

# KIC 007889486

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007889486-01	OBS	3300.02	24.237281	155.106197	314.1	12.062	10.9	11.5	0.90	5763	1.78	29.99
007889486-02	OBS	3300.01	24.238381	136.619388	510.5	2.825	10.8	11.7	0.90	5763	2.32	29.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007889486-01	OBS	FP	0.00	0	1	1	1	<del>HAS_SEC_TCE</del> <del>CENT_CROWDED</del> <del>HALO_GHOST</del> <del>EPHEM_MATCH</del>
007889486-02	OBS	FP	0.00	1	1	1	1	<del>IS_SEC_TCE</del> <del>CENT_RESOLVED_OFFSET</del> <del>HALO_GHOST</del> <del>EPHEM_MATCH</del>

**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.

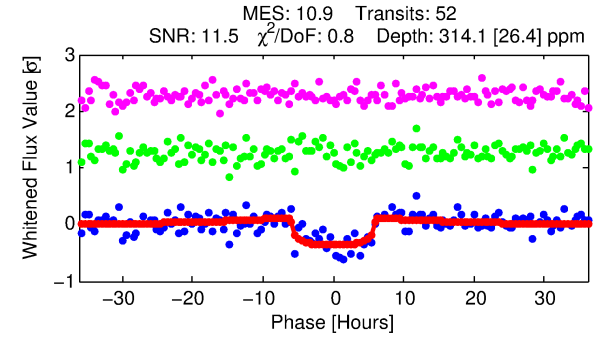
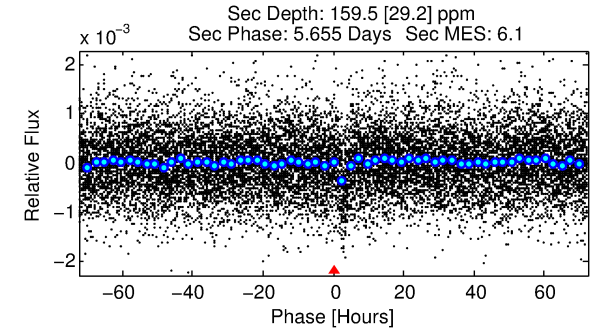
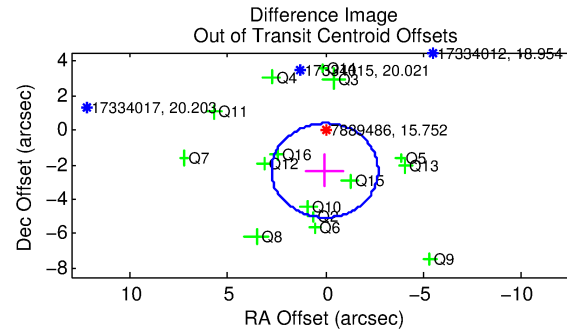
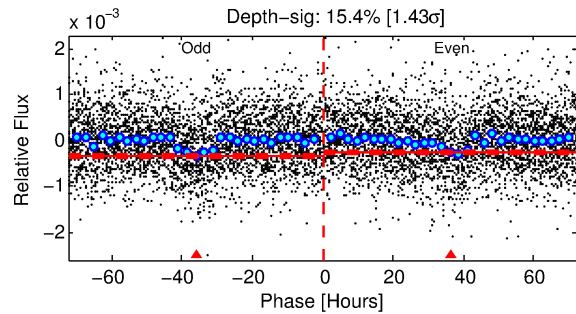
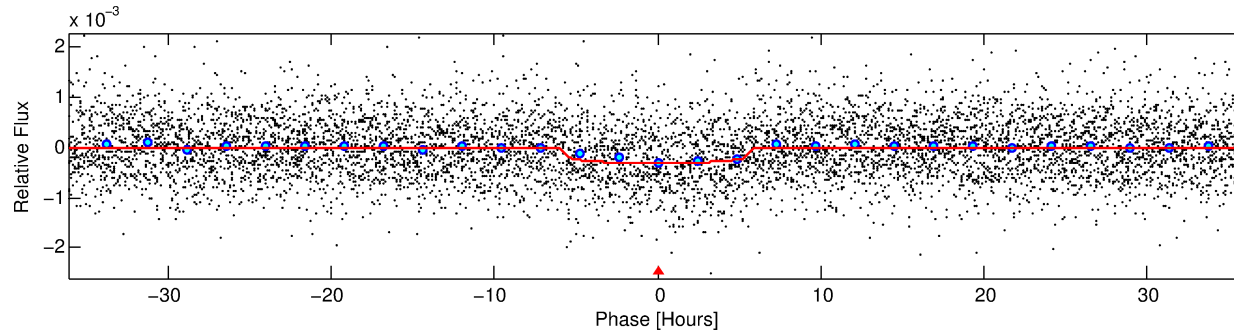
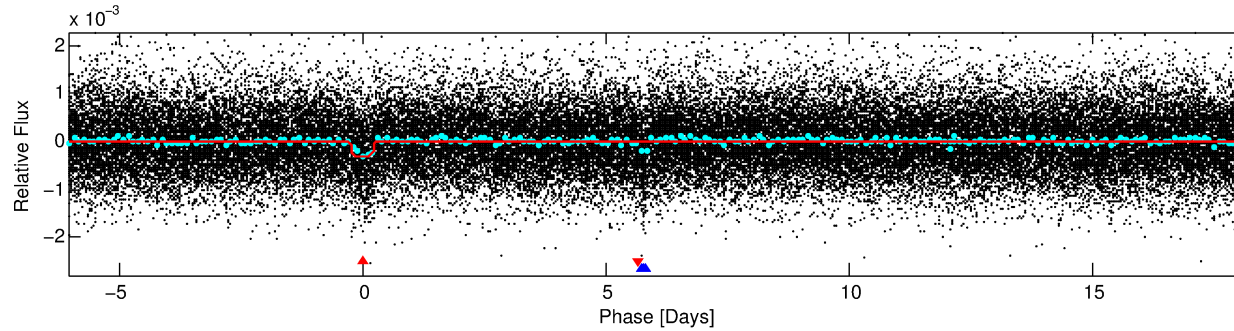
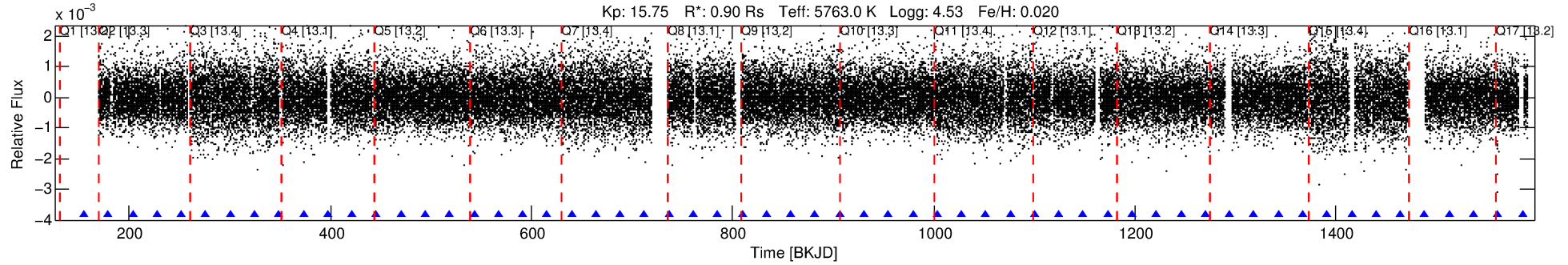
## Ephemeris Match Information For 007889486-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007889486-01	7889486	007821010-02	7821010	1:1	106.6	-14	23	10.82	15.76	1200.30	Direct-PRF	0	1.28	0.28

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

# DV One-Page Summary

KIC: 7889486 Candidate: 1 of 2 Period: 24.237 d  
KOI: K03300.02 Corr: 0.752



## DV Fit Results:

Period = 24.23728 [0.00042] d  
Epoch = 155.1062 [0.0139] BKJD  
Rp/R\* = 0.0181 [0.0035]  
a/R\* = 9.63 [8.08]  
b = 0.80 [0.38]  
Seff = 29.99 [11.93]  
Teq = 597 [59] K  
Rp = 1.78 [0.64] Re  
a = 0.1641 [0.0419] AU  
Ag = 744.28 [424.23] [1.75 $\sigma$ ]  
Teffp = 4819 [547] K [7.68 $\sigma$ ]

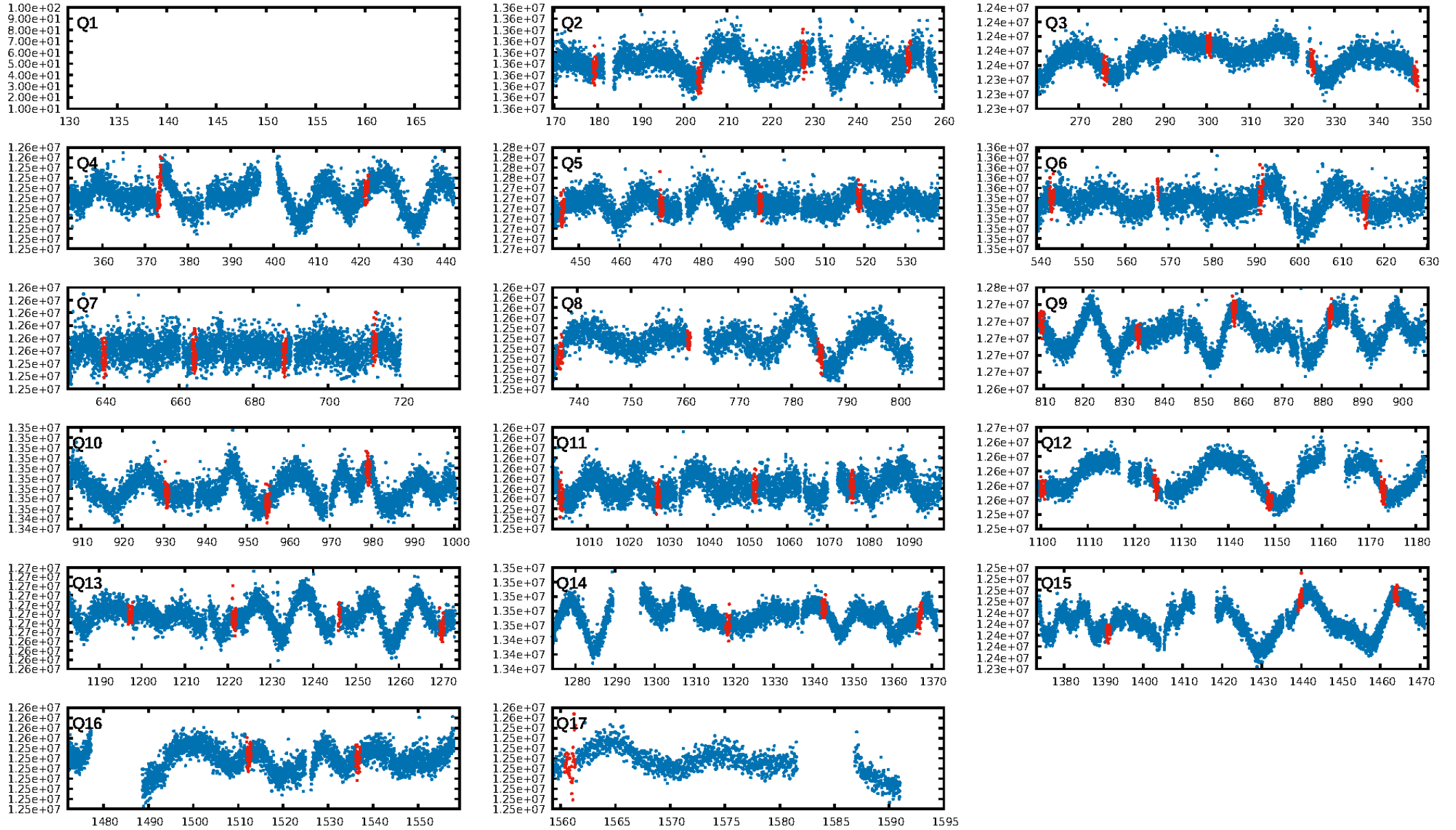
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.2% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: 57.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.61e-26  
RollingBand-fgt: 1.00 [51/51]  
GhostDiagnostic-chr: -0.02415  
Centroid-sig: 0.0%  
Centroid-so: 2.574 arcsec [2.76 $\sigma$ ]  
OotOffset-rm: 2.340 arcsec [2.57 $\sigma$ ]  
KicOffset-rm: 2.321 arcsec [2.55 $\sigma$ ]  
OotOffset-st: 4/4/4/3 [15]  
KicOffset-st: 4/4/4/3 [15]  
DiffImageQuality-fgm: 0.13 [2/15]  
DiffImageOverlap-fno: 1.00 [15/15]

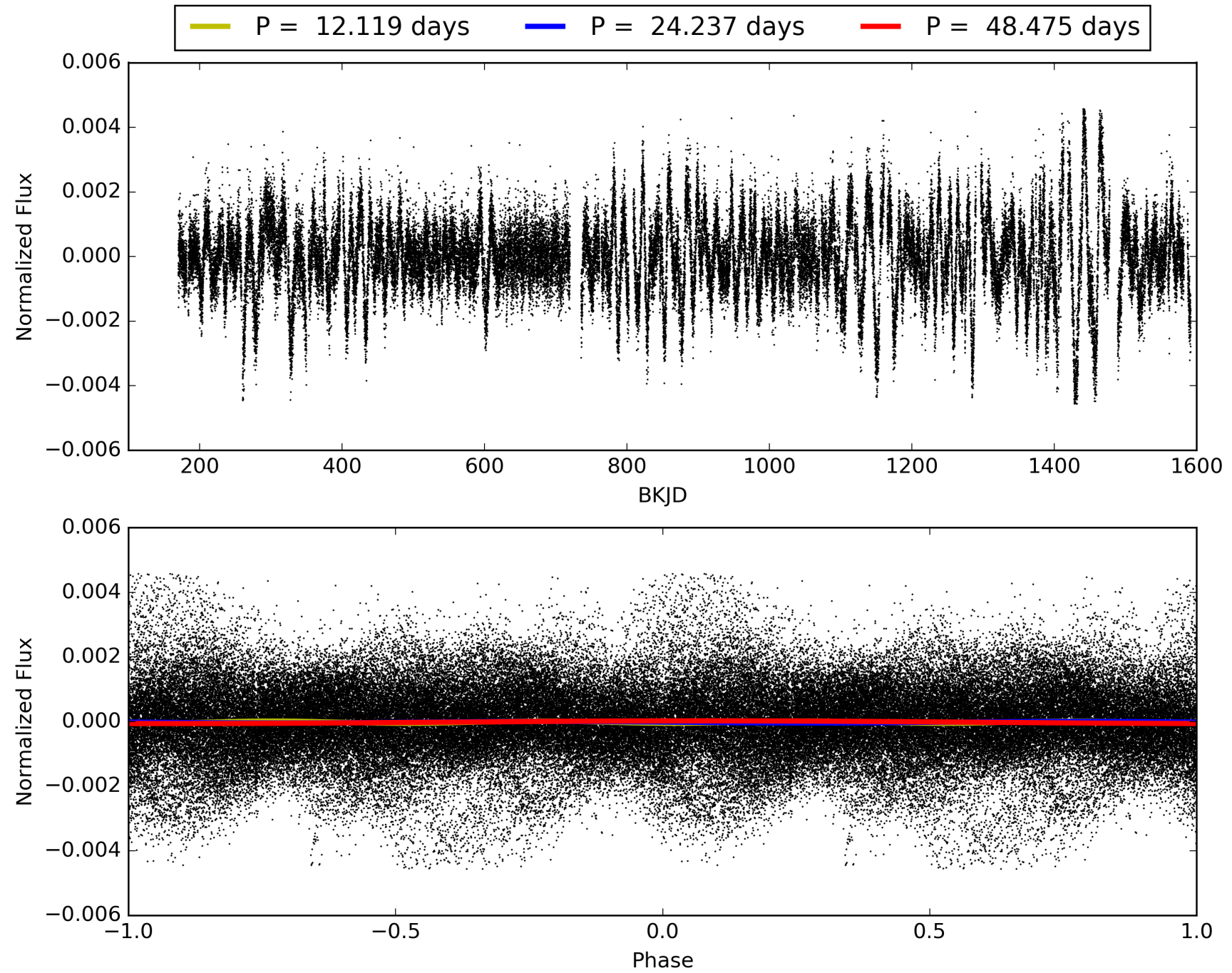
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:20:33 Z

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

# TCE 007889486-01, PDC Light Curves

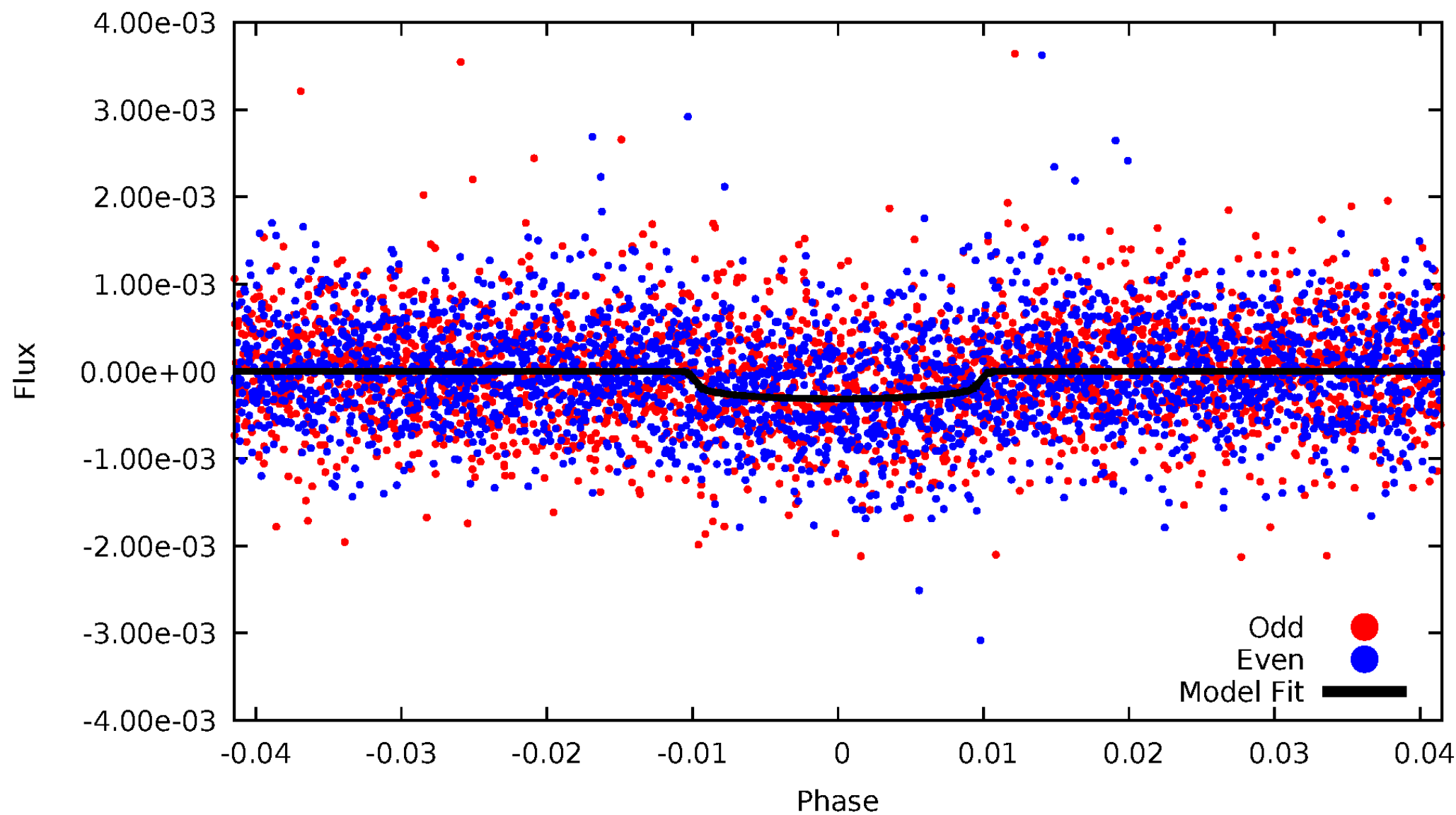


TCE 007889486-01



# DV Odd/Even

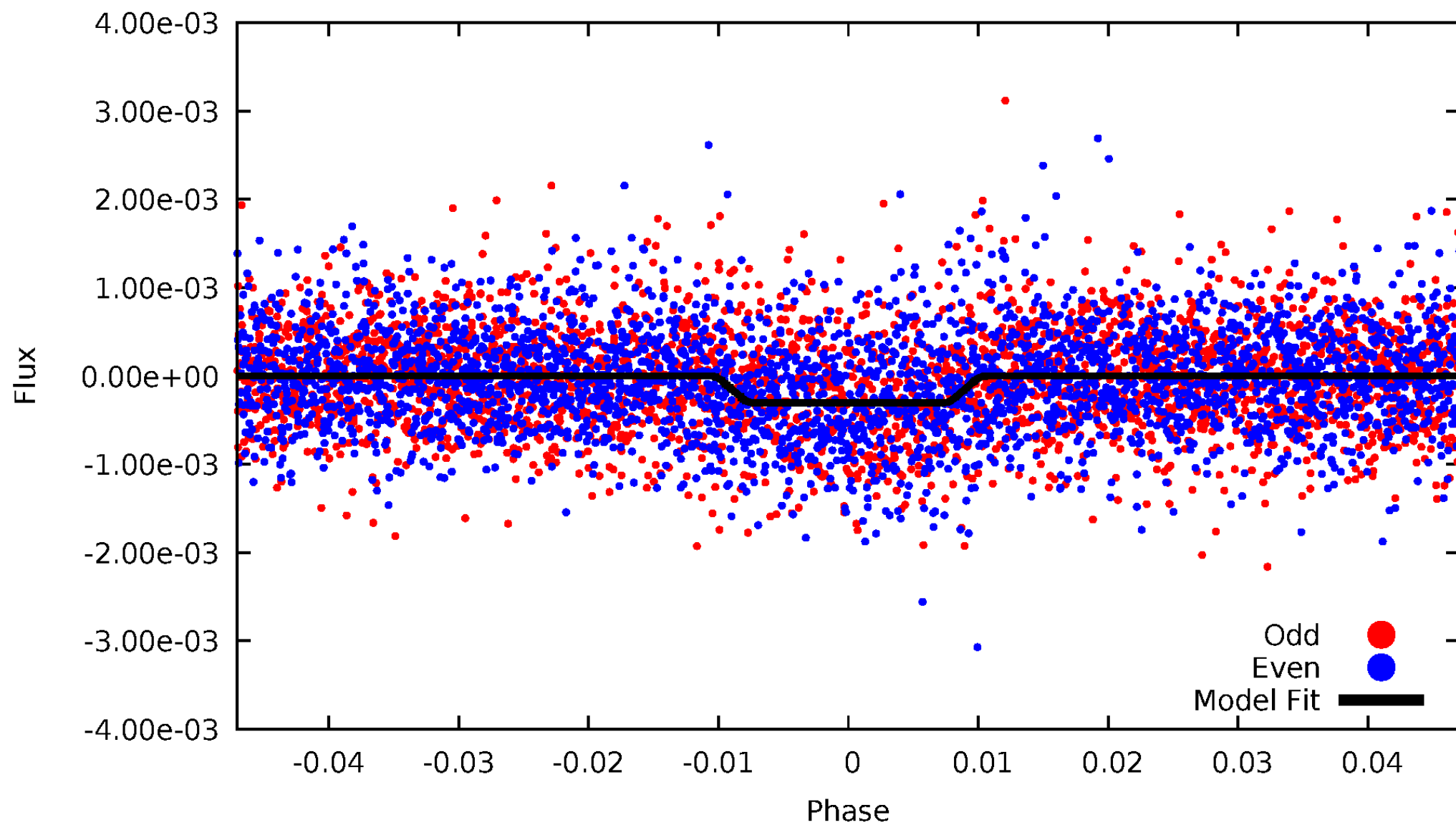
TCE 007889486-01



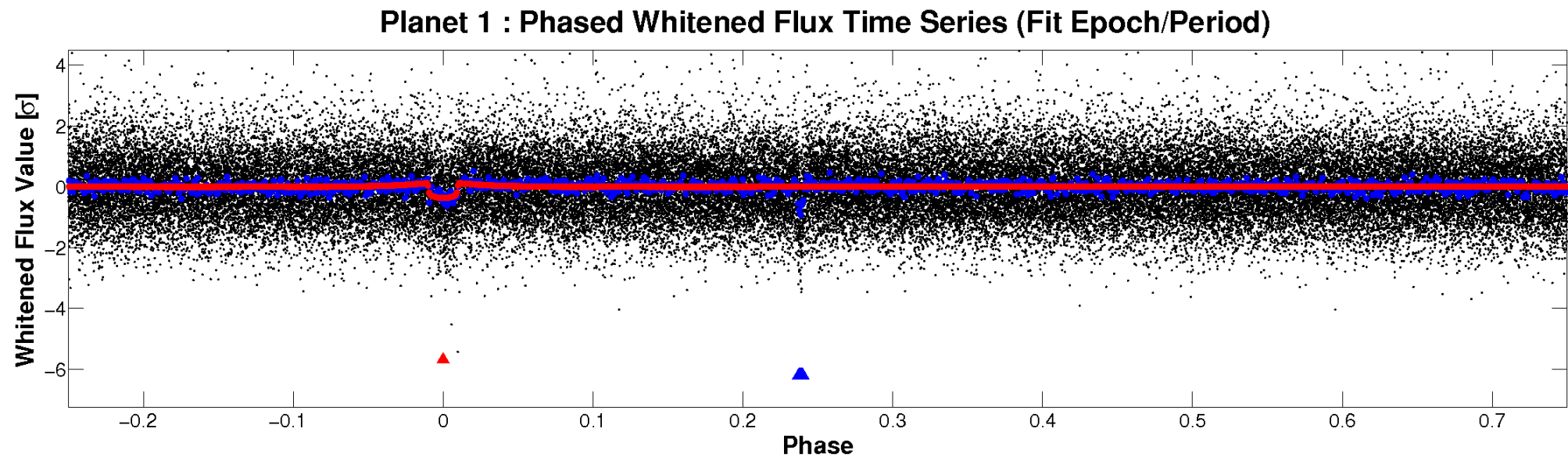
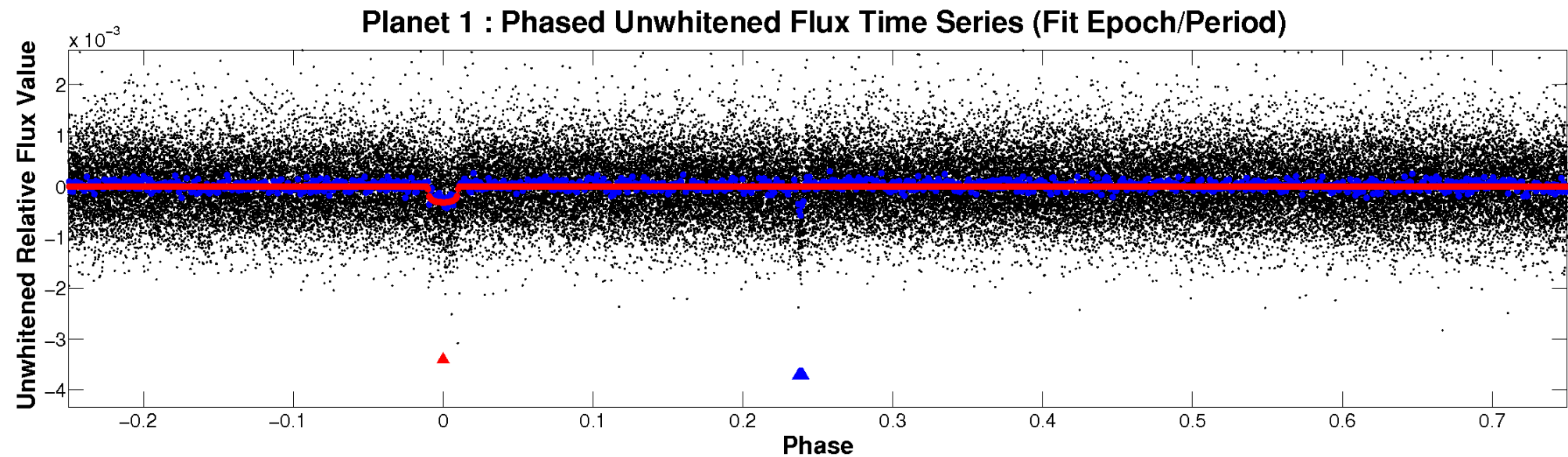


# ALT Odd/Even

TCE 007889486-01

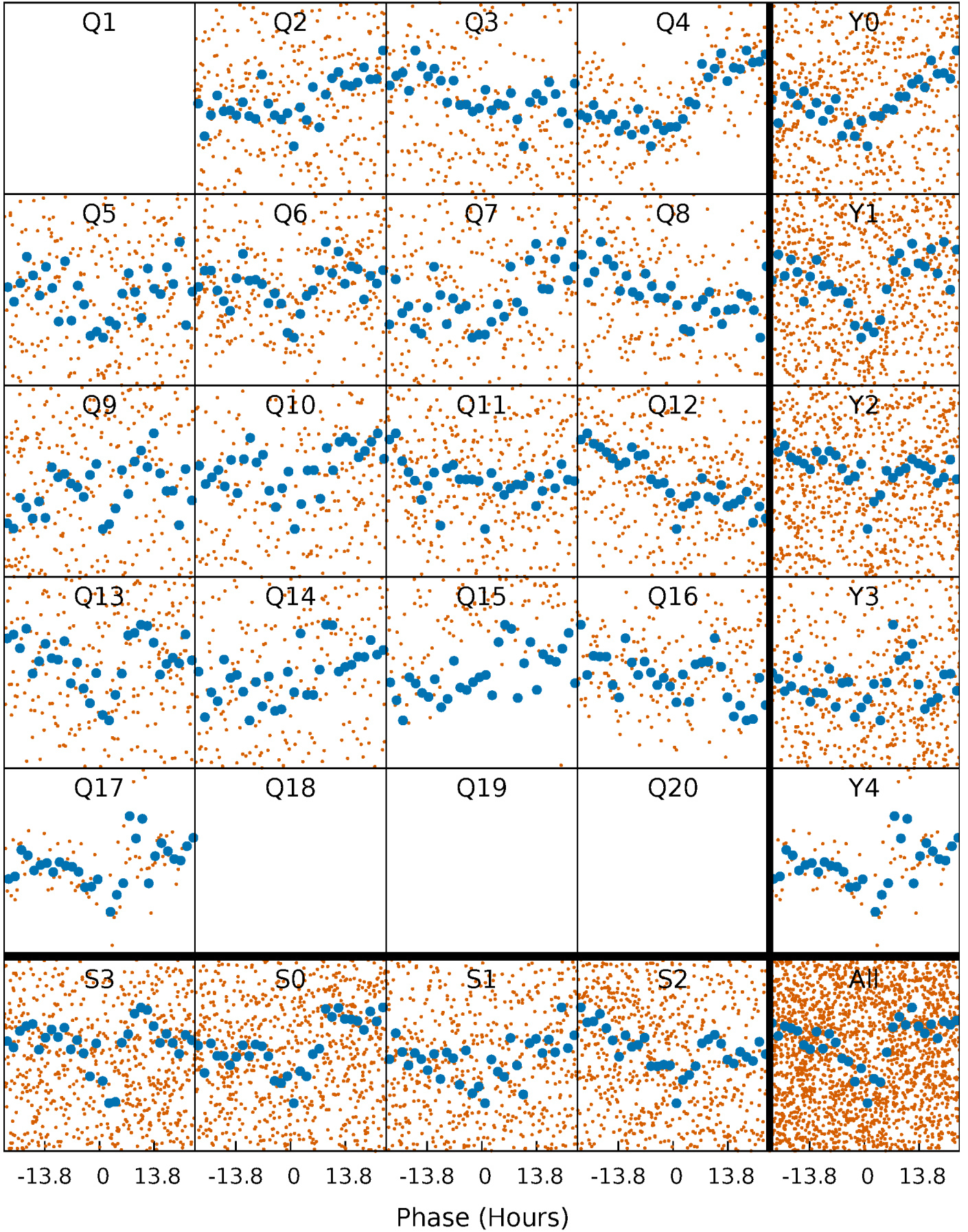


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

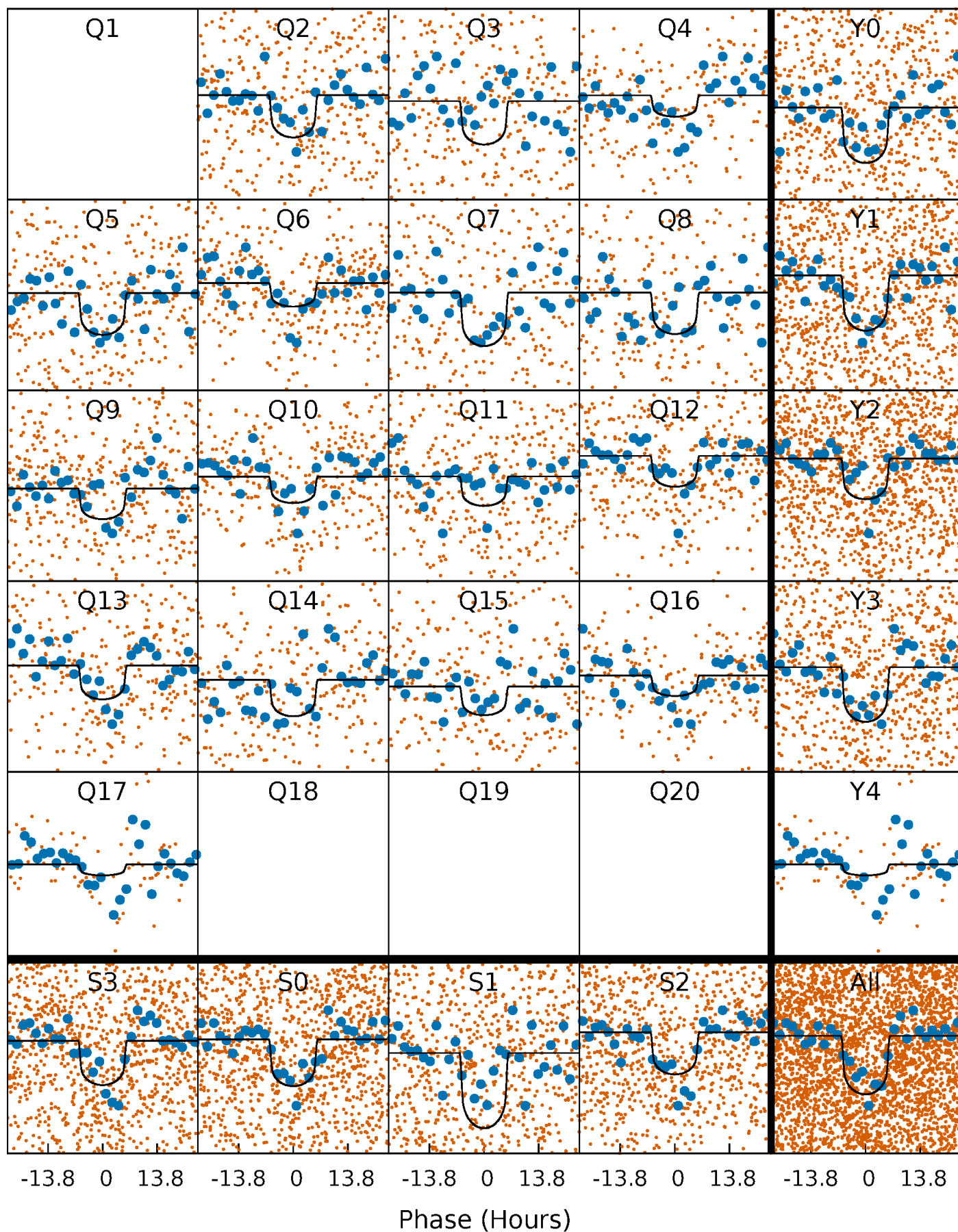
TCE 007889486-01   P= 24.237281 Days    $T_0=155.106197$  (BKJD)





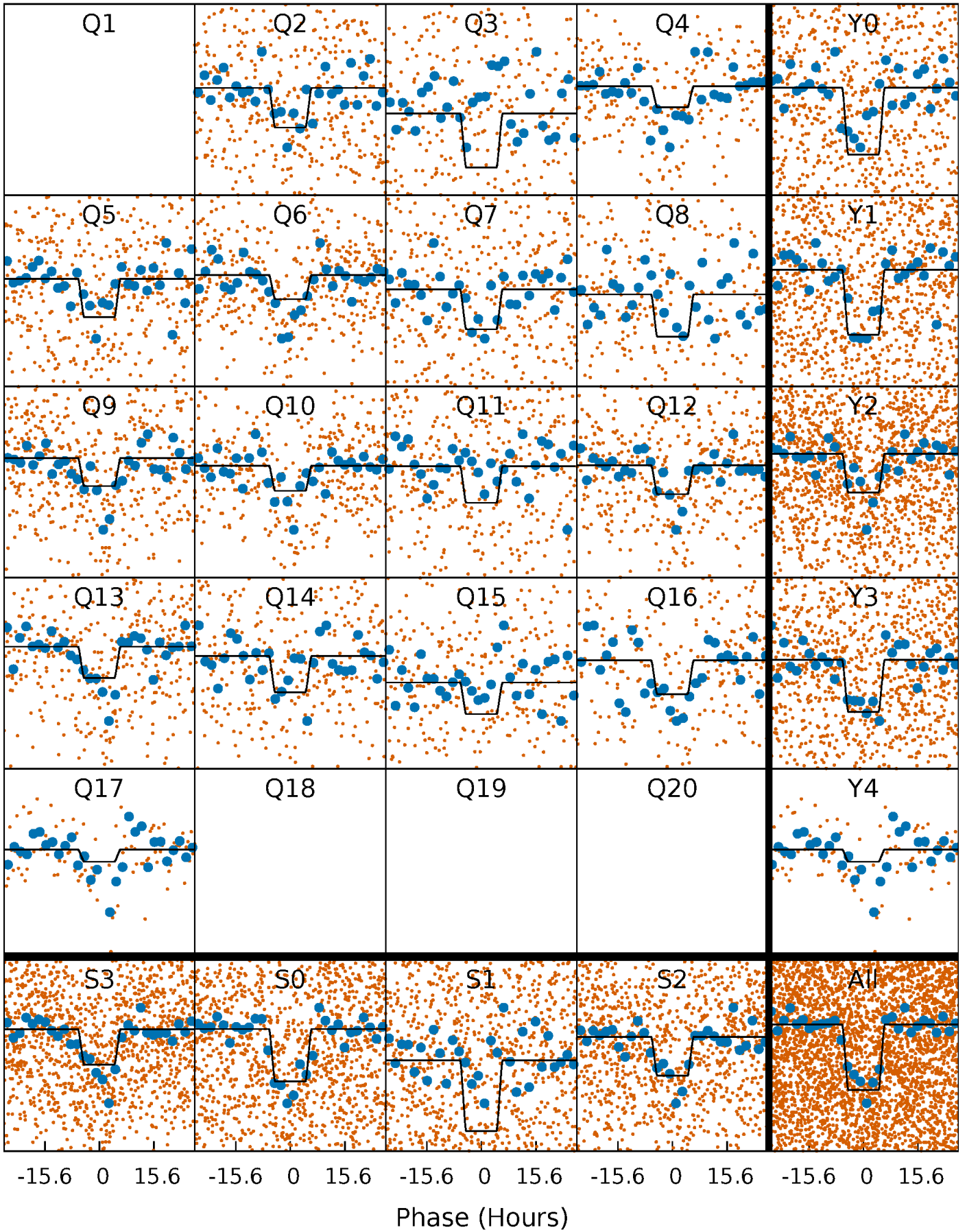
# DV Quarter-Phased Transit Curves

TCE 007889486-01 P= 24.237281 Days  $T_0=155.106197$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

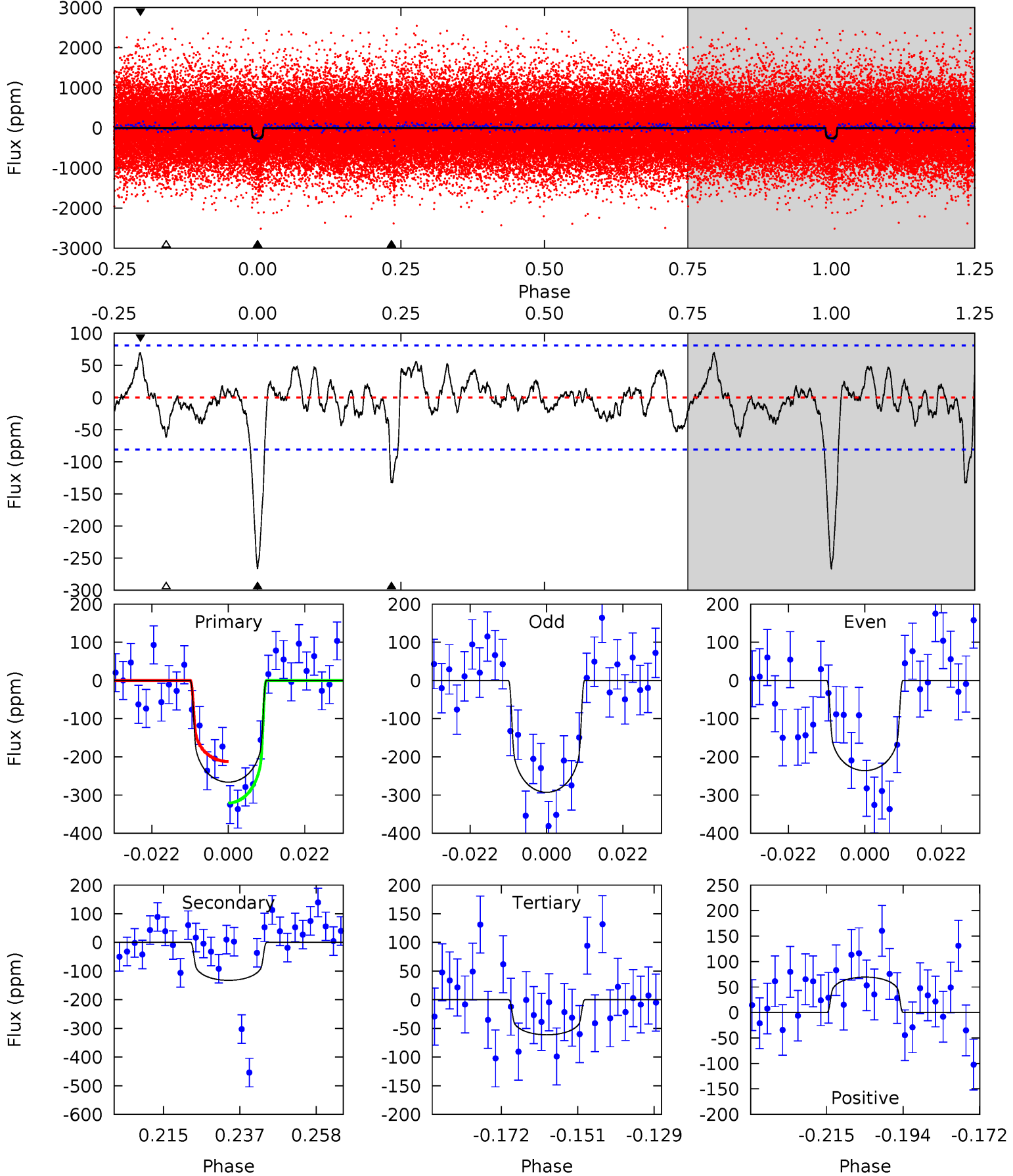
TCE 007889486-01 P= 24.236276 Days  $T_0=155.161246$  (BKJD)



# DV Model-Shift Uniqueness Test

007889486-01, P = 24.237281 Days, E = 155.106197 Days

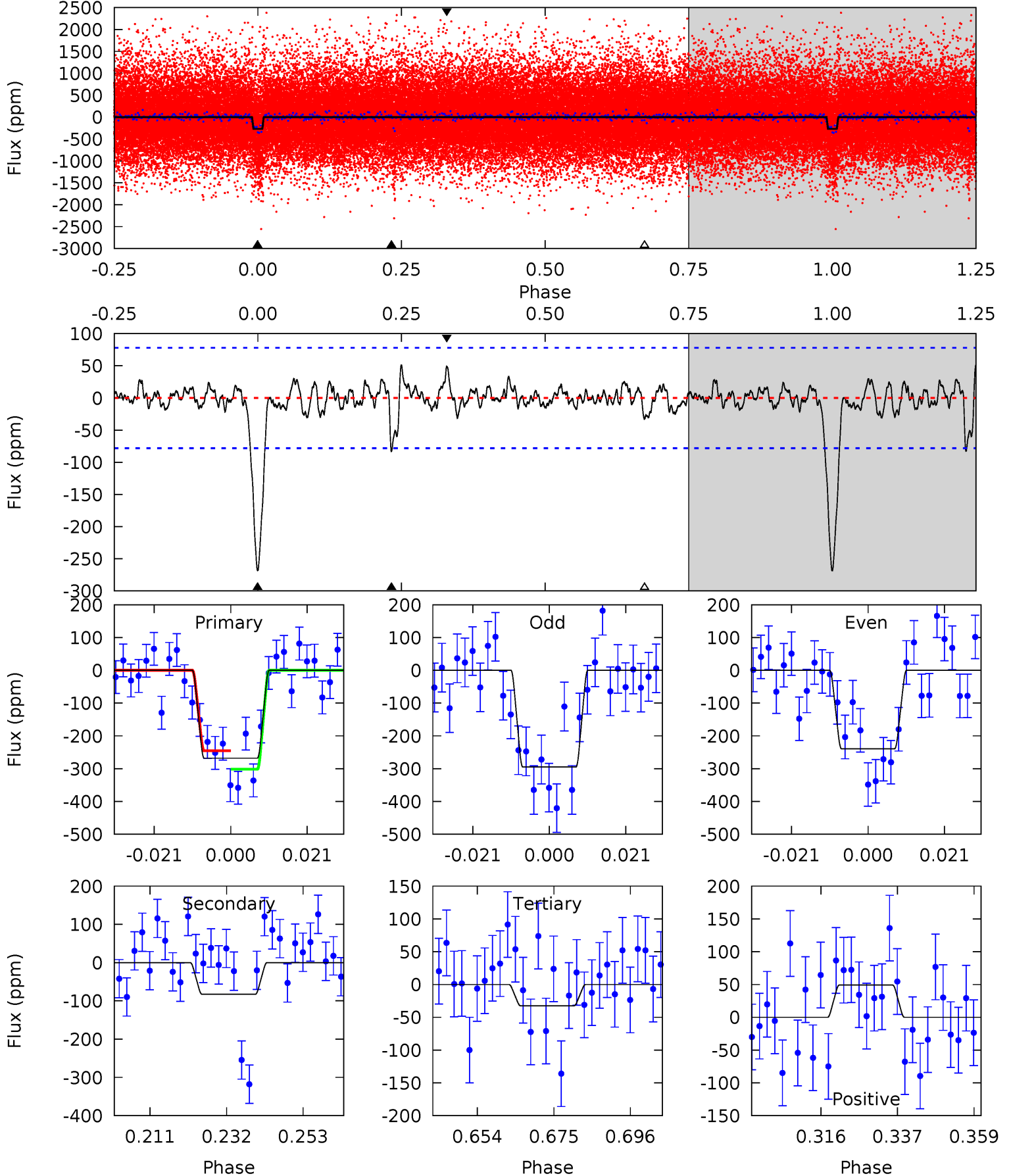
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	7.98	3.69	4.19	4.88	2.30	1.41	12.4	11.9	4.29	3.79	1.71	1.07	0.21	3.28



# Alt Model-Shift Uniqueness Test

007889486-01, P = 24.236276 Days, E = 155.161246 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.8	5.18	2.03	3.07	4.88	2.31	0.82	14.8	13.7	3.15	2.11	1.74	0.74	0.16	1.76



### Stellar Parameters For KIC 007889486

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5763^{+182}_{-202}$	$4.527^{+0.036}_{-0.204}$	$0.020^{+0.250}_{-0.300}$	$0.904^{+0.273}_{-0.073}$	$1.002^{+0.114}_{-0.125}$	$1.913^{+0.379}_{-0.976}$
	+3%/-4%	+1%/-5%	+1250%/-1500%	+30%/-8%	+11%/-12%	+20%/-51%
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 007889486-01 / KOI 3300.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-132 \pm 17$	$1.84^{+0.52}_{-0.37}$	$856^{+59}_{-44}$	$4714^{+501}_{-349}$	$551^{+318}_{-207}$
Alt.	$-83 \pm 16$	$1.82^{+0.43}_{-0.42}$	$850^{+59}_{-39}$	$4346^{+453}_{-348}$	$363^{+238}_{-145}$

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



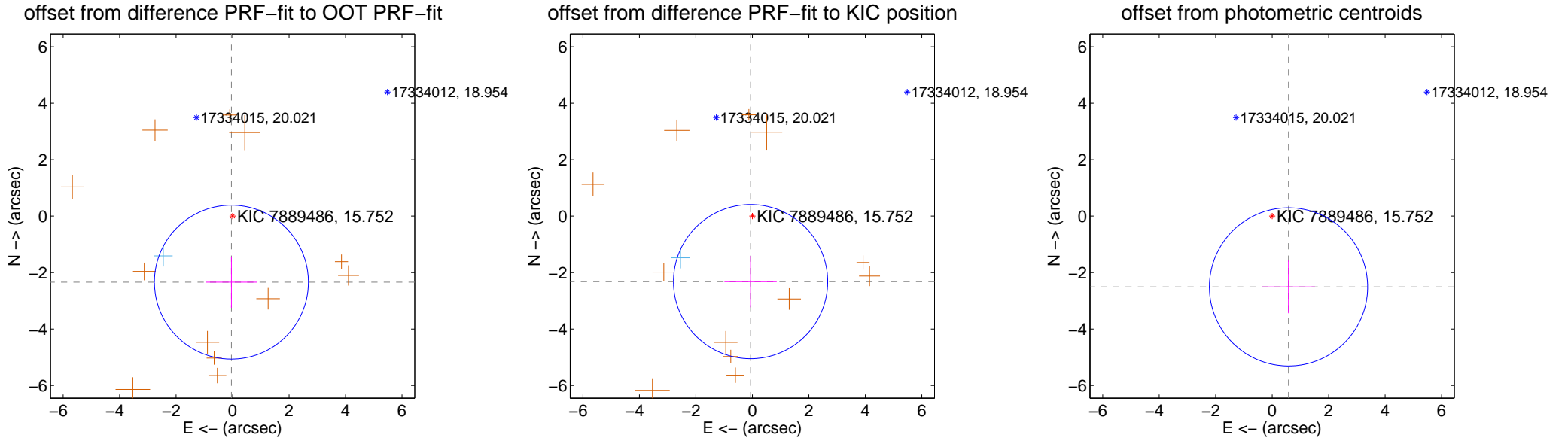
## DV Centroid Data

Supplemental centroid analysis for 007889486-01. Kepler magnitude: 15.75. Transit SNR 11.48

There are 2 quarters with good PRF difference image offsets

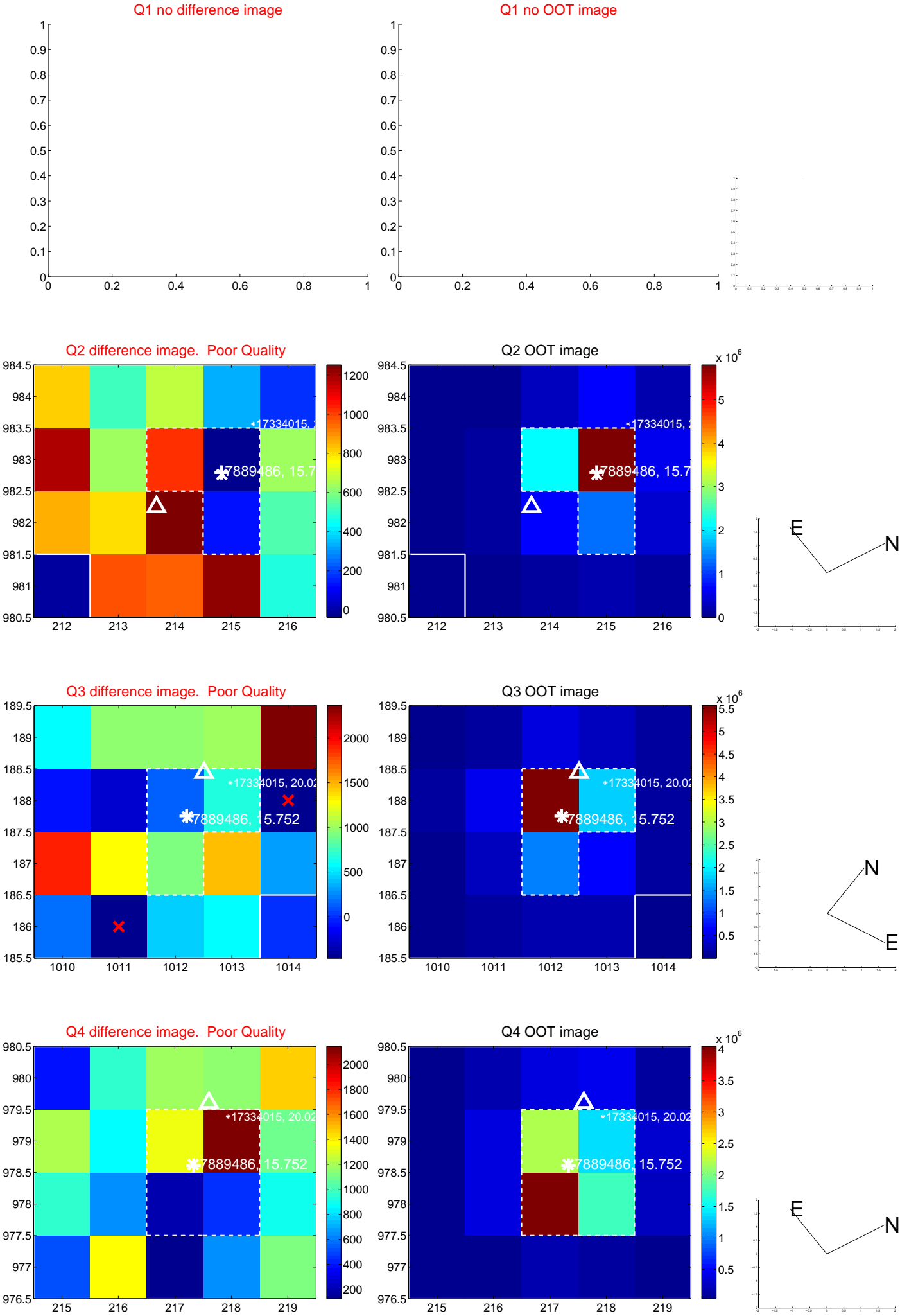
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.340 \pm 0.909$	2.57	$0.042 \pm 0.916$	$-2.339 \pm 0.909$
PRF-fit source offset from KIC position	$2.321 \pm 0.910$	2.55	$0.064 \pm 0.926$	$-2.321 \pm 0.910$
photometric centroid source offset	$2.57 \pm 0.93$	2.76	$-0.58 \pm 0.94$	$-2.51 \pm 0.93$

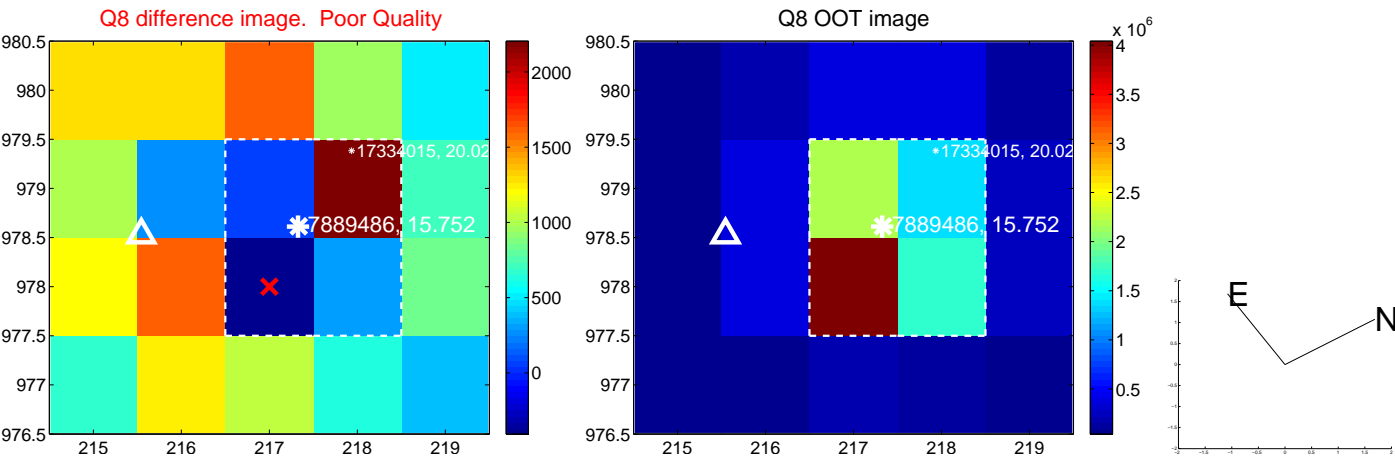
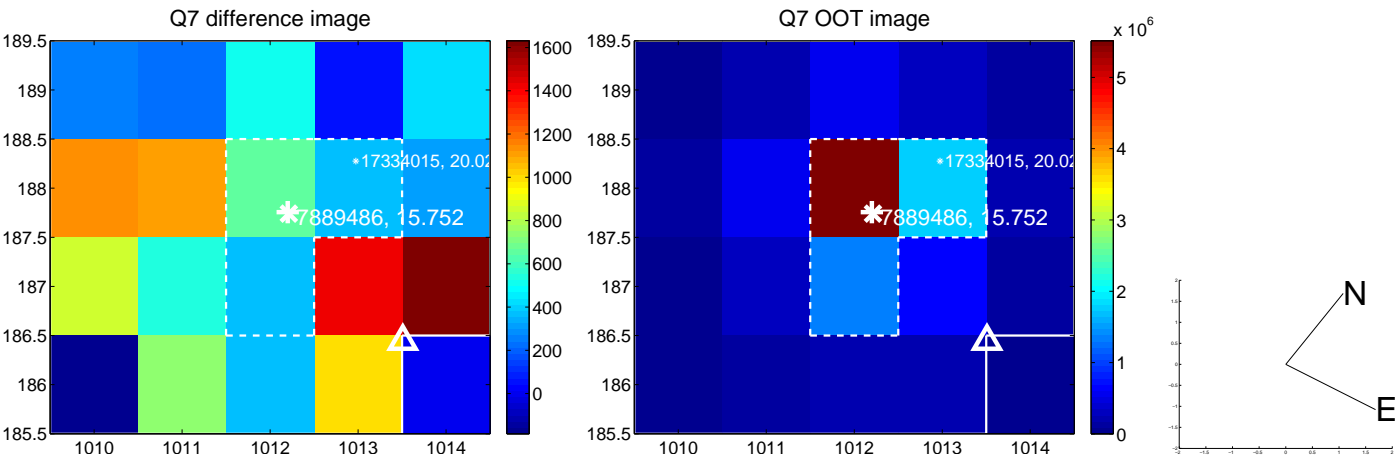
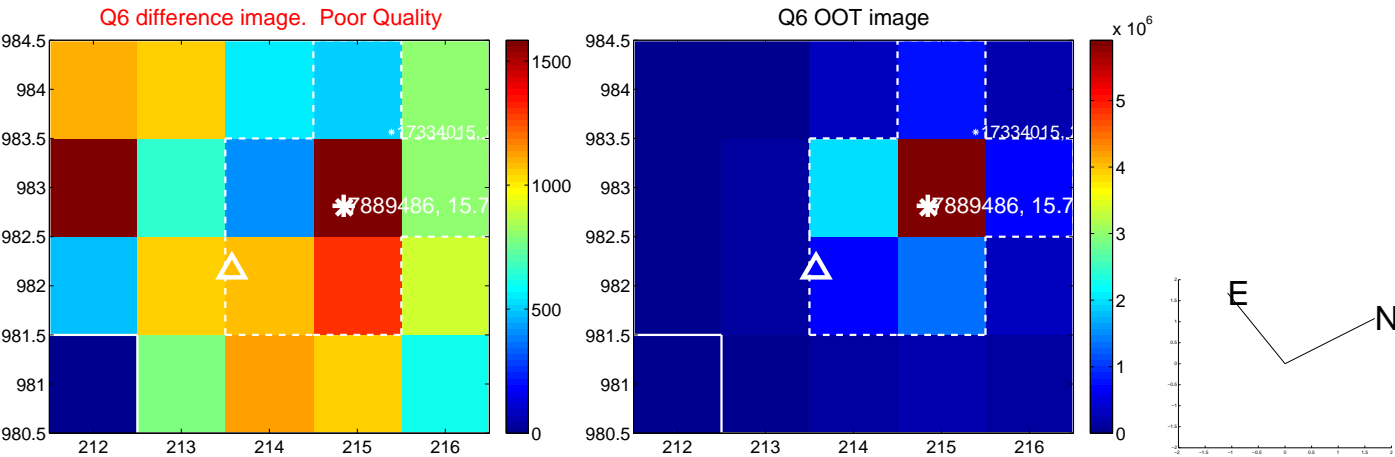
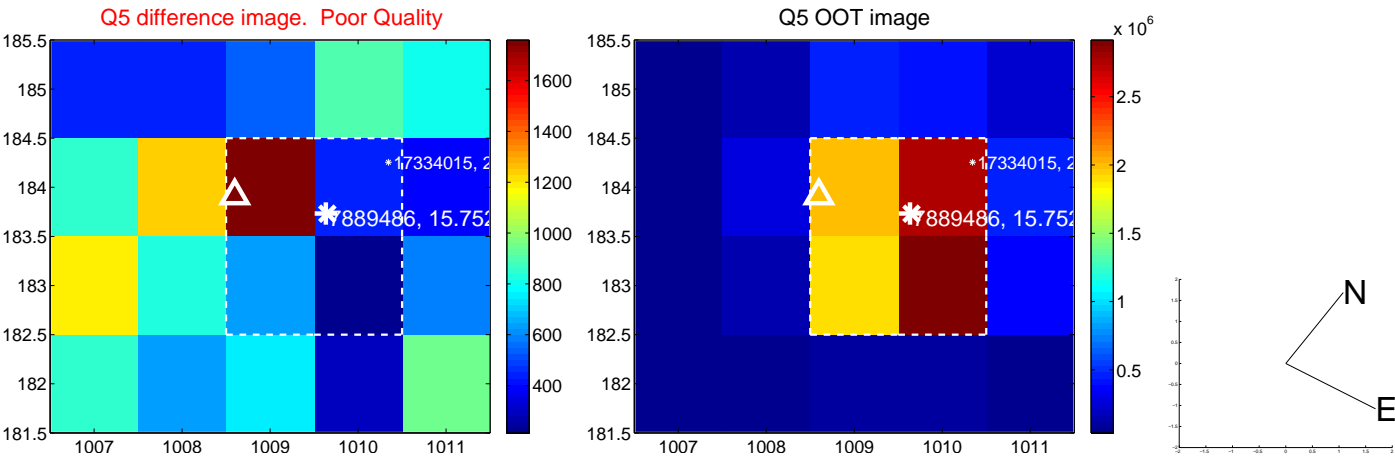


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

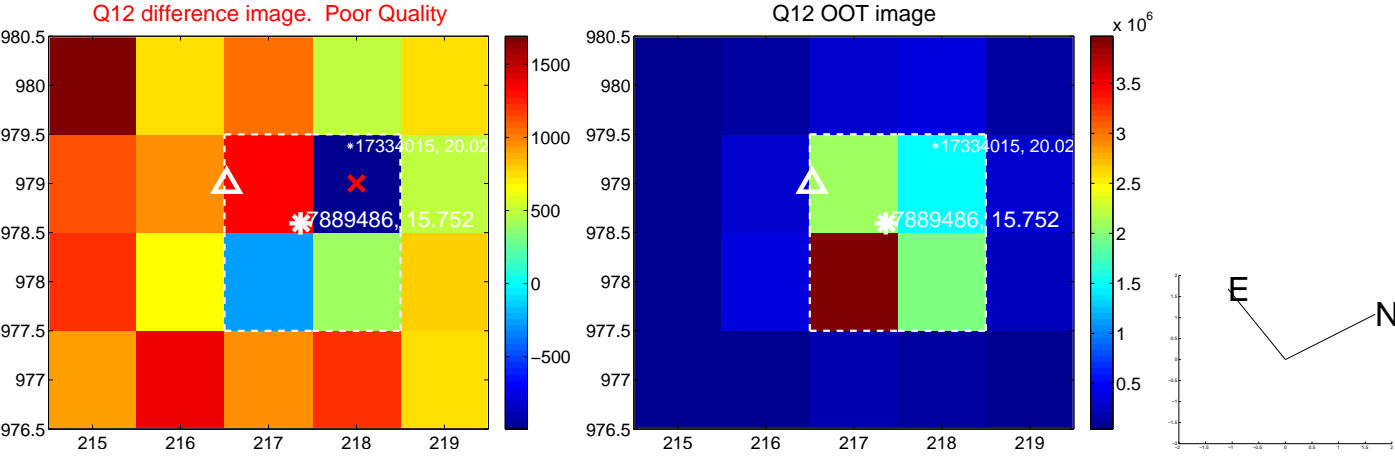
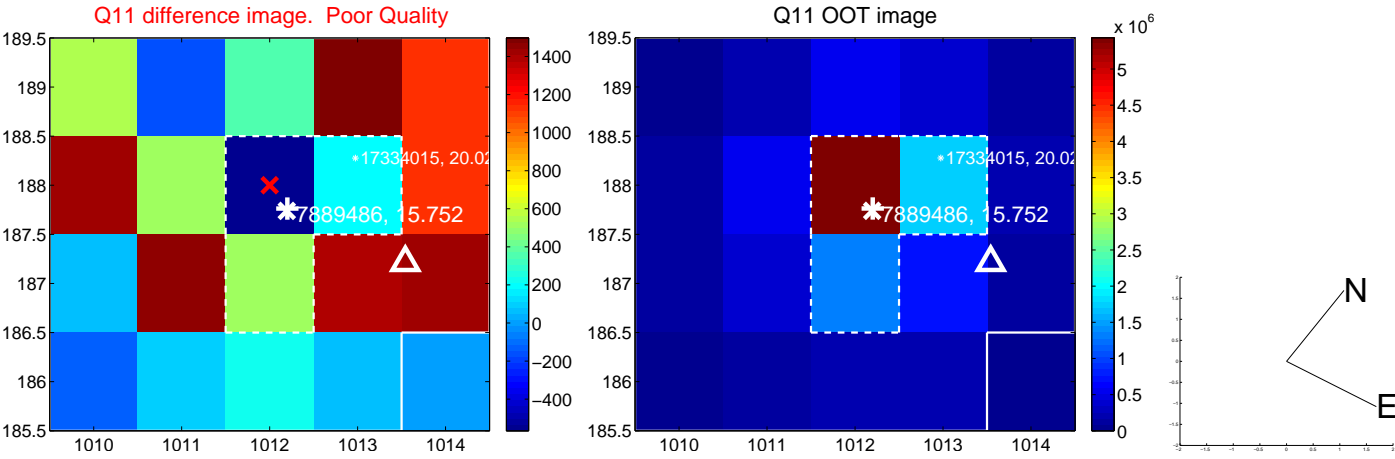
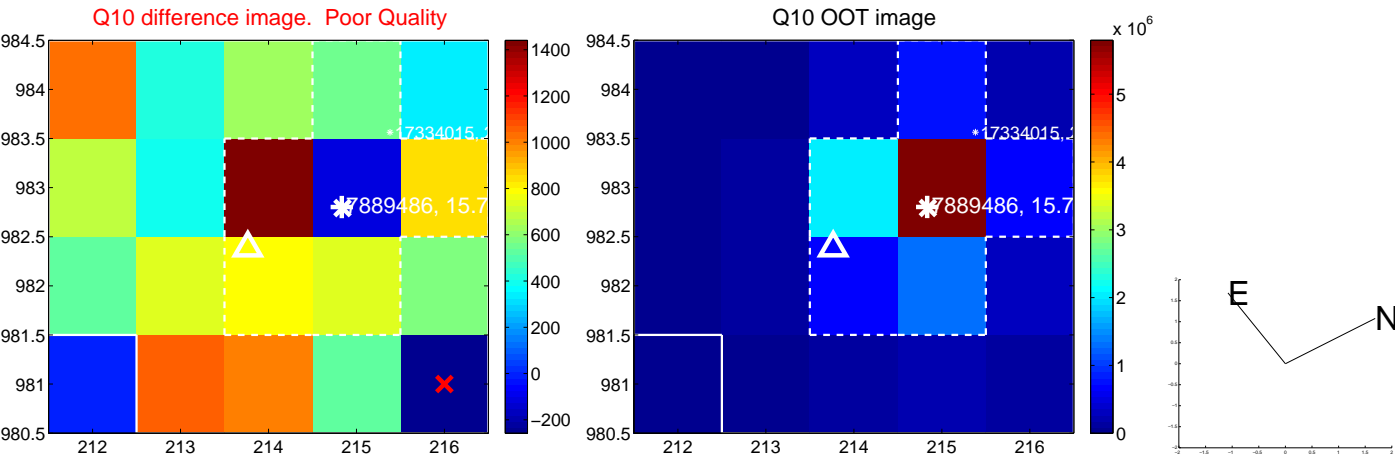
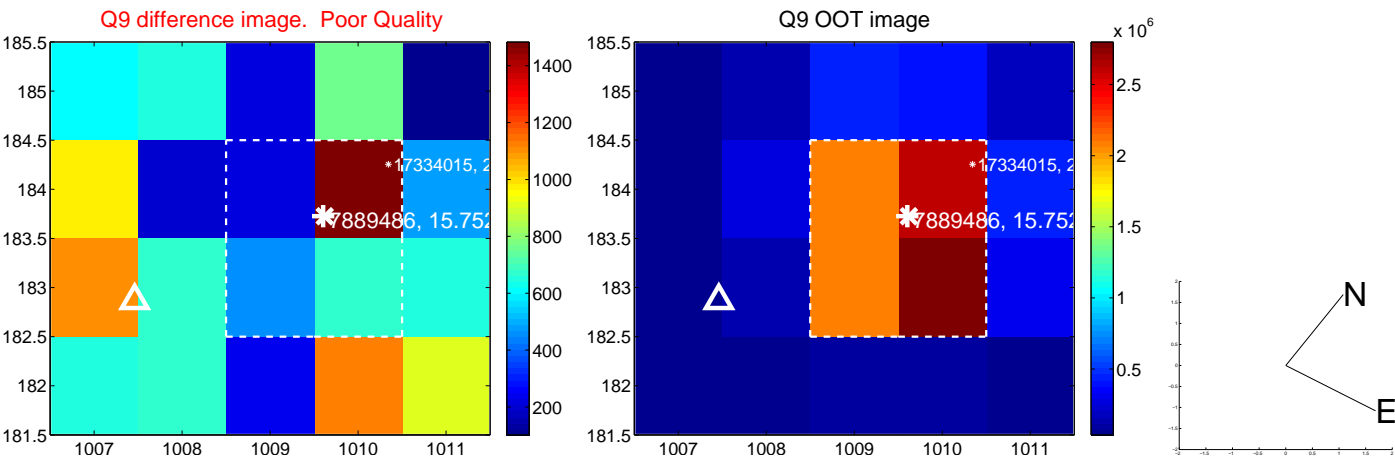
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



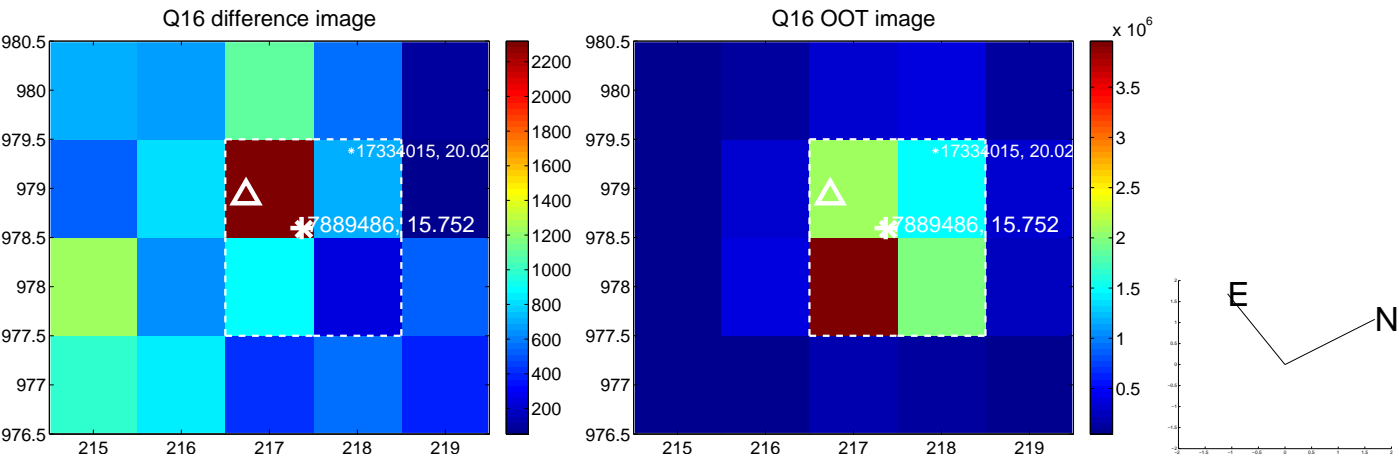
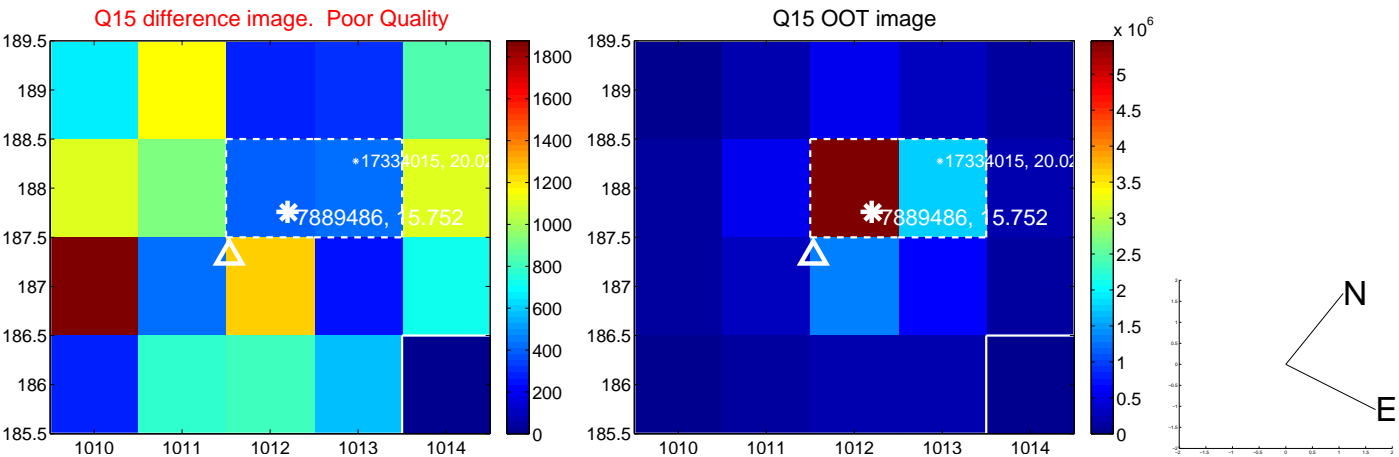
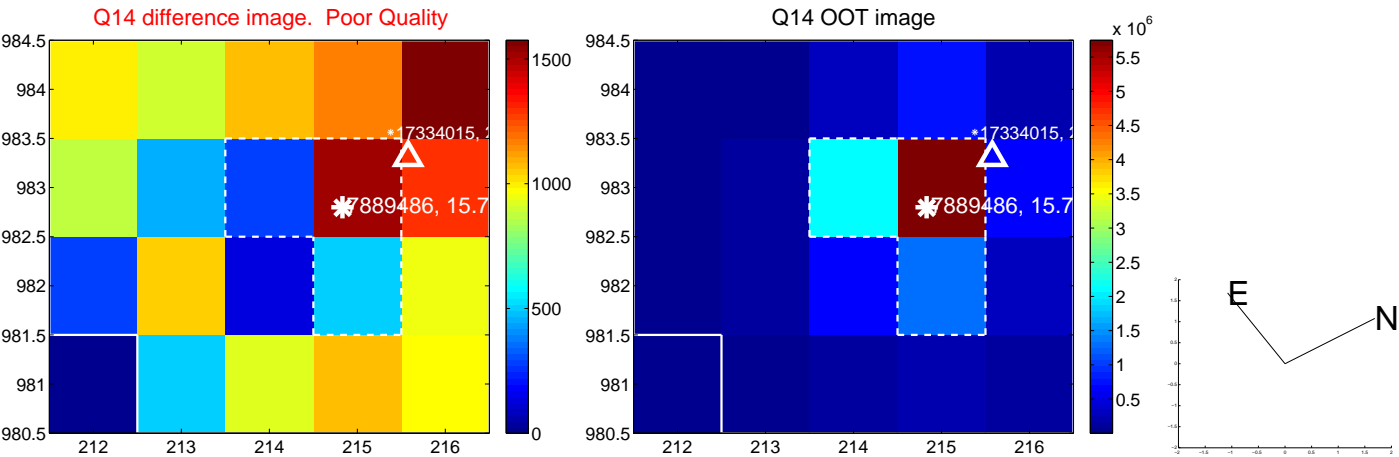
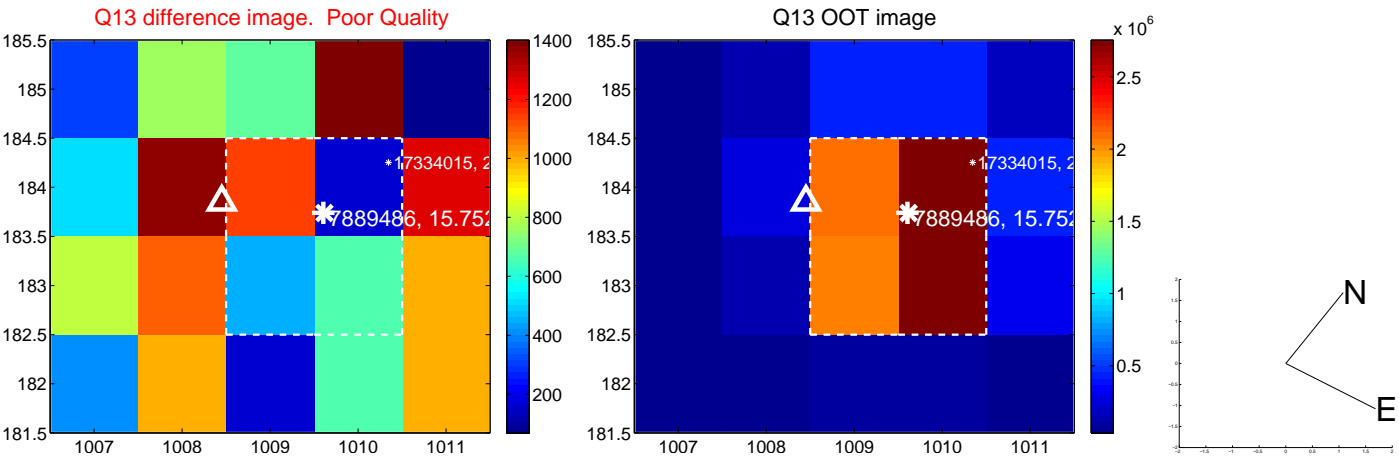
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

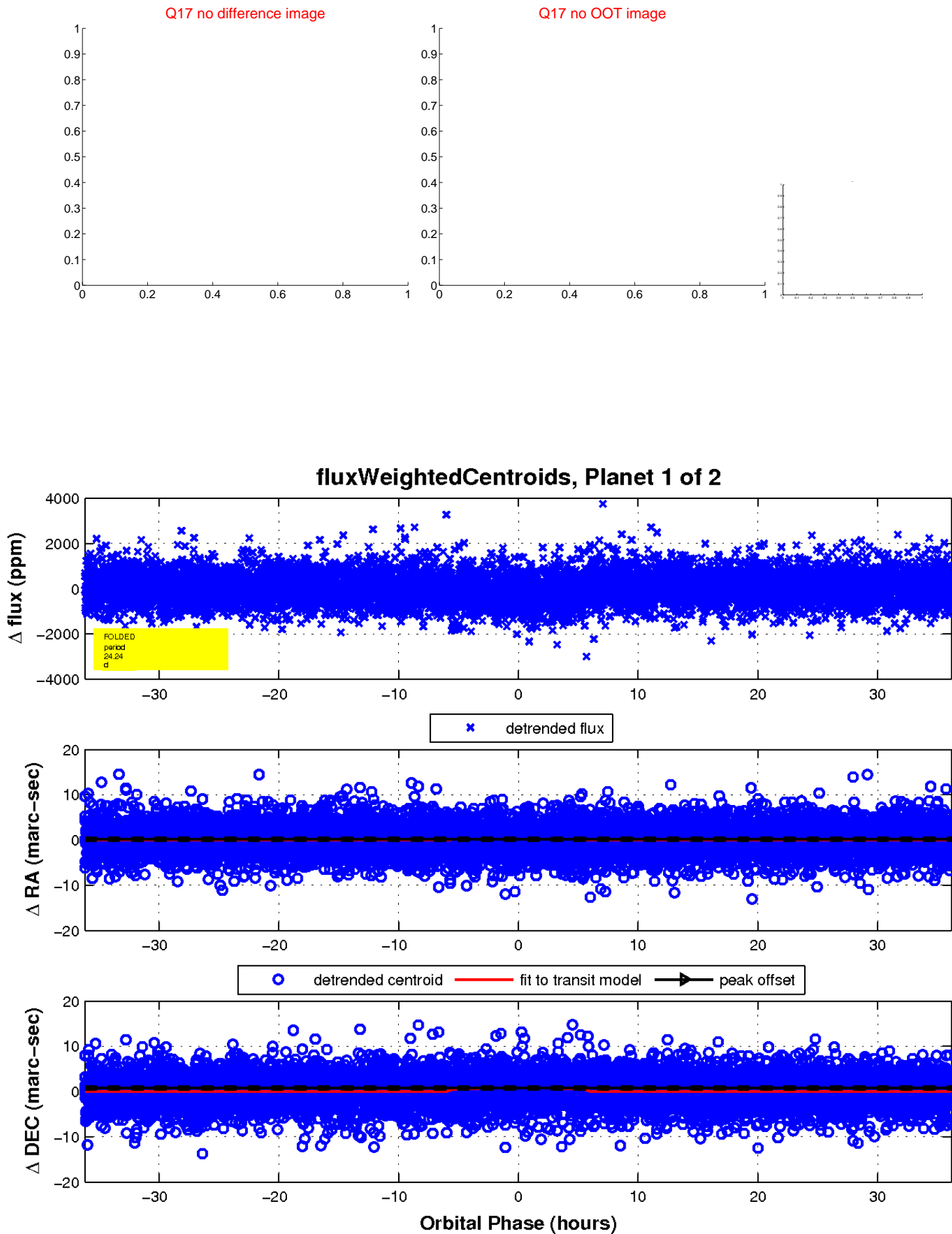


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

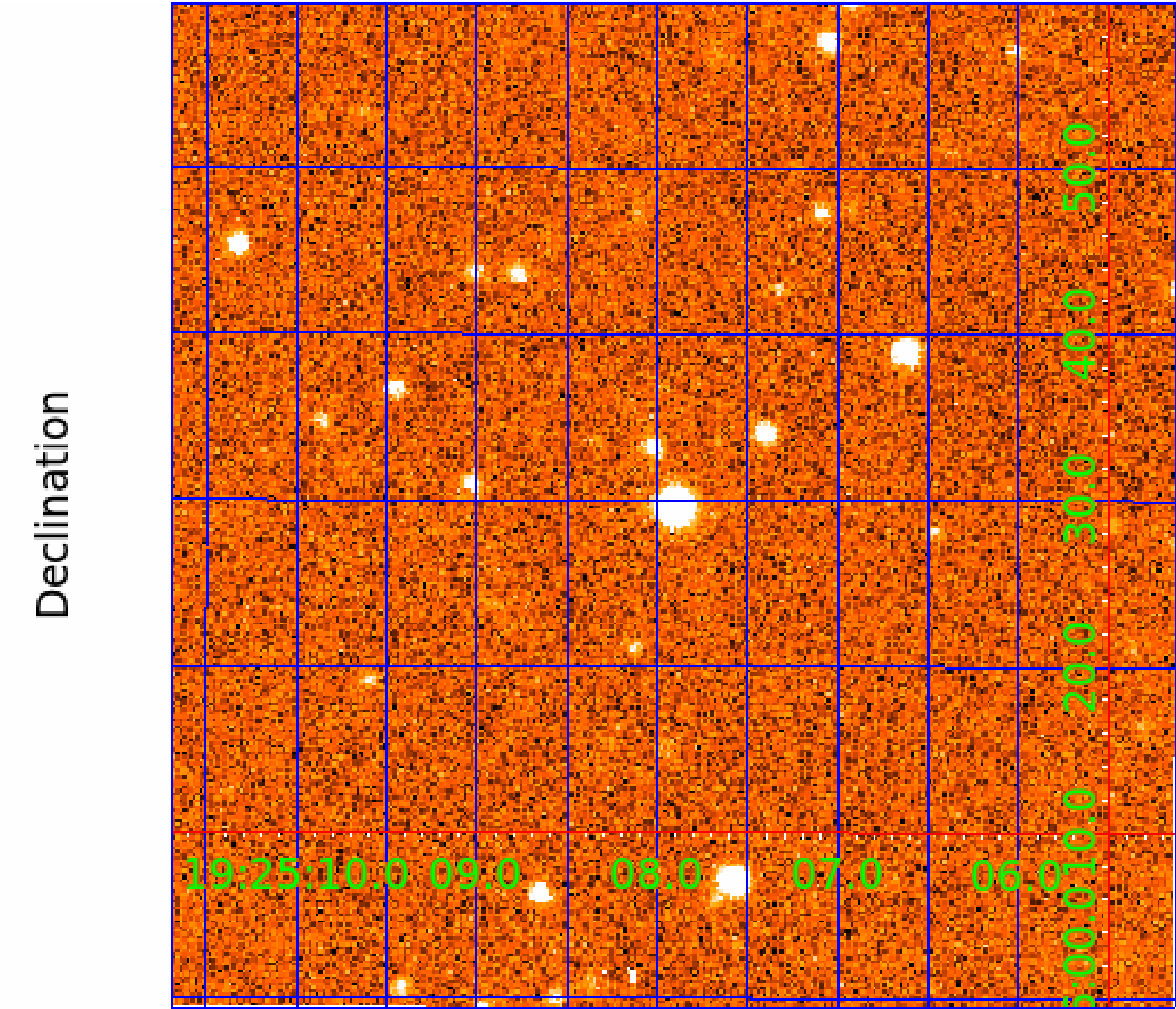




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 007889486

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007889486-01	OBS	3300.02	24.237281	155.106197	314.1	12.062	10.9	11.5	0.90	5763	1.78	29.99
007889486-02	OBS	3300.01	24.238381	136.619388	510.5	2.825	10.8	11.7	0.90	5763	2.32	29.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007889486-01	OBS	FP	0.00	0	1	1	1	HAS_SEC_TCE—CENT_CROWDED—HALO_GHOST—EPHEM_MATCH
007889486-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

**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 007889486-02

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007889486-02	7889486	007821010-01	7821010	1:1	106.6	-14	23	10.82	15.76	923.06	Direct-PRF	0	0.05	0.22

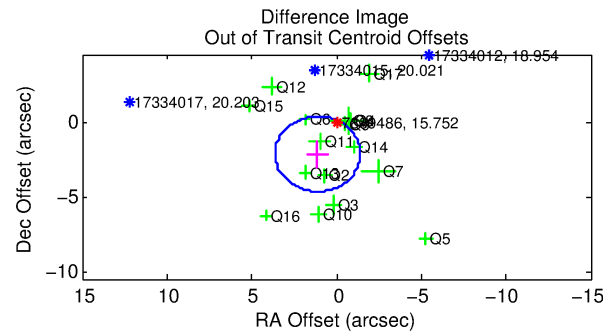
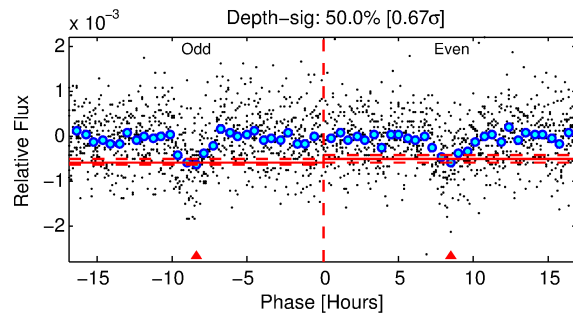
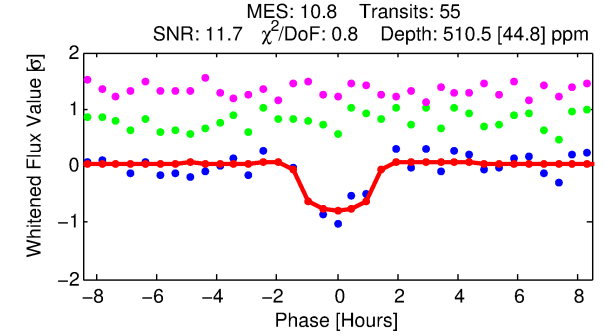
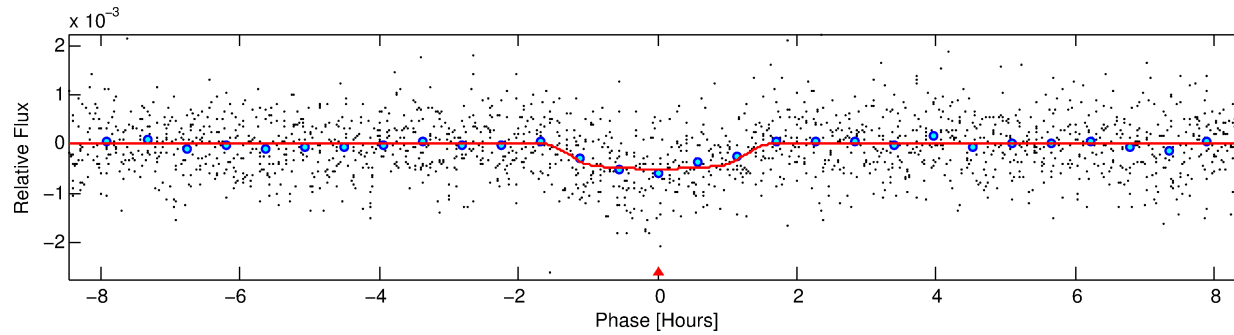
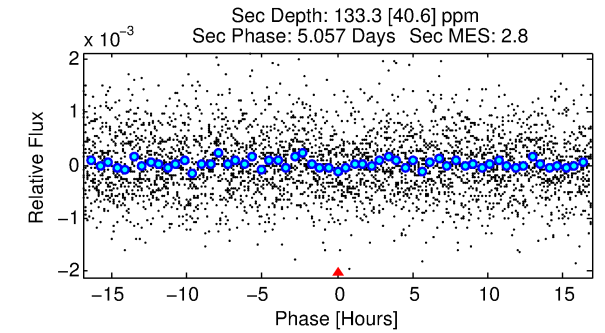
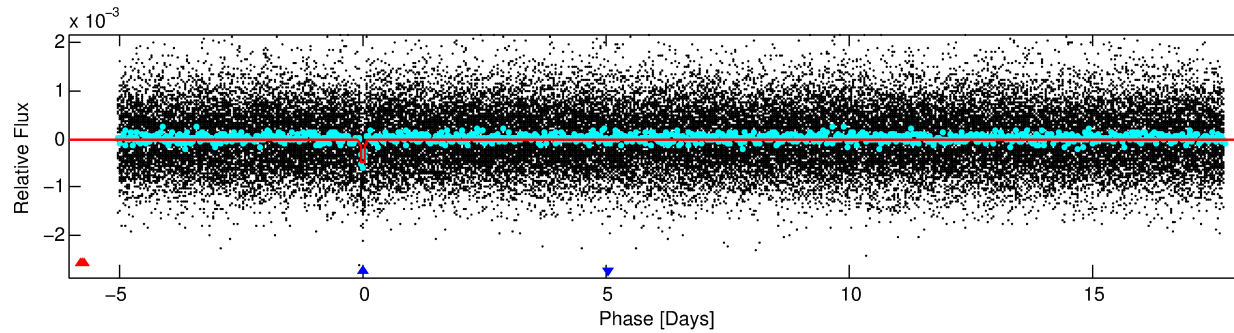
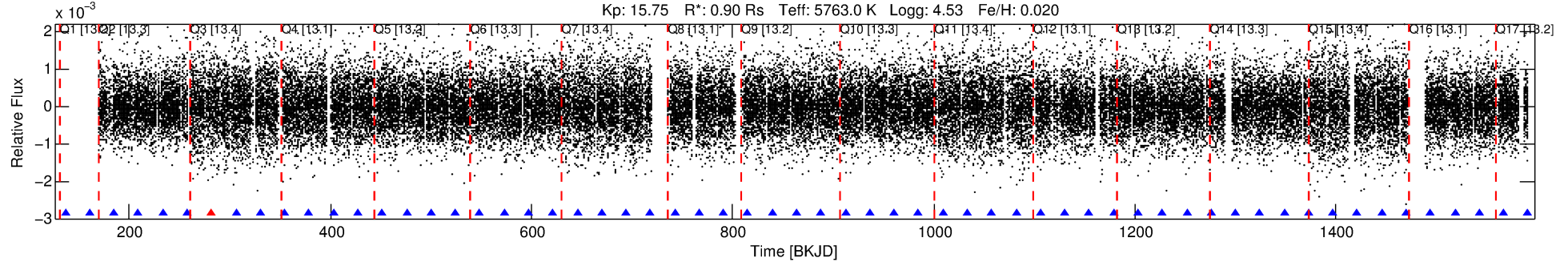
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$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

# DV One-Page Summary

KIC: 7889486 Candidate: 2 of 2 Period: 24.238 d

KOI: K03300.01 Corr: 0.980

Kp: 15.75 R\*: 0.90 Rs Teff: 5763.0 K Logg: 4.53 Fe/H: 0.020



## DV Fit Results:

Period = 24.23838 [0.00016] d  
Epoch = 136.6194 [0.0056] BKJD  
Rp/R\* = 0.0235 [0.0141]  
a/R\* = 38.32 [102.53]  
b = 0.84 [0.96]  
Seff = 29.99 [11.93]  
Teq = 597 [59] K  
Rp = 2.32 [1.56] Re  
a = 0.1641 [0.0419] AU  
Ag = 366.36 [472.98] [0.77σ]  
Teffp = 4036 [1255] K [2.74σ]

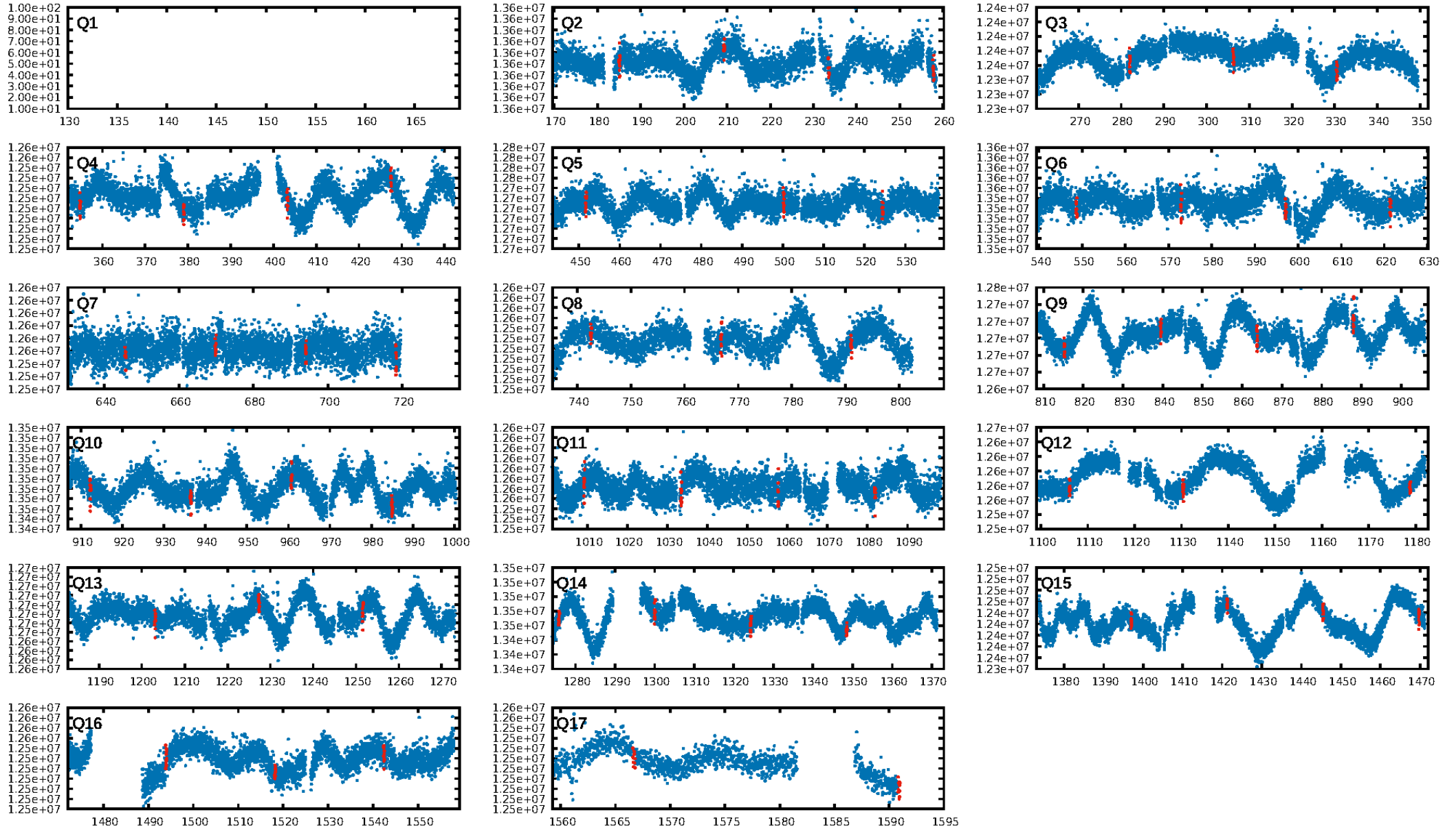
## DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 71.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.75e-26  
RollingBand-fgt: 0.98 [52/53]  
GhostDiagnostic-chr: 0.08584  
Centroid-sig: 63.1%  
Centroid-so: 0.754 arcsec [0.67σ]  
OotOffset-rm: 2.430 arcsec [2.90σ]  
KicOffset-rm: 2.425 arcsec [2.89σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.00 [0/16]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:20:41 Z

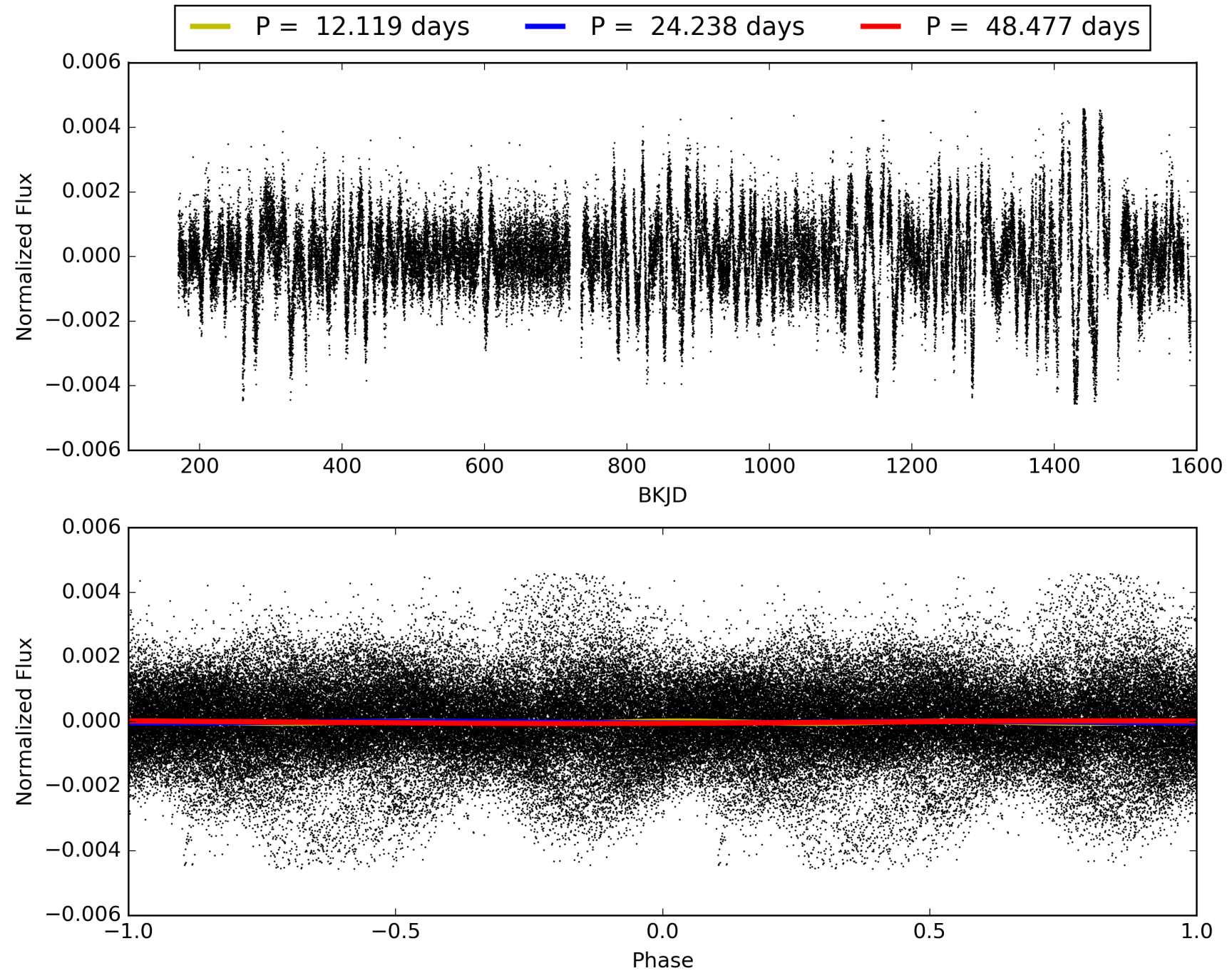
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007889486-02, PDC Light Curves



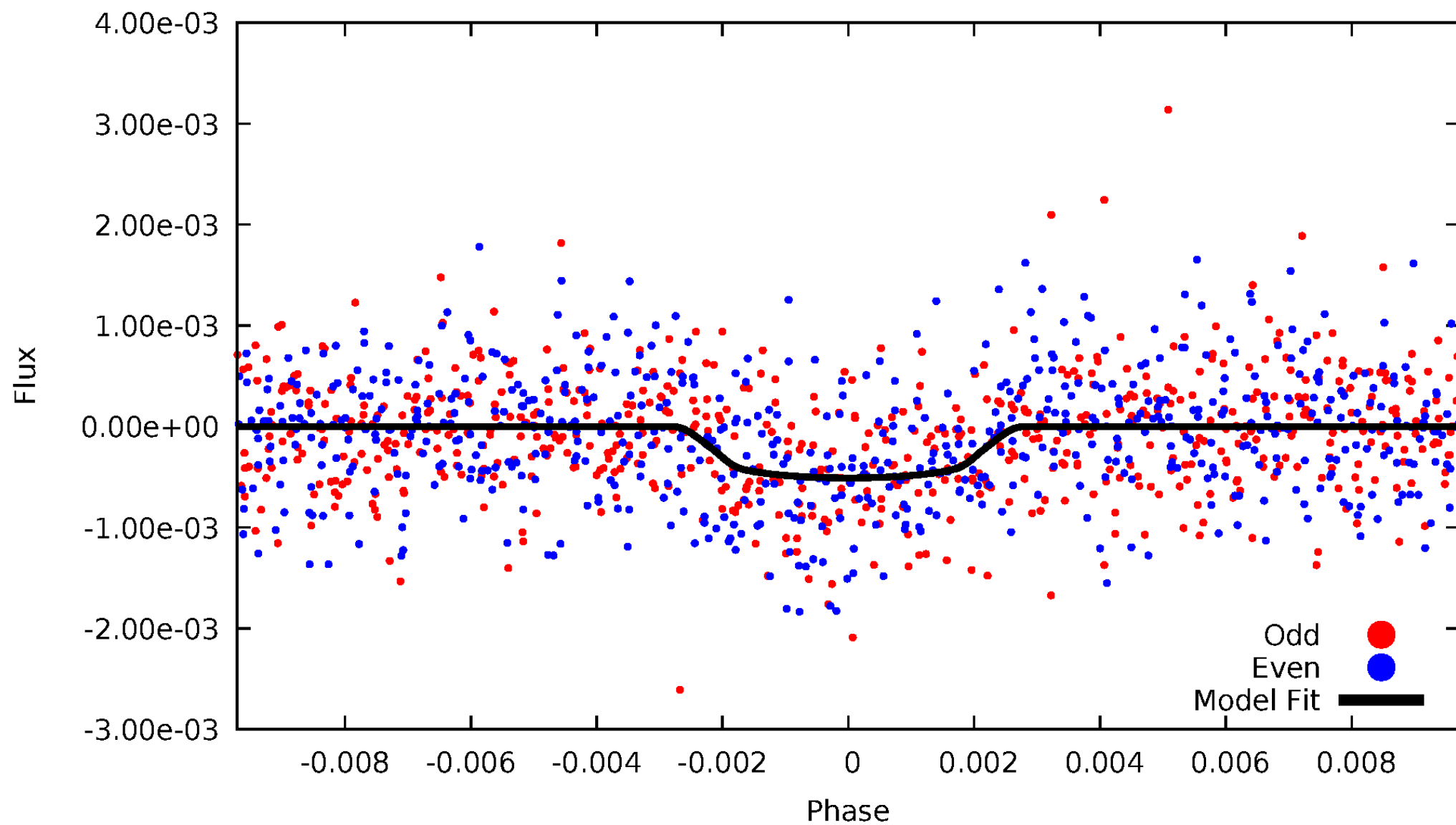


TCE 007889486-02



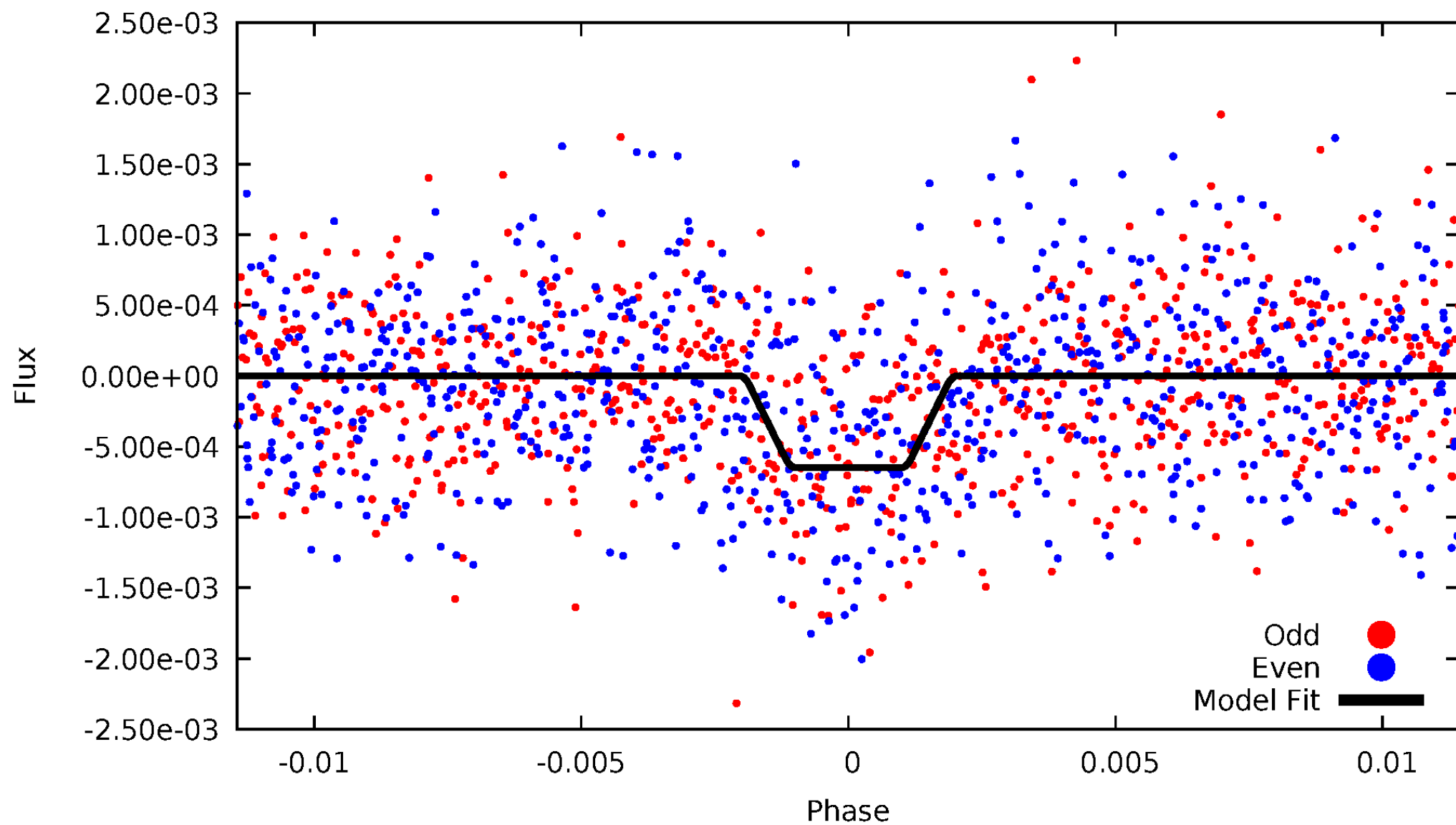
# DV Odd/Even

TCE 007889486-02



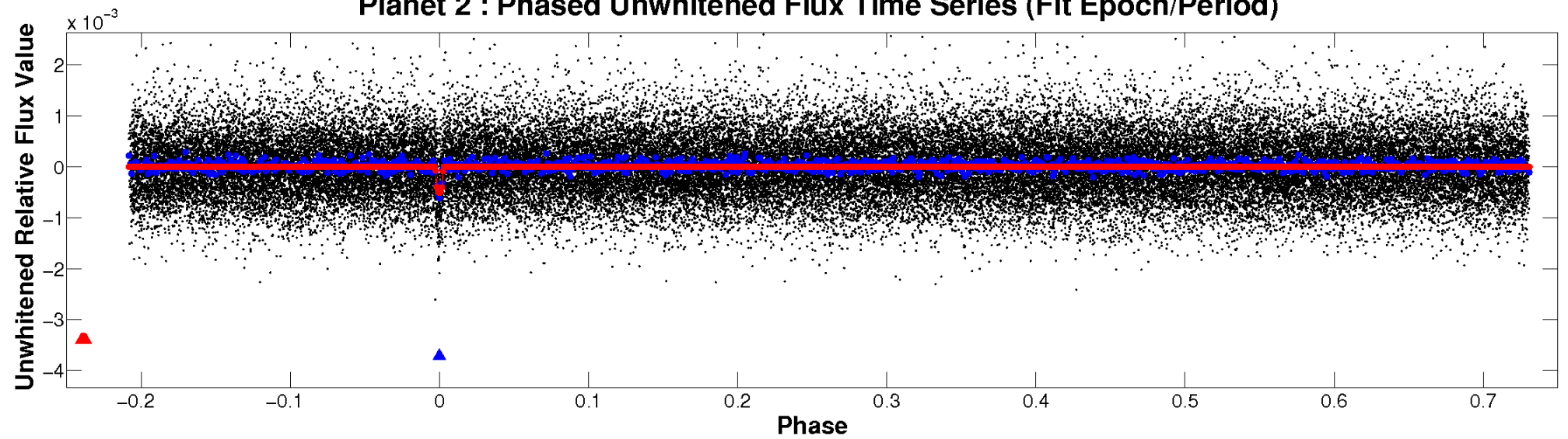
# ALT Odd/Even

TCE 007889486-02

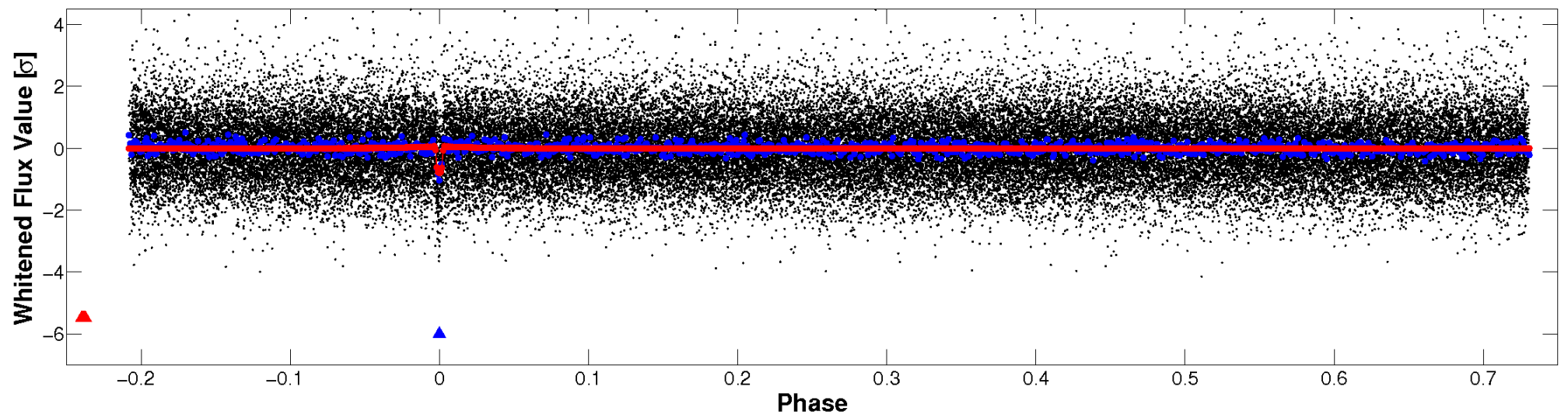


# Non-Whitened Vs. Whitened Light Curve

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

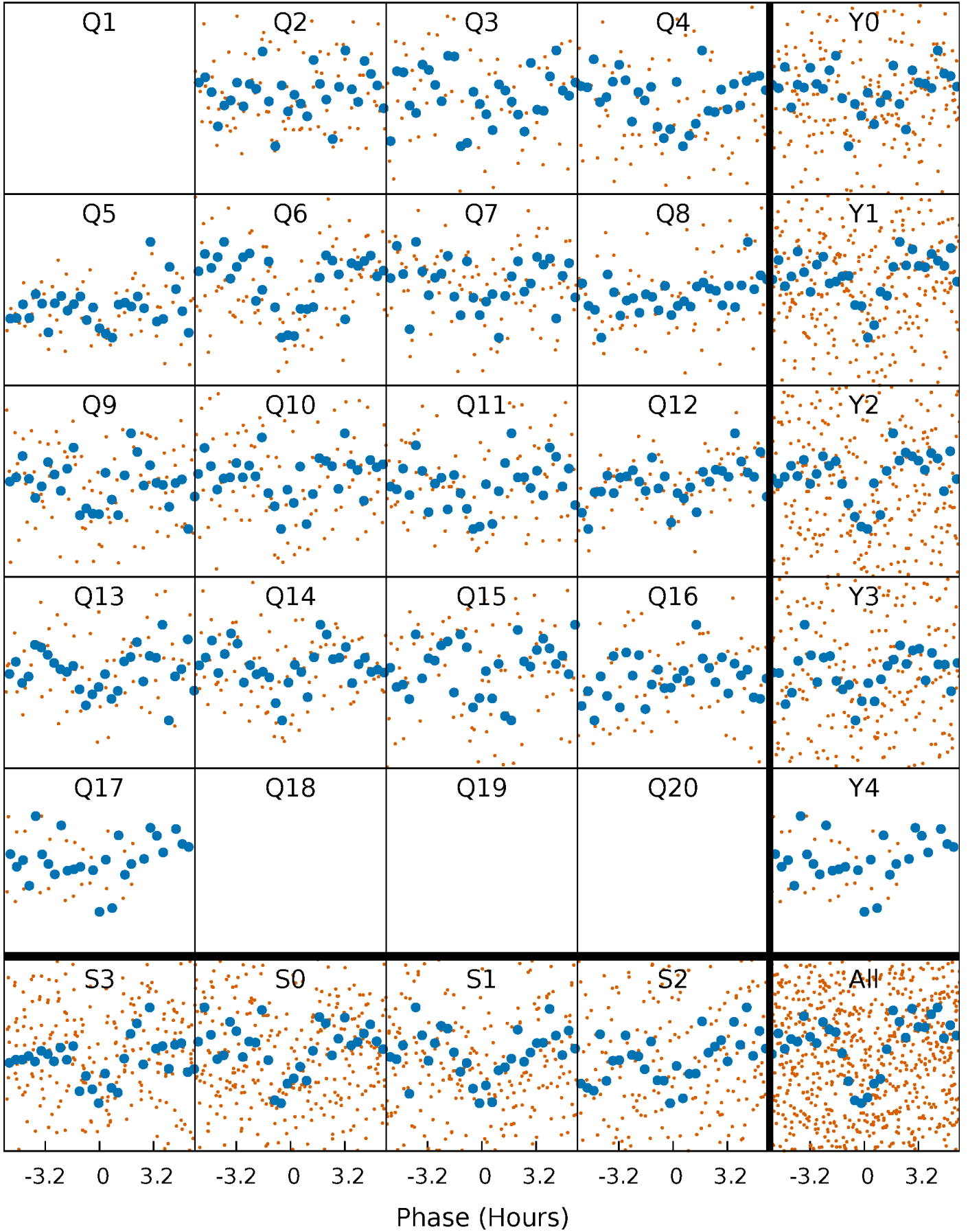


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

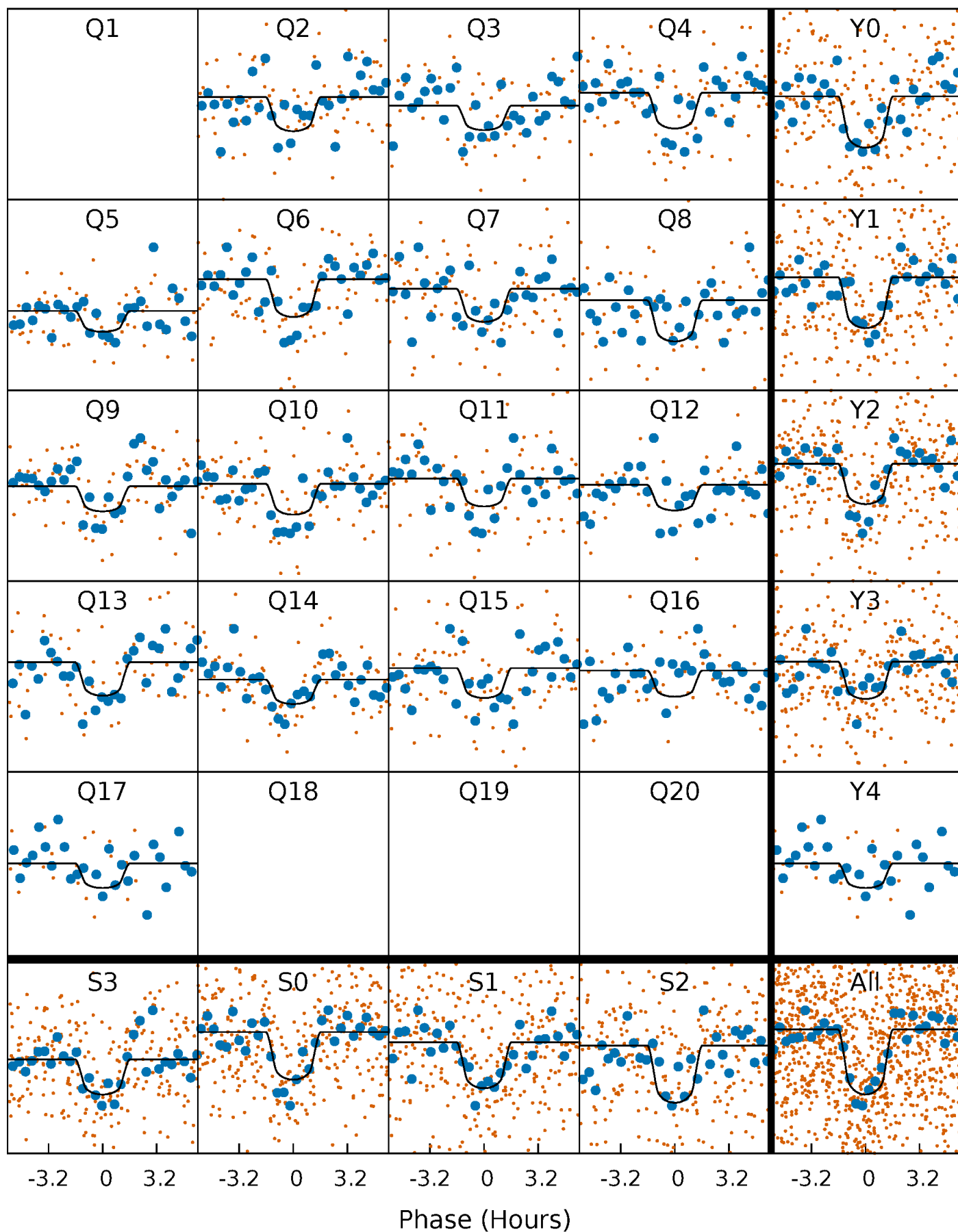
TCE 007889486-02 P= 24.238381 Days  $T_0=136.619388$  (BKJD)





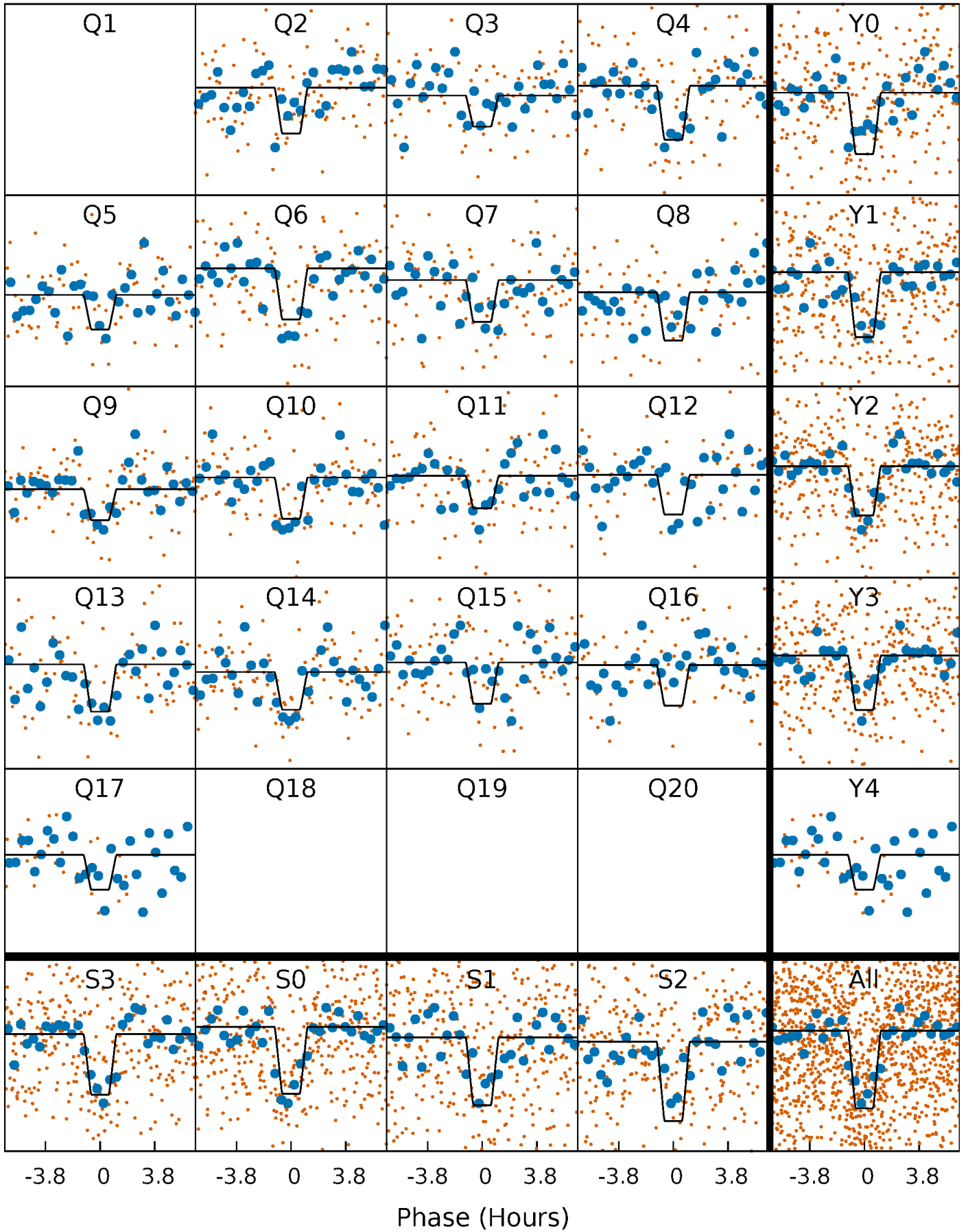
# DV Quarter-Phased Transit Curves

TCE 007889486-02 P= 24.238381 Days  $T_0=136.619388$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

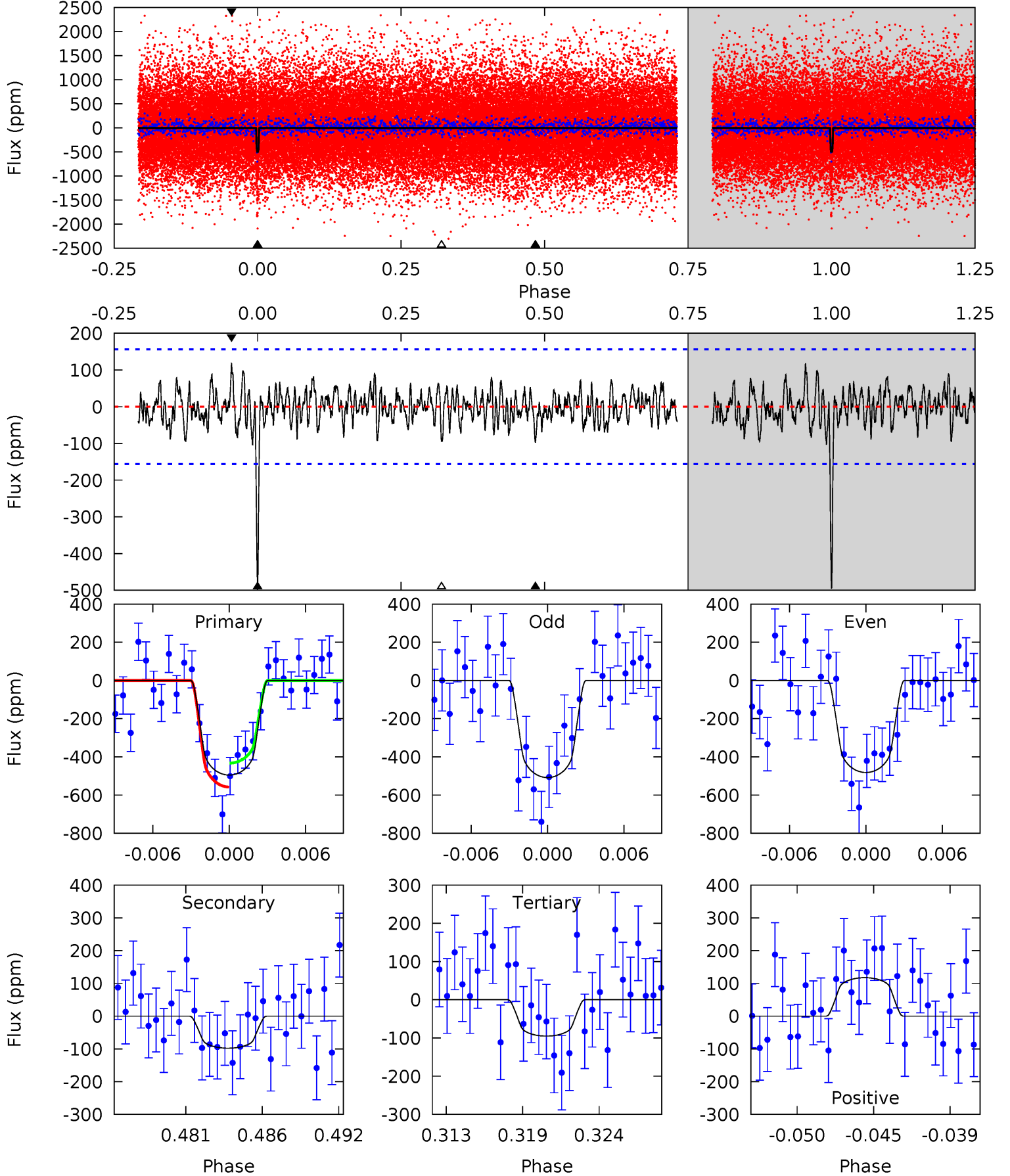
TCE 007889486-02   P= 24.237996 Days    $T_0=136.626375$  (BKJD)



# DV Model-Shift Uniqueness Test

007889486-02, P = 24.238381 Days, E = 136.619388 Days

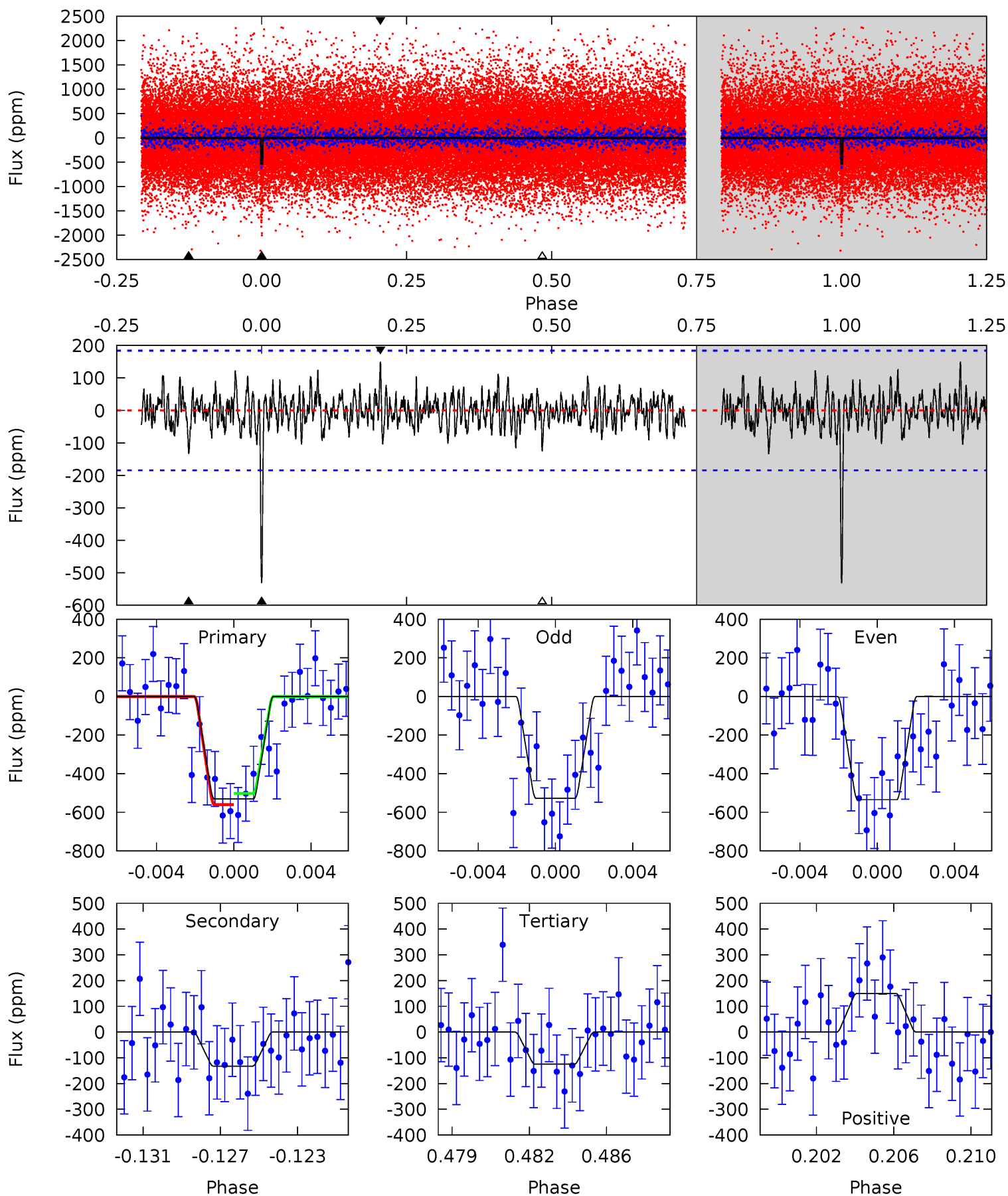
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	3.22	3.13	3.86	5.14	2.77	1.18	13.2	12.4	0.09	-0.64	0.44	0.95	0.19	2.06



# Alt Model-Shift Uniqueness Test

007889486-02,  $P = 24.237996$  Days,  $E = 136.626375$  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
15.0	3.73	3.53	4.23	5.20	2.88	1.15	11.5	10.8	0.21	-0.49	0.10	0.97	0.22	0.83



### Stellar Parameters For KIC 007889486

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5763^{+182}_{-202}$	$4.527^{+0.036}_{-0.204}$	$0.020^{+0.250}_{-0.300}$	$0.904^{+0.273}_{-0.073}$	$1.002^{+0.114}_{-0.125}$	$1.913^{+0.379}_{-0.976}$
	+3%/-4%	+1%/-5%	+1250%/-1500%	+30%/-8%	+11%/-12%	+20%/-51%
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 007889486-02 / KOI 3300.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-98 \pm 30$	$2.52^{+1.56}_{-1.41}$	$853^{+57}_{-40}$	$4003^{+1587}_{-629}$	$226^{+978}_{-148}$
Alt.	$-132 \pm 35$	$2.70^{+1.58}_{-1.34}$	$853^{+59}_{-40}$	$4101^{+1300}_{-600}$	$256^{+775}_{-155}$

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

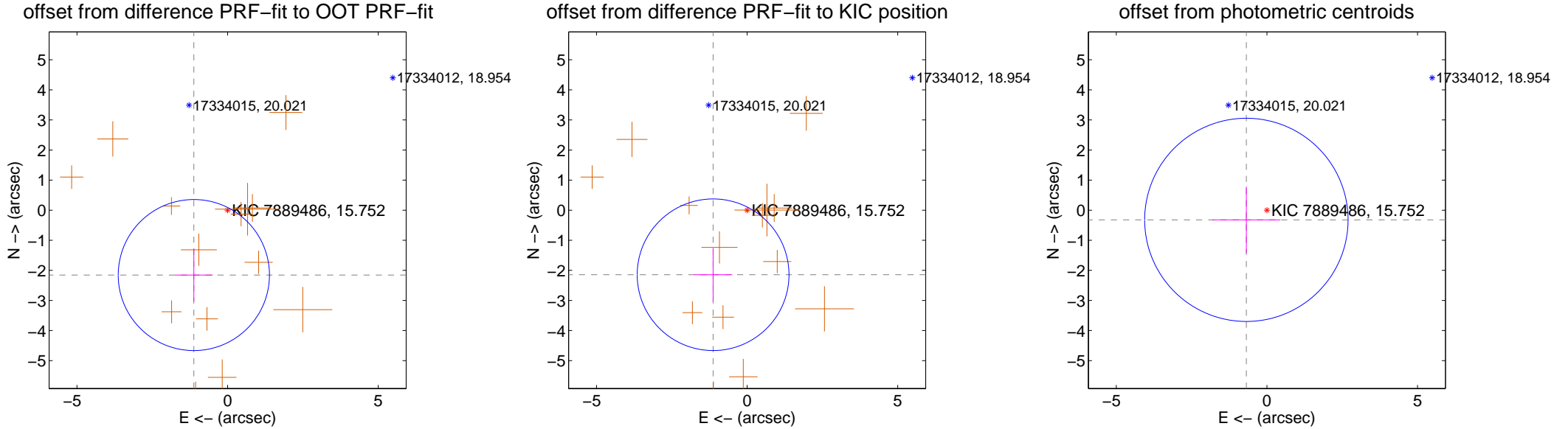
## DV Centroid Data

Supplemental centroid analysis for 007889486-02. Kepler magnitude: 15.75. Transit SNR 11.73

There are 0 quarters with good PRF difference image offsets

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

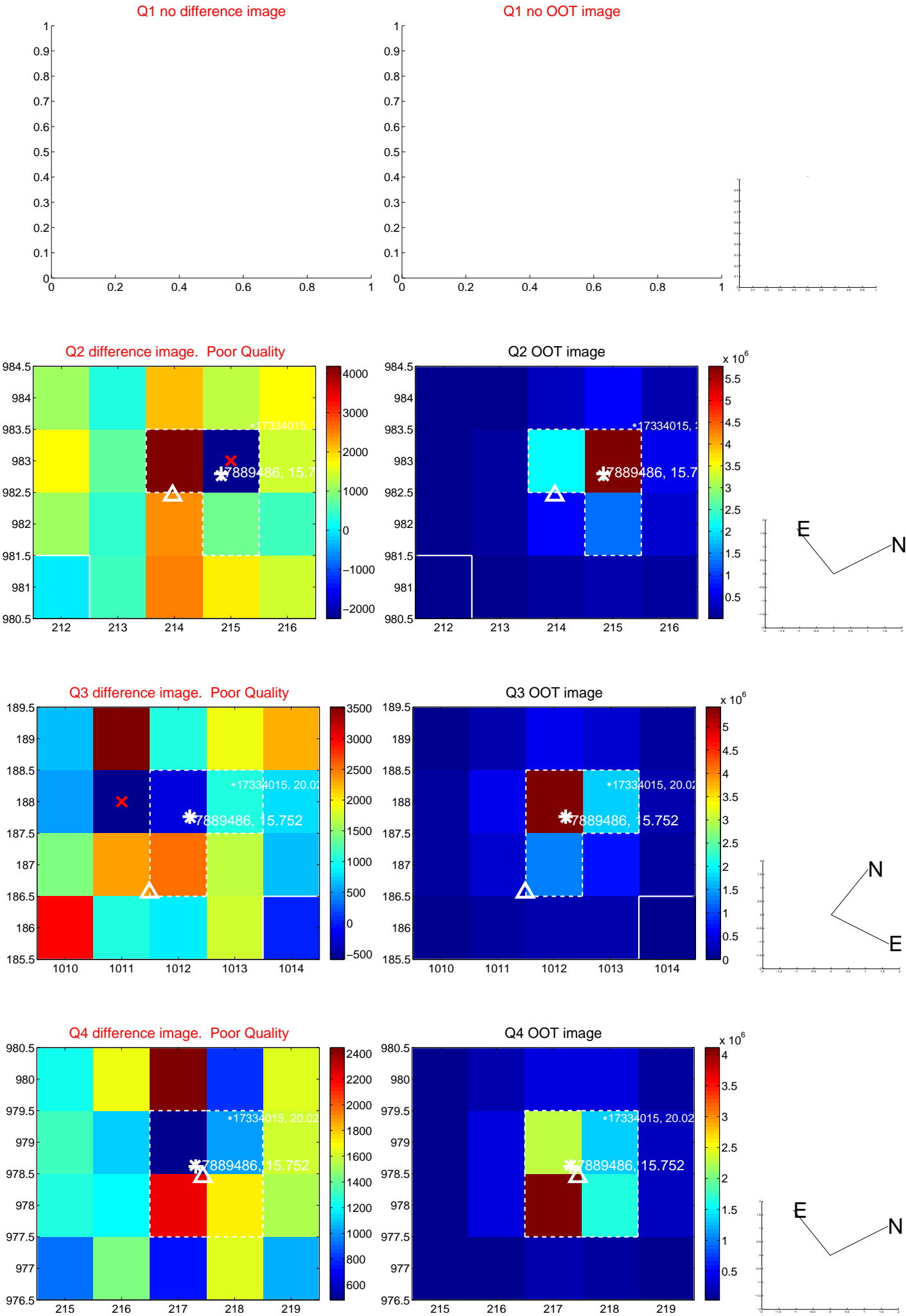
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.430 \pm 0.837$	2.90	$1.121 \pm 0.630$	$-2.156 \pm 0.885$
PRF-fit source offset from KIC position	$2.425 \pm 0.840$	2.89	$1.130 \pm 0.638$	$-2.145 \pm 0.888$
photometric centroid source offset	$0.75 \pm 1.13$	0.67	$0.68 \pm 1.13$	$-0.32 \pm 1.11$



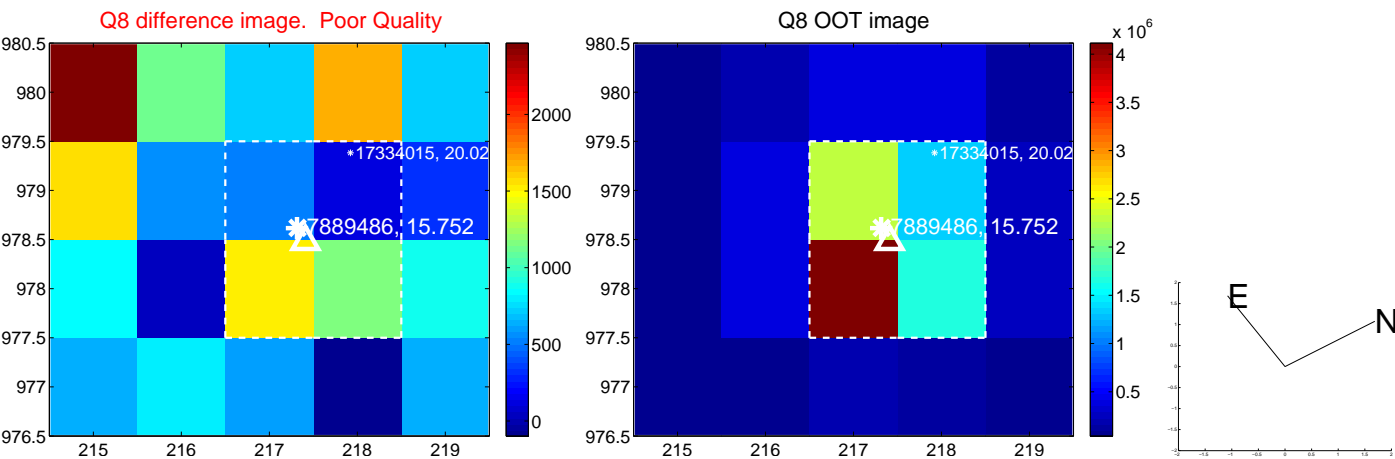
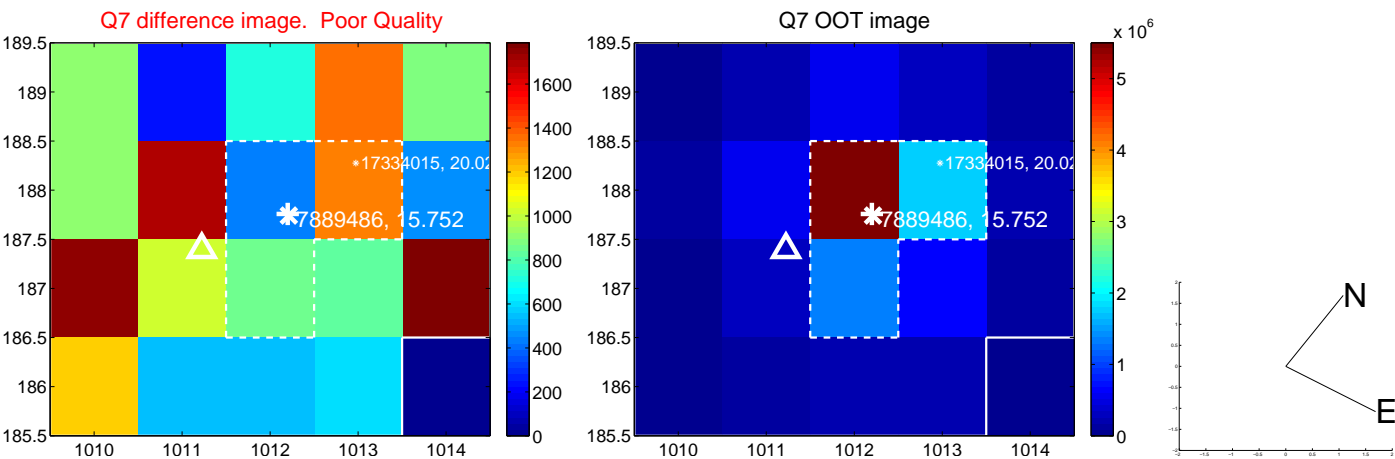
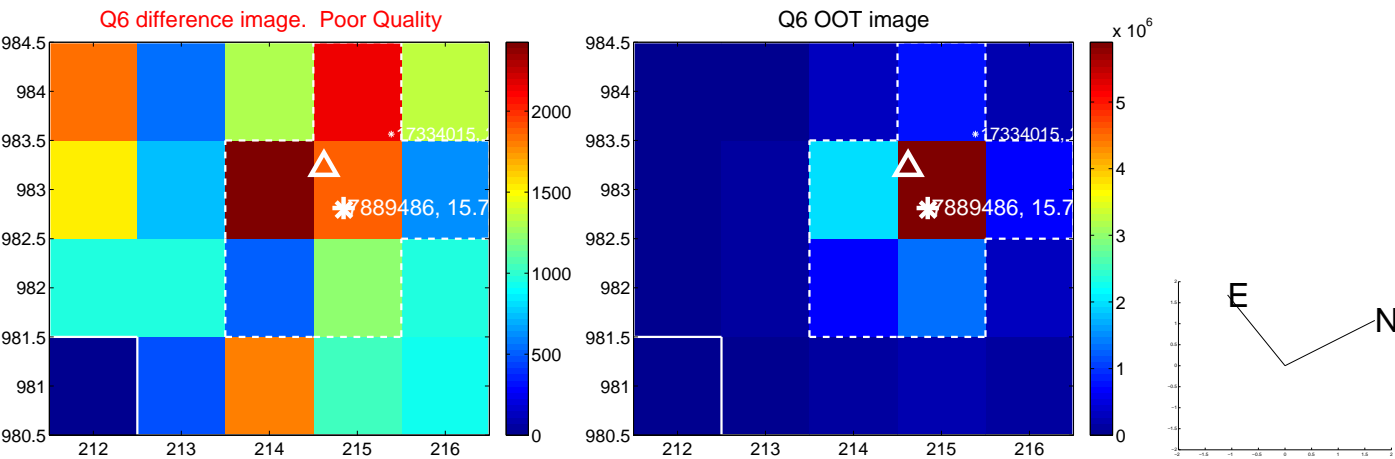
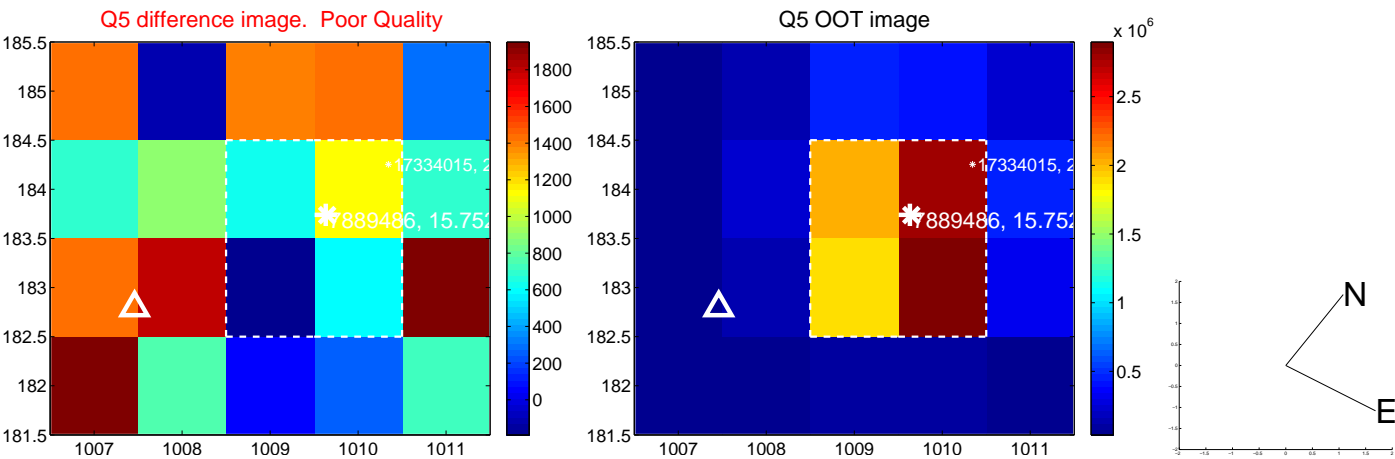
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000 are from the UKIRT catalog.



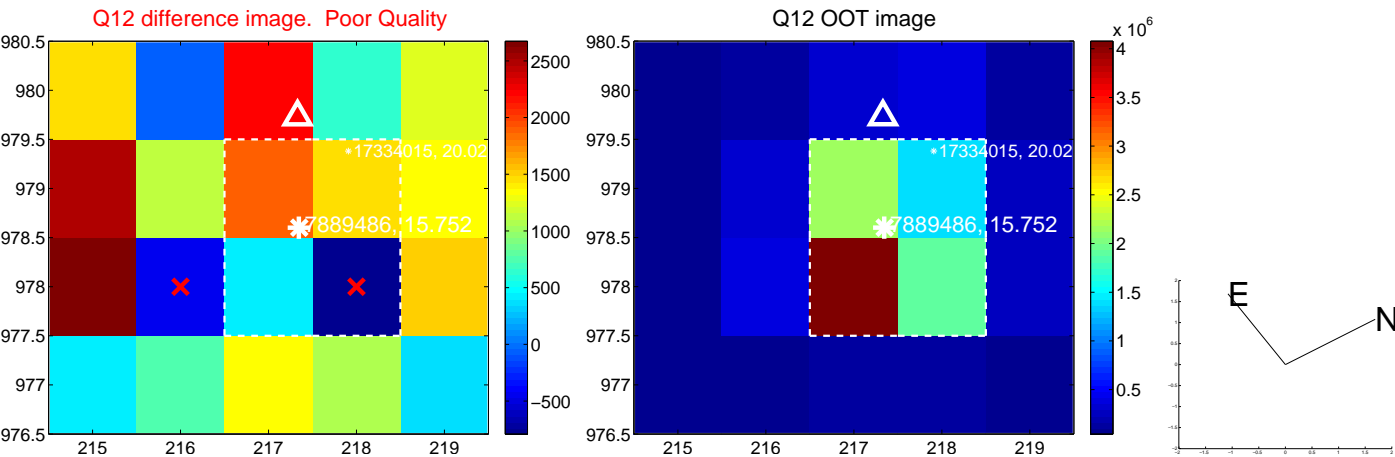
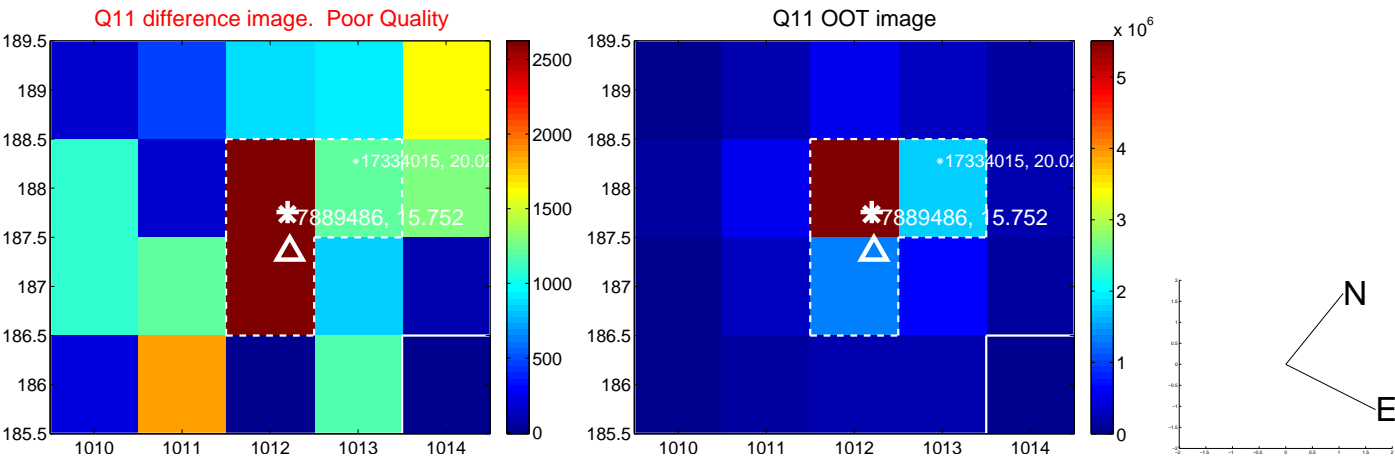
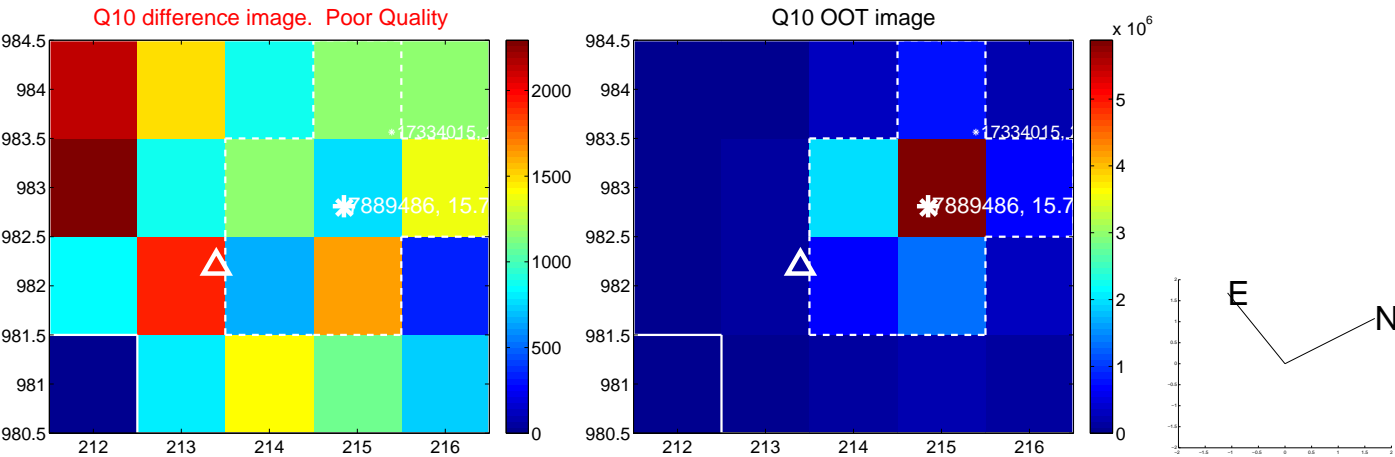
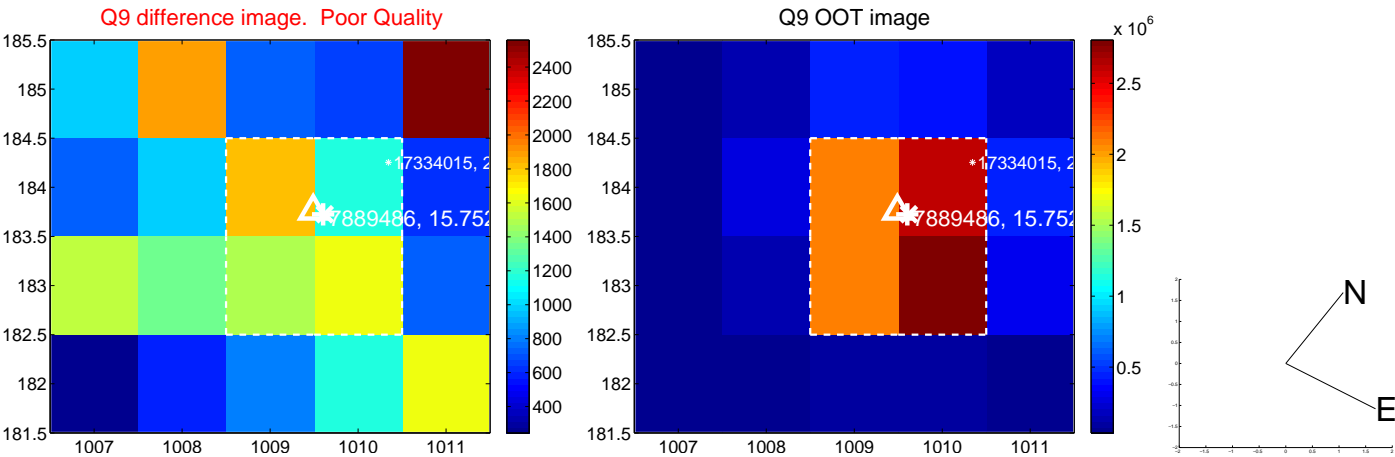
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



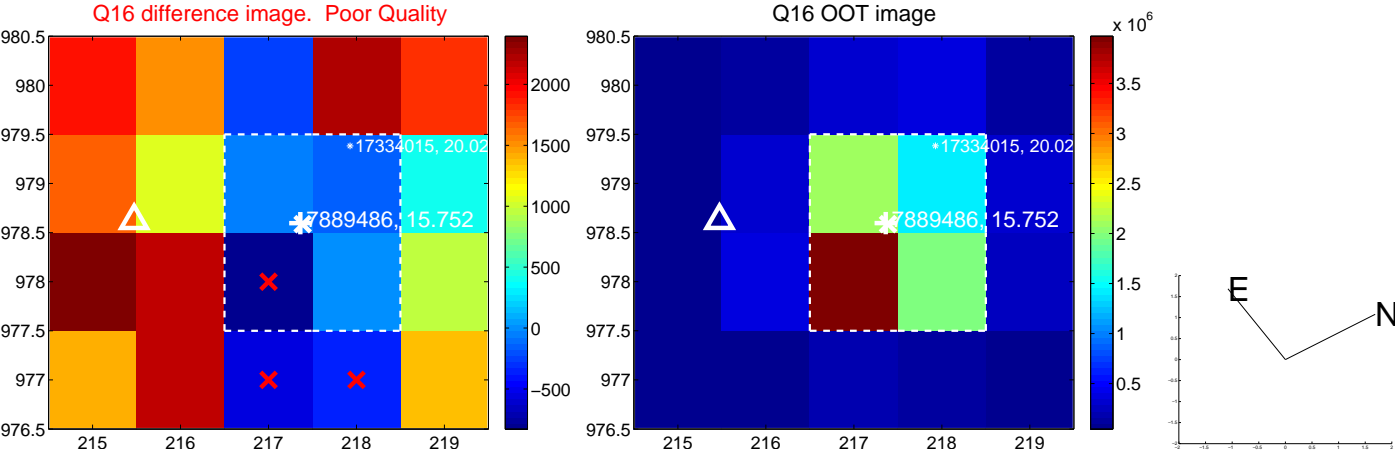
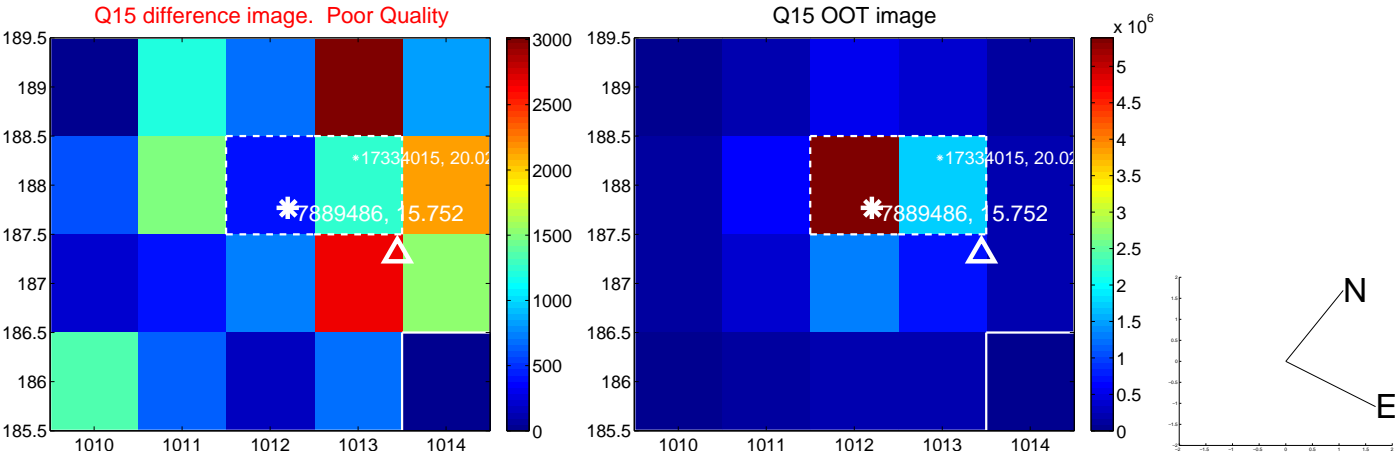
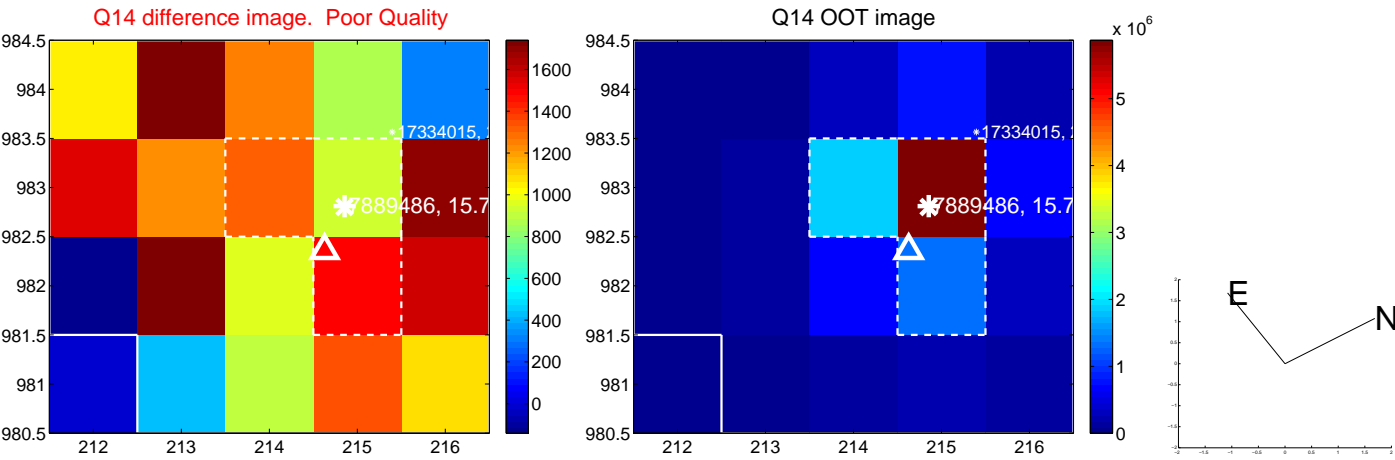
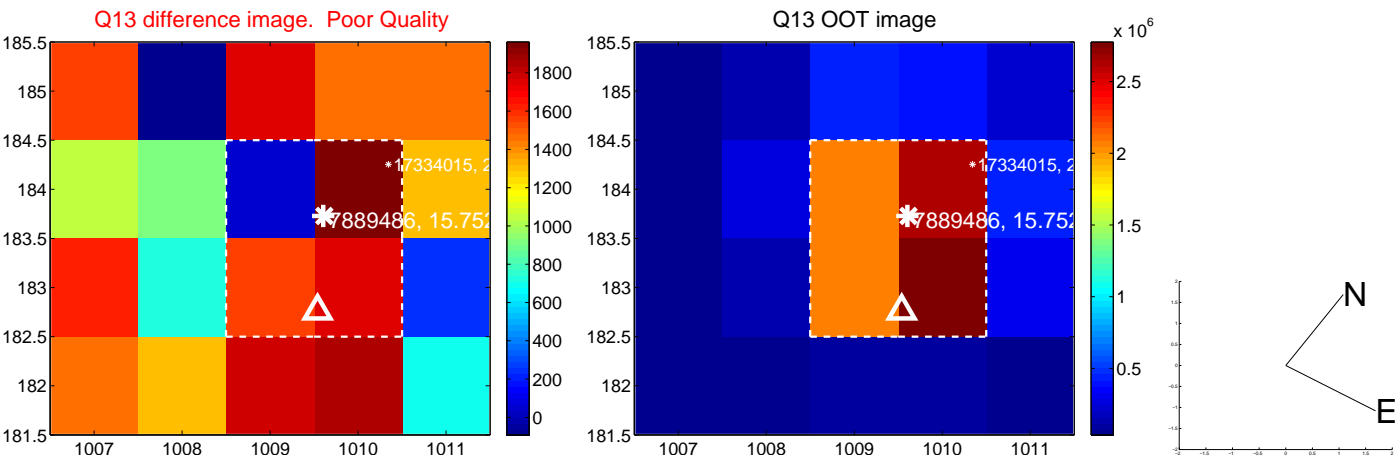
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



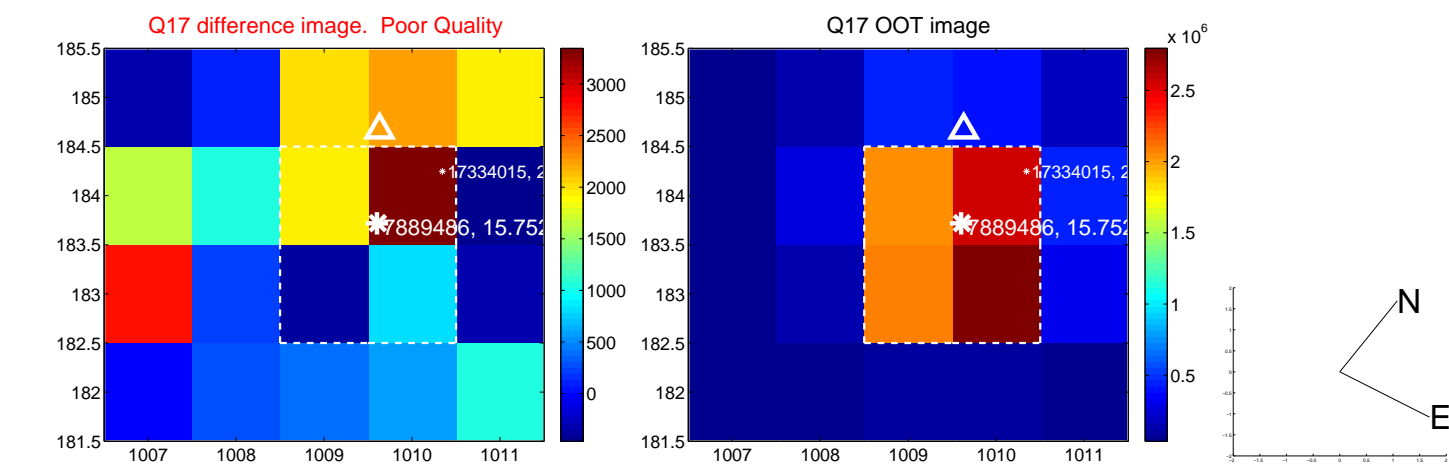
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



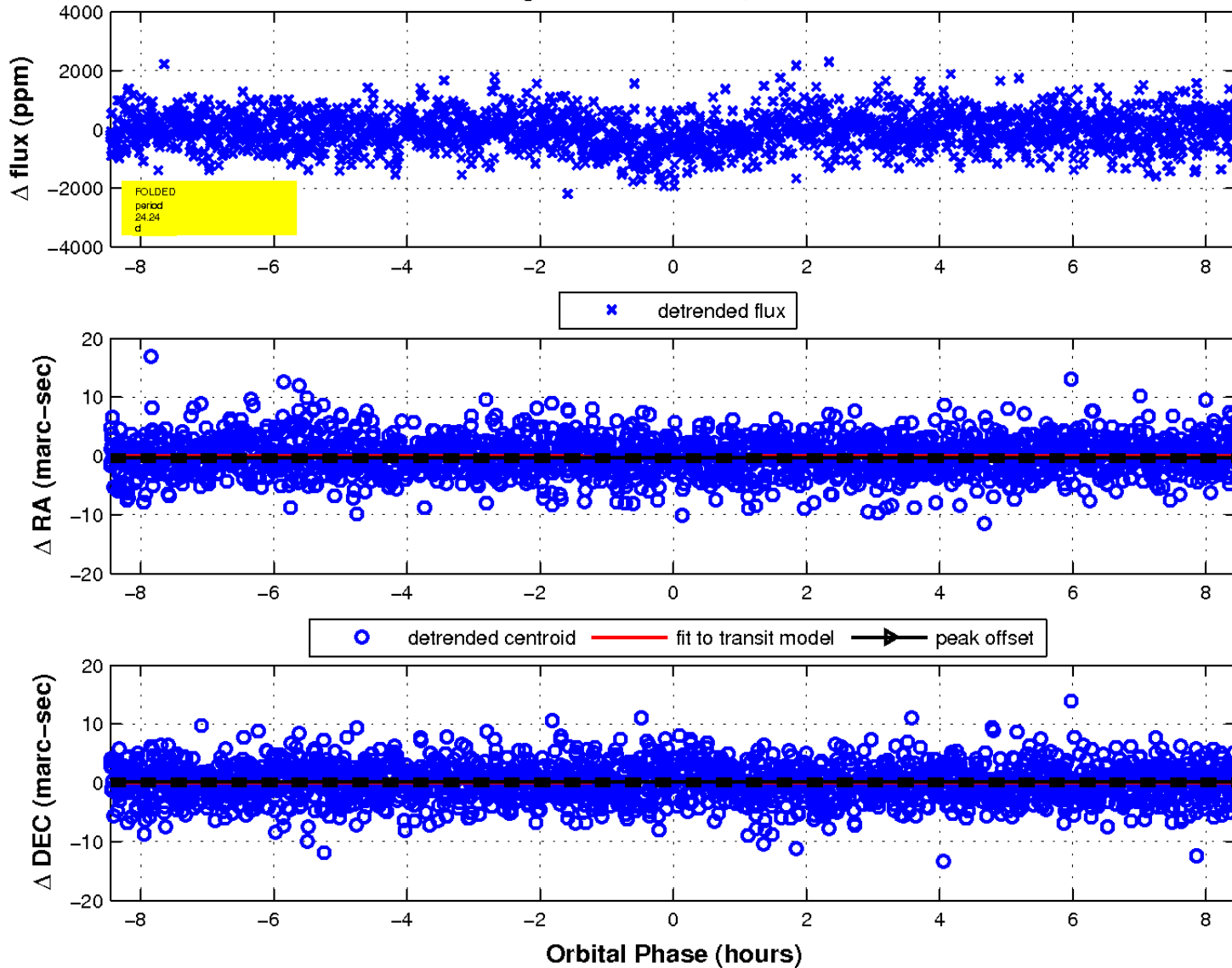
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

