

# KIC 009910828

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009910828-01	OBS	4897.01	8.480197	135.862864	195.3	6.427	15.2	15.8	0.73	5415	1.22	78.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009910828-01	OBS	FP	0.00	0	0	1	1	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 009910828-01

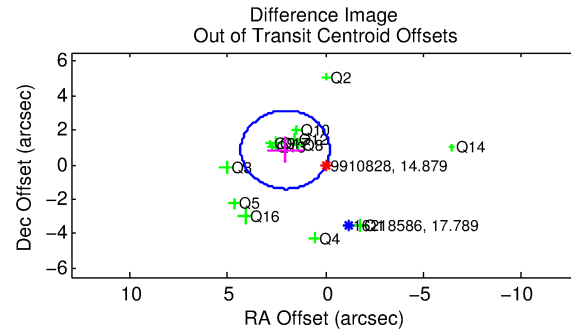
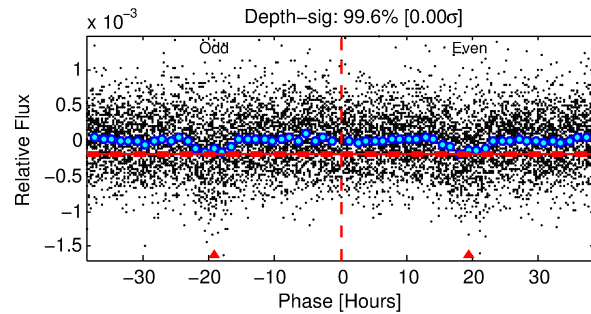
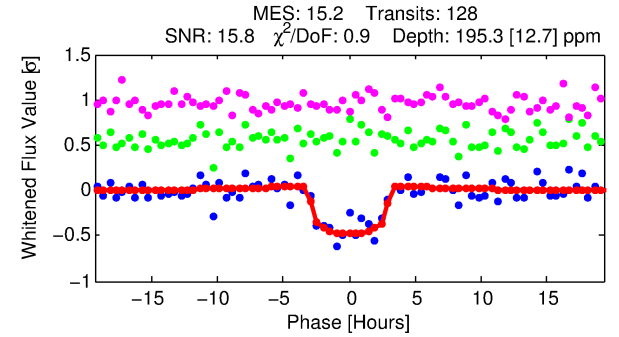
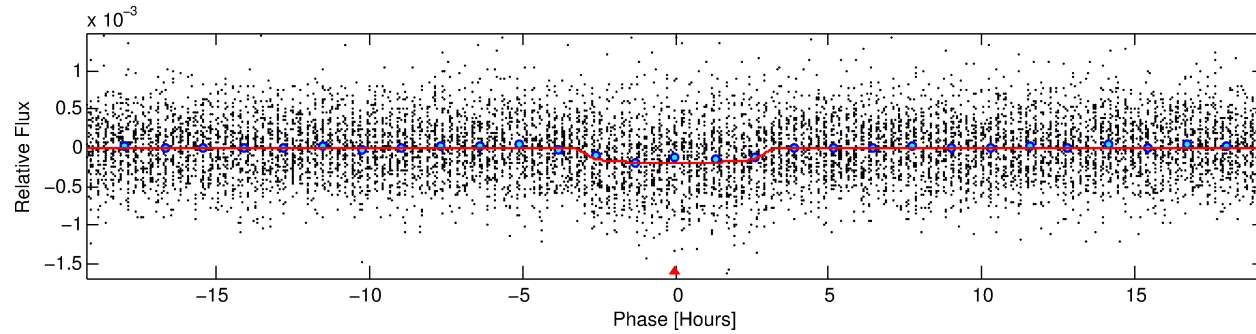
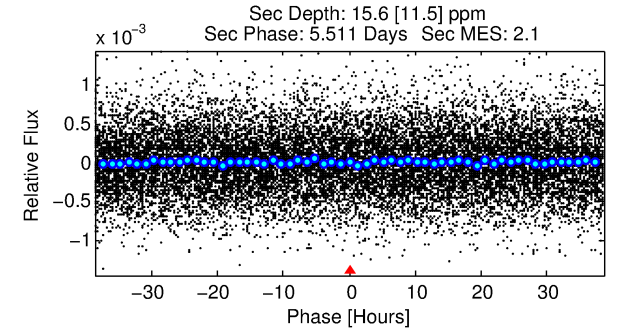
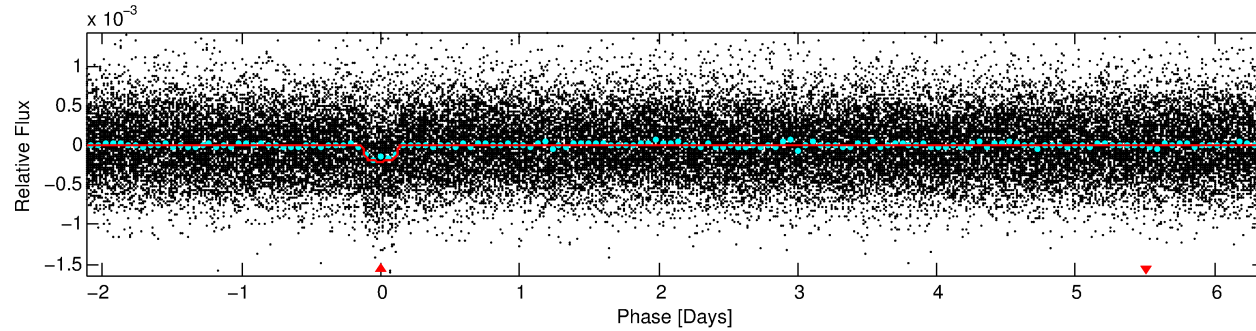
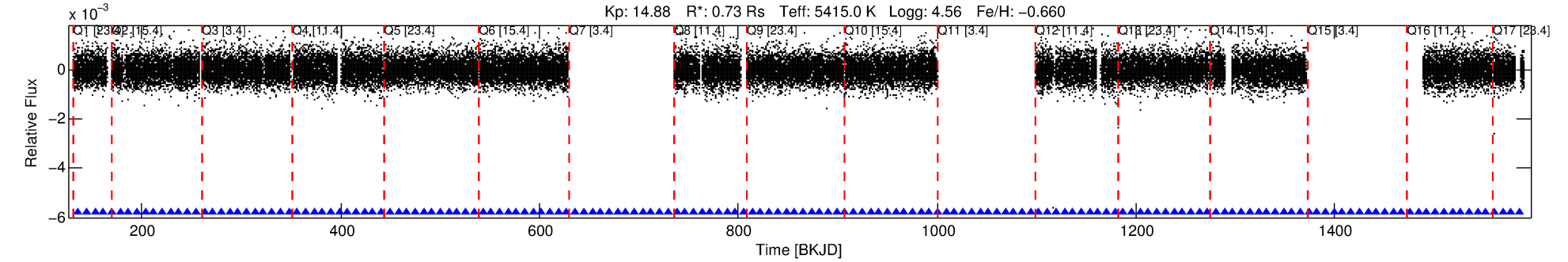
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009910828-01	9910828	009851142-pri	9851142	1:1	206.6	-21	47	7.63	14.88	467.18	Direct-PRF	0	0.50	0.24

**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: 9910828 Candidate: 1 of 1 Period: 8.480 d

KOI: K04897 Corr: No Ephemeris Match



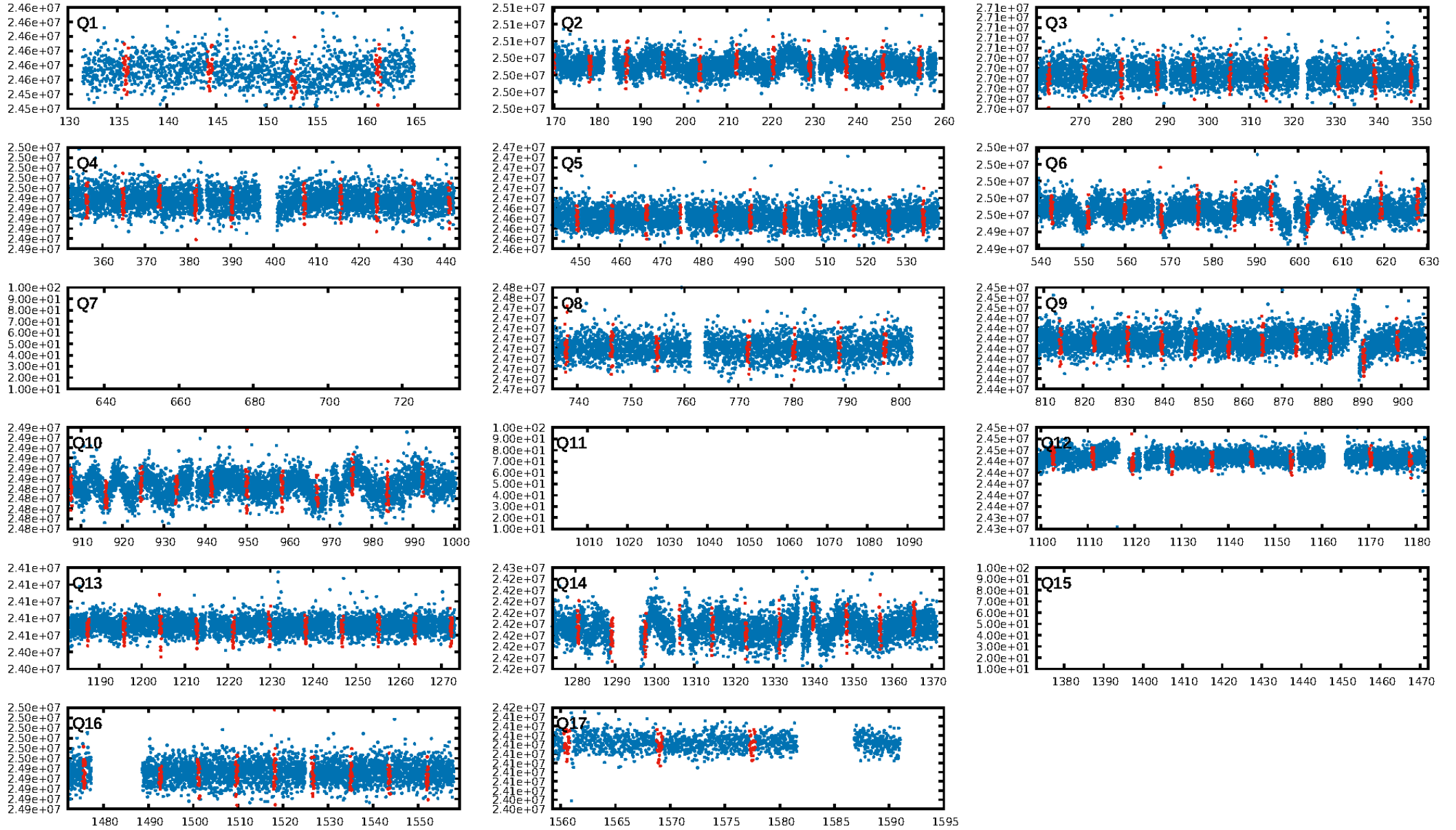
## DV Fit Results:

Period = 8.48020 [0.00008] d  
Epoch = 135.8629 [0.0068] BKJD  
Rp/R\* = 0.0154 [0.0024]  
a/R\* = 4.66 [3.15]  
b = 0.91 [0.14]  
Seff = 78.49 [15.48]  
Teq = 759 [37] K  
Rp = 1.22 [0.24] Re  
a = 0.0721 [0.0076] AU  
Ag = 30.02 [24.42] [1.19σ]  
Teffp = 2747 [554] K [3.58σ]

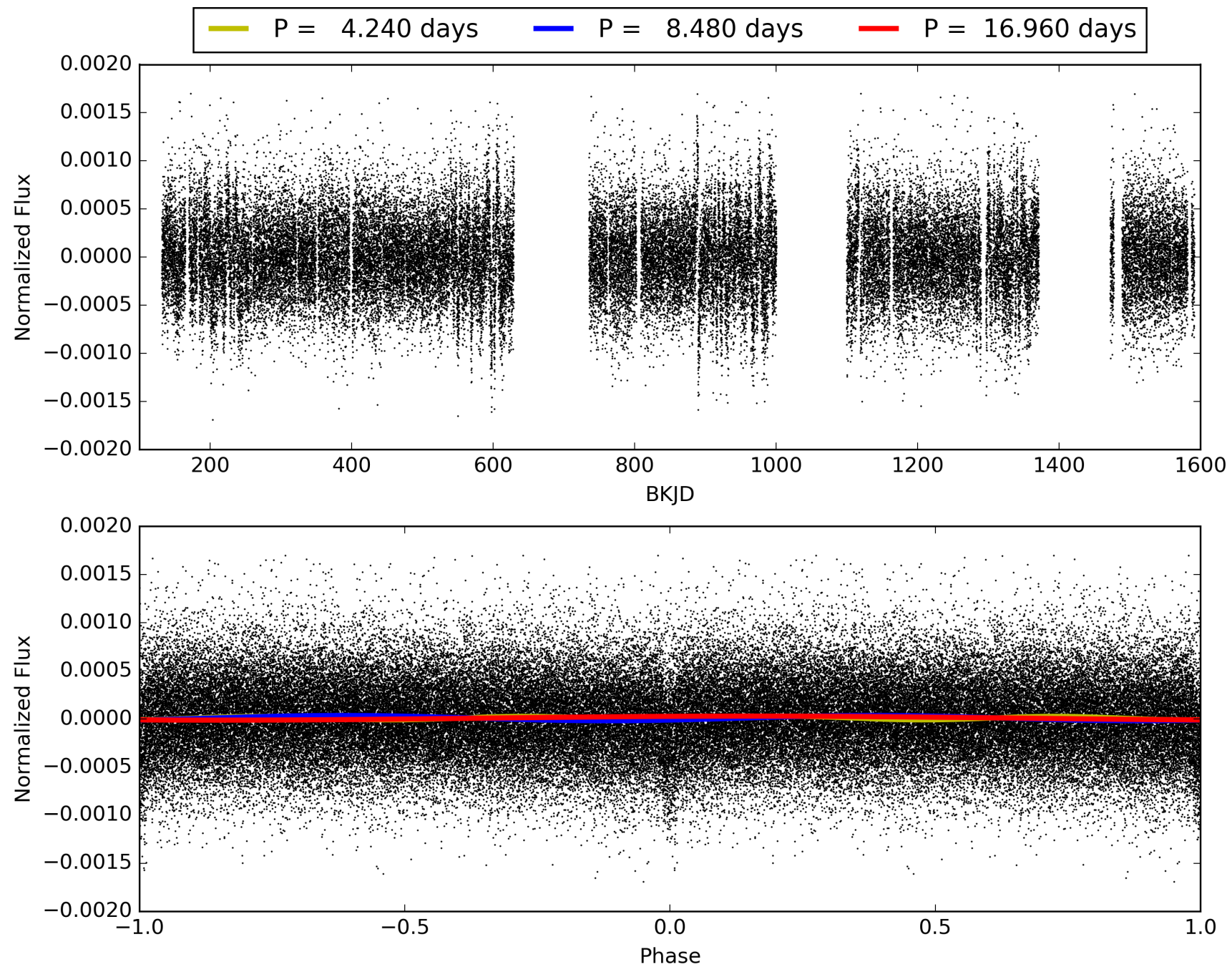
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.72e-48  
RollingBand-fgt: 1.00 [121/121]  
GhostDiagnostic-chr: -0.06197  
Centroid-sig: 0.0%  
Centroid-so: 3.475 arcsec [3.33σ]  
OotOffset-rm: 2.229 arcsec [2.95σ]  
KicOffset-rm: 2.278 arcsec [3.00σ]  
OotOffset-st: 3/1/4/5 [13]  
KicOffset-st: 3/1/4/5 [13]  
DiffImageQuality-fgm: 0.00 [0/13]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 009910828-01, PDC Light Curves

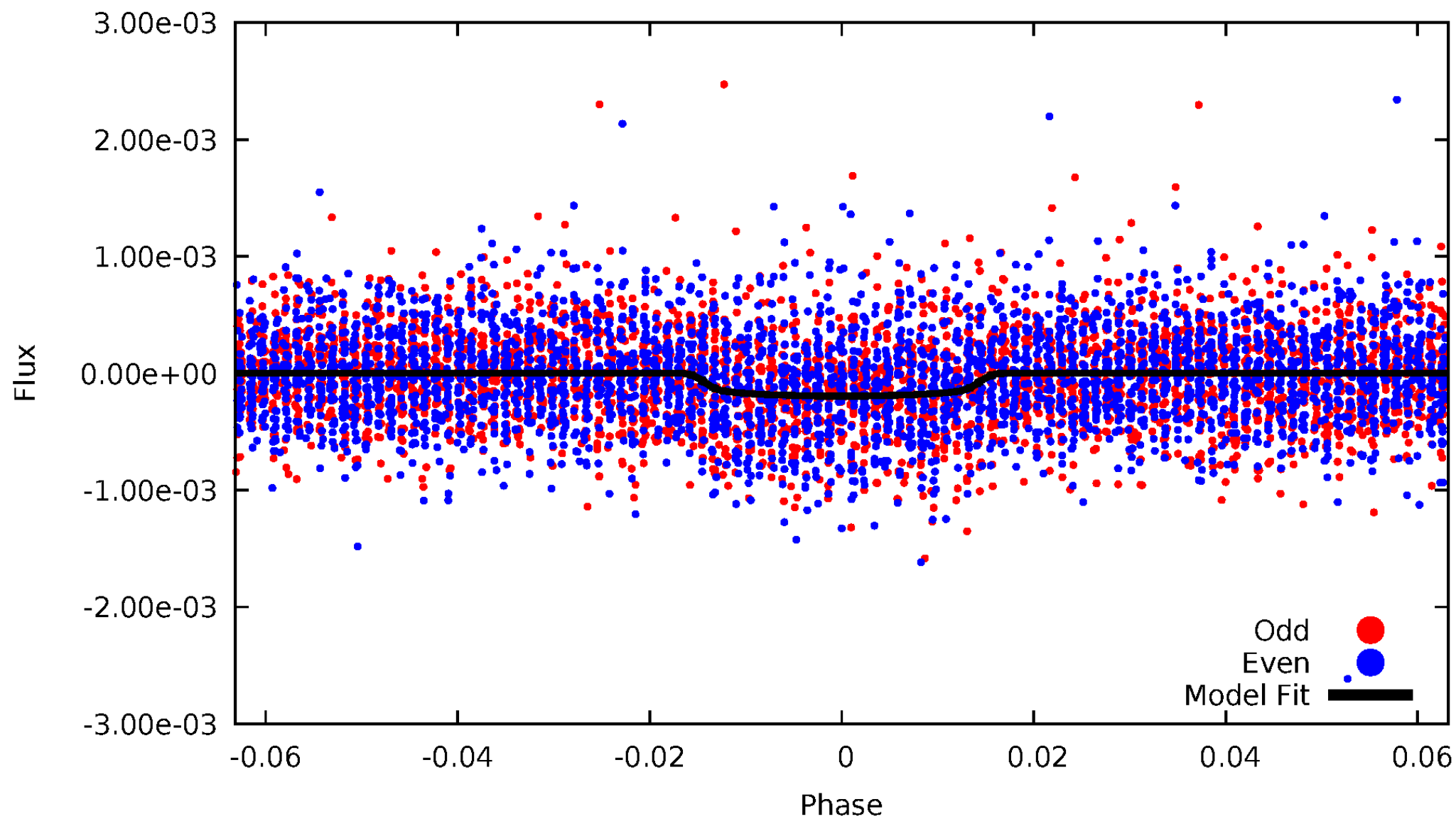


# TCE 009910828-01



# DV Odd/Even

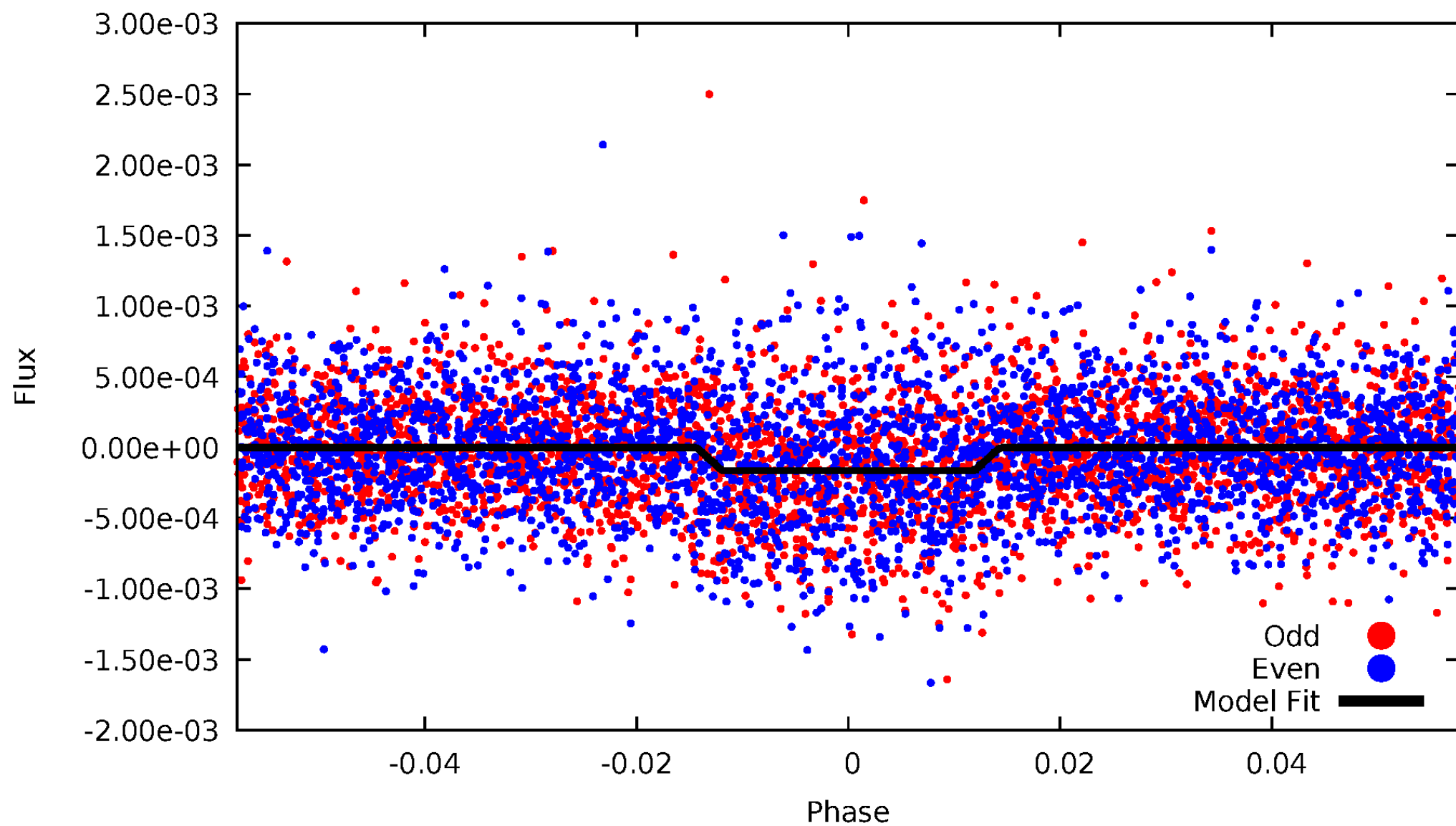
TCE 009910828-01





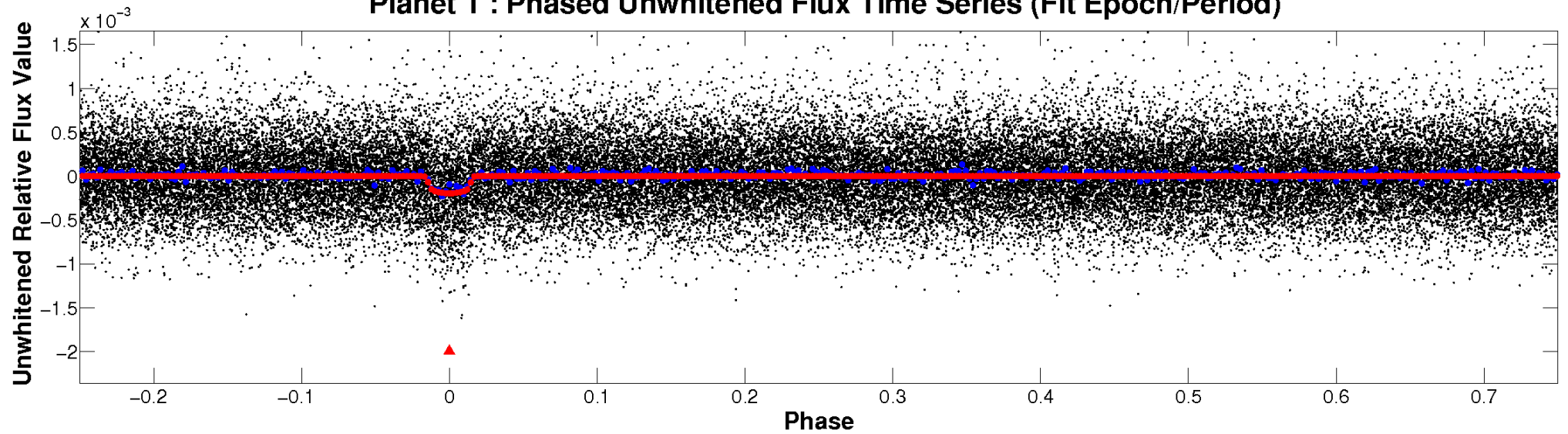
# ALT Odd/Even

TCE 009910828-01

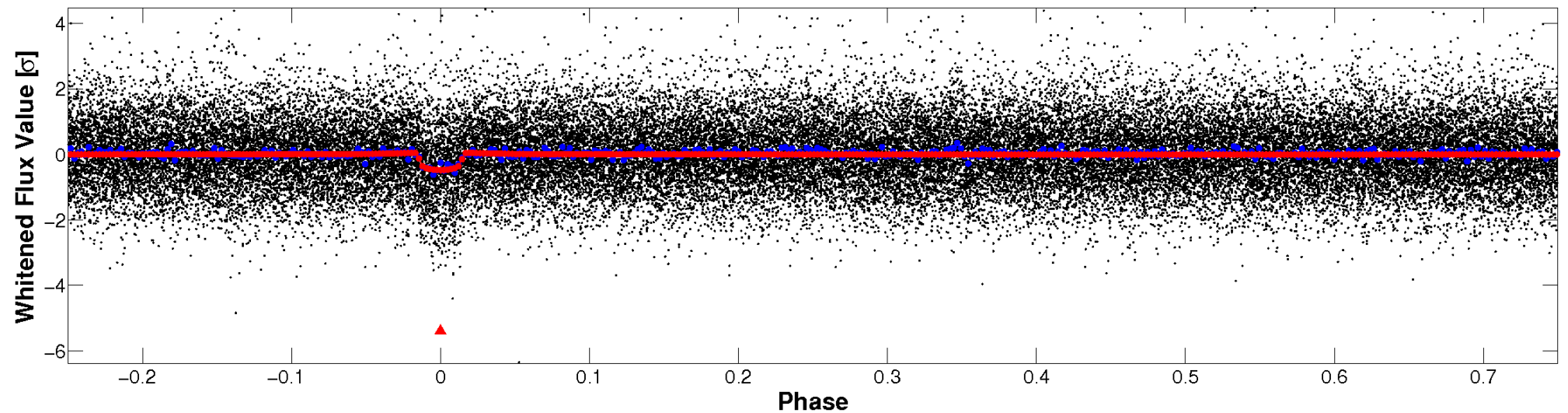


# Non-Whitened Vs. Whitened Light Curve

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

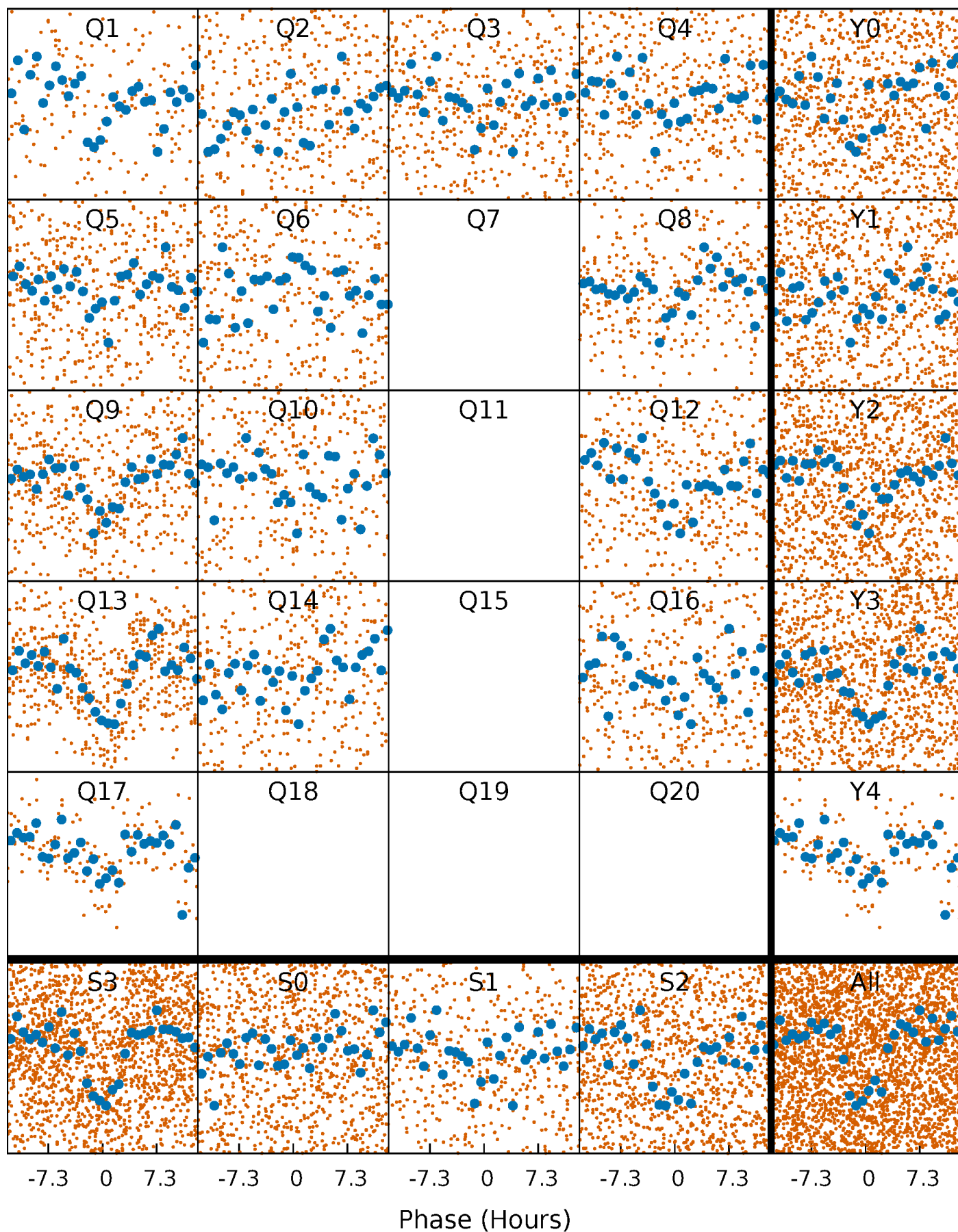


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

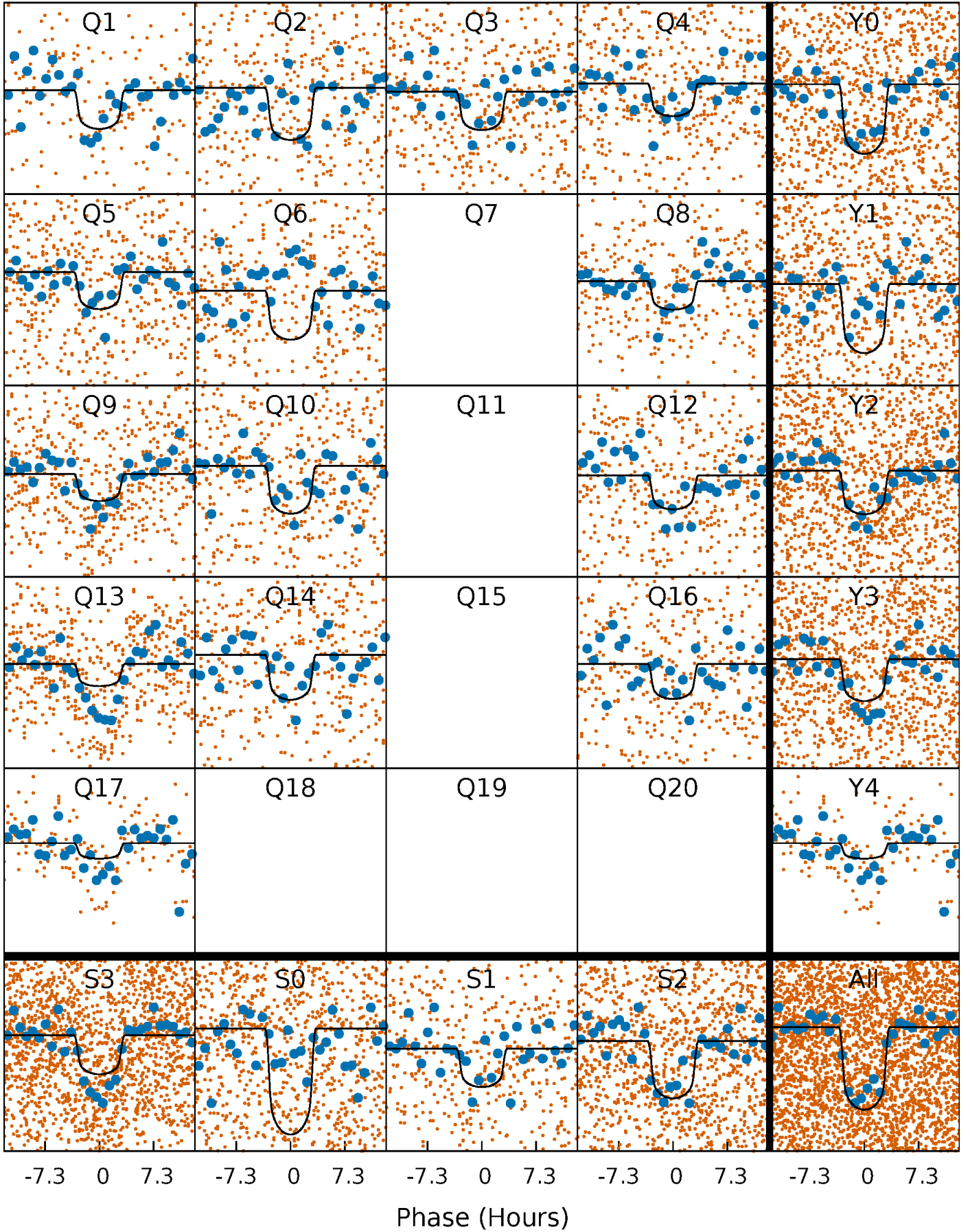
TCE 009910828-01 P= 8.480197 Days  $T_0=135.862865$  (BKJD)





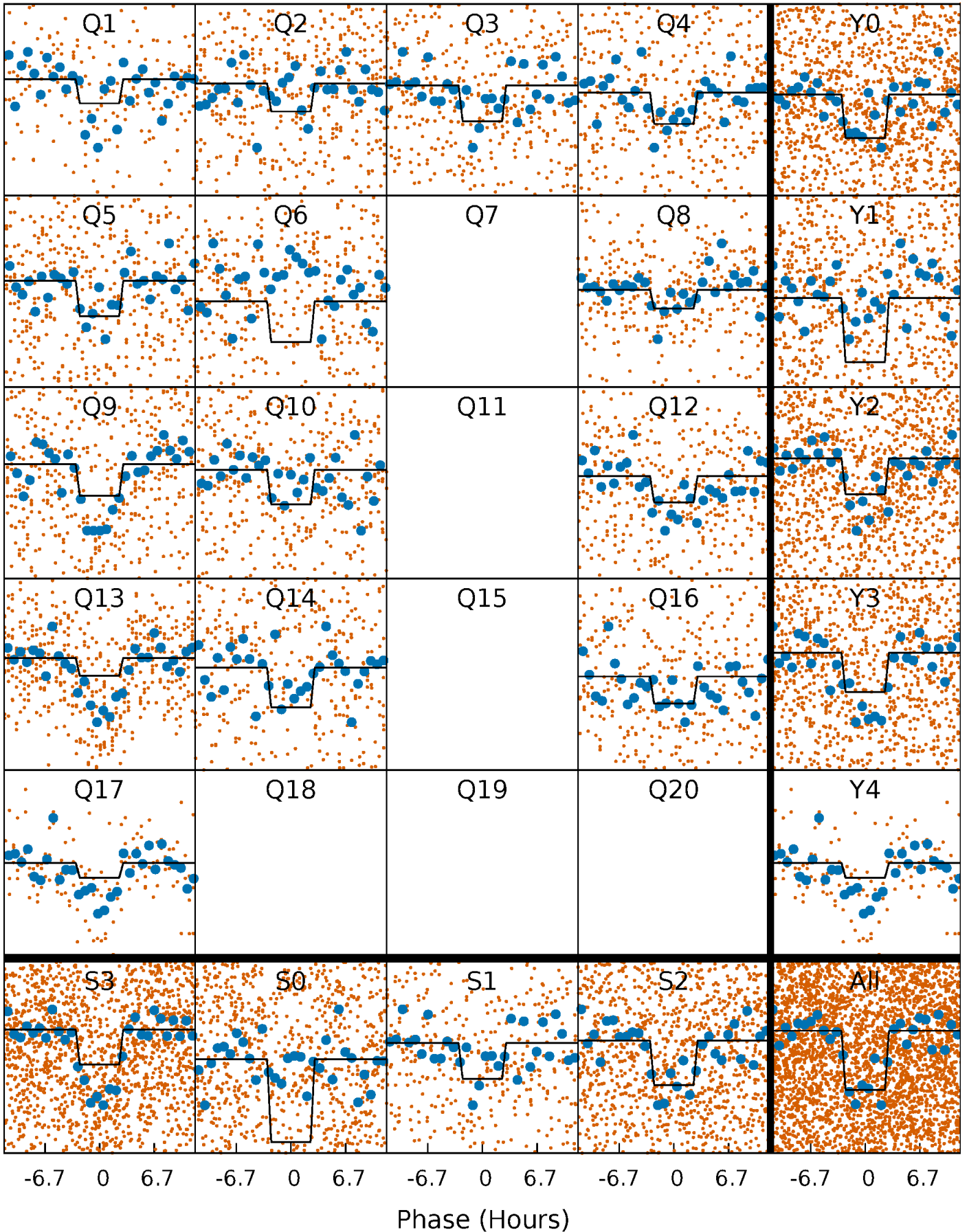
# DV Quarter-Phased Transit Curves

TCE 009910828-01   P= 8.480197 Days    $T_0=135.862865$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

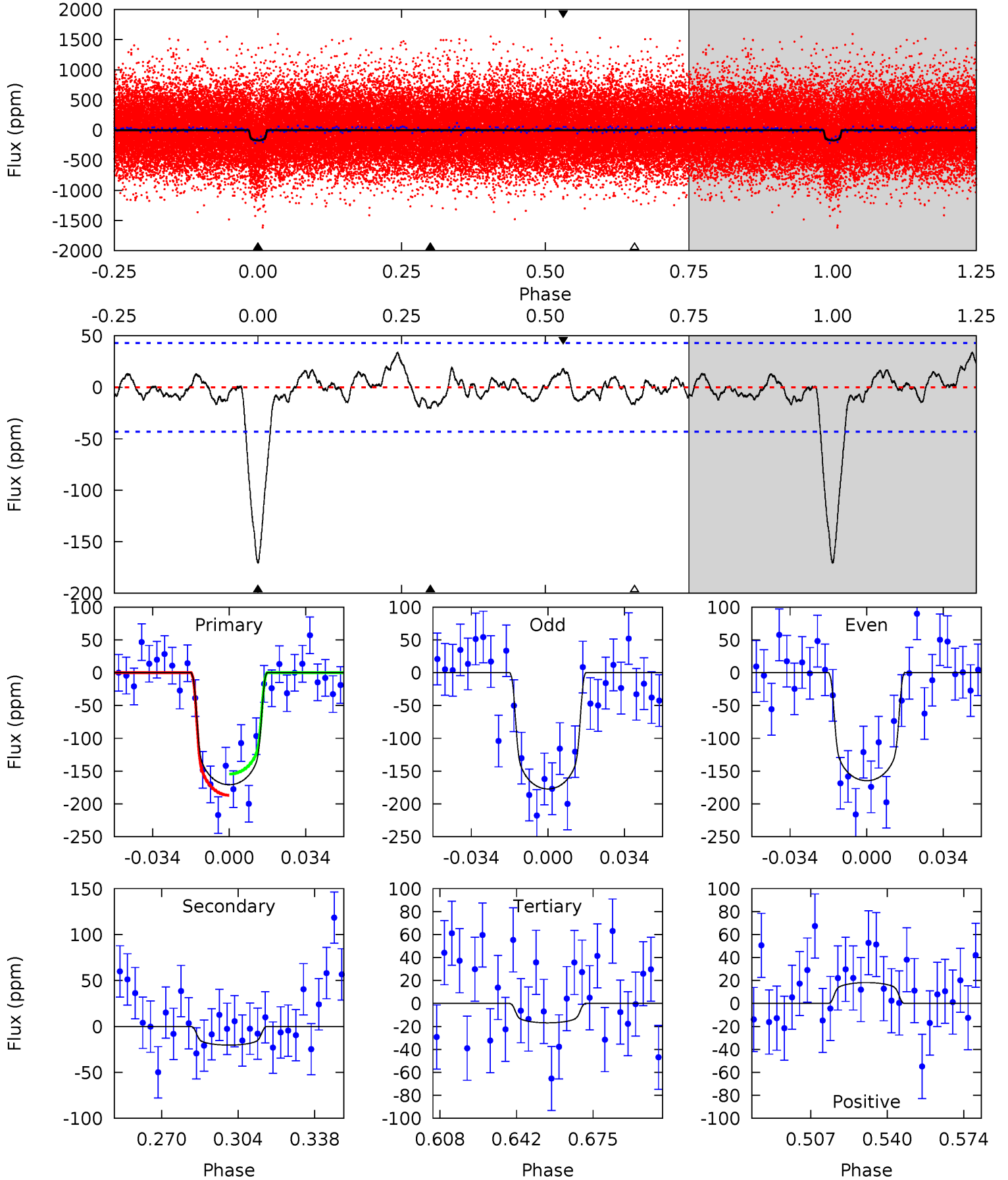
TCE 009910828-01 P= 8.480296 Days  $T_0=135.854295$  (BKJD)



# DV Model-Shift Uniqueness Test

009910828-01, P = 8.480197 Days, E = 127.382668 Days

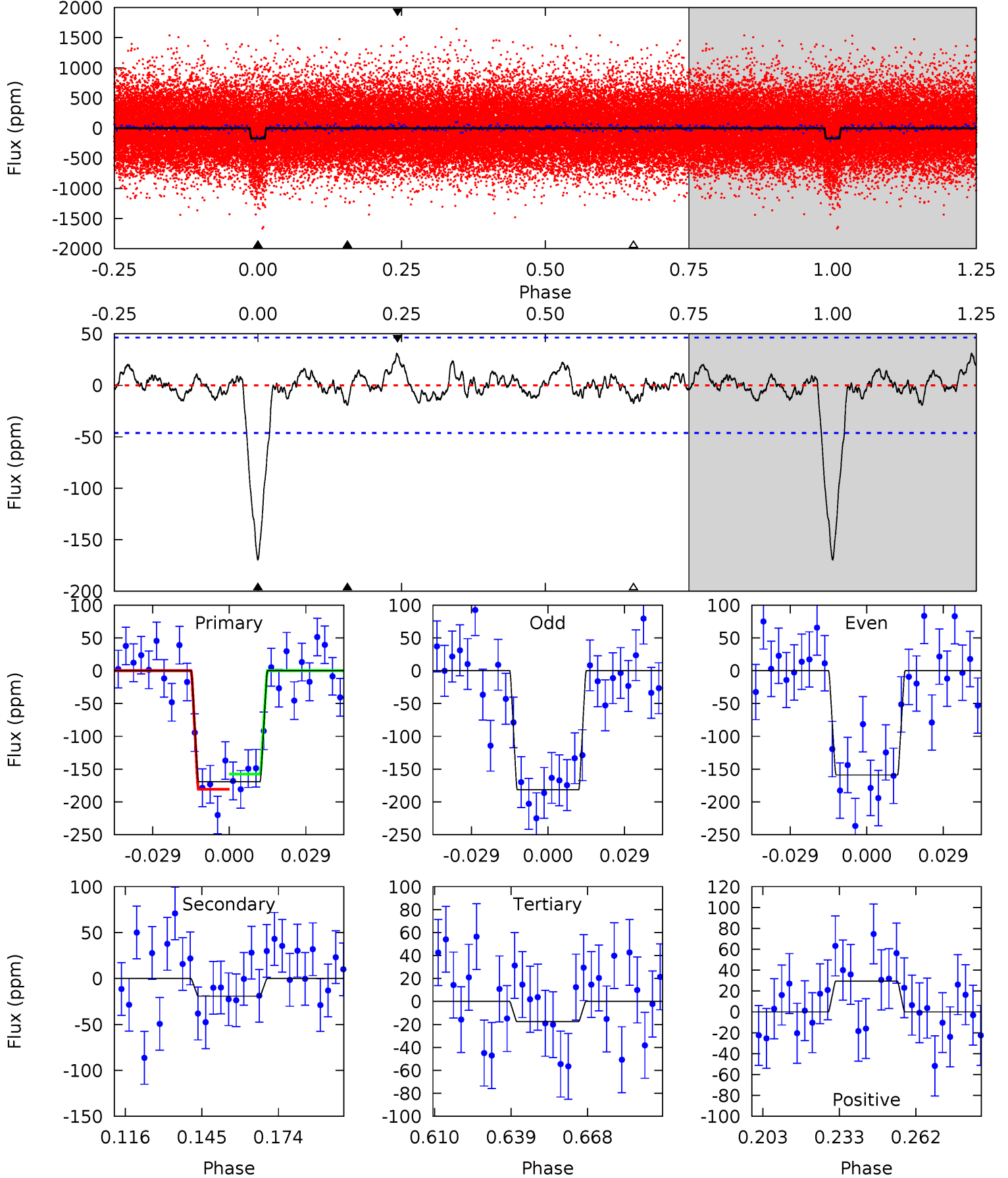
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	2.26	1.88	2.02	4.79	2.12	1.03	17.1	17.0	0.38	0.24	0.70	0.93	0.17	1.80



# Alt Model-Shift Uniqueness Test

009910828-01, P = 8.480296 Days, E = 127.373999 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
17.6	2.01	1.83	3.07	4.82	2.18	0.94	15.8	14.5	0.17	-1.07	1.17	0.85	0.15	1.21





### Stellar Parameters For KIC 009910828

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5415^{+161}_{-161}$	$4.556^{+0.088}_{-0.072}$	$-0.660^{+0.350}_{-0.300}$	$0.728^{+0.088}_{-0.079}$	$0.695^{+0.090}_{-0.038}$	$2.533^{+0.945}_{-0.634}$
	+3%/-3%	+2%/-2%	+53%/-45%	+12%/-11%	+13%/-5%	+37%/-25%
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 009910828-01 / KOI 4897.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-20 \pm 9$	$1.22^{+0.21}_{-0.19}$	$1059^{+44}_{-46}$	$3438^{+280}_{-312}$	$40^{+24}_{-18}$
Alt.	$-19 \pm 10$	$1.02^{+0.21}_{-0.18}$	$1054^{+47}_{-42}$	$3576^{+383}_{-423}$	$53^{+43}_{-29}$

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

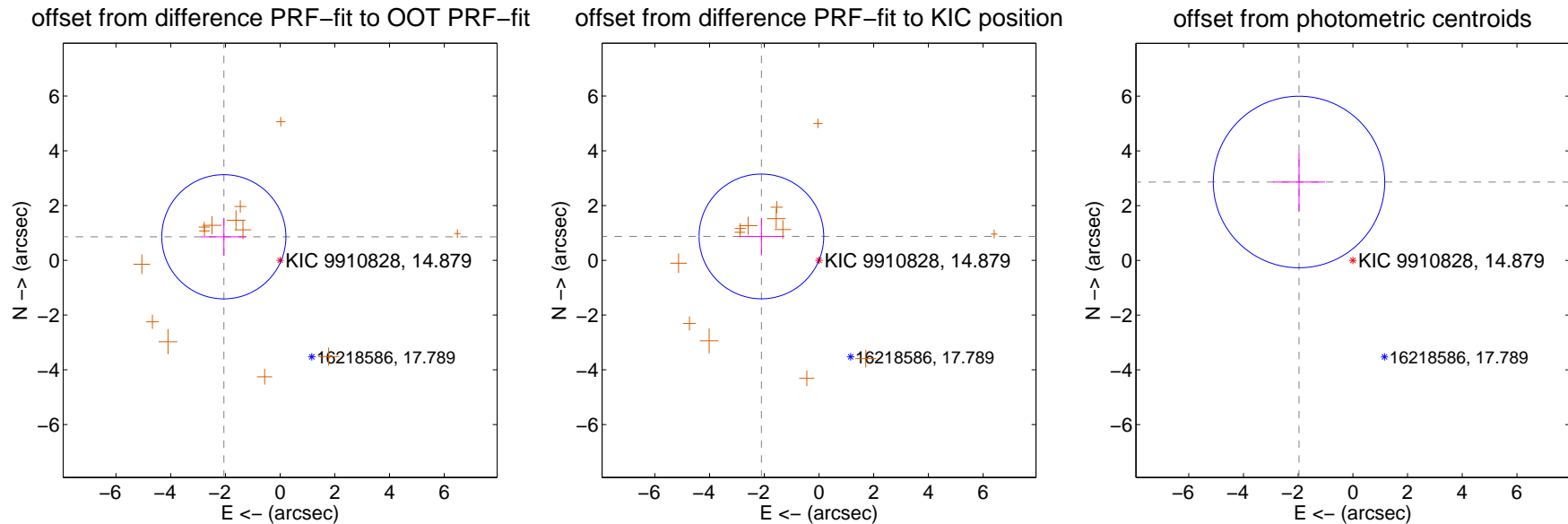
## DV Centroid Data

Supplemental centroid analysis for 009910828-01. Kepler magnitude: 14.88. Transit SNR 15.83

There are 0 quarters with good PRF difference image offsets

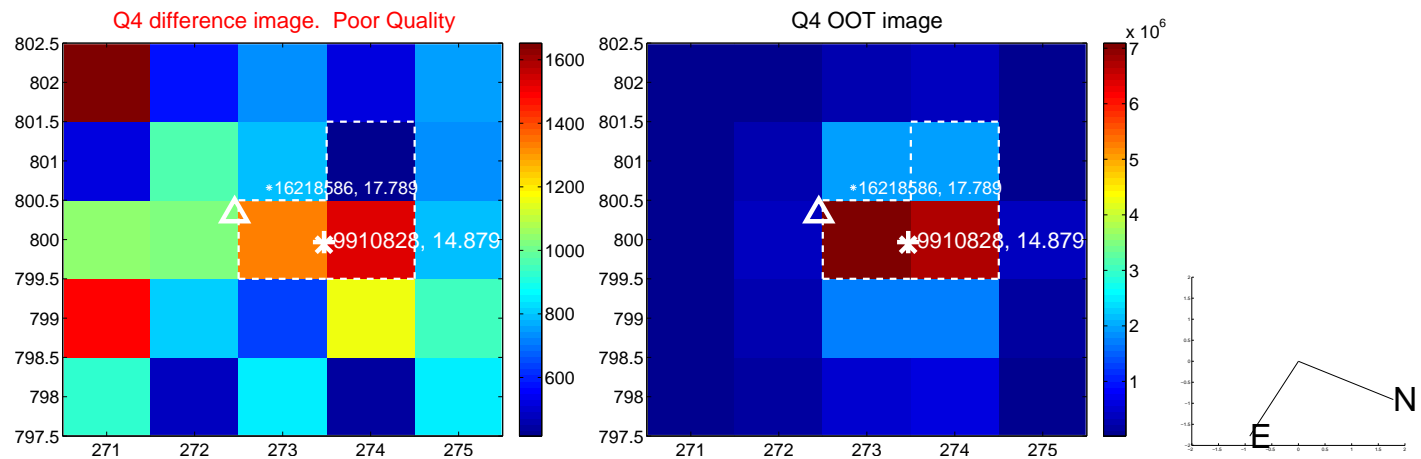
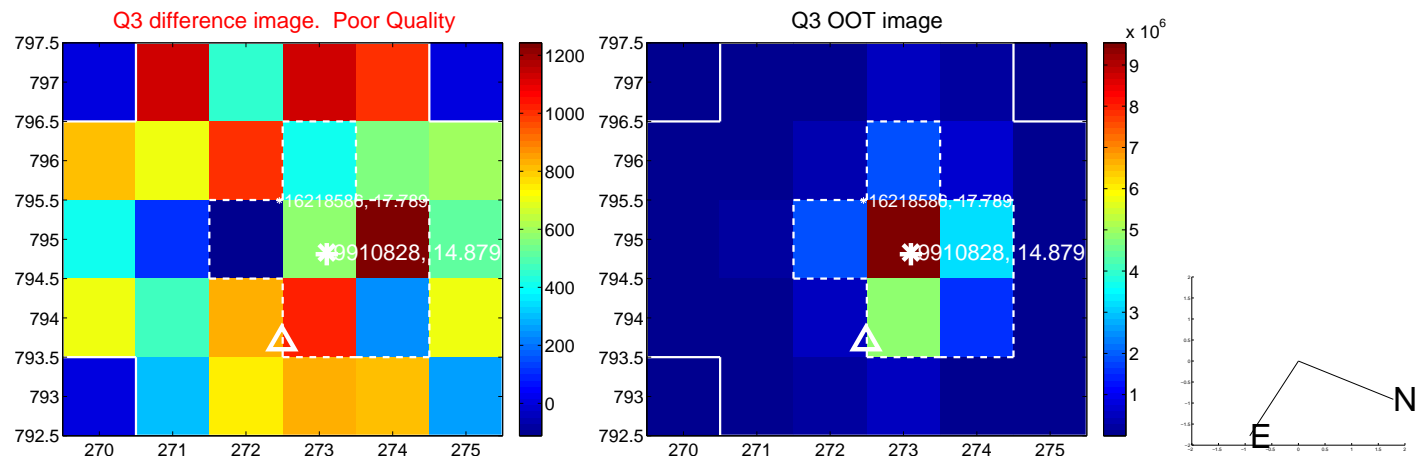
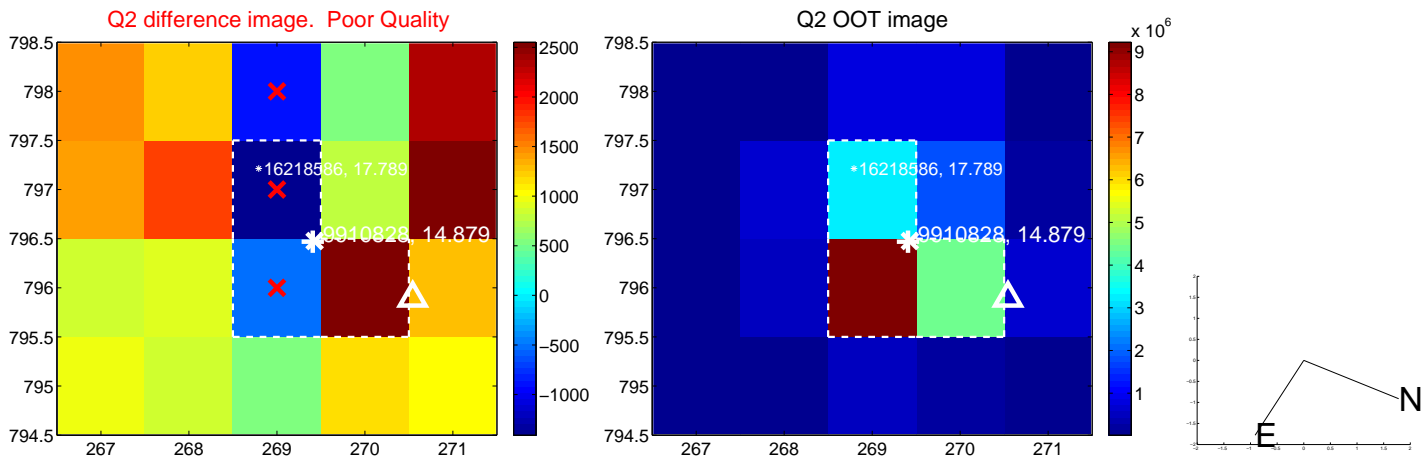
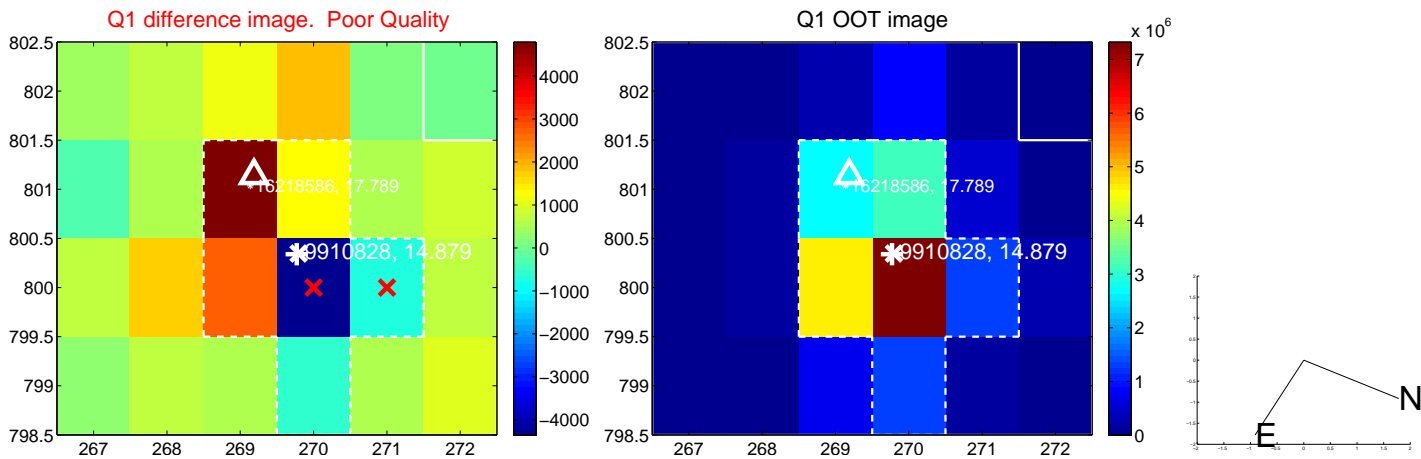
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.229 \pm 0.756$	2.95	$2.056 \pm 0.834$	$0.859 \pm 0.689$
PRF-fit source offset from KIC position	$2.278 \pm 0.759$	3.00	$2.105 \pm 0.808$	$0.872 \pm 0.665$
photometric centroid source offset	$3.47 \pm 1.04$	3.33	$1.97 \pm 0.95$	$2.86 \pm 1.09$

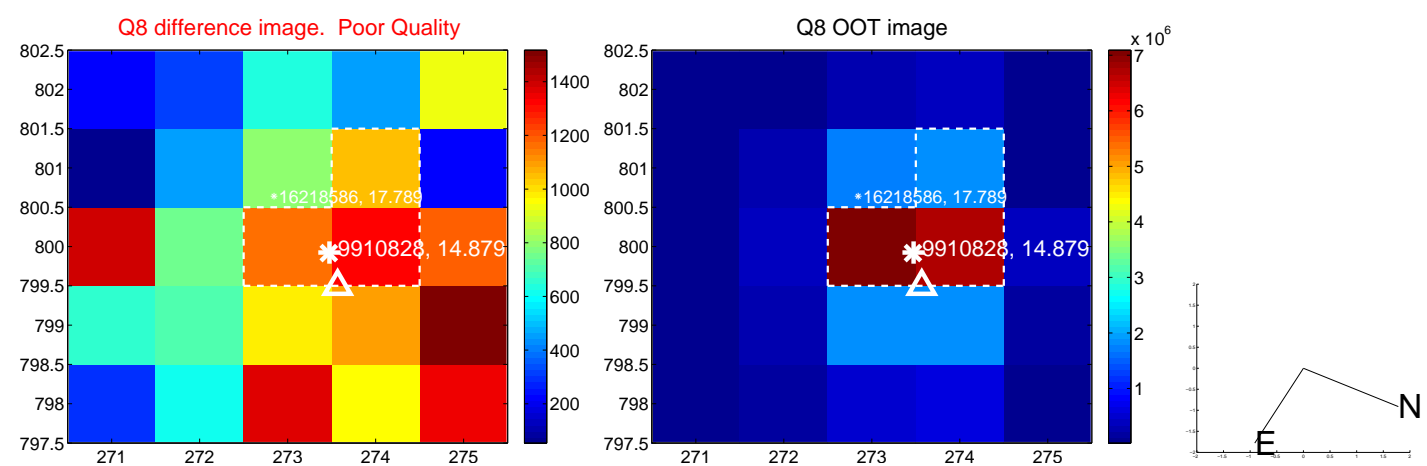
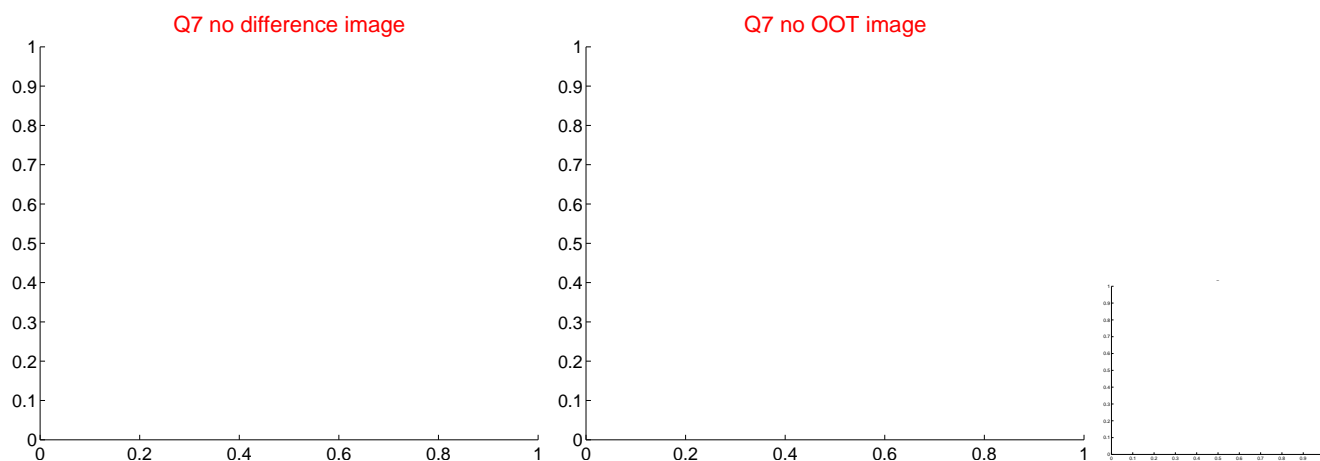
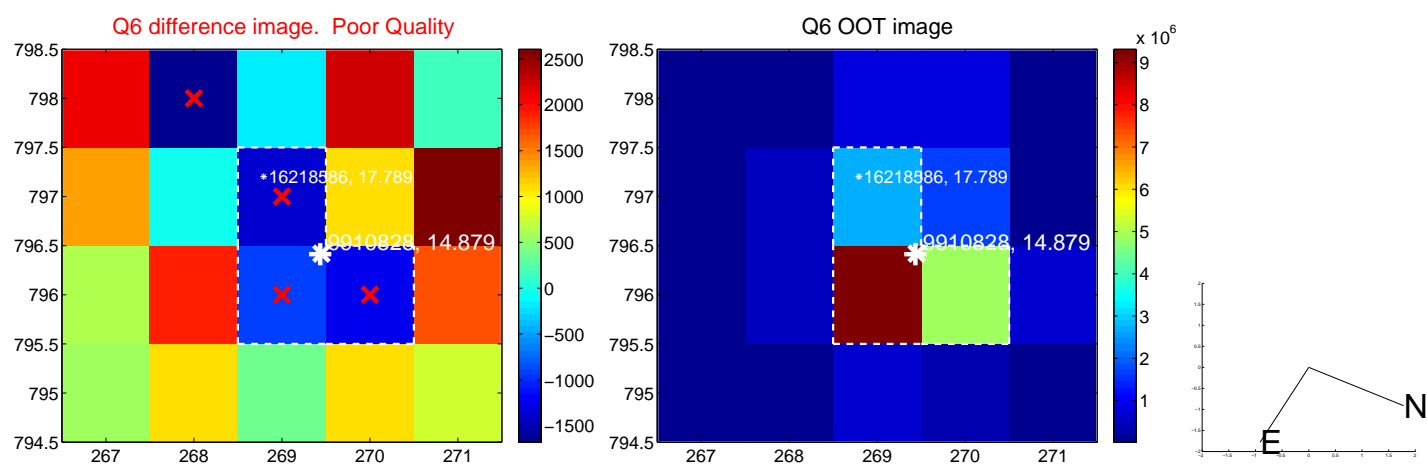
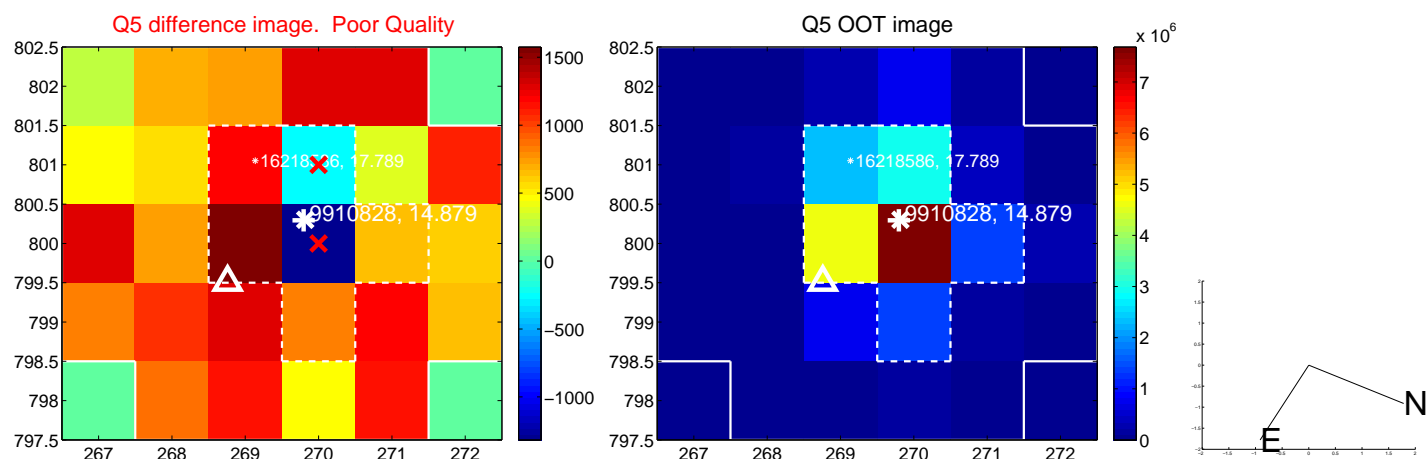


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

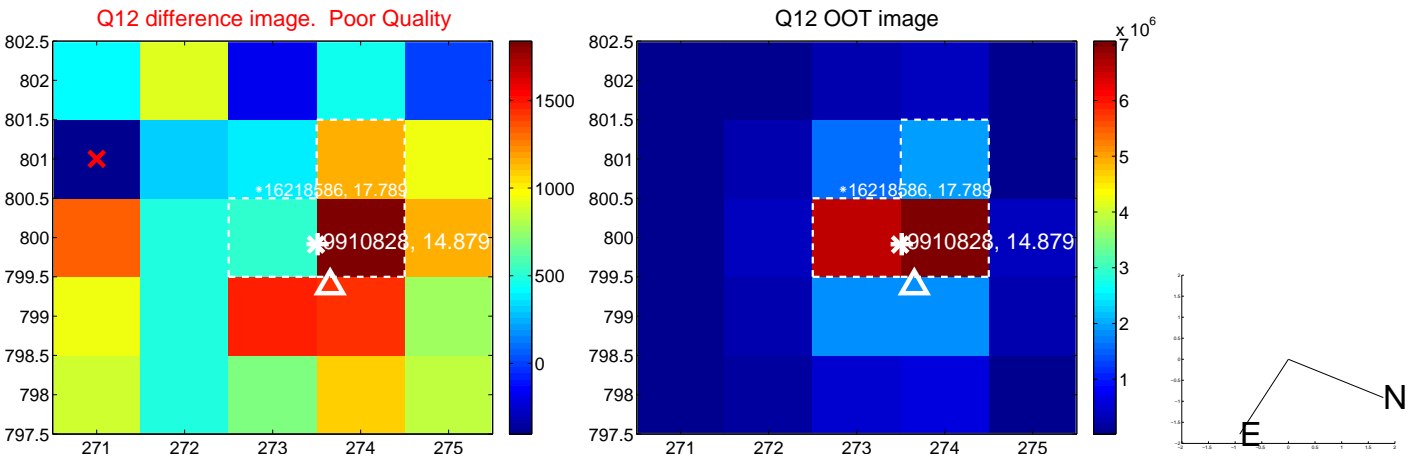
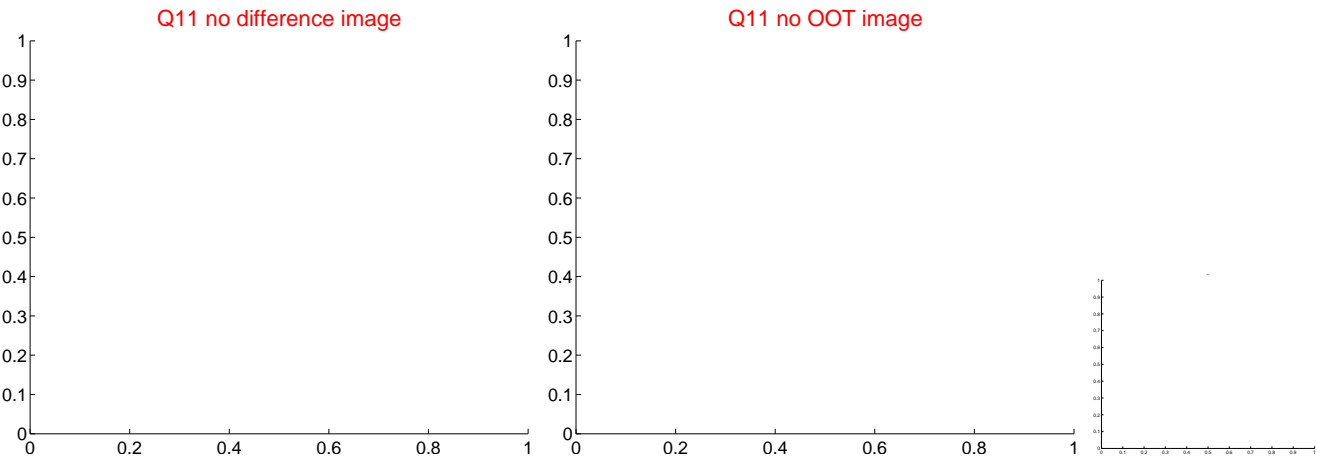
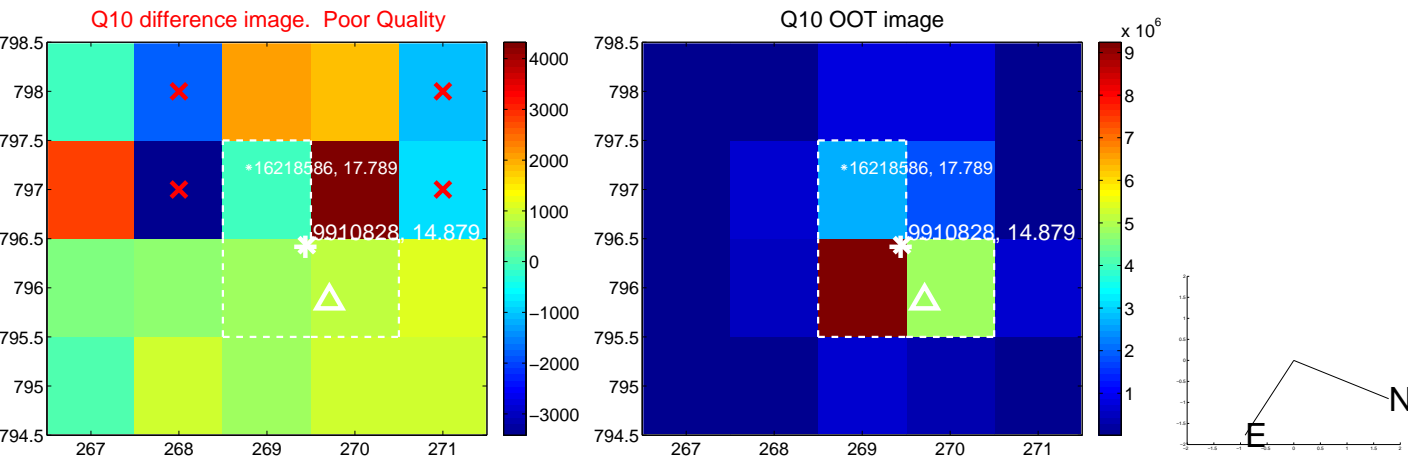
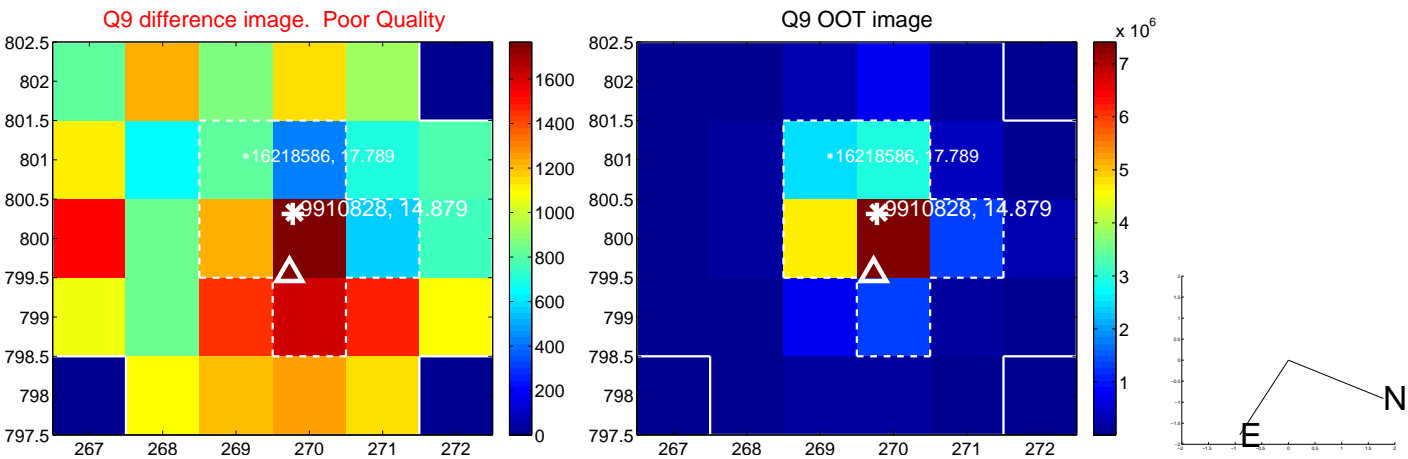


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

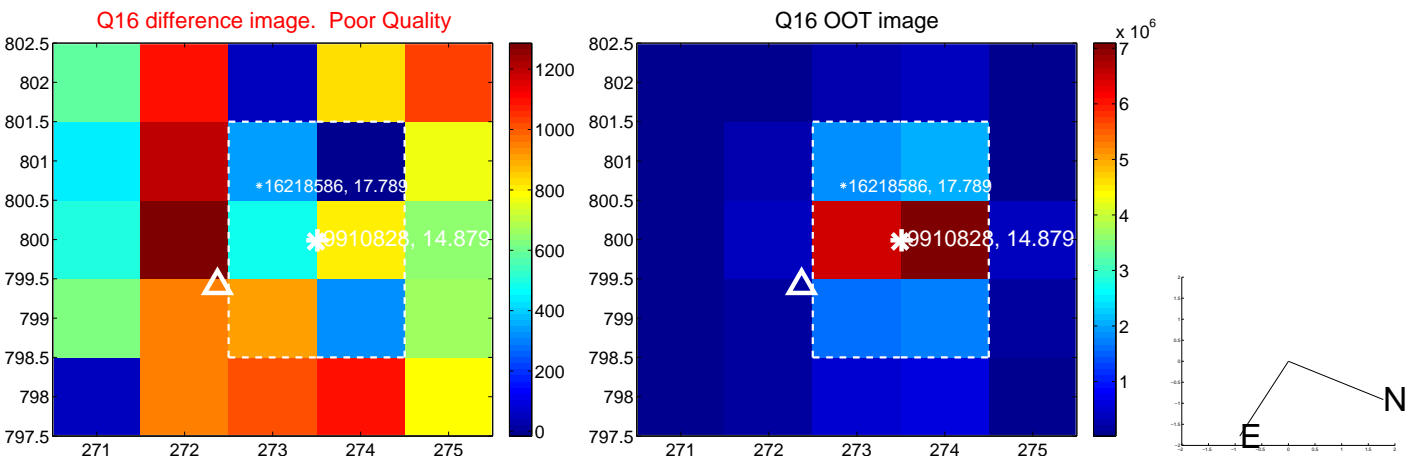
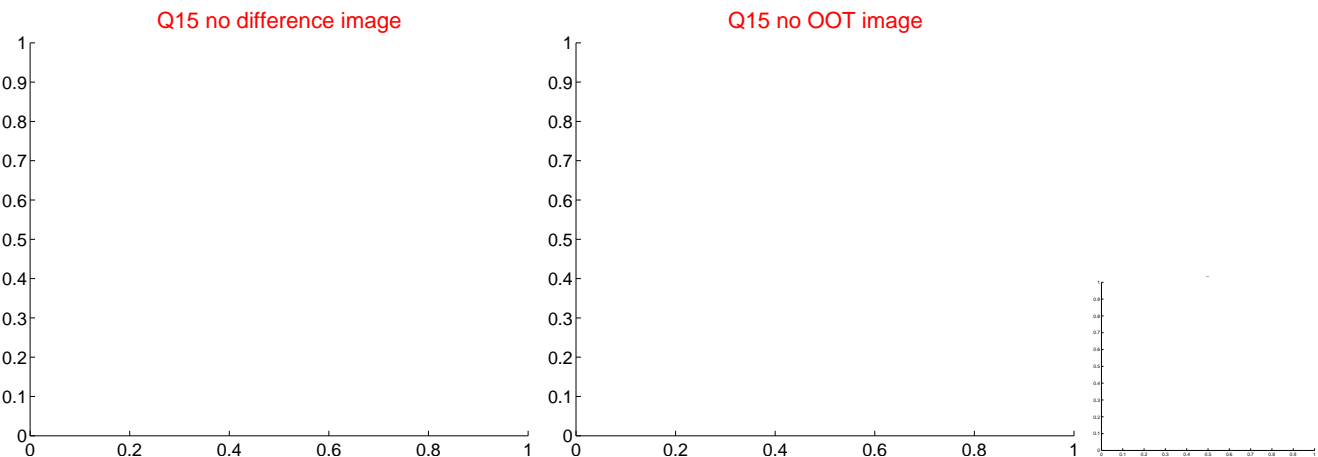
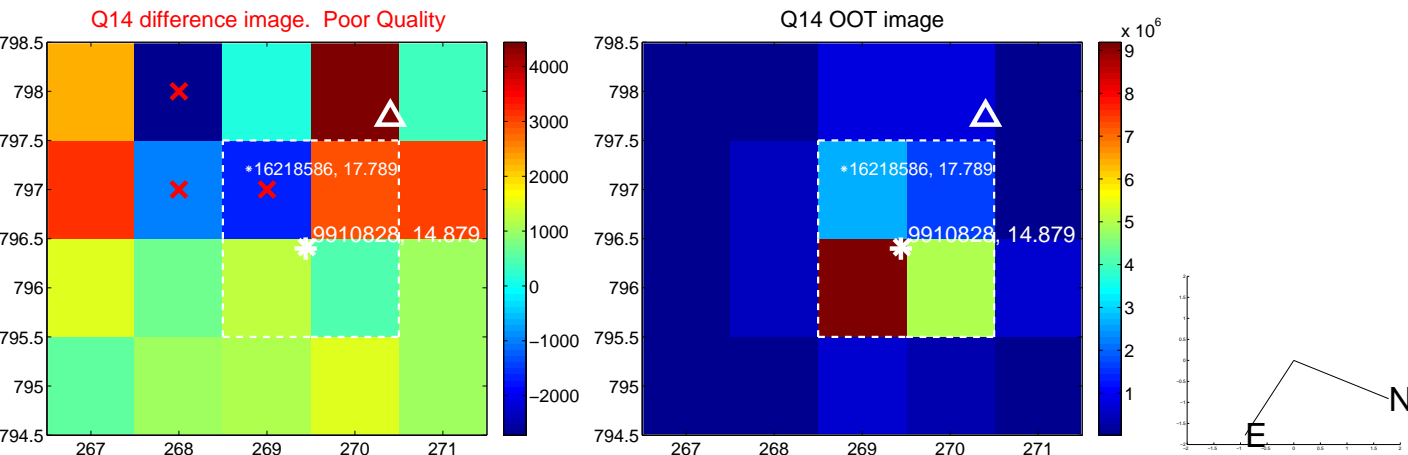
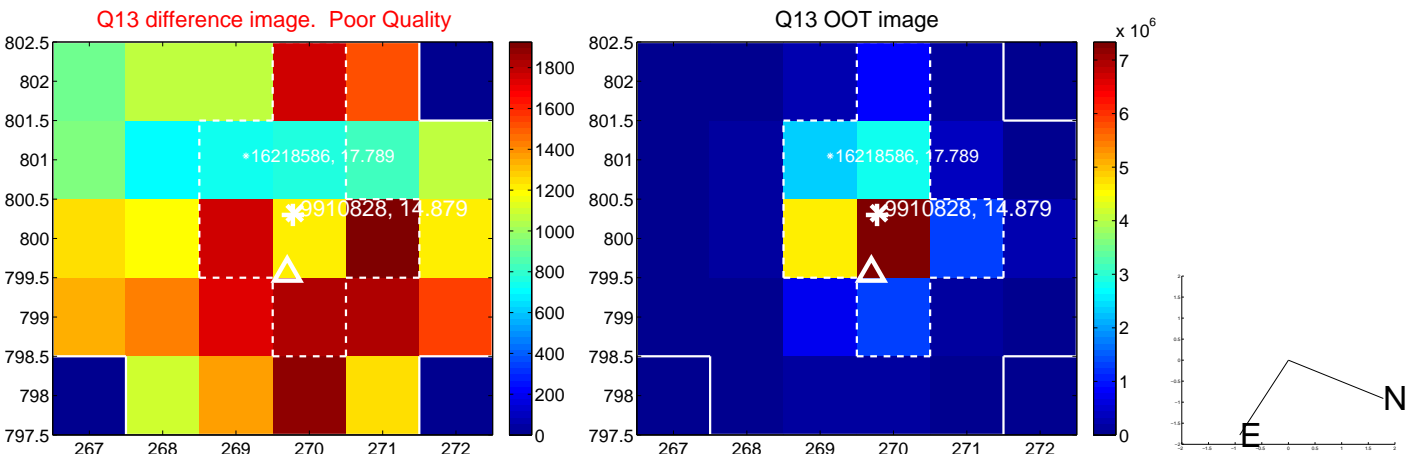




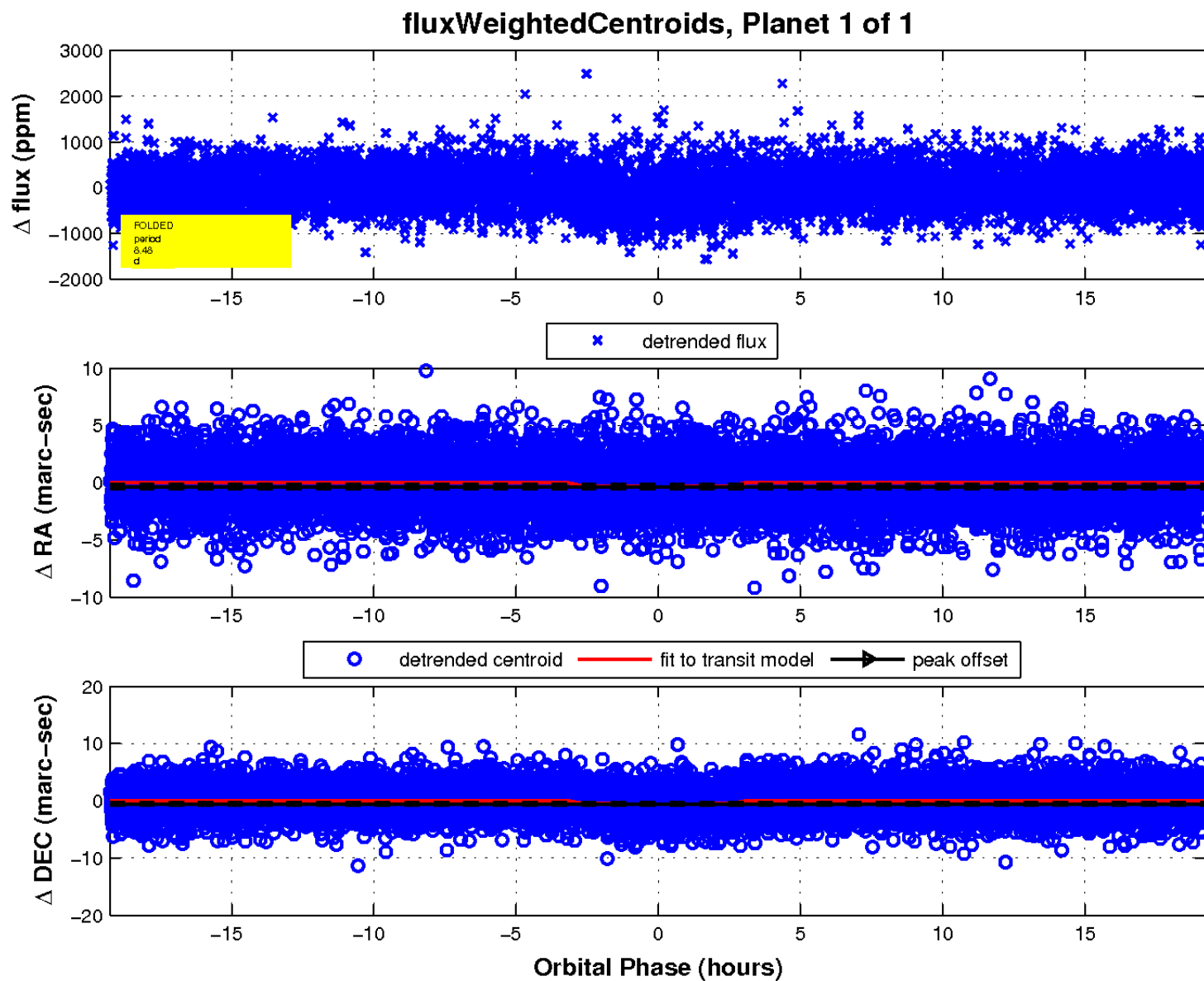
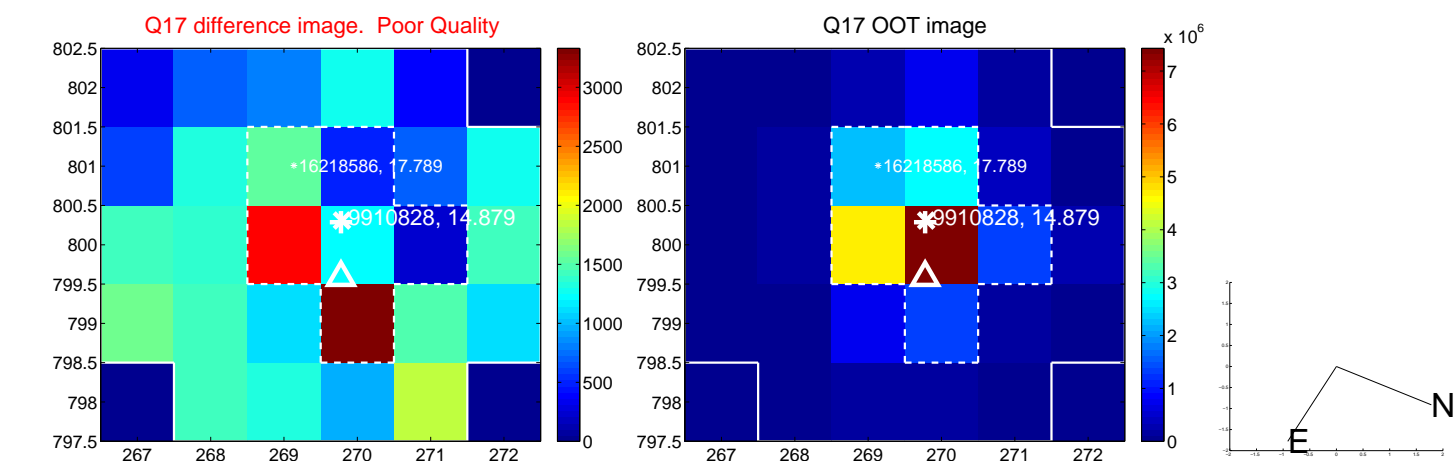
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

