

# KIC 003219037

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003219037-01	OBS	3395.01	10.005050	136.832770	142.5	3.599	10.1	10.4	0.92	5912	1.31	122.83
003219037-02	OBS	No	485.854689	219.553292	411.0	26.462	7.6	9.0	0.92	5912	1.99	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003219037-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
003219037-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—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.

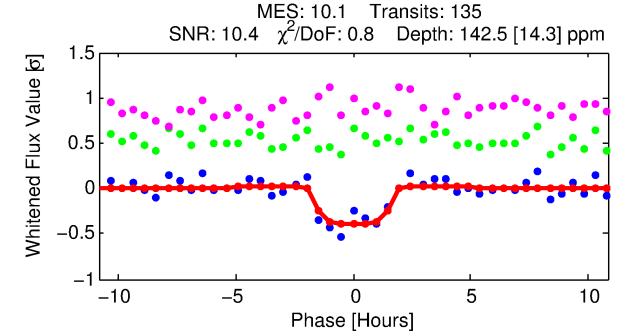
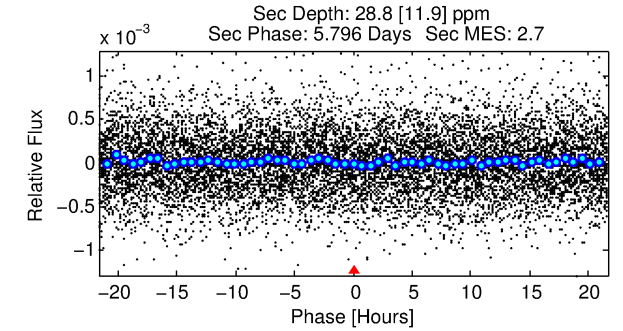
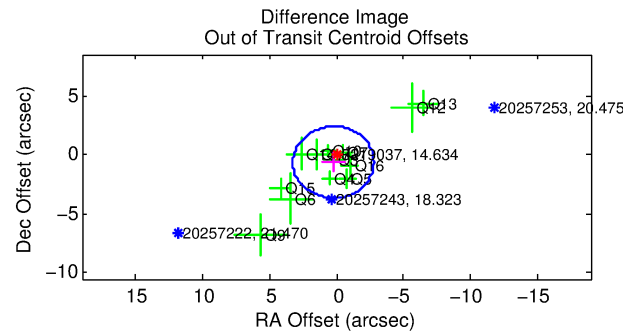
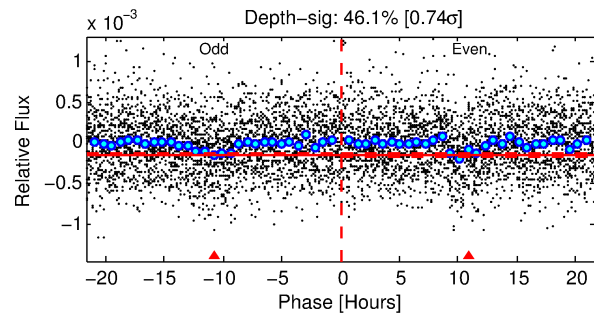
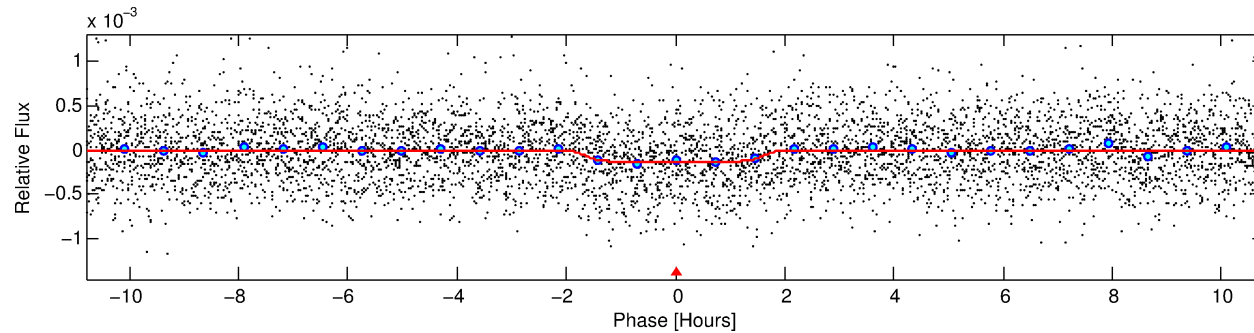
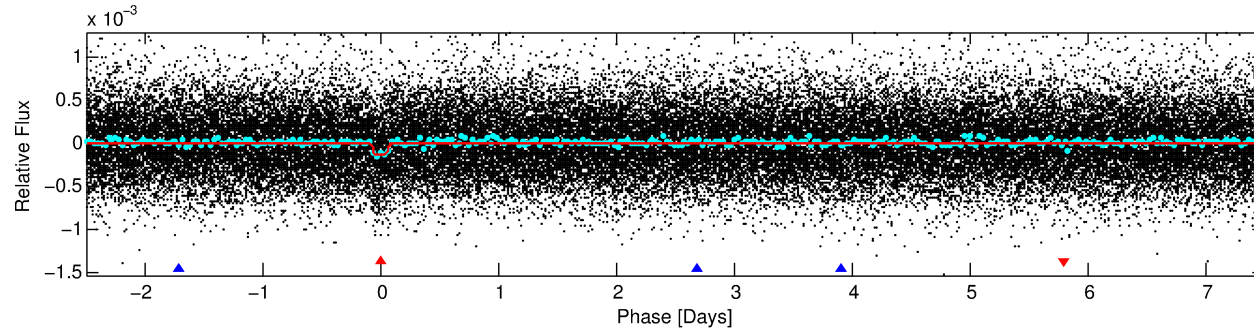
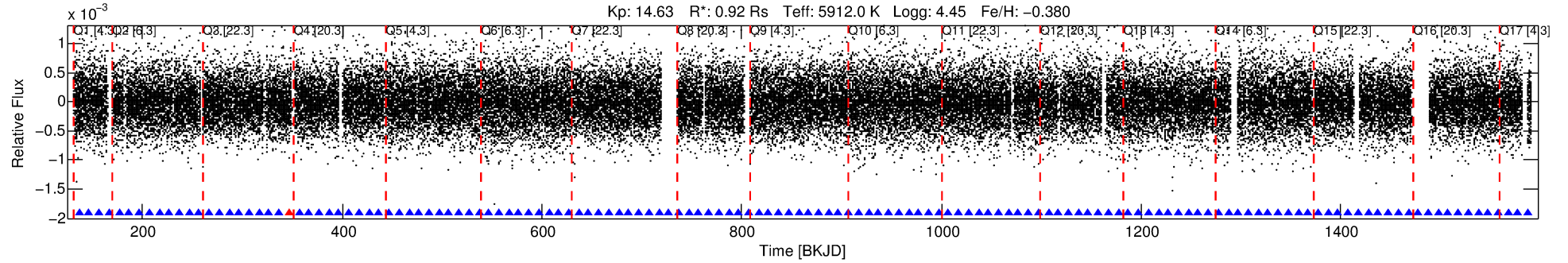
## Ephemeris Match Information For 003219037-01

No Significant Match Found

# DV One-Page Summary

KIC: 3219037 Candidate: 1 of 2 Period: 10.005 d

KOI: K03395.01 Corr: 0.951



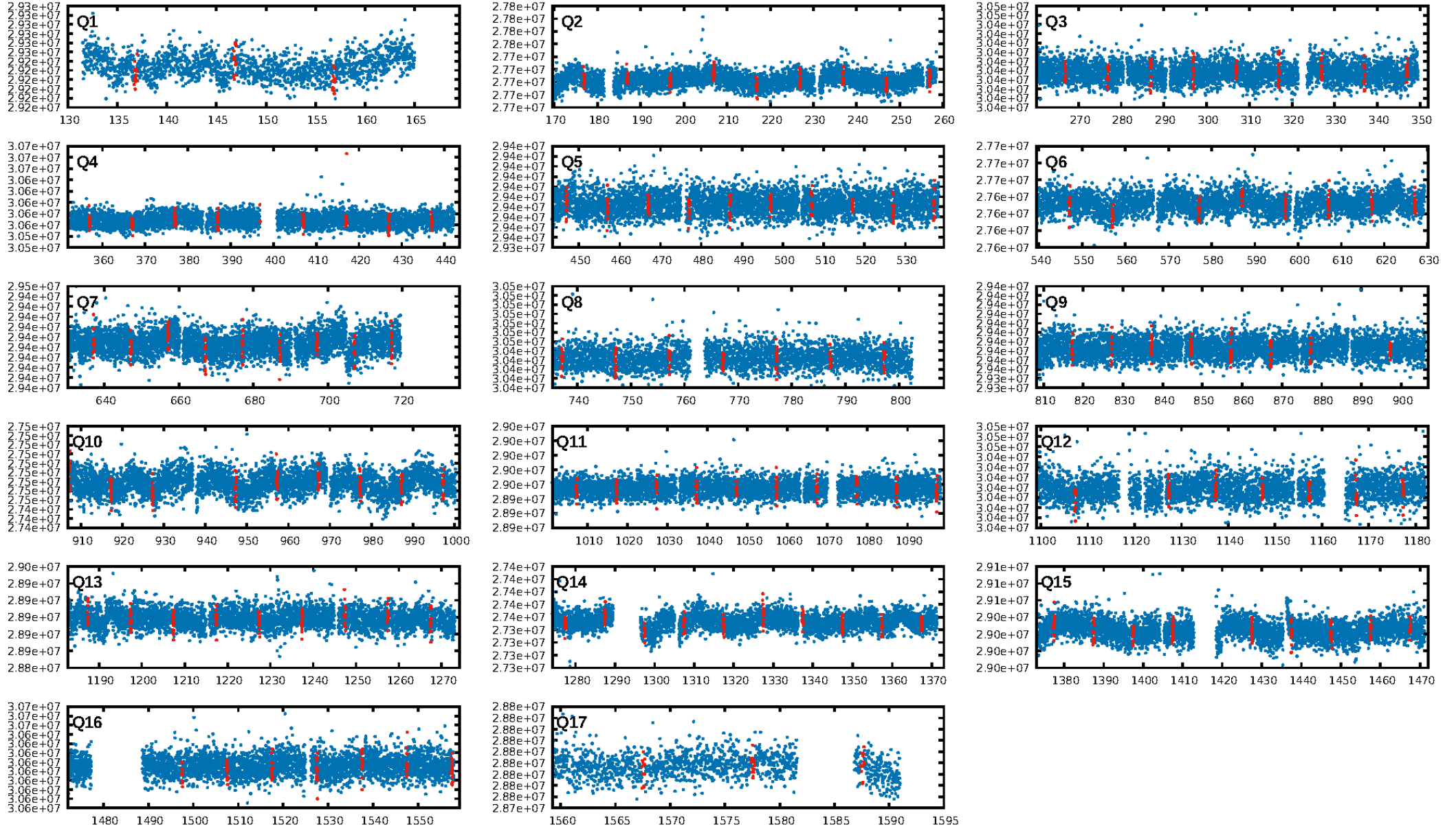
## DV Fit Results:

Period = 10.00505 [0.00009] d  
Epoch = 136.8328 [0.0069] BKJD  
Rp/R\* = 0.0130 [0.0059]  
a/R\* = 9.63 [22.57]  
b = 0.91 [0.47]  
Seff = 122.83 [43.59]  
Teff = 849 [75] K  
Rp = 1.31 [0.69] Re  
a = 0.0872 [0.0201] AU  
Ag = 70.45 [74.13] [0.94 $\sigma$ ]  
Teffp = 3803 [955] K [3.08 $\sigma$ ]

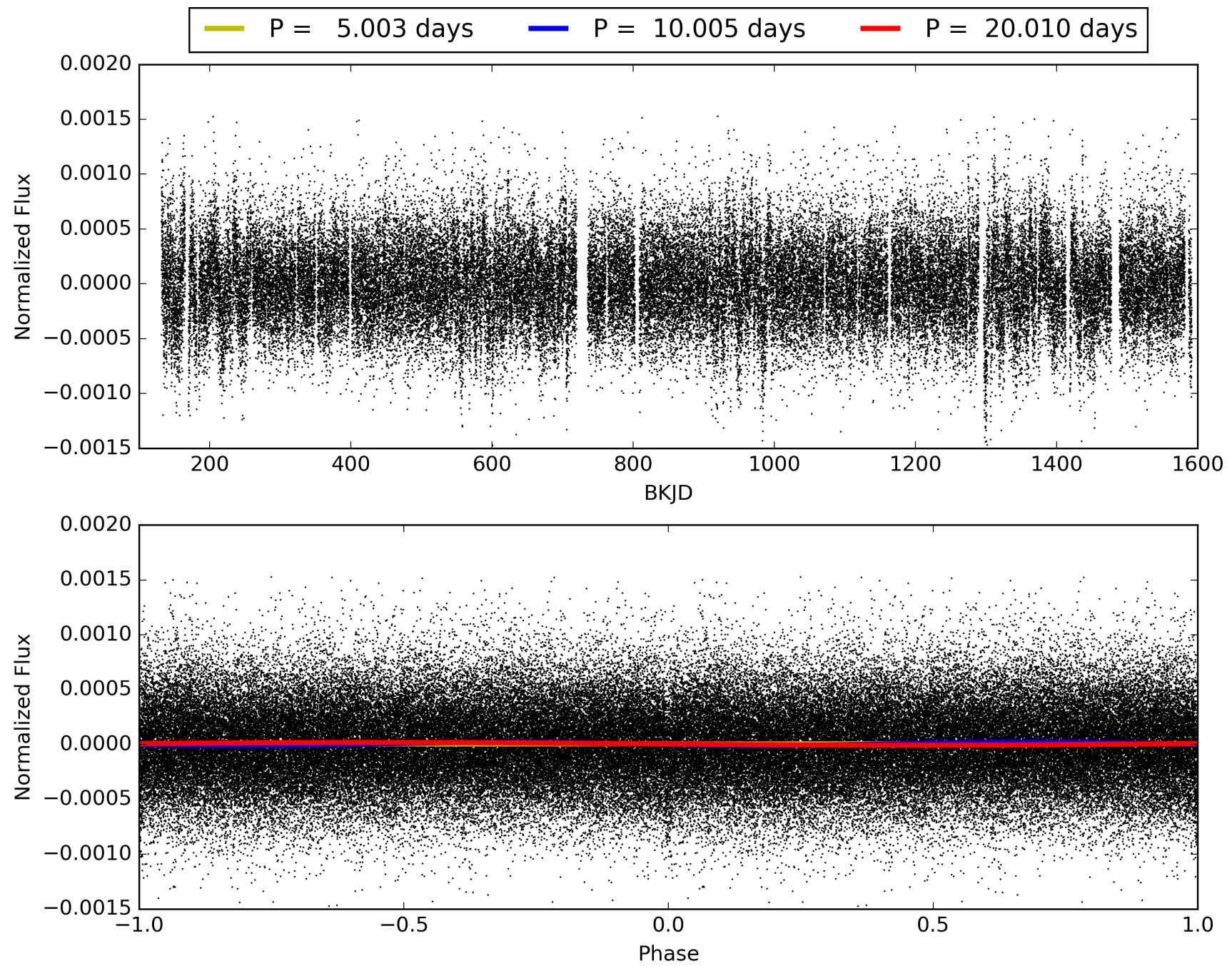
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [427.63 $\sigma$ ]  
ModelChiSquare2-sig: 99.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.87e-23  
RollingBand-fgt: 0.99 [128/129]  
GhostDiagnostic-chr: 1.118  
Centroid-sig: 2.6%  
Centroid-so: 1.347 arcsec [1.10 $\sigma$ ]  
OotOffset-rm: 0.671 arcsec [0.66 $\sigma$ ]  
KicOffset-rm: 0.737 arcsec [0.79 $\sigma$ ]  
OotOffset-st: 3/3/3/4 [13]  
KicOffset-st: 3/3/3/4 [13]  
DiffImageQuality-fgm: 0.23 [3/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 003219037-01, PDC Light Curves



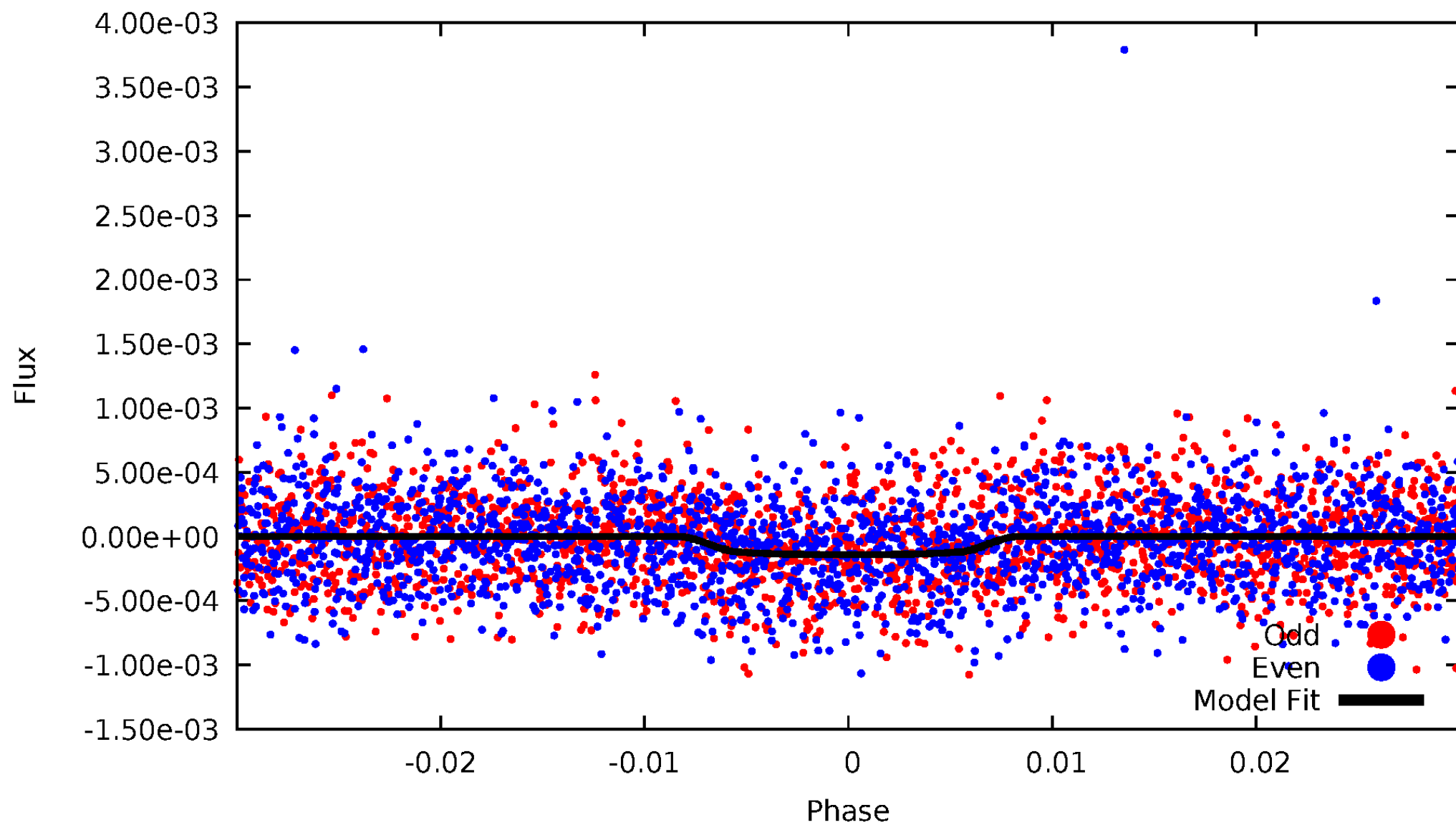
TCE 003219037-01





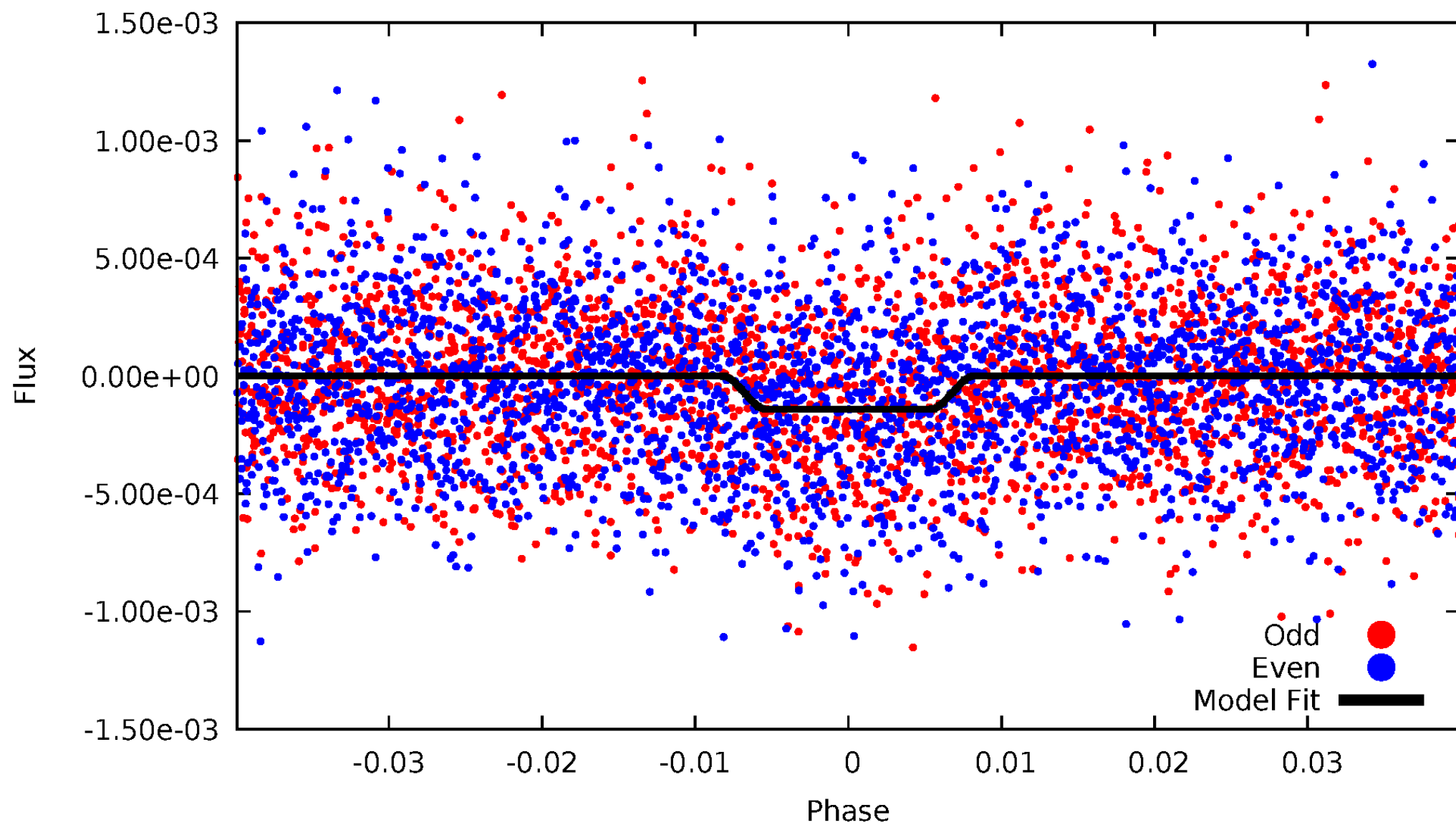
# DV Odd/Even

TCE 003219037-01



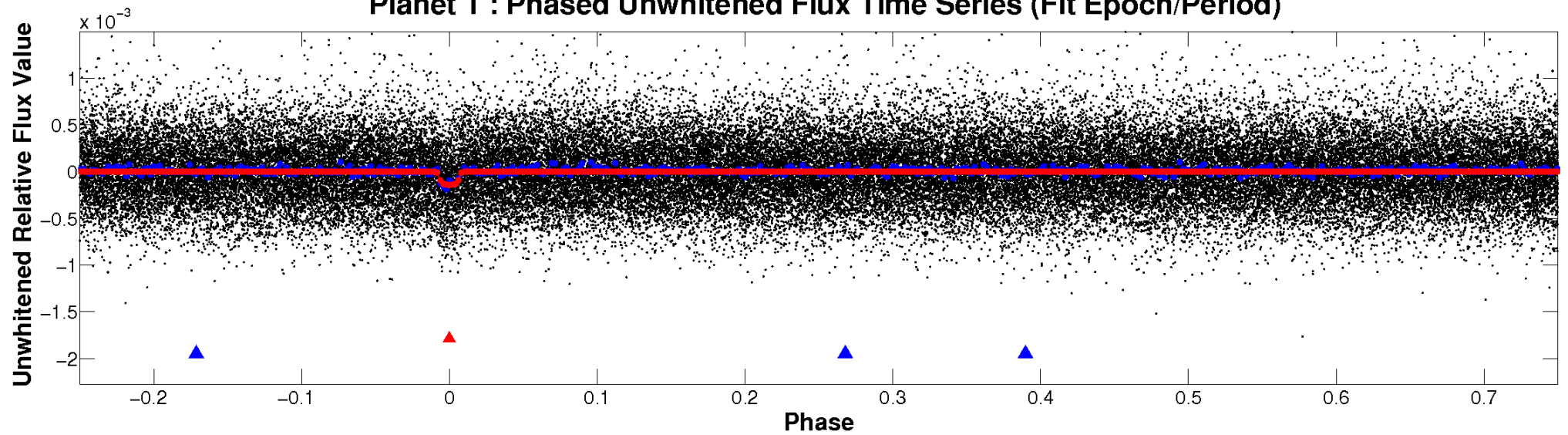
# ALT Odd/Even

TCE 003219037-01

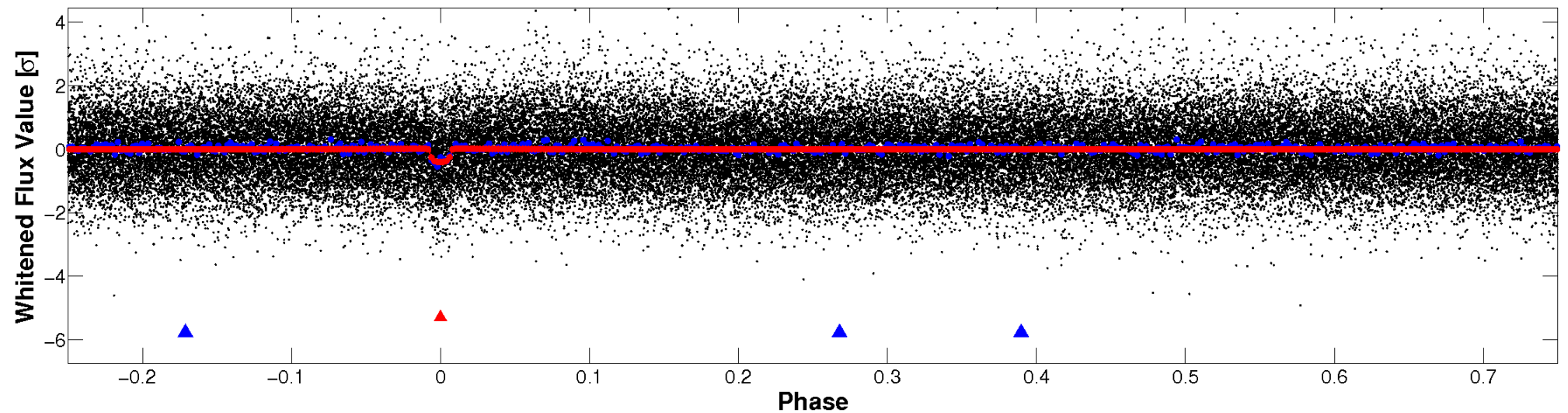


# Non-Whitened Vs. Whitened Light Curve

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

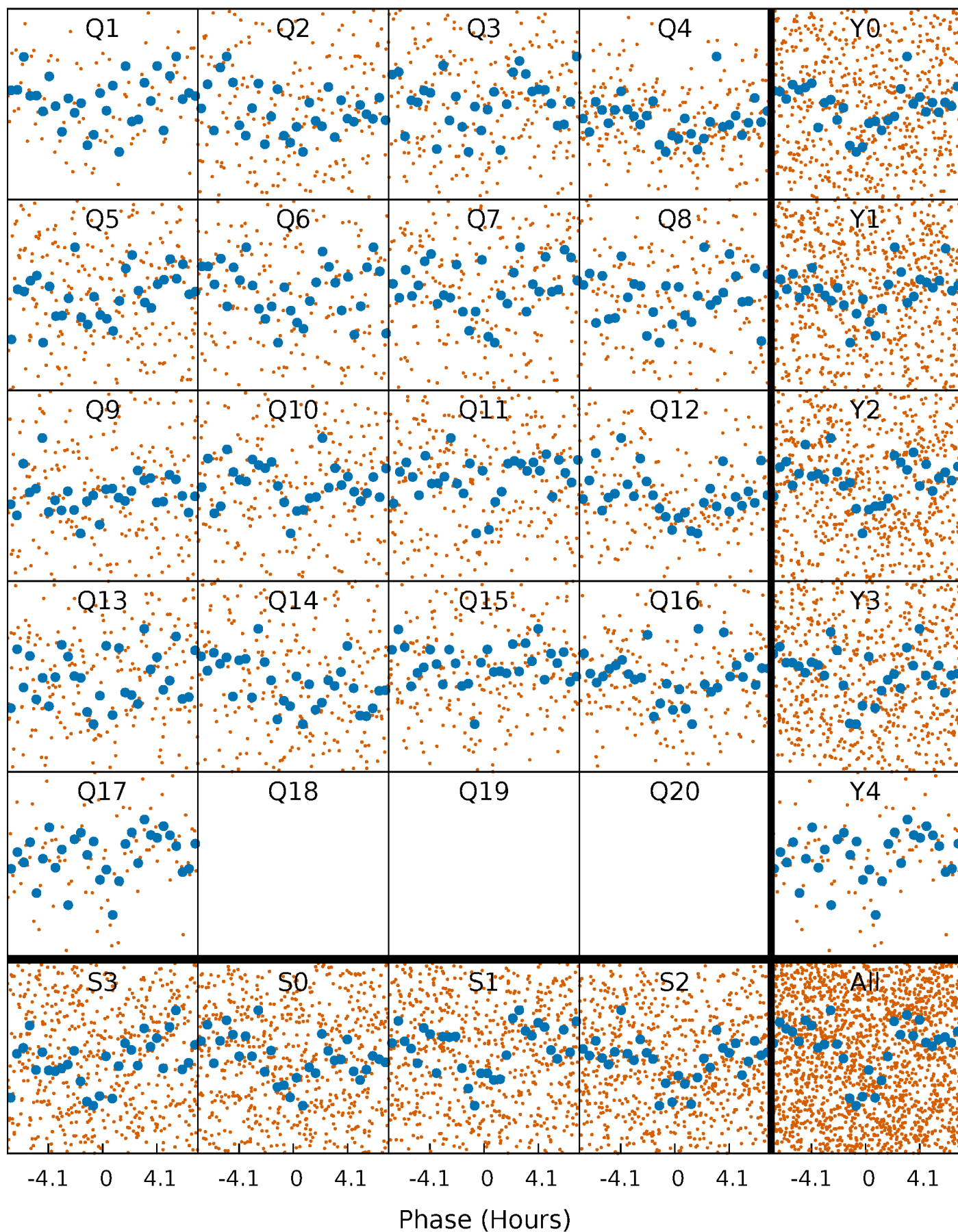


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

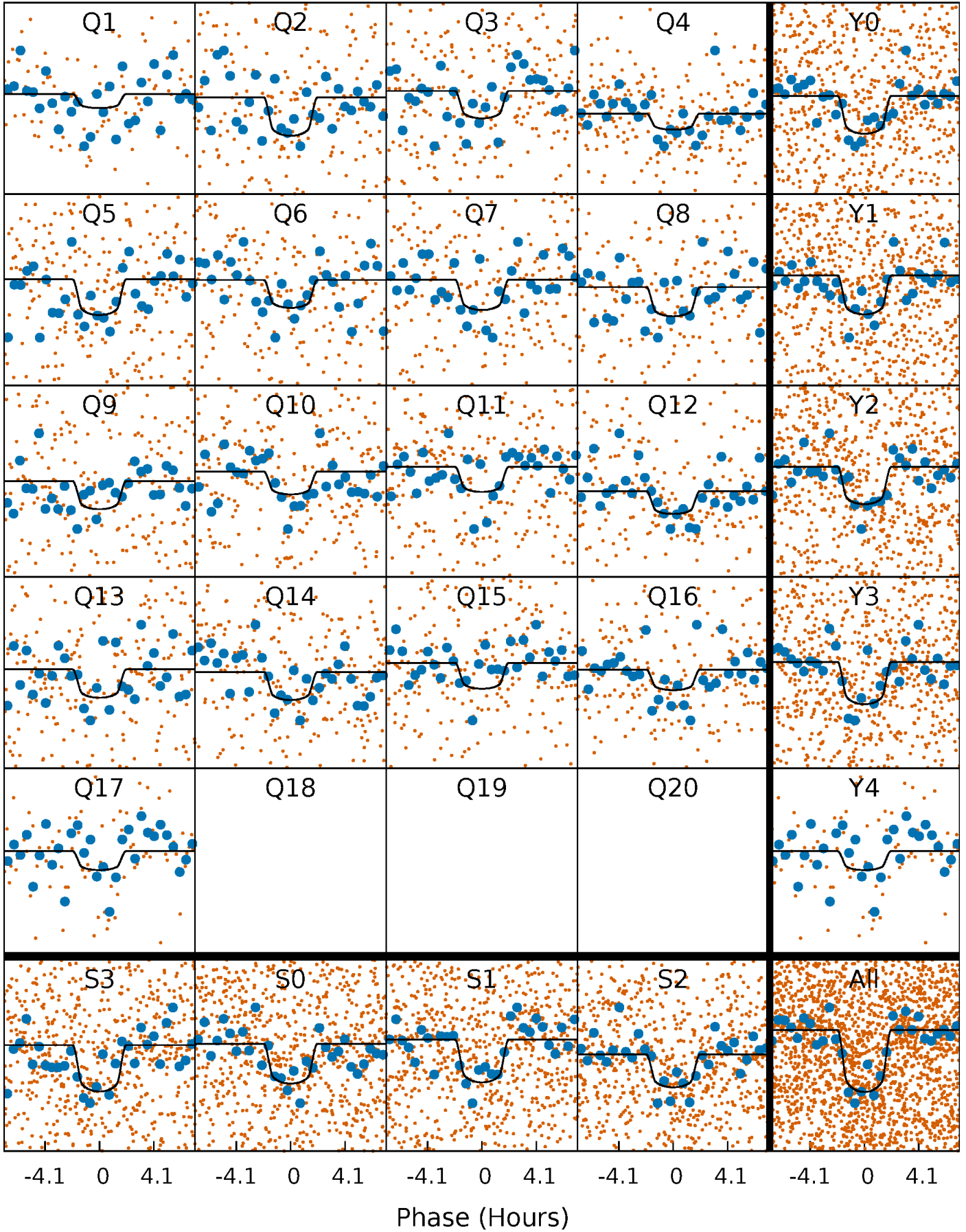
TCE 003219037-01 P= 10.005050 Days  $T_0=136.832770$  (BKJD)





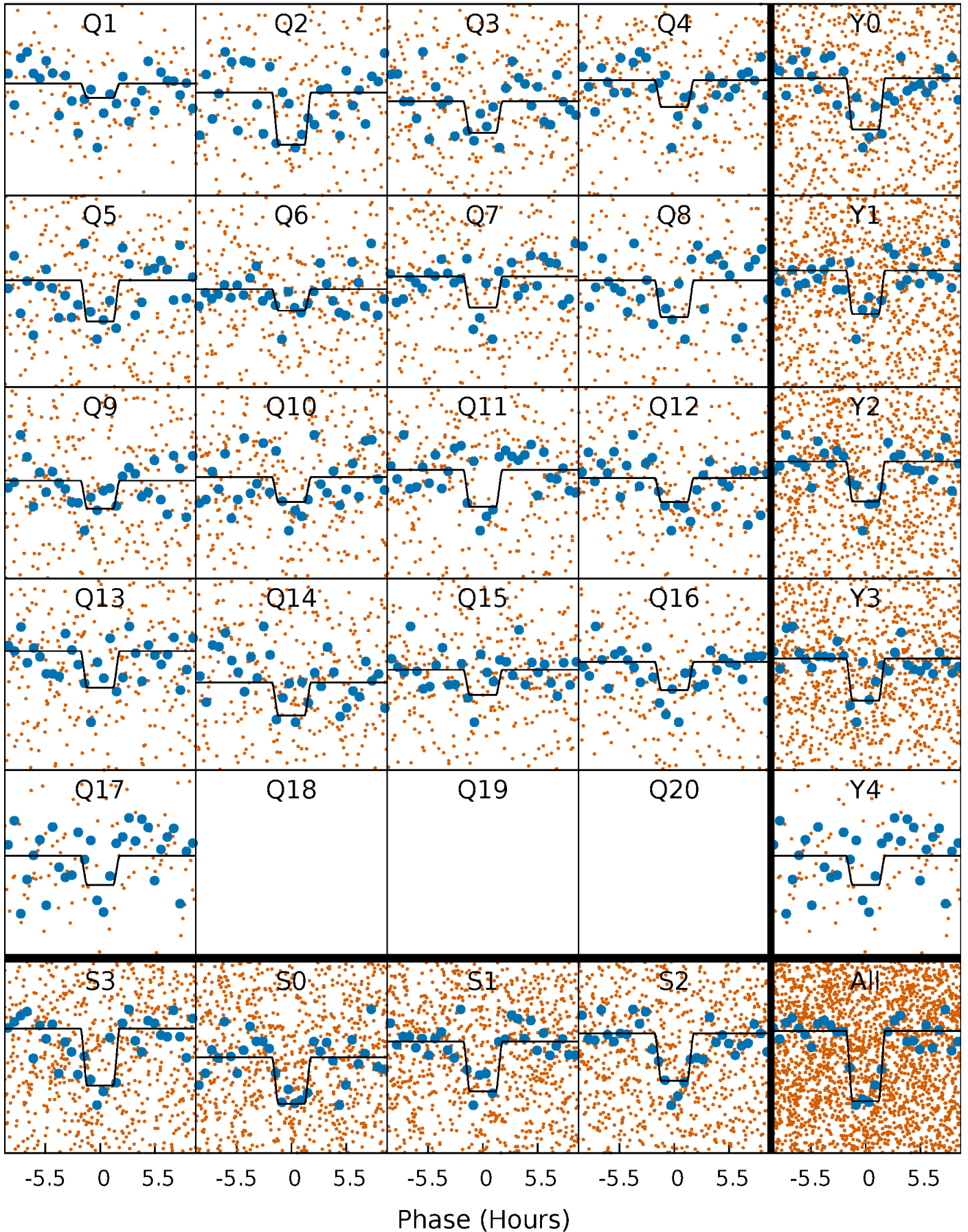
# DV Quarter-Phased Transit Curves

TCE 003219037-01 P= 10.005050 Days  $T_0=136.832770$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

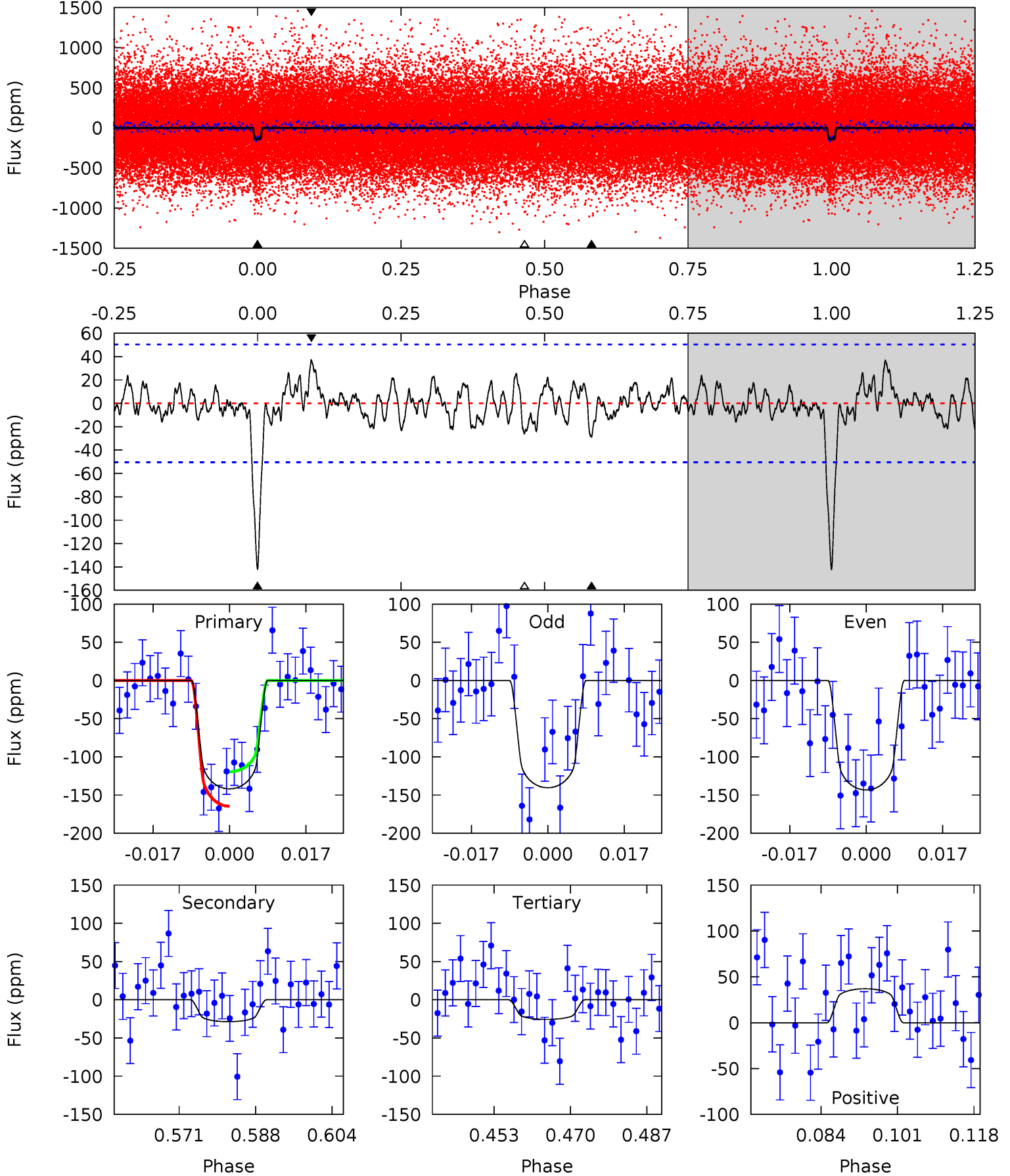
TCE 003219037-01 P= 10.005392 Days  $T_0=136.802362$  (BKJD)



# DV Model-Shift Uniqueness Test

003219037-01,  $P = 10.005050$  Days,  $E = 126.827720$  Days

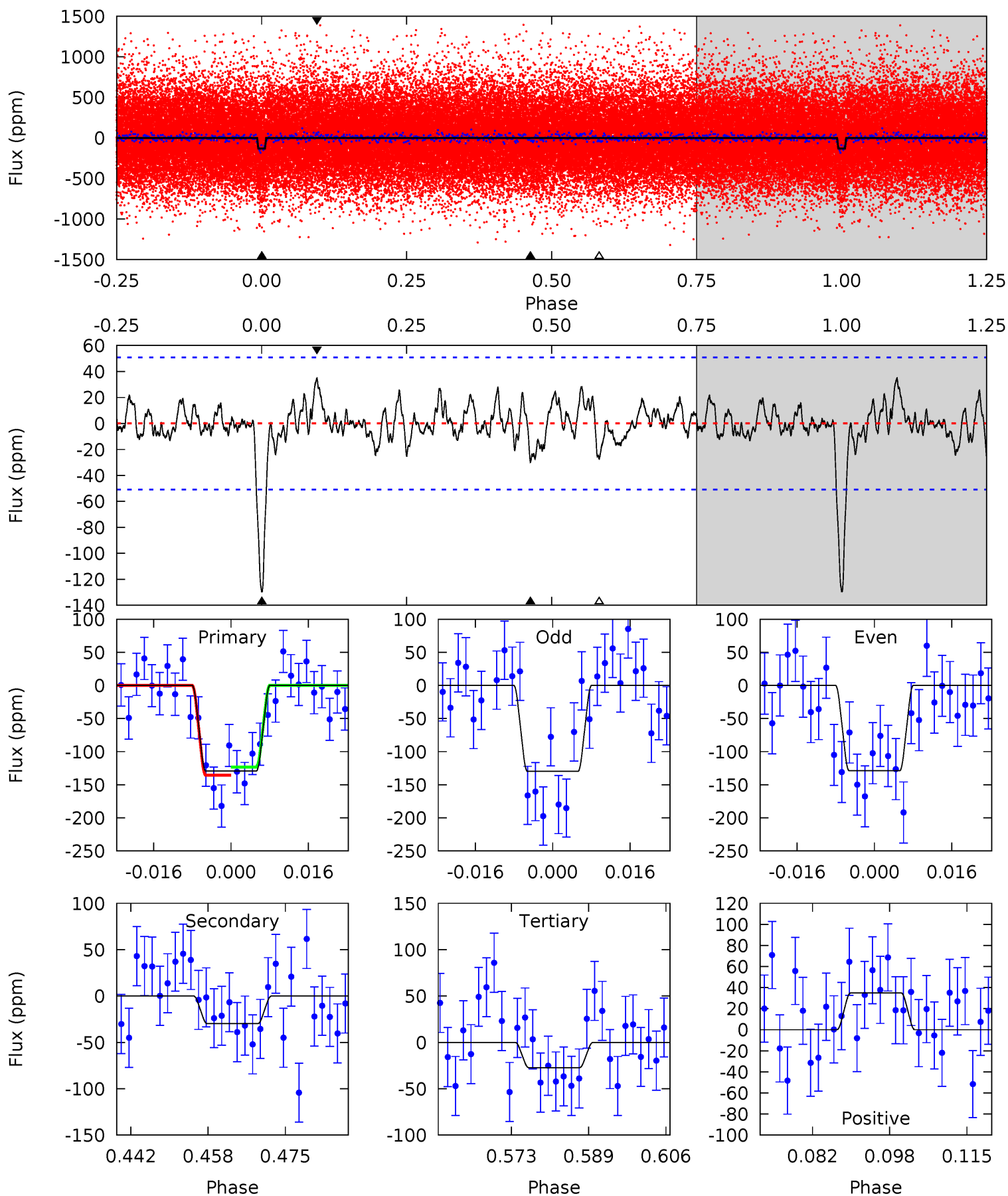
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	2.80	2.51	3.62	4.93	2.39	1.09	11.4	10.2	0.29	-0.82	0.15	0.96	0.21	2.21



# Alt Model-Shift Uniqueness Test

003219037-01, P = 10.005392 Days, E = 126.796970 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
12.5	2.89	2.65	3.38	4.93	2.40	1.04	9.89	9.16	0.24	-0.49	0.05	1.08	0.21	0.59





### Stellar Parameters For KIC 003219037

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5912^{+158}_{-175}$	$4.453^{+0.098}_{-0.182}$	$-0.380^{+0.300}_{-0.300}$	$0.924^{+0.255}_{-0.127}$	$0.884^{+0.109}_{-0.089}$	$1.577^{+0.678}_{-0.760}$
	+3%/-3%	+2%/-4%	+79%/-79%	+28%/-14%	+12%/-10%	+43%/-48%
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 003219037-01 / KOI 3395.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-29 \pm 10$	$1.39^{+0.61}_{-0.62}$	$1195^{+77}_{-59}$	$4023^{+1089}_{-555}$	$60^{+162}_{-36}$
Alt.	$-30 \pm 10$	$1.21^{+0.61}_{-0.54}$	$1196^{+84}_{-62}$	$4277^{+1128}_{-639}$	$86^{+196}_{-52}$

$T_{\text{max}}$  = 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

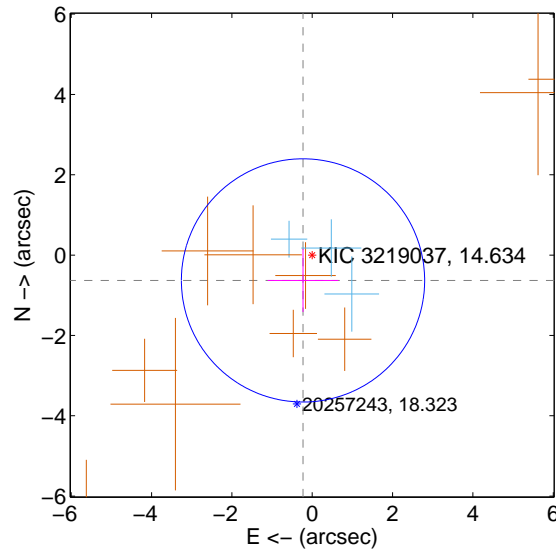
Supplemental centroid analysis for 003219037-01. Kepler magnitude: 14.63. Transit SNR 10.41

There are 3 quarters with good PRF difference image offsets

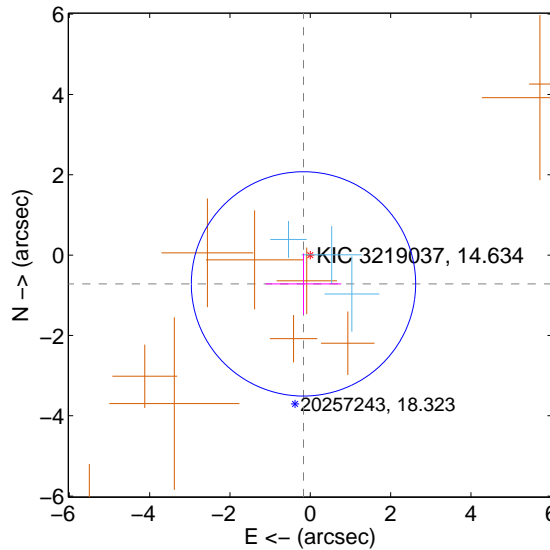
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.671 \pm 1.009$	0.66	$0.230 \pm 0.877$	$-0.630 \pm 0.785$
PRF-fit source offset from KIC position	$0.737 \pm 0.931$	0.79	$0.170 \pm 0.942$	$-0.717 \pm 0.756$
photometric centroid source offset	$1.35 \pm 1.22$	1.10	$-0.62 \pm 1.13$	$1.20 \pm 1.25$

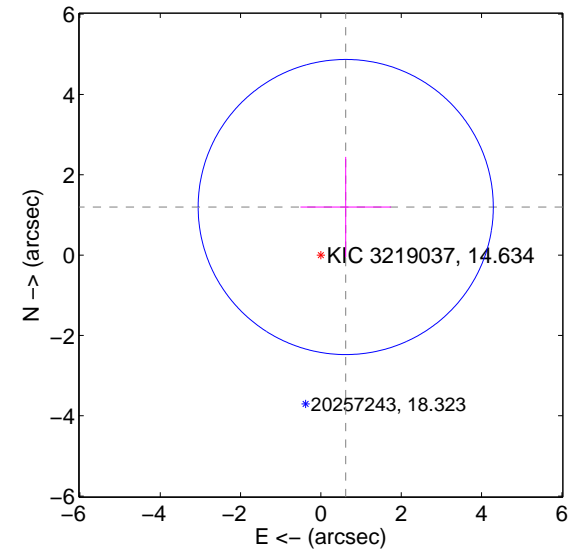
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

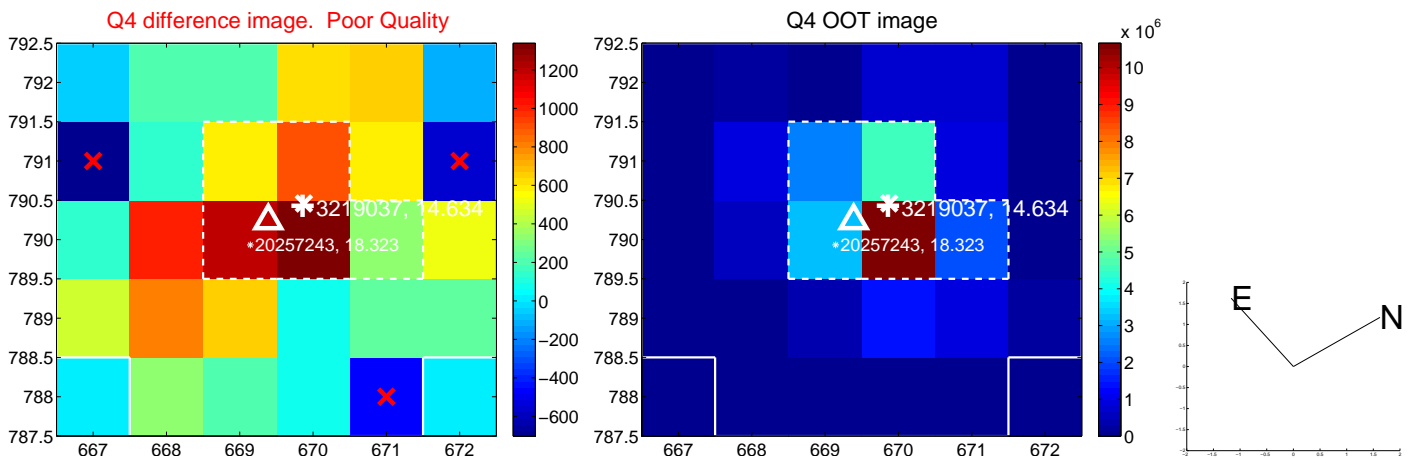
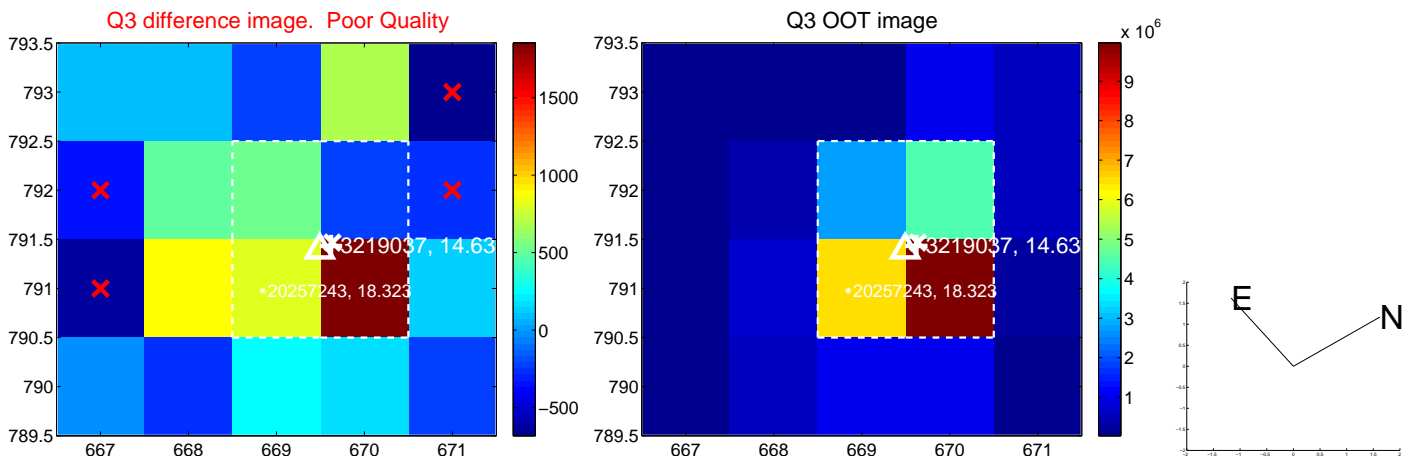
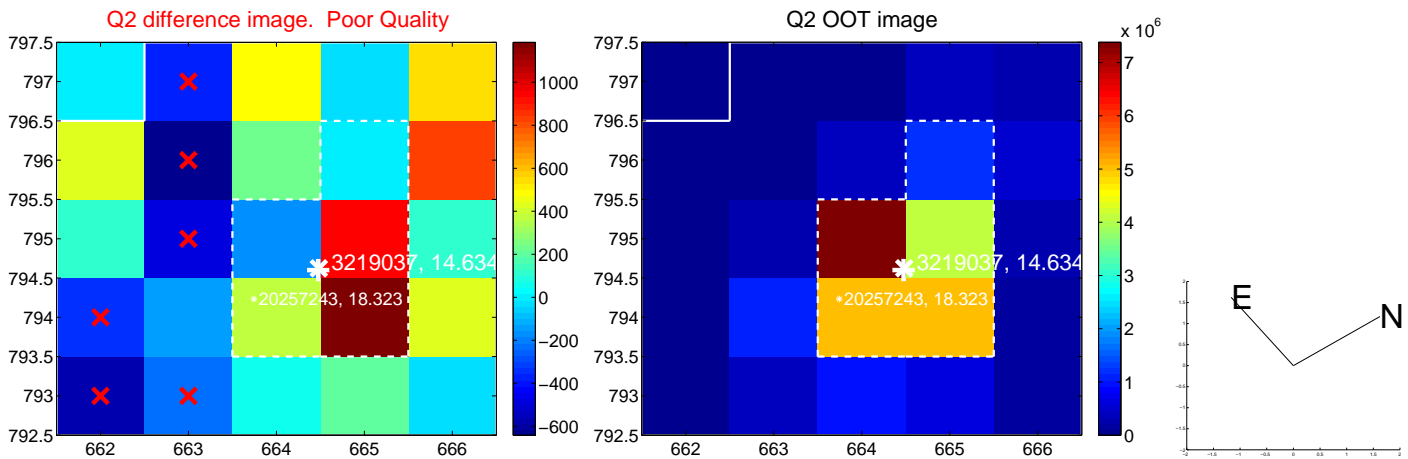
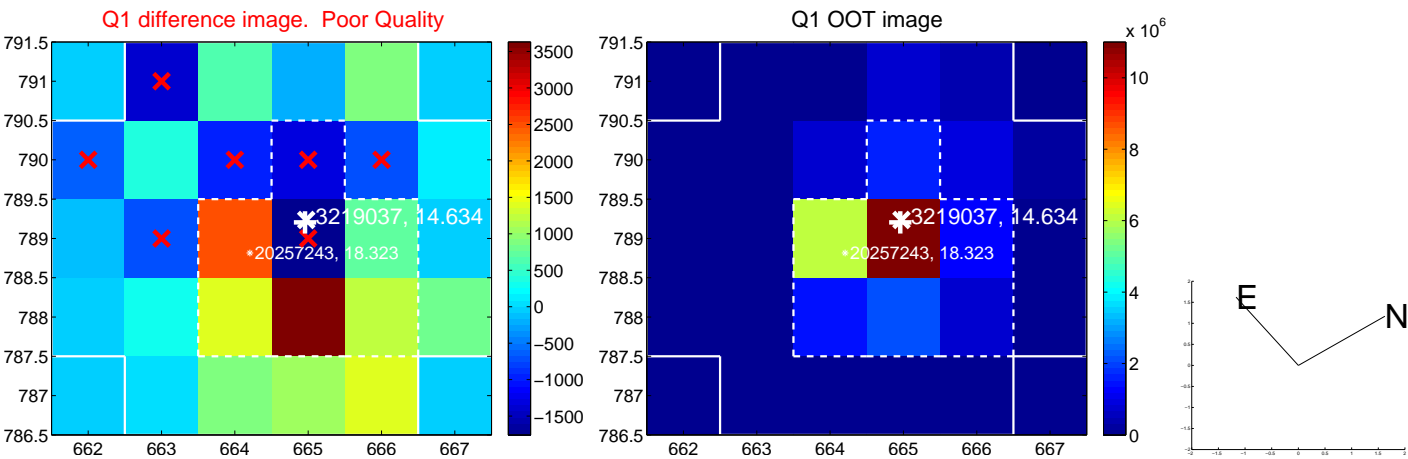


offset from photometric centroids



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.

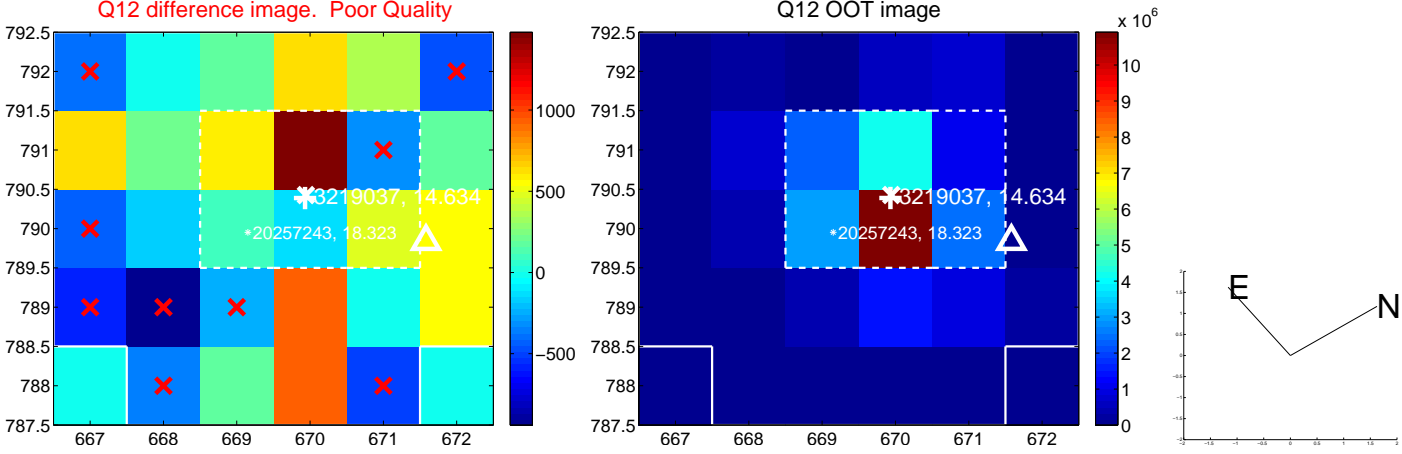
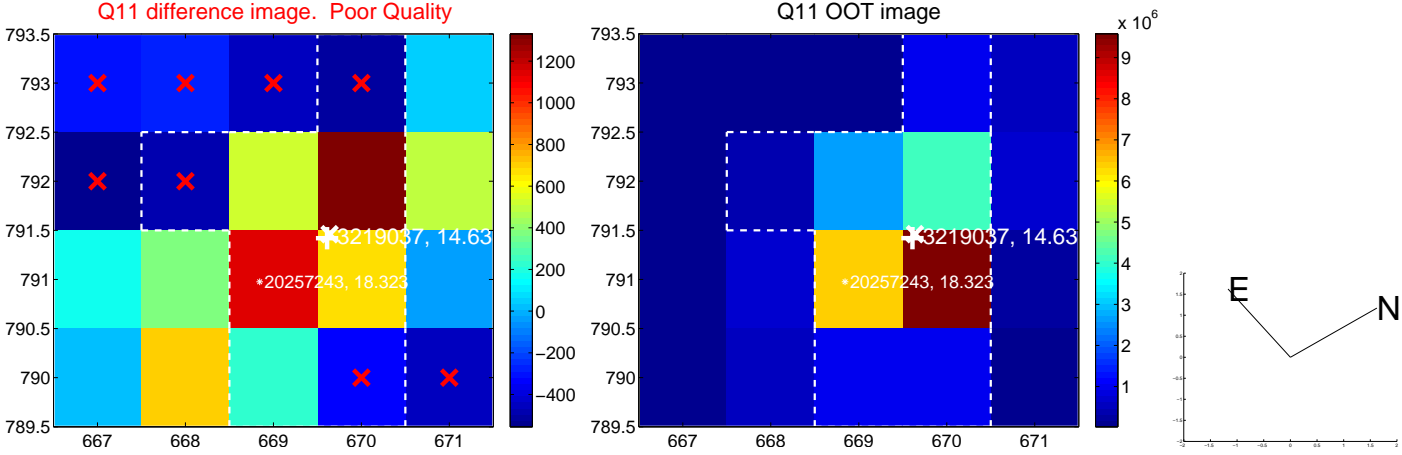
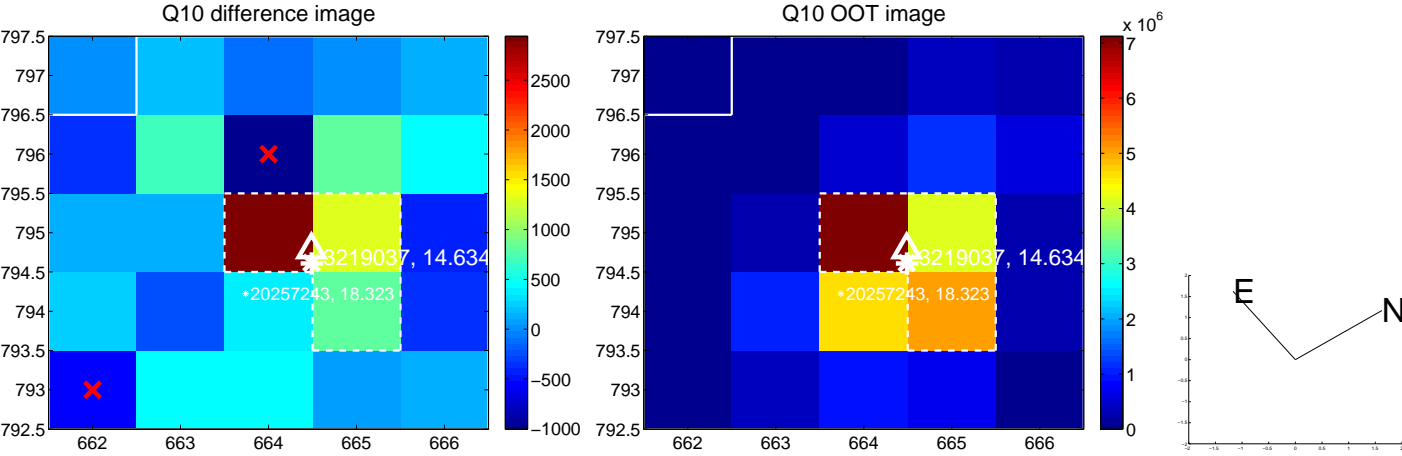
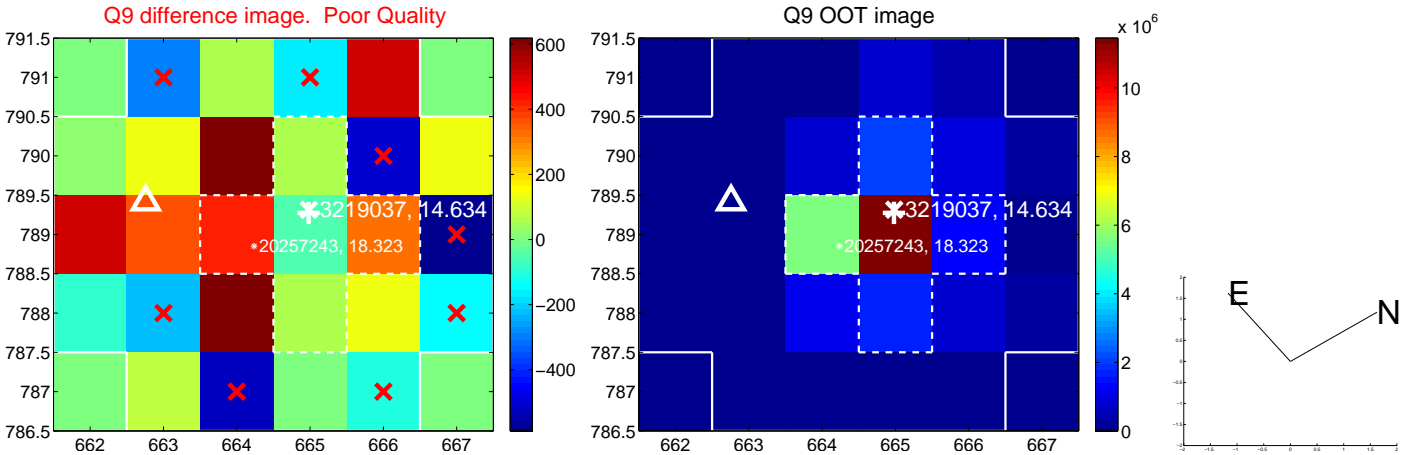
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



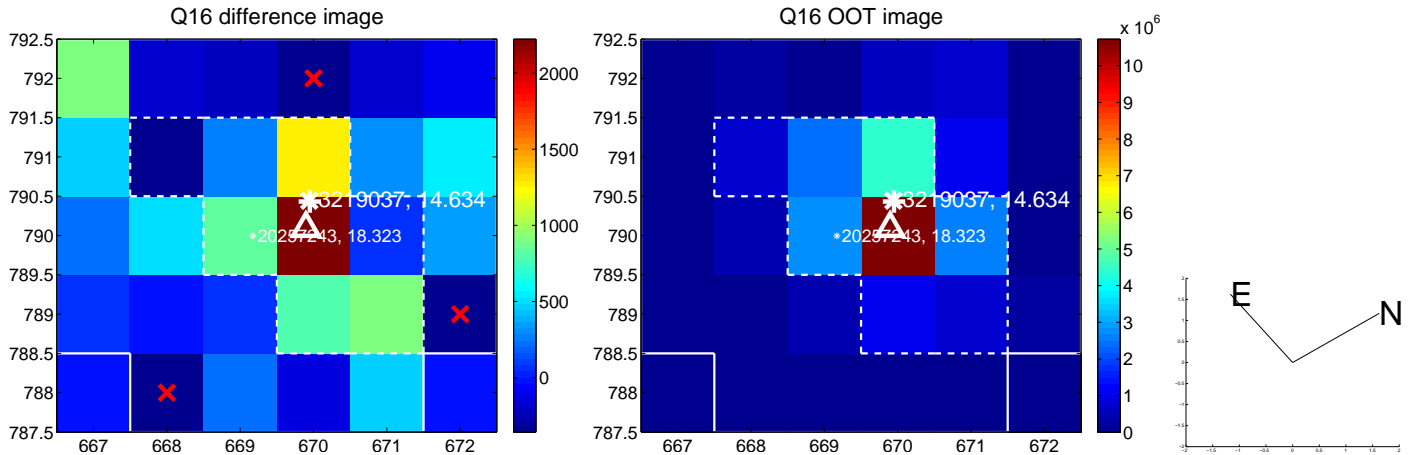
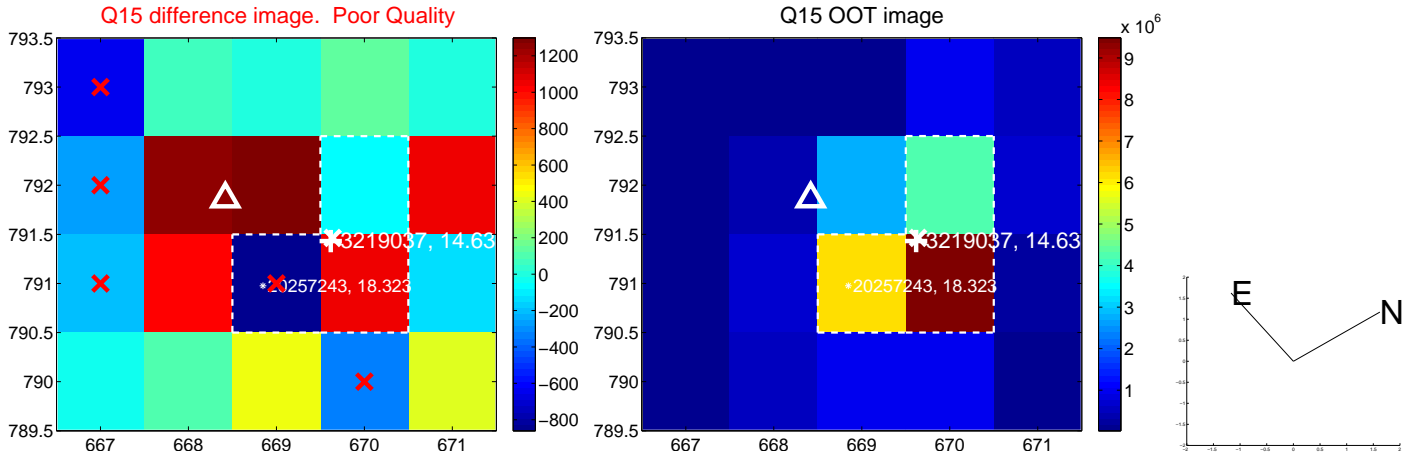
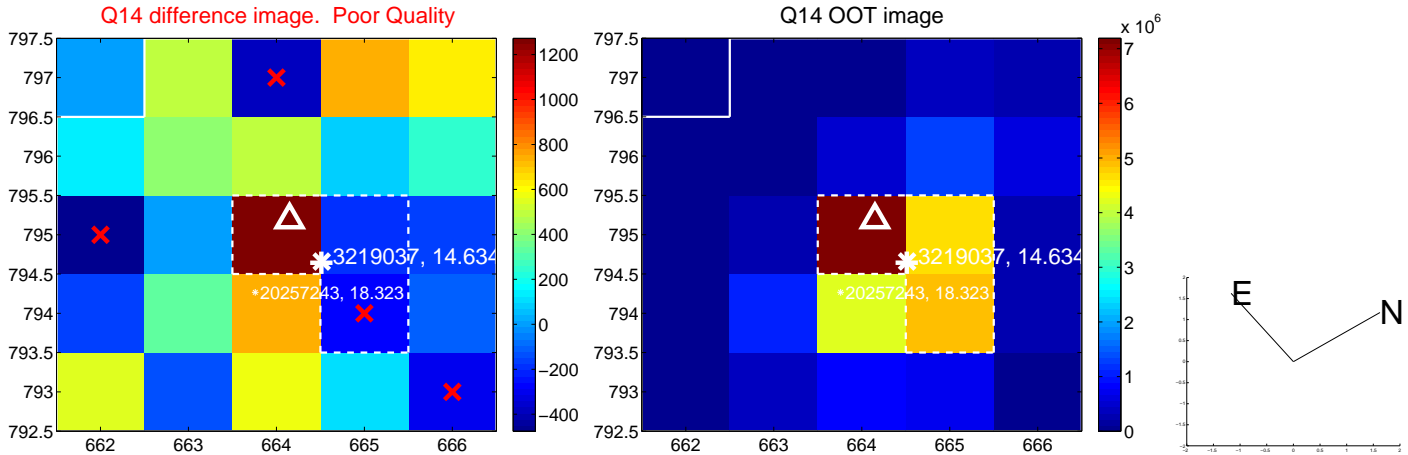
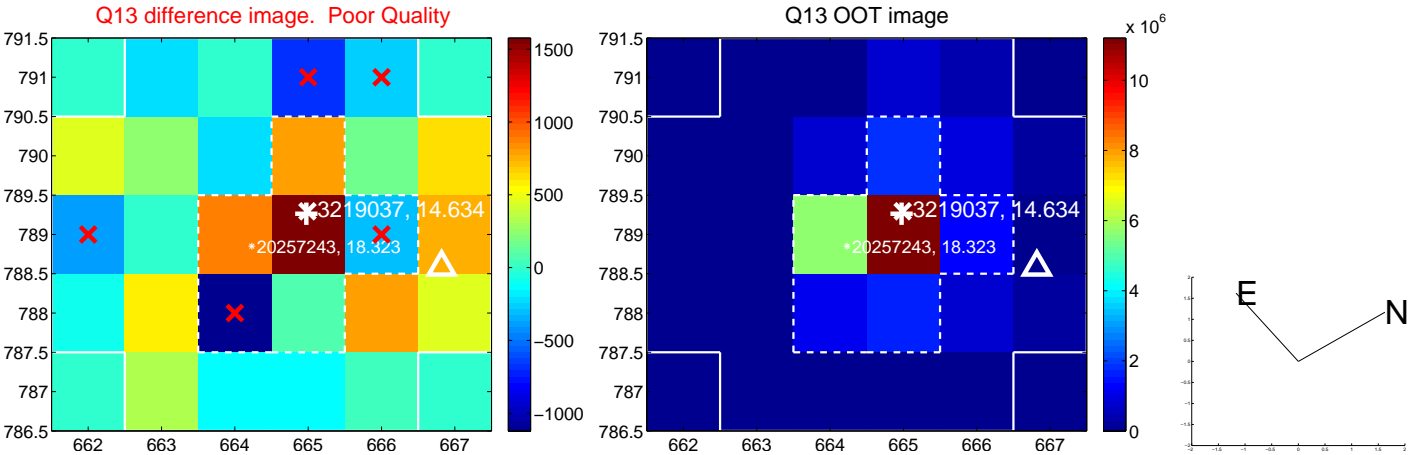




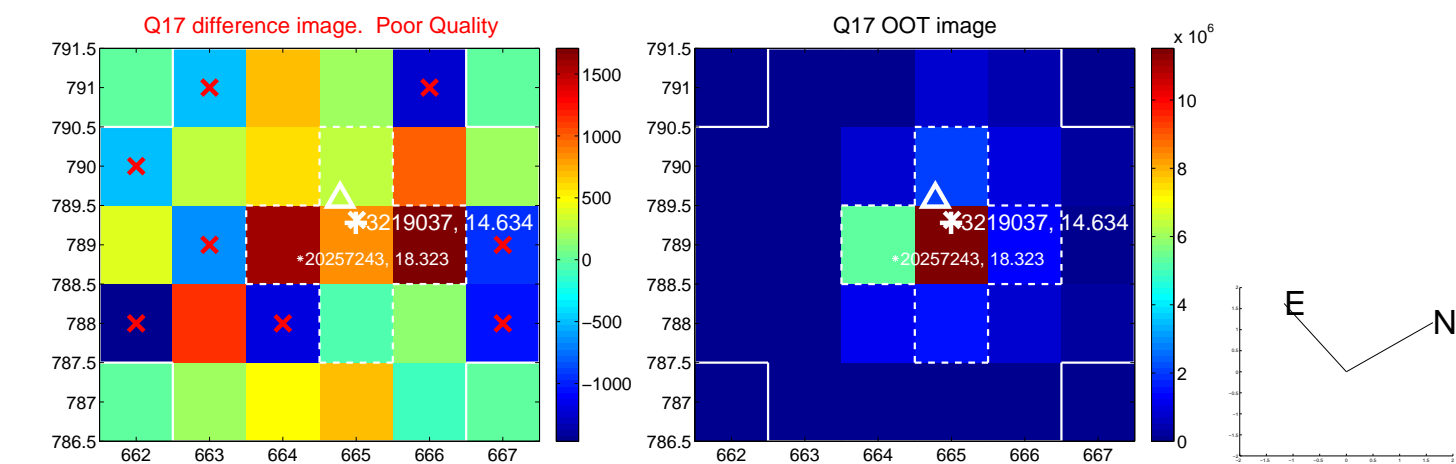
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



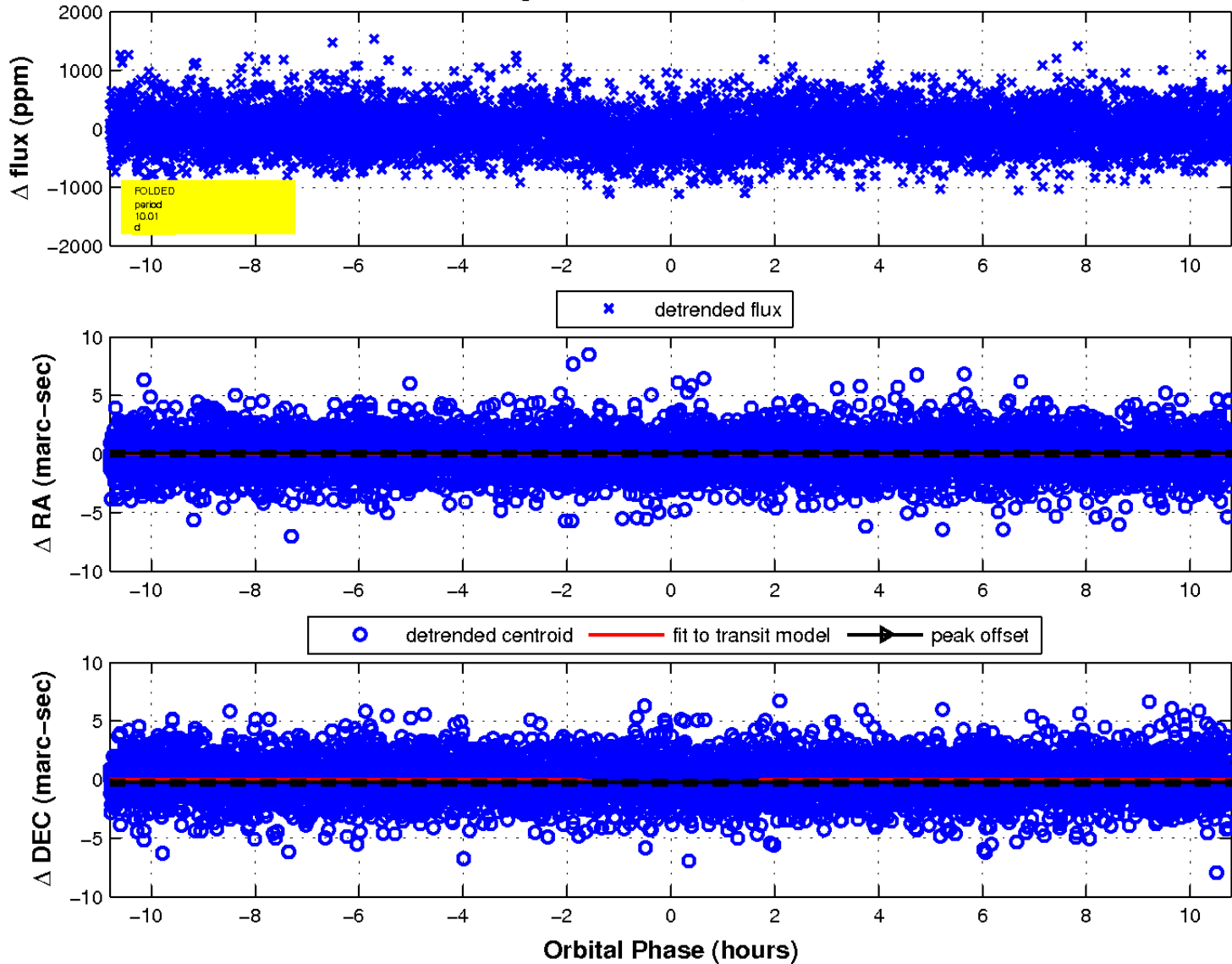
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

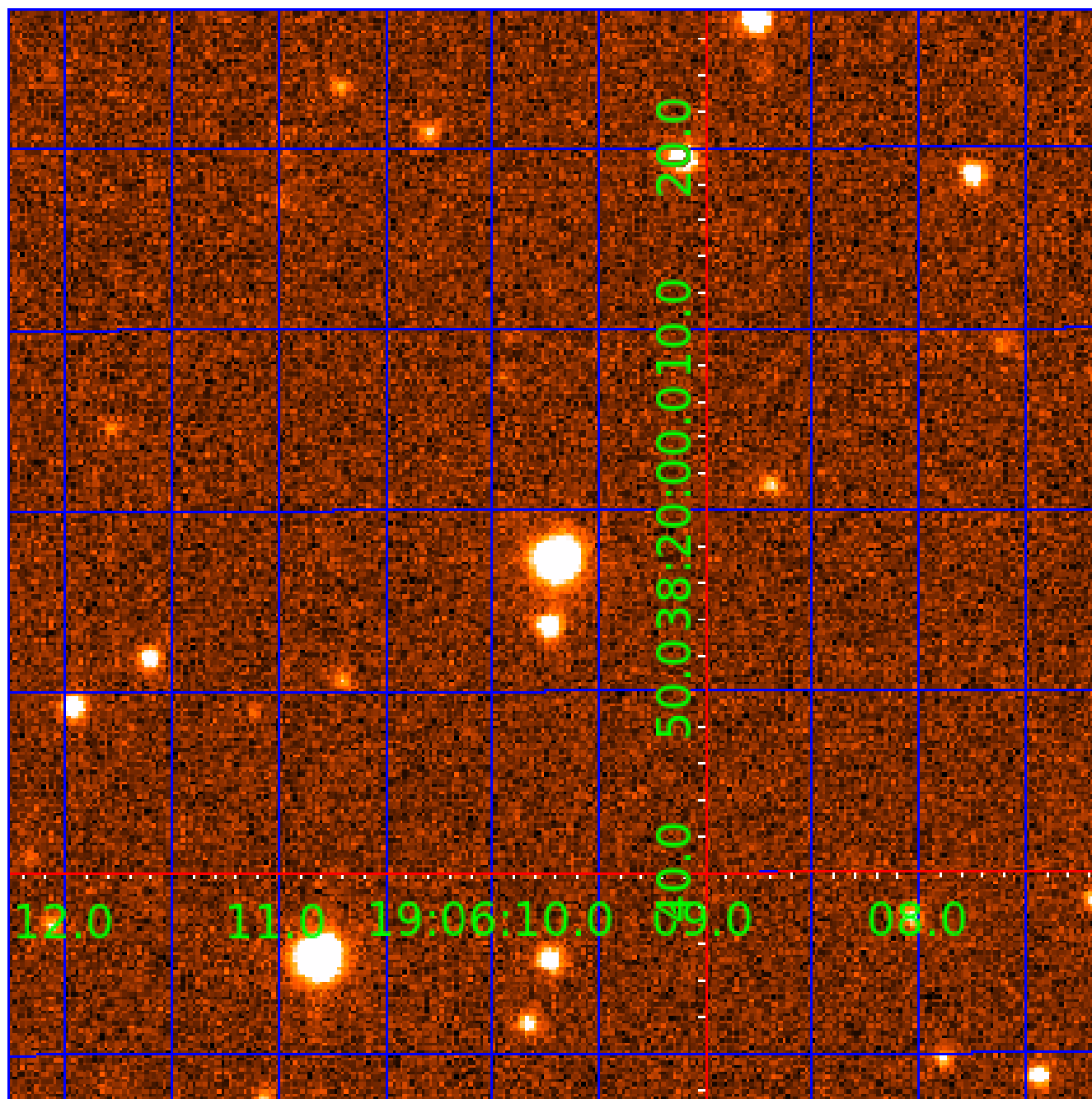


fluxWeightedCentroids, Planet 1 of 2



## UKIRT Image

Declination





# KIC 003219037

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003219037-01	OBS	3395.01	10.005050	136.832770	142.5	3.599	10.1	10.4	0.92	5912	1.31	122.83
003219037-02	OBS	No	485.854689	219.553292	411.0	26.462	7.6	9.0	0.92	5912	1.99	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003219037-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
003219037-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—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.

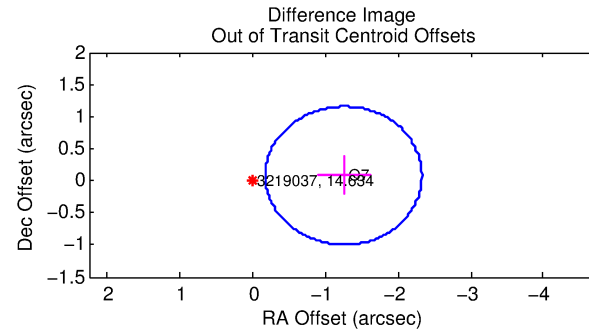
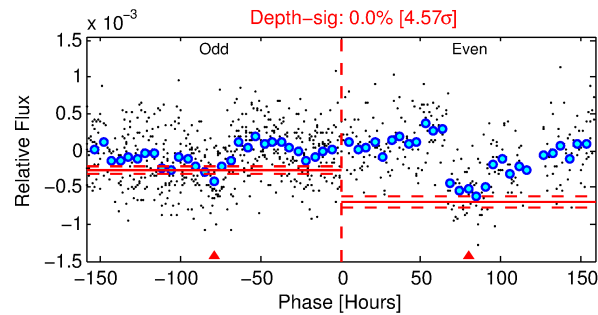
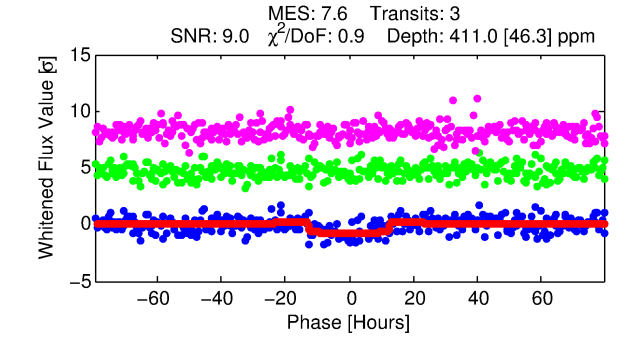
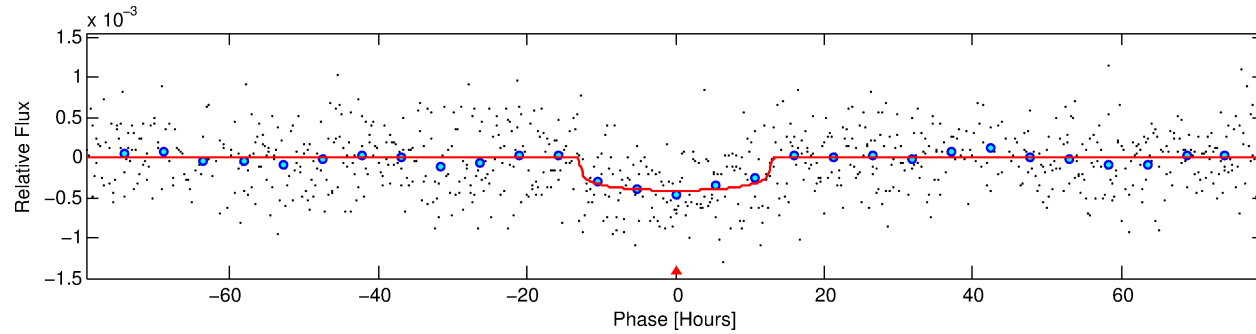
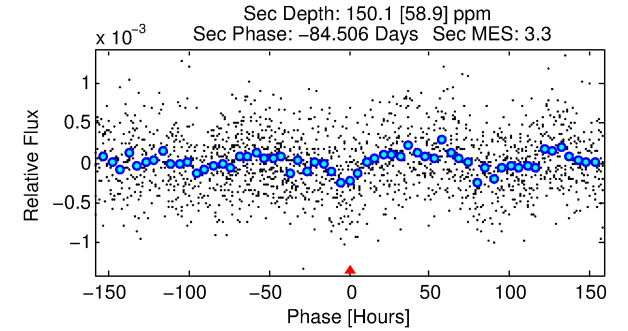
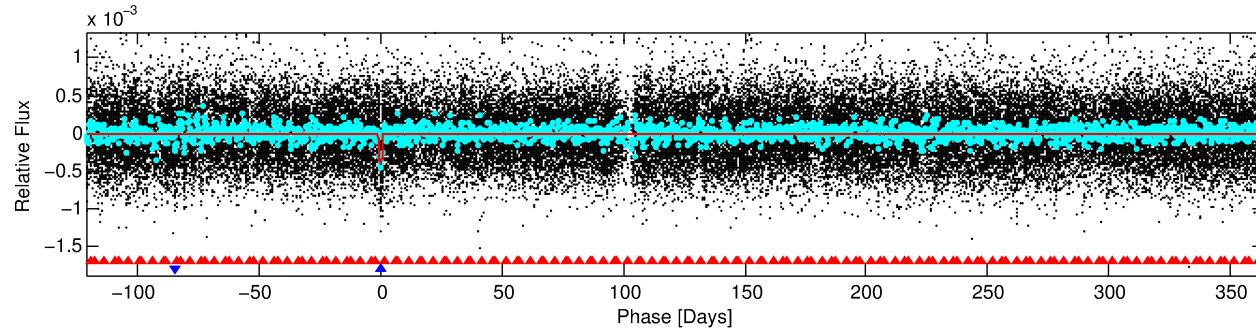
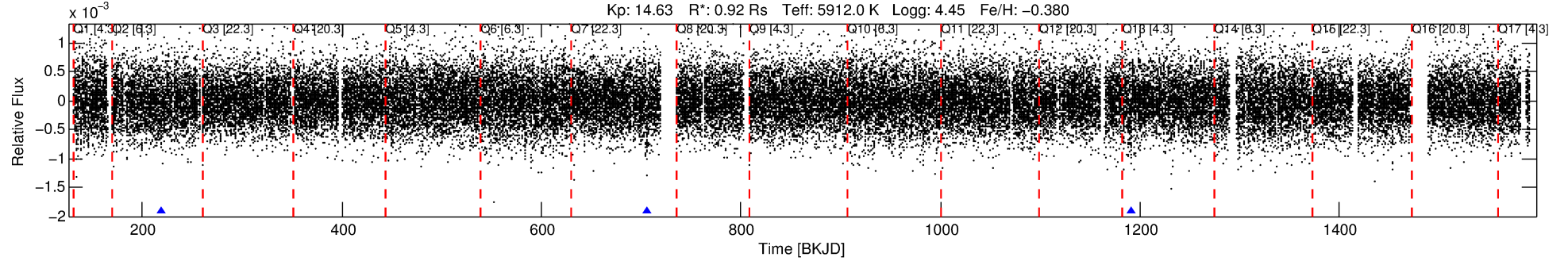
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003219037-02

No Significant Match Found

# DV One-Page Summary

KIC: 3219037 Candidate: 2 of 2 Period: 485.855 d  
KOI: K03395 Corr: No Ephemeris Match



## DV Fit Results:

Period = 485.85469 [0.02086] d  
Epoch = 219.5533 [0.0259] BKJD  
Rp/R\* = 0.0197 [0.0044]  
a/R\* = 107.28 [112.36]  
b = 0.67 [0.85]  
Seff = 0.69 [0.25]  
Teq = 233 [21] K  
Rp = 1.99 [0.71] Re  
a = 1.1610 [0.2682] AU  
Ag = 28158.69 [19204.10] [1.47 $\sigma$ ]  
Teff = 4660 [706] K [6.27 $\sigma$ ]

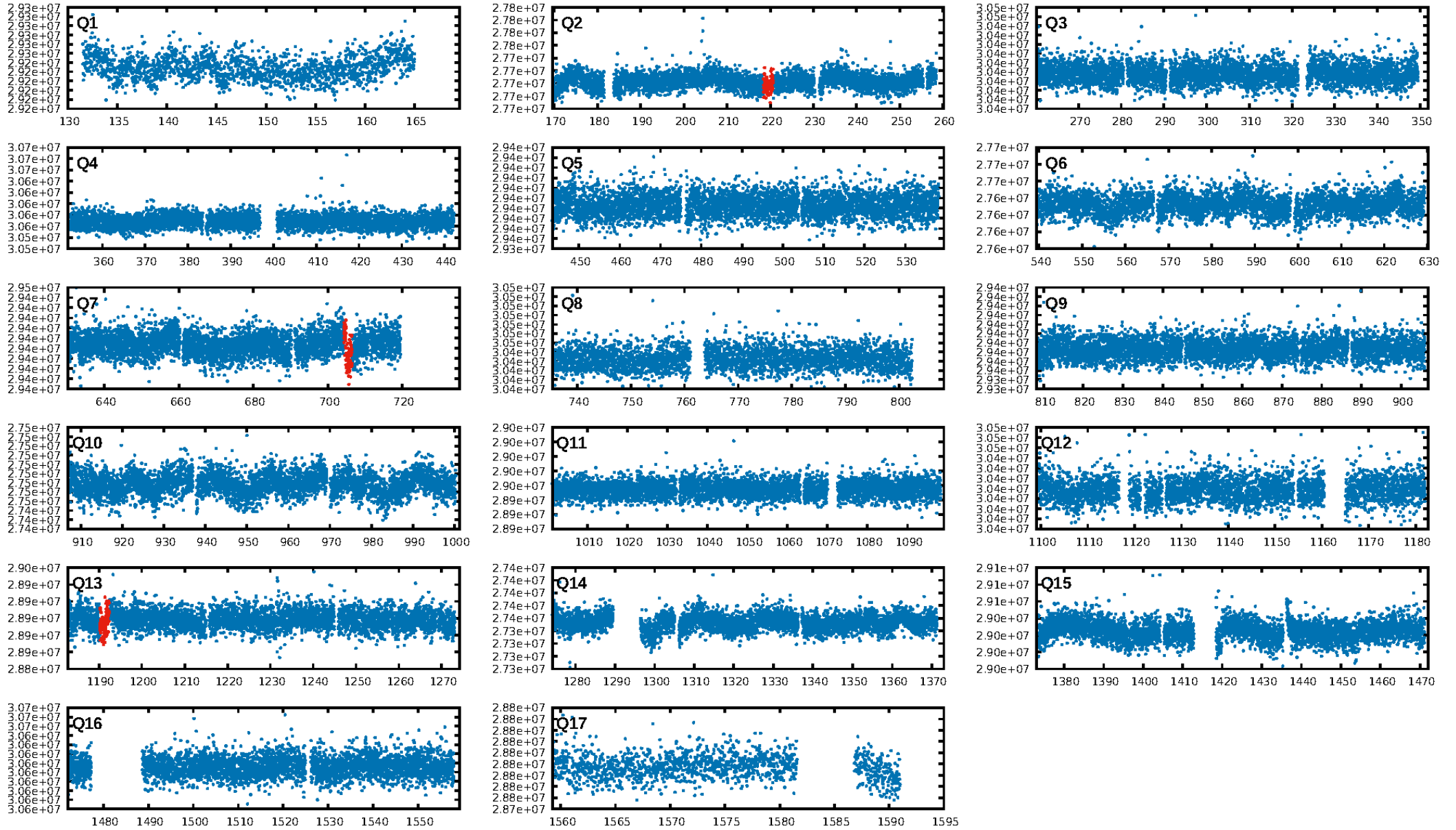
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [427.63 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.26e-12  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 14.48  
Centroid-sig: 1.4%  
Centroid-so: 2.651 arcsec [2.27 $\sigma$ ]  
OotOffset-rm: 1.256 arcsec [3.50 $\sigma$ ]  
KicOffset-rm: 1.313 arcsec [3.65 $\sigma$ ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 0.50 [1/2]

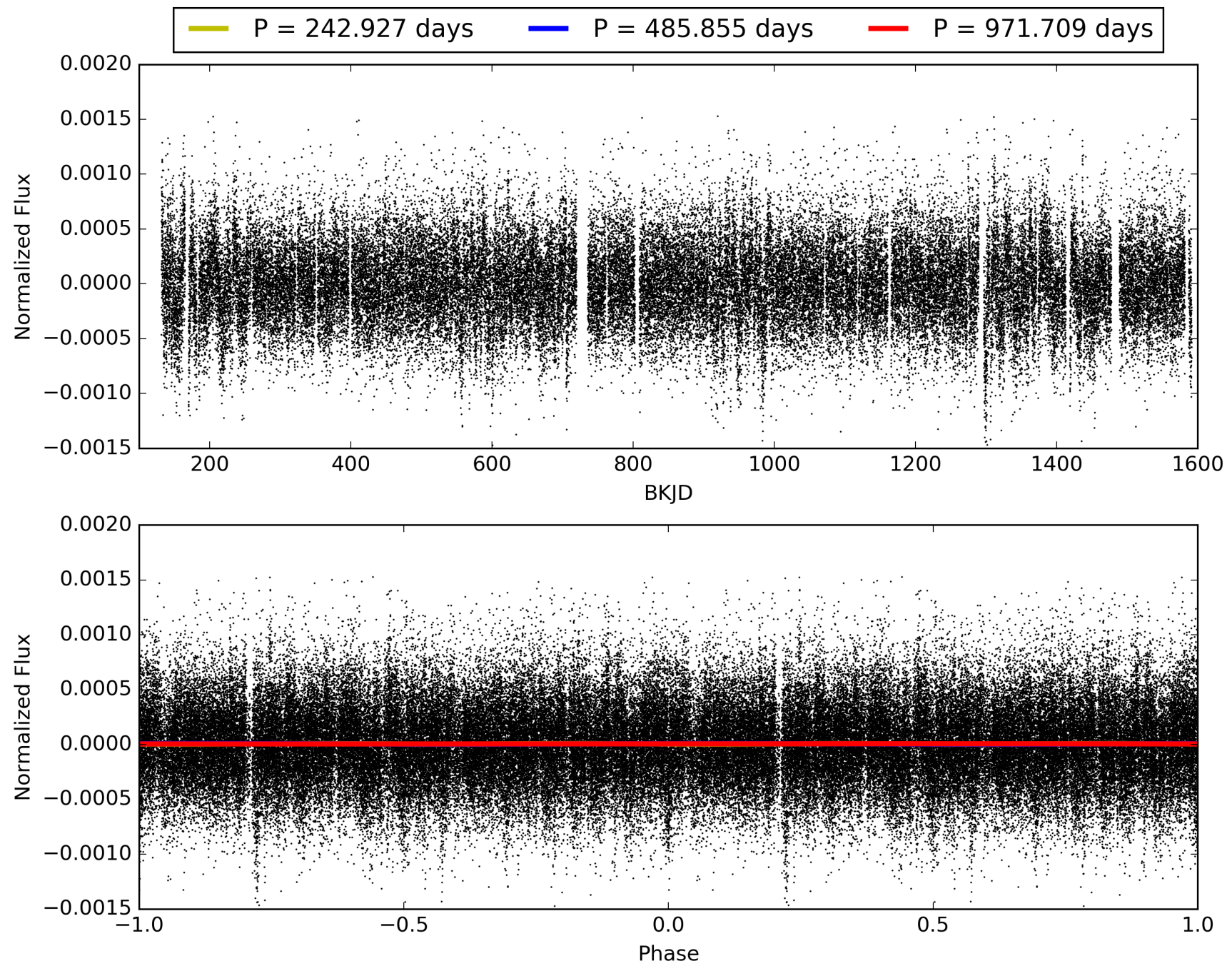
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:20:21 Z

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

# TCE 003219037-02, PDC Light Curves

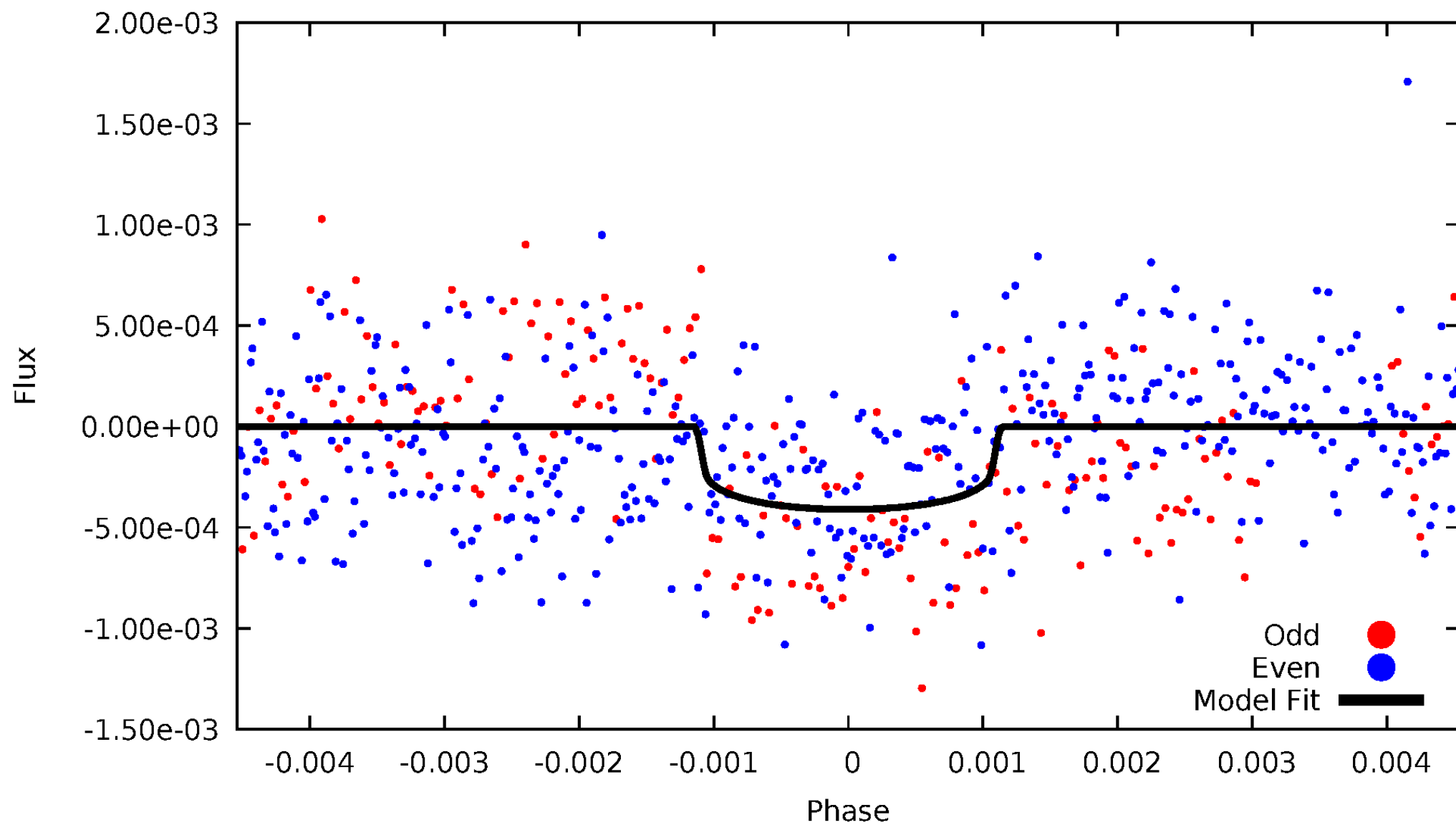


TCE 003219037-02



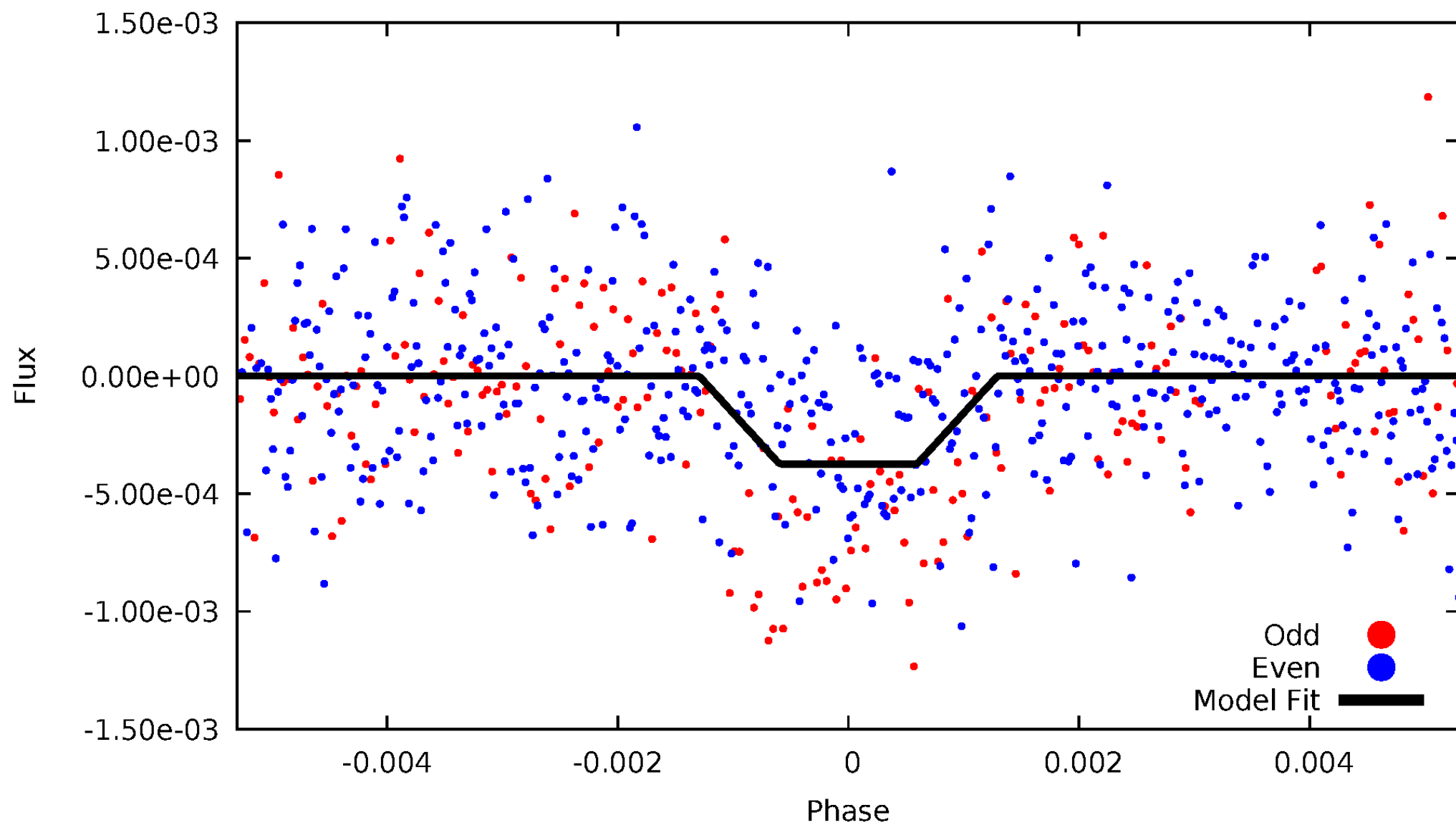
# DV Odd/Even

TCE 003219037-02



# ALT Odd/Even

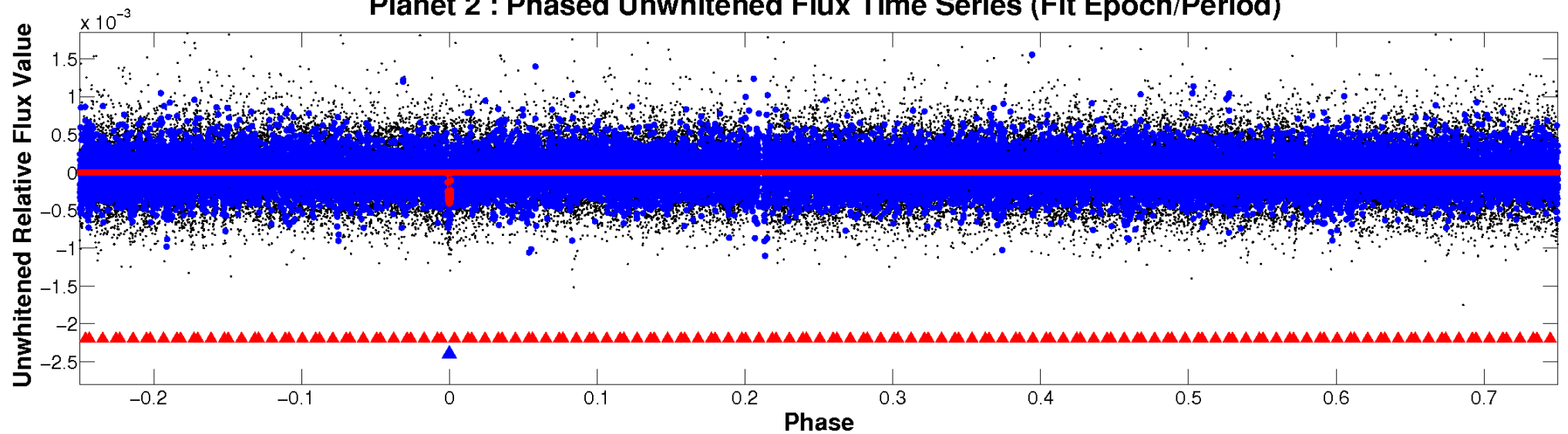
TCE 003219037-02



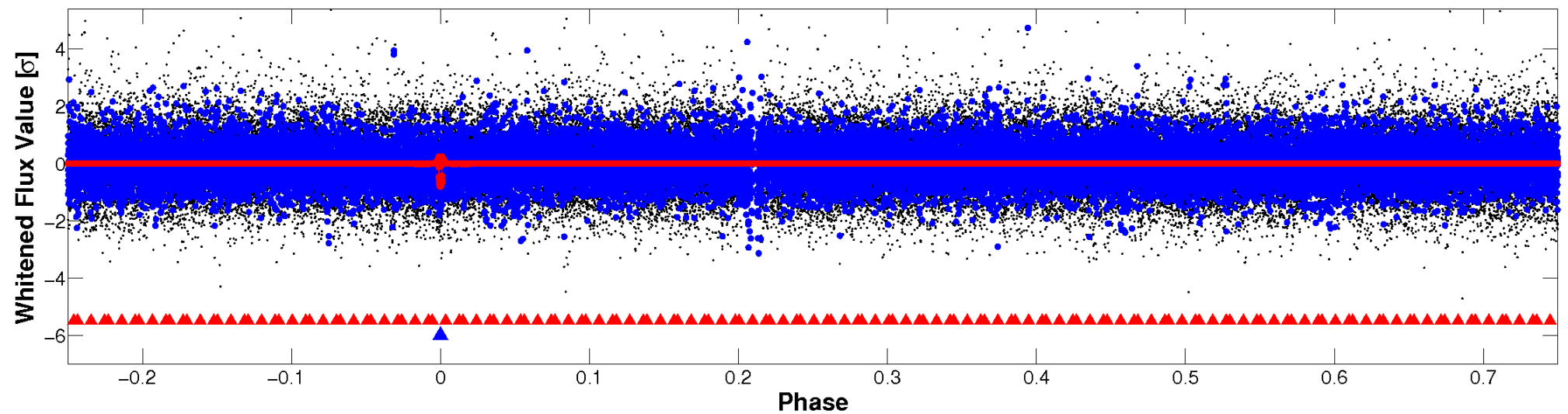


# Non-Whitened Vs. Whitened Light Curve

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

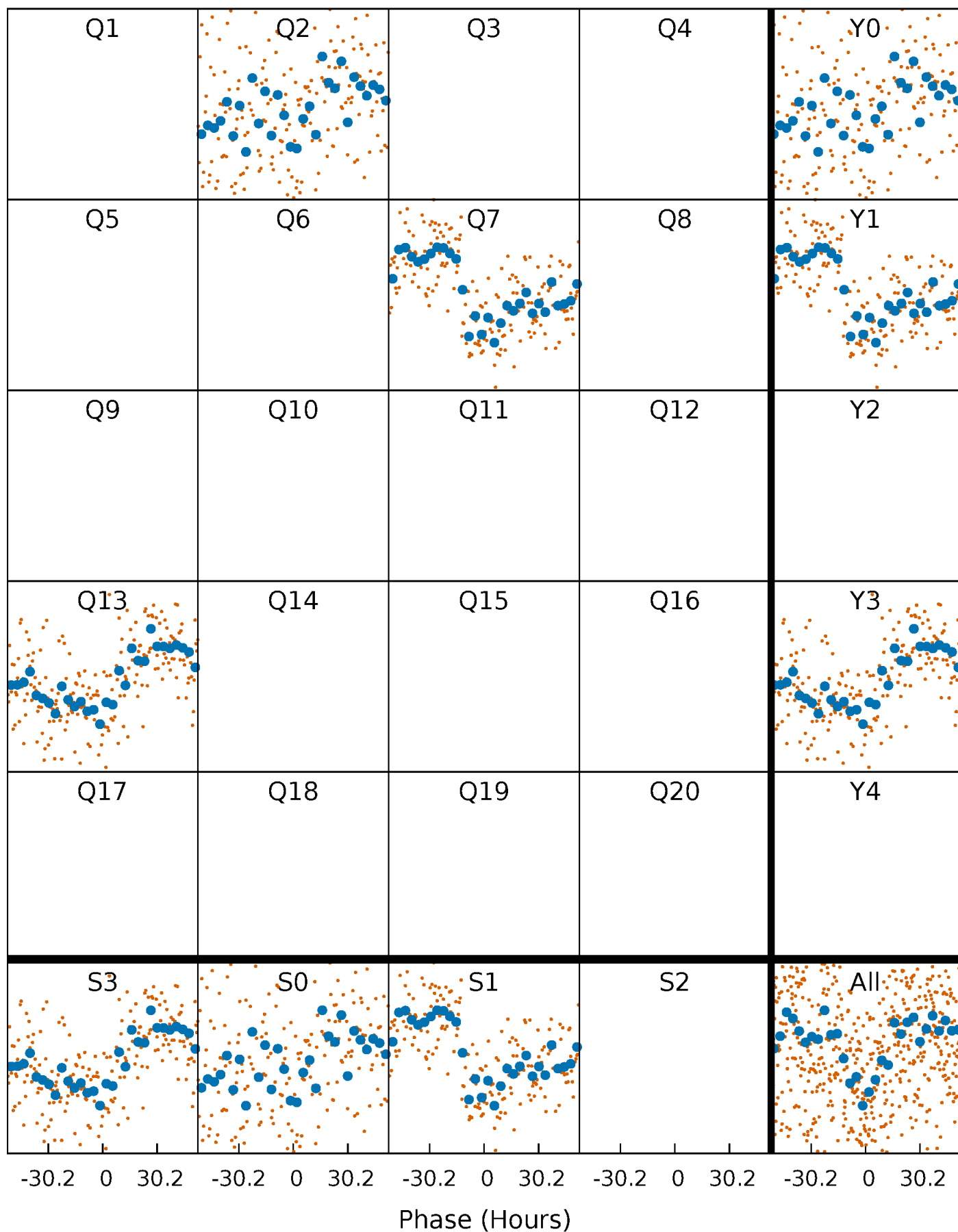


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



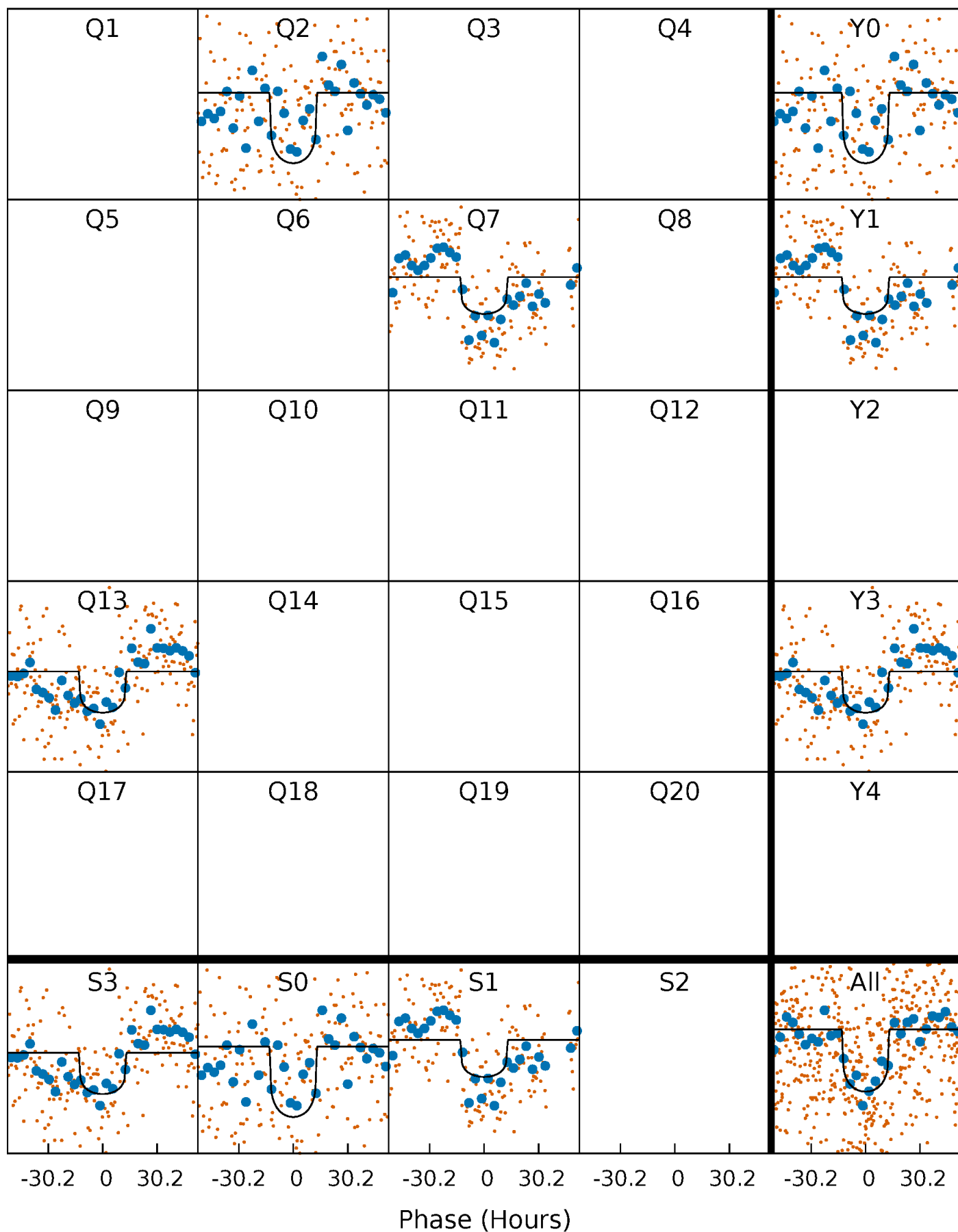
# PDC Quarter-Phased Transit Curves

TCE 003219037-02     $P=485.854689$  Days     $T_0=219.553292$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 003219037-02 P=485.854689 Days  $T_0=219.553292$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

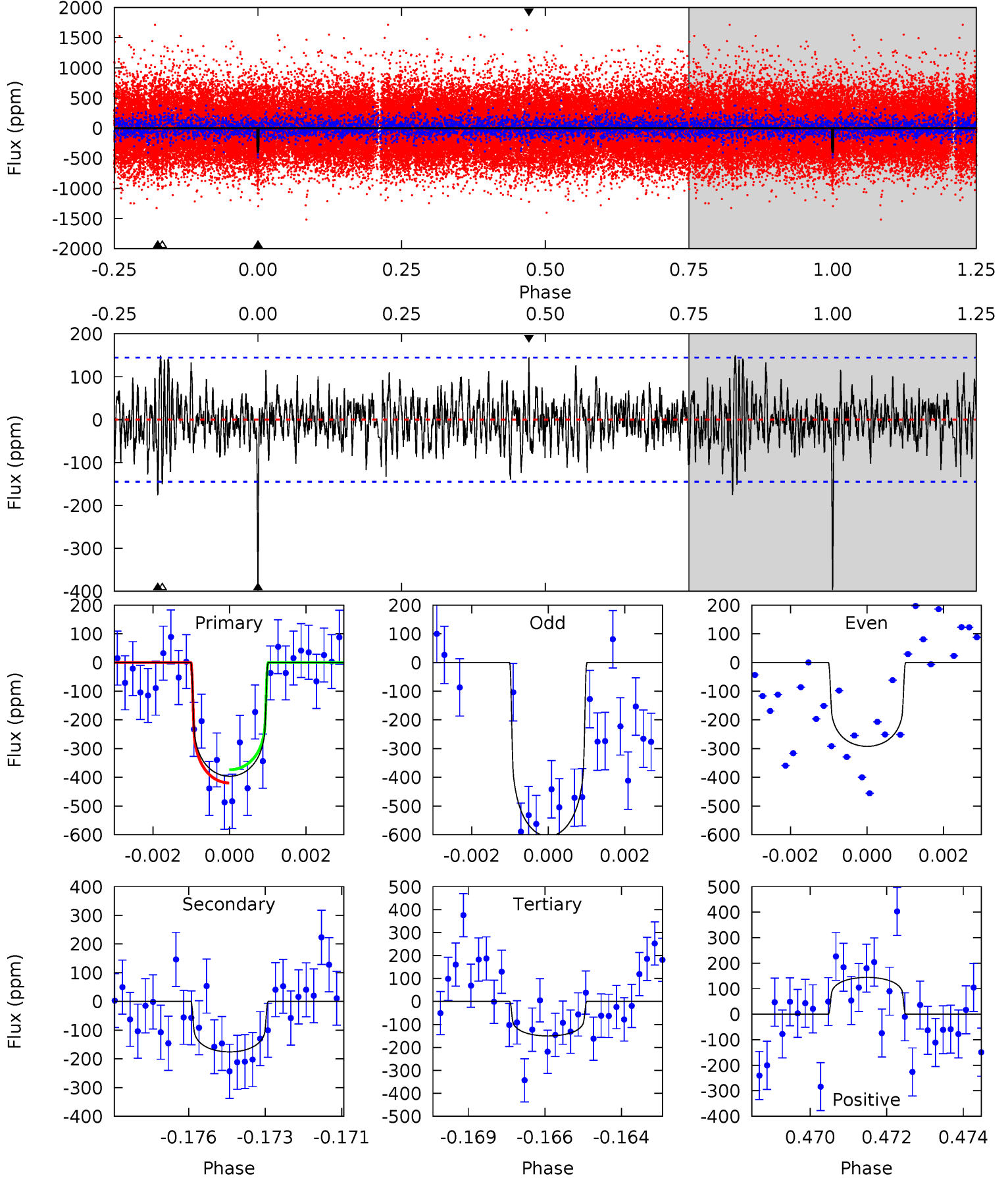
TCE 003219037-02 P=485.841945 Days  $T_0=219.555167$  (BKJD)



# DV Model-Shift Uniqueness Test

003219037-02, P = 485.854689 Days, E = 219.553292 Days

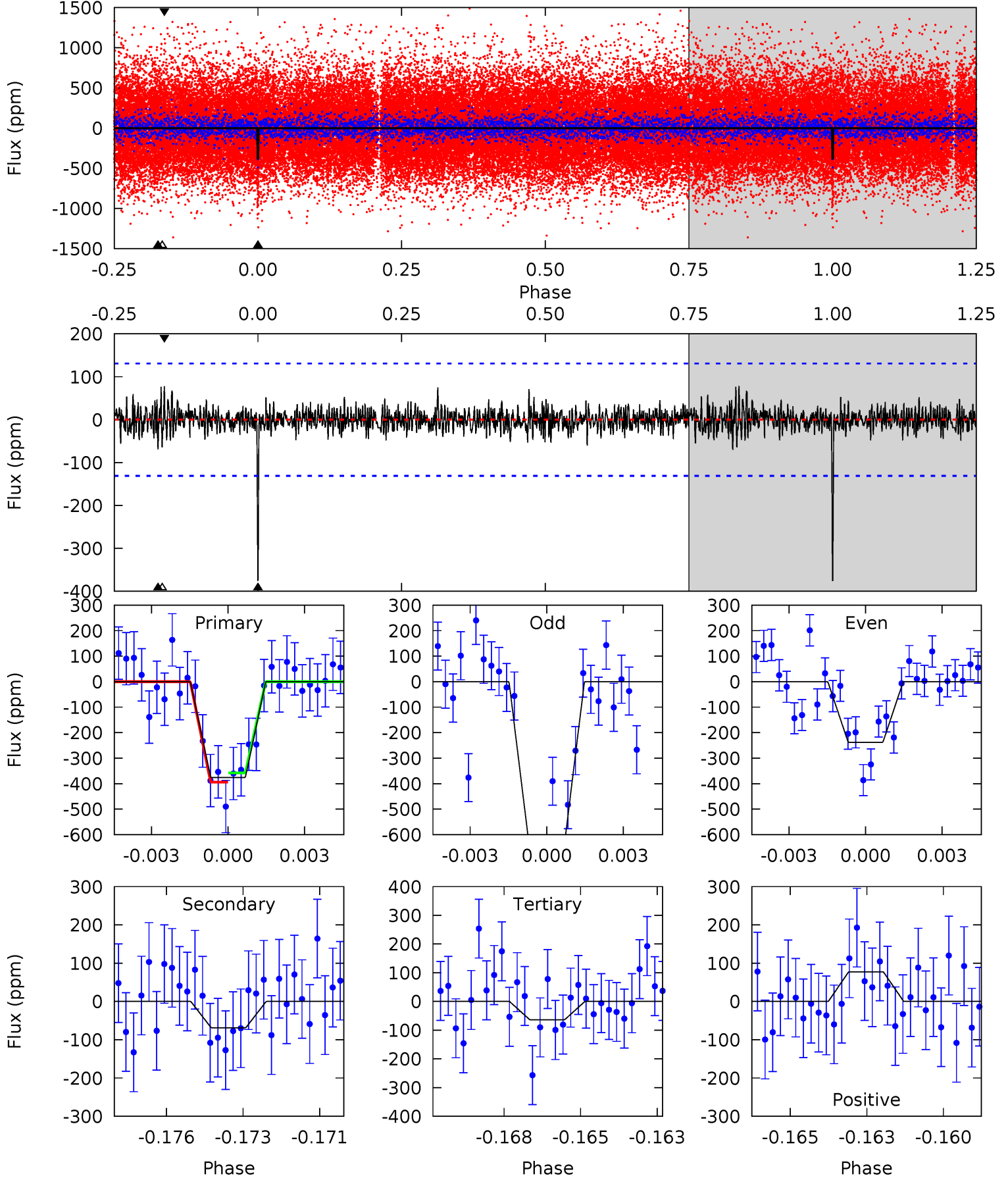
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	6.43	5.50	5.28	5.30	3.05	1.56	9.00	9.22	0.93	1.15	5.39	1.09	0.27	0.85



# Alt Model-Shift Uniqueness Test

003219037-02, P = 485.841945 Days, E = 219.555167 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
15.1	2.77	2.57	3.12	5.28	3.01	0.75	12.6	12.0	0.19	-0.35	7.81	1.22	0.17	0.73





### Stellar Parameters For KIC 003219037

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5912^{+158}_{-175}$	$4.453^{+0.098}_{-0.182}$	$-0.380^{+0.300}_{-0.300}$	$0.924^{+0.255}_{-0.127}$	$0.884^{+0.109}_{-0.089}$	$1.577^{+0.678}_{-0.760}$
	+3%/-3%	+2%/-4%	+79%/-79%	+28%/-14%	+12%/-10%	+43%/-48%
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 003219037-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-176 \pm 27$	$1.99^{+0.55}_{-0.44}$	$327^{+22}_{-16}$	$4966^{+596}_{-436}$	$32711^{+21985}_{-13392}$
Alt.	$-69 \pm 25$	$2.00^{+0.57}_{-0.46}$	$329^{+24}_{-16}$	$4138^{+523}_{-445}$	$12202^{+11139}_{-6014}$

$T_{\text{max}}$  = 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

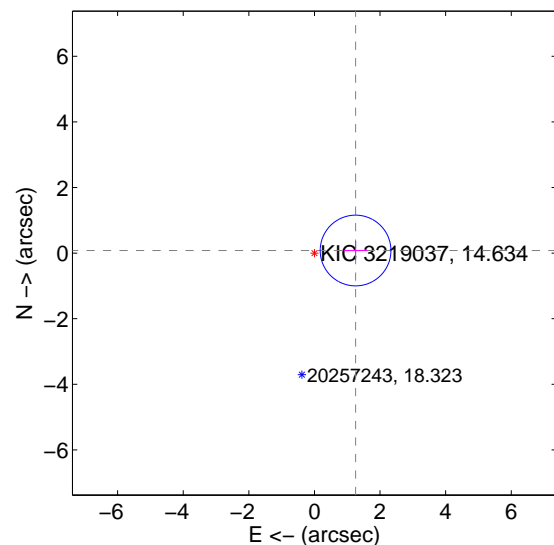
Supplemental centroid analysis for 003219037-02. Kepler magnitude: 14.63. Transit SNR 9.03

There are 1 quarters with good PRF difference image offsets

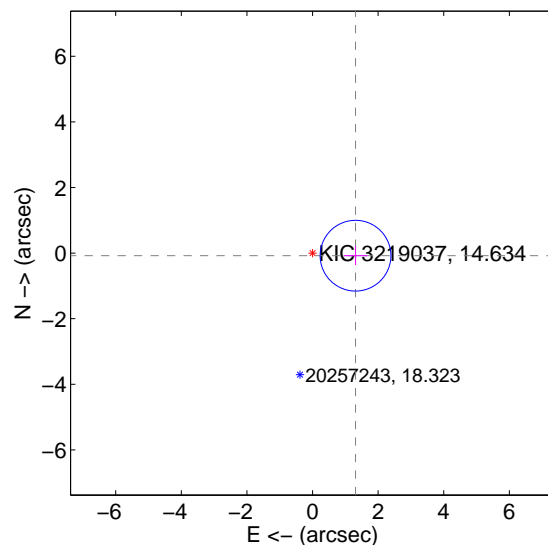
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.256 \pm 0.359$	3.50	$-1.253 \pm 0.360$	$0.079 \pm 0.288$
PRF-fit source offset from KIC position	$1.313 \pm 0.359$	3.65	$-1.310 \pm 0.360$	$-0.079 \pm 0.288$
photometric centroid source offset	$2.65 \pm 1.17$	2.27	$-1.87 \pm 1.03$	$-1.88 \pm 1.29$

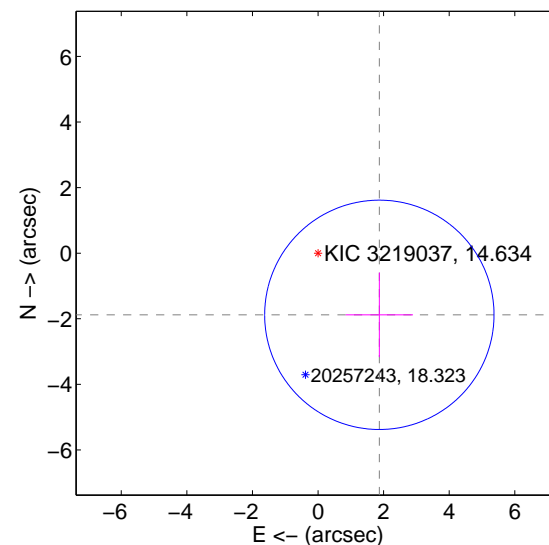
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

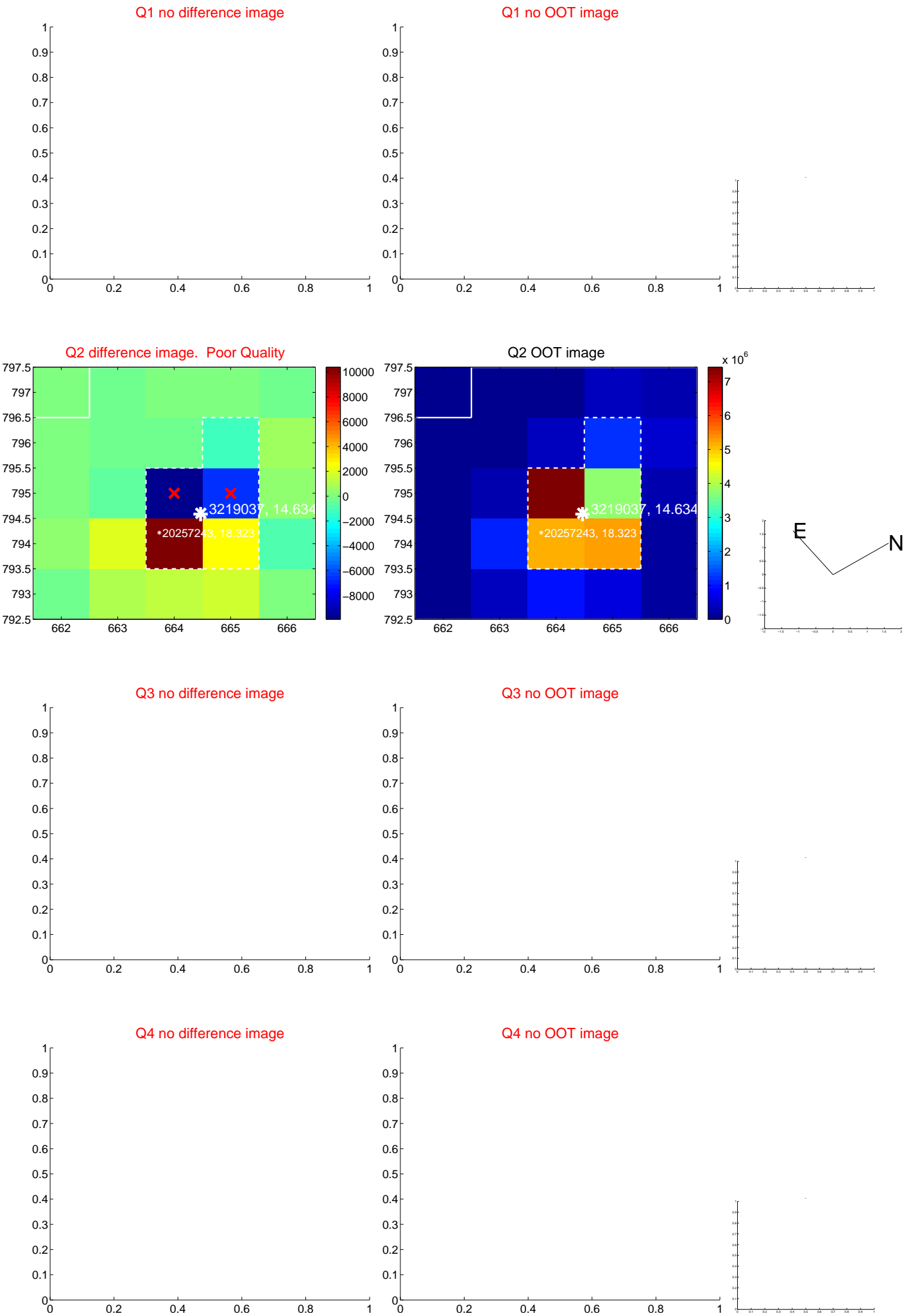


offset from photometric centroids

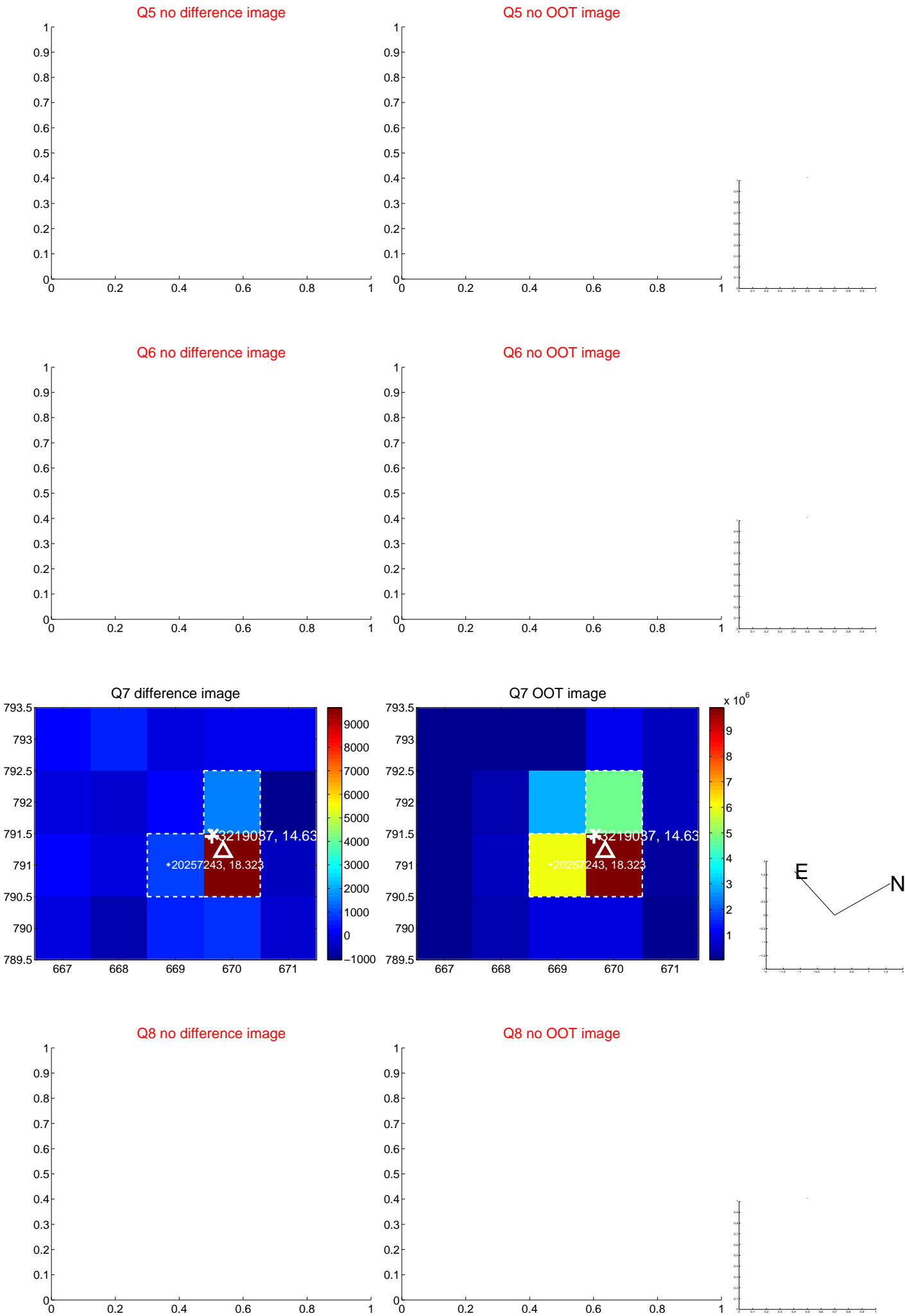


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

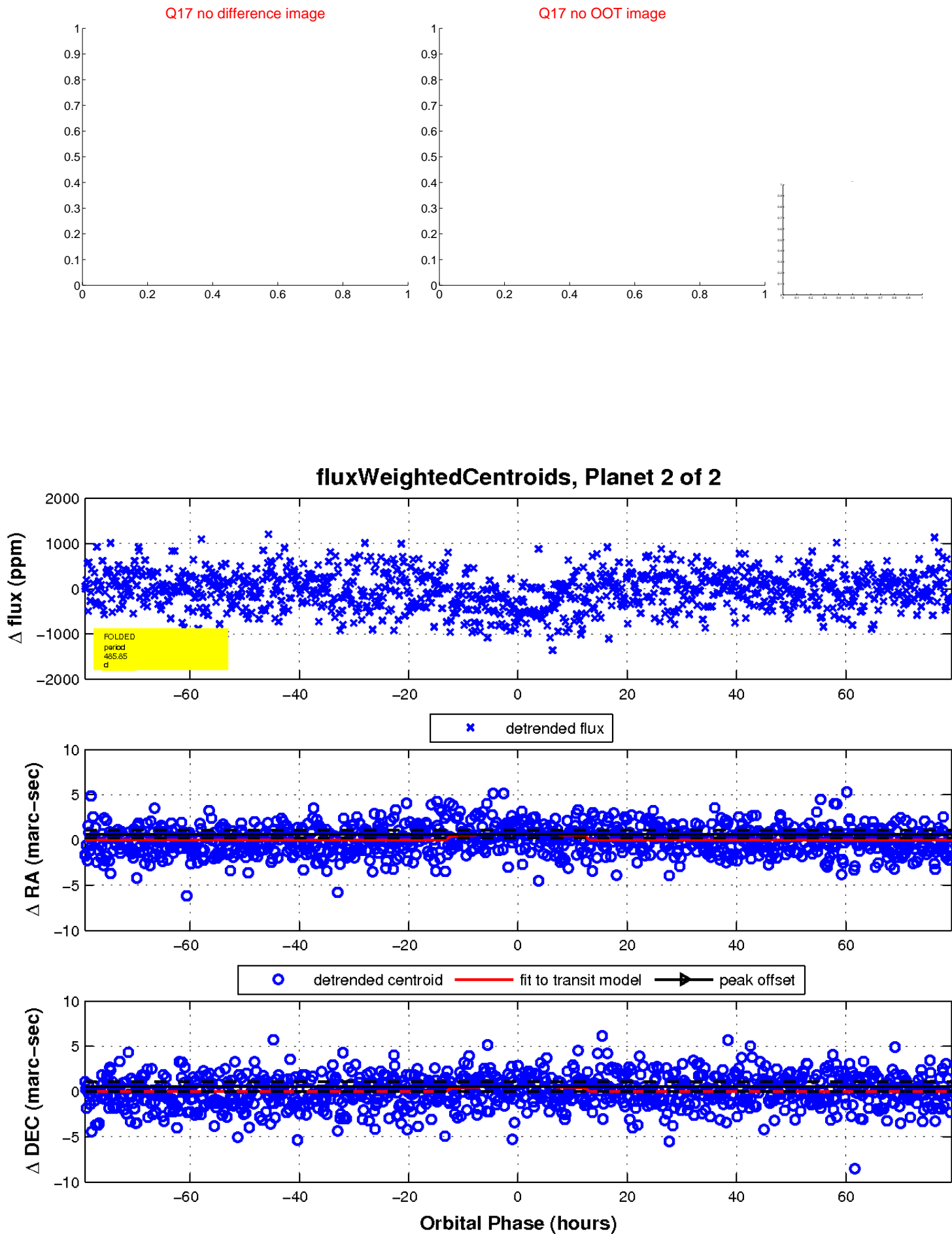


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



# UKIRT Image

Declination

