

# KIC 010661778

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R <sub>★</sub> (R <sub>☉</sub> )	T <sub>★</sub> (K)	R <sub>p</sub> (R <sub>⊕</sub> )	S <sub>p</sub> (S <sub>⊕</sub> )
010661778-01	OBS	4118.01	1.231318	131.825373	673.5	3.363	16.8	15.3	1.00	5780	3.09	1977.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010661778-01	OBS	FP	0.00	1	0	0	1	LPP_DV—CENT_FEW_DIFFS—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 010661778-01

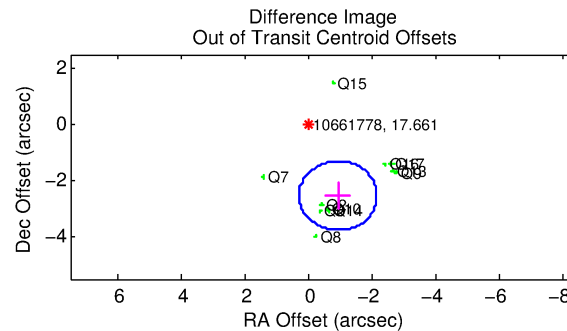
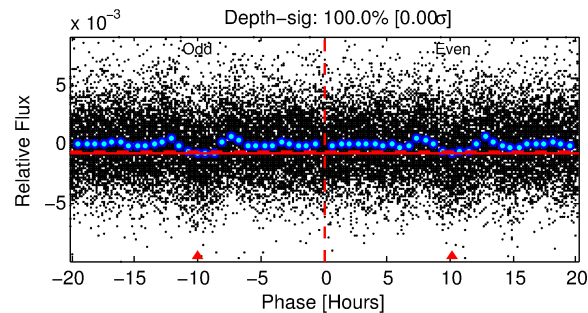
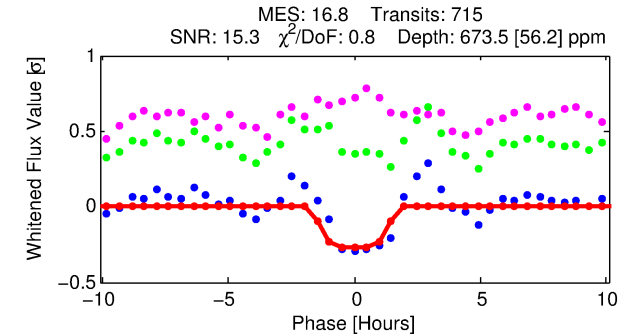
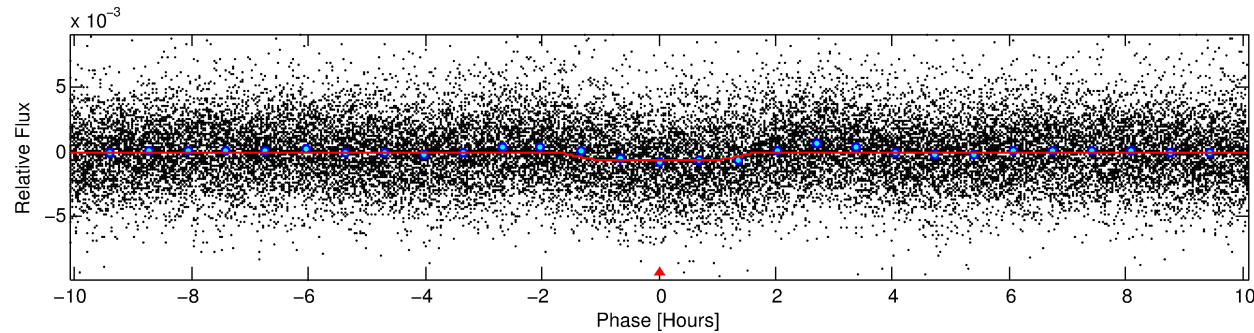
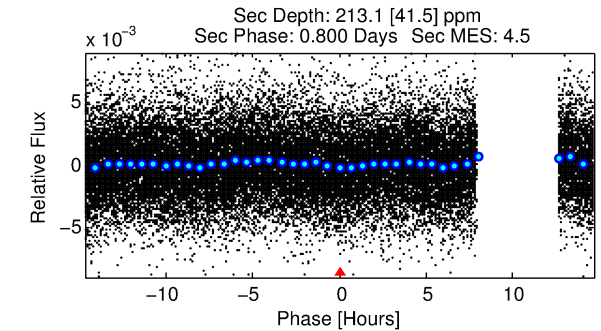
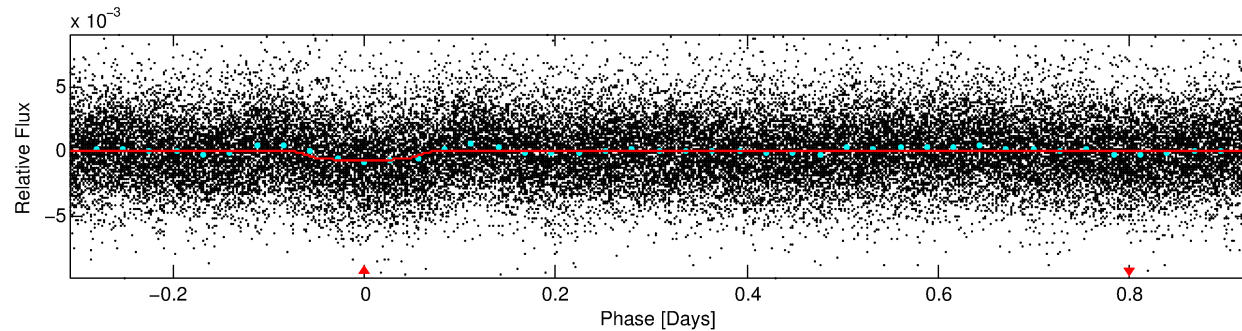
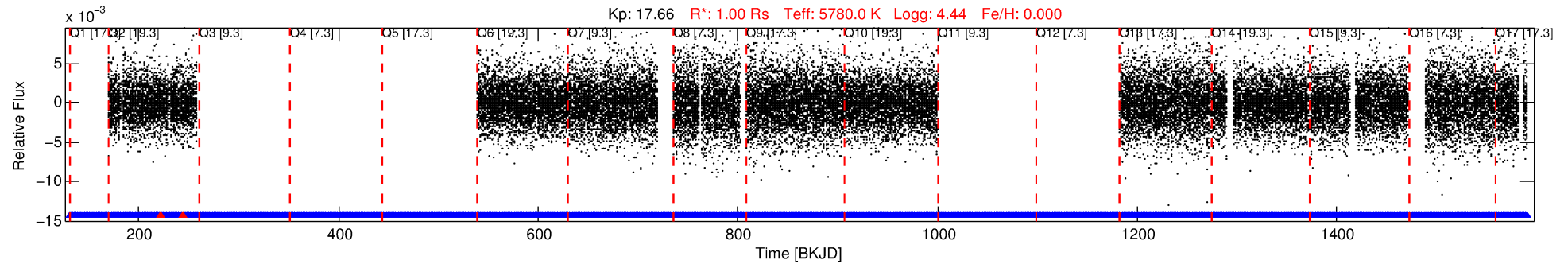
TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist (″)	ΔRow	ΔCol	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	σ <sub>P</sub>	σ <sub>T</sub>
010661778-01	10661778	010661783-pri	10661783	1:1	42.6	-10	5	9.59	17.67	323.15	Direct-PRF	0	3.13	1.39

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's. σ<sub>P</sub> and σ<sub>T</sub> are the significance of the match in period and epoch. For a match to be considered significant σ<sub>P</sub> < 5.0 and σ<sub>T</sub> < 5.0. Matches which have σ<sub>P</sub> and σ<sub>T</sub> very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 10661778 Candidate: 1 of 1 Period: 1.231 d

KOI: K04118.01 Corr: 0.764



## DV Fit Results:

Period = 1.23132 [0.00001] d  
Epoch = 131.8254 [0.0029] BKJD  
Rp/R\* = 0.0283 [0.0044]  
a/R\* = 1.68 [0.74]  
b = 0.90 [0.15]  
Seff = 1977.48 [0.02]  
Teff = 1700 [0] K  
Rp = 3.09 [0.48] Re  
a = 0.0225 [0.0000] AU  
Ag = 6.21 [2.28] [2.29 $\sigma$ ]  
Teffp = 4151 [380] K [6.45 $\sigma$ ]

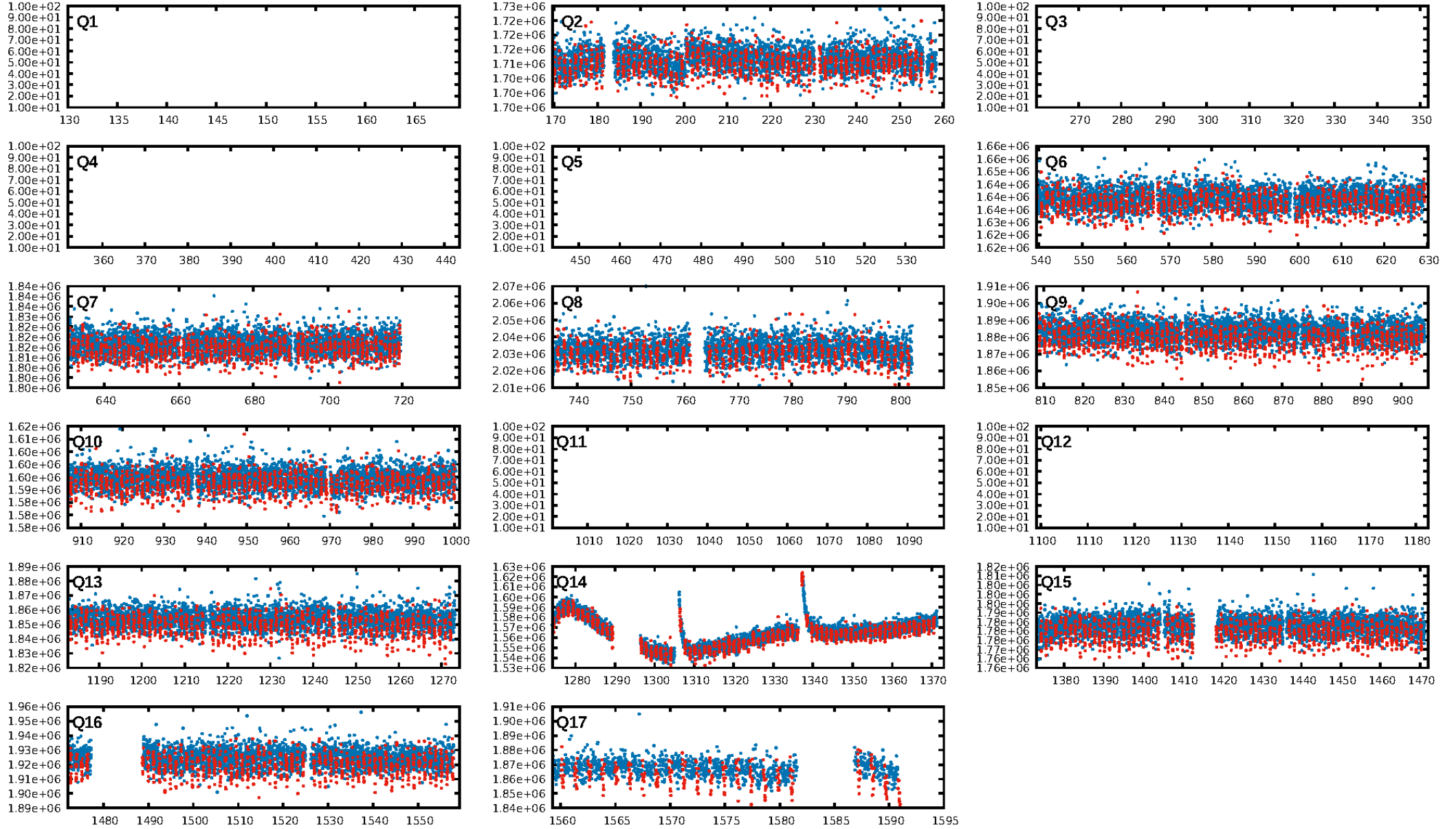
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.42e-59  
RollingBand-fgt: 1.00 [691/693]  
GhostDiagnostic-chr: 0.3947  
Centroid-sig: 0.0%  
Centroid-so: 3.765 arcsec [4.48 $\sigma$ ]  
OotOffset-rm: 2.697 arcsec [6.59 $\sigma$ ]  
KicOffset-rm: 2.933 arcsec [8.76 $\sigma$ ]  
OotOffset-st: 4/2/2/3 [11]  
KicOffset-st: 4/2/2/3 [11]  
DiffImageQuality-fgm: 0.00 [0/11]  
DiffImageOverlap-fno: 1.00 [11/11]

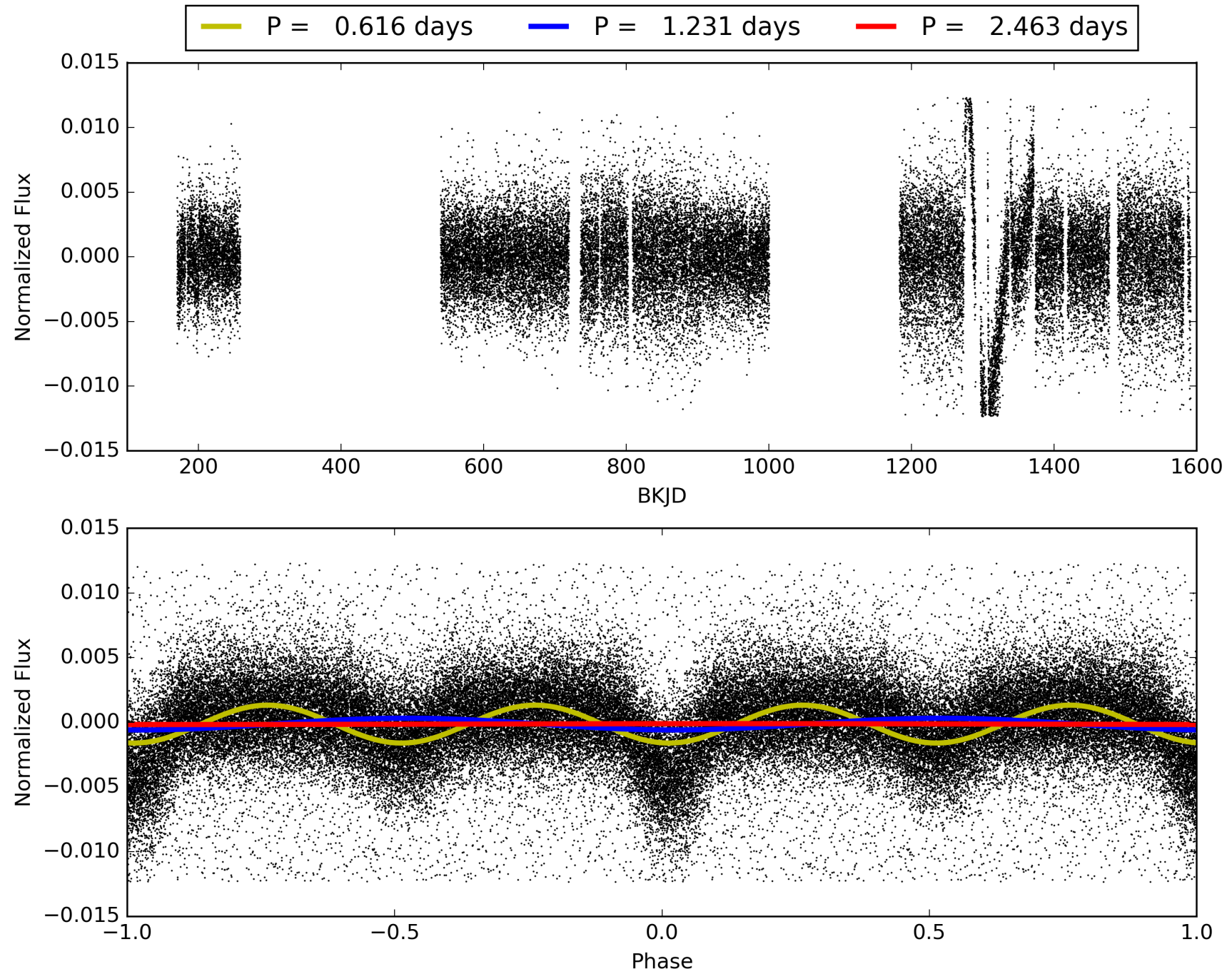
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:45:31 Z

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

# TCE 010661778-01, PDC Light Curves



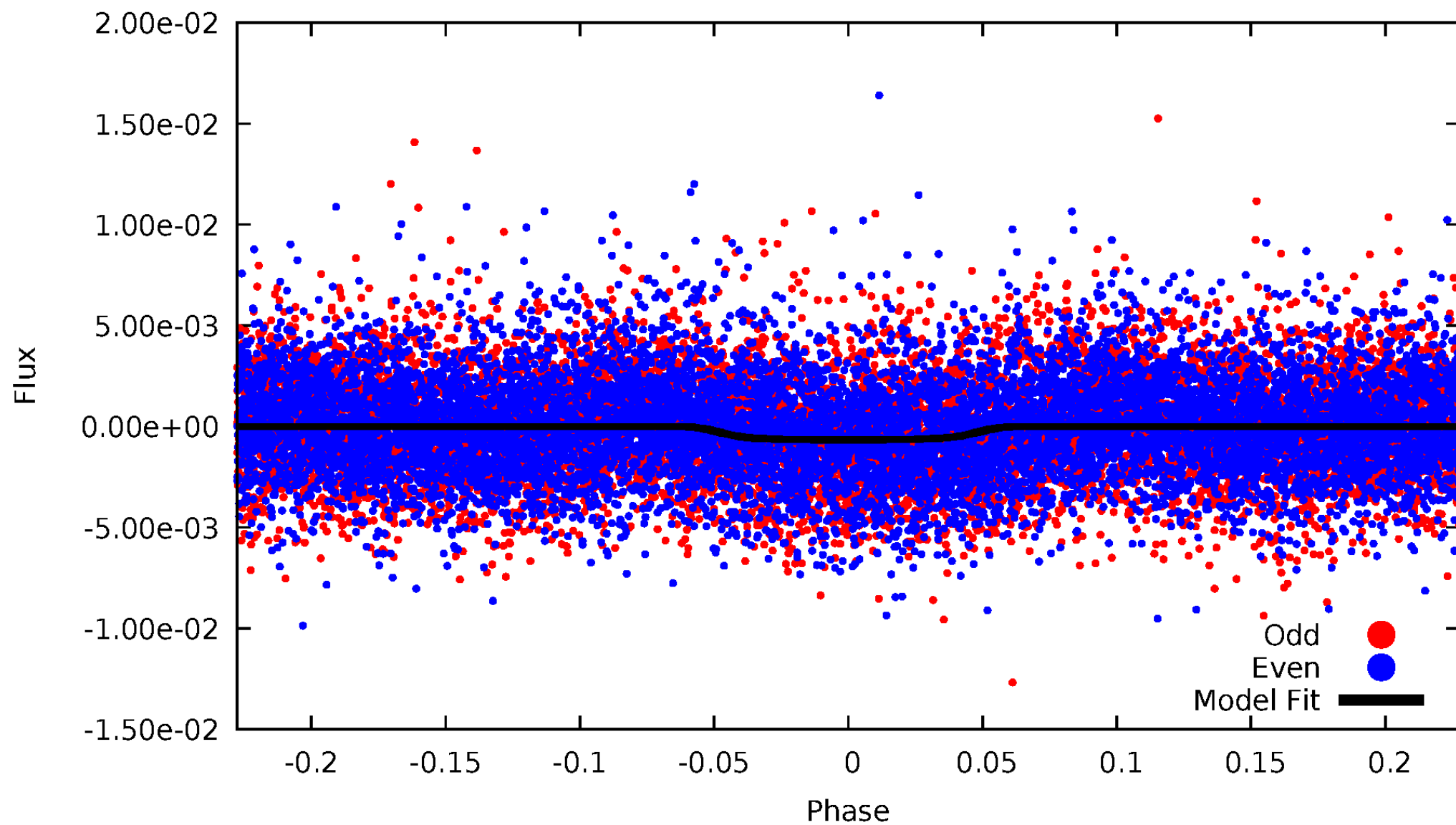
TCE 010661778-01





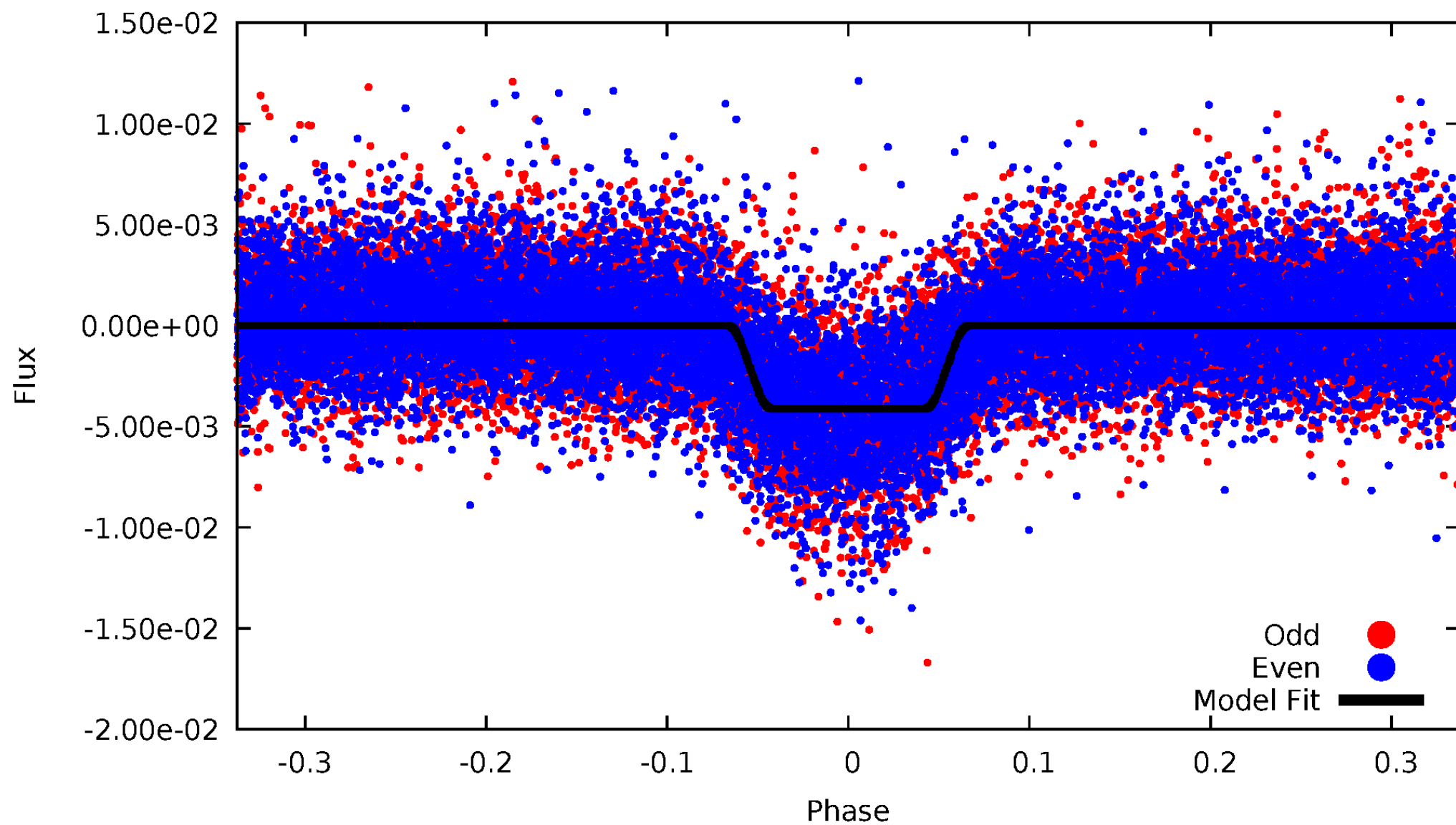
# DV Odd/Even

TCE 010661778-01



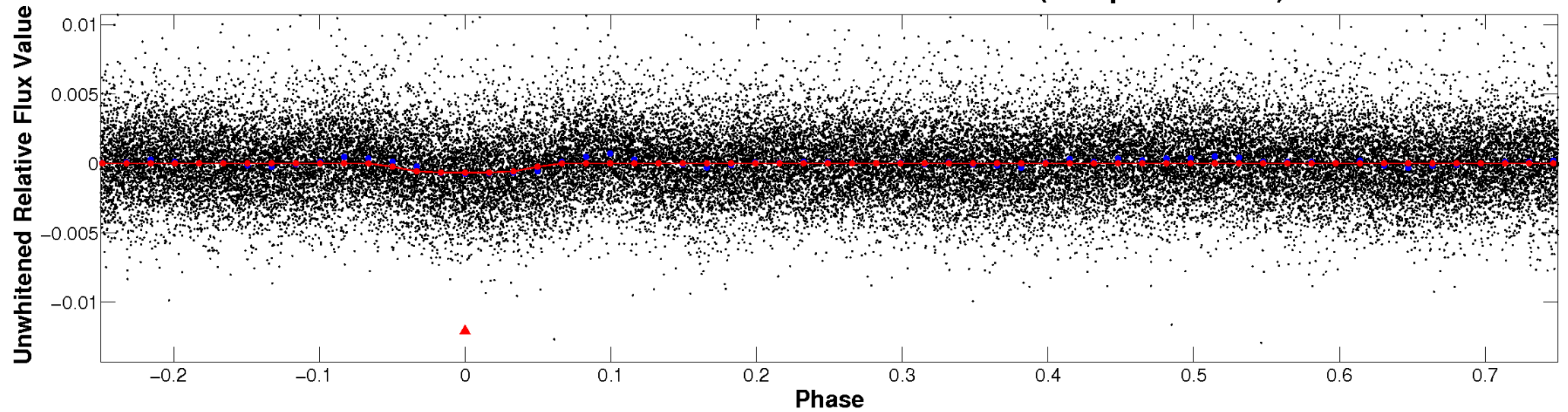
# ALT Odd/Even

TCE 010661778-01

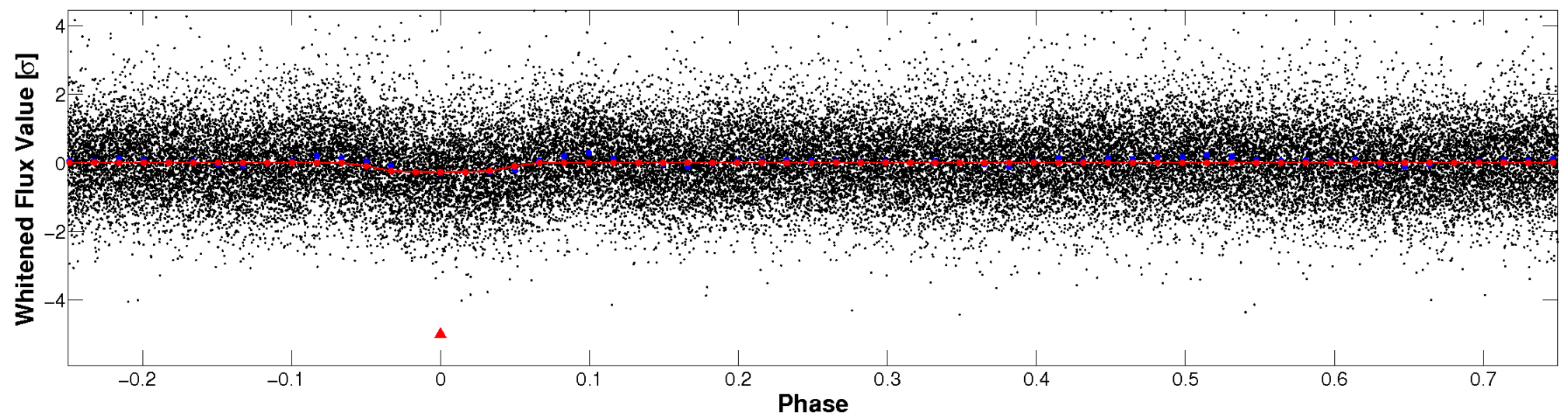


# Non-Whitened Vs. Whitened Light Curve

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

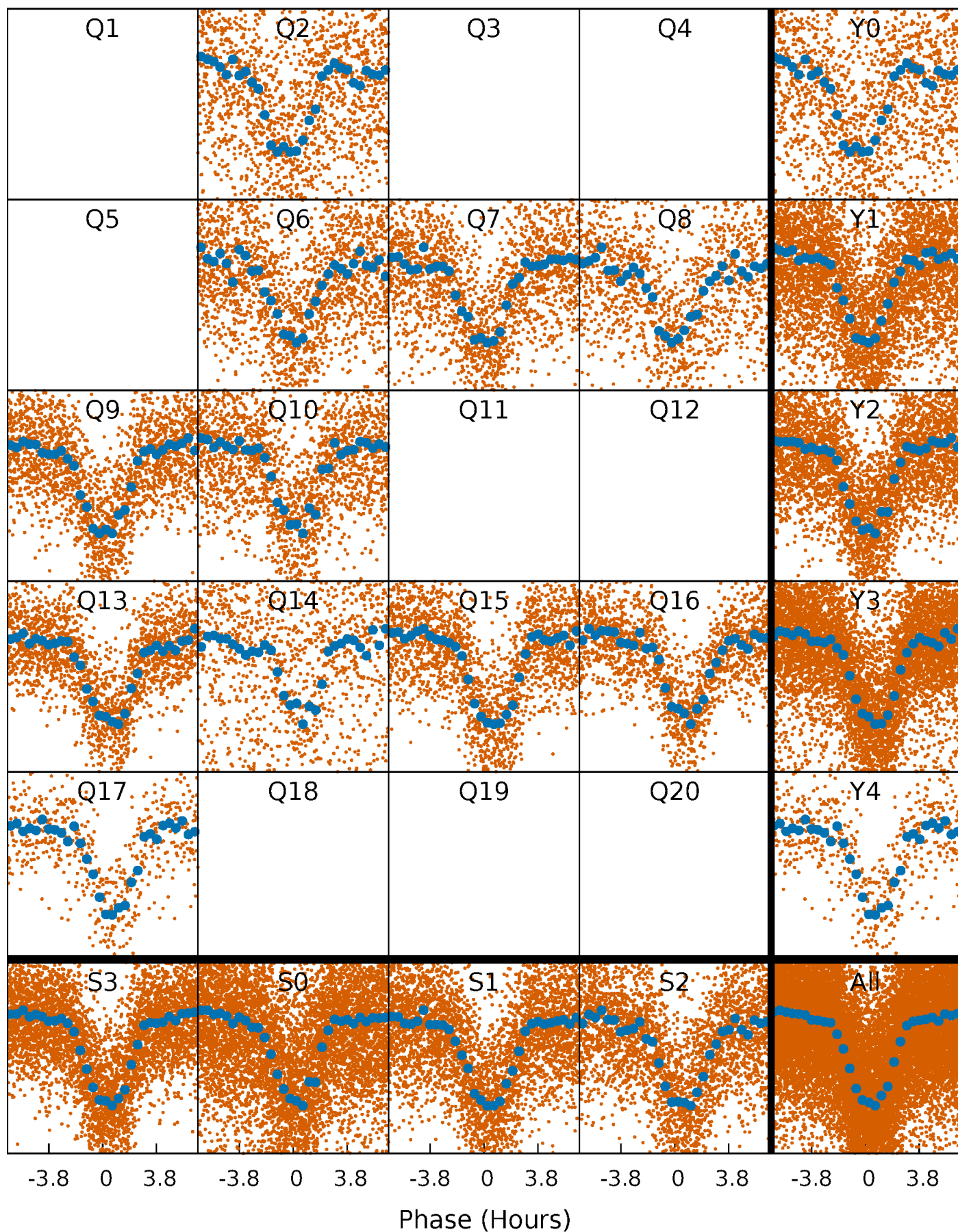


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

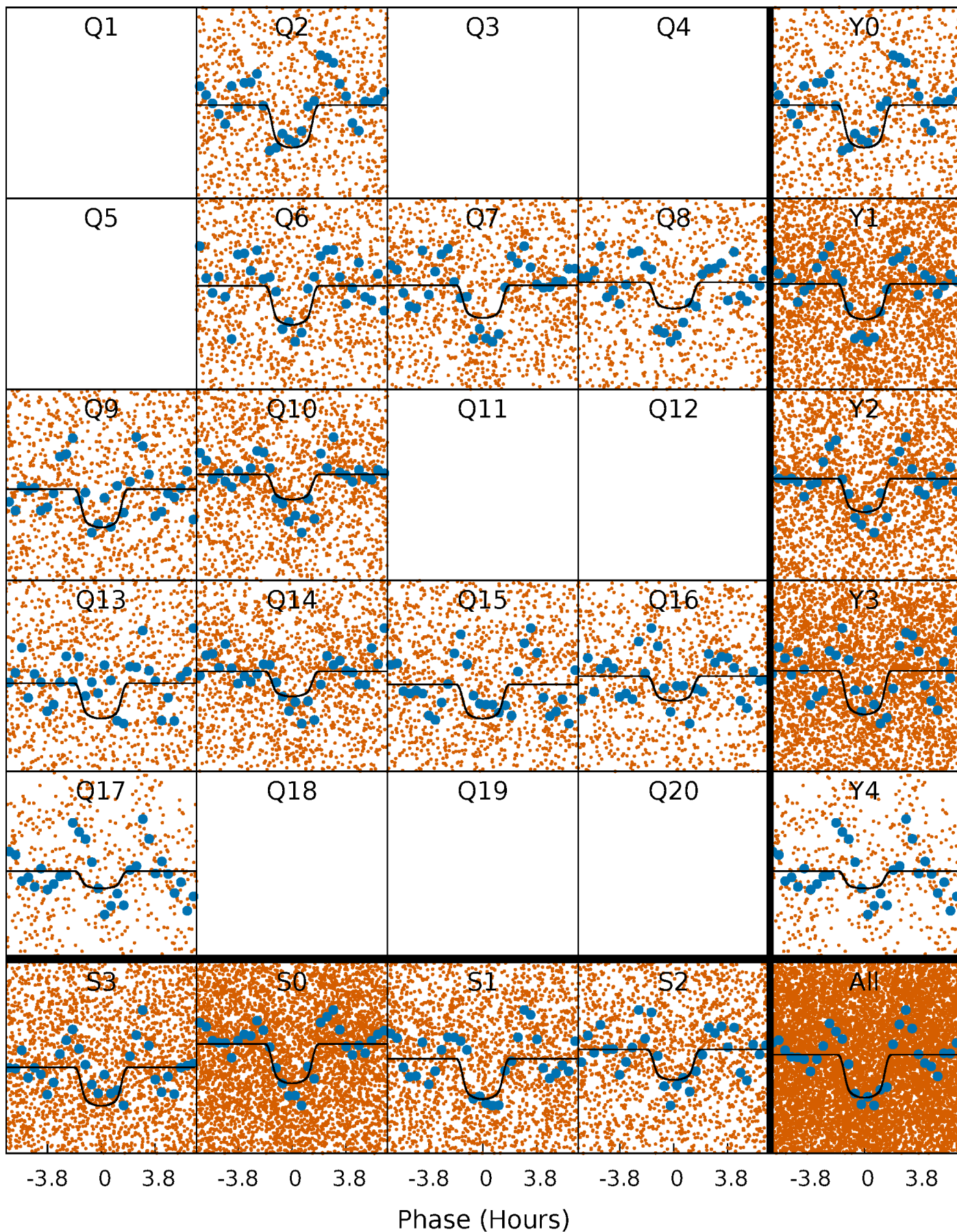
TCE 010661778-01 P= 1.231318 Days  $T_0=131.825373$  (BKJD)





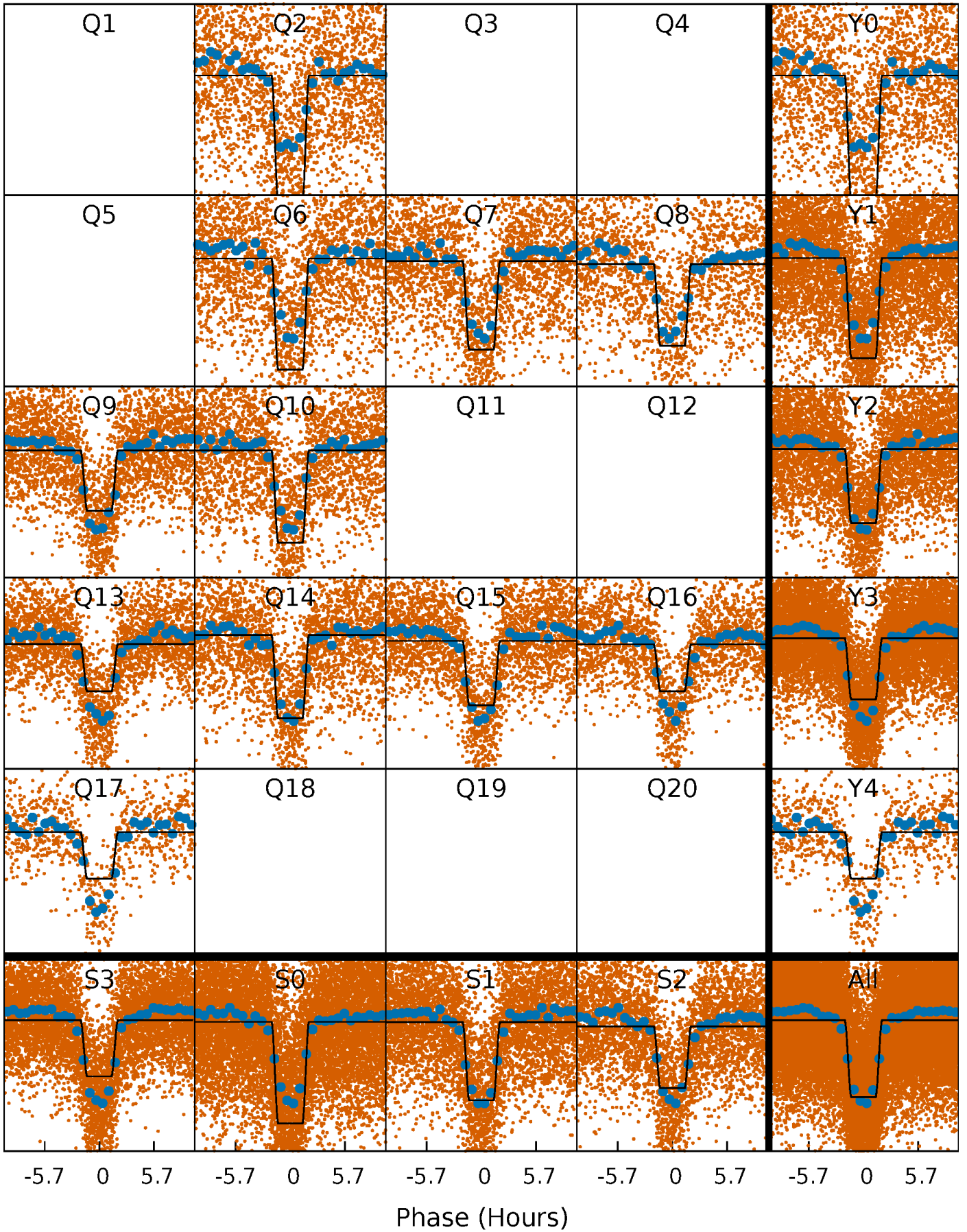
# DV Quarter-Phased Transit Curves

TCE 010661778-01 P= 1.231318 Days  $T_0=131.825373$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

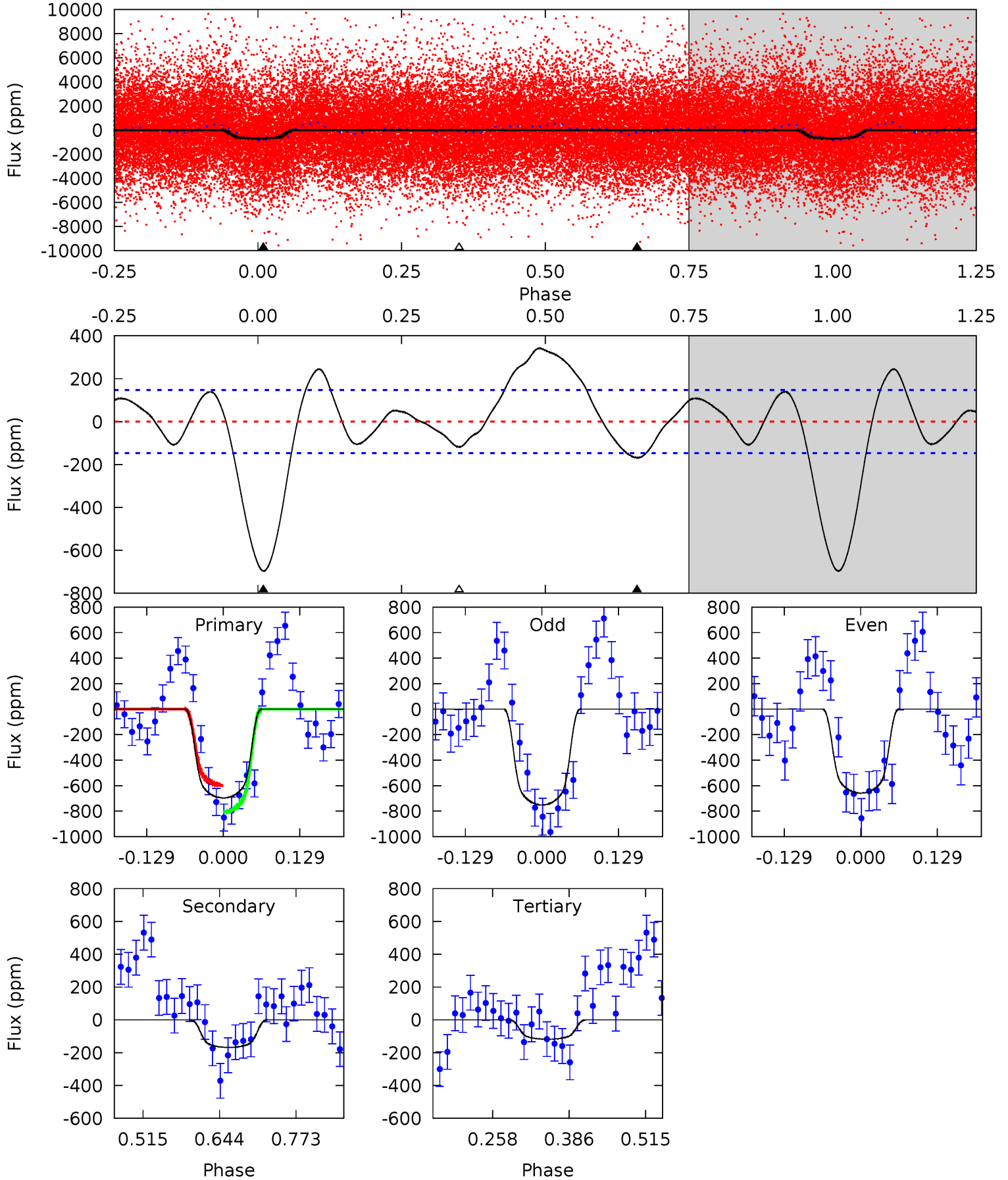
TCE 010661778-01 P= 1.231359 Days  $T_0=131.809557$  (BKJD)



# DV Model-Shift Uniqueness Test

010661778-01, P = 1.231318 Days, E = 131.825373 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
21.3	5.16	3.62	0	4.51	1.52	4.25	17.7	21.3	1.54	5.16	1.43	0.89	0.33	3.21

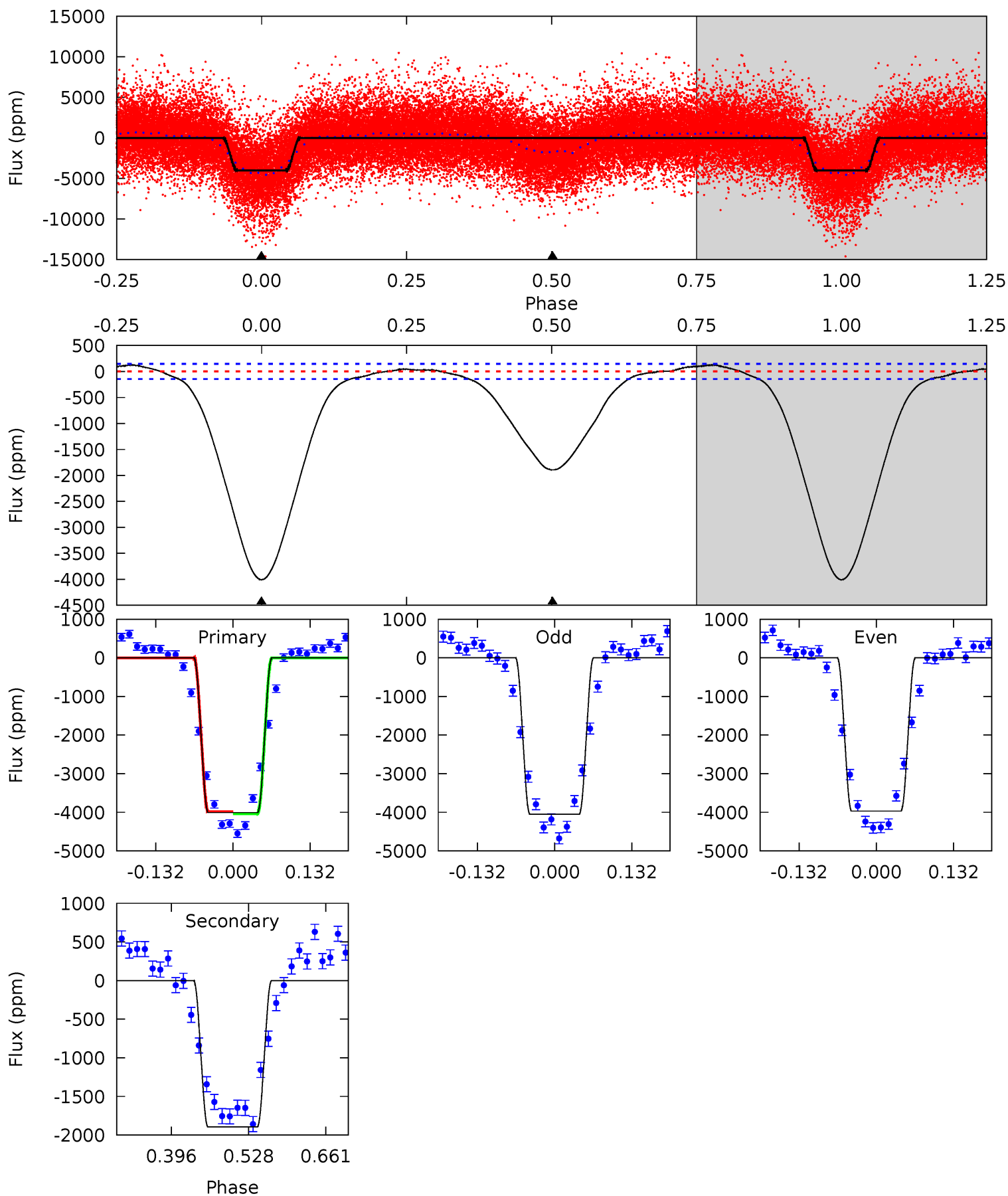




# Alt Model-Shift Uniqueness Test

010661778-01, P = 1.231359 Days, E = 131.809557 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
124.8	59.0	0	0	4.51	1.51	2.67	124.8	124.8	59.0	59.0	1.24	1.06	0.03	0.79





### Stellar Parameters For KIC 010661778

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5780^{+1}_{-1}$	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

### Secondary Eclipse Parameters for KIC 010661778-01 / KOI 4118.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-168 \pm 33$	$3.06^{+0.57}_{-0.49}$	$2380^{+117}_{-109}$	$4133^{+368}_{-285}$	$4.969^{+2.555}_{-1.633}$
Alt.	$-1894 \pm 32$	$7.00^{+0.74}_{-0.71}$	$2379^{+111}_{-122}$	$4842^{+219}_{-211}$	$11^{+3}_{-2}$

$T_{\text{max}}$  = 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

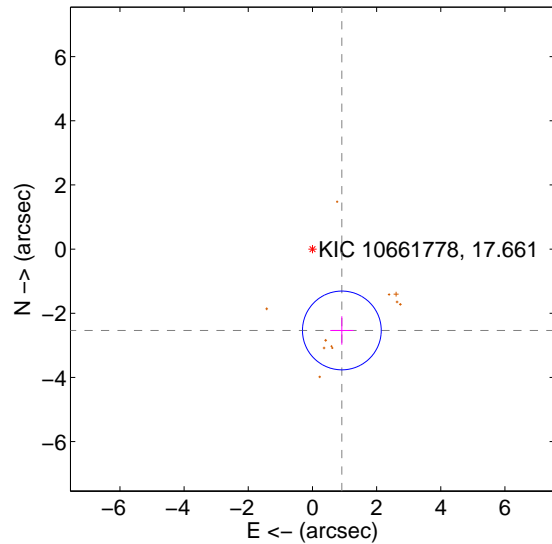
Supplemental centroid analysis for 010661778-01. Kepler magnitude: 17.66. Transit SNR 15.30

There are 0 quarters with good PRF difference image offsets

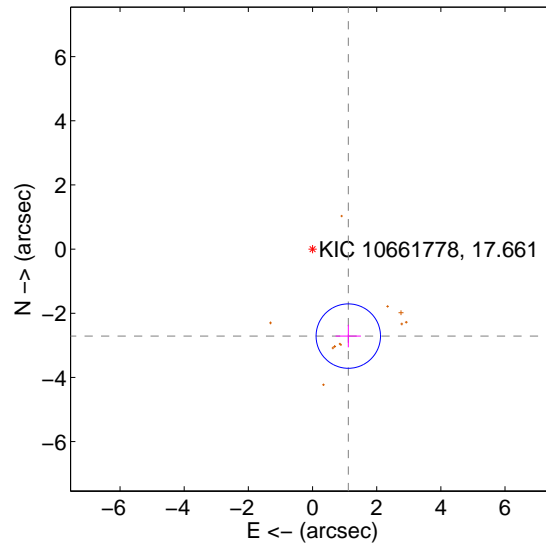
The direct PRF centroid is offset from the target star catalog position by about 0.60 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.697 \pm 0.409$	6.59	$-0.917 \pm 0.362$	$-2.537 \pm 0.442$
PRF-fit source offset from KIC position	$2.933 \pm 0.335$	8.76	$-1.115 \pm 0.394$	$-2.712 \pm 0.351$
photometric centroid source offset	$3.76 \pm 0.84$	4.48	$1.17 \pm 0.96$	$-3.58 \pm 0.83$

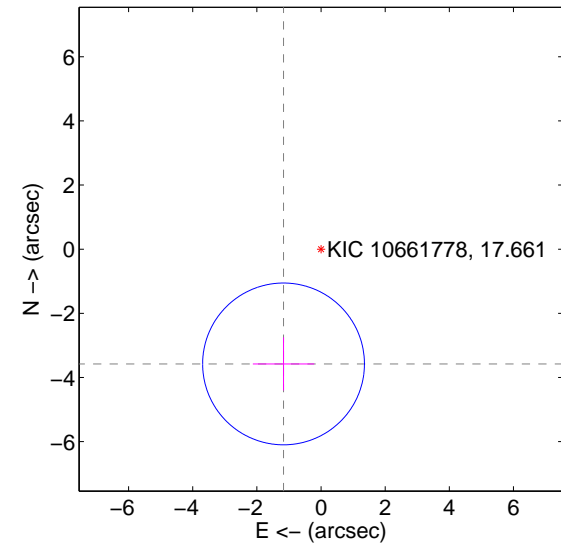
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

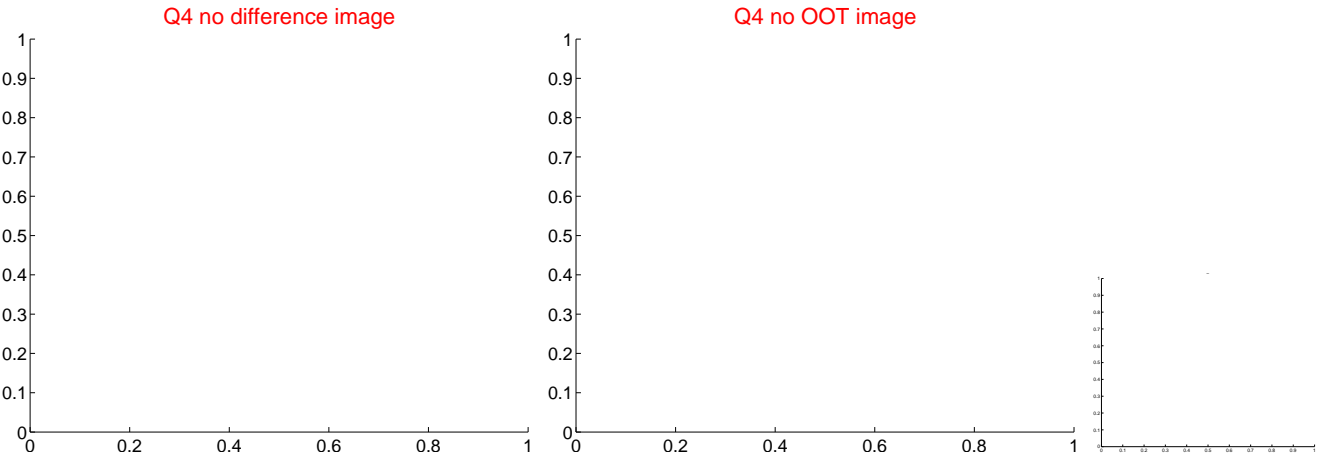
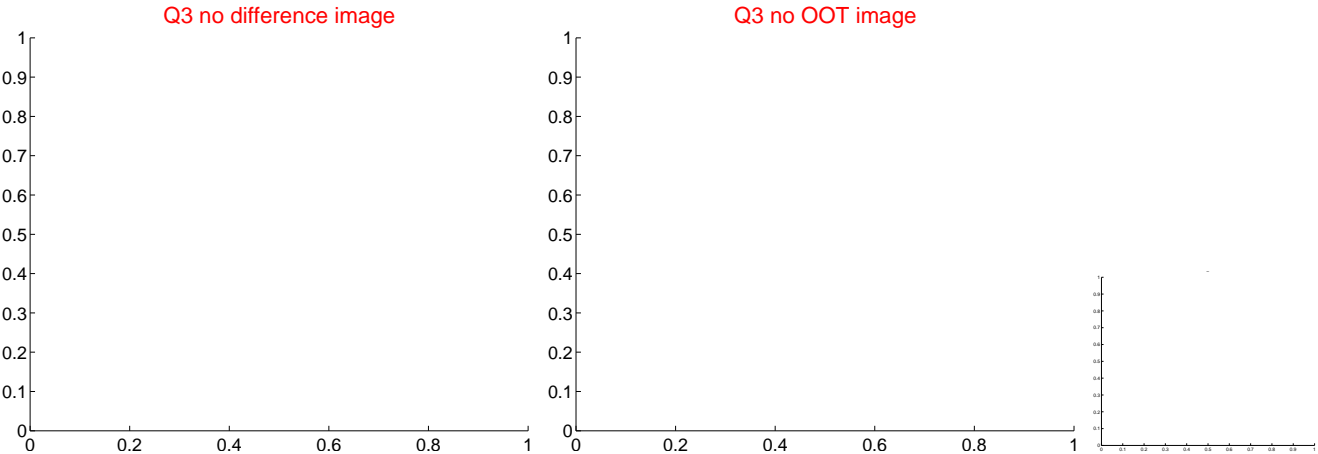
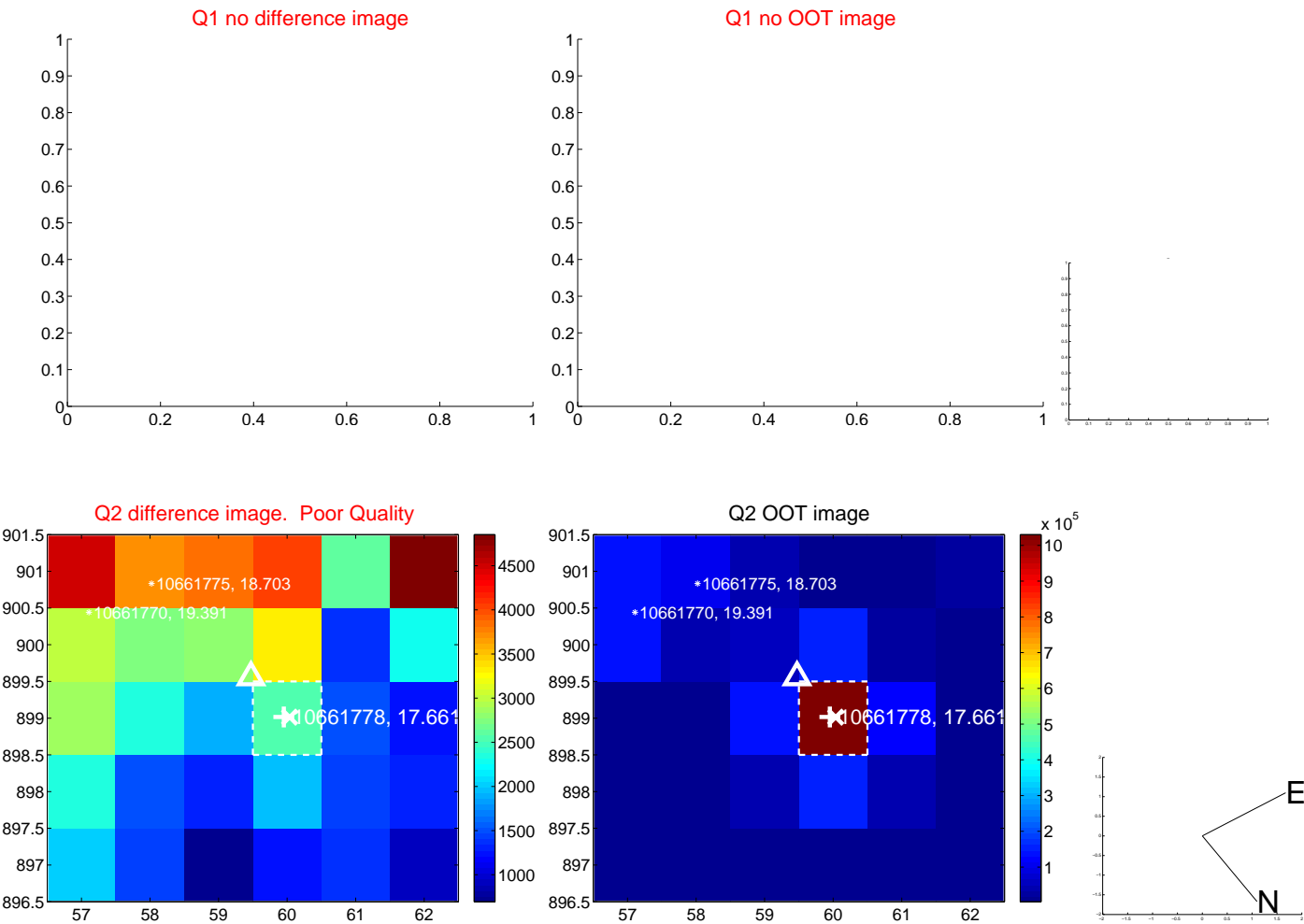


offset from photometric centroids

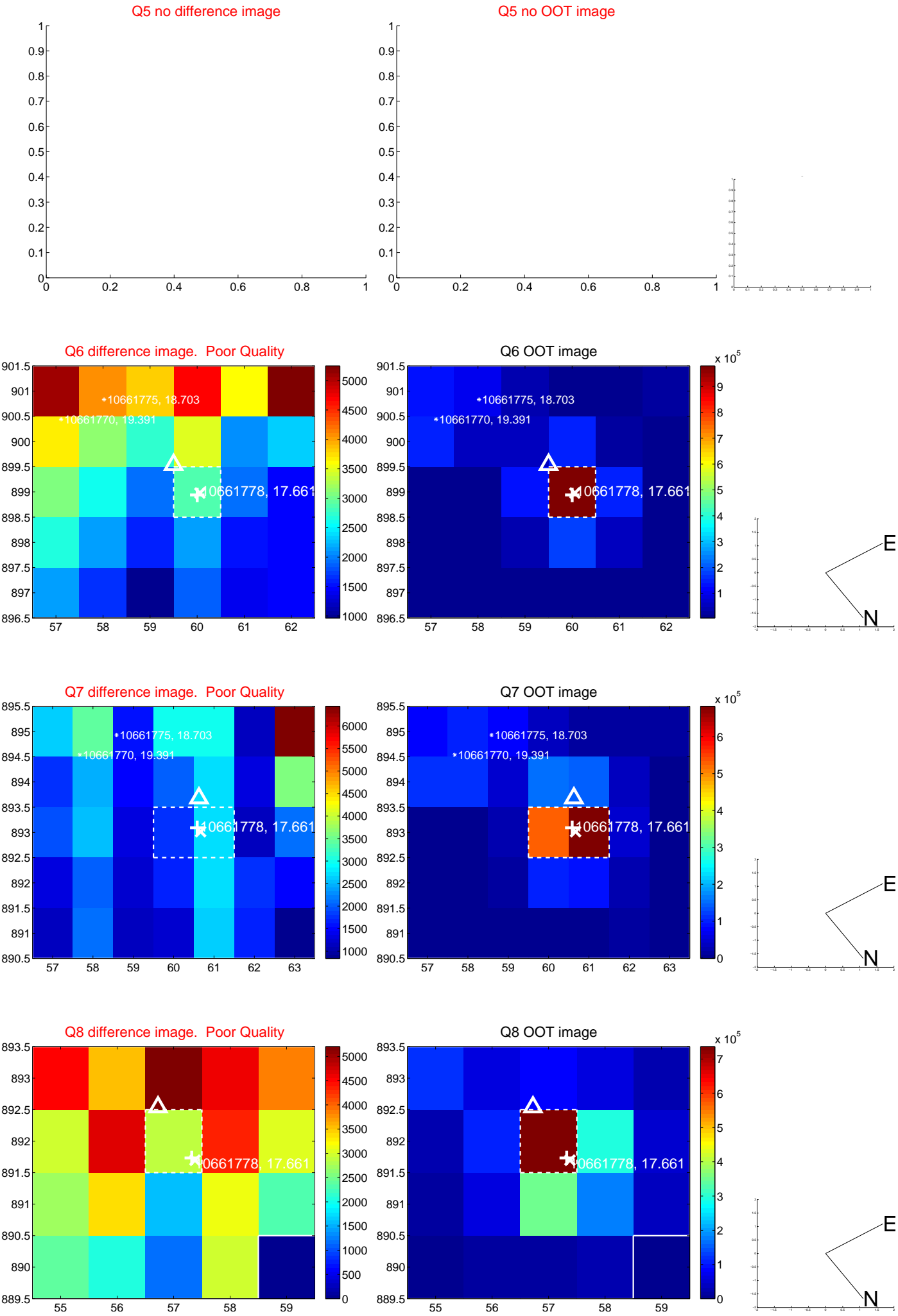


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

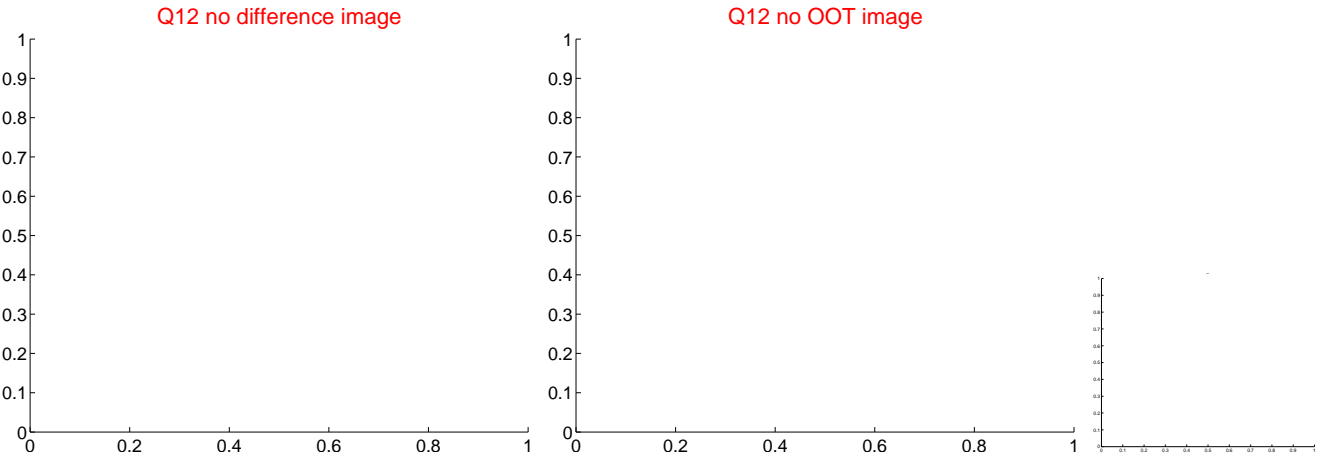
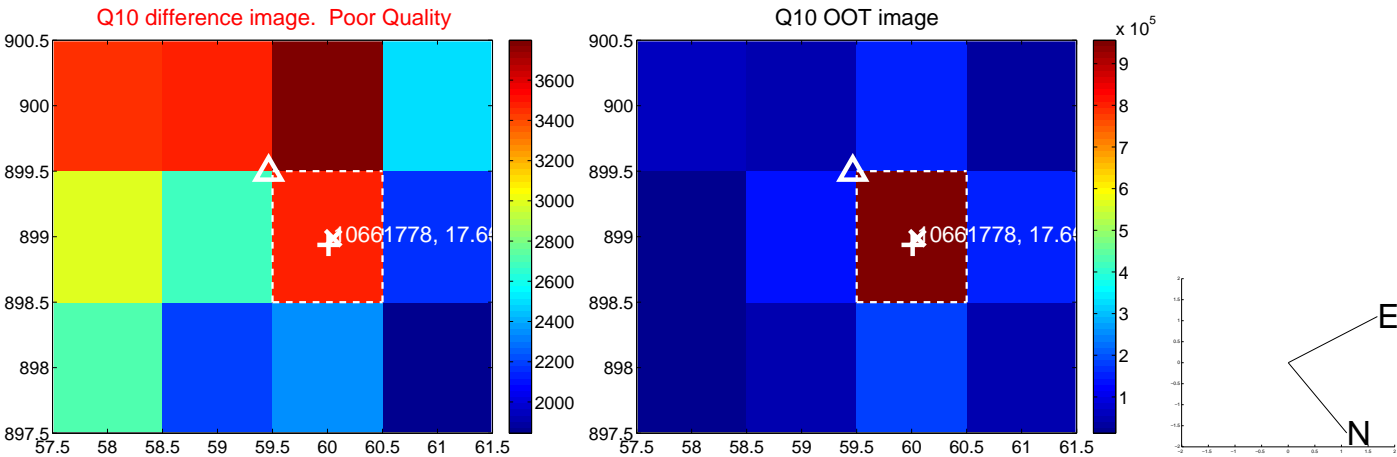
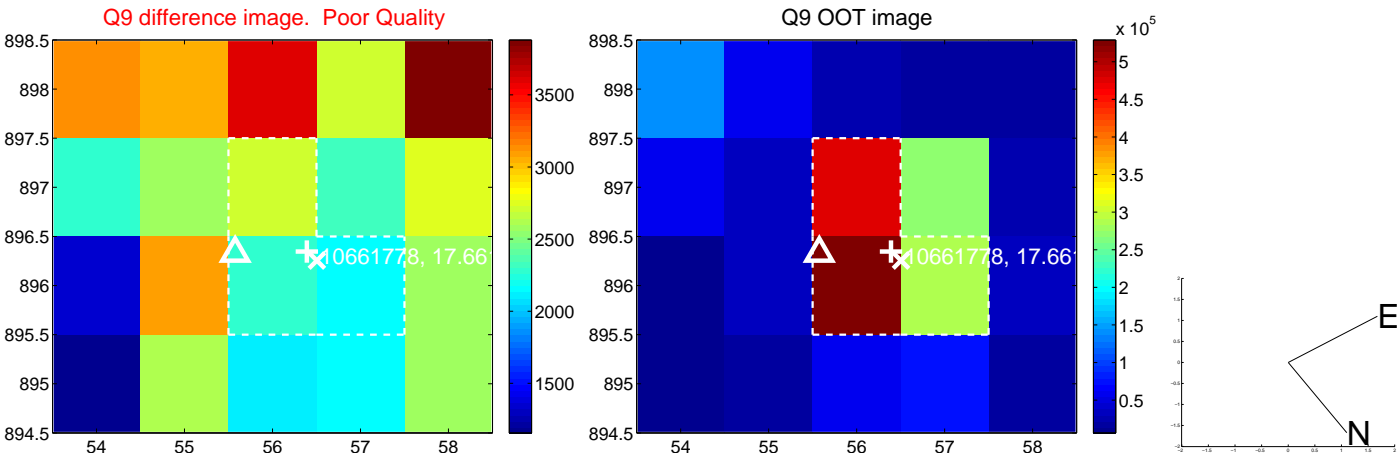


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



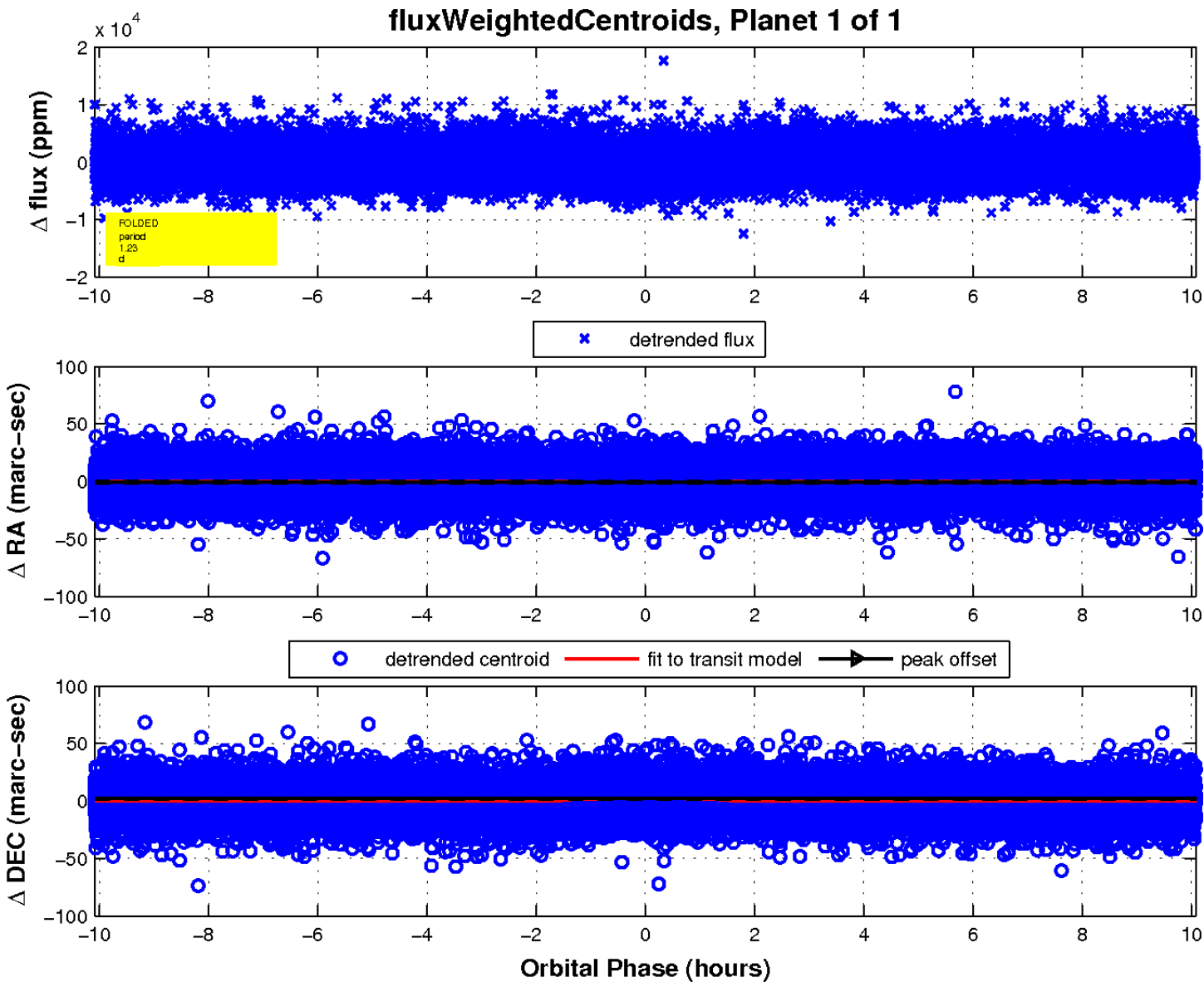
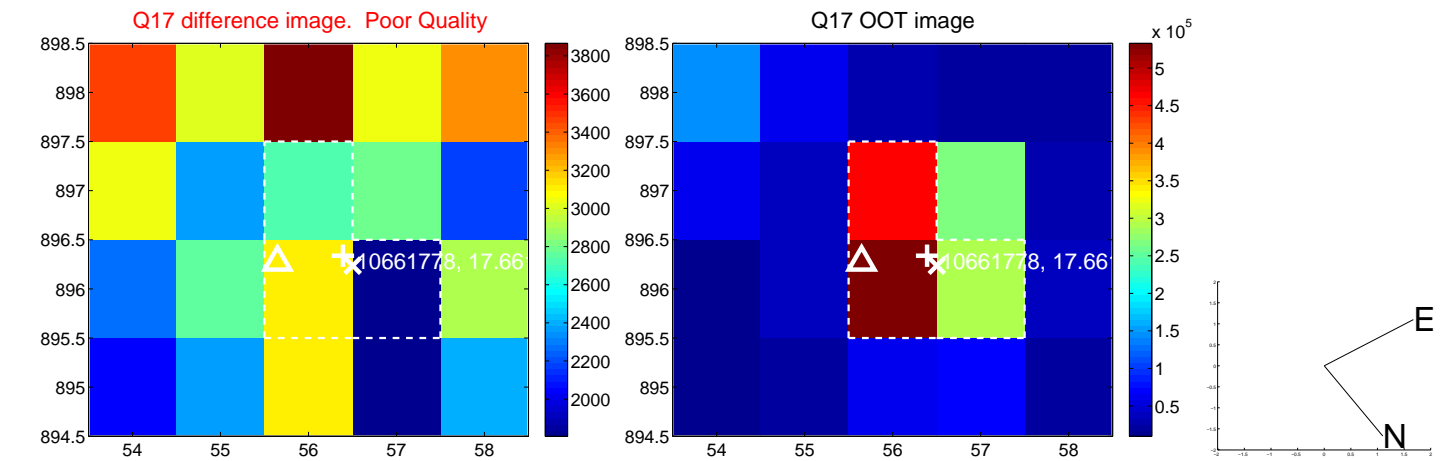


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

