

# KIC 008848271

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008848271-01	OBS	1256.01	9.991631	137.447826	3481.8	3.834	244.2	219.6	1.10	5874	12.05	160.32
008848271-02	OBS	No	9.991625	140.663698	960.6	4.382	72.1	73.8	1.10	5874	6.55	160.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008848271-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
008848271-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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 008848271-01

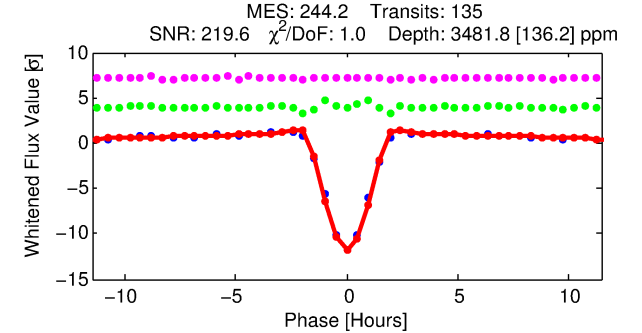
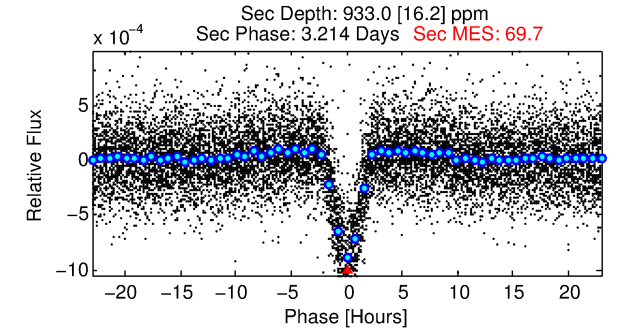
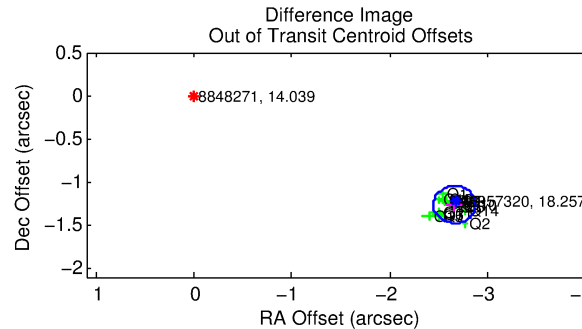
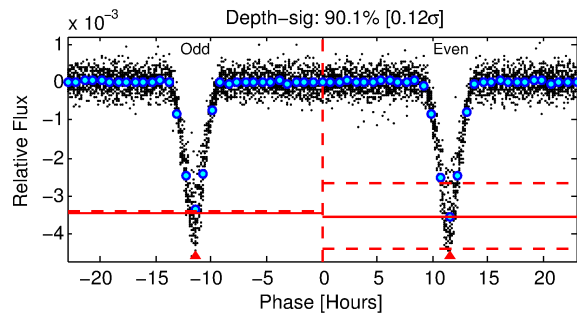
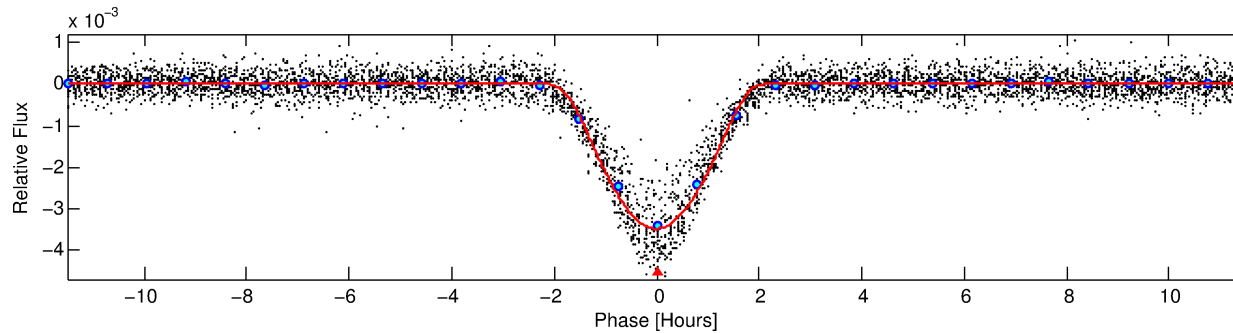
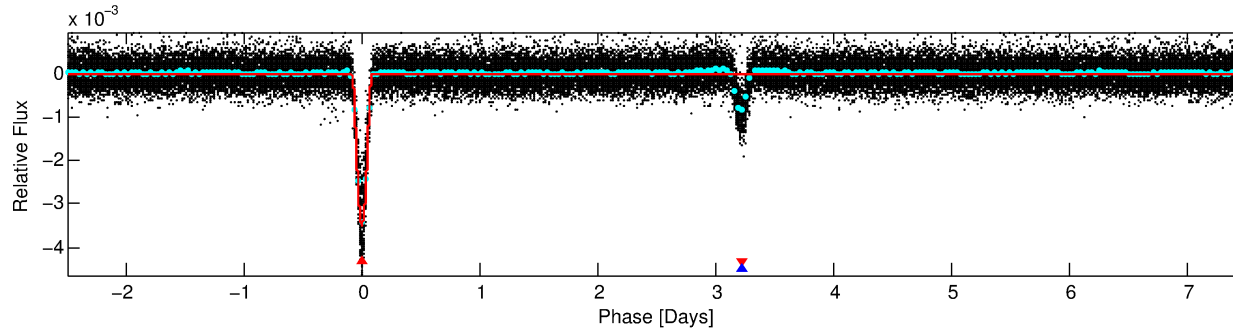
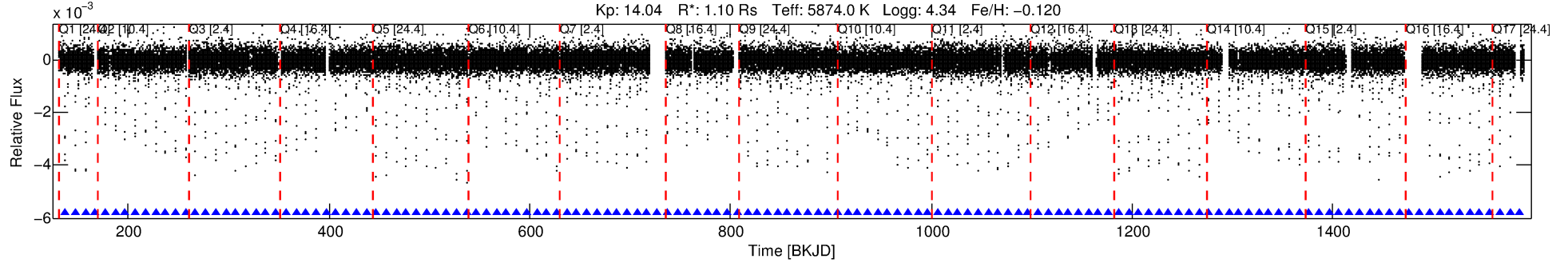
No Significant Match Found

# DV One-Page Summary

KIC: 8848271 Candidate: 1 of 2 Period: 9.992 d

KOI: K01256.01 Corr: 0.997

Kp: 14.04 R\*: 1.10 Rs Teff: 5874.0 K Logg: 4.34 Fe/H: -0.120



## DV Fit Results:

Period = 9.99163 [0.00000] d  
Epoch = 137.4478 [0.0004] BKJD  
Rp/R\* = 0.1008 [0.0203]  
a/R\* = 9.22 [0.36]  
b = 1.00 [0.03]  
Seff = 160.32 [58.27]  
Teq = 907 [82] K  
Rp = 12.05 [4.18] Re  
a = 0.0894 [0.0211] AU  
Ag = 28.23 [14.94] [1.82σ]  
Teff = 3234 [340] K [6.65σ]

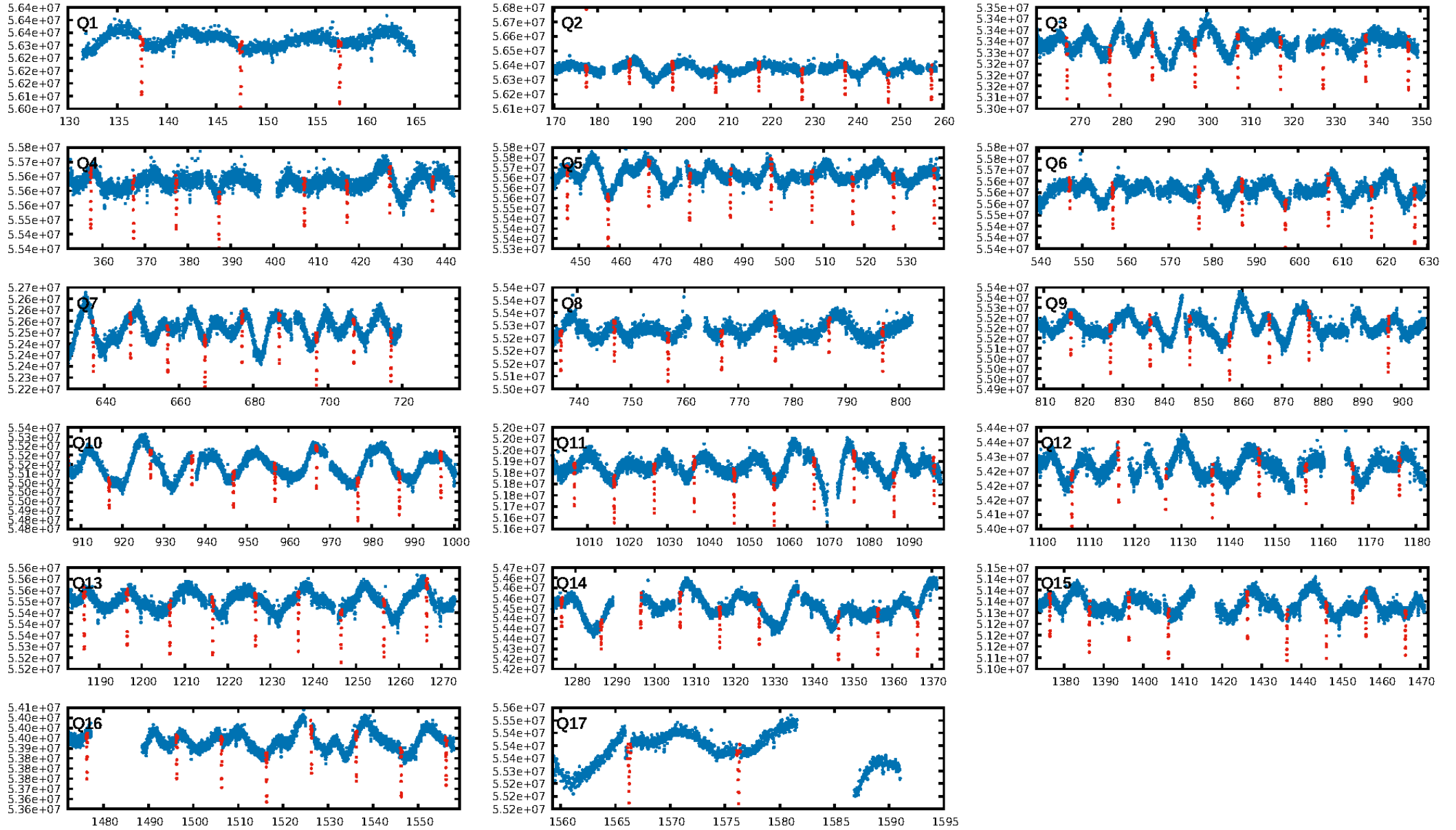
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [130/130]  
GhostDiagnostic-chr: 1.771  
Centroid-sig: 0.0%  
Centroid-so: 2.126 arcsec [45.26σ]  
OotOffset-rm: 2.945 arcsec [40.96σ]  
KicOffset-rm: 3.003 arcsec [42.92σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

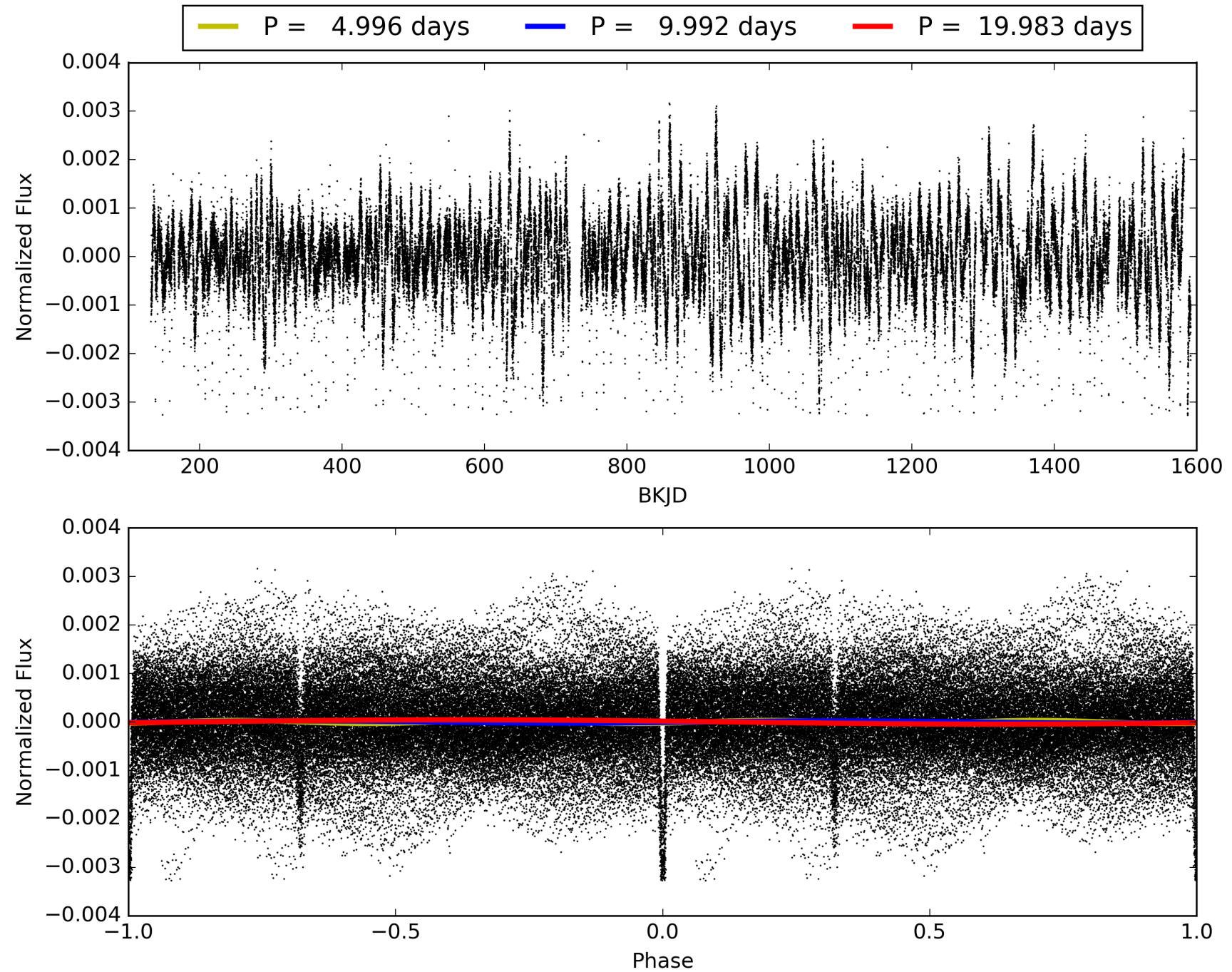
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:38:09 Z

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

# TCE 008848271-01, PDC Light Curves

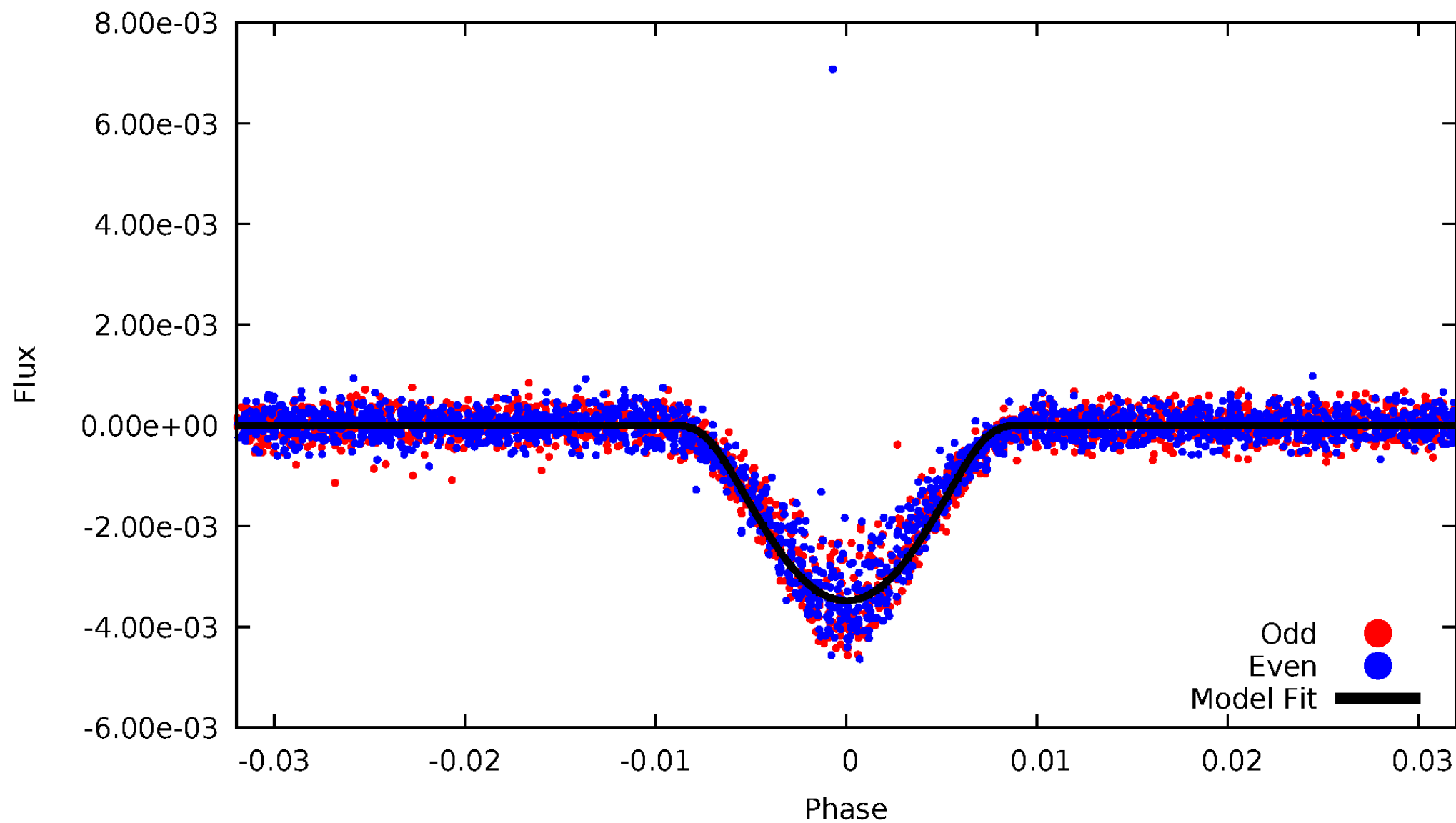


TCE 008848271-01



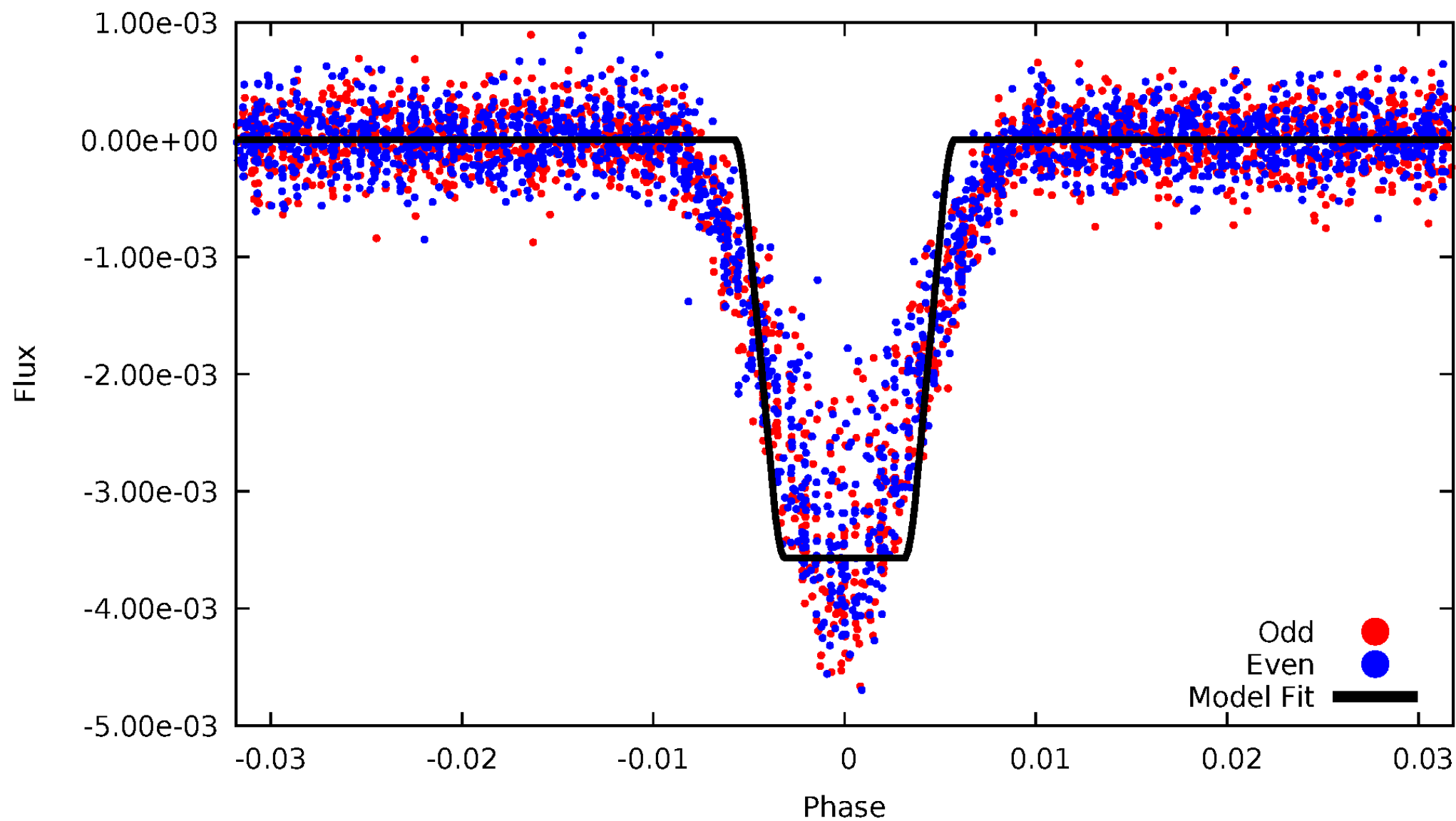
# DV Odd/Even

TCE 008848271-01



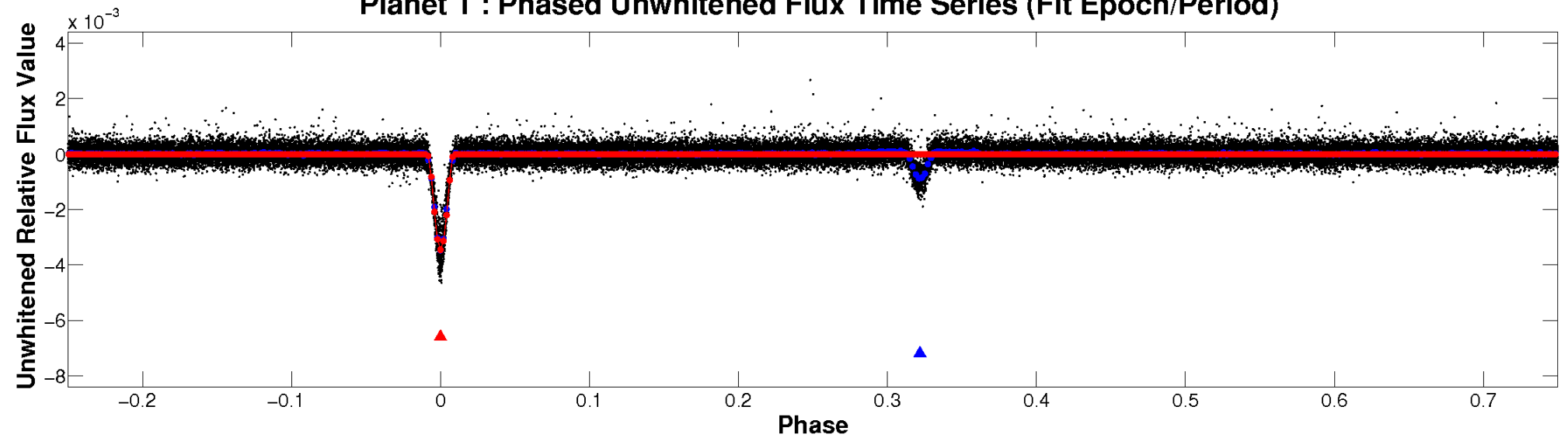
# ALT Odd/Even

TCE 008848271-01

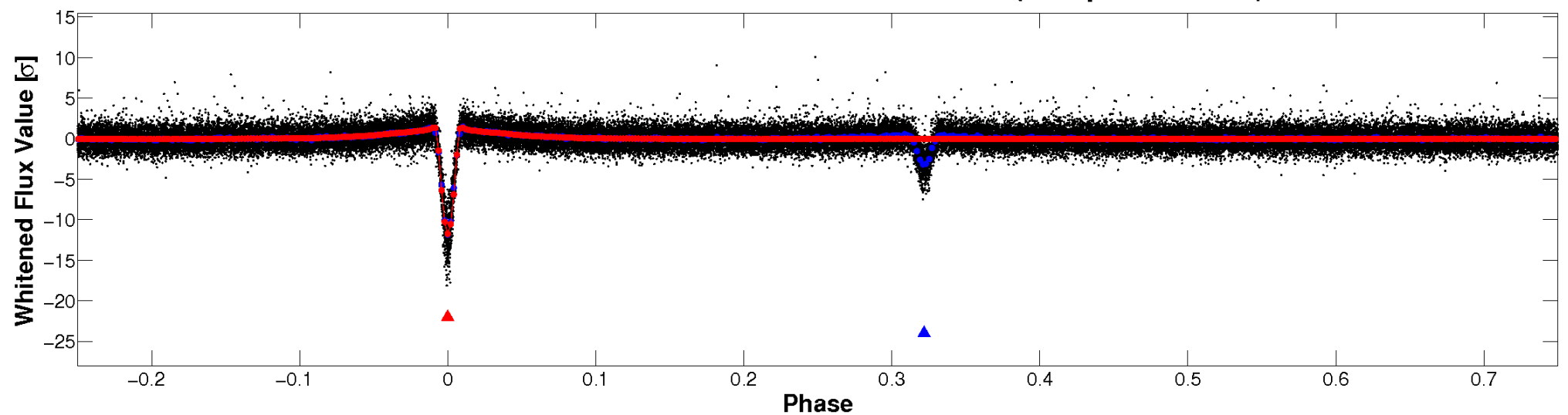


# Non-Whitened Vs. Whitened Light Curve

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



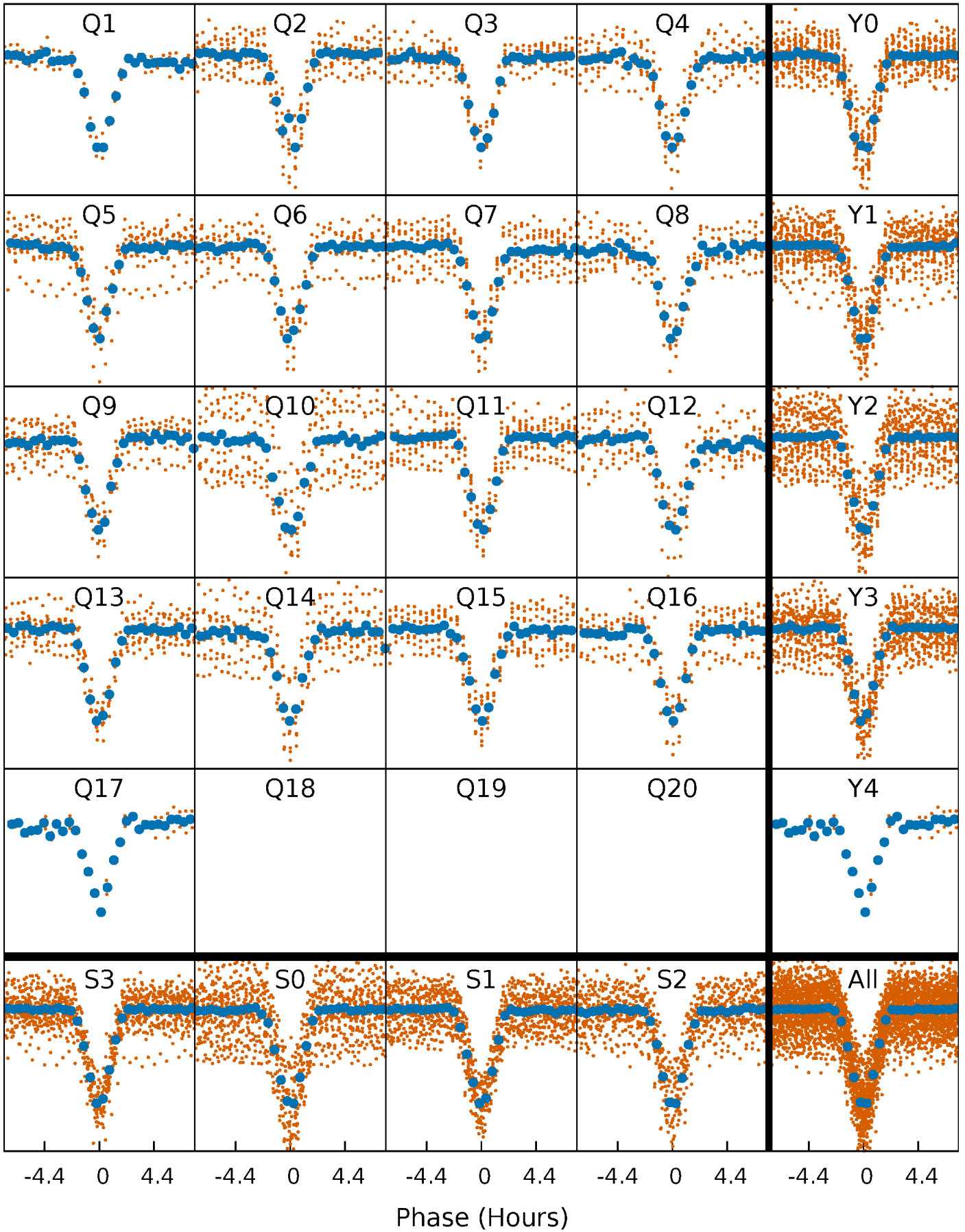
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

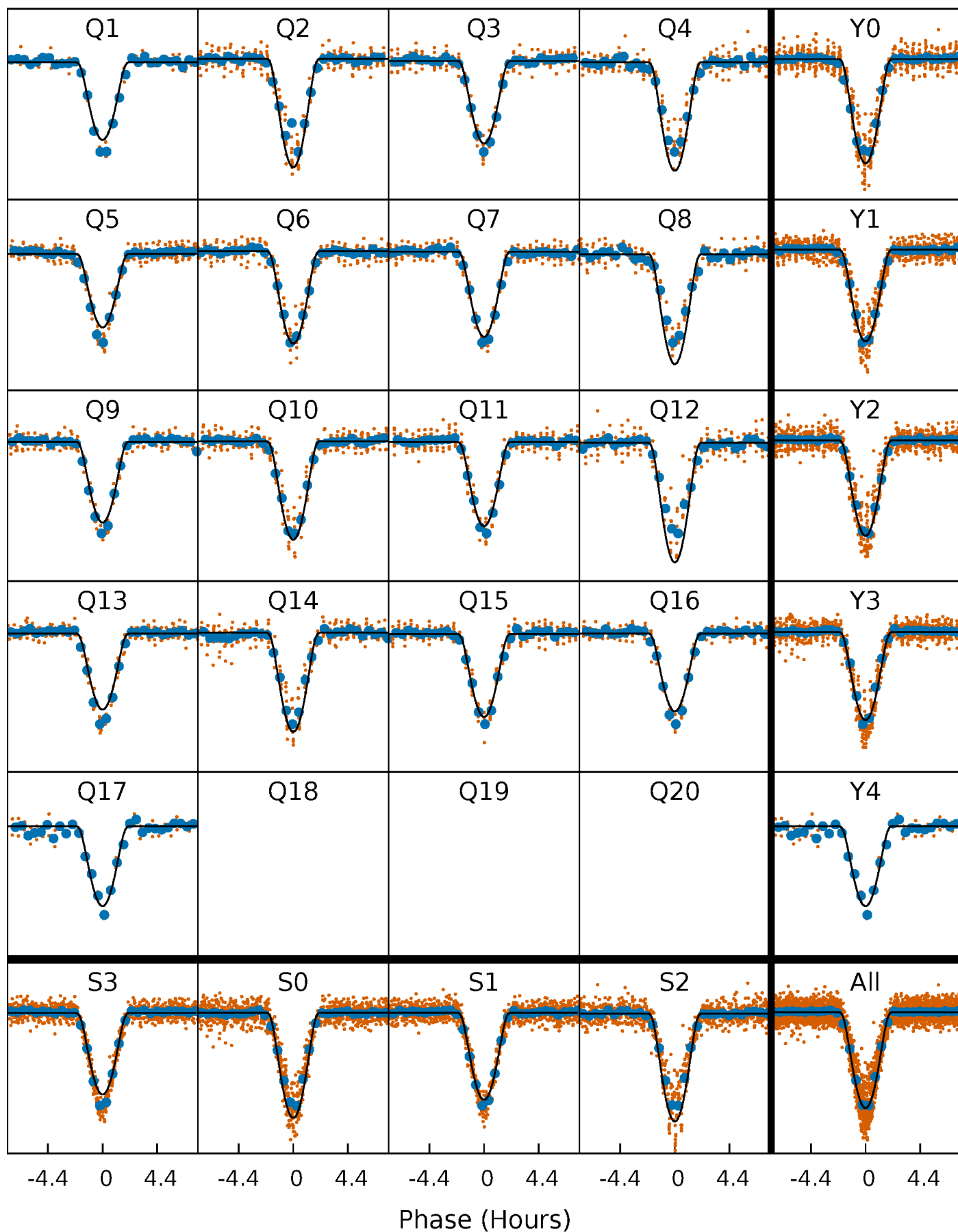
TCE 008848271-01 P= 9.991631 Days  $T_0=137.447826$  (BKJD)





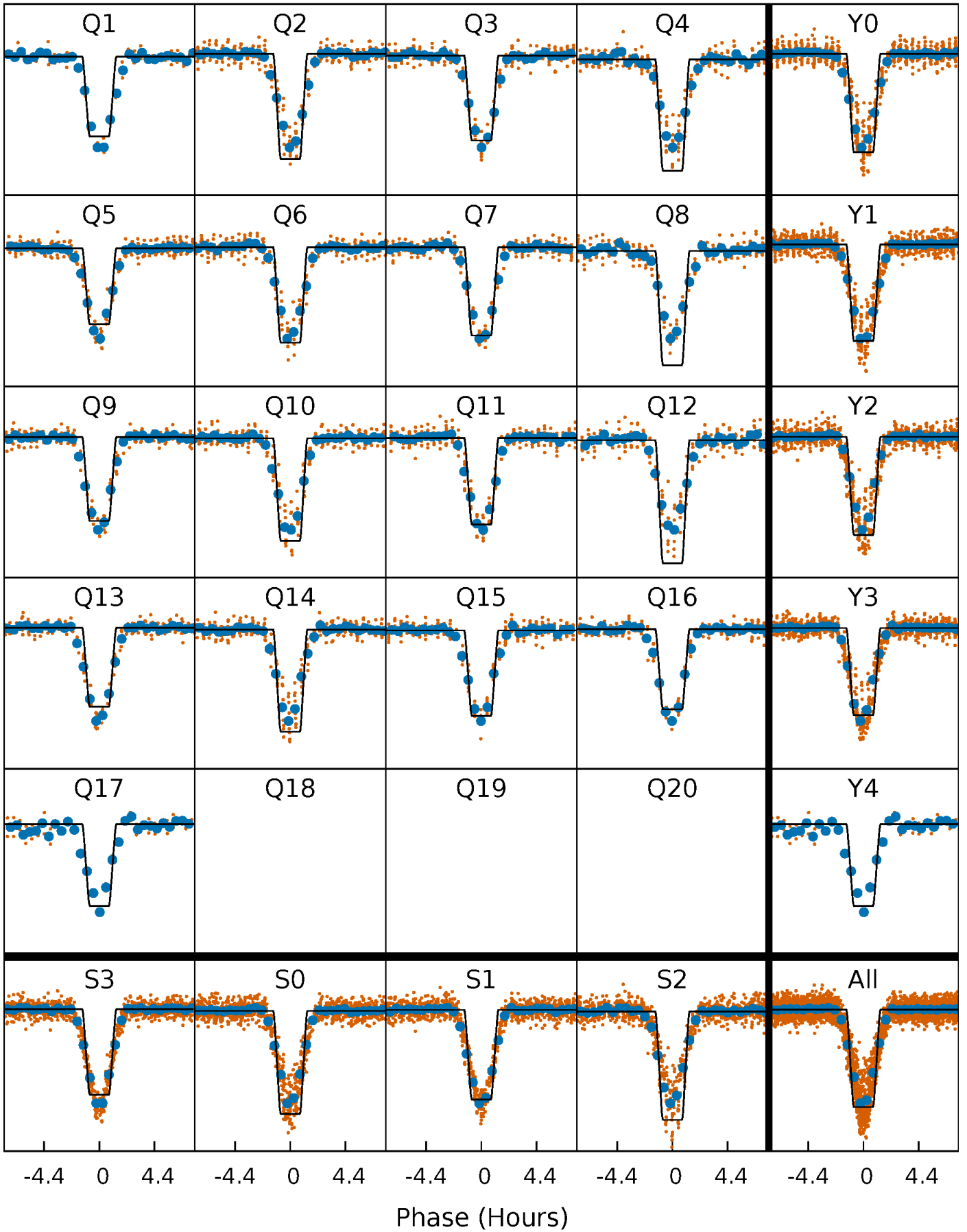
# DV Quarter-Phased Transit Curves

TCE 008848271-01 P= 9.991631 Days  $T_0=137.447826$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

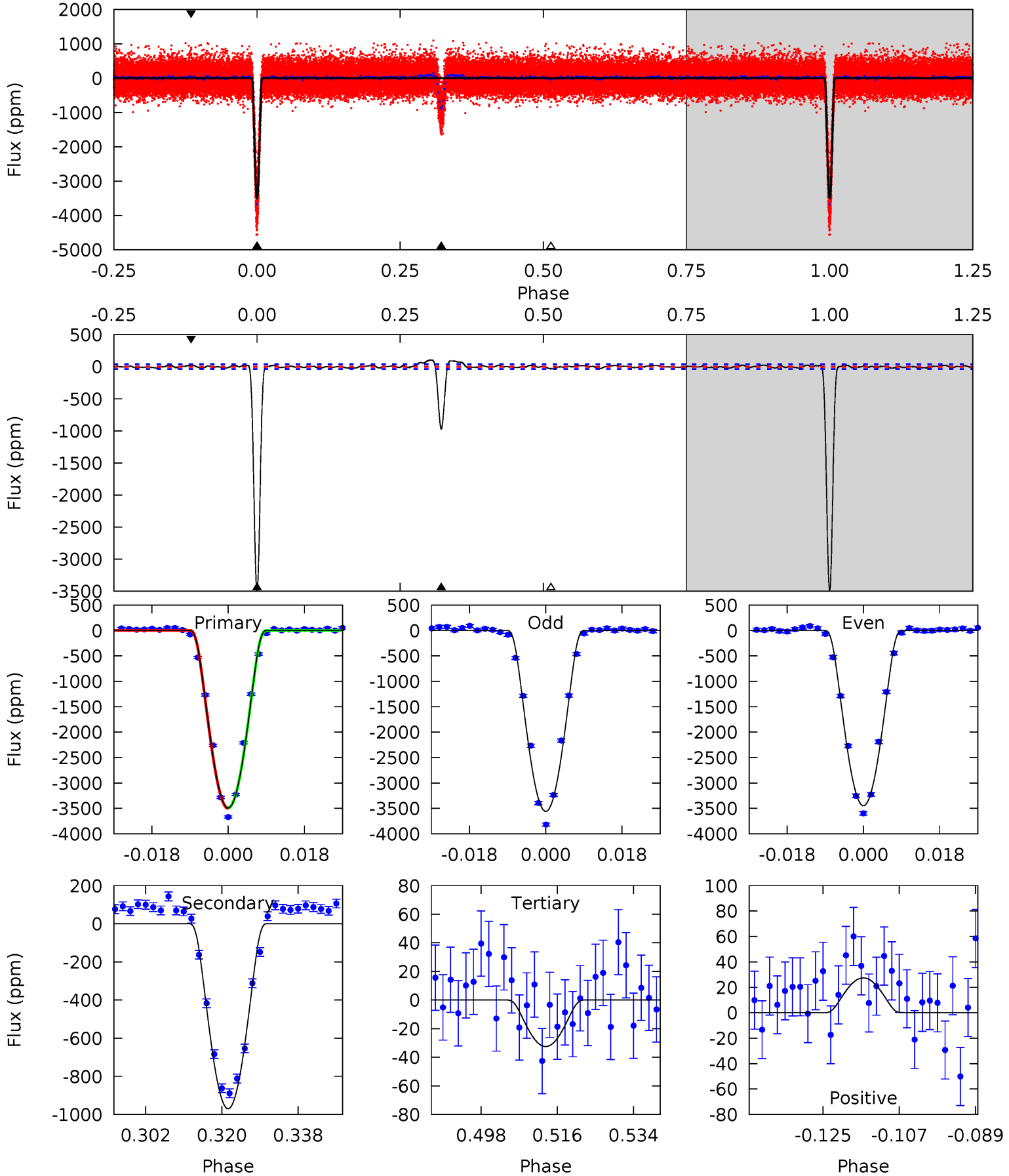
TCE 008848271-01 P= 9.991678 Days  $T_0=137.443956$  (BKJD)



# DV Model-Shift Uniqueness Test

008848271-01, P = 9.991631 Days, E = 127.456195 Days

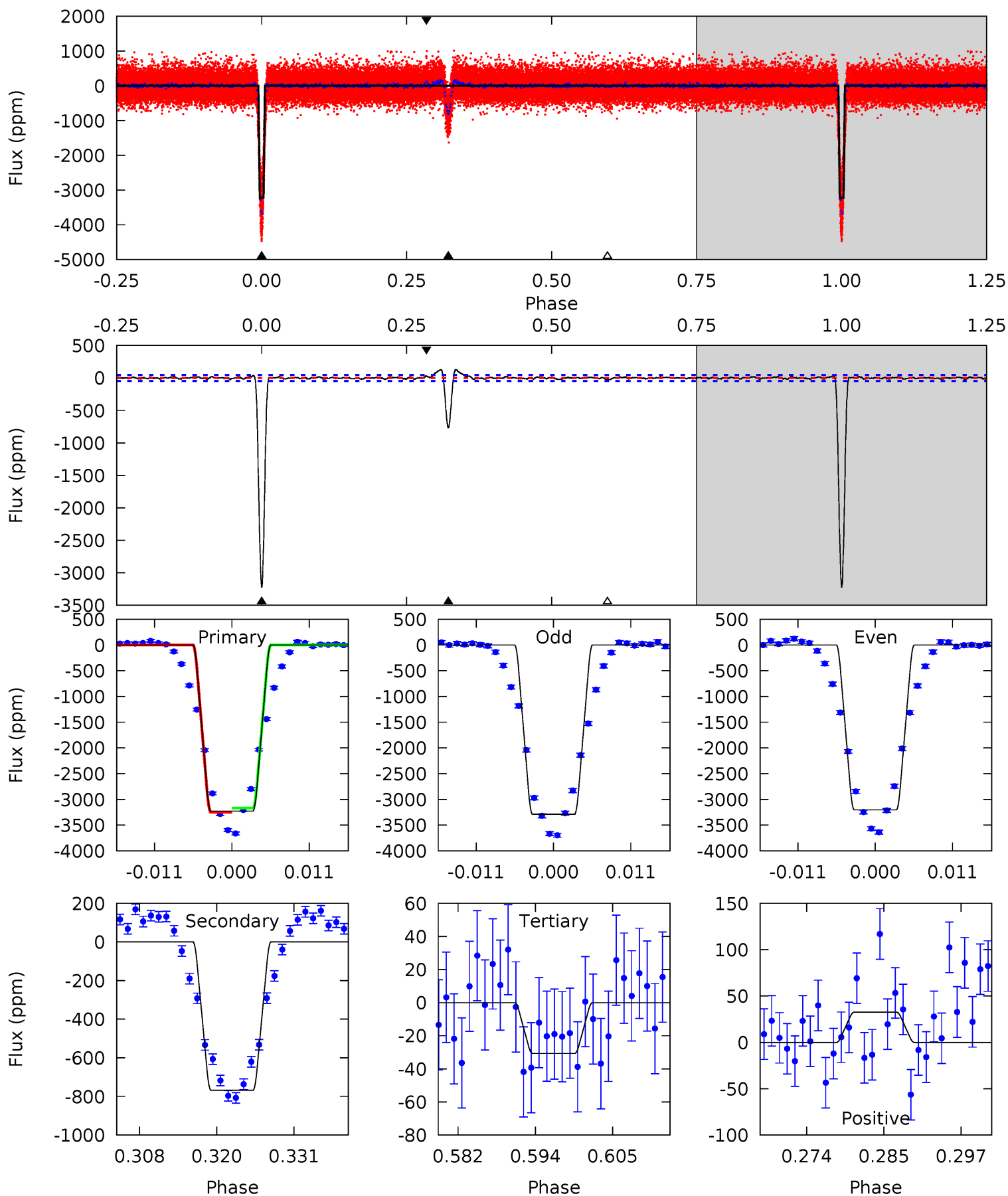
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
478.6	133.0	4.46	3.76	4.91	2.37	2.77	474.2	474.9	128.5	129.2	7.61	0.95	0.03	1.03



# Alt Model-Shift Uniqueness Test

008848271-01, P = 9.991678 Days, E = 127.452278 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
351.0	83.5	3.34	3.55	5.00	2.53	2.12	347.7	347.5	80.2	80.0	4.53	0.96	0.04	4.18



### Stellar Parameters For KIC 008848271

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5874^{+158}_{-176}$	$4.338^{+0.153}_{-0.187}$	$-0.120^{+0.300}_{-0.300}$	$1.096^{+0.309}_{-0.206}$	$0.954^{+0.140}_{-0.102}$	$1.020^{+0.754}_{-0.504}$
	+3%/-3%	+4%/-4%	+250%/-250%	+28%/-19%	+15%/-11%	+74%/-49%
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 008848271-01 / KOI 1256.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-970 \pm 7$	$12.20^{+3.08}_{-2.79}$	$1274^{+96}_{-77}$	$3680^{+303}_{-222}$	$29^{+20}_{-11}$
Alt.	$-768 \pm 9$	$7.27^{+2.64}_{-2.62}$	$1272^{+101}_{-81}$	$4246^{+789}_{-435}$	$65^{+93}_{-31}$

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

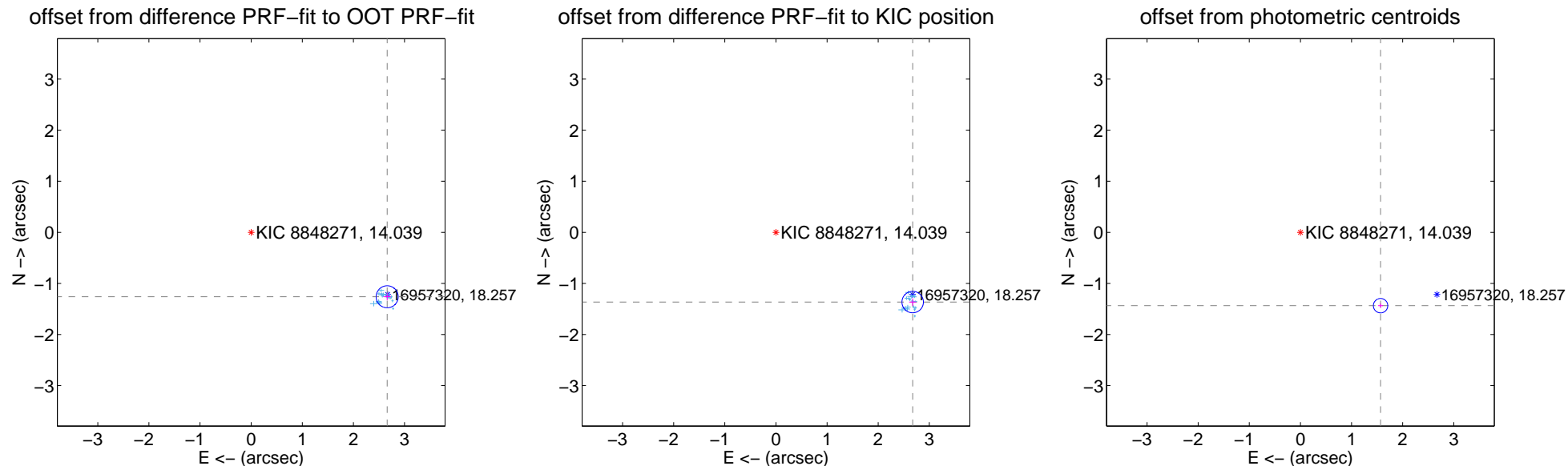
## DV Centroid Data

Supplemental centroid analysis for 008848271-01. Kepler magnitude: 14.04. Transit SNR 219.63

There are 17 quarters with good PRF difference image offsets

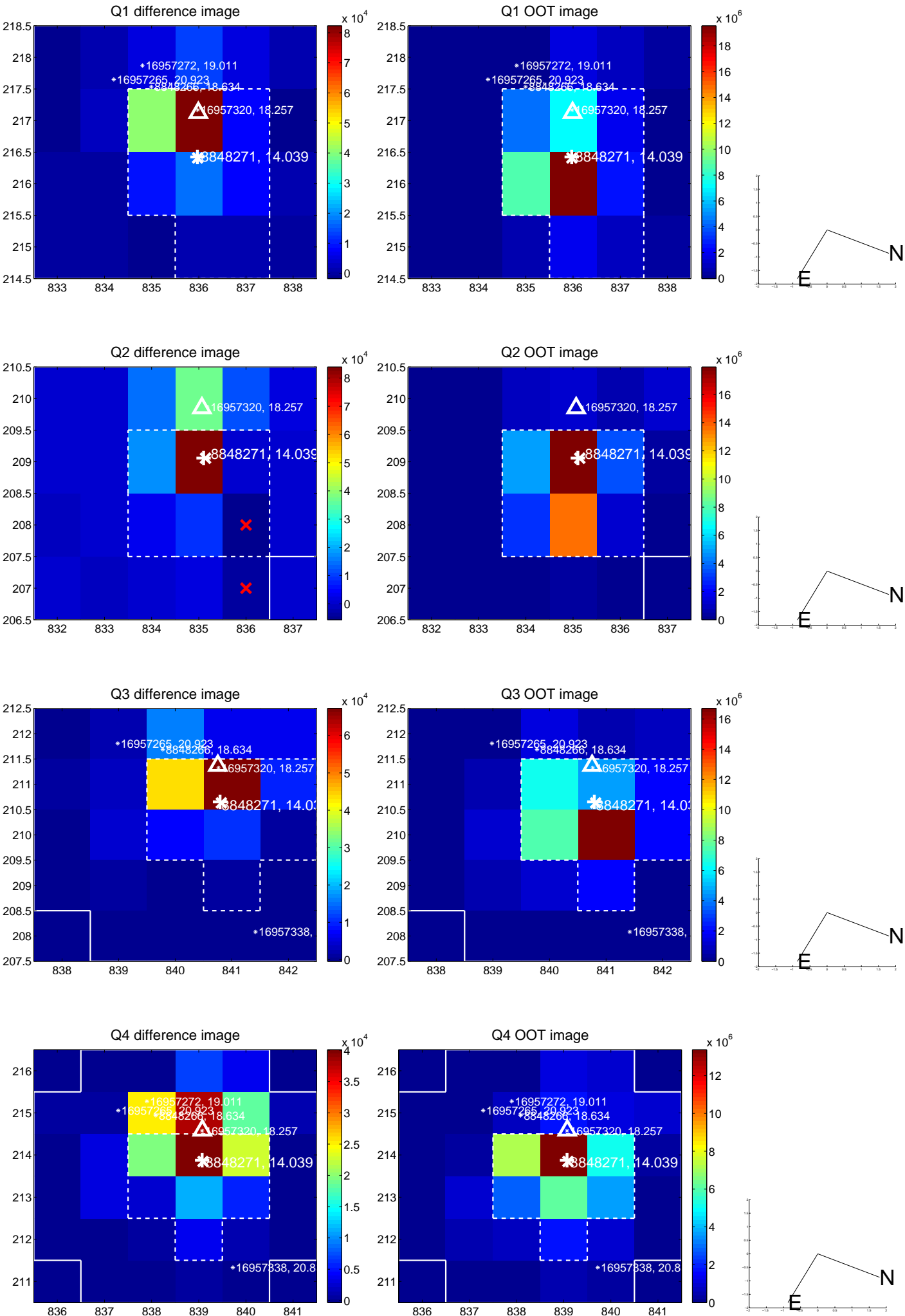
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.945 \pm 0.072$	40.96	$-2.661 \pm 0.072$	$-1.261 \pm 0.069$
PRF-fit source offset from KIC position	$3.003 \pm 0.070$	42.92	$-2.675 \pm 0.069$	$-1.365 \pm 0.073$
photometric centroid source offset	$2.13 \pm 0.05$	45.26	$-1.57 \pm 0.05$	$-1.44 \pm 0.05$



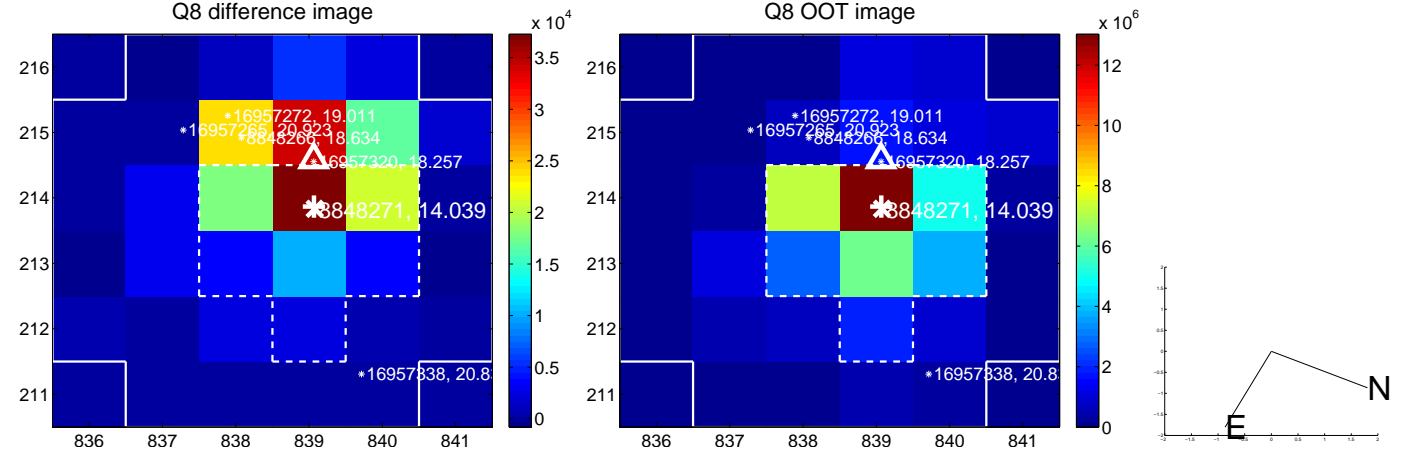
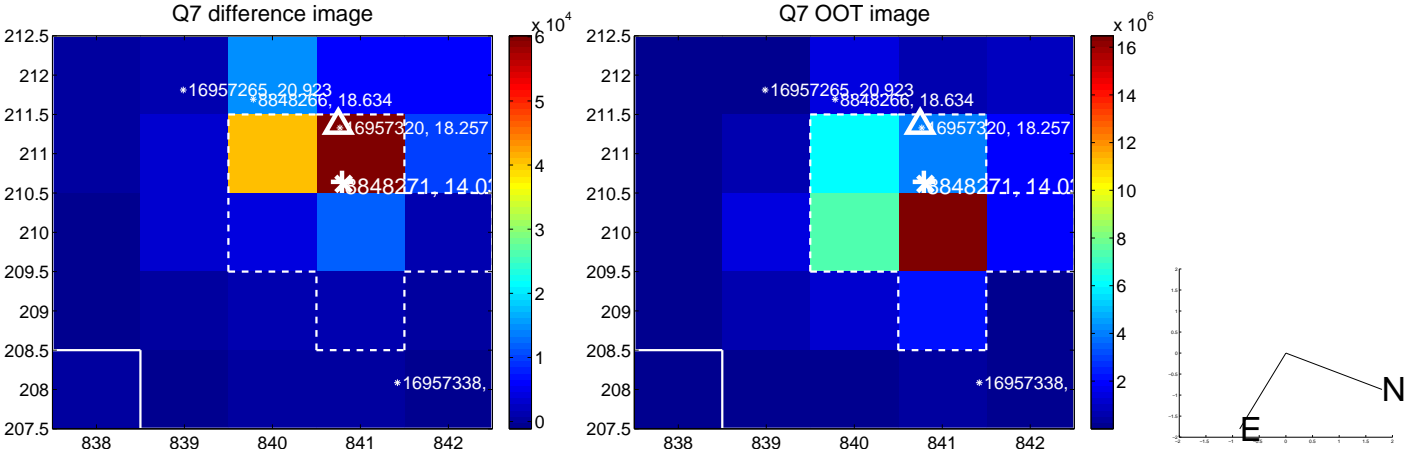
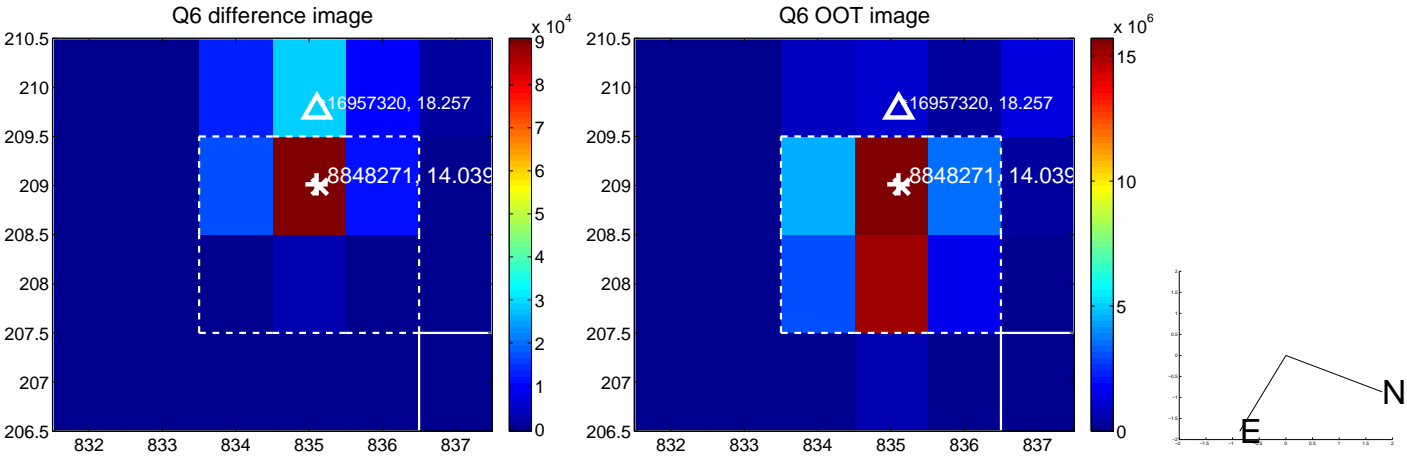
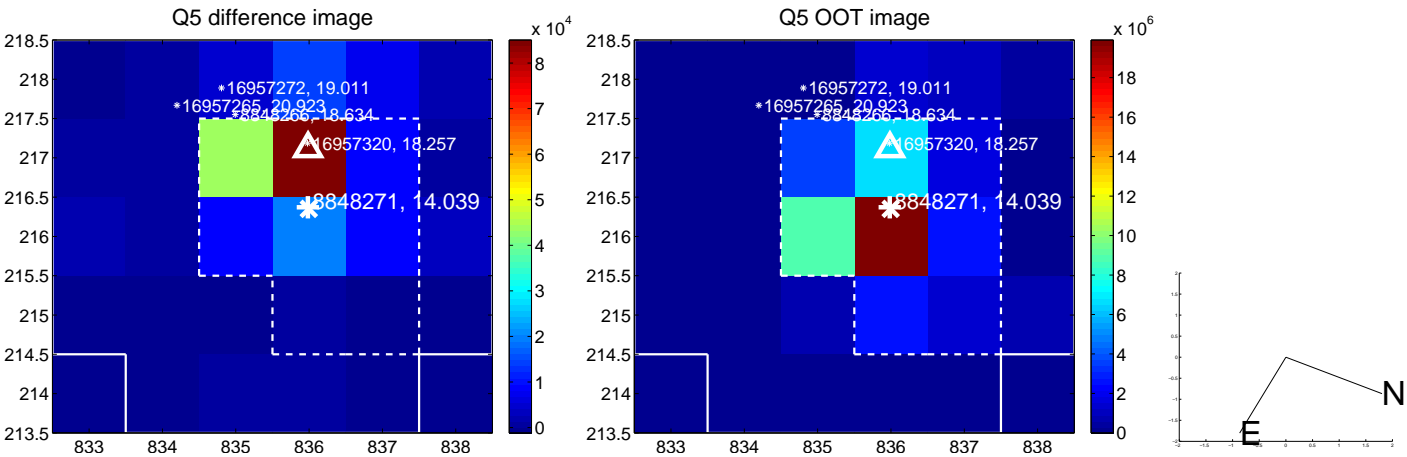
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

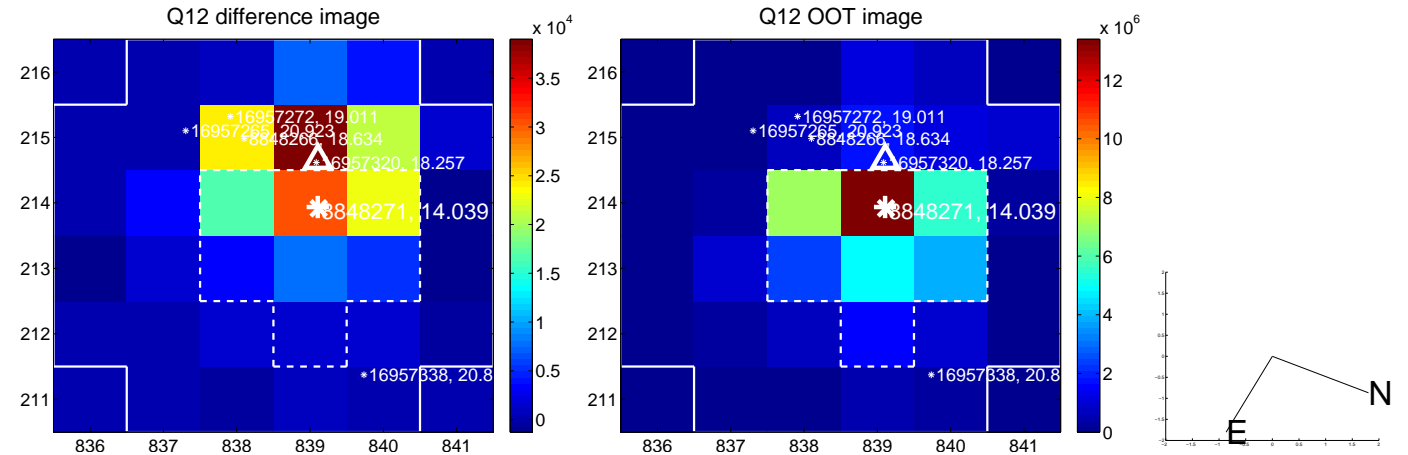
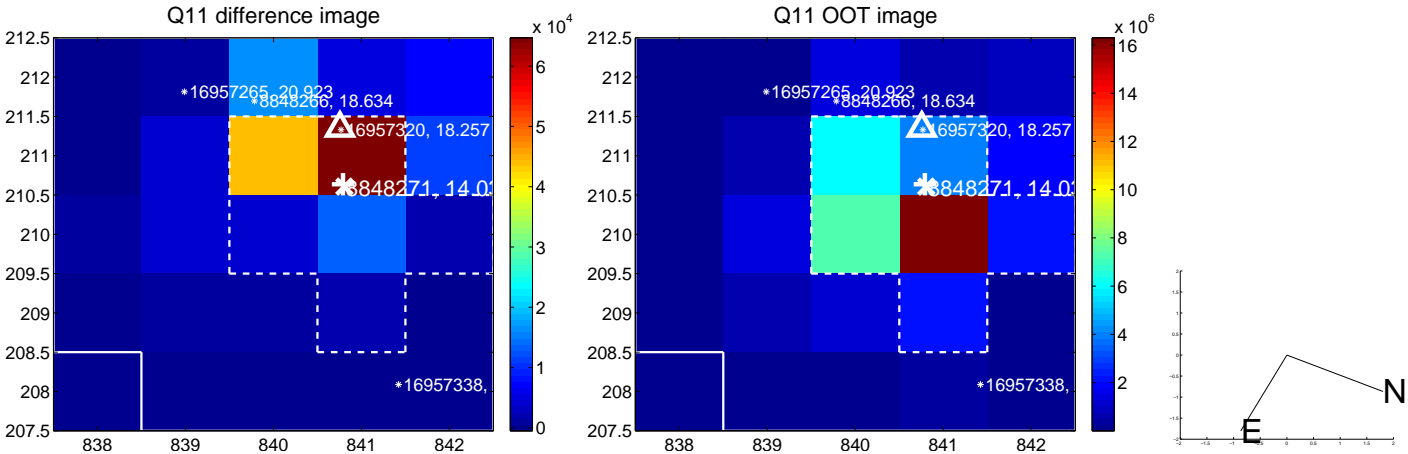
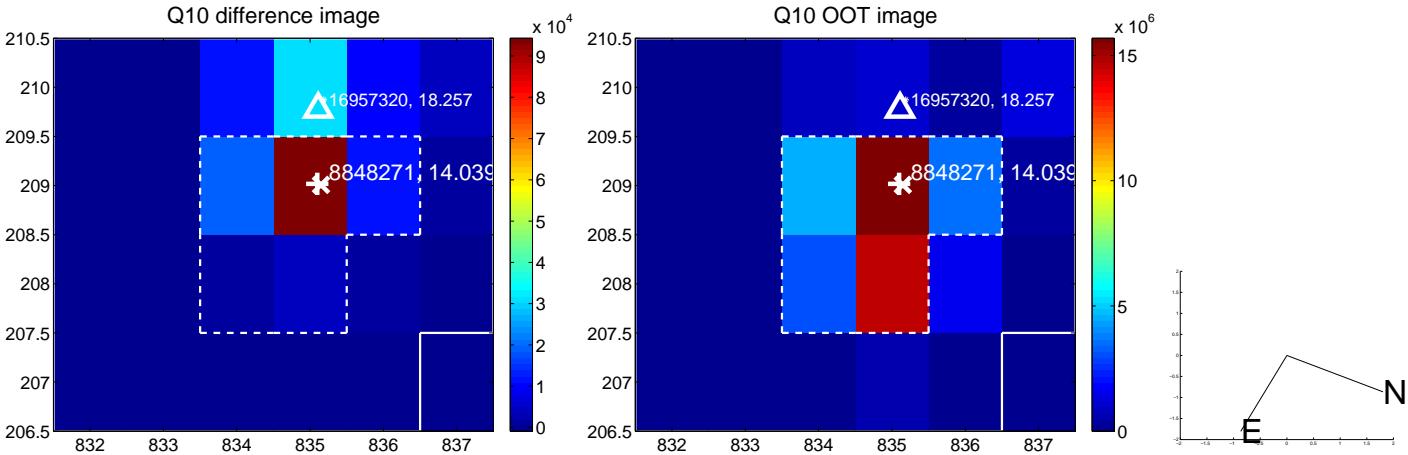
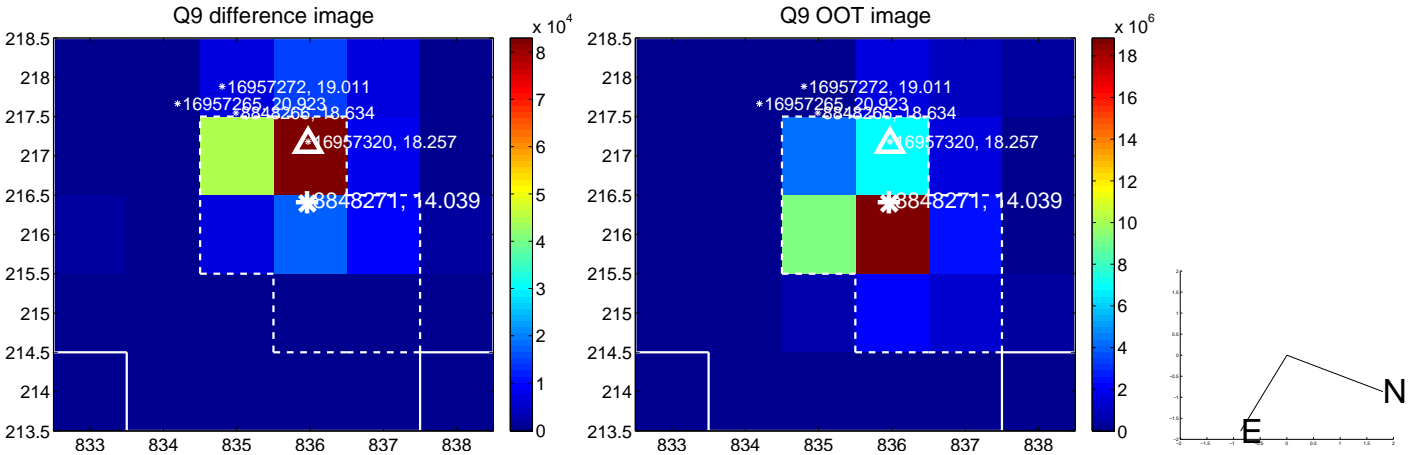




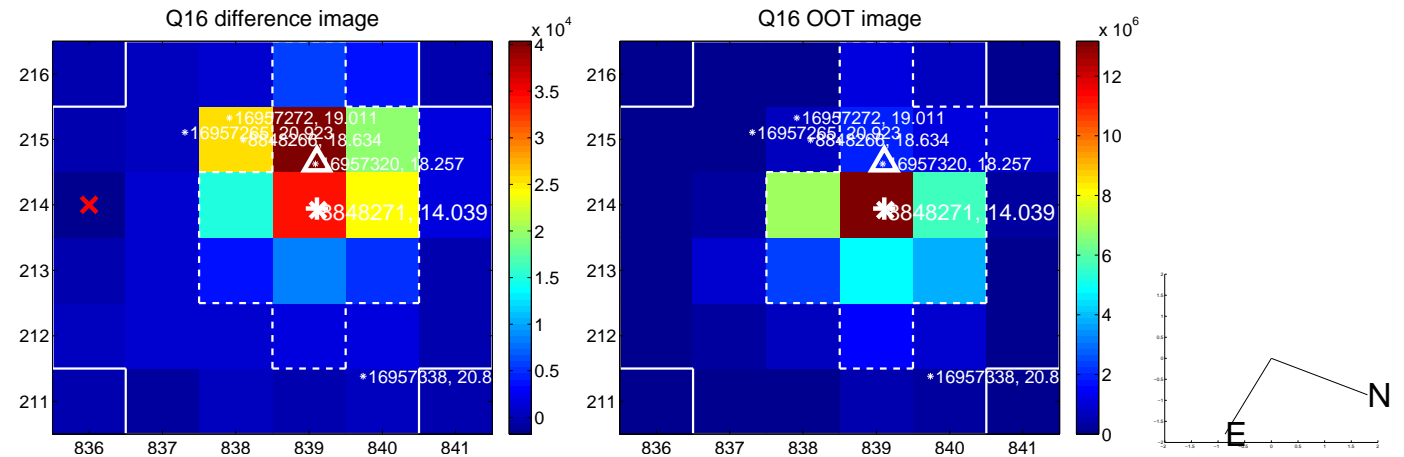
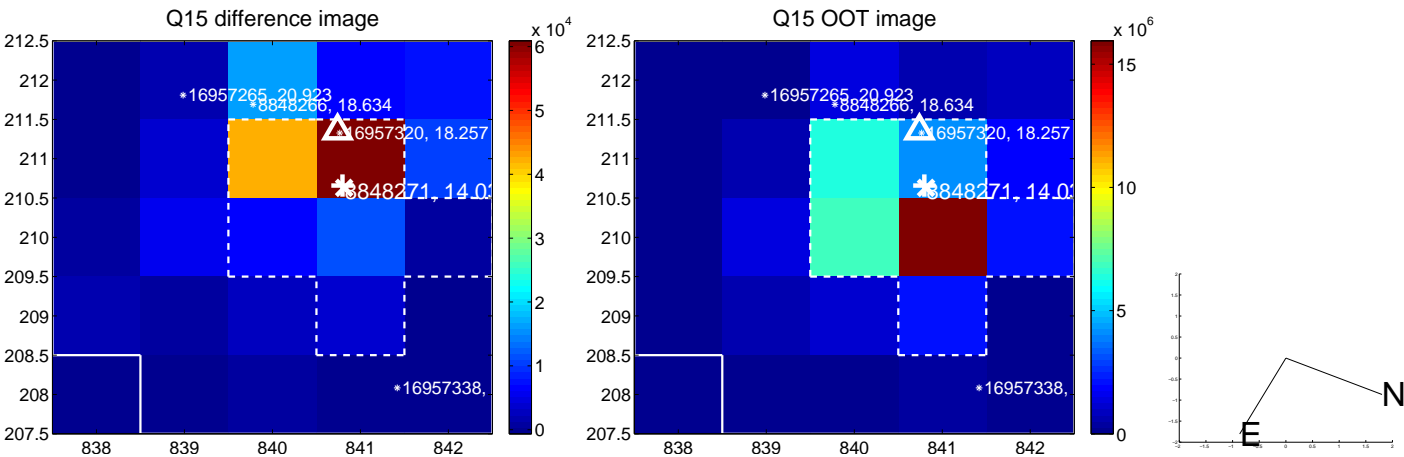
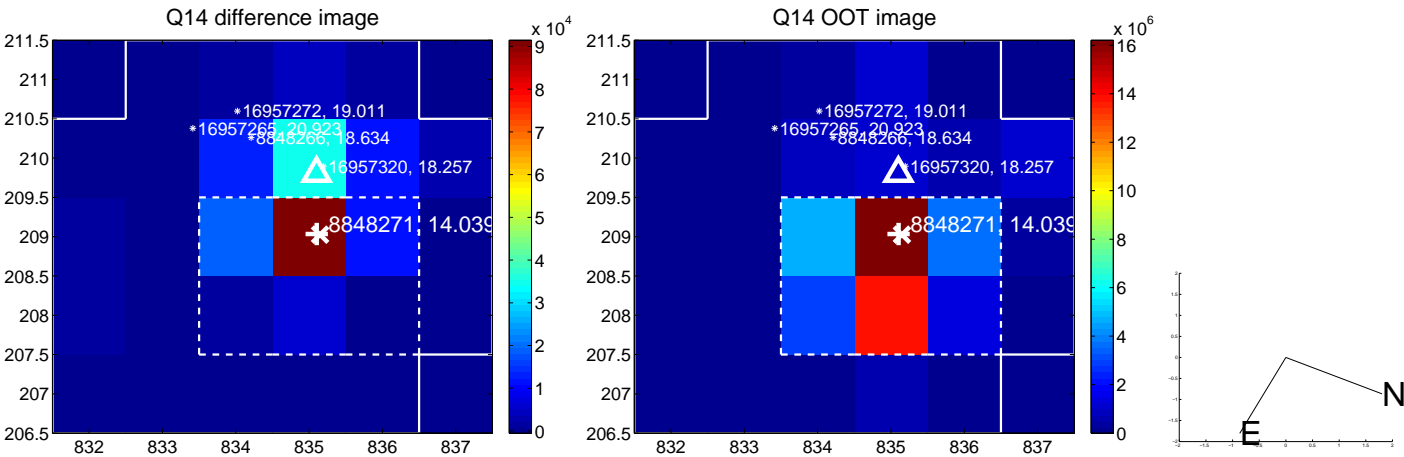
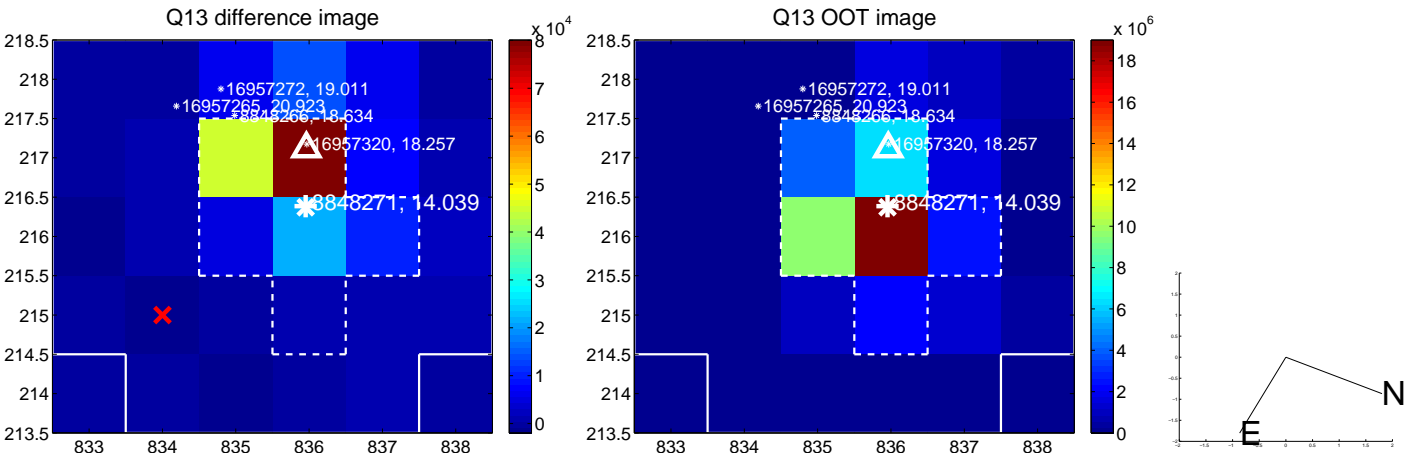
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



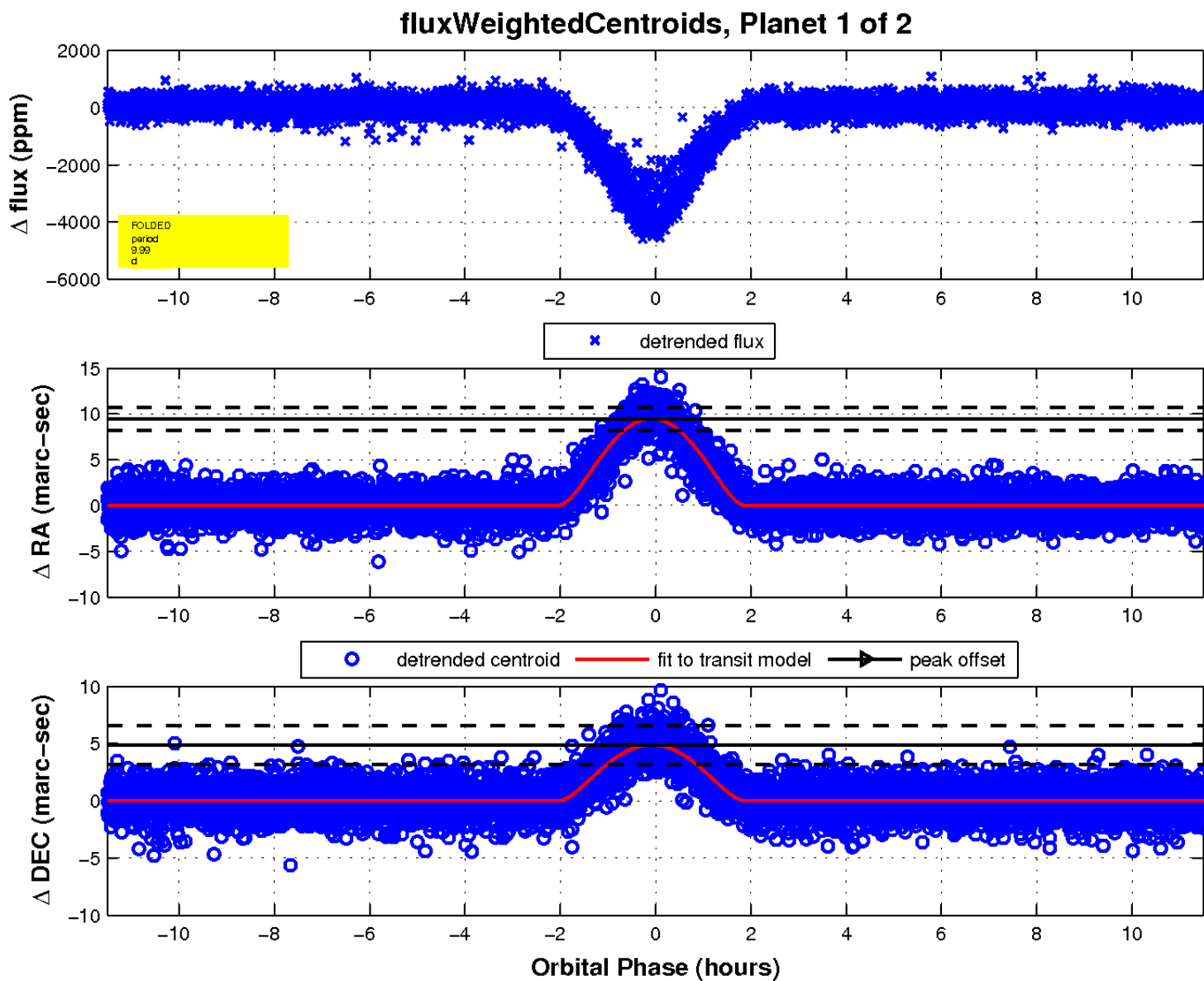
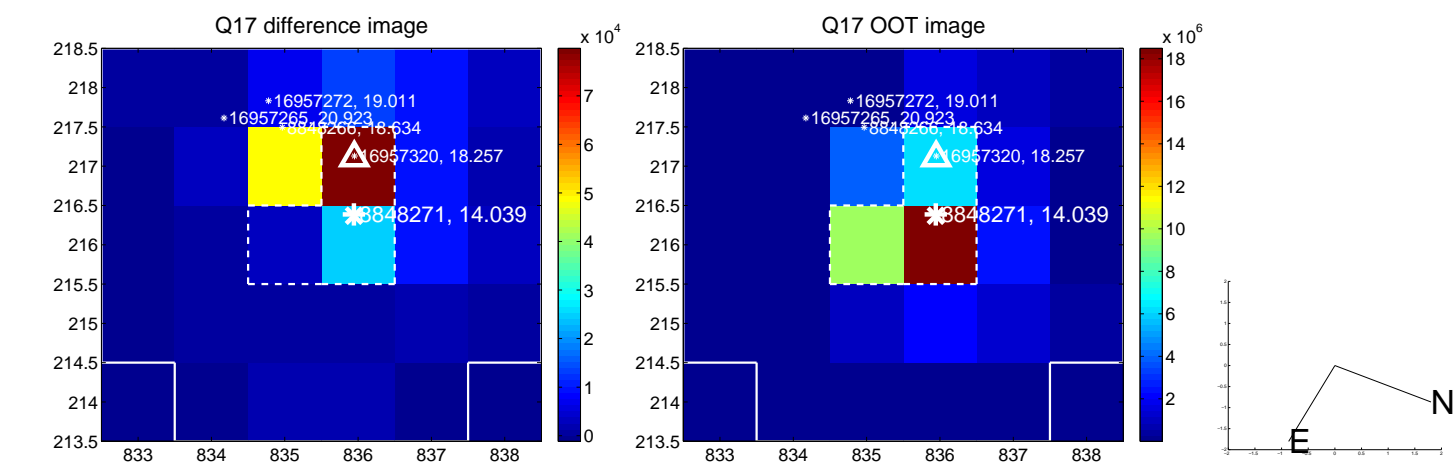
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



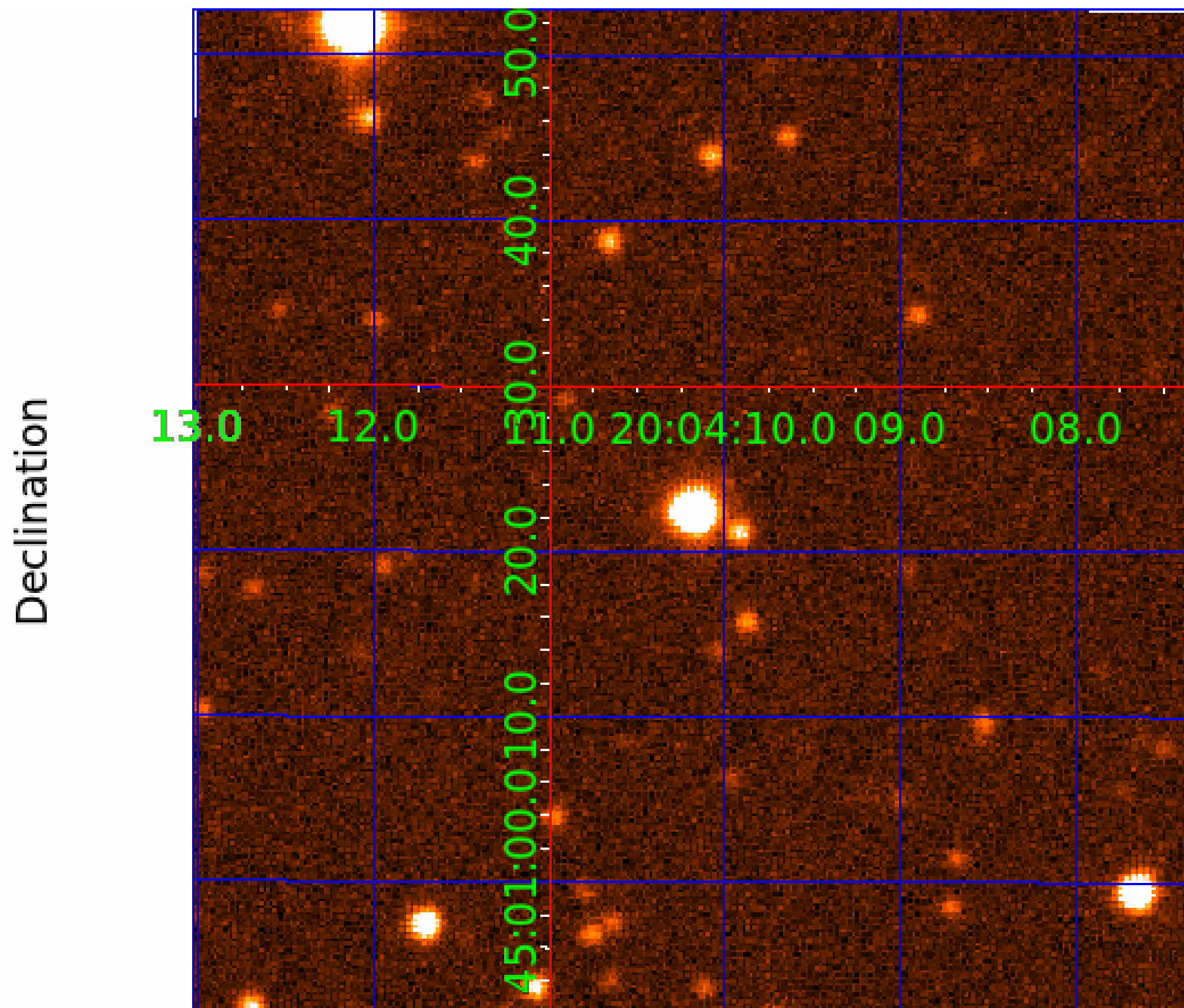
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 008848271

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008848271-01	OBS	1256.01	9.991631	137.447826	3481.8	3.834	244.2	219.6	1.10	5874	12.05	160.32
008848271-02	OBS	No	9.991625	140.663698	960.6	4.382	72.1	73.8	1.10	5874	6.55	160.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008848271-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
008848271-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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.

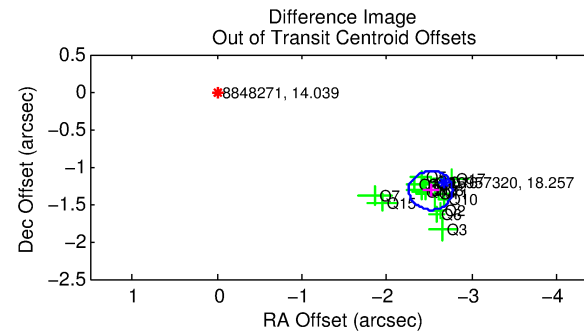
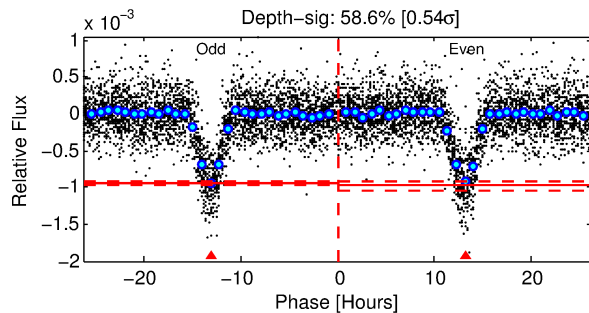
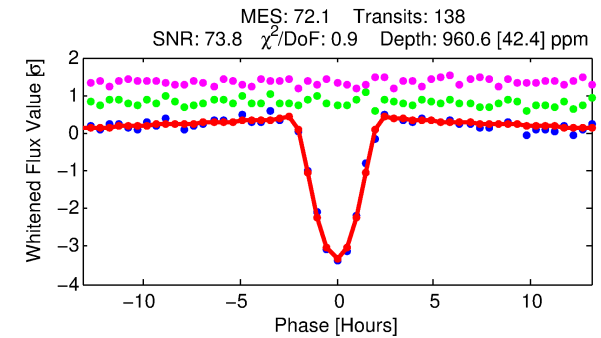
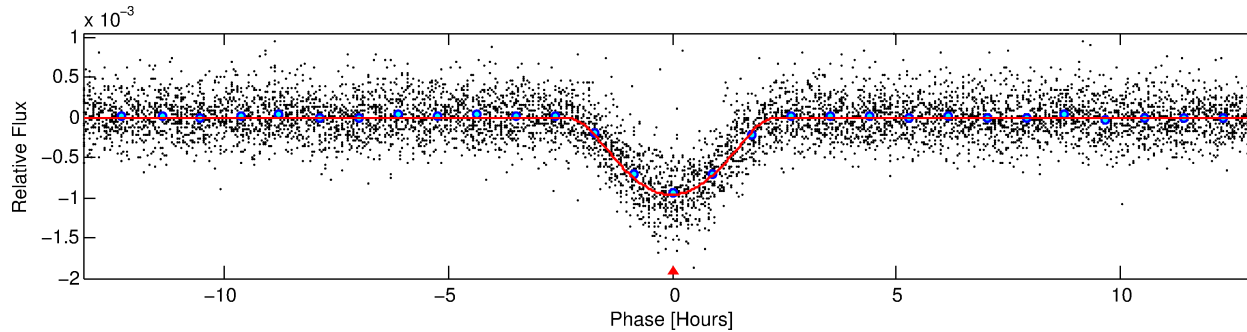
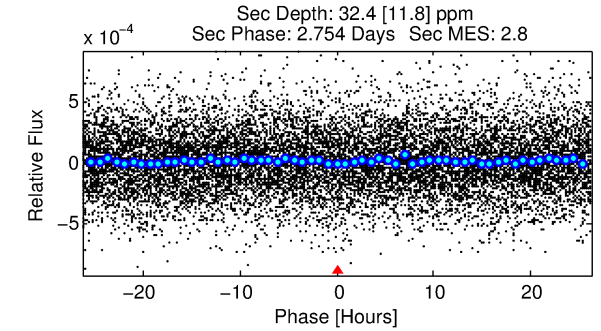
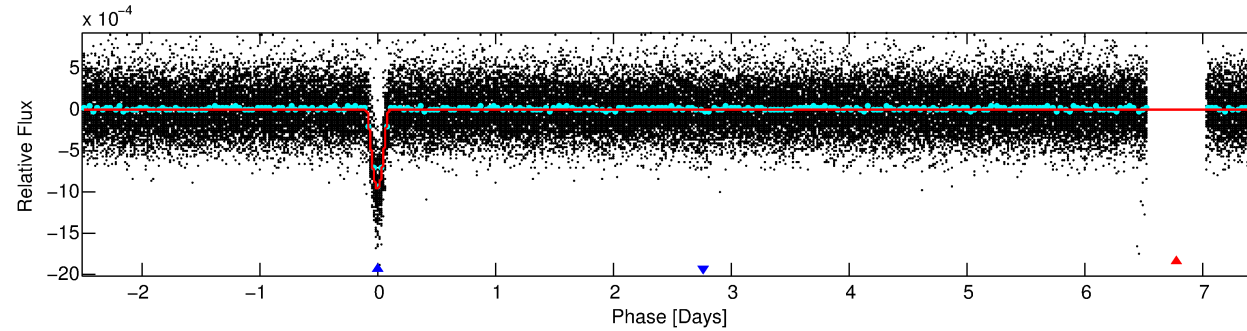
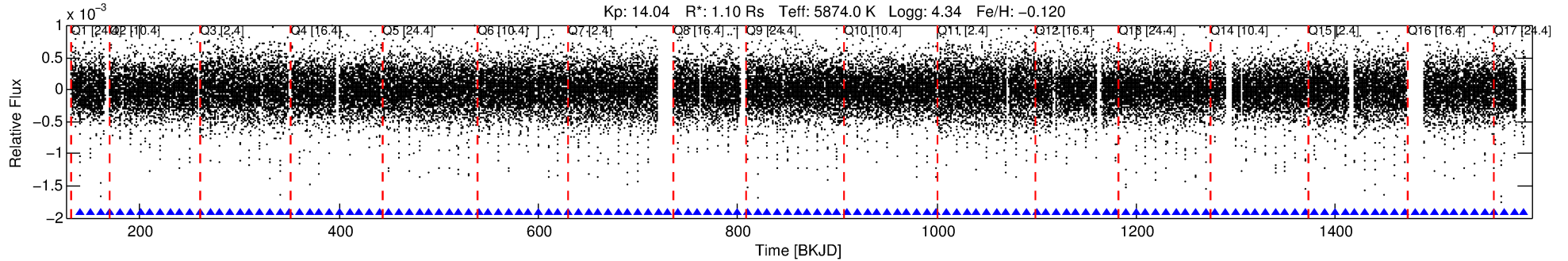
## Ephemeris Match Information For 008848271-02

No Significant Match Found

# DV One-Page Summary

KIC: 8848271 Candidate: 2 of 2 Period: 9.992 d  
KOI: K01256 Corr: No Ephemeris Match

Kp: 14.04 R\*: 1.10 Rs Teff: 5874.0 K Logg: 4.34 Fe/H: -0.120



## DV Fit Results:

Period = 9.99162 [0.00002] d  
Epoch = 140.6637 [0.0013] BKJD  
Rp/R\* = 0.0548 [0.0279]  
a/R\* = 5.96 [0.70]  
b = 1.00 [0.04]  
Seff = 160.32 [58.27]  
Teq = 907 [82] K  
Rp = 6.55 [3.81] Re  
a = 0.0894 [0.0211] AU  
Ag = 3.31 [3.75] [0.62σ]  
Teffp = 1892 [514] K [1.89σ]

## DV Diagnostic Results:

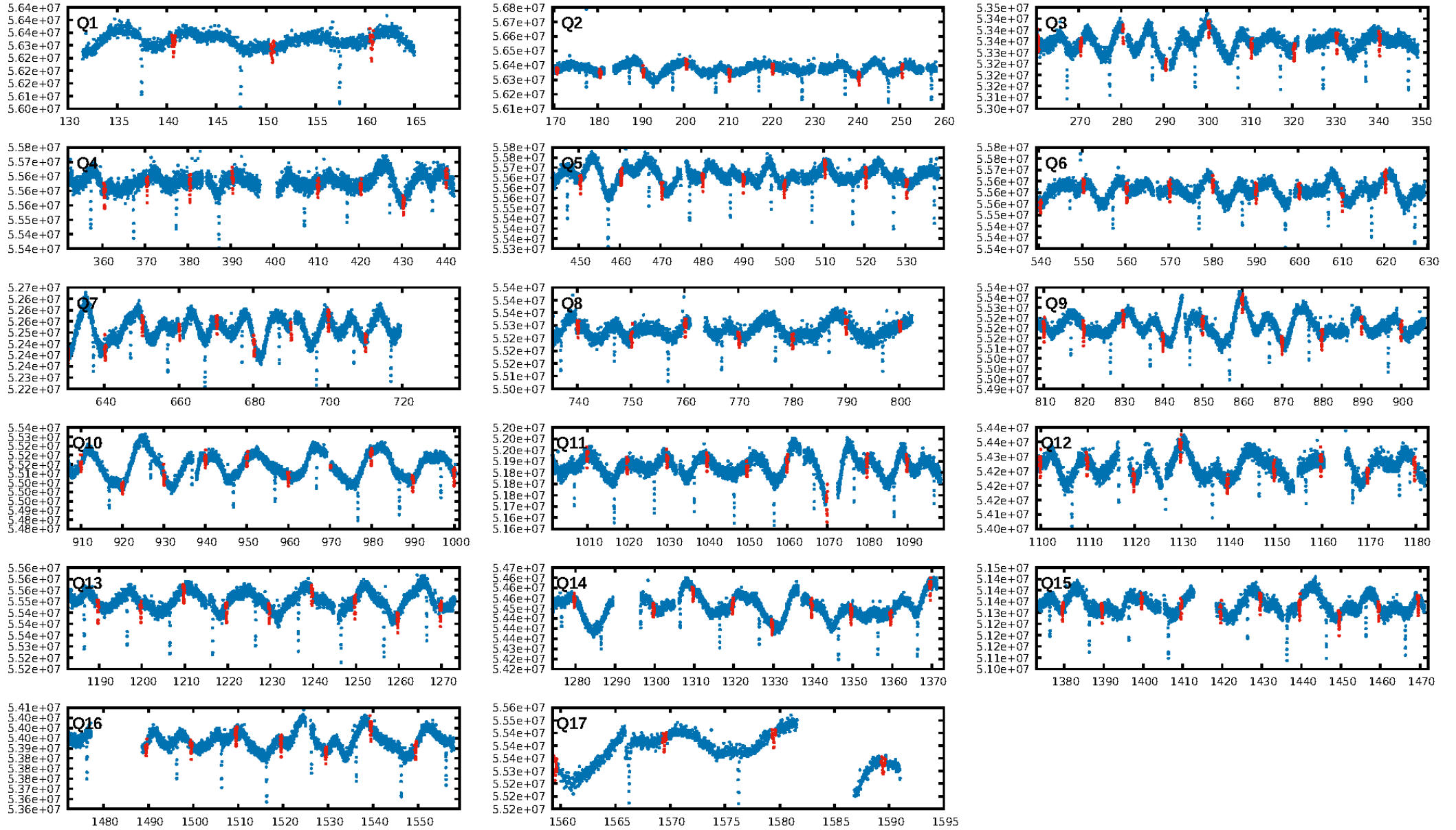
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [131/131]  
GhostDiagnostic-chr: 1.36  
Centroid-sig: 0.0%  
Centroid-so: 2.233 arcsec [14.24σ]  
OotOffset-rm: 2.844 arcsec [32.93σ]  
KicOffset-rm: 2.913 arcsec [34.90σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:38:16 Z

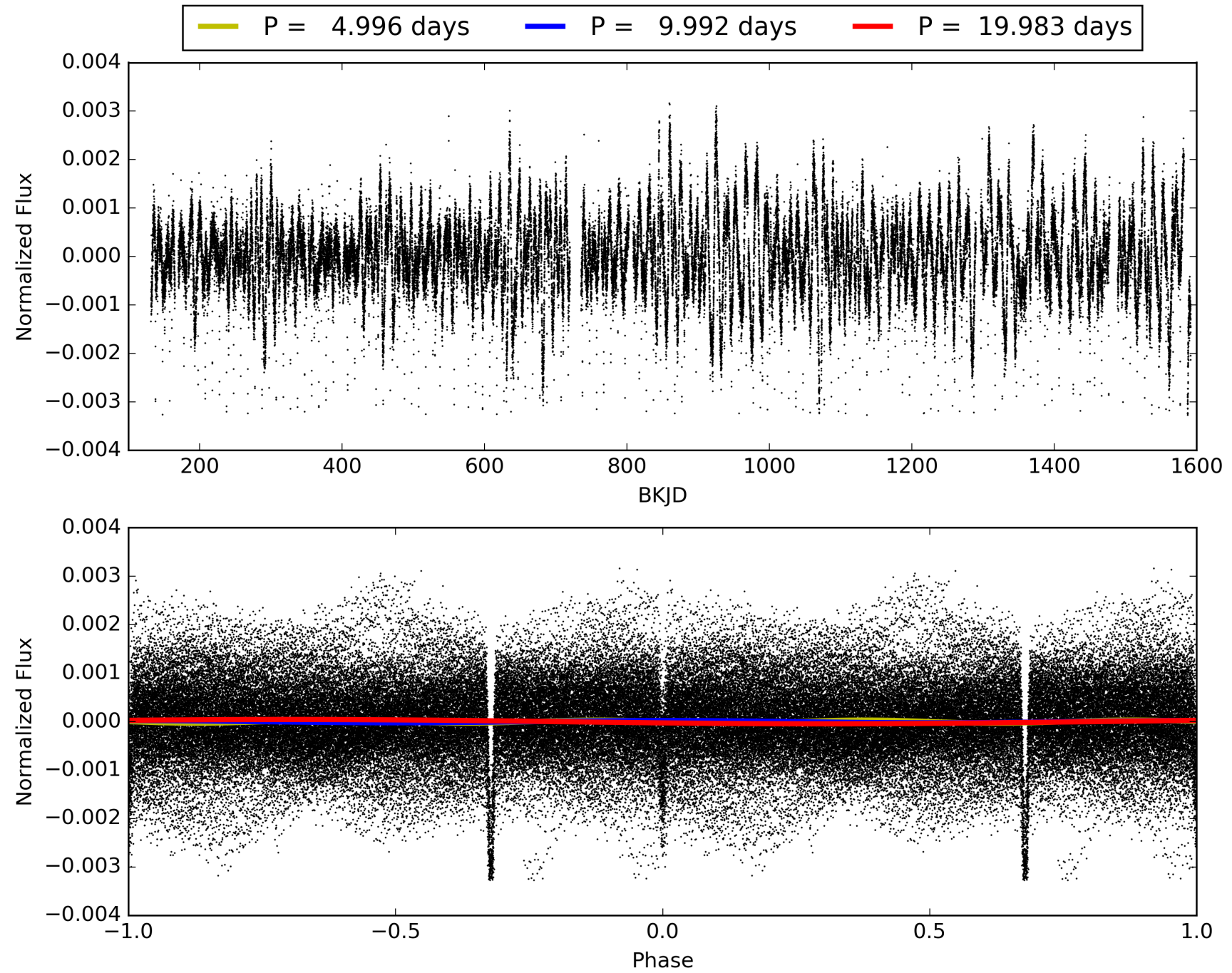
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008848271-02, PDC Light Curves

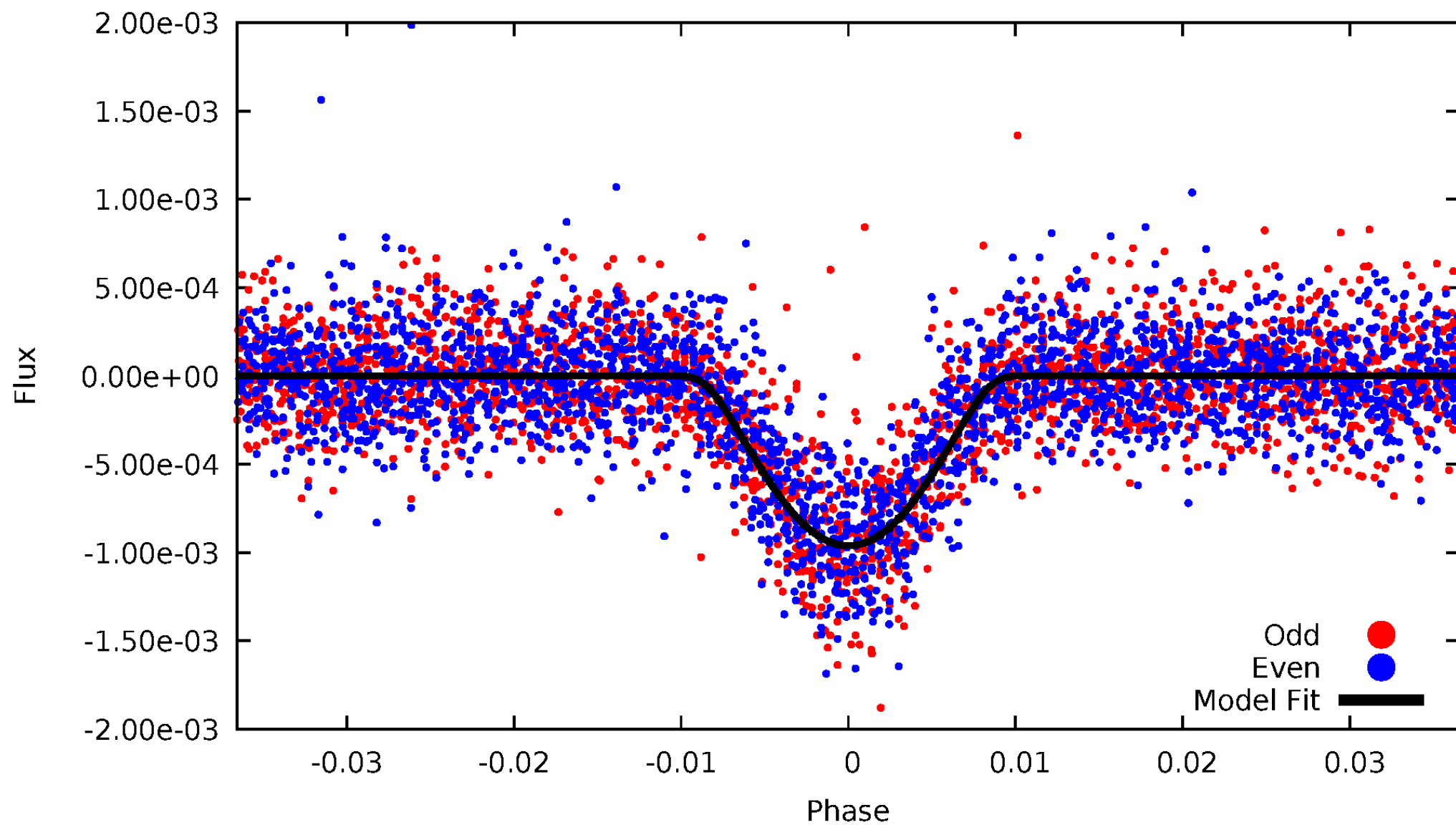


TCE 008848271-02



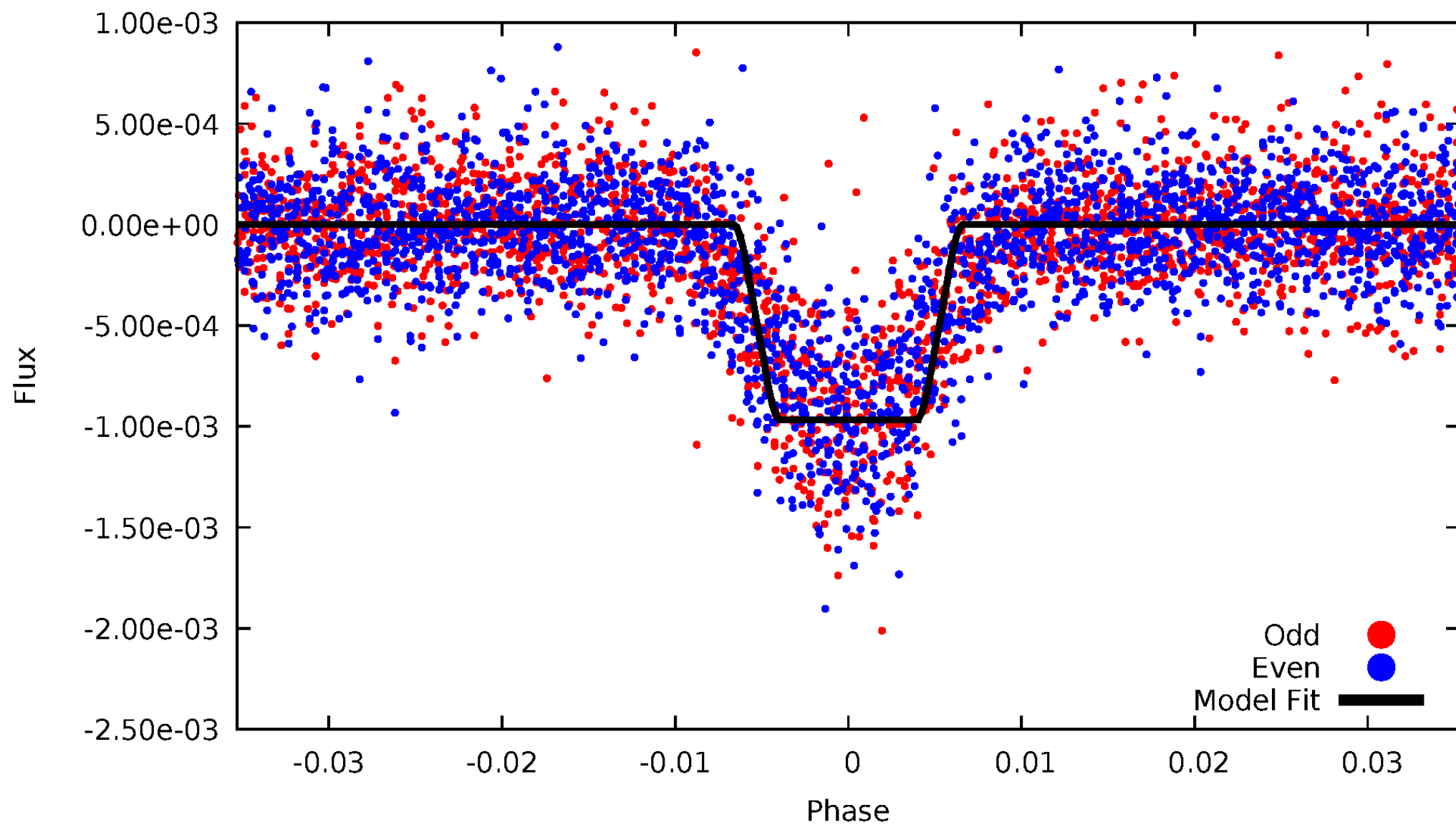
# DV Odd/Even

TCE 008848271-02



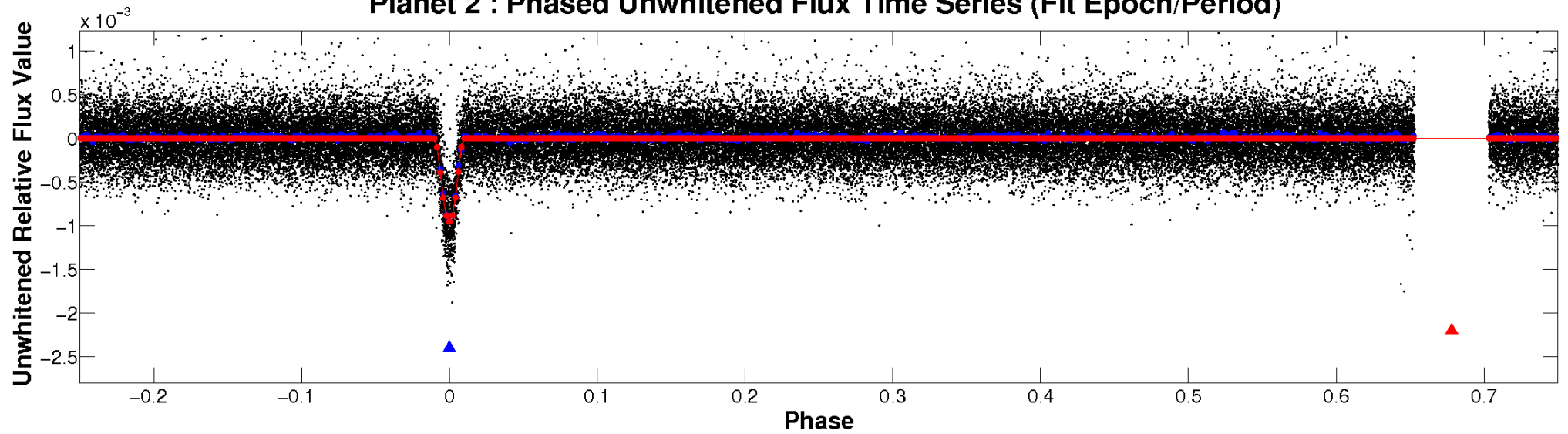
# ALT Odd/Even

TCE 008848271-02

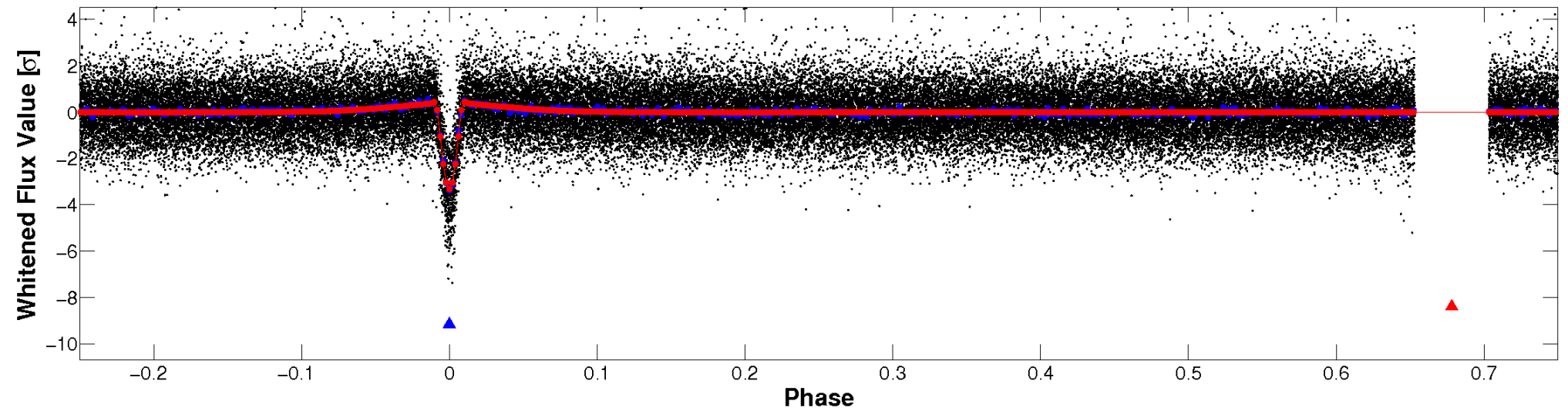


# Non-Whitened Vs. Whitened Light Curve

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



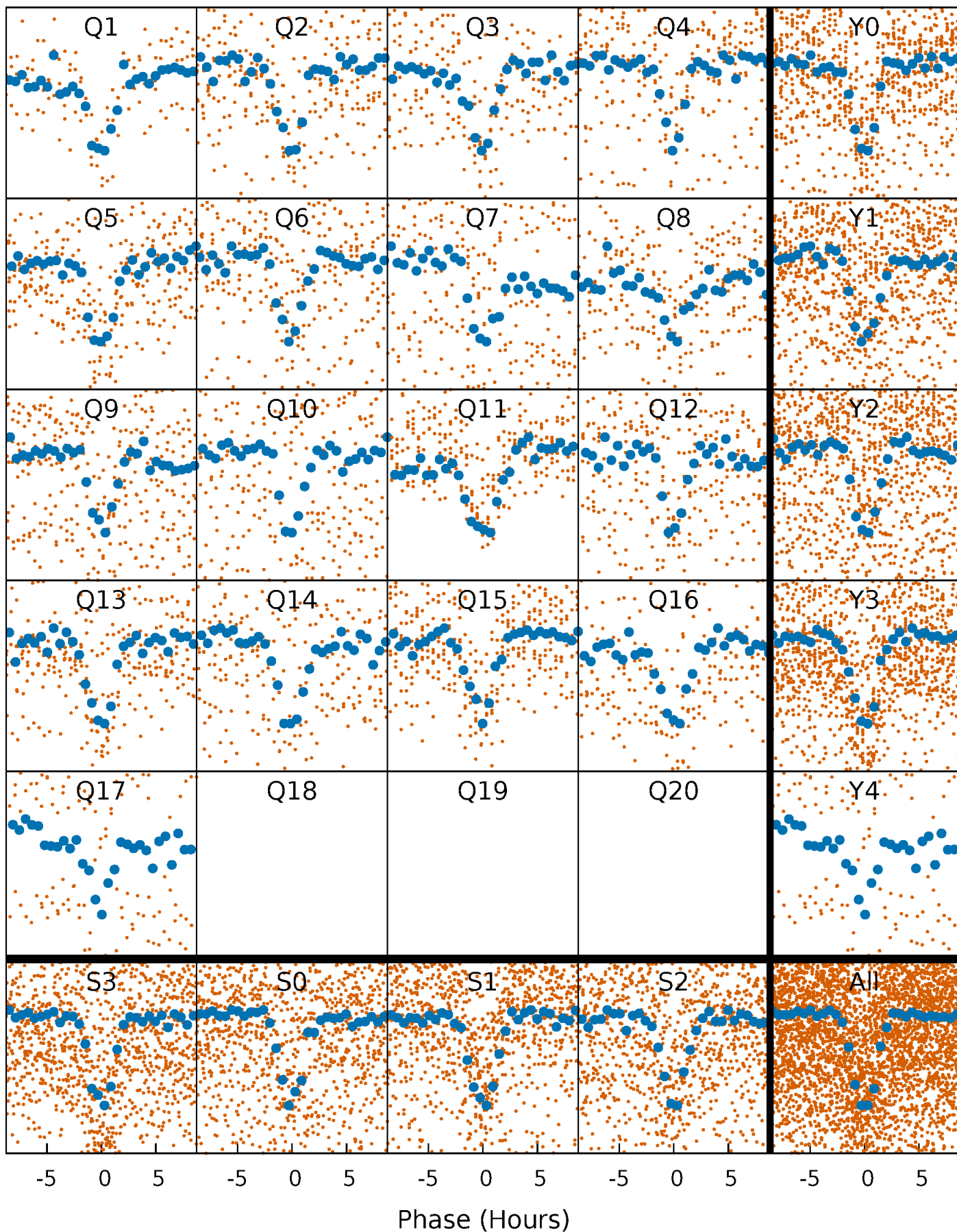
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





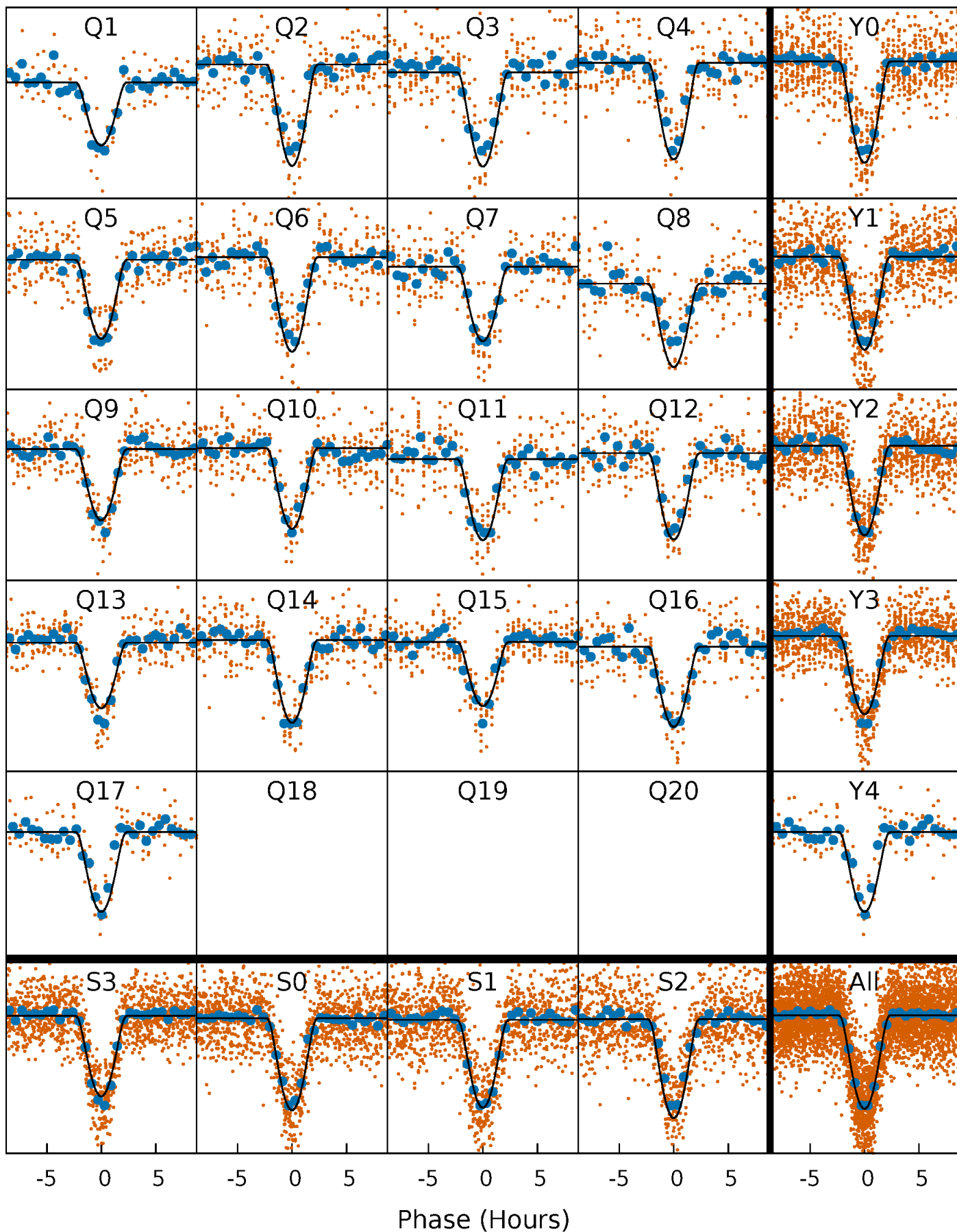
# PDC Quarter-Phased Transit Curves

TCE 008848271-02   P= 9.991625 Days    $T_0=140.663698$  (BKJD)



# DV Quarter-Phased Transit Curves

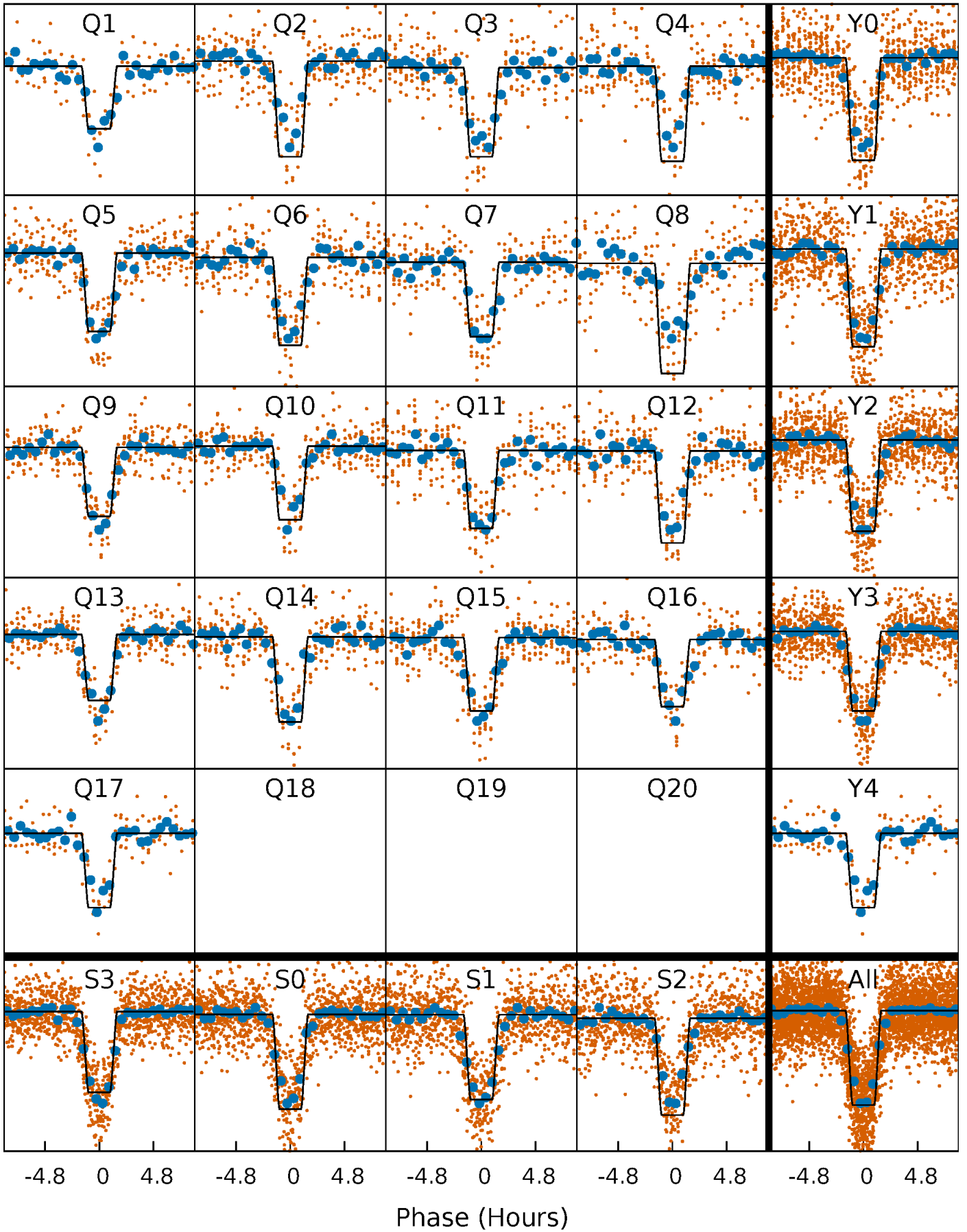
TCE 008848271-02   P= 9.991625 Days    $T_0=140.663698$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

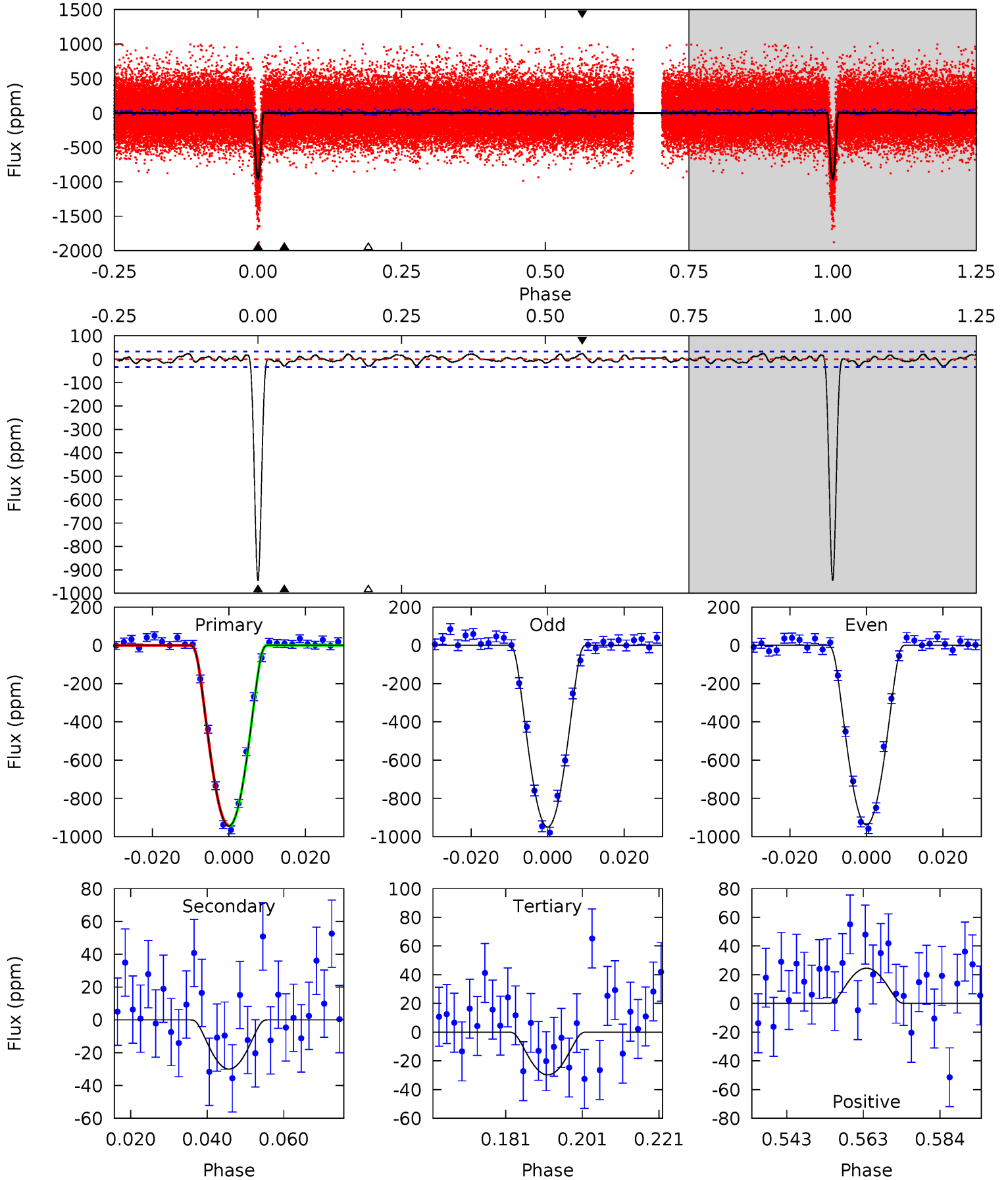
TCE 008848271-02   P= 9.991613 Days    $T_0=140.664675$  (BKJD)



# DV Model-Shift Uniqueness Test

008848271-02, P = 9.991625 Days, E = 130.672073 Days

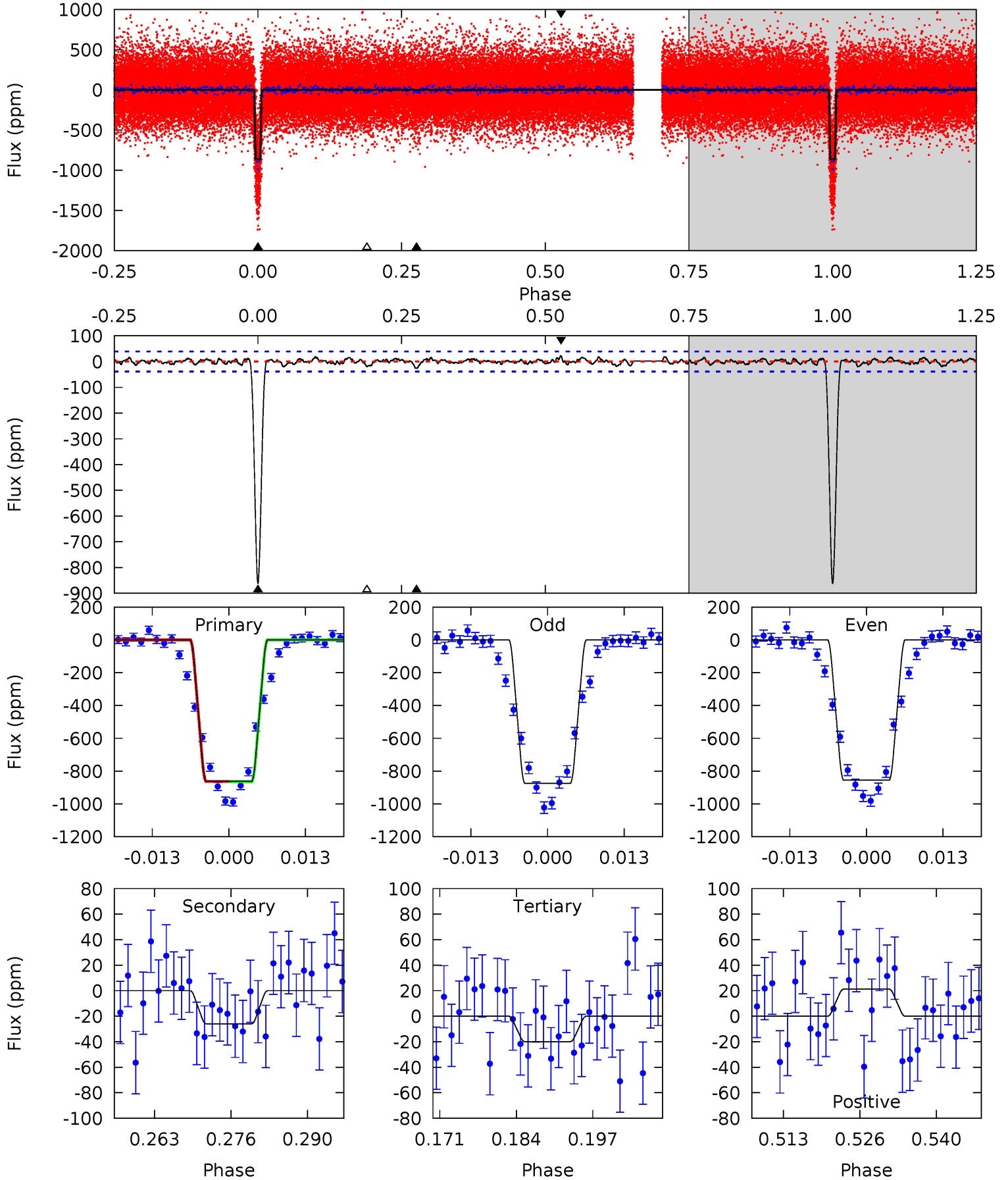
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
140.8	4.48	4.44	3.66	4.89	2.32	1.53	136.4	137.2	0.04	0.81	0.80	0.98	0.03	0.18



# Alt Model-Shift Uniqueness Test

008848271-02, P = 9.991613 Days, E = 130.673062 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
109.5	3.29	2.54	2.69	4.97	2.48	0.92	106.9	106.8	0.75	0.60	1.17	1.00	0.02	0.10



### Stellar Parameters For KIC 008848271

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5874^{+158}_{-176}$	$4.338^{+0.153}_{-0.187}$	$-0.120^{+0.300}_{-0.300}$	$1.096^{+0.309}_{-0.206}$	$0.954^{+0.140}_{-0.102}$	$1.020^{+0.754}_{-0.504}$
	+3%/-3%	+4%/-4%	+250%/-250%	+28%/-19%	+15%/-11%	+74%/-49%
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 008848271-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-30 \pm 7$	$6.50^{+3.67}_{-3.23}$	$1273^{+91}_{-82}$	$2628^{+574}_{-303}$	$3.101^{+9.260}_{-1.823}$
Alt.	$-26 \pm 8$	$4.34^{+3.31}_{-2.58}$	$1275^{+89}_{-79}$	$2895^{+849}_{-461}$	$6.031^{+29.086}_{-4.207}$

$T_{\text{max}}$  = 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

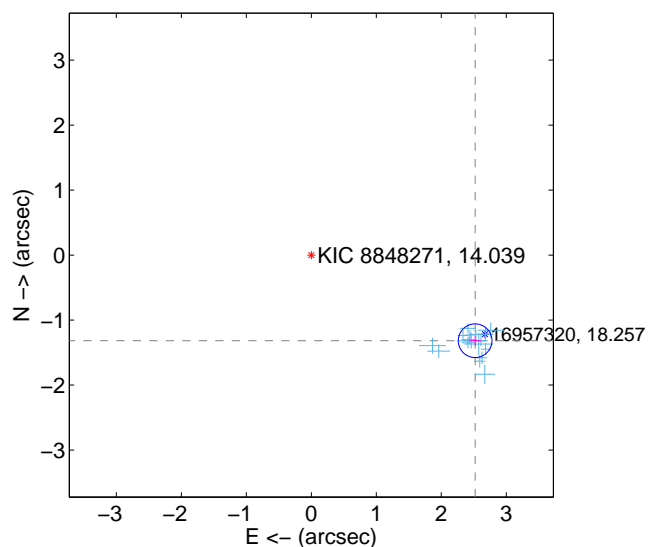
Supplemental centroid analysis for 008848271-02. Kepler magnitude: 14.04. Transit SNR 73.80

There are 17 quarters with good PRF difference image offsets

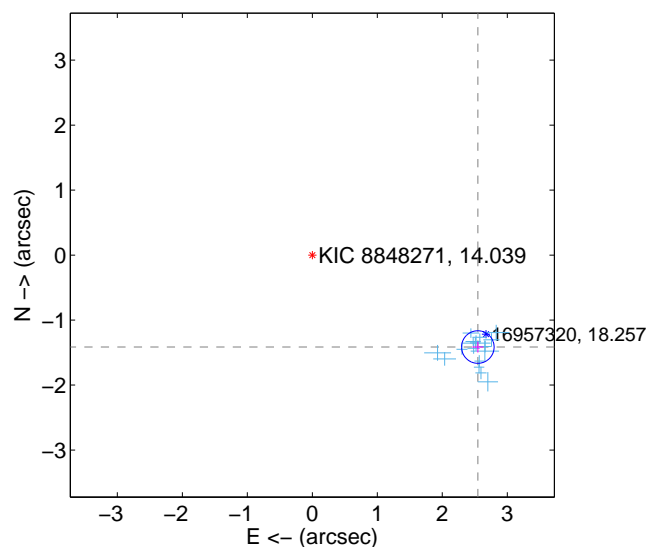
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.844 \pm 0.086$	32.93	$-2.520 \pm 0.088$	$-1.317 \pm 0.078$
PRF-fit source offset from KIC position	$2.913 \pm 0.083$	34.90	$-2.547 \pm 0.085$	$-1.415 \pm 0.084$
photometric centroid source offset	$2.23 \pm 0.16$	14.24	$-1.80 \pm 0.16$	$-1.32 \pm 0.15$

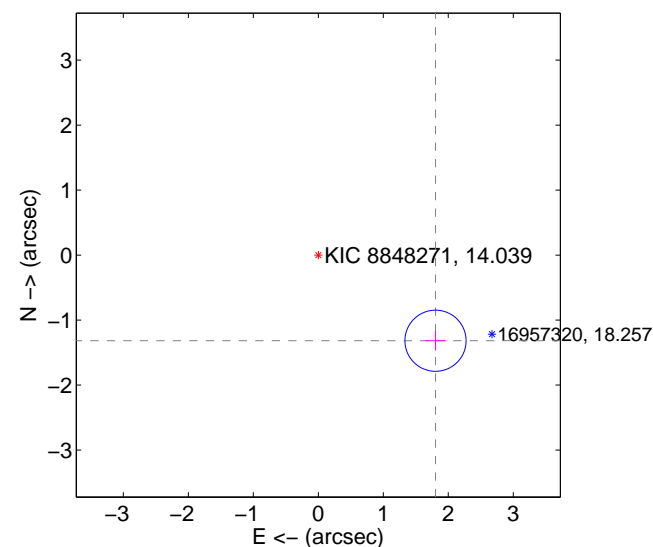
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

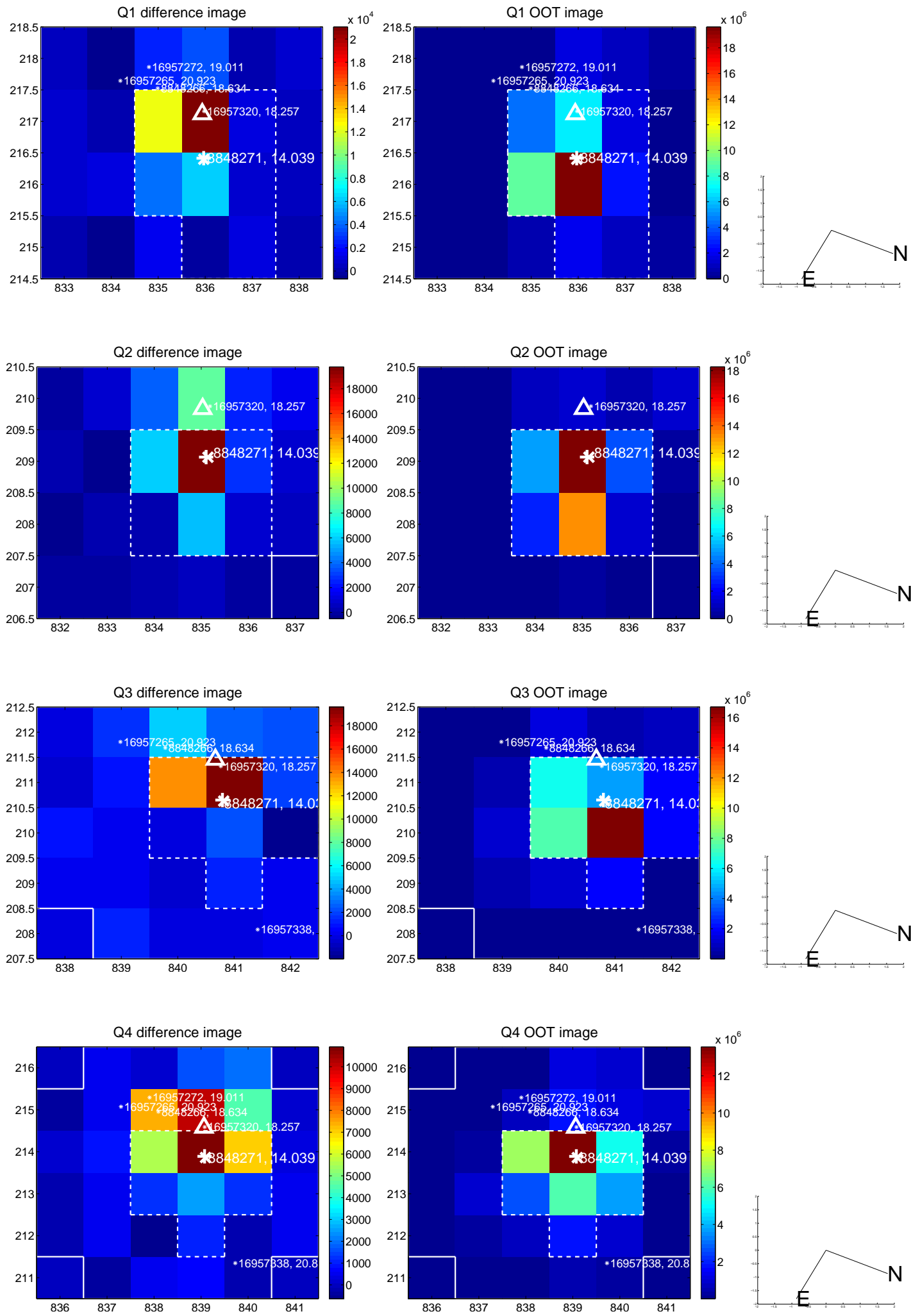


offset from photometric centroids

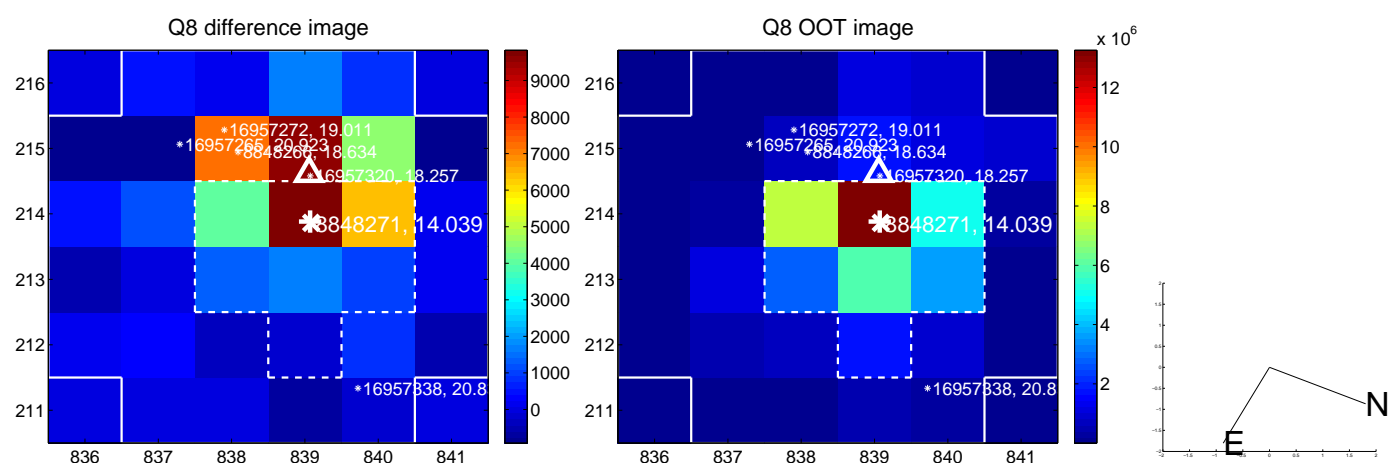
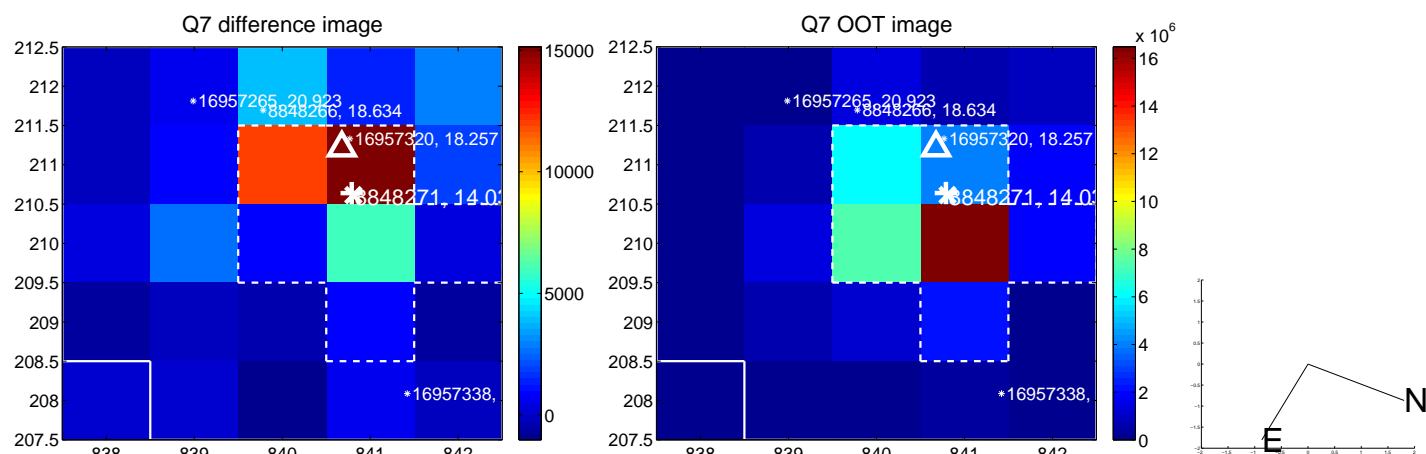
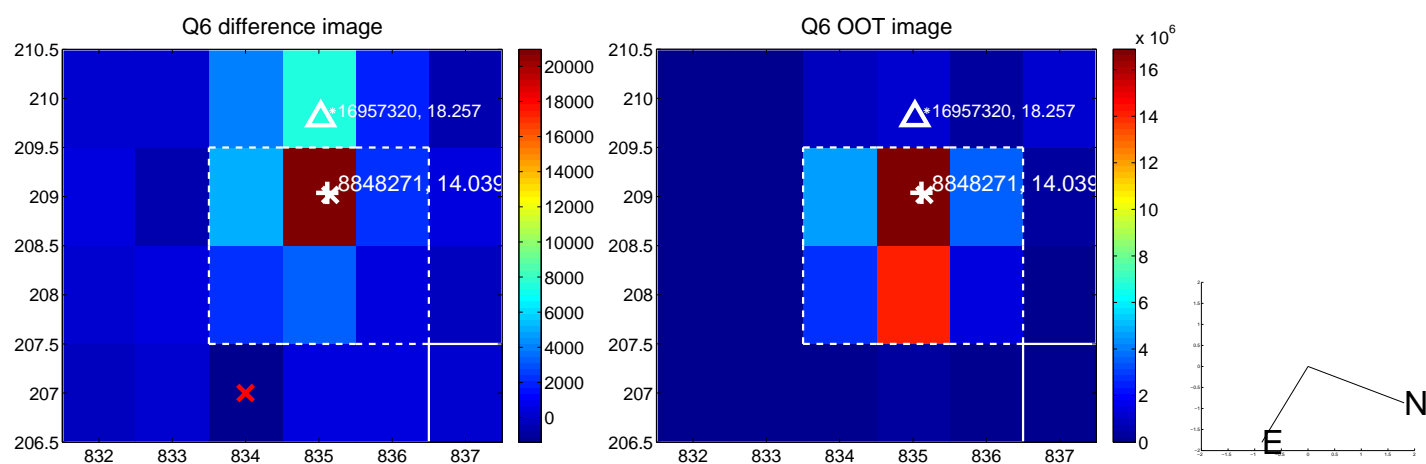
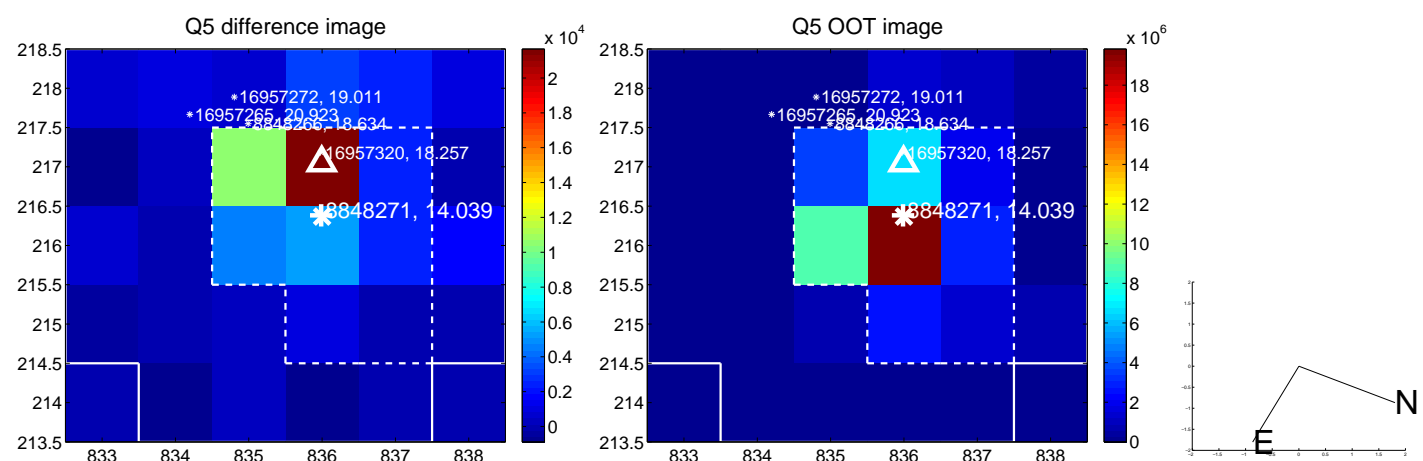


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



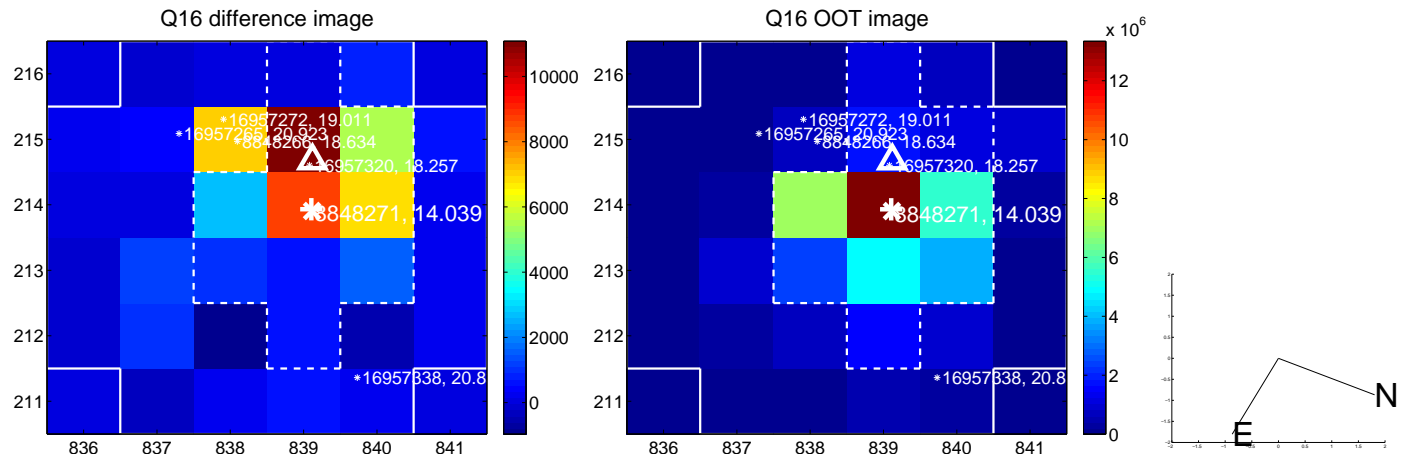
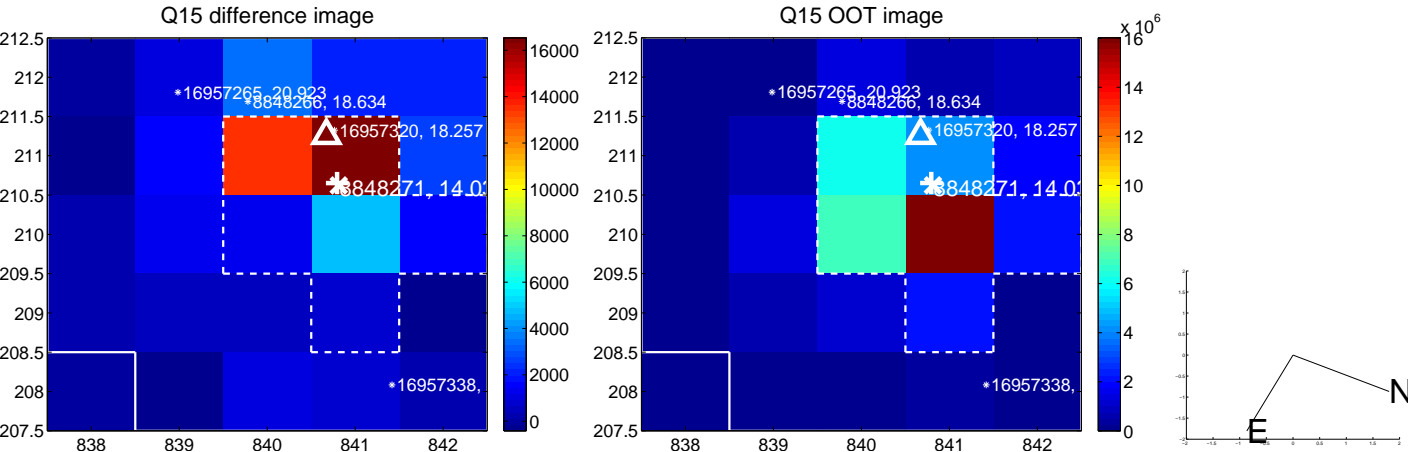
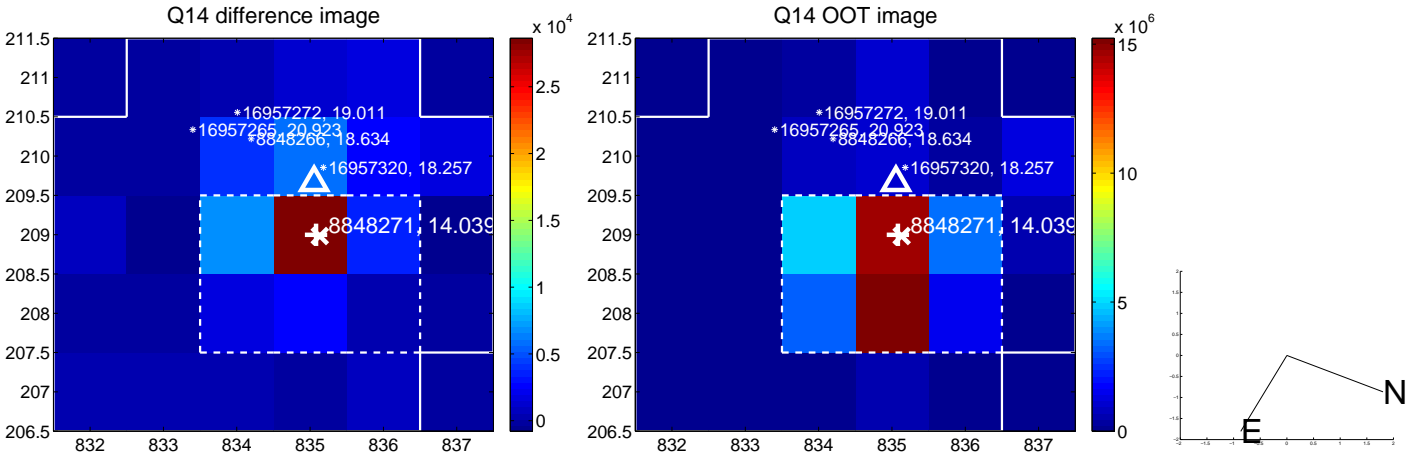
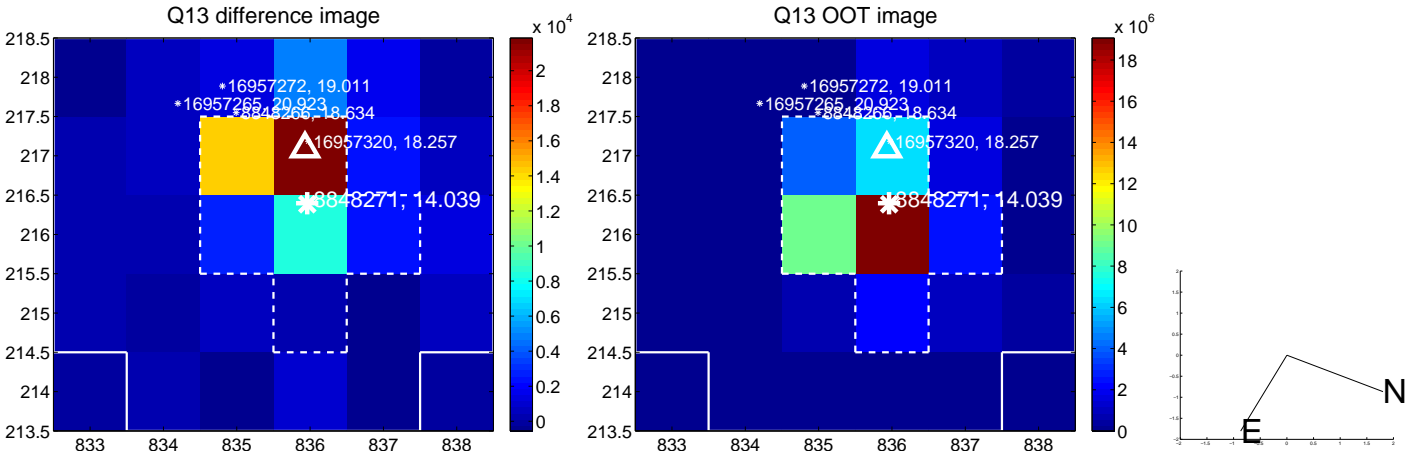
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



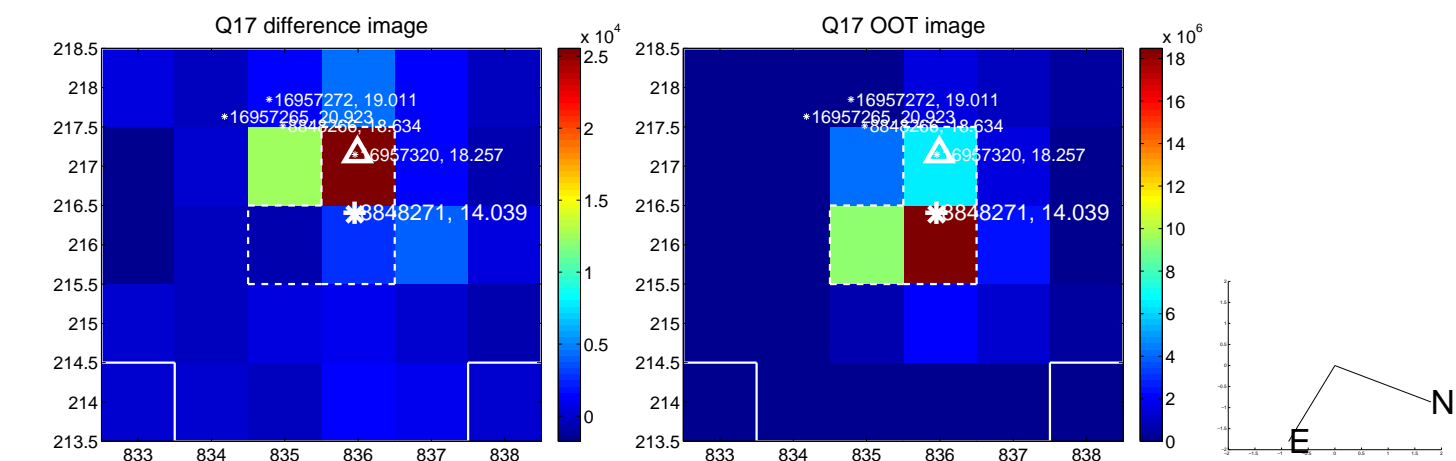




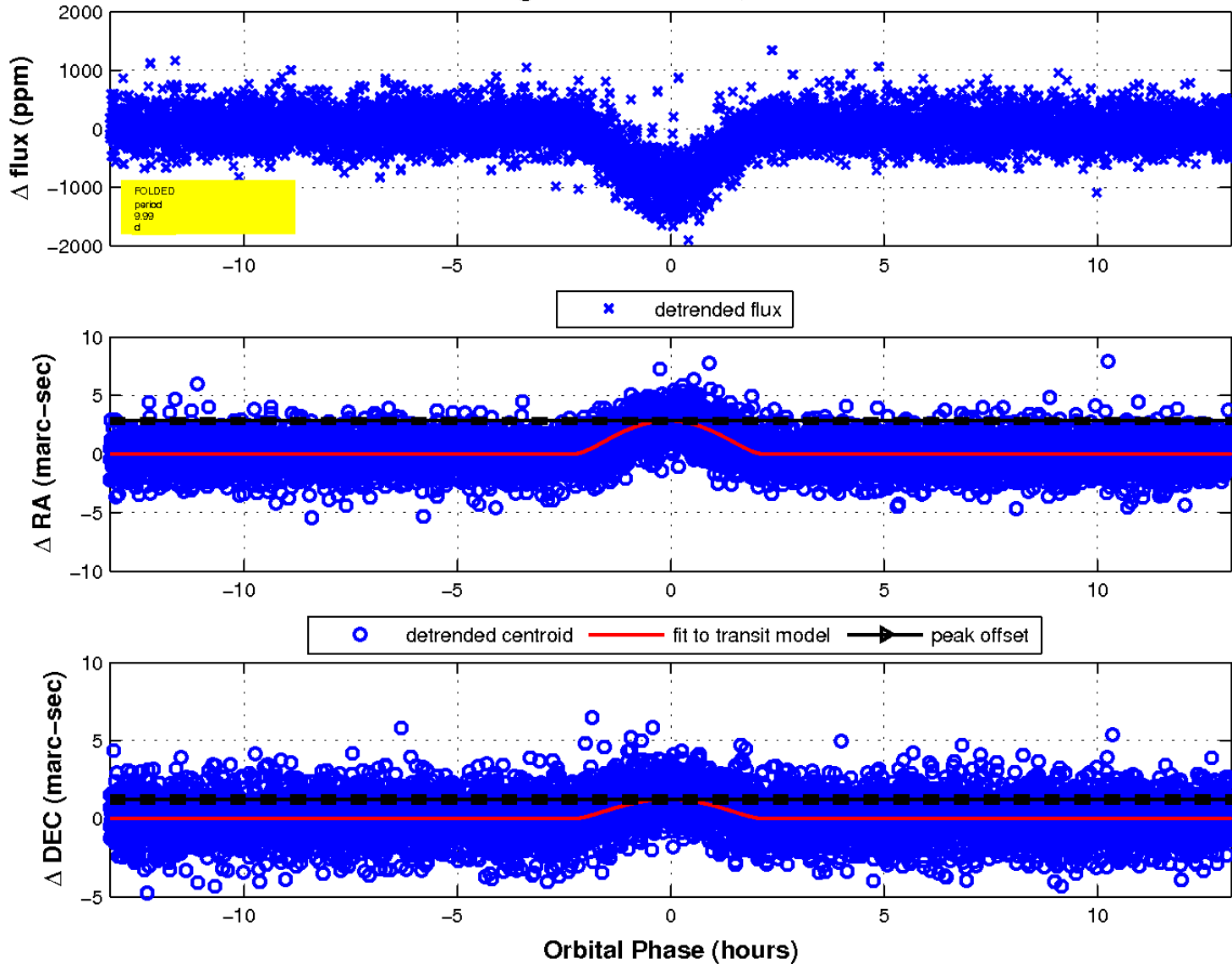
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

