

# KIC 005556804

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005556804-01	OBS	6013.01	12.424376	141.631988	230.5	25.156	11.4	13.2	0.79	5761	1.64	61.47
005556804-02	OBS	No	12.426384	133.896933	171.6	26.160	10.9	13.1	0.79	5761	1.08	61.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005556804-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—HALO_GHOST—EPHEM_MATCH
005556804-02	OBS	FP	0.00	1	0	0	1	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—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 005556804-01

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	$\sigma_P$	$\sigma_T$
005556804-01	5556804	V380-Cyg-pri	5385723	1:1	398.7	94	33	5.77	15.90	630.14	Direct-PRF	0	3.85	2.79

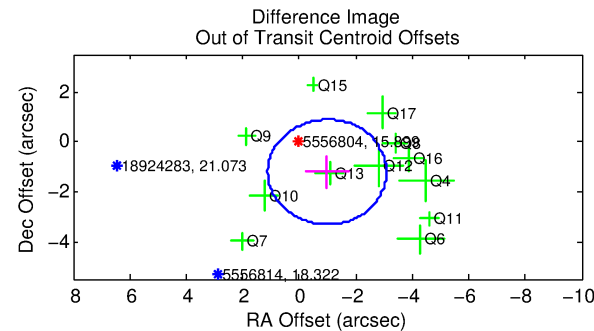
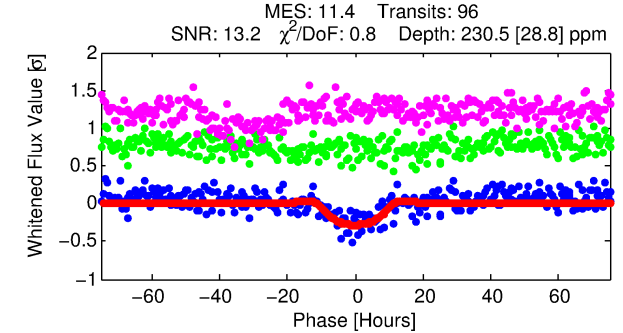
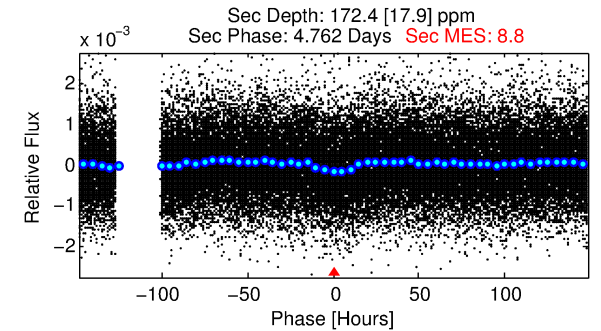
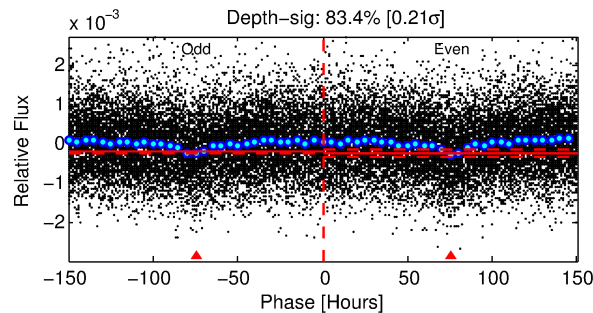
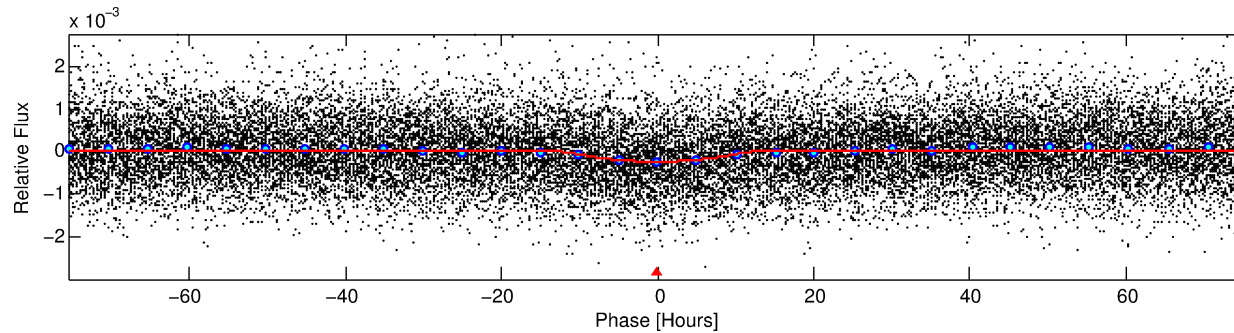
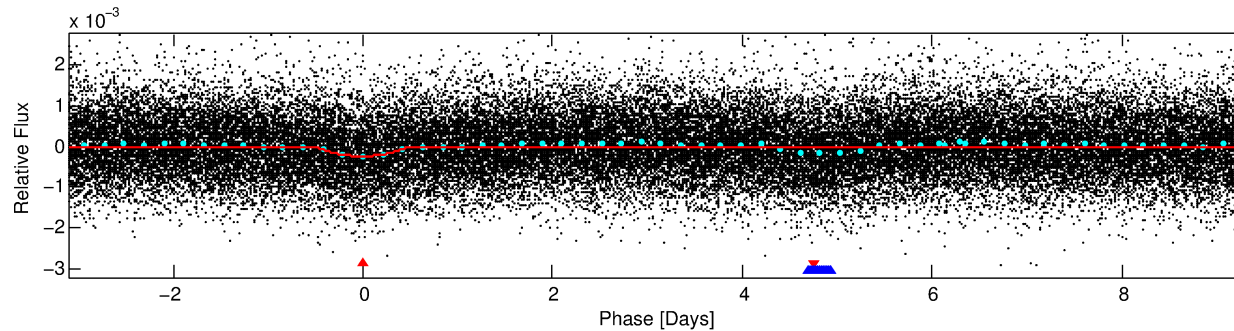
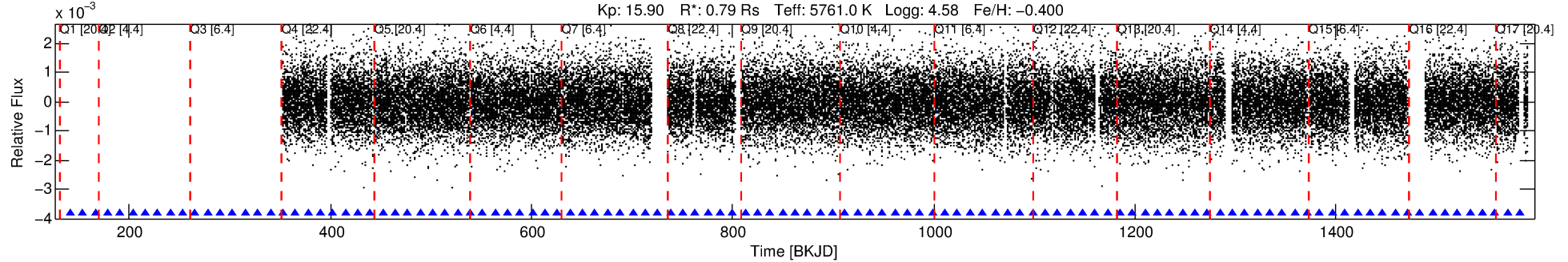
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  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: 5556804 Candidate: 1 of 2 Period: 12.424 d

KOI: K06013.01 Corr: 0.858

Kp: 15.90 R\*: 0.79 Rs Teff: 5761.0 K Logg: 4.58 Fe/H: -0.400



## DV Fit Results:

Period = 12.42438 [0.00075] d  
Epoch = 141.6320 [0.0532] BKJD  
Rp/R\* = 0.0190 [0.0017]  
a/R\* = 1.45 [0.11]  
b = 0.98 [0.01]  
Seff = 61.47 [20.73]  
Teq = 714 [60] K  
Rp = 1.64 [0.45] Re  
a = 0.1002 [0.0216] AU  
Ag = 353.05 [131.56] [2.68σ]  
Teff = 4785 [293] K [13.62σ]

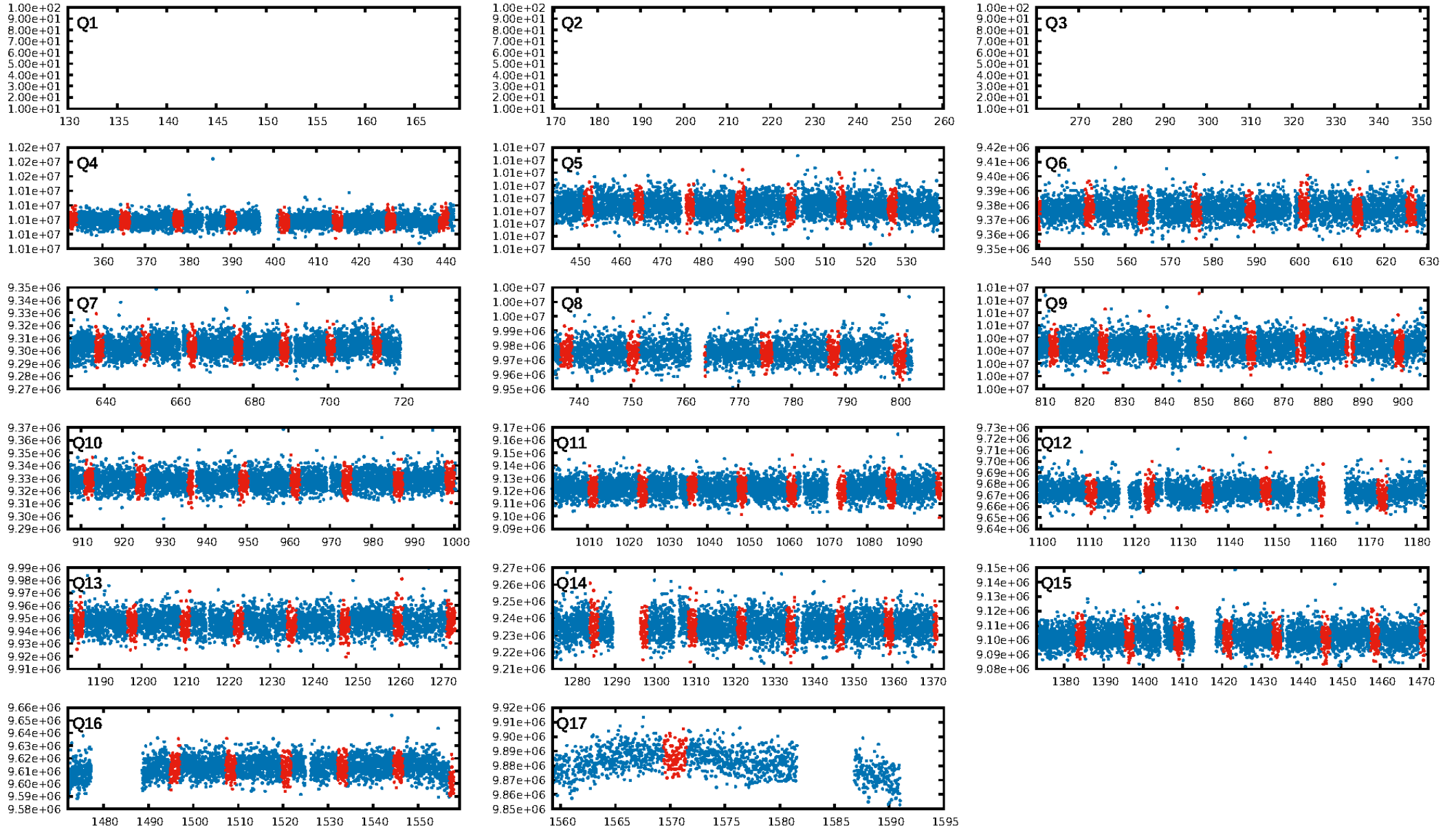
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 97.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.12e-29  
RollingBand-fgt: 1.00 [95/95]  
GhostDiagnostic-chr: 0.1637  
Centroid-sig: 0.0%  
Centroid-so: 3.573 arcsec [3.47σ]  
OotOffset-rm: 1.562 arcsec [2.23σ]  
KicOffset-rm: 1.632 arcsec [2.42σ]  
OotOffset-st: 2/3/4/3 [12]  
KicOffset-st: 2/3/4/3 [12]  
DiffImageQuality-fgm: 0.17 [2/12]  
DiffImageOverlap-fno: 1.00 [14/14]

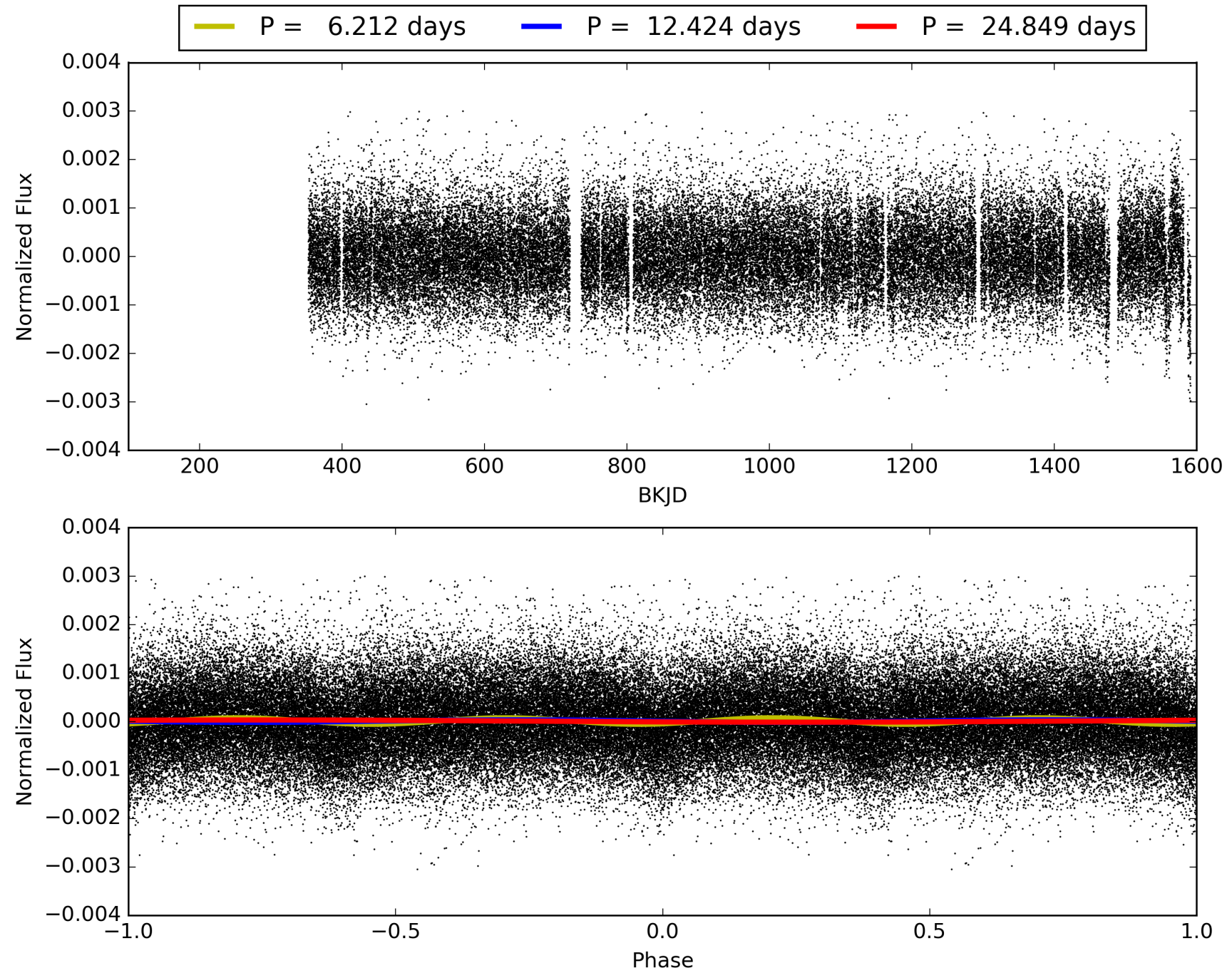
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:04:12 Z

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

# TCE 005556804-01, PDC Light Curves



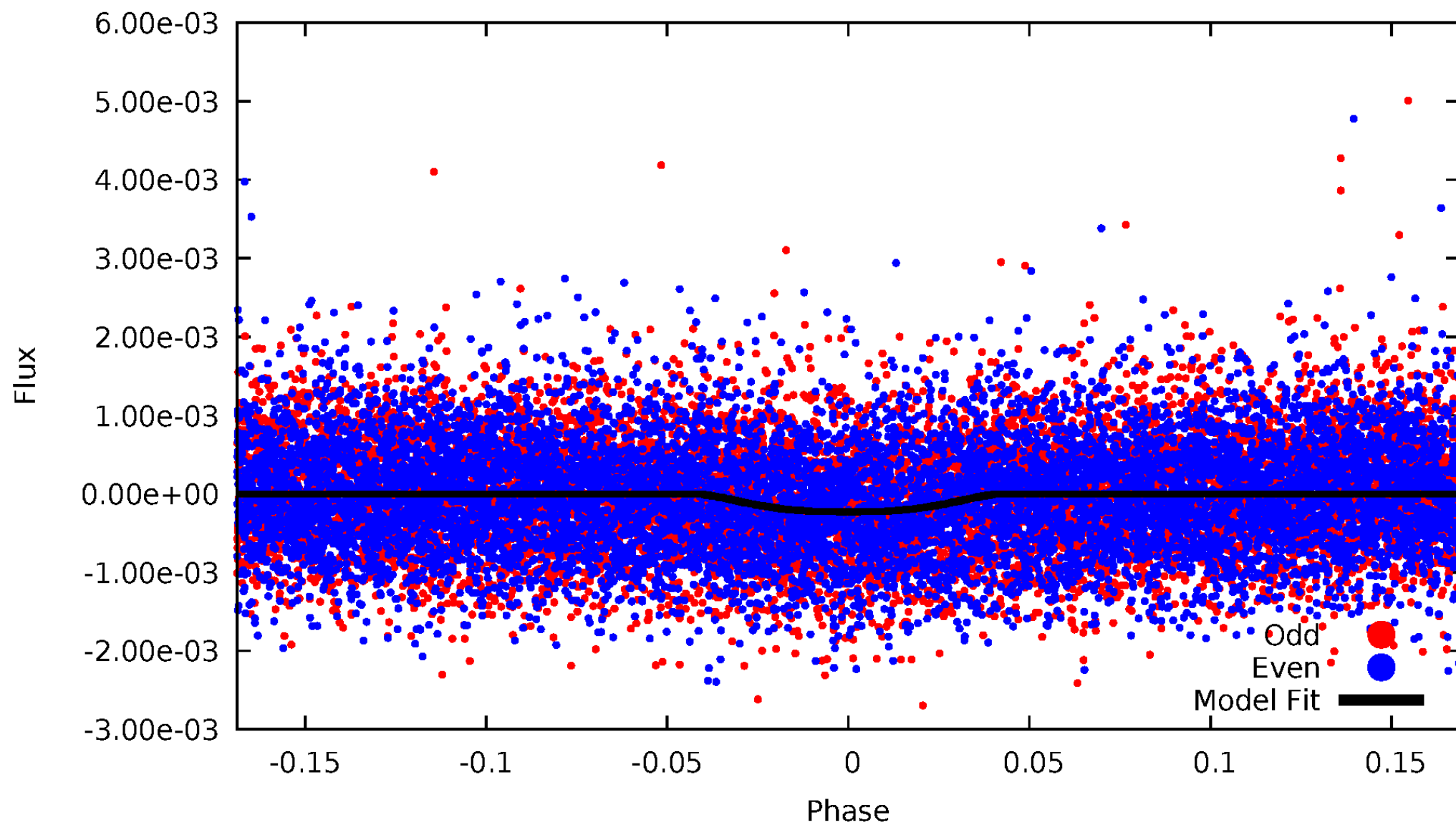
TCE 005556804-01





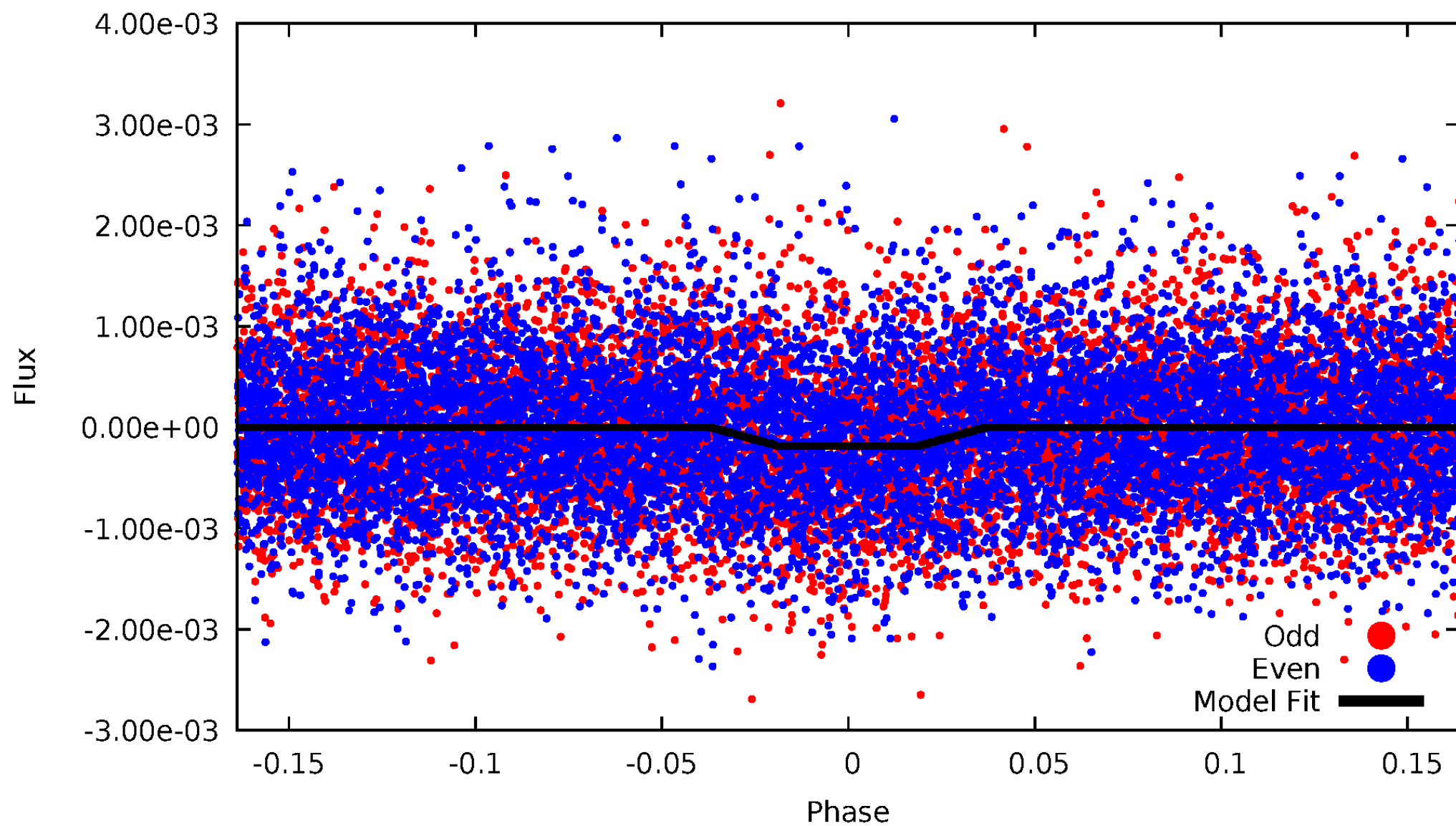
# DV Odd/Even

TCE 005556804-01



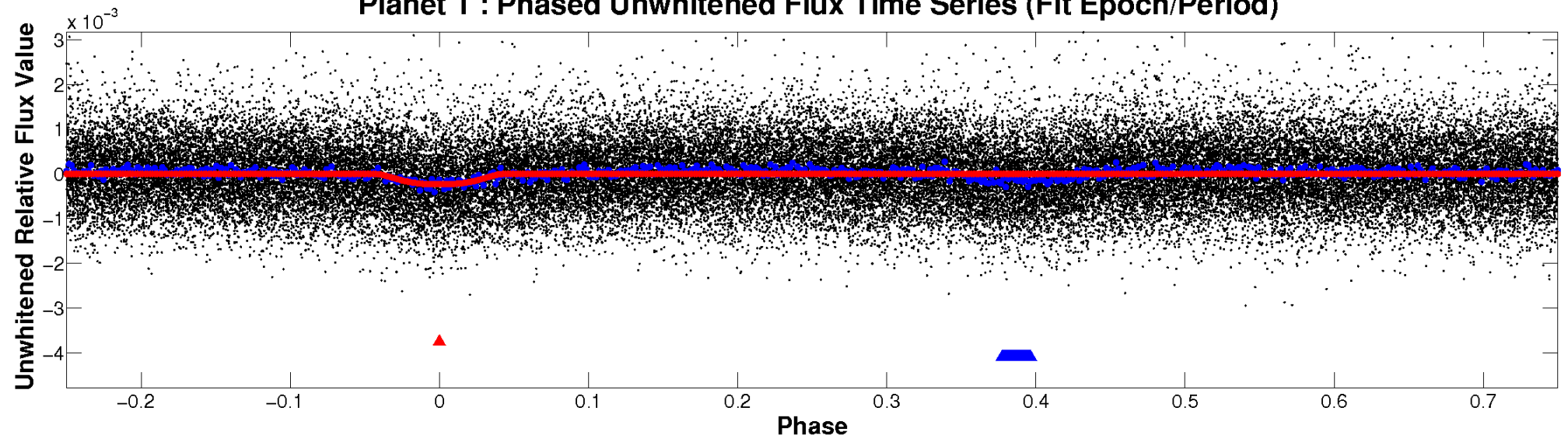
# ALT Odd/Even

TCE 005556804-01

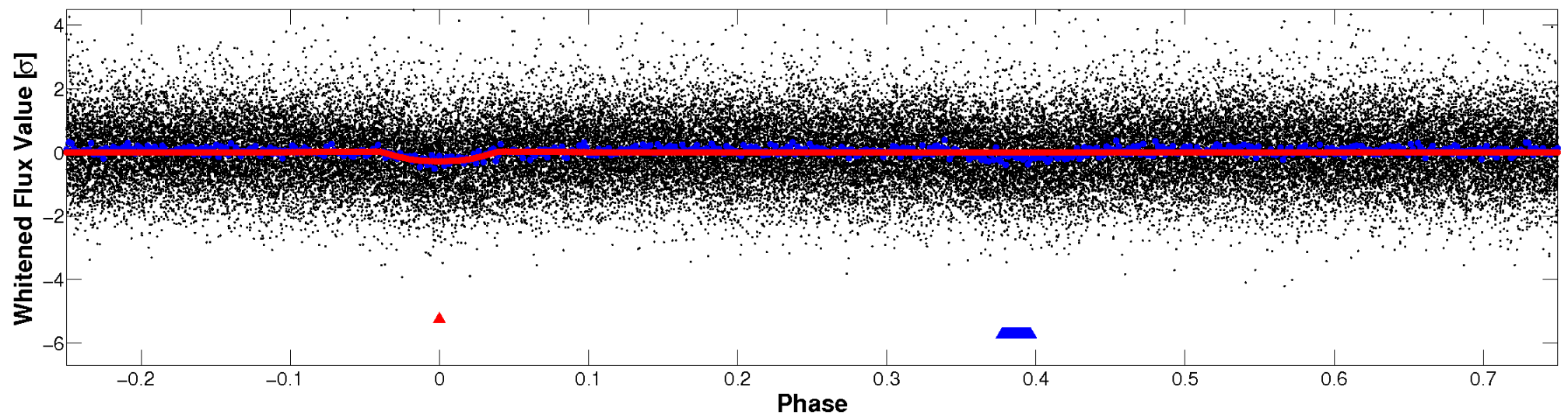


# Non-Whitened Vs. Whitened Light Curve

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

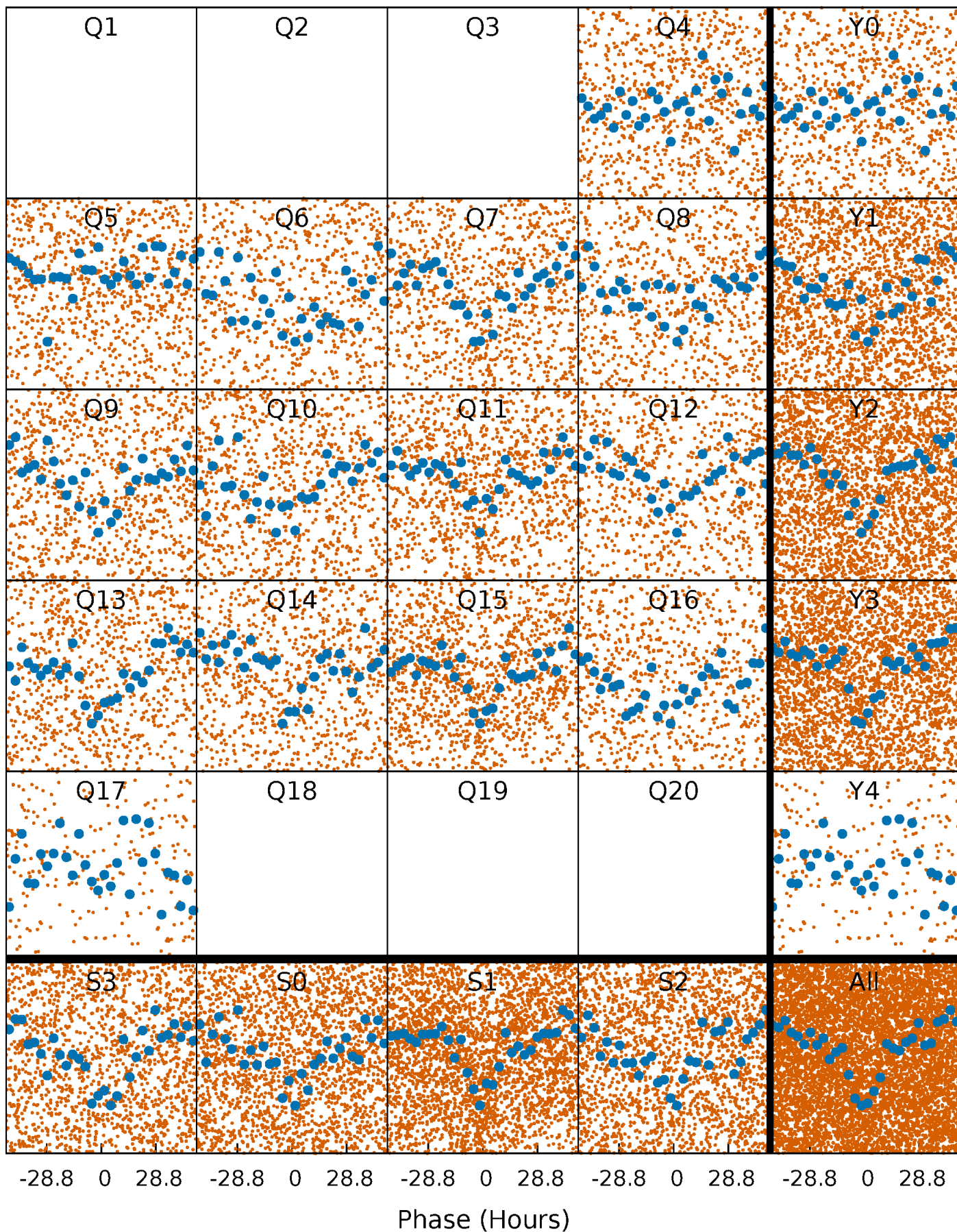


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

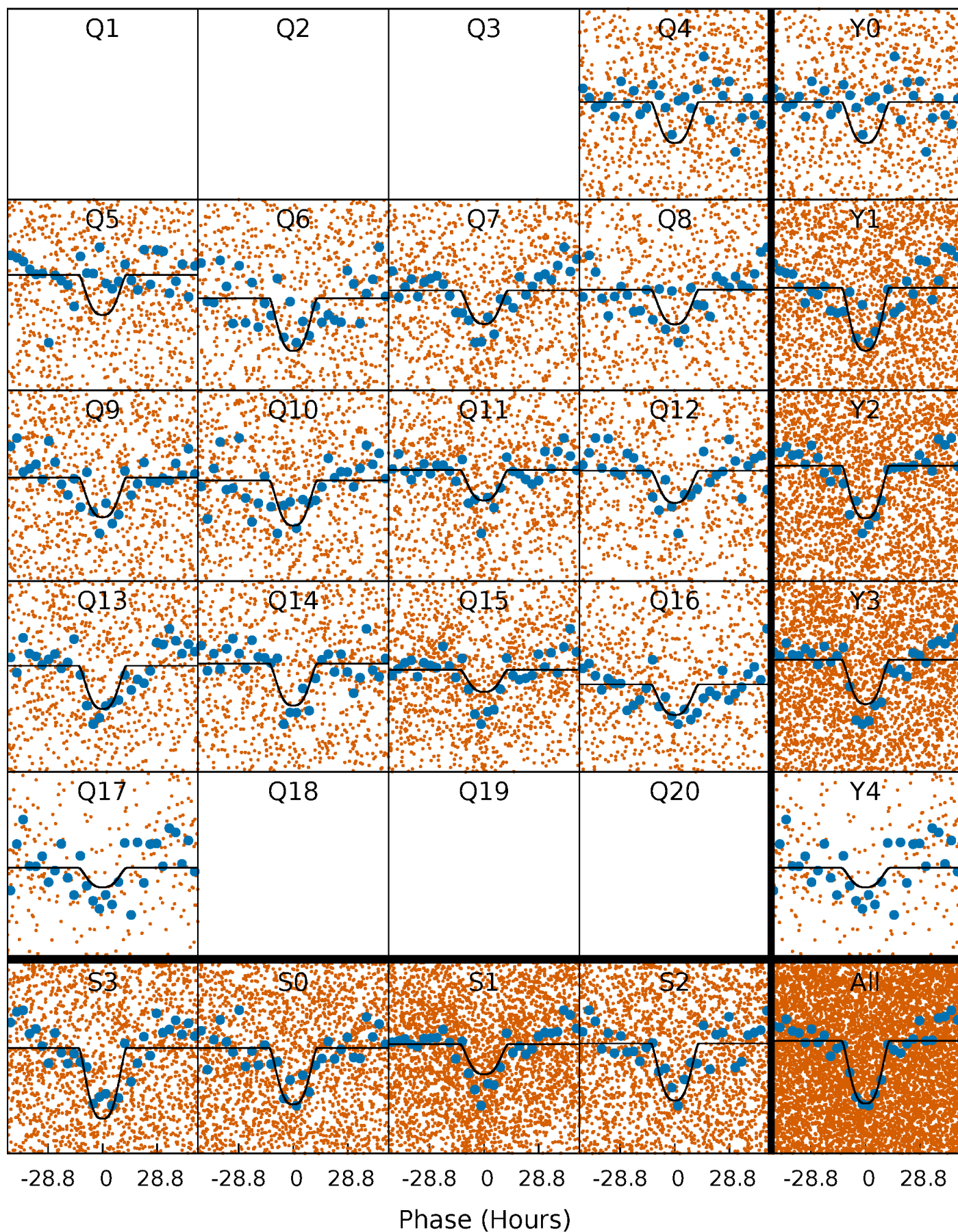
TCE 005556804-01 P= 12.424376 Days  $T_0=141.631988$  (BKJD)





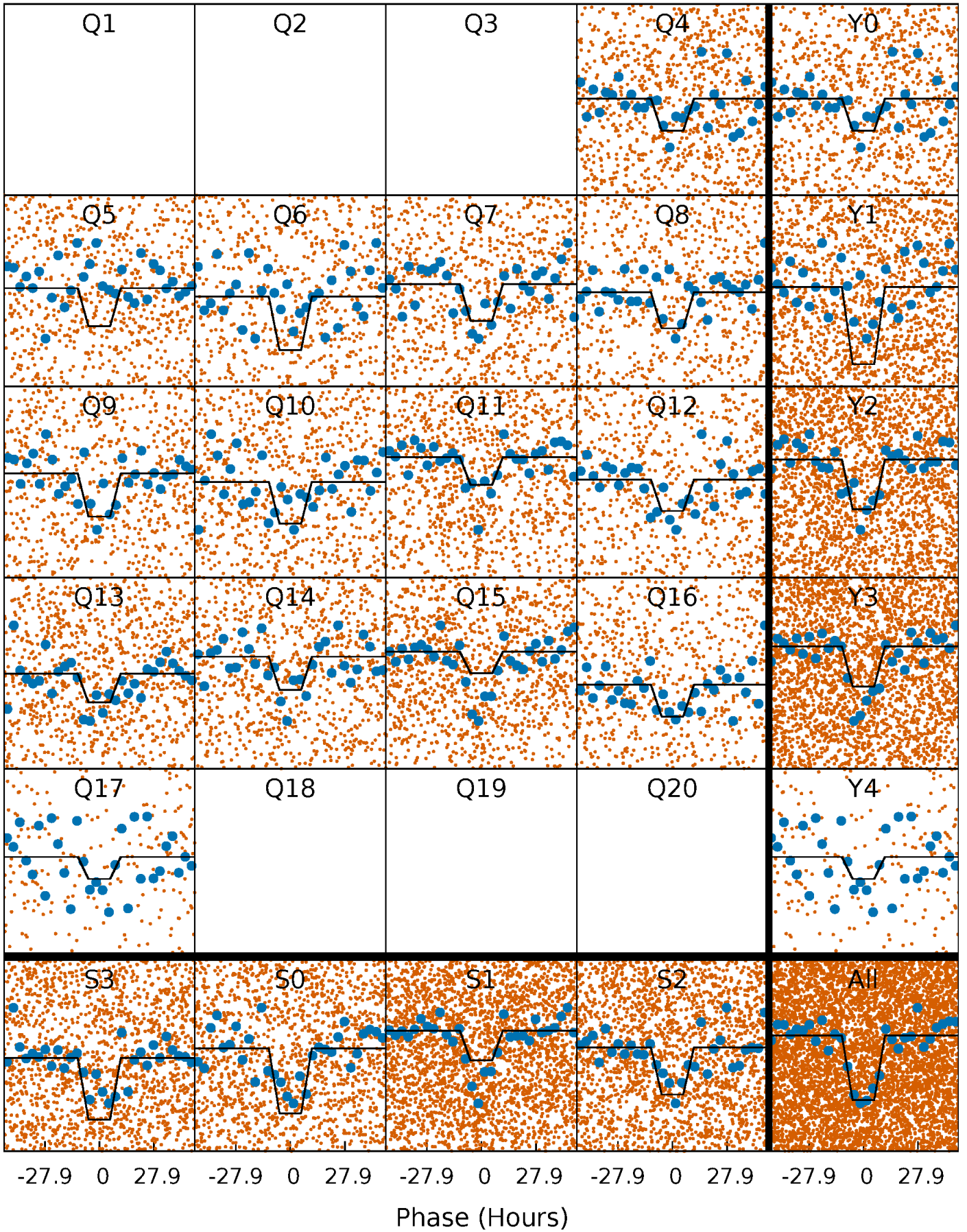
# DV Quarter-Phased Transit Curves

TCE 005556804-01 P= 12.424376 Days  $T_0=141.631988$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

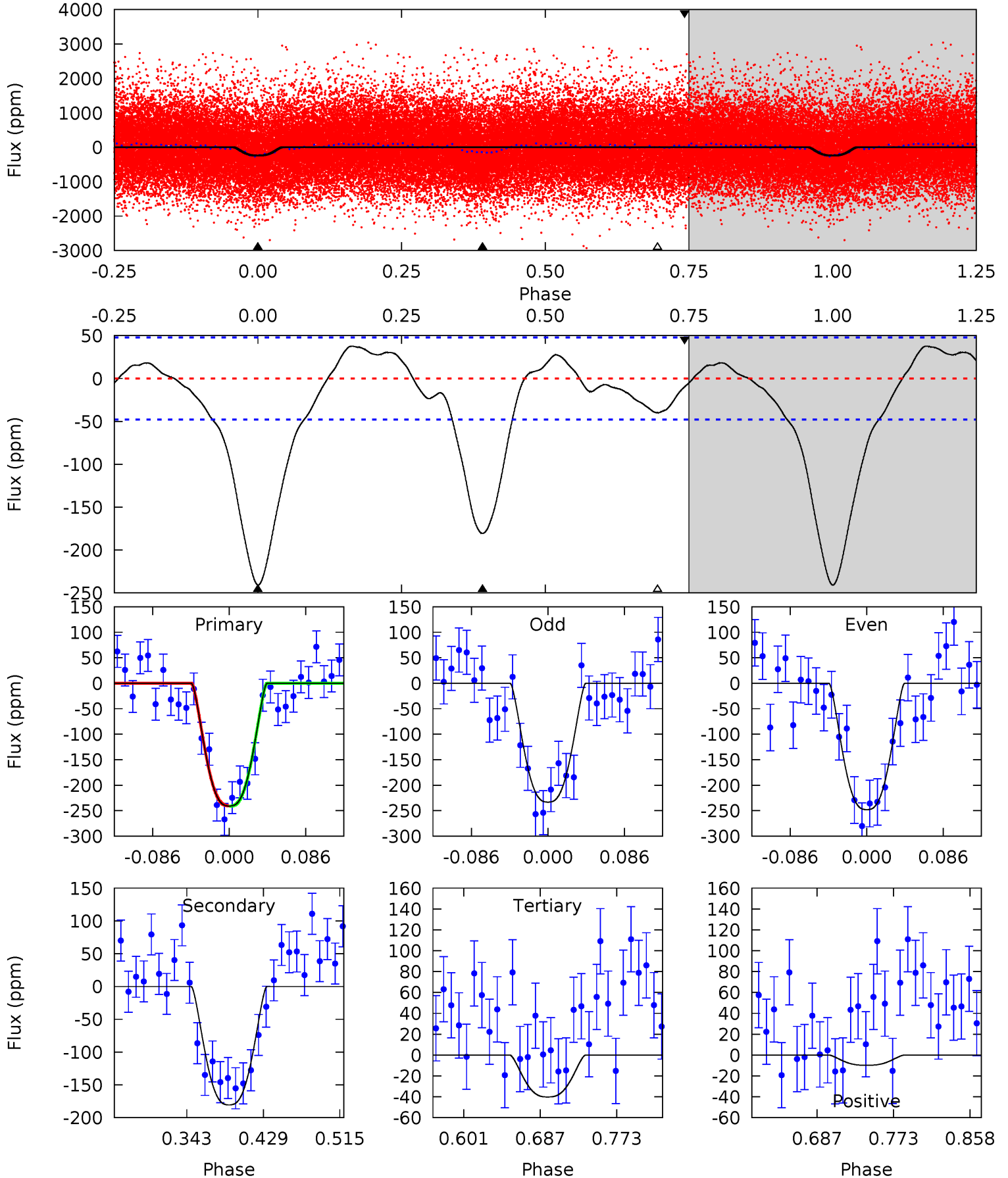
TCE 005556804-01 P= 12.424613 Days  $T_0=141.624895$  (BKJD)



# DV Model-Shift Uniqueness Test

005556804-01, P = 12.424376 Days, E = 141.631988 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
23.1	17.4	3.86	-0.94	4.60	1.72	2.09	19.3	24.1	13.5	18.3	0.71	1.10	0.14	0.04

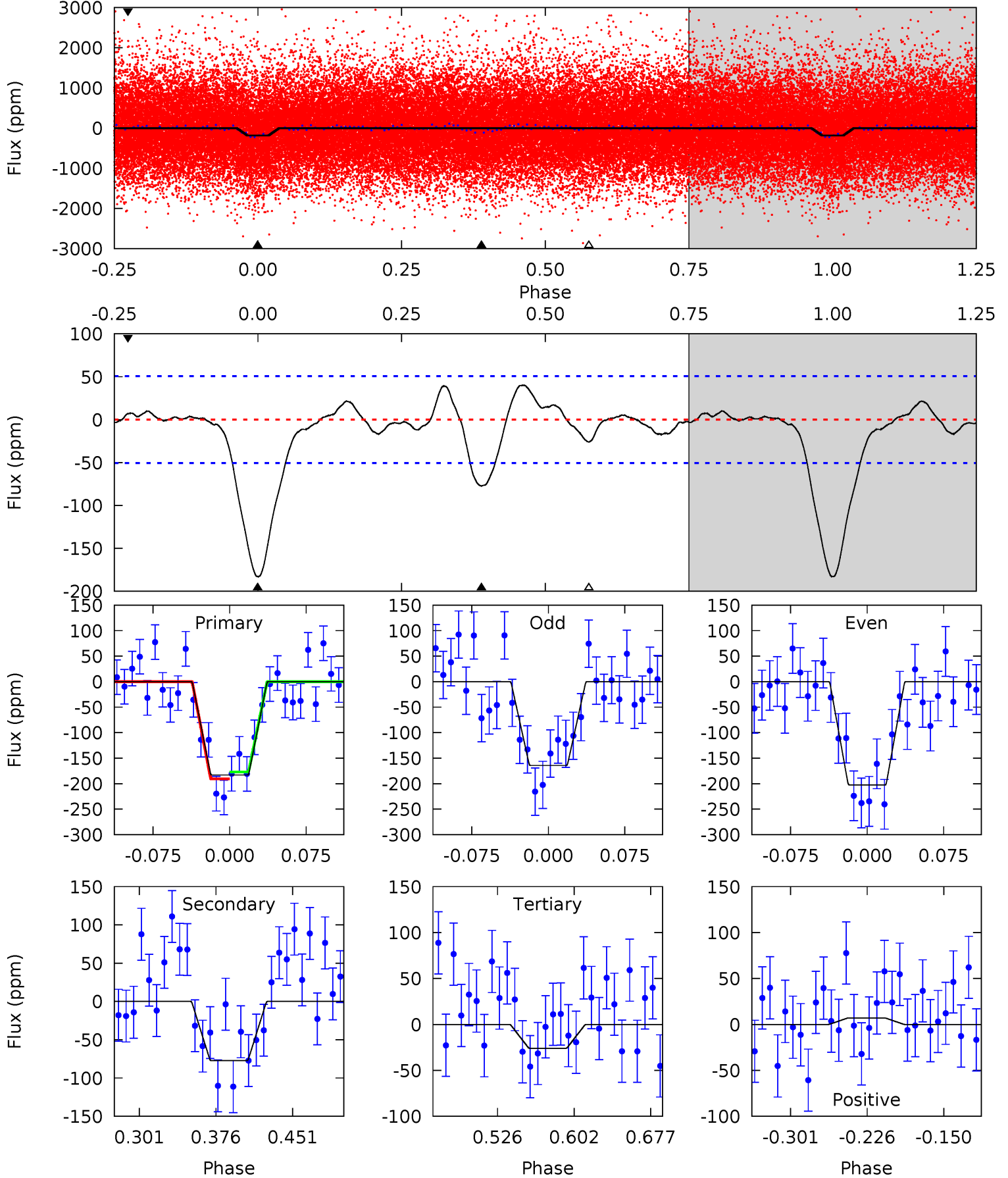




# Alt Model-Shift Uniqueness Test

005556804-01, P = 12.424613 Days, E = 141.624895 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
16.7	7.04	2.37	0.64	4.62	1.78	1.04	14.3	16.1	4.67	6.41	1.73	1.00	0.18	0.62





### Stellar Parameters For KIC 005556804

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5761^{+190}_{-190}$	$4.581^{+0.042}_{-0.168}$	$-0.400^{+0.300}_{-0.300}$	$0.791^{+0.205}_{-0.068}$	$0.881^{+0.096}_{-0.096}$	$2.505^{+0.421}_{-1.156}$
	+3%/-3%	+1%/-4%	+75%/-75%	+26%/-9%	+11%/-11%	+17%/-46%
Source	KIC0	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 005556804-01 / KOI 6013.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-181 \pm 10$	$1.70^{+0.26}_{-0.19}$	$1019^{+65}_{-48}$	$4937^{+258}_{-226}$	$342^{+86}_{-82}$
Alt.	$-77 \pm 11$	$1.24^{+0.20}_{-0.19}$	$1016^{+66}_{-48}$	$4748^{+344}_{-305}$	$277^{+117}_{-80}$

$T_{max}$  = 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

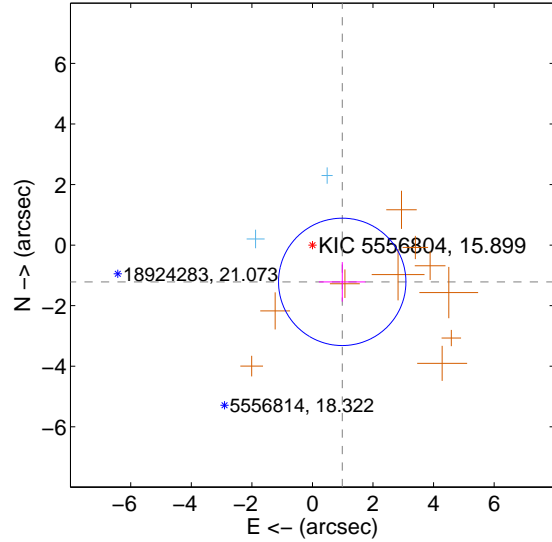
Supplemental centroid analysis for 005556804-01. Kepler magnitude: 15.90. Transit SNR 13.20

There are 2 quarters with good PRF difference image offsets

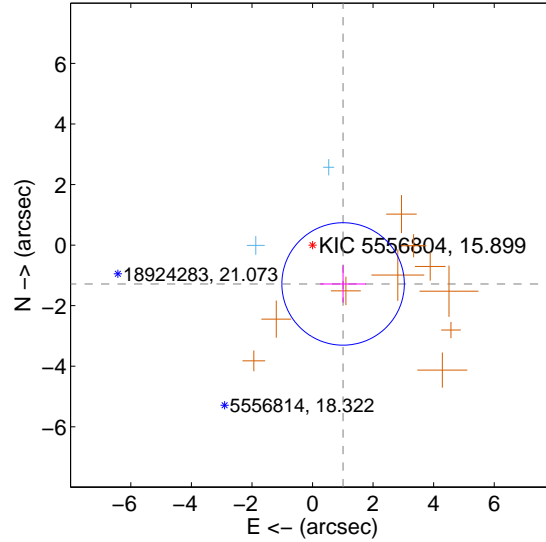
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.562 \pm 0.701$	2.23	$-0.983 \pm 0.768$	$-1.214 \pm 0.653$
PRF-fit source offset from KIC position	$1.632 \pm 0.674$	2.42	$-1.009 \pm 0.758$	$-1.283 \pm 0.616$
photometric centroid source offset	$3.57 \pm 1.03$	3.47	$-3.47 \pm 1.03$	$0.86 \pm 0.94$

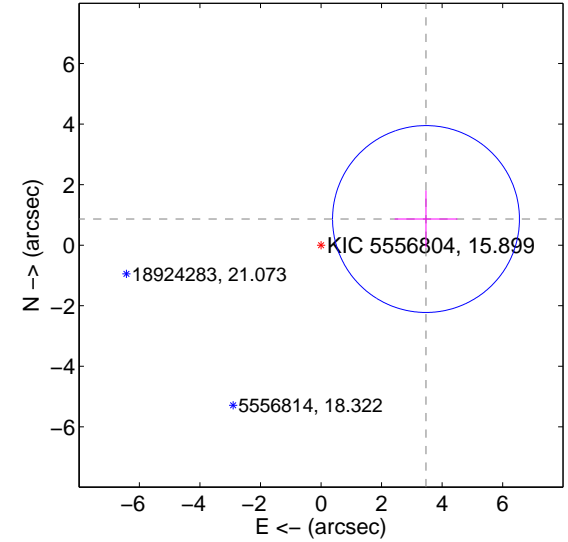
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



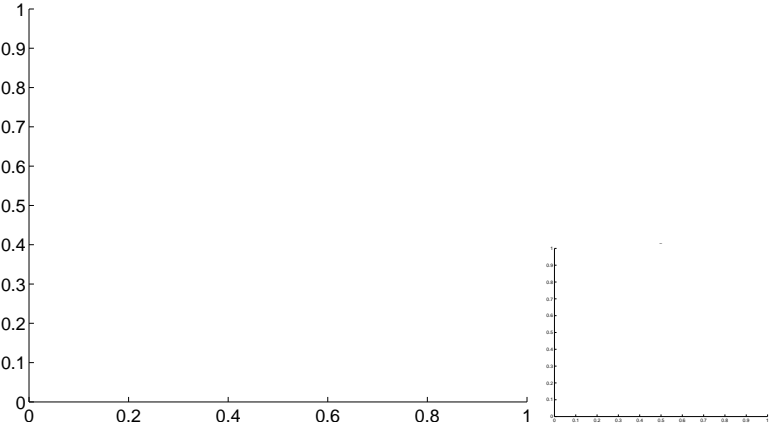
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

Q1 no difference image



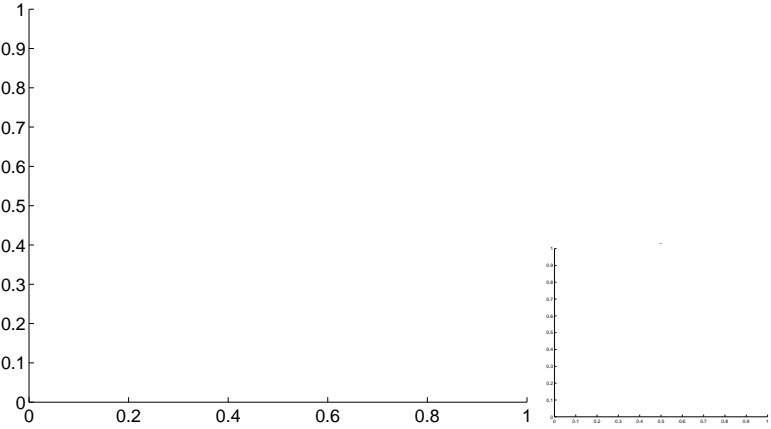
Q1 no OOT image



Q2 no difference image



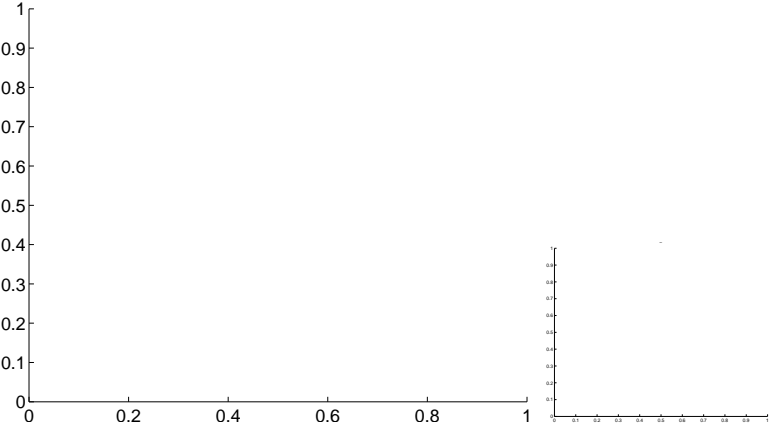
Q2 no OOT image



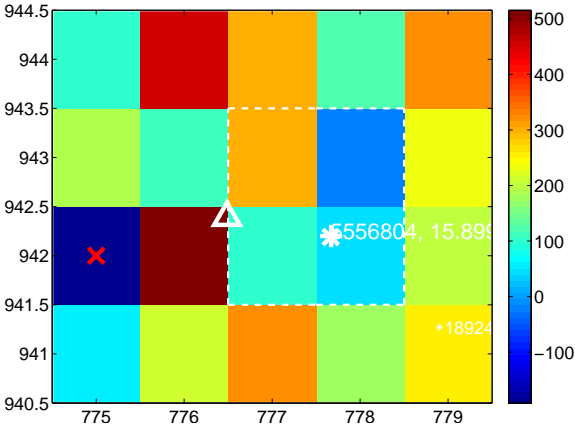
Q3 no difference image



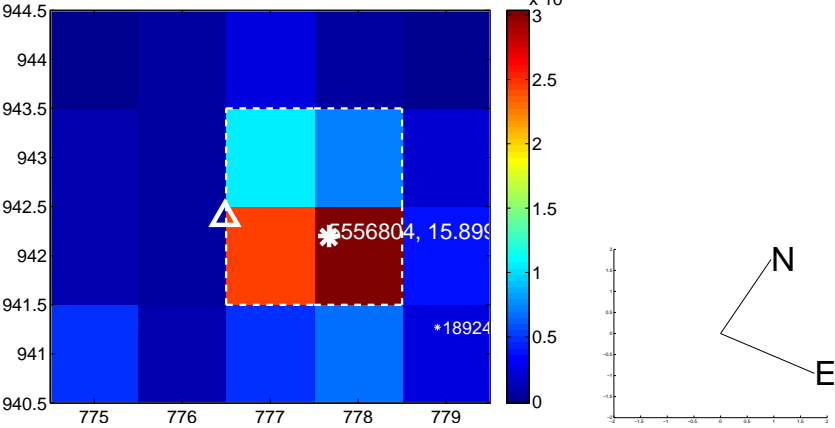
Q3 no OOT image



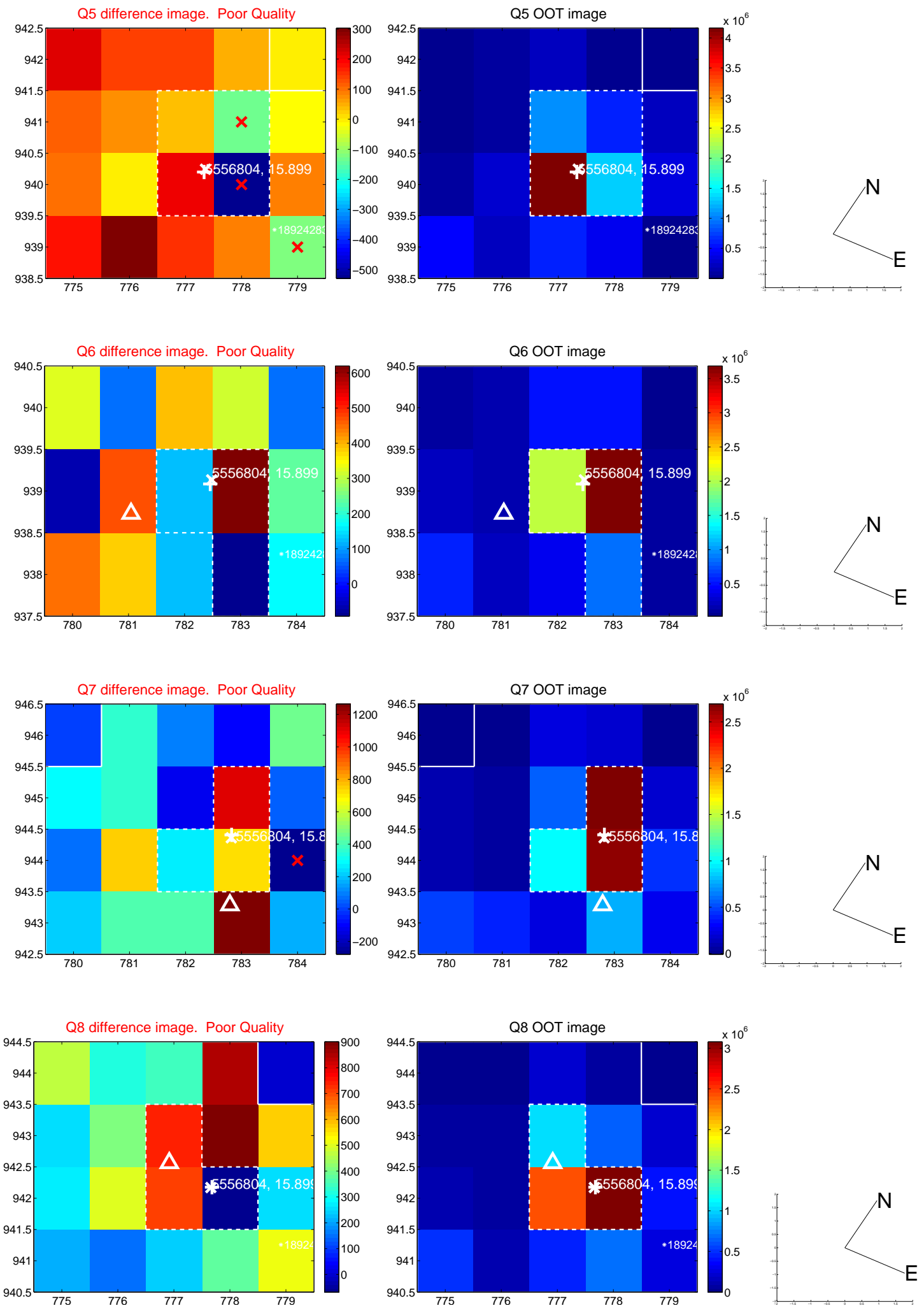
Q4 difference image. Poor Quality



Q4 OOT image

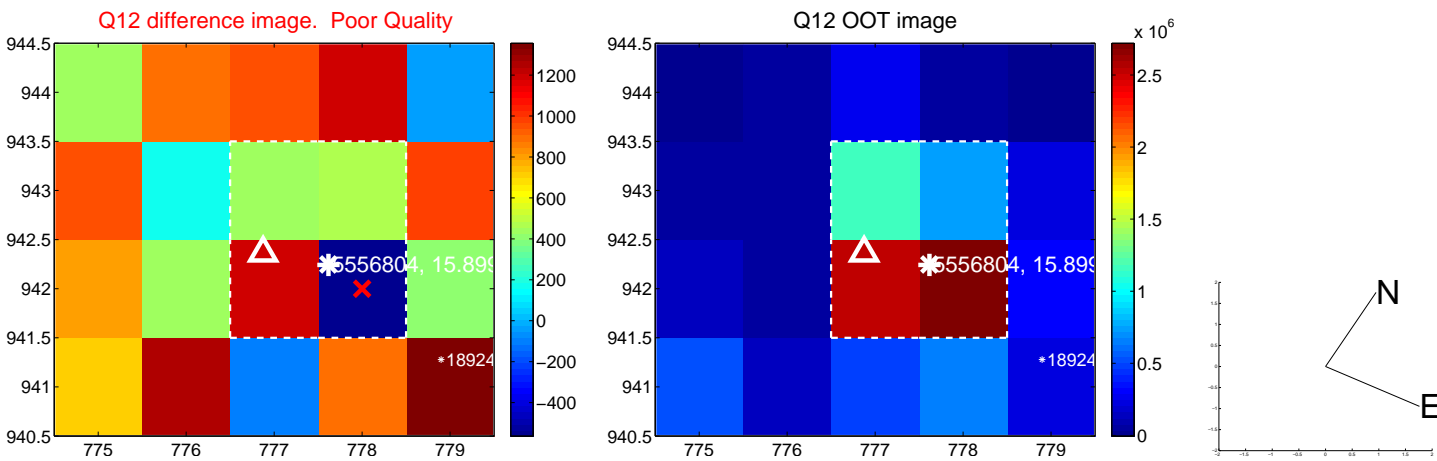
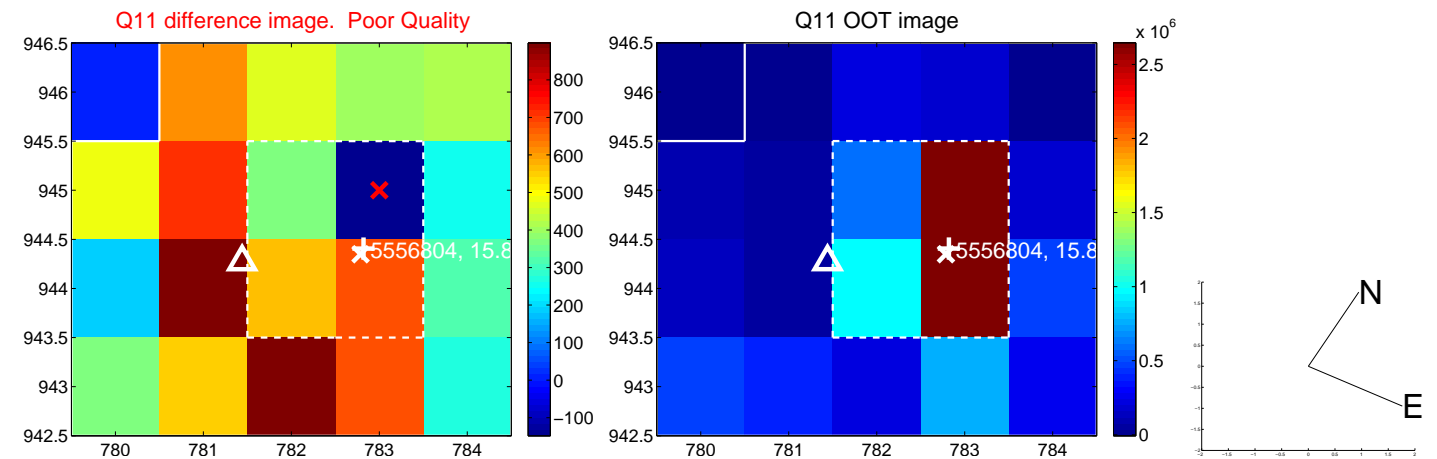
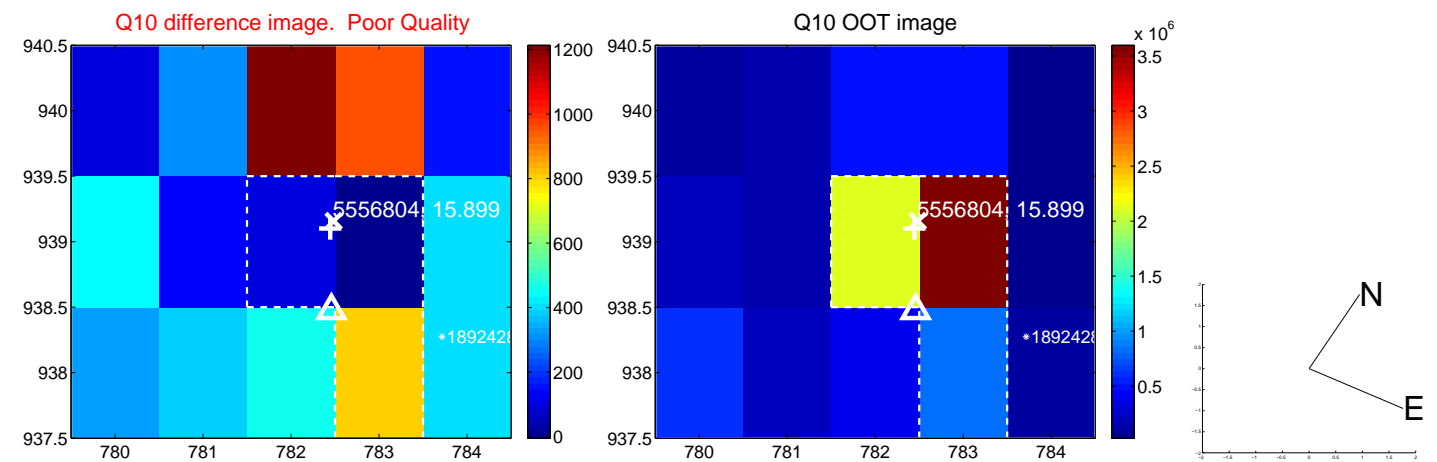
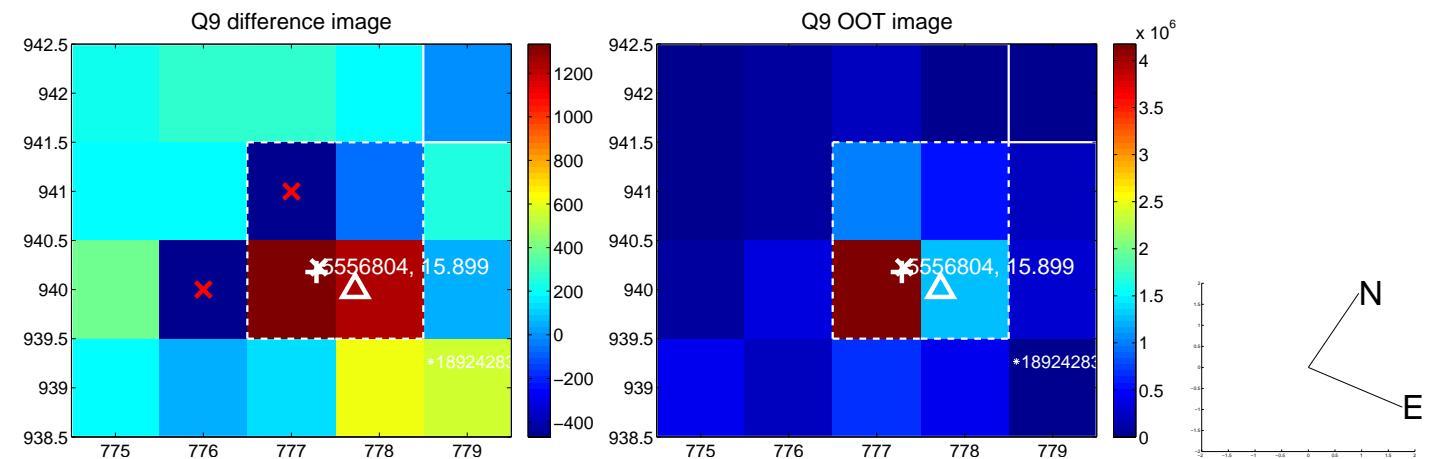


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

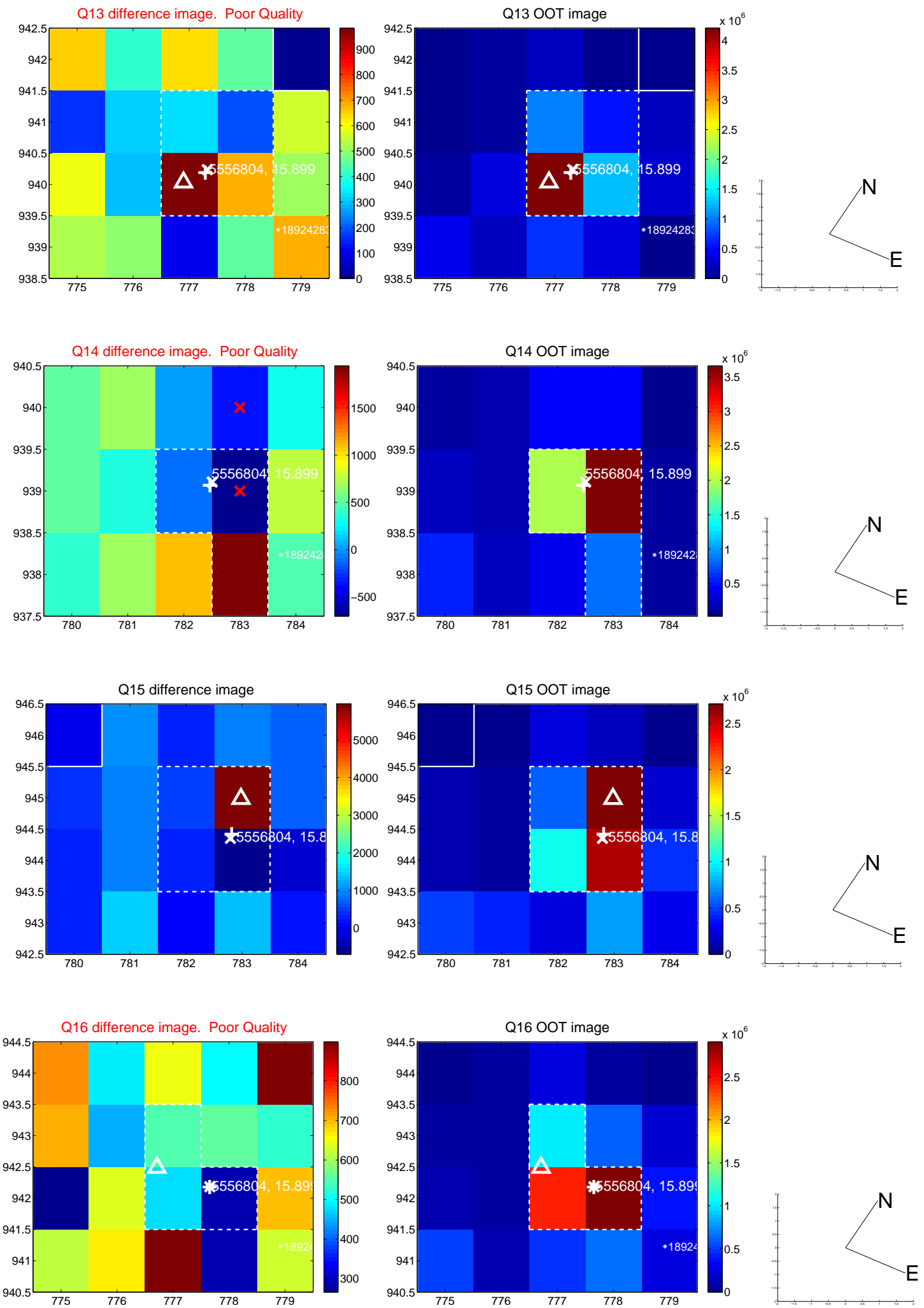




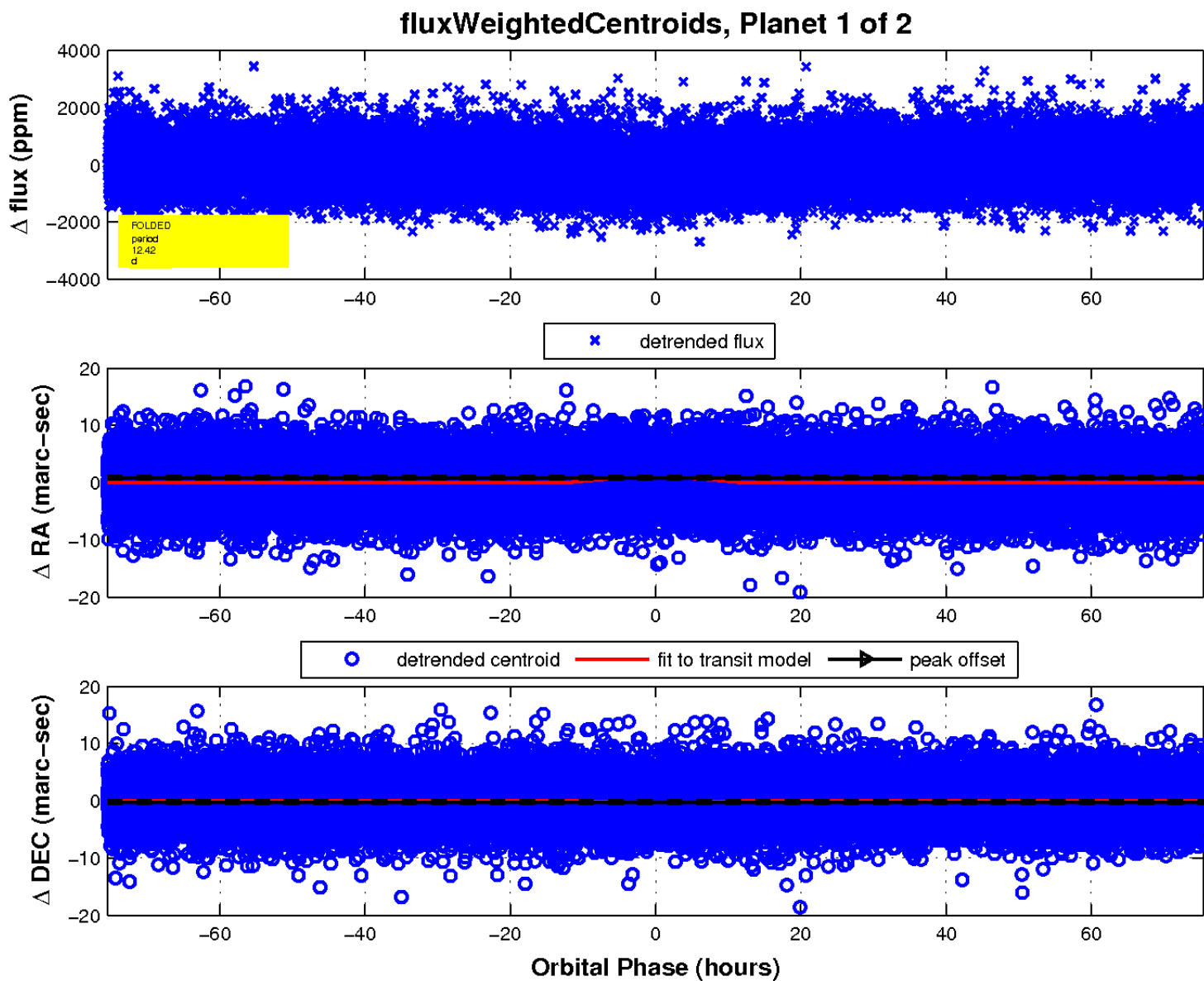
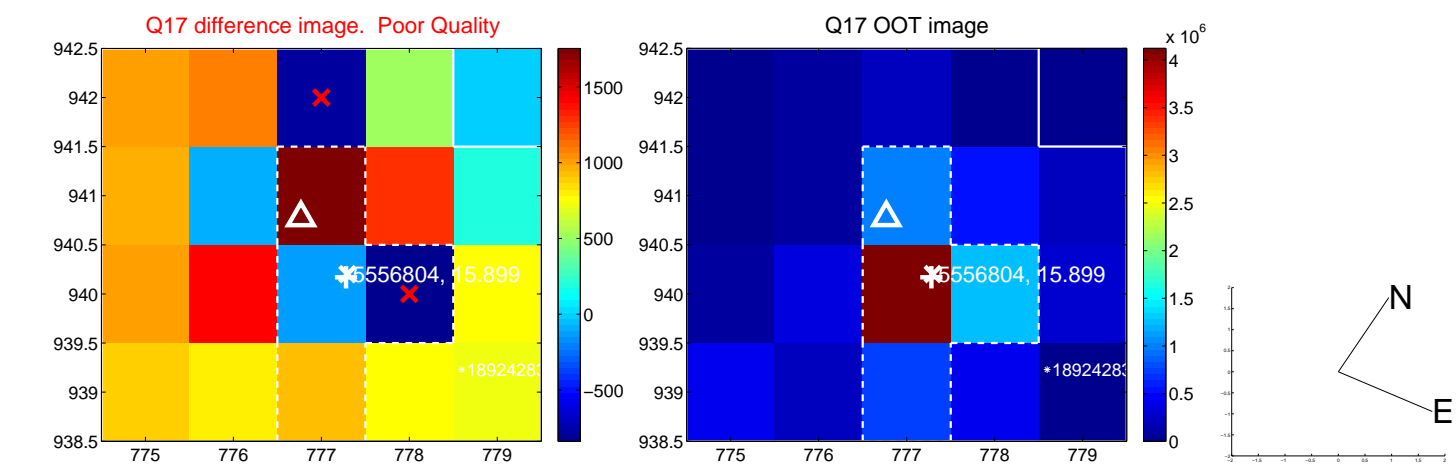
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

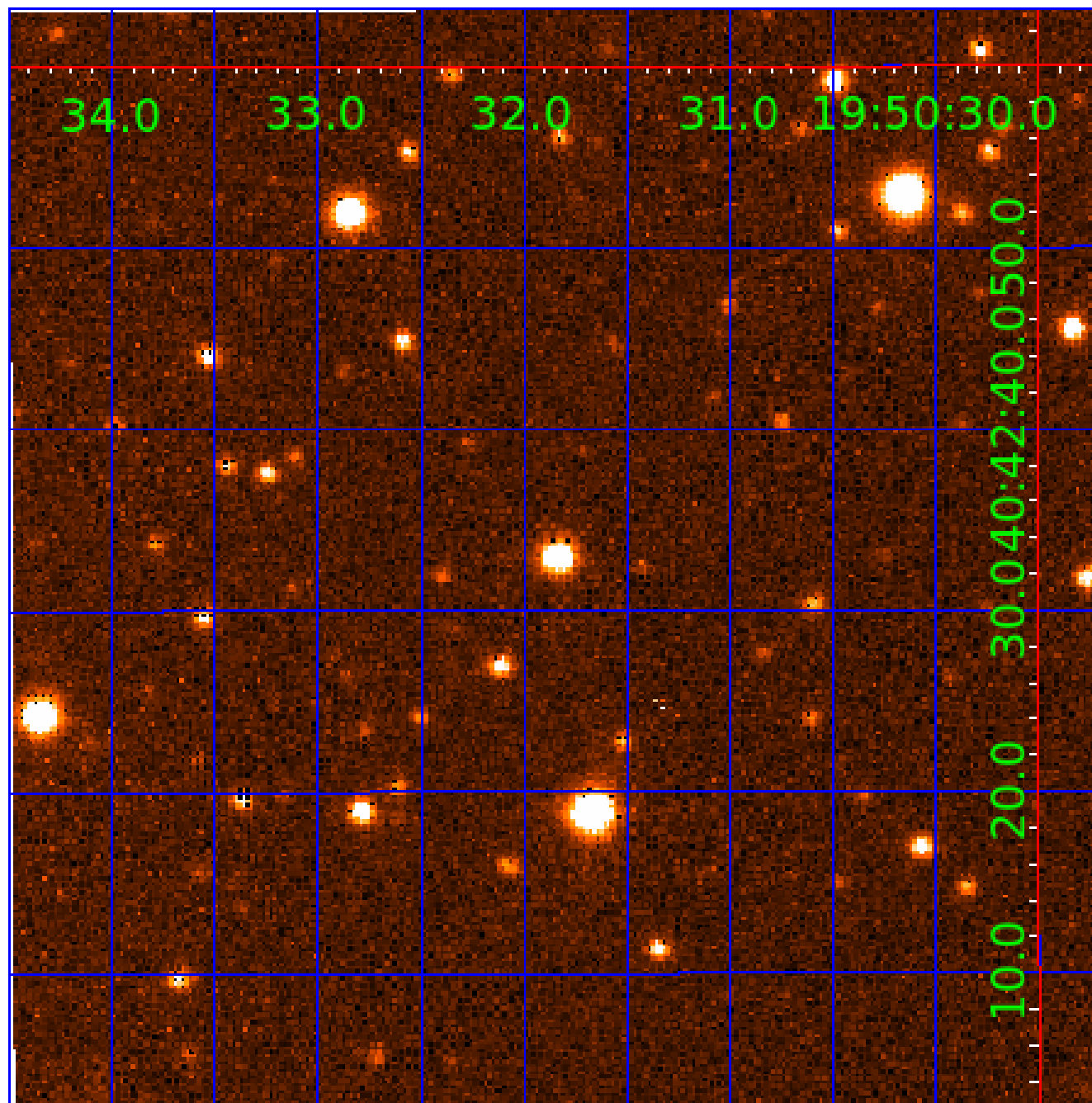


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005556804

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005556804-01	OBS	6013.01	12.424376	141.631988	230.5	25.156	11.4	13.2	0.79	5761	1.64	61.47
005556804-02	OBS	No	12.426384	133.896933	171.6	26.160	10.9	13.1	0.79	5761	1.08	61.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005556804-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—HALO_GHOST—EPHEM_MATCH
005556804-02	OBS	FP	0.00	1	0	0	1	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—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 005556804-02

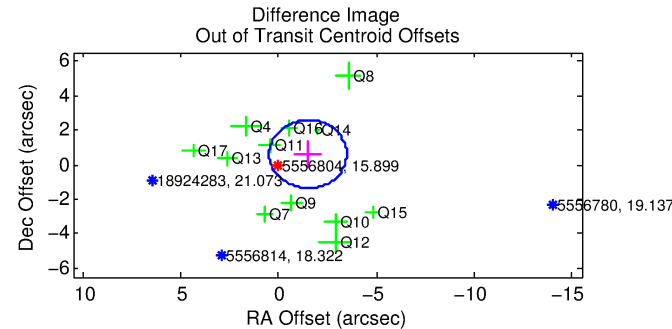
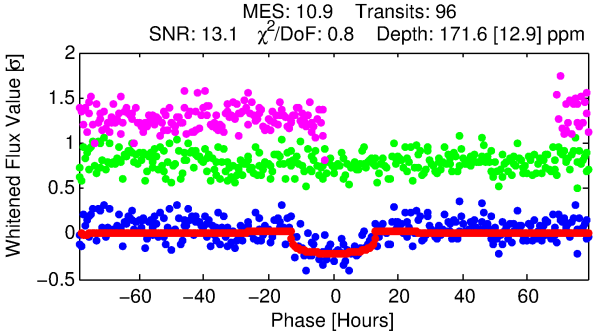
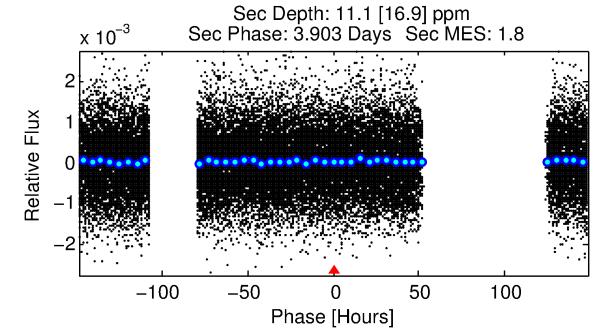
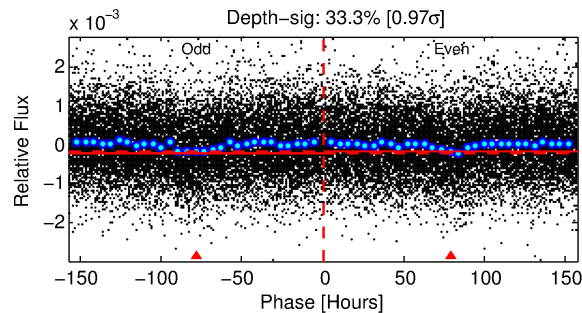
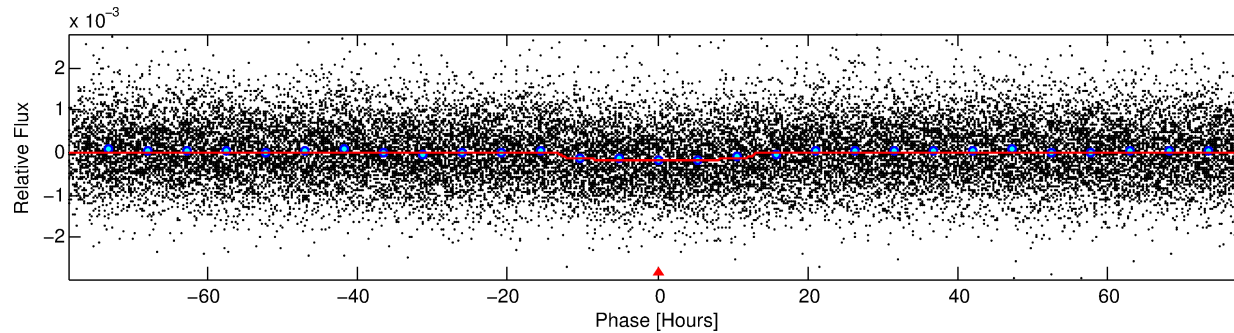
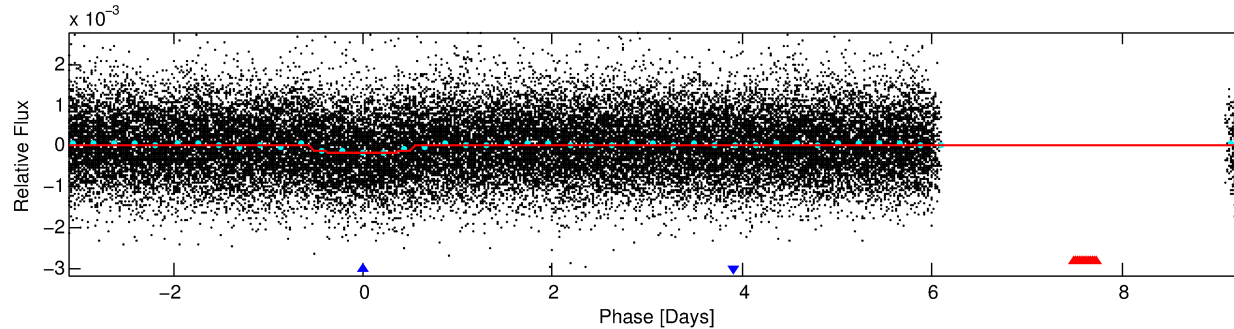
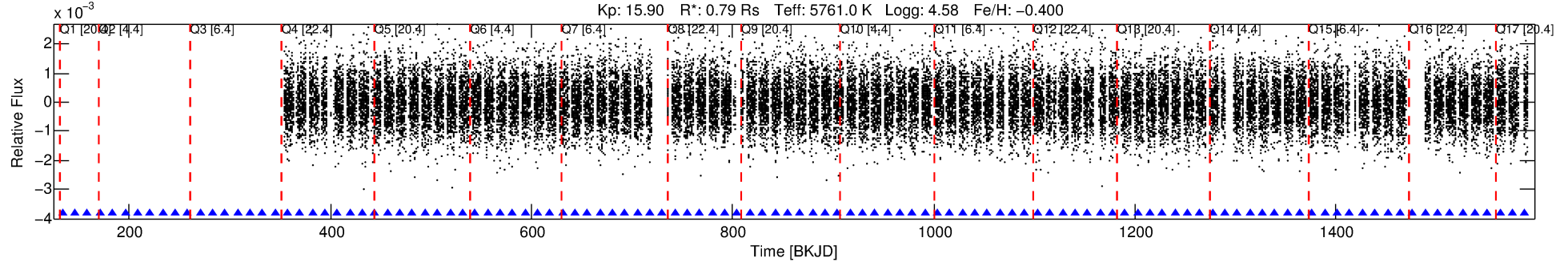
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005556804-02	5556804	V380-Cyg-sec	5385723	1:1	398.7	94	33	5.77	15.90	750.21	Direct-PRF	0	2.58	1.46

**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: 5556804 Candidate: 2 of 2 Period: 12.426 d  
KOI: K06013 Corr: No Ephemeris Match

Kp: 15.90 R\*: 0.79 Rs Teff: 5761.0 K Logg: 4.58 Fe/H: -0.400



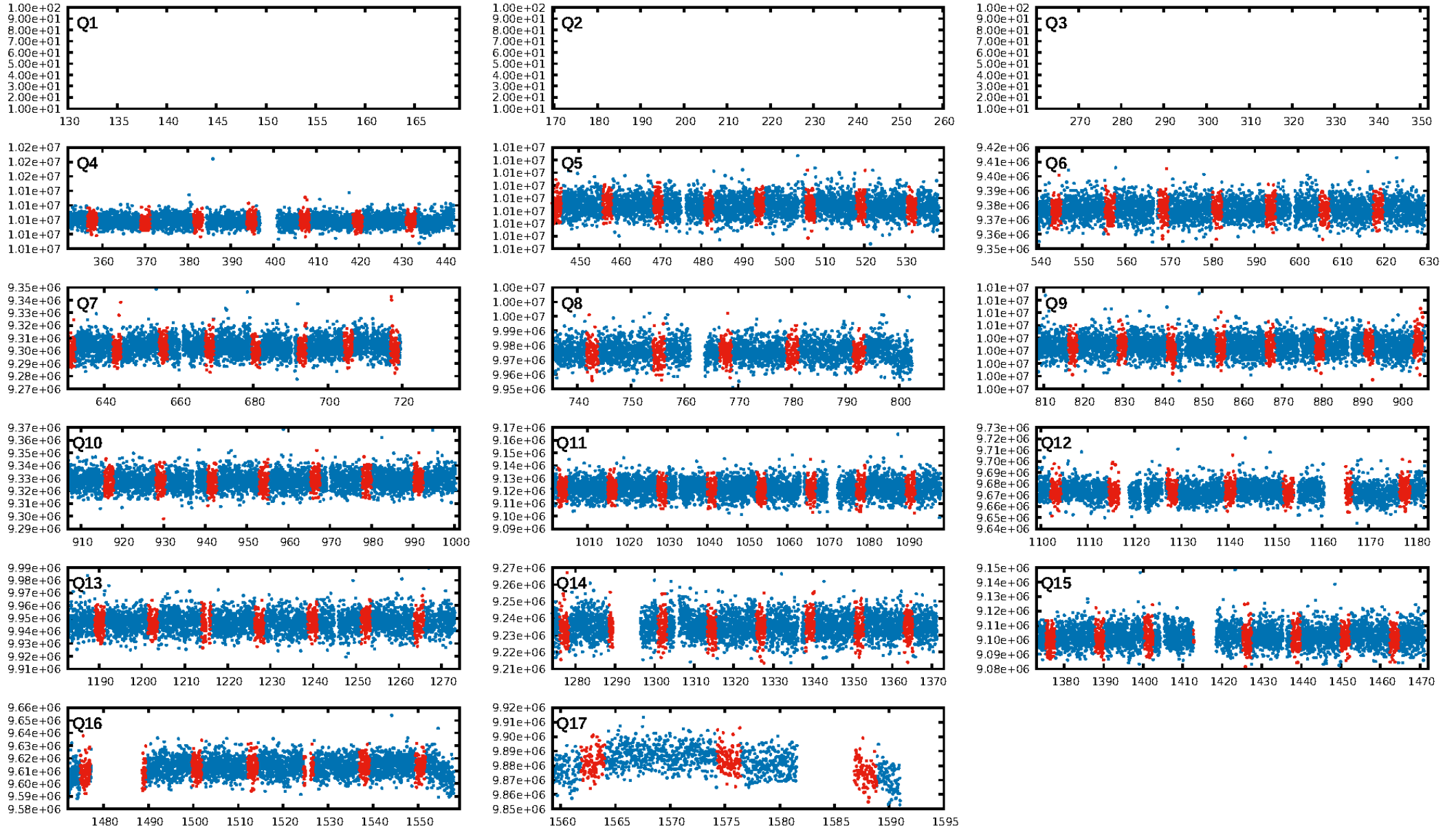
## DV Fit Results:

Period = 12.42638 [0.00044] d  
Epoch = 133.8969 [0.0307] BKJD  
Rp/R\* = 0.0125 [0.0040]  
a/R\* = 3.04 [4.05]  
b = 0.61 [1.56]  
Seff = 61.45 [20.73]  
Teq = 714 [60] K  
Rp = 1.08 [0.45] Re  
a = 0.1002 [0.0216] AU  
Ag = 52.42 [88.05] [0.58σ]  
Teffp = 2970 [1230] K [1.83σ]

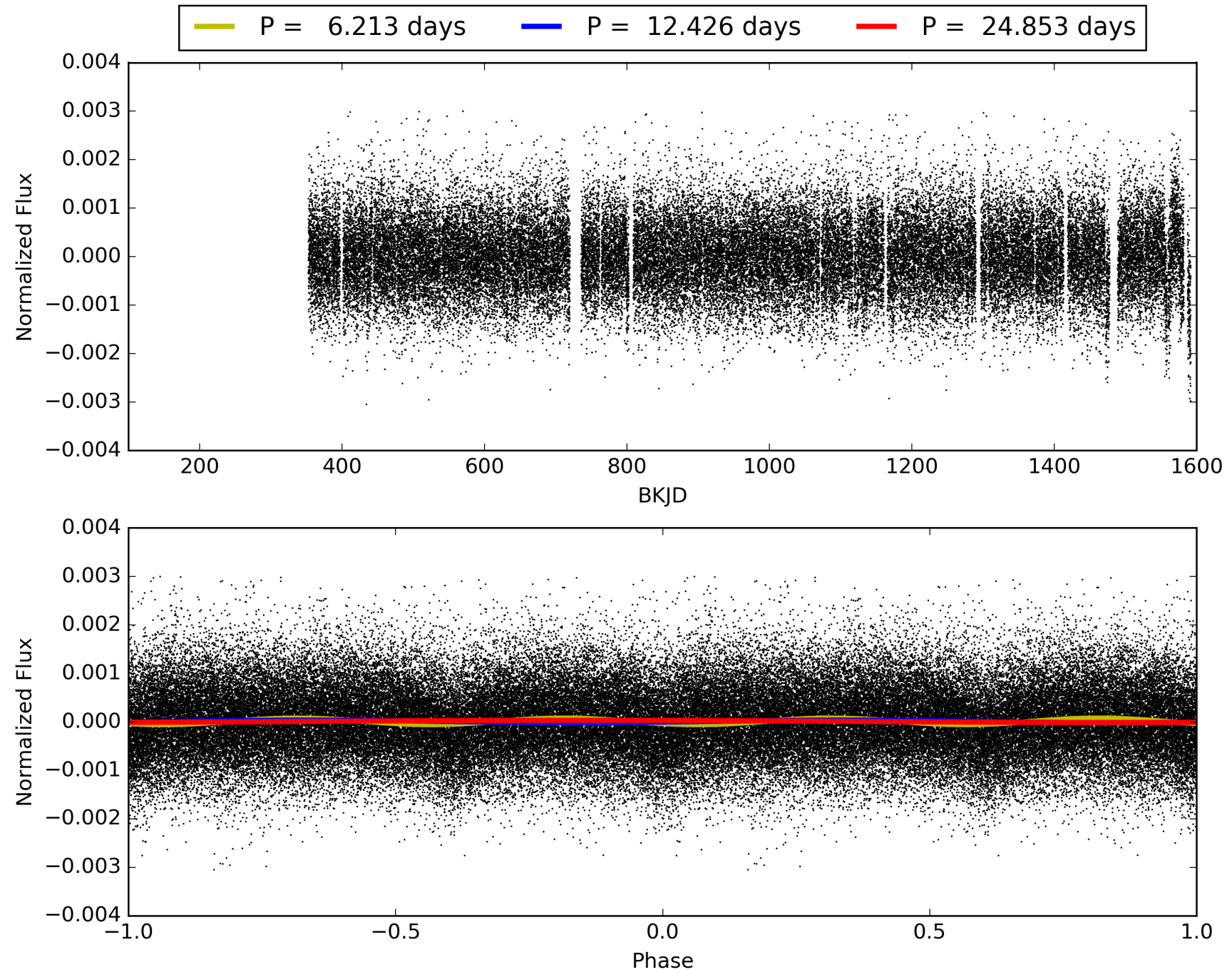
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.72e-27  
RollingBand-fgt: 1.00 [93/93]  
GhostDiagnostic-chr: 0.3479  
Centroid-sig: 17.1%  
Centroid-so: 1.360 arcsec [1.35σ]  
OotOffset-rm: 1.618 arcsec [2.45σ]  
KicOffset-rm: 1.630 arcsec [2.24σ]  
OotOffset-st: 2/3/4/3 [12]  
KicOffset-st: 2/3/4/3 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 005556804-02, PDC Light Curves



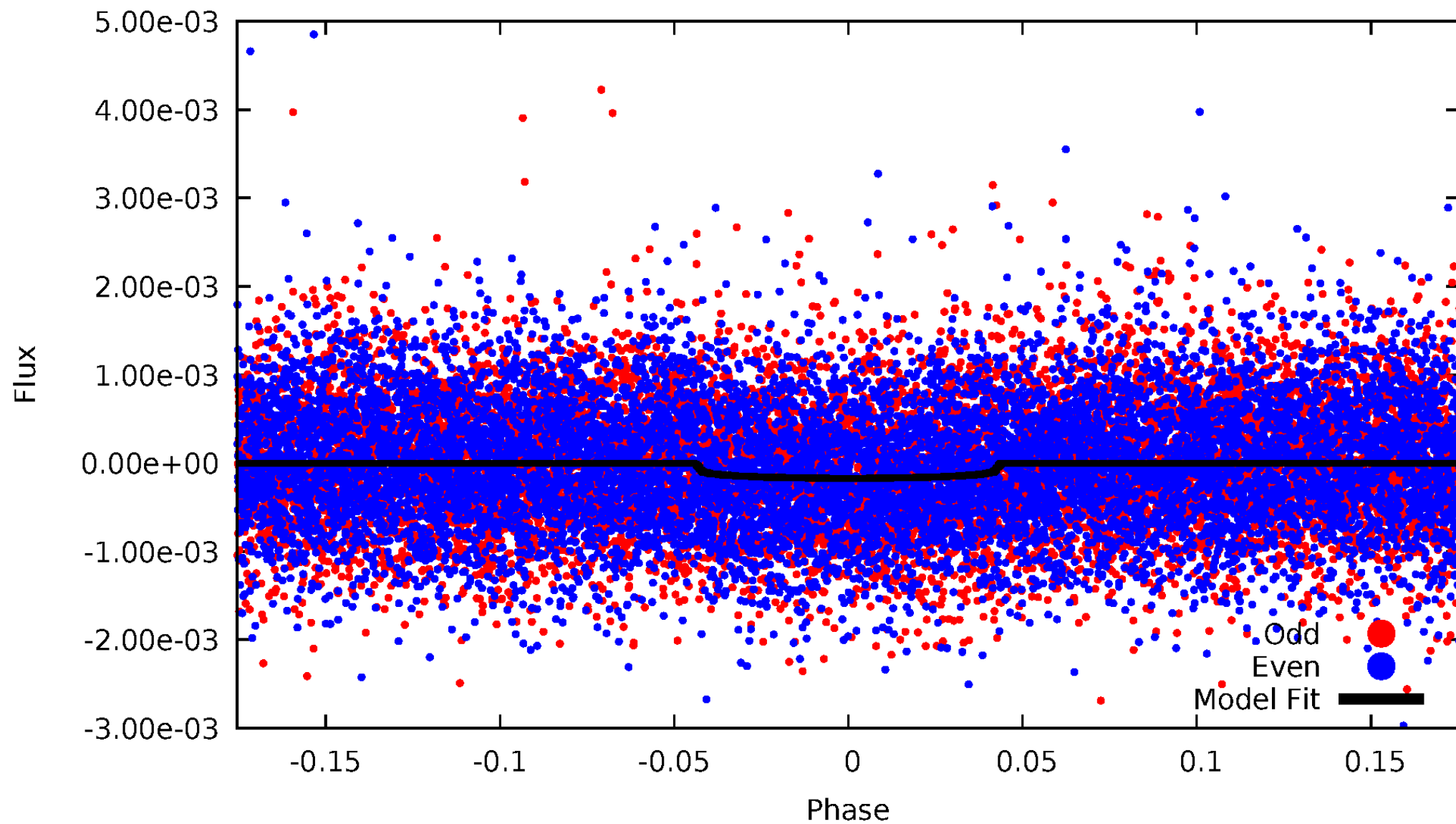
TCE 005556804-02





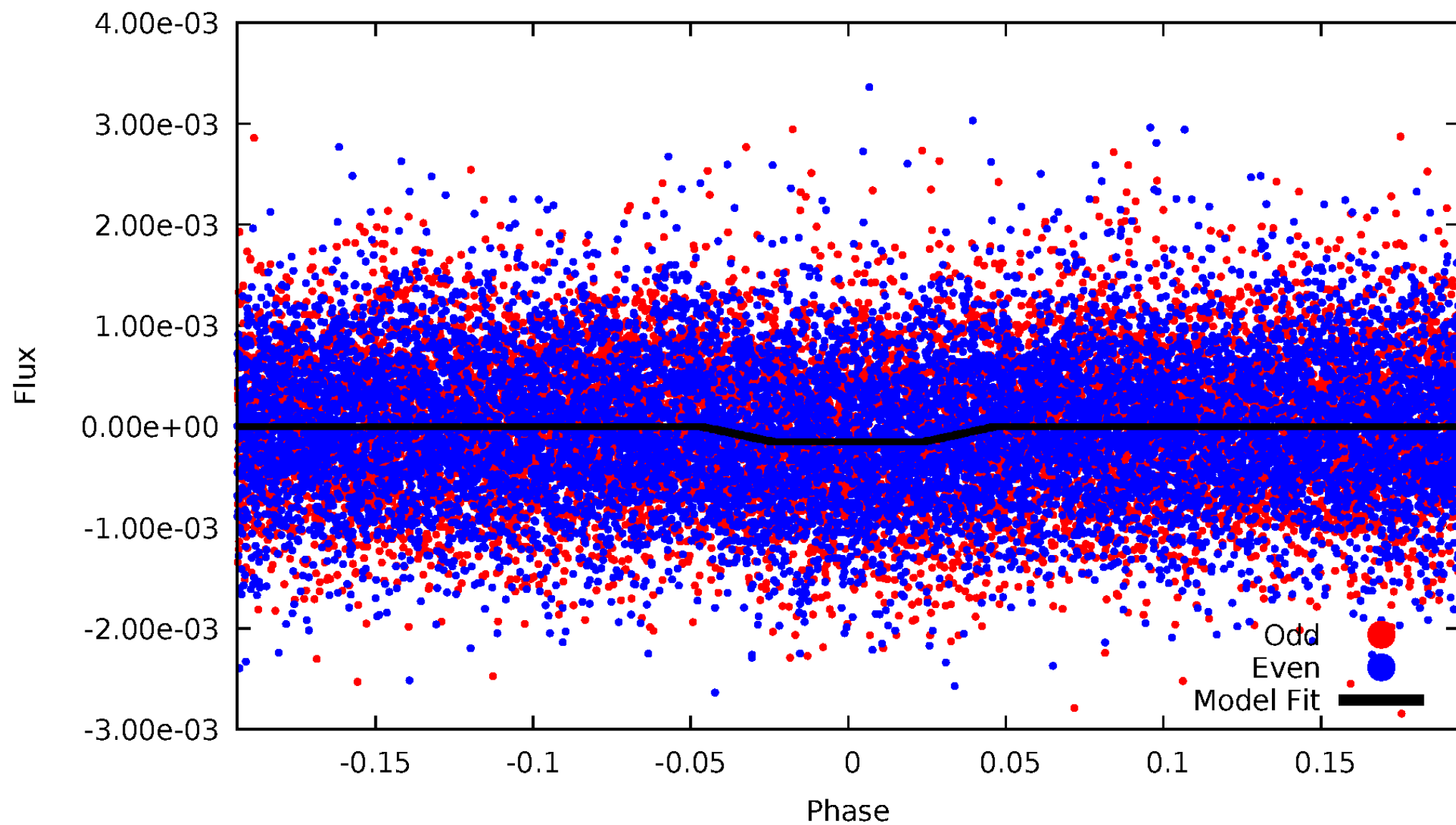
# DV Odd/Even

TCE 005556804-02



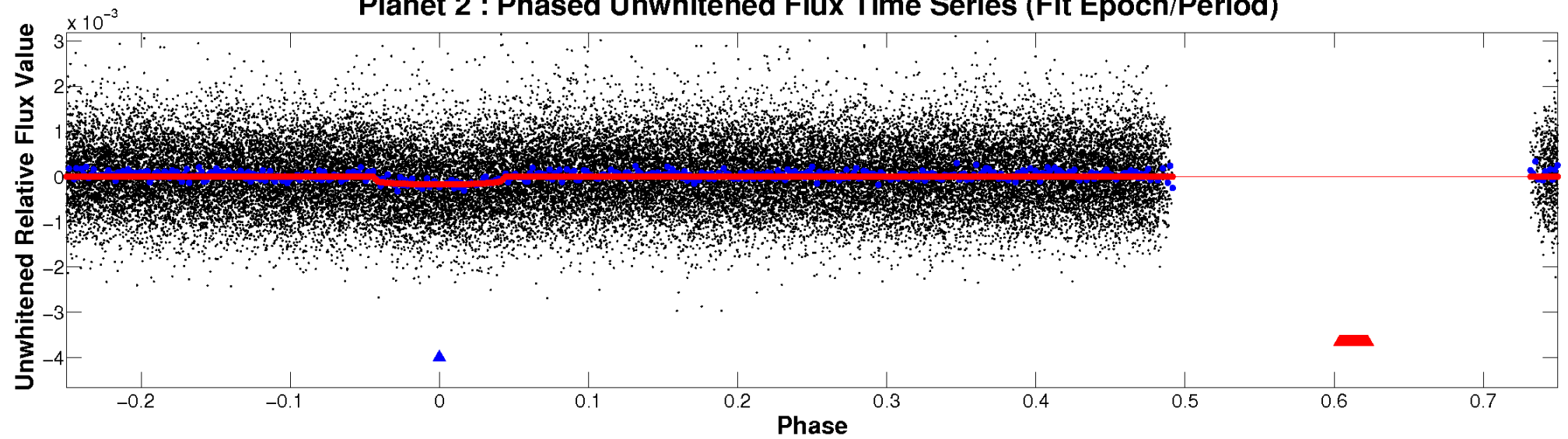
# ALT Odd/Even

TCE 005556804-02

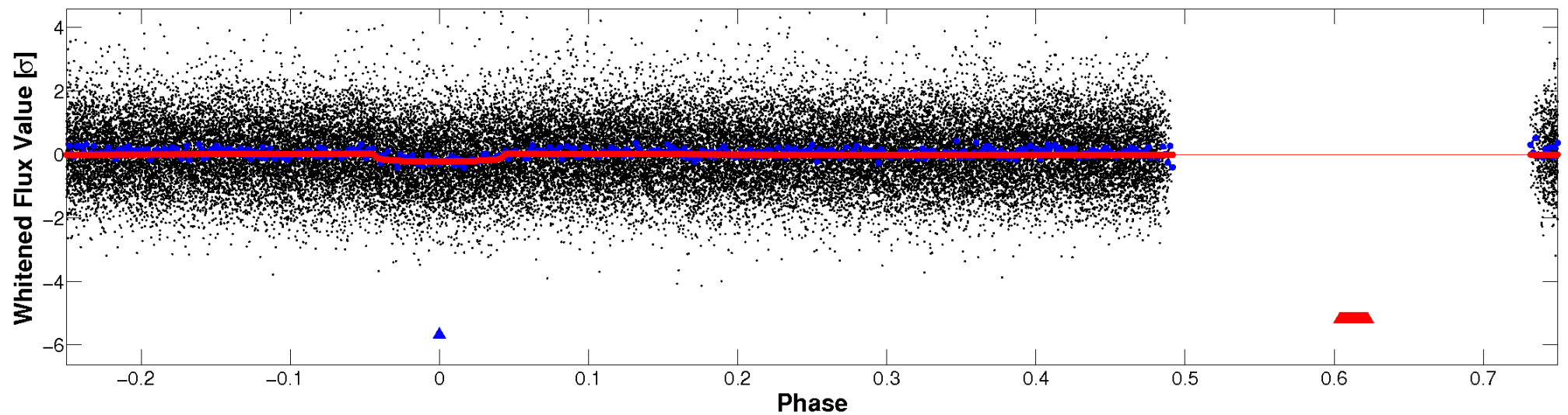


# Non-Whitened Vs. Whitened Light Curve

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

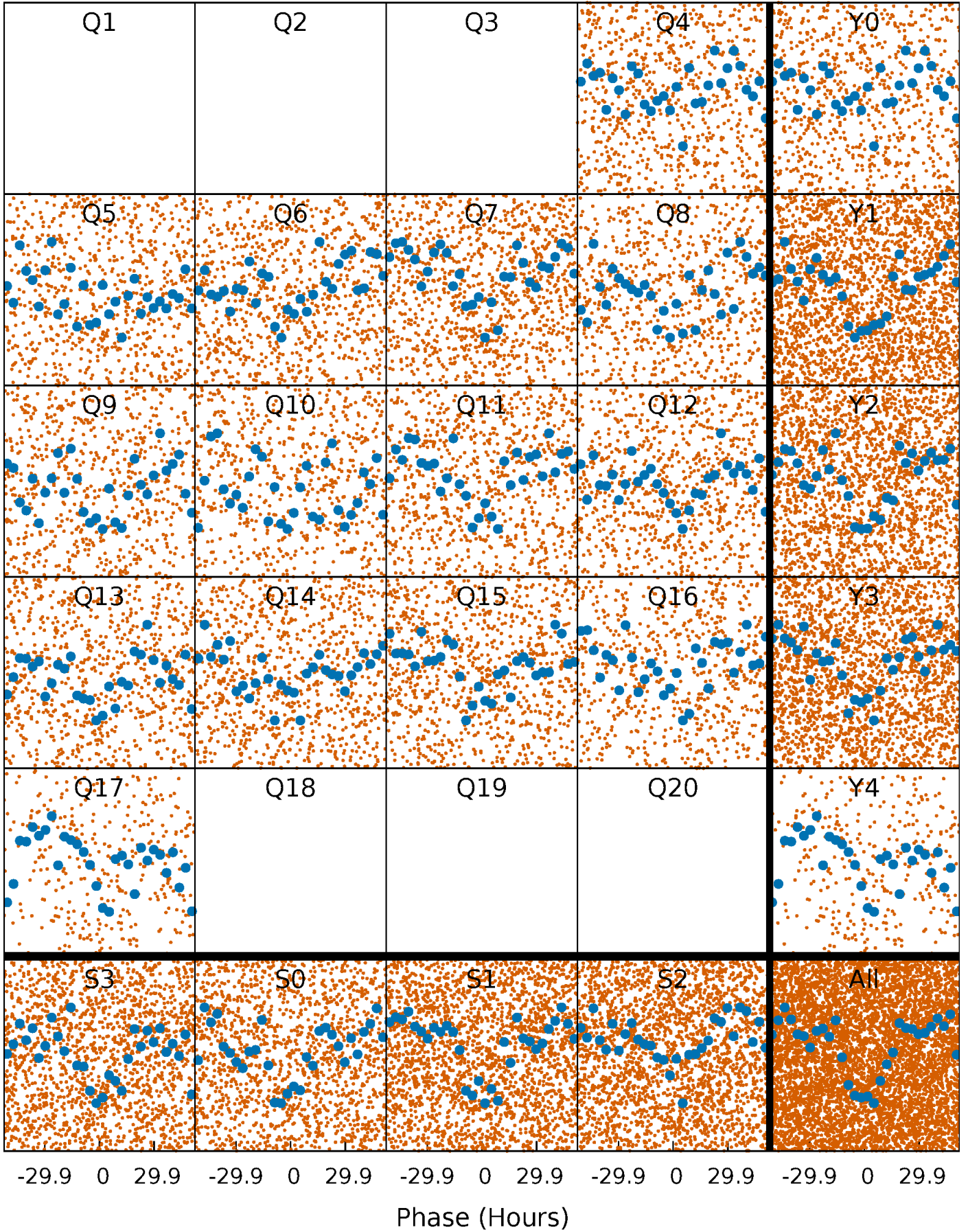


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

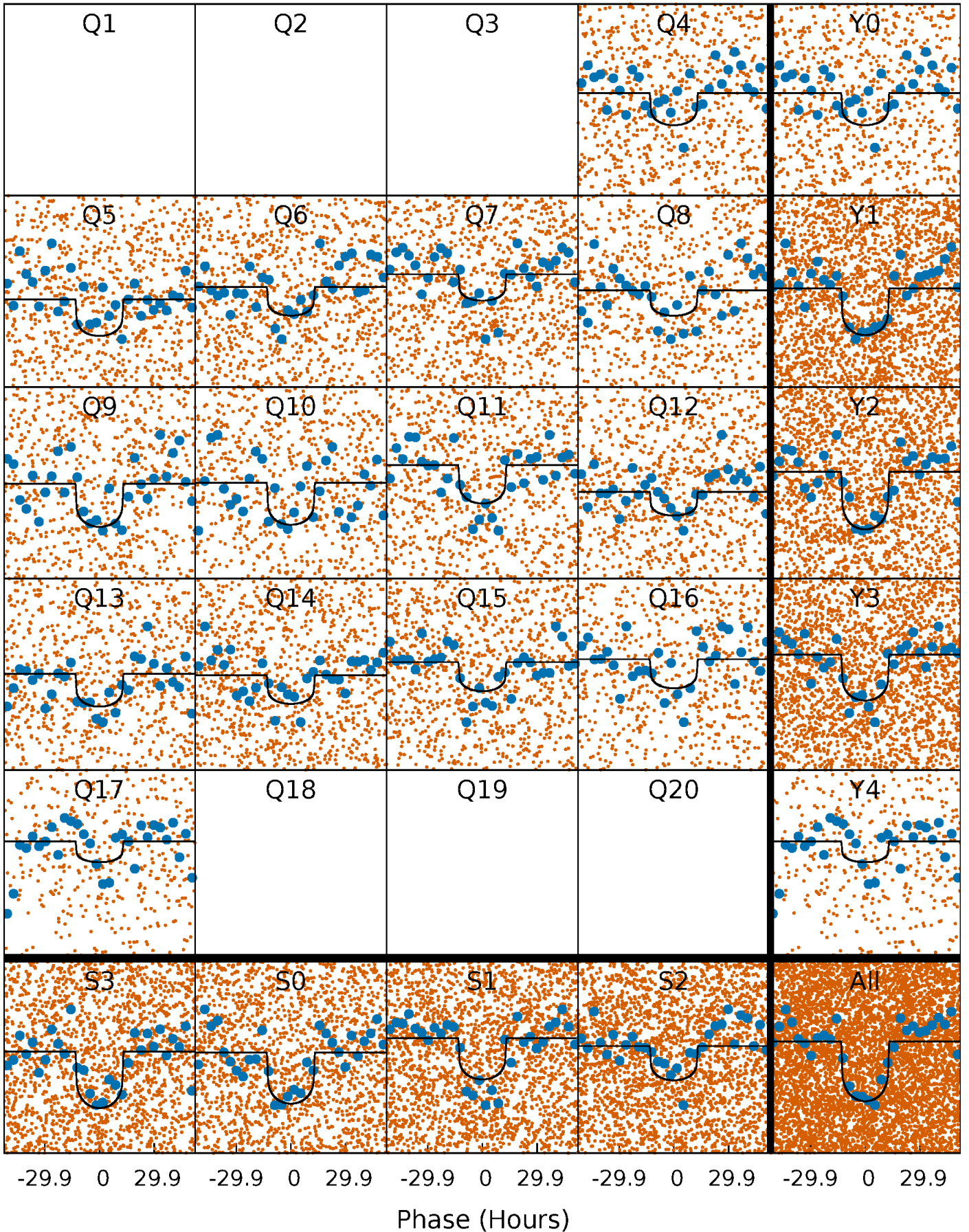
TCE 005556804-02 P= 12.426384 Days  $T_0=133.896933$  (BKJD)





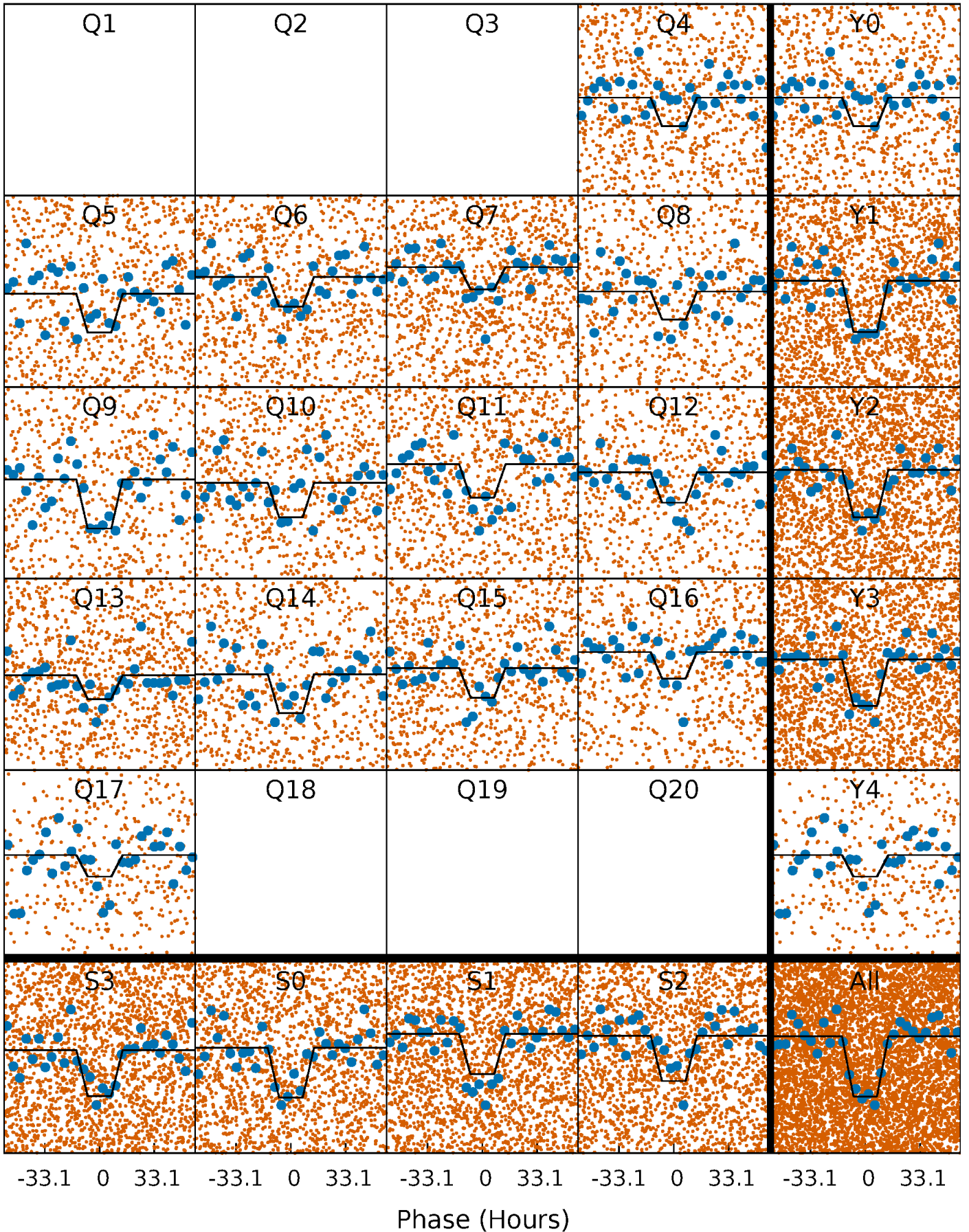
# DV Quarter-Phased Transit Curves

TCE 005556804-02 P= 12.426384 Days  $T_0=133.896933$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005556804-02 P= 12.426067 Days  $T_0=133.926726$  (BKJD)

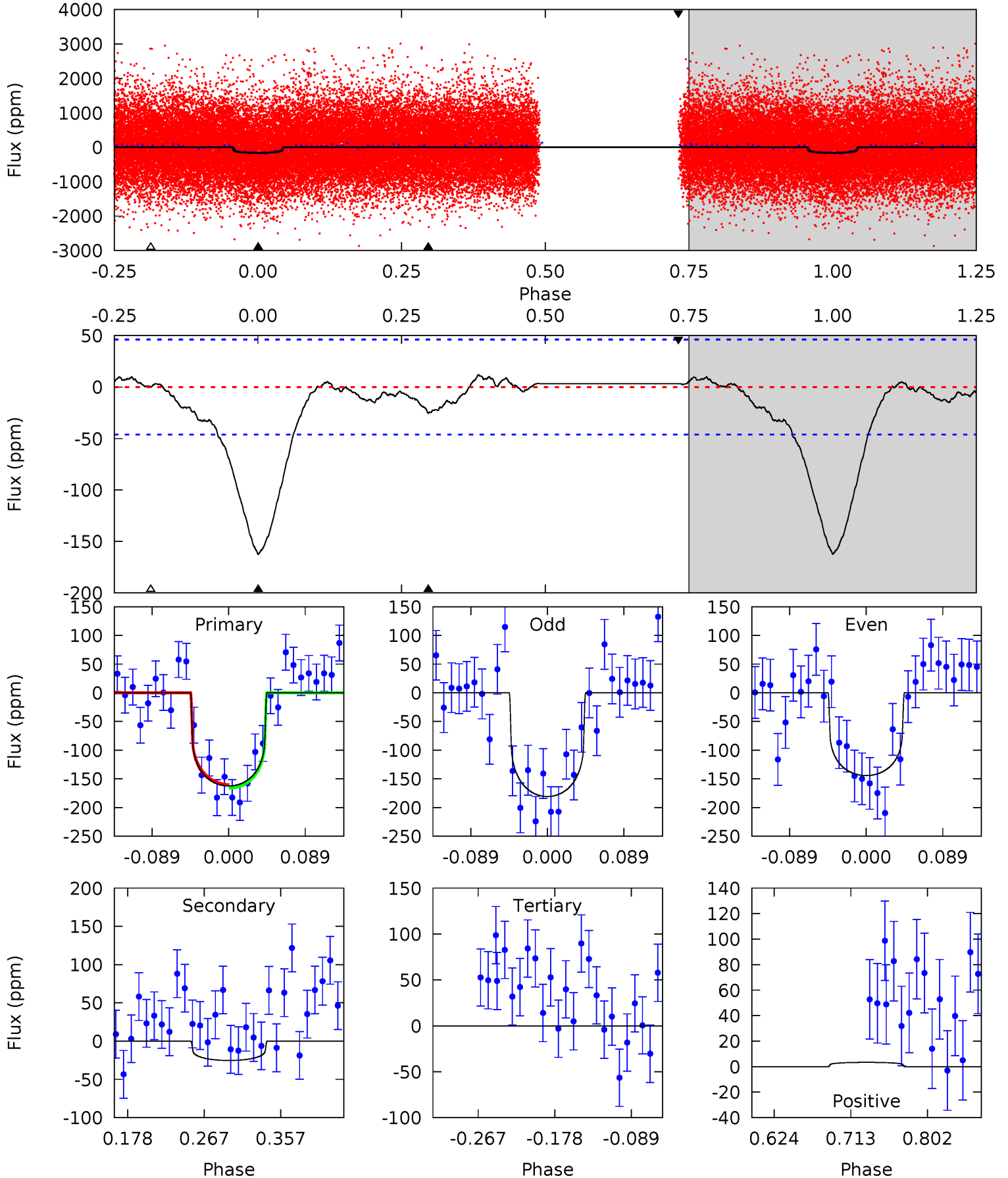




# DV Model-Shift Uniqueness Test

005556804-02, P = 12.426384 Days, E = 133.896933 Days

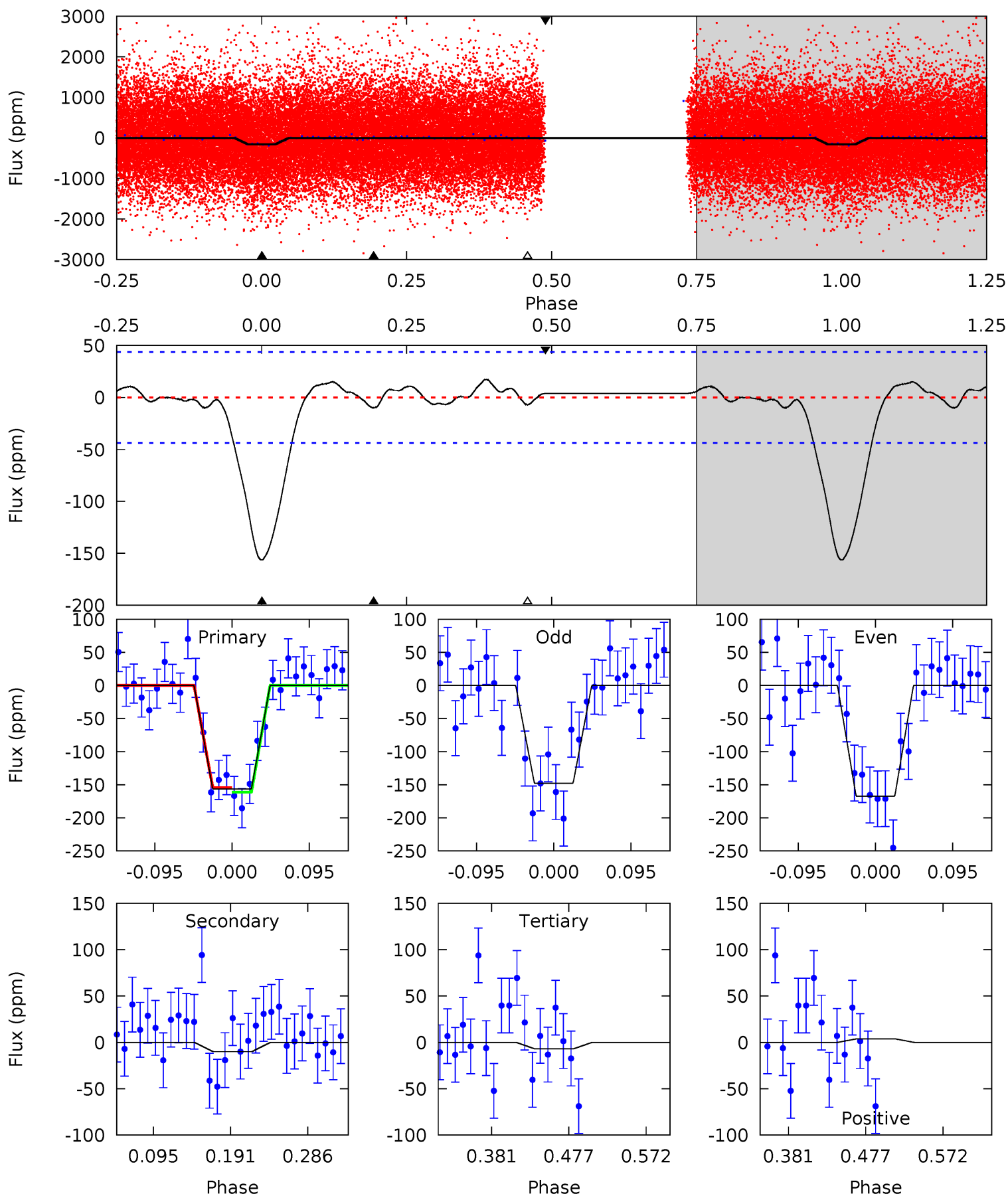
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	2.51	0.02	0.33	4.59	1.70	1.06	16.1	15.8	2.49	2.18	1.81	0.82	0.07	0.30



# Alt Model-Shift Uniqueness Test

005556804-02, P = 12.426067 Days, E = 133.926726 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	1.05	0.73	0.40	4.57	1.67	0.68	15.6	16.0	0.32	0.65	1.01	0.83	0.10	0.35



### Stellar Parameters For KIC 005556804

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5761^{+190}_{-190}$	$4.581^{+0.042}_{-0.168}$	$-0.400^{+0.300}_{-0.300}$	$0.791^{+0.205}_{-0.068}$	$0.881^{+0.096}_{-0.096}$	$2.505^{+0.421}_{-1.156}$
	+3%/-3%	+1%/-4%	+75%/-75%	+26%/-9%	+11%/-11%	+17%/-46%
Source	KIC0	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 005556804-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-25 \pm 10$	$1.16^{+0.39}_{-0.37}$	$1019^{+63}_{-48}$	$3945^{+642}_{-458}$	$101^{+140}_{-53}$
Alt.	$-10 \pm 10$	$1.10^{+0.39}_{-0.36}$	$1018^{+62}_{-50}$	$3412^{+652}_{-1148}$	$44^{+83}_{-42}$

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

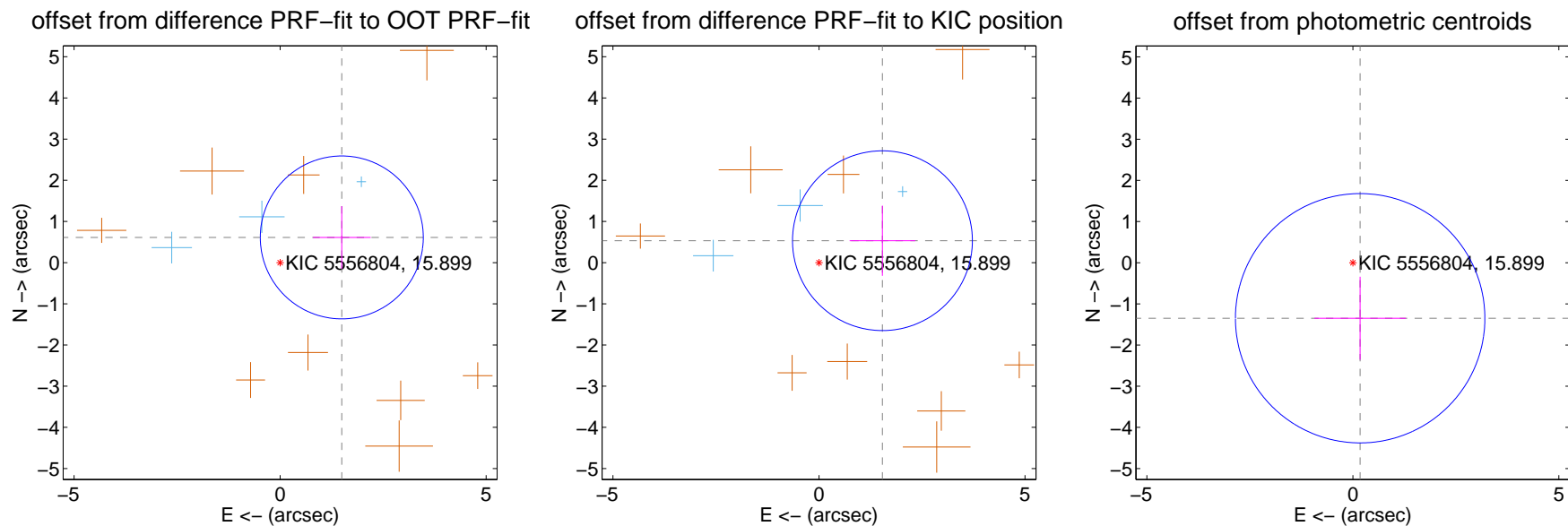
## DV Centroid Data

Supplemental centroid analysis for 005556804-02. Kepler magnitude: 15.90. Transit SNR 13.09

There are 3 quarters with good PRF difference image offsets

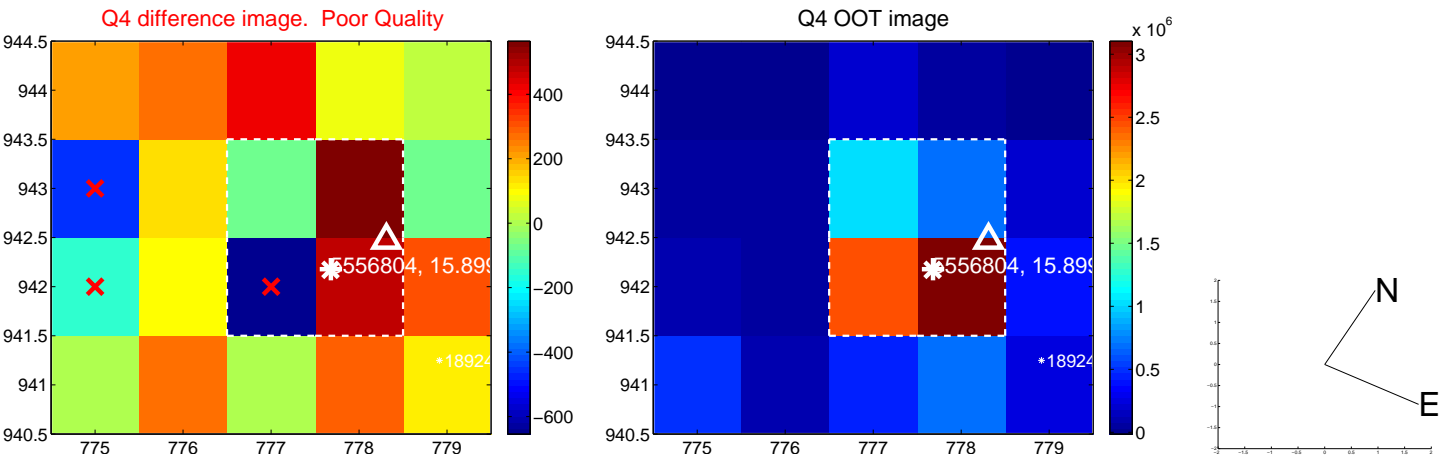
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.618 \pm 0.659$	2.45	$-1.497 \pm 0.701$	$0.612 \pm 0.760$
PRF-fit source offset from KIC position	$1.630 \pm 0.728$	2.24	$-1.540 \pm 0.797$	$0.533 \pm 0.852$
photometric centroid source offset	$1.36 \pm 1.01$	1.35	$-0.18 \pm 1.11$	$-1.35 \pm 1.01$

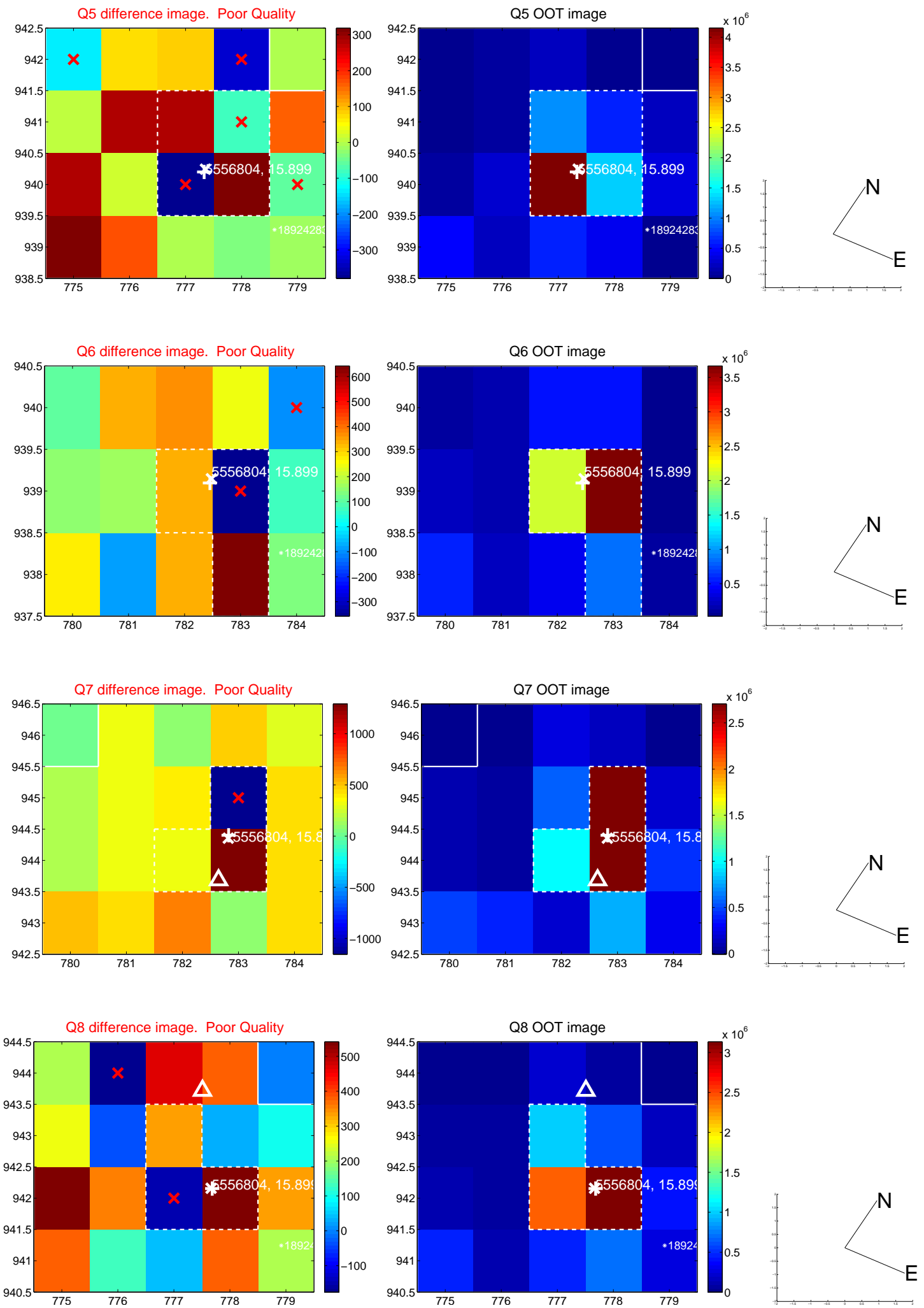


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

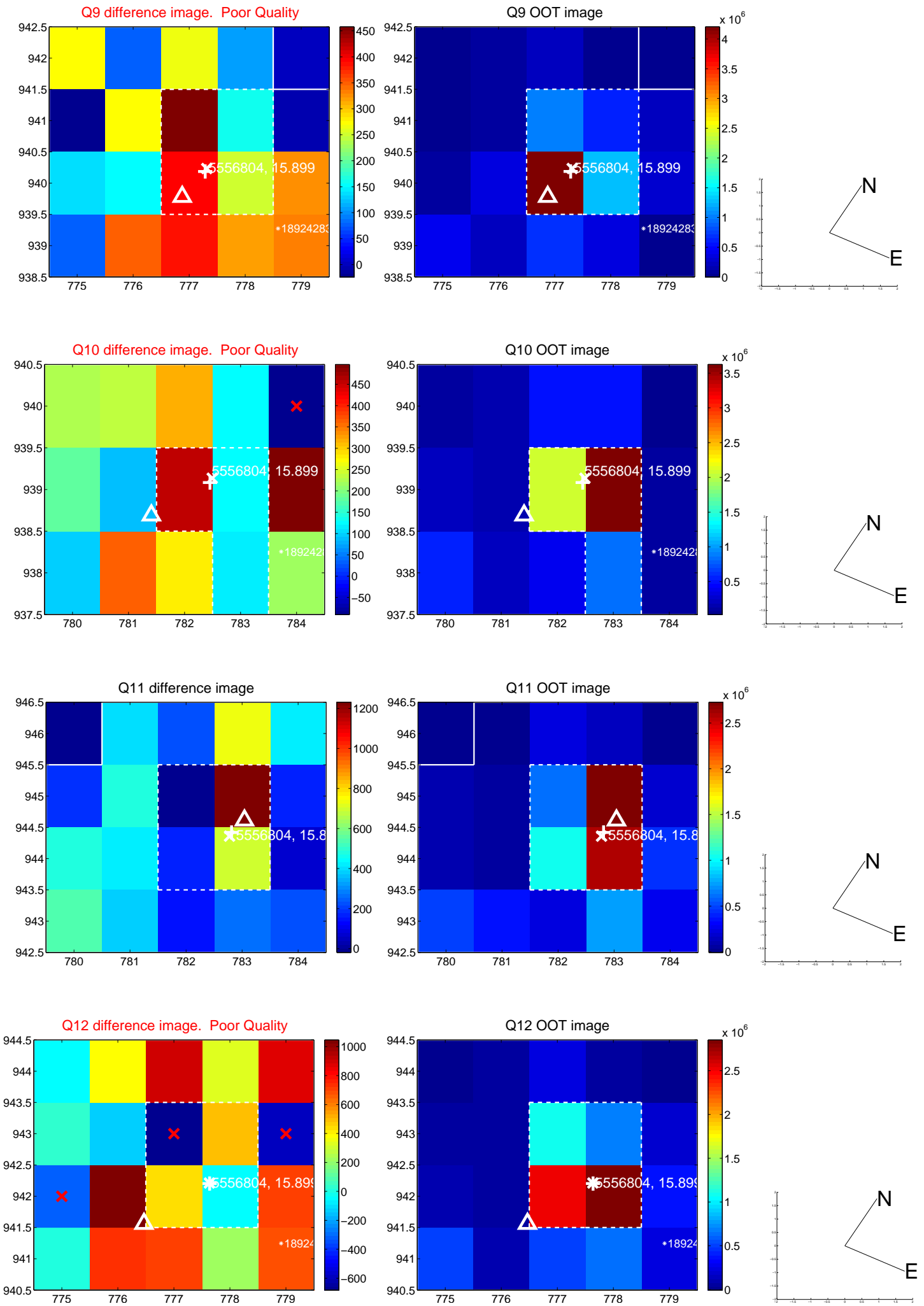


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

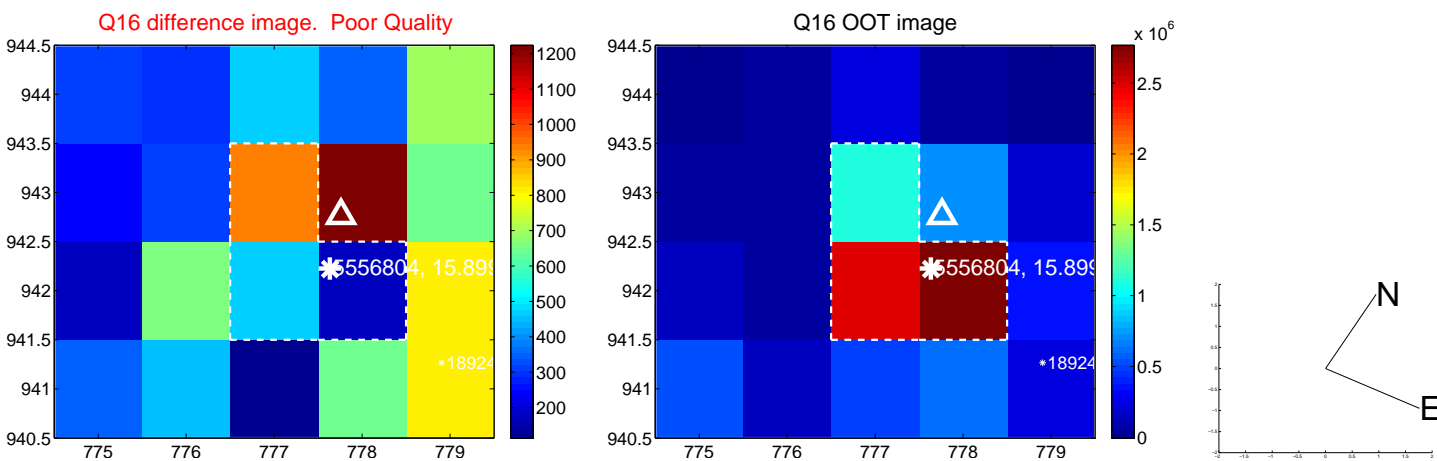
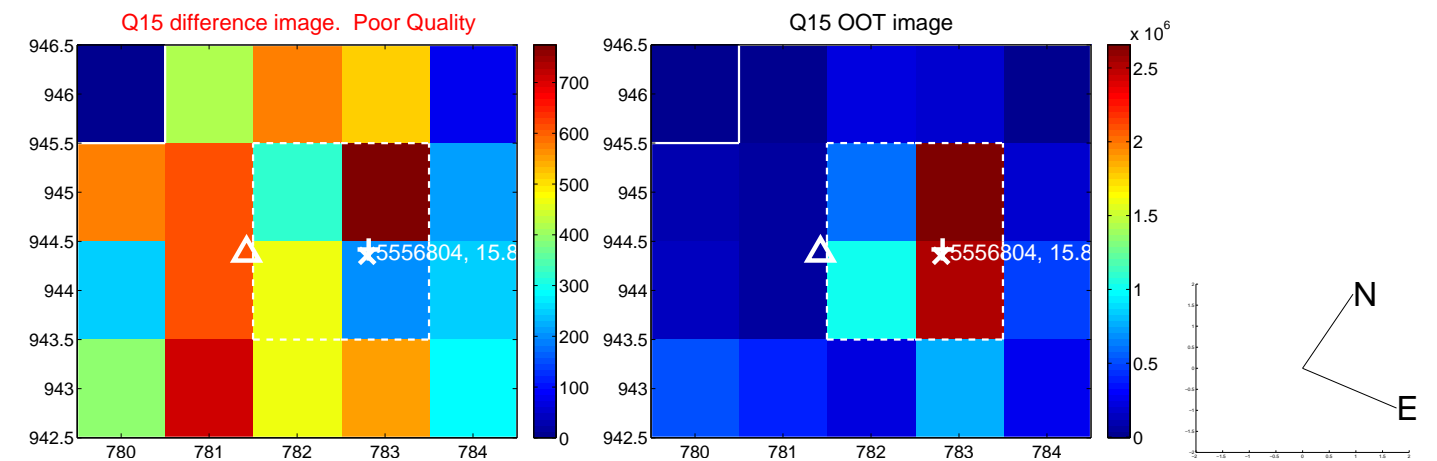
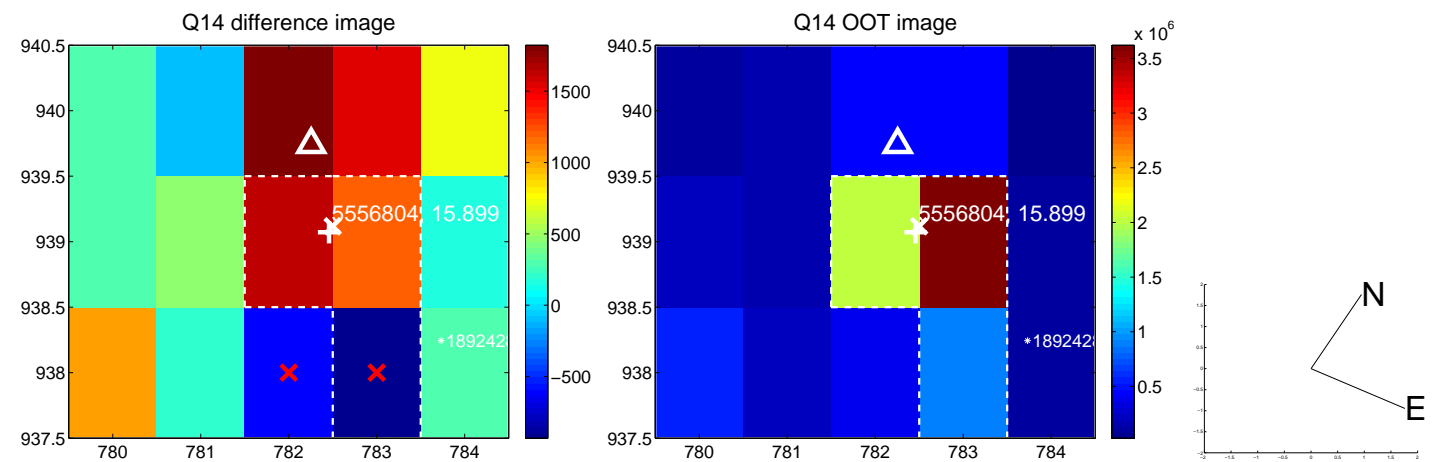
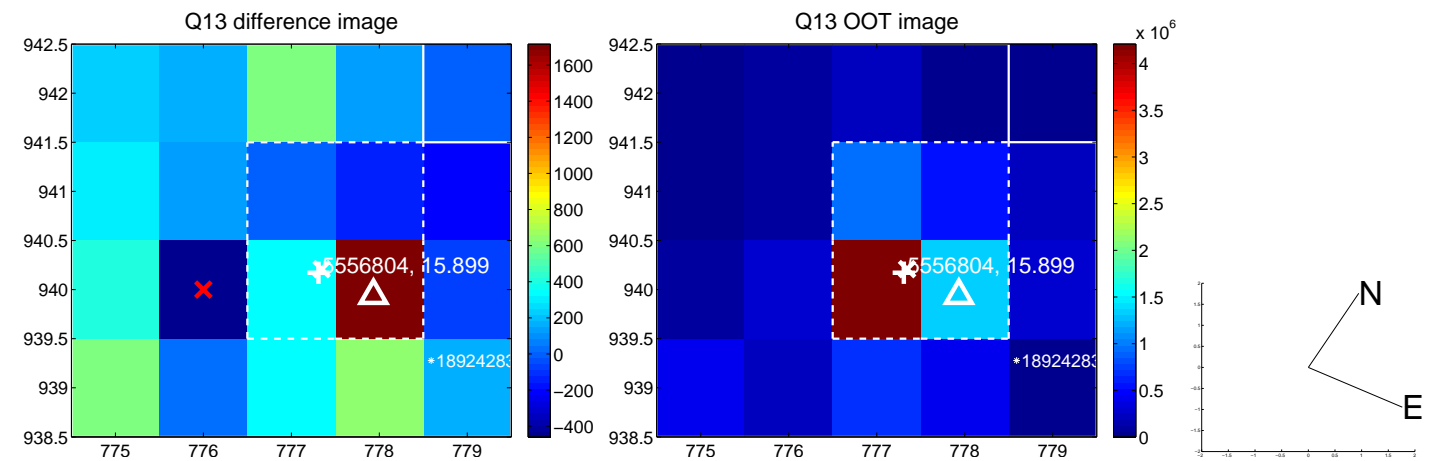




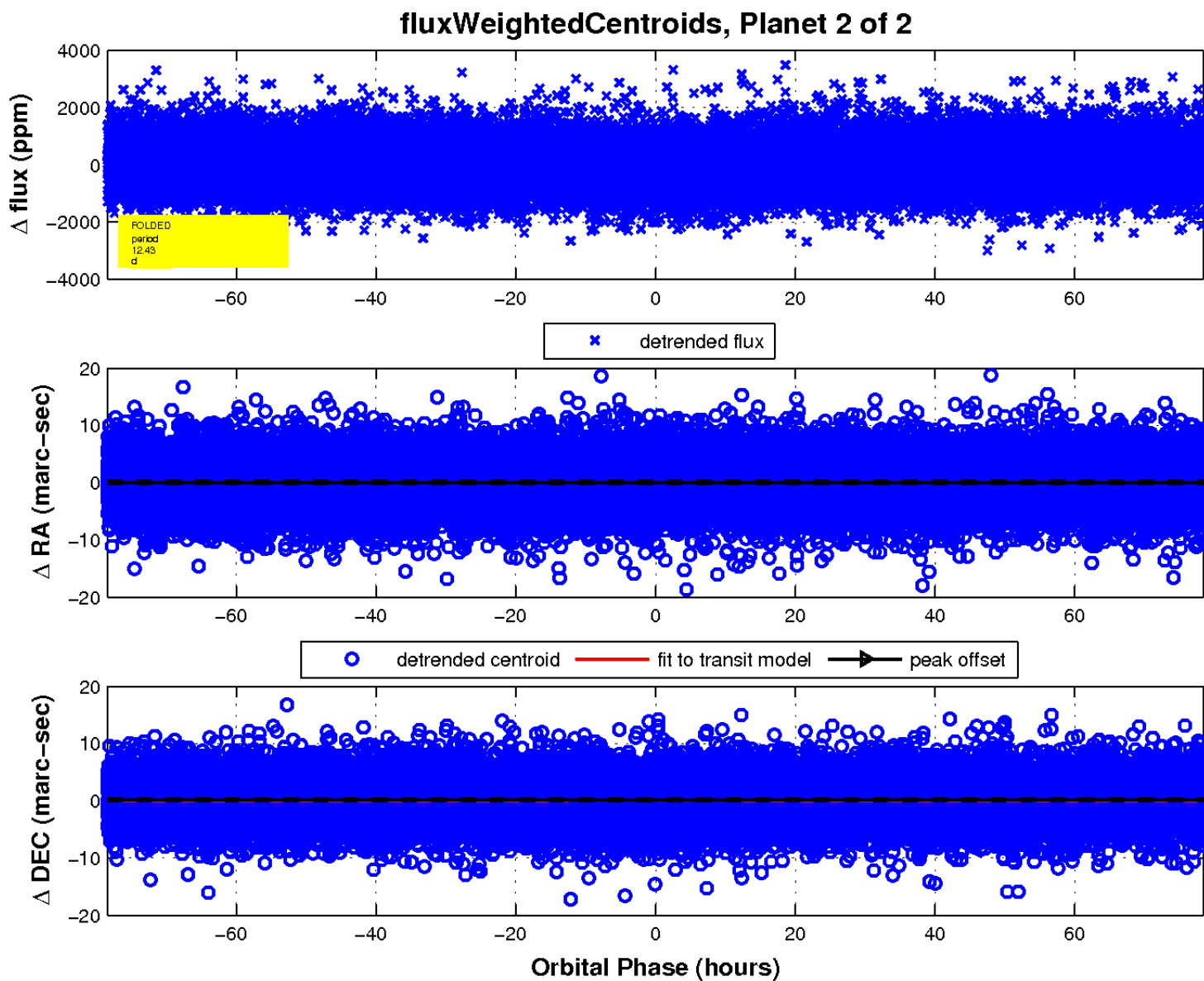
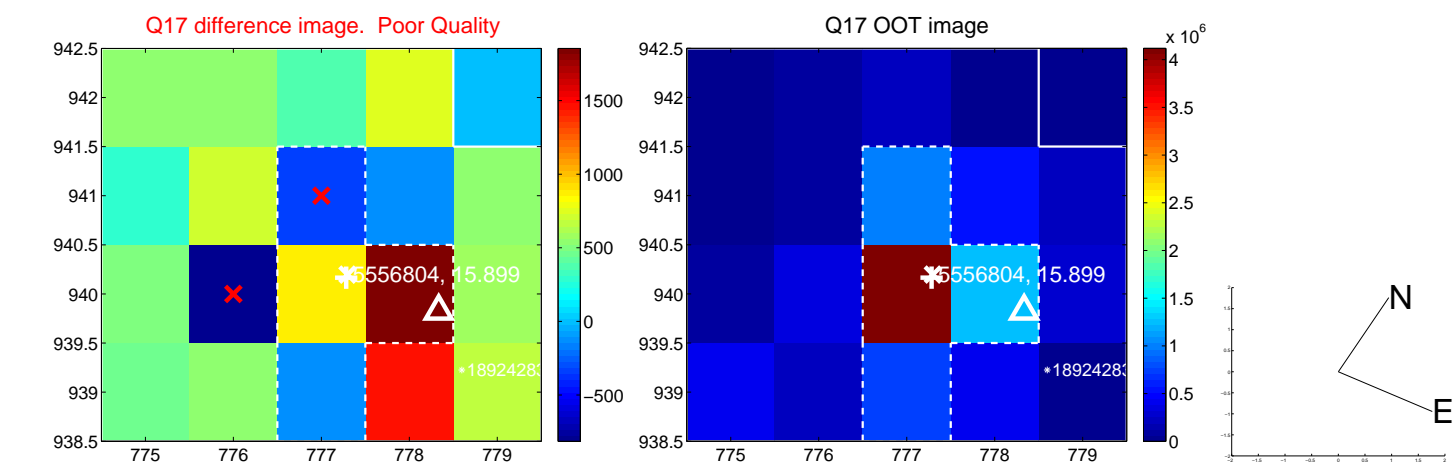
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

