

# KIC 002711597

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002711597-01	OBS	4746.01	0.980399	131.795004	64.4	1.329	9.5	9.4	0.72	4861	0.71	878.25
002711597-02	OBS	No	0.980425	132.267640	91.8	0.767	10.2	10.8	0.72	4861	0.75	878.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002711597-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
002711597-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 002711597-01

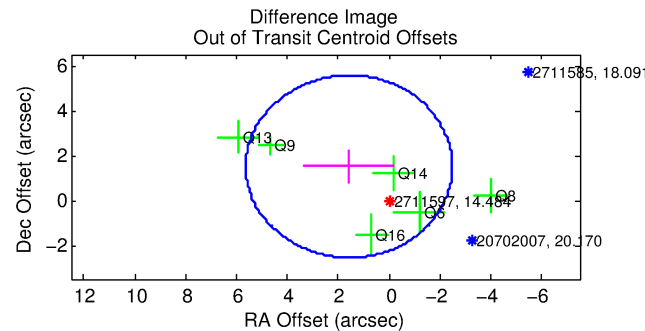
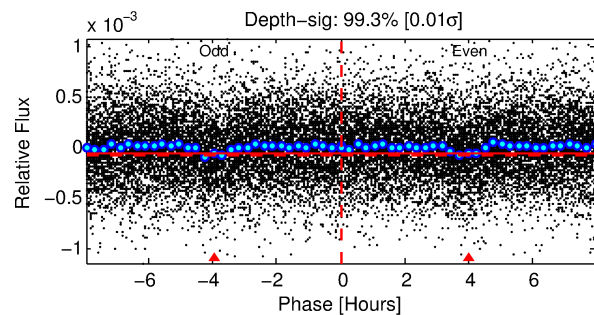
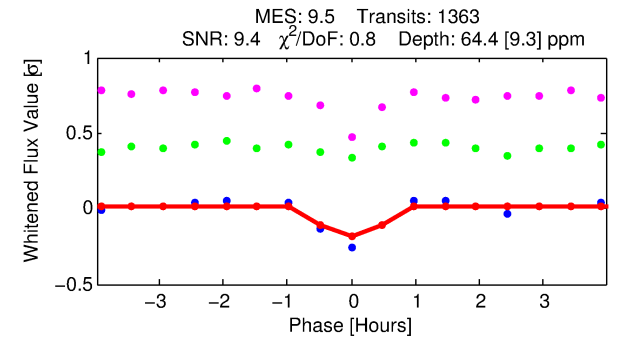
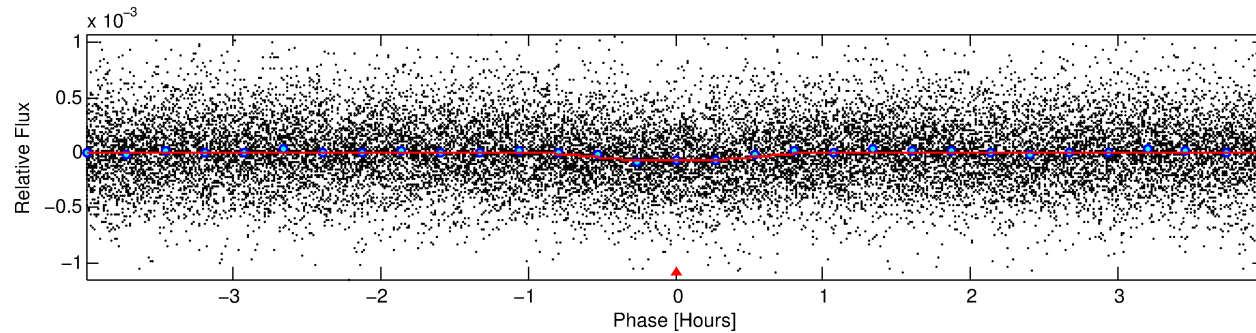
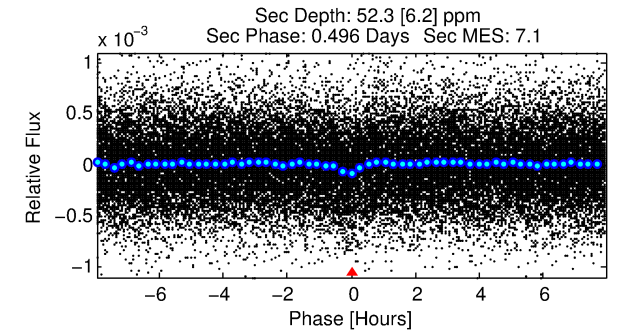
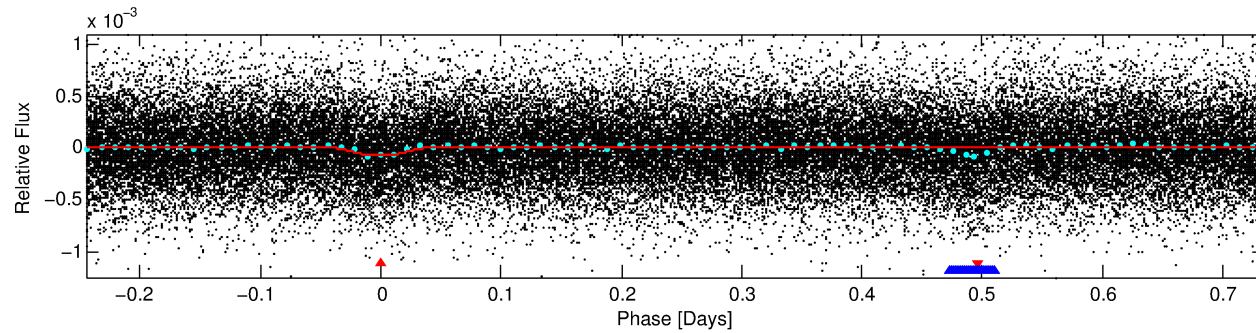
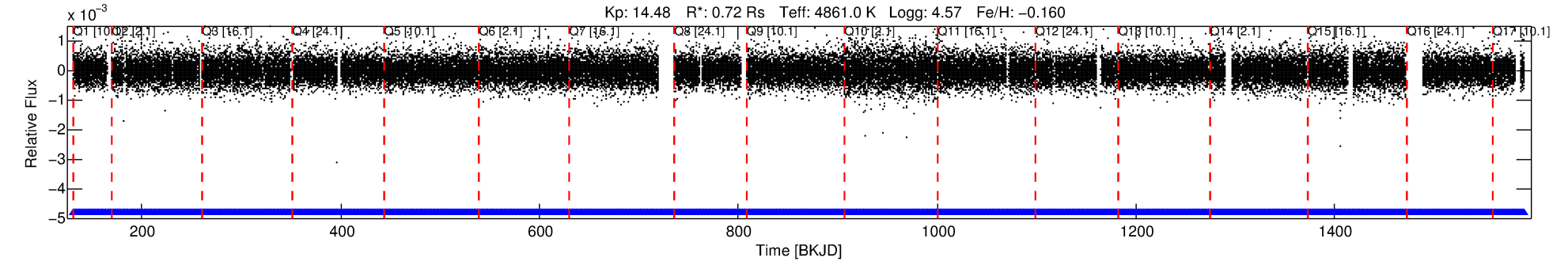
No Significant Match Found

# DV One-Page Summary

KIC: 2711597 Candidate: 1 of 2 Period: 0.980 d

KOI: K04746.01 Corr: 0.842

Kp: 14.48 R\*: 0.72 Rs Teff: 4861.0 K Logg: 4.57 Fe/H: -0.160



## DV Fit Results:

Period = 0.98040 [0.00001] d  
Epoch = 131.7950 [0.0021] BKJD  
Rp/R\* = 0.0090 [0.0078]  
a/R\* = 2.74 [8.07]  
b = 0.90 [0.75]  
Seff = 878.25 [143.93]  
Teq = 1388 [57] K  
Rp = 0.71 [0.62] Re  
a = 0.0172 [0.0013] AU  
Ag = 16.87 [29.36] [0.54σ]  
Teffp = 4350 [1893] K [1.56σ]

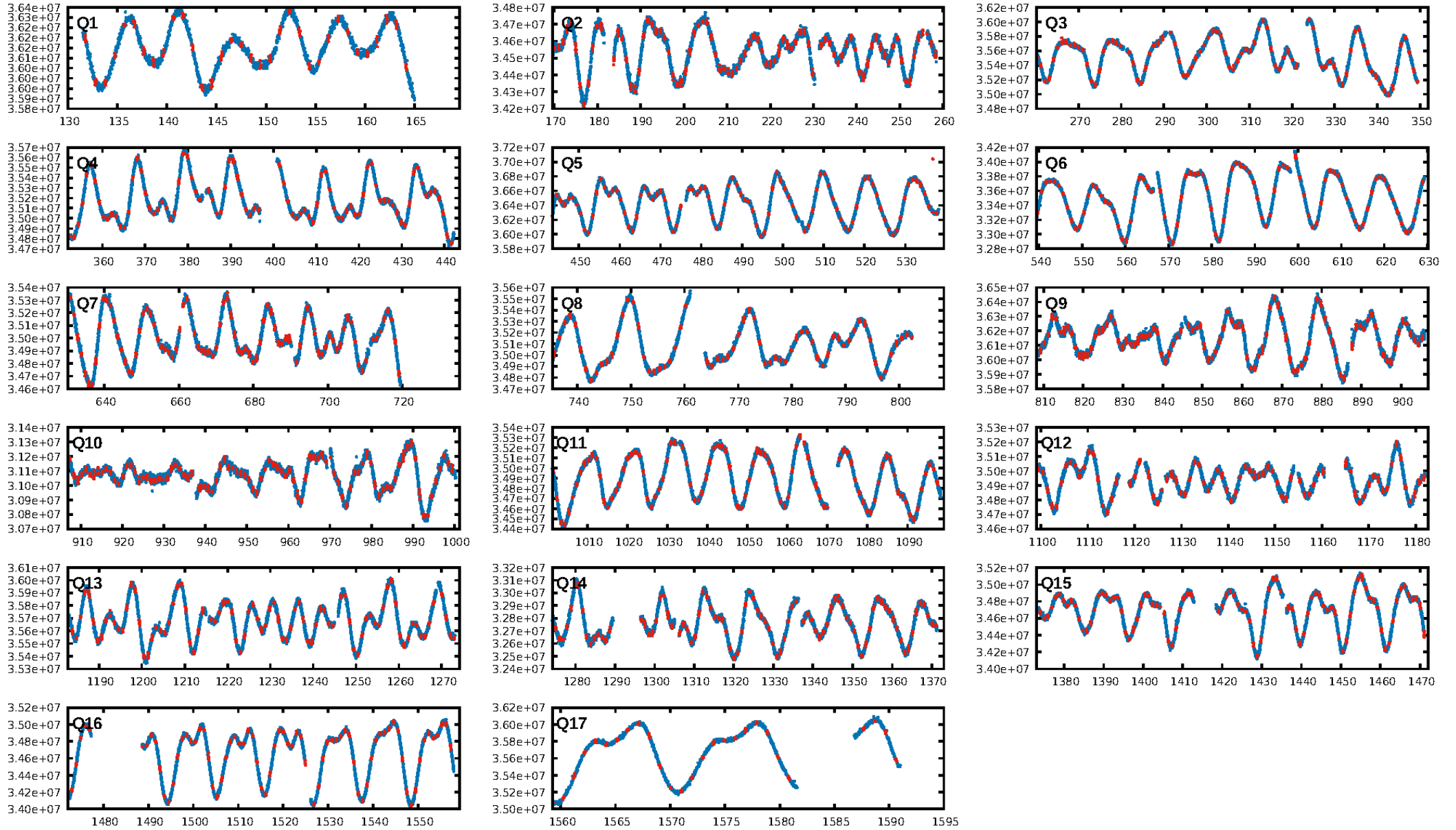
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.58e-21  
RollingBand-fgt: 1.00 [1302/1302]  
GhostDiagnostic-chr: -4.432  
Centroid-sig: N/A  
Centroid-so: 2.928 arcsec [2.31σ]  
OotOffset-rm: 2.177 arcsec [1.61σ]  
KicOffset-rm: 0.487 arcsec [1.58σ]  
OotOffset-st: 2/0/2/2 [6]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 0.12 [1/8]  
DiffImageOverlap-fno: 1.00 [17/17]

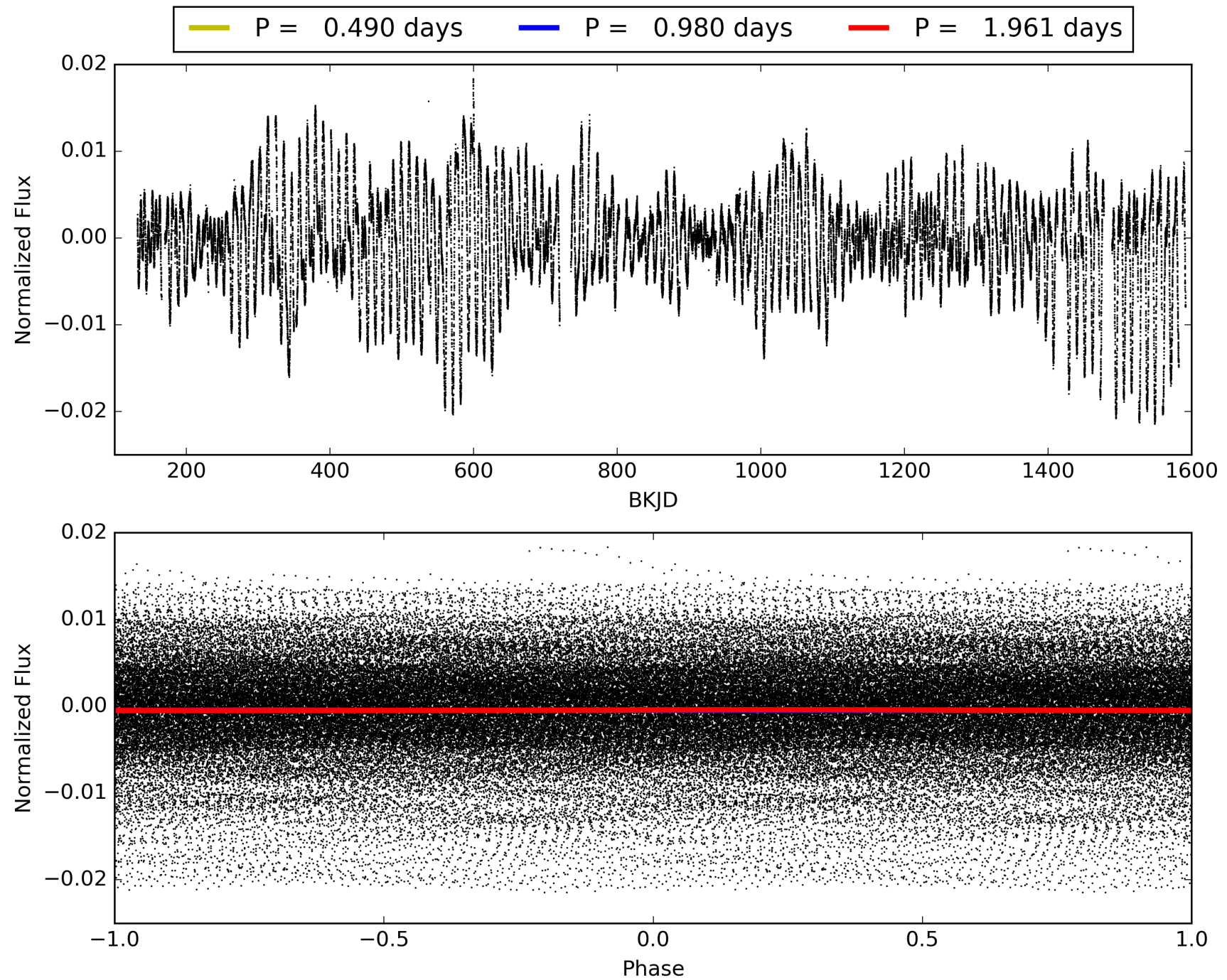
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:11:03 Z

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

# TCE 002711597-01, PDC Light Curves

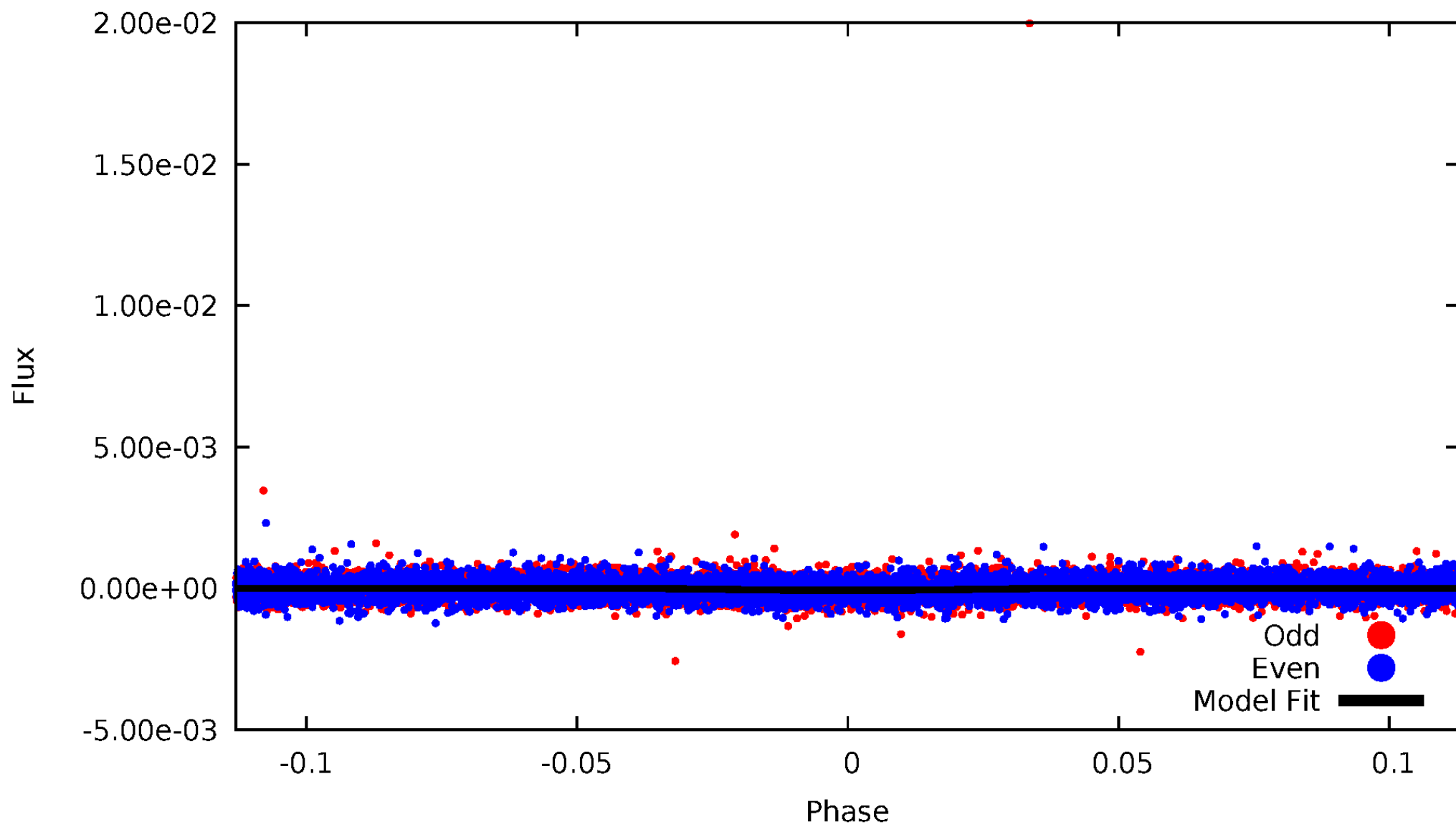


TCE 002711597-01



# DV Odd/Even

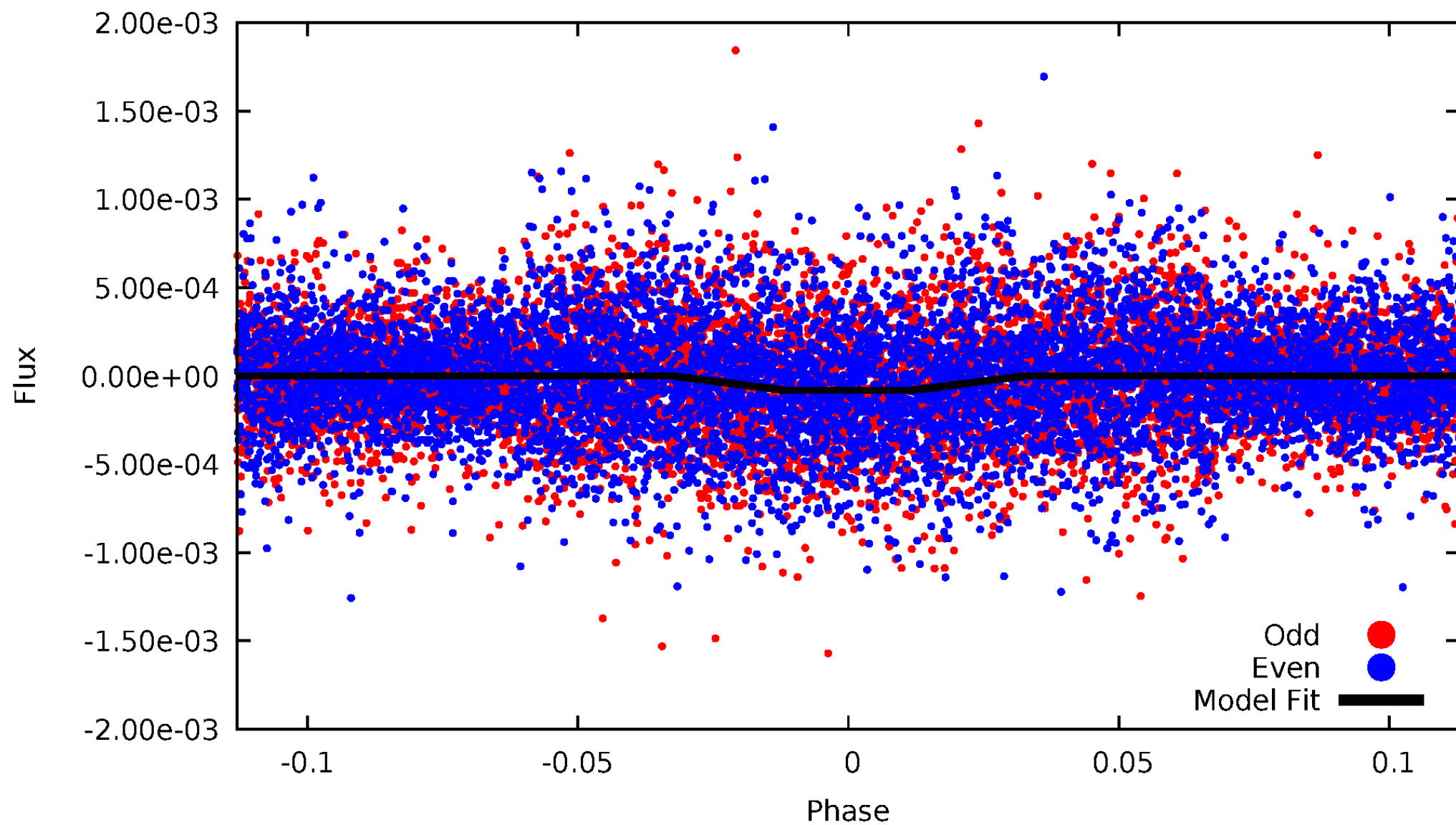
TCE 002711597-01





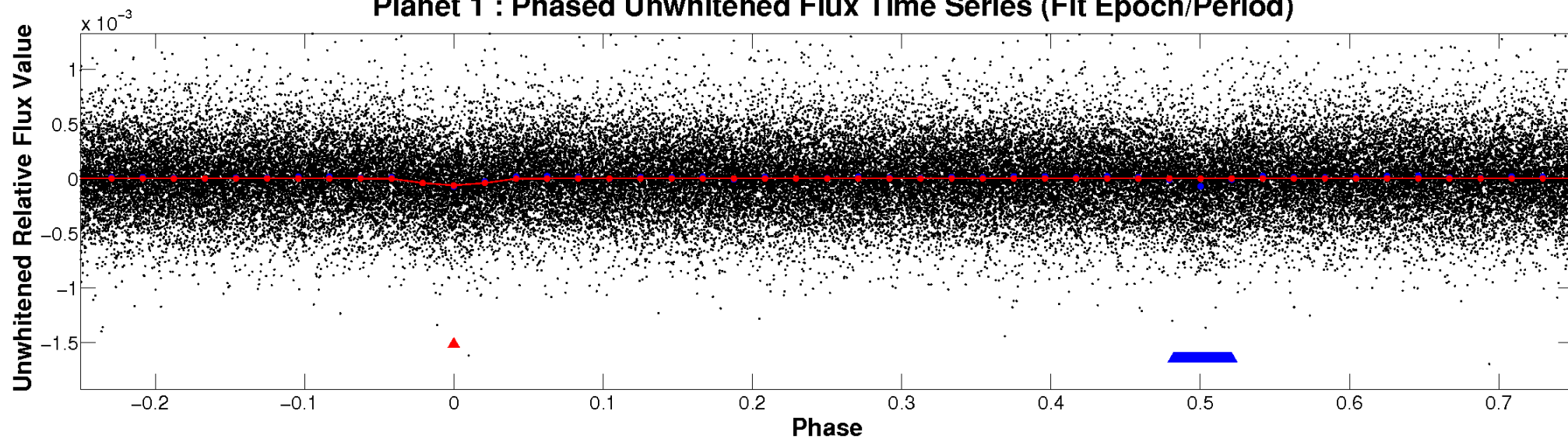
# ALT Odd/Even

TCE 002711597-01

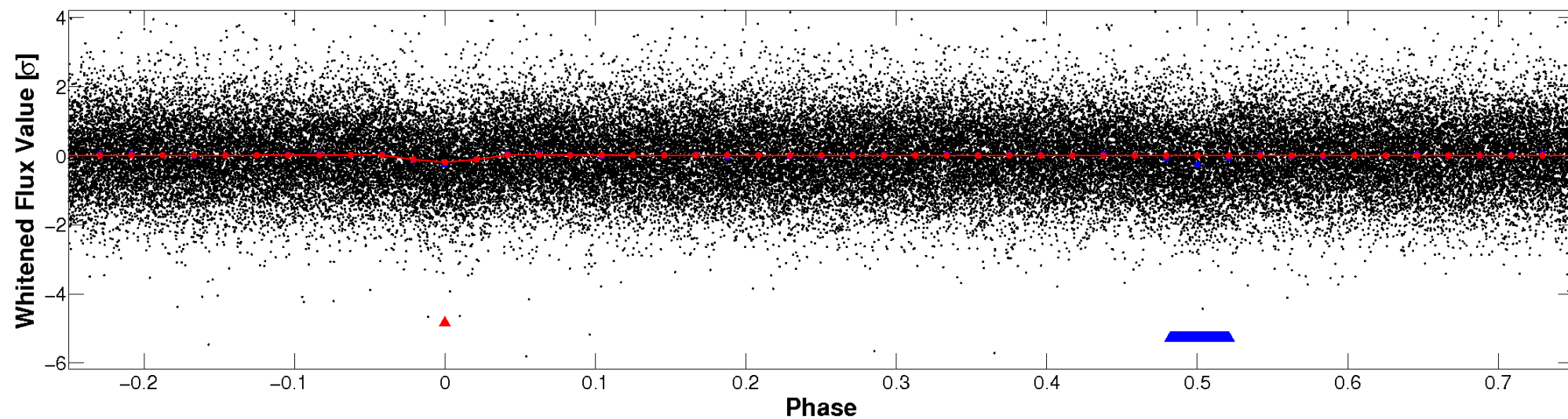


# Non-Whitened Vs. Whitened Light Curve

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

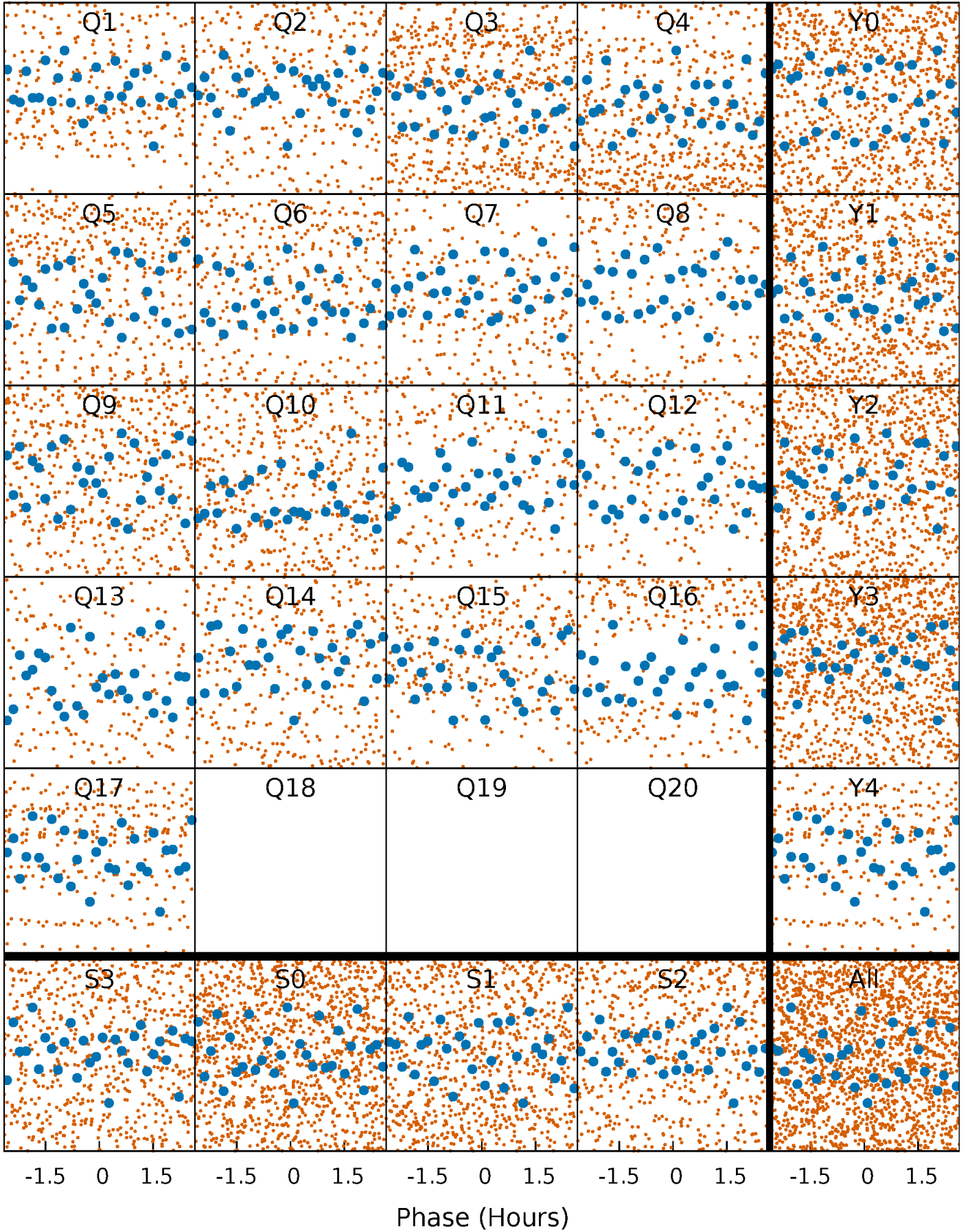


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

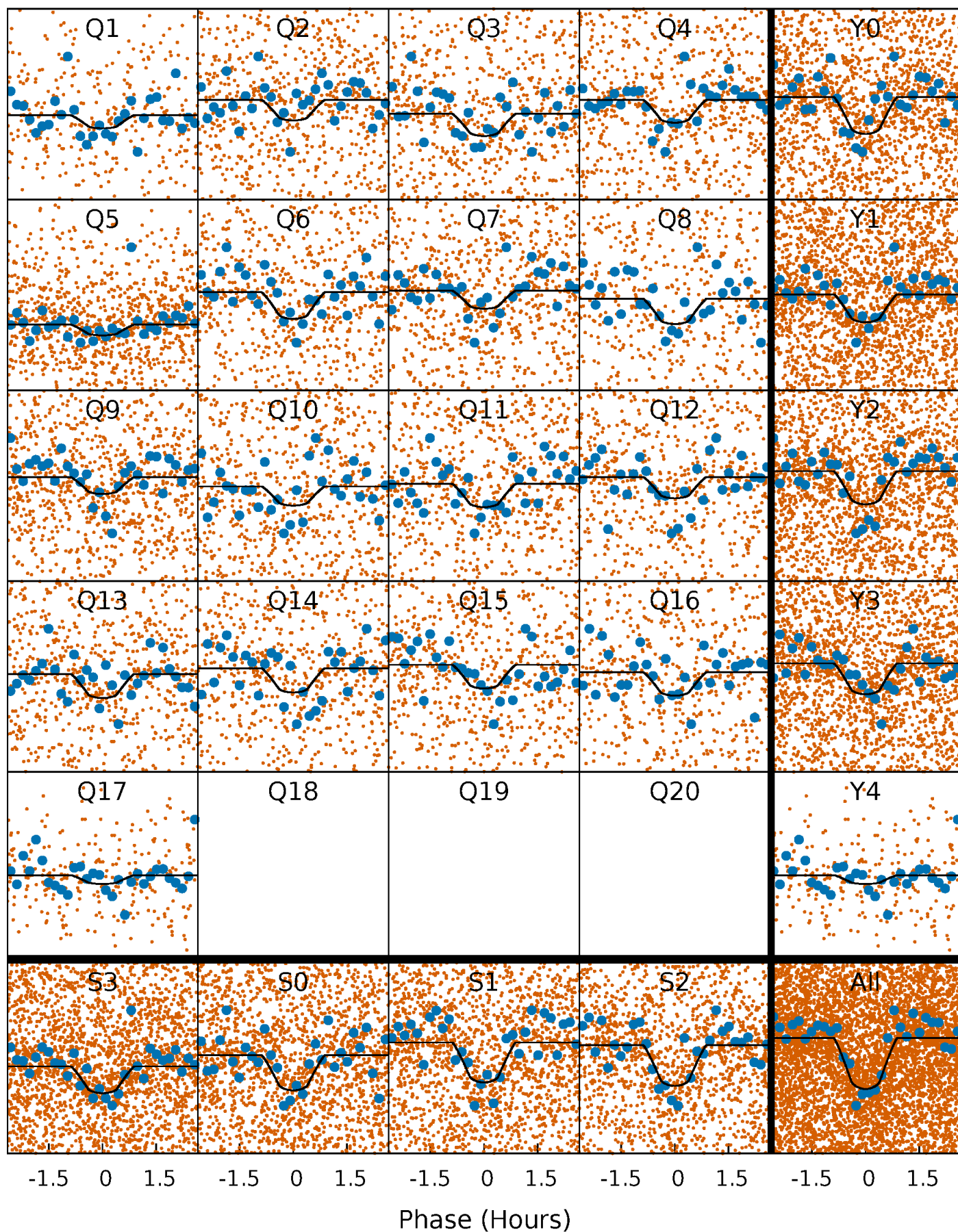
TCE 002711597-01   P= 0.980399 Days    $T_0=131.795004$  (BKJD)





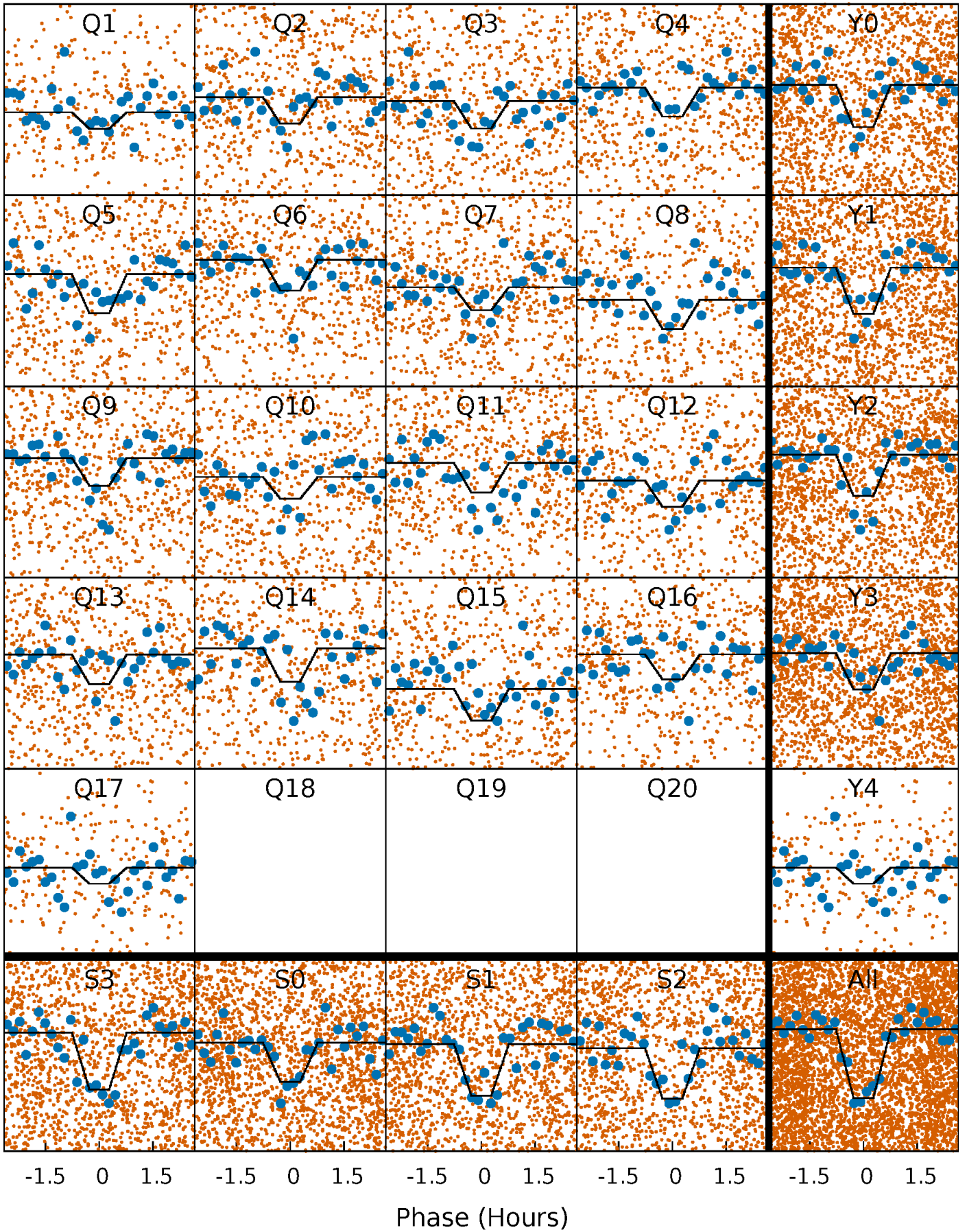
# DV Quarter-Phased Transit Curves

TCE 002711597-01   P= 0.980399 Days    $T_0=131.795004$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

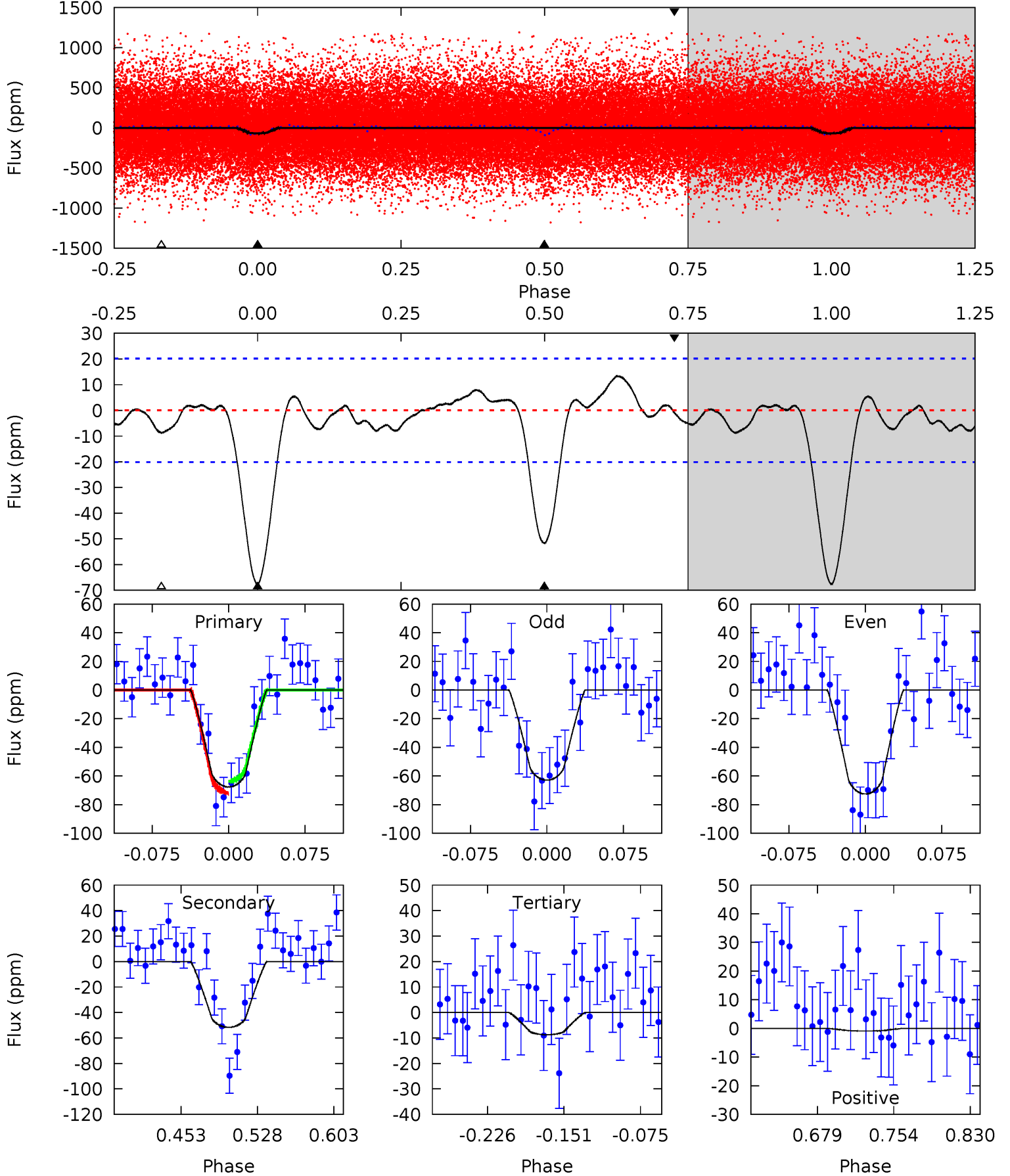
TCE 002711597-01   P= 0.980399 Days    $T_0=131.795004$  (BKJD)



# DV Model-Shift Uniqueness Test

002711597-01, P = 0.980399 Days, E = 130.814605 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
15.5	11.9	2.01	-0.21	4.62	1.78	1.17	13.5	15.7	9.86	12.1	1.11	0.83	0.16	0.92

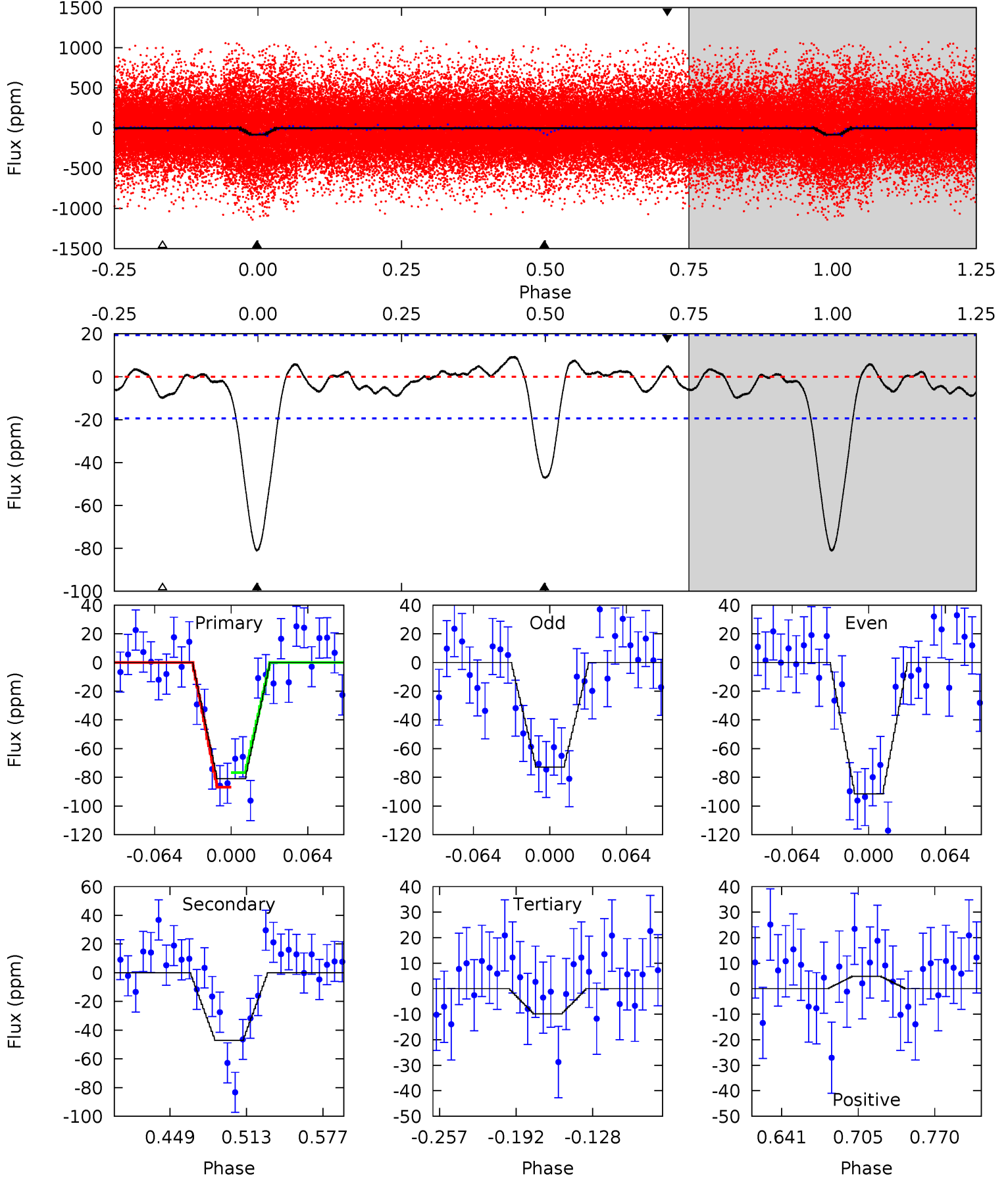




# Alt Model-Shift Uniqueness Test

002711597-01, P = 0.980399 Days, E = 130.814605 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
19.5	11.3	2.38	1.17	4.66	1.85	0.92	17.1	18.3	8.96	10.2	2.24	0.97	0.10	1.22



### Stellar Parameters For KIC 002711597

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4861^{+131}_{-146}$	$4.572^{+0.060}_{-0.035}$	$-0.160^{+0.300}_{-0.300}$	$0.722^{+0.062}_{-0.068}$	$0.710^{+0.081}_{-0.054}$	$2.656^{+0.703}_{-0.385}$
	+3%/-3%	+1%/-1%	+188%/-188%	+9%/-9%	+11%/-8%	+26%/-14%
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 002711597-01 / KOI 4746.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-52 \pm 4$	$0.84^{+0.51}_{-0.49}$	$1927^{+71}_{-69}$	$4152^{+1859}_{-689}$	$12^{+57}_{-8}$
Alt.	$-47 \pm 4$	$0.82^{+0.52}_{-0.50}$	$1930^{+65}_{-71}$	$4125^{+2053}_{-697}$	$12^{+65}_{-7}$

$T_{max}$  = 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

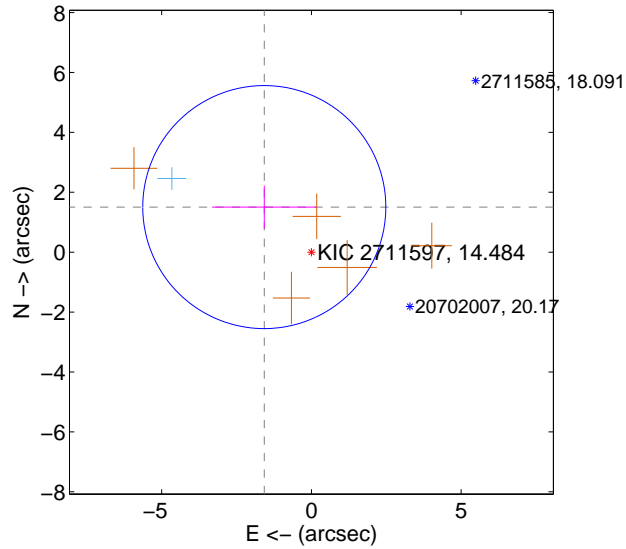
Supplemental centroid analysis for 002711597-01. Kepler magnitude: 14.48. Transit SNR 9.42

There are 1 quarters with good PRF difference image offsets

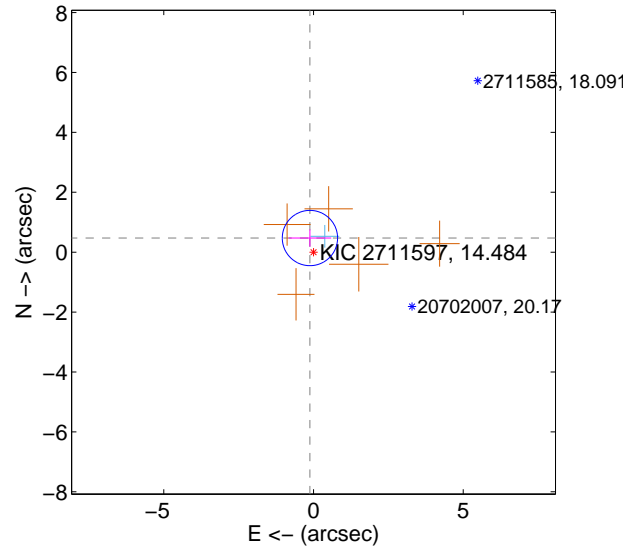
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.177 \pm 1.352$	1.61	$1.573 \pm 1.742$	$1.505 \pm 0.716$
PRF-fit source offset from KIC position	$0.487 \pm 0.308$	1.58	$0.119 \pm 0.709$	$0.472 \pm 0.286$
photometric centroid source offset	$2.93 \pm 1.27$	2.31	$-2.92 \pm 1.27$	$0.25 \pm 1.18$

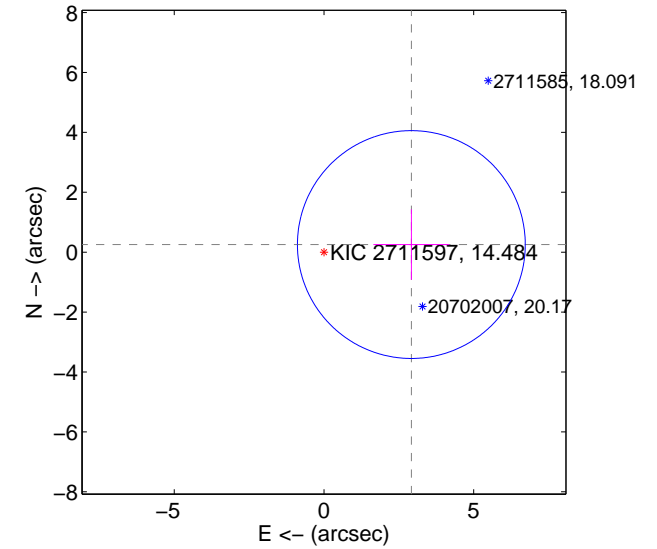
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

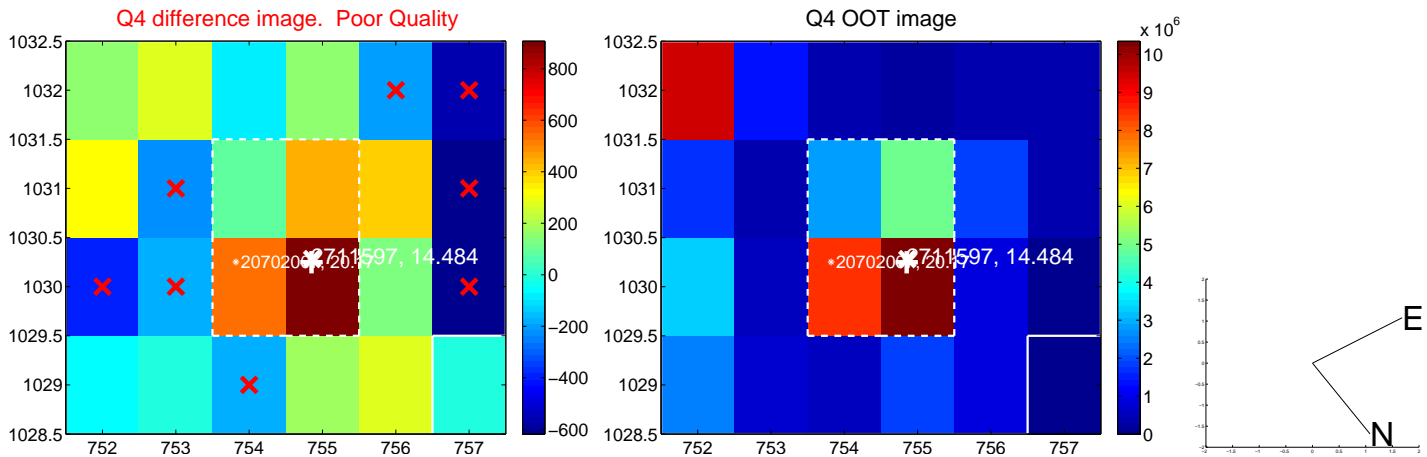
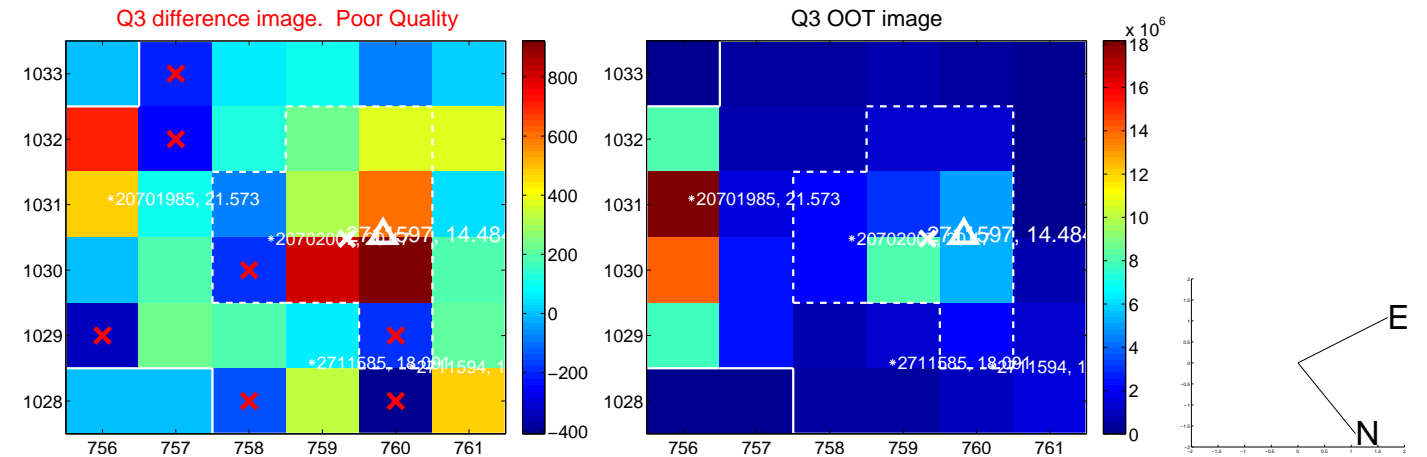
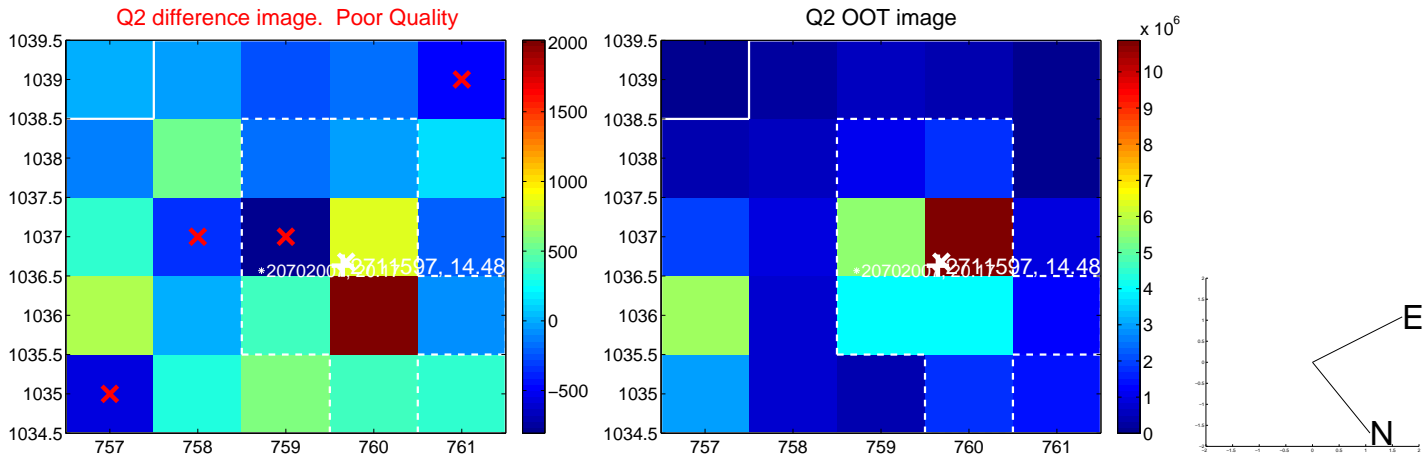
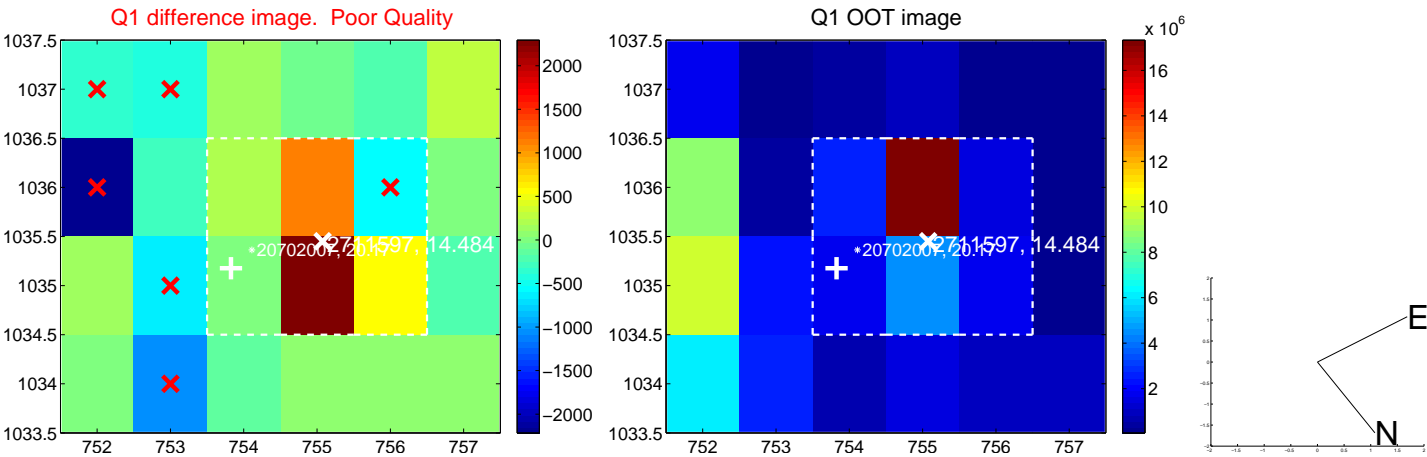


offset from photometric centroids

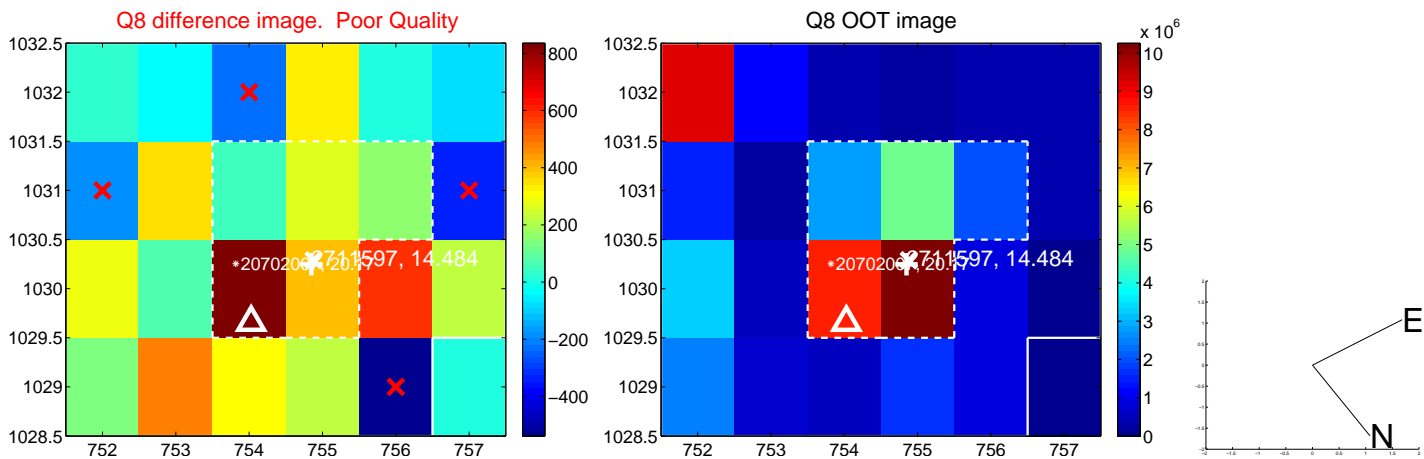
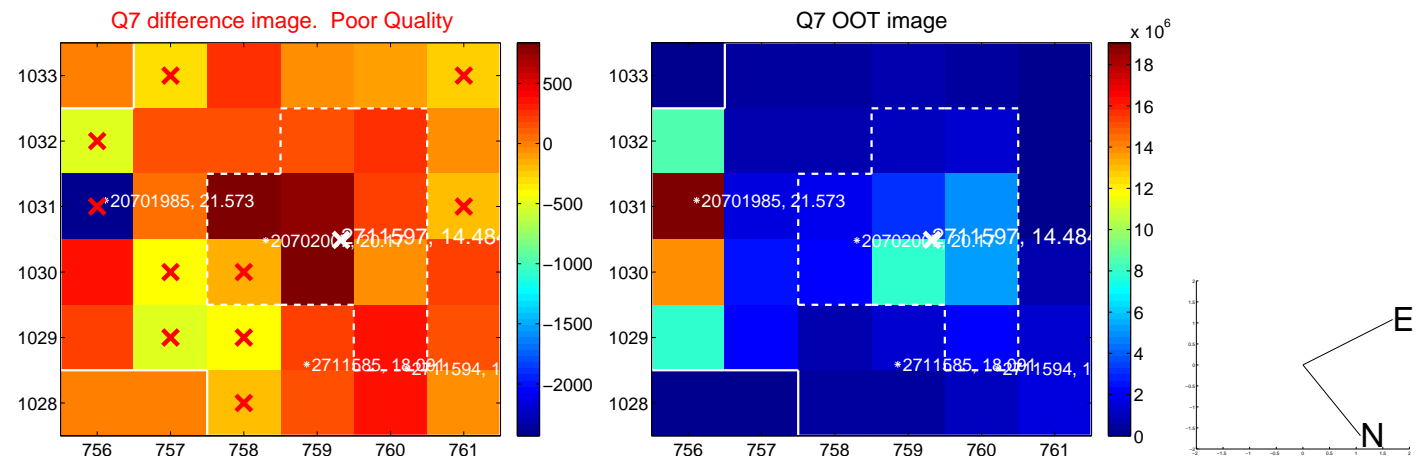
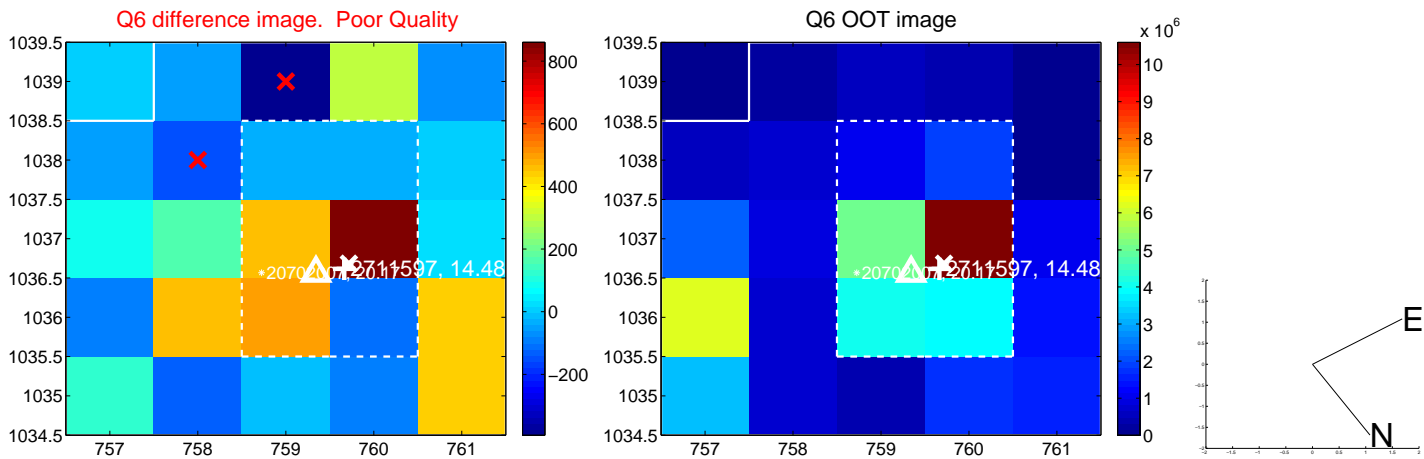
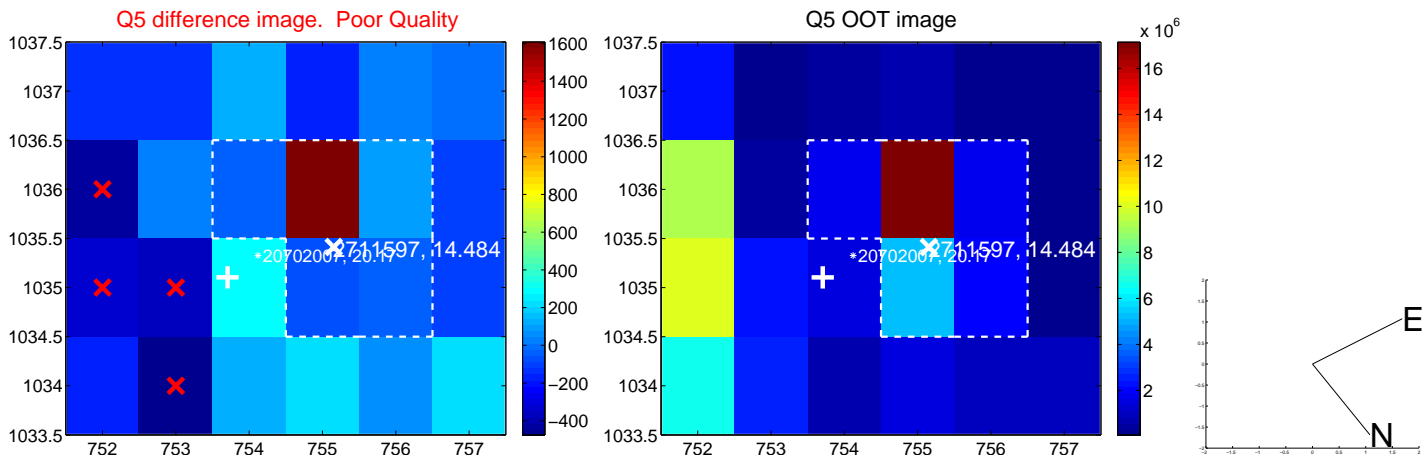


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

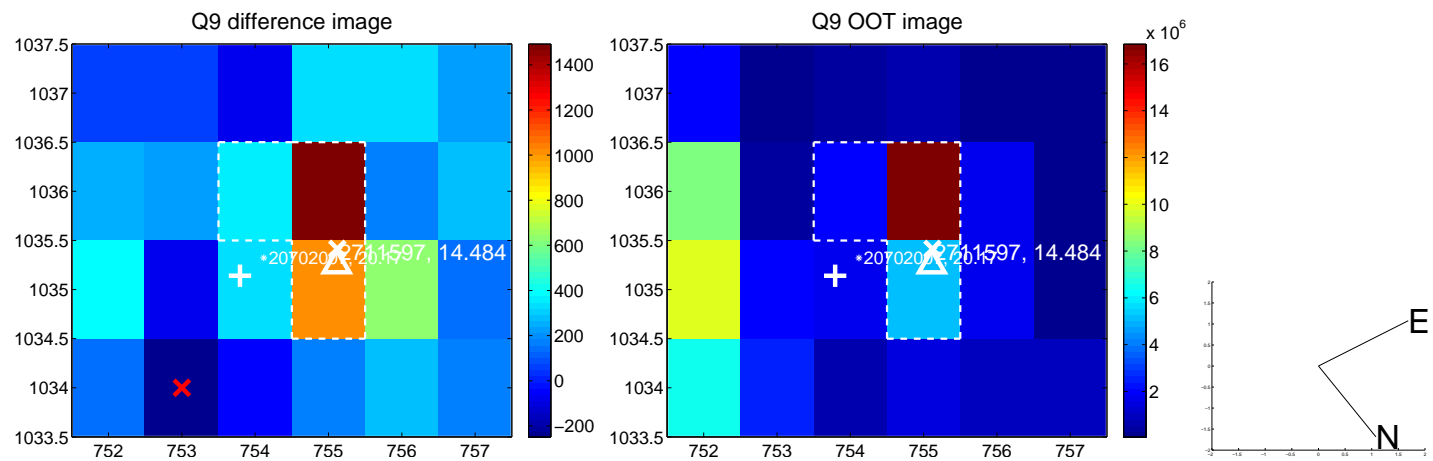
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



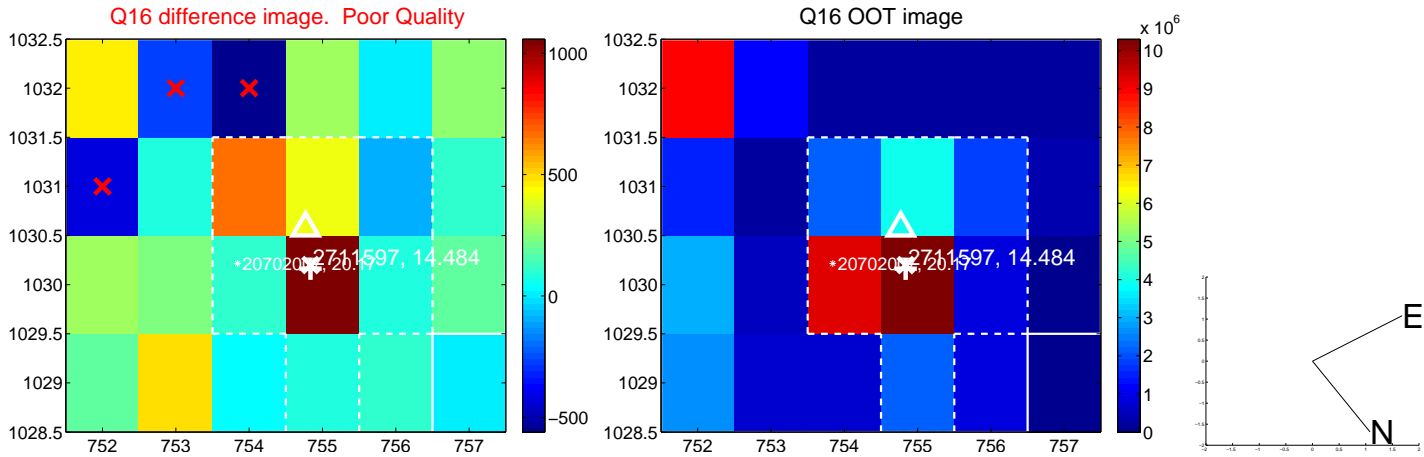
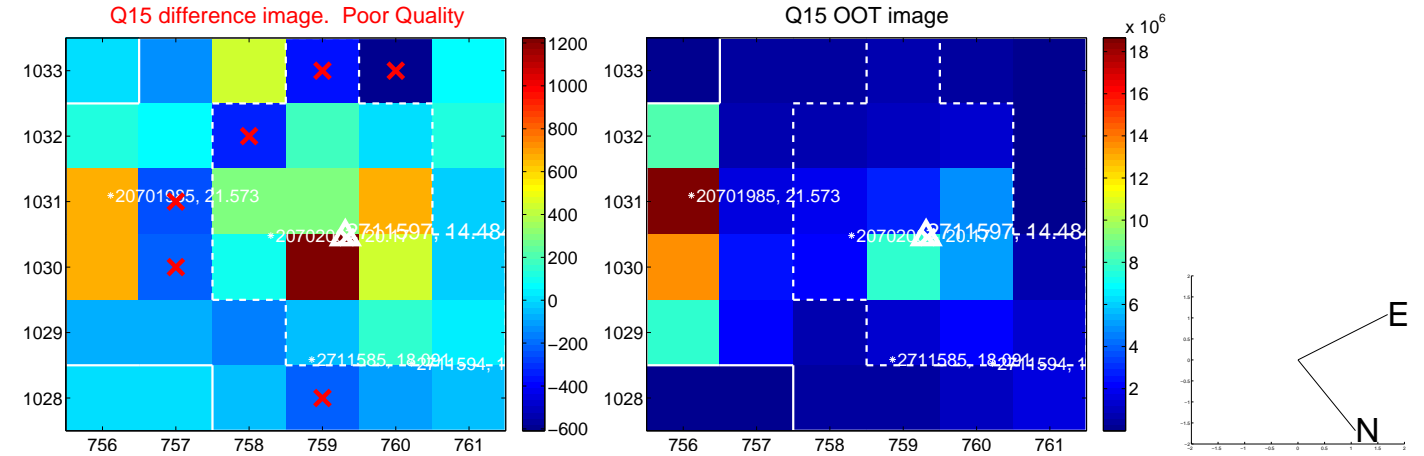
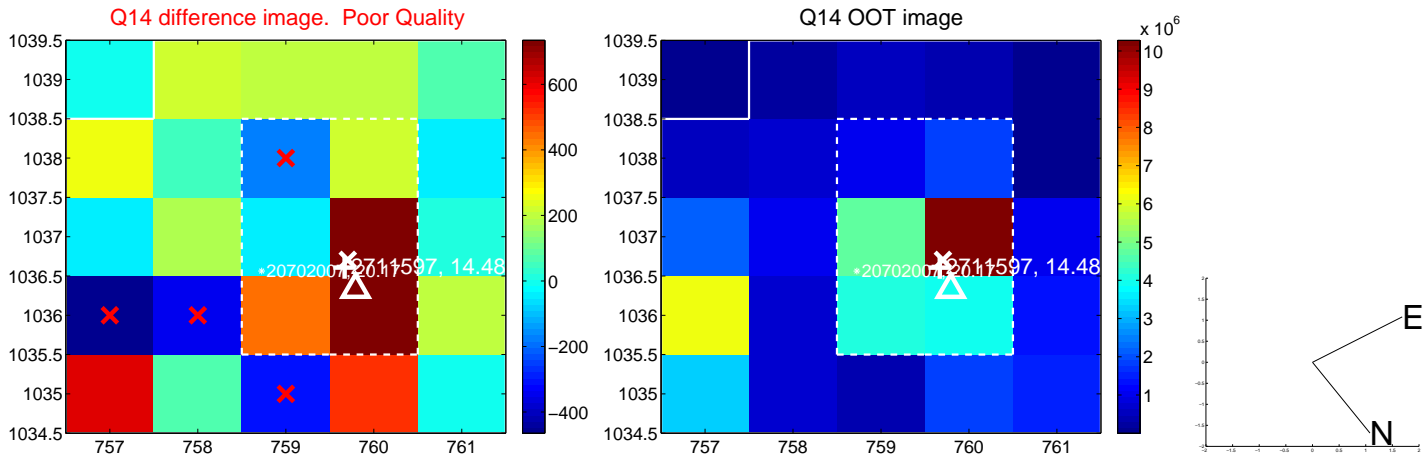
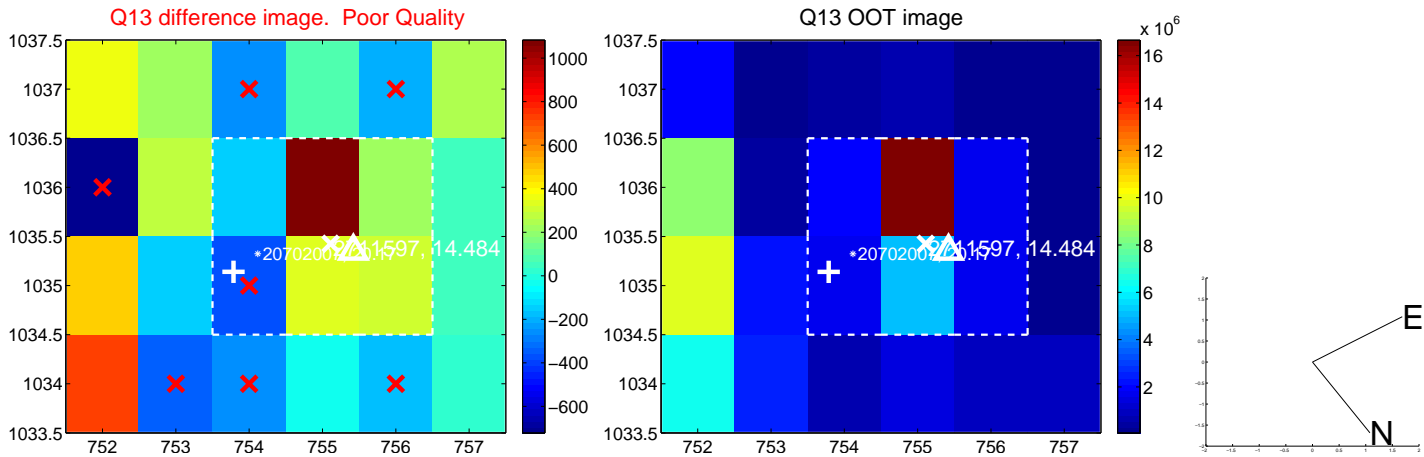
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

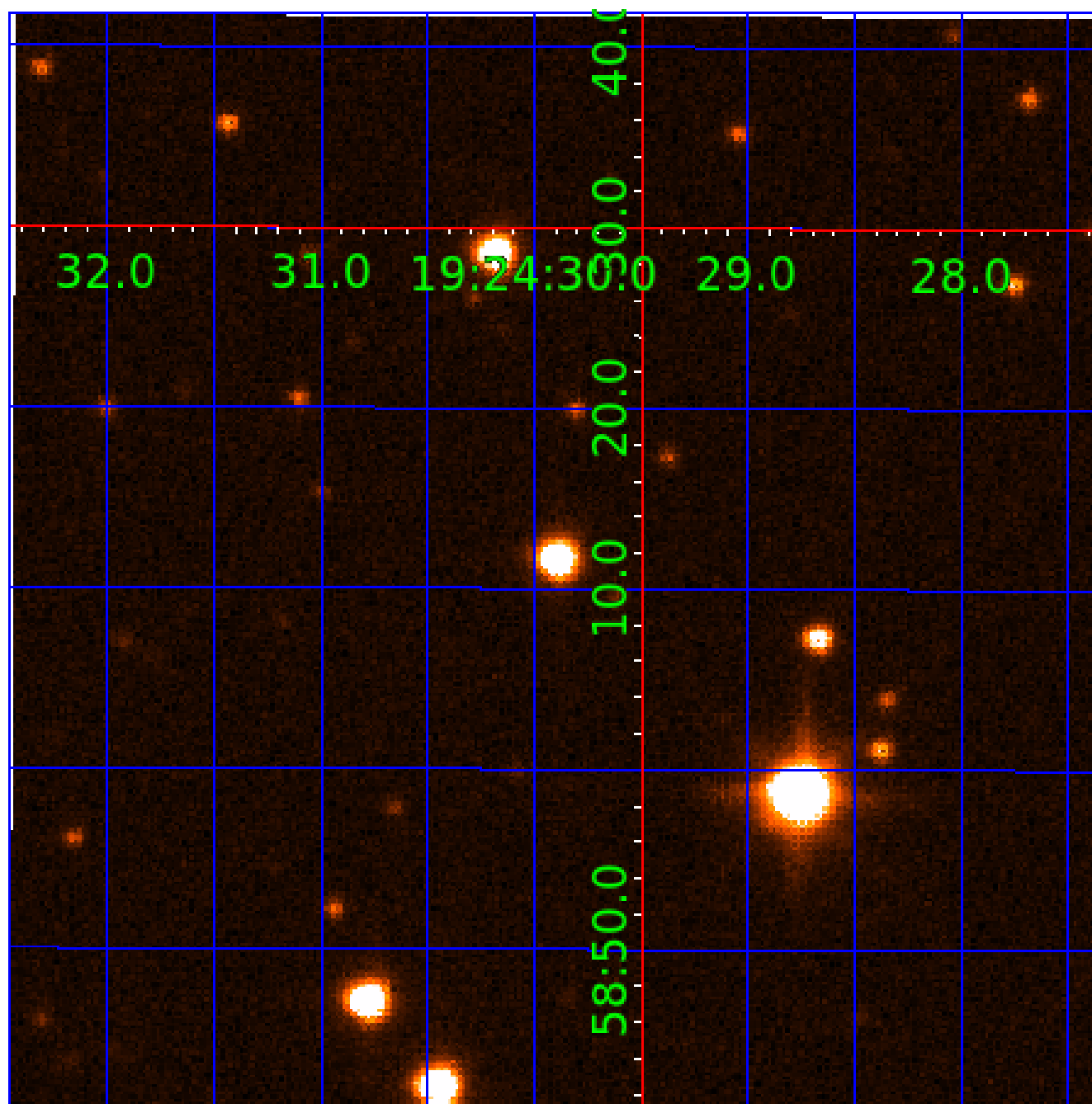






UKIRT Image

Declination



# KIC 002711597

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002711597-01	OBS	4746.01	0.980399	131.795004	64.4	1.329	9.5	9.4	0.72	4861	0.71	878.25
002711597-02	OBS	No	0.980425	132.267640	91.8	0.767	10.2	10.8	0.72	4861	0.75	878.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002711597-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
002711597-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

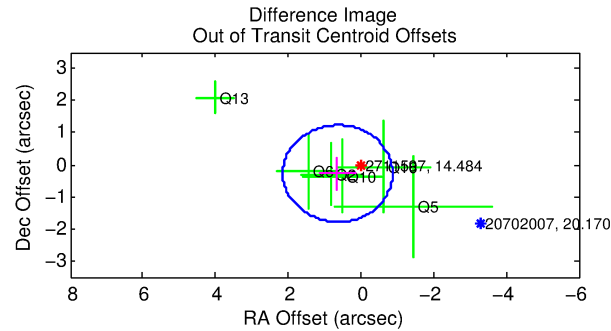
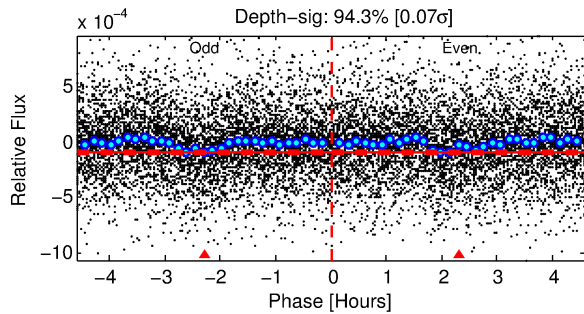
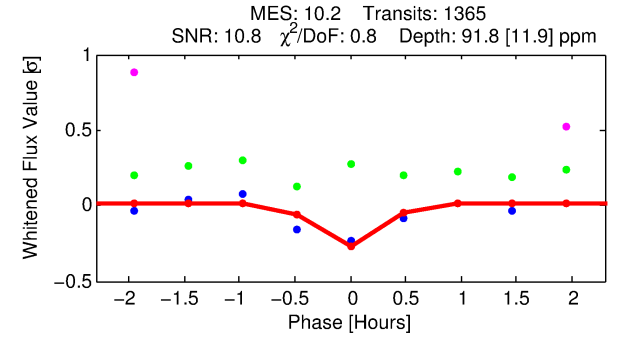
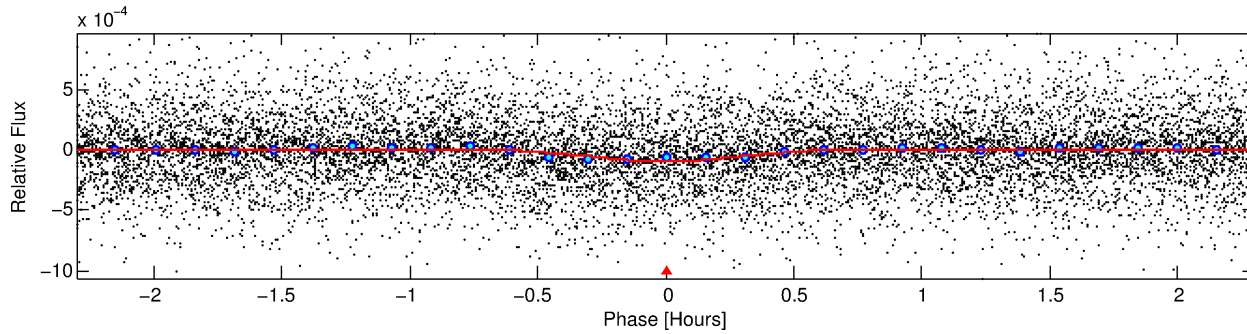
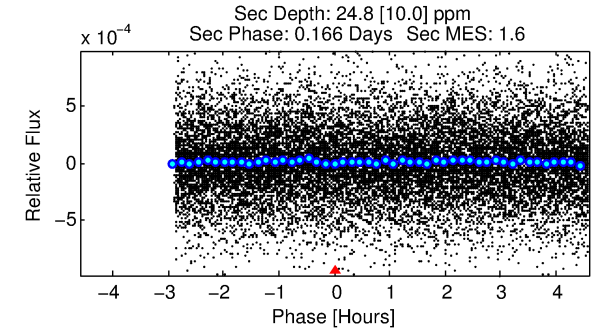
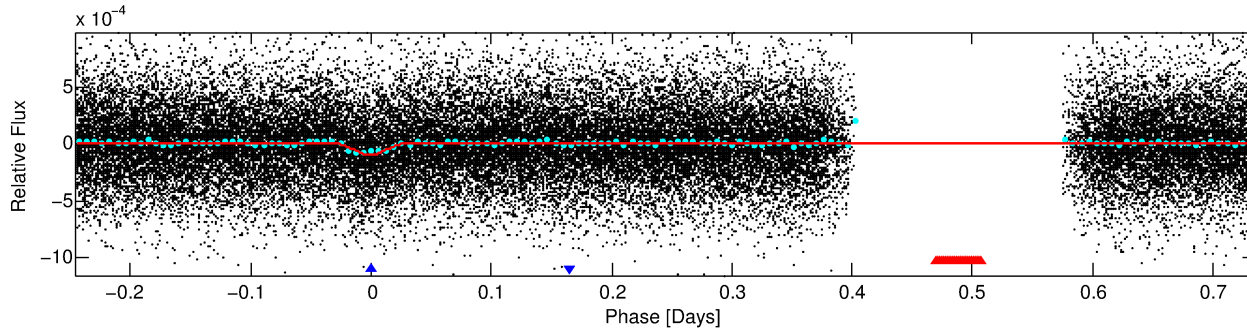
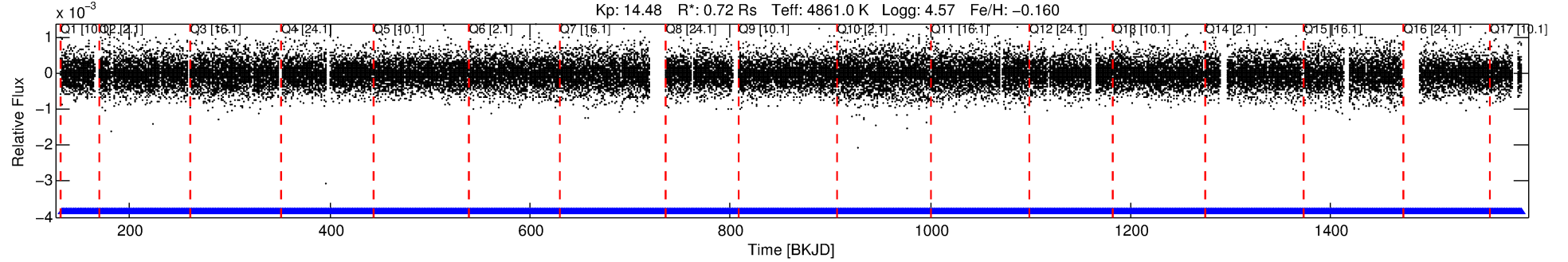
## Ephemeris Match Information For 002711597-02

No Significant Match Found

# DV One-Page Summary

KIC: 2711597 Candidate: 2 of 2 Period: 0.980 d  
KOI: K04746 Corr: No Ephemeris Match

Kp: 14.48 R\*: 0.72 Rs Teff: 4861.0 K Logg: 4.57 Fe/H: -0.160



## DV Fit Results:

Period = 0.98042 [0.00001] d  
Epoch = 132.2676 [0.0013] BKJD  
Rp/R\* = 0.0096 [0.0052]  
a/R\* = 7.21 [13.43]  
b = 0.69 [1.44]  
Seff = 878.22 [143.93]  
Teq = 1388 [57] K  
Rp = 0.75 [0.42] Re  
a = 0.0172 [0.0013] AU  
Ag = 7.14 [8.39] [0.73σ]  
Teffp = 3509 [1031] K [2.05σ]

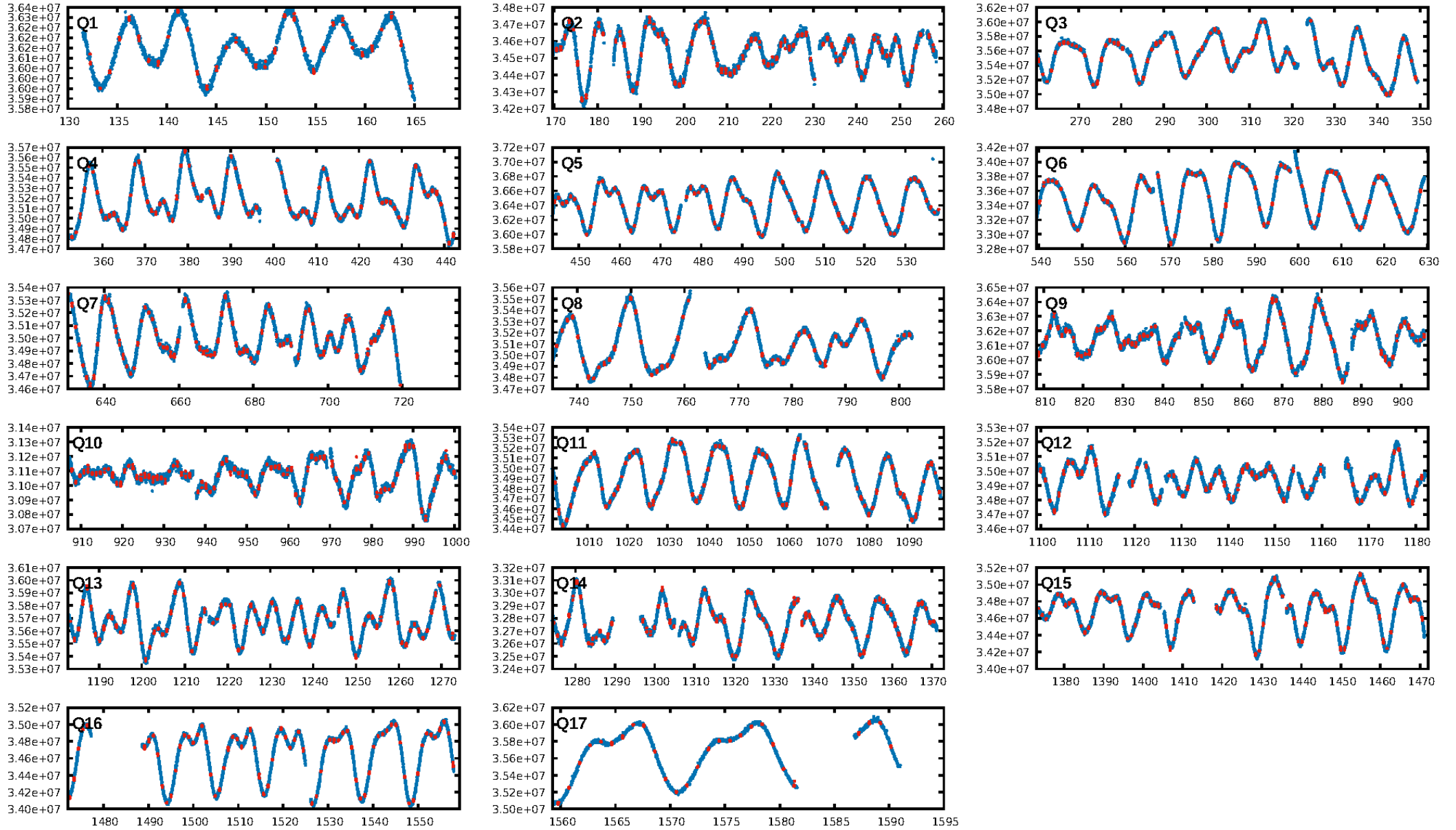
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.66e-23  
RollingBand-fgt: 1.00 [1304/1304]  
GhostDiagnostic-chr: -1.527  
Centroid-sig: N/A  
Centroid-so: 0.355 arcsec [0.32σ]  
OotOffset-rm: 0.700 arcsec [1.39σ]  
KicOffset-rm: 0.271 arcsec [0.30σ]  
OotOffset-st: 3/0/1/2 [6]  
KicOffset-st: 3/3/1/2 [9]  
DiffImageQuality-fgm: 0.22 [2/9]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:11:11 Z

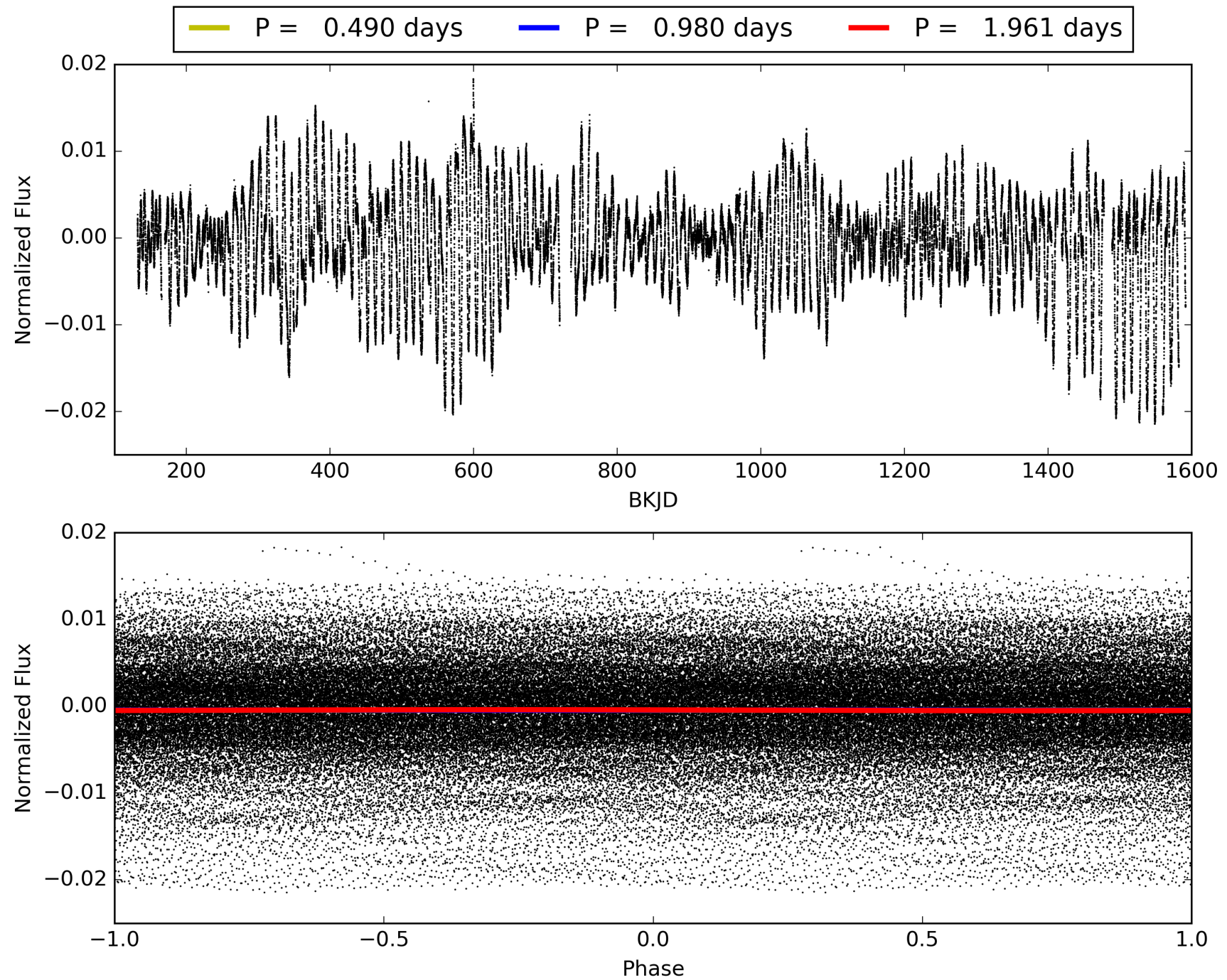
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002711597-02, PDC Light Curves



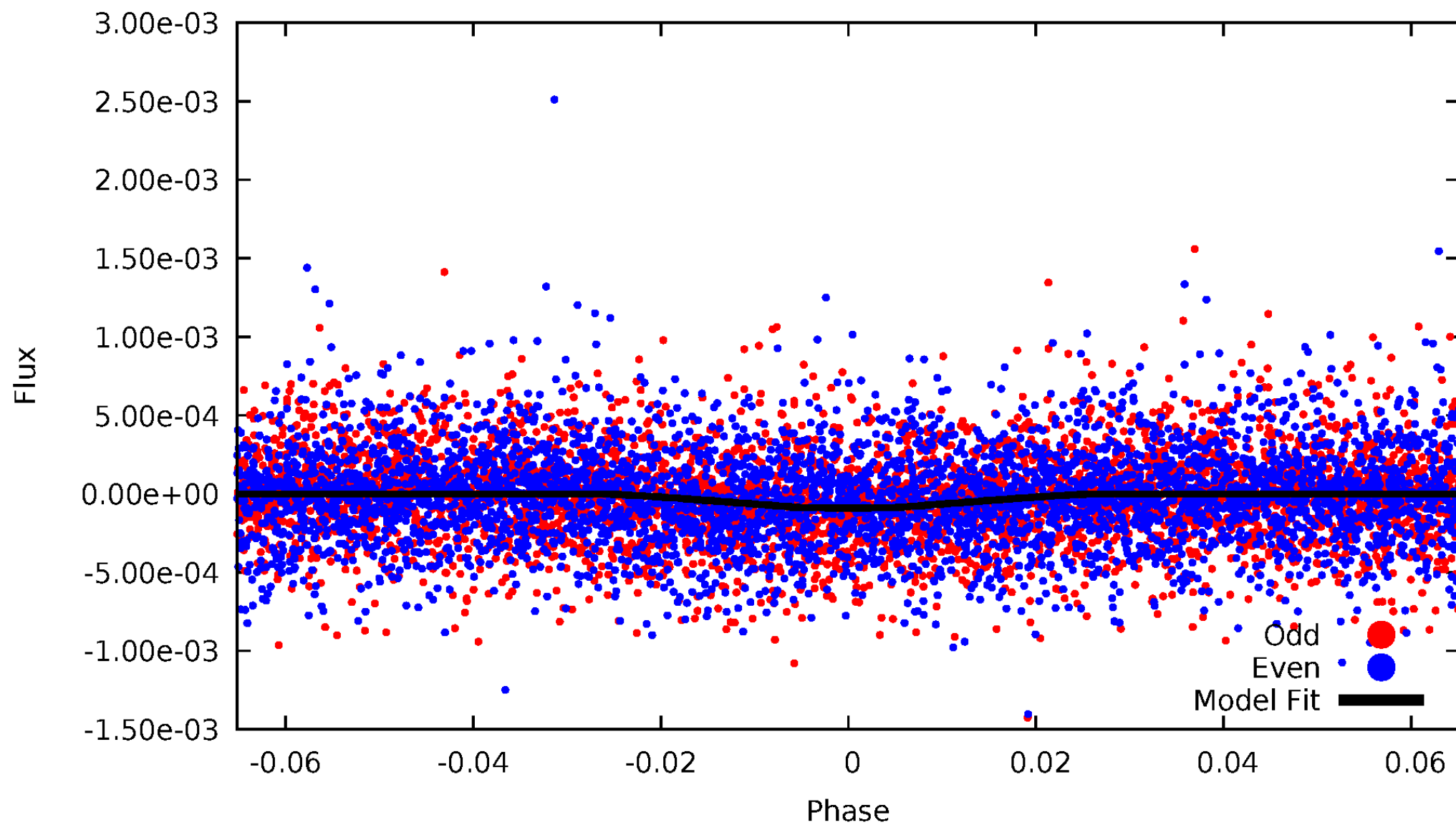


# TCE 002711597-02



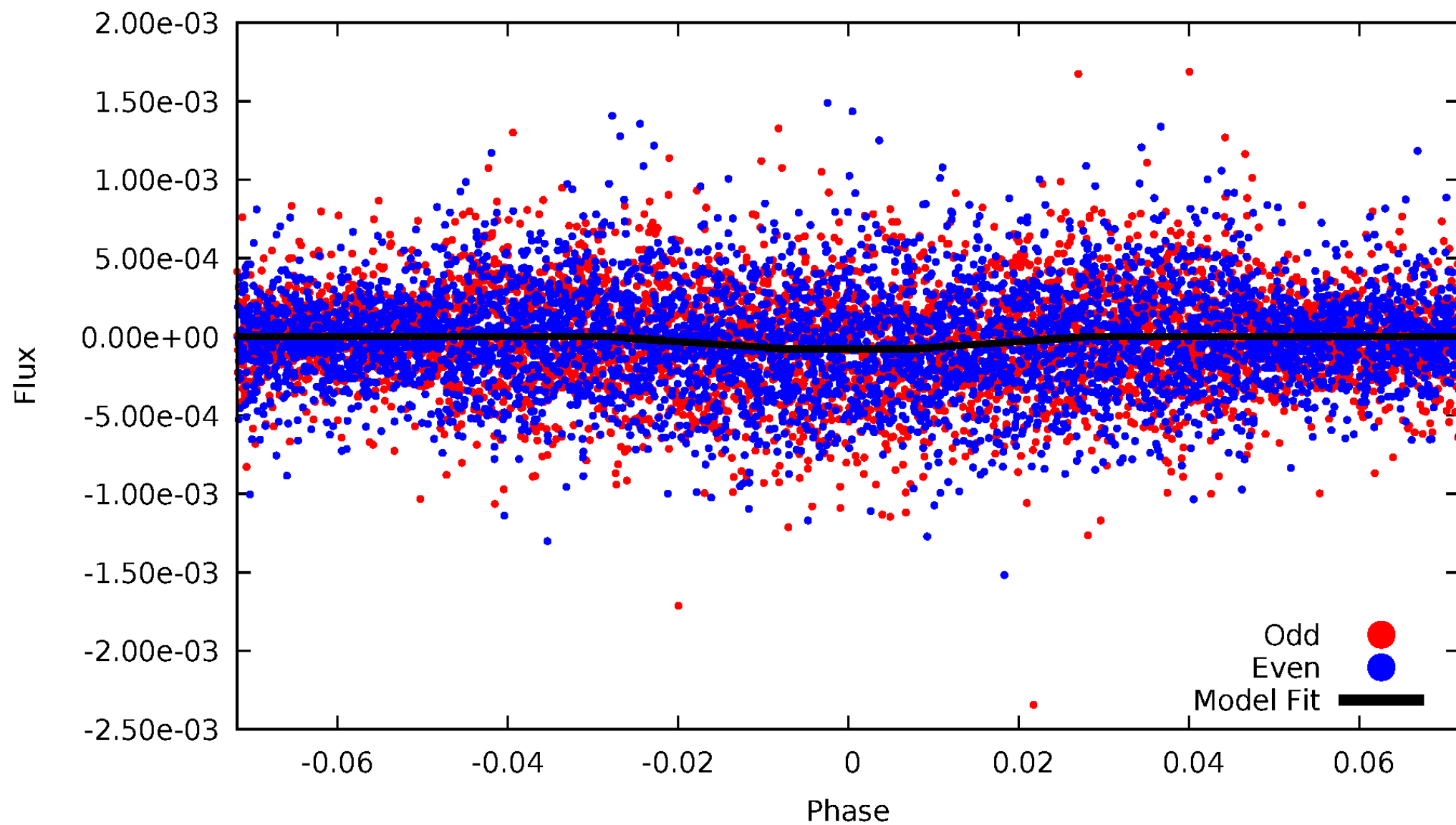
# DV Odd/Even

TCE 002711597-02



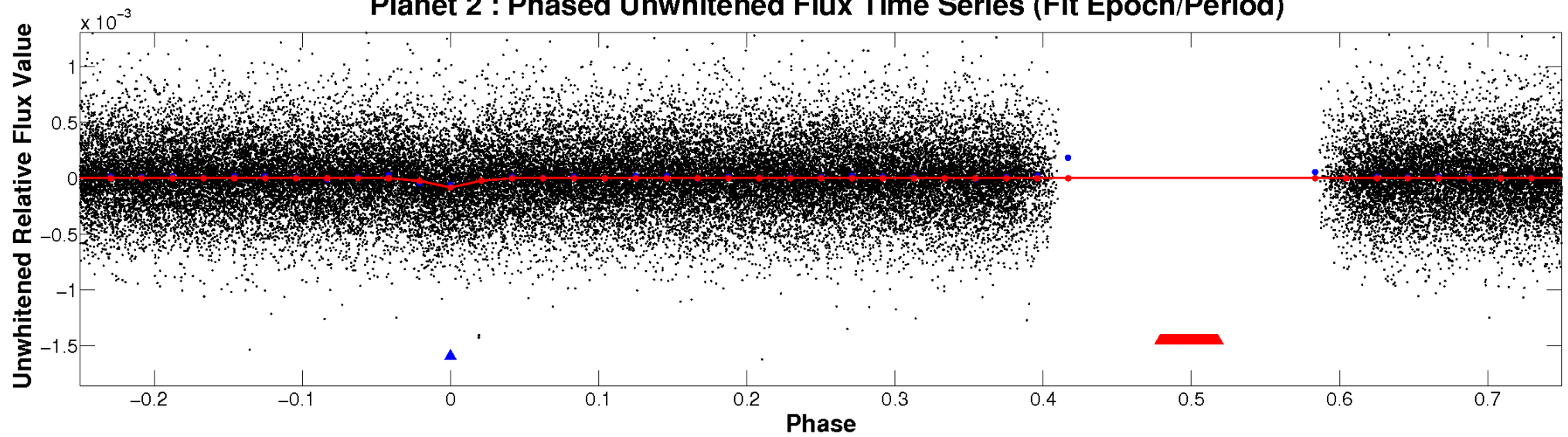
ALT Odd/Even

TCE 002711597-02

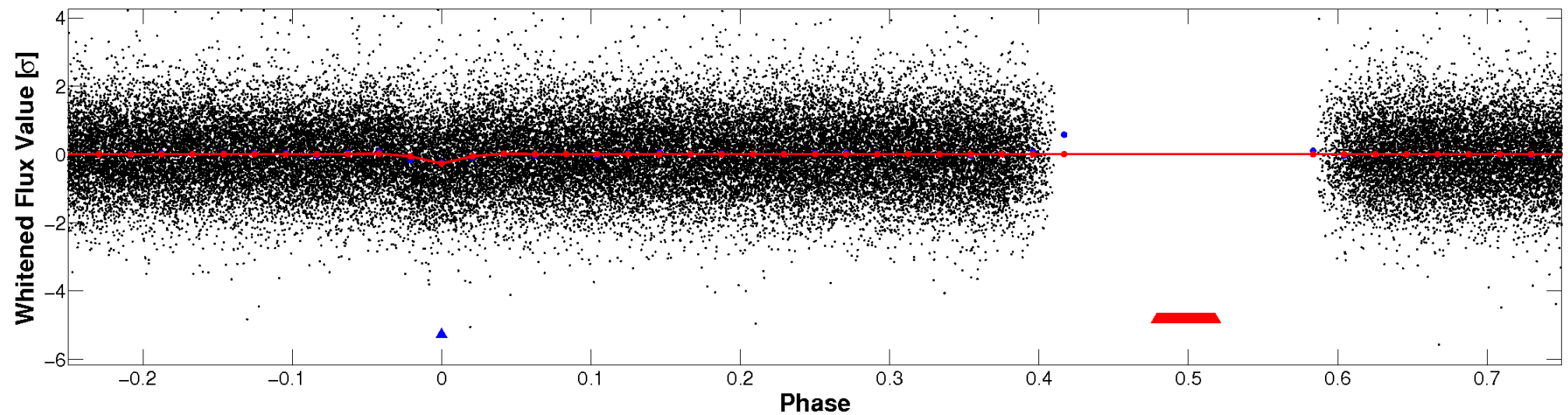


# Non-Whitened Vs. Whitened Light Curve

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



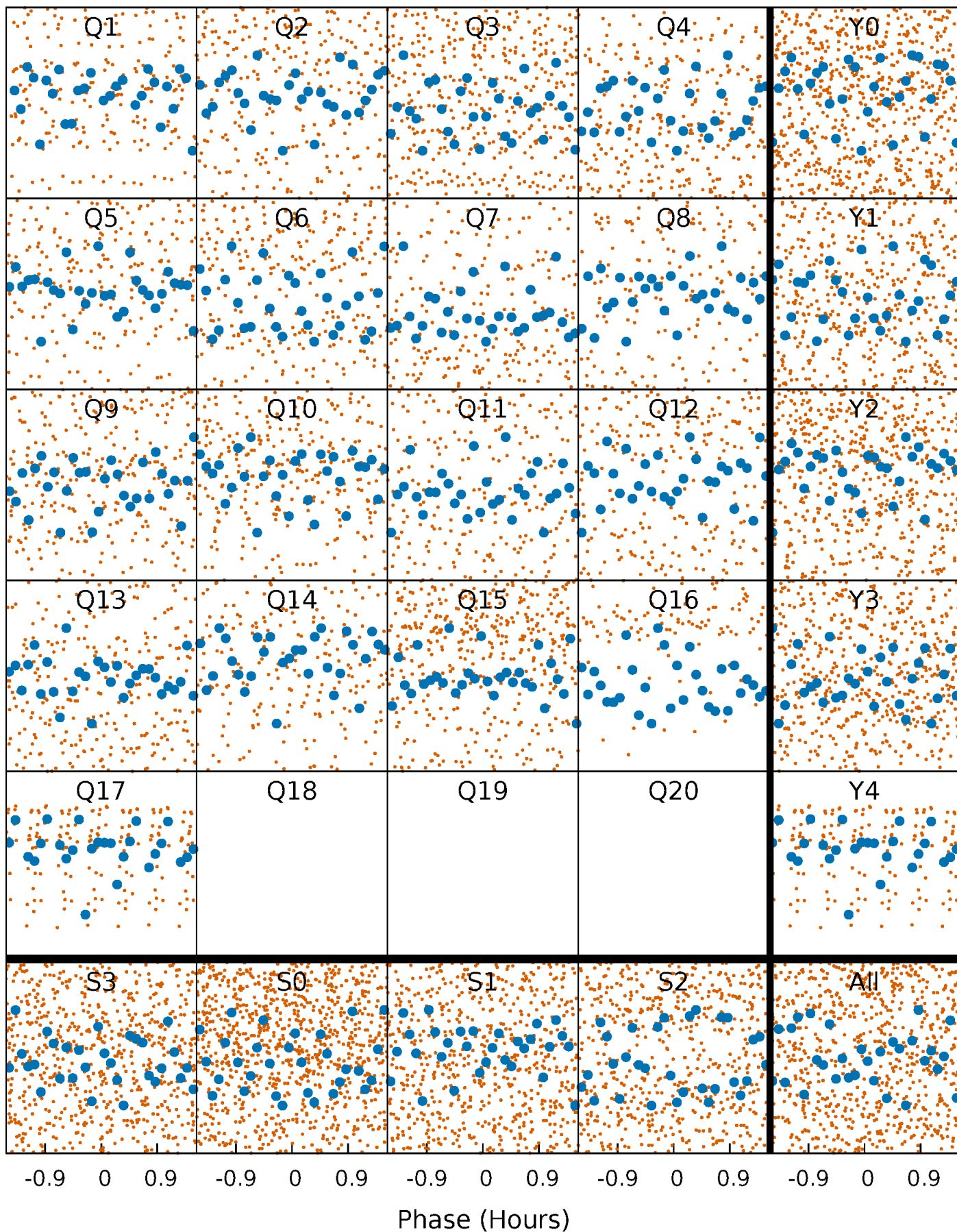
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

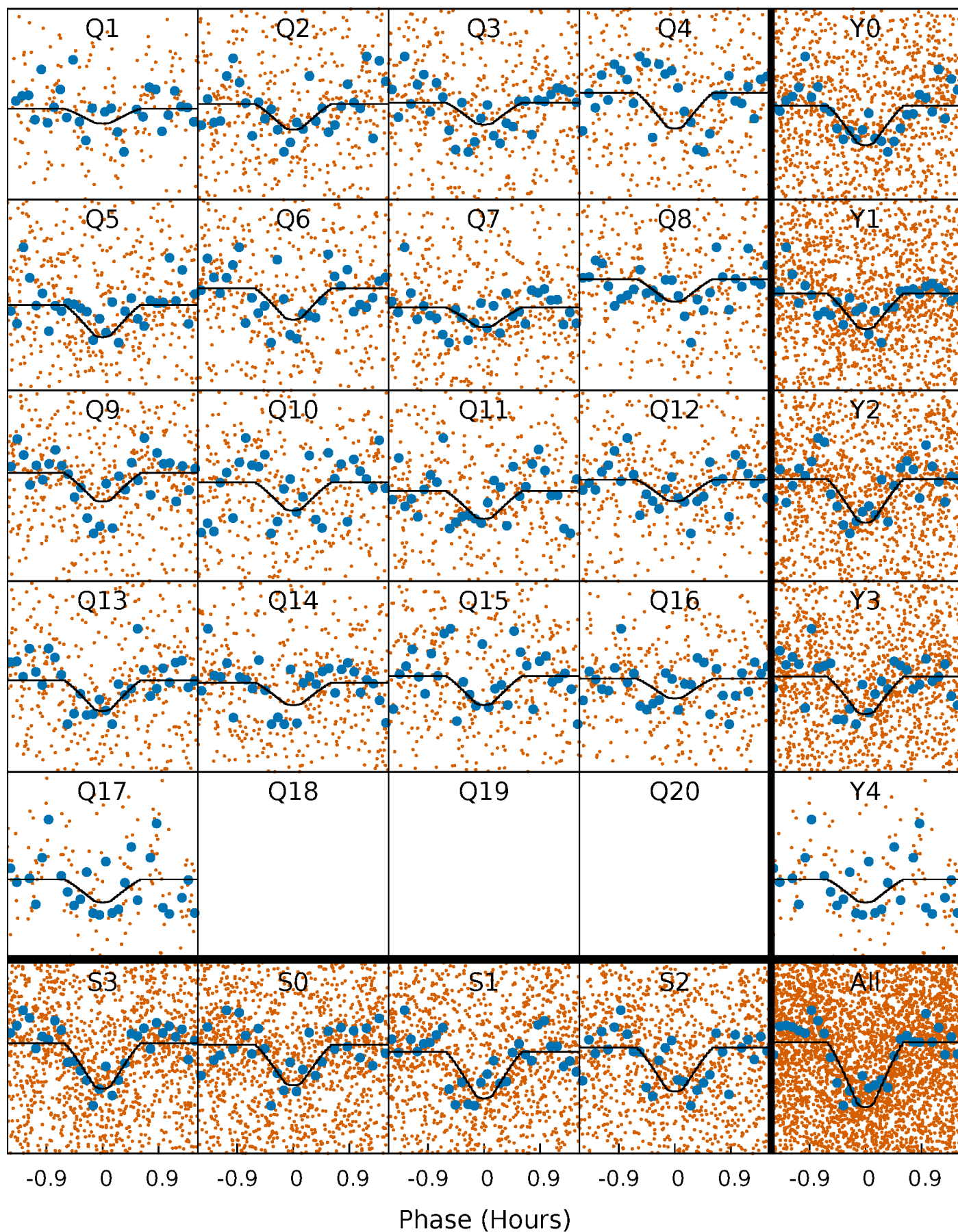
TCE 002711597-02   P= 0.980425 Days    $T_0=132.267640$  (BKJD)





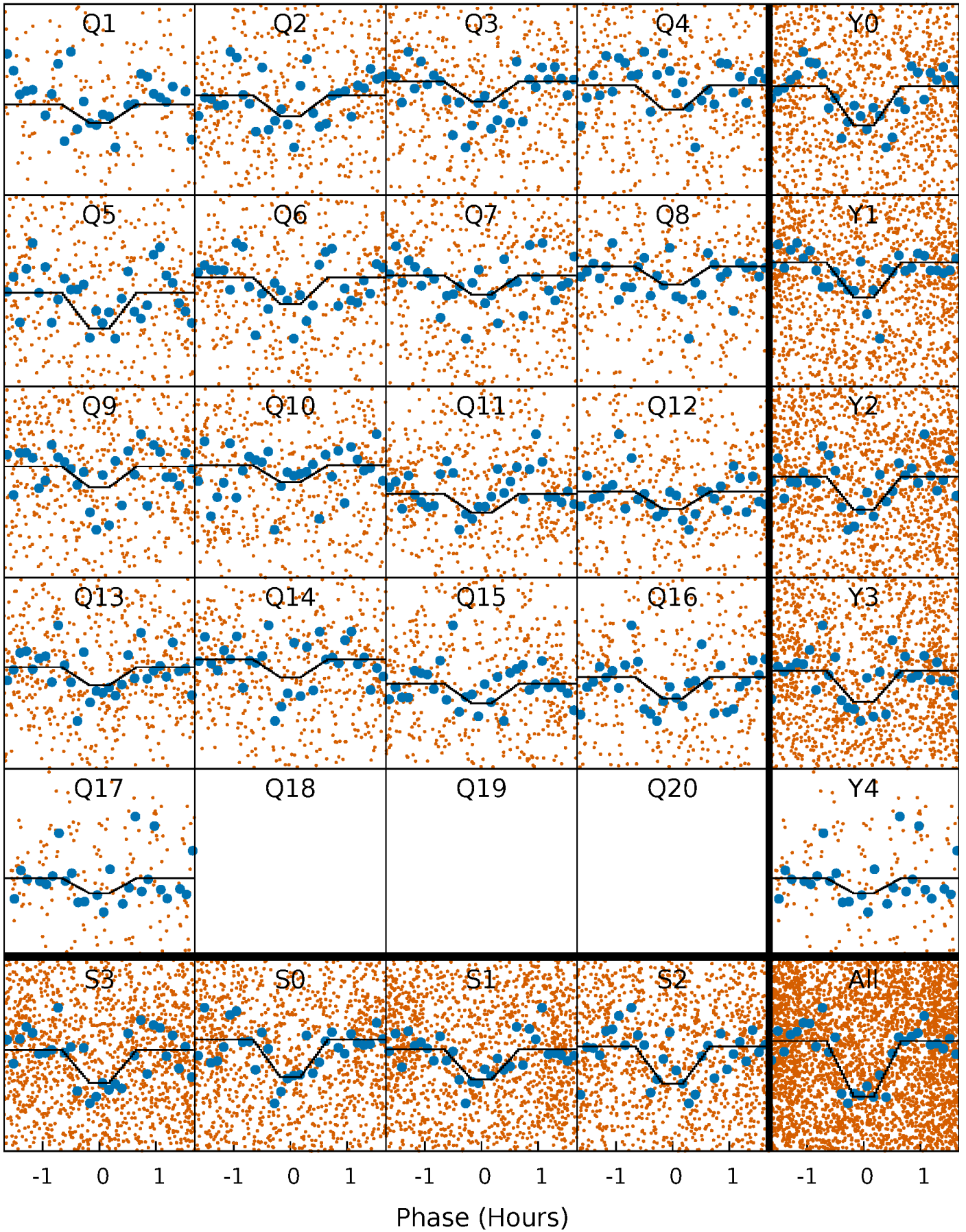
# DV Quarter-Phased Transit Curves

TCE 002711597-02   P= 0.980425 Days    $T_0=132.267640$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

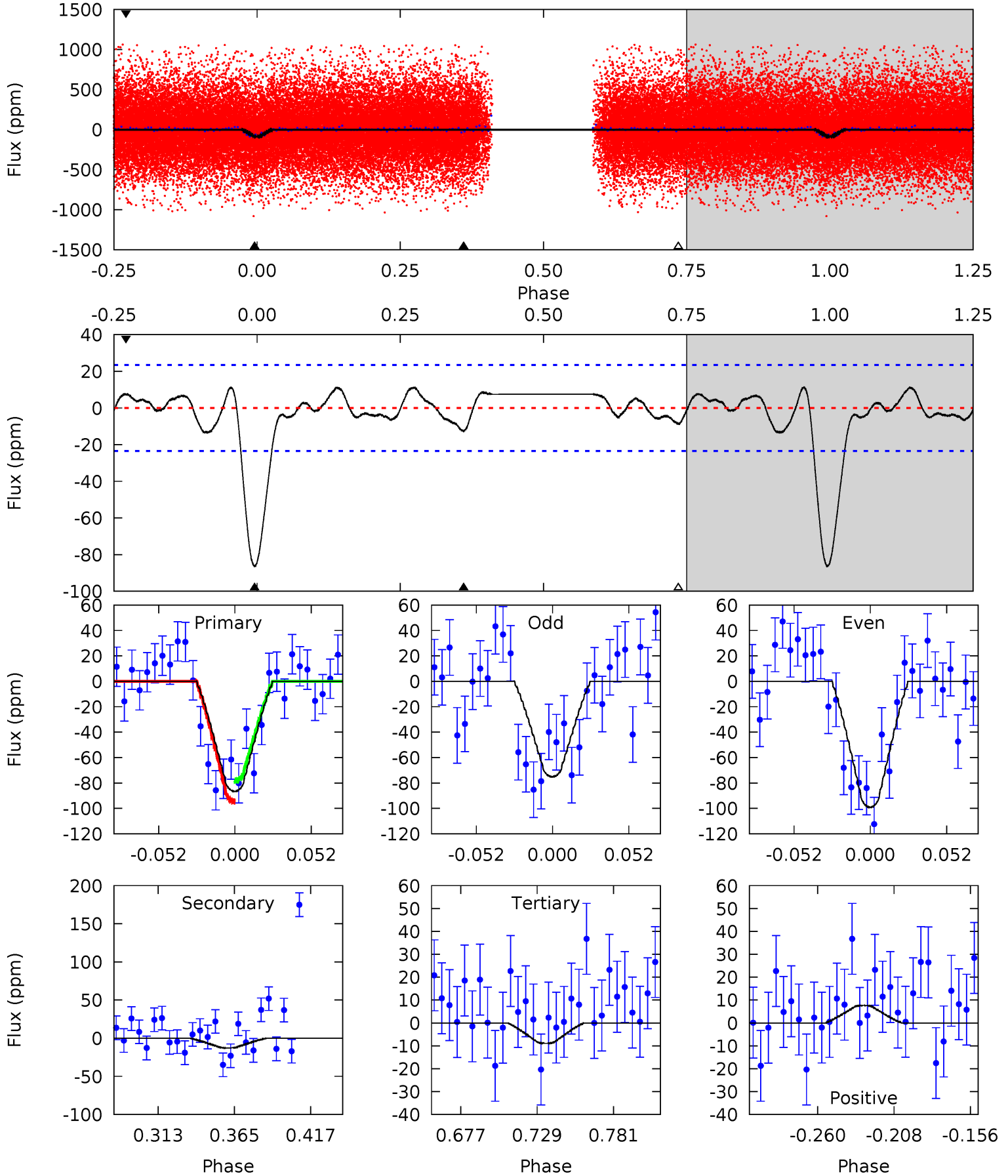
TCE 002711597-02 P= 0.980420 Days  $T_0=132.268913$  (BKJD)



# DV Model-Shift Uniqueness Test

002711597-02, P = 0.980425 Days, E = 131.287215 Days

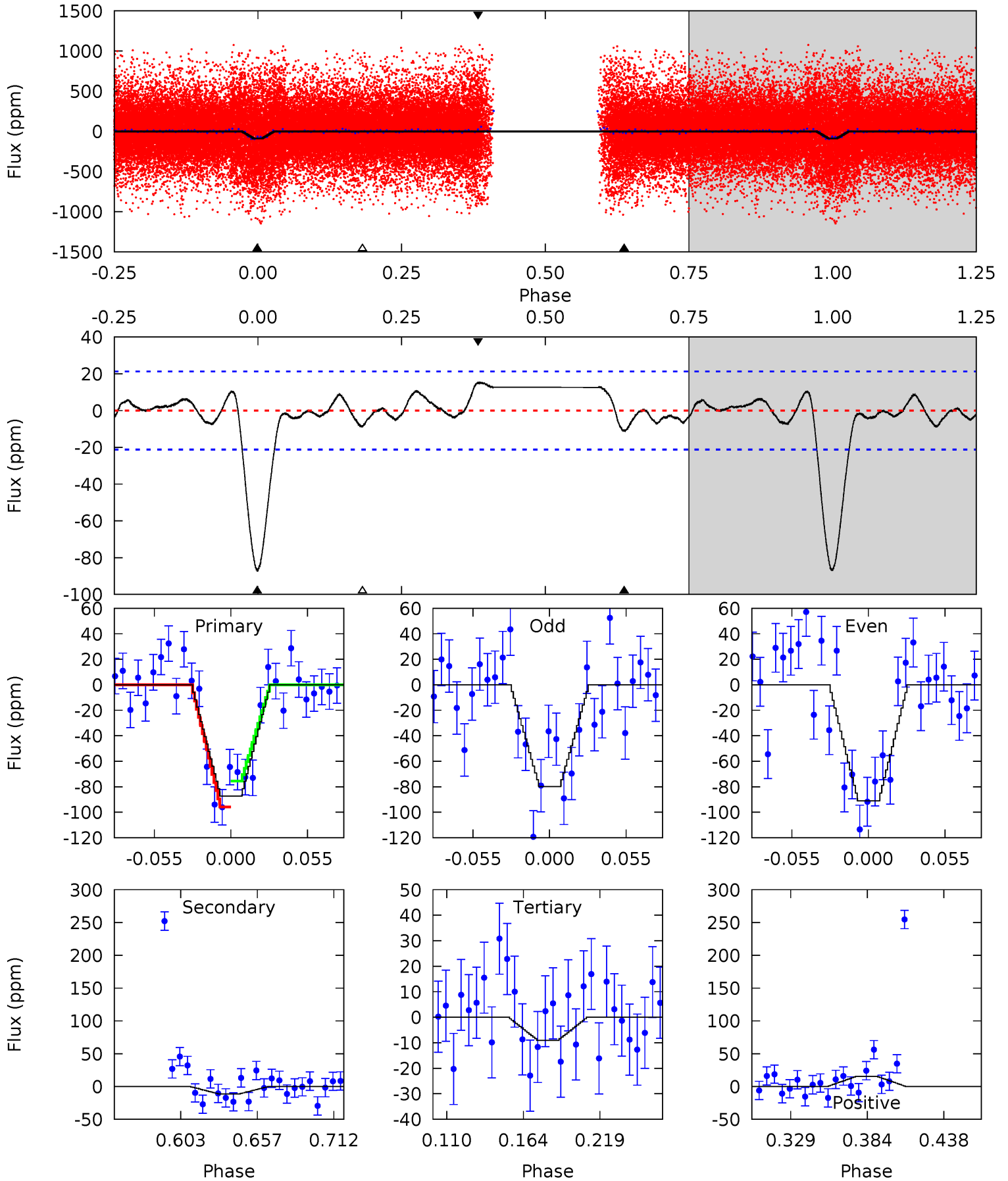
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	2.56	1.79	1.53	4.70	1.94	1.12	15.5	15.8	0.77	1.02	2.41	0.92	0.12	1.65



# Alt Model-Shift Uniqueness Test

002711597-02, P = 0.980420 Days, E = 131.288493 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
19.2	2.50	1.99	3.40	4.69	1.92	1.10	17.3	15.8	0.51	-0.90	1.21	0.99	0.15	2.28



### Stellar Parameters For KIC 002711597

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4861^{+131}_{-146}$	$4.572^{+0.060}_{-0.035}$	$-0.160^{+0.300}_{-0.300}$	$0.722^{+0.062}_{-0.068}$	$0.710^{+0.081}_{-0.054}$	$2.656^{+0.703}_{-0.385}$
	+3%/-3%	+1%/-1%	+188%/-188%	+9%/-9%	+11%/-8%	+26%/-14%
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 002711597-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-13 \pm 5$	$0.77^{+0.43}_{-0.39}$	$1926^{+67}_{-62}$	$3314^{+887}_{-526}$	$3.408^{+10.159}_{-2.185}$
Alt.	$-11 \pm 5$	$0.73^{+0.43}_{-0.38}$	$1934^{+65}_{-72}$	$3297^{+1003}_{-554}$	$3.252^{+12.133}_{-2.160}$

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



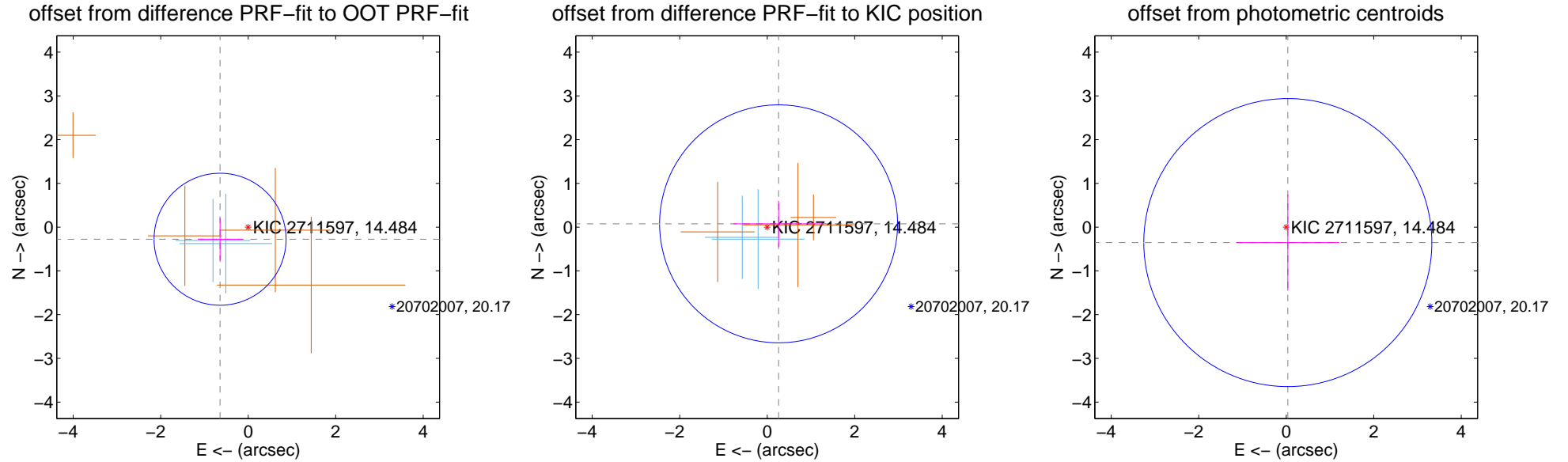
## DV Centroid Data

Supplemental centroid analysis for 002711597-02. Kepler magnitude: 14.48. Transit SNR 10.85

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

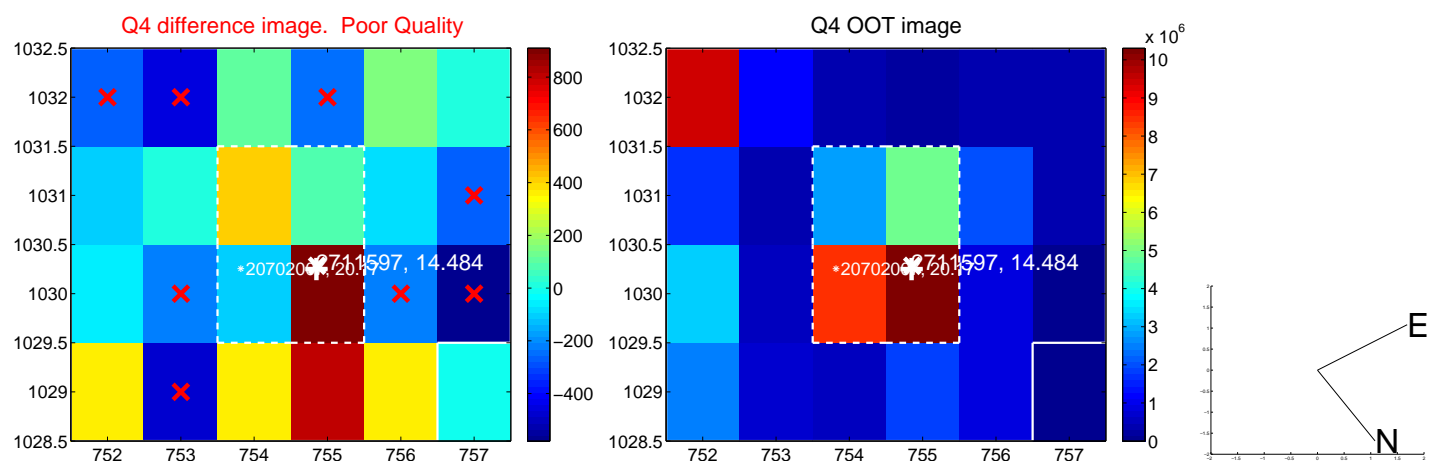
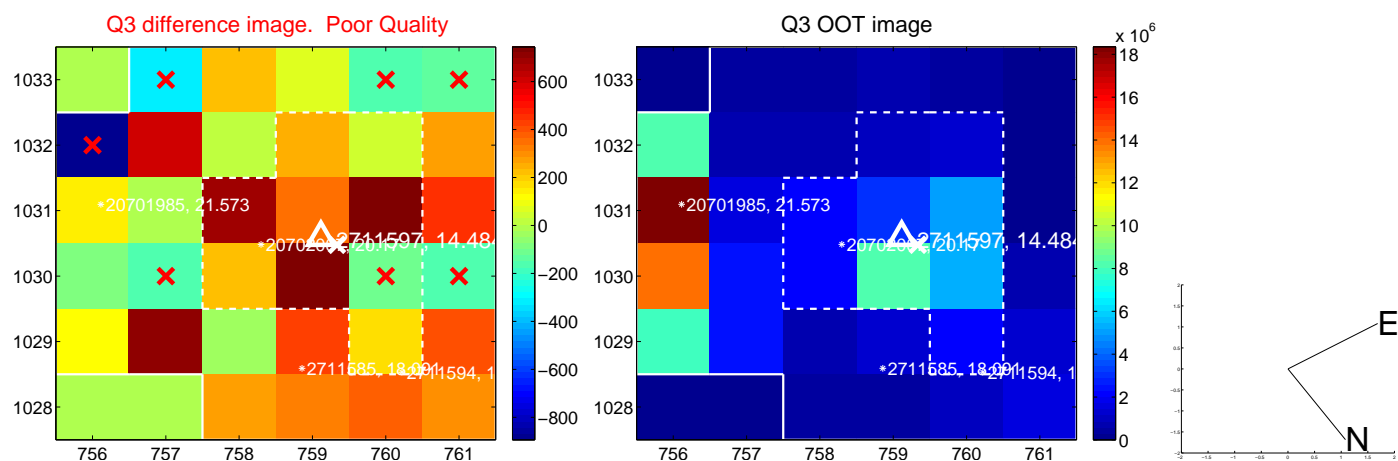
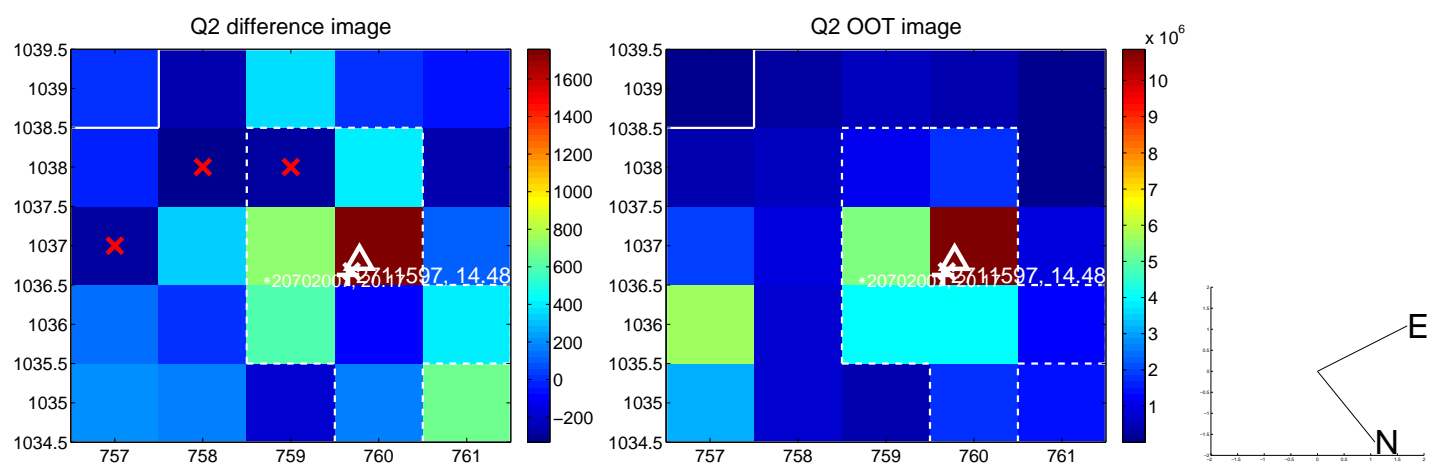
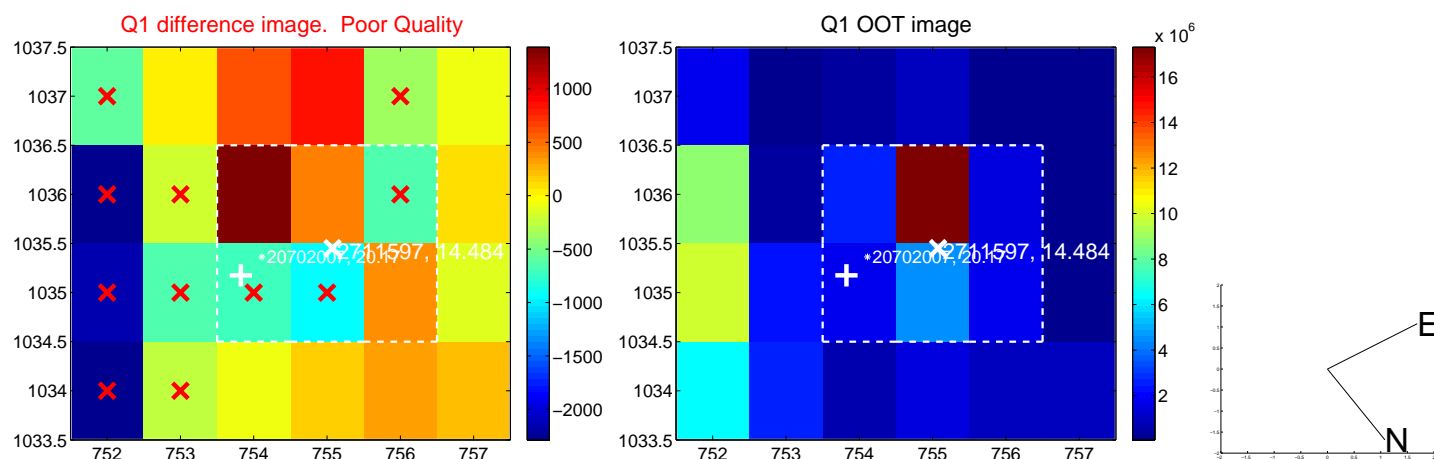
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.700 \pm 0.503$	1.39	$0.643 \pm 0.506$	$-0.277 \pm 0.483$
PRF-fit source offset from KIC position	$0.271 \pm 0.906$	0.30	$-0.260 \pm 1.027$	$0.075 \pm 0.526$
photometric centroid source offset	$0.35 \pm 1.10$	0.32	$-0.04 \pm 1.18$	$-0.35 \pm 1.10$



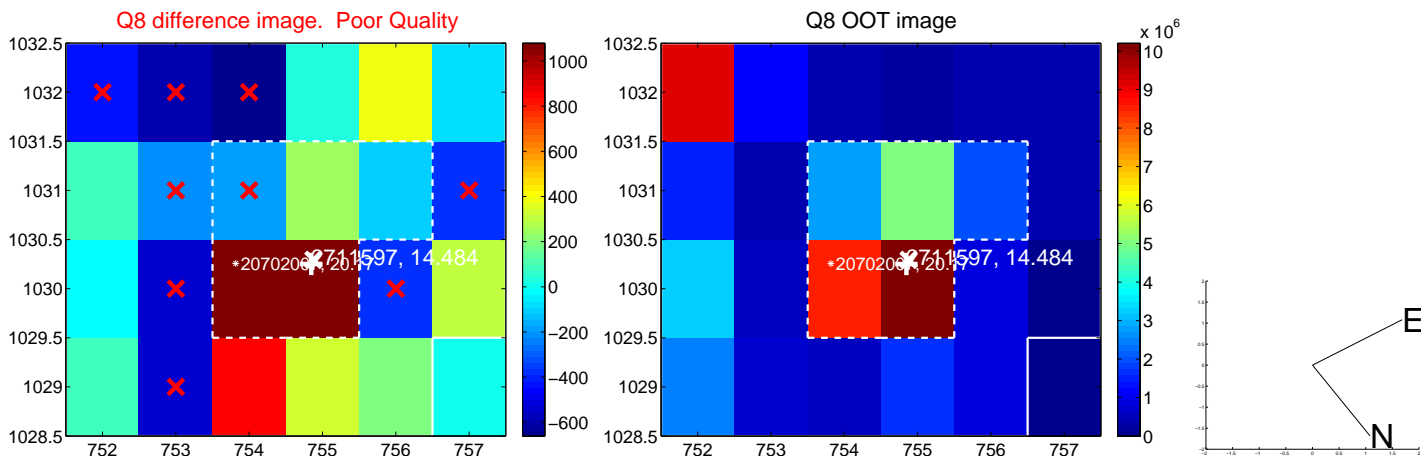
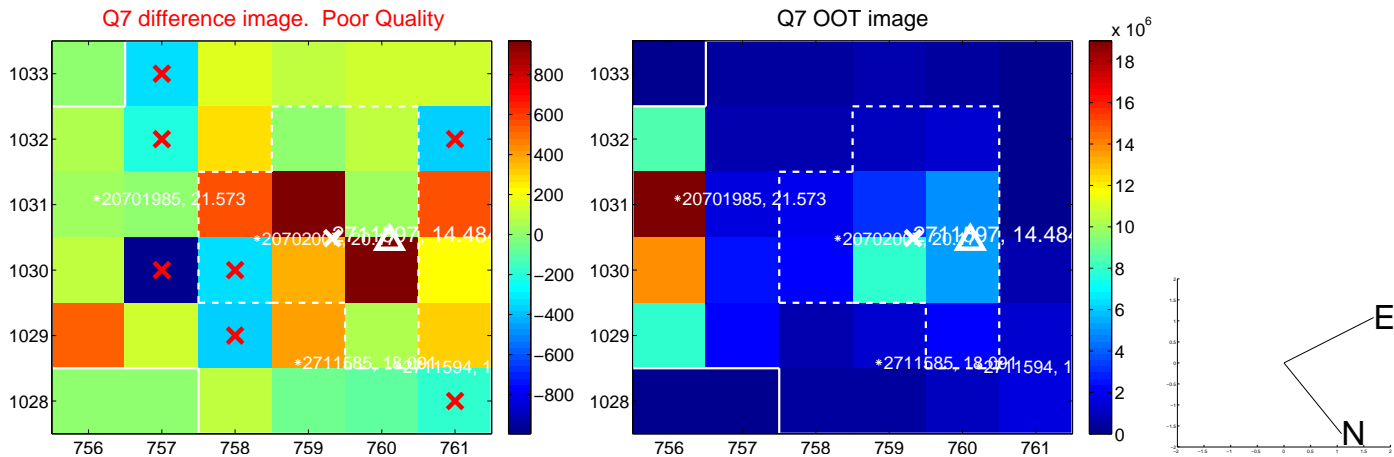
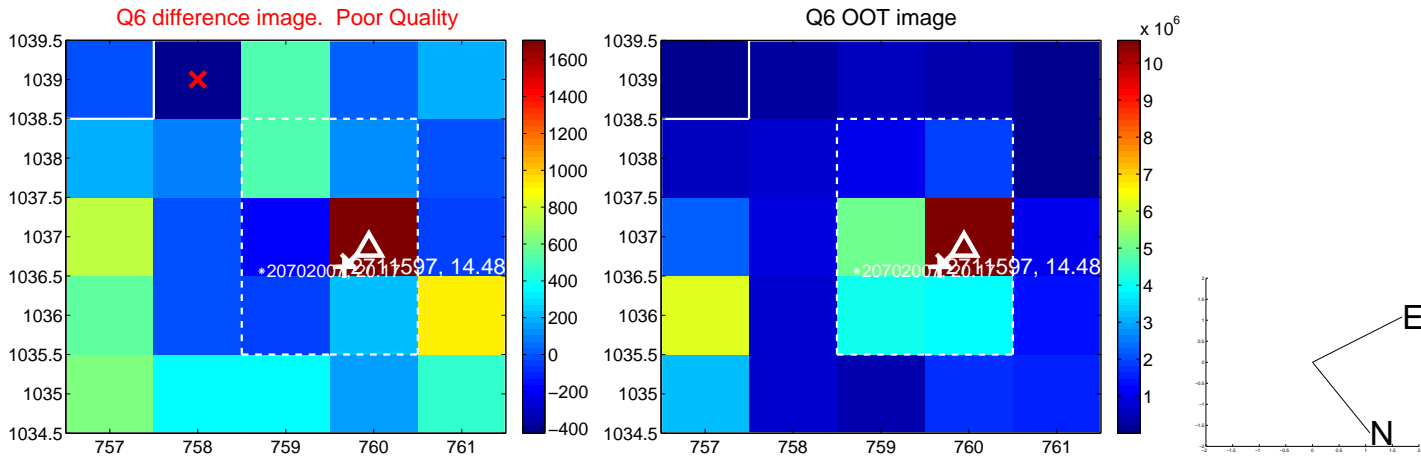
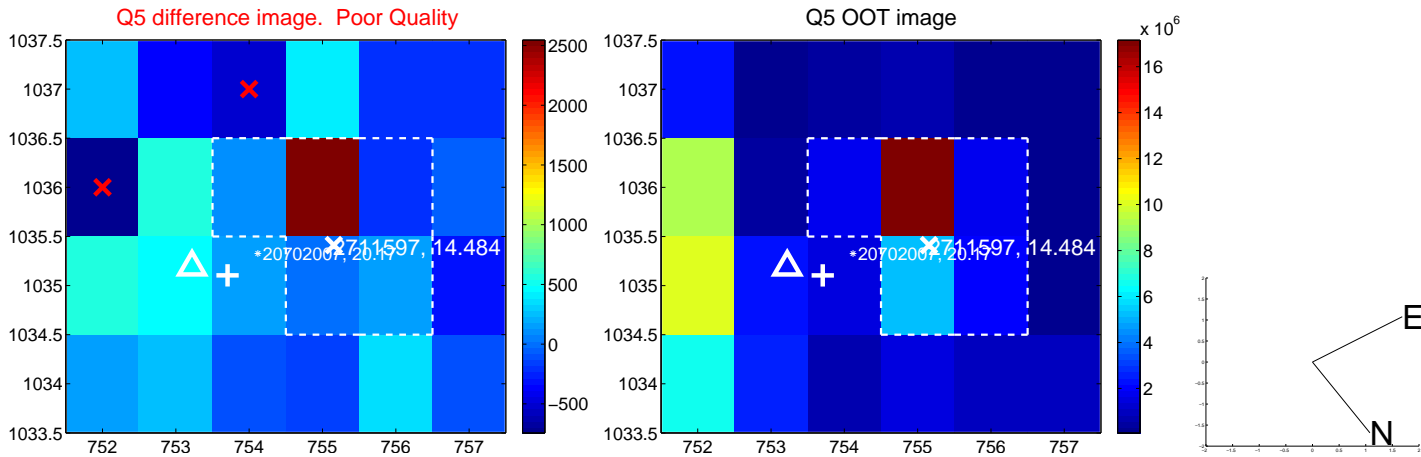
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



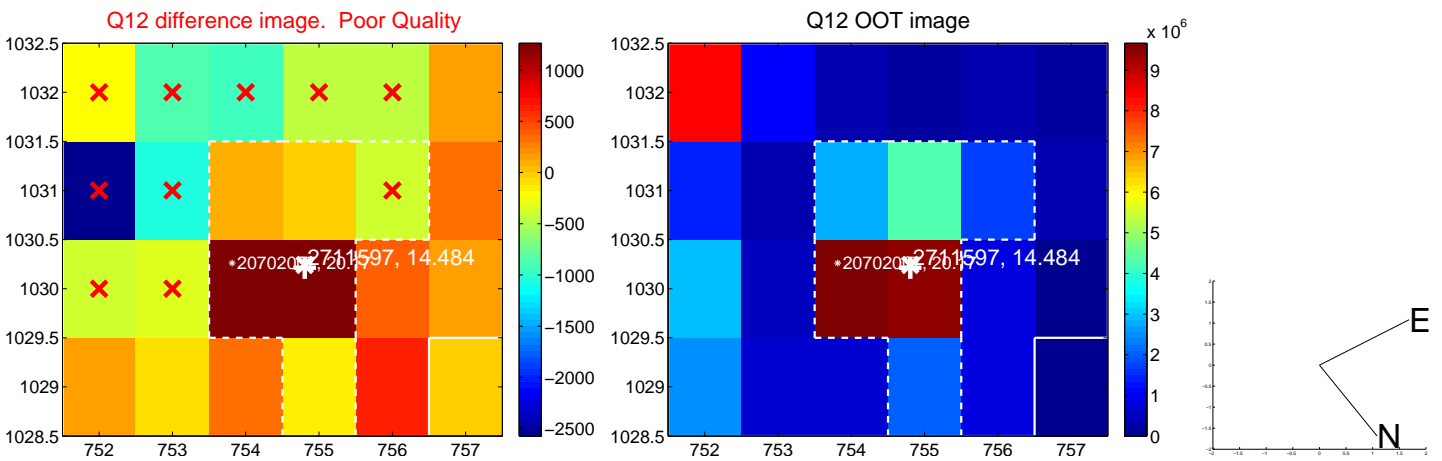
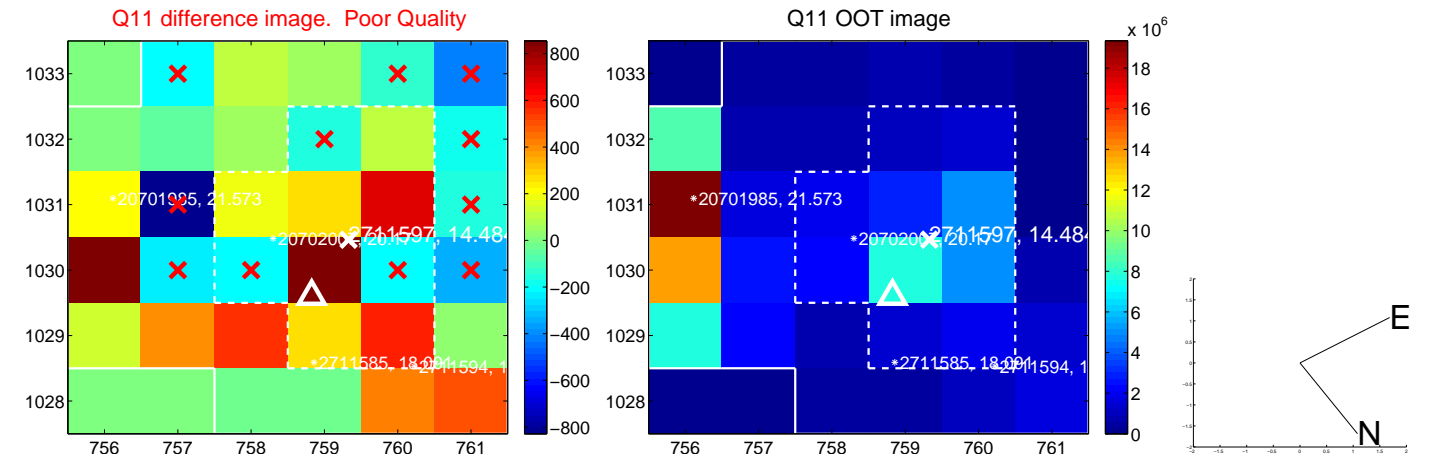
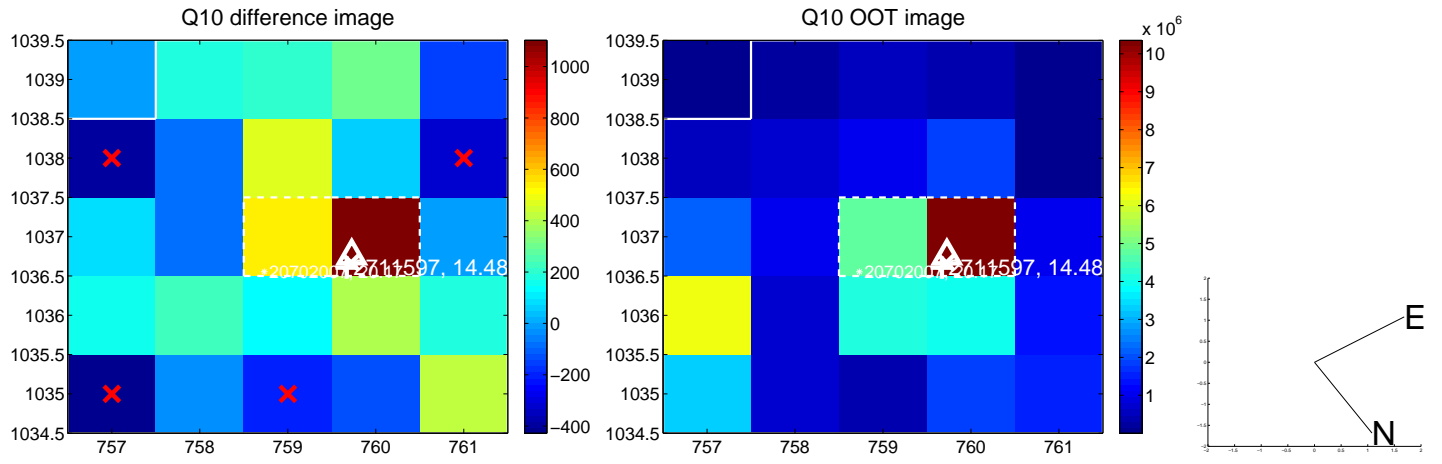
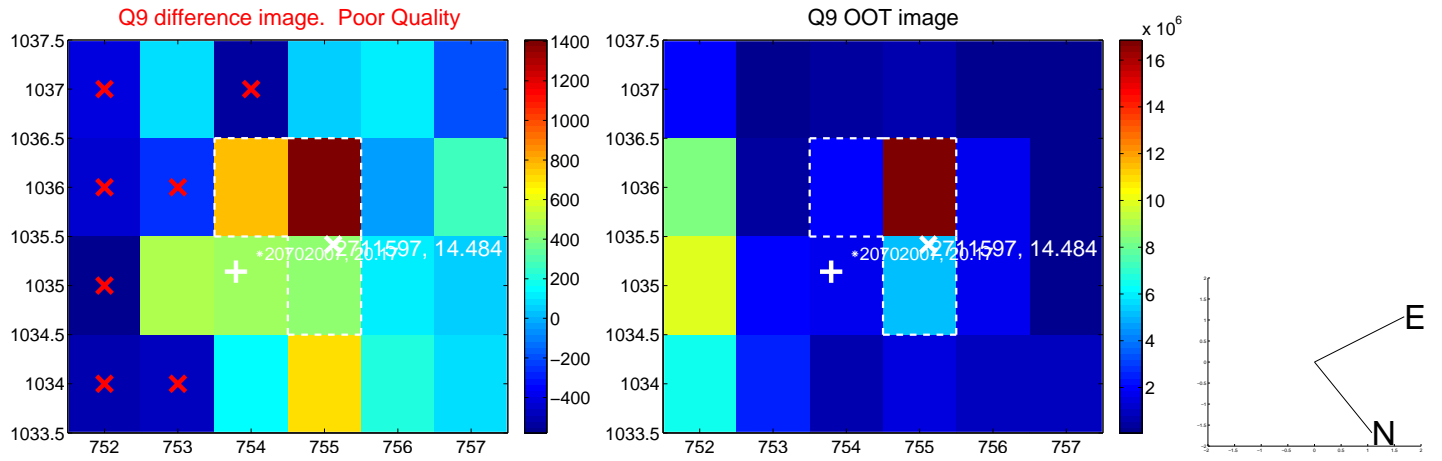
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



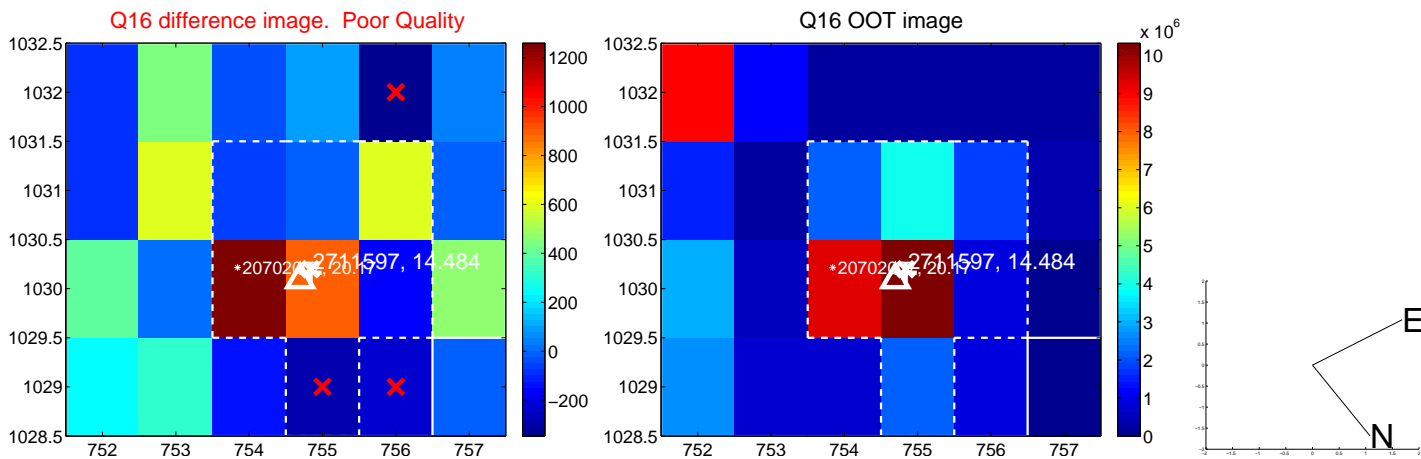
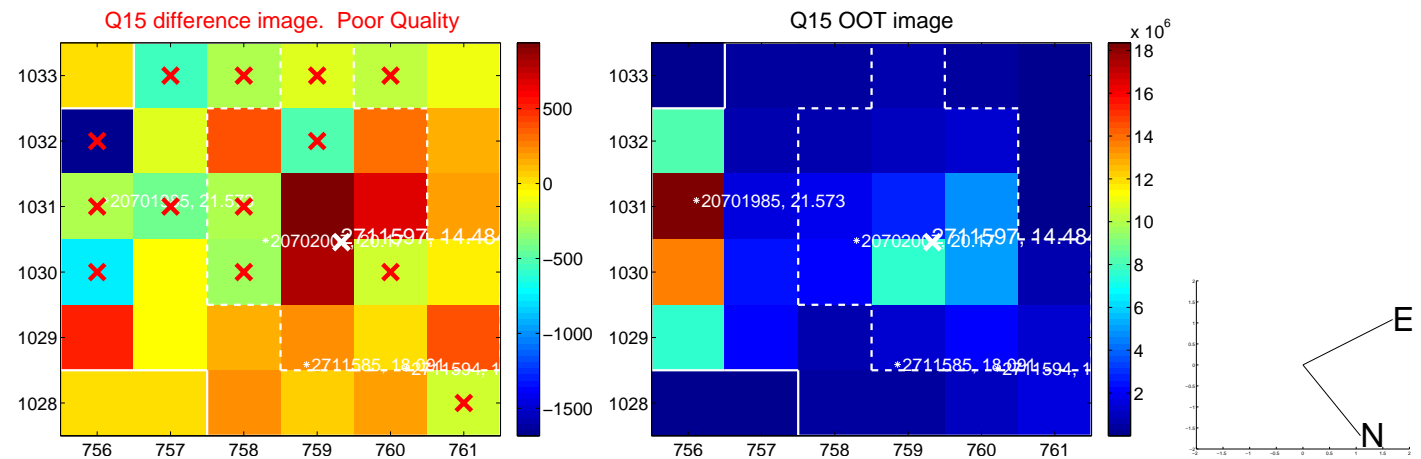
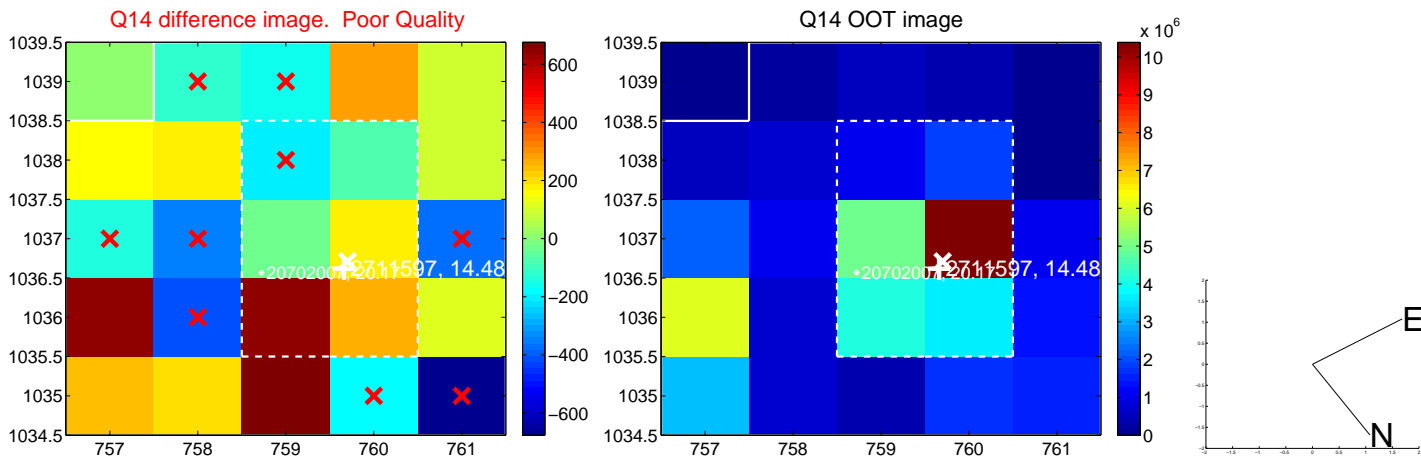
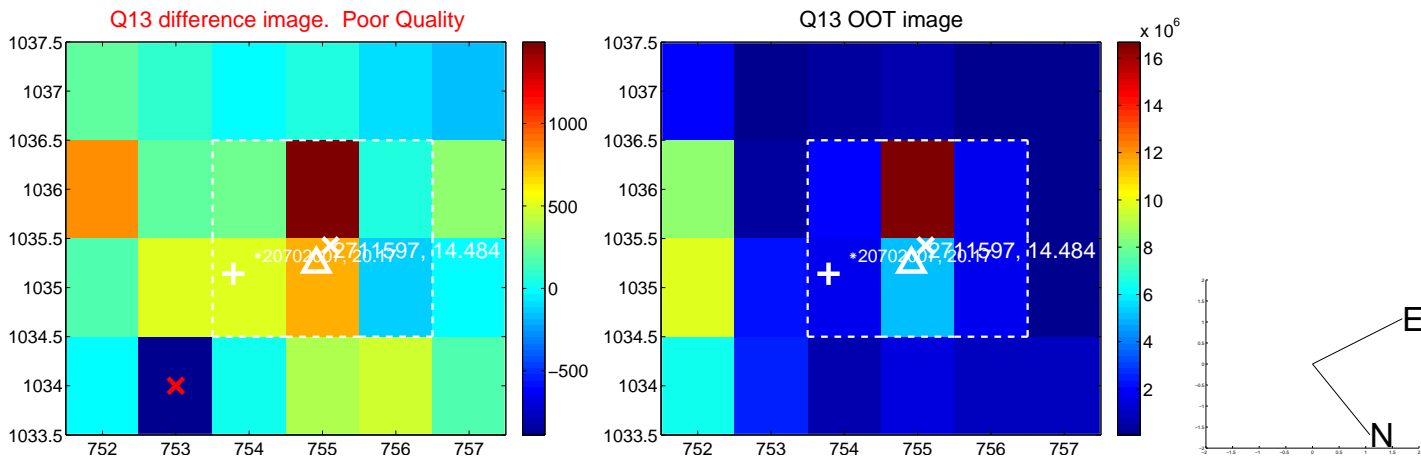
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



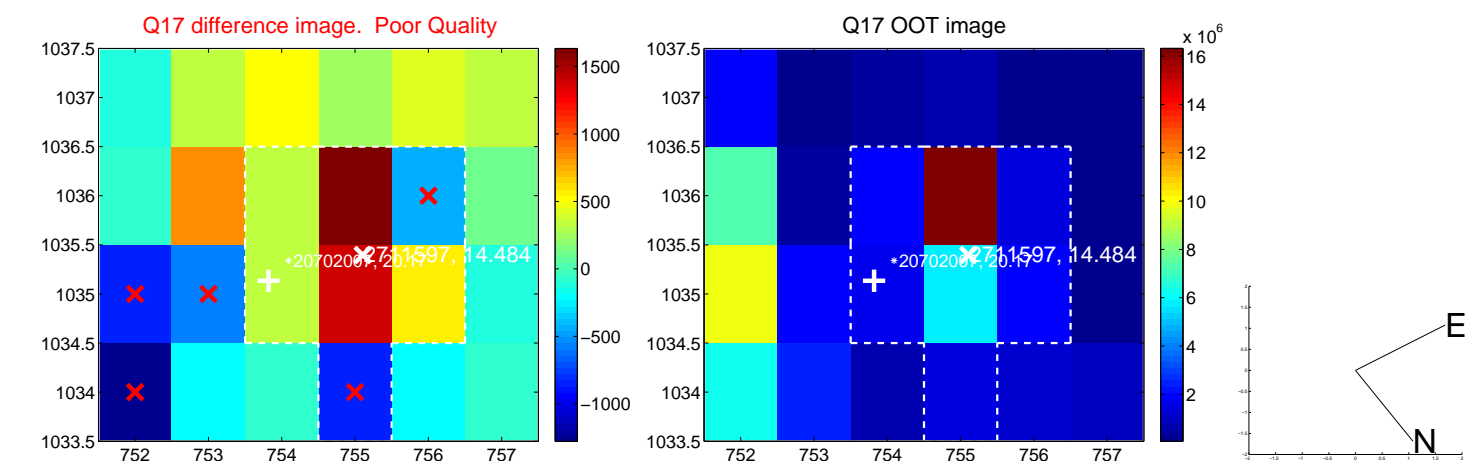
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



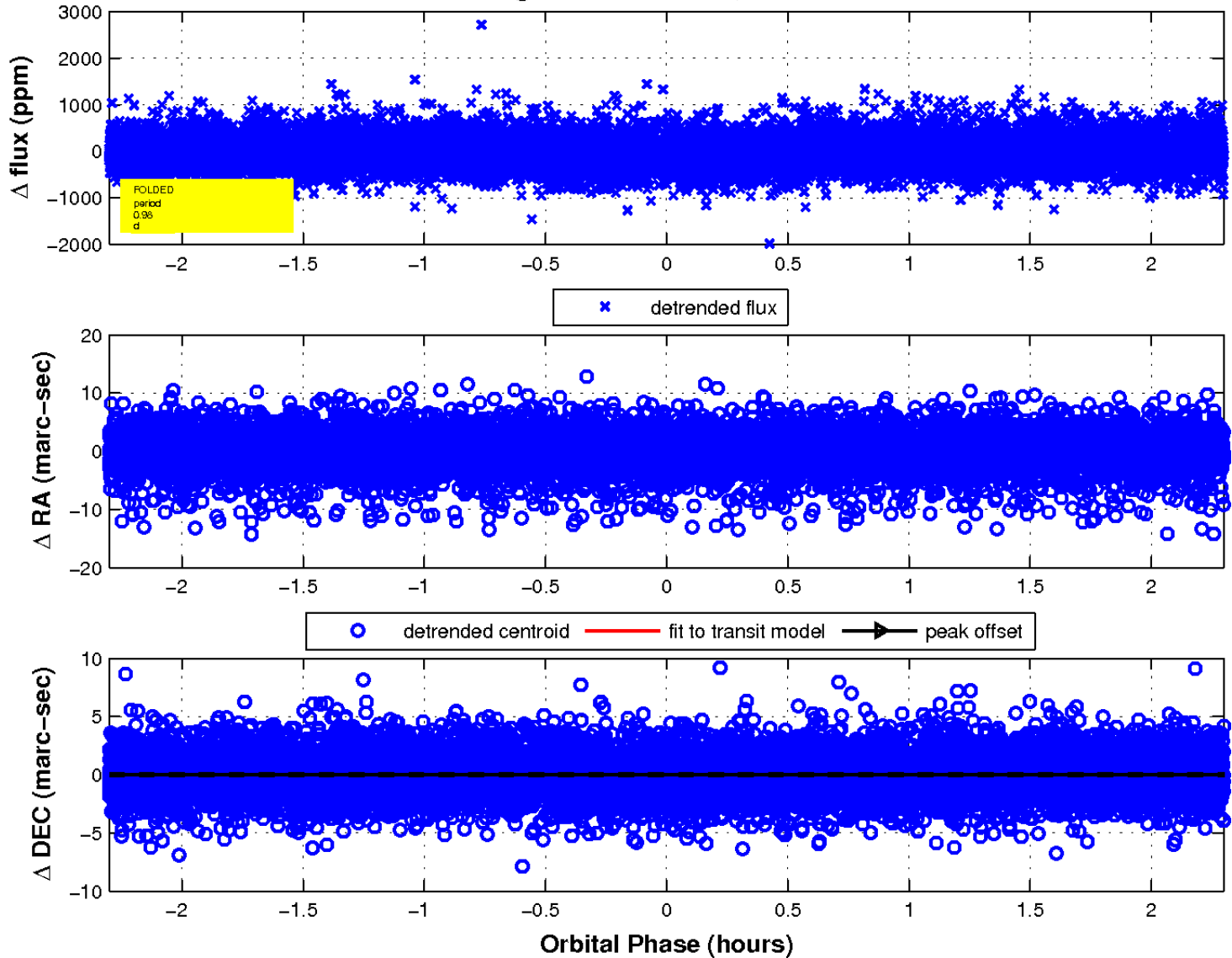
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

