

# KIC 004931331

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004931331-01	OBS	No	267.755883	372.945233	633.4	23.426	8.0	9.1	0.76	5295	1.92	0.77

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004931331-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_NONUNIQ_ALT—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.

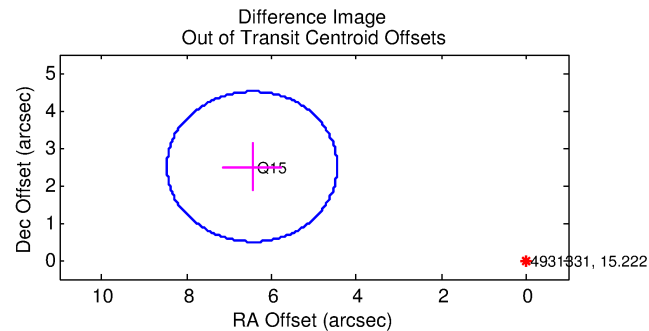
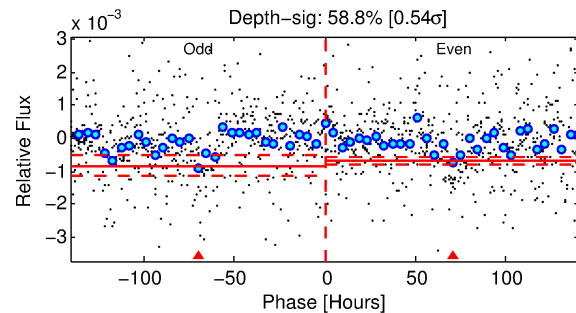
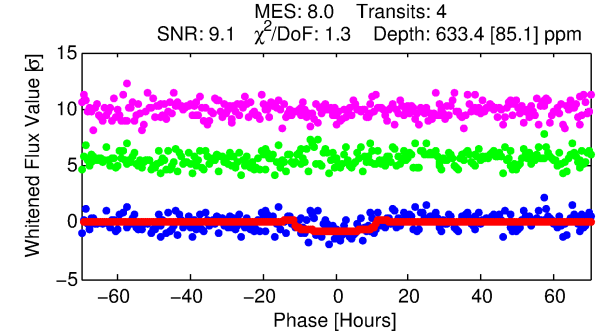
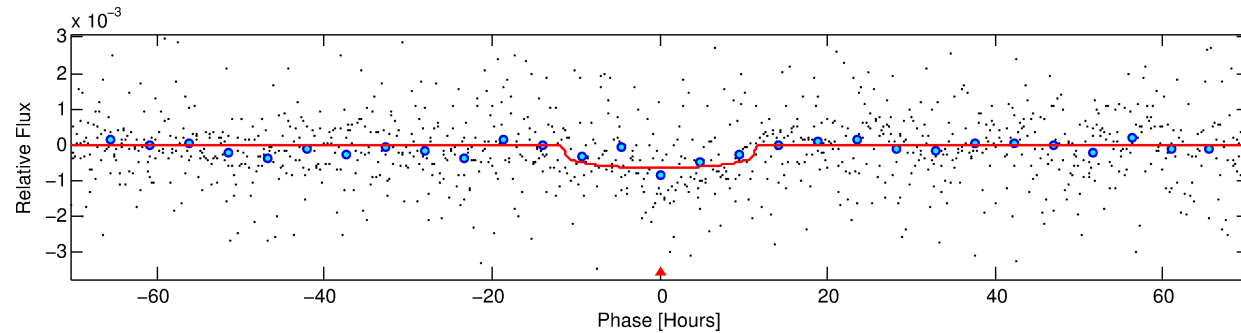
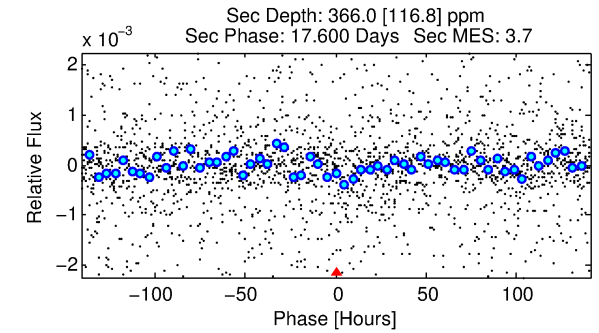
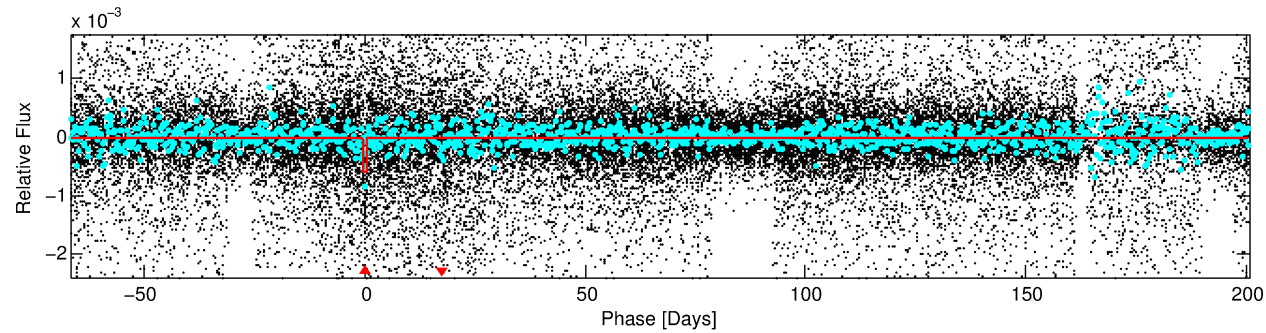
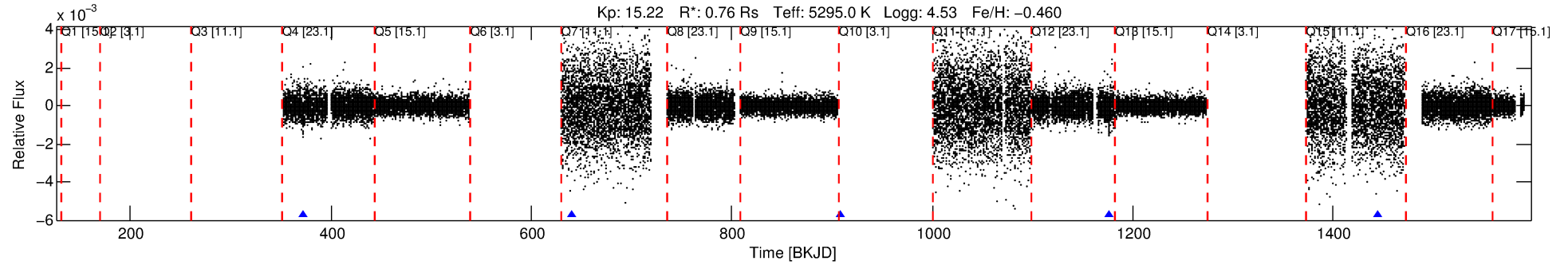
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004931331-01

No Significant Match Found

# DV One-Page Summary

KIC: 4931331 Candidate: 1 of 1 Period: 267.756 d



## DV Fit Results:

Period = 267.75588 [0.01219] d  
Epoch = 372.9452 [0.0281] BKJD  
Rp/R\* = 0.0232 [0.0136]  
a/R\* = 80.98 [190.74]  
b = 0.43 [4.46]  
Seff = 0.77 [0.18]  
Teq = 239 [14] K  
Rp = 1.92 [1.15] Re  
a = 0.7242 [0.0852] AU  
Ag = 28771.65 [35408.05] [0.81σ]  
Teff = 4806 [1472] K [3.10σ]

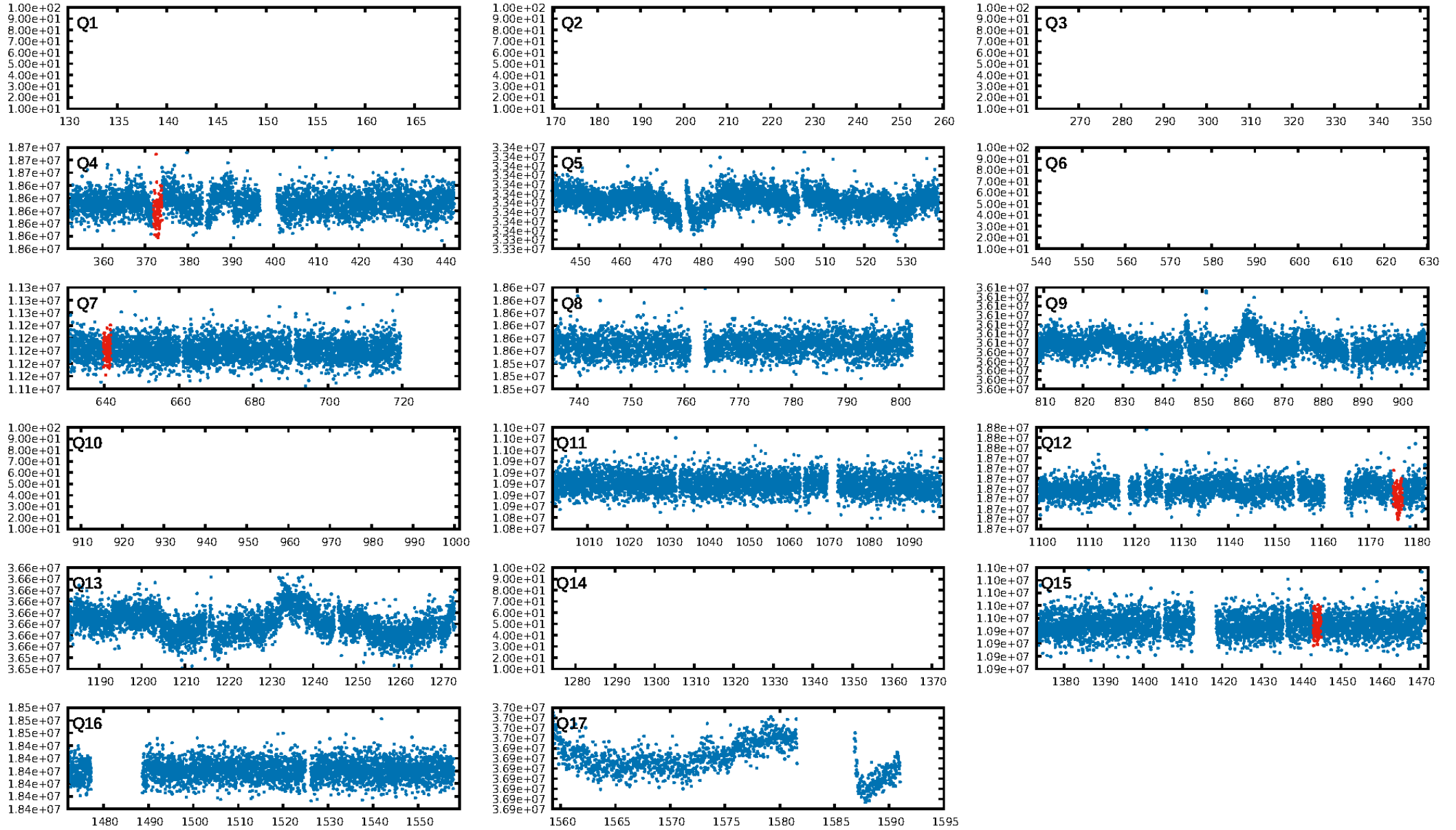
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 24.2%  
ModelChiSquareGof-sig: 73.5%  
**Bootstrap-pfa: 4.65e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.9004  
Centroid-sig: 43.5%  
**Centroid-so: 4.693 arcsec [44.73σ]**  
**OotOffset-rm: 6.919 arcsec [10.34σ]**  
KicOffset-rm: 1.705 arcsec [2.57σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [2/2]

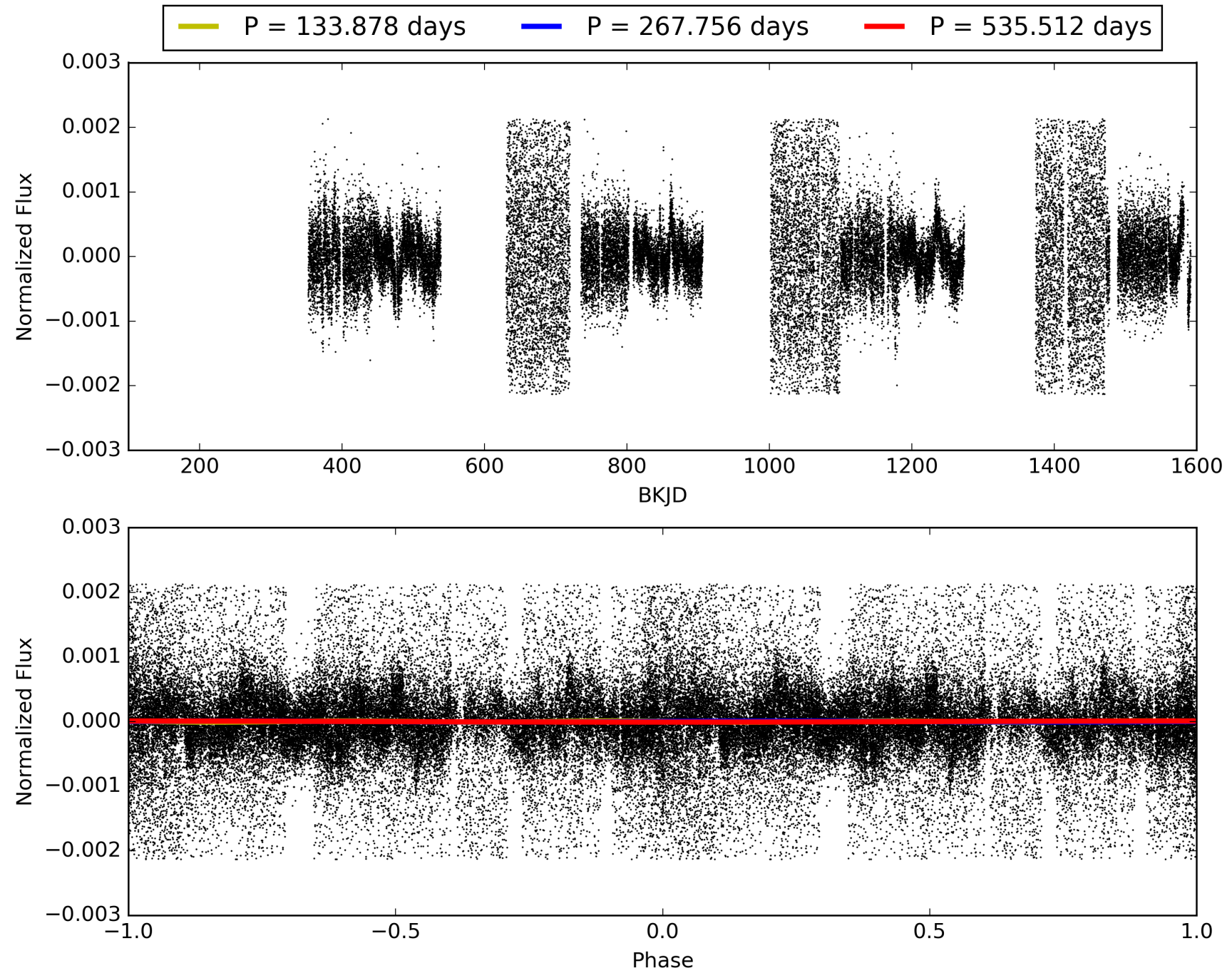
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:02:14 Z

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

# TCE 004931331-01, PDC Light Curves

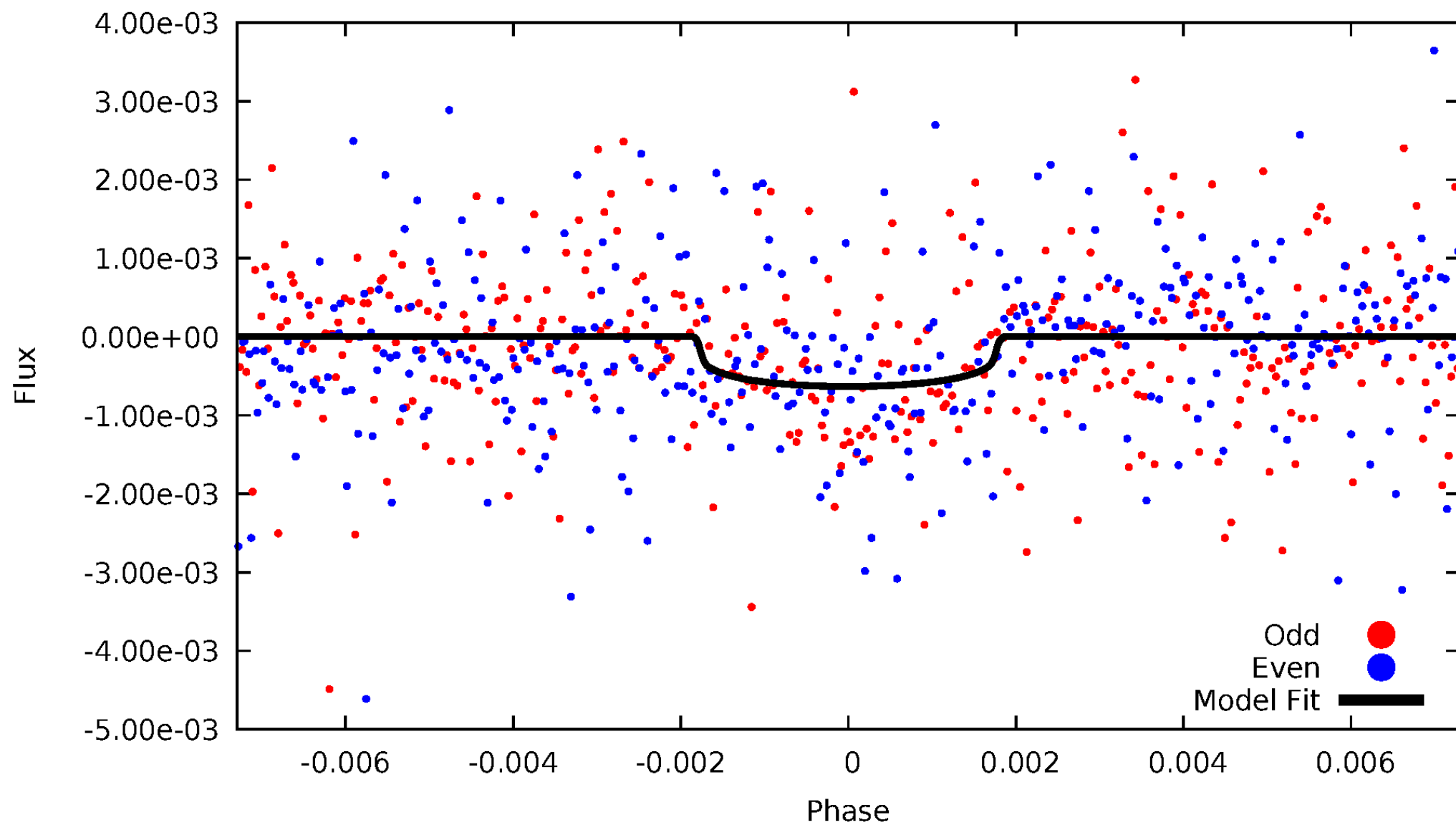


TCE 004931331-01



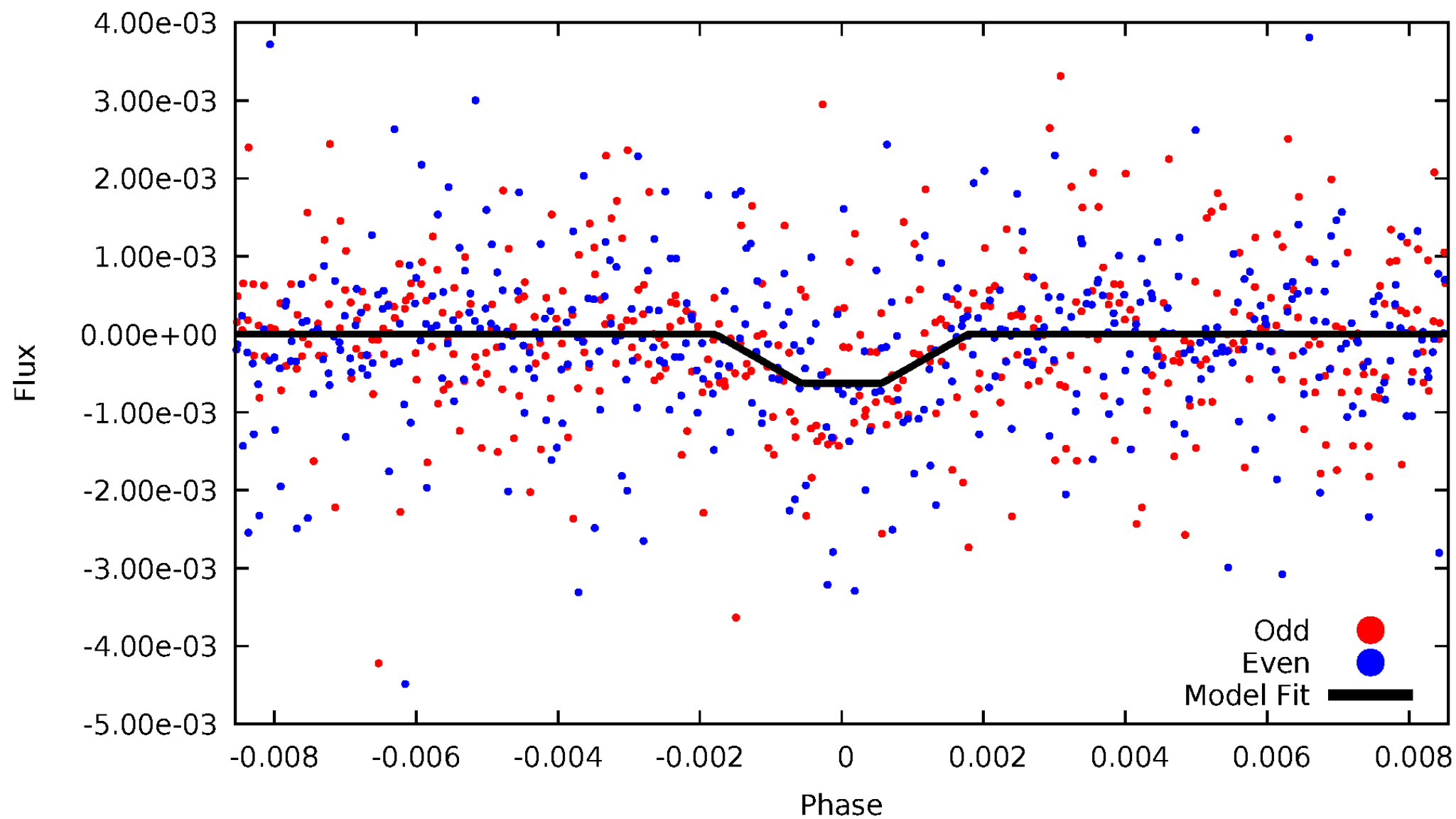
# DV Odd/Even

TCE 004931331-01



# ALT Odd/Even

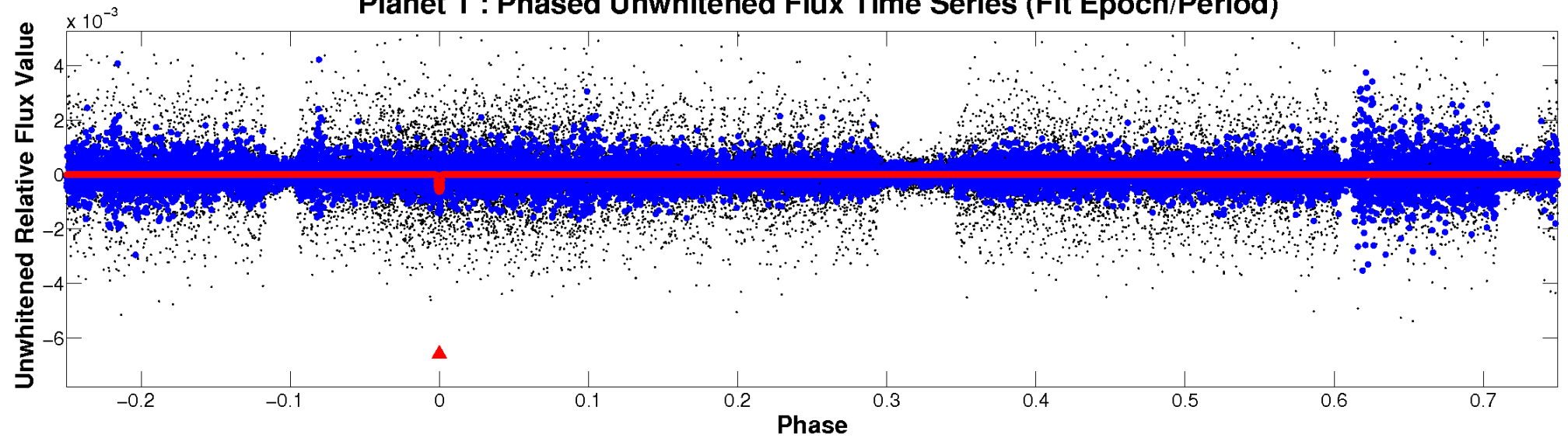
TCE 004931331-01



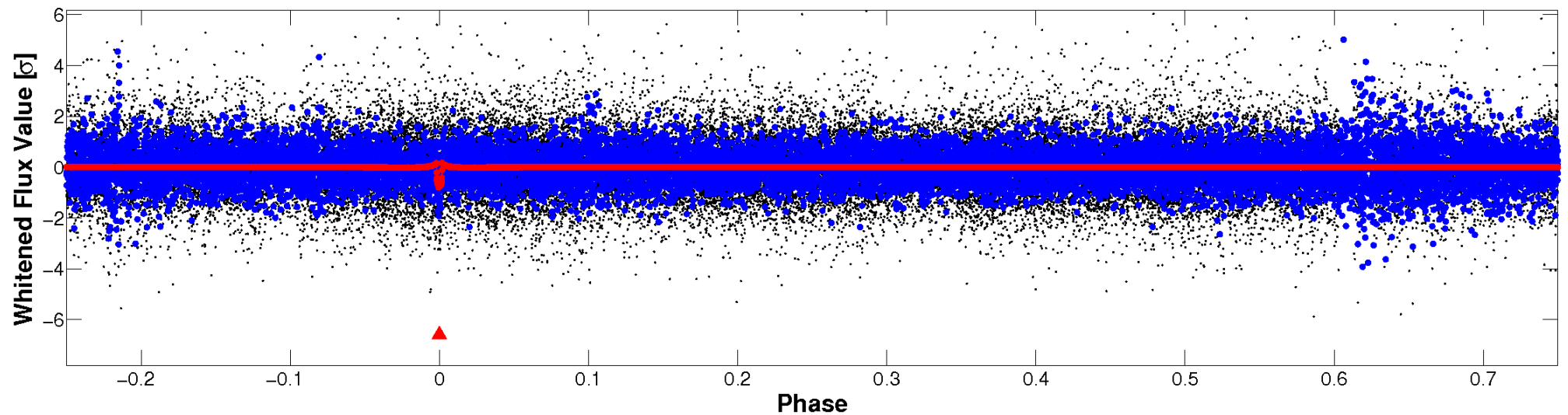


# Non-Whitened Vs. Whitened Light Curve

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

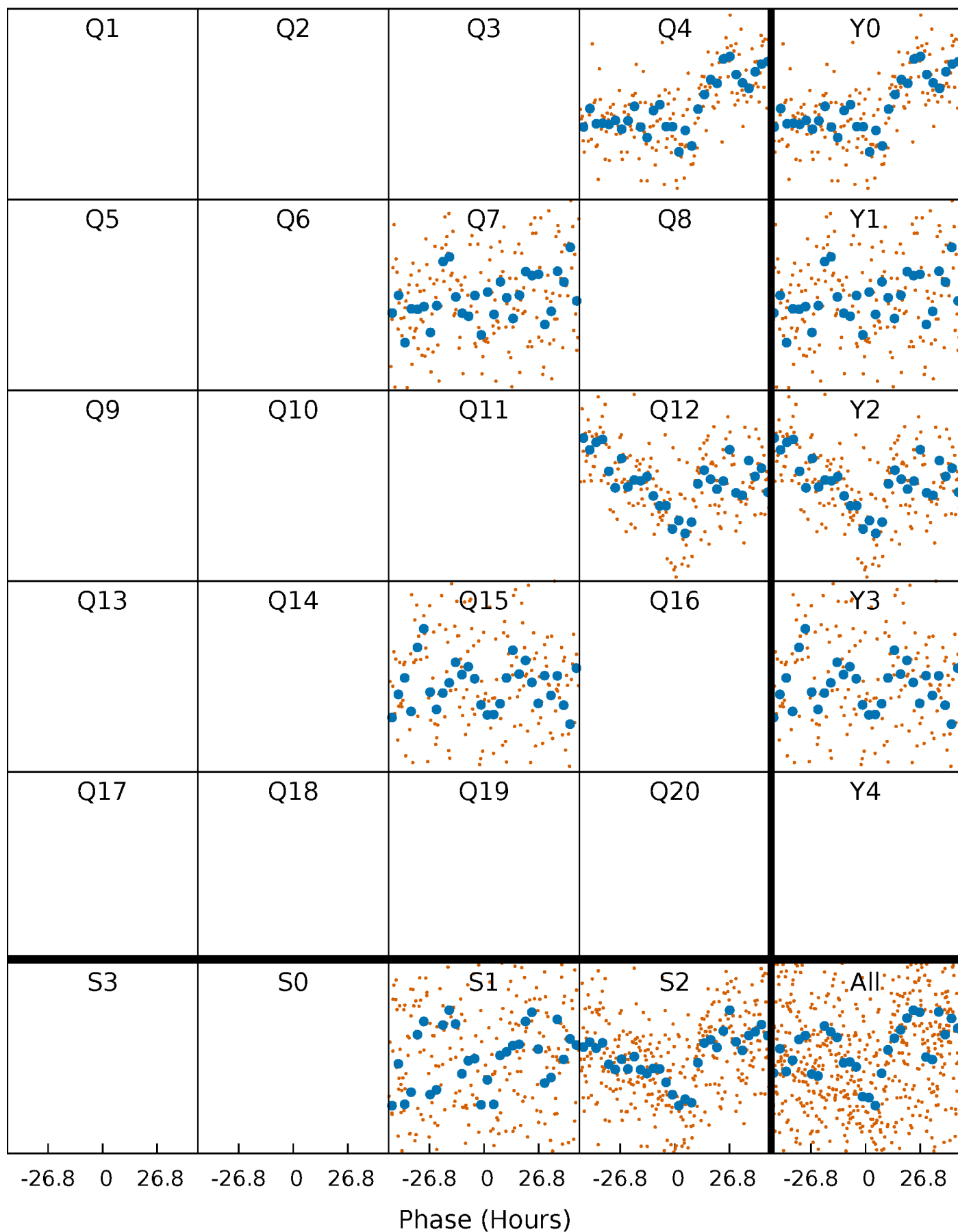


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

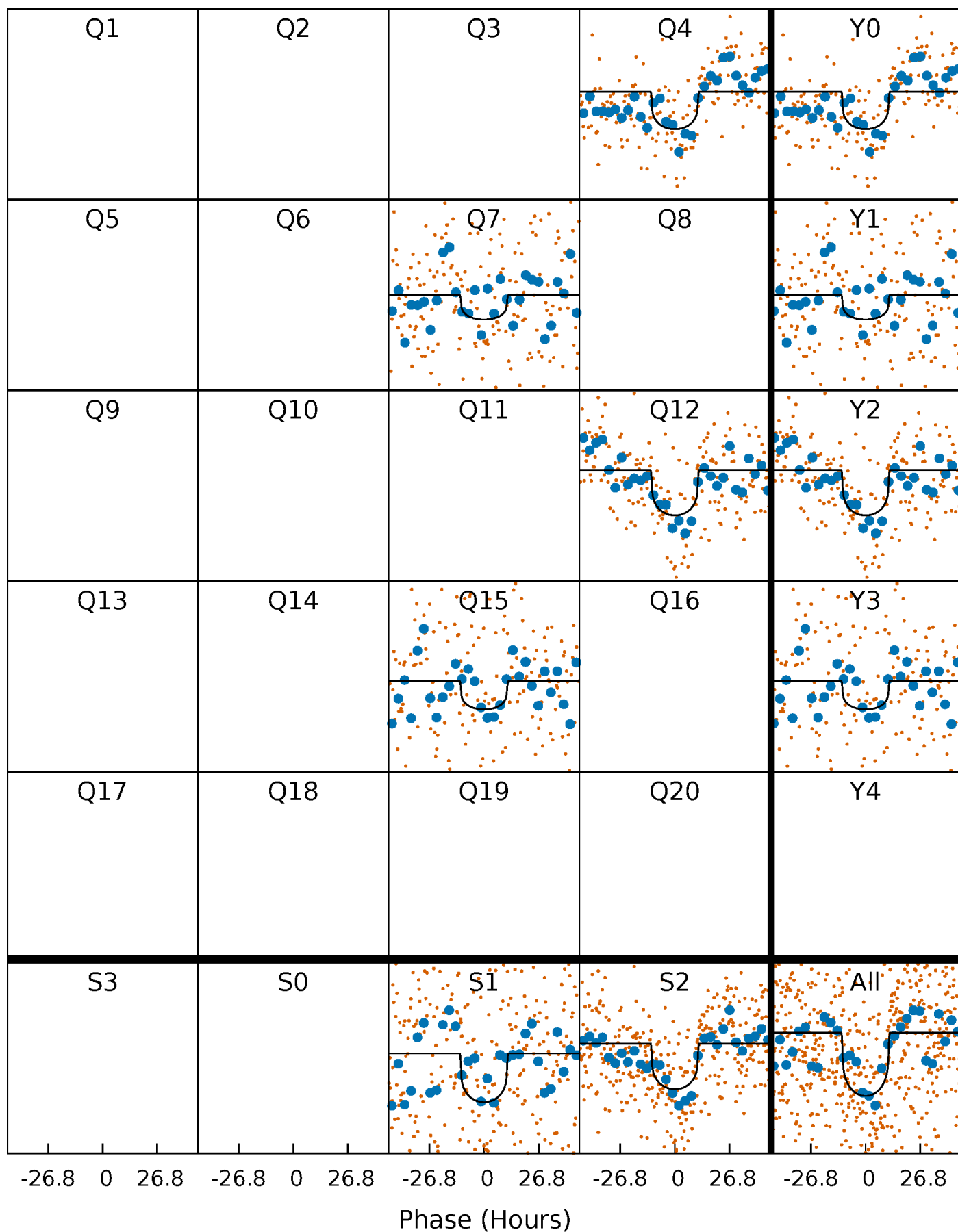
TCE 004931331-01 P=267.755883 Days  $T_0=372.945233$  (BKJD)





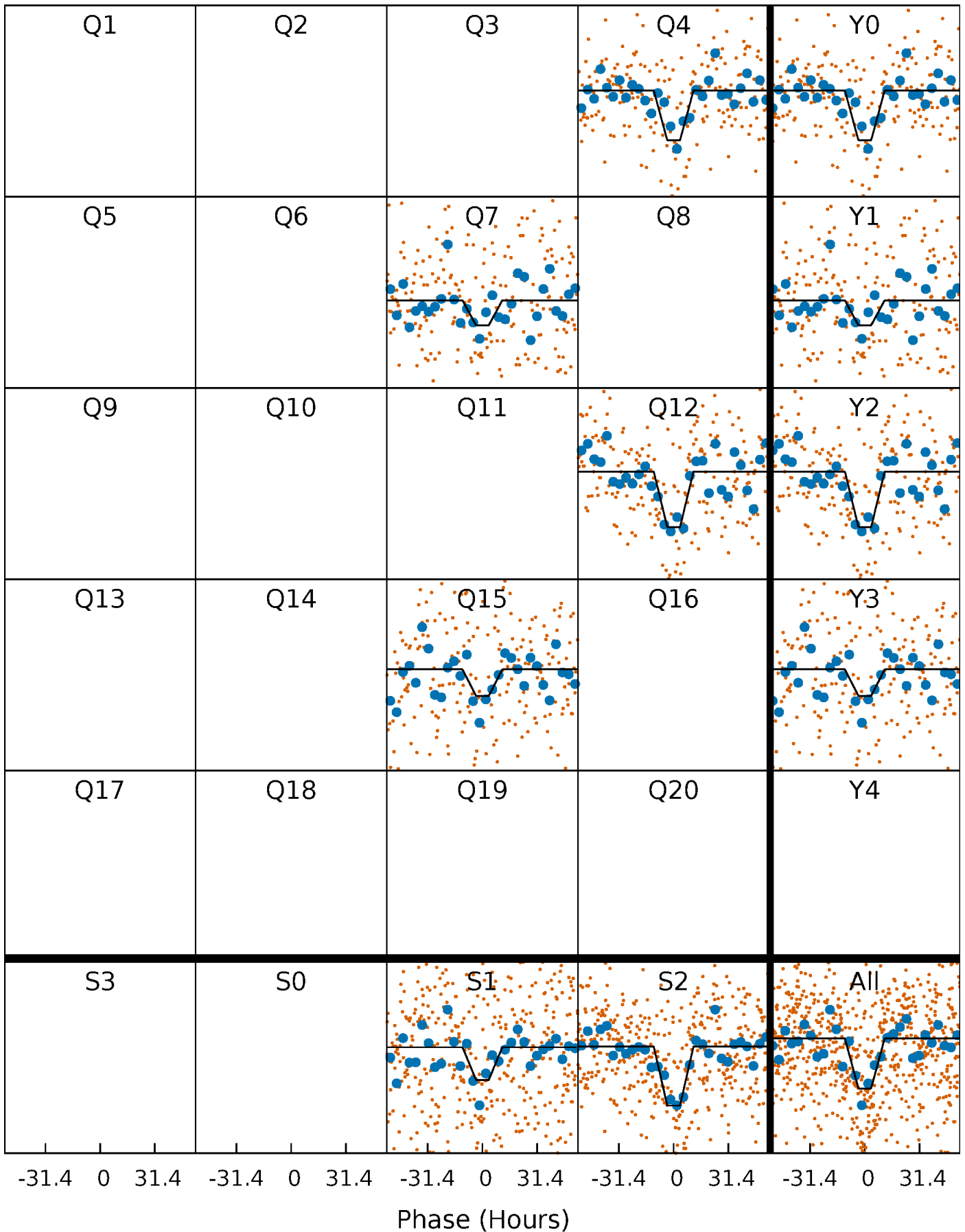
# DV Quarter-Phased Transit Curves

TCE 004931331-01 P=267.755883 Days  $T_0=372.945233$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

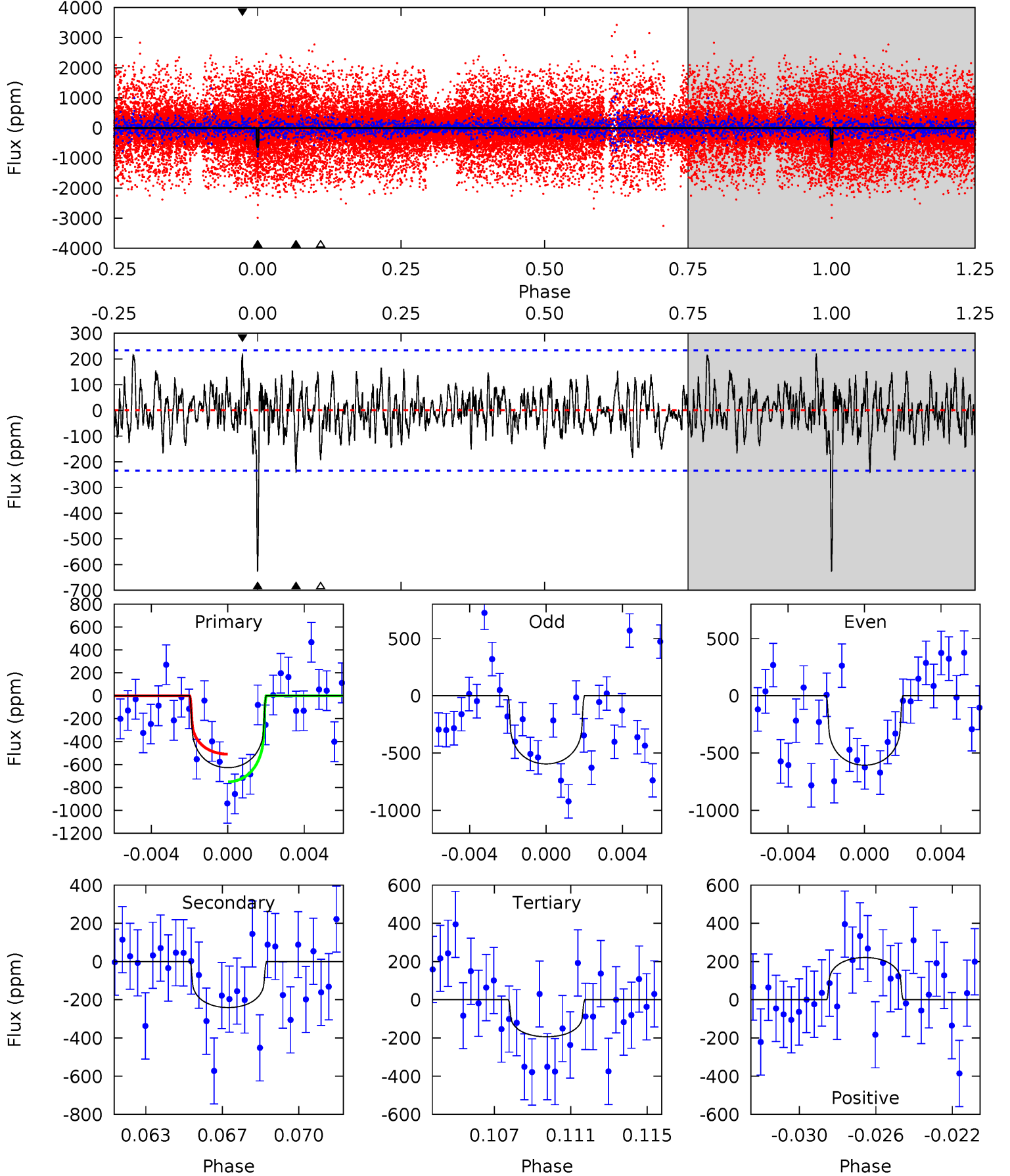
TCE 004931331-01 P=267.761370 Days  $T_0=373.030187$  (BKJD)



# DV Model-Shift Uniqueness Test

004931331-01, P = 267.755883 Days, E = 105.189350 Days

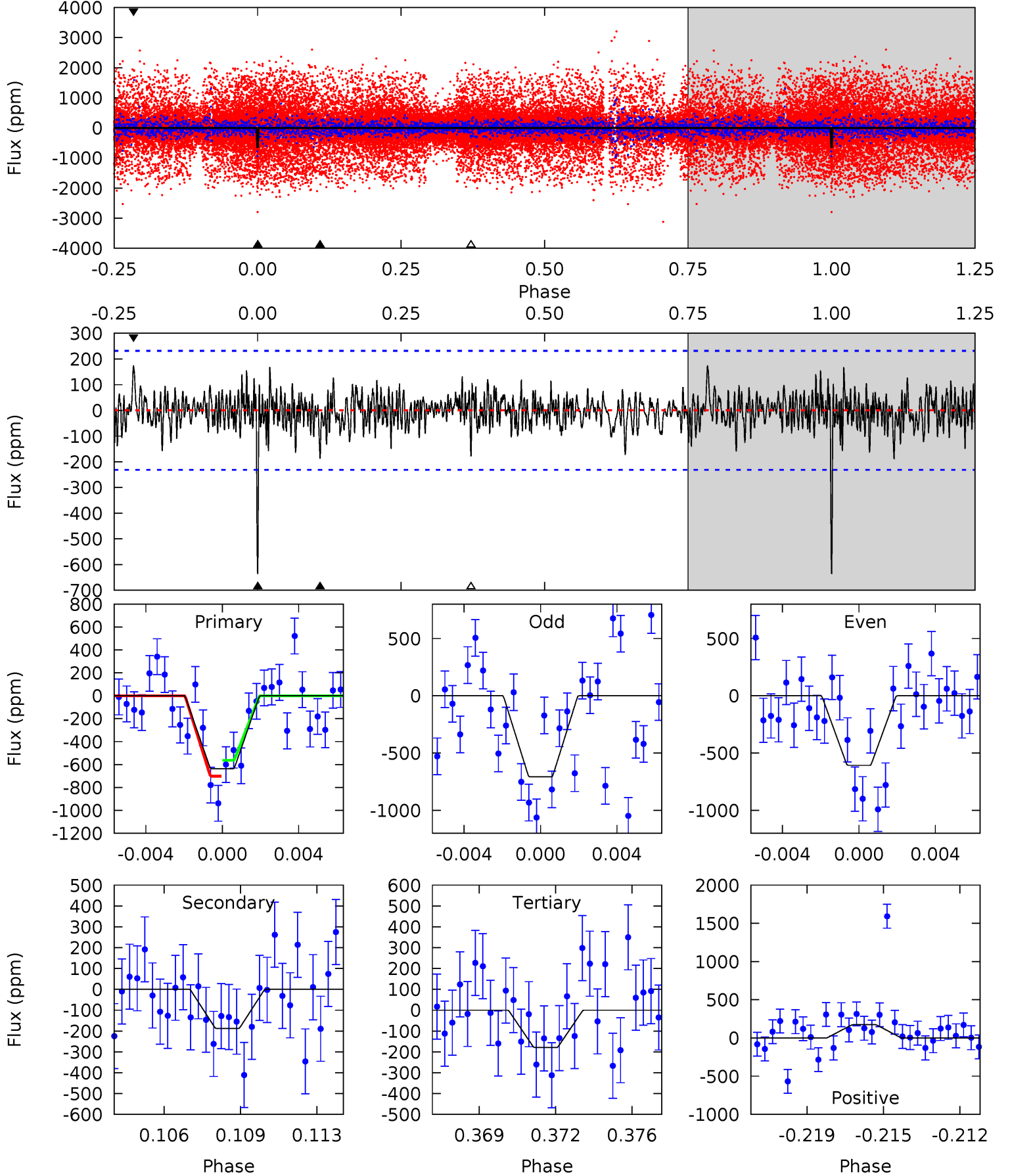
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	5.36	4.31	4.92	5.21	2.90	1.42	9.66	9.05	1.05	0.44	0.12	0.97	0.26	2.74



# Alt Model-Shift Uniqueness Test

004931331-01, P = 267.761370 Days, E = 105.268817 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
14.3	4.24	4.04	3.93	5.22	2.91	1.12	10.3	10.4	0.20	0.31	1.09	1.07	0.21	1.58



### Stellar Parameters For KIC 004931331

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5295^{+185}_{-185}$	$4.530^{+0.104}_{-0.085}$	$-0.460^{+0.300}_{-0.300}$	$0.756^{+0.098}_{-0.098}$	$0.707^{+0.103}_{-0.044}$	$2.299^{+1.009}_{-0.590}$
	+3%/-3%	+2%/-2%	+65%/-65%	+13%/-13%	+15%/-6%	+44%/-26%
Source	KIC0	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 004931331-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-241 \pm 45$	$1.96^{+1.24}_{-1.01}$	$333^{+15}_{-17}$	$4423^{+1676}_{-723}$	$17664^{+62293}_{-10927}$
Alt.	$-188 \pm 44$	$2.10^{+1.12}_{-1.05}$	$334^{+15}_{-18}$	$4143^{+1274}_{-586}$	$12204^{+39321}_{-7007}$

$T_{\text{max}}$  = 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

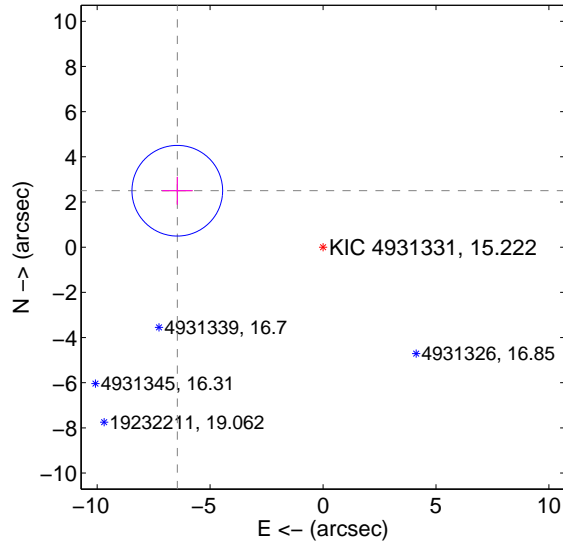
Supplemental centroid analysis for 004931331-01. Kepler magnitude: 15.22. Transit SNR 9.14

There are 0 quarters with good PRF difference image offsets

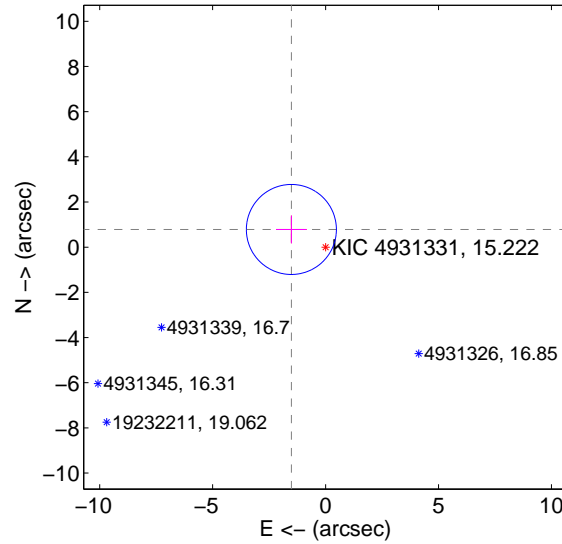
The OOT PRF centroid is offset from the target star catalog position by about 5.23 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.919 \pm 0.669$	10.34	$6.452 \pm 0.677$	$2.499 \pm 0.616$
PRF-fit source offset from KIC position	$1.705 \pm 0.664$	2.57	$1.514 \pm 0.677$	$0.784 \pm 0.616$
photometric centroid source offset	$4.69 \pm 0.10$	44.73	$-3.92 \pm 0.11$	$-2.58 \pm 0.10$

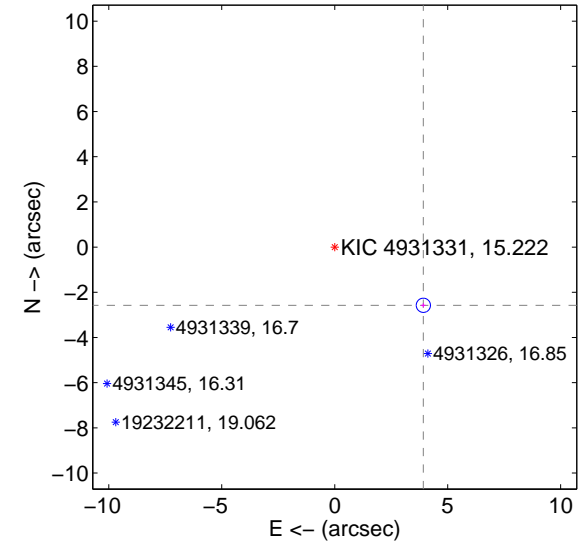
offset from difference PRF-fit to OOT PRF-fit



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

Q5 no difference image



Q5 no OOT image



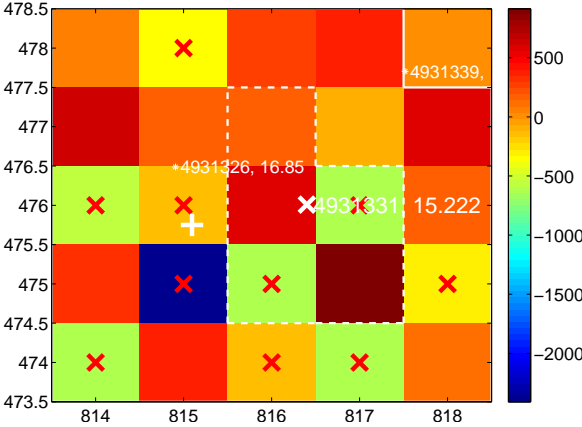
Q6 no difference image



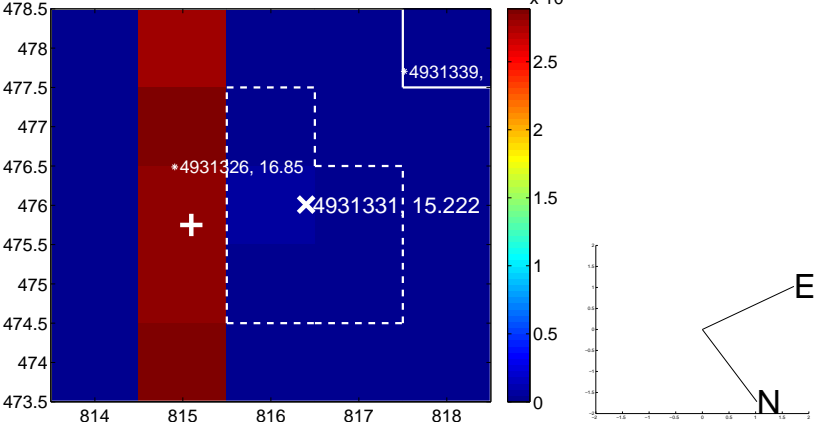
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 OOT image



Q8 no difference image



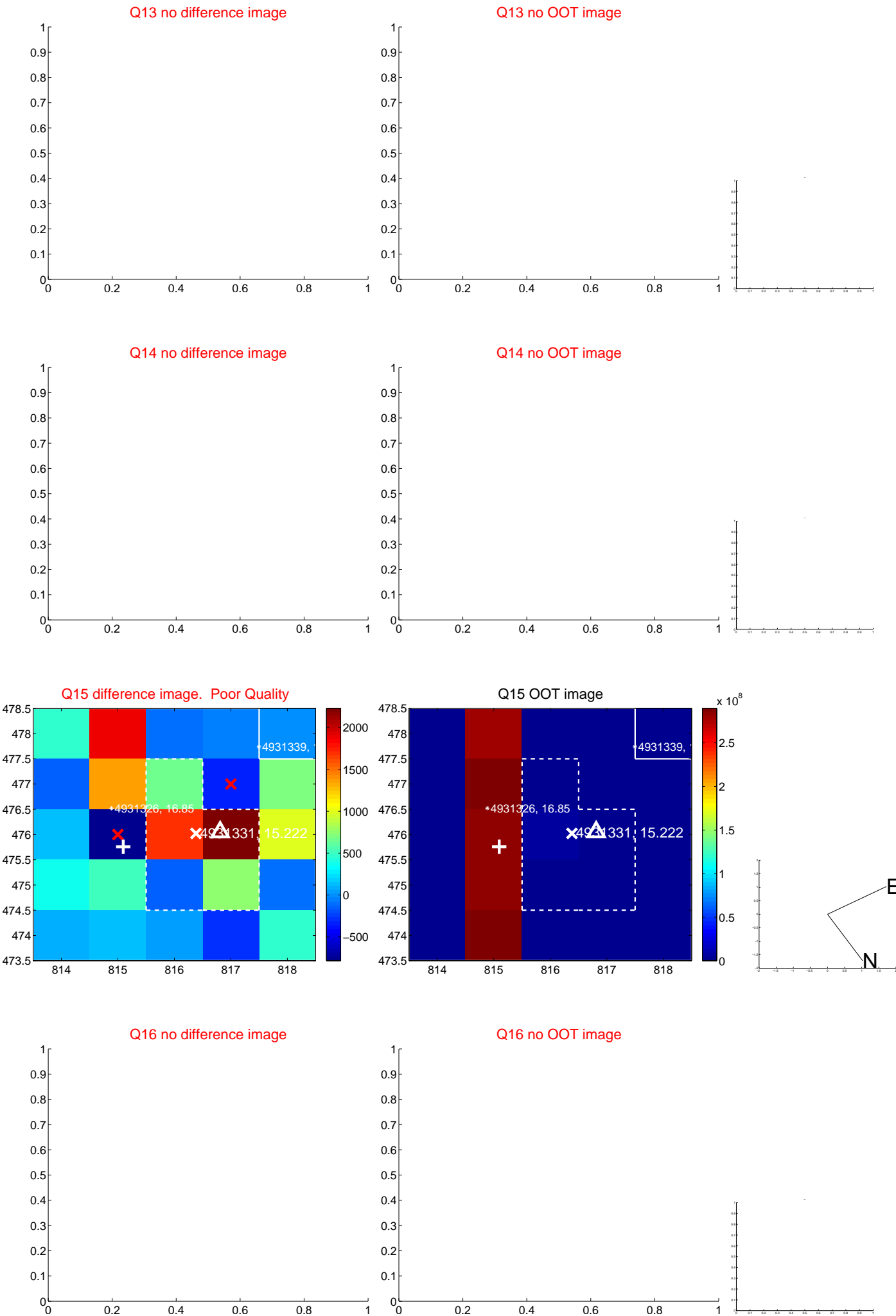
Q8 no OOT image



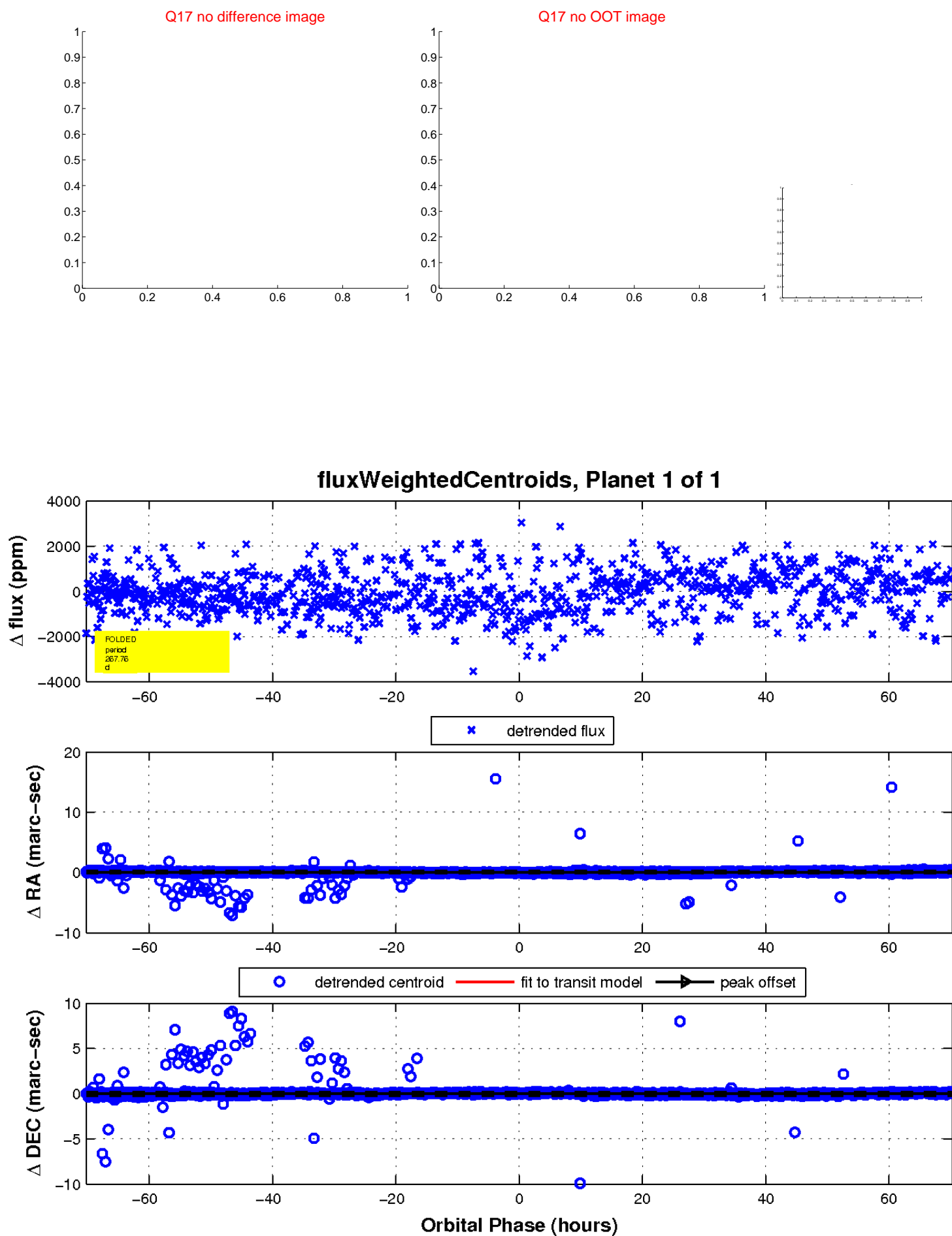
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

