

# KIC 010031918

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010031918-01	OBS	4894.01	8.589497	132.030655	114.8	5.693	8.7	9.6	0.71	4914	0.90	49.84

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010031918-01	OBS	FP	0.00	0	0	0	1	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 010031918-01

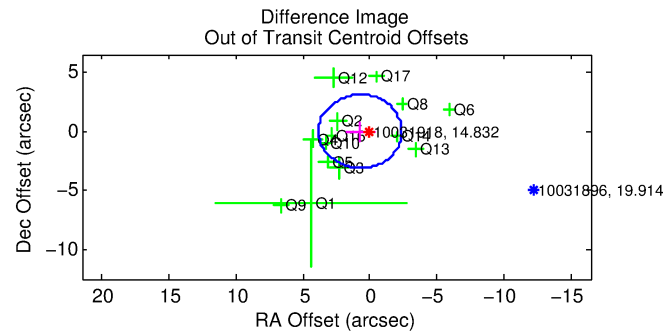
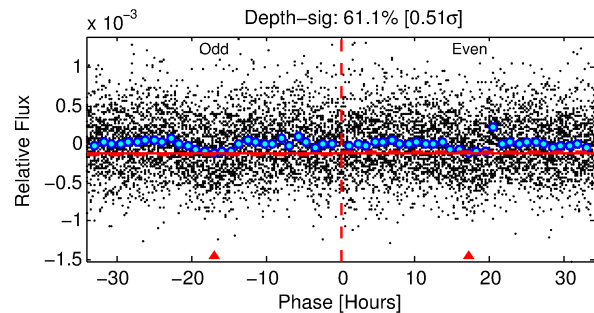
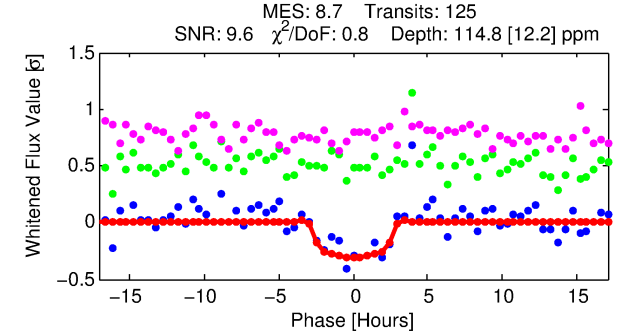
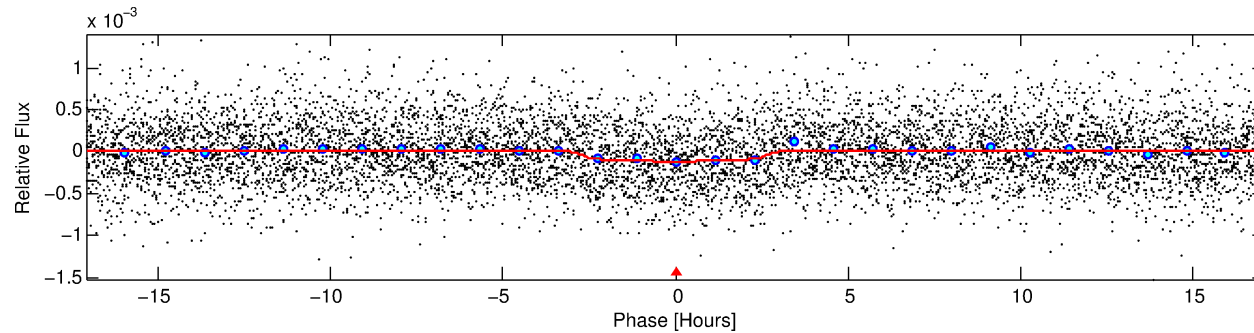
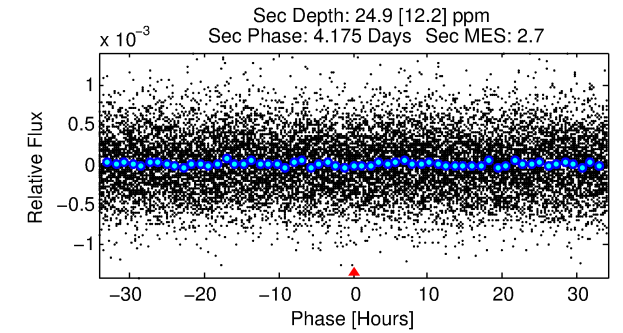
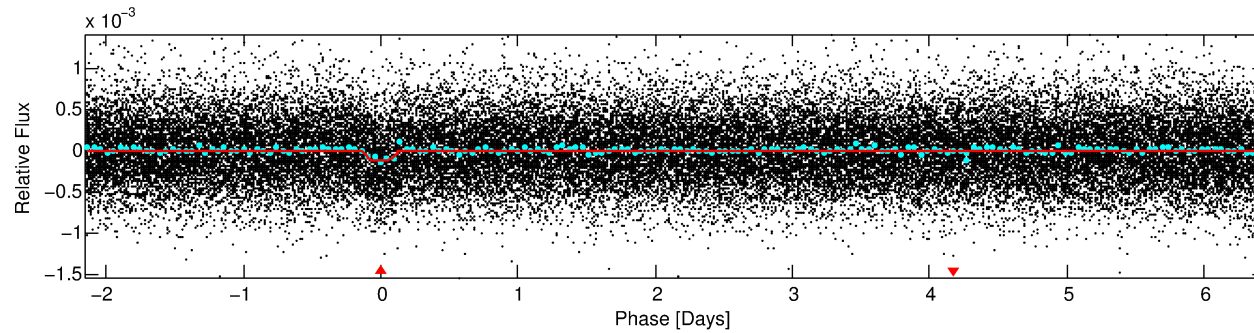
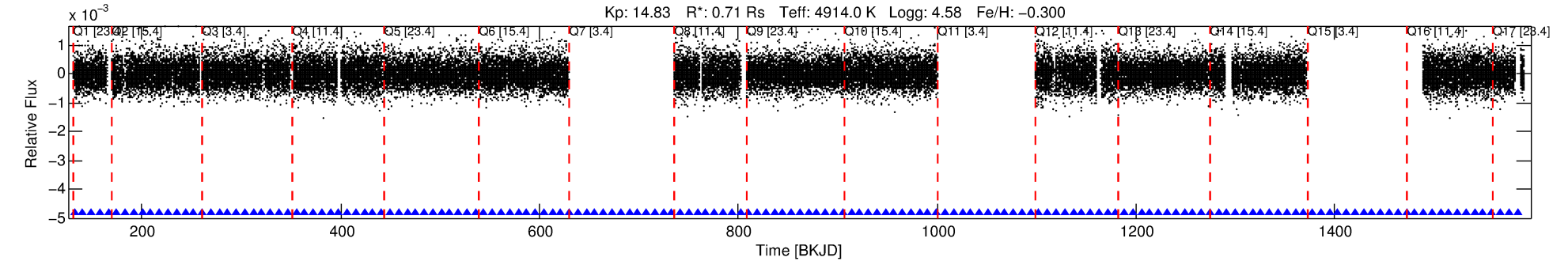
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
010031918-01	10031918	010031808-01	10031808	1:1	117.8	-26	13	9.56	14.84	2349.00	Direct-PRF	0	0.29	0.86

**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: 10031918 Candidate: 1 of 1 Period: 8.589 d

KOI: K04894.01 Corr: 0.927



## DV Fit Results:

Period = 8.58950 [0.00012] d  
Epoch = 132.0307 [0.0103] BKJD  
Rp/R\* = 0.0117 [0.0071]  
a/R\* = 5.88 [13.80]  
b = 0.88 [0.65]  
Seff = 49.85 [8.39]  
Teq = 678 [29] K  
Rp = 0.90 [0.56] Re  
a = 0.0724 [0.0059] AU  
Ag = 88.87 [117.38] [0.75σ]  
Teffp = 3216 [1062] K [2.39σ]

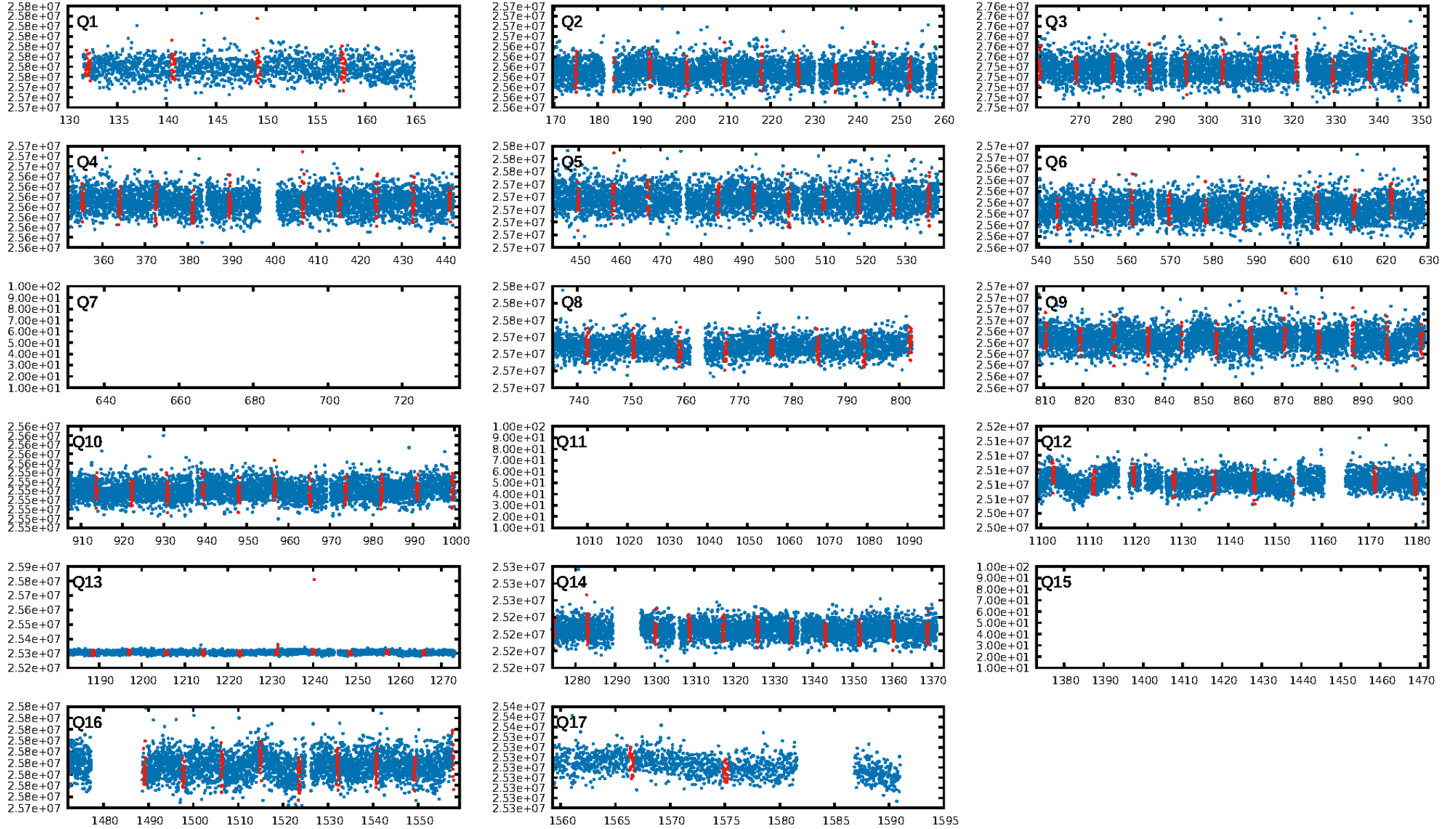
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.28e-18  
RollingBand-fgt: 1.00 [119/119]  
**GhostDiagnostic-chr: 0.3674**  
Centroid-sig: 28.9%  
Centroid-so: 1.791 arcsec [1.10σ]  
OotOffset-rm: 0.728 arcsec [0.70σ]  
KicOffset-rm: 0.842 arcsec [0.83σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.14 [2/14]  
DiffImageOverlap-fno: 1.00 [14/14]

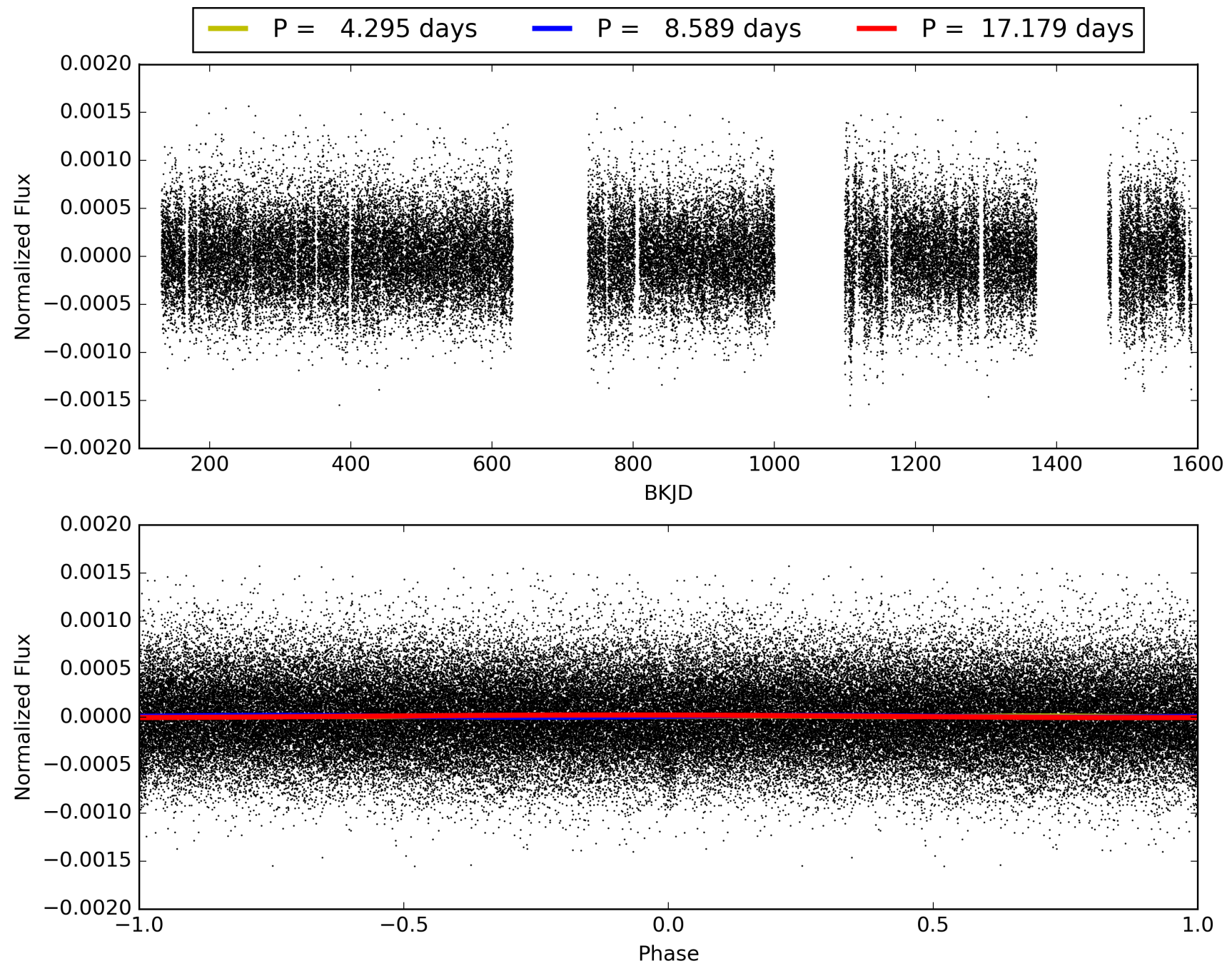
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:14:29 Z

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

# TCE 010031918-01, PDC Light Curves

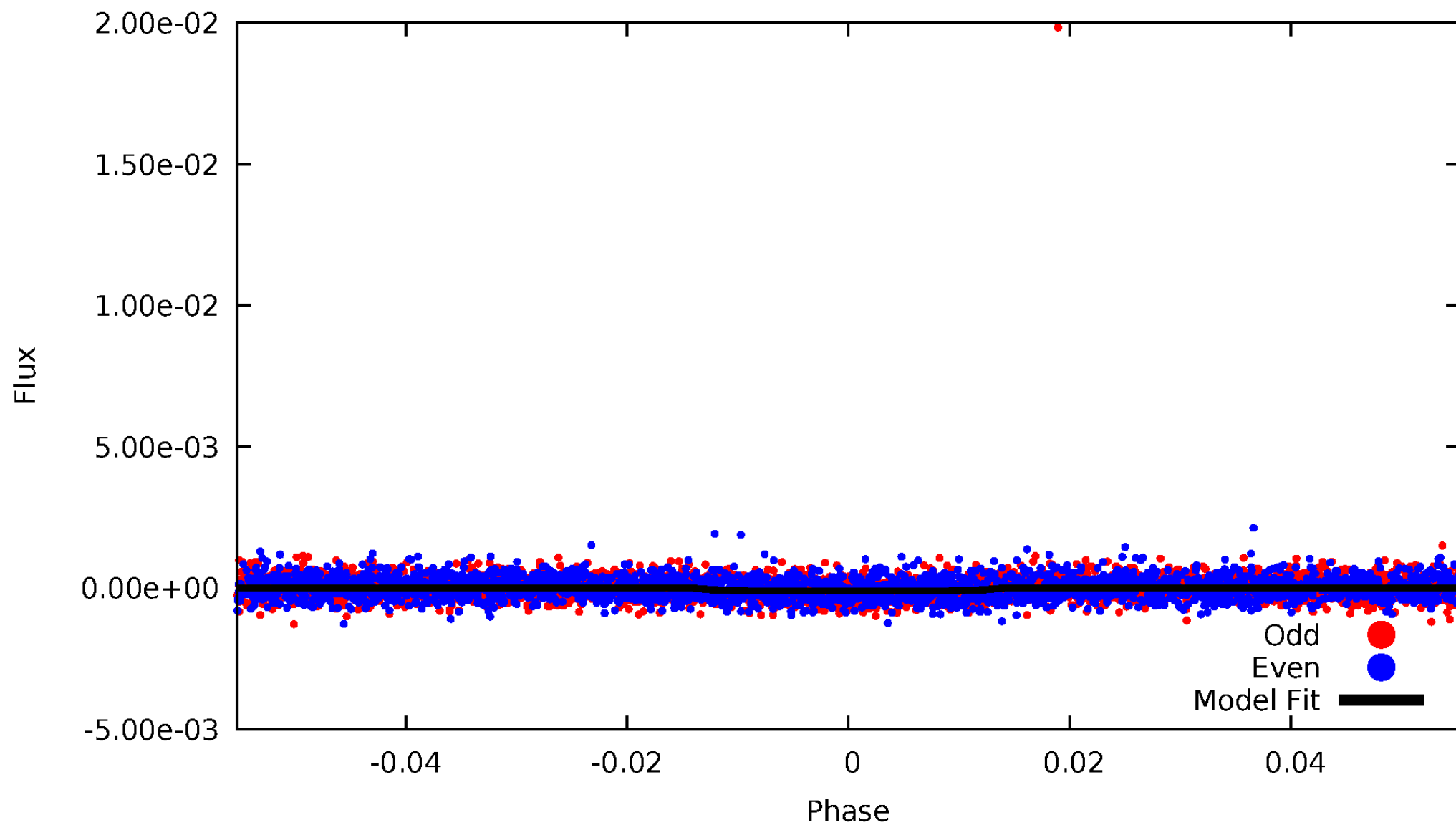


TCE 010031918-01



# DV Odd/Even

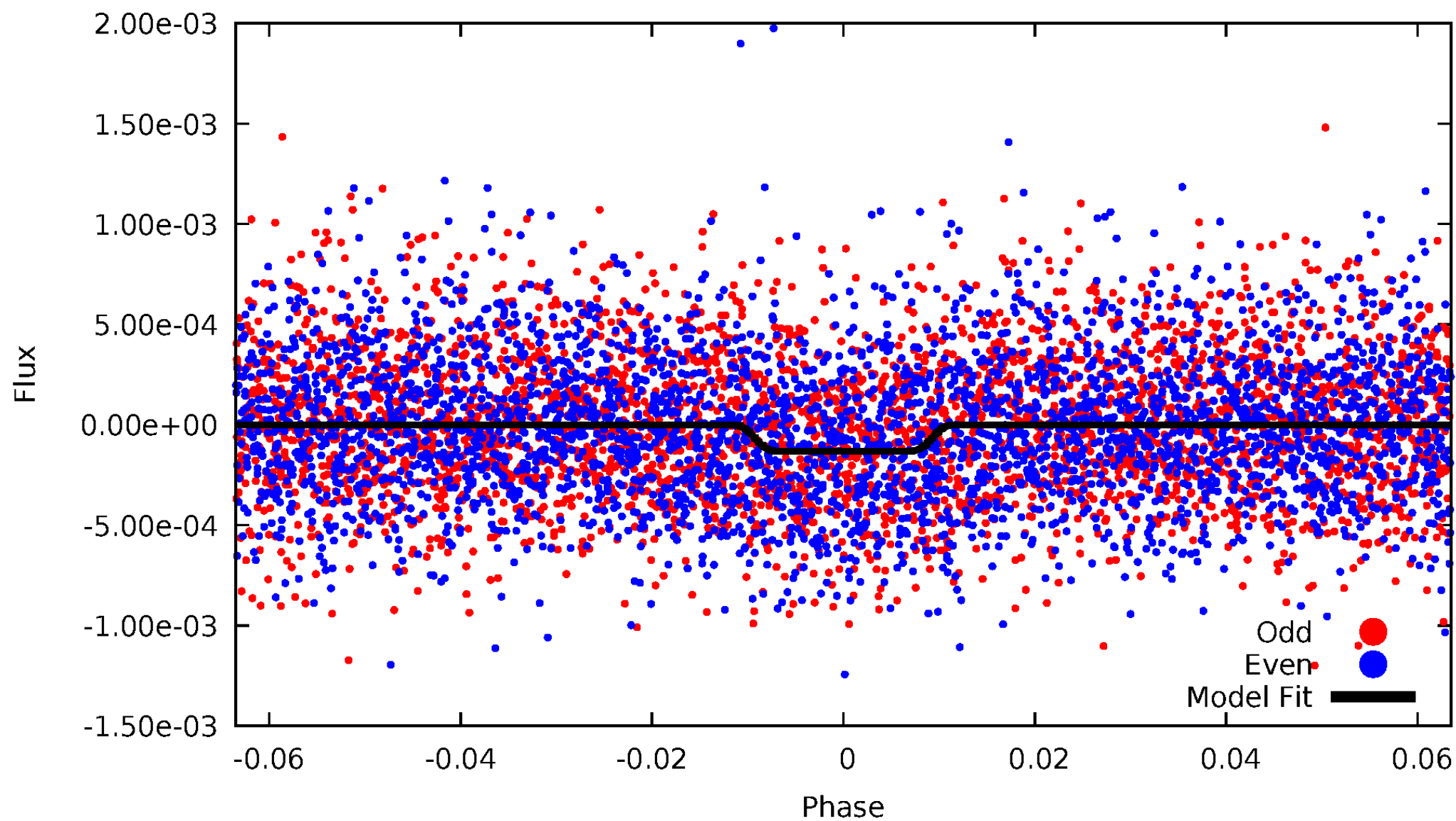
TCE 010031918-01





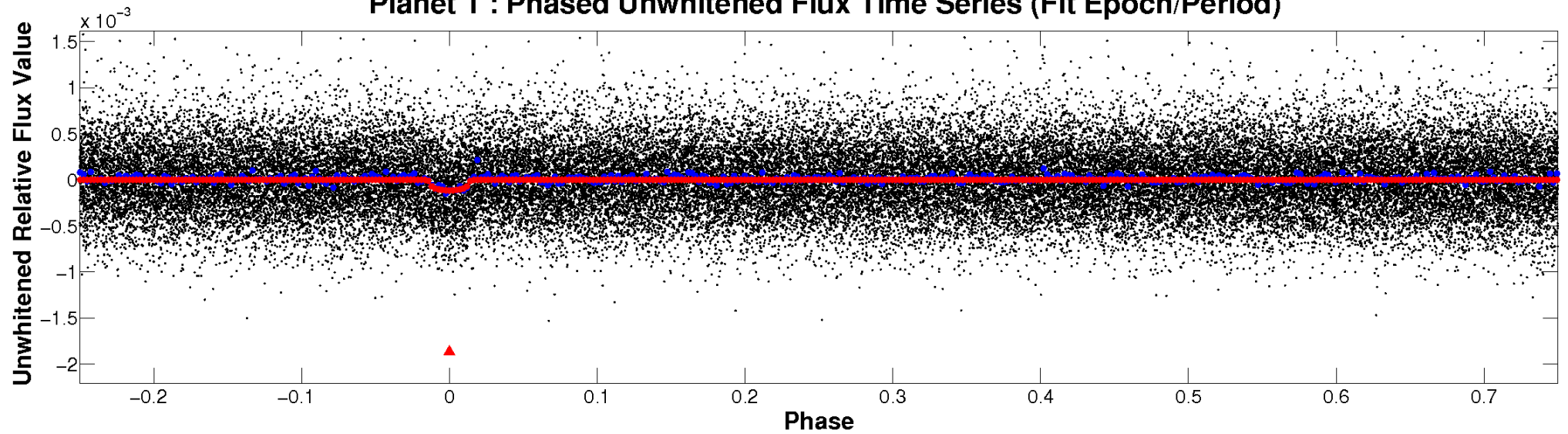
# ALT Odd/Even

TCE 010031918-01

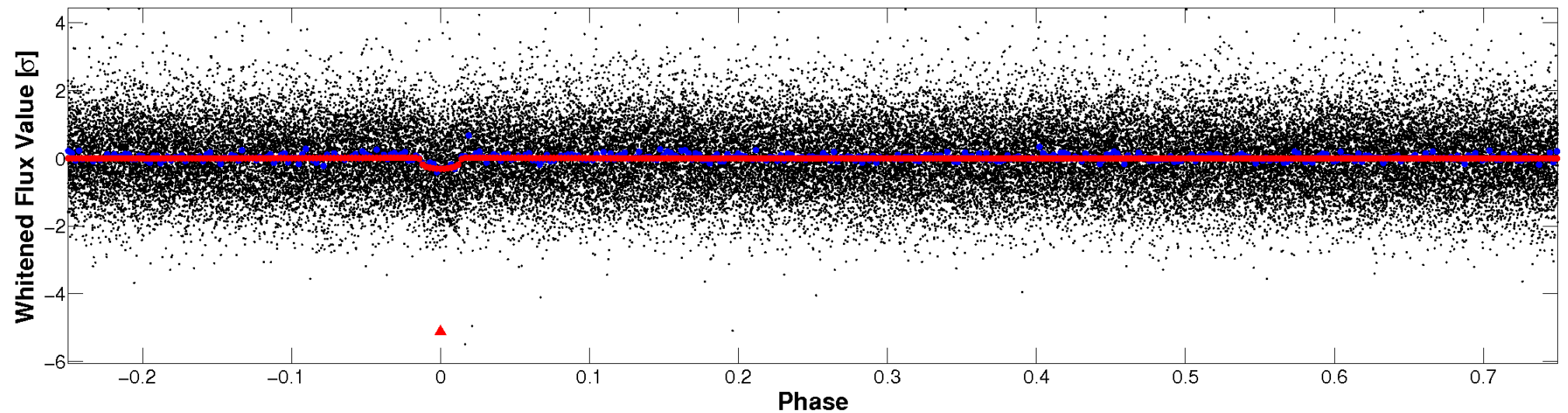


# Non-Whitened Vs. Whitened Light Curve

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

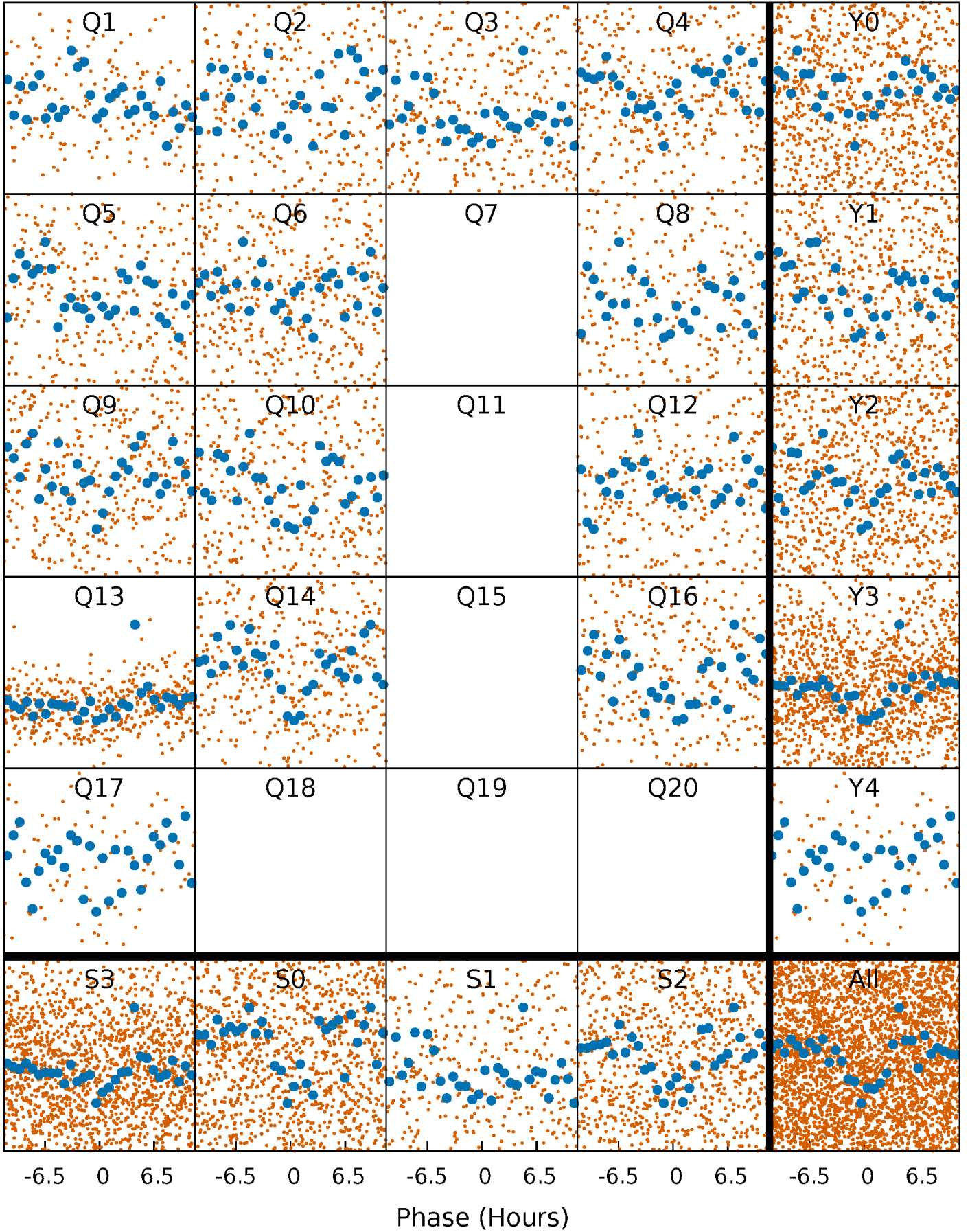


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

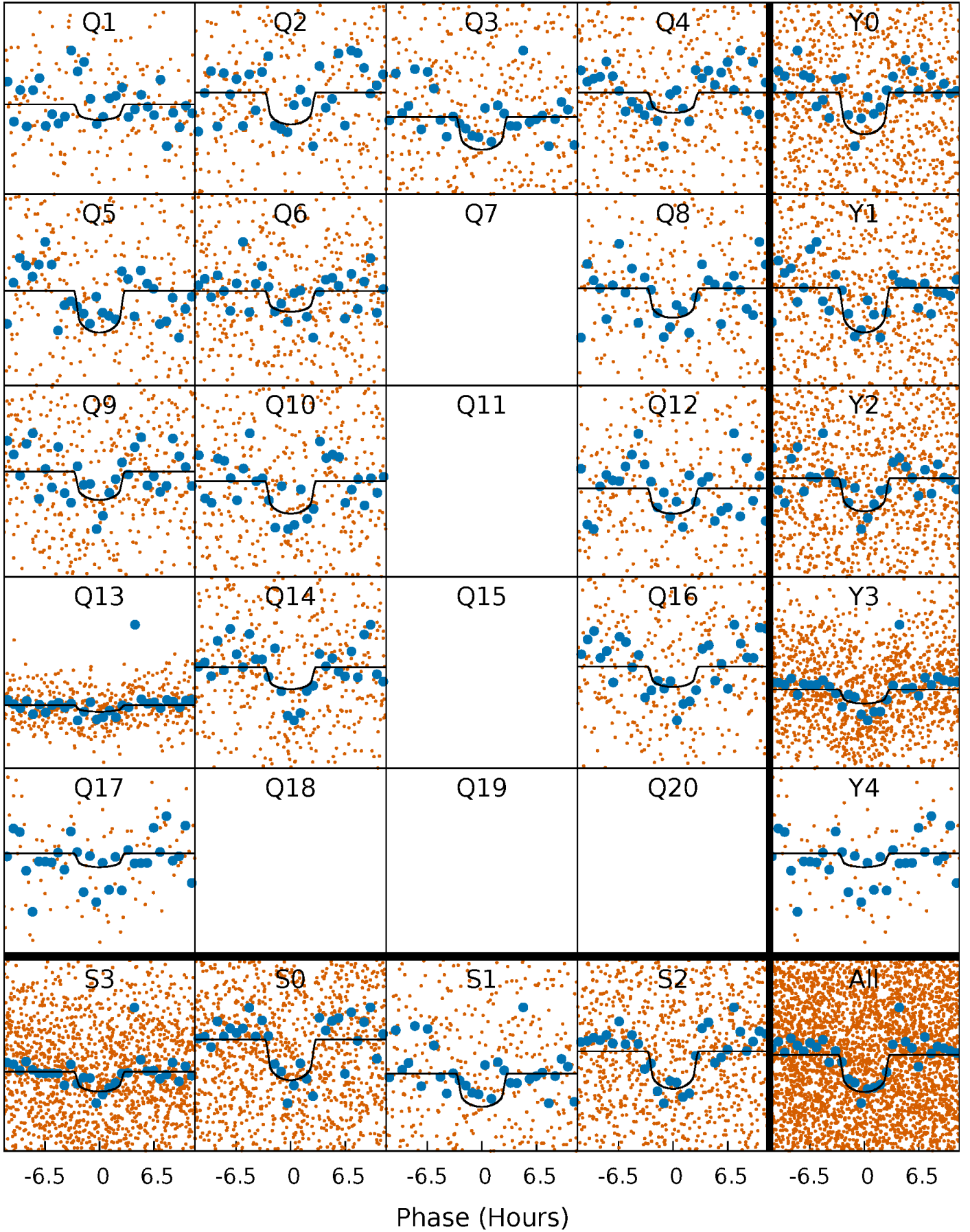
TCE 010031918-01 P= 8.589497 Days  $T_0=132.030655$  (BKJD)





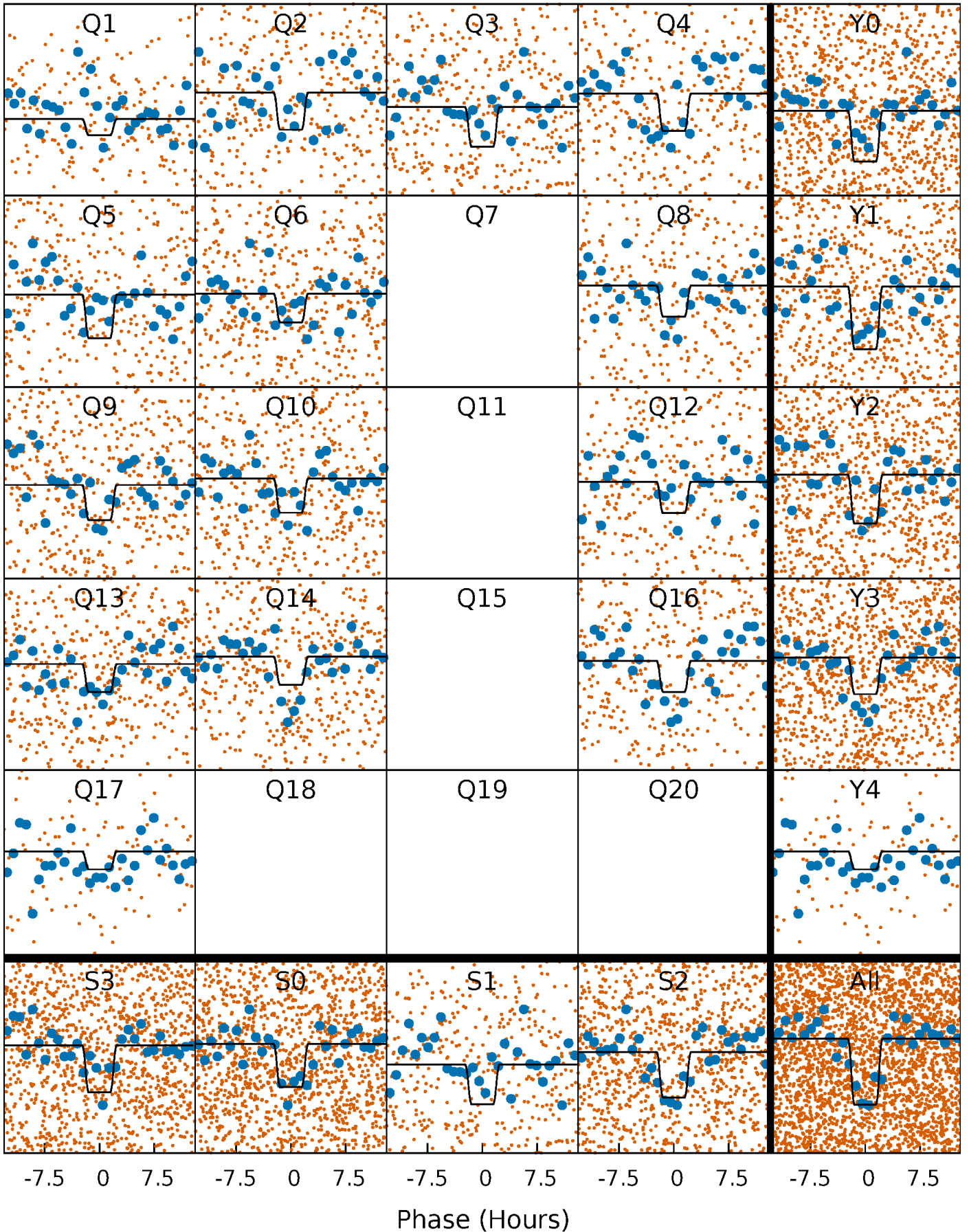
# DV Quarter-Phased Transit Curves

TCE 010031918-01 P= 8.589497 Days  $T_0=132.030655$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

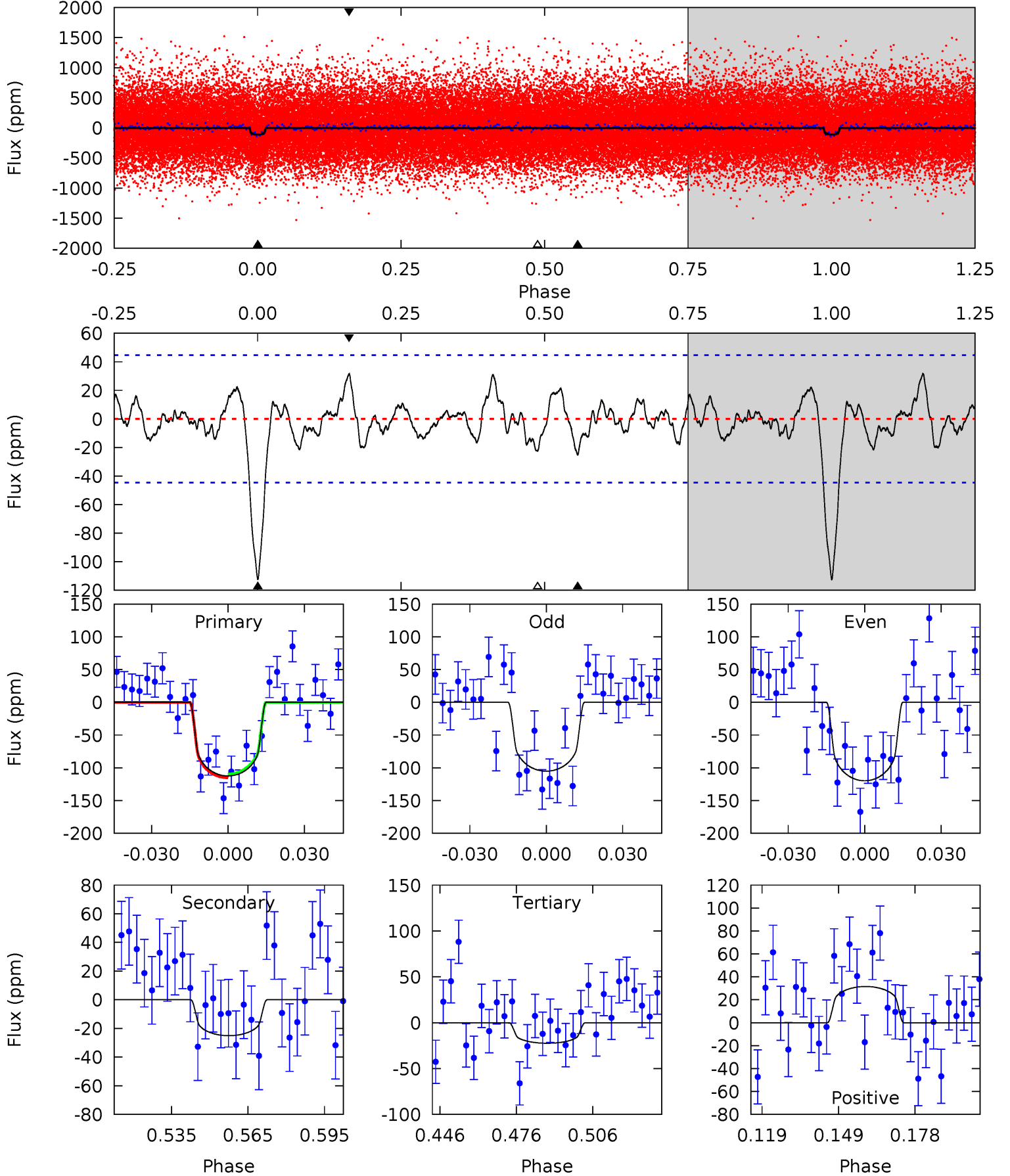
TCE 010031918-01 P= 8.589803 Days  $T_0=132.009328$  (BKJD)



# DV Model-Shift Uniqueness Test

010031918-01, P = 8.589497 Days, E = 123.441158 Days

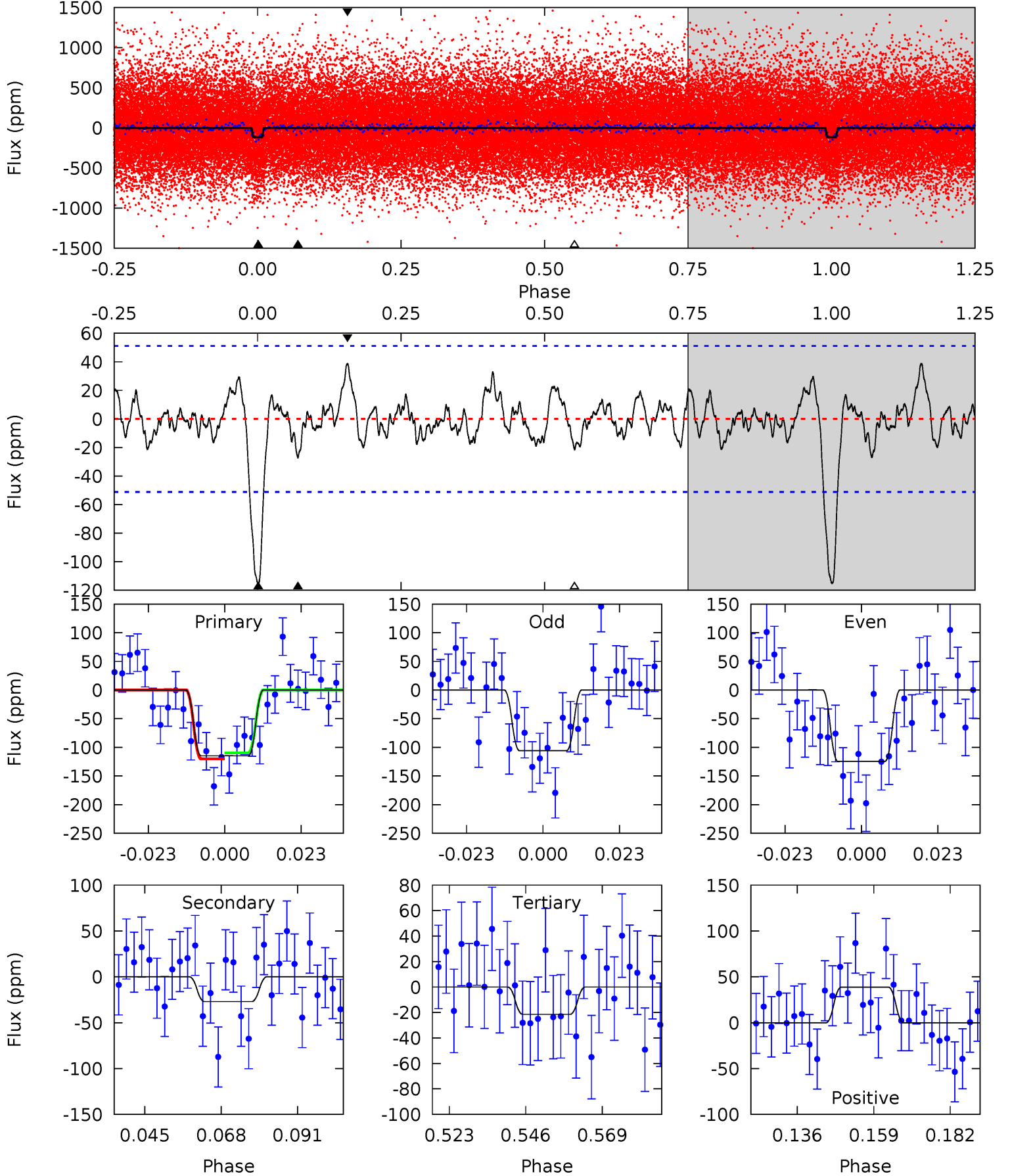
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	2.70	2.42	3.40	4.81	2.17	1.12	9.71	8.72	0.28	-0.70	0.79	0.95	0.22	0.29



# Alt Model-Shift Uniqueness Test

010031918-01, P = 8.589803 Days, E = 123.419525 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
11.0	2.57	2.05	3.68	4.87	2.28	1.09	8.91	7.27	0.53	-1.11	0.89	1.20	0.25	0.49



### Stellar Parameters For KIC 010031918

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+146}_{-131}$	$4.575^{+0.065}_{-0.040}$	$-0.300^{+0.350}_{-0.300}$	$0.707^{+0.069}_{-0.069}$	$0.684^{+0.095}_{-0.047}$	$2.729^{+0.748}_{-0.442}$
	+3%/-3%	+1%/-1%	+117%/-100%	+10%/-10%	+14%/-7%	+27%/-16%
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 010031918-01 / KOI 4894.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-25 \pm 9$	$0.91^{+0.52}_{-0.50}$	$944^{+31}_{-30}$	$3601^{+1115}_{-529}$	$92^{+325}_{-59}$
Alt.	$-27 \pm 10$	$0.90^{+0.51}_{-0.47}$	$943^{+34}_{-34}$	$3571^{+1219}_{-498}$	$87^{+336}_{-56}$

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



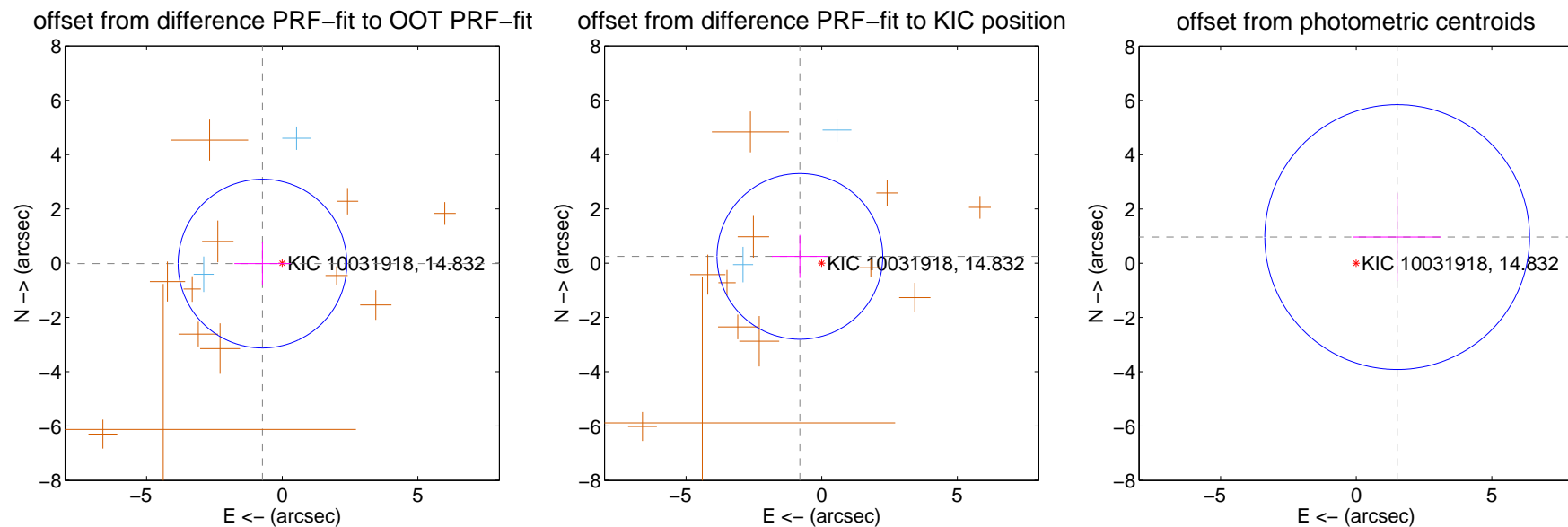
## DV Centroid Data

Supplemental centroid analysis for 010031918-01. Kepler magnitude: 14.83. Transit SNR 9.63

There are 2 quarters with good PRF difference image offsets

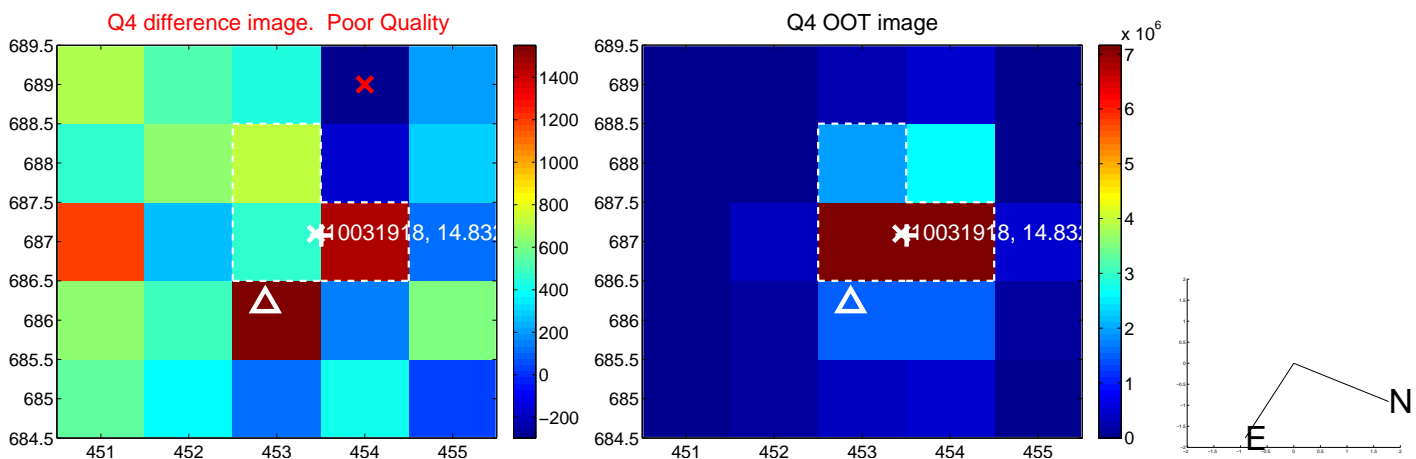
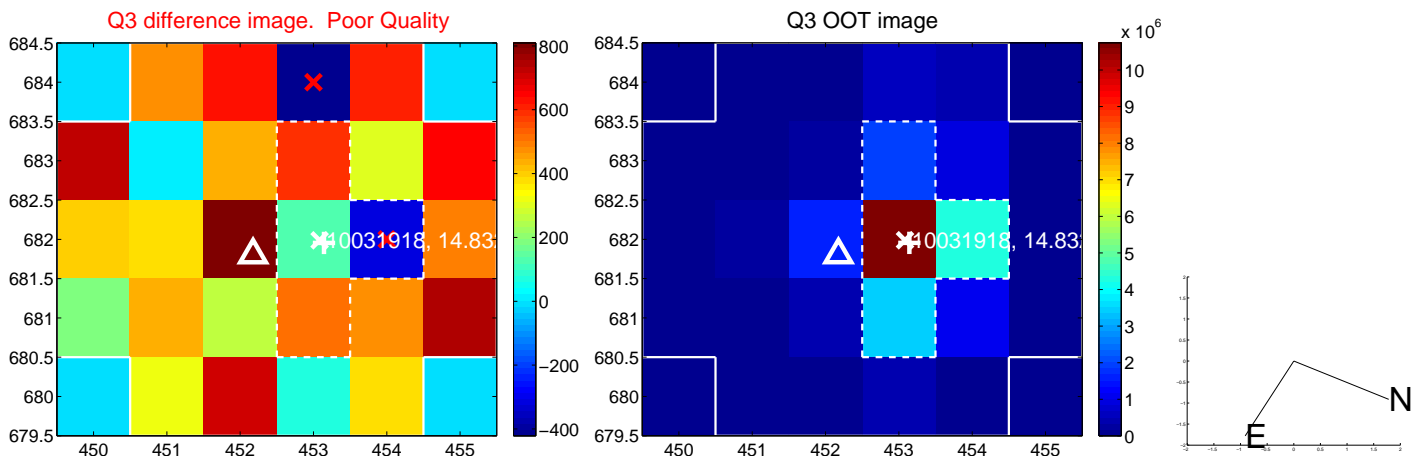
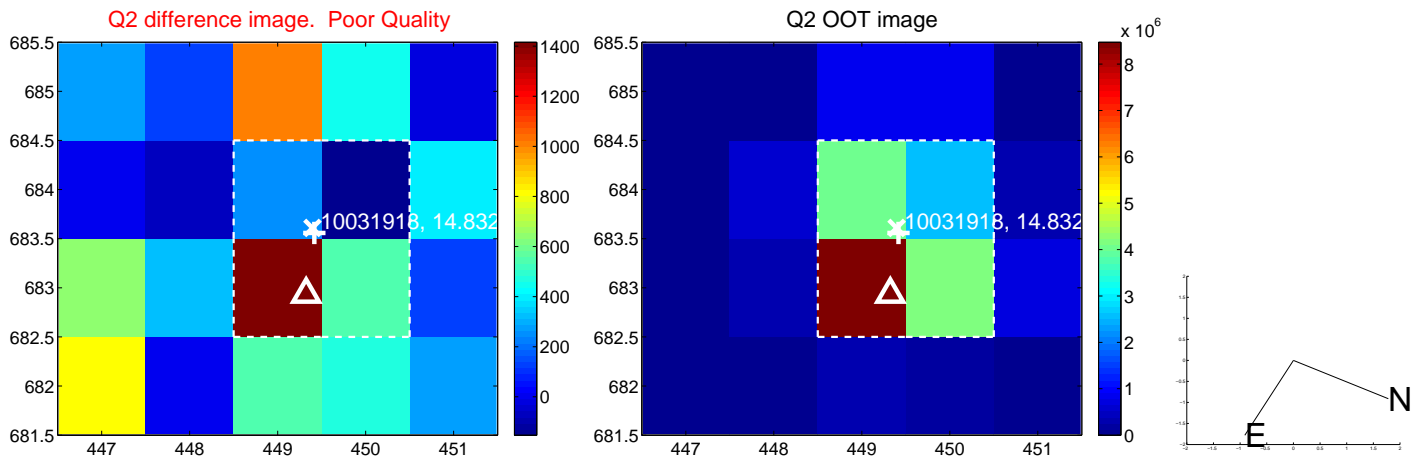
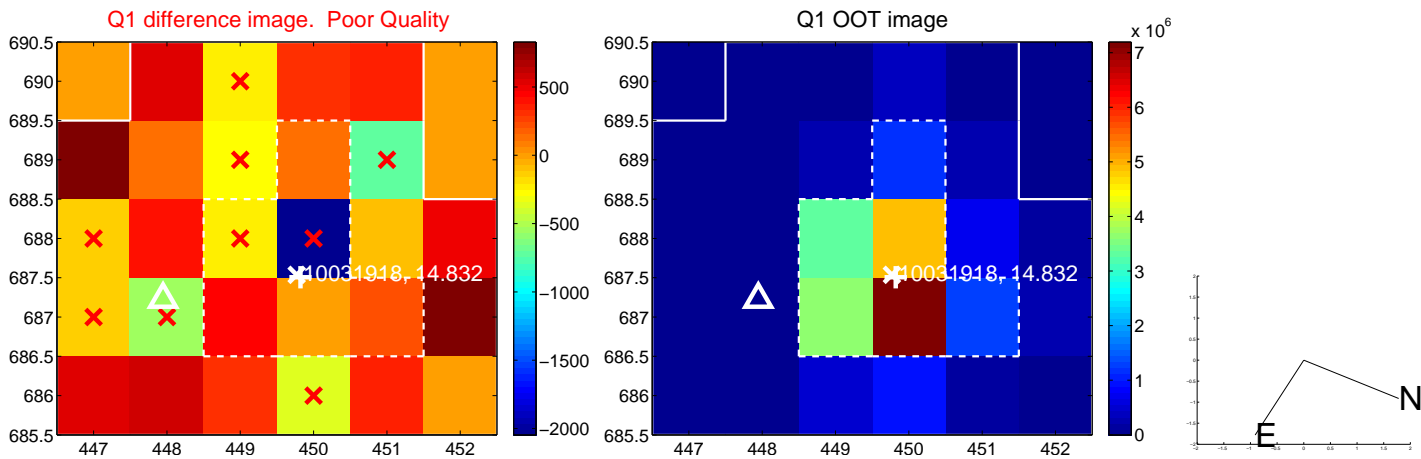
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.728 \pm 1.036$	0.70	$0.728 \pm 1.036$	$-0.017 \pm 0.793$
PRF-fit source offset from KIC position	$0.842 \pm 1.018$	0.83	$0.805 \pm 1.036$	$0.248 \pm 0.793$
photometric centroid source offset	$1.79 \pm 1.63$	1.10	$-1.51 \pm 1.63$	$0.96 \pm 1.62$

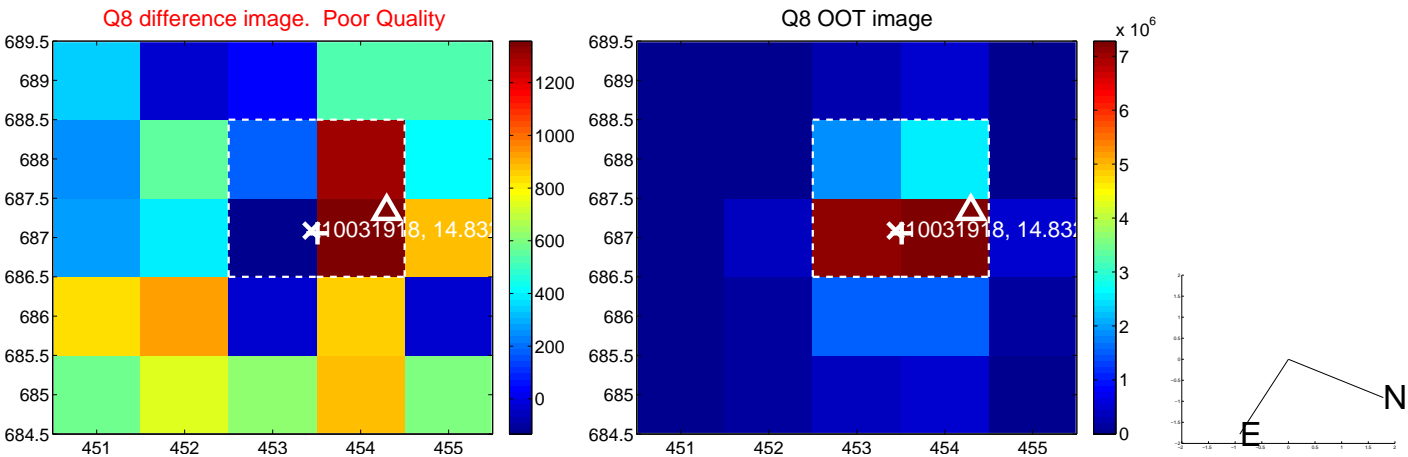
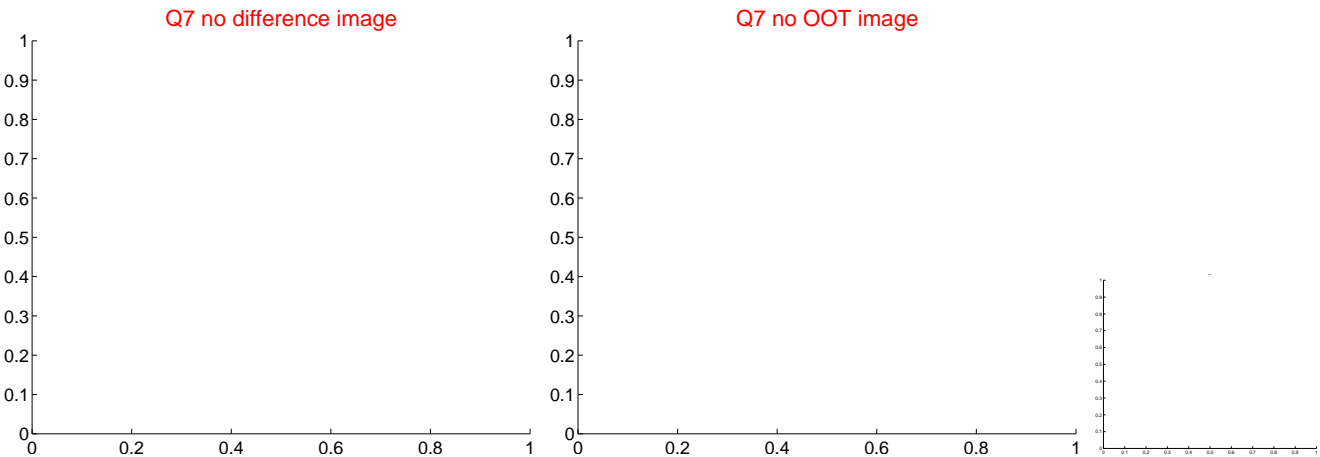
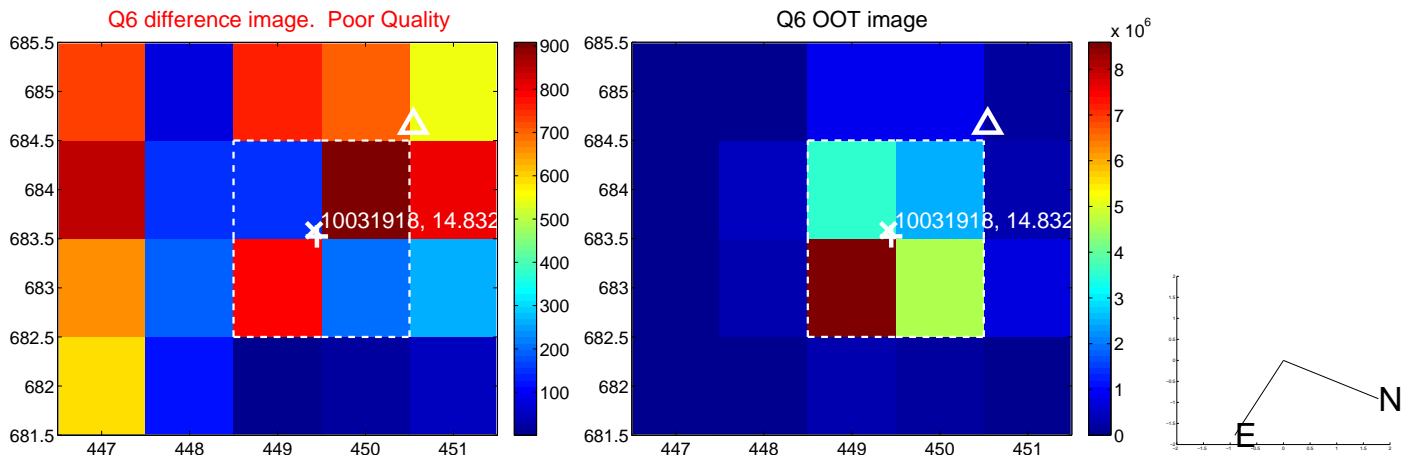
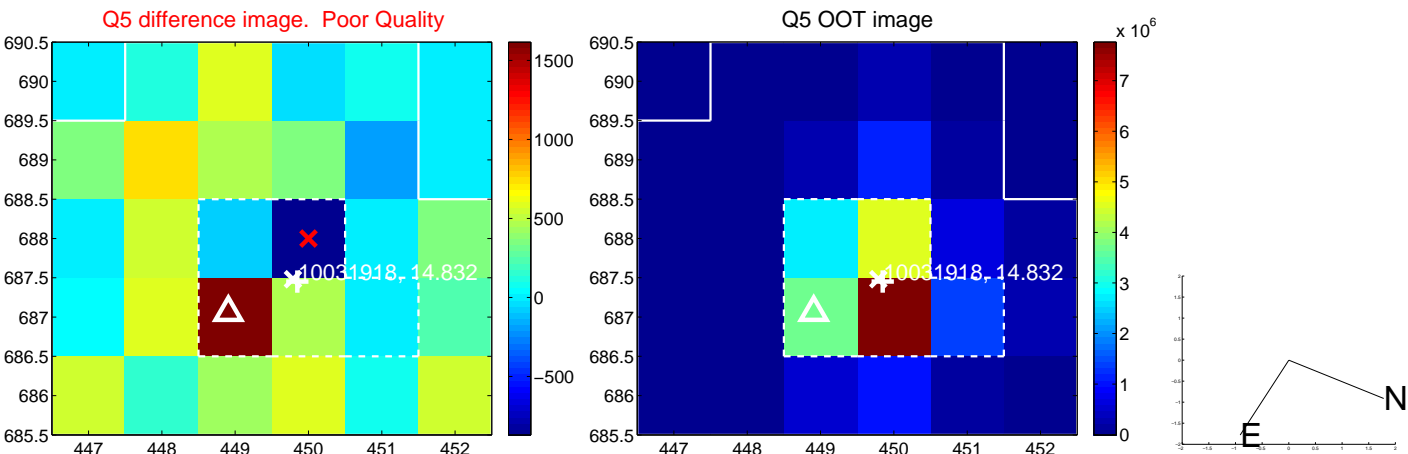


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

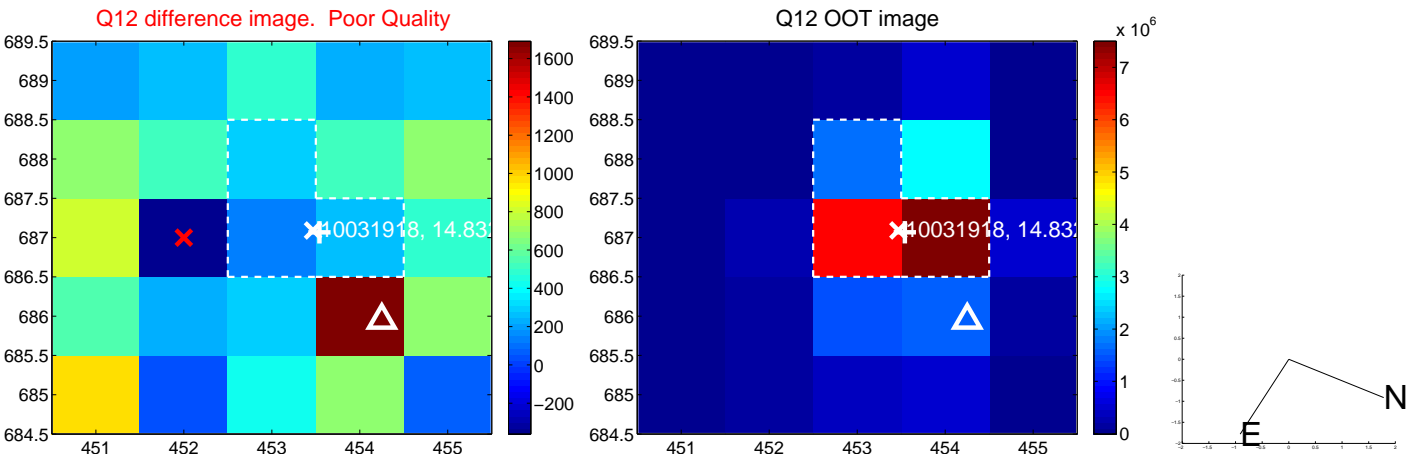
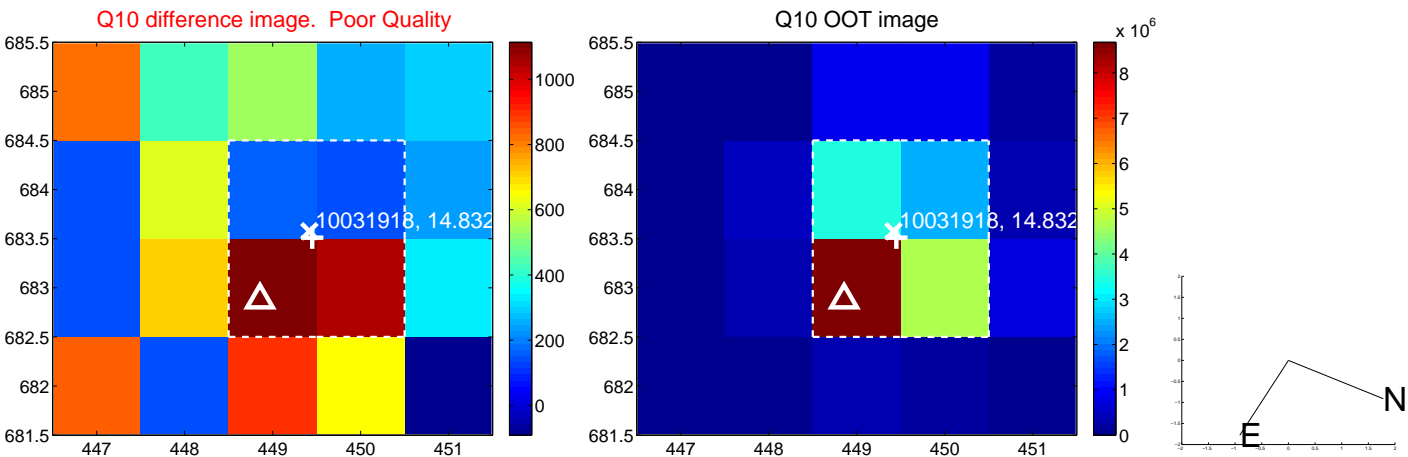
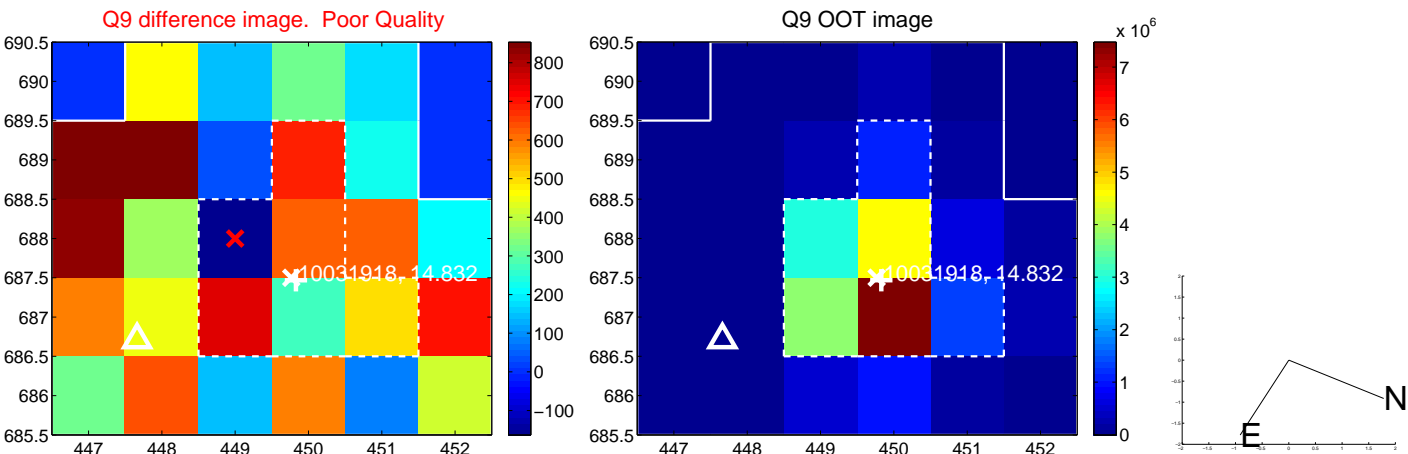
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



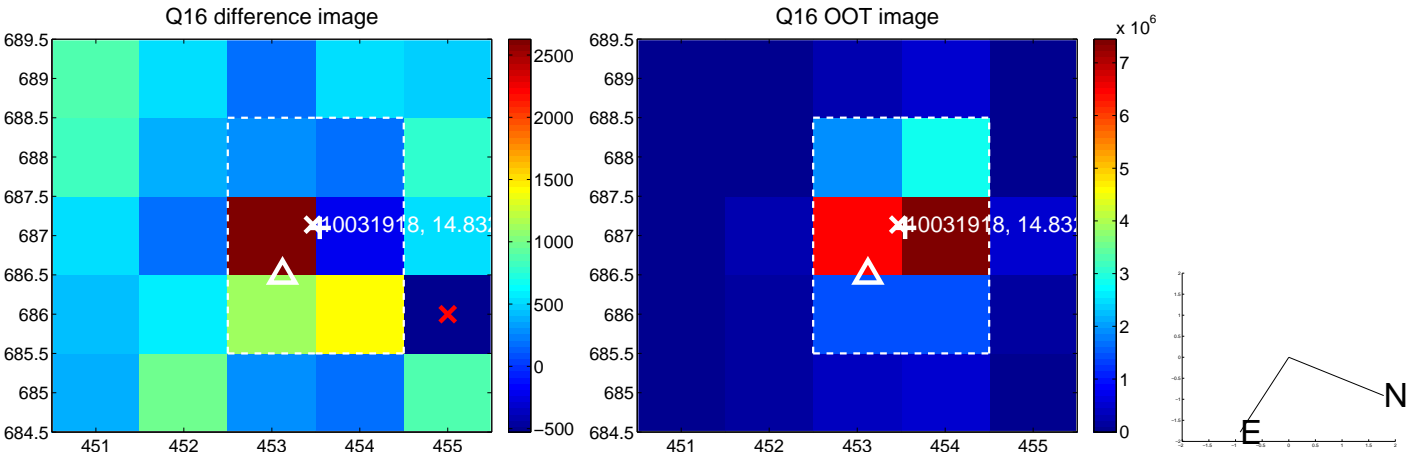
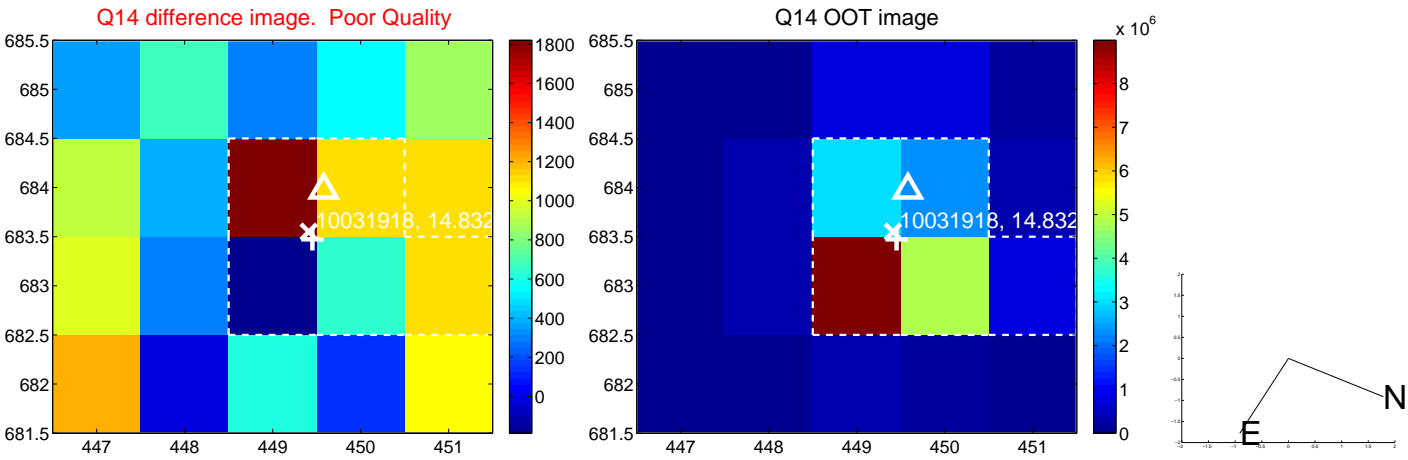
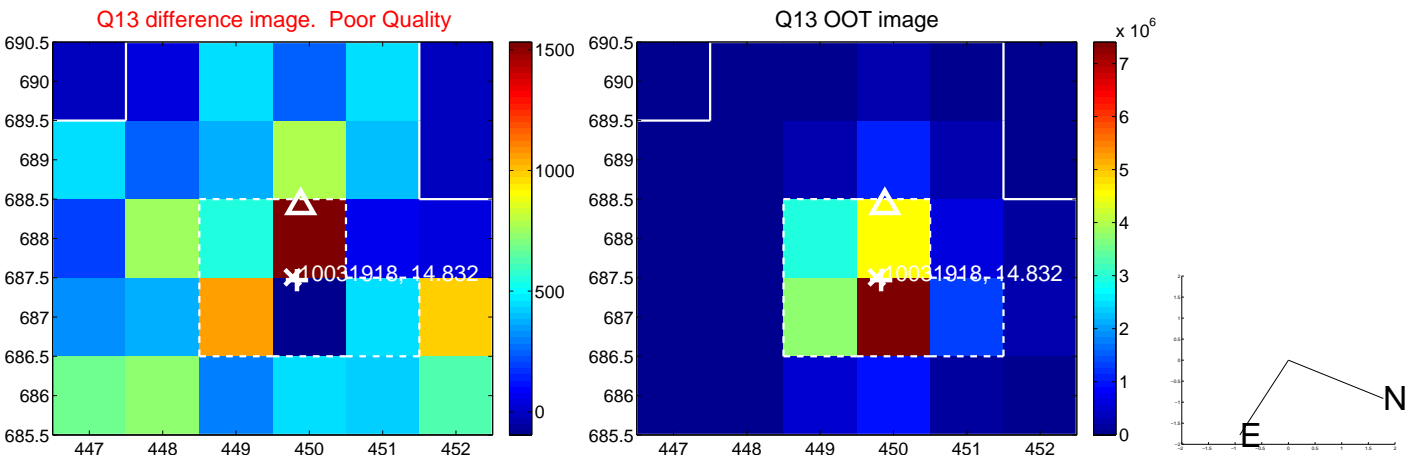
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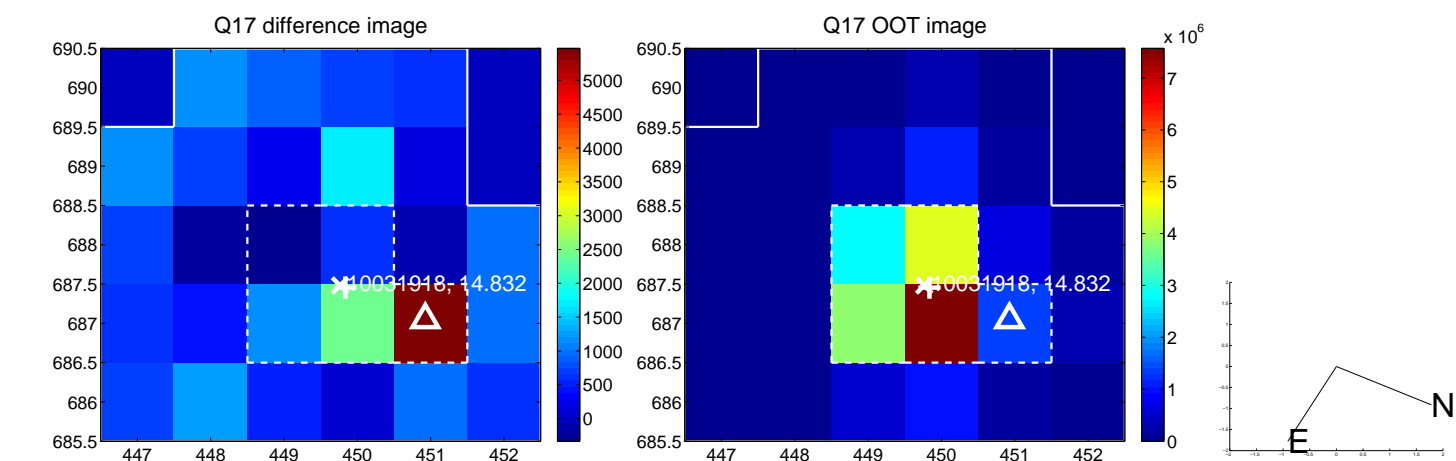


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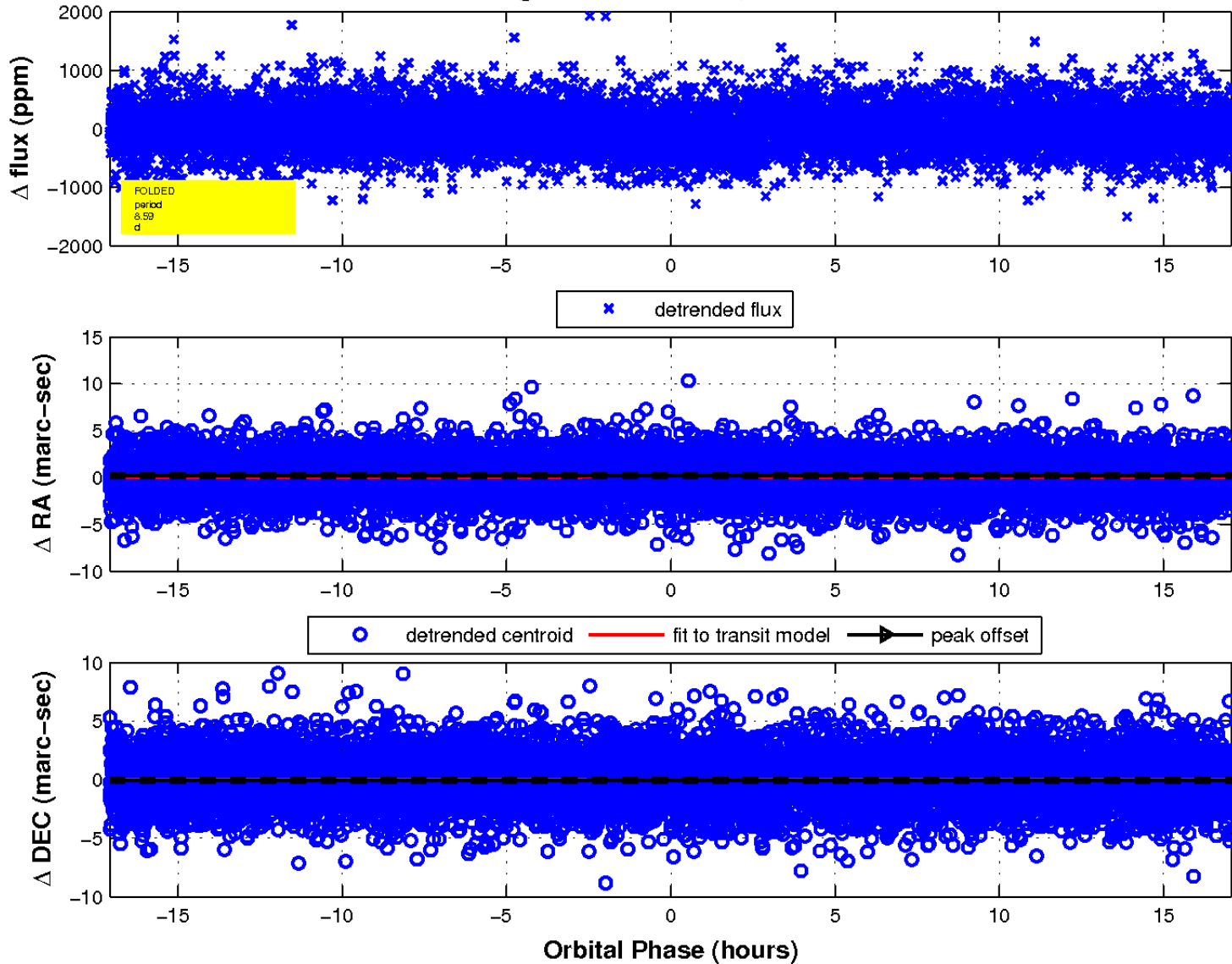




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

