

# KIC 007620844

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007620844-01	OBS	3551.01	58.621588	178.567334	142474.7	8.547	2771.5	2125.6	0.72	5232	40.69	5.20
007620844-02	OBS	No	58.621562	151.693499	41617.7	6.095	775.1	720.7	0.72	5232	24.10	5.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007620844-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—HAS_SEC_TCE
007620844-02	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.

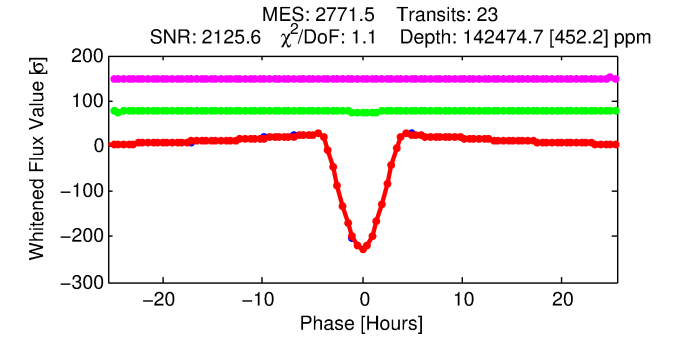
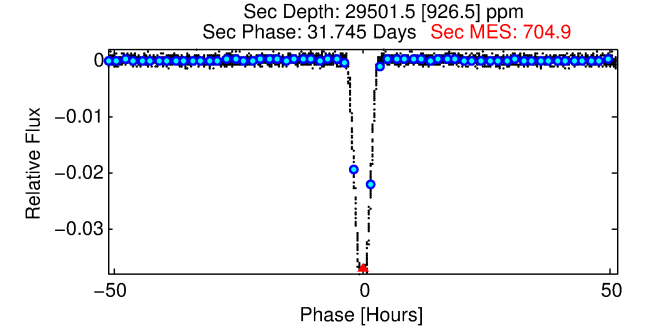
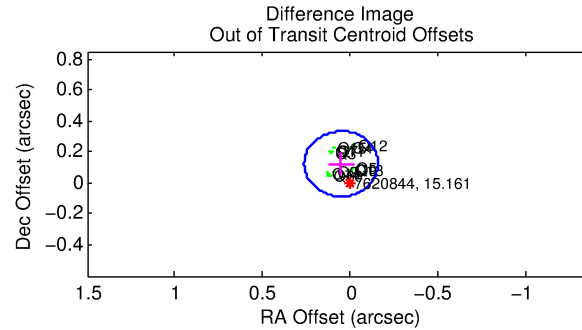
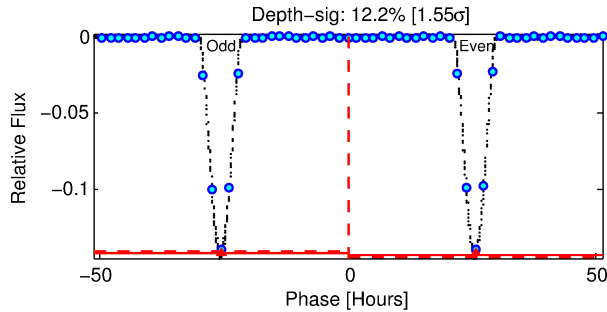
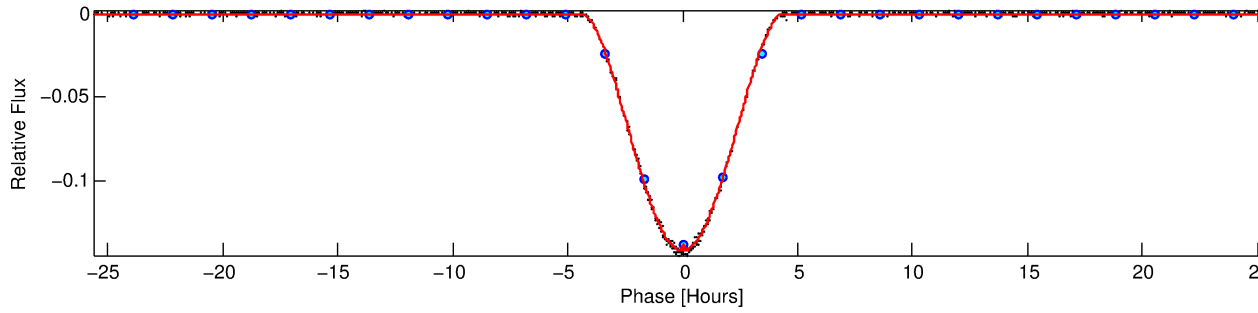
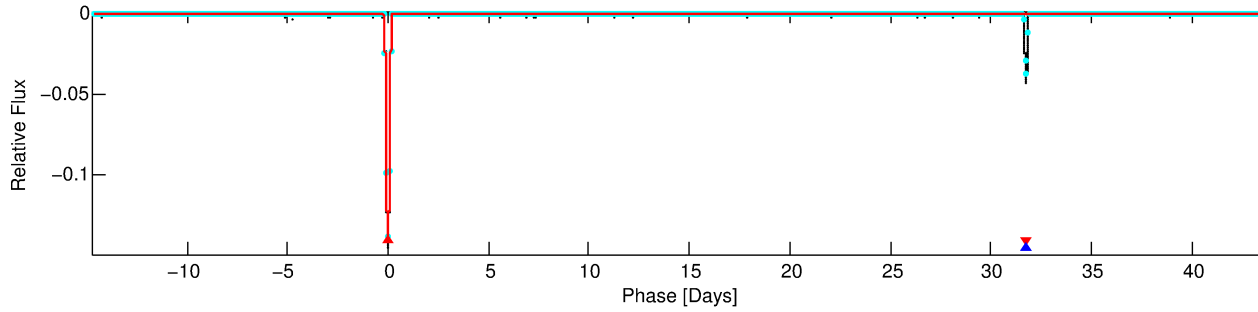
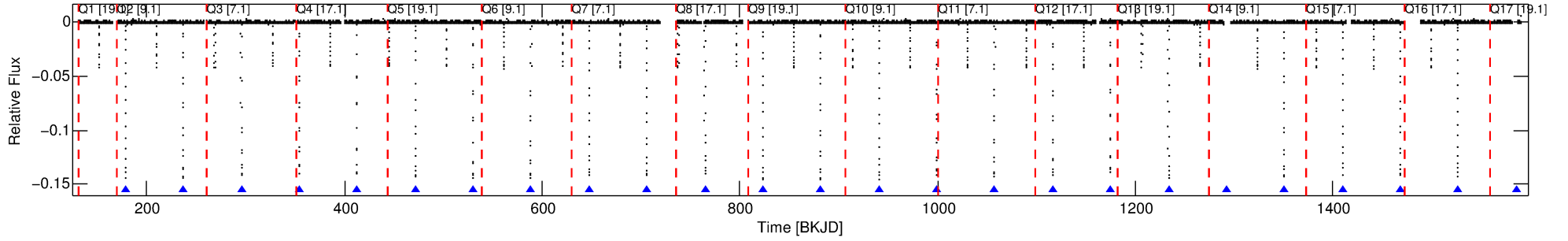
## Ephemeris Match Information For 007620844-01

No Significant Match Found

# DV One-Page Summary

KIC: 7620844 Candidate: 1 of 2 Period: 58.622 d  
KOI: K03551.01 Corr: 0.999

Kp: 15.16 R\*: 0.72 Rs Teff: 5232.0 K Logg: 4.55 Fe/H: -0.520



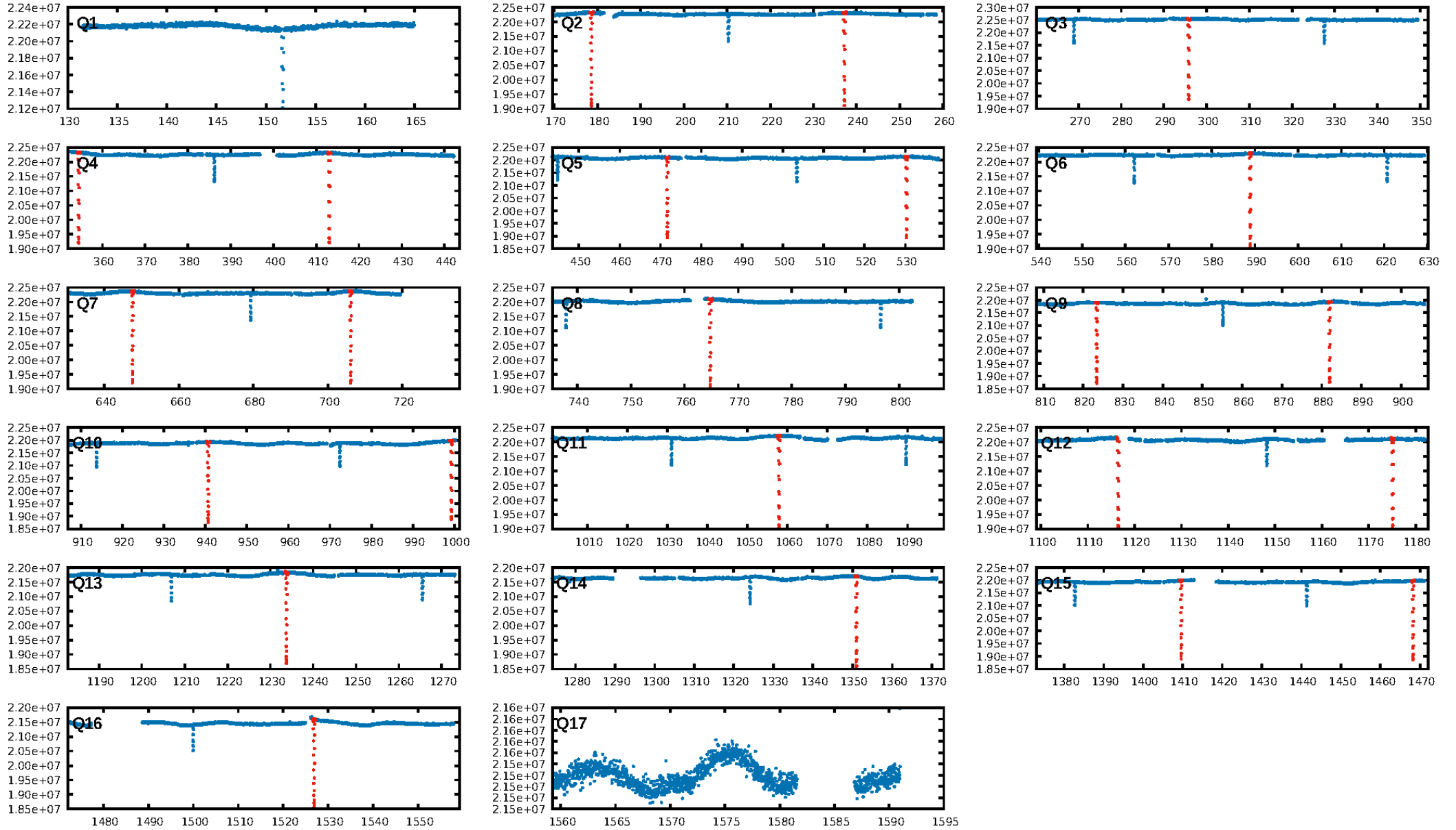
## DV Fit Results:

Period = 58.62159 [0.00001] d  
Epoch = 178.5673 [0.0001] BKJD  
Rp/R\* = 0.5143 [0.1219]  
a/R\* = 63.79 [1.43]  
b = 0.90 [0.17]  
Seff = 5.20 [1.04]  
Teq = 385 [19] K  
Rp = 40.69 [10.86] Re  
a = 0.2606 [0.0279] AU  
Ag = 665.73 [333.96] [1.99σ]  
Teffp = 3024 [371] K [7.11σ]

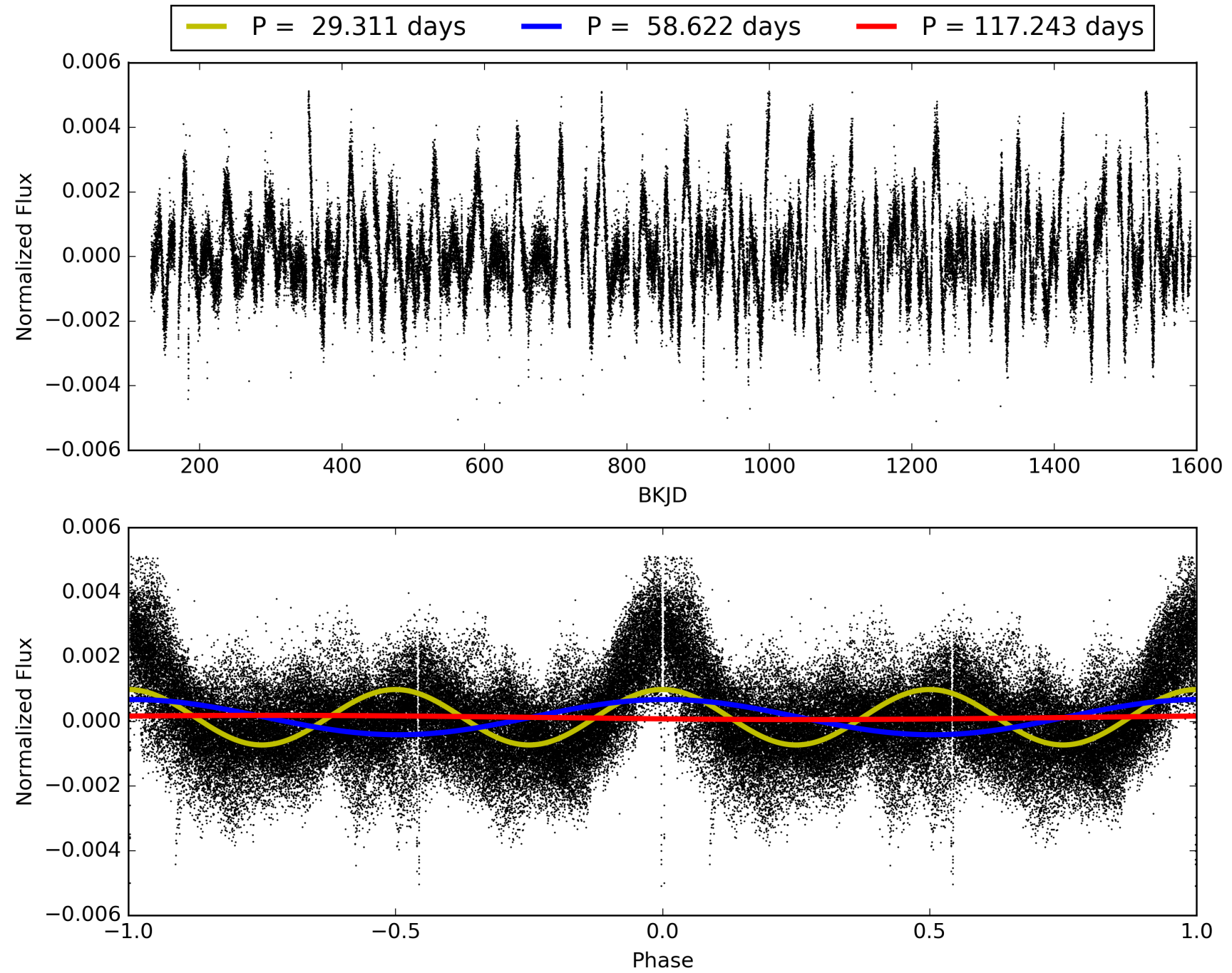
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 93.8%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [23/23]  
GhostDiagnostic-chr: 5.847  
Centroid-sig: 0.0%  
Centroid-so: 0.129 arcsec [34.81σ]  
OotOffset-rm: 0.135 arcsec [1.92σ]  
KicOffset-rm: 0.159 arcsec [2.33σ]  
OotOffset-st: 4/4/2/3 [13]  
KicOffset-st: 4/4/2/3 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

# TCE 007620844-01, PDC Light Curves

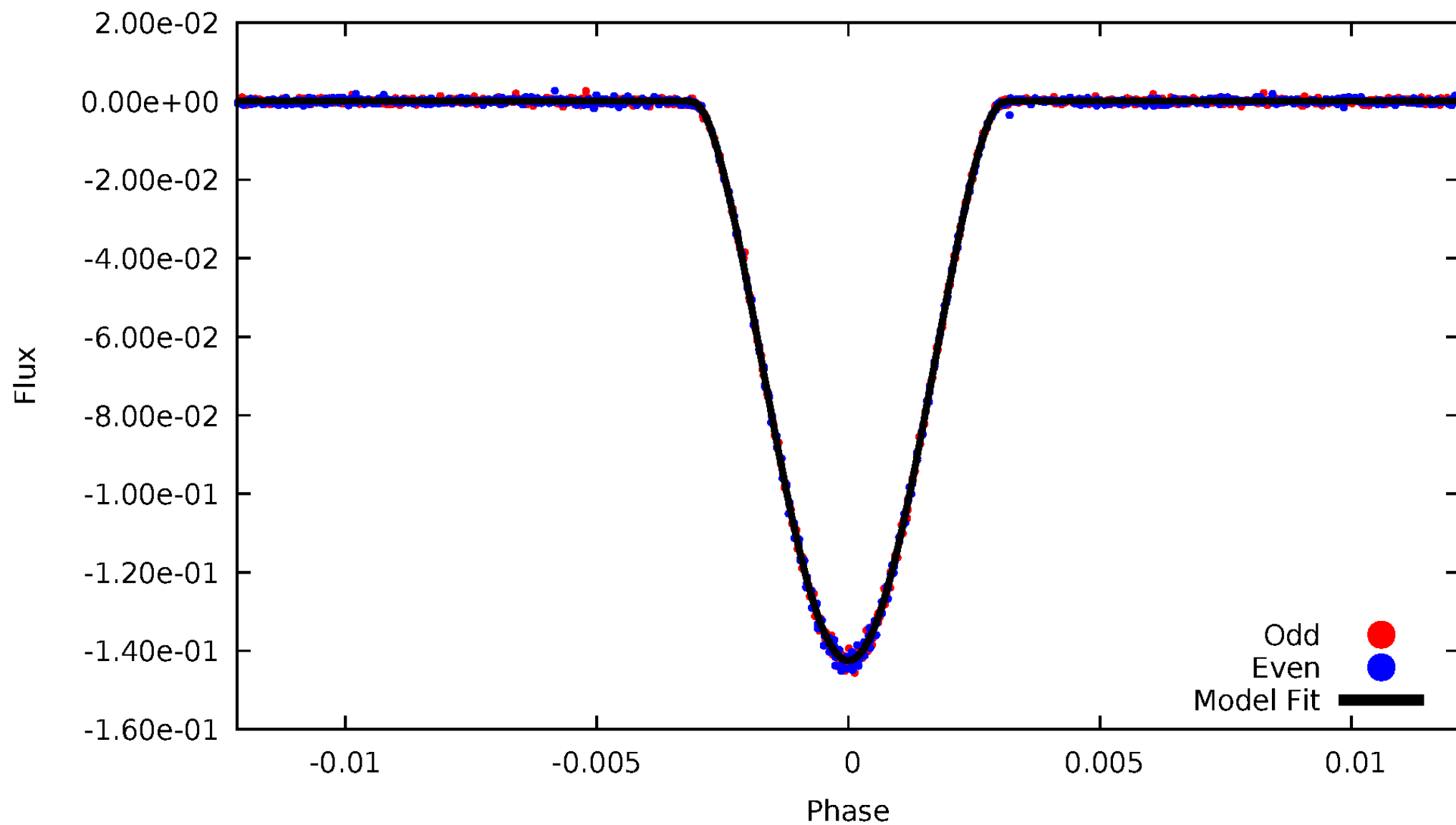


TCE 007620844-01



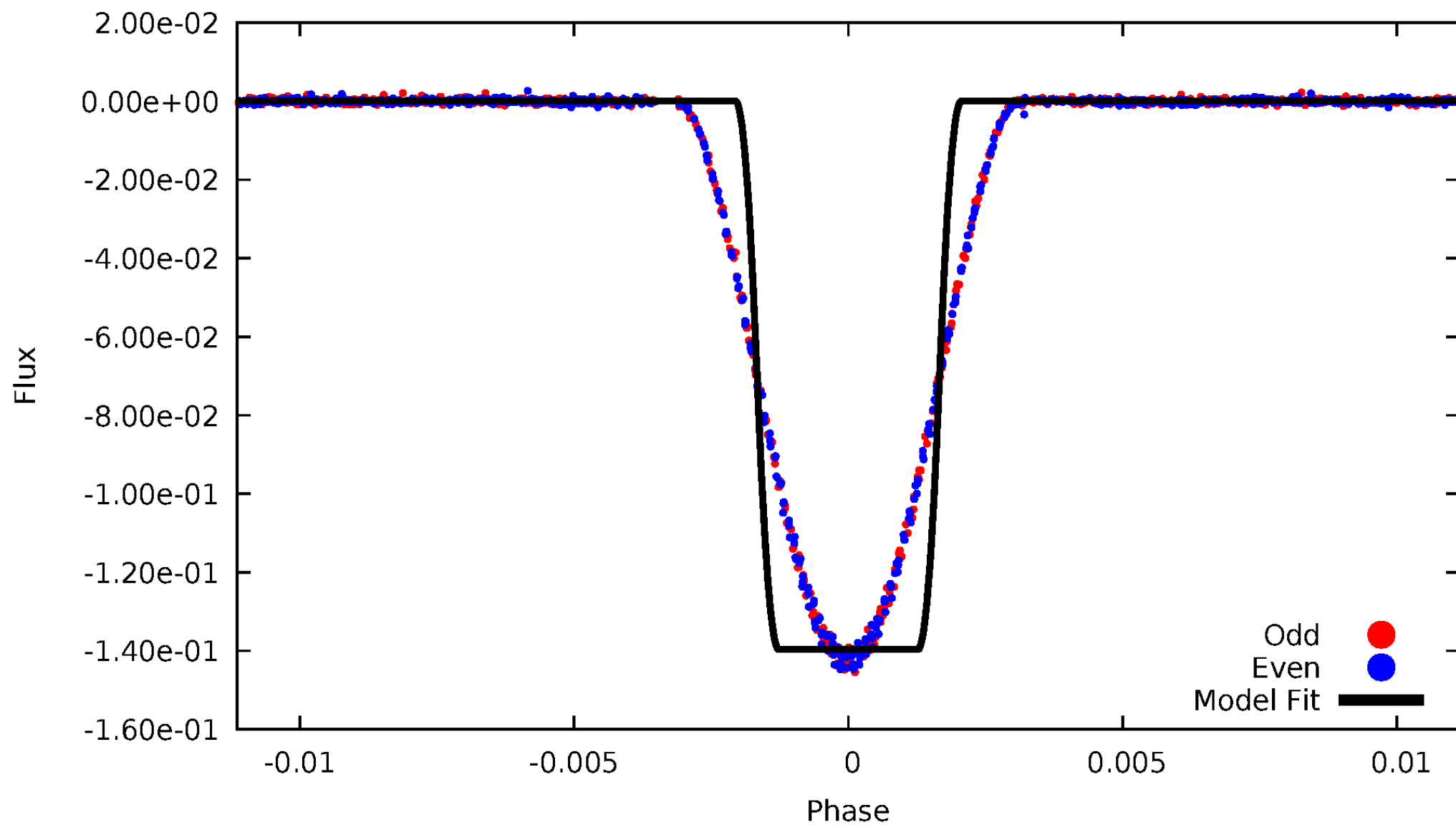
# DV Odd/Even

TCE 007620844-01



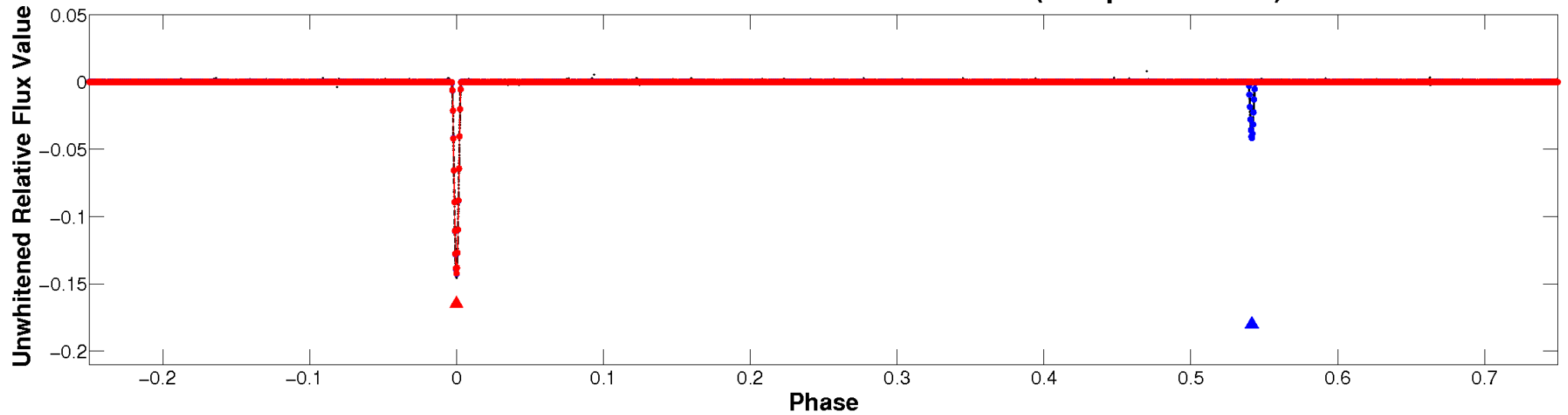
# ALT Odd/Even

TCE 007620844-01

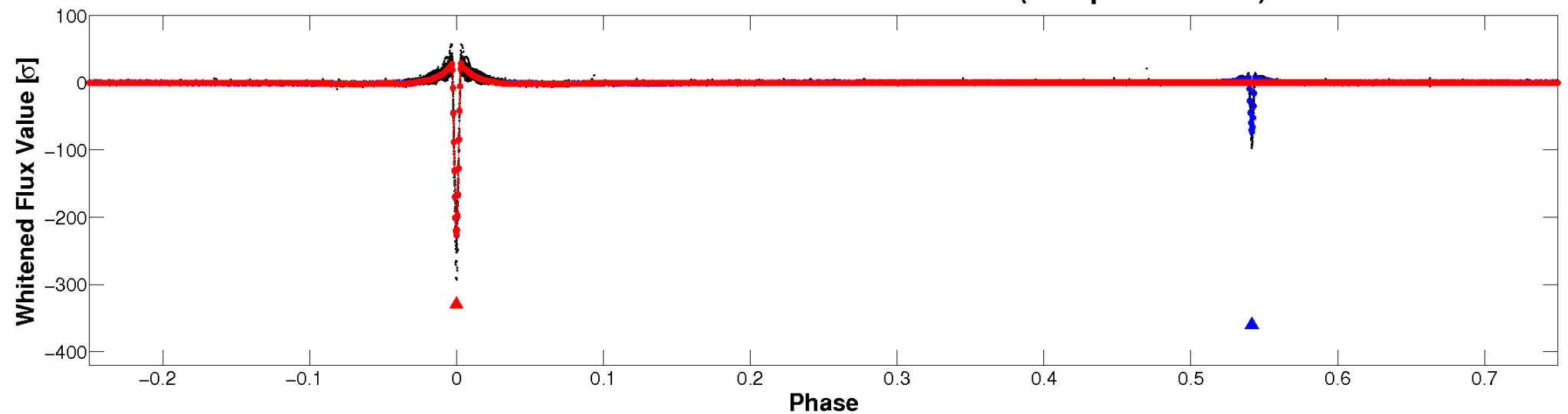


# Non-Whitened Vs. Whitened Light Curve

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

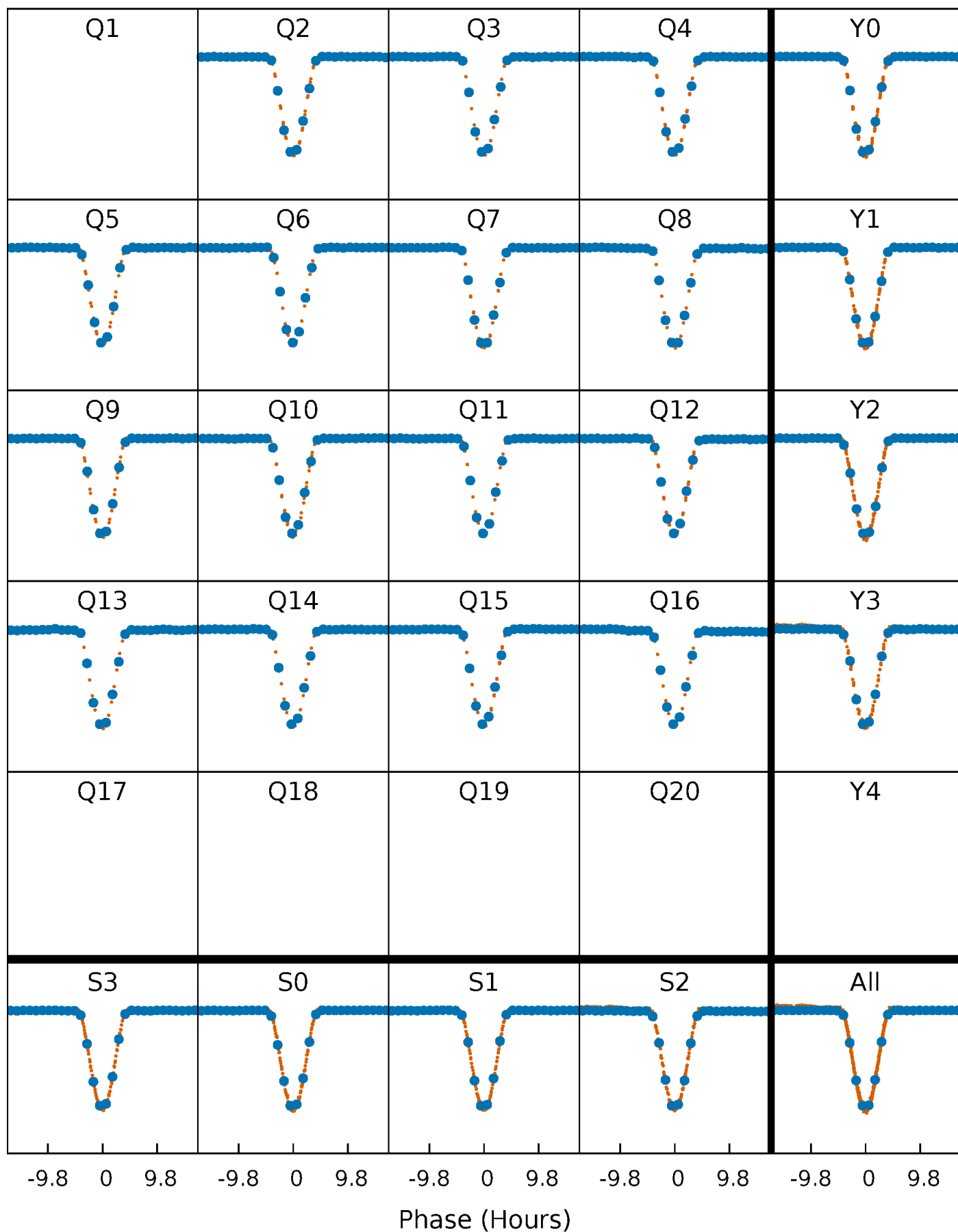


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

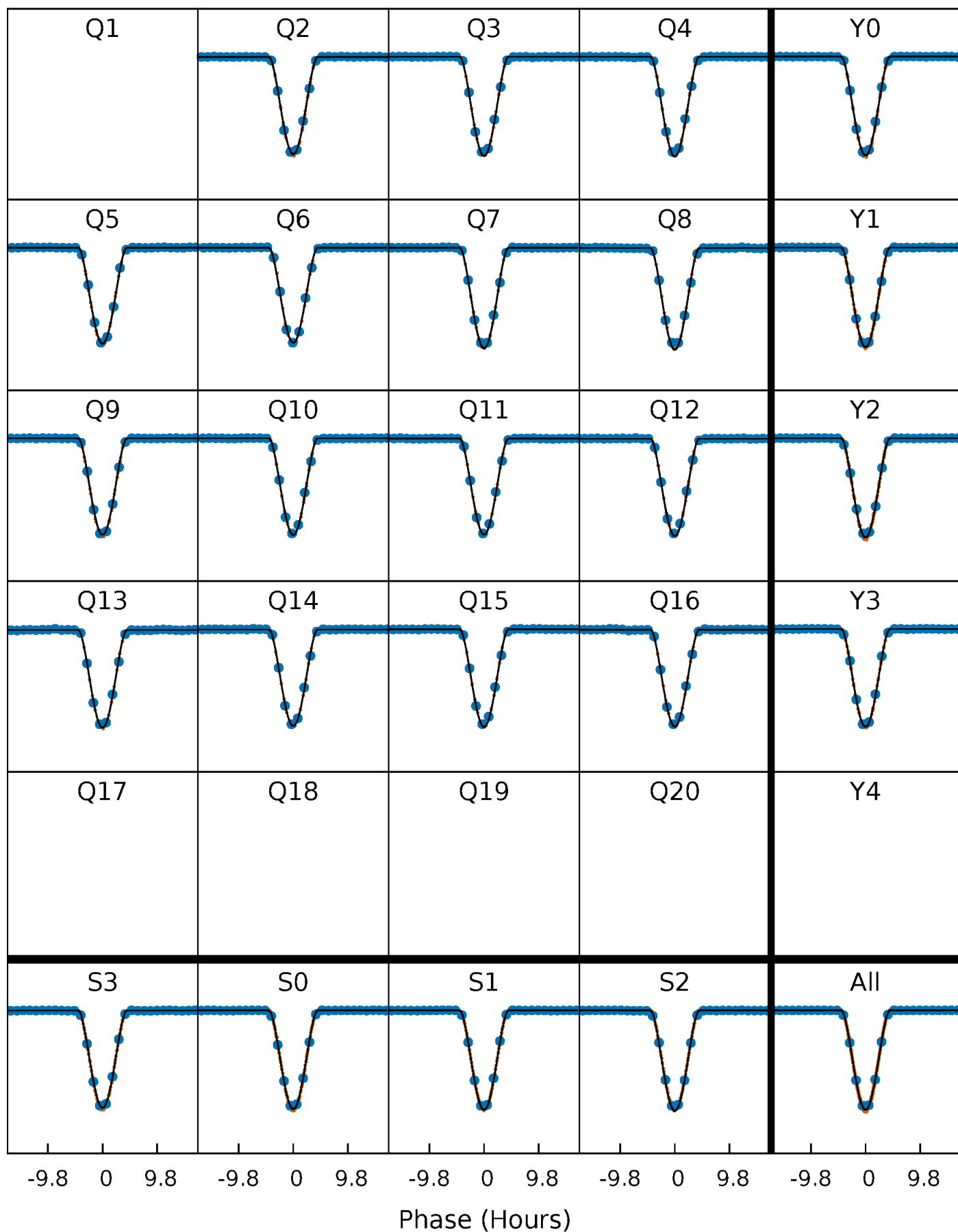
TCE 007620844-01 P= 58.621588 Days  $T_0=178.567334$  (BKJD)





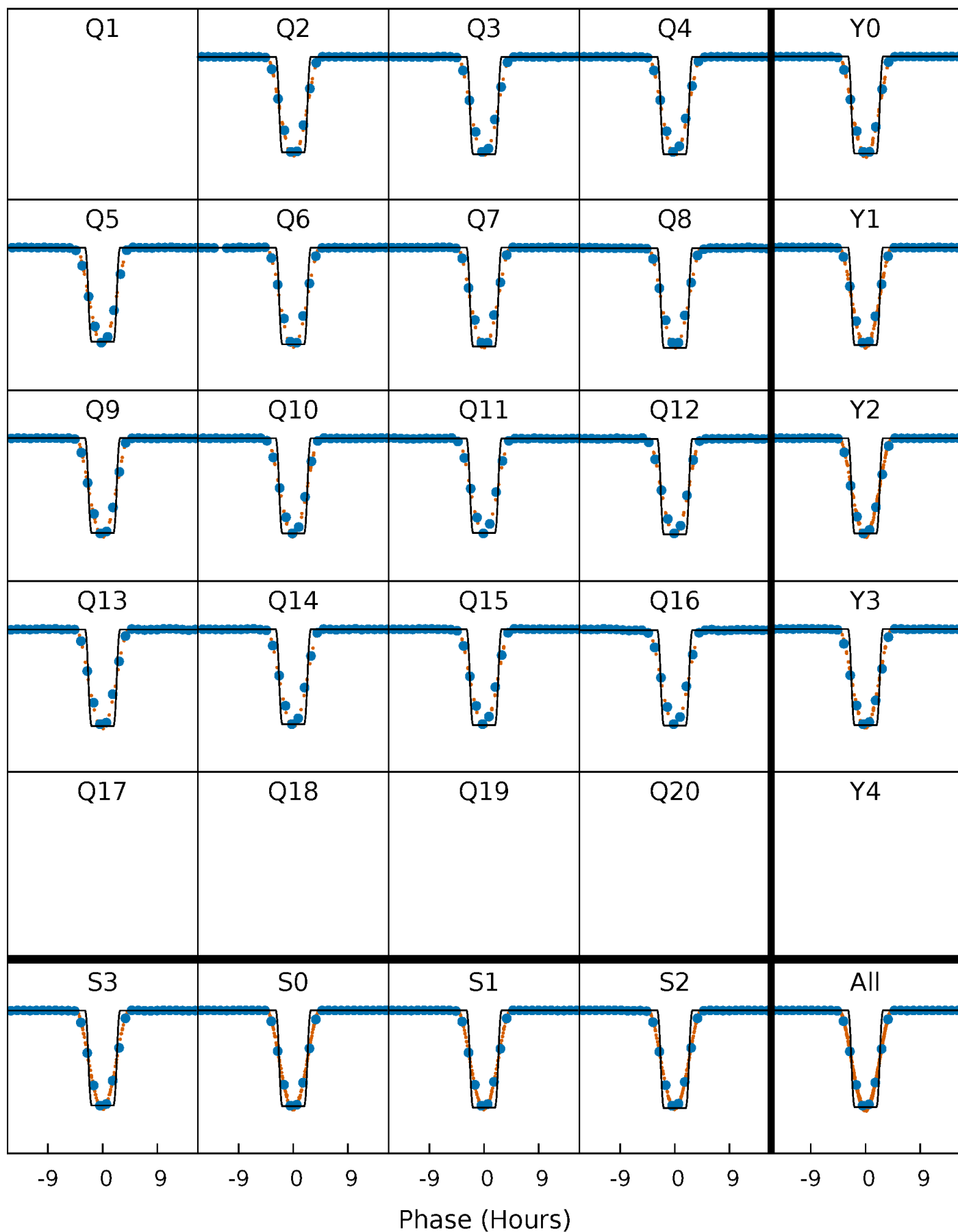
# DV Quarter-Phased Transit Curves

TCE 007620844-01 P= 58.621588 Days  $T_0=178.567334$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

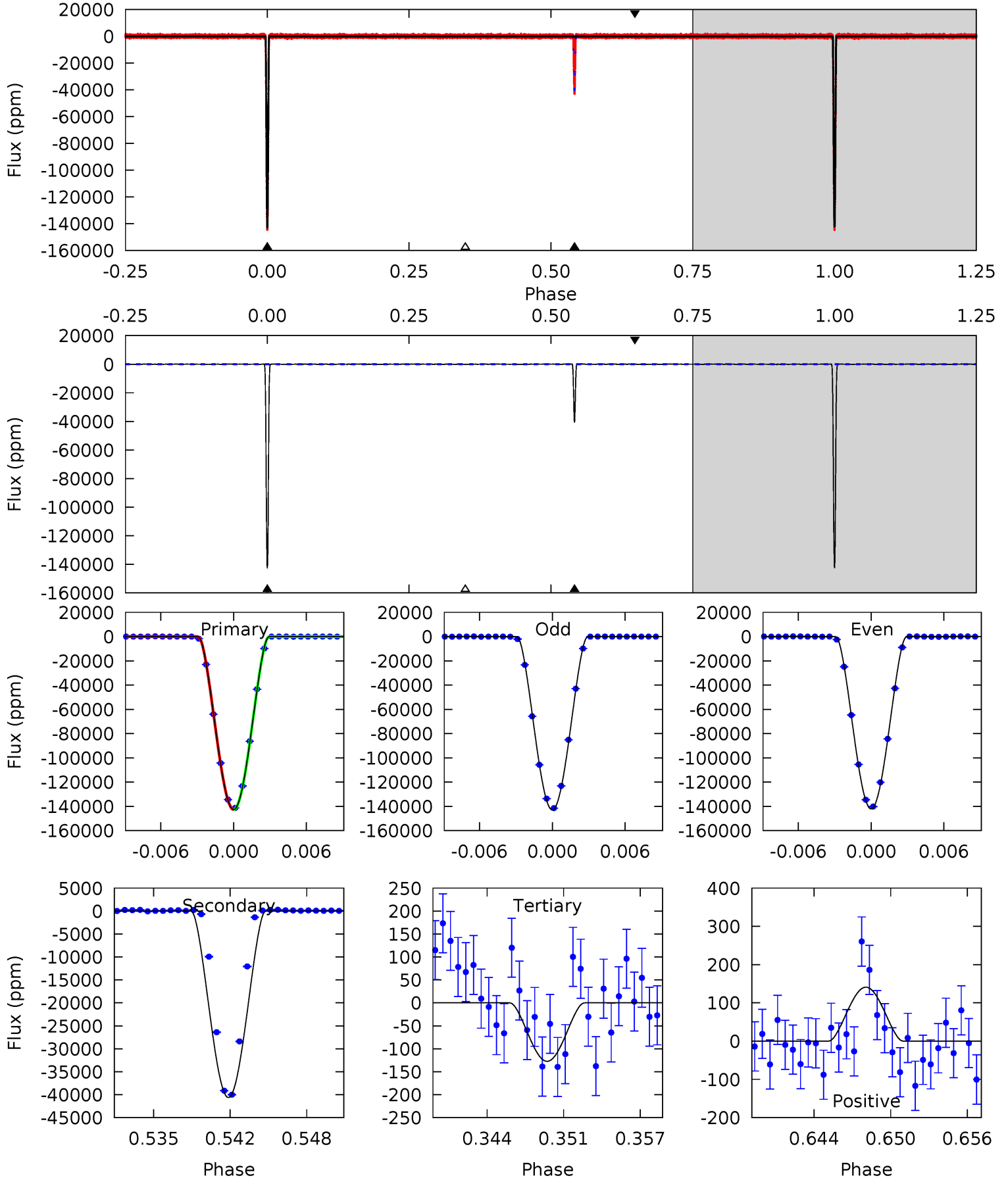
TCE 007620844-01 P= 58.621640 Days  $T_0=178.566832$  (BKJD)



# DV Model-Shift Uniqueness Test

007620844-01, P = 58.621588 Days, E = 119.945746 Days

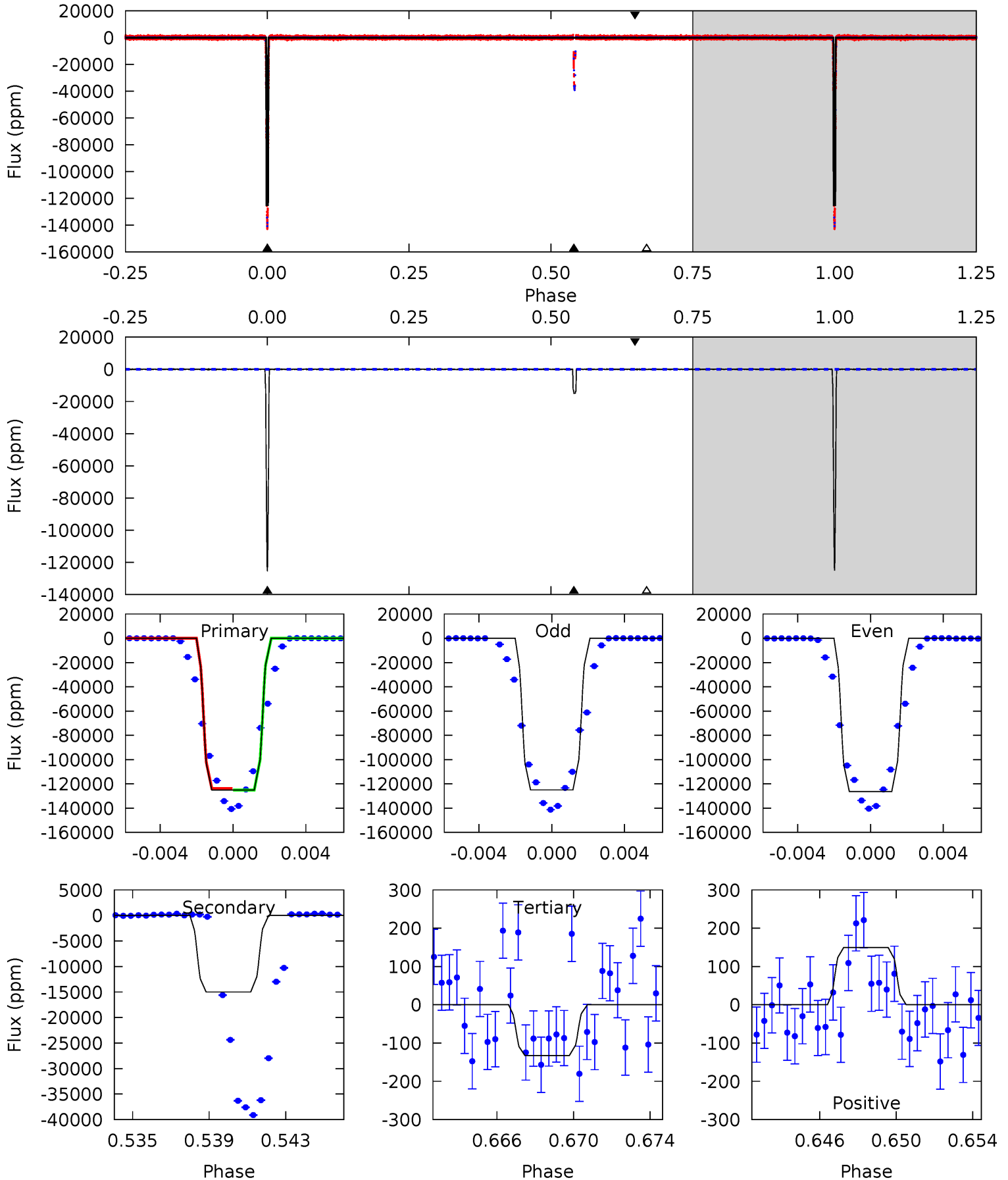
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5737	1634	5.12	5.67	5.11	2.73	1.97	5732	5732	1629	1628	17.6	1.00	0.00	0.12



# Alt Model-Shift Uniqueness Test

007620844-01, P = 58.621640 Days, E = 119.945192 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
3261	391.5	3.45	3.90	5.20	2.87	1.83	3258	3257	388.0	387.6	18.7	1.00	0.00	0



### Stellar Parameters For KIC 007620844

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5232^{+157}_{-157}$	$4.554^{+0.090}_{-0.067}$	$-0.520^{+0.350}_{-0.300}$	$0.725^{+0.089}_{-0.081}$	$0.686^{+0.099}_{-0.042}$	$2.540^{+0.939}_{-0.575}$
	+3%/-3%	+2%/-1%	+67%/-58%	+12%/-11%	+14%/-6%	+37%/-23%
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 007620844-01 / KOI 3551.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-40606 \pm 25$	$40.67^{+10.84}_{-10.13}$	$536^{+23}_{-23}$	$3696^{+377}_{-259}$	$971^{+746}_{-353}$
Alt.	$-15013 \pm 38$	$29.17^{+10.71}_{-8.55}$	$535^{+23}_{-23}$	$3463^{+445}_{-288}$	$684^{+722}_{-313}$

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

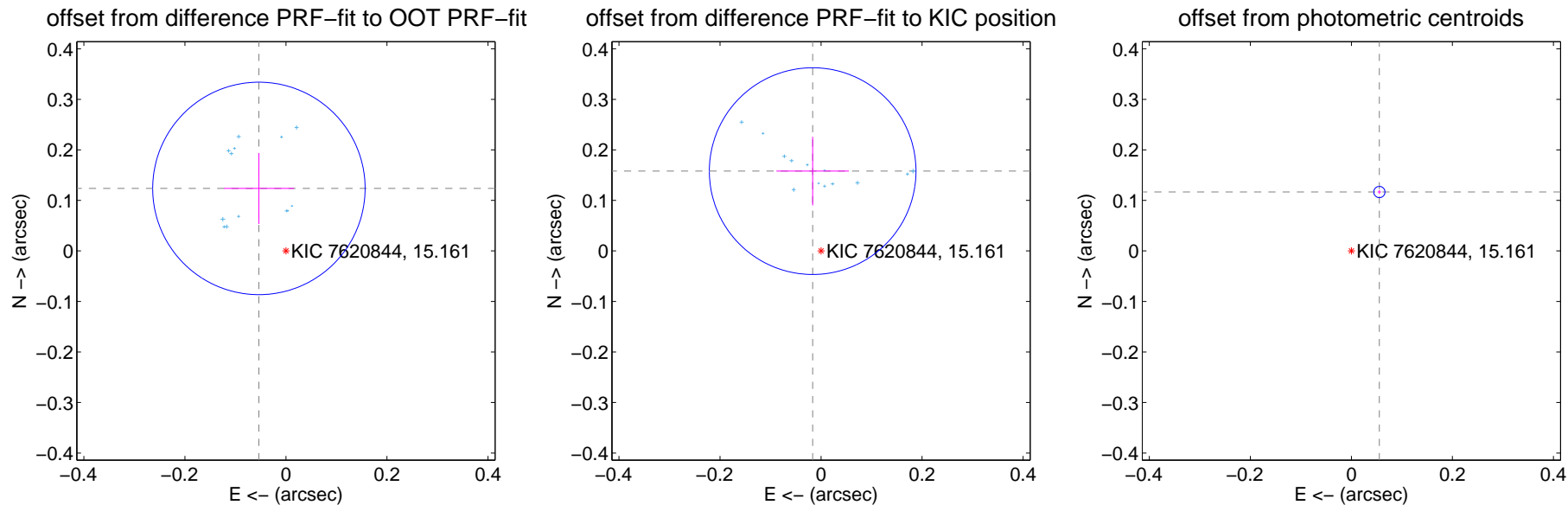
## DV Centroid Data

Supplemental centroid analysis for 007620844-01. Kepler magnitude: 15.16. Transit SNR 2125.62

There are 13 quarters with good PRF difference image offsets

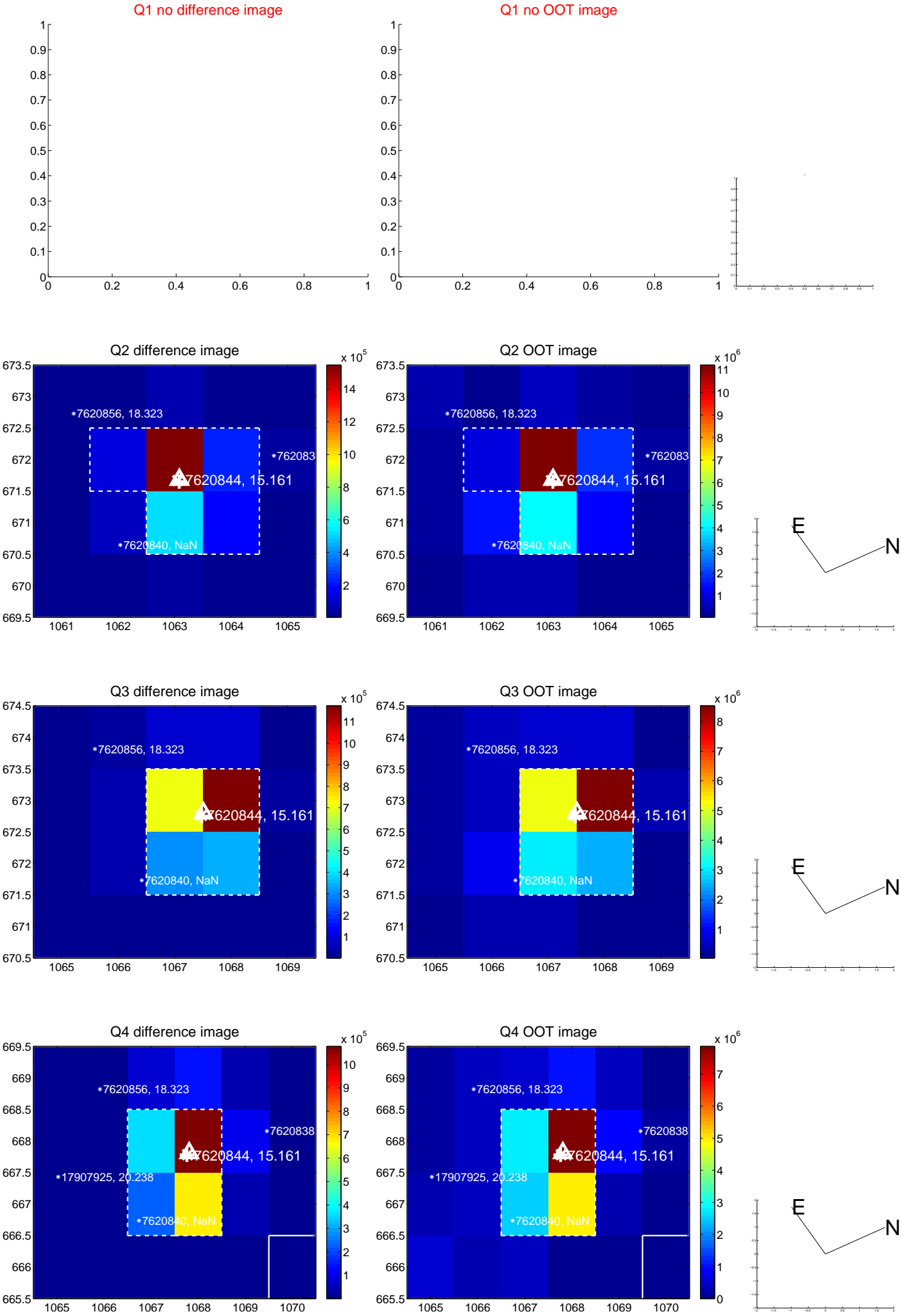
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.135 \pm 0.070$	1.92	$0.054 \pm 0.069$	$0.124 \pm 0.070$
PRF-fit source offset from KIC position	$0.159 \pm 0.068$	2.33	$0.017 \pm 0.072$	$0.158 \pm 0.068$
photometric centroid source offset	$0.13 \pm 0.00$	34.81	$-0.06 \pm 0.00$	$0.12 \pm 0.00$

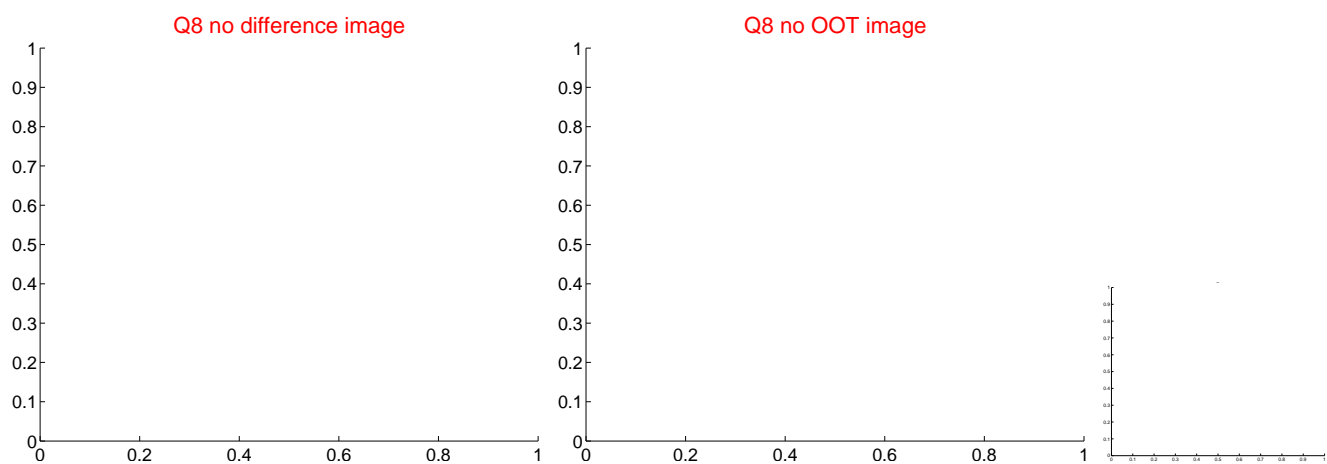
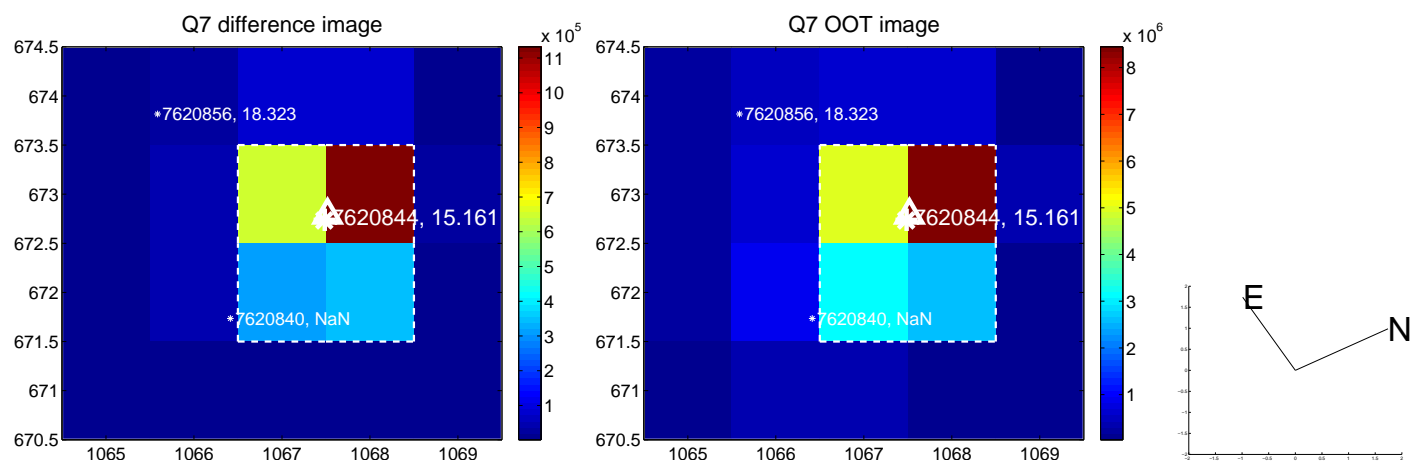
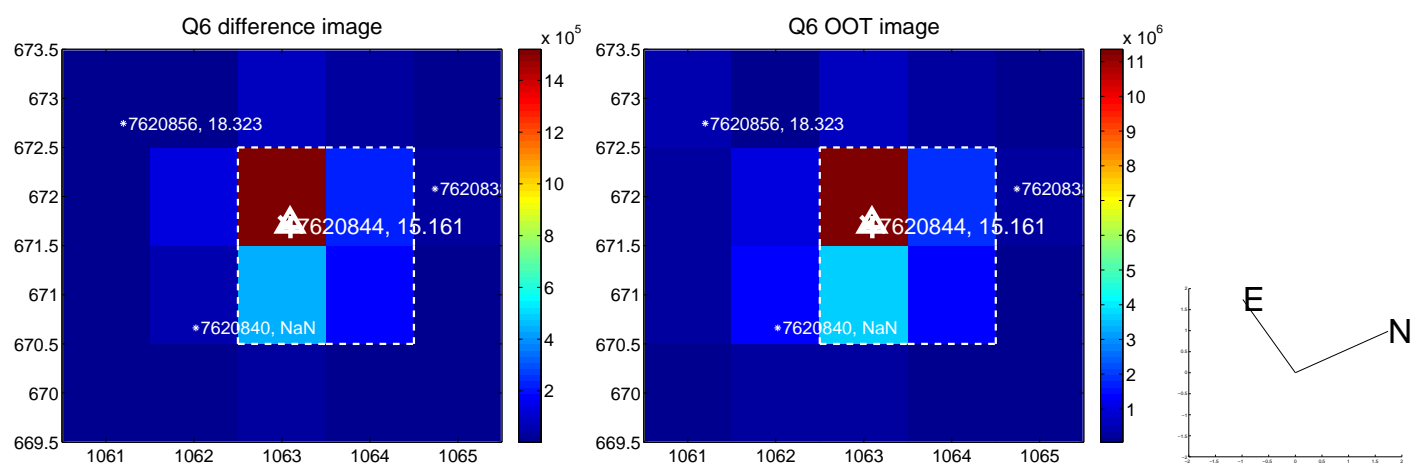
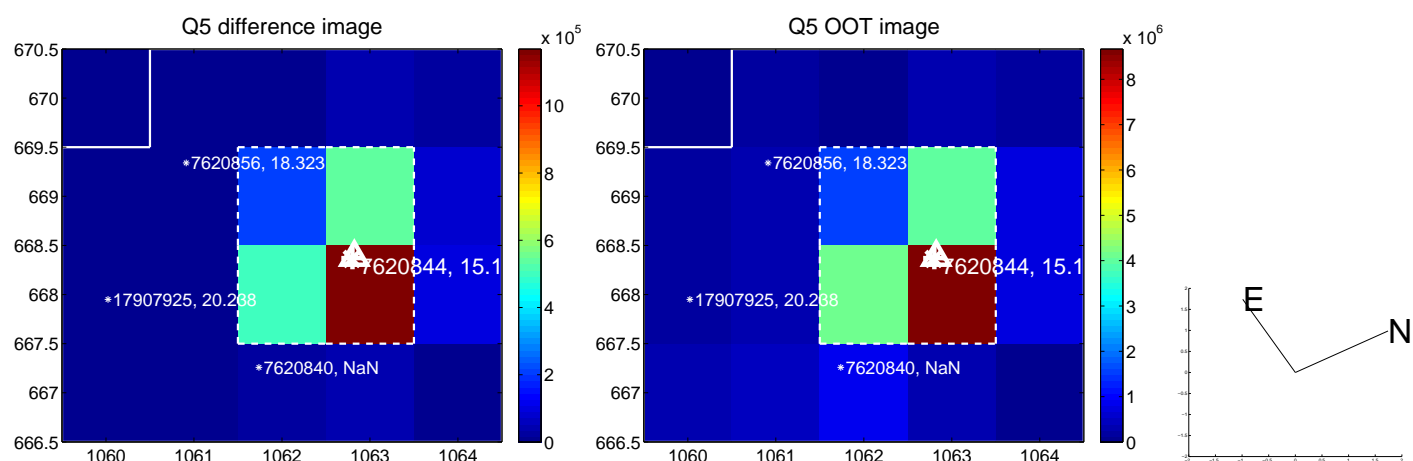


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

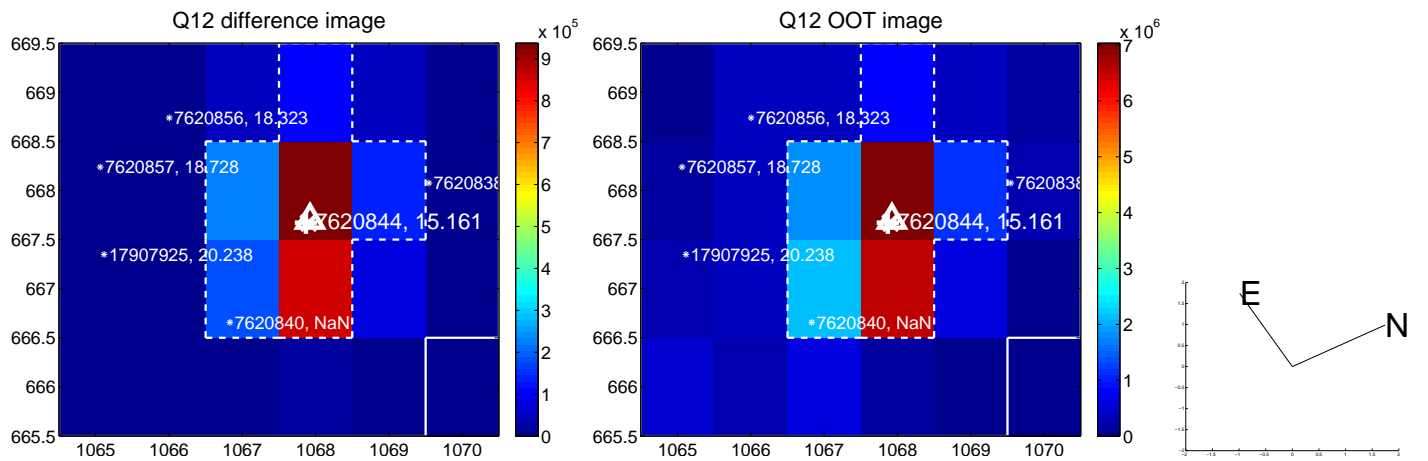
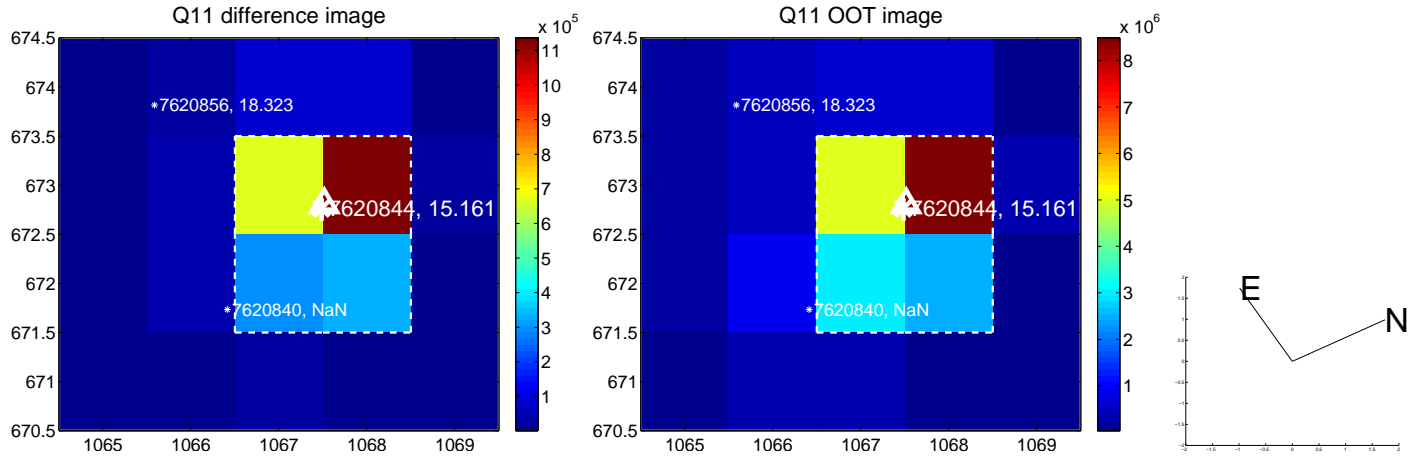
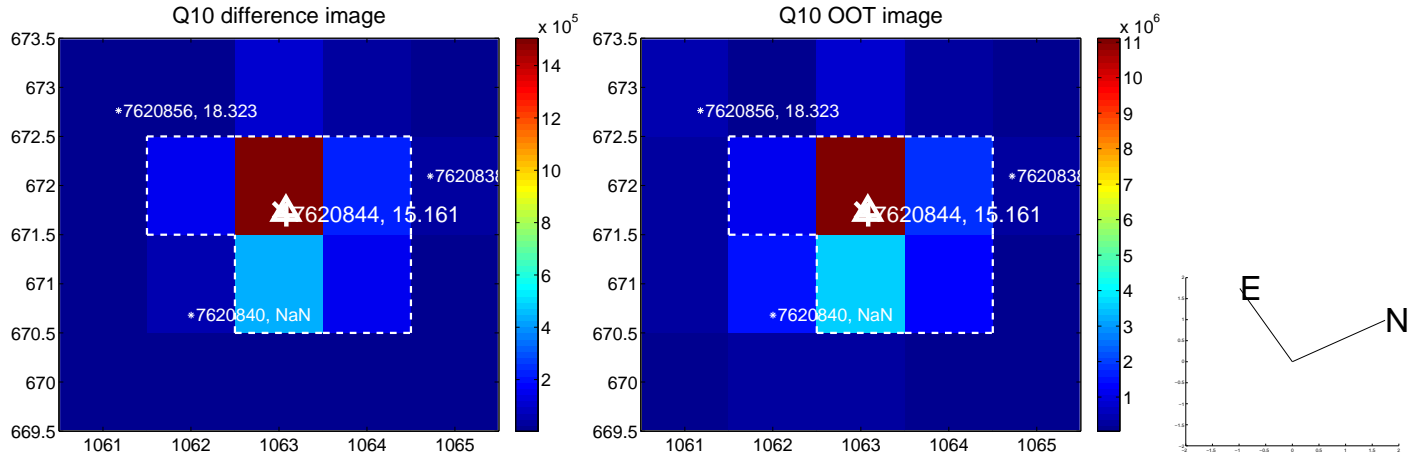
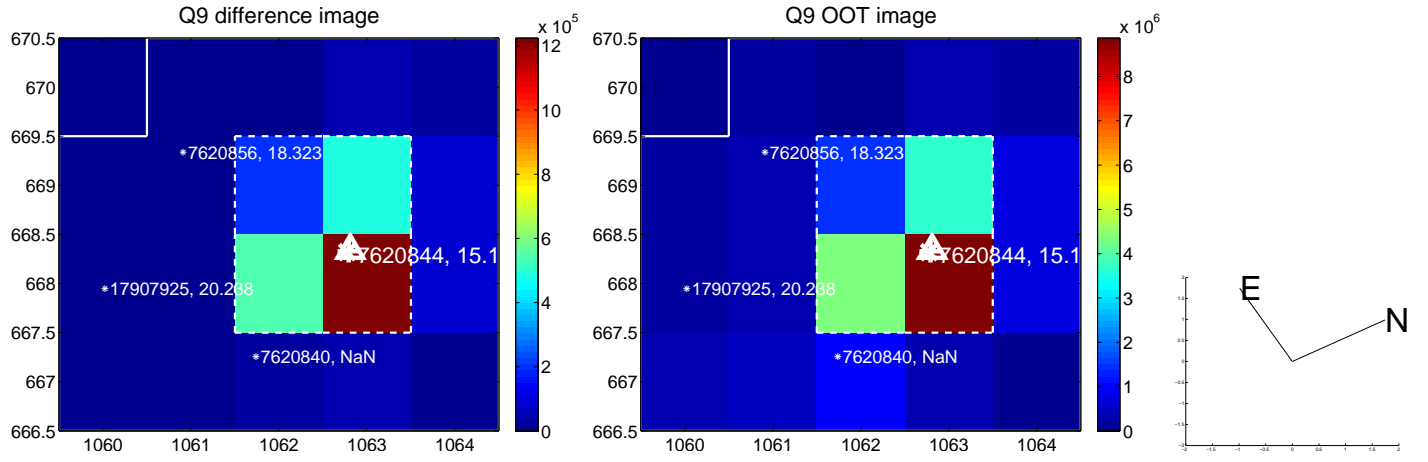


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

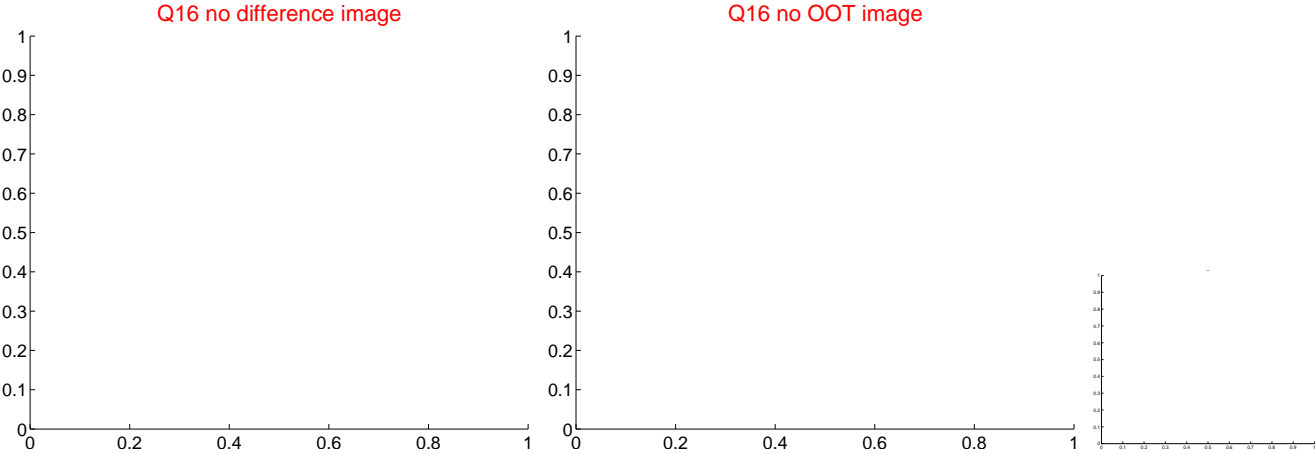
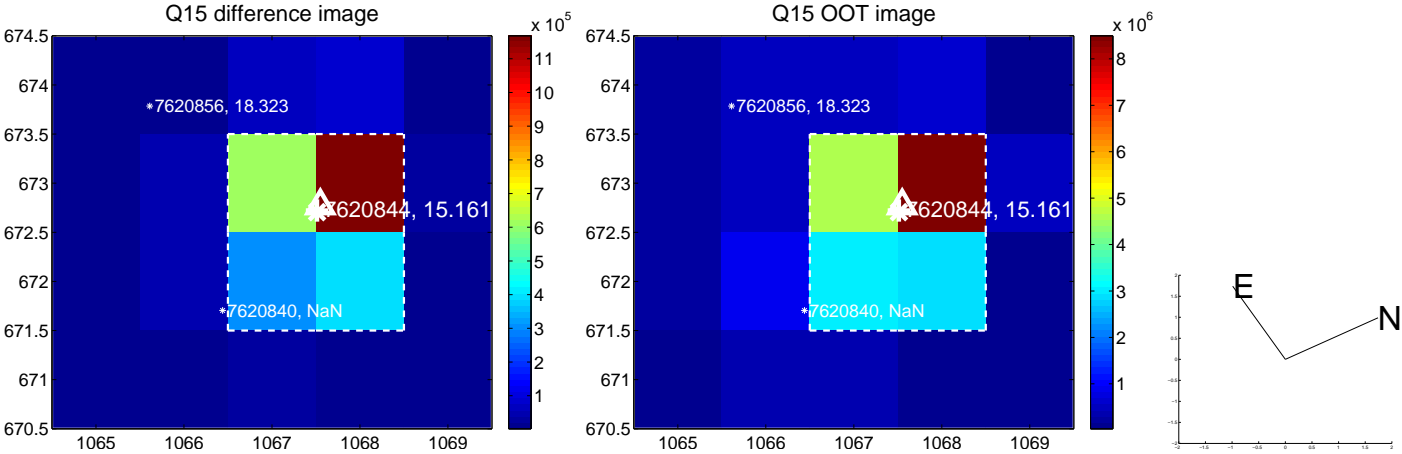
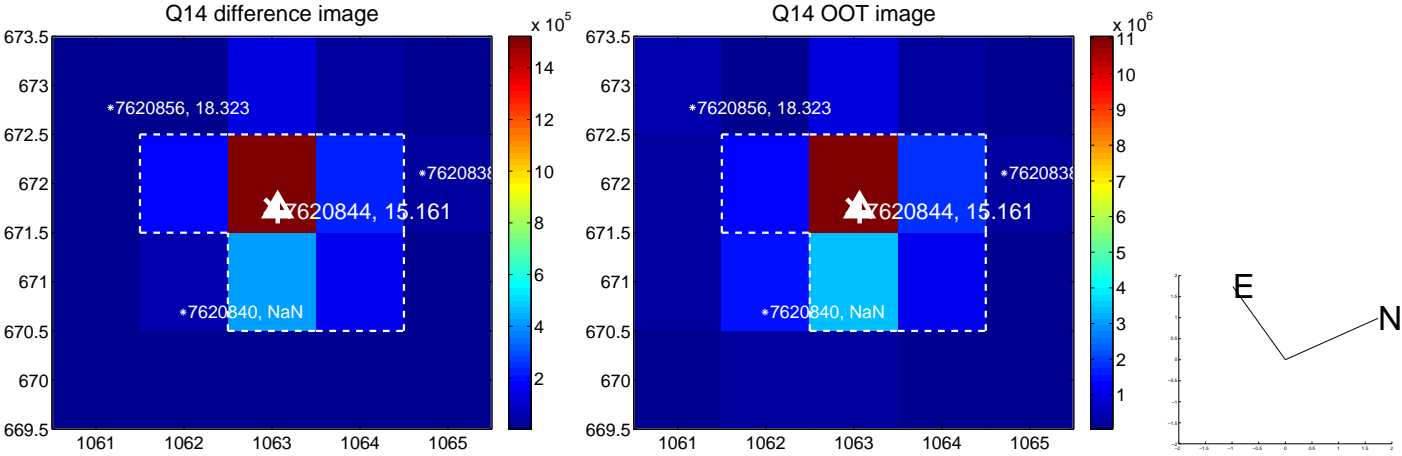
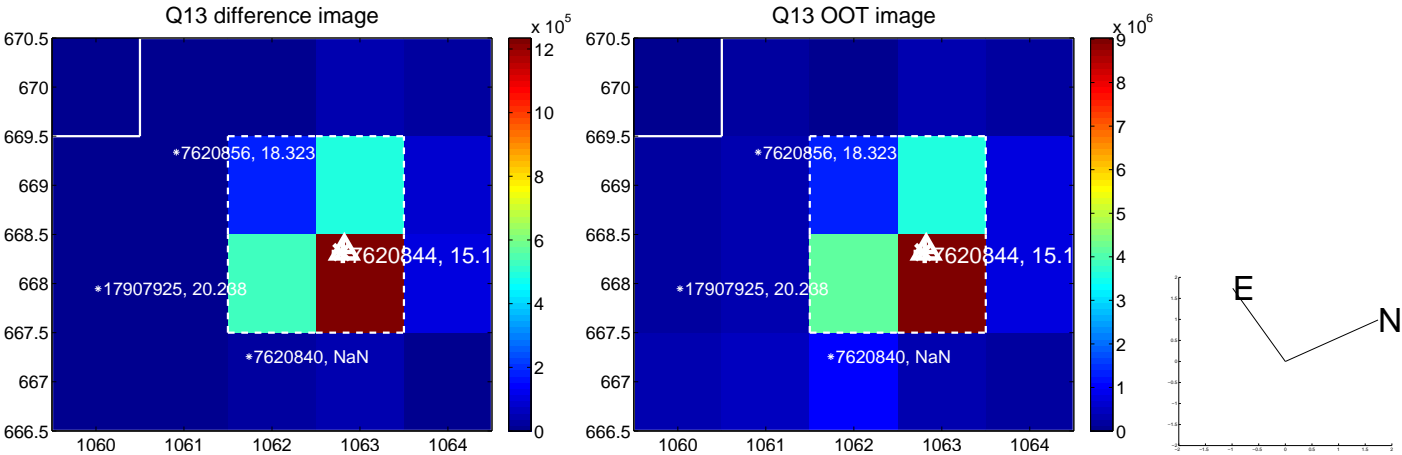




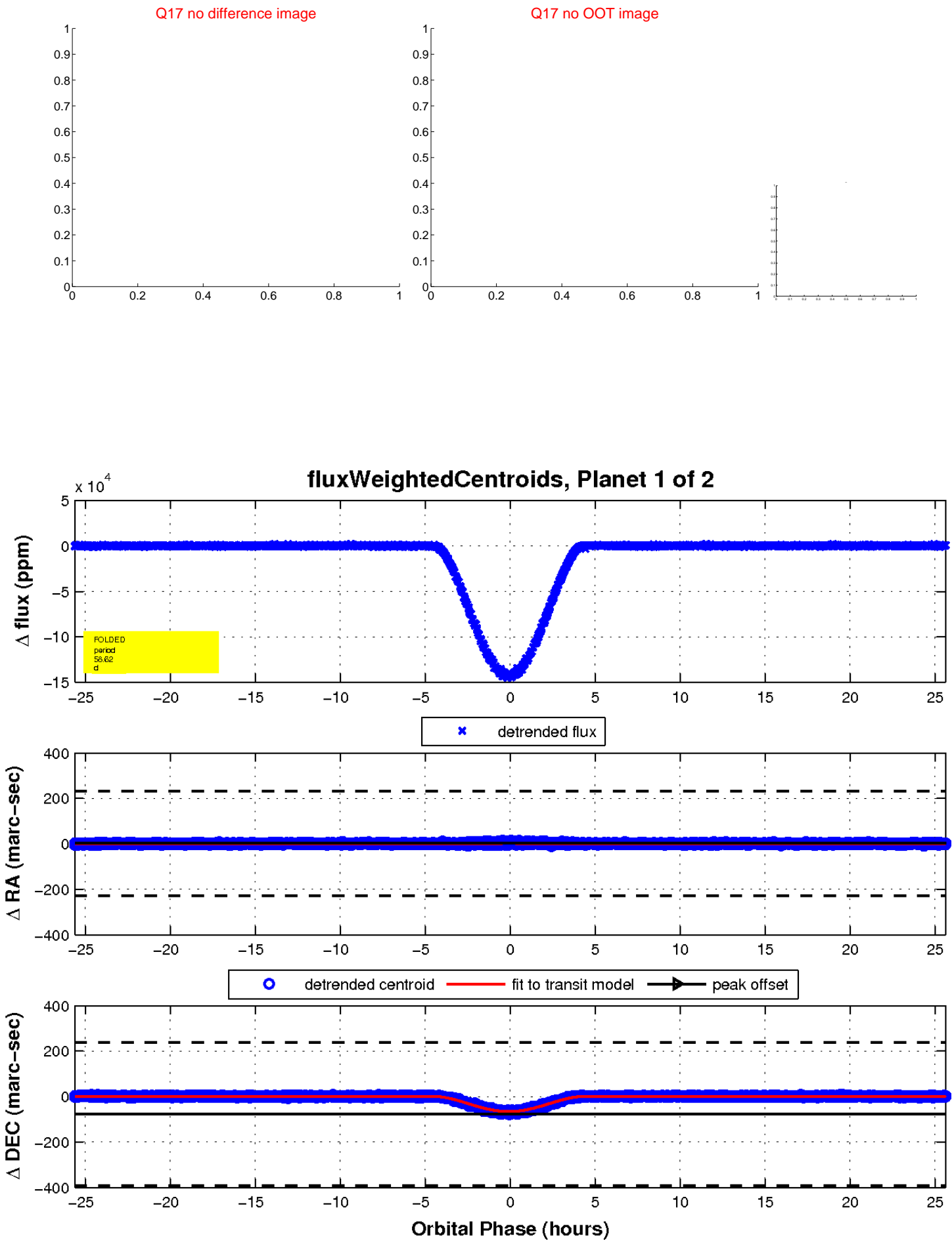
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

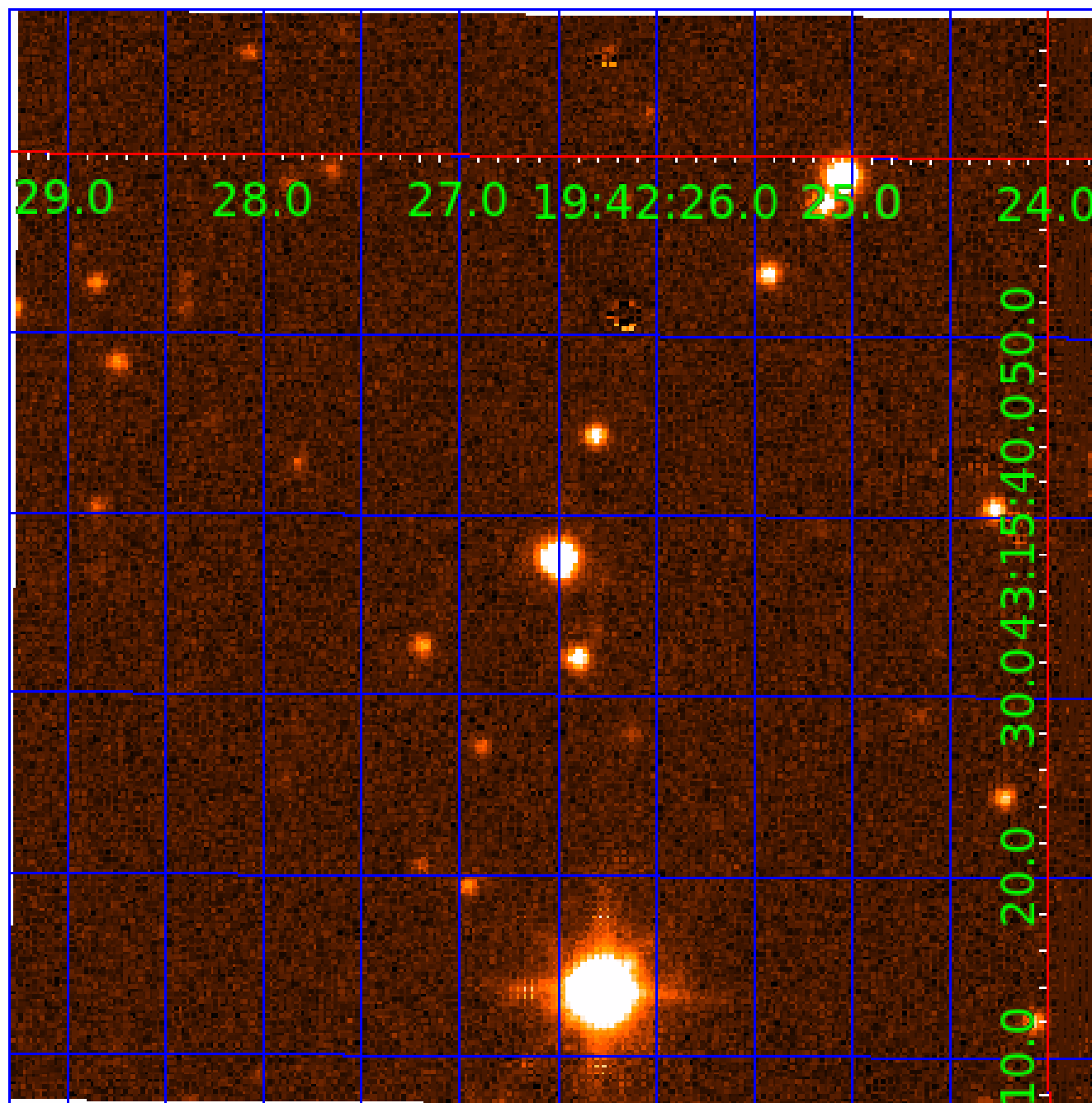


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007620844

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007620844-01	OBS	3551.01	58.621588	178.567334	142474.7	8.547	2771.5	2125.6	0.72	5232	40.69	5.20
007620844-02	OBS	No	58.621562	151.693499	41617.7	6.095	775.1	720.7	0.72	5232	24.10	5.20

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007620844-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—HAS_SEC_TCE
007620844-02	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.

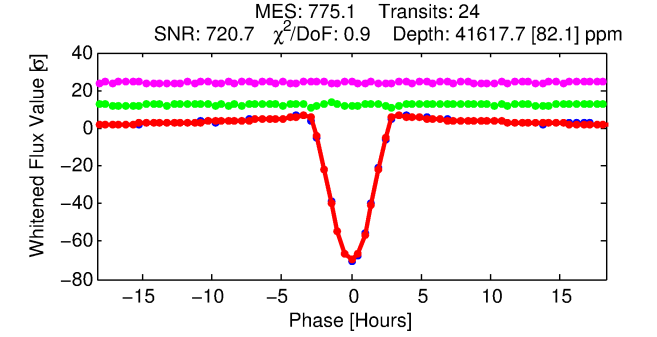
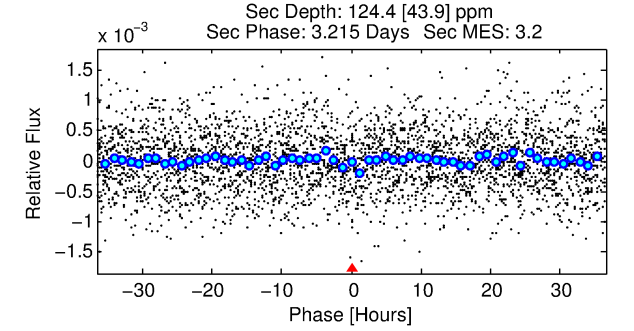
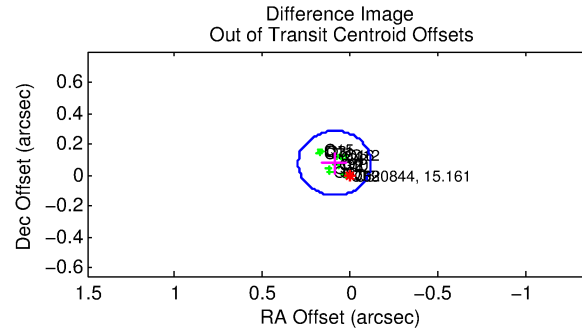
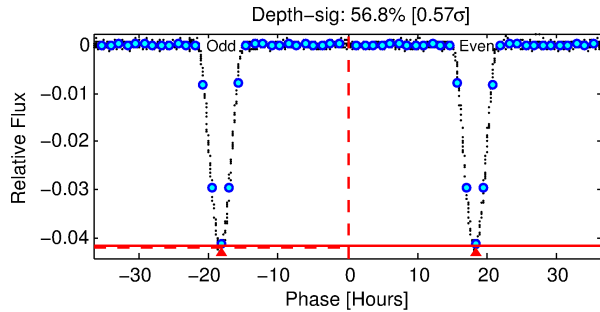
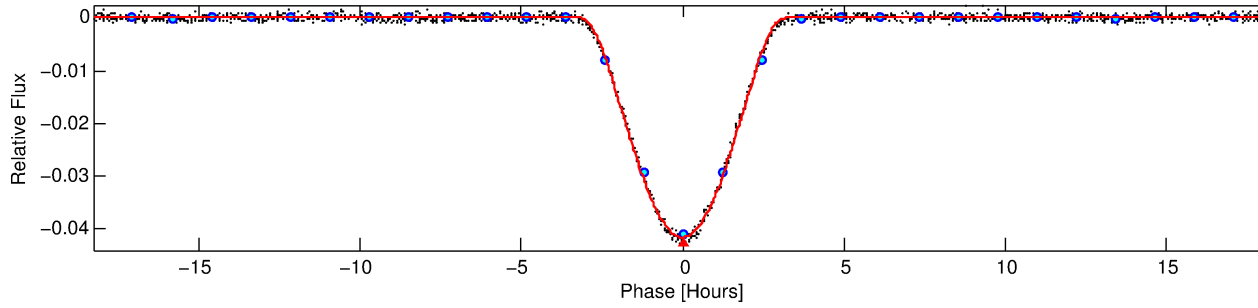
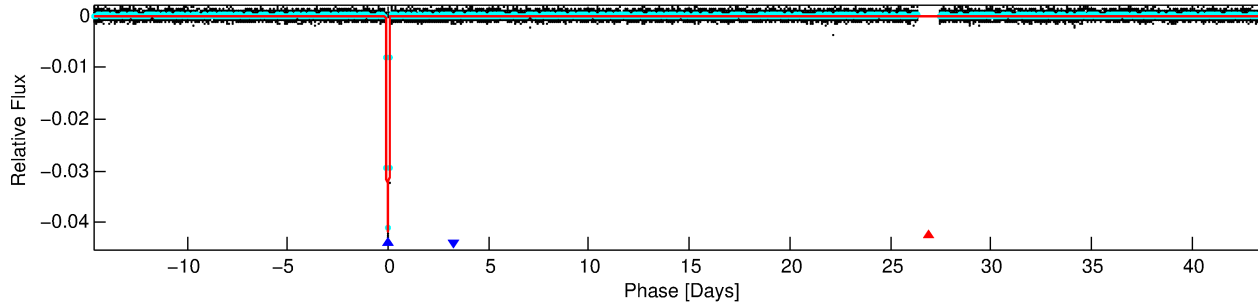
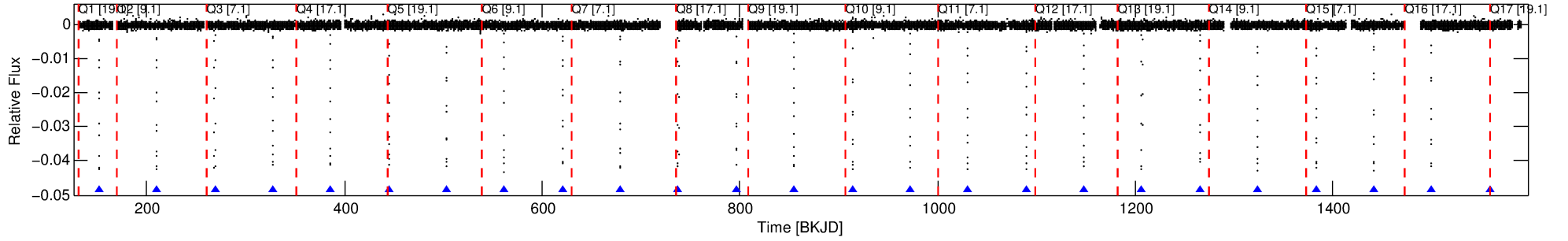
## Ephemeris Match Information For 007620844-02

No Significant Match Found

# DV One-Page Summary

KIC: 7620844 Candidate: 2 of 2 Period: 58.622 d  
KOI: K03551 Corr: No Ephemeris Match

Kp: 15.16 R\*: 0.72 Rs Teff: 5232.0 K Logg: 4.55 Fe/H: -0.520



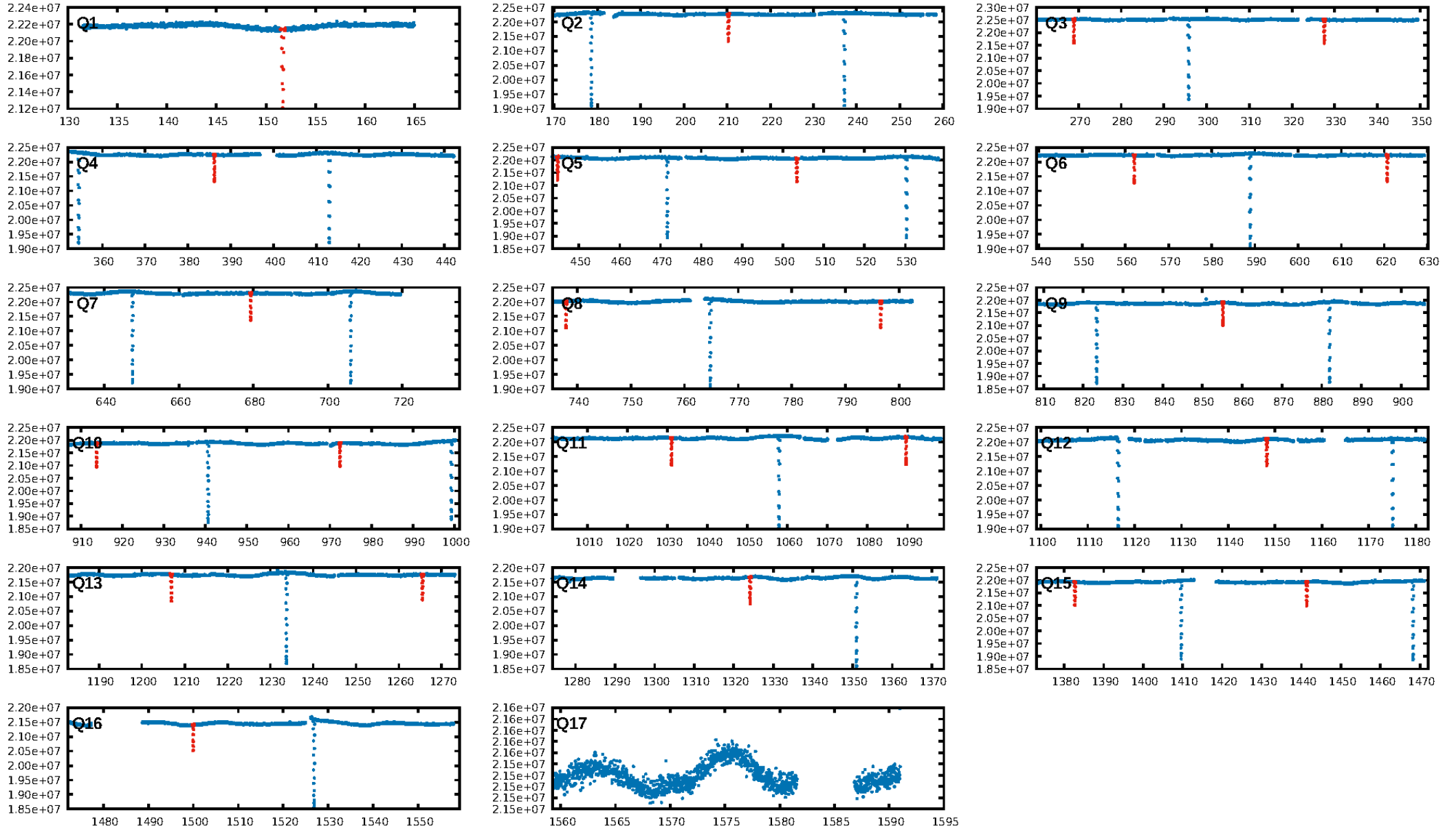
## DV Fit Results:

Period = 58.62156 [0.00001] d  
Epoch = 151.6935 [0.0002] BKJD  
Rp/R\* = 0.3046 [0.0284]  
a/R\* = 64.10 [0.30]  
b = 0.97 [0.04]  
Seff = 5.20 [1.04]  
Teq = 385 [19] K  
Rp = 24.10 [3.72] Re  
a = 0.2606 [0.0279] AU  
Ag = 8.00 [3.44] [2.03σ]  
Teffp = 1001 [104] K [5.81σ]

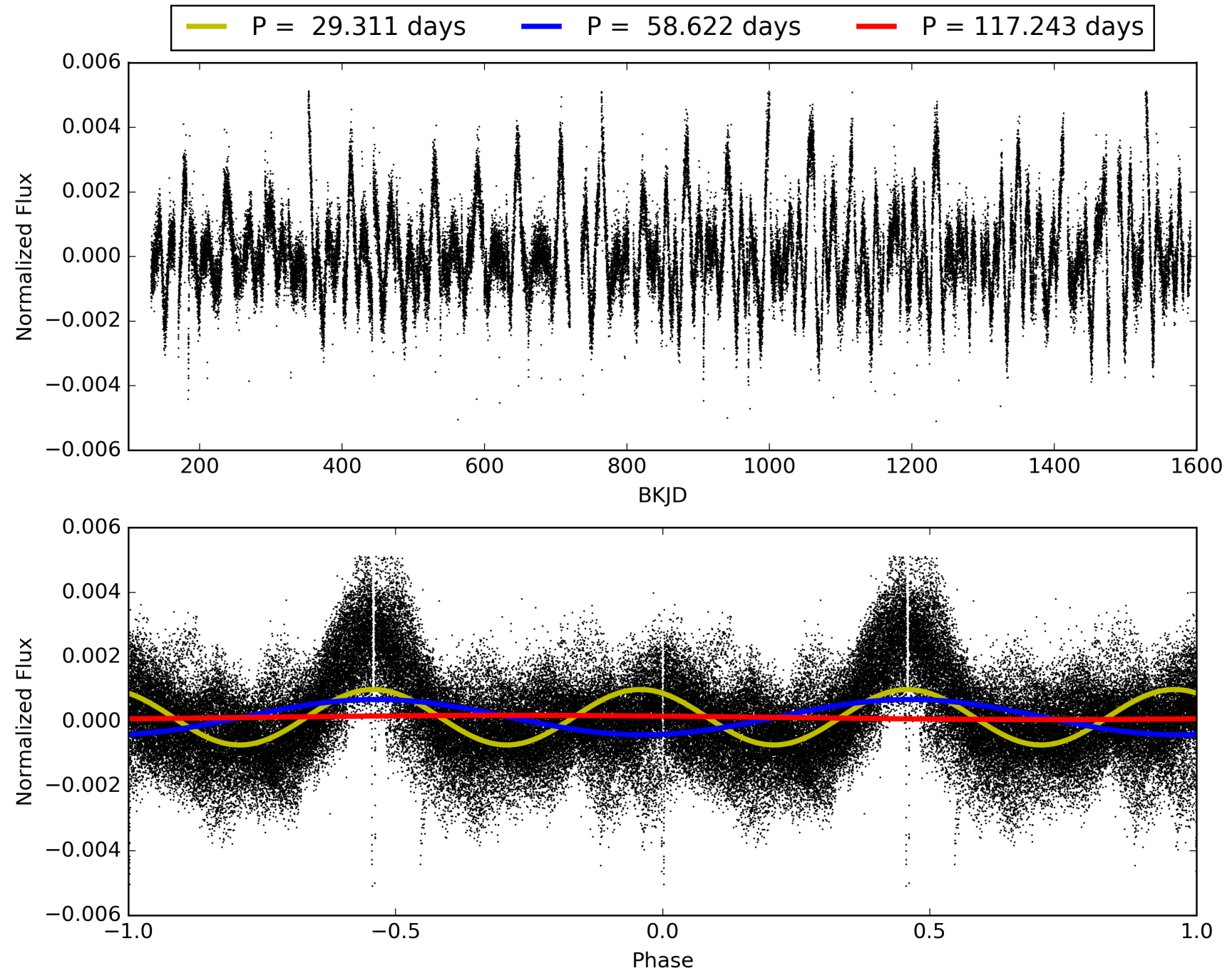
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 97.1%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [23/23]  
GhostDiagnostic-chr: 5.568  
Centroid-sig: 0.0%  
Centroid-so: 0.056 arcsec [4.14σ]  
OotOffset-rm: 0.119 arcsec [1.72σ]  
KicOffset-rm: 0.118 arcsec [1.70σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [16/16]

# TCE 007620844-02, PDC Light Curves



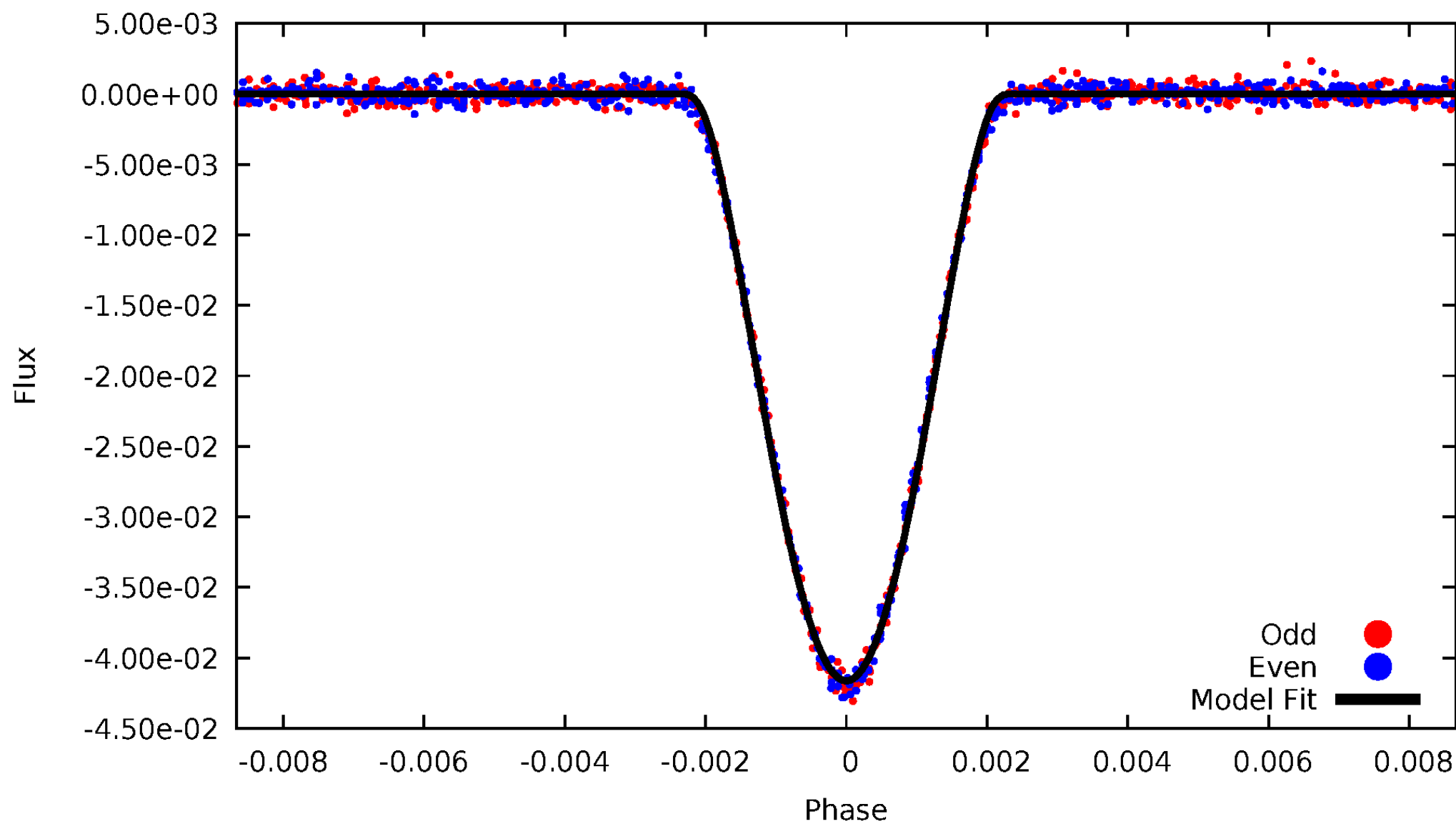
TCE 007620844-02





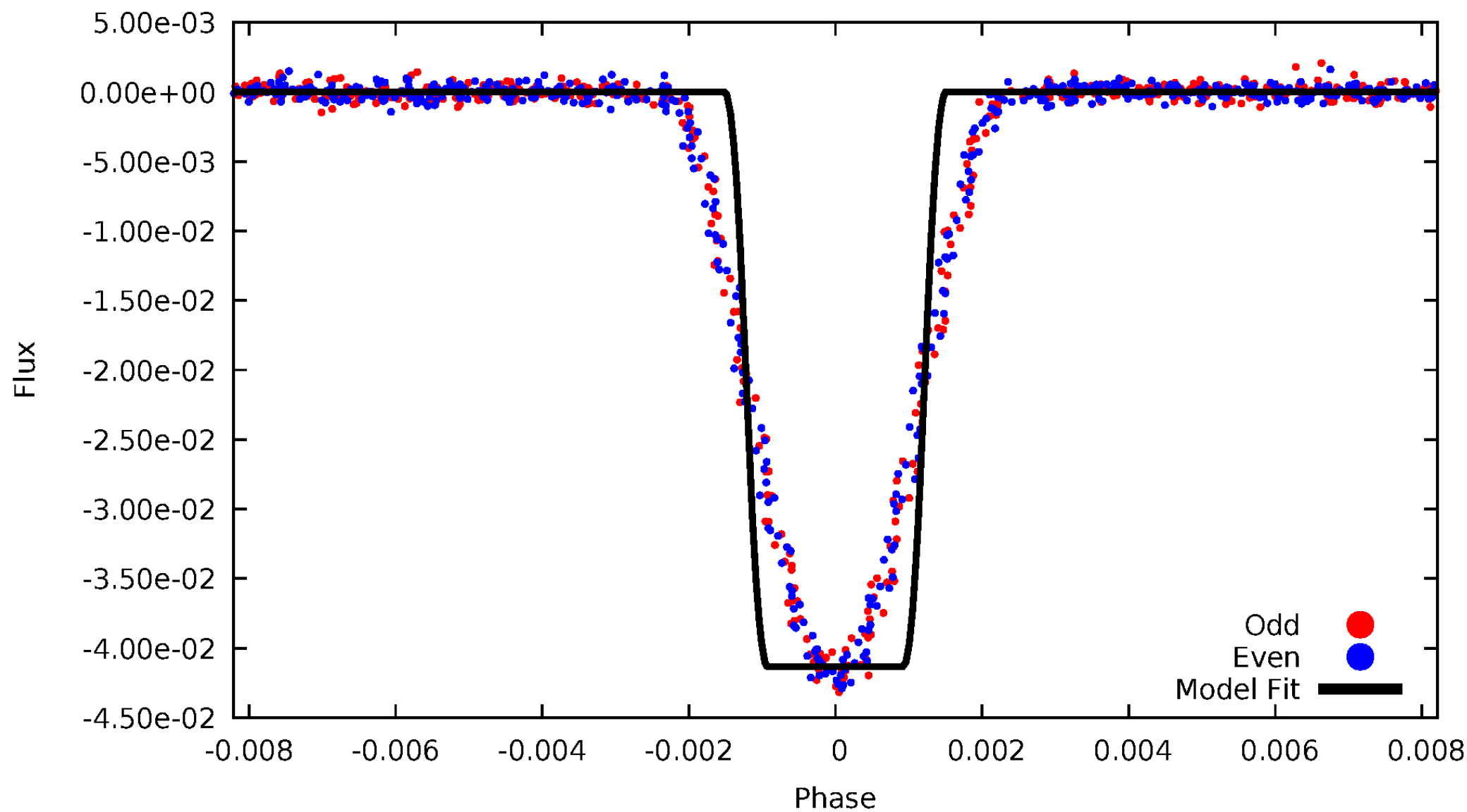
DV Odd/Even

TCE 007620844-02



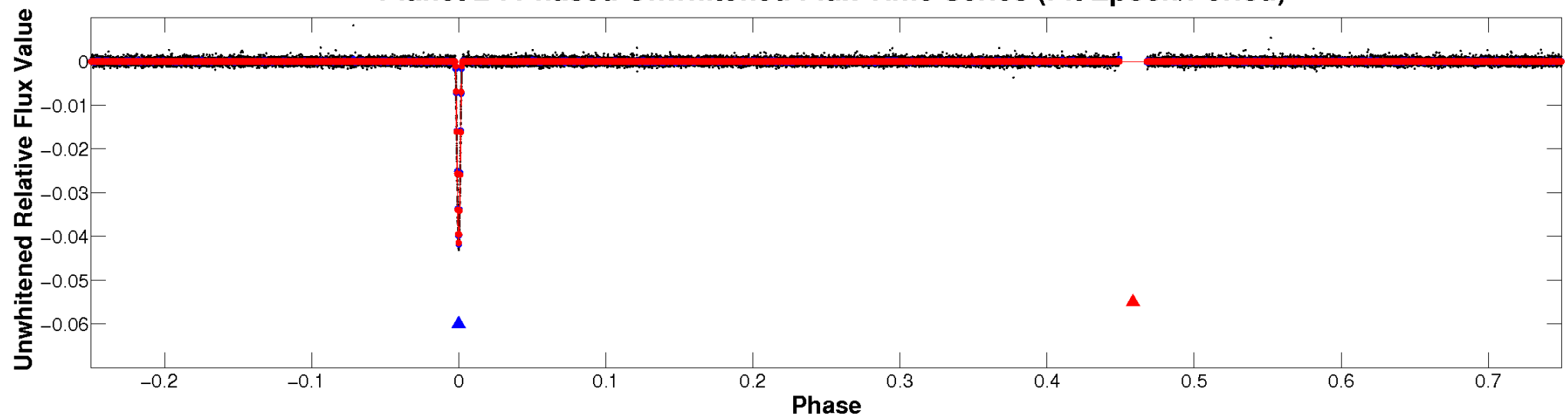
# ALT Odd/Even

TCE 007620844-02

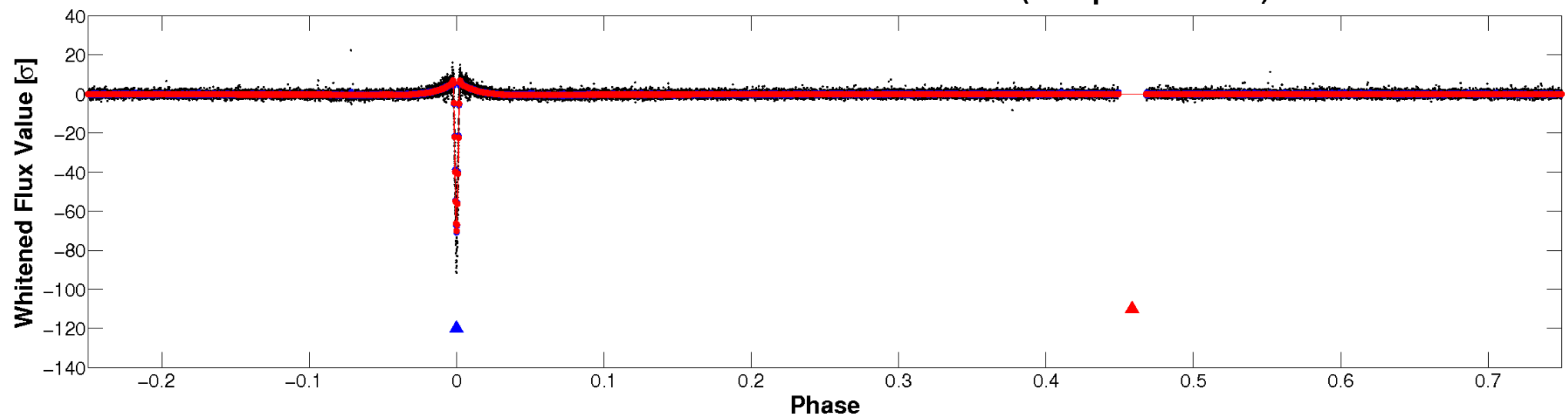


# Non-Whitened Vs. Whitened Light Curve

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

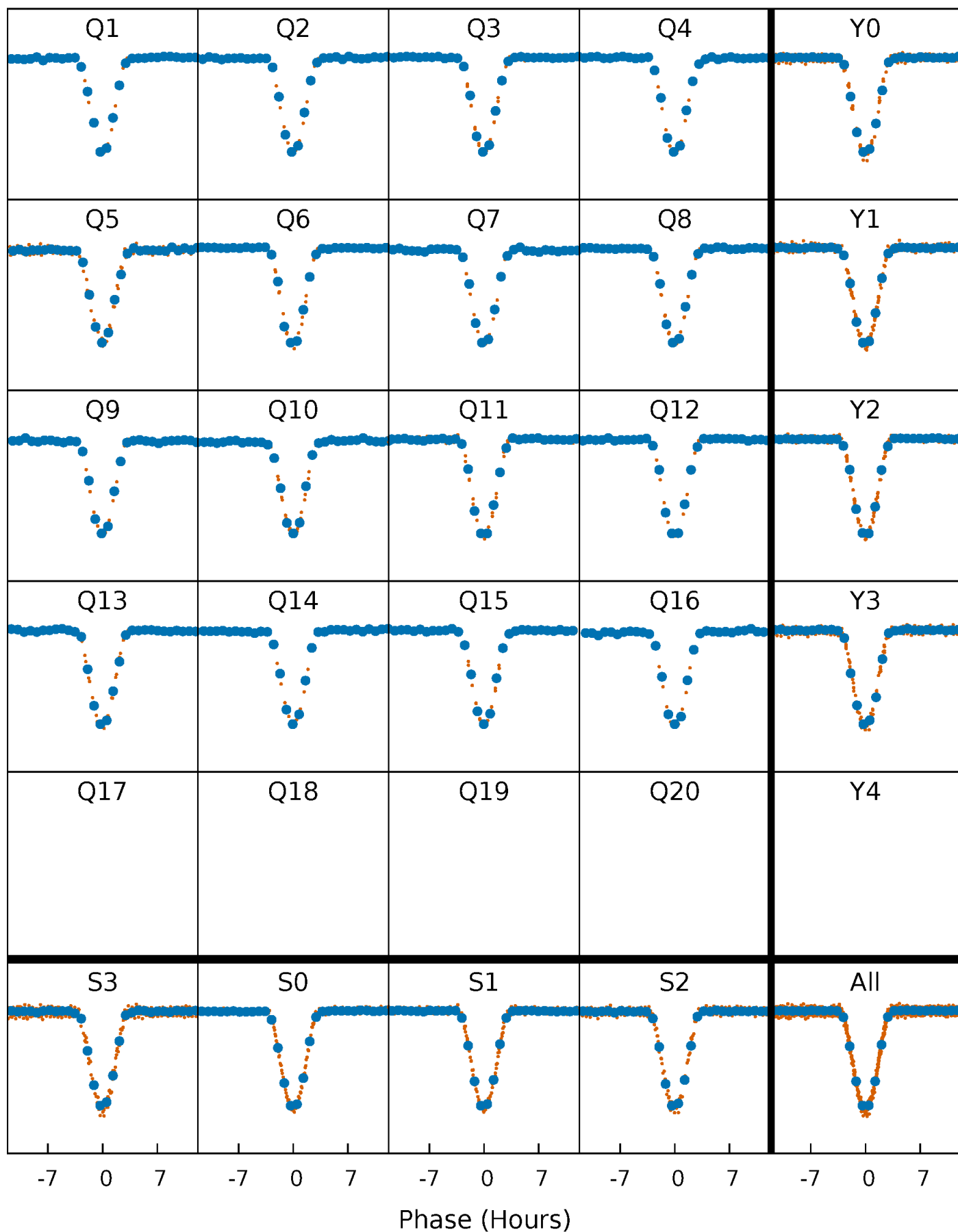


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



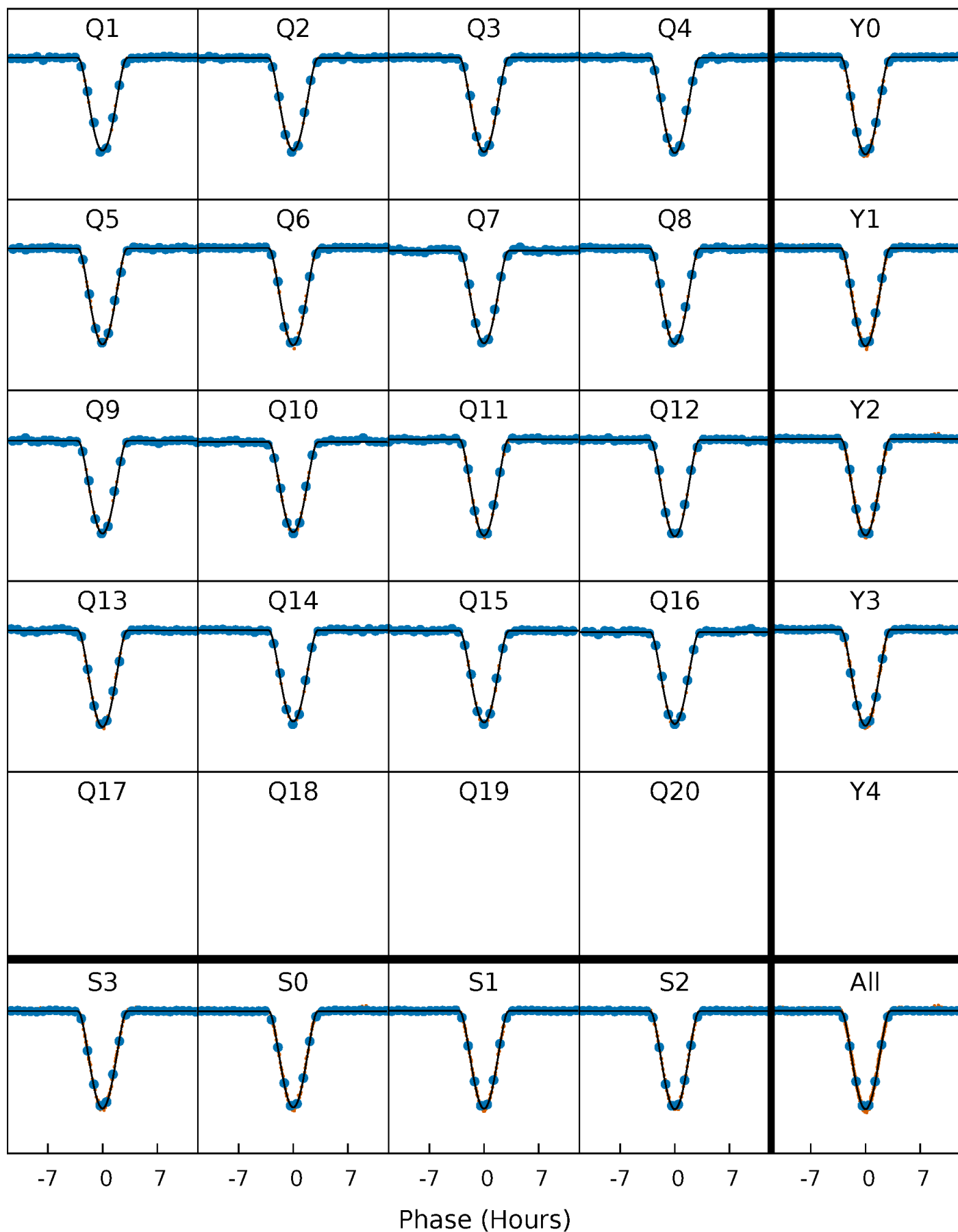
# PDC Quarter-Phased Transit Curves

TCE 007620844-02 P= 58.621562 Days  $T_0=151.693499$  (BKJD)



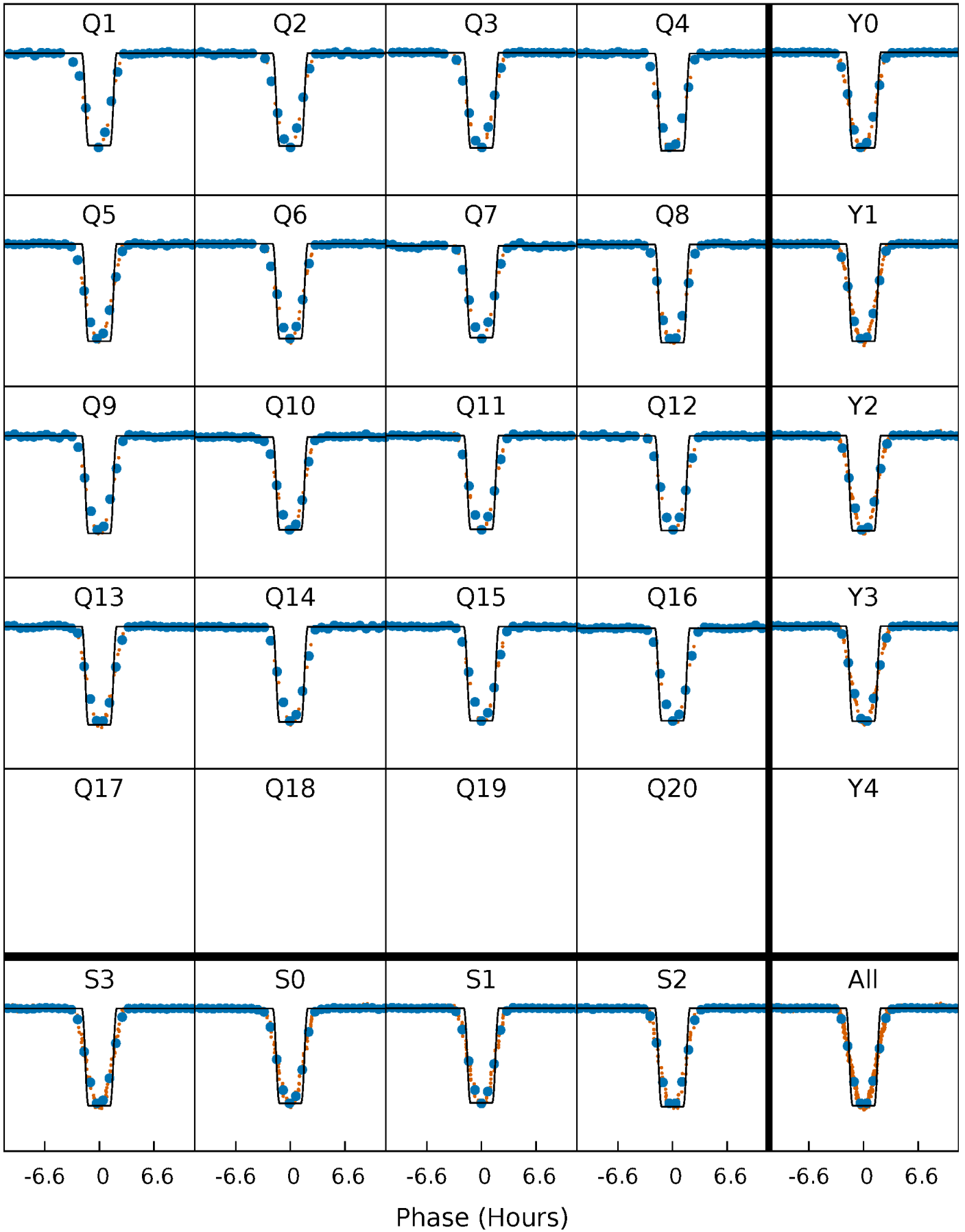
# DV Quarter-Phased Transit Curves

TCE 007620844-02 P= 58.621562 Days  $T_0=151.693499$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

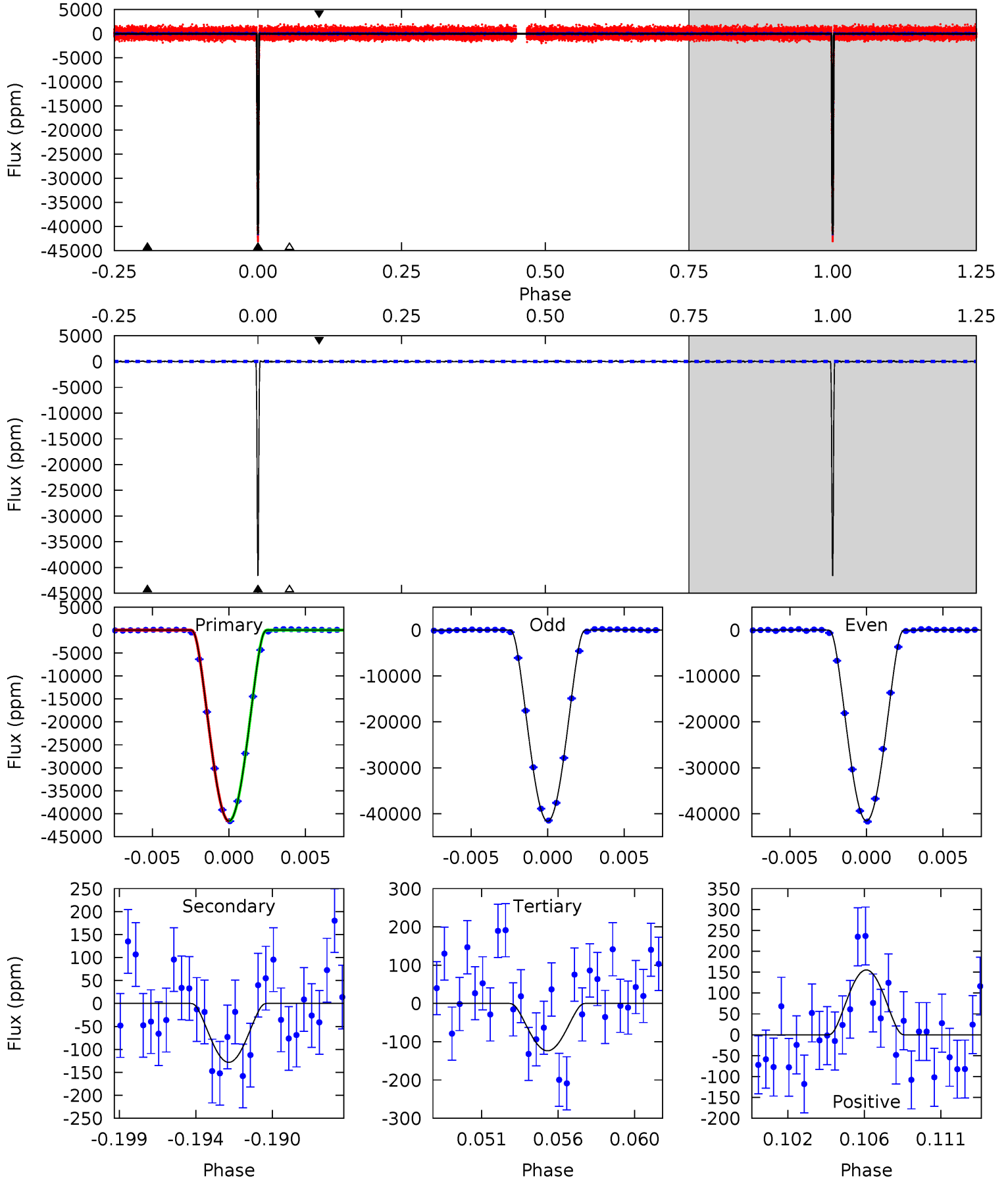
TCE 007620844-02 P= 58.620936 Days  $T_0=151.700528$  (BKJD)



# DV Model-Shift Uniqueness Test

007620844-02, P = 58.621562 Days, E = 93.071937 Days

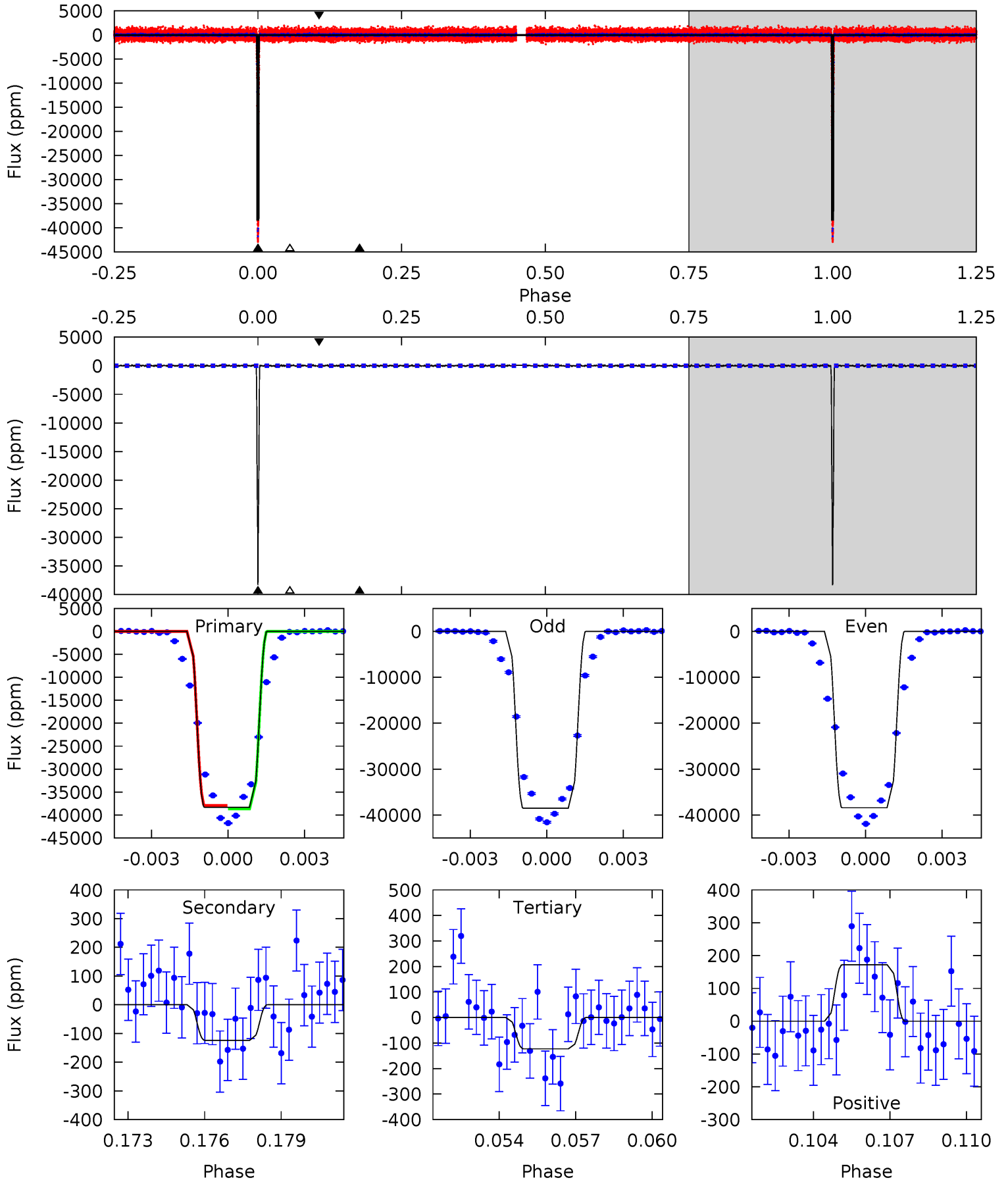
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1558	4.80	4.63	5.81	5.17	2.83	1.65	1554	1553	0.17	-1.01	2.00	1.00	0.00	0.04



# Alt Model-Shift Uniqueness Test

007620844-02, P = 58.620936 Days, E = 93.079592 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
954.3	3.08	3.06	4.28	5.25	2.97	1.07	951.2	950.0	0.03	-1.20	1.74	1.00	0.00	9.66





### Stellar Parameters For KIC 007620844

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5232^{+157}_{-157}$	$4.554^{+0.090}_{-0.067}$	$-0.520^{+0.350}_{-0.300}$	$0.725^{+0.089}_{-0.081}$	$0.686^{+0.099}_{-0.042}$	$2.540^{+0.939}_{-0.575}$
	+3%/-3%	+2%/-1%	+67%/-58%	+12%/-11%	+14%/-6%	+37%/-23%
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 007620844-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-128 \pm 27$	$23.97^{+2.96}_{-2.81}$	$537^{+21}_{-23}$	$1998^{+66}_{-68}$	$8.395^{+3.102}_{-2.210}$
Alt.	$-124 \pm 40$	$15.93^{+2.56}_{-2.33}$	$535^{+23}_{-23}$	$2165^{+112}_{-108}$	$18^{+10}_{-6}$

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

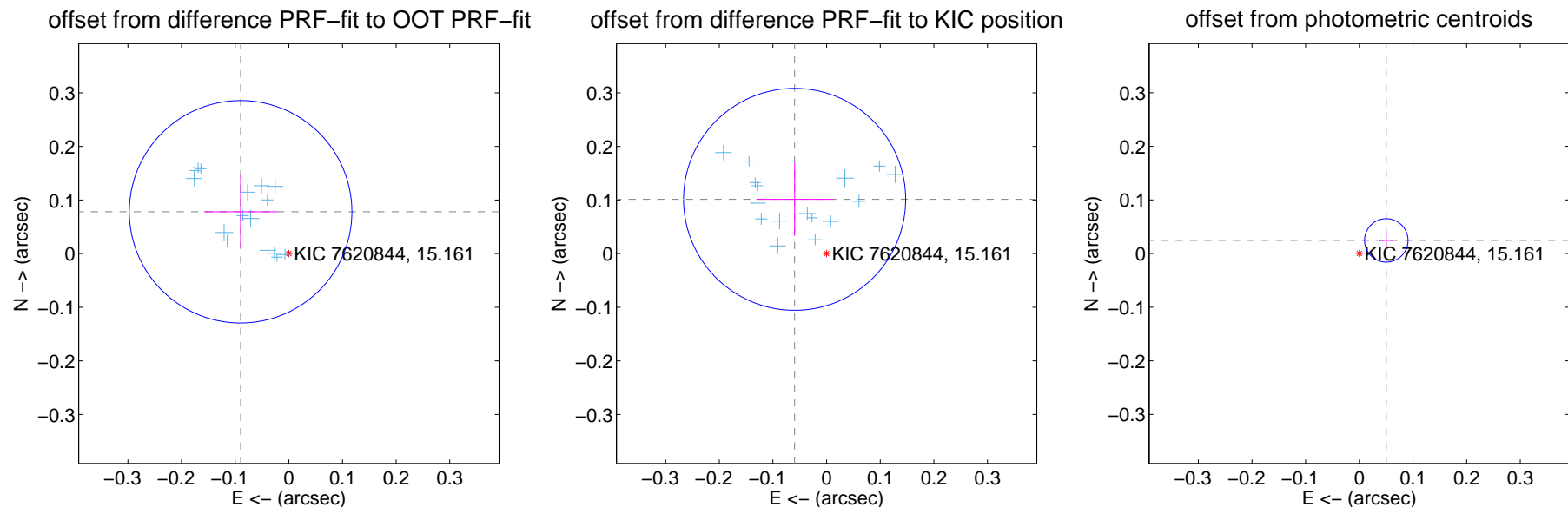
## DV Centroid Data

Supplemental centroid analysis for 007620844-02. Kepler magnitude: 15.16. Transit SNR 720.73

There are 16 quarters with good PRF difference image offsets

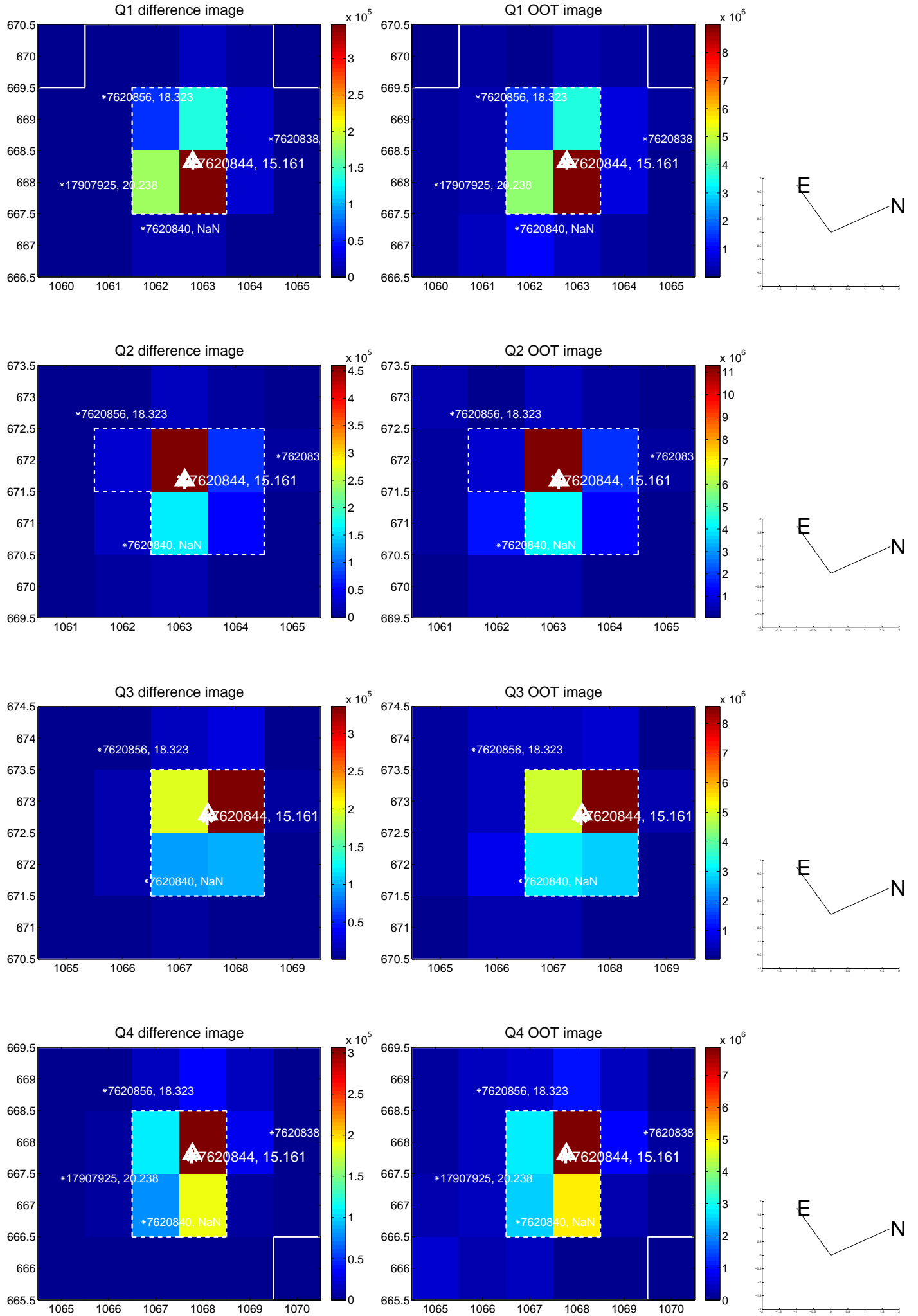
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.119 \pm 0.069$	1.72	$0.090 \pm 0.068$	$0.078 \pm 0.068$
PRF-fit source offset from KIC position	$0.118 \pm 0.069$	1.70	$0.060 \pm 0.071$	$0.101 \pm 0.068$
photometric centroid source offset	$0.06 \pm 0.01$	4.14	$-0.05 \pm 0.01$	$0.02 \pm 0.01$

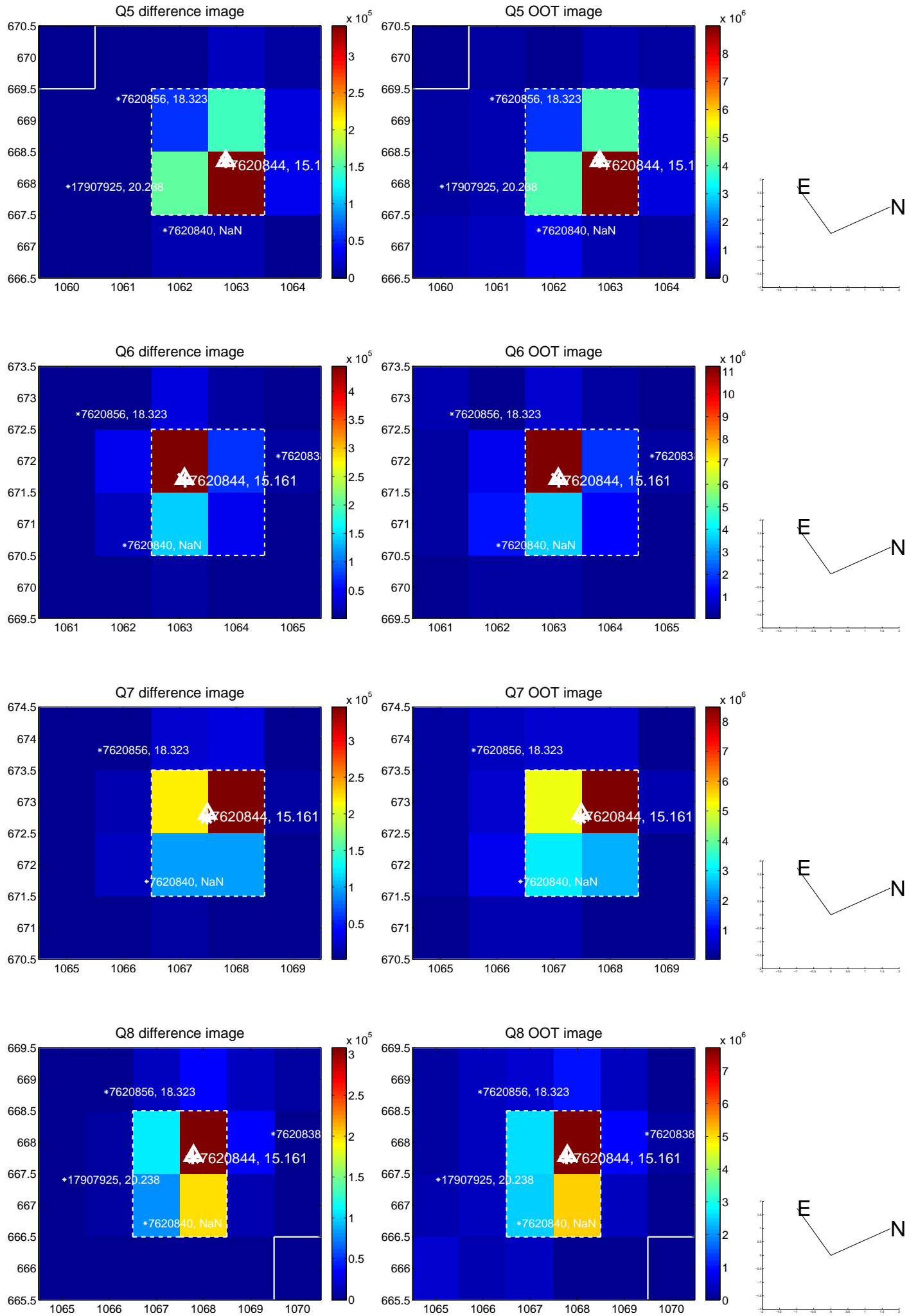


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

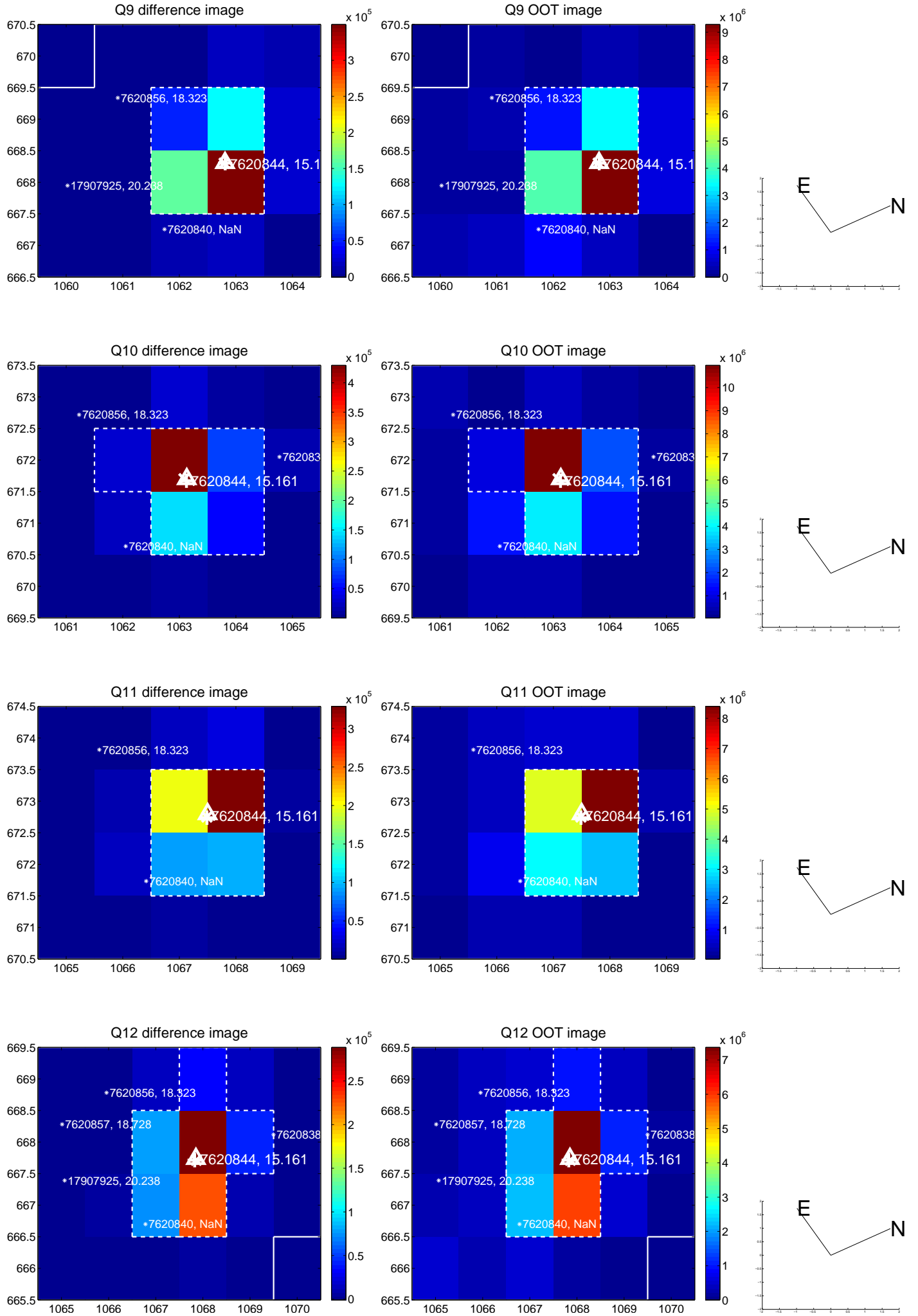
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



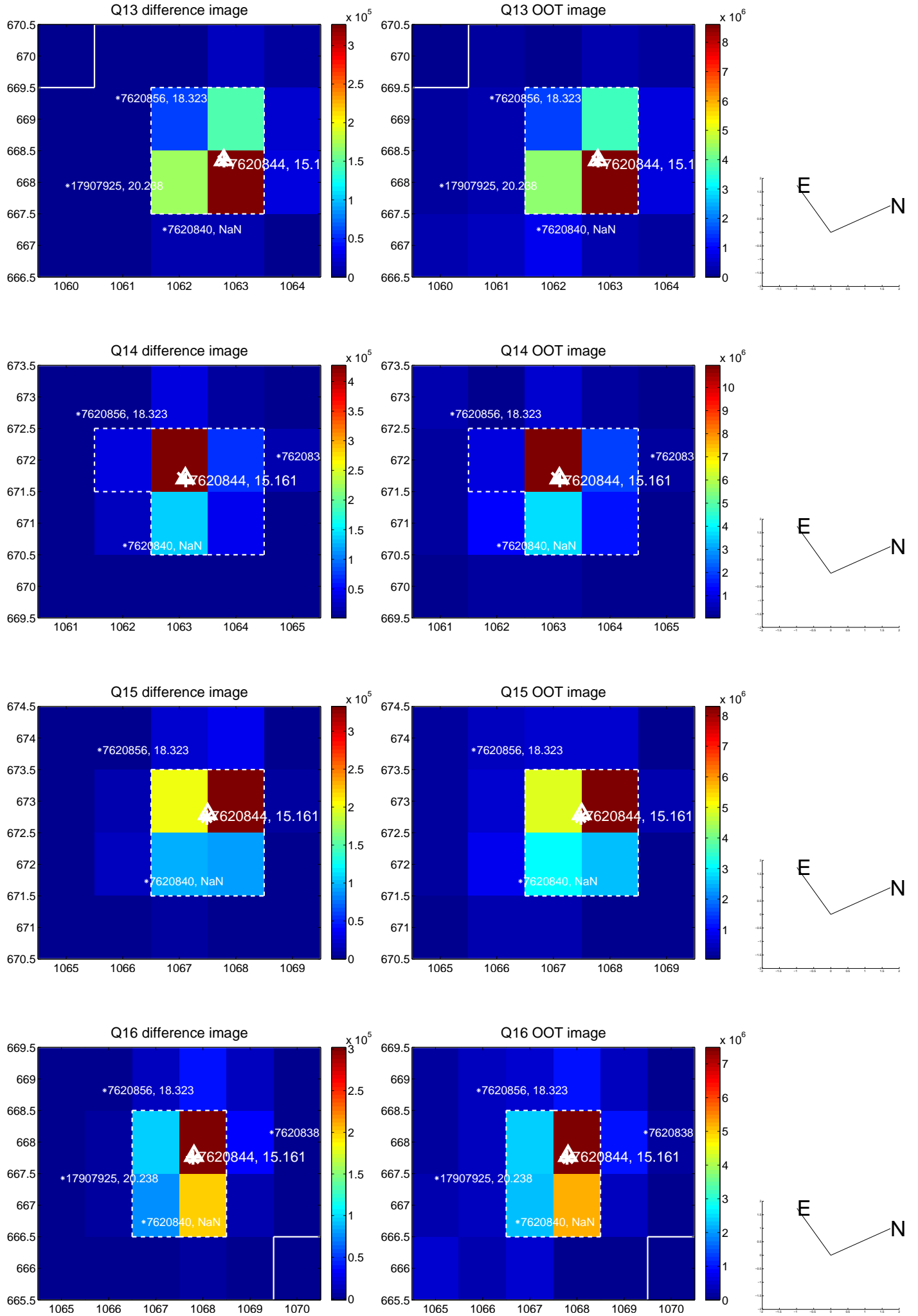
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



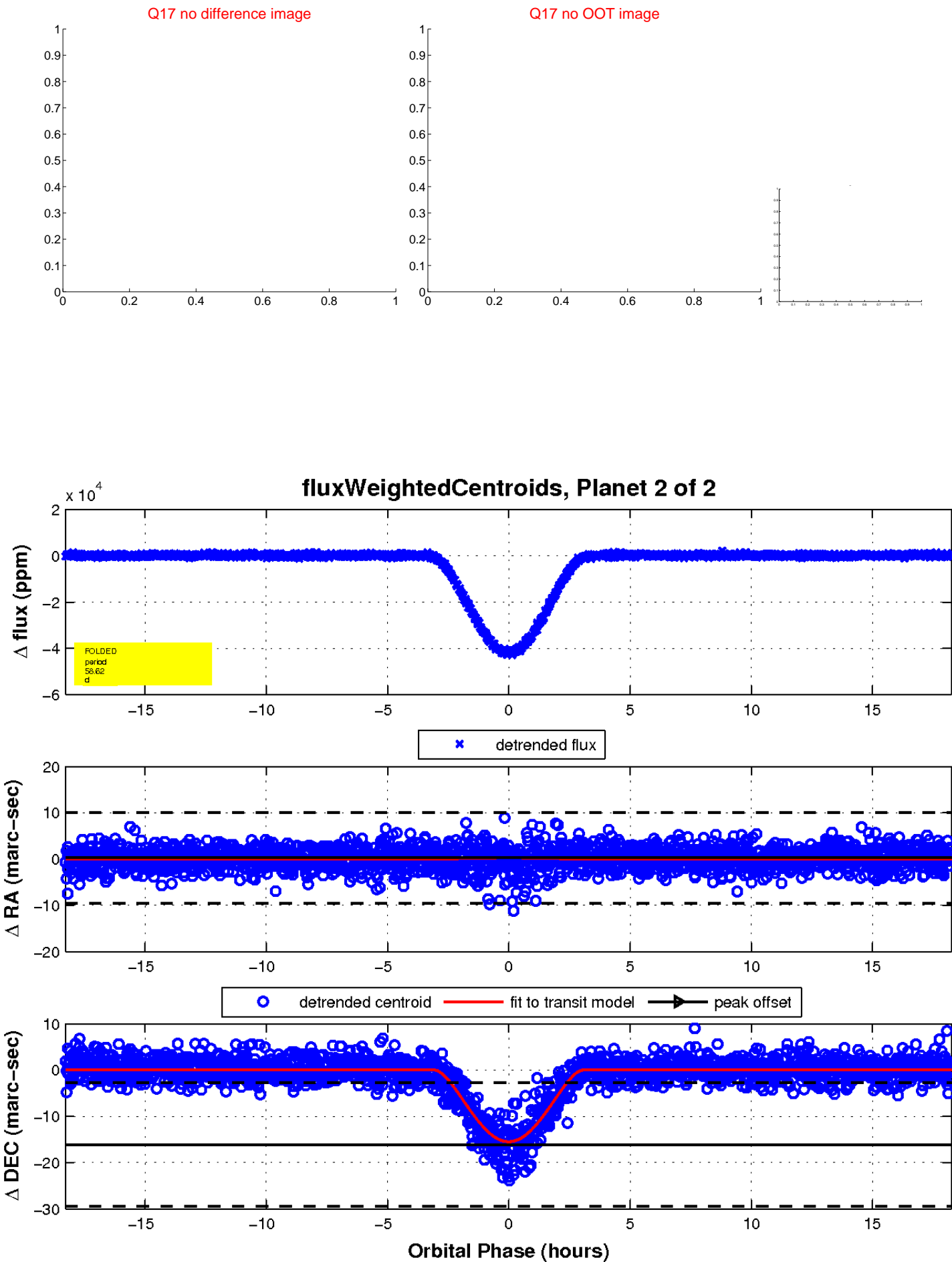
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

