

# KIC 004679769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004679769-01	OBS	No	0.992691	131.567046	27.6	4.503	9.8	8.7	1.33	6596	0.70	7492.51
004679769-02	OBS	No	0.992715	132.034435	34.9	5.893	11.6	12.8	1.33	6596	0.92	7492.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004679769-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
004679769-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

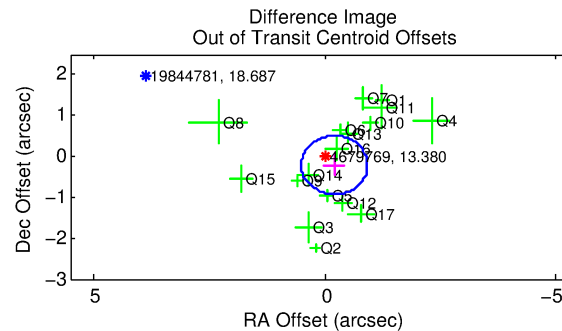
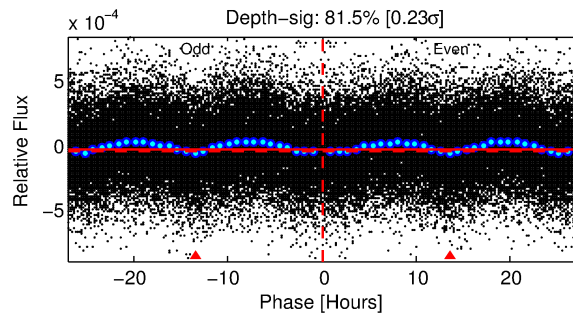
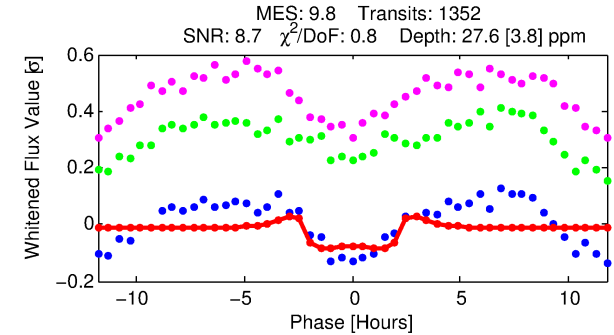
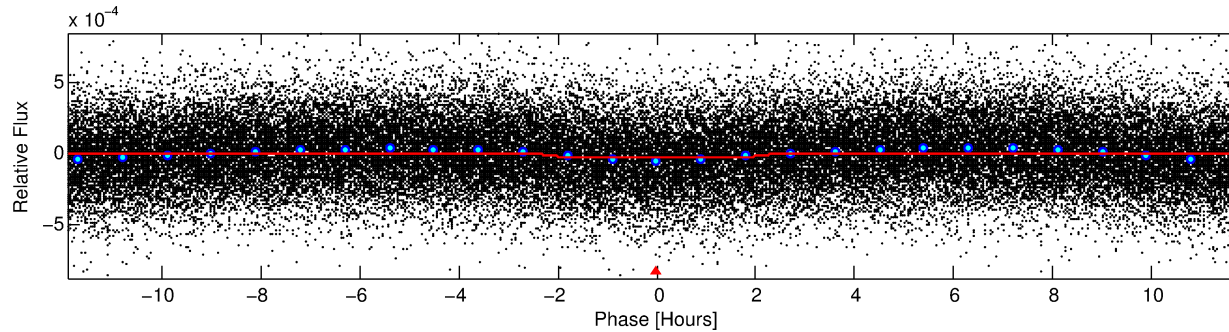
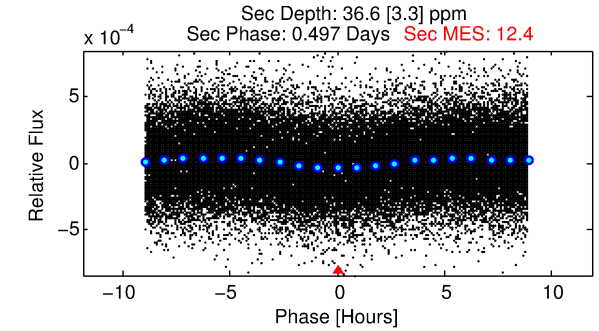
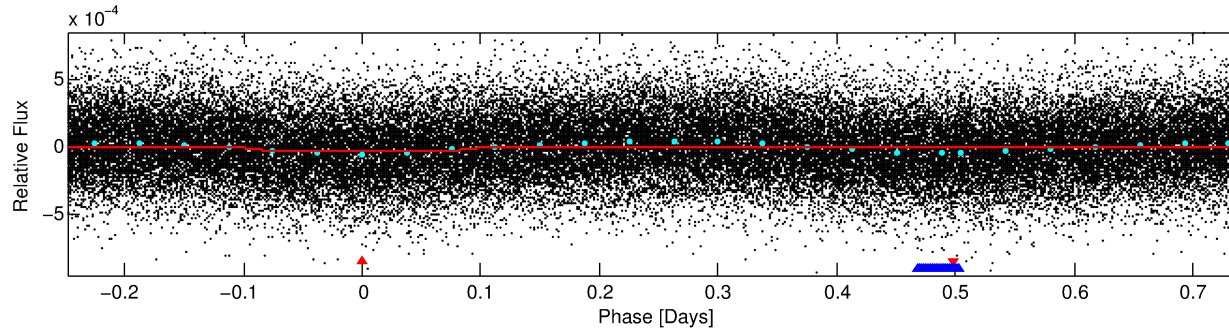
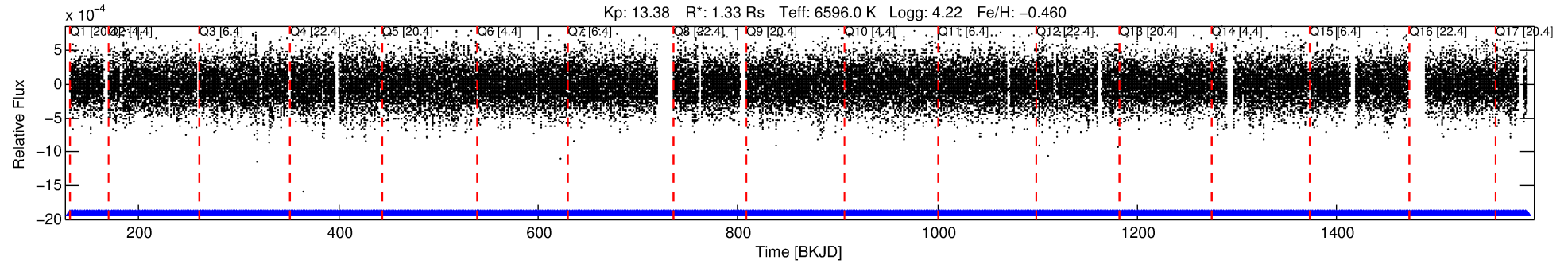
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004679769-01

No Significant Match Found

# DV One-Page Summary

KIC: 4679769 Candidate: 1 of 2 Period: 0.993 d



## DV Fit Results:

Period = 0.99269 [0.00001] d  
Epoch = 131.5670 [0.0037] BKJD  
Rp/R\* = 0.0048 [0.0034]  
a/R\* = 1.80 [4.76]  
b = 0.01 [772.41]  
Seff = 7492.50 [2589.50]  
Teq = 2372 [205] K  
Rp = 0.70 [0.53] Re  
a = 0.0199 [0.0044] AU  
Ag = 16.29 [23.70] [0.64σ]  
Teffp = 7369 [2625] K [1.90σ]

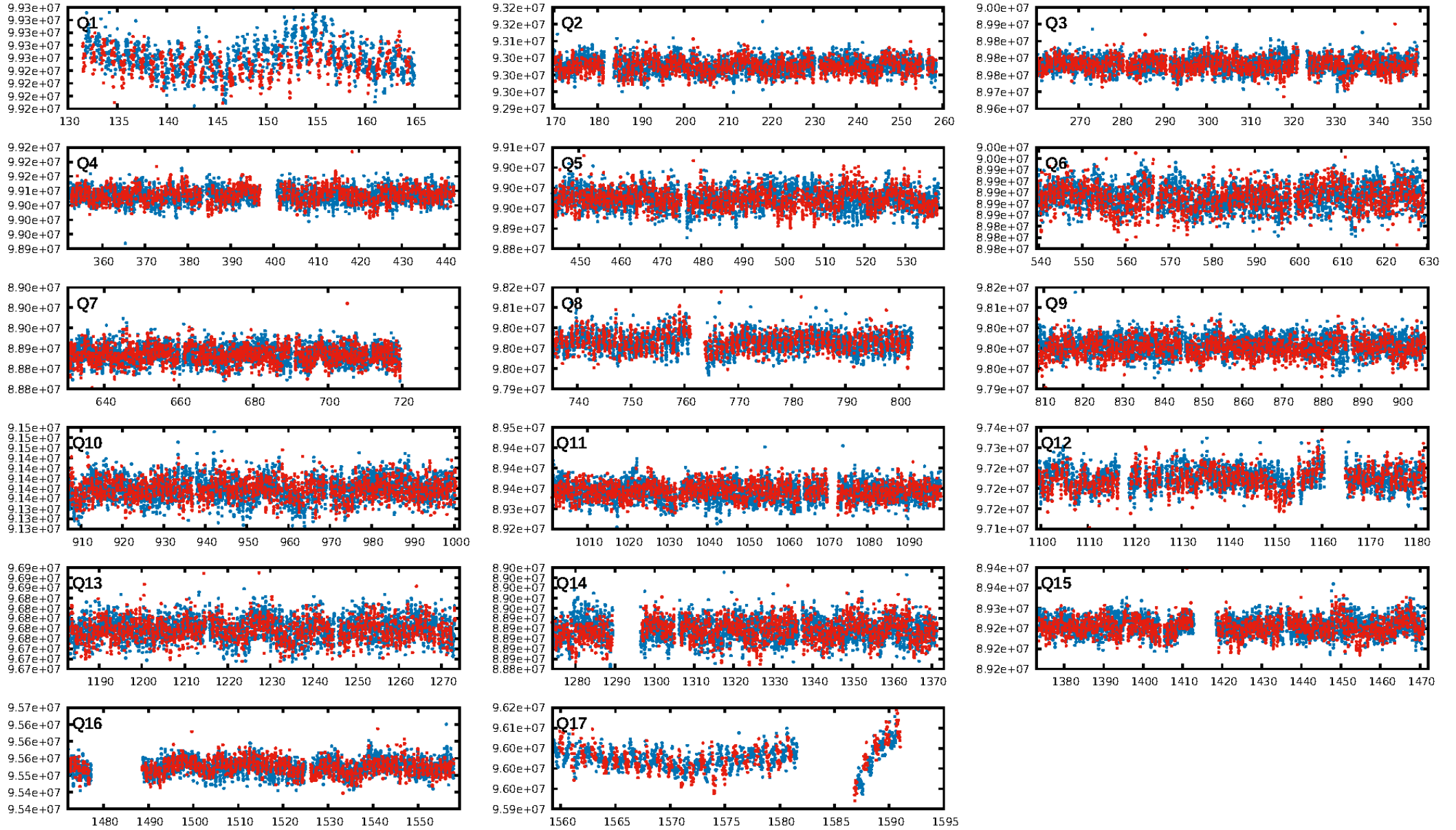
## DV Diagnostic Results:

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 [1291/1291]  
GhostDiagnostic-chr: 3.306  
Centroid-sig: 69.9%  
Centroid-so: 0.400 arcsec [0.43σ]  
OotOffset-rm: 0.296 arcsec [1.24σ]  
KicOffset-rm: 0.215 arcsec [0.89σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

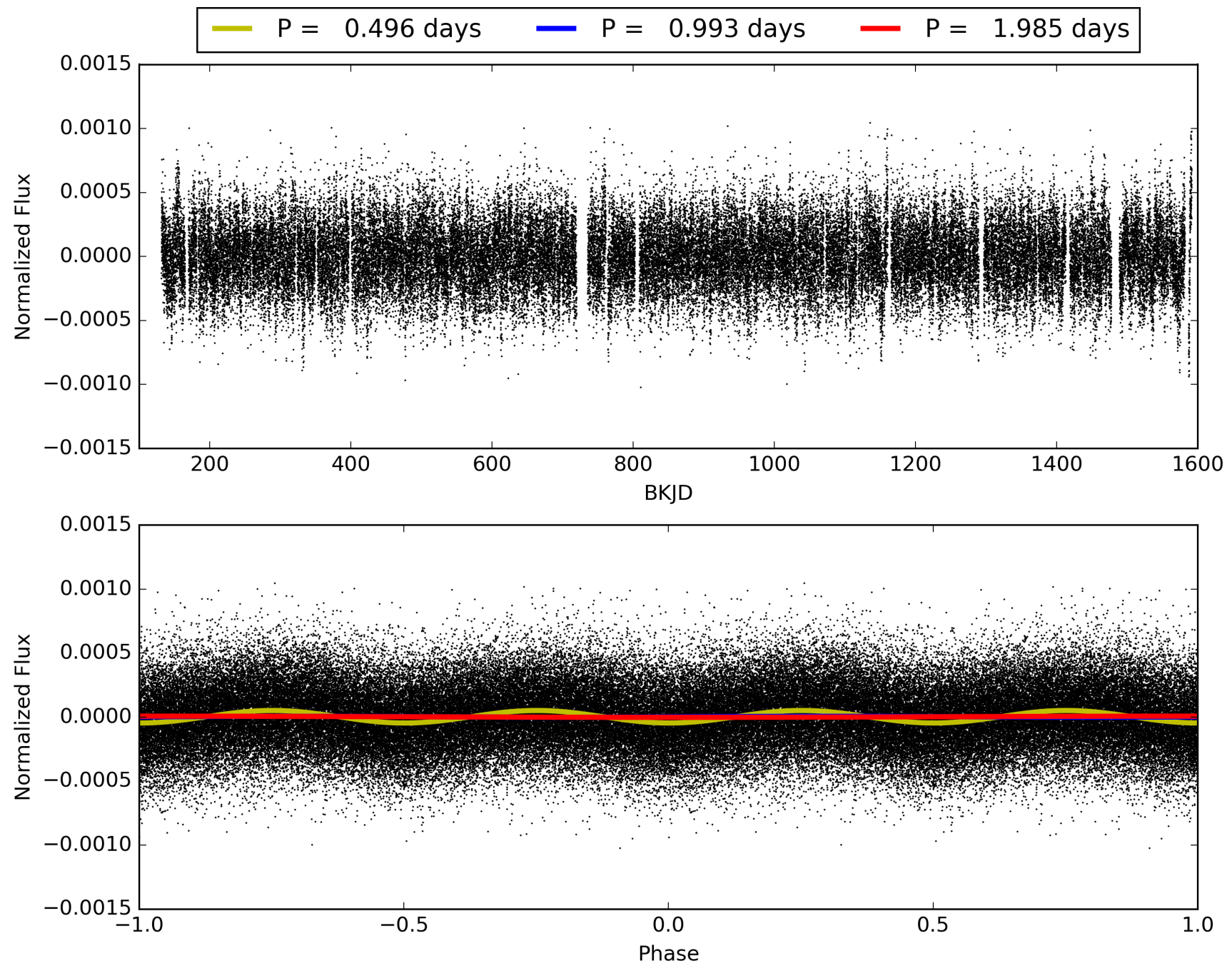
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:04:46 Z

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

# TCE 004679769-01, PDC Light Curves



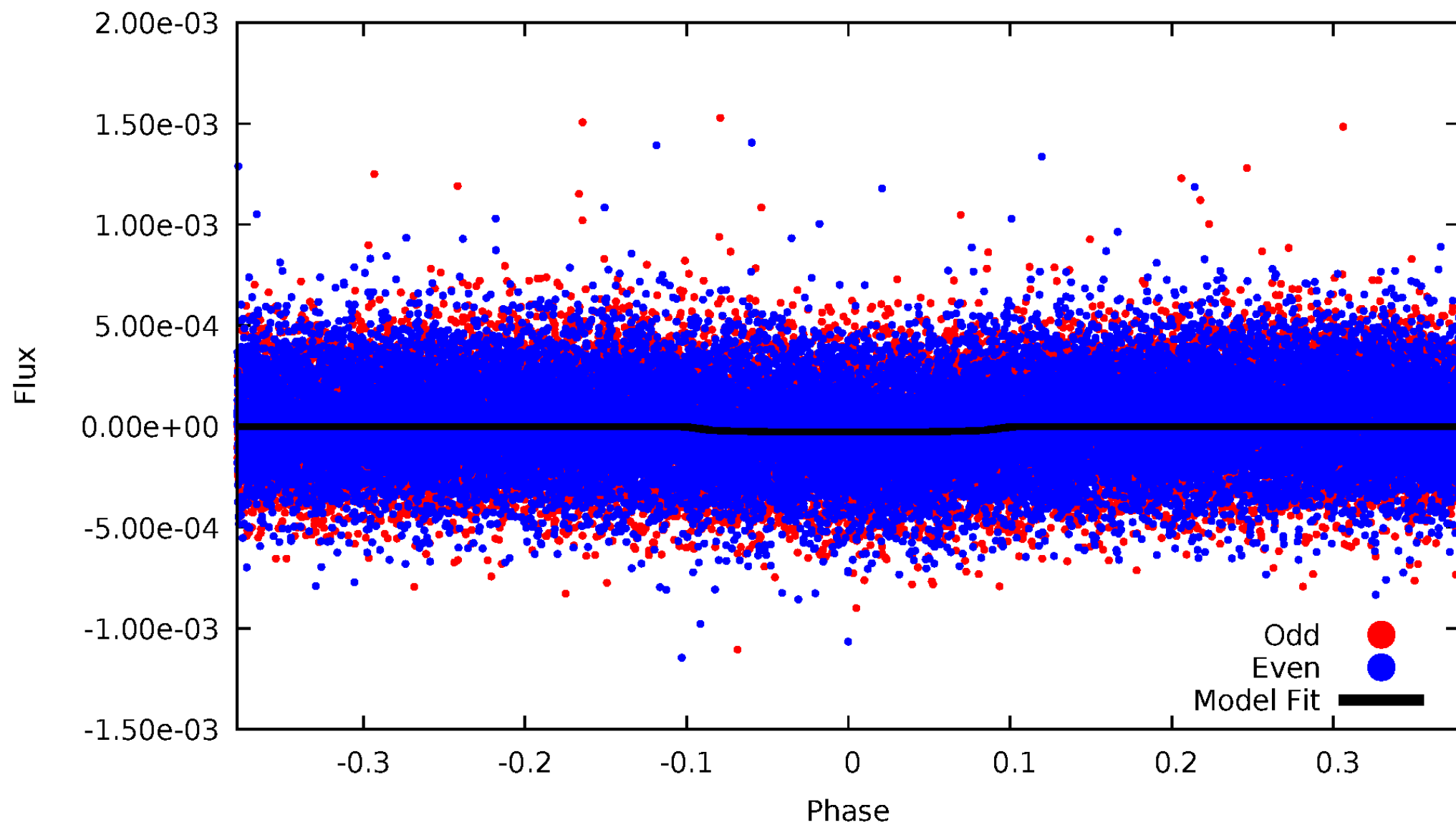
TCE 004679769-01





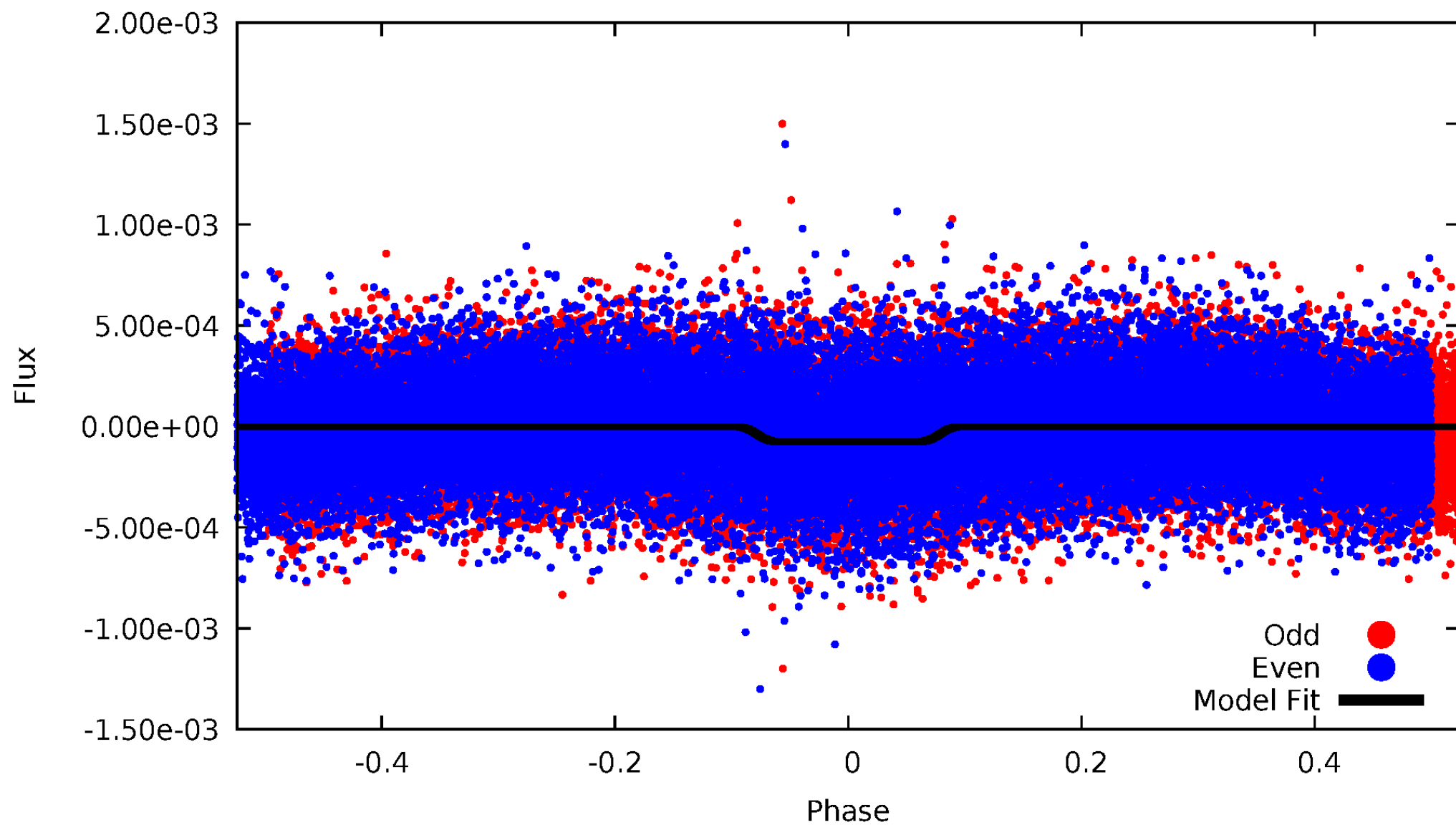
# DV Odd/Even

TCE 004679769-01

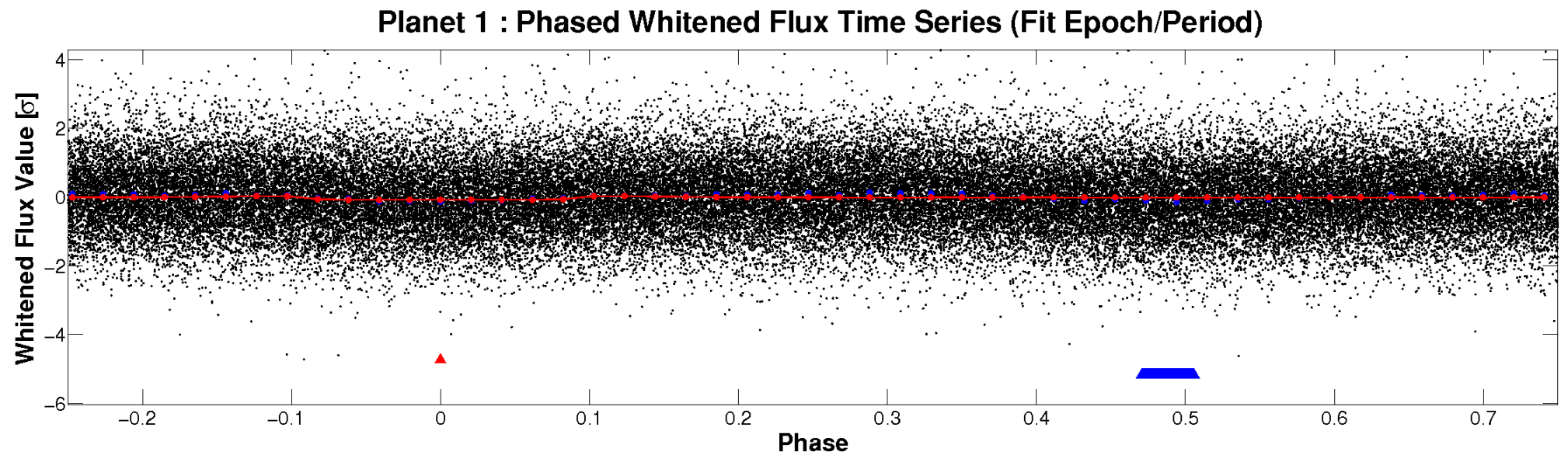
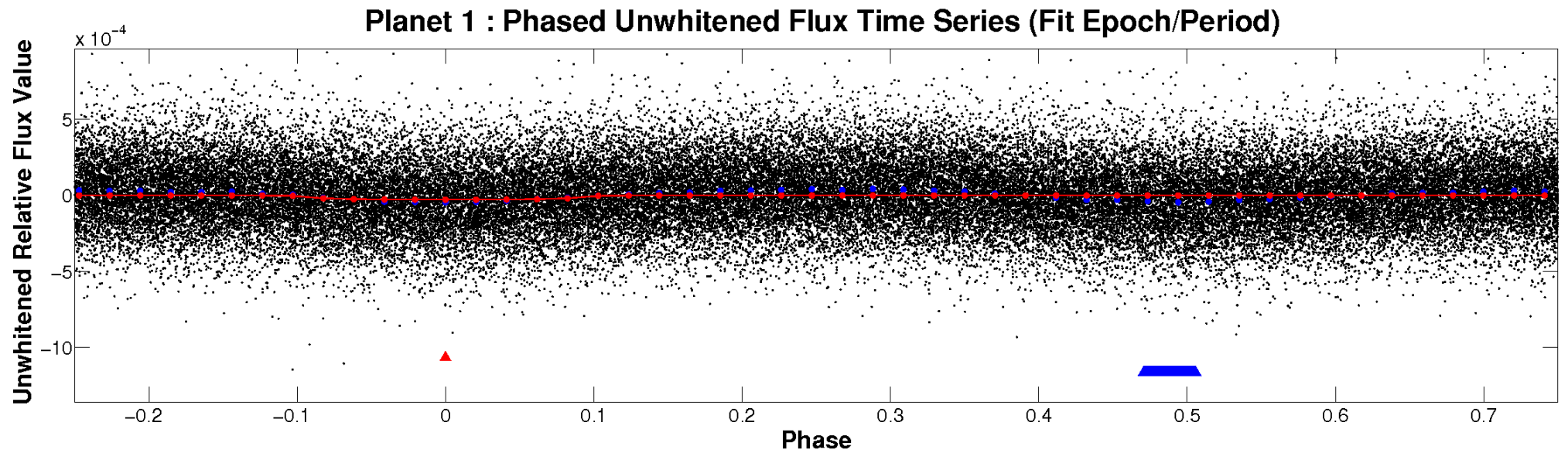


# ALT Odd/Even

TCE 004679769-01

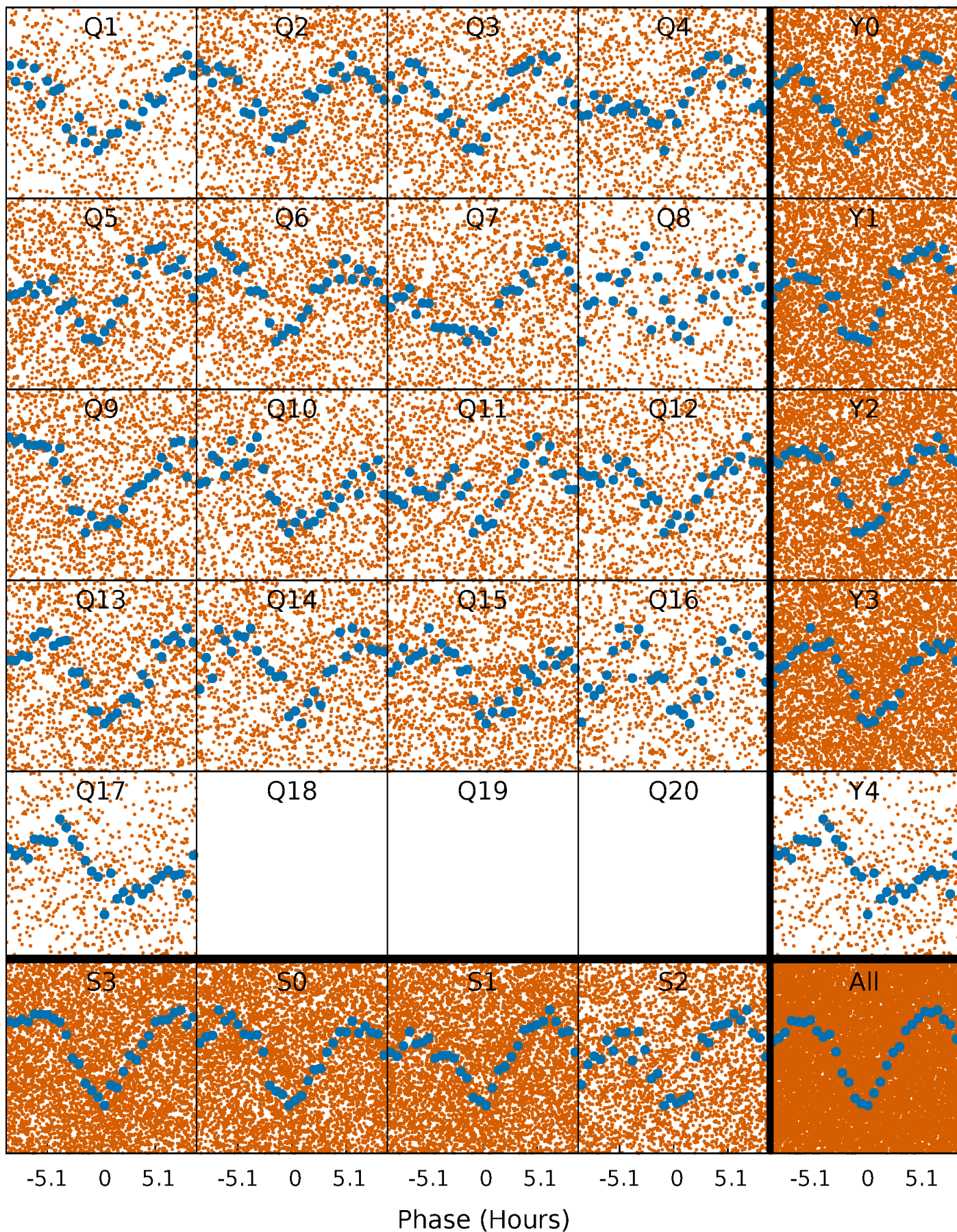


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

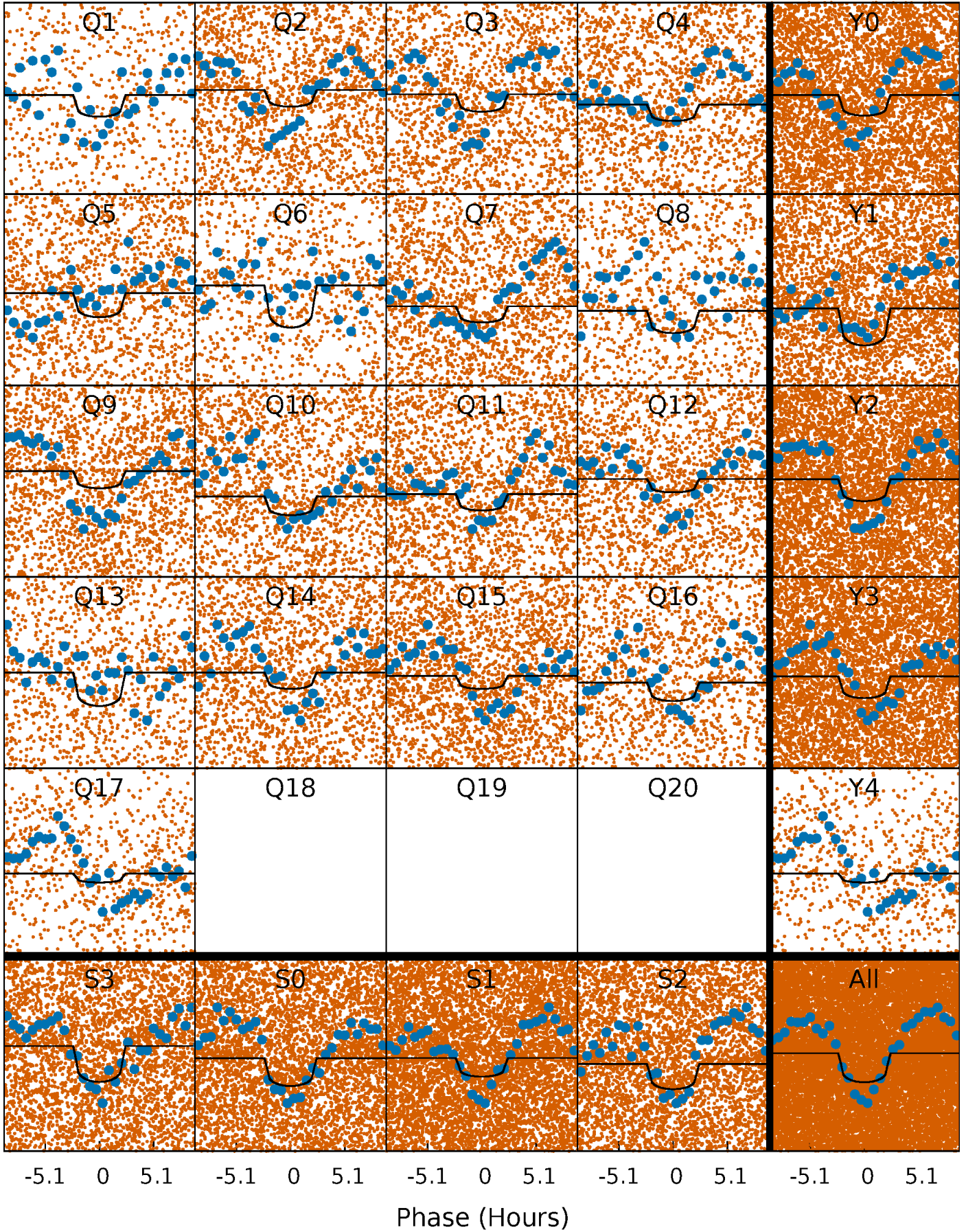
TCE 004679769-01 P= 0.992691 Days  $T_0=131.567046$  (BKJD)





# DV Quarter-Phased Transit Curves

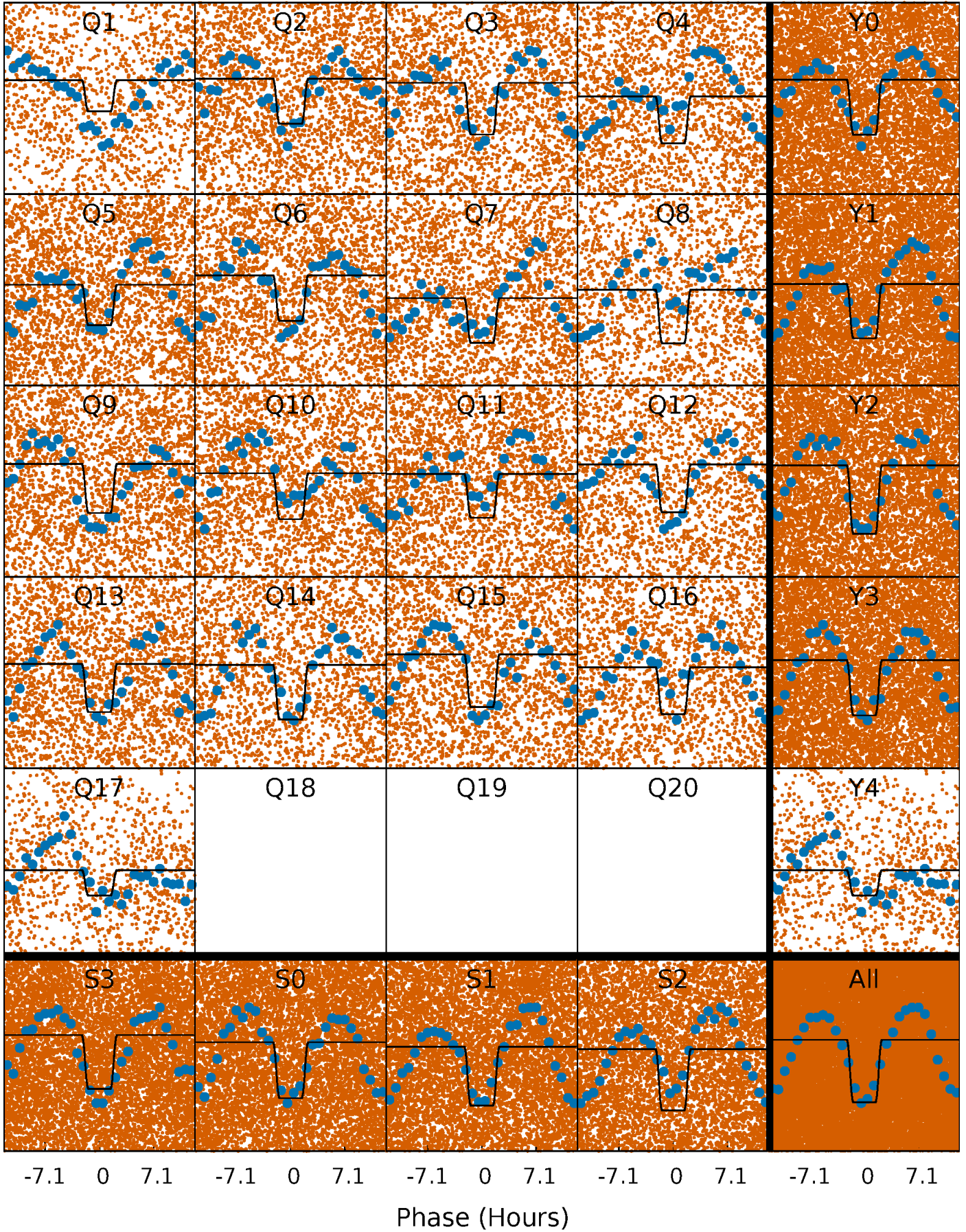
TCE 004679769-01 P= 0.992691 Days  $T_0=131.567046$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

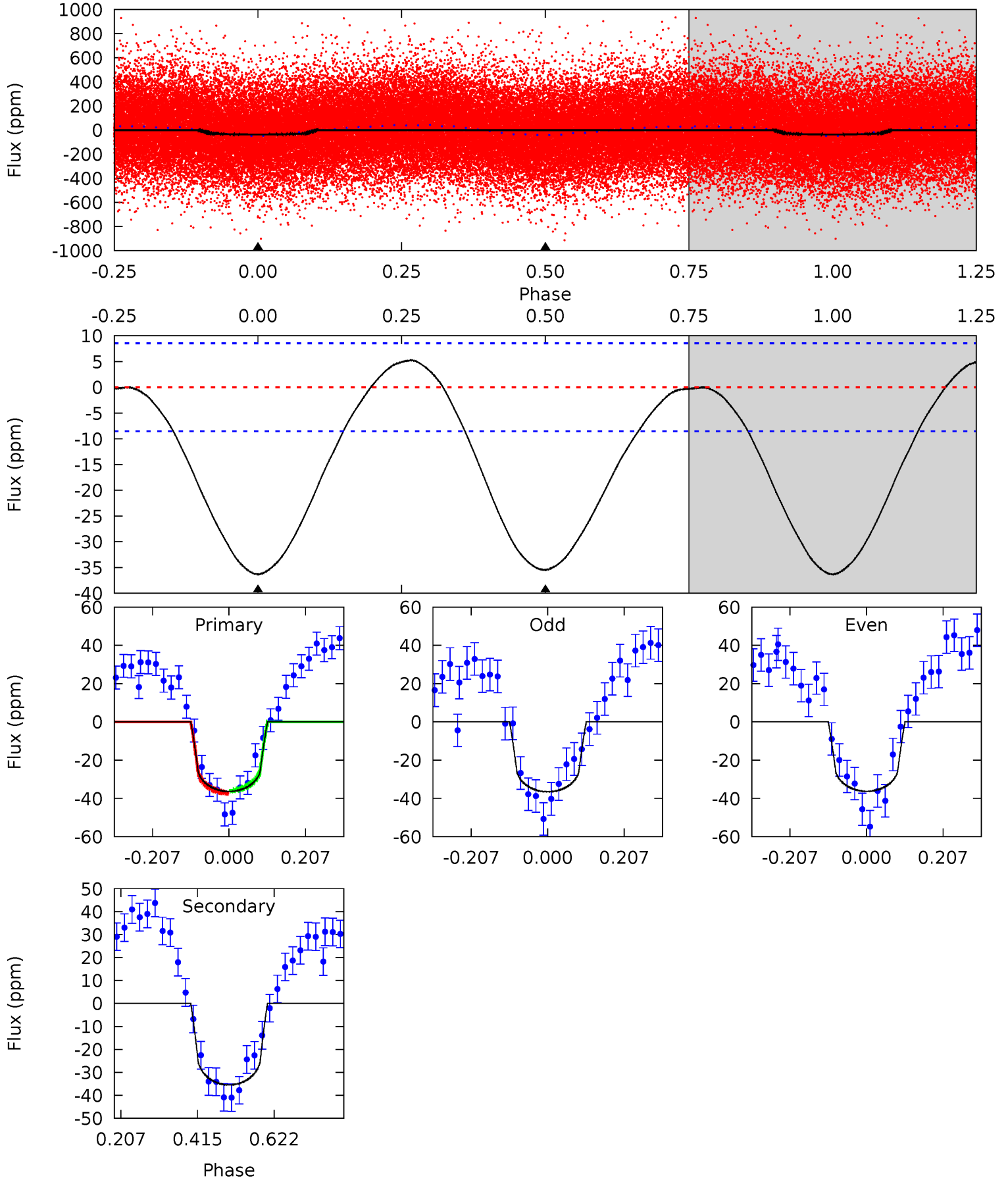
TCE 004679769-01 P= 0.992740 Days  $T_0=131.530631$  (BKJD)



# DV Model-Shift Uniqueness Test

004679769-01, P = 0.992691 Days, E = 130.574355 Days

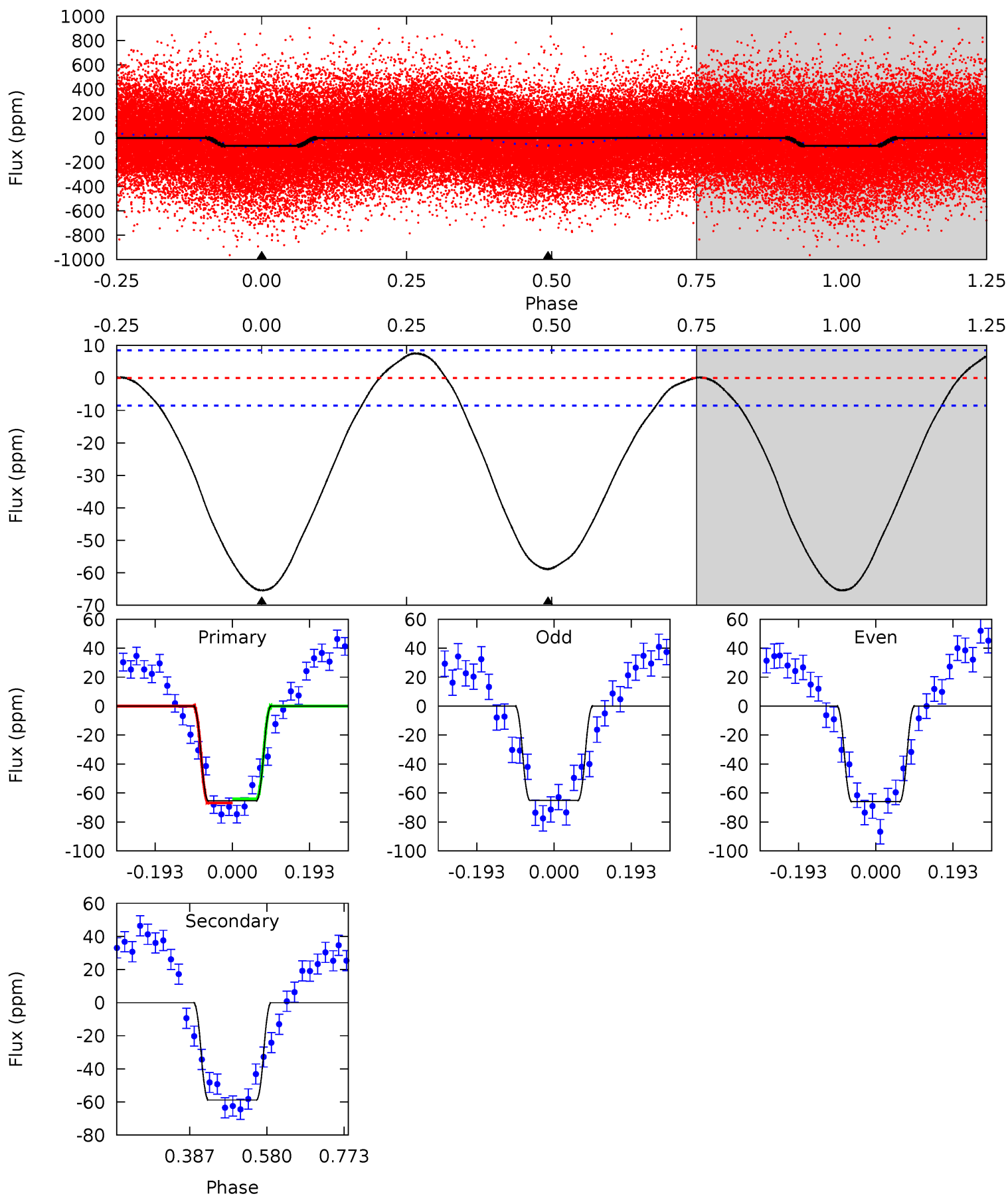
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.8	18.3	0	0	4.41	1.26	1.29	18.8	18.8	18.3	18.3	0.06	1.11	0.13	0.32



# Alt Model-Shift Uniqueness Test

004679769-01, P = 0.992740 Days, E = 130.537891 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
34.0	30.6	0	0	4.42	1.30	2.10	34.0	34.0	30.6	30.6	0.25	1.10	0.10	0.73





### Stellar Parameters For KIC 004679769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6596^{+160}_{-206}$	$4.224^{+0.175}_{-0.175}$	$-0.460^{+0.250}_{-0.300}$	$1.326^{+0.354}_{-0.257}$	$1.074^{+0.175}_{-0.131}$	$0.648^{+0.570}_{-0.299}$
	+2%/-3%	+4%/-4%	+54%/-65%	+27%/-19%	+16%/-12%	+88%/-46%
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 004679769-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-35 \pm 2$	$0.74^{+0.52}_{-0.41}$	$3312^{+240}_{-204}$	$7142^{+5283}_{-1698}$	$14^{+57}_{-9}$
Alt.	$-59 \pm 2$	$1.26^{+0.54}_{-0.55}$	$3300^{+238}_{-210}$	$6163^{+2058}_{-955}$	$8.155^{+17.405}_{-4.164}$

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

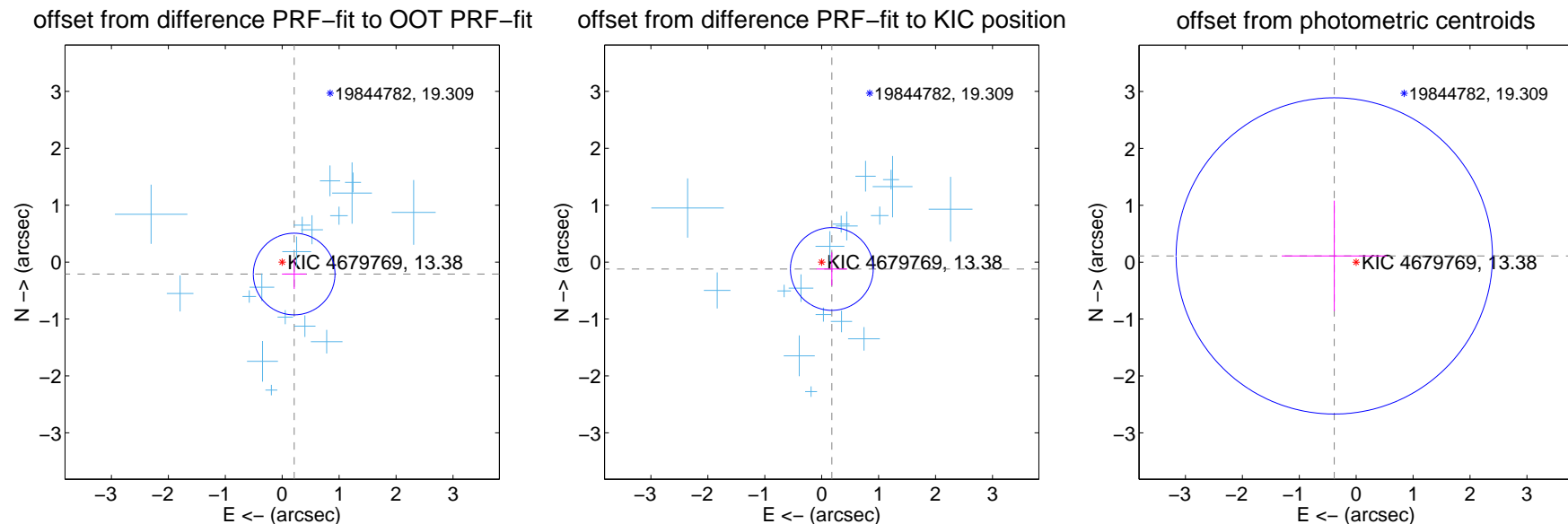
## DV Centroid Data

Supplemental centroid analysis for 004679769-01. Kepler magnitude: 13.38. Transit SNR 8.71

There are 17 quarters with good PRF difference image offsets

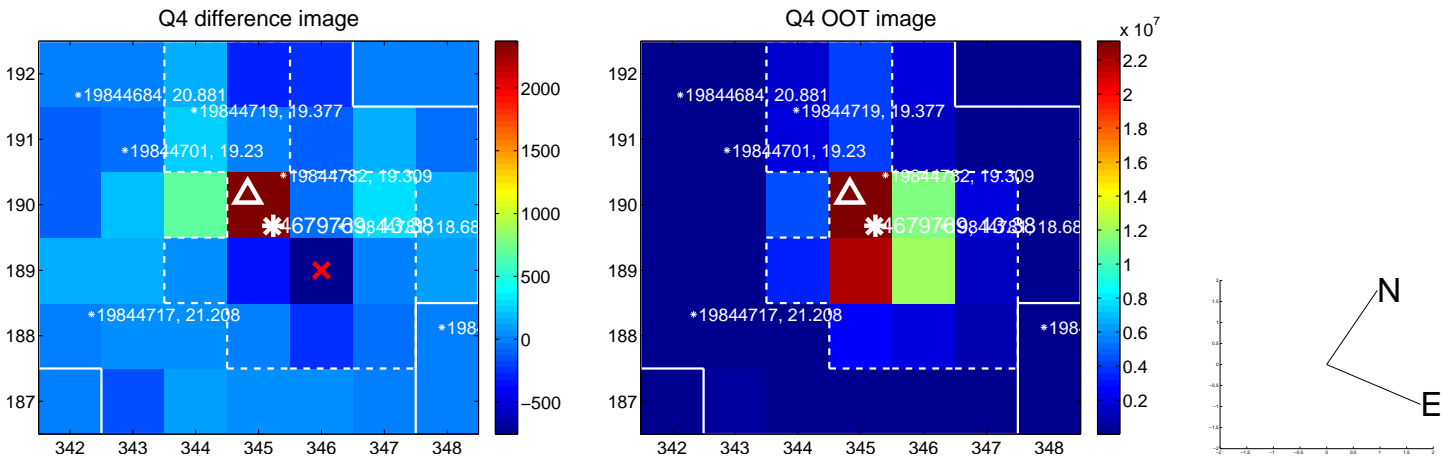
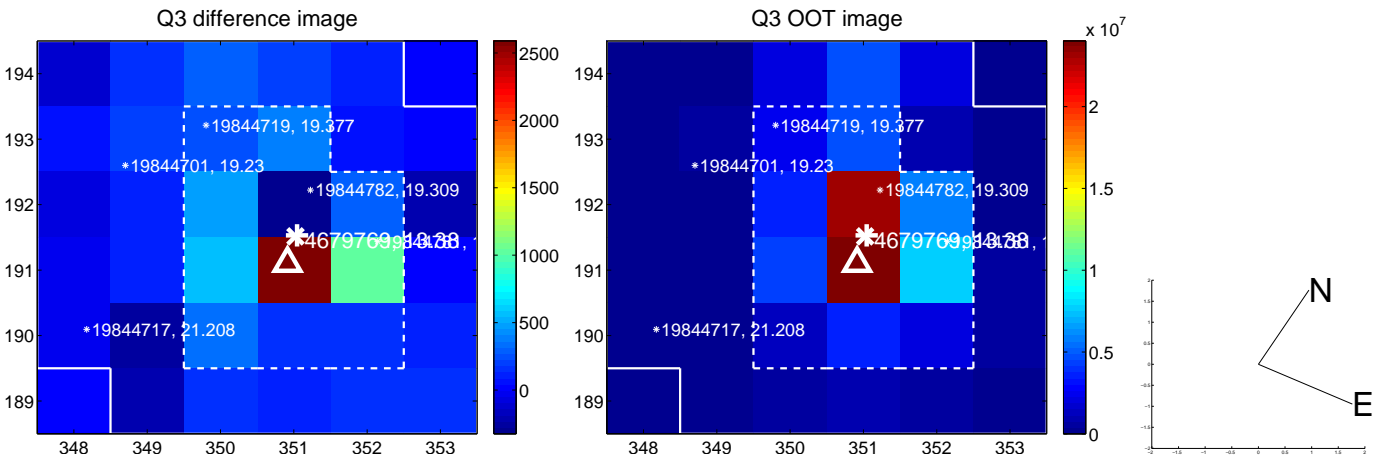
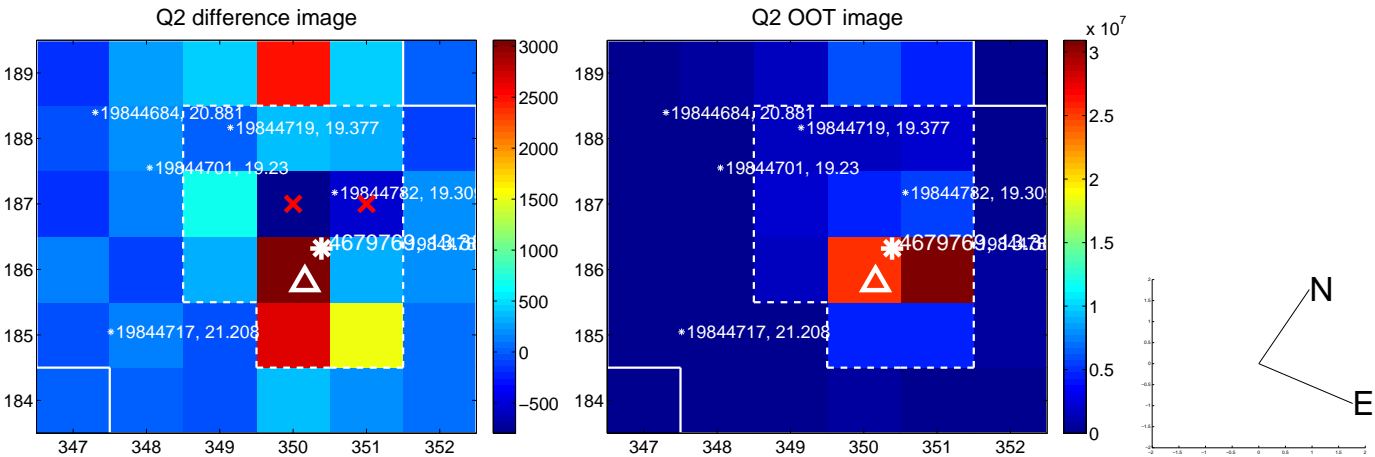
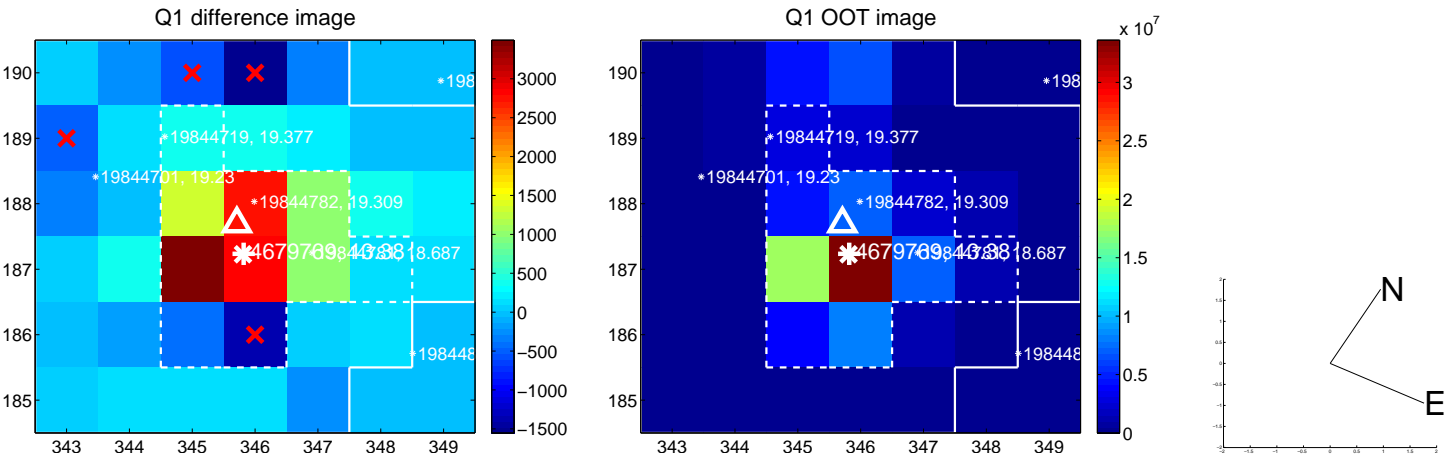
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.296 \pm 0.239$	1.24	$-0.210 \pm 0.214$	$-0.210 \pm 0.261$
PRF-fit source offset from KIC position	$0.215 \pm 0.242$	0.89	$-0.178 \pm 0.269$	$-0.121 \pm 0.291$
photometric centroid source offset	$0.40 \pm 0.93$	0.43	$0.38 \pm 0.92$	$0.11 \pm 0.97$

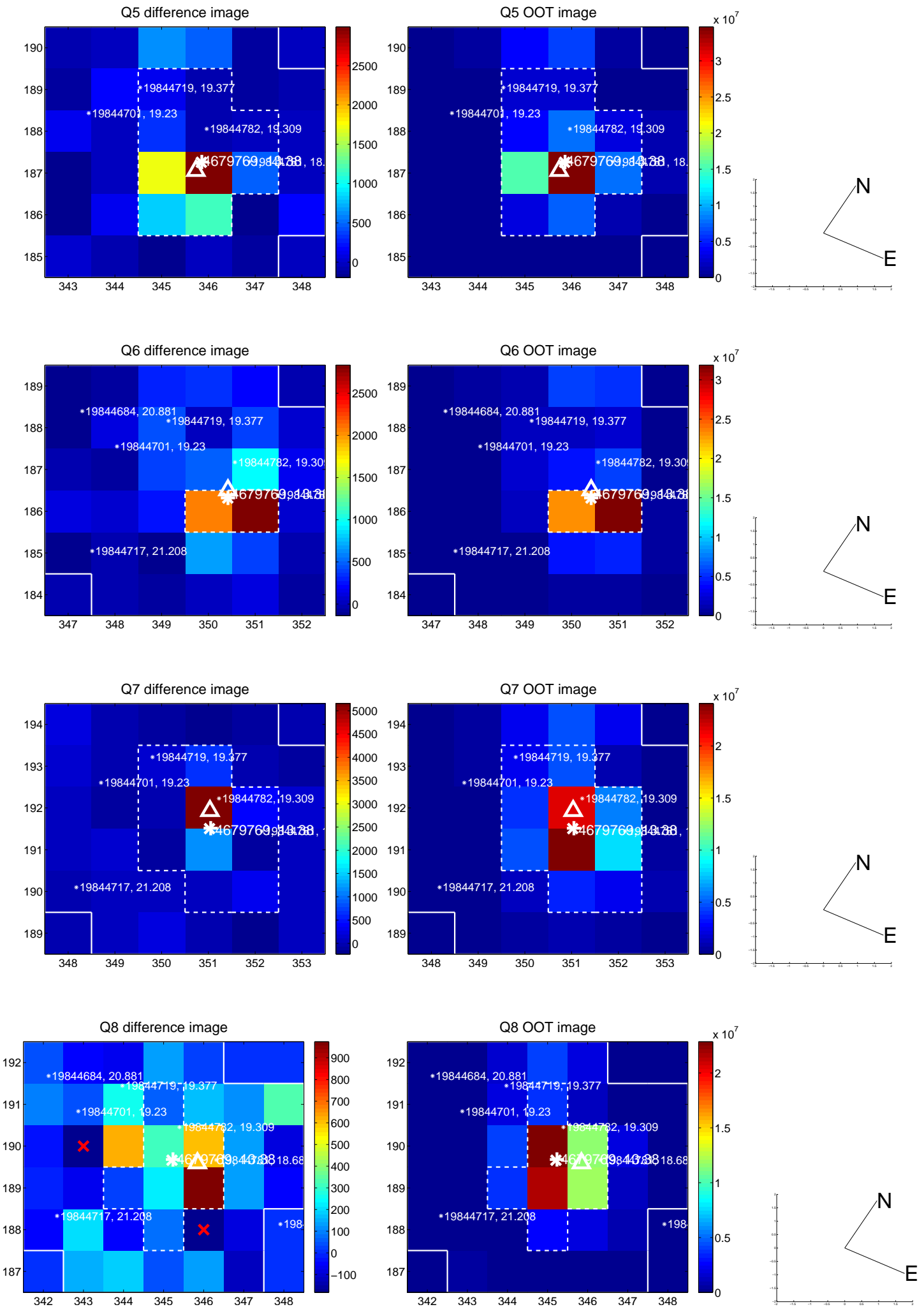


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

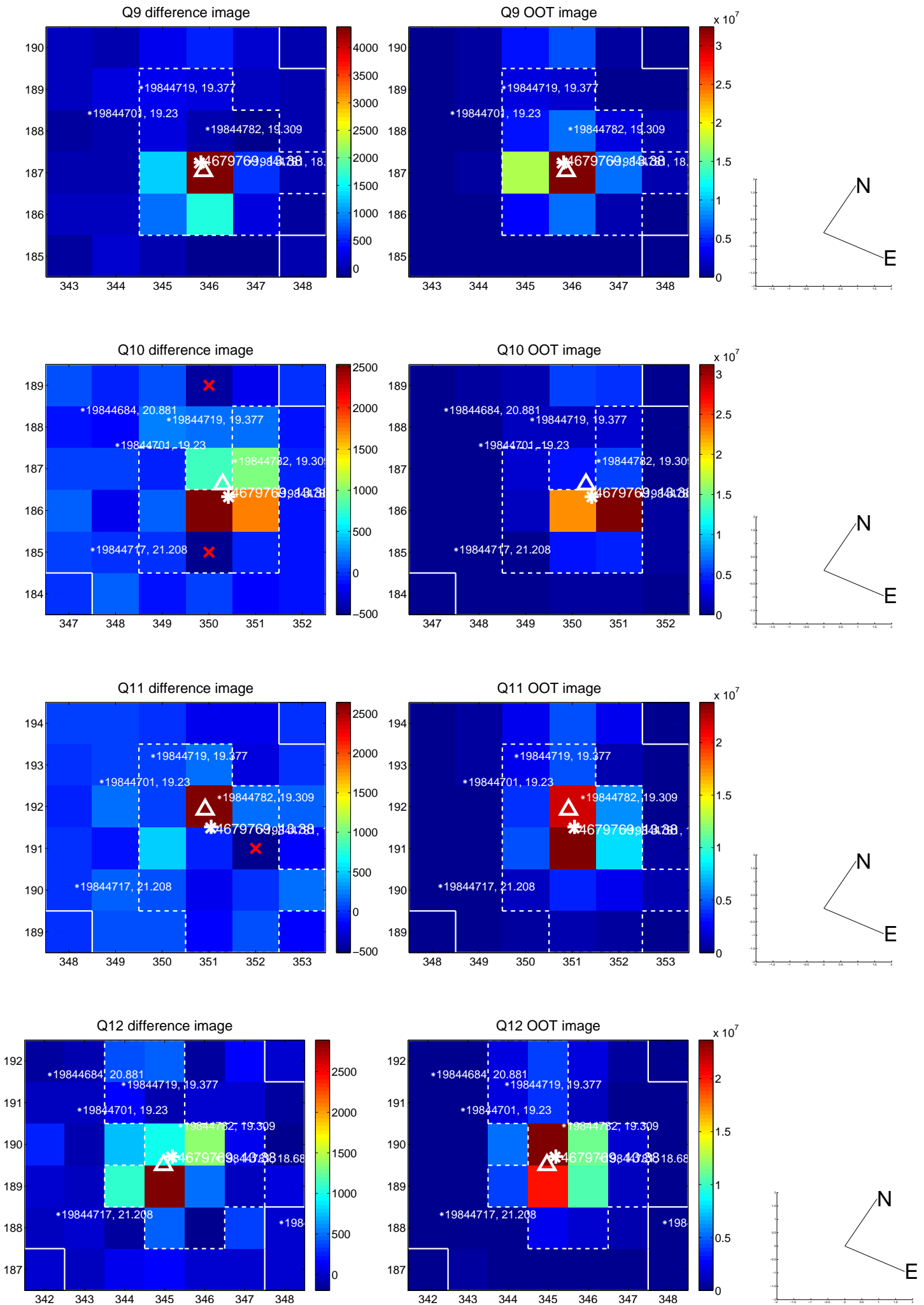


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

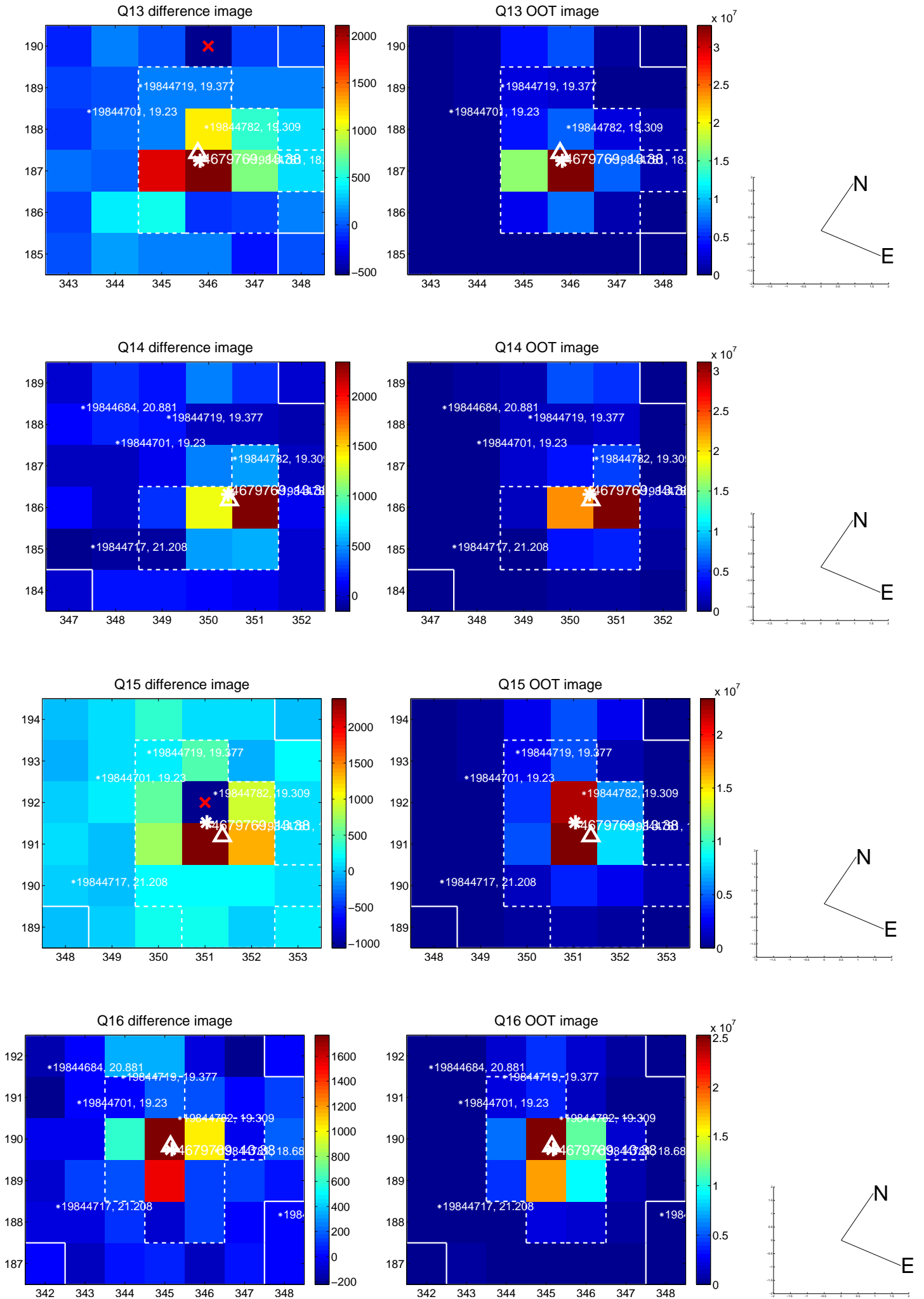




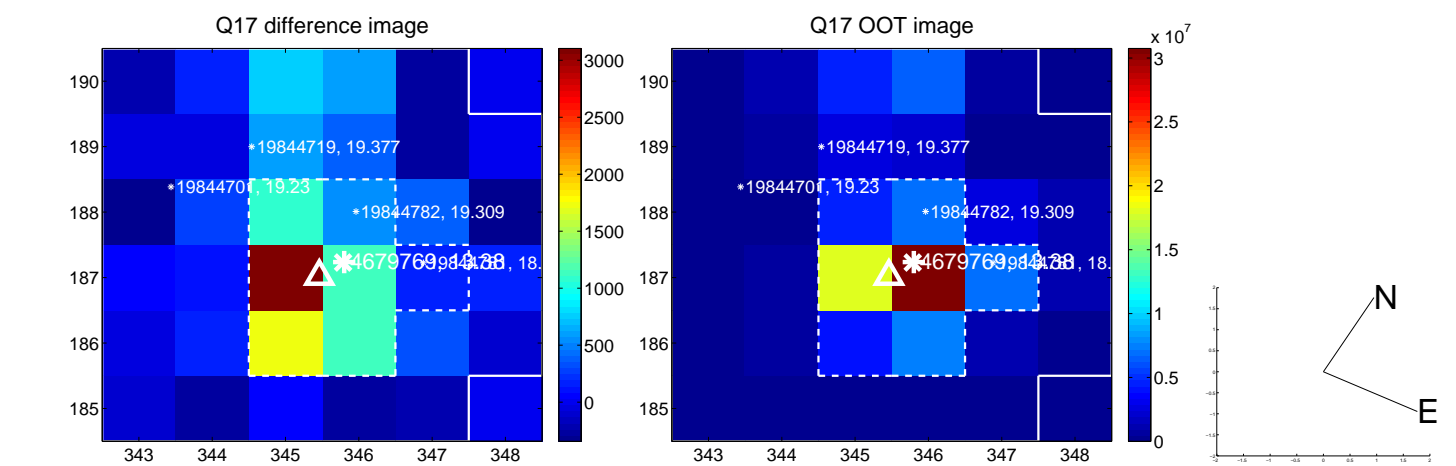
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



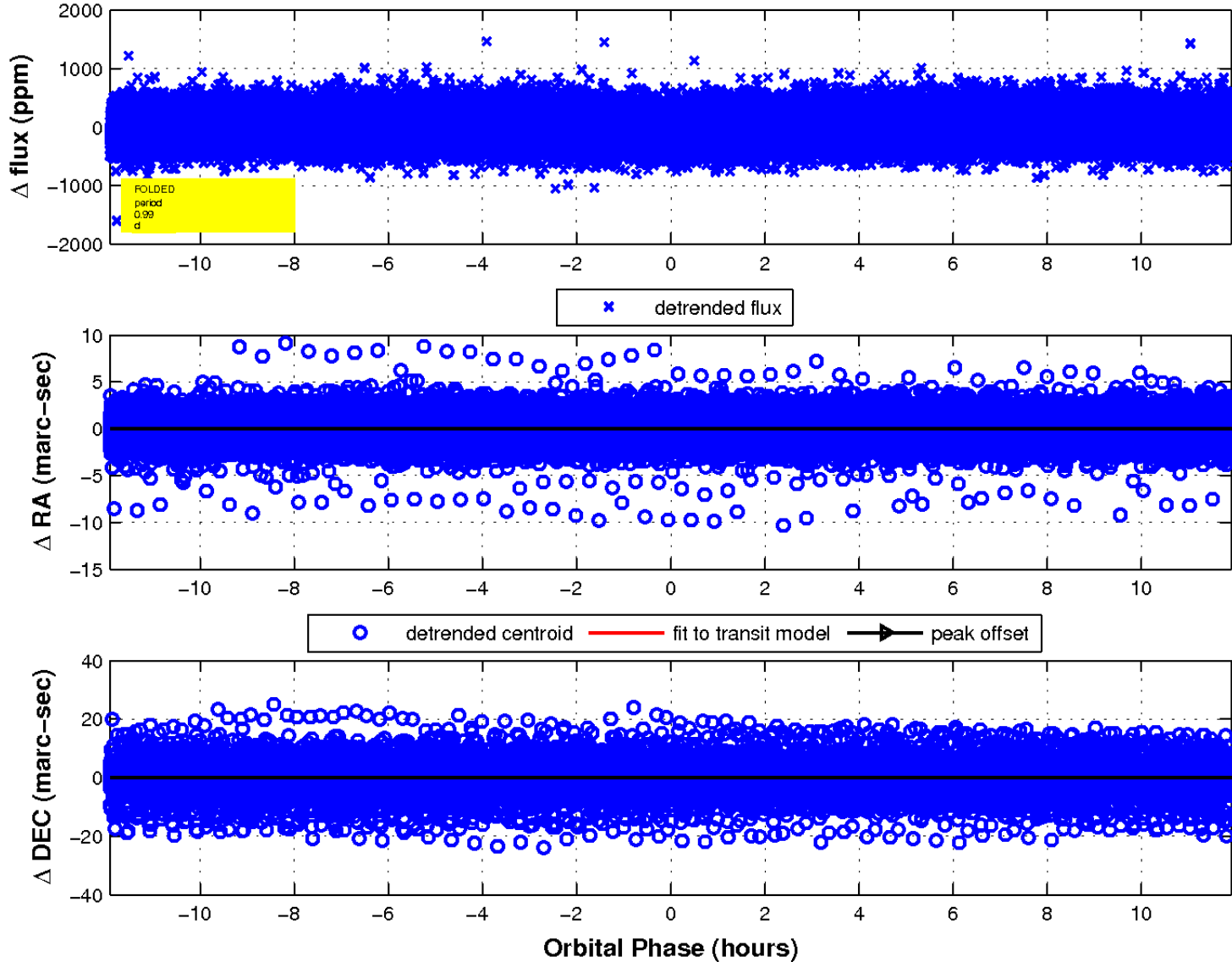
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

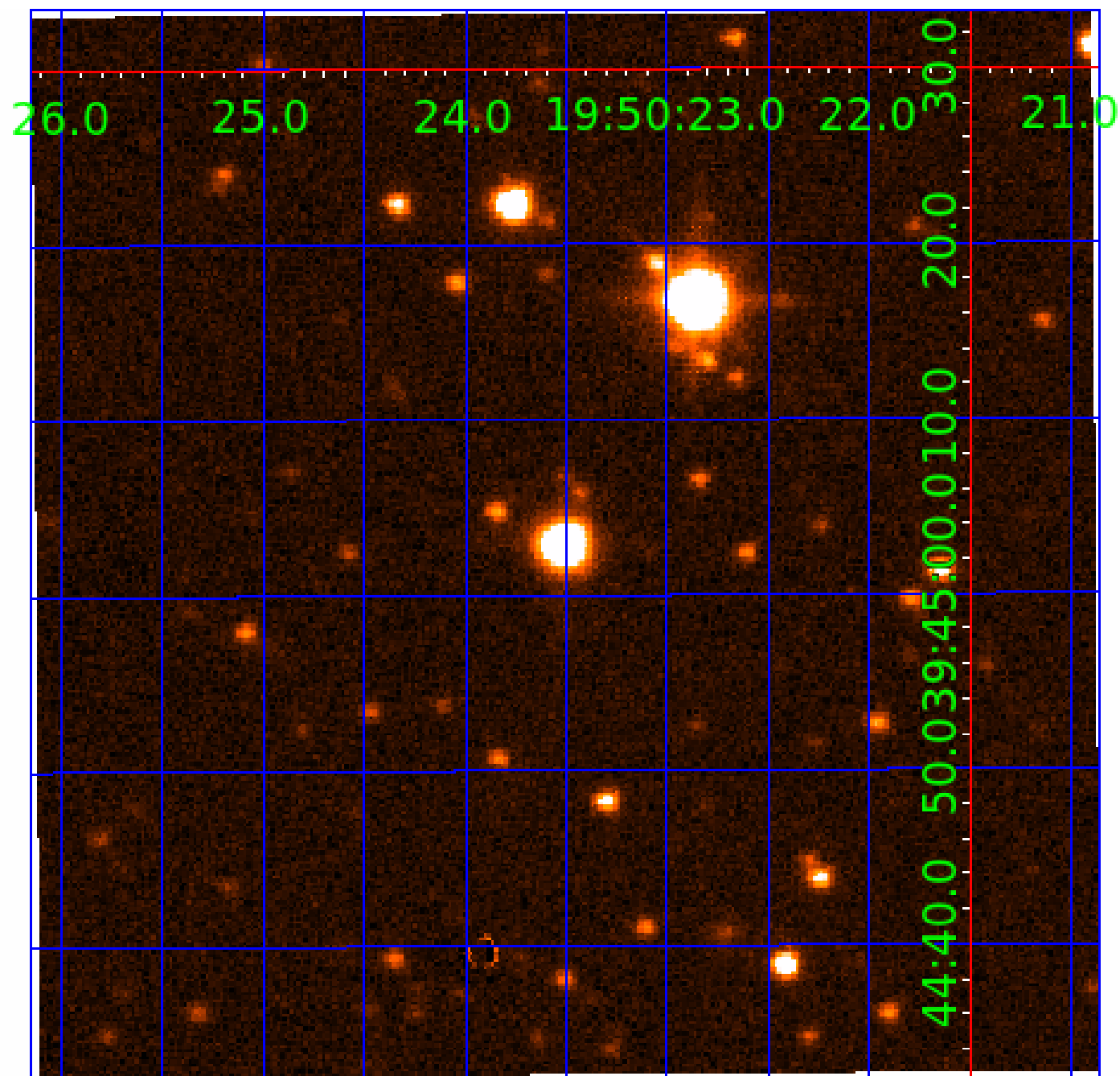


### fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 004679769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004679769-01	OBS	No	0.992691	131.567046	27.6	4.503	9.8	8.7	1.33	6596	0.70	7492.51
004679769-02	OBS	No	0.992715	132.034435	34.9	5.893	11.6	12.8	1.33	6596	0.92	7492.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004679769-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
004679769-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

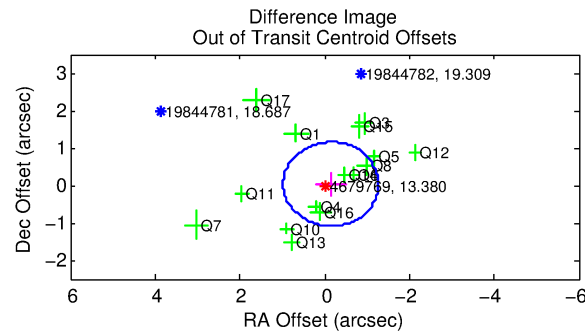
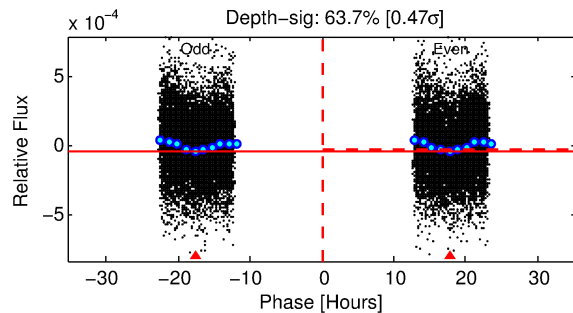
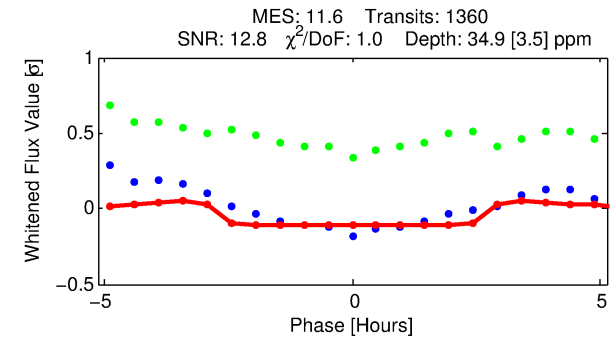
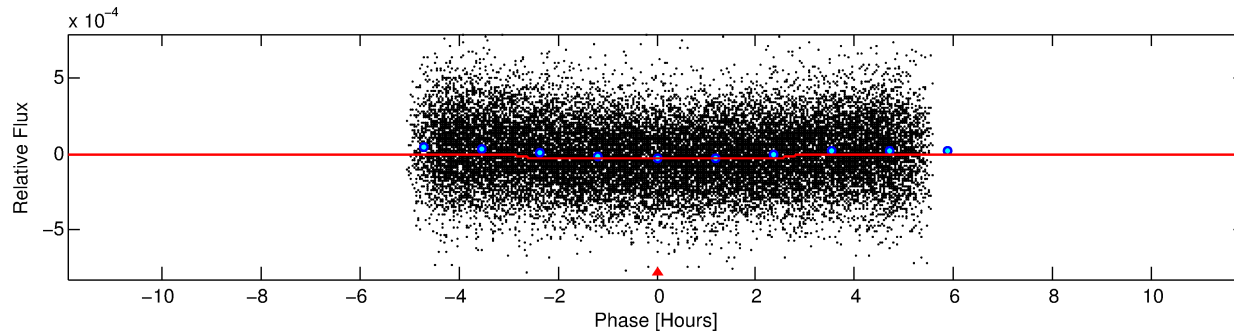
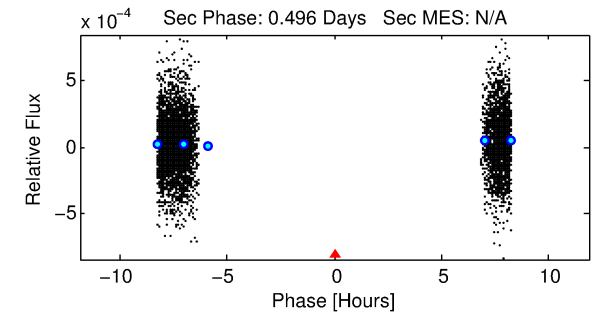
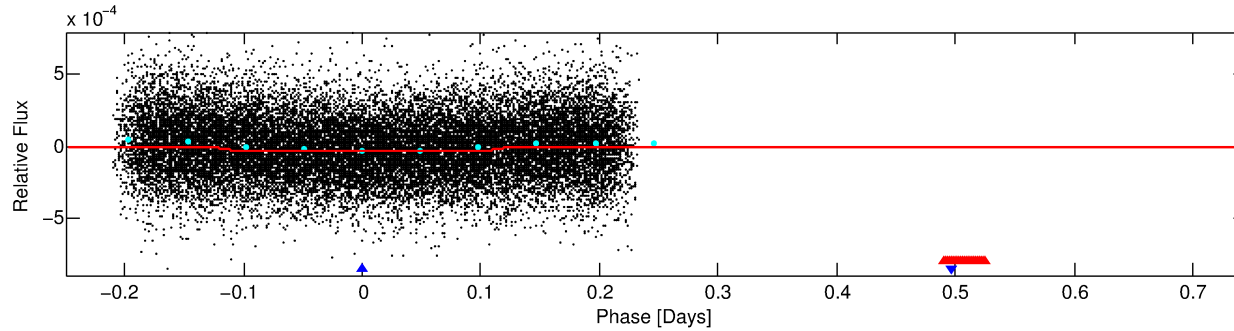
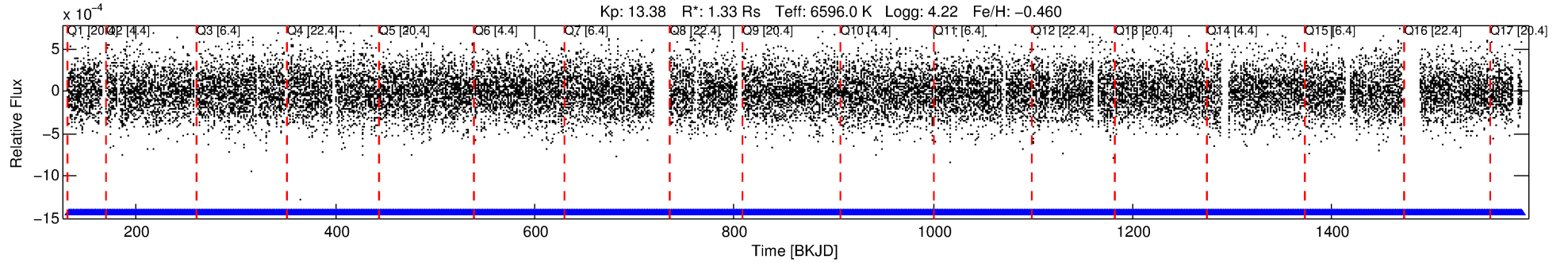
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004679769-02

No Significant Match Found

# DV One-Page Summary

KIC: 4679769 Candidate: 2 of 2 Period: 0.993 d



## DV Fit Results:

Period = 0.99271 [0.00001] d  
Epoch = 132.0344 [0.0032] BKJD  
Rp/R\* = 0.0063 [0.0016]  
a/R\* = 1.10 [0.28]  
b = 0.90 [0.29]  
Seff = 7492.27 [2589.41]  
Teq = 2372 [205] K  
Rp = 0.92 [0.33] Re  
a = 0.0199 [0.0044] AU

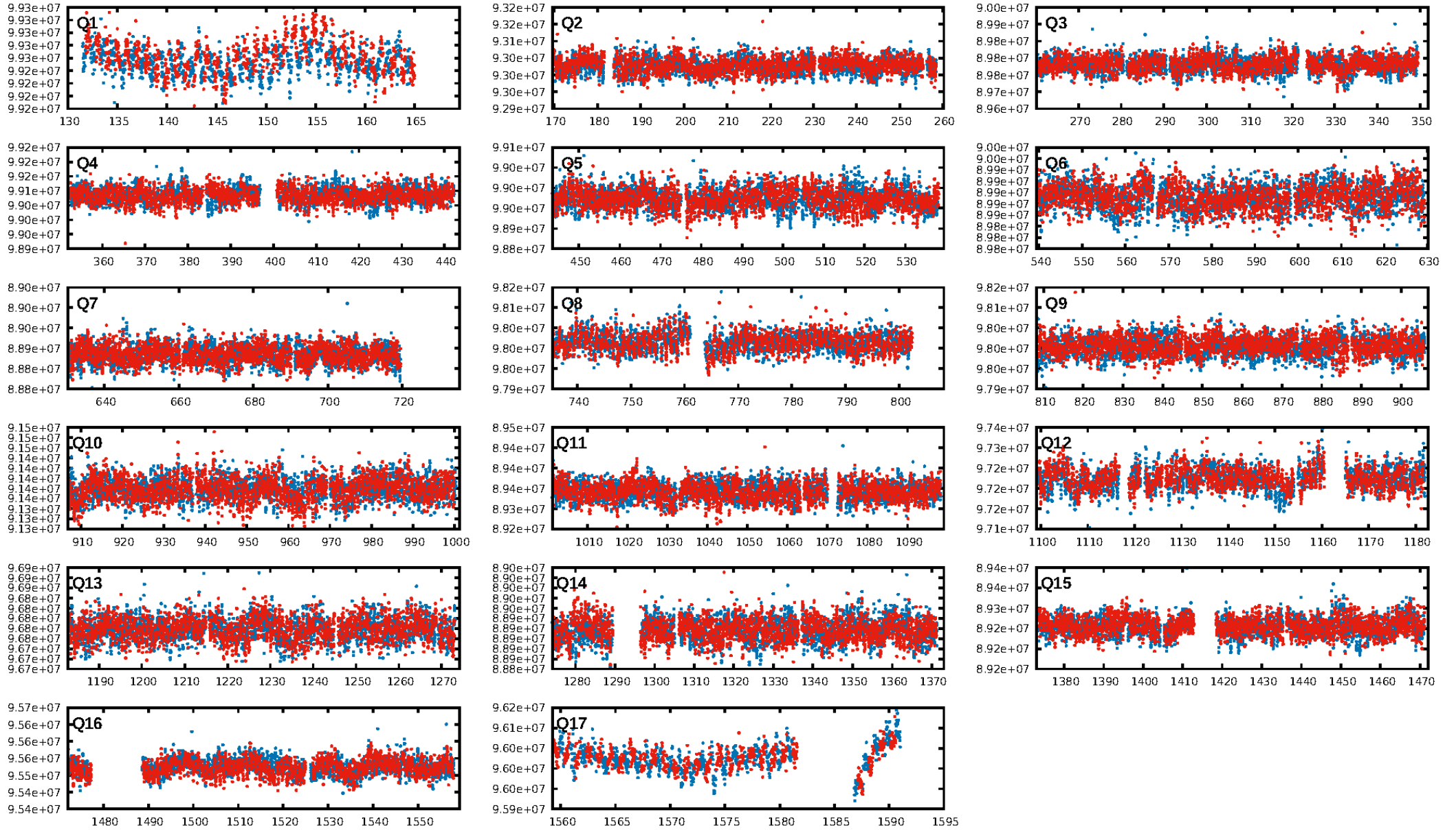
## DV Diagnostic Results:

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 [1299/1299]  
GhostDiagnostic-chr: 1.232  
Centroid-sig: 23.6%  
Centroid-so: 0.612 arcsec [0.93σ]  
OotOffset-rm: 0.149 arcsec [0.40σ]  
KicOffset-rm: 0.145 arcsec [0.39σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.87 [13/15]  
DiffImageOverlap-fno: 0.00 [0/17]

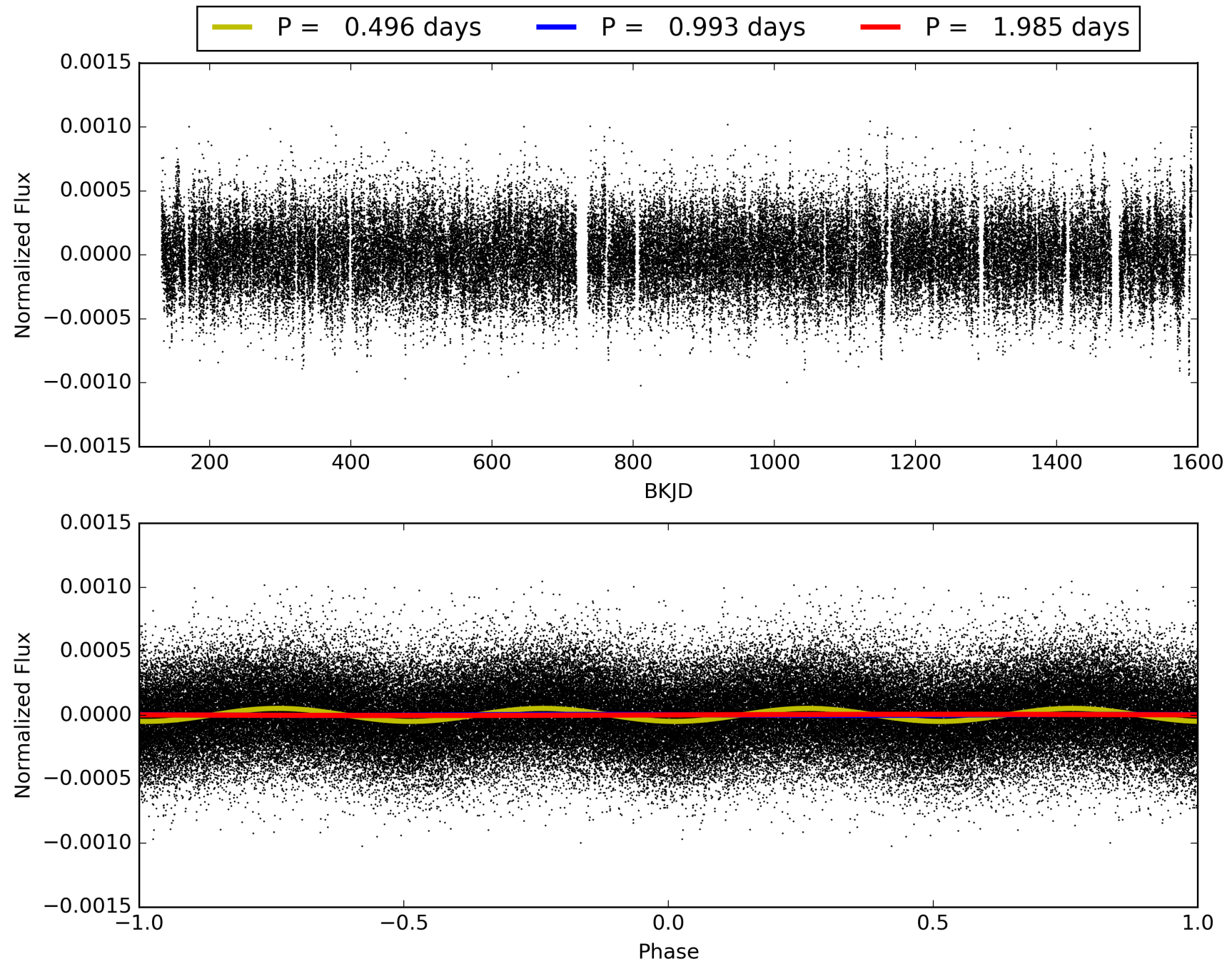
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:04:59 Z

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

# TCE 004679769-02, PDC Light Curves



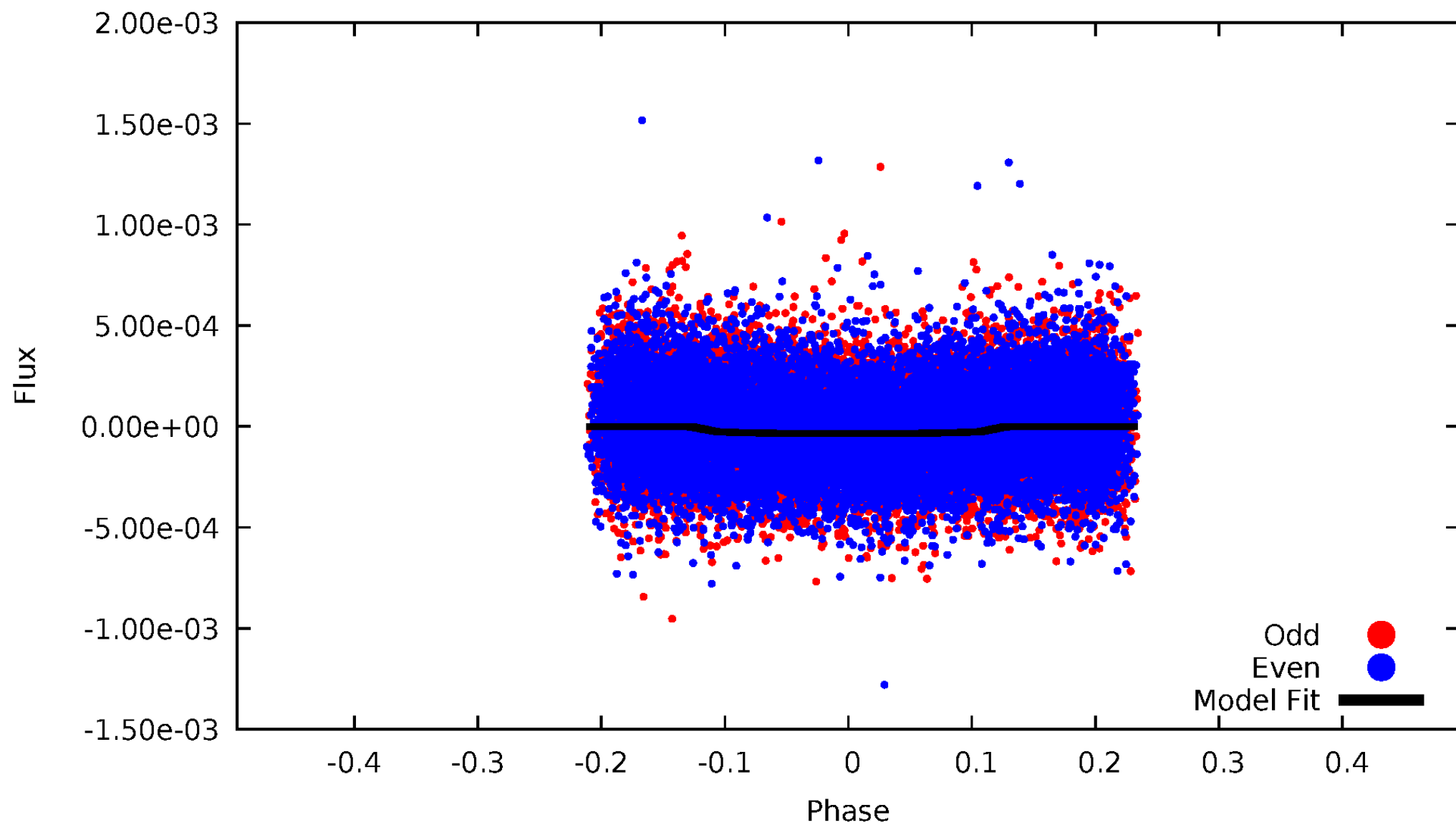
TCE 004679769-02





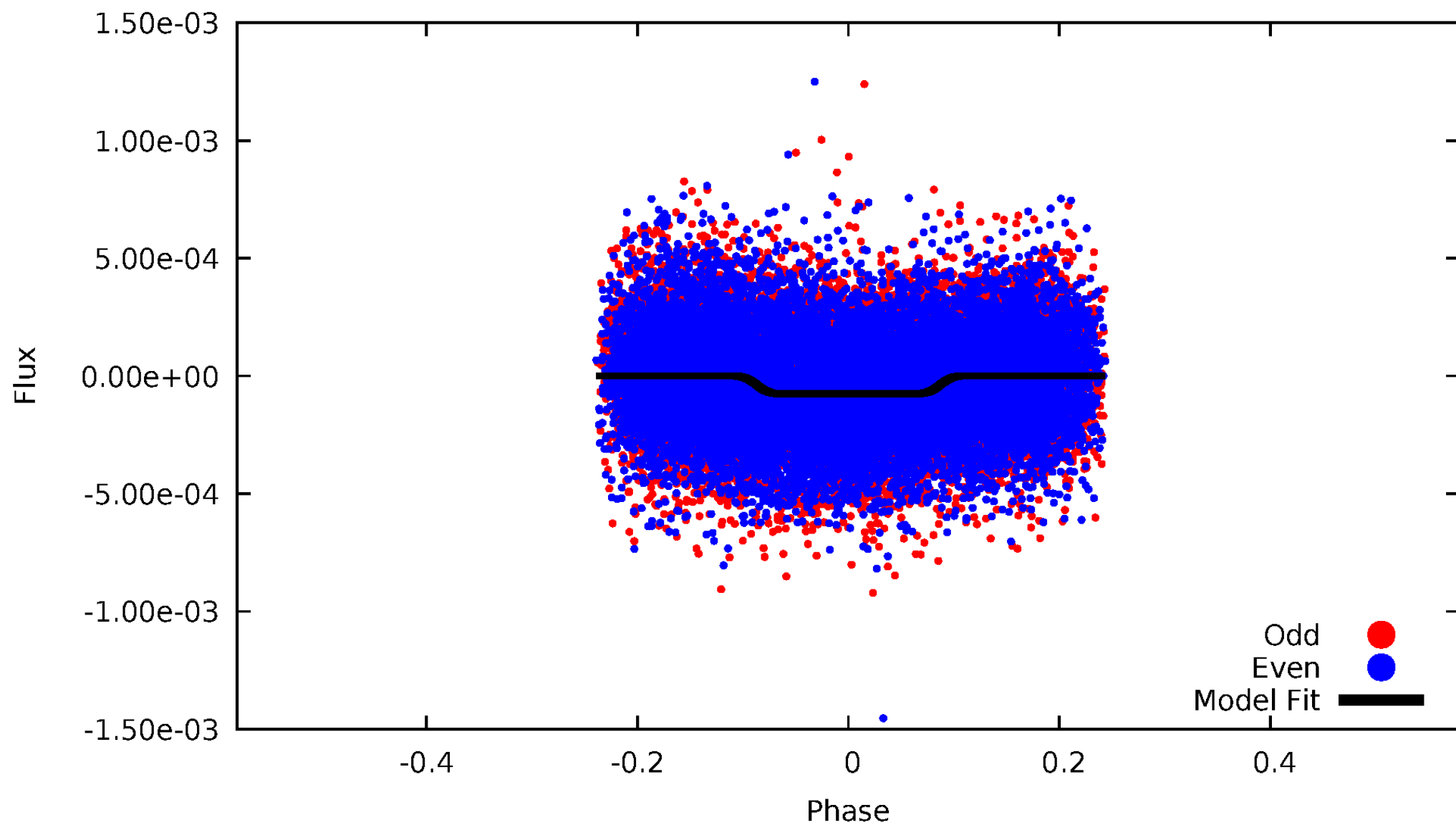
# DV Odd/Even

TCE 004679769-02



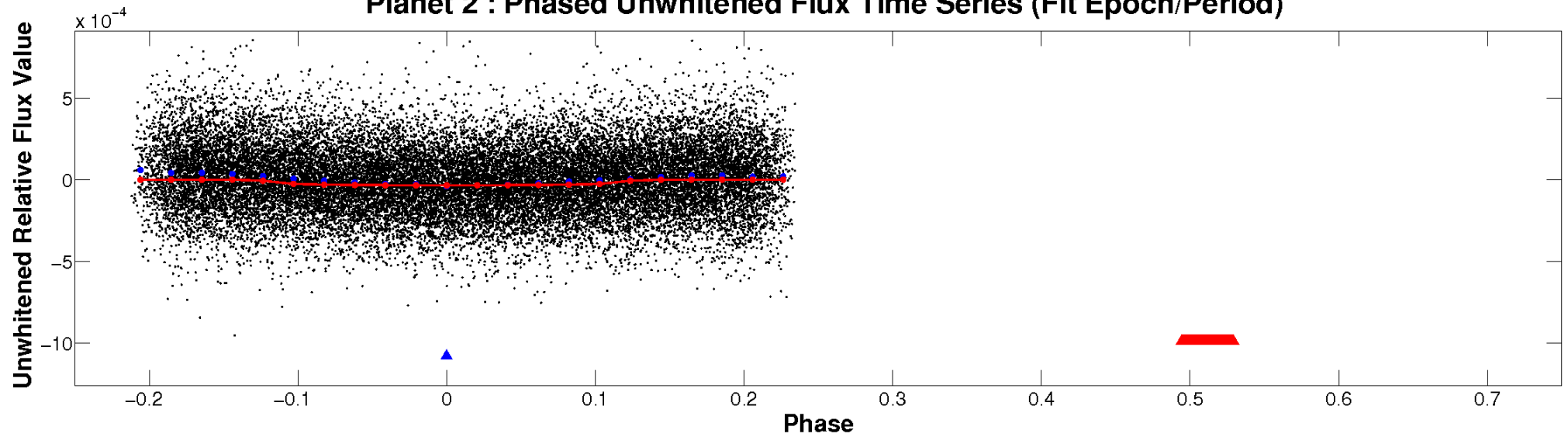
# ALT Odd/Even

TCE 004679769-02

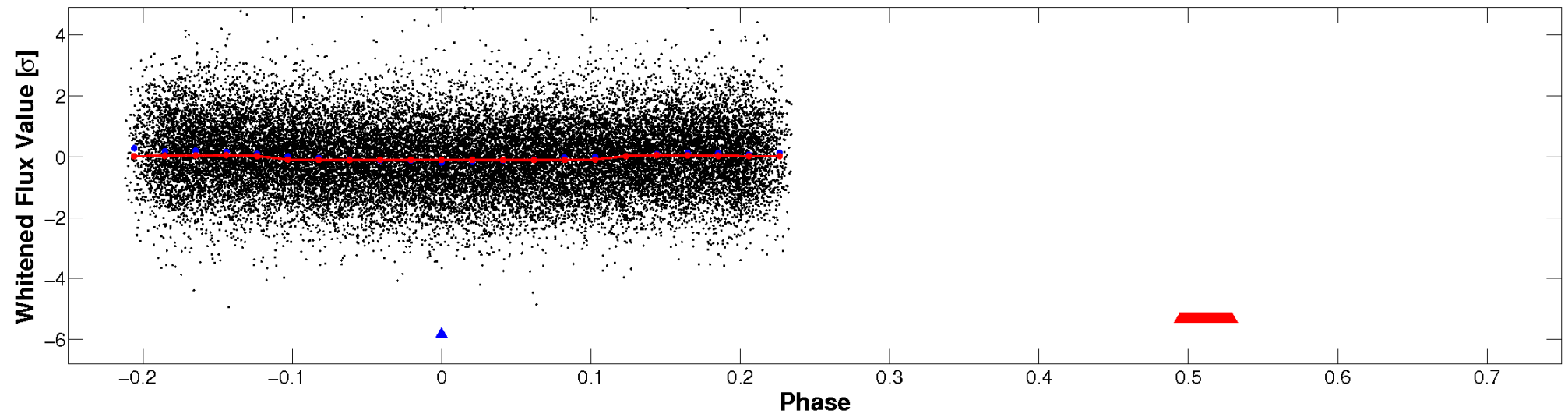


# Non-Whitened Vs. Whitened Light Curve

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

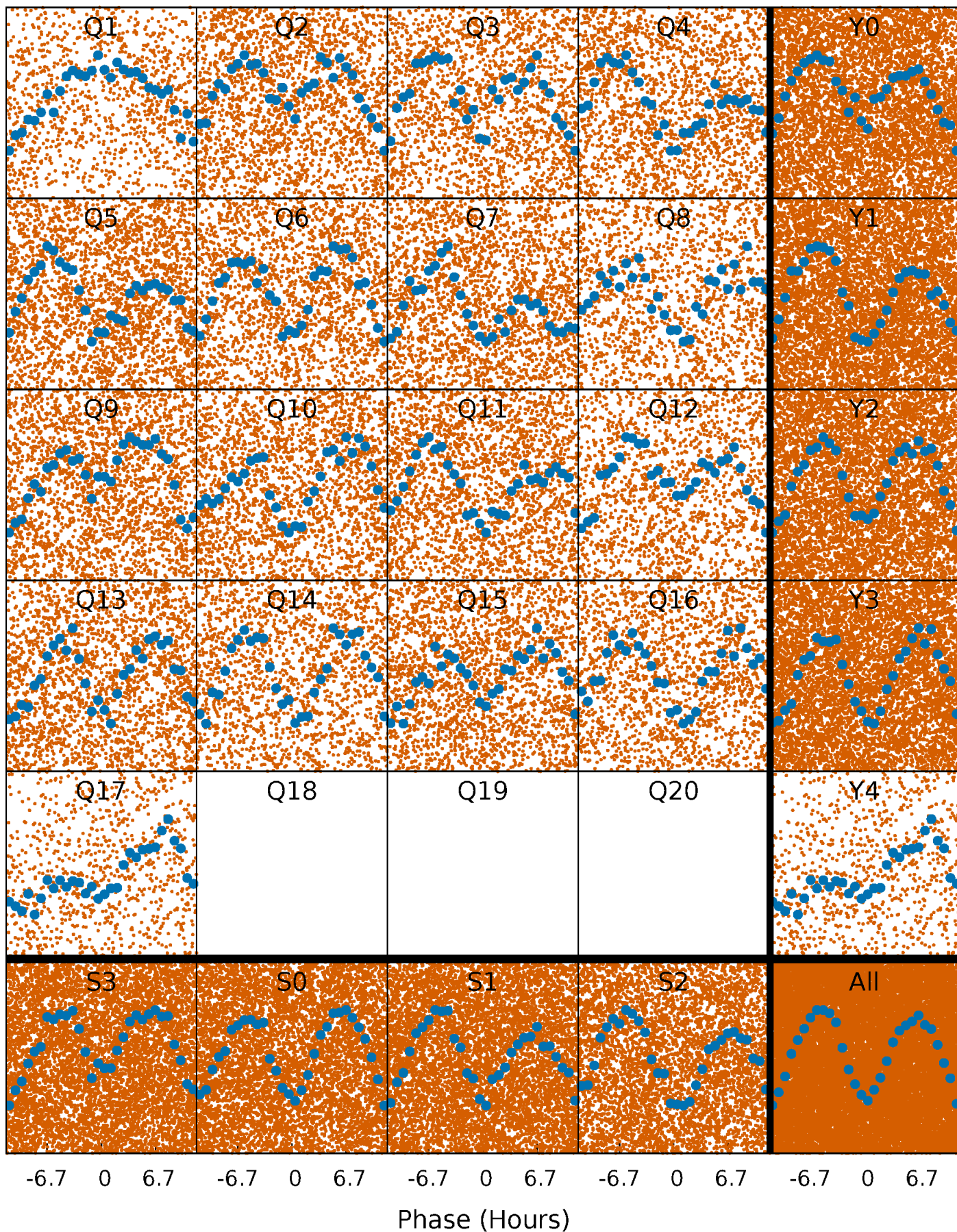


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

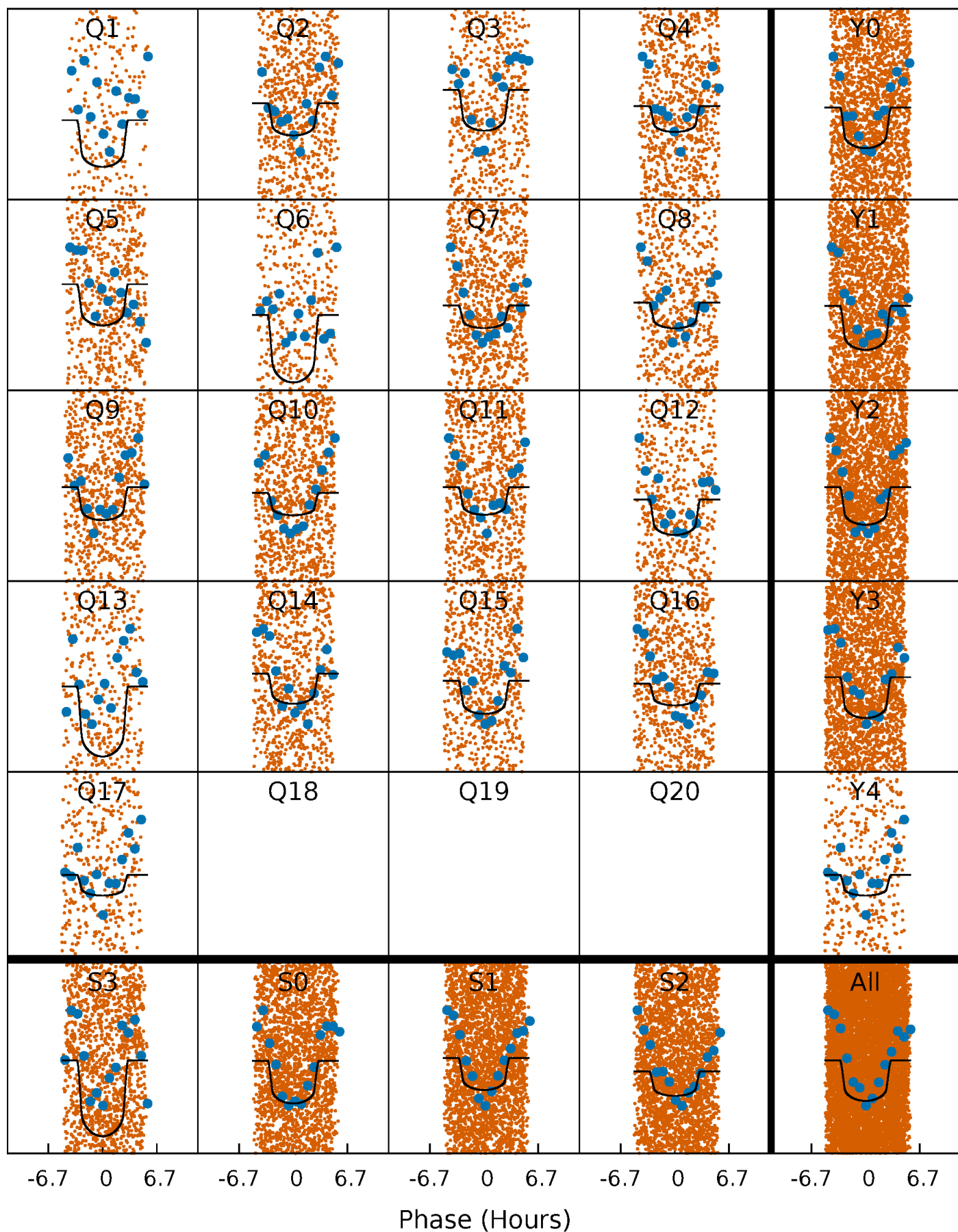
TCE 004679769-02   P= 0.992715 Days    $T_0=132.034435$  (BKJD)





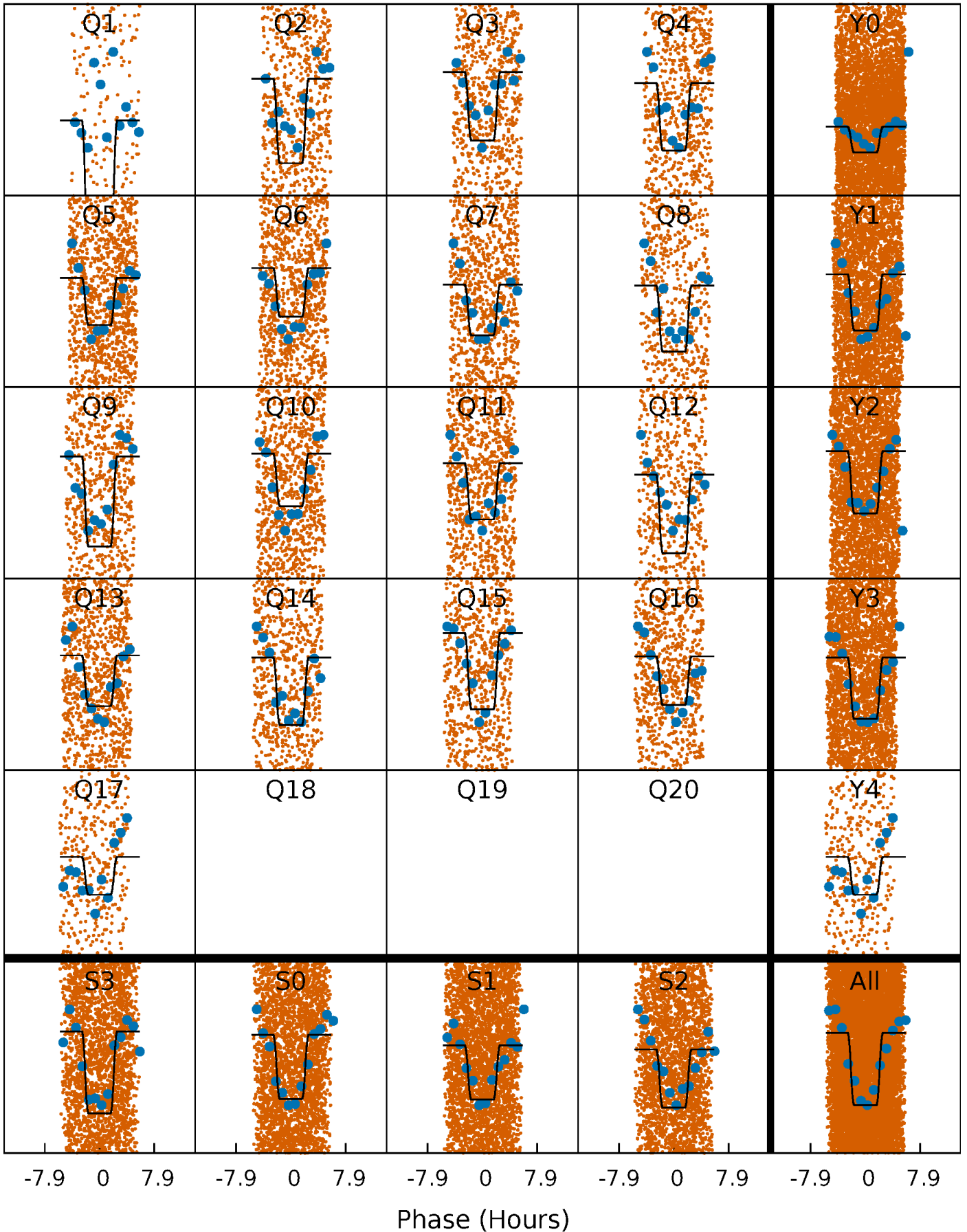
# DV Quarter-Phased Transit Curves

TCE 004679769-02   P= 0.992715 Days    $T_0=132.034435$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004679769-02     $P = 0.992740$  Days     $T_0 = 132.024849$  (BKJD)

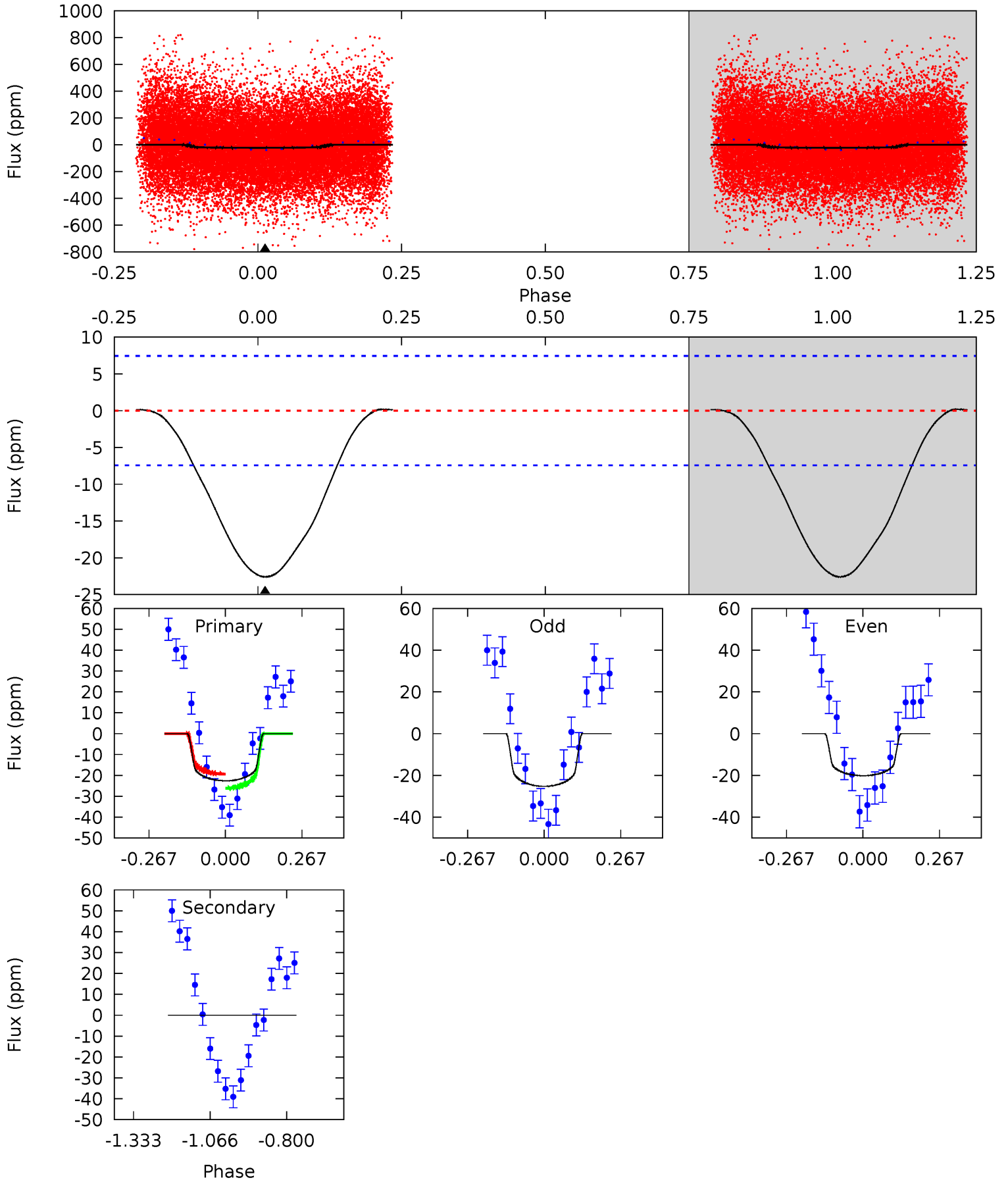




# DV Model-Shift Uniqueness Test

004679769-02, P = 0.992715 Days, E = 131.041720 Days

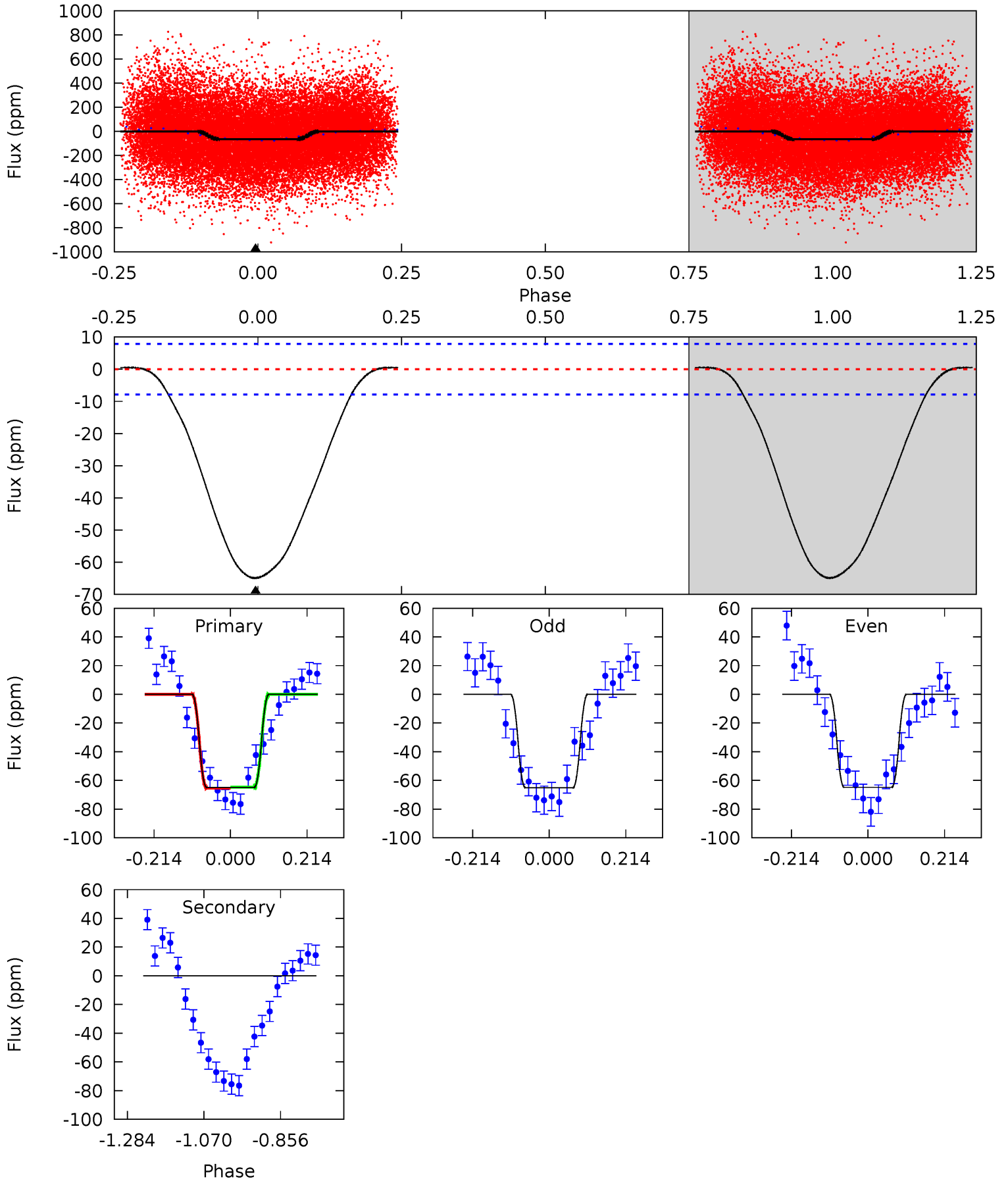
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	0	0	0	4.35	1.11	0.11	13.2	13.2	0	0	1.50	1.12	0.01	1.99



# Alt Model-Shift Uniqueness Test

004679769-02, P = 0.992740 Days, E = 131.032109 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
36.3	0	0	0	4.40	1.24	0.51	36.3	36.3	0	0	0.10	1.09	0.01	0.22



### Stellar Parameters For KIC 004679769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6596^{+160}_{-206}$	$4.224^{+0.175}_{-0.175}$	$-0.460^{+0.250}_{-0.300}$	$1.326^{+0.354}_{-0.257}$	$1.074^{+0.175}_{-0.131}$	$0.648^{+0.570}_{-0.299}$
	+2%/-3%	+4%/-4%	+54%/-65%	+27%/-19%	+16%/-12%	+88%/-46%
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 004679769-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 2$	$0.91^{+0.29}_{-0.24}$	$3315^{+230}_{-226}$	$-3281^{+6353}_{-550}$	$0.004^{+0.491}_{-0.475}$
Alt.	$0 \pm 2$	$1.27^{+0.26}_{-0.28}$	$3294^{+247}_{-215}$	$-3282^{+689}_{-344}$	$0.003^{+0.237}_{-0.264}$

$T_{\text{max}}$  = 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

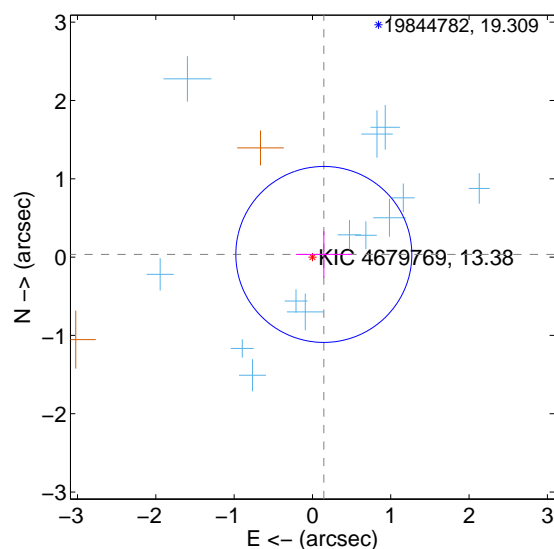
Supplemental centroid analysis for 004679769-02. Kepler magnitude: 13.38. Transit SNR 12.82

There are 13 quarters with good PRF difference image offsets

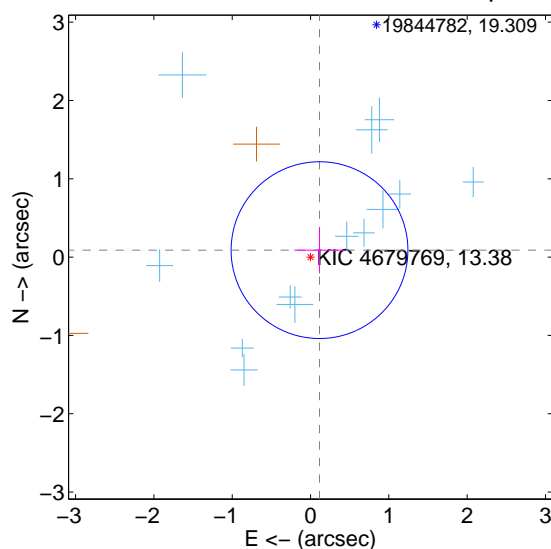
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.149 \pm 0.375$	0.40	$-0.145 \pm 0.355$	$0.034 \pm 0.298$
PRF-fit source offset from KIC position	$0.145 \pm 0.376$	0.39	$-0.115 \pm 0.324$	$0.089 \pm 0.296$
photometric centroid source offset	$0.61 \pm 0.65$	0.93	$-0.61 \pm 0.65$	$-0.02 \pm 0.70$

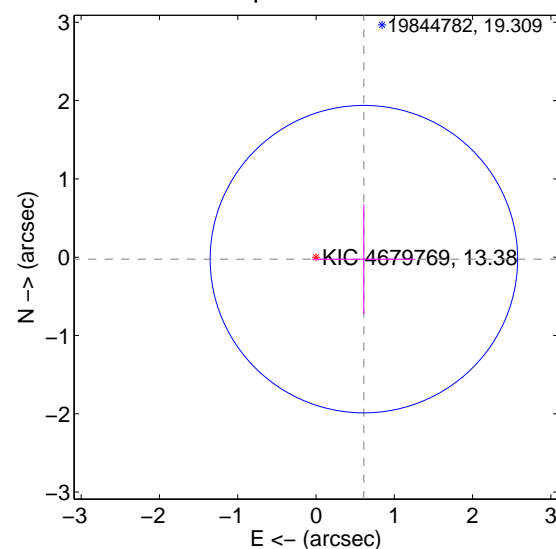
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



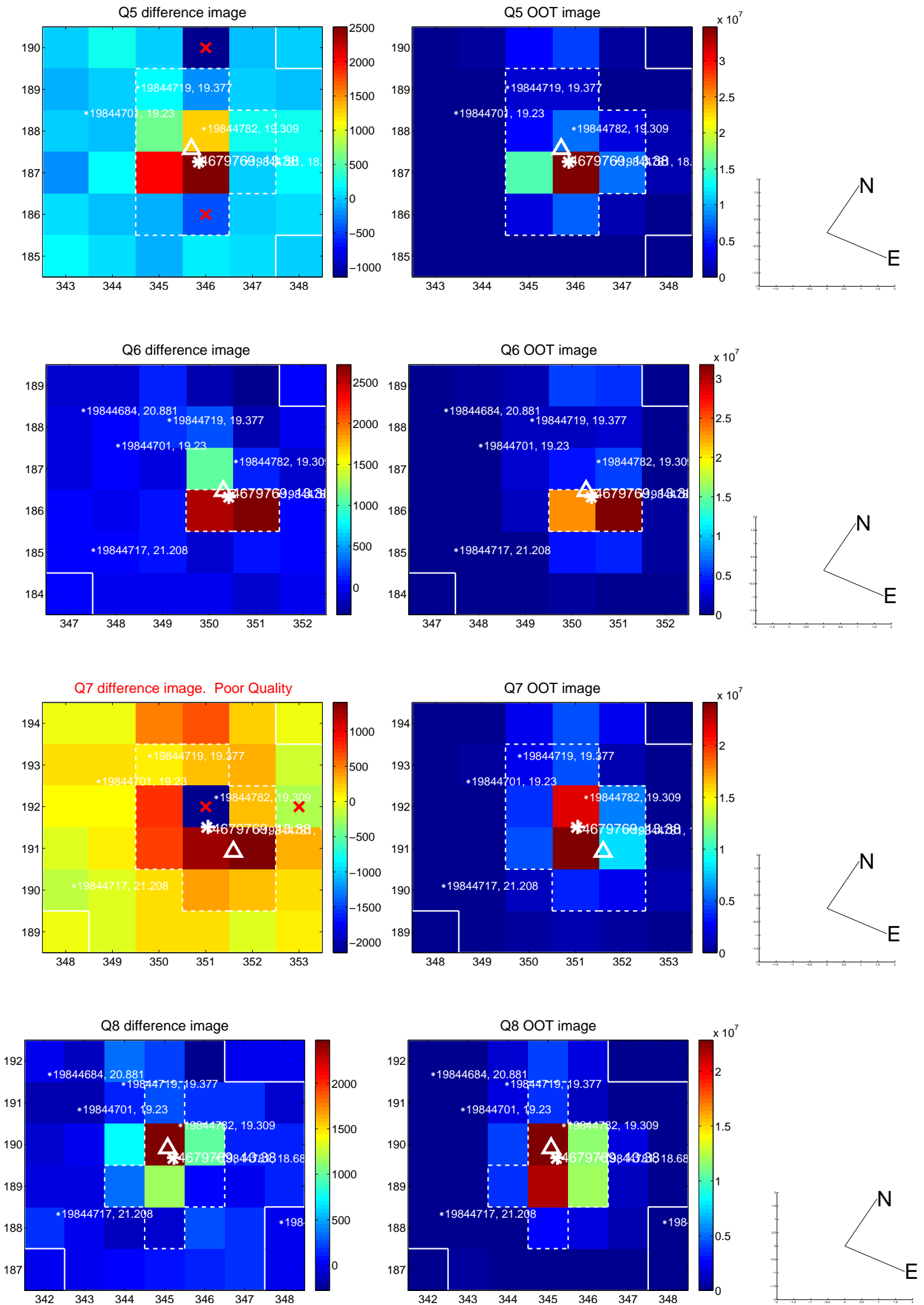
offset from photometric centroids



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.

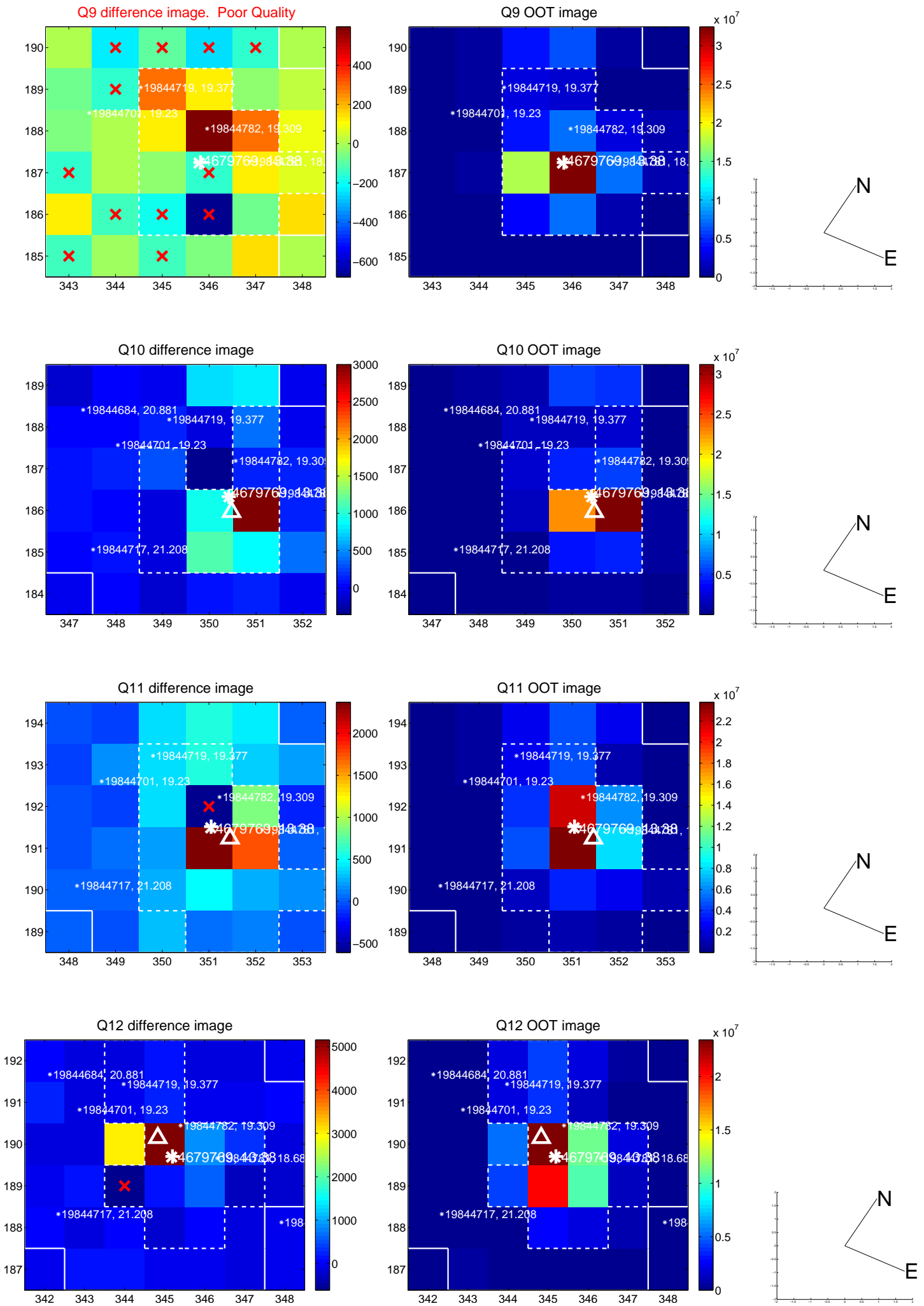


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

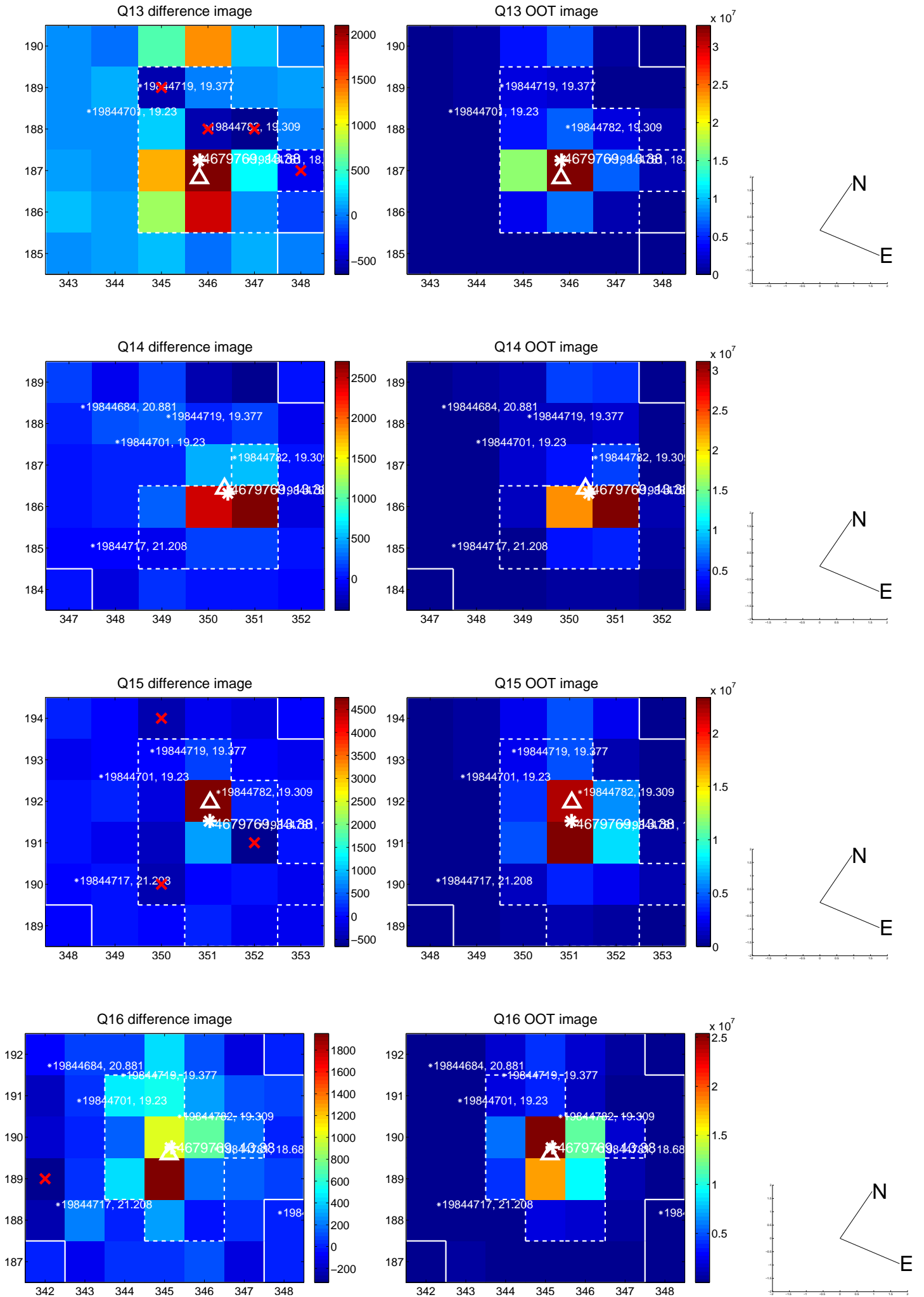




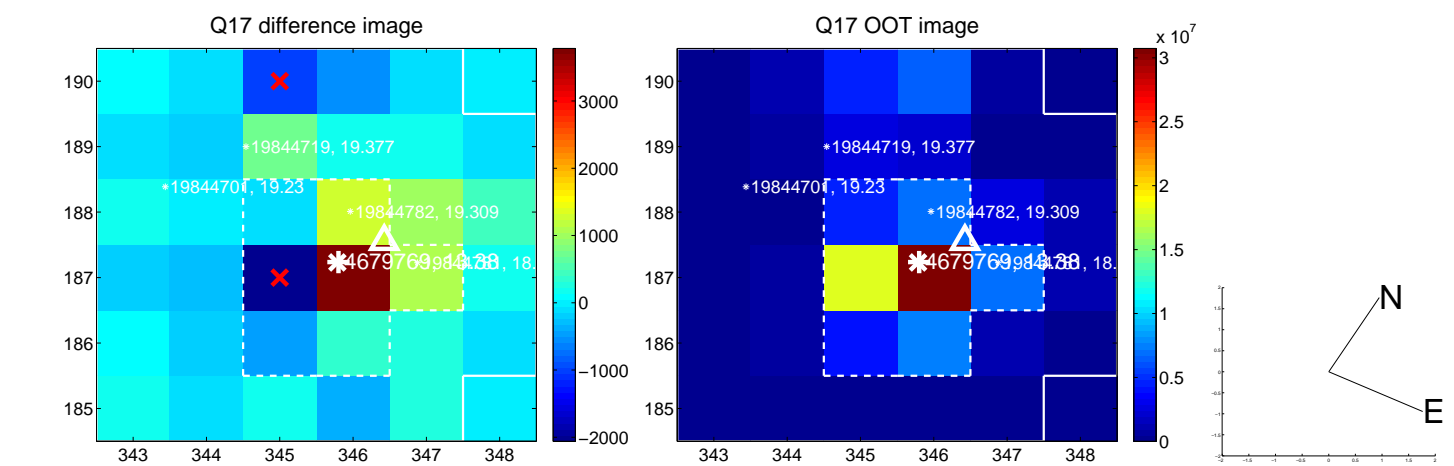
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



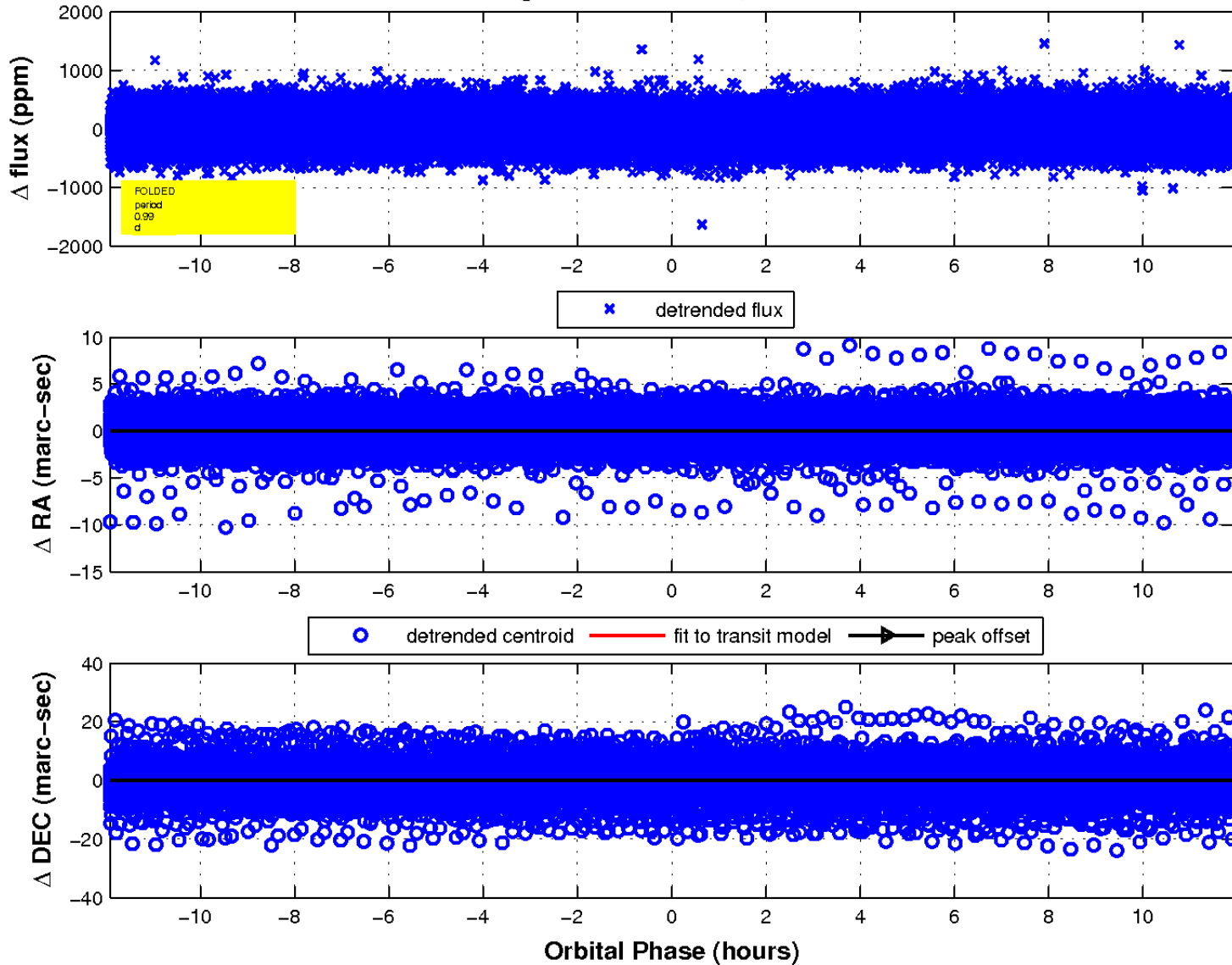
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



### fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

