

# KIC 010003599

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010003599-01	OBS	No	602.786975	328.017444	596.8	6.554	8.2	7.4	0.65	4576	1.71	0.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010003599-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

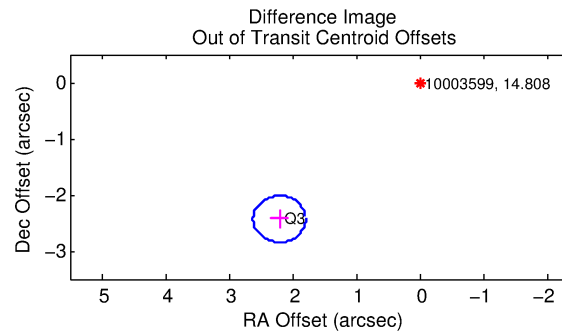
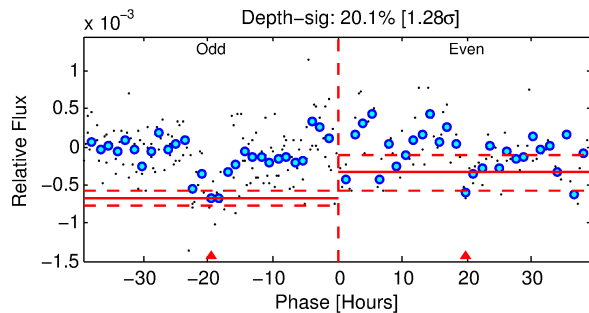
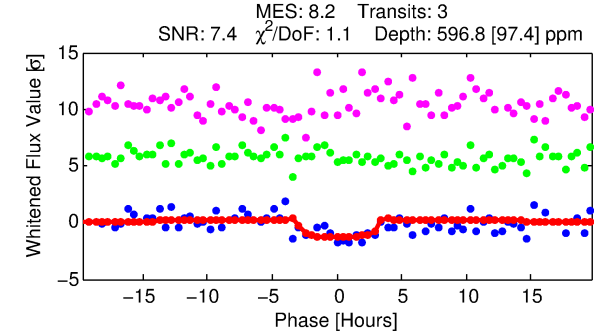
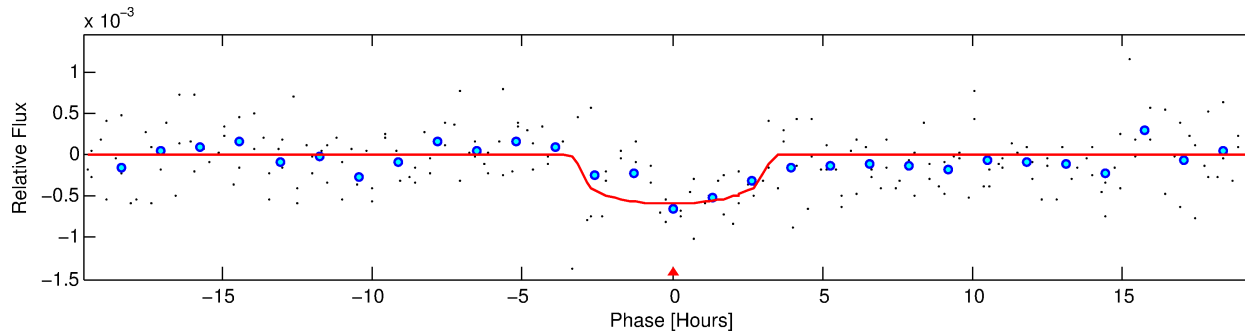
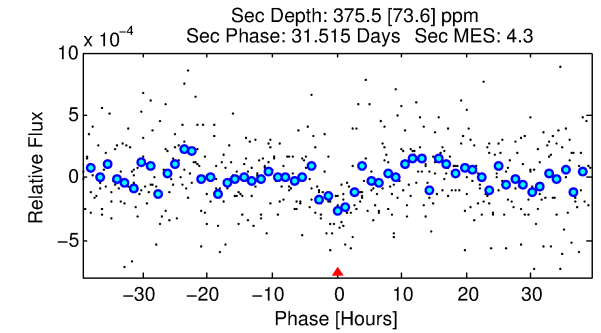
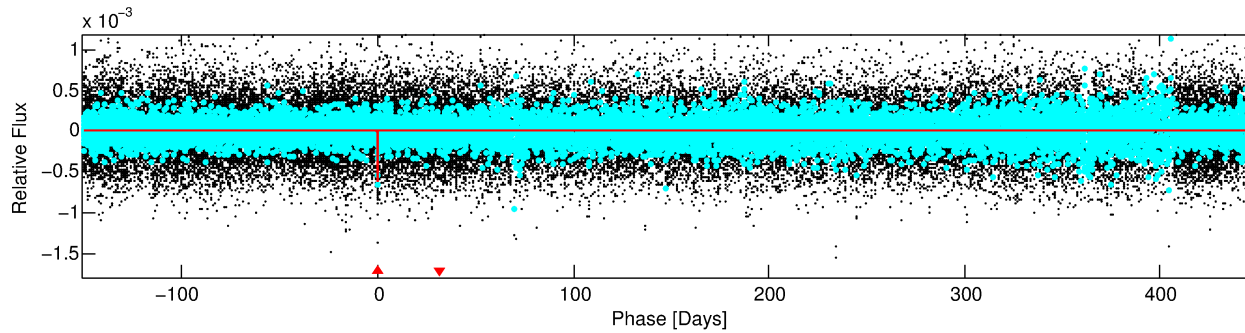
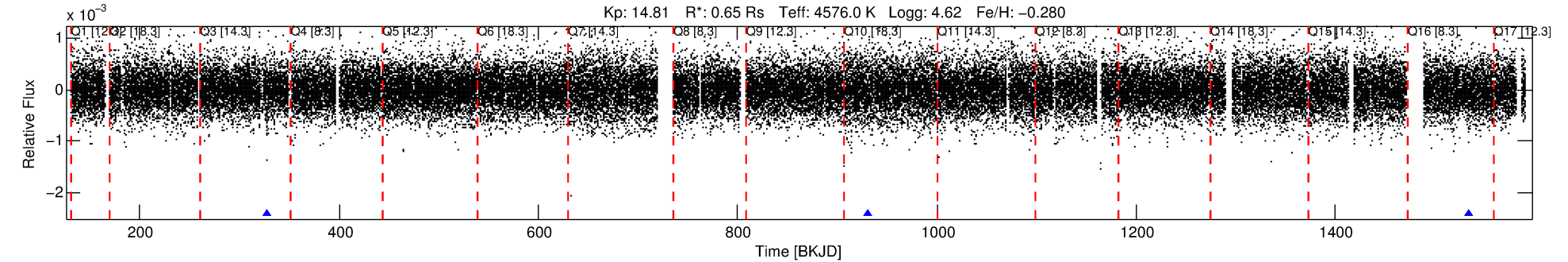
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010003599-01

No Significant Match Found

# DV One-Page Summary

KIC: 10003599 Candidate: 1 of 1 Period: 602.787 d



## DV Fit Results:

Period = 602.78698 [0.00978] d  
Epoch = 328.0174 [0.0123] BKJD  
Rp/R\* = 0.0240 [0.0244]  
a/R\* = 516.33 [1710.30]  
b = 0.71 [2.33]  
Seff = 0.12 [0.02]  
Teq = 149 [6] K  
Rp = 1.71 [1.74] Re  
a = 1.2053 [0.0861] AU  
Ag = 102486.27 [209440.37] [0.49σ]  
Teffp = 4111 [2101] K [1.89σ]

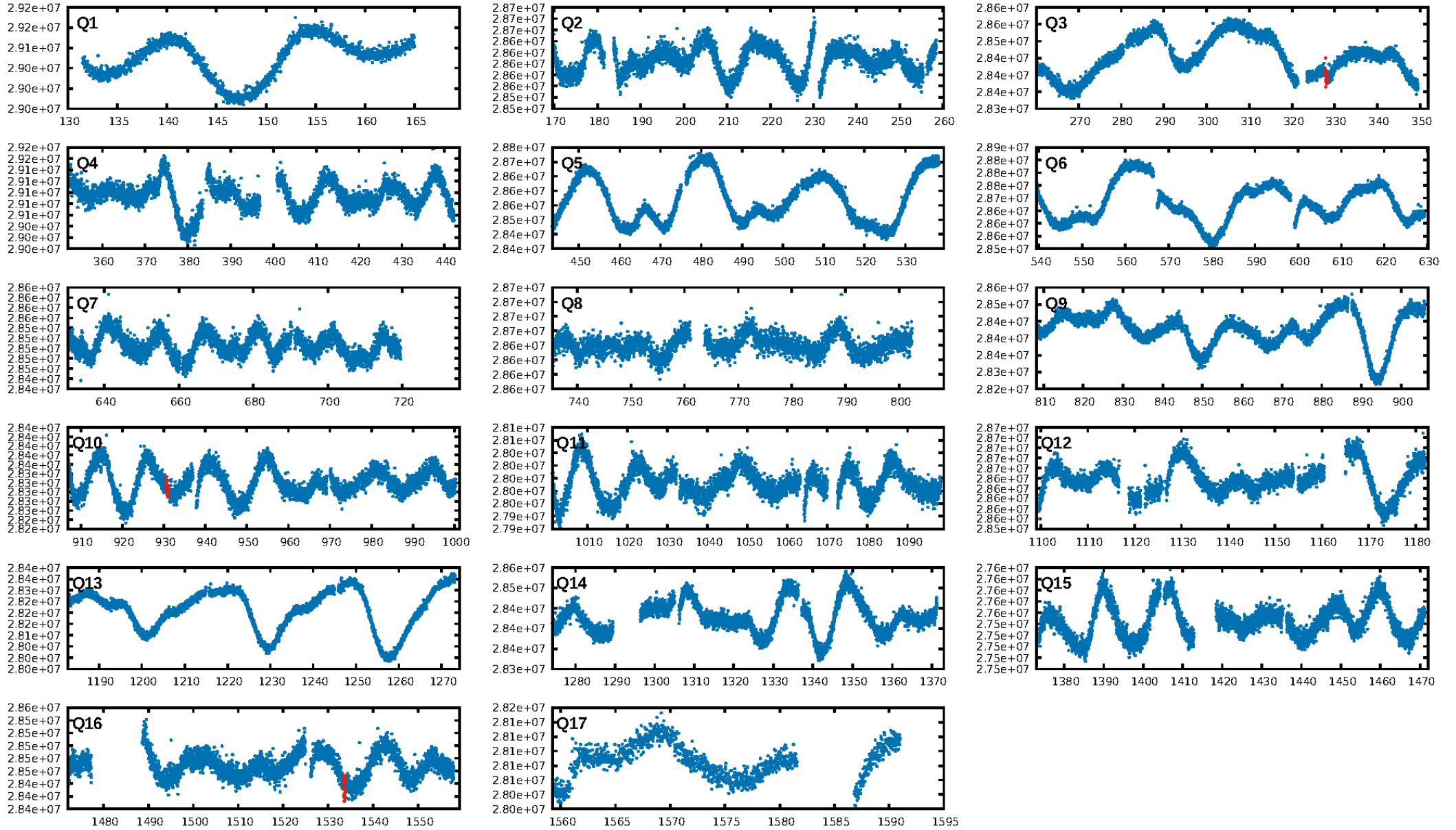
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 17.5%  
ModelChiSquareGof-sig: 98.5%  
**Bootstrap-pfa: 3.19e-11**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.4939**  
Centroid-sig: 0.1%  
Centroid-so: 3.159 arcsec [2.12σ]  
**OotOffset-rm: 3.283 arcsec [23.78σ]**  
**KicOffset-rm: 3.273 arcsec [23.57σ]**  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

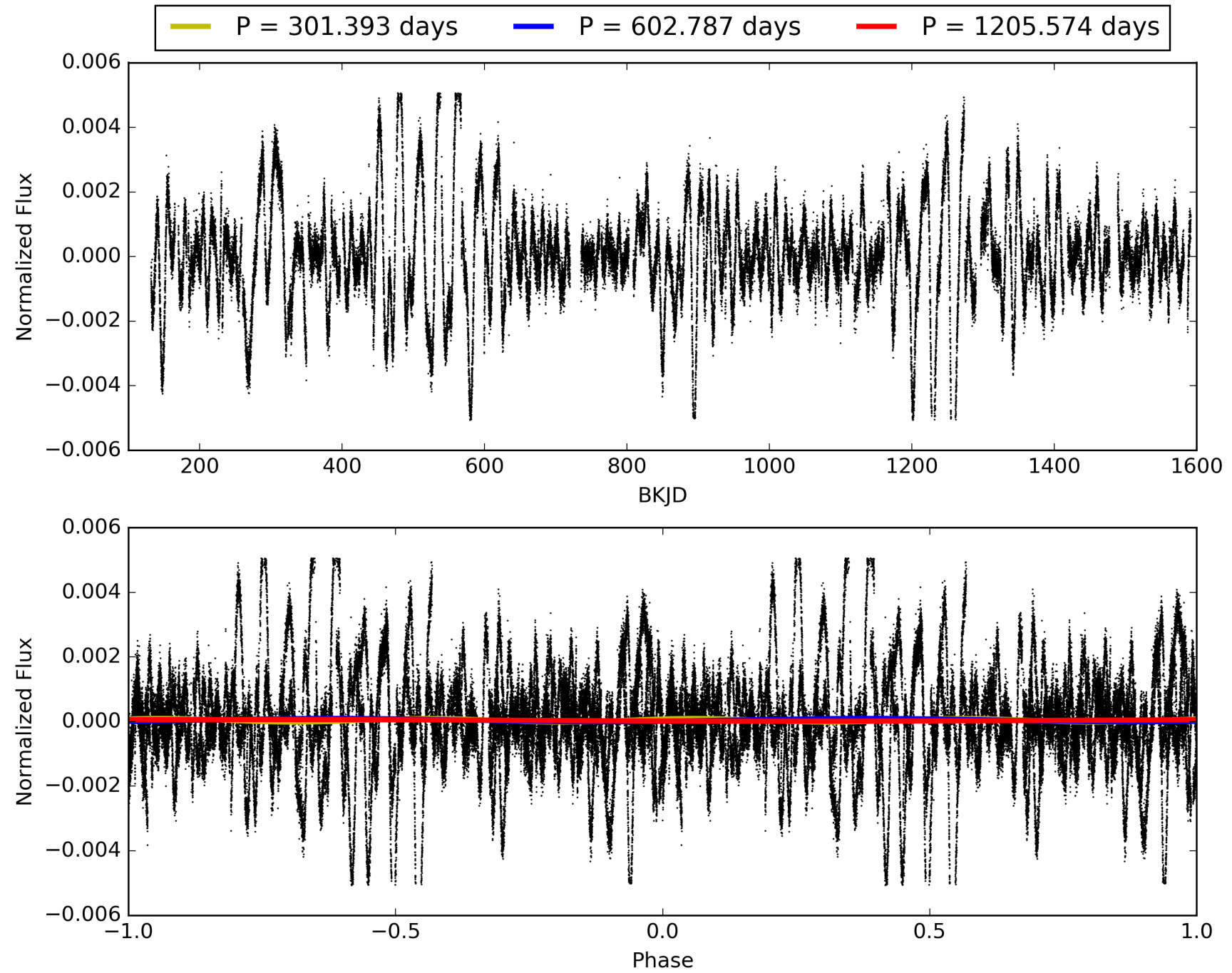
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:11:41 Z

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

# TCE 010003599-01, PDC Light Curves

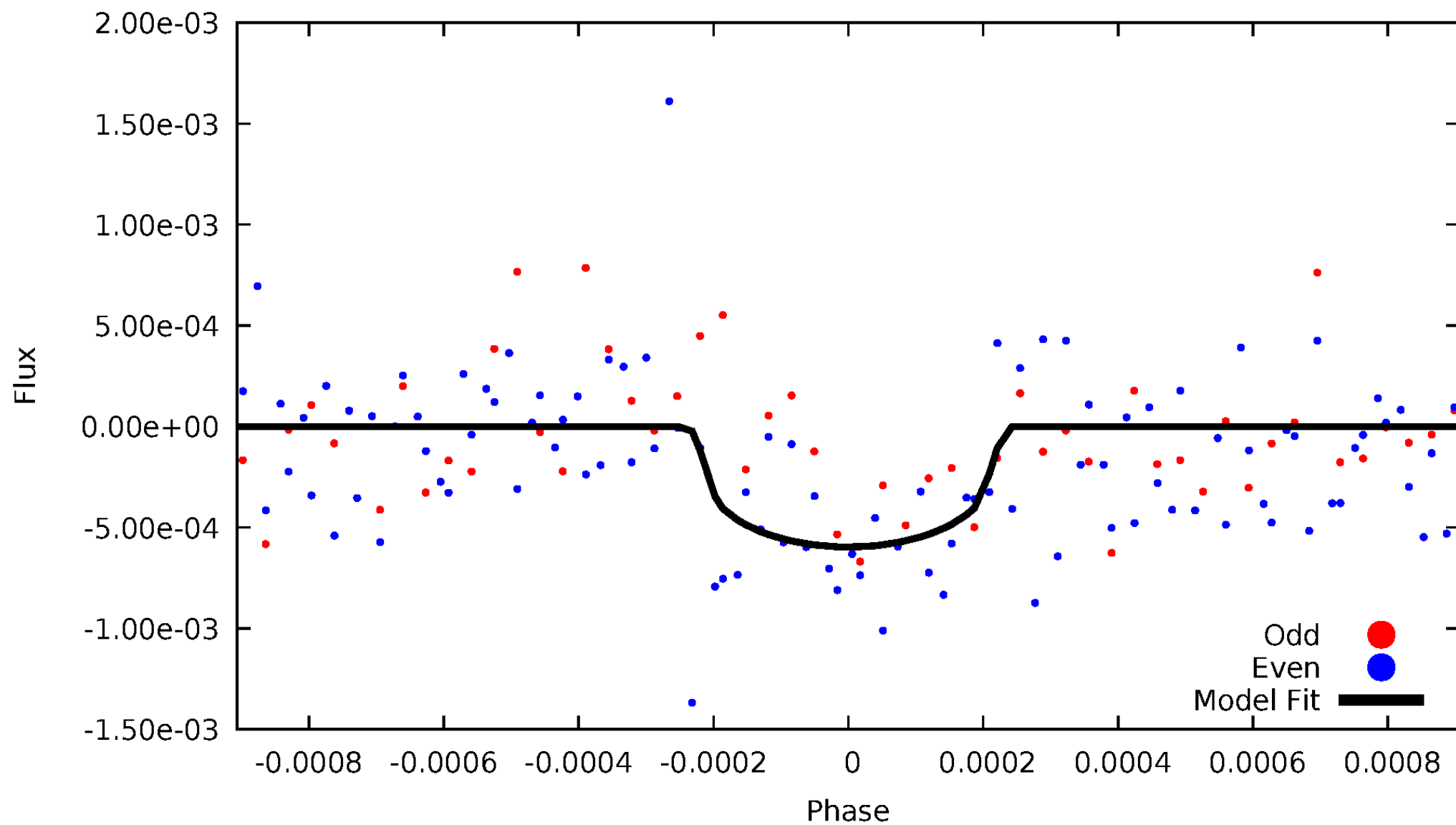


TCE 010003599-01



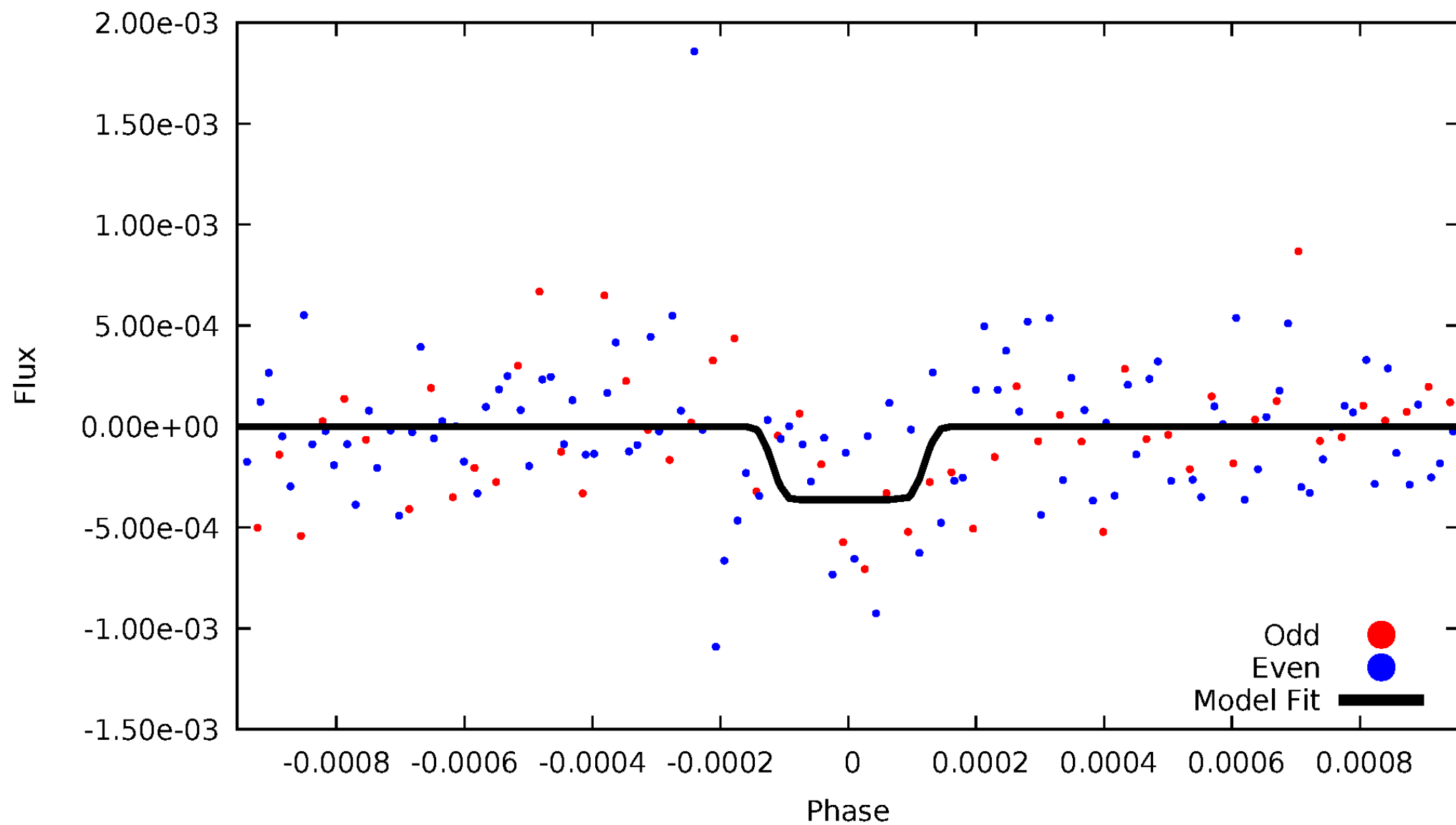
# DV Odd/Even

TCE 010003599-01



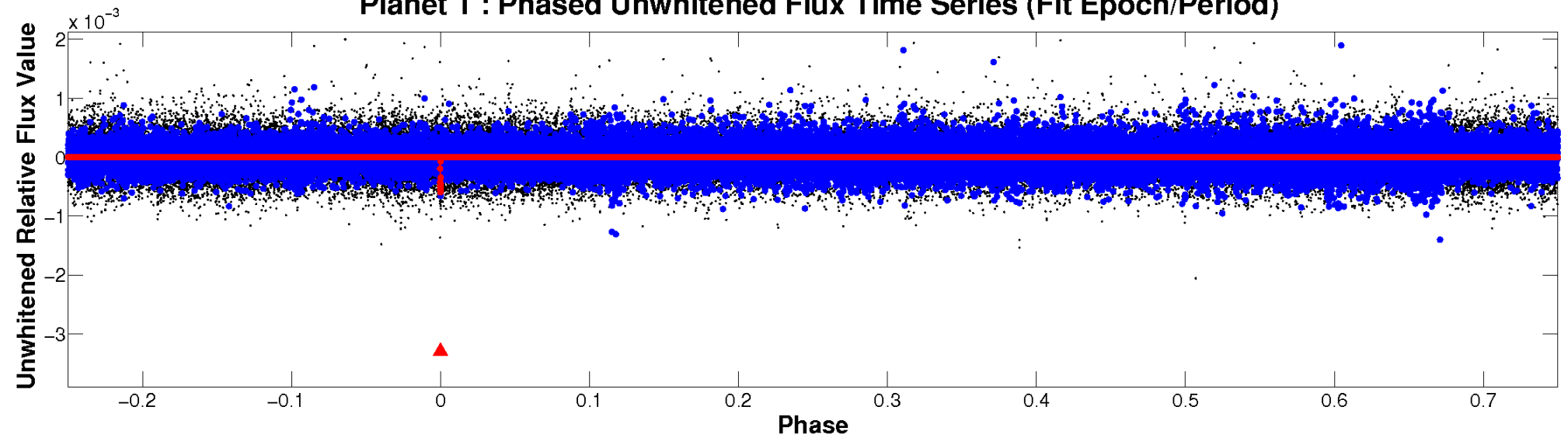
# ALT Odd/Even

TCE 010003599-01

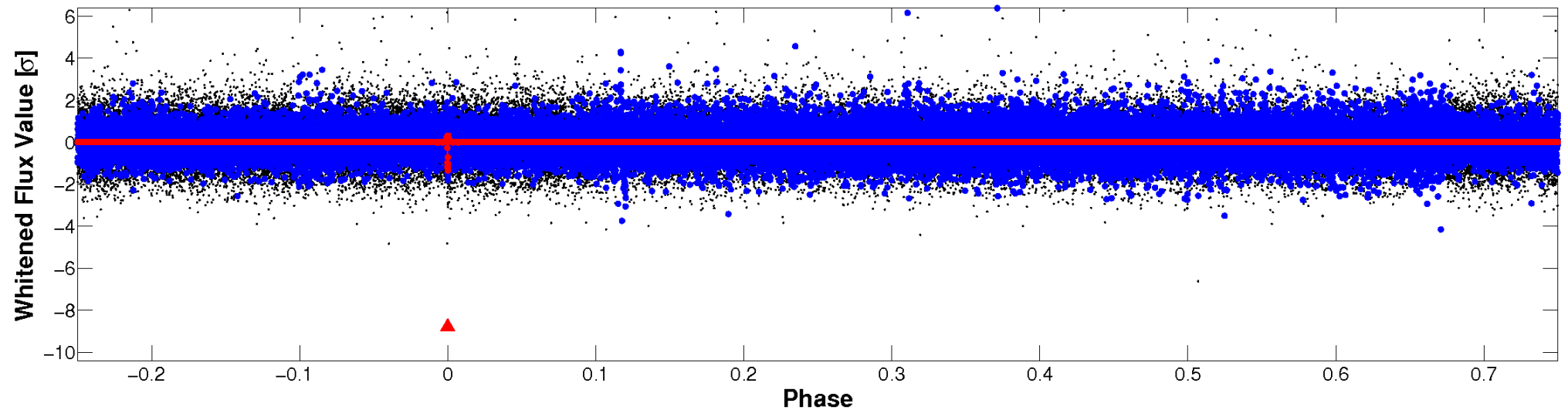


# Non-Whitened Vs. Whitened Light Curve

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

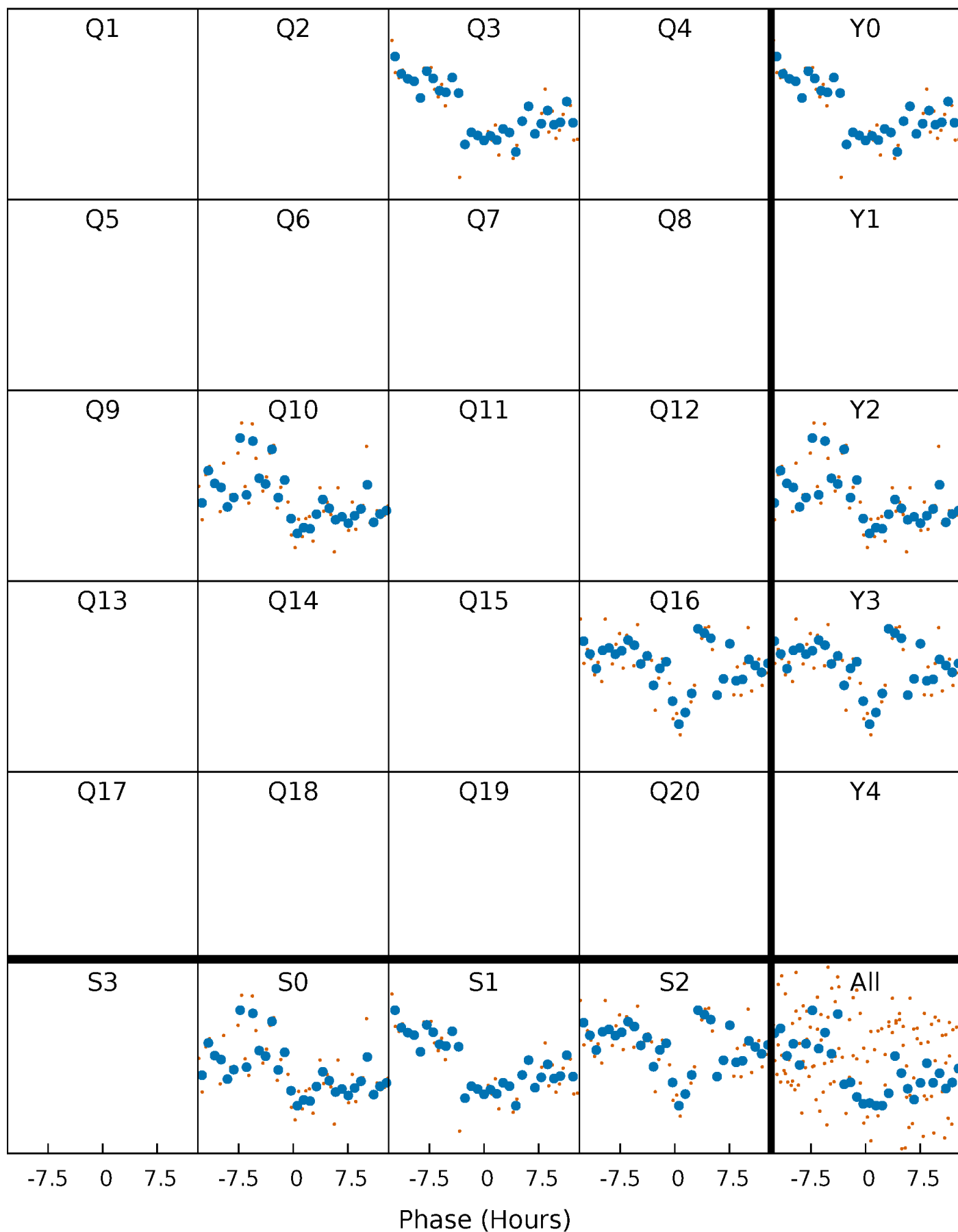


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

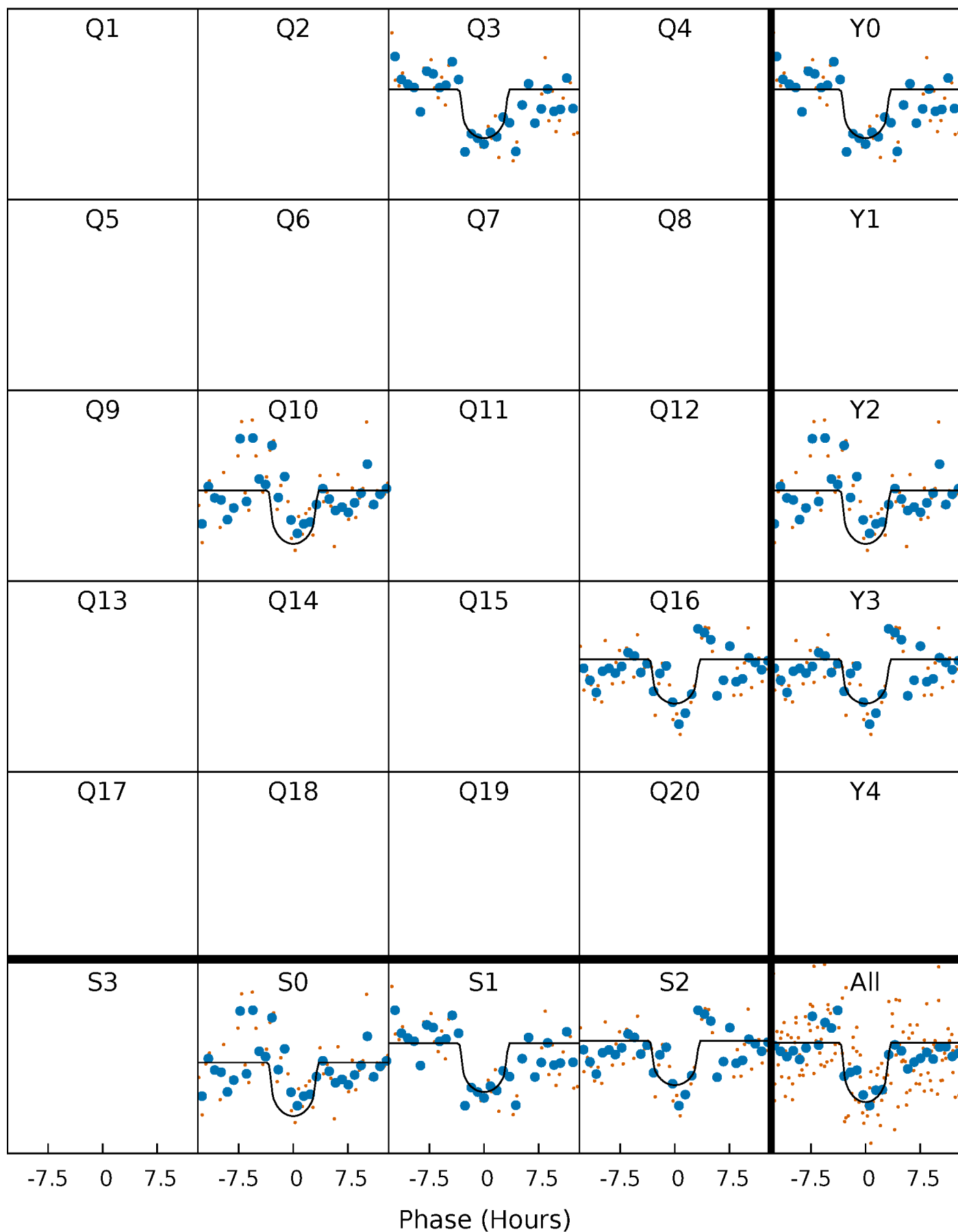
TCE 010003599-01 P=602.786975 Days  $T_0=328.017444$  (BKJD)





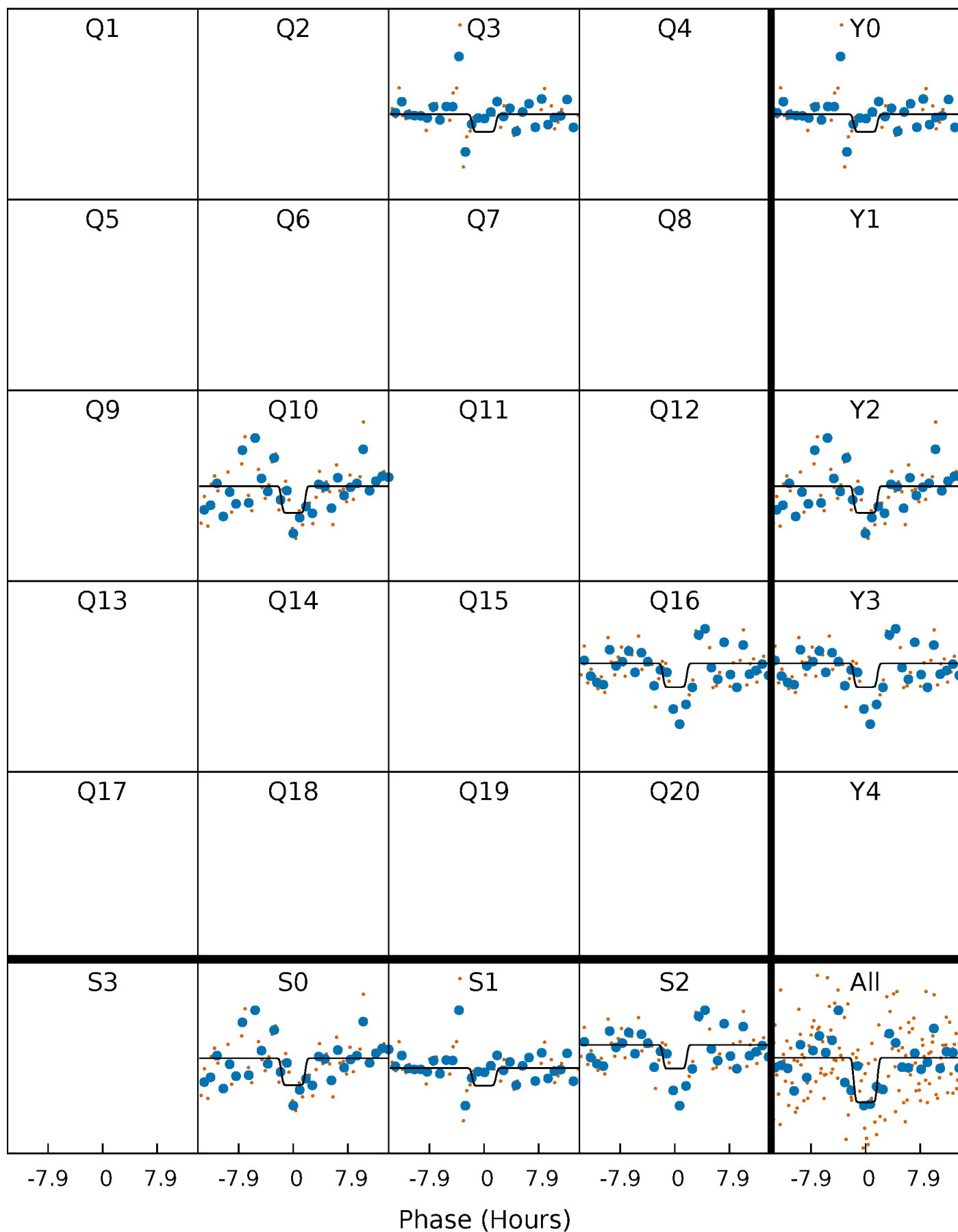
# DV Quarter-Phased Transit Curves

TCE 010003599-01 P=602.786975 Days  $T_0=328.017444$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

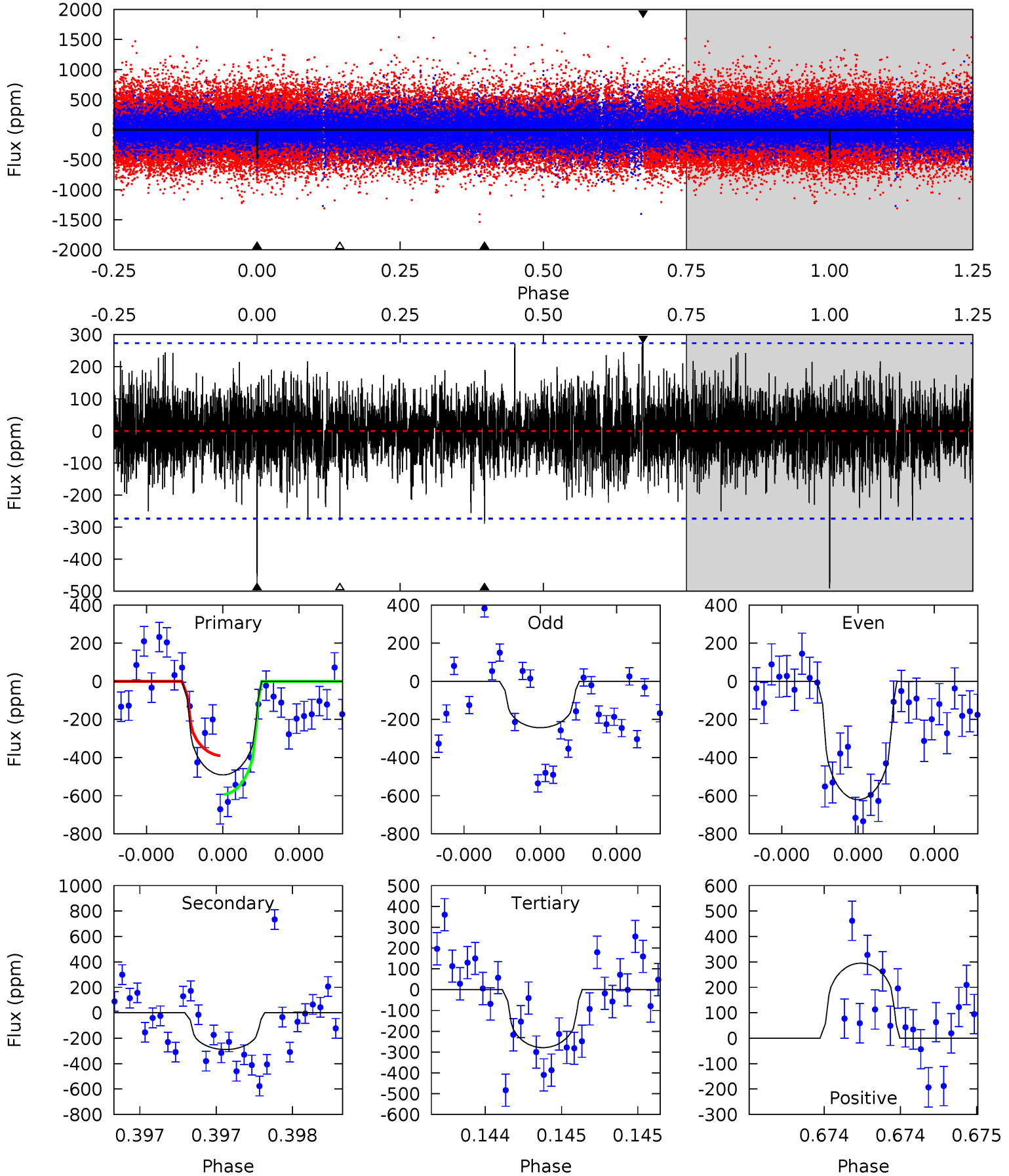
TCE 010003599-01 P=602.796831 Days  $T_0=328.002678$  (BKJD)



# DV Model-Shift Uniqueness Test

010003599-01, P = 602.786975 Days, E = 328.017444 Days

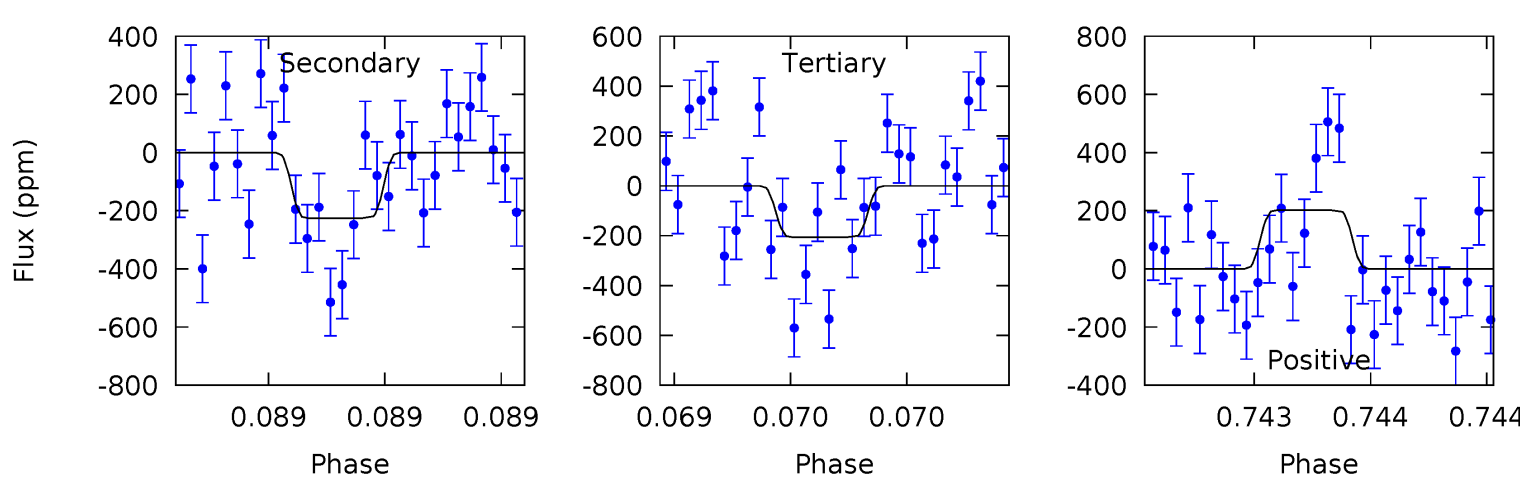
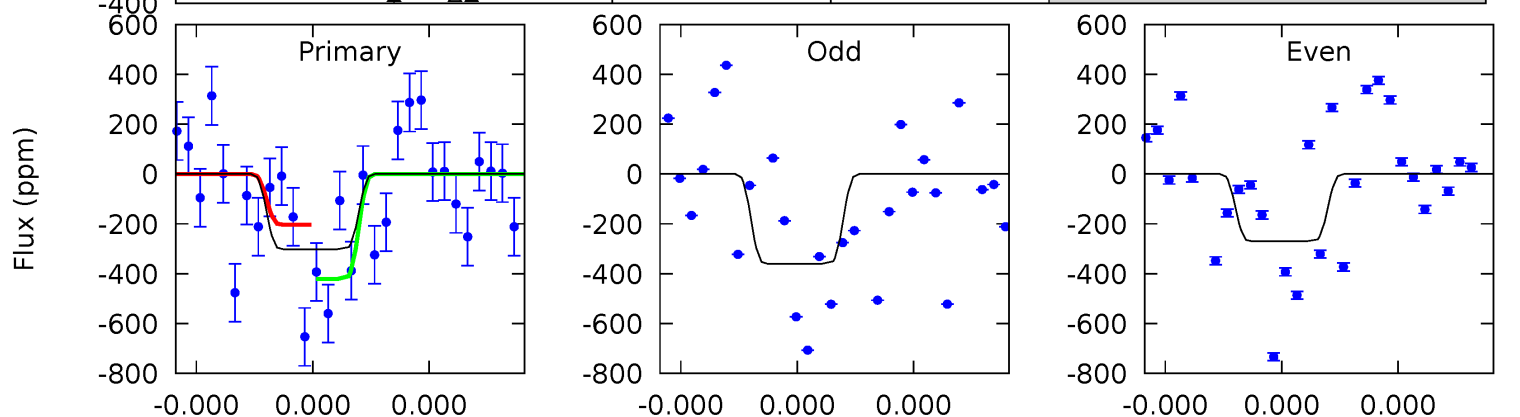
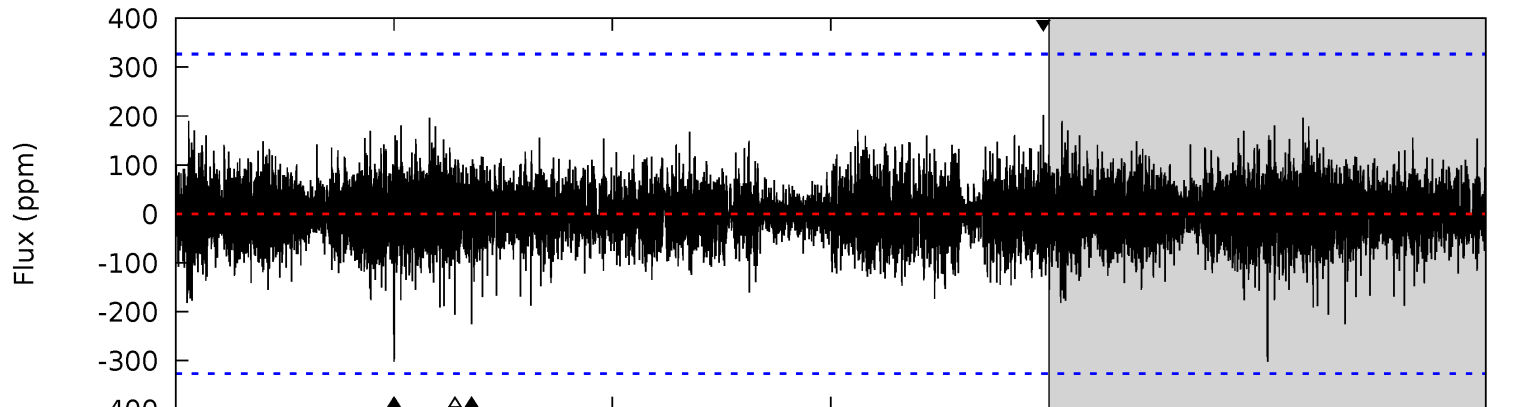
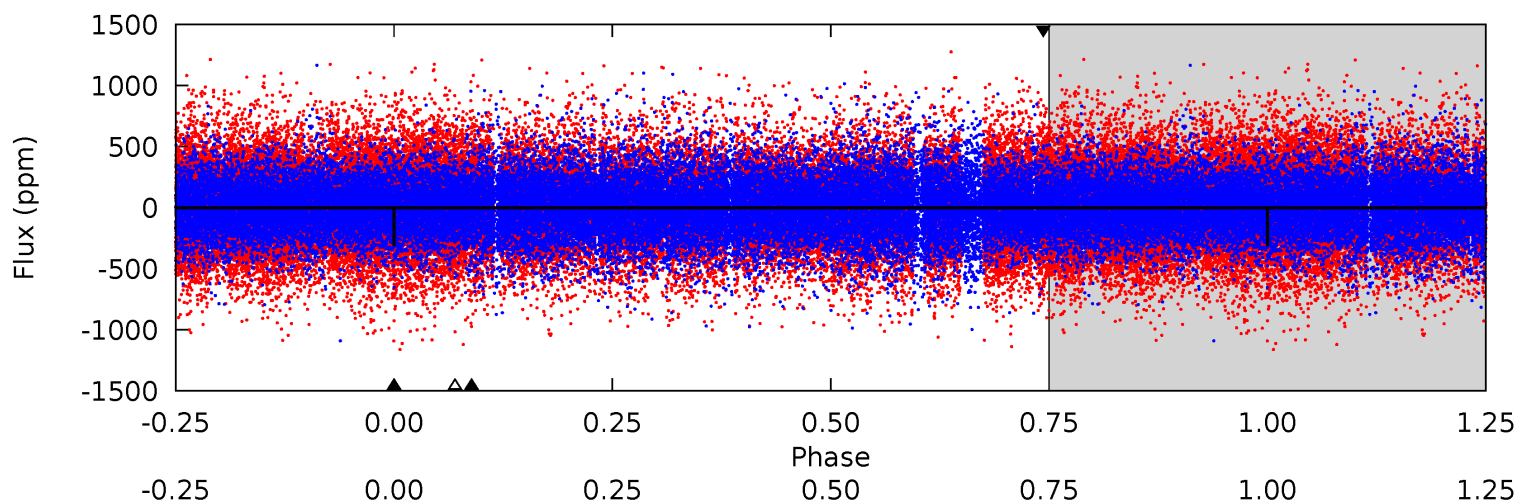
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	5.91	5.69	6.03	5.58	3.49	1.43	4.34	4.00	0.22	-0.12	3.64	0.85	0.38	2.08



# Alt Model-Shift Uniqueness Test

010003599-01, P = 602.796831 Days, E = 328.002678 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
5.23	3.90	3.57	3.49	5.66	3.61	0.78	1.66	1.73	0.33	0.41	0.72	0.87	0.40	1.89



### Stellar Parameters For KIC 010003599

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4576^{+123}_{-136}$	$4.616^{+0.052}_{-0.028}$	$-0.280^{+0.300}_{-0.300}$	$0.653^{+0.052}_{-0.058}$	$0.643^{+0.077}_{-0.045}$	$3.253^{+0.745}_{-0.417}$
	+3%/-3%	+1%/-1%	+107%/-107%	+8%/-9%	+12%/-7%	+23%/-13%
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 010003599-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-289 \pm 49$	$2.03^{+1.54}_{-1.28}$	$206^{+7}_{-7}$	$3772^{+1708}_{-612}$	$55520^{+348484}_{-37092}$
Alt.	$-225 \pm 58$	$1.79^{+1.56}_{-1.11}$	$207^{+7}_{-7}$	$3783^{+1698}_{-679}$	$55628^{+318996}_{-39744}$

$T_{max}$  = 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

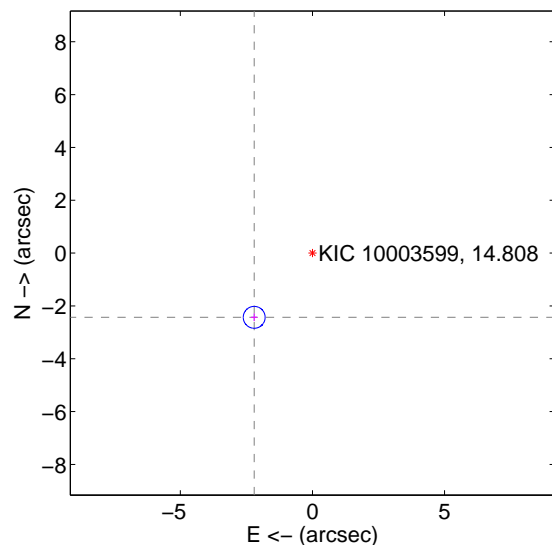
Supplemental centroid analysis for 010003599-01. Kepler magnitude: 14.81. Transit SNR 7.41

There are 1 quarters with good PRF difference image offsets

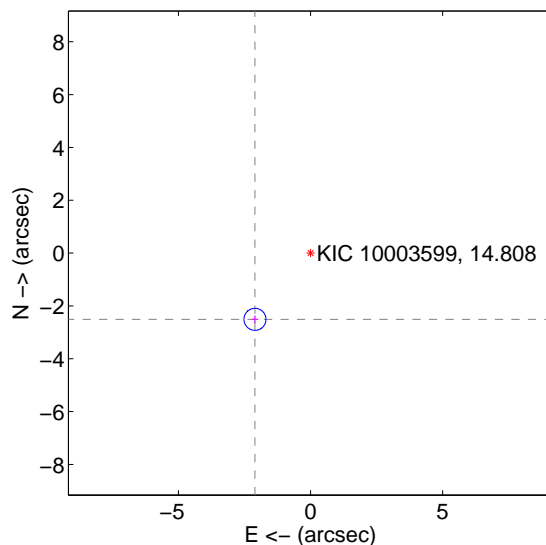
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.283 \pm 0.138$	23.78	$2.205 \pm 0.125$	$-2.432 \pm 0.148$
PRF-fit source offset from KIC position	$3.273 \pm 0.139$	23.57	$2.103 \pm 0.125$	$-2.508 \pm 0.148$
photometric centroid source offset	$3.16 \pm 1.49$	2.12	$1.33 \pm 1.45$	$-2.86 \pm 1.50$

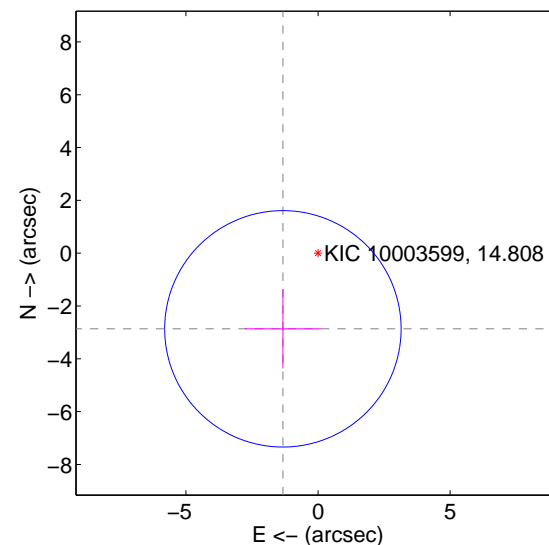
offset from difference PRF-fit to OOT PRF-fit



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

Q1 no difference image



Q1 no OOT image



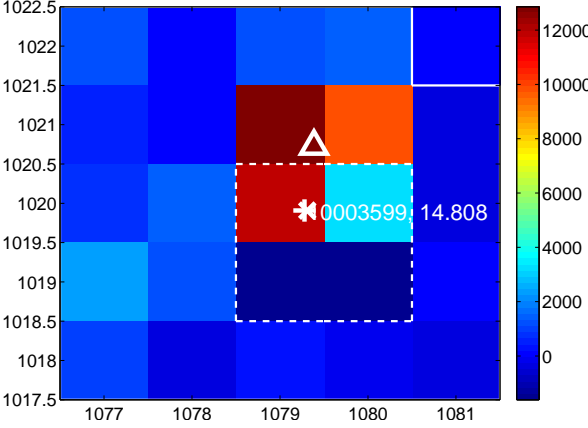
Q2 no difference image



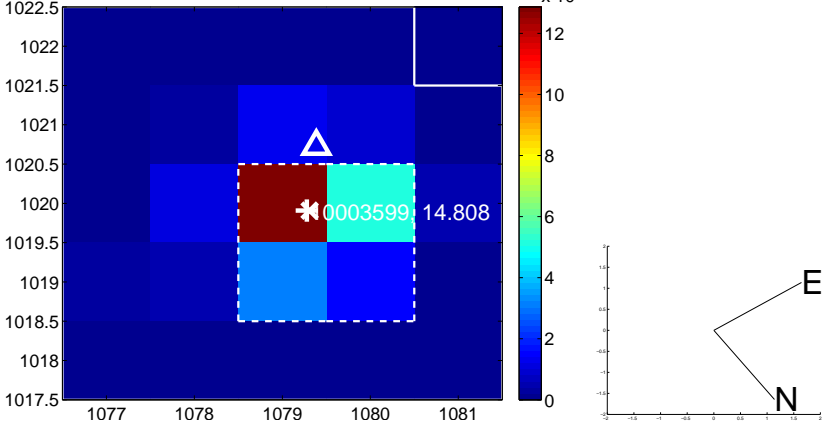
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 no OOT image



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.

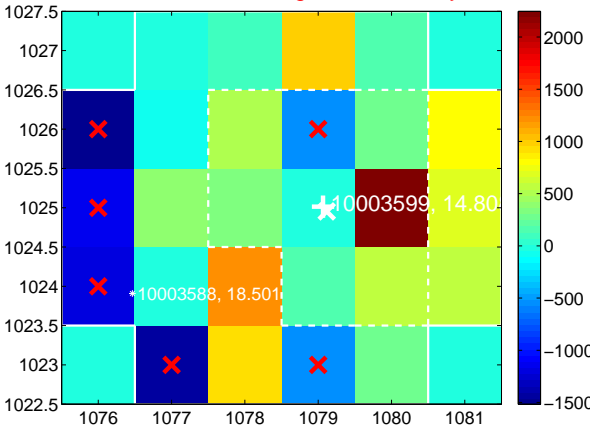
Q9 no difference image



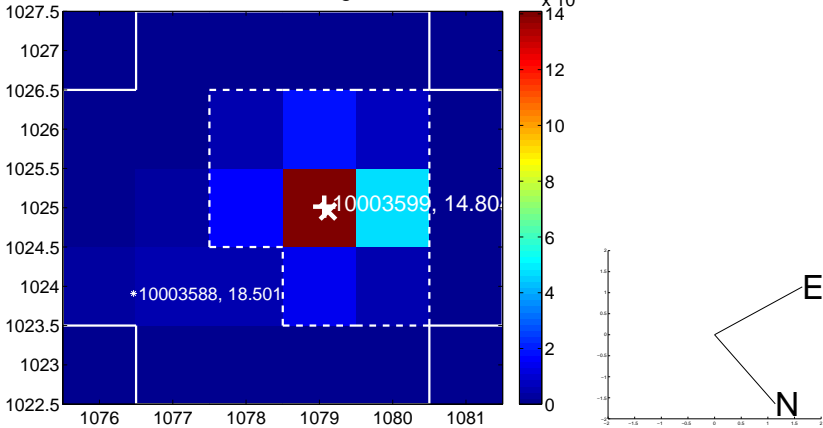
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



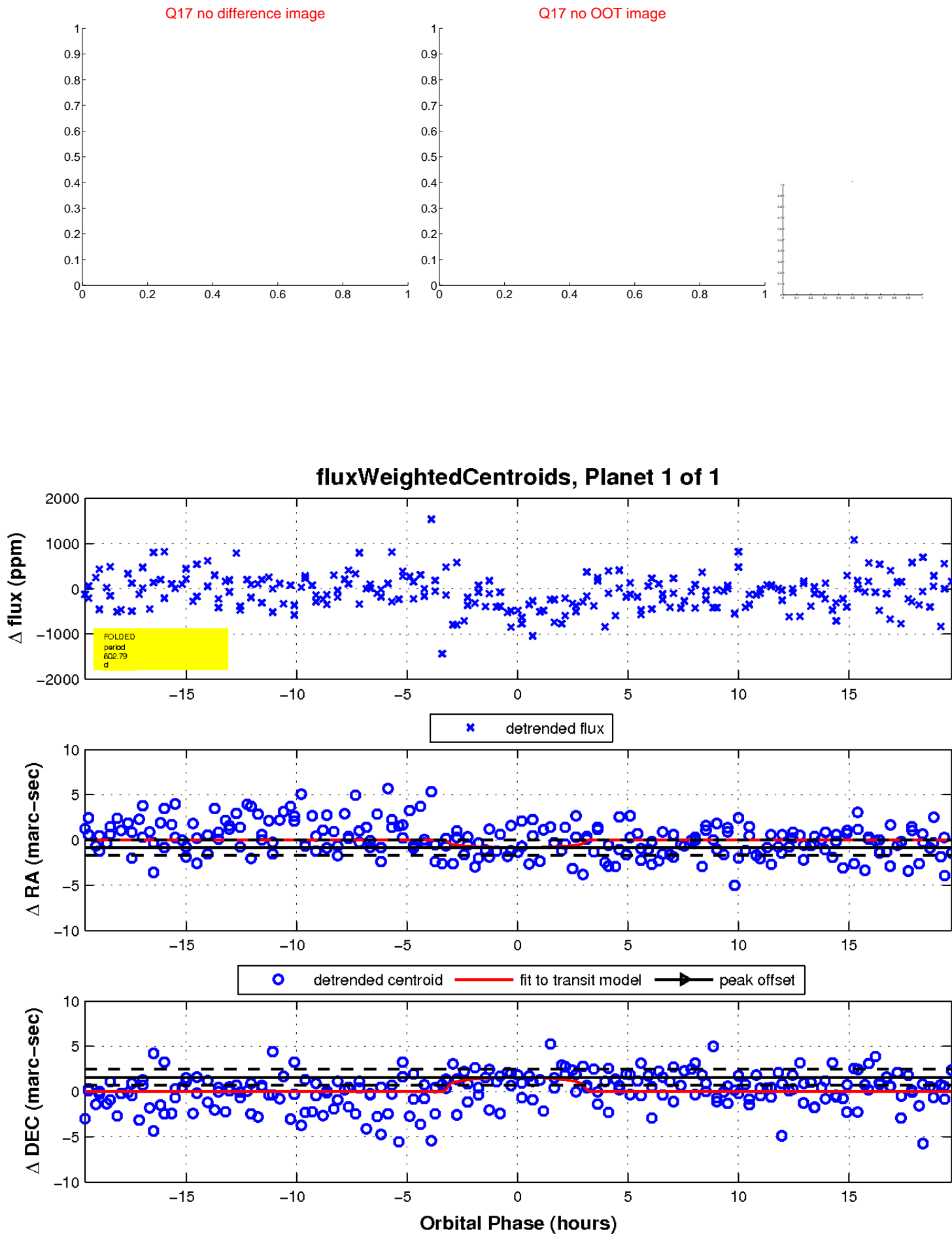
Q12 no OOT image



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.



UKIRT Image

Declination

