

# KIC 008842494

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008842494-01	OBS	No	0.775620	131.705887	99.1	1.492	10.0	10.4	4.46	7021	4.77	98398.11
008842494-02	OBS	No	0.929230	131.850111	102.1	2.096	8.7	9.1	4.46	7021	5.25	77331.18
008842494-03	OBS	No	0.559243	132.001031	113.9	2.865	7.8	11.1	4.46	7021	5.54	0.00
008842494-04	OBS	No	49.683295	163.758395	766.7	2.856	7.7	7.4	4.46	7021	13.96	383.92

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008842494-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
008842494-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

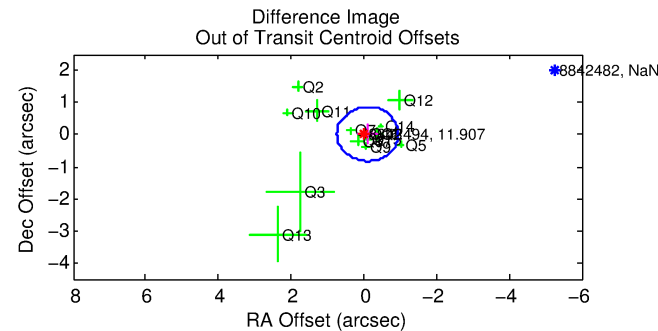
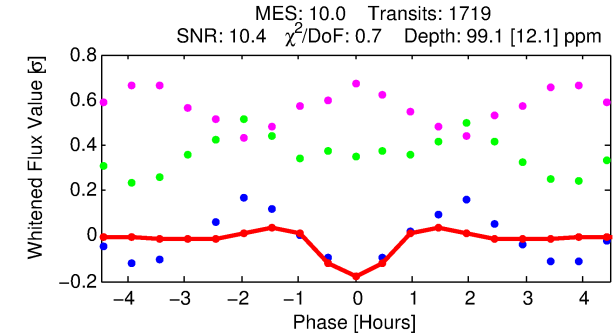
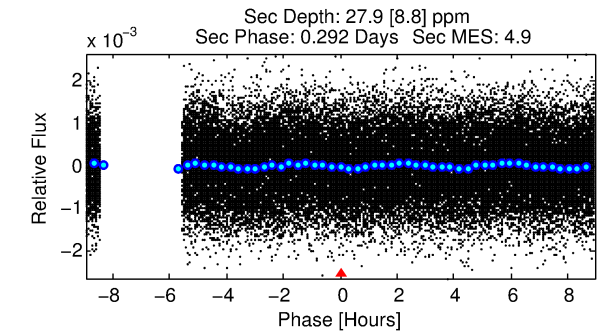
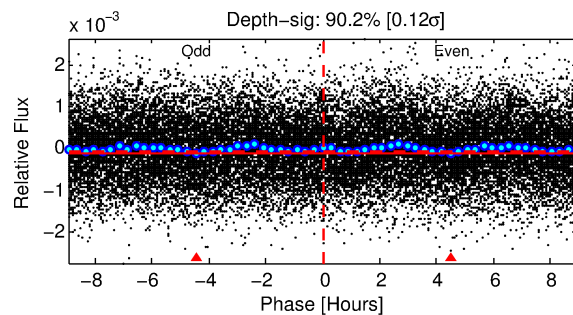
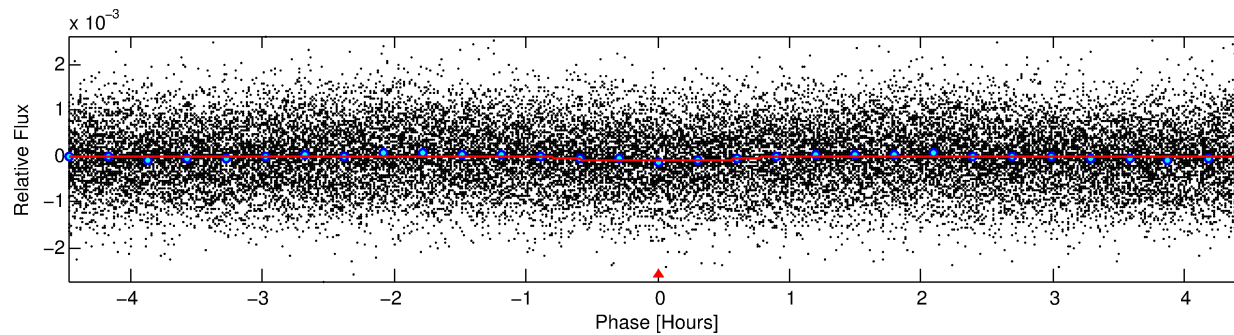
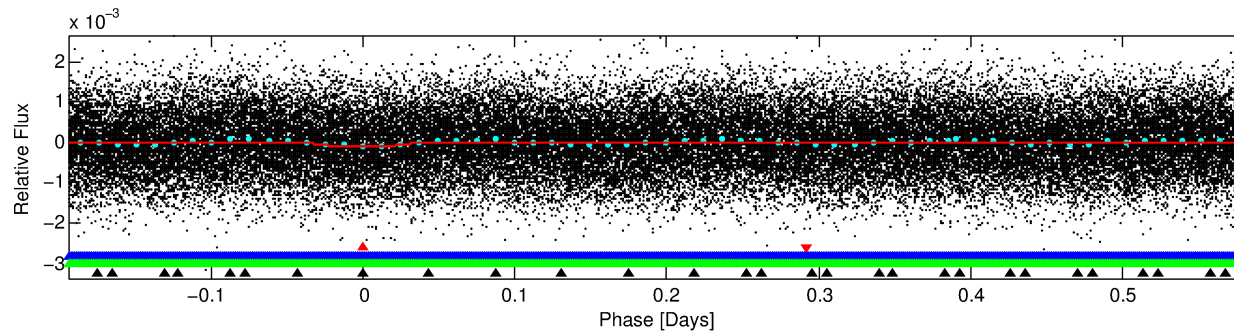
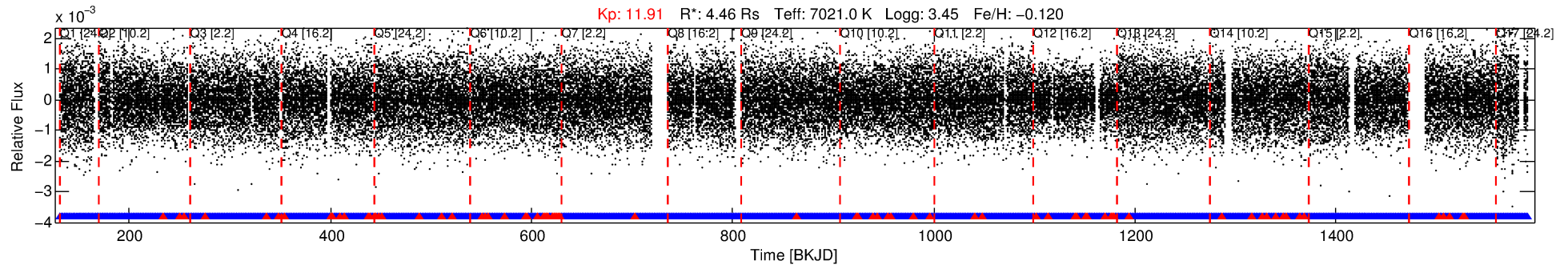
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008842494-01

No Significant Match Found

# DV One-Page Summary

KIC: 8842494 Candidate: 1 of 4 Period: 0.776 d



## DV Fit Results:

Period = 0.77562 [0.00001] d  
Epoch = 131.7059 [0.0019] BKJD  
 $R_p/R^* = 0.0098$  [0.0034]  
 $a/R^* = 3.00$  [5.40]  
 $b = 0.70$  [1.48]  
 $\text{Seff} = 98398.11$  [106455.76]  
 $T_{\text{eq}} = 4516$  [1222] K  
 $R_p = 4.77$  [3.26]  $R_e$   
 $a = 0.0210$  [0.0133] AU  
 $A_g = 0.30$  [0.39] [-1.80 $\sigma$ ]  
 $T_{\text{eff}} = 5155$  [1009] K [0.40 $\sigma$ ]

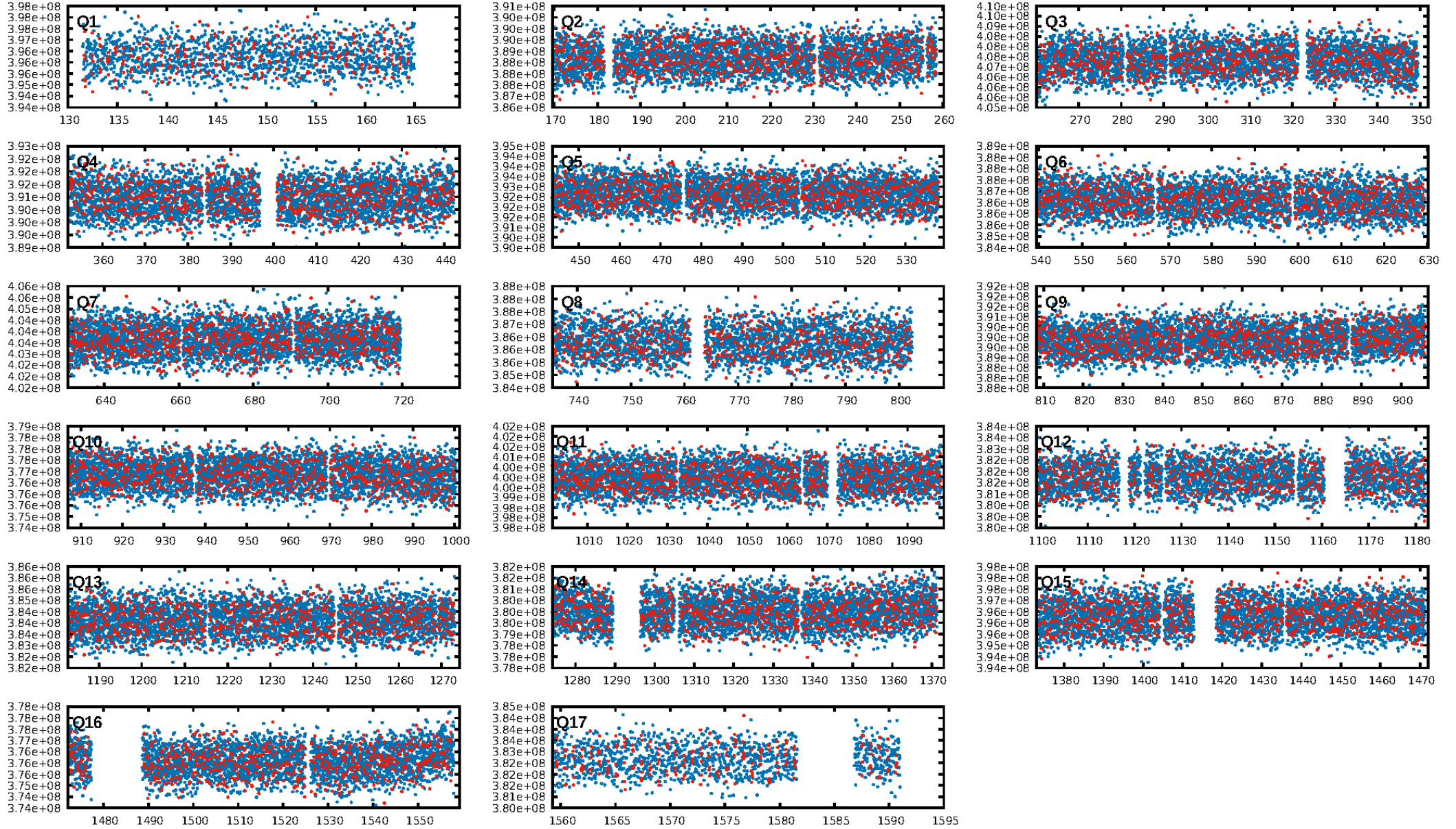
## DV Diagnostic Results:

ShortPeriod-sig: 89.2% [1.61 $\sigma$ ]  
LongPeriod-sig: 84.8% [1.43 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.48e-09**  
RollingBand-fgt: 0.95 [1565/1642]  
GhostDiagnostic-chr: 1.283  
Centroid-sig: 34.7%  
Centroid-so: 0.655 arcsec [2.94 $\sigma$ ]  
OotOffset-rm: 0.102 arcsec [0.36 $\sigma$ ]  
KicOffset-rm: 0.226 arcsec [0.91 $\sigma$ ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.53 [8/15]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:12:43 Z

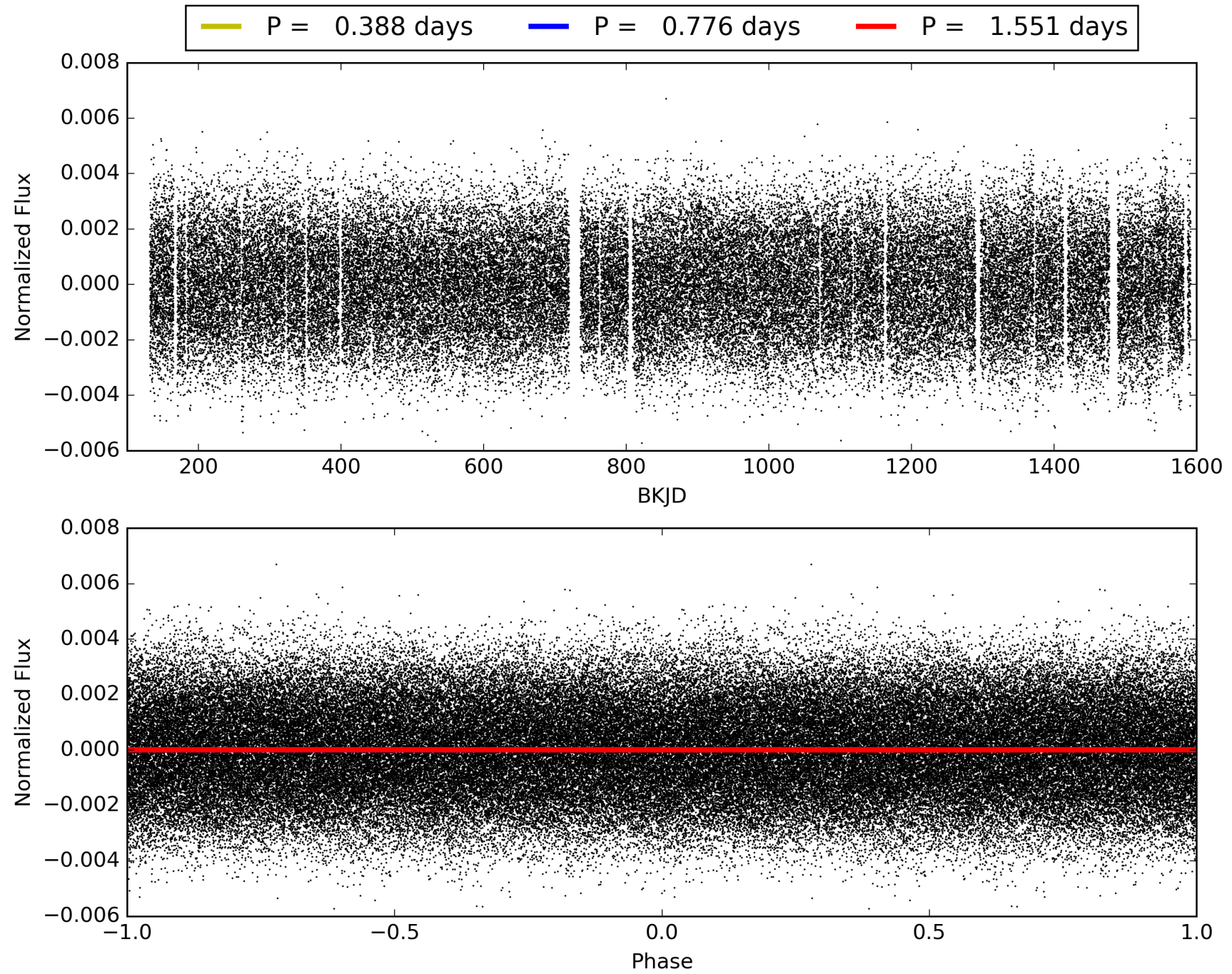
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008842494-01, PDC Light Curves





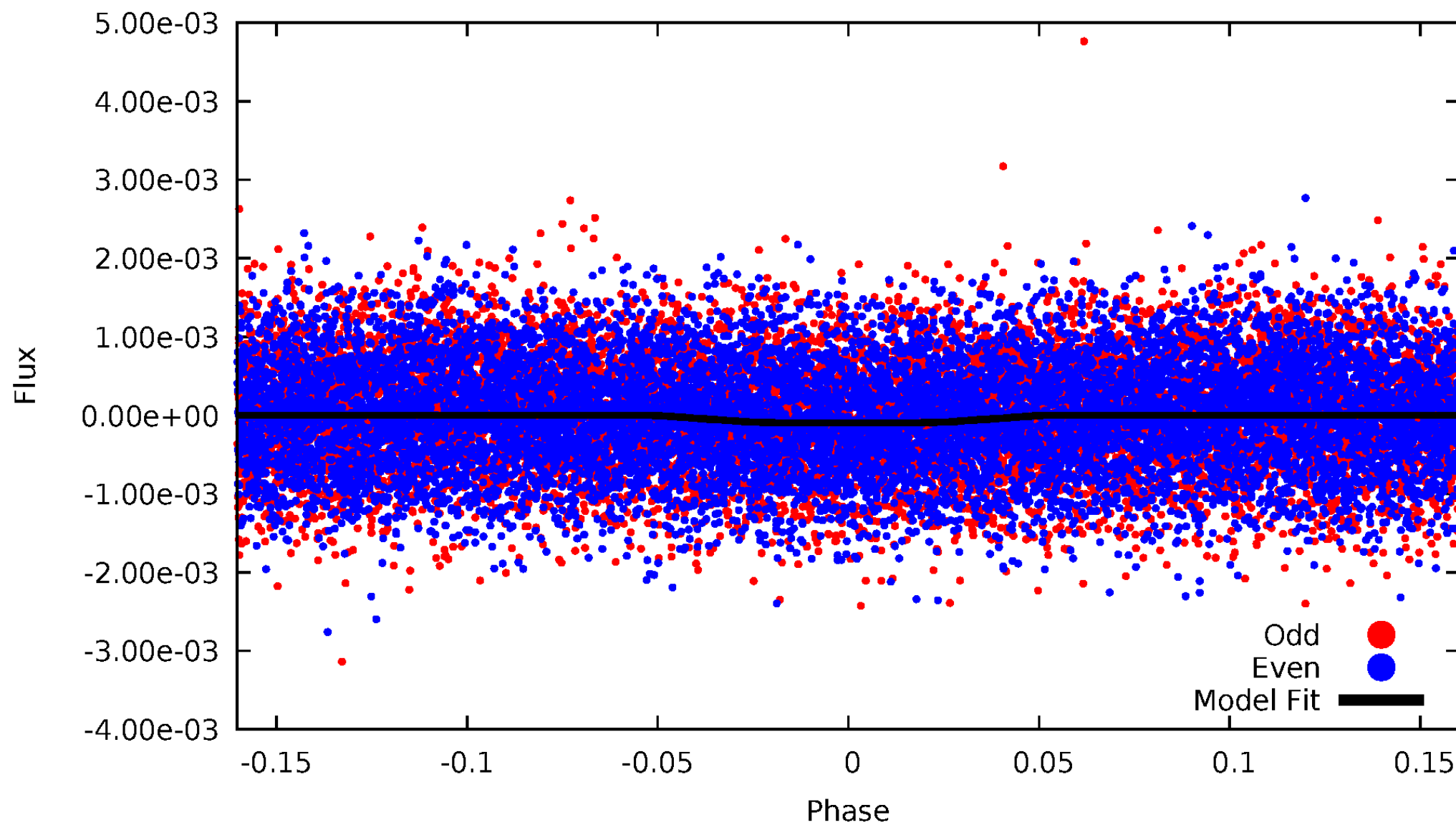
TCE 008842494-01





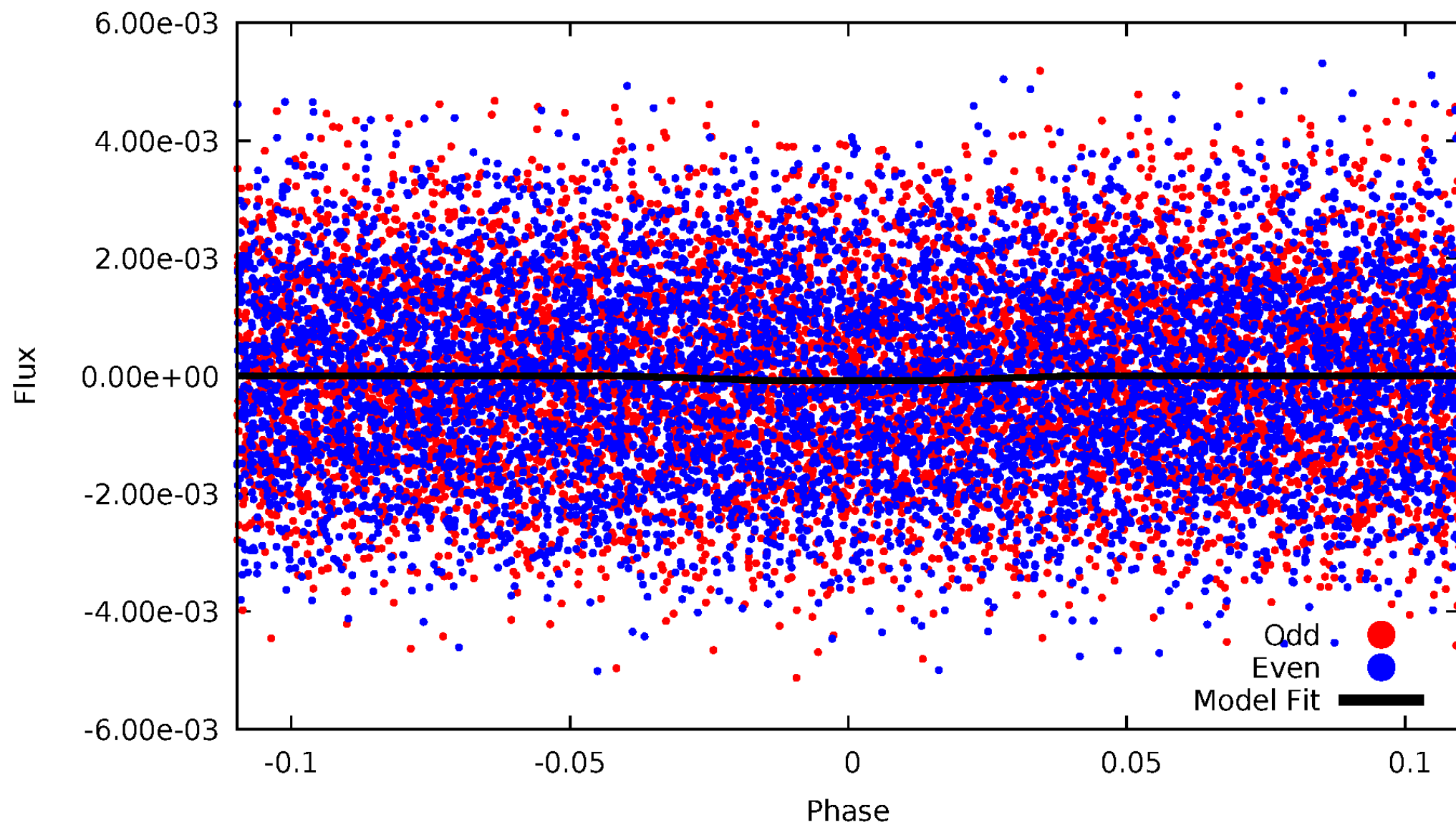
# DV Odd/Even

TCE 008842494-01



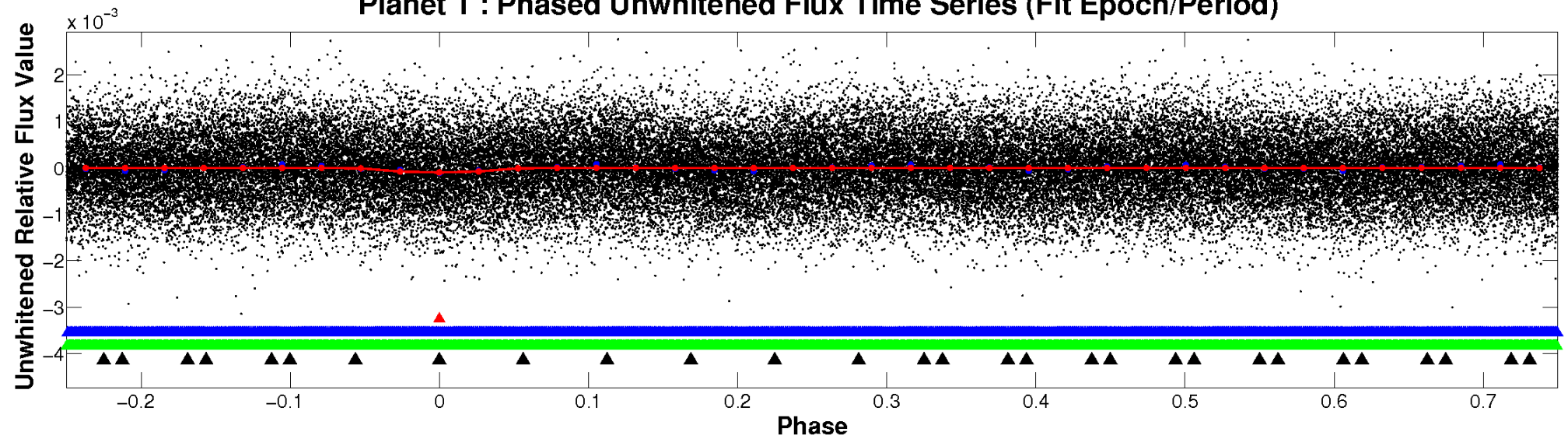
# ALT Odd/Even

TCE 008842494-01

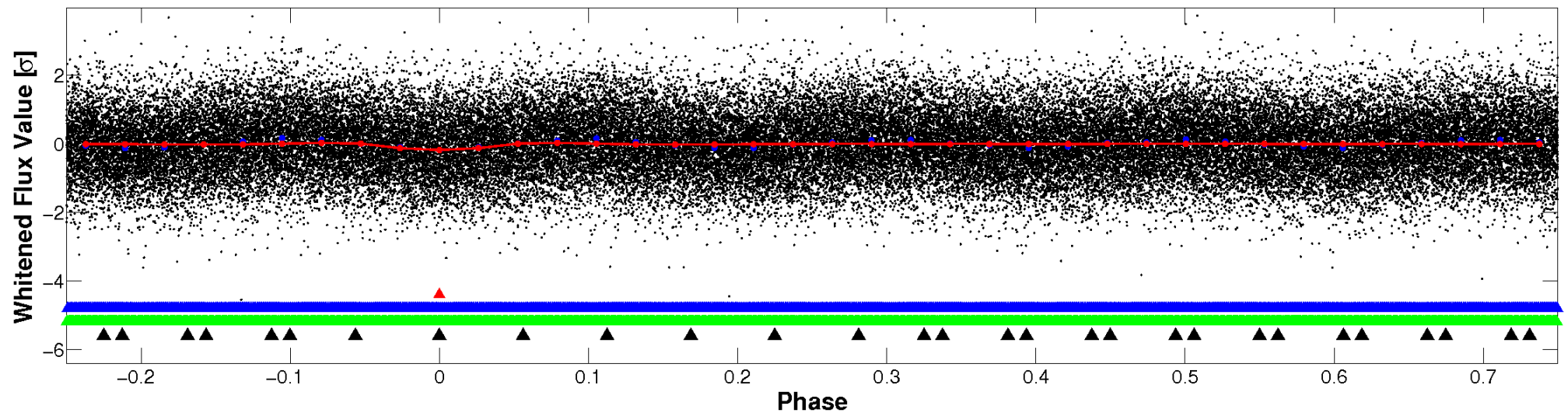


# Non-Whitened Vs. Whitened Light Curve

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



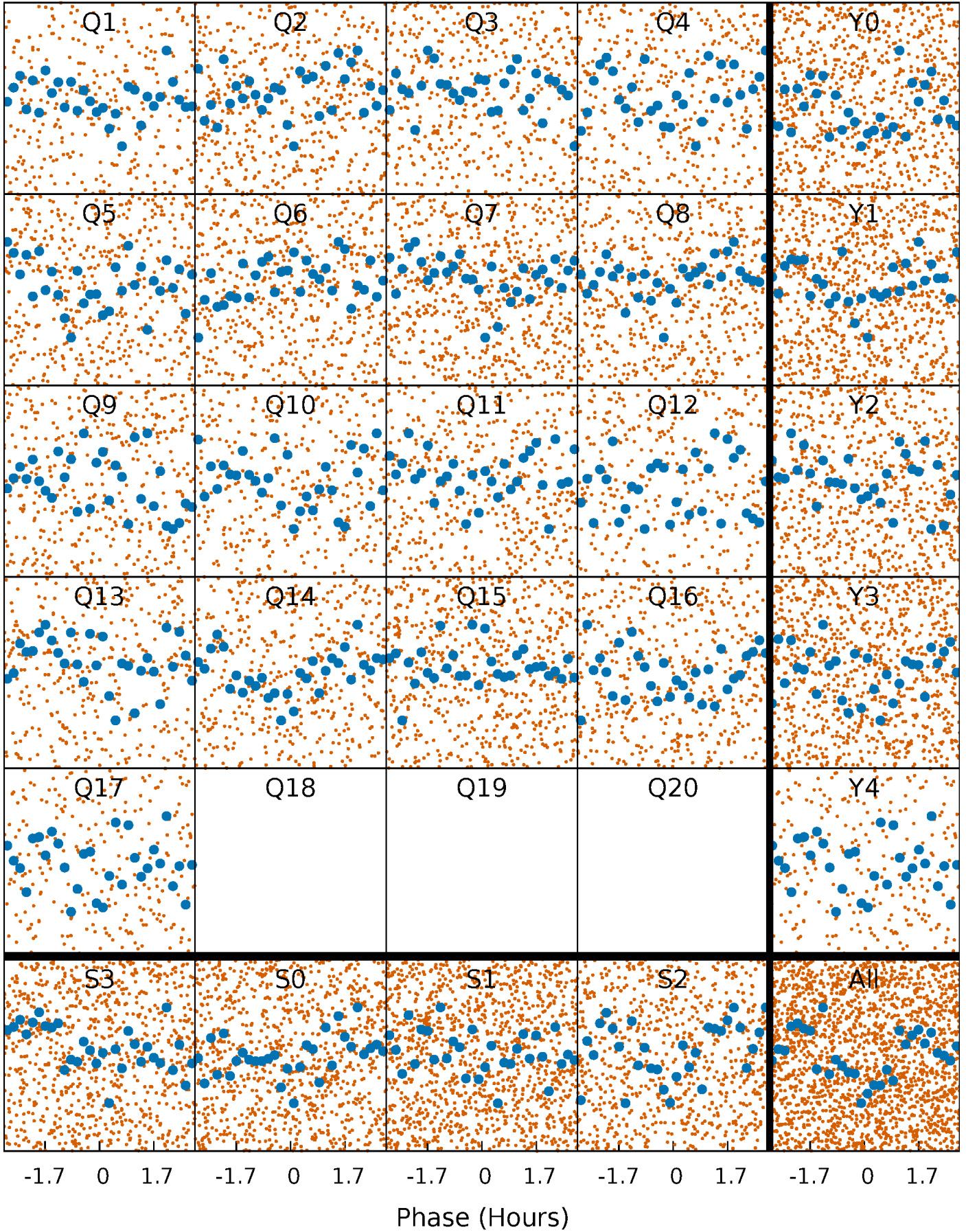
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





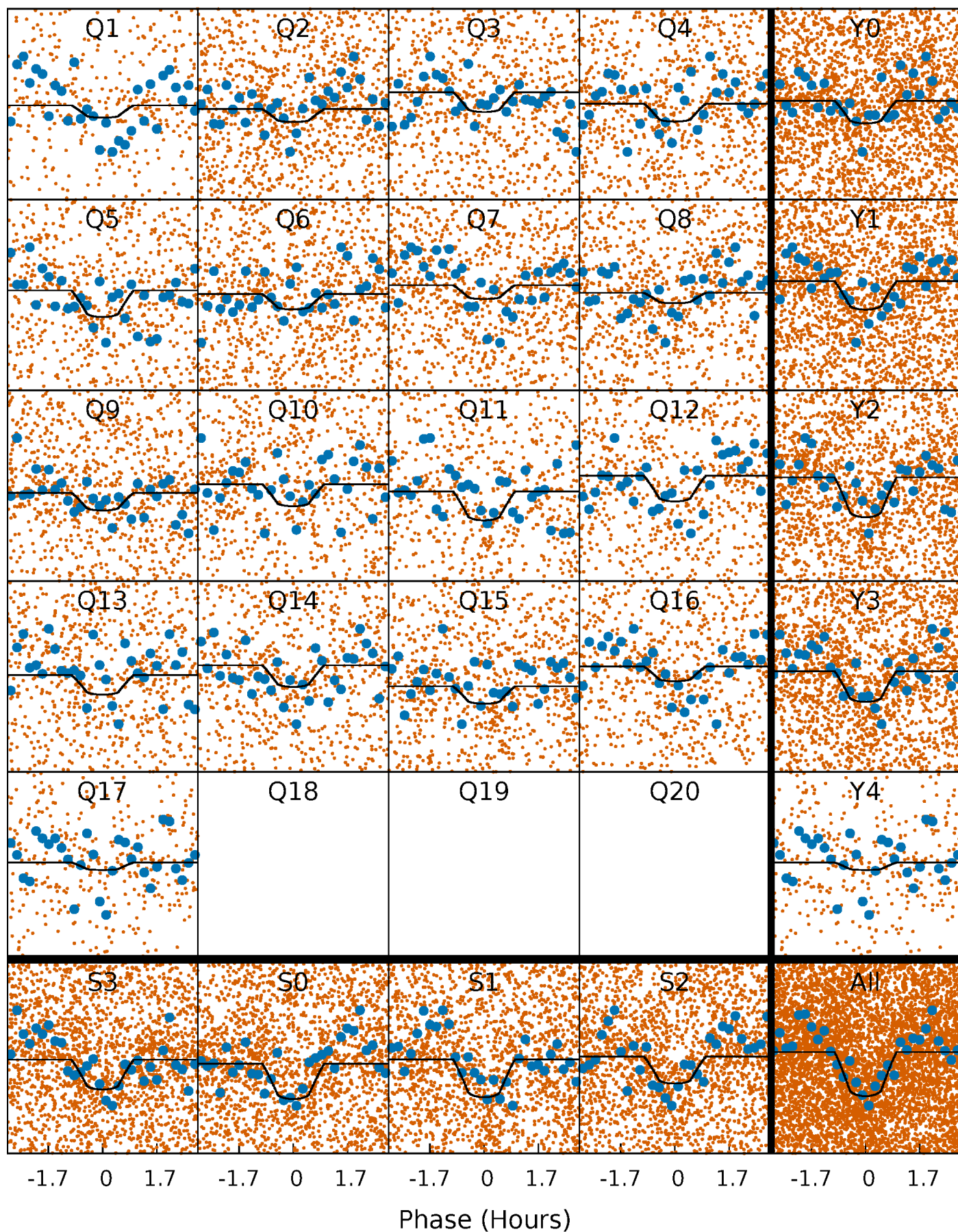
# PDC Quarter-Phased Transit Curves

TCE 008842494-01 P= 0.775620 Days  $T_0=131.705887$  (BKJD)



# DV Quarter-Phased Transit Curves

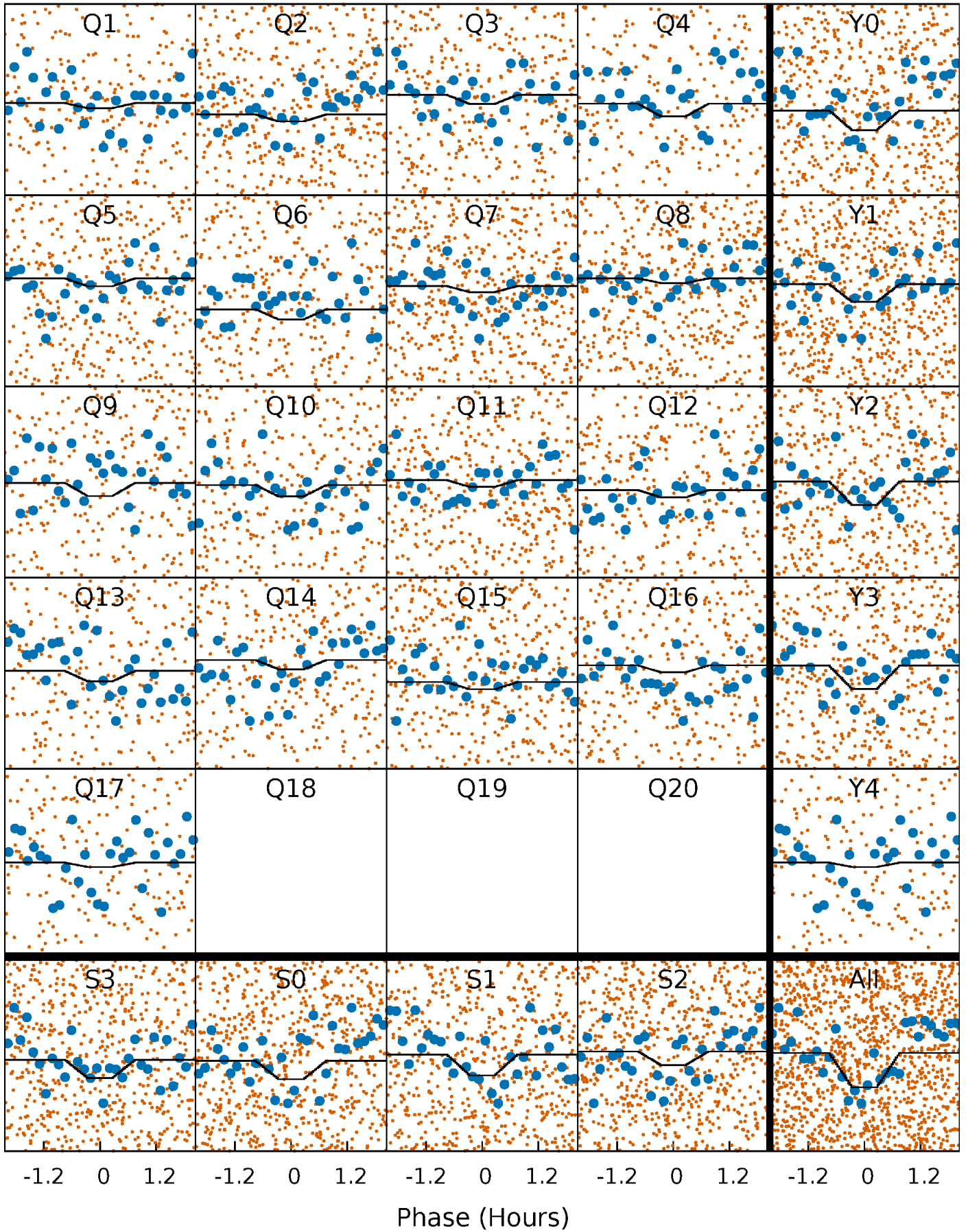
TCE 008842494-01   P= 0.775620 Days    $T_0=131.705887$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 008842494-01   P= 0.775618 Days    $T_0=131.713986$  (BKJD)

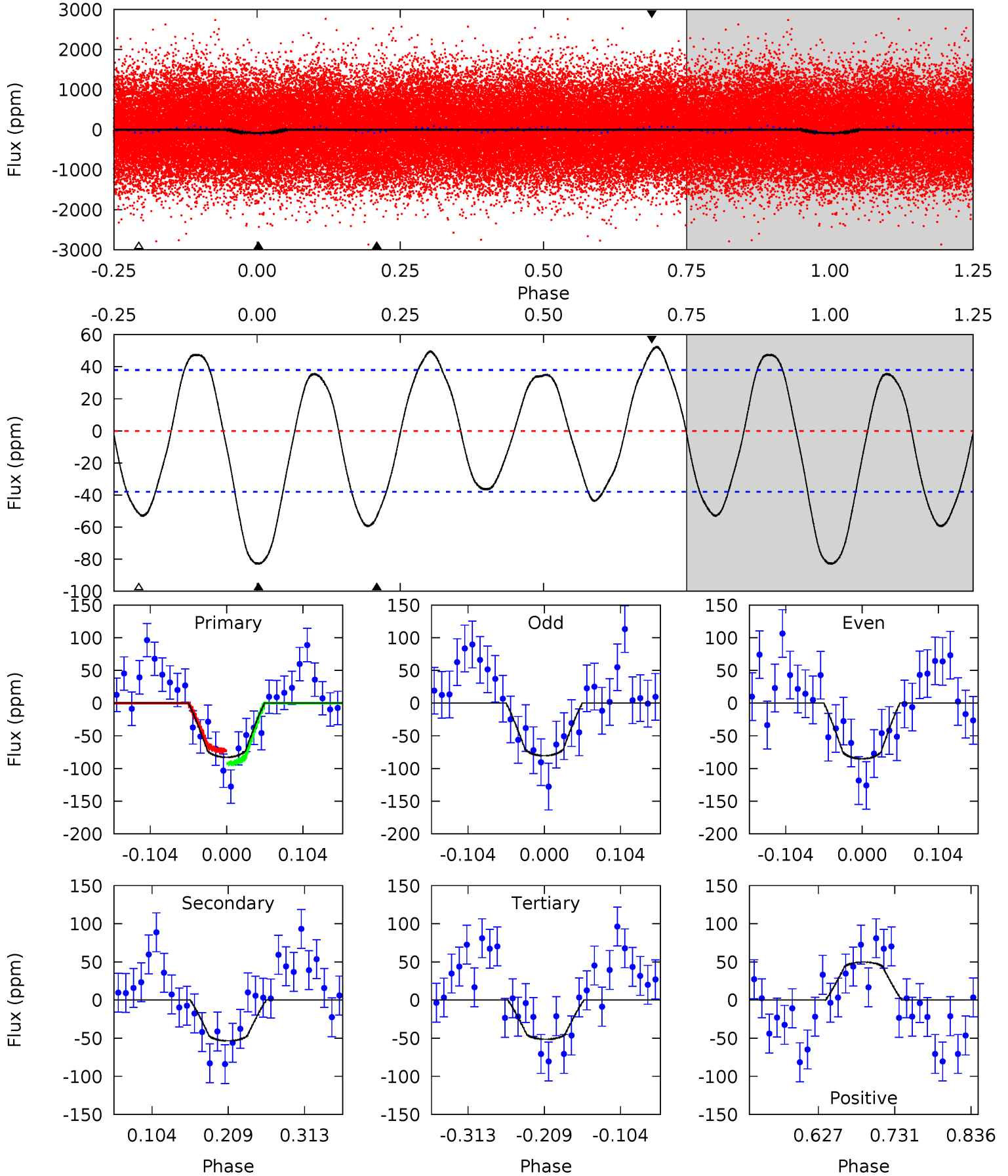




# DV Model-Shift Uniqueness Test

008842494-01, P = 0.775620 Days, E = 130.930267 Days

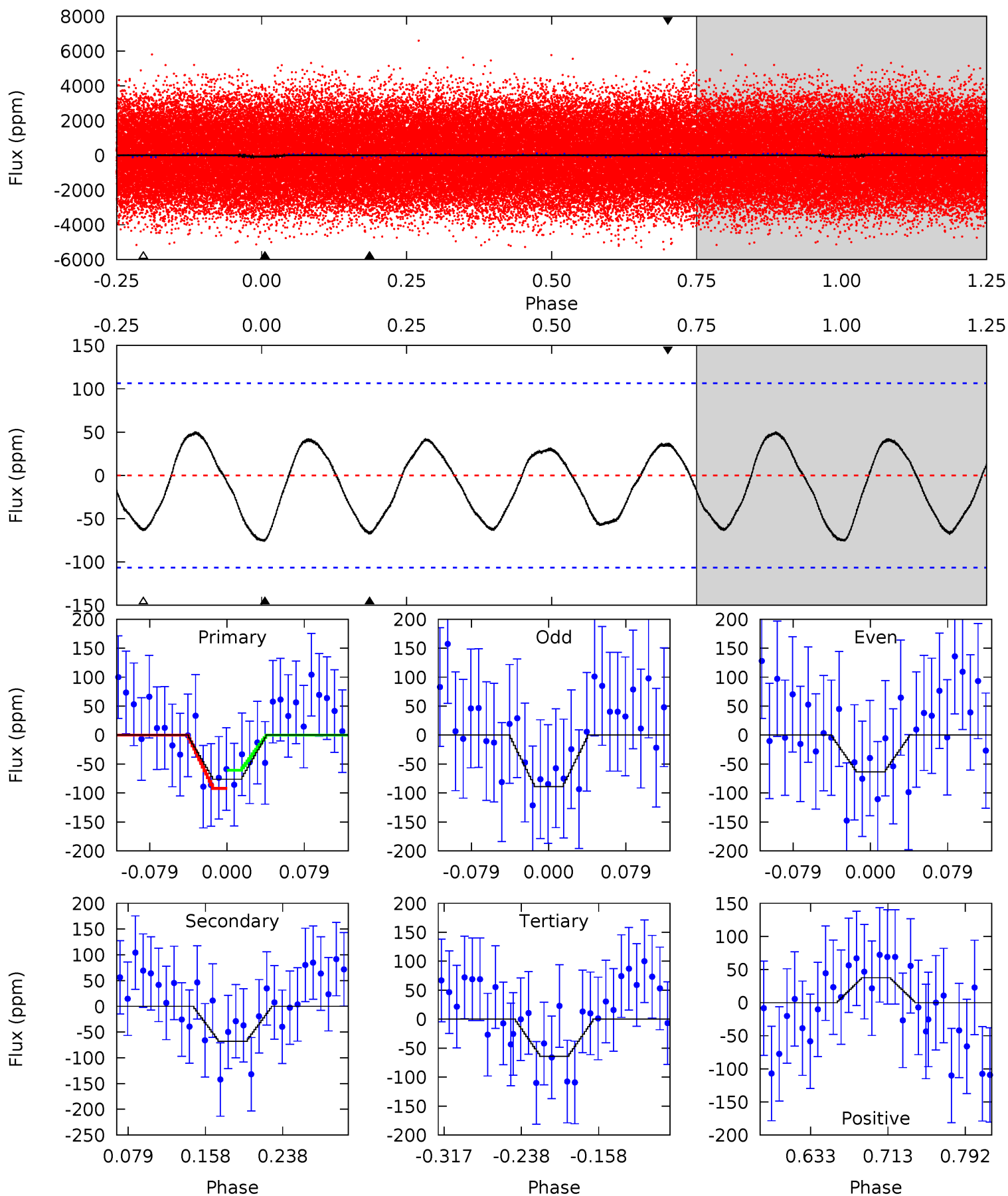
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.93	6.40	6.17	5.97	4.56	1.62	3.83	3.76	3.96	0.23	0.43	0.29	0.99	0.39	1.18



# Alt Model-Shift Uniqueness Test

008842494-01, P = 0.775618 Days, E = 130.938368 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
3.30	2.93	2.77	1.63	4.61	1.76	1.52	0.54	1.68	0.17	1.31	0.55	1.17	0.40	0.68



### Stellar Parameters For KIC 008842494

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7021^{+194}_{-292}$	$3.450^{+0.648}_{-0.072}$	$-0.120^{+0.250}_{-0.300}$	$4.457^{+0.308}_{-2.618}$	$2.041^{+0.073}_{-0.659}$	$0.032^{+0.337}_{-0.008}$
	+3%/-4%	+19%/-2%	+208%/-250%	+7%/-59%	+4%/-32%	+1039%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008842494-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-53 \pm 8$	$4.18^{+1.73}_{-1.77}$	$6100^{+407}_{-961}$	$5243^{+1874}_{-1415}$	$0.717^{+1.485}_{-0.350}$
Alt.	$-68 \pm 23$	$3.58^{+1.73}_{-1.67}$	$6085^{+430}_{-825}$	$6352^{+2821}_{-1698}$	$1.258^{+2.937}_{-0.732}$

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



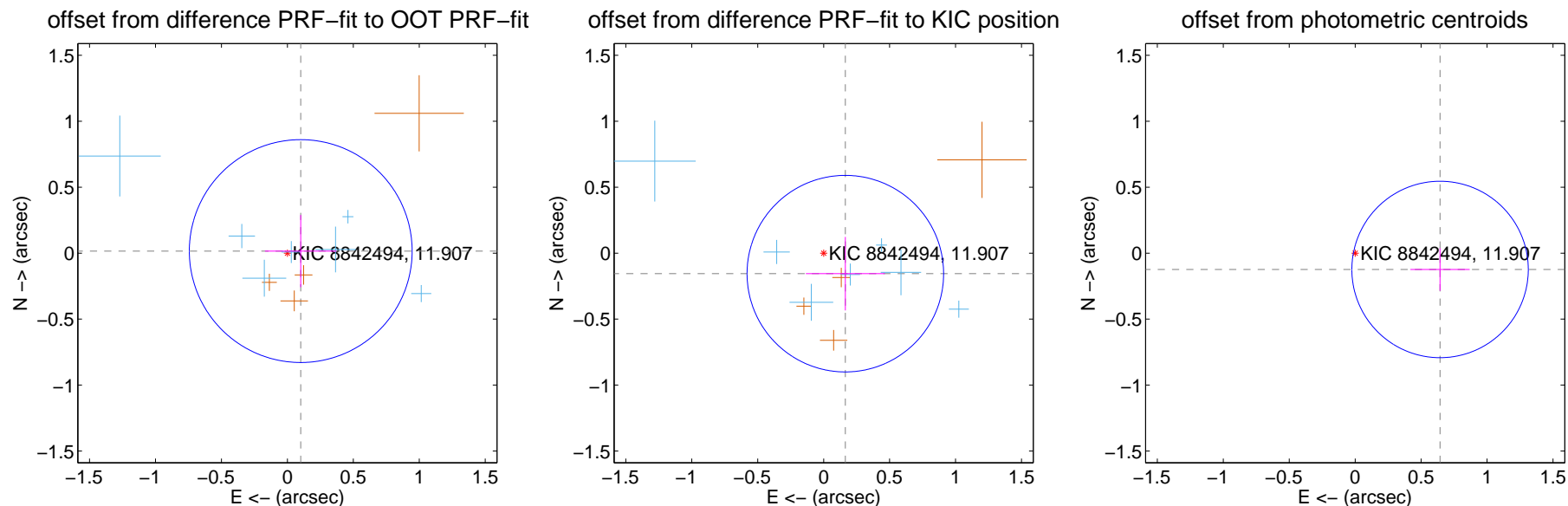
## DV Centroid Data

Supplemental centroid analysis for 008842494-01. **Kepler magnitude: 11.91.** Transit SNR 10.38

There are 8 quarters with good PRF difference image offsets

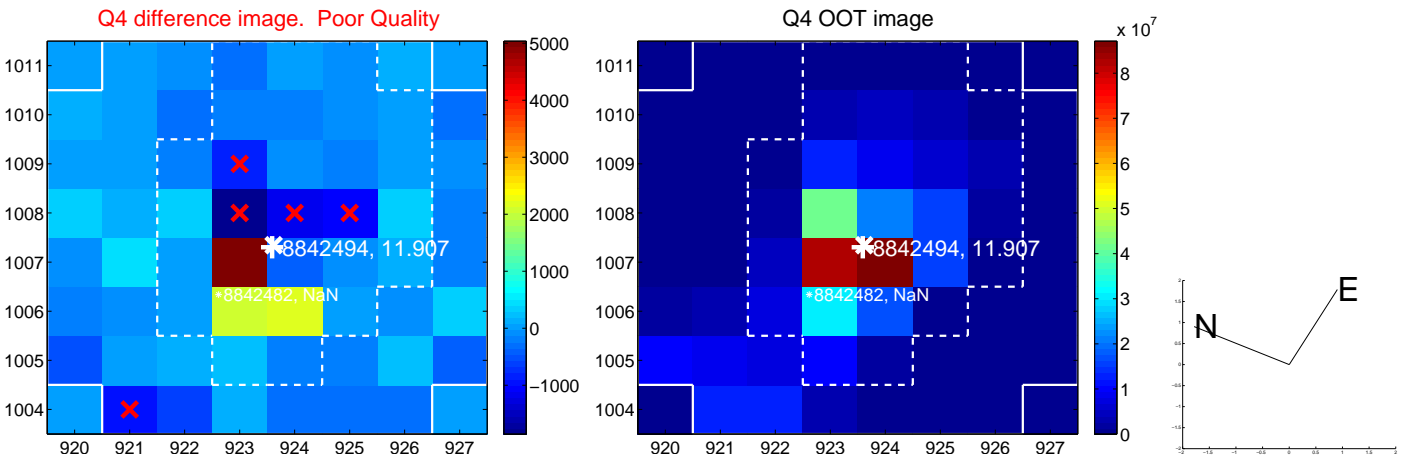
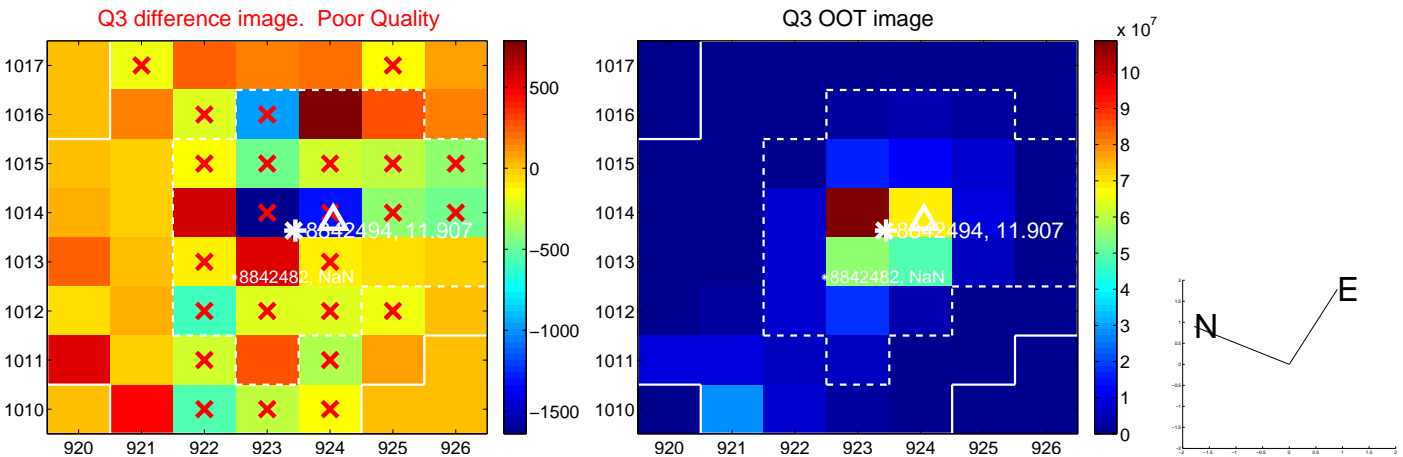
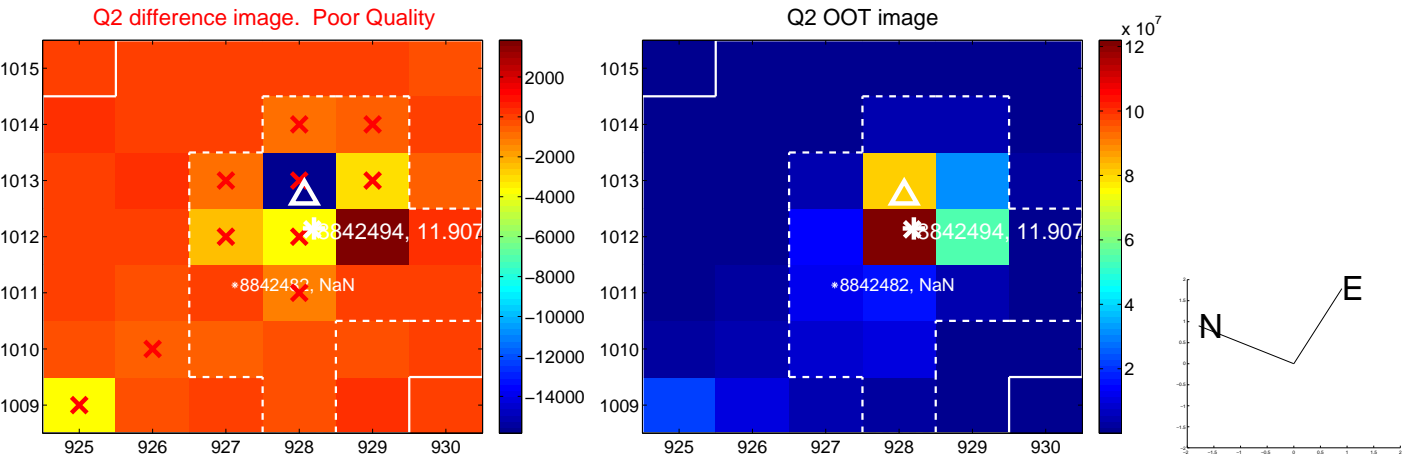
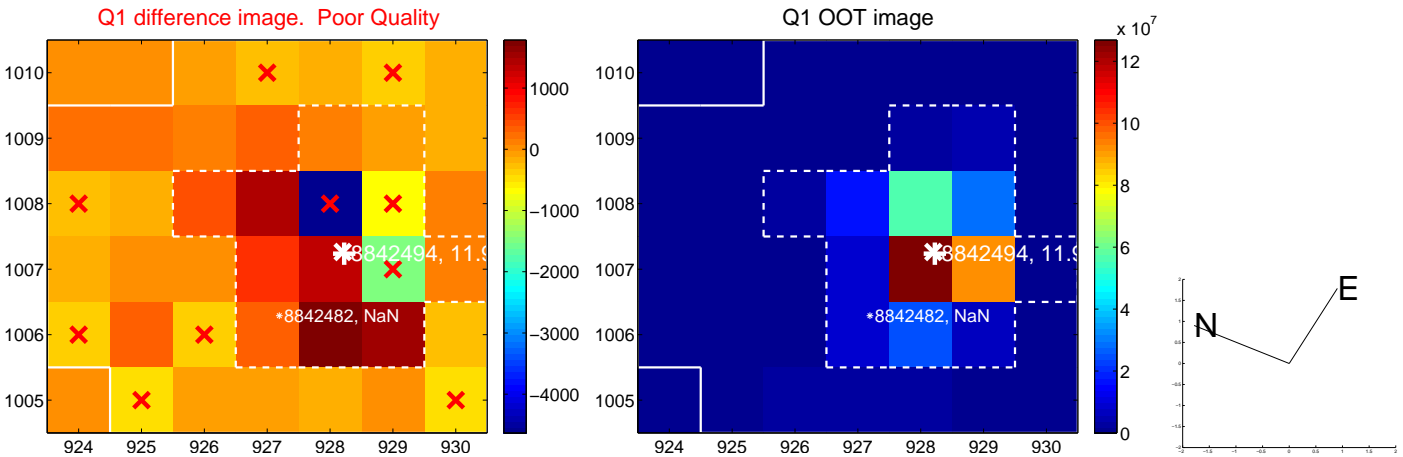
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.102 \pm 0.282$	0.36	$-0.101 \pm 0.271$	$0.016 \pm 0.273$
PRF-fit source offset from KIC position	$0.226 \pm 0.248$	0.91	$-0.164 \pm 0.300$	$-0.155 \pm 0.278$
photometric centroid source offset	$0.66 \pm 0.22$	2.94	$-0.64 \pm 0.22$	$-0.12 \pm 0.16$

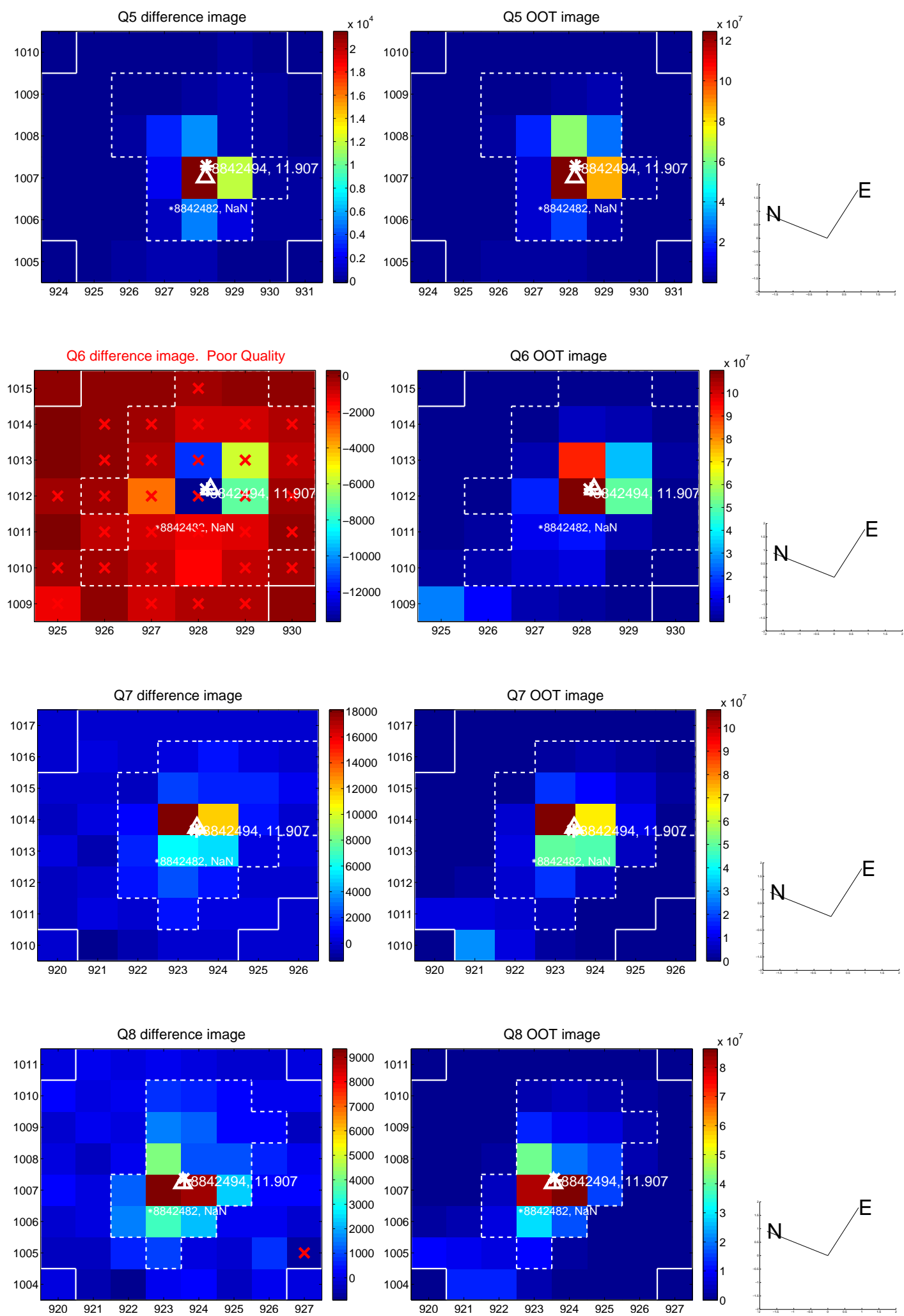


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

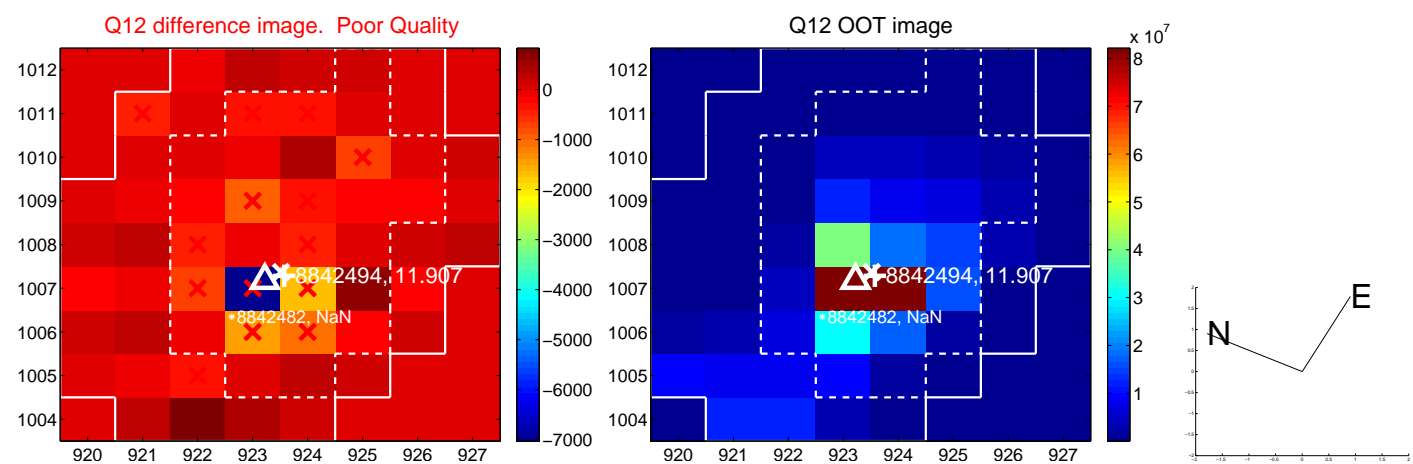
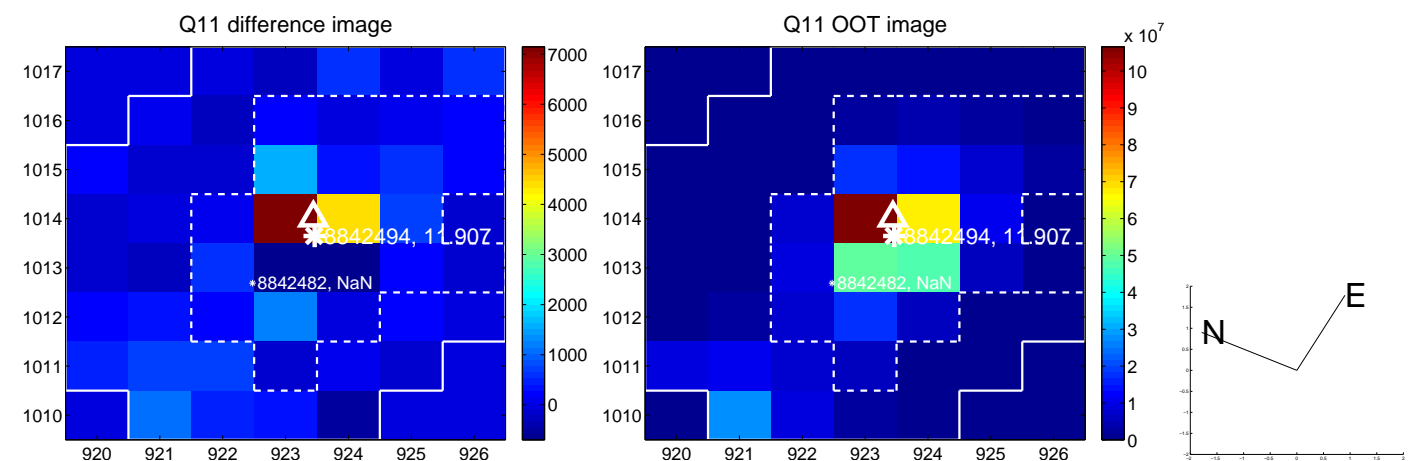
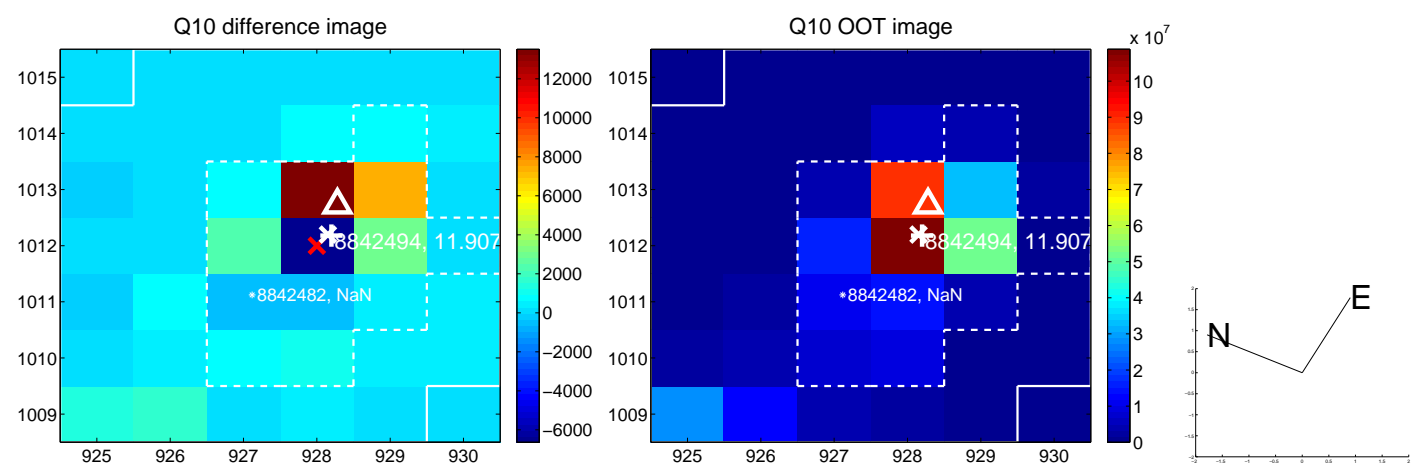
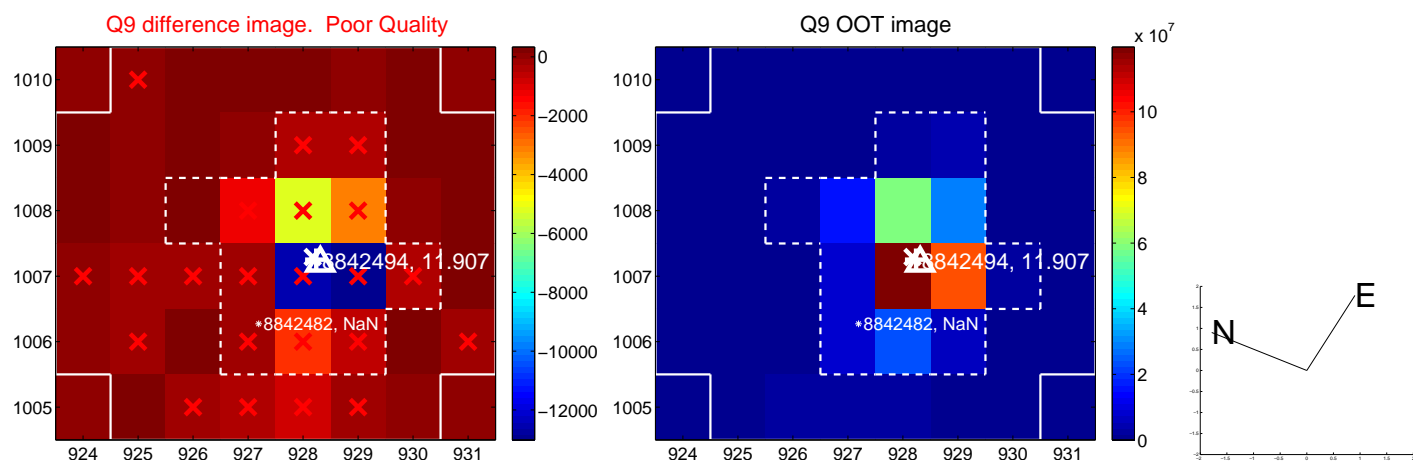


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



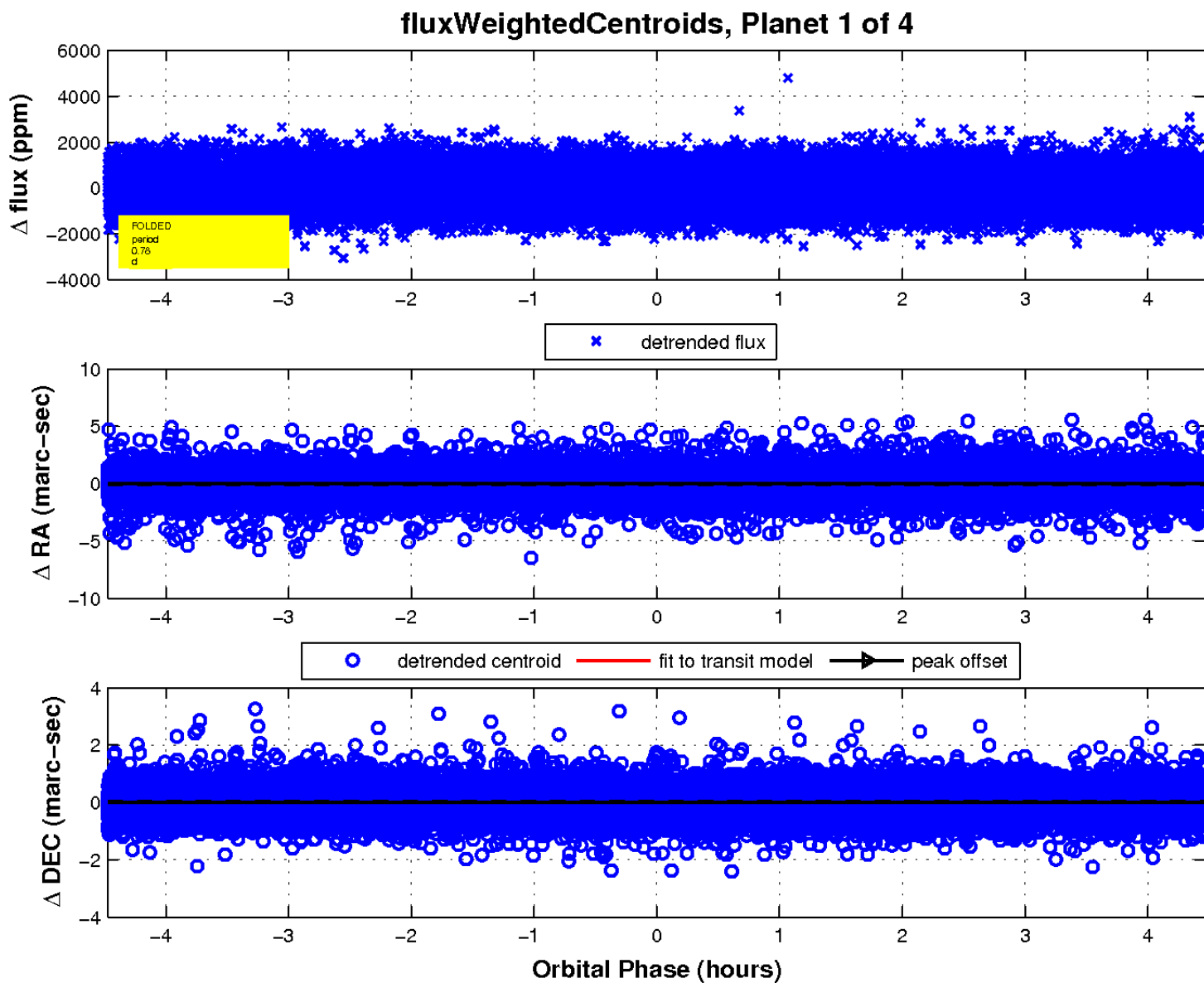
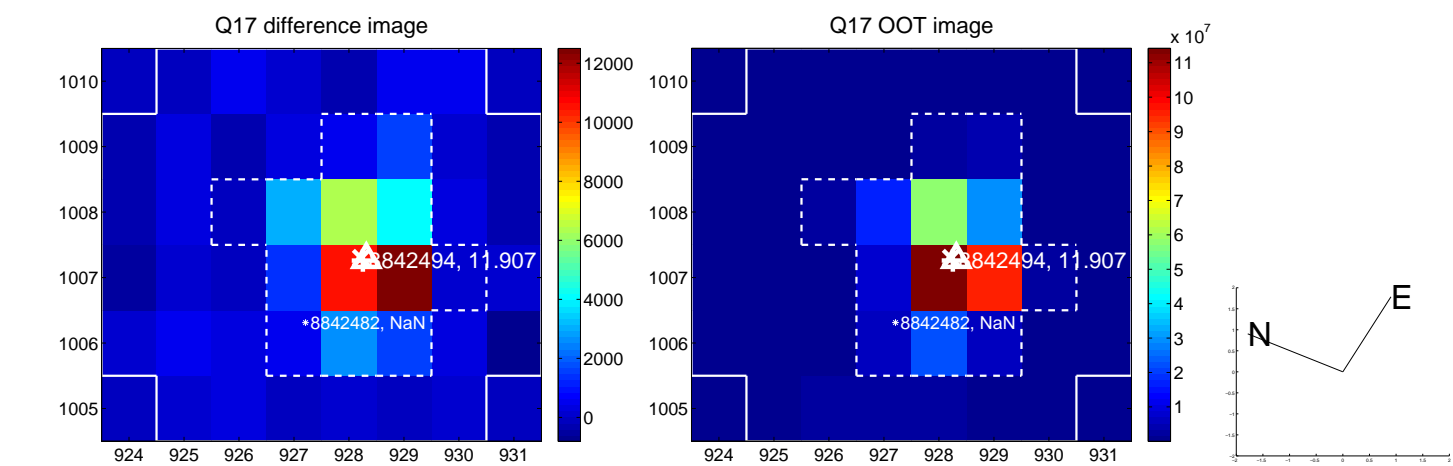


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



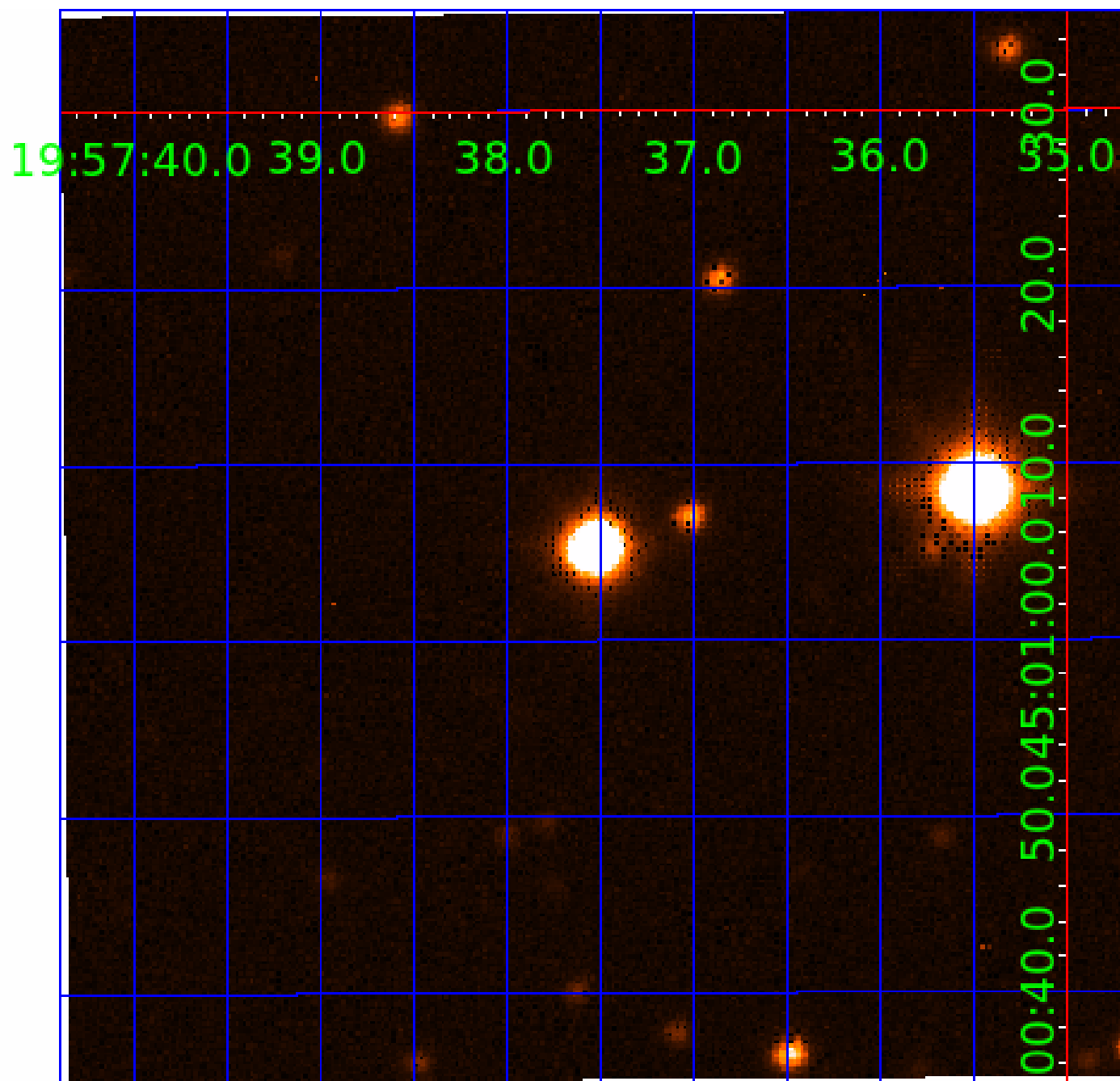


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008842494

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008842494-01	OBS	No	0.775620	131.705887	99.1	1.492	10.0	10.4	4.46	7021	4.77	98398.11
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008842494-04	OBS	No	49.683295	163.758395	766.7	2.856	7.7	7.4	4.46	7021	13.96	383.92

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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008842494-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
008842494-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

**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.

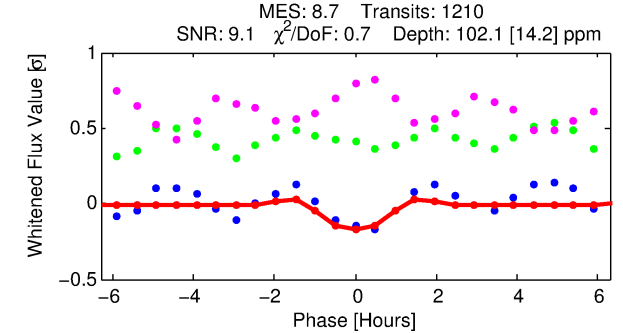
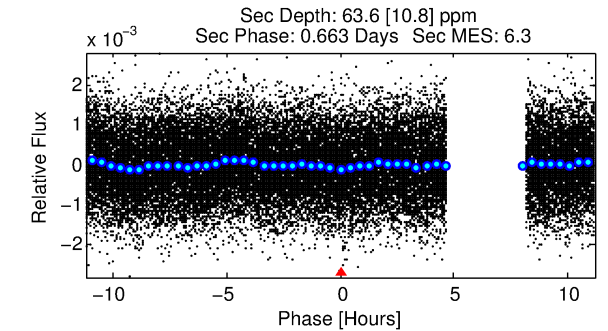
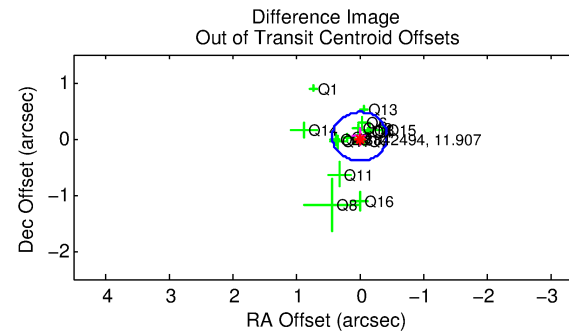
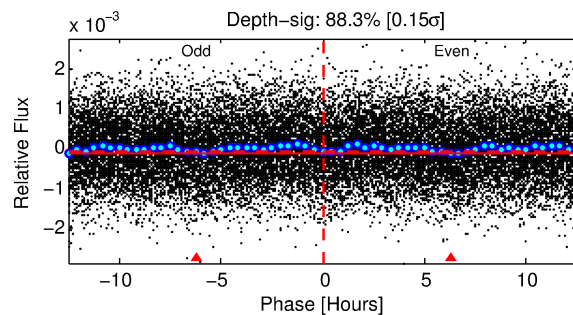
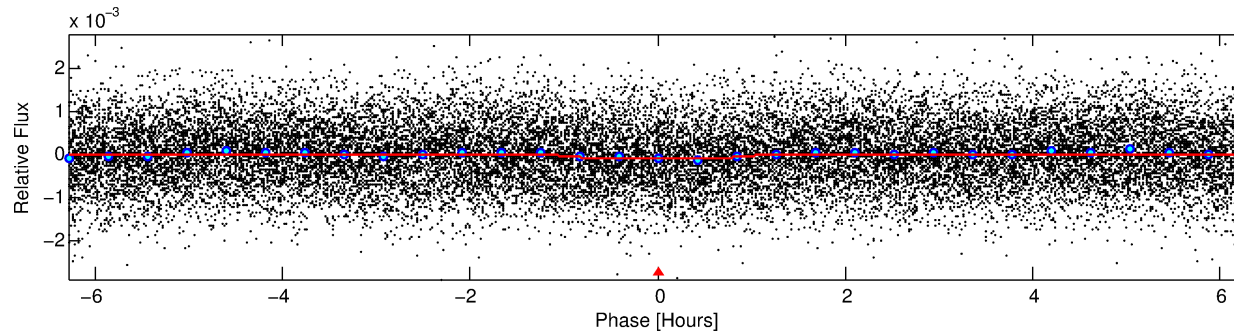
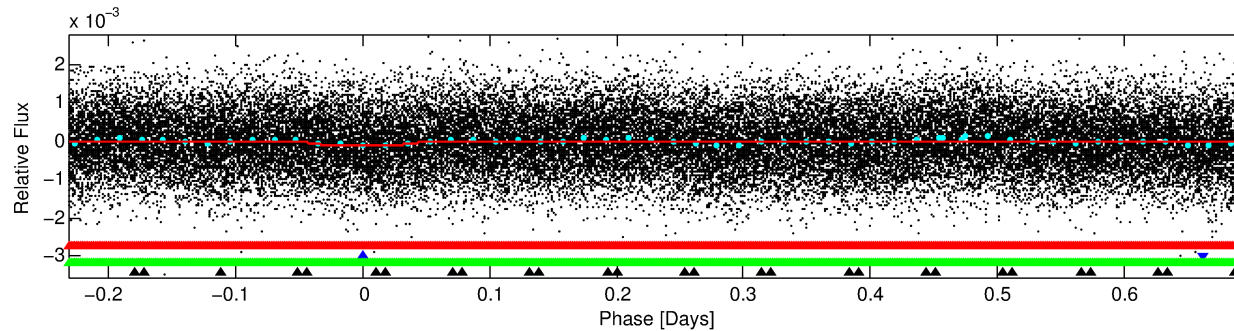
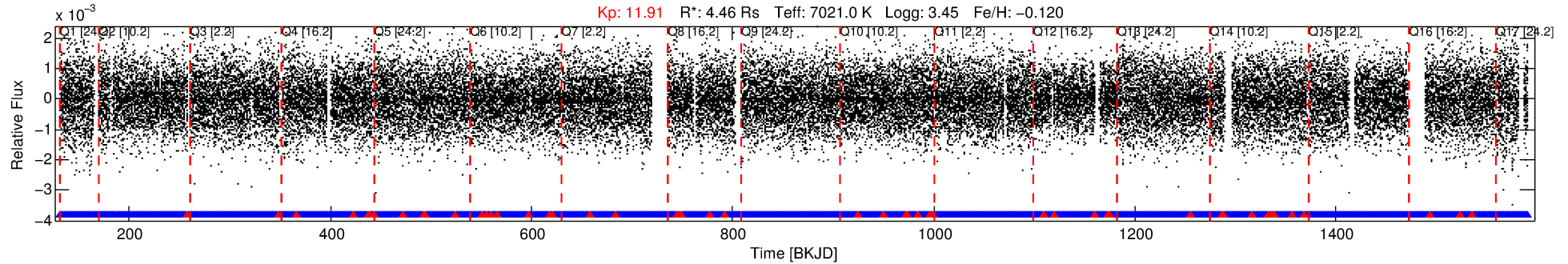
Ephemeris Match Information For 008842494-02

No Significant Match Found



# DV One-Page Summary

KIC: 8842494 Candidate: 2 of 4 Period: 0.929 d



## DV Fit Results:

Period = 0.92923 [0.00001] d  
Epoch = 131.8501 [0.0028] BKJD  
Rp/R\* = 0.0108 [0.0073]  
a/R\* = 1.81 [5.19]  
b = 0.90 [0.86]  
Seff = 77331.19 [83663.70]  
Teq = 4252 [1150] K  
Rp = 5.26 [4.72] Re  
a = 0.0236 [0.0150] AU  
Ag = 0.71 [1.23] [-0.24 $\sigma$ ]  
Teffp = 6033 [2079] K [0.75 $\sigma$ ]

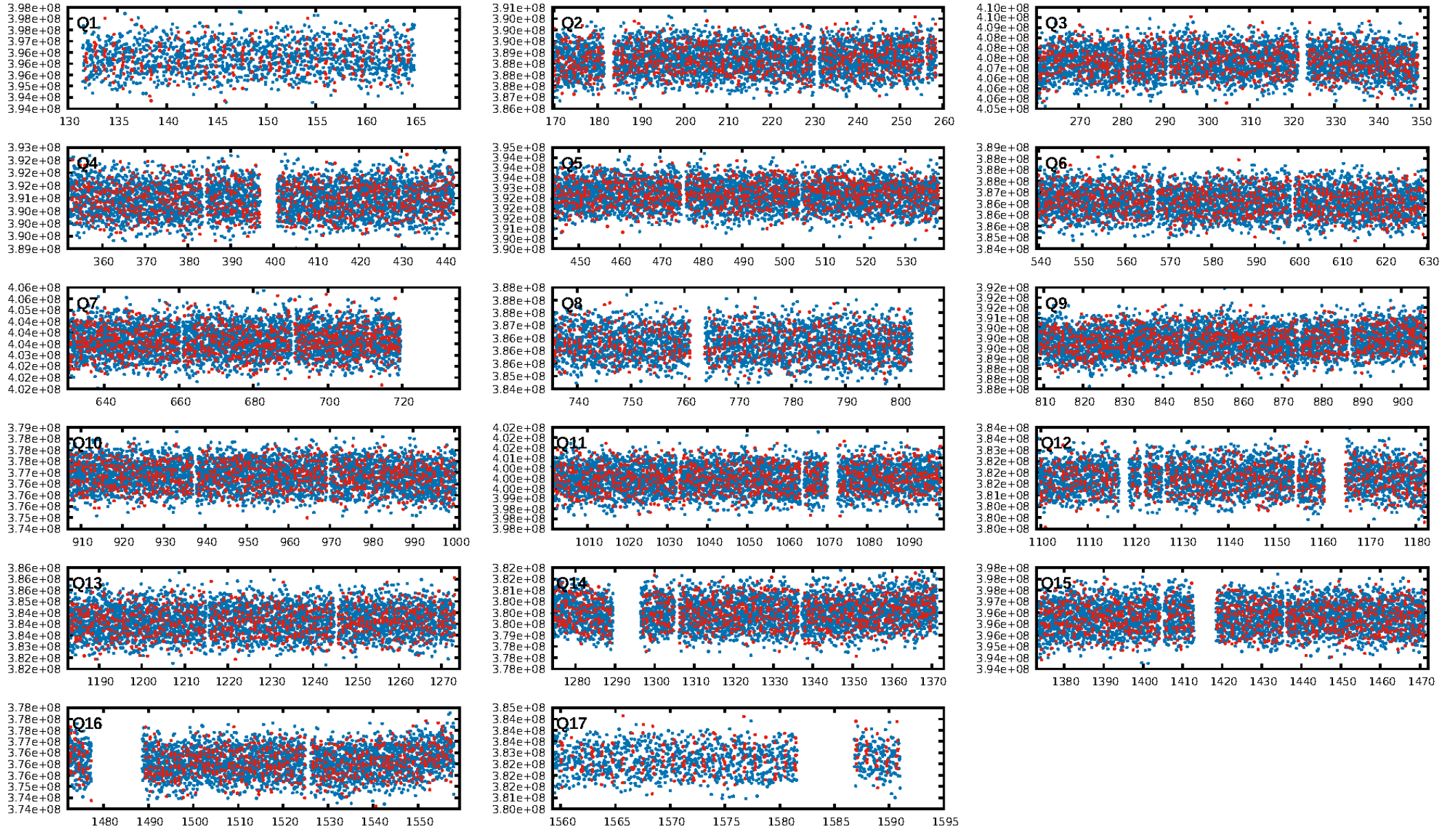
## DV Diagnostic Results:

ShortPeriod-sig: 84.8% [1.43 $\sigma$ ]  
LongPeriod-sig: 100.0% [330.32 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.48e-08  
RollingBand-fgt: 0.96 [1109/1158]  
GhostDiagnostic-chr: 0.5744  
Centroid-sig: 8.9%  
Centroid-so: 0.615 arcsec [3.02 $\sigma$ ]  
OotOffset-rm: 0.038 arcsec [0.26 $\sigma$ ]  
KicOffset-rm: 0.099 arcsec [0.70 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.81 [13/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:12:53 Z

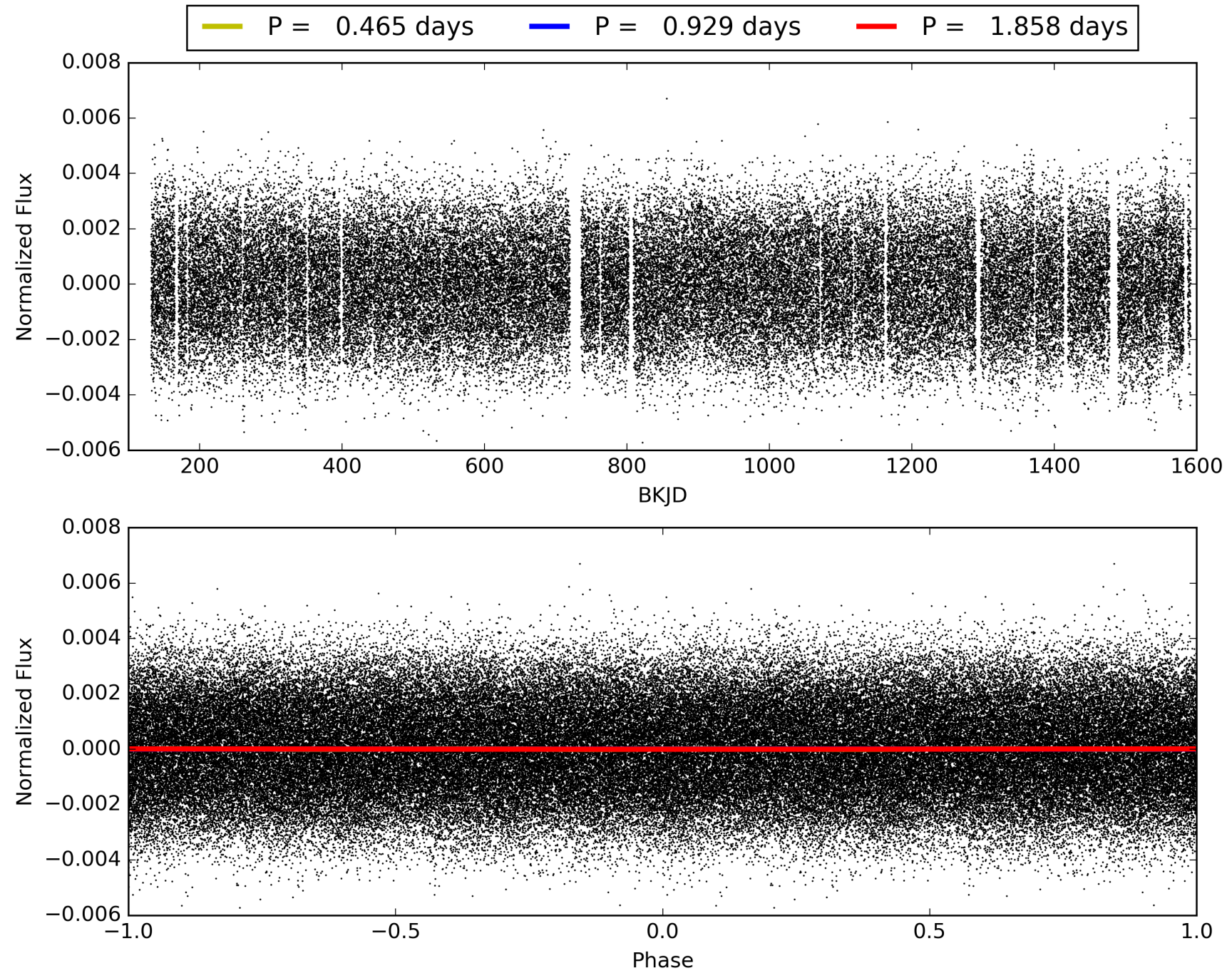
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008842494-02, PDC Light Curves



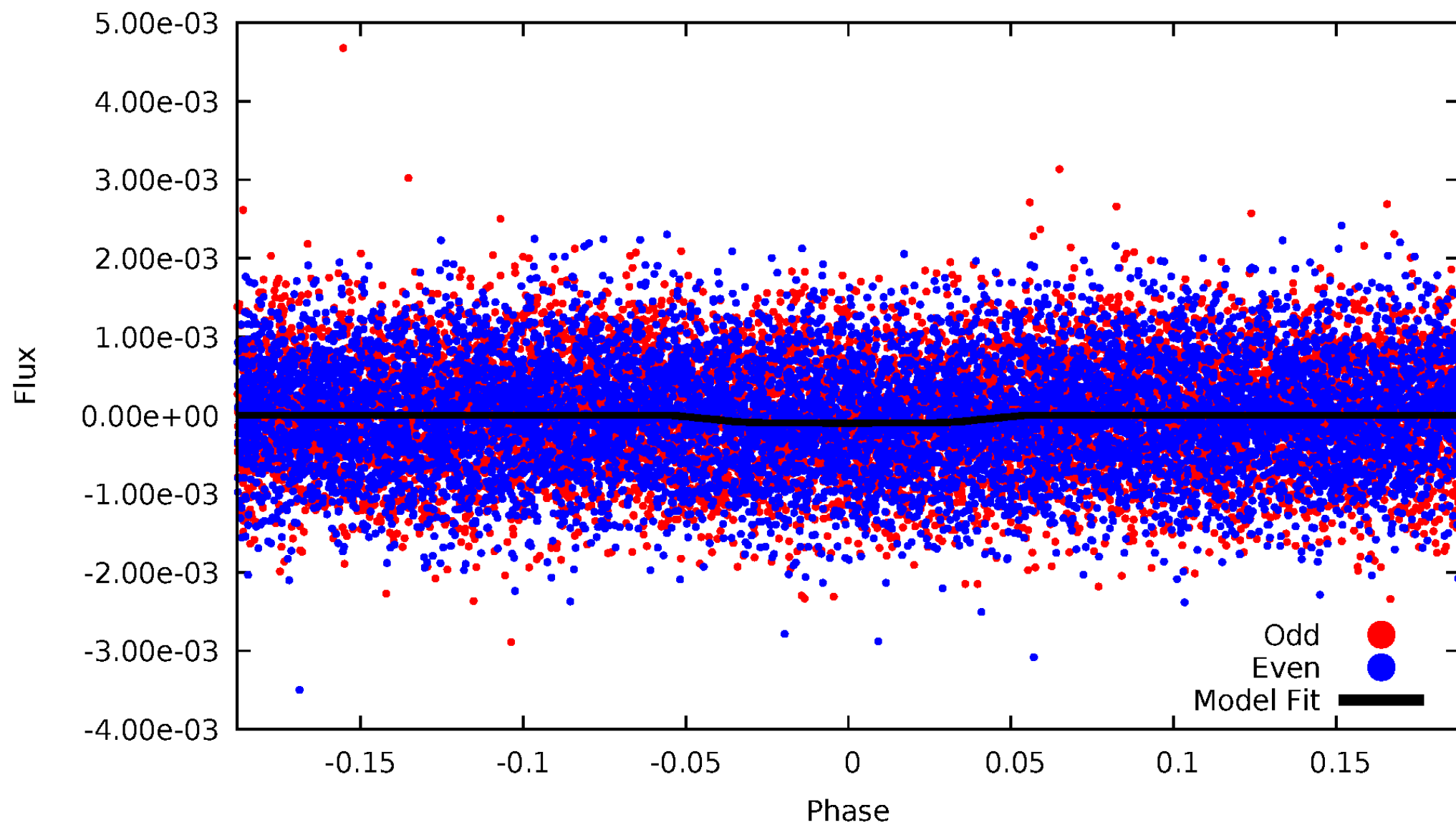


TCE 008842494-02



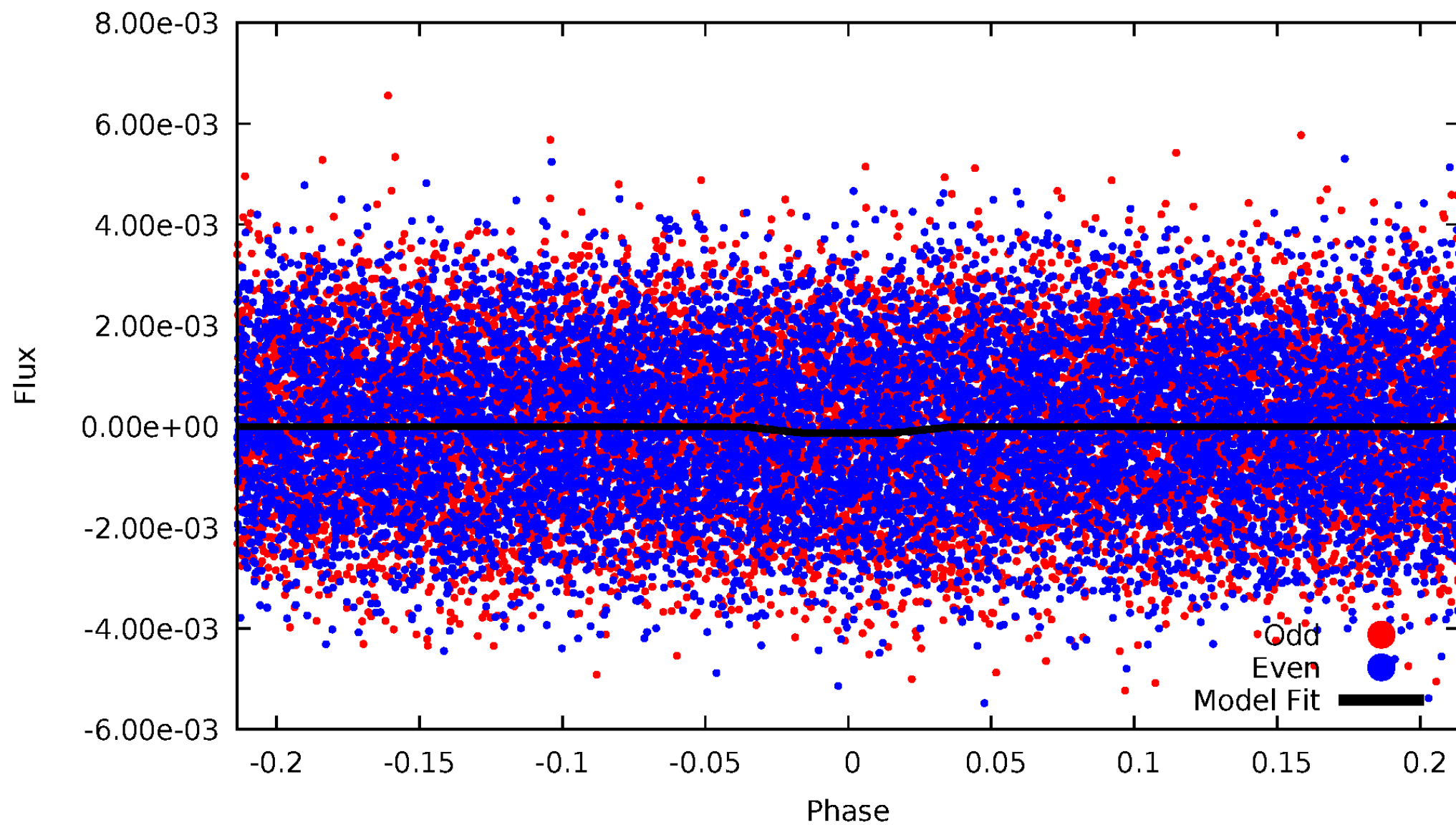
# DV Odd/Even

TCE 008842494-02



# ALT Odd/Even

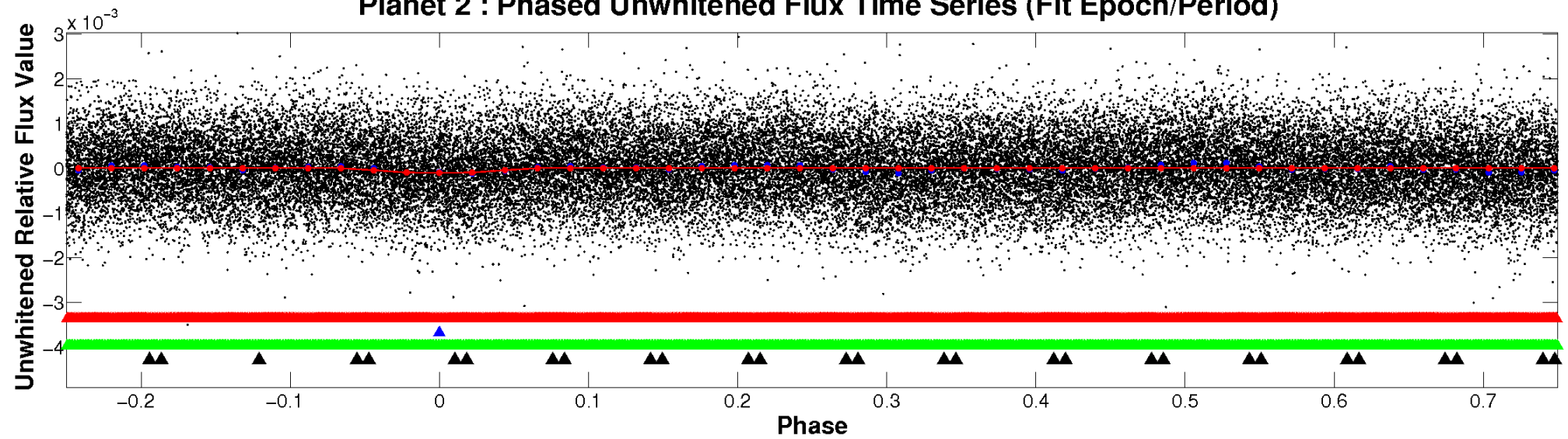
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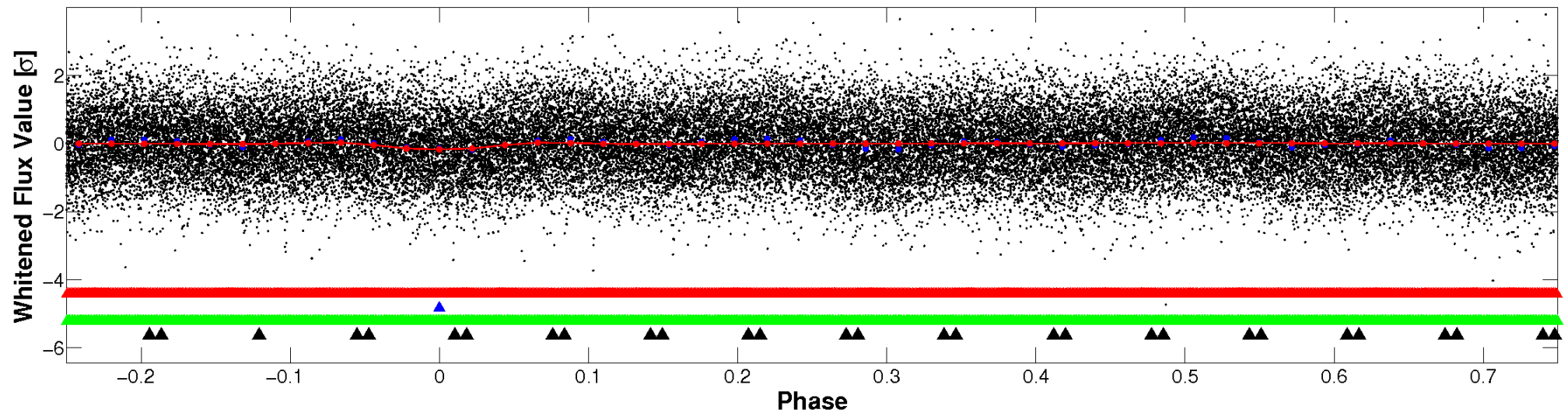


# Non-Whitened Vs. Whitened Light Curve

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

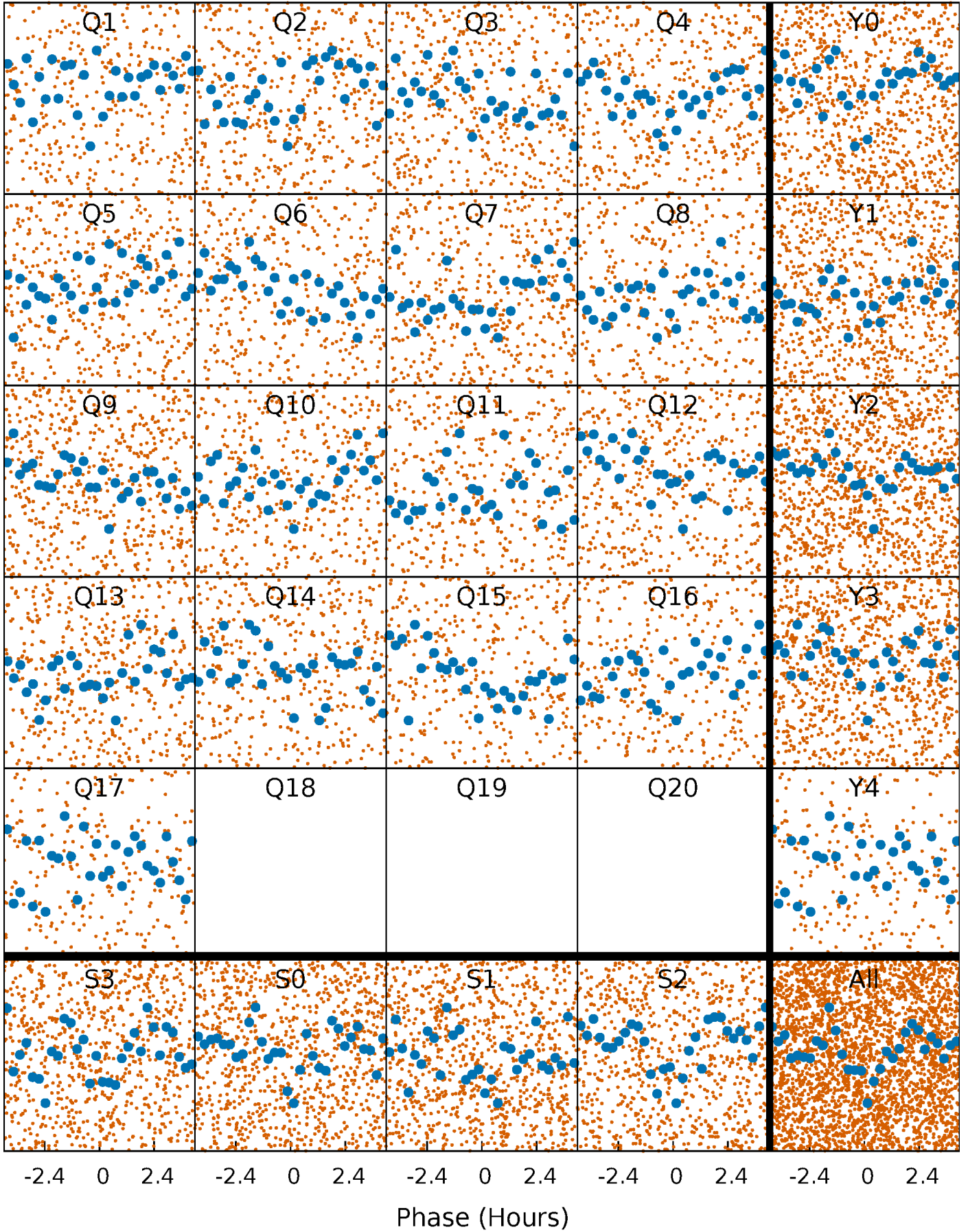


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



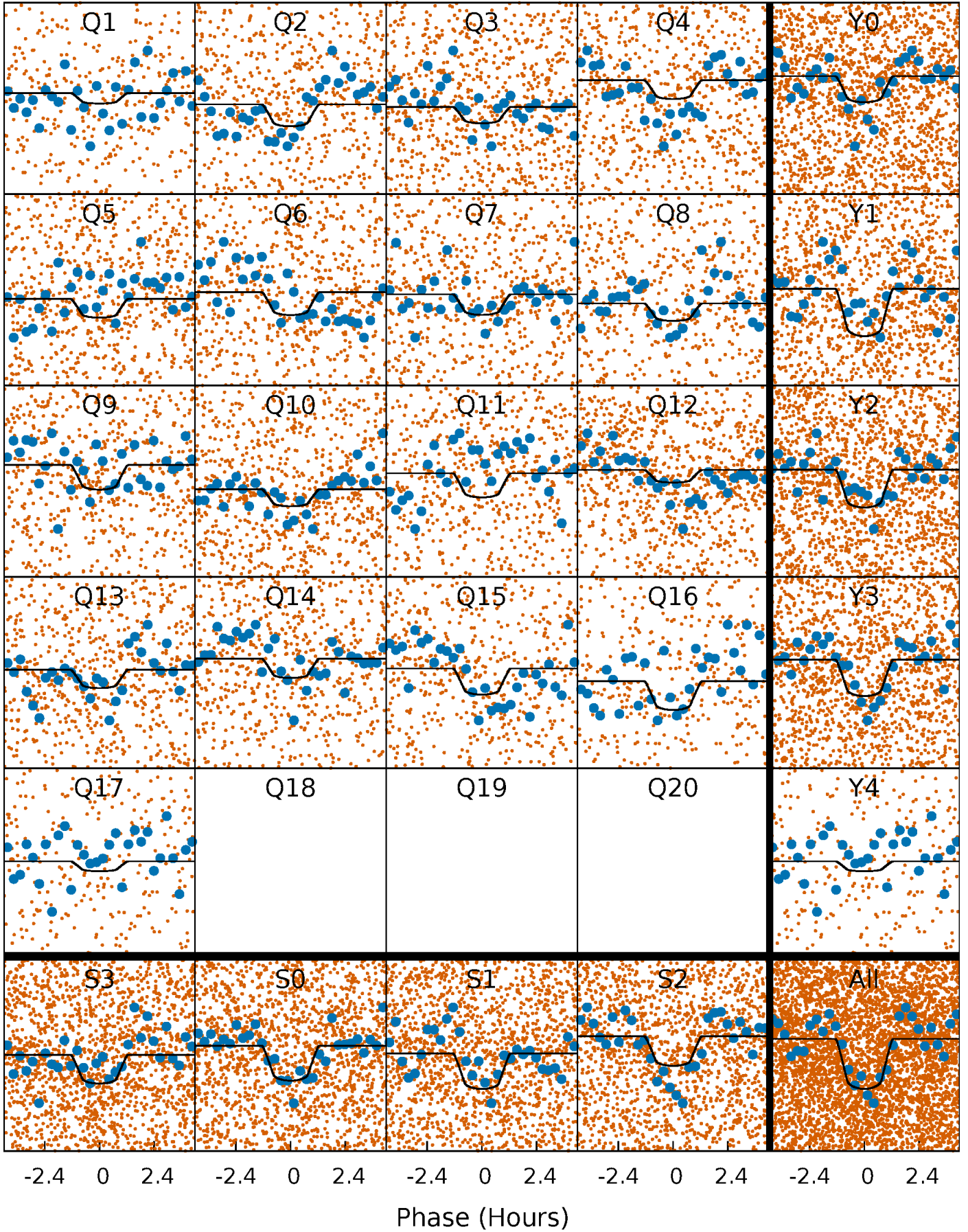
# PDC Quarter-Phased Transit Curves

TCE 008842494-02   P= 0.929230 Days    $T_0=131.850111$  (BKJD)



# DV Quarter-Phased Transit Curves

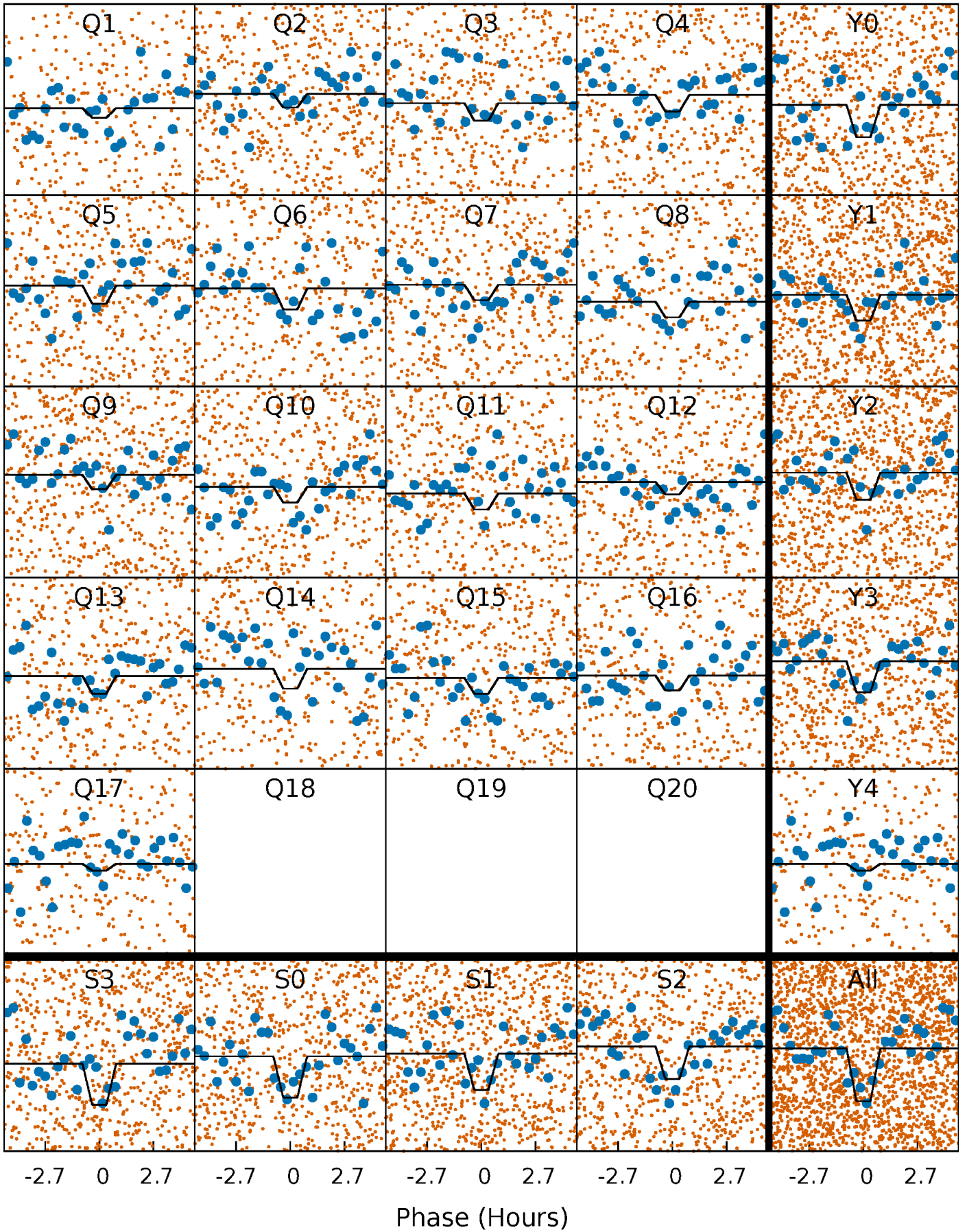
TCE 008842494-02     $P = 0.929230$  Days     $T_0 = 131.850111$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 008842494-02   P= 0.929237 Days    $T_0=131.849691$  (BKJD)

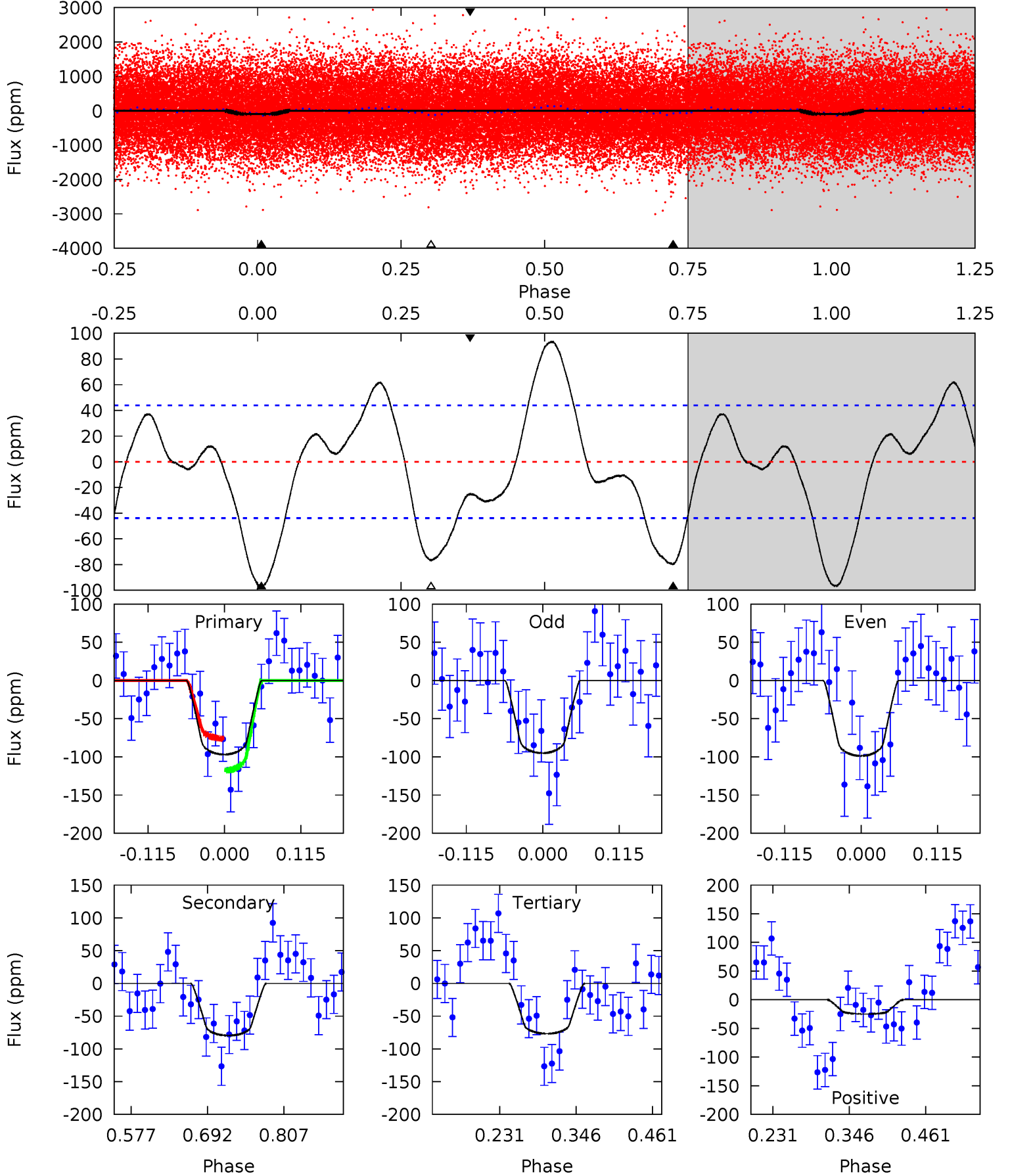




# DV Model-Shift Uniqueness Test

008842494-02, P = 0.929230 Days, E = 130.920881 Days

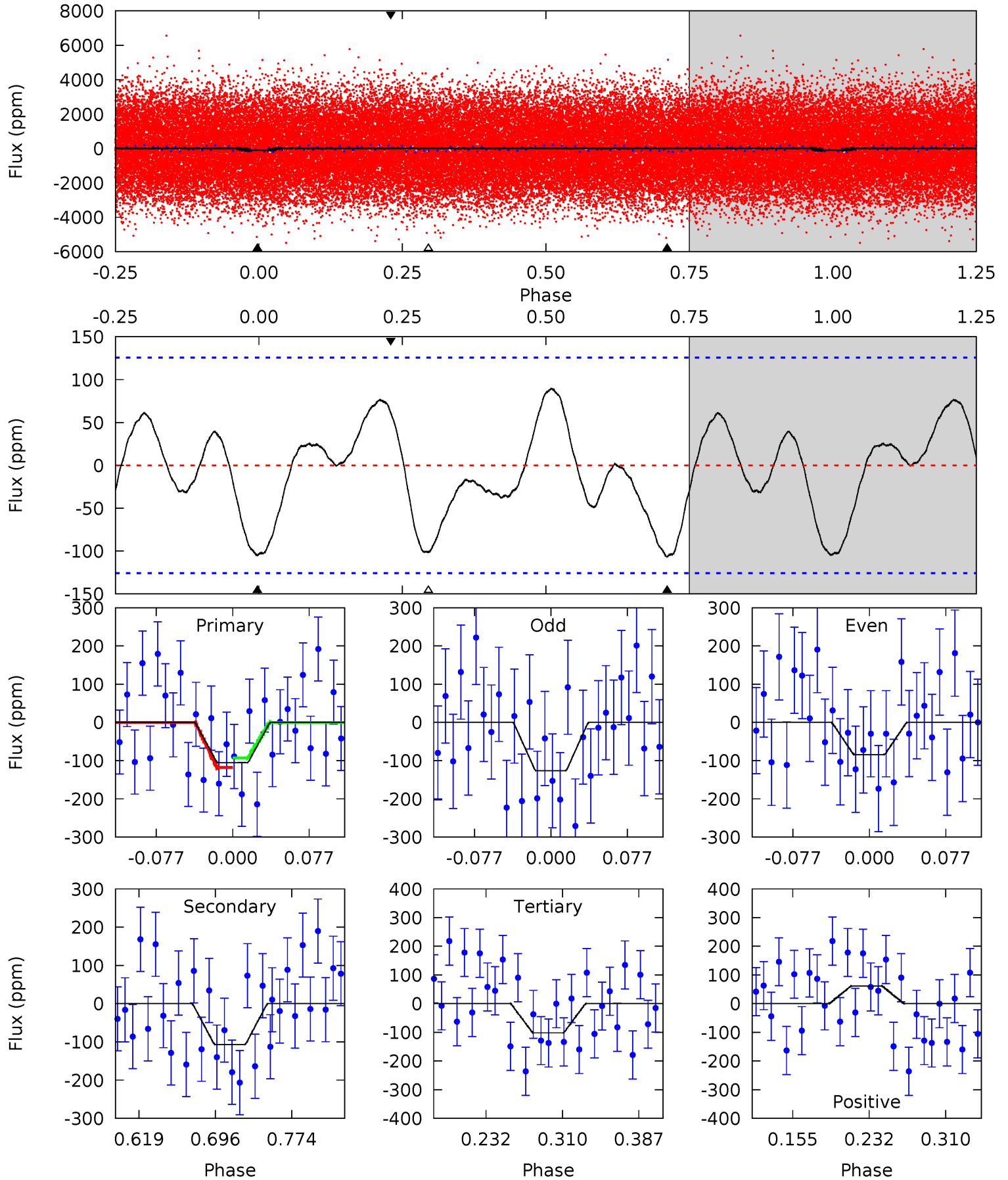
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	8.23	7.94	-2.58	4.53	1.57	4.61	2.08	12.6	0.30	10.8	0.19	0.88	0.49	2.16



# Alt Model-Shift Uniqueness Test

008842494-02, P = 0.929237 Days, E = 130.920454 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
3.87	3.93	3.73	2.26	4.62	1.77	1.67	0.13	1.61	0.20	1.67	0.77	0.79	0.46	0.47



### Stellar Parameters For KIC 008842494

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7021^{+194}_{-292}$	$3.450^{+0.648}_{-0.072}$	$-0.120^{+0.250}_{-0.300}$	$4.457^{+0.308}_{-2.618}$	$2.041^{+0.073}_{-0.659}$	$0.032^{+0.337}_{-0.008}$
	+3%/-4%	+19%/-2%	+208%/-250%	+7%/-59%	+4%/-32%	+1039%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008842494-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-80 \pm 10$	$4.89^{+3.34}_{-3.14}$	$5739^{+374}_{-963}$	$5429^{+5249}_{-1948}$	$0.965^{+6.751}_{-0.617}$
Alt.	$-107 \pm 27$	$5.02^{+3.40}_{-2.91}$	$5759^{+399}_{-828}$	$5938^{+4480}_{-2001}$	$1.223^{+5.829}_{-0.814}$

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

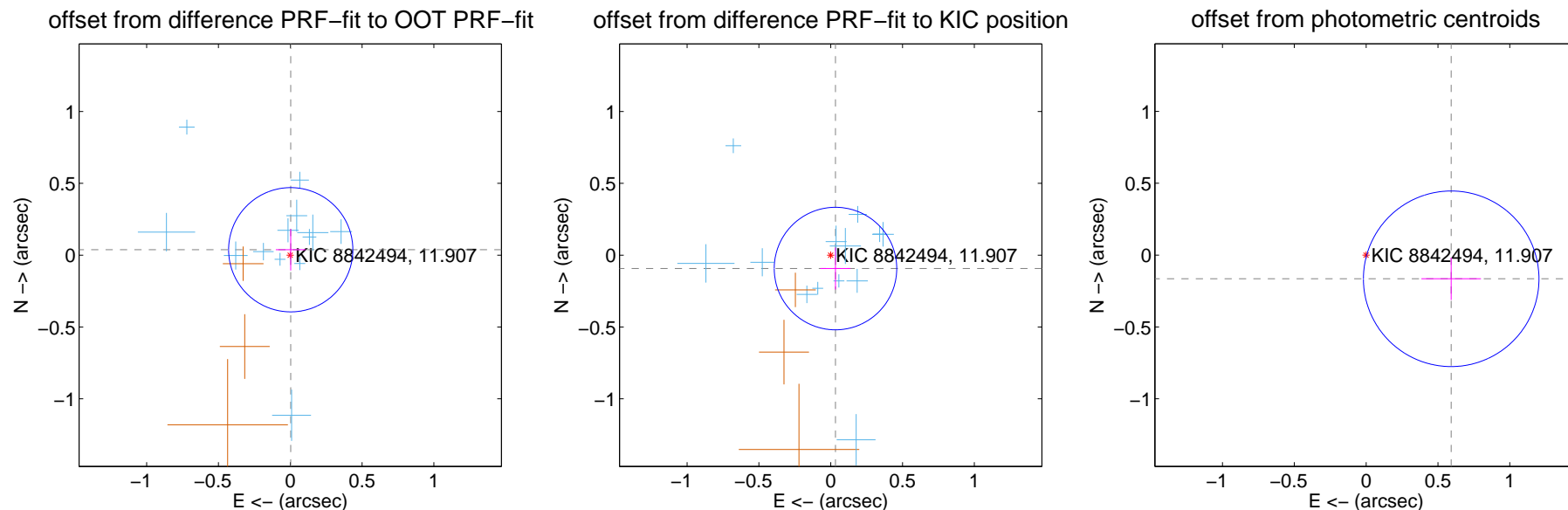
## DV Centroid Data

Supplemental centroid analysis for 008842494-02. **Kepler magnitude: 11.91.** Transit SNR 9.08

There are 13 quarters with good PRF difference image offsets

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

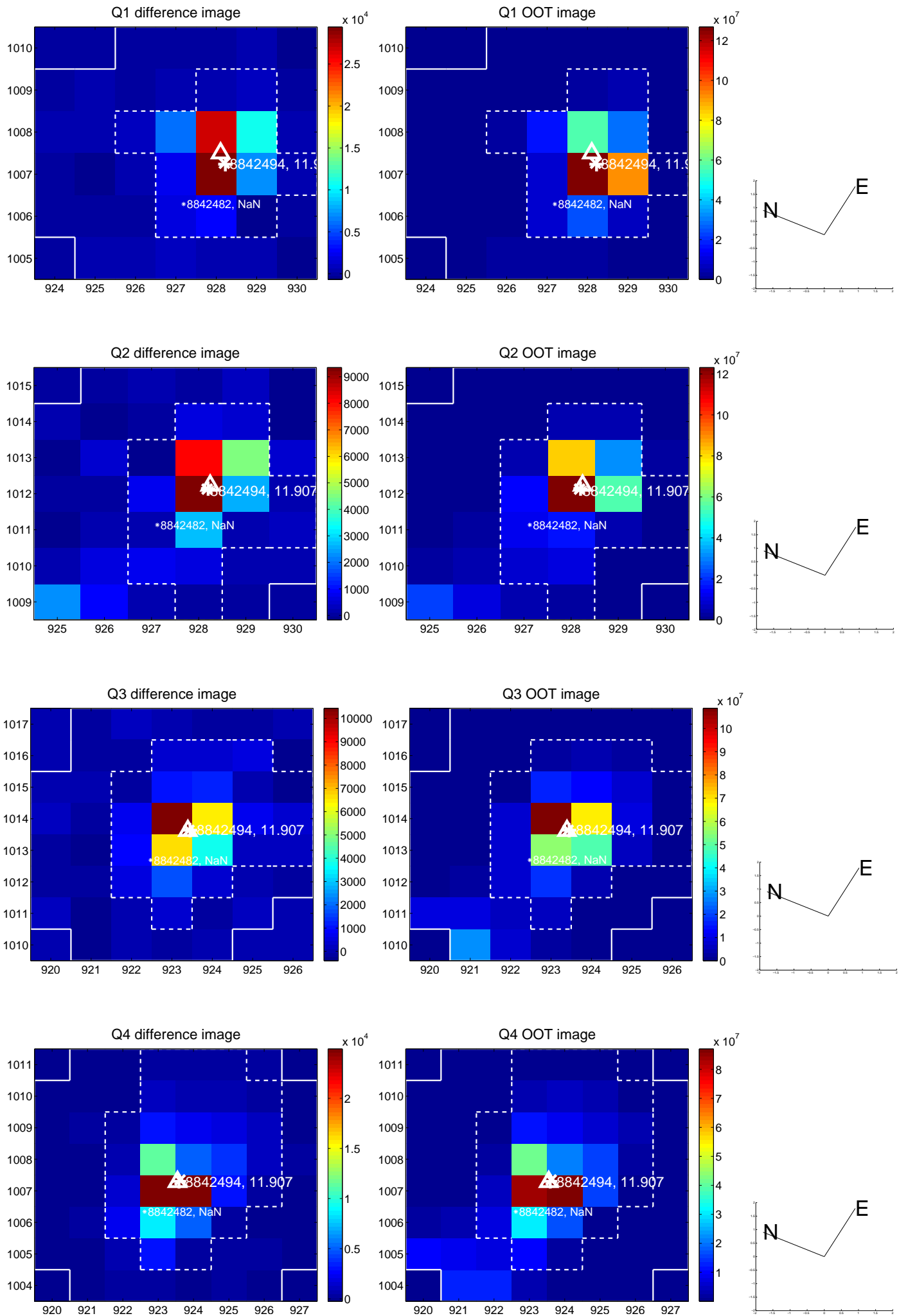
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.038 \pm 0.144$	0.26	$-0.003 \pm 0.104$	$0.038 \pm 0.145$
PRF-fit source offset from KIC position	$0.099 \pm 0.142$	0.70	$-0.033 \pm 0.105$	$-0.093 \pm 0.146$
photometric centroid source offset	<b><math>0.61 \pm 0.20</math></b>	<b>3.02</b>	$-0.59 \pm 0.21$	$-0.16 \pm 0.15$



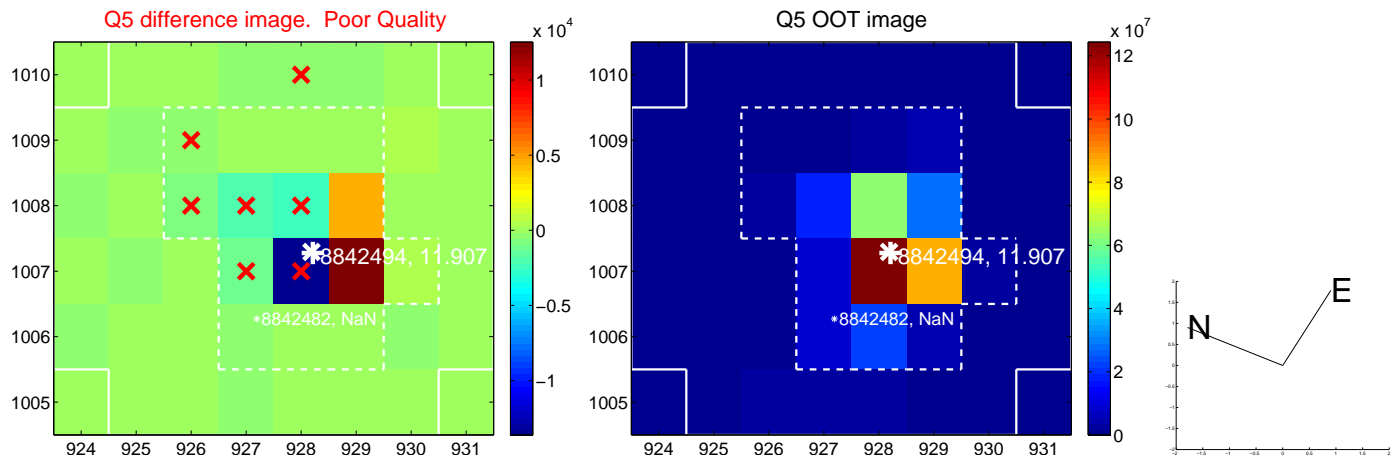
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



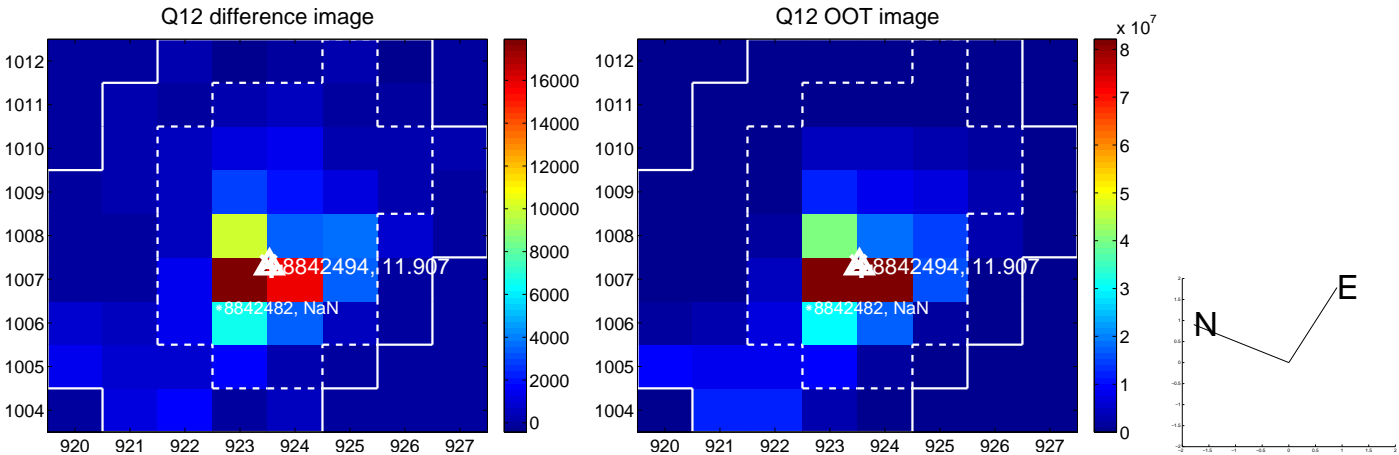
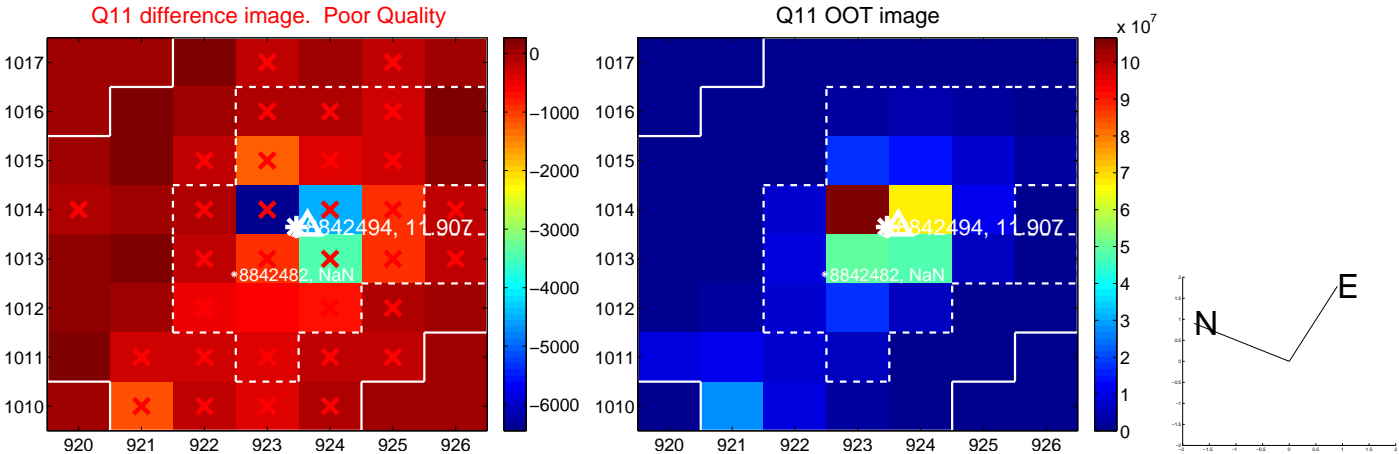
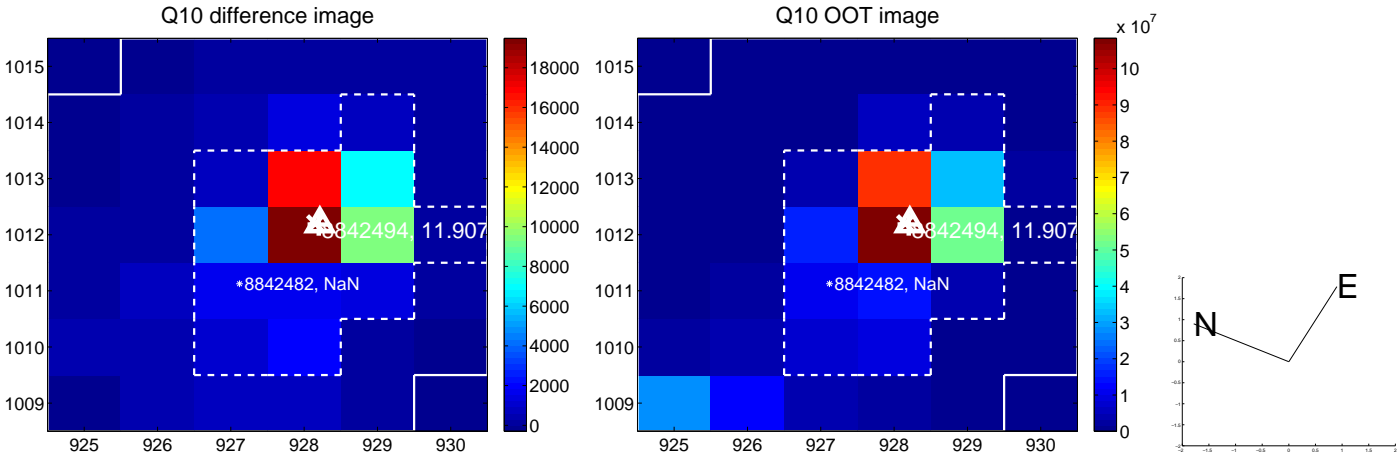
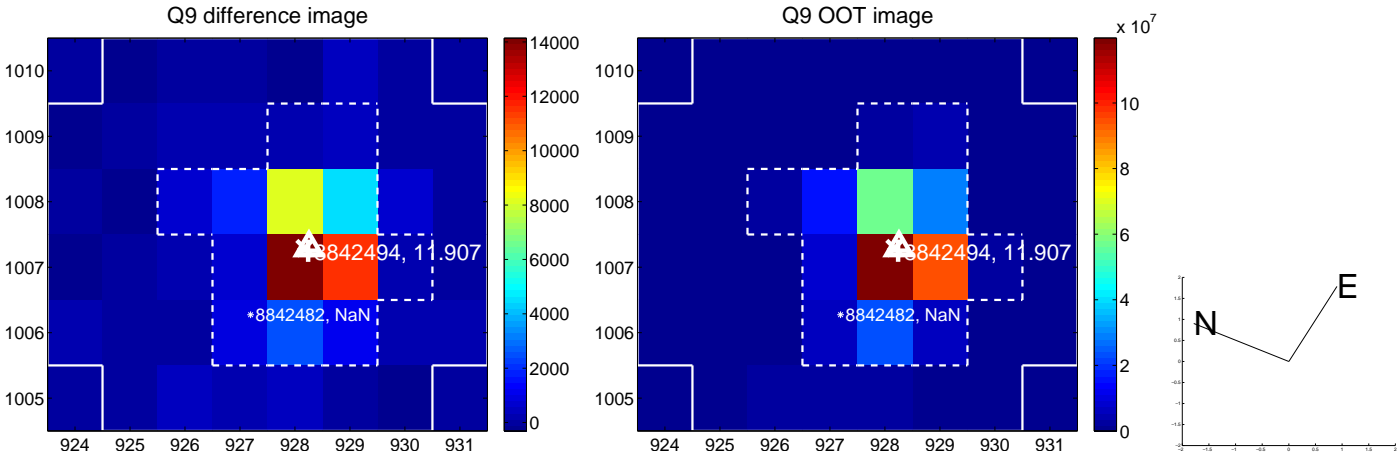
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



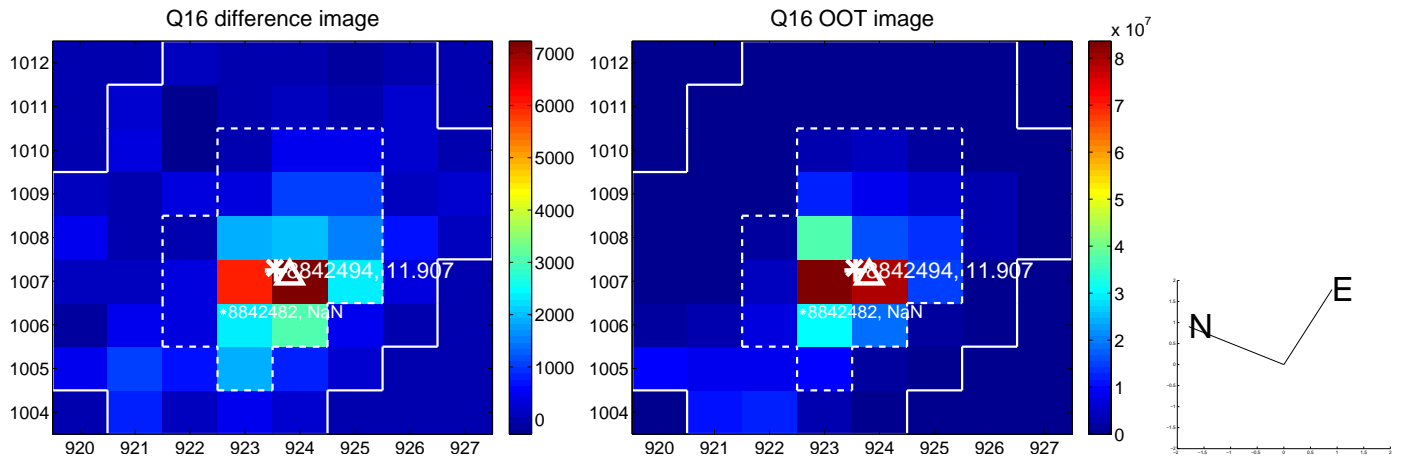
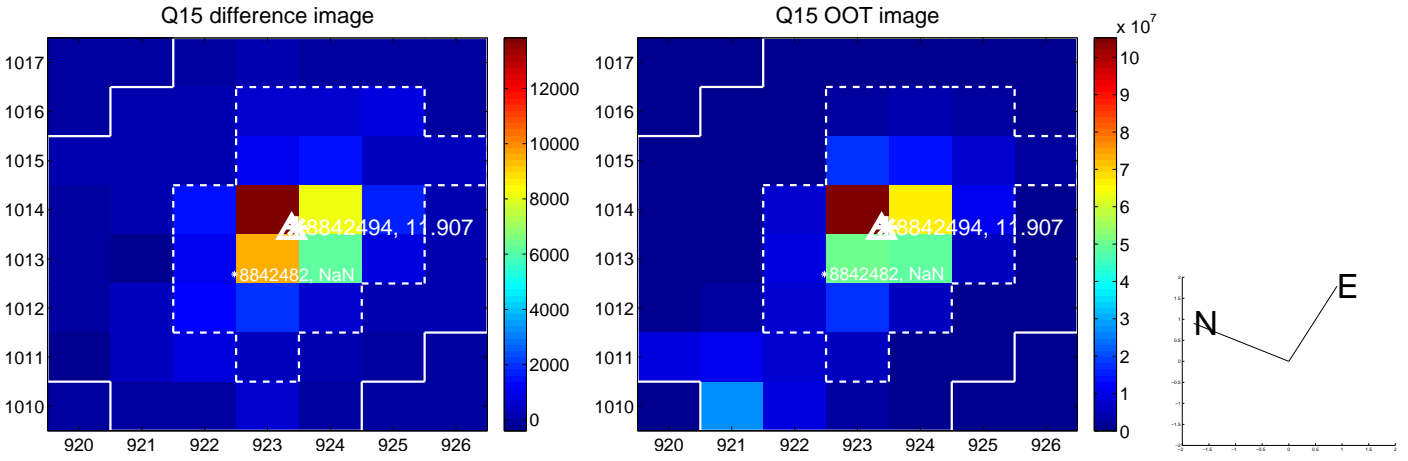
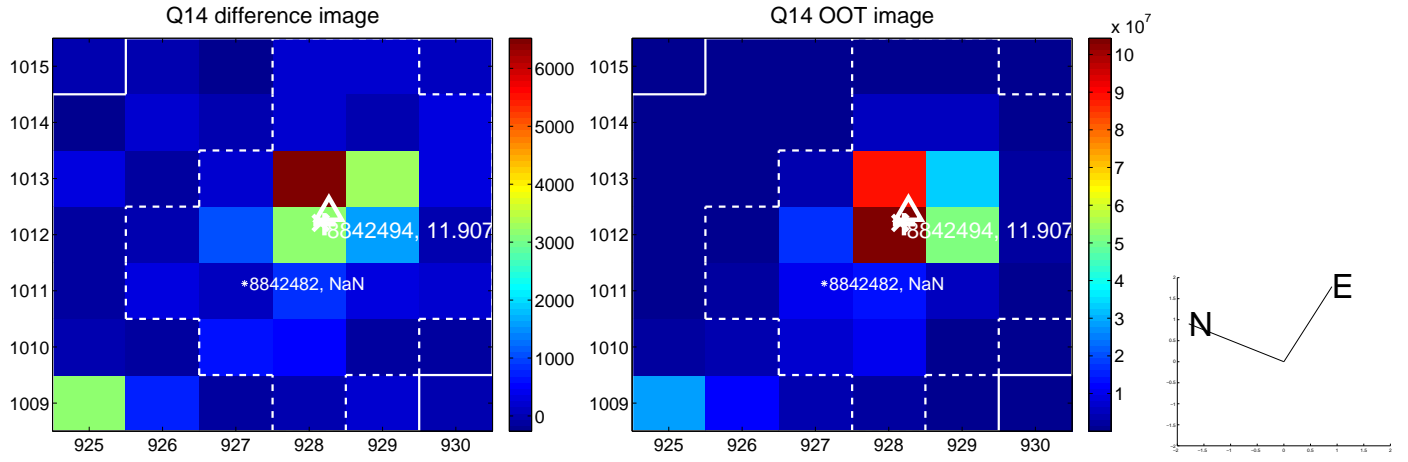
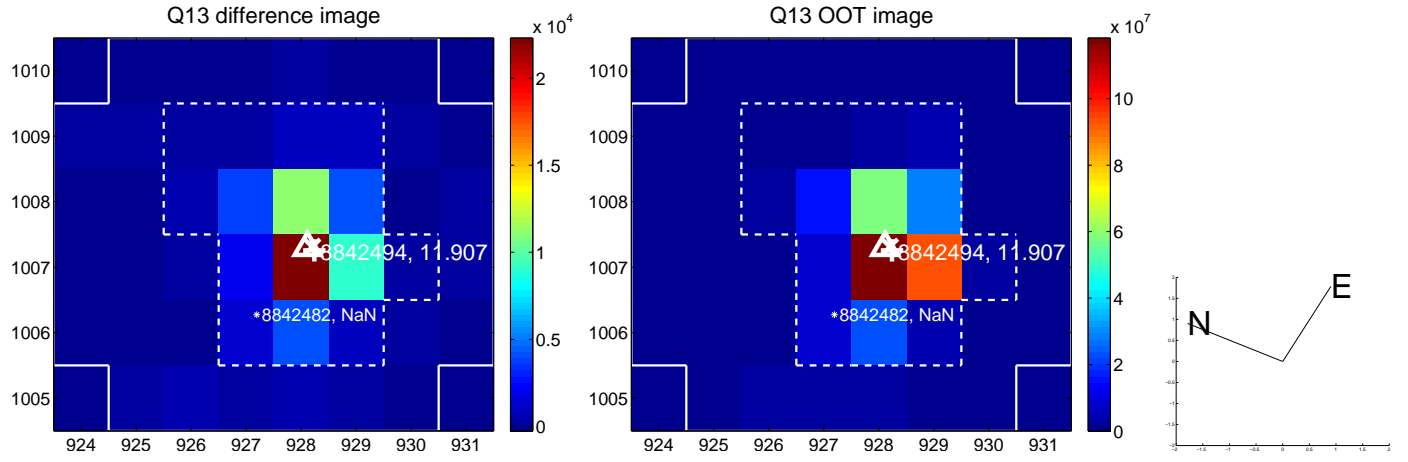
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

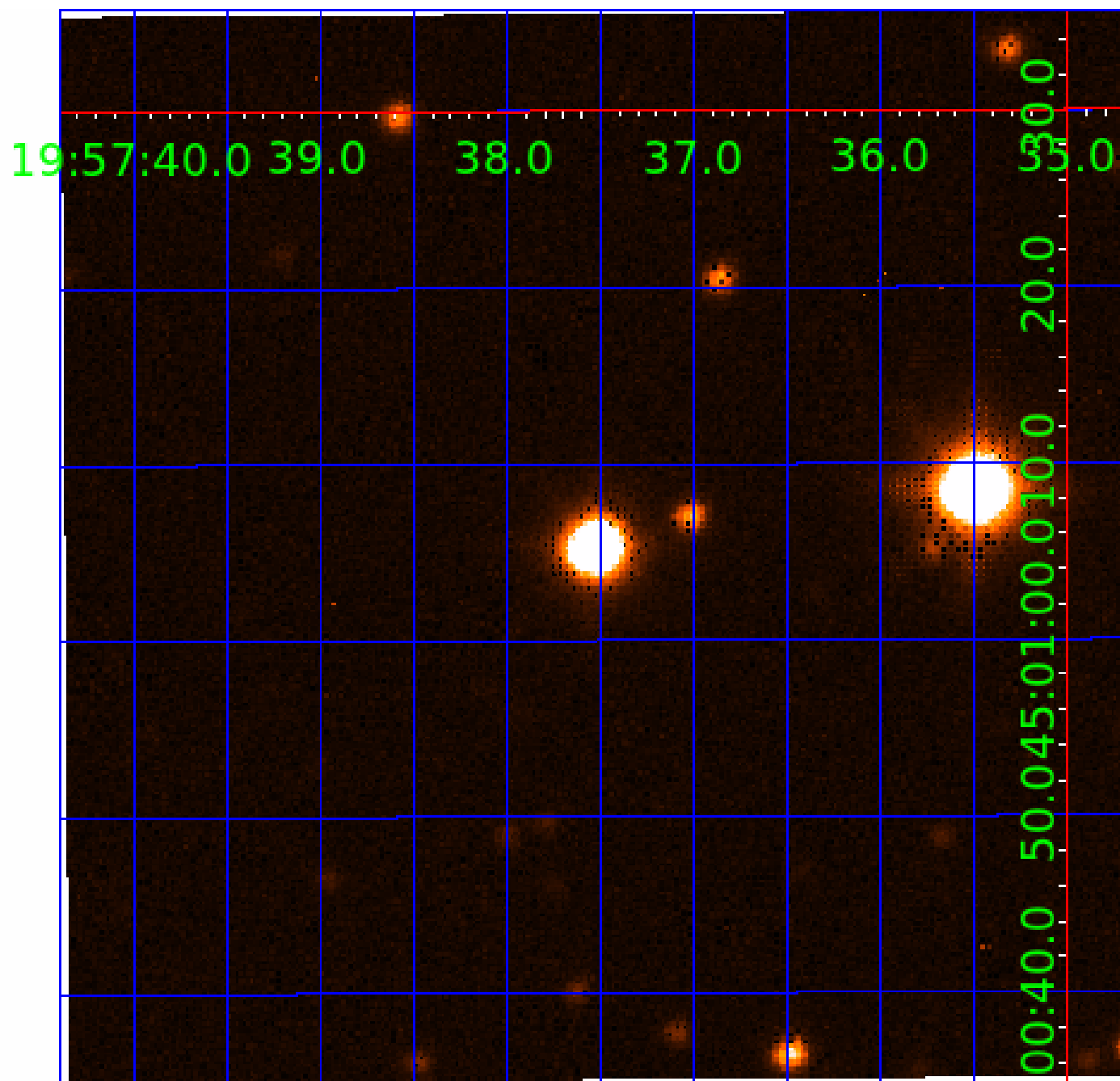






UKIRT Image

Declination



# KIC 008842494

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008842494-01	OBS	No	0.775620	131.705887	99.1	1.492	10.0	10.4	4.46	7021	4.77	98398.11
008842494-02	OBS	No	0.929230	131.850111	102.1	2.096	8.7	9.1	4.46	7021	5.25	77331.18
008842494-03	OBS	No	0.559243	132.001031	113.9	2.865	7.8	11.1	4.46	7021	5.54	0.00
008842494-04	OBS	No	49.683295	163.758395	766.7	2.856	7.7	7.4	4.46	7021	13.96	383.92

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008842494-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
008842494-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

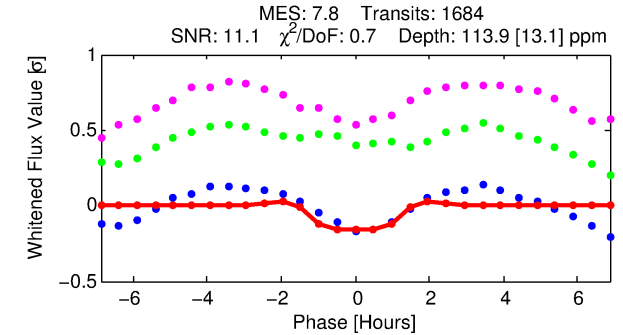
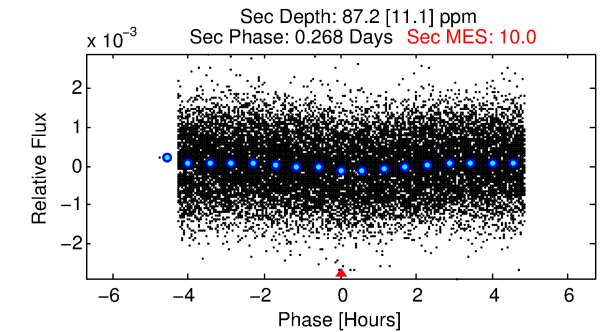
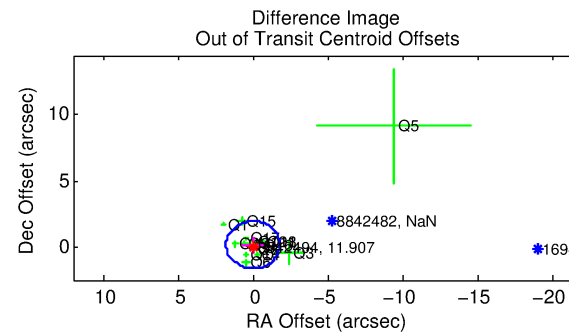
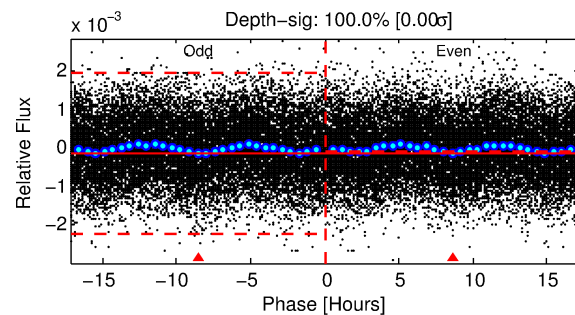
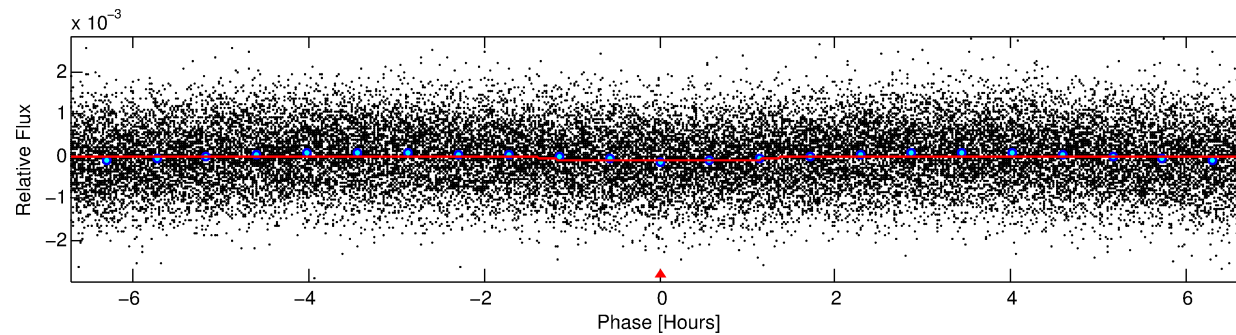
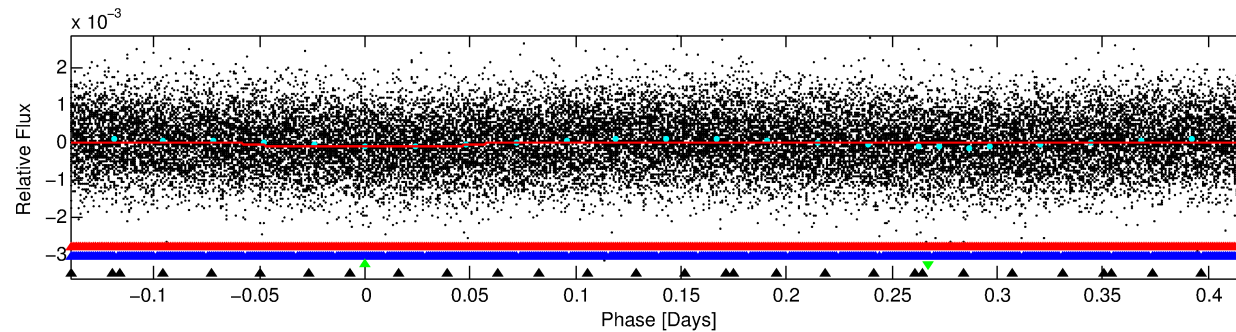
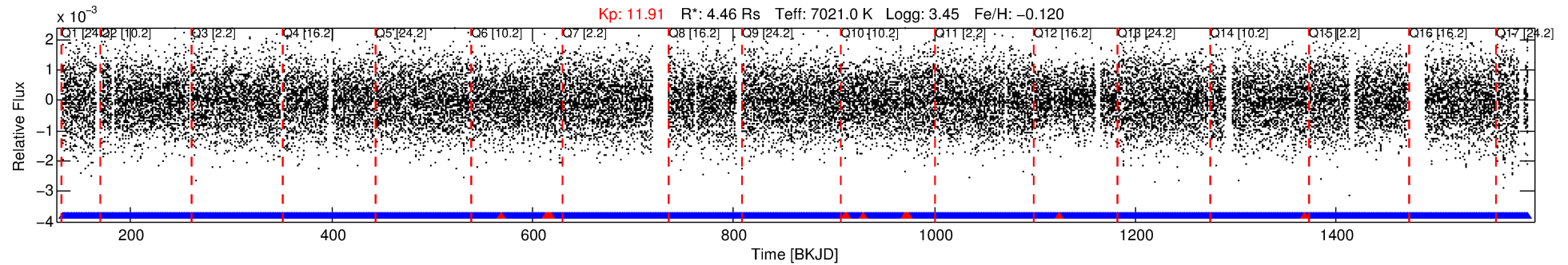
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008842494-03

No Significant Match Found

# DV One-Page Summary

KIC: 8842494 Candidate: 3 of 4 Period: 0.559 d



## DV Fit Results:

Period = 0.55924 [0.00001] d  
Epoch = 132.0010 [0.0027] BKJD  
Rp/R\* = 0.0114 [0.0053]  
a/R\* = 1.16 [0.86]  
b = 0.90 [0.59]  
Seff = N/A  
Teq = N/A  
Rp = 5.54 [4.16] Re  
Ag = N/A  
Teffp = N/A

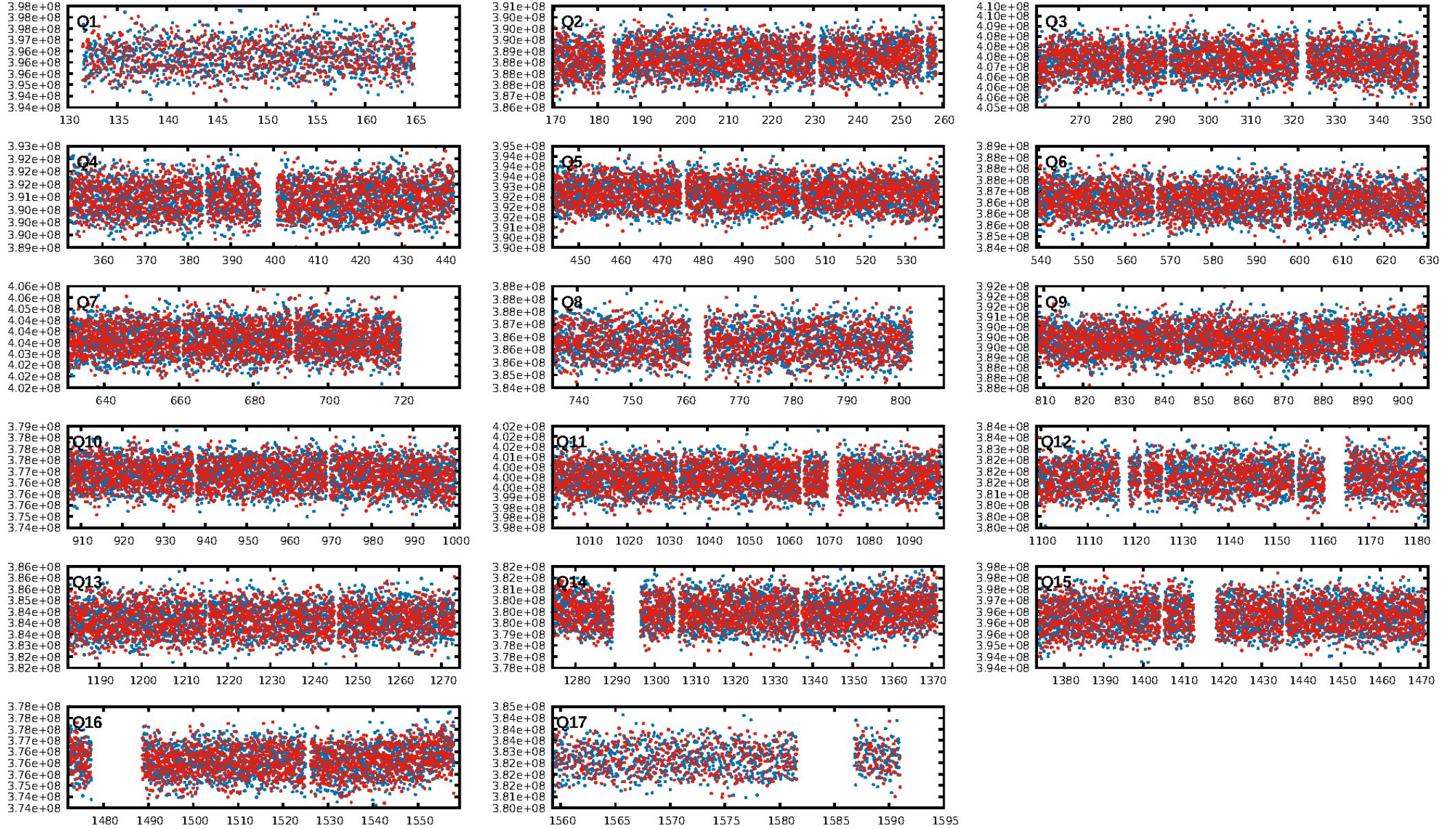
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 89.2% [1.61 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.10e-05  
RollingBand-fgt: 0.99 [1590/1603]  
GhostDiagnostic-chr: 2.121  
Centroid-sig: 0.0%  
Centroid-so: 0.450 arcsec [3.59 $\sigma$ ]  
OotOffset-rm: 0.163 arcsec [0.27 $\sigma$ ]  
KicOffset-rm: 0.136 arcsec [0.16 $\sigma$ ]  
OotOffset-st: 2/4/4/5 [15]  
KicOffset-st: 2/4/4/5 [15]  
DiffImageQuality-fgm: 0.73 [11/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:13:04 Z

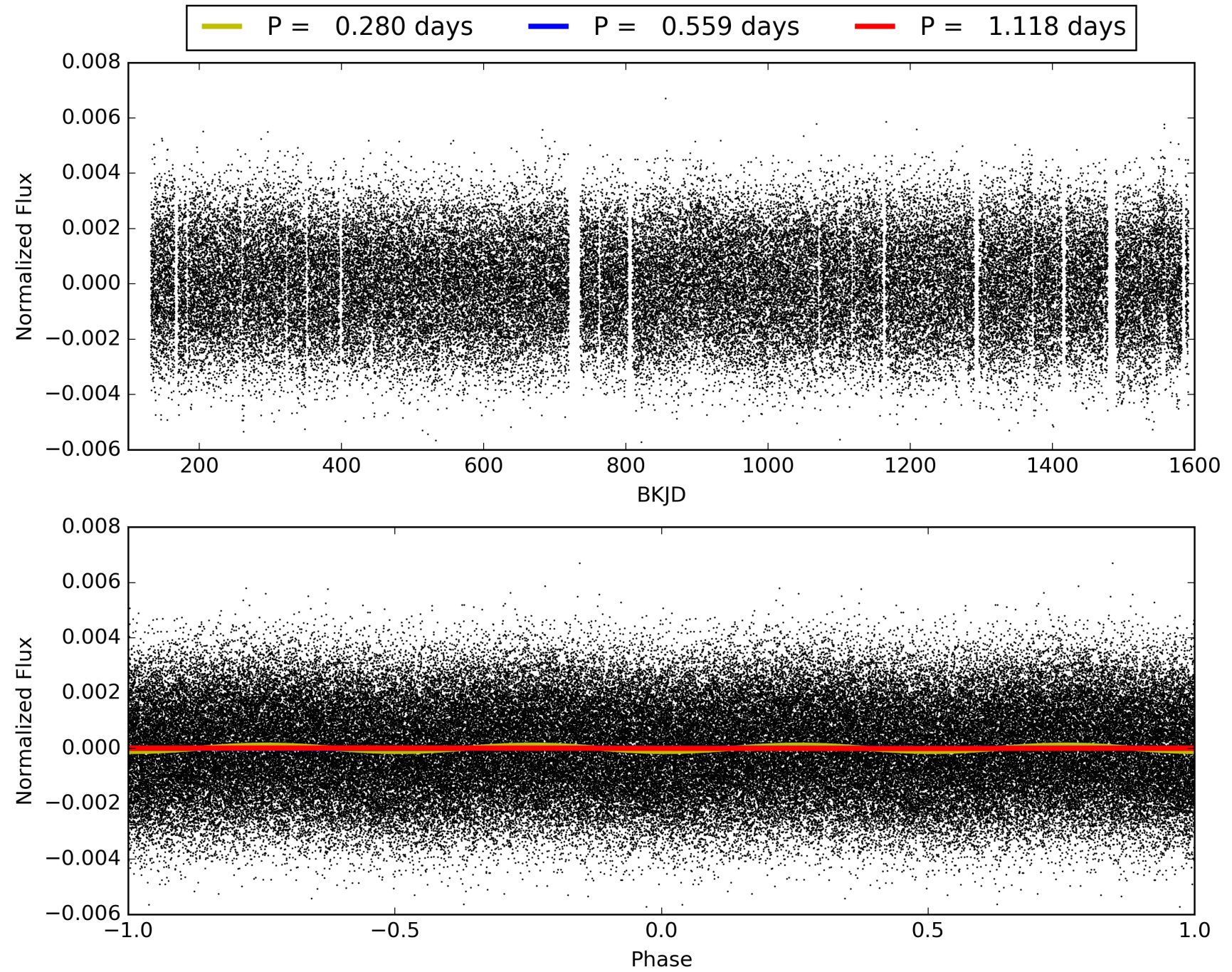
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008842494-03, PDC Light Curves



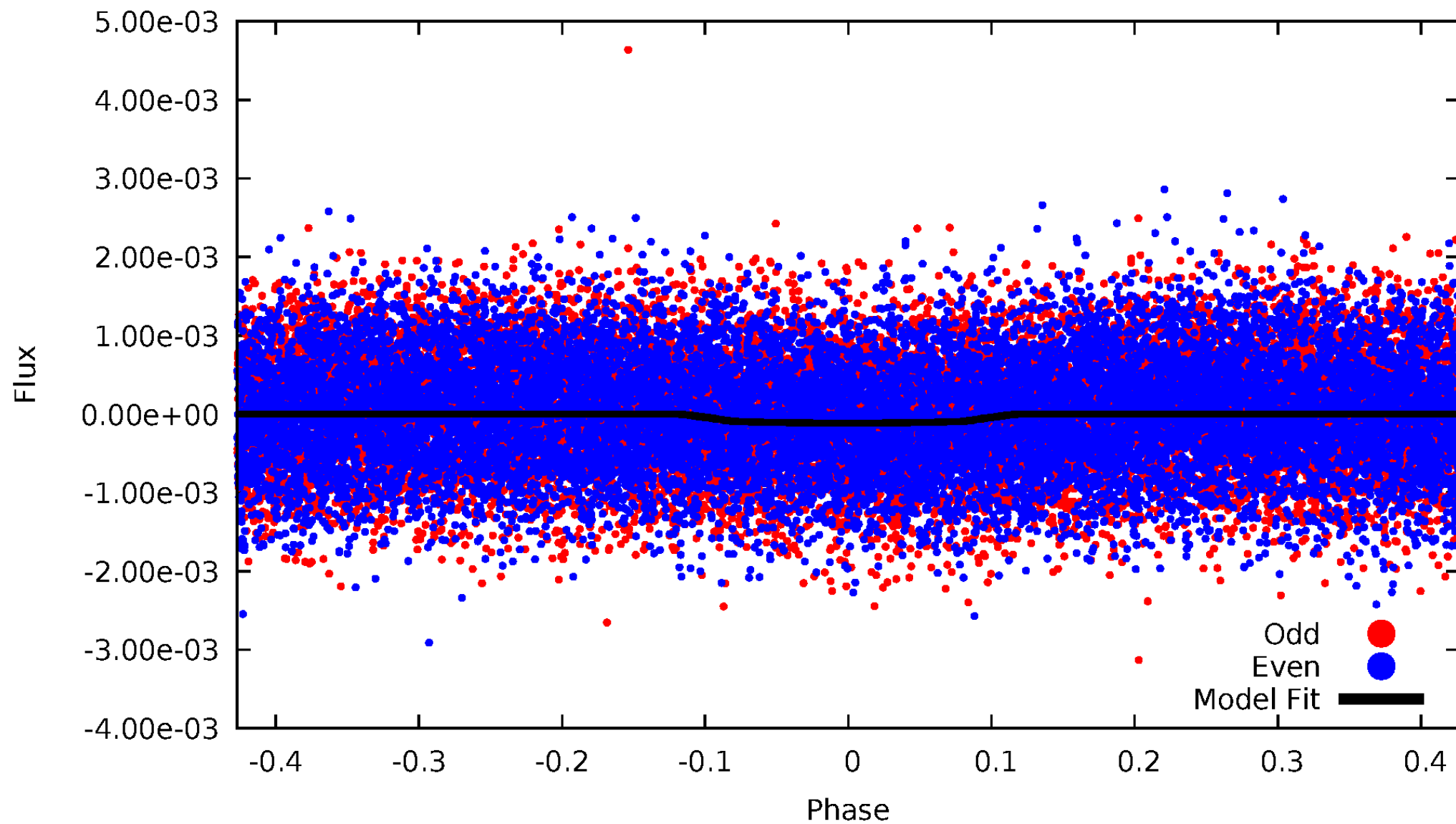


# TCE 008842494-03



# DV Odd/Even

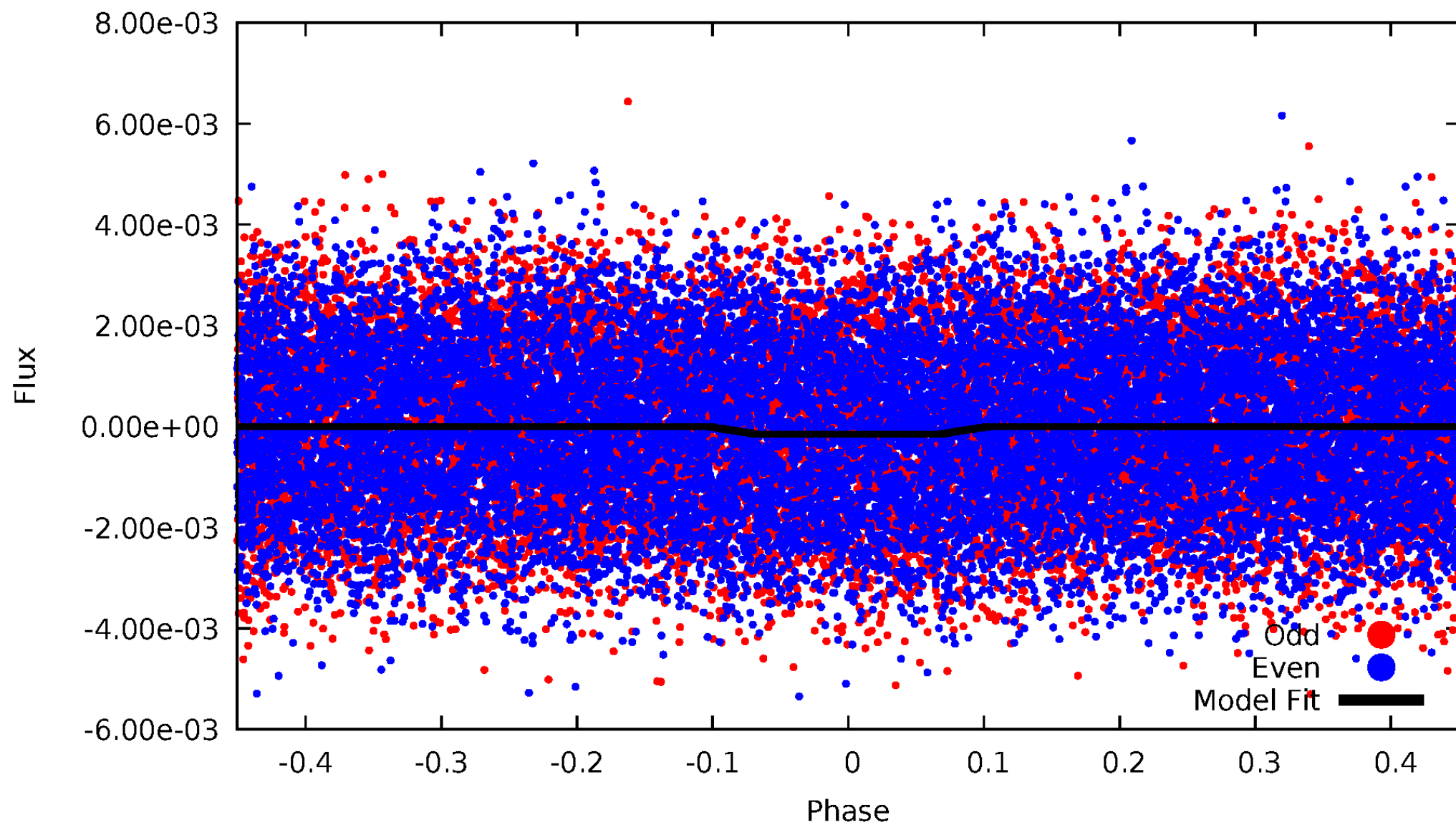
TCE 008842494-03





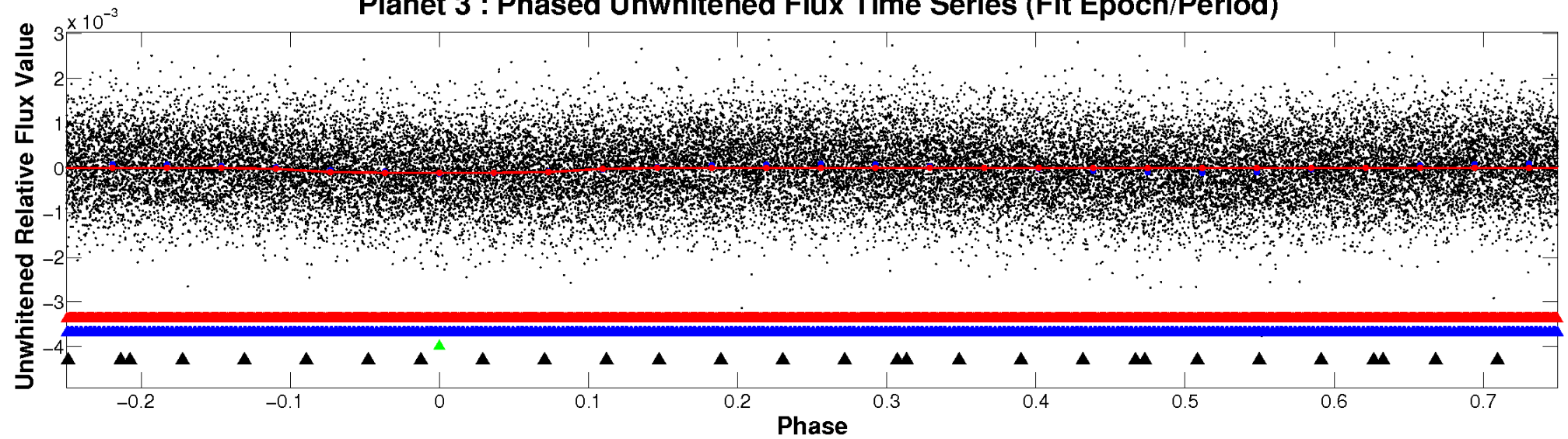
# ALT Odd/Even

TCE 008842494-03

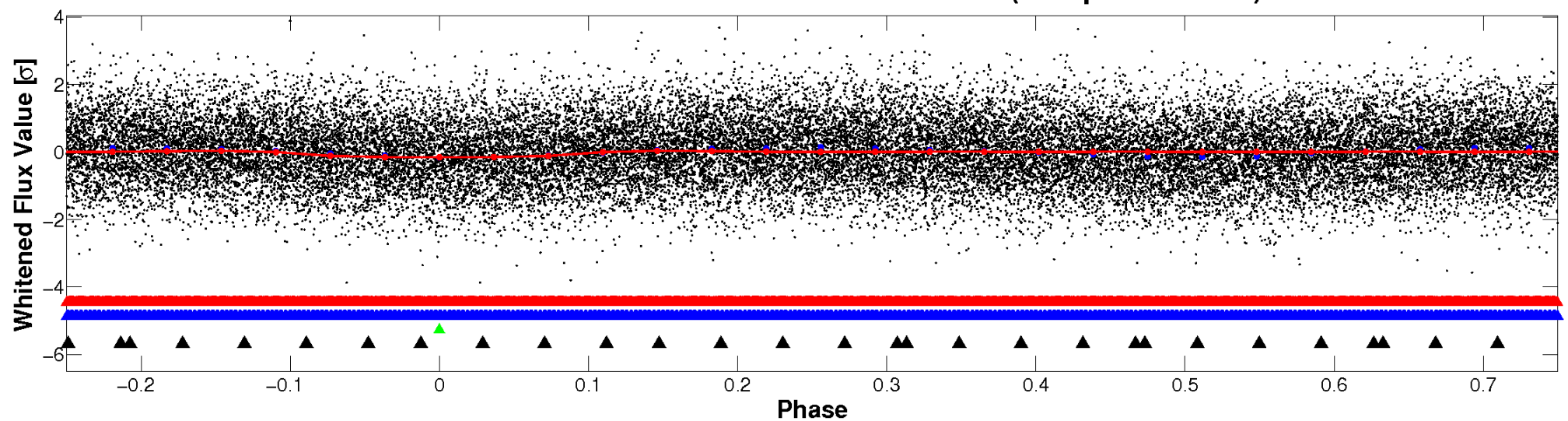


# Non-Whitened Vs. Whitened Light Curve

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

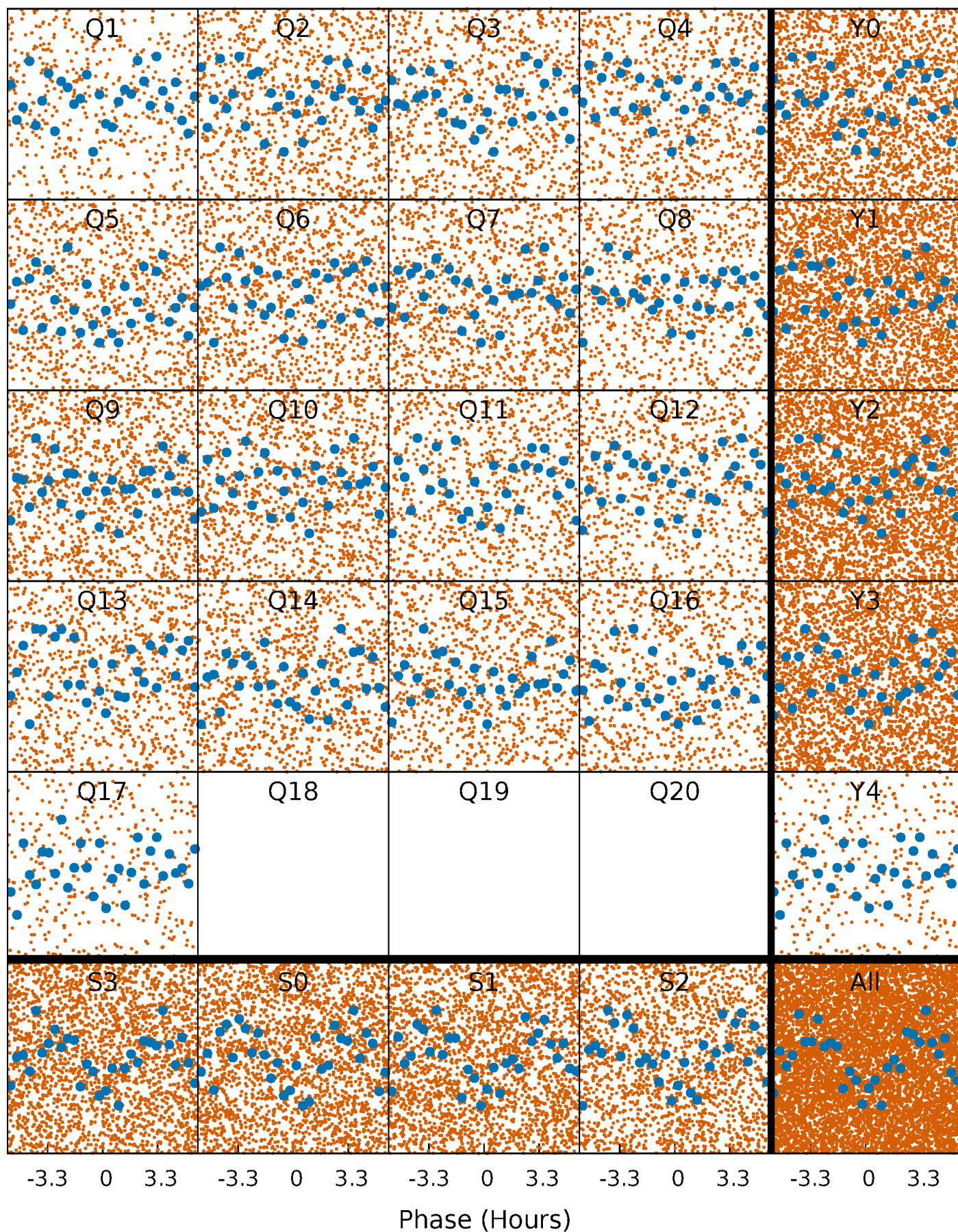


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

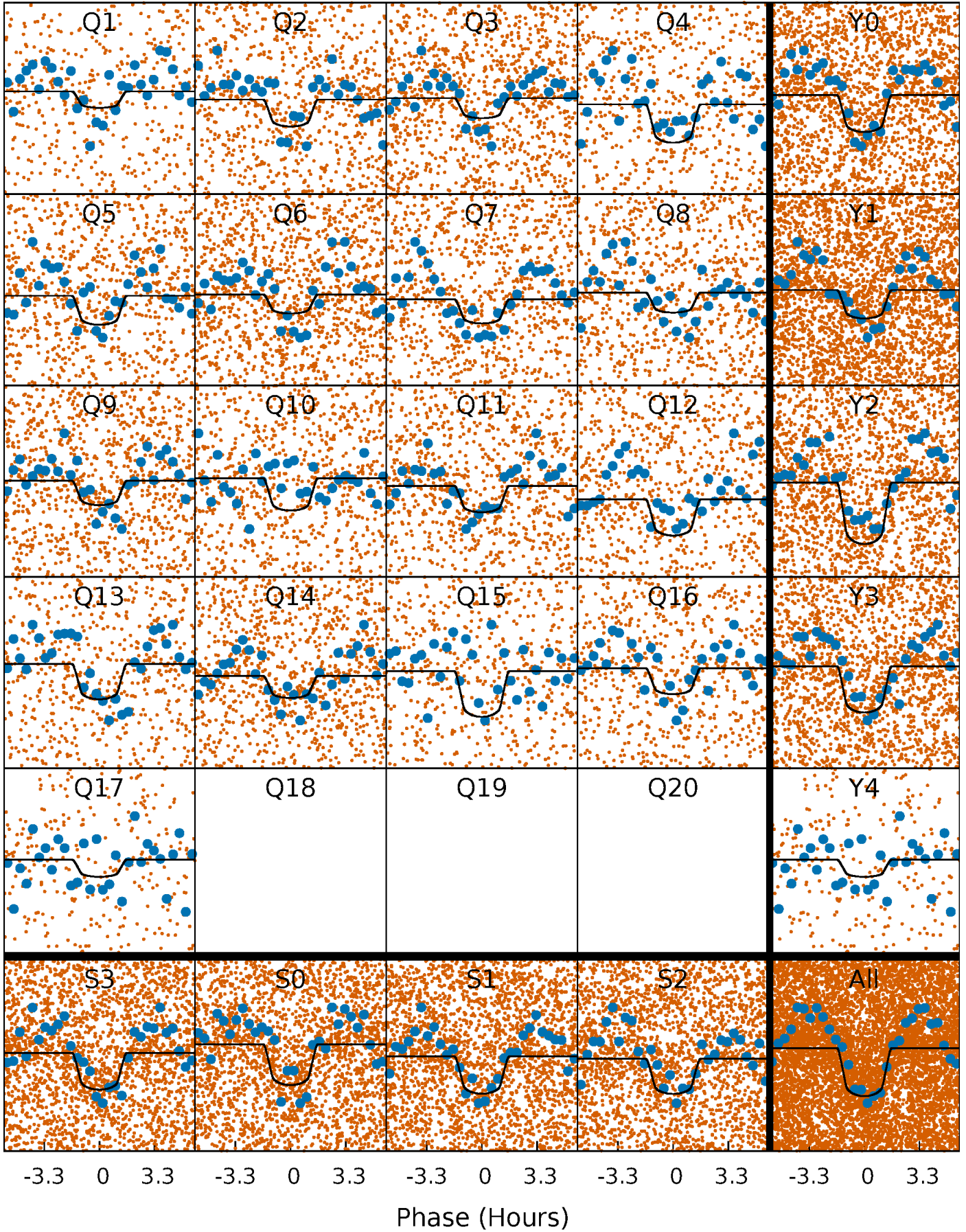
TCE 008842494-03 P= 0.559243 Days  $T_0=132.001031$  (BKJD)





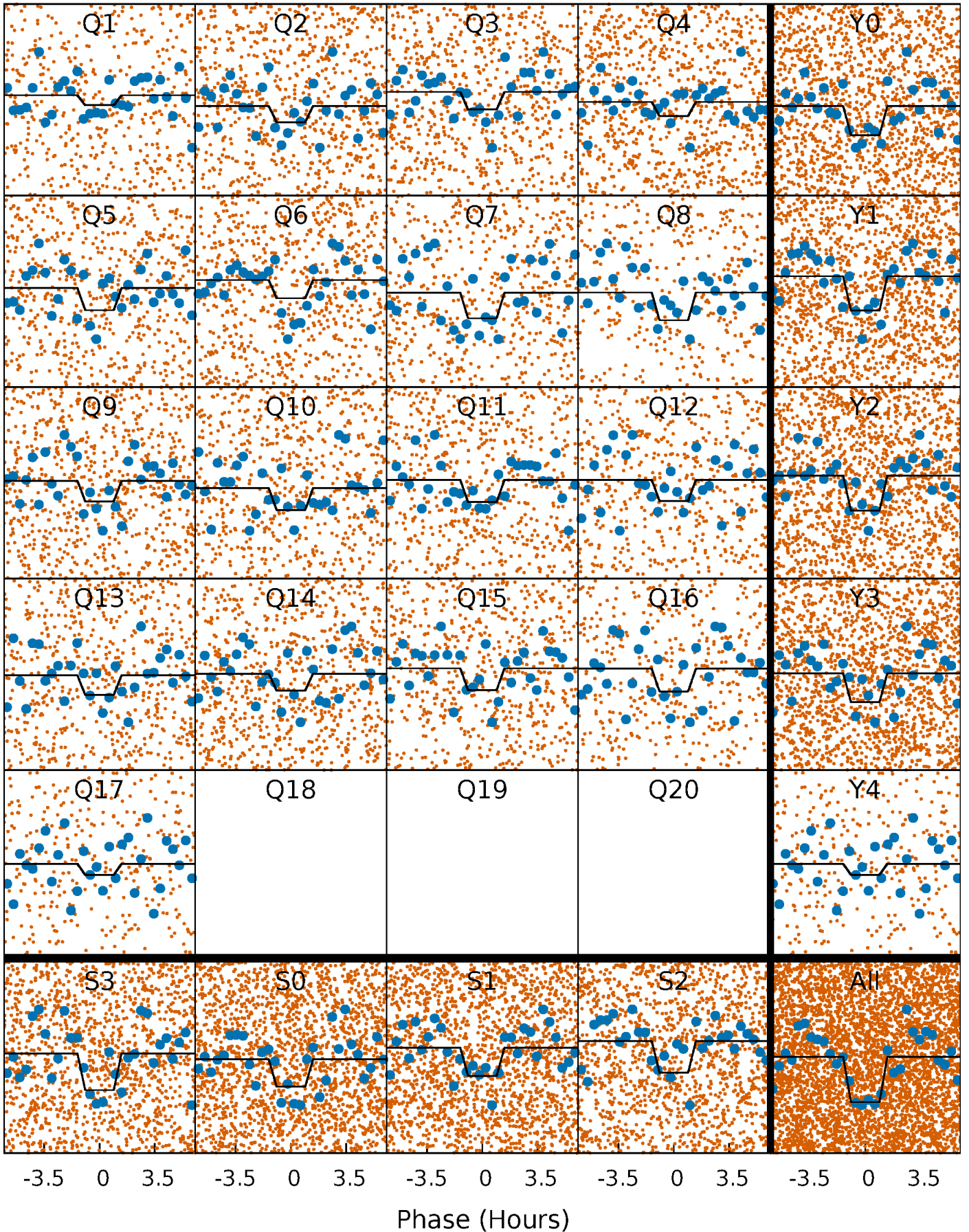
# DV Quarter-Phased Transit Curves

TCE 008842494-03 P= 0.559243 Days  $T_0=132.001031$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008842494-03 P= 0.559248 Days  $T_0=131.999114$  (BKJD)

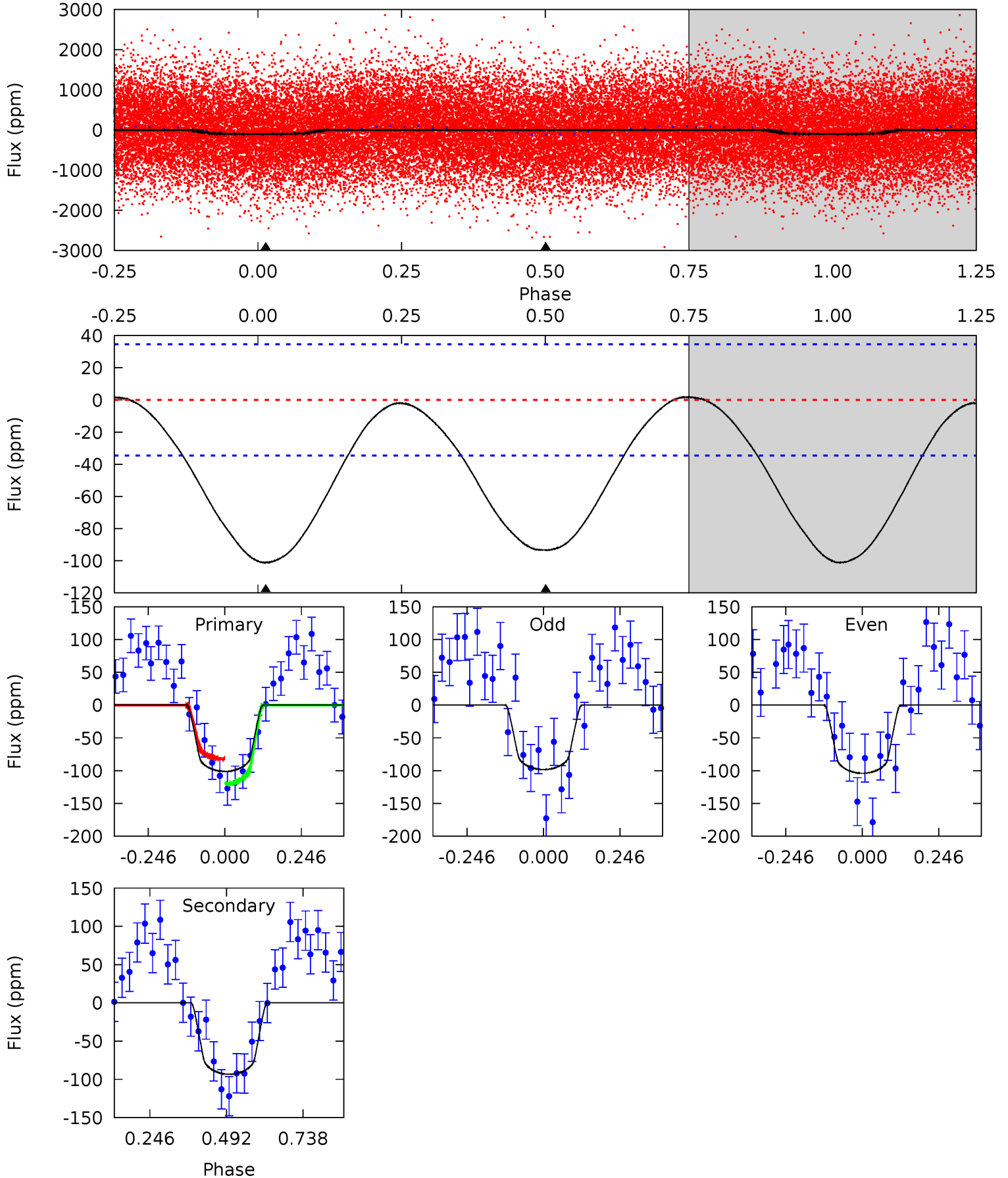




# DV Model-Shift Uniqueness Test

008842494-03, P = 0.559243 Days, E = 131.441788 Days

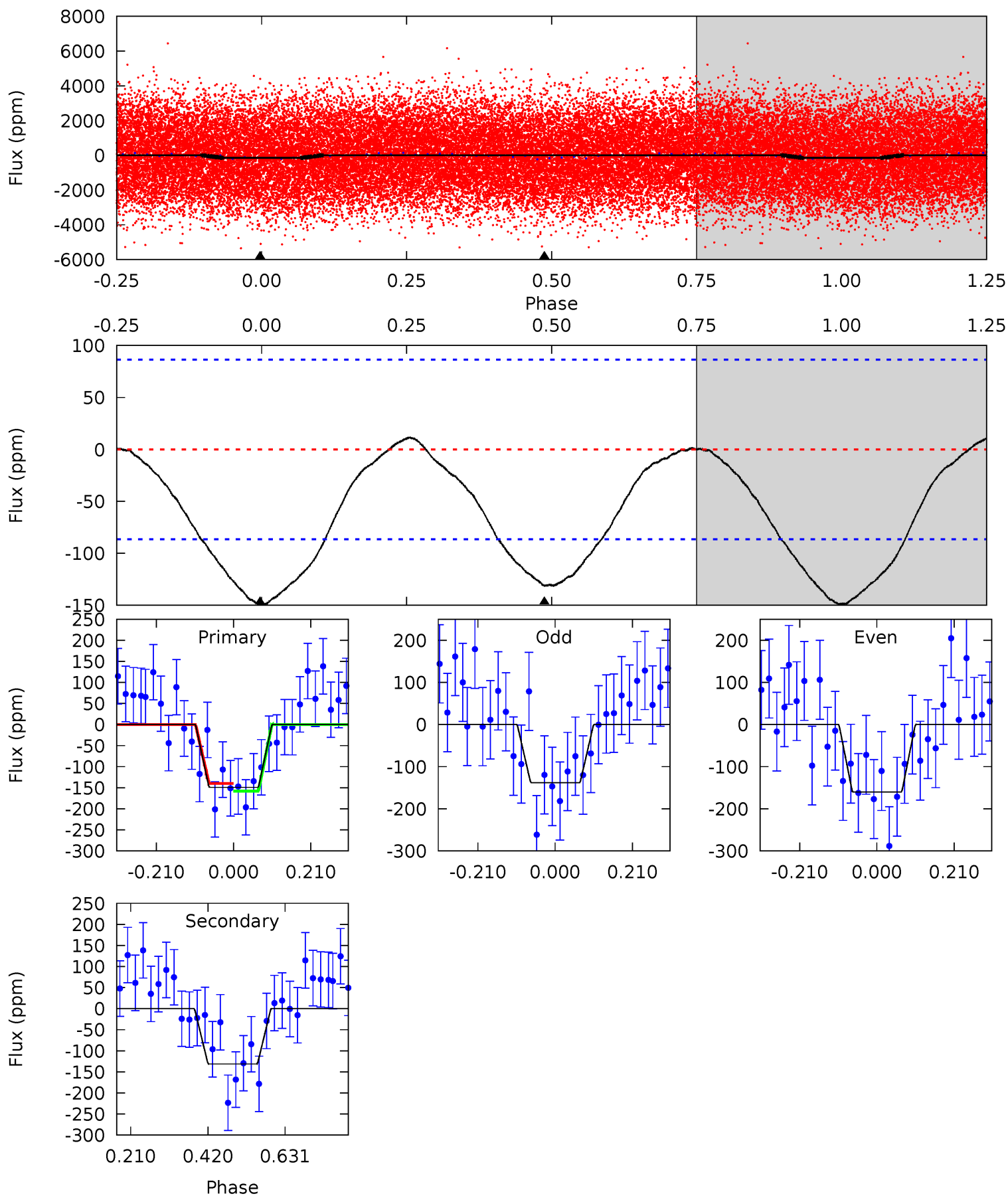
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	11.8	0	0	4.37	1.16	0.26	12.8	12.8	11.8	11.8	0.36	1.25	0.02	2.39



# Alt Model-Shift Uniqueness Test

008842494-03, P = 0.559248 Days, E = 131.439866 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
7.60	6.70	0	0	4.41	1.25	0.27	7.60	7.60	6.70	6.70	0.56	1.13	0.07	0.45



### Stellar Parameters For KIC 008842494

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7021^{+194}_{-292}$	$3.450^{+0.648}_{-0.072}$	$-0.120^{+0.250}_{-0.300}$	$4.457^{+0.308}_{-2.618}$	$2.041^{+0.073}_{-0.659}$	$0.032^{+0.337}_{-0.008}$
	+3%/-4%	+19%/-2%	+208%/-250%	+7%/-59%	+4%/-32%	+1039%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008842494-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-93 \pm 8$	$4.75^{+2.75}_{-2.19}$	$6786^{+431}_{-998}$	$5381^{+2819}_{-9287}$	$0.623^{+1.515}_{-0.377}$
Alt.	$-131 \pm 20$	$5.35^{+2.81}_{-2.50}$	$6819^{+431}_{-975}$	$5641^{+3129}_{-8690}$	$0.685^{+1.733}_{-0.394}$

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

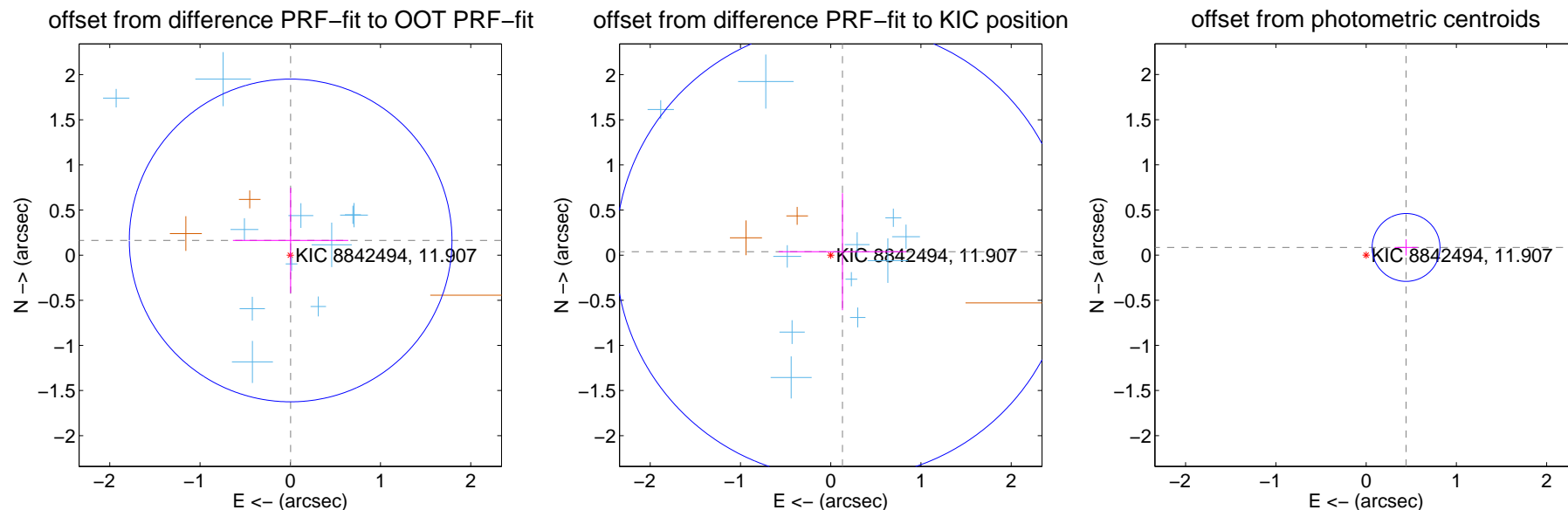
## DV Centroid Data

Supplemental centroid analysis for 008842494-03. **Kepler magnitude: 11.91.** Transit SNR 11.14

There are 11 quarters with good PRF difference image offsets

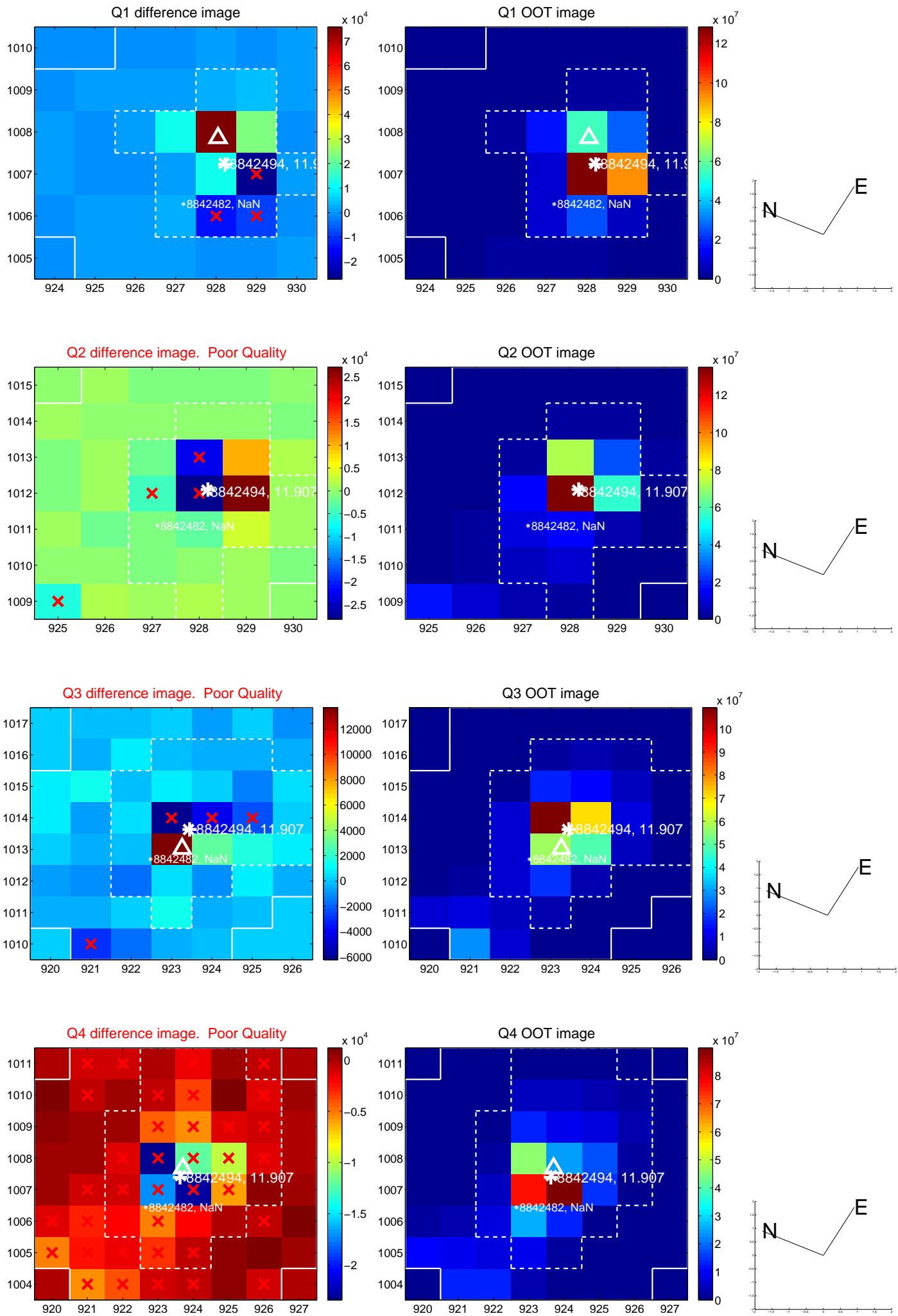
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.163 \pm 0.596$	0.27	$-0.004 \pm 0.639$	$0.163 \pm 0.583$
PRF-fit source offset from KIC position	$0.136 \pm 0.838$	0.16	$-0.131 \pm 0.708$	$0.038 \pm 0.648$
photometric centroid source offset	<b><math>0.45 \pm 0.13</math></b>	<b>3.59</b>	$-0.44 \pm 0.13$	$0.08 \pm 0.09$



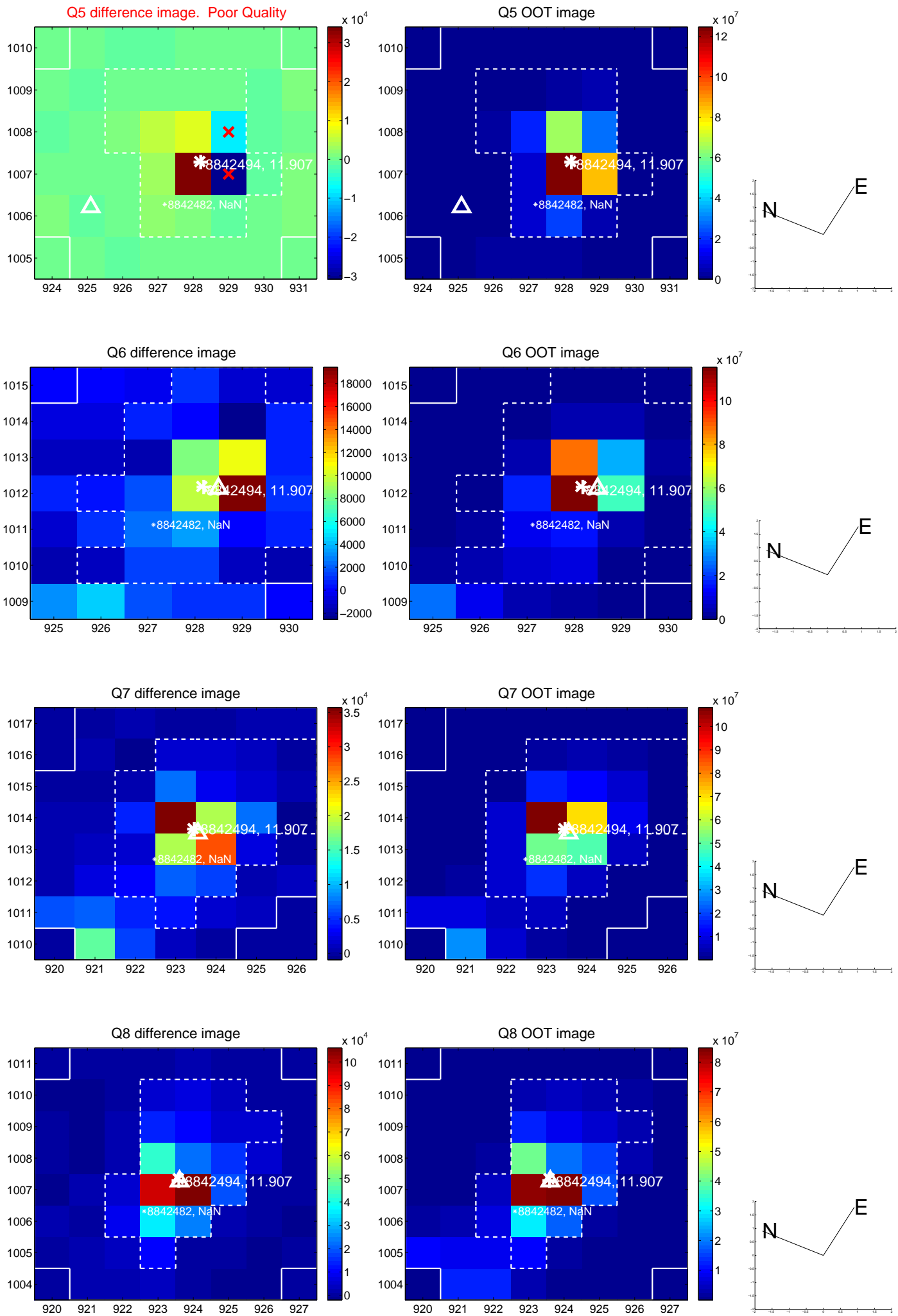
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

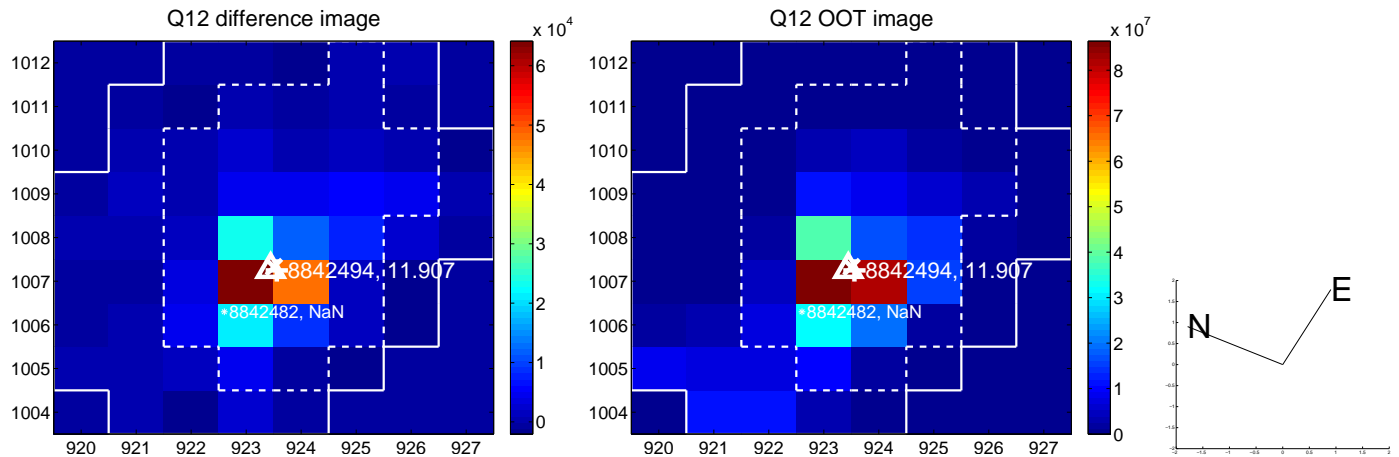
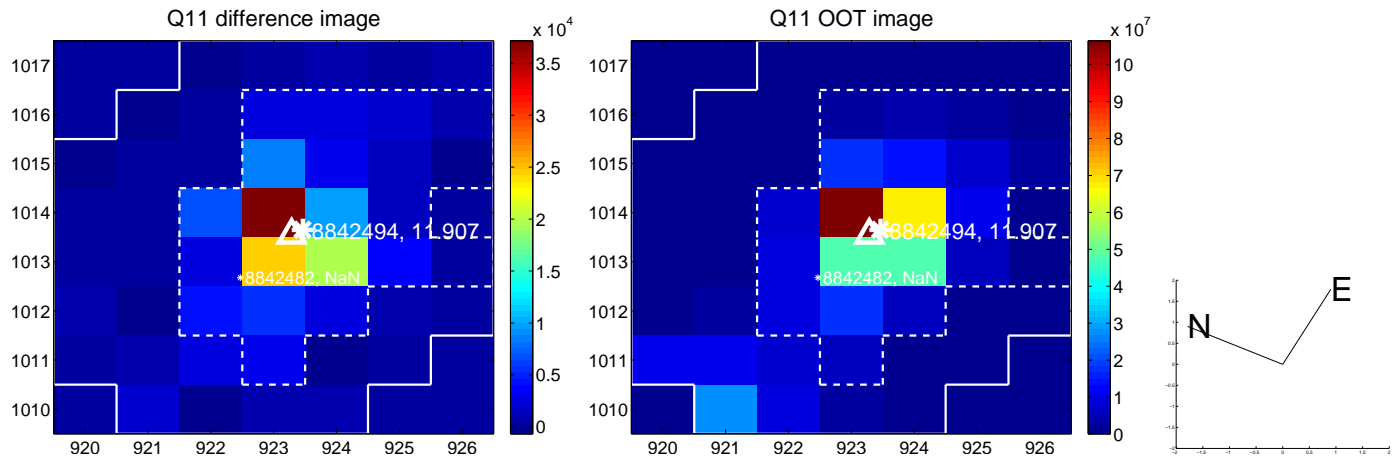
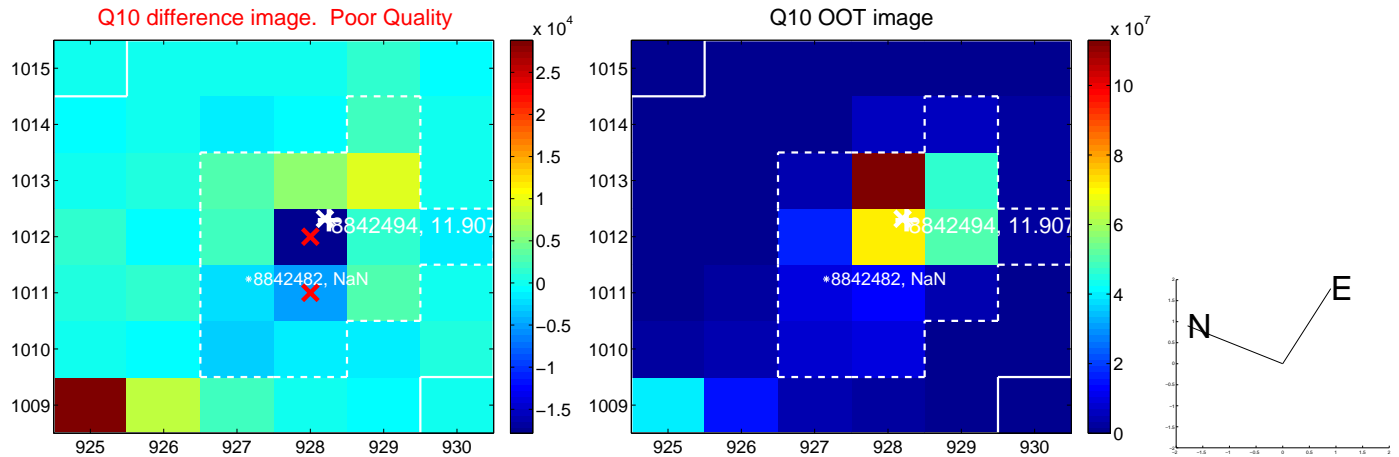
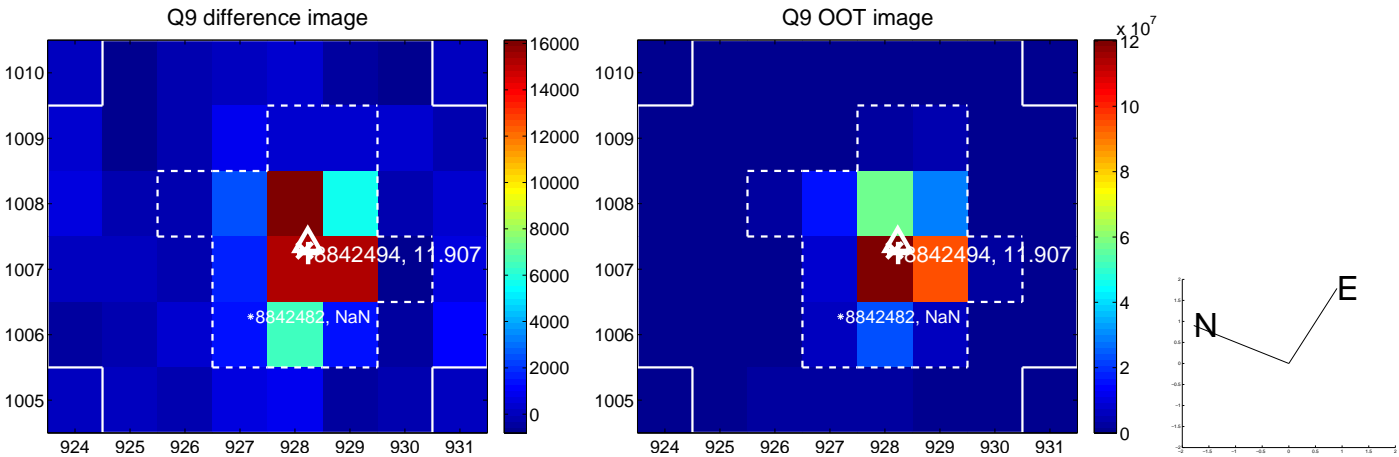




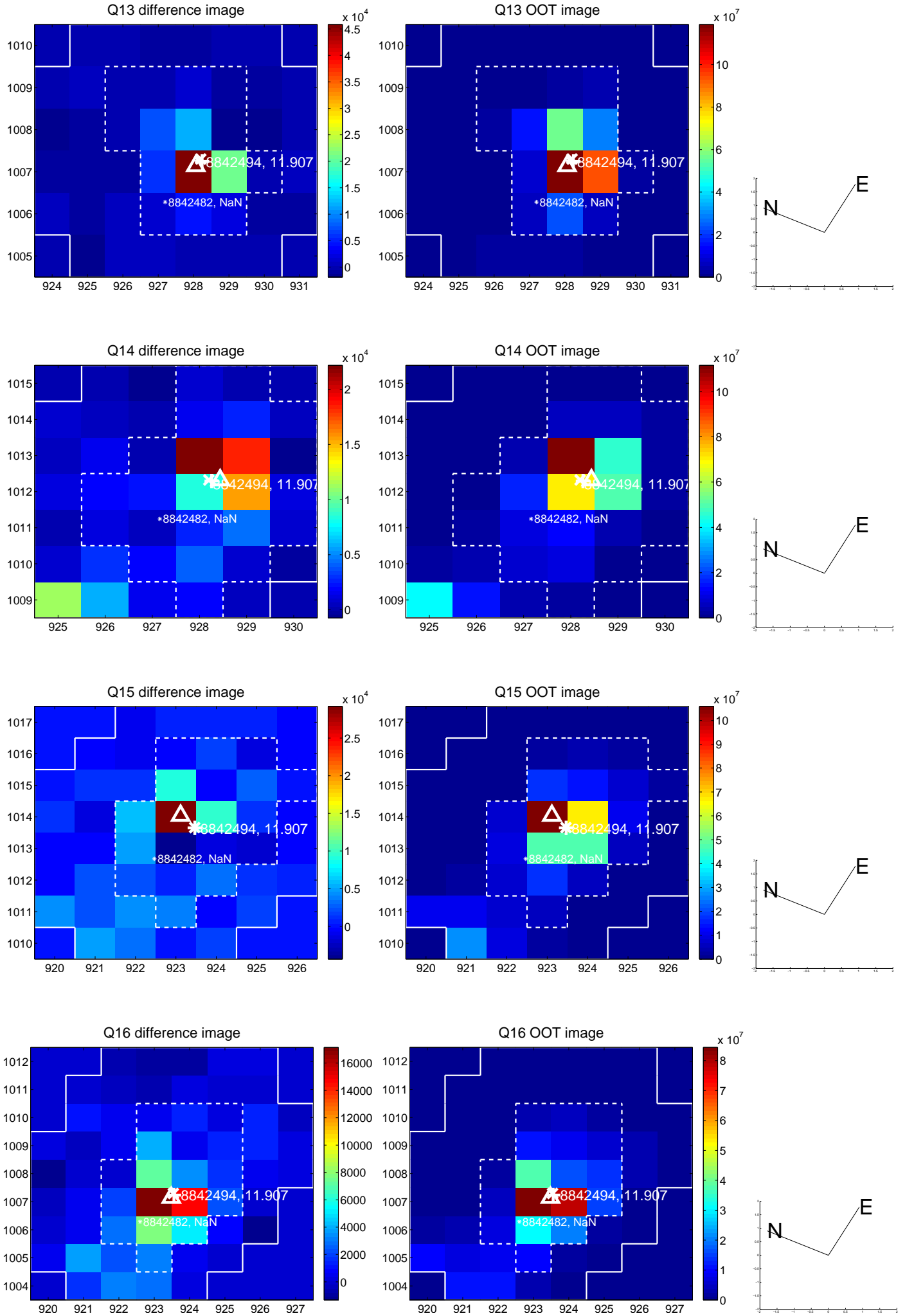
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



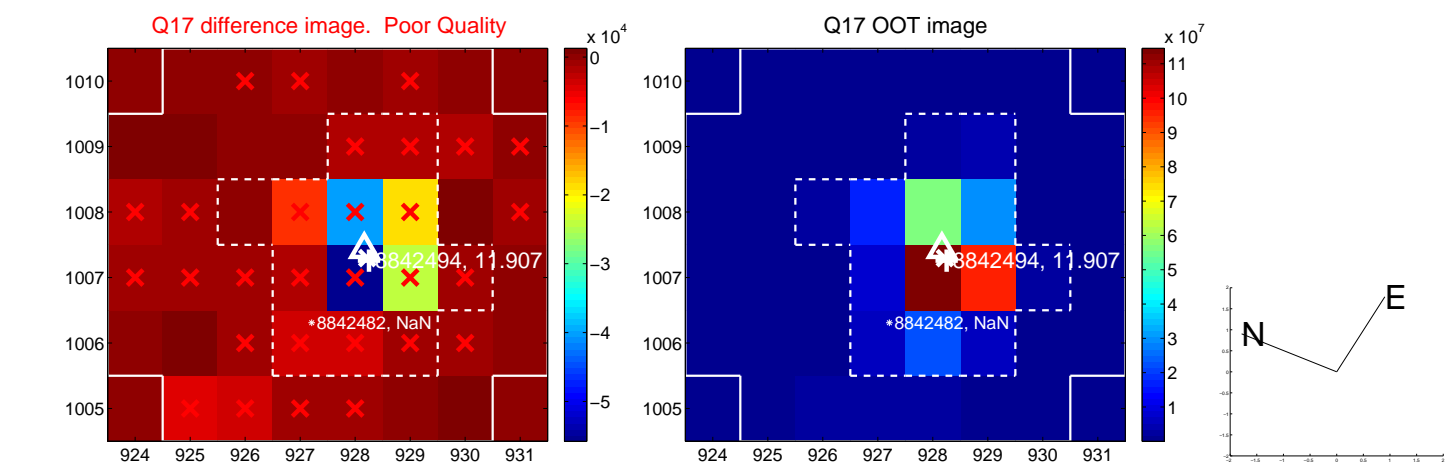
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



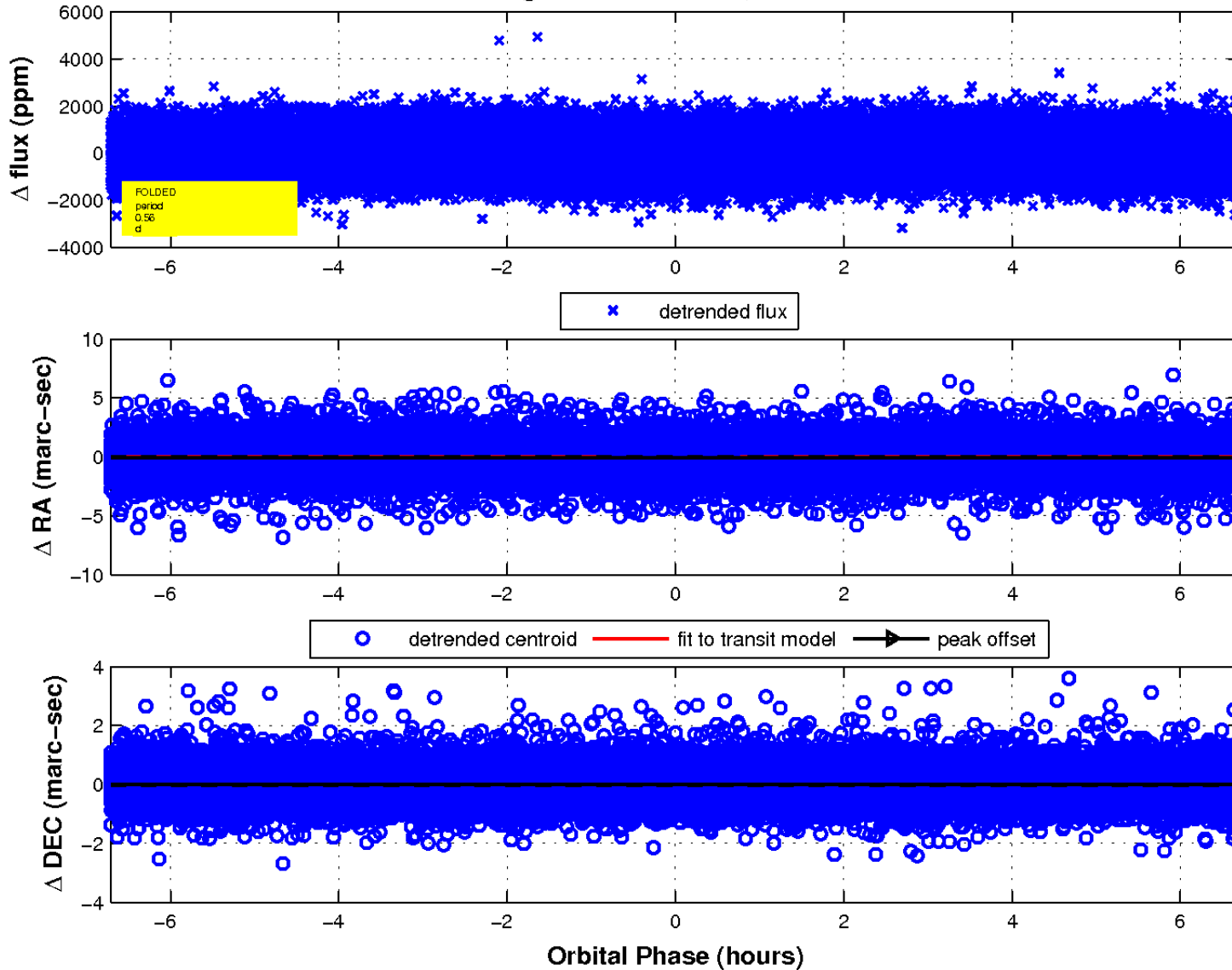
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

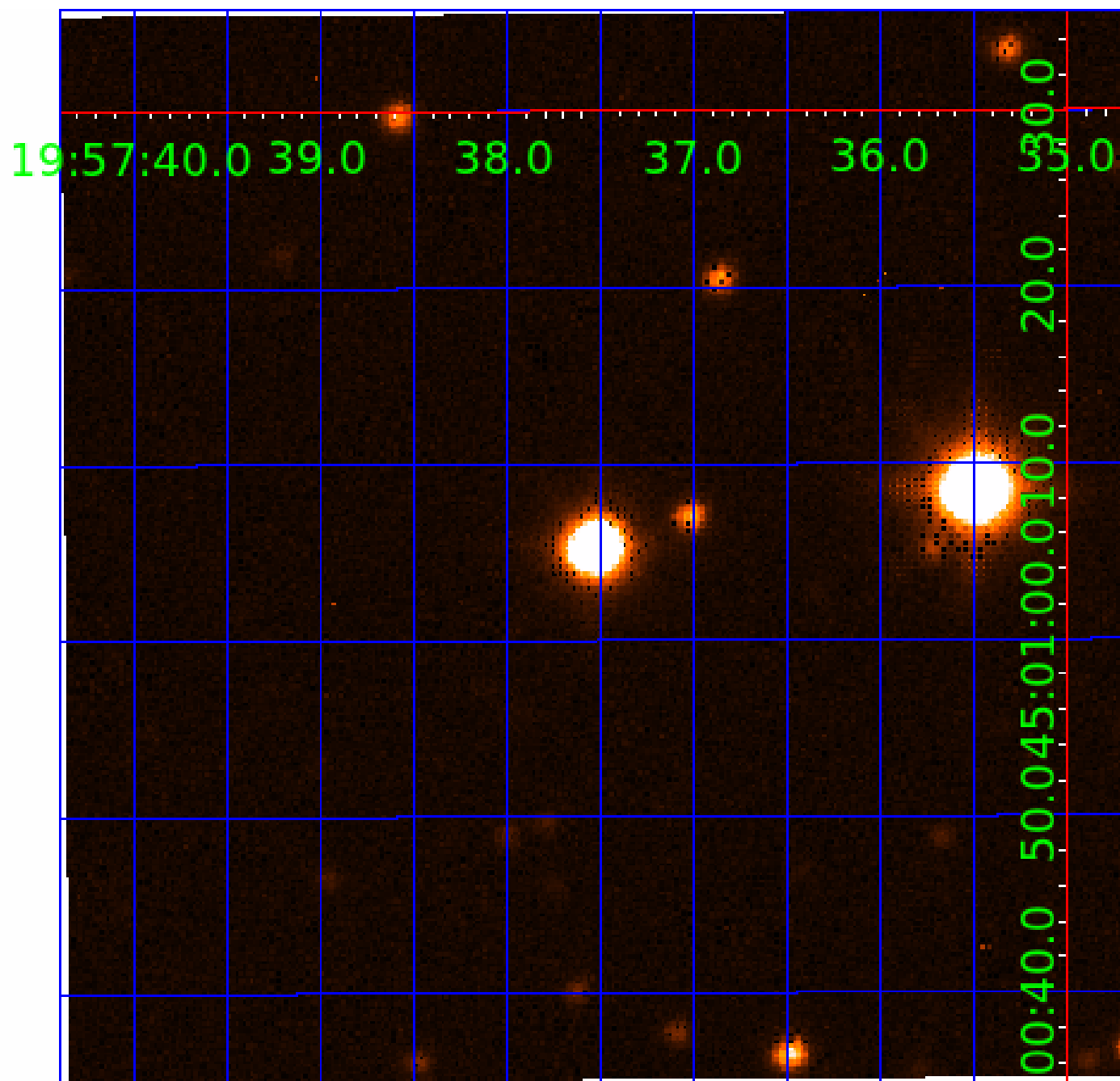


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination





# KIC 008842494

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008842494-01	OBS	No	0.775620	131.705887	99.1	1.492	10.0	10.4	4.46	7021	4.77	98398.11
008842494-02	OBS	No	0.929230	131.850111	102.1	2.096	8.7	9.1	4.46	7021	5.25	77331.18
008842494-03	OBS	No	0.559243	132.001031	113.9	2.865	7.8	11.1	4.46	7021	5.54	0.00
008842494-04	OBS	No	49.683295	163.758395	766.7	2.856	7.7	7.4	4.46	7021	13.96	383.92

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008842494-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
008842494-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
008842494-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

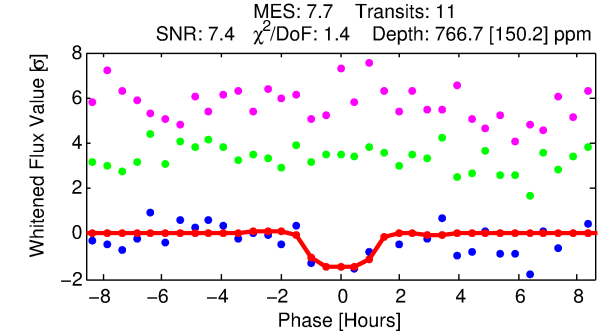
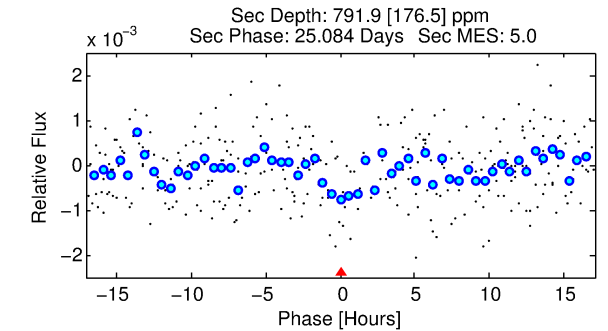
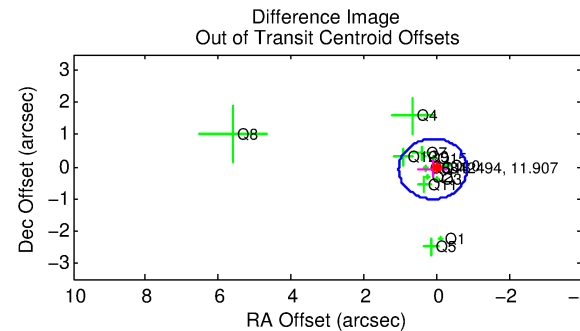
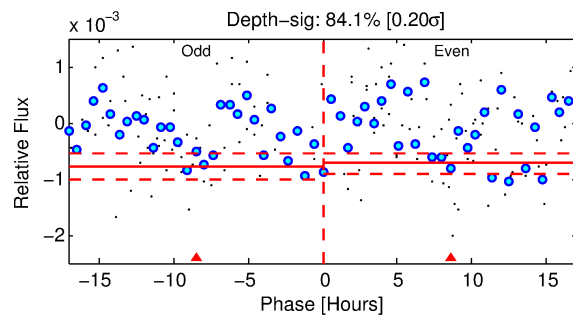
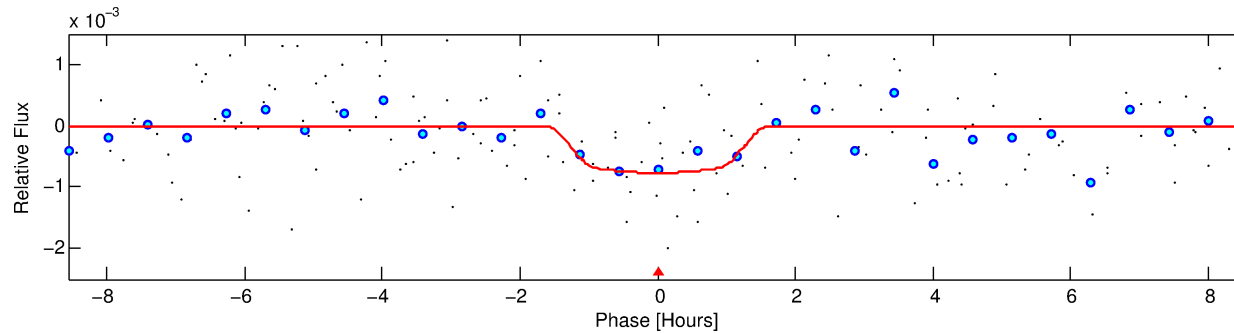
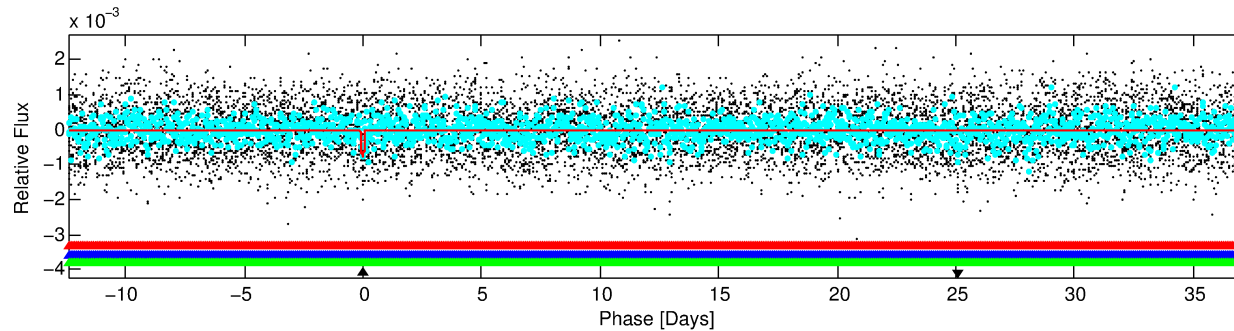
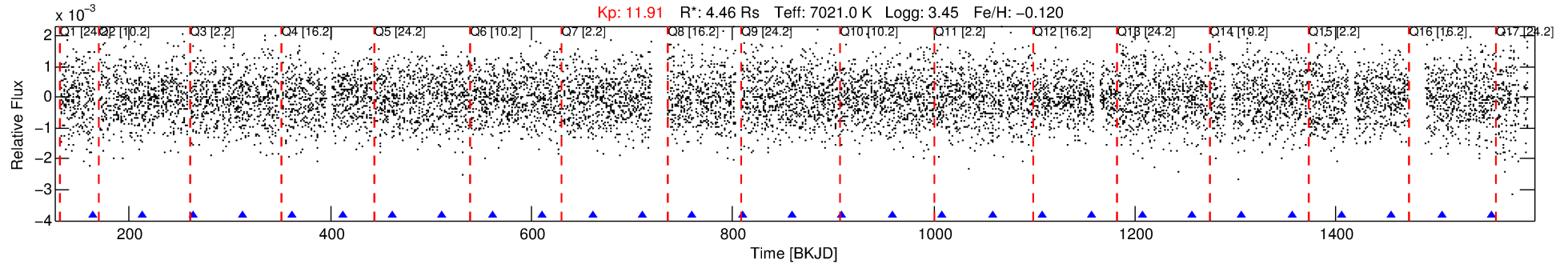
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008842494-04

No Significant Match Found

# DV One-Page Summary

KIC: 8842494 Candidate: 4 of 4 Period: 49.683 d



## DV Fit Results:

Period = 49.68330 [0.00074] d  
Epoch = 163.7584 [0.0118] BKJD  
Rp/R\* = 0.0287 [0.0207]  
a/R\* = 76.11 [313.36]  
b = 0.85 [1.31]  
Seff = 383.92 [415.36]  
Teq = 1129 [305] K  
Rp = 13.96 [12.98] Re  
a = 0.3356 [0.2125] AU  
Ag = 251.72 [454.95] [0.55 $\sigma$ ]  
Teffp = 6951 [2549] K [2.27 $\sigma$ ]

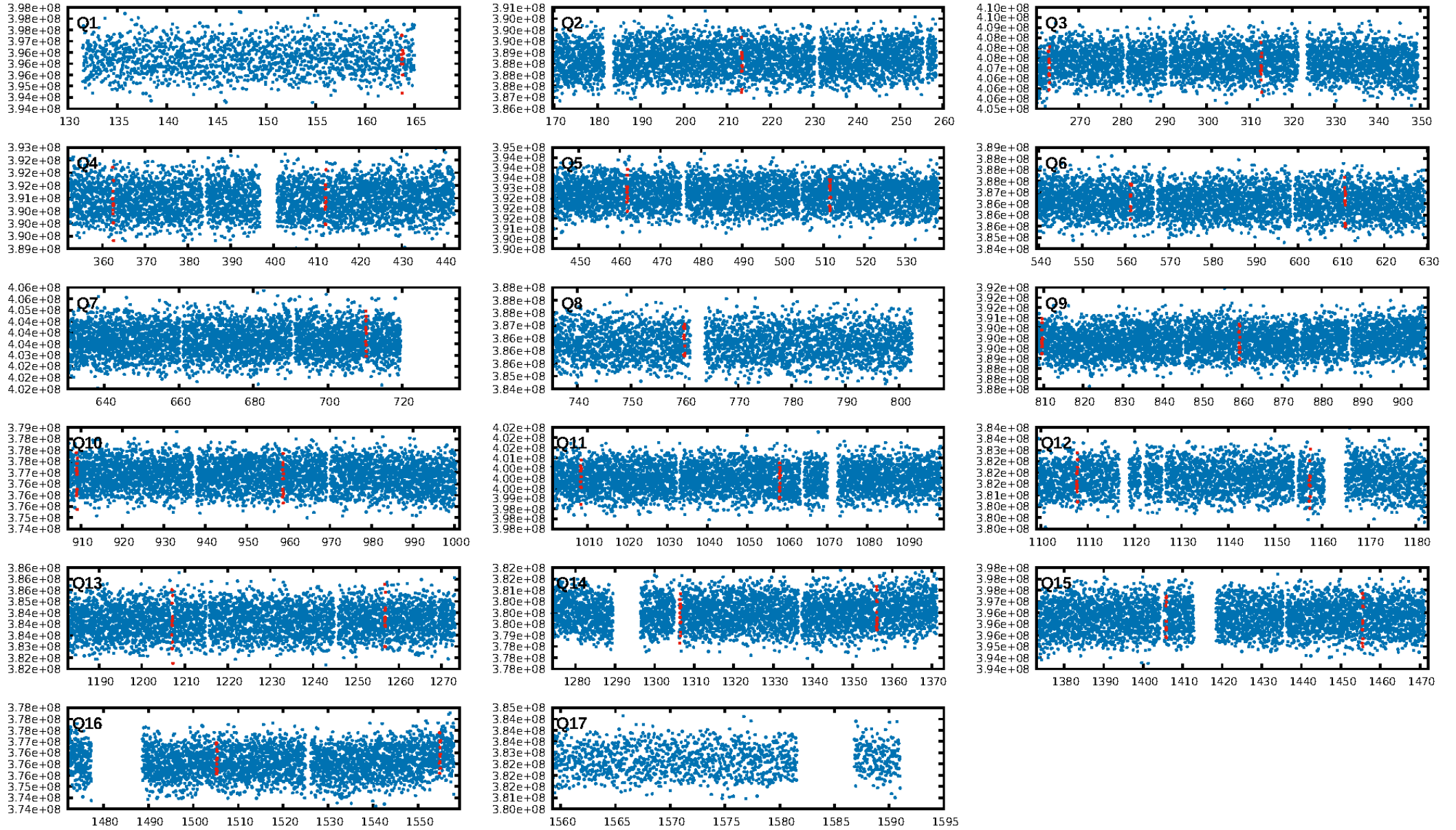
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [330.32 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 28.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.20e-08**  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 0.04767  
Centroid-sig: 0.5%  
**Centroid-so: 0.869 arcsec [4.88 $\sigma$ ]**  
OotOffset-rm: 0.128 arcsec [0.41 $\sigma$ ]  
KicOffset-rm: 0.241 arcsec [0.94 $\sigma$ ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.71 [10/14]  
DiffImageOverlap-fno: 0.00 [0/16]

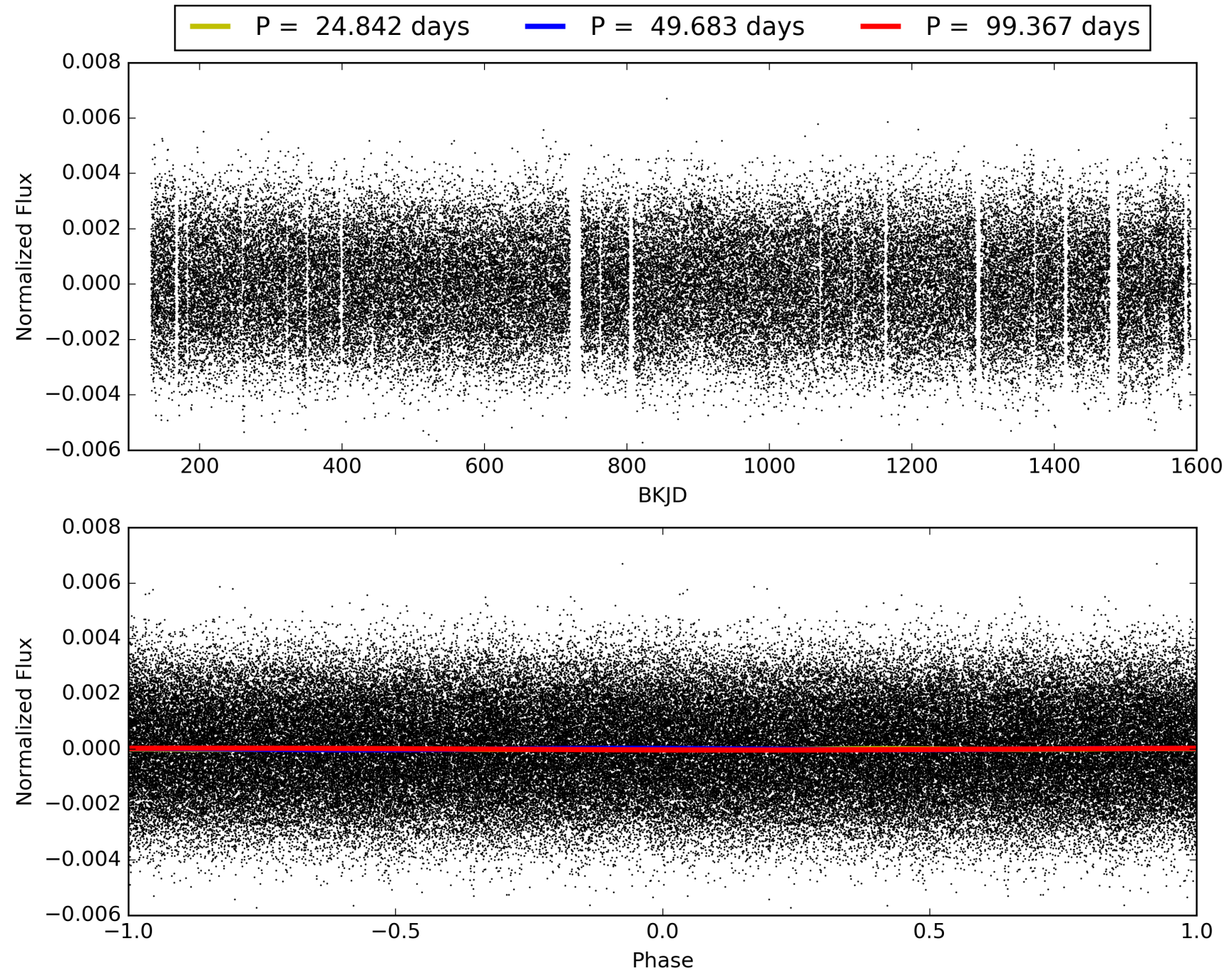
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:13:12 Z

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

# TCE 008842494-04, PDC Light Curves



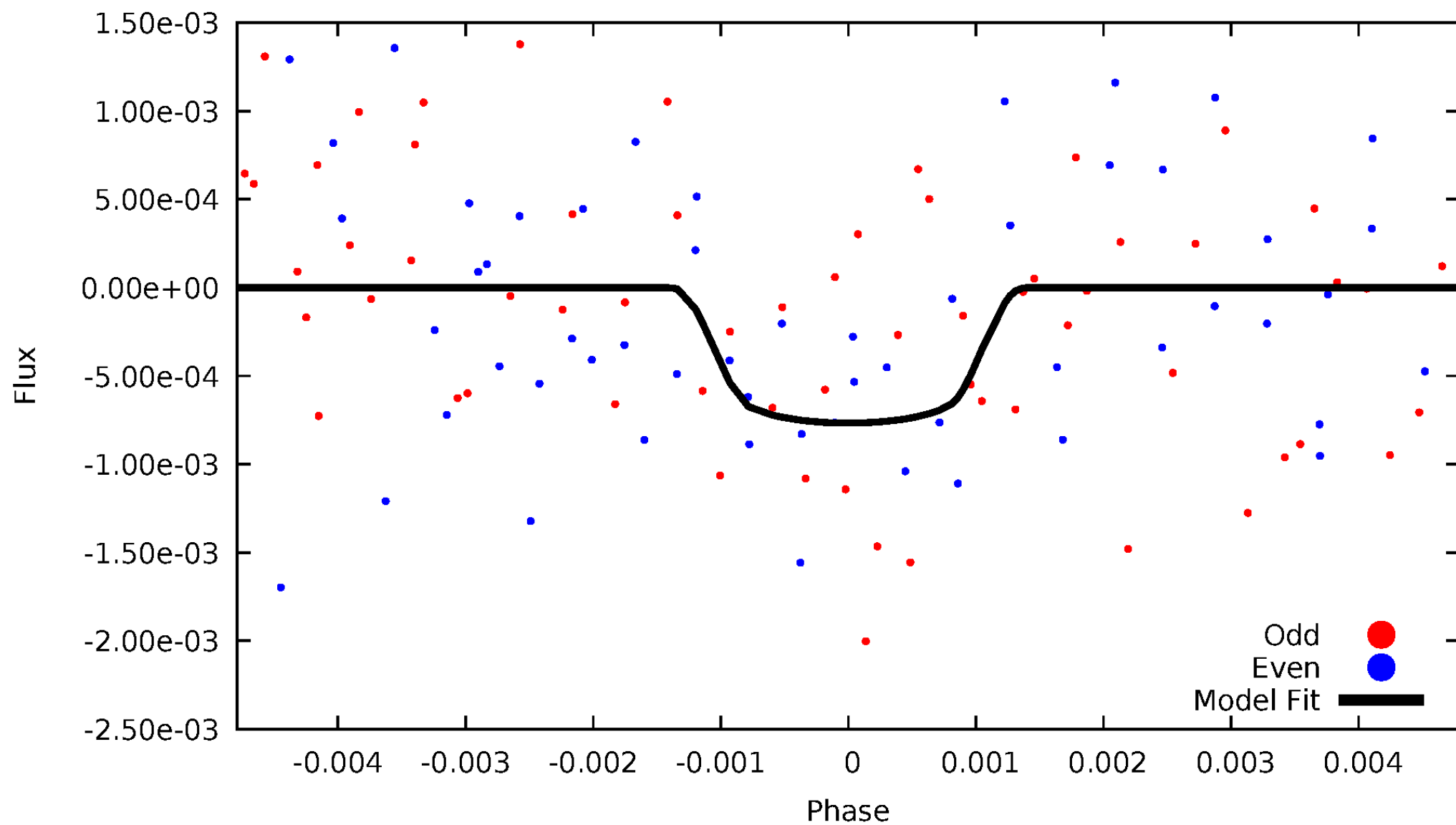
TCE 008842494-04





# DV Odd/Even

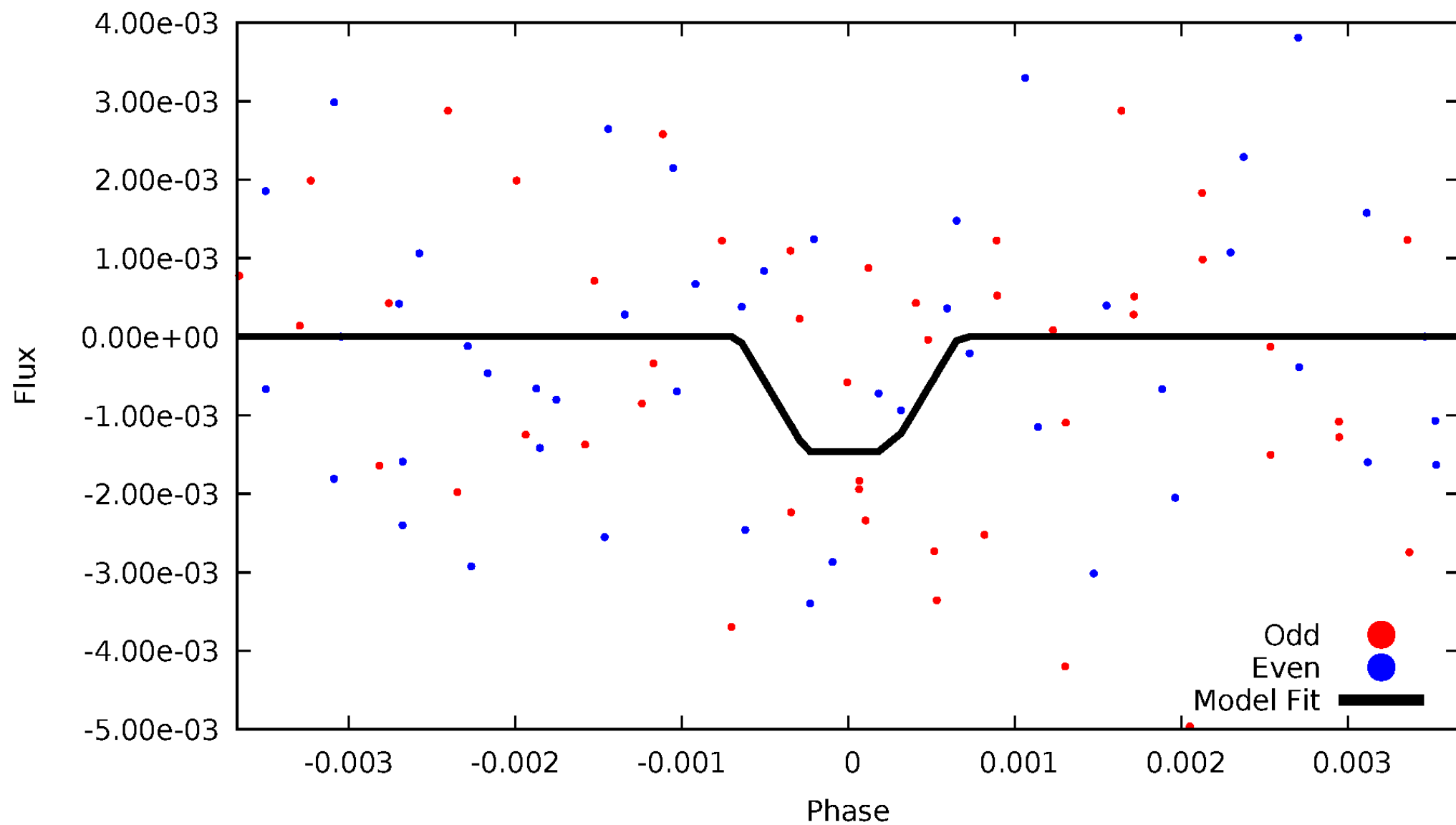
TCE 008842494-04





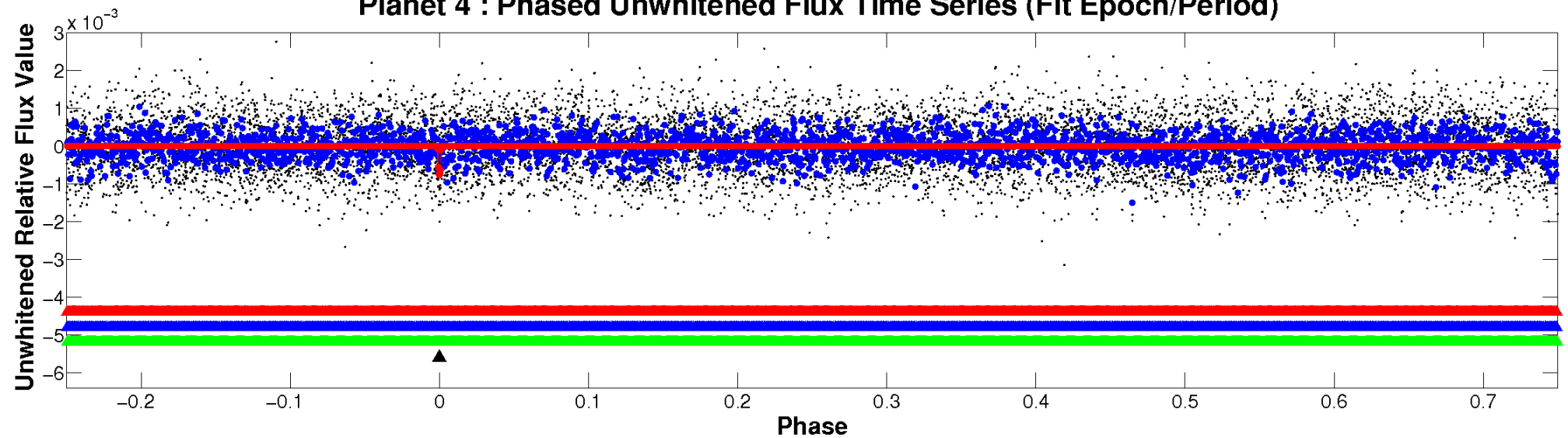
# ALT Odd/Even

TCE 008842494-04

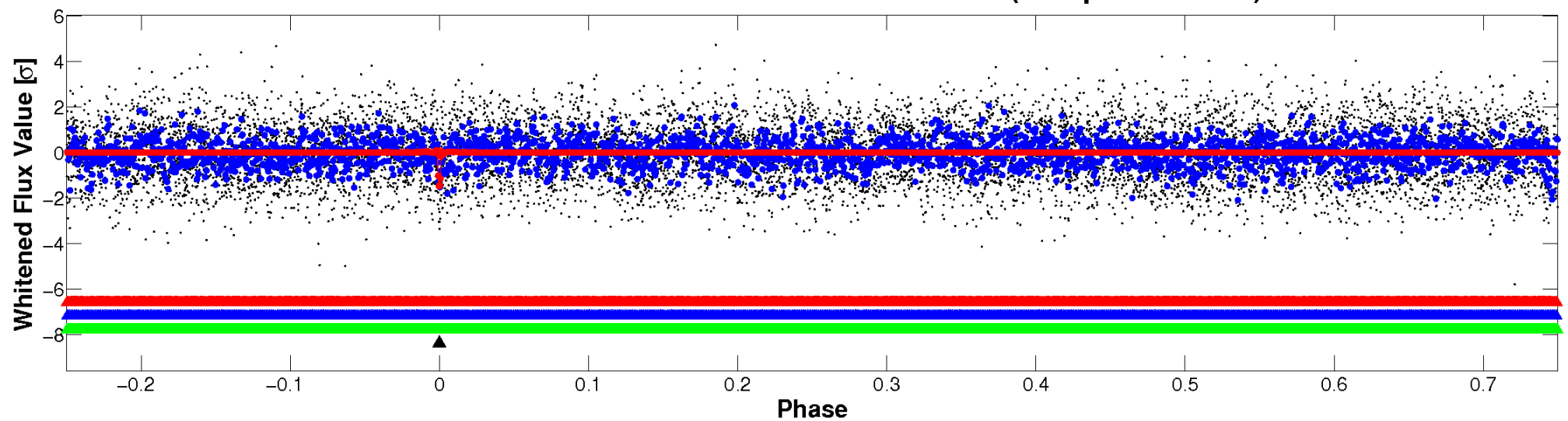


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

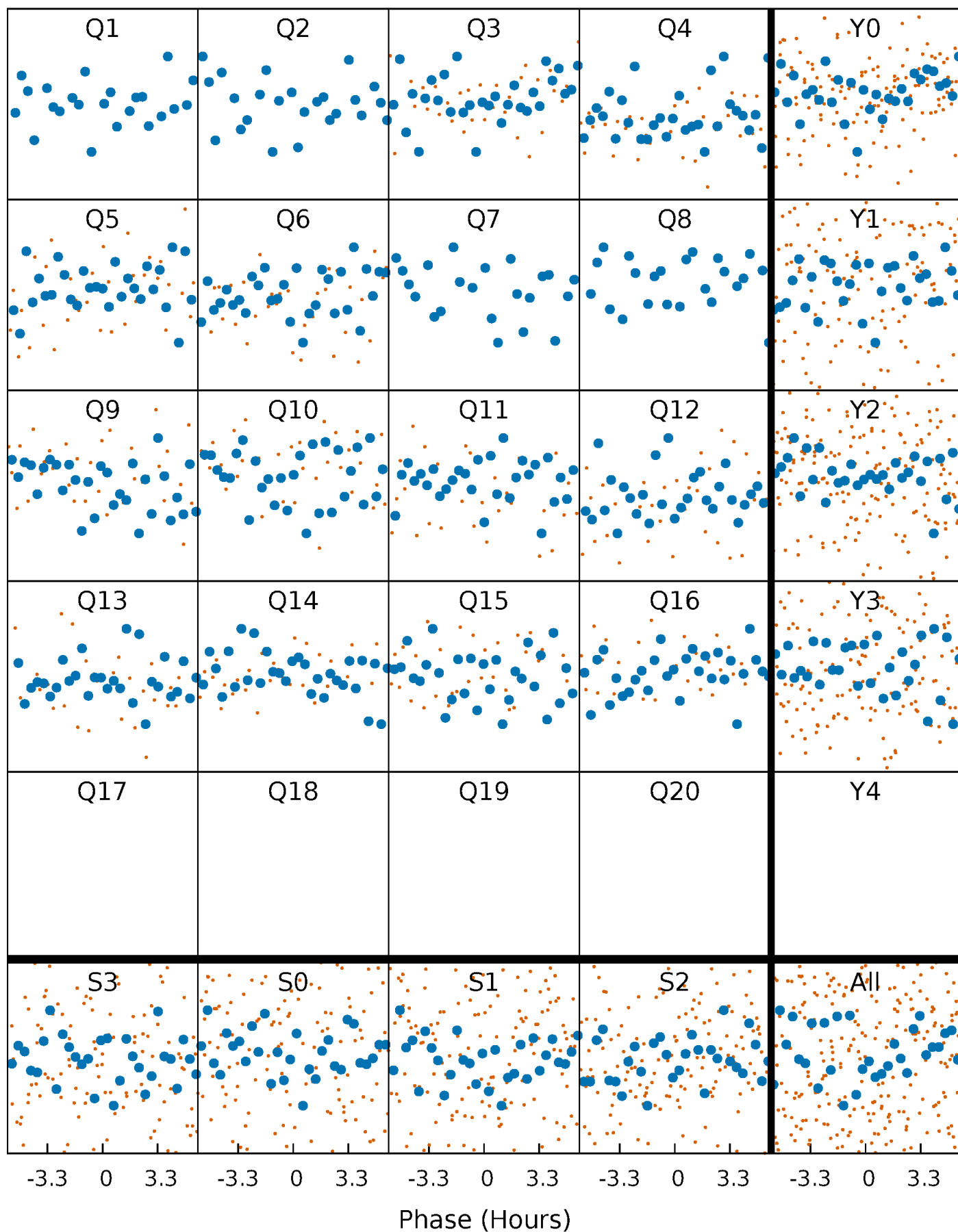


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



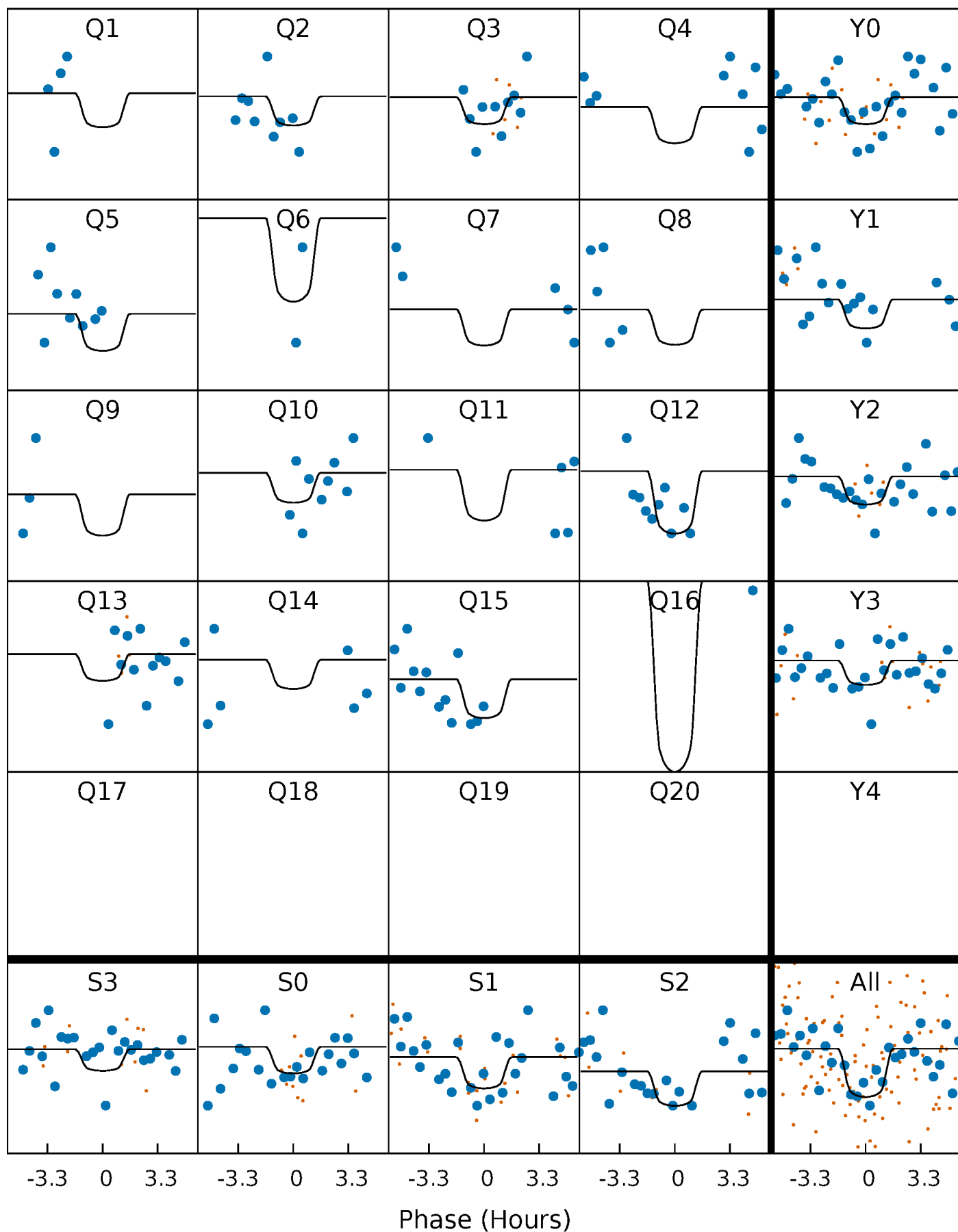
# PDC Quarter-Phased Transit Curves

TCE 008842494-04   P= 49.683295 Days    $T_0=163.758395$  (BKJD)



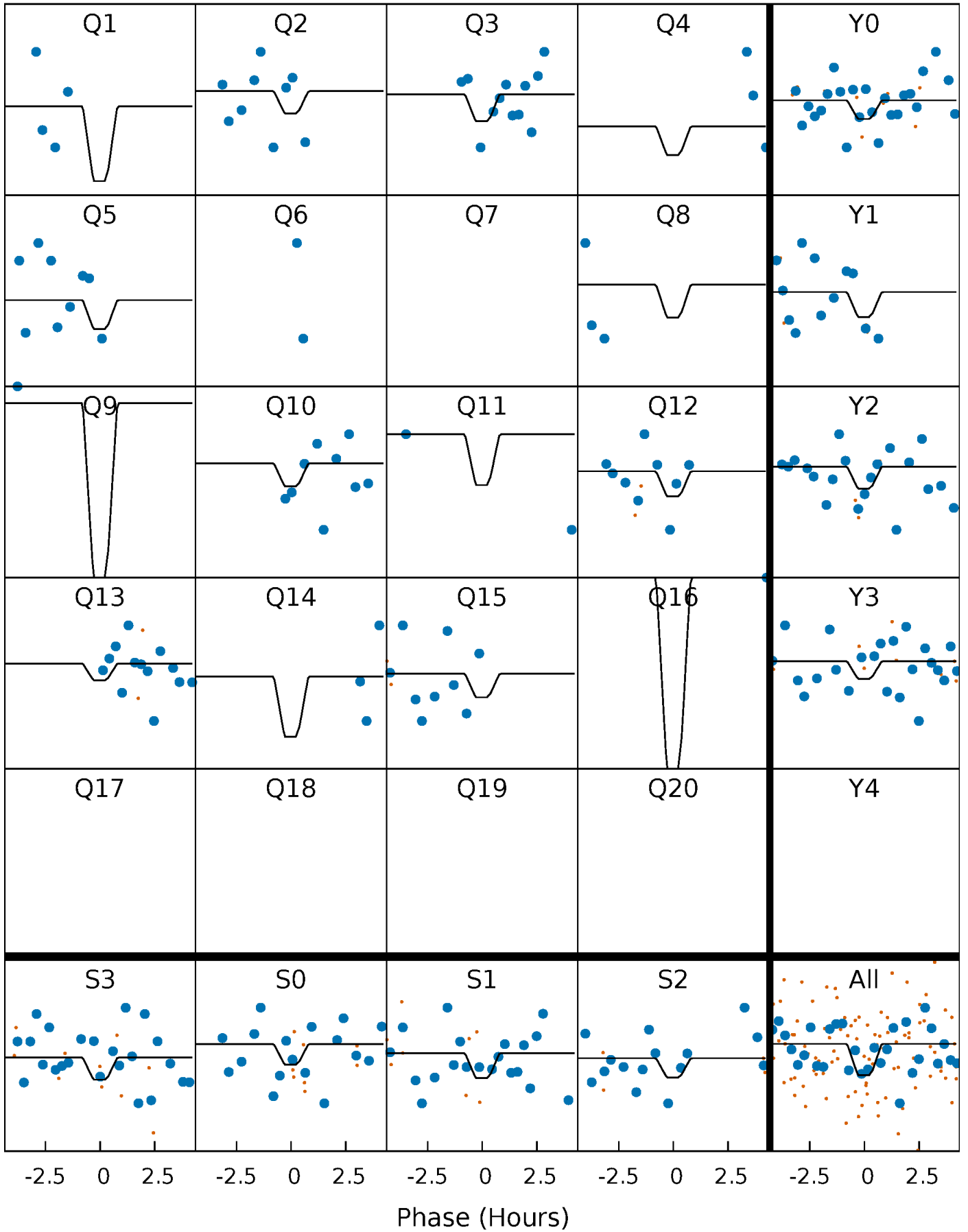
# DV Quarter-Phased Transit Curves

TCE 008842494-04   P= 49.683295 Days    $T_0=163.758395$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008842494-04     $P = 49.684401$  Days     $T_0 = 163.742222$  (BKJD)

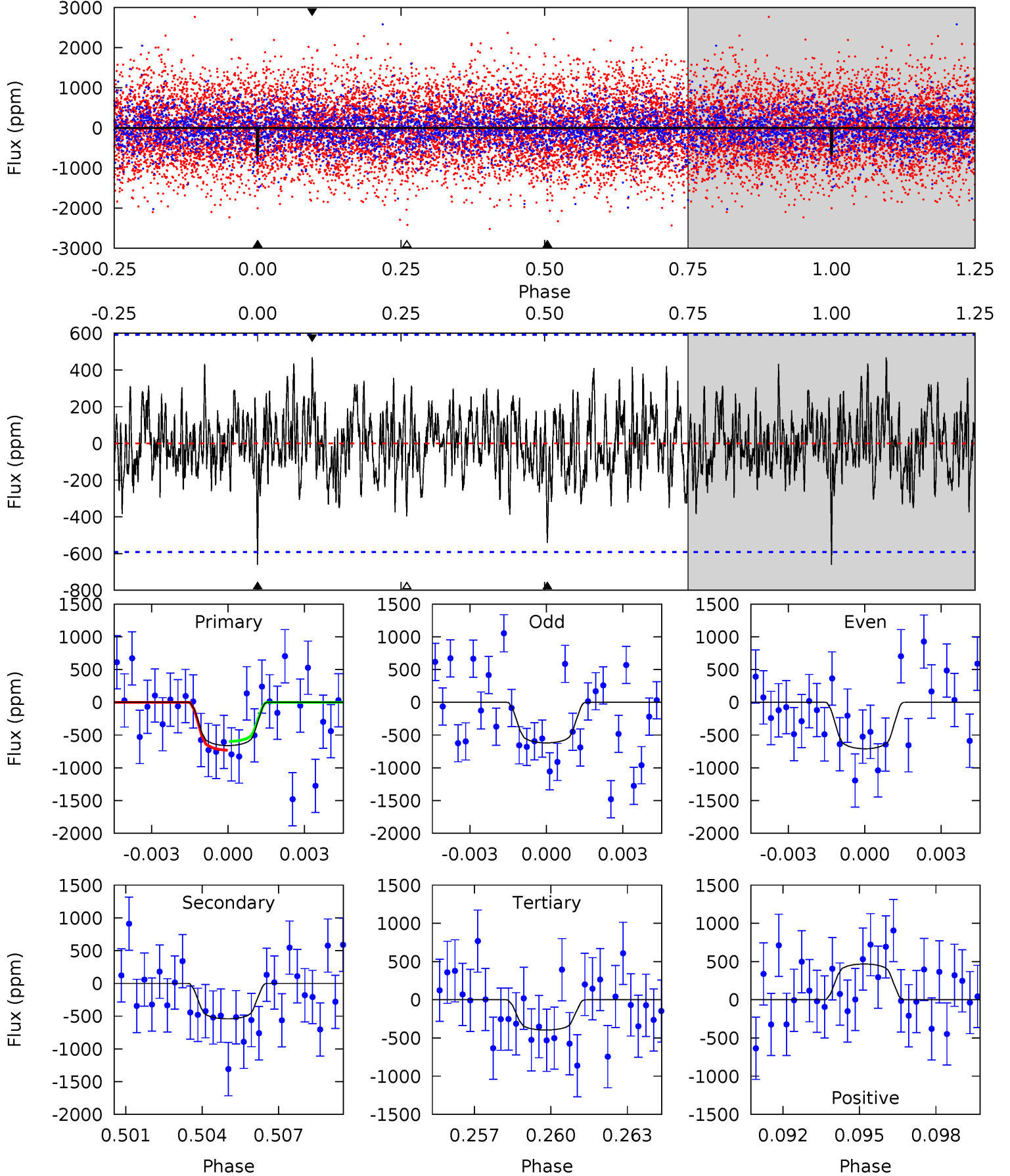




# DV Model-Shift Uniqueness Test

008842494-04, P = 49.683295 Days, E = 114.075100 Days

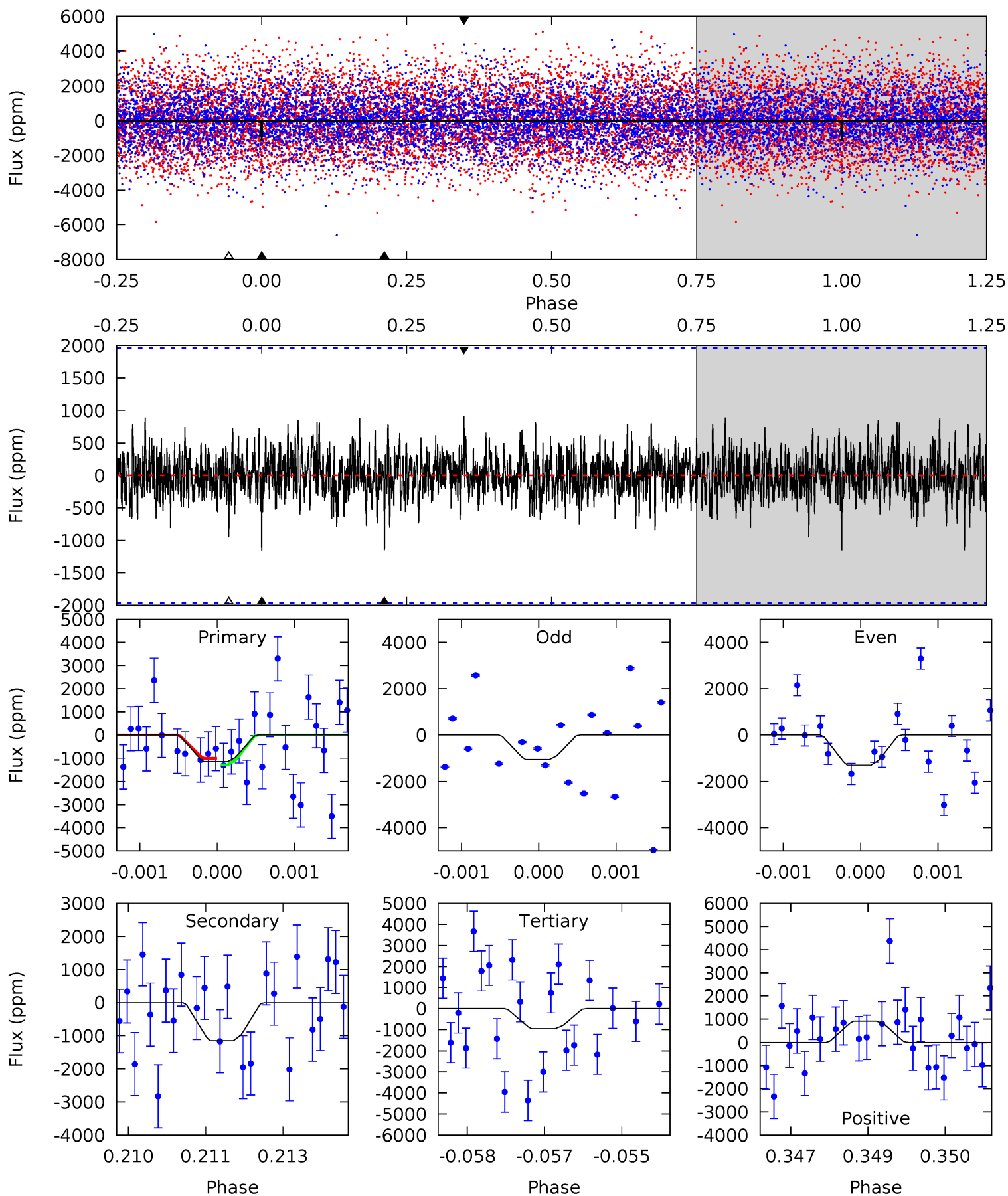
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.88	4.82	3.53	4.17	5.27	3.00	1.29	2.36	1.72	1.29	0.65	0.40	0.75	0.41	0.59



# Alt Model-Shift Uniqueness Test

008842494-04, P = 49.684401 Days, E = 114.057821 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
3.17	3.16	2.61	2.50	5.40	3.21	0.75	0.56	0.67	0.55	0.66	0.33	0.87	0.44	0.38



### Stellar Parameters For KIC 008842494

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7021^{+194}_{-292}$	$3.450^{+0.648}_{-0.072}$	$-0.120^{+0.250}_{-0.300}$	$4.457^{+0.308}_{-2.618}$	$2.041^{+0.073}_{-0.659}$	$0.032^{+0.337}_{-0.008}$
	+3%/-4%	+19%/-2%	+208%/-250%	+7%/-59%	+4%/-32%	+1039%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008842494-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-541 \pm 112$	$12.59^{+9.30}_{-7.62}$	$1517^{+106}_{-228}$	$6022^{+4524}_{-1206}$	$205^{+1139}_{-139}$
Alt.	$-1149 \pm 363$	$16.21^{+10.40}_{-8.93}$	$1522^{+103}_{-212}$	$6373^{+3431}_{-1176}$	$258^{+962}_{-168}$

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

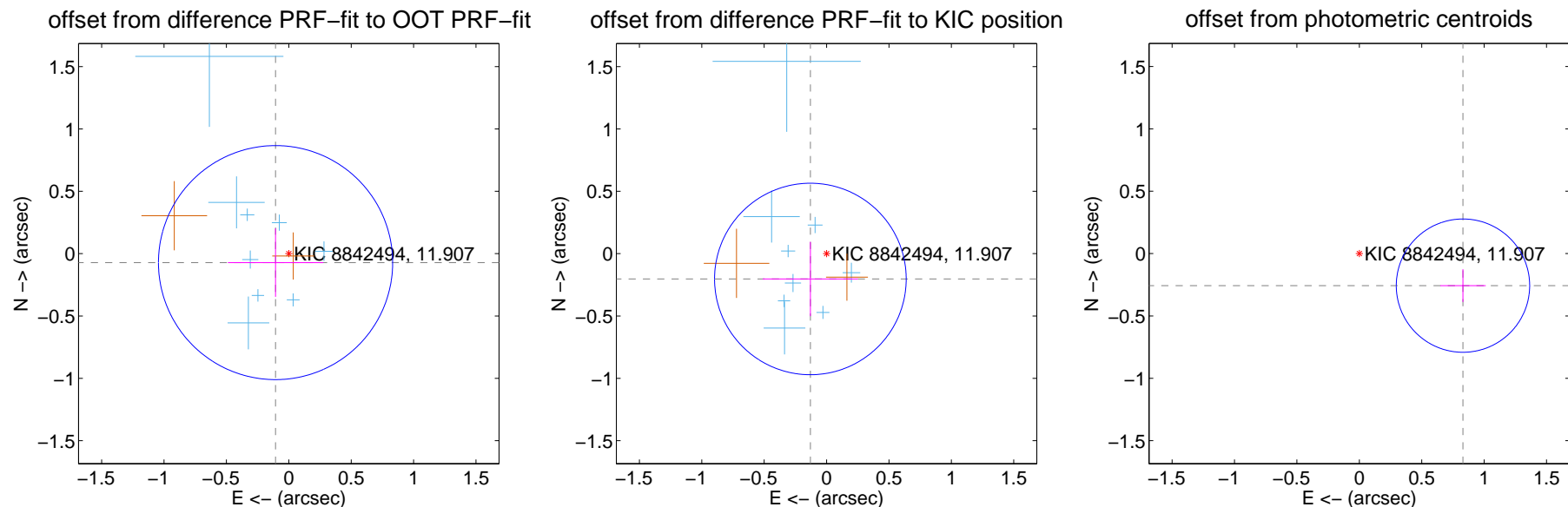
## DV Centroid Data

Supplemental centroid analysis for 008842494-04. **Kepler magnitude: 11.91.** Transit SNR 7.36

There are 10 quarters with good PRF difference image offsets

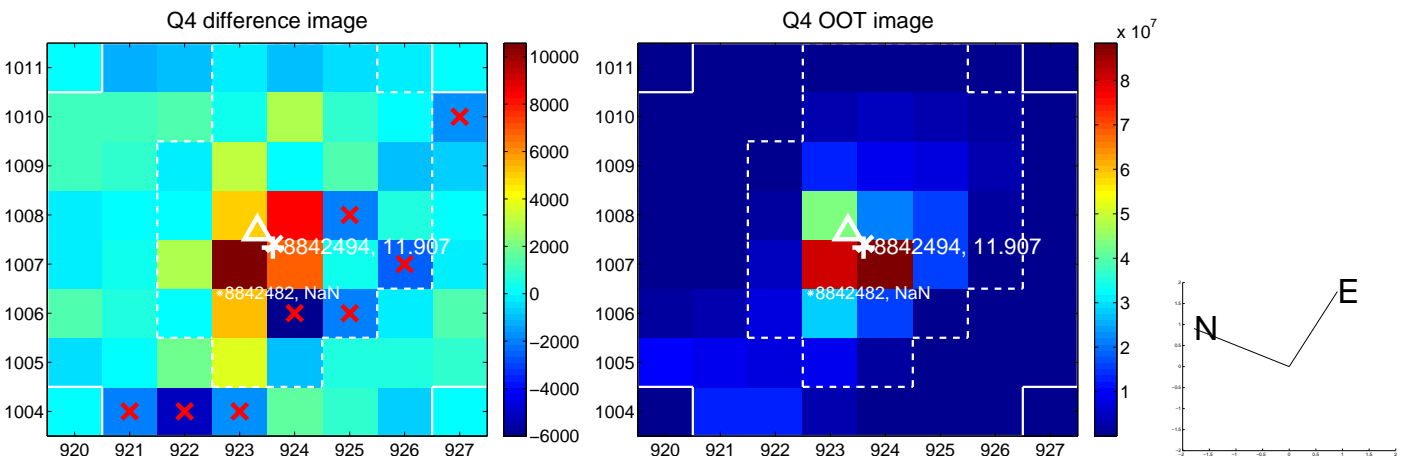
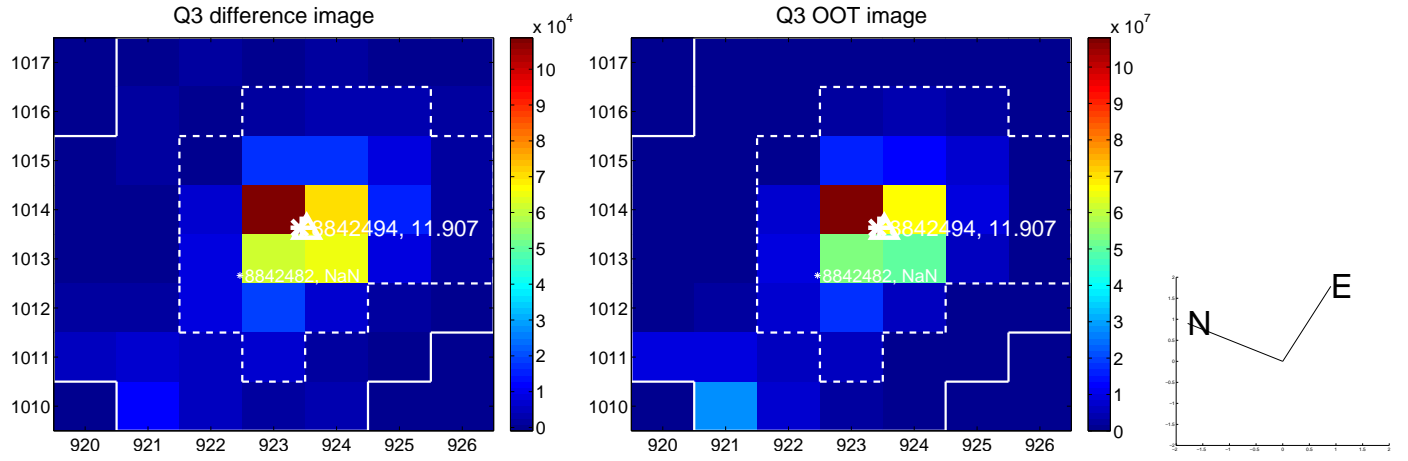
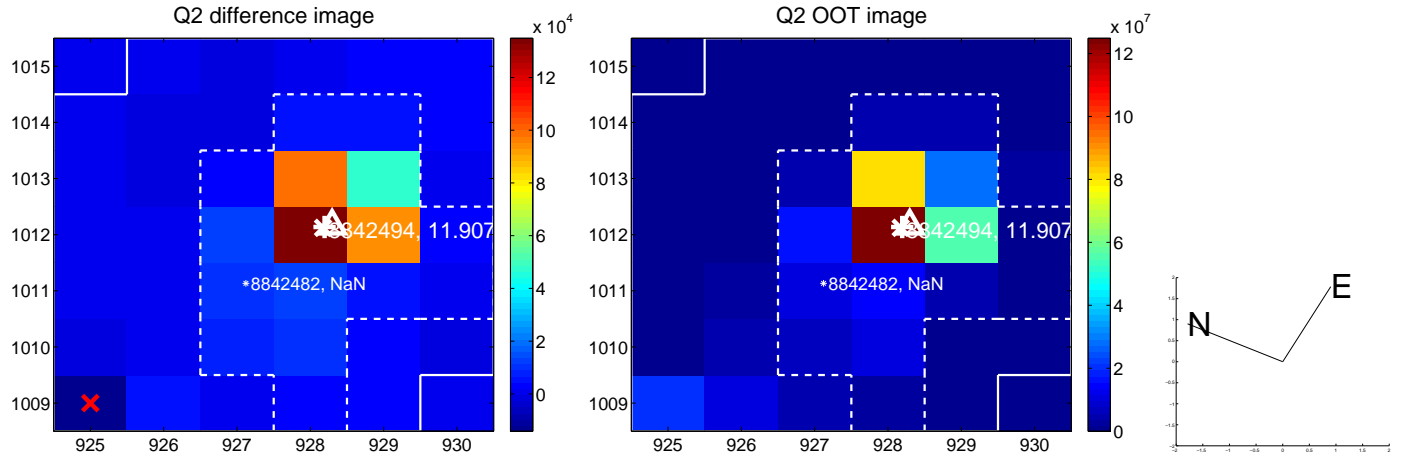
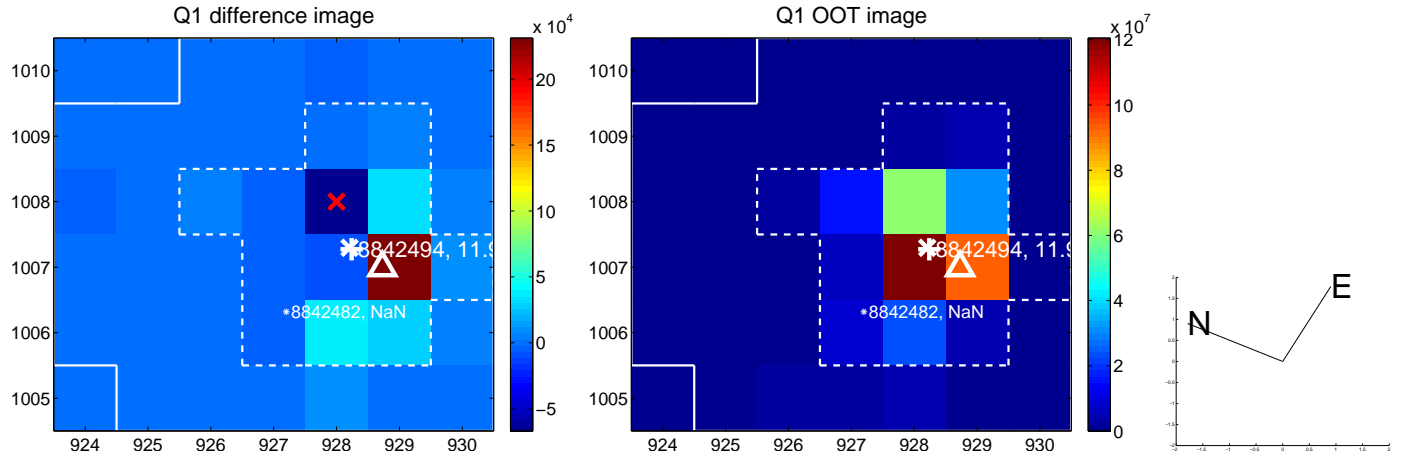
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.128 \pm 0.313$	0.41	$0.106 \pm 0.382$	$-0.072 \pm 0.274$
PRF-fit source offset from KIC position	$0.241 \pm 0.256$	0.94	$0.130 \pm 0.382$	$-0.203 \pm 0.298$
photometric centroid source offset	<b><math>0.87 \pm 0.18</math></b>	<b>4.88</b>	$-0.83 \pm 0.18$	$-0.26 \pm 0.13$



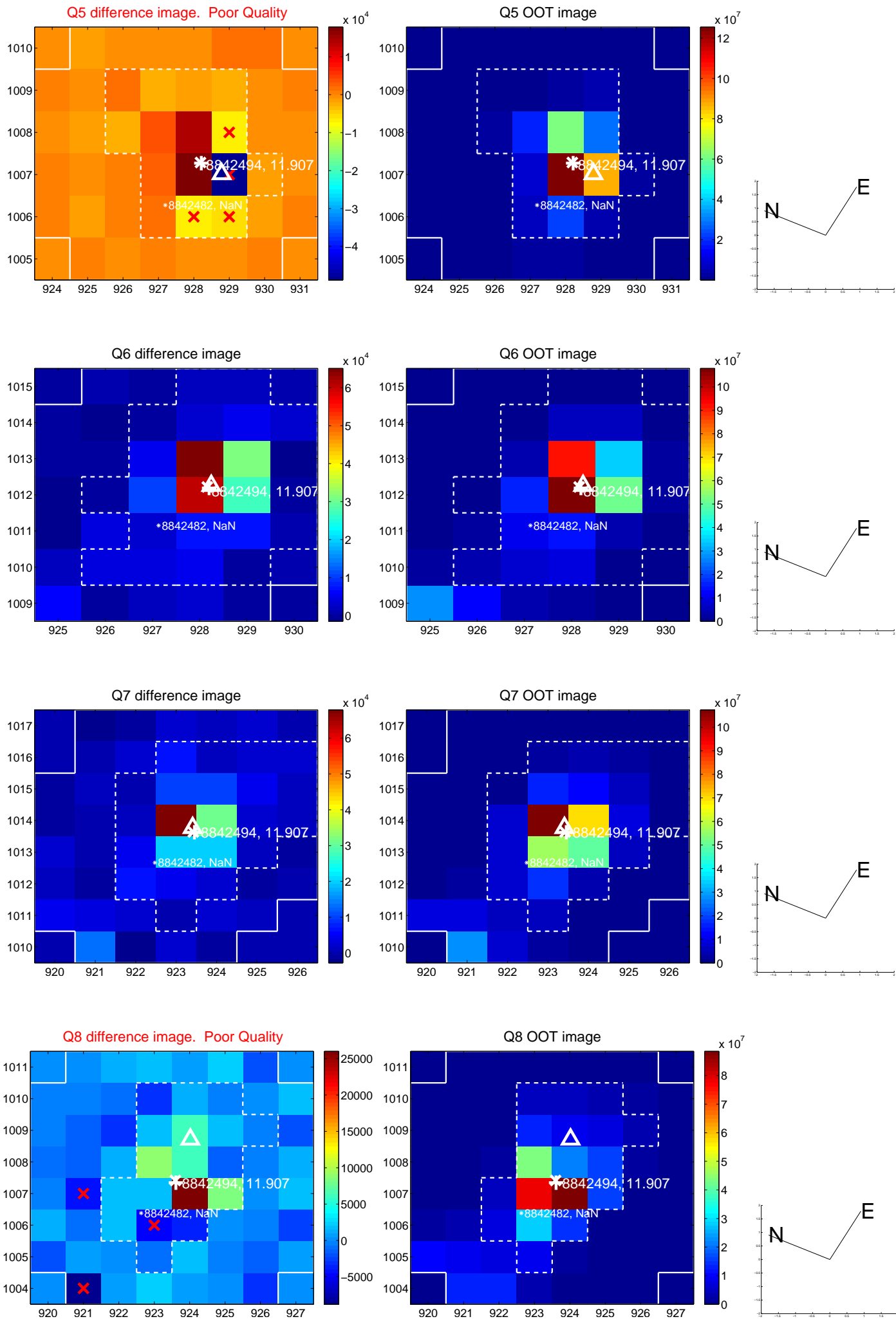
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

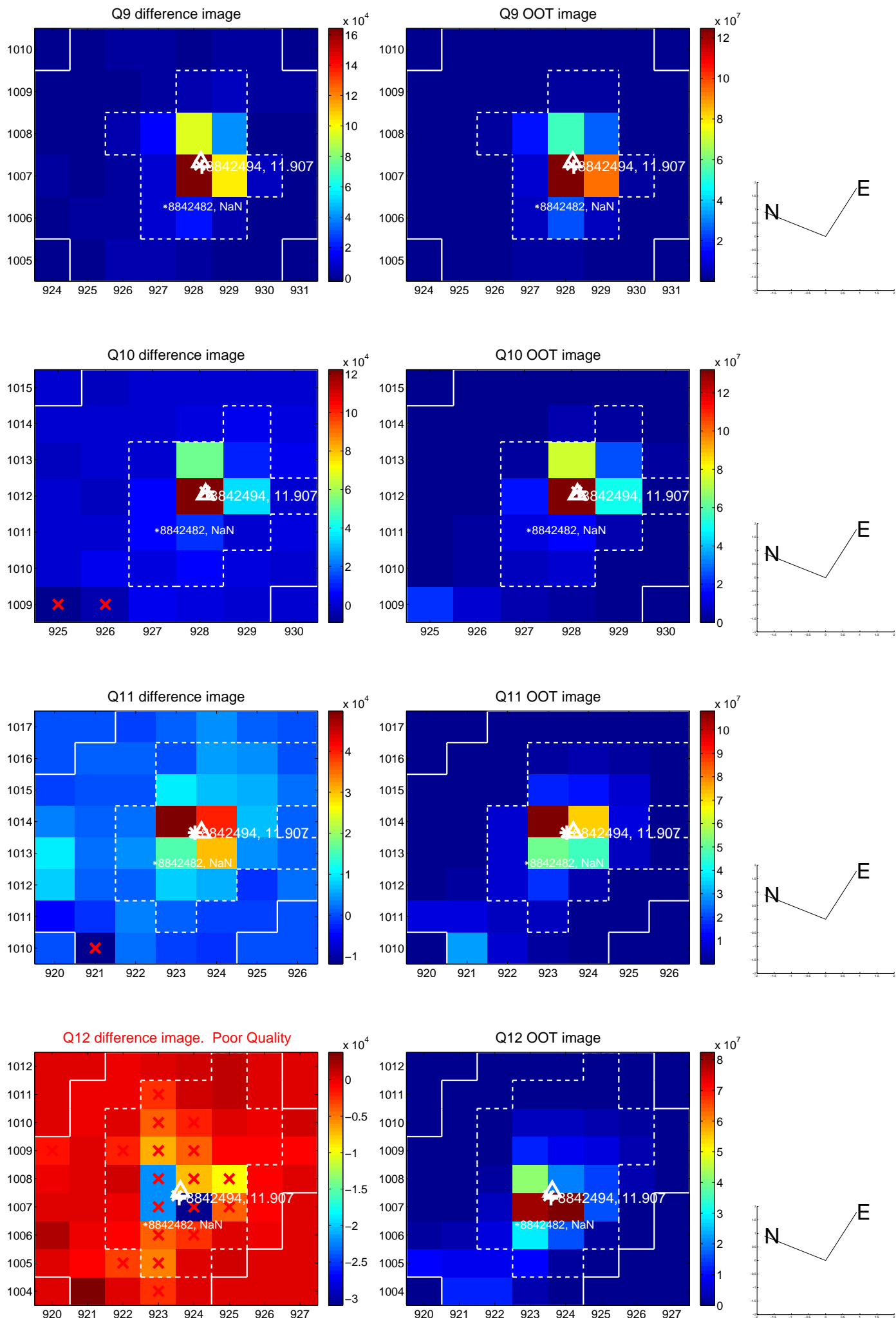




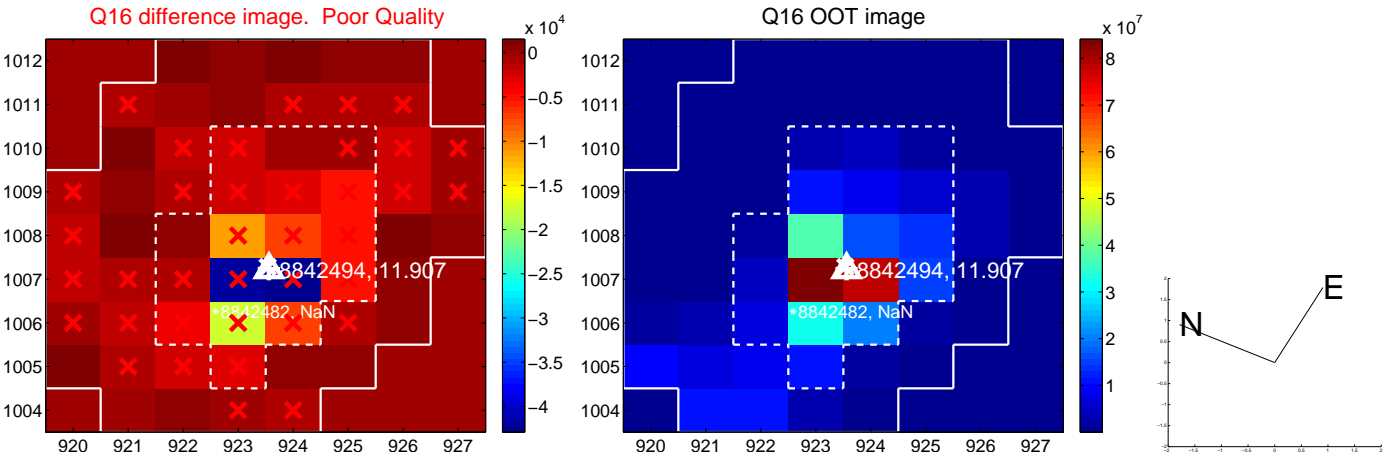
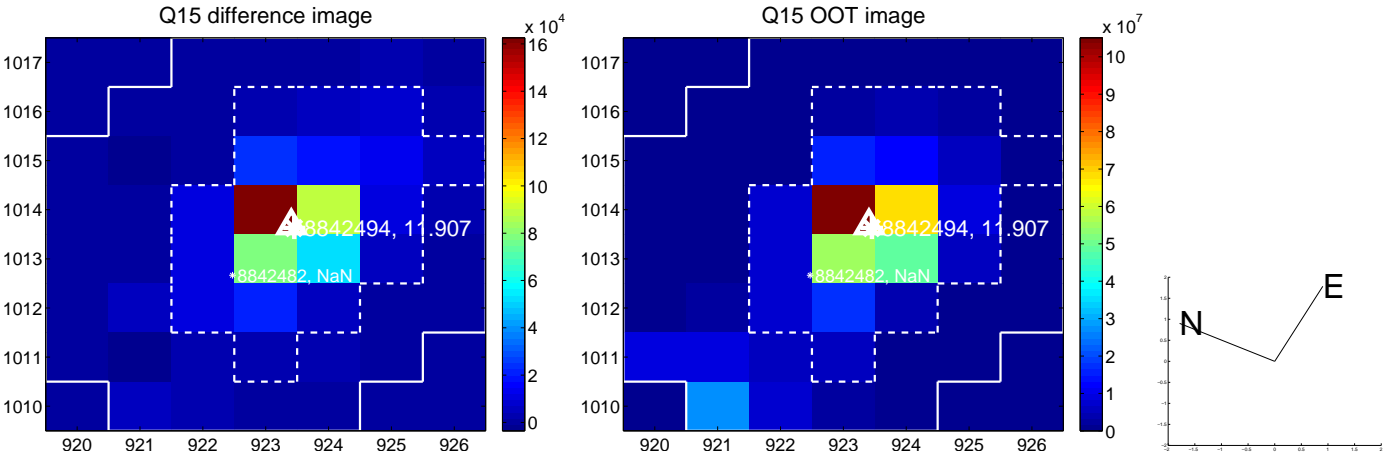
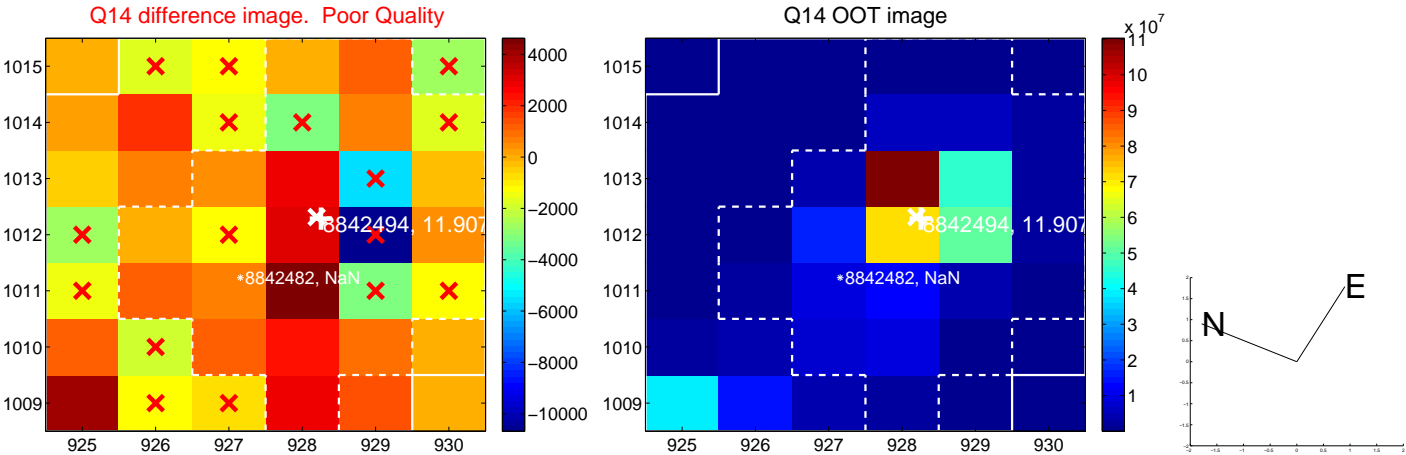
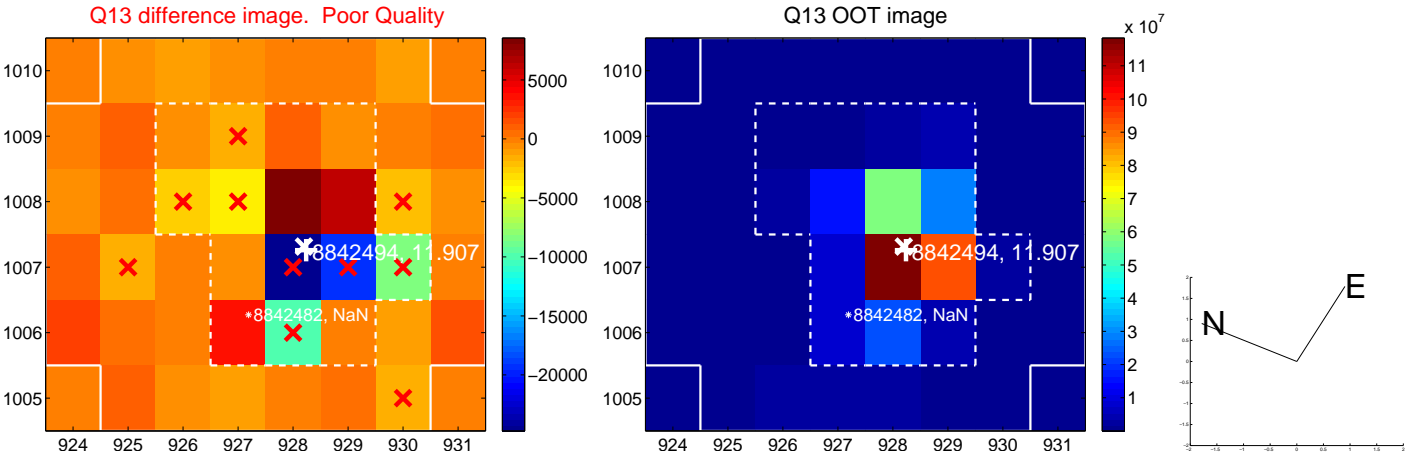
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



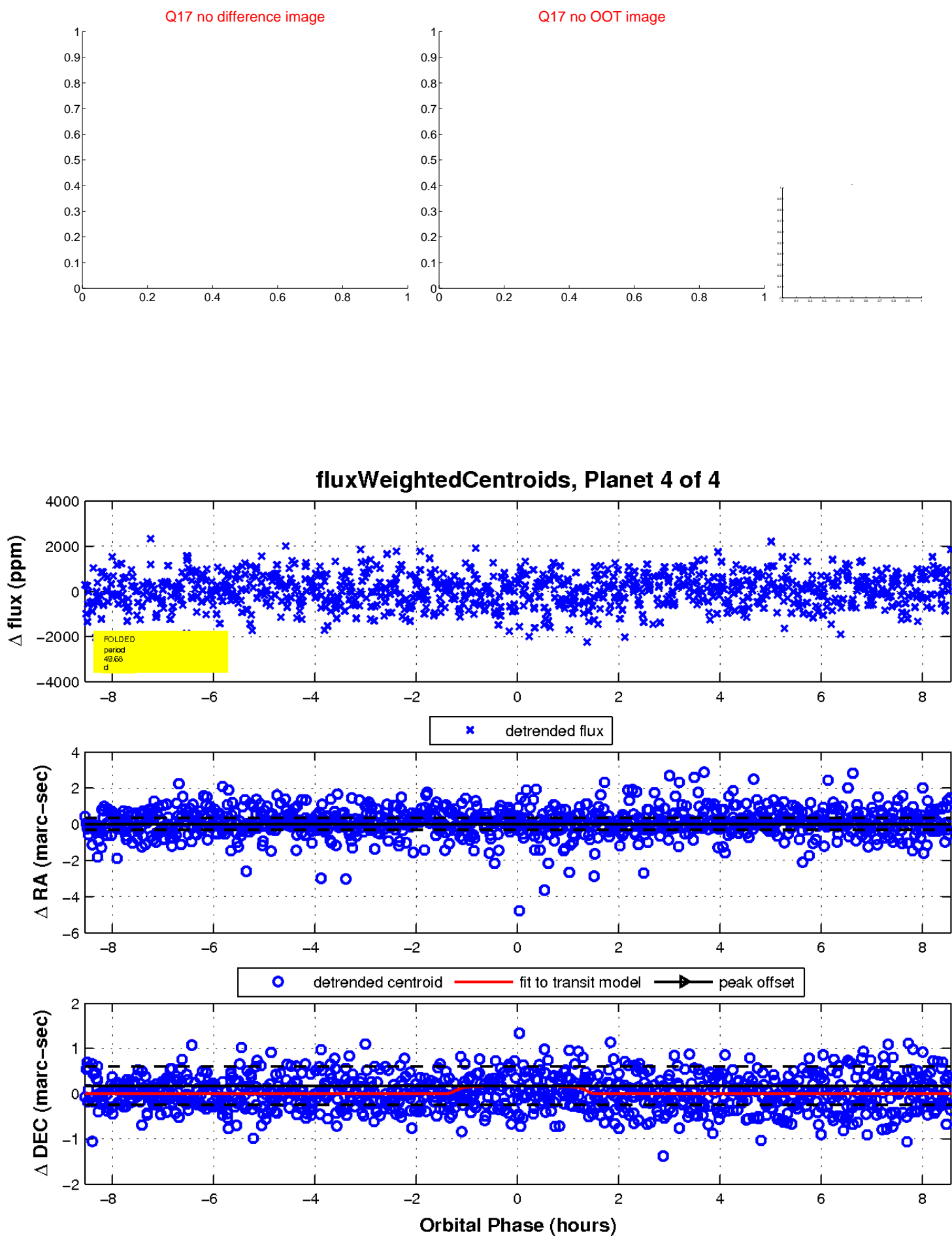
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

