

# KIC 004647662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004647662-01	OBS	4806.01	1.064815	131.604007	34.6	2.656	9.0	8.8	1.09	6445	0.74	4051.11
004647662-02	OBS	No	308.562759	194.750599	471.4	4.215	7.3	7.4	1.09	6445	2.47	2.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004647662-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—EPHEM_MATCH
004647662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—MOD_NONUNIQ_ALT

**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.

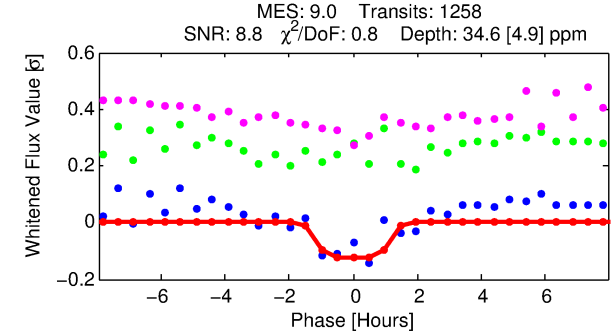
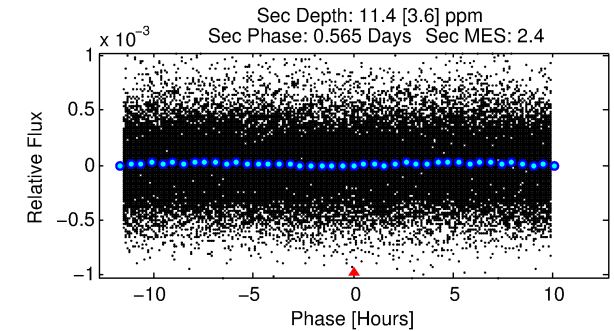
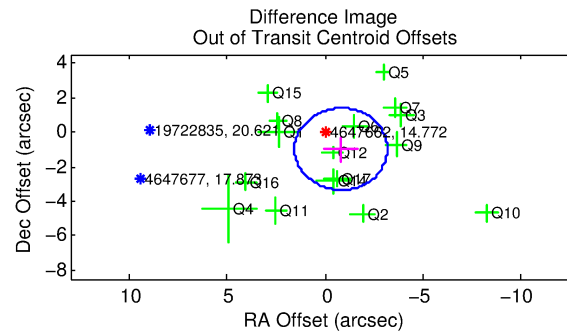
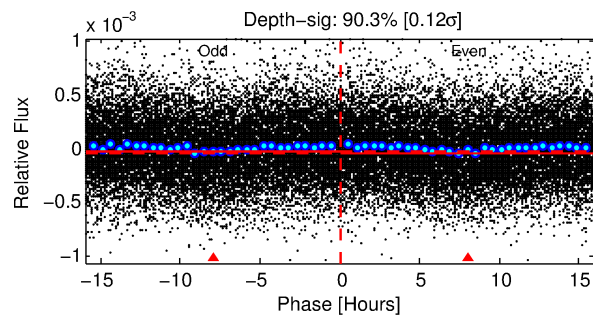
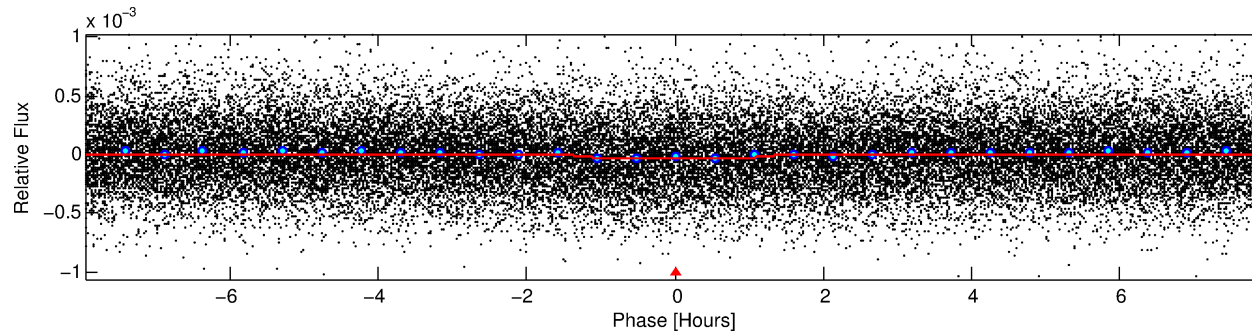
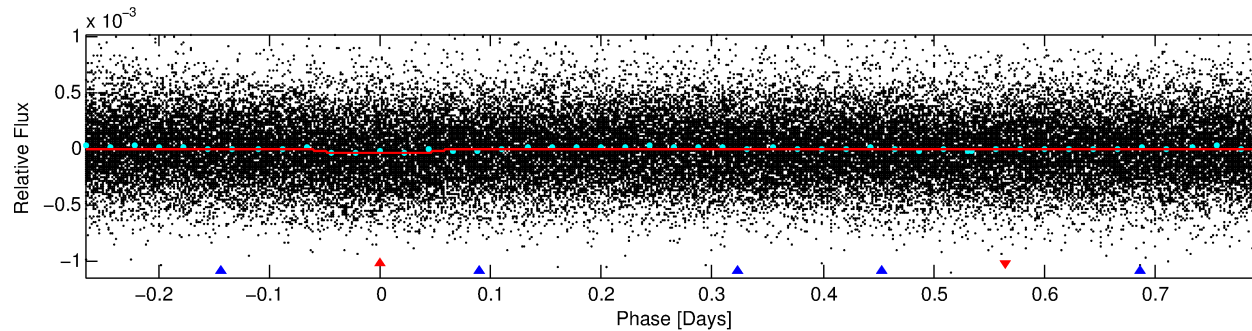
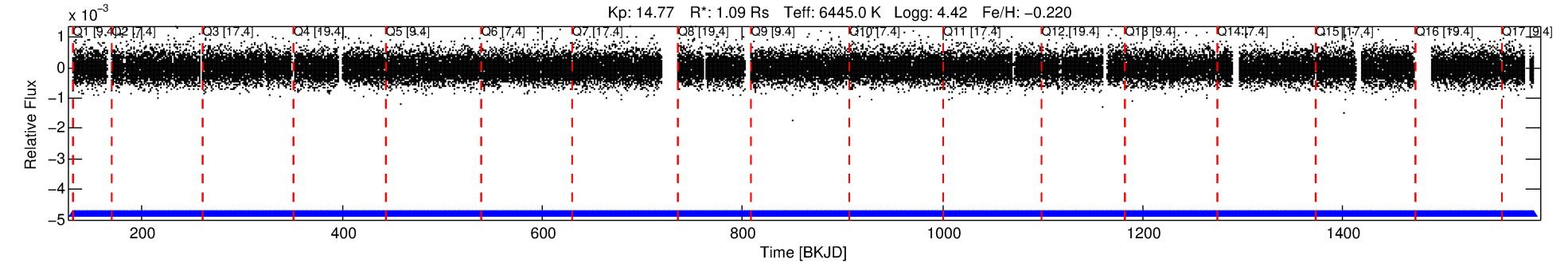
## Ephemeris Match Information For 004647662-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
004647662-01	4647662	004647652-pri	4647652	1:1	47.3	9	8	11.81	14.77	3077.10	Direct-PRF	0	0.80	0.63

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 4647662 Candidate: 1 of 2 Period: 1.065 d  
KOI: K04806.01 Corr: 0.882



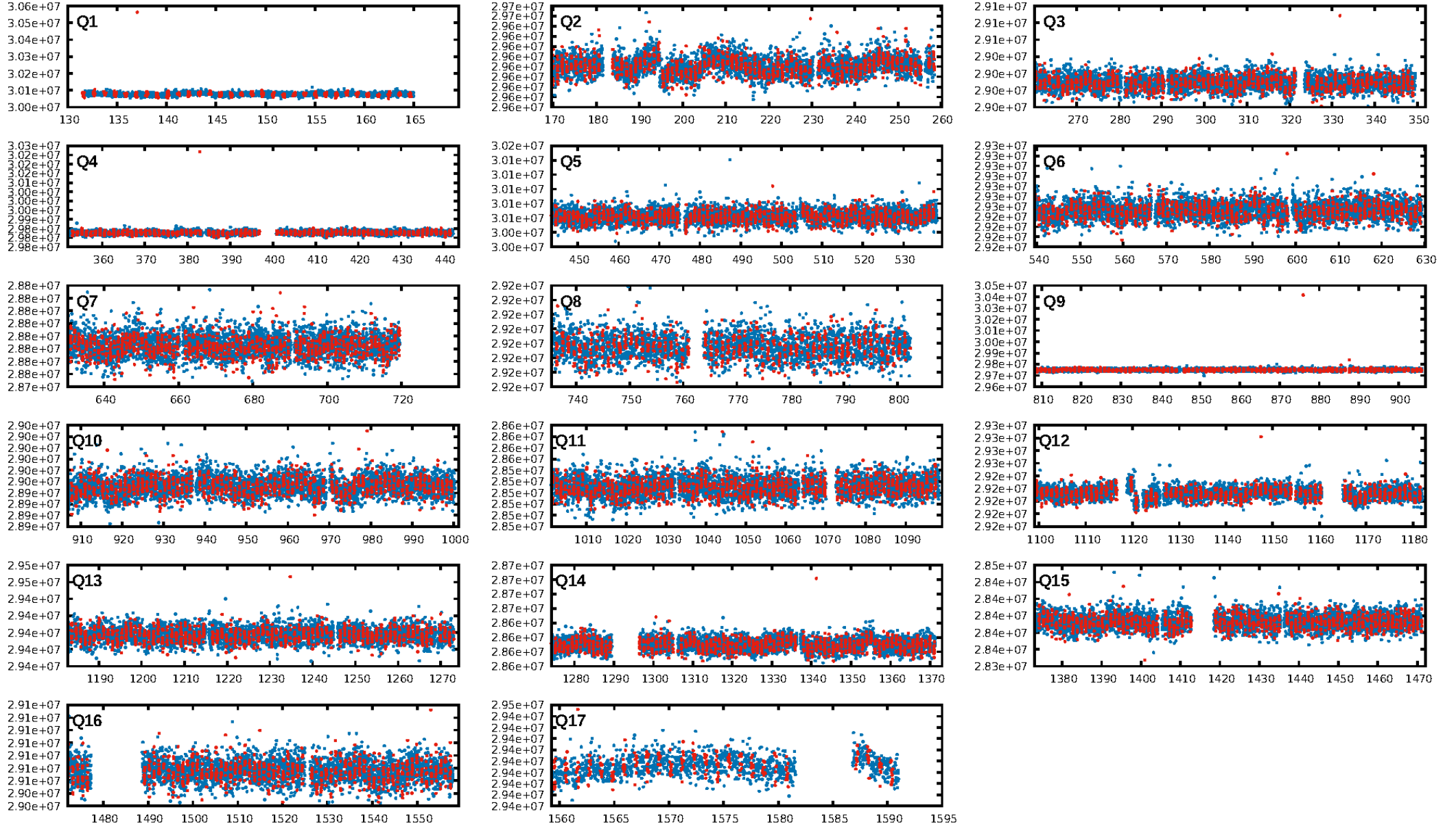
## DV Fit Results:

Period = 1.06481 [0.00001] d  
Epoch = 131.6040 [0.0041] BKJD  
Rp/R\* = 0.0062 [0.0031]  
a/R\* = 1.76 [3.37]  
b = 0.88 [0.74]  
Seff = 4051.11 [877.88]  
Teq = 2034 [110] K  
Rp = 0.74 [0.38] Re  
a = 0.0212 [0.0029] AU  
Ag = 5.20 [5.54] [0.76 $\sigma$ ]  
Teffp = 4750 [1241] K [2.18 $\sigma$ ]

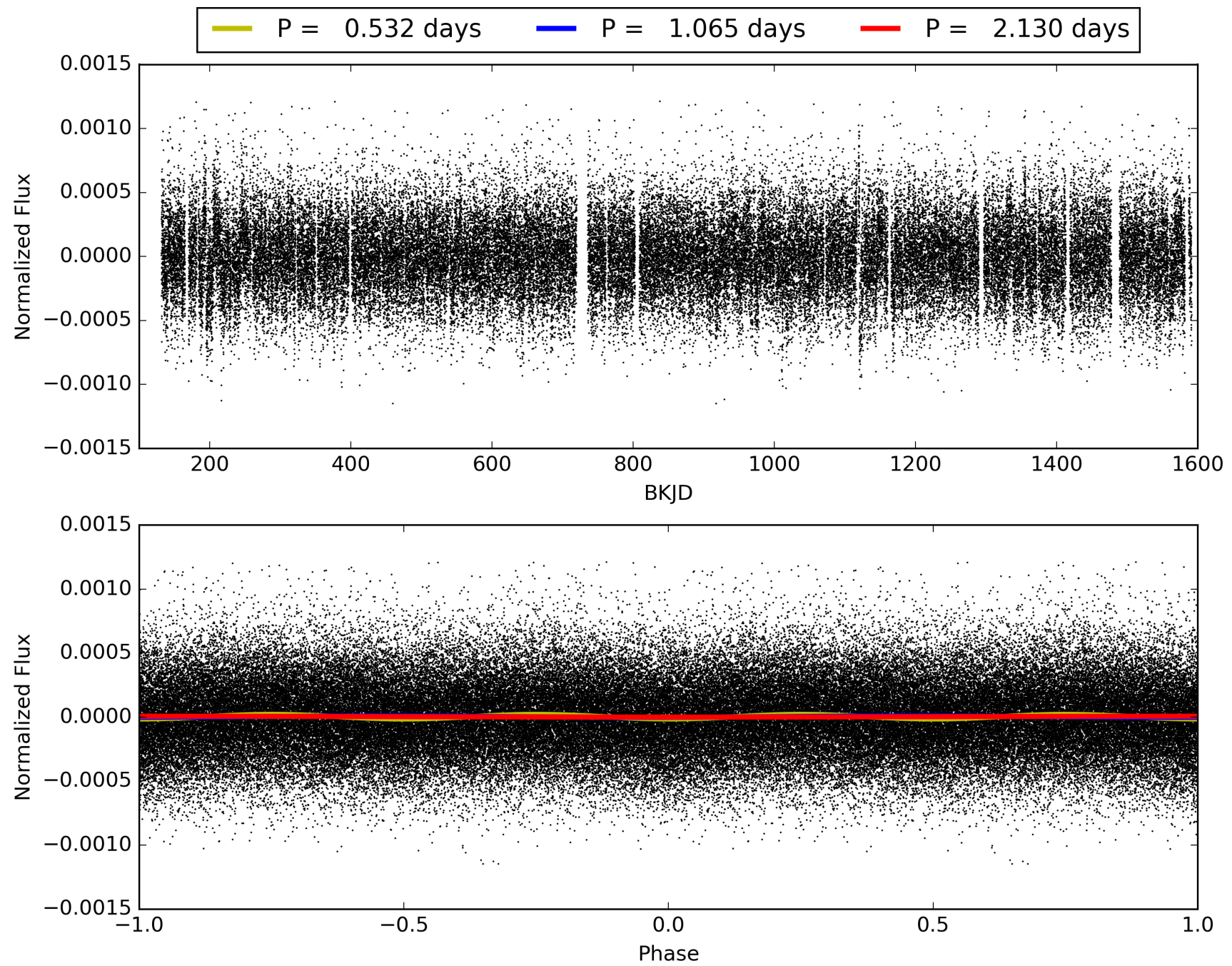
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1481.10 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.72e-17  
RollingBand-fgt: 1.00 [1201/1201]  
**GhostDiagnostic-chr: 0.1702**  
Centroid-sig: 0.0%  
Centroid-so: 4.150 arcsec [2.95 $\sigma$ ]  
OotOffset-rm: 1.273 arcsec [1.61 $\sigma$ ]  
KicOffset-rm: 1.302 arcsec [1.64 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.19 [3/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 004647662-01, PDC Light Curves

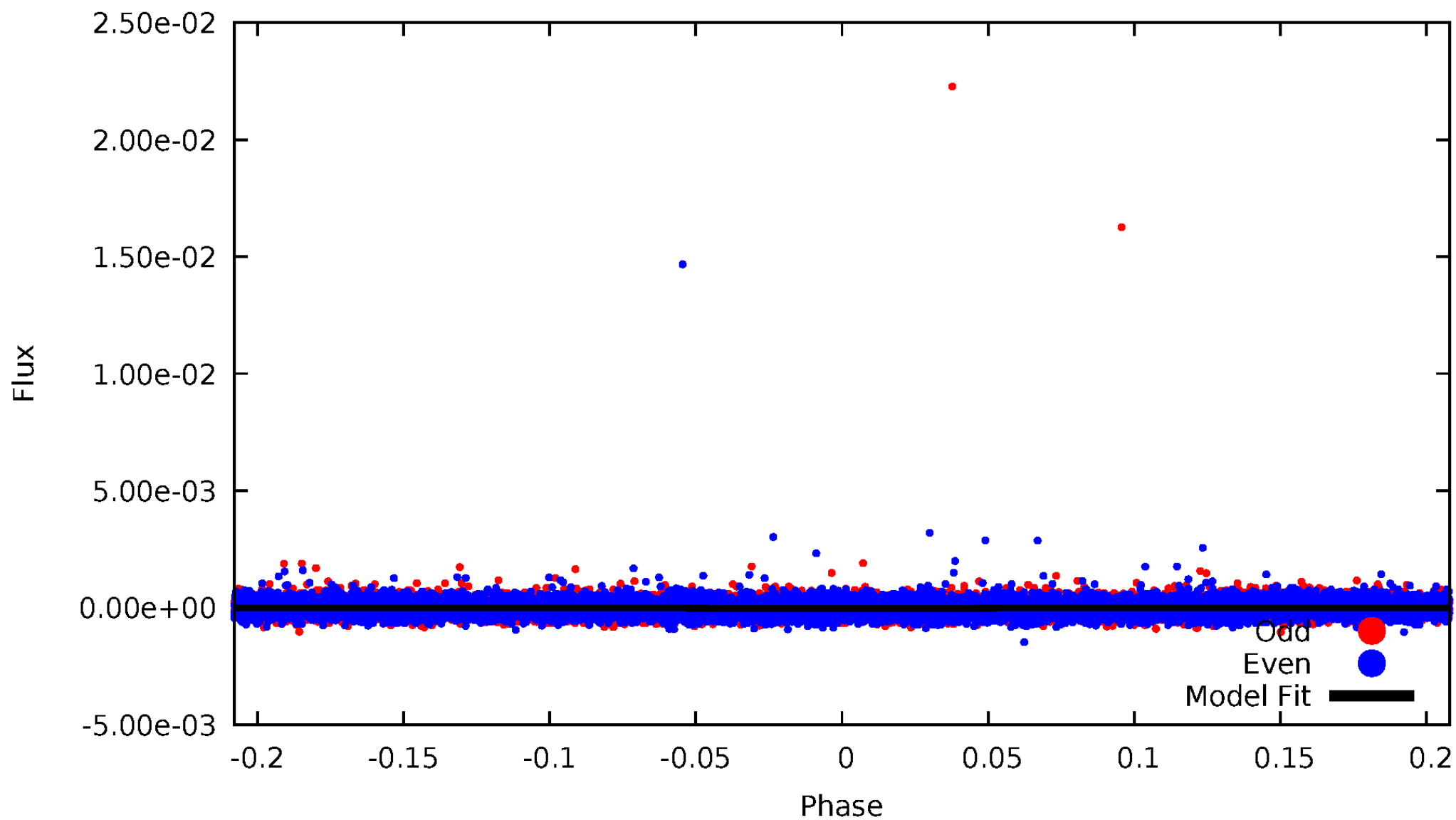


TCE 004647662-01



# DV Odd/Even

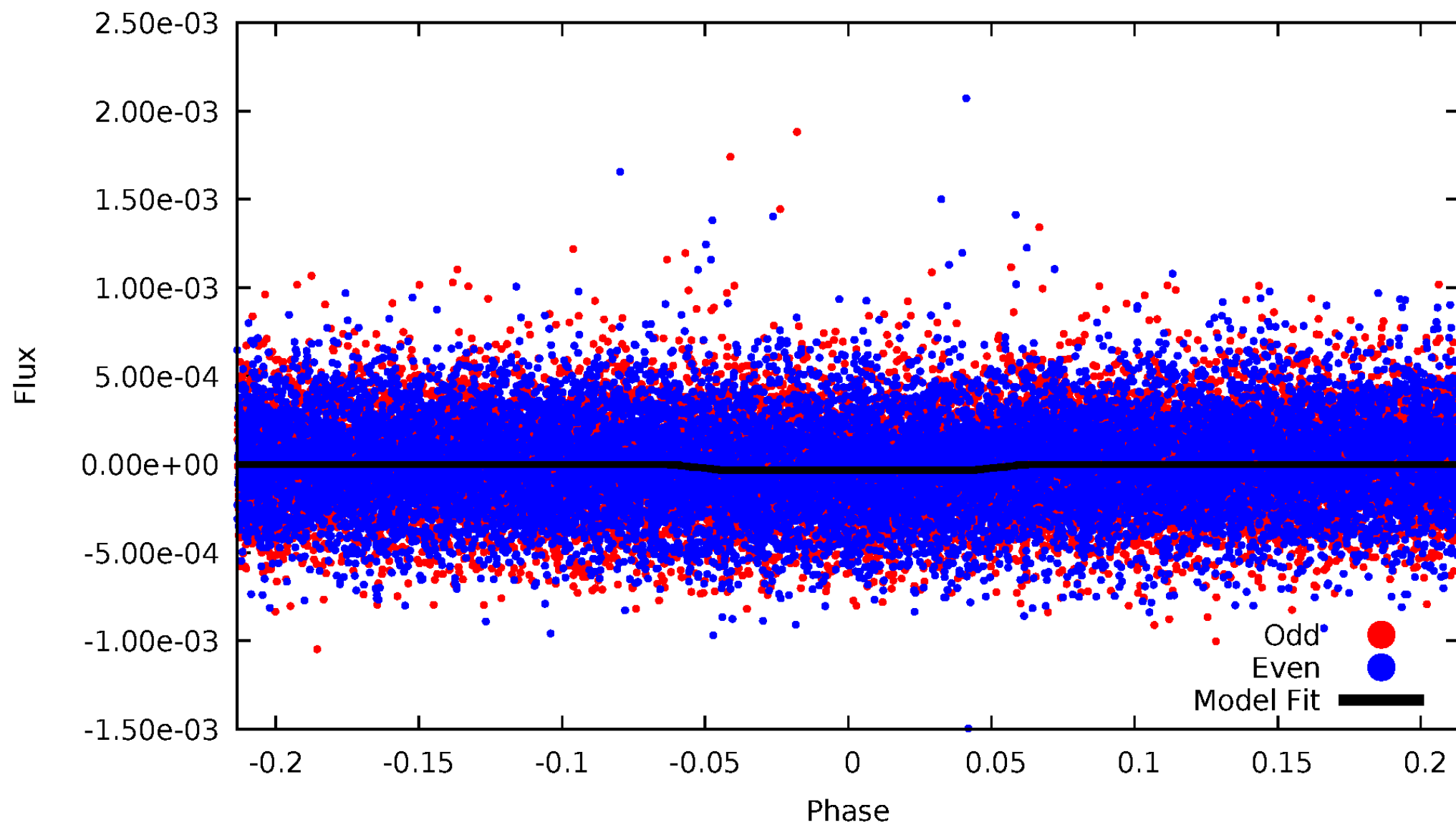
TCE 004647662-01





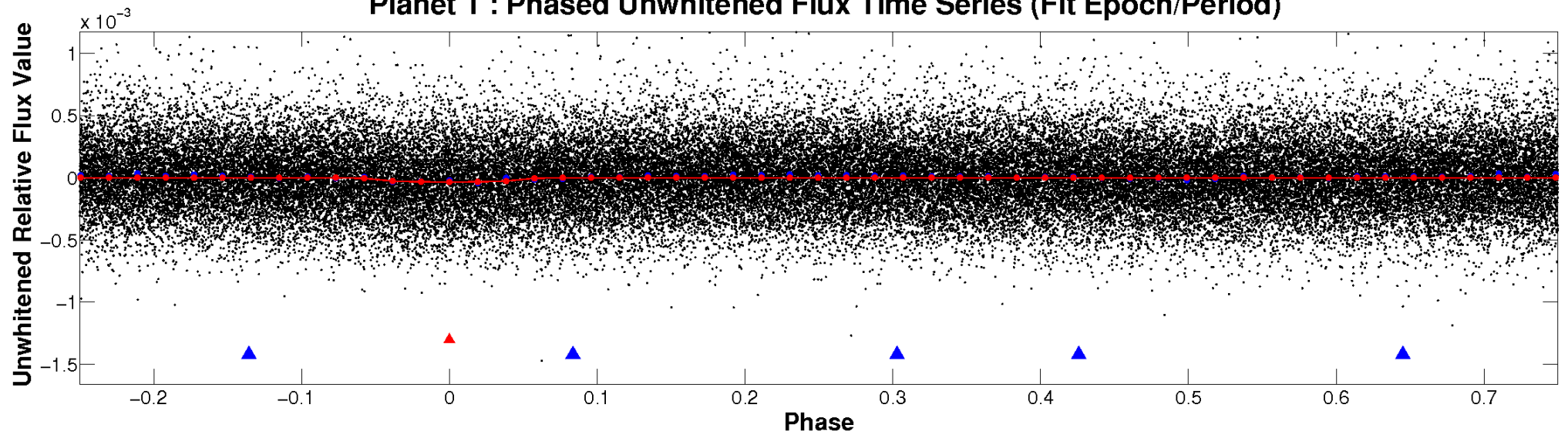
# ALT Odd/Even

TCE 004647662-01

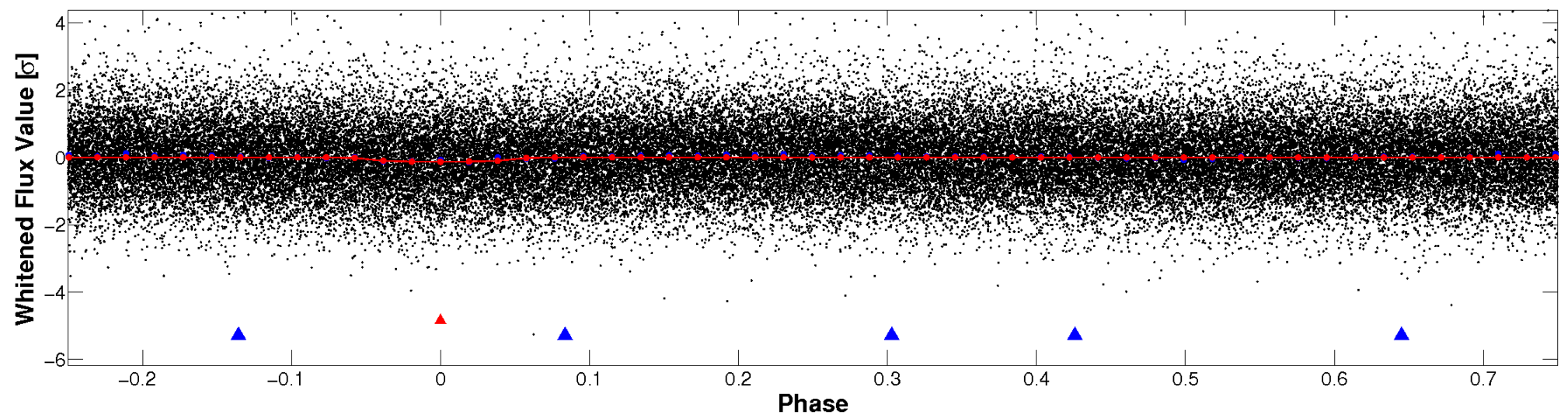


# Non-Whitened Vs. Whitened Light Curve

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

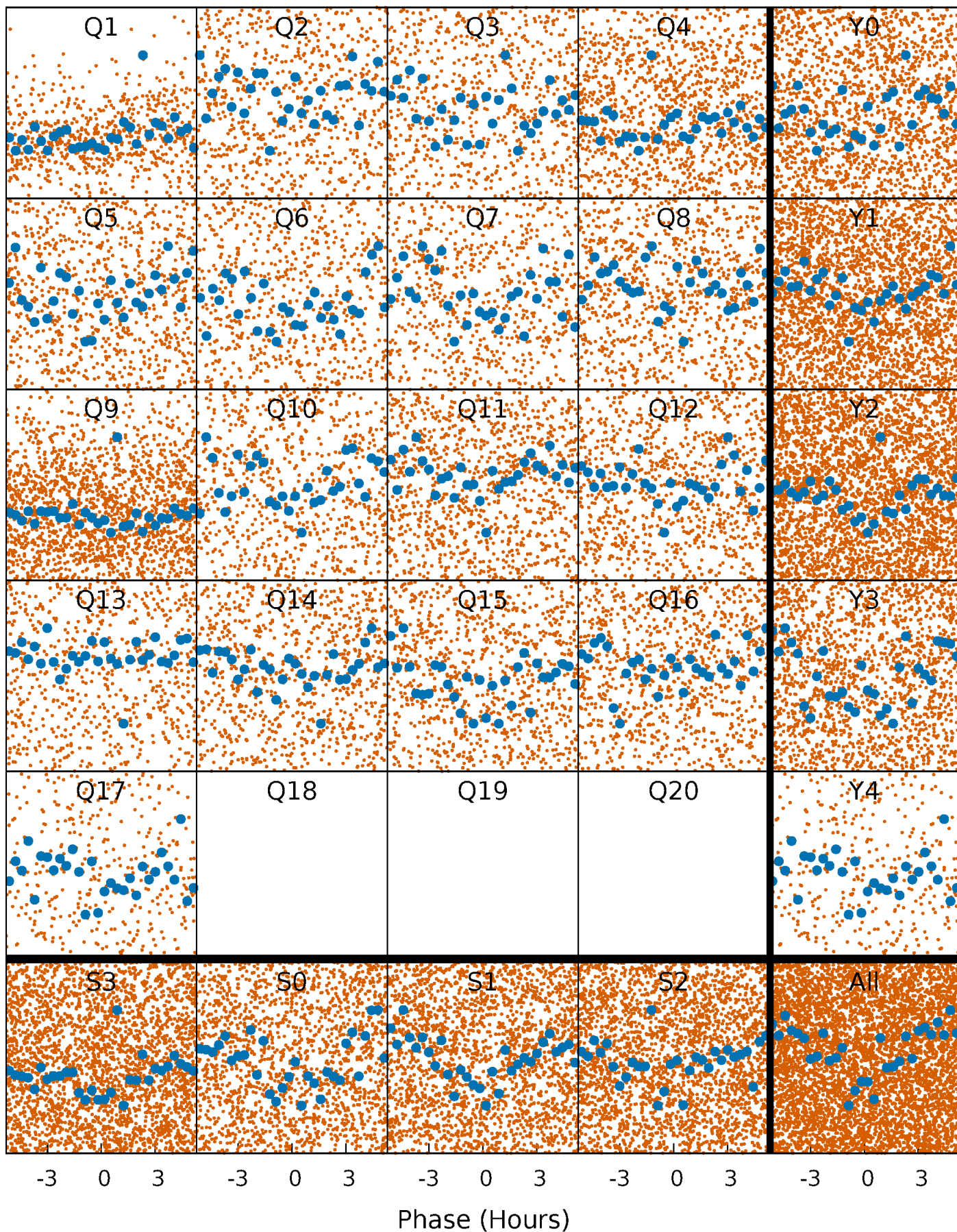


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

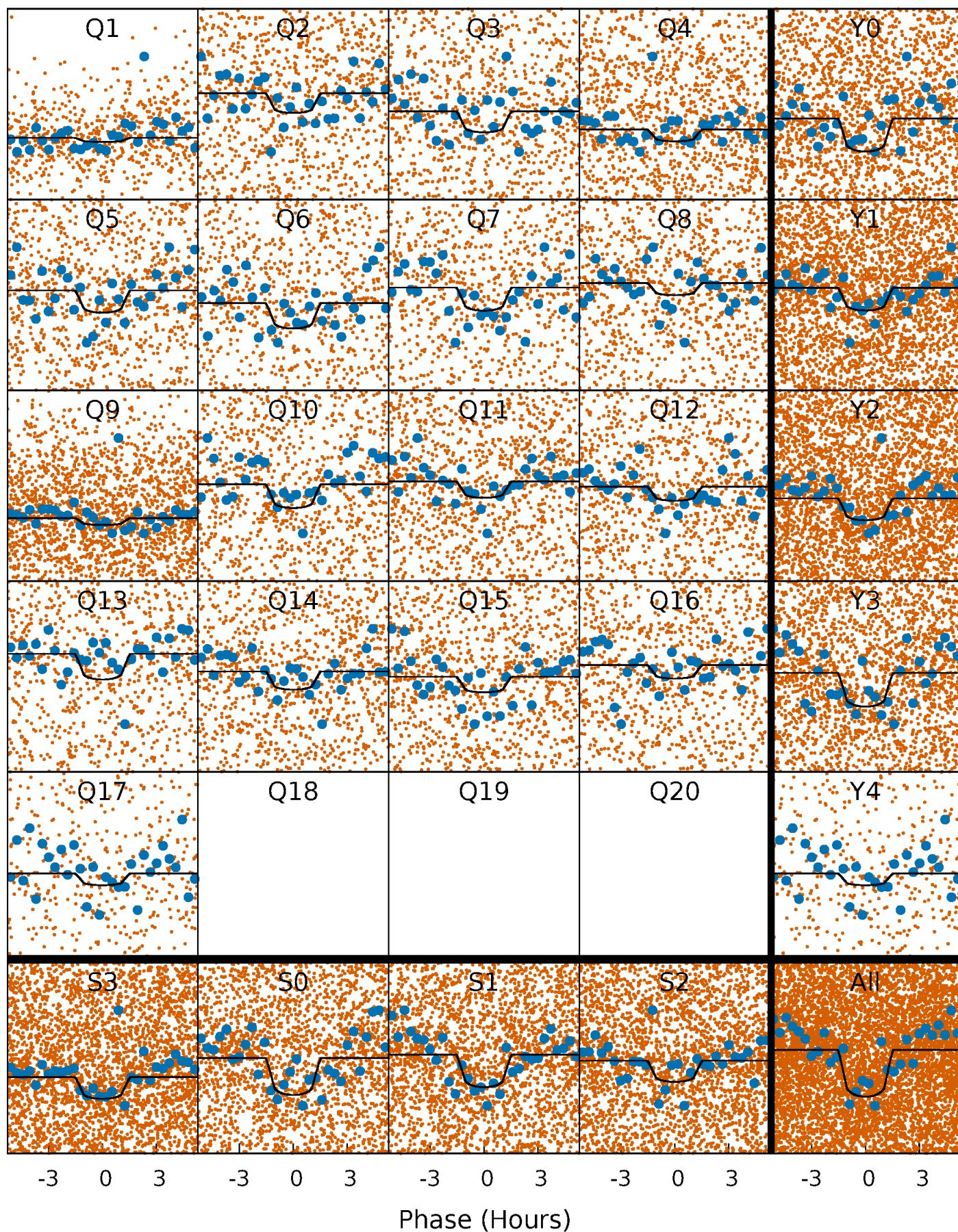
TCE 004647662-01 P= 1.064815 Days  $T_0=131.604007$  (BKJD)





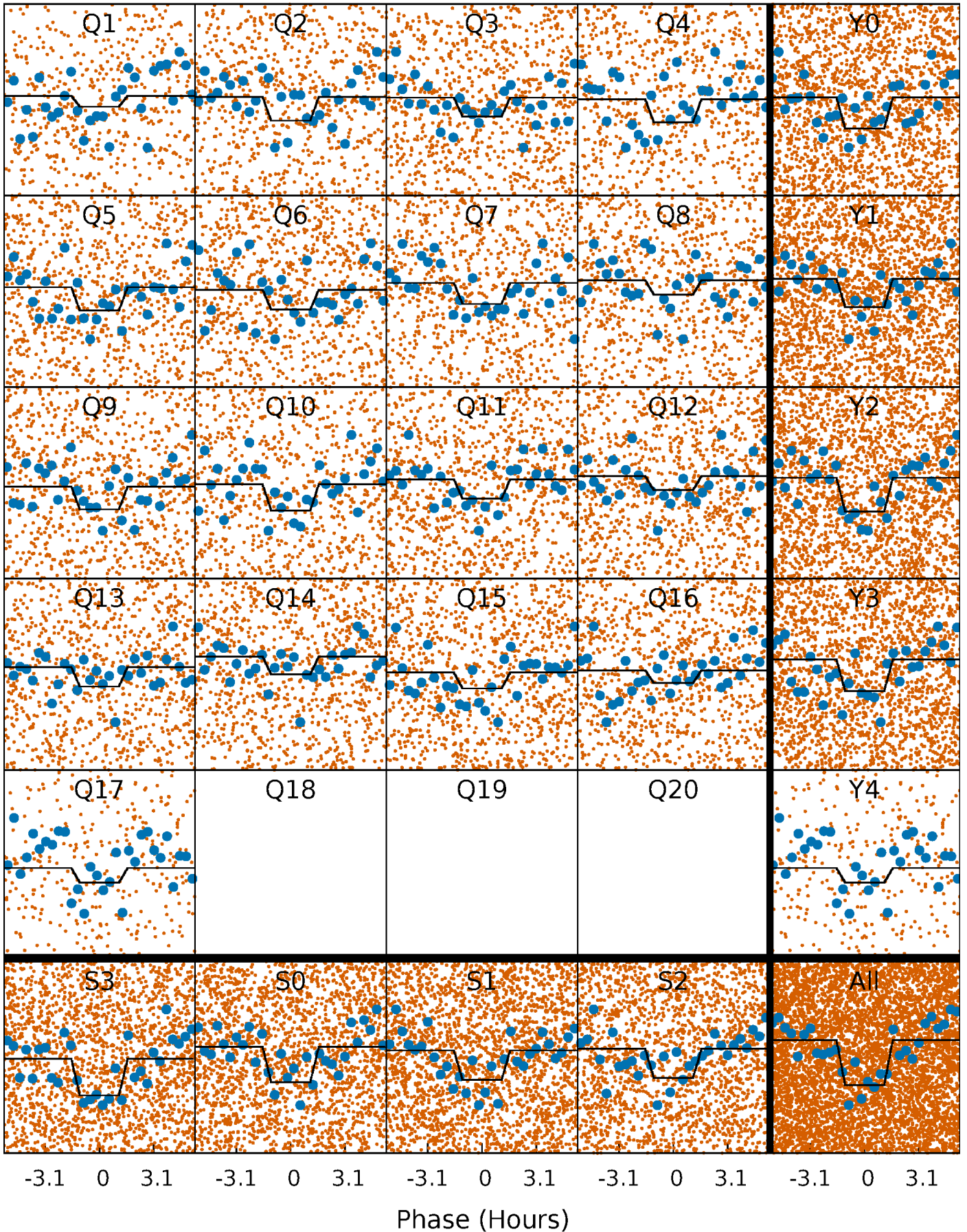
# DV Quarter-Phased Transit Curves

TCE 004647662-01 P= 1.064815 Days  $T_0=131.604007$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004647662-01 P= 1.064847 Days  $T_0=131.587090$  (BKJD)

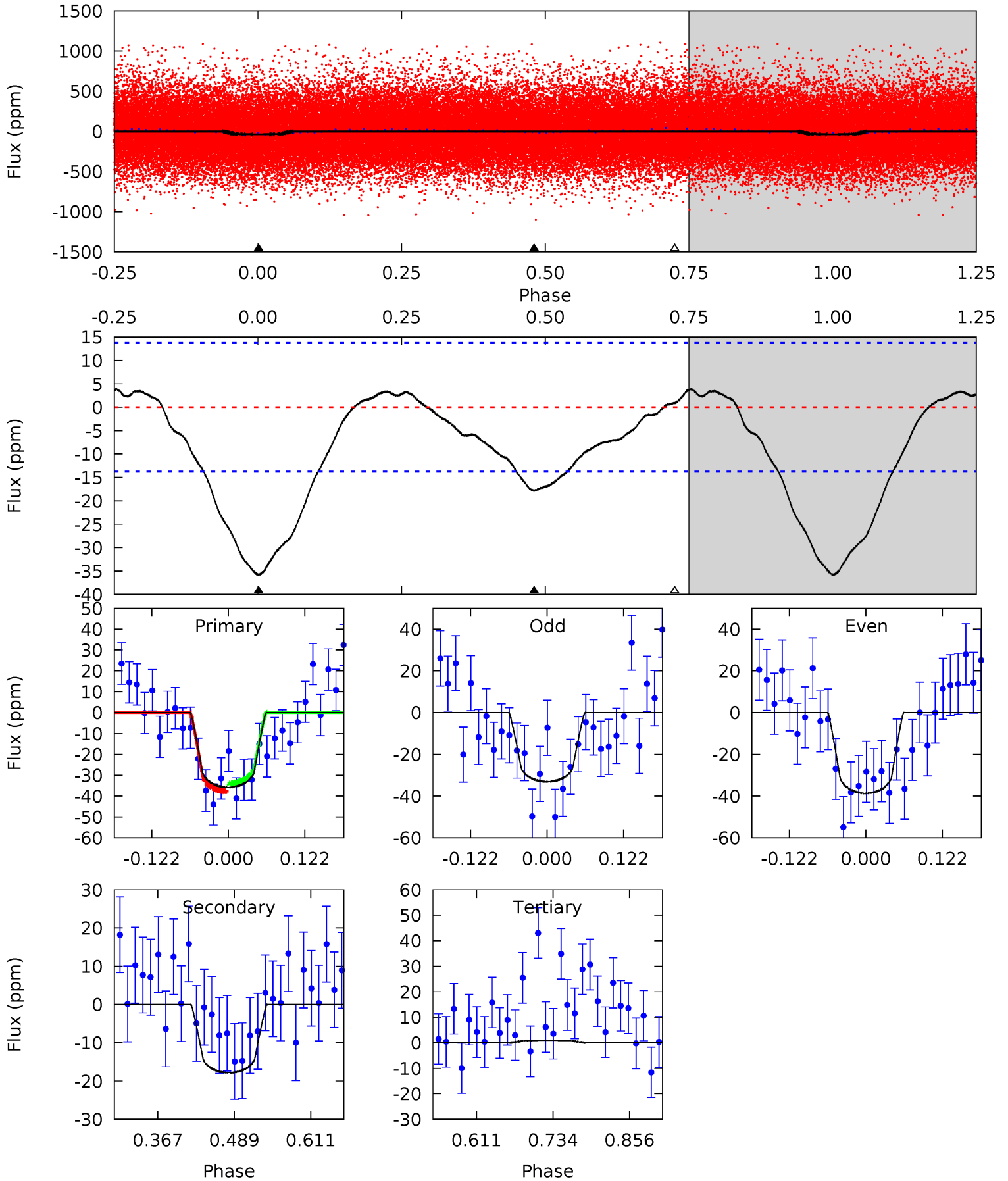




# DV Model-Shift Uniqueness Test

004647662-01, P = 1.064815 Days, E = 130.539192 Days

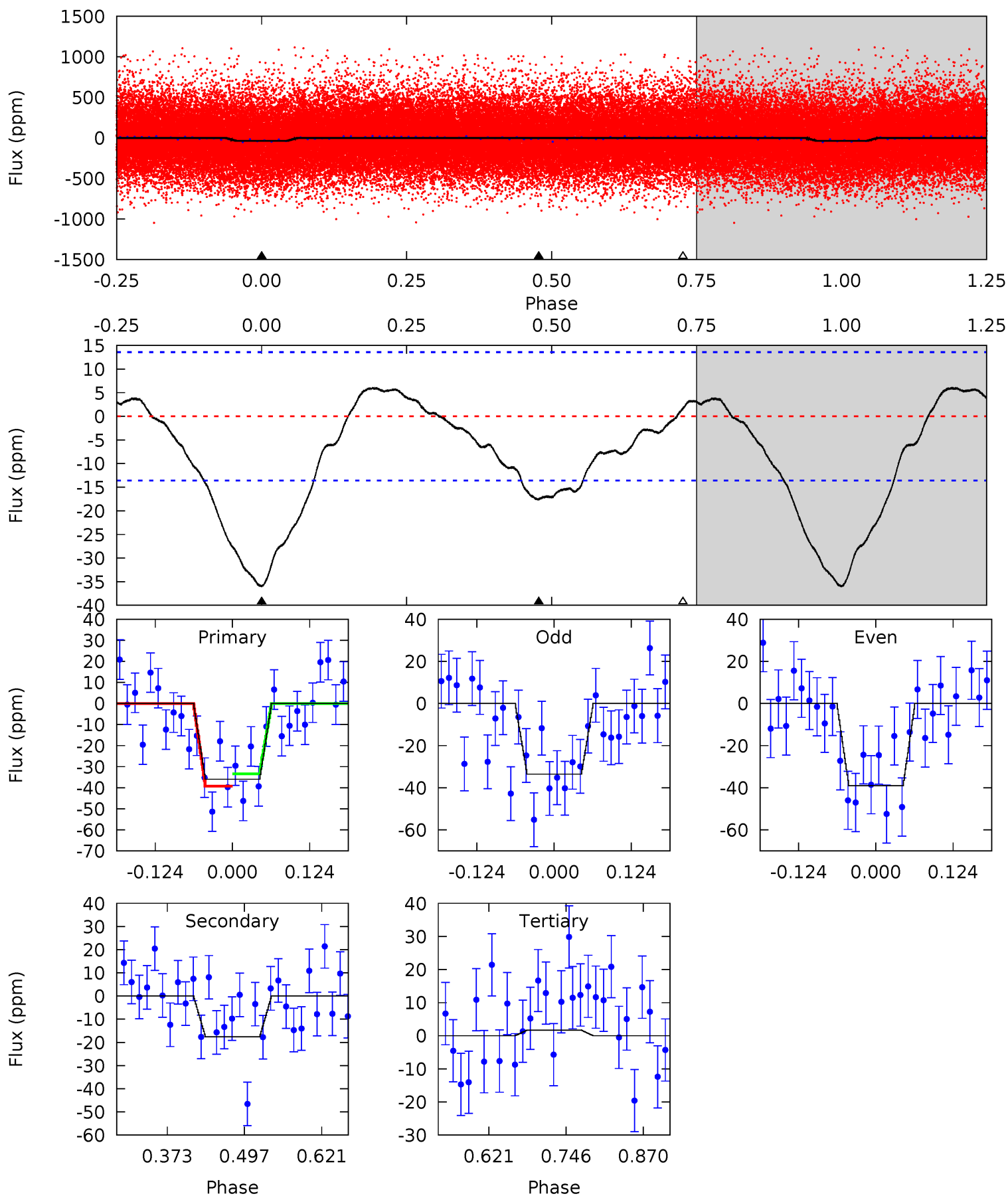
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	5.87	-0.29	0	4.52	1.55	1.17	12.1	11.8	6.15	5.87	0.93	0.83	0.10	0.60



# Alt Model-Shift Uniqueness Test

004647662-01, P = 1.064847 Days, E = 130.522243 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
12.0	5.86	-0.56	0	4.52	1.54	1.35	12.5	12.0	6.42	5.86	0.92	0.99	0.14	0.97





### Stellar Parameters For KIC 004647662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6445^{+77}_{-77}$	$4.417^{+0.030}_{-0.120}$	$-0.220^{+0.150}_{-0.150}$	$1.087^{+0.169}_{-0.060}$	$1.125^{+0.069}_{-0.084}$	$1.234^{+0.137}_{-0.423}$
	+1%/-1%	+1%/-3%	+68%/-68%	+16%/-6%	+6%/-7%	+11%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 004647662-01 / KOI 4806.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-18 \pm 3$	$0.78^{+0.35}_{-0.36}$	$2868^{+109}_{-60}$	$5232^{+1999}_{-810}$	$7.214^{+17.635}_{-3.863}$
Alt.	$-18 \pm 3$	$0.71^{+0.39}_{-0.35}$	$2878^{+116}_{-70}$	$5420^{+2530}_{-918}$	$8.571^{+25.143}_{-5.007}$

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

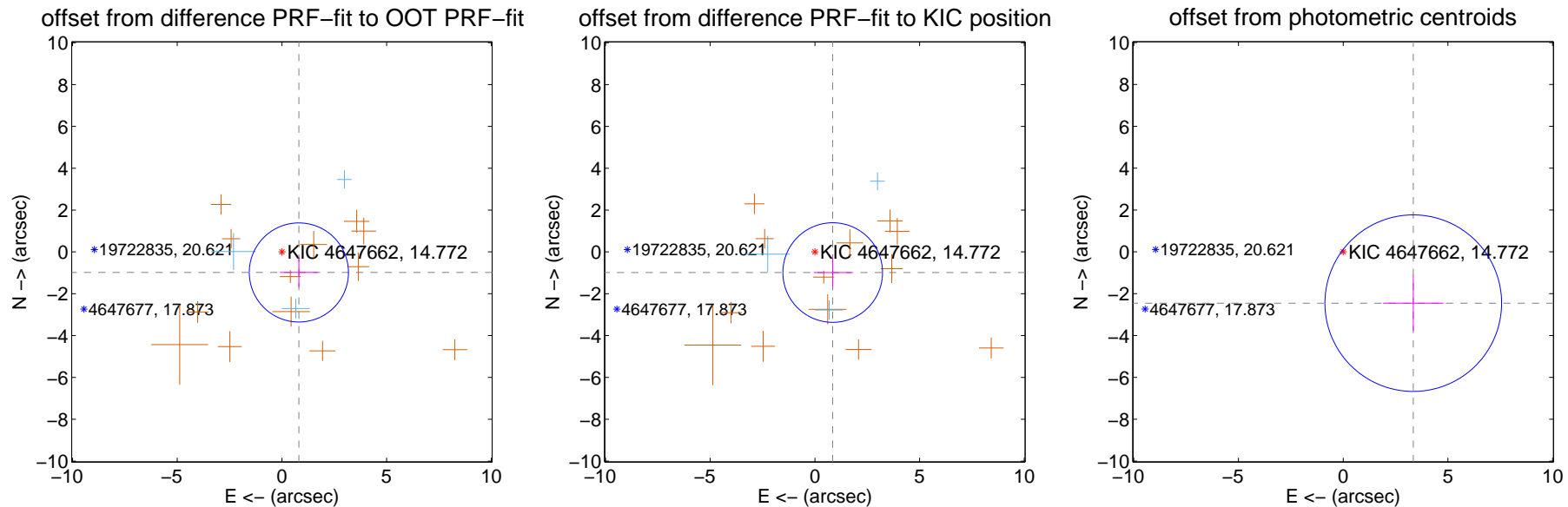
## DV Centroid Data

Supplemental centroid analysis for 004647662-01. Kepler magnitude: 14.77. Transit SNR 8.83

There are 3 quarters with good PRF difference image offsets

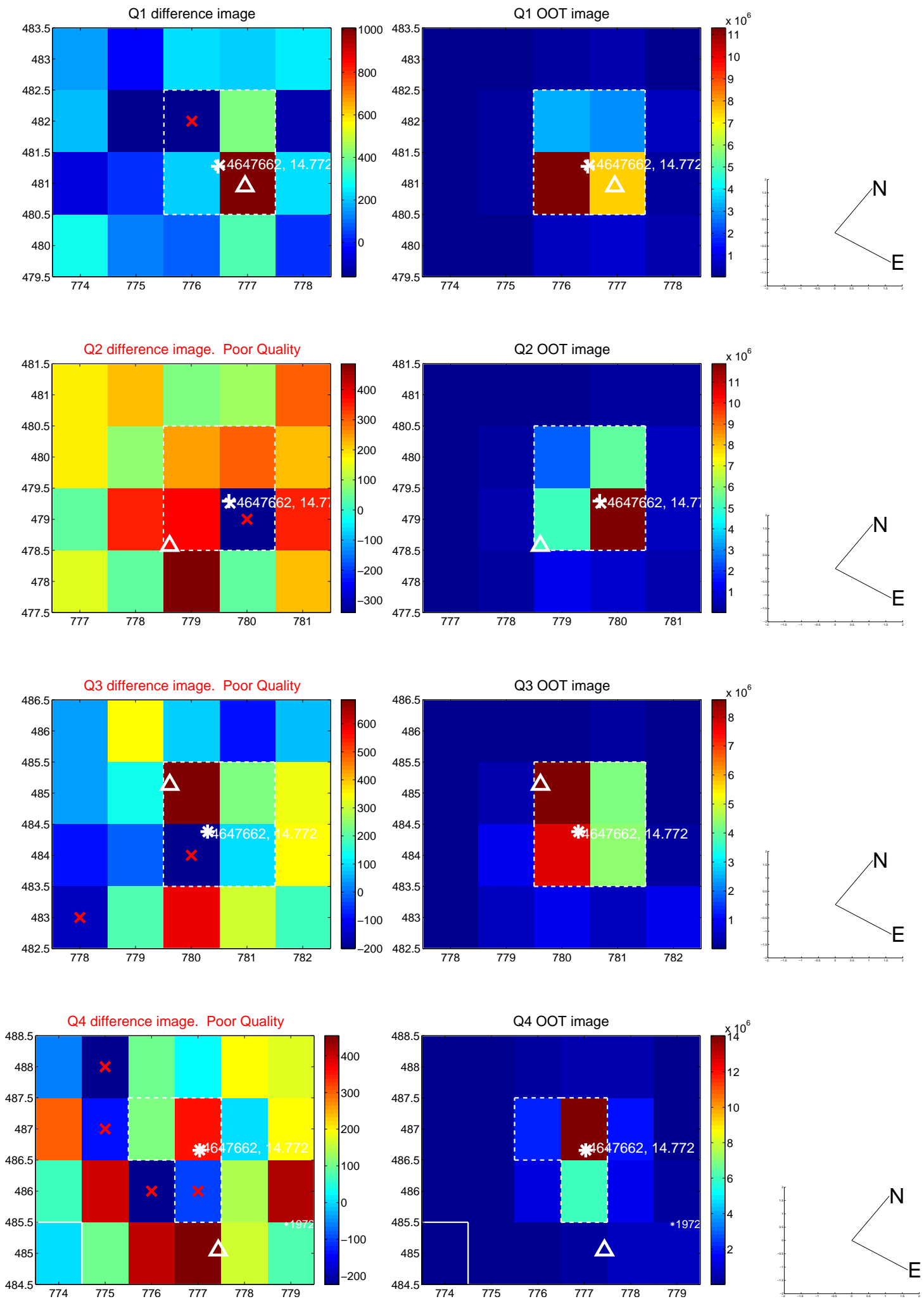
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.273 \pm 0.790$	1.61	$-0.810 \pm 0.896$	$-0.982 \pm 0.708$
PRF-fit source offset from KIC position	$1.302 \pm 0.794$	1.64	$-0.851 \pm 0.901$	$-0.986 \pm 0.703$
photometric centroid source offset	$4.15 \pm 1.41$	2.95	$-3.35 \pm 1.45$	$-2.45 \pm 1.33$

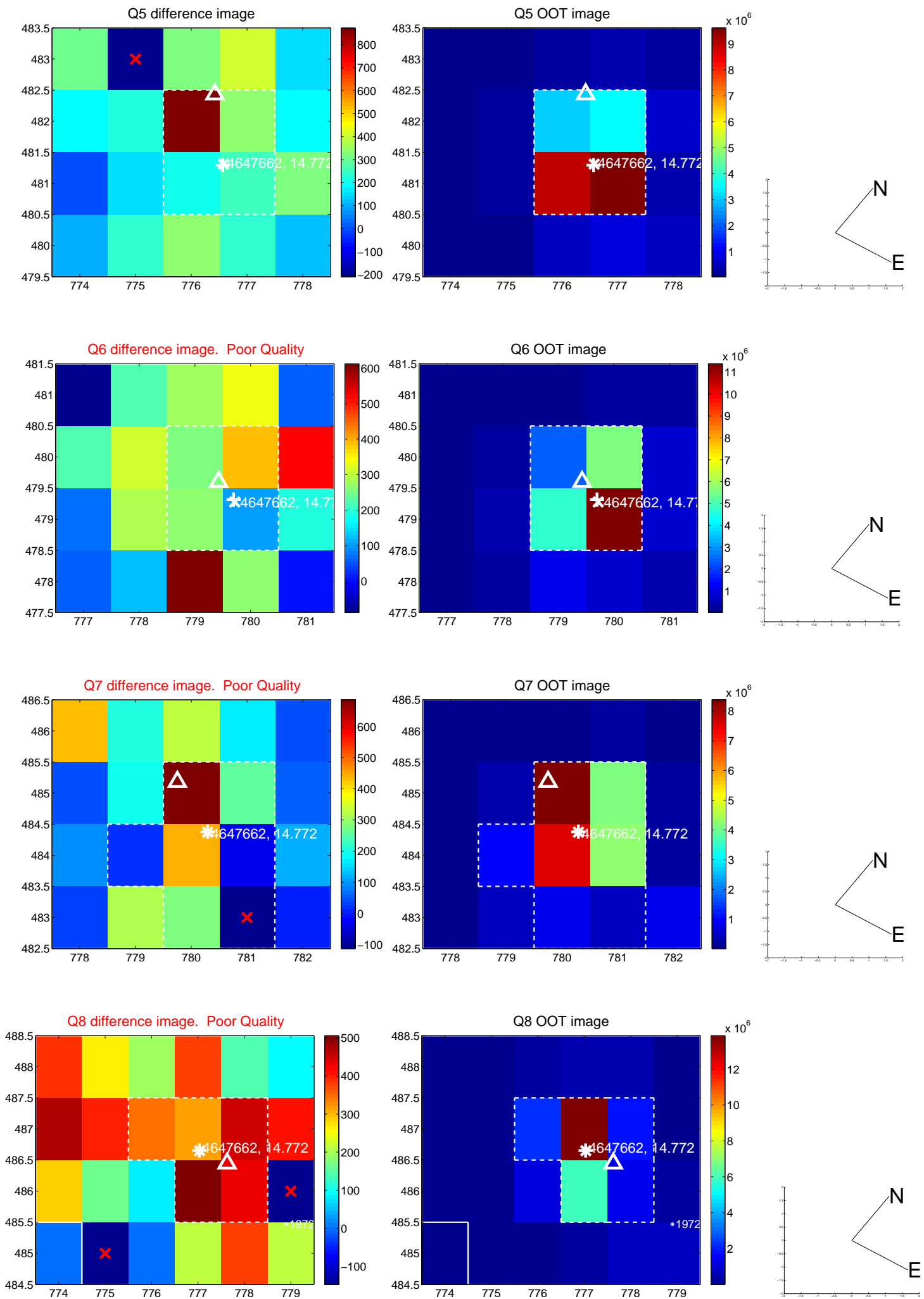


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

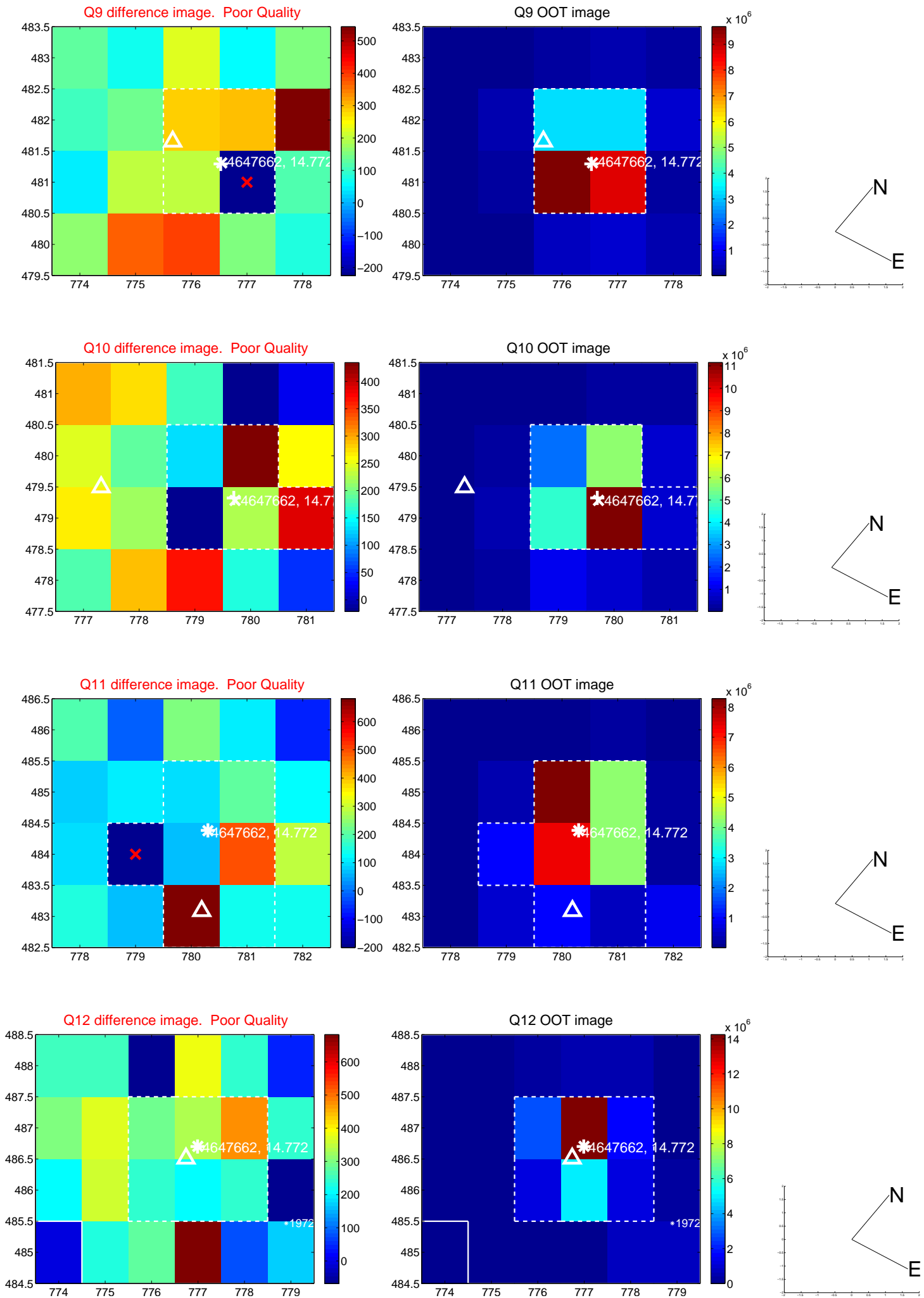


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

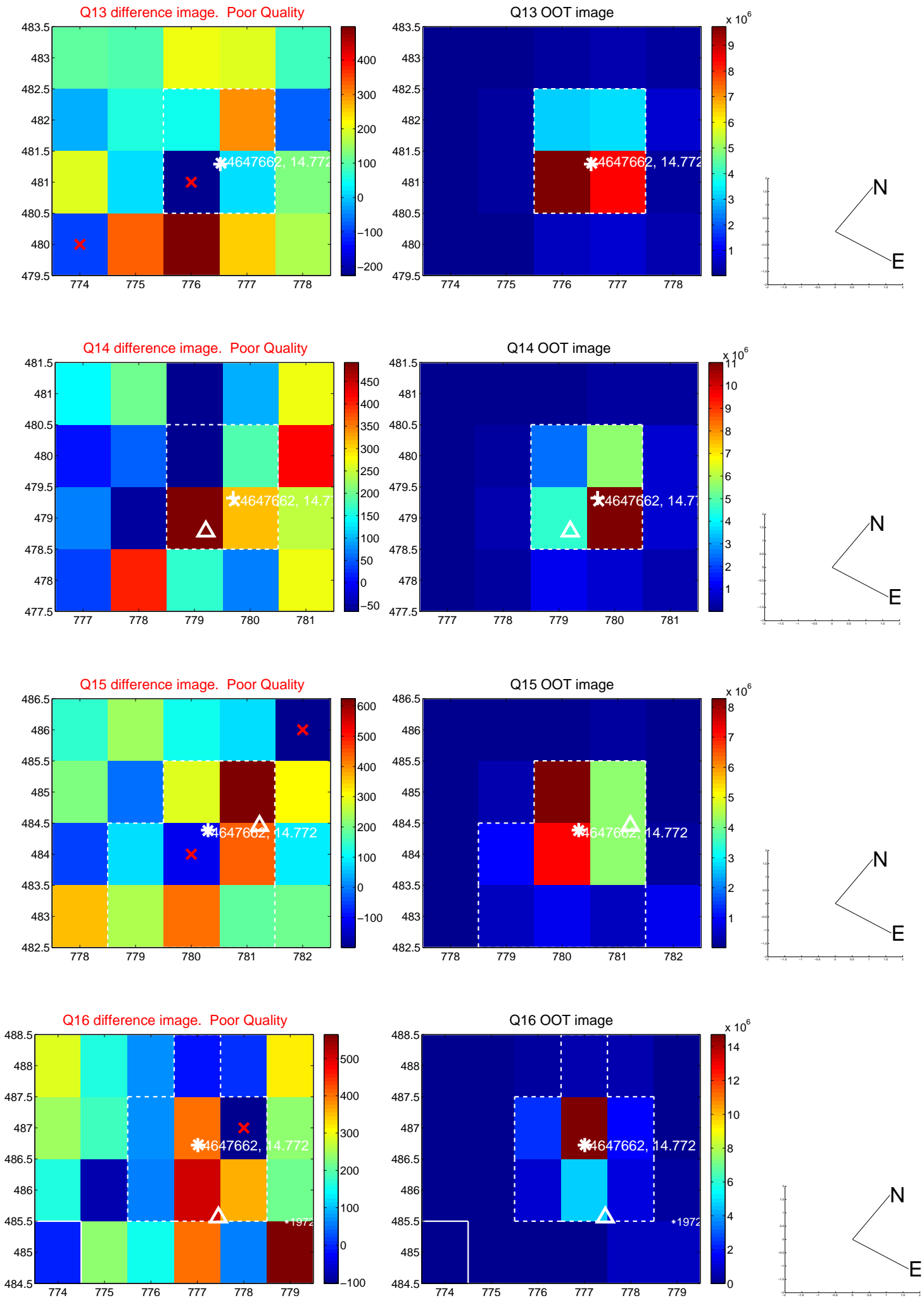




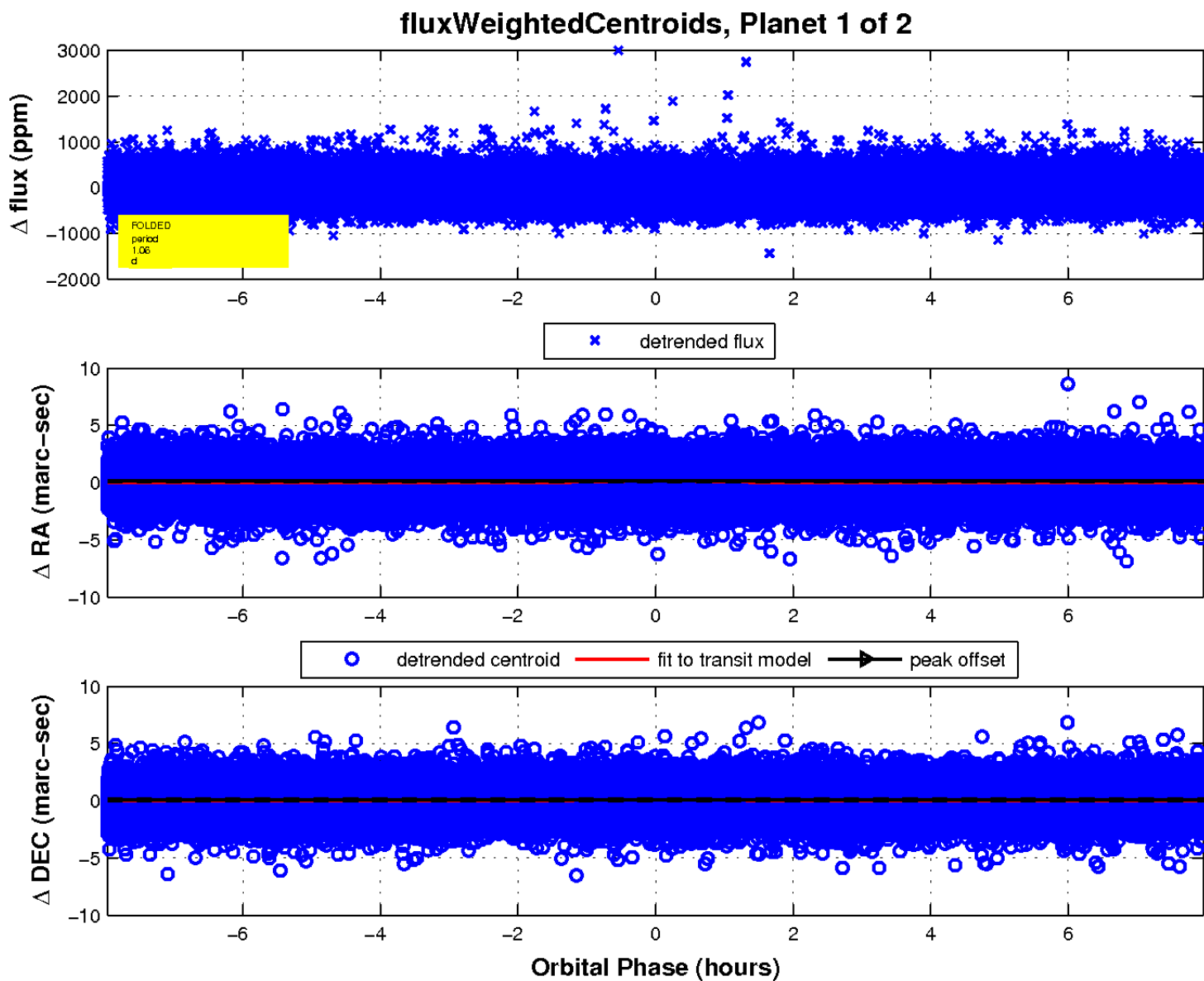
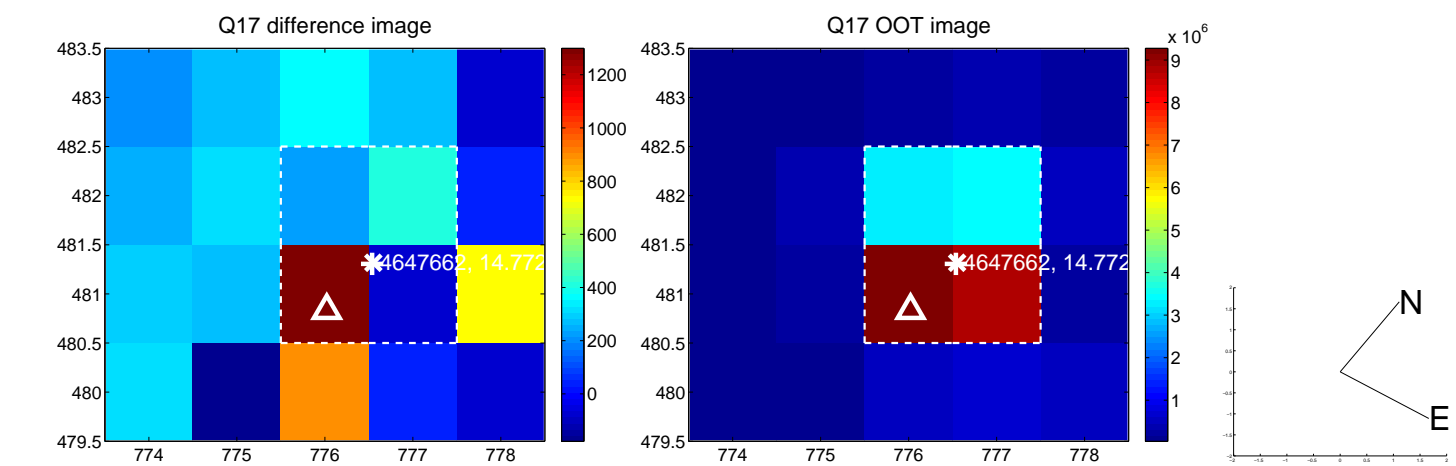
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

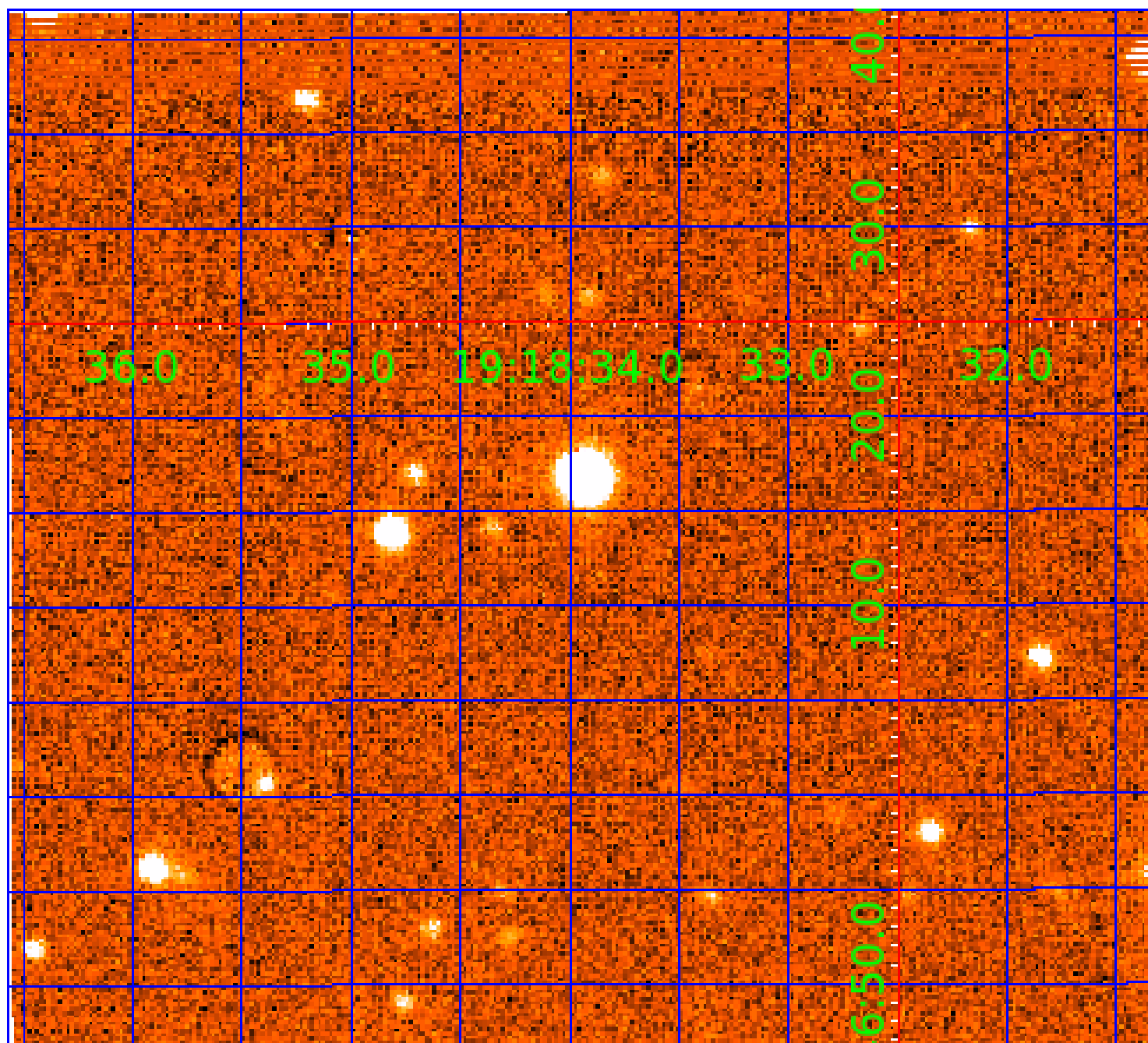


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



UKIRT Image

Declination





# KIC 004647662

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004647662-01	OBS	4806.01	1.064815	131.604007	34.6	2.656	9.0	8.8	1.09	6445	0.74	4051.11
004647662-02	OBS	No	308.562759	194.750599	471.4	4.215	7.3	7.4	1.09	6445	2.47	2.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004647662-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—EPHEM_MATCH
004647662-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—MOD_NONUNIQ_ALT

**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.

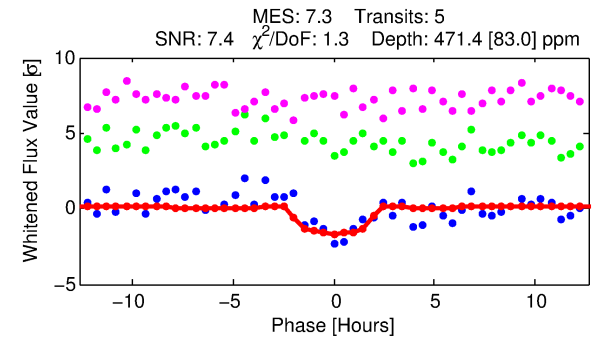
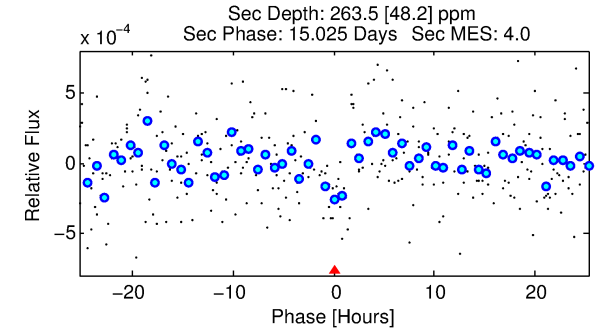
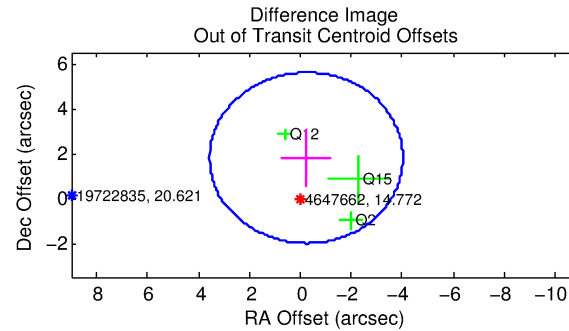
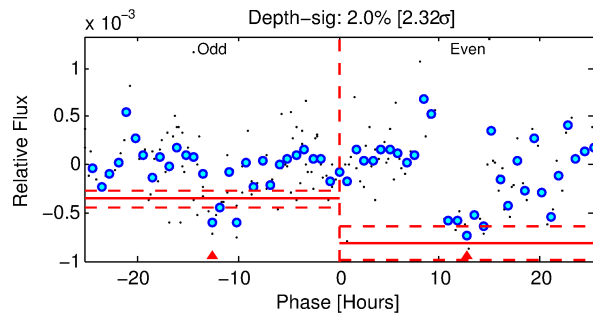
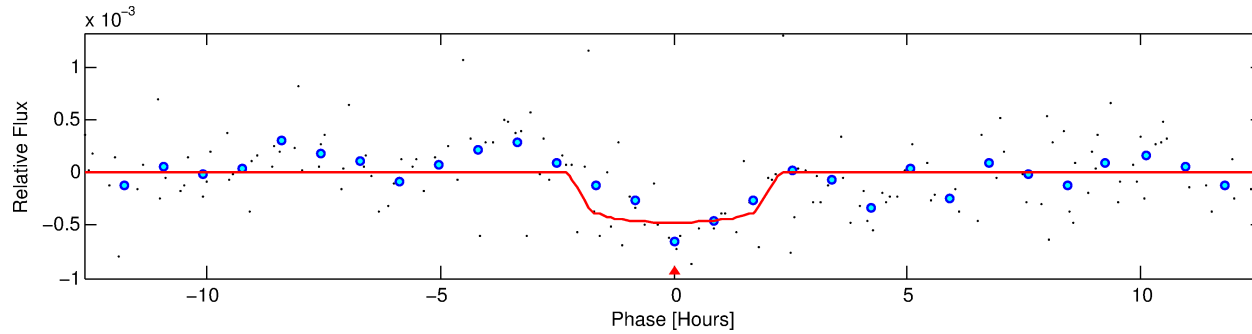
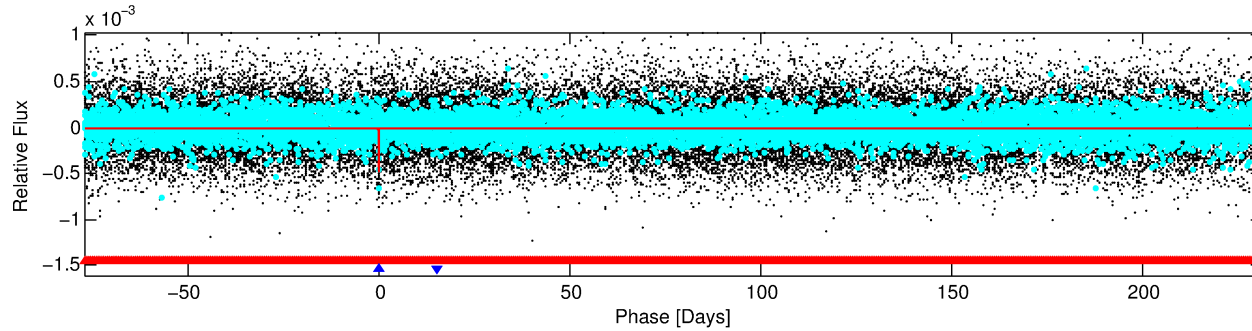
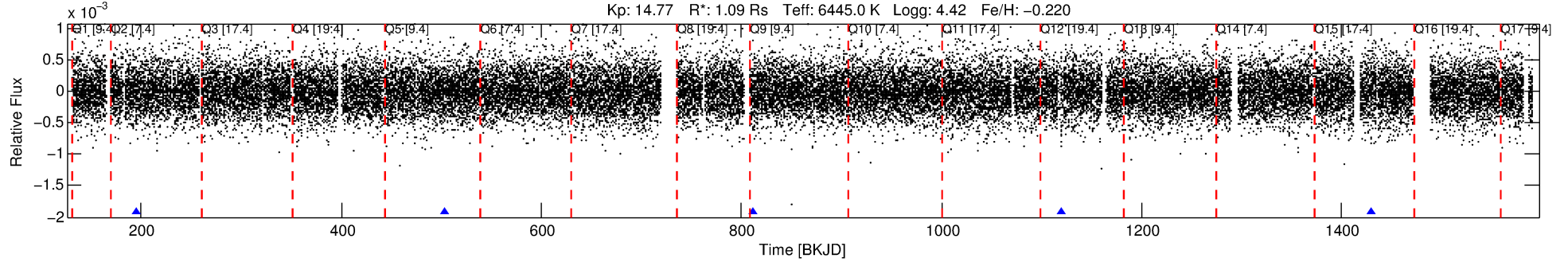
## Ephemeris Match Information For 004647662-02

No Significant Match Found

# DV One-Page Summary

KIC: 4647662 Candidate: 2 of 2 Period: 308.563 d  
KOI: K04806 Corr: No Ephemeris Match

Kp: 14.77 R\*: 1.09 Rs Teff: 6445.0 K Logg: 4.42 Fe/H: -0.220



## DV Fit Results:

Period = 308.56276 [0.00427] d  
Epoch = 194.7506 [0.0116] BKJD  
Rp/R\* = 0.0209 [0.0439]  
a/R\* = 461.35 [5198.92]  
b = 0.60 [12.07]  
Seff = 2.11 [0.46]  
Teq = 307 [17] K  
Rp = 2.47 [5.22] Re  
a = 0.9298 [0.1289] AU  
Ag = 20480.91 [86359.81] [0.24σ]  
Teffp = 5686 [5987] K [0.90σ]

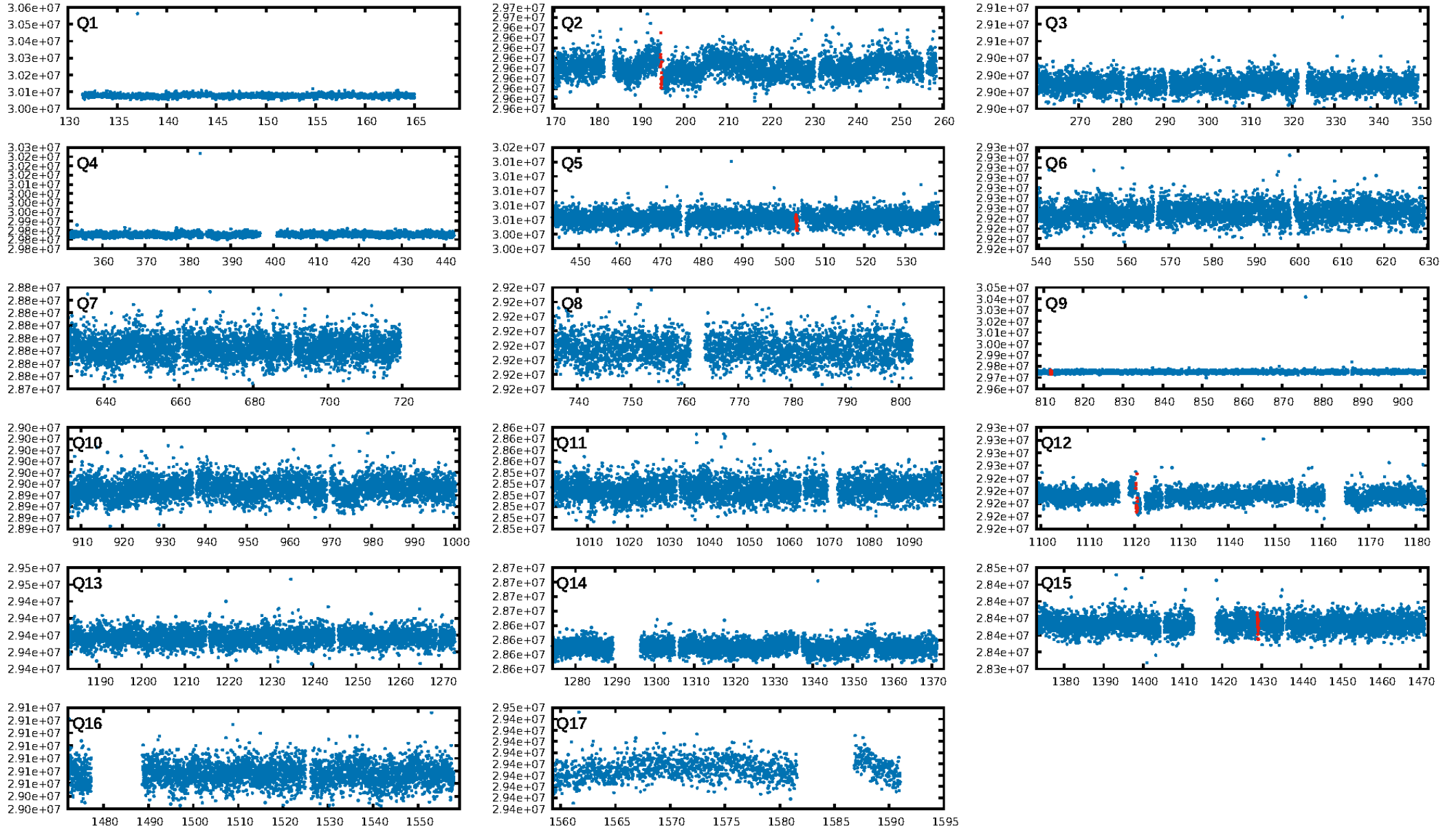
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1481.10σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 3.0%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 5.01e-10**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 4.942  
Centroid-sig: 47.0%  
Centroid-so: 1.154 arcsec [0.86σ]  
OotOffset-rm: 1.816 arcsec [1.43σ]  
KicOffset-rm: 1.822 arcsec [1.46σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.20 [1/5]

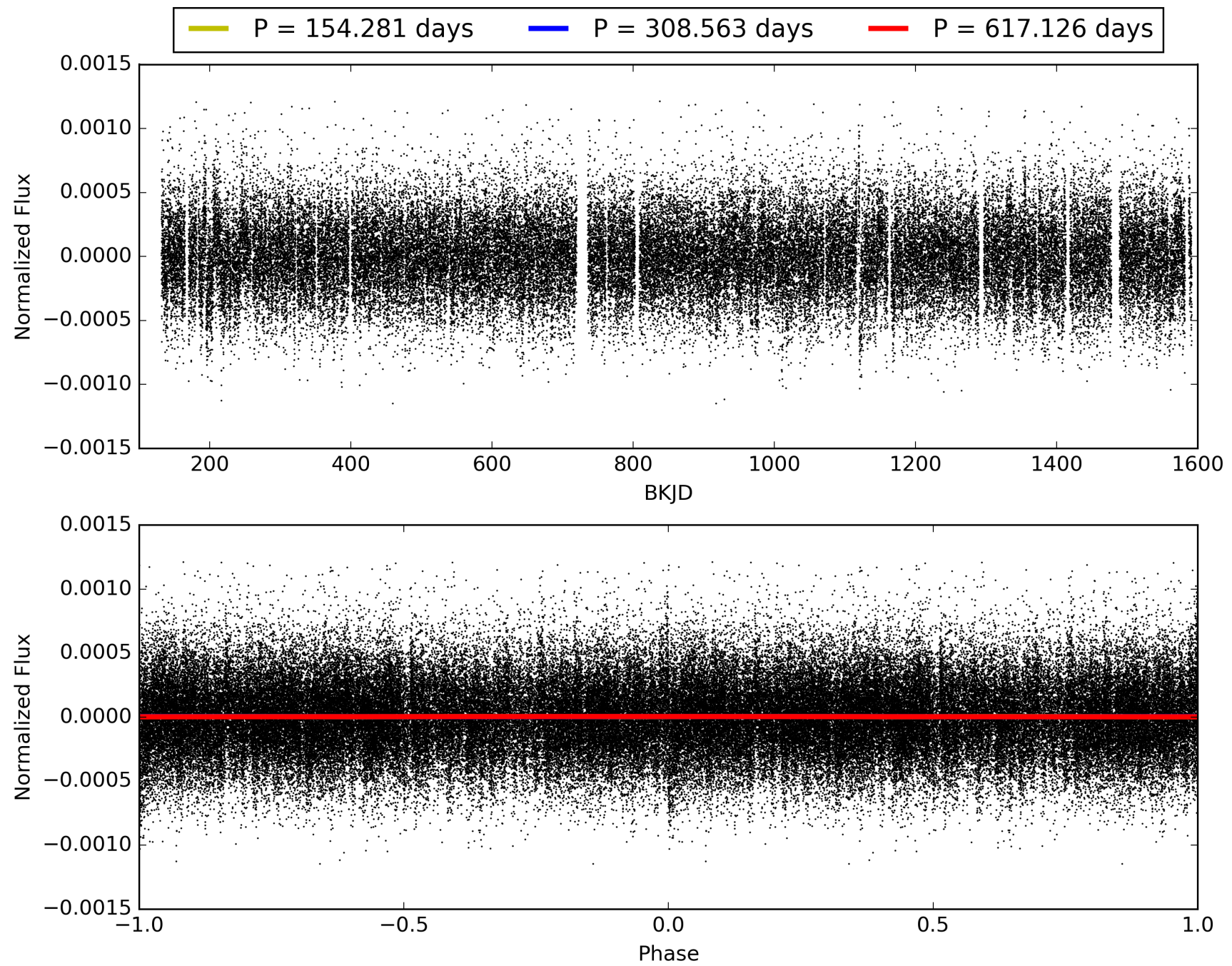
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:19:28 Z

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

# TCE 004647662-02, PDC Light Curves



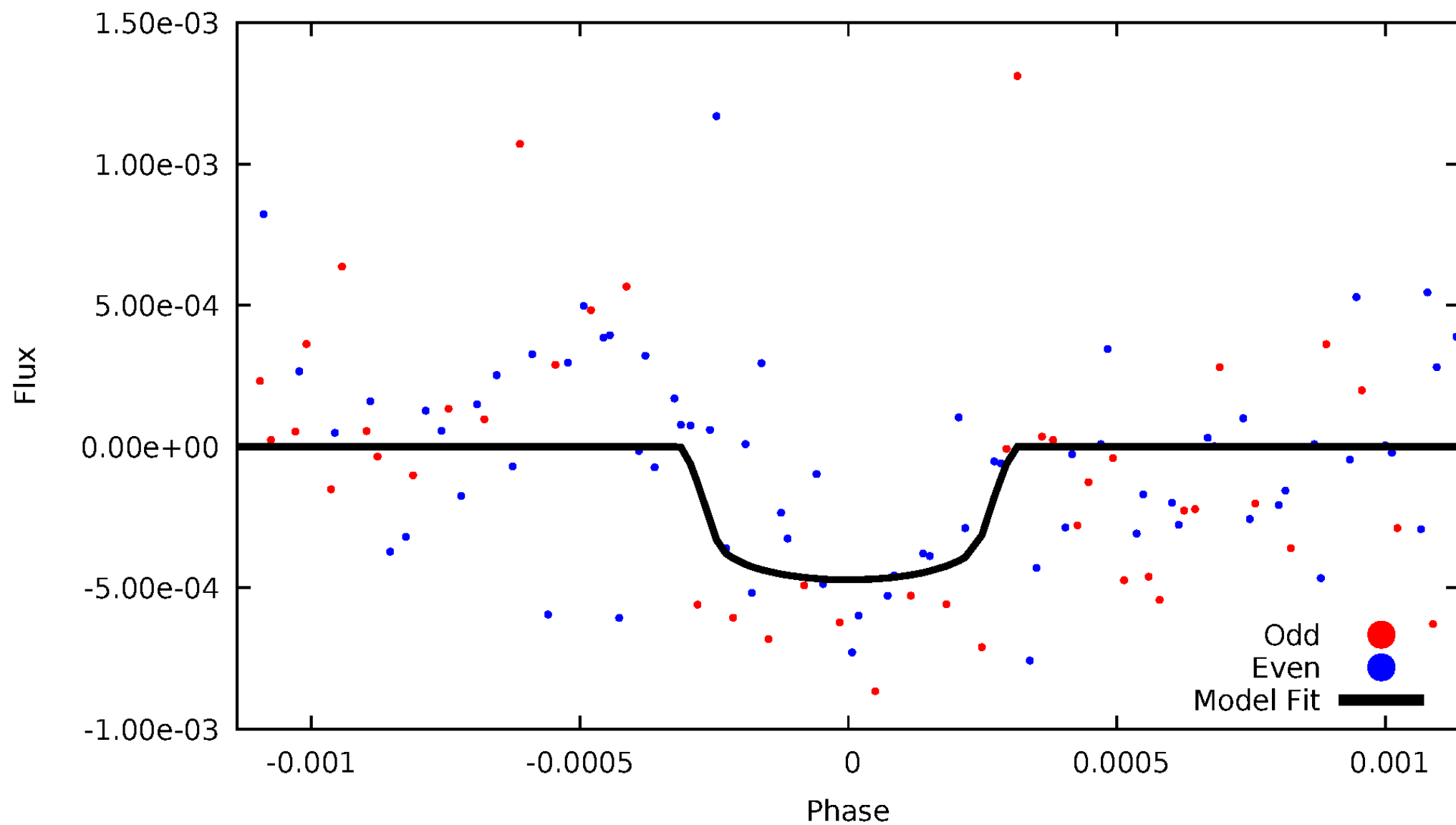
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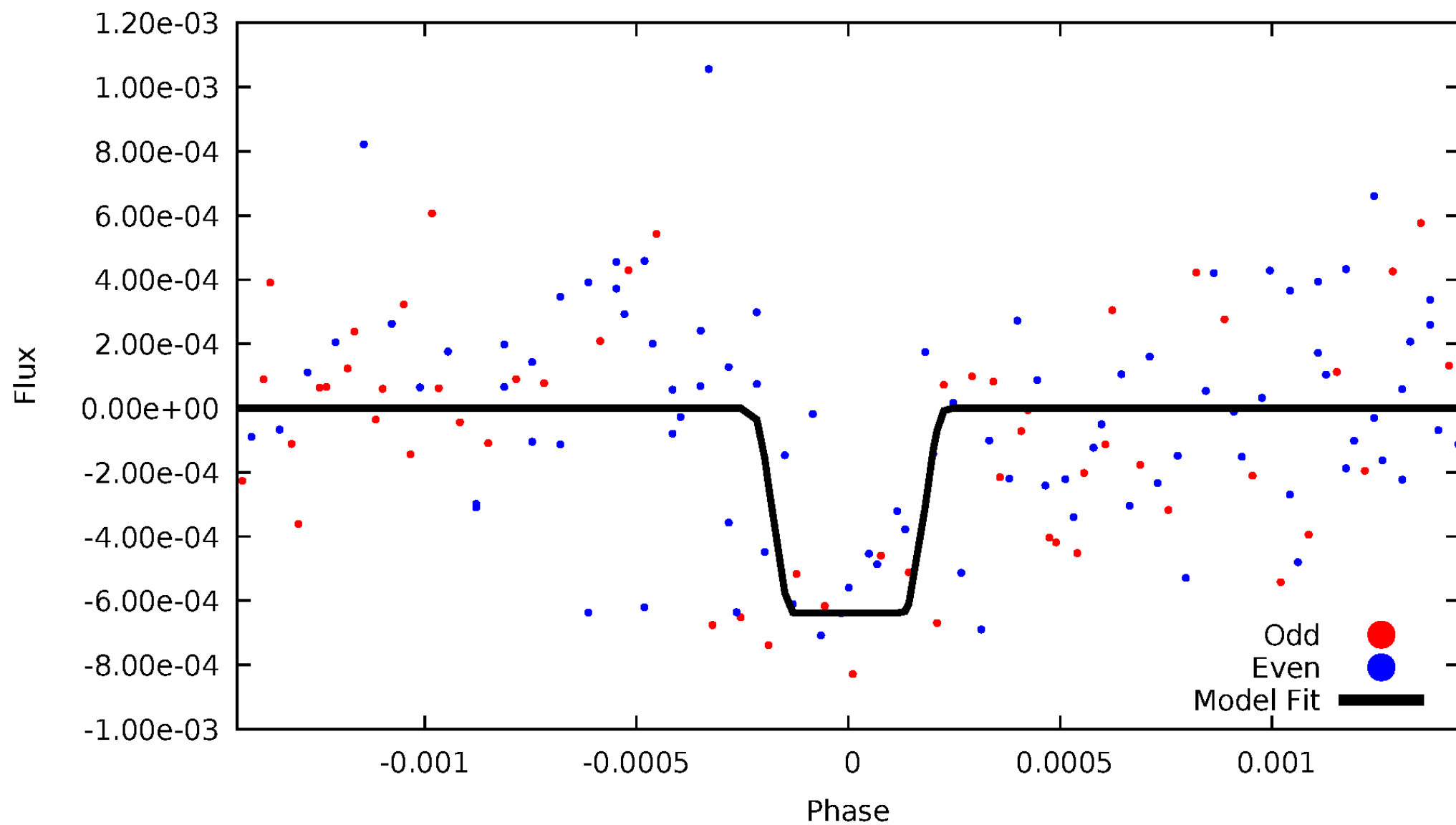
# DV Odd/Even

TCE 004647662-02



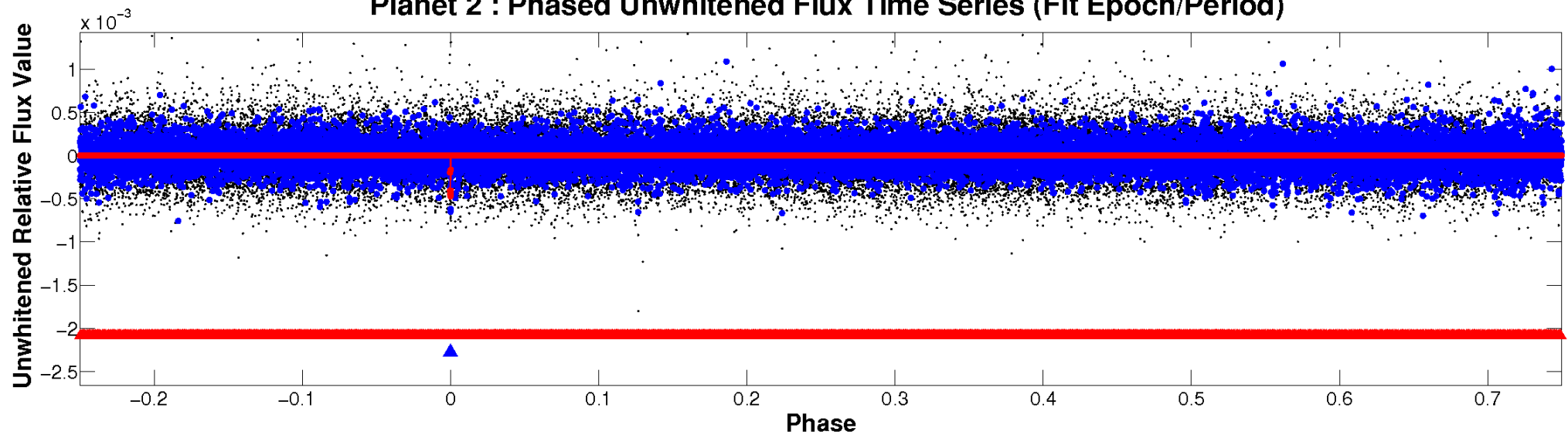
# ALT Odd/Even

TCE 004647662-02

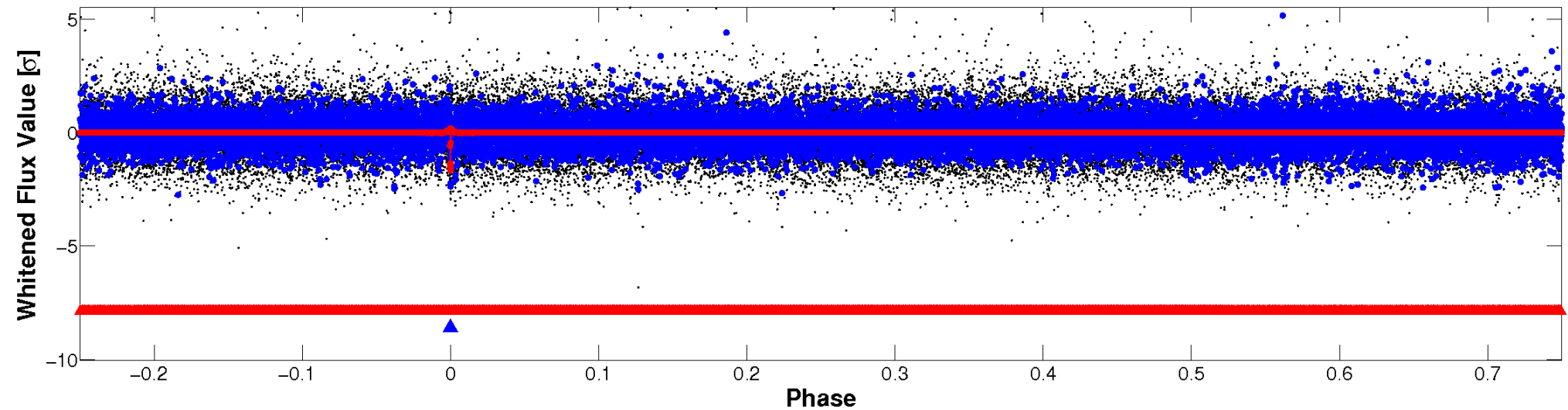


# Non-Whitened Vs. Whitened Light Curve

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

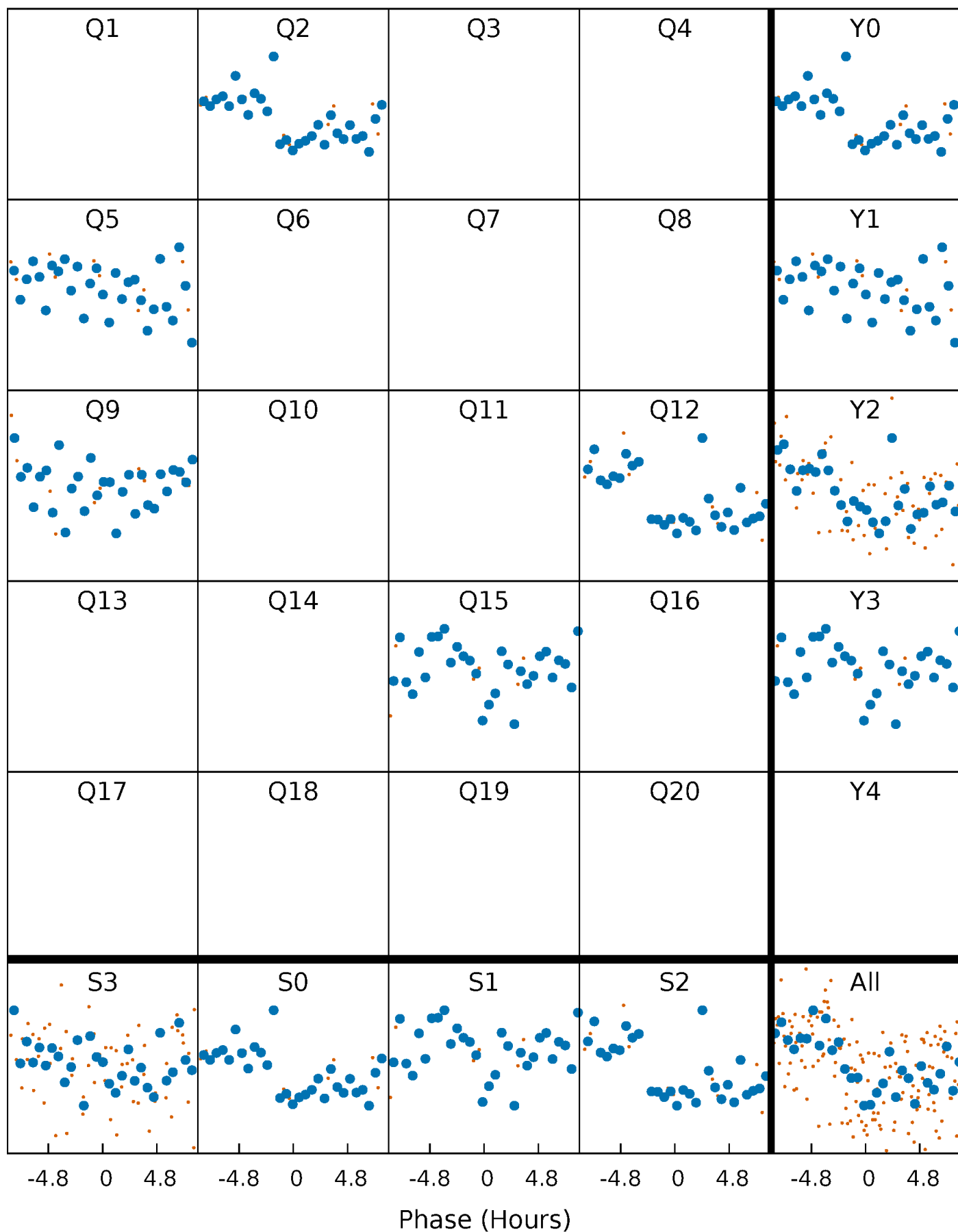


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



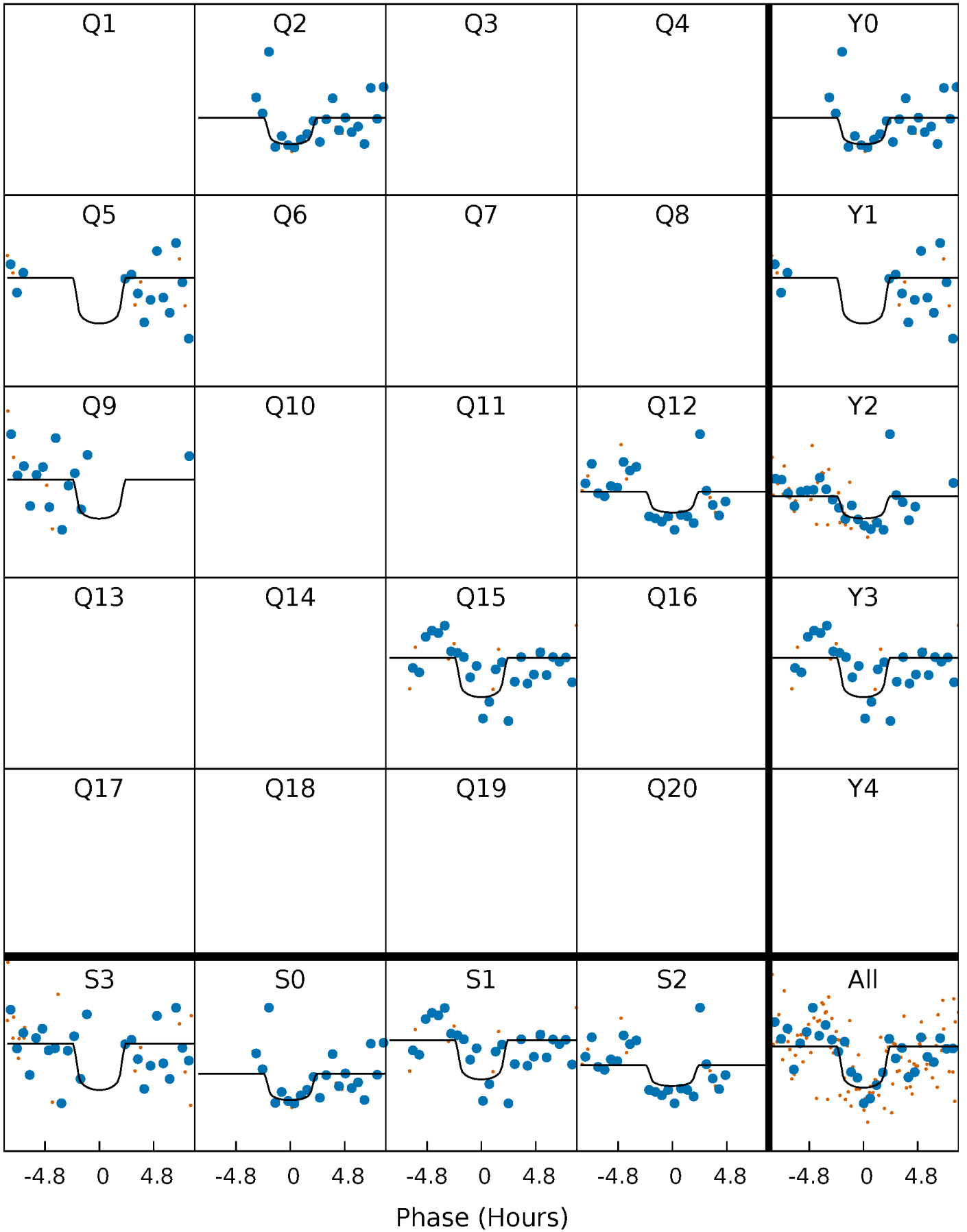
# PDC Quarter-Phased Transit Curves

TCE 004647662-02     $P=308.562759$  Days     $T_0=194.750599$  (BKJD)



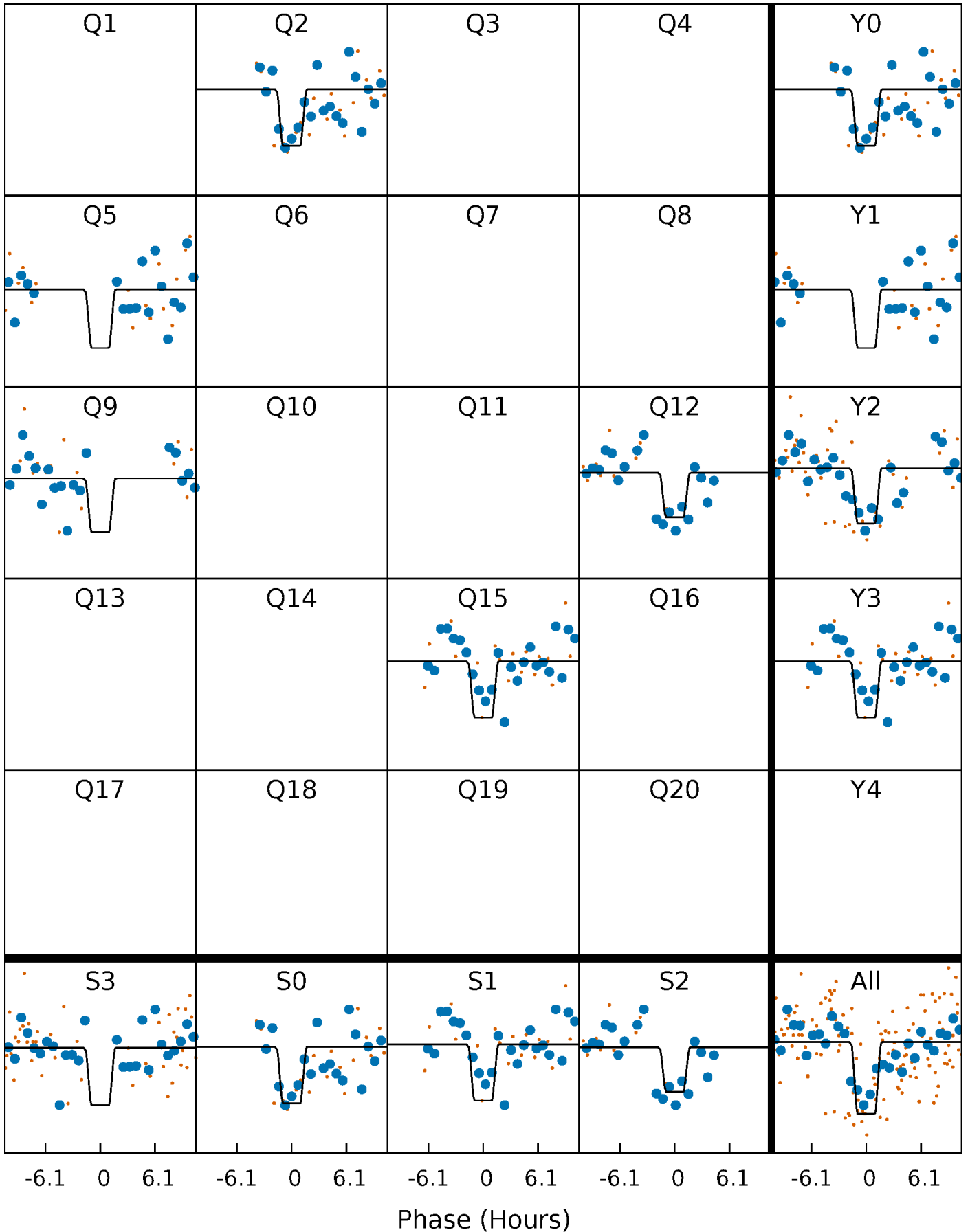
# DV Quarter-Phased Transit Curves

TCE 004647662-02     $P=308.562759$  Days     $T_0=194.750599$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004647662-02     $P=308.558173$  Days     $T_0=194.776532$  (BKJD)

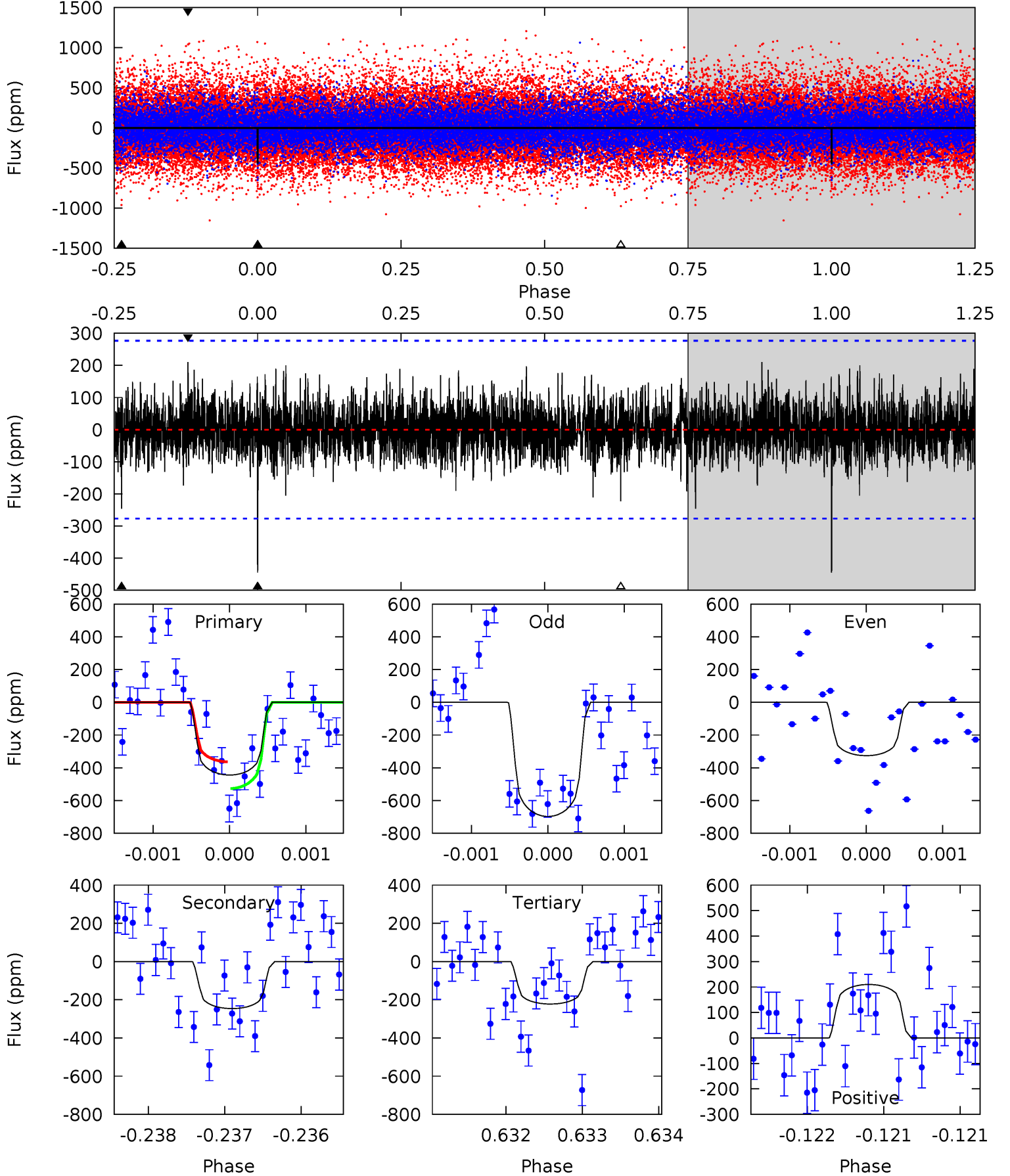




# DV Model-Shift Uniqueness Test

004647662-02, P = 308.562759 Days, E = 194.750599 Days

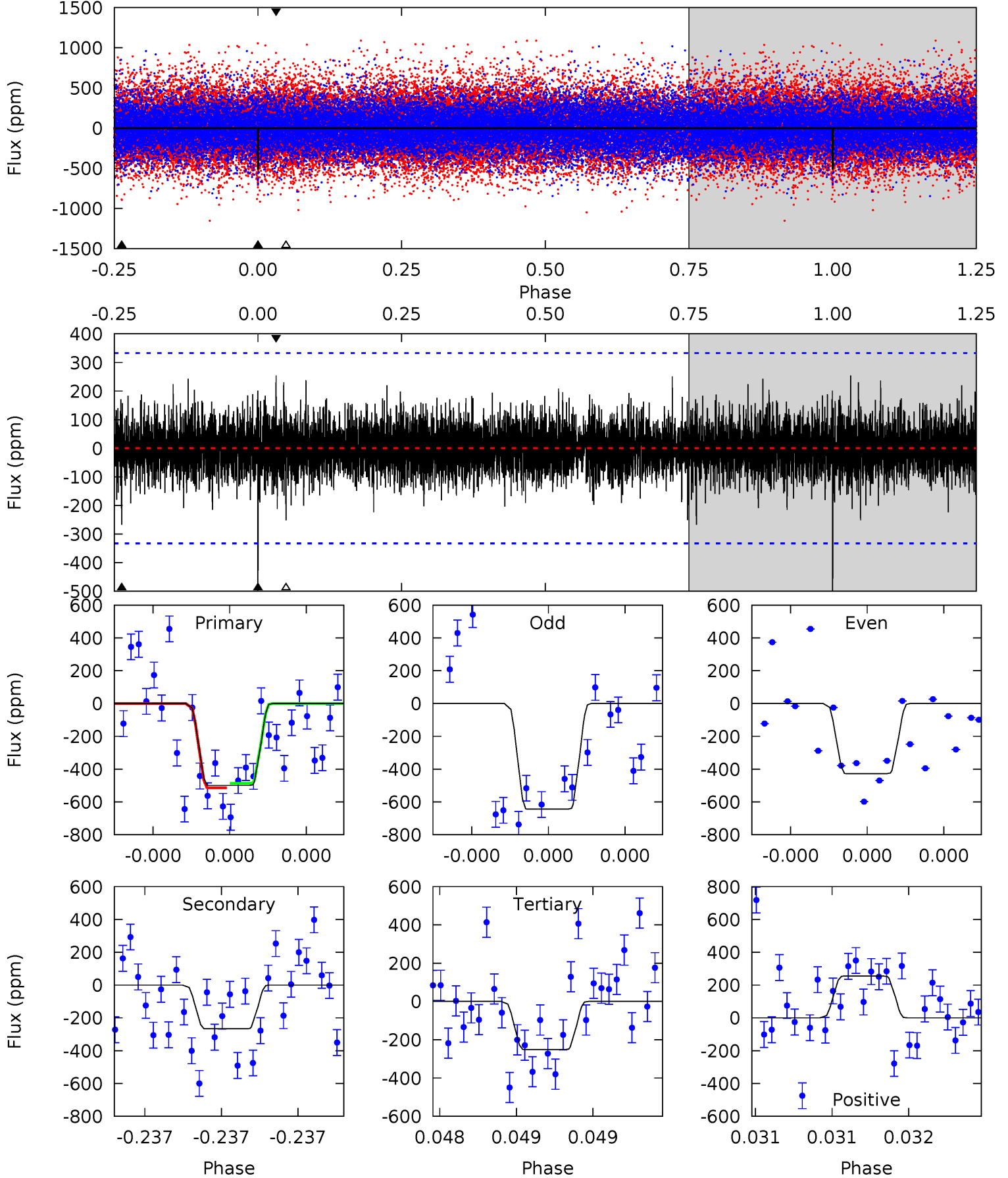
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.90	4.93	4.45	4.21	5.54	3.43	1.09	4.44	4.69	0.48	0.73	3.48	1.11	0.32	1.63



# Alt Model-Shift Uniqueness Test

004647662-02, P = 308.558173 Days, E = 194.776532 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
8.41	4.49	4.22	4.27	5.59	3.51	1.03	4.18	4.13	0.27	0.21	1.77	0.88	0.34	0.23



### Stellar Parameters For KIC 004647662

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6445^{+77}_{-77}$	$4.417^{+0.030}_{-0.120}$	$-0.220^{+0.150}_{-0.150}$	$1.087^{+0.169}_{-0.060}$	$1.125^{+0.069}_{-0.084}$	$1.234^{+0.137}_{-0.423}$
	+1%/-1%	+1%/-3%	+68%/-68%	+16%/-6%	+6%/-7%	+11%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 004647662-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-246 \pm 50$	$4.71^{+4.39}_{-3.06}$	$435^{+17}_{-11}$	$4325^{+2544}_{-879}$	$5151^{+35372}_{-3776}$
Alt.	$-267 \pm 59$	$5.03^{+4.53}_{-3.48}$	$434^{+17}_{-10}$	$4309^{+3080}_{-885}$	$4960^{+49571}_{-3627}$

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

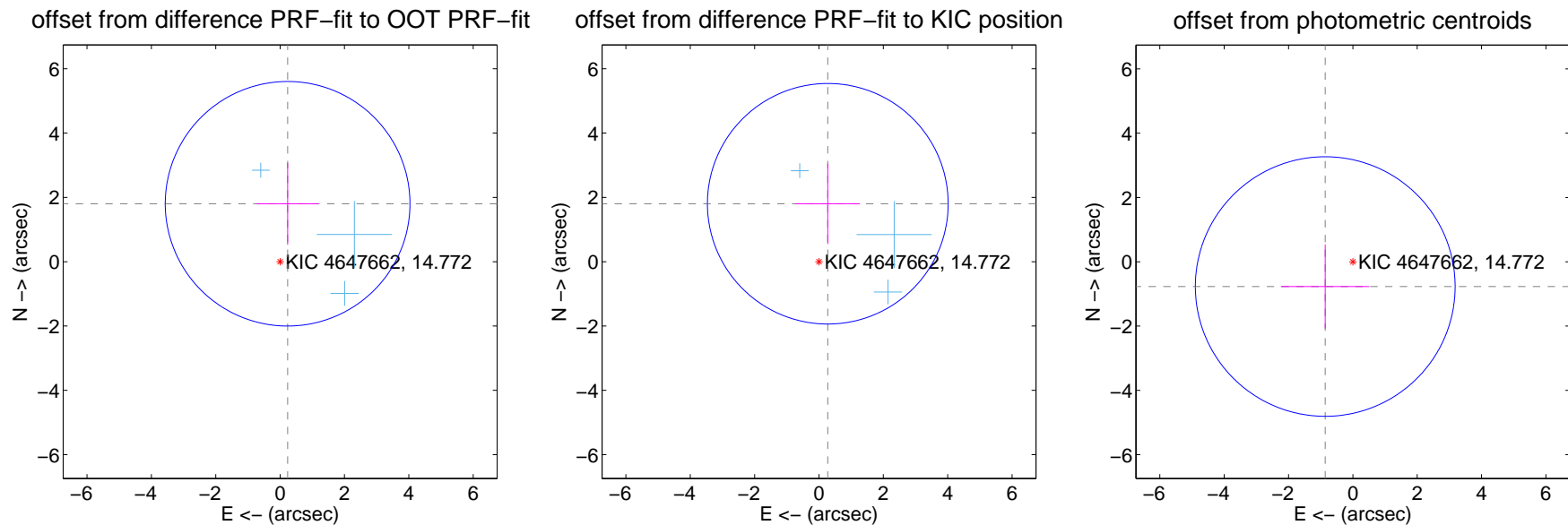
## DV Centroid Data

Supplemental centroid analysis for 004647662-02. Kepler magnitude: 14.77. Transit SNR 7.44

There are 3 quarters with good PRF difference image offsets

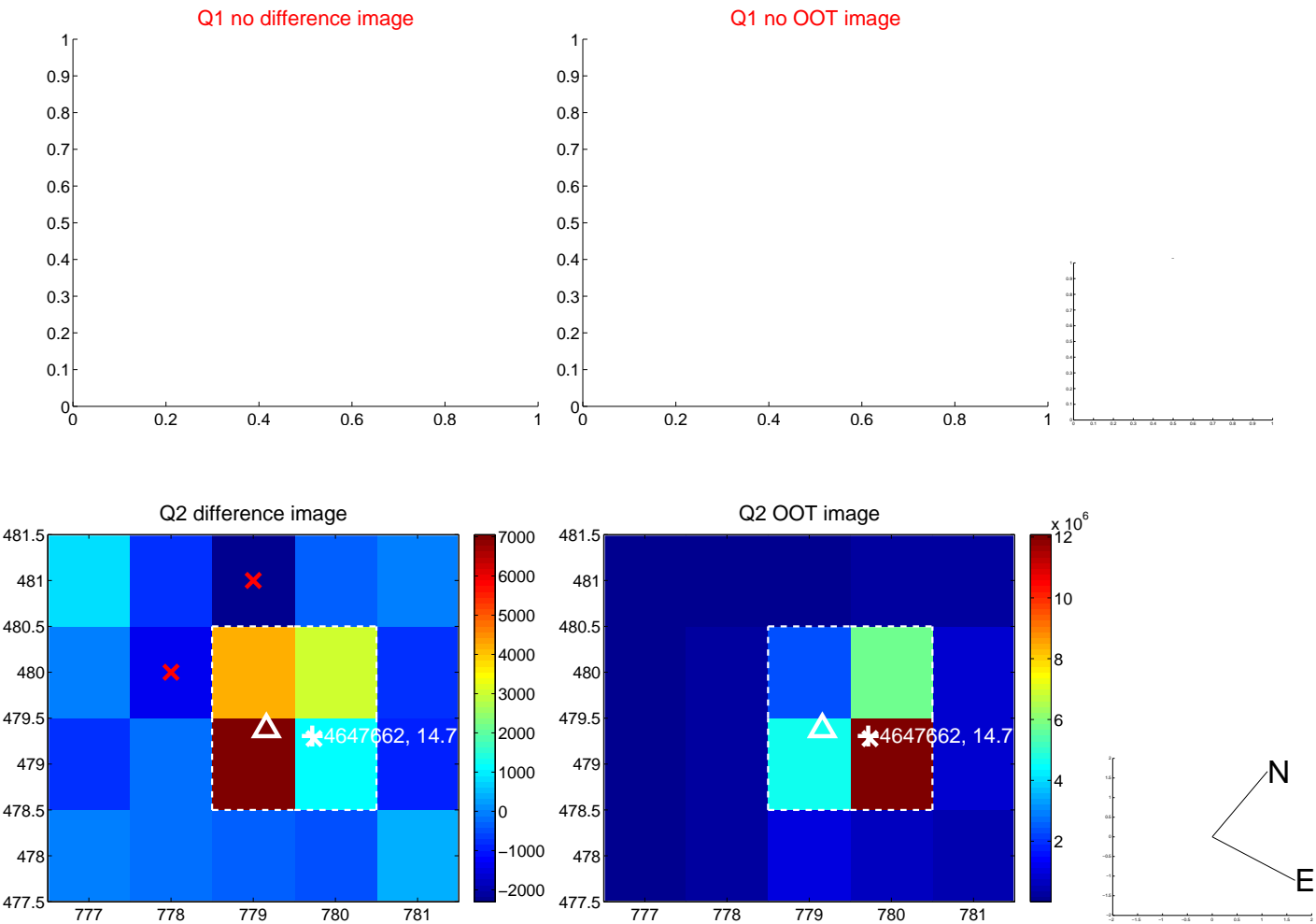
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.816 \pm 1.267$	1.43	$-0.233 \pm 0.960$	$1.801 \pm 1.272$
PRF-fit source offset from KIC position	$1.822 \pm 1.247$	1.46	$-0.274 \pm 0.999$	$1.802 \pm 1.252$
photometric centroid source offset	$1.15 \pm 1.35$	0.86	$0.86 \pm 1.38$	$-0.77 \pm 1.31$

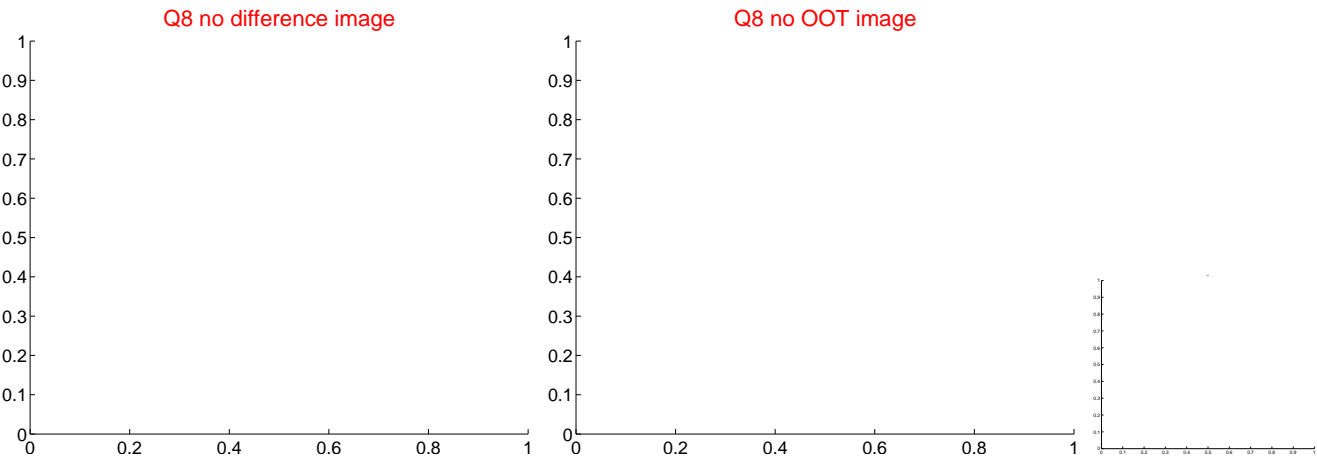
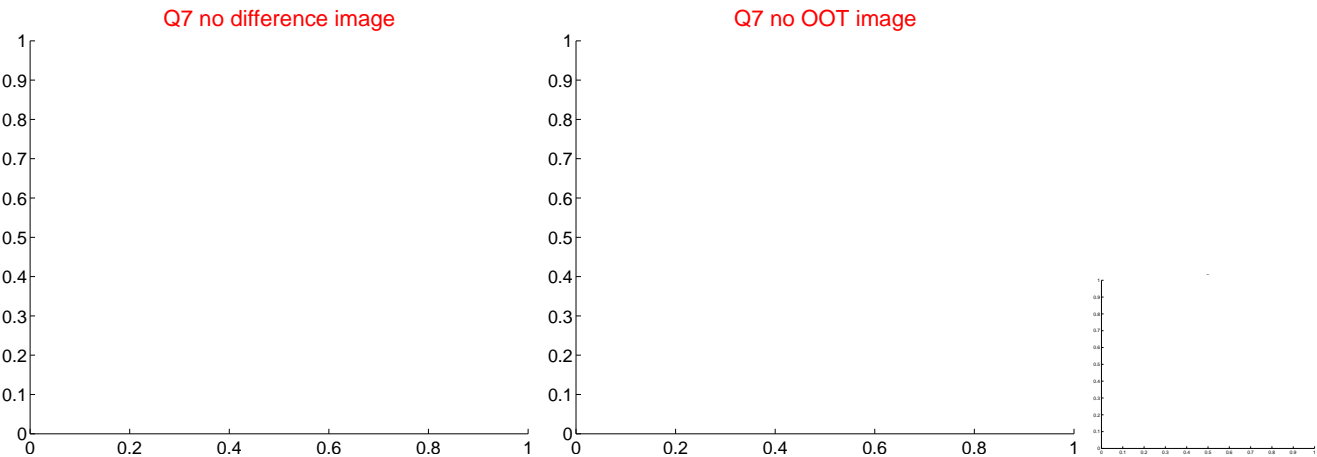
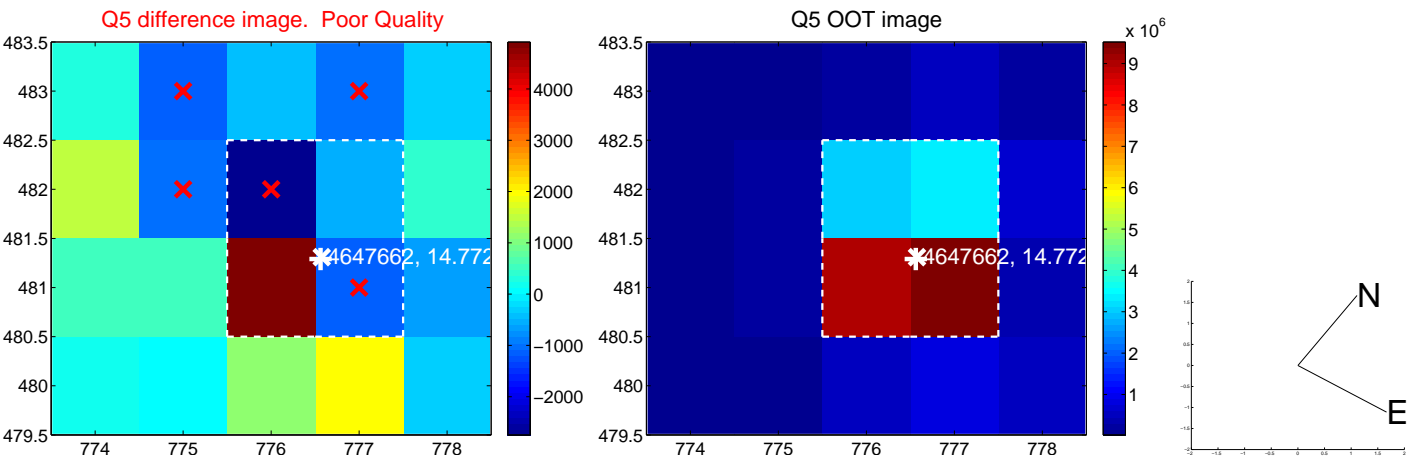


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

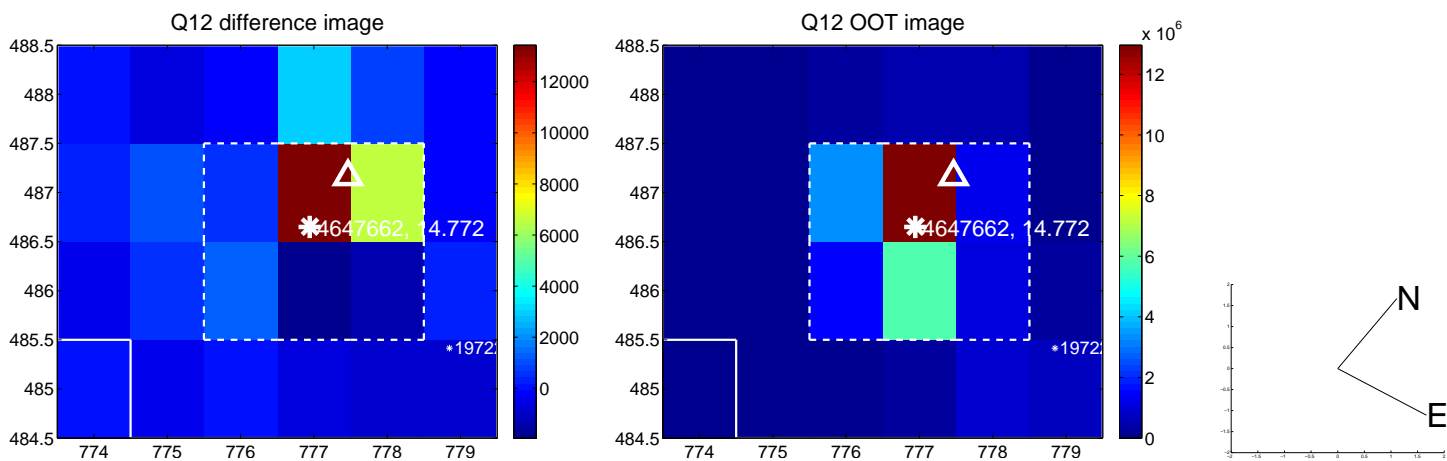
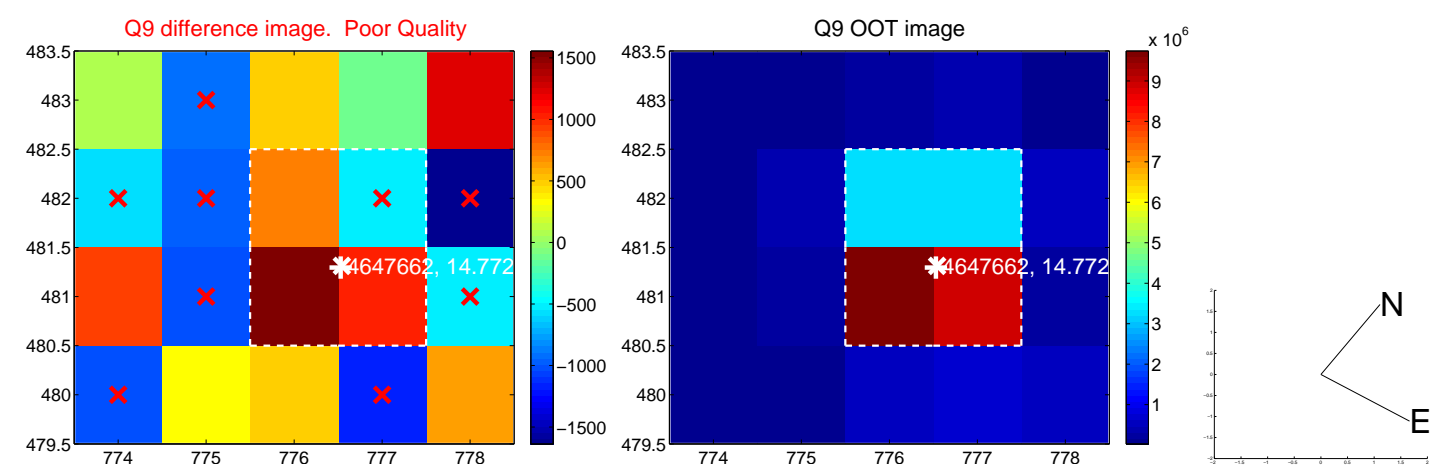


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

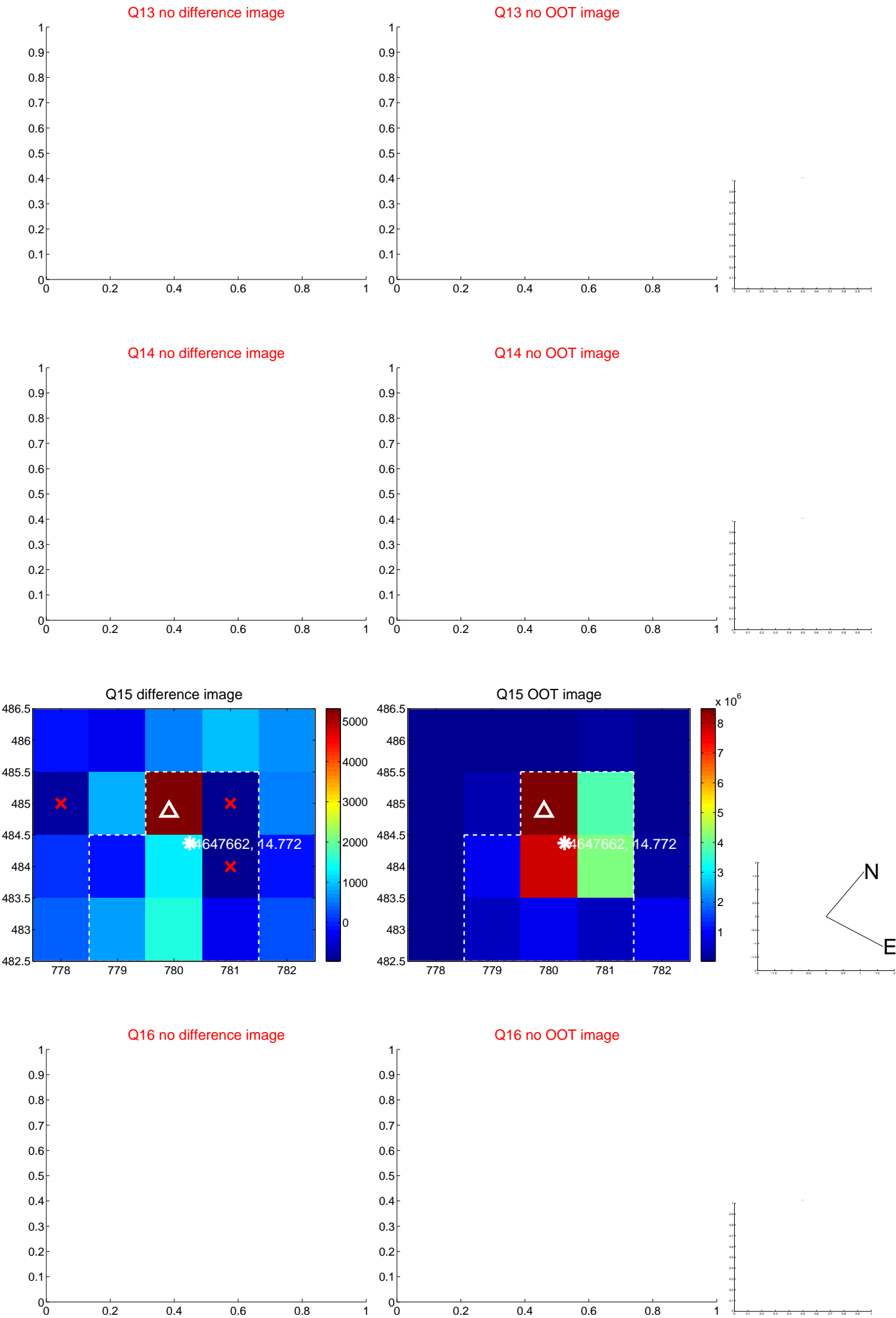




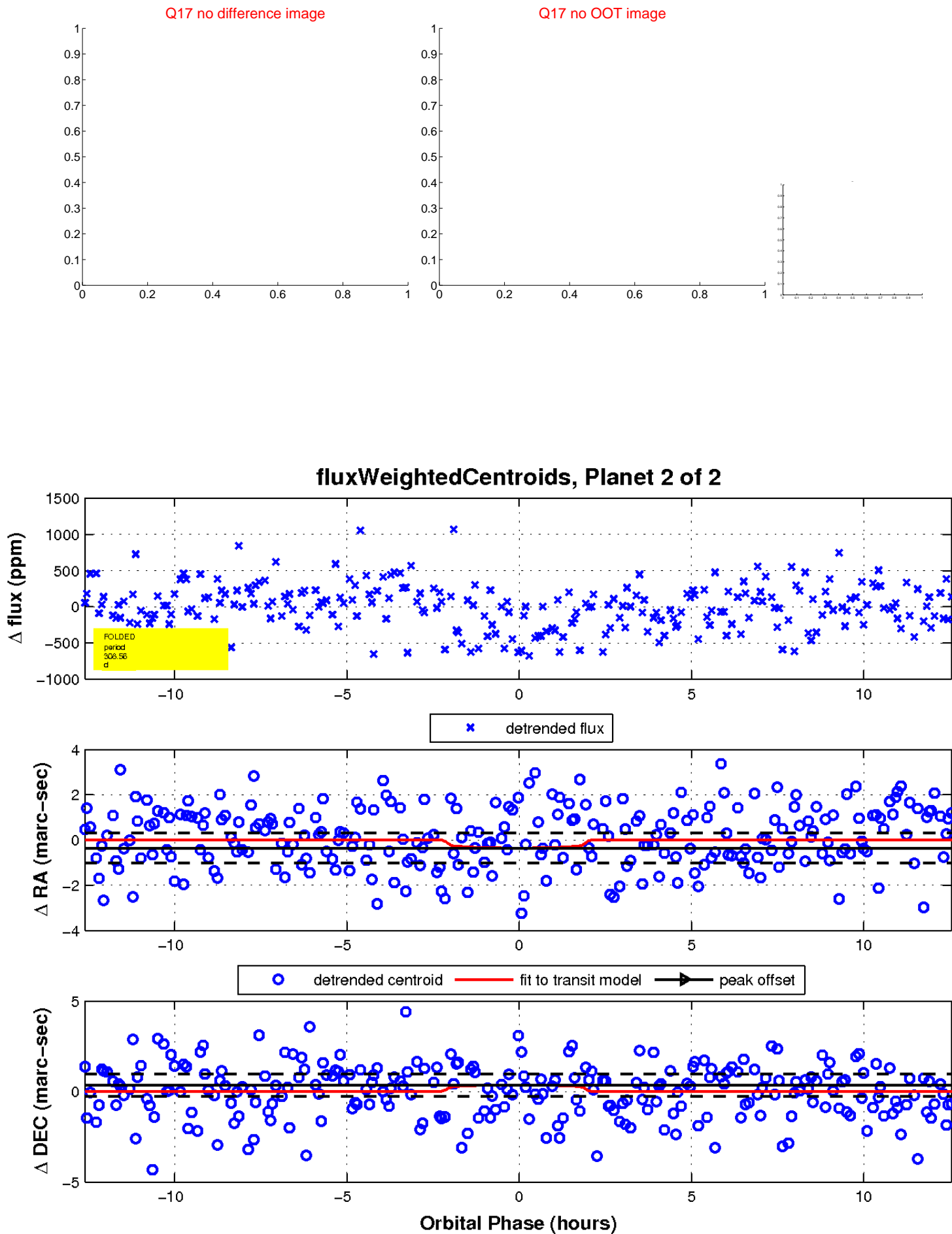
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination

