

# KIC 006768394

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006768394-01	OBS	2086.02	8.918955	140.078497	183.0	5.243	23.9	25.8	1.31	5862	2.40	259.52
006768394-02	OBS	2086.01	7.132928	135.994206	144.5	4.605	23.6	25.0	1.31	5862	1.90	349.60
006768394-03	OBS	2086.03	11.898606	133.346083	126.9	3.333	12.4	12.9	1.31	5862	1.66	176.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006768394-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
006768394-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
006768394-03	OBS	PC	0.95	0	0	0	0	NO_COMMENT

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

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

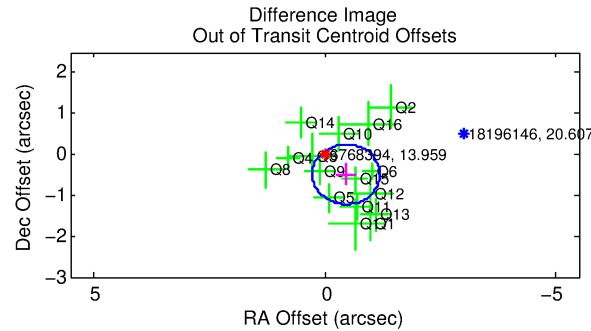
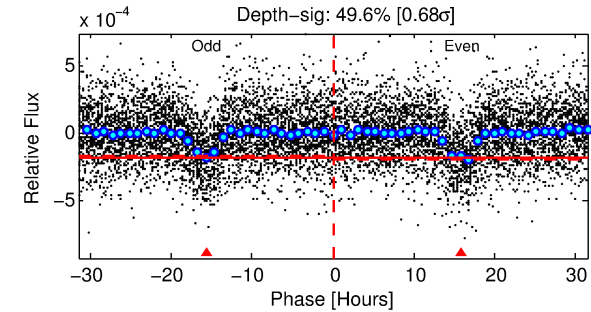
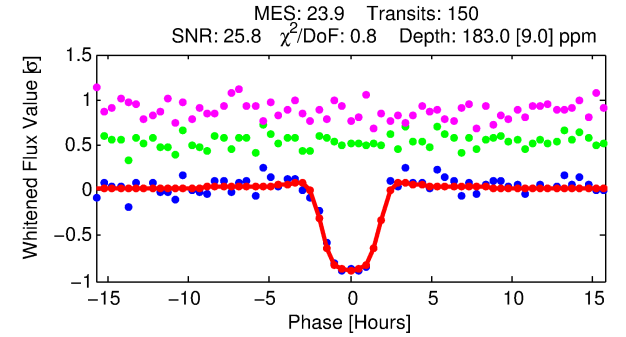
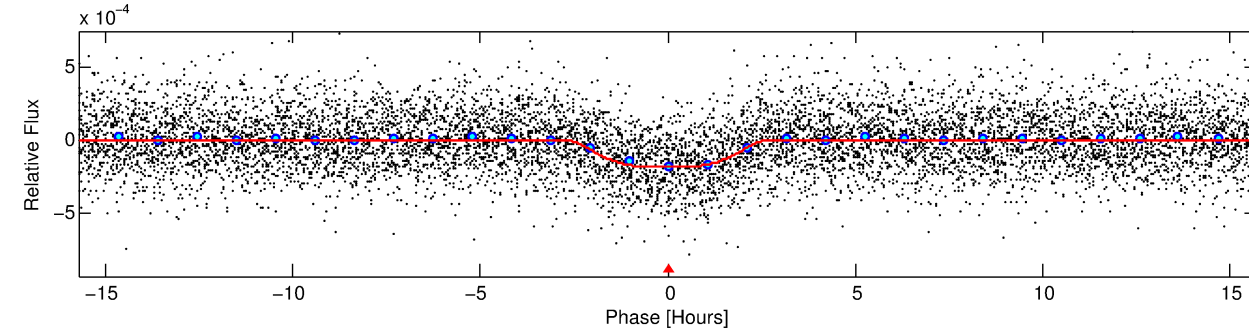
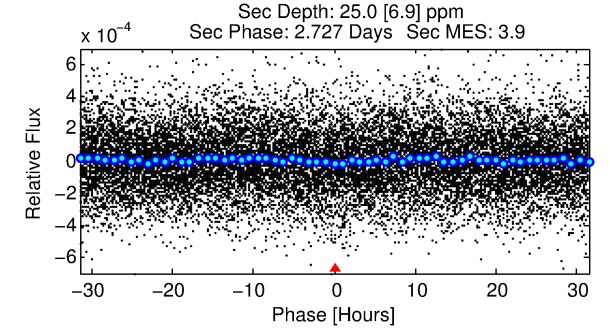
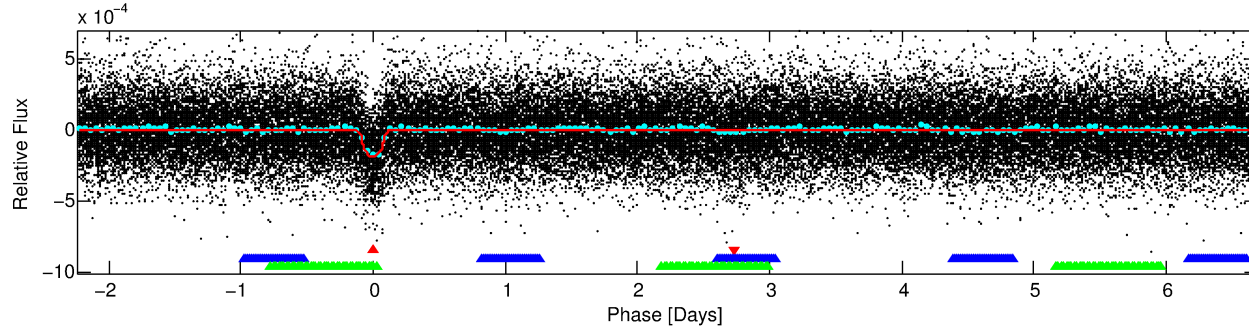
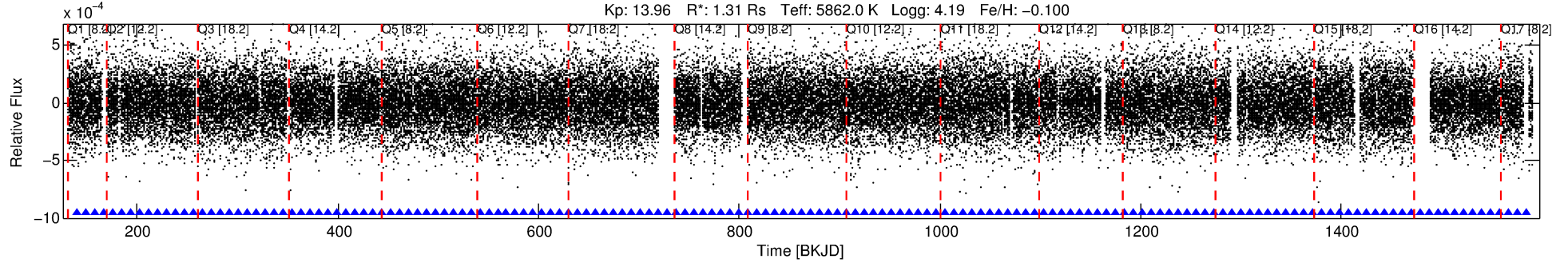
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006768394-01

No Significant Match Found

# DV One-Page Summary

KIC: 6768394 Candidate: 1 of 3 Period: 8.919 d  
KOI: K02086.02 Name: Kepler-60c Corr: 0.889



## DV Fit Results:

Period = 8.91895 [0.00005] d  
Epoch = 140.0785 [0.0045] BKJD  
Rp/R\* = 0.0168 [0.0006]  
a/R\* = 3.75 [0.32]  
b = 0.98 [0.00]  
Seff = 259.52 [82.67]  
Teq = 1023 [82] K  
Rp = 2.40 [0.48] Re  
a = 0.0834 [0.0160] AU  
Ag = 16.66 [6.99] [2.24σ]  
Teffp = 3197 [236] K [8.70σ]

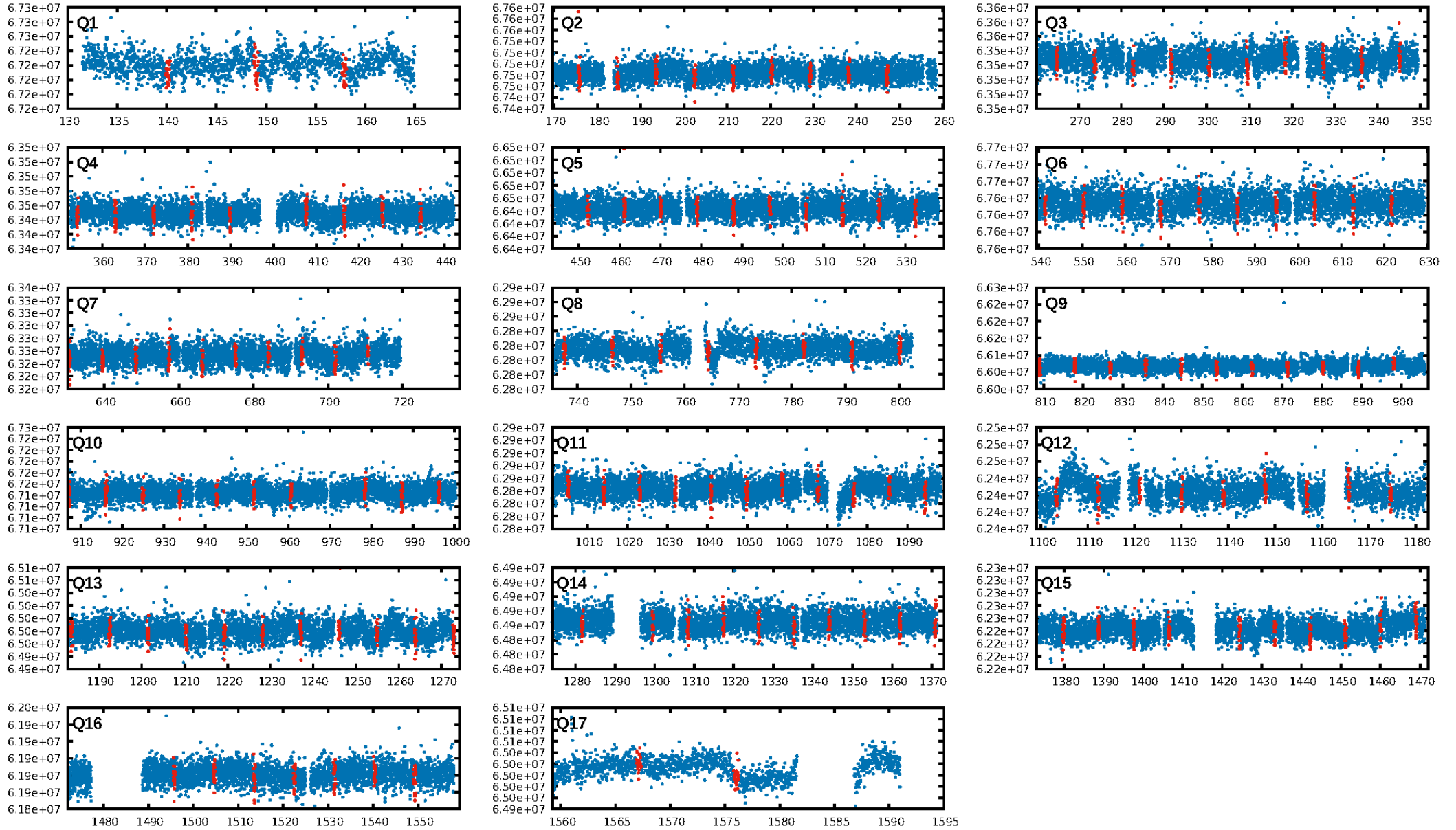
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.14σ]  
LongPeriod-sig: 100.0% [11.51σ]  
ModelChiSquare2-sig: 99.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.09e-118  
RollingBand-fgt: 1.00 [145/145]  
GhostDiagnostic-chr: 4.174  
Centroid-sig: 0.9%  
Centroid-so: 1.060 arcsec [2.31σ]  
OotOffset-rm: 0.670 arcsec [2.75σ]  
KicOffset-rm: 0.620 arcsec [2.70σ]  
OotOffset-st: 4/3/4/5 [16]  
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DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

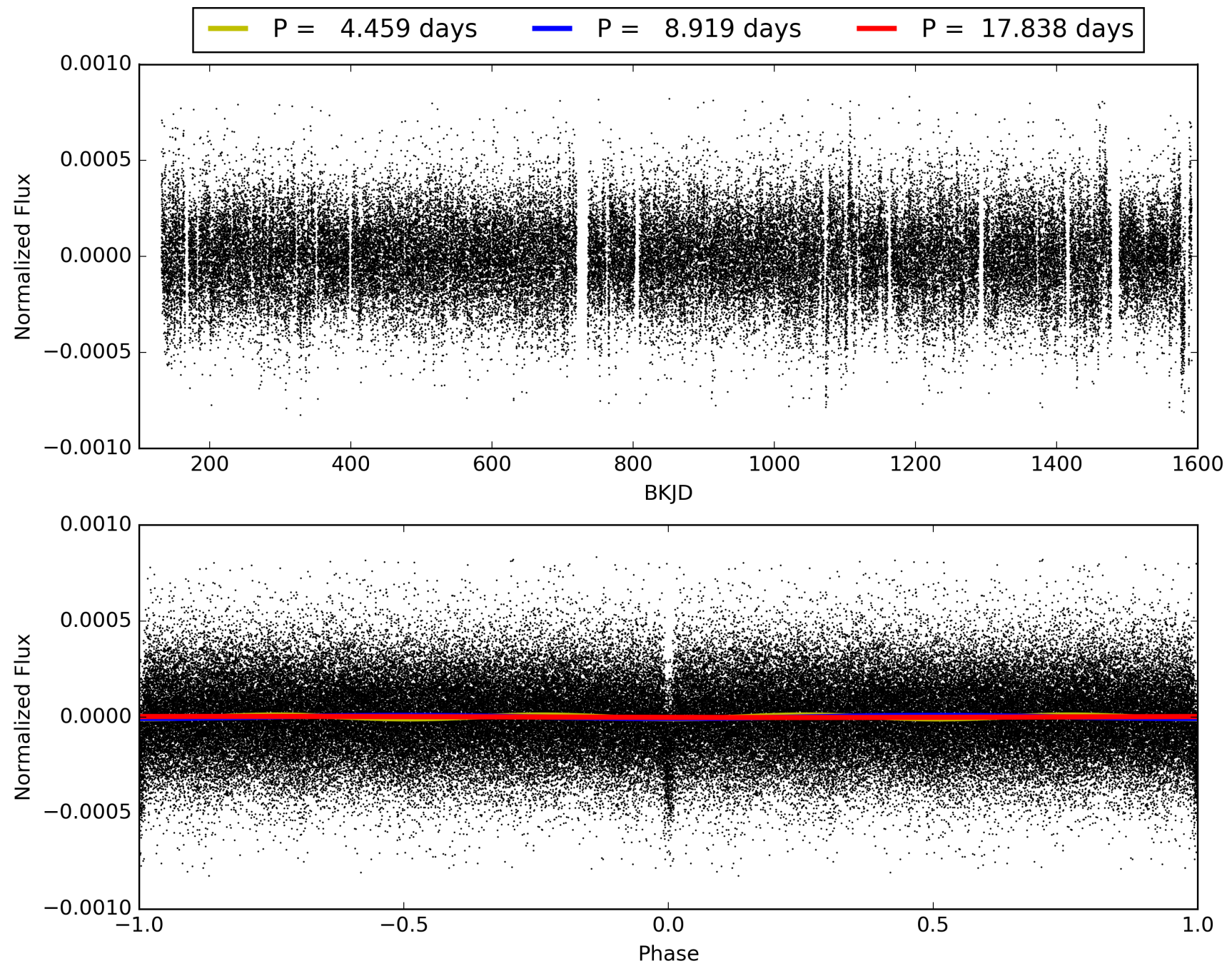
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:44:46 Z

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

# TCE 006768394-01, PDC Light Curves



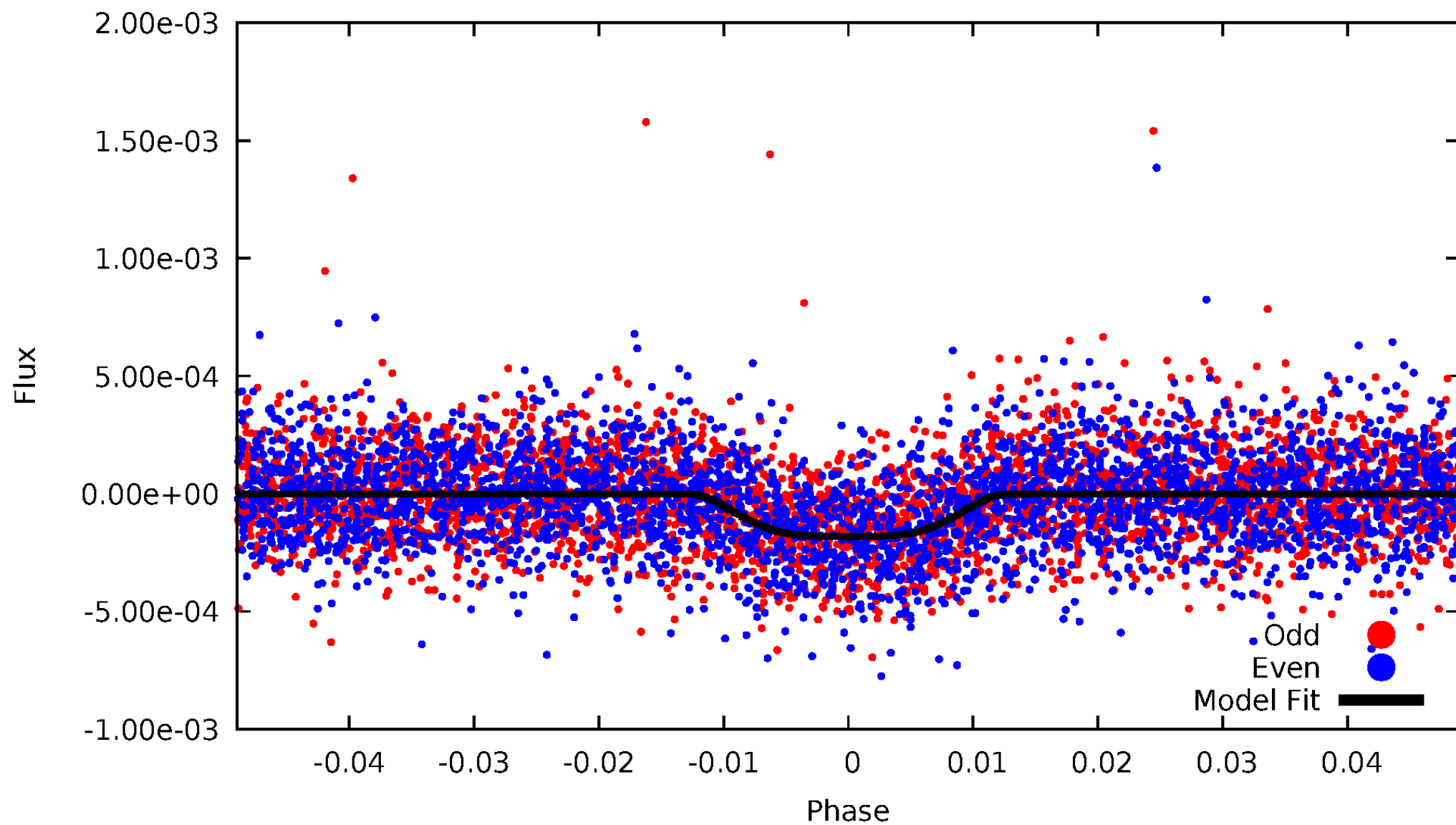
TCE 006768394-01





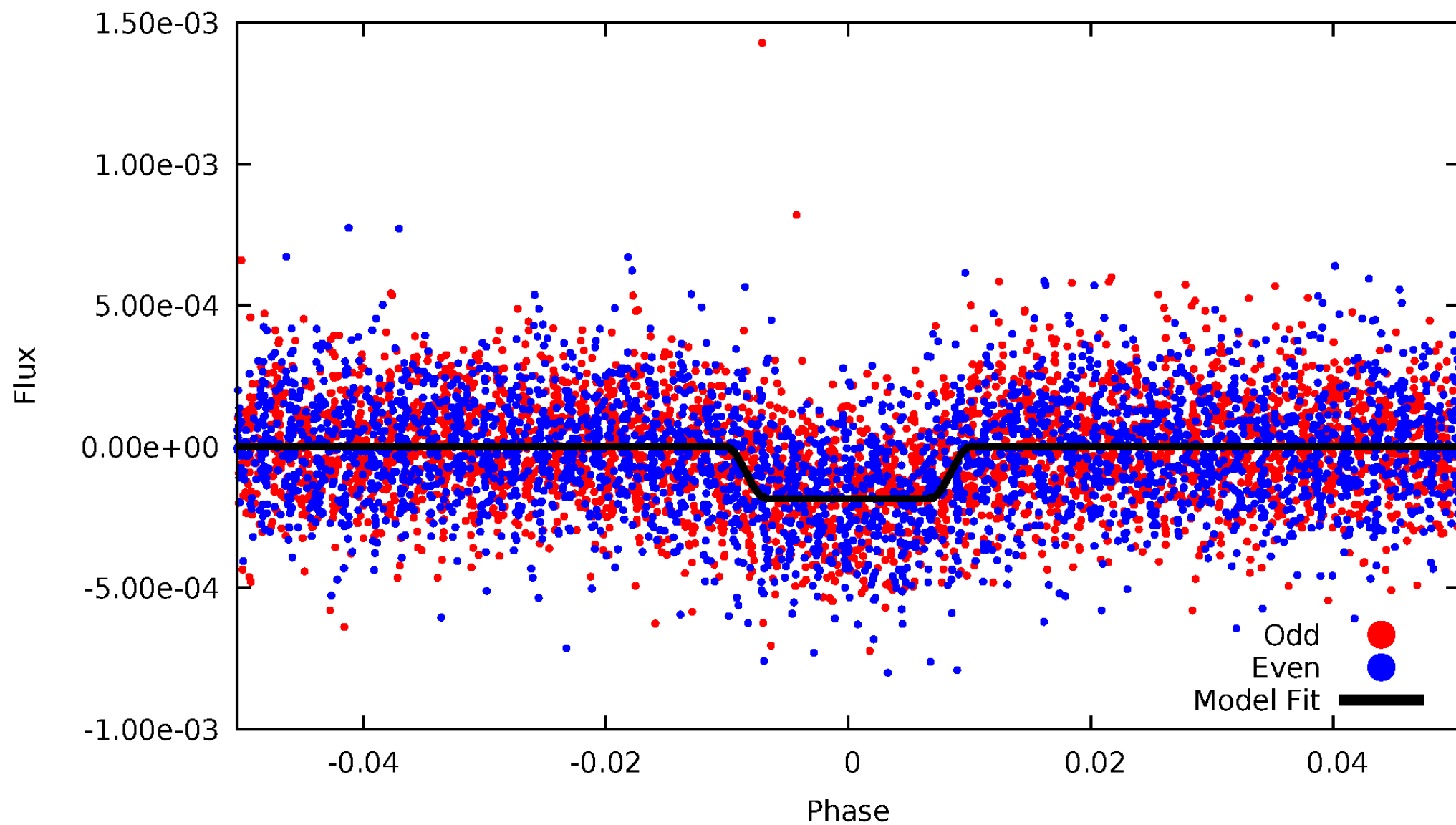
# DV Odd/Even

TCE 006768394-01

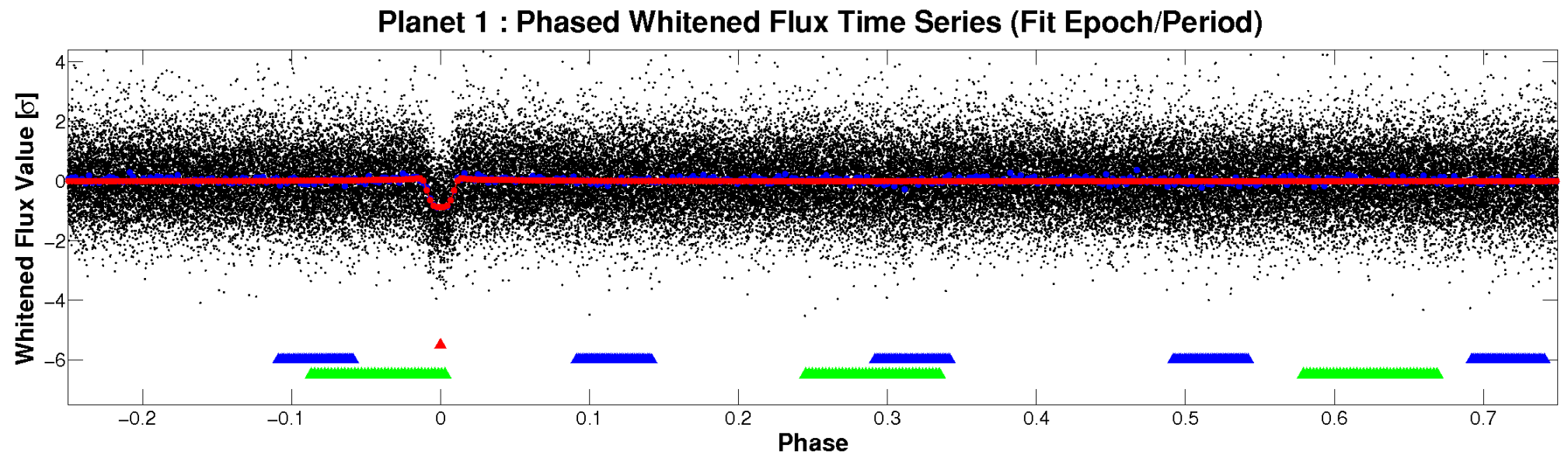
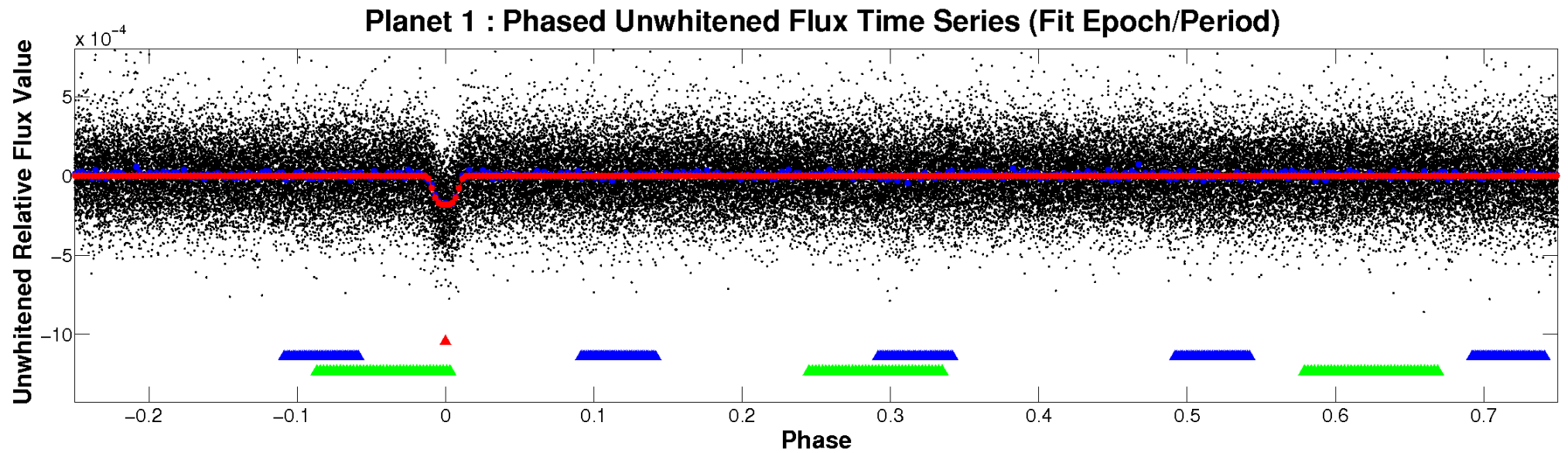


# ALT Odd/Even

TCE 006768394-01

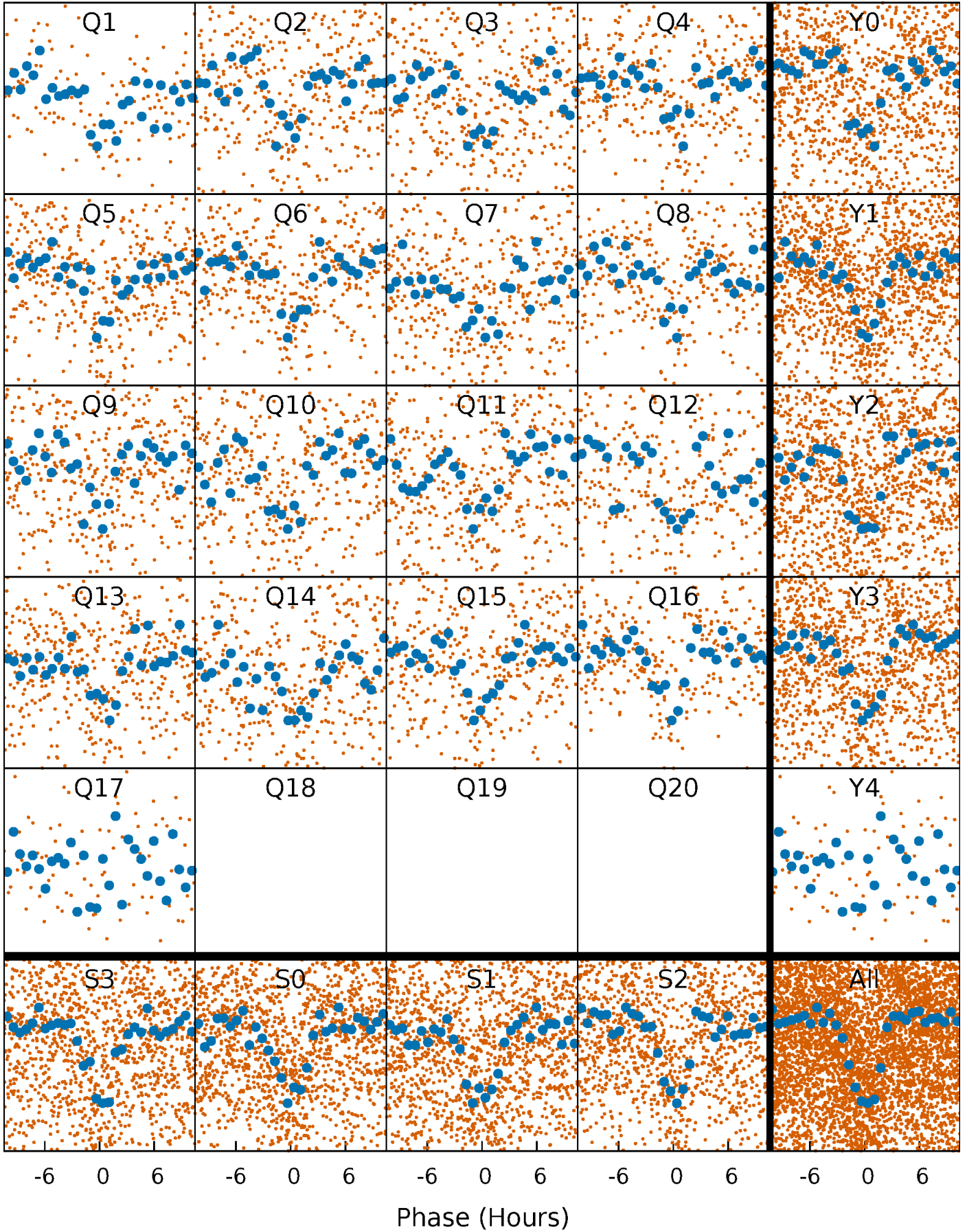


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

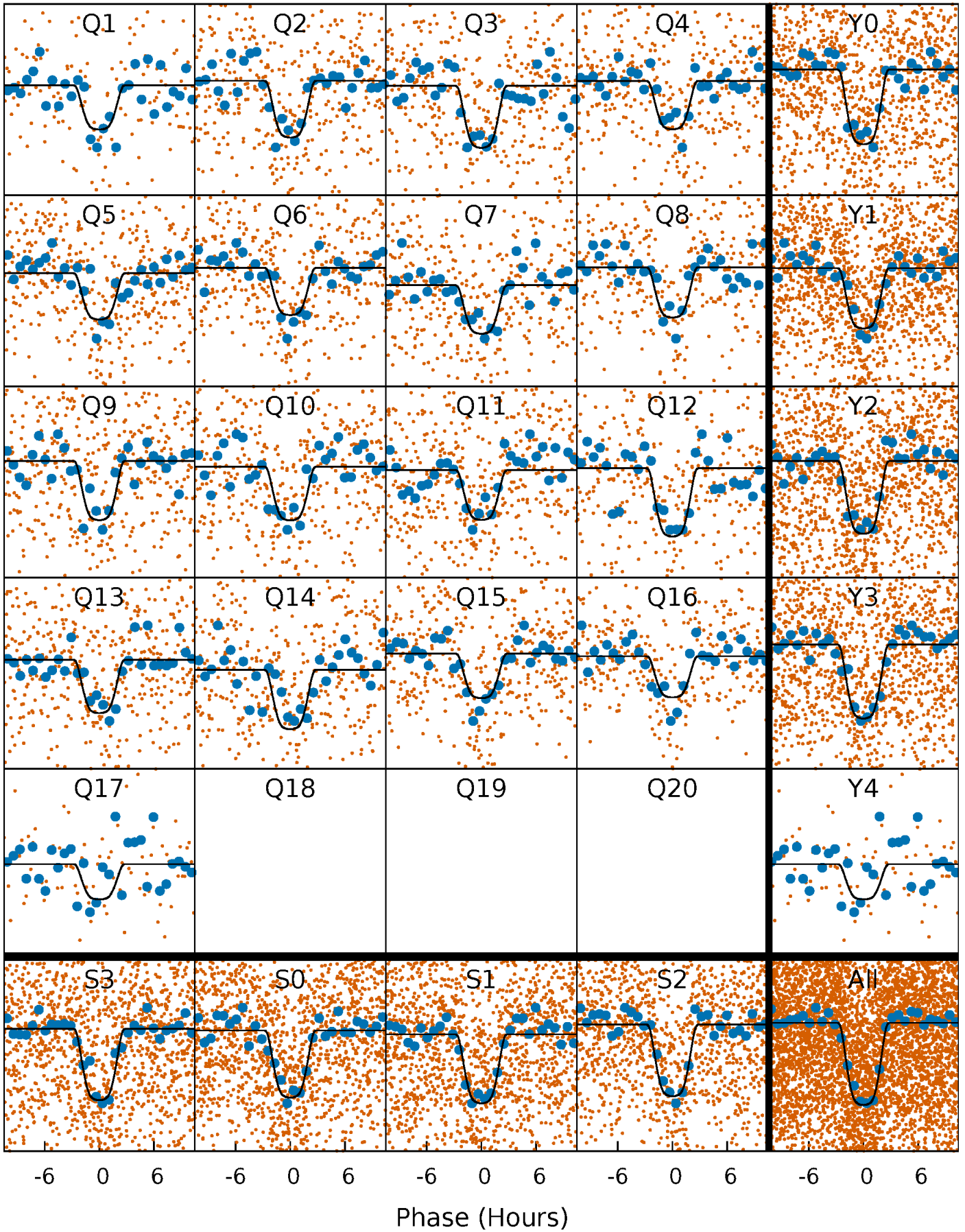
TCE 006768394-01 P= 8.918955 Days  $T_0=140.078497$  (BKJD)





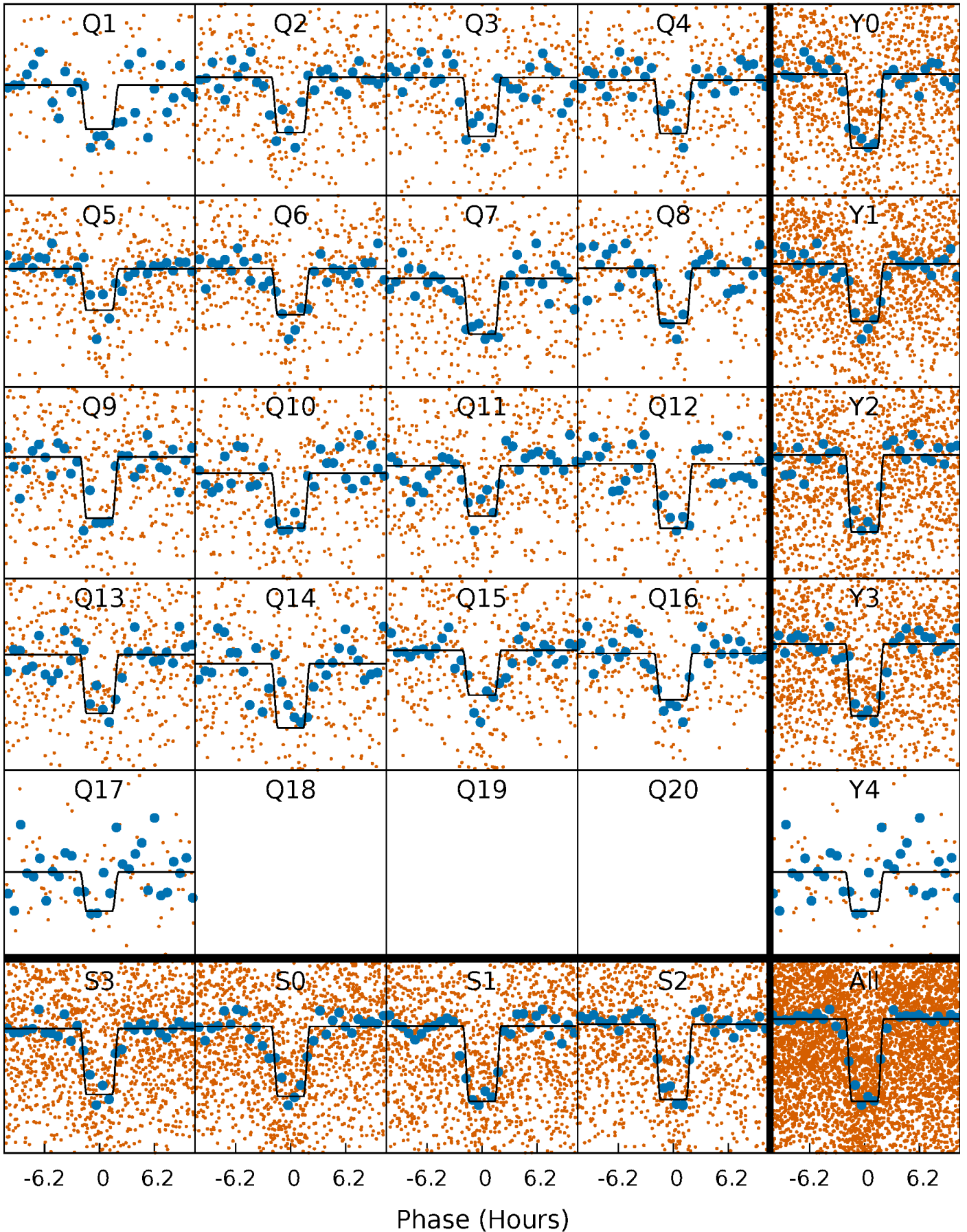
# DV Quarter-Phased Transit Curves

TCE 006768394-01   P= 8.918955 Days    $T_0=140.078497$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

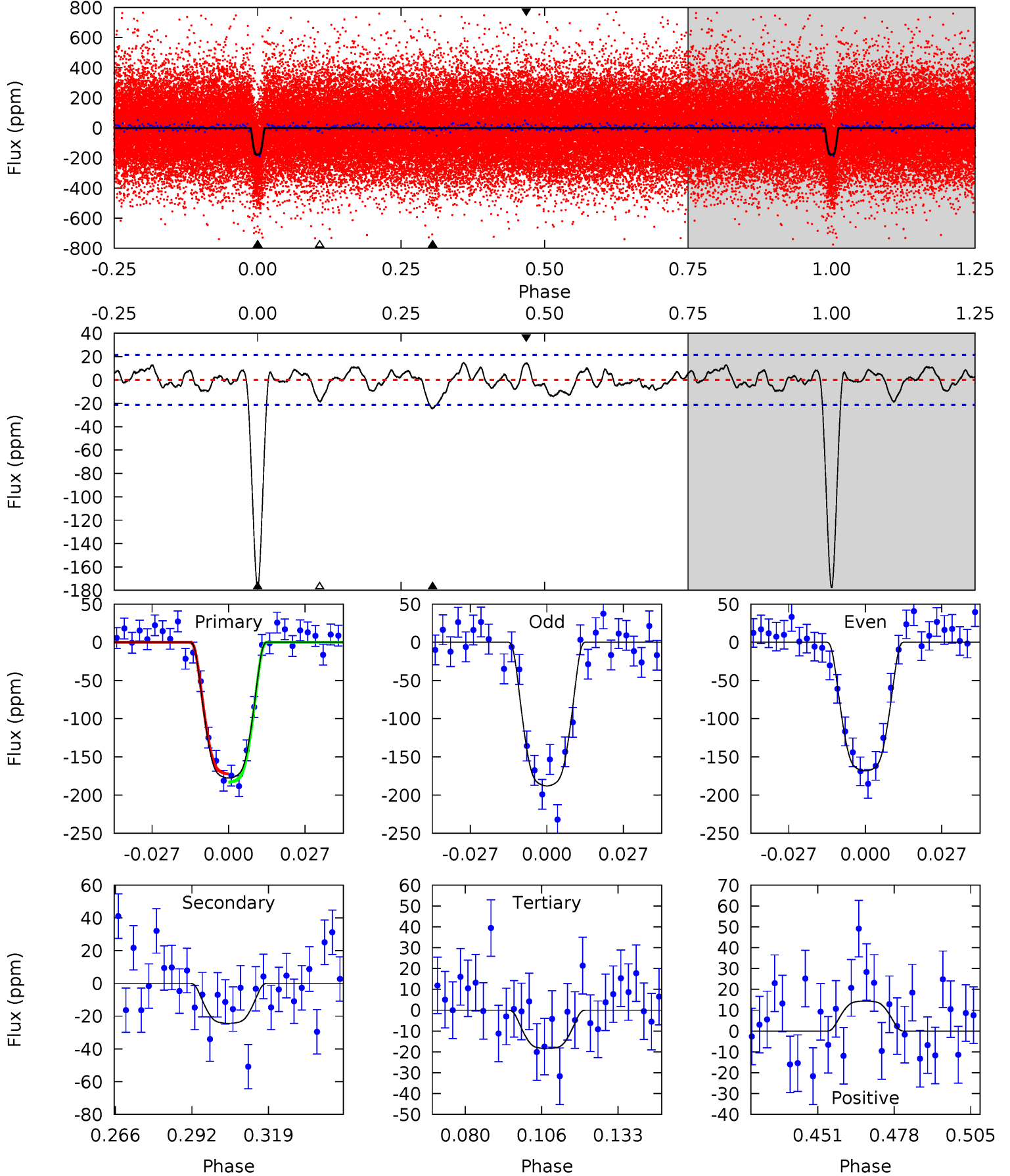
TCE 006768394-01   P= 8.918805 Days    $T_0=140.091241$  (BKJD)



# DV Model-Shift Uniqueness Test

006768394-01, P = 8.918955 Days, E = 131.159542 Days

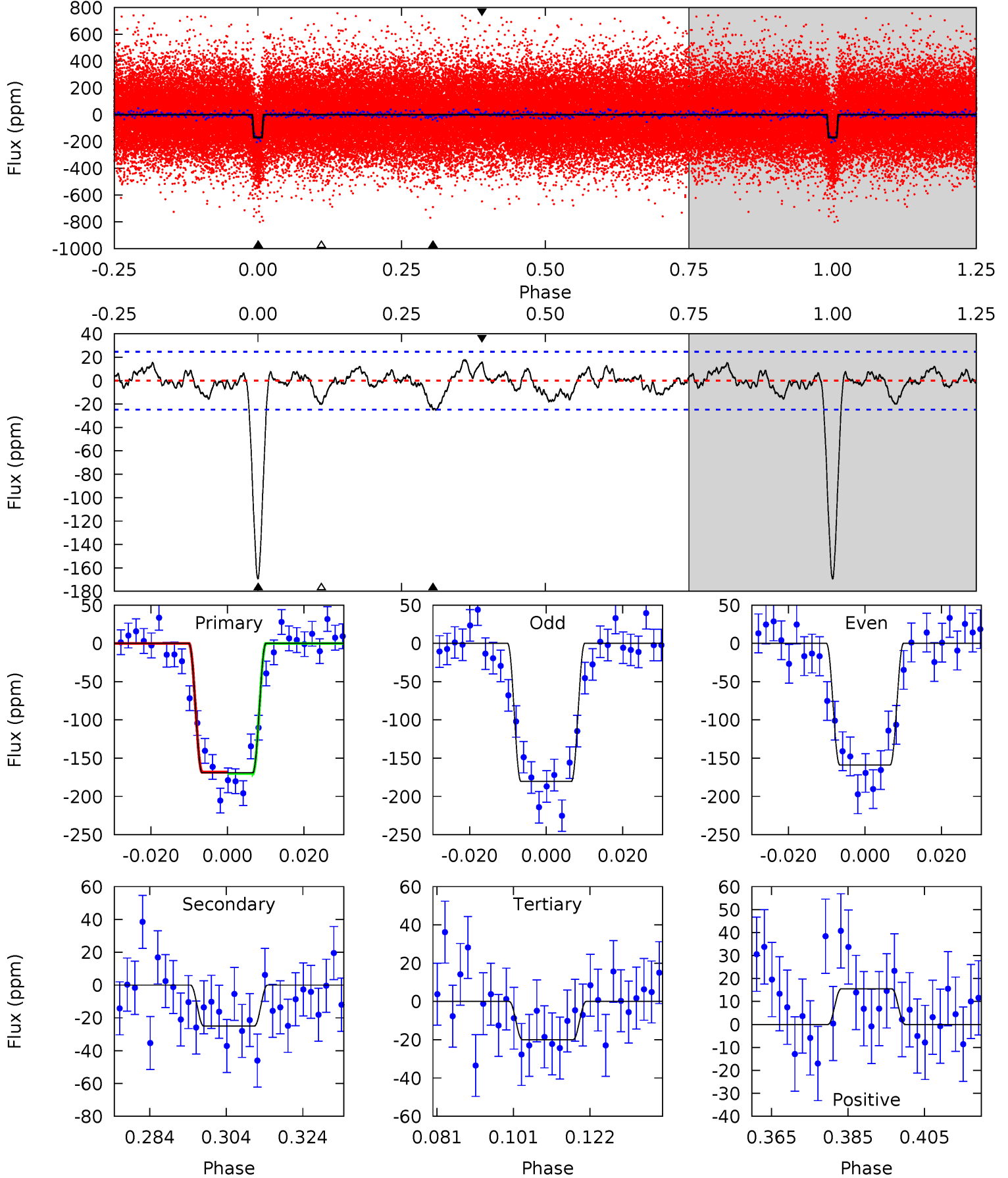
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.2	5.52	4.16	3.25	4.84	2.22	1.46	36.0	37.0	1.35	2.26	2.23	0.98	0.08	1.25



# Alt Model-Shift Uniqueness Test

006768394-01, P = 8.918805 Days, E = 131.172436 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
33.5	4.94	3.96	3.06	4.89	2.32	1.41	29.5	30.4	0.98	1.88	2.12	1.01	0.09	0.17





### Stellar Parameters For KIC 006768394

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5862^{+105}_{-117}$	$4.194^{+0.182}_{-0.098}$	$-0.100^{+0.150}_{-0.150}$	$1.307^{+0.209}_{-0.256}$	$0.973^{+0.085}_{-0.071}$	$0.614^{+0.515}_{-0.205}$
	+2%/-2%	+4%/-2%	+150%/-150%	+16%/-20%	+9%/-7%	+84%/-33%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 006768394-01 / KOI 2086.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	-24±4	$2.36^{+0.25}_{-0.28}$	$1414^{+70}_{-81}$	$3601^{+130}_{-124}$	$17^{+6}_{-4}$
Alt.	-25±5	$1.90^{+0.22}_{-0.21}$	$1421^{+70}_{-85}$	$3894^{+163}_{-174}$	$26^{+10}_{-7}$

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

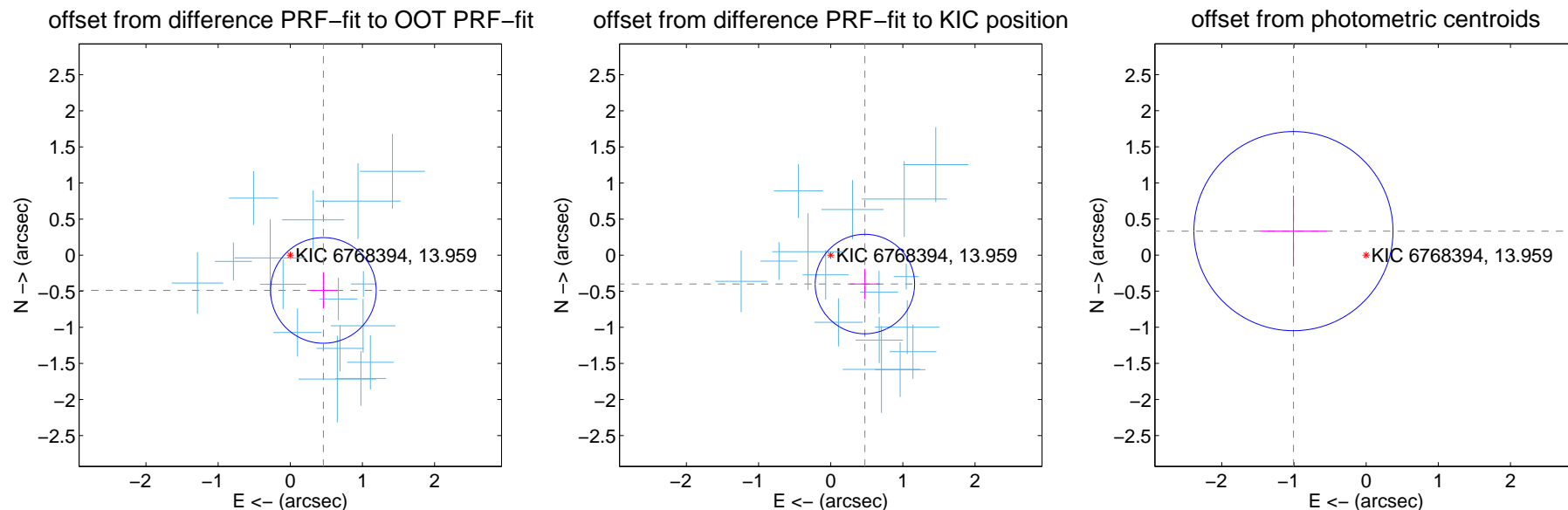
## DV Centroid Data

Supplemental centroid analysis for 006768394-01. Kepler magnitude: 13.96. Transit SNR 25.84

There are 16 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

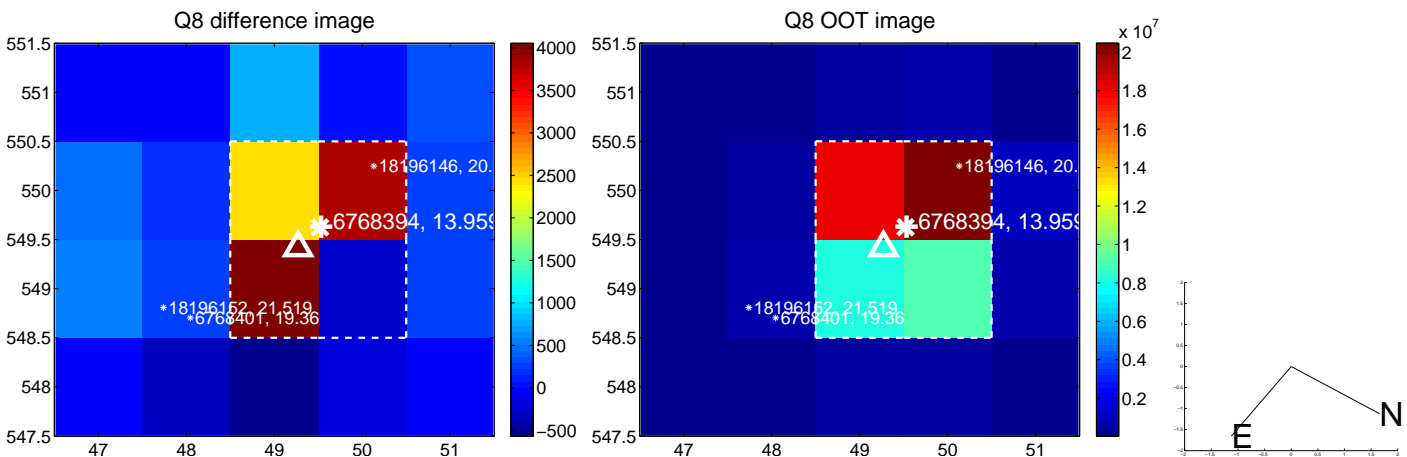
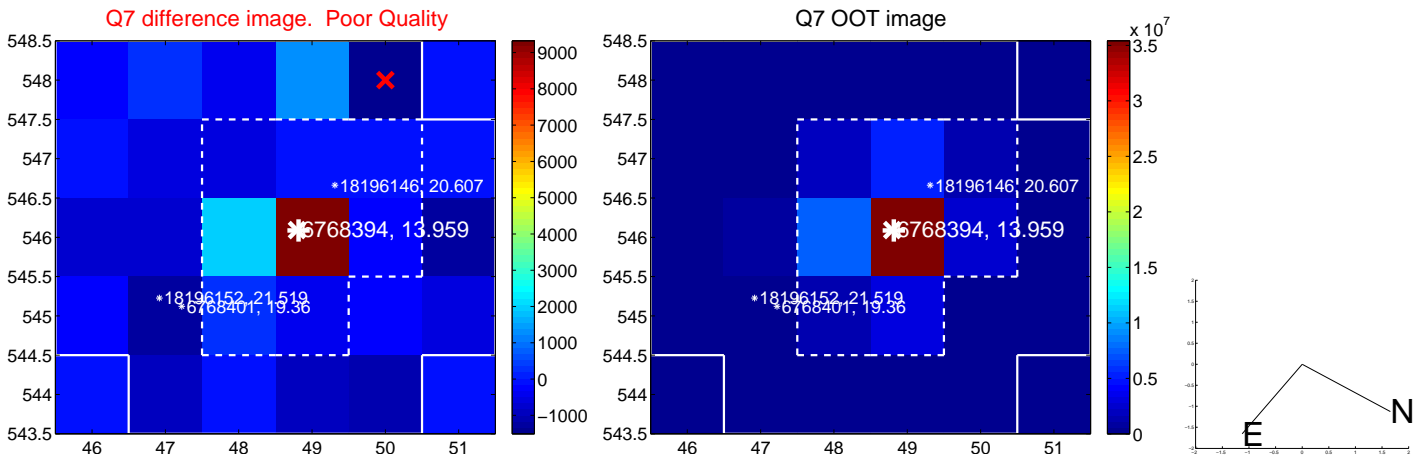
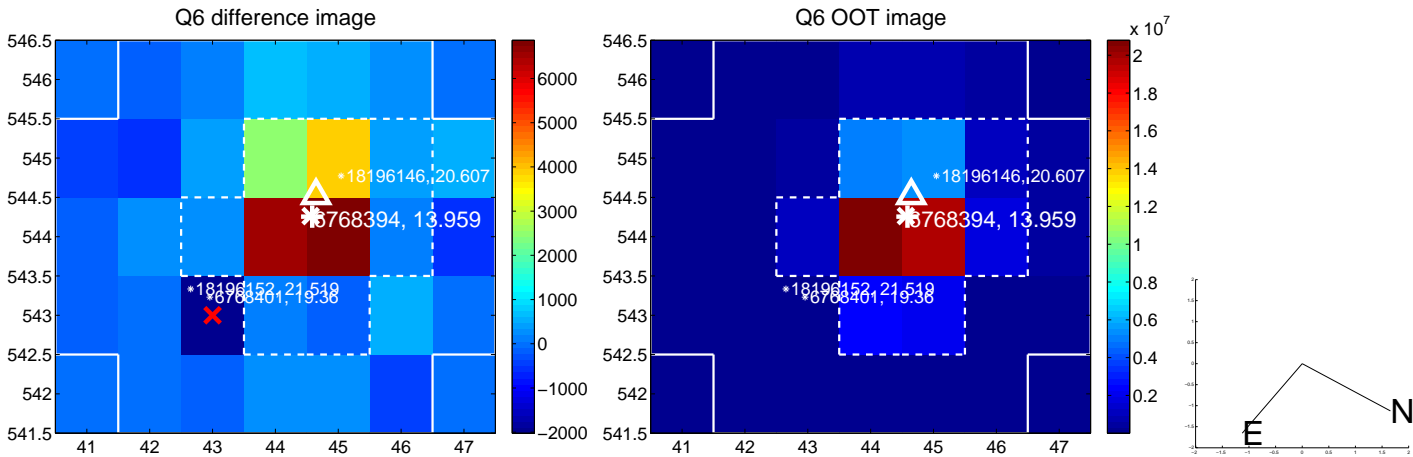
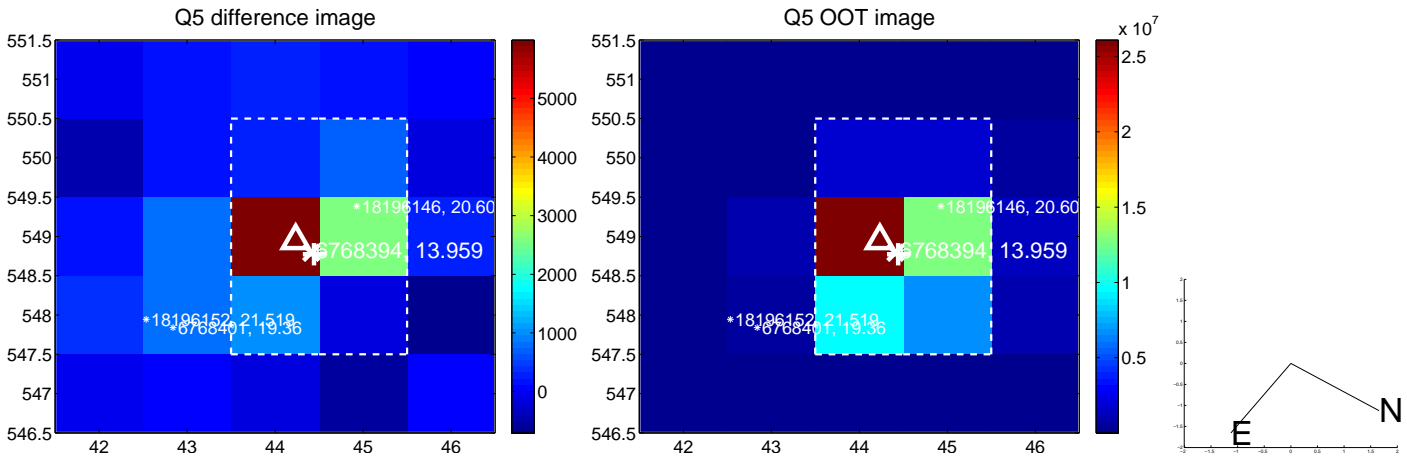
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.670 \pm 0.244$	2.75	$-0.459 \pm 0.192$	$-0.488 \pm 0.248$
PRF-fit source offset from KIC position	$0.620 \pm 0.230$	2.70	$-0.473 \pm 0.209$	$-0.400 \pm 0.211$
photometric centroid source offset	$1.06 \pm 0.46$	2.31	$1.01 \pm 0.46$	$0.33 \pm 0.49$



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.

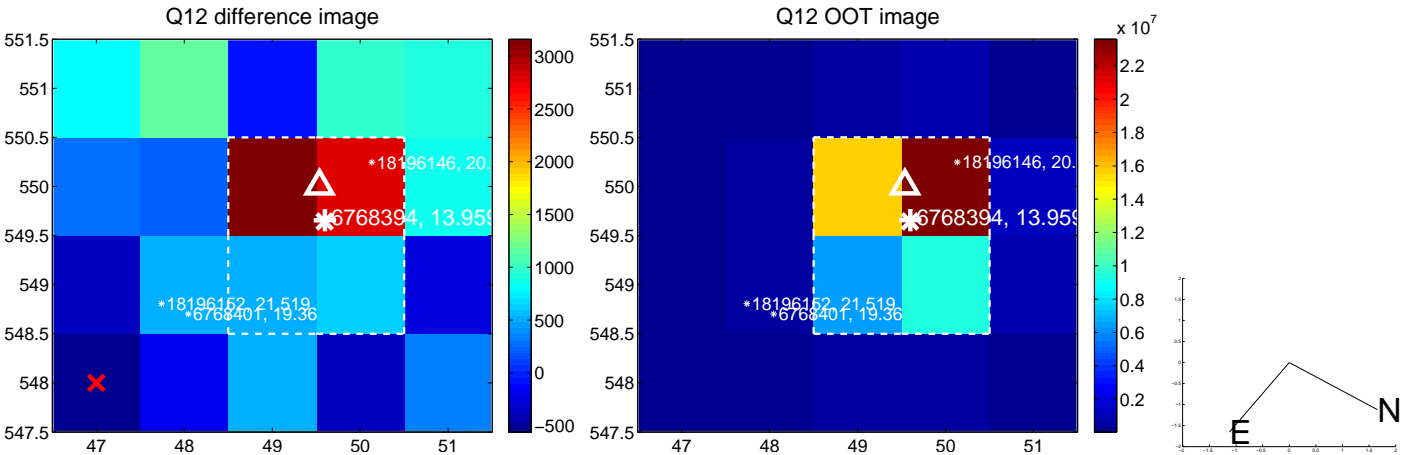
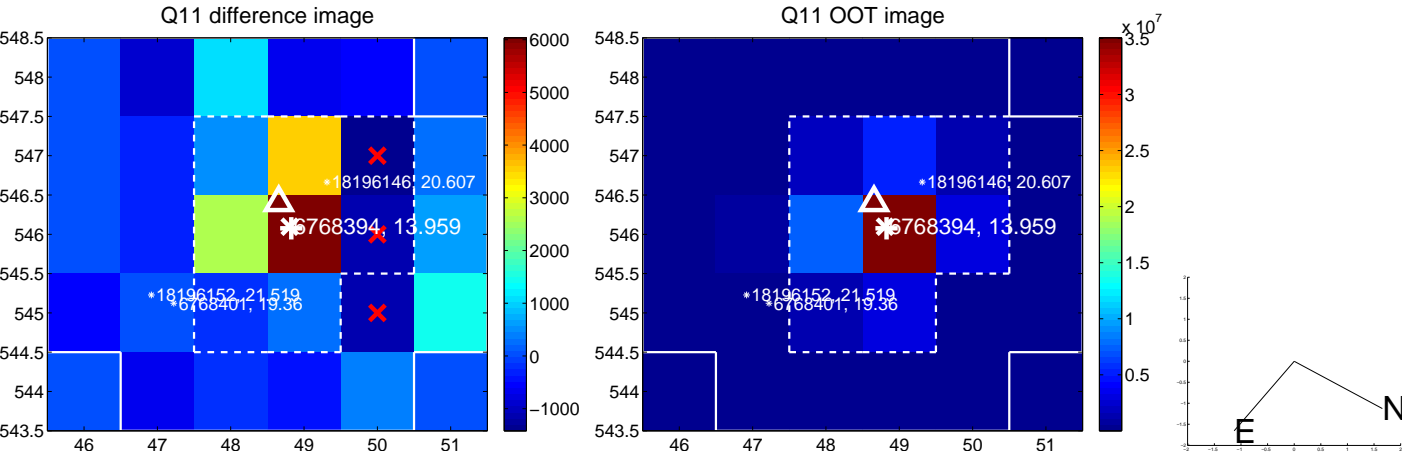
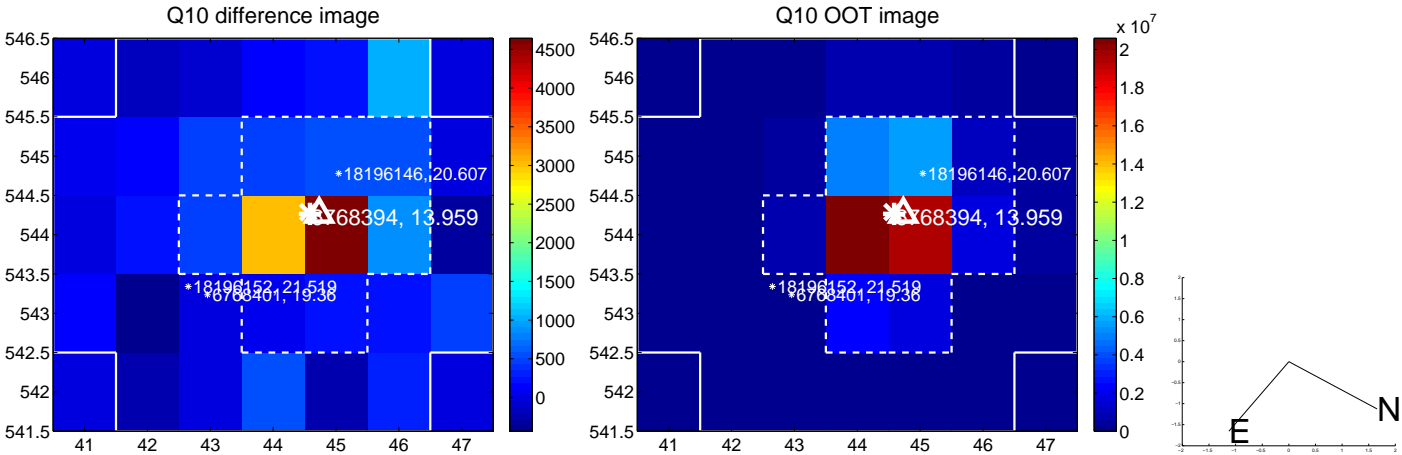
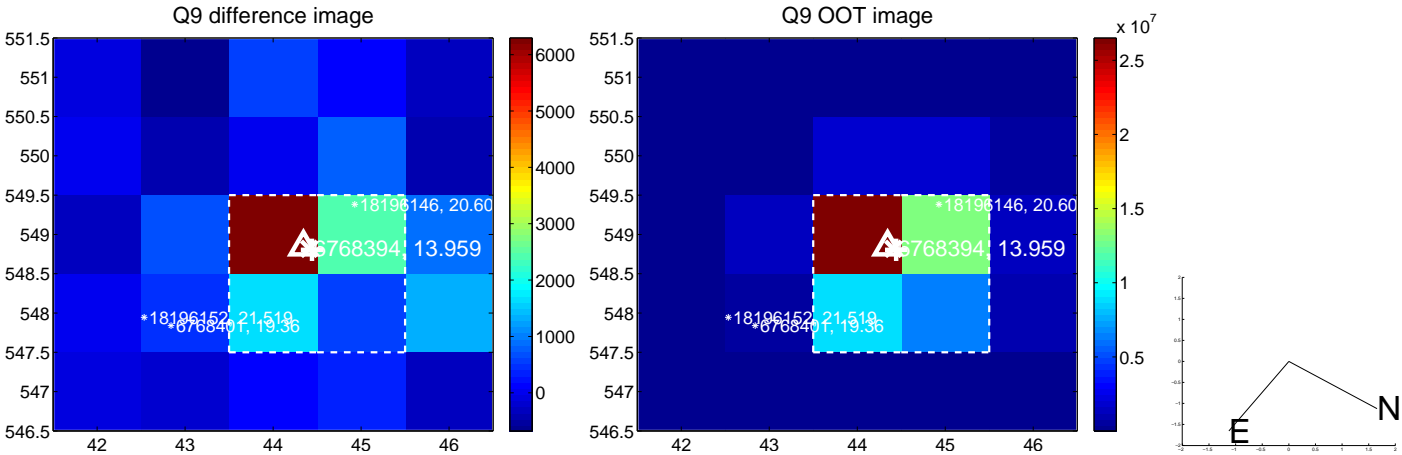


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

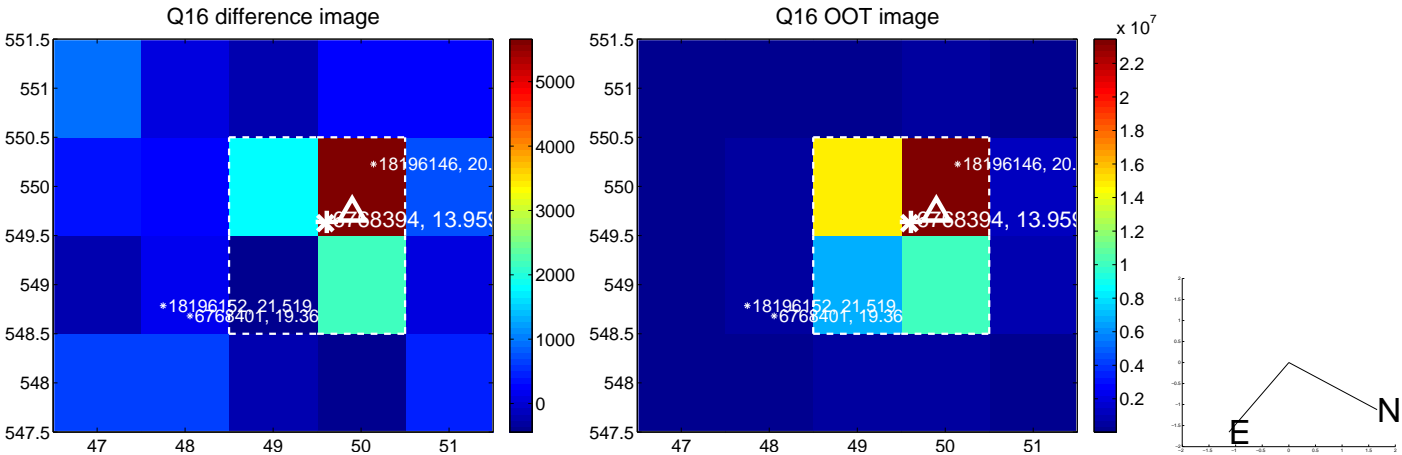
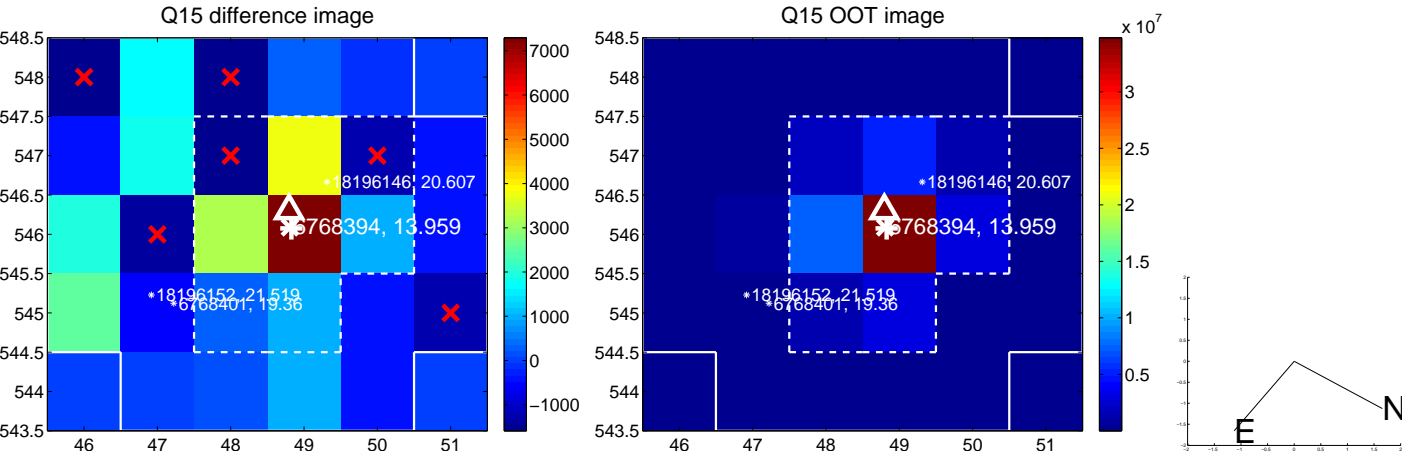
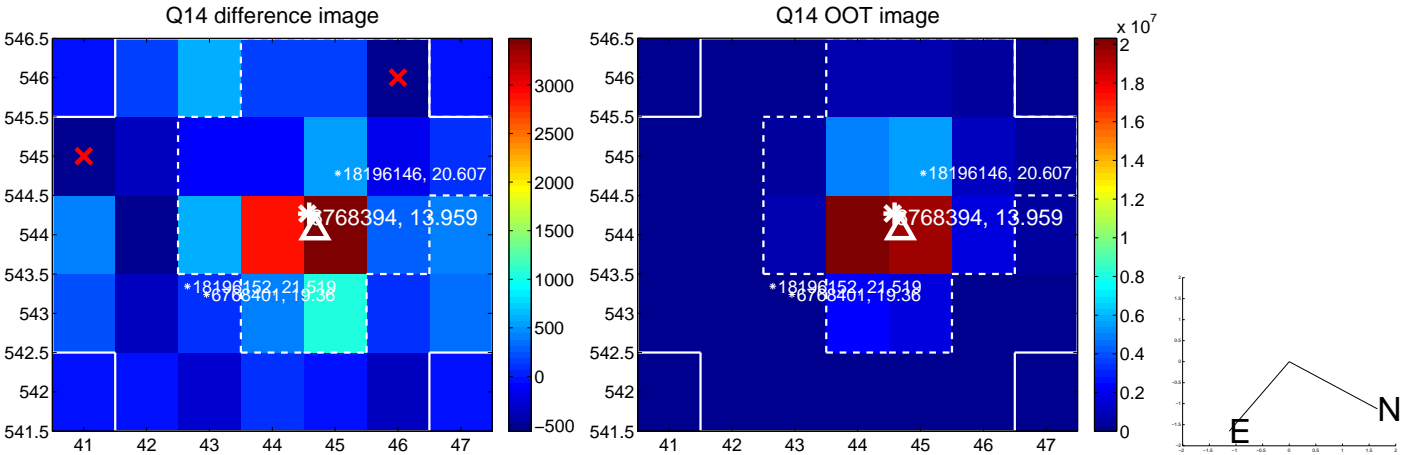
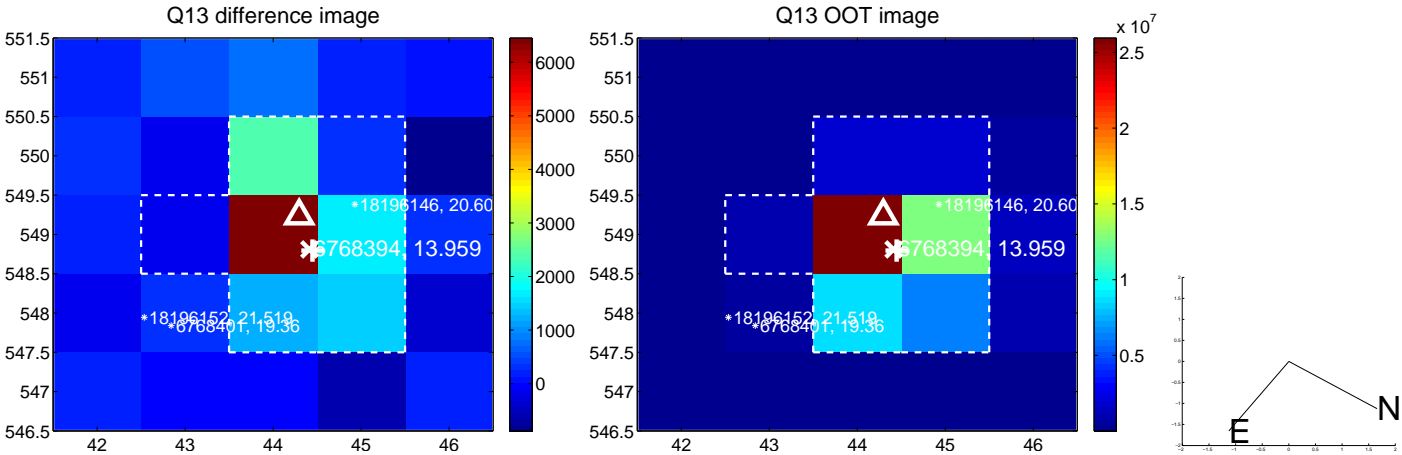




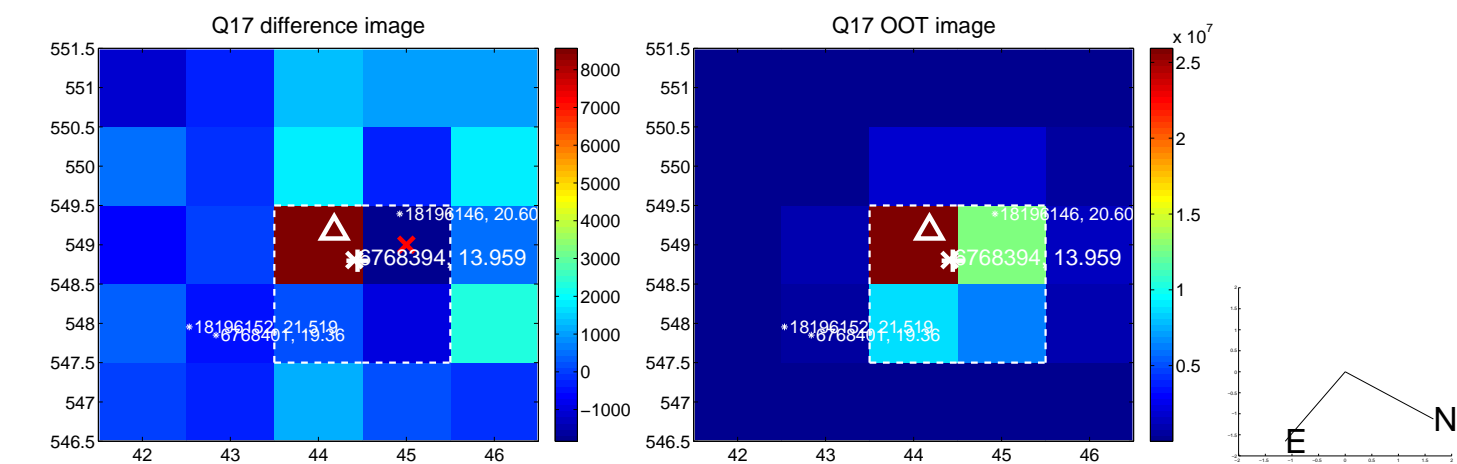
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



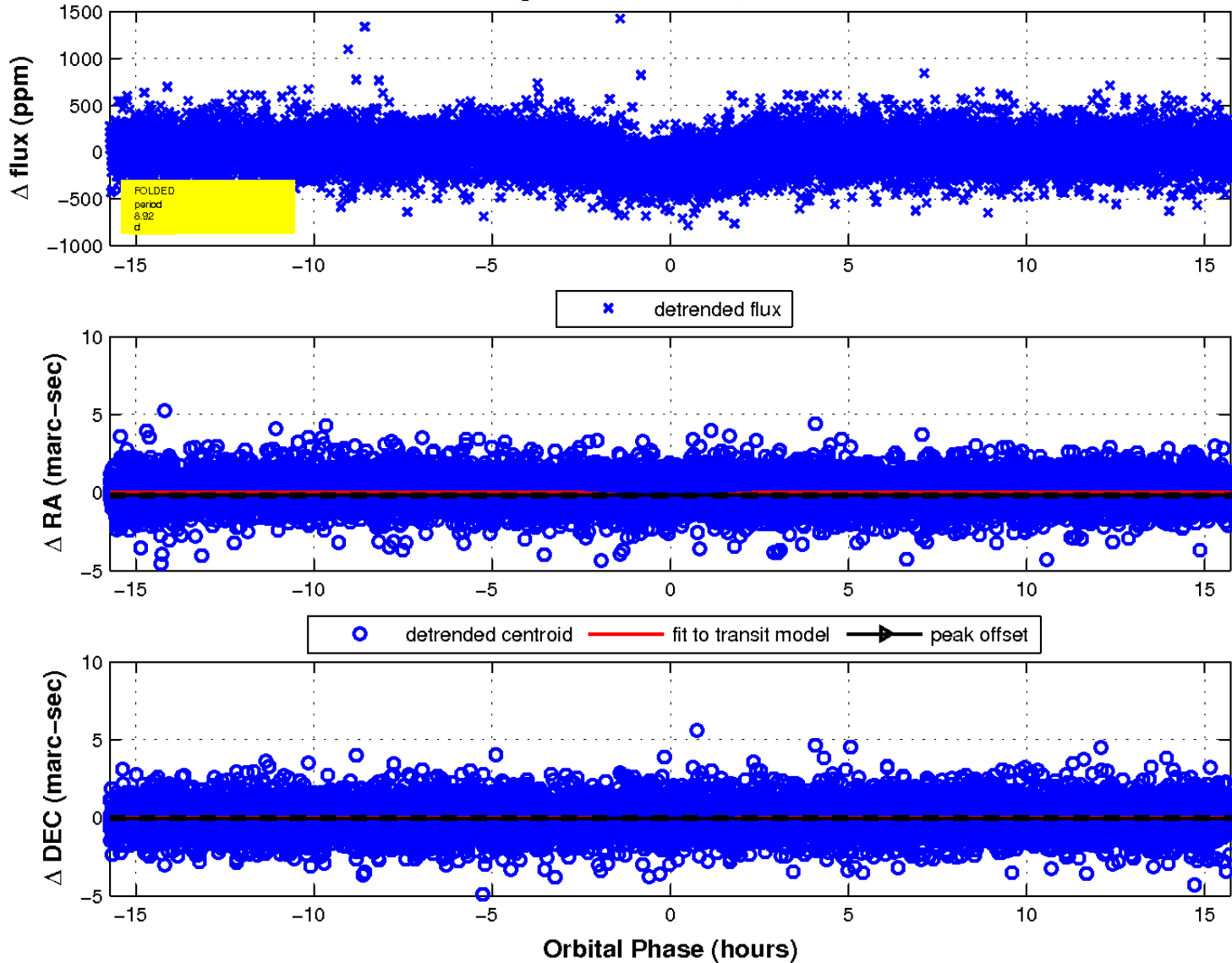
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

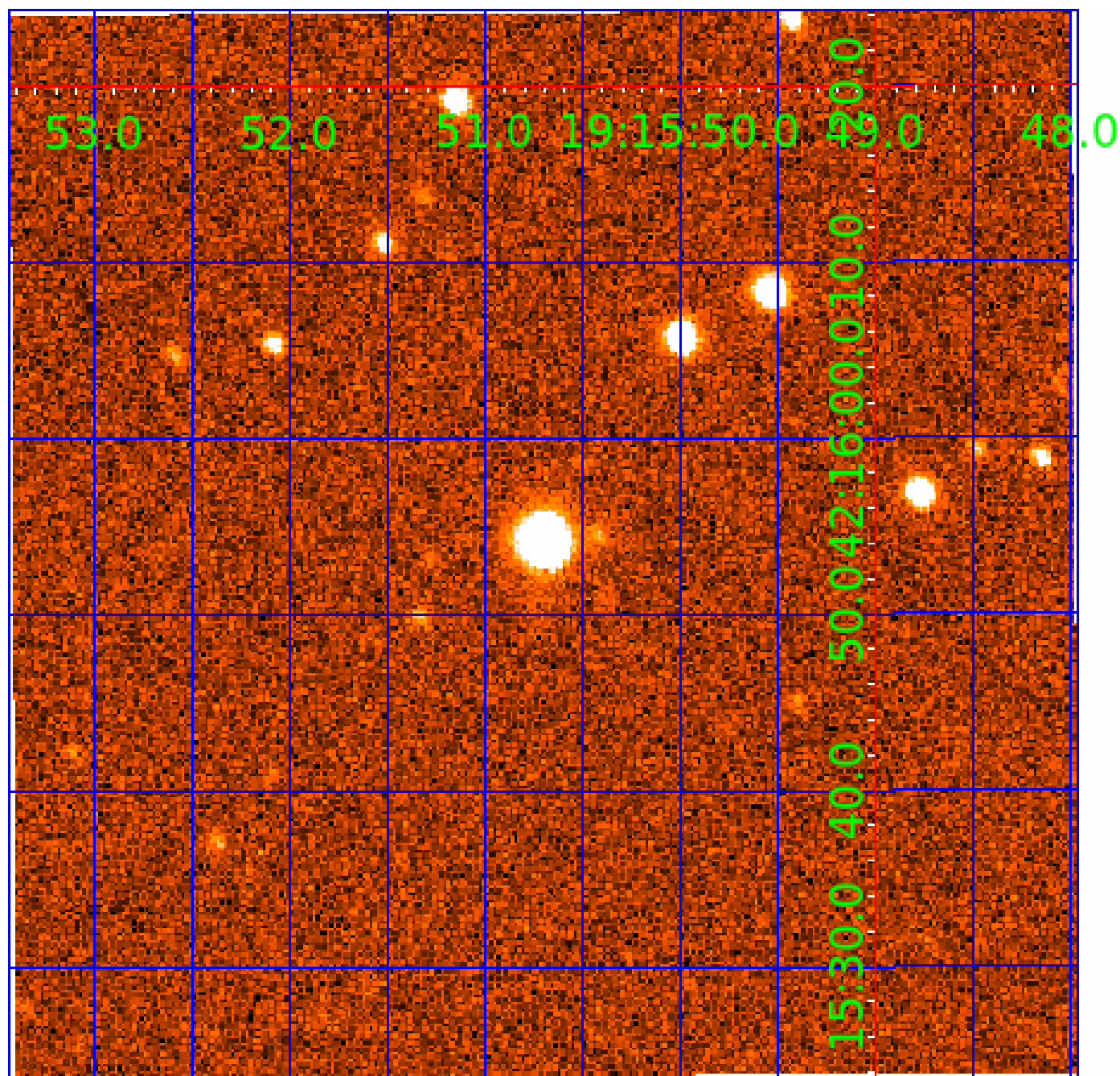


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 006768394

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006768394-01	OBS	2086.02	8.918955	140.078497	183.0	5.243	23.9	25.8	1.31	5862	2.40	259.52
006768394-02	OBS	2086.01	7.132928	135.994206	144.5	4.605	23.6	25.0	1.31	5862	1.90	349.60
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006768394-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
006768394-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
006768394-03	OBS	PC	0.95	0	0	0	0	NO_COMMENT

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

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

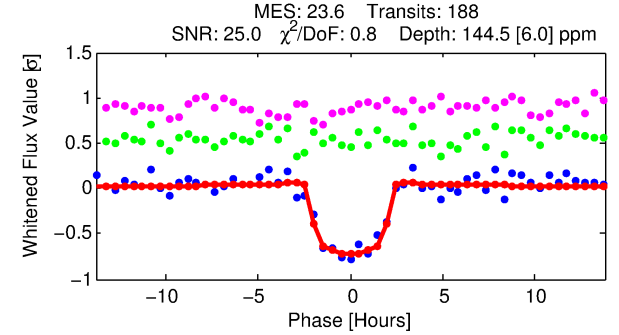
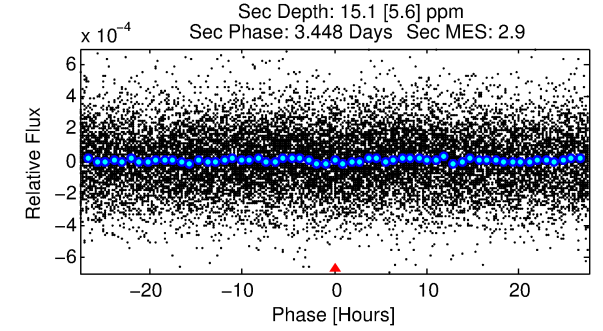
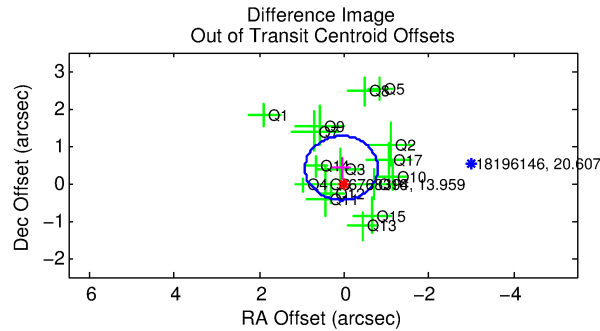
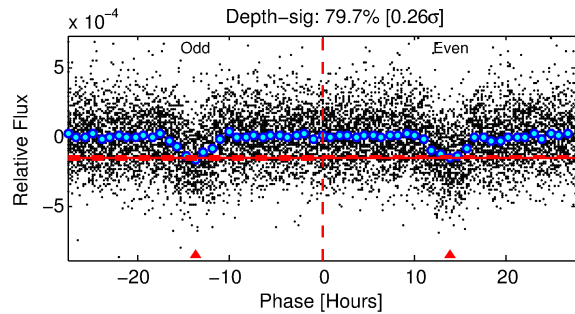
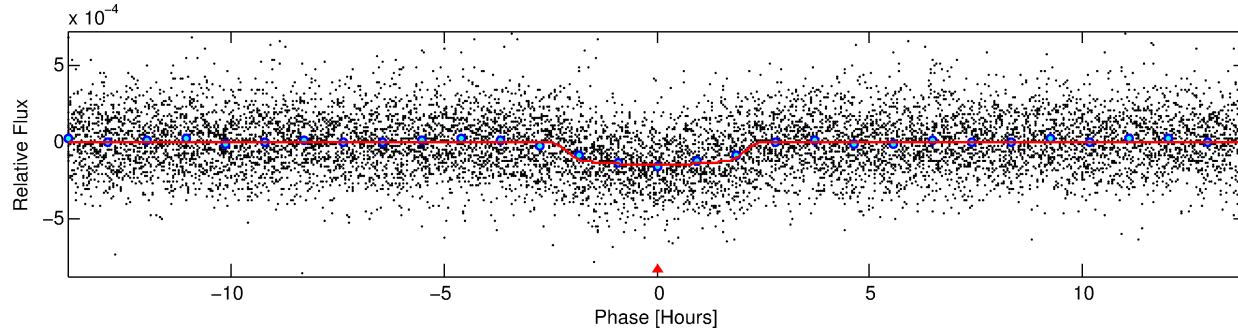
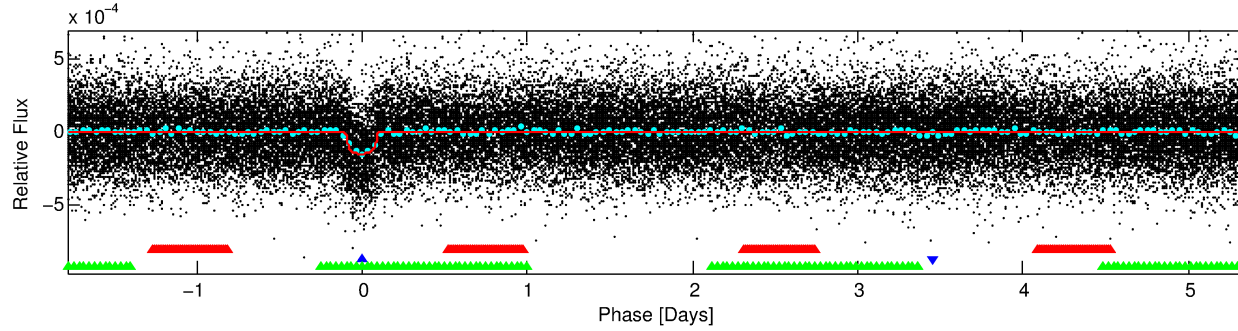
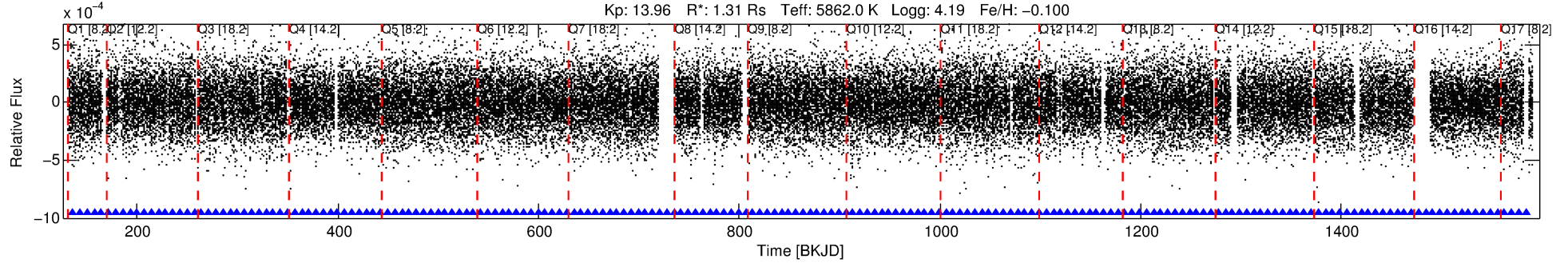
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006768394-02

No Significant Match Found

# DV One-Page Summary

KIC: 6768394 Candidate: 2 of 3 Period: 7.133 d  
KOI: K02086.01 Name: Kepler-60b Corr: 0.983



## DV Fit Results:

Period = 7.13293 [0.00003] d  
Epoch = 135.9942 [0.0032] BKJD  
Rp/R\* = 0.0133 [0.0016]  
a/R\* = 5.09 [2.90]  
b = 0.92 [0.10]  
Seff = 349.60 [111.37]  
Teq = 1103 [88] K  
Rp = 1.90 [0.43] Re  
a = 0.0719 [0.0137] AU  
Ag = 11.88 [6.40] [1.70 $\sigma$ ]  
Teffp = 3165 [355] K [5.63 $\sigma$ ]

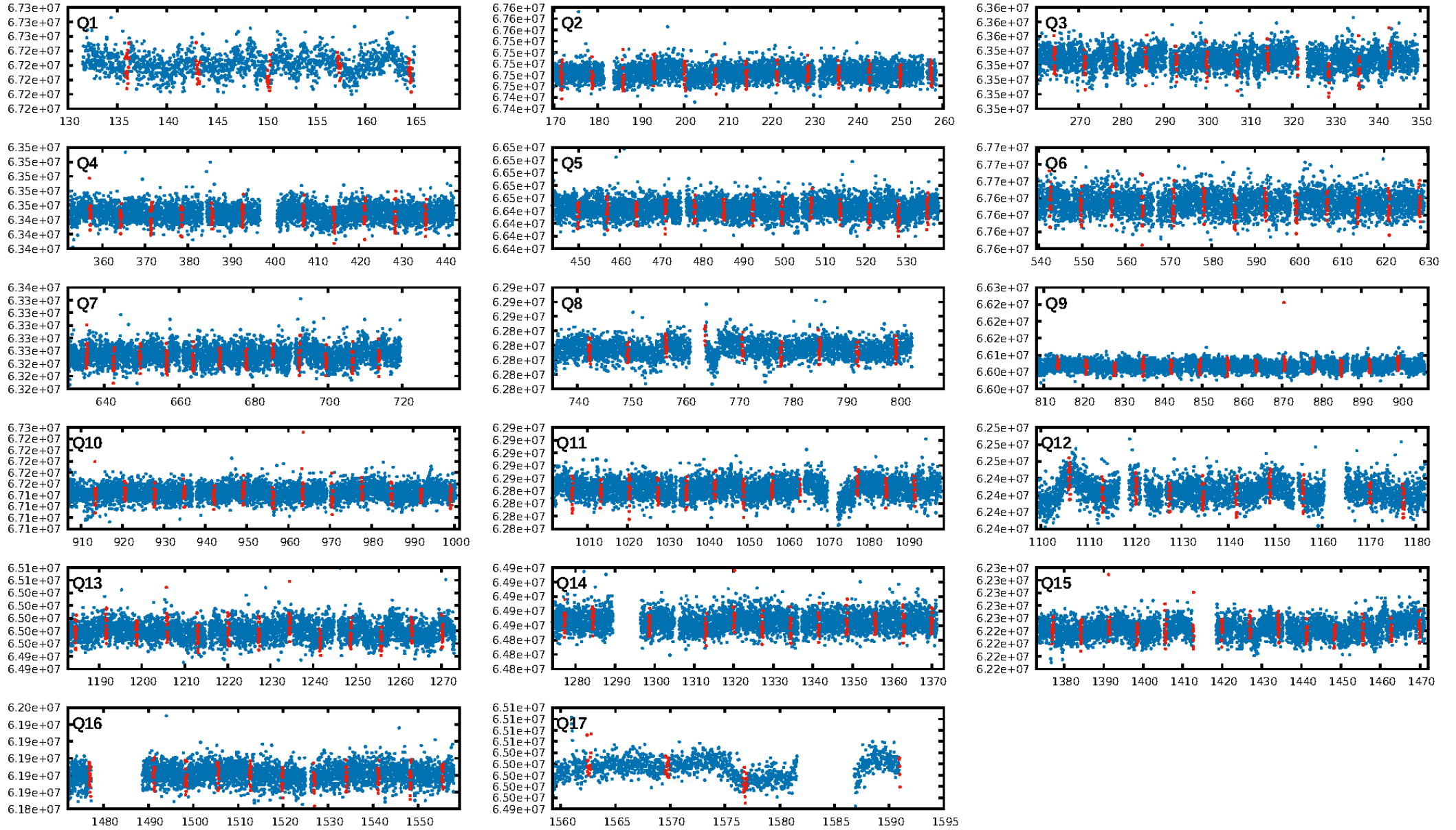
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [6.14 $\sigma$ ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.77e-115  
RollingBand-fgt: 1.00 [180/180]  
GhostDiagnostic-chr: 4.574  
Centroid-sig: 0.4%  
Centroid-so: 1.103 arcsec [2.16 $\sigma$ ]  
OotOffset-rm: 0.411 arcsec [1.44 $\sigma$ ]  
KicOffset-rm: 0.468 arcsec [1.64 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

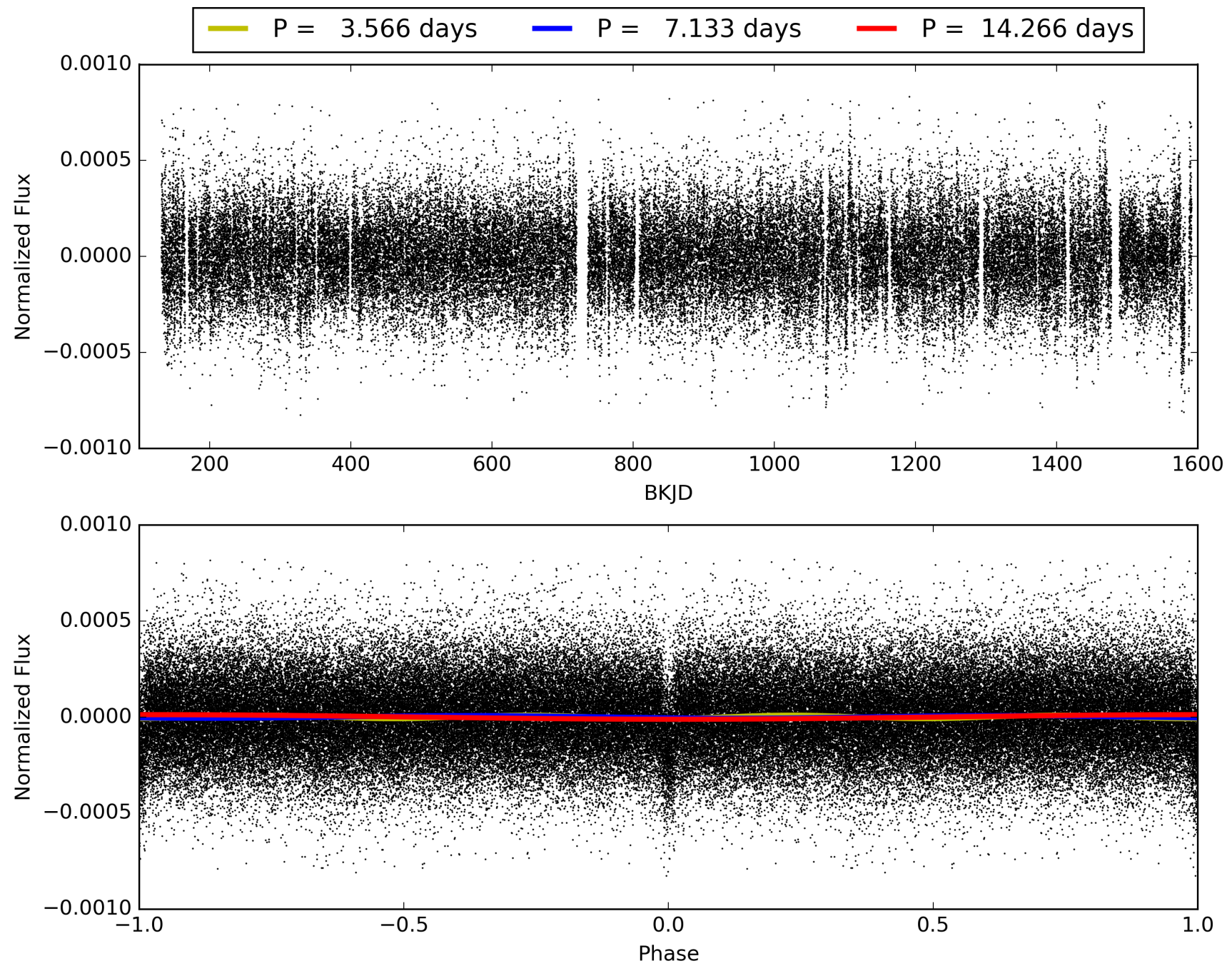
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:44:53 Z

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

# TCE 006768394-02, PDC Light Curves



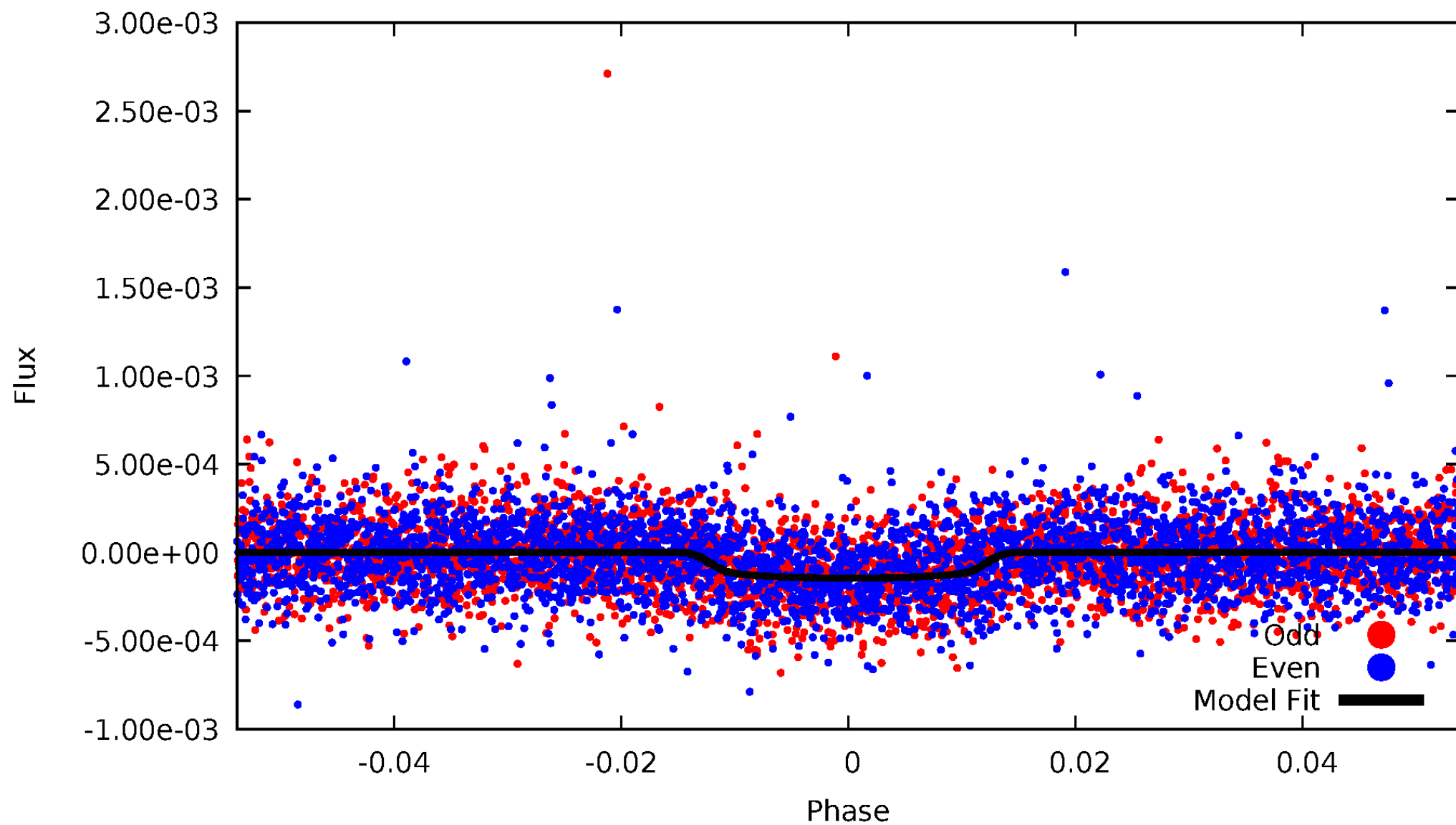
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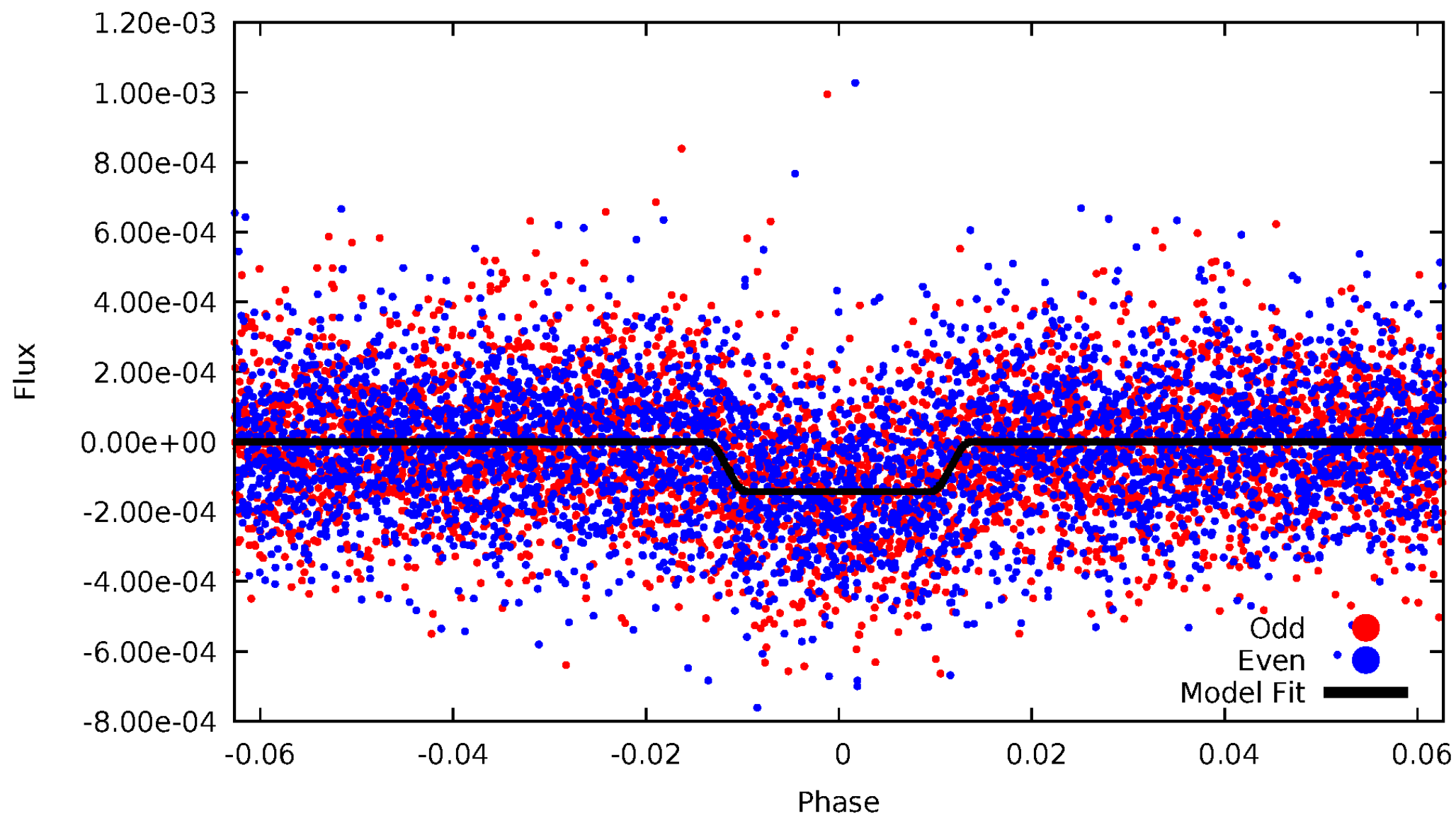
DV Odd/Even

TCE 006768394-02



# ALT Odd/Even

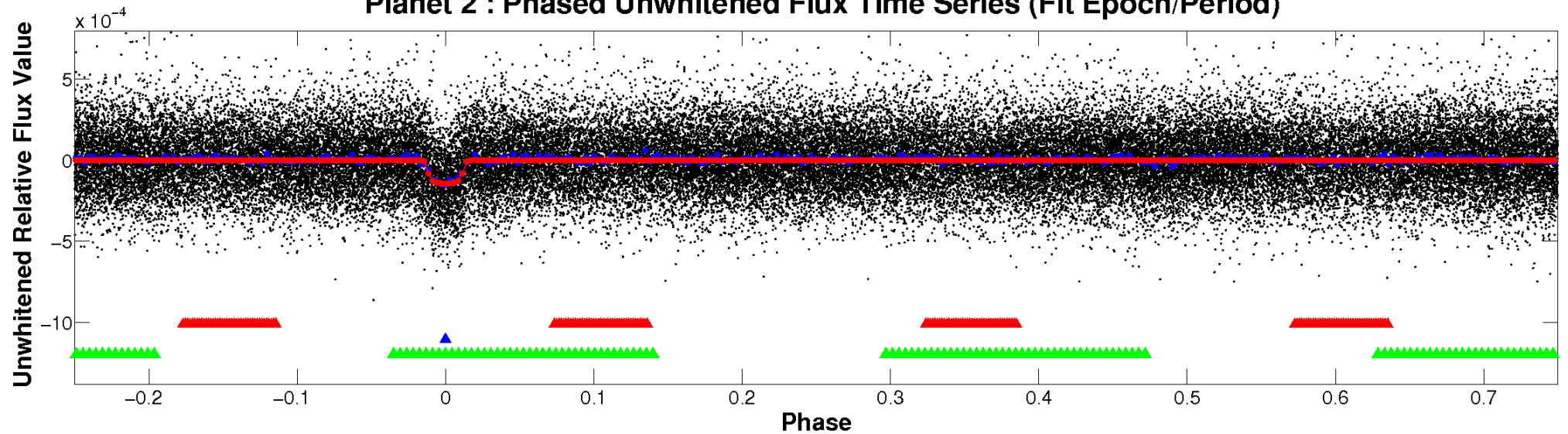
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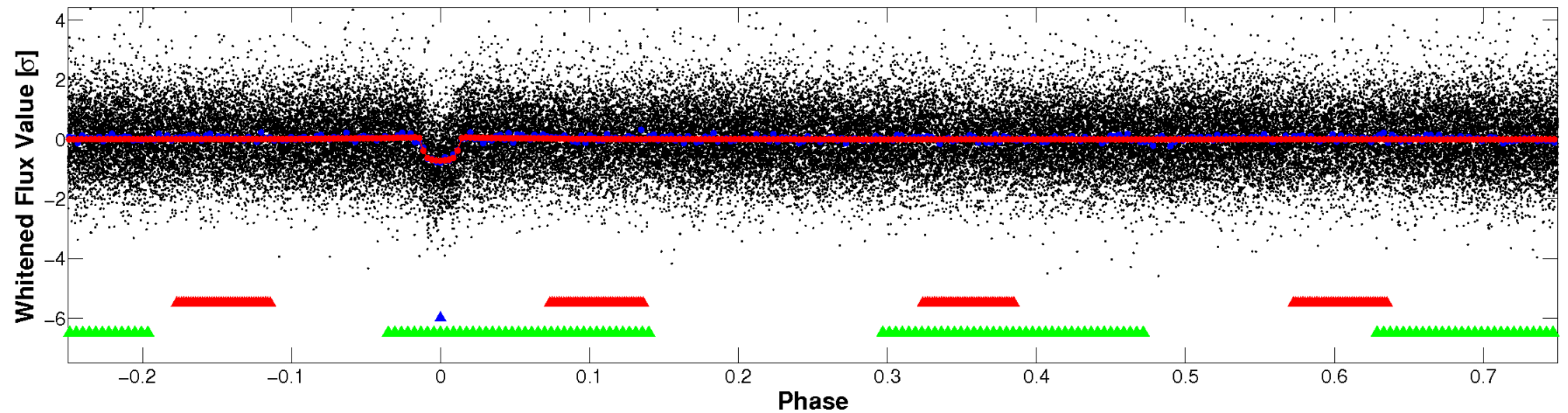


# Non-Whitened Vs. Whitened Light Curve

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

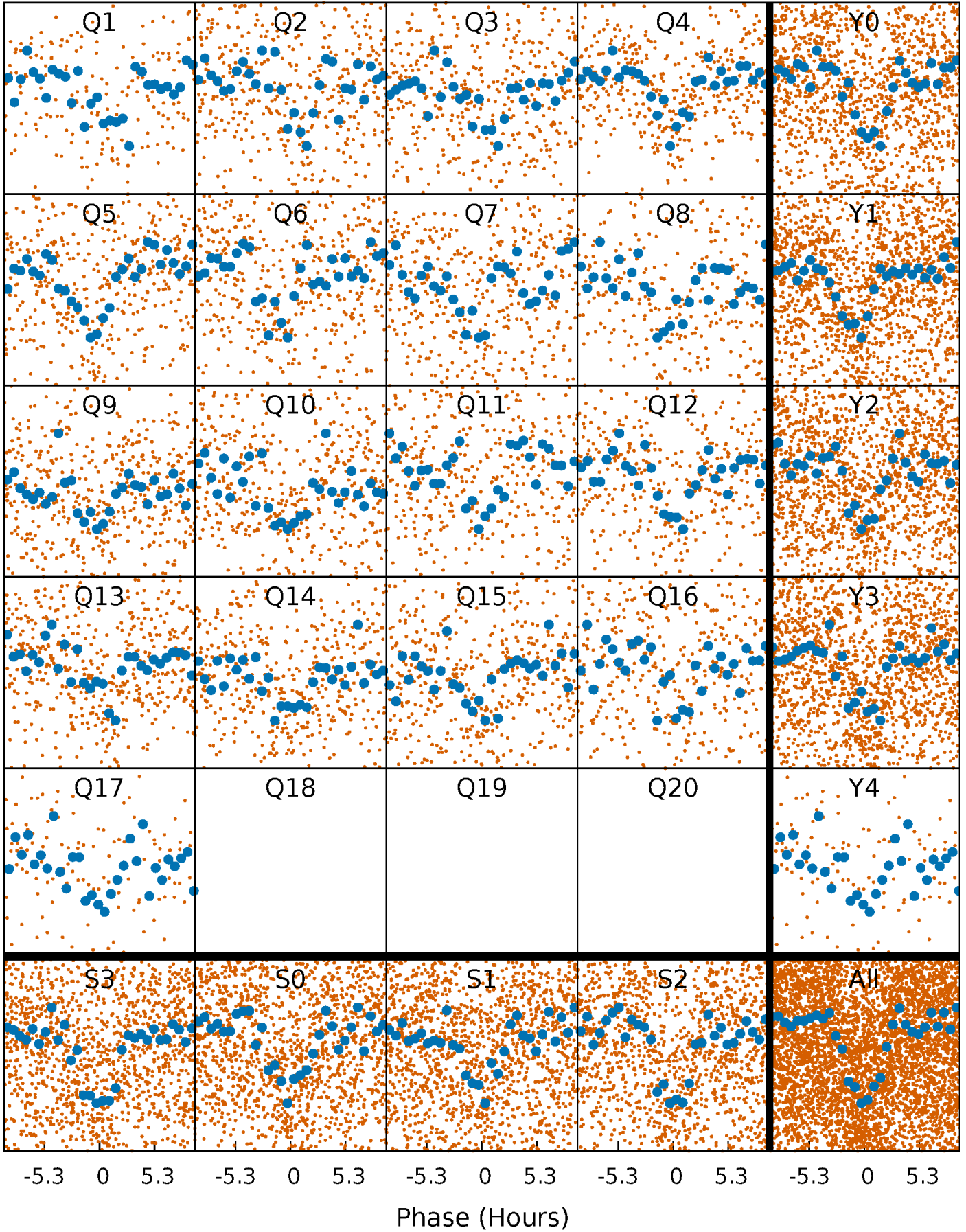


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



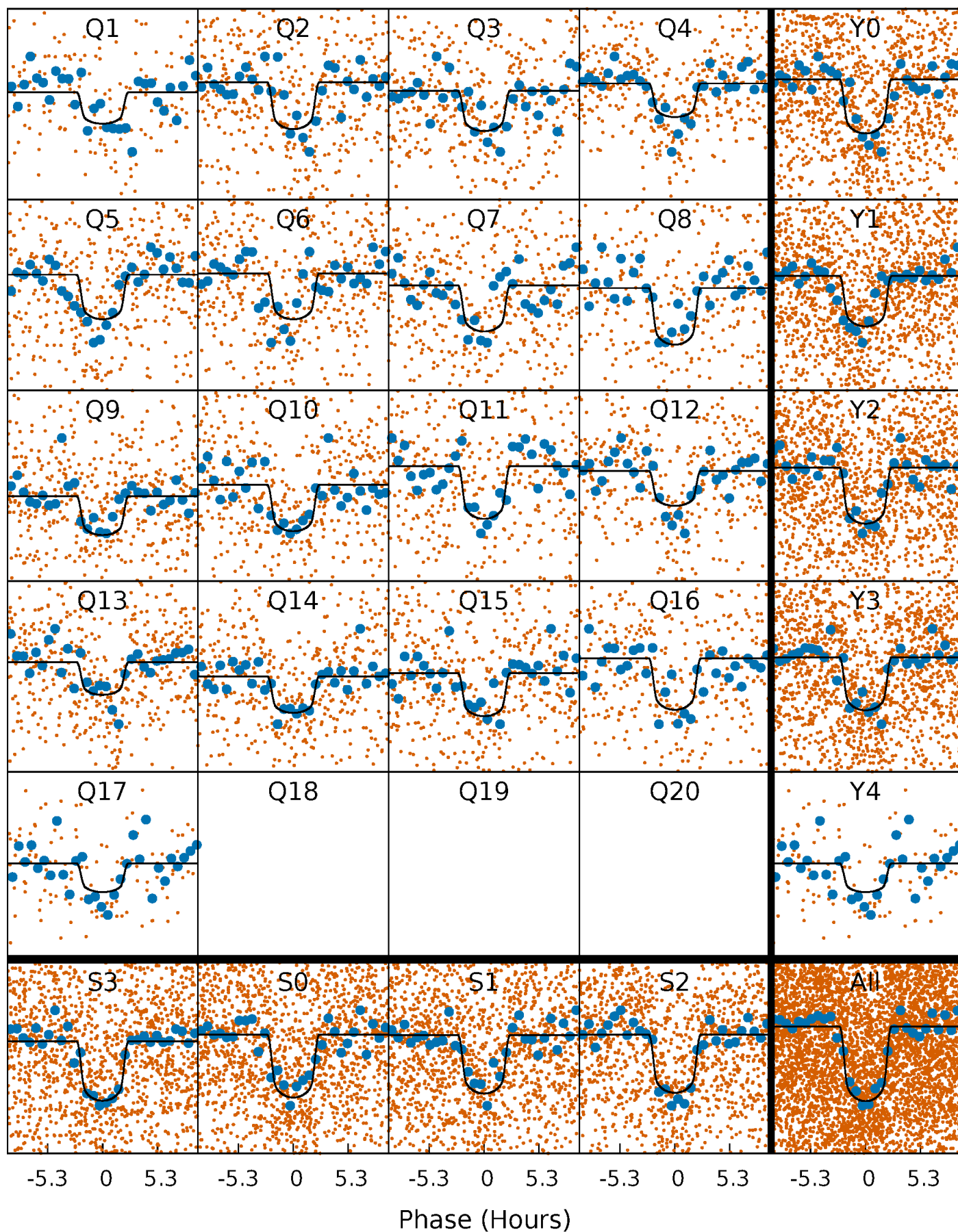
# PDC Quarter-Phased Transit Curves

TCE 006768394-02   P= 7.132928 Days    $T_0=135.994206$  (BKJD)



# DV Quarter-Phased Transit Curves

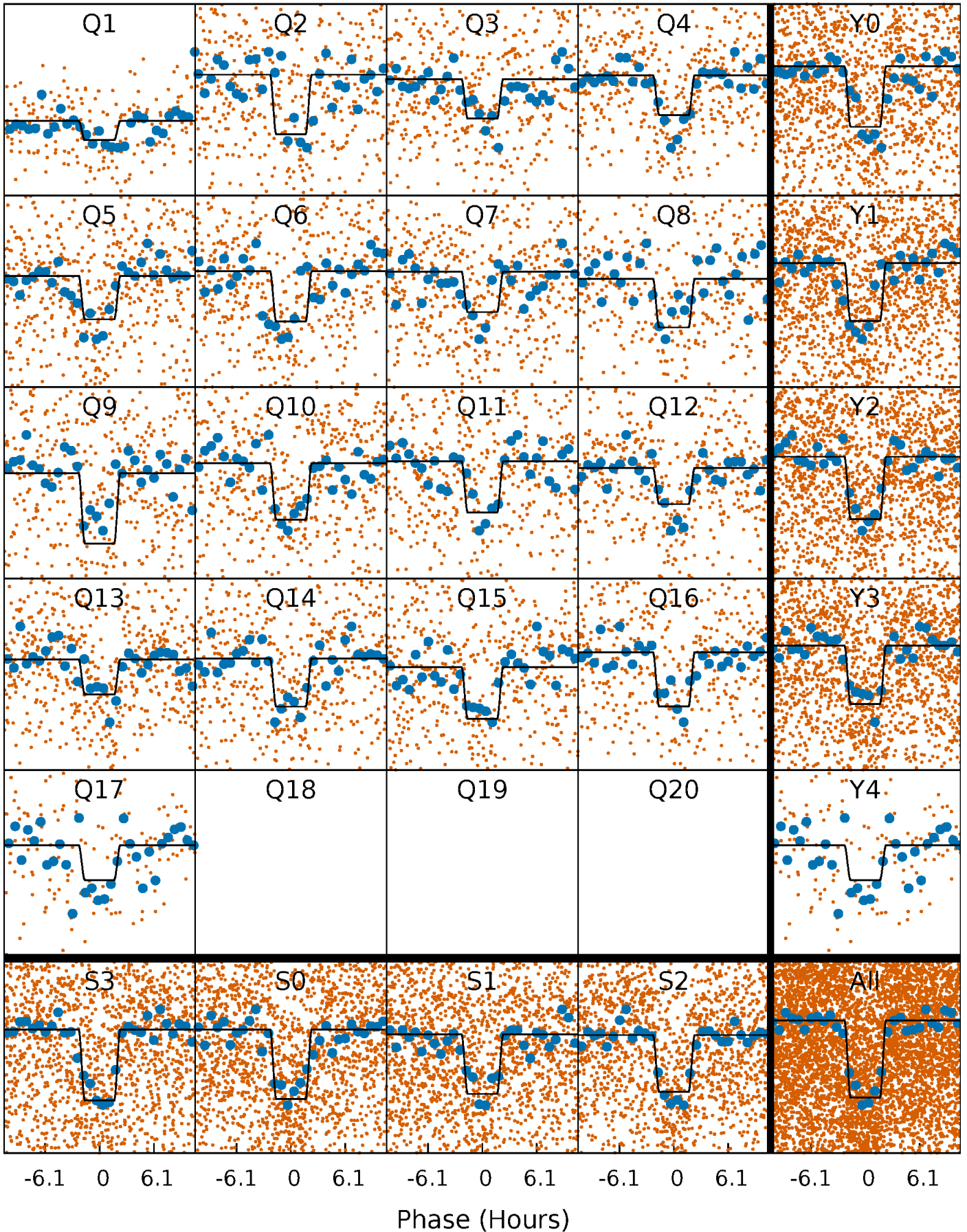
TCE 006768394-02 P= 7.132928 Days  $T_0=135.994206$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

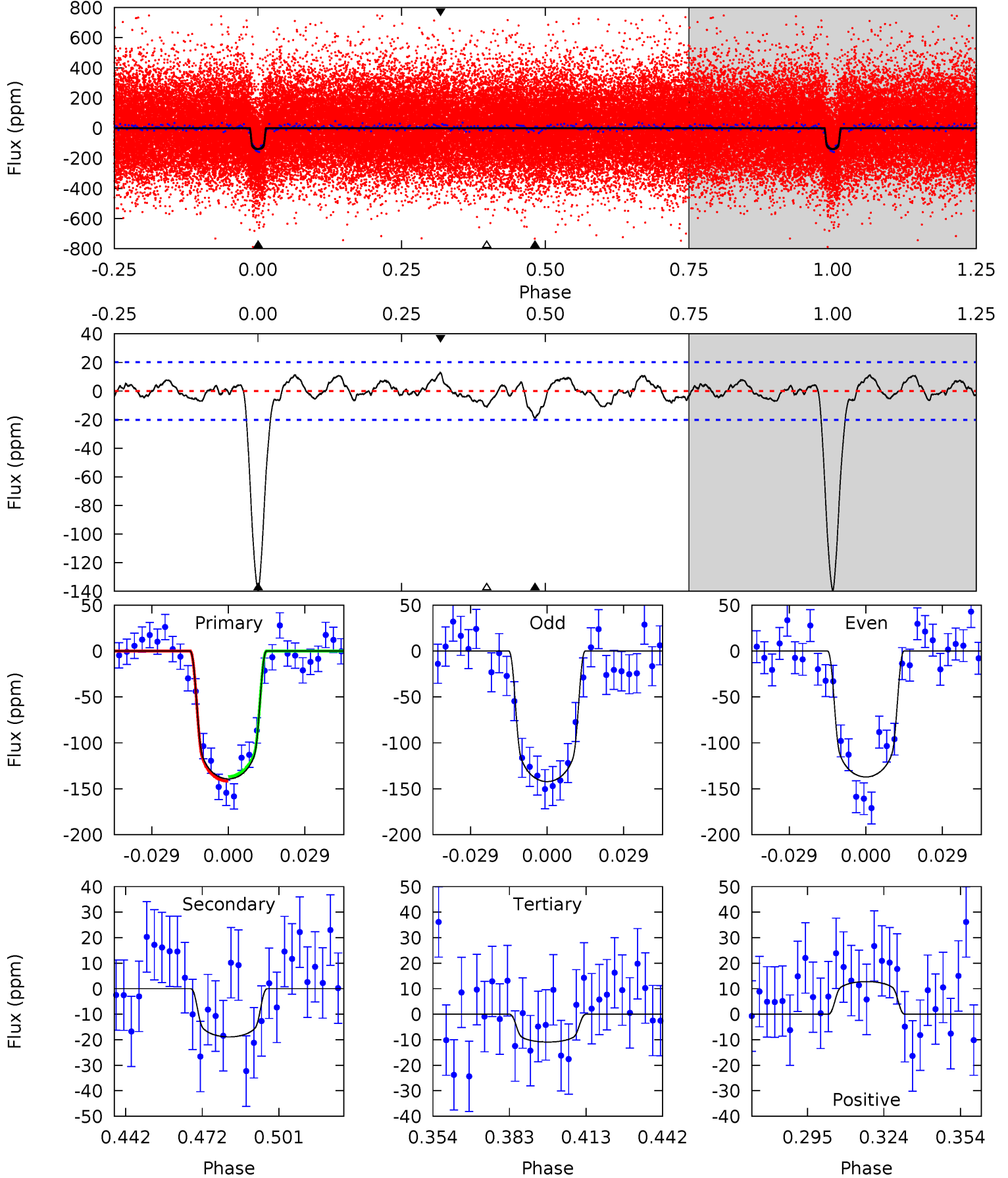
TCE 006768394-02     $P = 7.132971$  Days     $T_0 = 135.987147$  (BKJD)



# DV Model-Shift Uniqueness Test

006768394-02, P = 7.132928 Days, E = 128.861278 Days

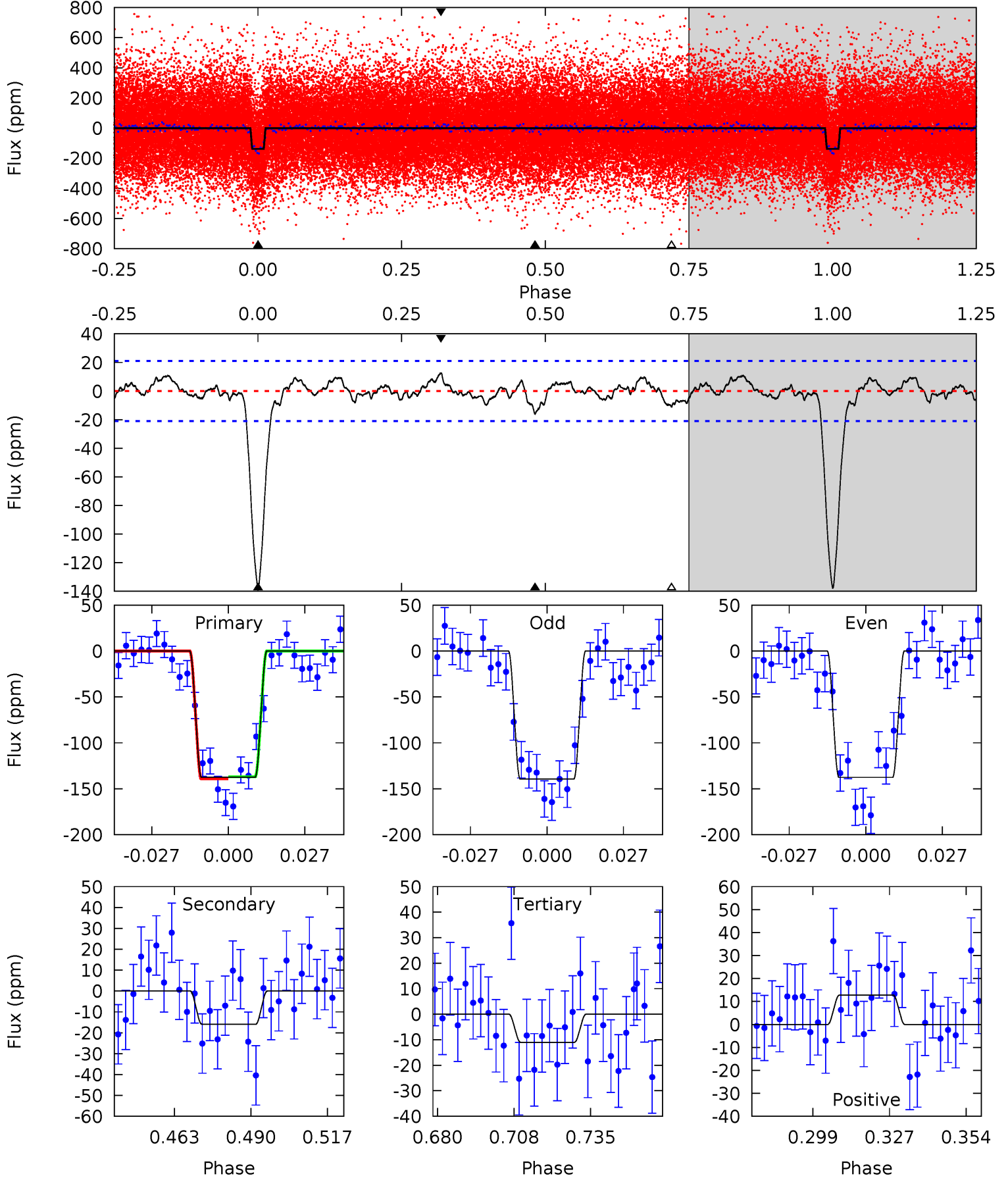
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.2	4.51	2.60	3.05	4.81	2.18	1.22	30.6	30.2	1.91	1.46	0.60	1.02	0.08	0.61



# Alt Model-Shift Uniqueness Test

006768394-02, P = 7.132971 Days, E = 128.854176 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
31.5	3.65	2.53	2.93	4.83	2.21	1.09	29.0	28.6	1.13	0.73	0.21	1.02	0.08	0.27





### Stellar Parameters For KIC 006768394

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5862^{+105}_{-117}$	$4.194^{+0.182}_{-0.098}$	$-0.100^{+0.150}_{-0.150}$	$1.307^{+0.209}_{-0.256}$	$0.973^{+0.085}_{-0.071}$	$0.614^{+0.515}_{-0.205}$
	+2%/-2%	+4%/-2%	+150%/-150%	+16%/-20%	+9%/-7%	+84%/-33%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 006768394-02 / KOI 2086.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-19 \pm 4$	$1.87^{+0.31}_{-0.28}$	$1527^{+69}_{-81}$	$3730^{+220}_{-209}$	$15^{+7}_{-5}$
Alt.	$-16 \pm 4$	$1.68^{+0.29}_{-0.29}$	$1533^{+66}_{-94}$	$3767^{+255}_{-248}$	$16^{+9}_{-6}$

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

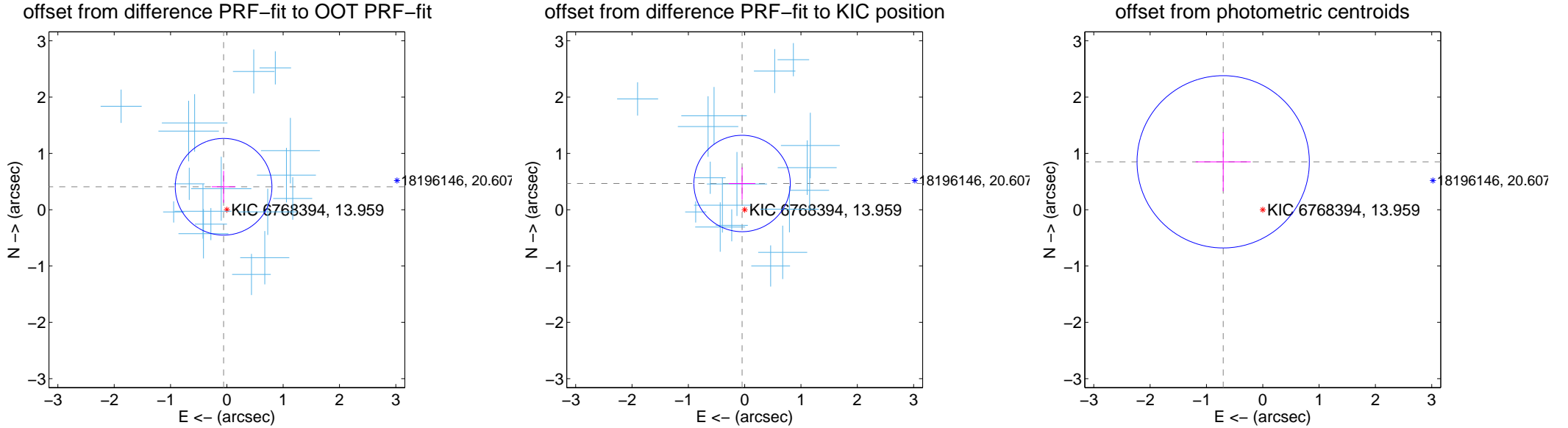
## DV Centroid Data

Supplemental centroid analysis for 006768394-02. Kepler magnitude: 13.96. Transit SNR 25.03

There are 17 quarters with good PRF difference image offsets

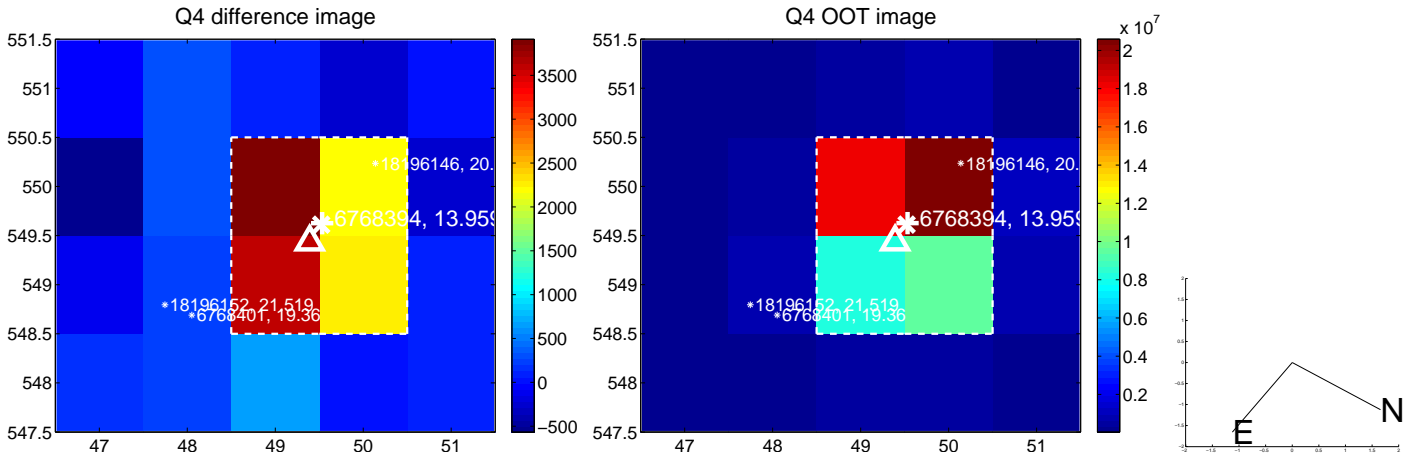
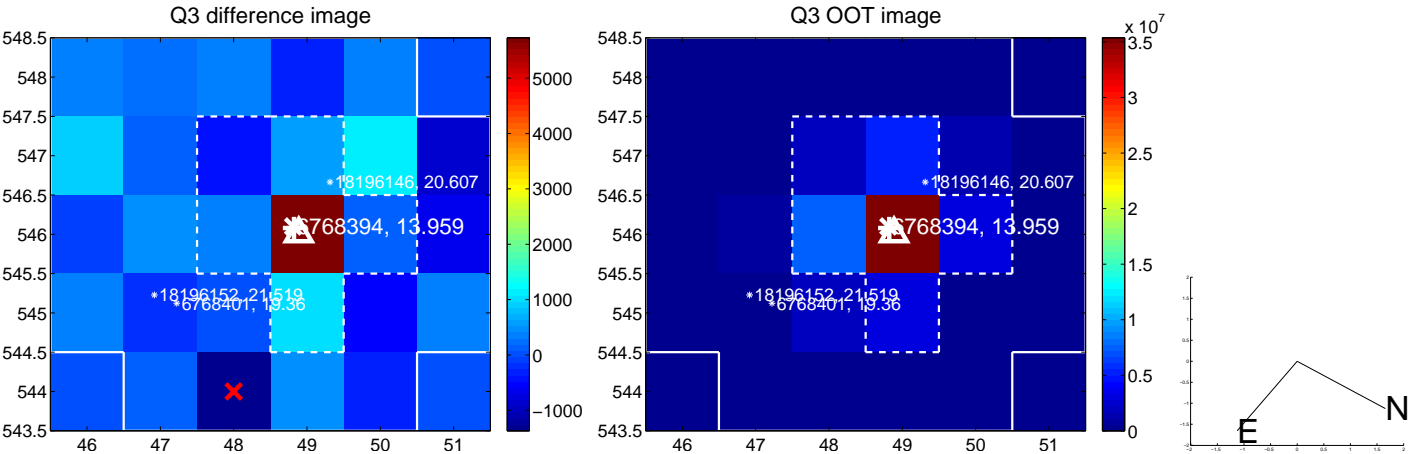
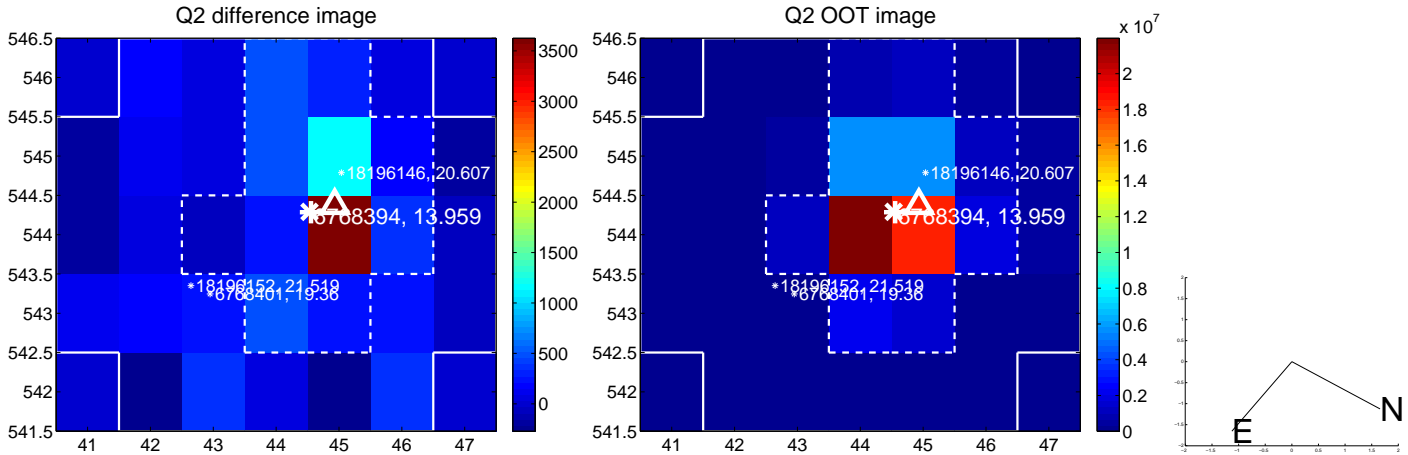
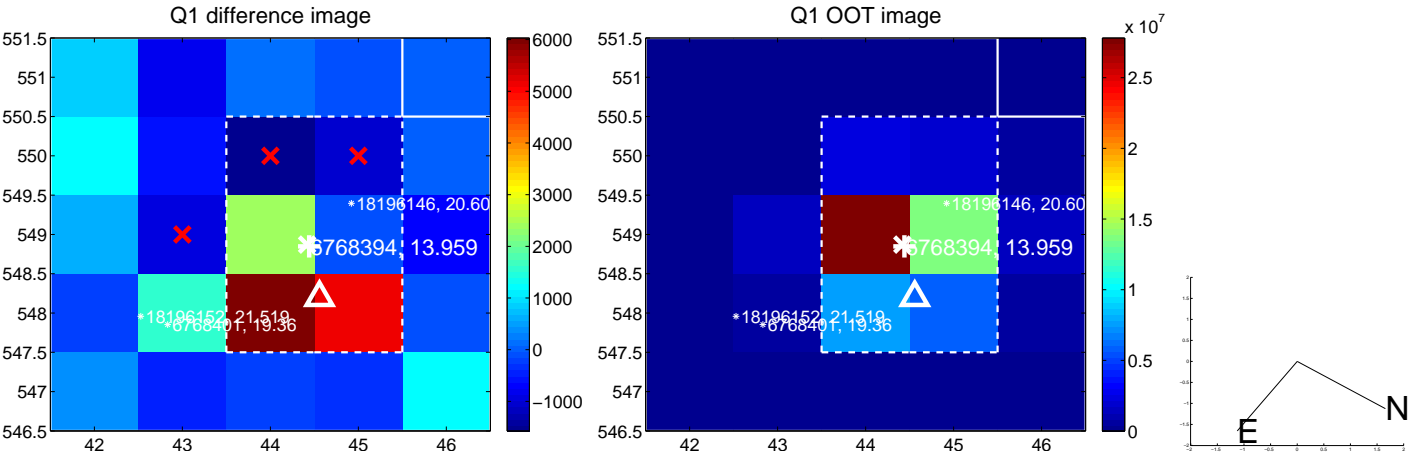
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.411 \pm 0.286$	1.44	$0.058 \pm 0.211$	$0.407 \pm 0.283$
PRF-fit source offset from KIC position	$0.468 \pm 0.285$	1.64	$0.046 \pm 0.237$	$0.465 \pm 0.286$
photometric centroid source offset	$1.10 \pm 0.51$	2.16	$0.70 \pm 0.49$	$0.85 \pm 0.52$

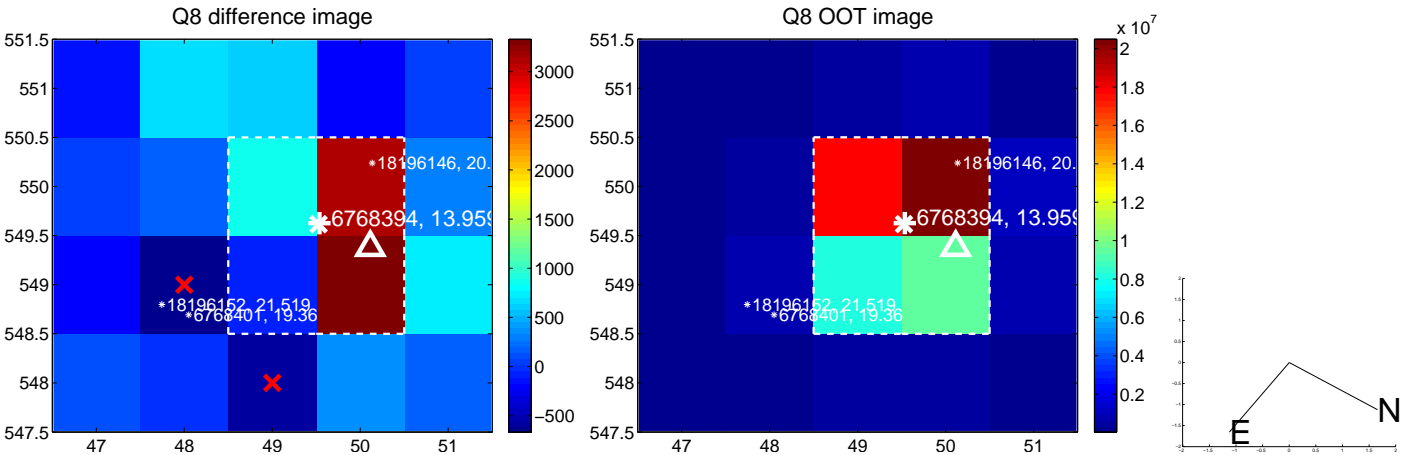
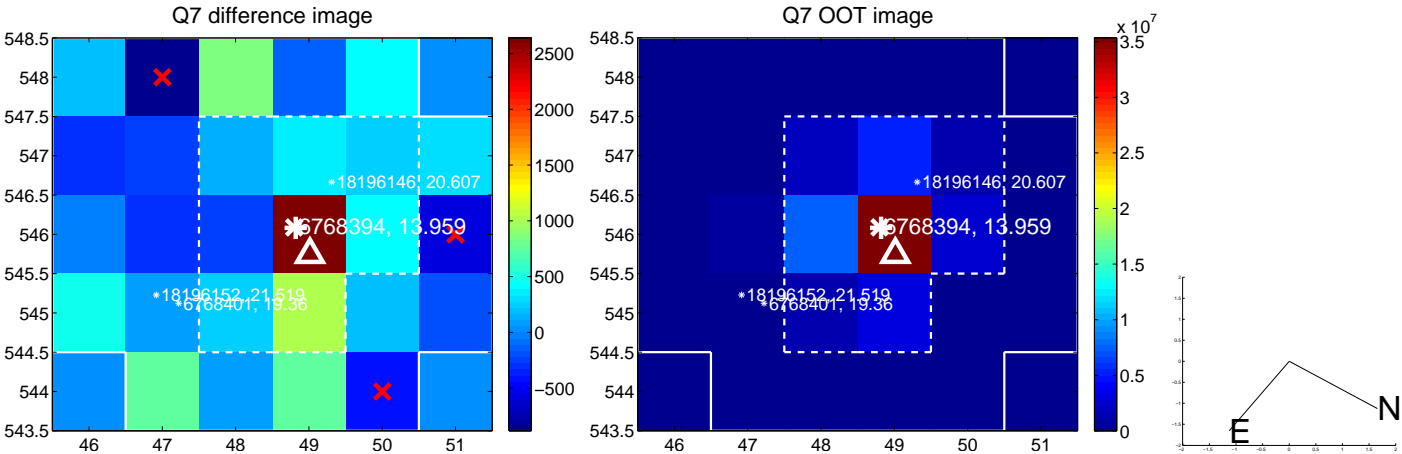
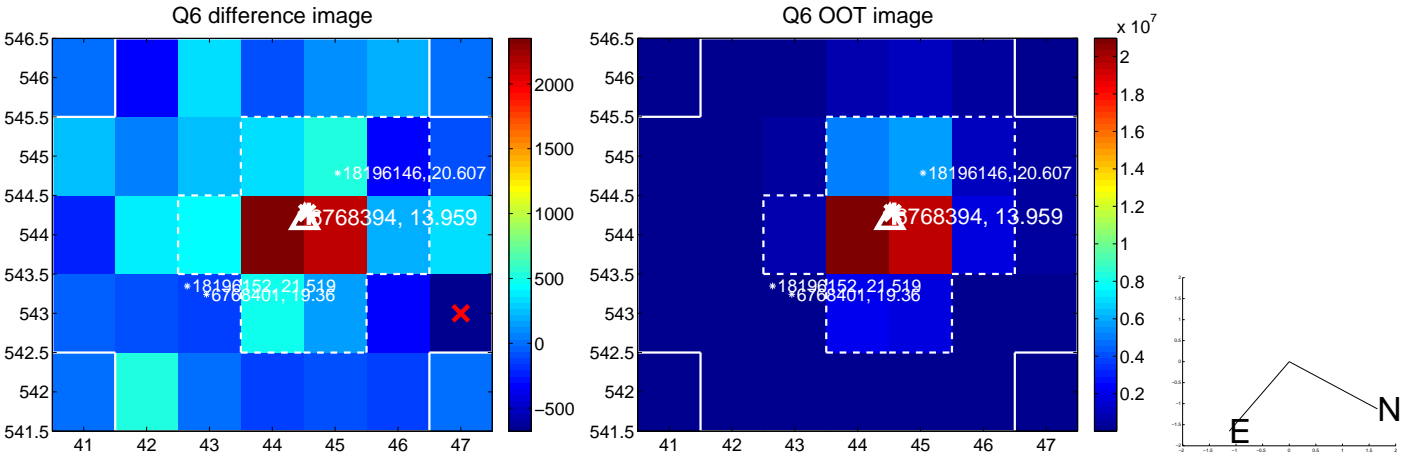
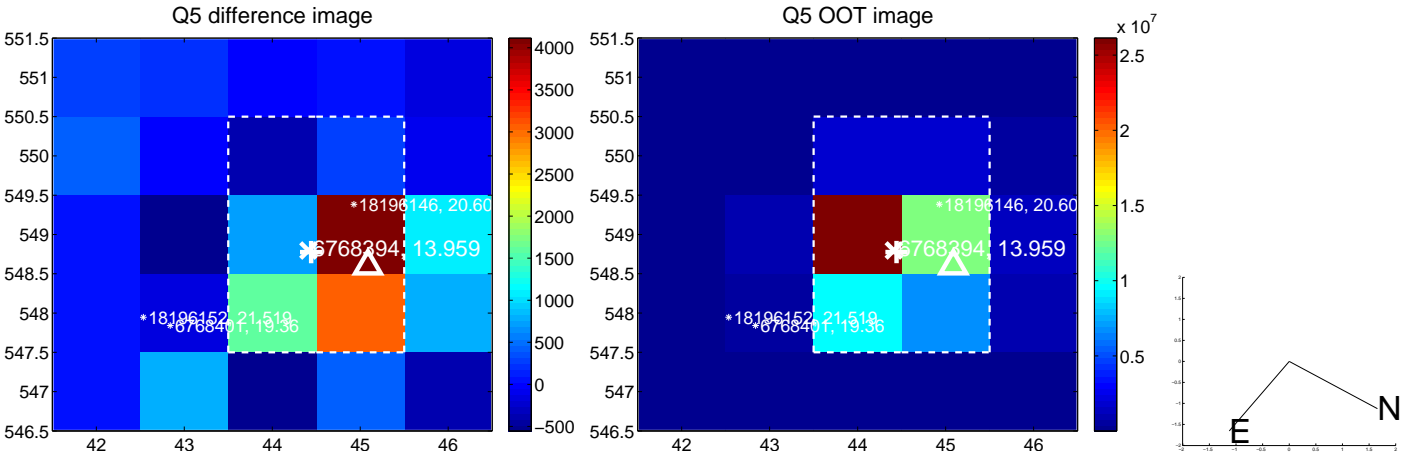


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

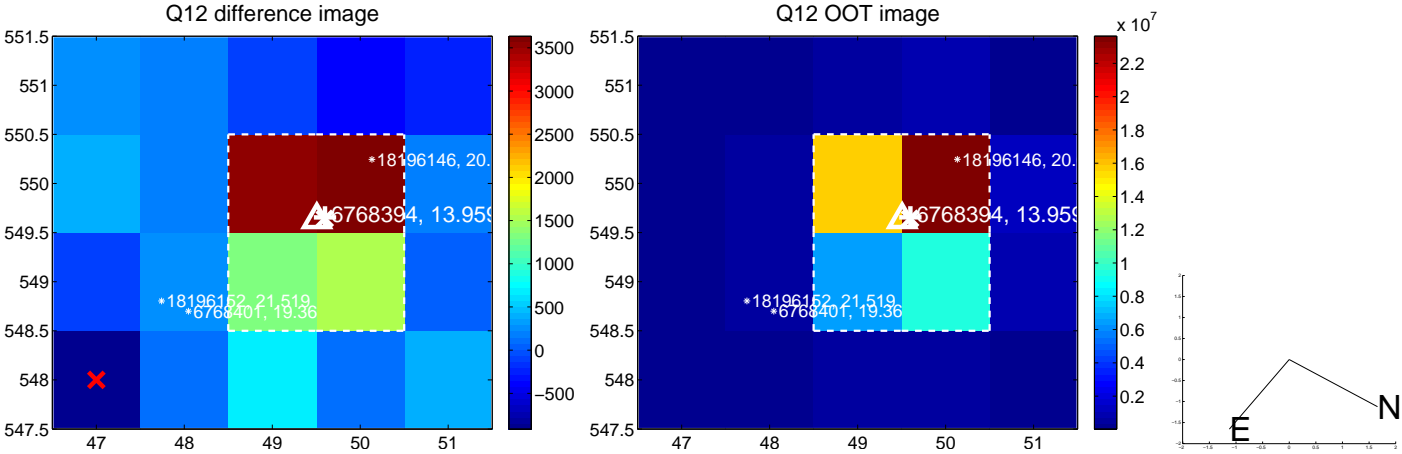
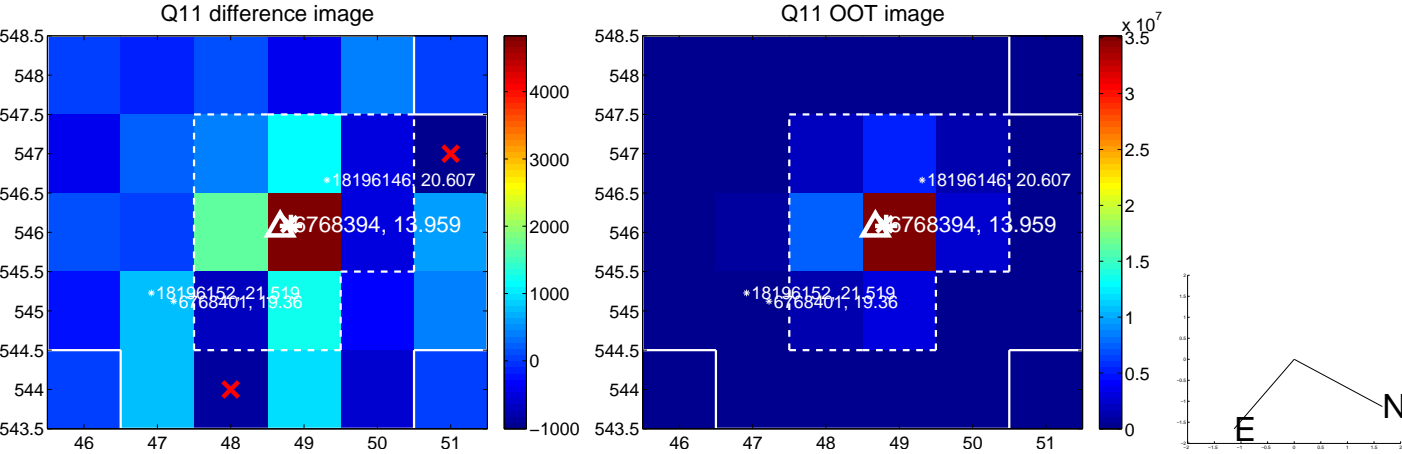
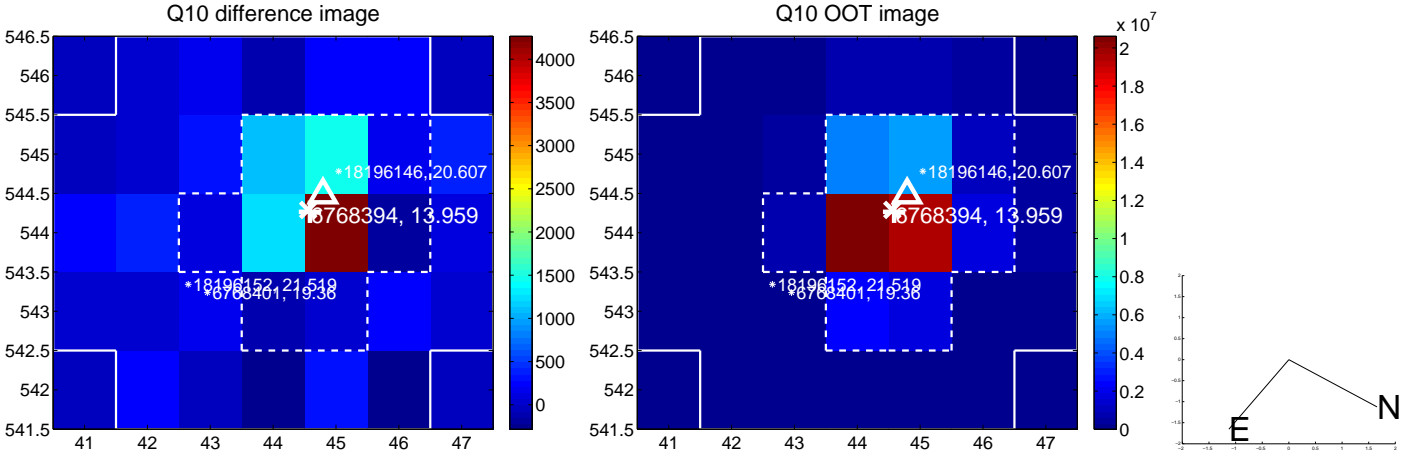
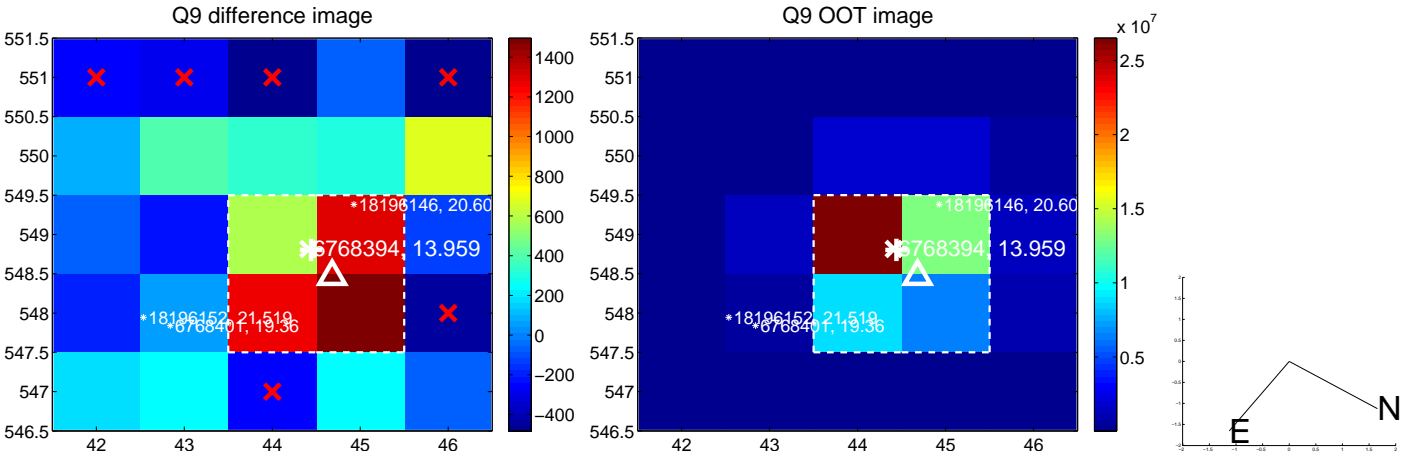
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



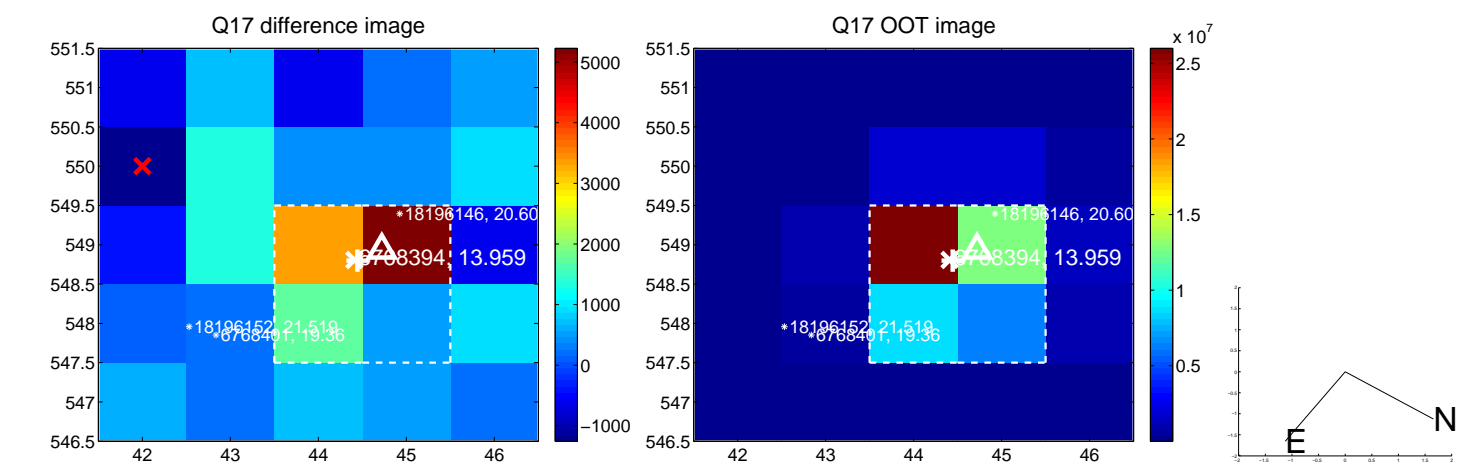
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



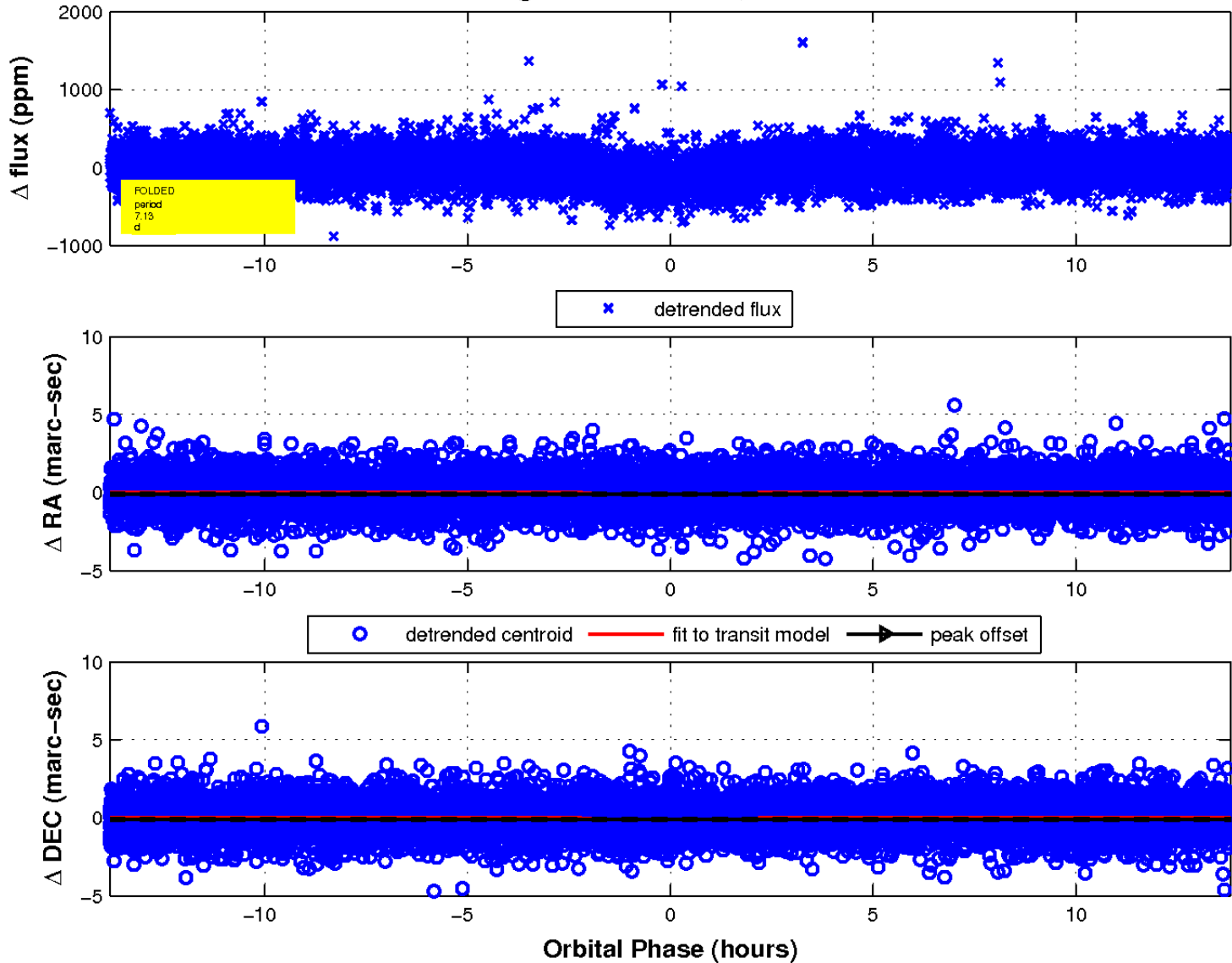




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

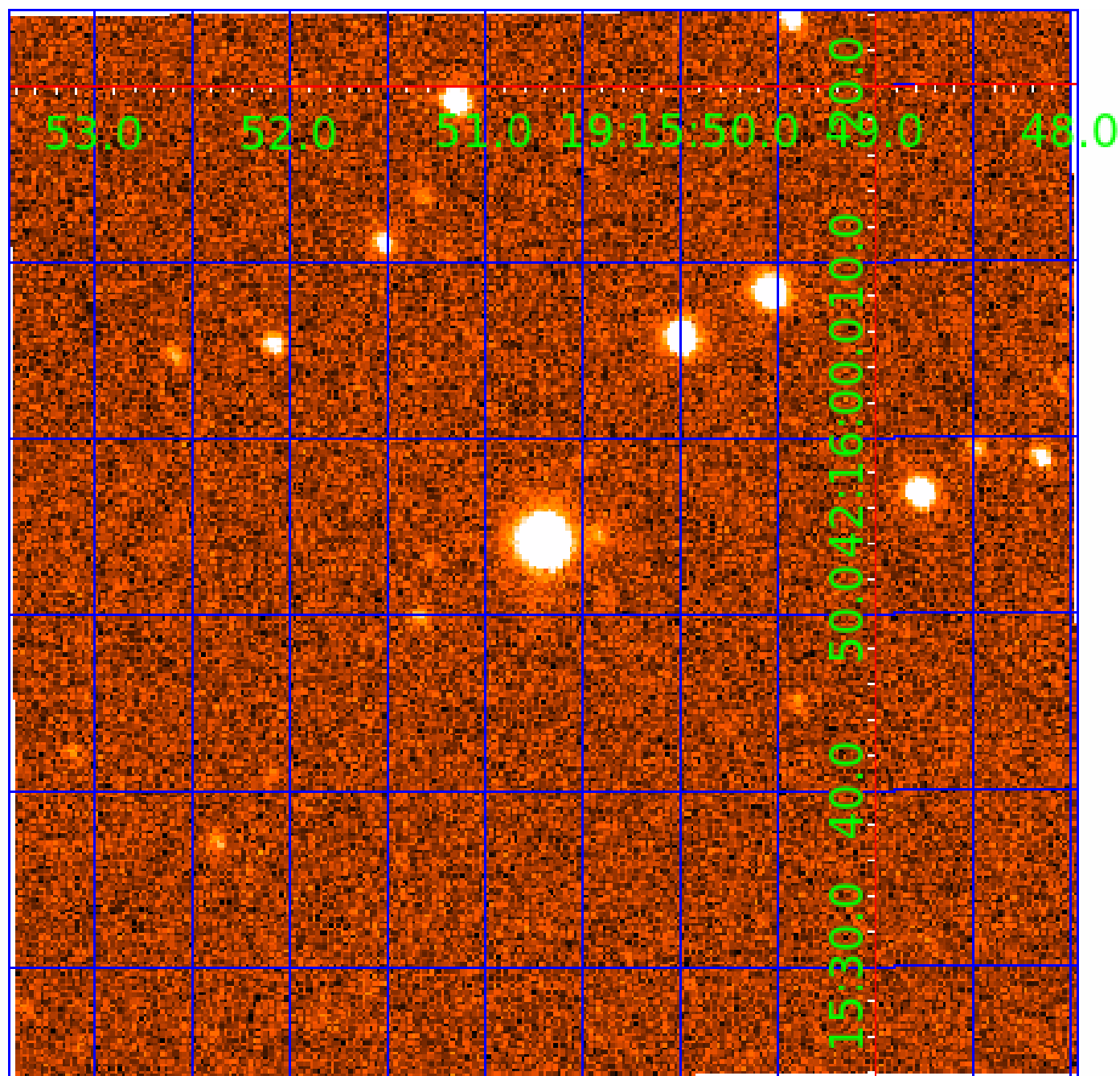


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



# KIC 006768394

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006768394-01	OBS	2086.02	8.918955	140.078497	183.0	5.243	23.9	25.8	1.31	5862	2.40	259.52
006768394-02	OBS	2086.01	7.132928	135.994206	144.5	4.605	23.6	25.0	1.31	5862	1.90	349.60
006768394-03	OBS	2086.03	11.898606	133.346083	126.9	3.333	12.4	12.9	1.31	5862	1.66	176.71

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006768394-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
006768394-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
006768394-03	OBS	PC	0.95	0	0	0	0	NO_COMMENT

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

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

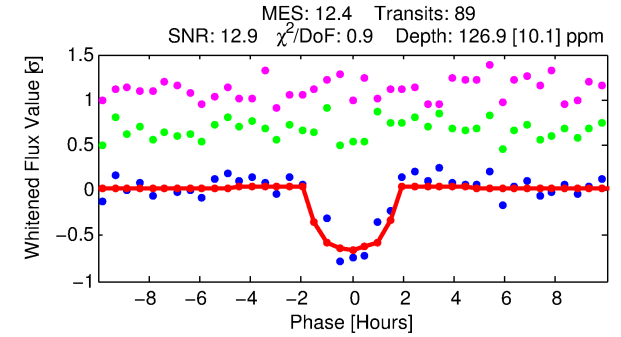
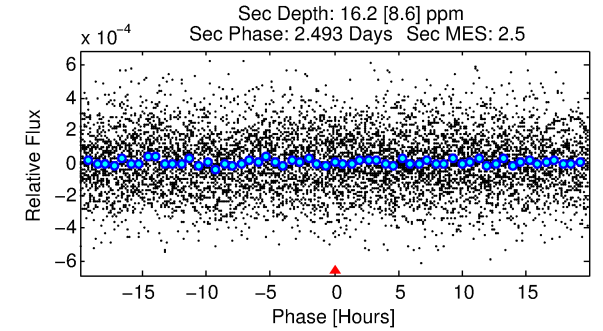
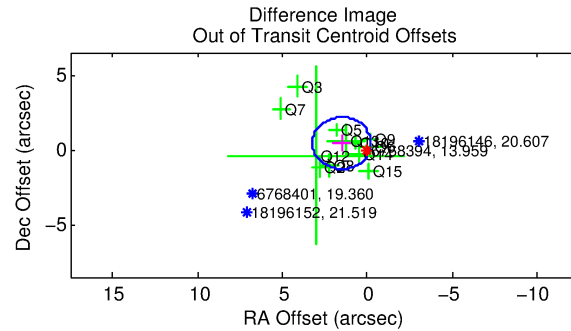
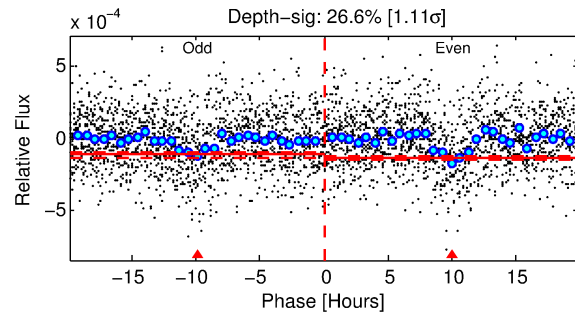
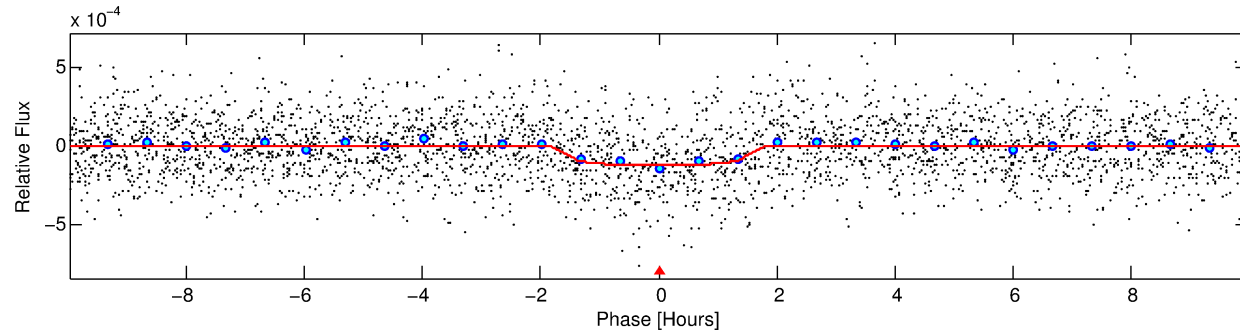
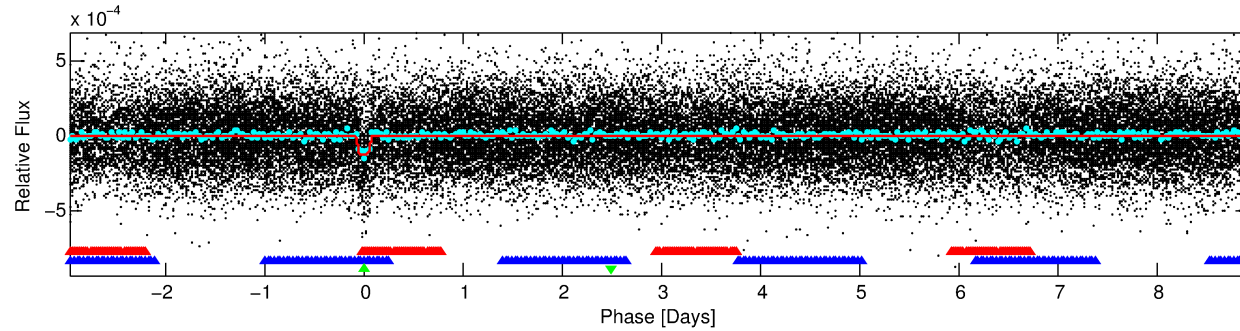
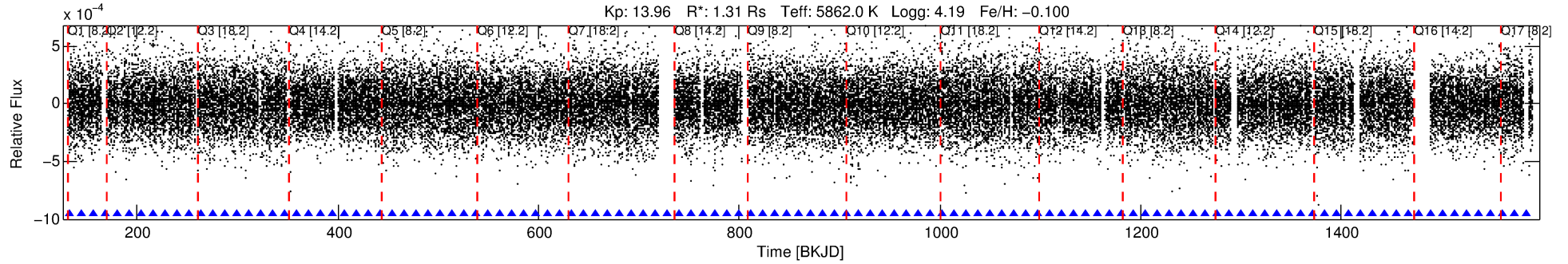
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006768394-03

No Significant Match Found

# DV One-Page Summary

KIC: 6768394 Candidate: 3 of 3 Period: 11.899 d  
KOI: K02086.03 Name: Kepler-60d Corr: 0.924



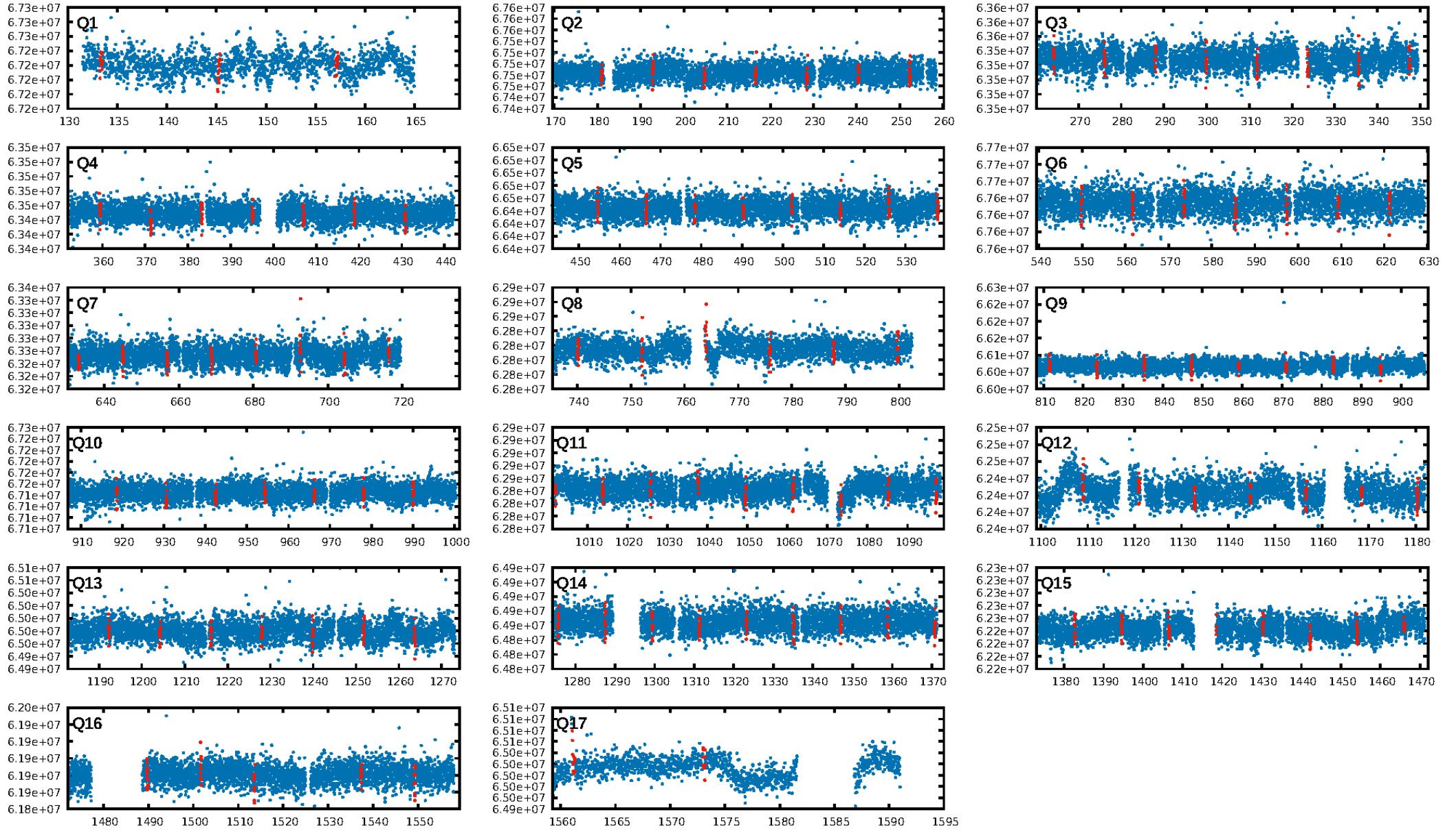
## DV Fit Results:

Period = 11.89861 [0.00009] d  
Epoch = 133.3461 [0.0057] BKJD  
Rp/R\* = 0.0117 [0.0064]  
a/R\* = 15.56 [40.93]  
b = 0.84 [0.96]  
Seff = 176.71 [56.29]  
Teq = 930 [74] K  
Rp = 1.66 [0.97] Re  
a = 0.1011 [0.0193] AU  
Ag = 32.98 [41.40] [0.77 $\sigma$ ]  
Teffp = 3445 [1050] K [2.39 $\sigma$ ]

## DV Diagnostic Results:

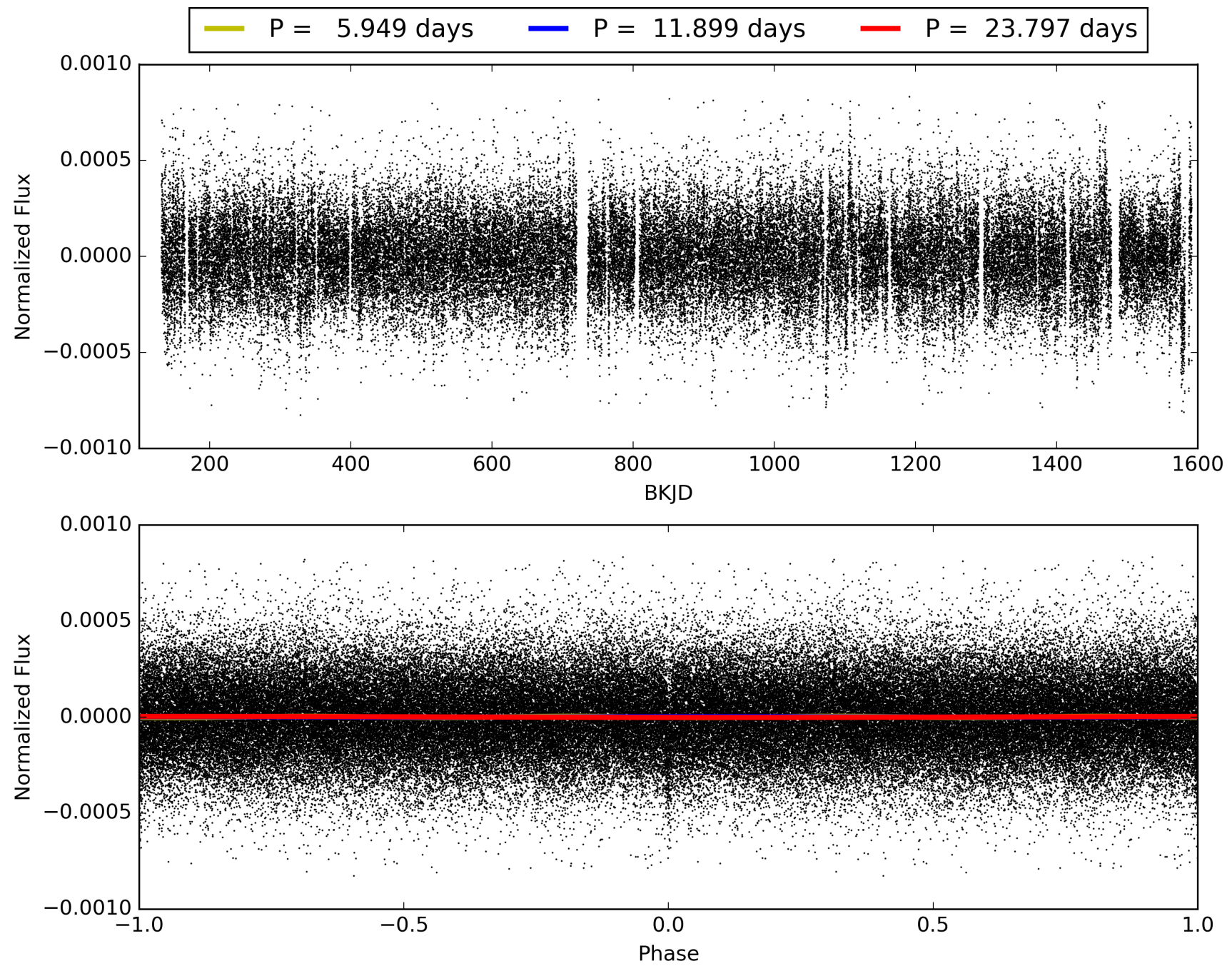
ShortPeriod-sig: 100.0% [11.51 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 96.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.43e-33  
RollingBand-fgt: 1.00 [84/84]  
GhostDiagnostic-chr: 3.302  
Centroid-sig: 0.1%  
Centroid-so: 1.614 arcsec [1.86 $\sigma$ ]  
OotOffset-rm: 1.567 arcsec [2.71 $\sigma$ ]  
KicOffset-rm: 1.587 arcsec [2.72 $\sigma$ ]  
OotOffset-st: 4/3/2/3 [12]  
KicOffset-st: 4/3/2/3 [12]  
DiffImageQuality-fgm: 0.67 [8/12]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 006768394-03, PDC Light Curves





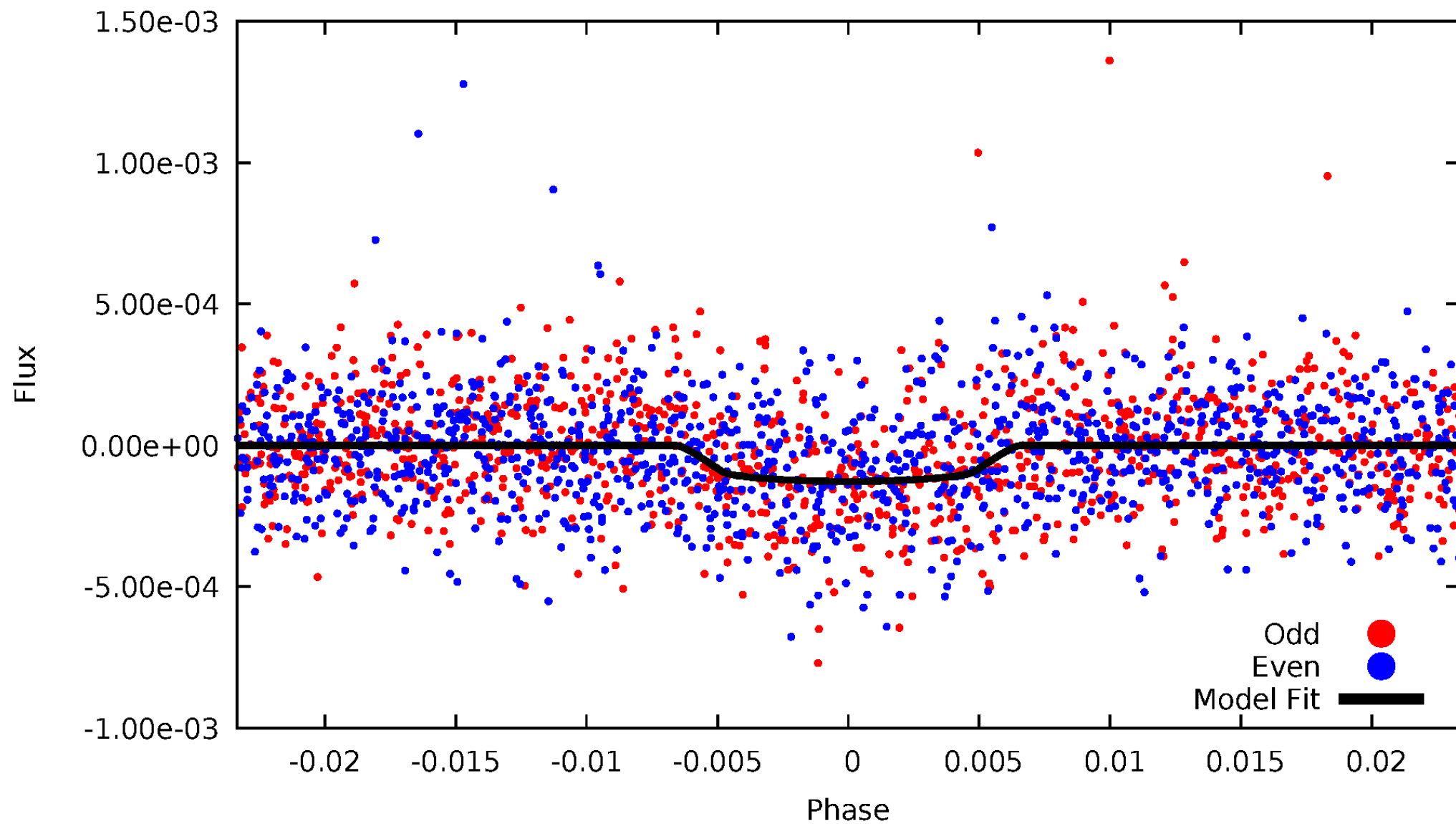
TCE 006768394-03





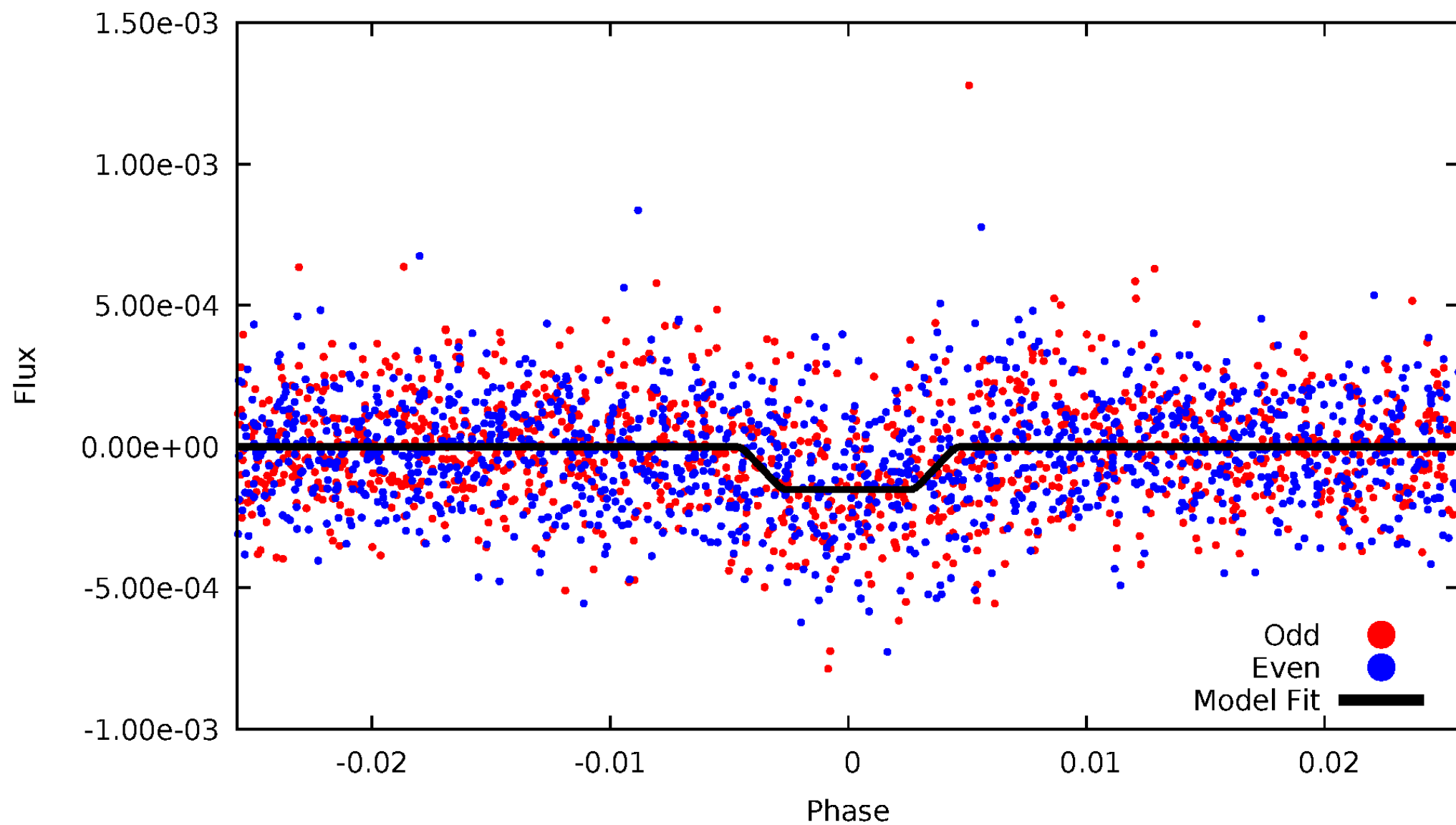
DV Odd/Even

TCE 006768394-03

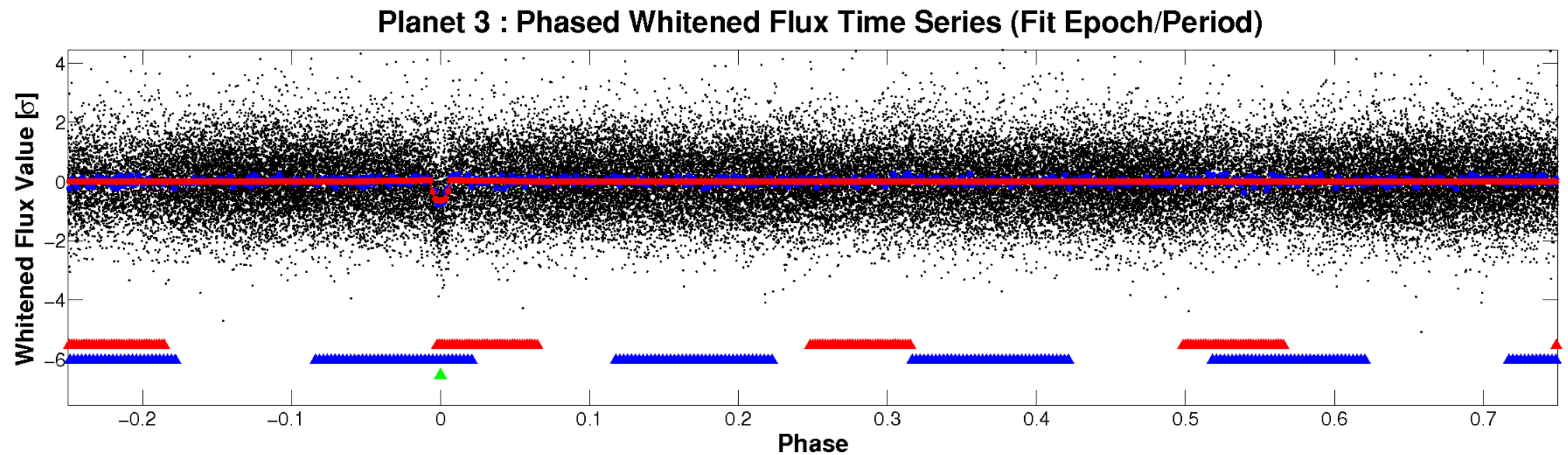
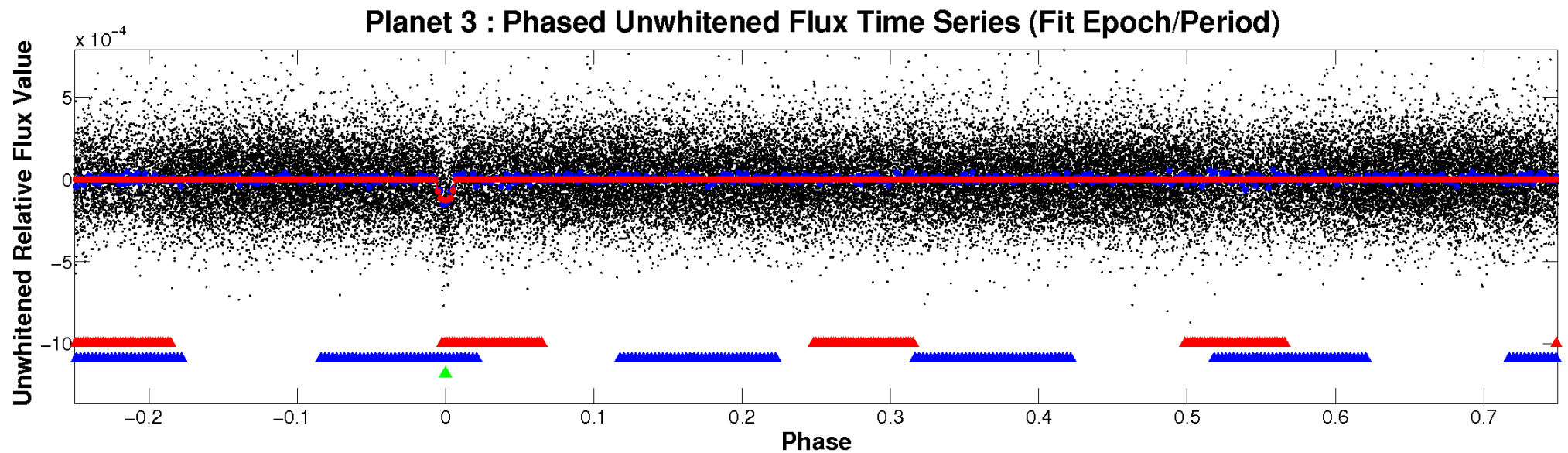


# ALT Odd/Even

TCE 006768394-03

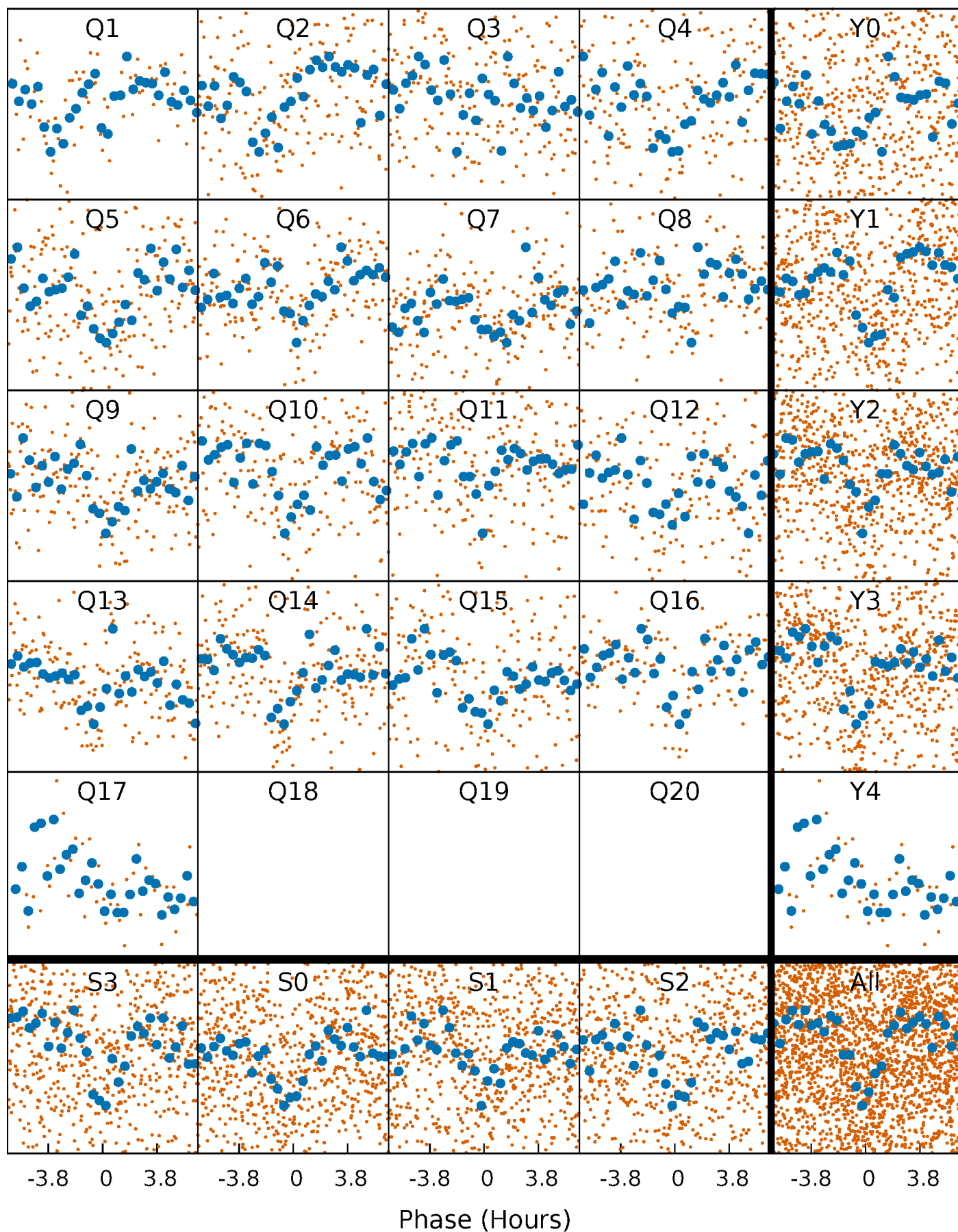


# Non-Whitened Vs. Whitened Light Curve



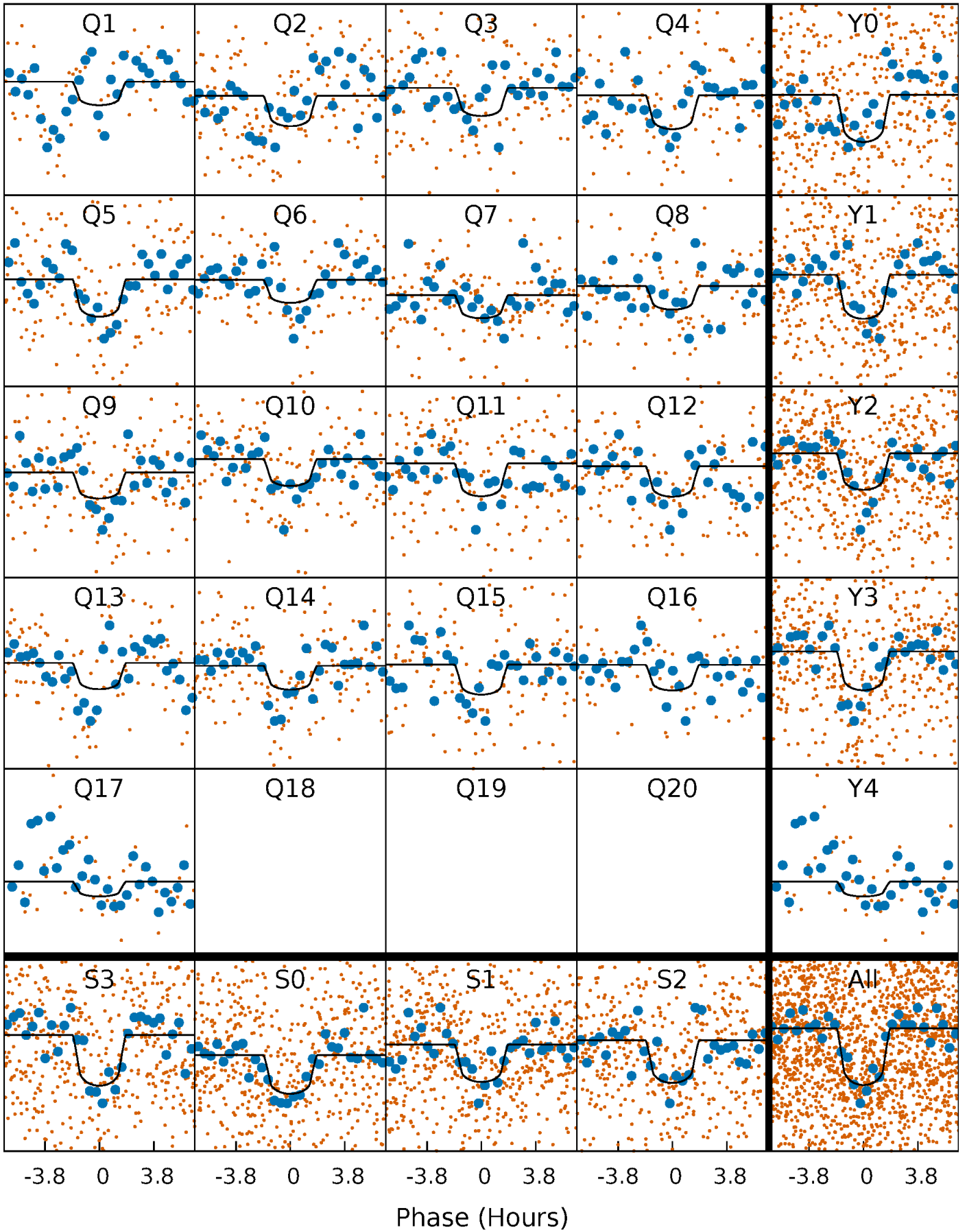
# PDC Quarter-Phased Transit Curves

TCE 006768394-03 P= 11.898606 Days  $T_0=133.346083$  (BKJD)



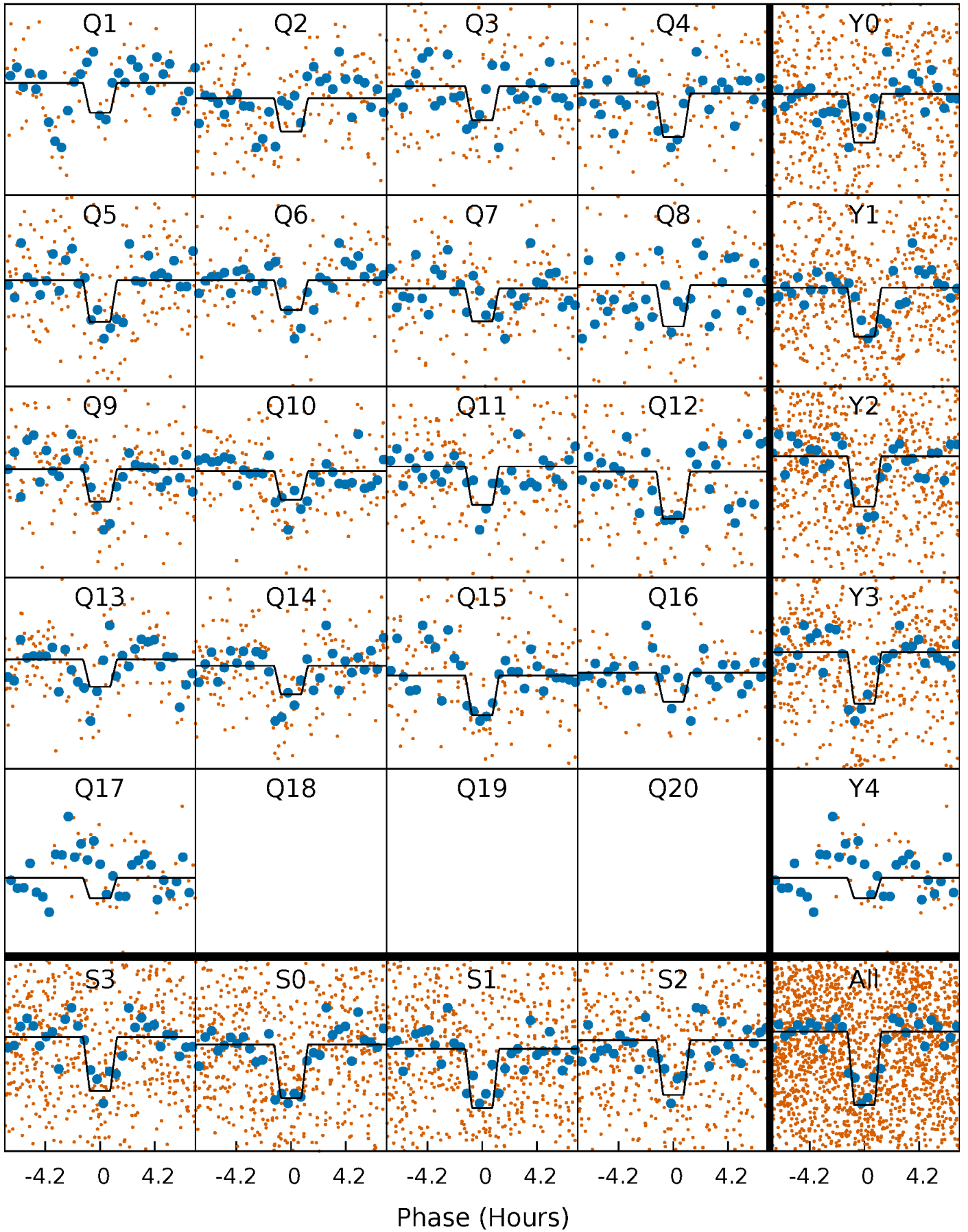
# DV Quarter-Phased Transit Curves

TCE 006768394-03 P= 11.898606 Days  $T_0=133.346083$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006768394-03 P= 11.898497 Days  $T_0=133.350601$  (BKJD)

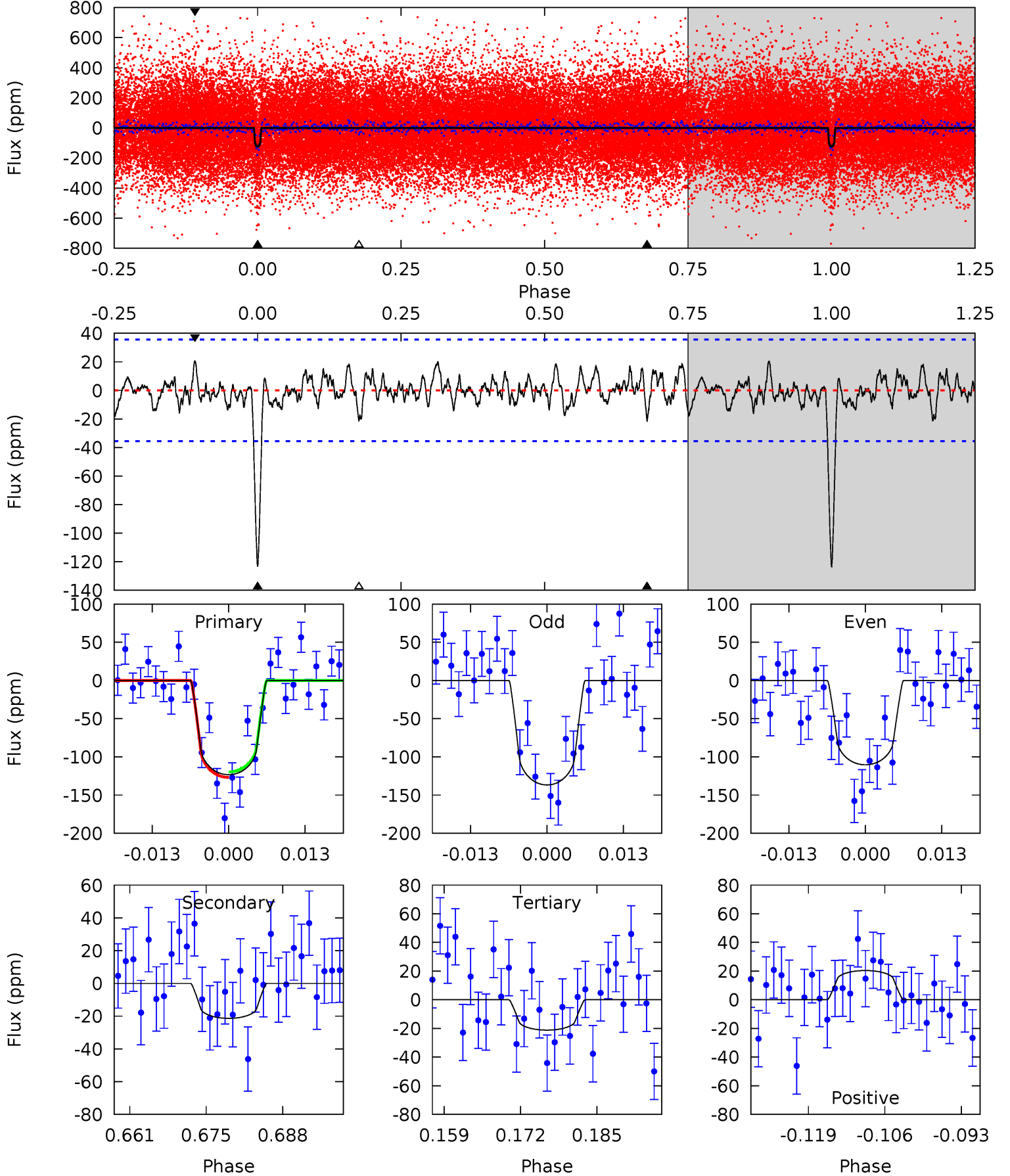




# DV Model-Shift Uniqueness Test

006768394-03, P = 11.898606 Days, E = 121.447477 Days

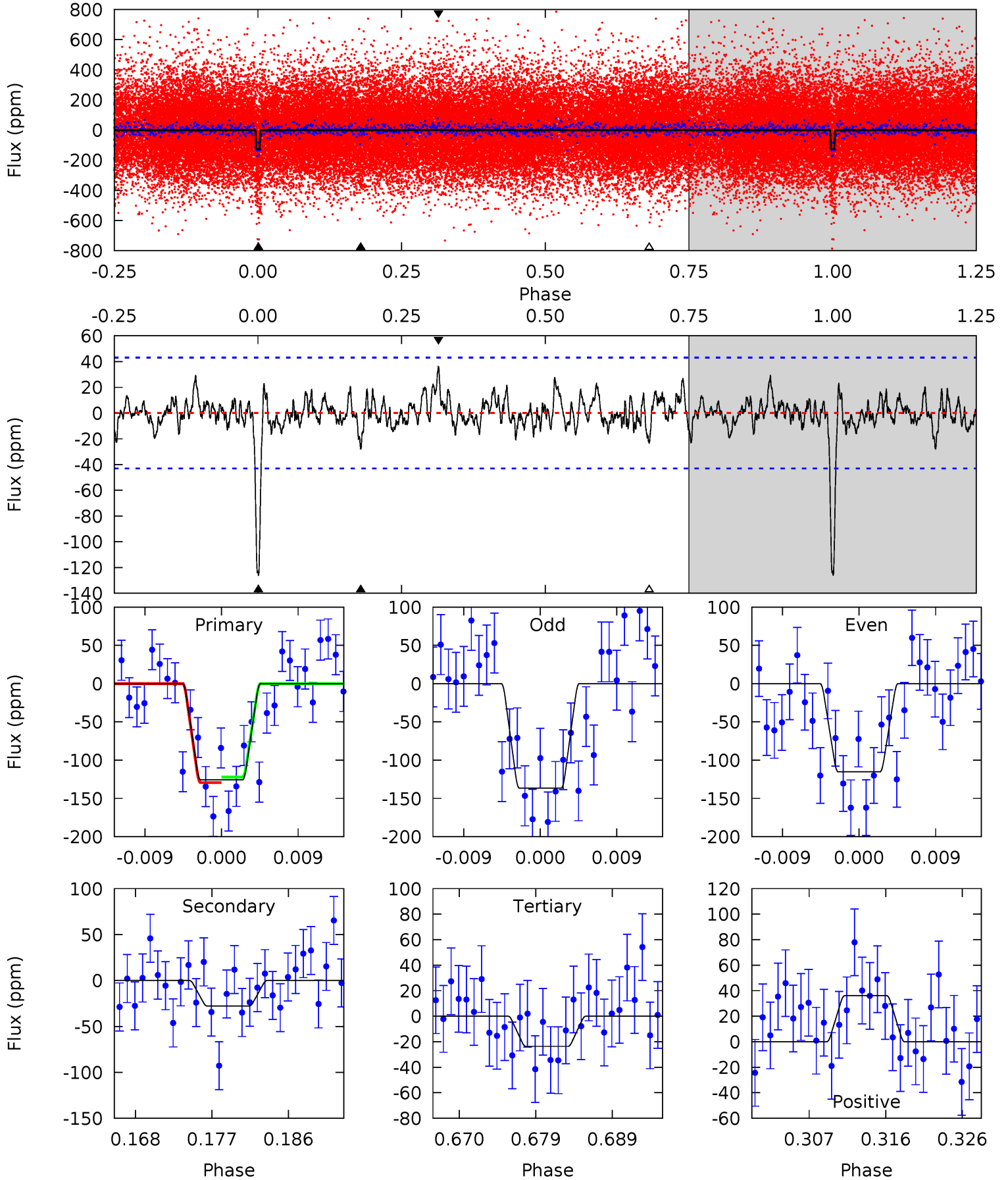
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	2.98	2.96	2.85	4.97	2.48	1.02	14.3	14.4	0.03	0.14	1.85	1.03	0.14	0.50



# Alt Model-Shift Uniqueness Test

006768394-03, P = 11.898497 Days, E = 121.452104 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
14.7	3.24	2.77	4.22	5.04	2.60	1.08	11.9	10.5	0.48	-0.98	1.25	0.98	0.22	0.41



### Stellar Parameters For KIC 006768394

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5862^{+105}_{-117}$	$4.194^{+0.182}_{-0.098}$	$-0.100^{+0.150}_{-0.150}$	$1.307^{+0.209}_{-0.256}$	$0.973^{+0.085}_{-0.071}$	$0.614^{+0.515}_{-0.205}$
	+2%/-2%	+4%/-2%	+150%/-150%	+16%/-20%	+9%/-7%	+84%/-33%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 006768394-03 / KOI 2086.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-21 \pm 7$	$1.65^{+0.90}_{-0.83}$	$1287^{+58}_{-74}$	$3963^{+1222}_{-570}$	$43^{+134}_{-27}$
Alt.	$-28 \pm 9$	$1.74^{+0.88}_{-0.81}$	$1289^{+58}_{-75}$	$4107^{+1049}_{-609}$	$52^{+114}_{-31}$

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

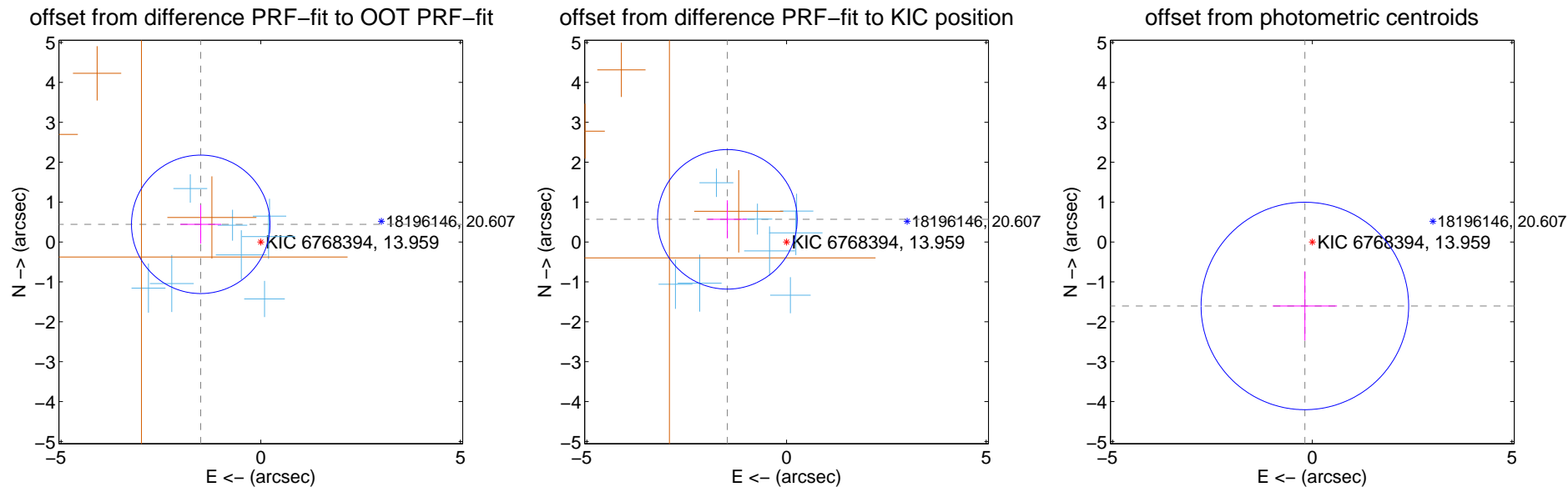
## DV Centroid Data

Supplemental centroid analysis for 006768394-03. Kepler magnitude: 13.96. Transit SNR 12.91

There are 8 quarters with good PRF difference image offsets

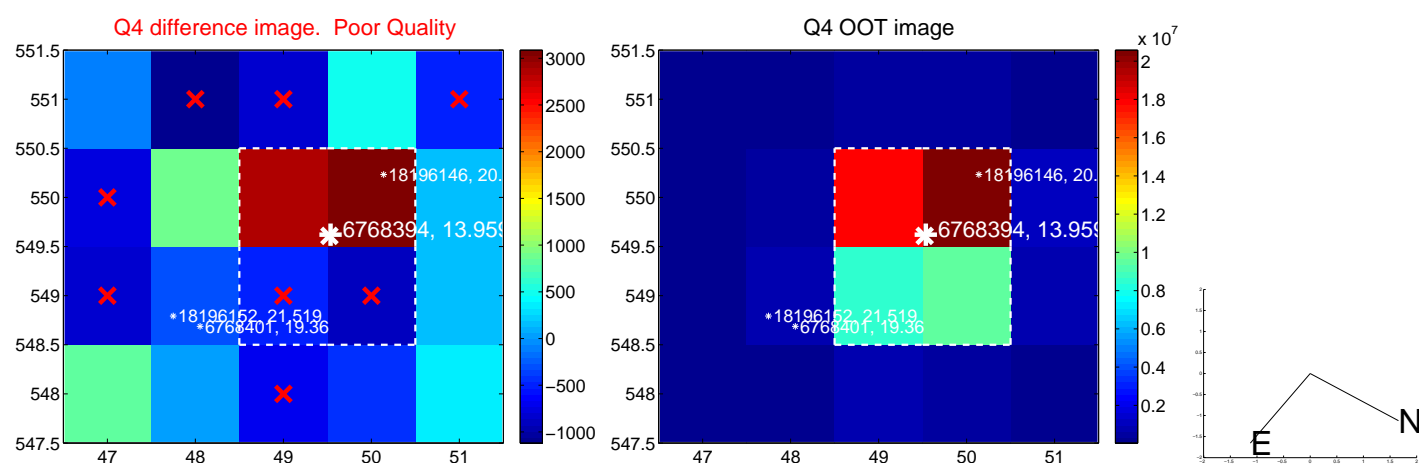
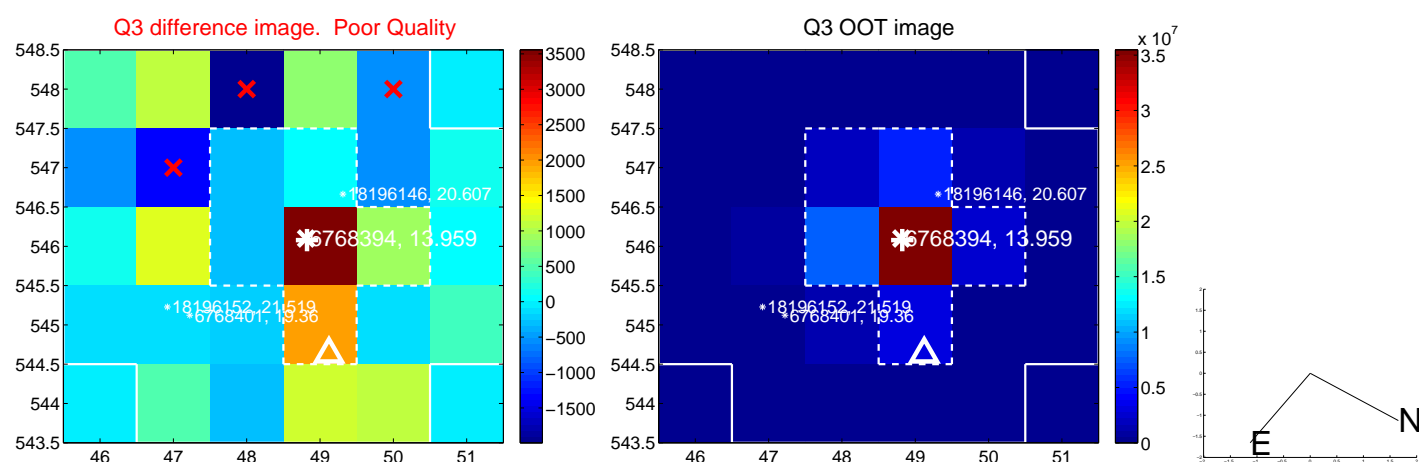
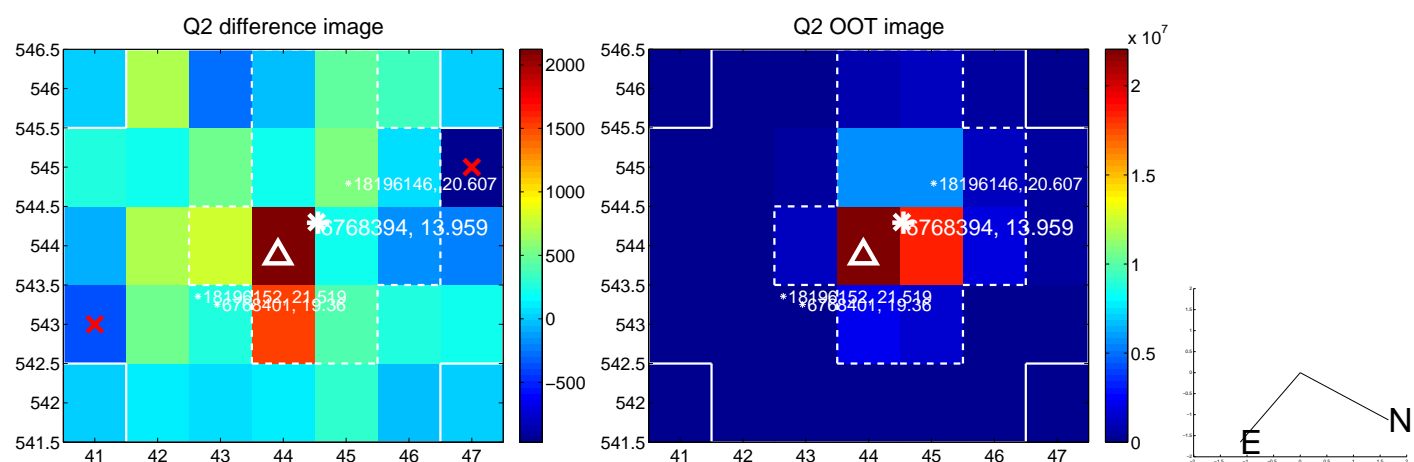
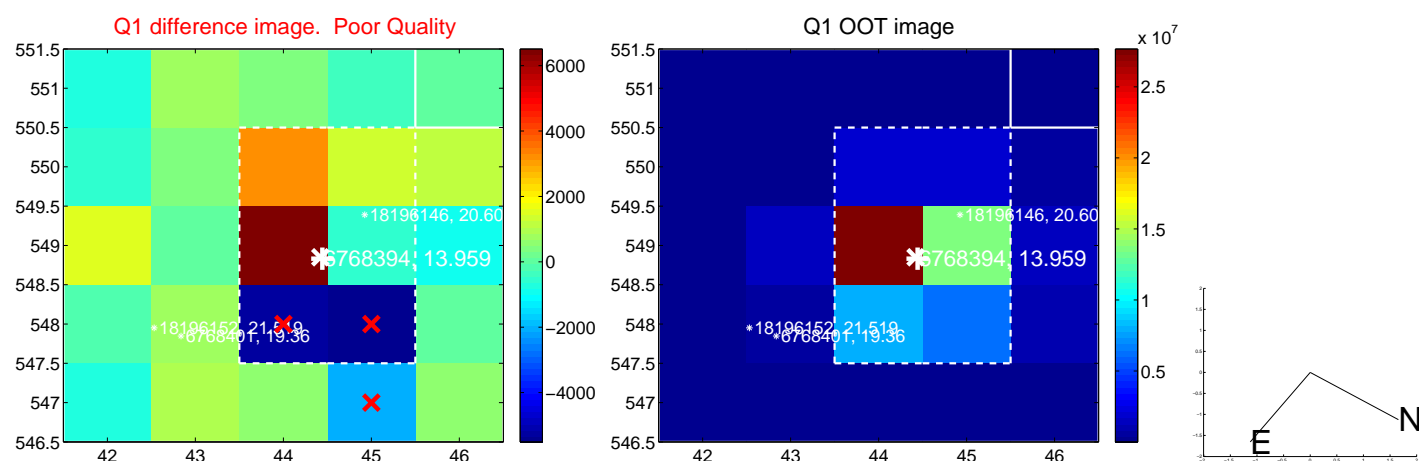
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.567 \pm 0.578$	2.71	$1.503 \pm 0.515$	$0.442 \pm 0.485$
PRF-fit source offset from KIC position	$1.587 \pm 0.583$	2.72	$1.482 \pm 0.493$	$0.567 \pm 0.477$
photometric centroid source offset	$1.61 \pm 0.87$	1.86	$0.19 \pm 0.80$	$-1.60 \pm 0.87$

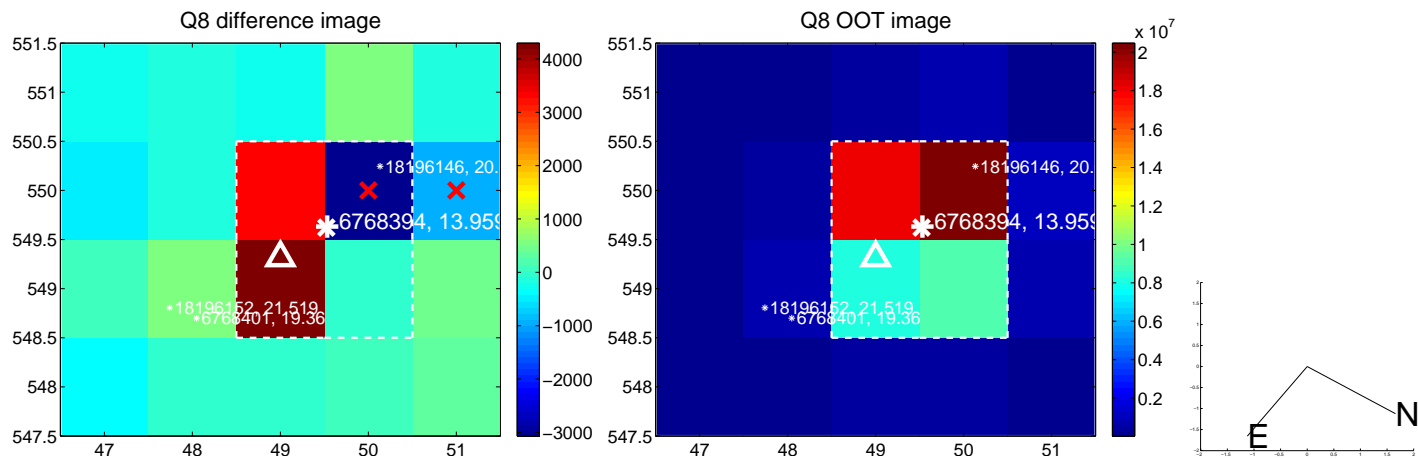
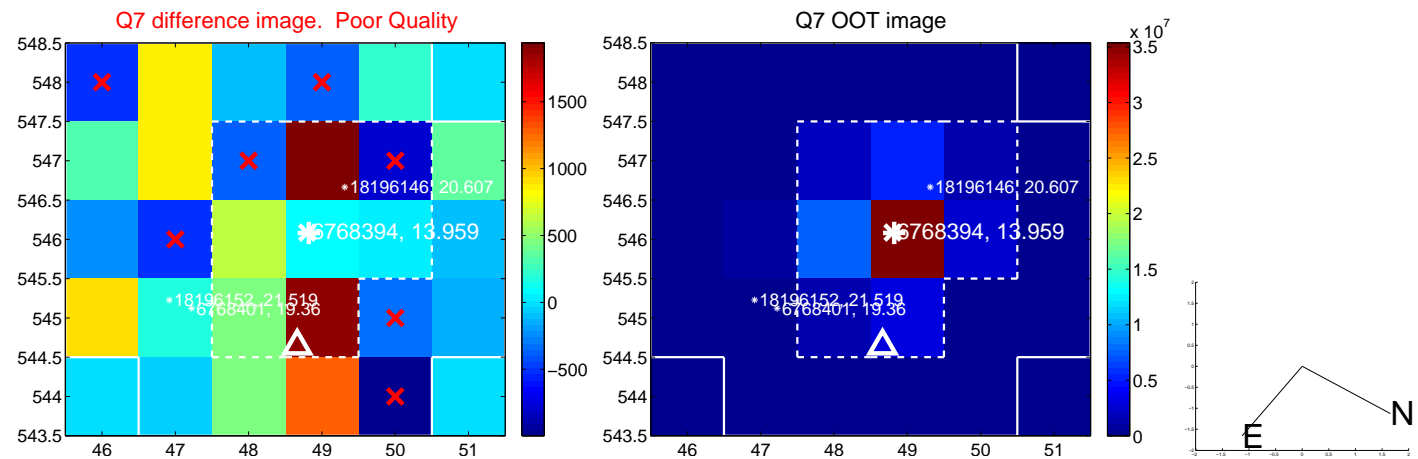
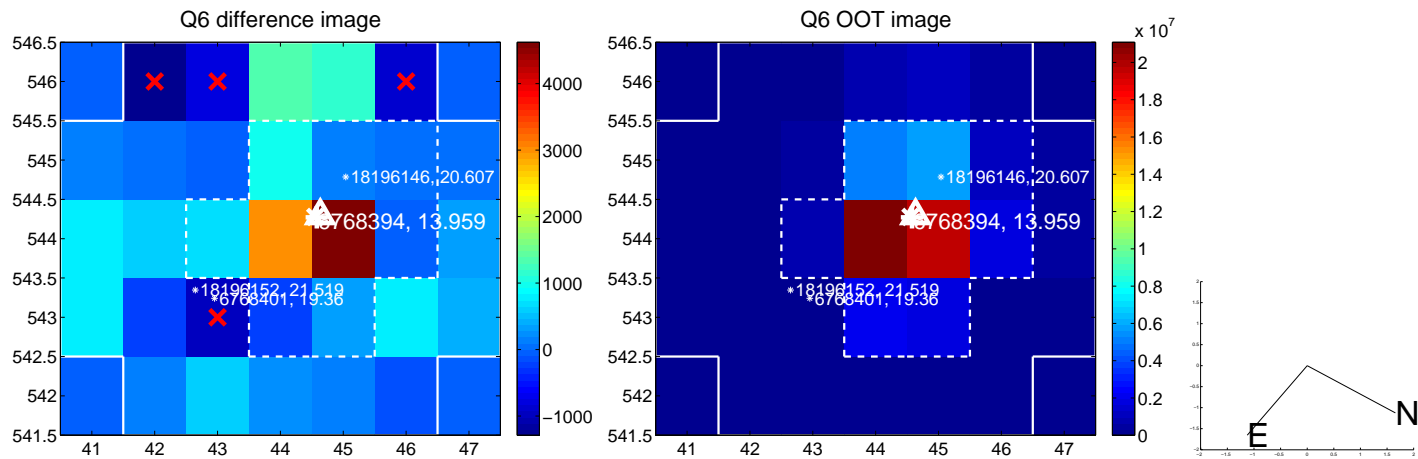
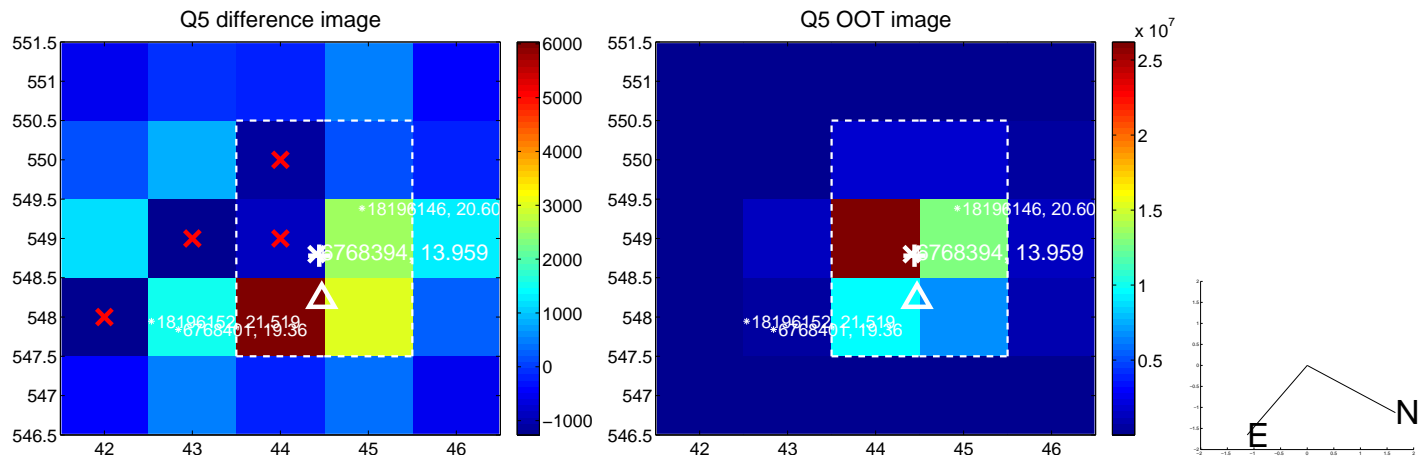


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

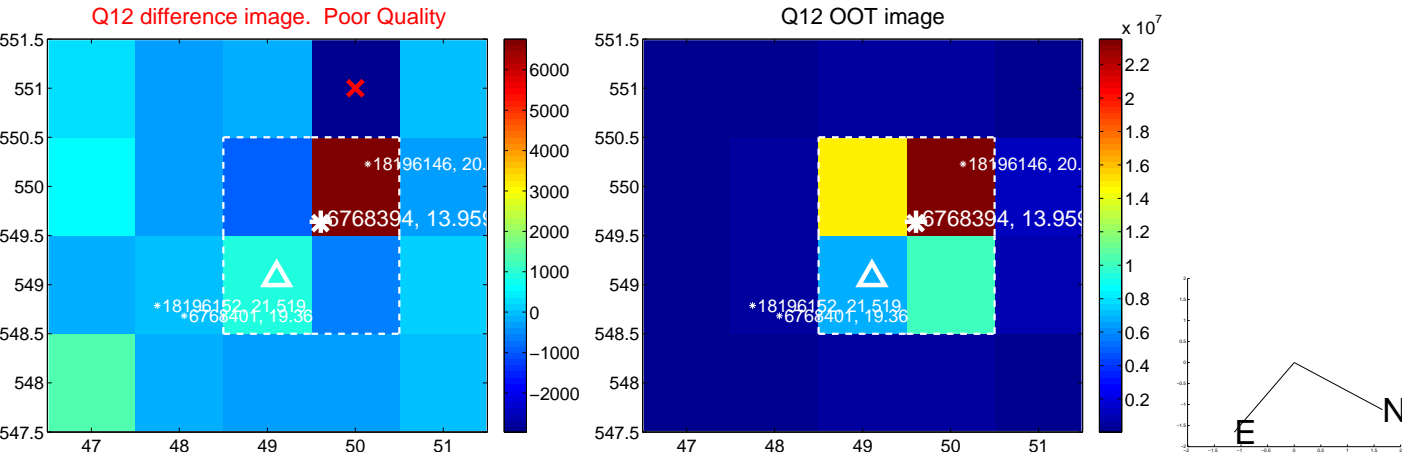
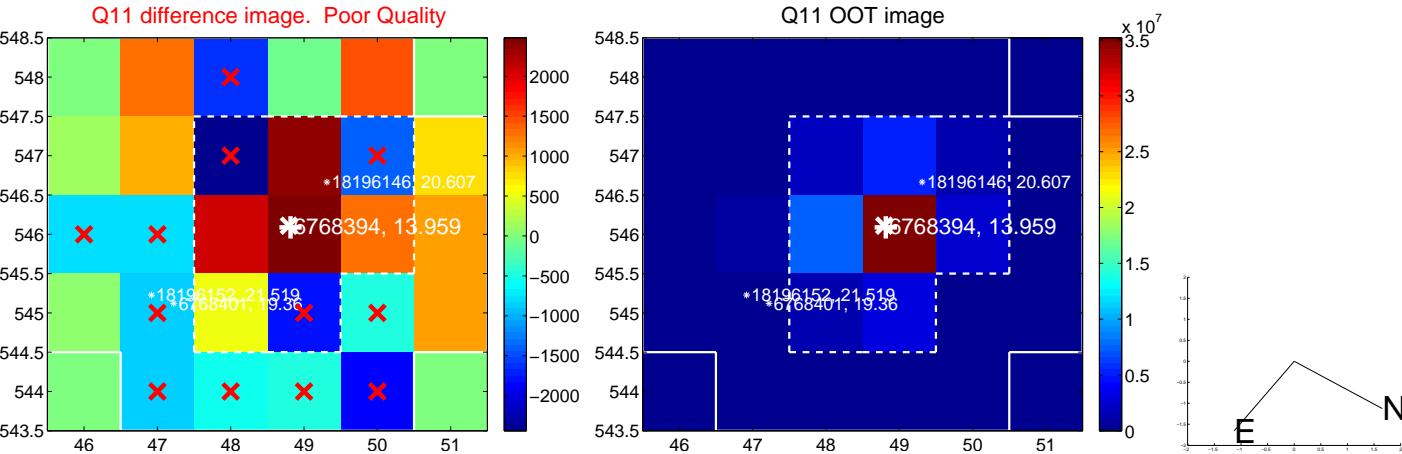
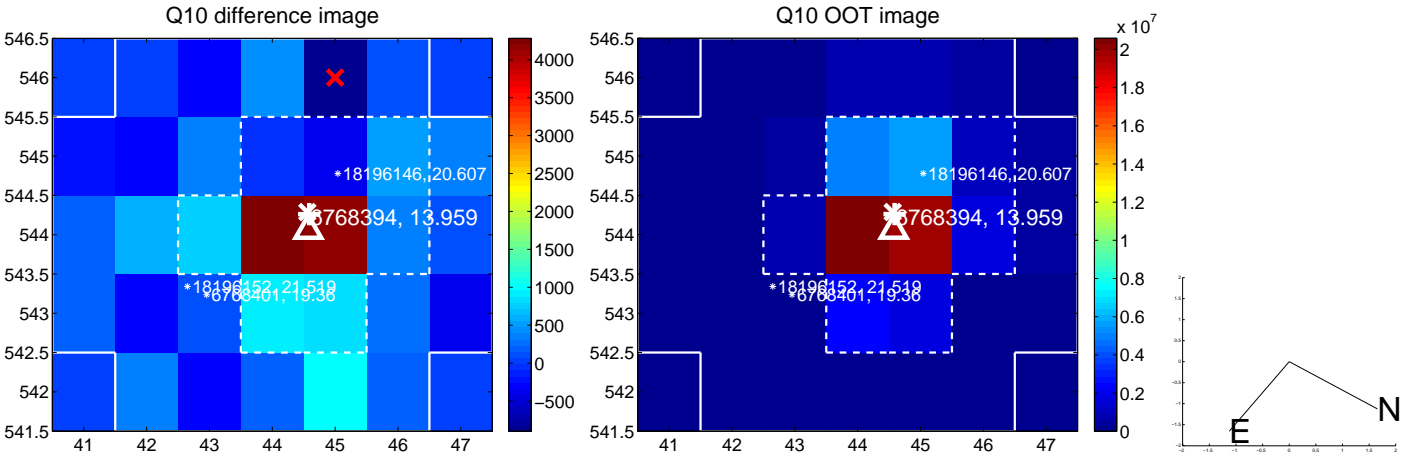
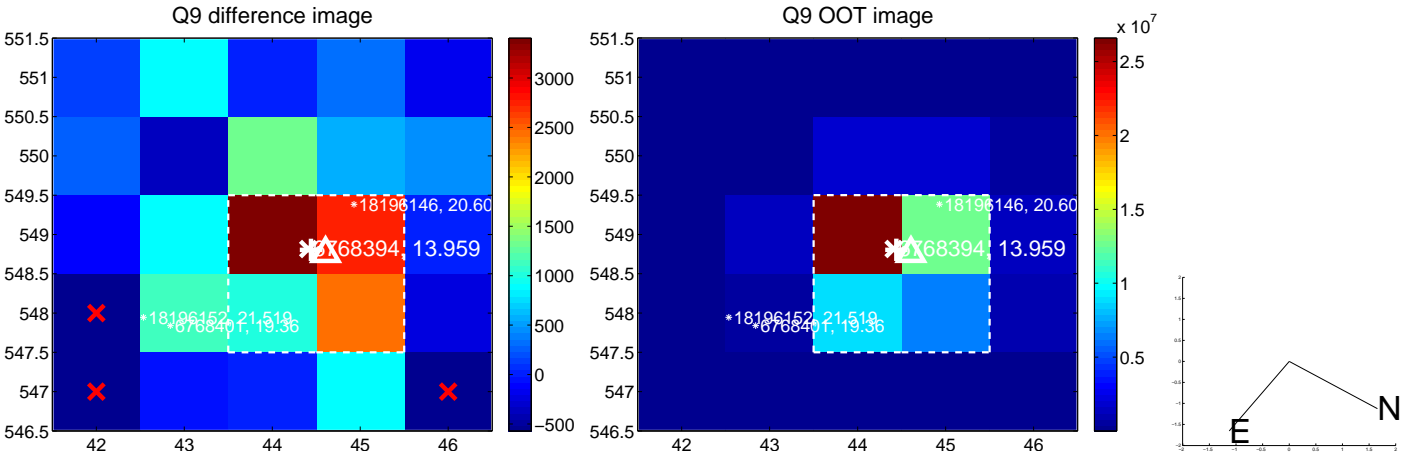


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

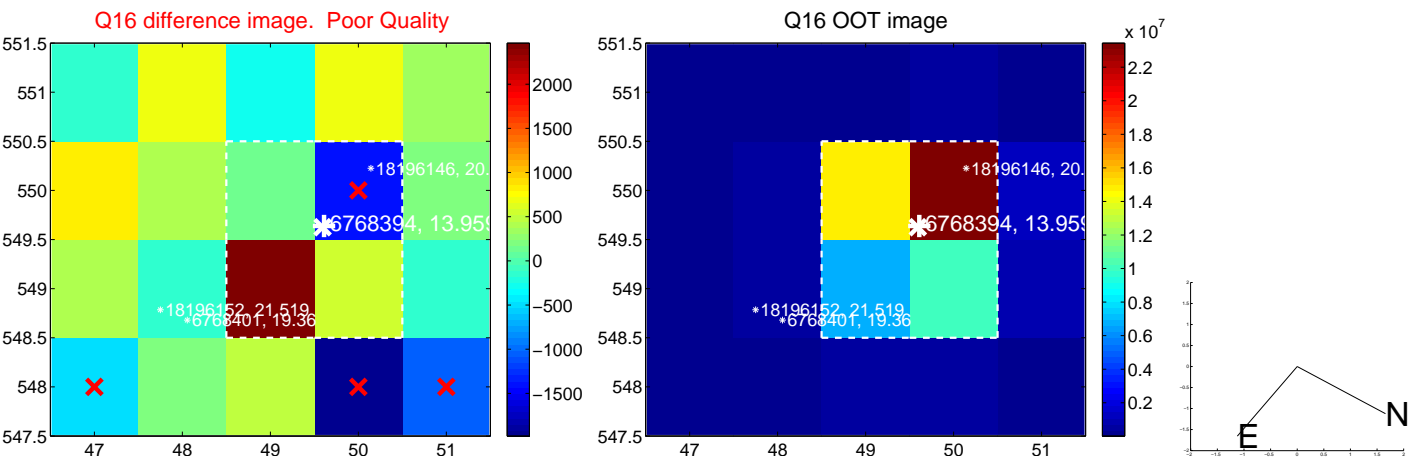
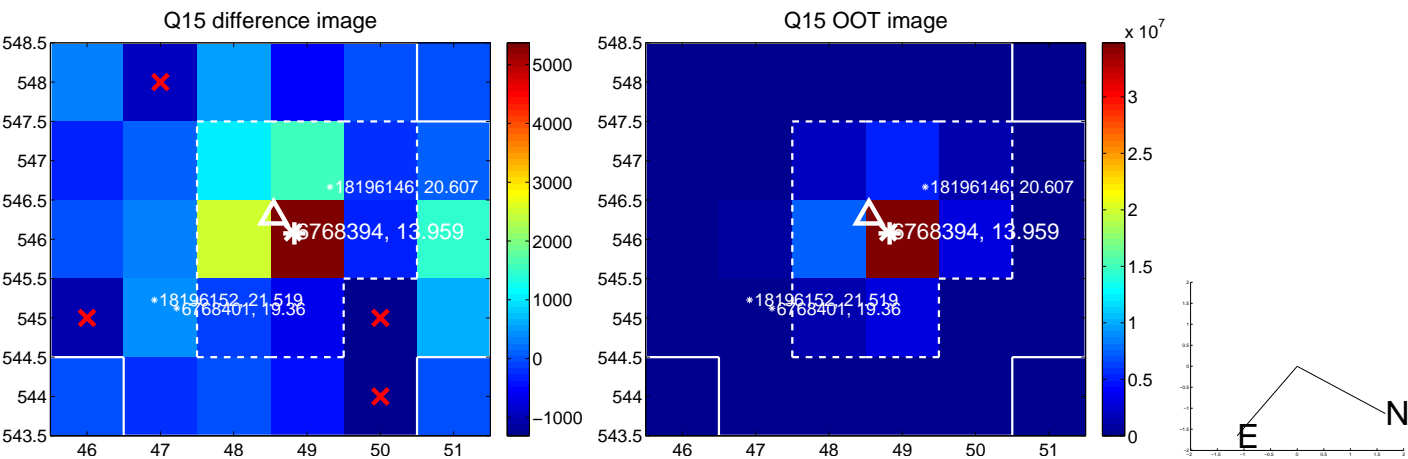
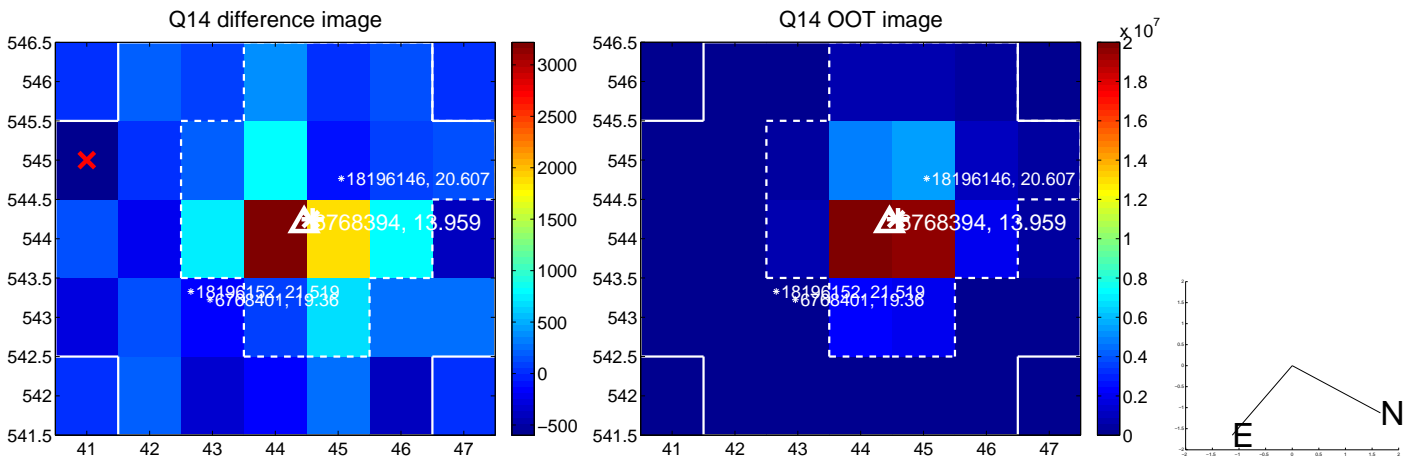
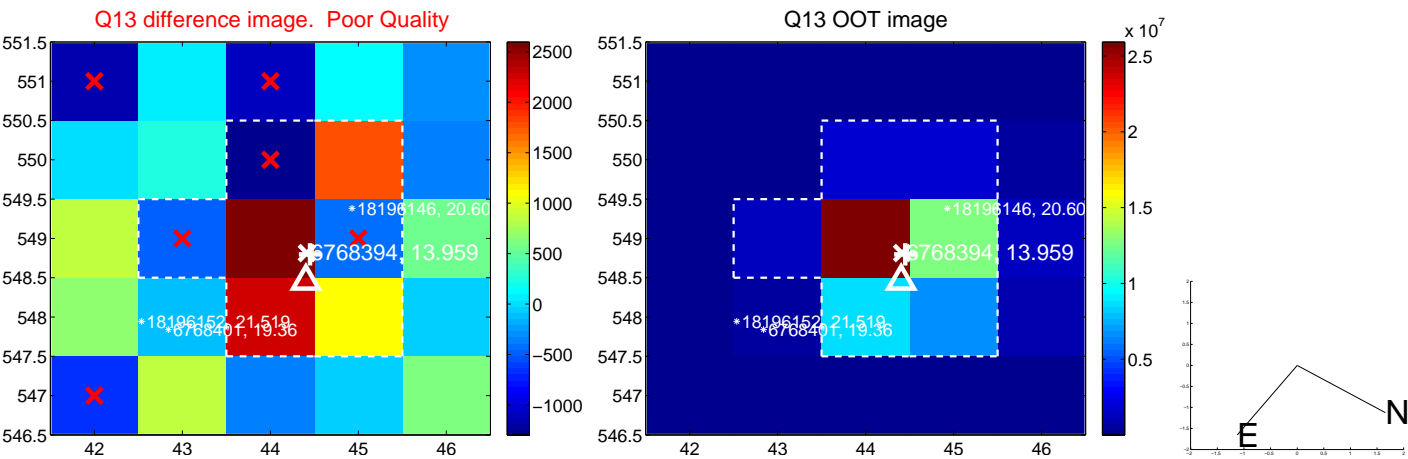




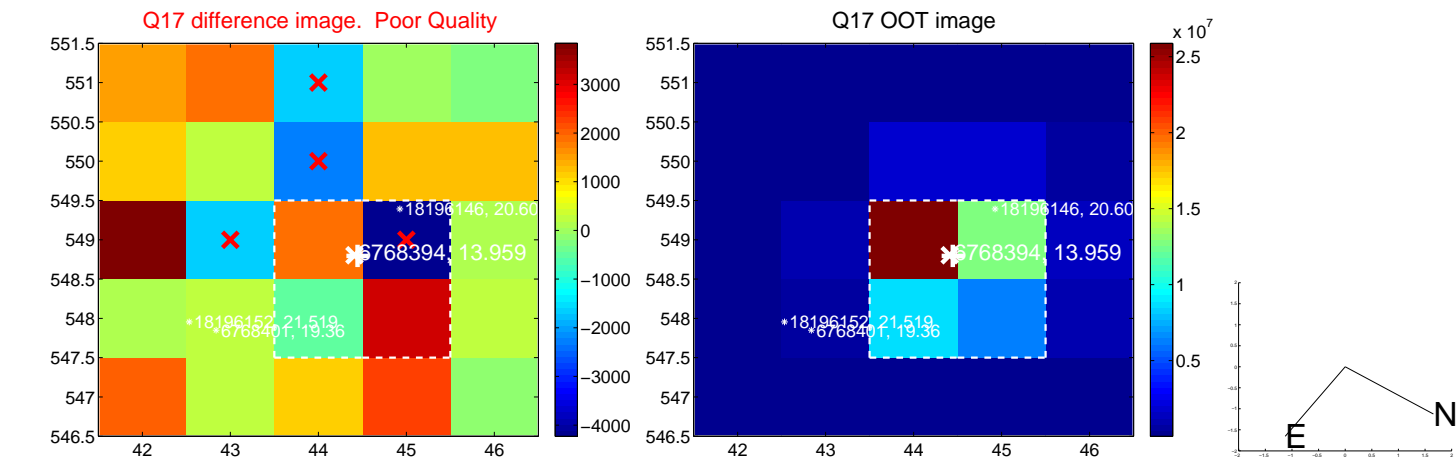
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



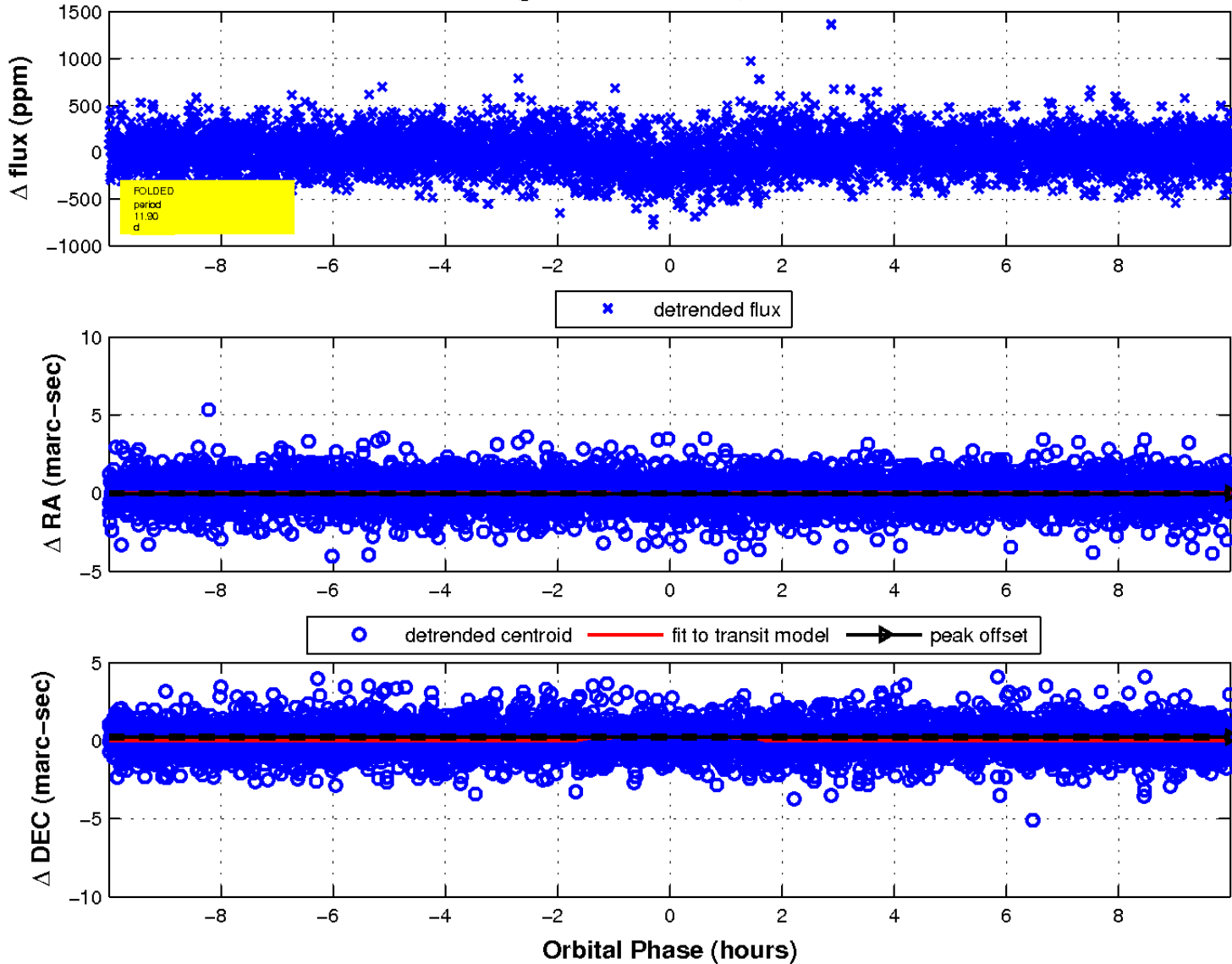
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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# UKIRT Image

Declination

