

# KIC 012314973

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012314973-01	OBS	0279.01	28.454890	148.251314	1418.8	8.221	193.5	196.1	1.57	6206	6.13	82.87
012314973-02	OBS	0279.02	15.413098	136.942058	248.7	7.102	43.6	48.5	1.57	6206	2.97	187.69
012314973-03	OBS	0279.03	7.514274	136.186667	32.9	5.348	8.2	9.7	1.57	6206	1.04	489.15

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012314973-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012314973-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012314973-03	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

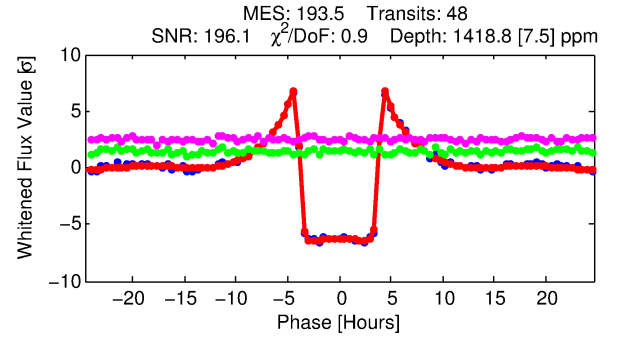
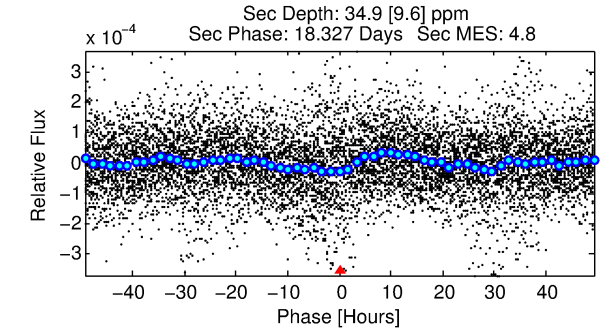
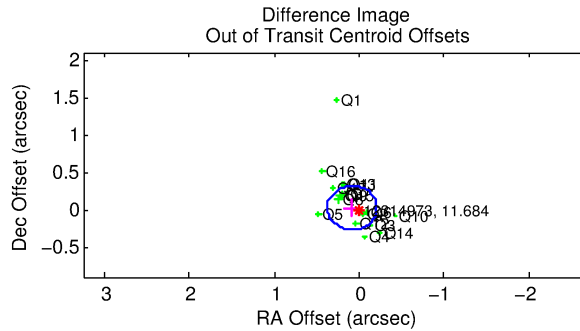
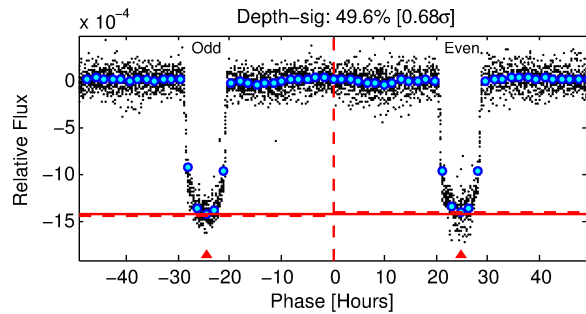
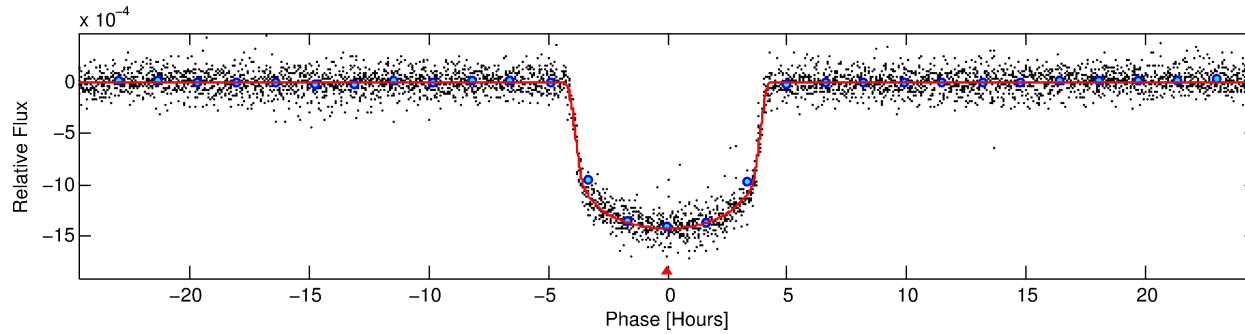
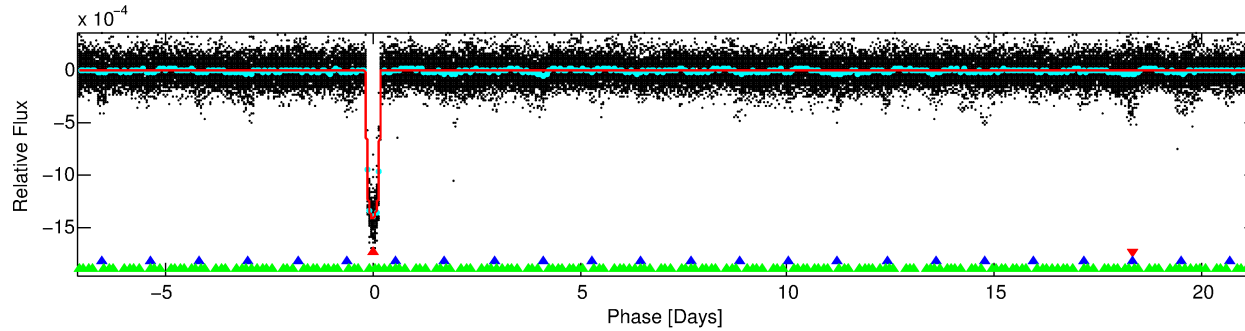
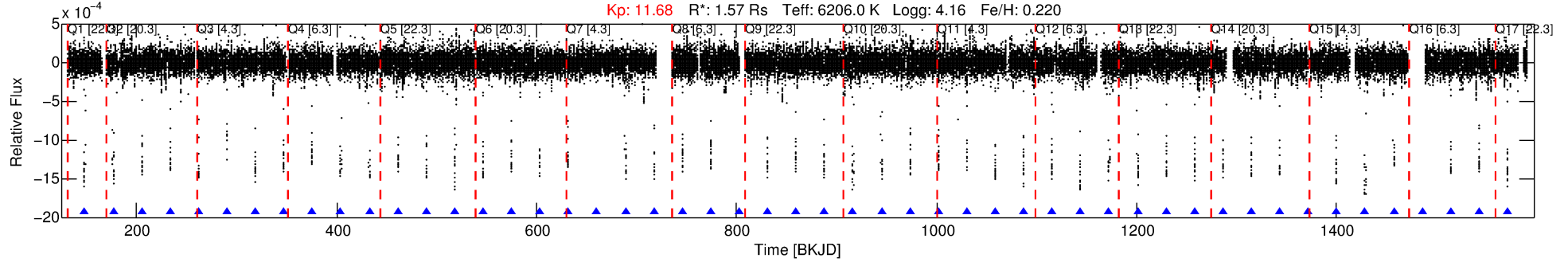
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012314973-01

No Significant Match Found

# DV One-Page Summary

KIC: 12314973 Candidate: 1 of 3 Period: 28.455 d  
KOI: K00279.01 Name: Kepler-450b Corr: 0.994



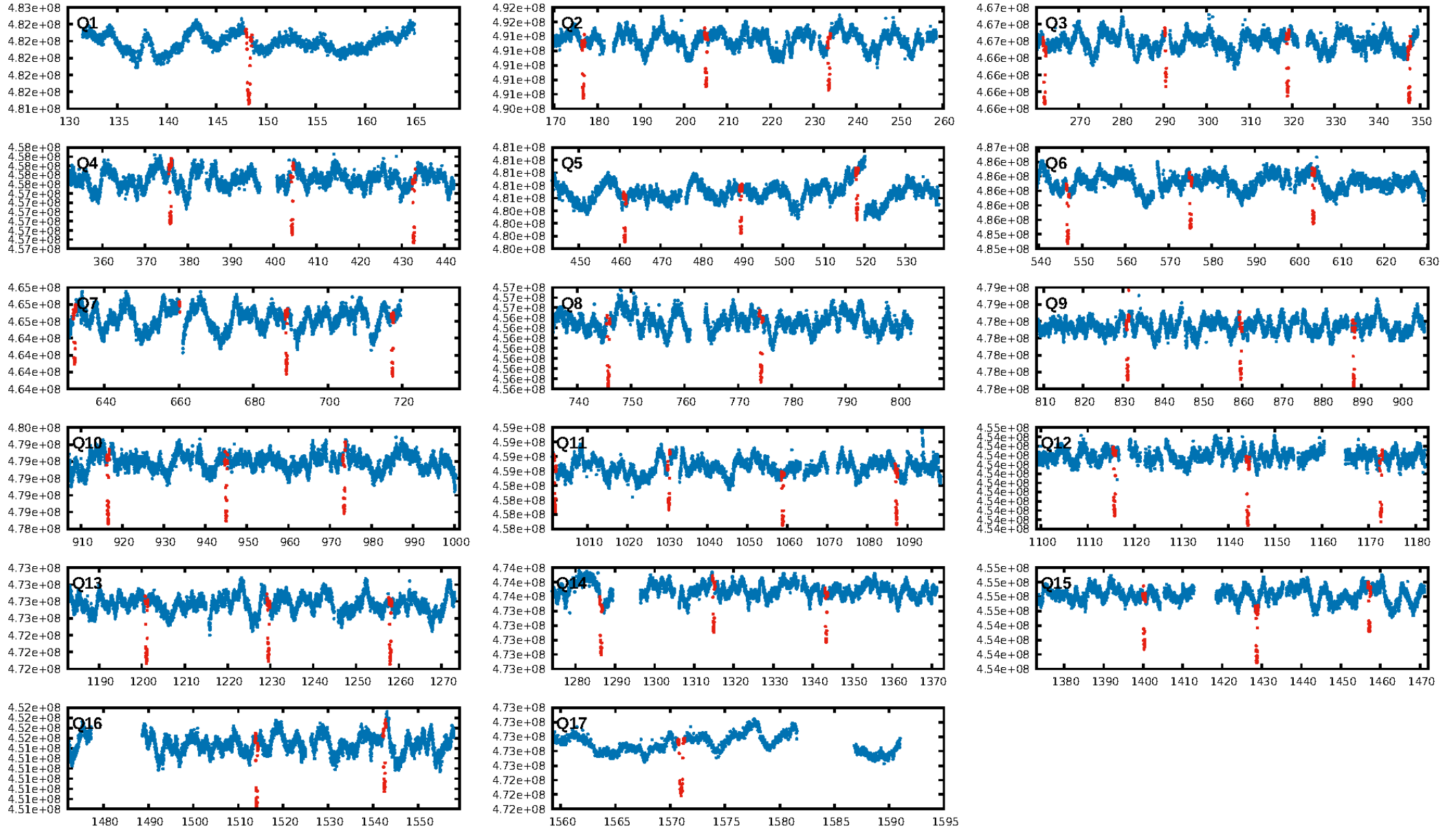
## DV Fit Results:

Period = 28.45489 [0.00001] d  
Epoch = 148.2513 [0.0004] BKJD  
Rp/R\* = 0.0357 [0.0004]  
a/R\* = 23.18 [1.25]  
b = 0.55 [0.07]  
Seff = 82.87 [8.41]  
Teq = 769 [20] K  
Rp = 6.13 [0.44] Re  
a = 0.1992 [0.0119] AU  
Ag = 20.28 [5.88] [3.28 $\sigma$ ]  
Teffp = 2524 [178] K [9.82 $\sigma$ ]

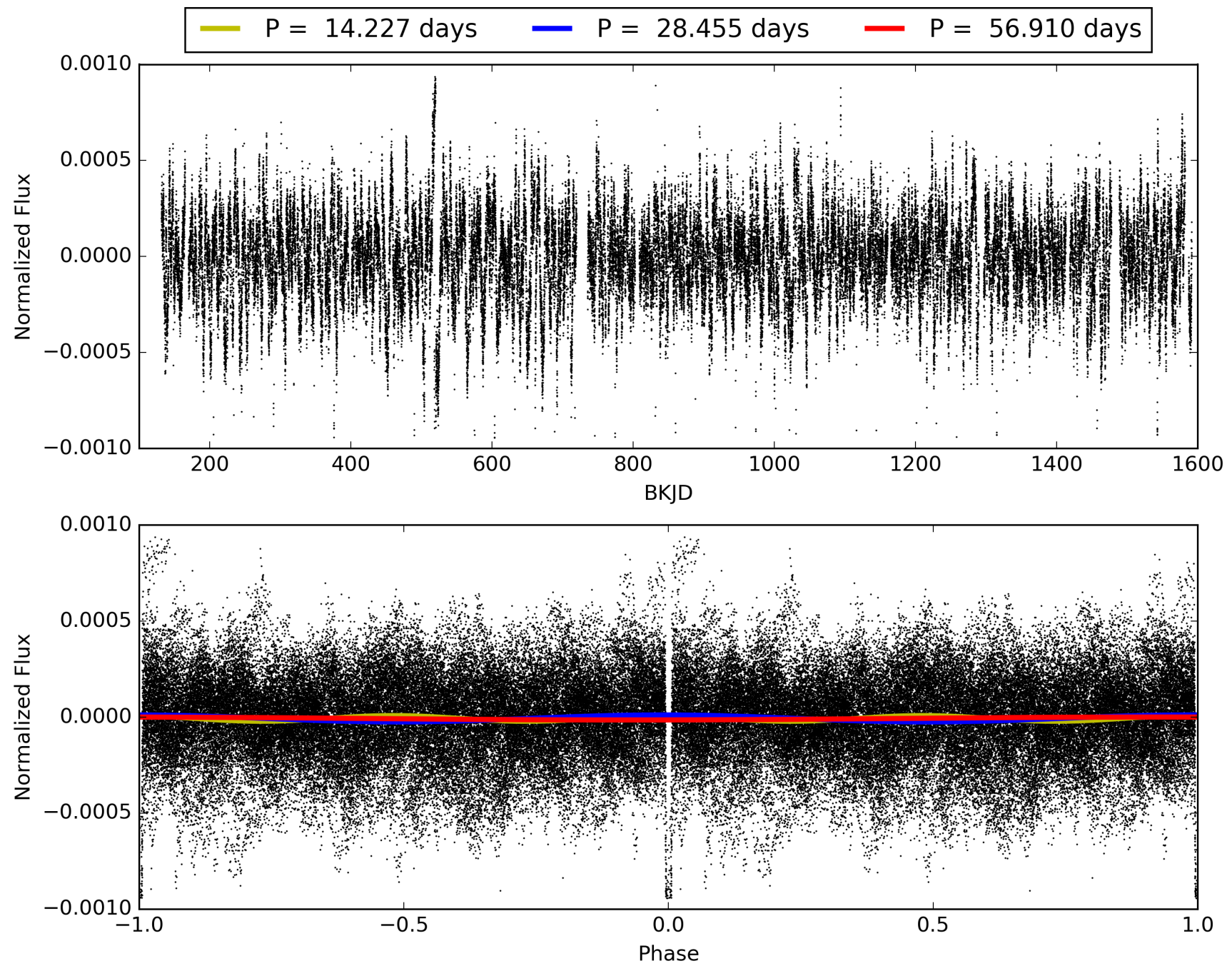
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.81 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 63.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [46/46]  
GhostDiagnostic-chr: 5.934  
Centroid-sig: 53.2%  
Centroid-so: 0.115 arcsec [3.26 $\sigma$ ]  
OotOffset-rm: 0.084 arcsec [0.87 $\sigma$ ]  
KicOffset-rm: 0.249 arcsec [2.22 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.94 [16/17]

# TCE 012314973-01, PDC Light Curves



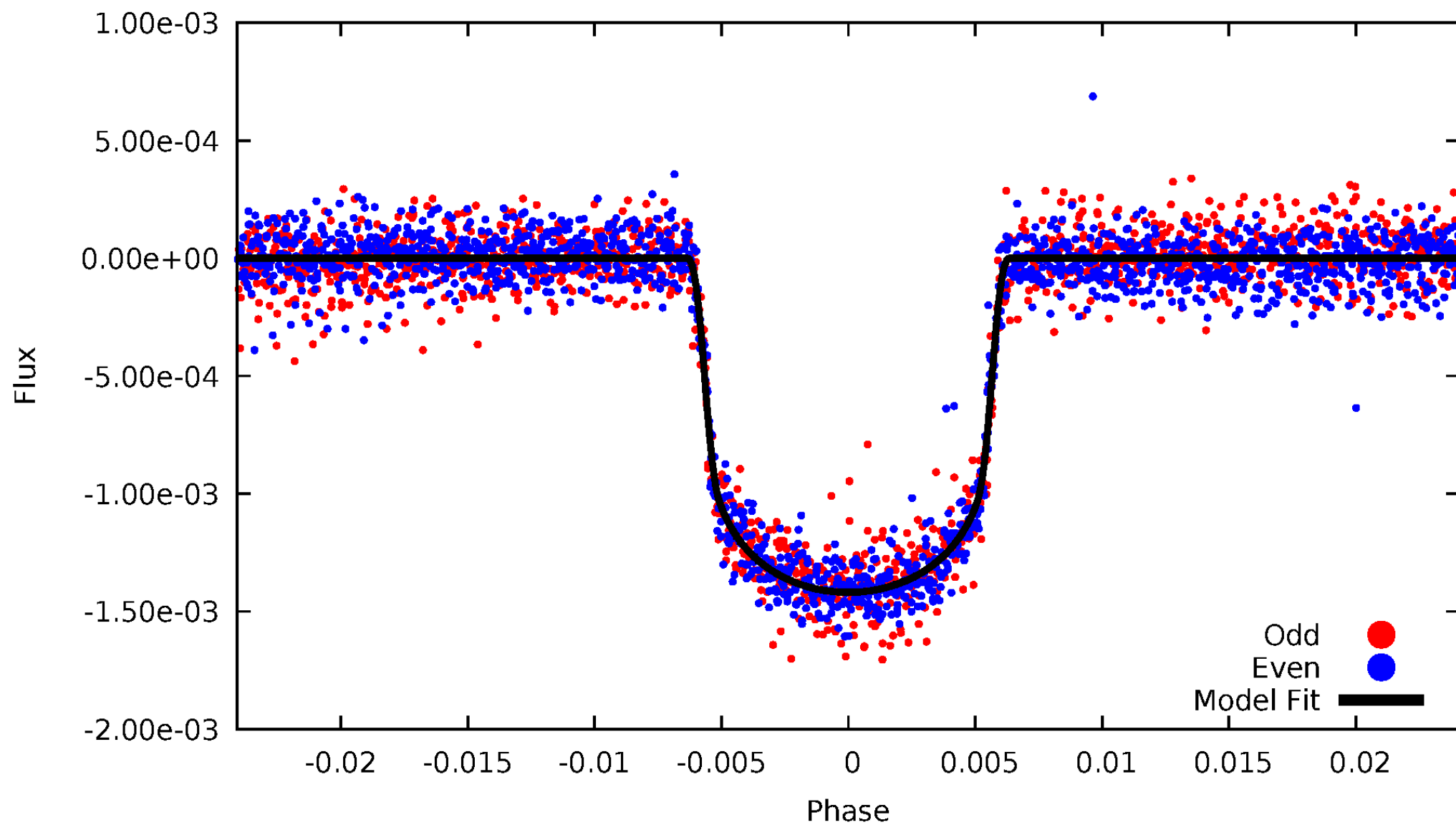
TCE 012314973-01





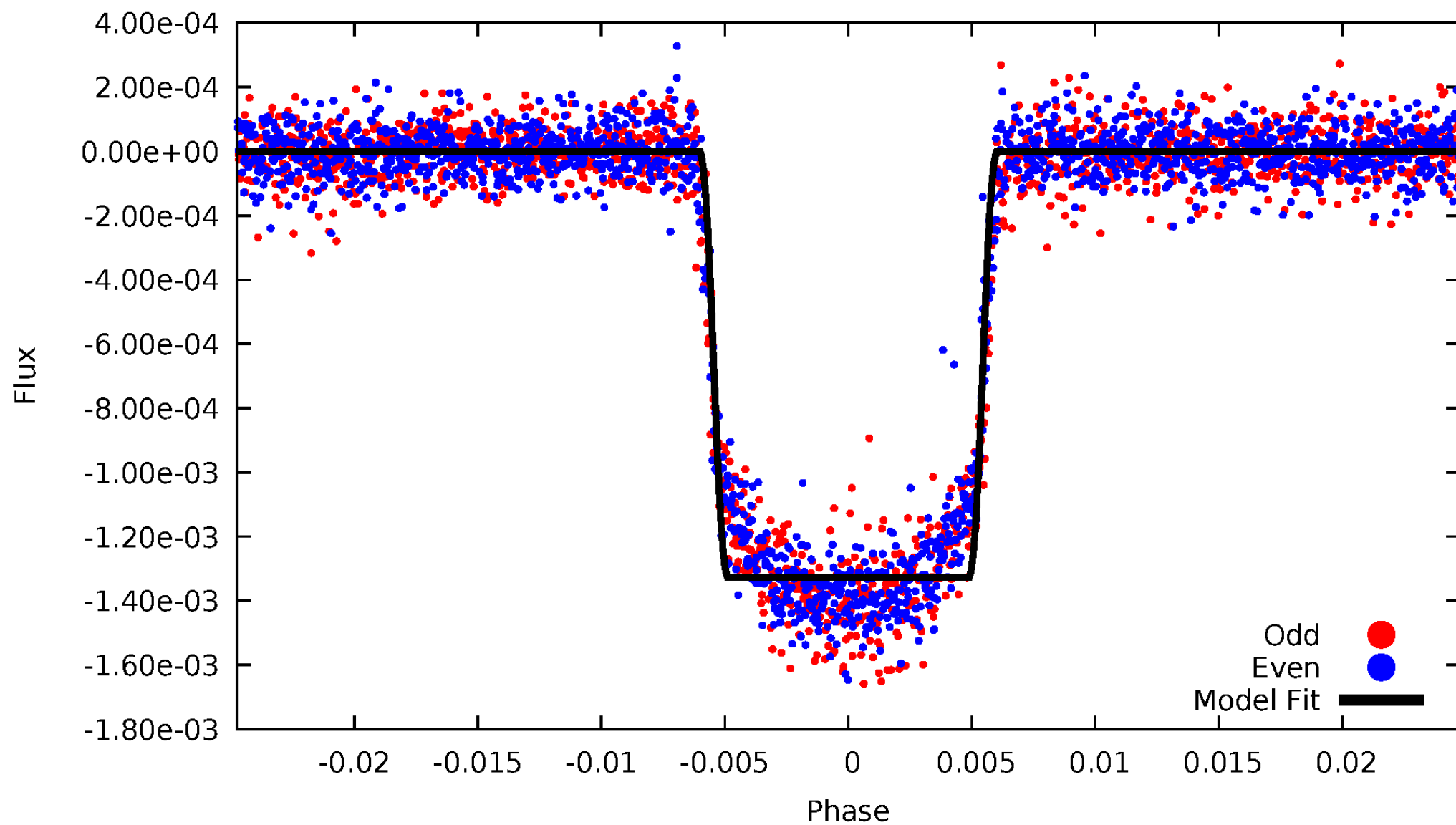
# DV Odd/Even

TCE 012314973-01



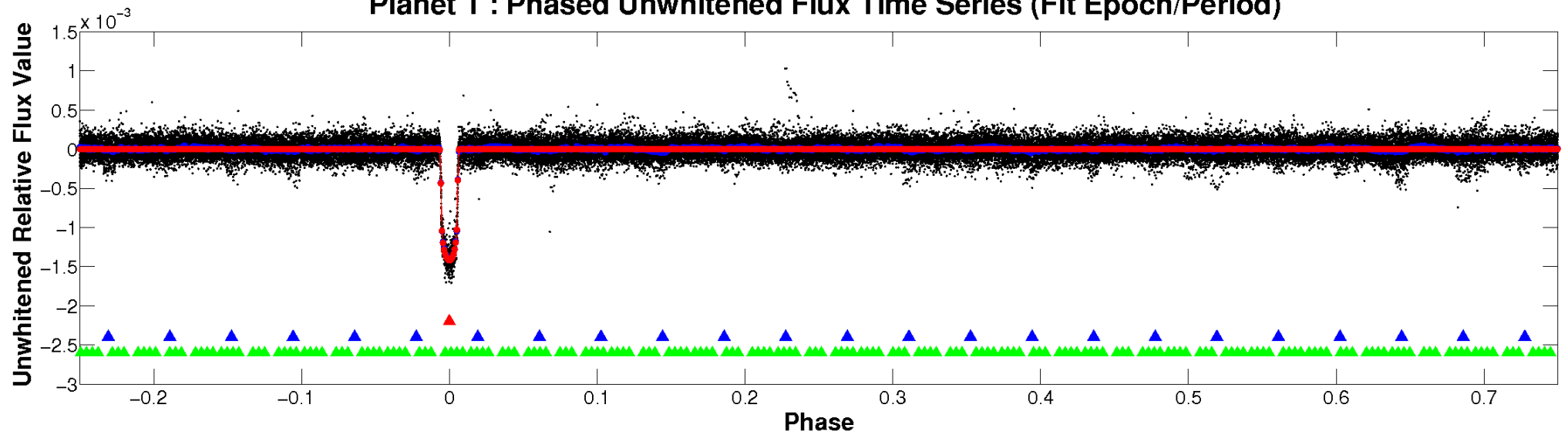
# ALT Odd/Even

TCE 012314973-01

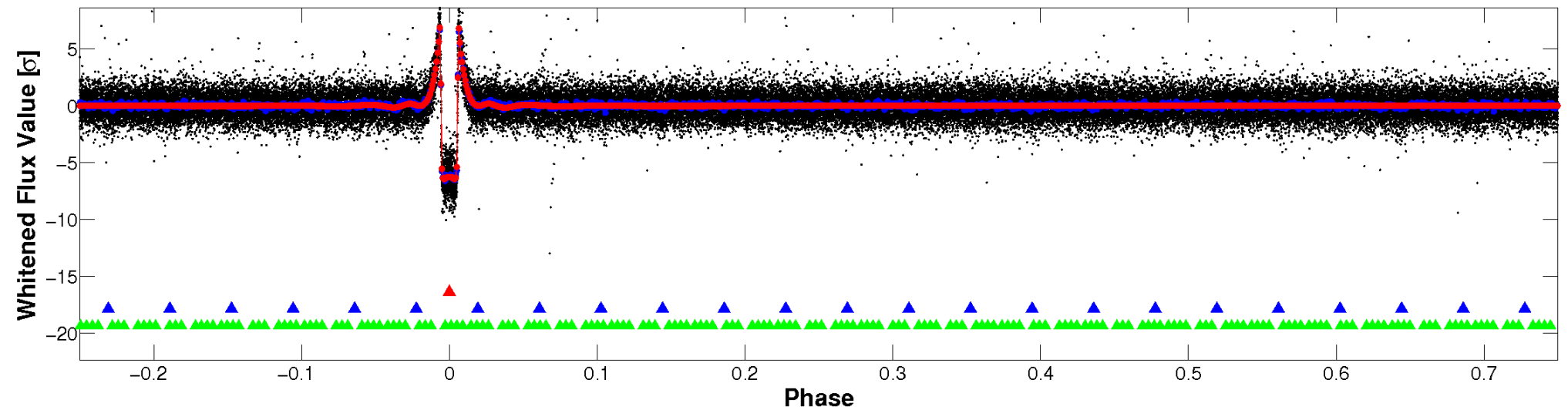


# Non-Whitened Vs. Whitened Light Curve

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

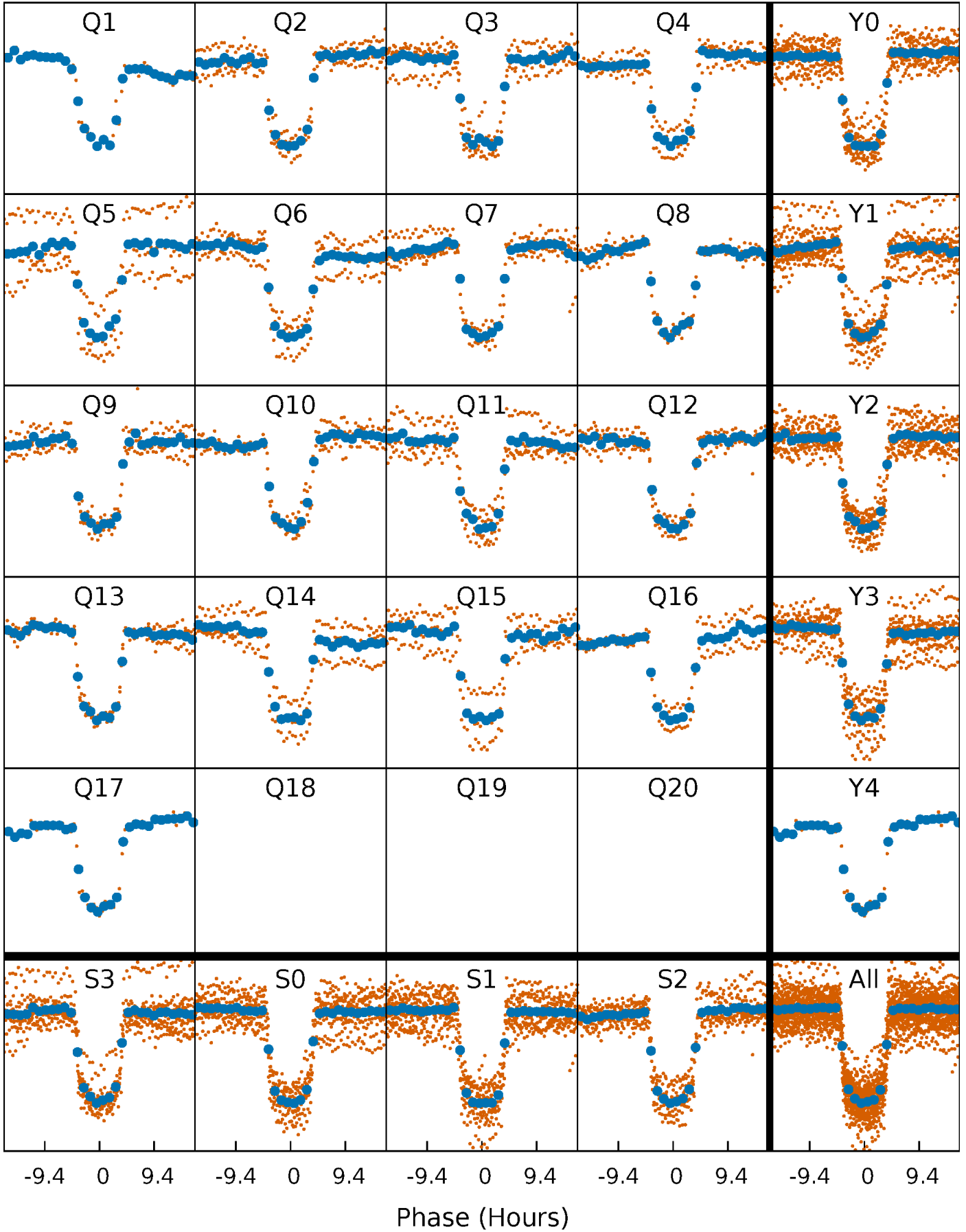


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



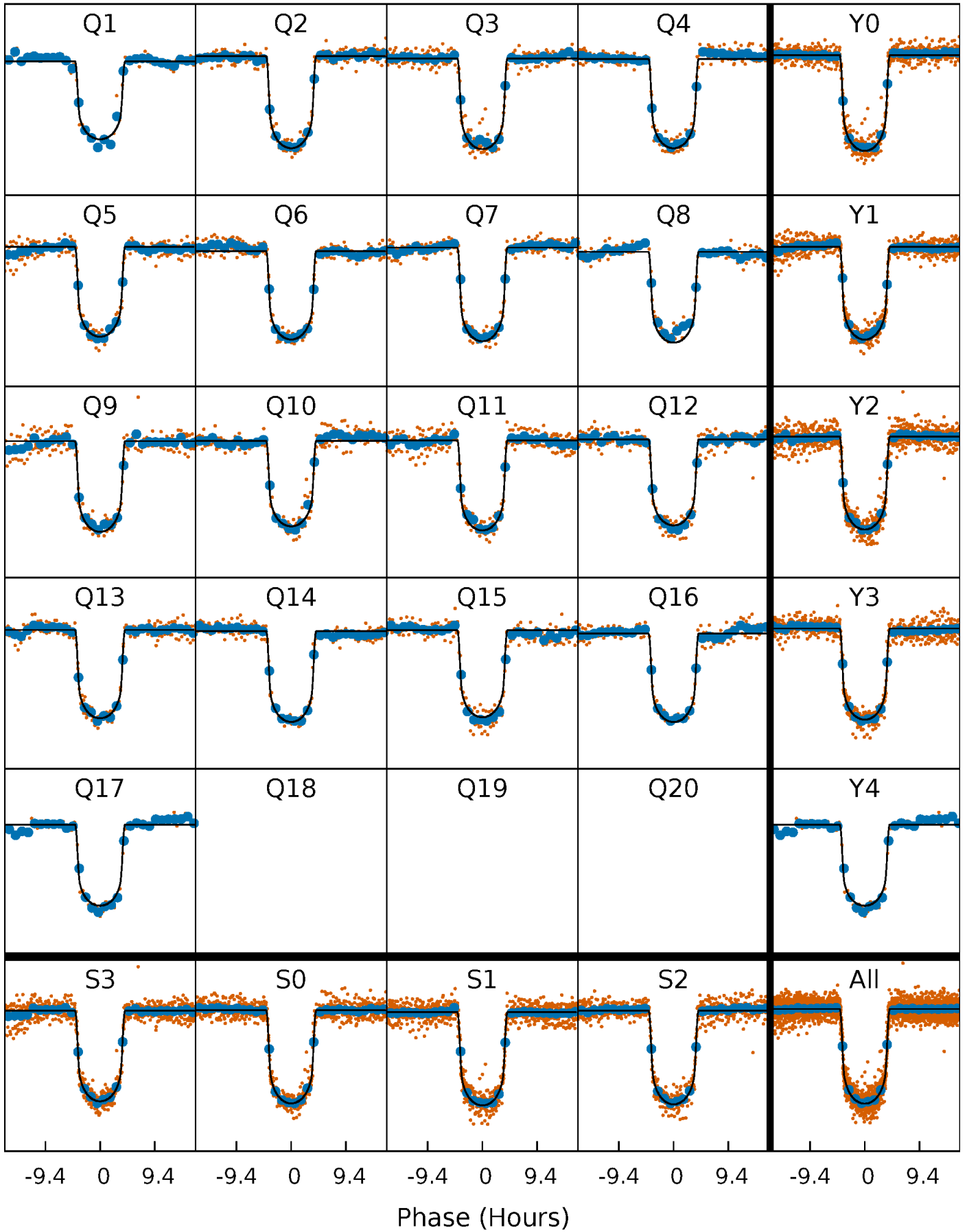
# PDC Quarter-Phased Transit Curves

TCE 012314973-01   P= 28.454890 Days    $T_0=148.251314$  (BKJD)



# DV Quarter-Phased Transit Curves

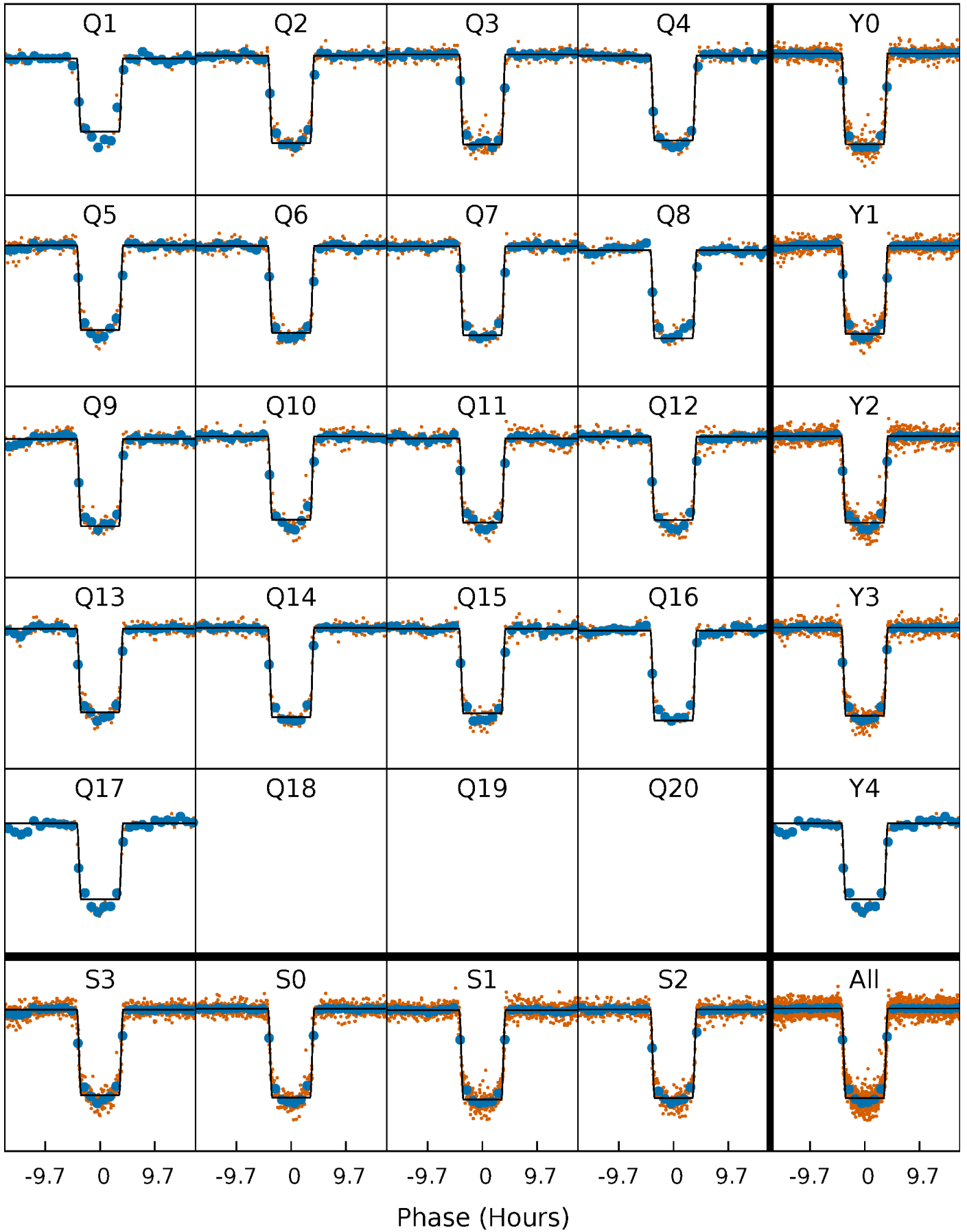
TCE 012314973-01 P= 28.454890 Days  $T_0=148.251314$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

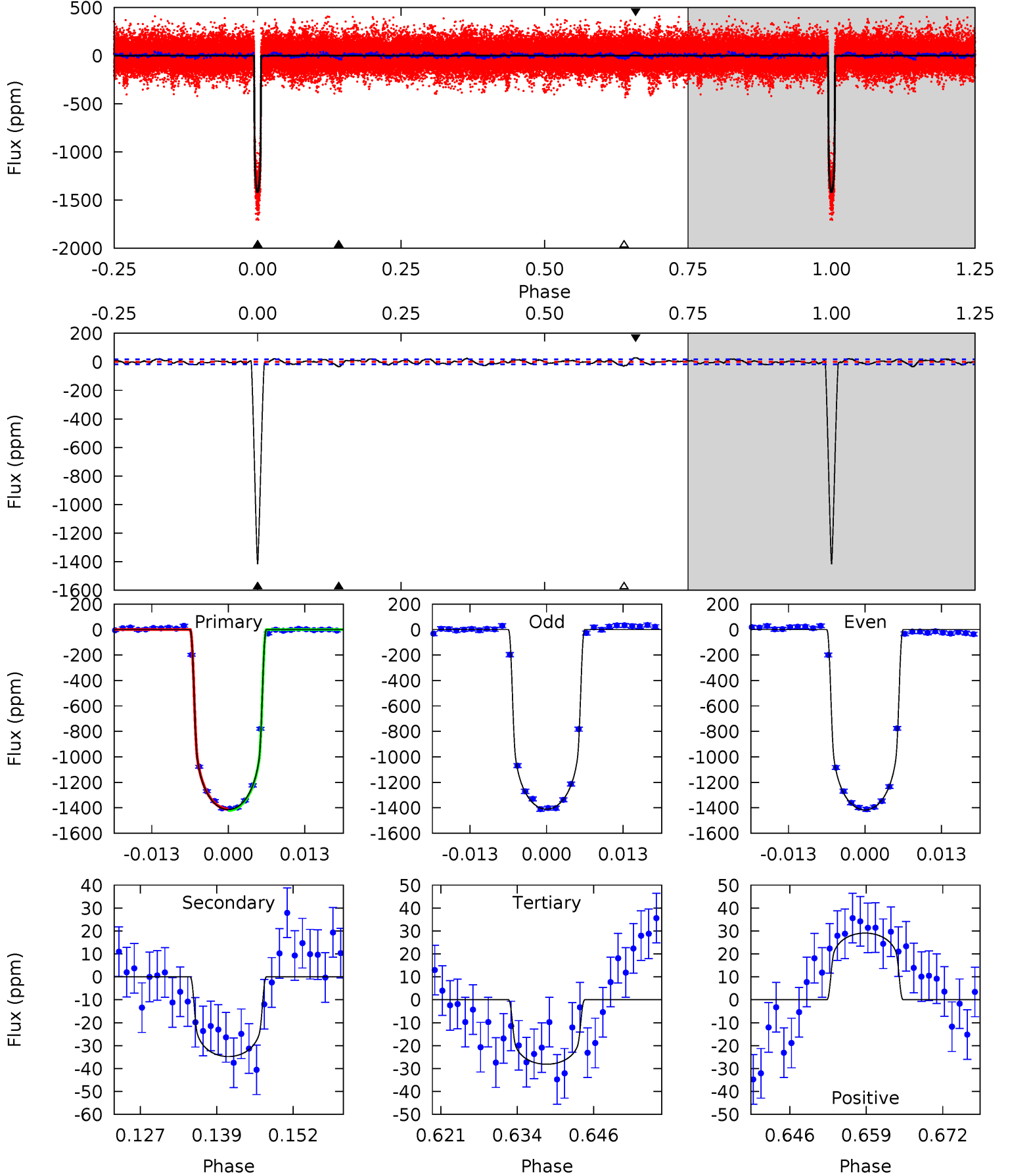
TCE 012314973-01   P= 28.455028 Days    $T_0=148.247983$  (BKJD)



# DV Model-Shift Uniqueness Test

012314973-01, P = 28.454890 Days, E = 119.796424 Days

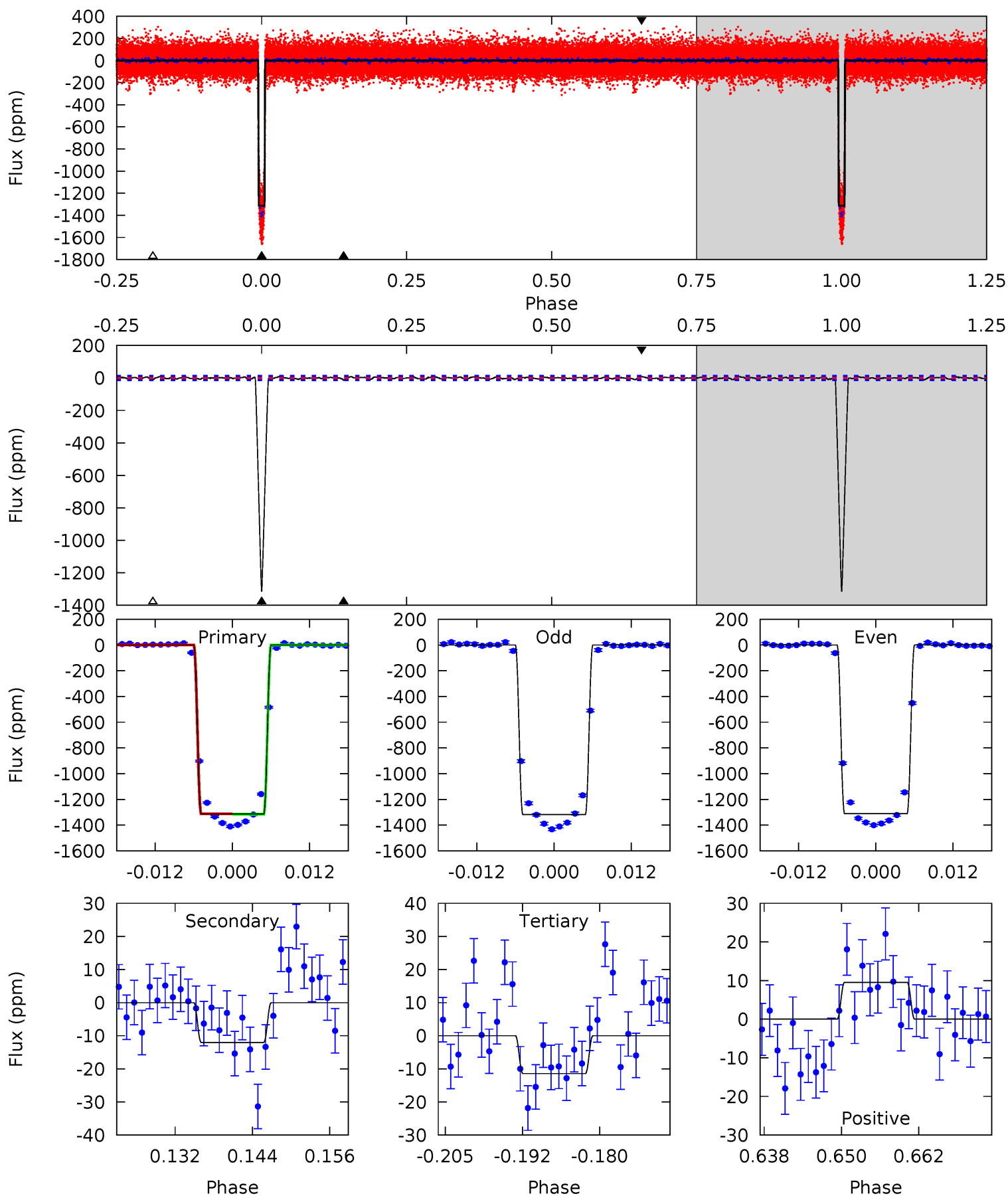
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
404.7	9.95	8.05	8.32	4.98	2.49	3.06	396.6	396.4	1.90	1.63	0.93	1.00	0.02	1.59



# Alt Model-Shift Uniqueness Test

012314973-01, P = 28.455028 Days, E = 119.792955 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
510.6	4.67	4.44	3.71	4.99	2.51	1.37	506.1	506.9	0.23	0.96	1.21	1.00	0.01	0.76



### Stellar Parameters For KIC 012314973

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6206^{+80}_{-74}$	$4.159^{+0.048}_{-0.032}$	$0.220^{+0.150}_{-0.200}$	$1.573^{+0.089}_{-0.111}$	$1.305^{+0.053}_{-0.093}$	$0.473^{+0.093}_{-0.054}$
	+1%/-1%	+1%/-1%	+68%/-91%	+6%/-7%	+4%/-7%	+20%/-11%
Source	SPE72	AST8	SPE72	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 012314973-01 / KOI 0279.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-35 \pm 3$	$6.10^{+0.24}_{-0.27}$	$1072^{+20}_{-21}$	$3135^{+53}_{-55}$	$20^{+2}_{-3}$
Alt.	$-12 \pm 3$	$6.23^{+0.23}_{-0.27}$	$1073^{+20}_{-21}$	$2683^{+71}_{-86}$	$6.770^{+1.447}_{-1.505}$

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

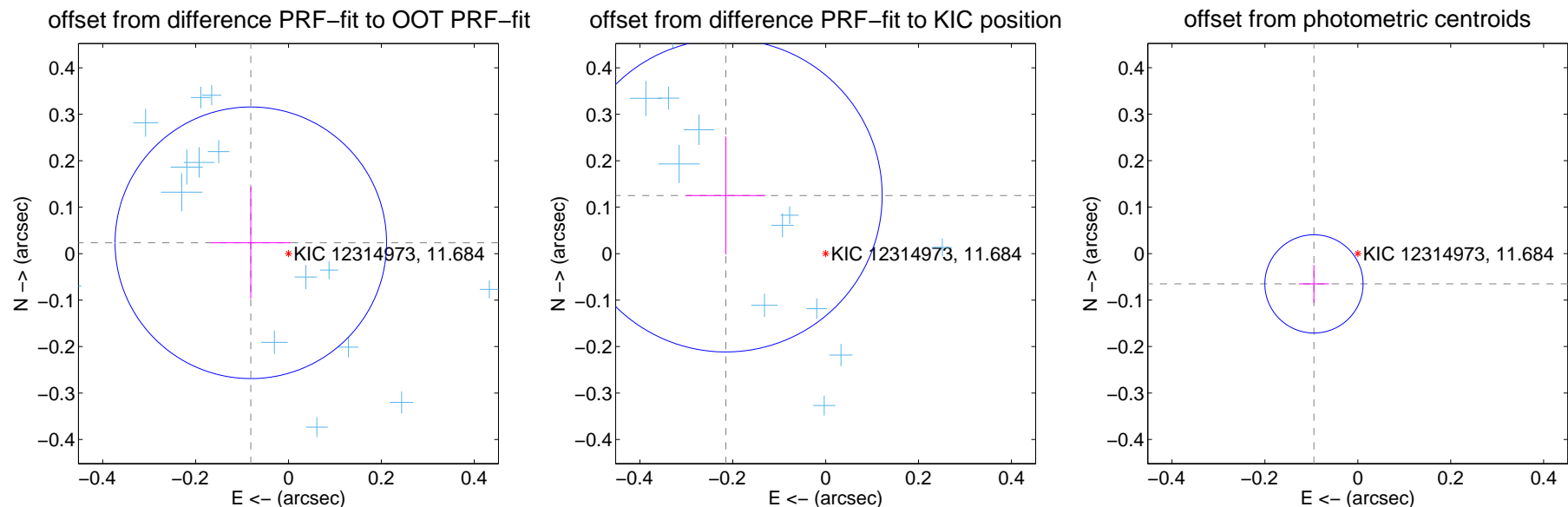
## DV Centroid Data

Supplemental centroid analysis for 012314973-01. **Kepler magnitude: 11.68.** Transit SNR 196.05

There are 17 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

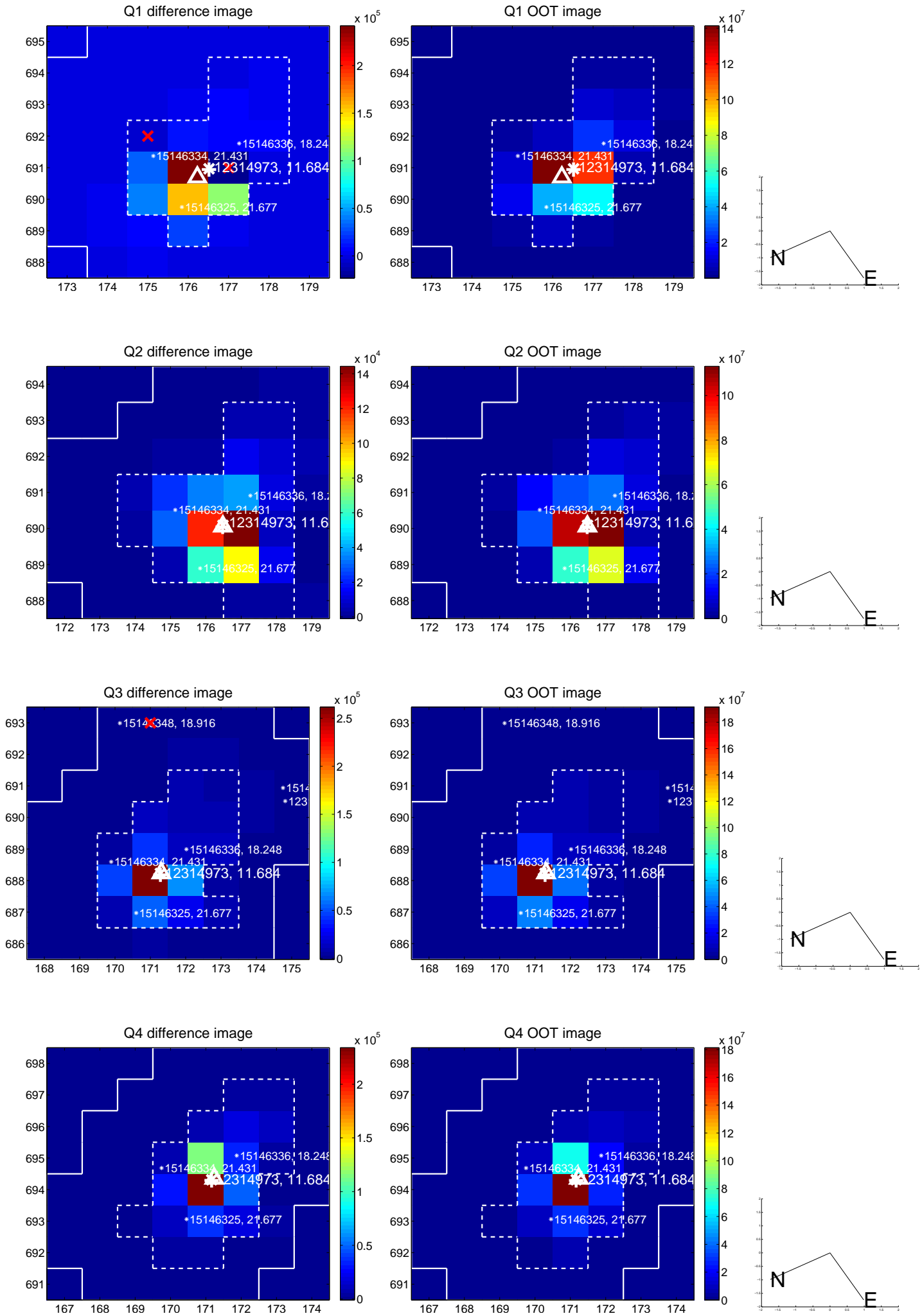
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.084 \pm 0.097$	0.87	$0.081 \pm 0.086$	$0.023 \pm 0.120$
PRF-fit source offset from KIC position	$0.249 \pm 0.112$	2.22	$0.215 \pm 0.085$	$0.125 \pm 0.127$
photometric centroid source offset	$0.11 \pm 0.04$	<b>3.26</b>	$0.09 \pm 0.03$	$-0.07 \pm 0.04$



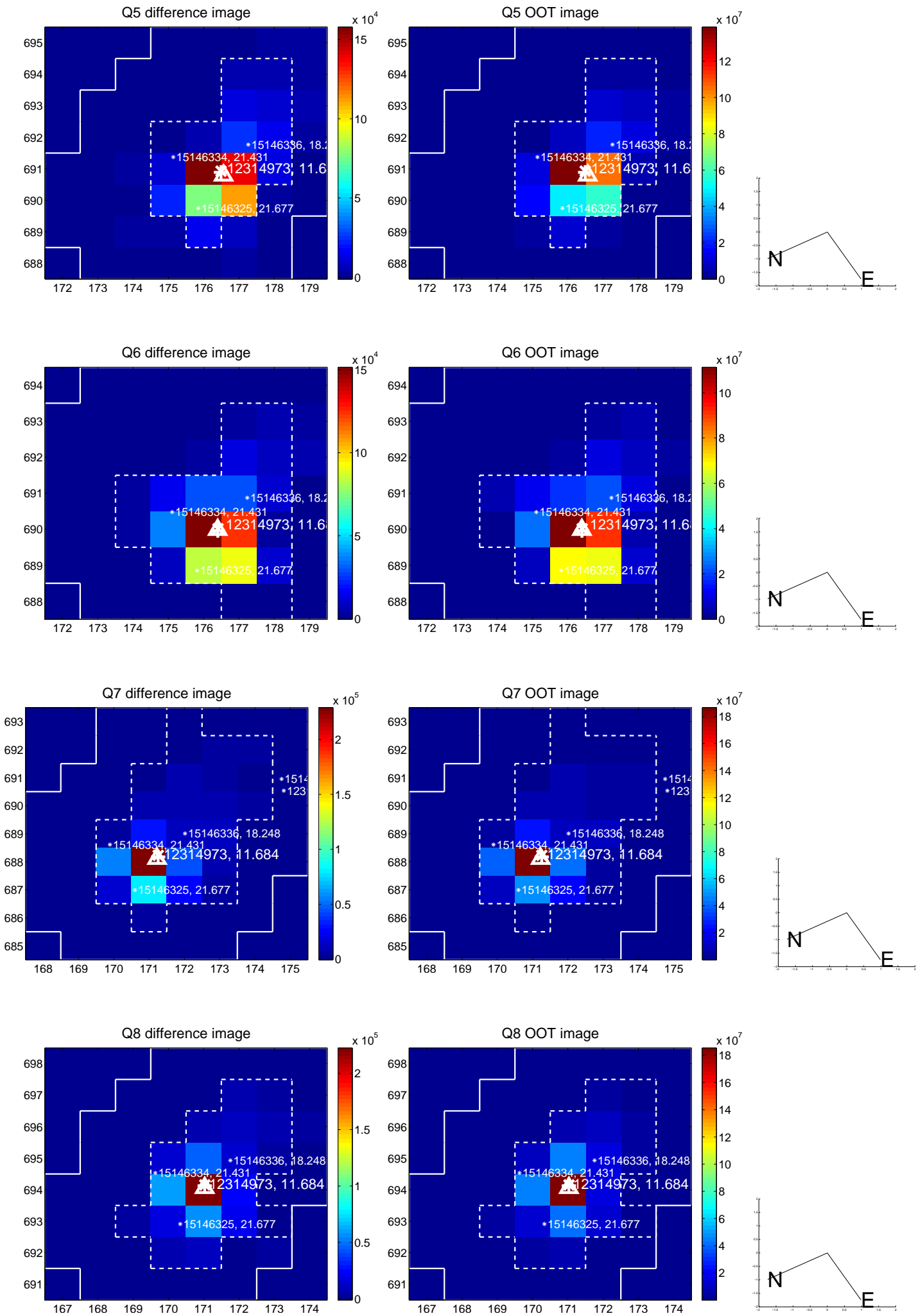
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



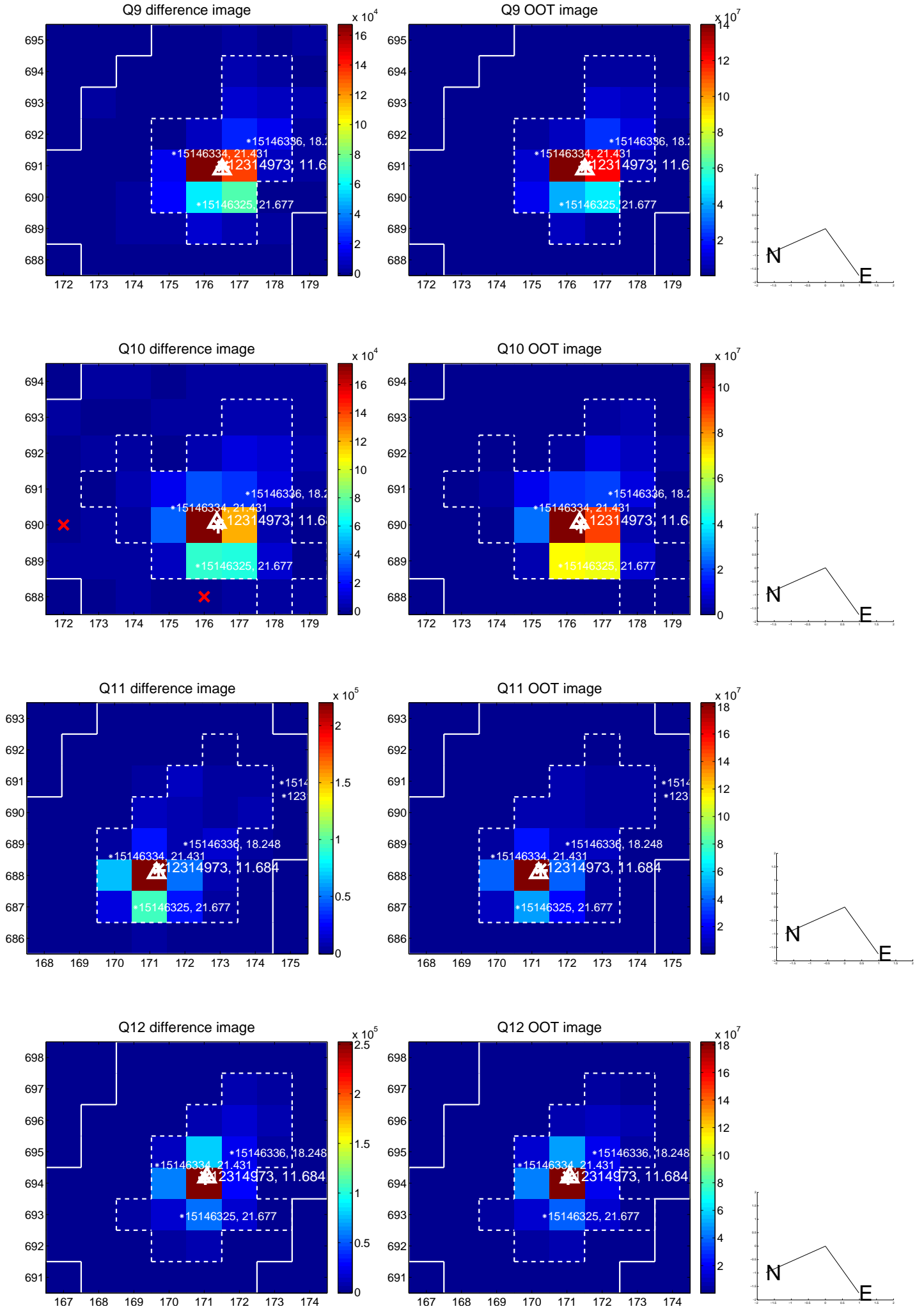
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



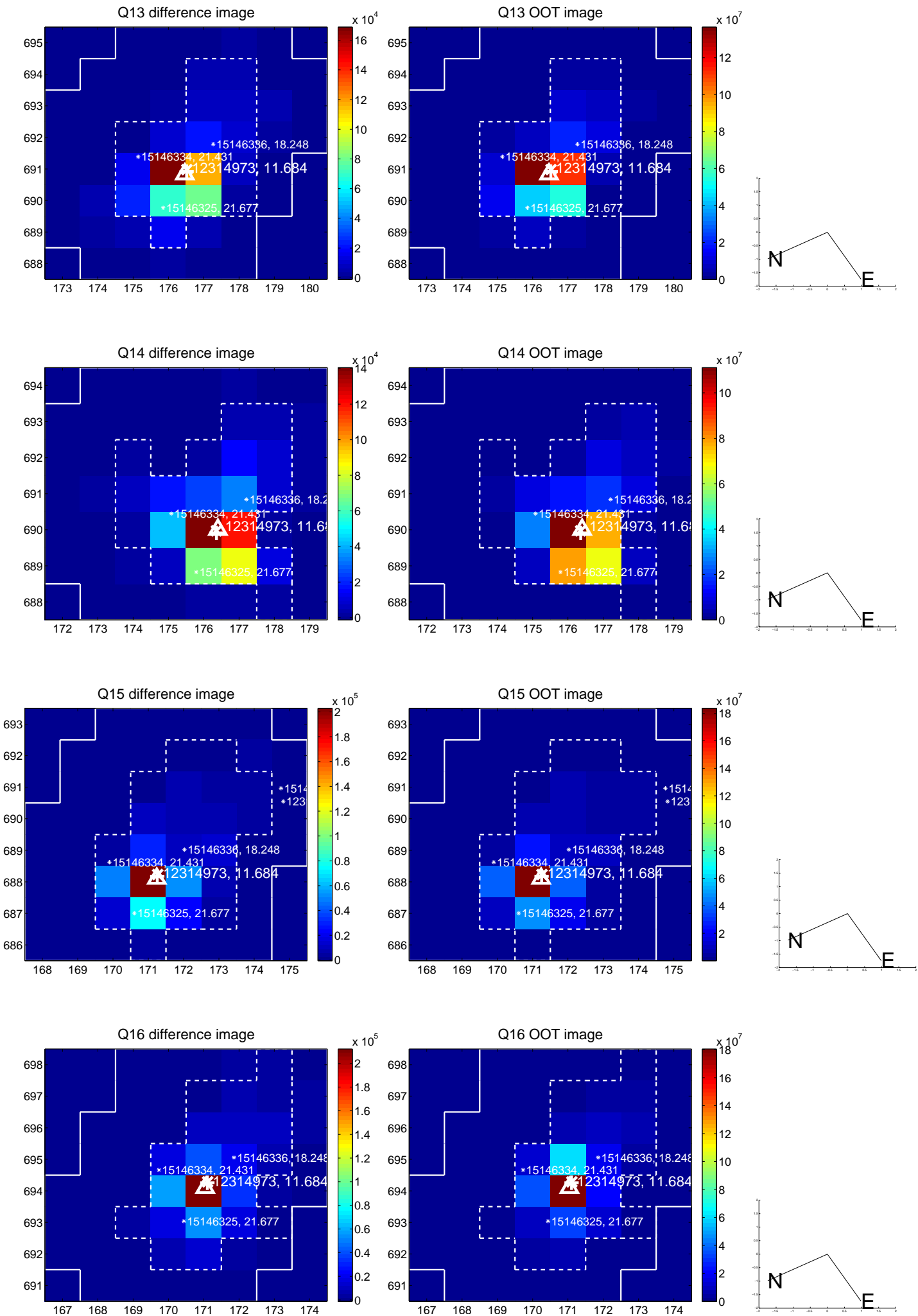
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



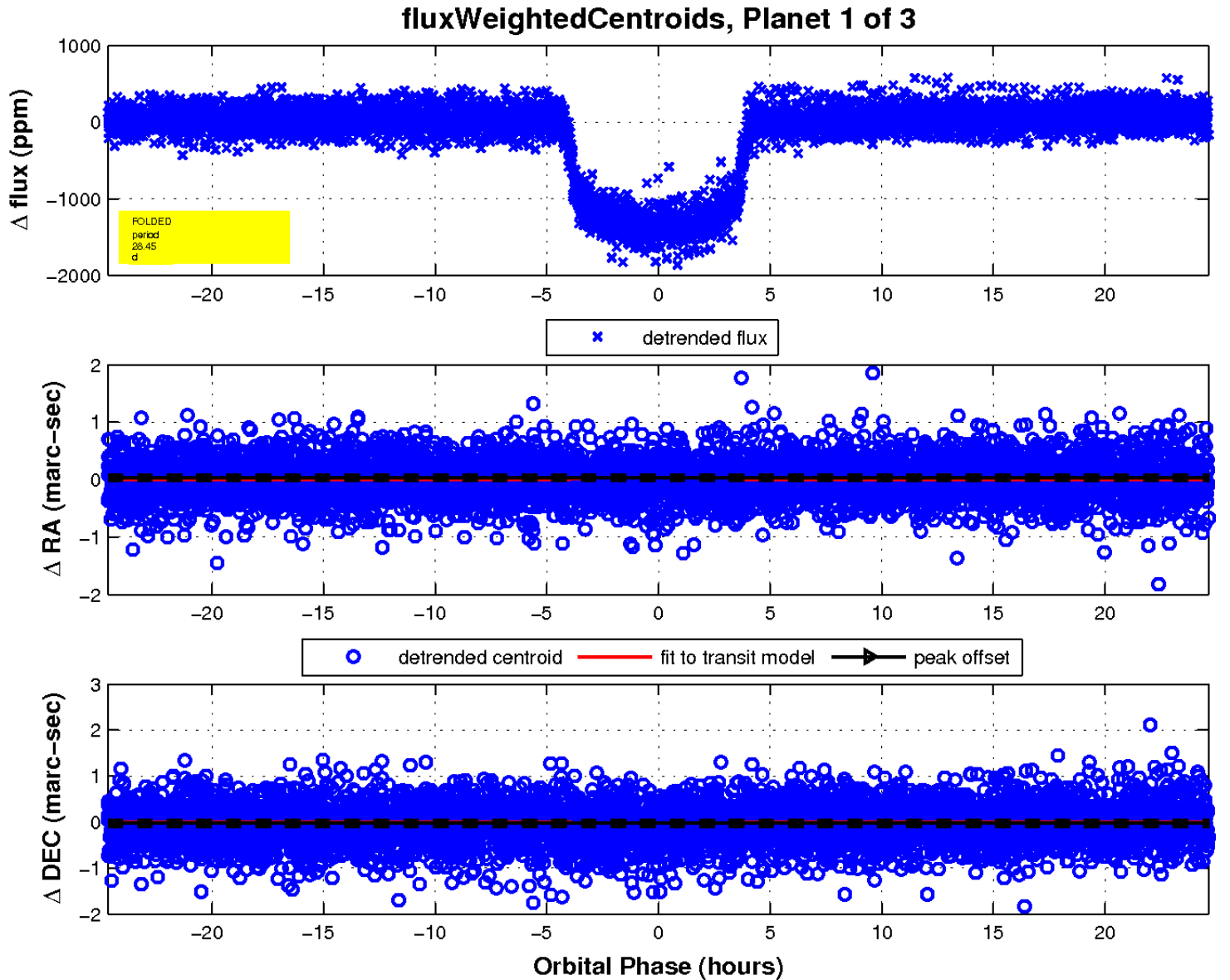
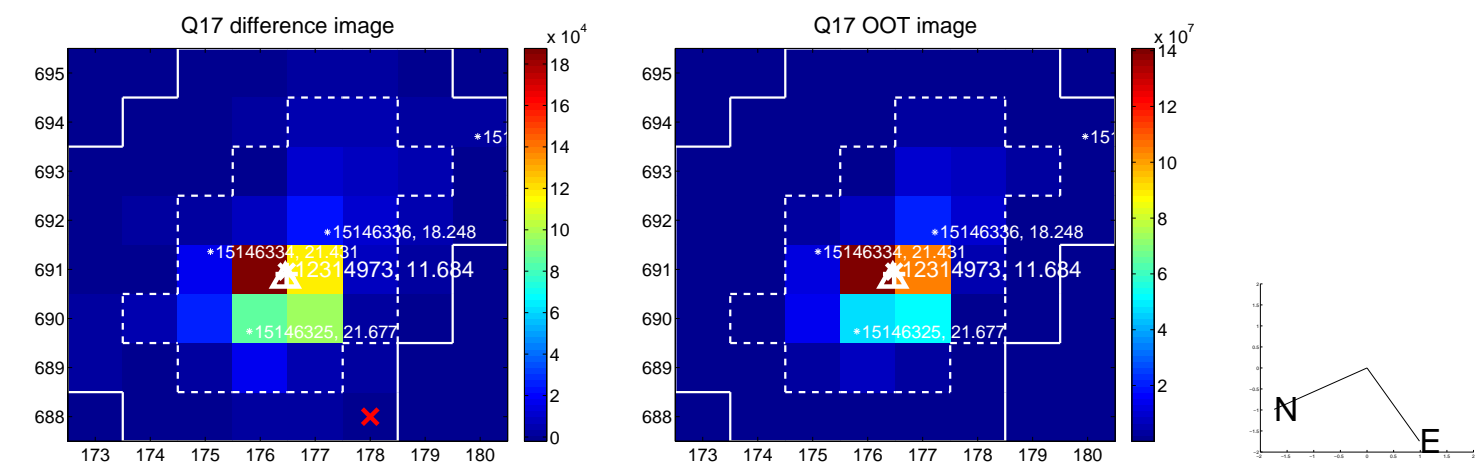
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



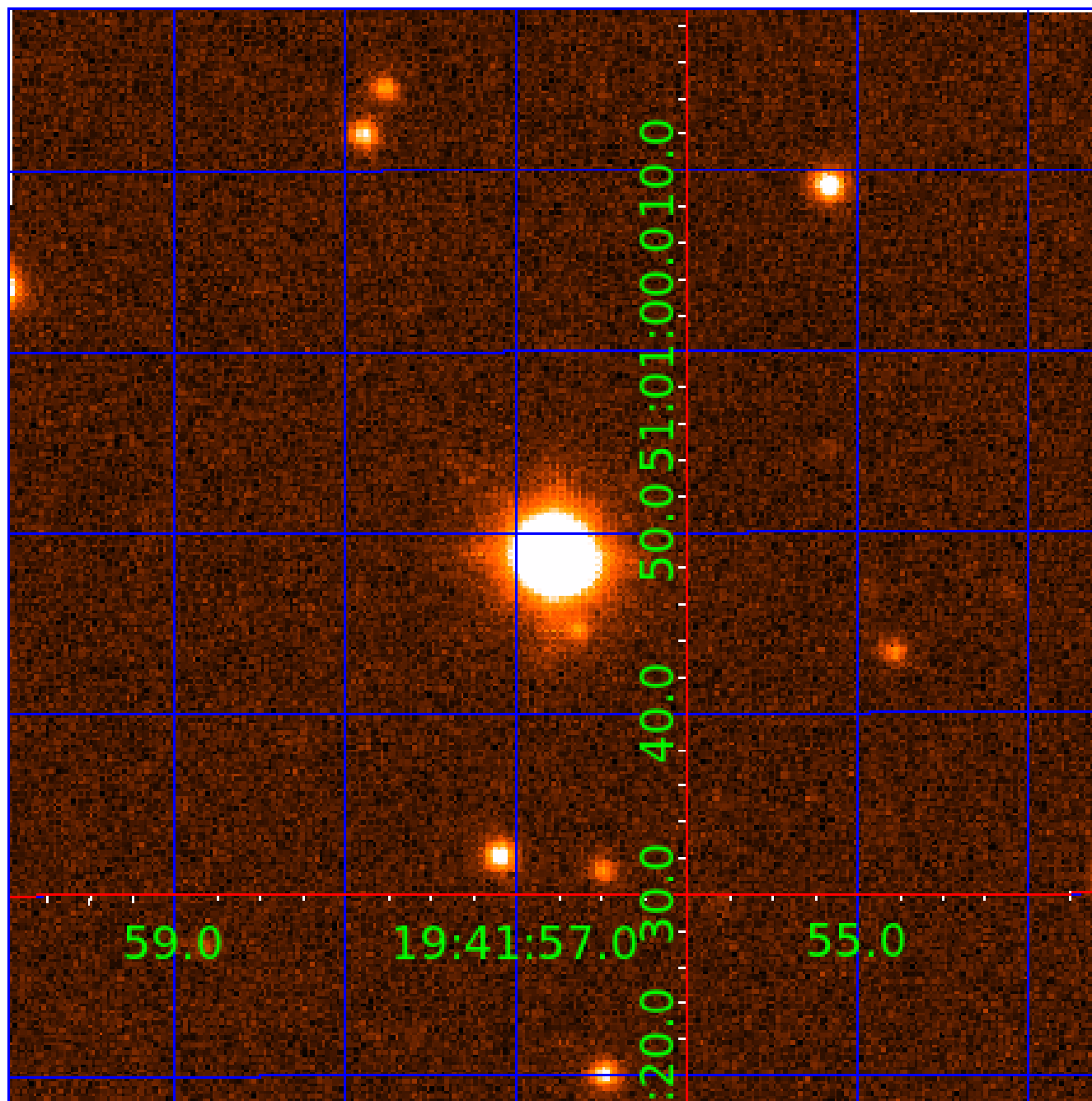
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 012314973

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012314973-01	OBS	0279.01	28.454890	148.251314	1418.8	8.221	193.5	196.1	1.57	6206	6.13	82.87
012314973-02	OBS	0279.02	15.413098	136.942058	248.7	7.102	43.6	48.5	1.57	6206	2.97	187.69
012314973-03	OBS	0279.03	7.514274	136.186667	32.9	5.348	8.2	9.7	1.57	6206	1.04	489.15

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012314973-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012314973-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012314973-03	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

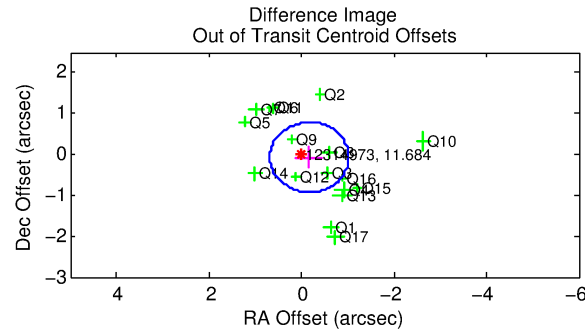
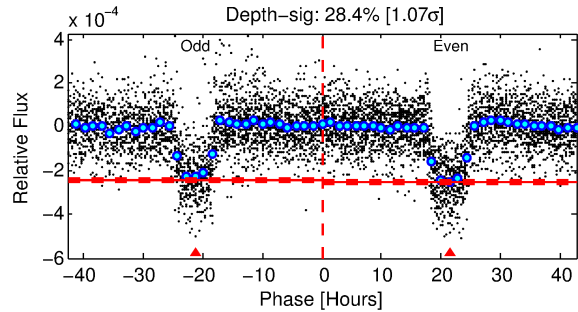
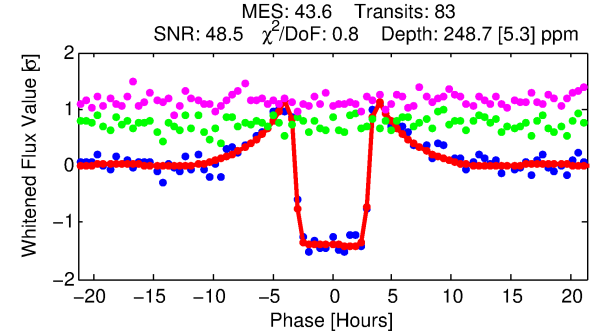
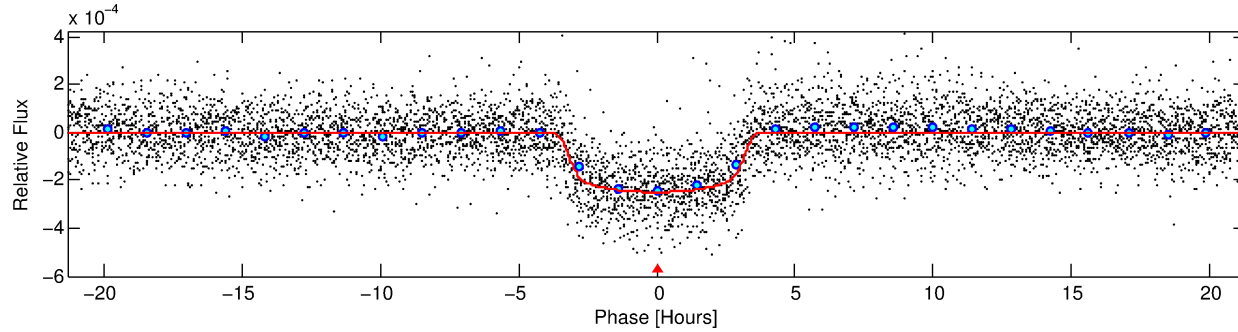
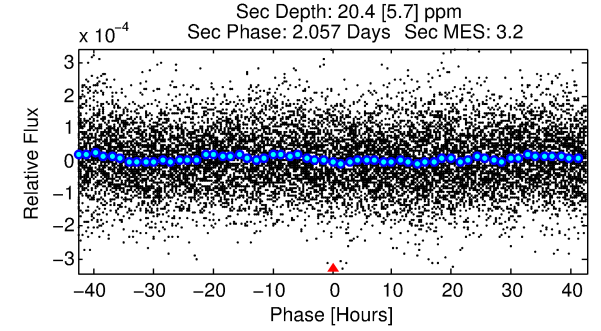
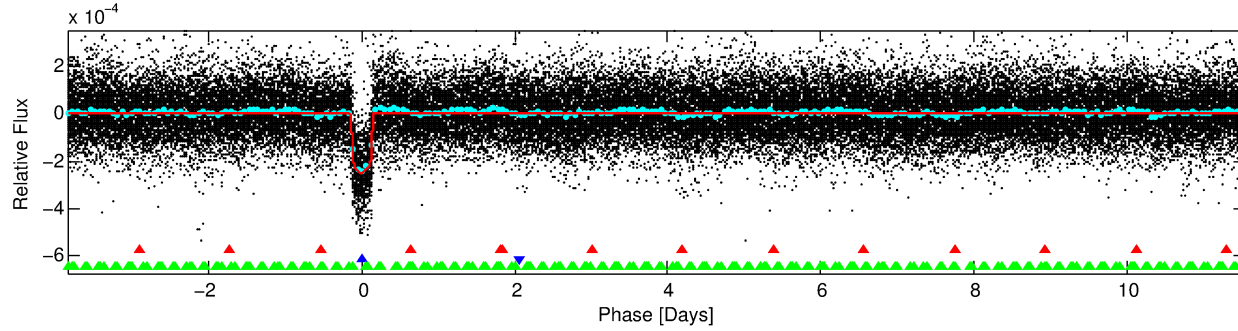
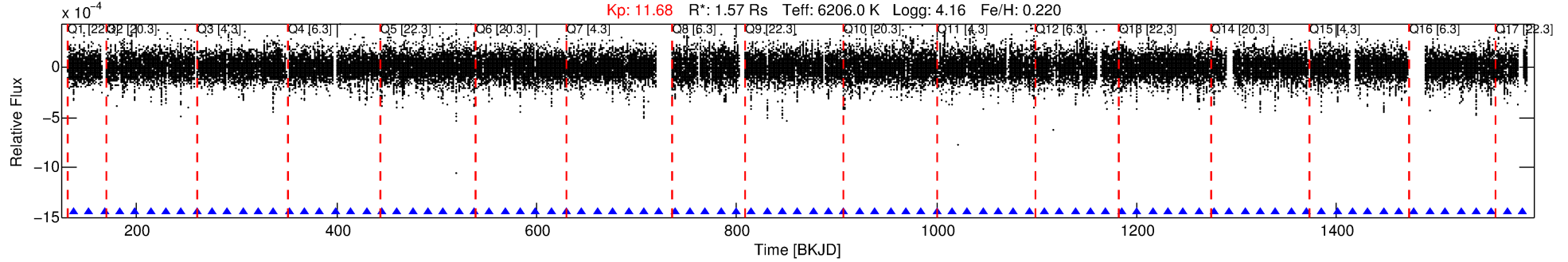
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012314973-02

No Significant Match Found

# DV One-Page Summary

KIC: 12314973 Candidate: 2 of 3 Period: 15.413 d  
KOI: K00279.02 Name: Kepler-450c Corr: 0.964



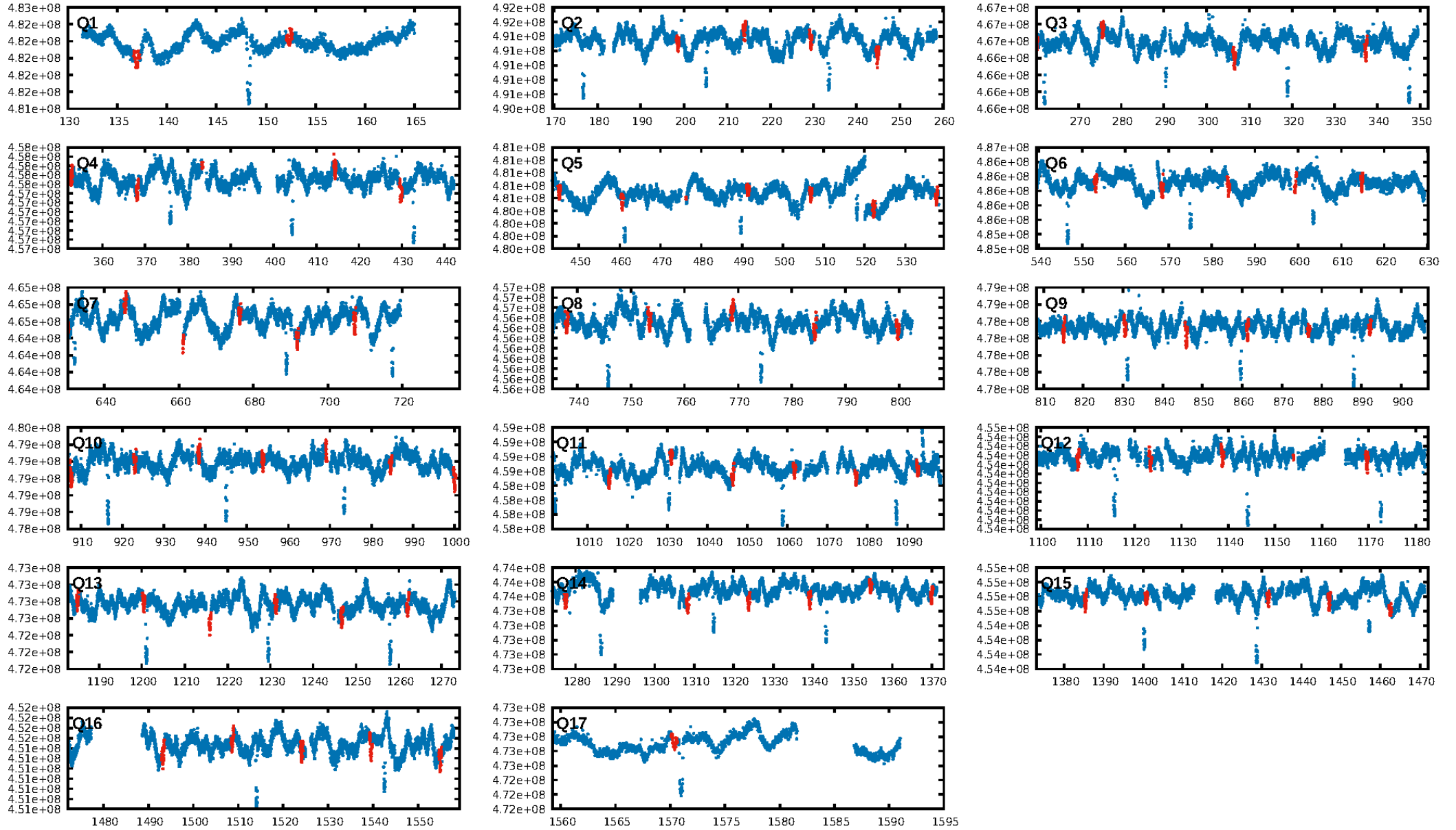
## DV Fit Results:

Period = 15.41310 [0.00003] d  
Epoch = 136.9421 [0.0018] BKJD  
Rp/R\* = 0.0173 [0.0004]  
a/R\* = 7.35 [0.59]  
b = 0.92 [0.01]  
Seff = 187.69 [19.05]  
Teff = 944 [24] K  
Rp = 2.97 [0.22] Re  
a = 0.1324 [0.0079] AU  
Ag = 22.25 [6.54] [3.25σ]  
Teffp = 3169 [226] K [9.80σ]

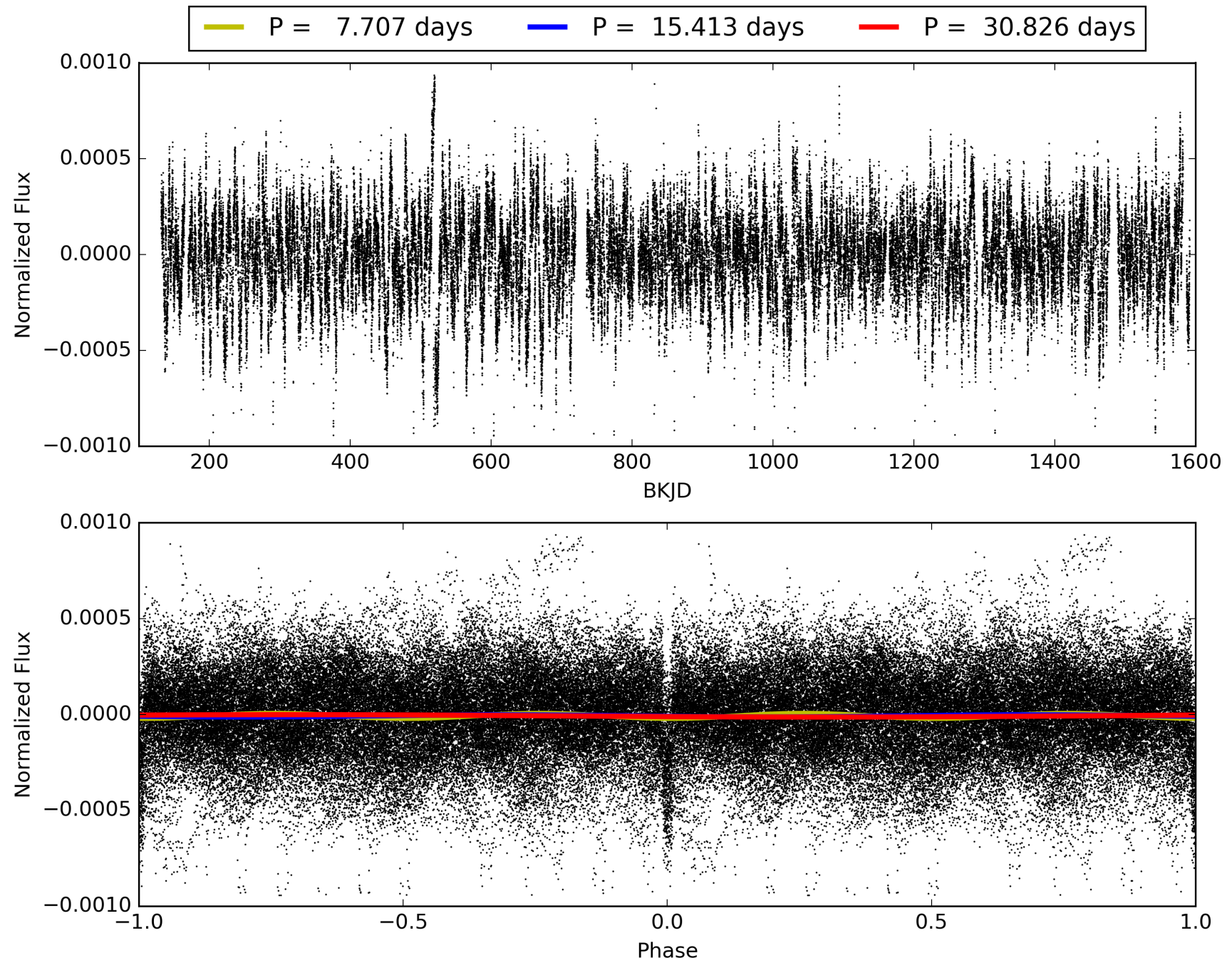
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [21.32σ]  
LongPeriod-sig: 100.0% [28.81σ]  
ModelChiSquare2-sig: 10.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [80/80]  
GhostDiagnostic-chr: 7.092  
Centroid-sig: 0.0%  
Centroid-so: 0.531 arcsec [3.00σ]  
OotOffset-rm: 0.181 arcsec [0.63σ]  
KicOffset-rm: 0.059 arcsec [0.21σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.94 [16/17]

# TCE 012314973-02, PDC Light Curves



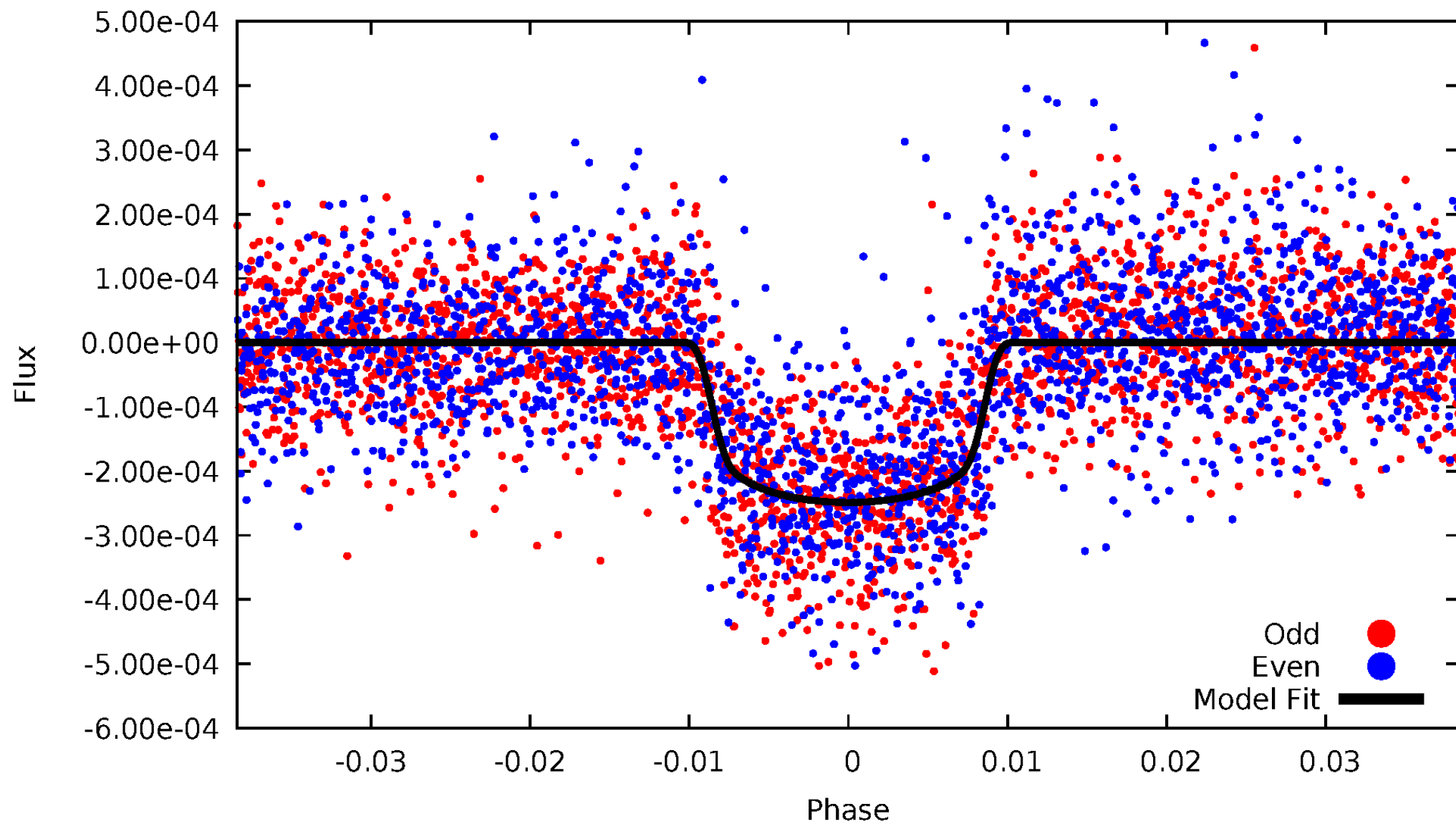
TCE 012314973-02





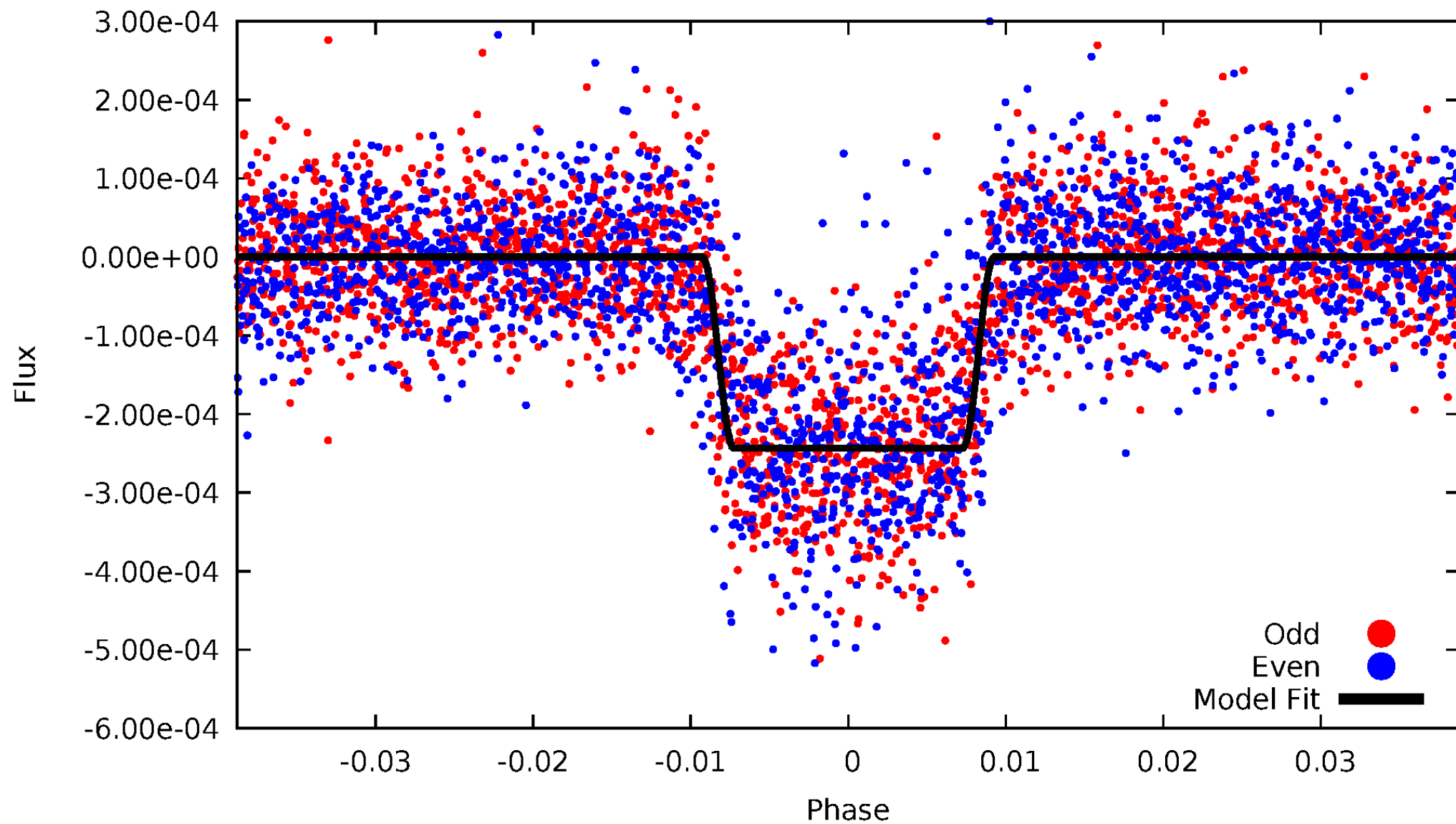
# DV Odd/Even

TCE 012314973-02



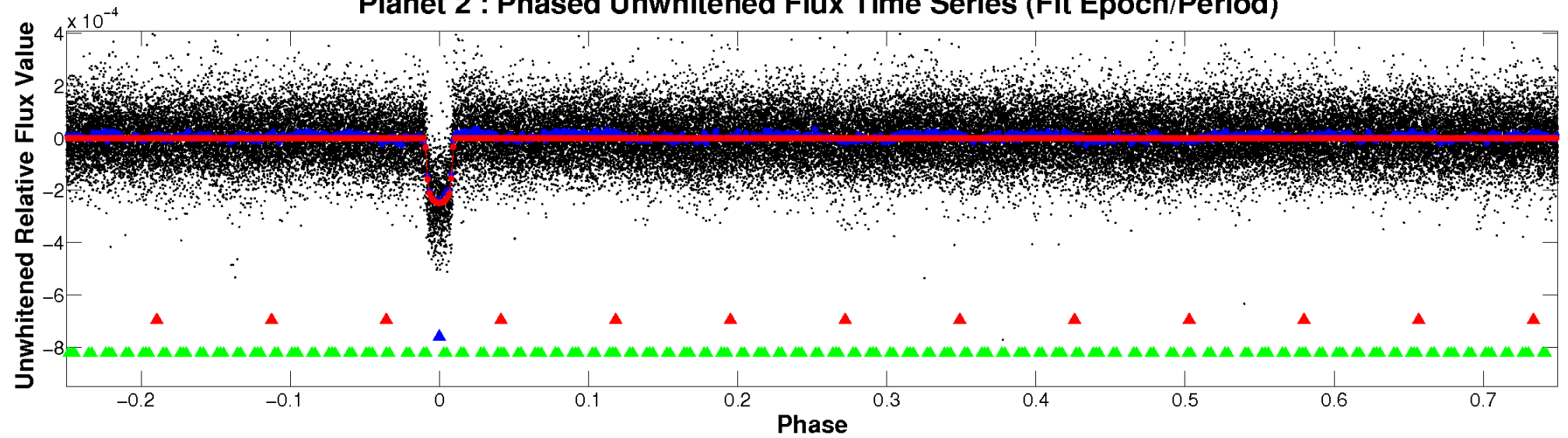
# ALT Odd/Even

TCE 012314973-02

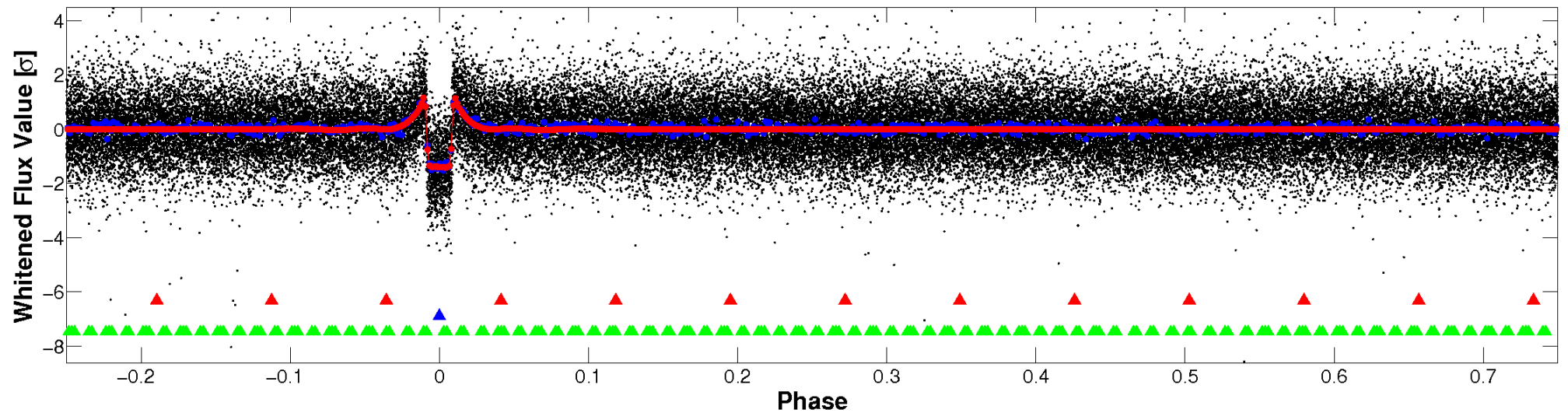


# Non-Whitened Vs. Whitened Light Curve

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

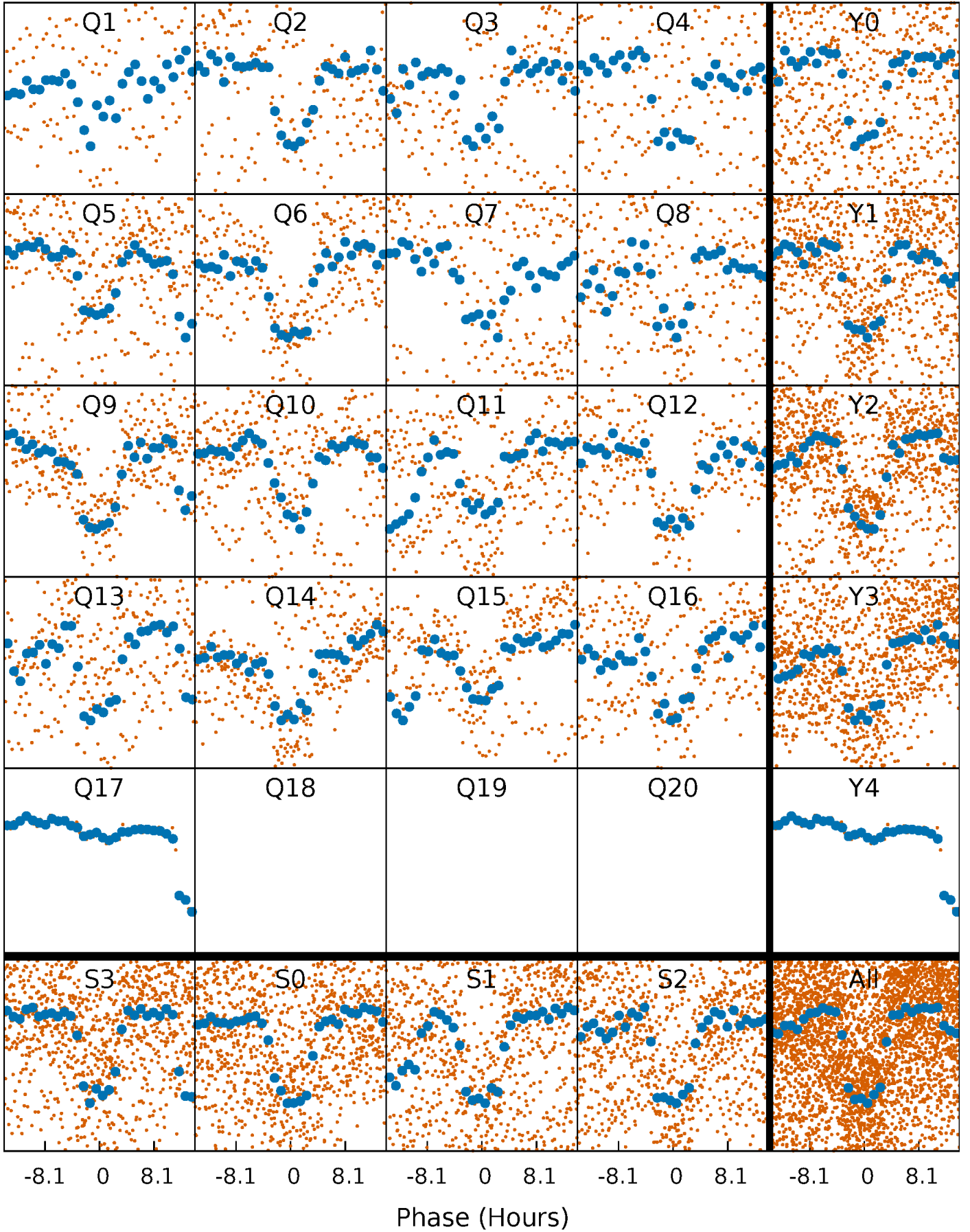


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



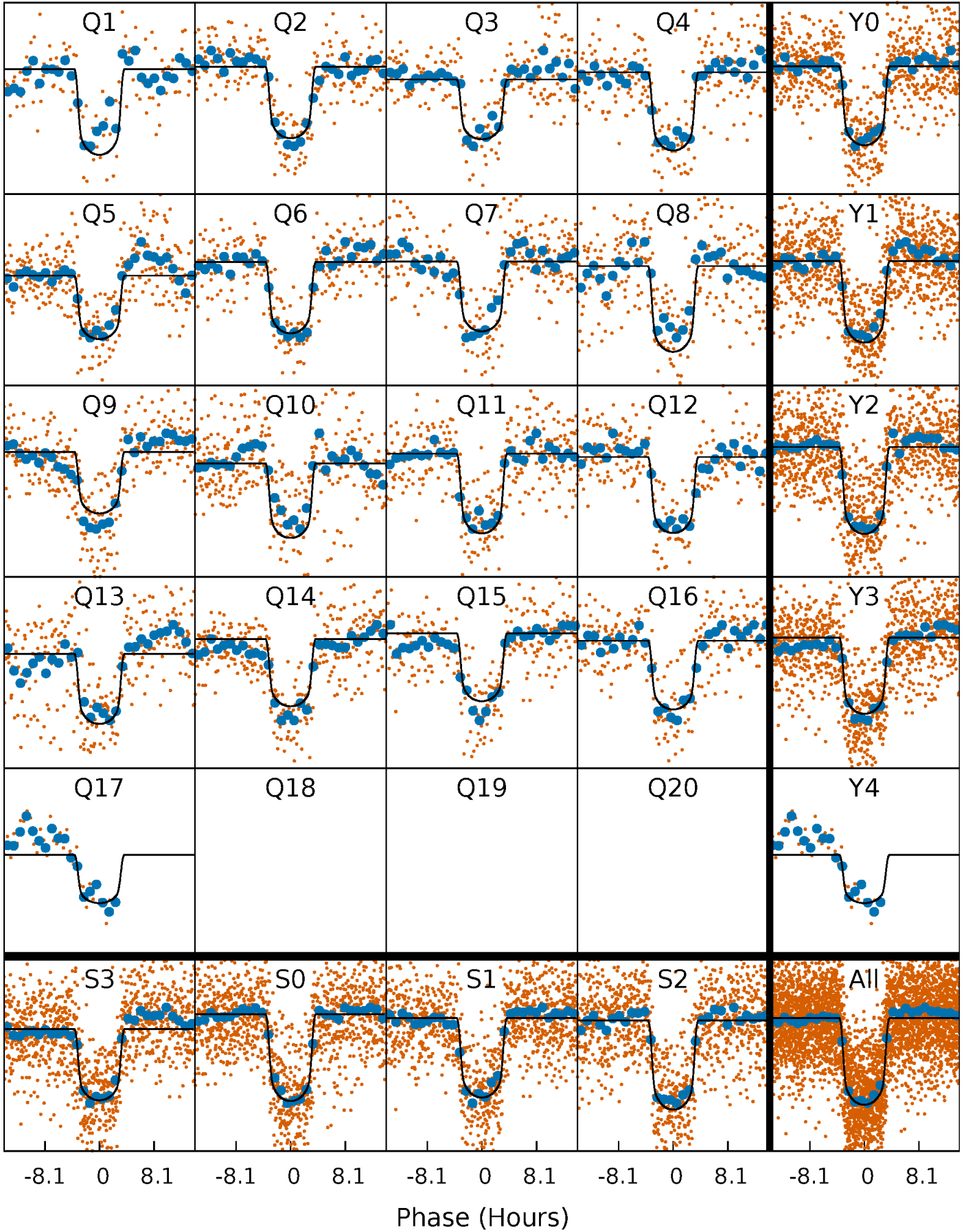
# PDC Quarter-Phased Transit Curves

TCE 012314973-02   P= 15.413098 Days    $T_0=136.942058$  (BKJD)



# DV Quarter-Phased Transit Curves

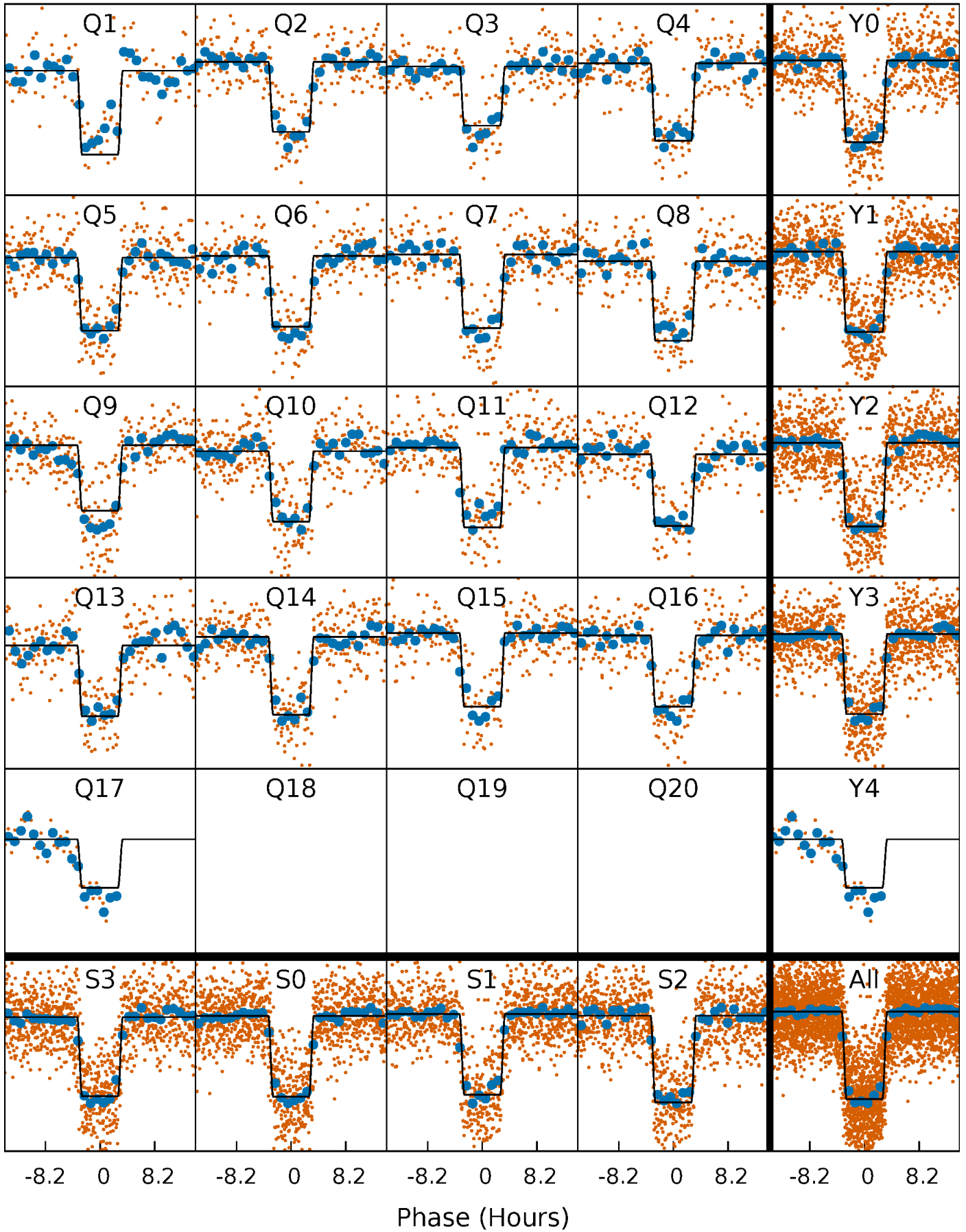
TCE 012314973-02 P= 15.413098 Days  $T_0=136.942058$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

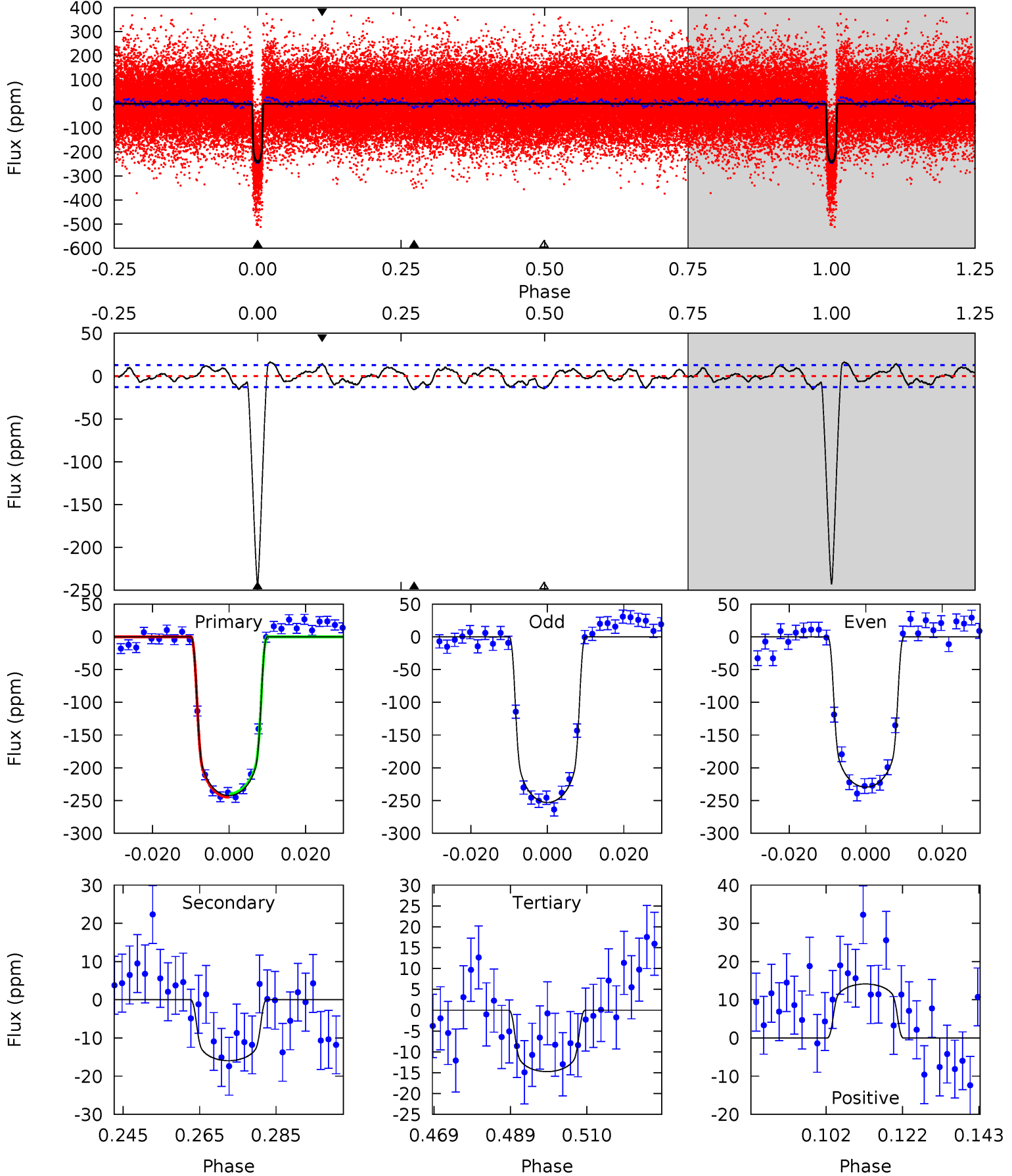
TCE 012314973-02 P= 15.413197 Days  $T_0=136.936893$  (BKJD)



# DV Model-Shift Uniqueness Test

012314973-02, P = 15.413098 Days, E = 121.528960 Days

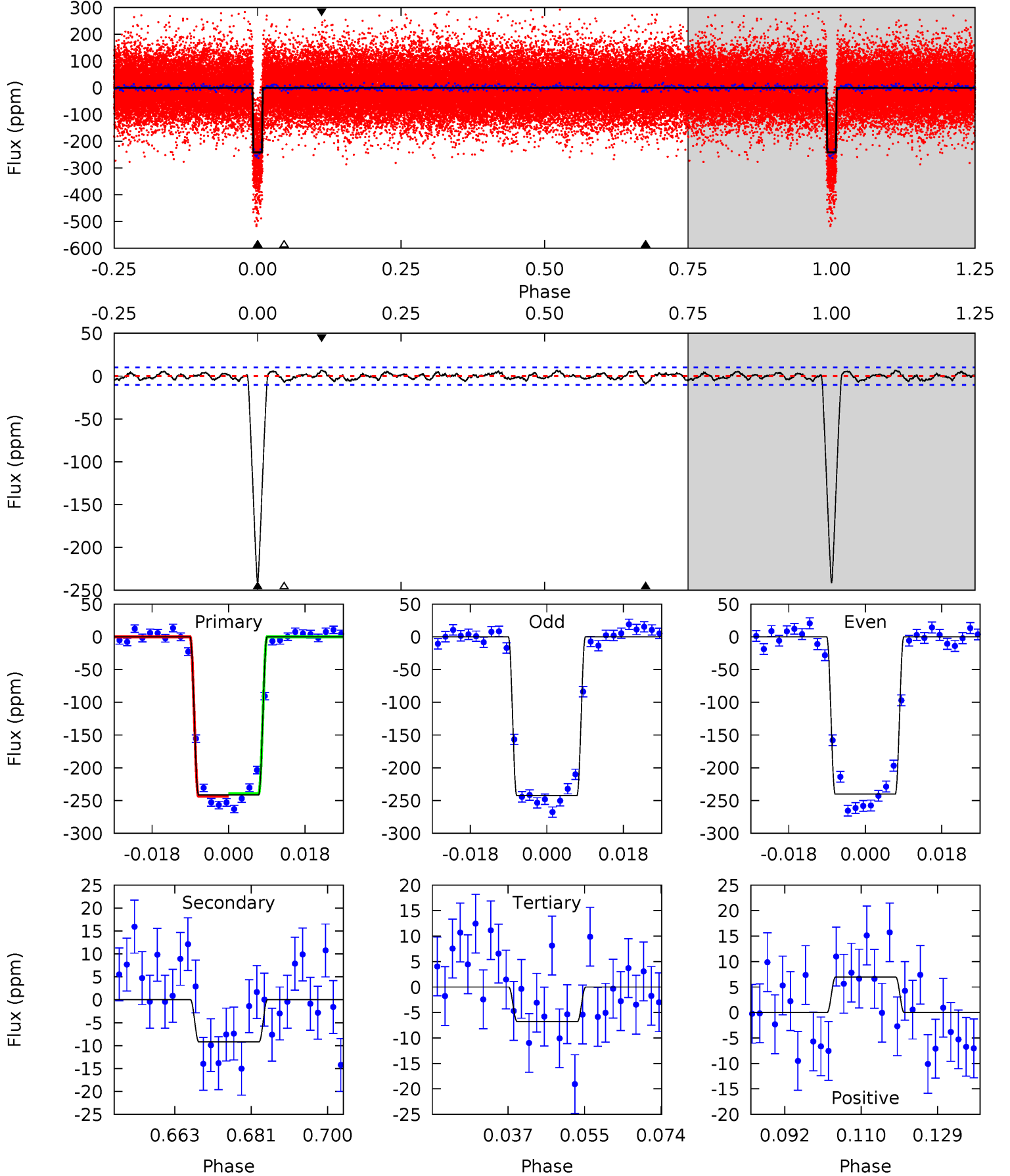
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
92.6	6.09	5.63	5.40	4.89	2.32	2.53	87.0	87.2	0.46	0.69	4.47	0.97	0.06	0.90



# Alt Model-Shift Uniqueness Test

012314973-02, P = 15.413197 Days, E = 121.523696 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
115.4	4.39	3.25	3.33	4.91	2.36	1.34	112.2	112.1	1.15	1.07	0.58	0.98	0.03	0.98





### Stellar Parameters For KIC 012314973

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6206^{+80}_{-74}$	$4.159^{+0.048}_{-0.032}$	$0.220^{+0.150}_{-0.200}$	$1.573^{+0.089}_{-0.111}$	$1.305^{+0.053}_{-0.093}$	$0.473^{+0.093}_{-0.054}$
	+1%/-1%	+1%/-1%	+68%/-91%	+6%/-7%	+4%/-7%	+20%/-11%
Source	SPE72	AST8	SPE72	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 012314973-02 / KOI 0279.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-16 \pm 3$	$2.96^{+0.11}_{-0.13}$	$1315^{+25}_{-27}$	$3462^{+100}_{-99}$	$17^{+3}_{-3}$
Alt.	$-9 \pm 2$	$2.67^{+0.11}_{-0.12}$	$1316^{+26}_{-29}$	$3289^{+105}_{-132}$	$13^{+3}_{-3}$

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

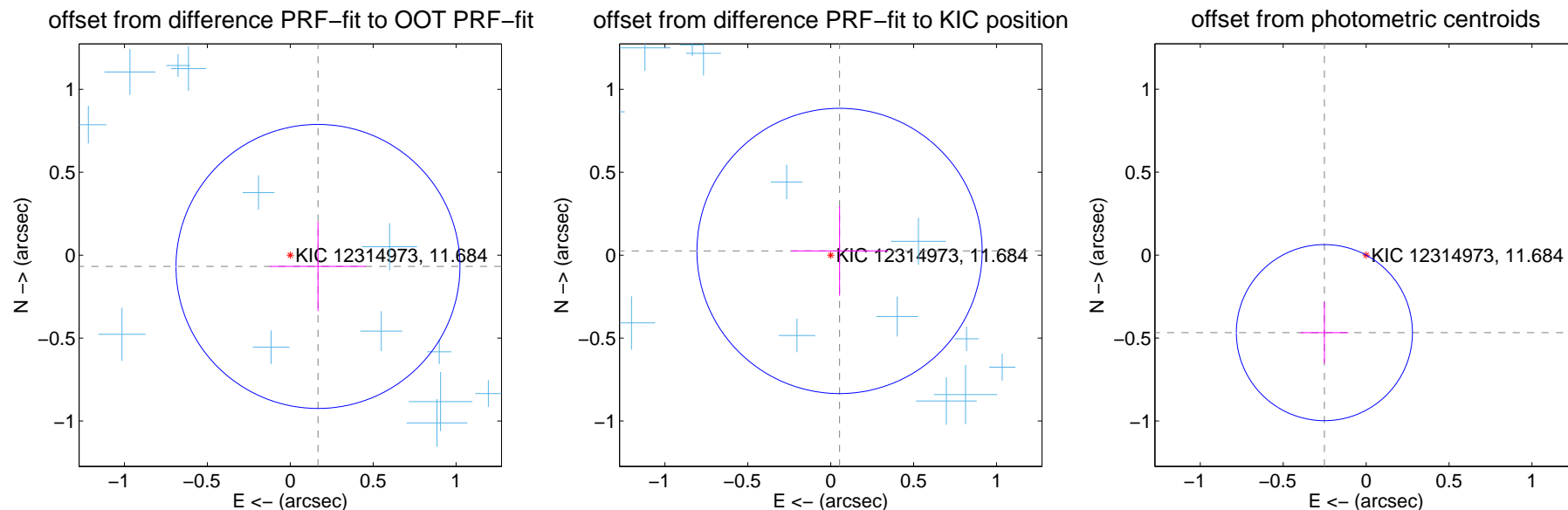
## DV Centroid Data

Supplemental centroid analysis for 012314973-02. **Kepler magnitude: 11.68.** Transit SNR 48.53

There are 17 quarters with good PRF difference image offsets

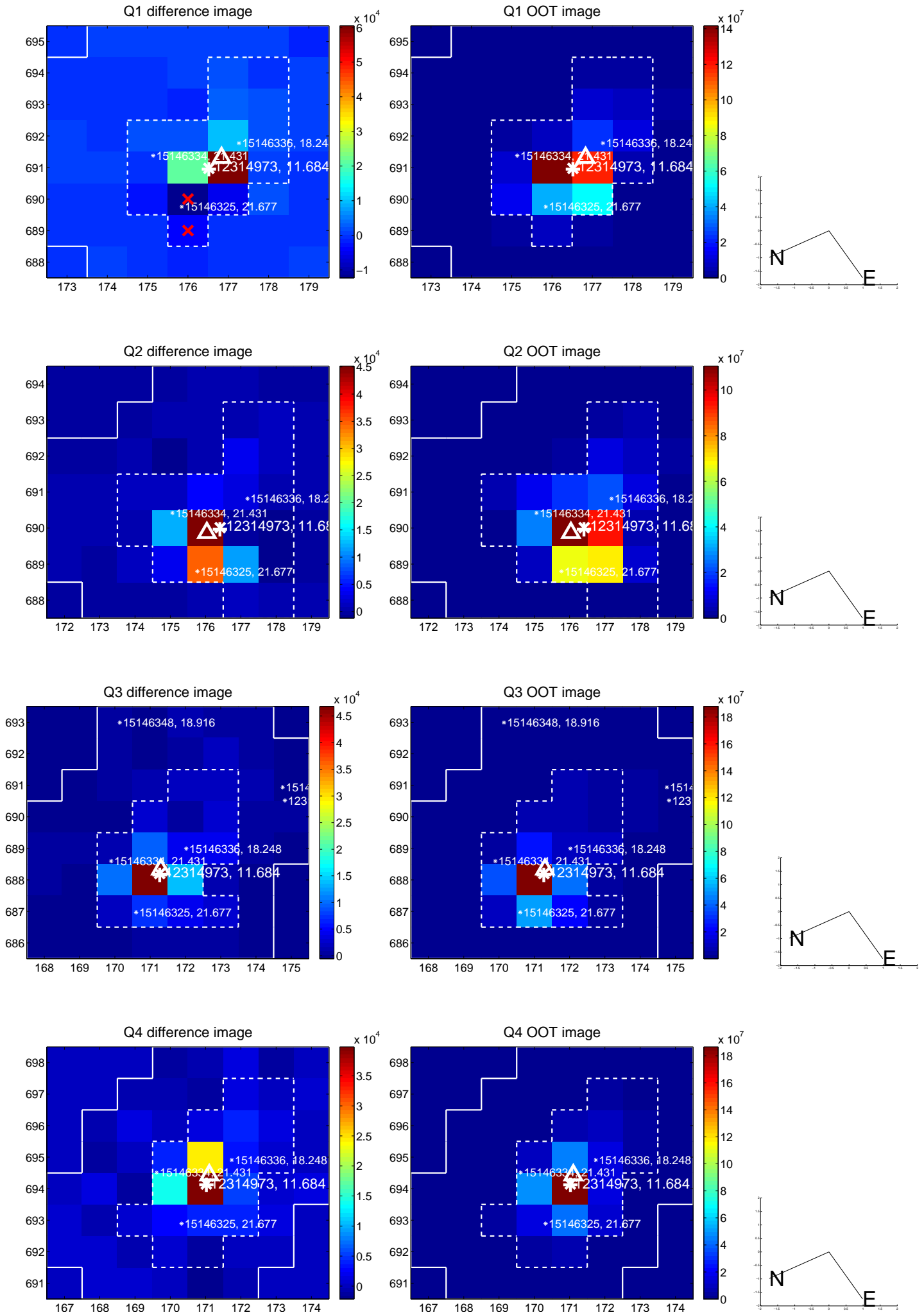
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.181 \pm 0.286$	0.63	$-0.167 \pm 0.288$	$-0.068 \pm 0.269$
PRF-fit source offset from KIC position	$0.059 \pm 0.287$	0.21	$-0.053 \pm 0.291$	$0.025 \pm 0.270$
photometric centroid source offset	<b><math>0.53 \pm 0.18</math></b>	<b>3.00</b>	$0.25 \pm 0.15$	$-0.47 \pm 0.19$

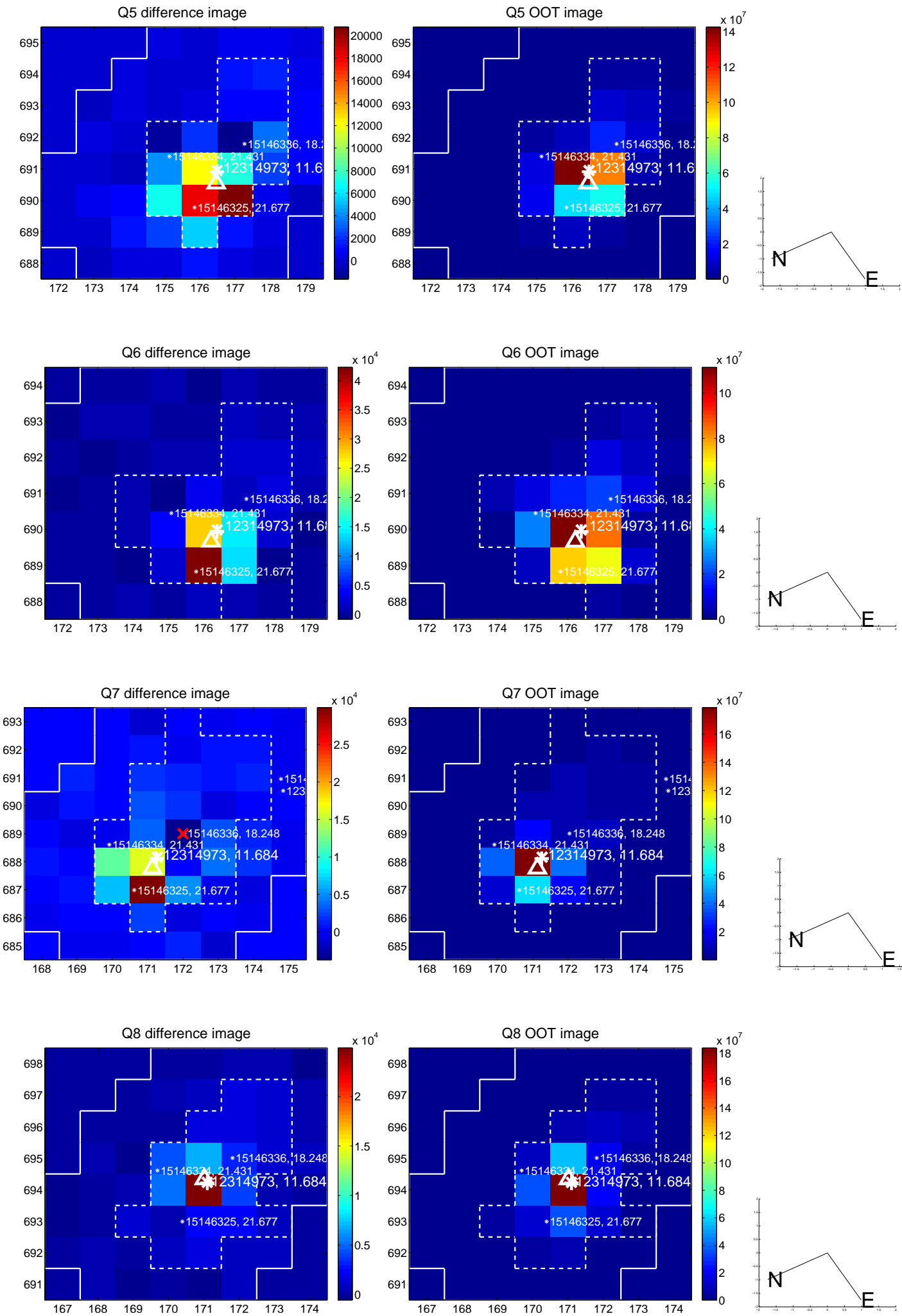


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

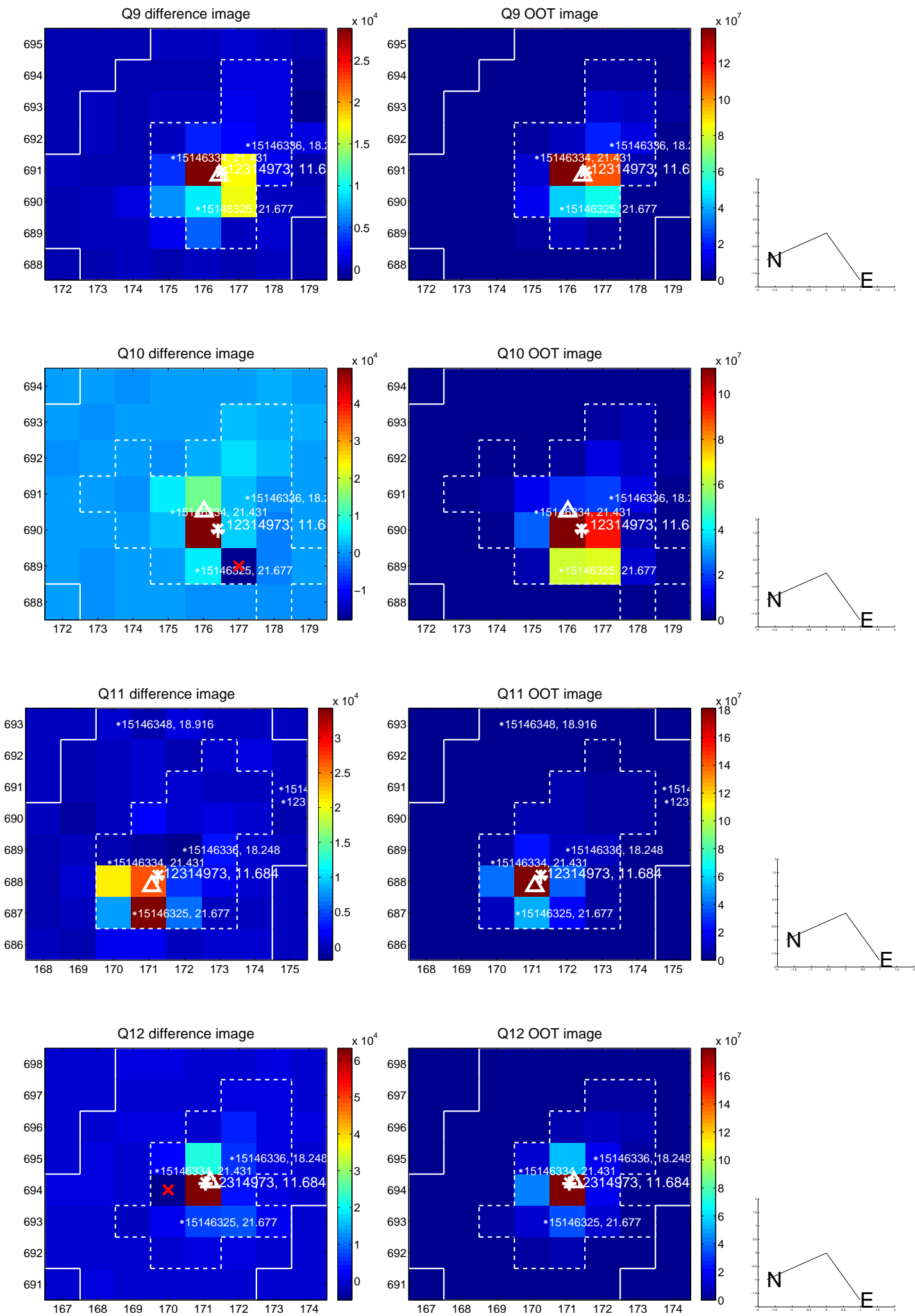
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



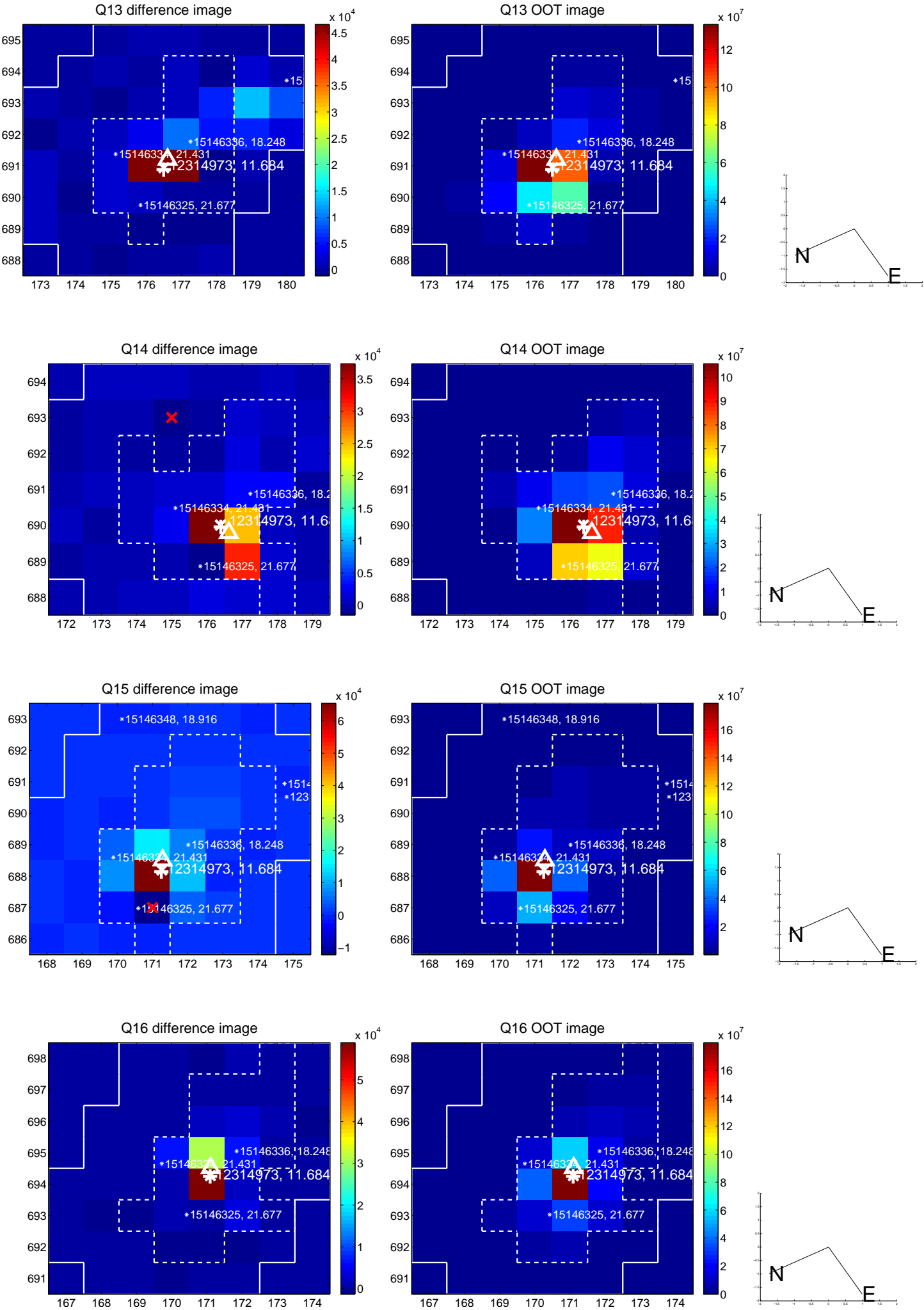
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



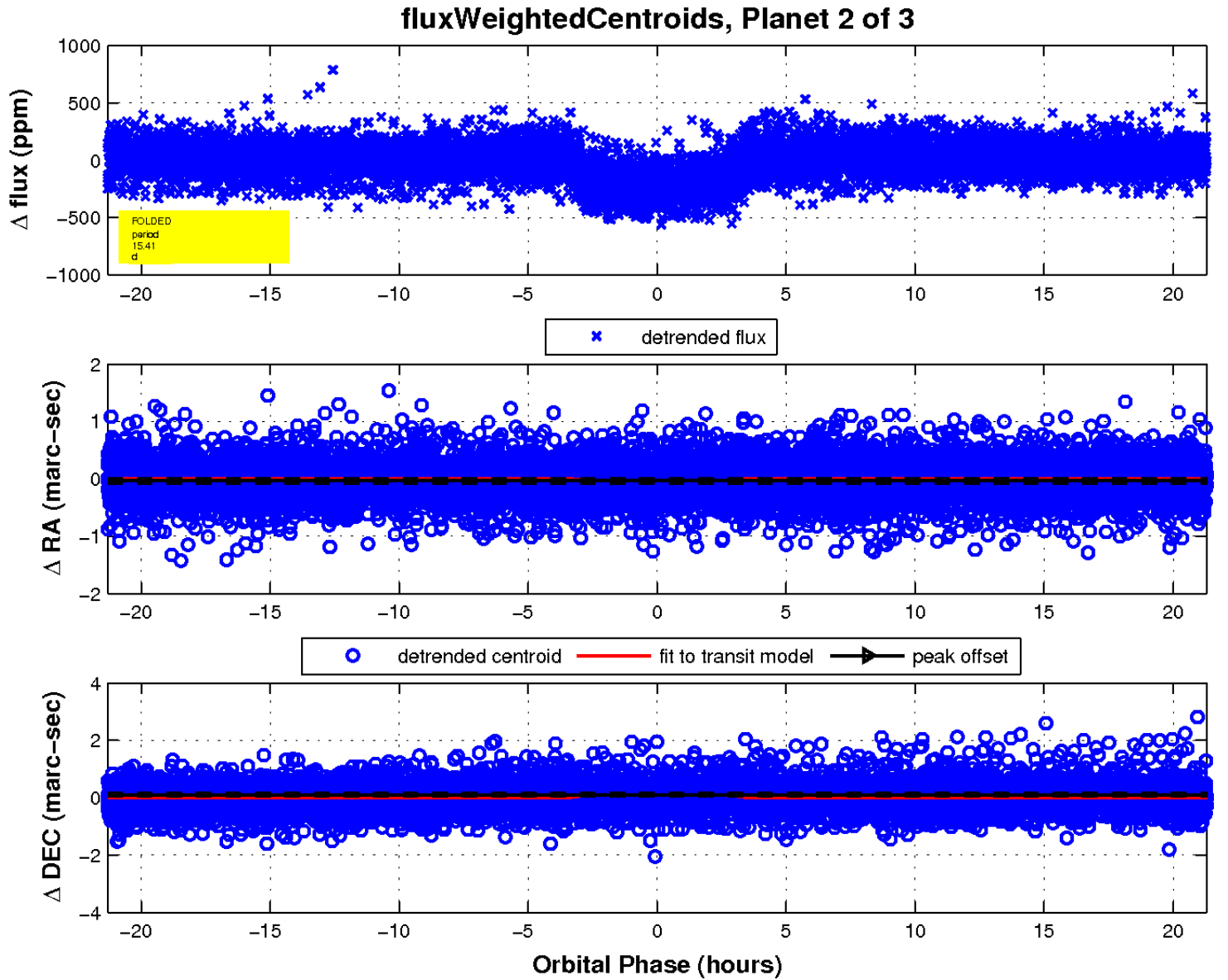
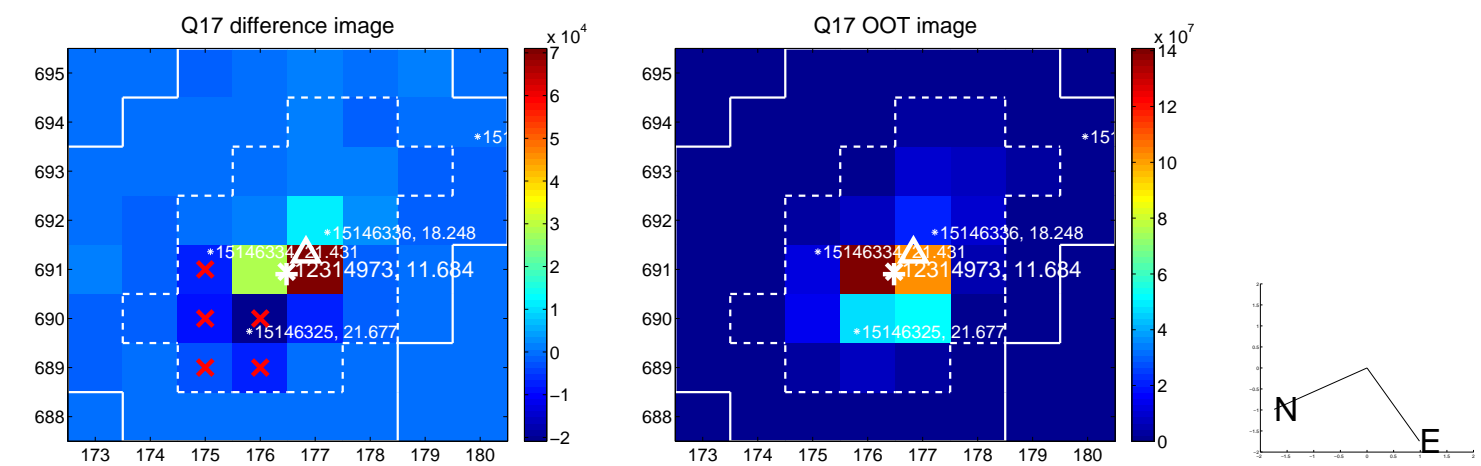
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

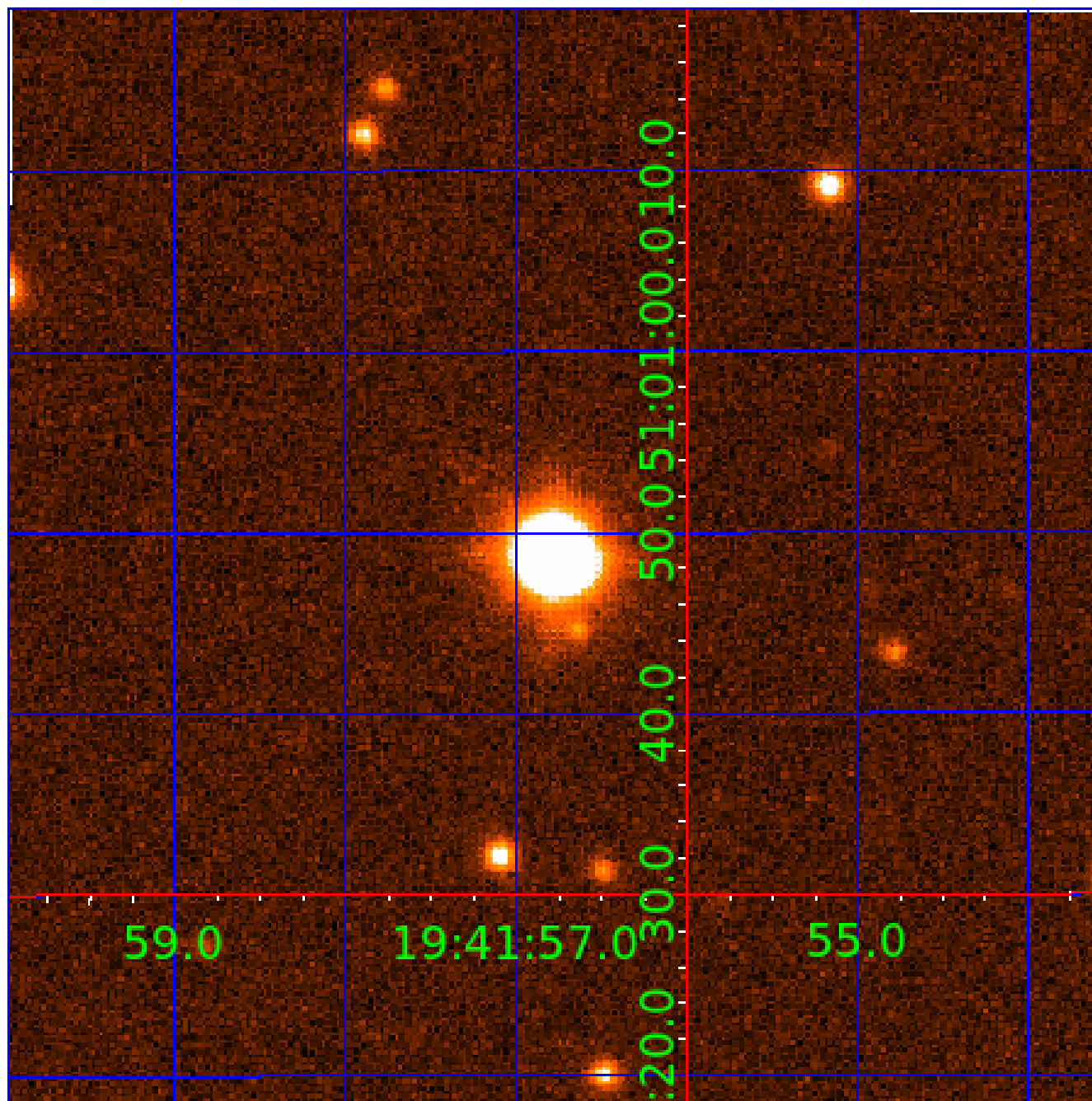


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 012314973

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012314973-01	OBS	0279.01	28.454890	148.251314	1418.8	8.221	193.5	196.1	1.57	6206	6.13	82.87
012314973-02	OBS	0279.02	15.413098	136.942058	248.7	7.102	43.6	48.5	1.57	6206	2.97	187.69
012314973-03	OBS	0279.03	7.514274	136.186667	32.9	5.348	8.2	9.7	1.57	6206	1.04	489.15

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012314973-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012314973-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
012314973-03	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

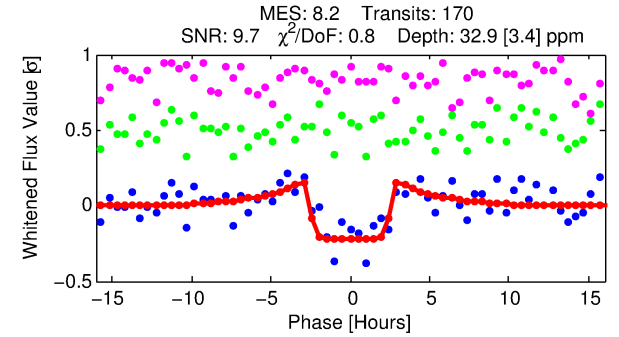
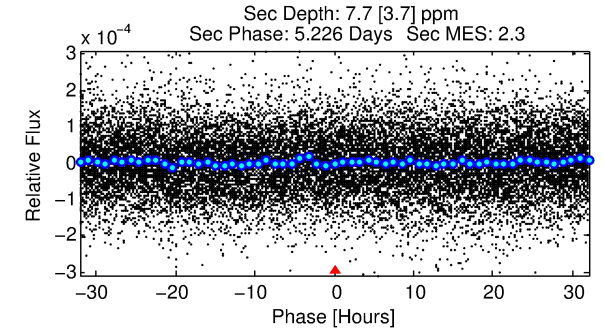
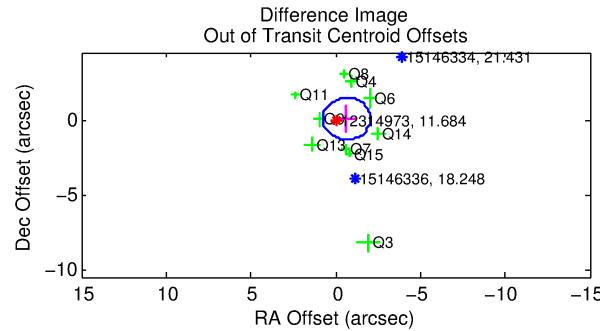
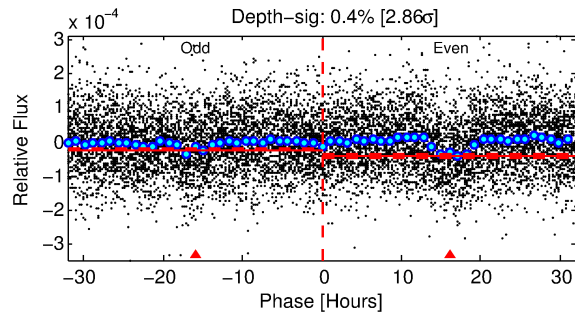
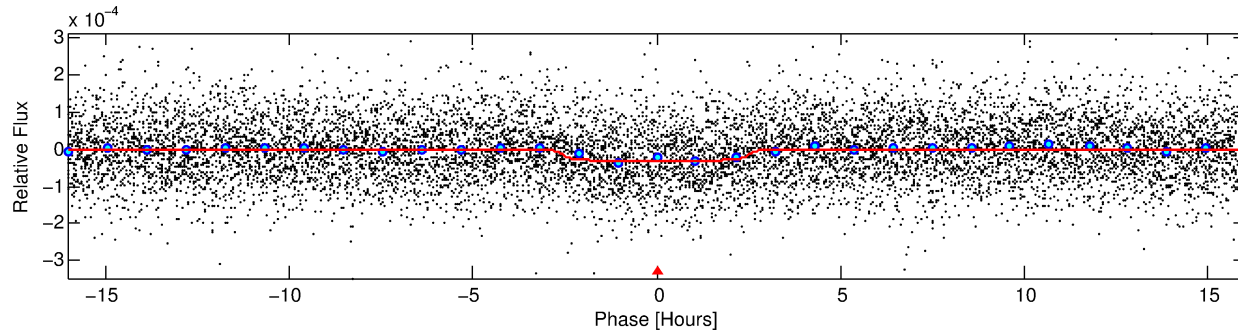
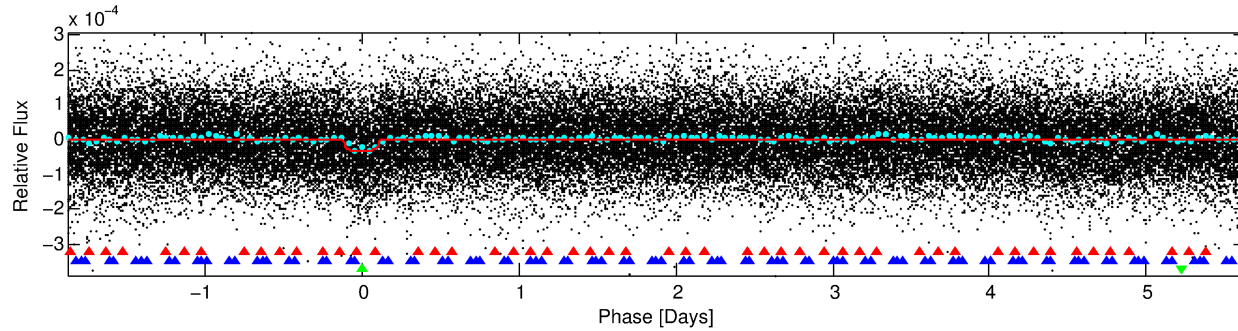
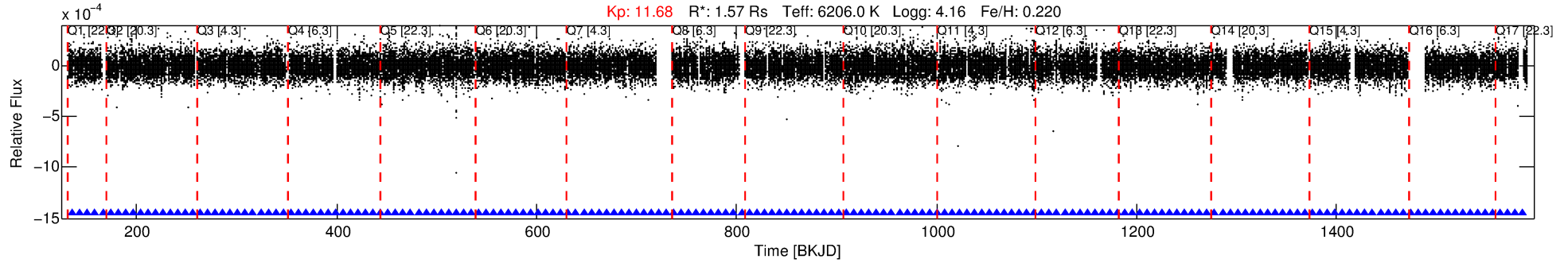
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012314973-03

No Significant Match Found

# DV One-Page Summary

KIC: 12314973 Candidate: 3 of 3 Period: 7.514 d  
KOI: K00279.03 Name: Kepler-450d Corr: 0.943



## DV Fit Results:

Period = 7.51427 [0.00006] d  
Epoch = 136.1867 [0.0056] BKJD  
 $R_p/R^*$  = 0.0061 [0.0016]  
 $a/R^*$  = 5.35 [7.14]  
 $b$  = 0.88 [0.36]  
 $S_{\text{eff}}$  = 489.15 [49.65]  
 $T_{\text{eq}}$  = 1199 [30] K  
 $R_p$  = 1.04 [0.29]  $R_e$   
 $a$  = 0.0820 [0.0049] AU  
 $A_g$  = 26.27 [19.23] [1.31 $\sigma$ ]  
 $T_{\text{eff}}$  = 4197 [765] K [3.92 $\sigma$ ]

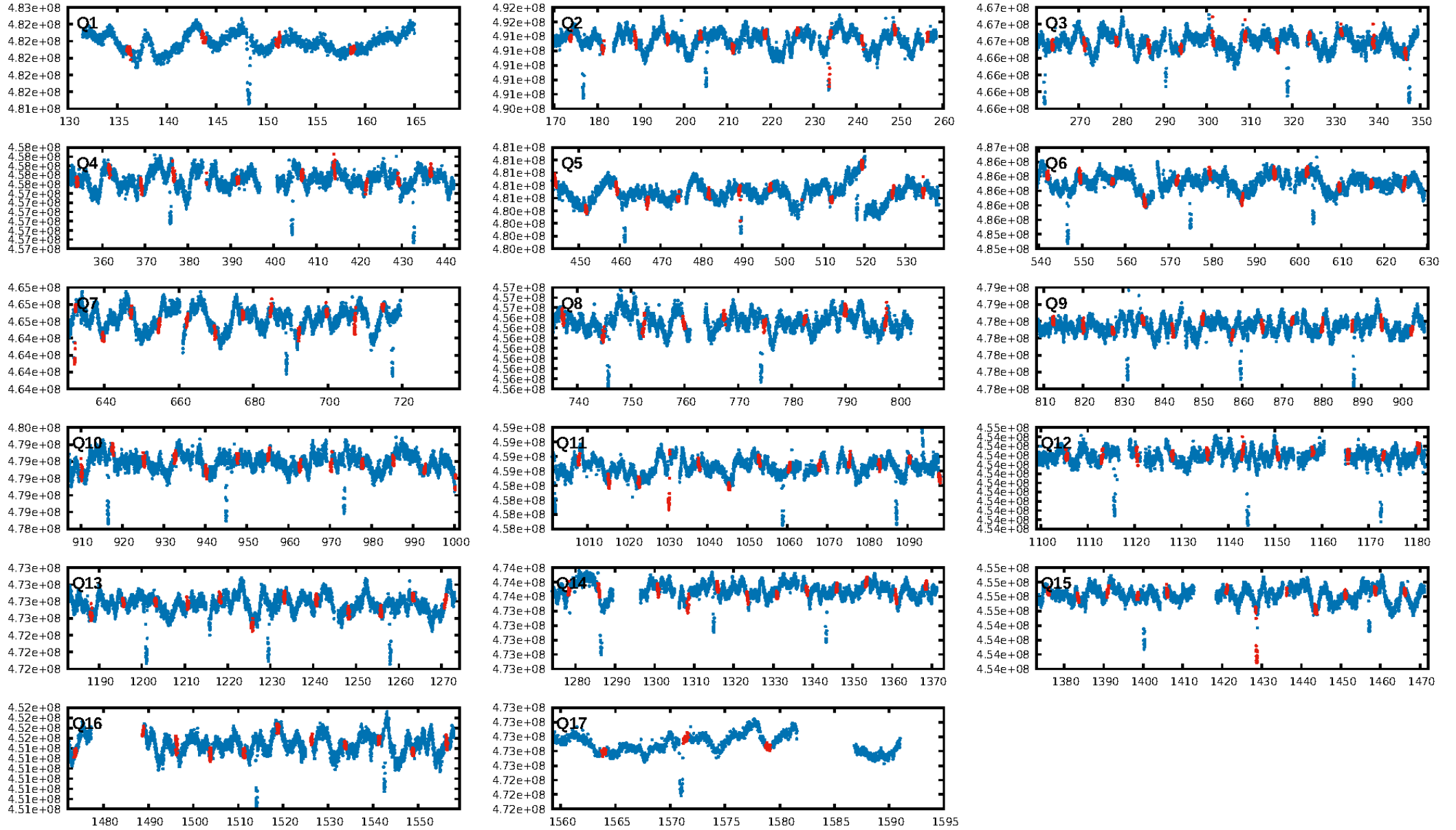
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [21.32 $\sigma$ ]  
ModelChiSquare2-sig: 99.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.71e-15  
RollingBand-fgt: 1.00 [163/163]  
GhostDiagnostic-chr: 1.538  
Centroid-sig: 92.3%  
Centroid-so: 0.352 arcsec [0.45 $\sigma$ ]  
OotOffset-rm: 0.661 arcsec [1.42 $\sigma$ ]  
KicOffset-rm: 0.594 arcsec [1.22 $\sigma$ ]  
OotOffset-st: 2/4/2/2 [10]  
KicOffset-st: 2/4/2/2 [10]  
DiffImageQuality-fgm: 0.80 [8/10]  
DiffImageOverlap-fno: 1.00 [17/17]

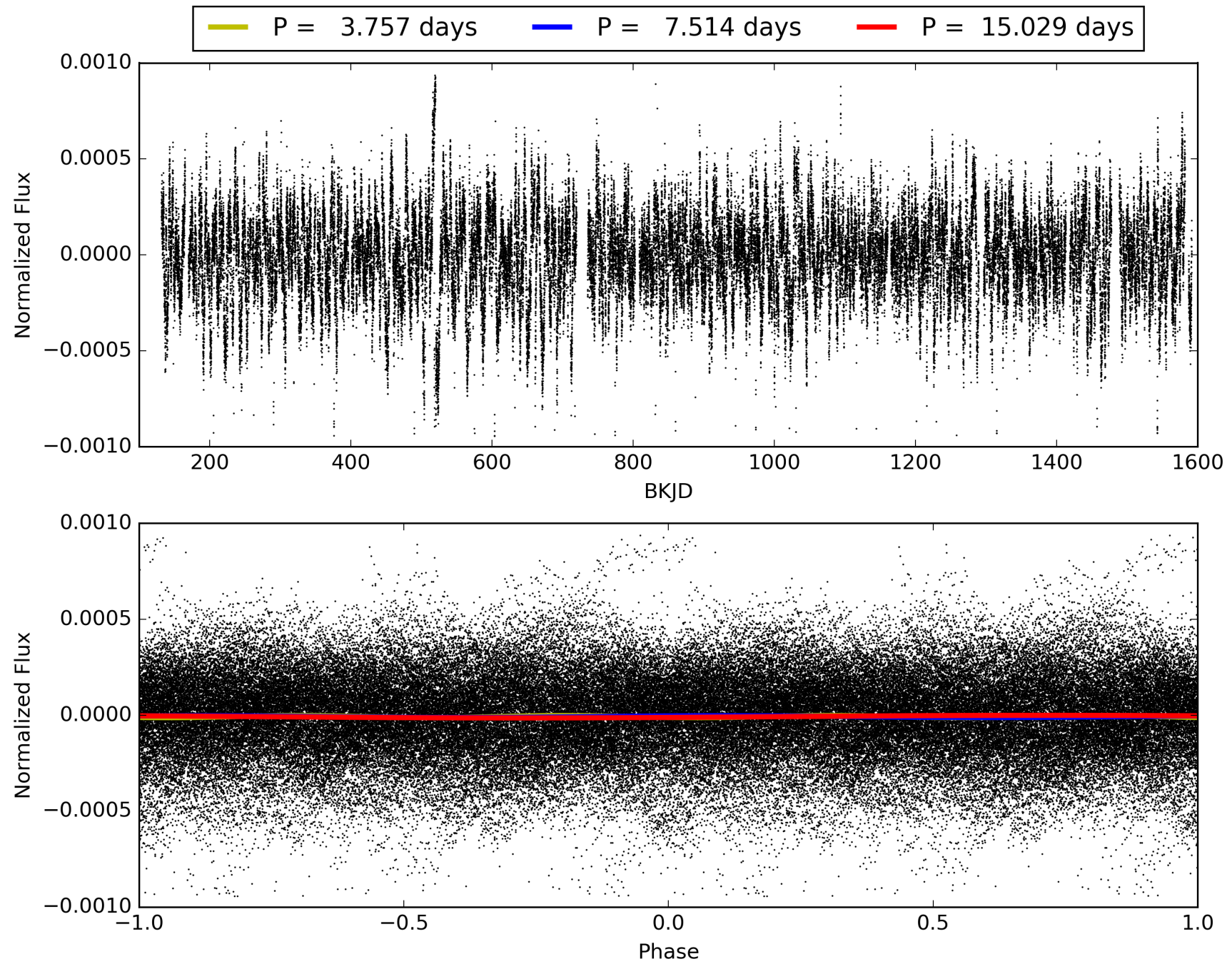
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 08:08:23 Z

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

# TCE 012314973-03, PDC Light Curves

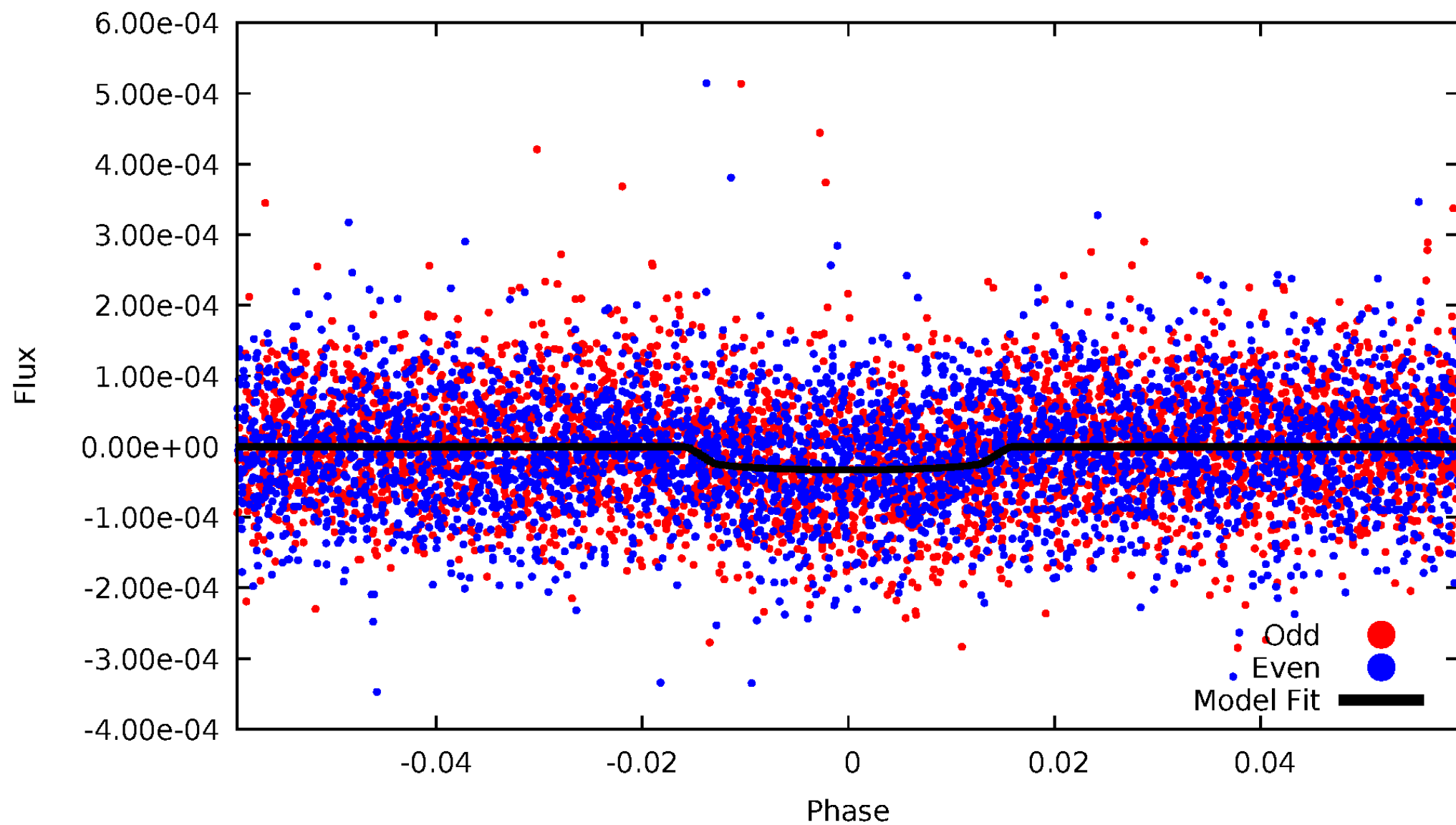


TCE 012314973-03



# DV Odd/Even

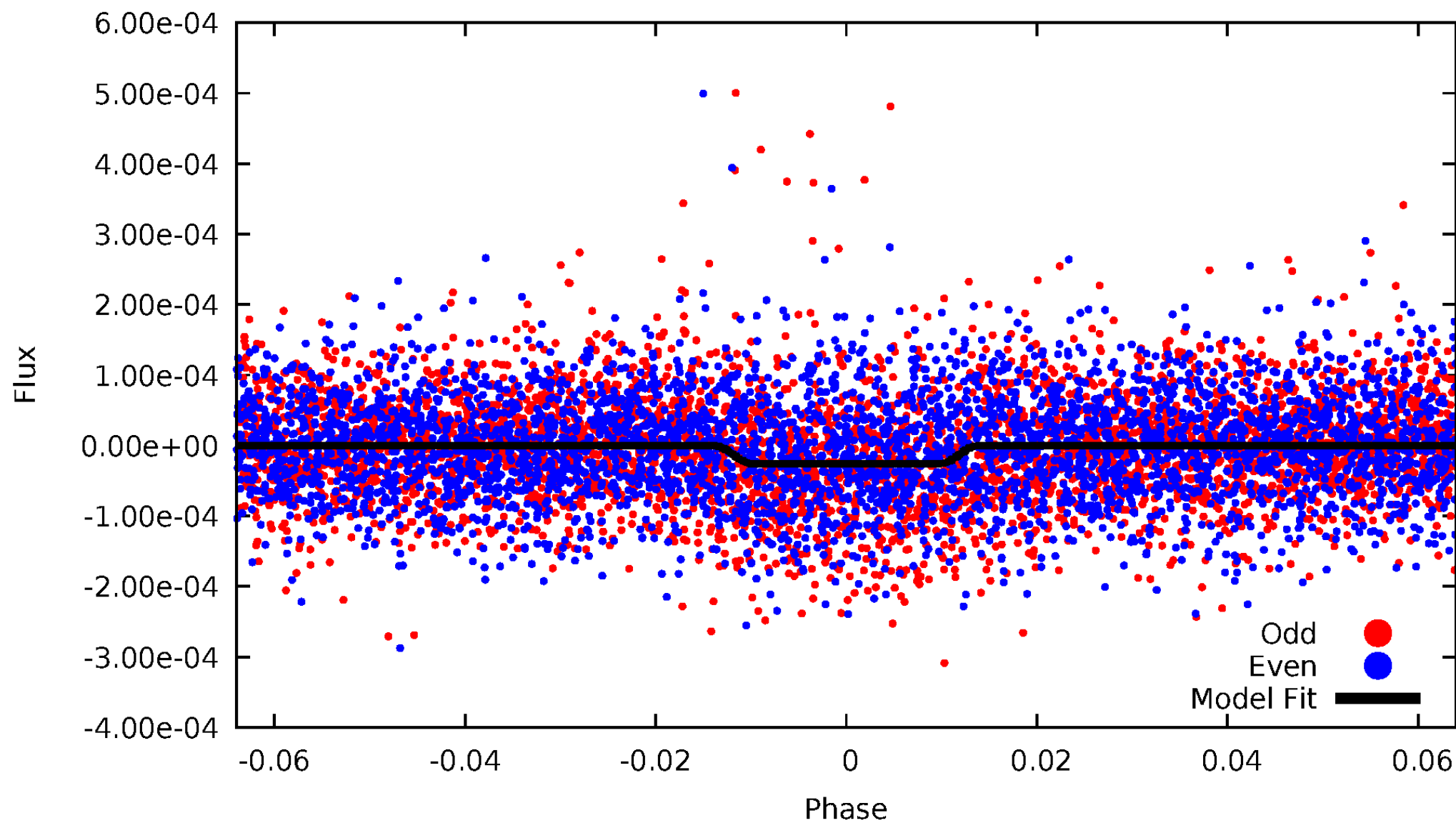
TCE 012314973-03





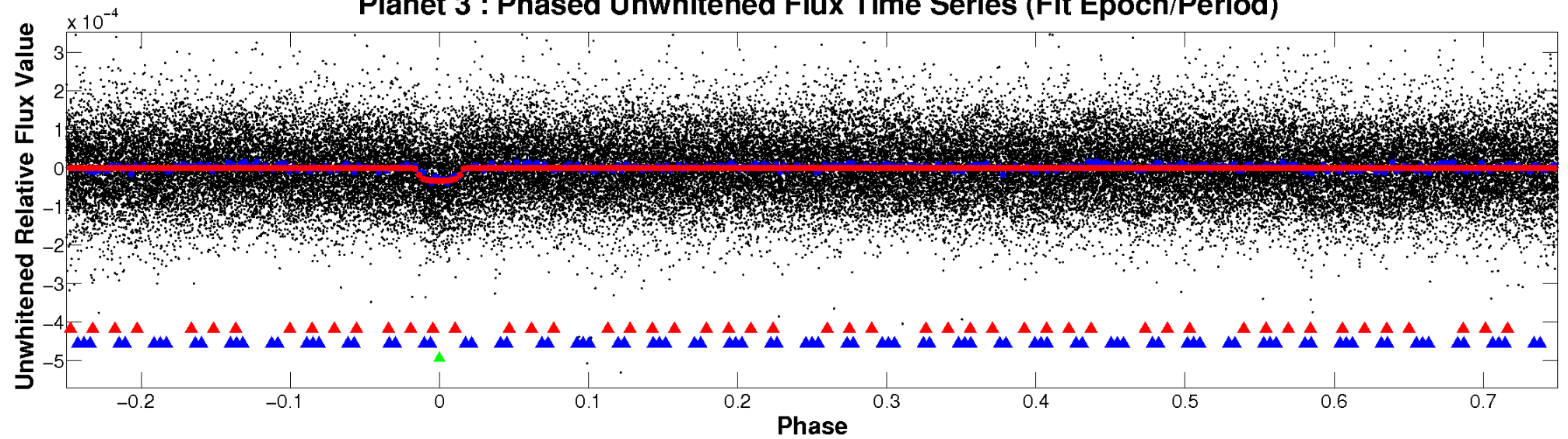
# ALT Odd/Even

TCE 012314973-03

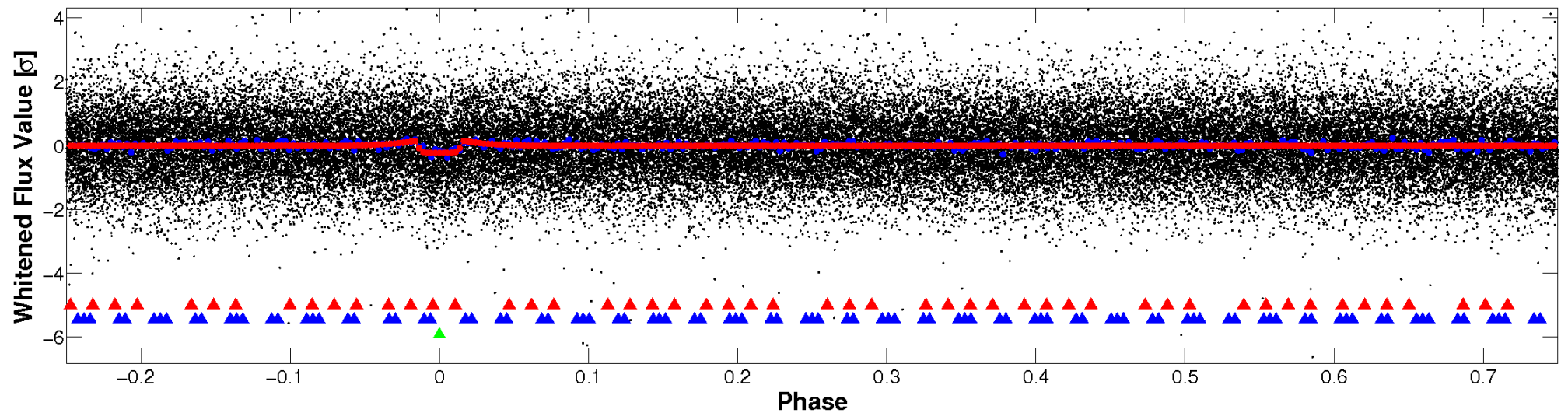


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

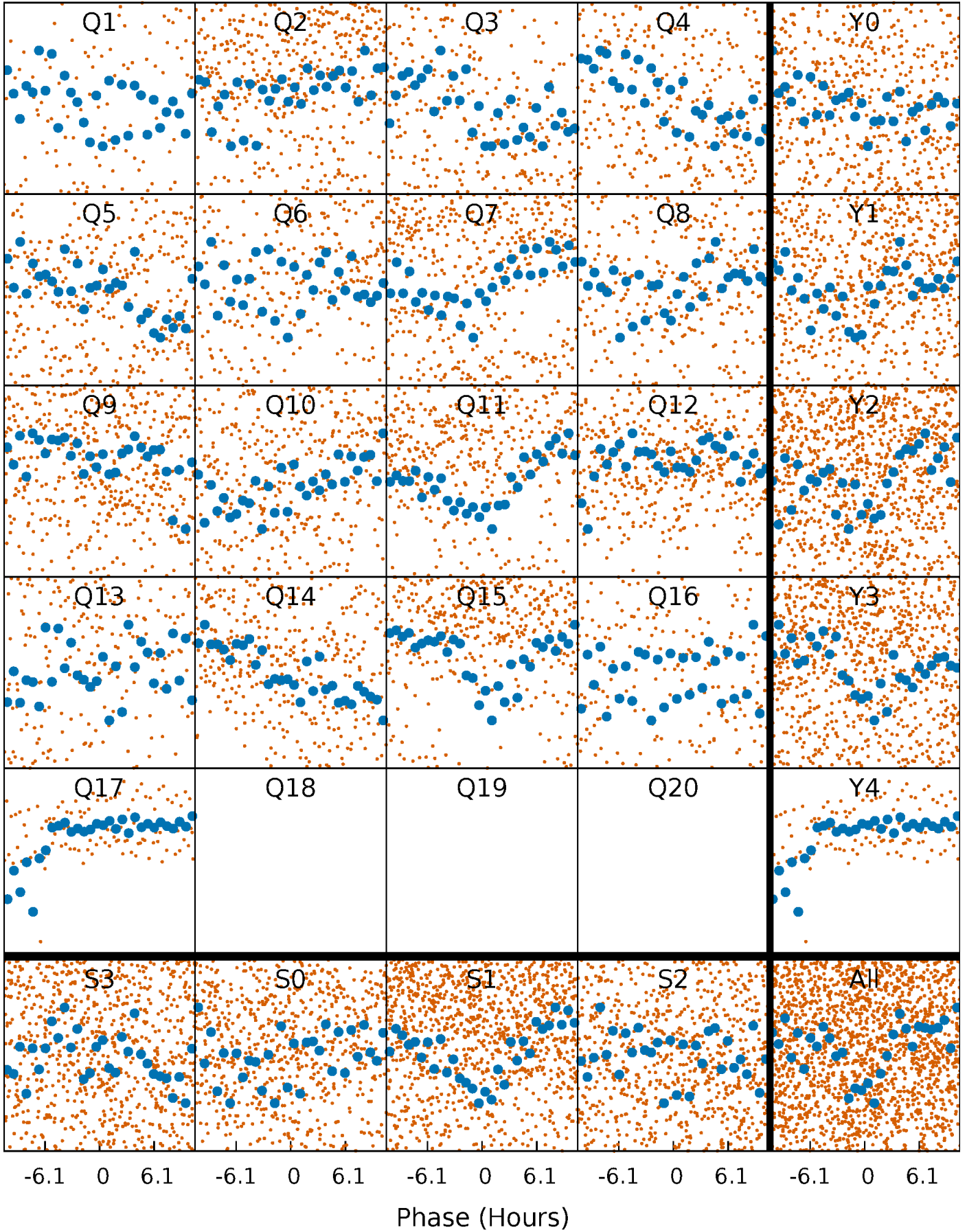


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

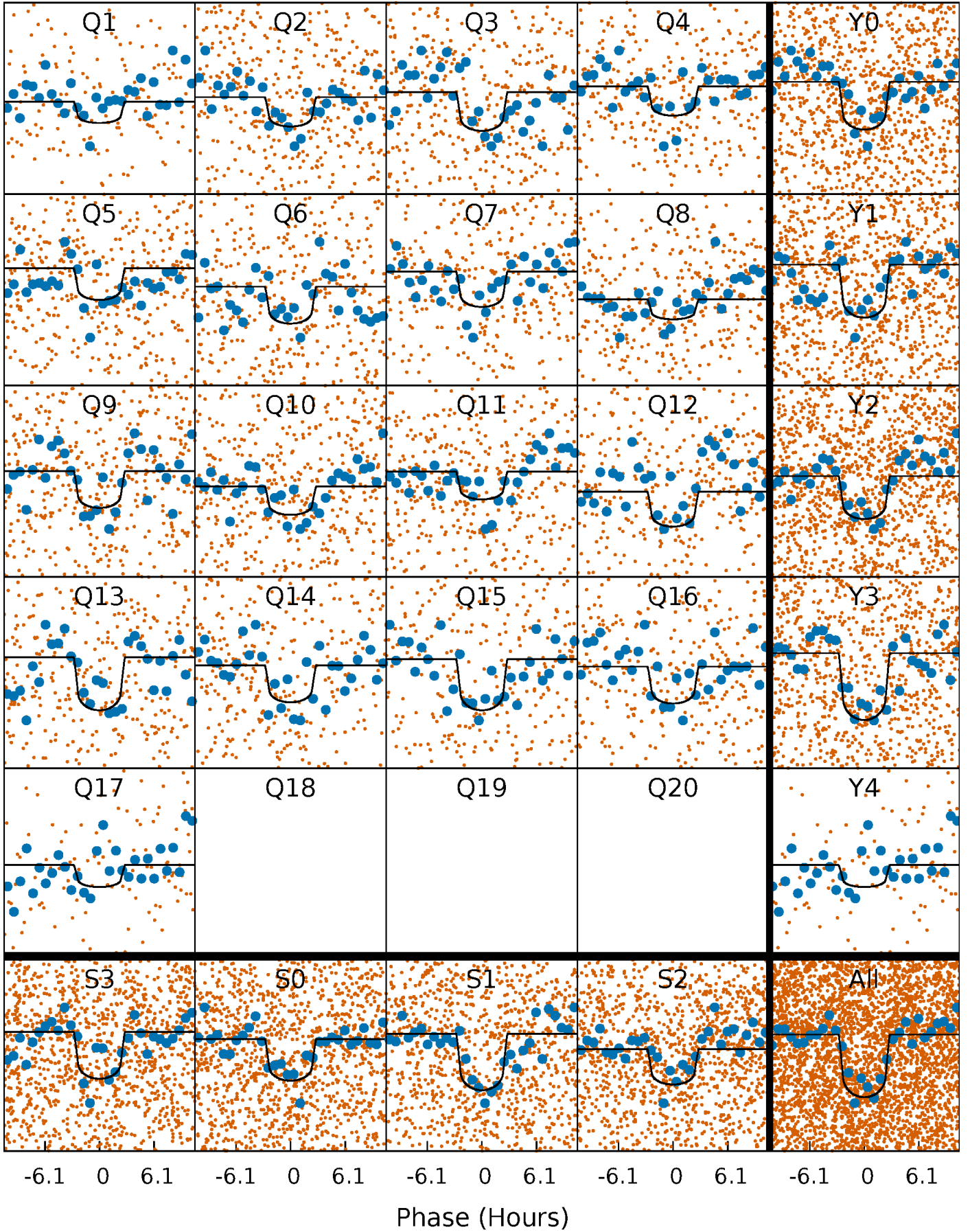
TCE 012314973-03 P= 7.514274 Days  $T_0=136.186667$  (BKJD)





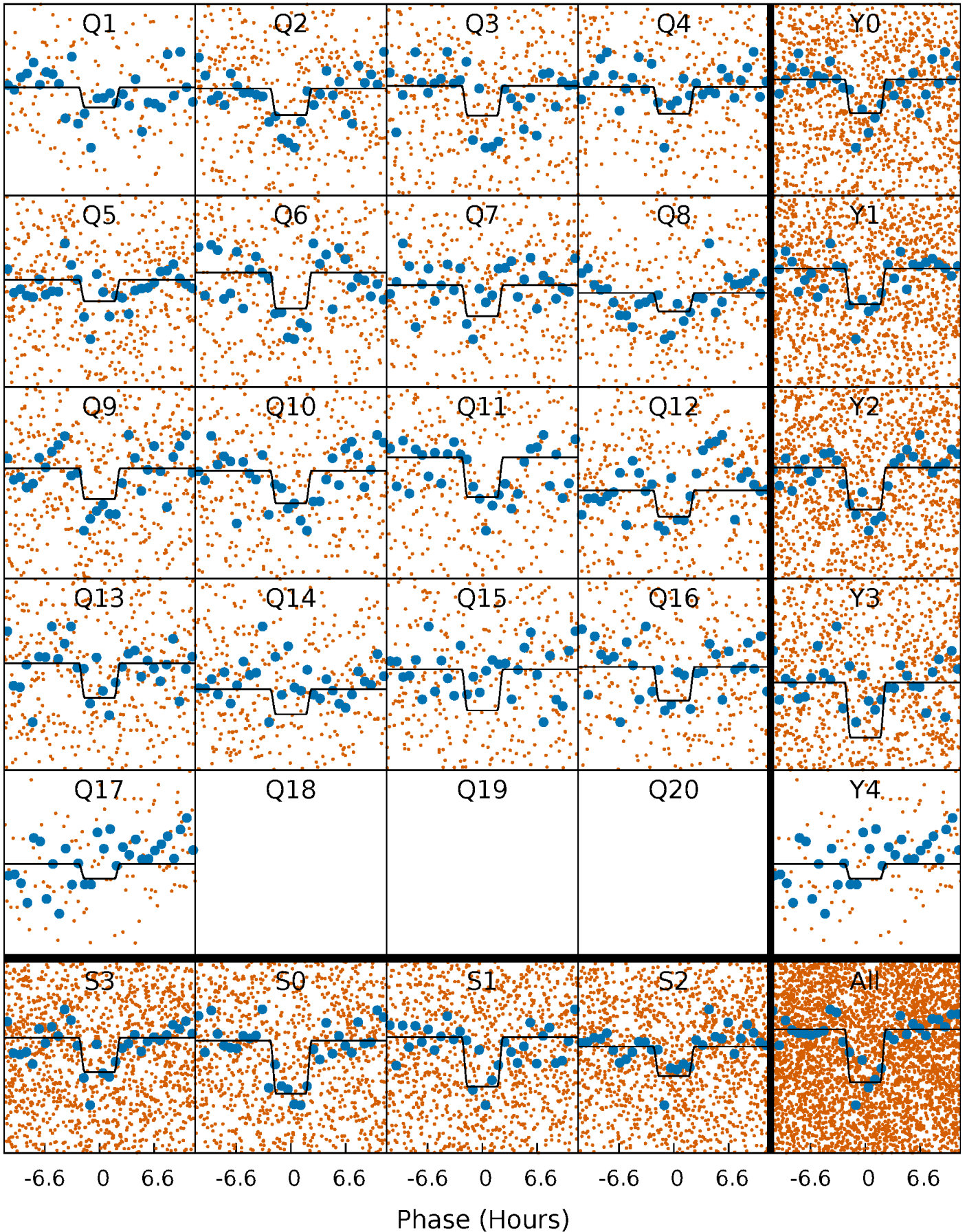
# DV Quarter-Phased Transit Curves

TCE 012314973-03 P= 7.514274 Days  $T_0=136.186667$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

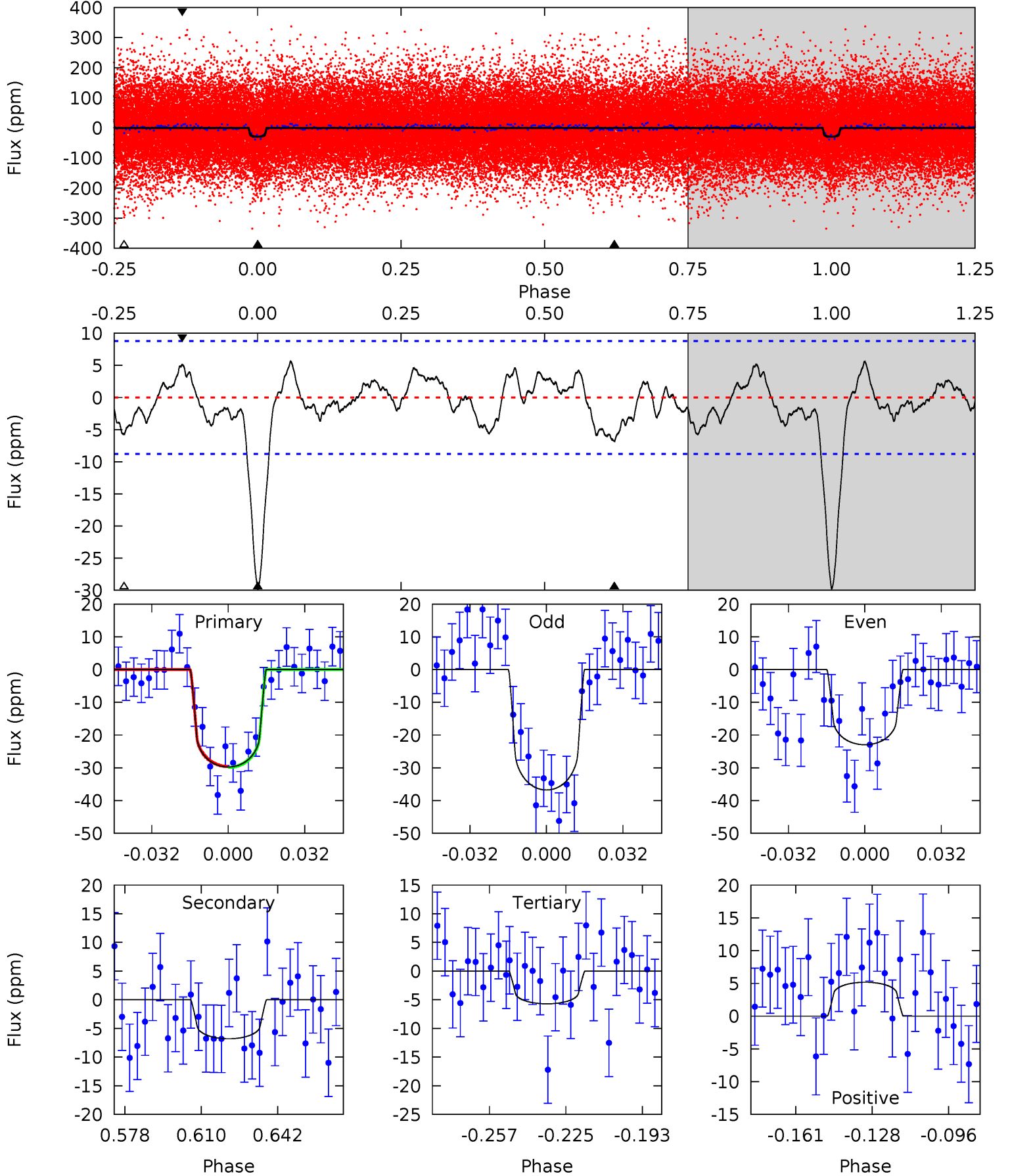
TCE 012314973-03 P= 7.514231 Days  $T_0=136.196868$  (BKJD)



# DV Model-Shift Uniqueness Test

012314973-03, P = 7.514274 Days, E = 128.672393 Days

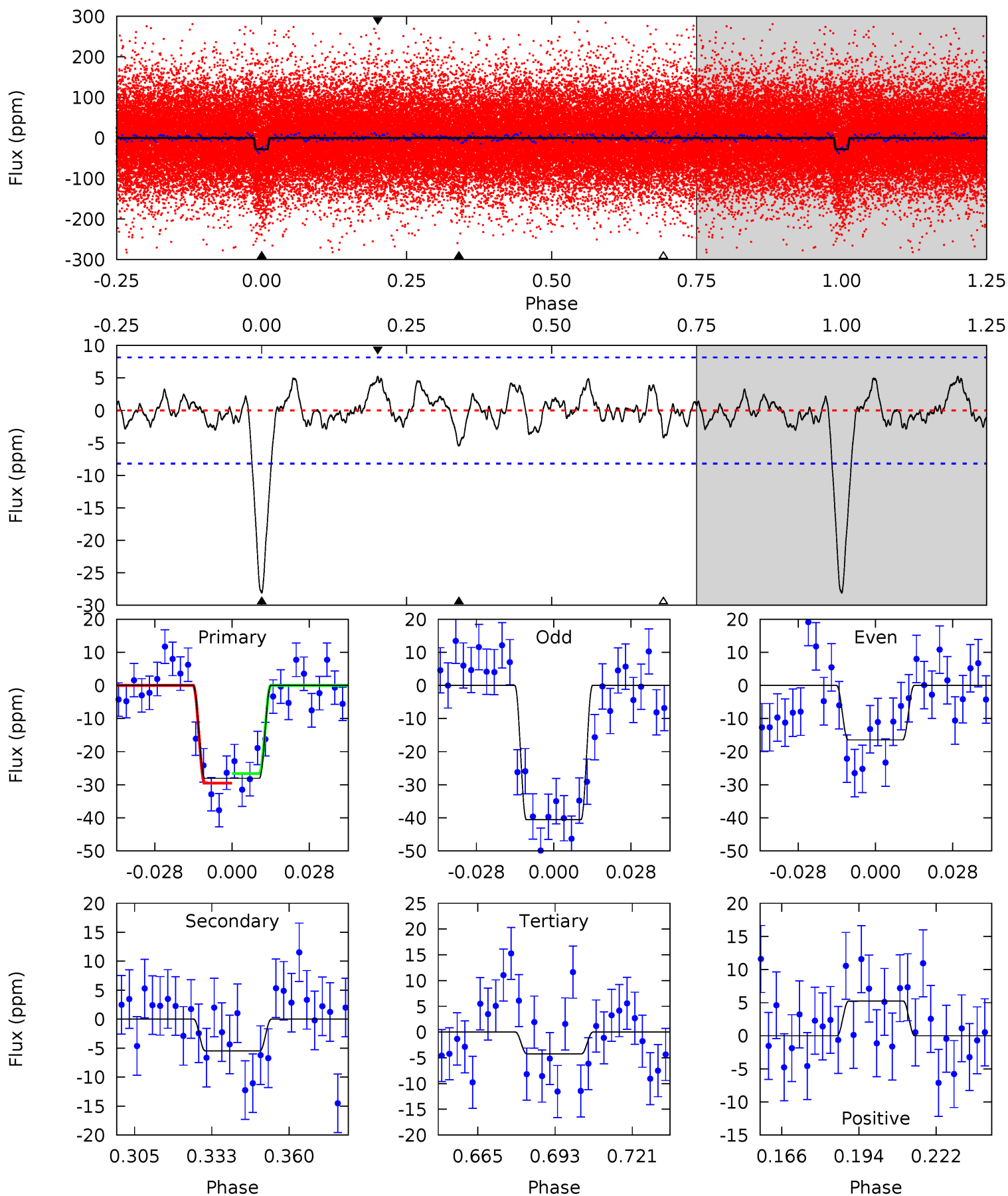
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	3.71	3.11	2.82	4.80	2.14	1.41	13.1	13.4	0.60	0.89	3.79	0.85	0.16	0.08



# Alt Model-Shift Uniqueness Test

012314973-03, P = 7.514231 Days, E = 128.682637 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
16.6	3.23	2.50	3.09	4.83	2.20	1.12	14.1	13.5	0.74	0.14	7.13	0.82	0.16	0.86



### Stellar Parameters For KIC 012314973

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6206^{+80}_{-74}$	$4.159^{+0.048}_{-0.032}$	$0.220^{+0.150}_{-0.200}$	$1.573^{+0.089}_{-0.111}$	$1.305^{+0.053}_{-0.093}$	$0.473^{+0.093}_{-0.054}$
	+1%/-1%	+1%/-1%	+68%/-91%	+6%/-7%	+4%/-7%	+20%/-11%
Source	SPE72	AST8	SPE72	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 012314973-03 / KOI 0279.03

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-7 \pm 2$	$1.04^{+0.29}_{-0.30}$	$1671^{+32}_{-35}$	$4256^{+635}_{-404}$	$22^{+23}_{-9}$
Alt.	$-5 \pm 2$	$0.86^{+0.29}_{-0.29}$	$1672^{+31}_{-35}$	$4387^{+967}_{-502}$	$26^{+41}_{-13}$

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



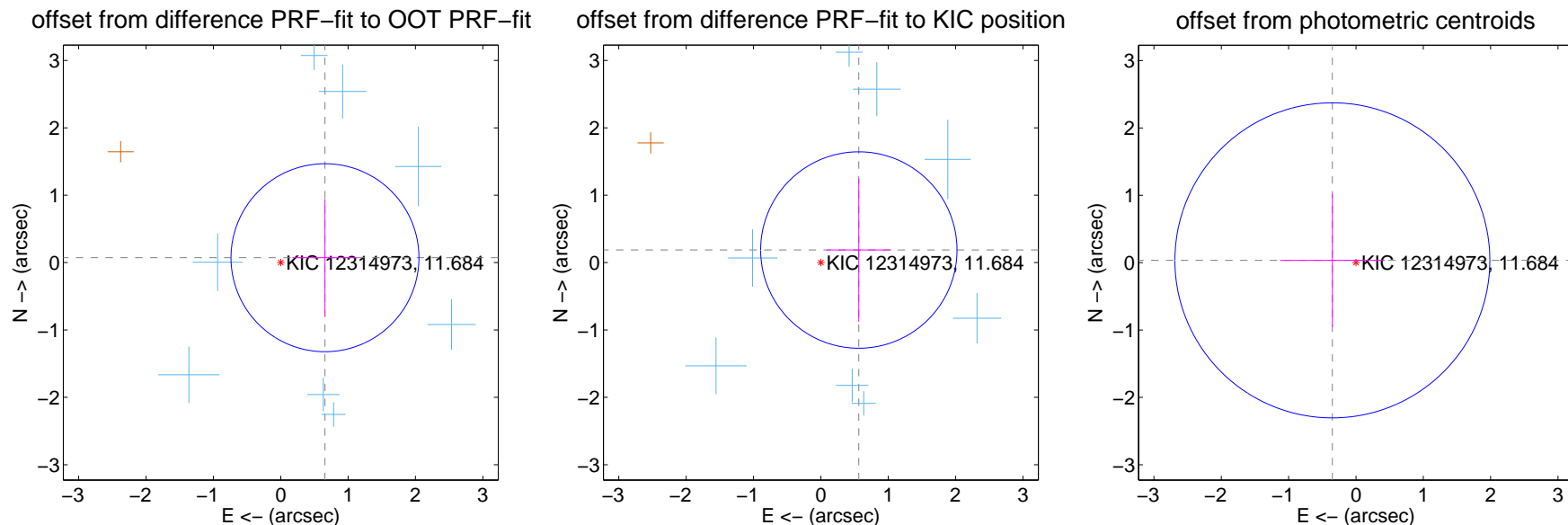
## DV Centroid Data

Supplemental centroid analysis for 012314973-03. **Kepler magnitude: 11.68.** Transit SNR 9.72

There are 8 quarters with good PRF difference image offsets

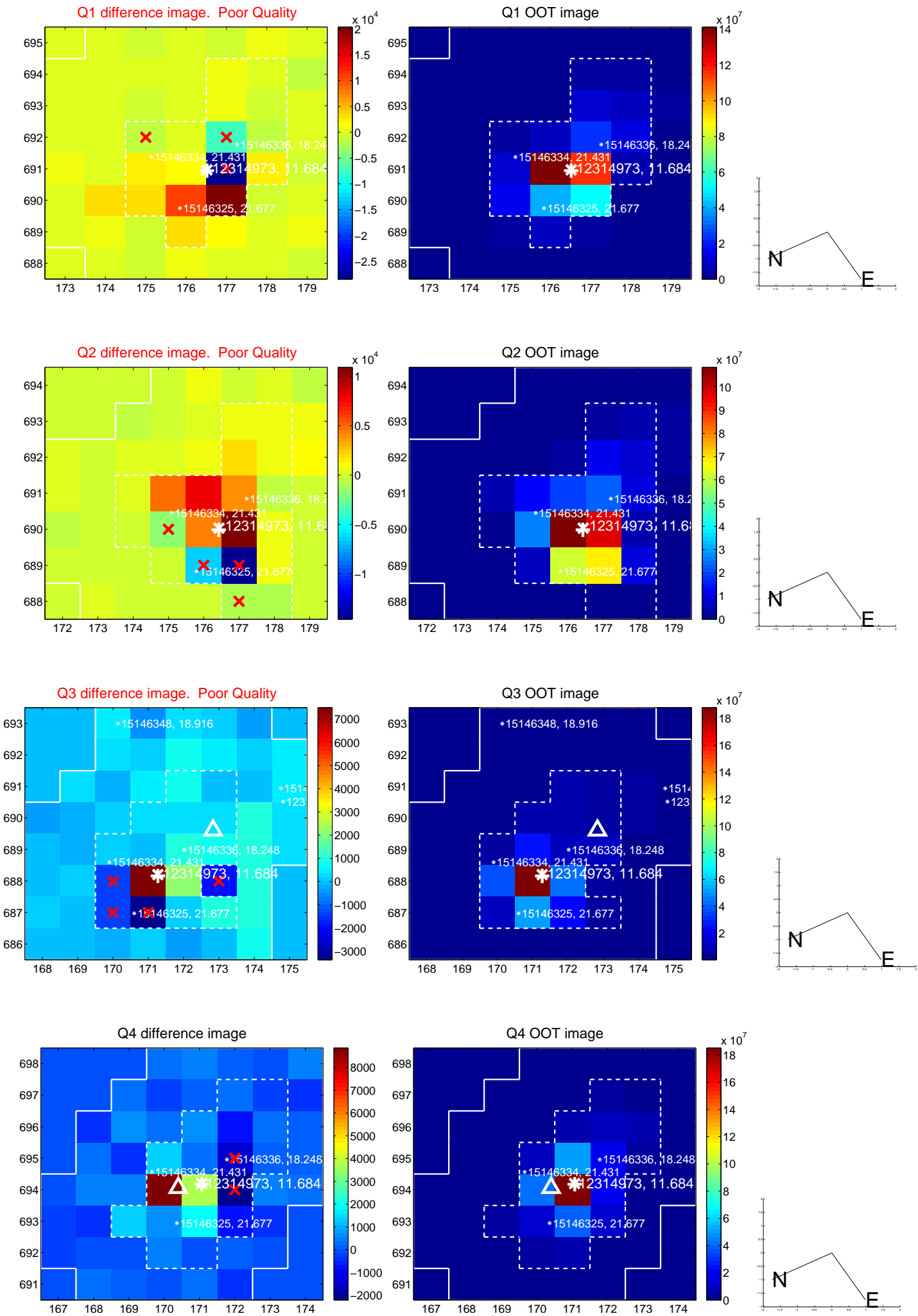
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.661 \pm 0.465$	1.42	$-0.657 \pm 0.483$	$0.072 \pm 0.871$
PRF-fit source offset from KIC position	$0.594 \pm 0.486$	1.22	$-0.564 \pm 0.478$	$0.186 \pm 1.064$
photometric centroid source offset	$0.35 \pm 0.78$	0.45	$0.35 \pm 0.78$	$0.03 \pm 0.99$



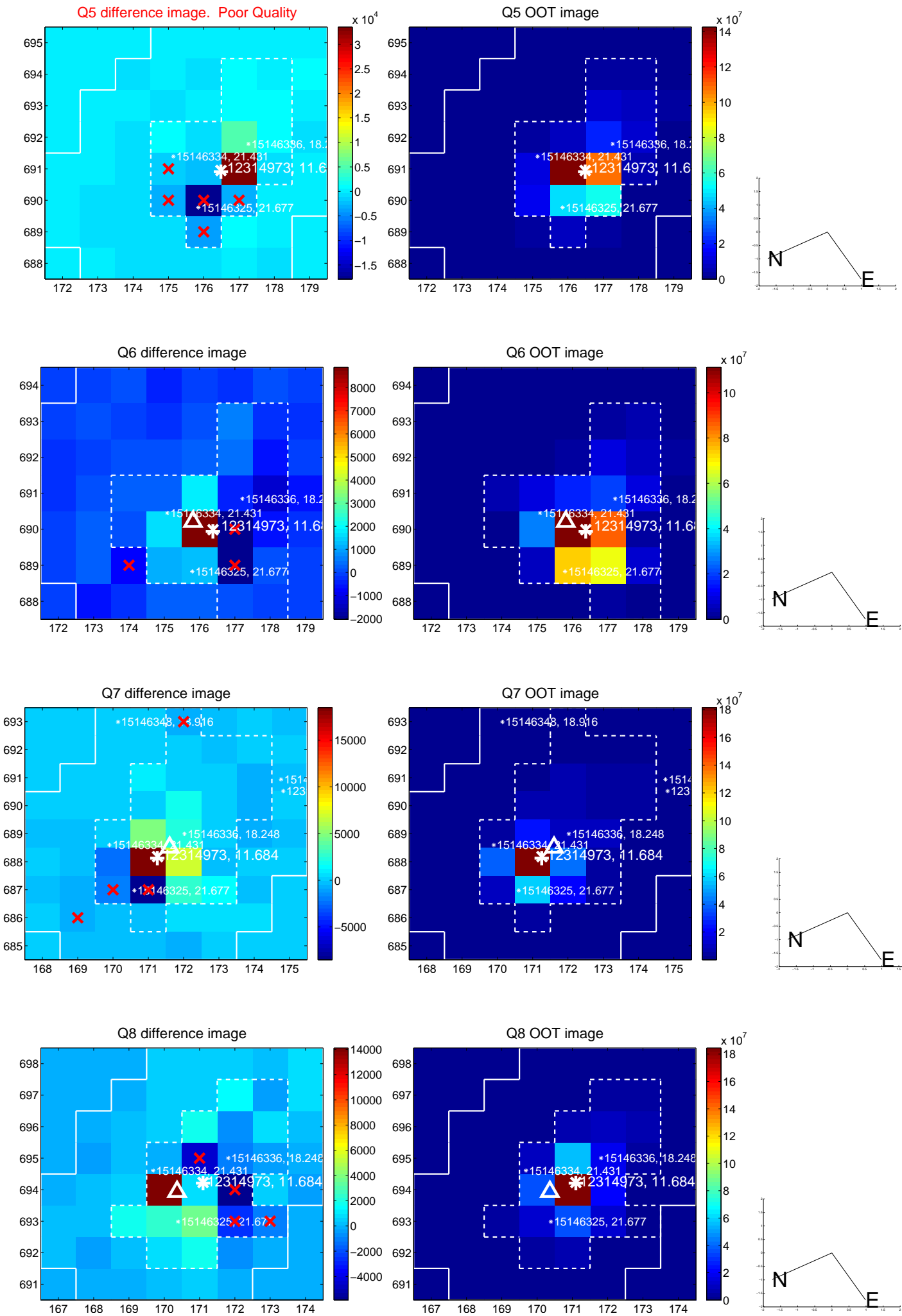
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

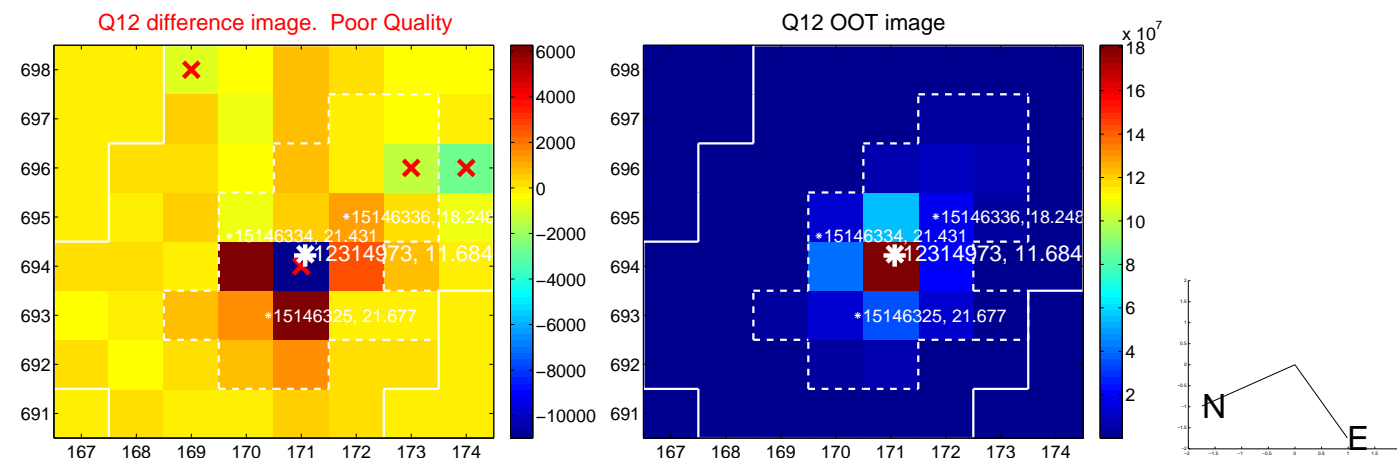
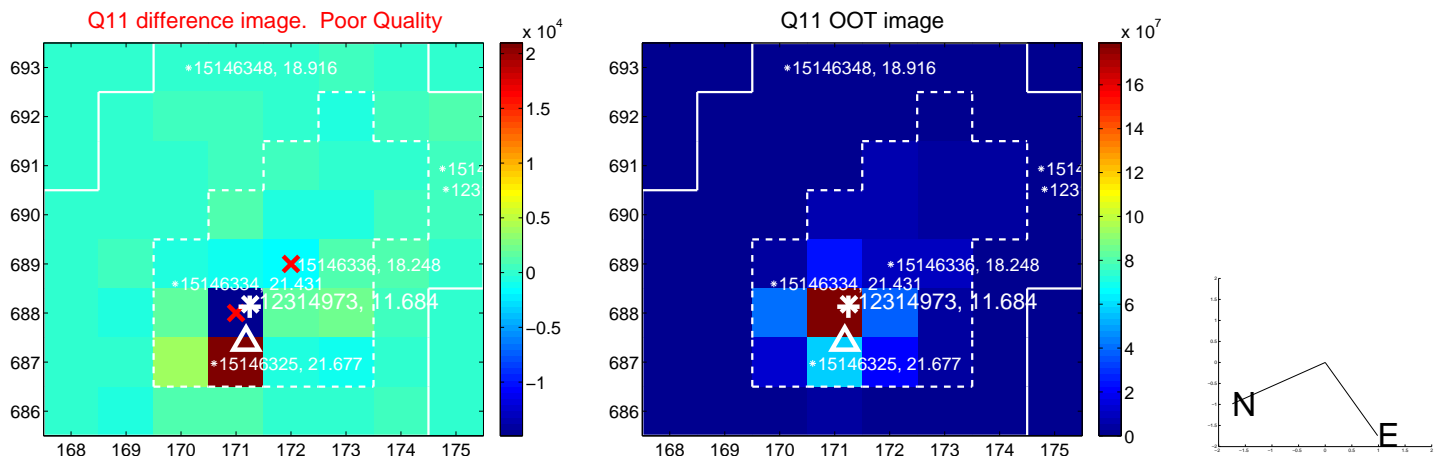
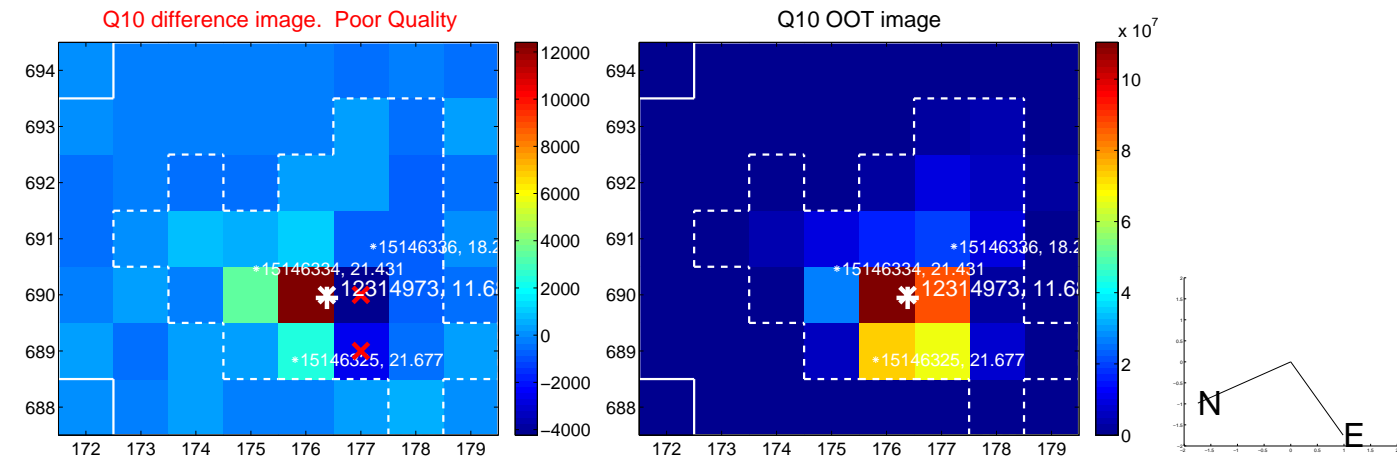
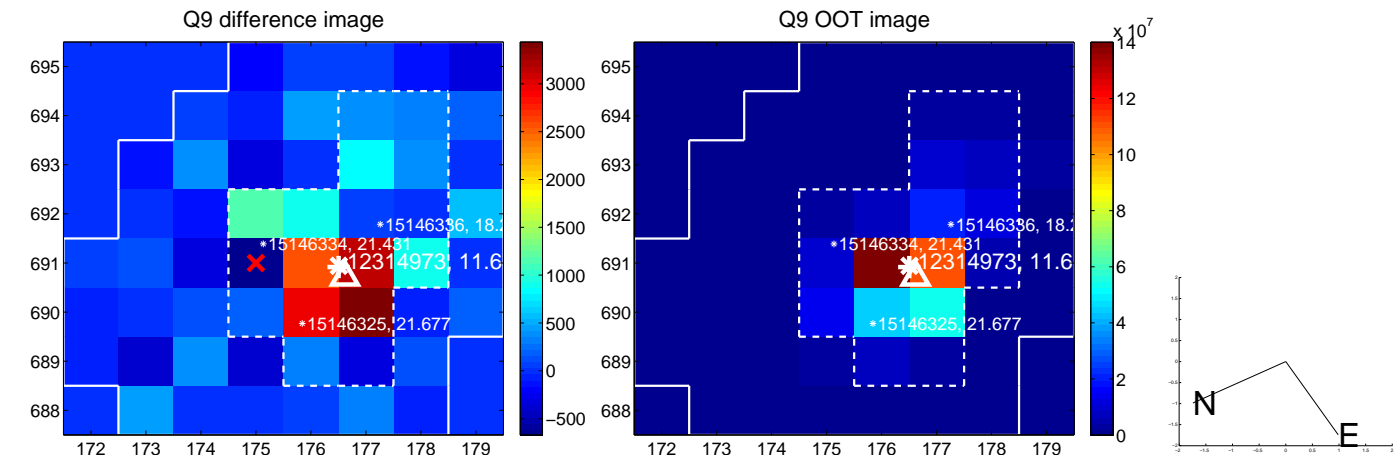




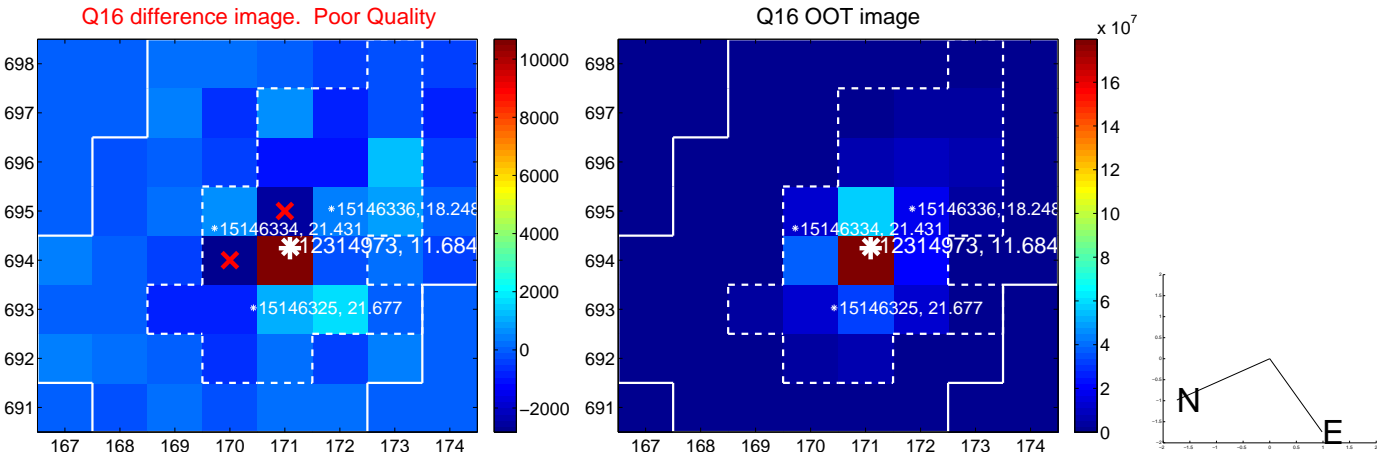
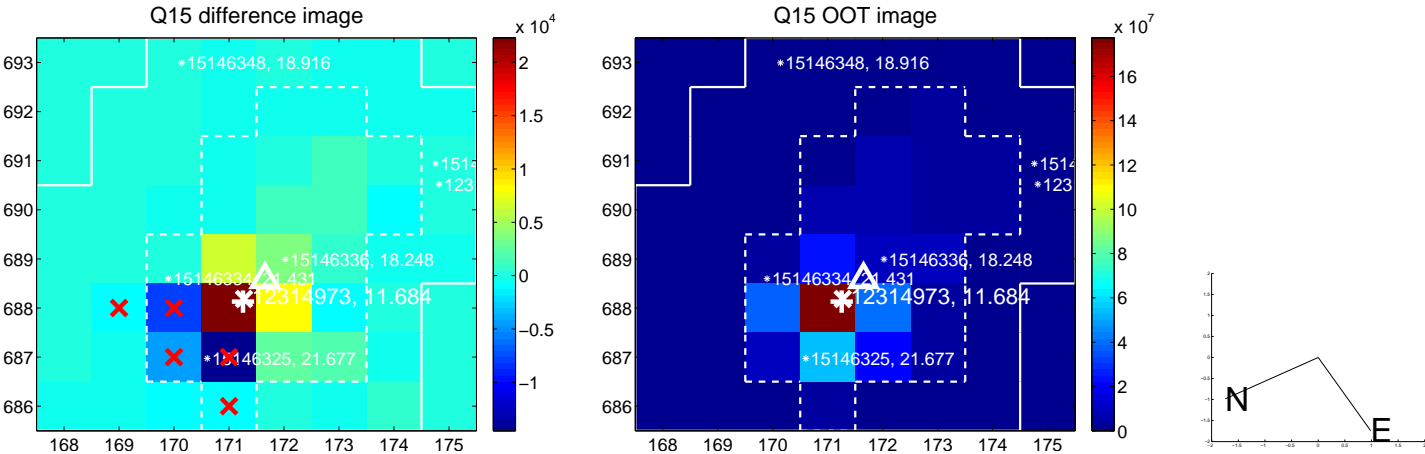
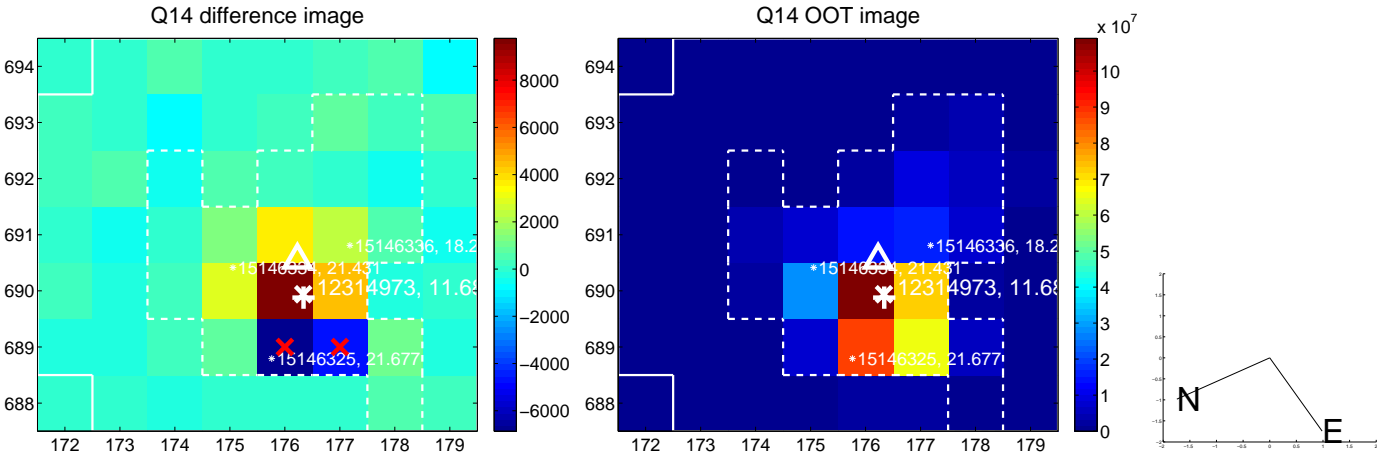
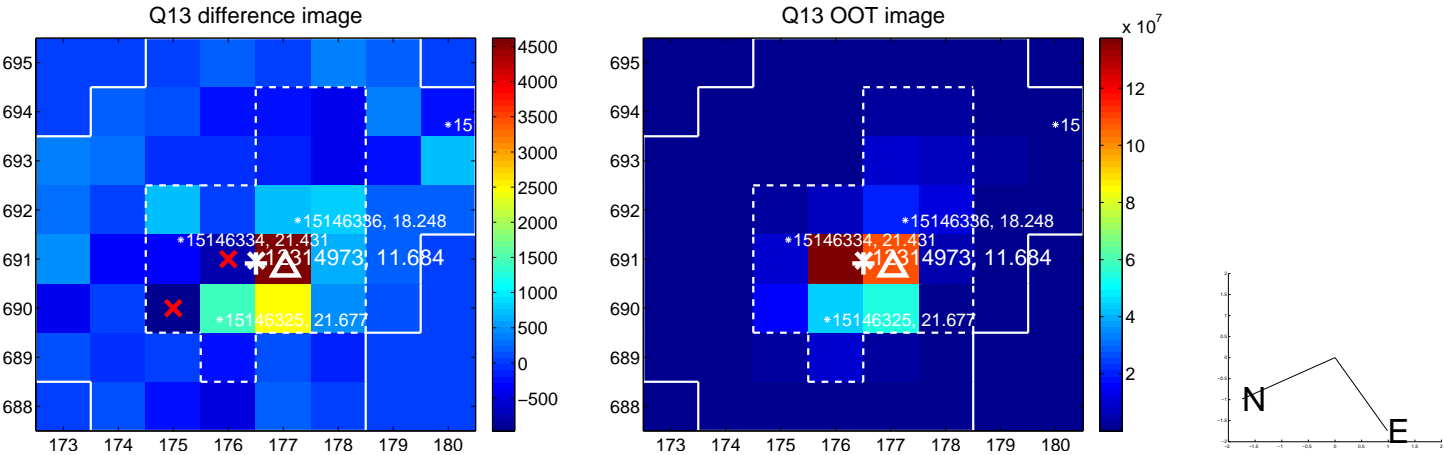
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



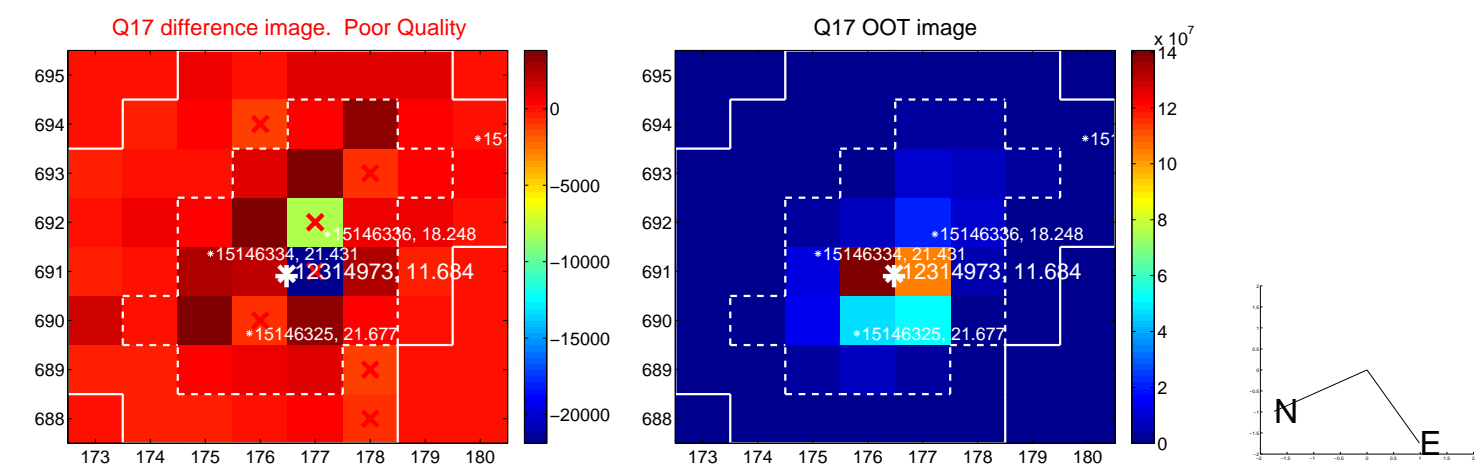
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



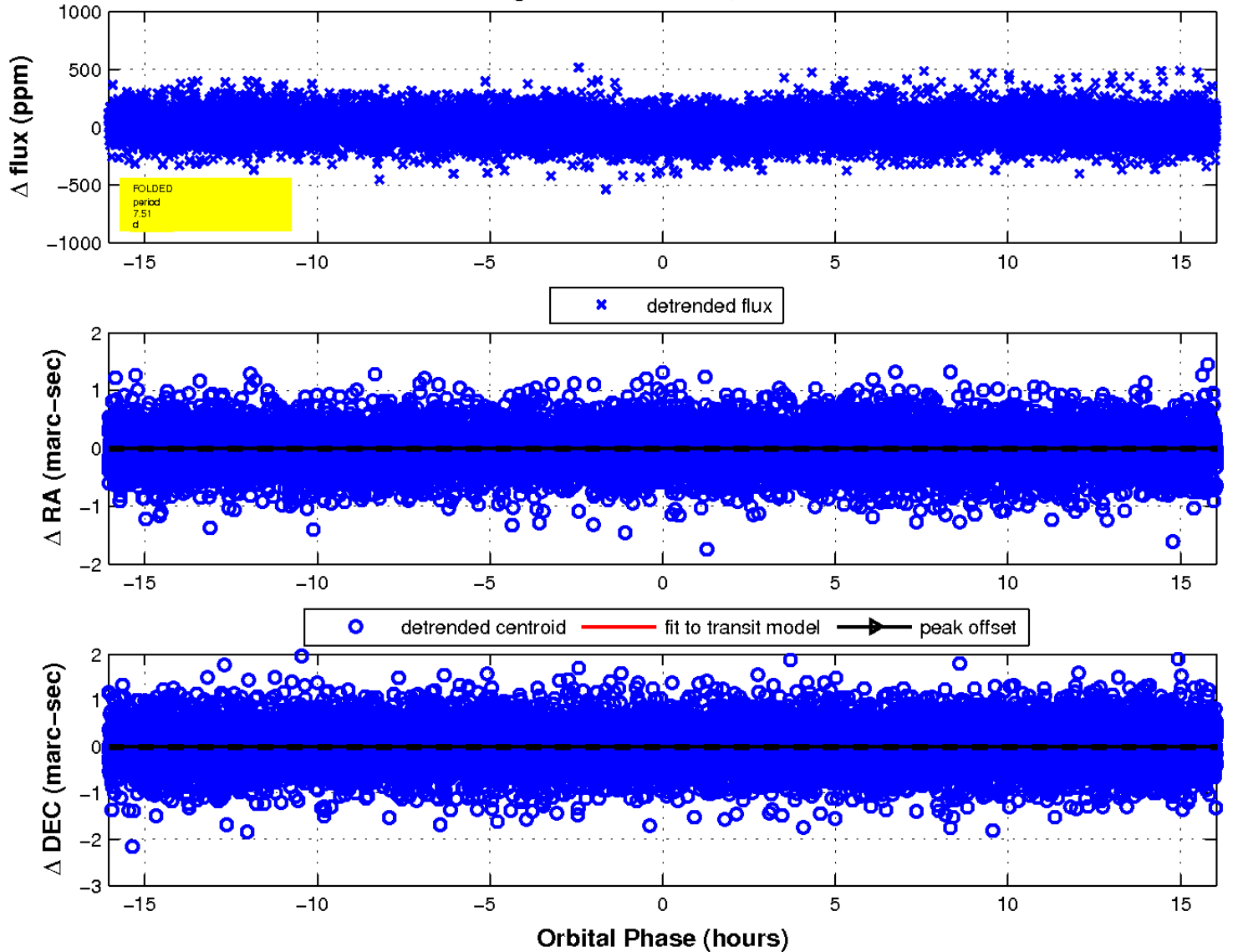
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

