

# KIC 004247991

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004247991-01	OBS	2311.03	104.352033	190.102117	272.6	3.815	12.6	13.2	0.87	5650	1.60	3.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004247991-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT

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

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

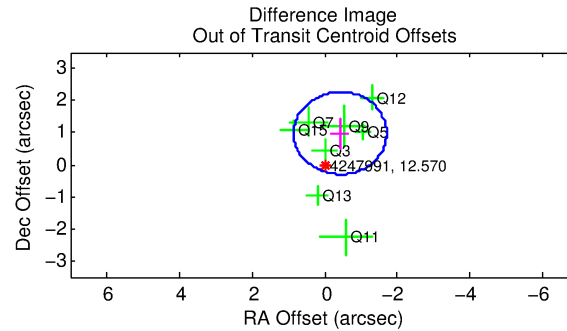
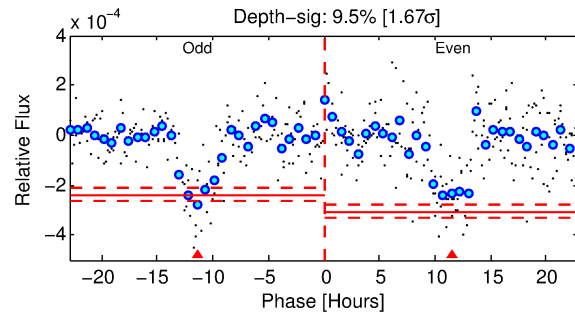
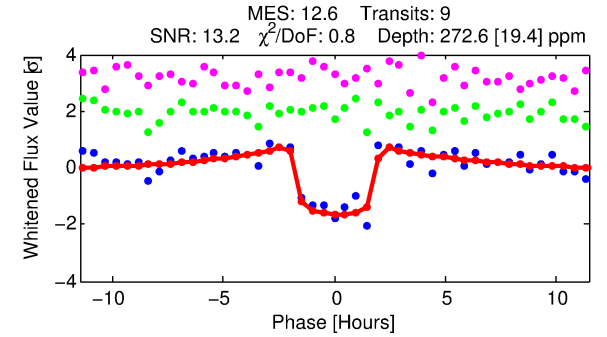
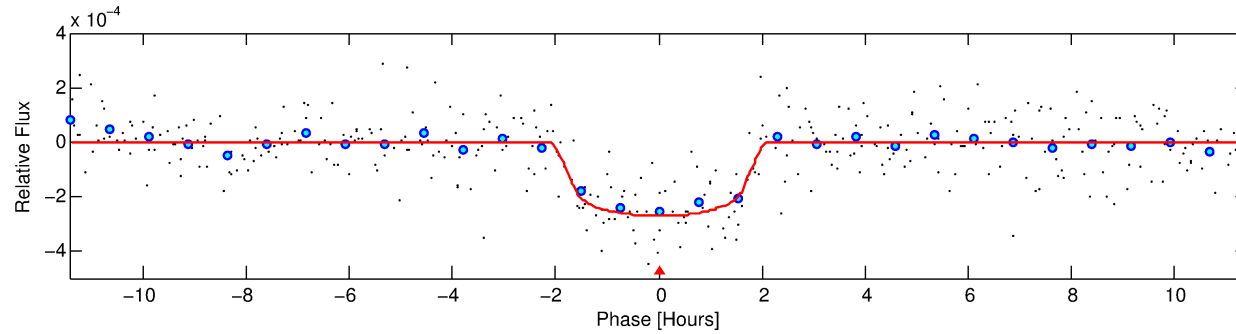
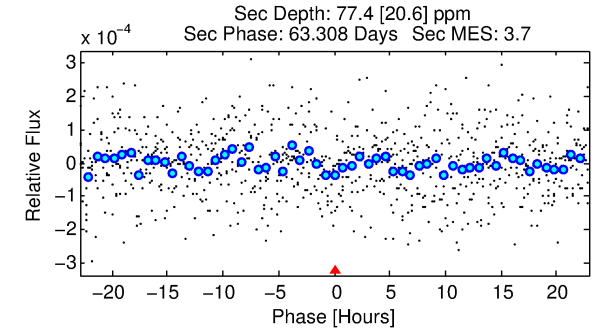
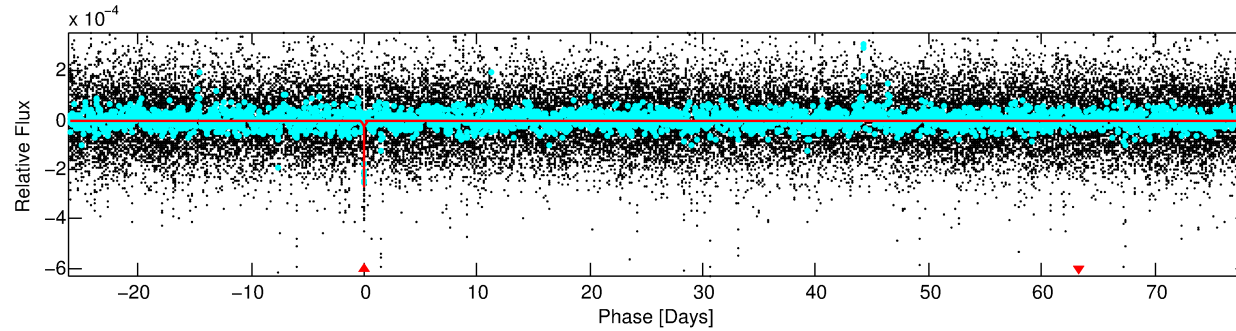
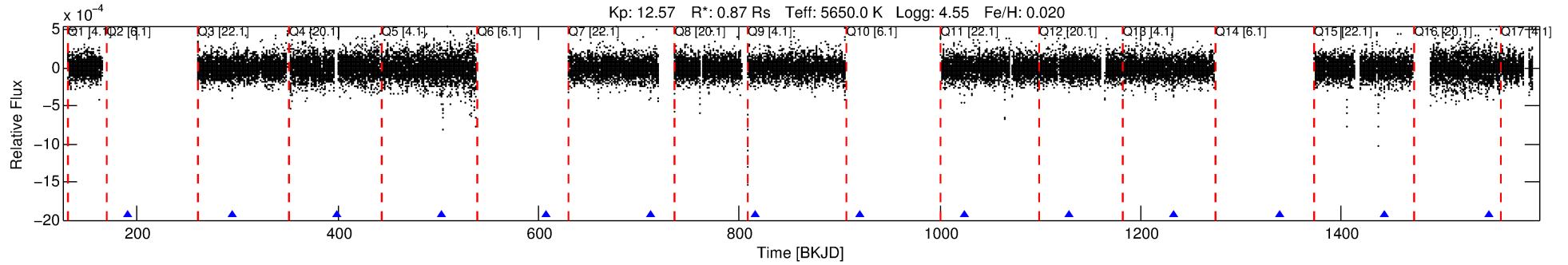
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004247991-01

No Significant Match Found

# DV One-Page Summary

KIC: 4247991 Candidate: 1 of 1 Period: 104.352 d  
KOI: K02311.03 Corr: 0.970



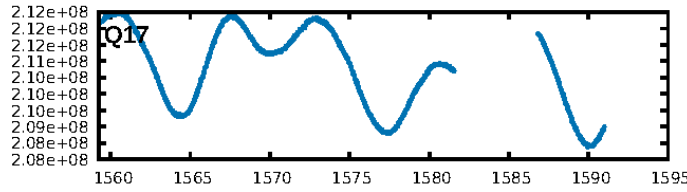
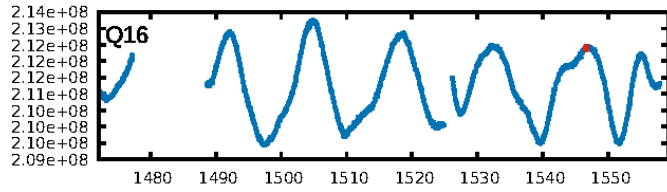
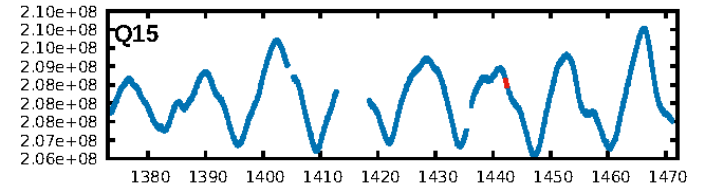
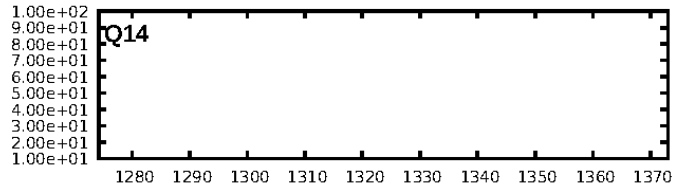
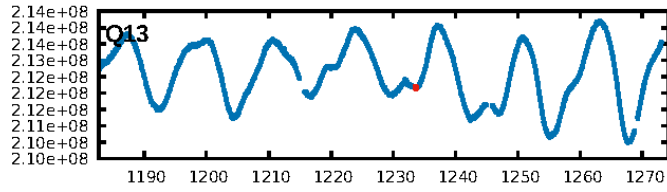
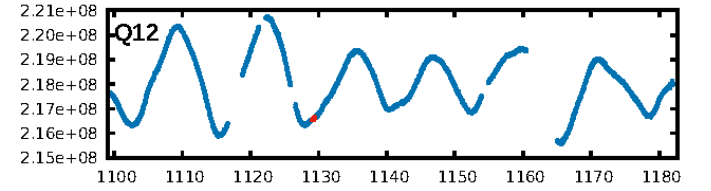
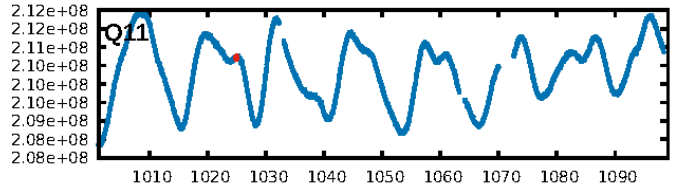
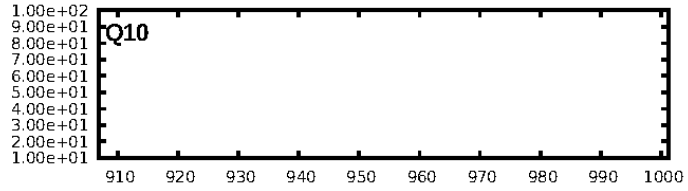
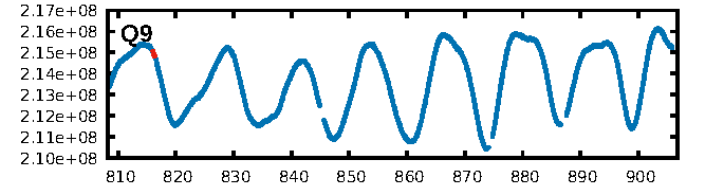
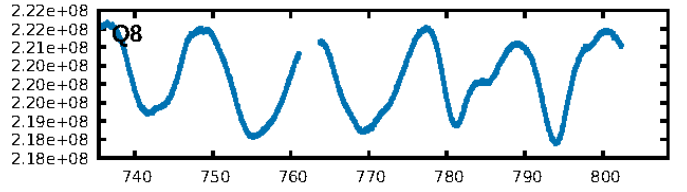
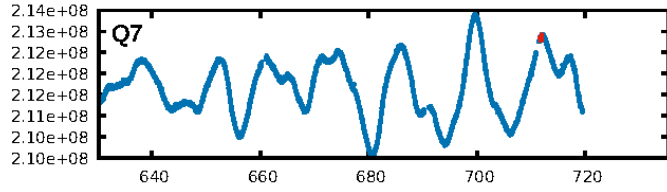
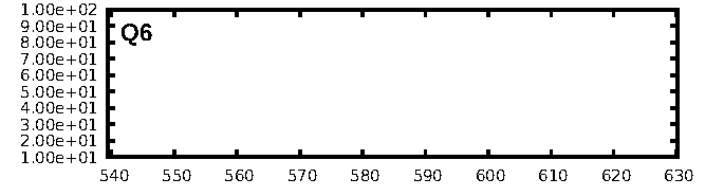
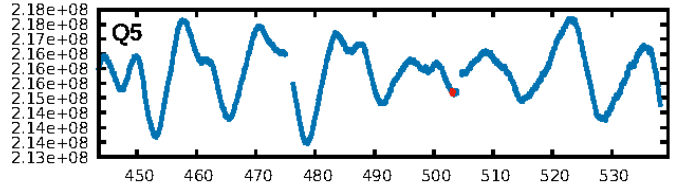
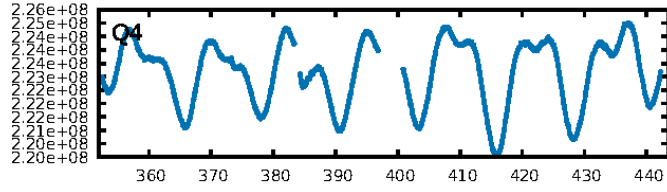
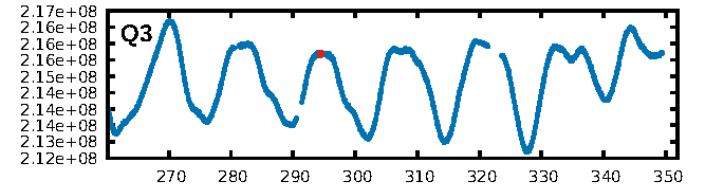
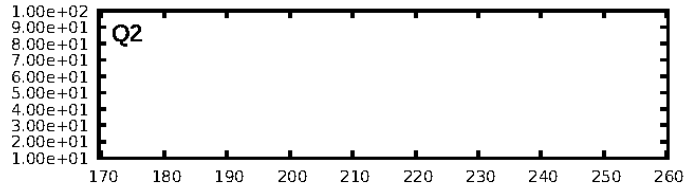
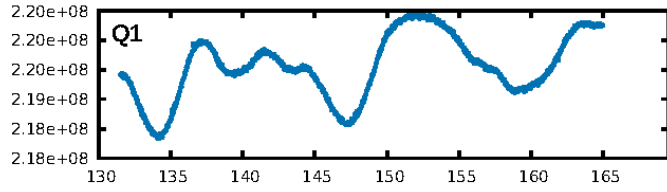
## DV Fit Results:

Period = 104.35203 [0.00063] d  
Epoch = 190.1021 [0.0052] BKJD  
Rp/R\* = 0.0169 [0.0068]  
a/R\* = 130.24 [227.99]  
b = 0.80 [0.78]  
Seff = 3.74 [0.83]  
Teq = 355 [20] K  
Rp = 1.60 [0.69] Re  
a = 0.4296 [0.0566] AU  
Ag = 3070.88 [2691.53] [1.14σ]  
Teffp = 4083 [873] K [4.27σ]

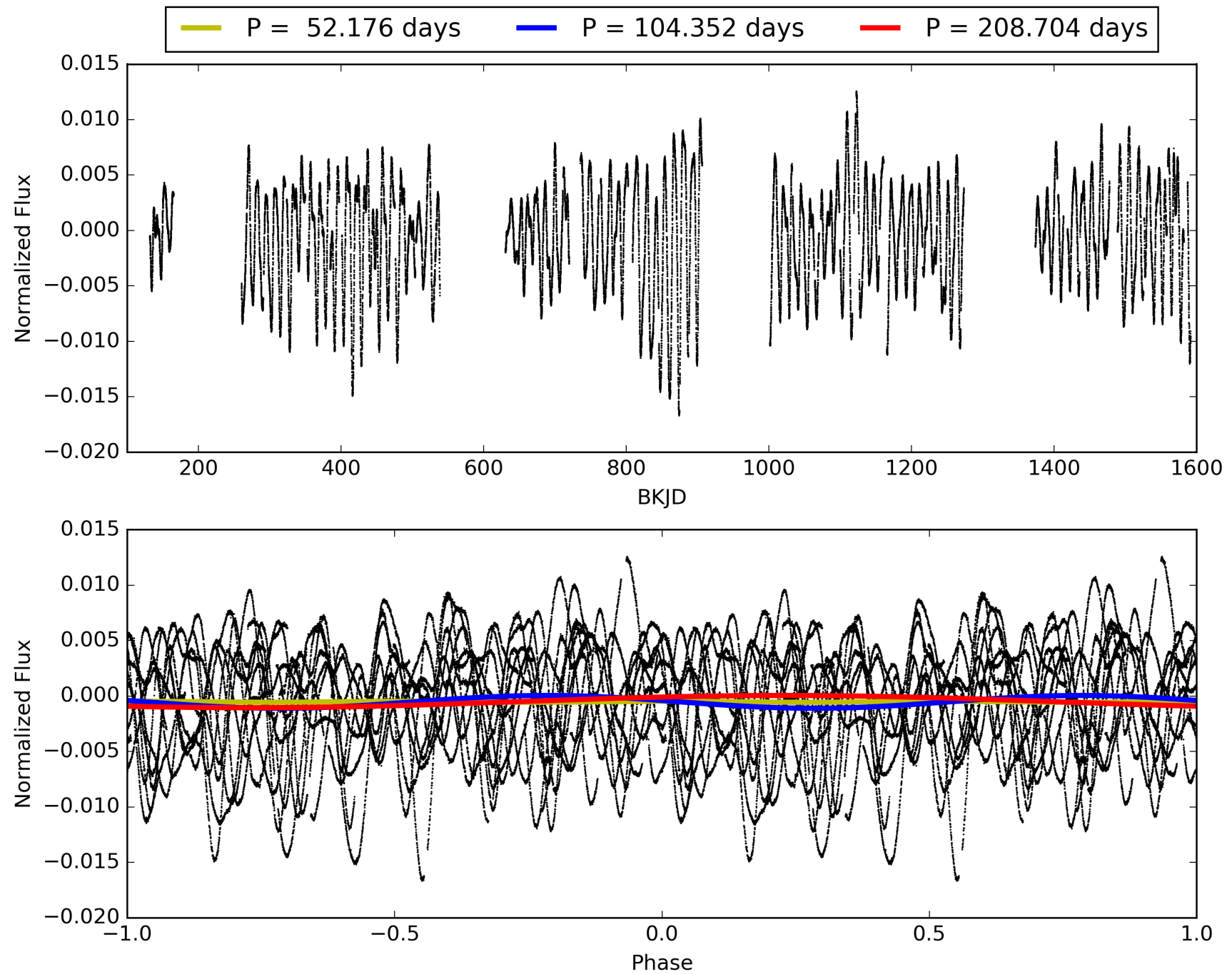
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 75.5%  
ModelChiSquareGof-sig: 99.6%  
Bootstrap-pfa: 5.59e-26  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 1.146  
Centroid-sig: 0.1%  
Centroid-so: 1.459 arcsec [2.22σ]  
OotOffset-rm: 1.069 arcsec [2.50σ]  
KicOffset-rm: 0.946 arcsec [2.15σ]  
OotOffset-st: 0/4/1/3 [8]  
KicOffset-st: 0/4/1/3 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [8/8]

## TCE 004247991-01, PDC Light Curves

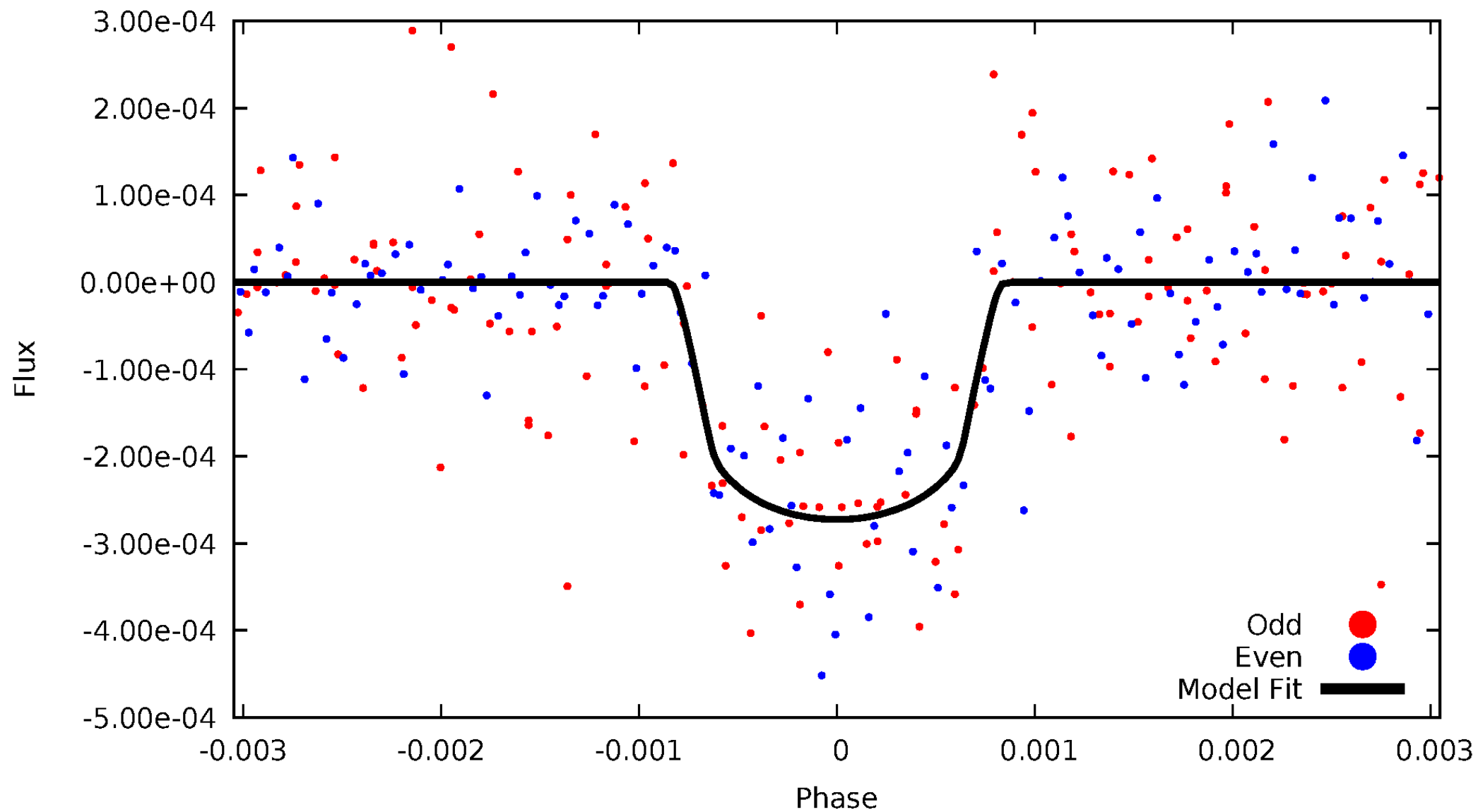


# TCE 004247991-01



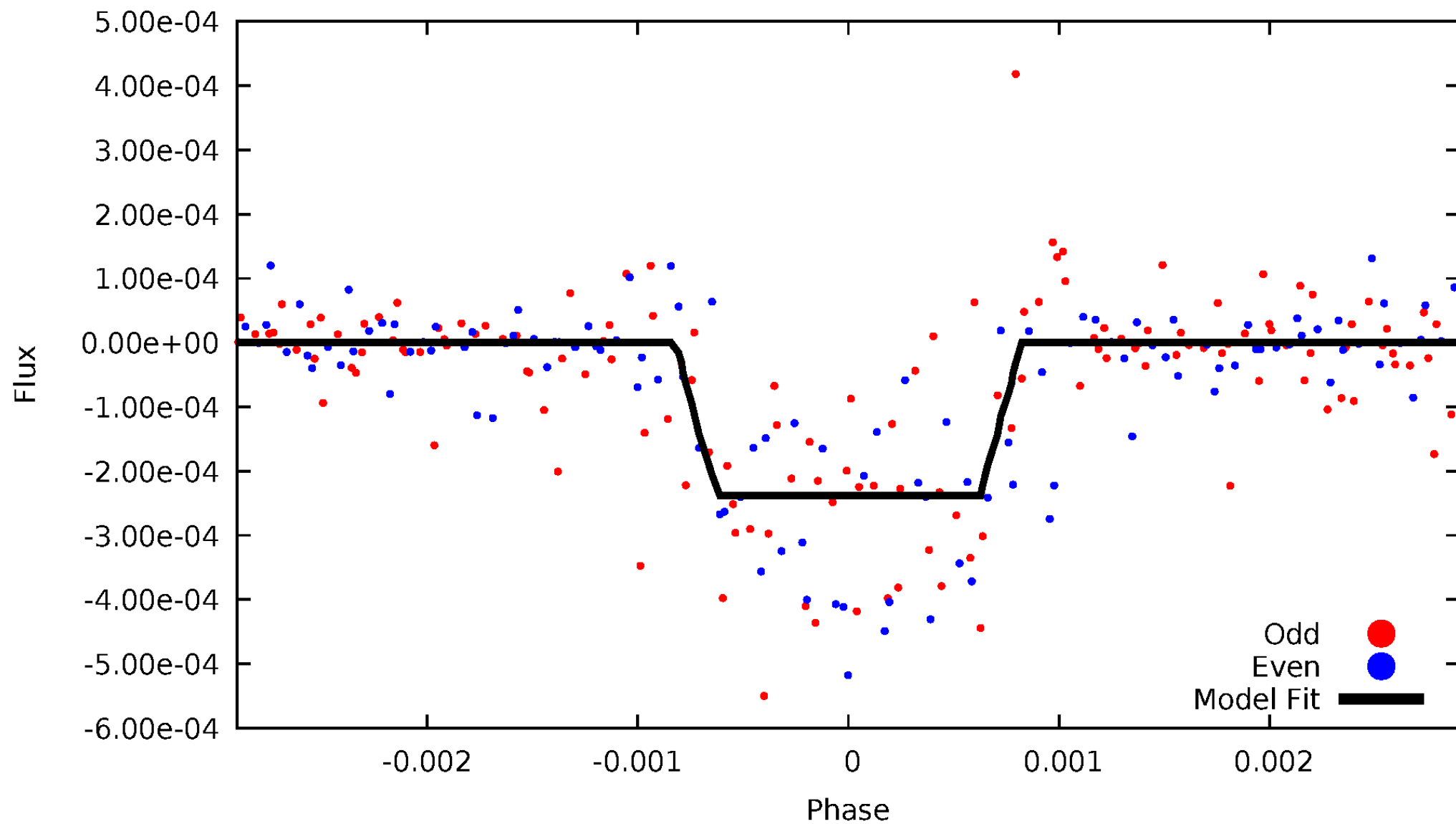
# DV Odd/Even

TCE 004247991-01



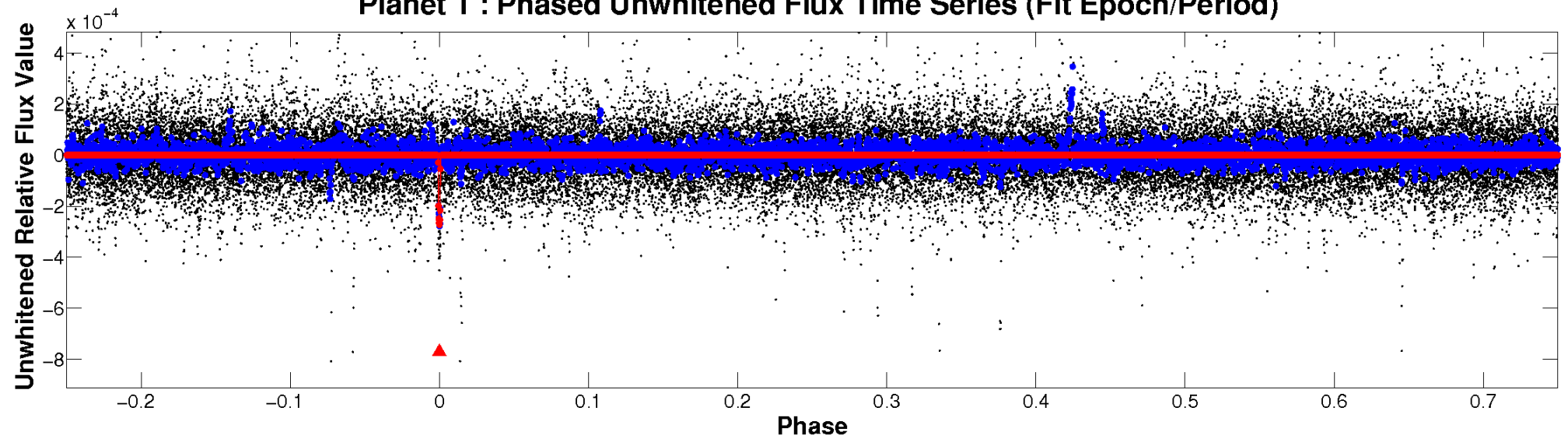
# ALT Odd/Even

TCE 004247991-01

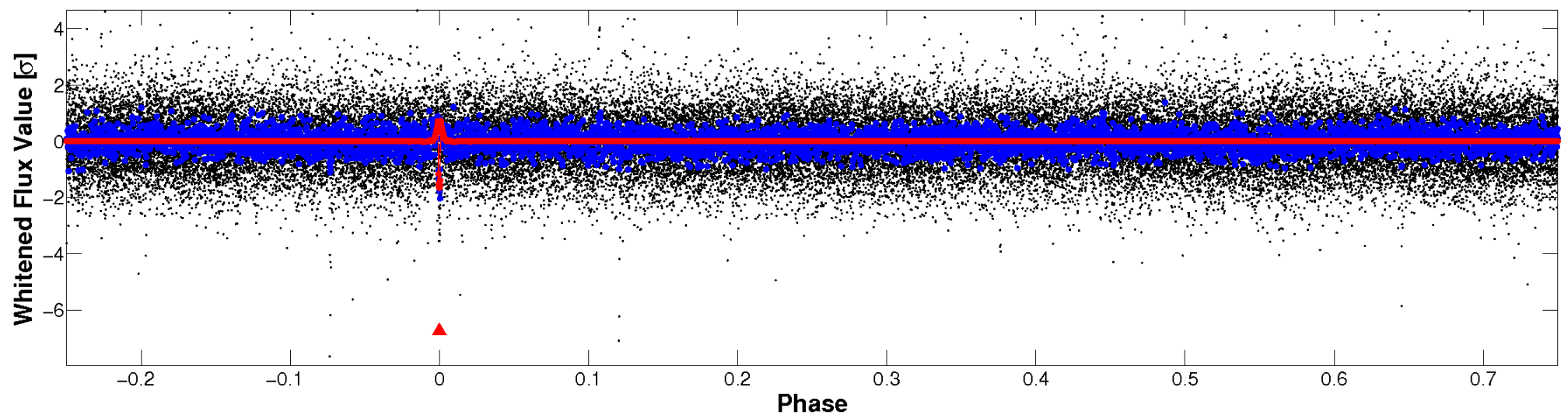


# Non-Whitened Vs. Whitened Light Curve

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

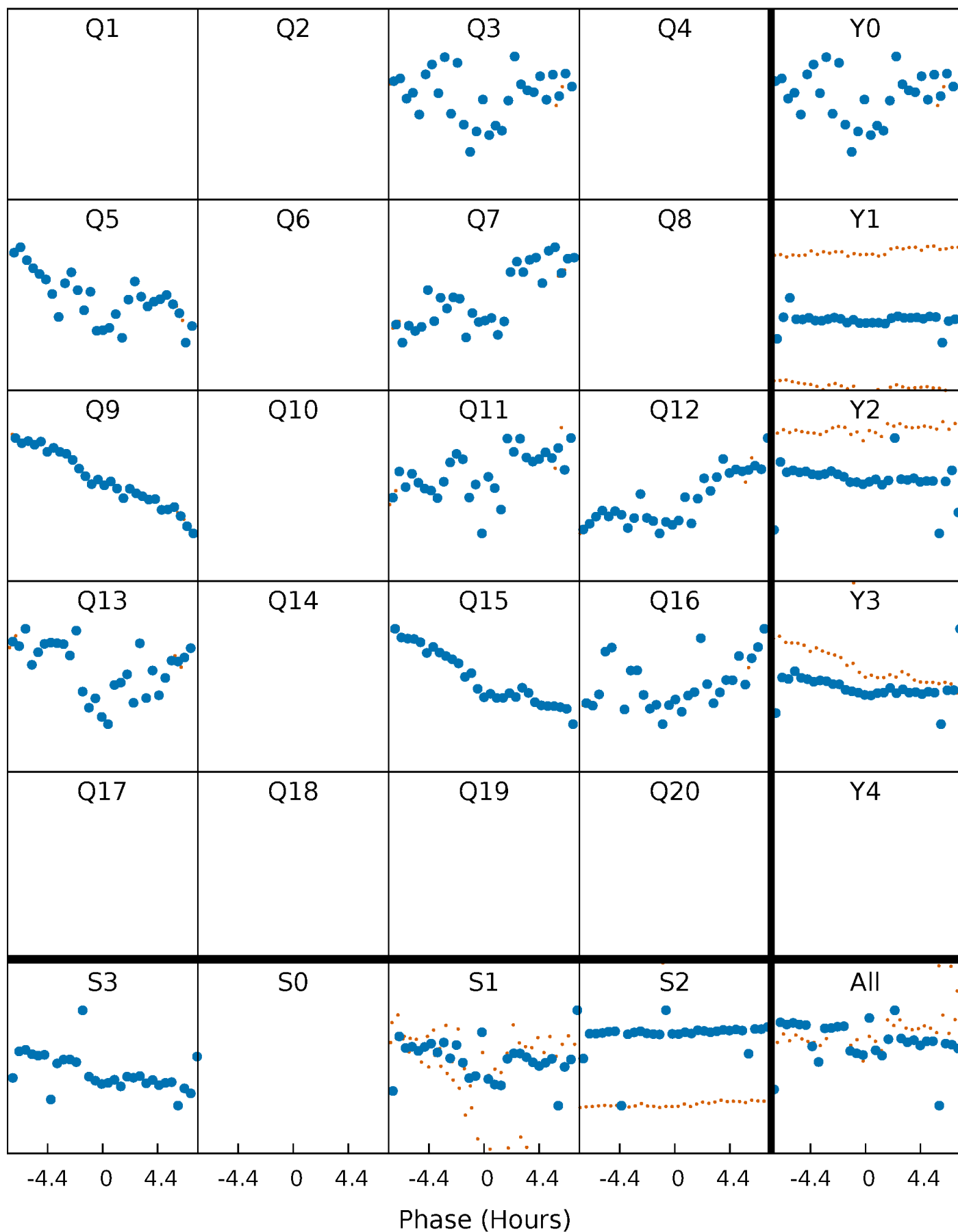


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

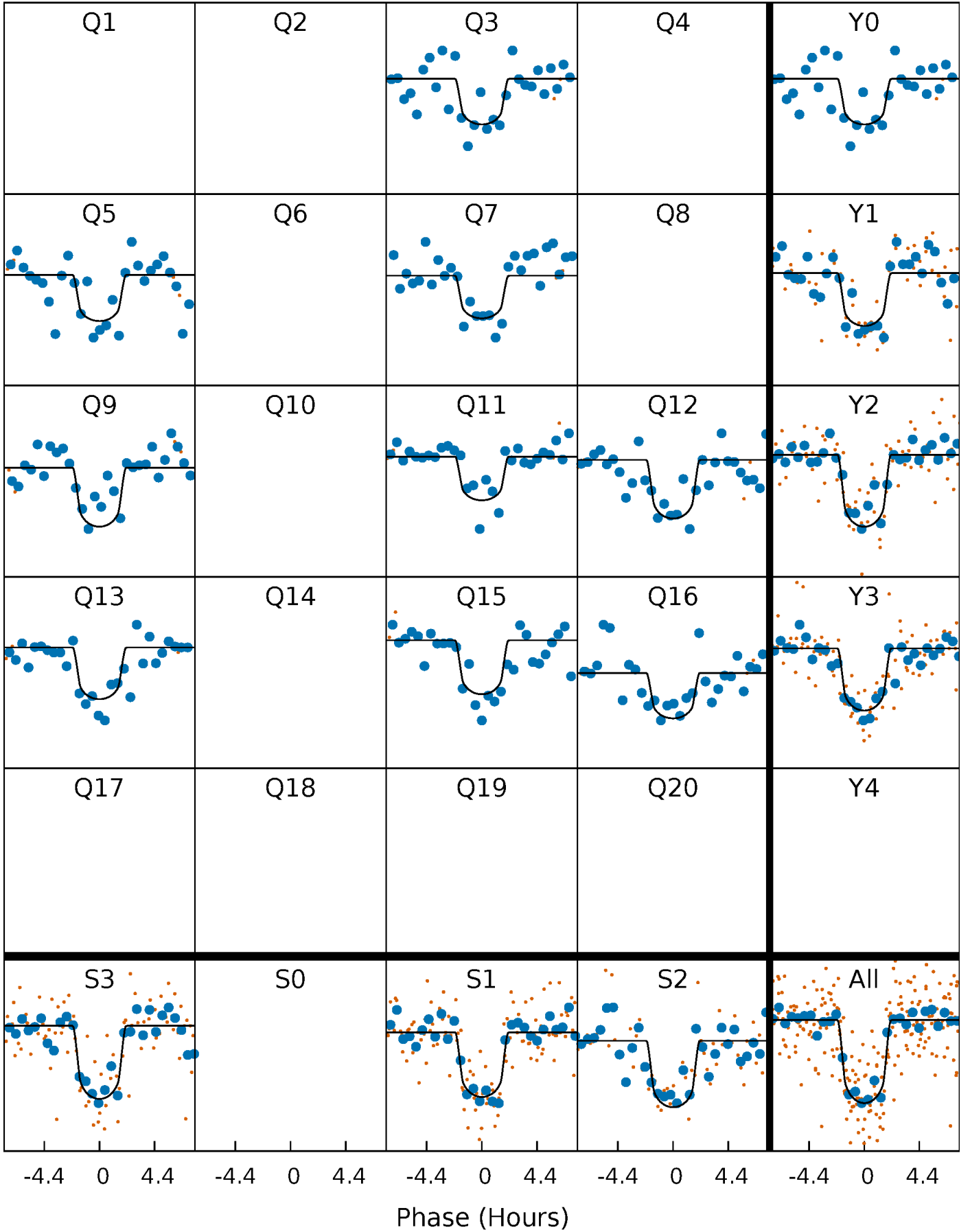
TCE 004247991-01 P=104.352033 Days  $T_0=190.102117$  (BKJD)





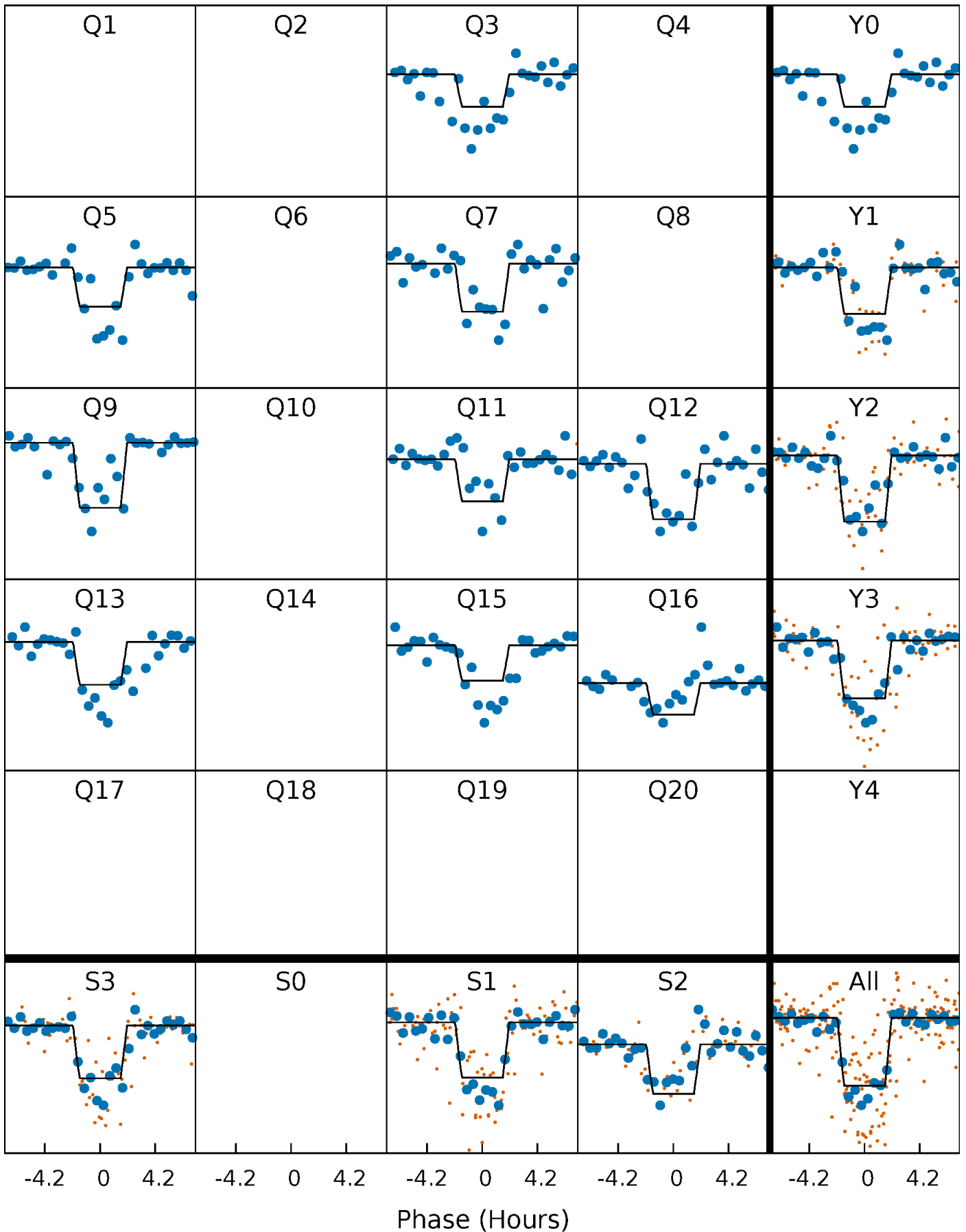
# DV Quarter-Phased Transit Curves

TCE 004247991-01     $P=104.352033$  Days     $T_0=190.102117$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

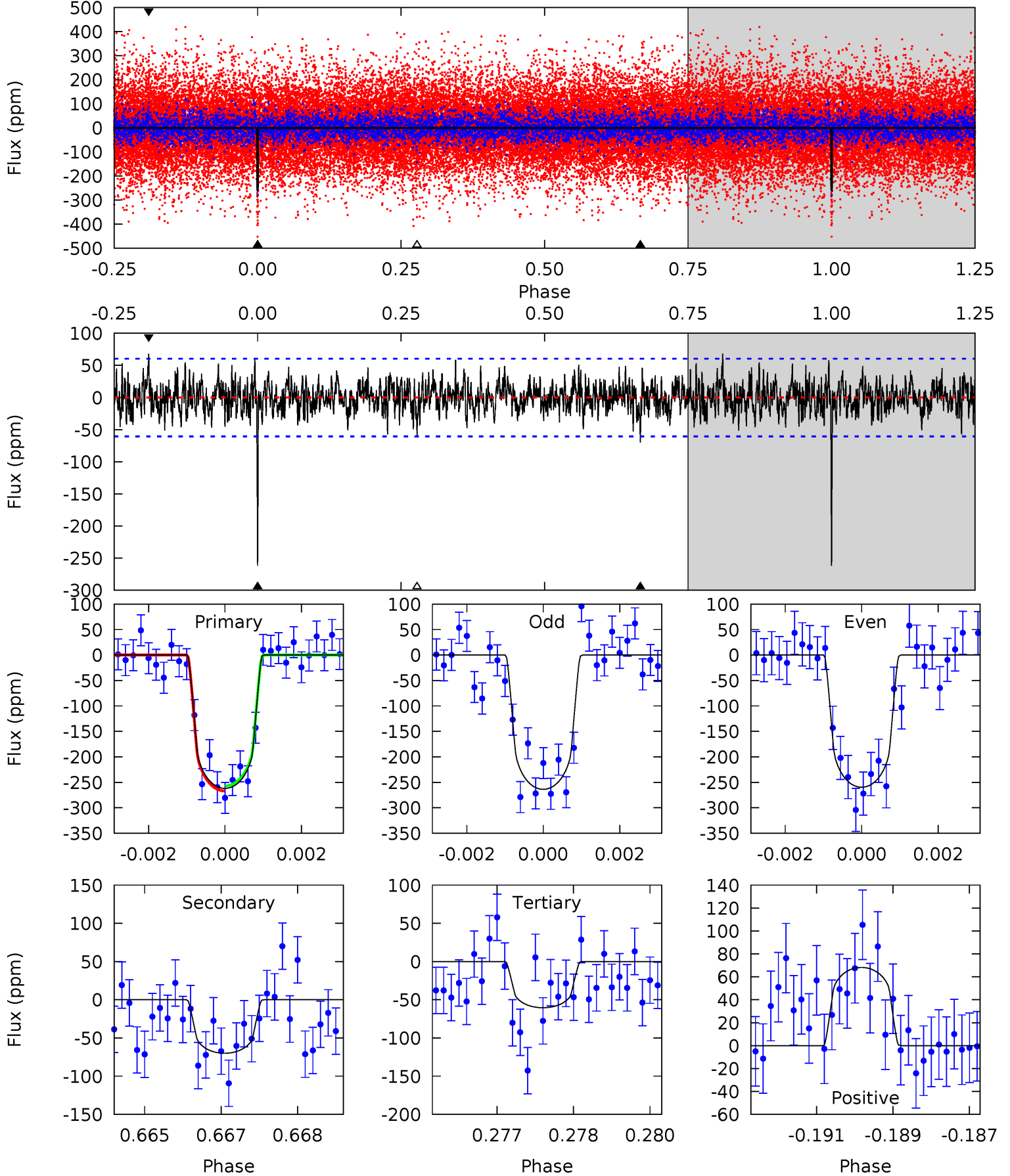
TCE 004247991-01     $P=104.352324$  Days     $T_0=190.098004$  (BKJD)



# DV Model-Shift Uniqueness Test

004247991-01, P = 104.352033 Days, E = 85.750084 Days

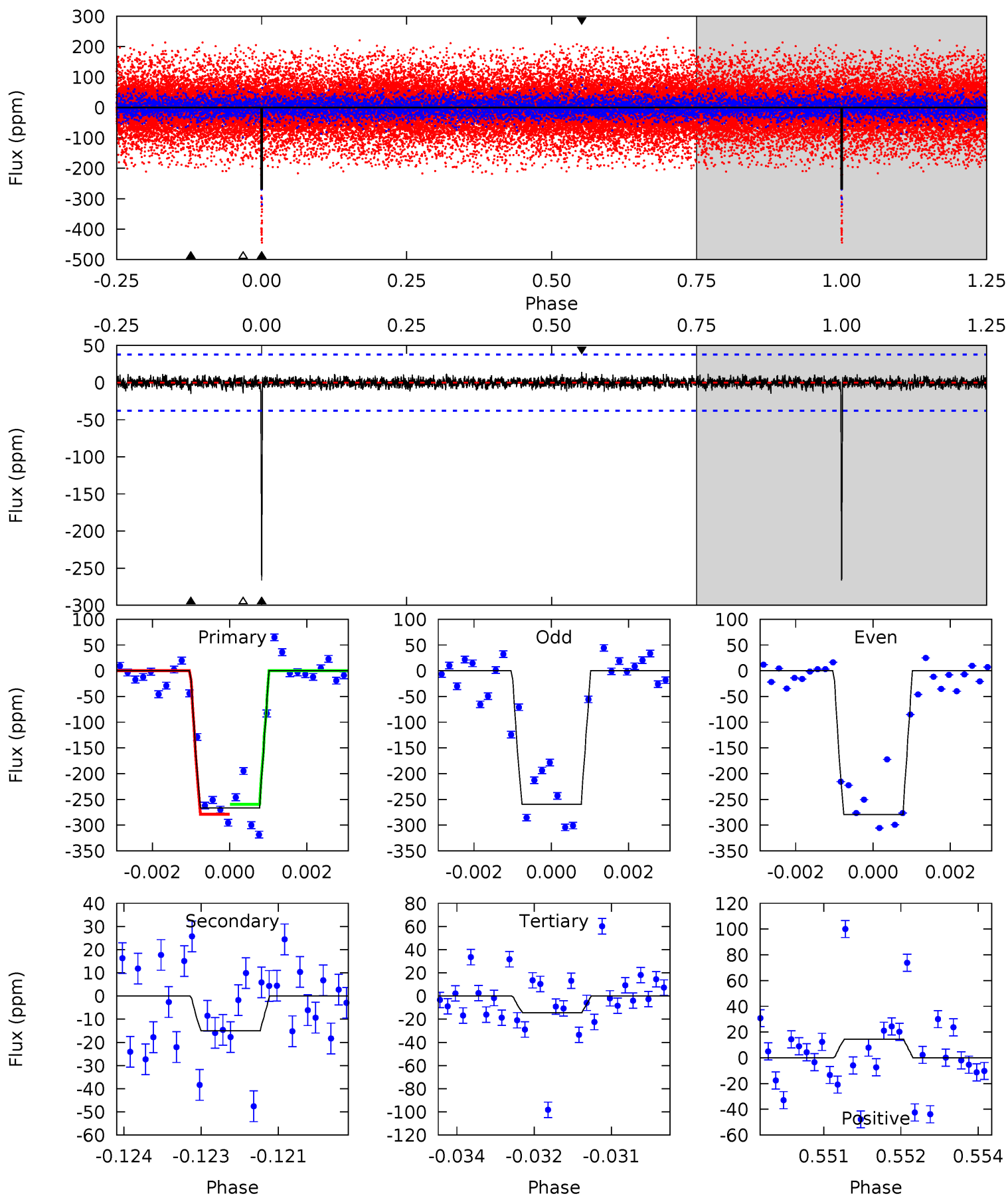
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.2	6.20	5.35	6.04	5.35	3.14	1.62	17.8	17.2	0.85	0.16	0.18	0.95	0.21	0.45



# Alt Model-Shift Uniqueness Test

004247991-01, P = 104.352324 Days, E = 85.745680 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
37.8	2.13	2.04	2.05	5.37	3.15	0.51	35.8	35.8	0.09	0.08	1.37	1.06	0.05	1.38



### Stellar Parameters For KIC 004247991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5650^{+112}_{-112}$	$4.546^{+0.021}_{-0.119}$	$0.020^{+0.150}_{-0.150}$	$0.870^{+0.124}_{-0.039}$	$0.971^{+0.046}_{-0.080}$	$2.075^{+0.212}_{-0.705}$
	+2%/-2%	+0%/-3%	+750%/-750%	+14%/-4%	+5%/-8%	+10%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 004247991-01 / KOI 2311.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-70 \pm 11$	$1.61^{+0.69}_{-0.67}$	$502^{+19}_{-14}$	$4277^{+1012}_{-554}$	$2723^{+5038}_{-1436}$
Alt.	$-15 \pm 7$	$1.54^{+0.66}_{-0.67}$	$502^{+19}_{-14}$	$3309^{+750}_{-434}$	$595^{+1522}_{-367}$

$T_{\text{max}}$  = 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

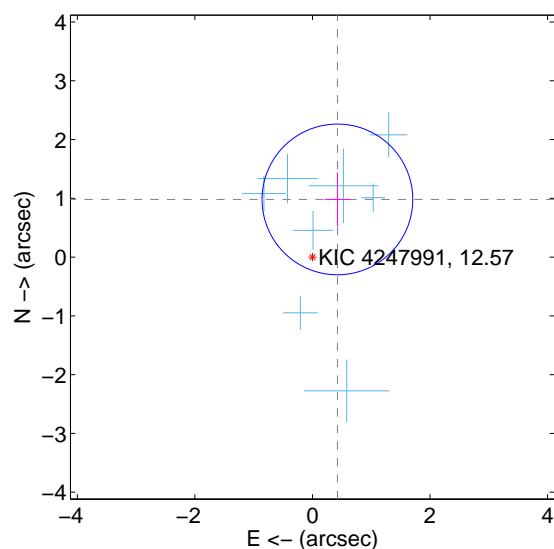
Supplemental centroid analysis for 004247991-01. Kepler magnitude: 12.57. Transit SNR 13.22

There are 8 quarters with good PRF difference image offsets

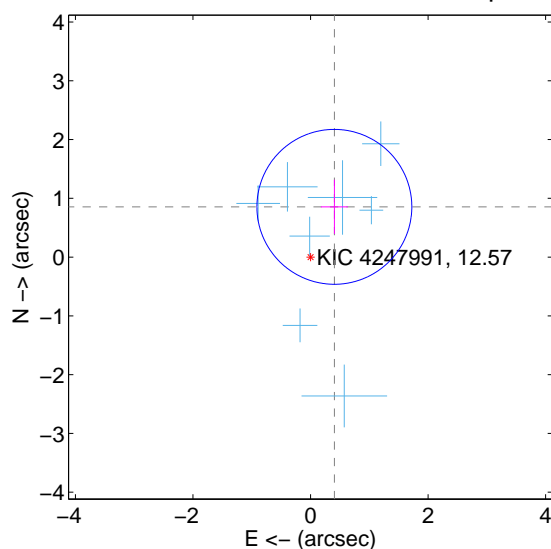
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.069 \pm 0.427$	2.50	$-0.425 \pm 0.220$	$0.981 \pm 0.460$
PRF-fit source offset from KIC position	$0.946 \pm 0.439$	2.15	$-0.406 \pm 0.228$	$0.855 \pm 0.460$
photometric centroid source offset	$1.46 \pm 0.66$	2.22	$-0.70 \pm 0.63$	$-1.28 \pm 0.67$

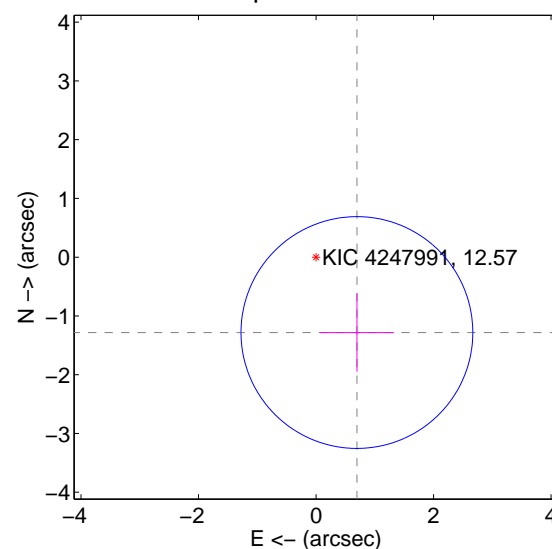
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

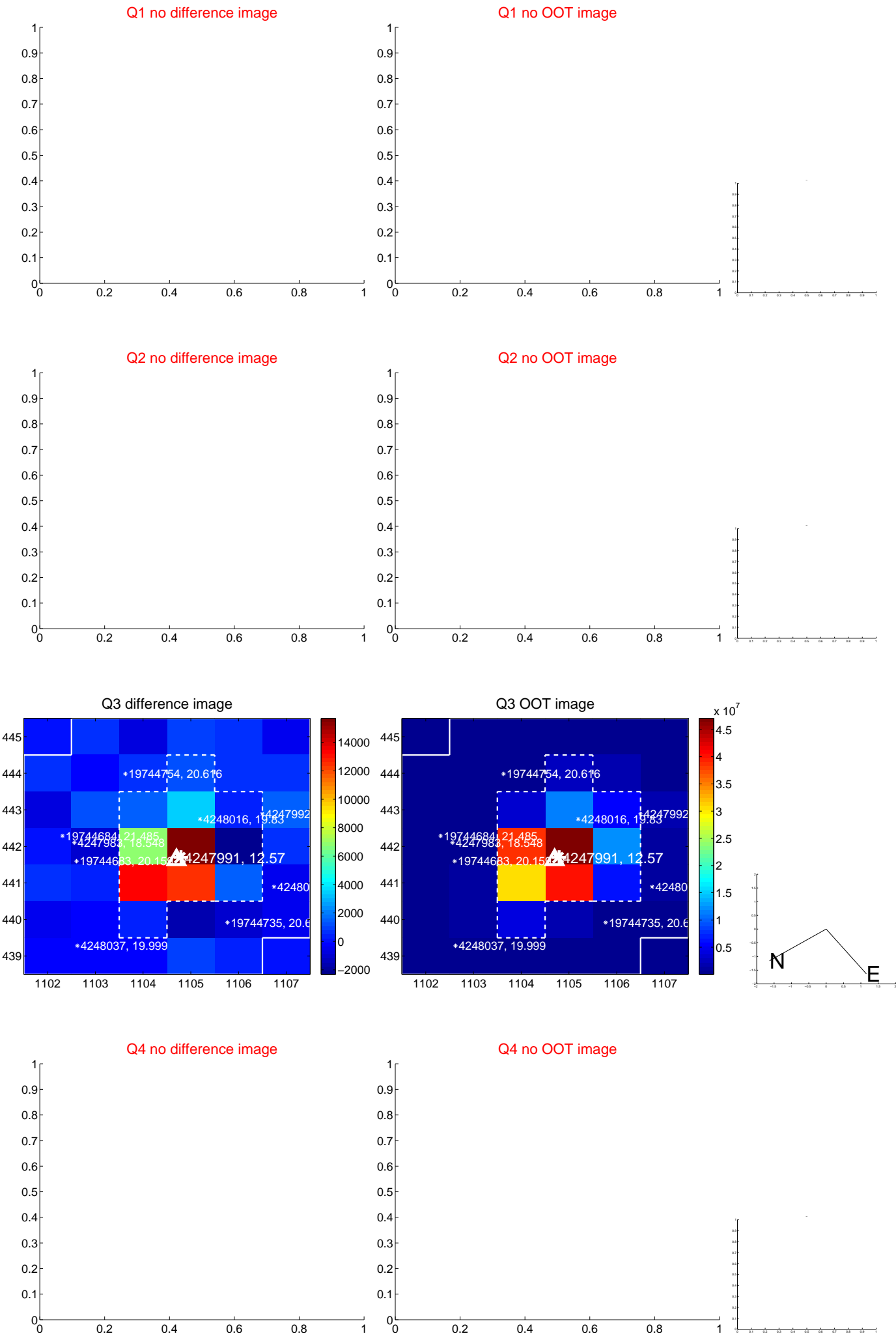


offset from photometric centroids

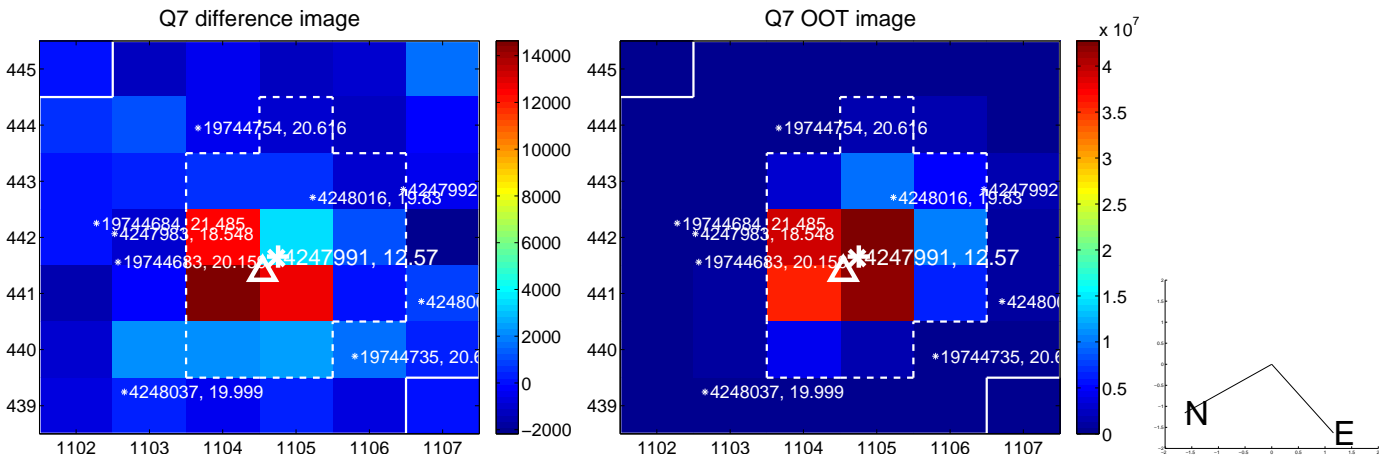
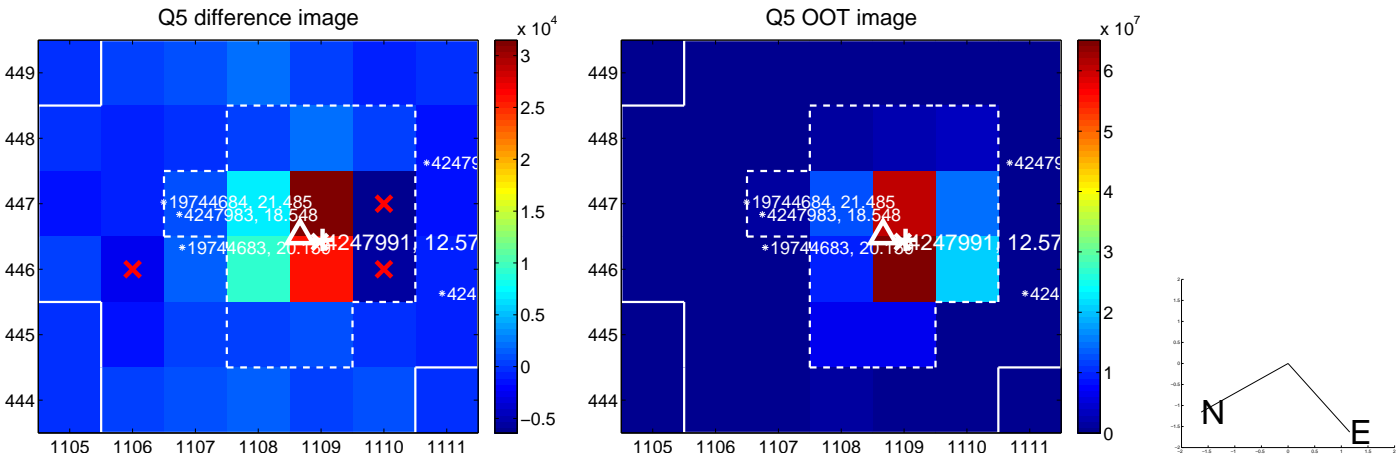


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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.

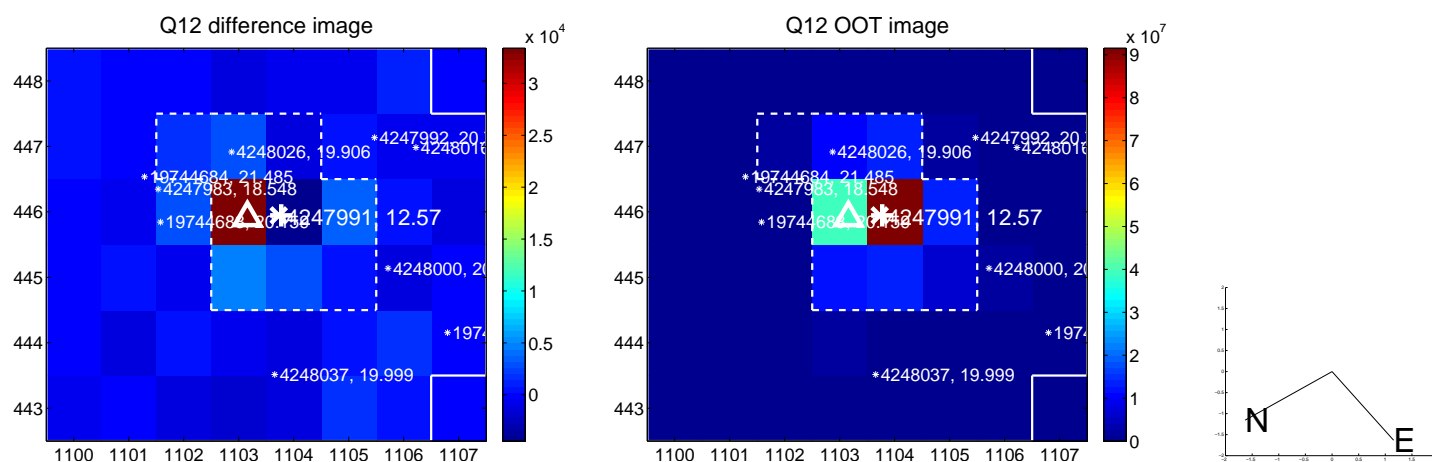
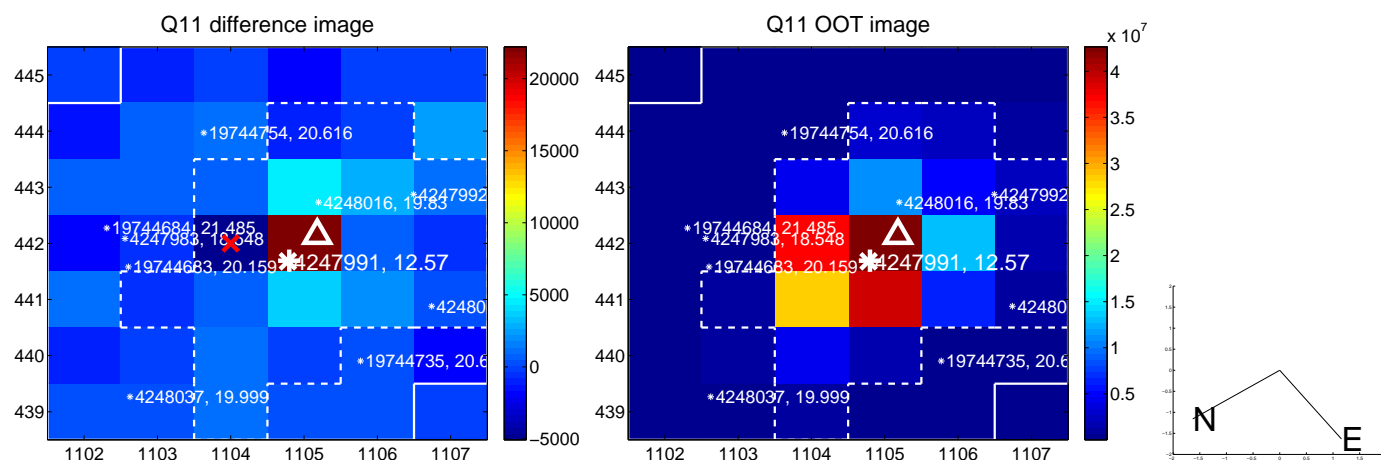
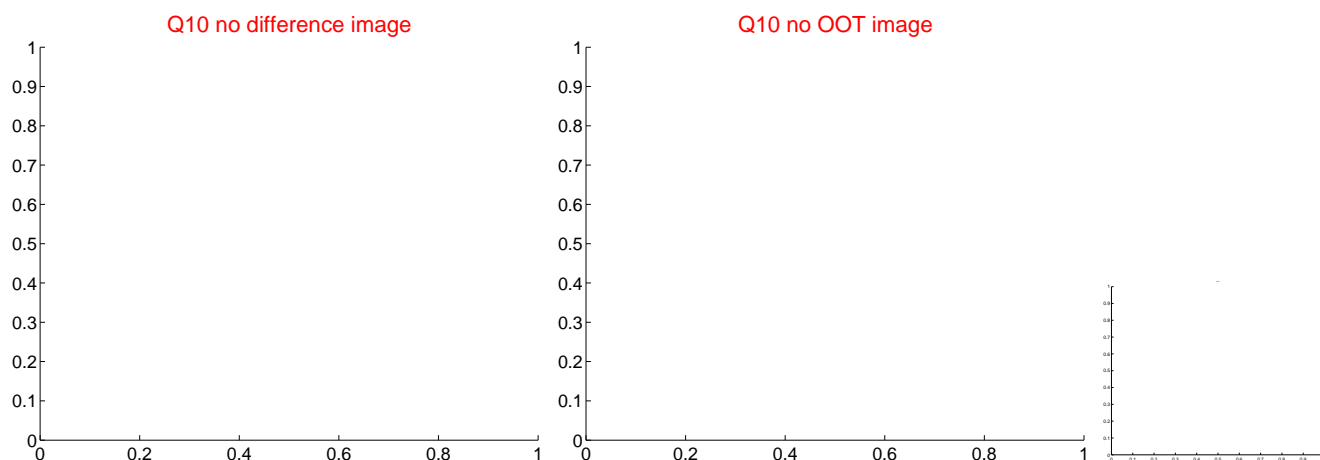
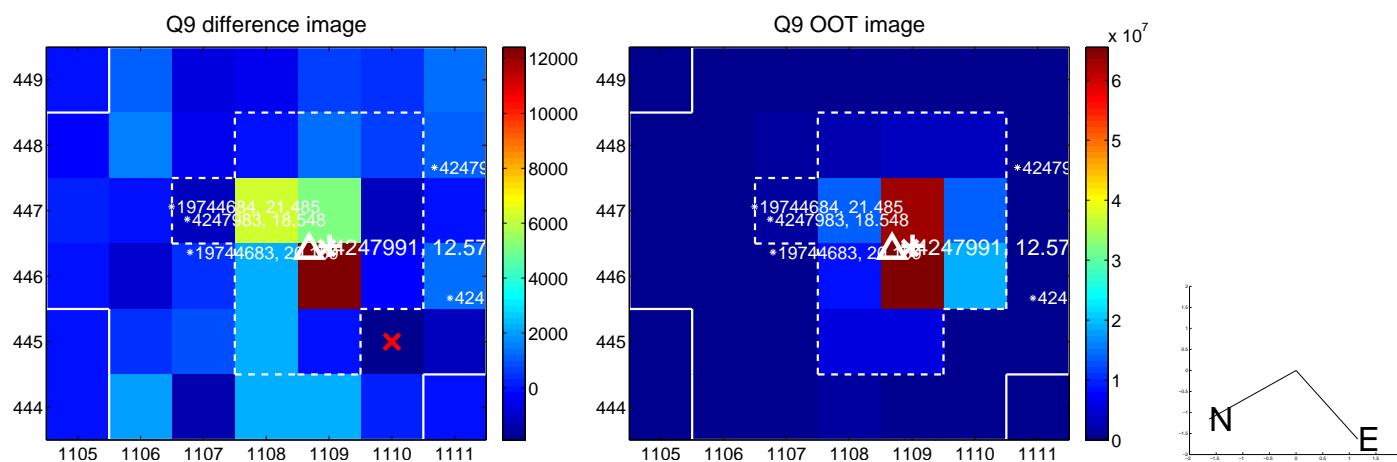


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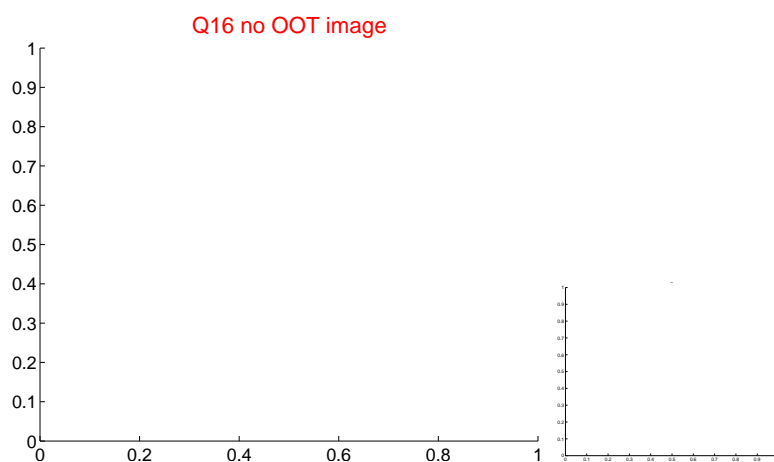
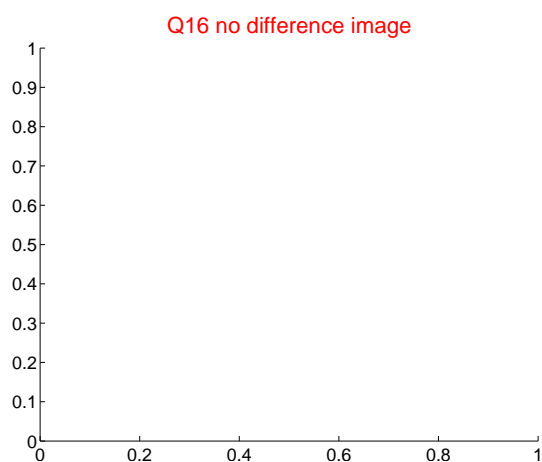
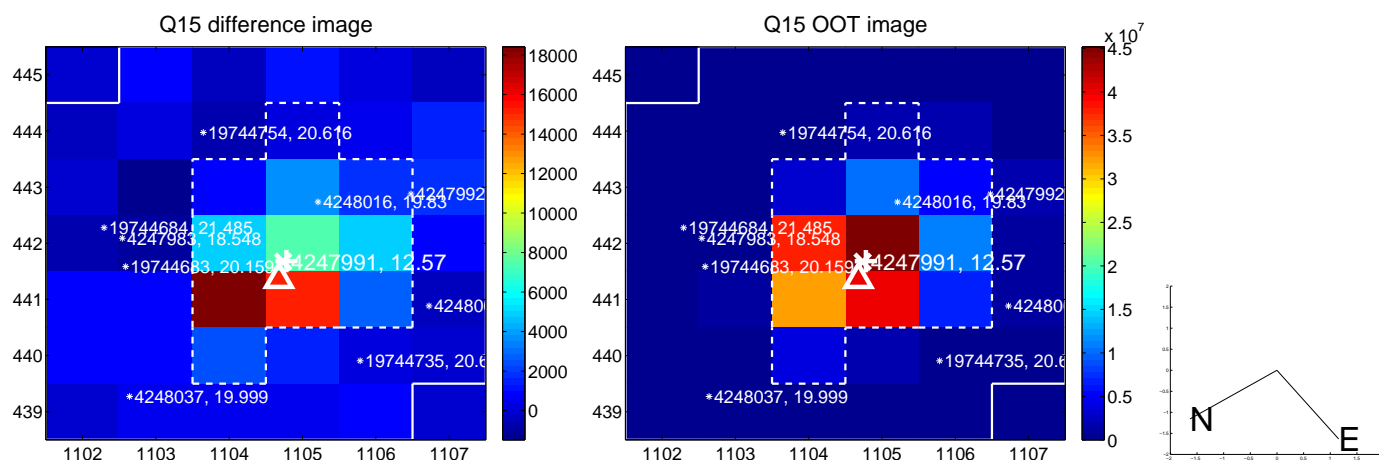
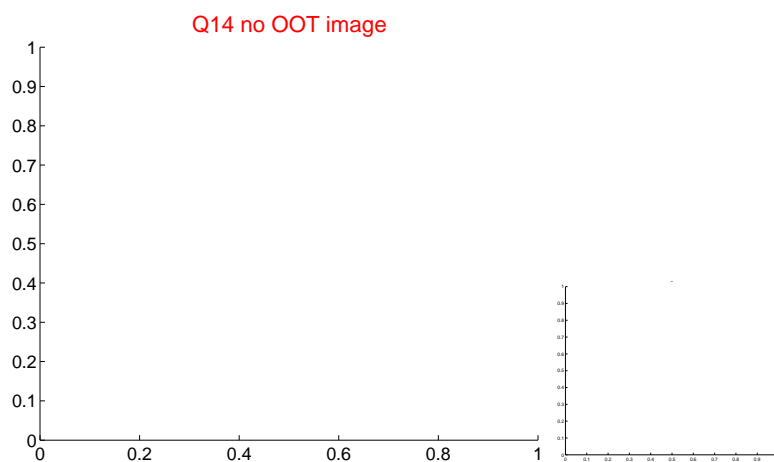
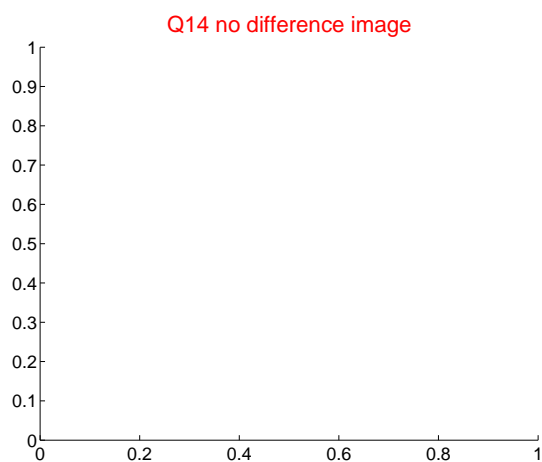
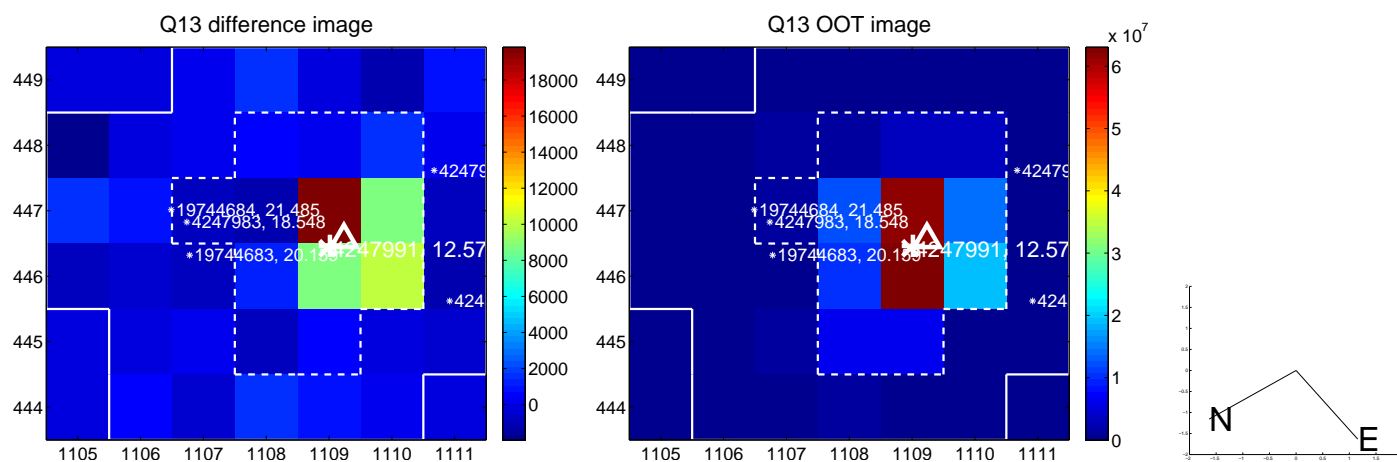




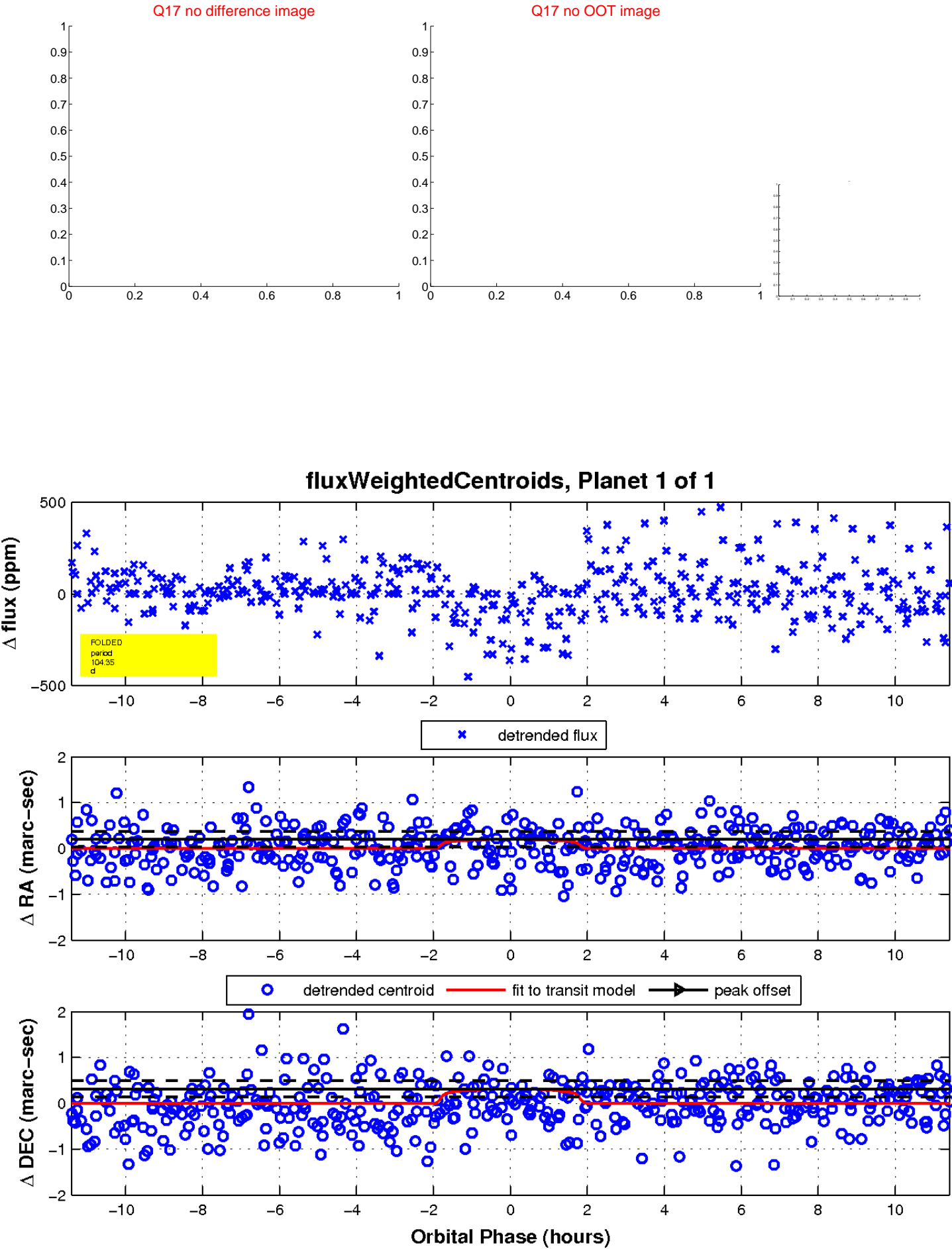
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

