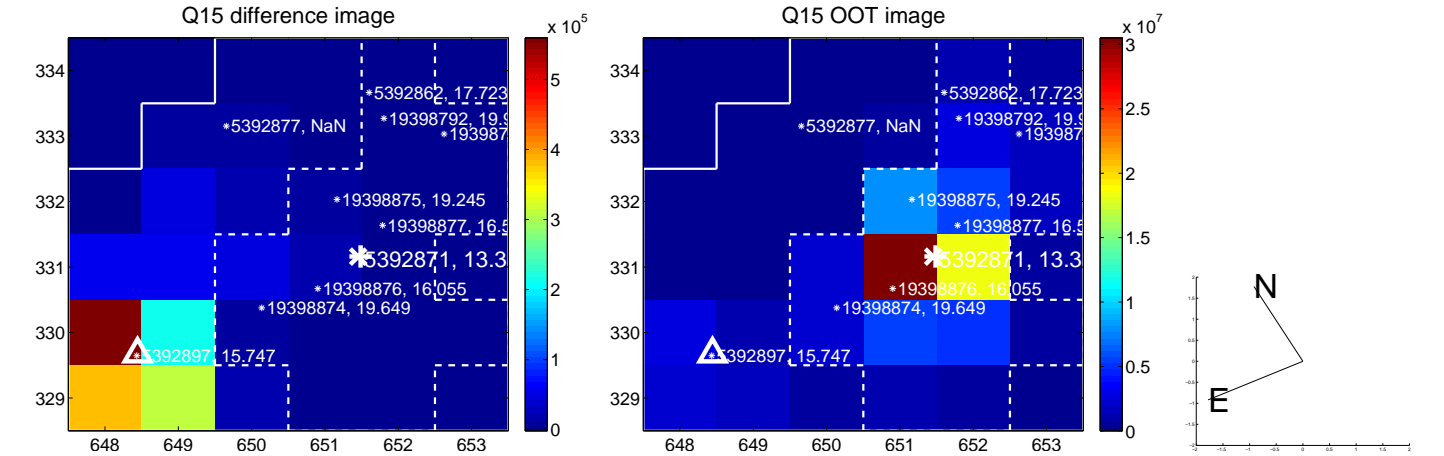
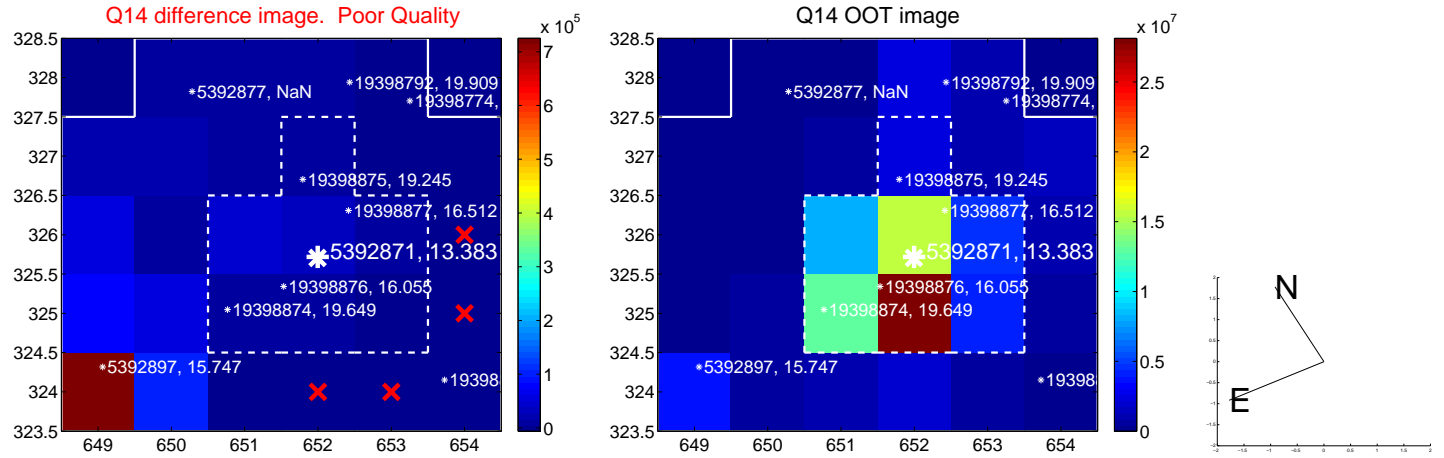
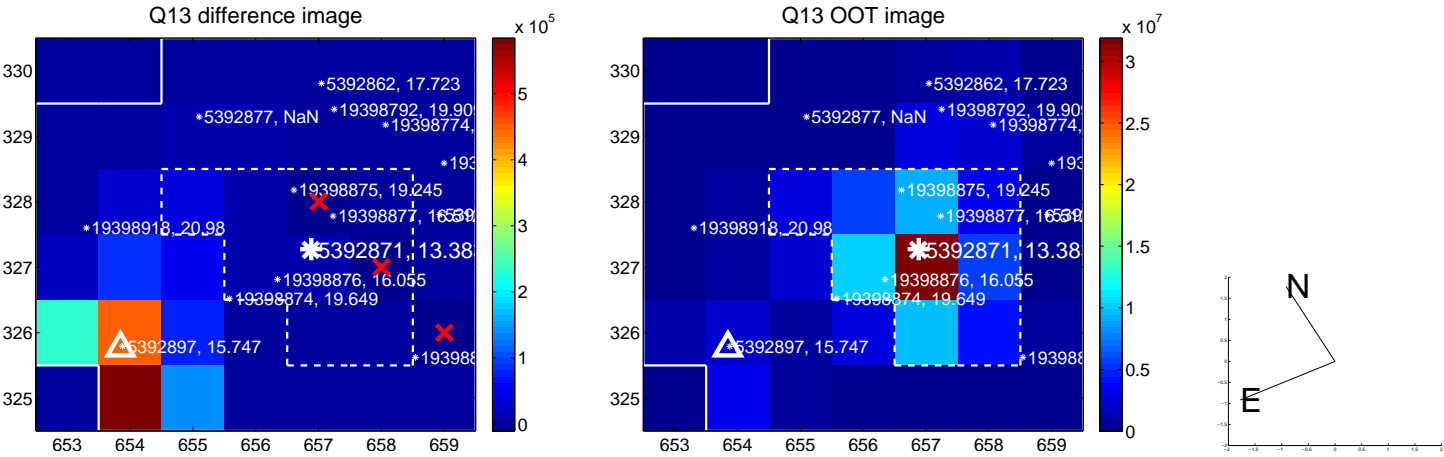
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

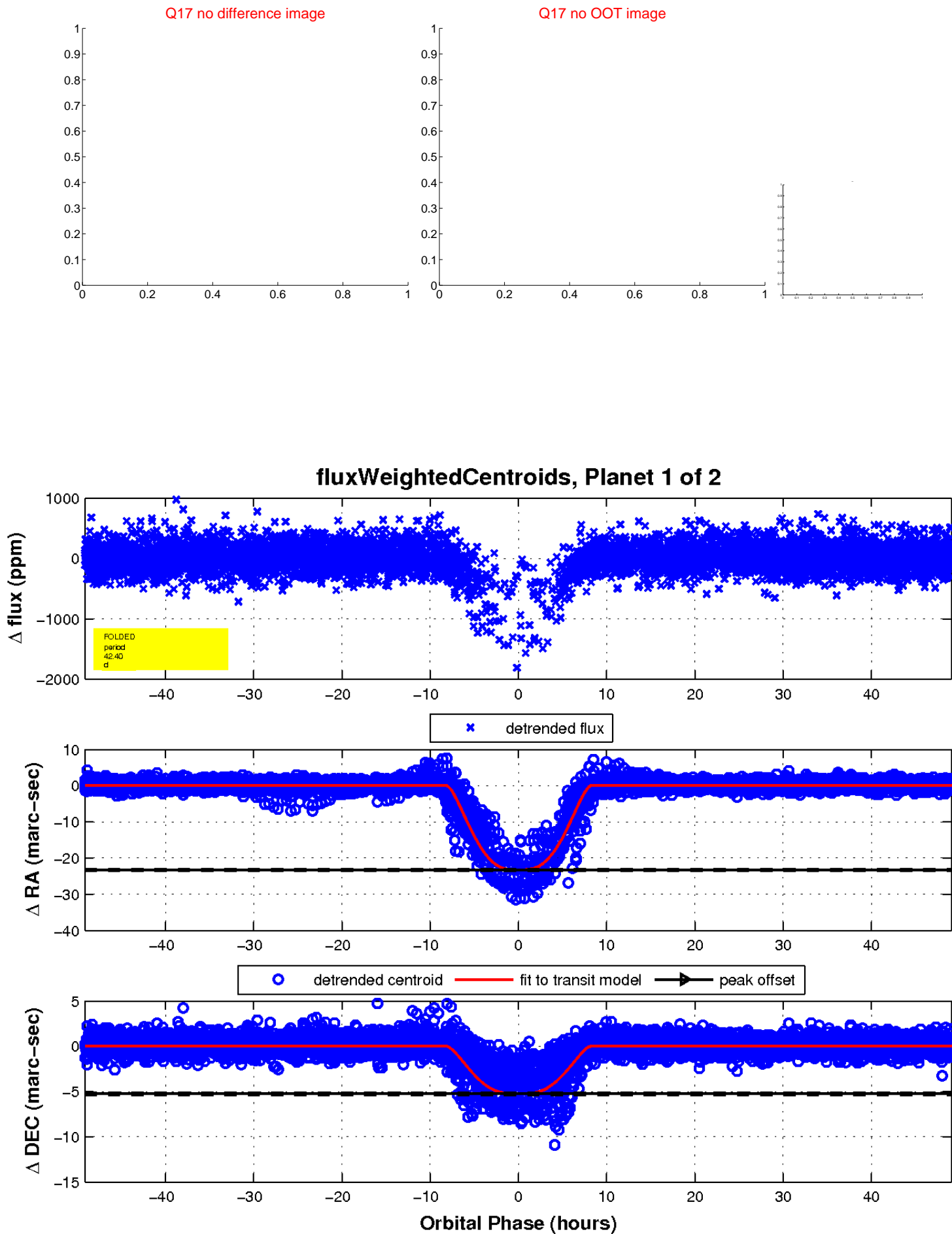


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



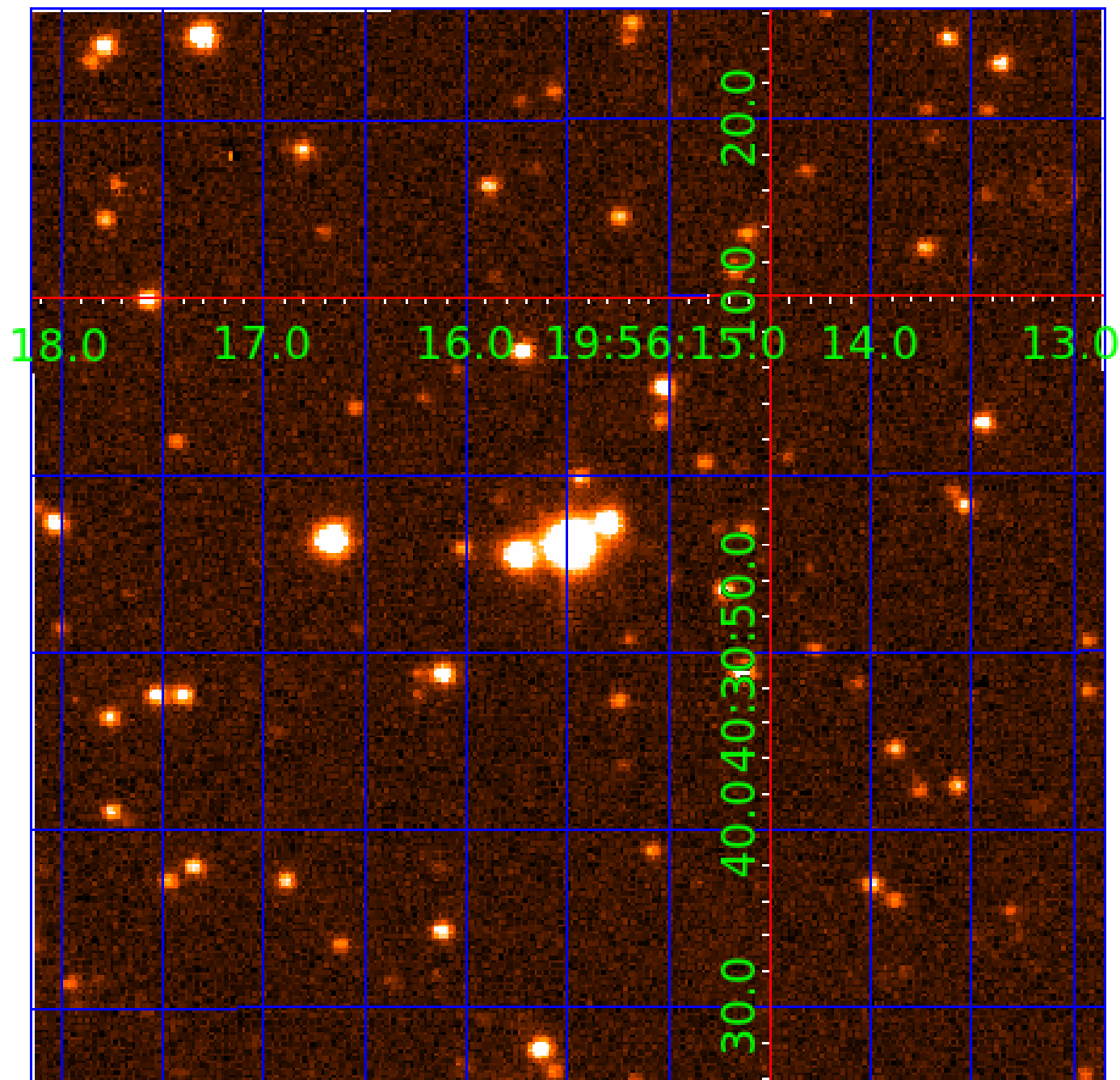


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005392871

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005392871-01	OBS	3292.01	42.398759	142.480292	582.9	16.371	24.6	26.7	1.12	6133	3.54	26.80
005392871-02	OBS	No	42.399194	151.961758	461.7	7.050	22.5	24.2	1.12	6133	3.12	26.80

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005392871-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
005392871-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—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.

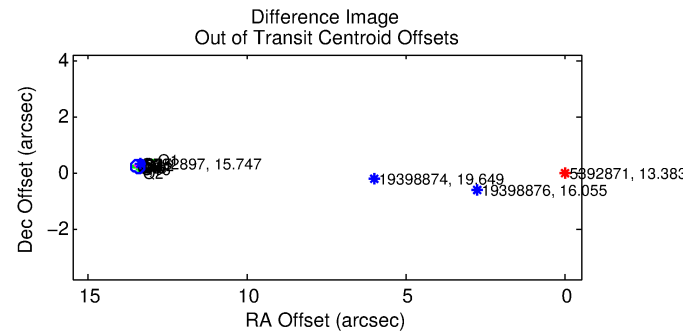
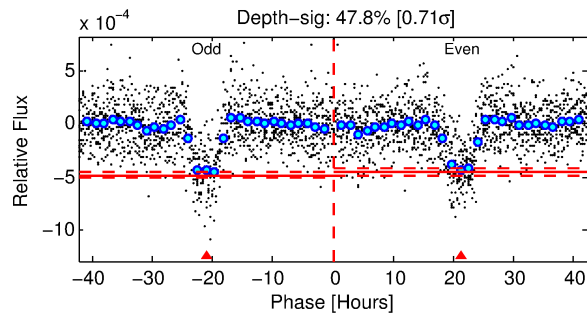
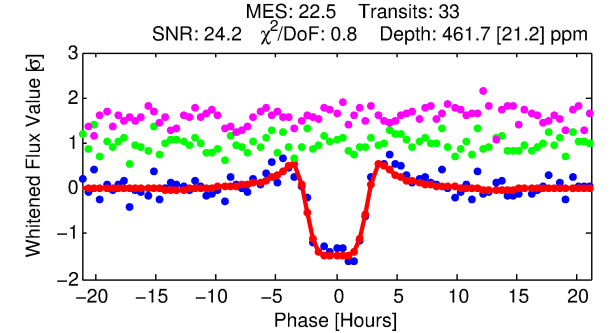
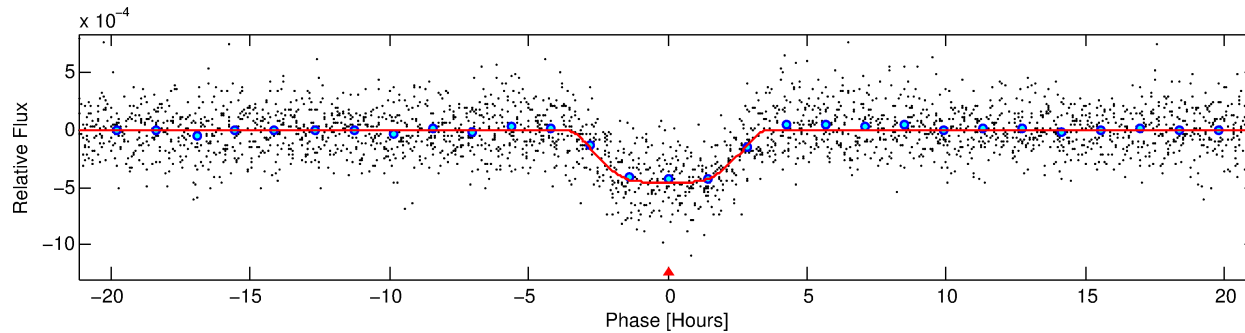
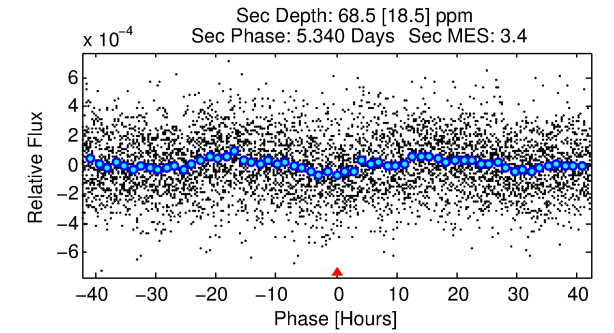
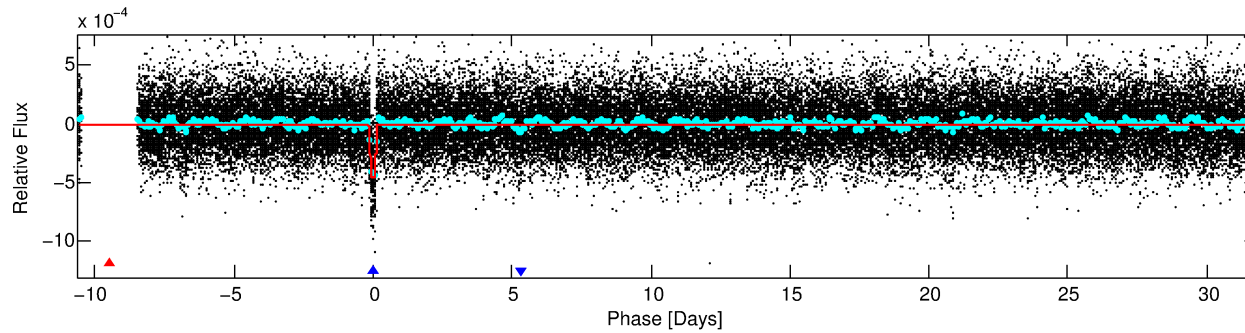
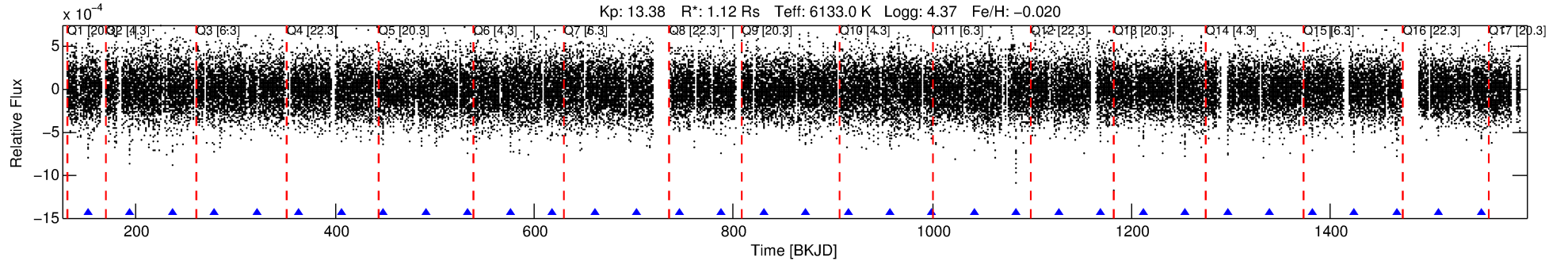
## Ephemeris Match Information For 005392871-02

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	$\sigma_P$	$\sigma_T$
005392871-02	5392871	005392897-sec	5392897	1:1	13.3	2	3	15.75	13.39	283.55	Direct-PRF	0	0.06	0.14

**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: 5392871 Candidate: 2 of 2 Period: 42.399 d  
KOI: K03292.01 Corr: 0.980



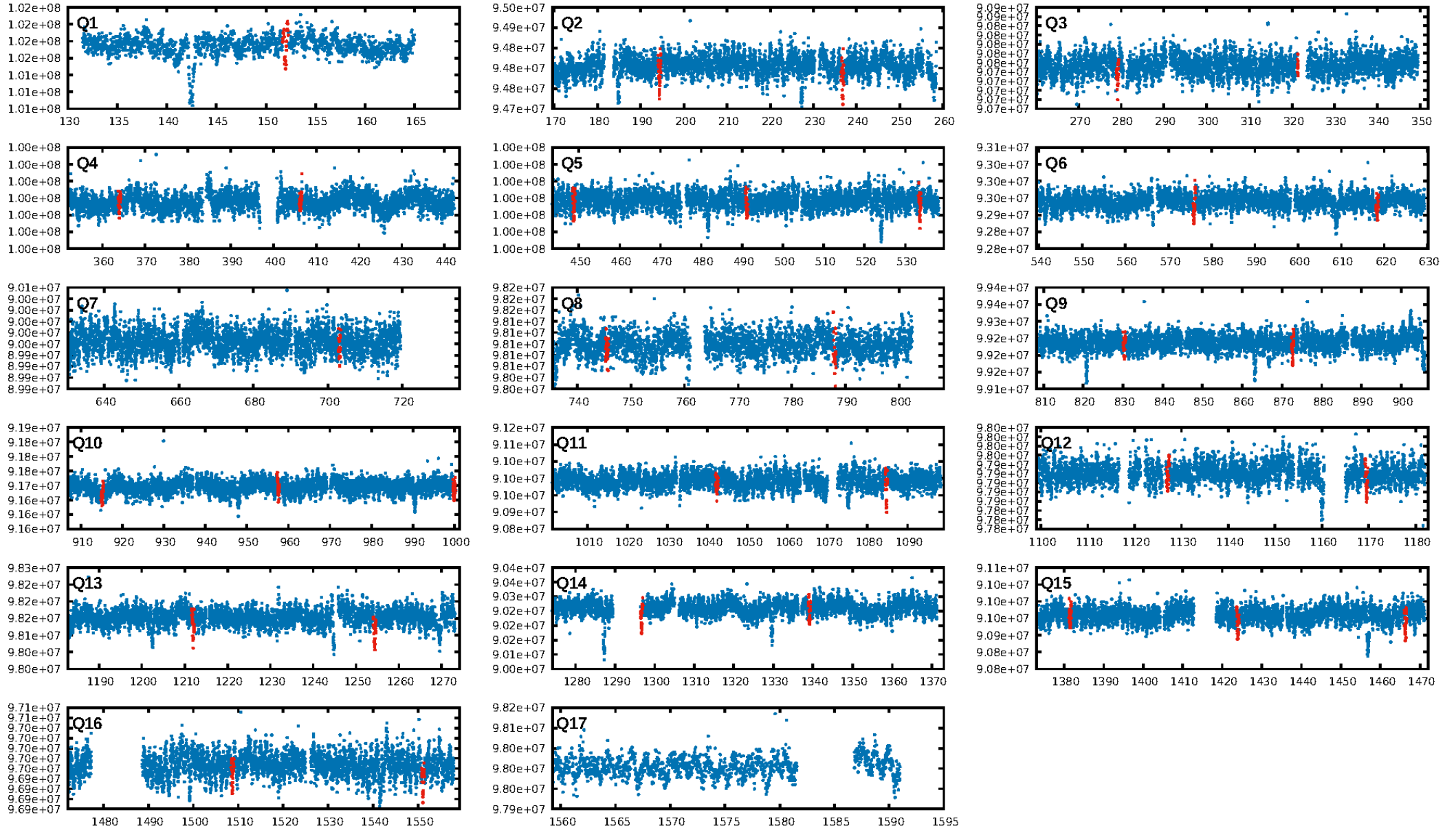
## DV Fit Results:

Period = 42.39919 [0.00025] d  
Epoch = 151.9618 [0.0049] BKJD  
Rp/R\* = 0.0255 [0.0007]  
a/R\* = 15.92 [0.96]  
b = 0.97 [0.00]  
Seff = 26.80 [11.08]  
Teq = 580 [60] K  
Rp = 3.12 [1.02] Re  
a = 0.2438 [0.0660] AU  
Ag = 230.28 [109.96] [2.09σ]  
Teff = 3494 [271] K [10.50σ]

## DV Diagnostic Results:

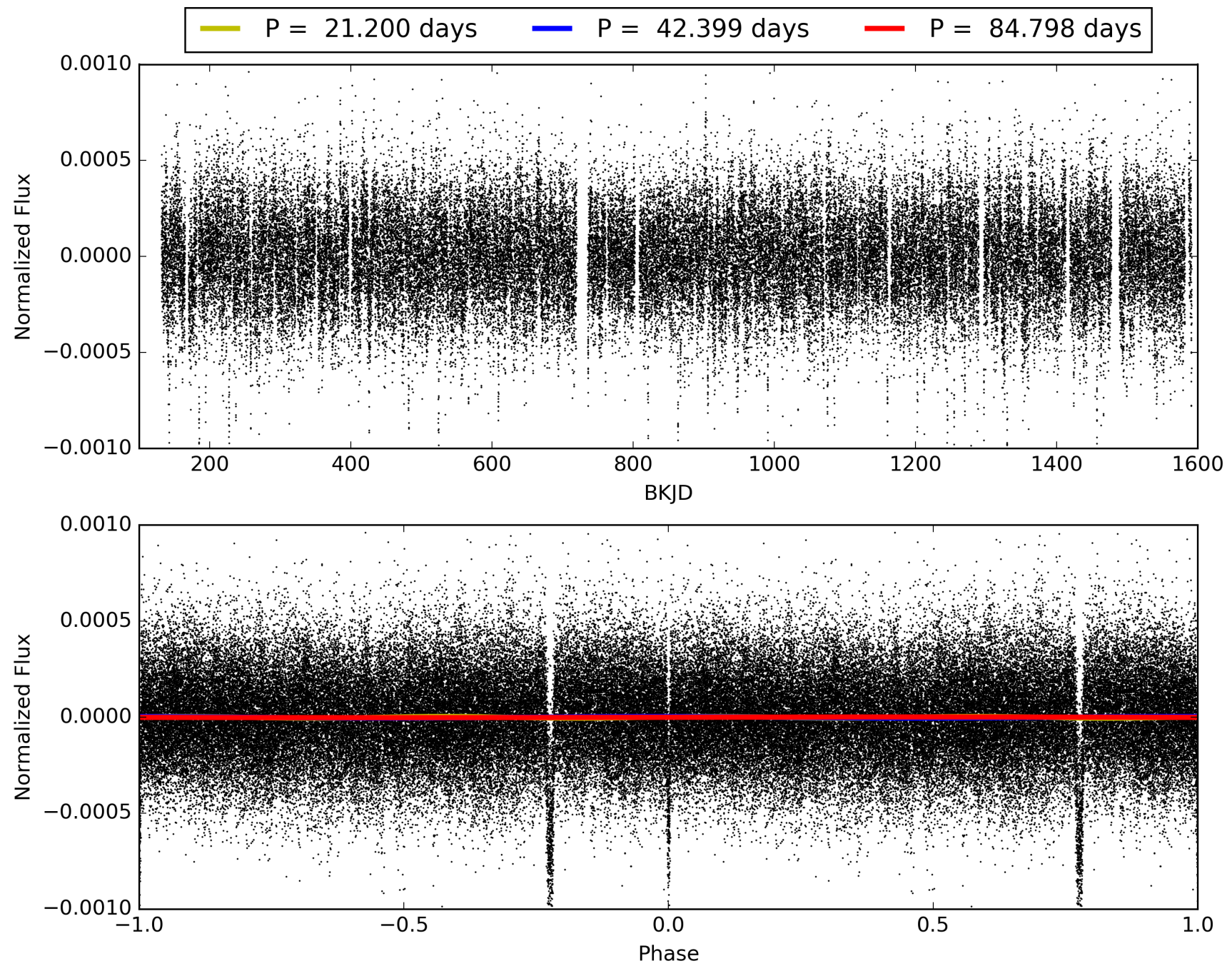
ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.39e-101  
RollingBand-fgt: 1.00 [32/32]  
GhostDiagnostic-chr: -0.2439  
Centroid-sig: 0.0%  
Centroid-so: 37.005 arcsec [105.19σ]  
OotOffset-rm: 13.446 arcsec [175.63σ]  
KicOffset-rm: 13.326 arcsec [167.76σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [16/16]

# TCE 005392871-02, PDC Light Curves



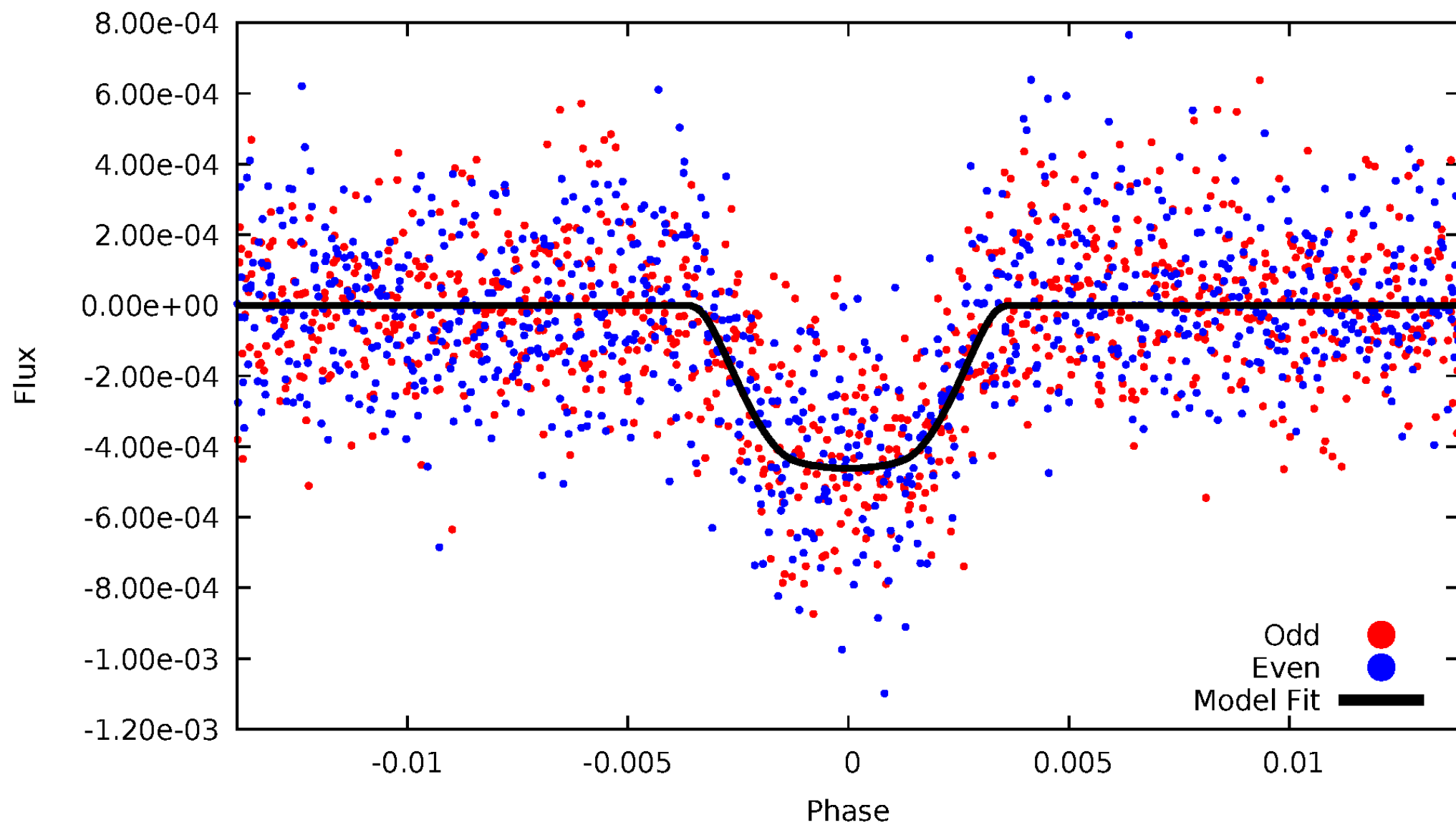


TCE 005392871-02



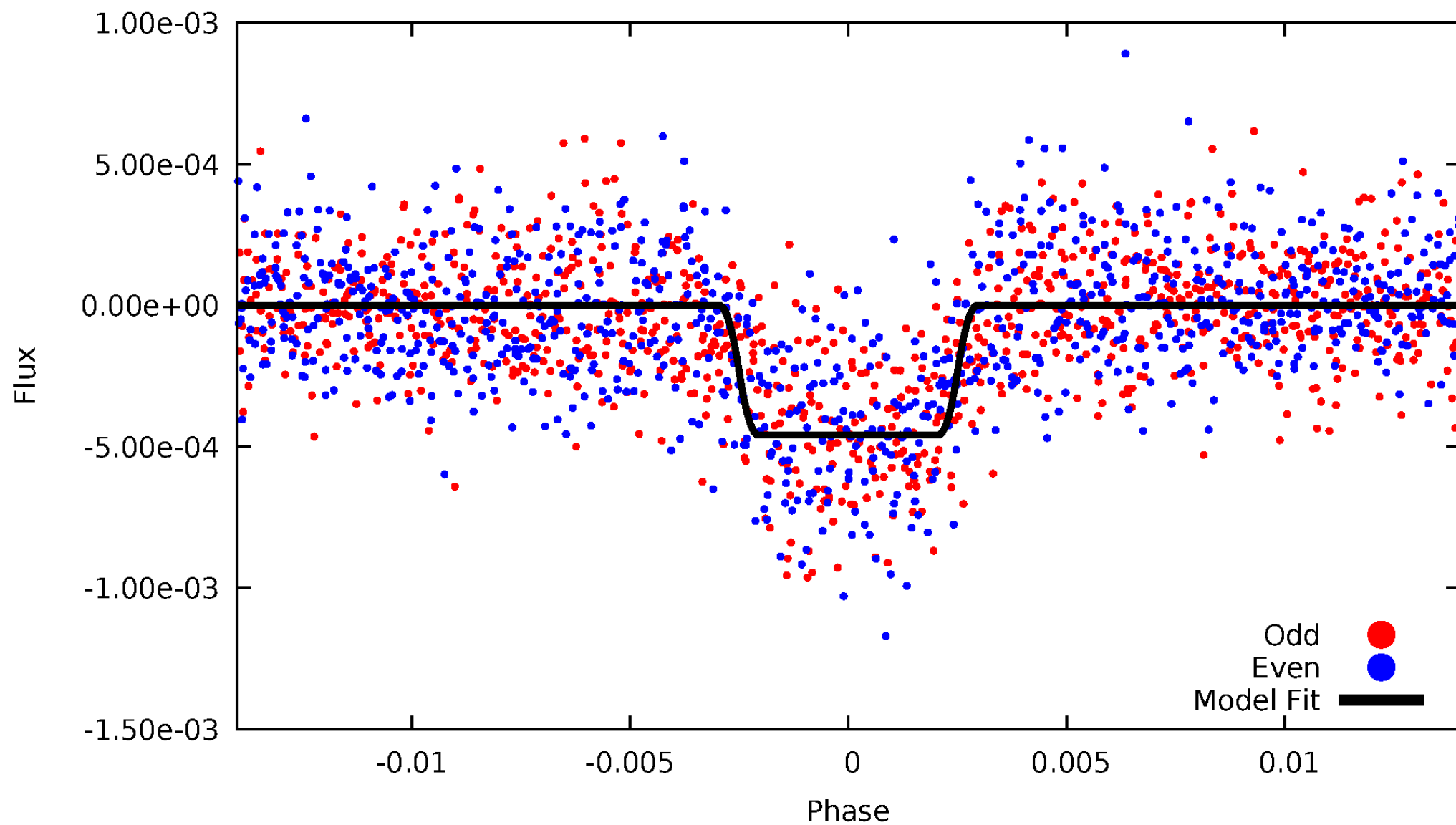
# DV Odd/Even

TCE 005392871-02



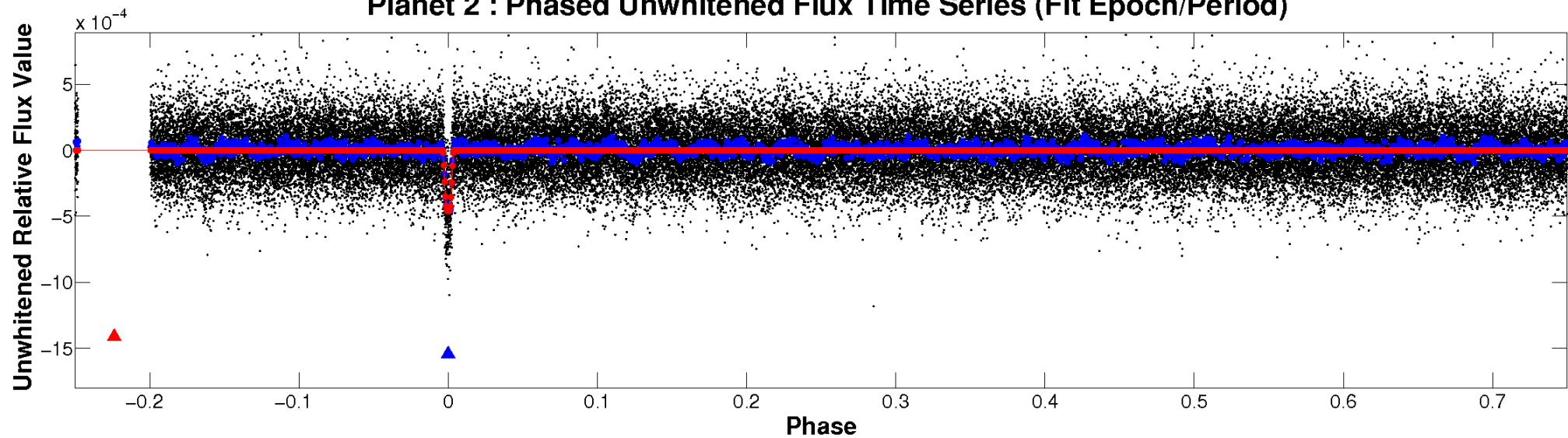
# ALT Odd/Even

TCE 005392871-02

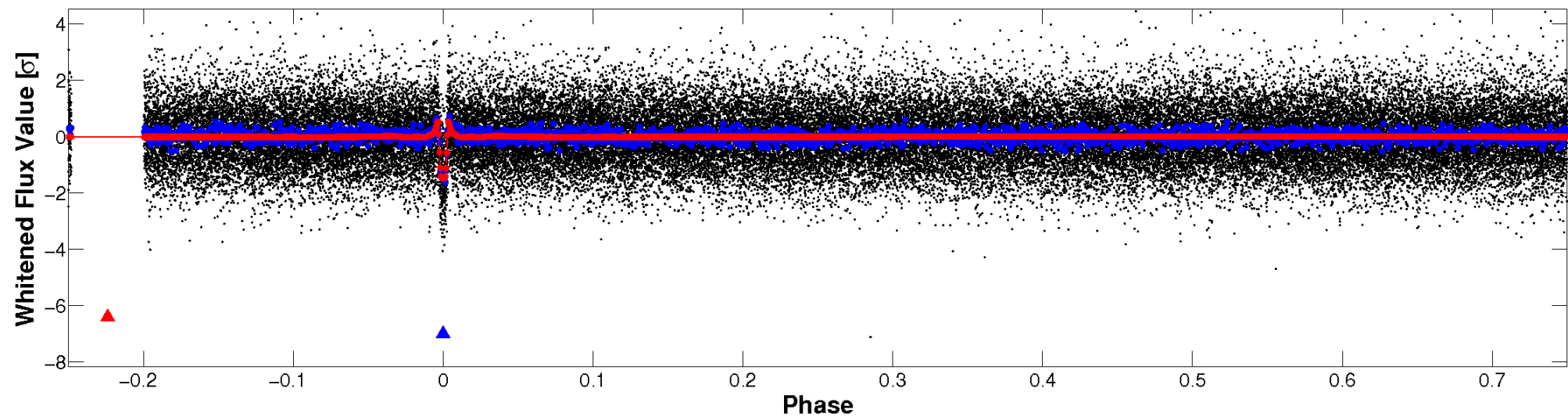


# Non-Whitened Vs. Whitened Light Curve

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

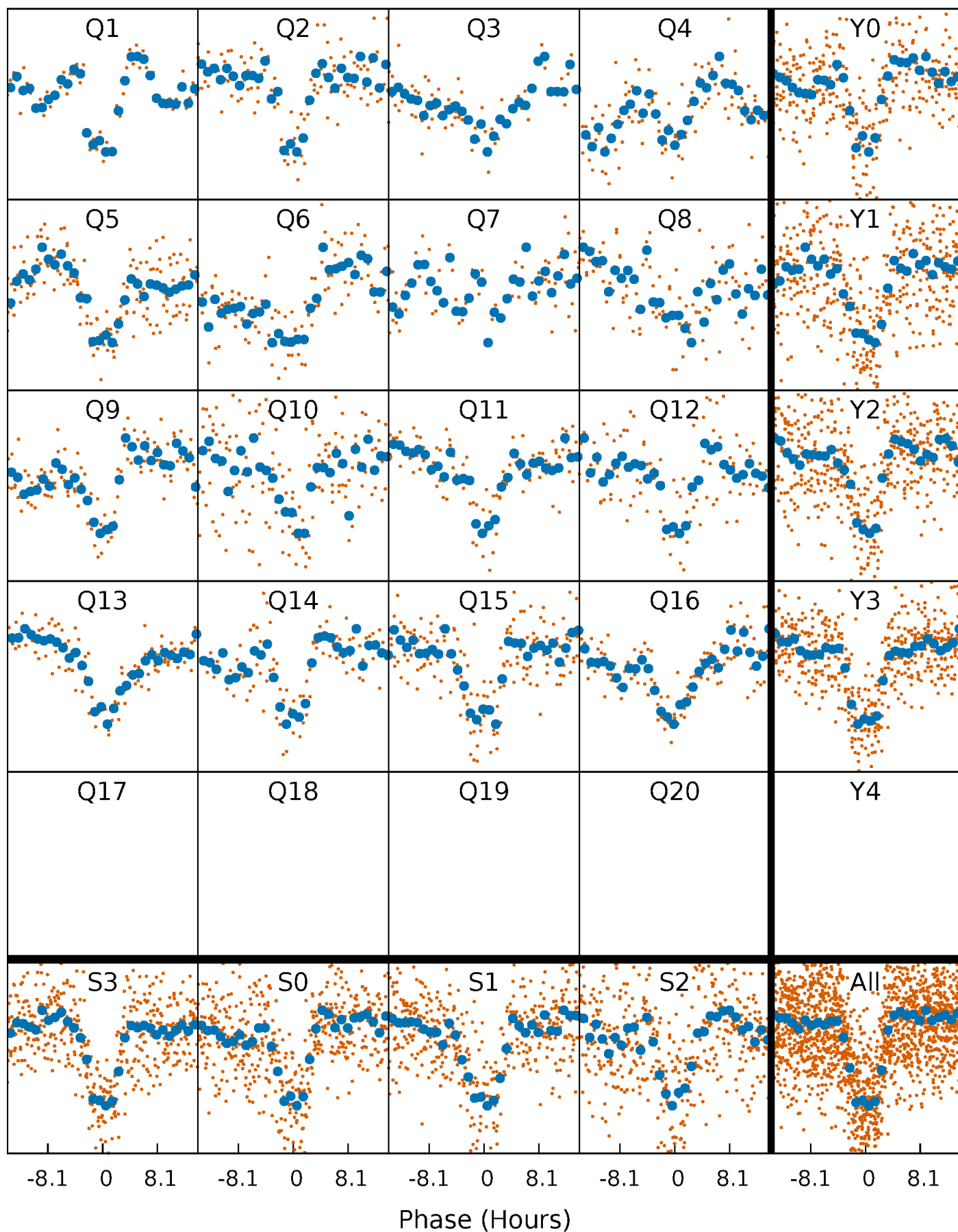


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

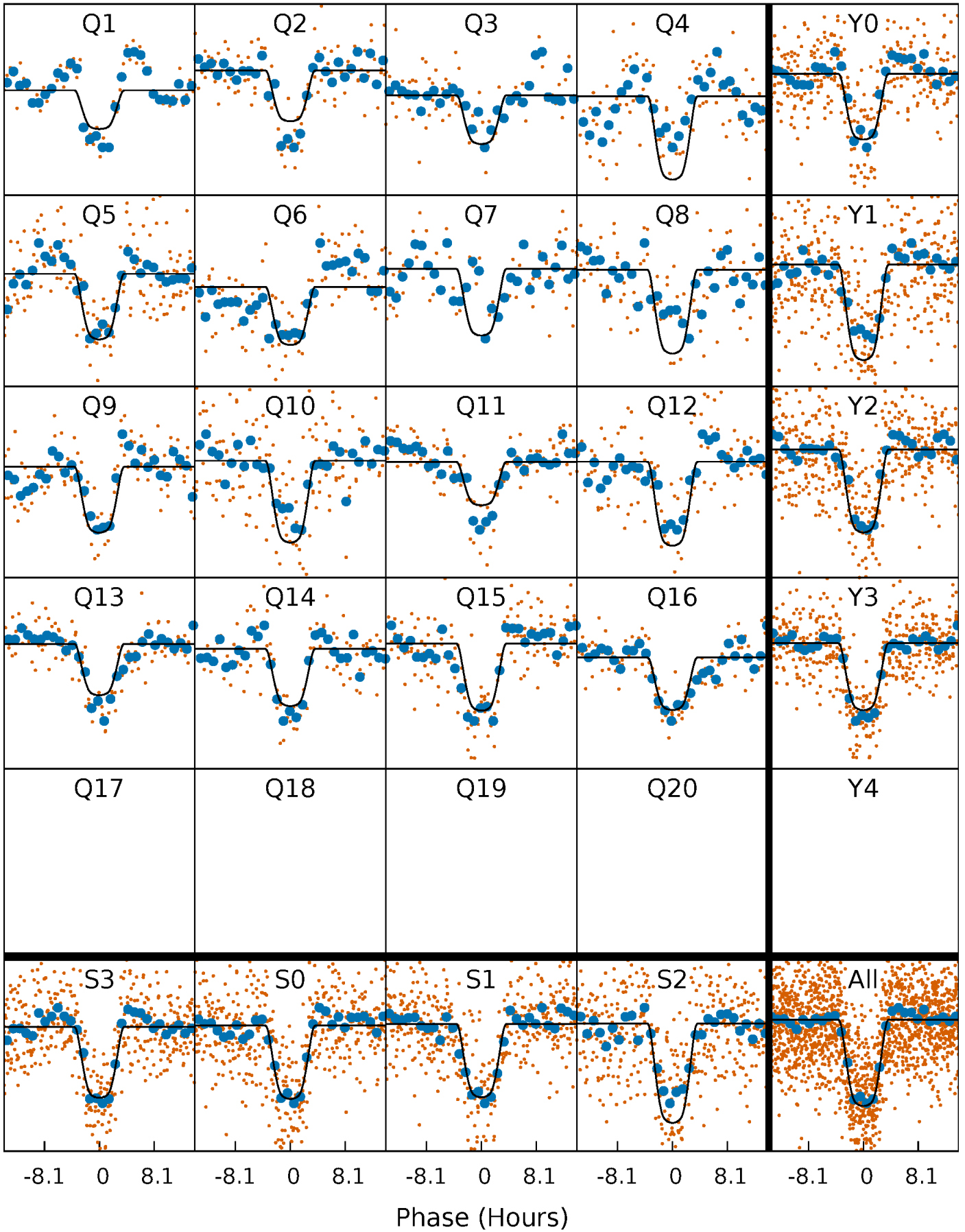
TCE 005392871-02   P= 42.399194 Days    $T_0=151.961758$  (BKJD)





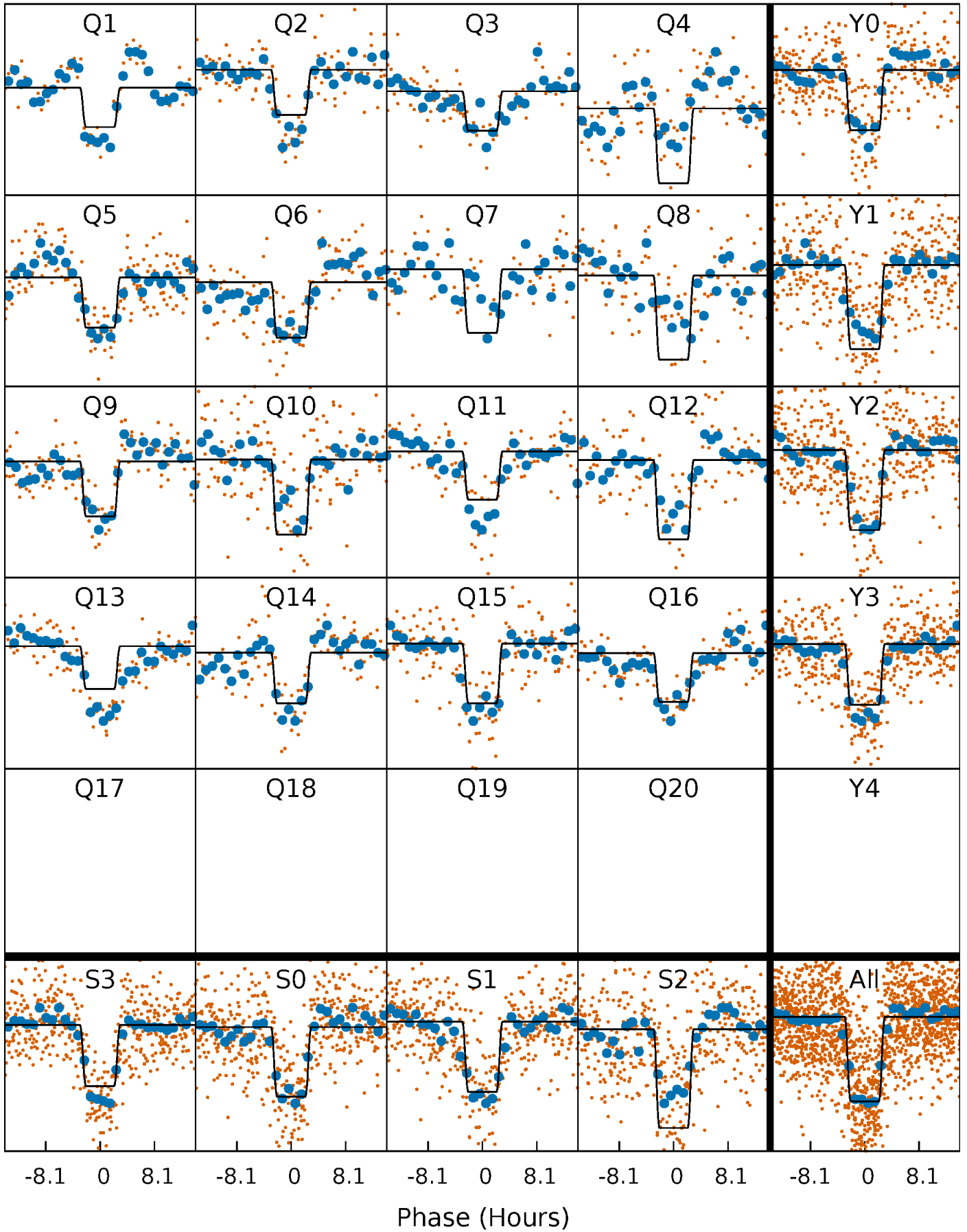
# DV Quarter-Phased Transit Curves

TCE 005392871-02   P= 42.399194 Days    $T_0=151.961758$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

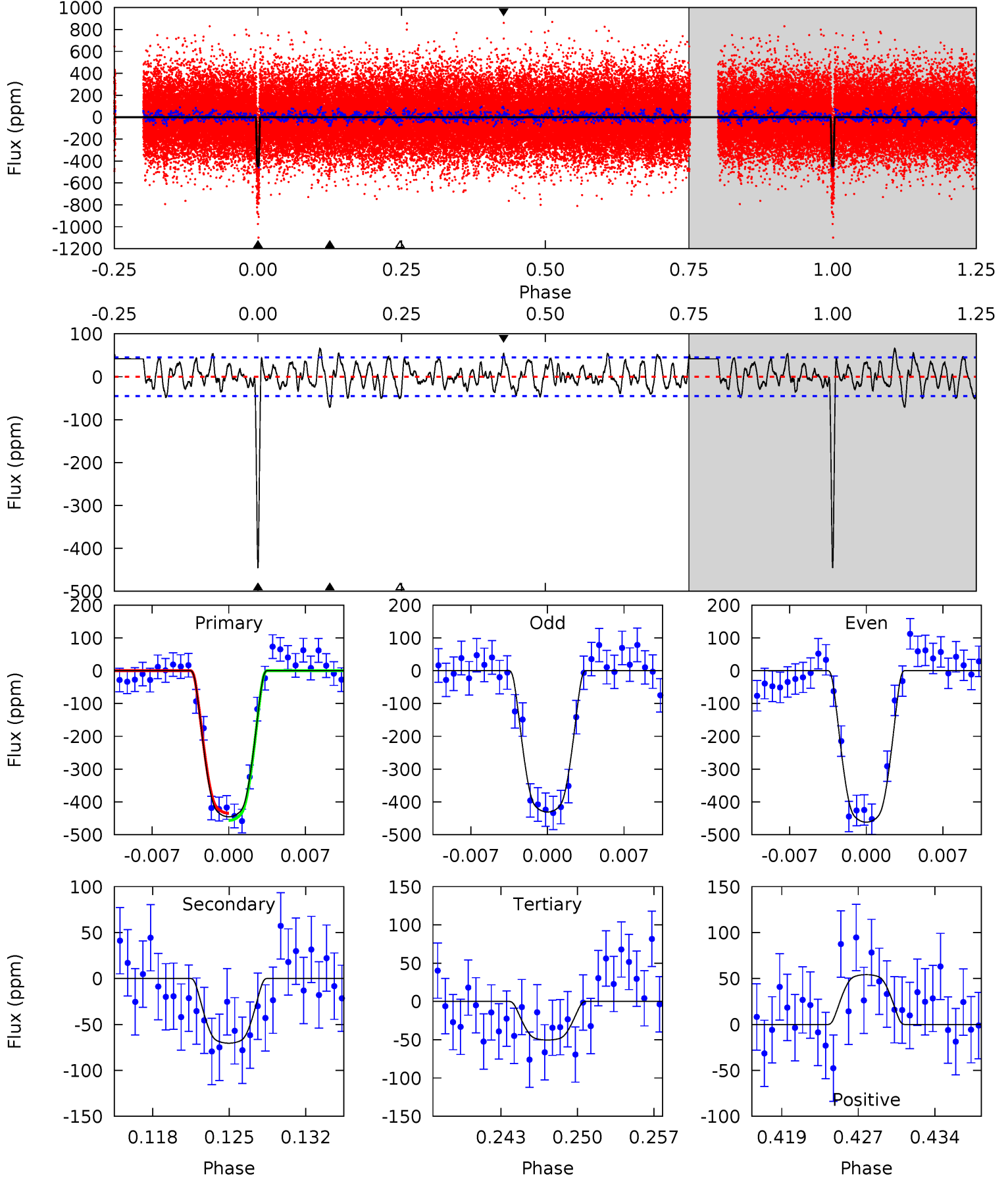
TCE 005392871-02     $P = 42.399038$  Days     $T_0 = 151.963489$  (BKJD)



# DV Model-Shift Uniqueness Test

005392871-02, P = 42.399194 Days, E = 109.562564 Days

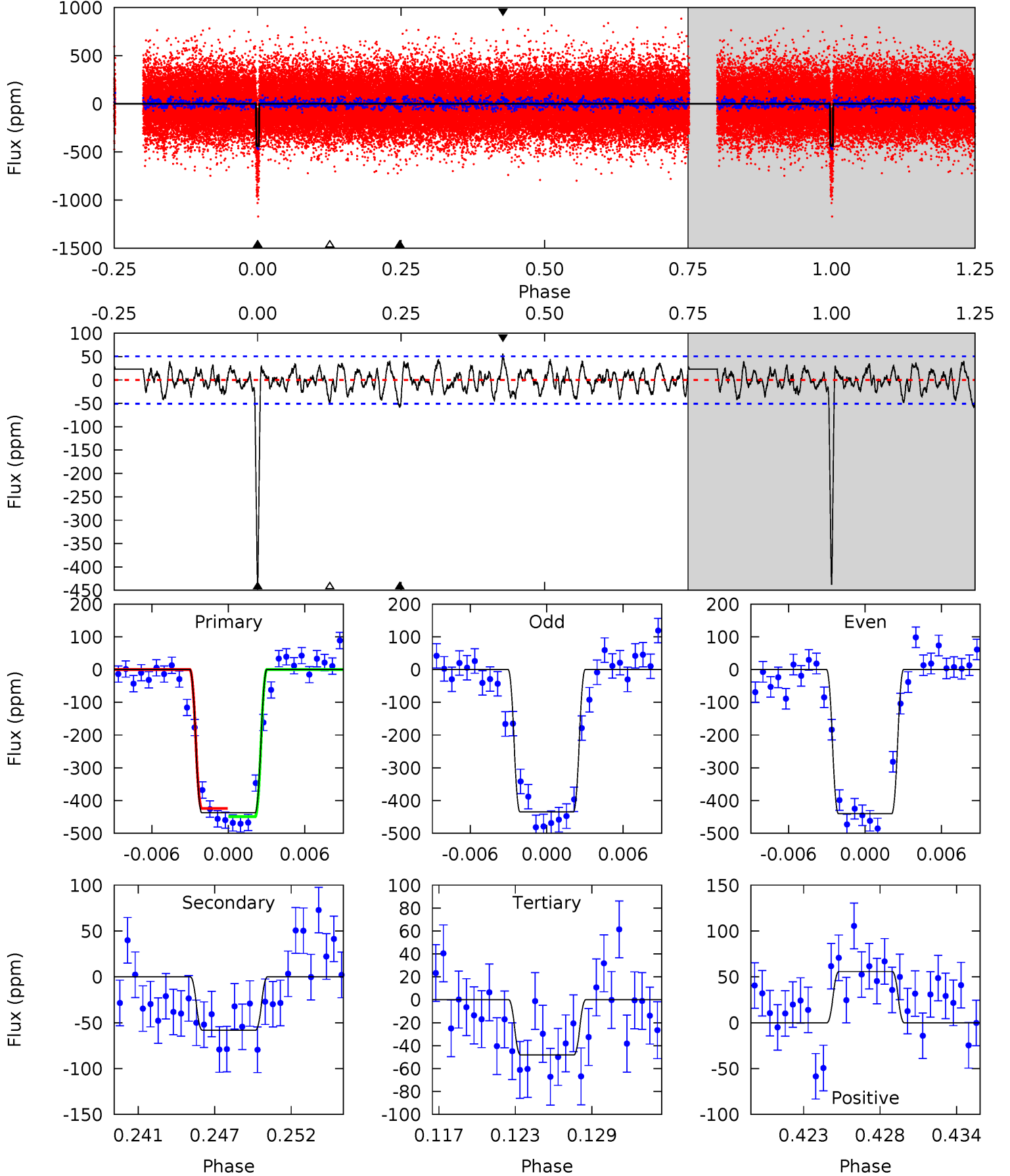
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
50.2	7.95	5.68	6.12	5.08	2.68	2.54	44.6	44.1	2.26	1.83	1.74	1.00	0.13	1.23



# Alt Model-Shift Uniqueness Test

005392871-02,  $P = 42.399038$  Days,  $E = 109.564451$  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
44.2	5.88	4.86	5.64	5.13	2.75	1.84	39.3	38.6	1.02	0.24	0.27	1.00	0.11	1.26



### Stellar Parameters For KIC 005392871

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6133^{+193}_{-214}$	$4.370^{+0.105}_{-0.210}$	$-0.020^{+0.250}_{-0.300}$	$1.121^{+0.366}_{-0.183}$	$1.071^{+0.166}_{-0.135}$	$1.072^{+0.500}_{-0.542}$
	+3%/-3%	+2%/-5%	+1250%/-1500%	+33%/-16%	+15%/-13%	+47%/-51%
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 005392871-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-70 \pm 9$	$3.15^{+0.60}_{-0.33}$	$821^{+66}_{-51}$	$3880^{+116}_{-138}$	$225^{+62}_{-64}$
Alt.	$-58 \pm 10$	$2.65^{+0.48}_{-0.27}$	$820^{+64}_{-51}$	$3984^{+157}_{-160}$	$260^{+88}_{-76}$

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

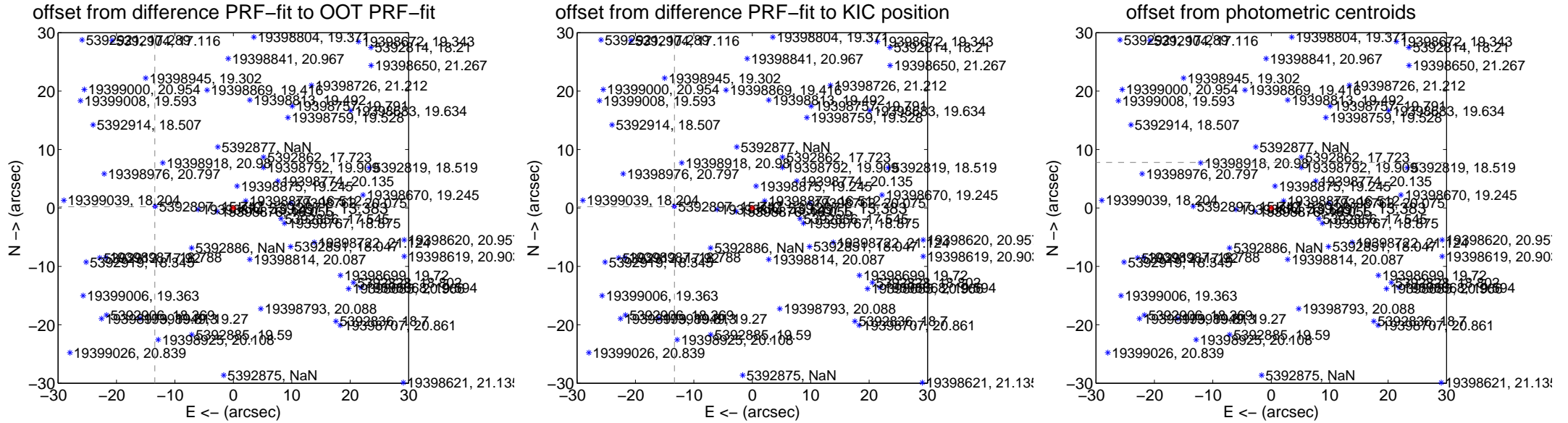
## DV Centroid Data

Supplemental centroid analysis for 005392871-02. Kepler magnitude: 13.38. Transit SNR 24.21

There are 13 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

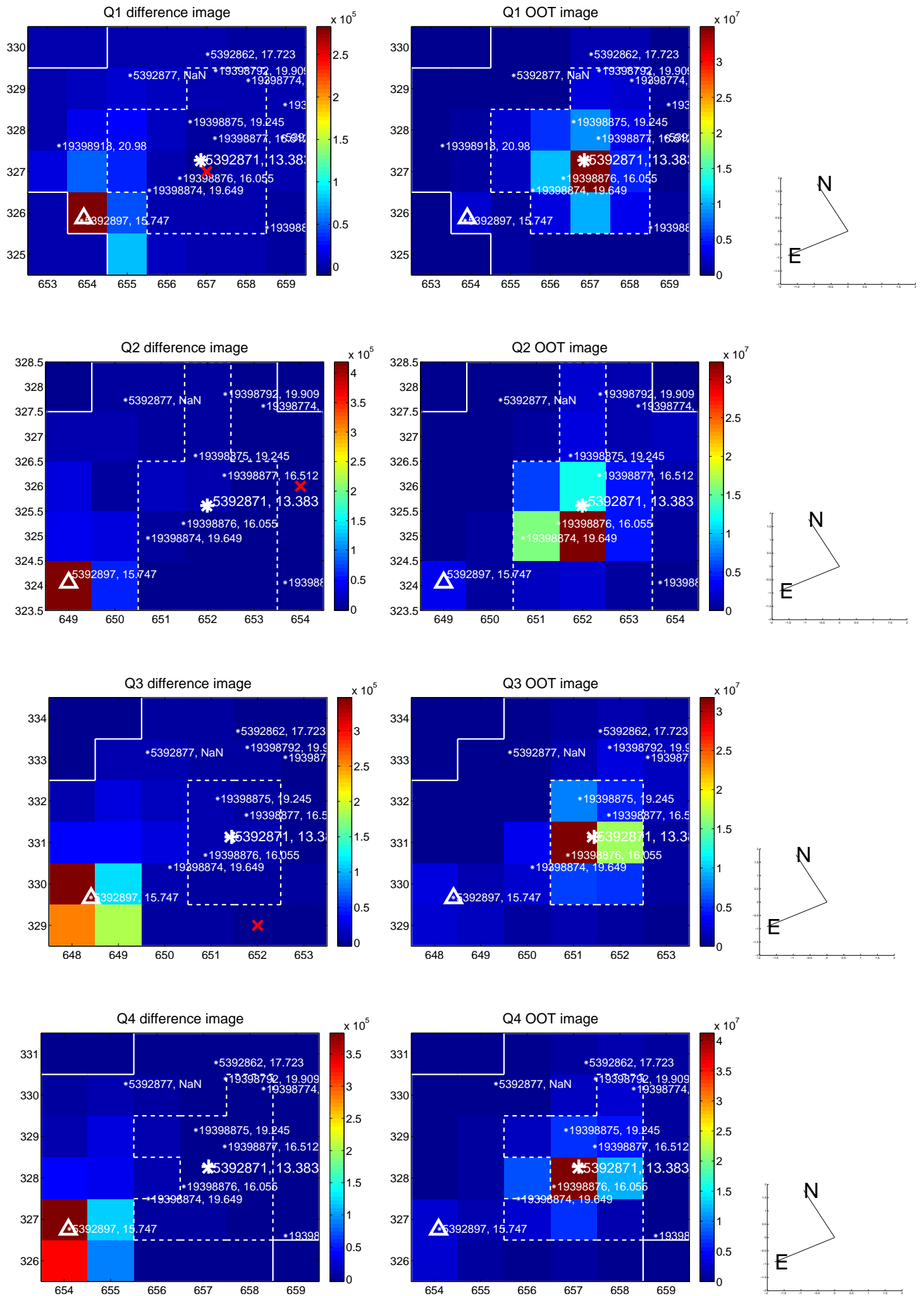
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>13.446 <math>\pm</math> 0.077</b>	<b>175.63</b>	13.445 $\pm$ 0.077	0.212 $\pm$ 0.073
PRF-fit source offset from KIC position	<b>13.326 <math>\pm</math> 0.079</b>	<b>167.76</b>	13.324 $\pm$ 0.080	0.222 $\pm$ 0.072
photometric centroid source offset	<b>37.00 <math>\pm</math> 0.35</b>	<b>105.19</b>	36.17 $\pm$ 0.35	7.79 $\pm$ 0.33



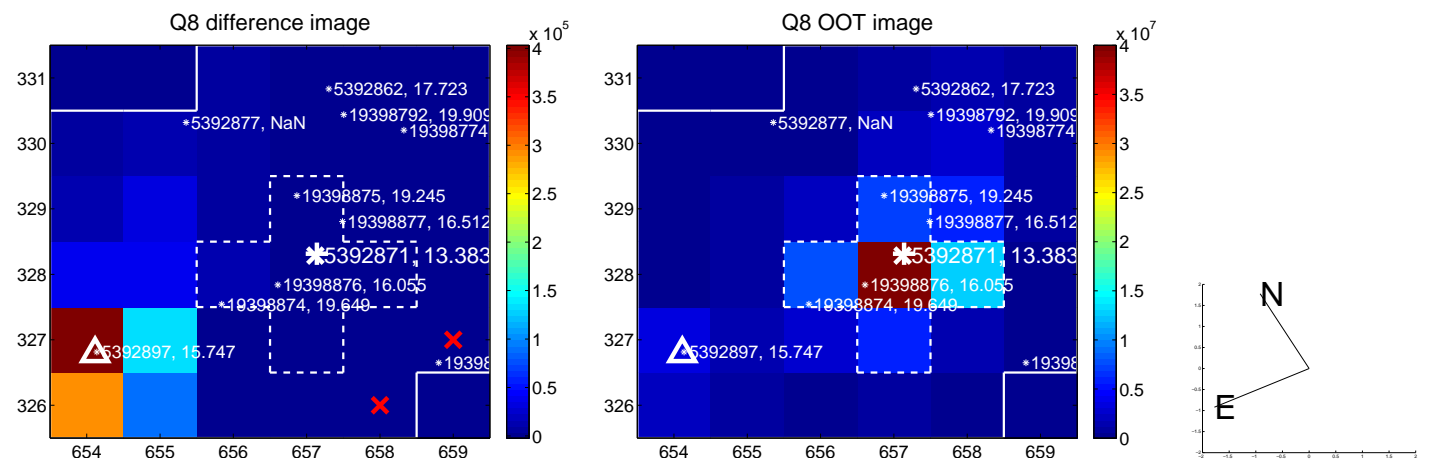
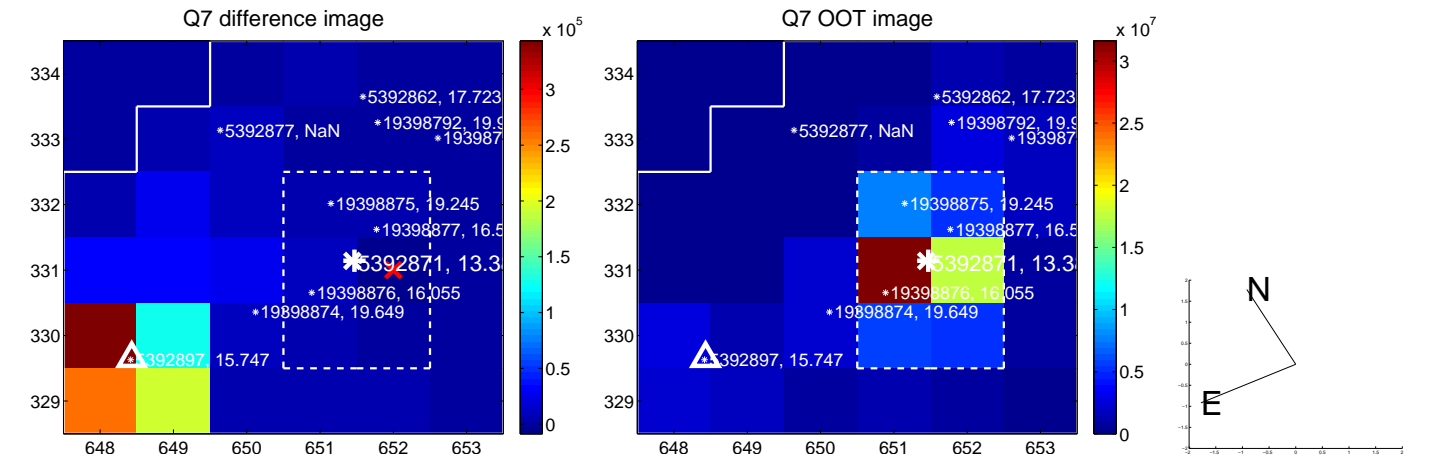
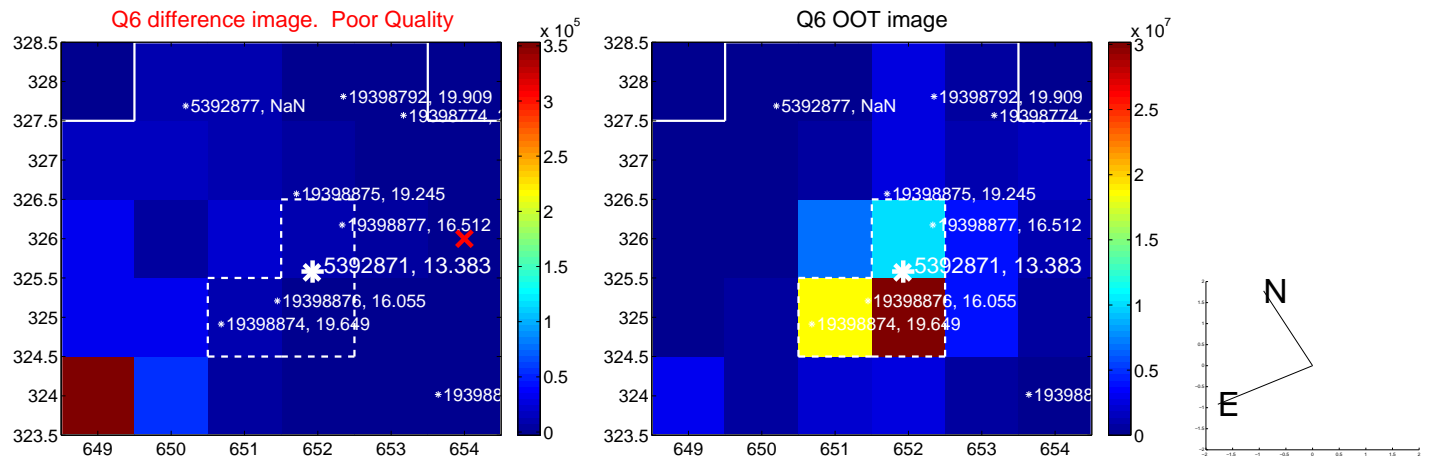
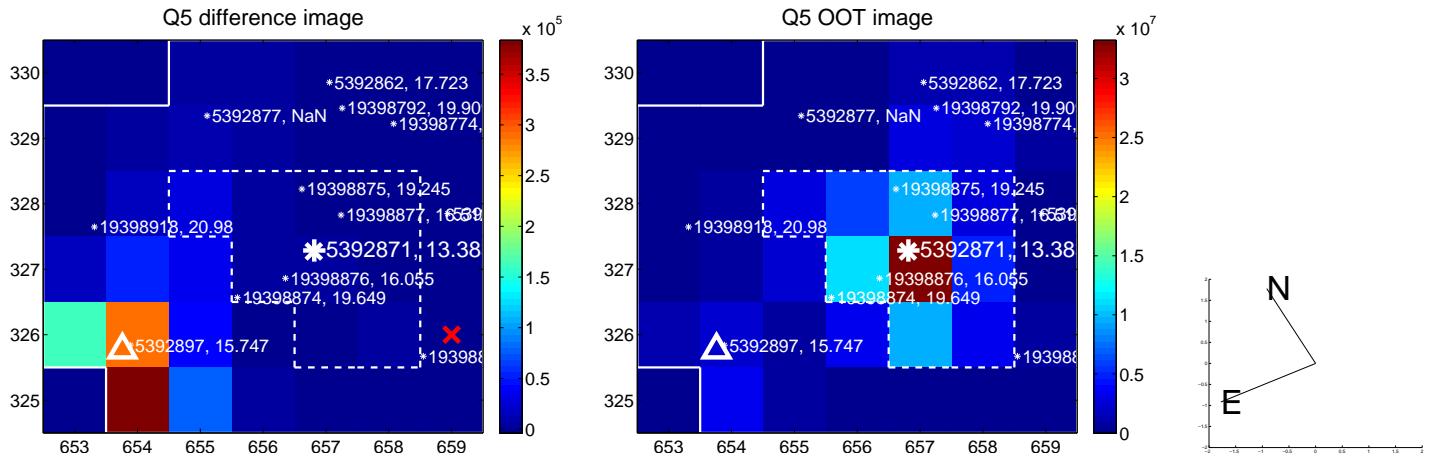
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



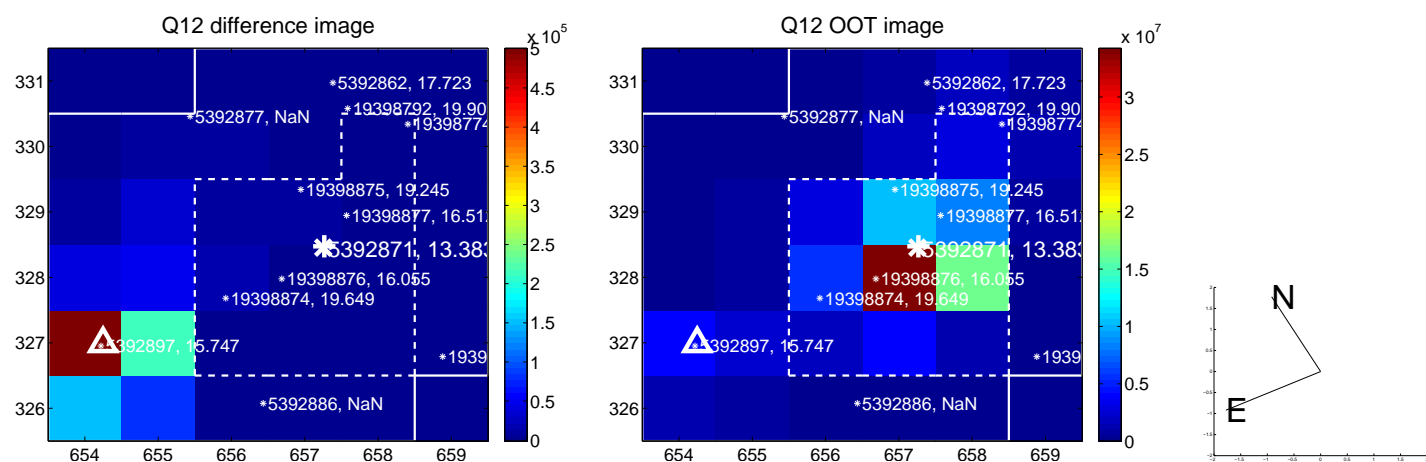
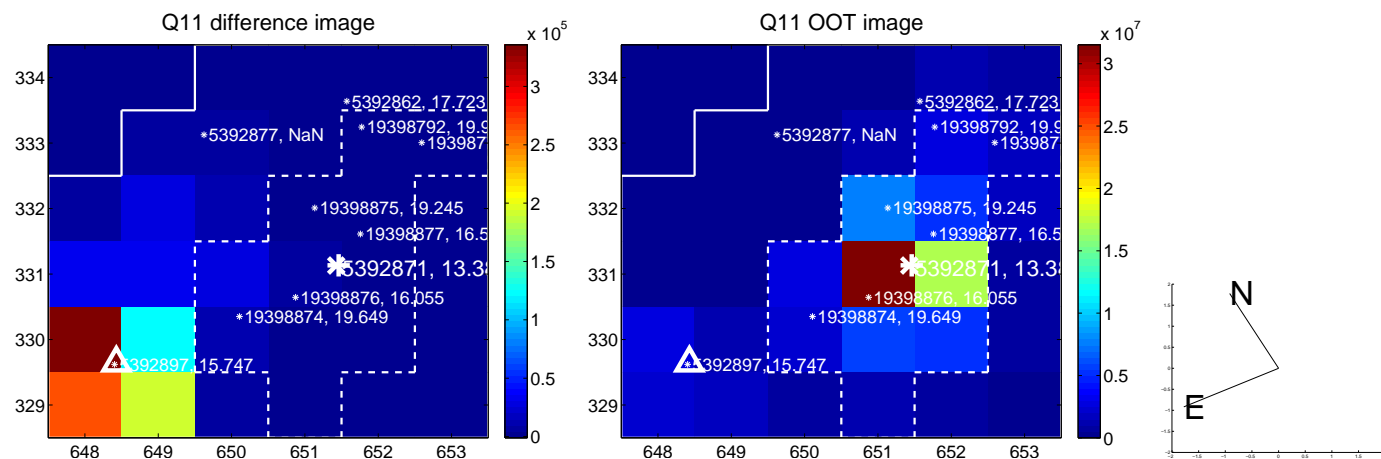
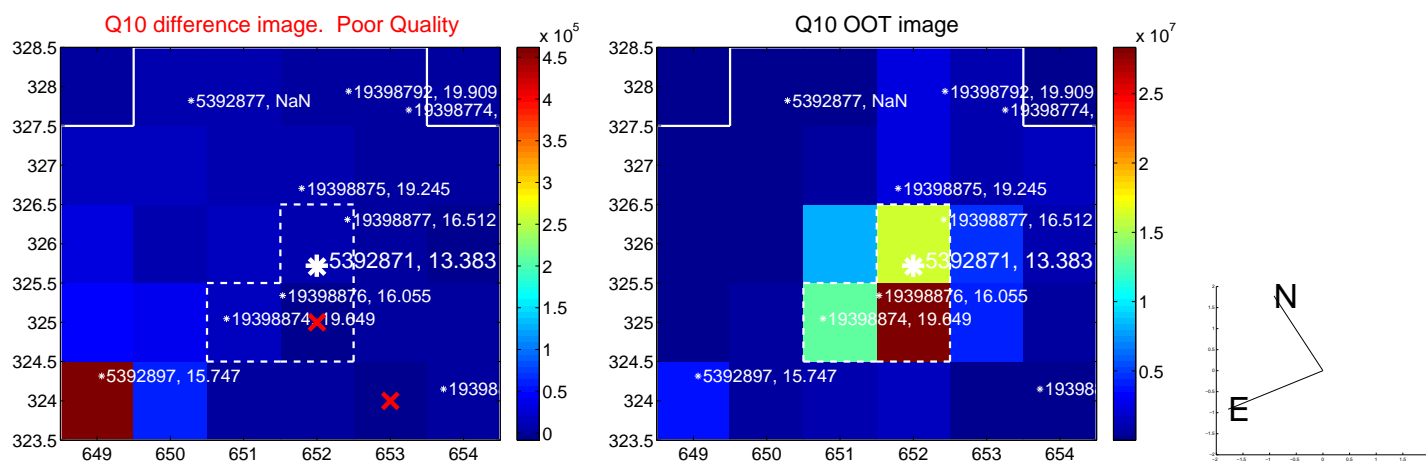
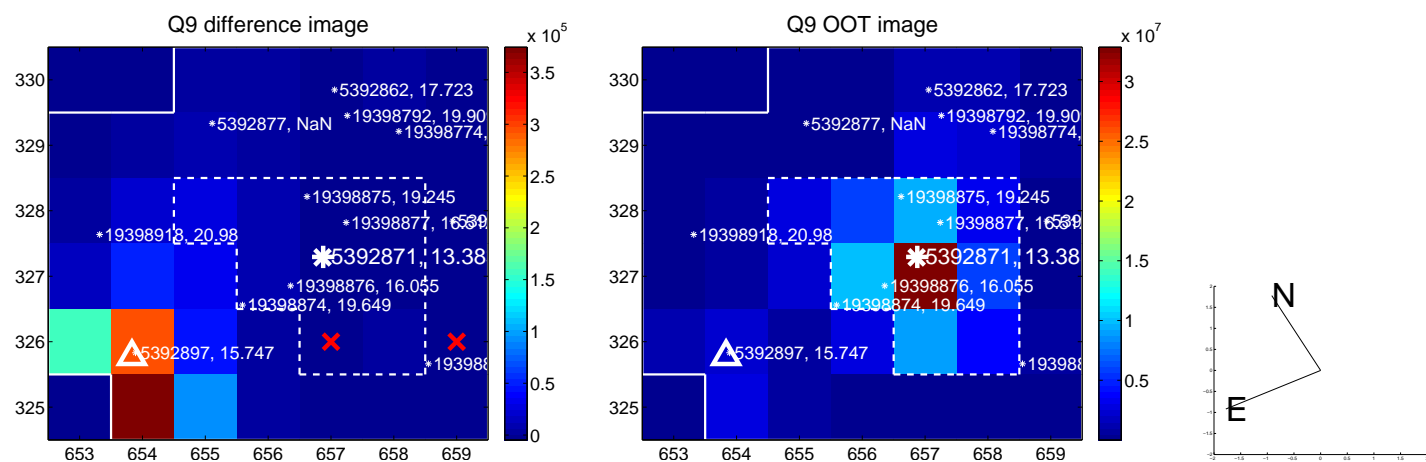
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



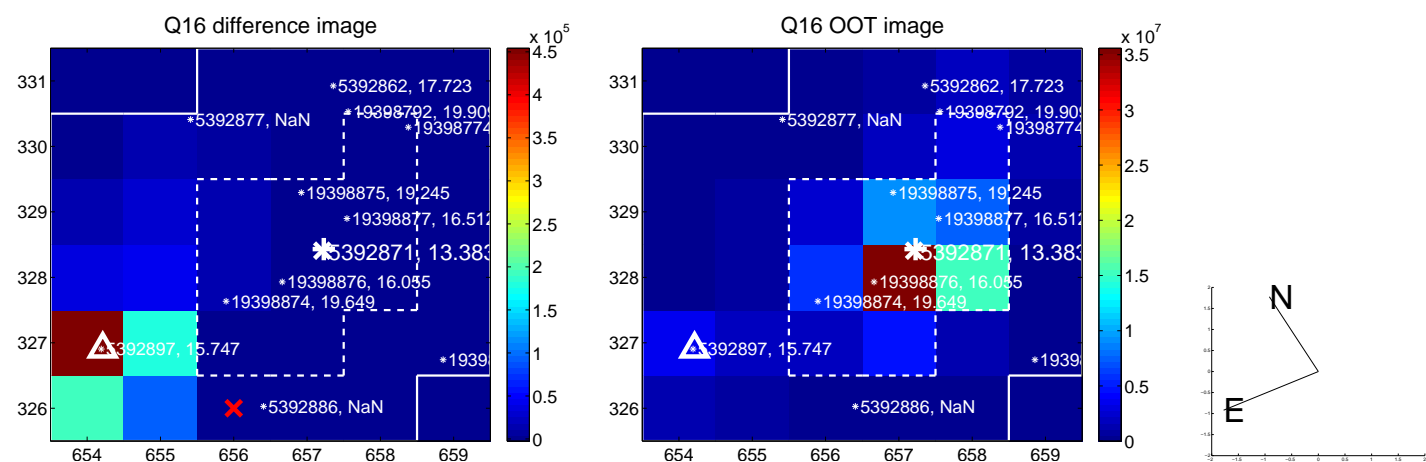
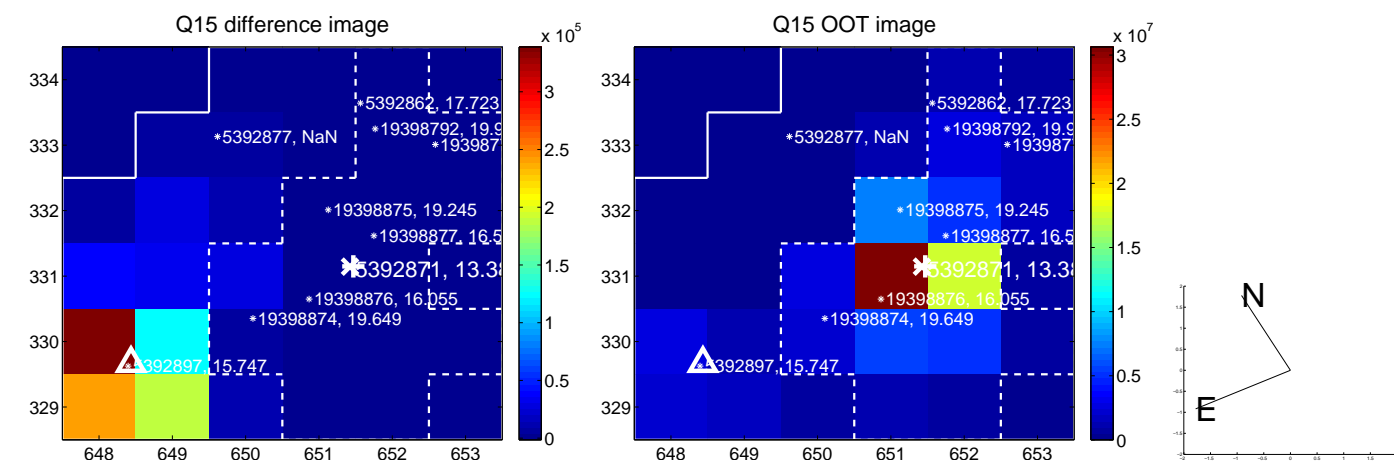
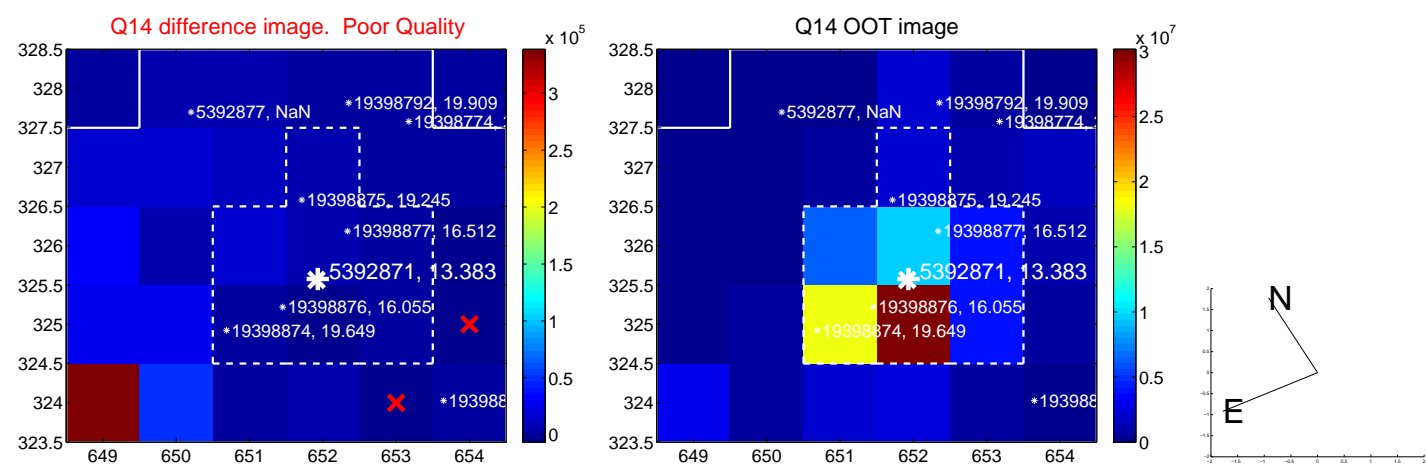
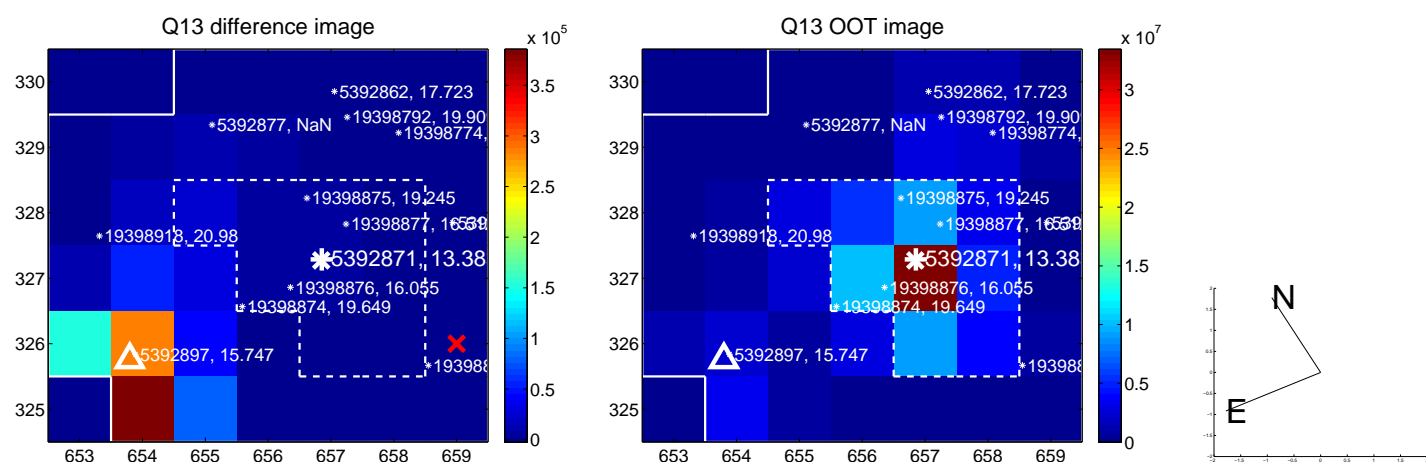
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



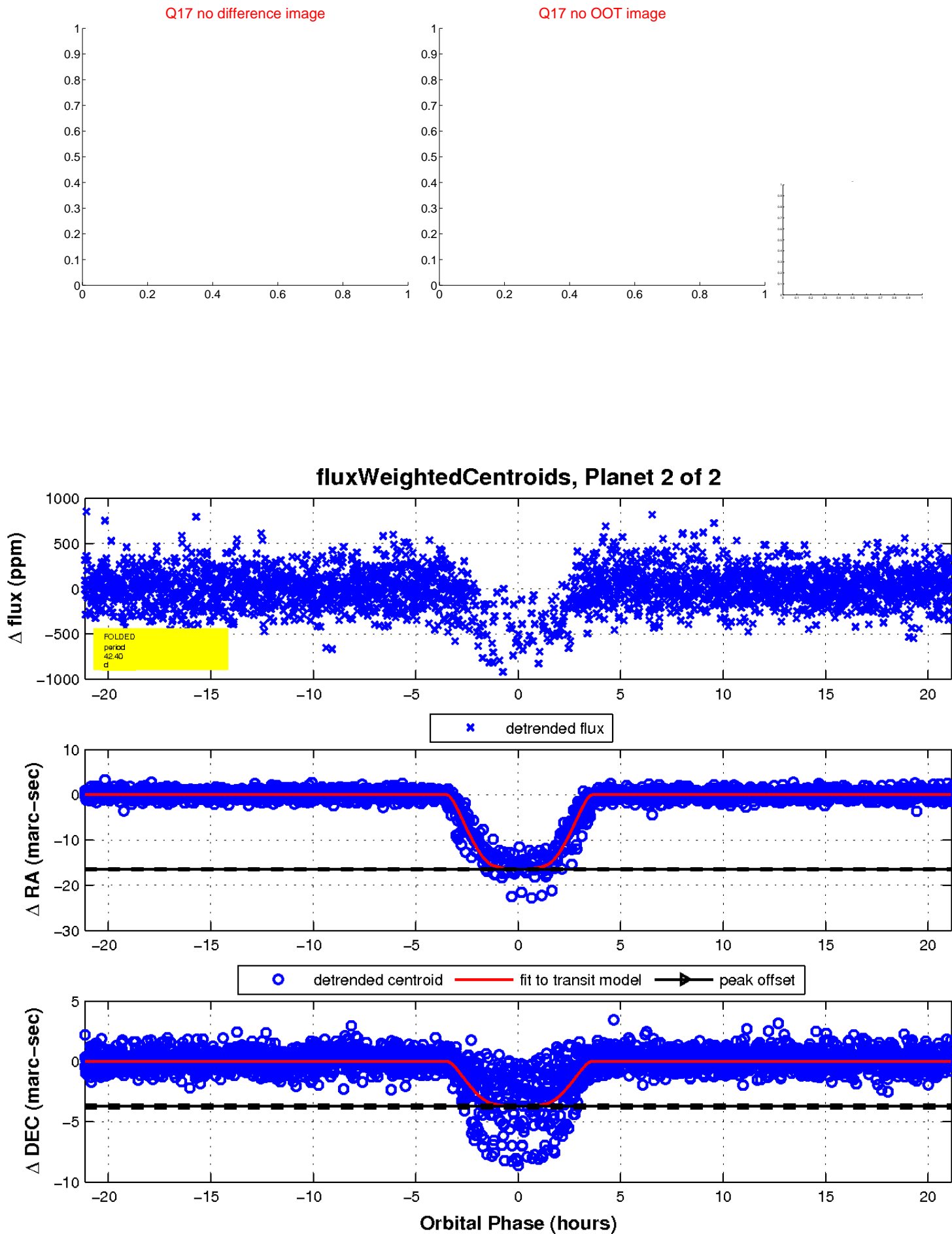
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

