

# KIC 009395246

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009395246-01	OBS	No	1.523827	132.842796	38.9	5.730	10.7	11.3	2.42	6911	1.78	12531.26
009395246-02	OBS	No	1.524067	132.435701	93.5	15.771	11.9	14.7	2.42	6911	2.36	12528.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009395246-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—HALO_GHOST
009395246-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD

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

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

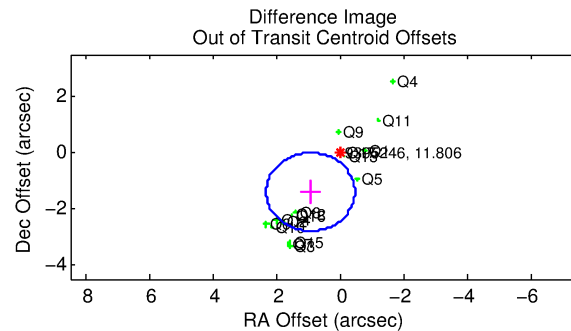
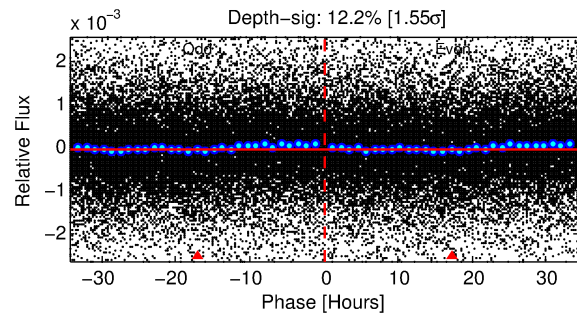
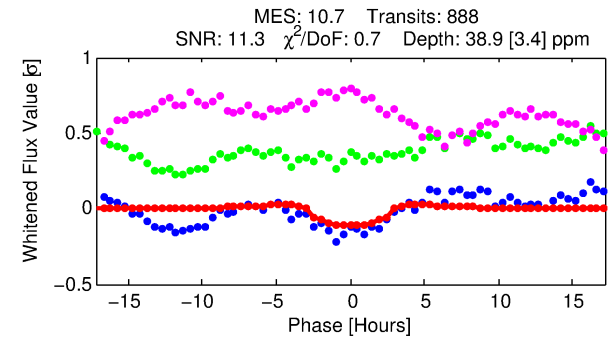
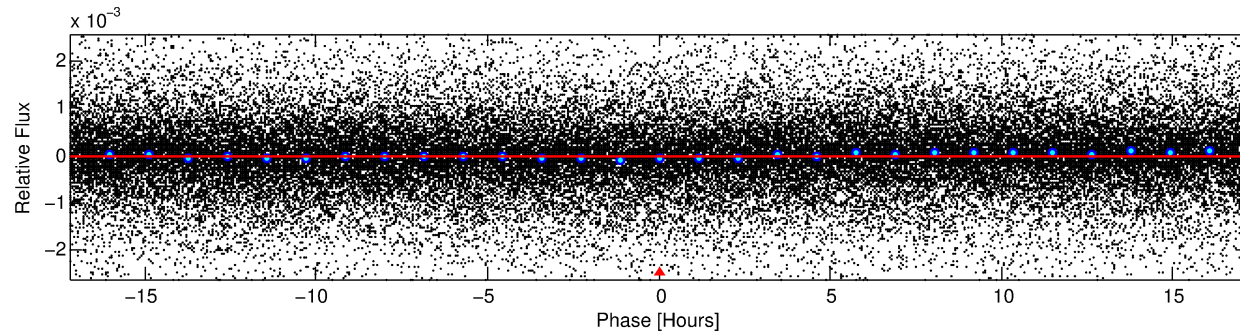
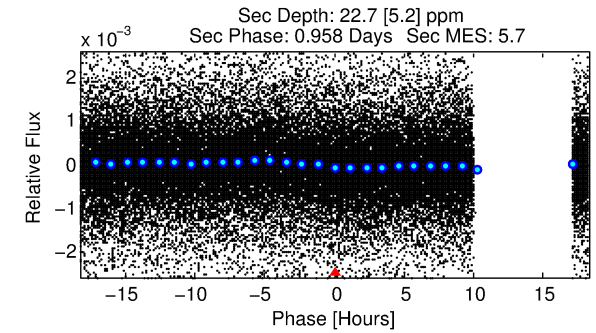
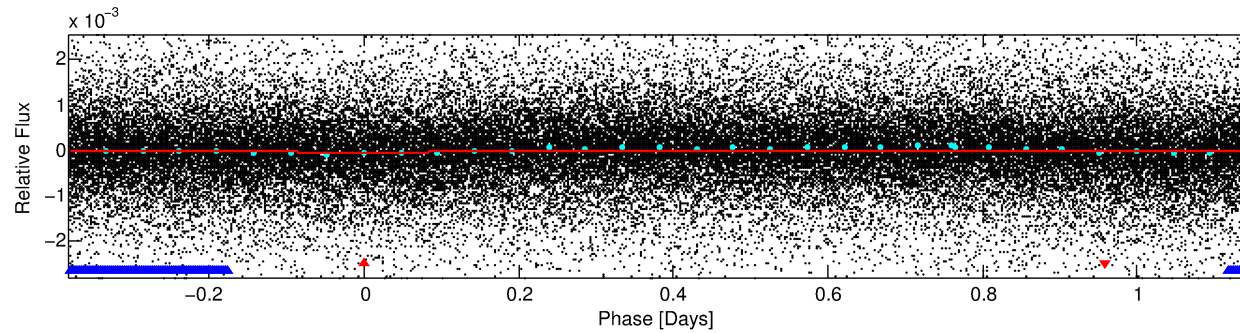
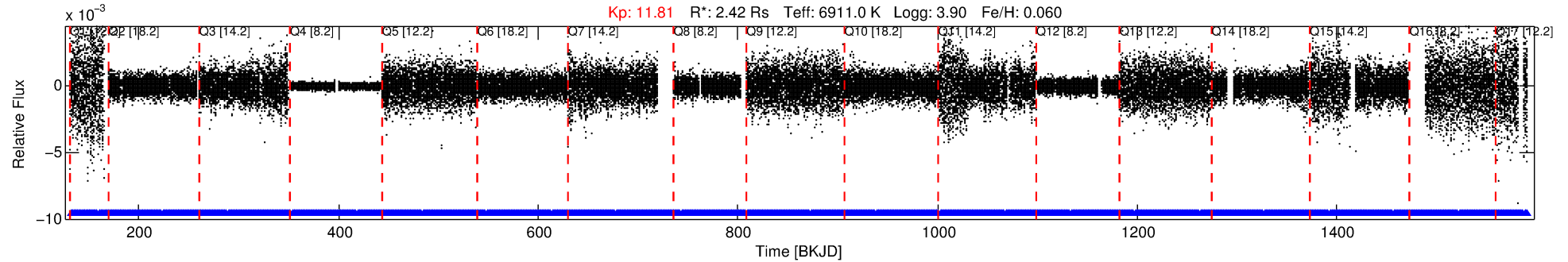
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009395246-01

No Significant Match Found

# DV One-Page Summary

KIC: 9395246 Candidate: 1 of 2 Period: 1.524 d



## DV Fit Results:

Period = 1.52383 [0.00002] d  
Epoch = 132.8428 [0.0061] BKJD  
Rp/R\* = 0.0067 [0.0021]  
a/R\* = 1.27 [0.92]  
b = 0.92 [0.33]  
Seff = 12531.26 [6834.99]  
Teq = 2698 [368] K  
Rp = 1.78 [0.85] Re  
a = 0.0309 [0.0103] AU  
Ag = 3.77 [3.18] [0.87σ]  
Teffp = 5814 [993] K [2.94σ]

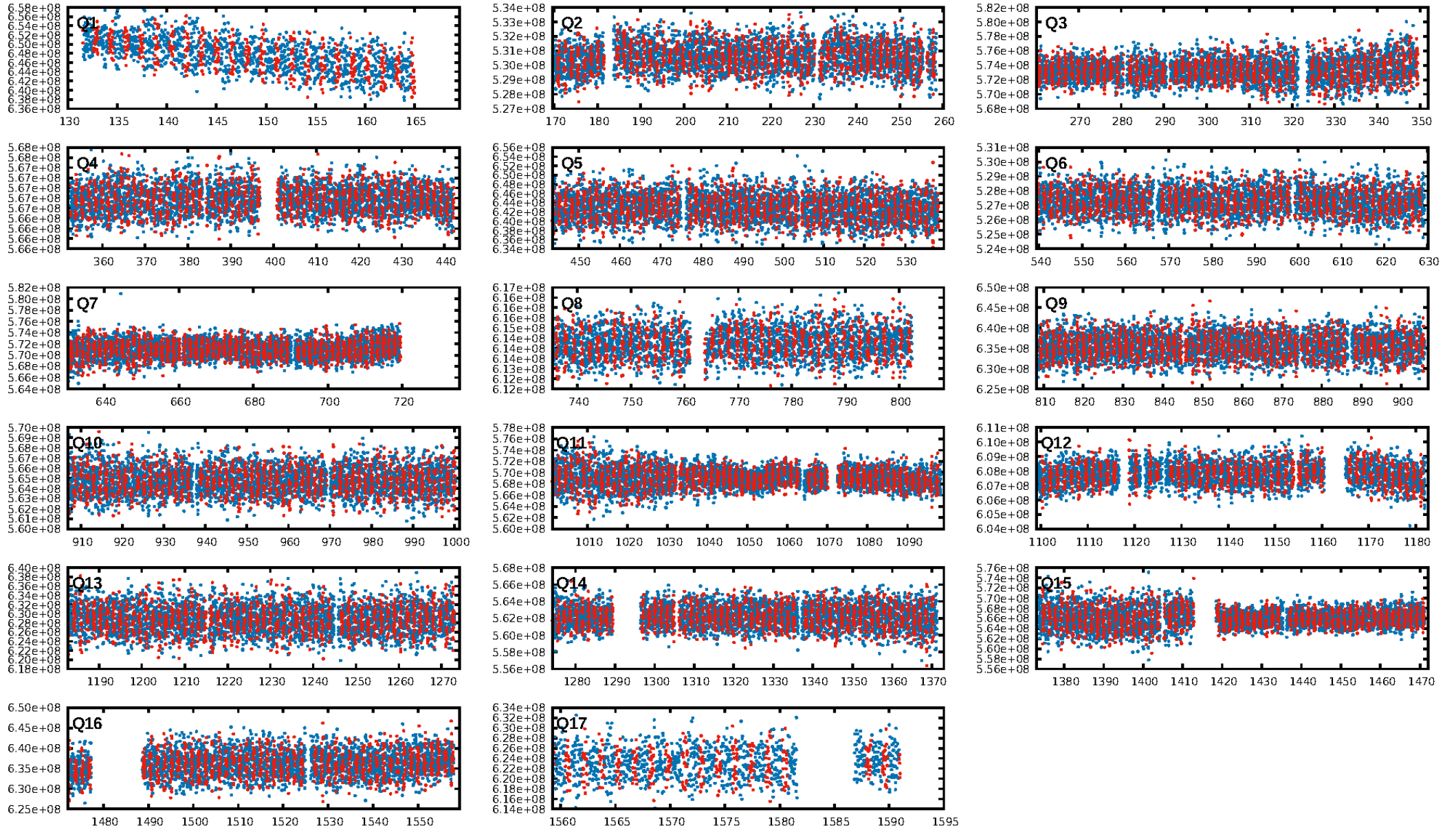
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [849/849]  
GhostDiagnostic-chr: 0.1075  
Centroid-sig: 0.0%  
Centroid-so: 2.991 arcsec [5.70σ]  
OotOffset-rm: 1.688 arcsec [3.64σ]  
KicOffset-rm: 1.777 arcsec [3.03σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.82 [14/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:06:56 Z

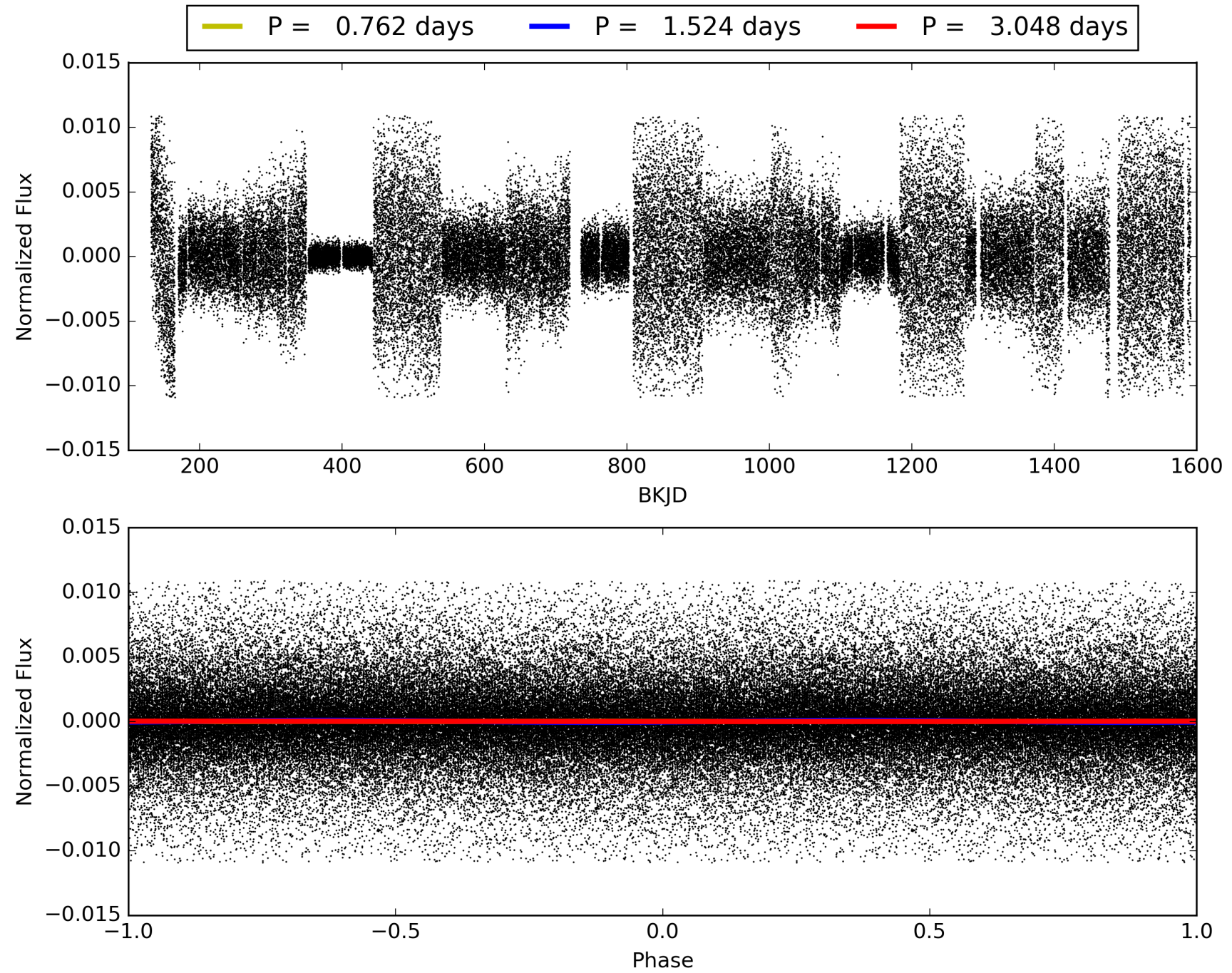
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009395246-01, PDC Light Curves



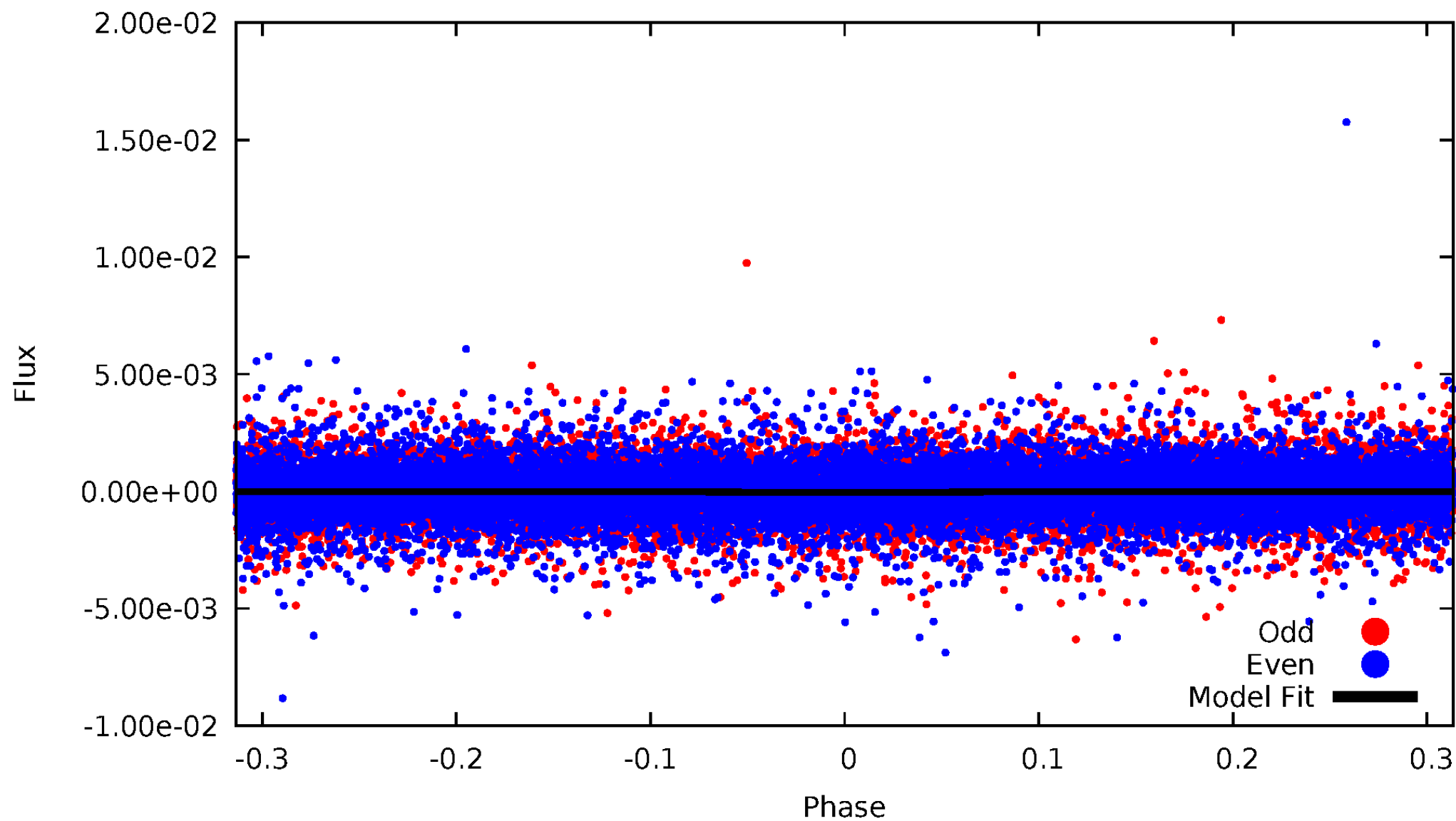


TCE 009395246-01



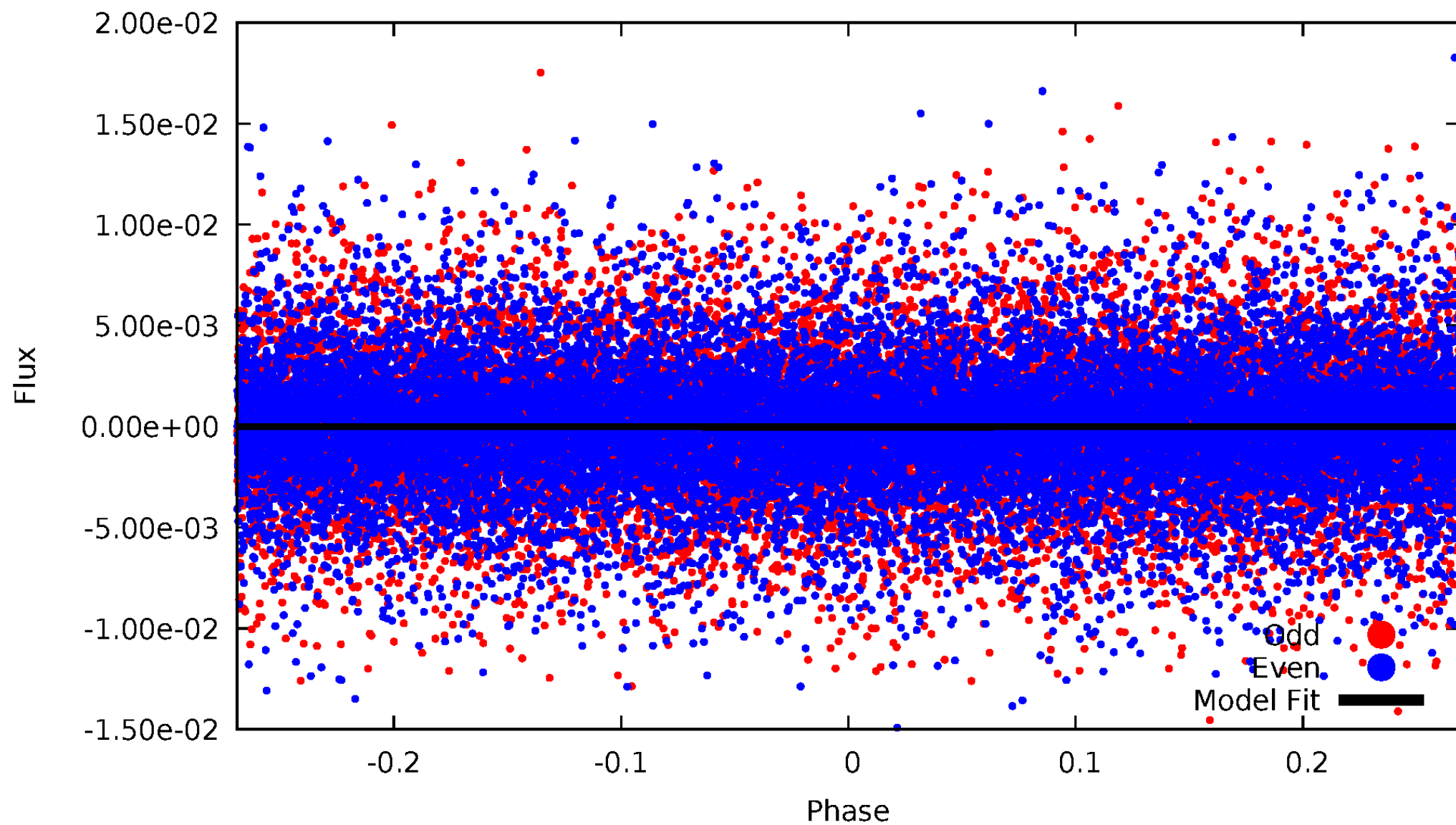
# DV Odd/Even

TCE 009395246-01



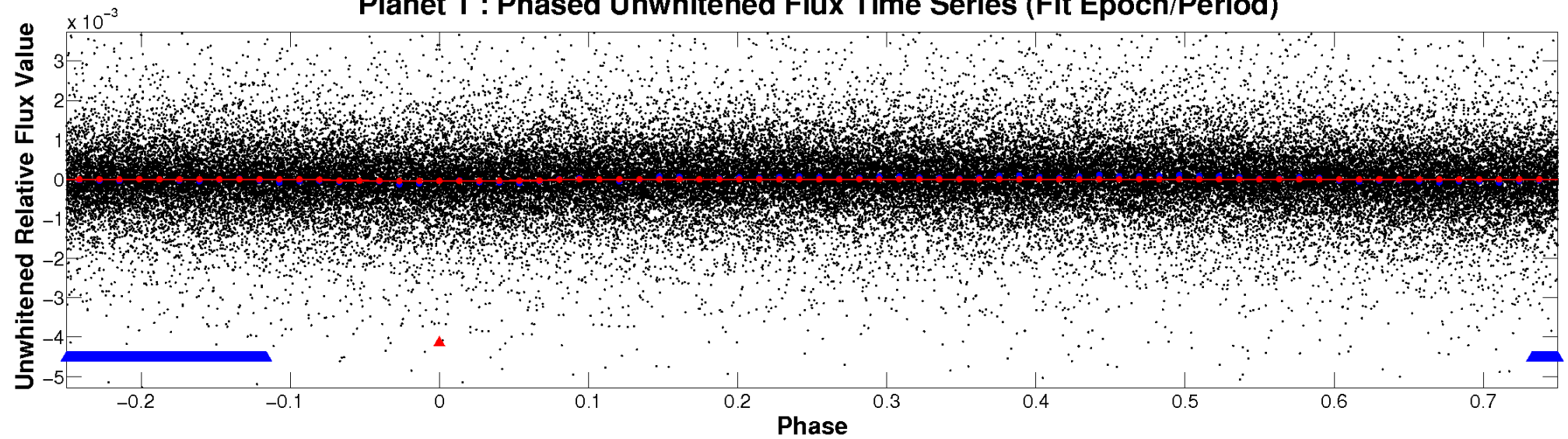
# ALT Odd/Even

TCE 009395246-01

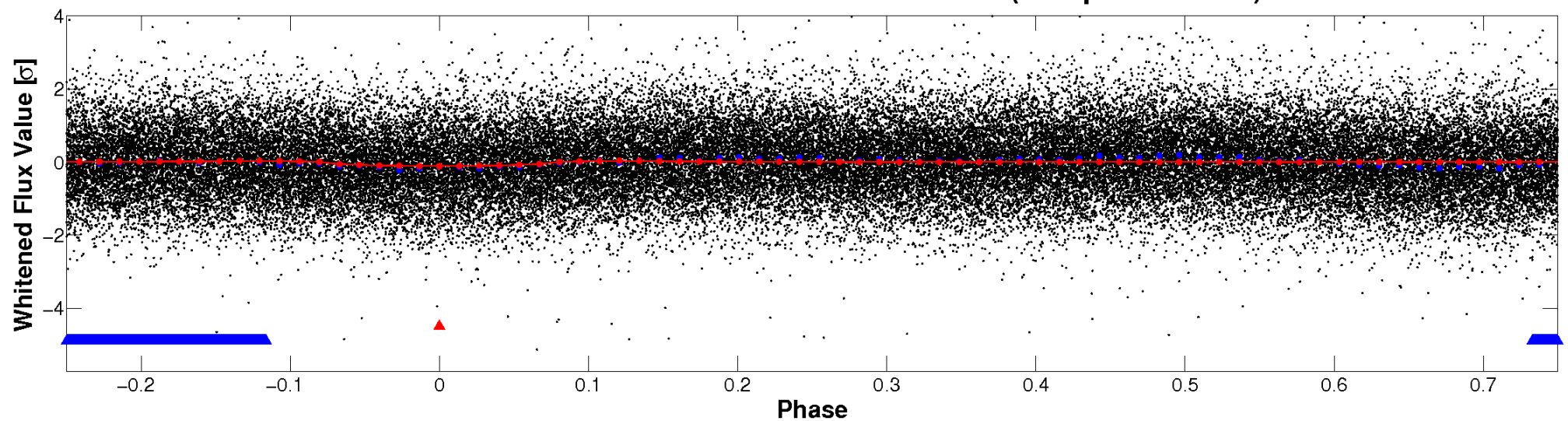


# Non-Whitened Vs. Whitened Light Curve

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



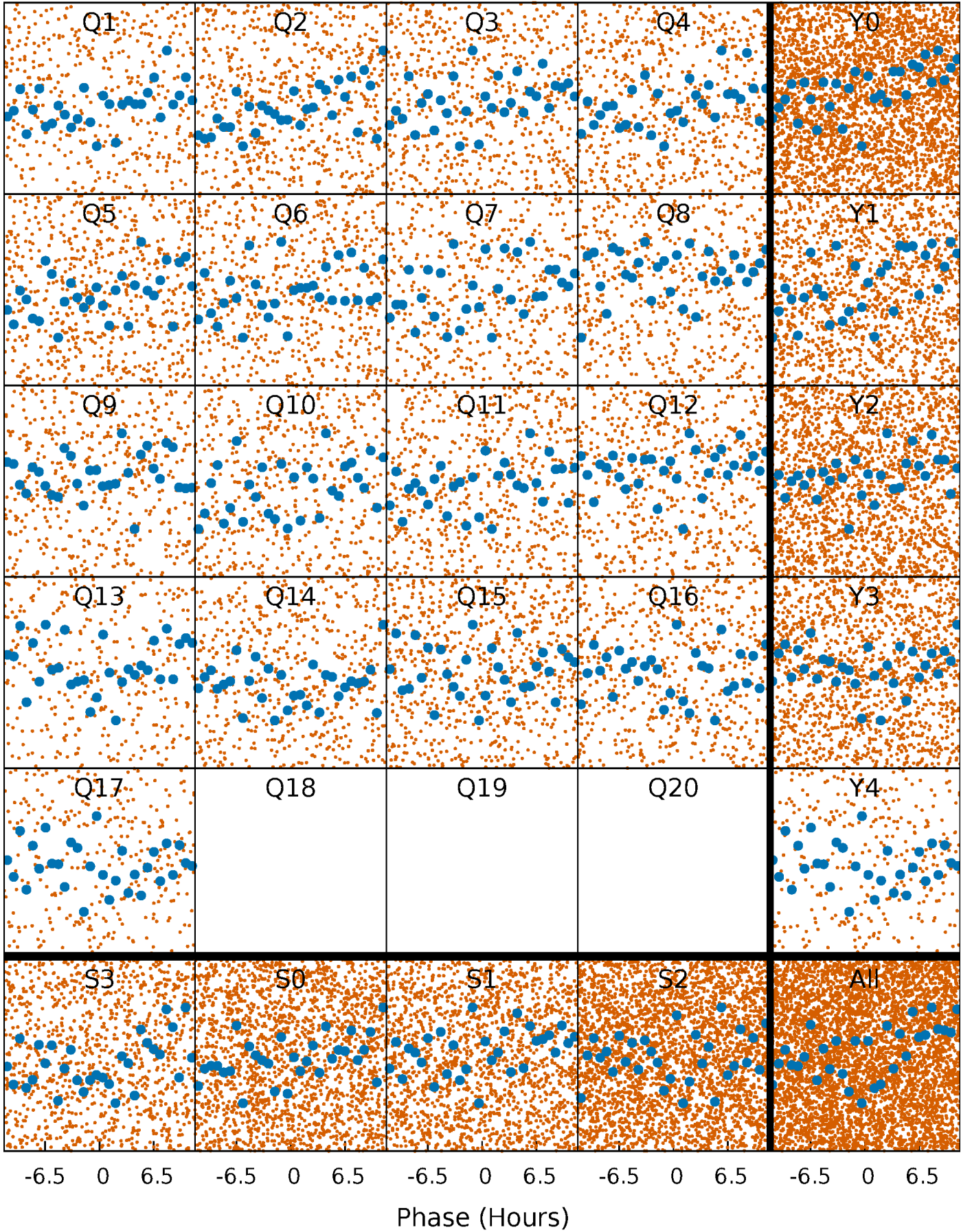
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

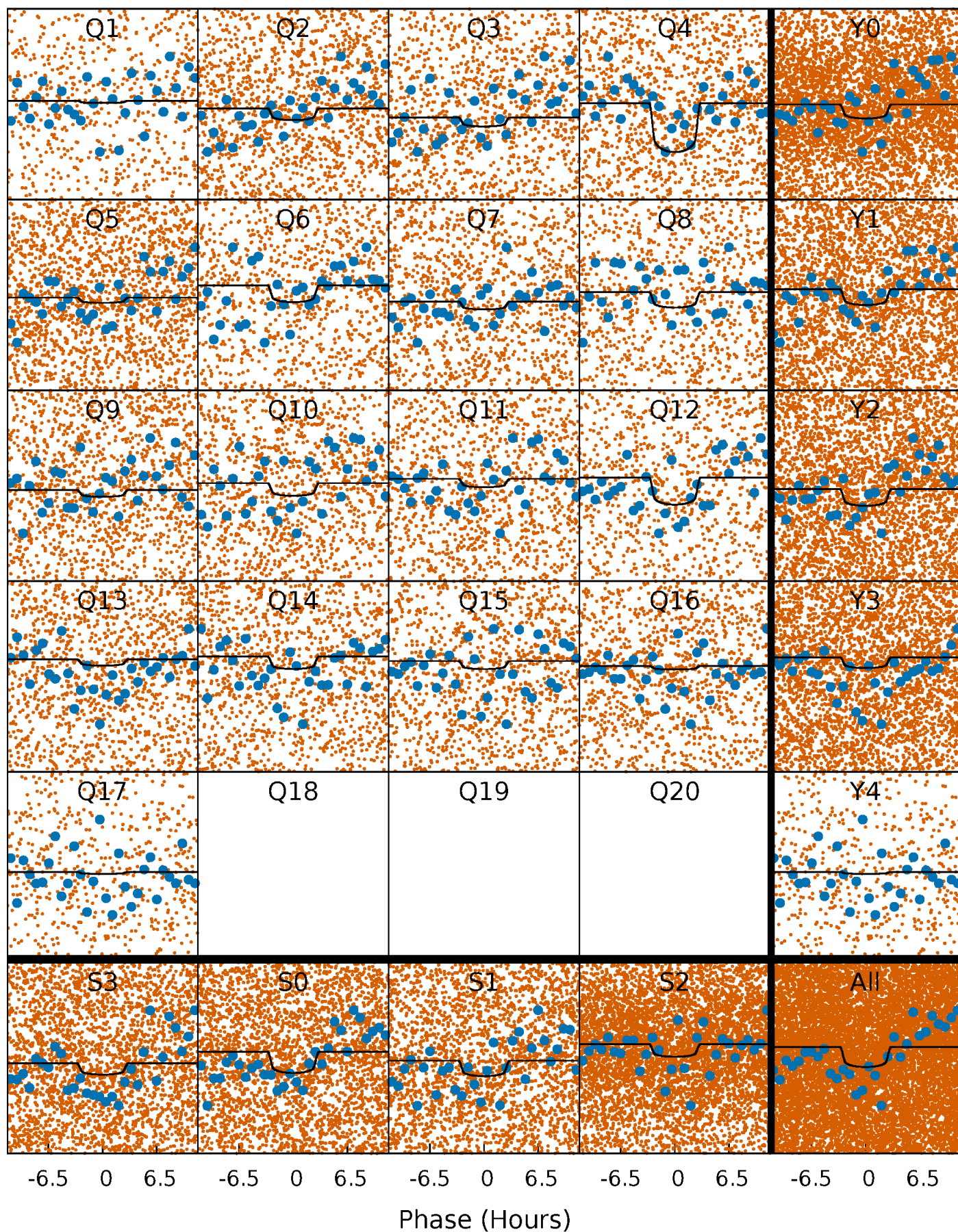
TCE 009395246-01   P= 1.523827 Days    $T_0=132.842796$  (BKJD)





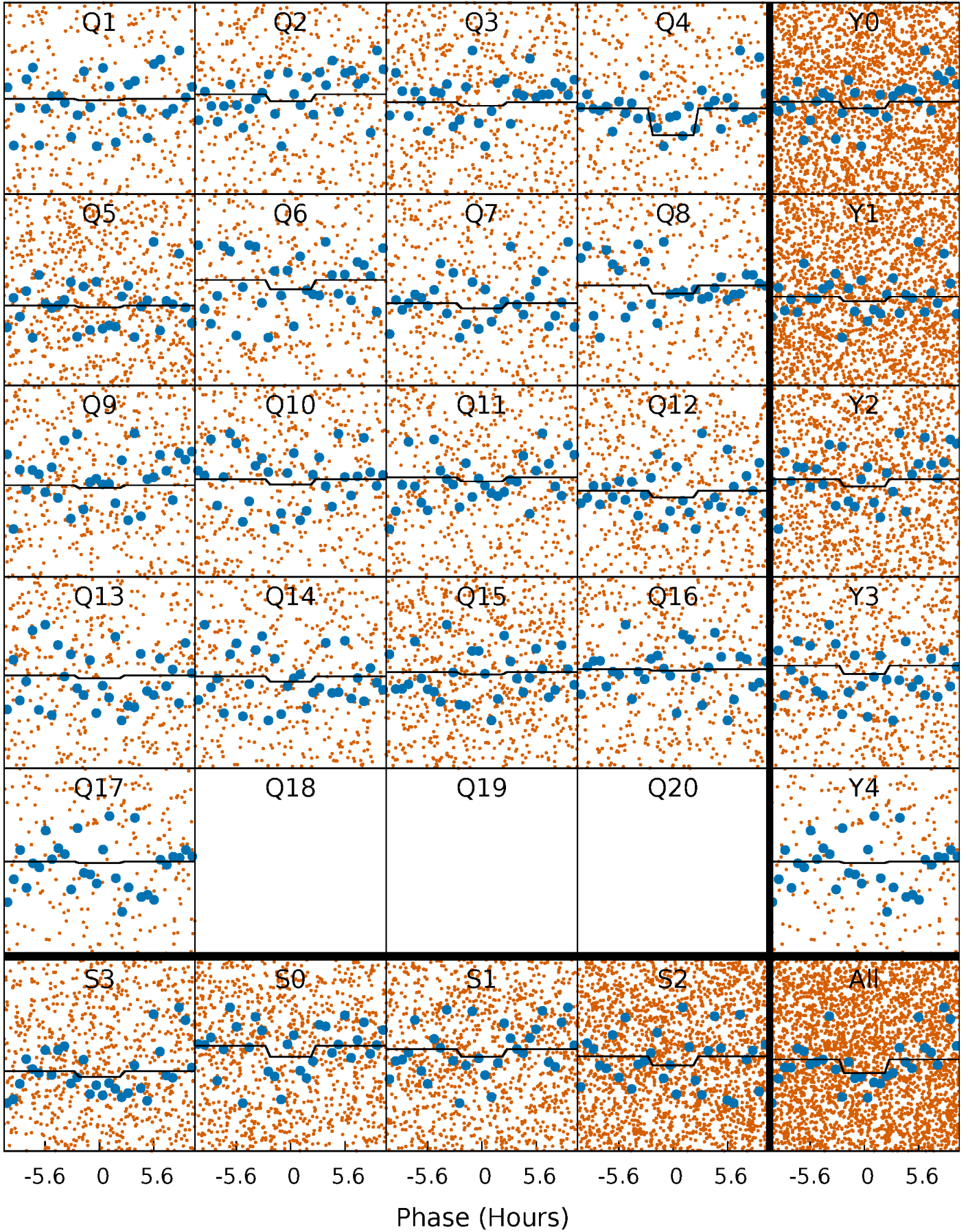
# DV Quarter-Phased Transit Curves

TCE 009395246-01 P= 1.523827 Days  $T_0=132.842796$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009395246-01 P= 1.523773 Days  $T_0=132.843097$  (BKJD)

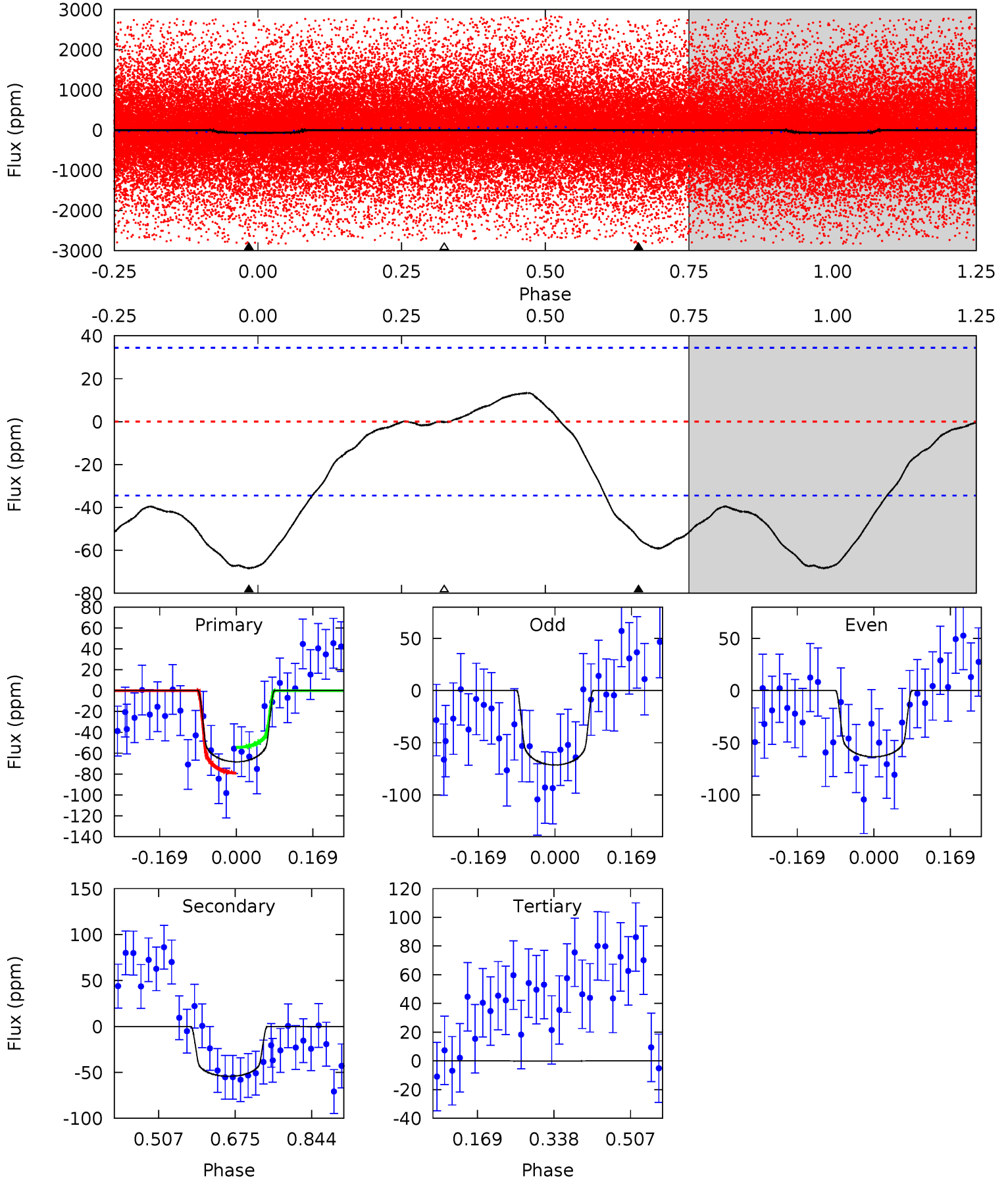




# DV Model-Shift Uniqueness Test

009395246-01, P = 1.523827 Days, E = 131.318969 Days

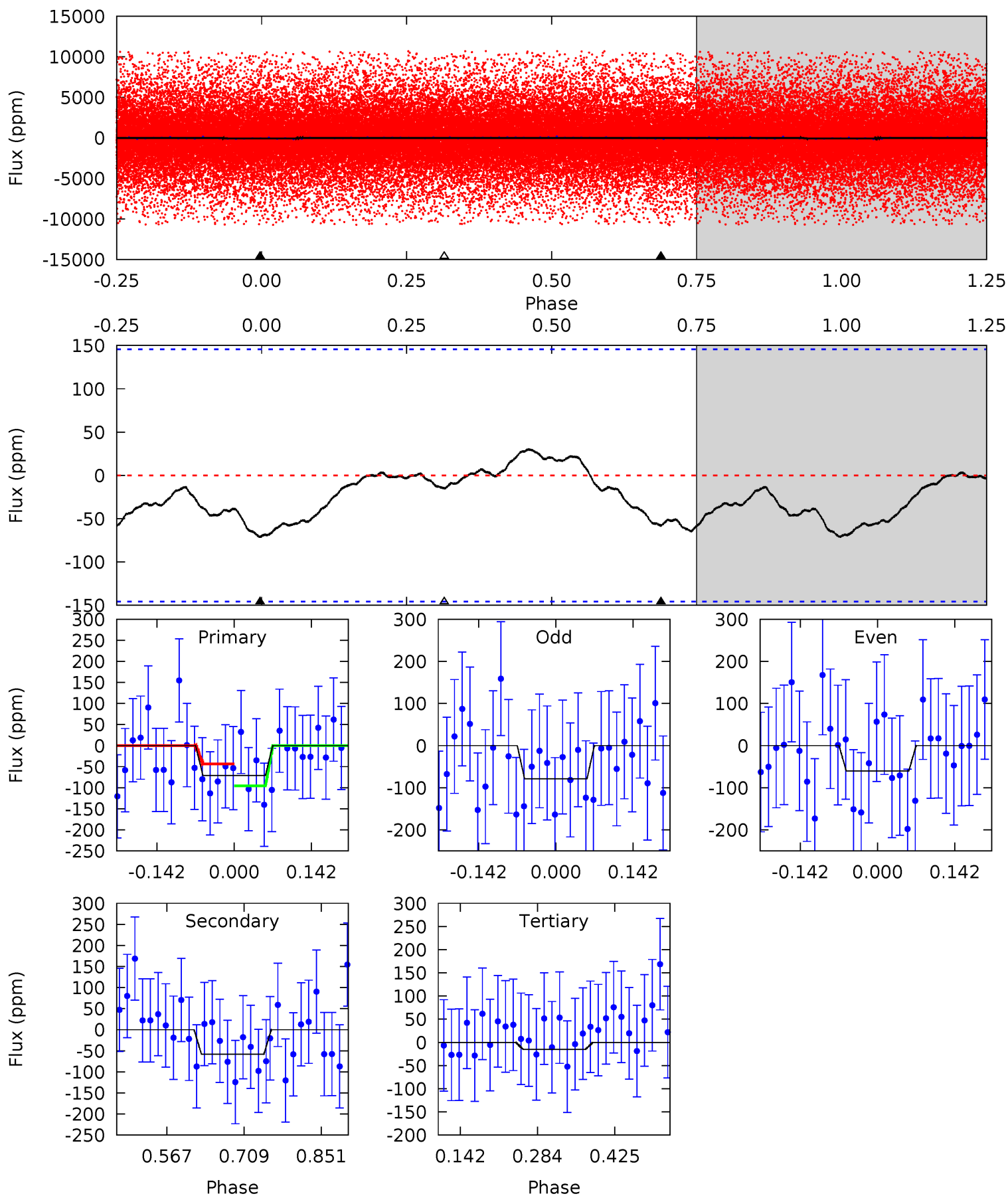
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.83	7.03	0.02	0	4.45	1.38	0.93	8.81	8.83	7.00	7.03	0.51	1.42	0.16	1.61



# Alt Model-Shift Uniqueness Test

009395246-01, P = 1.523773 Days, E = 131.319324 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
2.19	1.79	0.46	0	4.49	1.47	0.43	1.73	2.19	1.33	1.79	0.28	1.29	0.30	0.81





### Stellar Parameters For KIC 009395246

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6911^{+192}_{-288}$	$3.899^{+0.299}_{-0.161}$	$0.060^{+0.200}_{-0.350}$	$2.417^{+0.587}_{-0.881}$	$1.689^{+0.194}_{-0.361}$	$0.169^{+0.349}_{-0.076}$
	+3%/-4%	+8%/-4%	+333%/-583%	+24%/-36%	+11%/-21%	+207%/-45%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009395246-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-54 \pm 8$	$1.69^{+0.66}_{-0.58}$	$3718^{+299}_{-342}$	$7172^{+1834}_{-1046}$	$9.945^{+12.594}_{-4.914}$
Alt.	$-58 \pm 32$	$1.43^{+0.62}_{-0.57}$	$3751^{+286}_{-363}$	$7945^{+3389}_{-2162}$	$13^{+25}_{-9}$

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

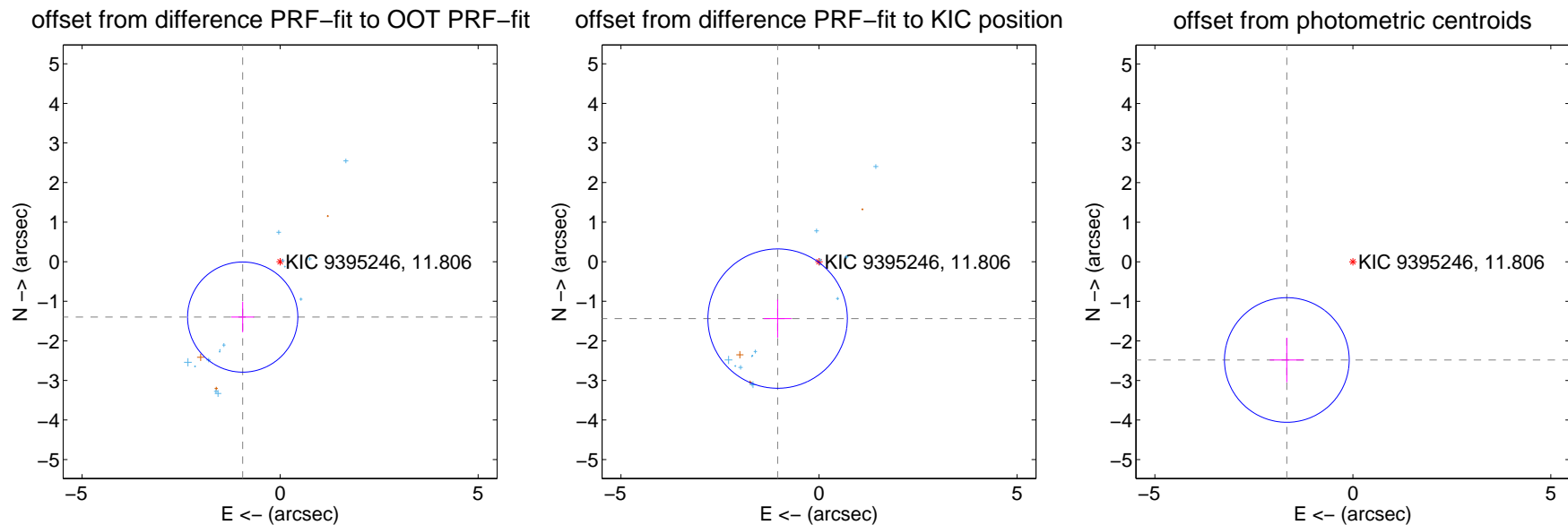
## DV Centroid Data

Supplemental centroid analysis for 009395246-01. **Kepler magnitude: 11.81.** Transit SNR 11.33

There are 14 quarters with good PRF difference image offsets

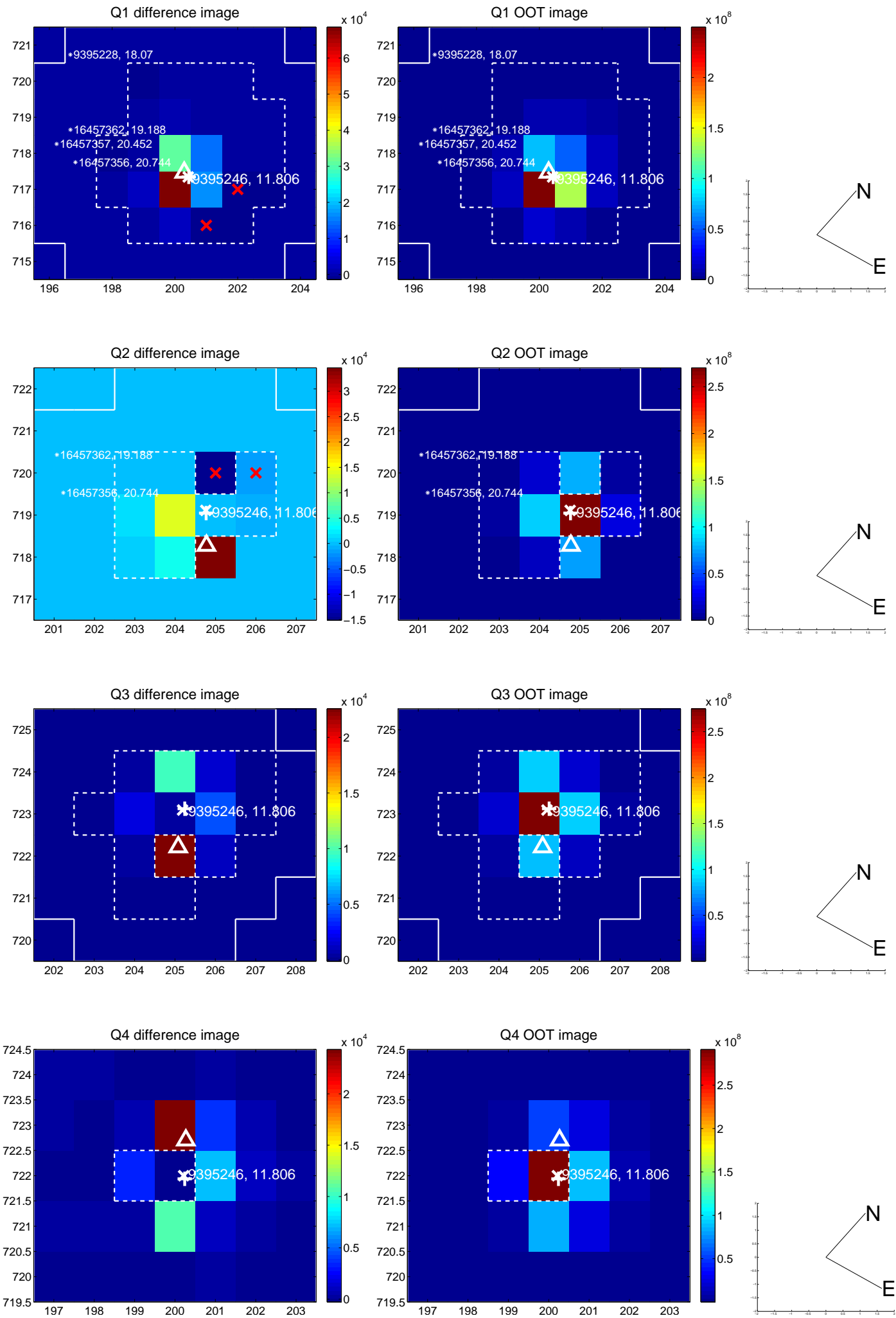
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.688 \pm 0.464$	<b>3.64</b>	$0.945 \pm 0.287$	$-1.400 \pm 0.383$
PRF-fit source offset from KIC position	$1.777 \pm 0.587$	<b>3.03</b>	$1.044 \pm 0.352$	$-1.438 \pm 0.481$
photometric centroid source offset	$2.99 \pm 0.53$	<b>5.70</b>	$1.67 \pm 0.43$	$-2.48 \pm 0.56$

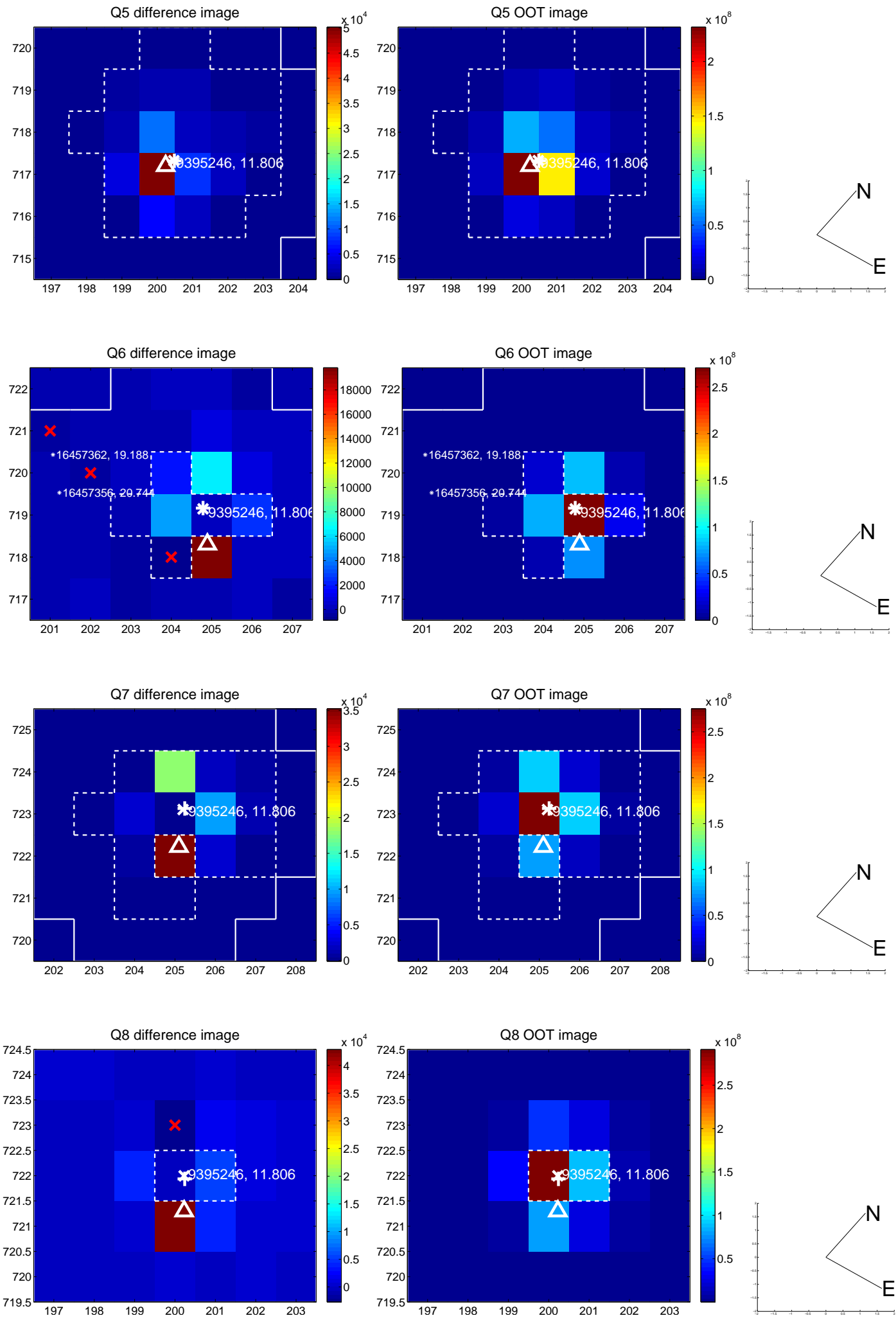


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

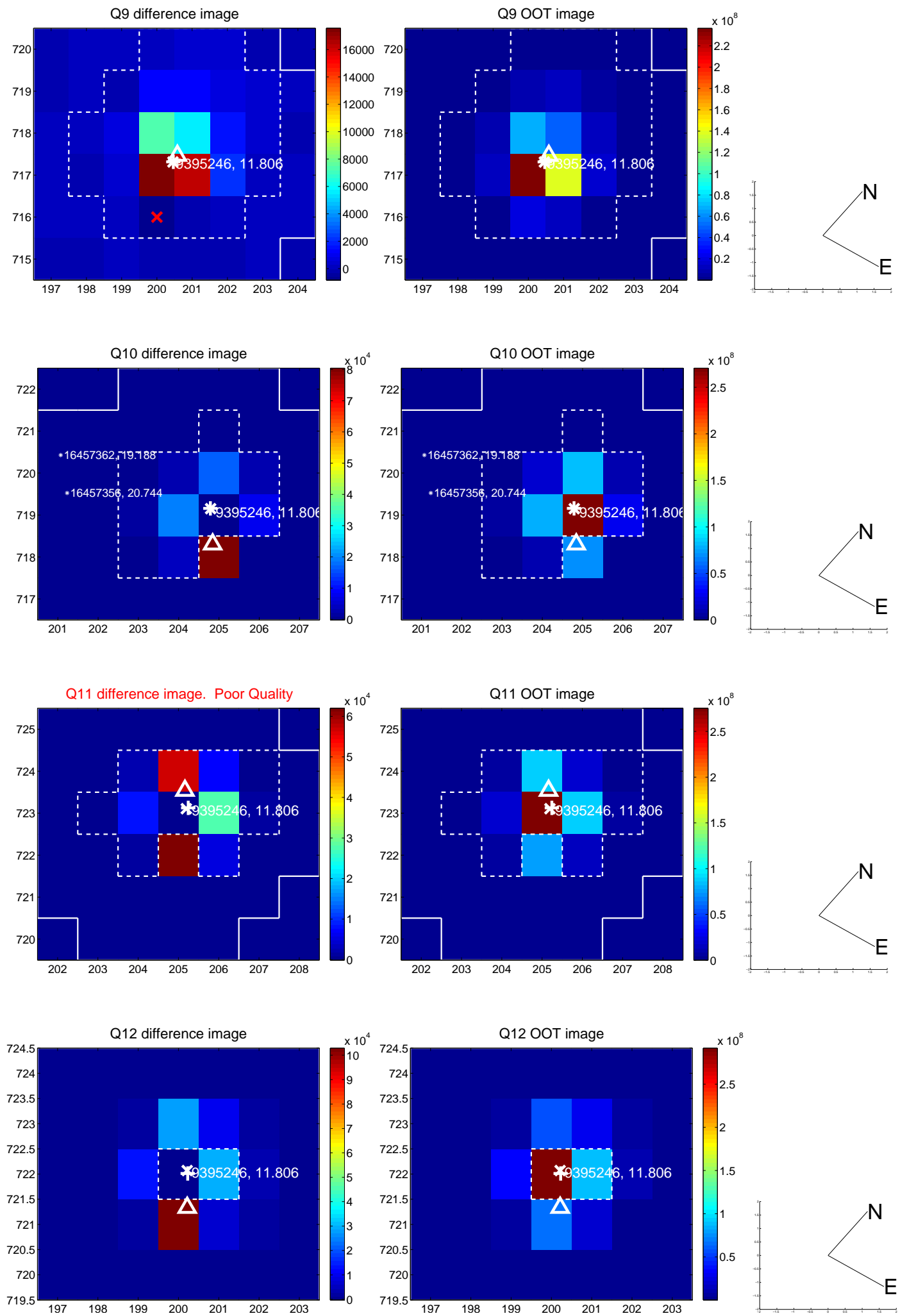


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

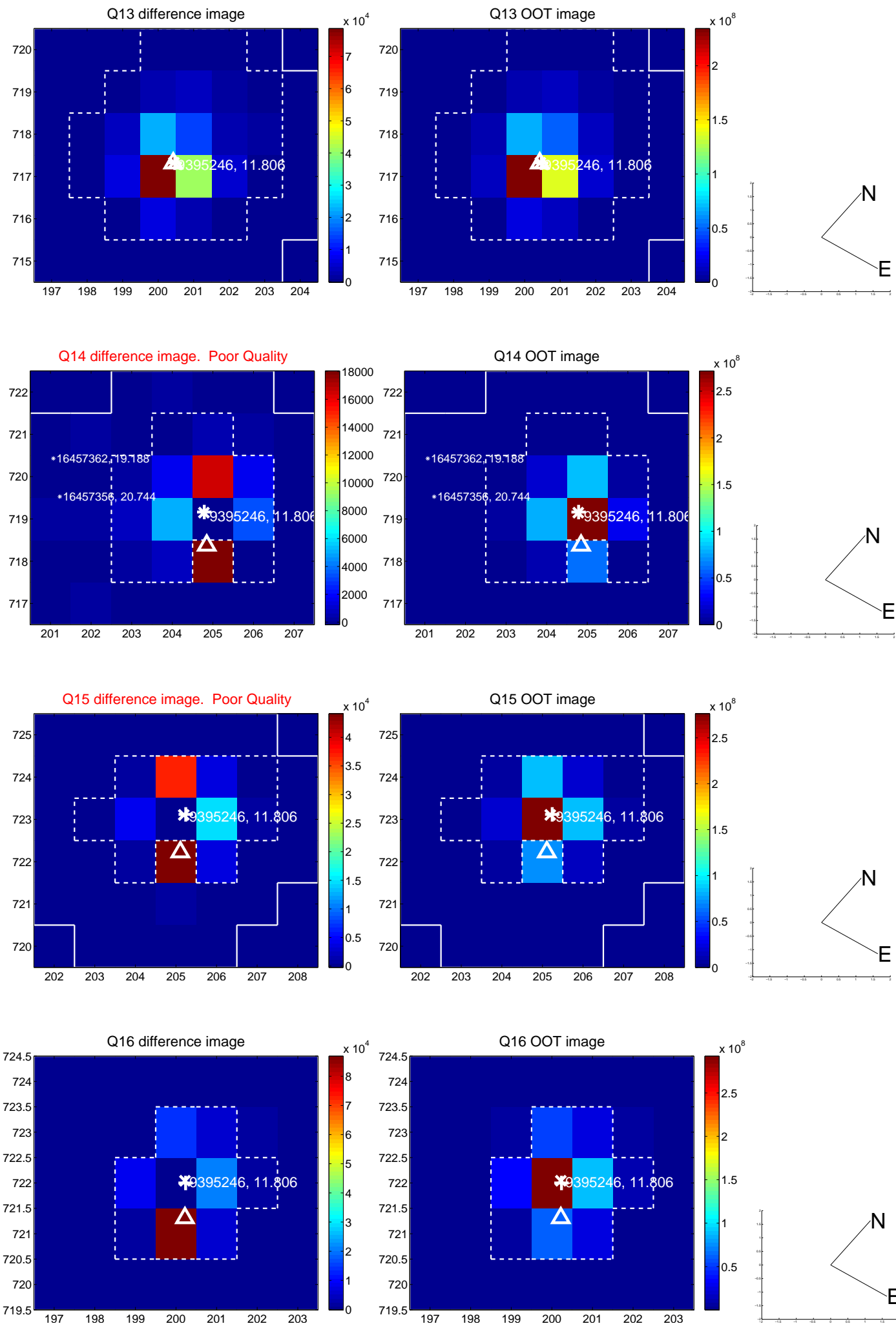




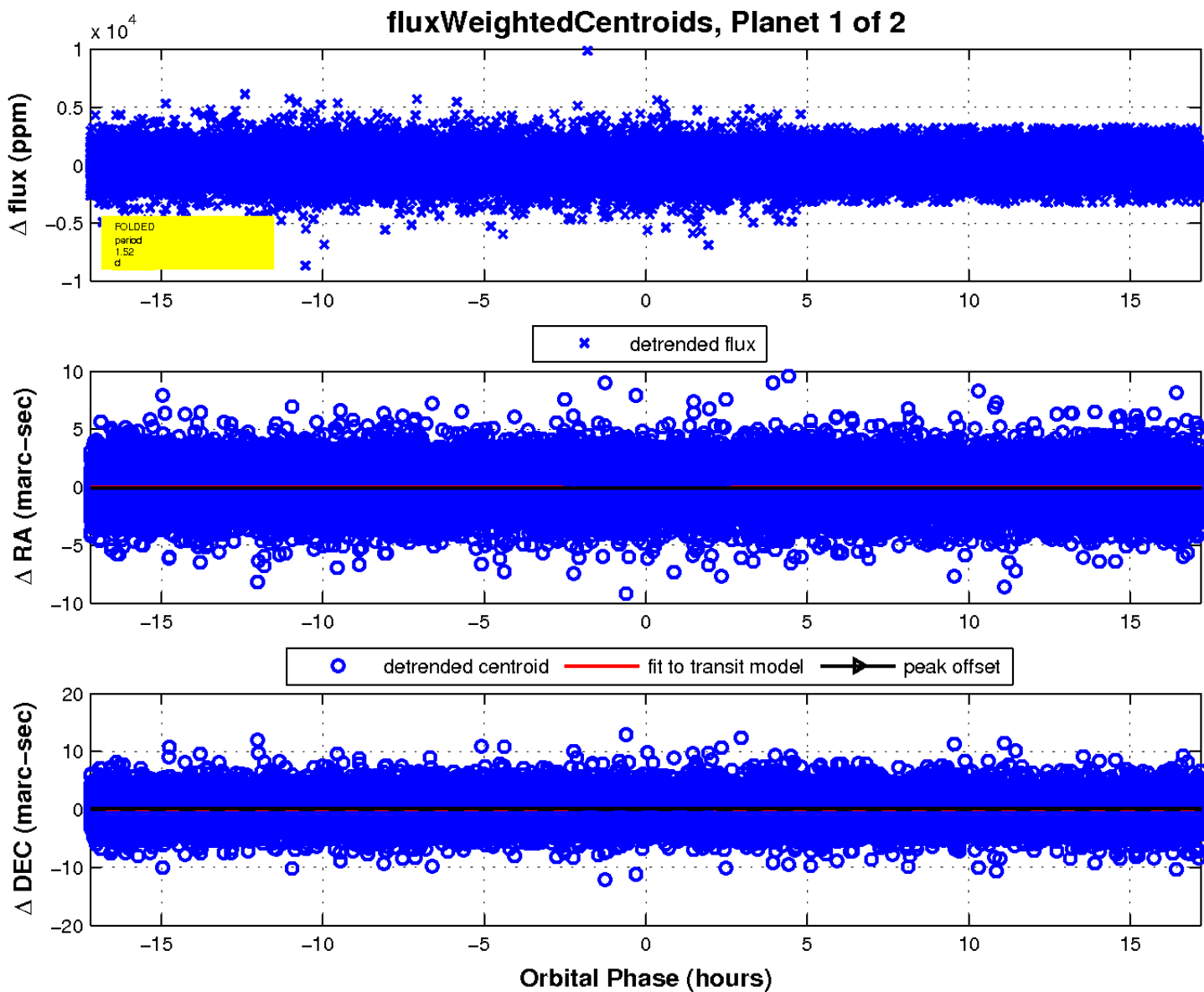
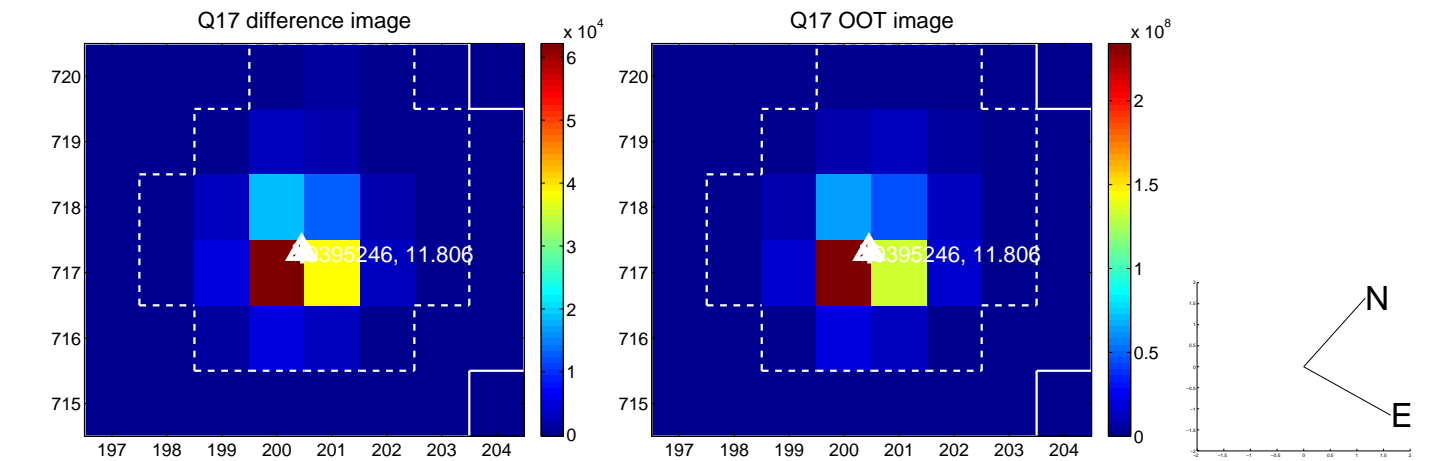
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

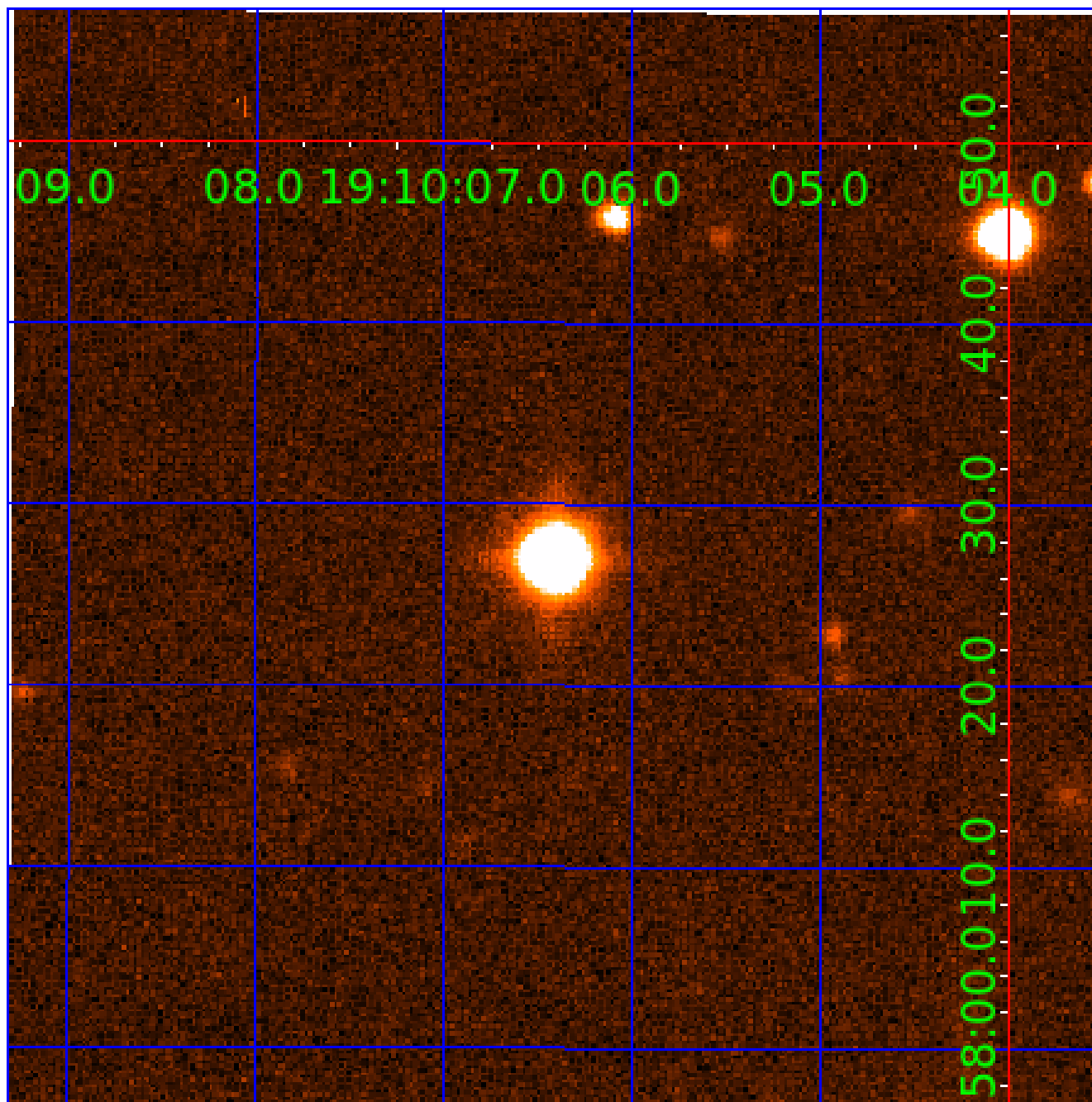


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009395246

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009395246-01	OBS	No	1.523827	132.842796	38.9	5.730	10.7	11.3	2.42	6911	1.78	12531.26
009395246-02	OBS	No	1.524067	132.435701	93.5	15.771	11.9	14.7	2.42	6911	2.36	12528.63

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009395246-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—HALO_GHOST
009395246-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD

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

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

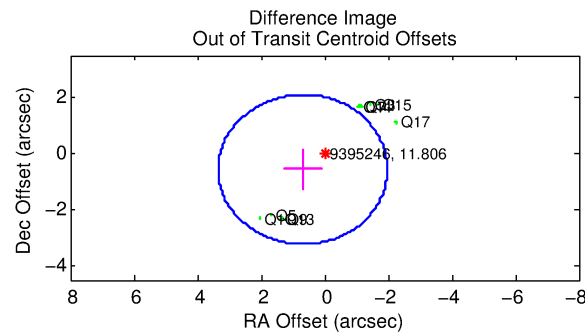
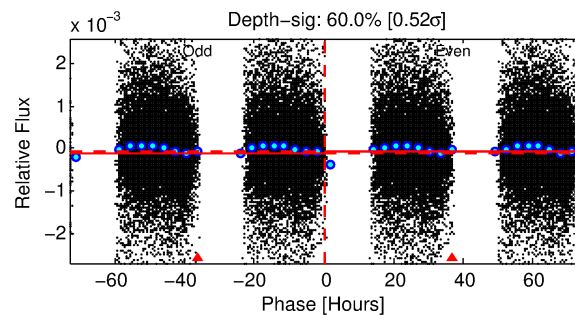
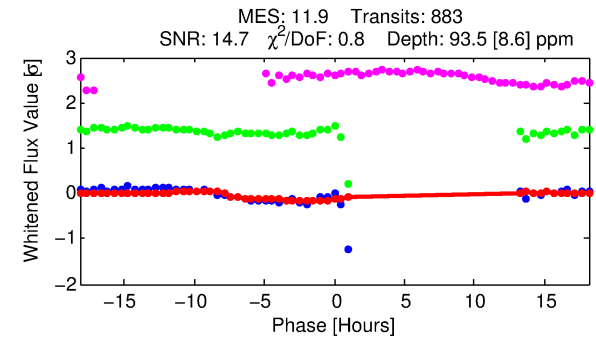
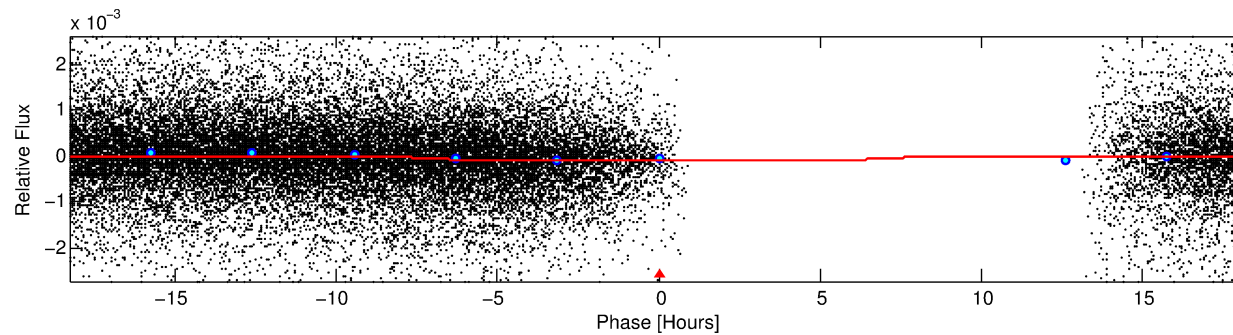
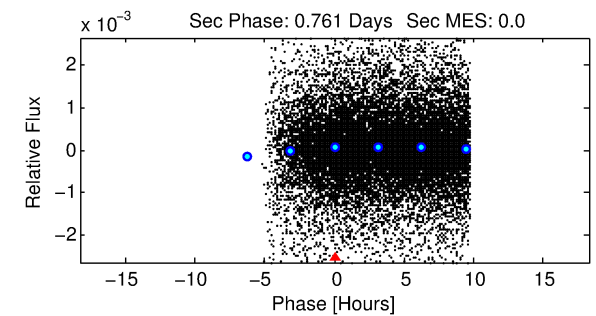
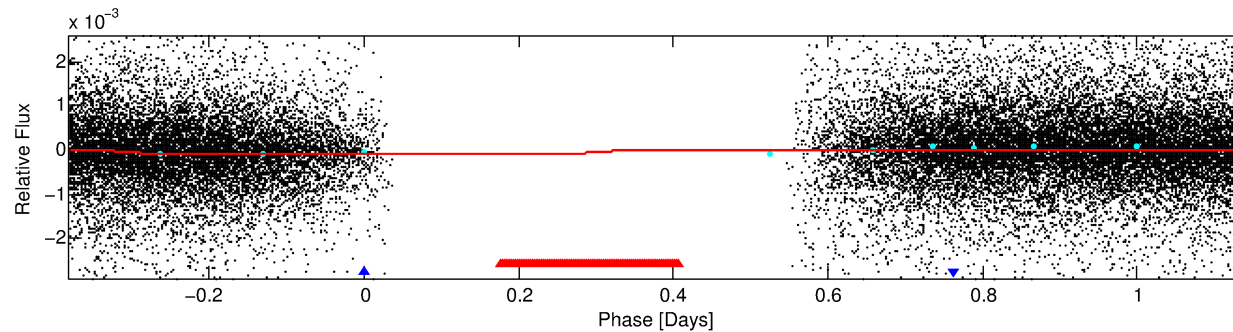
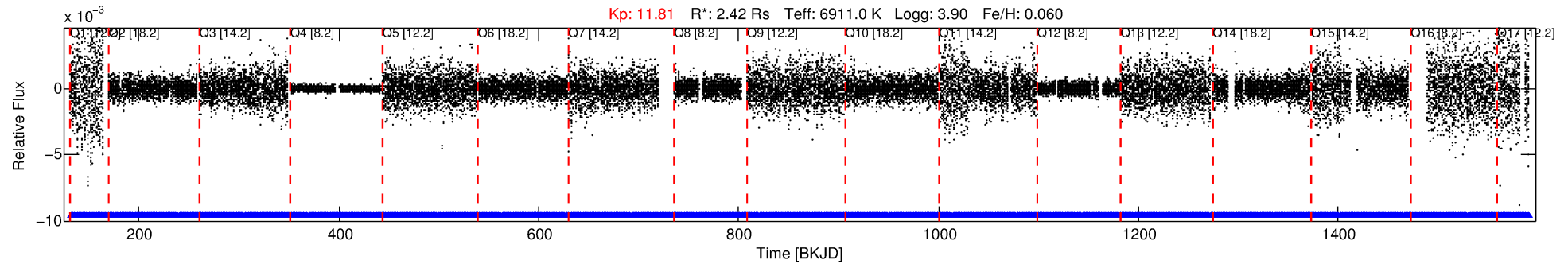
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009395246-02

No Significant Match Found

# DV One-Page Summary

KIC: 9395246 Candidate: 2 of 2 Period: 1.524 d



## DV Fit Results:

Period = 1.52407 [0.00003] d  
 Epoch = 132.4357 [0.0363] BKJD  
 Rp/R\* = 0.0089 [0.0036]  
 a/R\* = 1.03 [0.13]  
 b = 0.05 [48.10]  
 Seff = 12528.63 [6833.56]  
 Teq = 2698 [368] K  
 Rp = 2.36 [1.28] Re  
 a = 0.0309 [0.0103] AU  
 Ag = N/A  
 Tefp = N/A

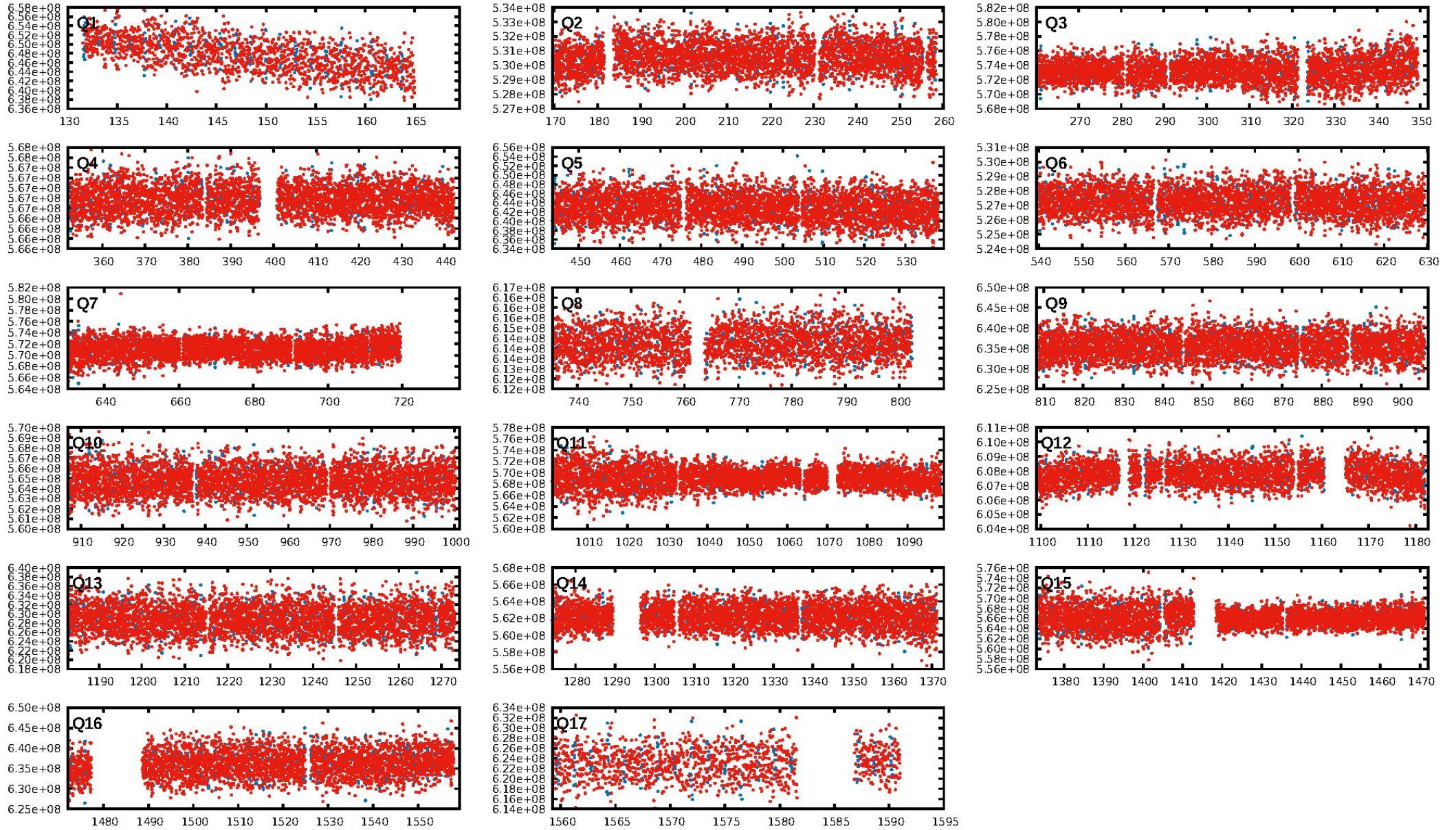
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
 LongPeriod-sig: N/A  
 ModelChiSquare2-sig: N/A  
 ModelChiSquareGof-sig: N/A  
 Bootstrap-pfa: N/A  
 RollingBand-fgt: 1.00 [843/843]  
 GhostDiagnostic-chr: 0.371  
 Centroid-sig: 0.0%  
 Centroid-so: 1.232 arcsec [8.19σ]  
 OotOffset-rm: 0.890 arcsec [1.00σ]  
 KicOffset-rm: 0.894 arcsec [1.09σ]  
 OotOffset-st: 0/4/0/5 [9]  
 KicOffset-st: 0/4/0/5 [9]  
 DiffImageQuality-fgm: 0.56 [5/9]  
 DiffImageOverlap-fno: 0.00 [0/17]

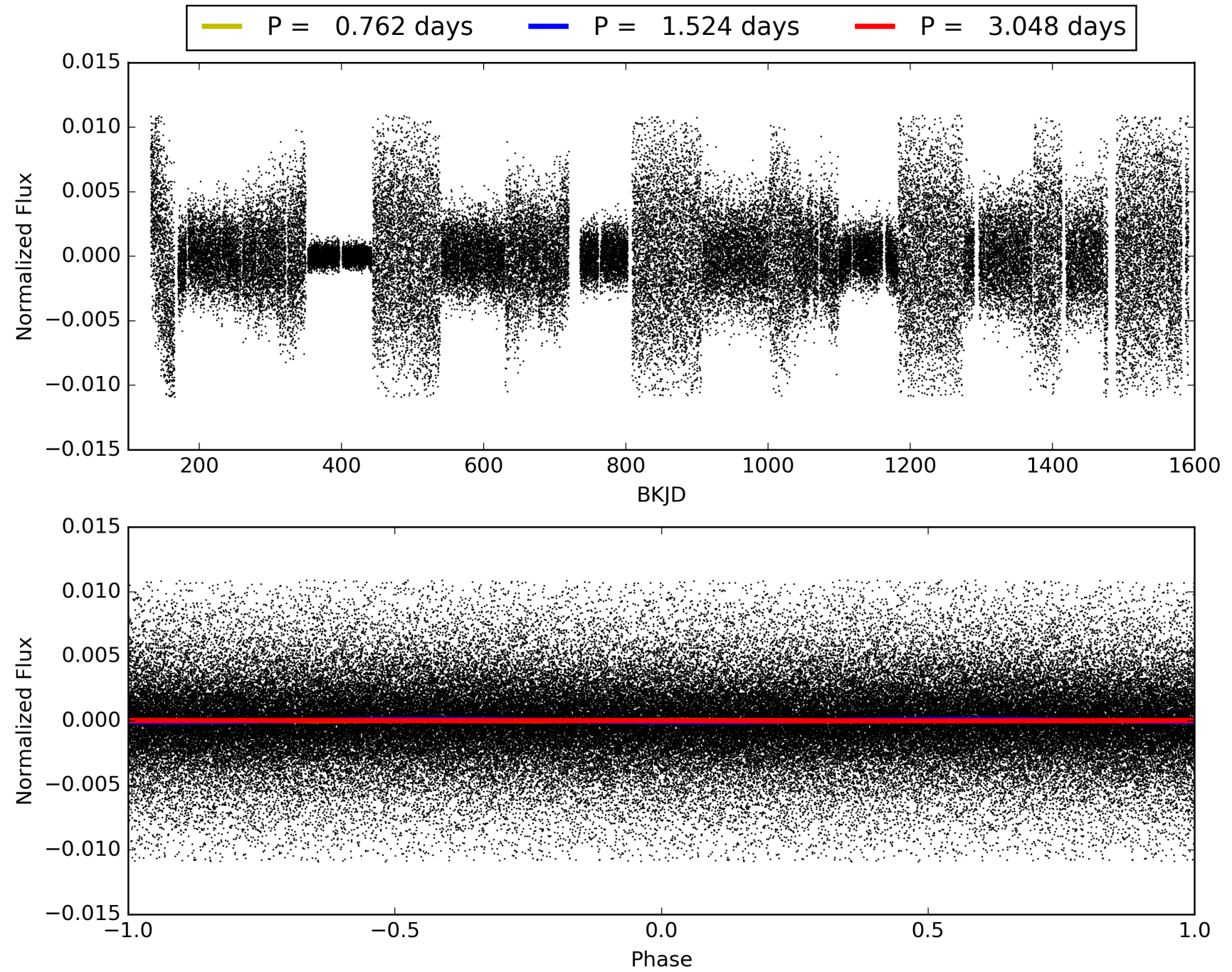
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:07:11 Z

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

# TCE 009395246-02, PDC Light Curves



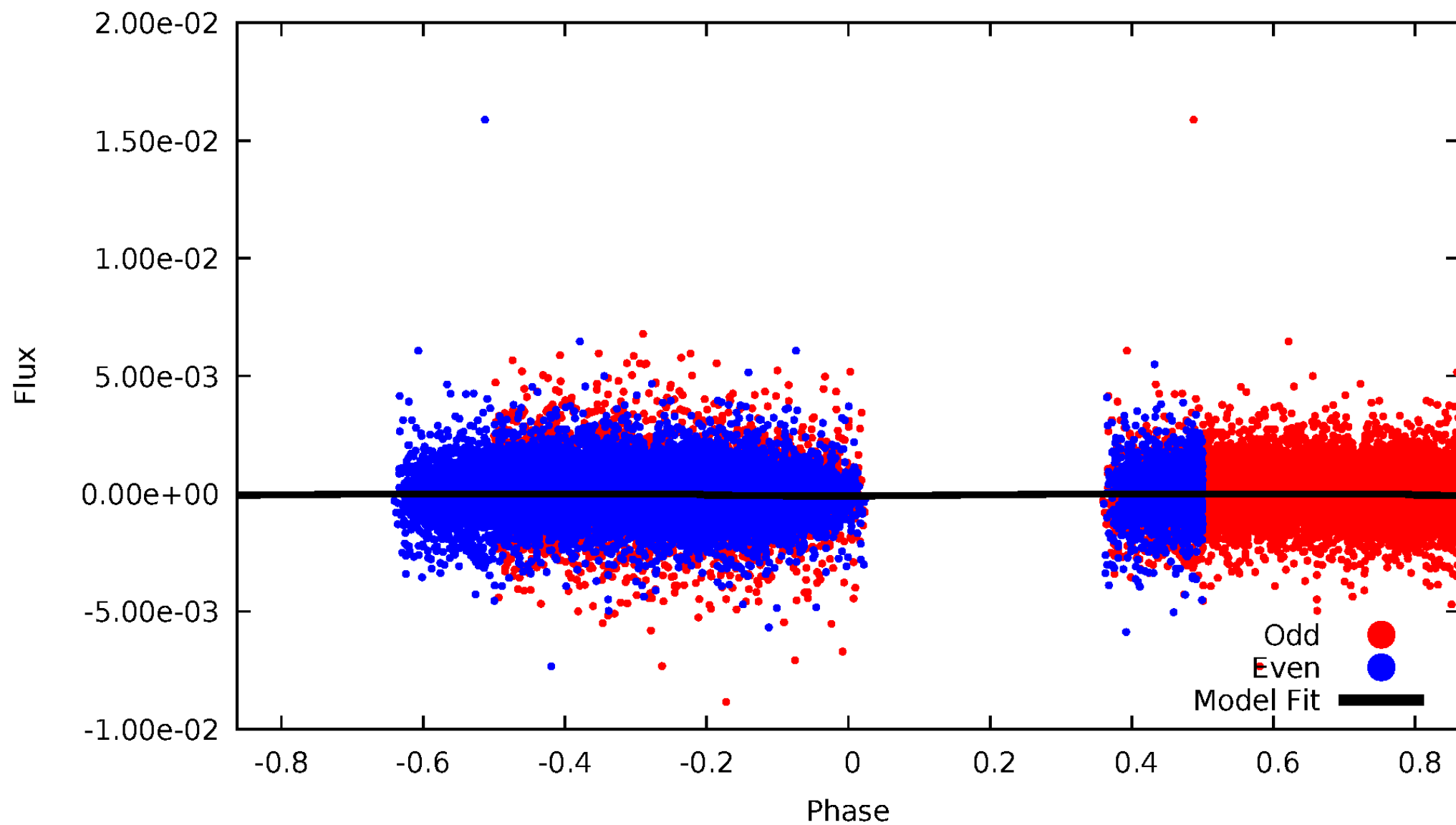
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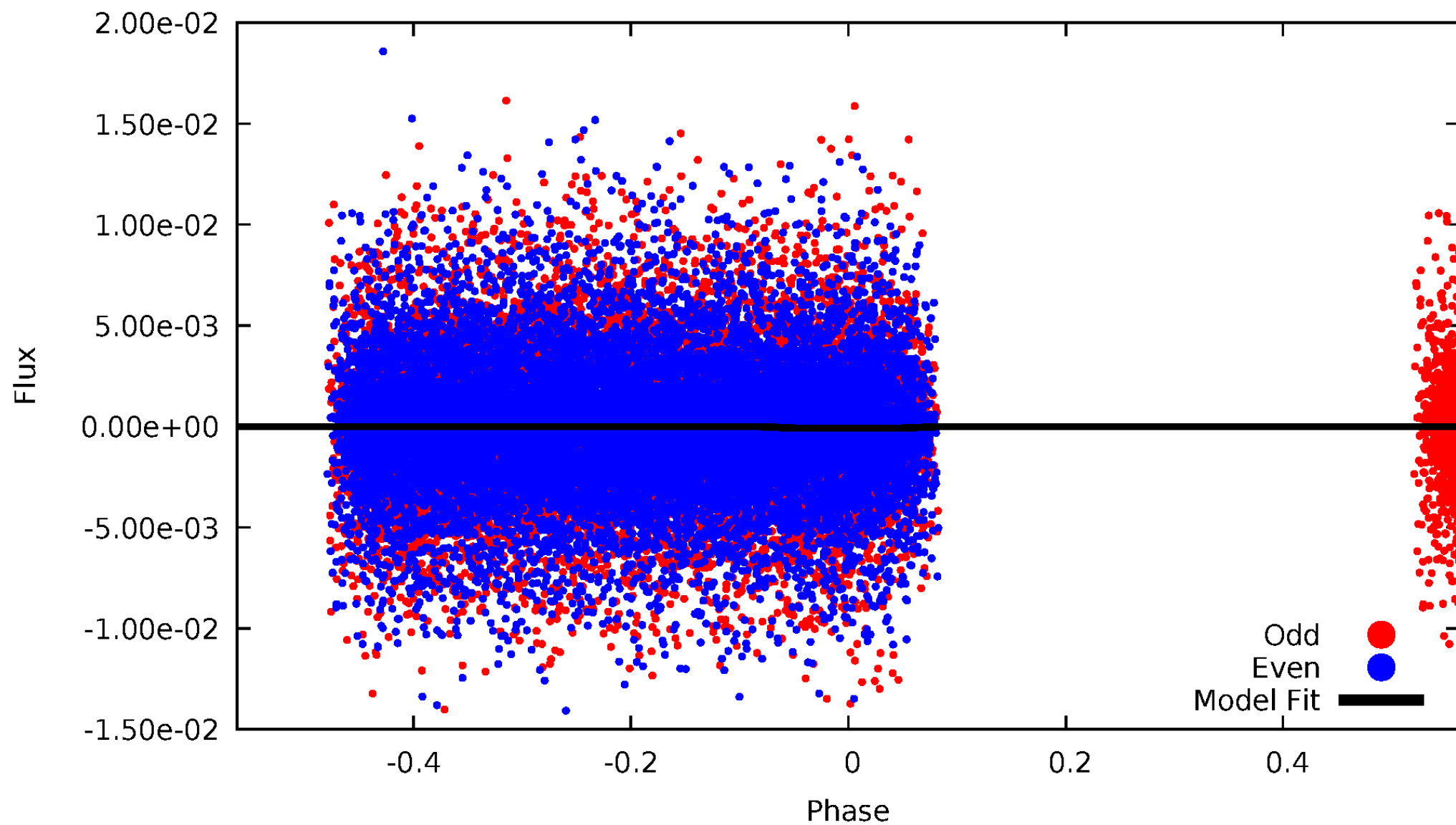
# DV Odd/Even

TCE 009395246-02



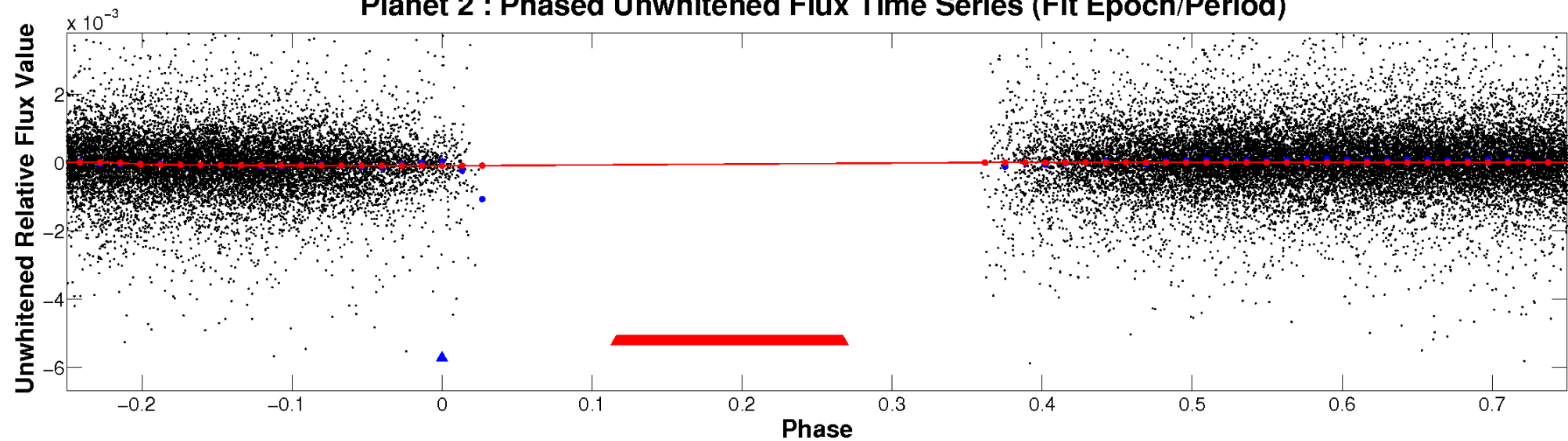
# ALT Odd/Even

TCE 009395246-02

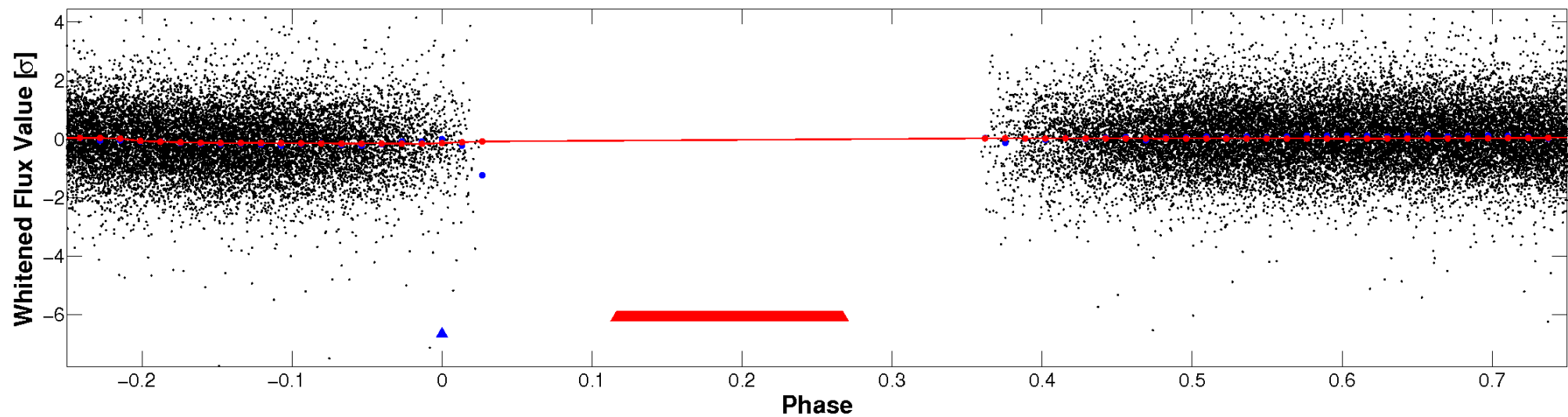


# Non-Whitened Vs. Whitened Light Curve

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

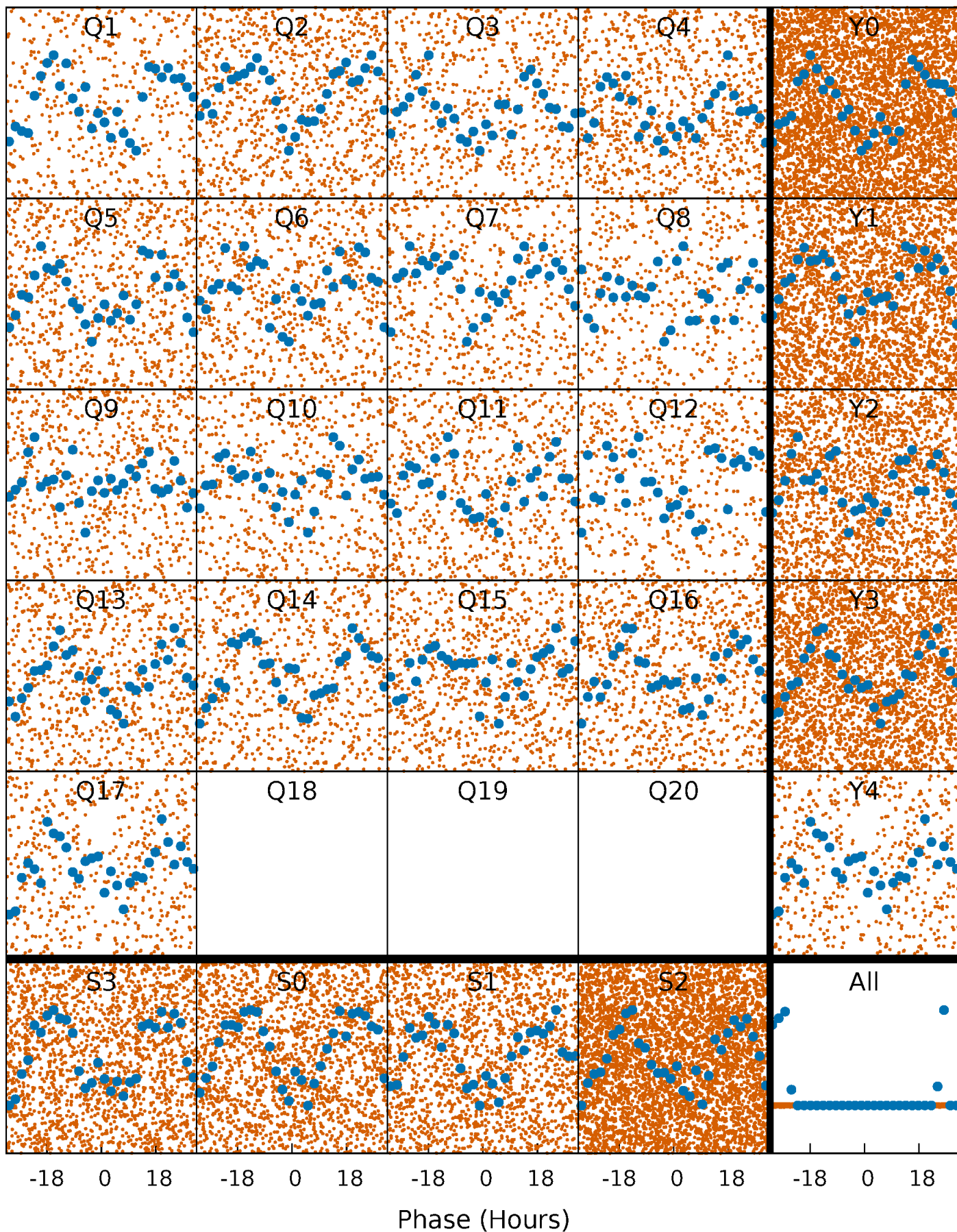


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

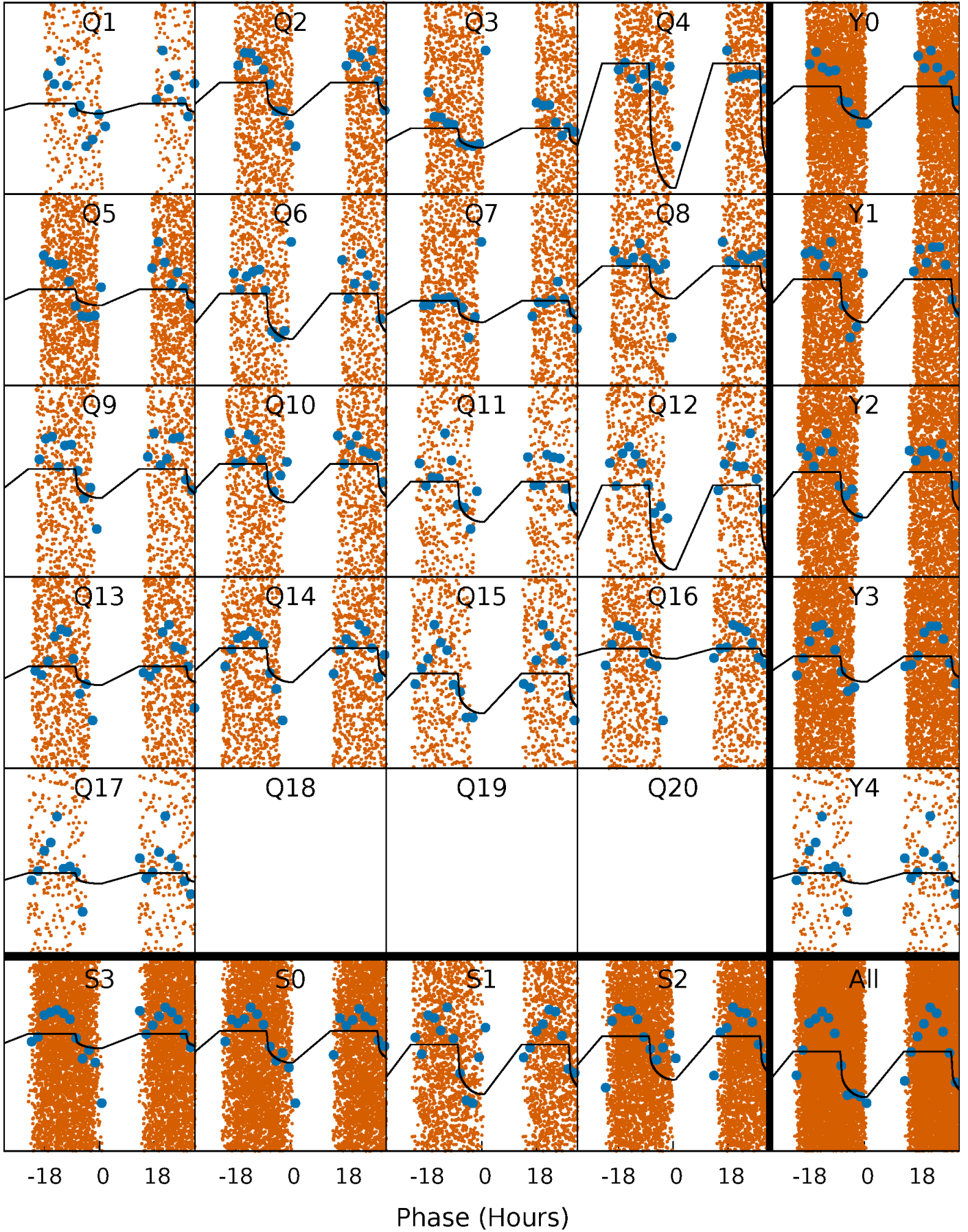
TCE 009395246-02   P= 1.524067 Days    $T_0=132.435701$  (BKJD)





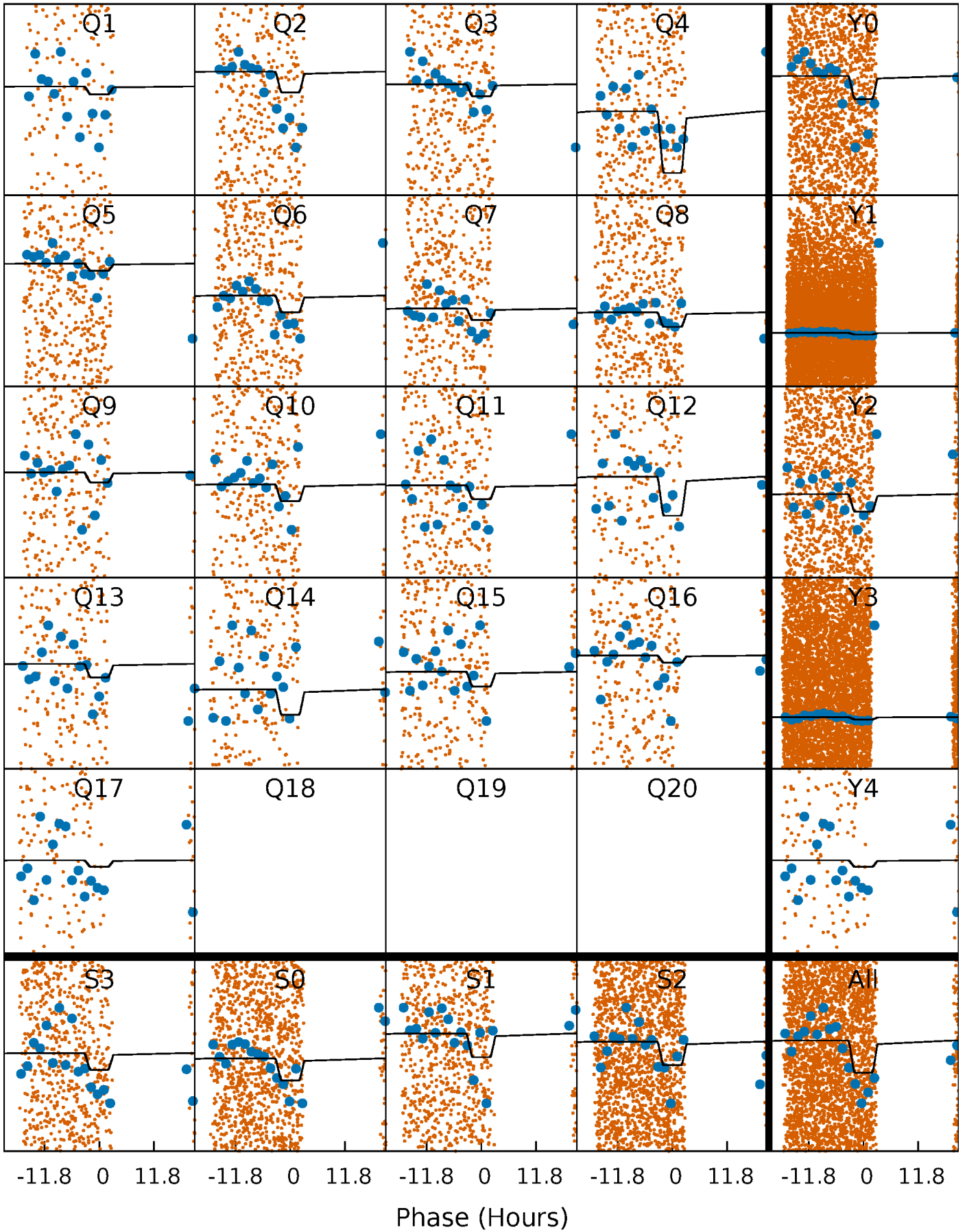
# DV Quarter-Phased Transit Curves

TCE 009395246-02   P= 1.524067 Days    $T_0=132.435701$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009395246-02 P= 1.523903 Days  $T_0=132.346660$  (BKJD)

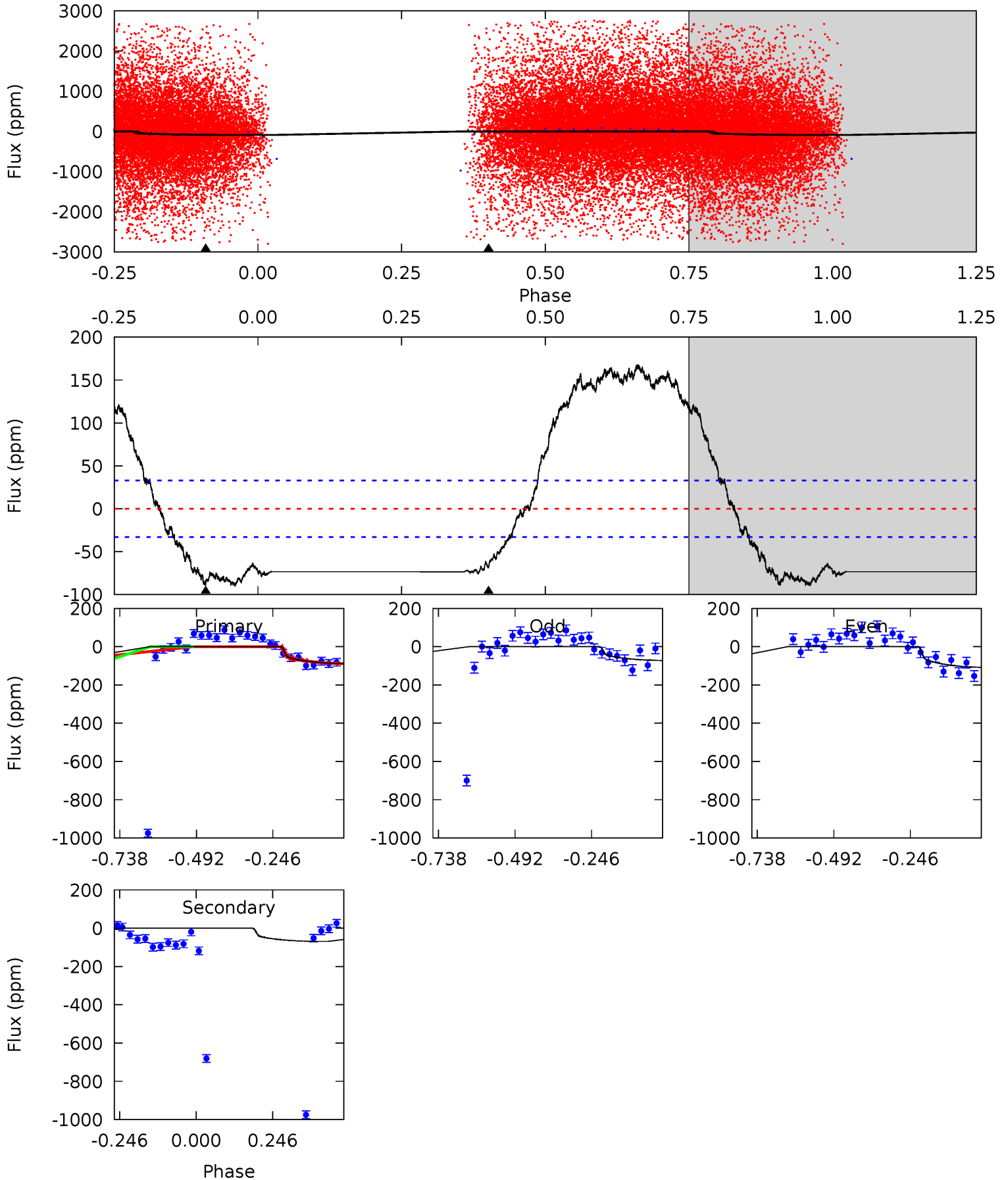




# DV Model-Shift Uniqueness Test

009395246-02, P = 1.524067 Days, E = 130.911634 Days

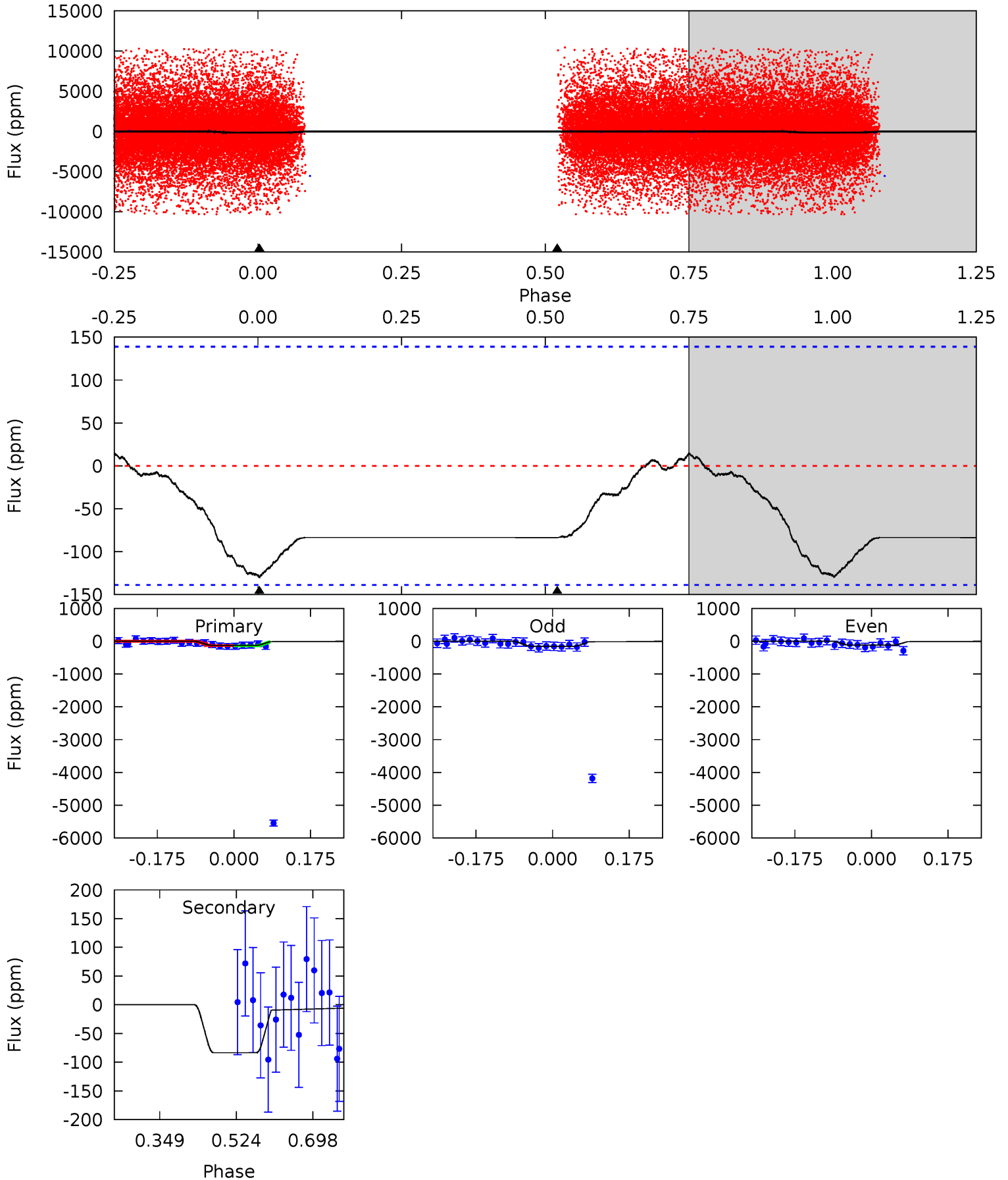
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	9.17	0	0	4.37	1.16	6.31	11.9	11.9	9.17	9.17	2.39	1.46	0.65	1.02



# Alt Model-Shift Uniqueness Test

009395246-02, P = 1.523903 Days, E = 130.822757 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
4.15	2.68	0	0	4.45	1.36	0.24	4.15	4.15	2.68	2.68	0.49	1.48	0.10	0.19



### Stellar Parameters For KIC 009395246

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6911^{+192}_{-288}$	$3.899^{+0.299}_{-0.161}$	$0.060^{+0.200}_{-0.350}$	$2.417^{+0.587}_{-0.881}$	$1.689^{+0.194}_{-0.361}$	$0.169^{+0.349}_{-0.076}$
	+3%/-4%	+8%/-4%	+333%/-583%	+24%/-36%	+11%/-21%	+207%/-45%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009395246-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-69 \pm 8$	$2.30^{+1.14}_{-0.99}$	$3731^{+277}_{-364}$	$6471^{+2554}_{-1081}$	$6.845^{+13.834}_{-3.770}$
Alt.	$-84 \pm 31$	$2.16^{+0.96}_{-0.97}$	$3737^{+293}_{-335}$	$7121^{+3124}_{-1523}$	$9.025^{+20.869}_{-5.263}$

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

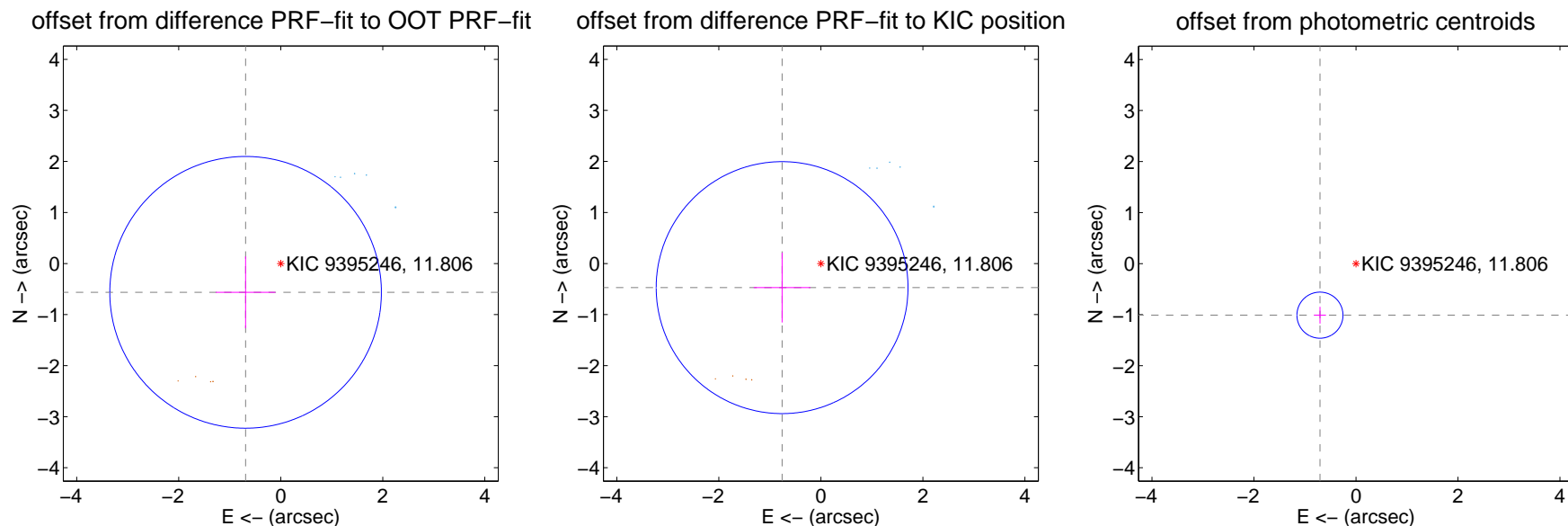
## DV Centroid Data

Supplemental centroid analysis for 009395246-02. **Kepler magnitude: 11.81.** Transit SNR 14.67

There are 5 quarters with good PRF difference image offsets

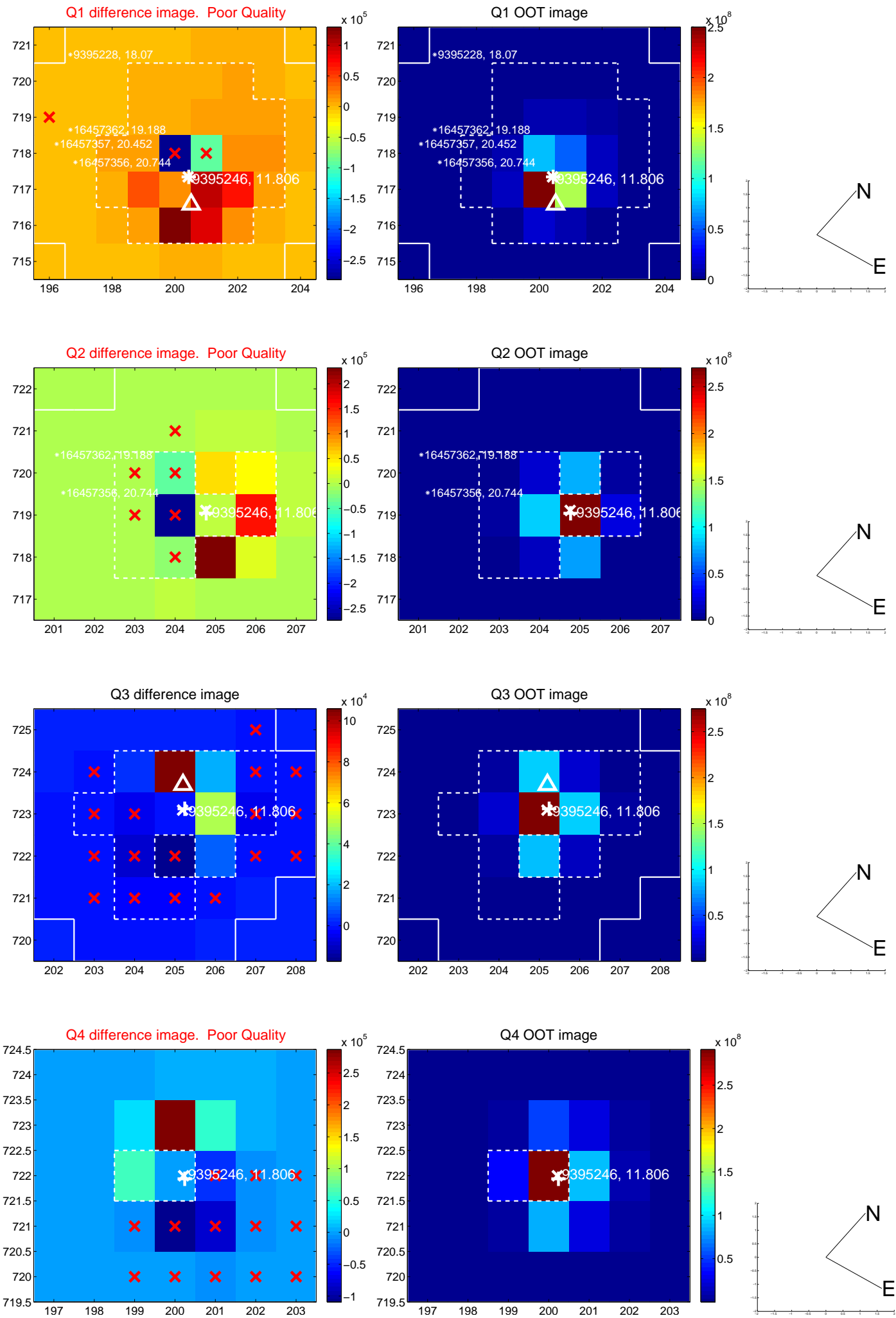
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.890 \pm 0.887$	1.00	$0.689 \pm 0.585$	$-0.564 \pm 0.704$
PRF-fit source offset from KIC position	$0.894 \pm 0.823$	1.09	$0.760 \pm 0.557$	$-0.472 \pm 0.682$
photometric centroid source offset	<b><math>1.23 \pm 0.15</math></b>	<b>8.19</b>	$0.71 \pm 0.12$	$-1.01 \pm 0.16$

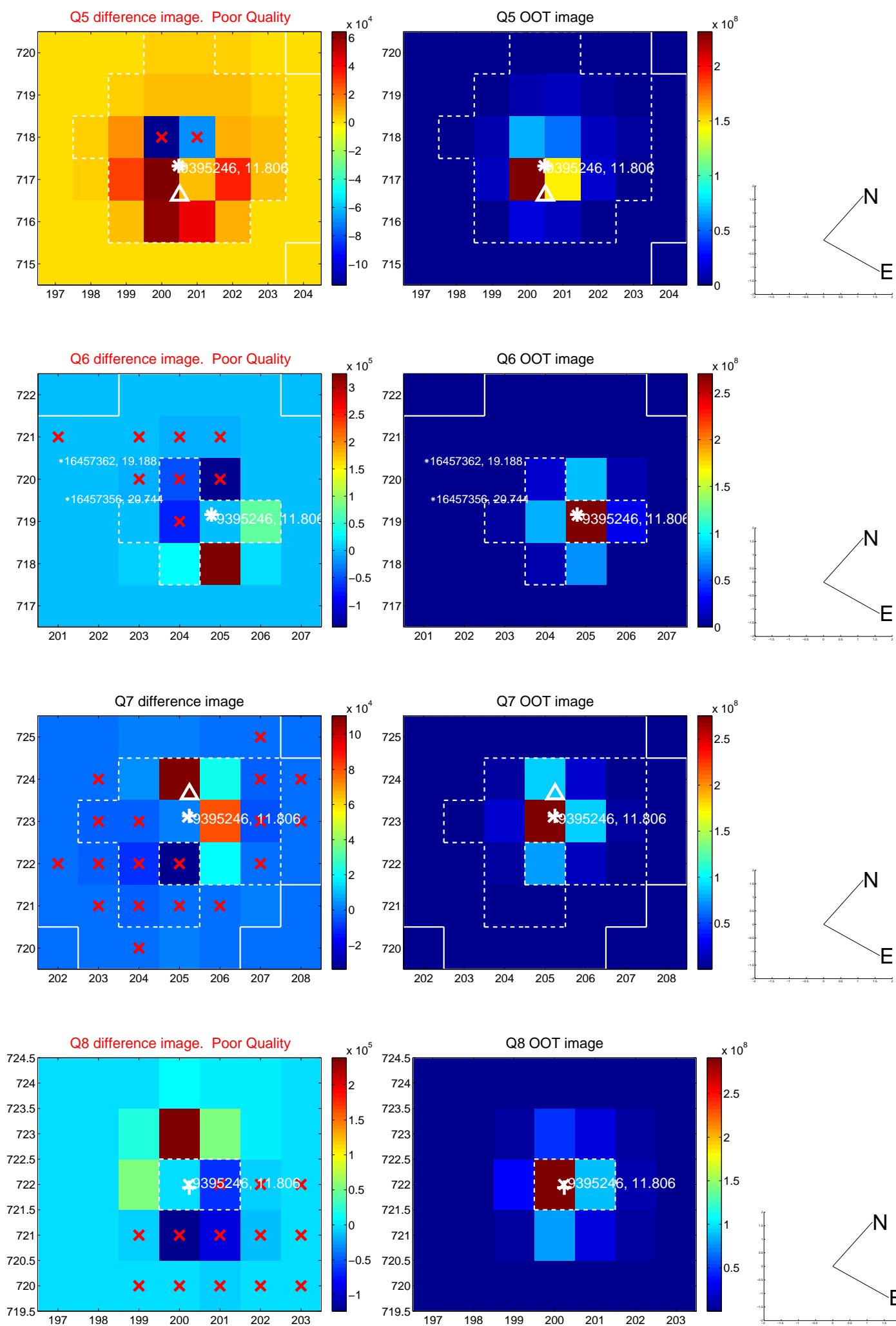


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

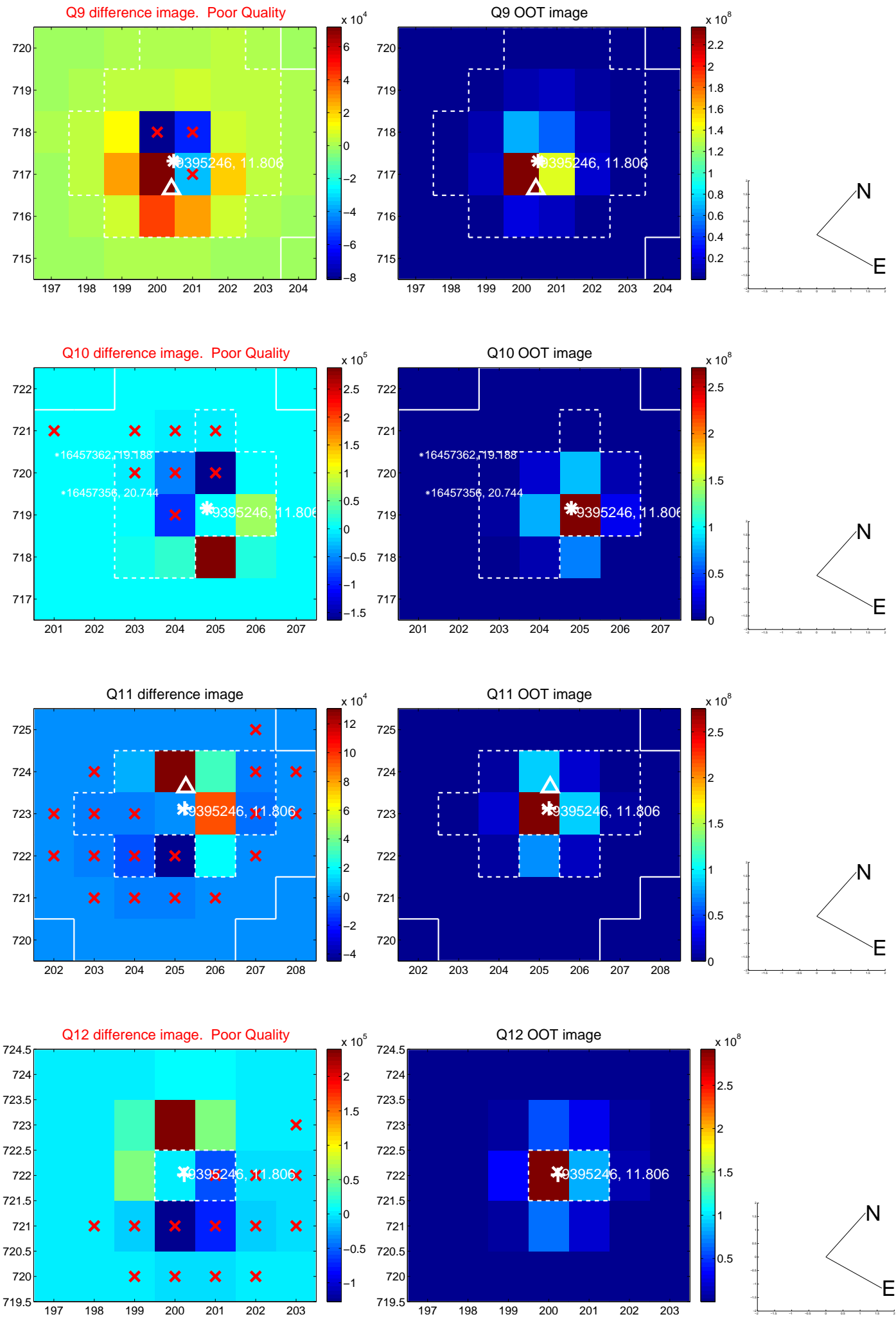


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

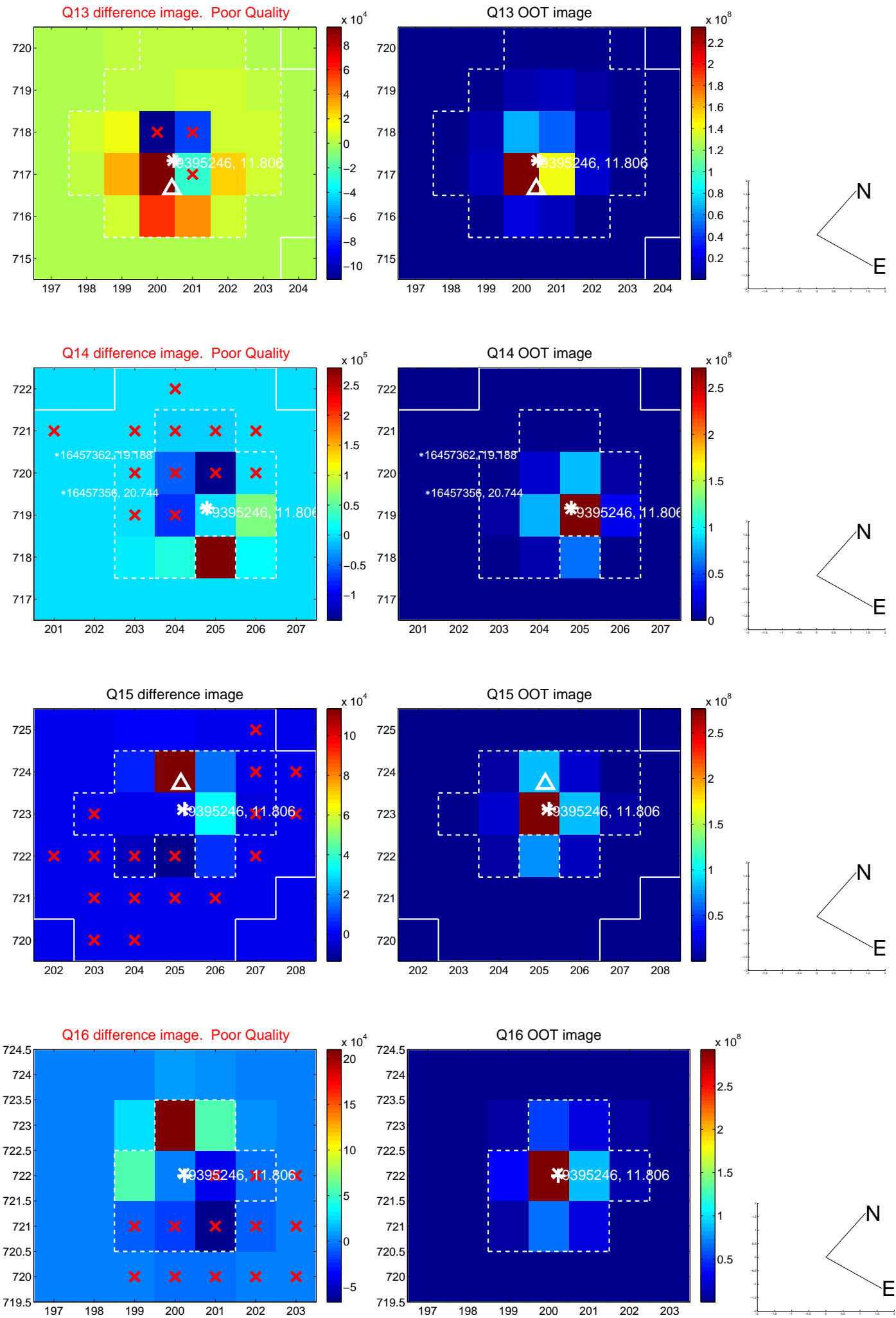




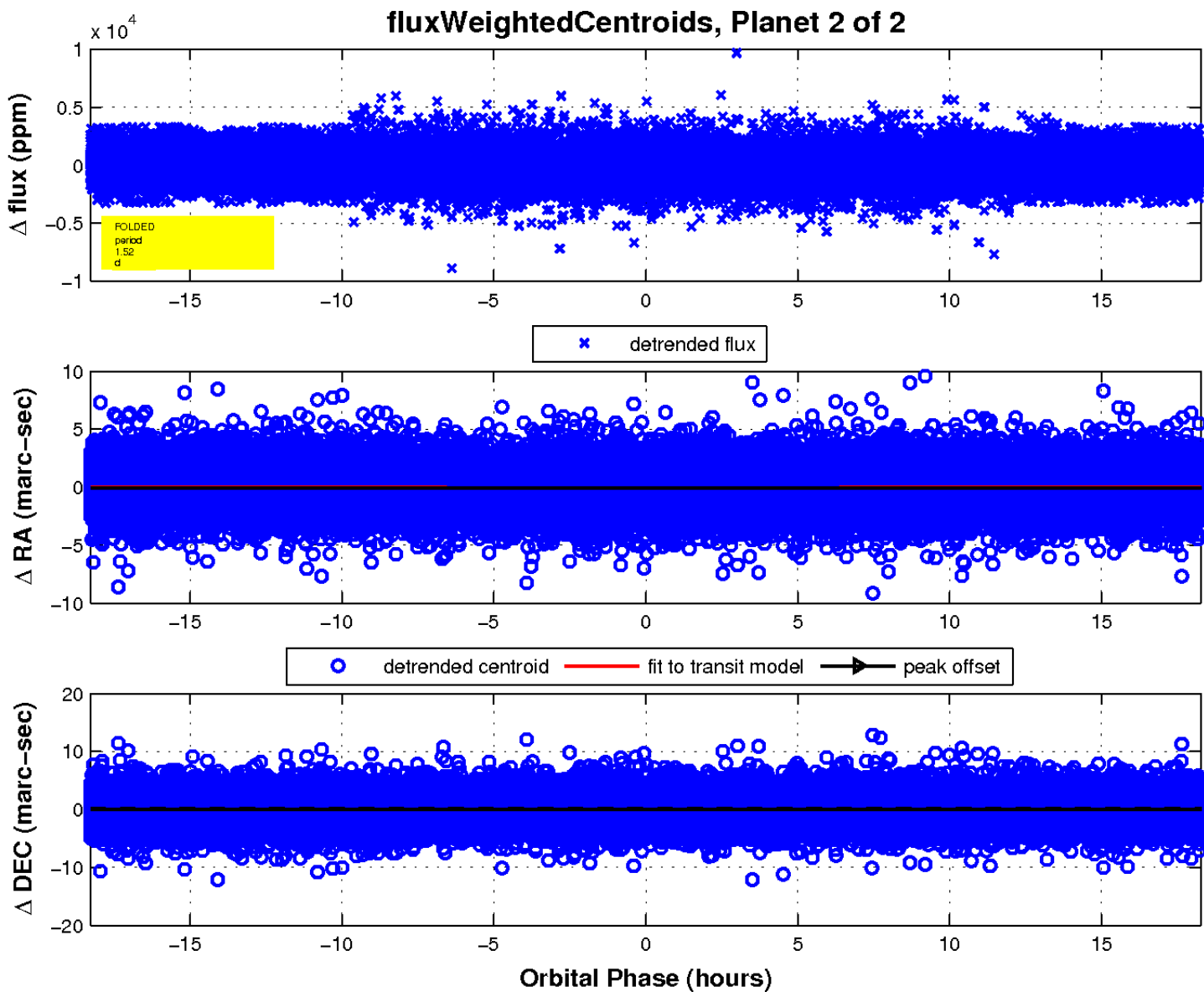
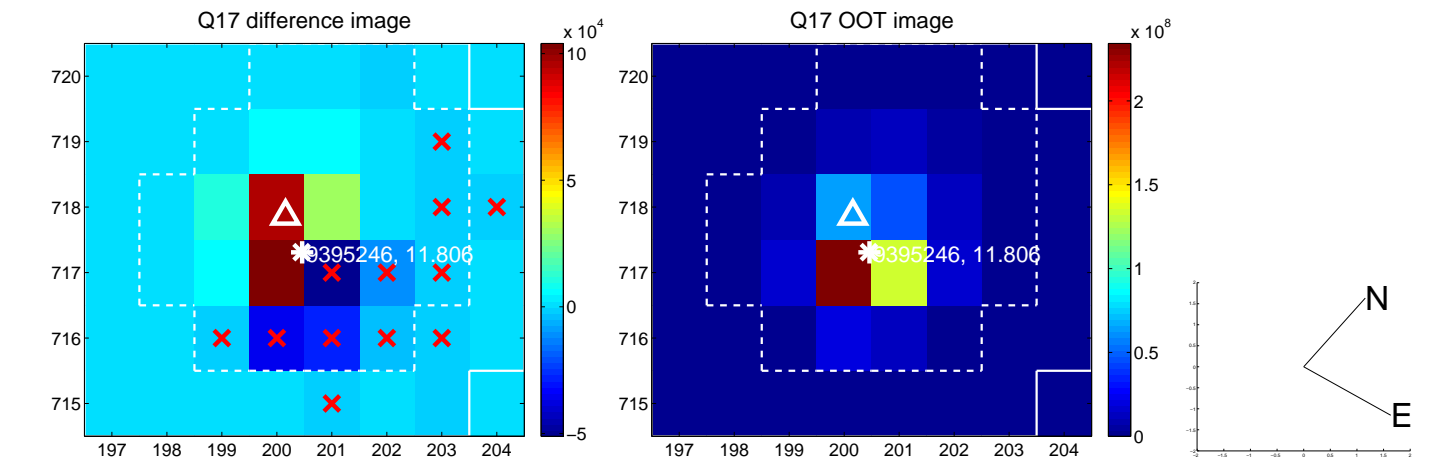
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

