

# KIC 008410637

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008410637-01	OBS	No	408.328488	157.624436	93102.9	63.082	195.8	496.5	9.86	4697	289.61	25.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008410637-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—CENT_SATURATED

**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.

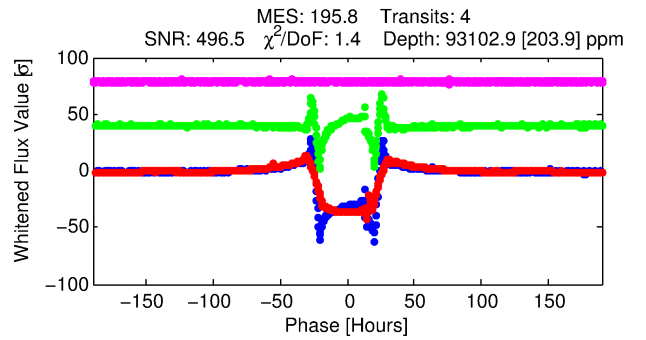
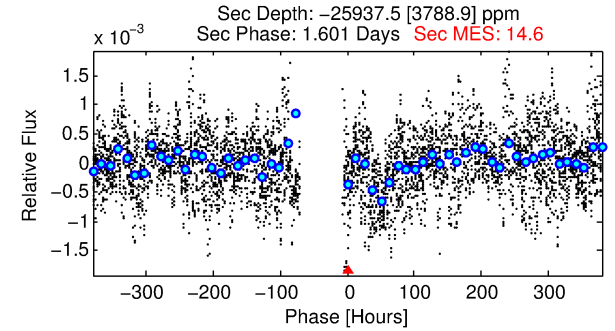
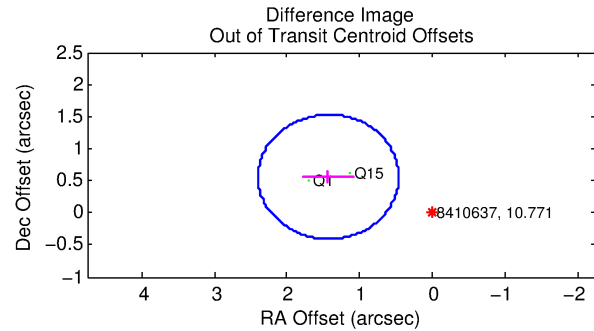
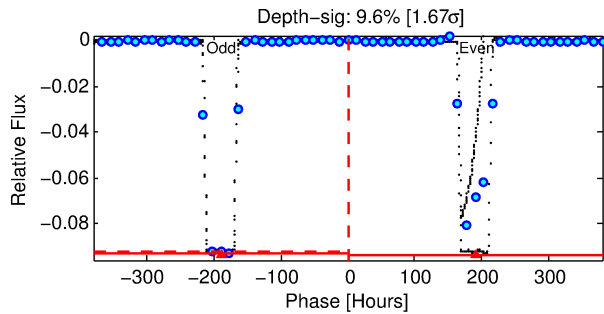
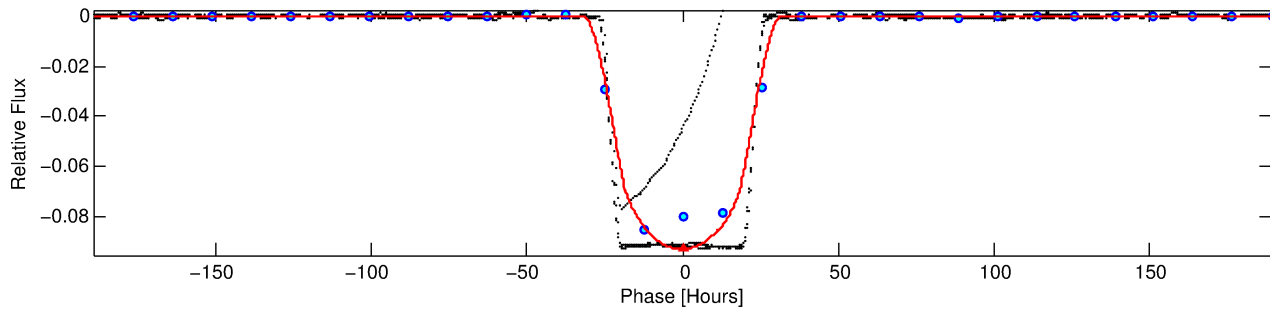
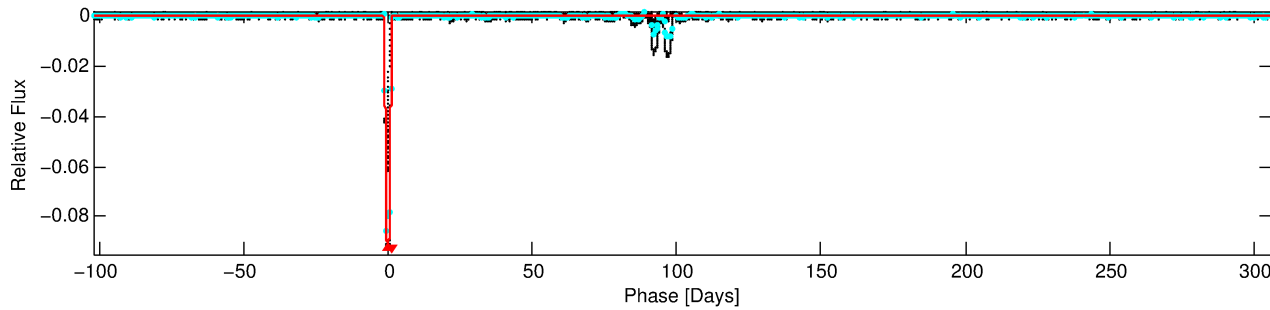
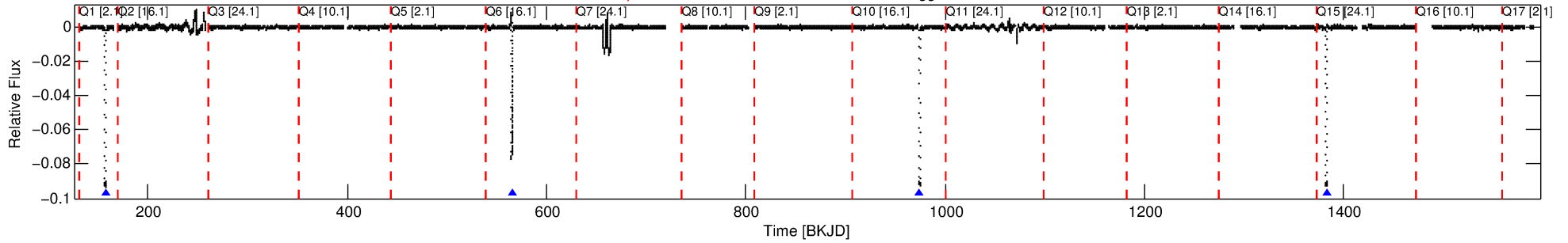
## Ephemeris Match Information For 008410637-01

No Significant Match Found

# DV One-Page Summary

KIC: 8410637 Candidate: 1 of 1 Period: 408.328 d

Kp: 10.77 R\*: 9.86 Rs Teff: 4697.0 K Logg: 2.68 Fe/H: 0.100



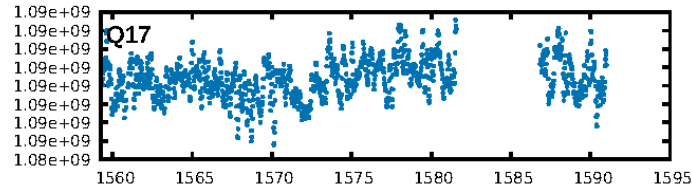
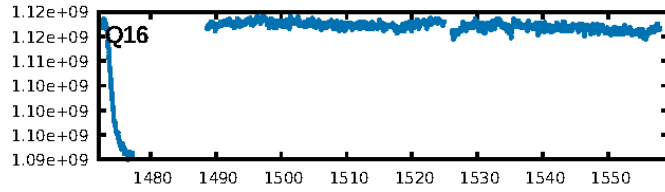
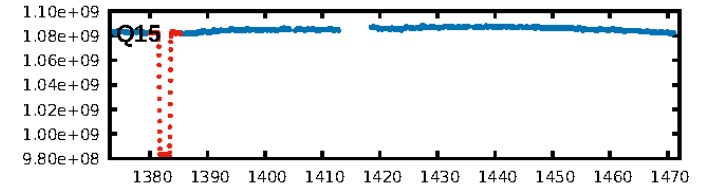
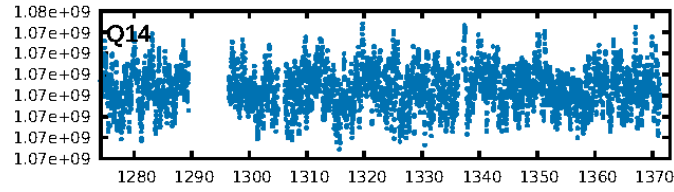
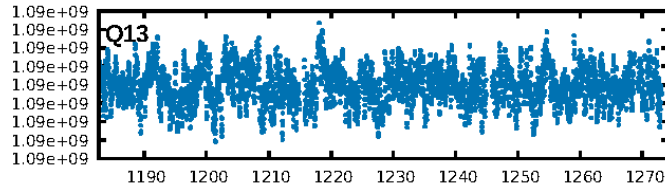
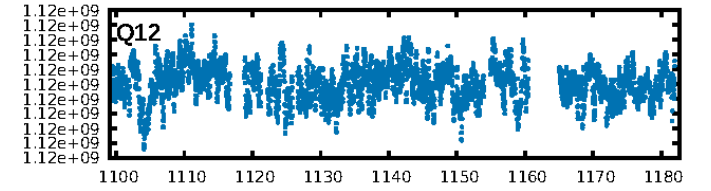
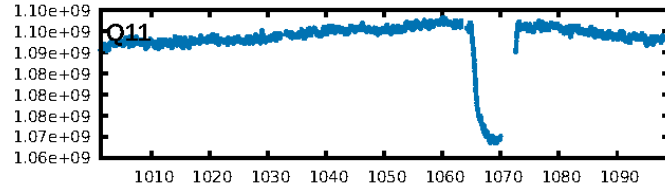
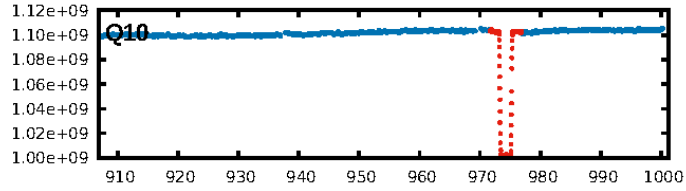
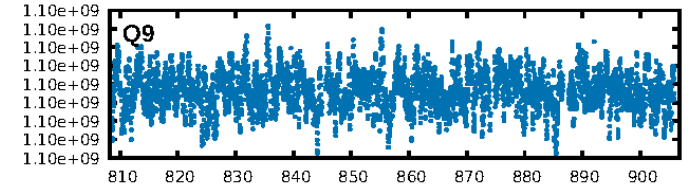
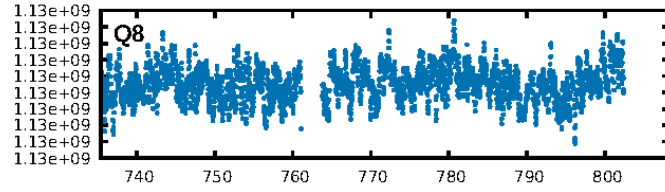
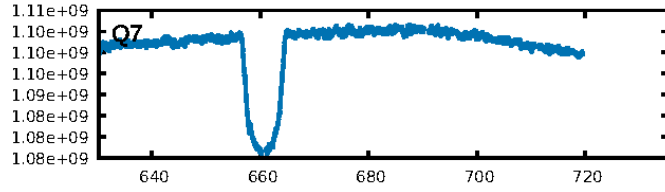
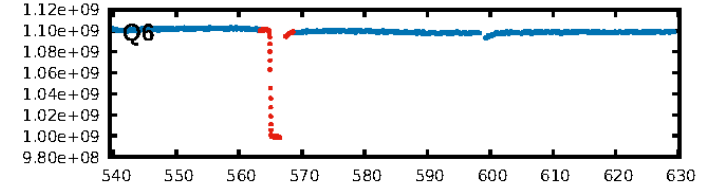
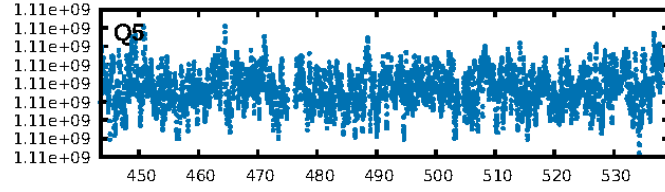
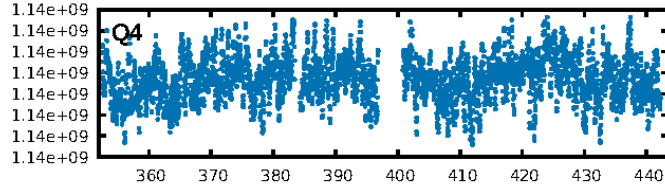
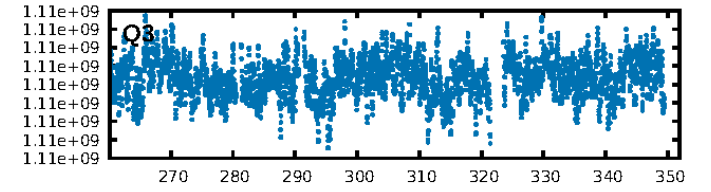
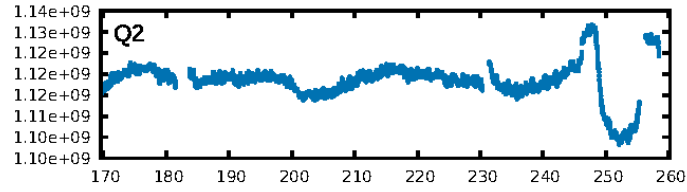
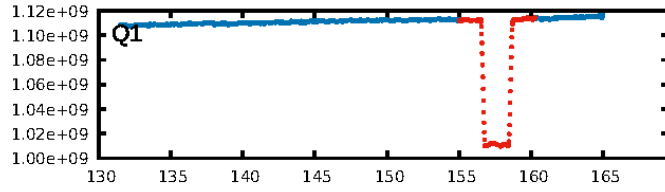
## DV Fit Results:

Period = 408.32849 [0.00100] d  
Epoch = 157.6244 [0.0021] BKJD  
Rp/R\* = 0.2693 [0.0004]  
a/R\* = 62.77 [0.21]  
b = 0.00 [1.63]  
Seff = 25.74 [8.23]  
Teq = 574 [46] K  
Rp = 289.61 [78.77] Re  
a = 1.2829 [0.2837] AU  
Ag = N/A  
Teffp = N/A

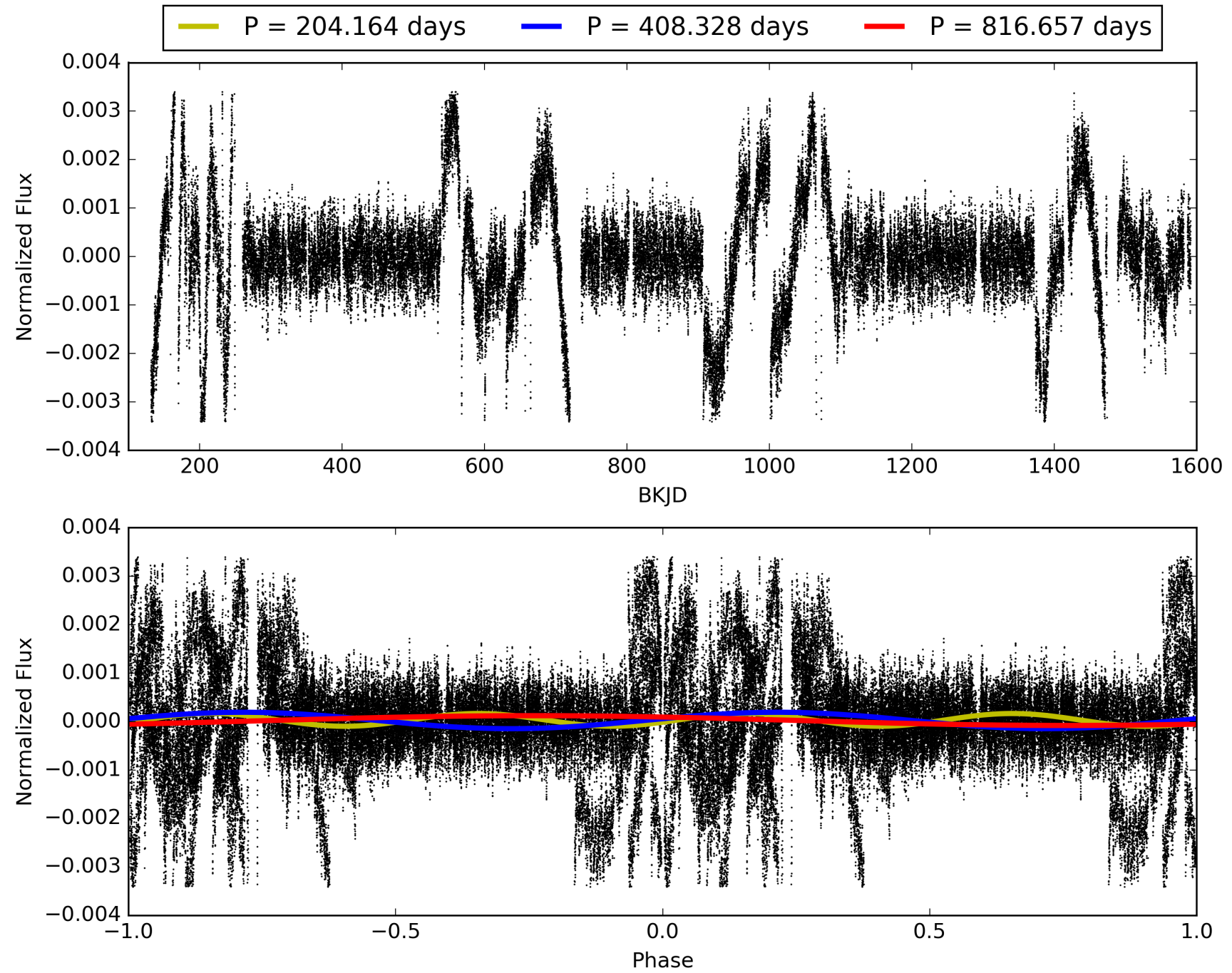
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.704  
Centroid-sig: 0.0%  
Centroid-so: 0.079 arcsec [28.62σ]  
OotOffset-rm: 1.538 arcsec [4.76σ]  
KicOffset-rm: 2.244 arcsec [5.82σ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 008410637-01, PDC Light Curves

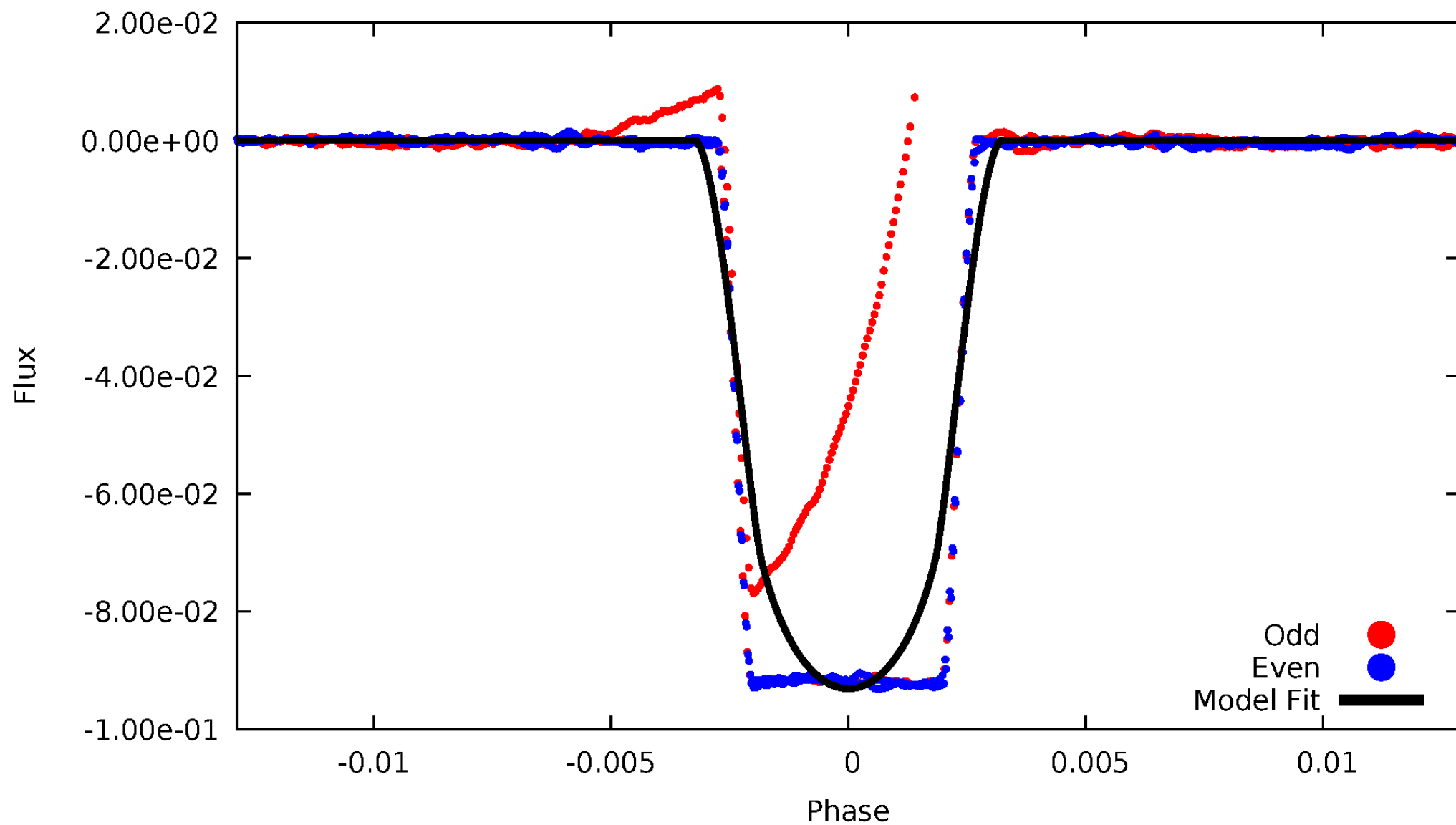


TCE 008410637-01



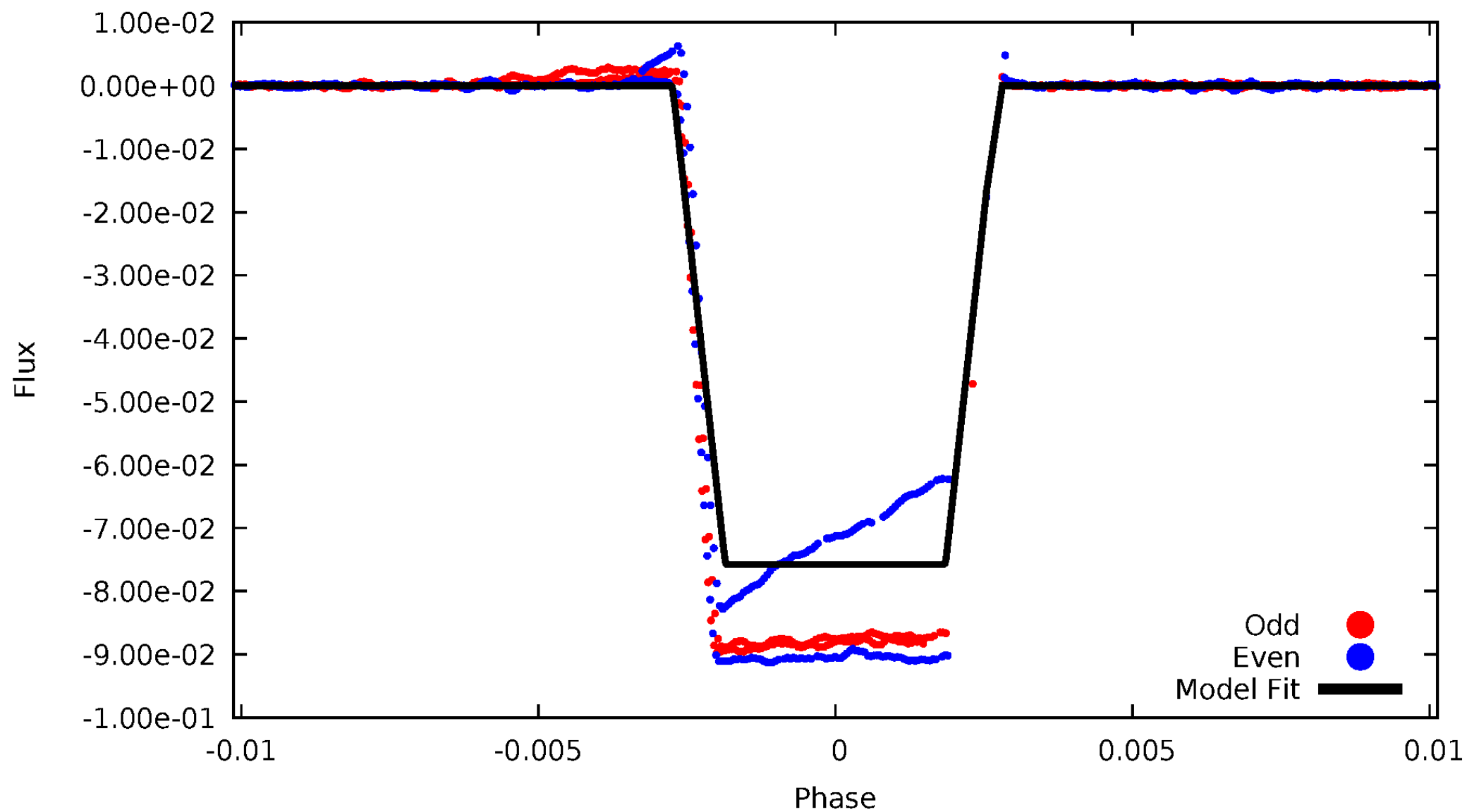
# DV Odd/Even

TCE 008410637-01



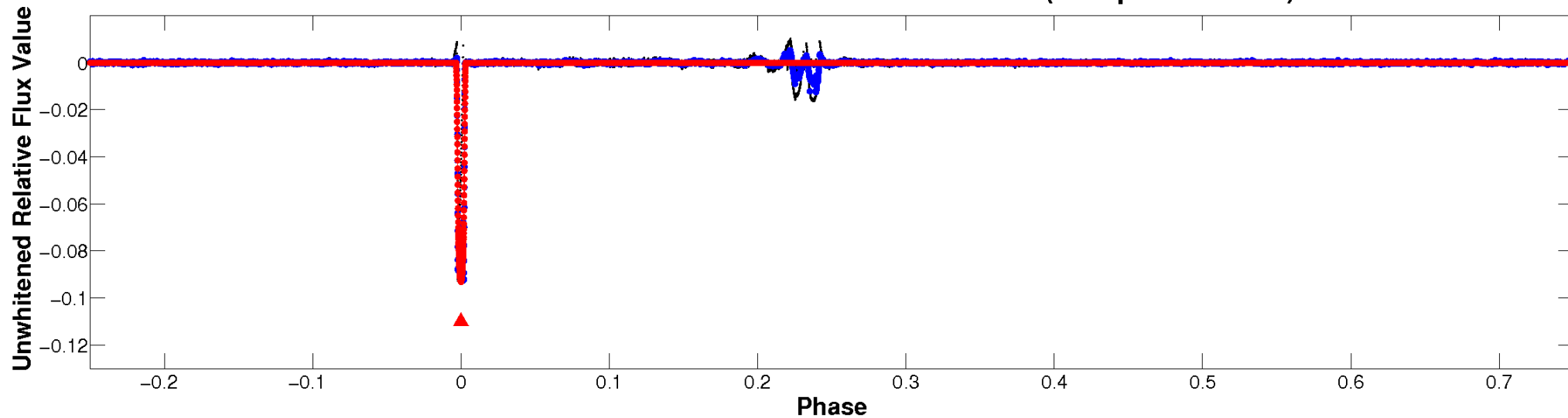
# ALT Odd/Even

TCE 008410637-01

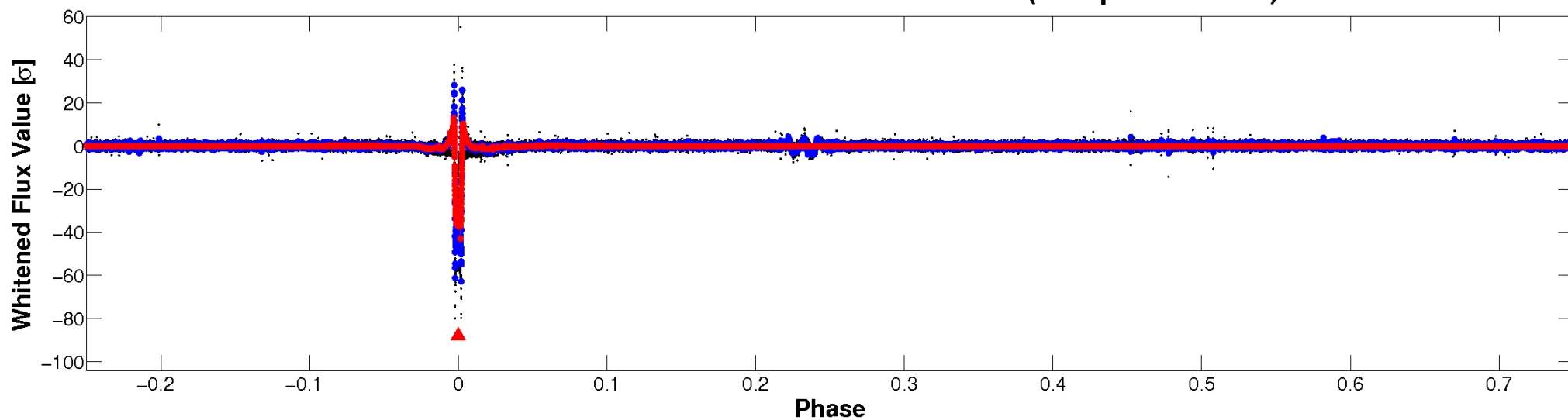


# Non-Whitened Vs. Whitened Light Curve

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

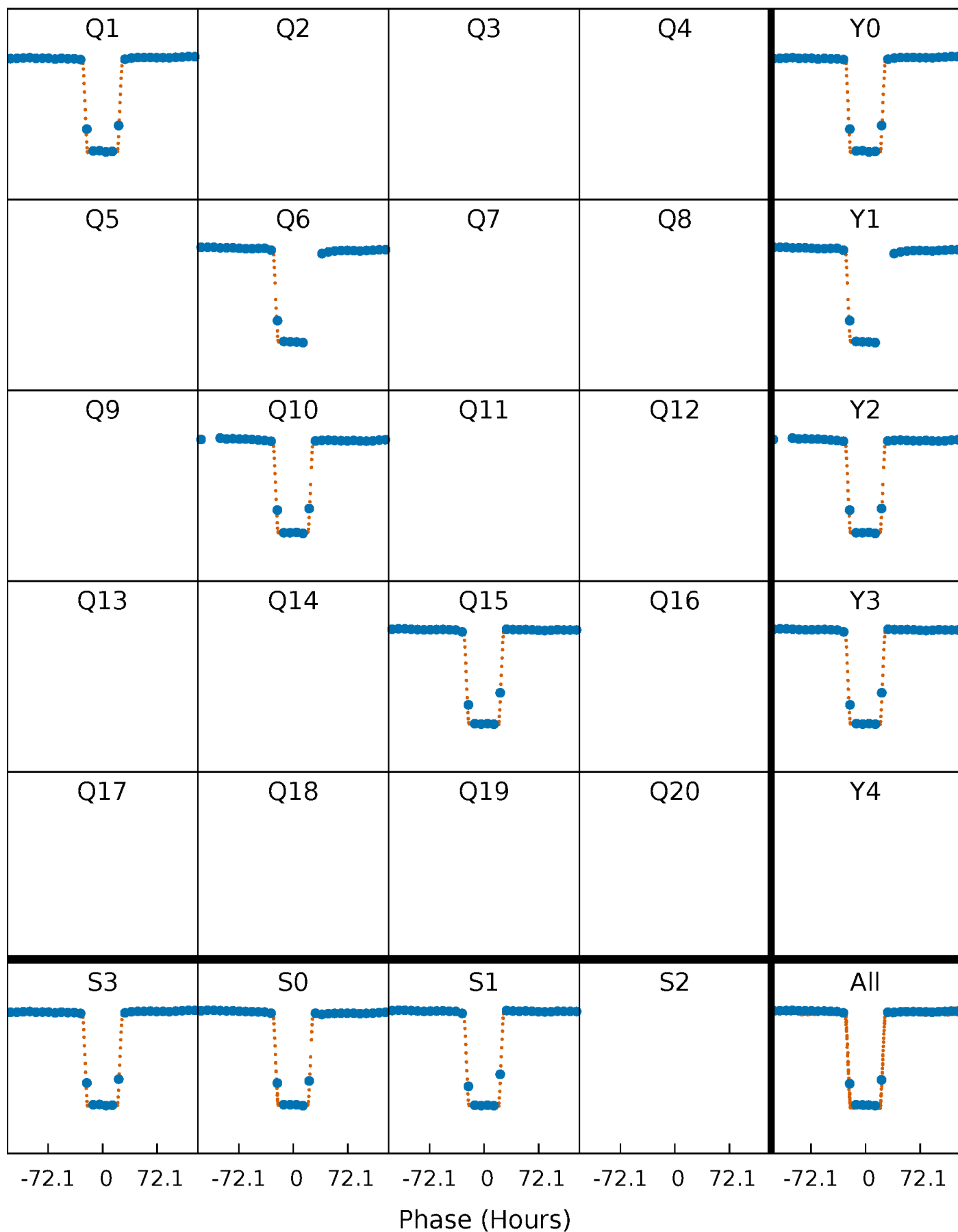


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

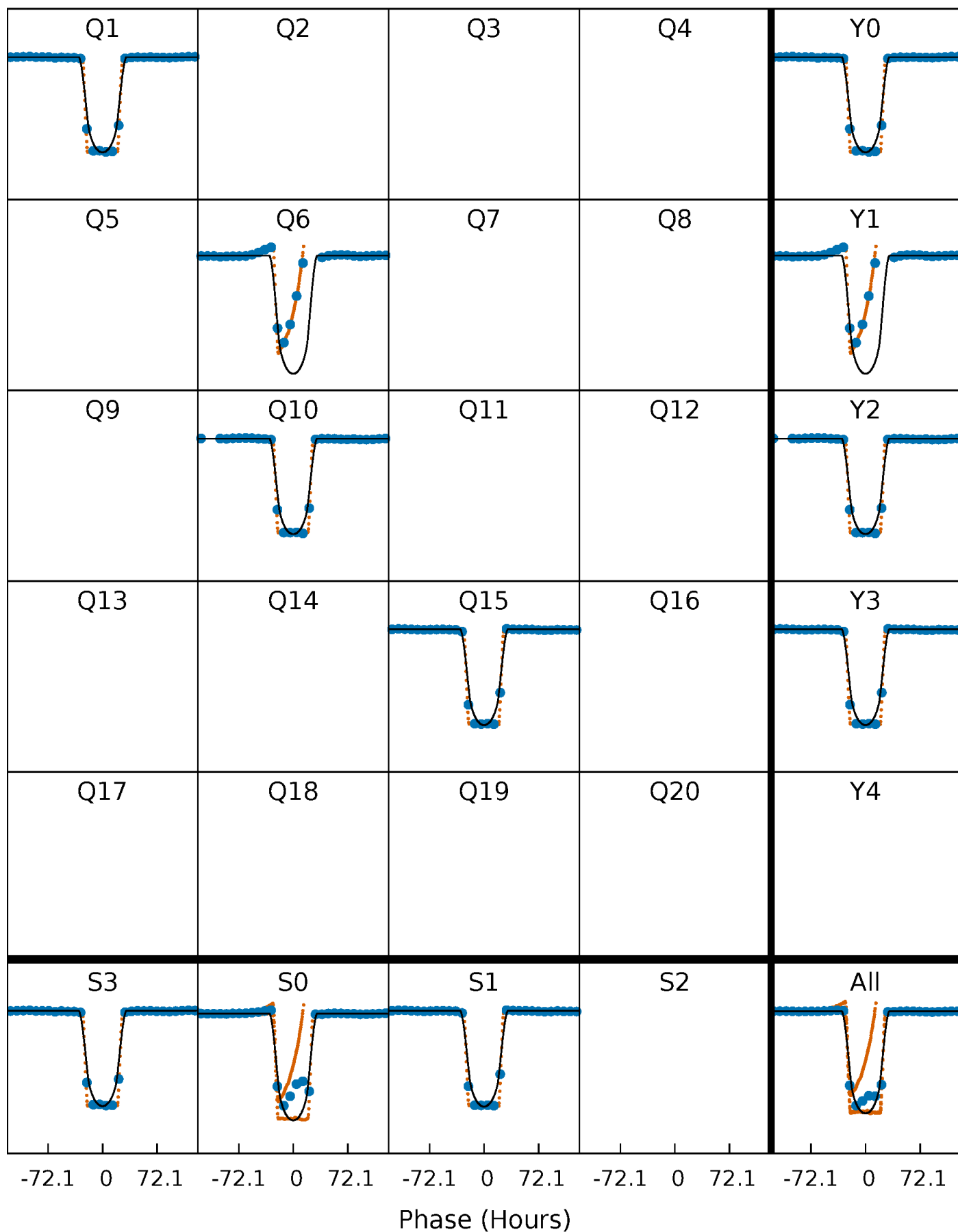
TCE 008410637-01 P=408.328487 Days  $T_0=157.624436$  (BKJD)





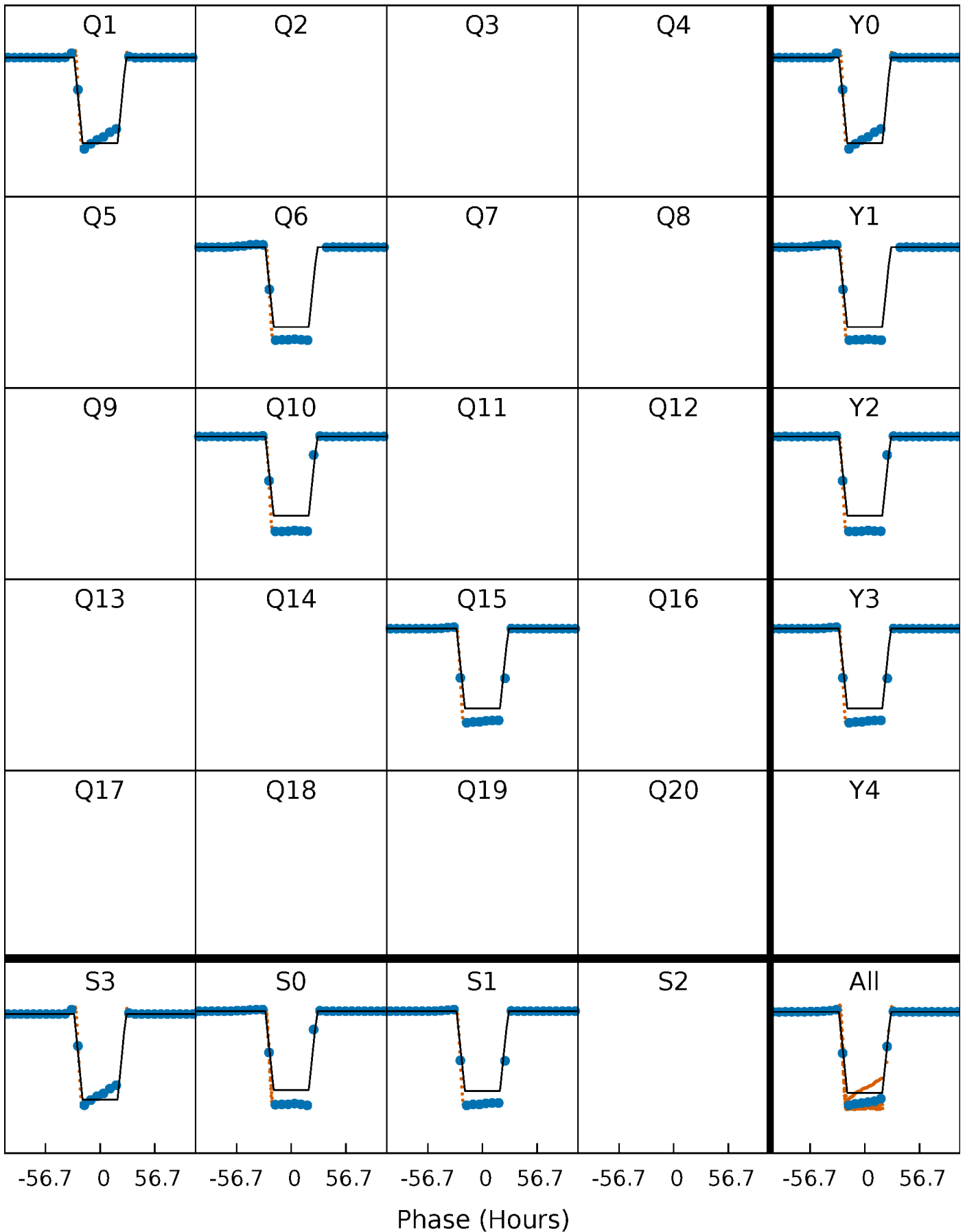
# DV Quarter-Phased Transit Curves

TCE 008410637-01 P=408.328487 Days  $T_0=157.624436$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

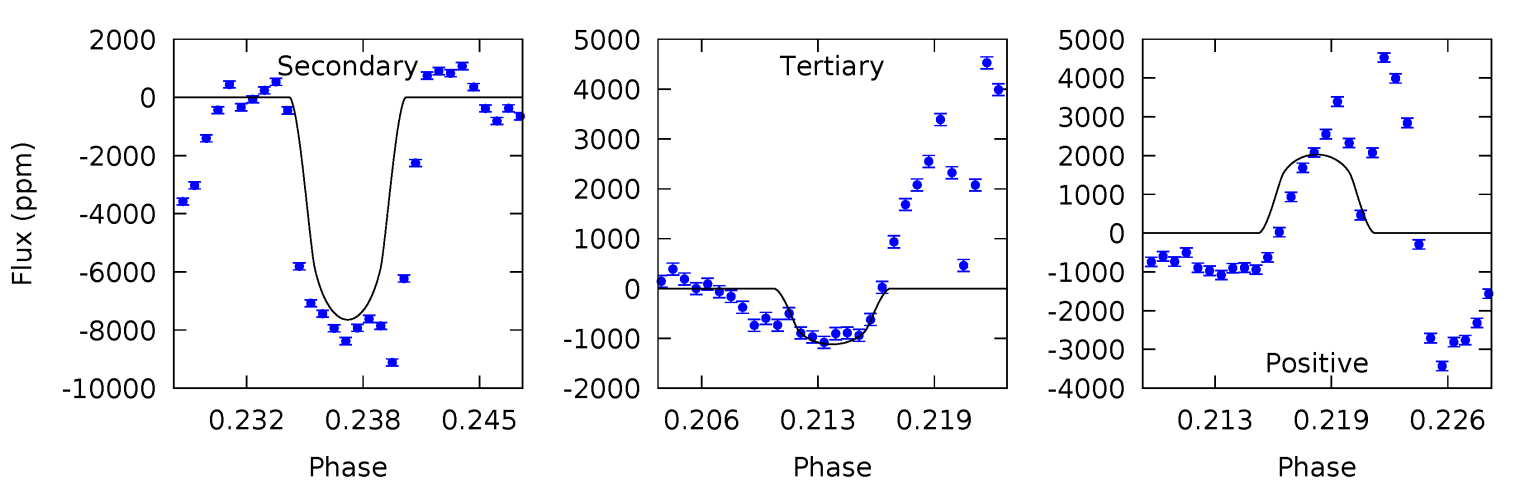
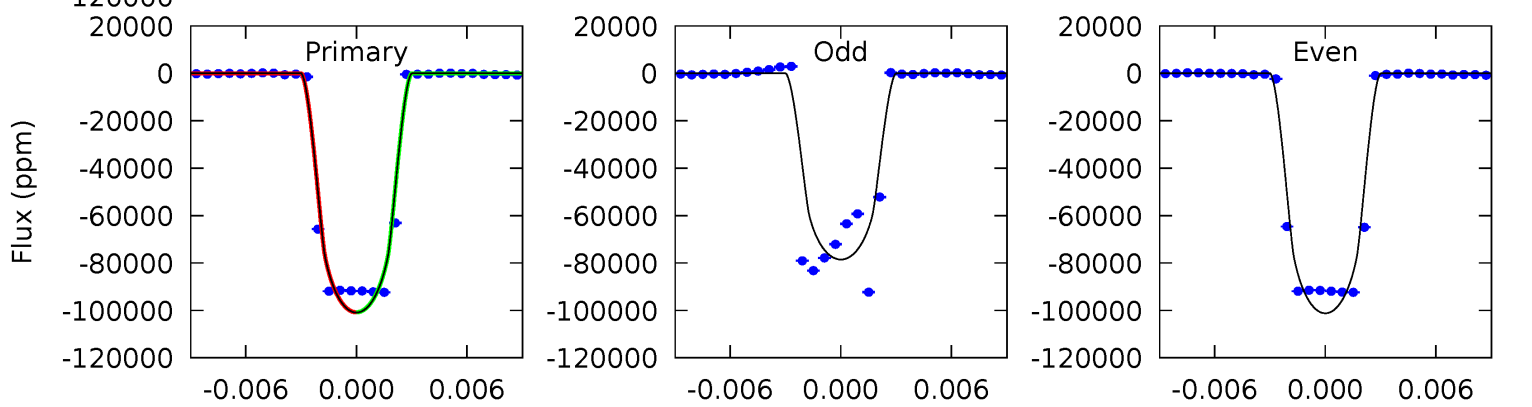
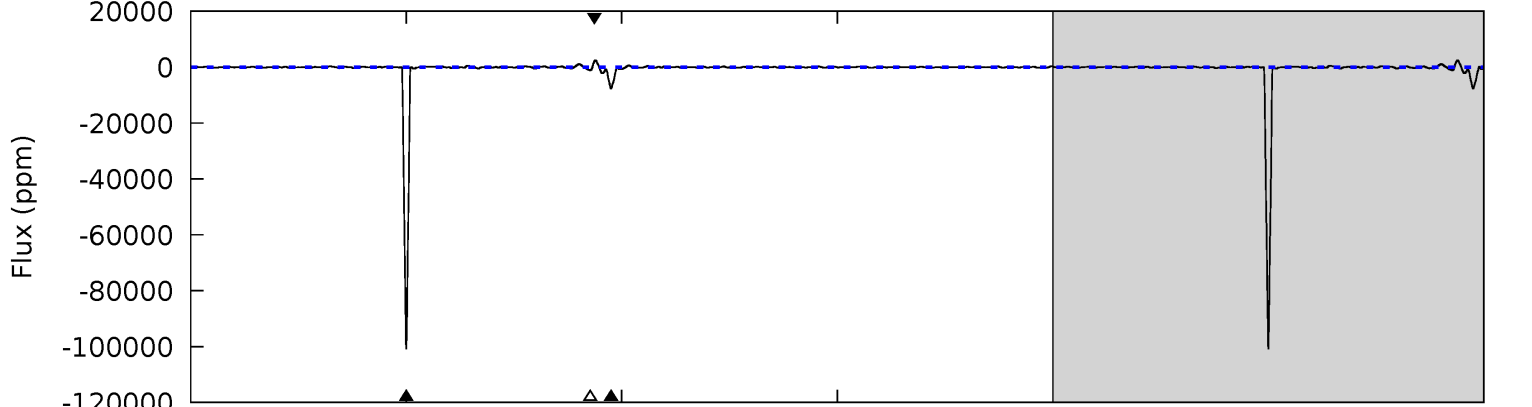
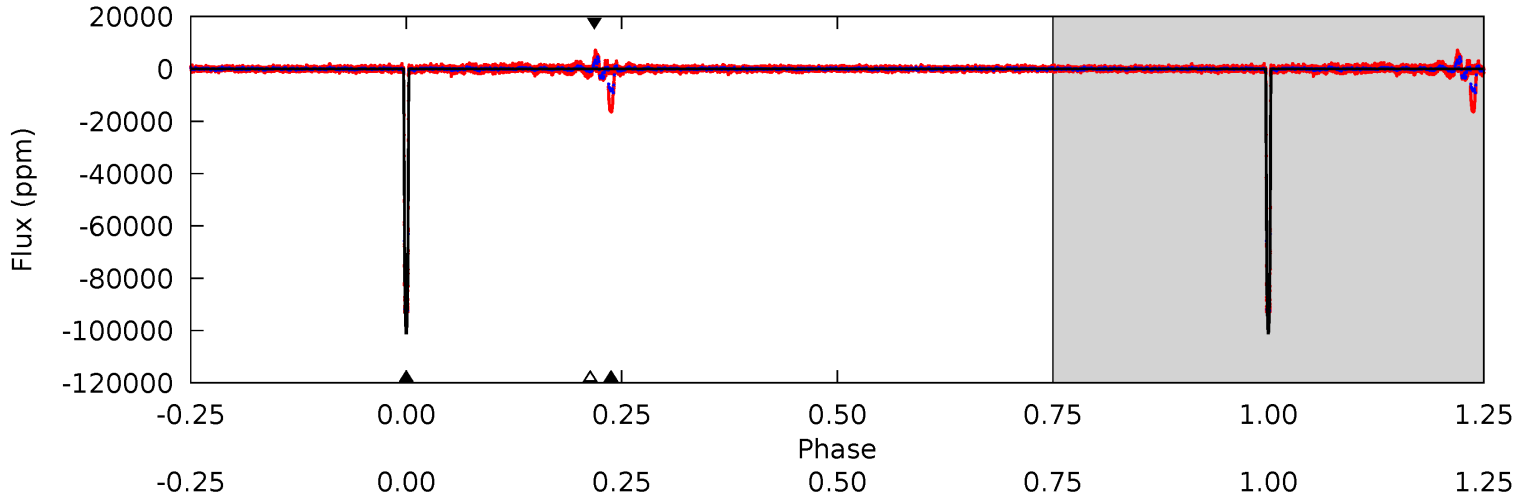
TCE 008410637-01 P=408.337452 Days  $T_0=157.584815$  (BKJD)



# DV Model-Shift Uniqueness Test

008410637-01, P = 408.328487 Days, E = 157.624436 Days

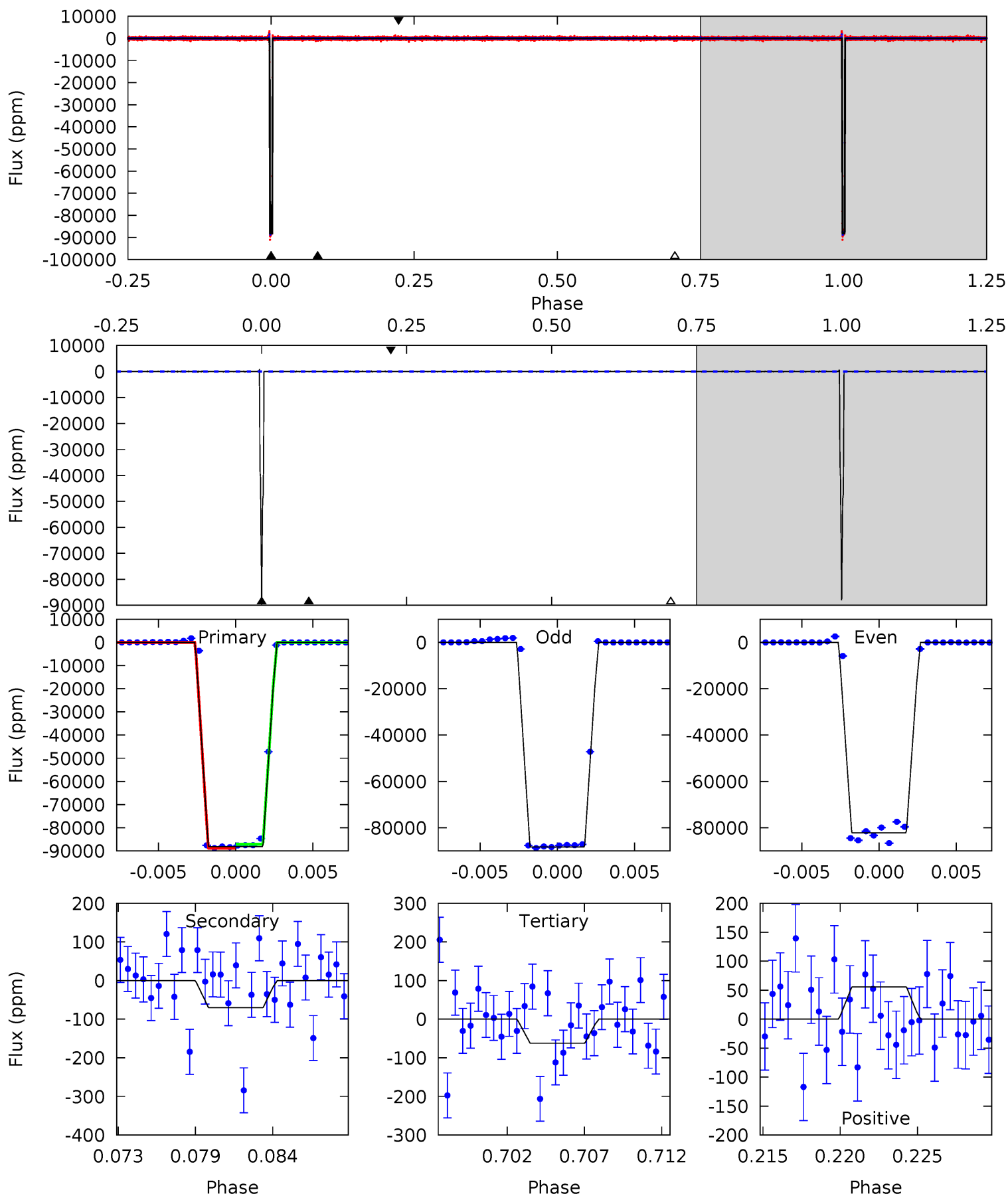
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3215	243.6	35.6	64.6	5.11	2.72	7.98	3179	3150	207.9	179.0	283.4	0.88	0.02	0



# Alt Model-Shift Uniqueness Test

008410637-01, P = 408.337452 Days, E = 157.584815 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
4415	3.51	3.12	2.79	5.15	2.79	0.65	4412	4412	0.39	0.72	206.7	0.96	0.01	0



### Stellar Parameters For KIC 008410637

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4697^{+63}_{-84}$	$2.678^{+0.165}_{-0.135}$	$0.100^{+0.100}_{-0.150}$	$9.857^{+1.444}_{-2.681}$	$1.687^{+0.280}_{-0.520}$	$0.002^{+0.003}_{-0.001}$
	+1%/-2%	+6%/-5%	+100%/-150%	+15%/-27%	+17%/-31%	+103%/-31%
Source	SPE74	SPE74	SPE74	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008410637-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-7644 \pm 31$	$295.44^{+28.92}_{-45.92}$	$804^{+38}_{-48}$	$3198^{+30}_{-40}$	$82^{+20}_{-13}$
Alt.	$-70 \pm 20$	$300.45^{+28.56}_{-45.66}$	$802^{+41}_{-49}$	$1740^{+70}_{-106}$	$0.722^{+0.297}_{-0.224}$

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

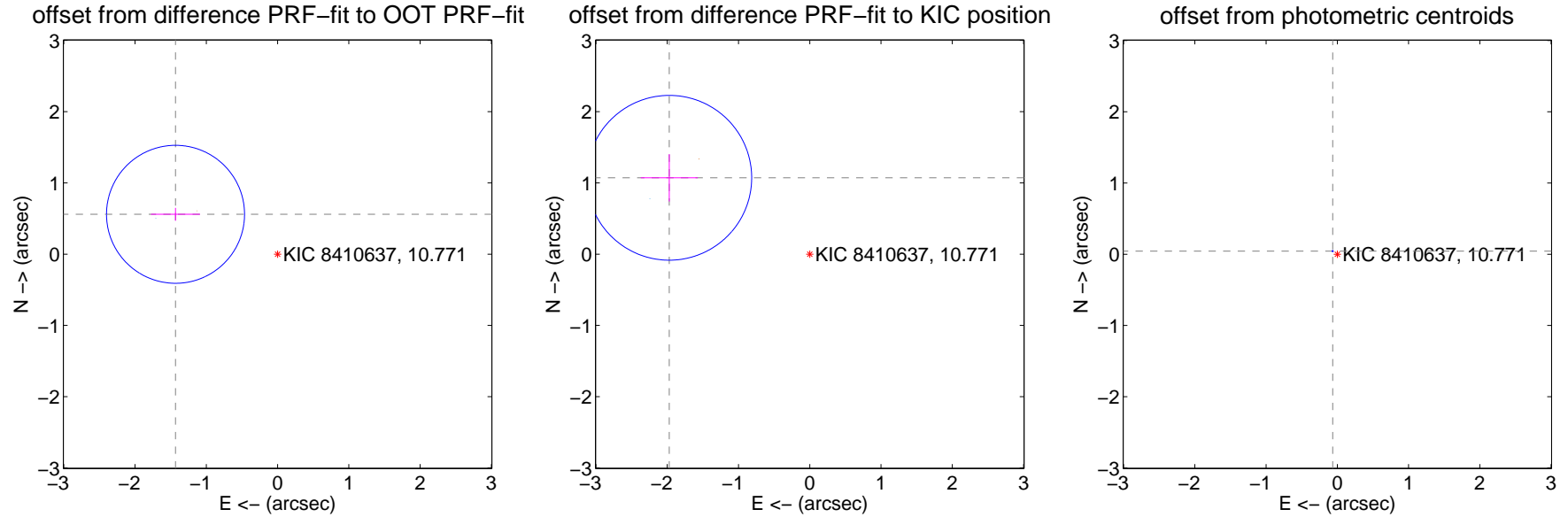
## DV Centroid Data

Supplemental centroid analysis for 008410637-01. **Kepler magnitude: 10.77.** Transit SNR 496.48

**There are 1 quarters with good PRF difference image offsets**

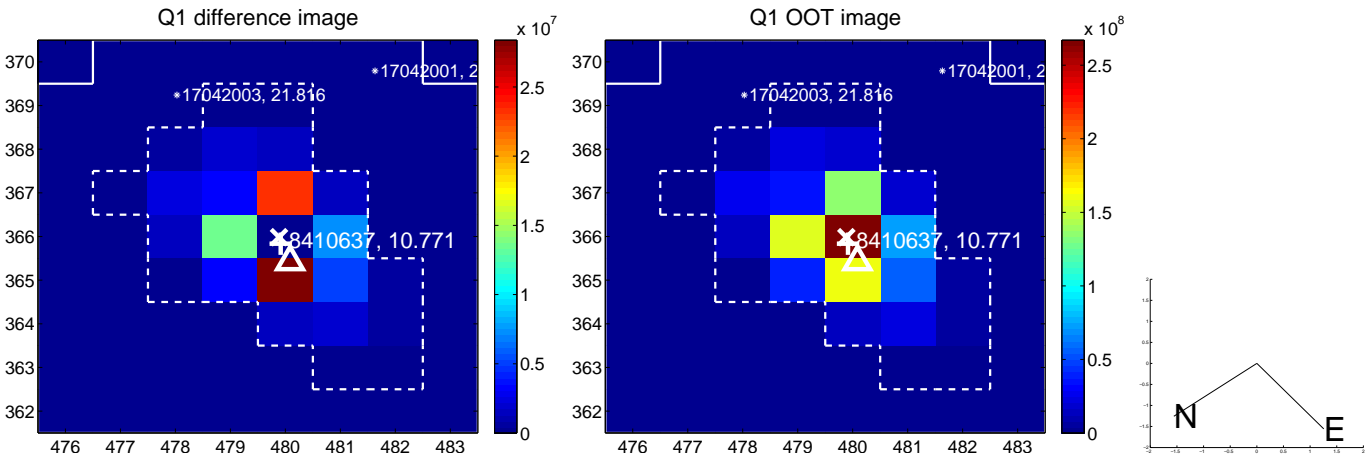
The direct PRF centroid is offset from the target star catalog position by about 0.84 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>1.538 \pm 0.323</math></b>	<b>4.76</b>	$1.432 \pm 0.345$	$0.559 \pm 0.091$
PRF-fit source offset from KIC position	<b><math>2.244 \pm 0.386</math></b>	<b>5.82</b>	$1.972 \pm 0.400$	$1.072 \pm 0.332$
photometric centroid source offset	<b><math>0.08 \pm 0.00</math></b>	<b>28.62</b>	$0.07 \pm 0.00$	$0.04 \pm 0.00$



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.



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.

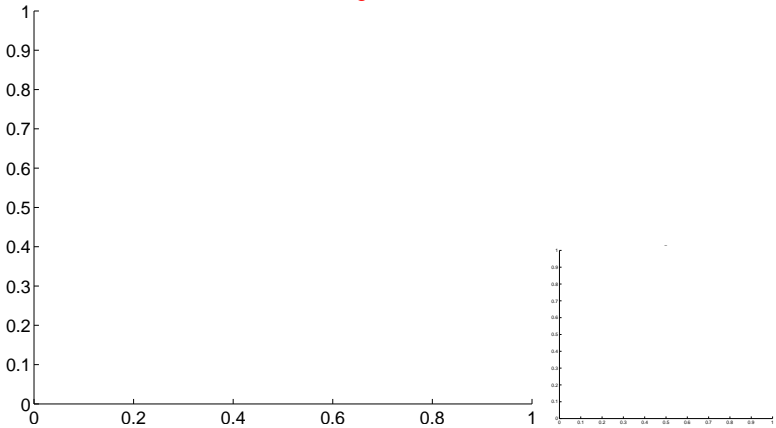


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q13 no difference image



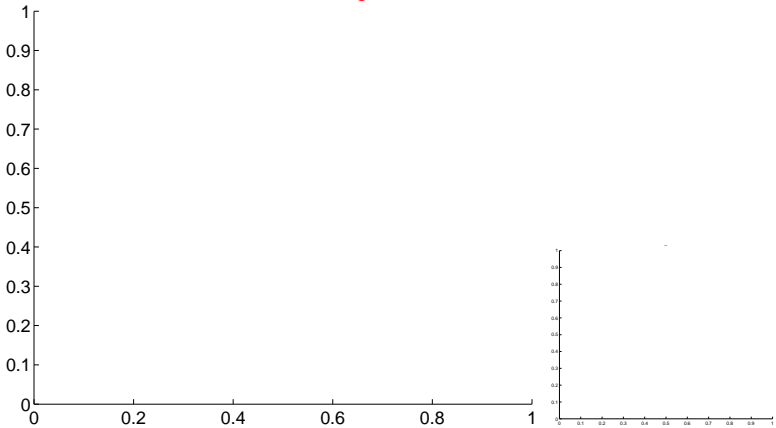
Q13 no OOT image



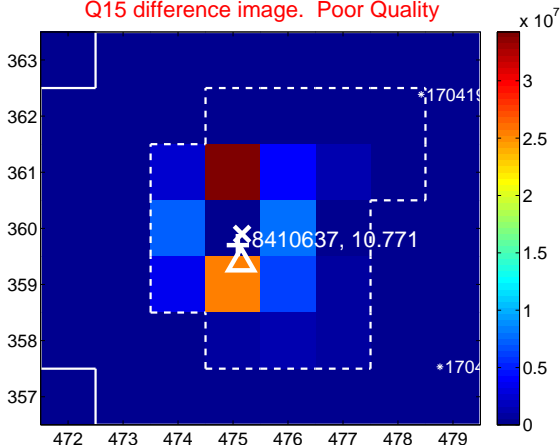
Q14 no difference image



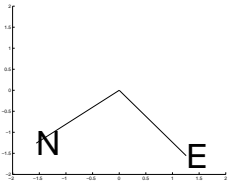
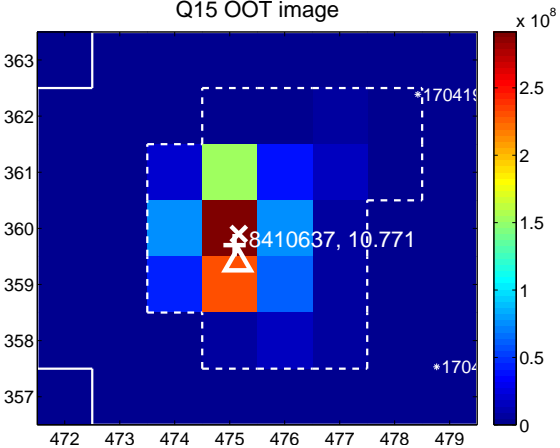
Q14 no OOT image



Q15 difference image. Poor Quality



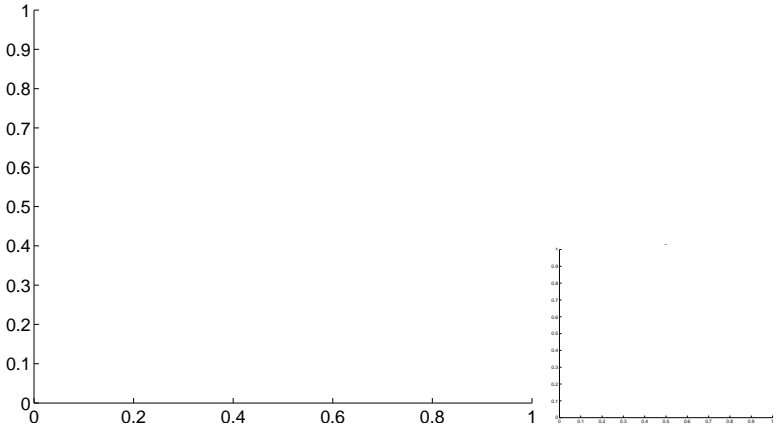
Q15 OOT image



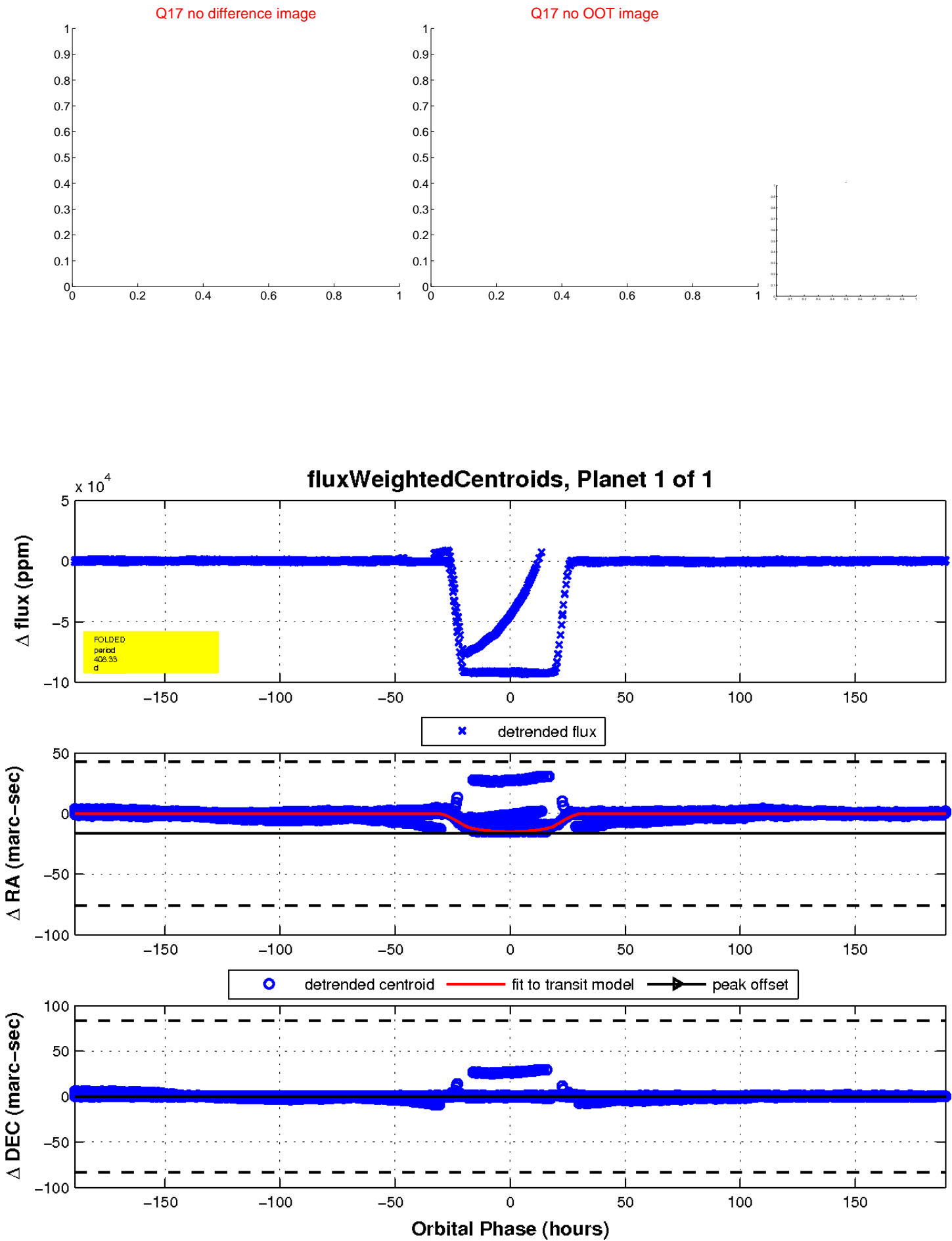
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

