

# KIC 008870286

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008870286-01	OBS	No	360.135931	373.505502	1552.9	6.336	8.9	9.3	0.80	5441	6.05	0.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008870286-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

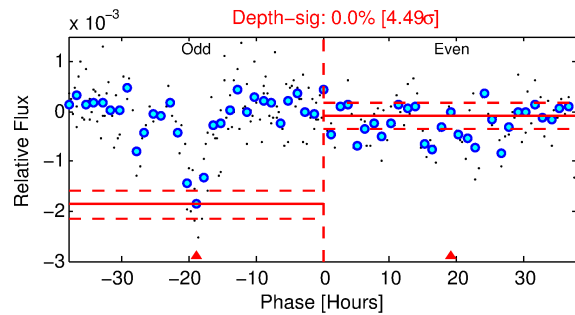
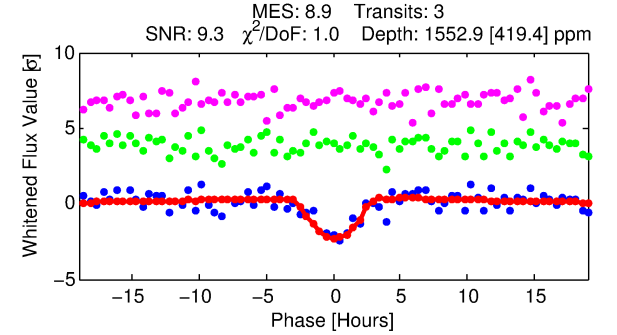
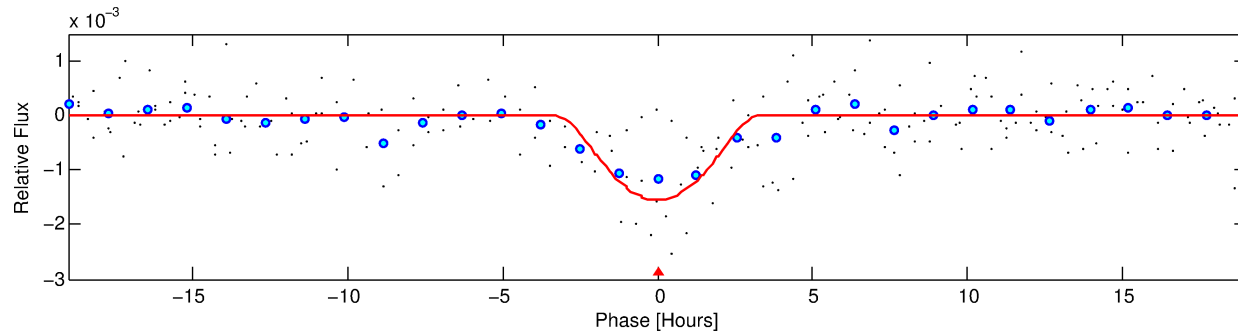
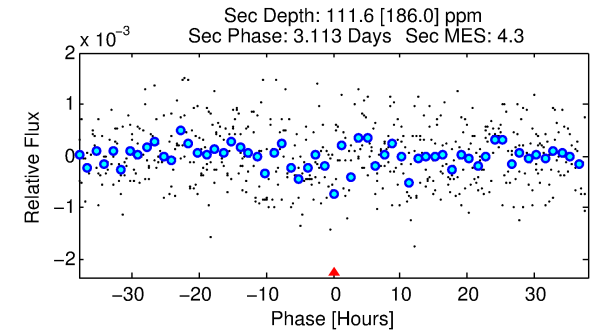
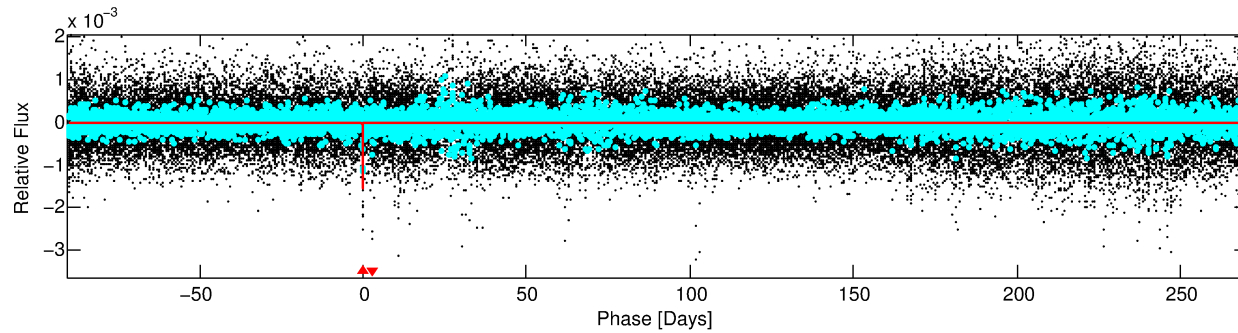
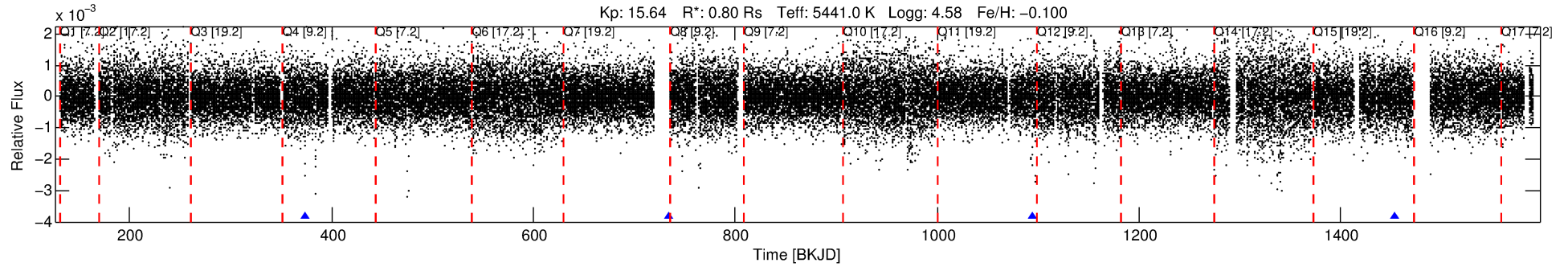
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008870286-01

No Significant Match Found

# DV One-Page Summary

KIC: 8870286 Candidate: 1 of 1 Period: 360.136 d



## DV Fit Results:

Period = 360.13593 [0.00696] d  
Epoch = 373.5055 [0.0122] BKJD  
Rp/R\* = 0.0694 [0.2904]  
a/R\* = 166.44 [157.81]  
b = 1.00 [0.43]  
Seff = 0.55 [0.15]  
Teq = 220 [15] K  
Rp = 6.05 [25.35] Re  
a = 0.9529 [0.1609] AU  
Ag = 1520.90 [12978.60] [0.12σ]  
Teffp = 2122 [4526] K [0.42σ]

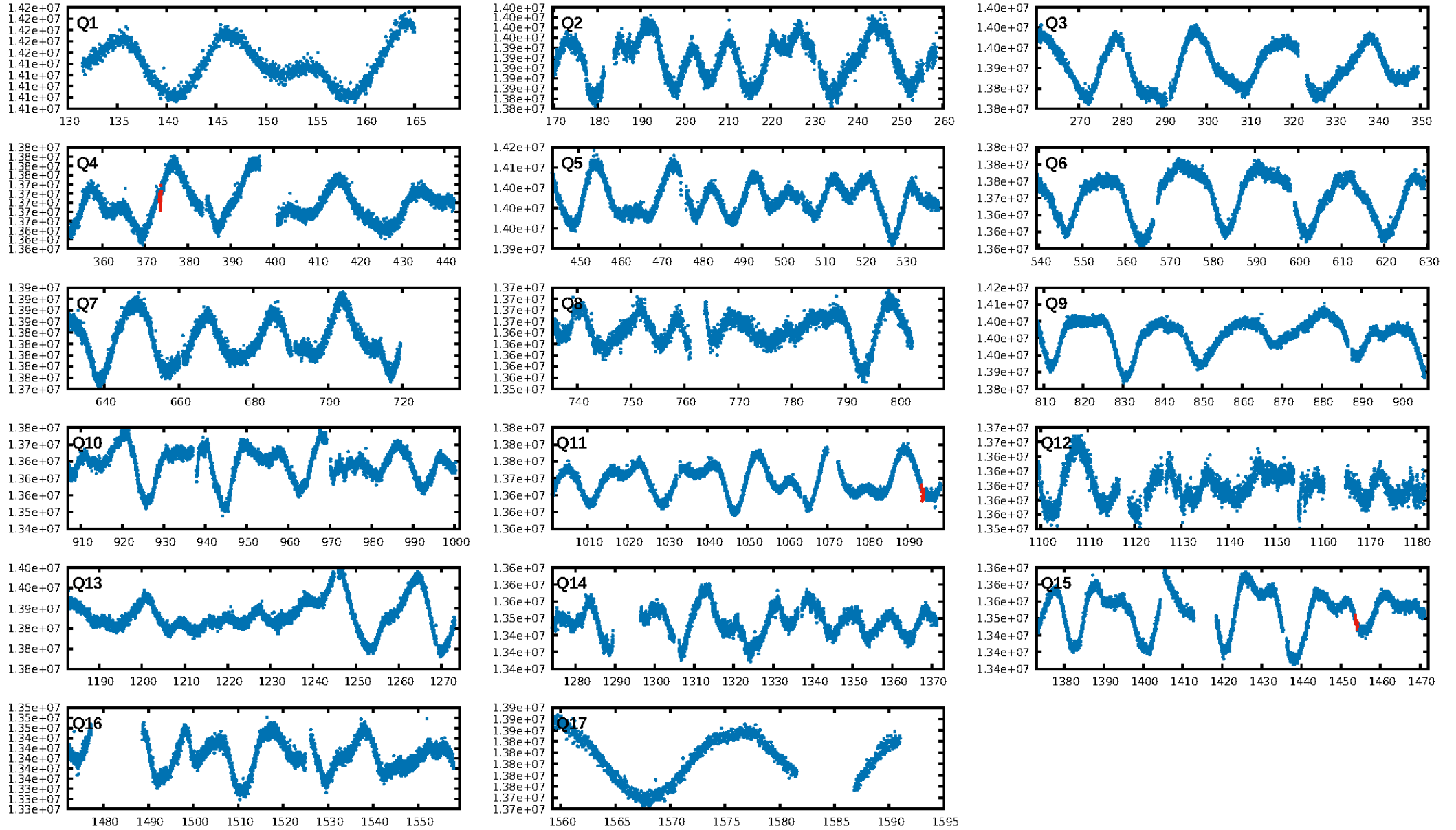
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 93.0%  
Bootstrap-pfa: 3.74e-12  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.2397  
Centroid-sig: 95.1%  
Centroid-so: 0.307 arcsec [0.26σ]  
OotOffset-rm: N/A  
OotOffset-st: 0/0/0 [0]  
KicOffset-rm: N/A  
KicOffset-st: 0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [1/1]

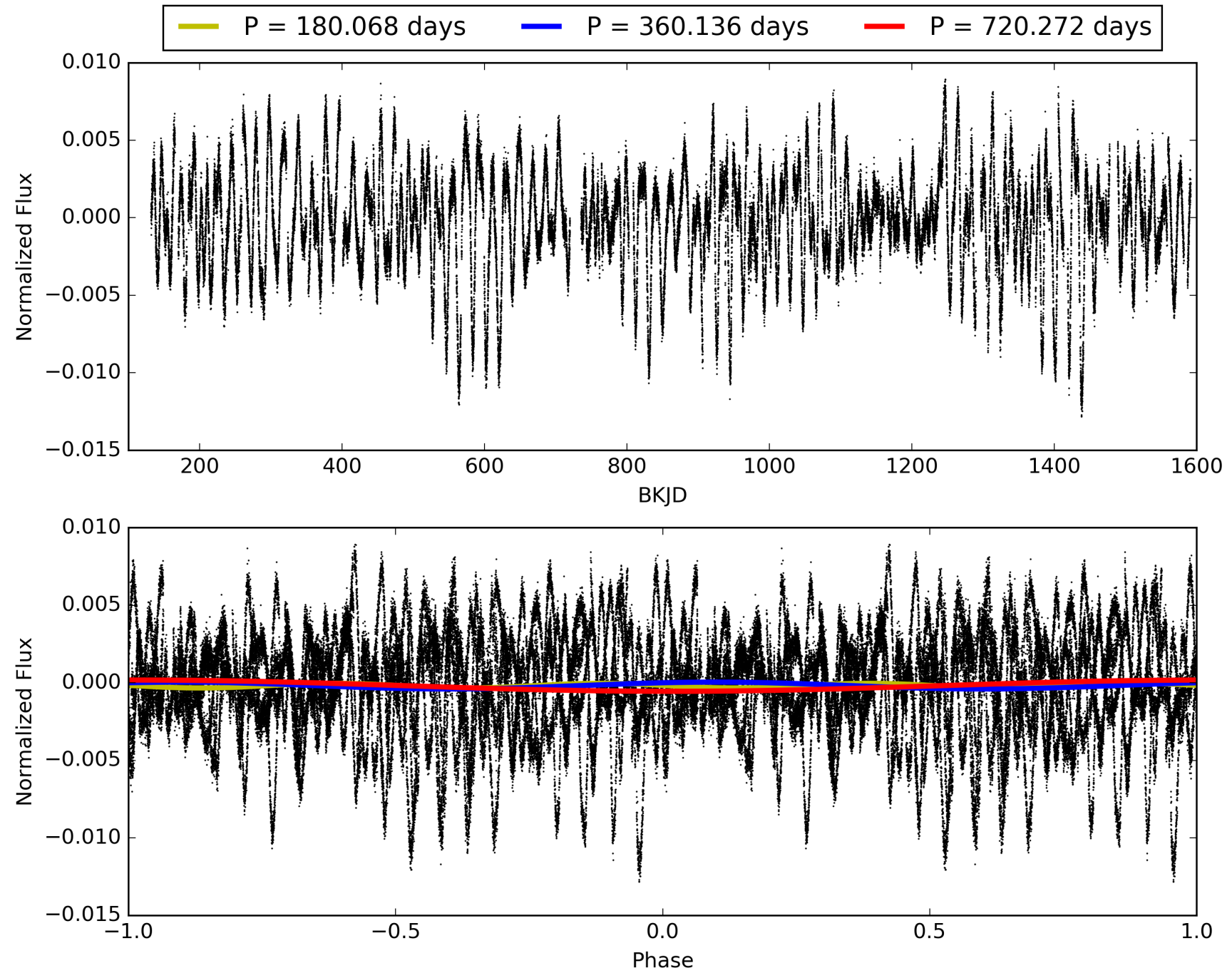
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:01:53 Z

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

# TCE 008870286-01, PDC Light Curves

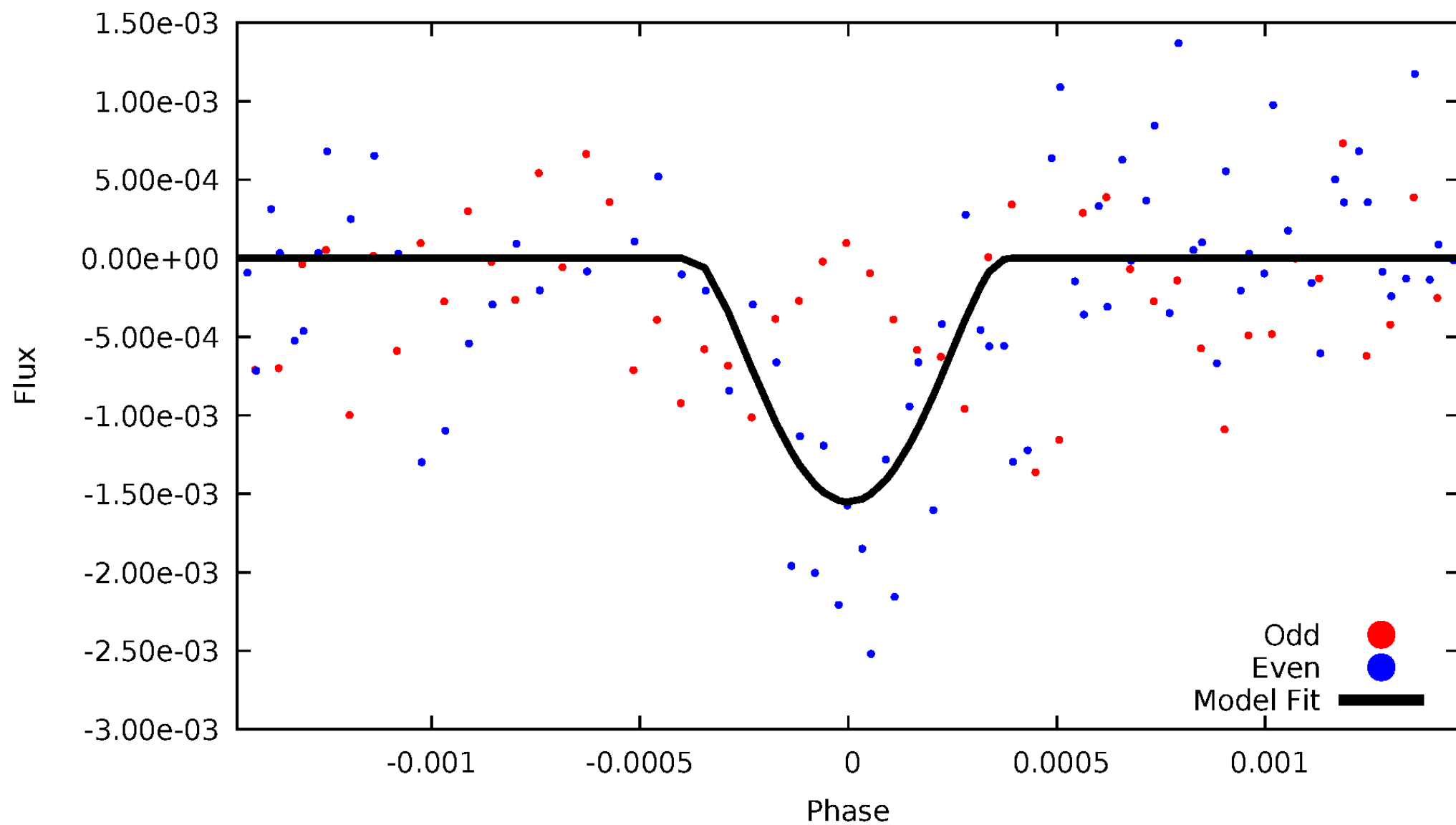


TCE 008870286-01



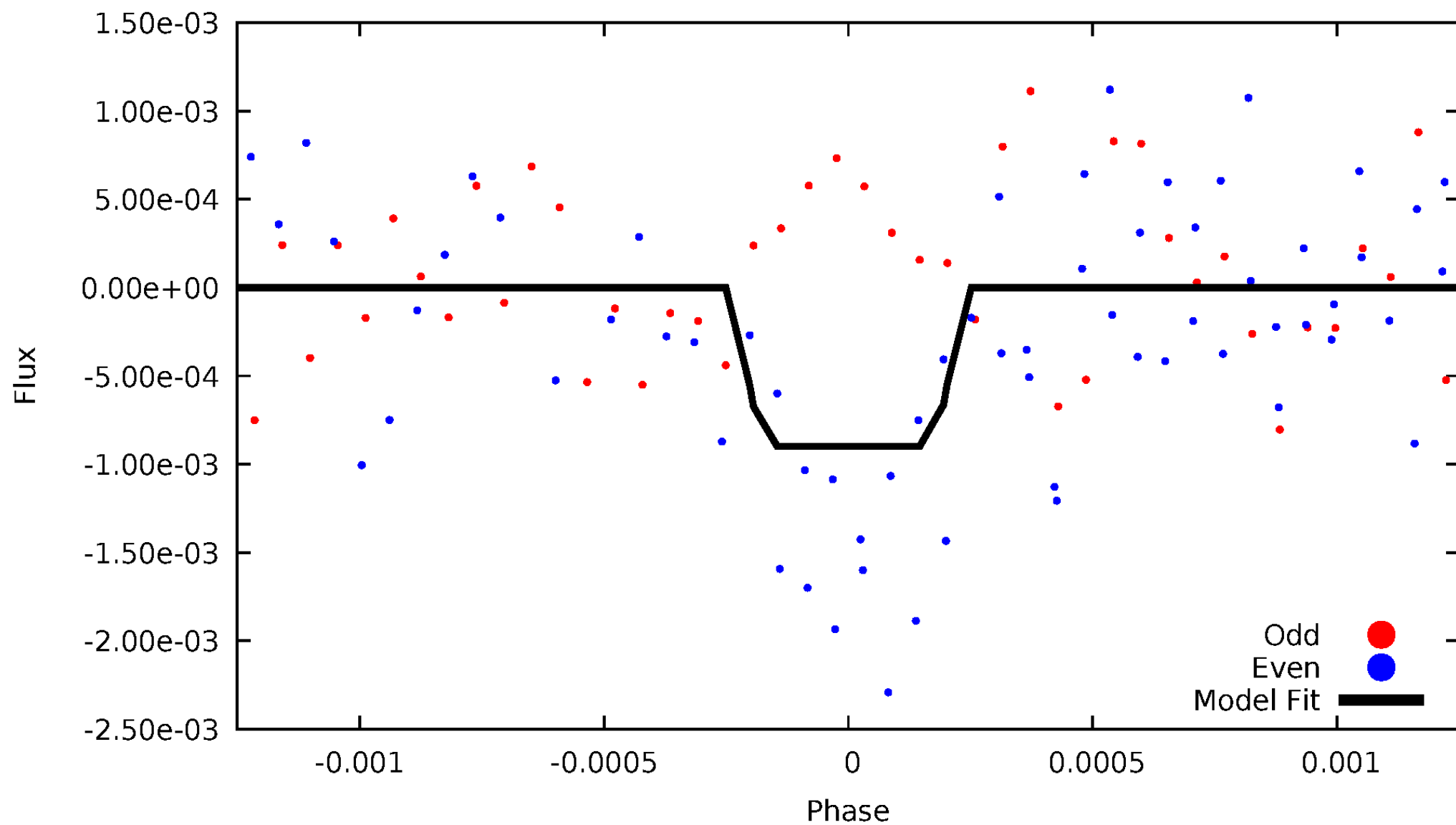
# DV Odd/Even

TCE 008870286-01



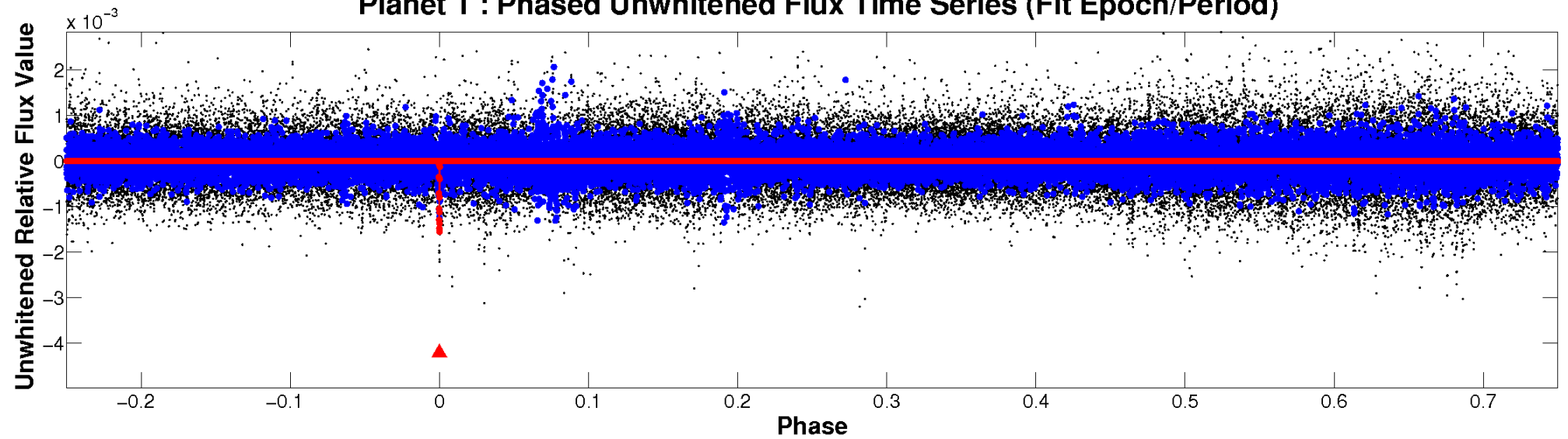
# ALT Odd/Even

TCE 008870286-01

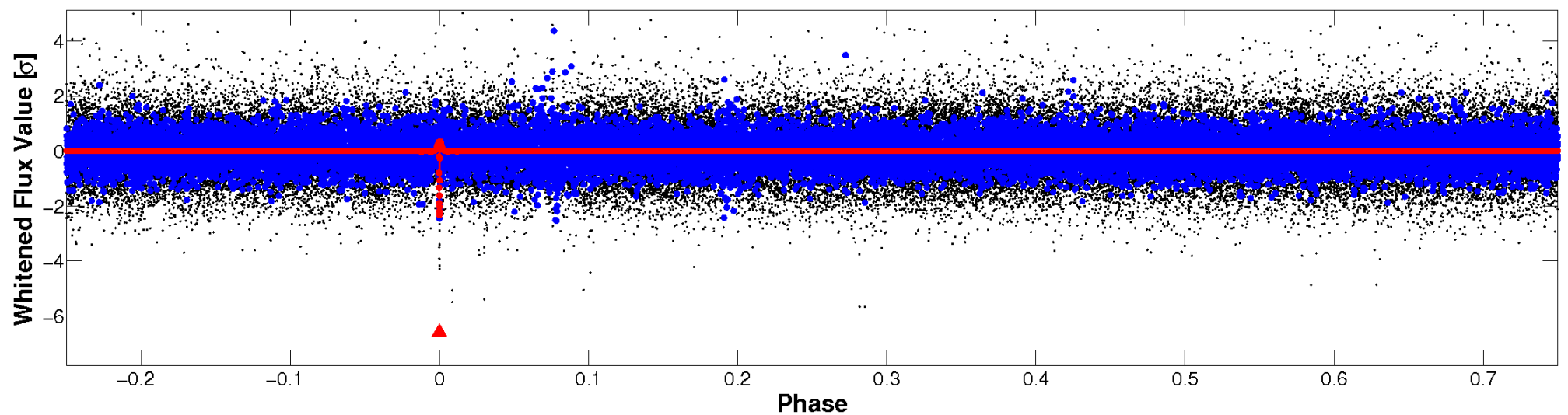


# Non-Whitened Vs. Whitened Light Curve

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

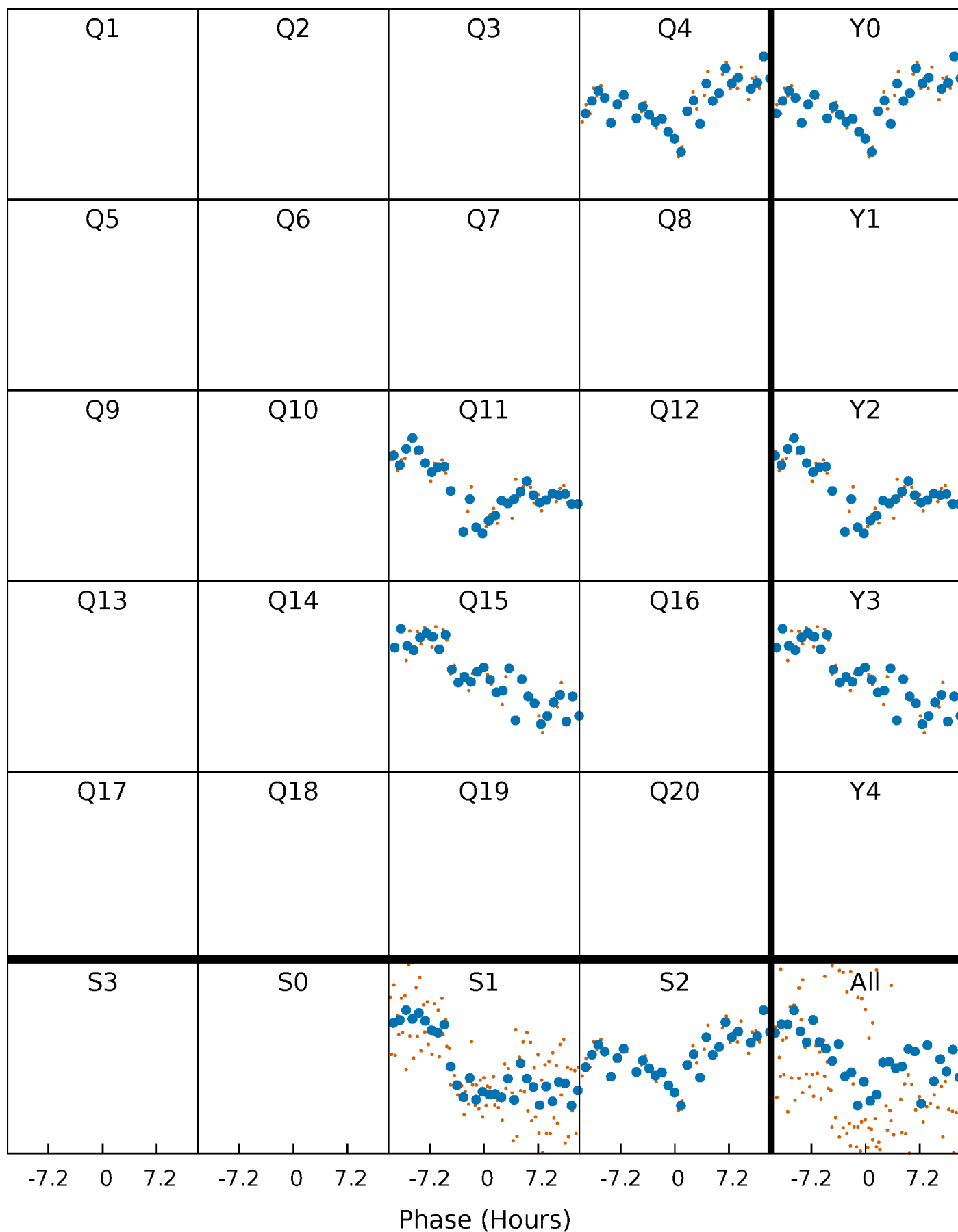


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

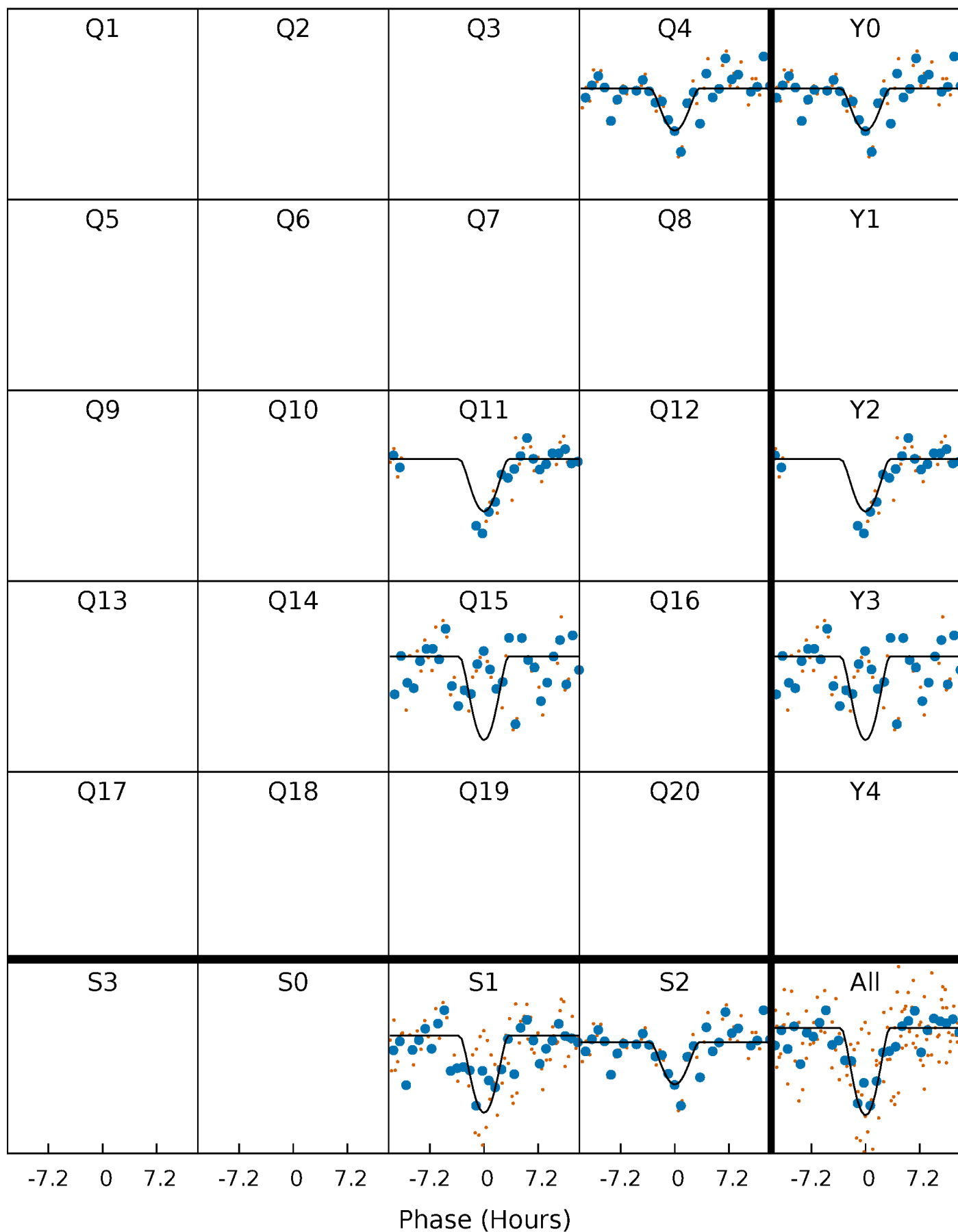
TCE 008870286-01 P=360.135931 Days  $T_0=373.505502$  (BKJD)





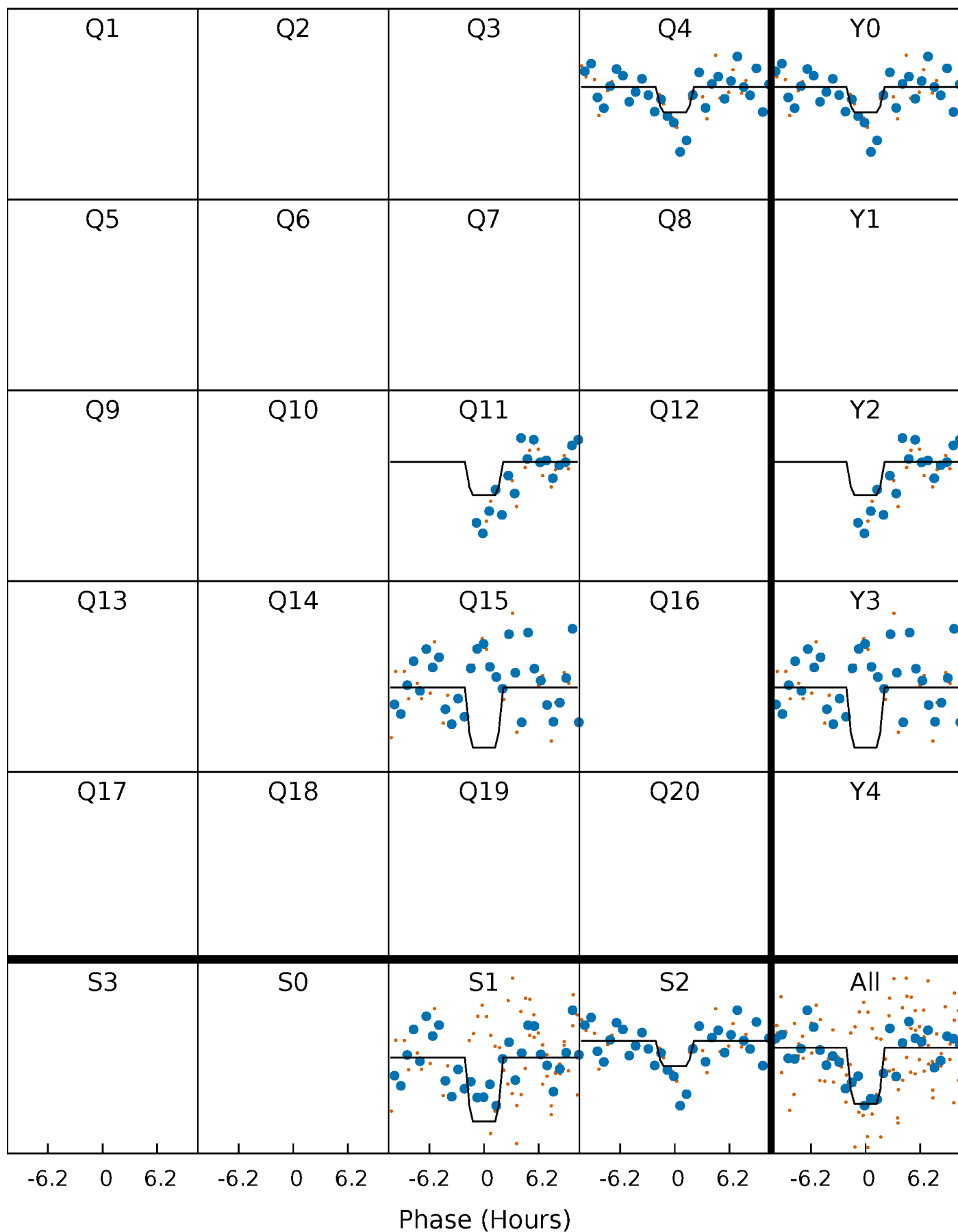
# DV Quarter-Phased Transit Curves

TCE 008870286-01 P=360.135931 Days  $T_0=373.505502$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

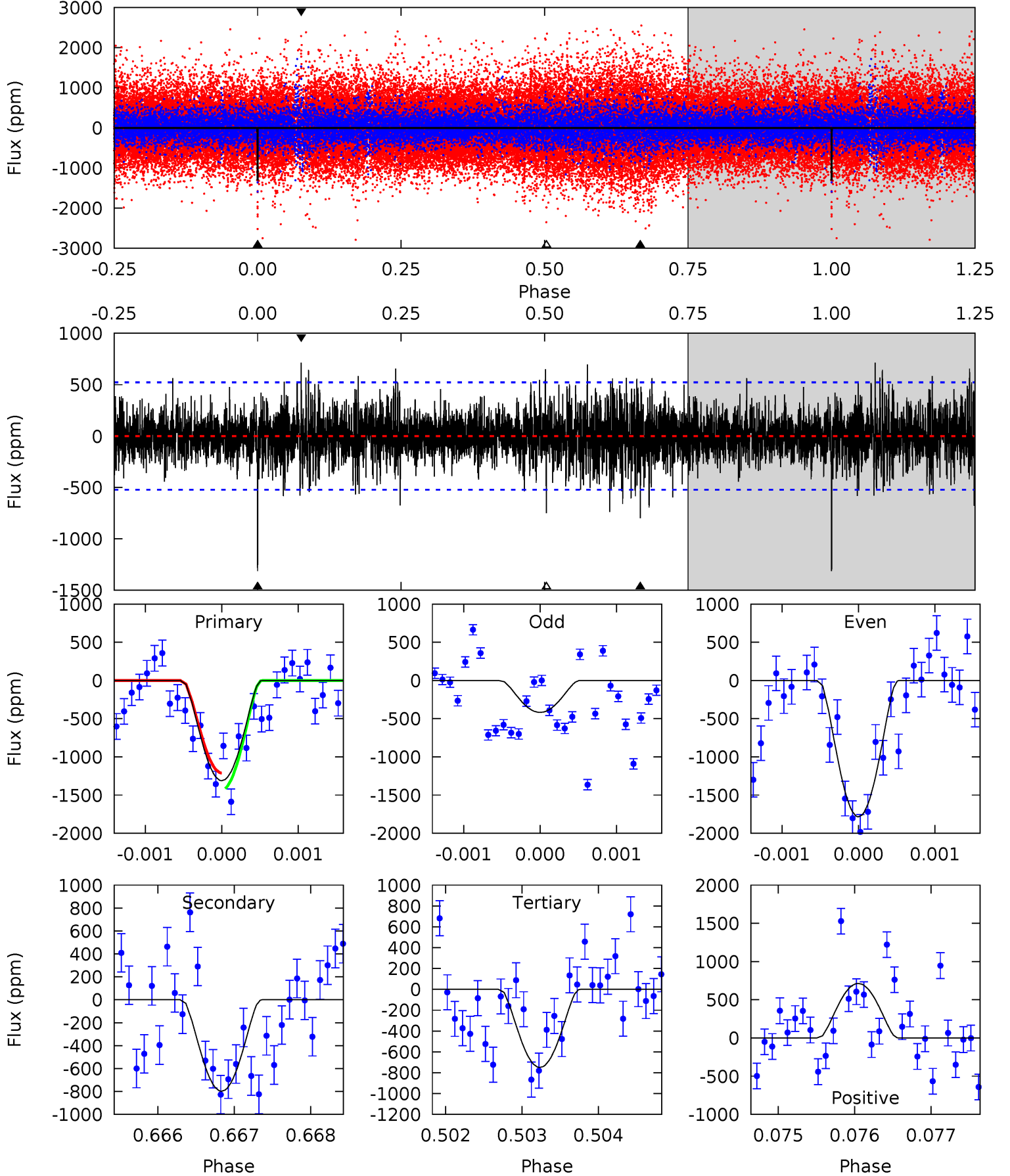
TCE 008870286-01 P=360.141495 Days  $T_0=373.495699$  (BKJD)



# DV Model-Shift Uniqueness Test

008870286-01,  $P = 360.135931$  Days,  $E = 13.369571$  Days

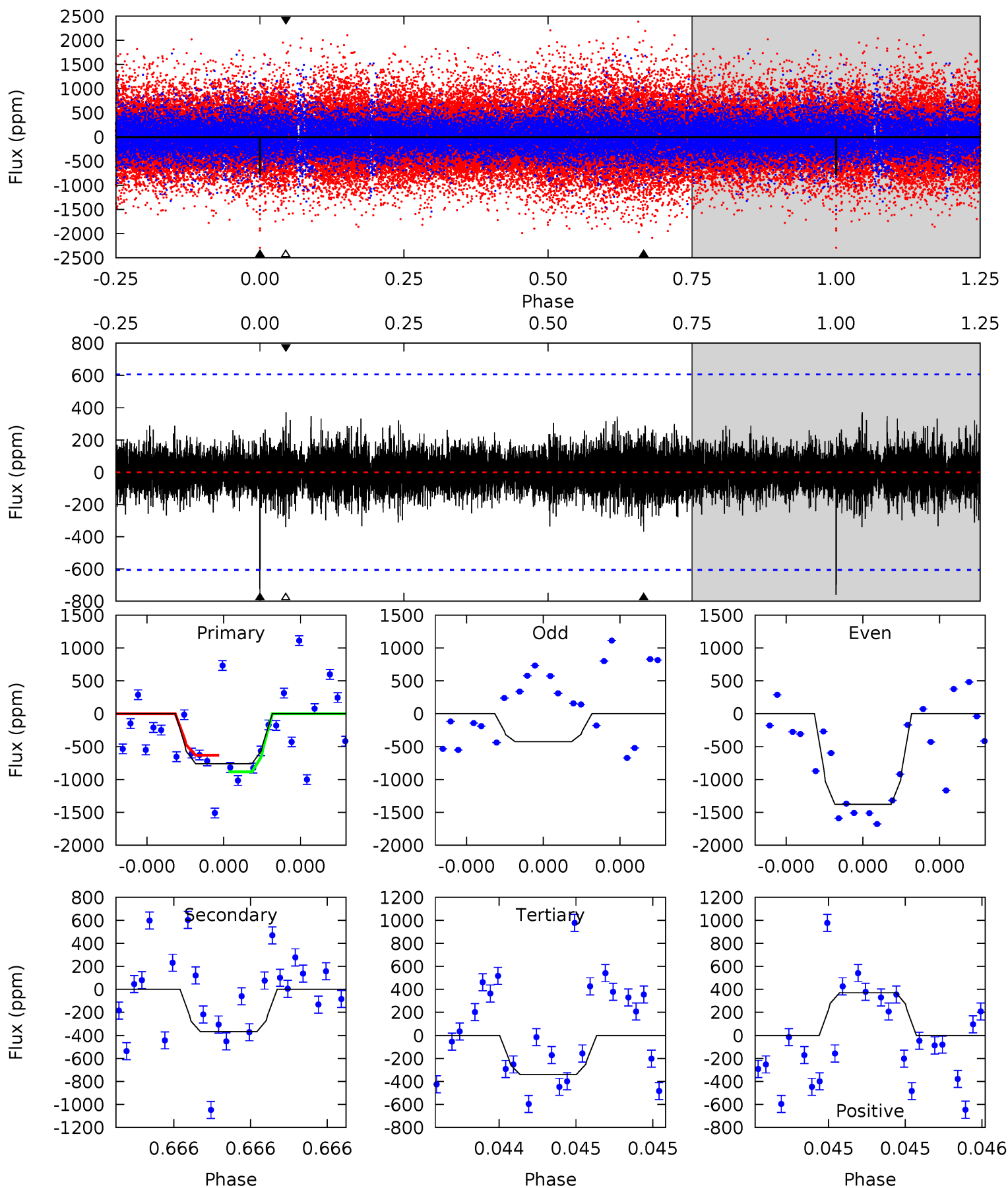
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	8.42	7.91	7.52	5.51	3.38	1.78	5.93	6.31	0.51	0.90	6.81	0.83	0.35	1.07



# Alt Model-Shift Uniqueness Test

008870286-01, P = 360.141495 Days, E = 13.354204 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
7.04	3.41	3.15	3.43	5.61	3.54	0.76	3.89	3.61	0.26	-0.02	4.00	0.61	0.33	1.16



### Stellar Parameters For KIC 008870286

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5441^{+145}_{-161}$	$4.582^{+0.034}_{-0.136}$	$-0.100^{+0.300}_{-0.300}$	$0.799^{+0.159}_{-0.068}$	$0.896^{+0.072}_{-0.099}$	$2.475^{+0.435}_{-0.954}$
	+3%/-3%	+1%/-3%	+300%/-300%	+20%/-9%	+8%/-11%	+18%/-39%
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 008870286-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-798 \pm 95$	$20.31^{+21.23}_{-13.82}$	$312^{+16}_{-13}$	$2708^{+1091}_{-459}$	$929^{+9164}_{-724}$
Alt.	$-368 \pm 108$	$17.44^{+19.85}_{-11.57}$	$312^{+14}_{-12}$	$2511^{+878}_{-395}$	$539^{+4261}_{-417}$

$T_{\text{max}}$  = 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 008870286-01. Kepler magnitude: 15.64. Transit SNR 9.30

There are 0 quarters with good PRF difference image offsets

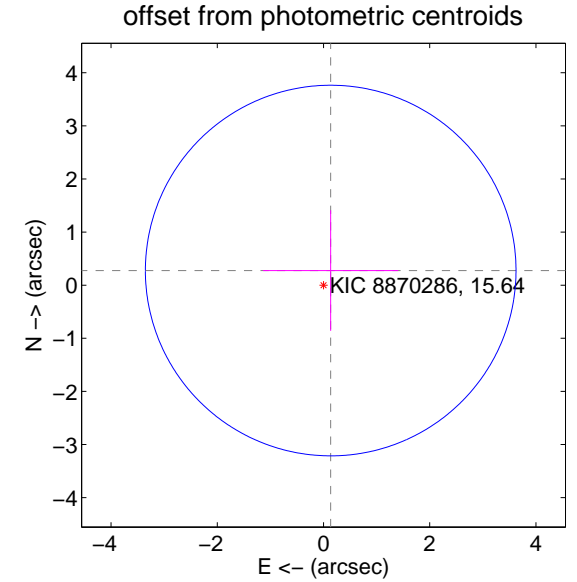
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$0.31 \pm 1.16$	0.26	$-0.14 \pm 1.27$	$0.28 \pm 1.13$

There is no PRF-fit offset from OOT-fit



There is no PRF-fit offset from KIC



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

Q13 no difference image



Q13 no OOT image



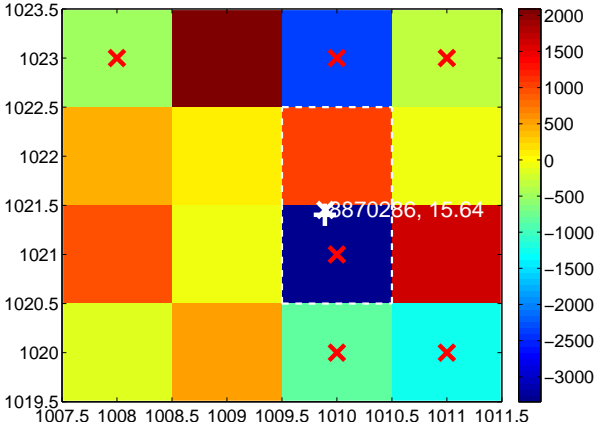
Q14 no difference image



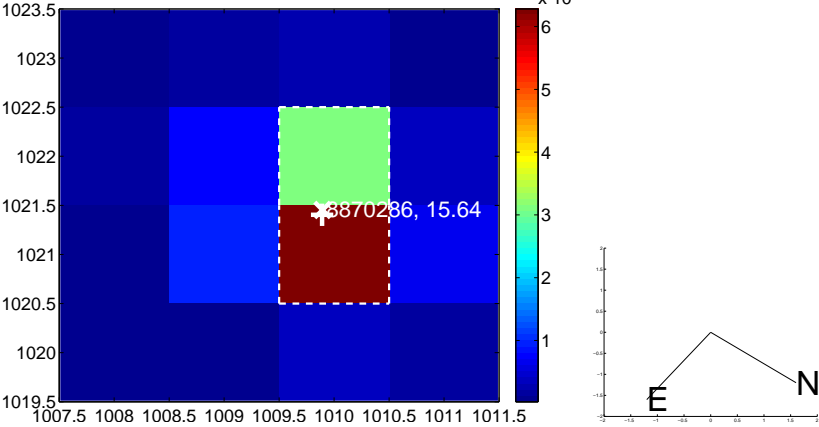
Q14 no OOT image



Q15 difference image. Poor Quality



Q15 OOT image



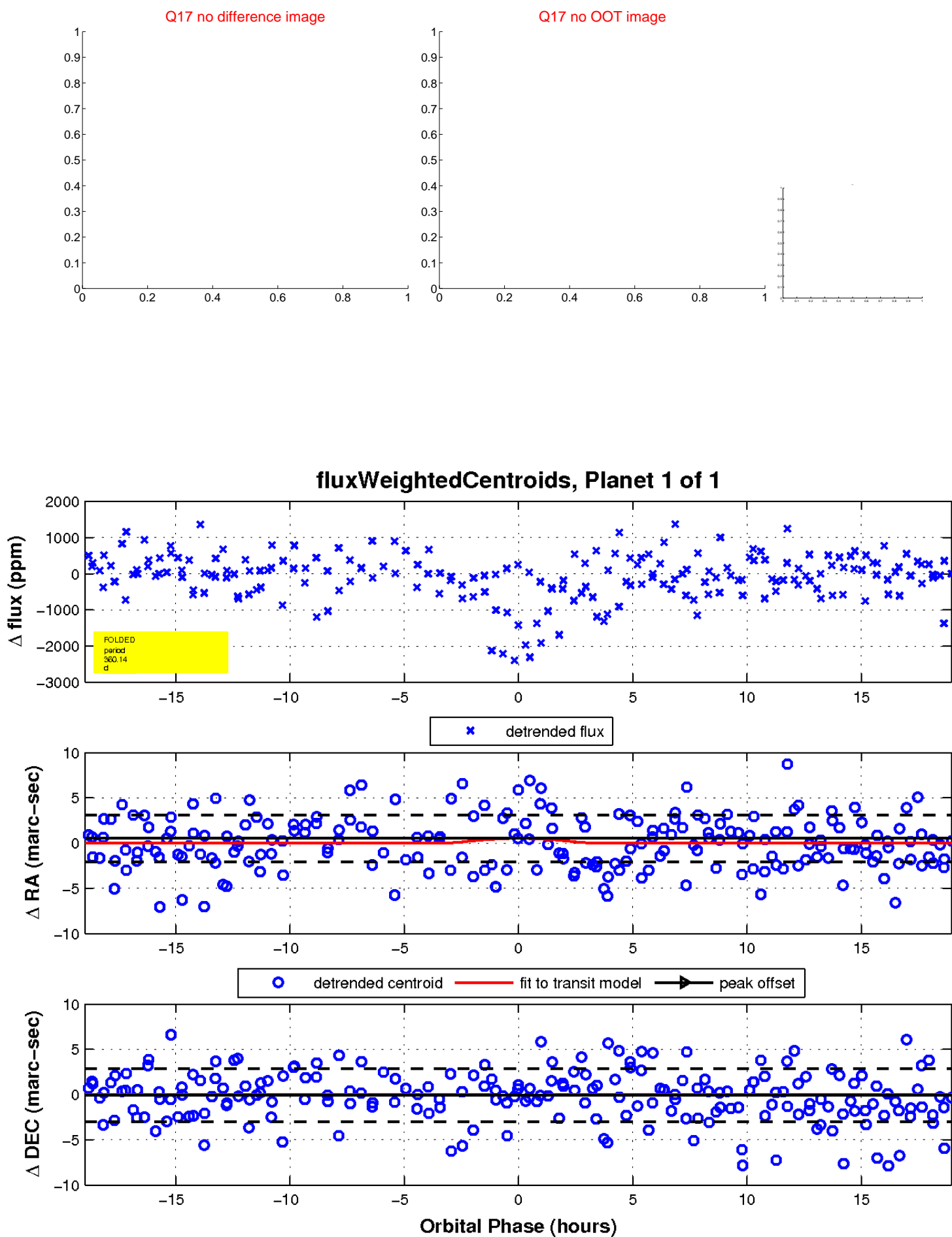
Q16 no difference image



Q16 no OOT image



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



# UKIRT Image

Declination

