

# KIC 009613070

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009613070-01	OBS	3601.01	2.332086	132.207037	106184.0	2.988	2761.4	1915.7	1.09	6384	51.92	1530.91

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009613070-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—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.

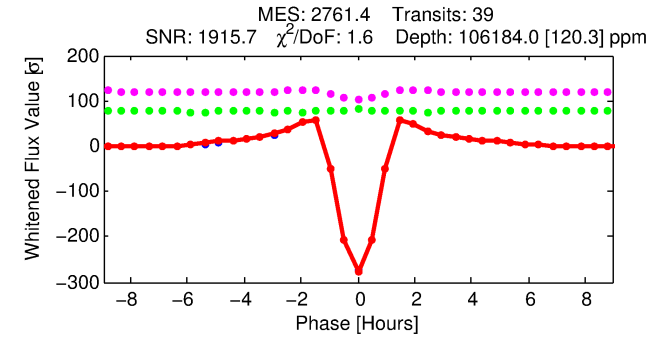
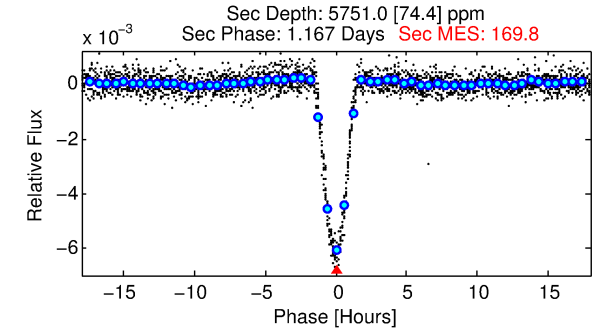
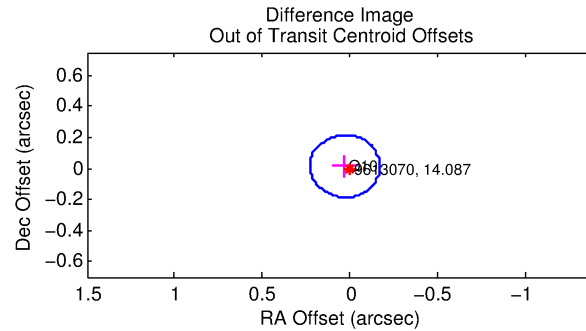
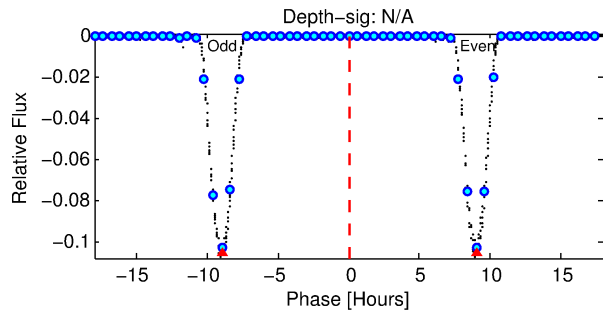
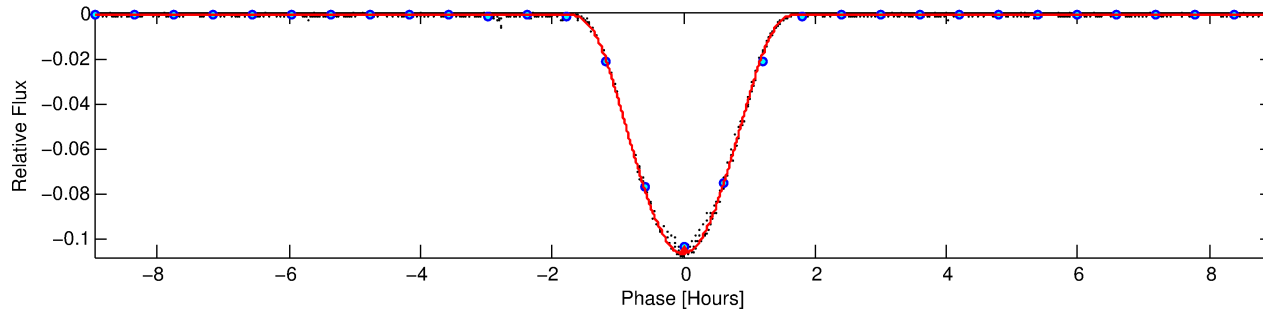
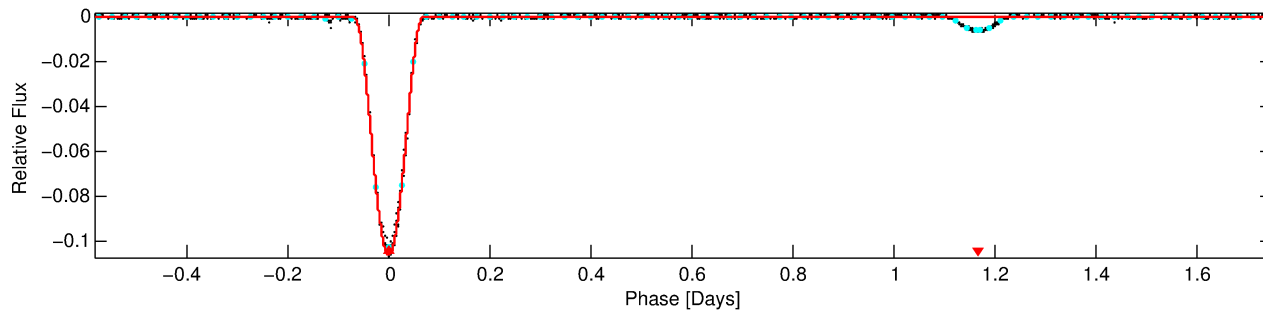
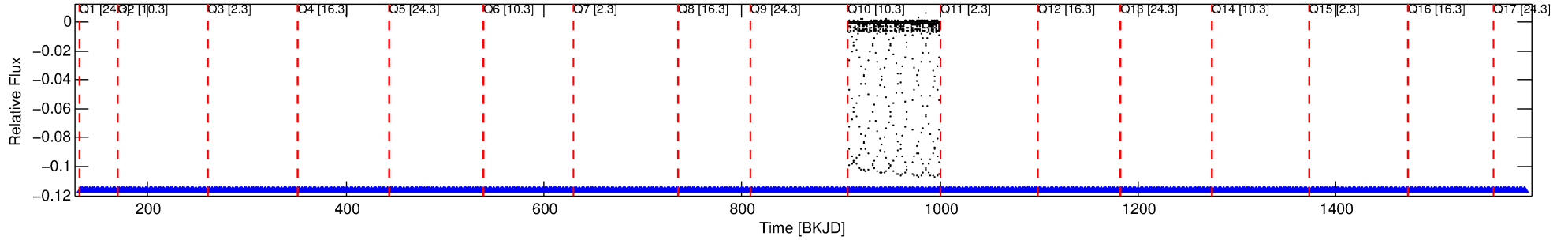
## Ephemeris Match Information For 009613070-01

No Significant Match Found

# DV One-Page Summary

KIC: 9613070 Candidate: 1 of 1 Period: 2.332 d  
KOI: K03601.01 Corr: 0.964

Kp: 14.09 R\*: 1.09 Rs Teff: 6384.0 K Logg: 4.35 Fe/H: -0.520



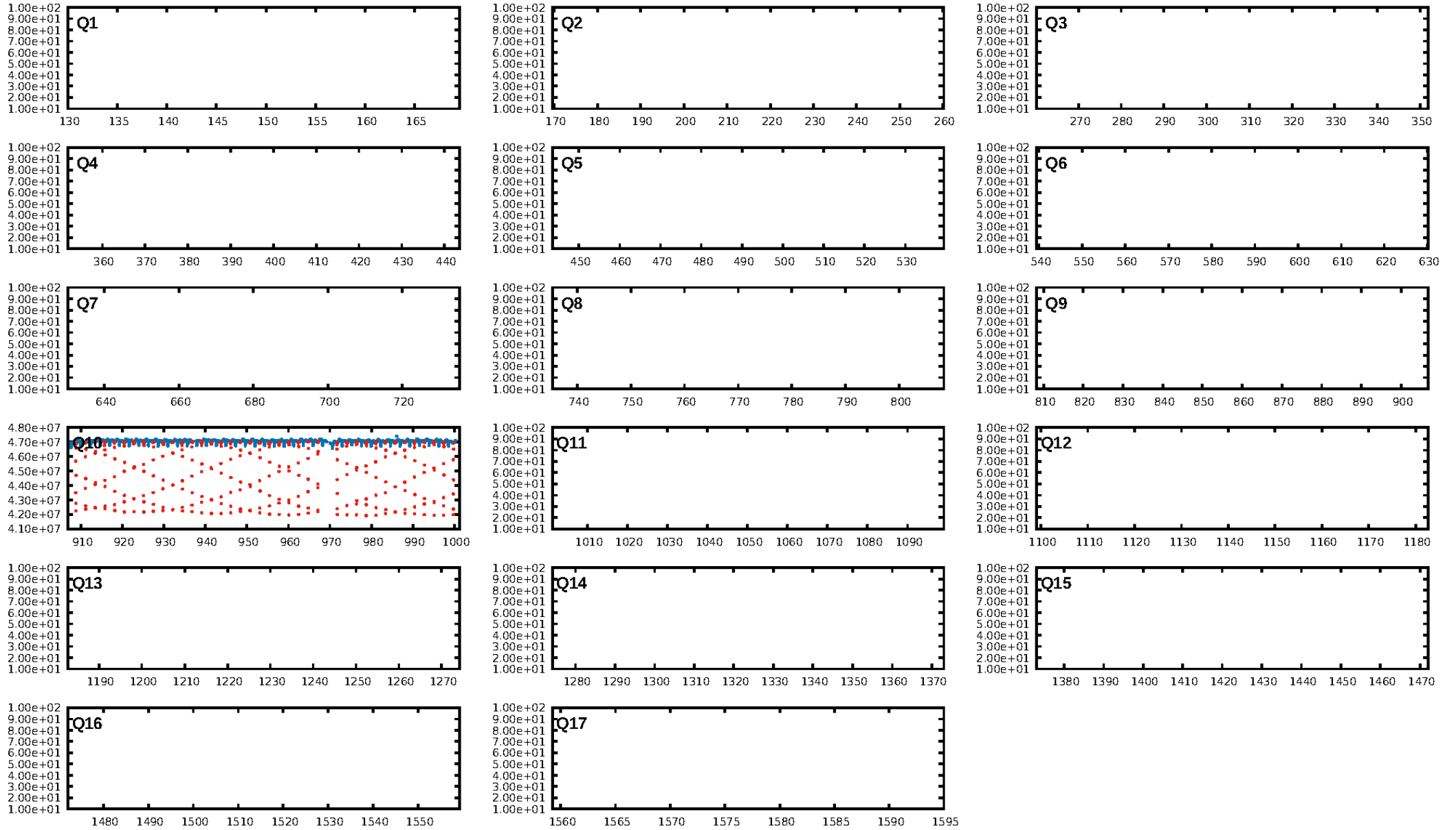
## DV Fit Results:

Period = 2.33209 [0.00000] d  
Epoch = 132.2070 [0.0000] BKJD  
Rp/R\* = 0.4349 [0.0214]  
a/R\* = 6.76 [0.01]  
b = 0.90 [0.03]  
Seff = 1530.92 [575.18]  
Teq = 1595 [150] K  
Rp = 51.92 [14.93] Re  
a = 0.0341 [0.0081] AU  
Ag = 1.37 [0.49] [0.75σ]  
Teffp = 2666 [122] K [5.53σ]

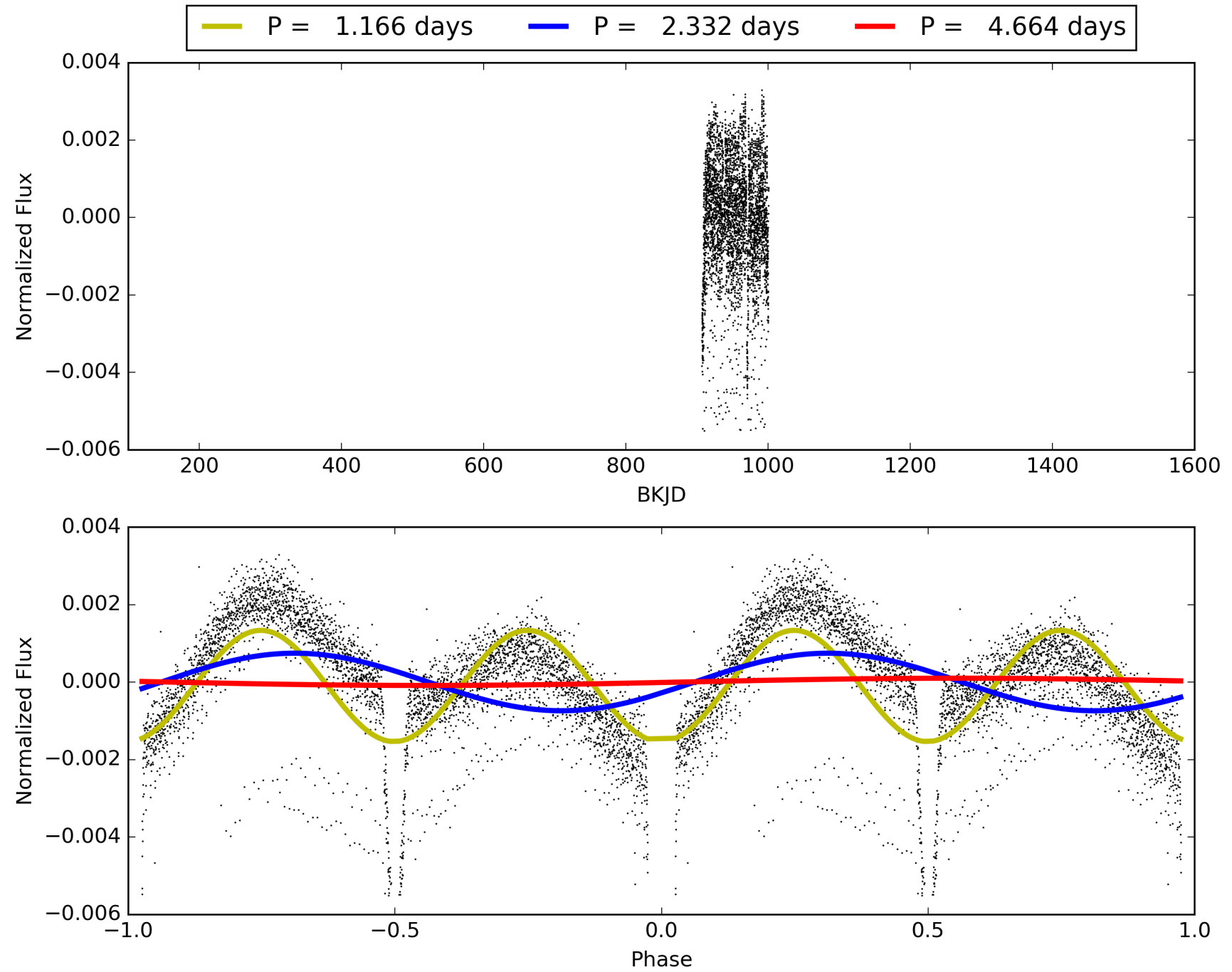
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 3.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [39/39]  
GhostDiagnostic-chr: 1.695  
Centroid-sig: 0.0%  
Centroid-so: 1.476 arcsec [565.30σ]  
OotOffset-rm: 0.033 arcsec [0.50σ]  
KicOffset-rm: 0.162 arcsec [2.42σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [1/1]

# TCE 009613070-01, PDC Light Curves

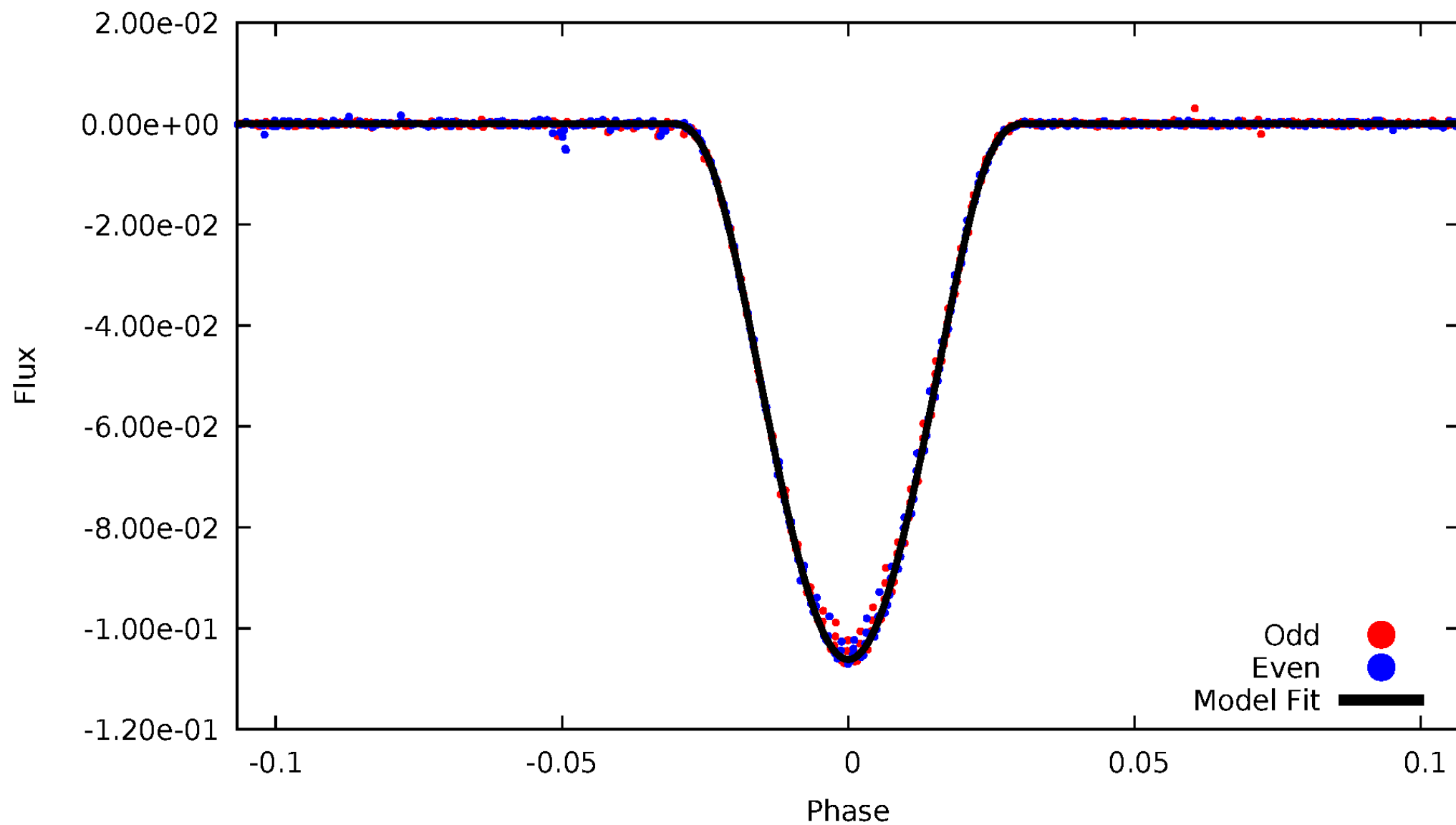


# TCE 009613070-01



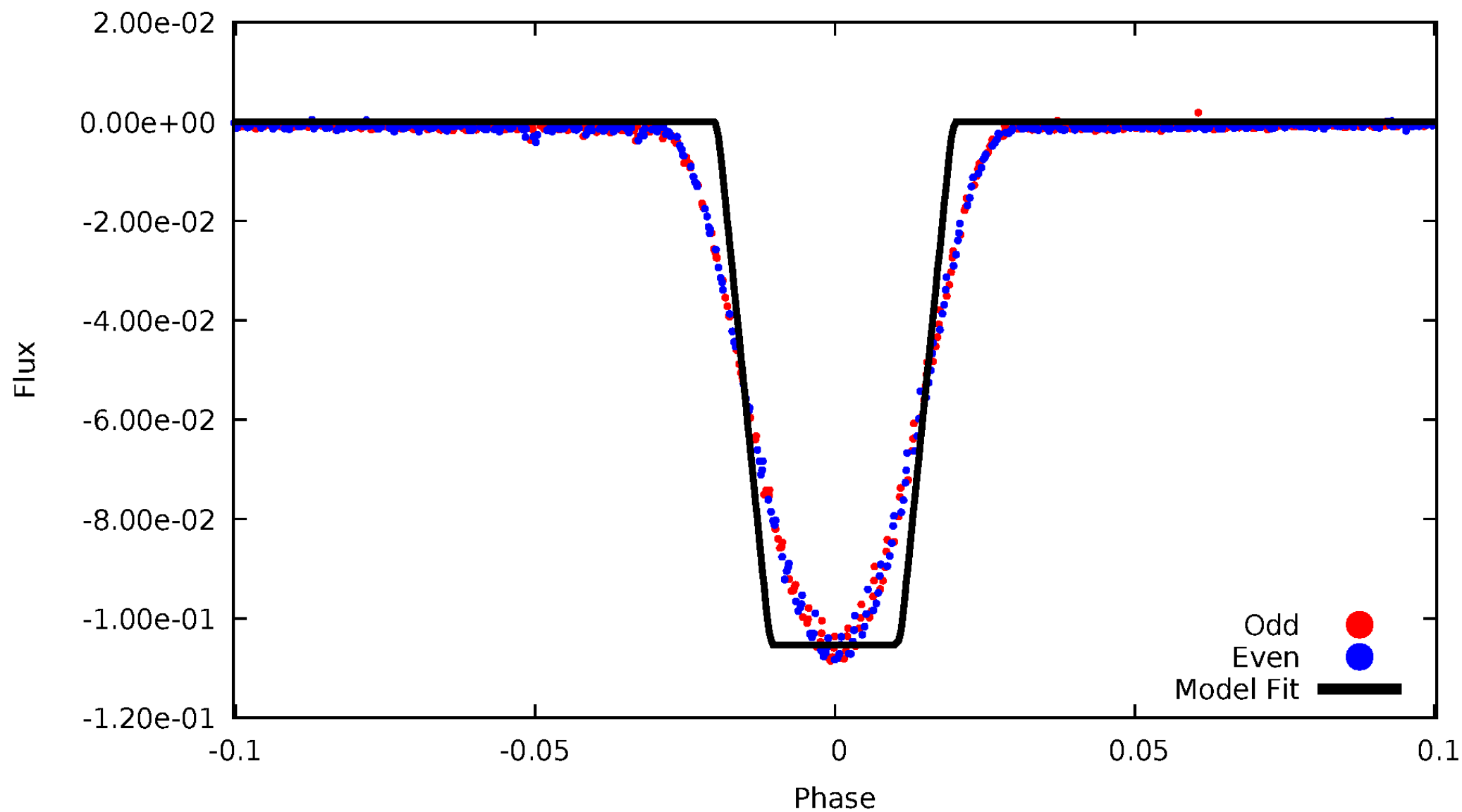
# DV Odd/Even

TCE 009613070-01



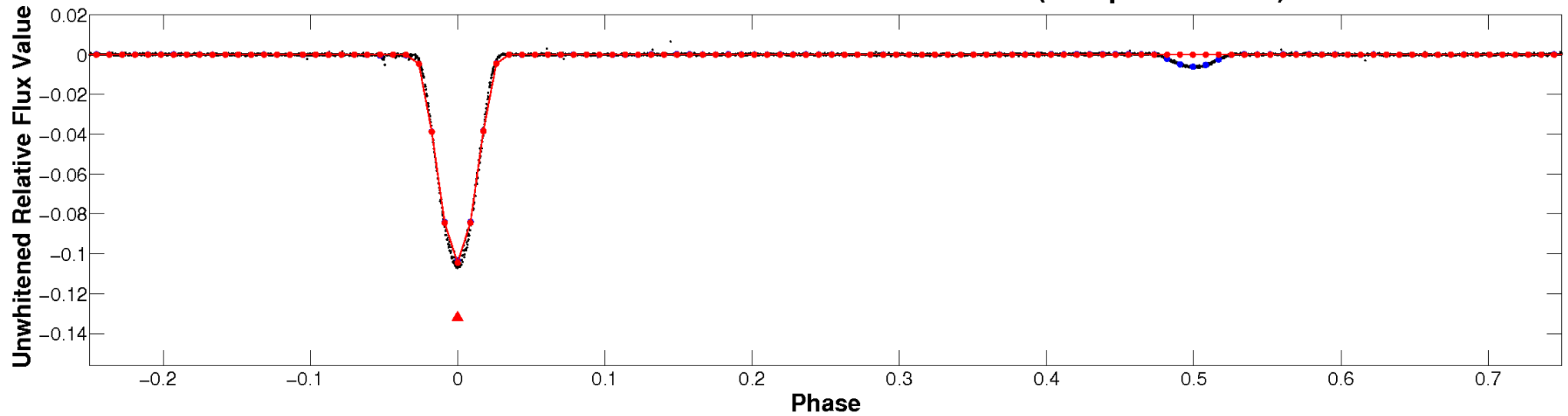
# ALT Odd/Even

TCE 009613070-01

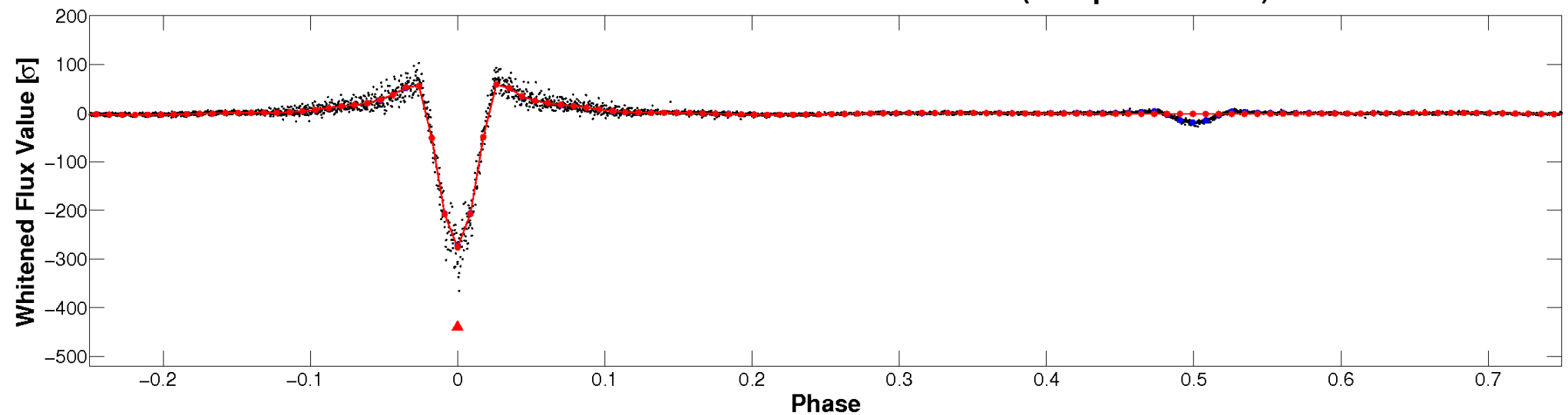


# Non-Whitened Vs. Whitened Light Curve

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

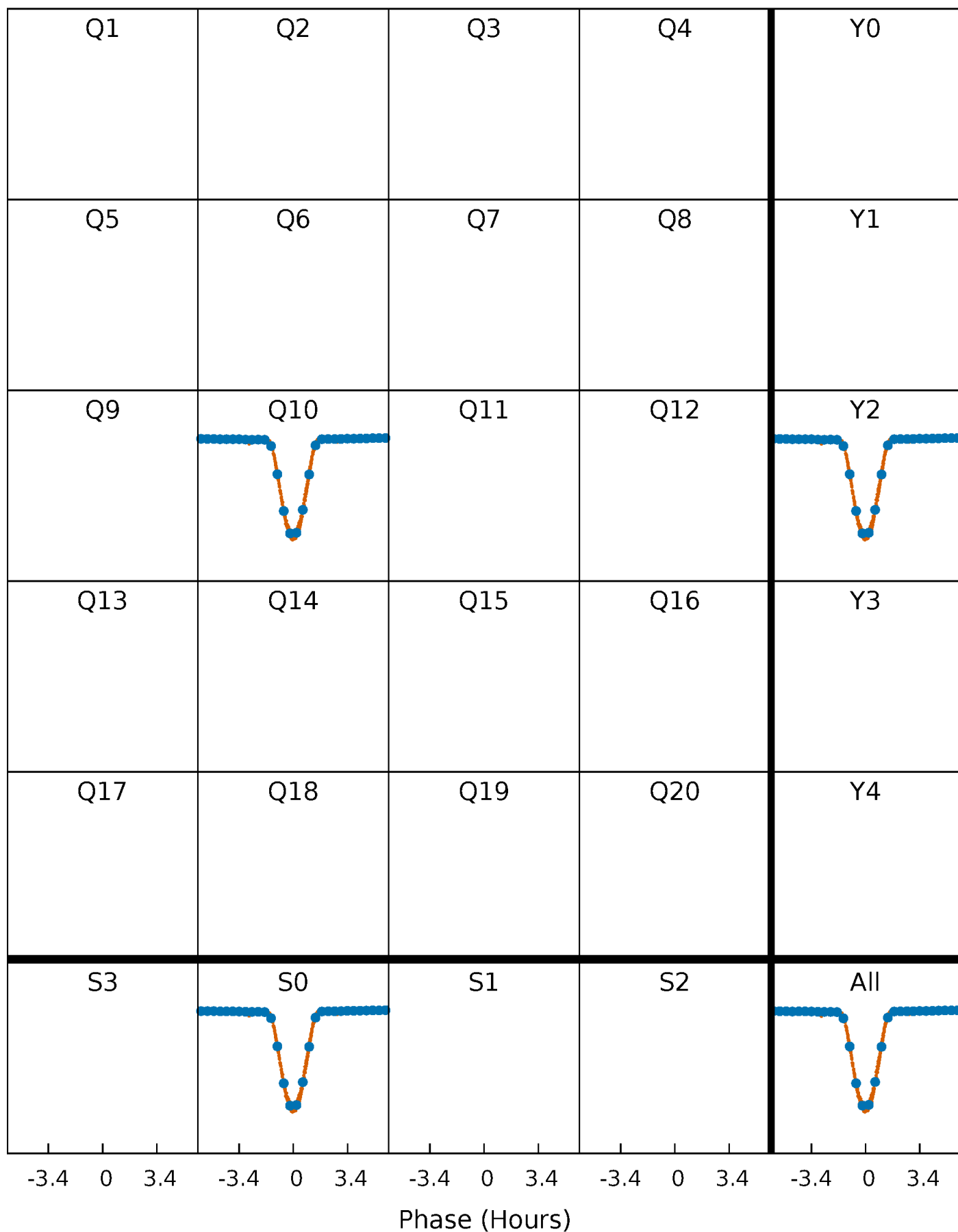


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

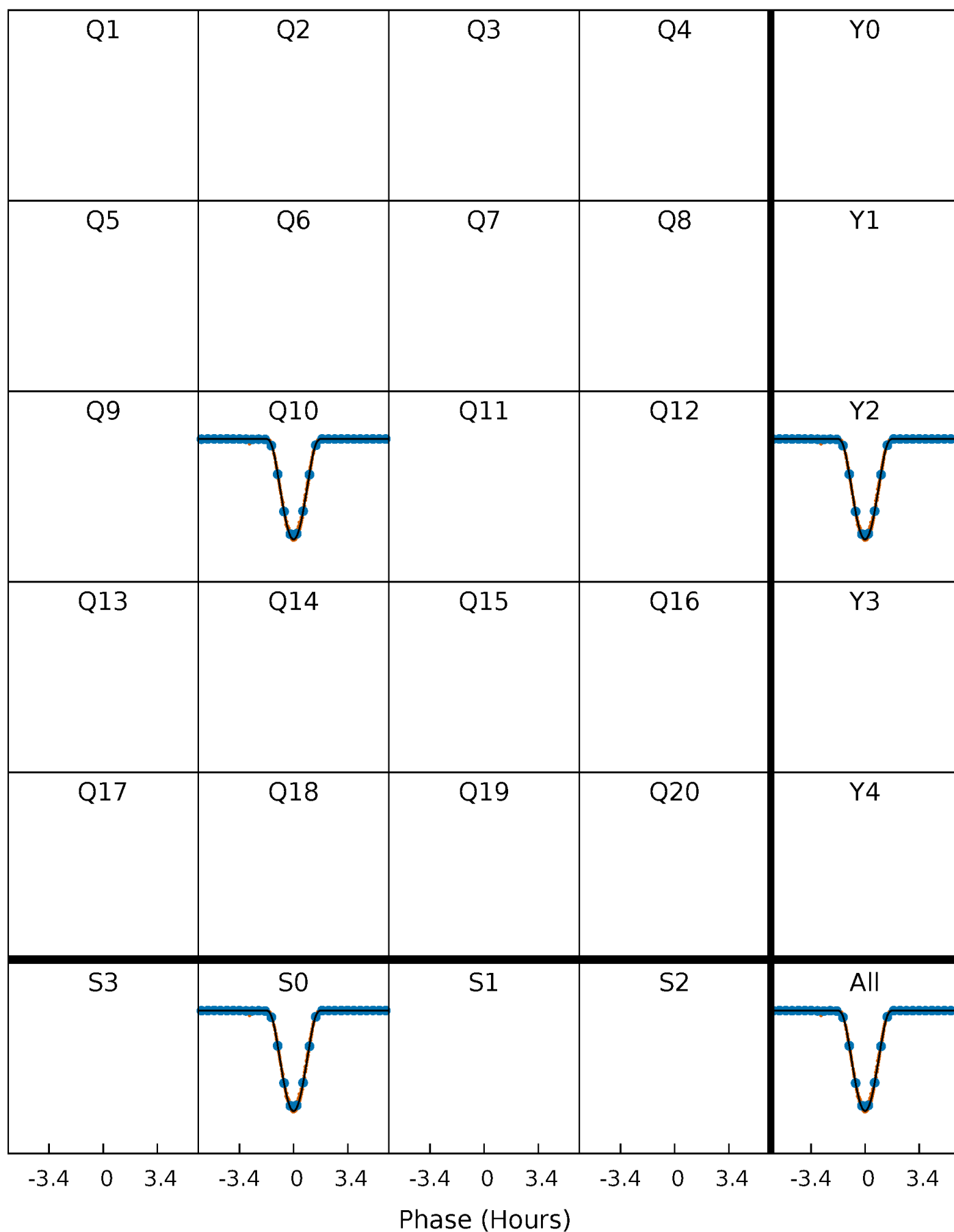
TCE 009613070-01 P= 2.332086 Days  $T_0=132.207037$  (BKJD)





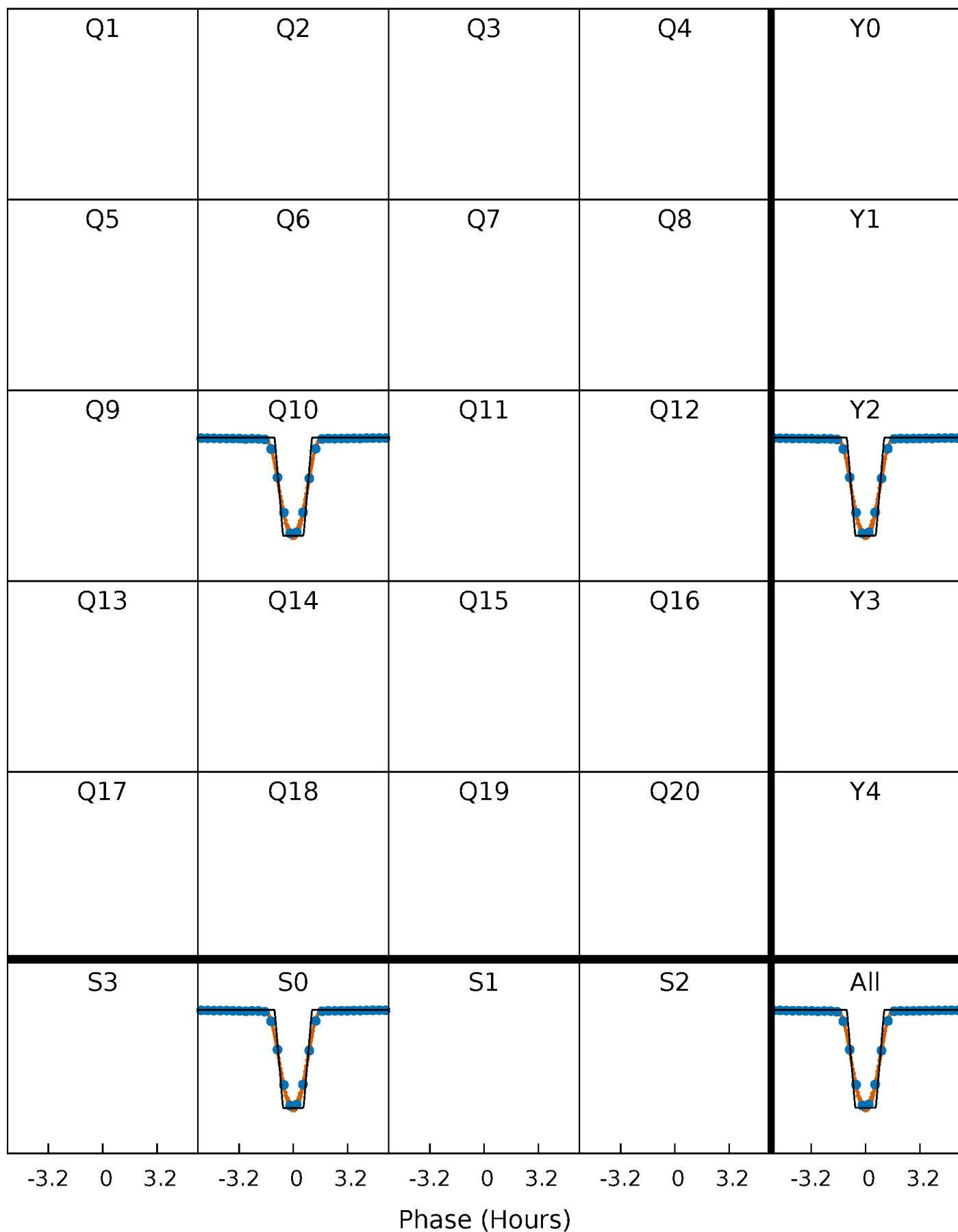
## DV Quarter-Phased Transit Curves

TCE 009613070-01    P= 2.332086 Days     $T_0=132.207037$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

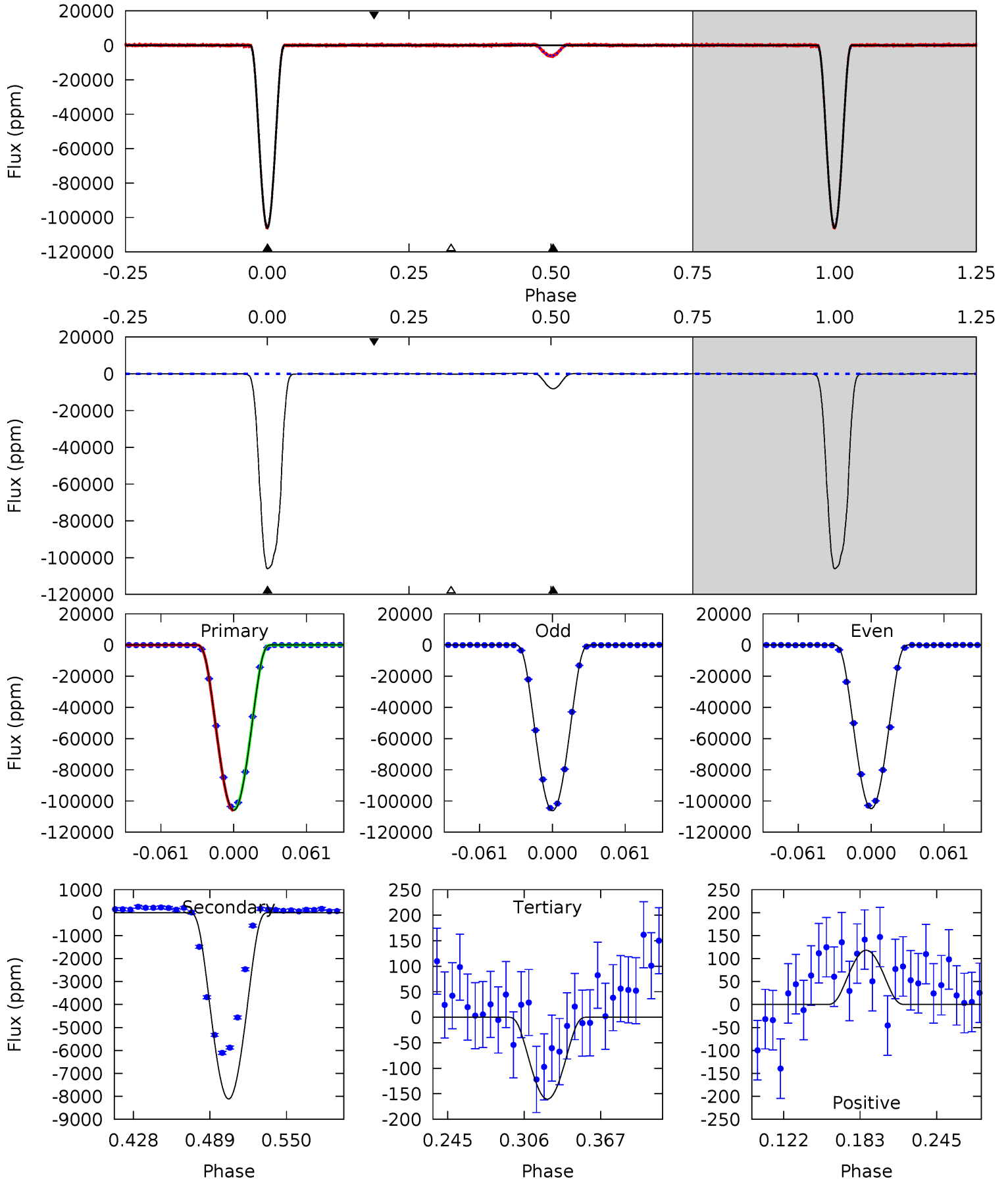
TCE 009613070-01 P= 2.332088 Days  $T_0=132.206420$  (BKJD)



# DV Model-Shift Uniqueness Test

009613070-01, P = 2.332086 Days, E = 132.207037 Days

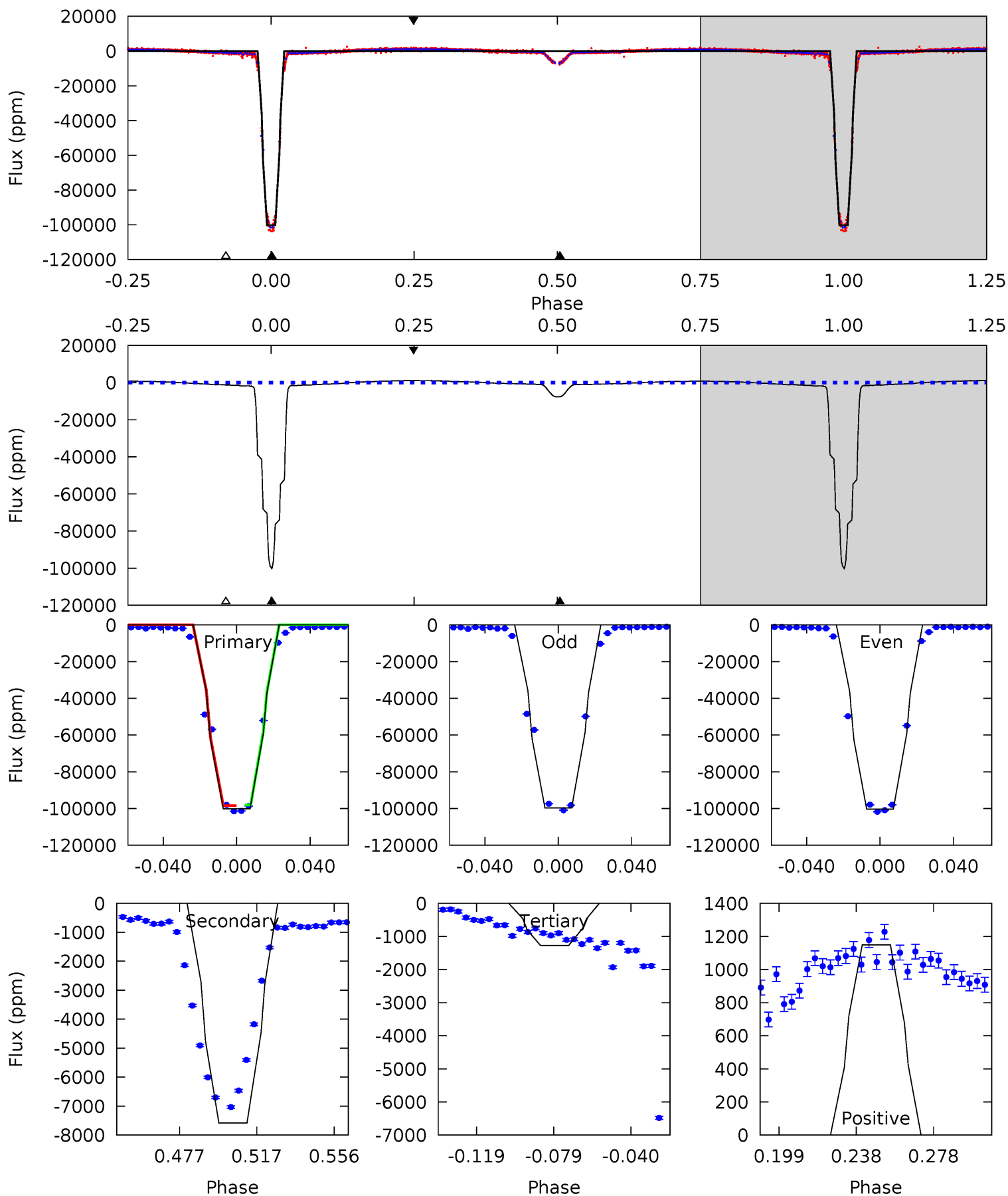
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4869	372.6	7.37	5.43	4.67	1.87	3.92	4861	4863	365.2	367.2	31.6	1.00	0.00	0



# Alt Model-Shift Uniqueness Test

009613070-01, P = 2.332088 Days, E = 132.206420 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
972.1	73.6	12.4	11.1	4.75	2.06	7.51	959.7	961.0	61.2	62.4	2.98	0.99	0.01	0



### Stellar Parameters For KIC 009613070

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6384^{+179}_{-247}$	$4.348^{+0.124}_{-0.186}$	$-0.520^{+0.300}_{-0.300}$	$1.094^{+0.310}_{-0.191}$	$0.970^{+0.144}_{-0.104}$	$1.045^{+0.601}_{-0.482}$
	+3%/-4%	+3%/-4%	+58%/-58%	+28%/-17%	+15%/-11%	+57%/-46%
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 009613070-01 / KOI 3601.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-8112 \pm 22$	$52.35^{+8.08}_{-5.80}$	$2228^{+161}_{-129}$	$3322^{+92}_{-97}$	$1.893^{+0.505}_{-0.460}$
Alt.	$-7584 \pm 103$	$39.41^{+6.92}_{-5.06}$	$2241^{+169}_{-137}$	$3649^{+126}_{-117}$	$3.182^{+0.901}_{-0.855}$

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

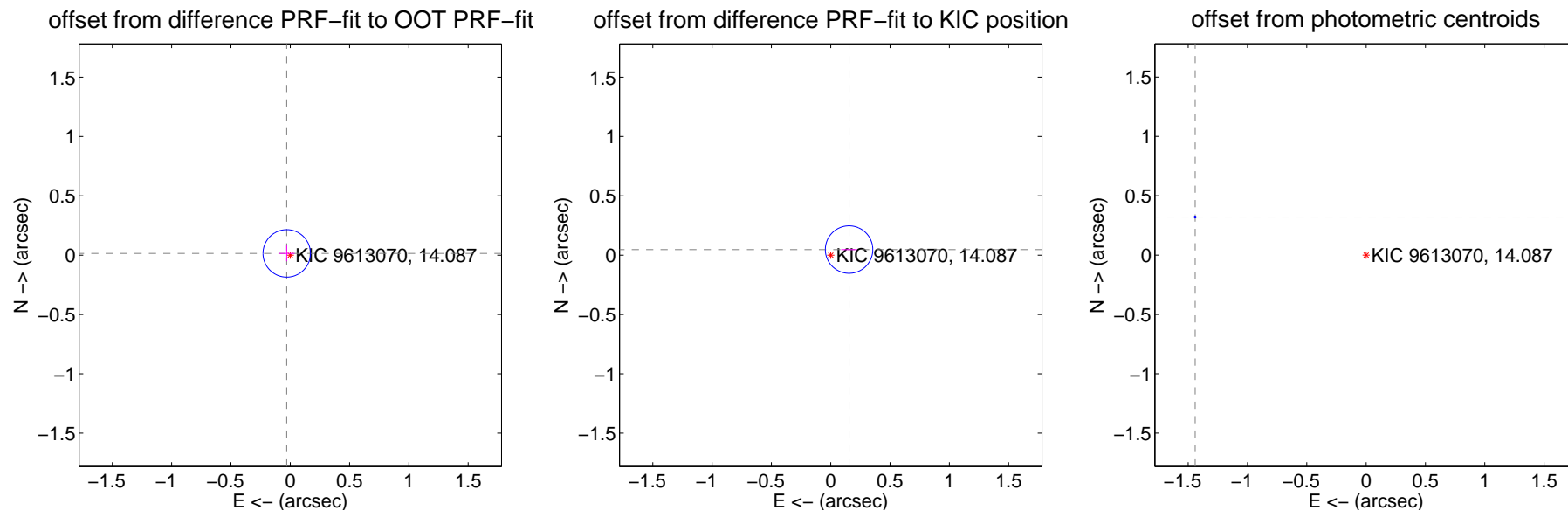
## DV Centroid Data

Supplemental centroid analysis for 009613070-01. Kepler magnitude: 14.09. Transit SNR 1915.74

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.033 \pm 0.067$	0.50	$0.030 \pm 0.067$	$0.015 \pm 0.067$
PRF-fit source offset from KIC position	$0.162 \pm 0.067$	2.42	$-0.155 \pm 0.067$	$0.047 \pm 0.067$
photometric centroid source offset	$1.48 \pm 0.00$	565.30	$1.44 \pm 0.00$	$0.32 \pm 0.00$



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

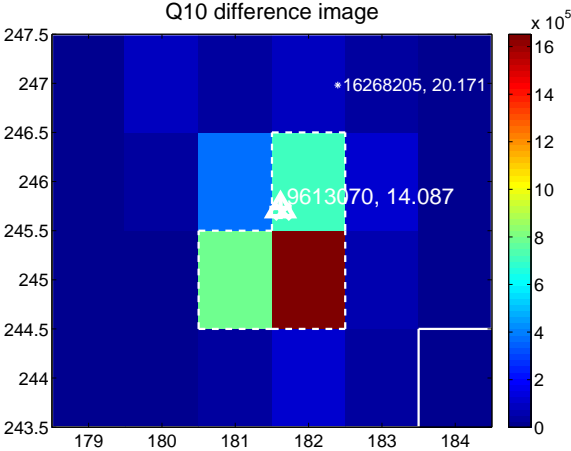
Q9 no difference image



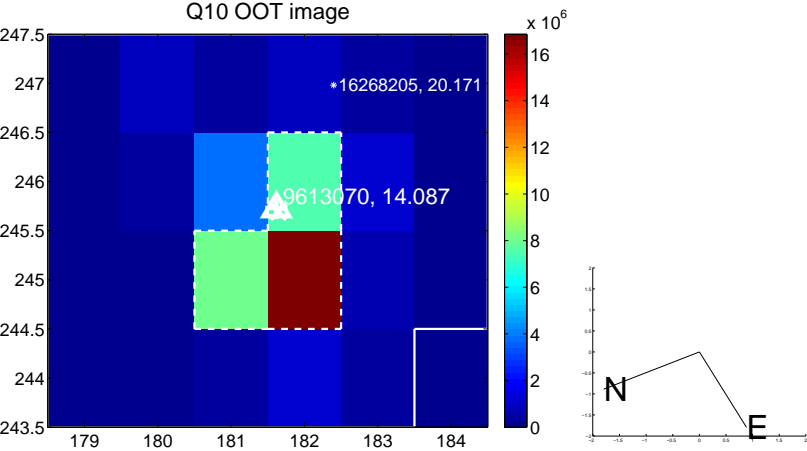
Q9 no OOT image



Q10 difference image



Q10 OOT image



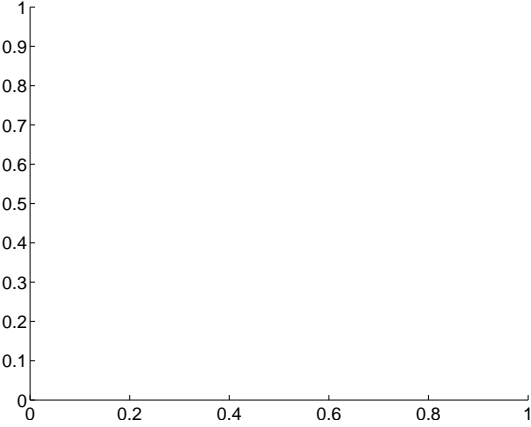
Q11 no difference image



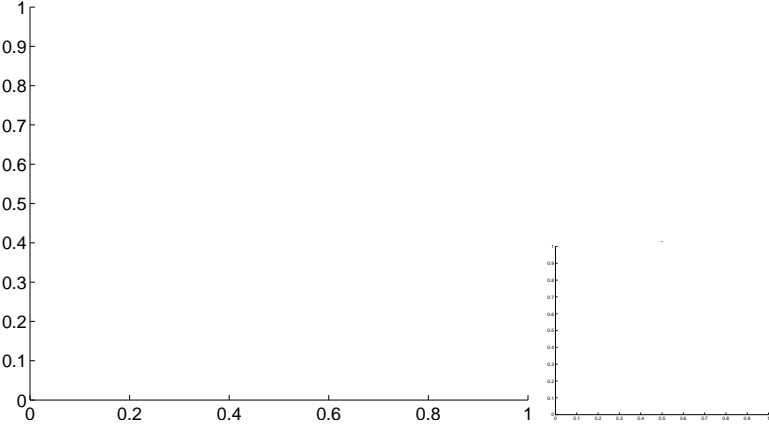
Q11 no OOT image



Q12 no difference image



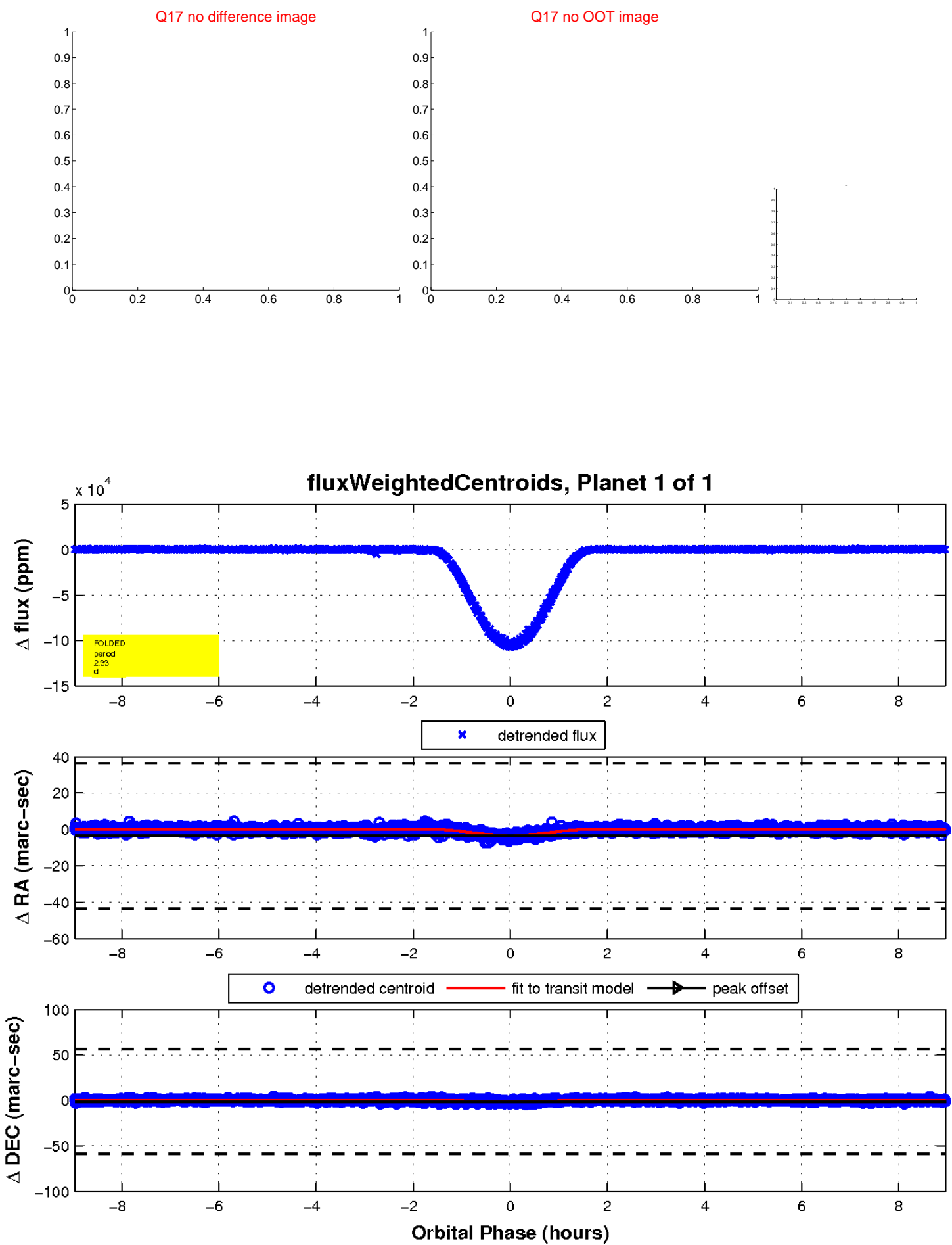
Q12 no OOT image



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

