

# KIC 006628237

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006628237-01	OBS	6030.01	3.840130	135.139742	60196.0	2.893	3879.9	3256.9	1.01	5931	35.16	500.11
006628237-02	OBS	No	3.840127	133.220434	2355.3	2.692	152.2	159.4	1.01	5931	7.44	500.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006628237-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
006628237-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

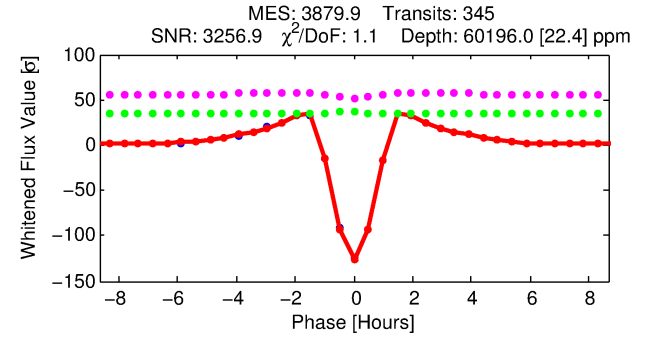
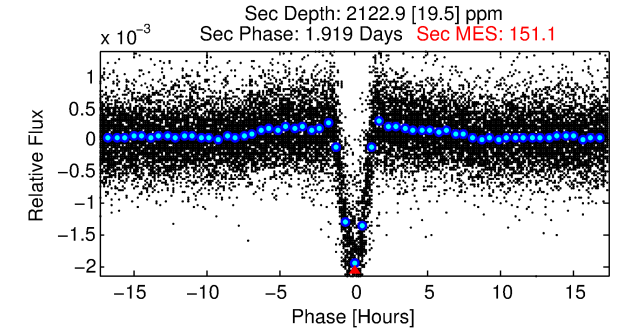
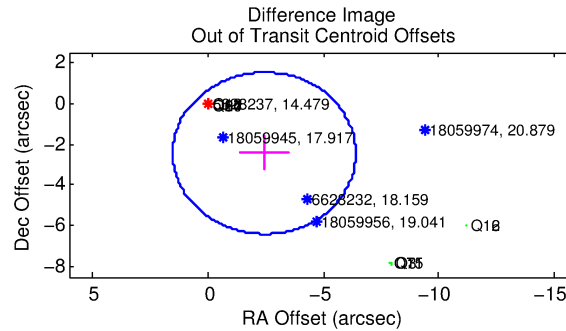
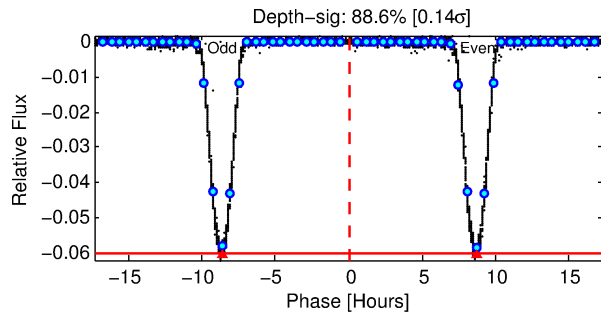
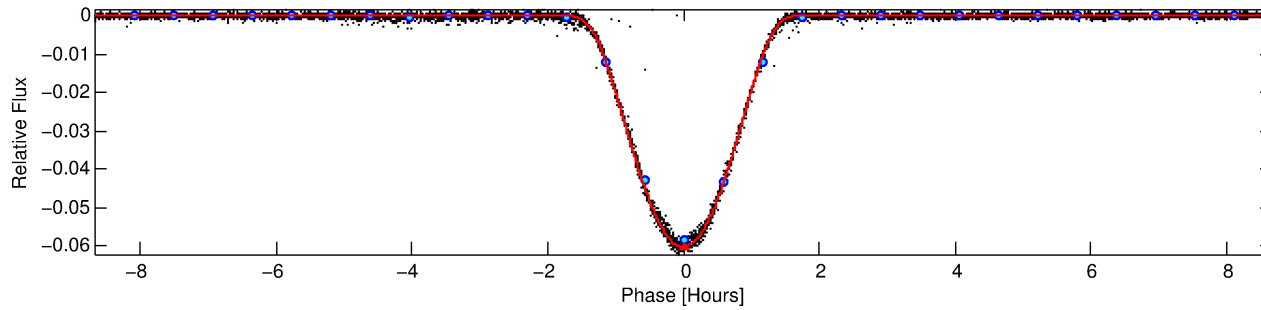
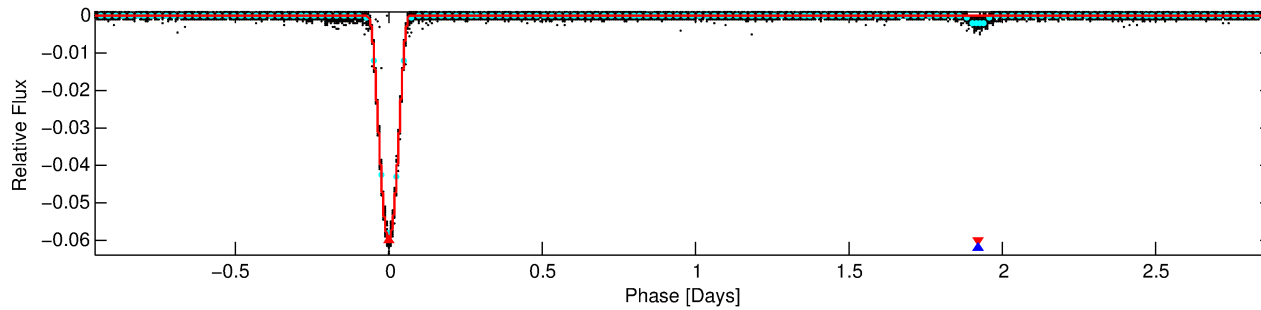
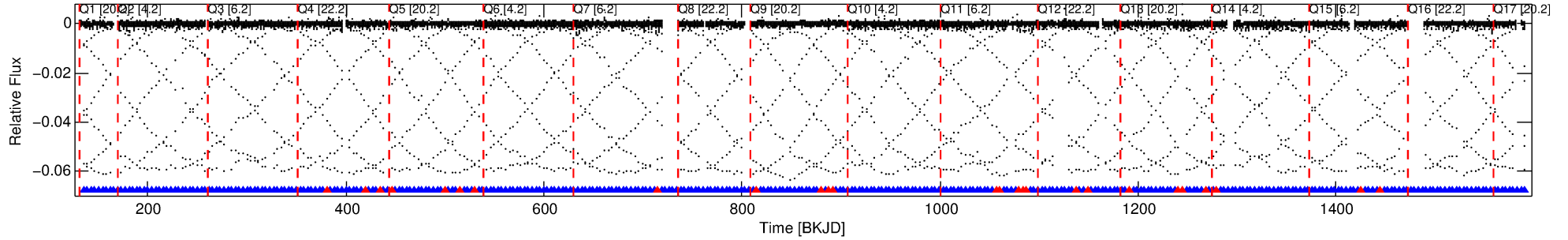
## Ephemeris Match Information For 006628237-01

No Significant Match Found

# DV One-Page Summary

KIC: 6628237 Candidate: 1 of 2 Period: 3.840 d  
KOI: K06030.01 Corr: 0.997

Kp: 14.48 R\*: 1.01 Rs Teff: 5931.0 K Logg: 4.42 Fe/H: -0.120



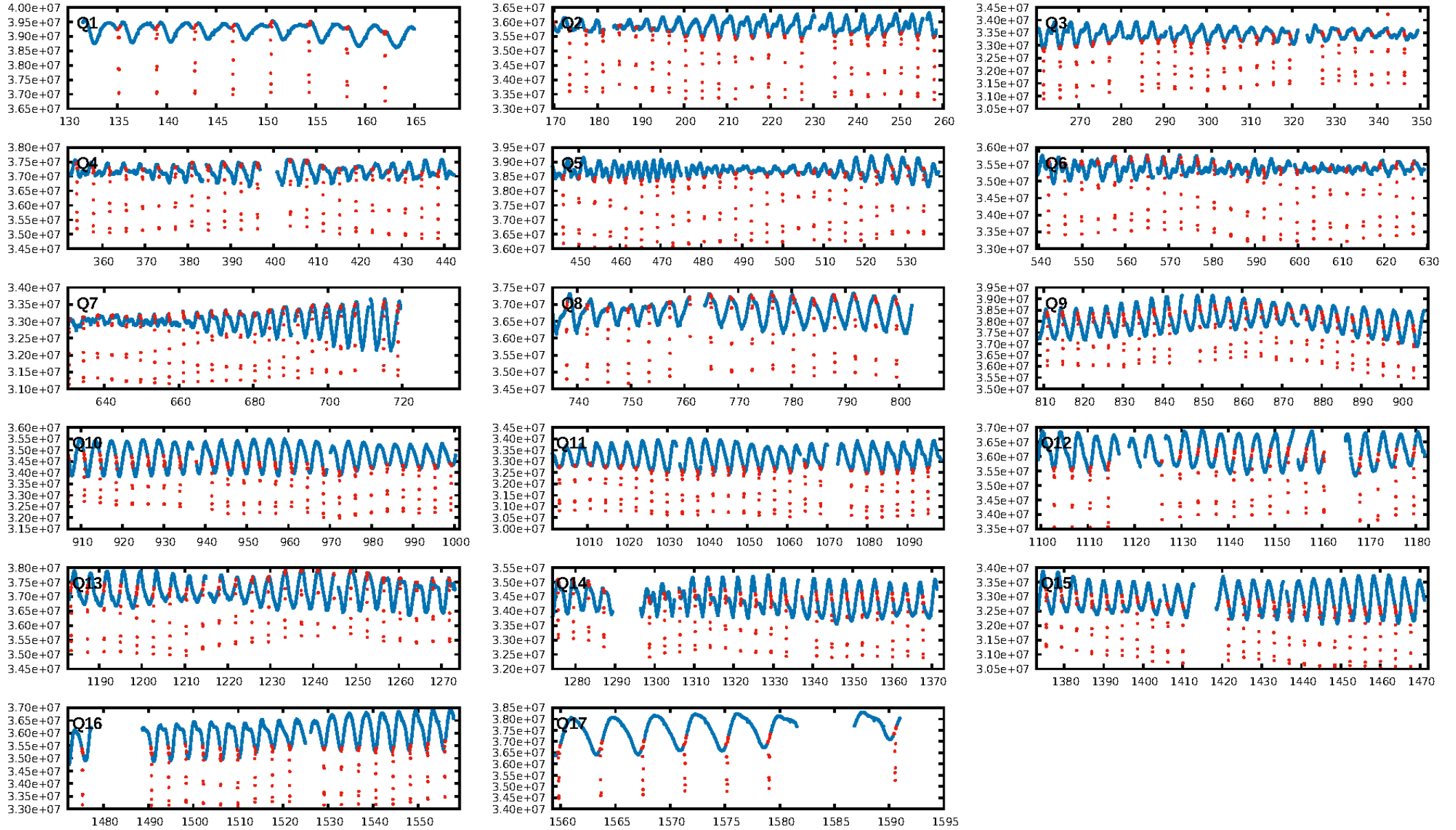
## DV Fit Results:

Period = 3.84013 [0.00000] d  
Epoch = 135.1397 [0.0000] BKJD  
Rp/R\* = 0.3184 [0.0037]  
a/R\* = 9.83 [0.01]  
b = 0.90 [0.01]  
Seff = 500.11 [187.17]  
Teq = 1206 [113] K  
Rp = 35.16 [10.47] Re  
a = 0.0476 [0.0117] AU  
Ag = 2.14 [0.75] [1.52σ]  
Teffp = 2256 [76] K [7.72σ]

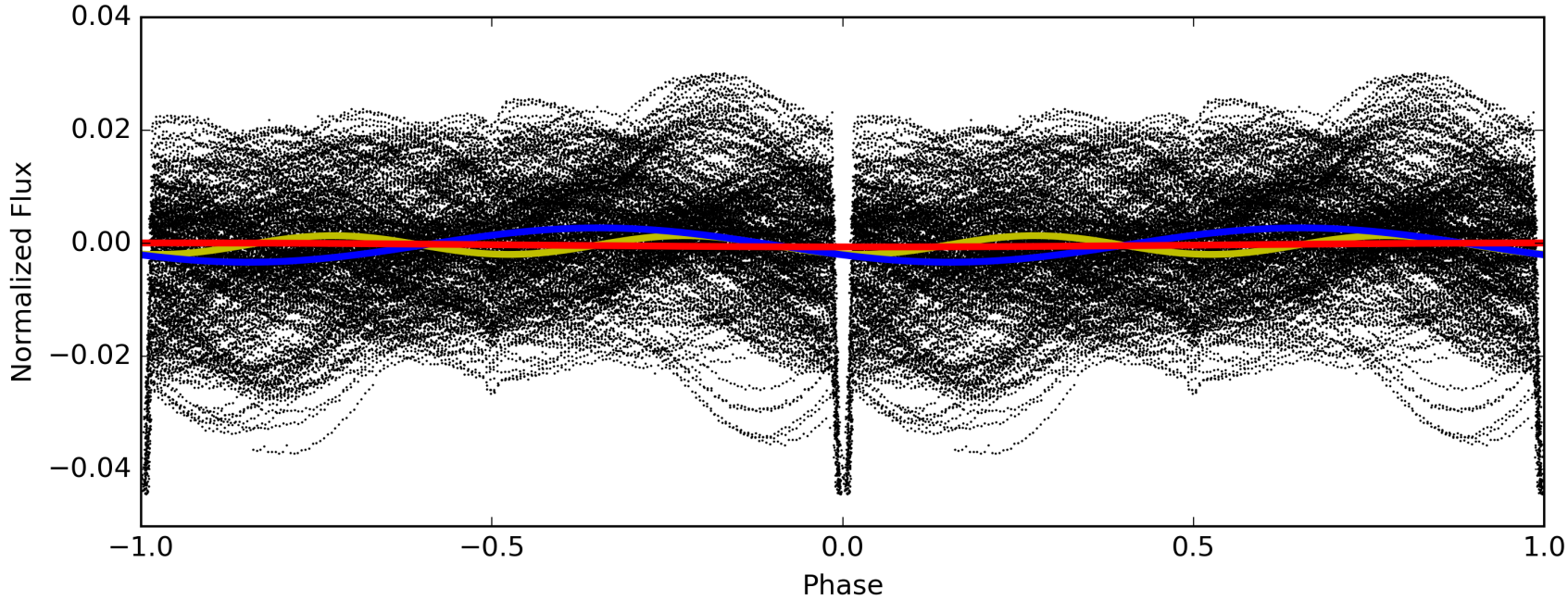
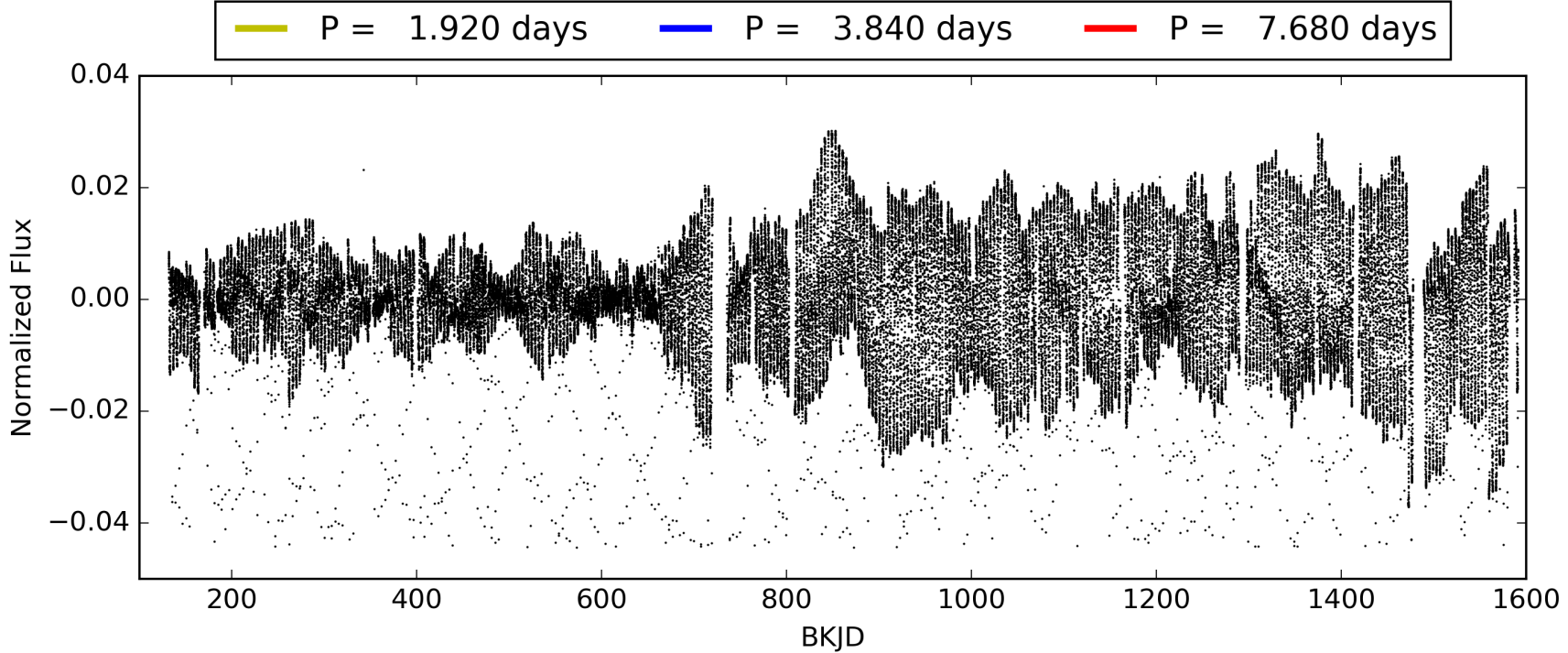
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.92 [304/330]  
GhostDiagnostic-chr: 5.744  
Centroid-sig: 0.0%  
Centroid-so: 0.688 arcsec [214.88σ]  
OotOffset-rm: 3.457 arcsec [2.62σ]  
KicOffset-rm: 0.002 arcsec [0.04σ]  
OotOffset-st: 4/4/2/5 [15]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 006628237-01, PDC Light Curves

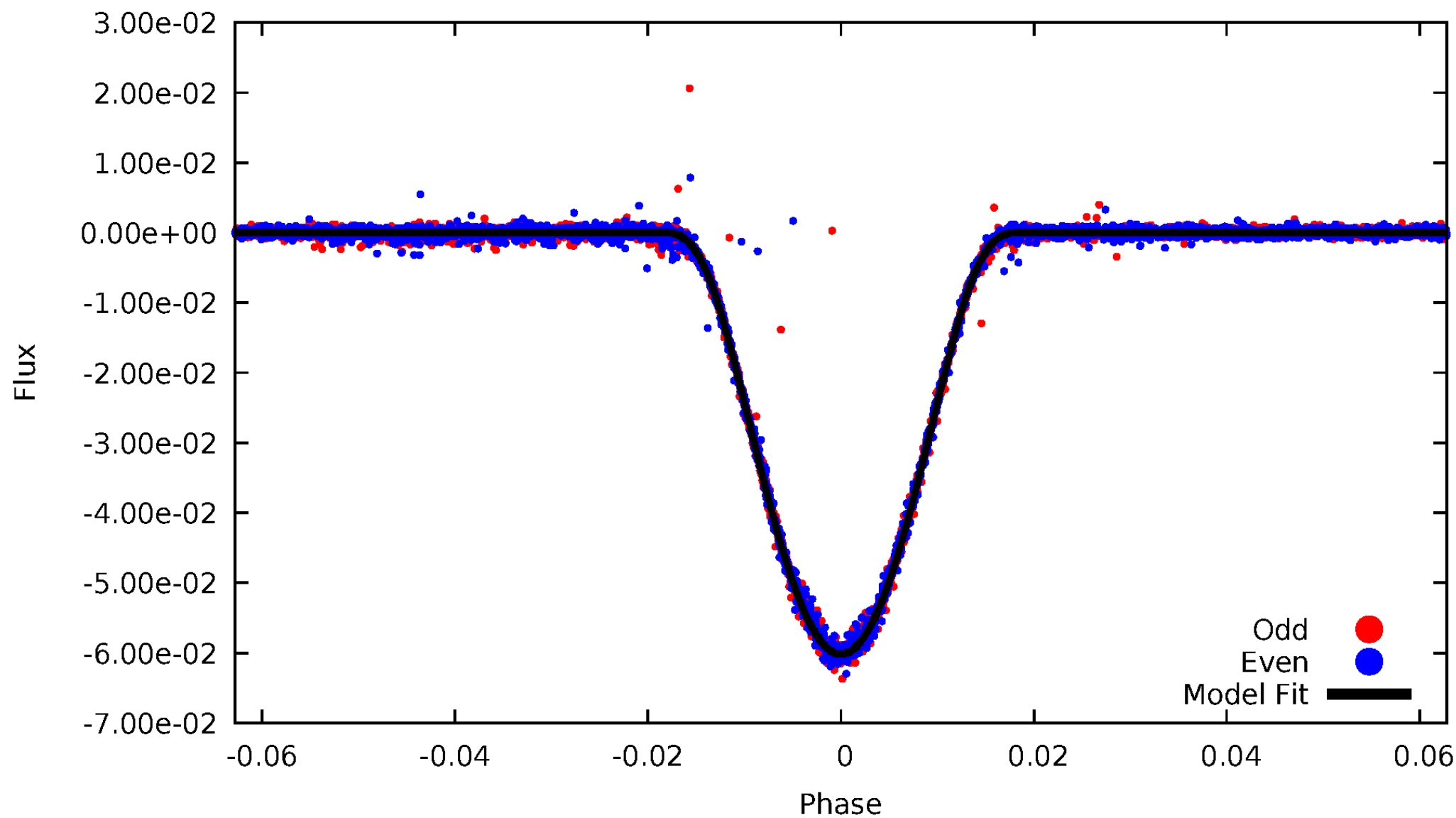


TCE 006628237-01



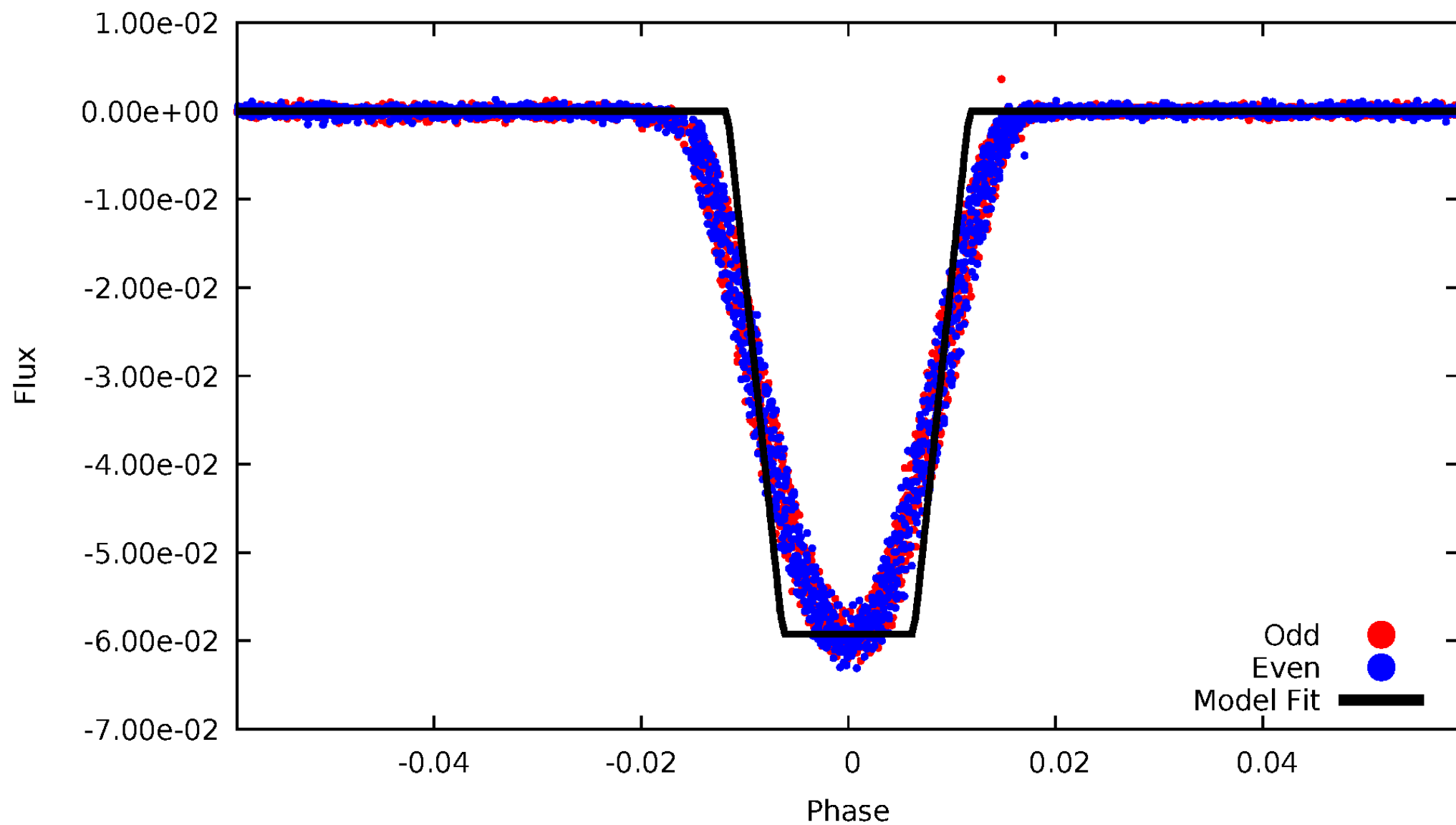
# DV Odd/Even

TCE 006628237-01



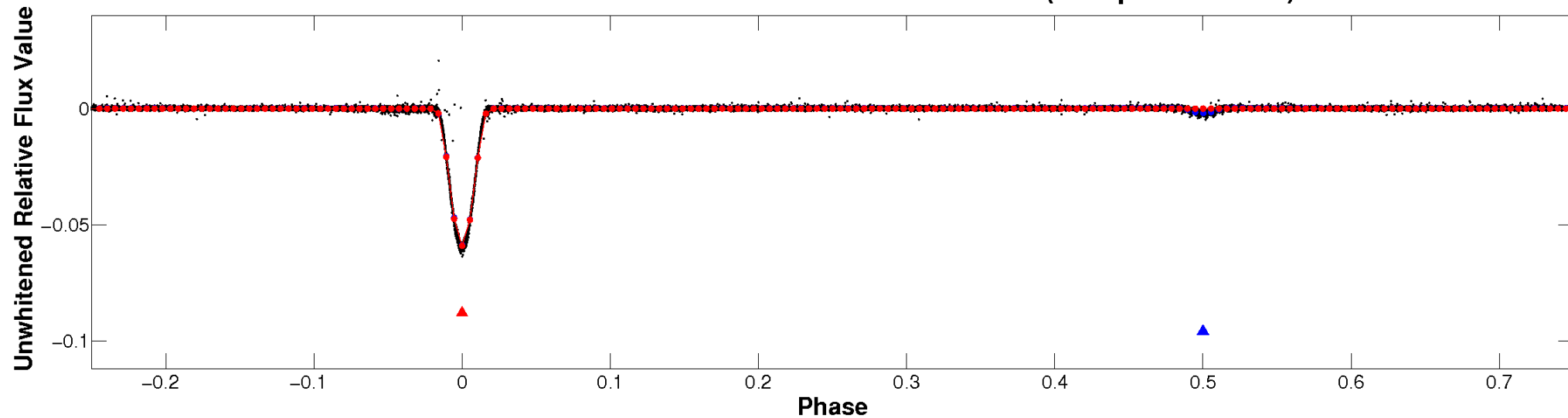
# ALT Odd/Even

TCE 006628237-01

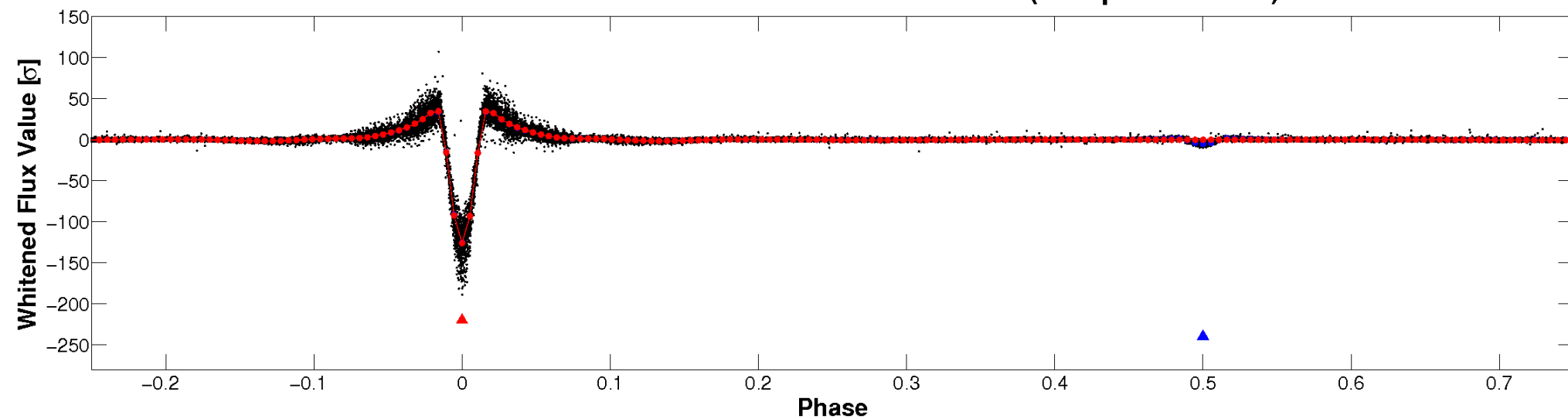


# Non-Whitened Vs. Whitened Light Curve

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



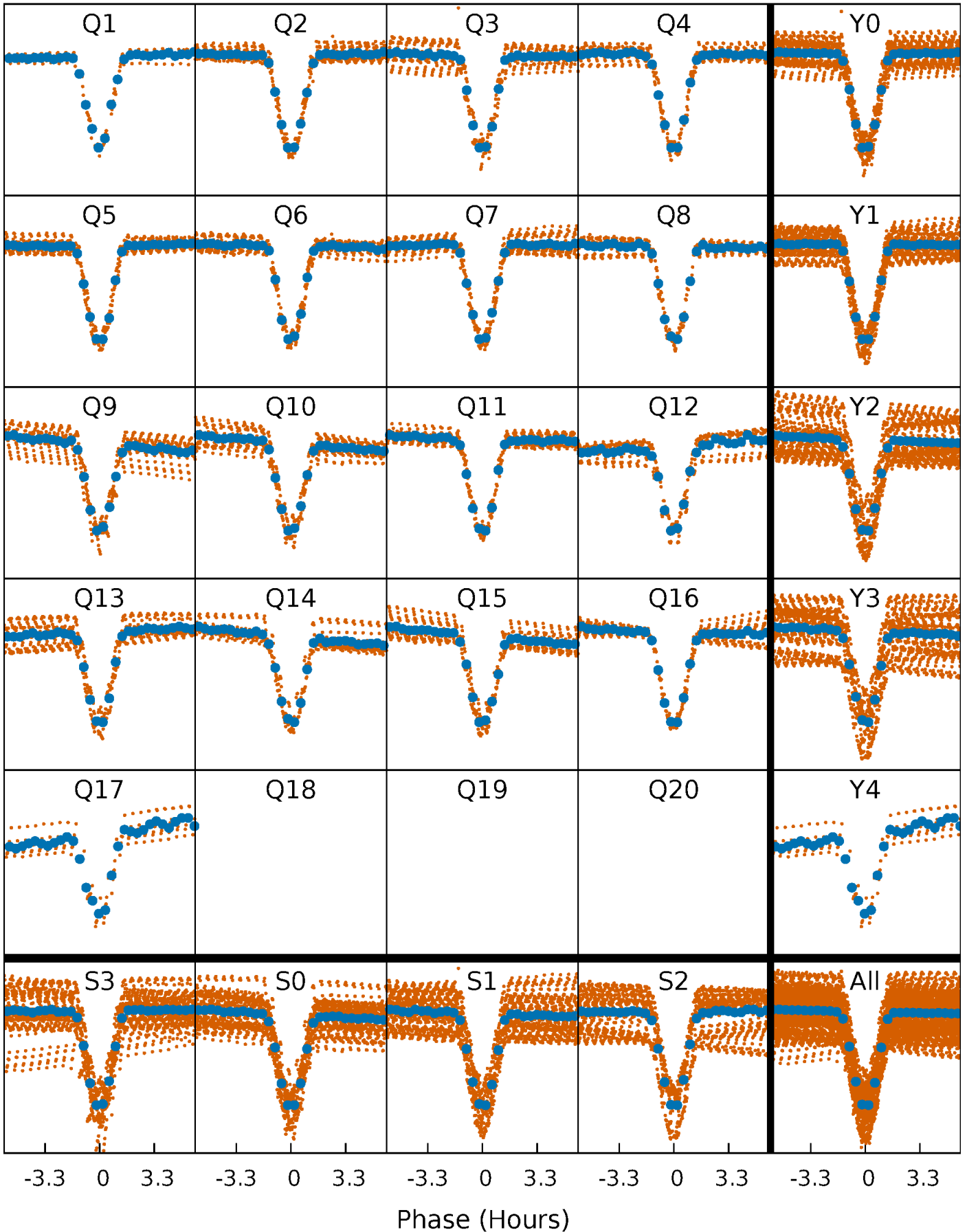
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

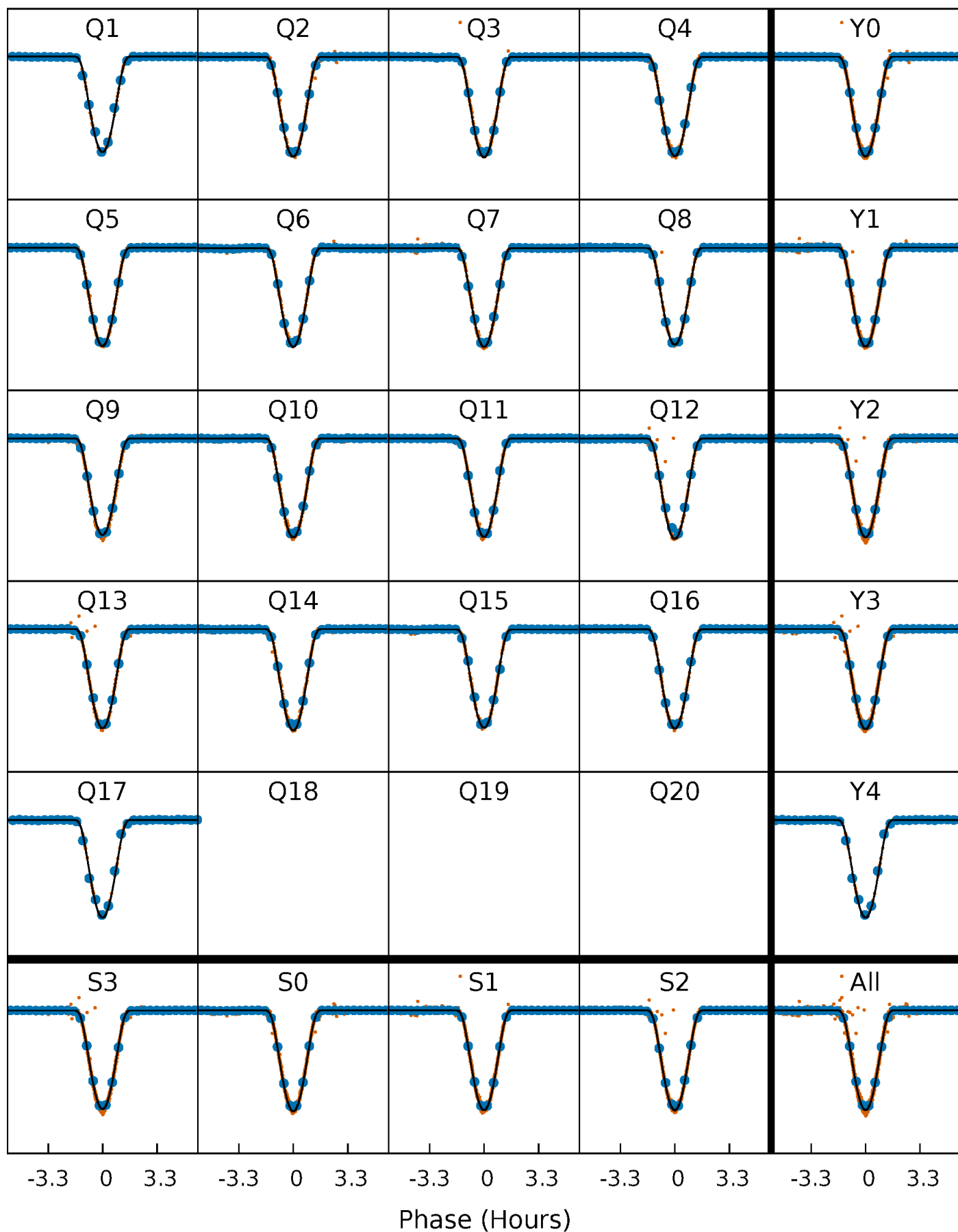
TCE 006628237-01 P= 3.840130 Days  $T_0=135.139742$  (BKJD)





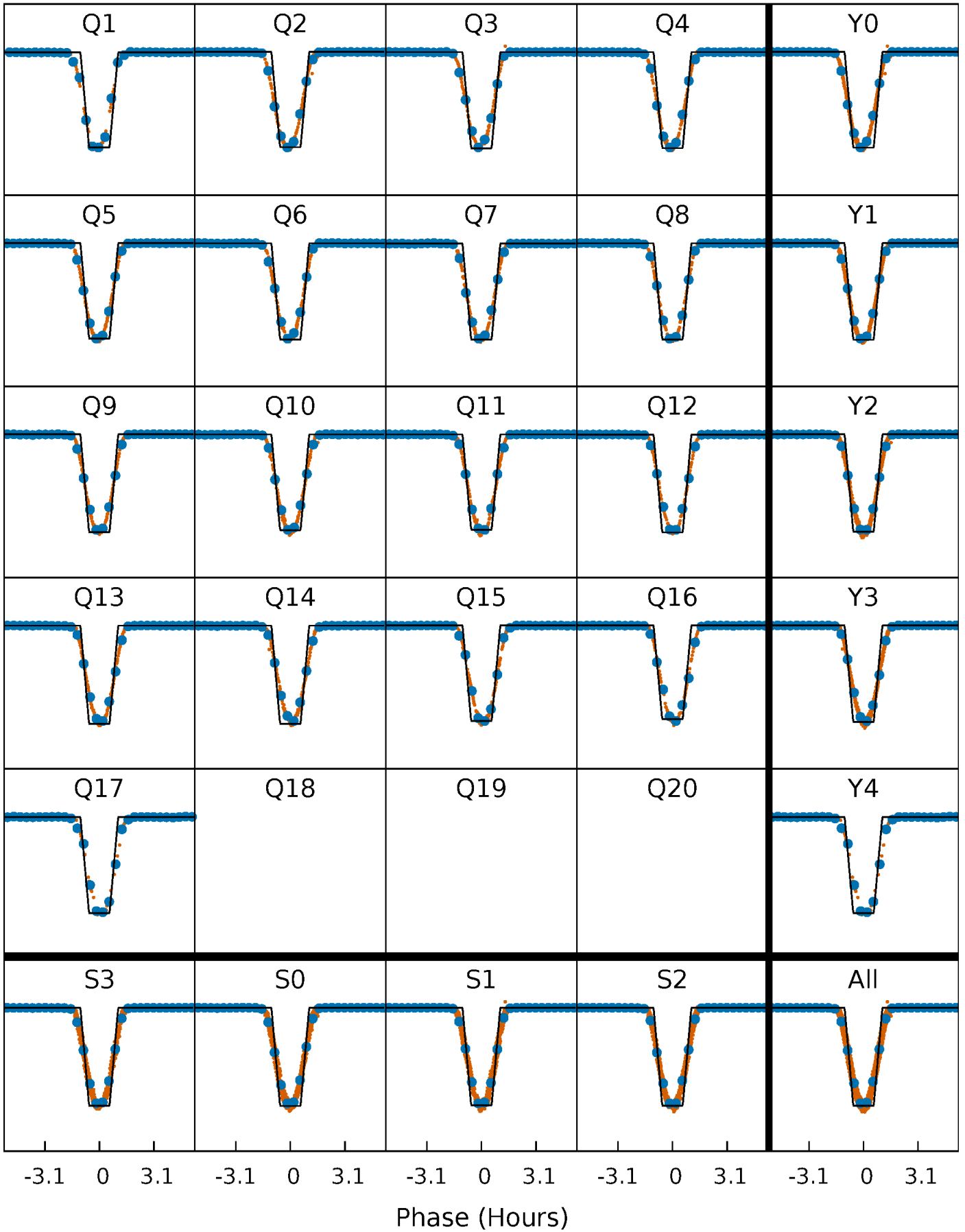
# DV Quarter-Phased Transit Curves

TCE 006628237-01 P= 3.840130 Days  $T_0=135.139742$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

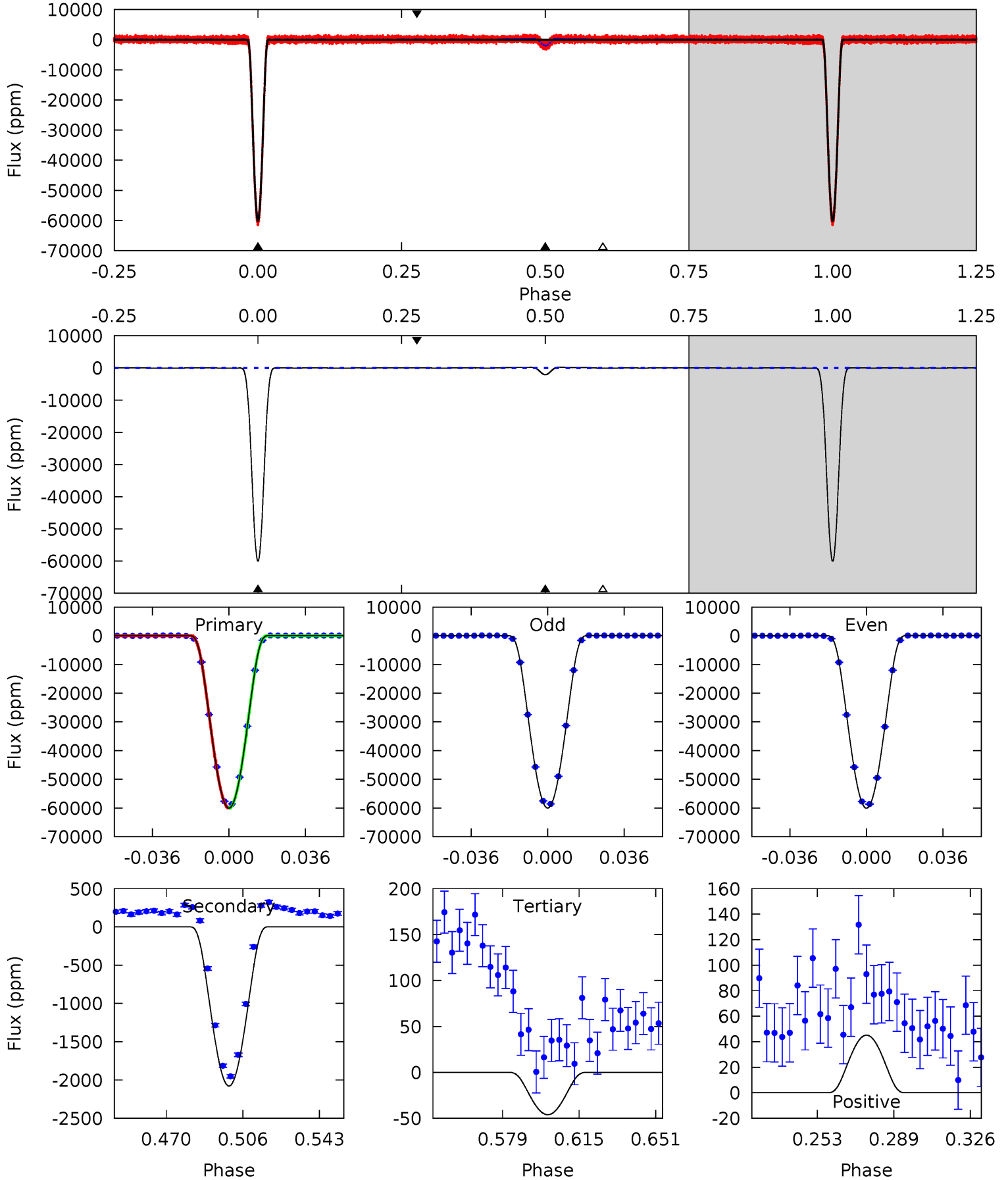
TCE 006628237-01   P= 3.840104 Days    $T_0=135.144918$  (BKJD)



# DV Model-Shift Uniqueness Test

006628237-01, P = 3.840130 Days, E = 131.299612 Days

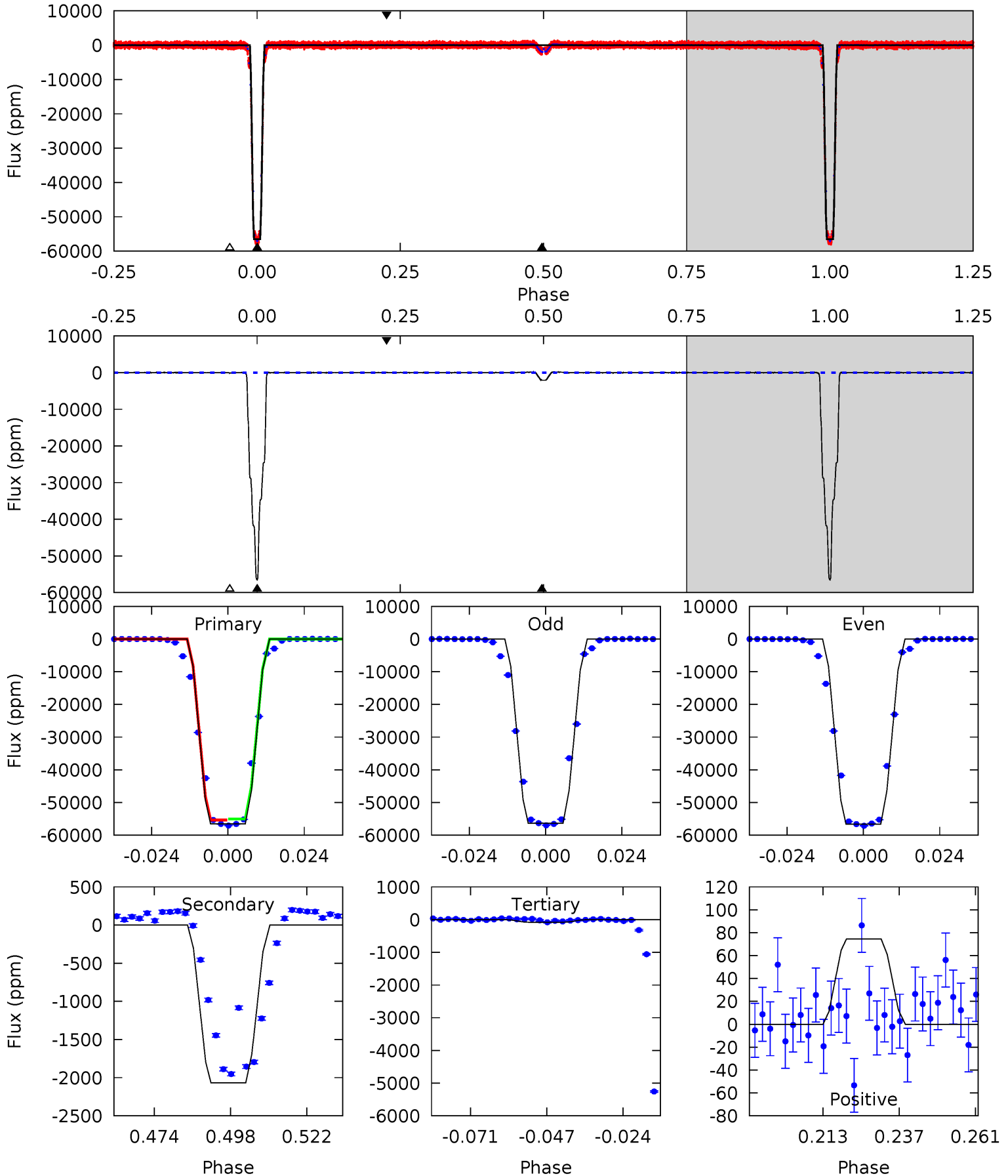
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7472	258.7	5.74	5.62	4.77	2.09	5.97	7466	7466	253.0	253.1	2.68	0.99	0.00	3.43



# Alt Model-Shift Uniqueness Test

006628237-01, P = 3.840104 Days, E = 131.304814 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
3059	111.9	4.43	4.02	4.86	2.26	1.75	3054	3055	107.4	107.8	5.98	1.00	0.00	0



### Stellar Parameters For KIC 006628237

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5931^{+160}_{-196}$	$4.418^{+0.101}_{-0.188}$	$-0.120^{+0.300}_{-0.300}$	$1.012^{+0.301}_{-0.151}$	$0.981^{+0.132}_{-0.119}$	$1.331^{+0.519}_{-0.683}$
	+3%/-3%	+2%/-4%	+250%/-250%	+30%/-15%	+13%/-12%	+39%/-51%
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 006628237-01 / KOI 6030.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2079 \pm 8$	$35.83^{+5.60}_{-3.19}$	$1703^{+123}_{-89}$	$2869^{+46}_{-54}$	$2.007^{+0.387}_{-0.451}$
Alt.	$-2068 \pm 18$	$27.31^{+4.30}_{-2.46}$	$1699^{+125}_{-85}$	$3126^{+54}_{-62}$	$3.439^{+0.642}_{-0.799}$

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

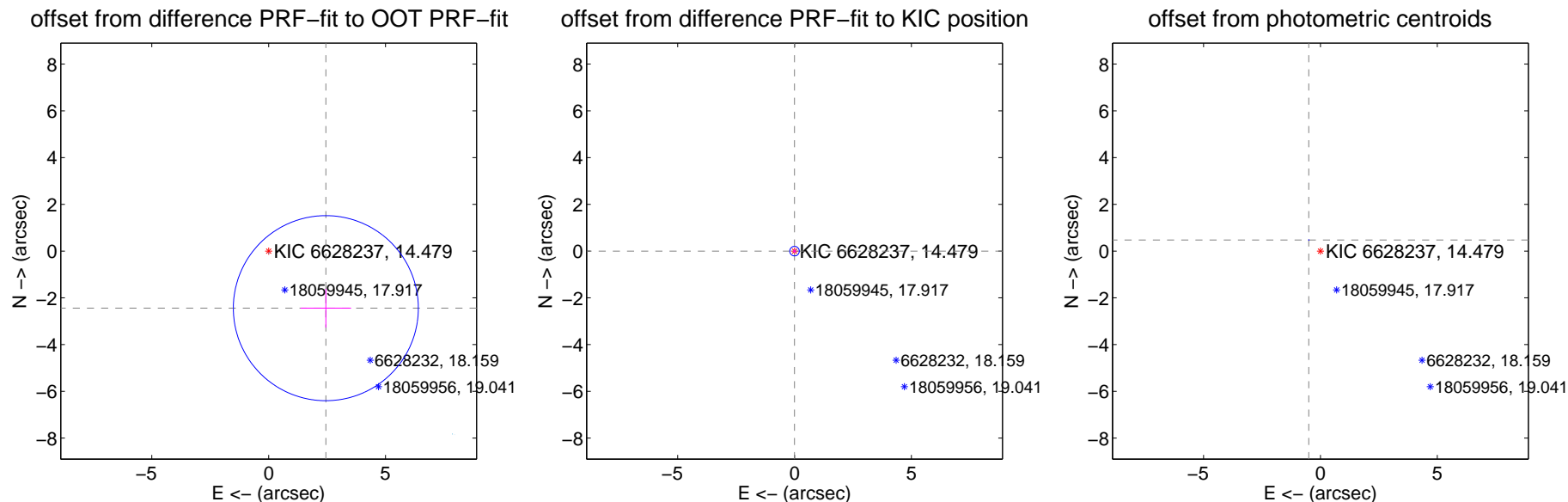
## DV Centroid Data

Supplemental centroid analysis for 006628237-01. Kepler magnitude: 14.48. Transit SNR 3256.87

There are 17 quarters with good PRF difference image offsets

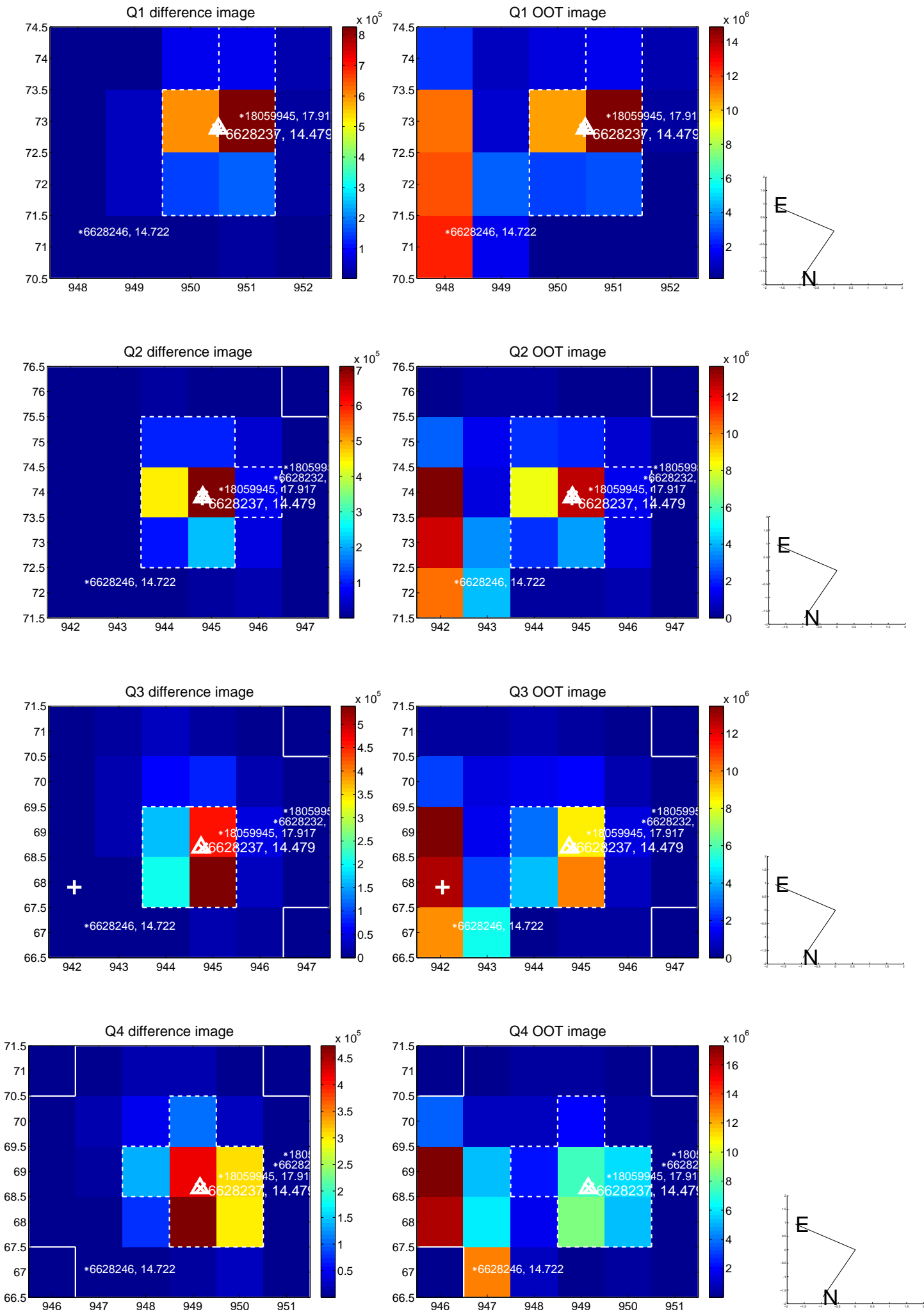
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.457 \pm 1.319$	2.62	$-2.447 \pm 1.078$	$-2.442 \pm 0.830$
PRF-fit source offset from KIC position	$0.002 \pm 0.068$	0.04	$0.001 \pm 0.070$	$-0.002 \pm 0.068$
photometric centroid source offset	$0.69 \pm 0.00$	214.88	$0.50 \pm 0.00$	$0.47 \pm 0.00$



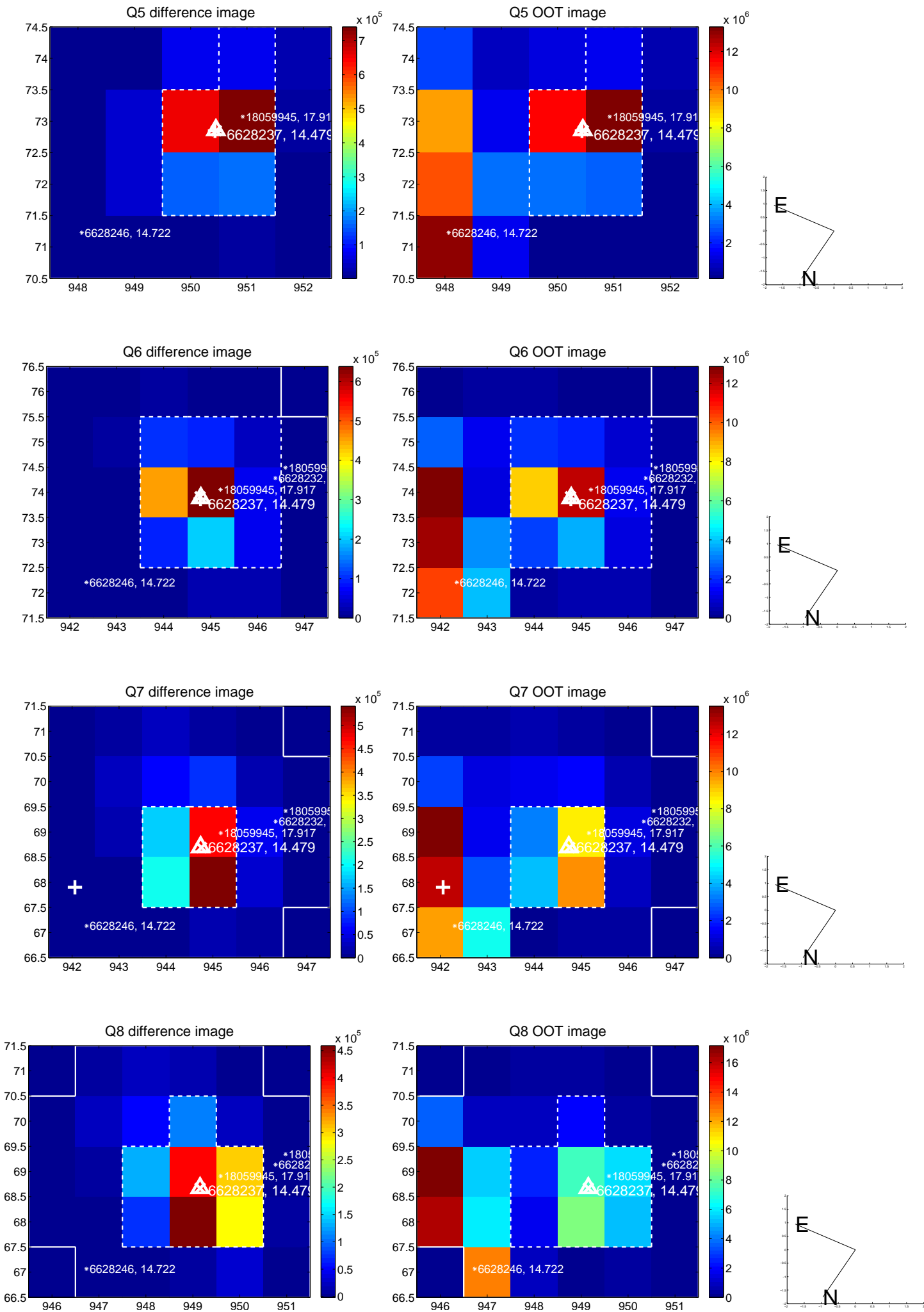
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

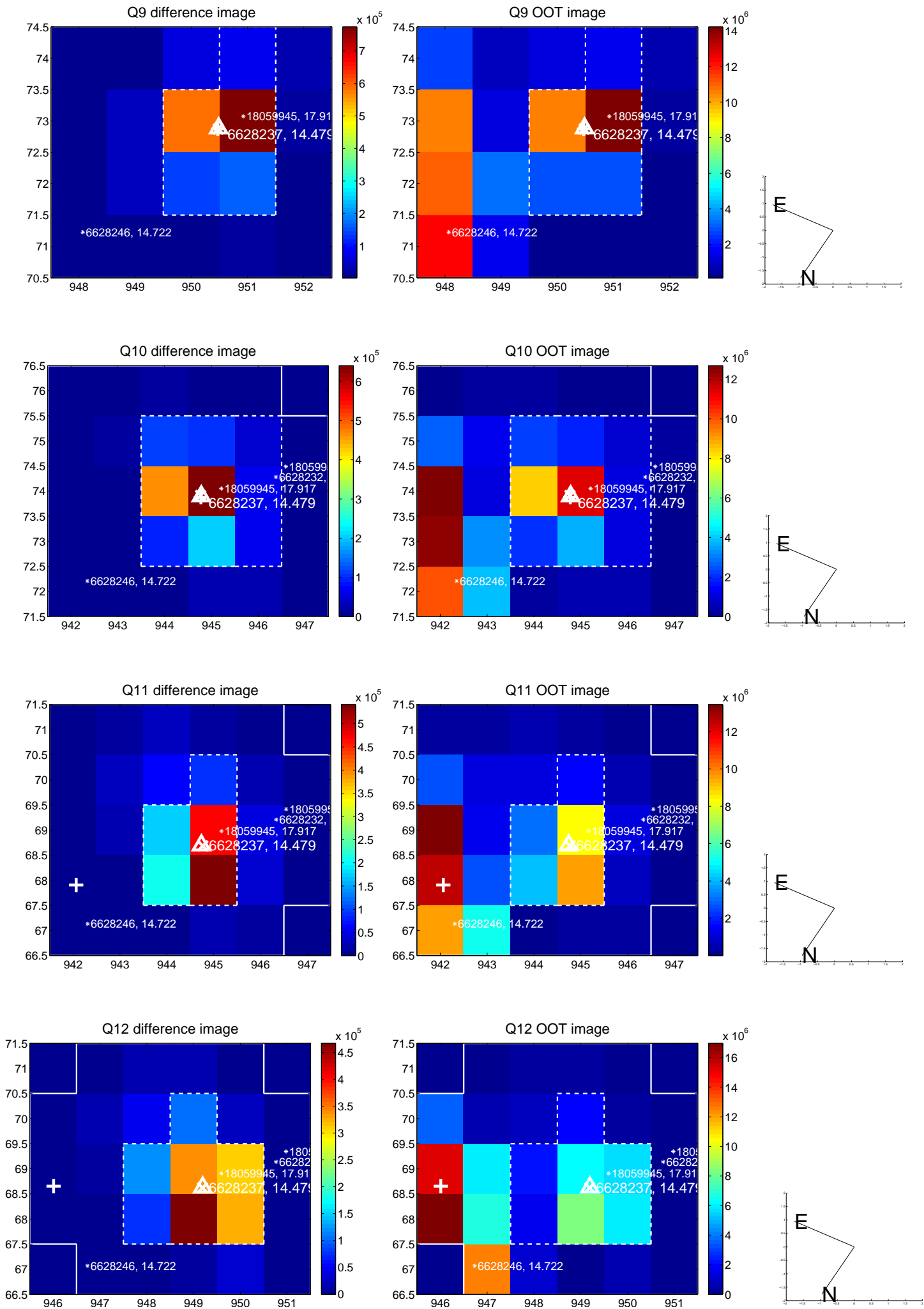




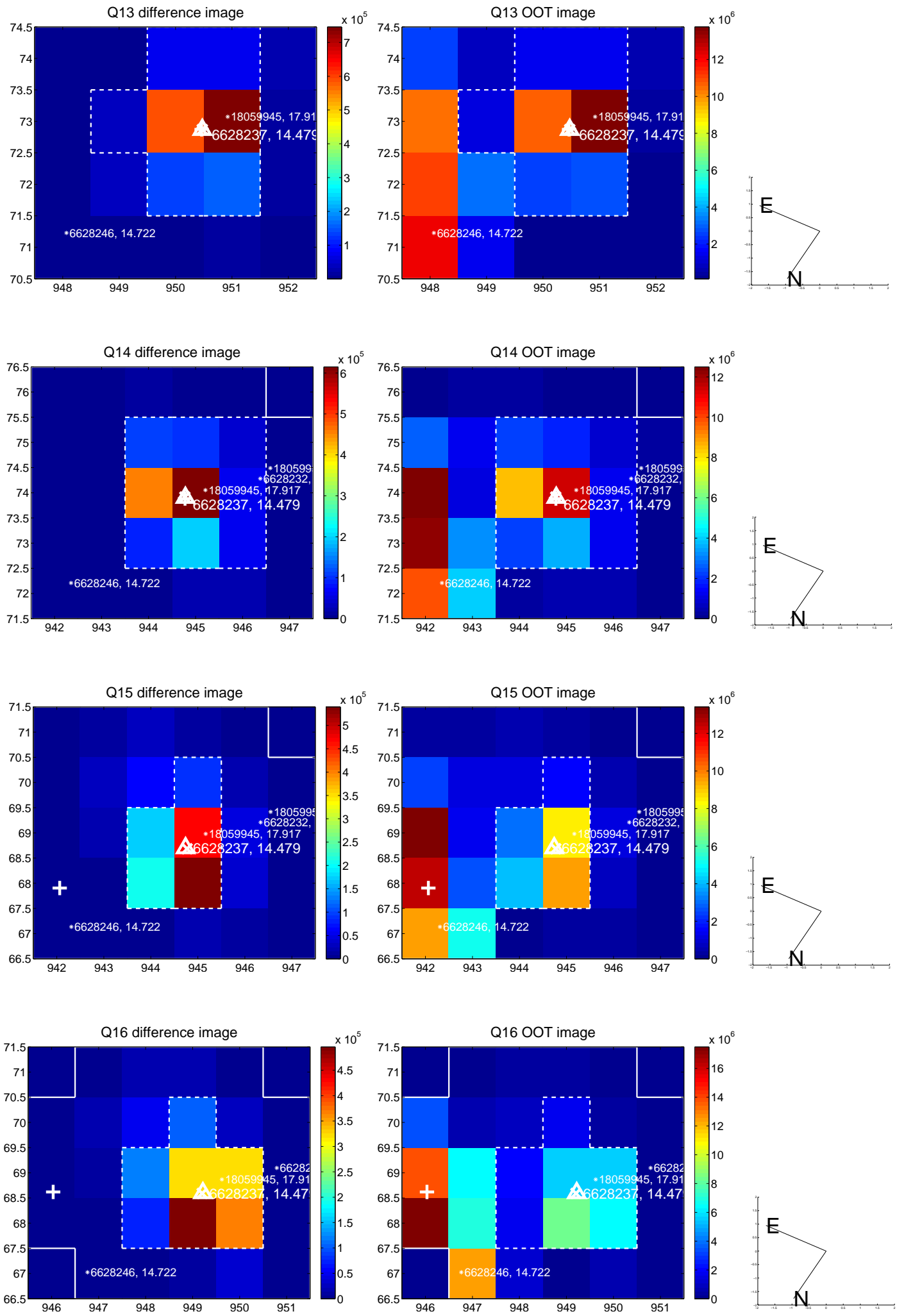
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



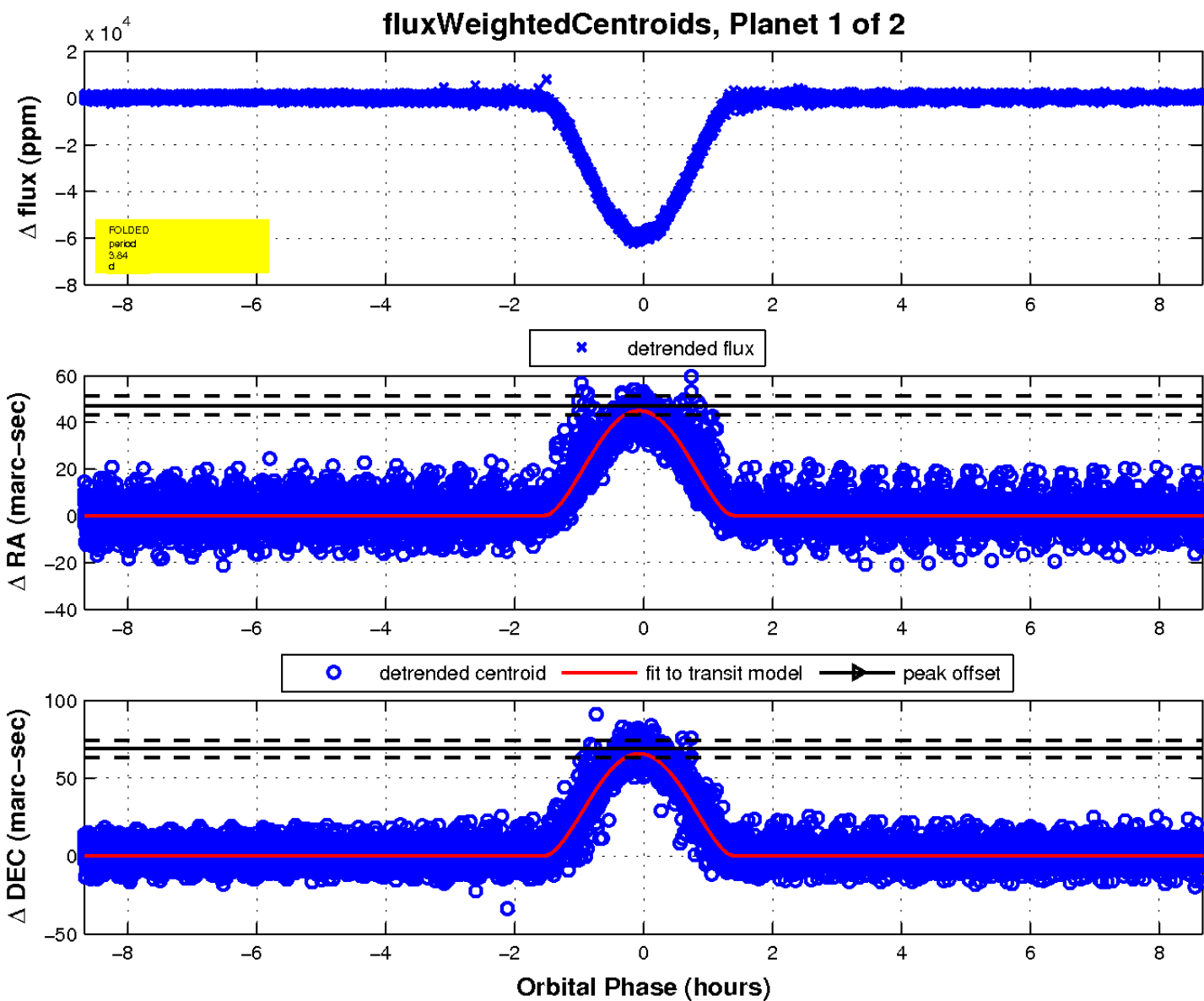
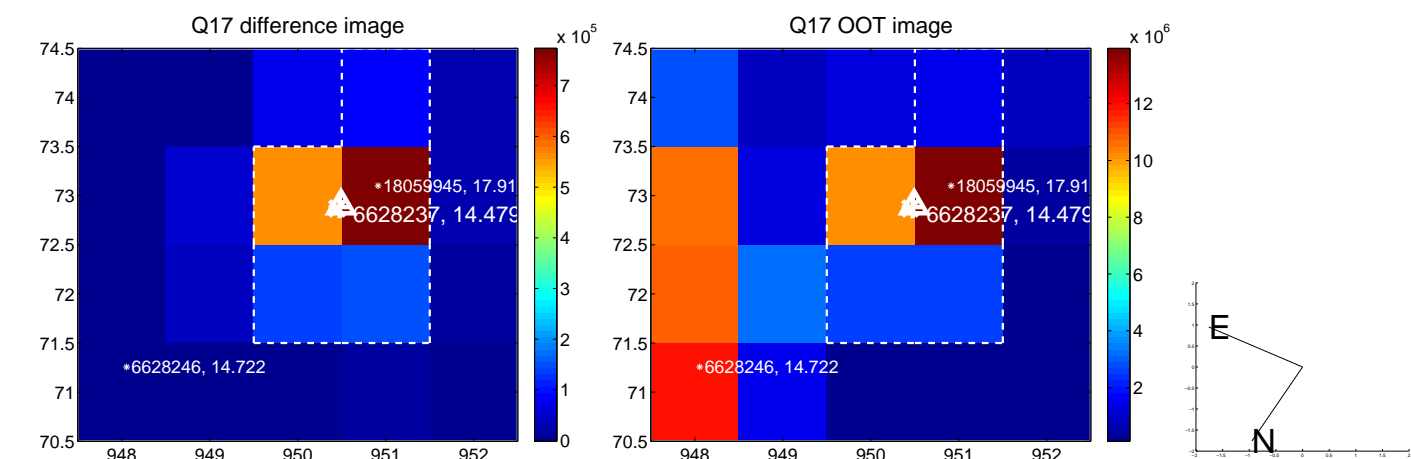
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

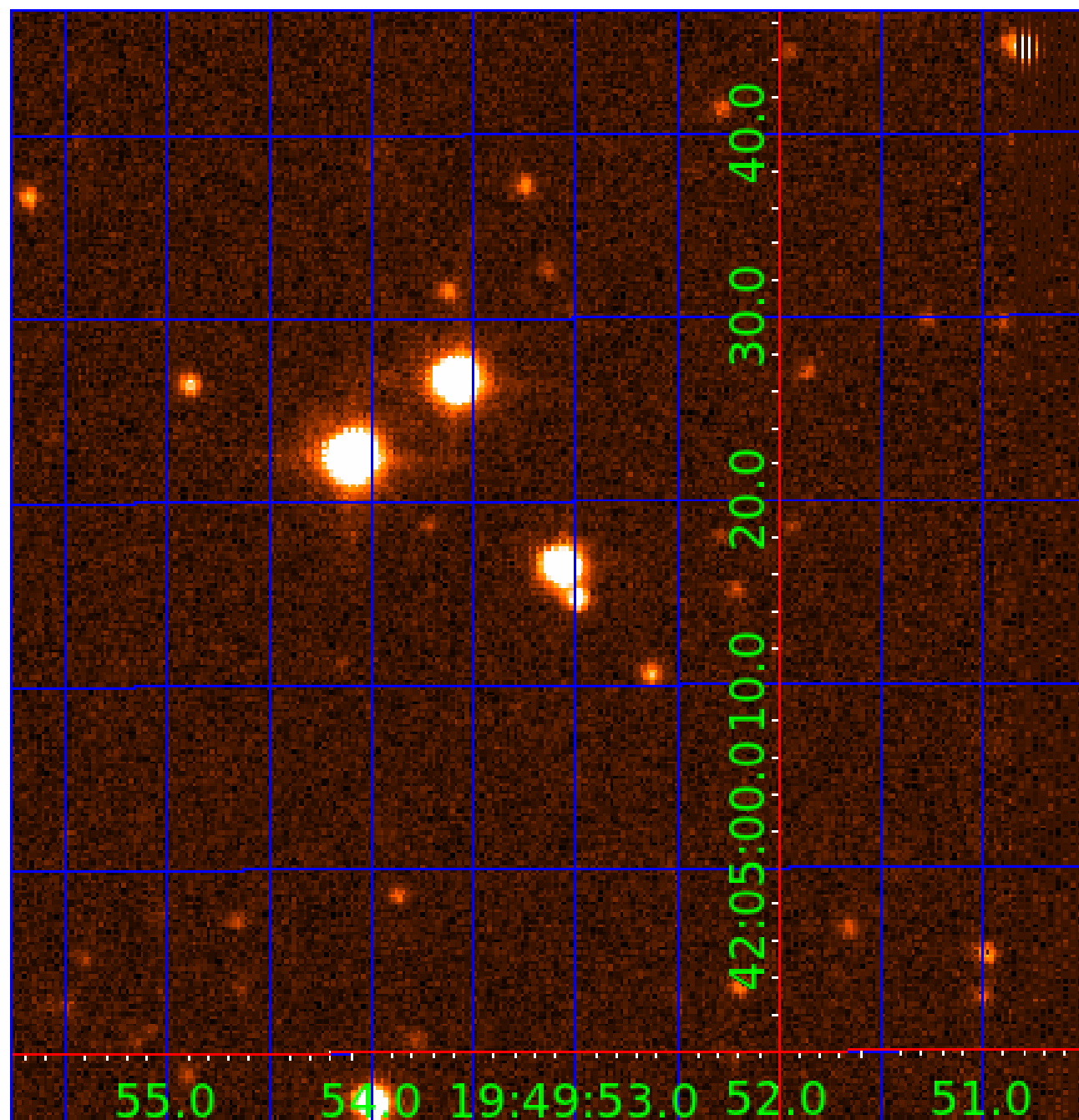


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006628237

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006628237-01	OBS	6030.01	3.840130	135.139742	60196.0	2.893	3879.9	3256.9	1.01	5931	35.16	500.11
006628237-02	OBS	No	3.840127	133.220434	2355.3	2.692	152.2	159.4	1.01	5931	7.44	500.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006628237-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
006628237-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

**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.

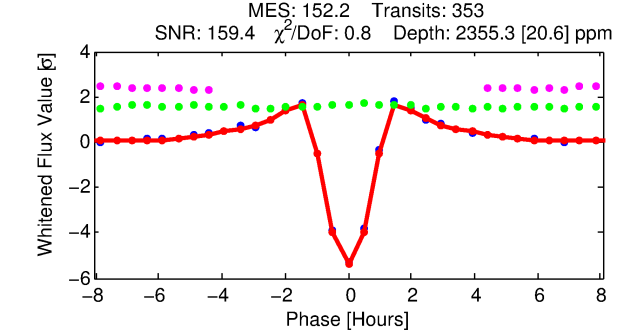
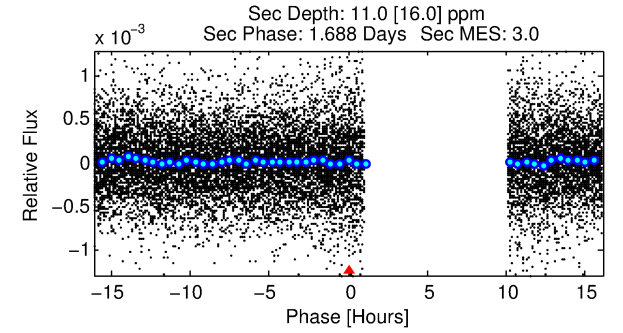
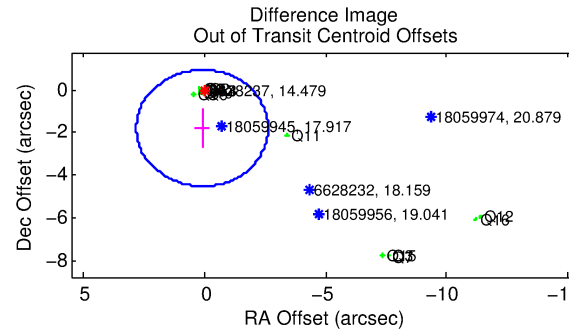
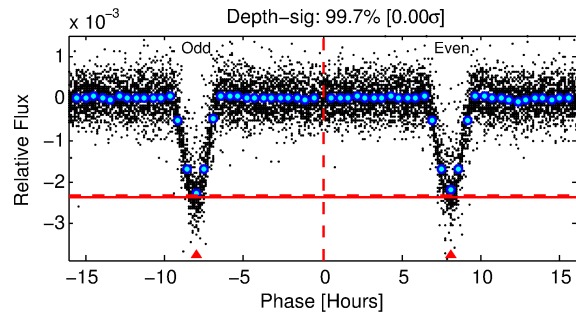
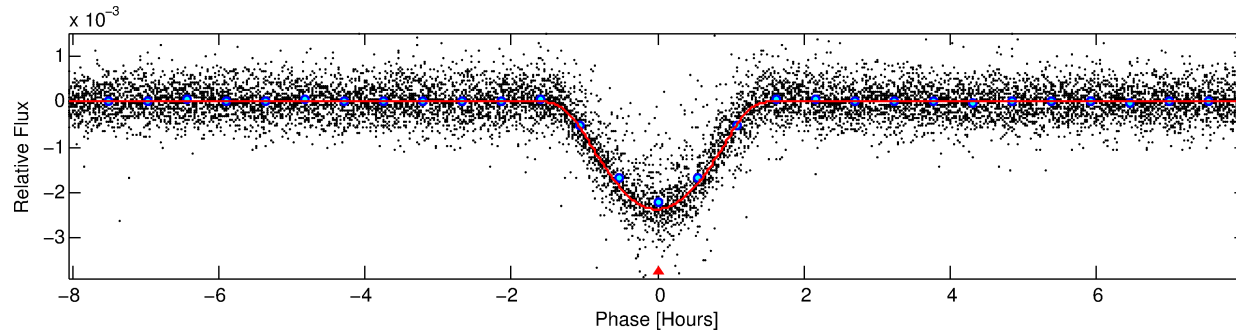
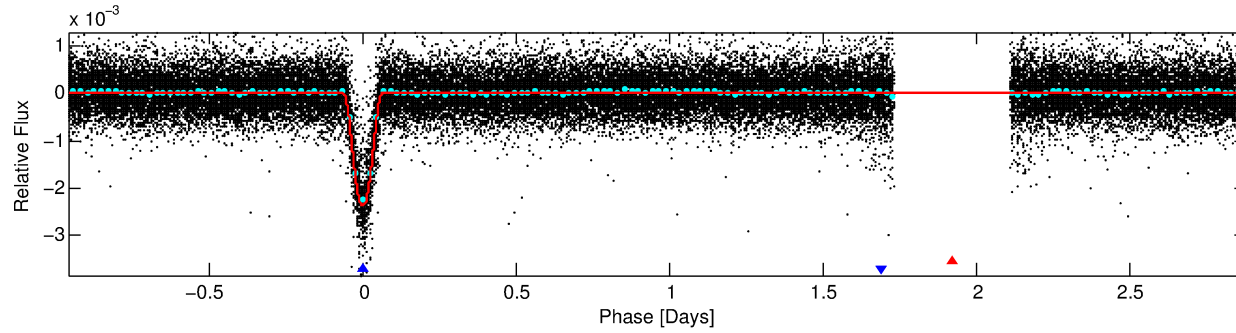
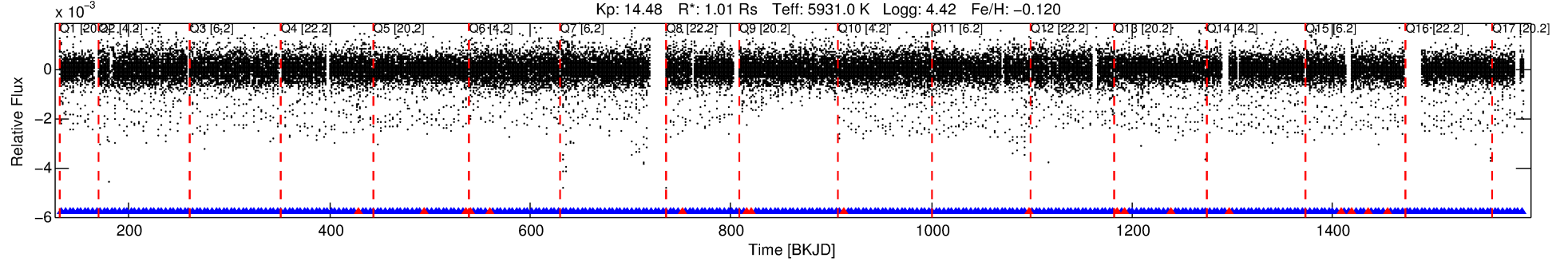
## Ephemeris Match Information For 006628237-02

No Significant Match Found

# DV One-Page Summary

KIC: 6628237 Candidate: 2 of 2 Period: 3.840 d  
KOI: K06030 Corr: No Ephemeris Match

Kp: 14.48 R\*: 1.01 Rs Teff: 5931.0 K Logg: 4.42 Fe/H: -0.120



## DV Fit Results:

Period = 3.84013 [0.00000] d  
Epoch = 133.2204 [0.0003] BKJD  
Rp/R\* = 0.0673 [0.0064]  
a/R\* = 4.89 [0.16]  
b = 0.97 [0.01]  
Seff = 500.11 [187.17]  
Teq = 1206 [113] K  
Rp = 7.44 [2.32] Re  
a = 0.0476 [0.0117] AU  
Ag = 0.25 [0.37] [-2.00σ]  
Teffp = 1318 [483] K [0.23σ]

## DV Diagnostic Results:

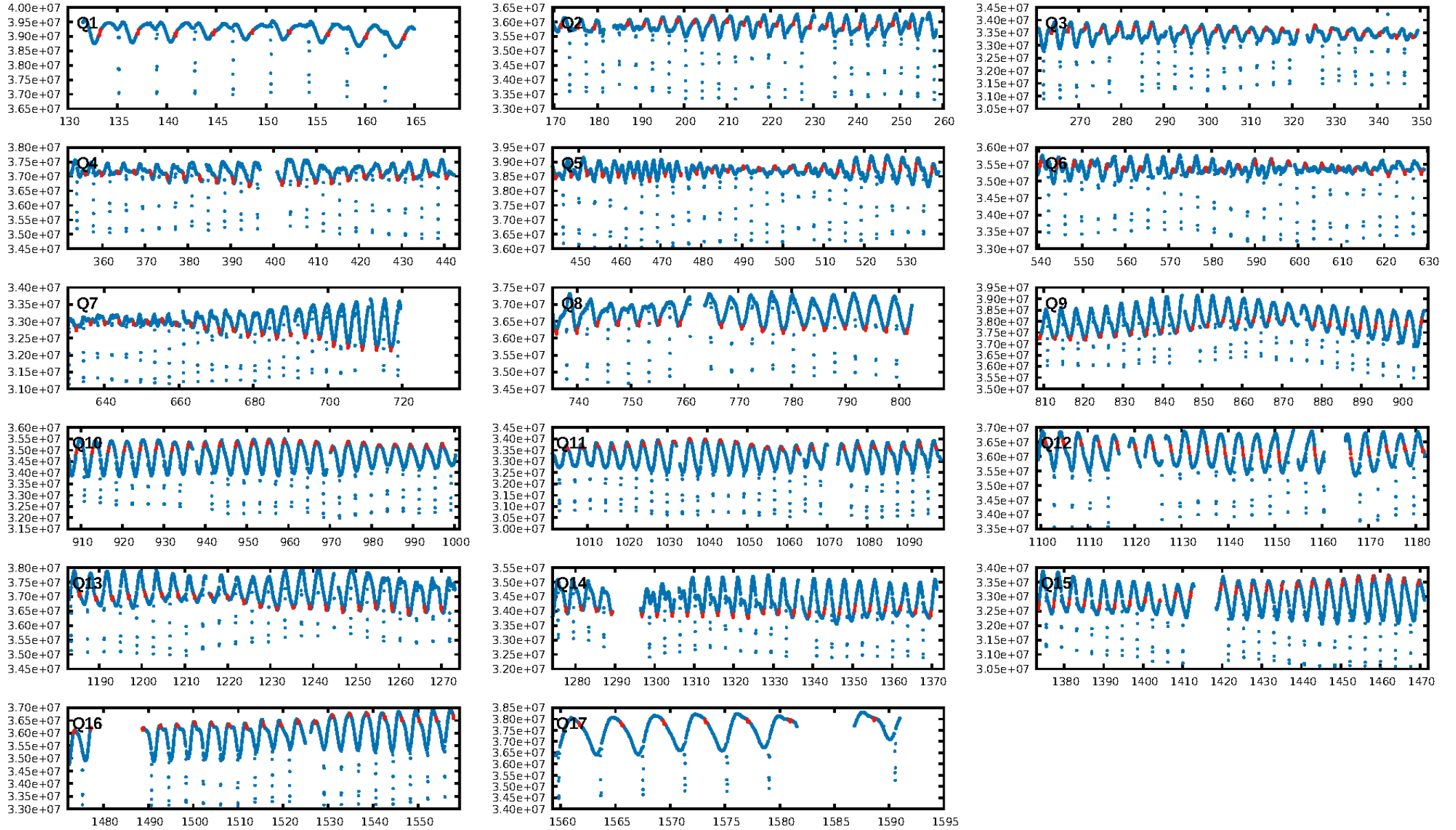
ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.95 [319/337]  
GhostDiagnostic-chr: 3.324  
**Centroid-sig: 0.0%**  
**Centroid-so: 0.818 arcsec [10.85σ]**  
OotOffset-rm: 1.795 arcsec [1.98σ]  
KicOffset-rm: 0.099 arcsec [1.19σ]  
OotOffset-st: 4/4/2/5 [15]  
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 18:44:33 Z

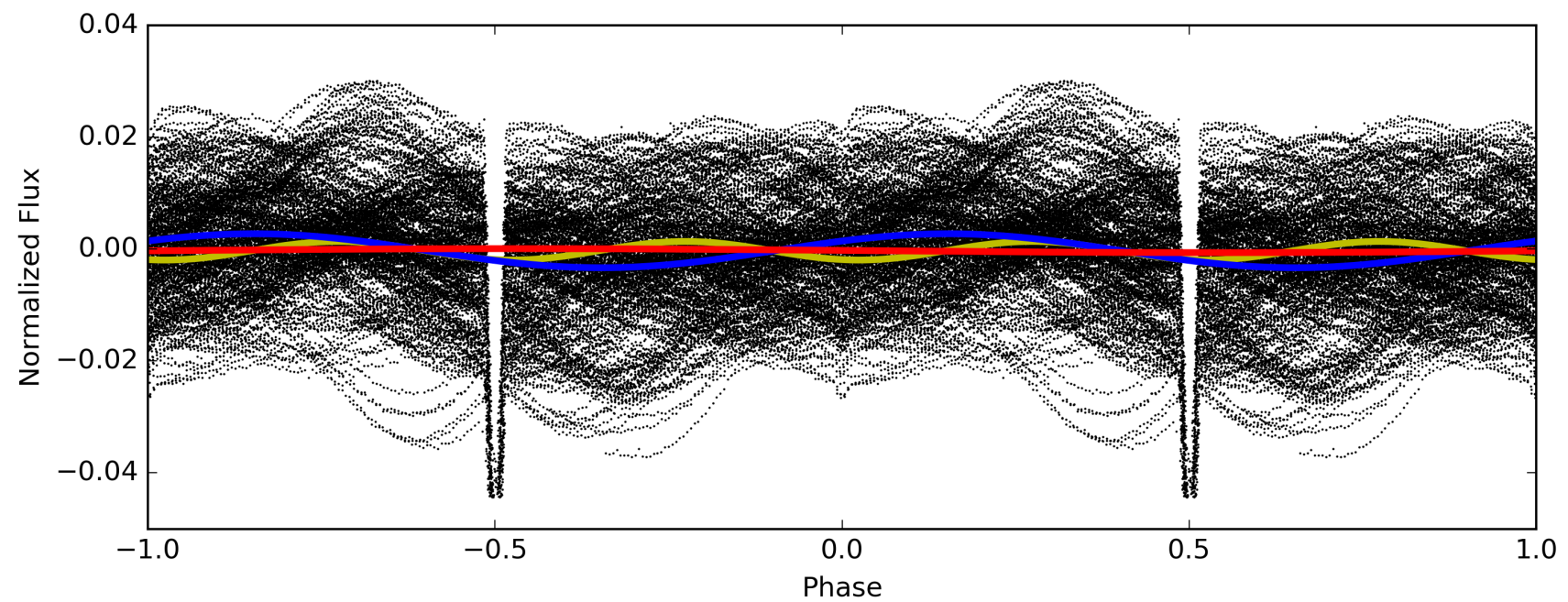
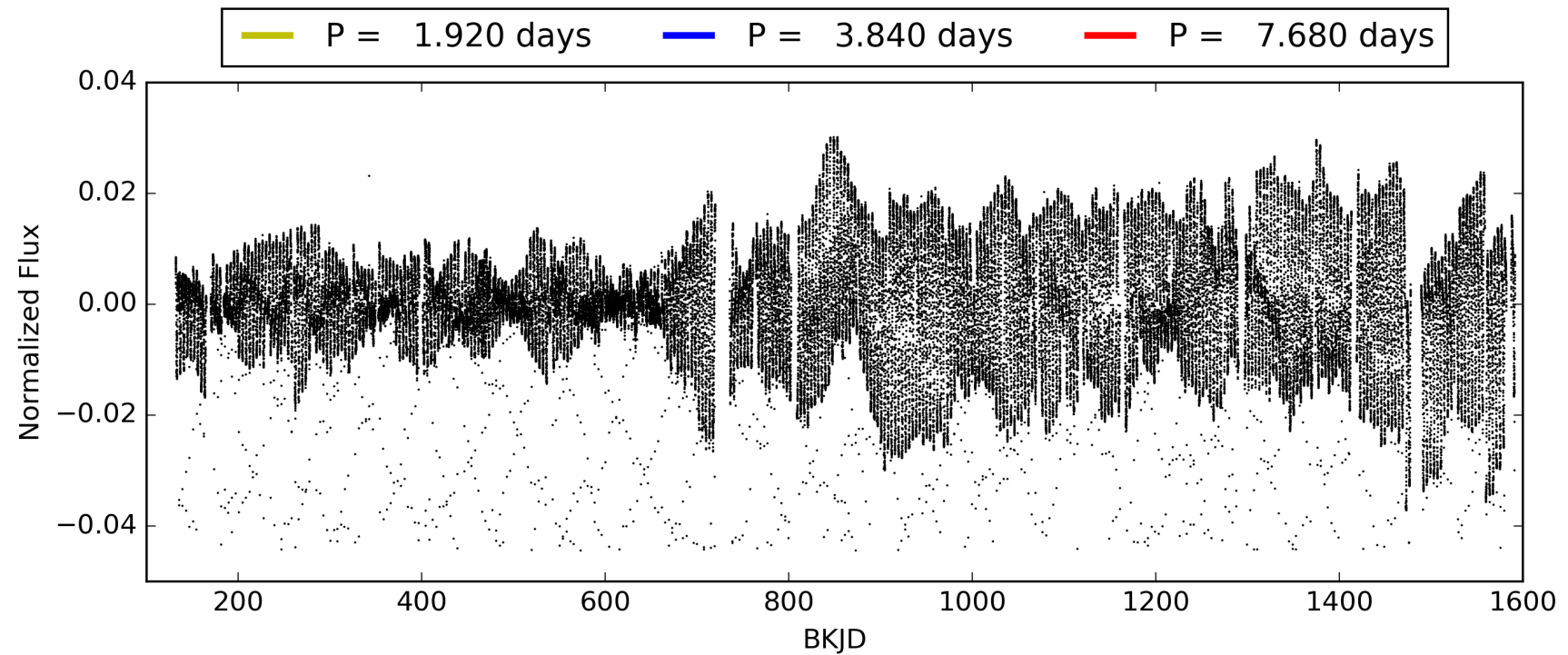
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006628237-02, PDC Light Curves

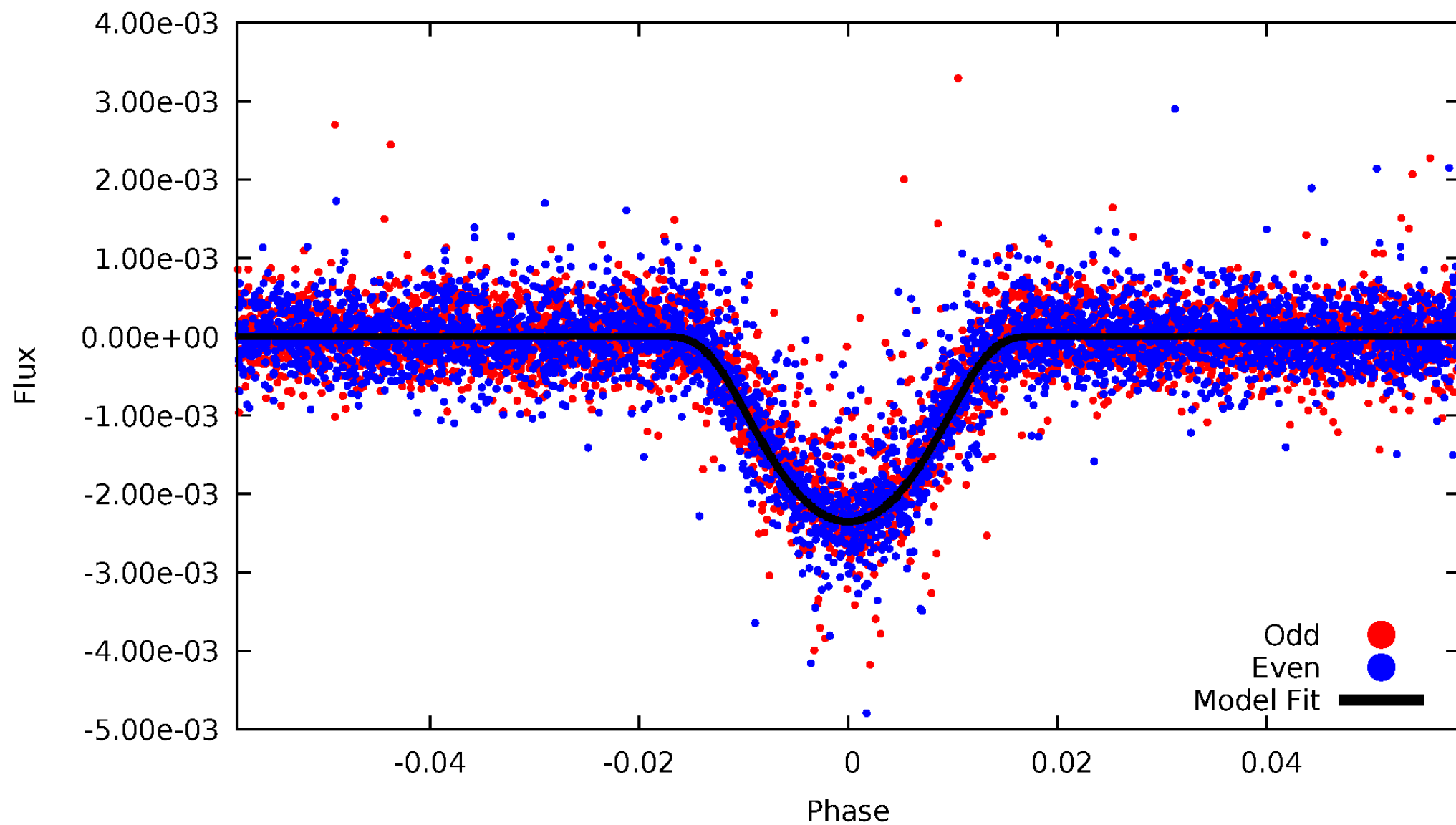


TCE 006628237-02



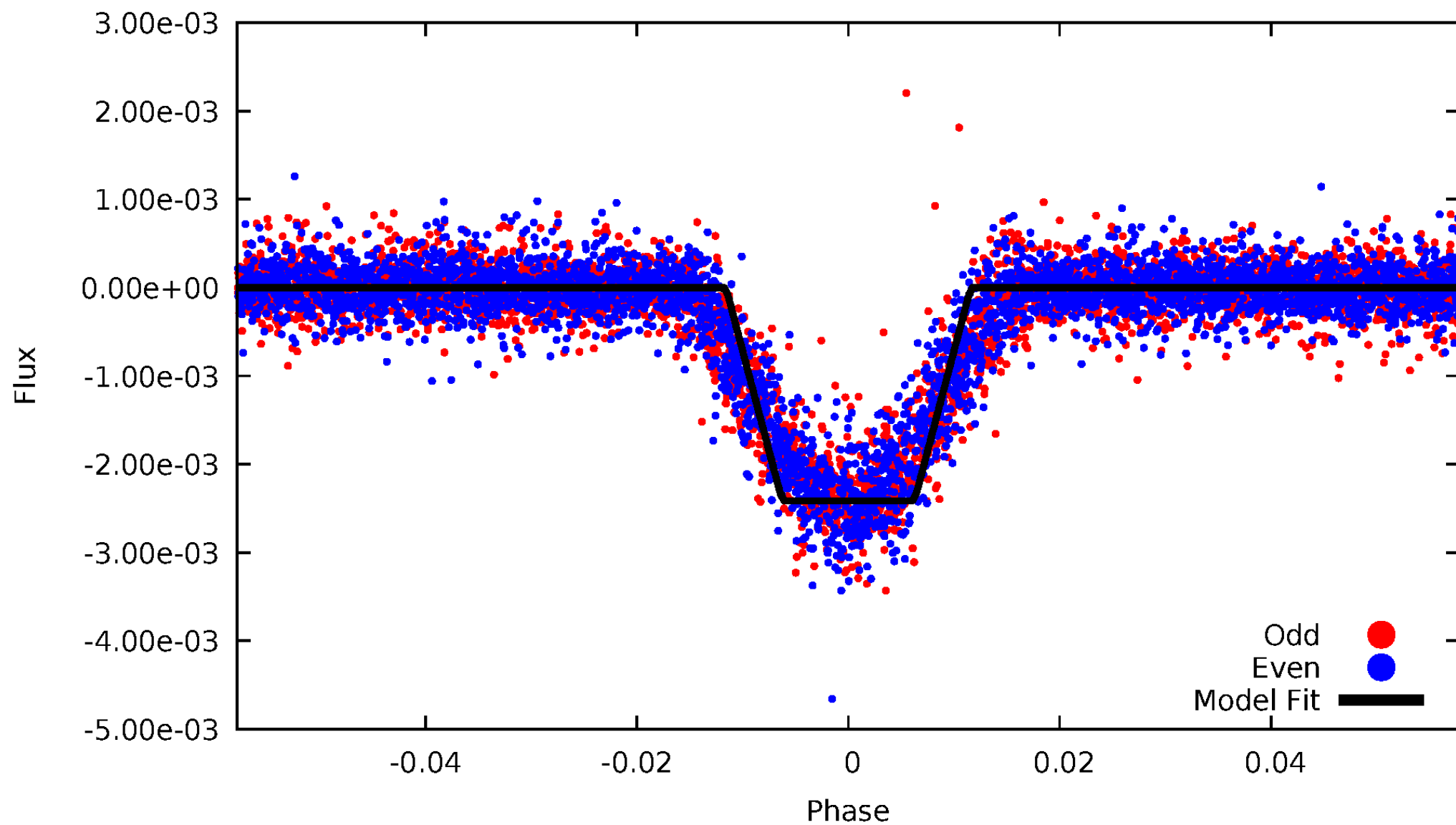
# DV Odd/Even

TCE 006628237-02



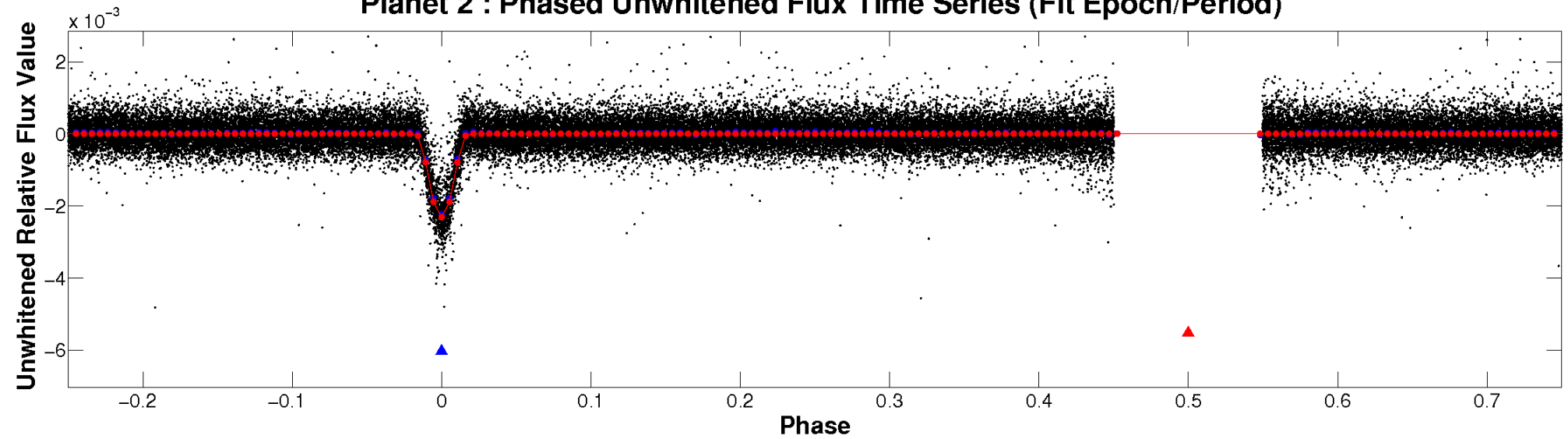
# ALT Odd/Even

TCE 006628237-02

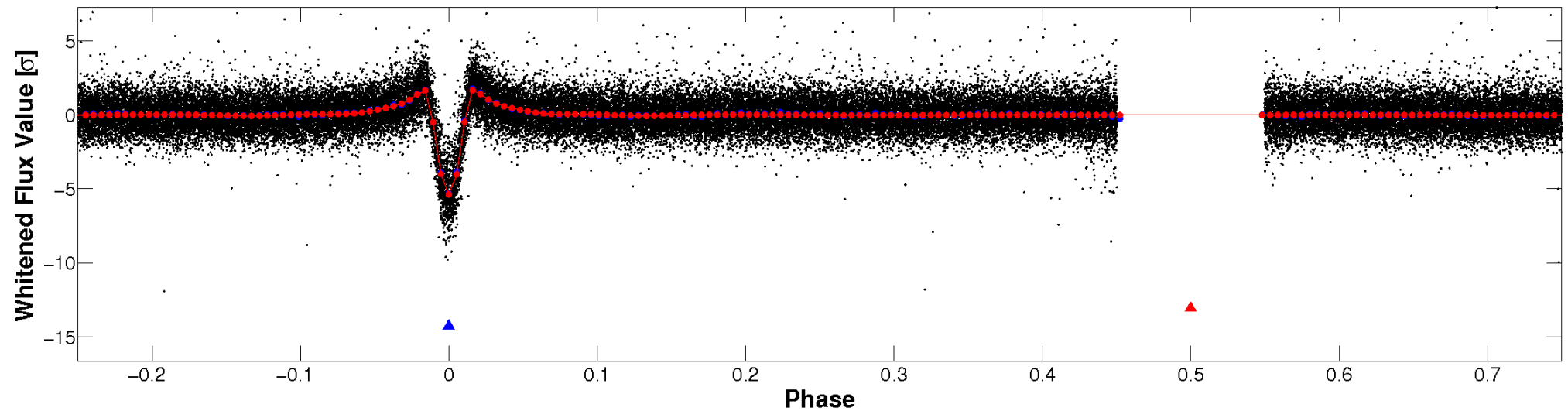


# Non-Whitened Vs. Whitened Light Curve

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



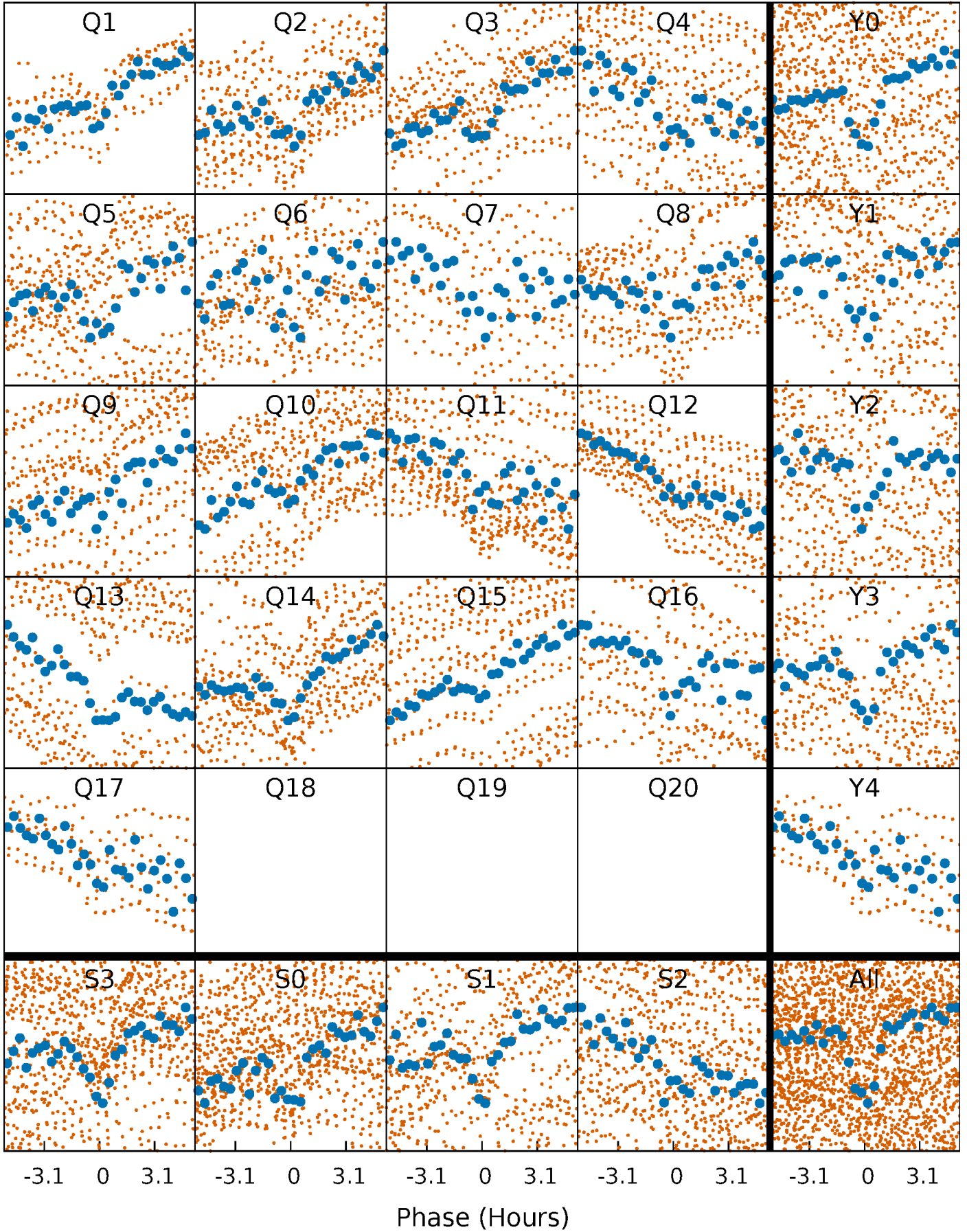
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





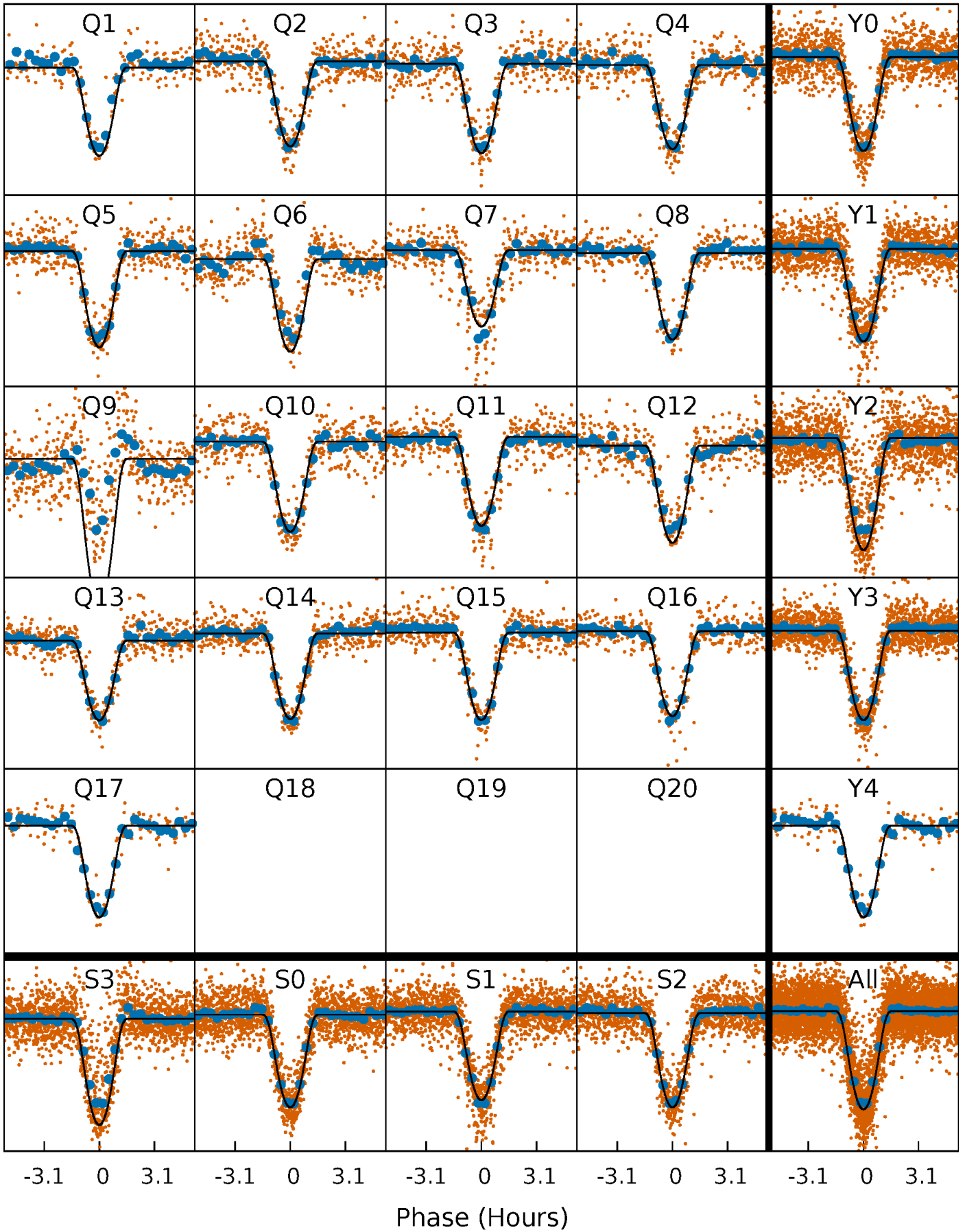
# PDC Quarter-Phased Transit Curves

TCE 006628237-02 P= 3.840127 Days  $T_0=133.220434$  (BKJD)



# DV Quarter-Phased Transit Curves

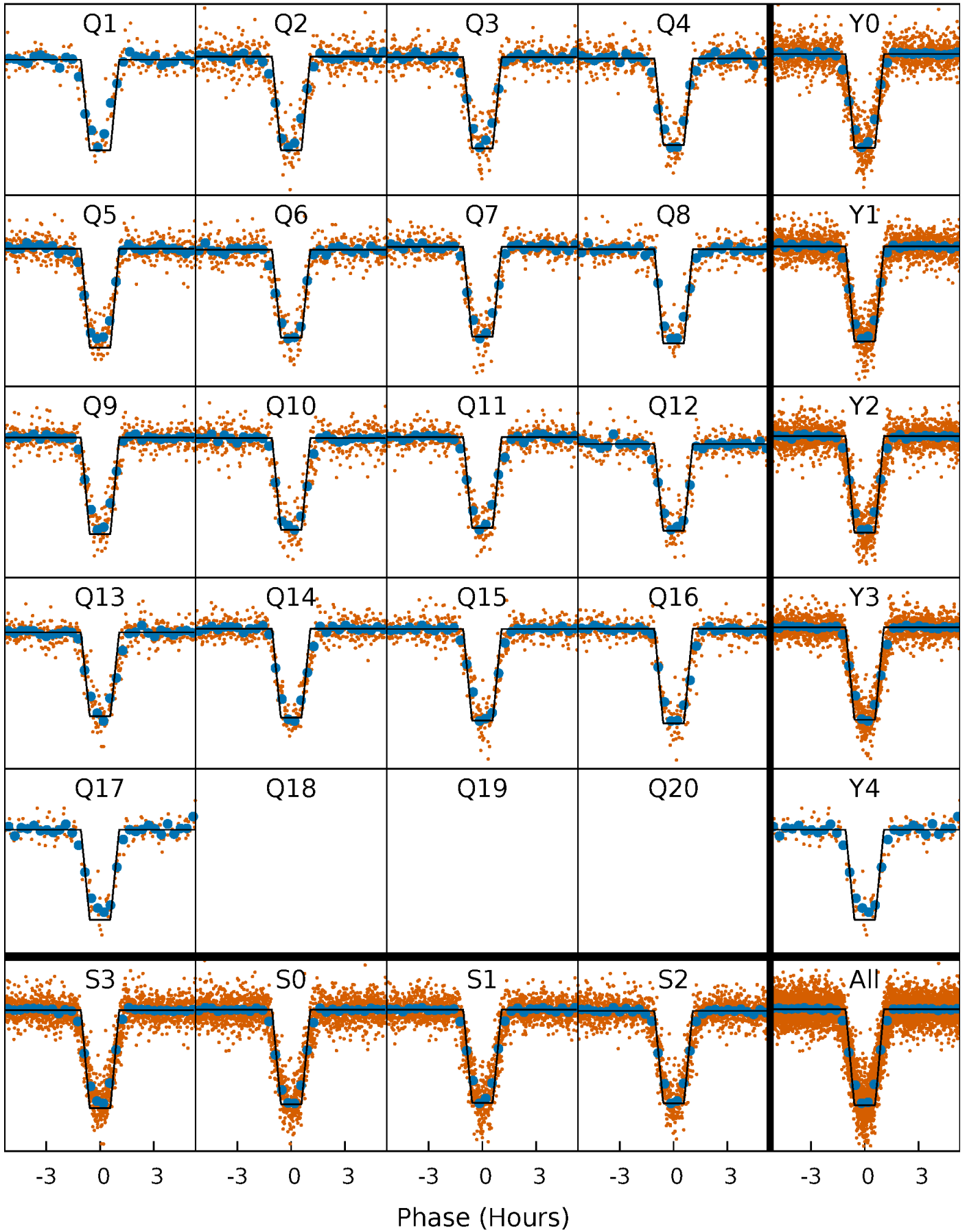
TCE 006628237-02   P= 3.840127 Days    $T_0=133.220434$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

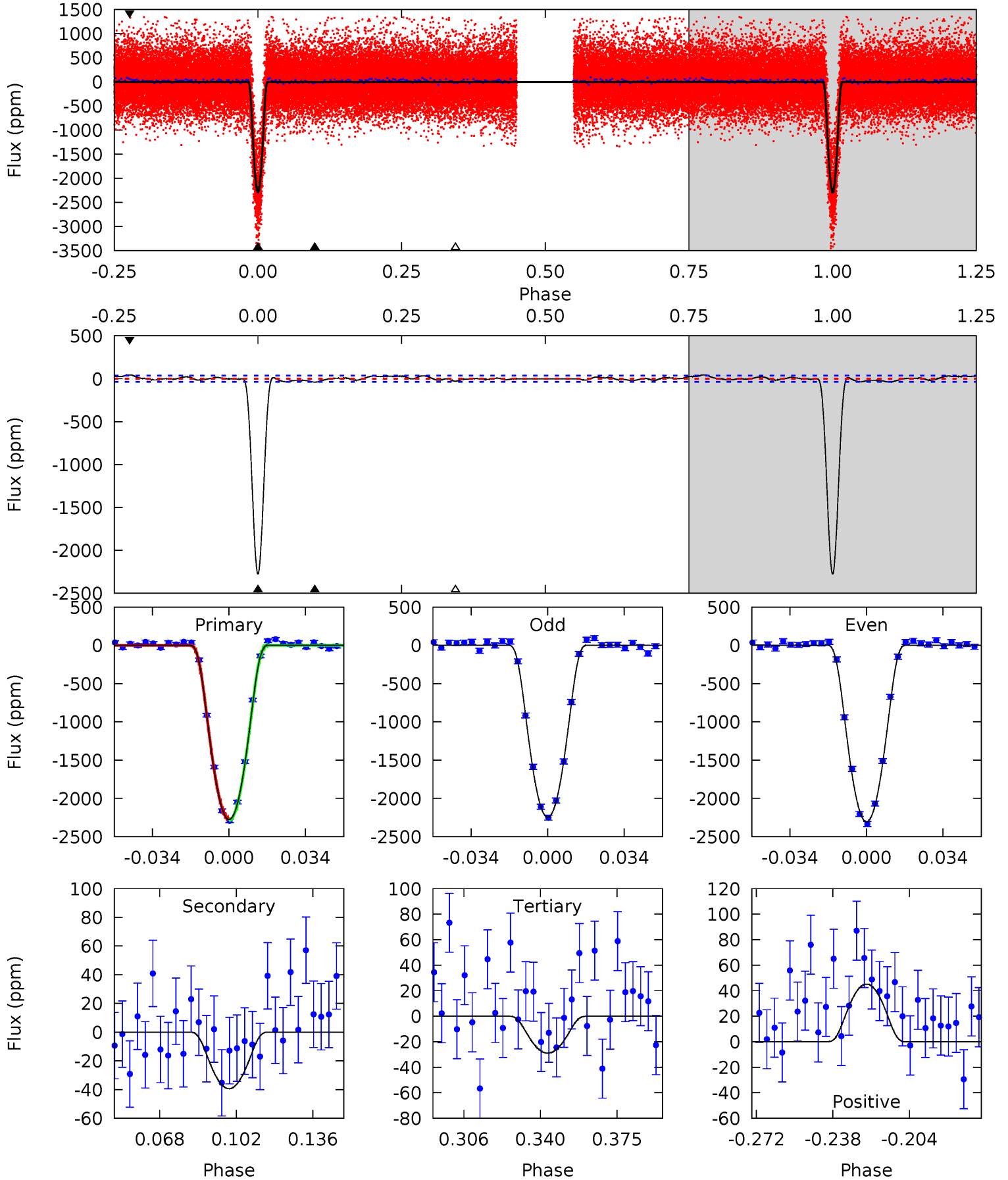
TCE 006628237-02 P= 3.840112 Days  $T_0=133.223559$  (BKJD)



# DV Model-Shift Uniqueness Test

006628237-02, P = 3.840127 Days, E = 129.380307 Days

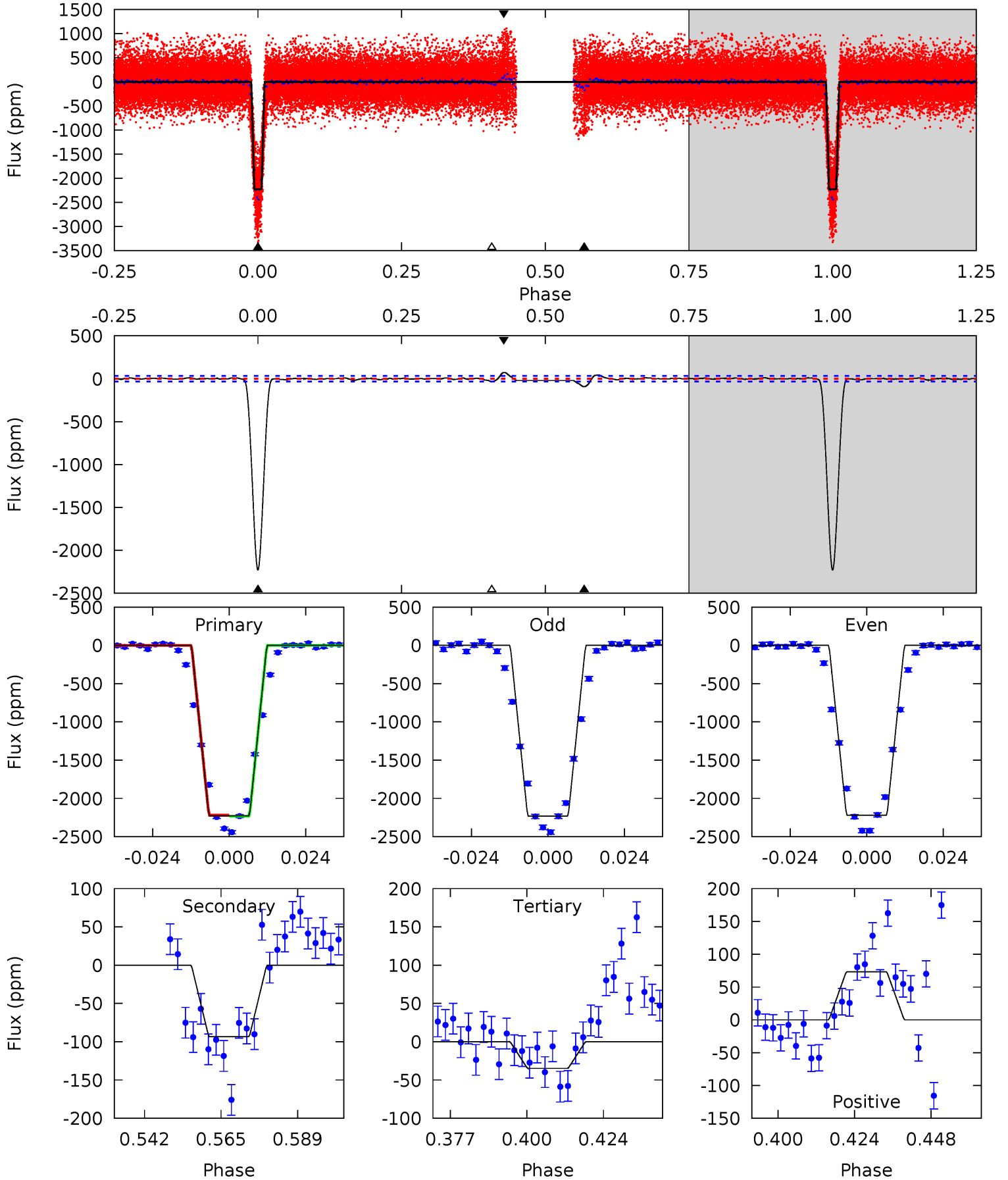
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
301.0	5.20	3.82	5.97	4.79	2.12	2.15	297.1	295.0	1.38	-0.77	3.91	0.97	0.02	1.29



# Alt Model-Shift Uniqueness Test

006628237-02, P = 3.840112 Days, E = 129.383447 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
334.0	14.0	5.22	11.0	4.86	2.26	1.65	328.7	323.0	8.78	3.01	0.82	1.00	0.03	0.94



### Stellar Parameters For KIC 006628237

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5931^{+160}_{-196}$	$4.418^{+0.101}_{-0.188}$	$-0.120^{+0.300}_{-0.300}$	$1.012^{+0.301}_{-0.151}$	$0.981^{+0.132}_{-0.119}$	$1.331^{+0.519}_{-0.683}$
	+3%/-3%	+2%/-4%	+250%/-250%	+30%/-15%	+13%/-12%	+39%/-51%
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 006628237-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-39 \pm 8$	$7.55^{+1.38}_{-1.01}$	$1702^{+113}_{-95}$	$2473^{+138}_{-142}$	$0.836^{+0.354}_{-0.254}$
Alt.	$-93 \pm 7$	$5.55^{+1.15}_{-0.89}$	$1705^{+112}_{-95}$	$3173^{+172}_{-142}$	$3.763^{+1.488}_{-1.161}$

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

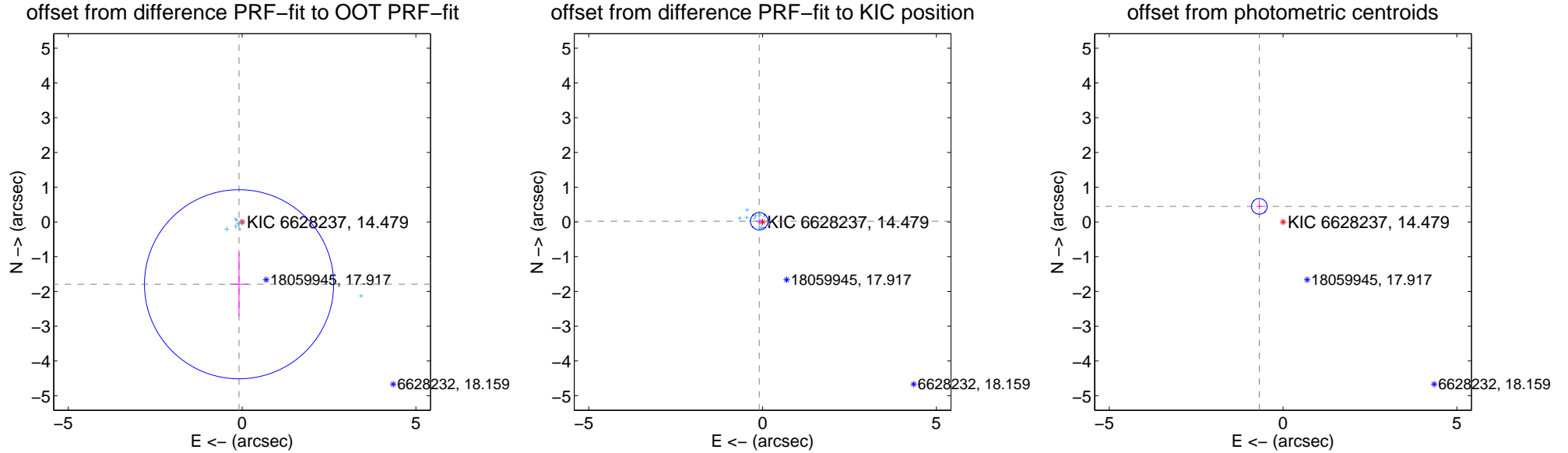
## DV Centroid Data

Supplemental centroid analysis for 006628237-02. Kepler magnitude: 14.48. Transit SNR 159.37

There are 17 quarters with good PRF difference image offsets

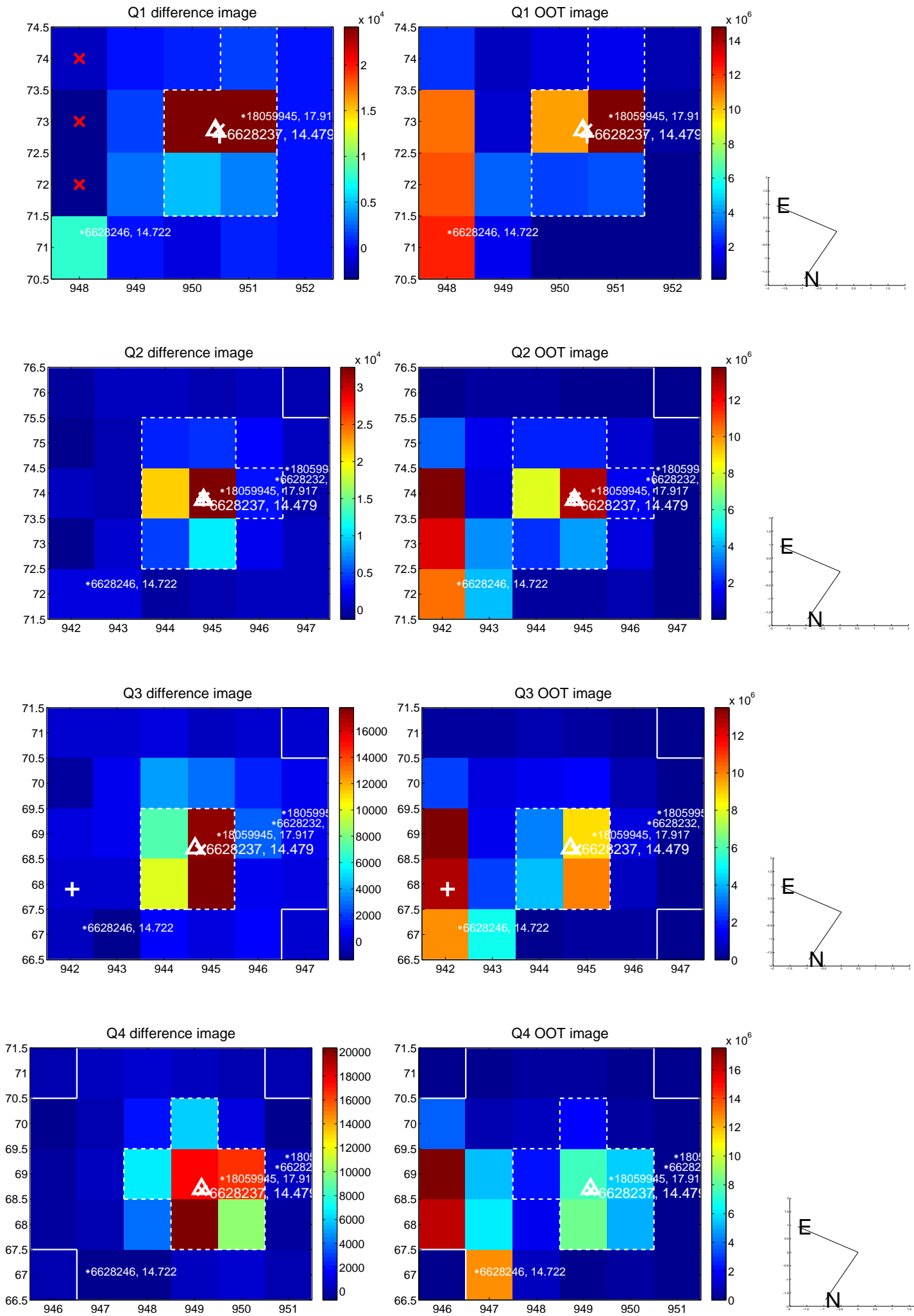
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.795 \pm 0.907$	1.98	$0.087 \pm 0.272$	$-1.792 \pm 0.908$
PRF-fit source offset from KIC position	$0.099 \pm 0.084$	1.19	$0.097 \pm 0.082$	$0.021 \pm 0.074$
photometric centroid source offset	$0.82 \pm 0.08$	10.85	$0.68 \pm 0.07$	$0.45 \pm 0.08$

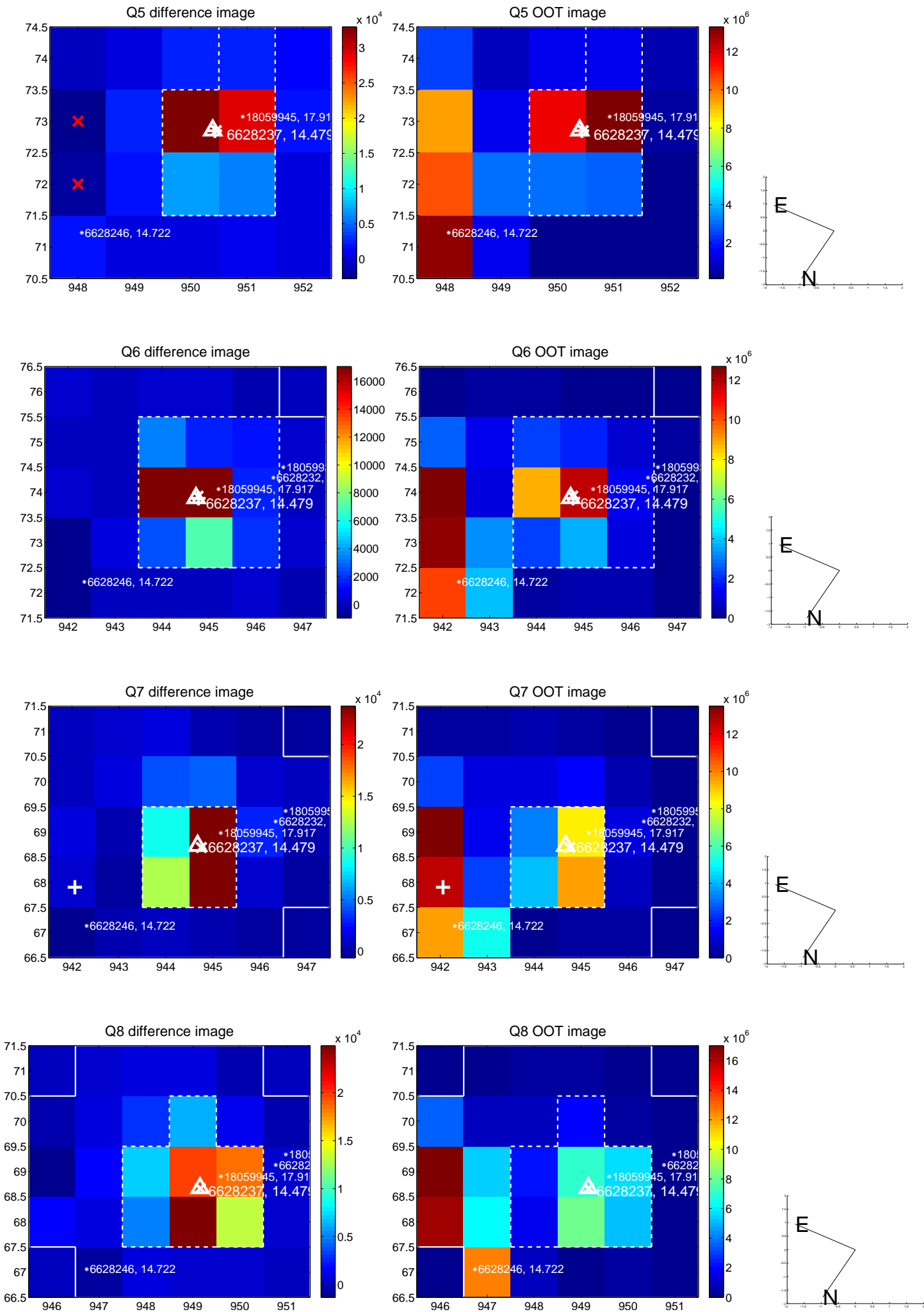


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

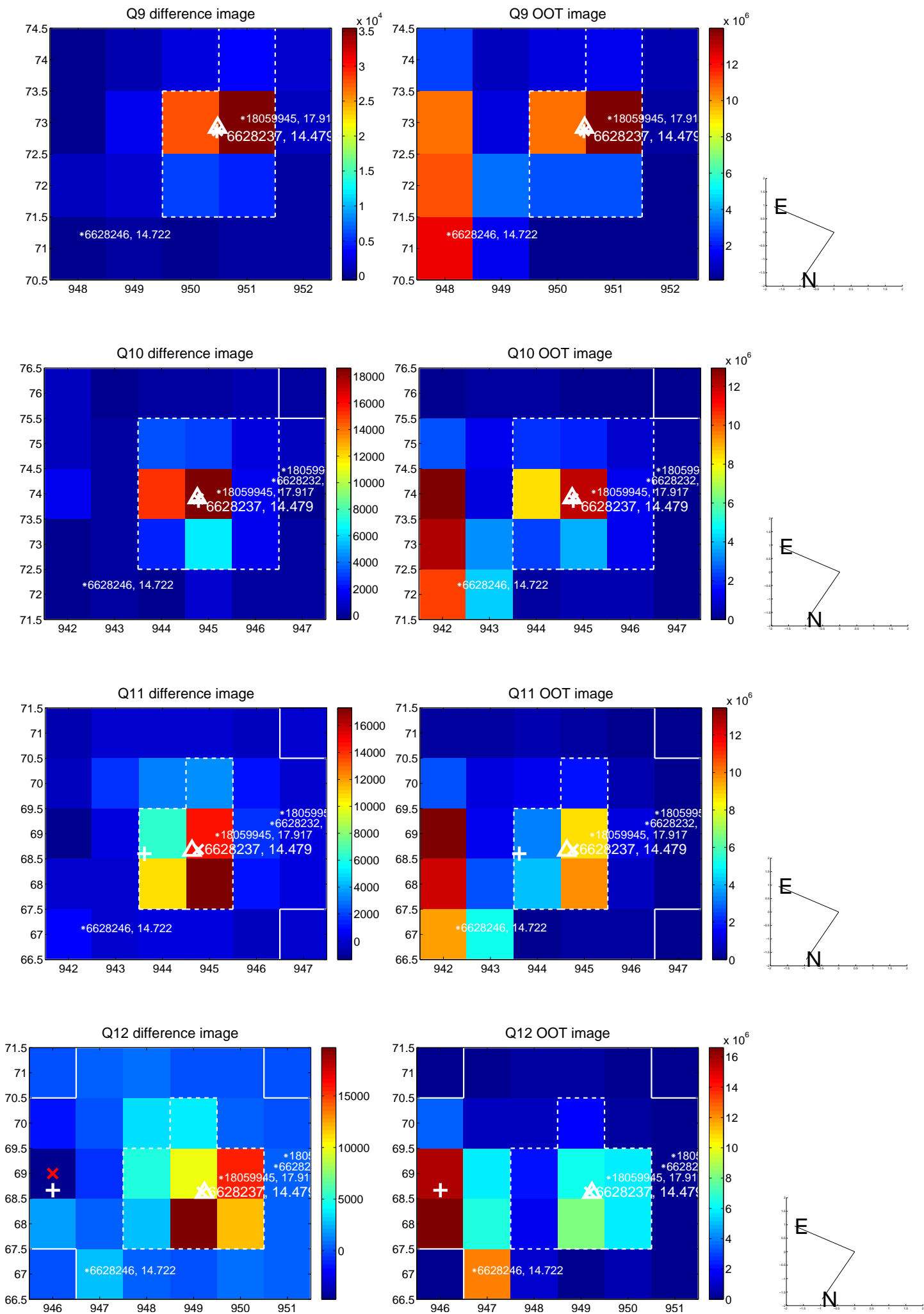


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

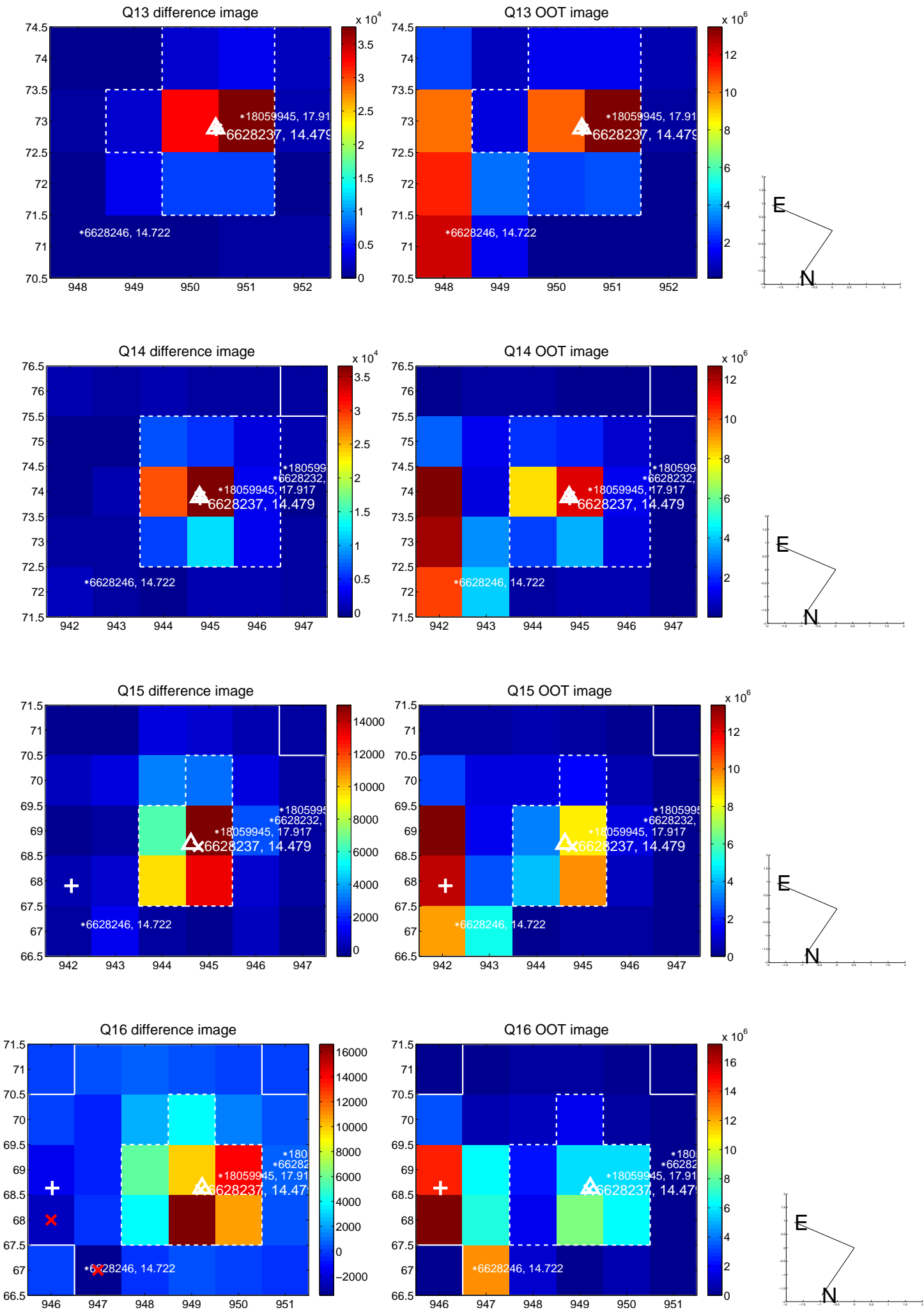




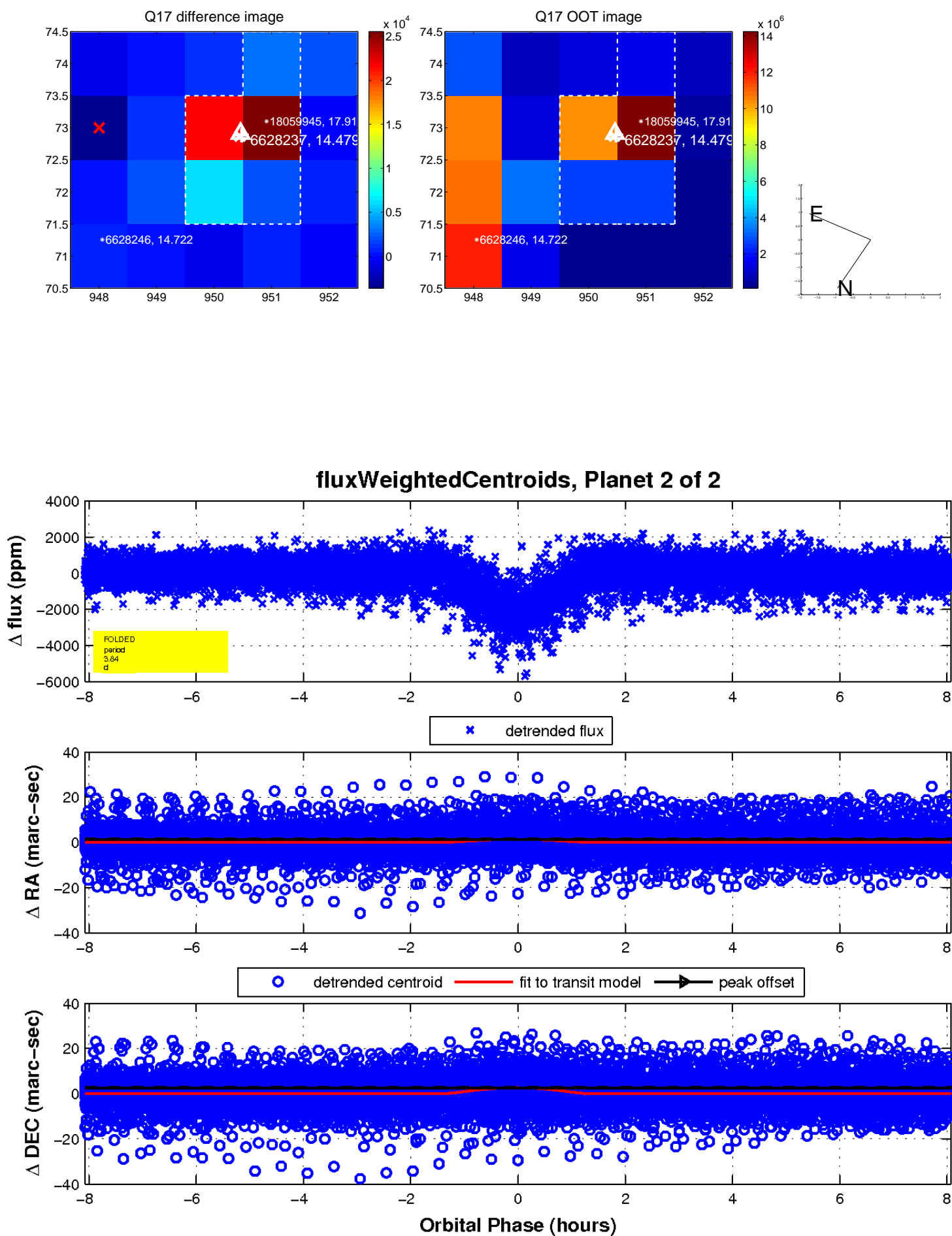
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

