

# KIC 006780158

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006780158-01	OBS	2231.01	2.464129	131.931580	98.5	1.793	18.6	22.4	1.88	5238	2.25	2019.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006780158-01	OBS	FP	0.00	0	0	1	0	CENT_RESOLVED_OFFSET

**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.

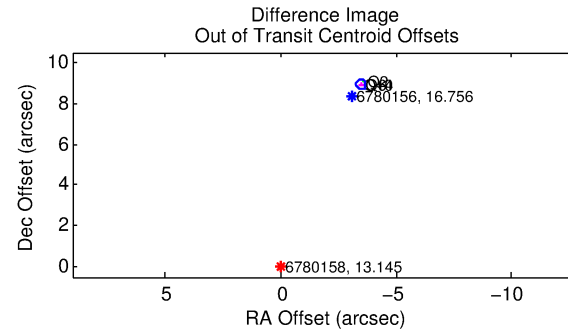
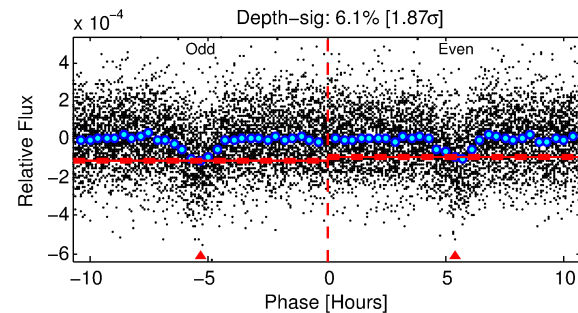
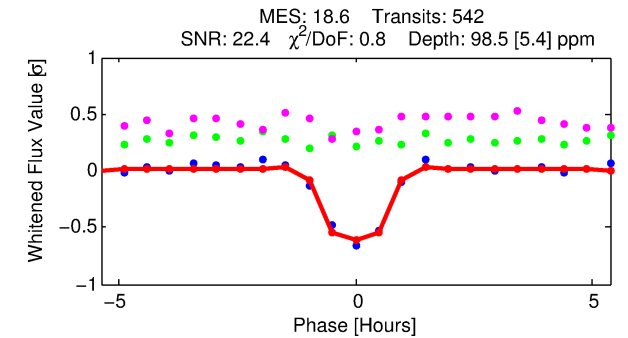
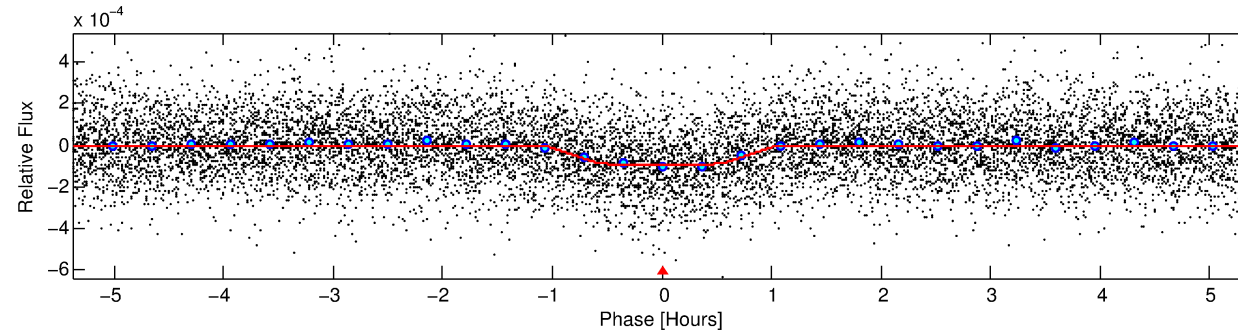
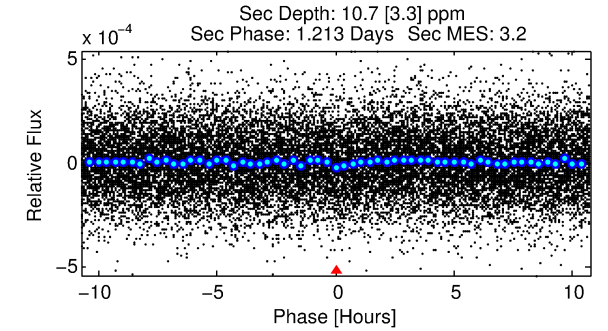
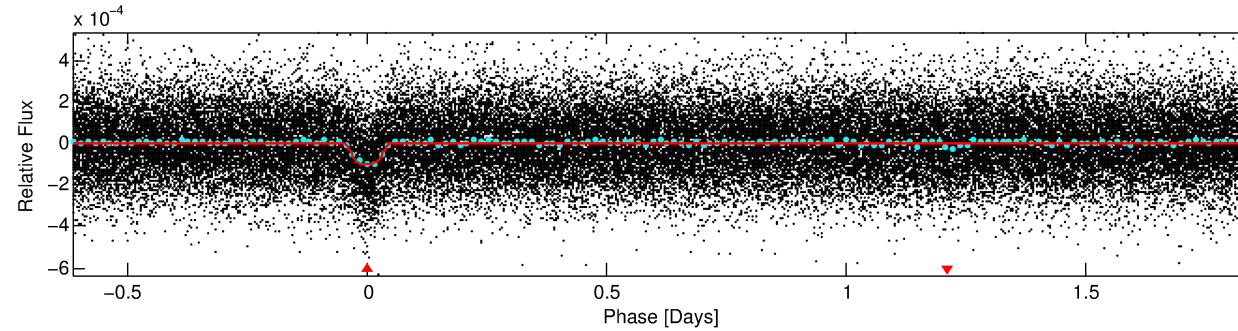
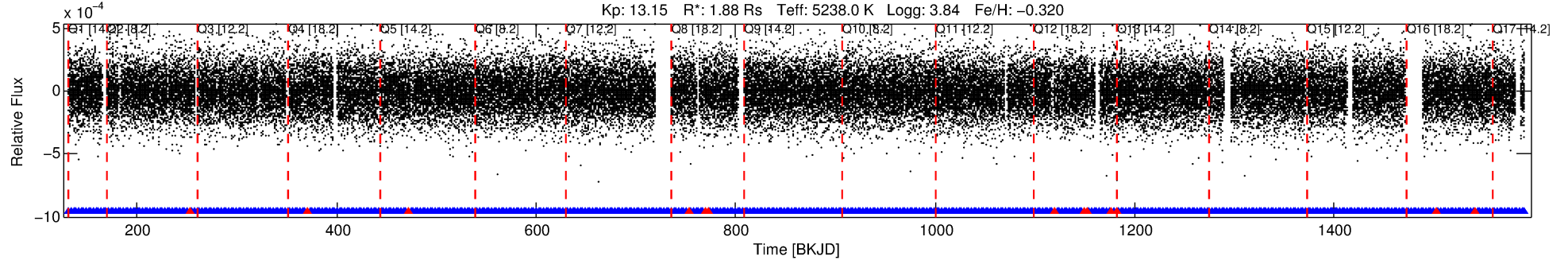
## Ephemeris Match Information For 006780158-01

No Significant Match Found

# DV One-Page Summary

KIC: 6780158 Candidate: 1 of 1 Period: 2.464 d  
KOI: K02231.01 Corr: 0.927

Kp: 13.15 R\*: 1.88 Rs Teff: 5238.0 K Logg: 3.84 Fe/H: -0.320



## DV Fit Results:

Period = 2.46413 [0.00001] d  
Epoch = 131.9316 [0.0013] BKJD  
Rp/R\* = 0.0110 [0.0038]  
a/R\* = 4.92 [7.16]  
b = 0.90 [0.33]  
Seff = 2019.48 [2500.57]  
Teq = 1709 [529] K  
Rp = 2.25 [1.60] Re  
a = 0.0344 [0.0245] AU  
Ag = 1.37 [1.99] [0.19σ]  
Teff = 2862 [550] K [1.51σ]

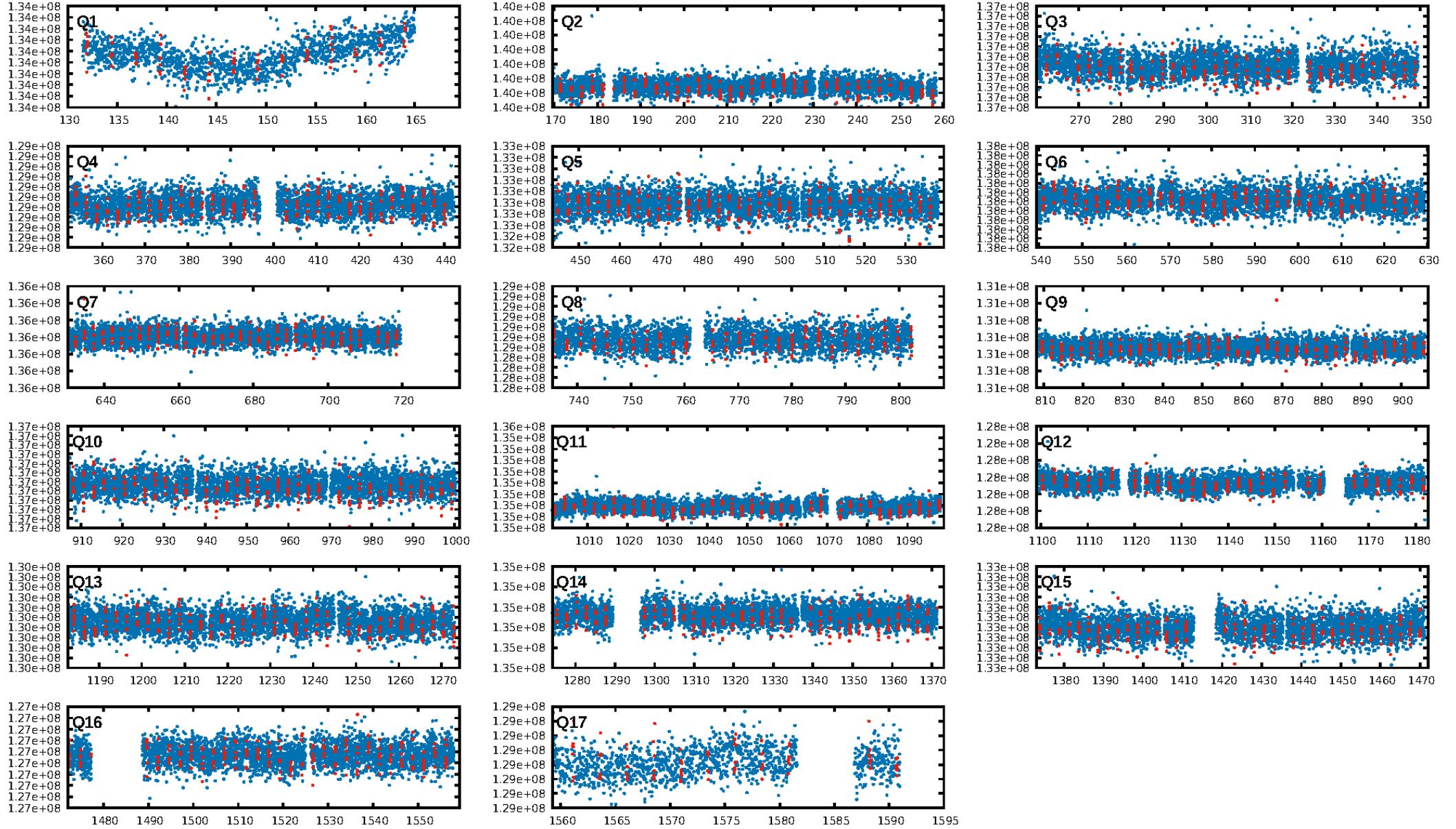
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.80e-74  
RollingBand-fgt: 0.97 [504/517]  
GhostDiagnostic-chr: -0.4426  
Centroid-sig: 0.0%  
Centroid-so: 68.524 arcsec [153.66σ]  
OotOffset-rm: 9.574 arcsec [124.22σ]  
KicOffset-rm: 9.439 arcsec [100.50σ]  
OotOffset-st: 4/0/0/0 [4]  
KicOffset-st: 4/0/0/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [17/17]

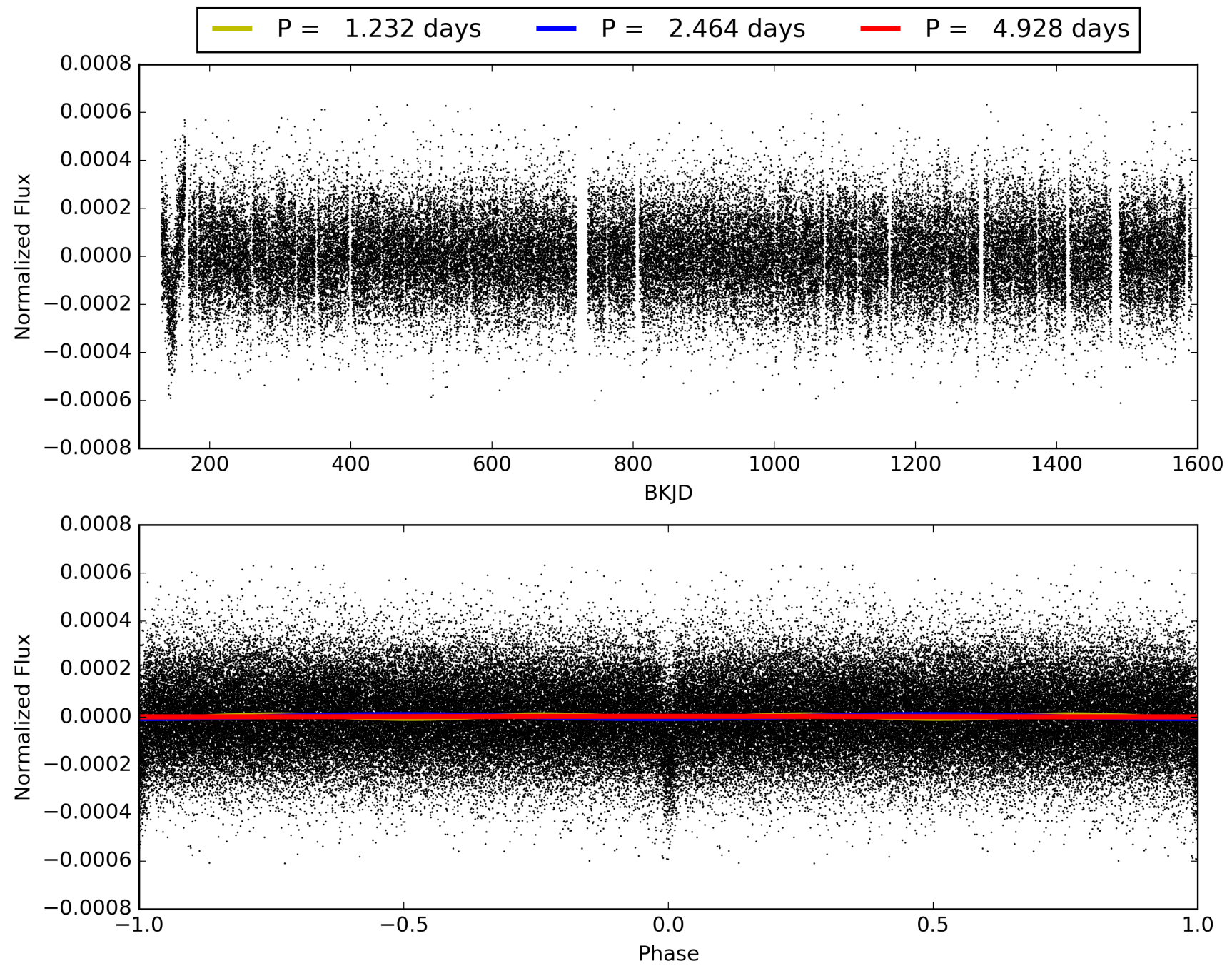
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:25:07 Z

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

# TCE 006780158-01, PDC Light Curves



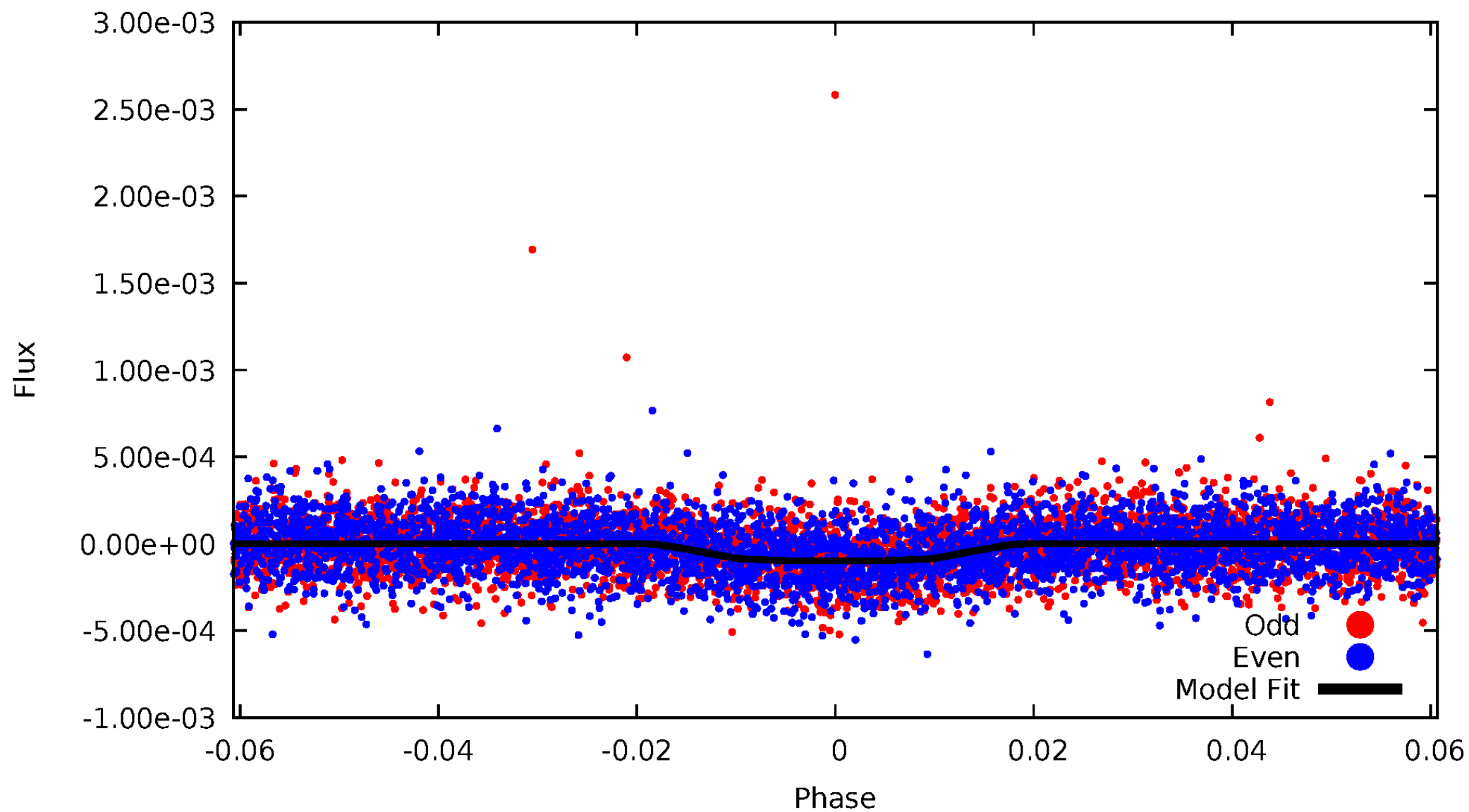
TCE 006780158-01





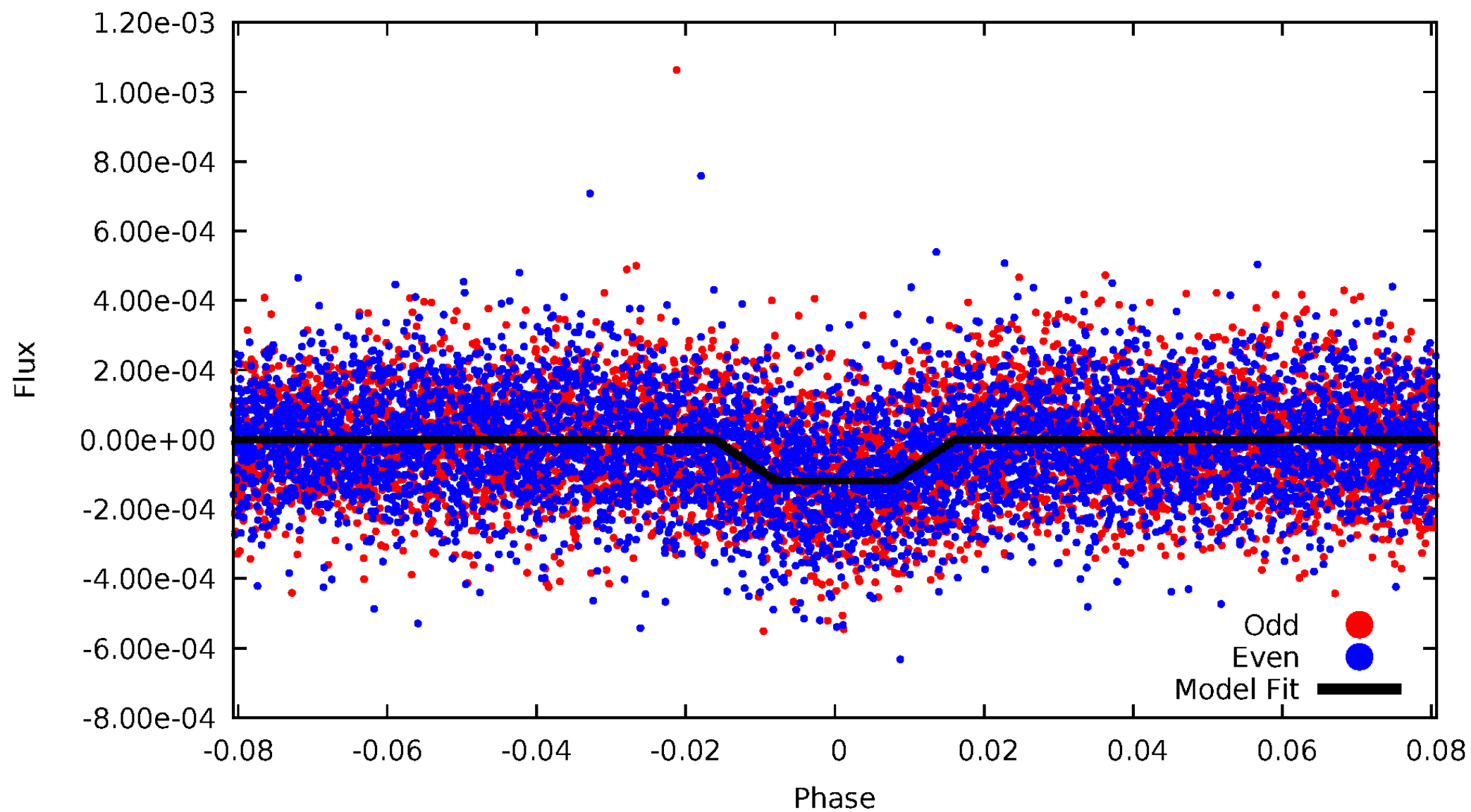
# DV Odd/Even

TCE 006780158-01



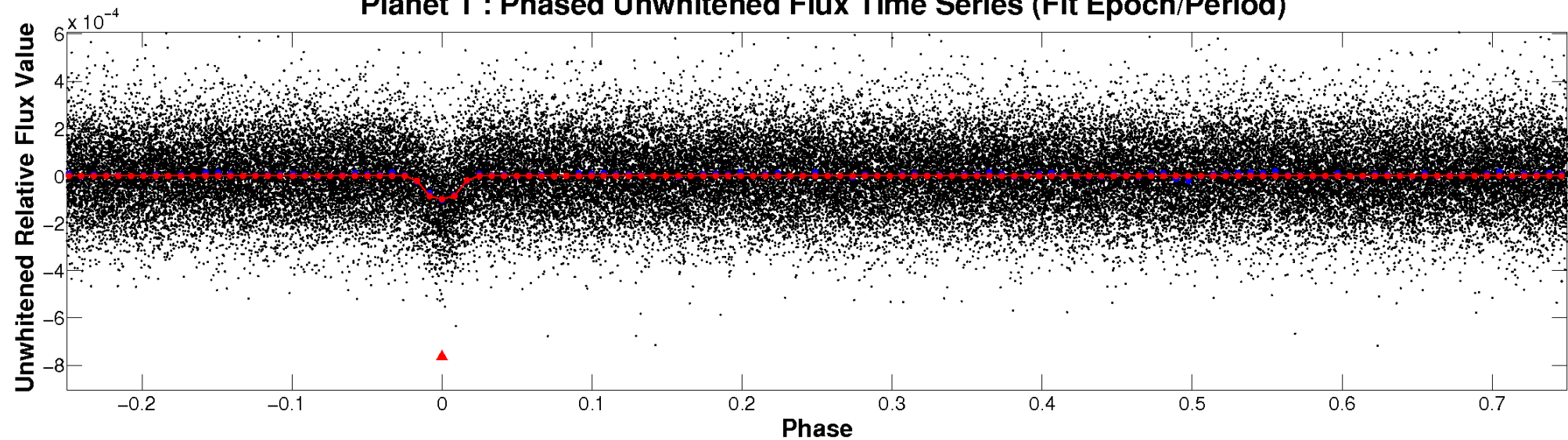
# ALT Odd/Even

TCE 006780158-01

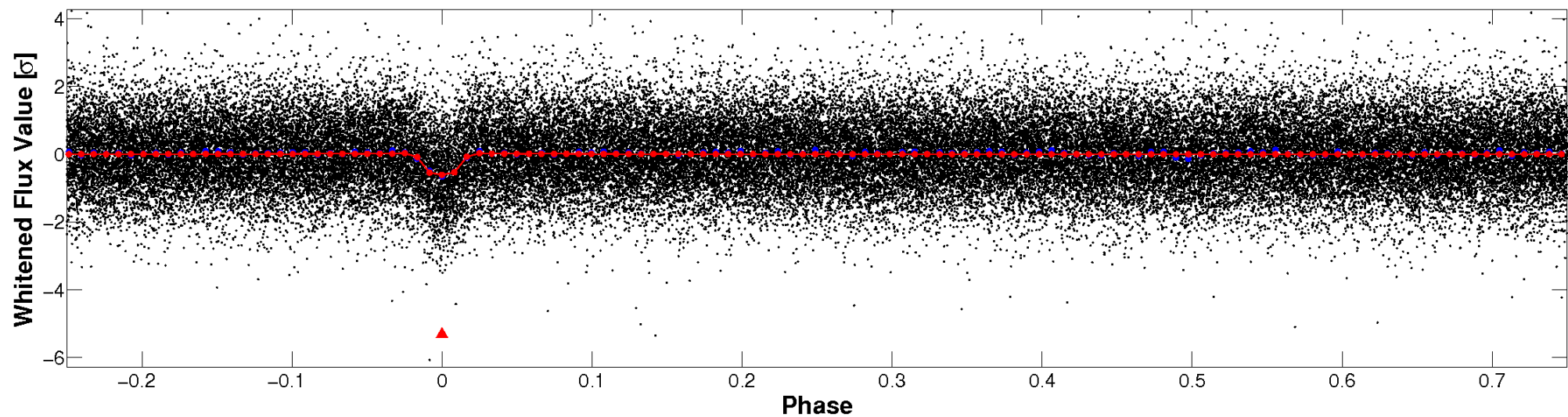


# Non-Whitened Vs. Whitened Light Curve

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

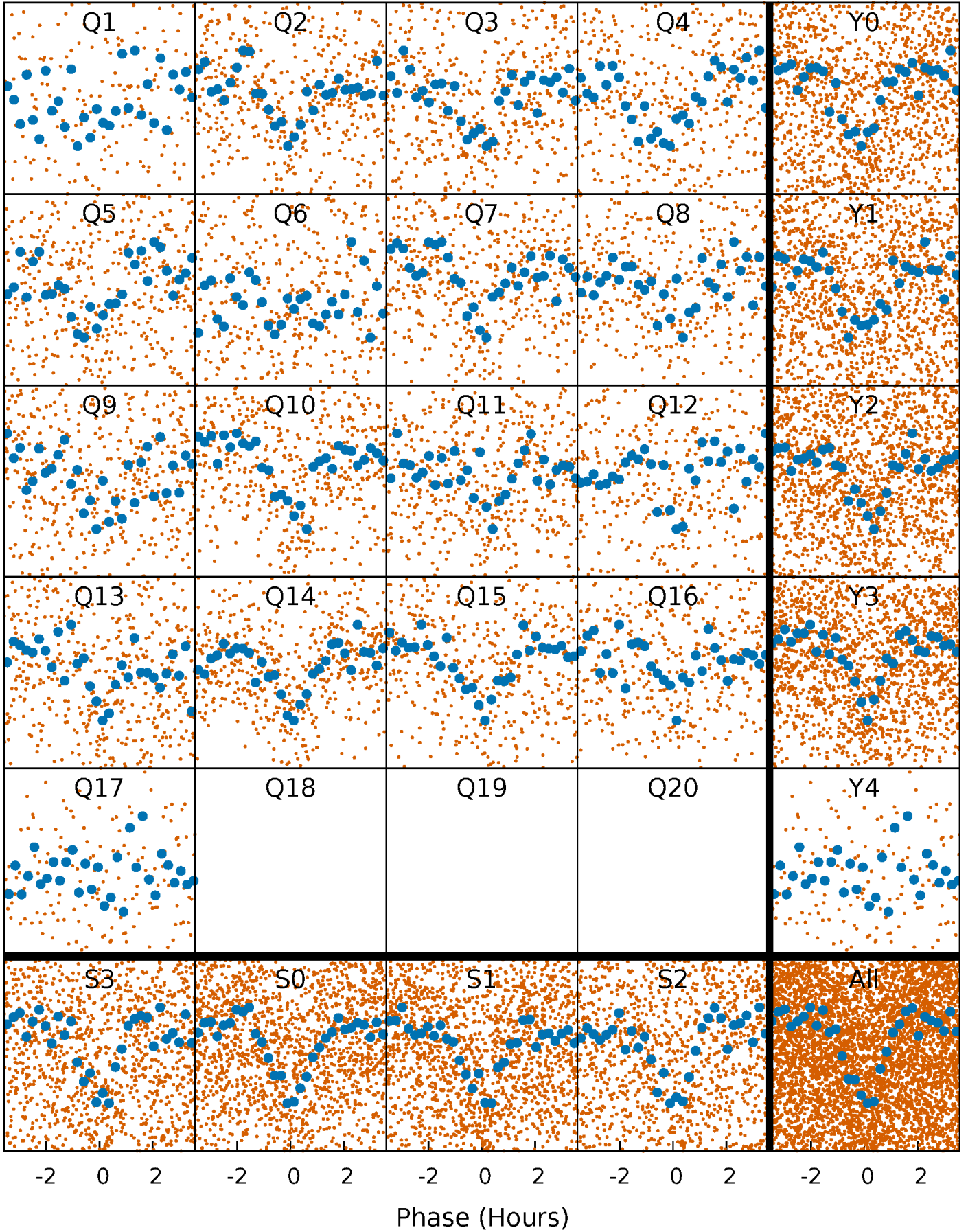


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

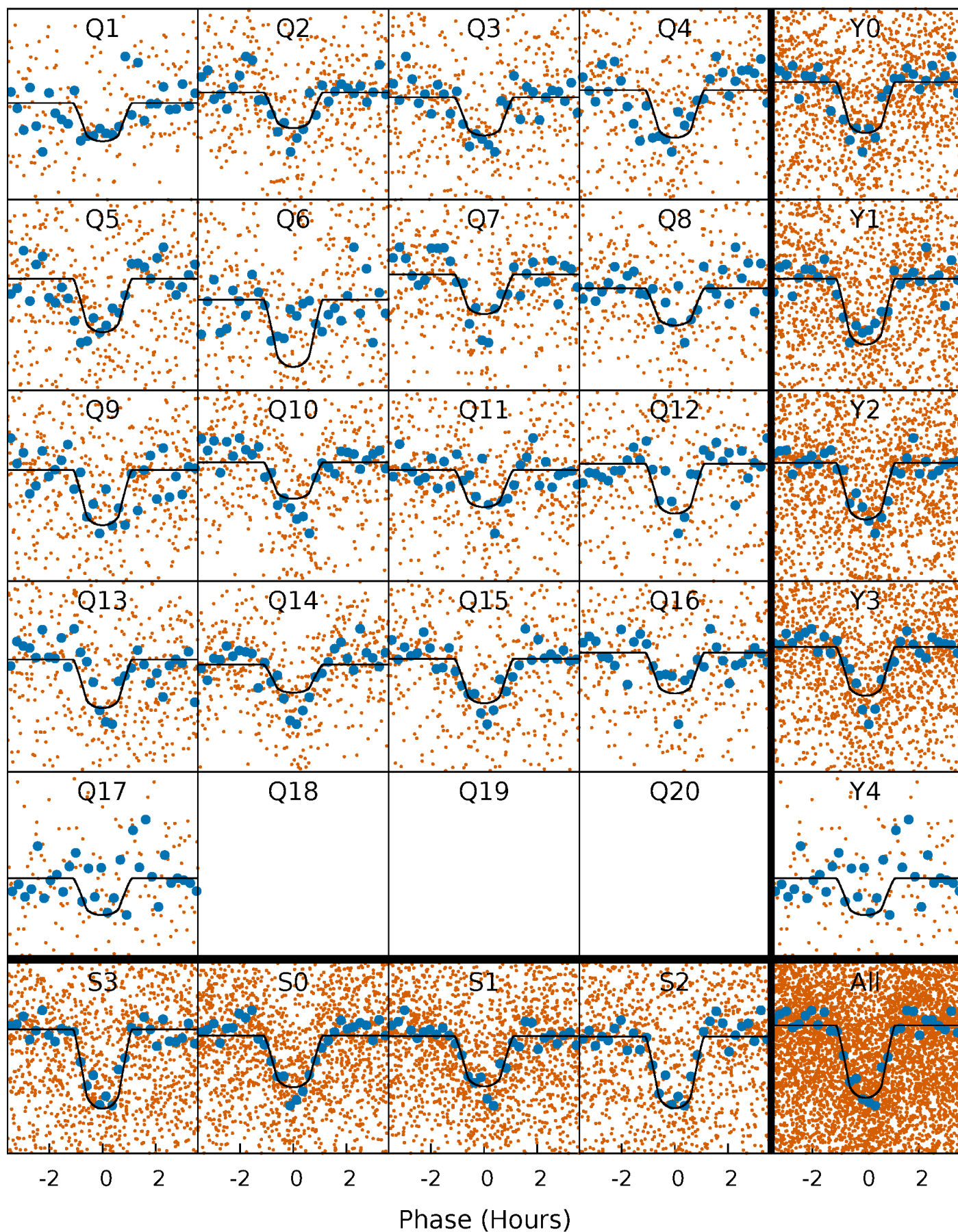
TCE 006780158-01 P= 2.464129 Days  $T_0=131.931580$  (BKJD)





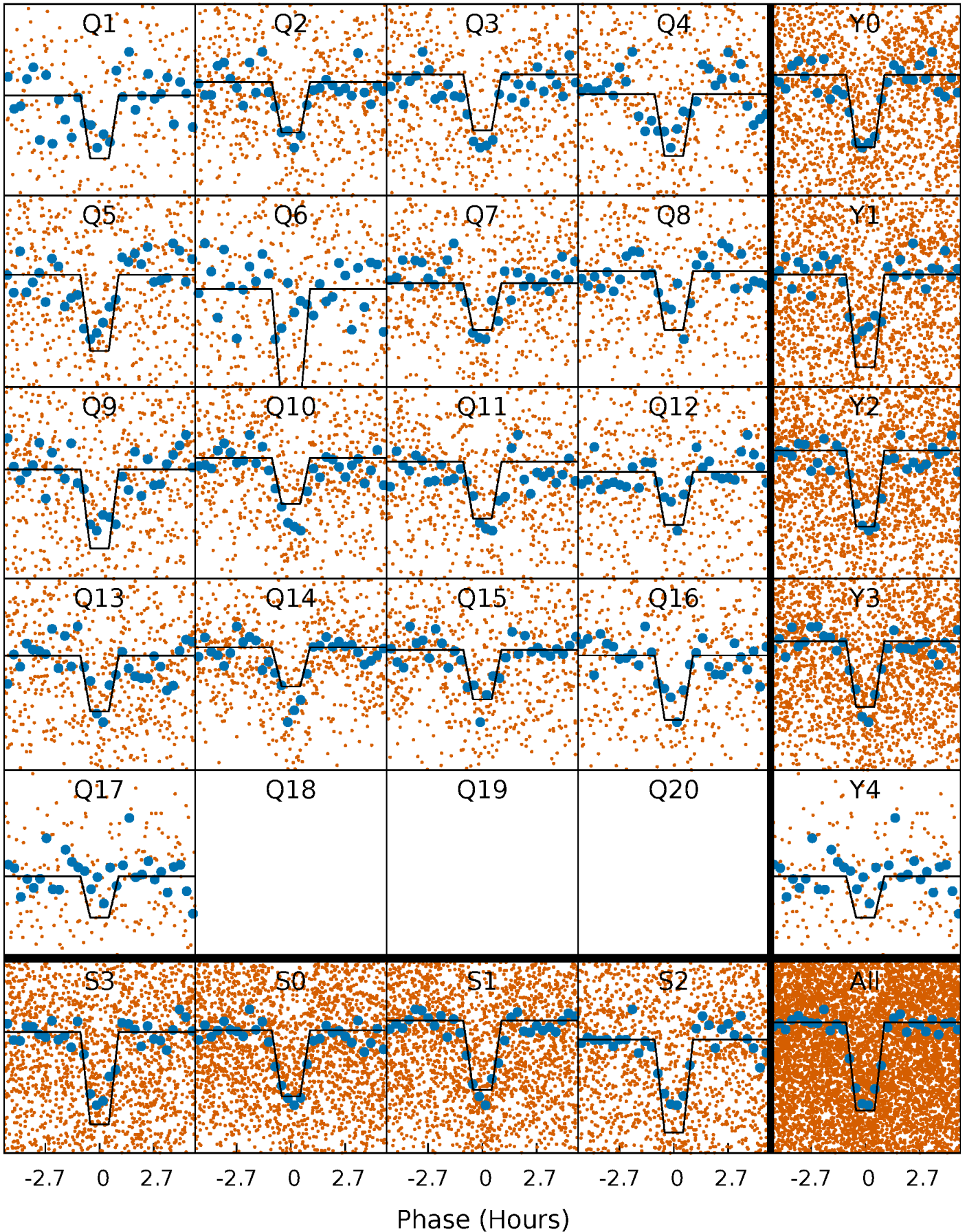
# DV Quarter-Phased Transit Curves

TCE 006780158-01 P= 2.464129 Days  $T_0=131.931580$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

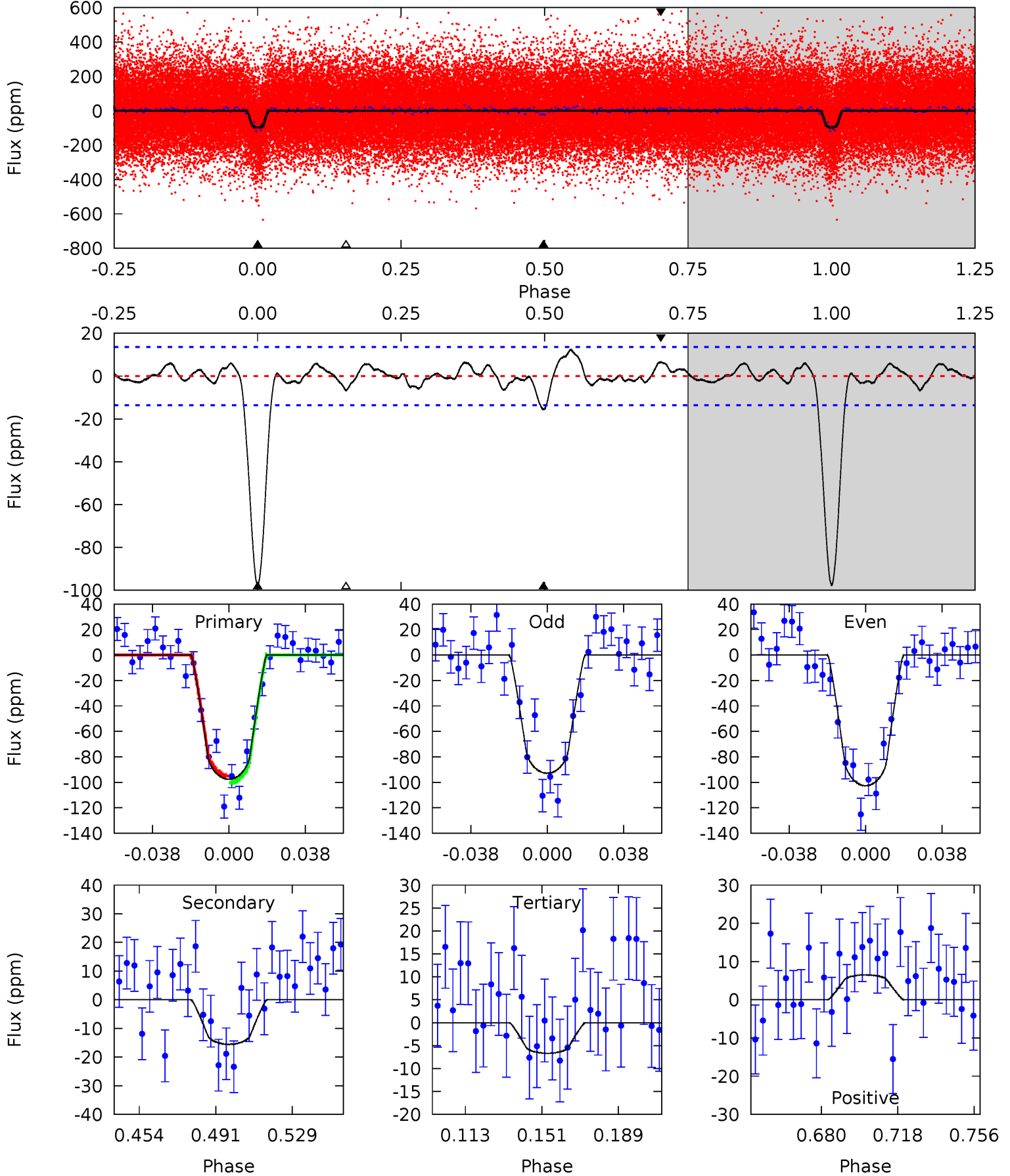
TCE 006780158-01 P= 2.464146 Days  $T_0=131.926858$  (BKJD)



# DV Model-Shift Uniqueness Test

006780158-01, P = 2.464129 Days, E = 129.467451 Days

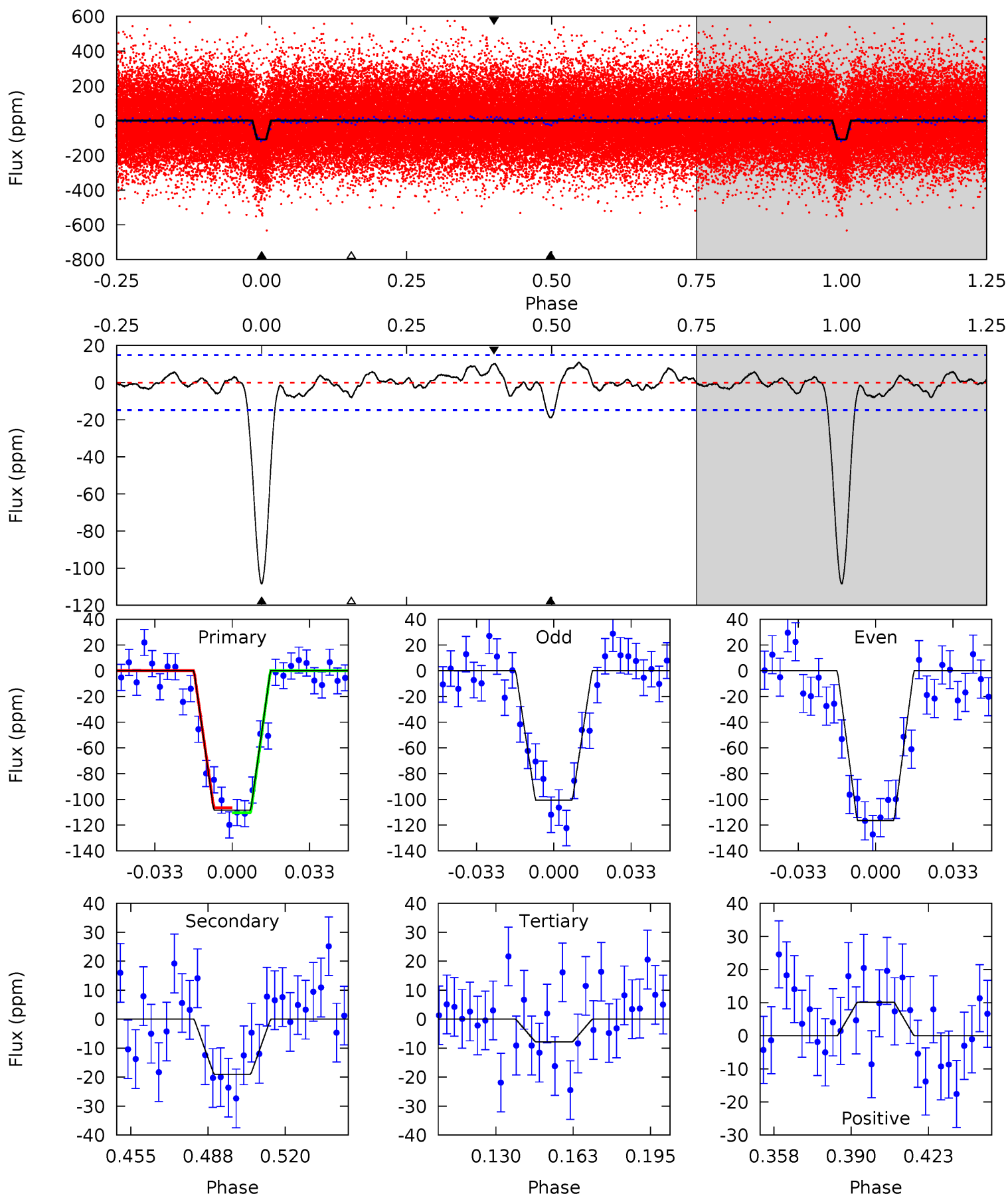
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.3	5.47	2.35	2.29	4.76	2.08	1.23	32.0	32.0	3.13	3.18	1.72	0.98	0.11	0.91



# Alt Model-Shift Uniqueness Test

006780158-01, P = 2.464146 Days, E = 129.462712 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
35.0	6.13	2.54	3.27	4.80	2.14	1.28	32.4	31.7	3.59	2.86	2.54	1.04	0.09	0.62





### Stellar Parameters For KIC 006780158

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5238^{+158}_{-142}$	$3.840^{+0.756}_{-0.378}$	$-0.320^{+0.350}_{-0.250}$	$1.883^{+1.171}_{-1.171}$	$0.894^{+0.228}_{-0.152}$	$0.189^{+2.328}_{-0.146}$
	+3%/-3%	+20%/-10%	+109%/-78%	+62%/-62%	+26%/-17%	+1234%/-77%
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 006780158-01 / KOI 2231.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-16 \pm 3$	$2.18^{+1.25}_{-0.95}$	$2373^{+421}_{-414}$	$3468^{+580}_{-436}$	$2.158^{+4.899}_{-1.275}$
Alt.	$-19 \pm 3$	$2.17^{+1.31}_{-0.96}$	$2383^{+401}_{-413}$	$3605^{+607}_{-425}$	$2.727^{+6.327}_{-1.690}$

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

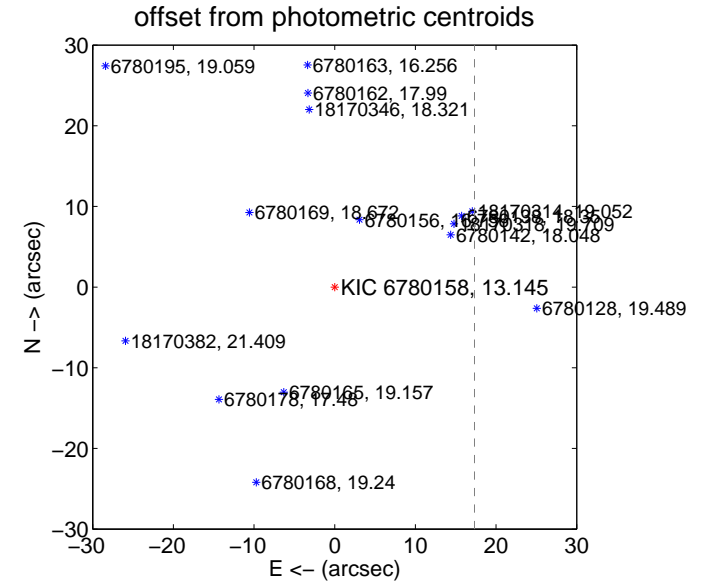
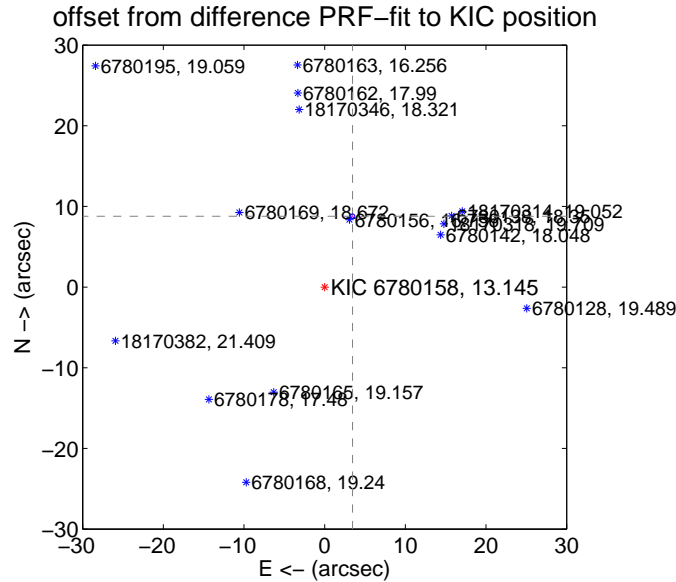
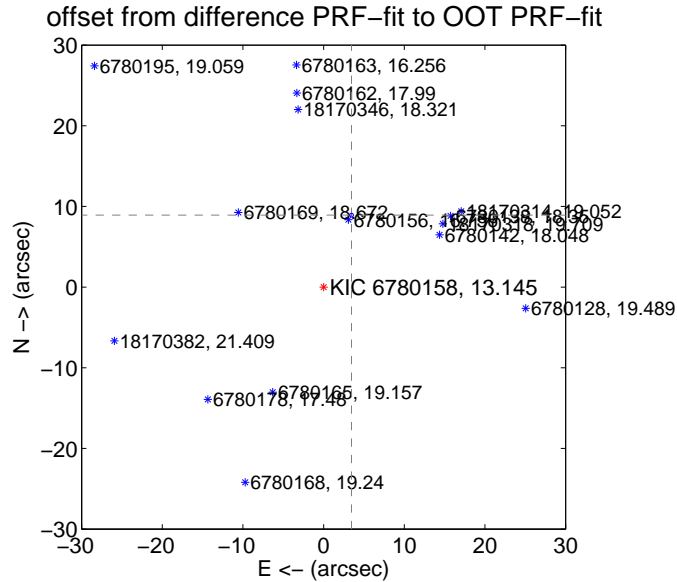
## DV Centroid Data

Supplemental centroid analysis for 006780158-01. Kepler magnitude: 13.14. Transit SNR 22.43

There are 4 quarters with good PRF difference image offsets

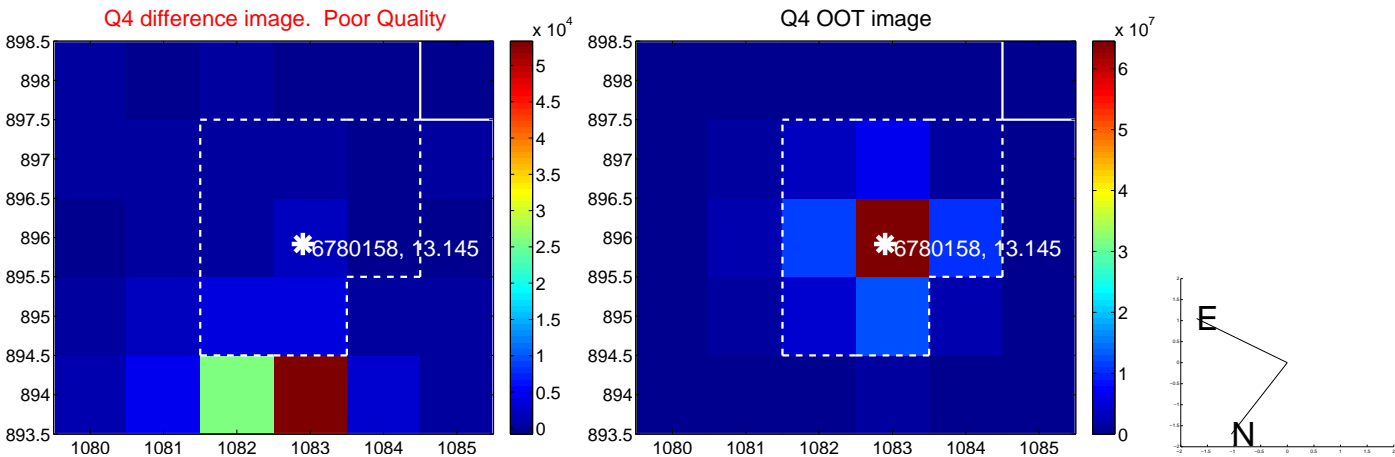
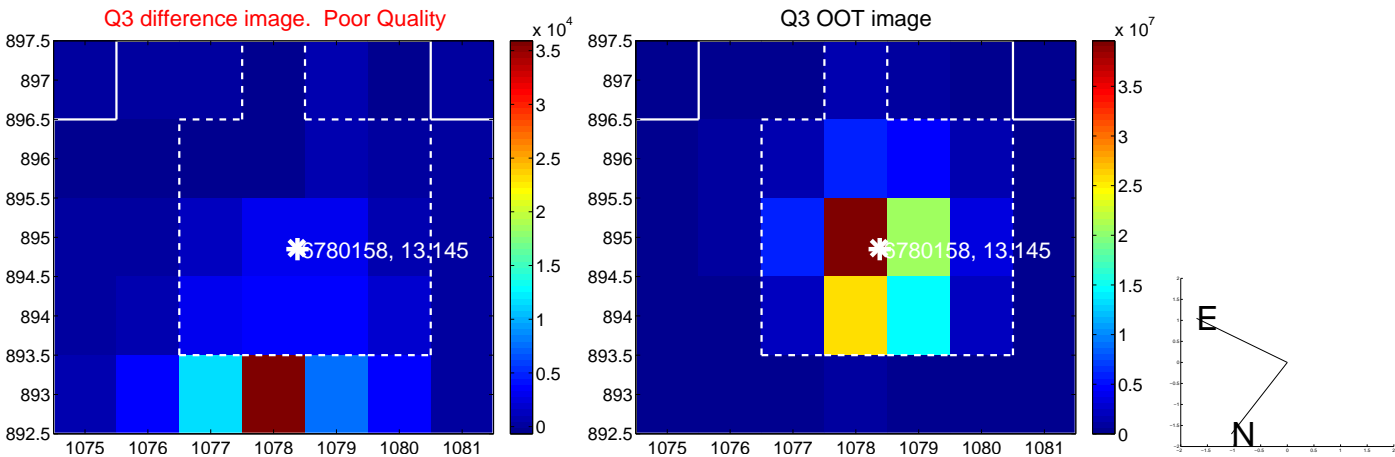
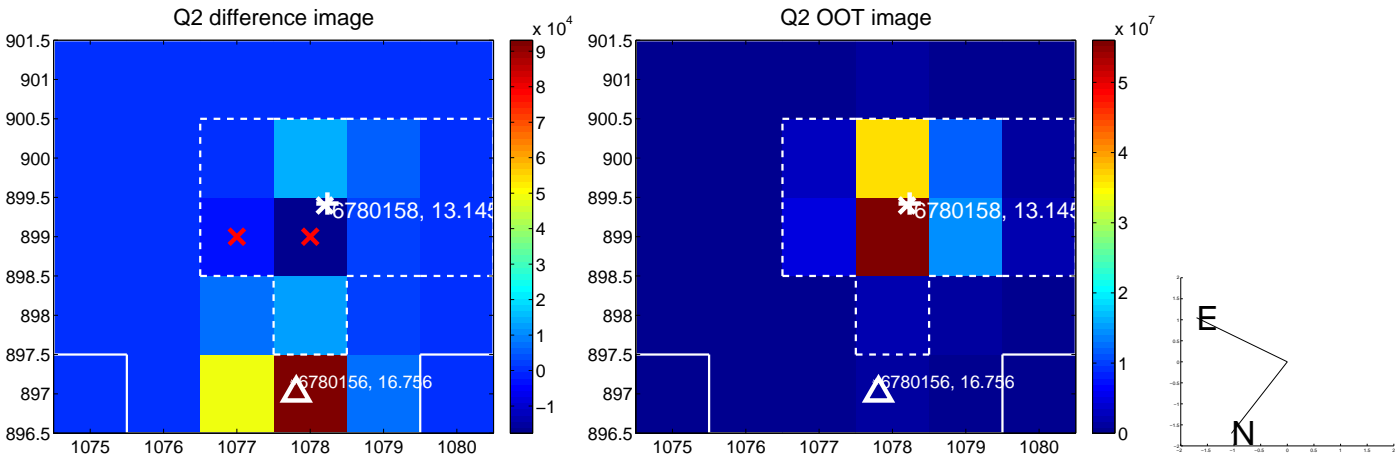
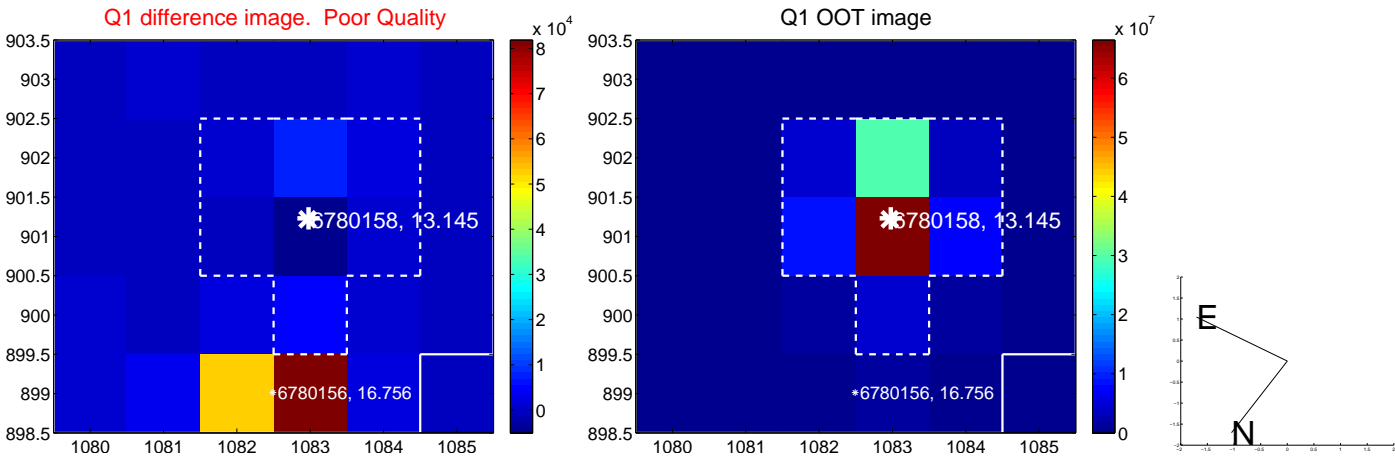
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>9.574 <math>\pm</math> 0.077</b>	<b>124.22</b>	-3.463 $\pm$ 0.076	8.926 $\pm$ 0.072
PRF-fit source offset from KIC position	<b>9.439 <math>\pm</math> 0.094</b>	<b>100.50</b>	-3.457 $\pm$ 0.094	8.783 $\pm$ 0.082
photometric centroid source offset	<b>68.52 <math>\pm</math> 0.45</b>	<b>153.66</b>	-17.33 $\pm$ 0.44	66.30 $\pm$ 0.45

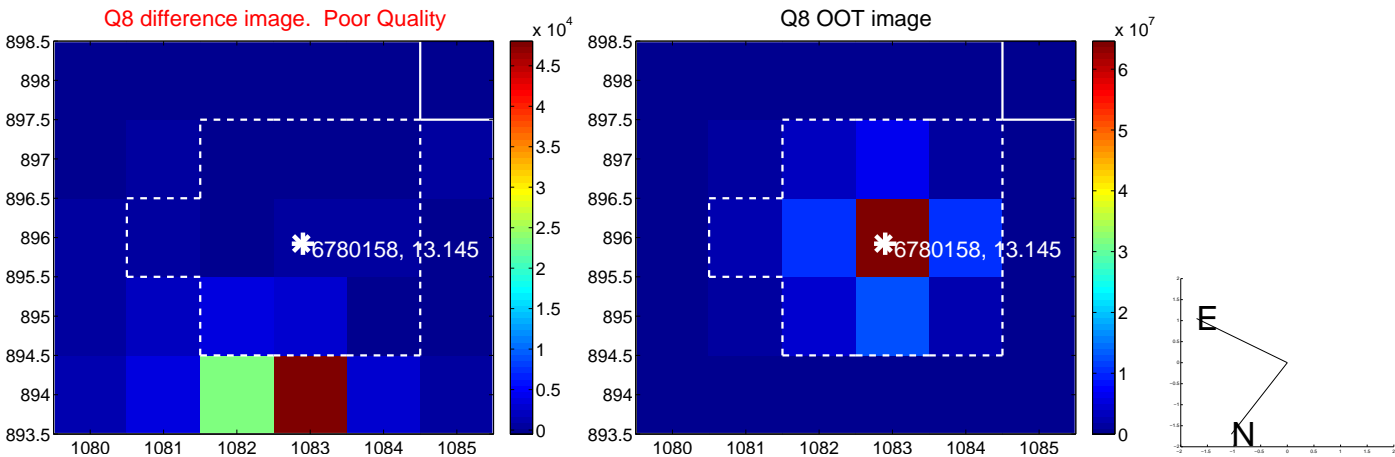
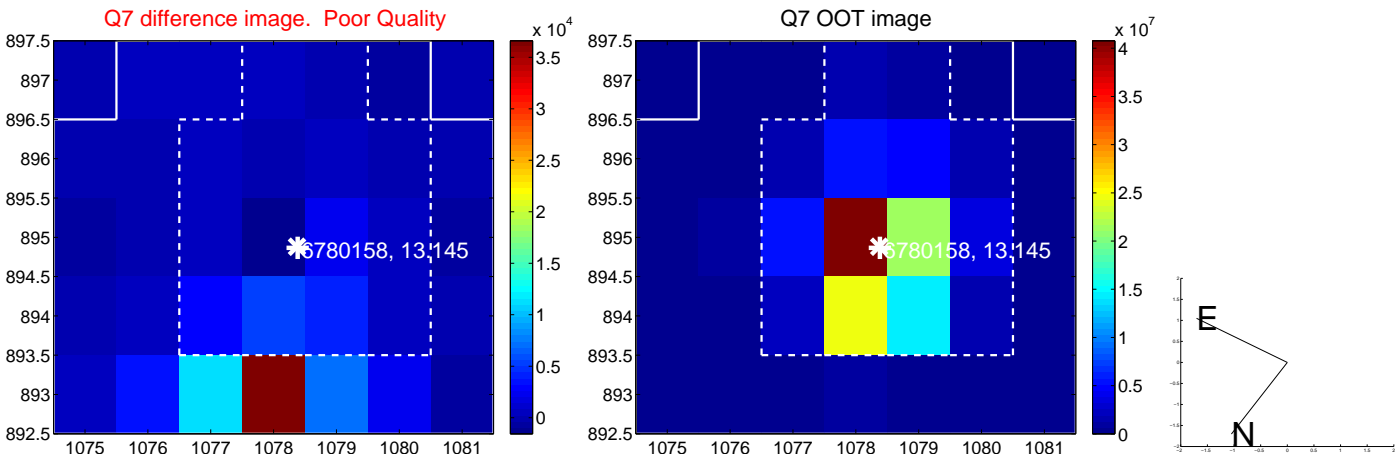
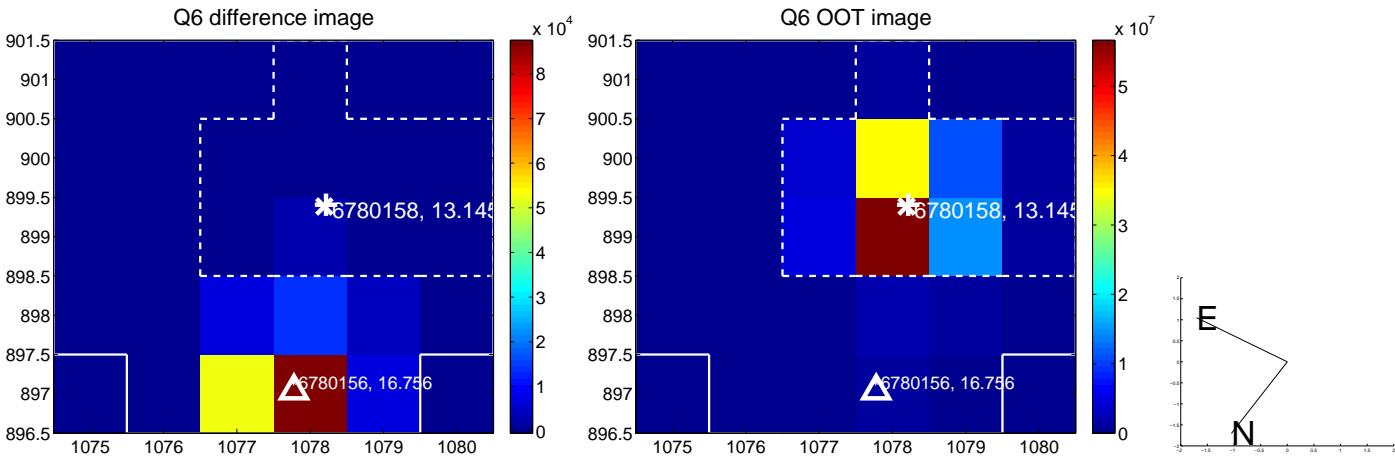
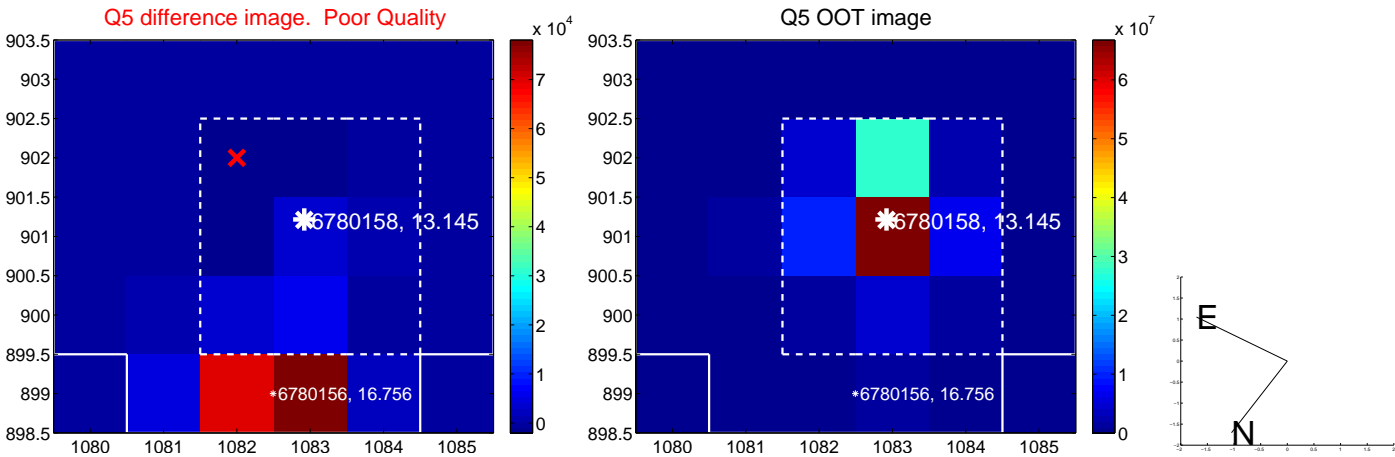


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

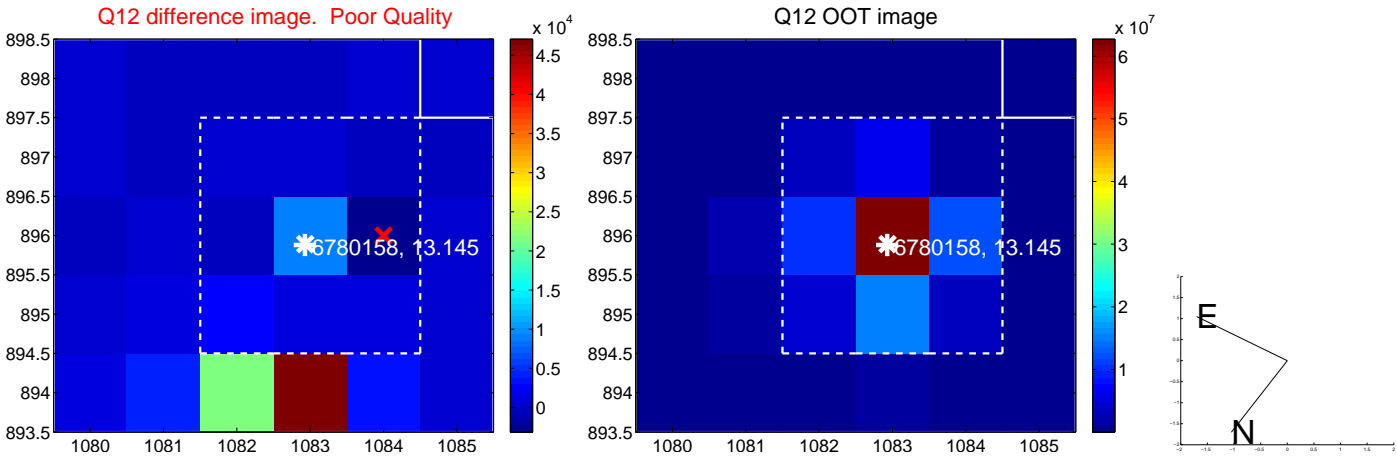
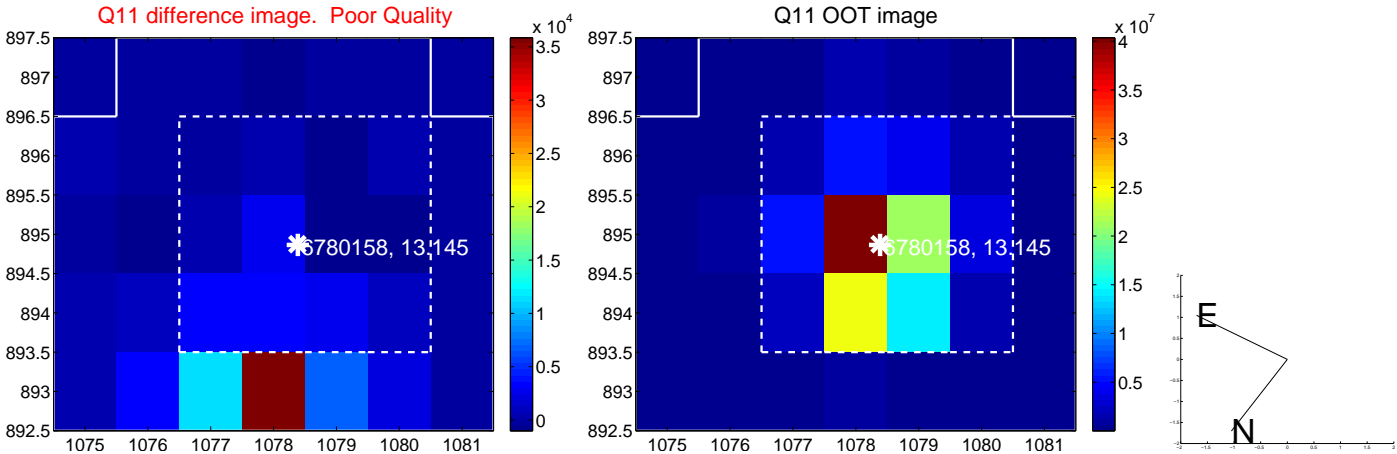
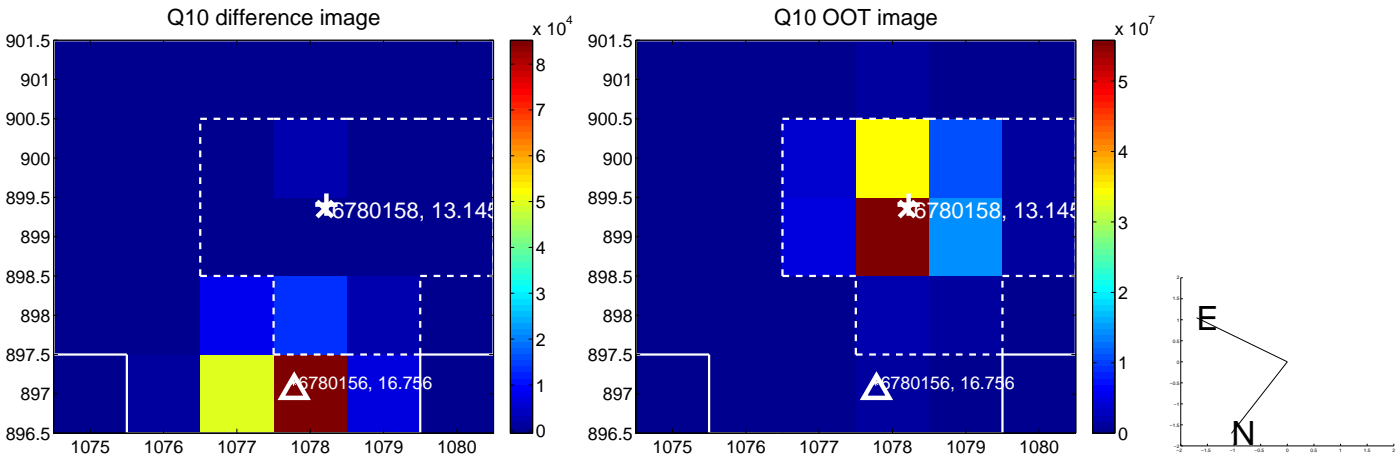
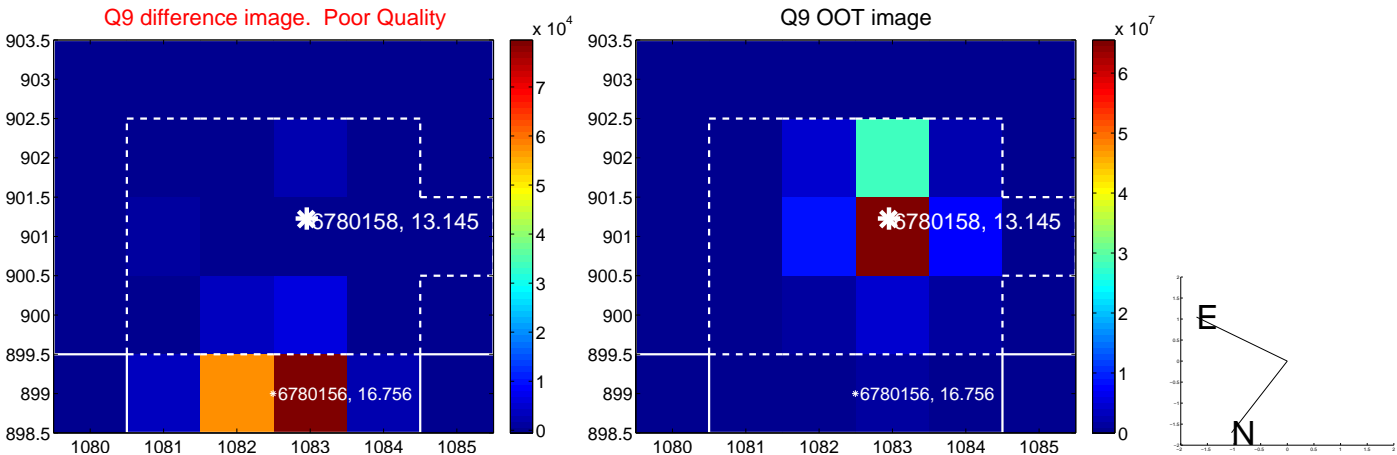


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

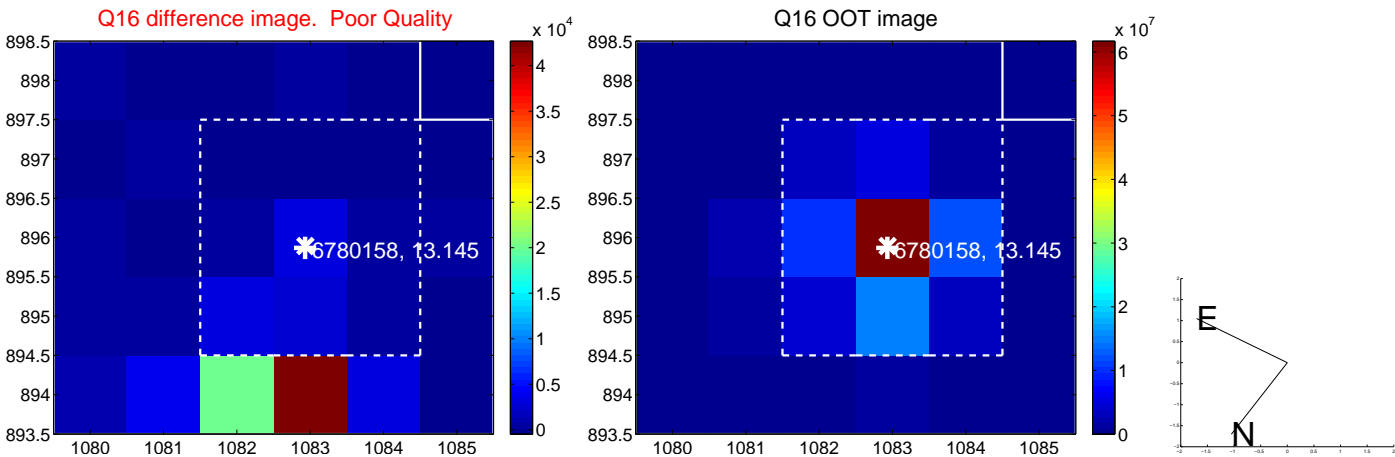
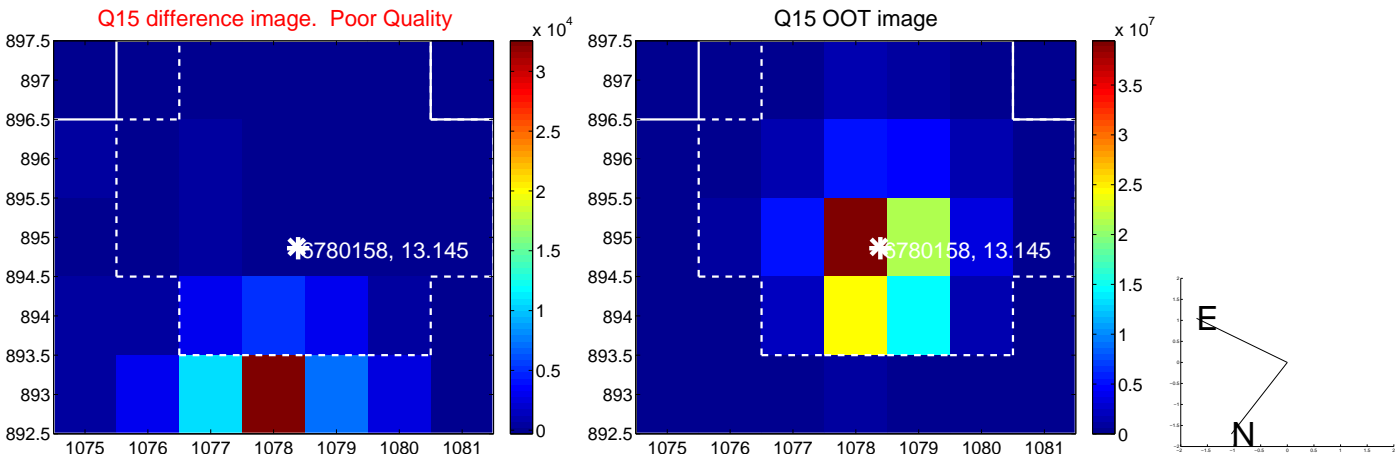
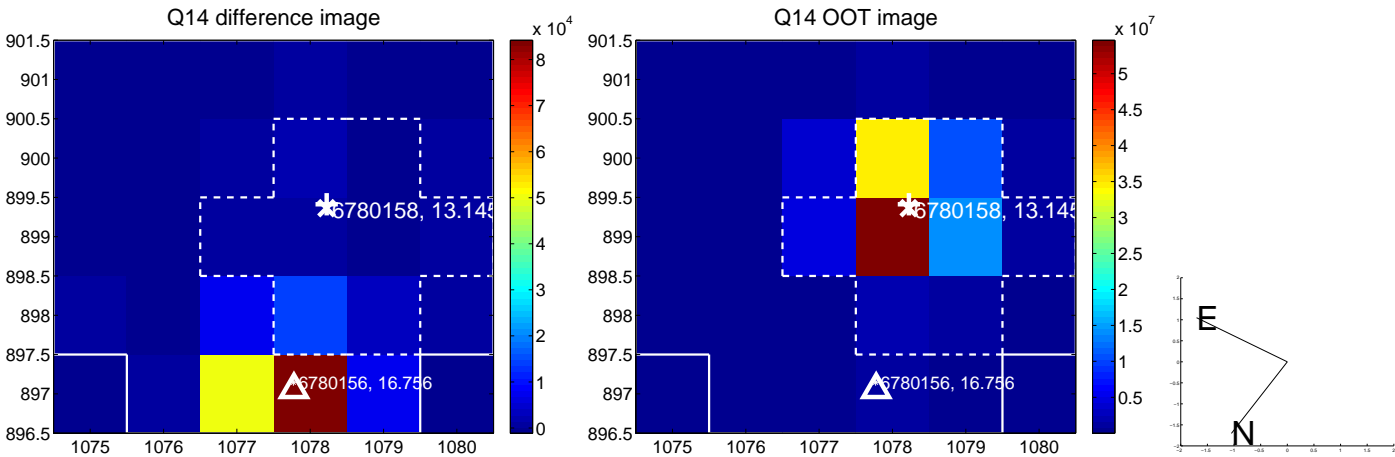
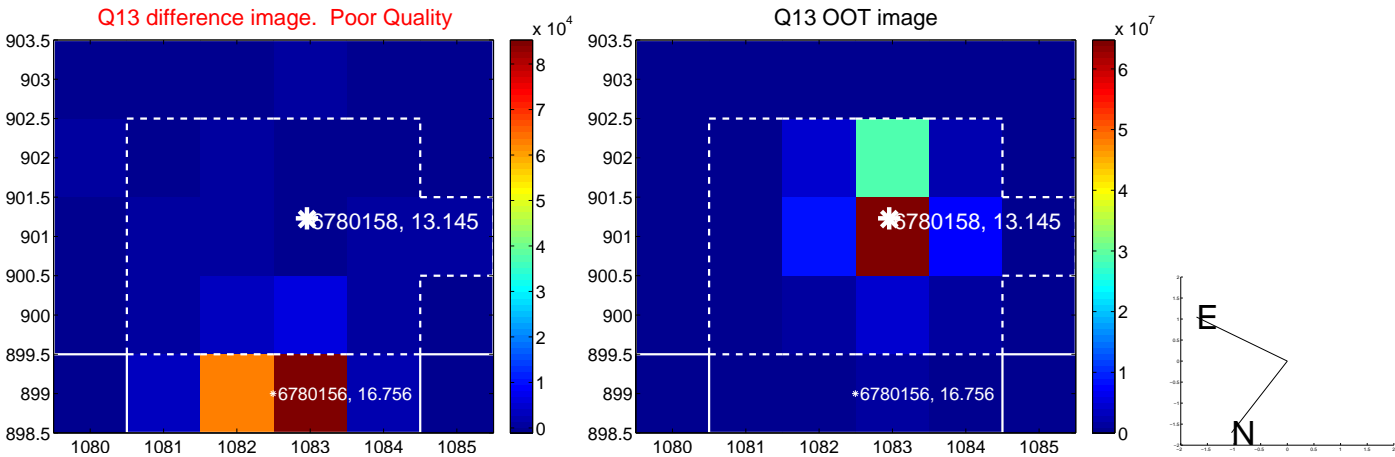




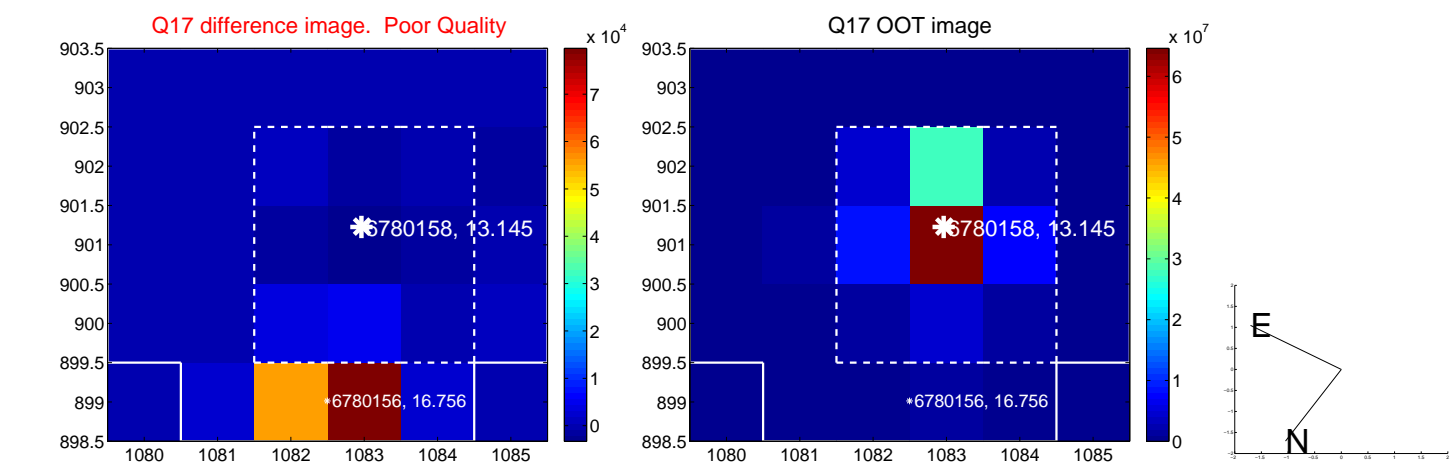
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



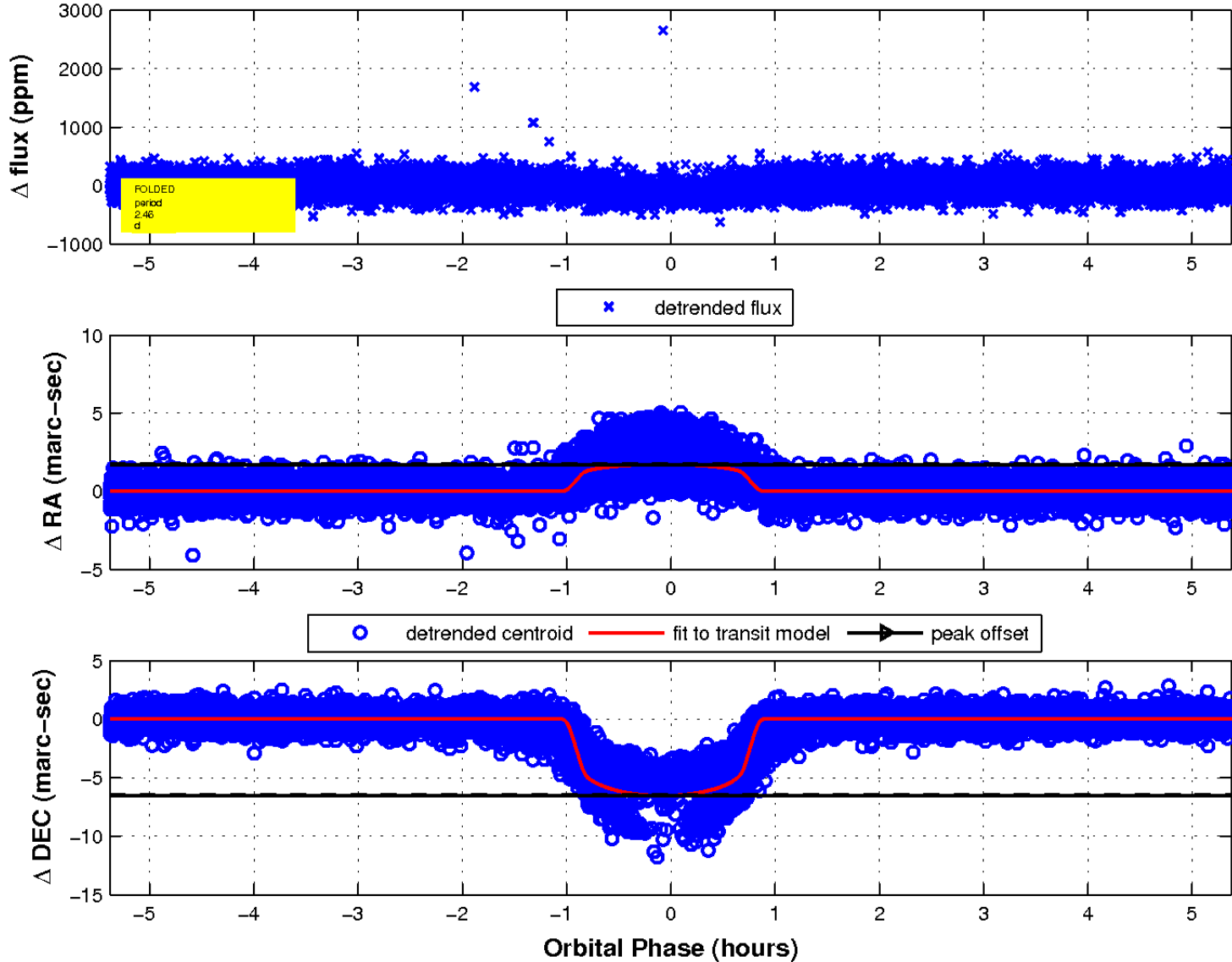
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

