

# KIC 001871056

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
001871056-01	OBS	1001.01	40.806331	155.720481	310.6	13.325	31.3	32.6	2.10	6207	3.94	83.92
001871056-02	OBS	1001.02	140.105358	216.217819	320.8	19.229	14.7	17.4	2.10	6207	4.35	16.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
001871056-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
001871056-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

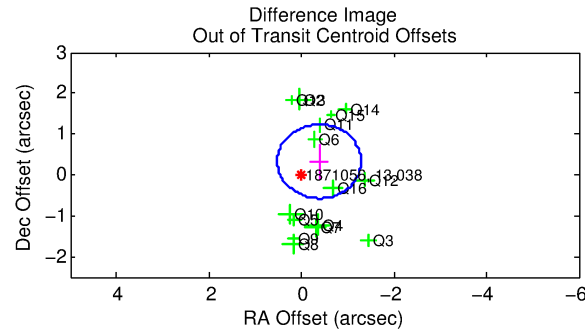
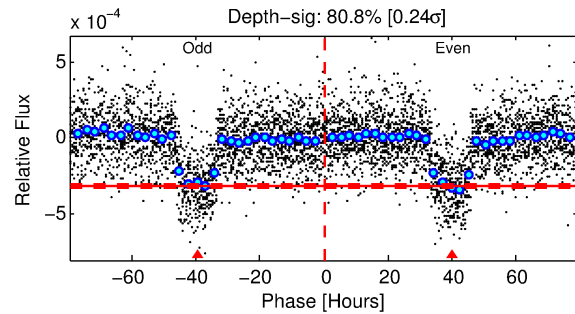
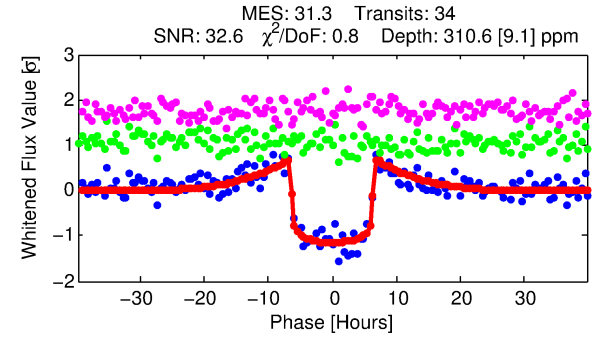
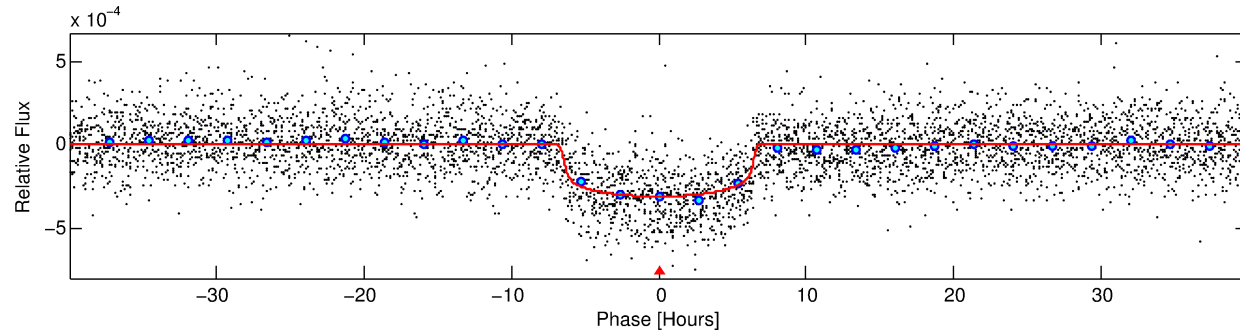
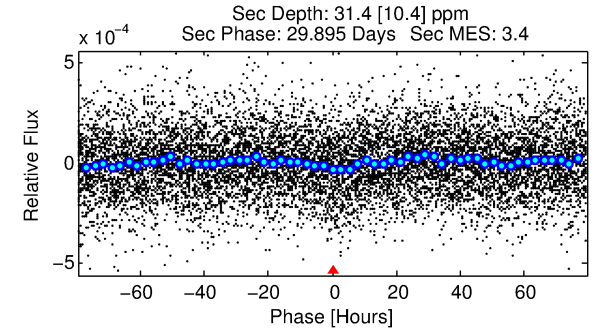
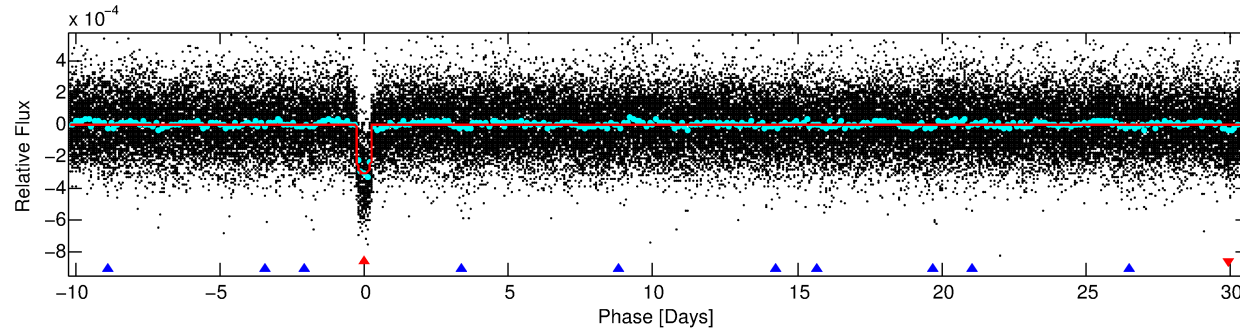
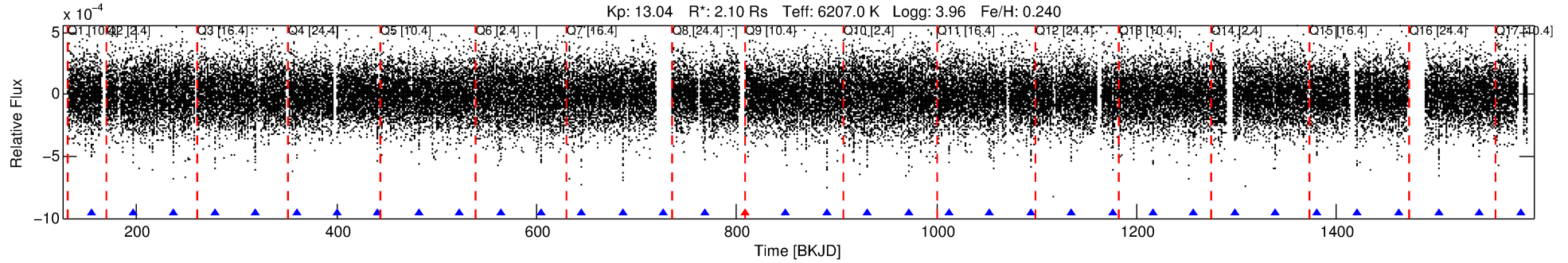
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 001871056-01

No Significant Match Found

# DV One-Page Summary

KIC: 1871056 Candidate: 1 of 2 Period: 40.806 d  
KOI: K01001.01 Name: Kepler-264b Corr: 0.991



## DV Fit Results:

Period = 40.80633 [0.00020] d  
Epoch = 155.7205 [0.0038] BKJD  
Rp/R\* = 0.0172 [0.0015]  
a/R\* = 17.47 [7.43]  
b = 0.69 [0.32]  
Seff = 83.92 [30.12]  
Teff = 772 [69] K  
Rp = 3.94 [1.12] Re  
a = 0.2640 [0.0620] AU  
Ag = 77.65 [39.80] [1.93σ]  
Teffp = 3542 [339] K [8.00σ]

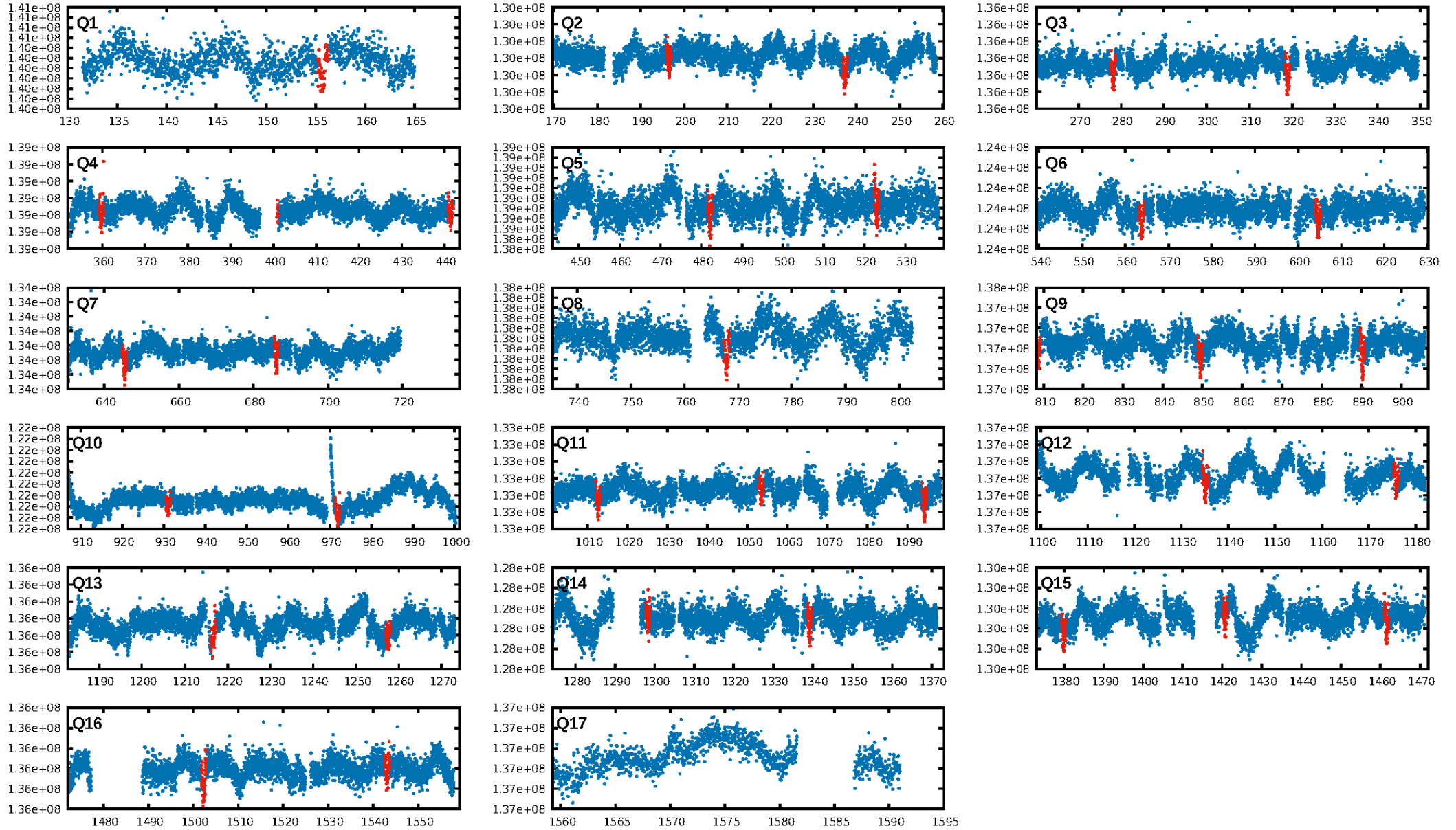
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [101.87σ]  
ModelChiSquare2-sig: 79.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.49e-178  
RollingBand-fgt: 0.97 [32/33]  
GhostDiagnostic-chr: 3.27  
Centroid-sig: 18.7%  
Centroid-so: 0.877 arcsec [2.88σ]  
OotOffset-rm: 0.501 arcsec [1.66σ]  
KicOffset-rm: 0.385 arcsec [1.33σ]  
OotOffset-st: 4/4/4/3 [15]  
KicOffset-st: 4/4/4/3 [15]  
DiffImageQuality-fgm: 0.93 [14/15]  
DiffImageOverlap-fno: 1.00 [16/16]

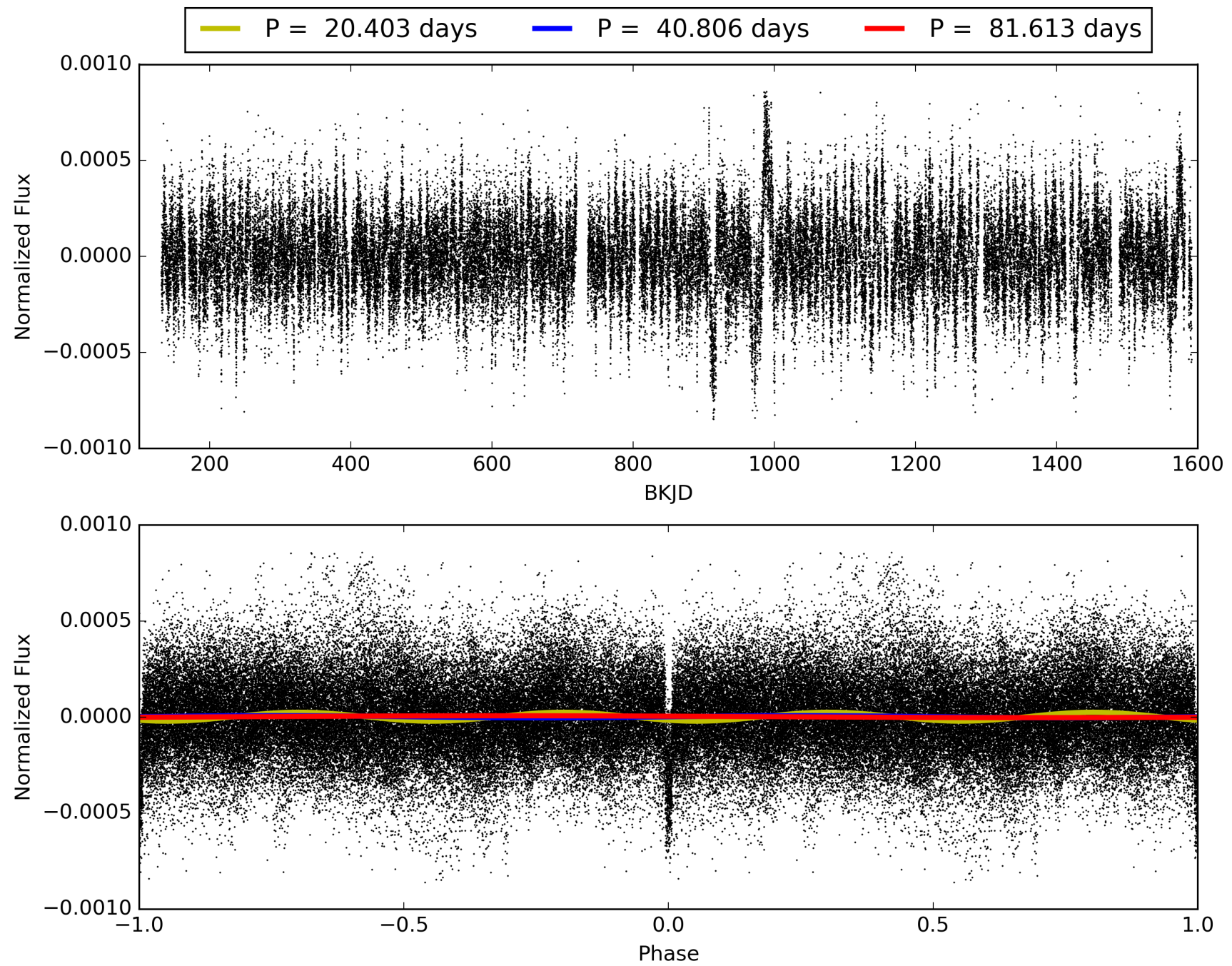
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:40:55 Z

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

# TCE 001871056-01, PDC Light Curves

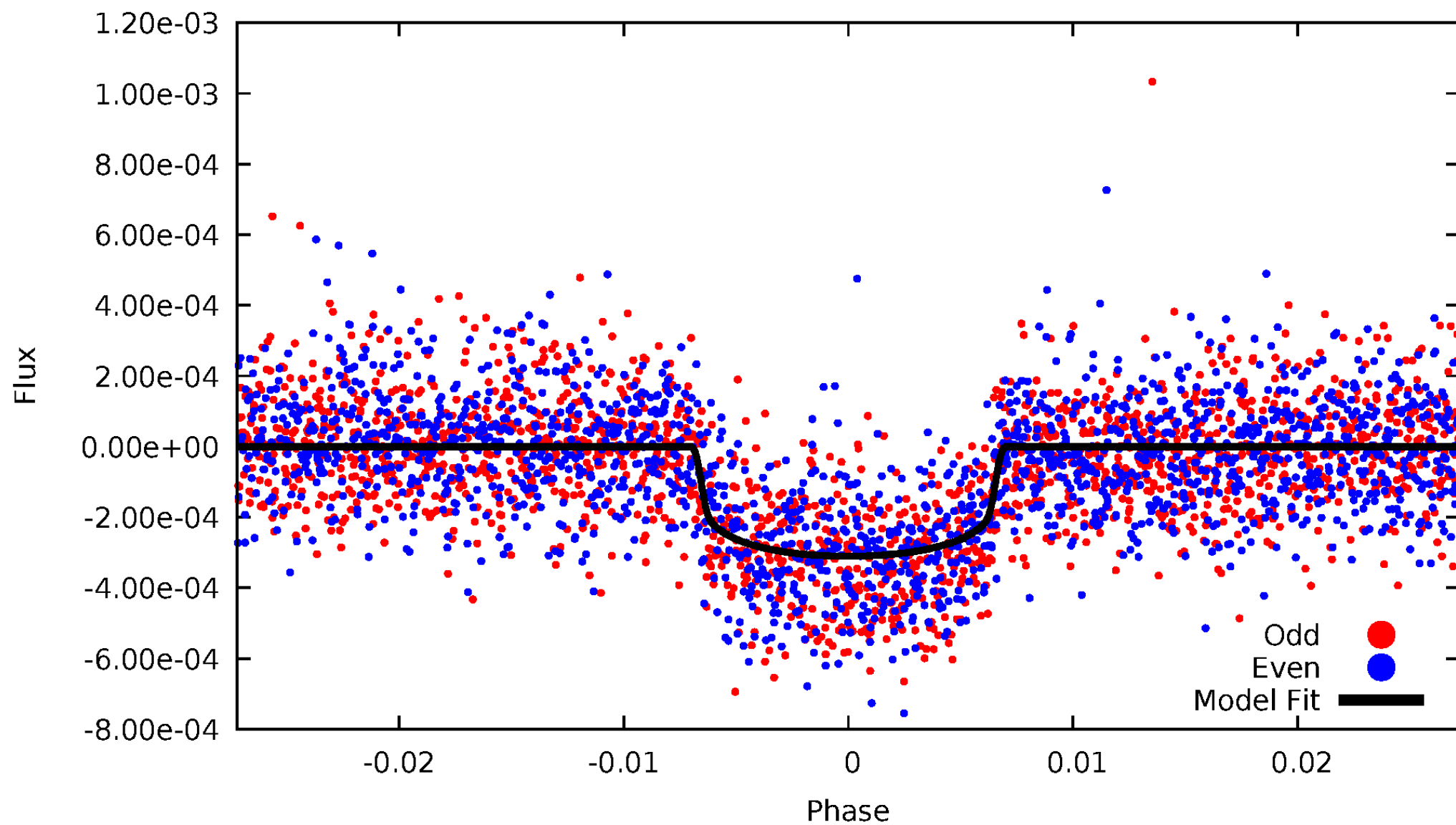


TCE 001871056-01



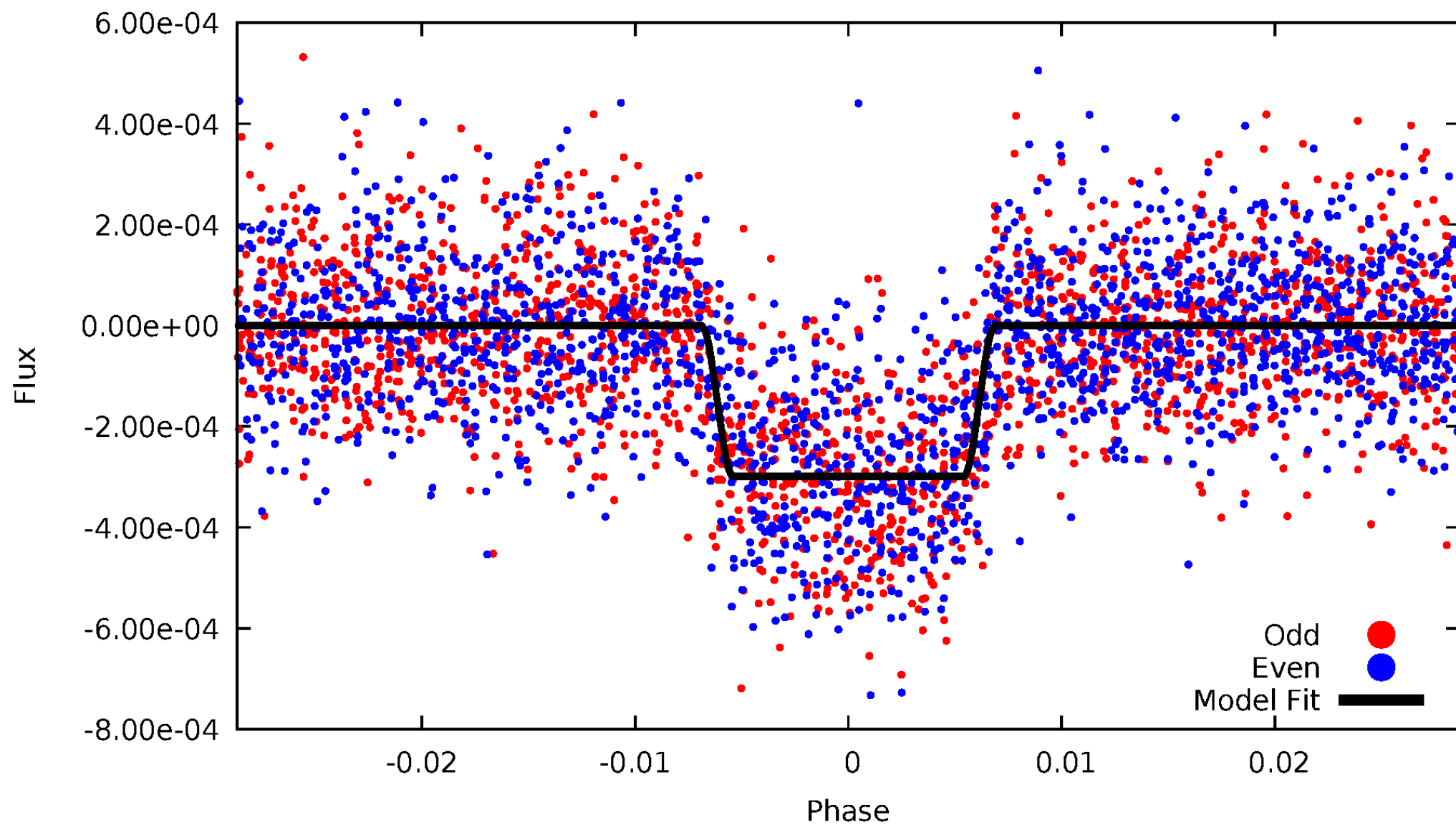
# DV Odd/Even

TCE 001871056-01



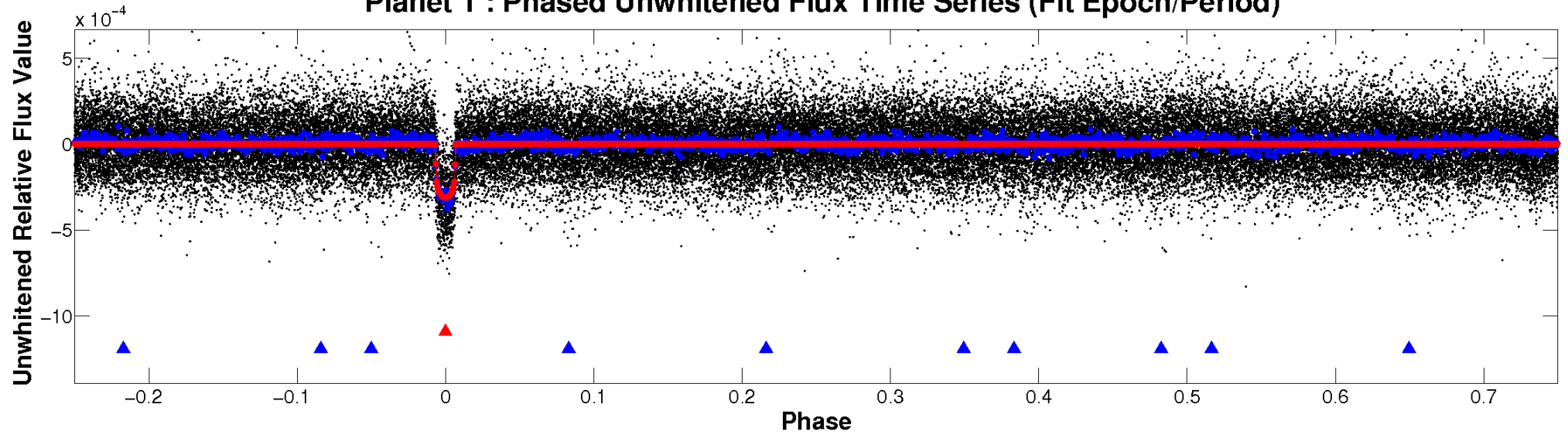
# ALT Odd/Even

TCE 001871056-01

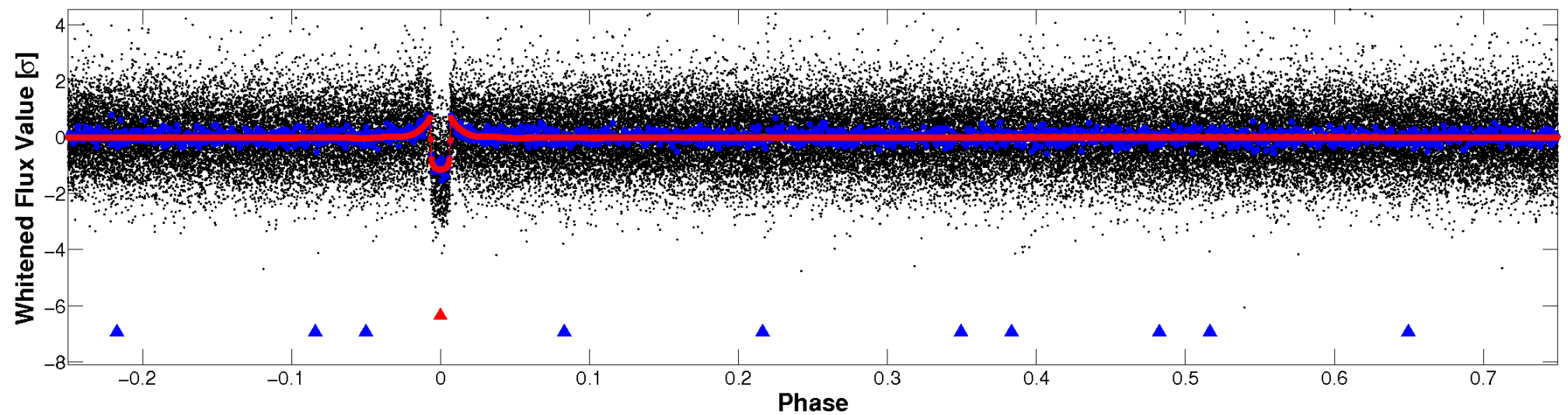


# Non-Whitened Vs. Whitened Light Curve

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

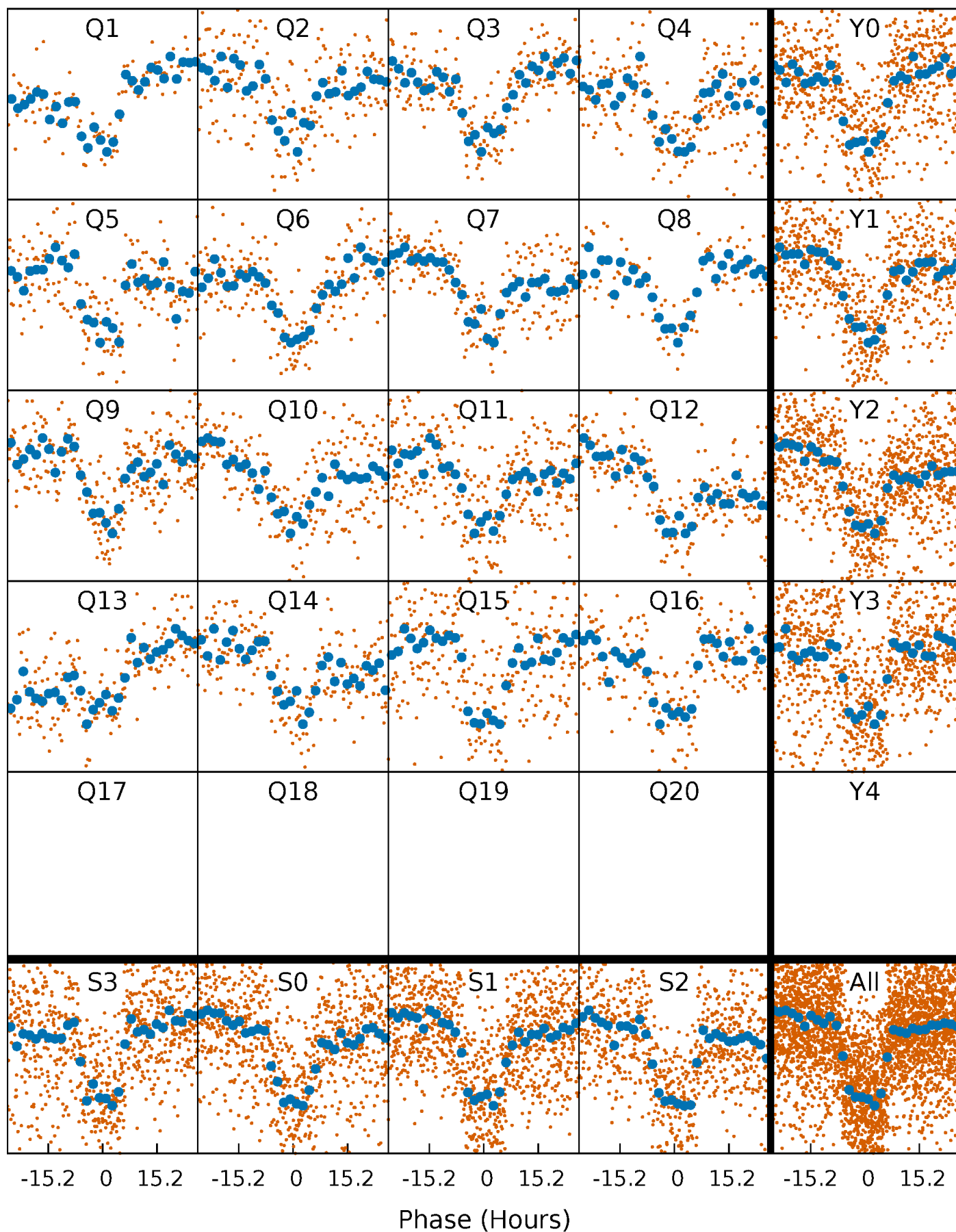


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



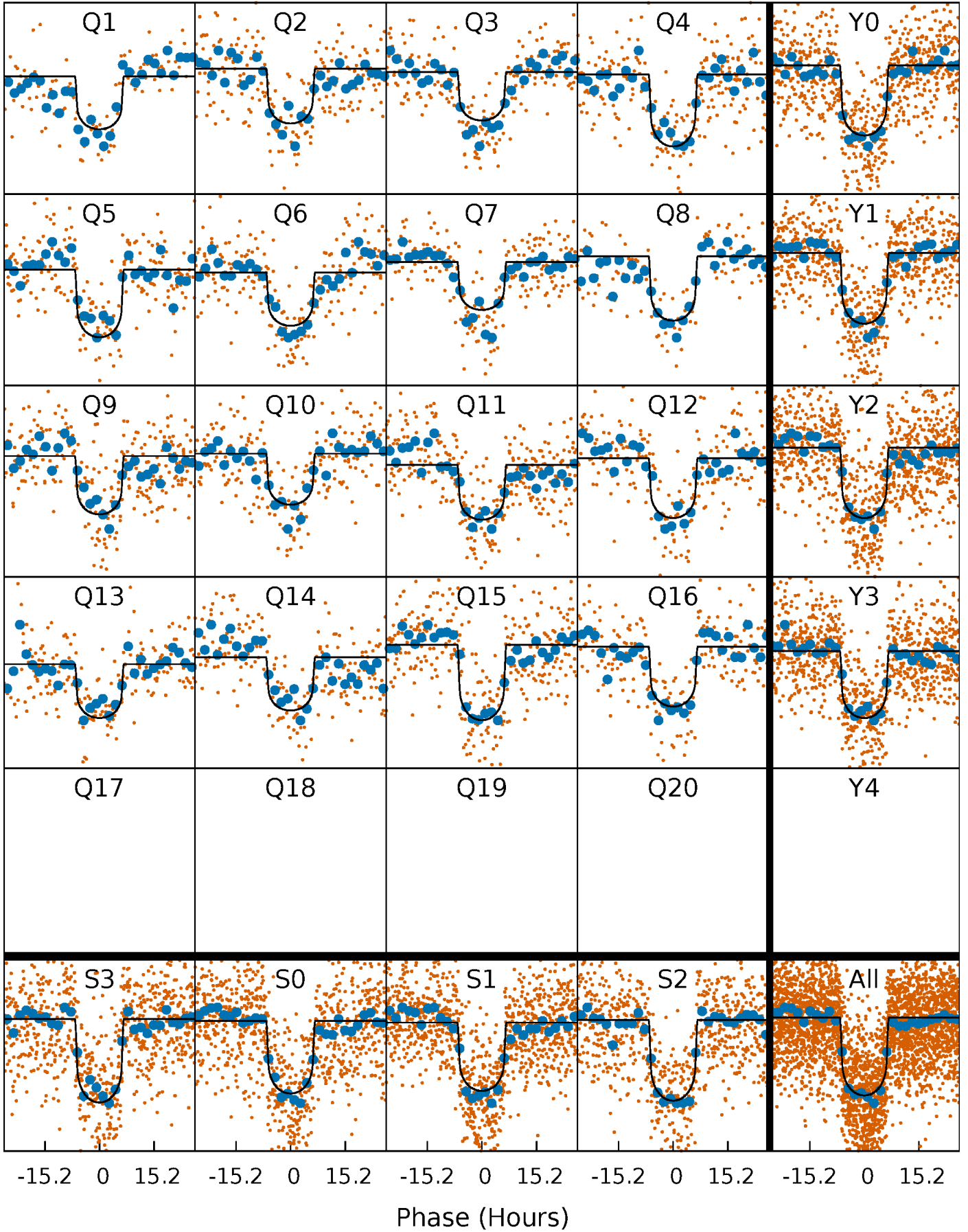
## PDC Quarter-Phased Transit Curves

TCE 001871056-01    P= 40.806331 Days     $T_0=155.720482$  (BKJD)



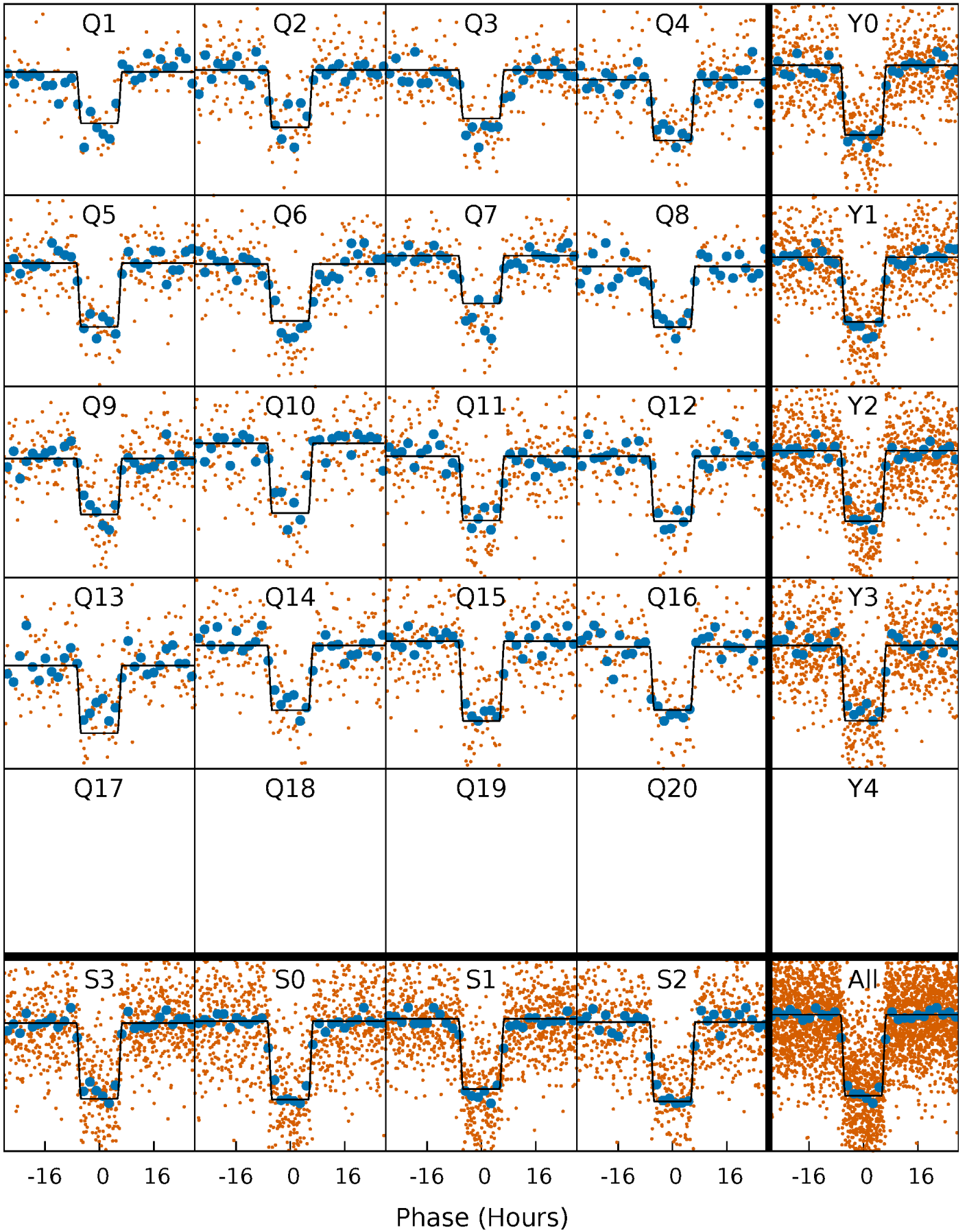
# DV Quarter-Phased Transit Curves

TCE 001871056-01 P= 40.806331 Days  $T_0=155.720482$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

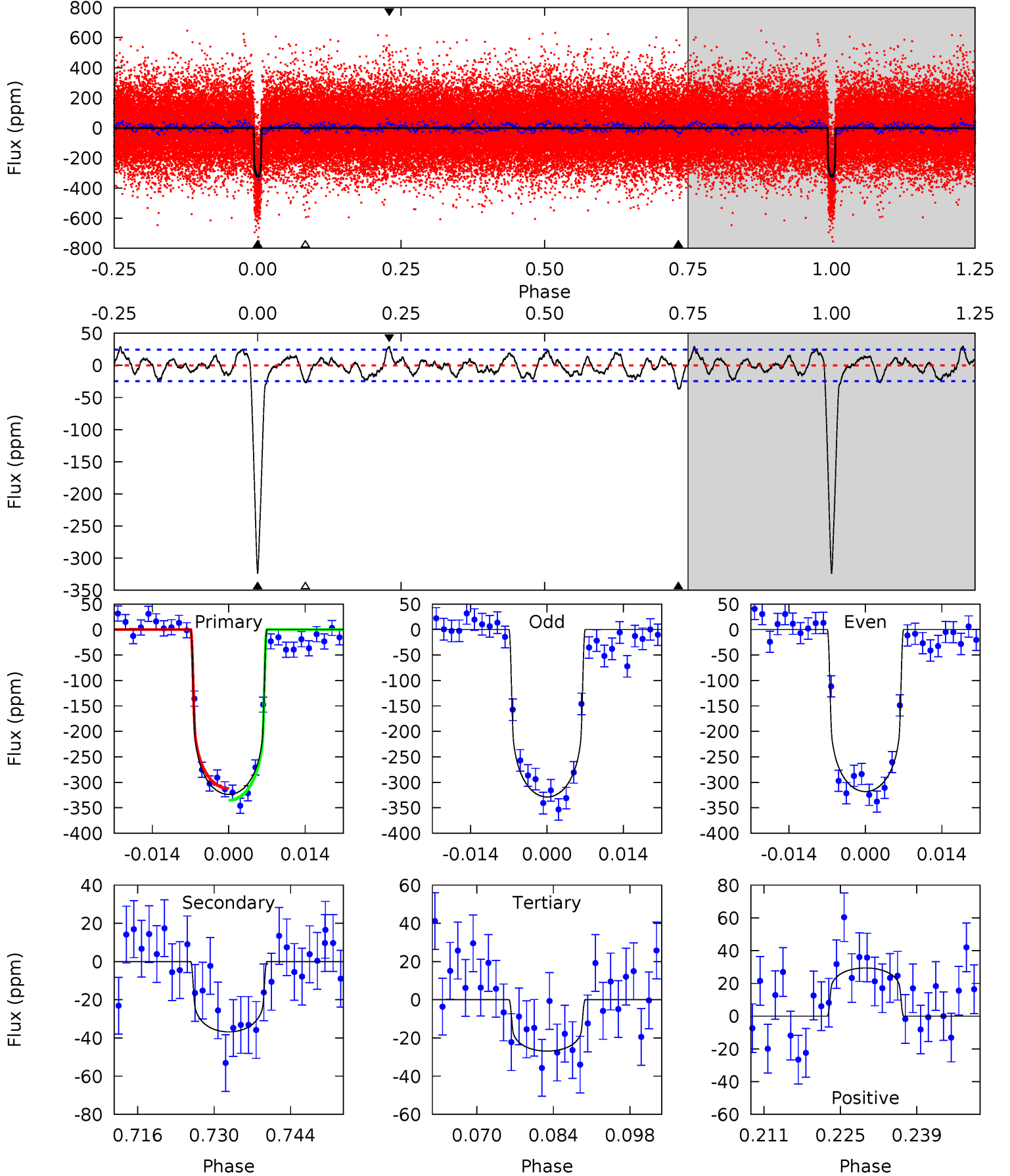
TCE 001871056-01 P= 40.806162 Days  $T_0=155.722266$  (BKJD)



# DV Model-Shift Uniqueness Test

001871056-01, P = 40.806331 Days, E = 114.914151 Days

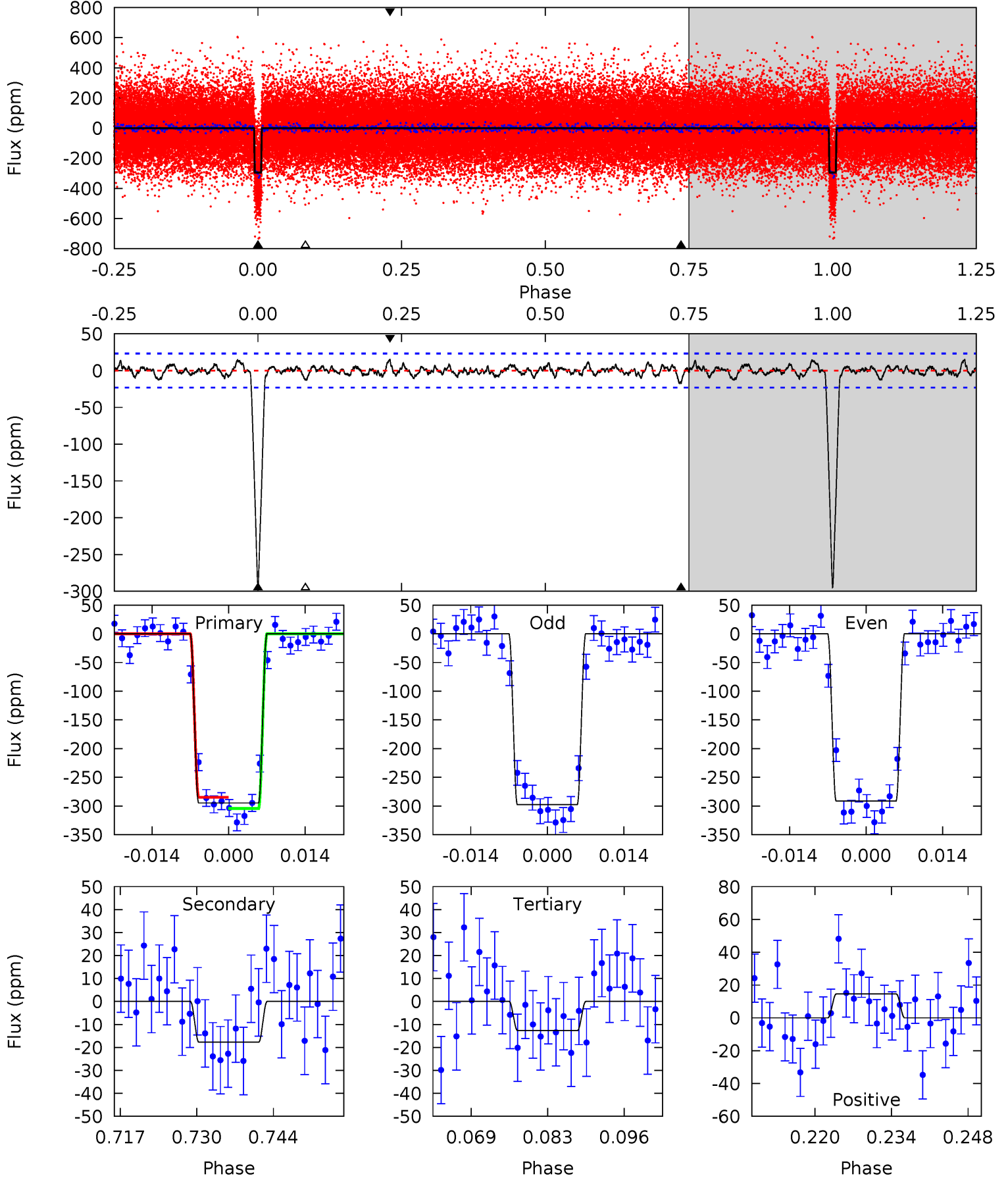
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
65.6	7.46	5.45	5.96	4.96	2.46	2.26	60.2	59.7	2.02	1.50	1.08	1.01	0.08	2.36



# Alt Model-Shift Uniqueness Test

001871056-01, P = 40.806162 Days, E = 114.916104 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
63.3	3.80	2.72	3.13	4.96	2.46	1.02	60.6	60.2	1.08	0.67	0.68	1.01	0.05	2.09



### Stellar Parameters For KIC 001871056

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6207^{+112}_{-125}$	$3.963^{+0.195}_{-0.105}$	$0.240^{+0.150}_{-0.150}$	$2.097^{+0.350}_{-0.569}$	$1.472^{+0.126}_{-0.198}$	$0.225^{+0.242}_{-0.073}$
	+2%/-2%	+5%/-3%	+62%/-62%	+17%/-27%	+9%/-13%	+108%/-32%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 001871056-01 / KOI 1001.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-37 \pm 5$	$3.86^{+0.53}_{-0.59}$	$1068^{+56}_{-68}$	$4000^{+168}_{-170}$	$95^{+38}_{-25}$
Alt.	$-18 \pm 5$	$3.91^{+0.54}_{-0.57}$	$1075^{+50}_{-74}$	$3517^{+189}_{-195}$	$44^{+20}_{-15}$

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

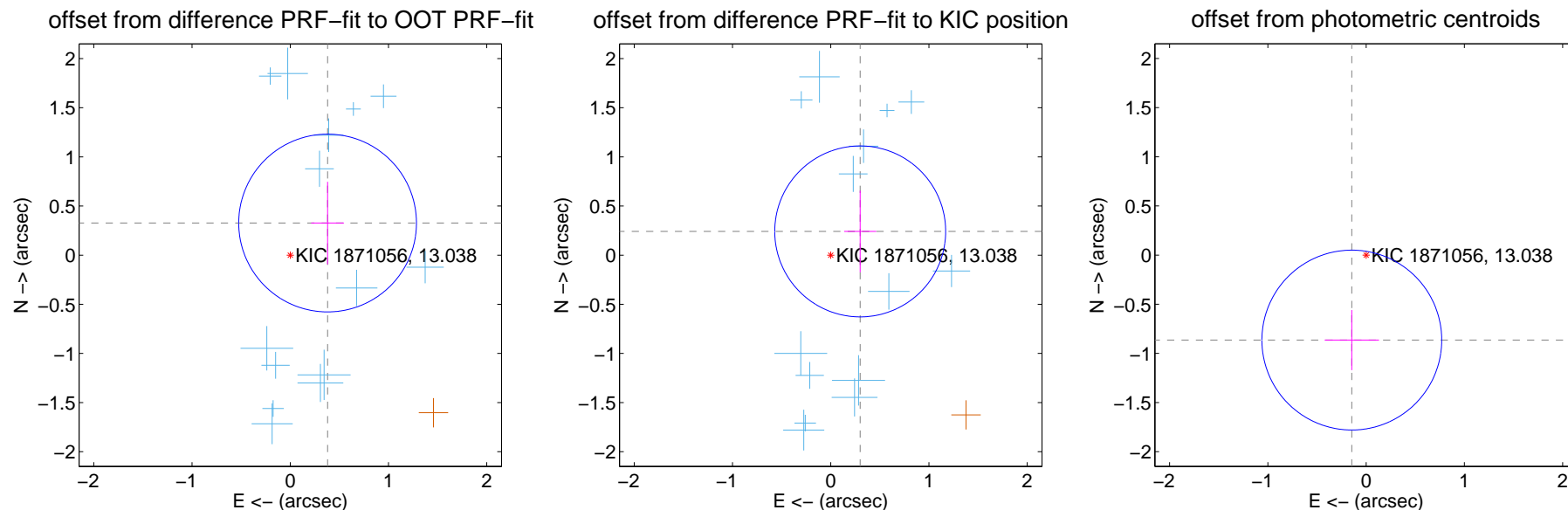
## DV Centroid Data

Supplemental centroid analysis for 001871056-01. Kepler magnitude: 13.04. Transit SNR 32.55

There are 14 quarters with good PRF difference image offsets

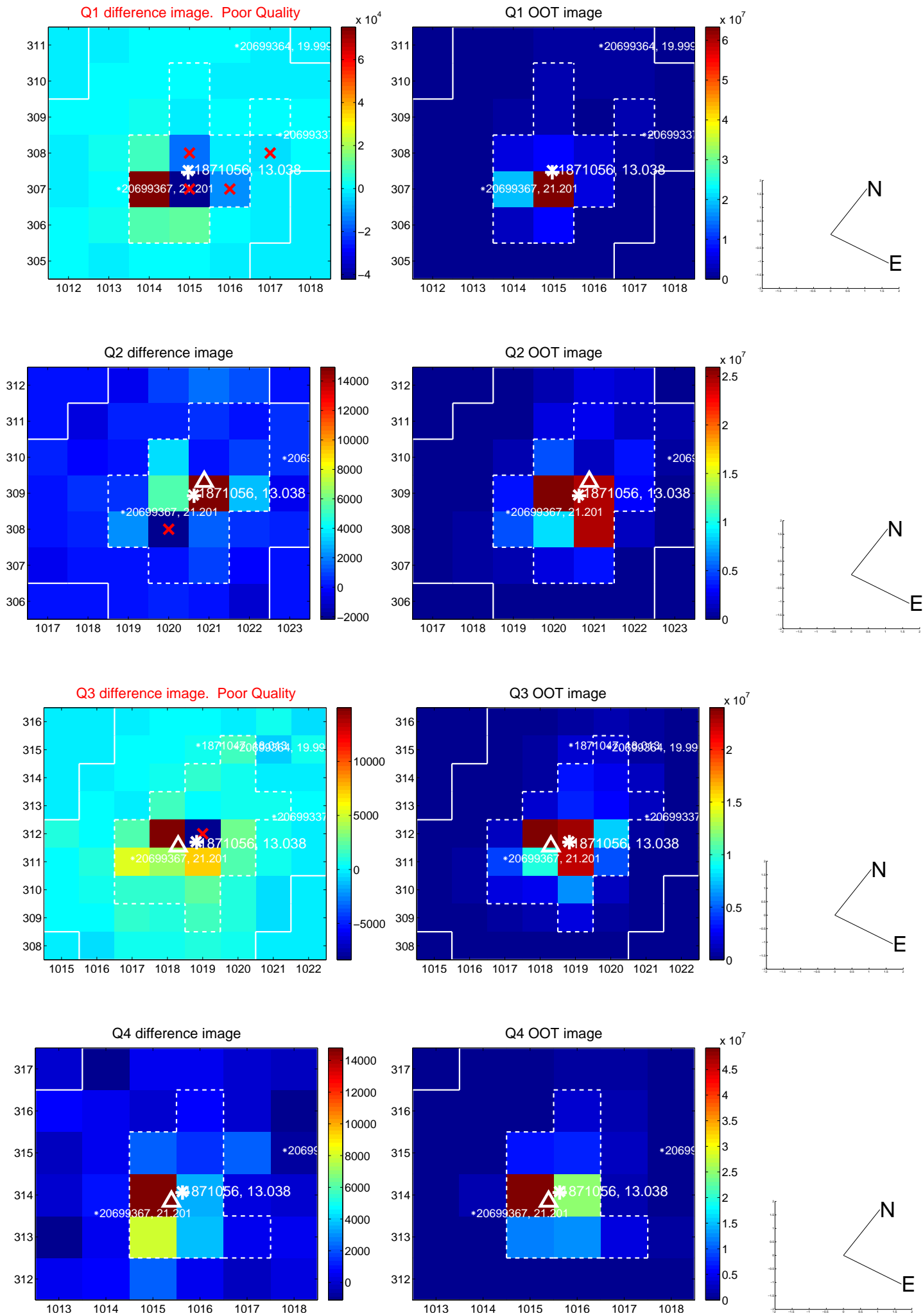
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.501 \pm 0.302$	1.66	$-0.380 \pm 0.166$	$0.327 \pm 0.420$
PRF-fit source offset from KIC position	$0.385 \pm 0.290$	1.33	$-0.300 \pm 0.164$	$0.242 \pm 0.415$
photometric centroid source offset	$0.88 \pm 0.30$	2.88	$0.15 \pm 0.28$	$-0.86 \pm 0.31$

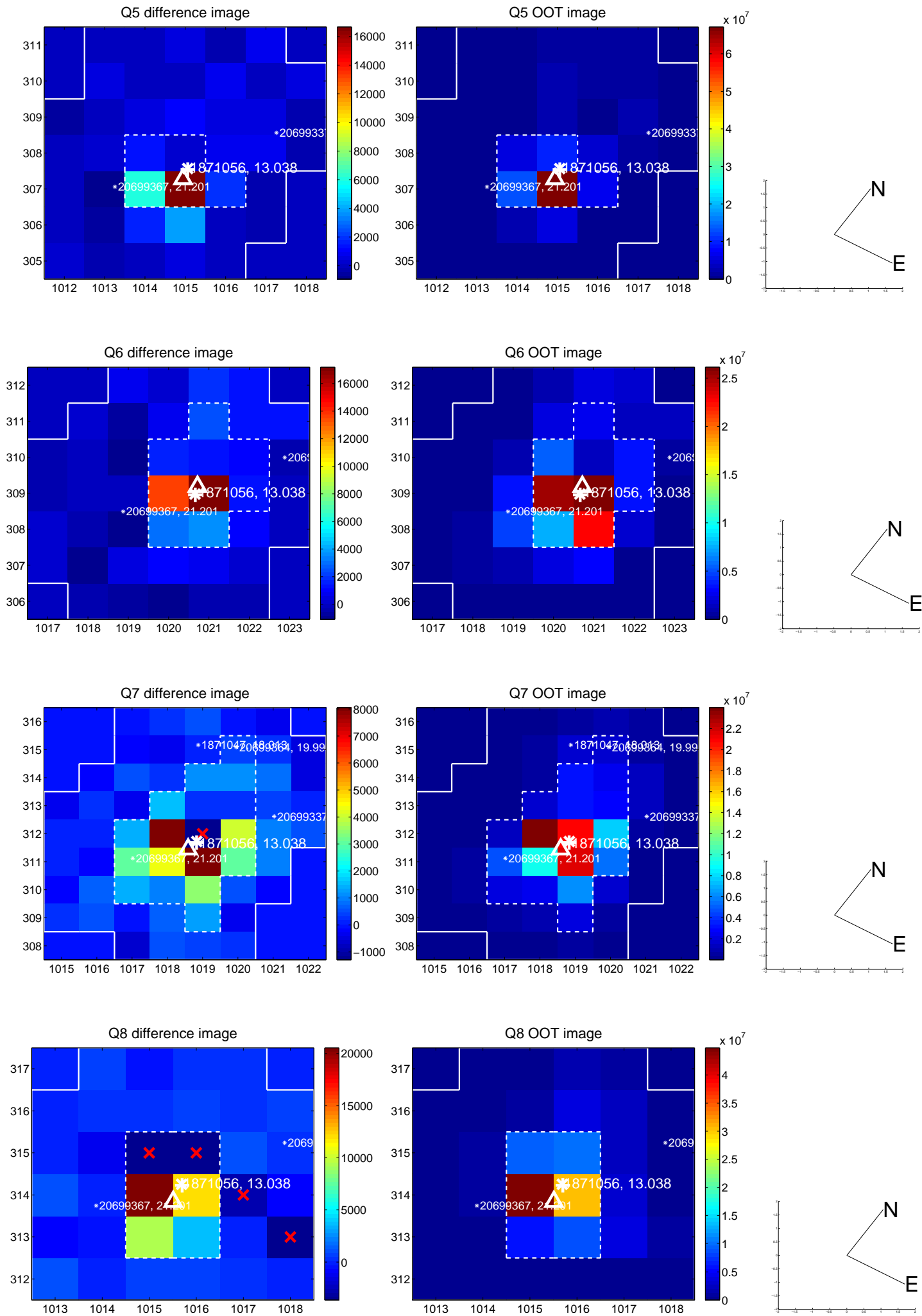


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

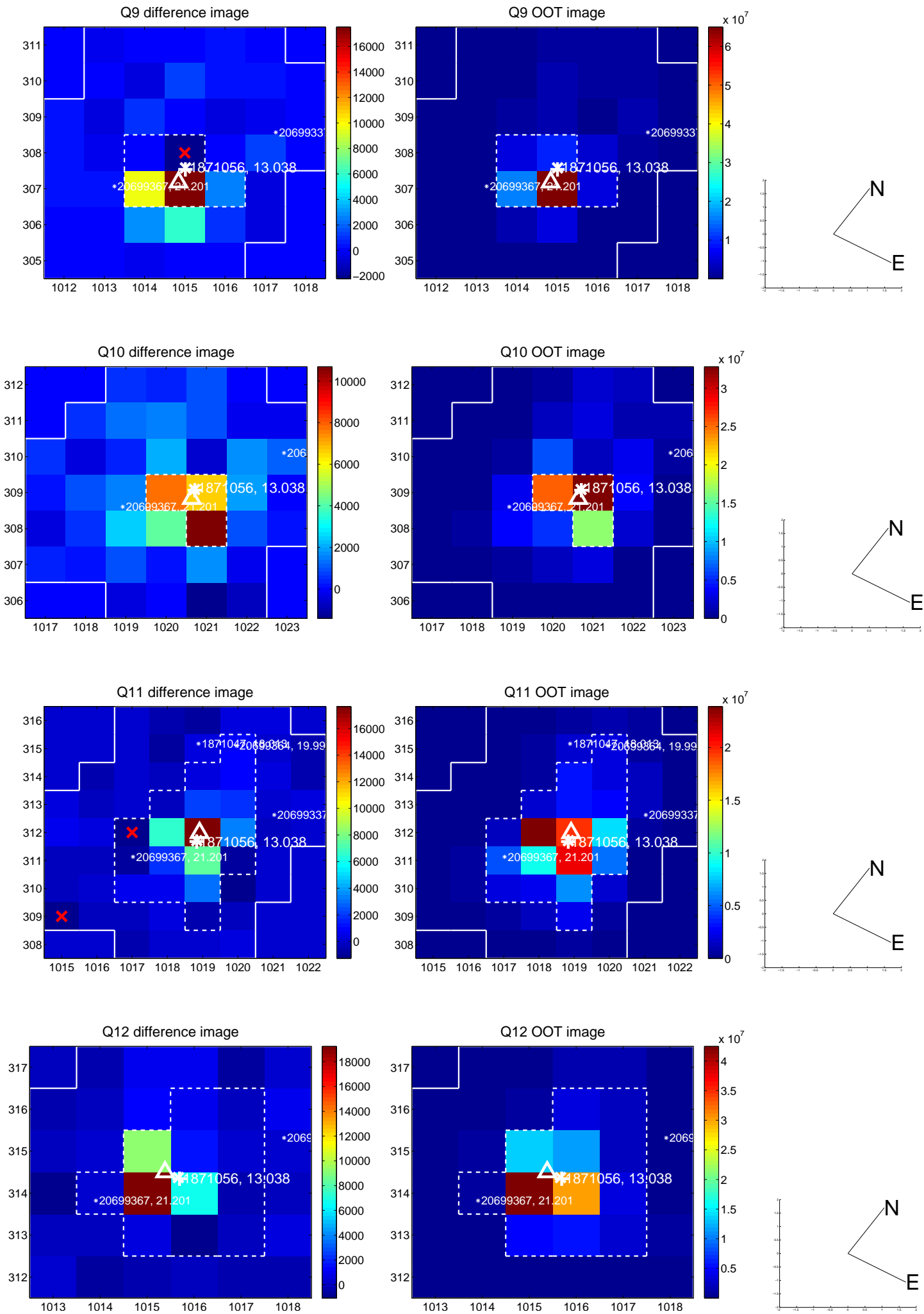
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



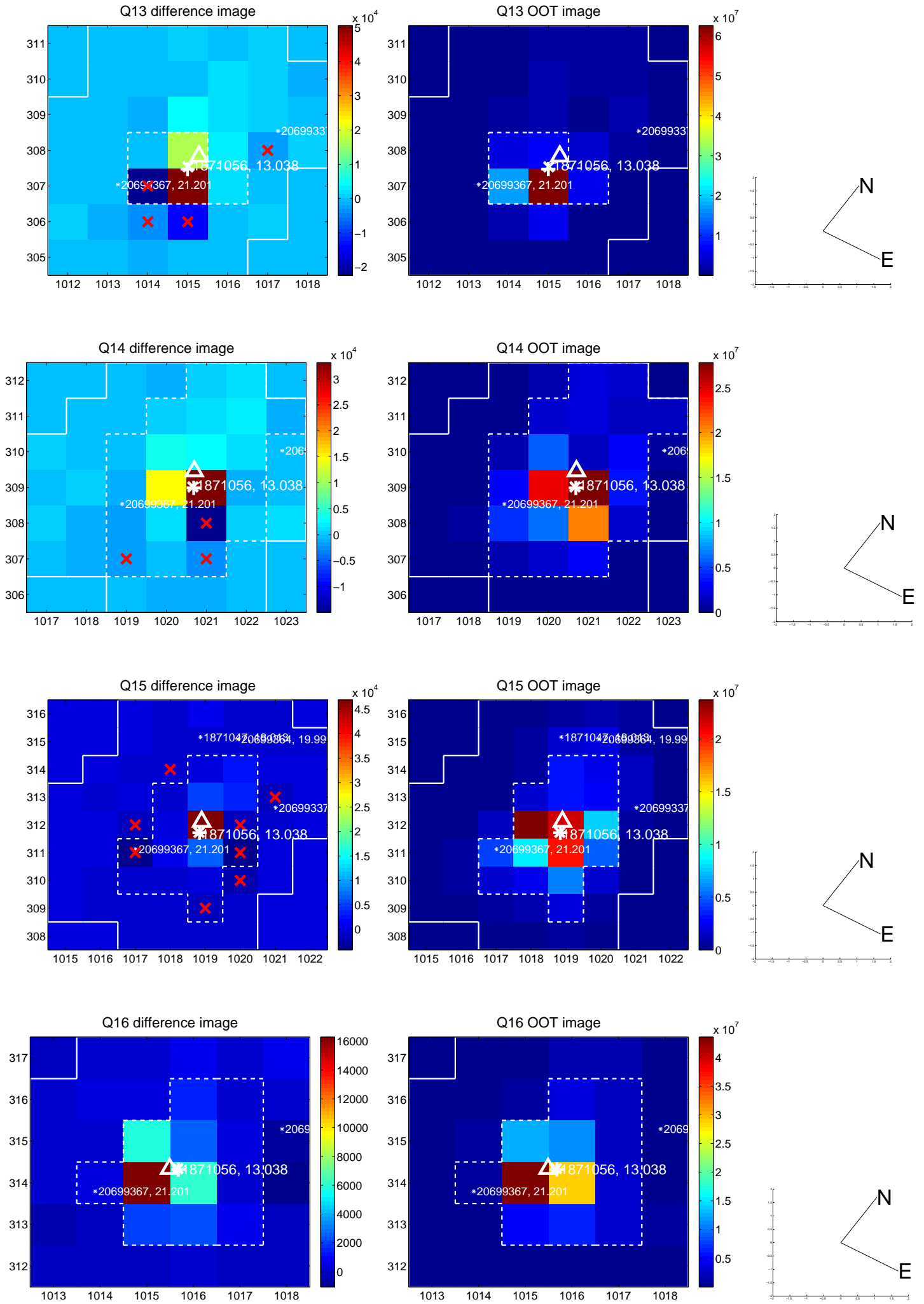
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



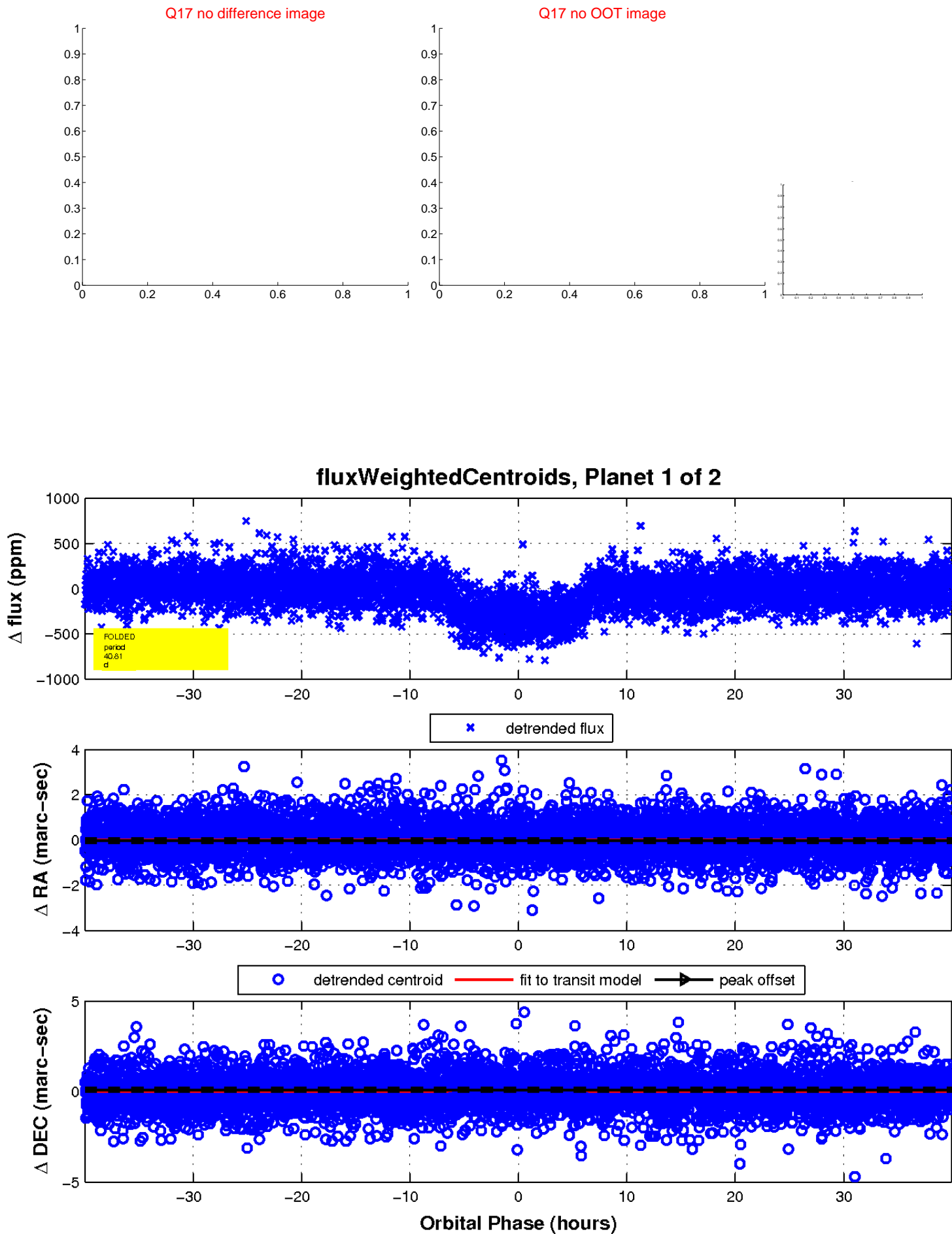
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

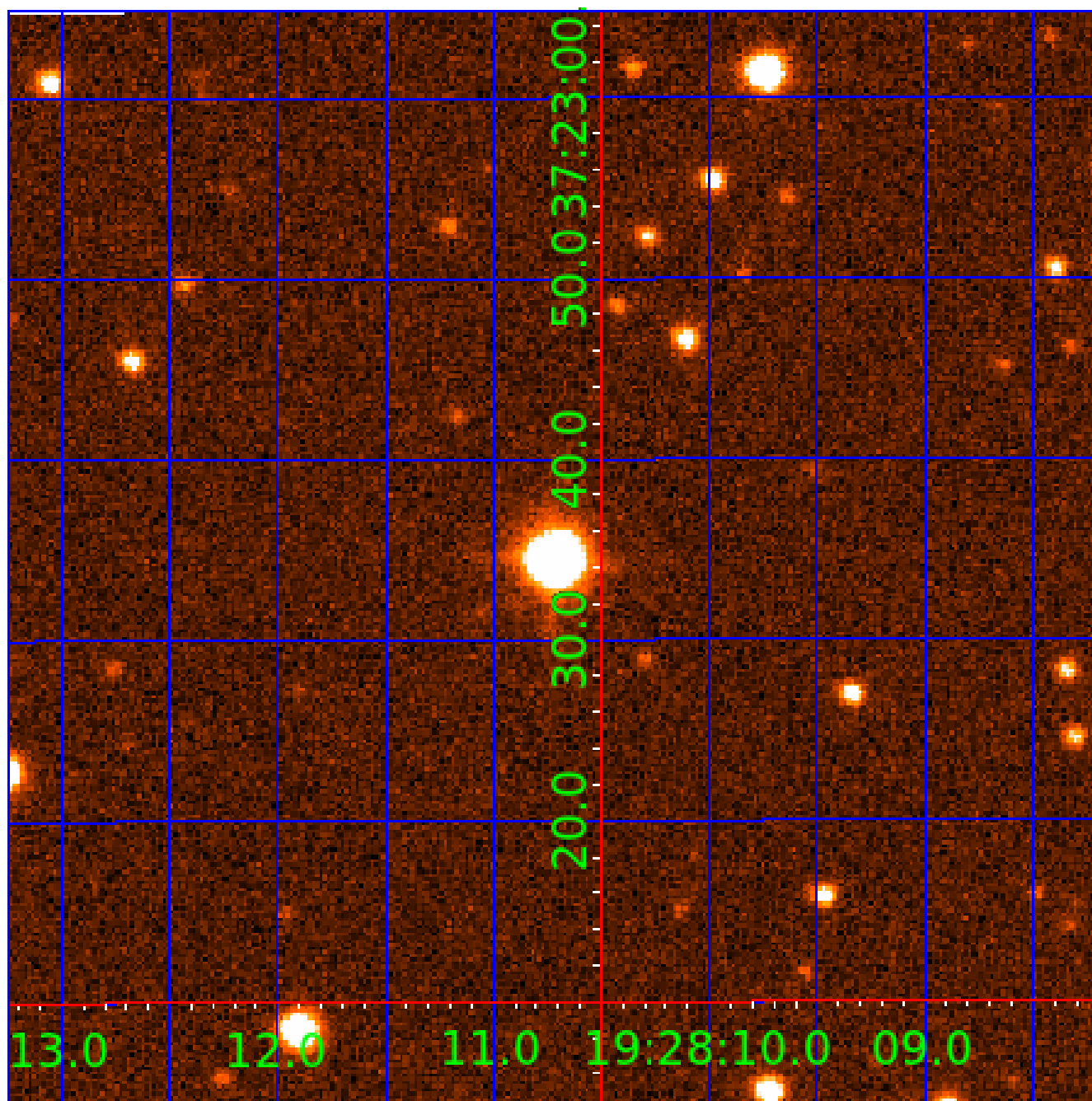


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 001871056

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
001871056-01	OBS	1001.01	40.806331	155.720481	310.6	13.325	31.3	32.6	2.10	6207	3.94	83.92
001871056-02	OBS	1001.02	140.105358	216.217819	320.8	19.229	14.7	17.4	2.10	6207	4.35	16.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
001871056-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
001871056-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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

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

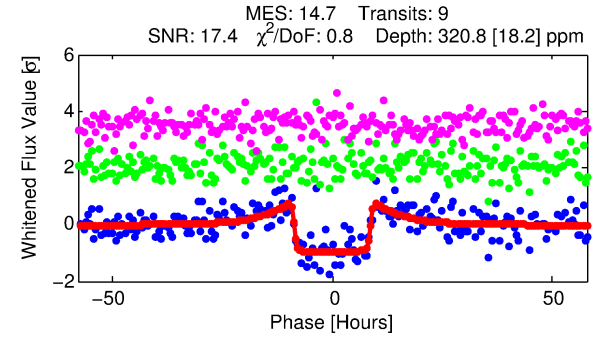
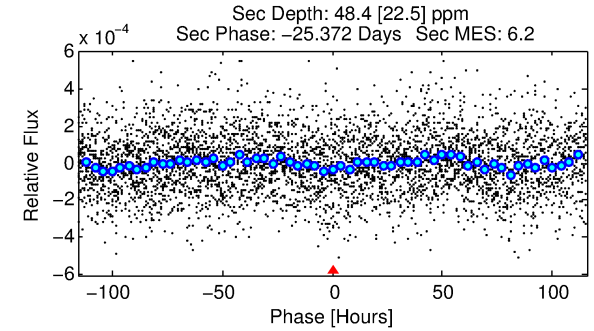
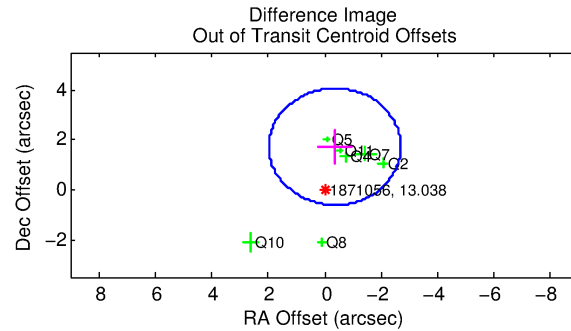
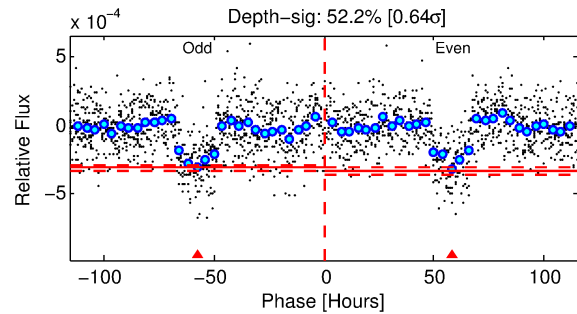
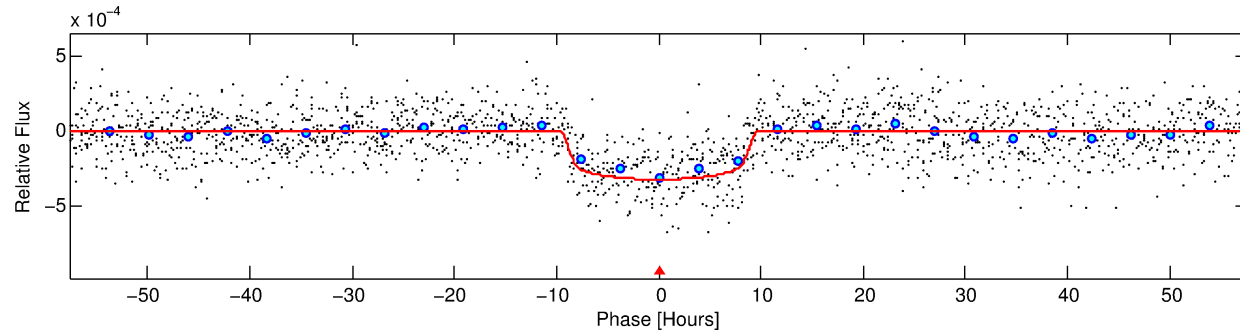
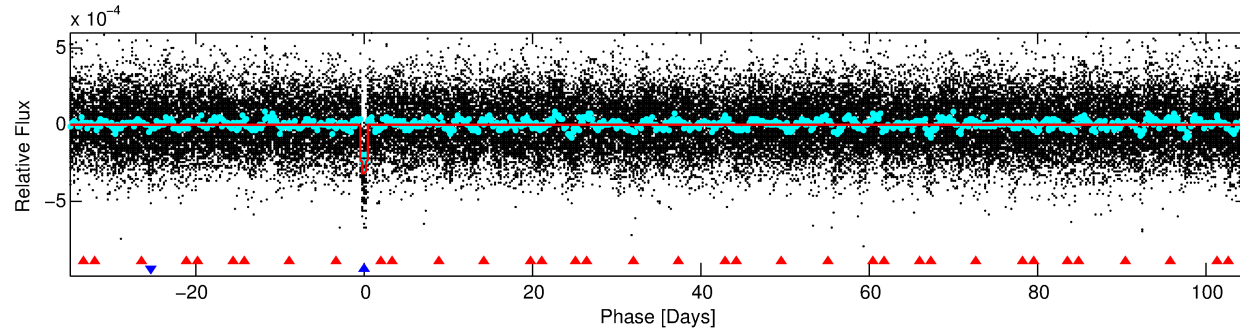
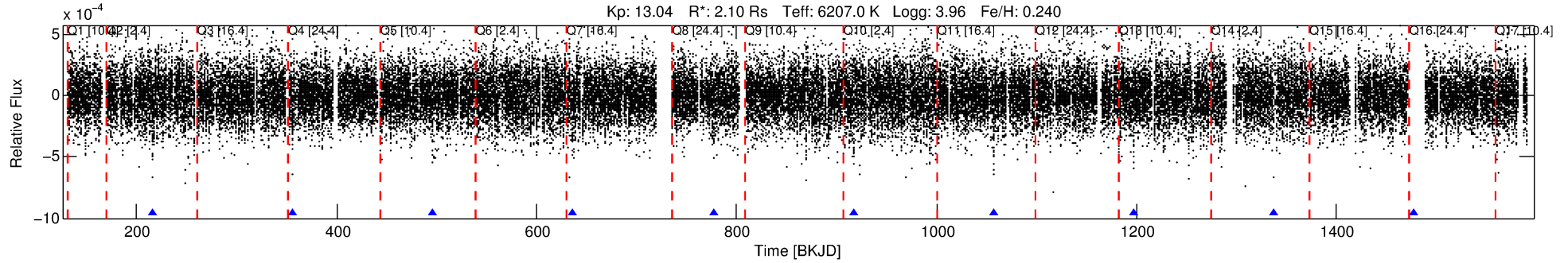
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 001871056-02

No Significant Match Found

# DV One-Page Summary

KIC: 1871056 Candidate: 2 of 2 Period: 140.105 d  
KOI: K01001.02 Name: Kepler-264c Corr: 0.958



## DV Fit Results:

Period = 140.10536 [0.00230] d  
Epoch = 216.2178 [0.0101] BKJD  
Rp/R\* = 0.0190 [0.0009]  
a/R\* = 28.63 [5.52]  
b = 0.88 [0.05]  
Seff = 16.20 [5.81]  
Teq = 512 [46] K  
Rp = 4.35 [1.20] Re  
a = 0.6008 [0.1411] AU  
Ag = 507.72 [299.45] [1.69 $\sigma$ ]  
Teffp = 3755 [452] K [7.14 $\sigma$ ]

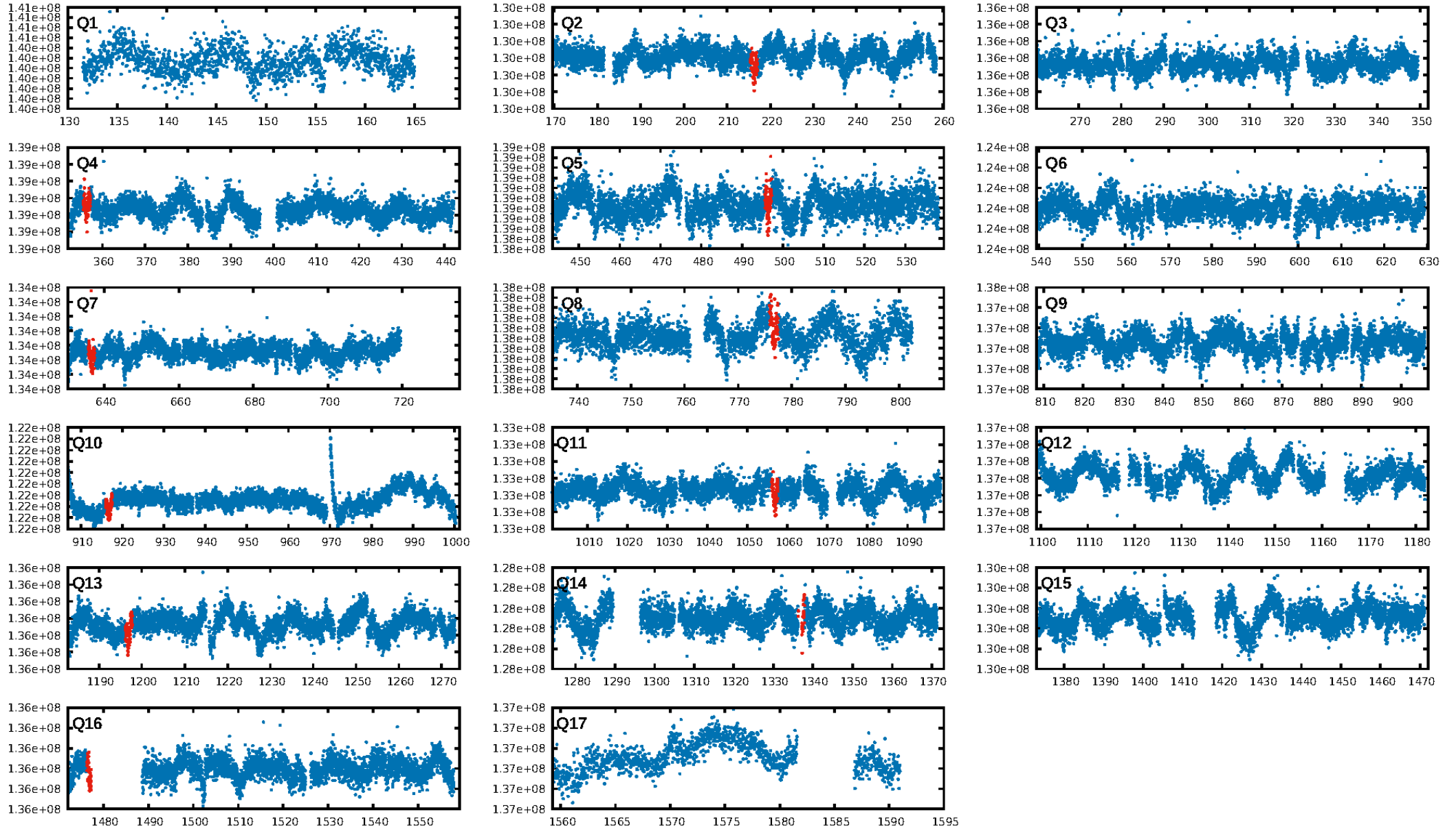
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [101.87 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 75.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.98e-33  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 1.749  
Centroid-sig: 37.0%  
Centroid-so: 0.218 arcsec [0.44 $\sigma$ ]  
OotOffset-rm: 1.755 arcsec [2.25 $\sigma$ ]  
KicOffset-rm: 1.371 arcsec [2.09 $\sigma$ ]  
OotOffset-st: 2/2/2/1 [7]  
KicOffset-st: 2/2/2/1 [7]  
DiffImageQuality-fgm: 1.00 [7/7]  
DiffImageOverlap-fno: 1.00 [7/7]

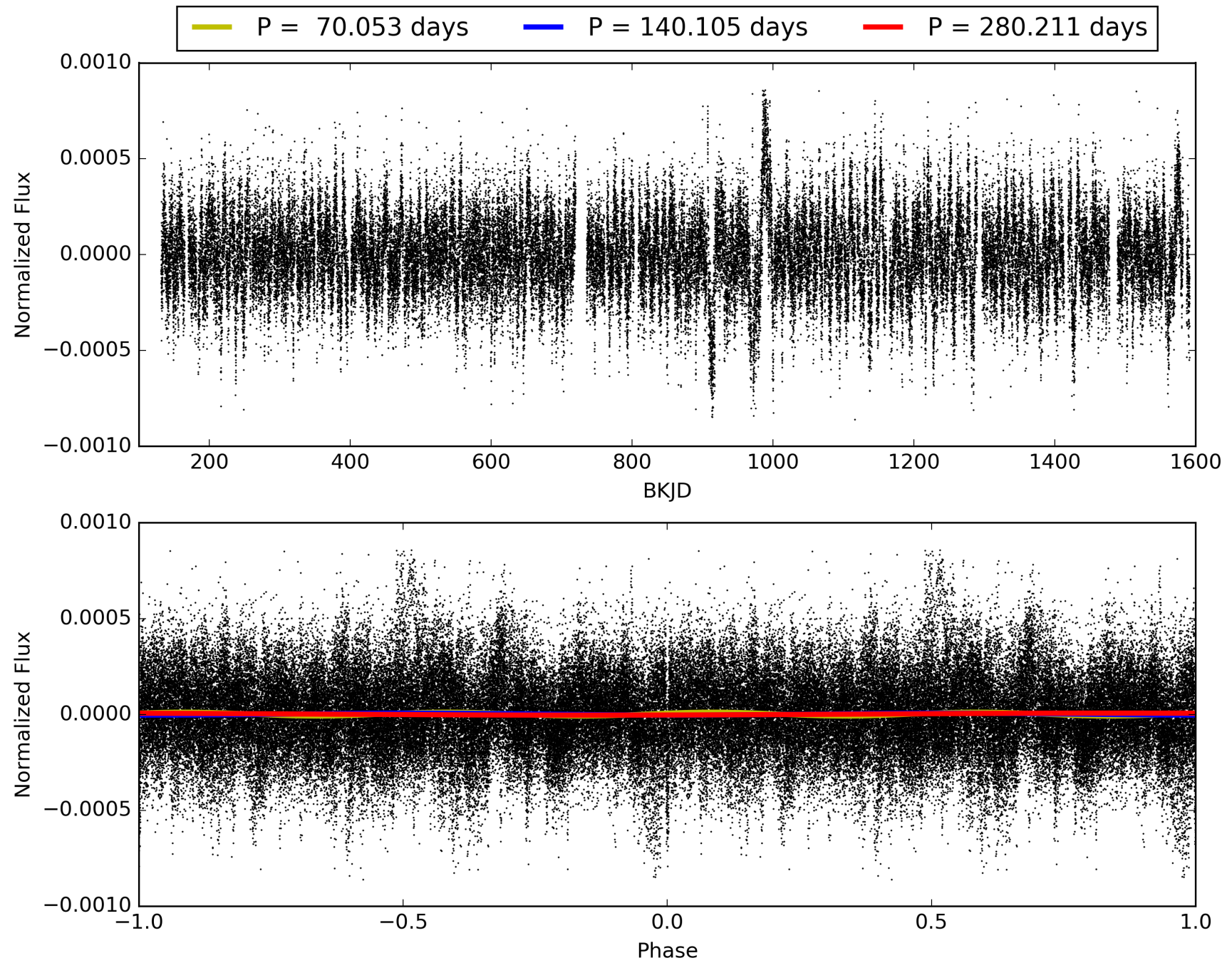
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:41:02 Z

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

# TCE 001871056-02, PDC Light Curves

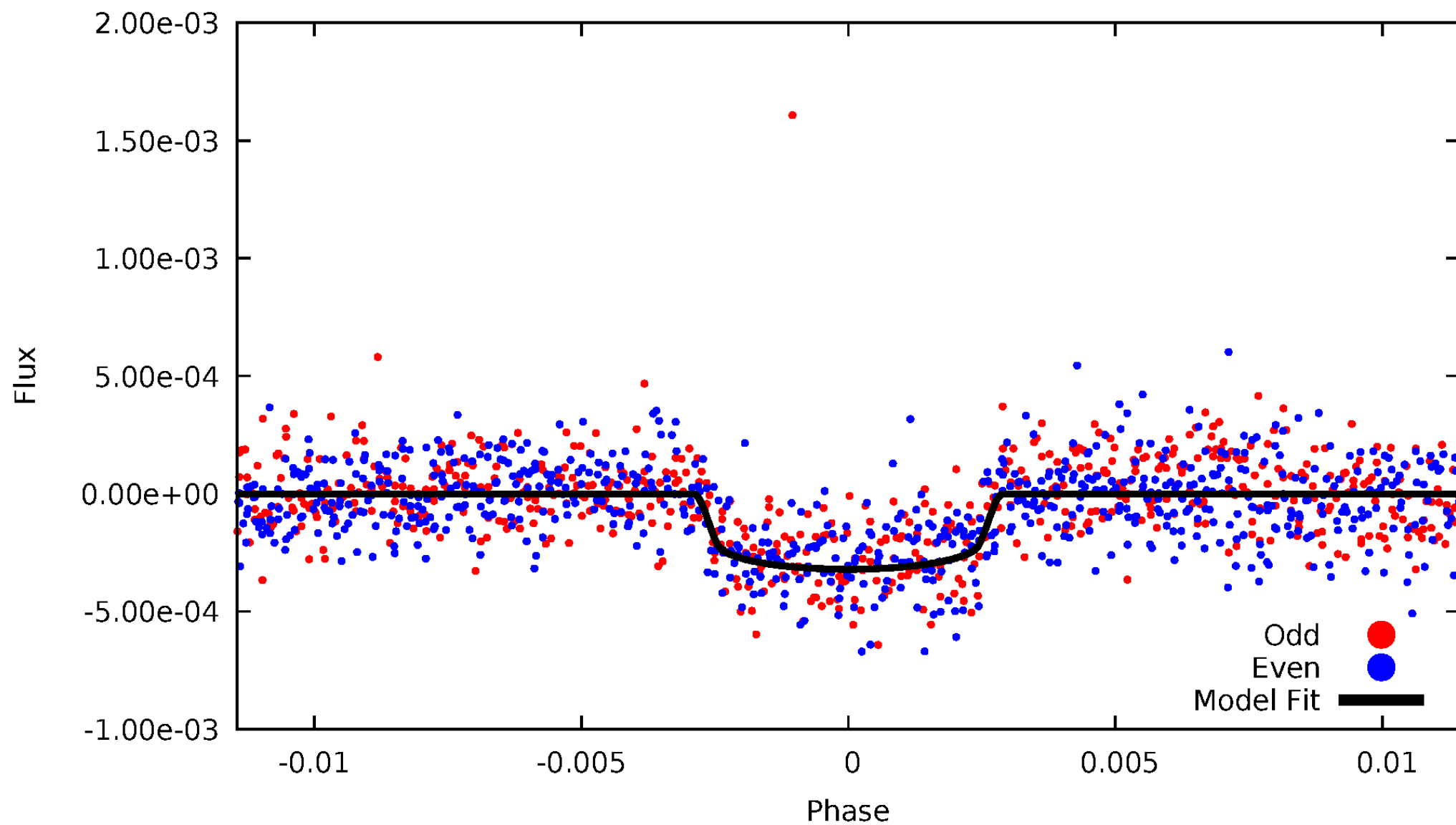


TCE 001871056-02



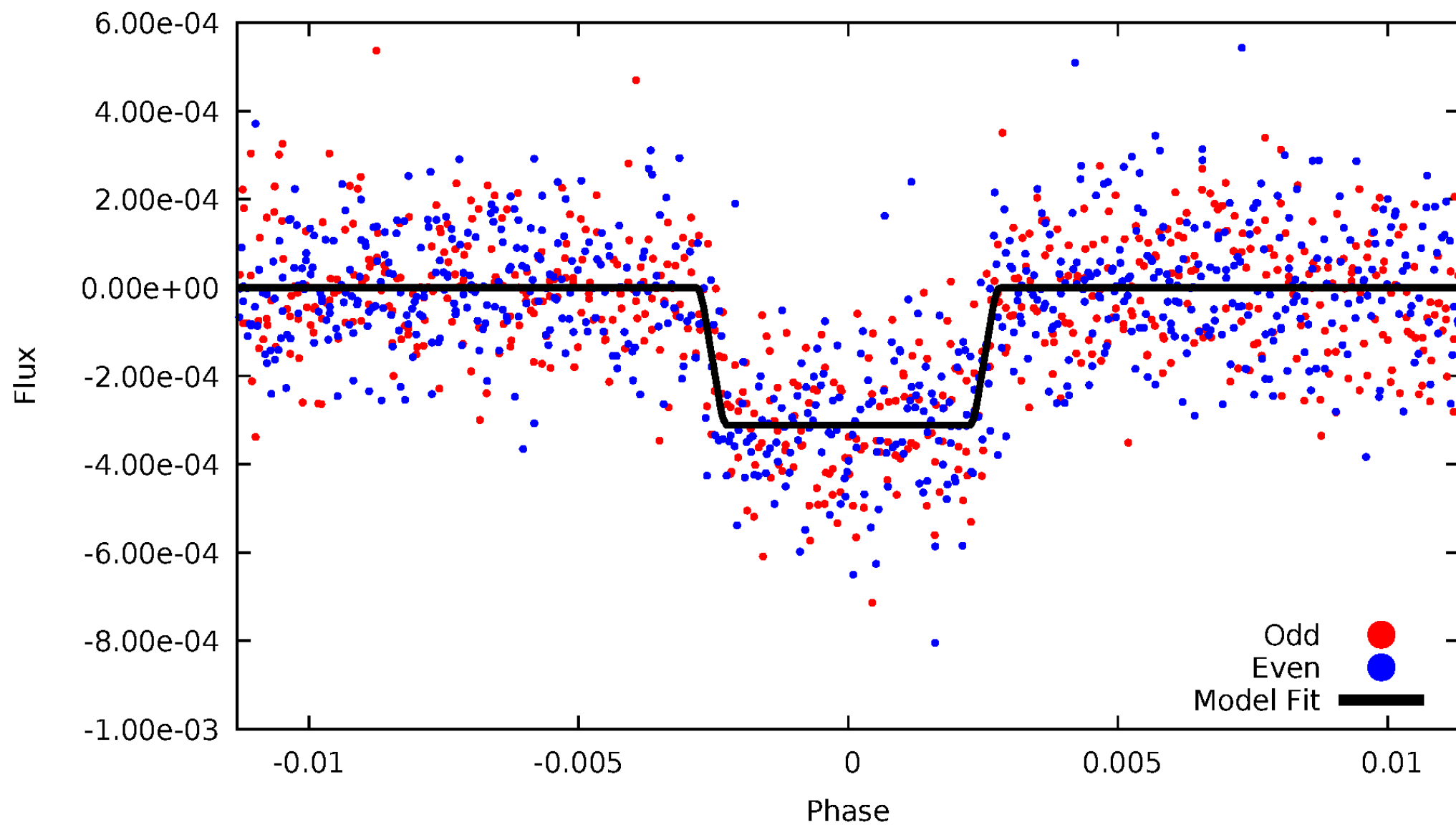
# DV Odd/Even

TCE 001871056-02



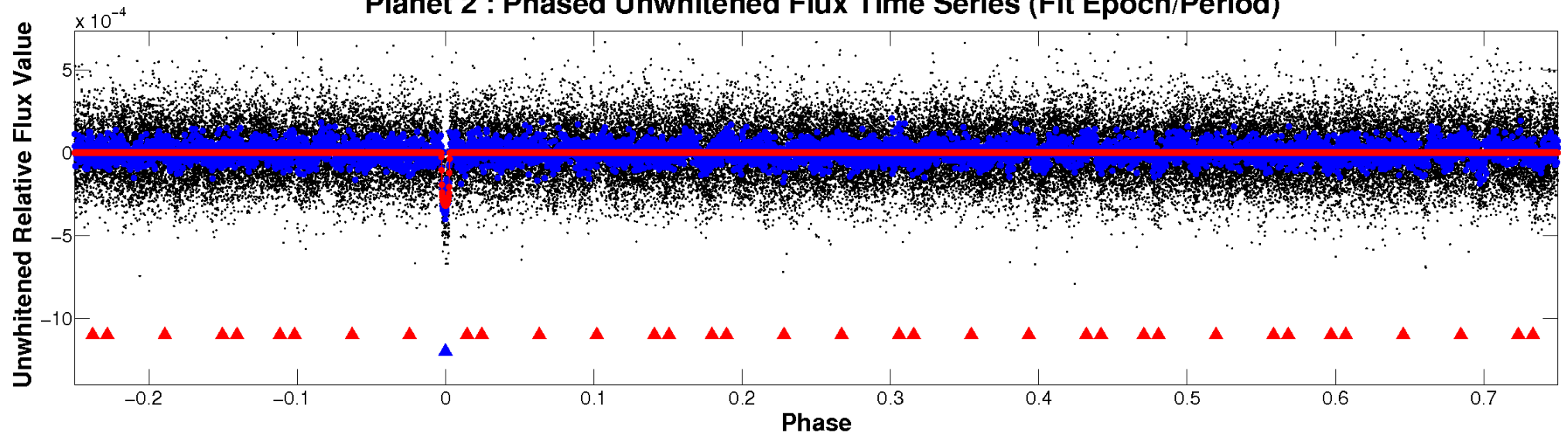
# ALT Odd/Even

TCE 001871056-02

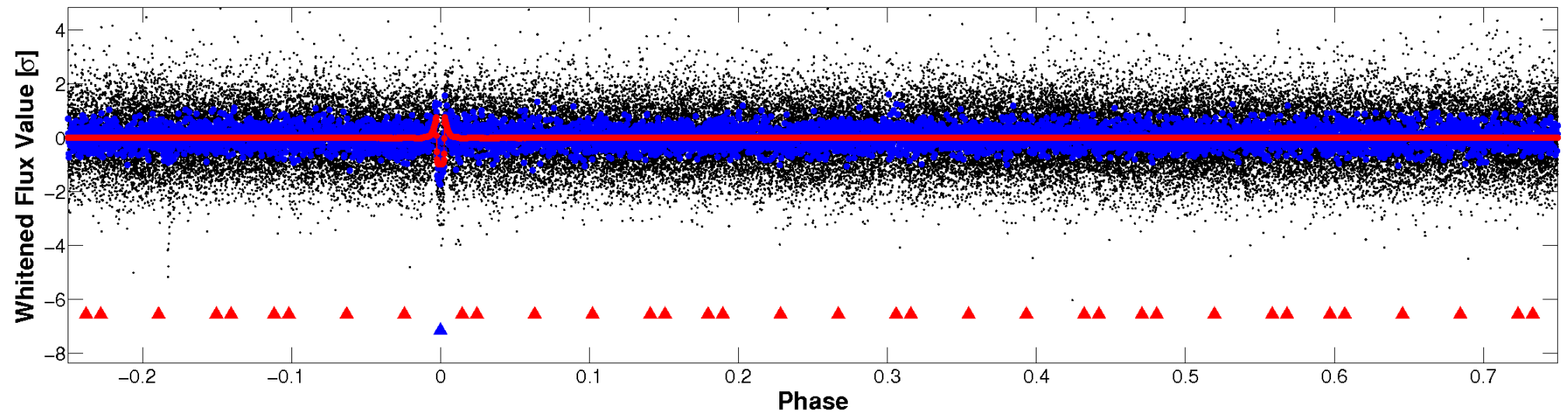


# Non-Whitened Vs. Whitened Light Curve

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

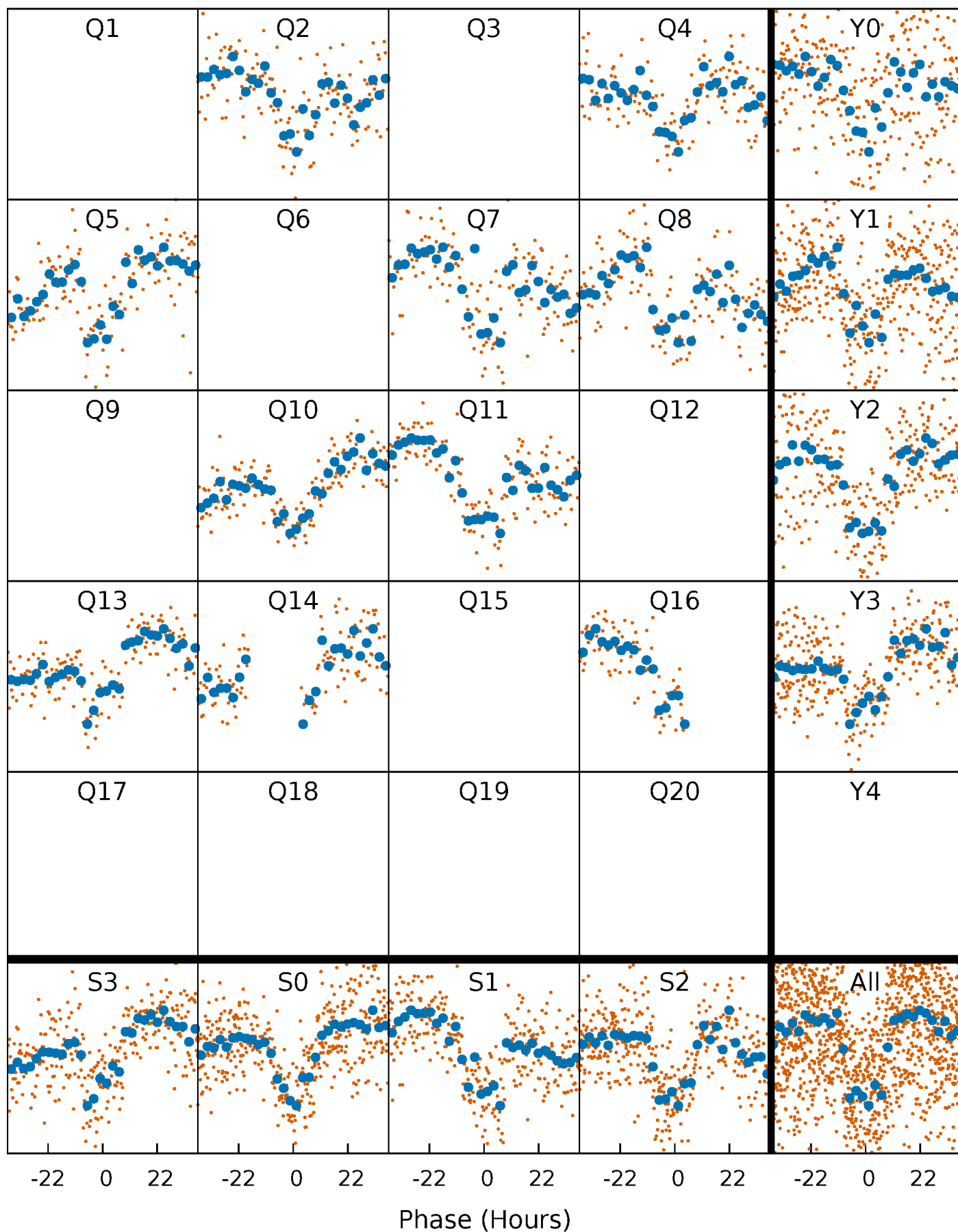


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



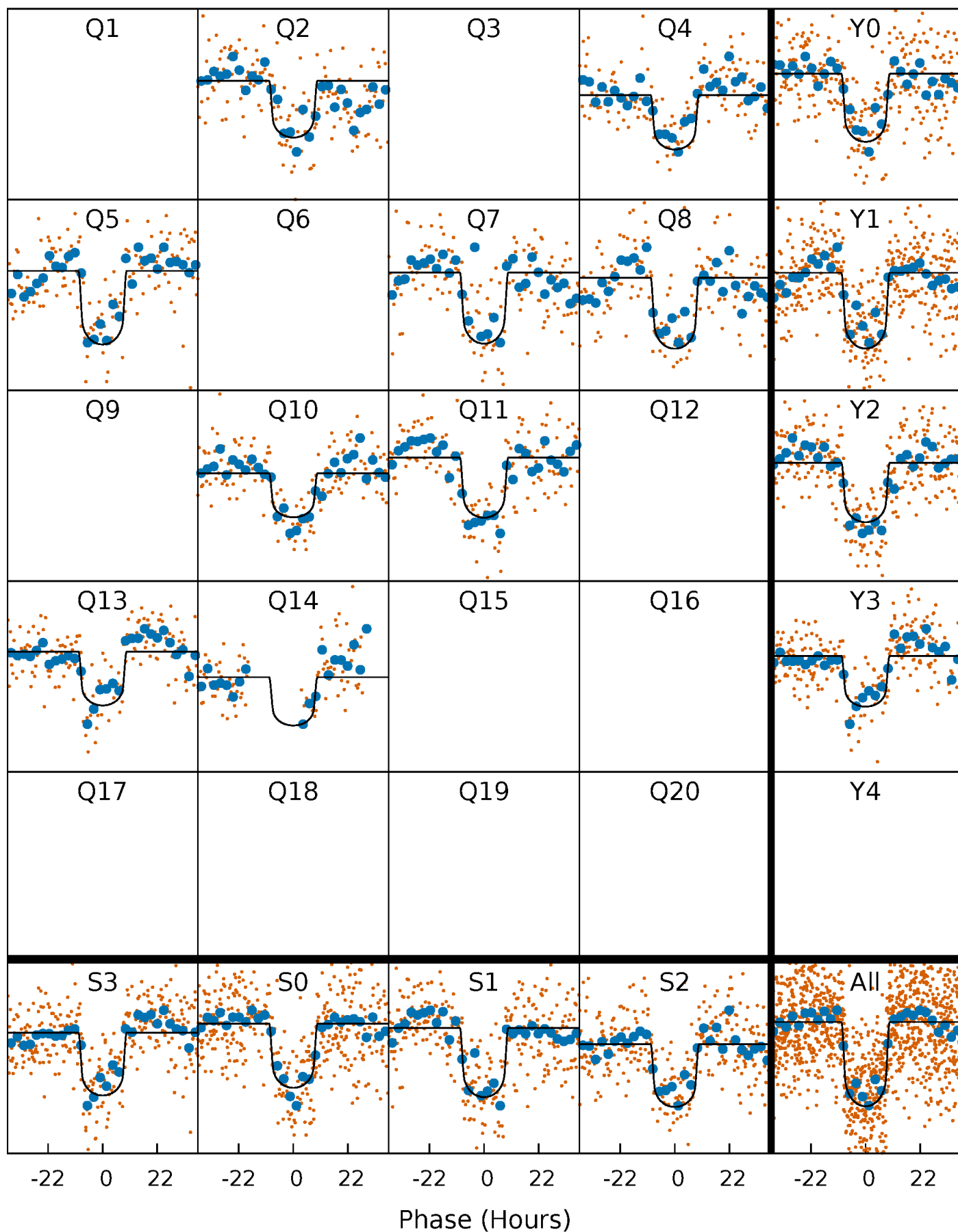
# PDC Quarter-Phased Transit Curves

TCE 001871056-02   P=140.105358 Days    $T_0=216.217819$  (BKJD)



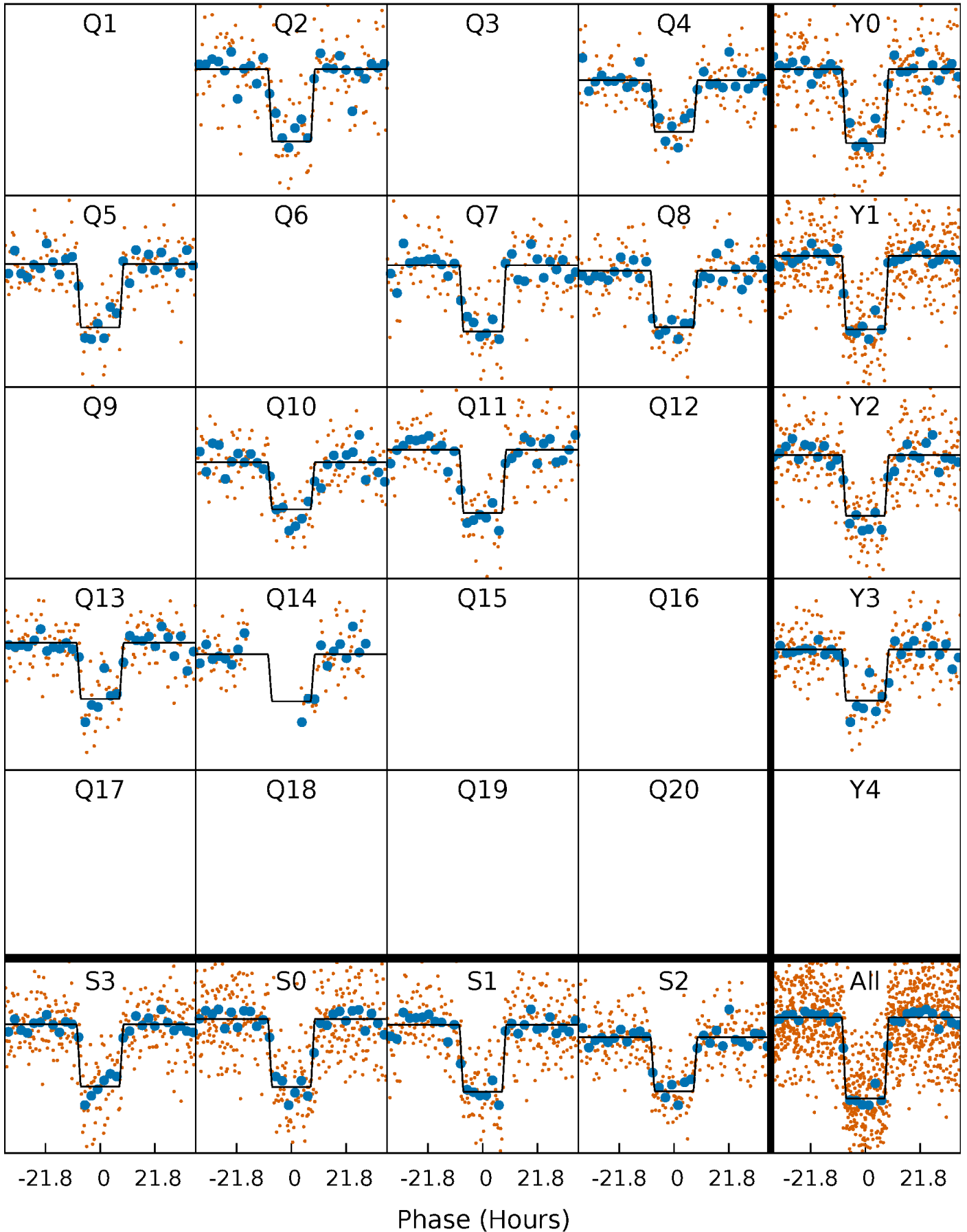
# DV Quarter-Phased Transit Curves

TCE 001871056-02 P=140.105358 Days  $T_0=216.217819$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

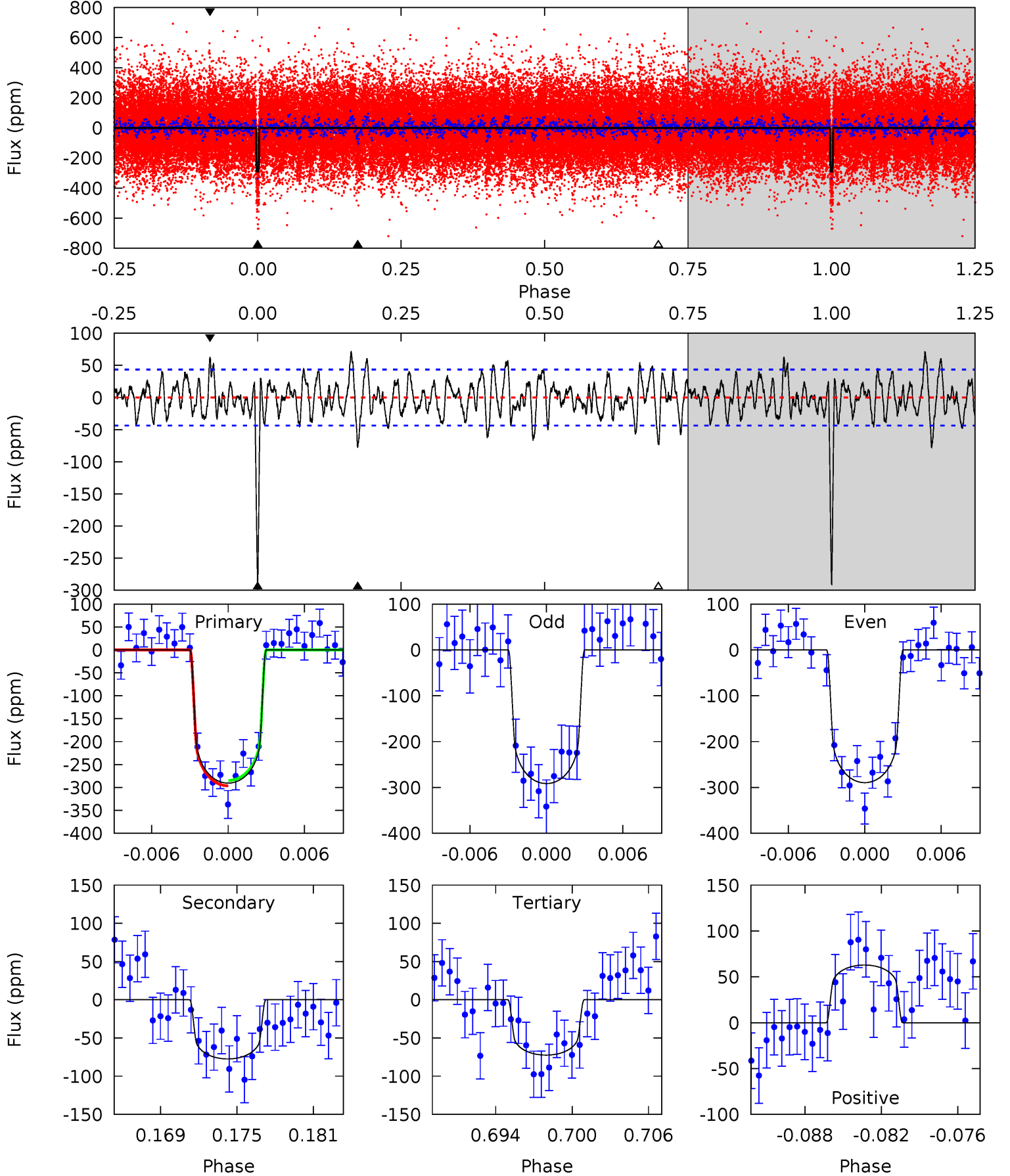
TCE 001871056-02 P=140.099299 Days  $T_0=216.240452$  (BKJD)



# DV Model-Shift Uniqueness Test

001871056-02, P = 140.105358 Days, E = 76.112461 Days

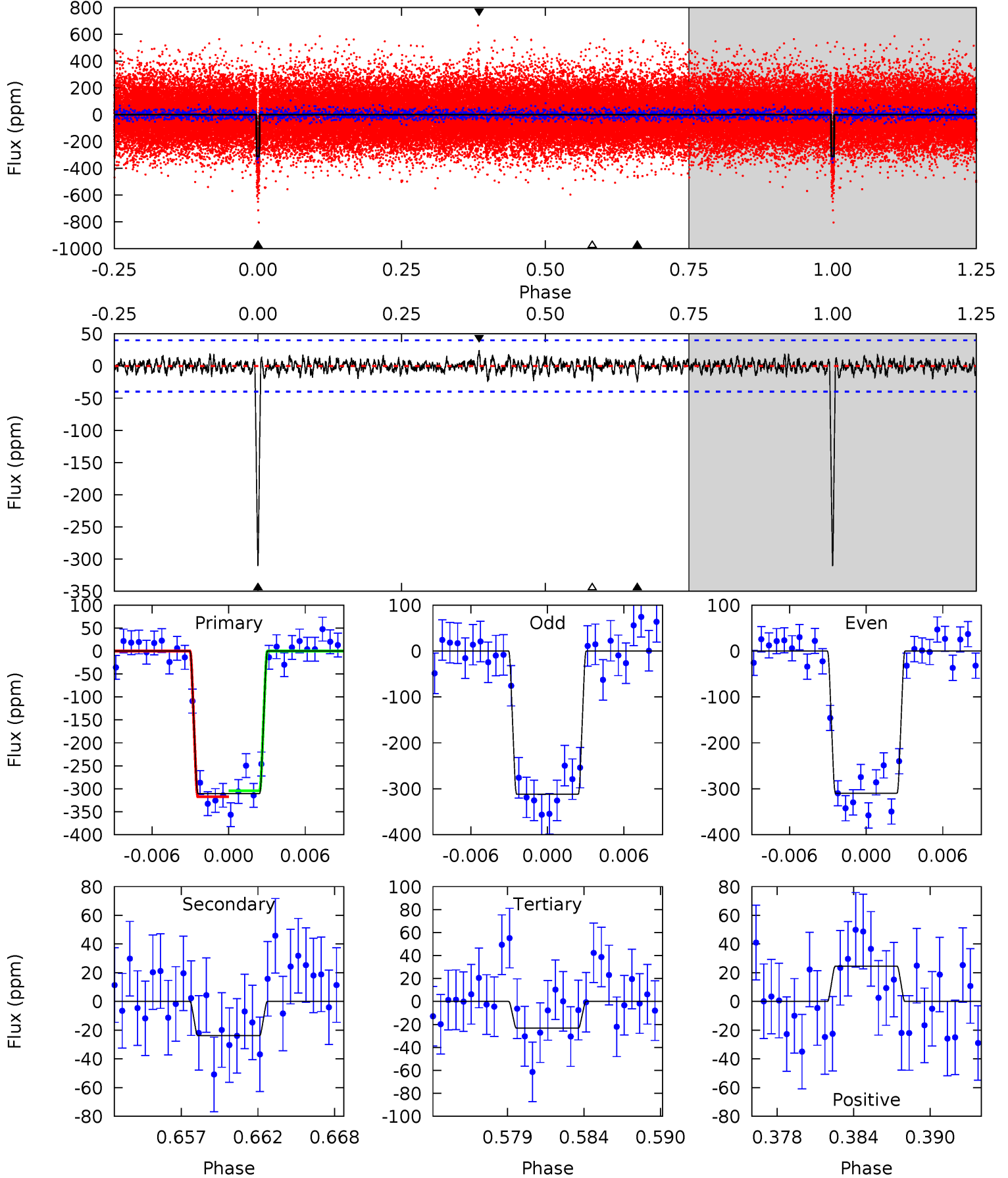
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.2	9.10	8.51	7.39	5.13	2.76	2.77	25.6	26.8	0.59	1.71	0.12	1.05	0.20	0.68



# Alt Model-Shift Uniqueness Test

001871056-02,  $P = 140.099299$  Days,  $E = 76.141153$  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
40.0	3.07	3.00	3.16	5.14	2.77	0.86	37.0	36.8	0.06	-0.09	0.14	1.00	0.07	0.83



### Stellar Parameters For KIC 001871056

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6207^{+112}_{-125}$	$3.963^{+0.195}_{-0.105}$	$0.240^{+0.150}_{-0.150}$	$2.097^{+0.350}_{-0.569}$	$1.472^{+0.126}_{-0.198}$	$0.225^{+0.242}_{-0.073}$
	+2%/-2%	+5%/-3%	+62%/-62%	+17%/-27%	+9%/-13%	+108%/-32%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 001871056-02 / KOI 1001.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-77 \pm 9$	$4.32^{+0.47}_{-0.57}$	$712^{+33}_{-50}$	$4423^{+145}_{-147}$	$824^{+288}_{-168}$
Alt.	$-24 \pm 8$	$3.98^{+0.49}_{-0.51}$	$711^{+38}_{-42}$	$3674^{+219}_{-251}$	$289^{+145}_{-106}$

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

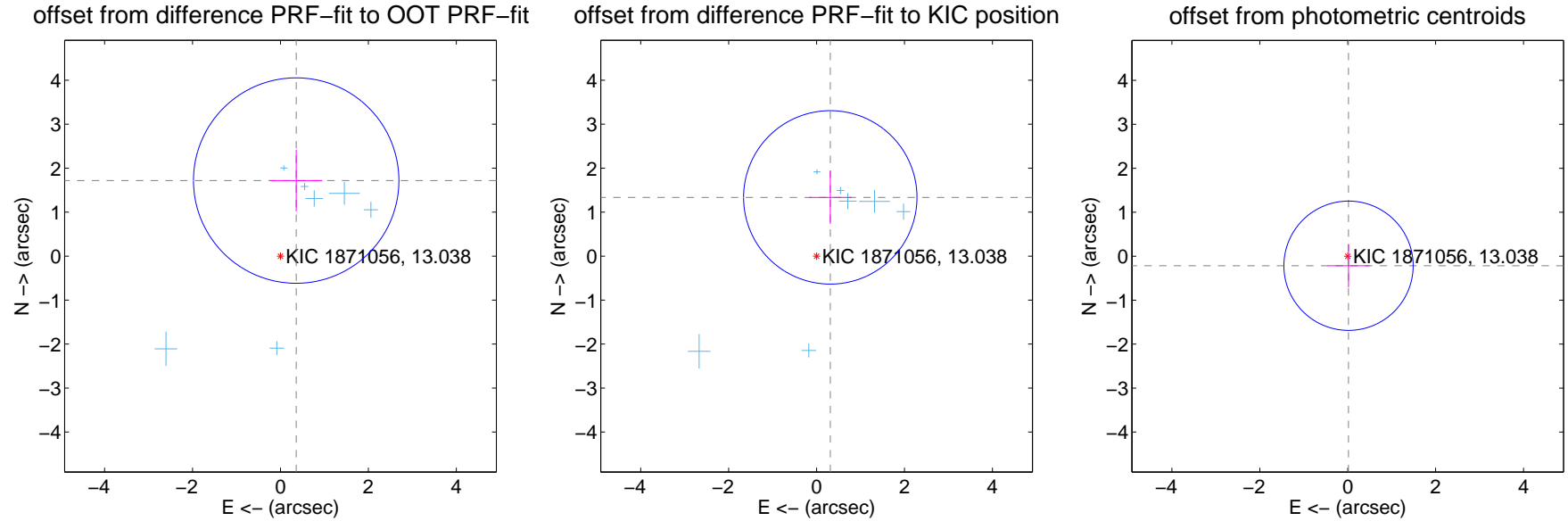
## DV Centroid Data

Supplemental centroid analysis for 001871056-02. Kepler magnitude: 13.04. Transit SNR 17.43

There are 7 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

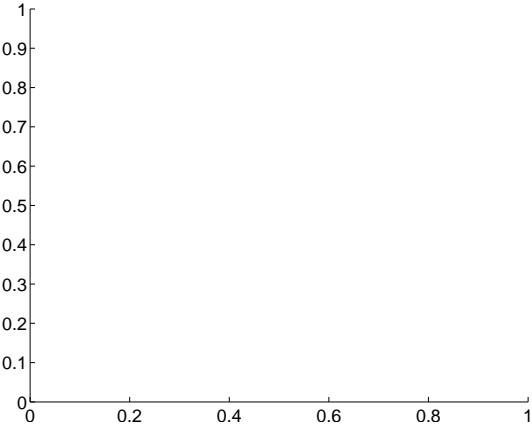
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.755 \pm 0.779$	2.25	$-0.358 \pm 0.596$	$1.718 \pm 0.700$
PRF-fit source offset from KIC position	$1.371 \pm 0.657$	2.09	$-0.312 \pm 0.485$	$1.336 \pm 0.603$
photometric centroid source offset	$0.22 \pm 0.49$	0.44	$-0.02 \pm 0.47$	$-0.22 \pm 0.49$



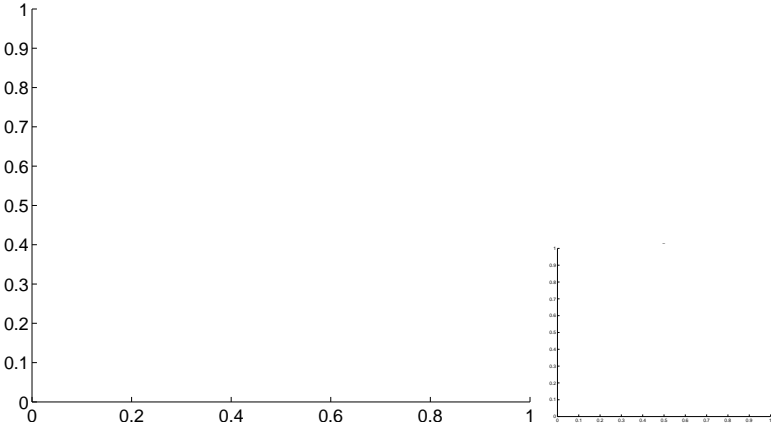
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

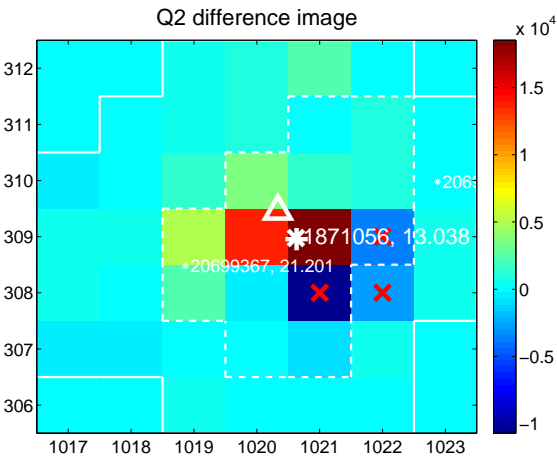
Q1 no difference image



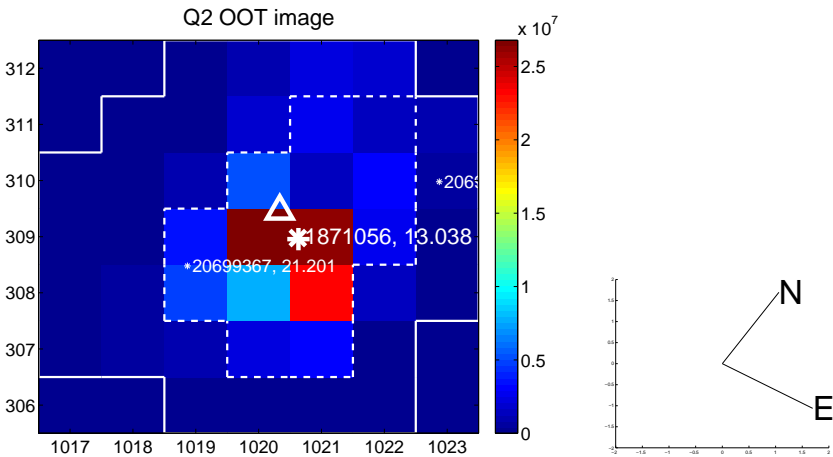
Q1 no OOT image



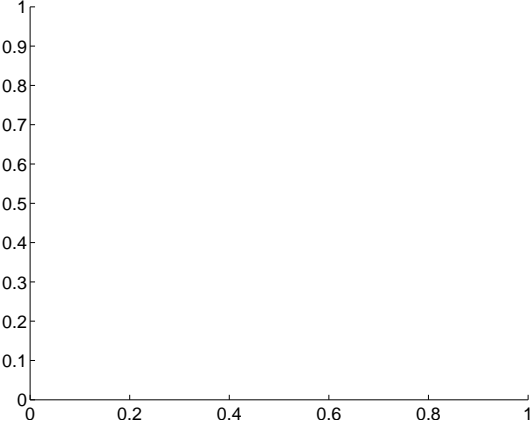
Q2 difference image



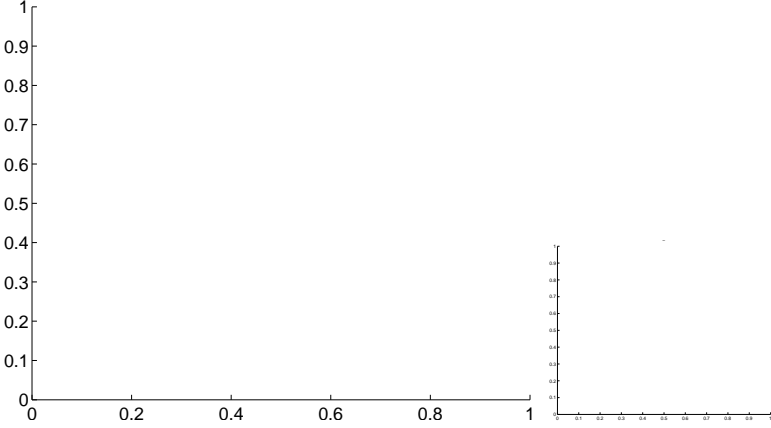
Q2 OOT image



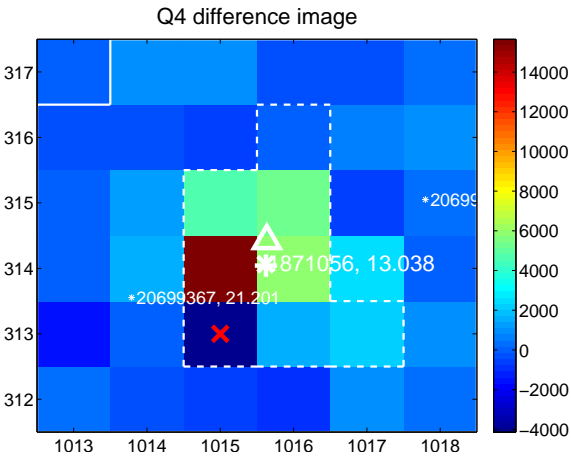
Q3 no difference image



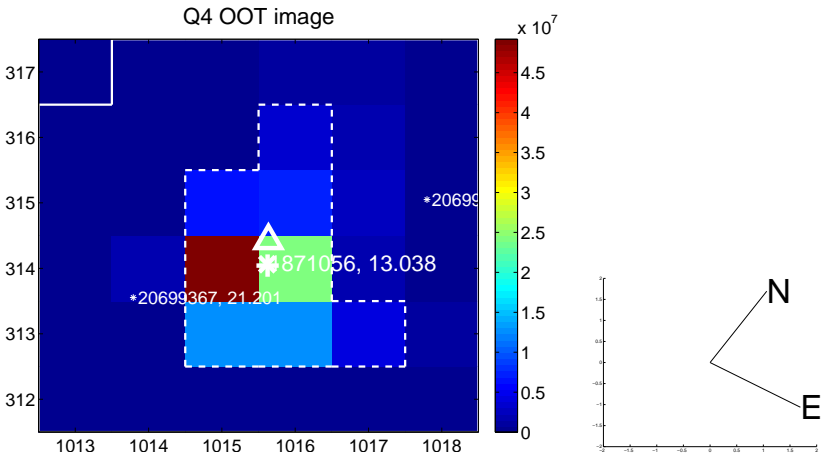
Q3 no OOT image



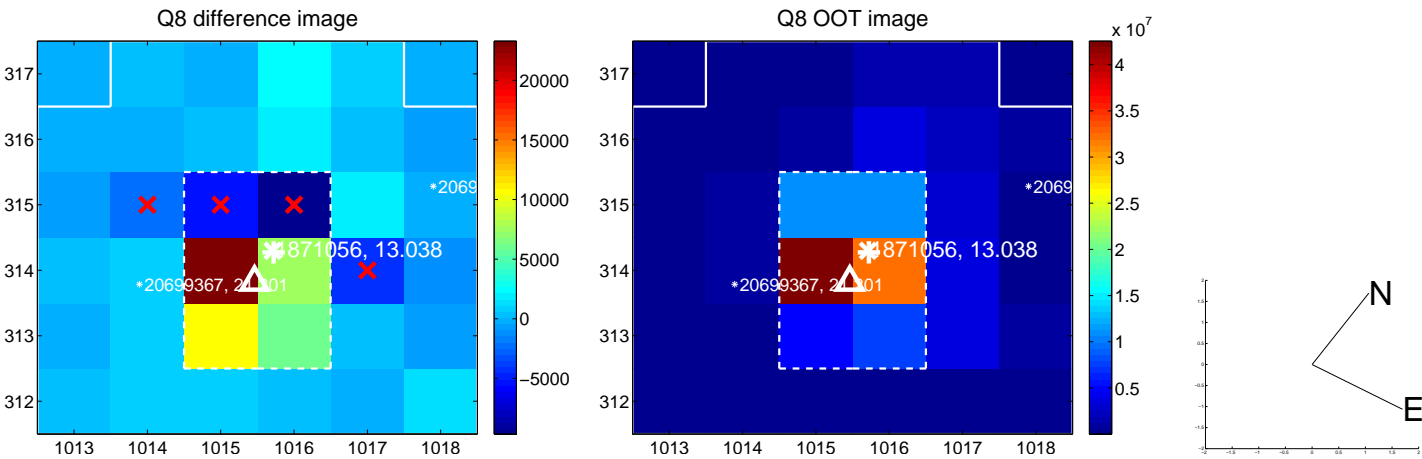
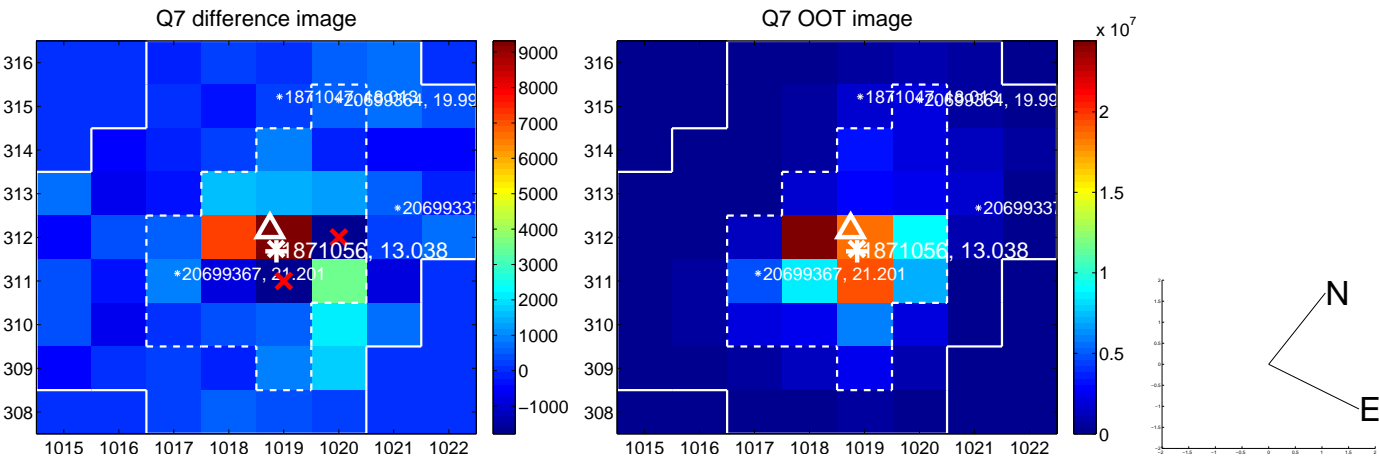
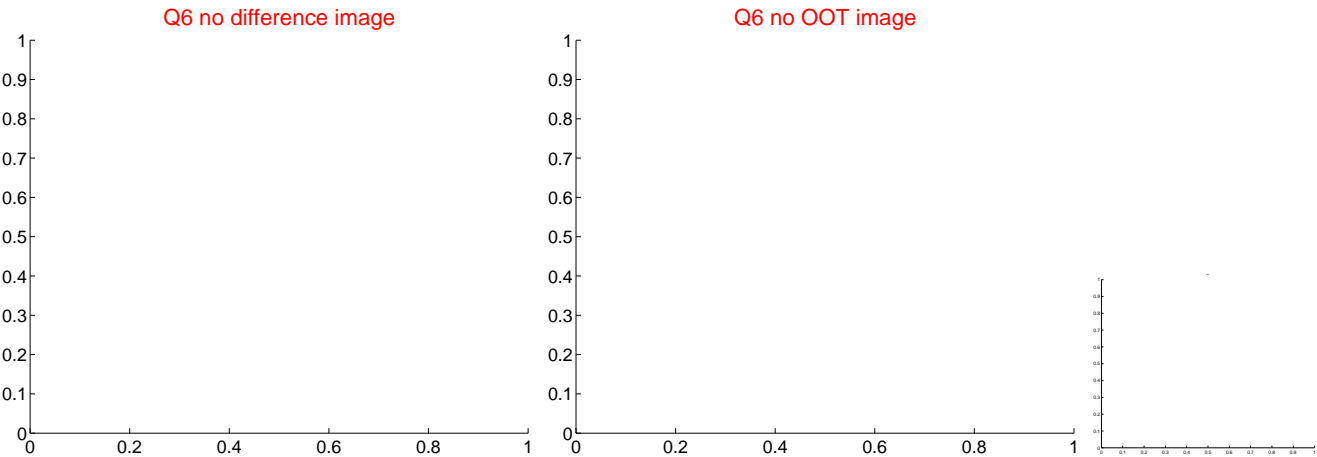
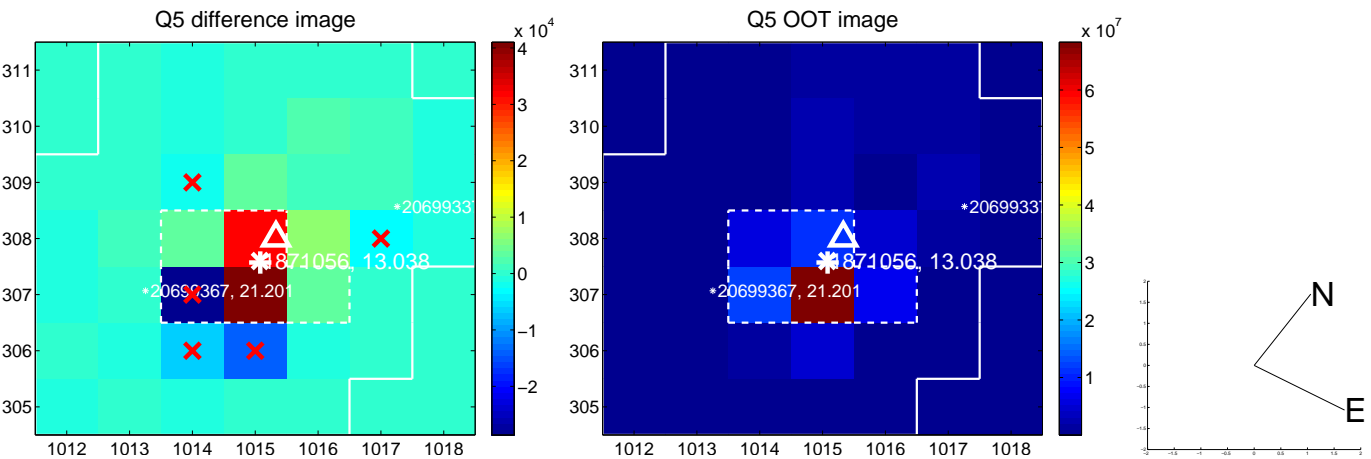
Q4 difference image



Q4 OOT image

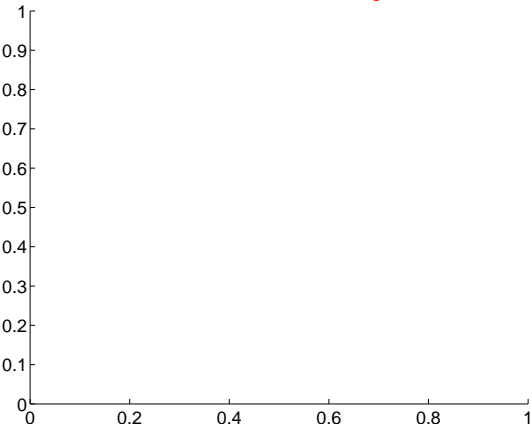


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

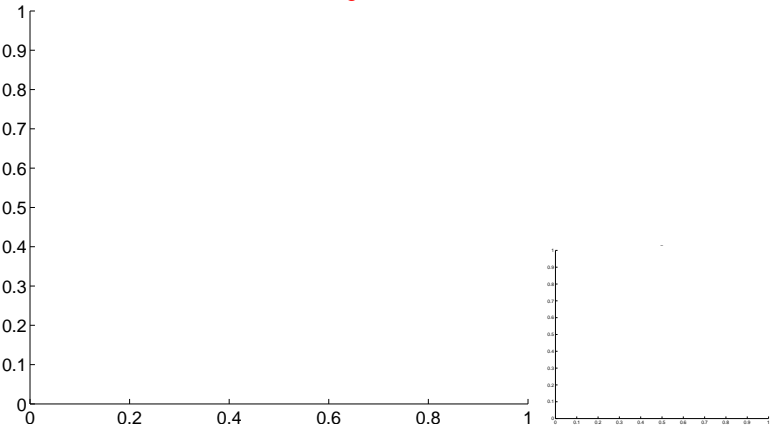


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

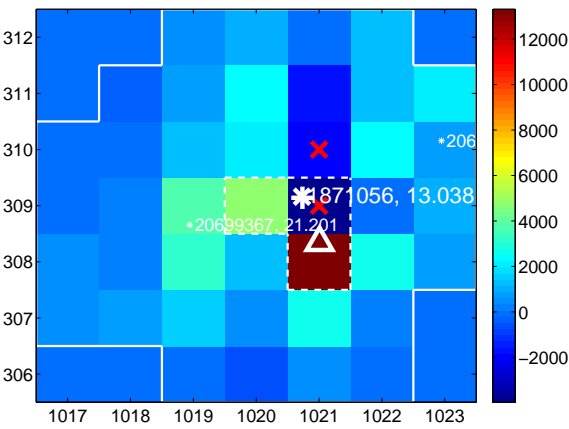
Q9 no difference image



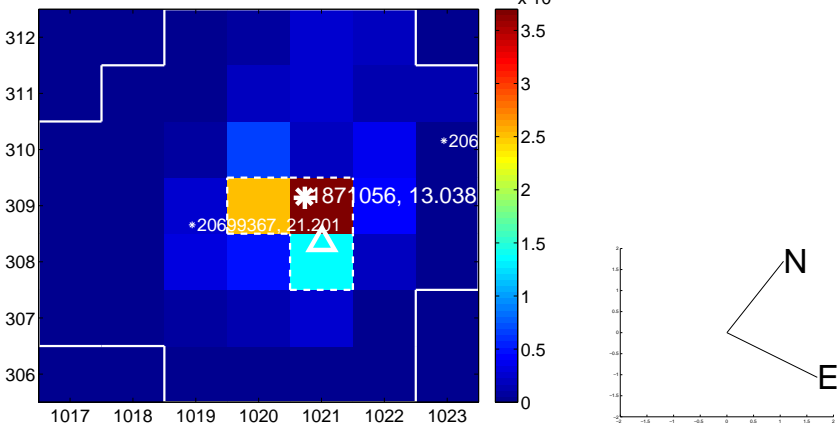
Q9 no OOT image



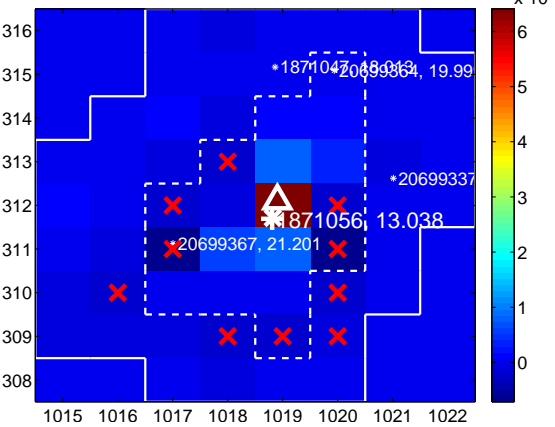
Q10 difference image



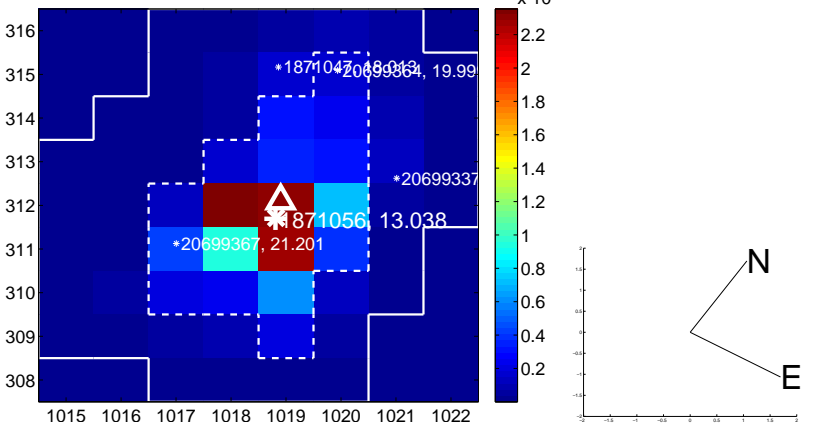
Q10 OOT image



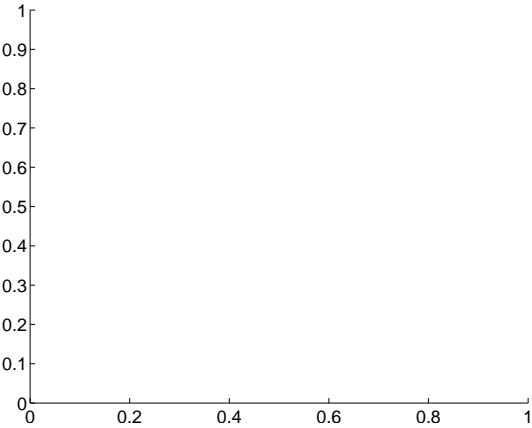
Q11 difference image



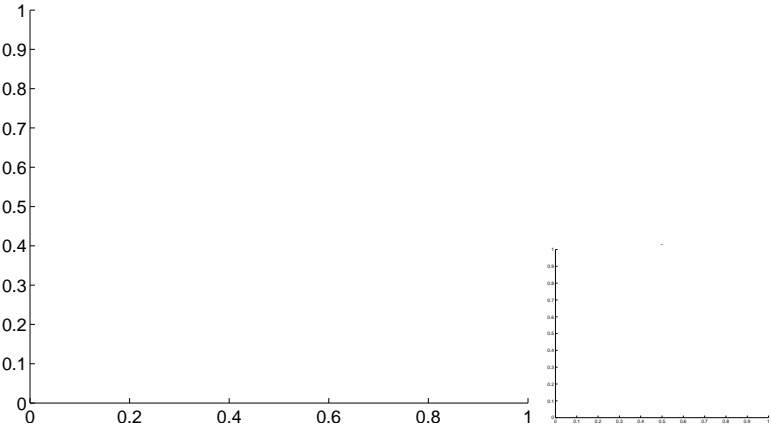
Q11 OOT image



Q12 no difference image



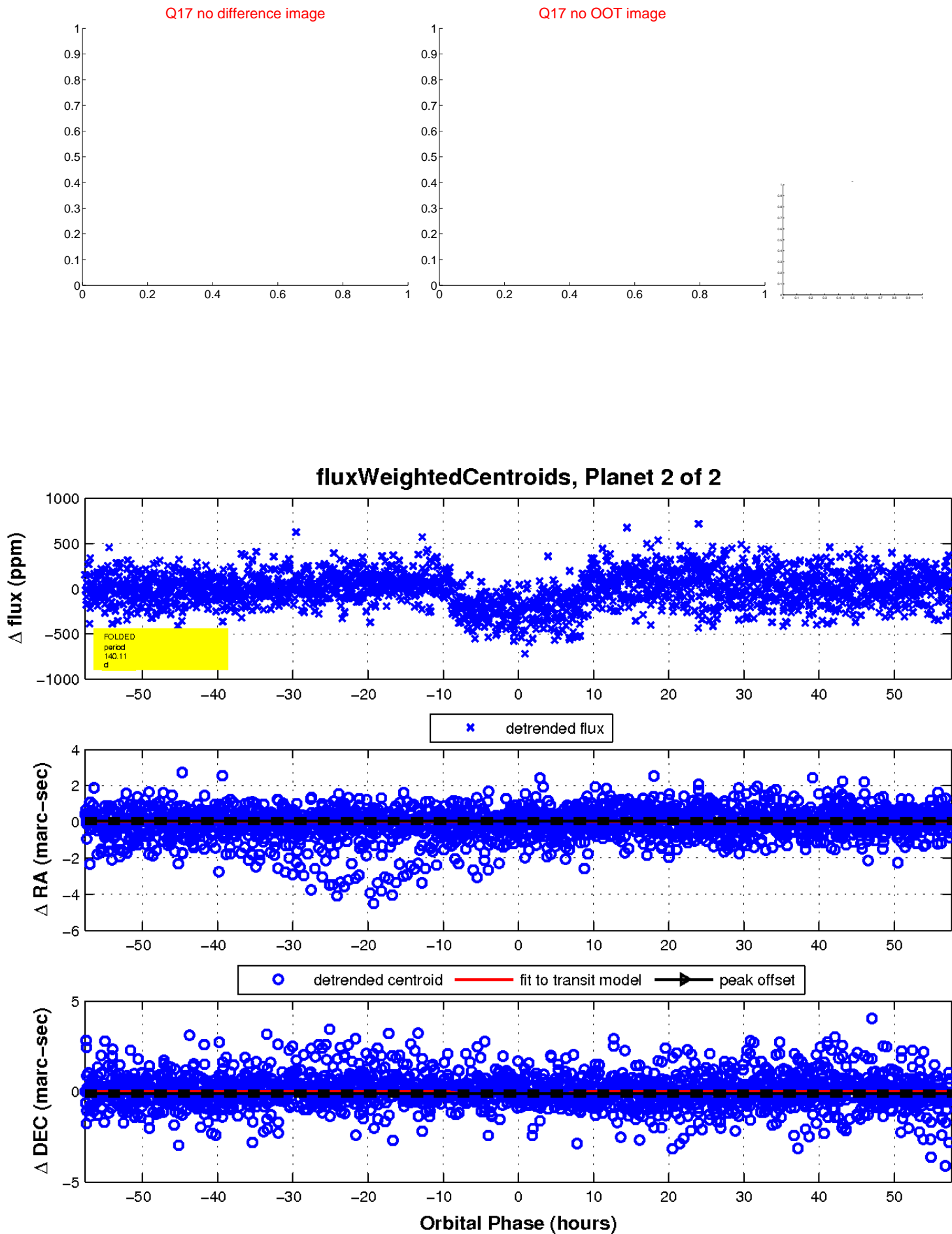
Q12 no OOT image



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

