

# KIC 012023218

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012023218-01	OBS	No	336.569971	299.653971	211.9	13.013	7.6	7.5	1.58	6752	2.42	4.42

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012023218-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

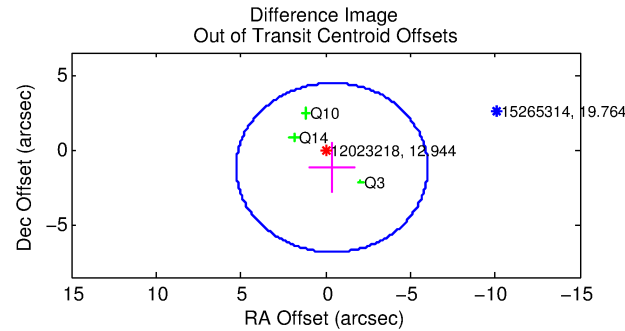
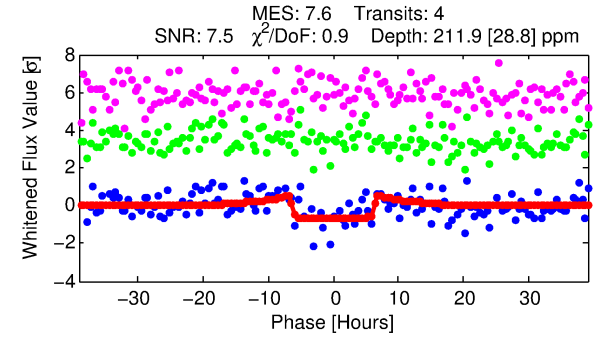
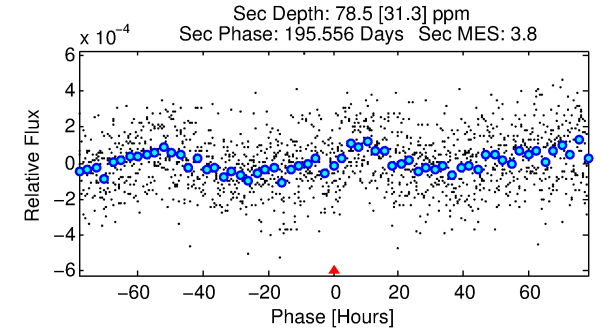
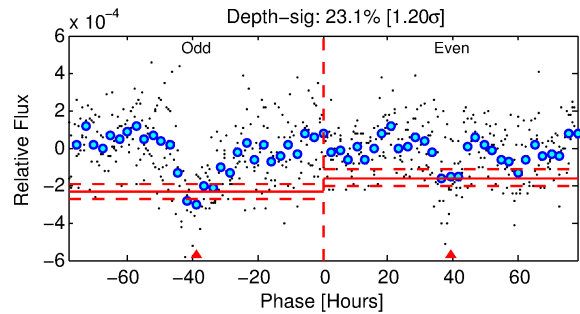
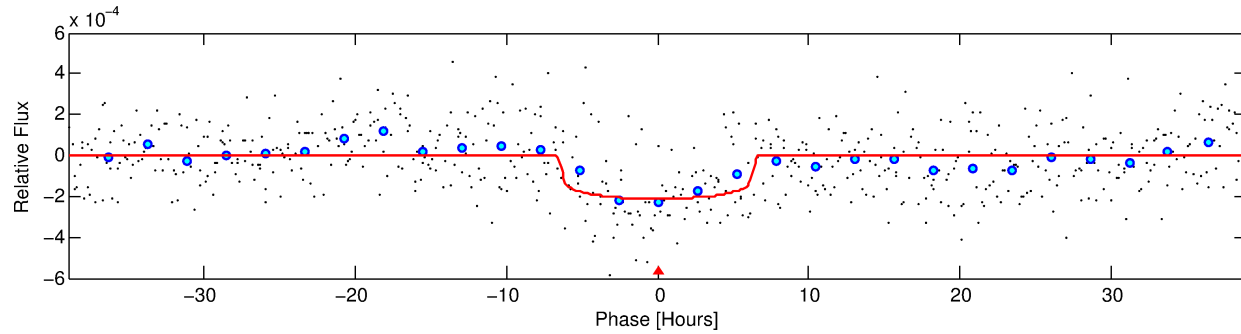
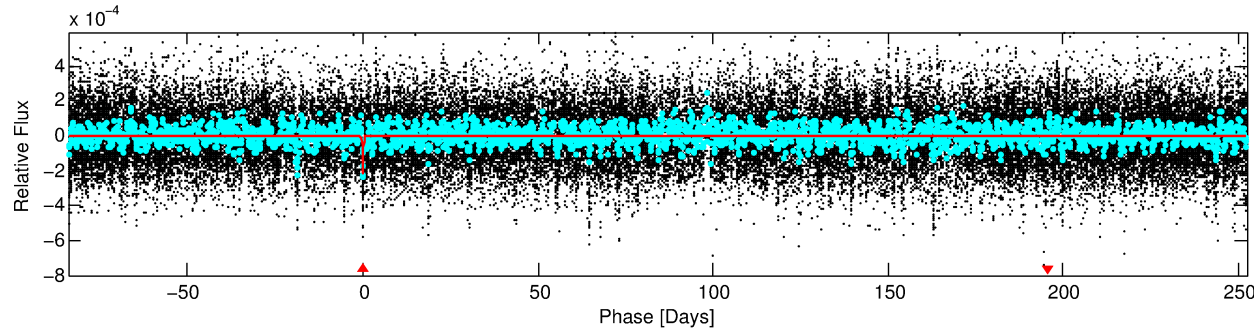
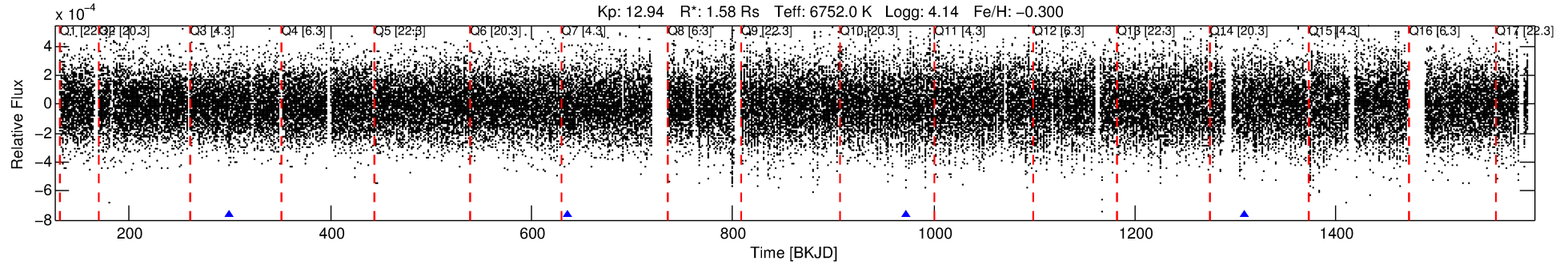
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012023218-01

No Significant Match Found

# DV One-Page Summary

KIC: 12023218 Candidate: 1 of 1 Period: 336.570 d



## DV Fit Results:

Period = 336.56997 [0.00674] d  
Epoch = 299.6540 [0.0125] BKJD  
Rp/R\* = 0.0140 [0.0044]  
a/R\* = 159.34 [271.32]  
b = 0.61 [1.73]  
Seff = 4.42 [1.75]  
Teq = 370 [37] K  
Rp = 2.42 [1.04] Re  
a = 1.0257 [0.2598] AU  
Ag = 7744.37 [6395.48] [1.21 $\sigma$ ]  
Teffp = 5364 [1007] K [4.96 $\sigma$ ]

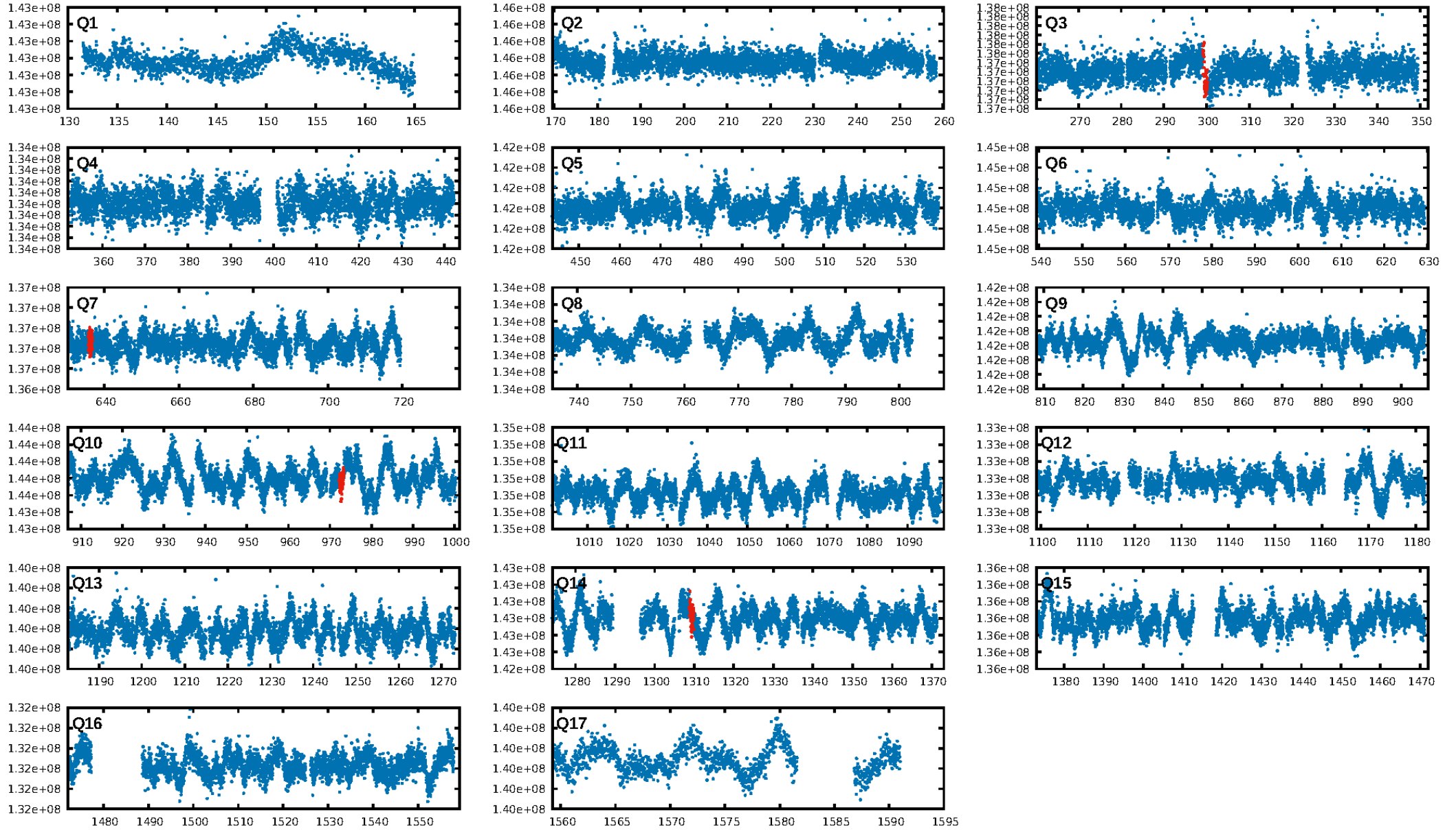
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.1%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: 1.14e-14  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -5.203  
Centroid-sig: 1.1%  
Centroid-so: 0.554 arcsec [0.64 $\sigma$ ]  
OotOffset-rm: 1.259 arcsec [0.67 $\sigma$ ]  
KicOffset-rm: 1.114 arcsec [0.81 $\sigma$ ]  
OotOffset-st: 2/1/0/0 [3]  
KicOffset-st: 2/1/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [4/4]

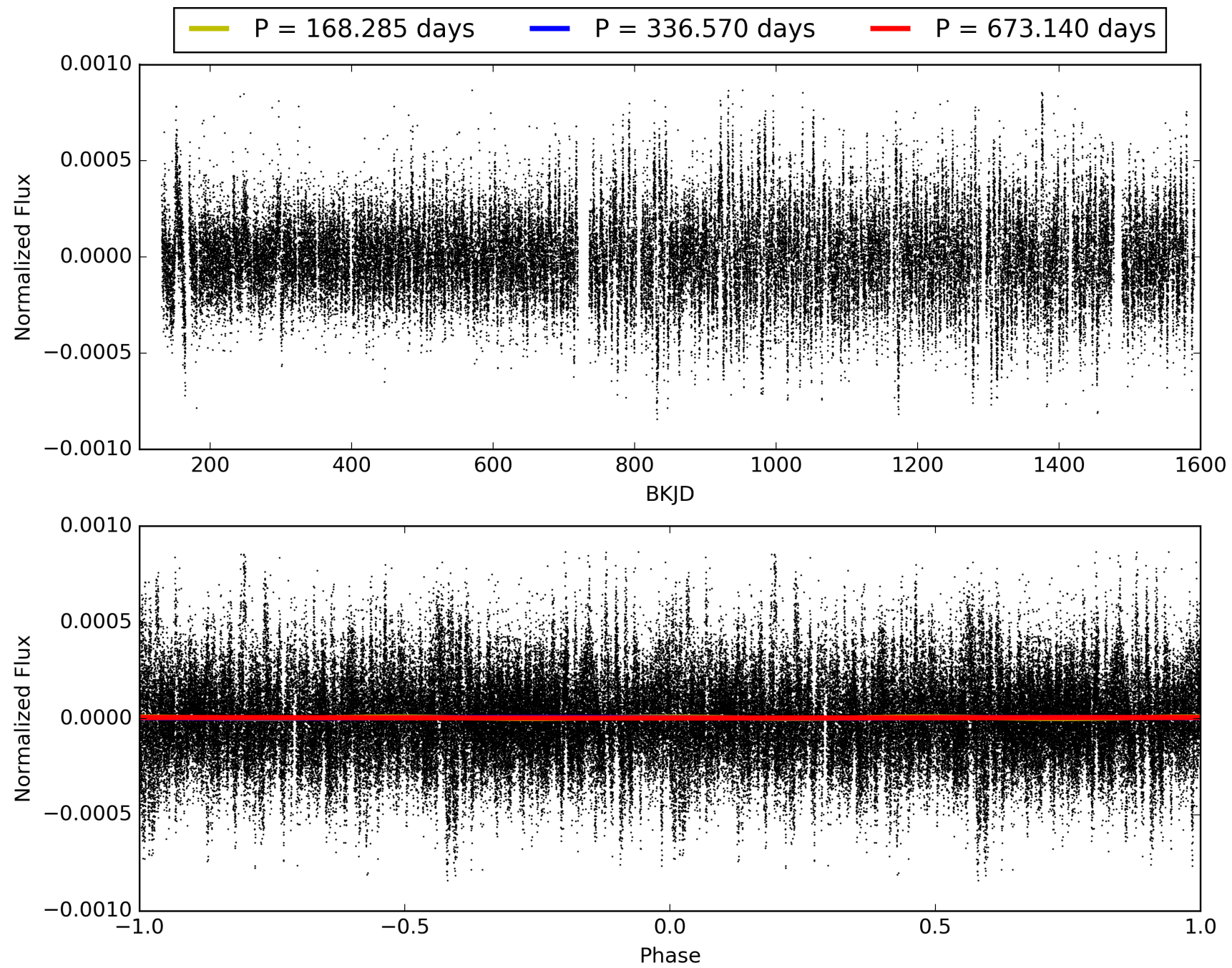
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:33:16 Z

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

# TCE 012023218-01, PDC Light Curves

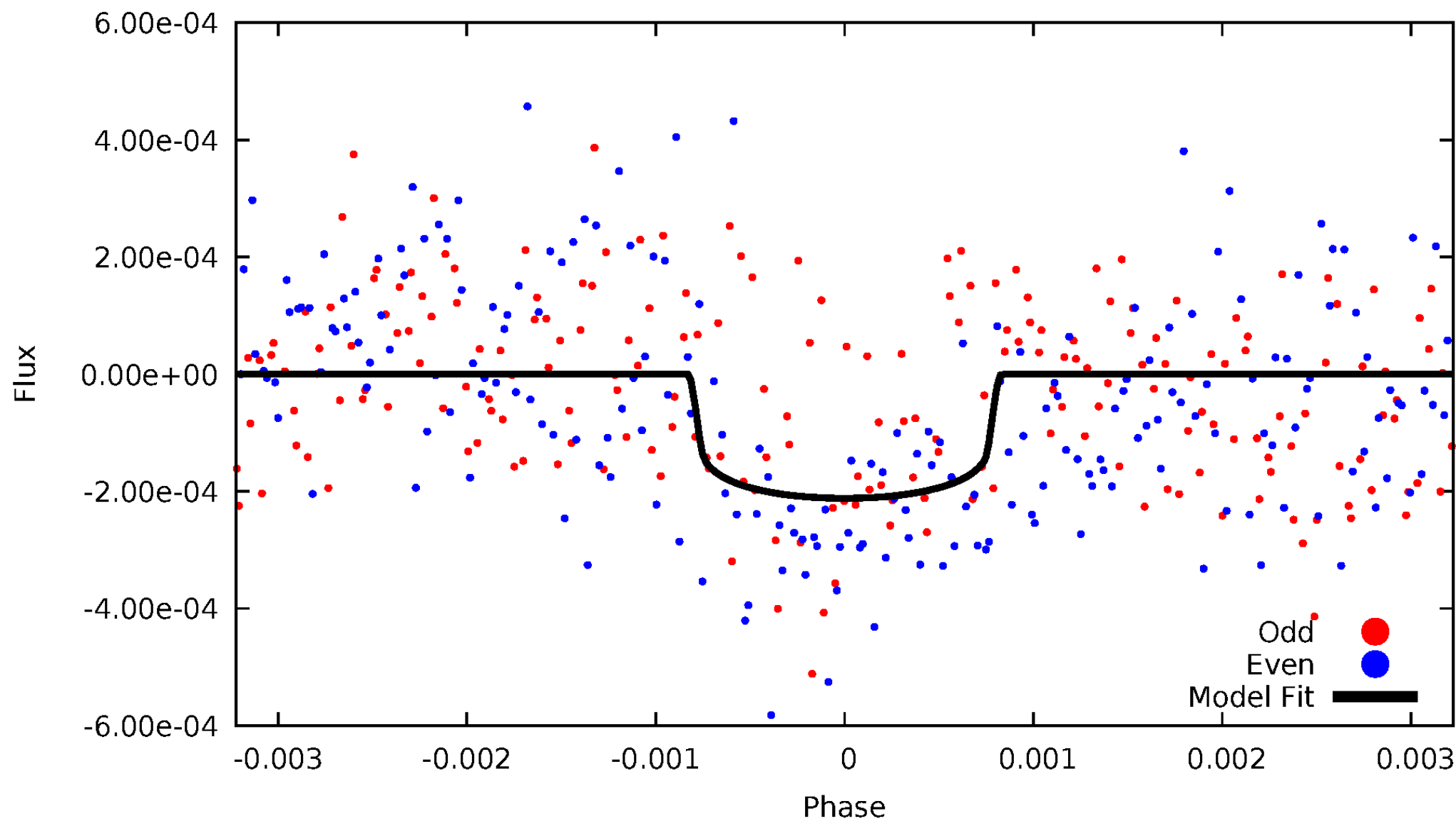


# TCE 012023218-01



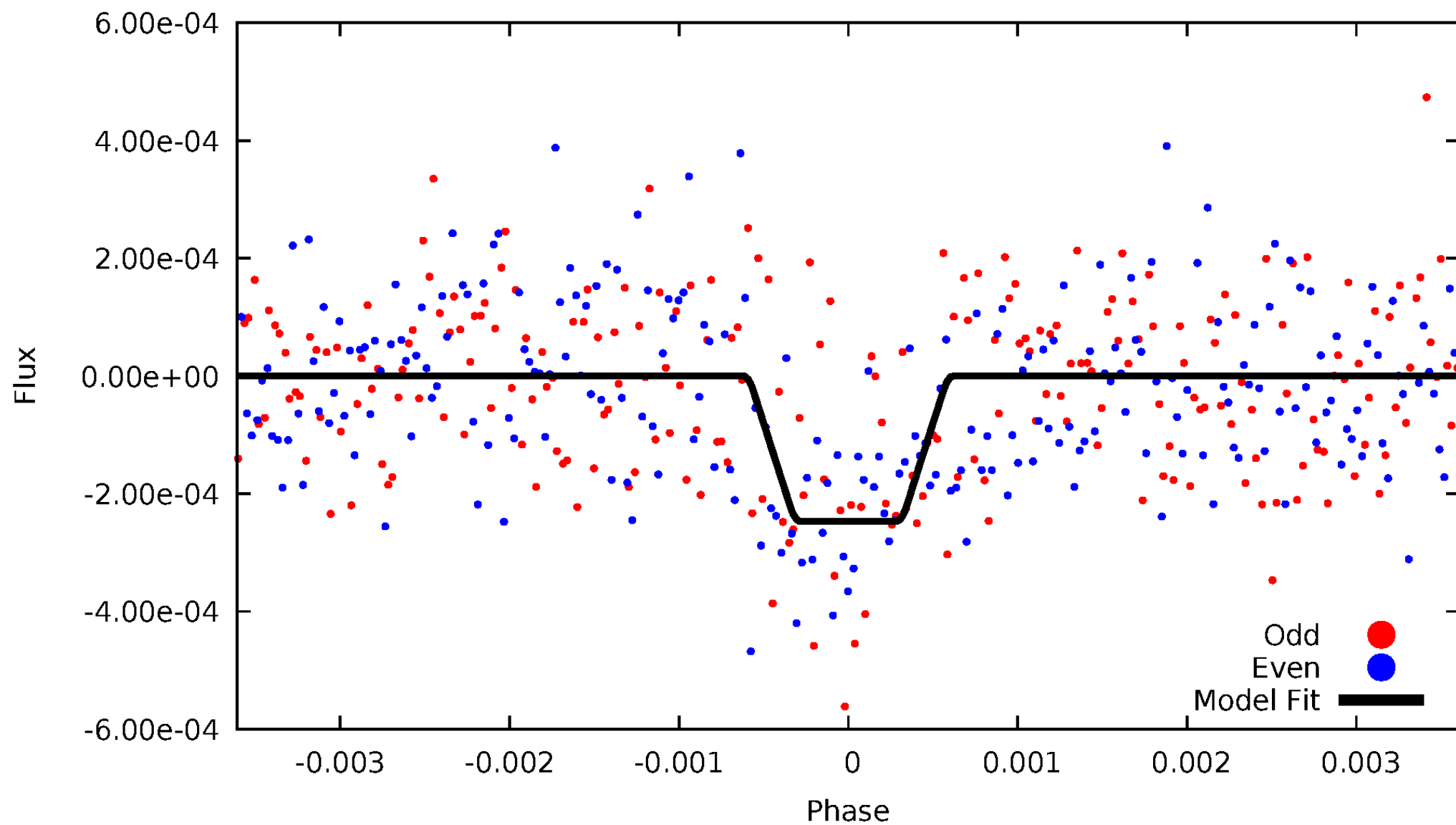
# DV Odd/Even

TCE 012023218-01



# ALT Odd/Even

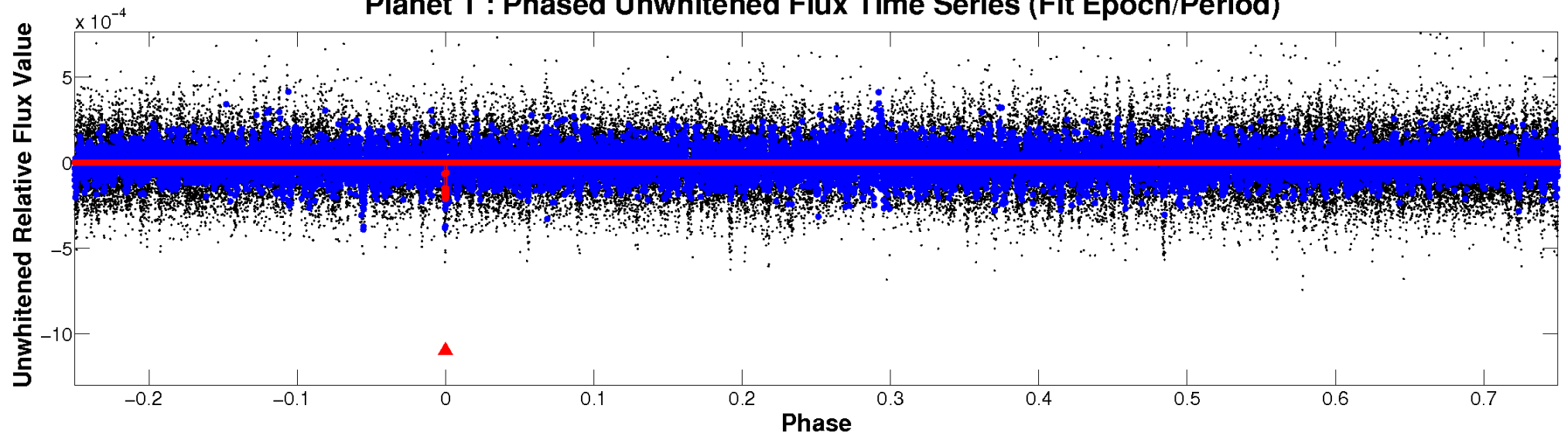
TCE 012023218-01



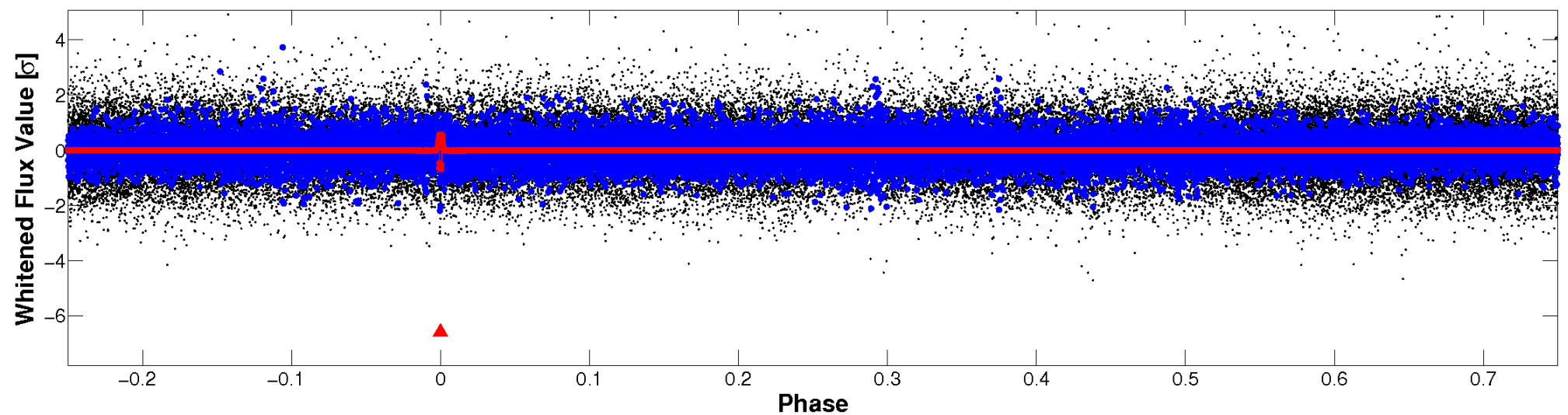


# Non-Whitened Vs. Whitened Light Curve

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

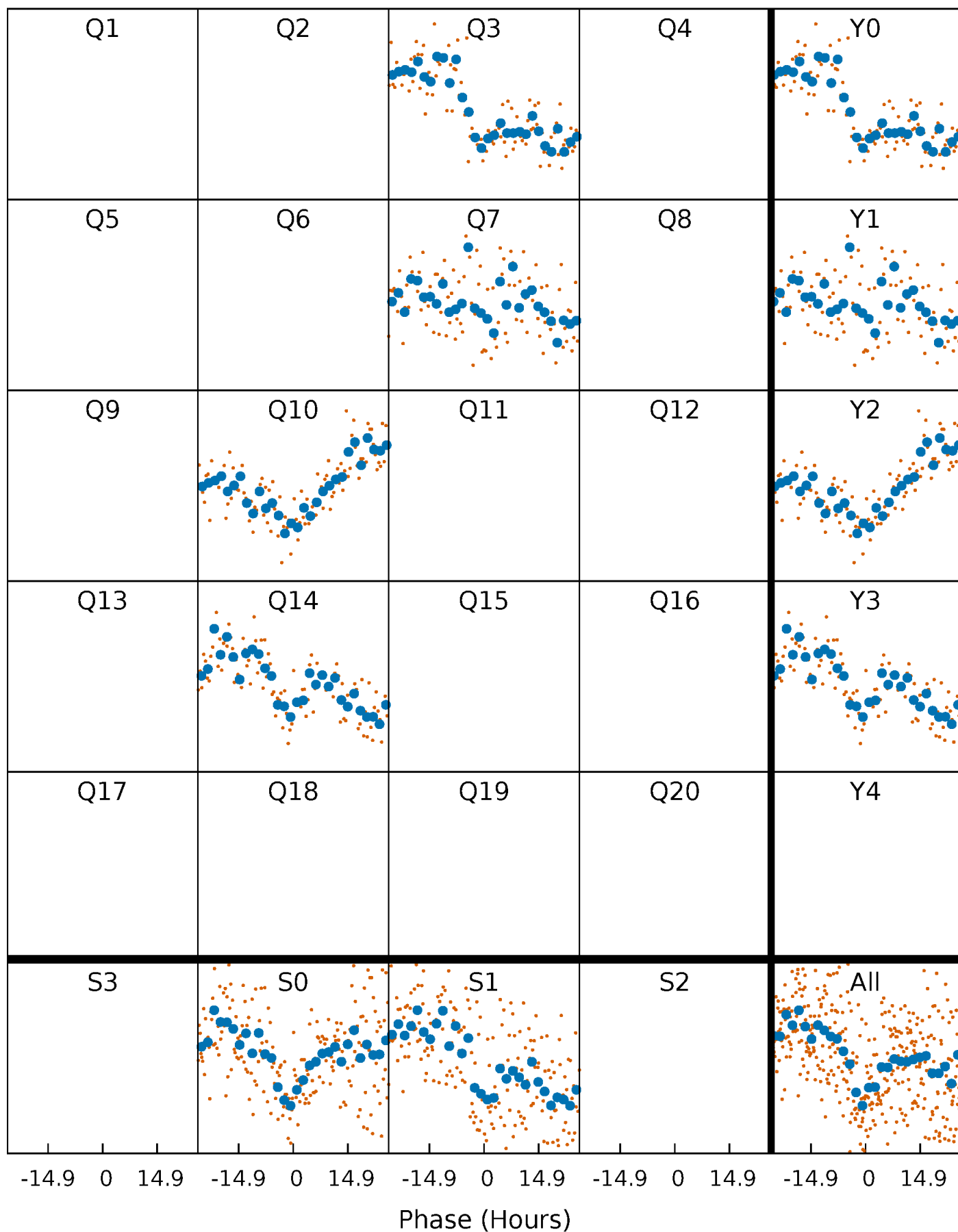


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

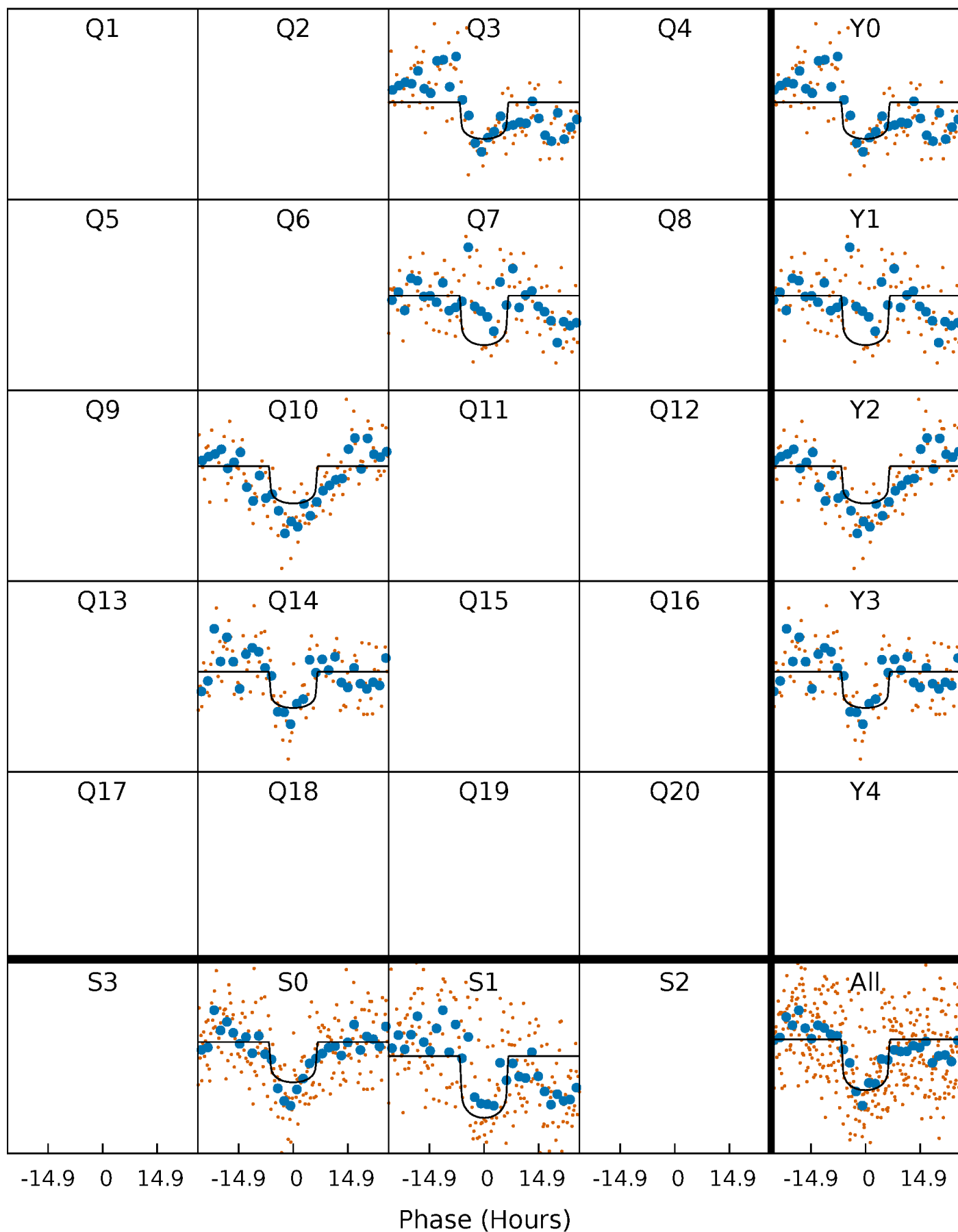
TCE 012023218-01 P=336.569971 Days  $T_0=299.653971$  (BKJD)





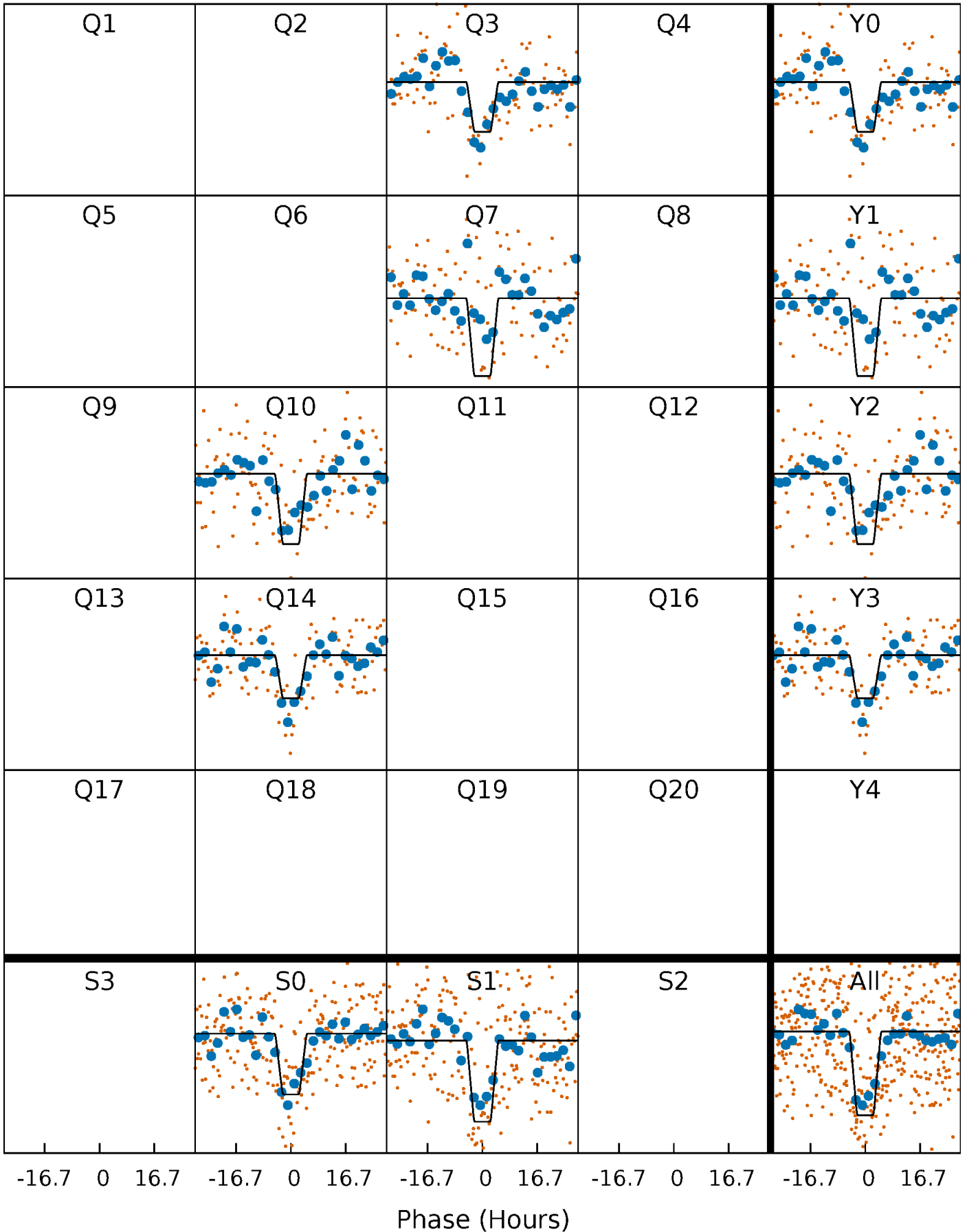
# DV Quarter-Phased Transit Curves

TCE 012023218-01 P=336.569971 Days  $T_0=299.653971$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

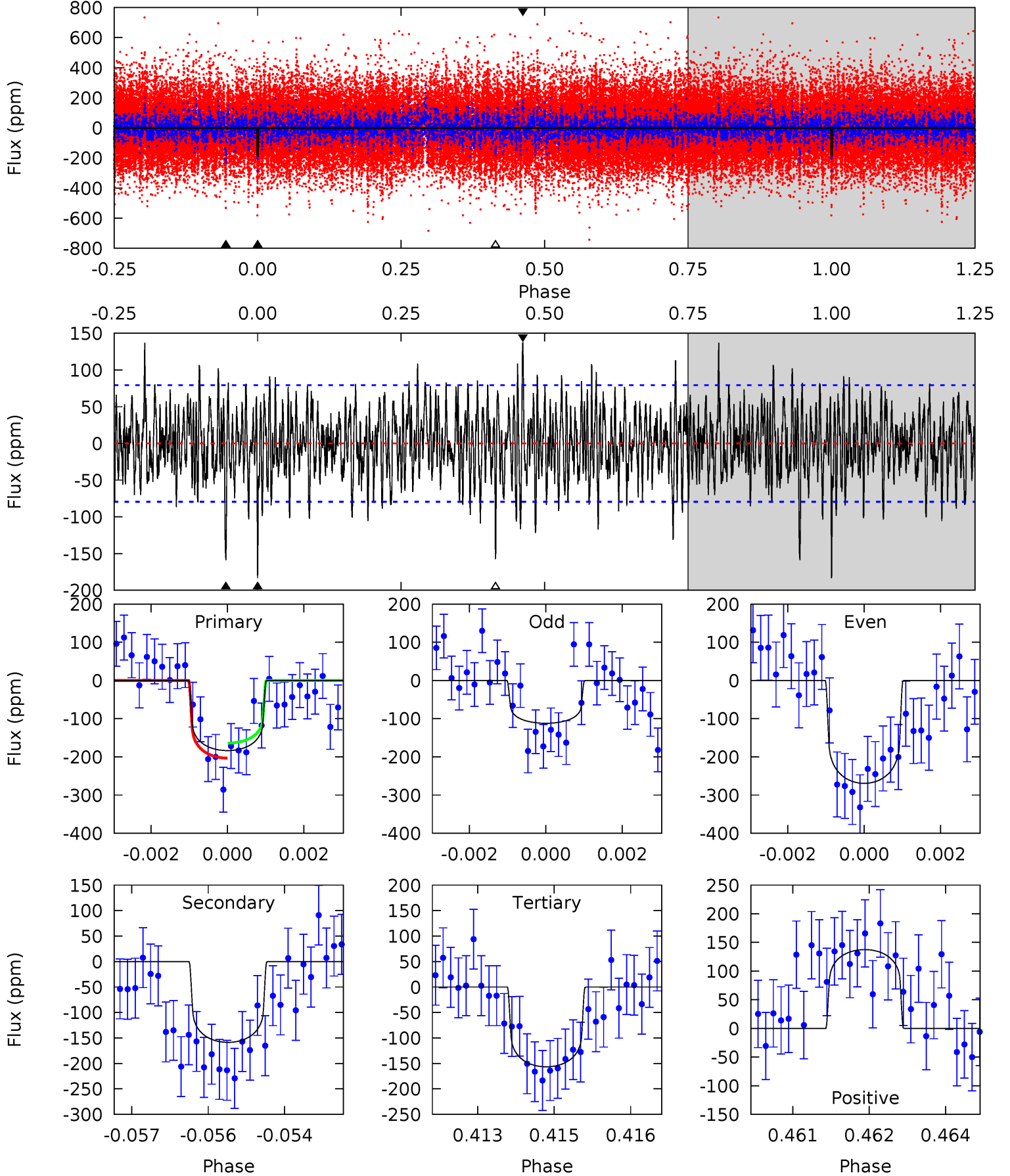
TCE 012023218-01 P=336.547544 Days  $T_0=299.670777$  (BKJD)



# DV Model-Shift Uniqueness Test

012023218-01, P = 336.569971 Days, E = 299.653971 Days

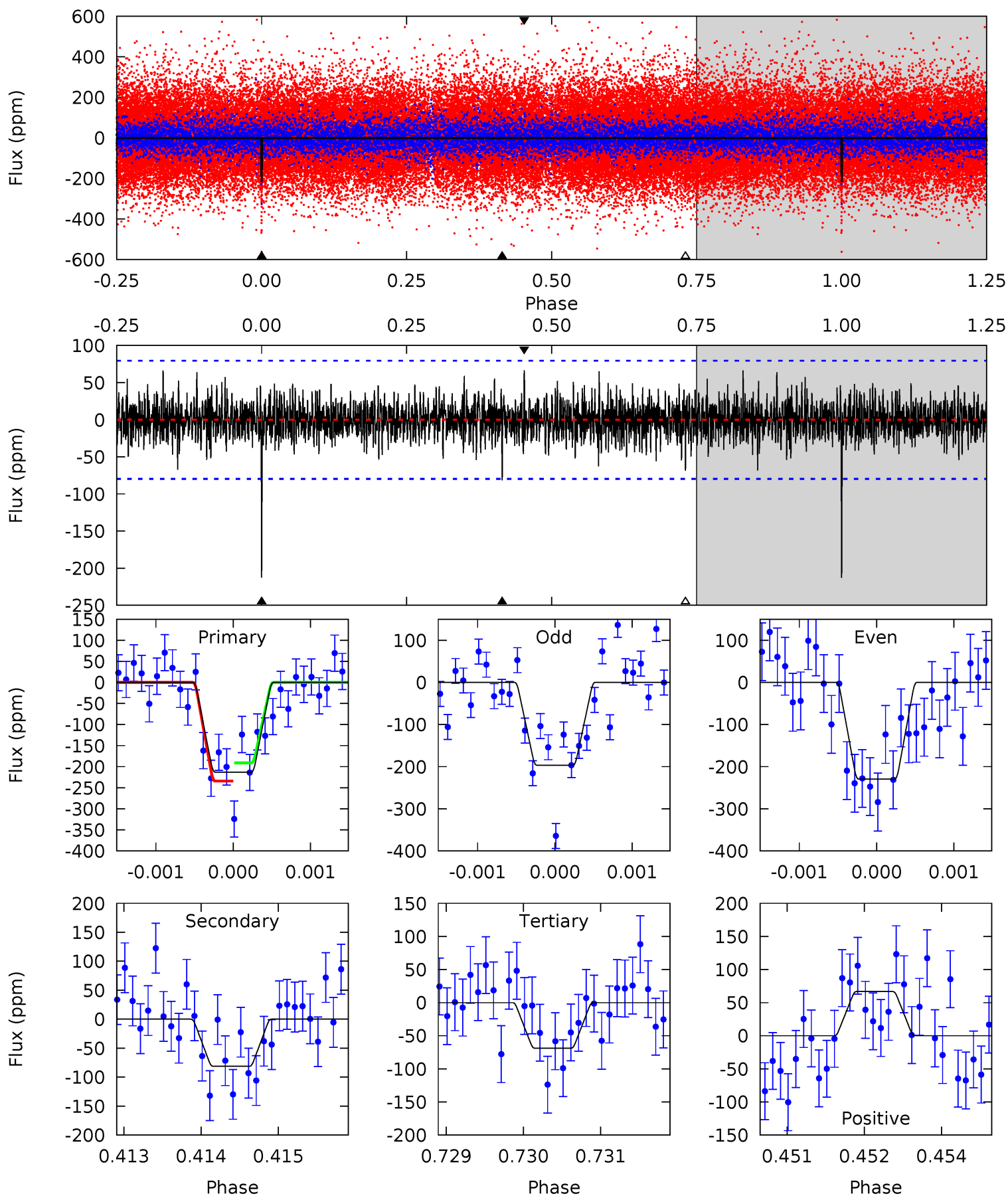
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	10.7	10.6	9.29	5.36	3.15	2.74	1.82	3.11	0.14	1.43	5.29	0.95	0.43	1.32



# Alt Model-Shift Uniqueness Test

012023218-01, P = 336.547544 Days, E = 299.670777 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
14.5	5.54	4.69	4.55	5.42	3.24	1.26	9.81	9.95	0.86	1.00	1.12	0.93	0.24	1.48



### Stellar Parameters For KIC 012023218

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6752^{+165}_{-236}$	$4.144^{+0.204}_{-0.185}$	$-0.300^{+0.250}_{-0.300}$	$1.581^{+0.472}_{-0.386}$	$1.276^{+0.182}_{-0.202}$	$0.455^{+0.522}_{-0.210}$
	+2%/-3%	+5%/-4%	+83%/-100%	+30%/-24%	+14%/-16%	+115%/-46%
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 012023218-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-159±15	$2.42^{+0.85}_{-0.82}$	$517^{+40}_{-42}$	$6375^{+1513}_{-814}$	$15287^{+21089}_{-6739}$
Alt.	-81±15	$2.67^{+0.94}_{-0.79}$	$514^{+40}_{-38}$	$5137^{+831}_{-565}$	$6503^{+6512}_{-3047}$

$T_{max}$  = 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

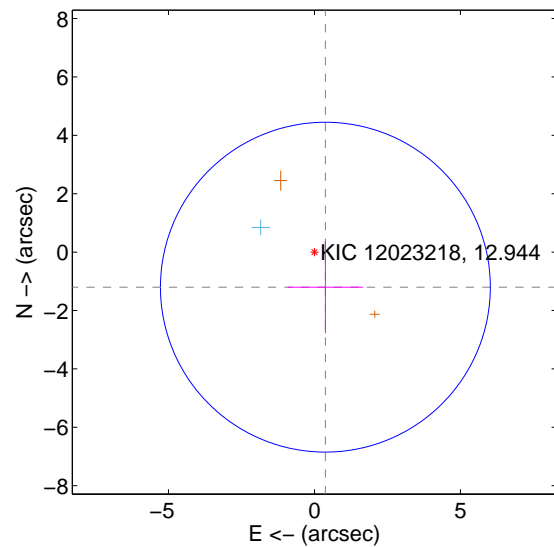
Supplemental centroid analysis for 012023218-01. Kepler magnitude: 12.94. Transit SNR 7.46

There are 1 quarters with good PRF difference image offsets

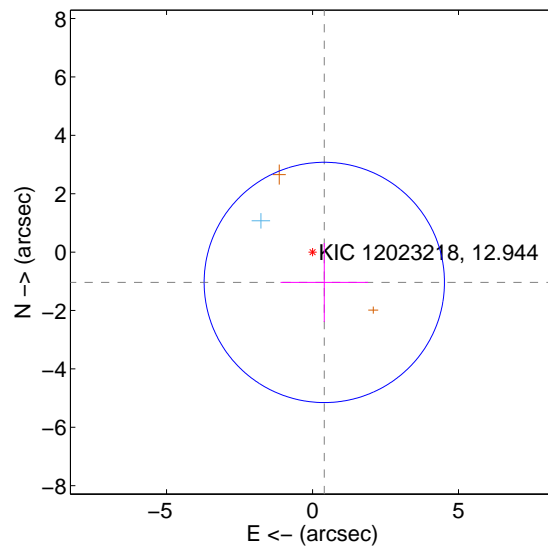
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.259 \pm 1.883$	0.67	$-0.375 \pm 1.289$	$-1.202 \pm 1.579$
PRF-fit source offset from KIC position	$1.114 \pm 1.372$	0.81	$-0.403 \pm 1.501$	$-1.039 \pm 1.351$
photometric centroid source offset	$0.55 \pm 0.86$	0.64	$0.55 \pm 0.86$	$-0.01 \pm 1.36$

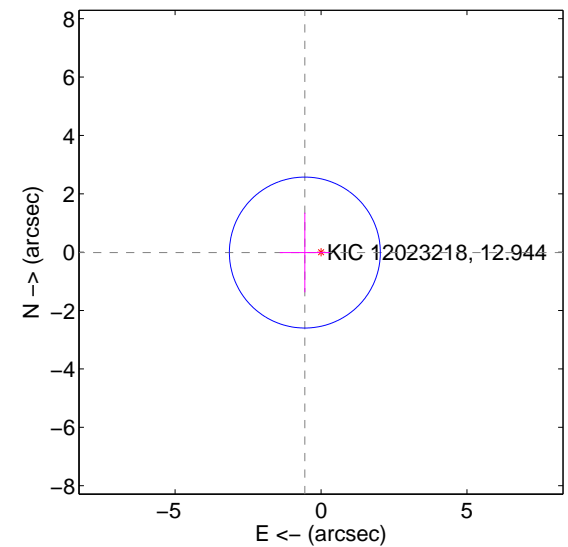
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

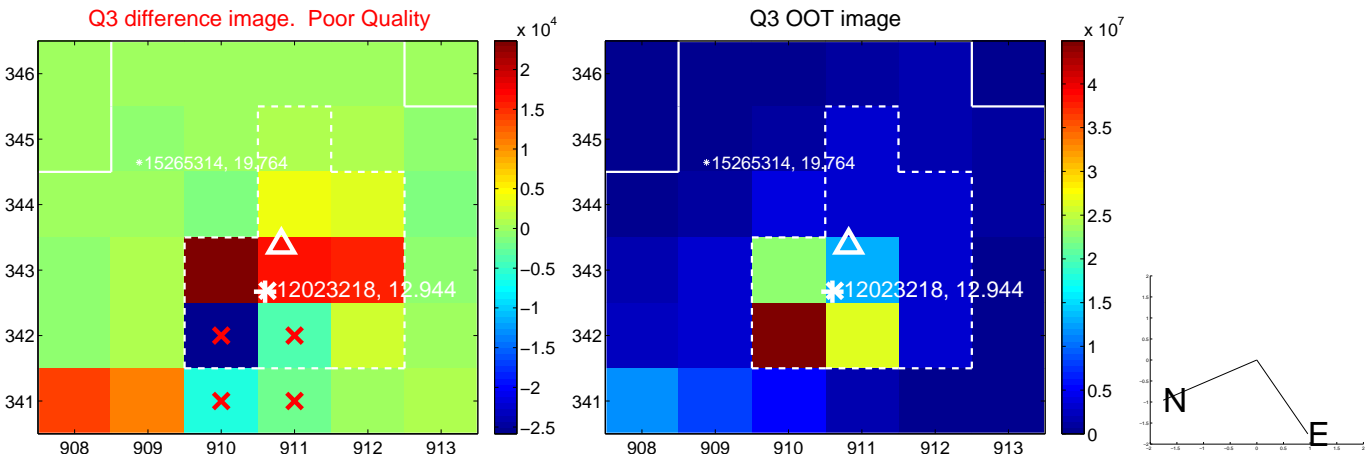


offset from photometric centroids



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.



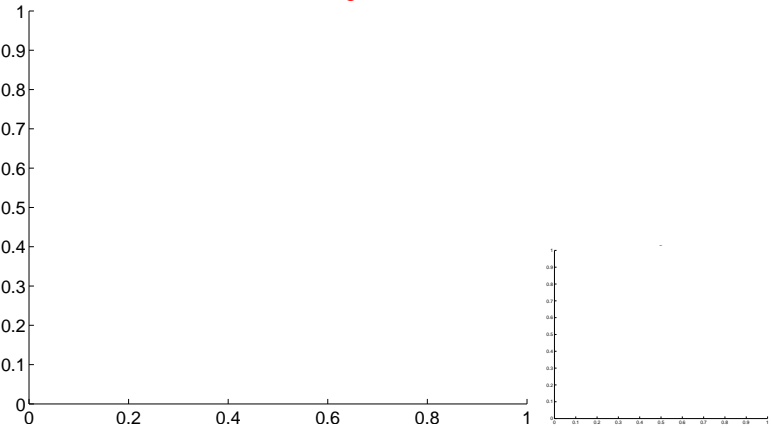


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q5 no difference image



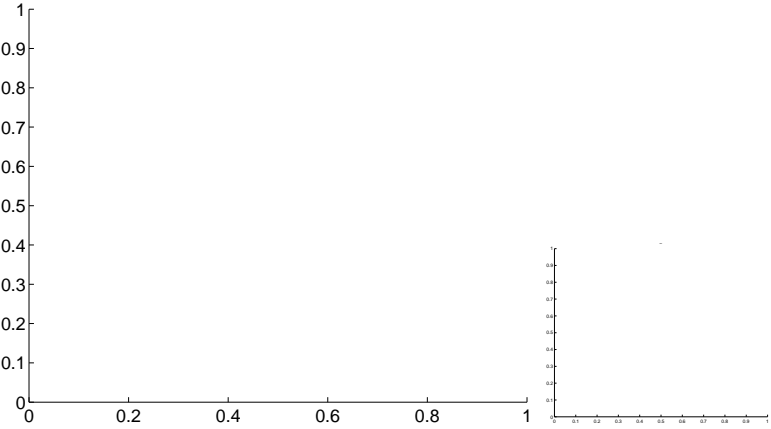
Q5 no OOT image



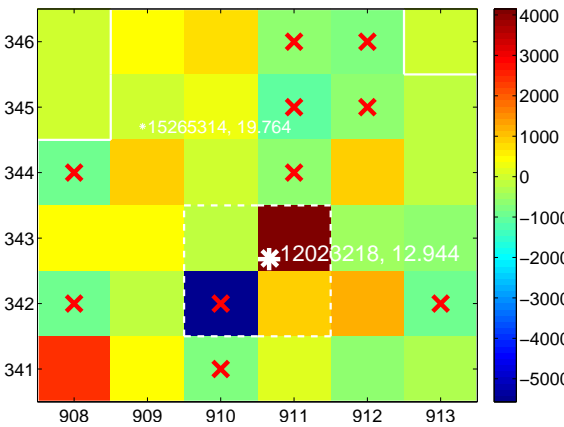
Q6 no difference image



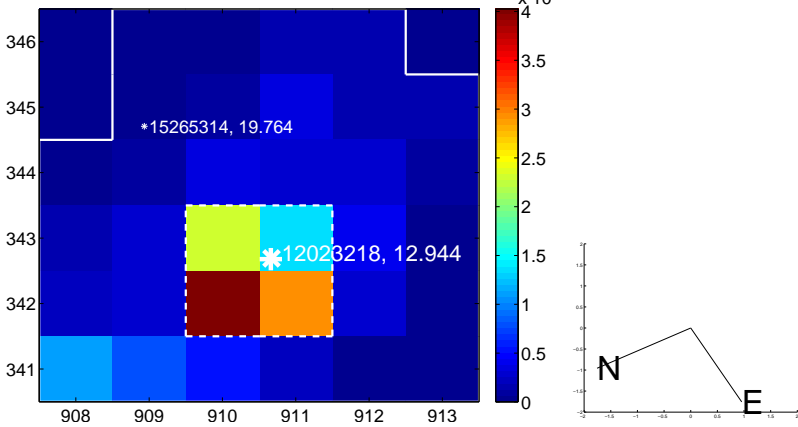
Q6 no OOT image



Q7 difference image. Poor Quality



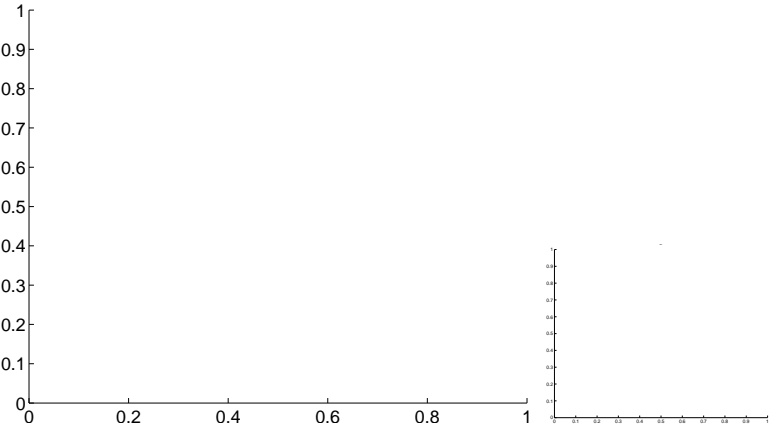
Q7 OOT image



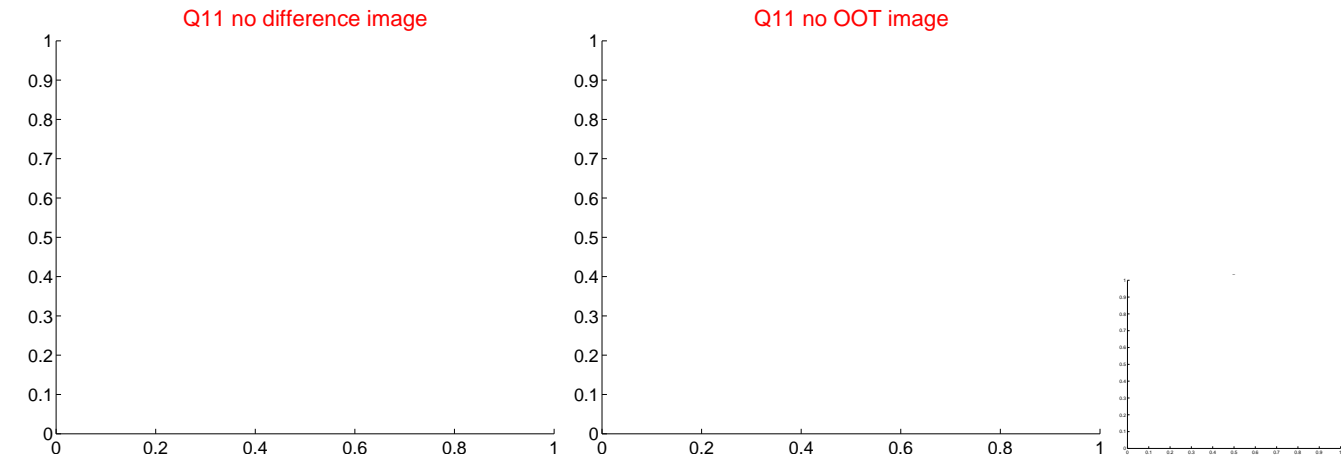
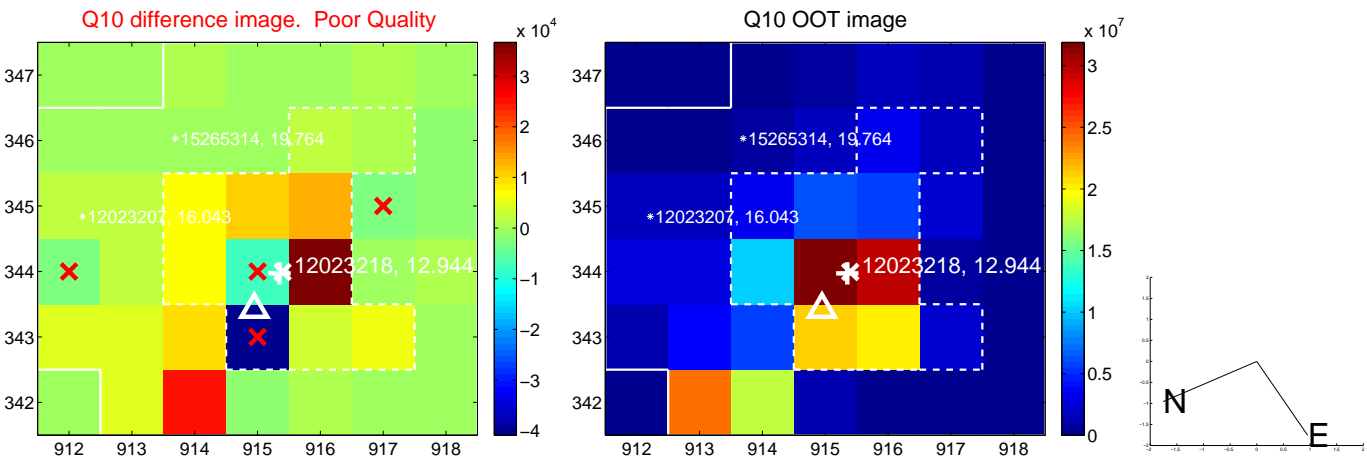
Q8 no difference image



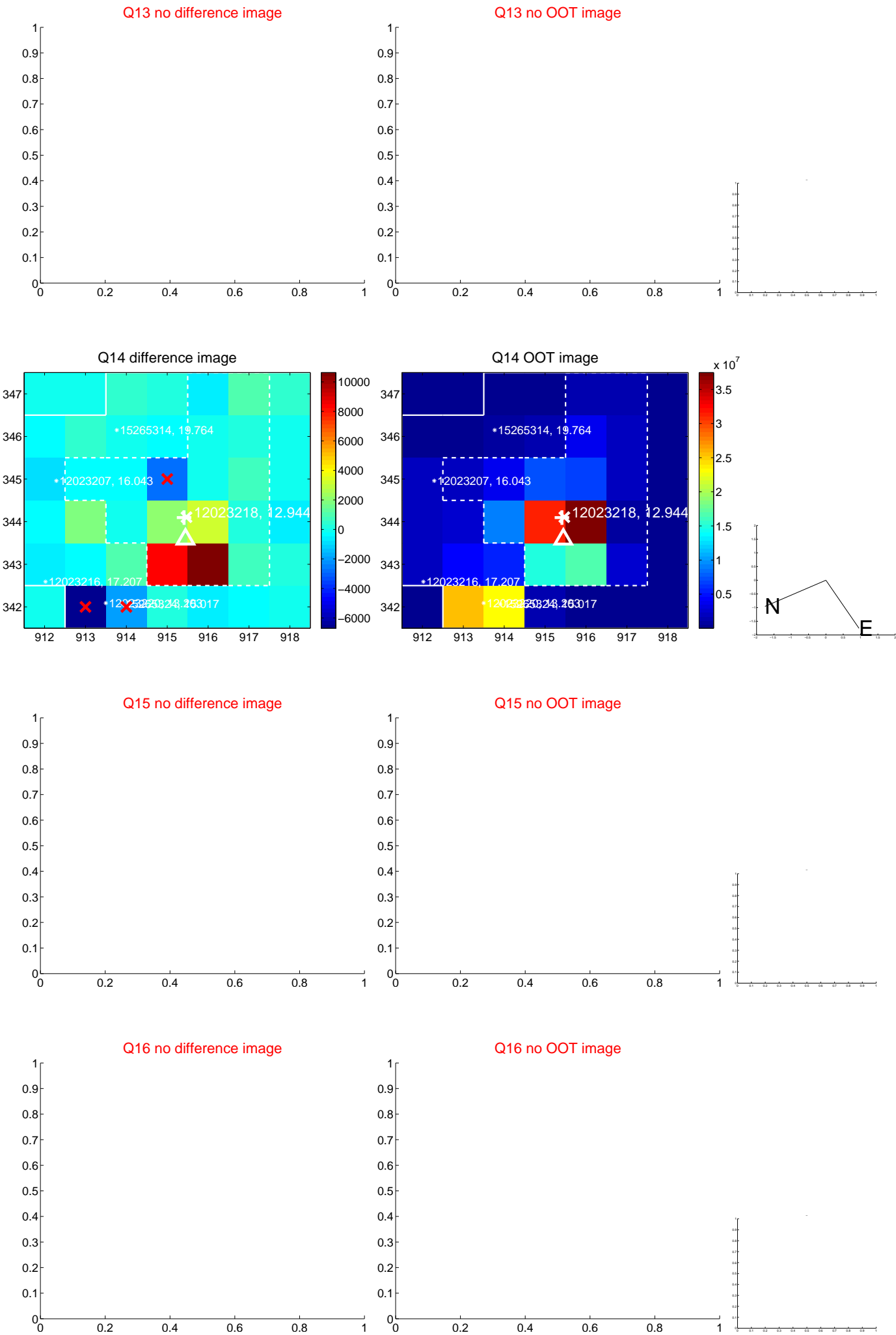
Q8 no OOT image



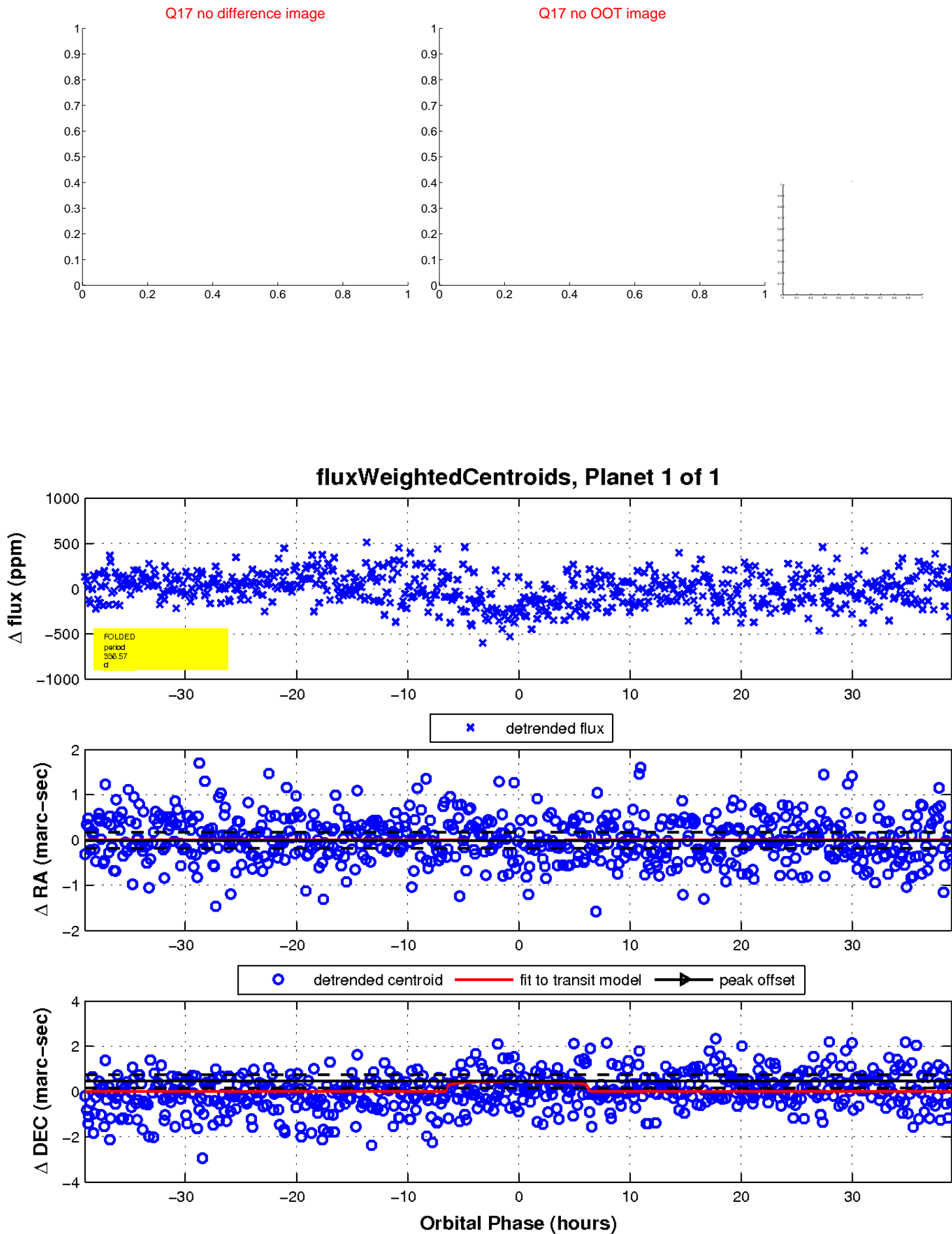
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

