

# KIC 010661718

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010661718-01	OBS	3931.01	1.231309	131.831794	112.2	3.485	25.1	21.4	1.02	6095	1.26	2709.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010661718-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_ALT—CENT_RESOLVED_OFFSET—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 010661718-01

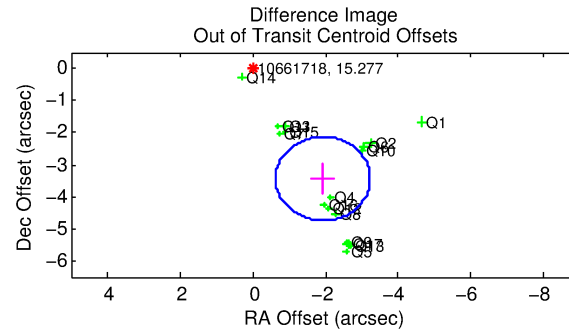
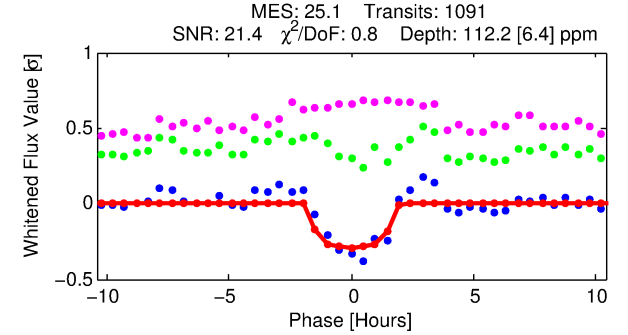
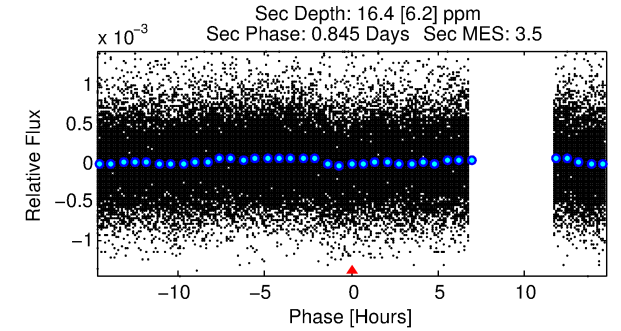
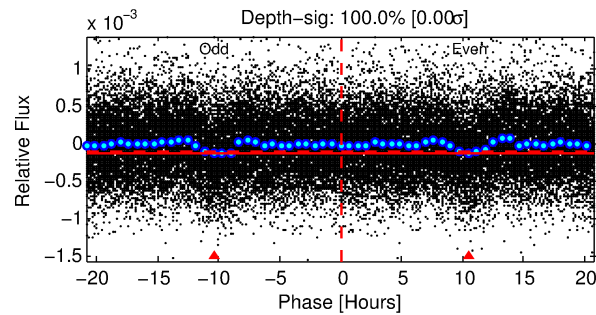
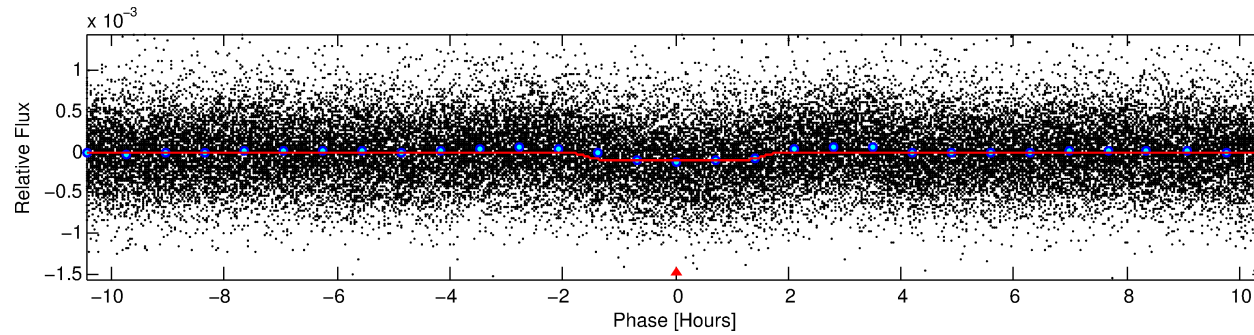
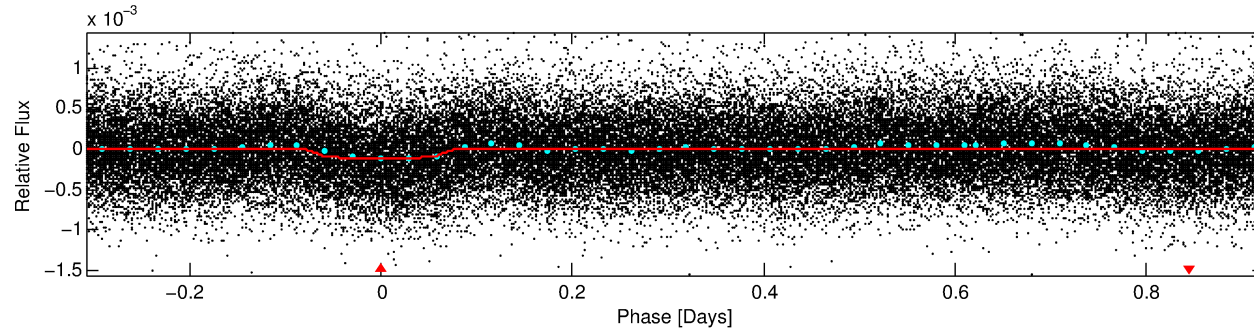
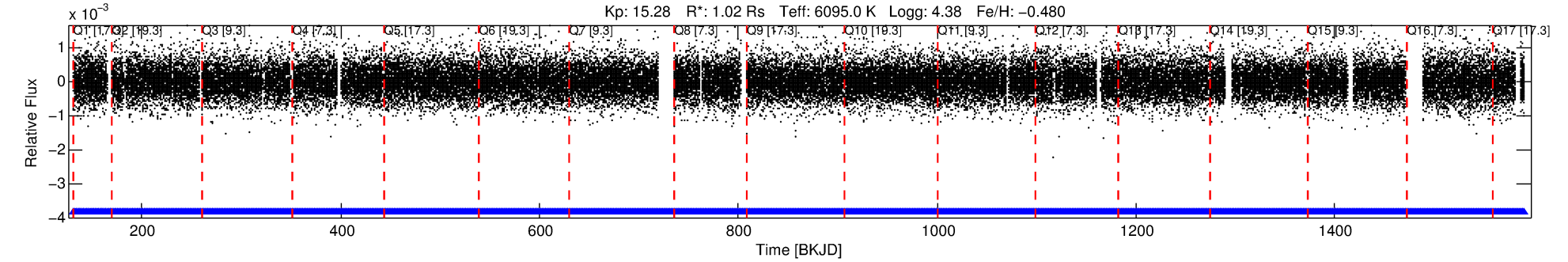
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
010661718-01	10661718	010661783-pri	10661783	1:1	66.9	-15	-9	9.59	15.28	1944.60	Direct-PRF	0	3.79	1.83

**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: 10661718 Candidate: 1 of 1 Period: 1.231 d

KOI: K03931.01 Corr: 0.797



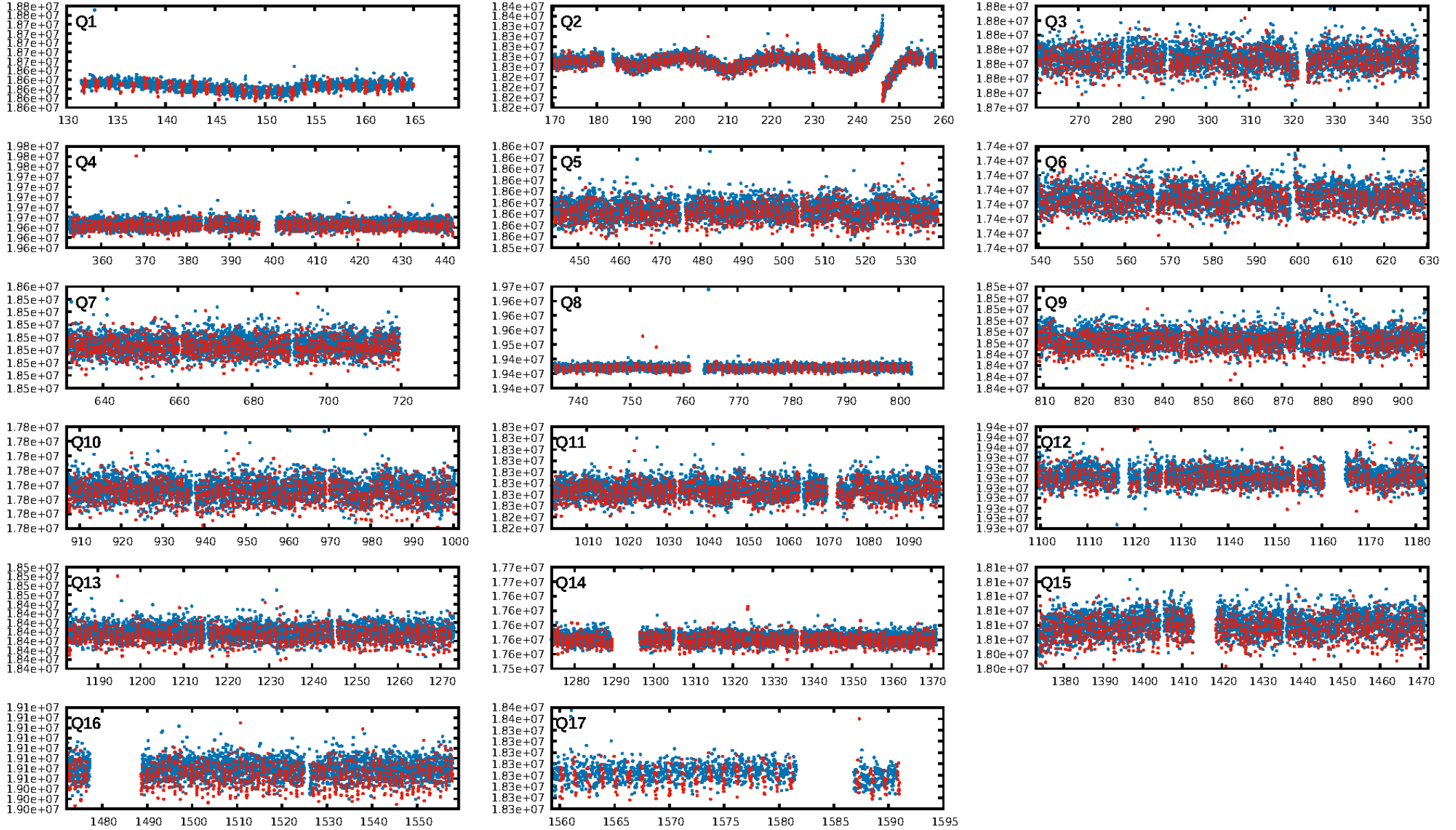
## DV Fit Results:

Period = 1.23131 [0.00001] d  
Epoch = 131.8318 [0.0021] BKJD  
Rp/R\* = 0.0114 [0.0029]  
a/R\* = 1.56 [1.28]  
b = 0.90 [0.30]  
Seff = 2709.54 [975.53]  
Teq = 1840 [166] K  
Rp = 1.26 [0.47] Re  
a = 0.0217 [0.0050] AU  
Ag = 2.67 [1.91] [0.88σ]  
Teffp = 3636 [585] K [2.95σ]

## DV Diagnostic Results:

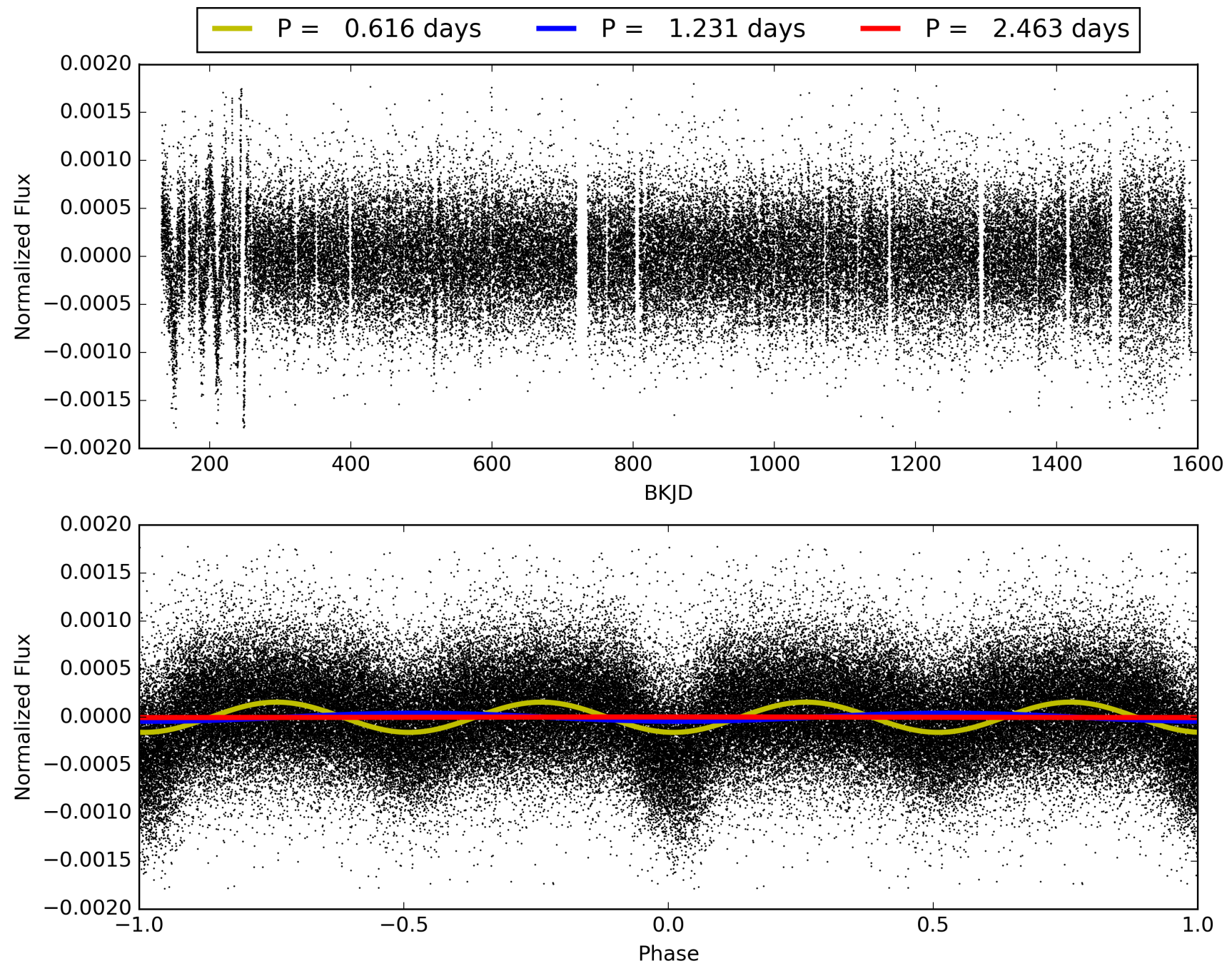
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.39e-134  
RollingBand-fgt: 1.00 [1042/1042]  
GhostDiagnostic-chr: 0.2738  
Centroid-sig: 0.0%  
Centroid-so: 5.607 arcsec [8.71σ]  
OotOffset-rm: 3.941 arcsec [9.05σ]  
KicOffset-rm: 4.217 arcsec [9.69σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.00 [0/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010661718-01, PDC Light Curves



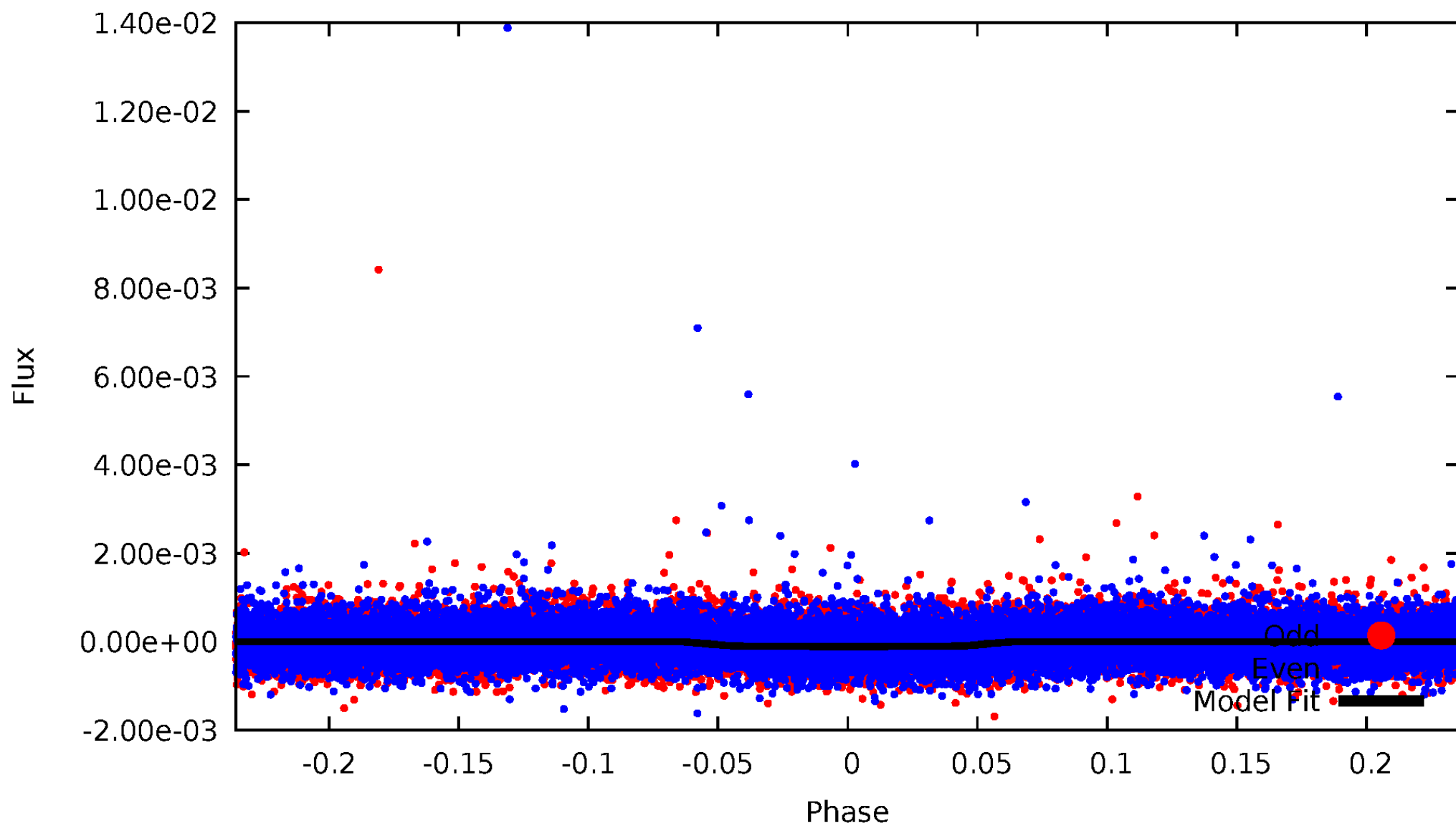


TCE 010661718-01



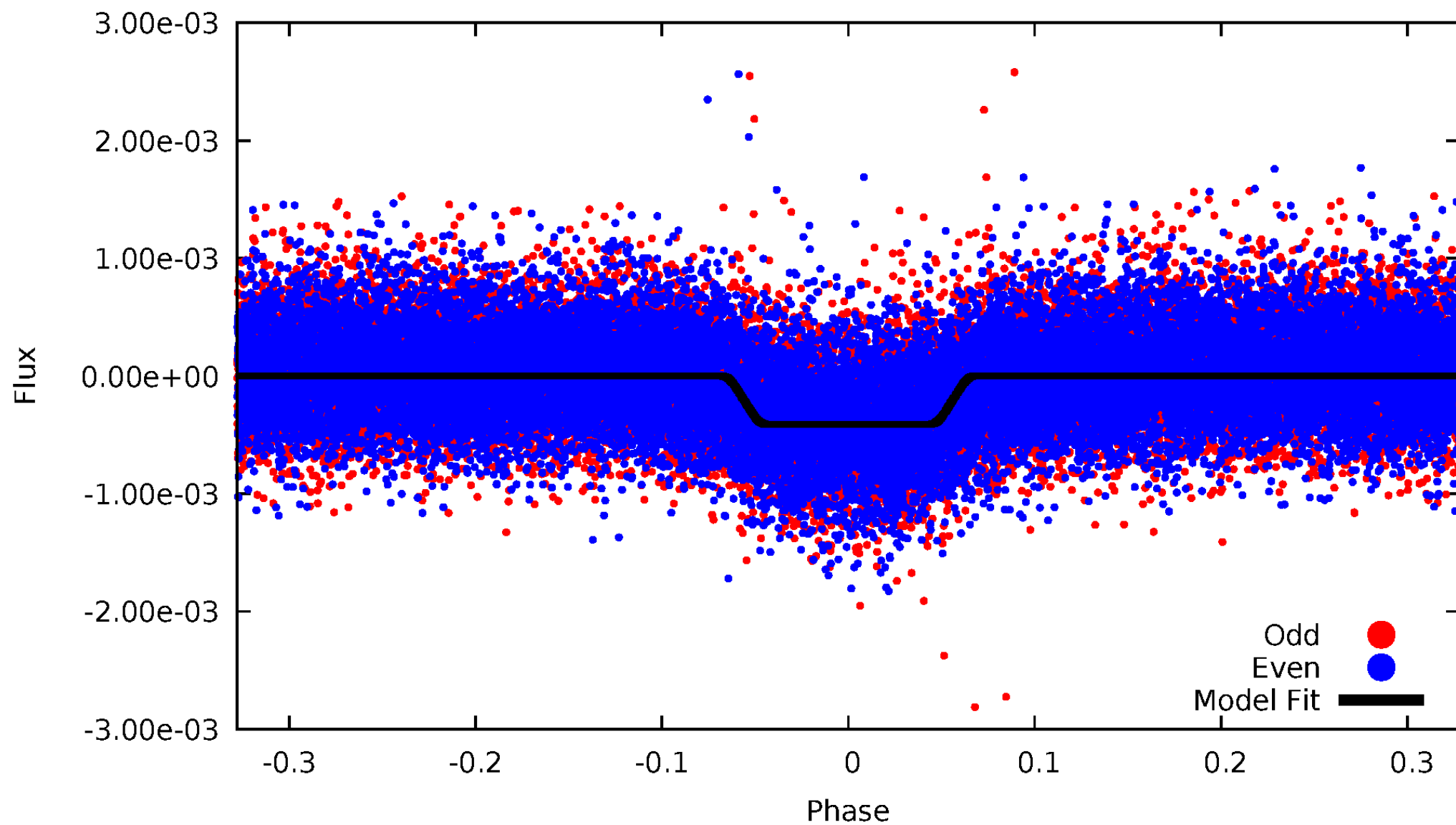
# DV Odd/Even

TCE 010661718-01



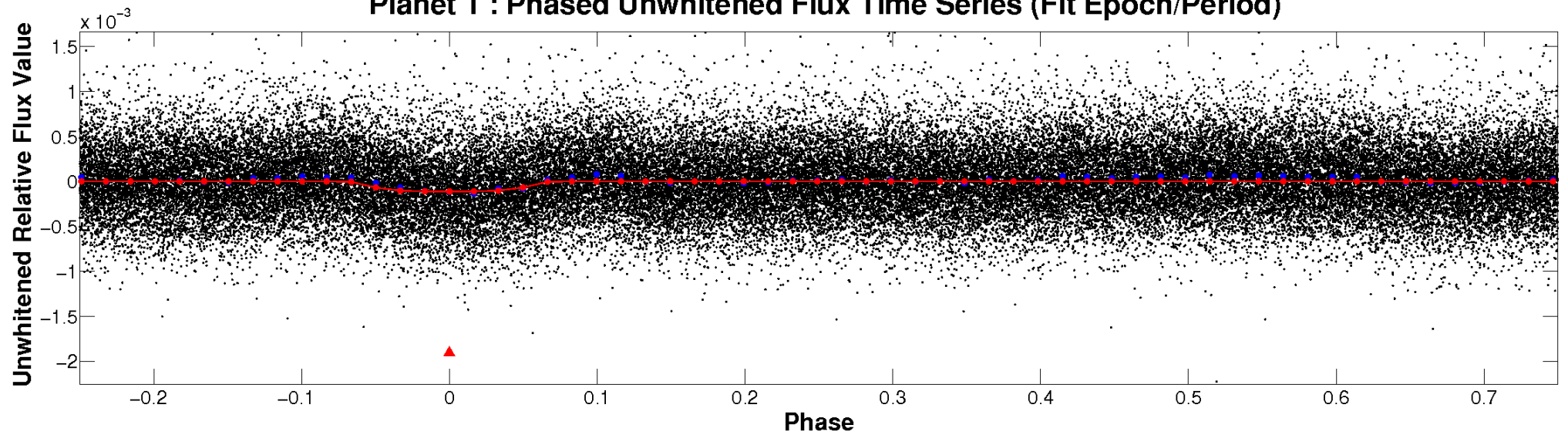
# ALT Odd/Even

TCE 010661718-01

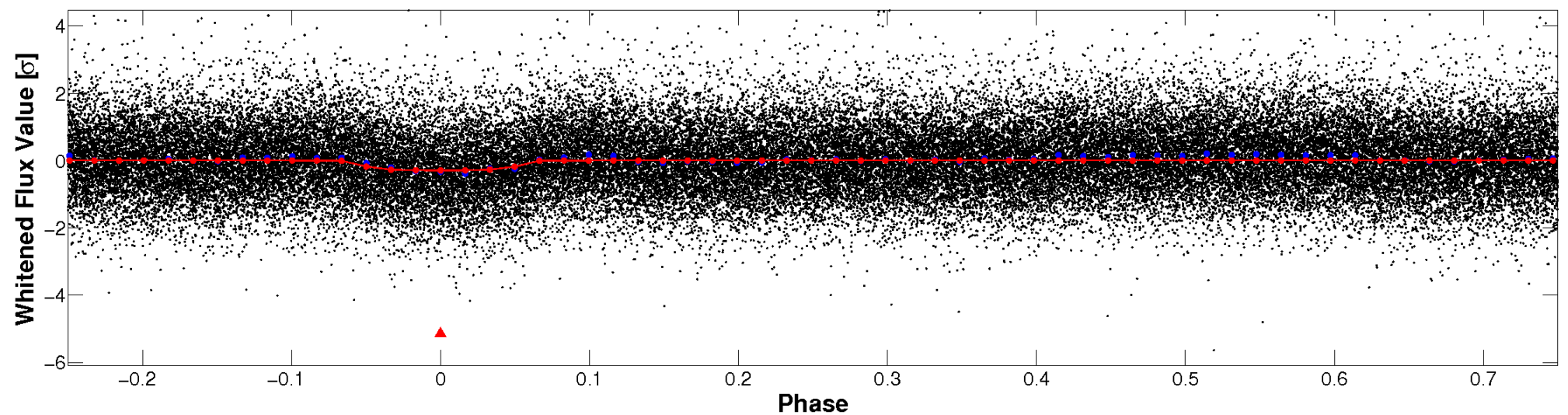


# Non-Whitened Vs. Whitened Light Curve

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



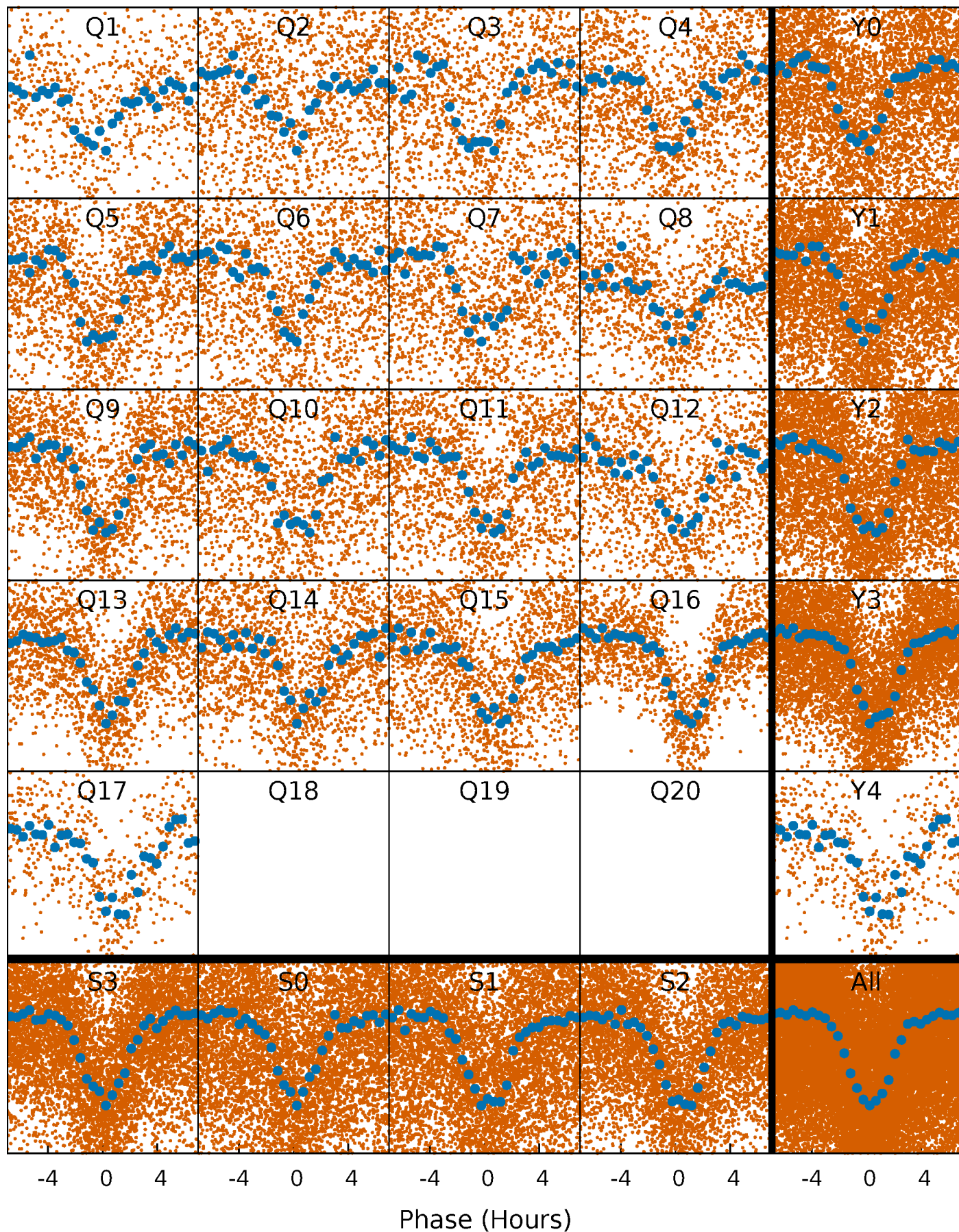
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

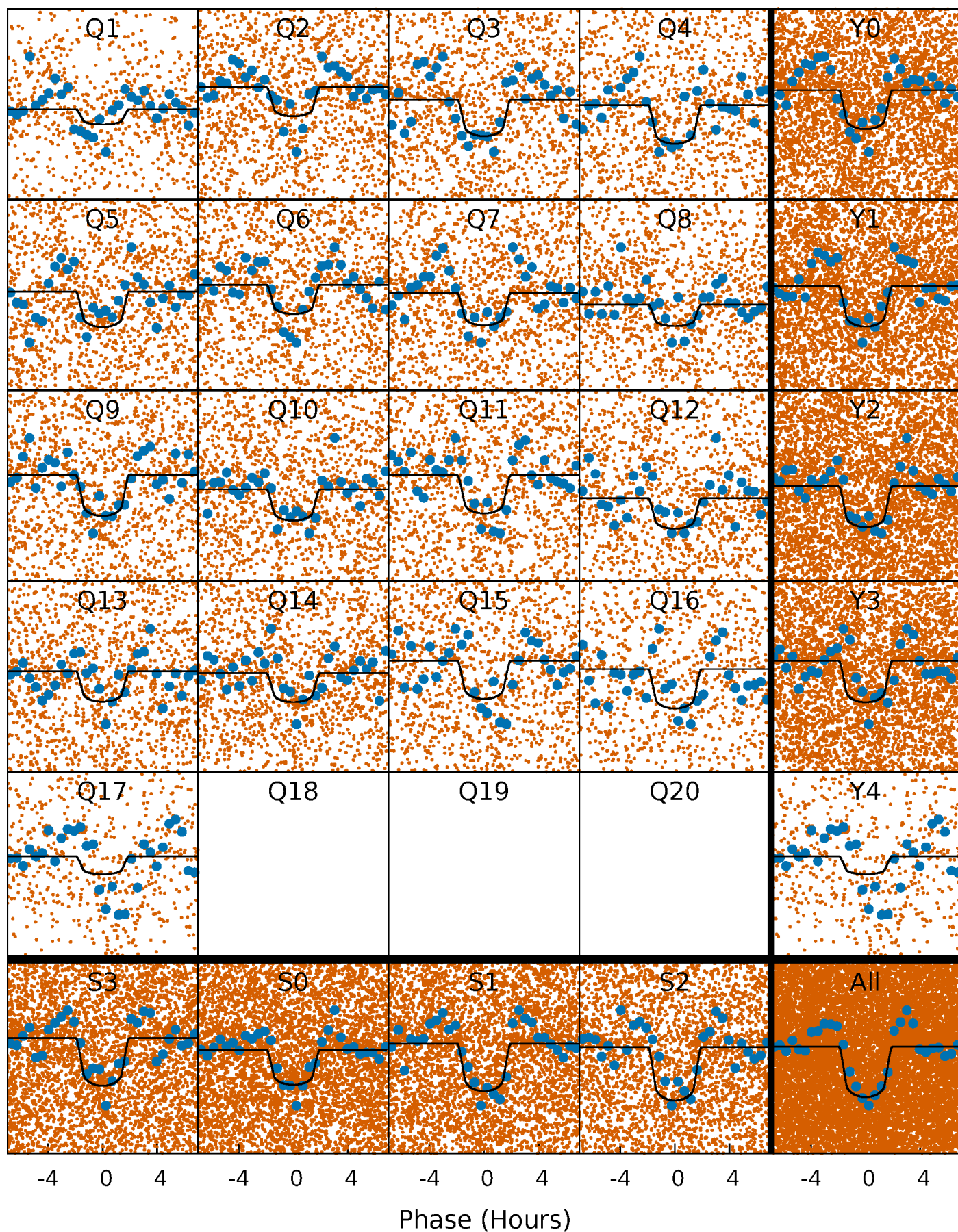
TCE 010661718-01 P= 1.231309 Days  $T_0=131.831794$  (BKJD)





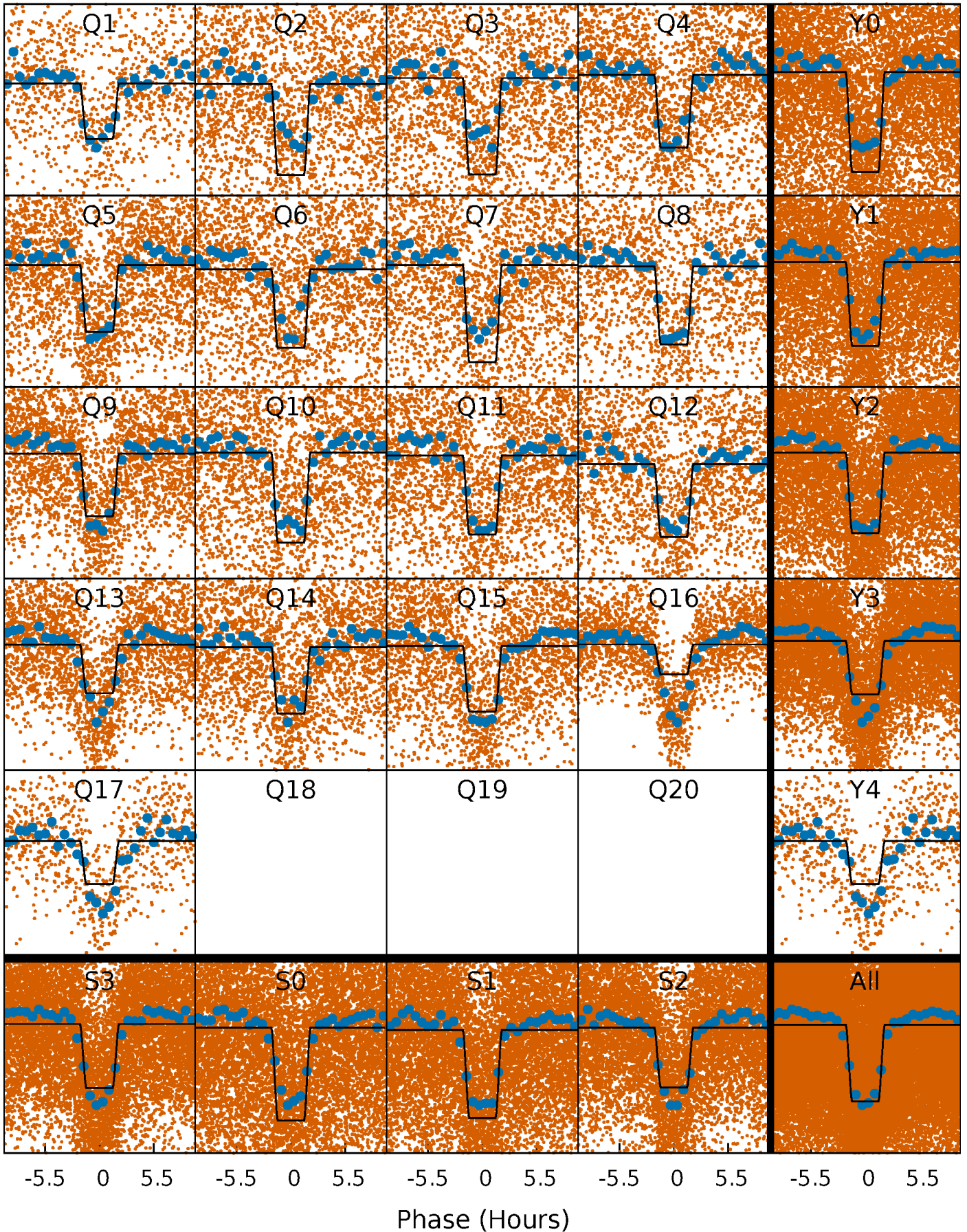
# DV Quarter-Phased Transit Curves

TCE 010661718-01 P= 1.231309 Days  $T_0=131.831794$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010661718-01 P= 1.231356 Days  $T_0=131.811974$  (BKJD)

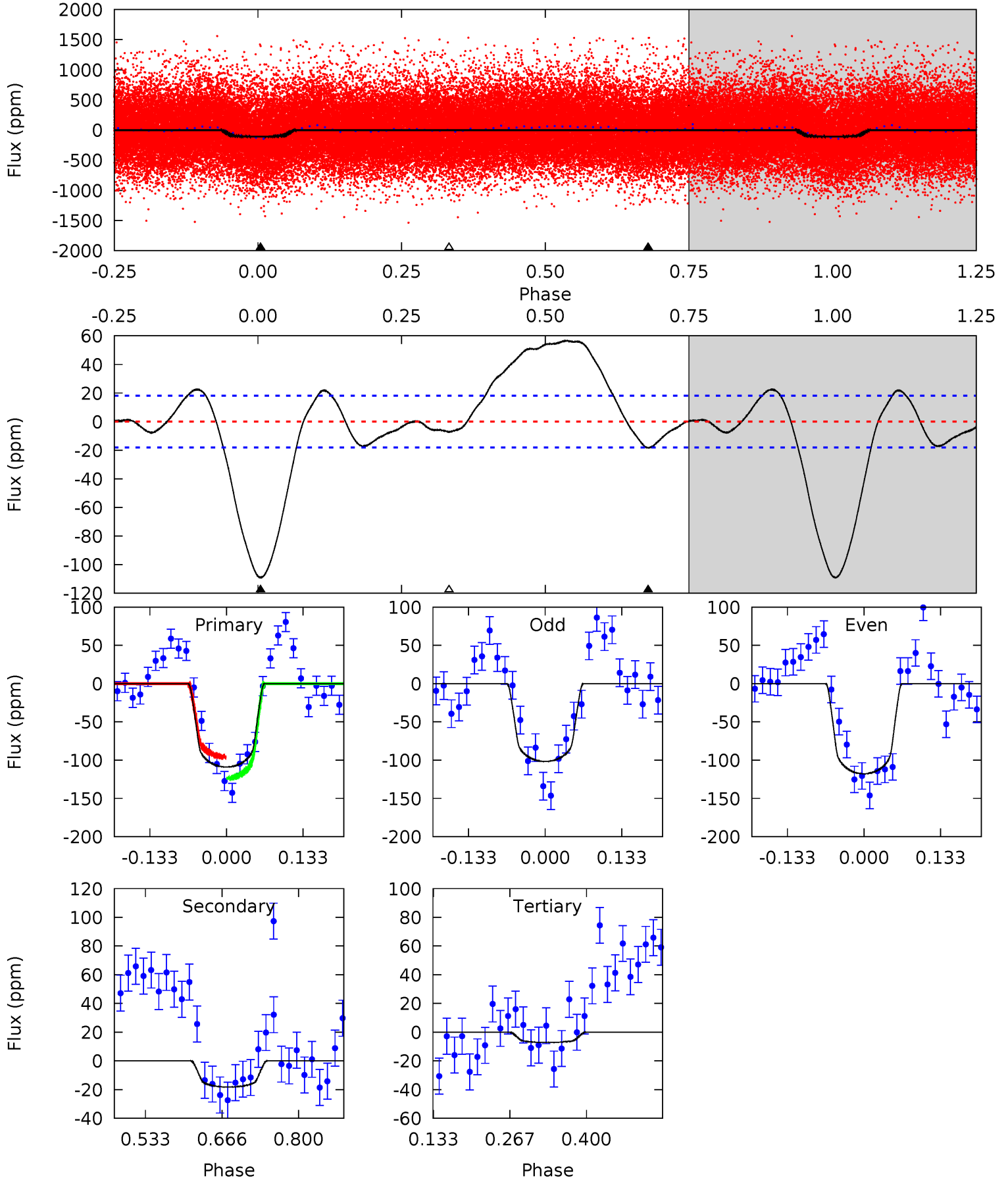




# DV Model-Shift Uniqueness Test

010661718-01, P = 1.231309 Days, E = 130.600485 Days

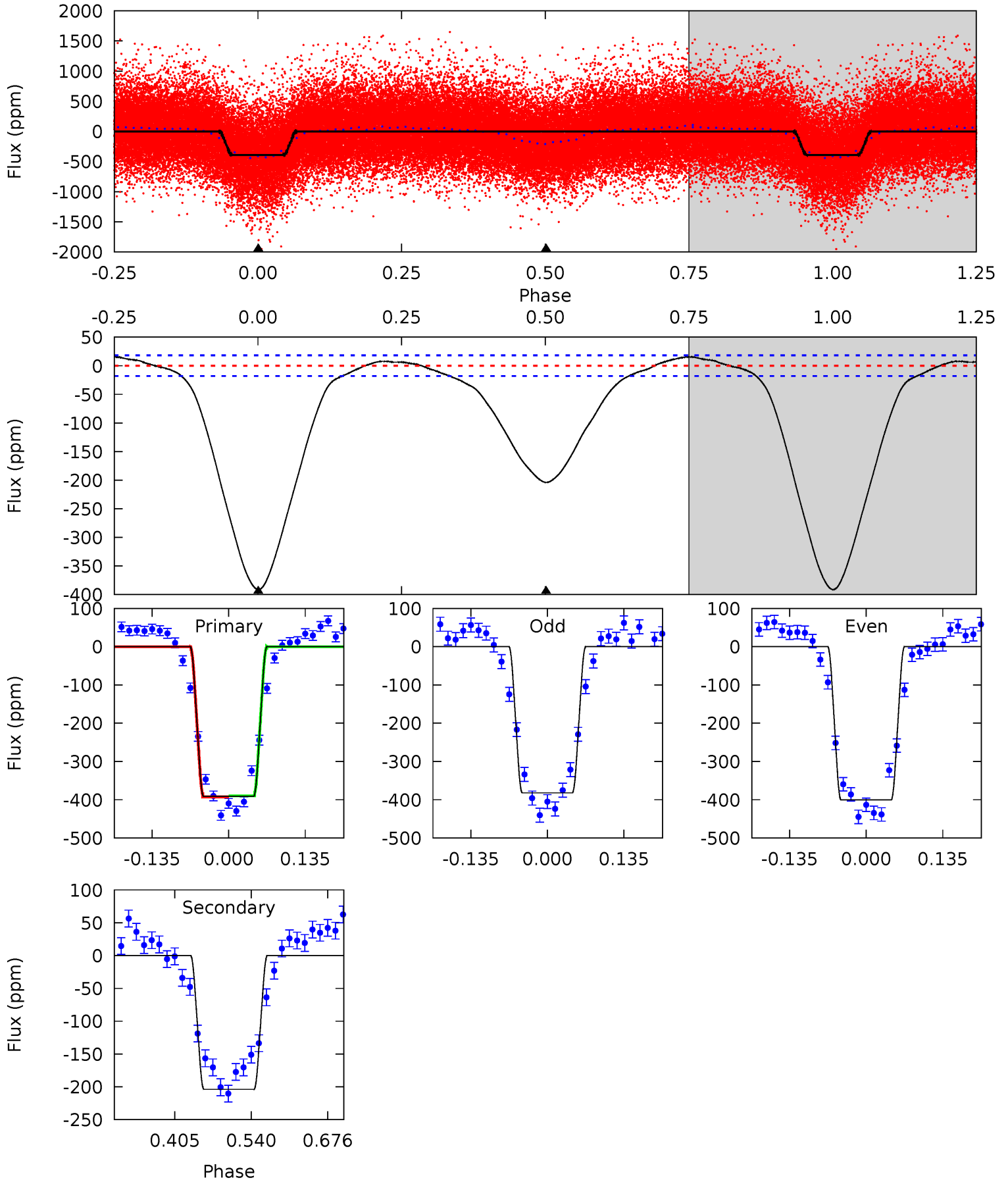
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.1	4.54	1.78	0	4.50	1.50	6.05	25.3	27.1	2.76	4.54	2.01	1.01	0.34	3.49



# Alt Model-Shift Uniqueness Test

010661718-01, P = 1.231356 Days, E = 130.580618 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
97.5	50.8	0	0	4.50	1.49	2.89	97.5	97.5	50.8	50.8	2.34	1.04	0.04	0.37





### Stellar Parameters For KIC 010661718

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6095^{+184}_{-202}$	$4.378^{+0.132}_{-0.182}$	$-0.480^{+0.300}_{-0.300}$	$1.016^{+0.281}_{-0.173}$	$0.900^{+0.117}_{-0.087}$	$1.207^{+0.711}_{-0.606}$
	+3%/-3%	+3%/-4%	+62%/-62%	+28%/-17%	+13%/-10%	+59%/-50%
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 010661718-01 / KOI 3931.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-18 \pm 4$	$1.30^{+0.37}_{-0.33}$	$2568^{+185}_{-151}$	$3908^{+525}_{-371}$	$2.789^{+2.298}_{-1.167}$
Alt.	$-204 \pm 4$	$2.27^{+0.46}_{-0.39}$	$2581^{+177}_{-139}$	$5151^{+430}_{-322}$	$10^{+4}_{-3}$

$T_{\text{max}}$  = 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

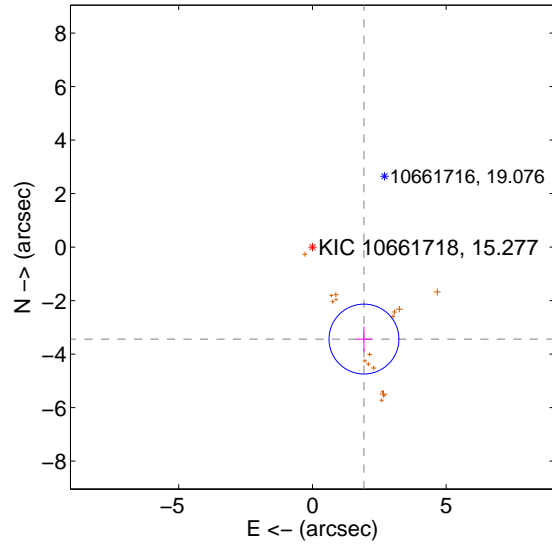
Supplemental centroid analysis for 010661718-01. Kepler magnitude: 15.28. Transit SNR 21.40

There are 0 quarters with good PRF difference image offsets

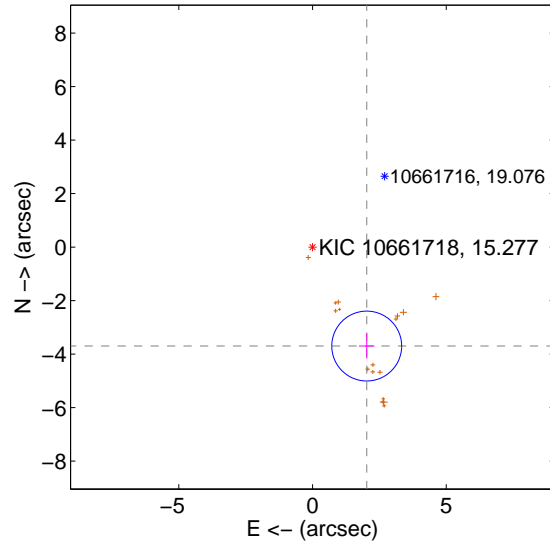
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.941 \pm 0.435$	9.05	$-1.926 \pm 0.299$	$-3.438 \pm 0.470$
PRF-fit source offset from KIC position	$4.217 \pm 0.435$	9.69	$-2.026 \pm 0.292$	$-3.699 \pm 0.470$
photometric centroid source offset	$5.61 \pm 0.64$	8.71	$2.68 \pm 0.63$	$-4.92 \pm 0.65$

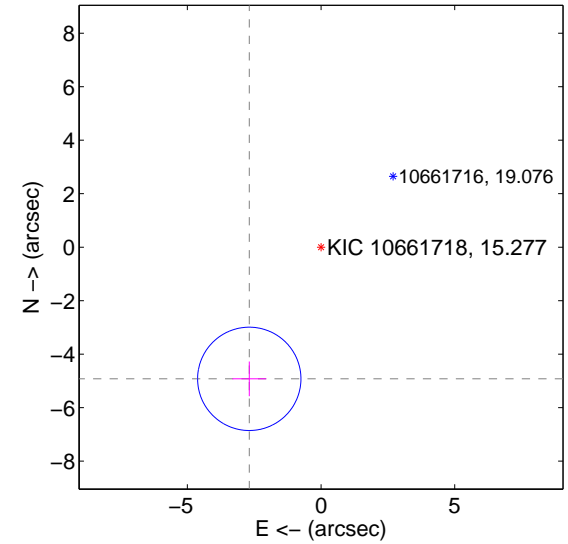
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

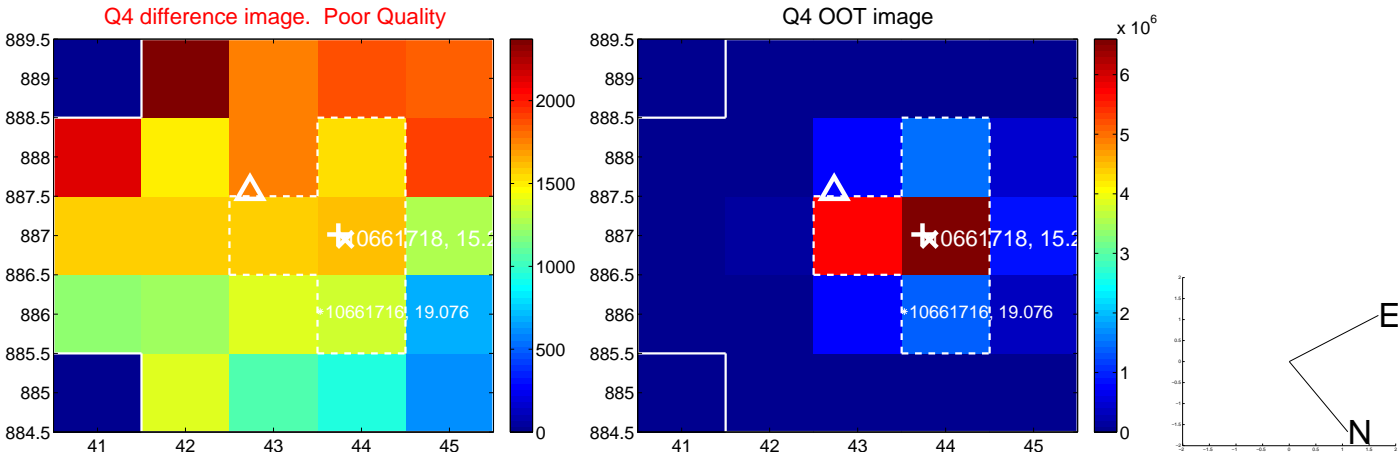
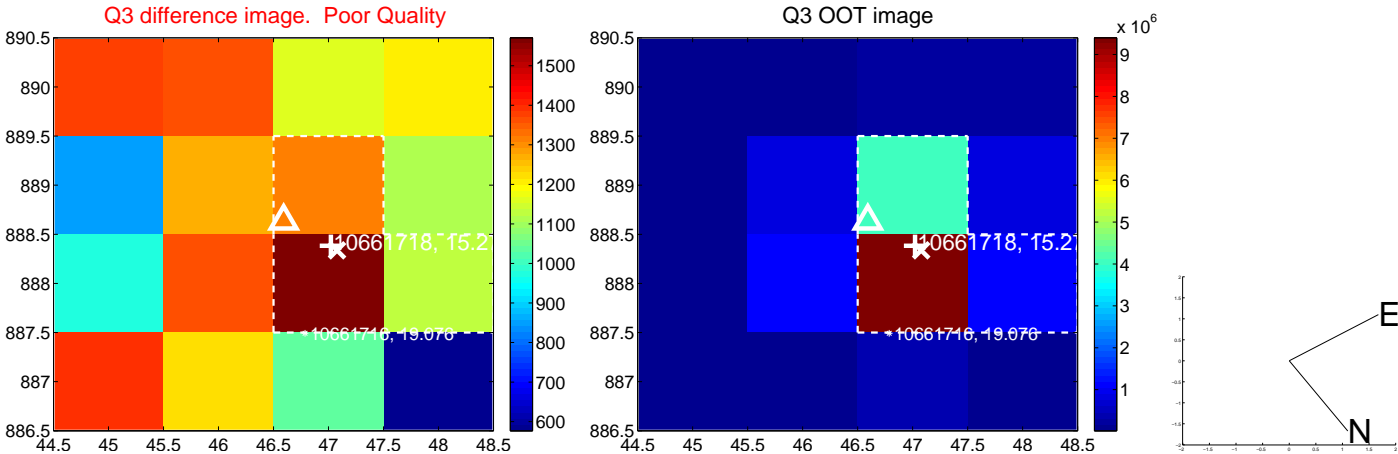
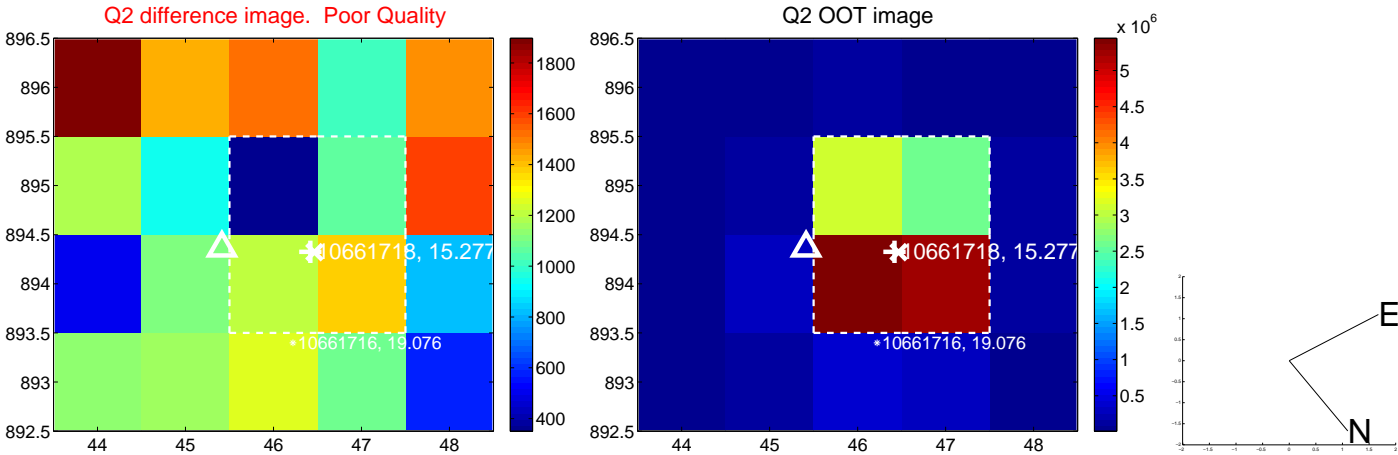
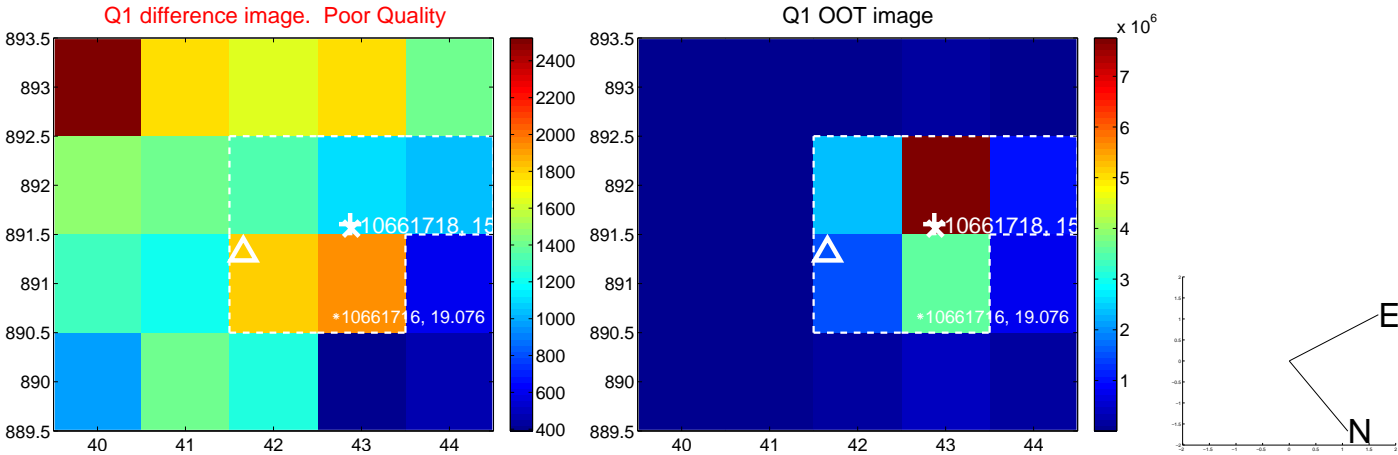


offset from photometric centroids

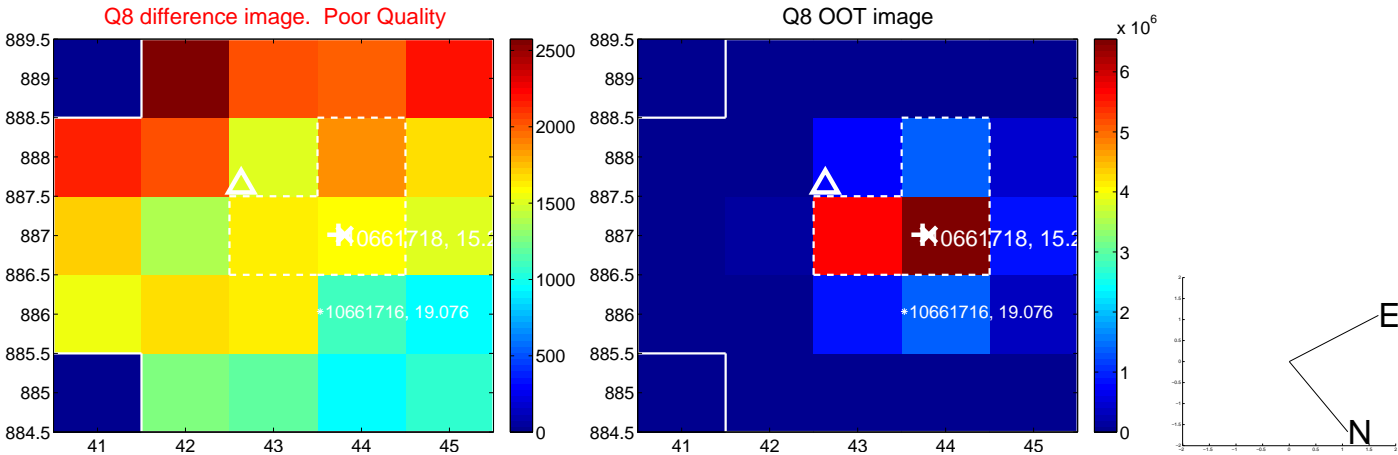
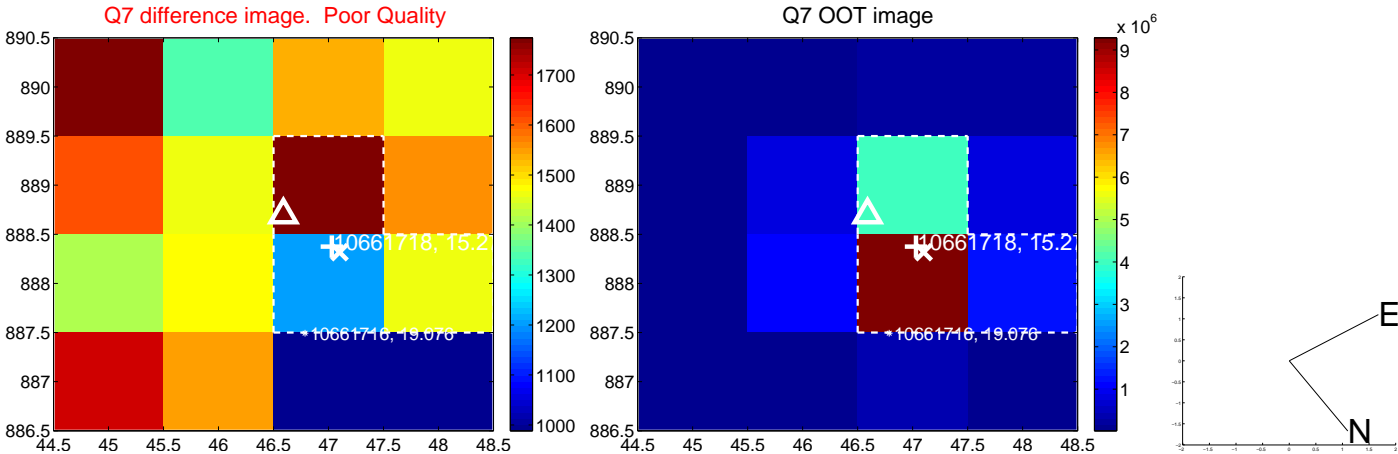
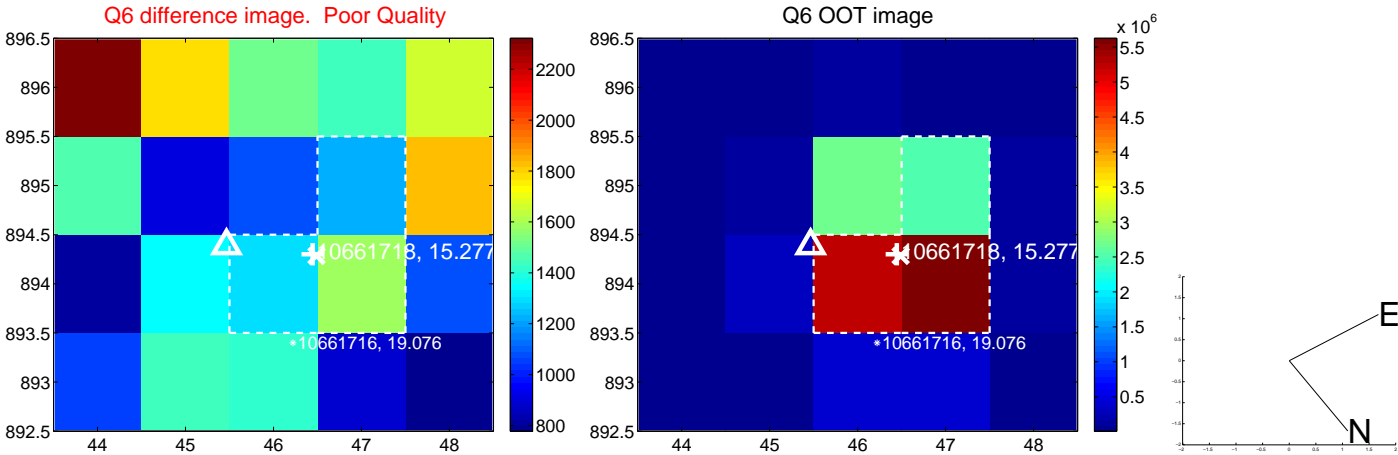
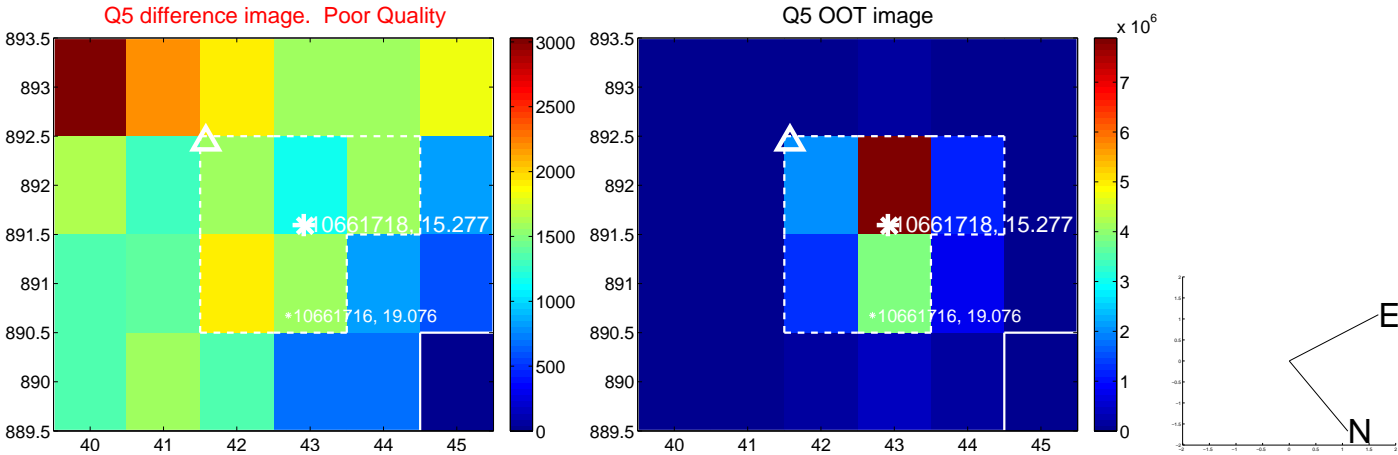


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

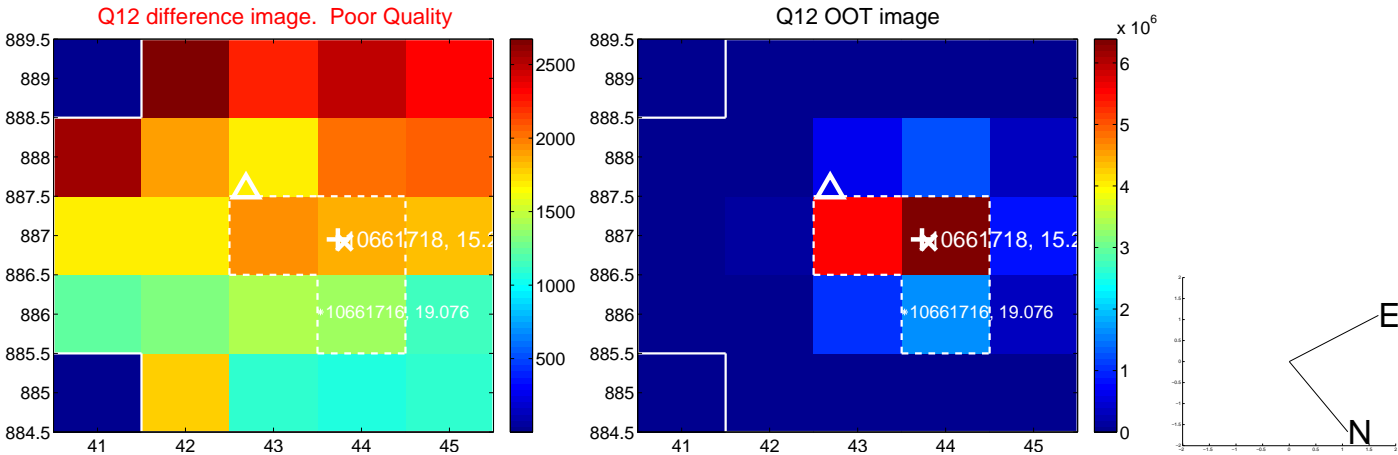
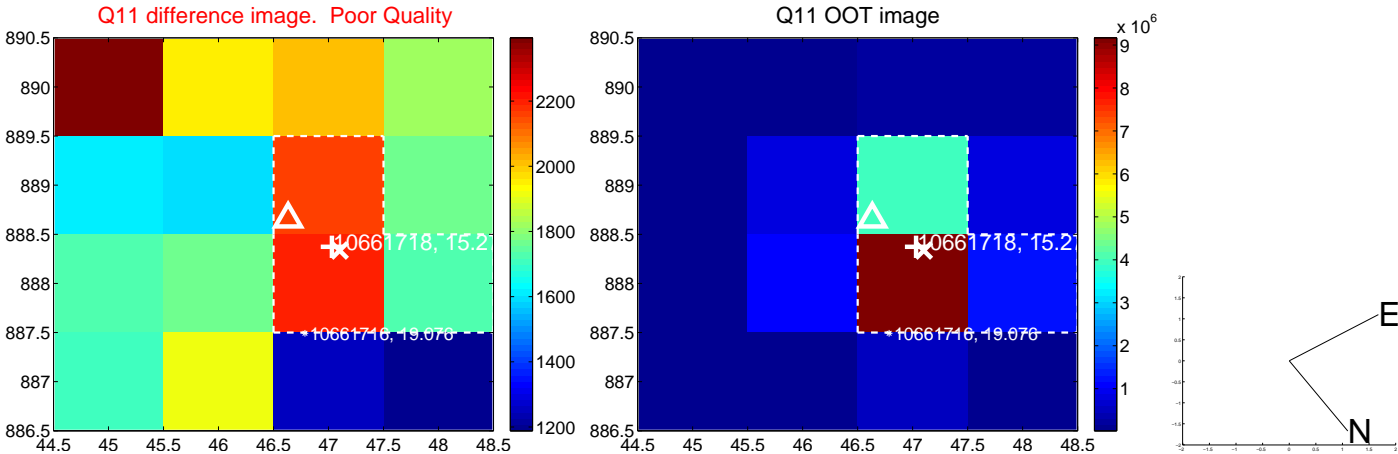
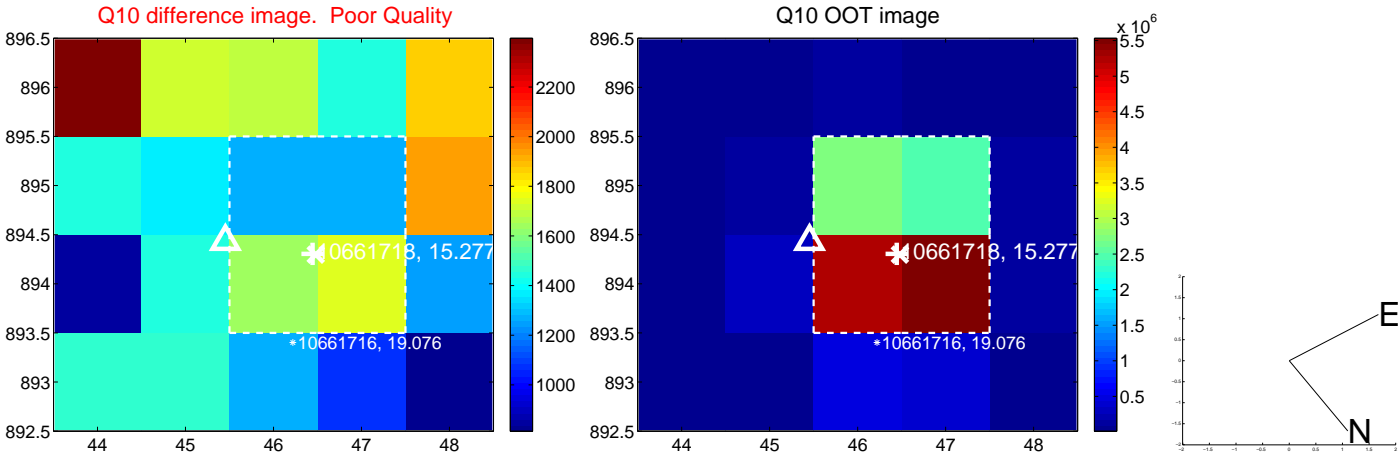
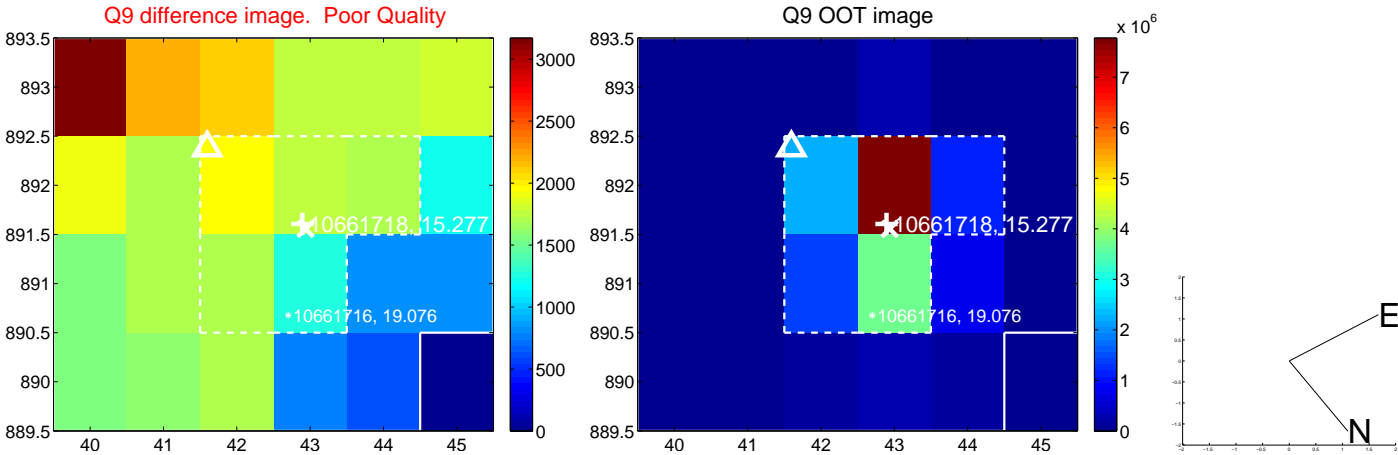


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

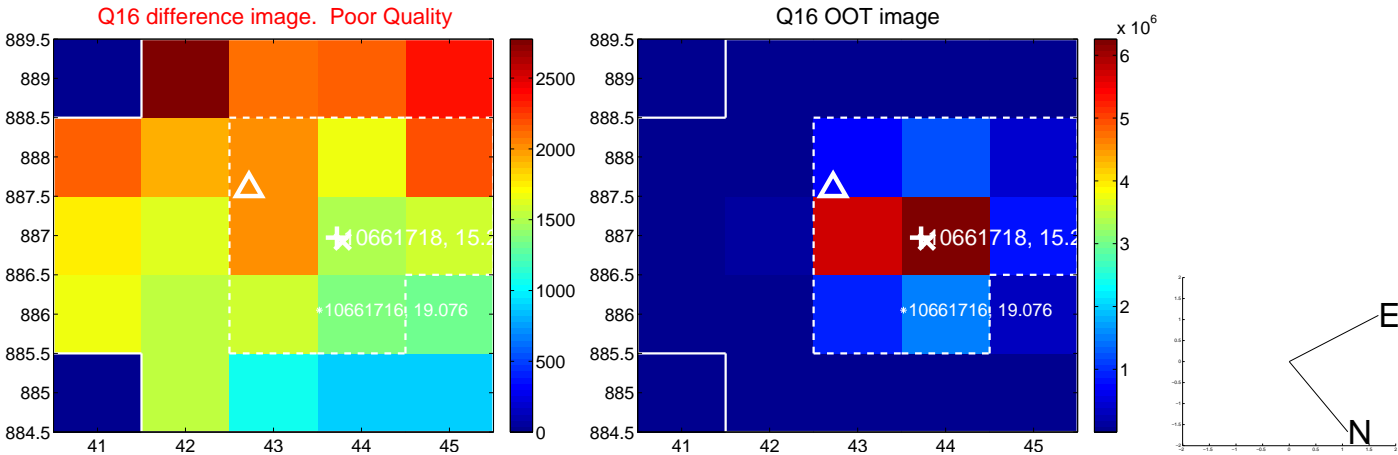
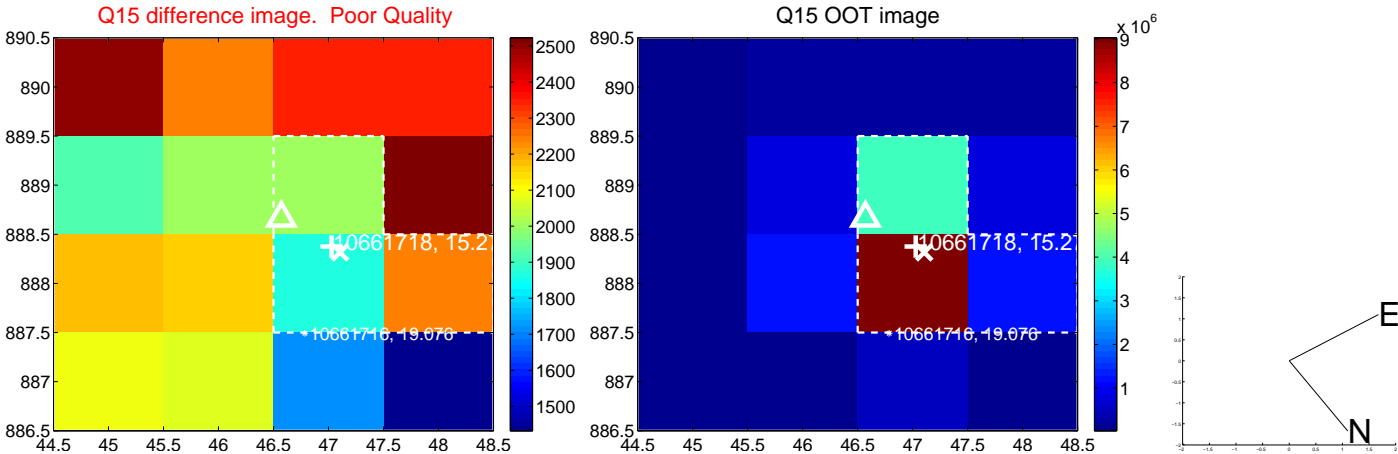
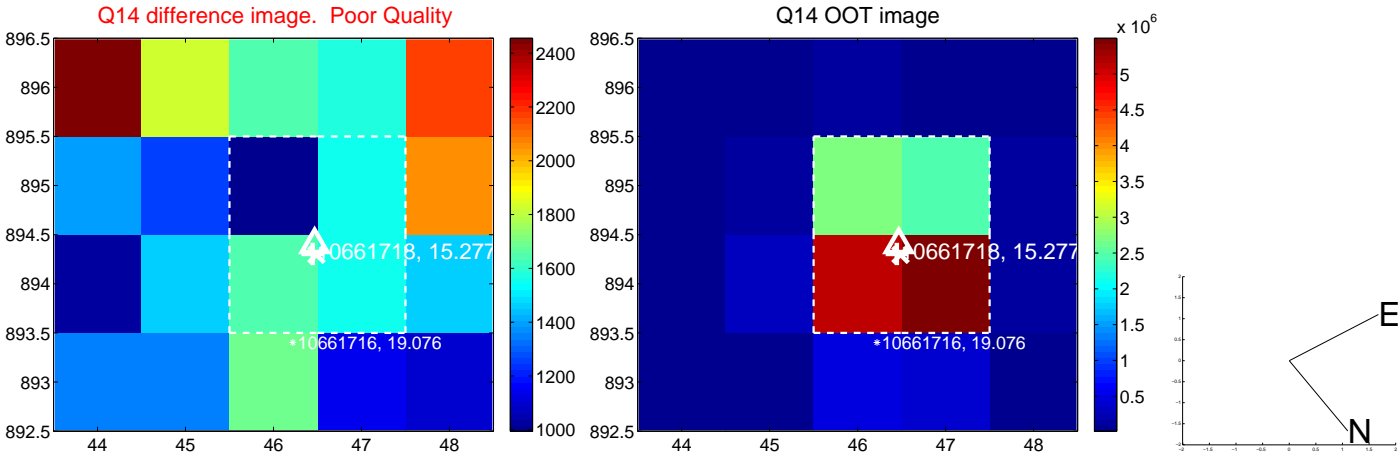
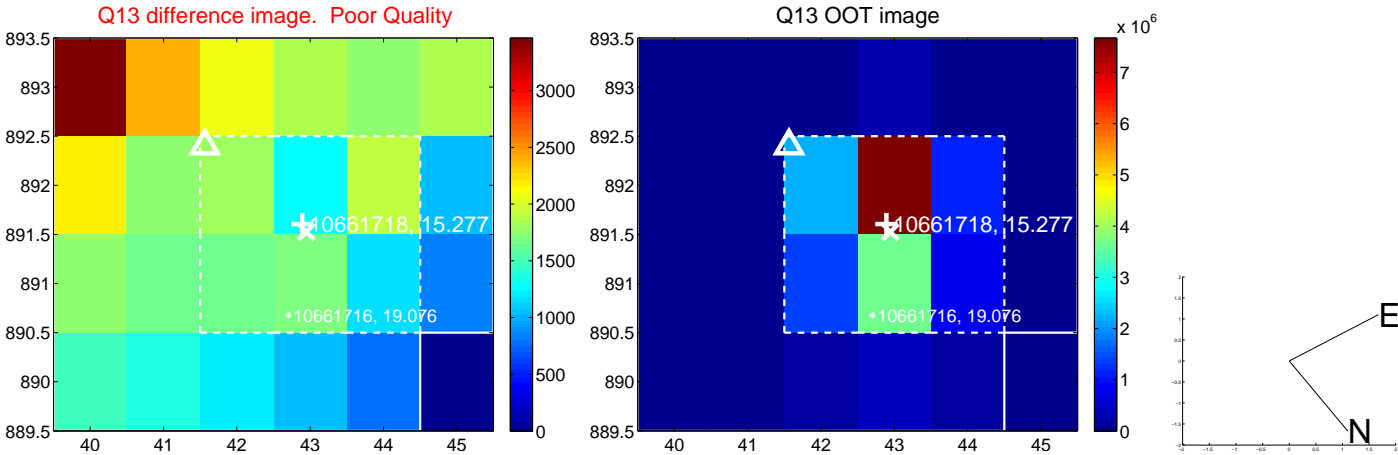




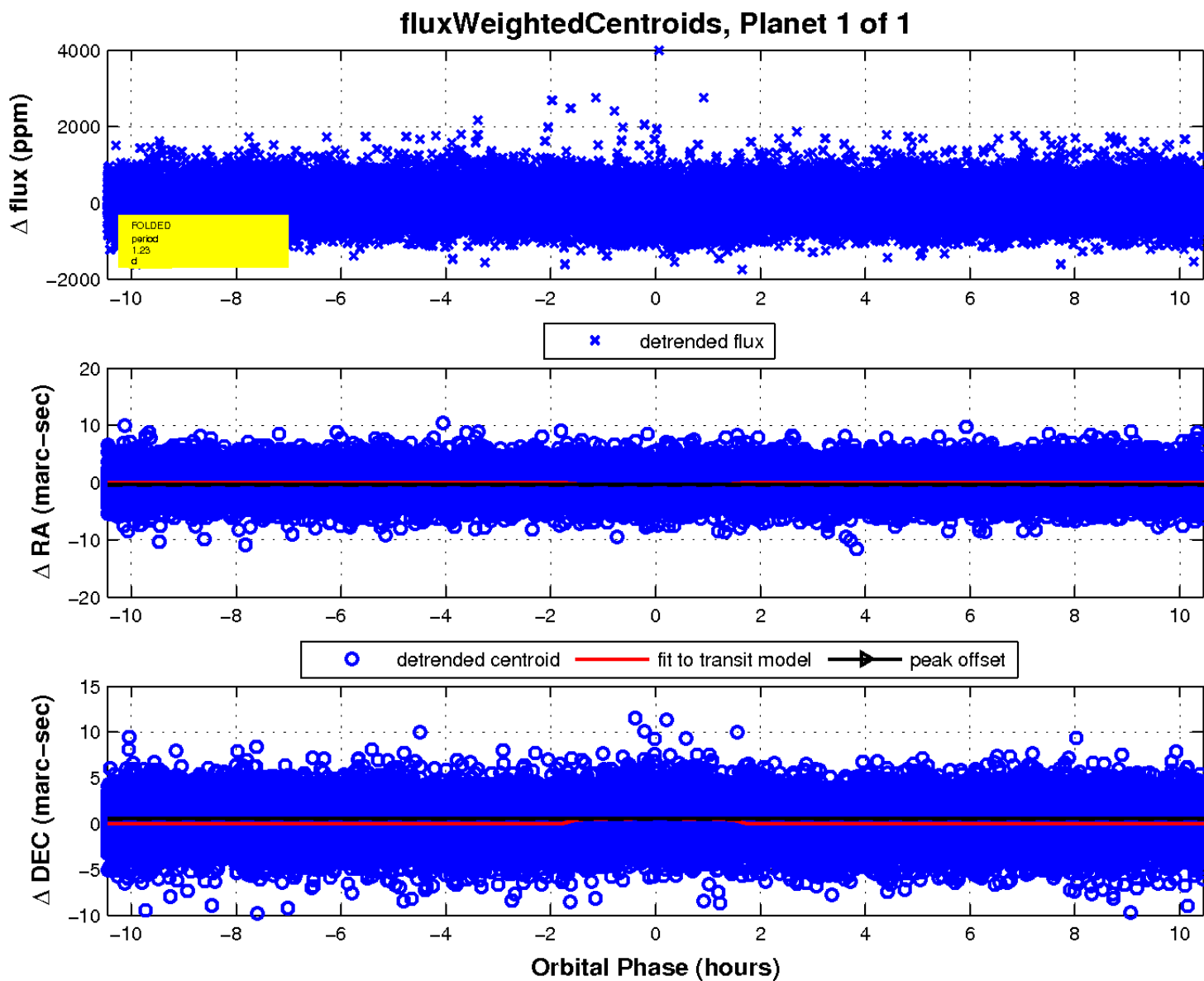
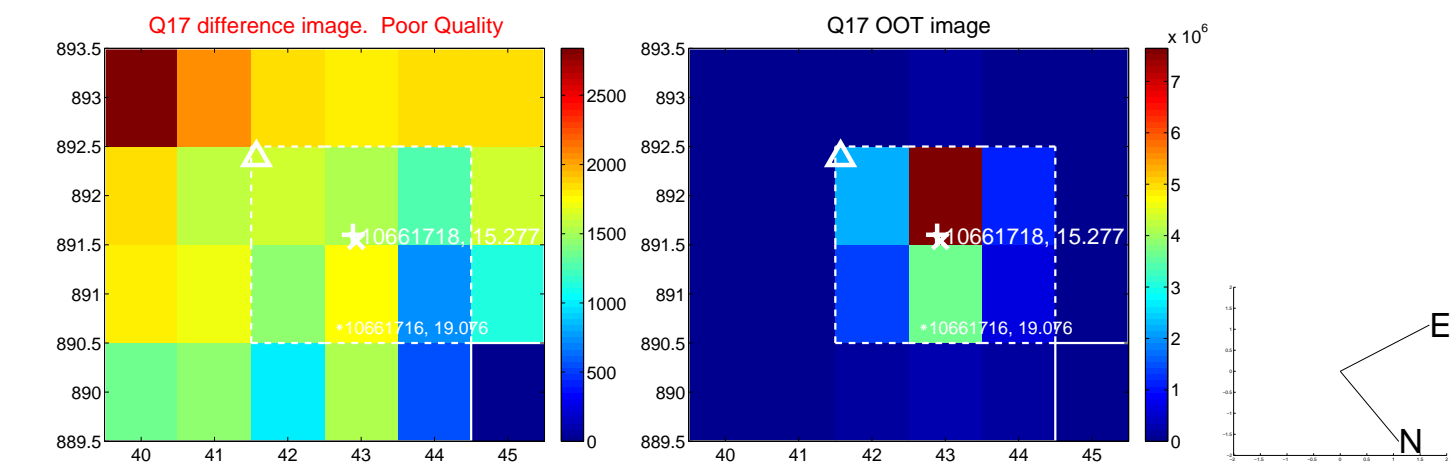
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

Declination

