

# KIC 009388304

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009388304-01	OBS	No	403.056850	352.102334	18611.7	2.138	20.9	15.9	0.81	5398	10.79	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009388304-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_POS_DV—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.

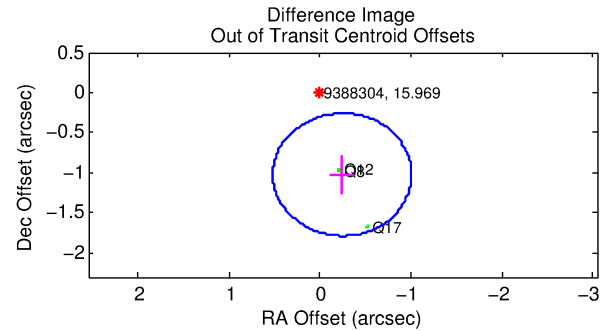
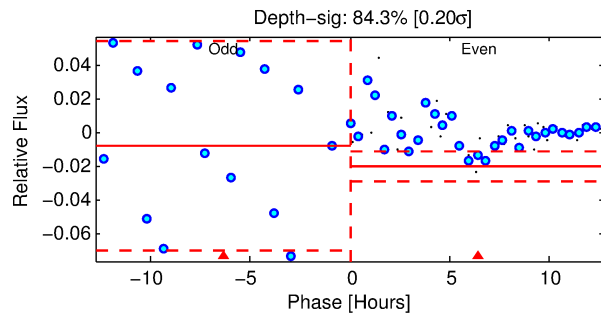
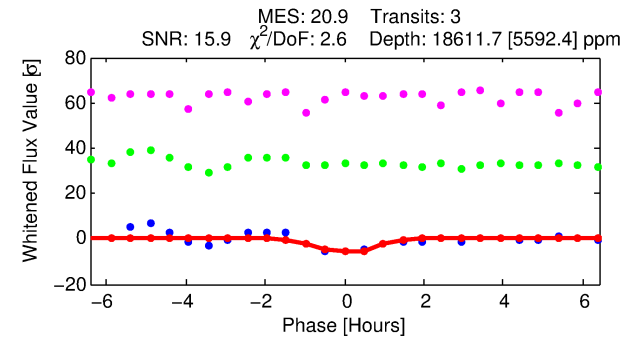
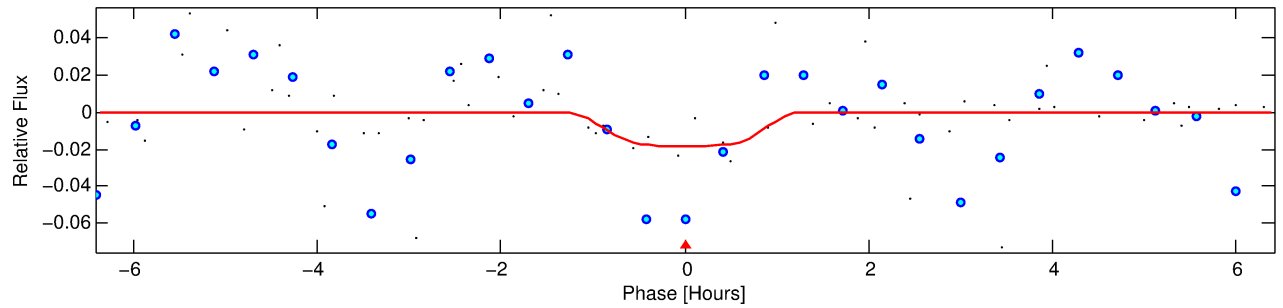
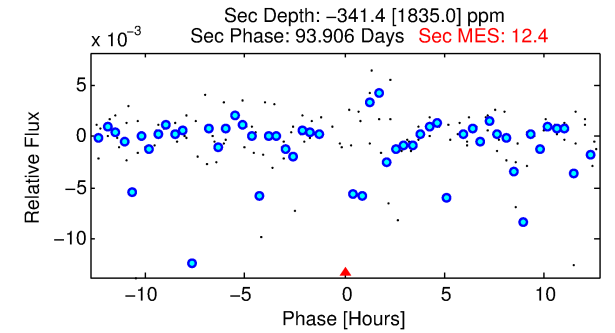
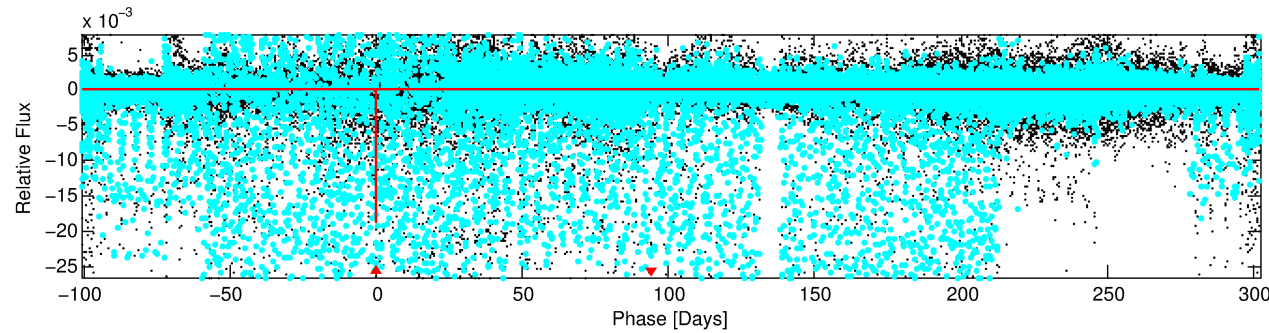
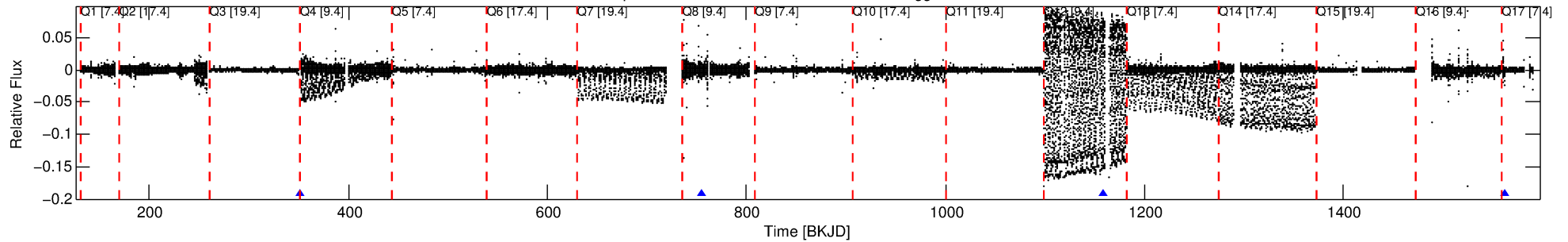
## Ephemeris Match Information For 009388304-01

No Significant Match Found

# DV One-Page Summary

KIC: 9388304 Candidate: 1 of 1 Period: 403.057 d

Kp: 15.97 R\*: 0.81 Rs Teff: 5398.0 K Logg: 4.58 Fe/H: -0.040



## DV Fit Results:

Period = 403.05685 [0.00603] d  
Epoch = 352.1023 [0.0162] BKJD  
Rp/R\* = 0.1228 [0.0105]  
a/R\* = 1617.02 [40008.03]  
b = 0.01 [3998.67]  
Seff = 0.46 [0.11]  
Teq = 210 [13] K  
Rp = 10.79 [71.22] Re  
a = 1.0307 [0.1500] AU  
Ag = N/A  
Teffp = N/A

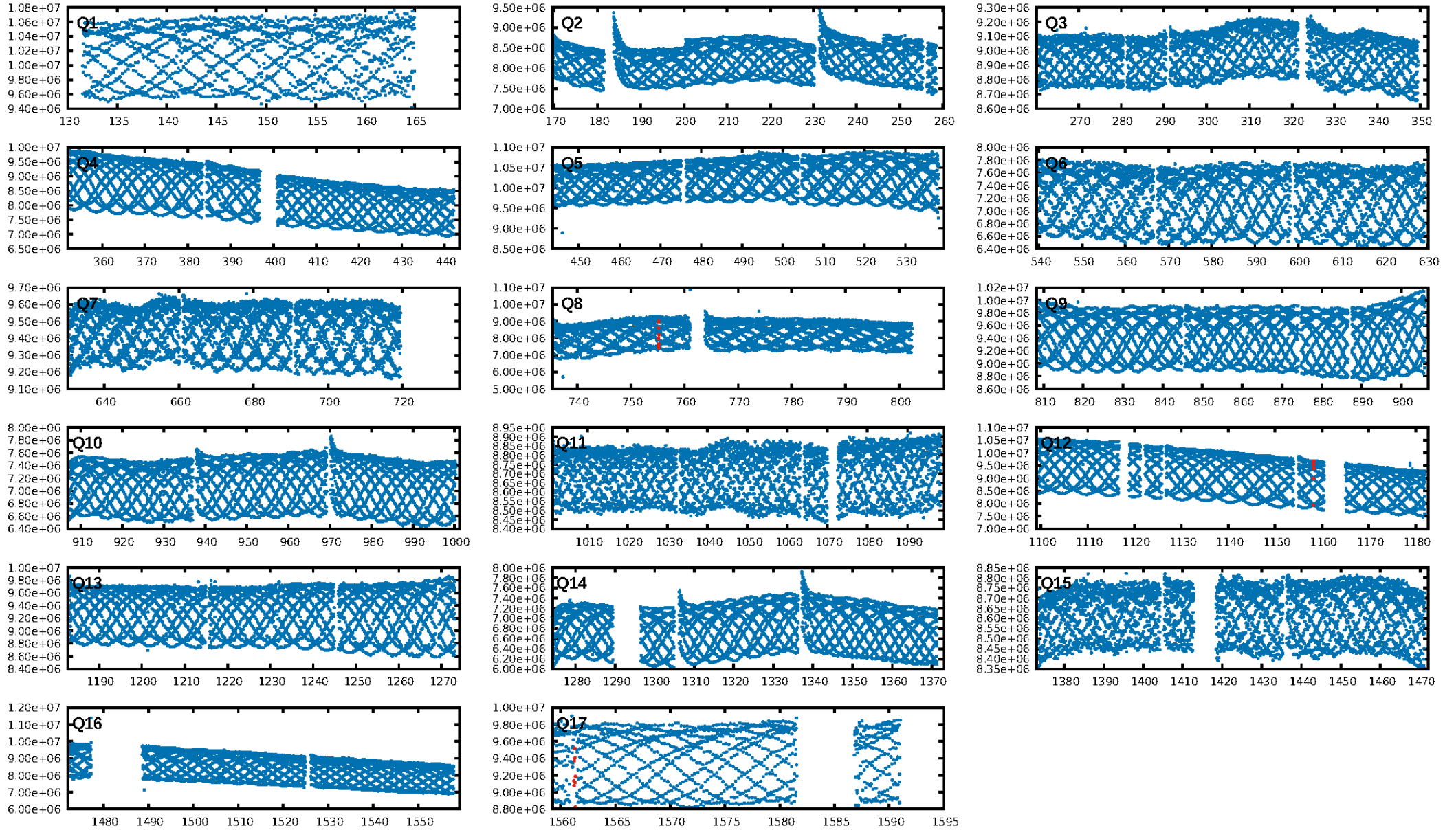
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 15.0%  
Bootstrap-pfa: 9.34e-07  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.9575  
Centroid-sig: 0.3%  
Centroid-so: 3.254 arcsec [3.29σ]  
OotOffset-rm: 1.053 arcsec [4.14σ]  
KicOffset-rm: 3.661 arcsec [39.88σ]  
OotOffset-st: 0/0/2/1 [3]  
KicOffset-st: 0/0/2/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

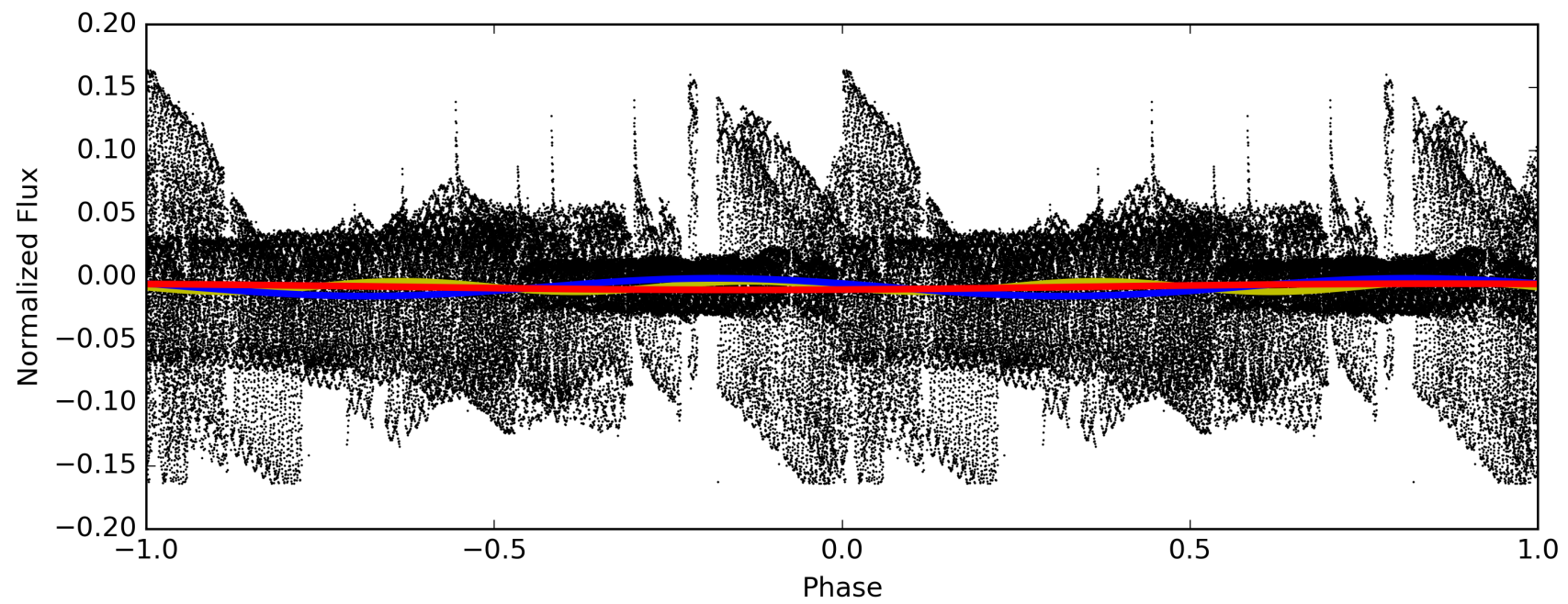
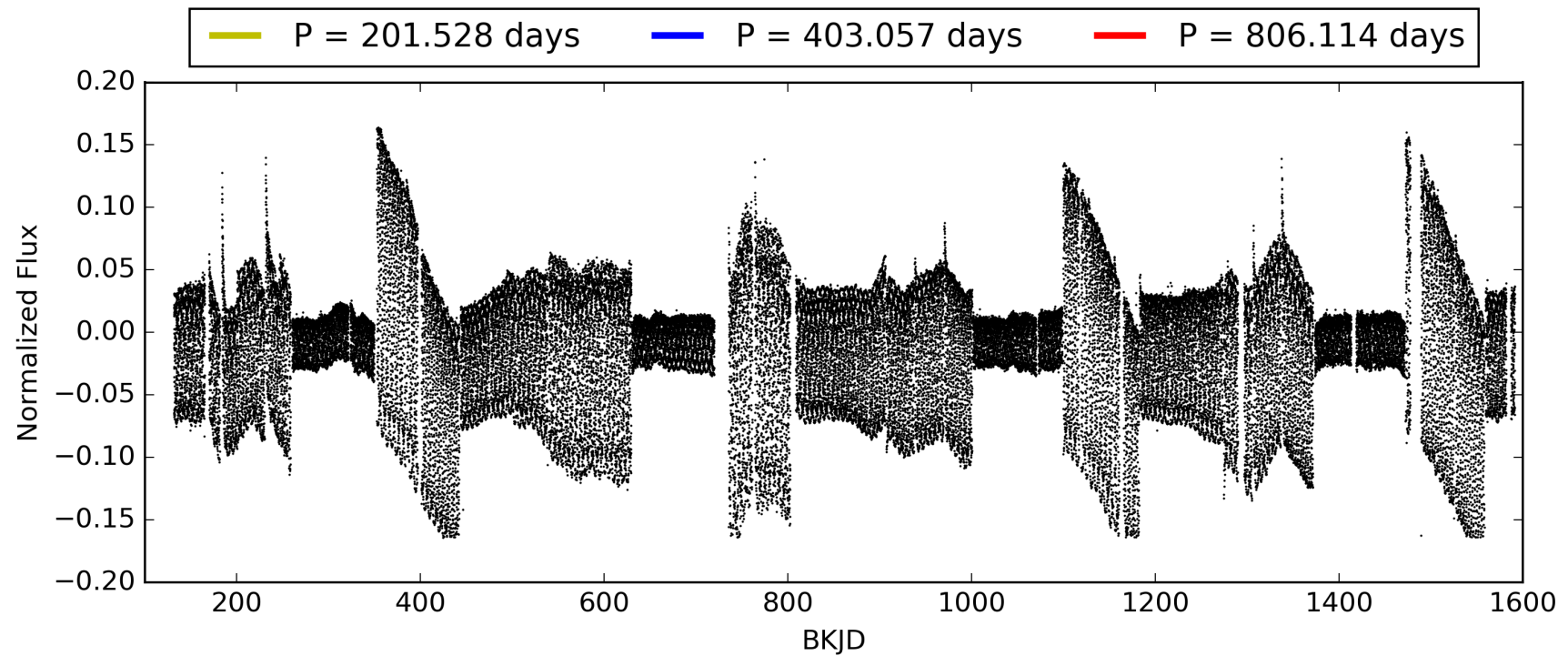
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 03:49:26 Z

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

# TCE 009388304-01, PDC Light Curves

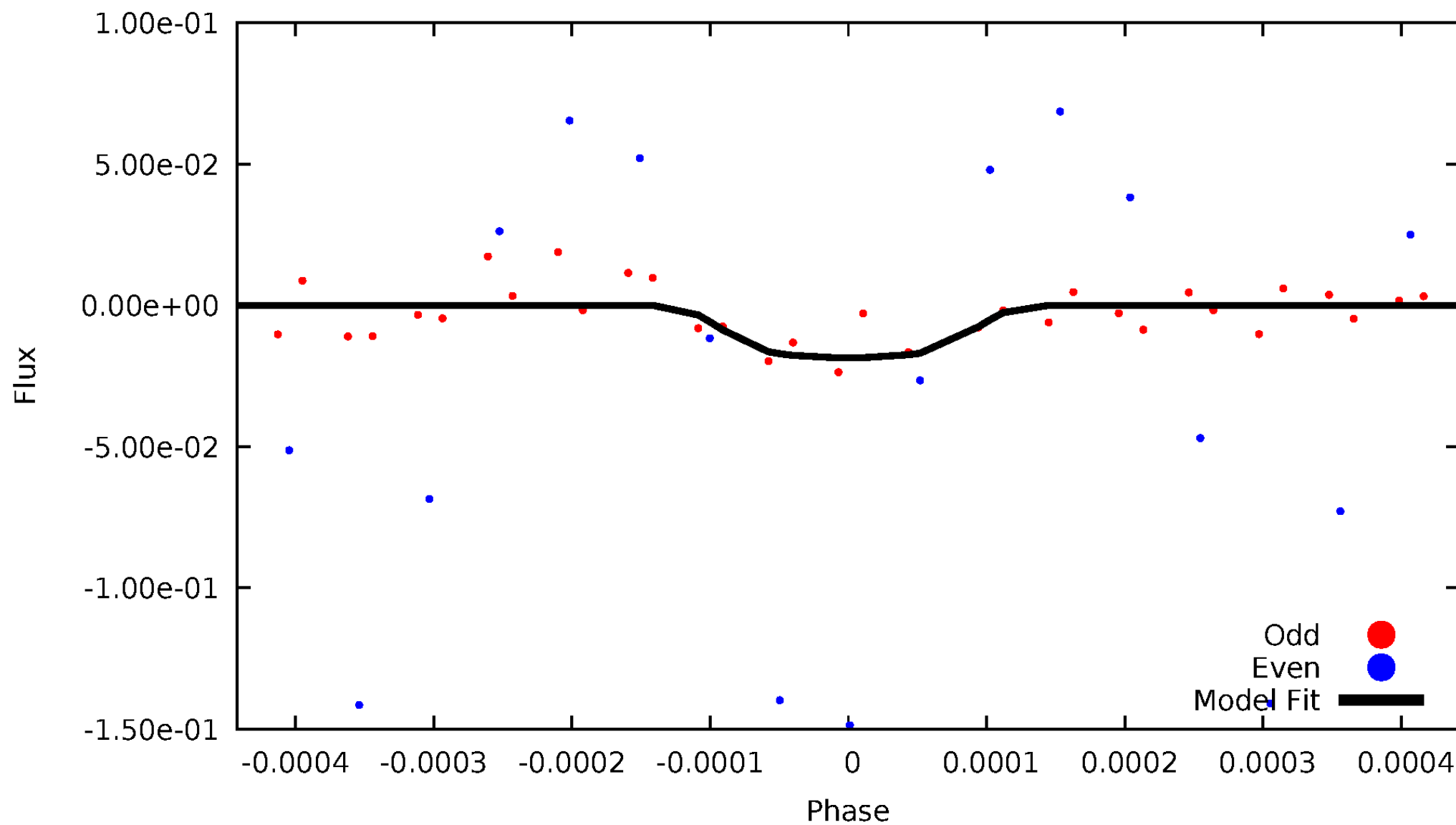


TCE 009388304-01



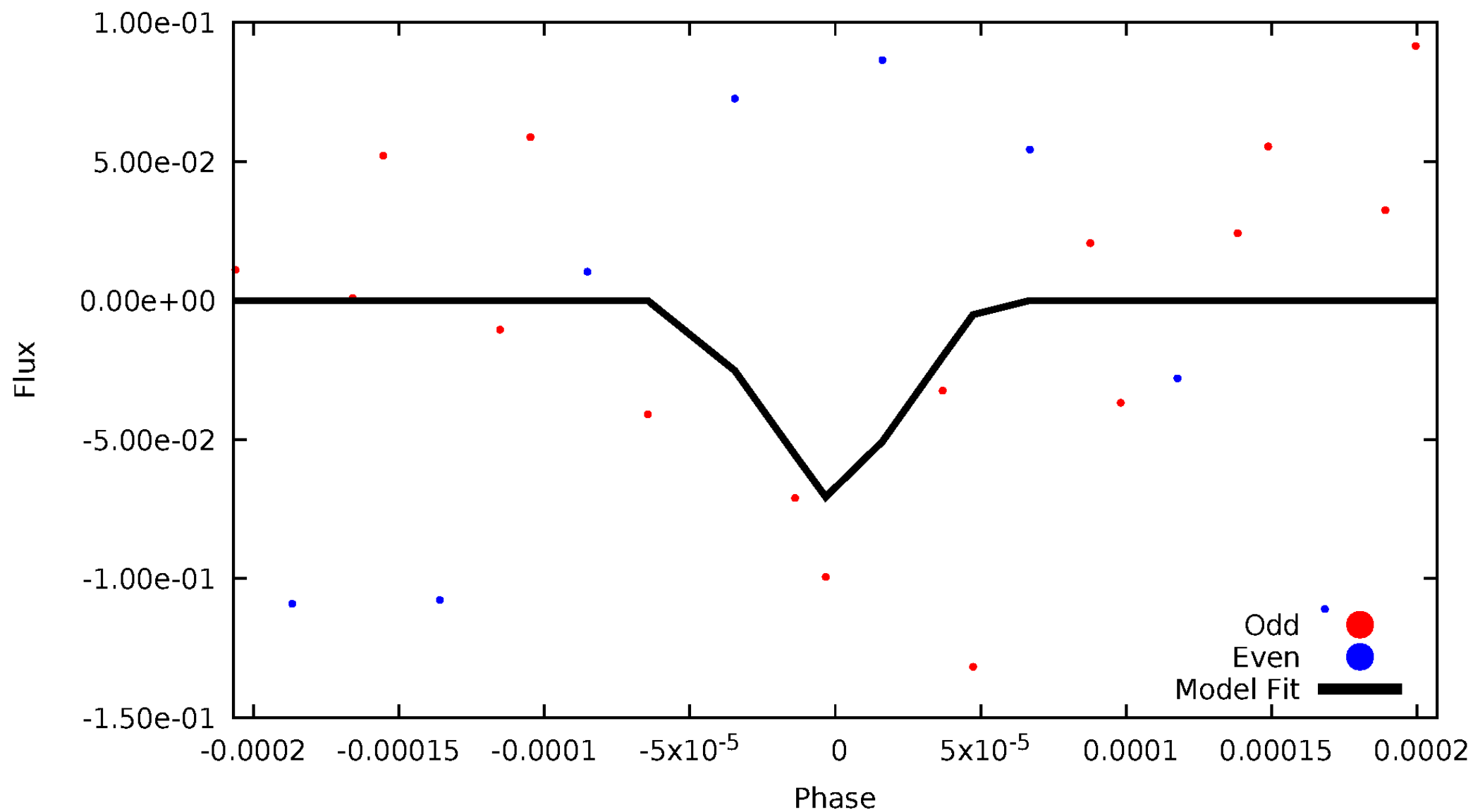
# DV Odd/Even

TCE 009388304-01



# ALT Odd/Even

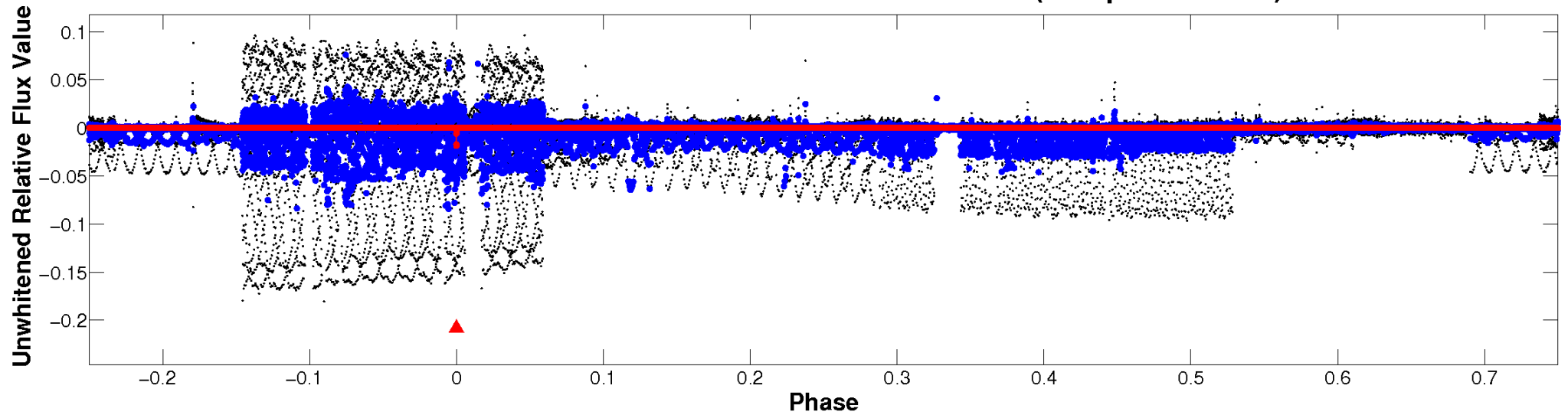
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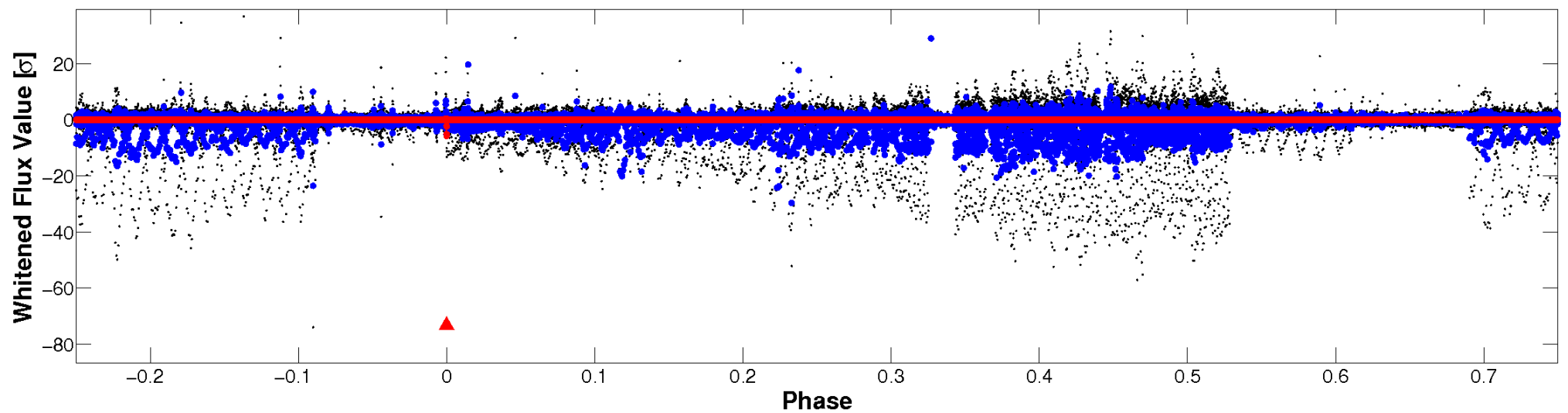


# Non-Whitened Vs. Whitened Light Curve

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

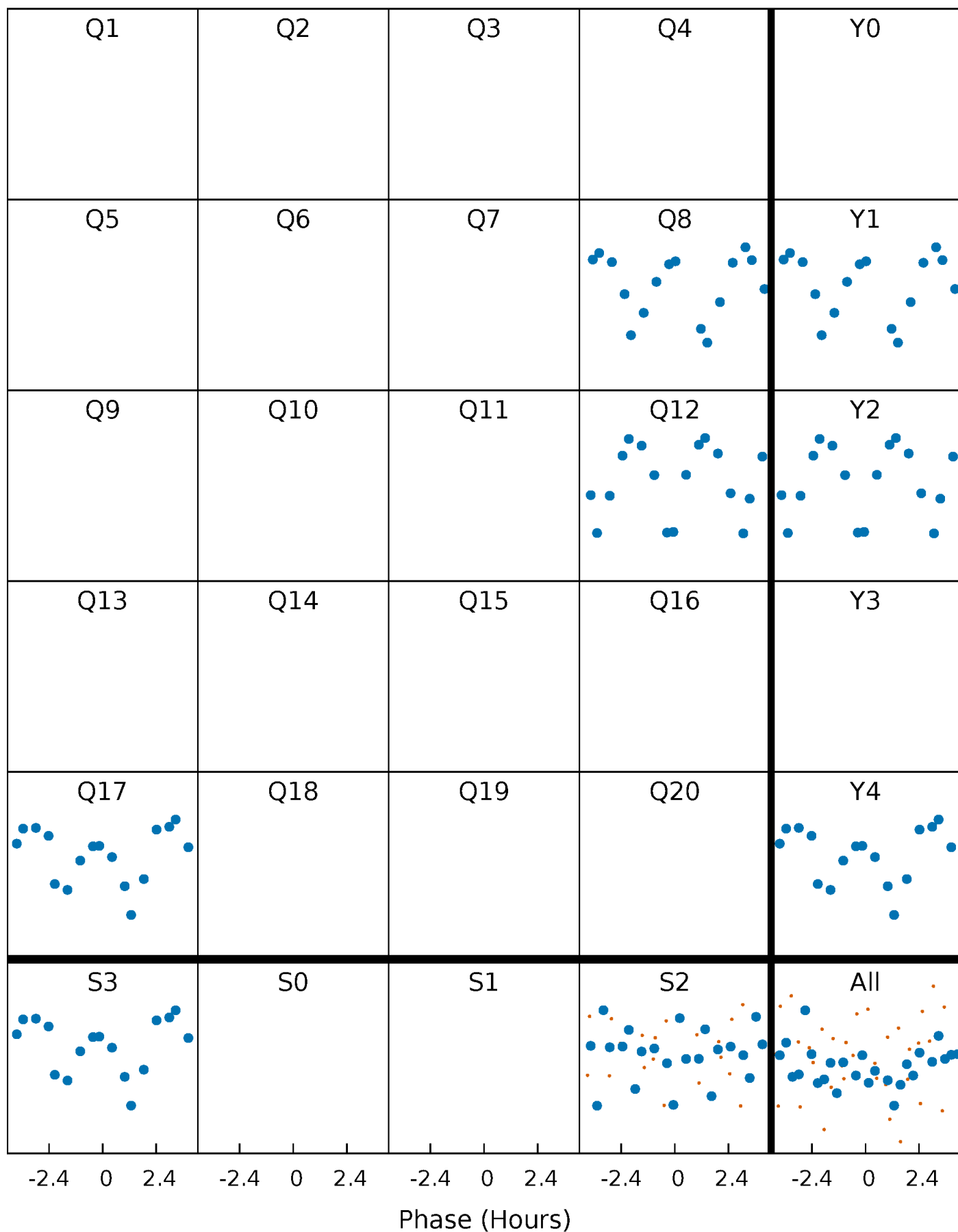


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

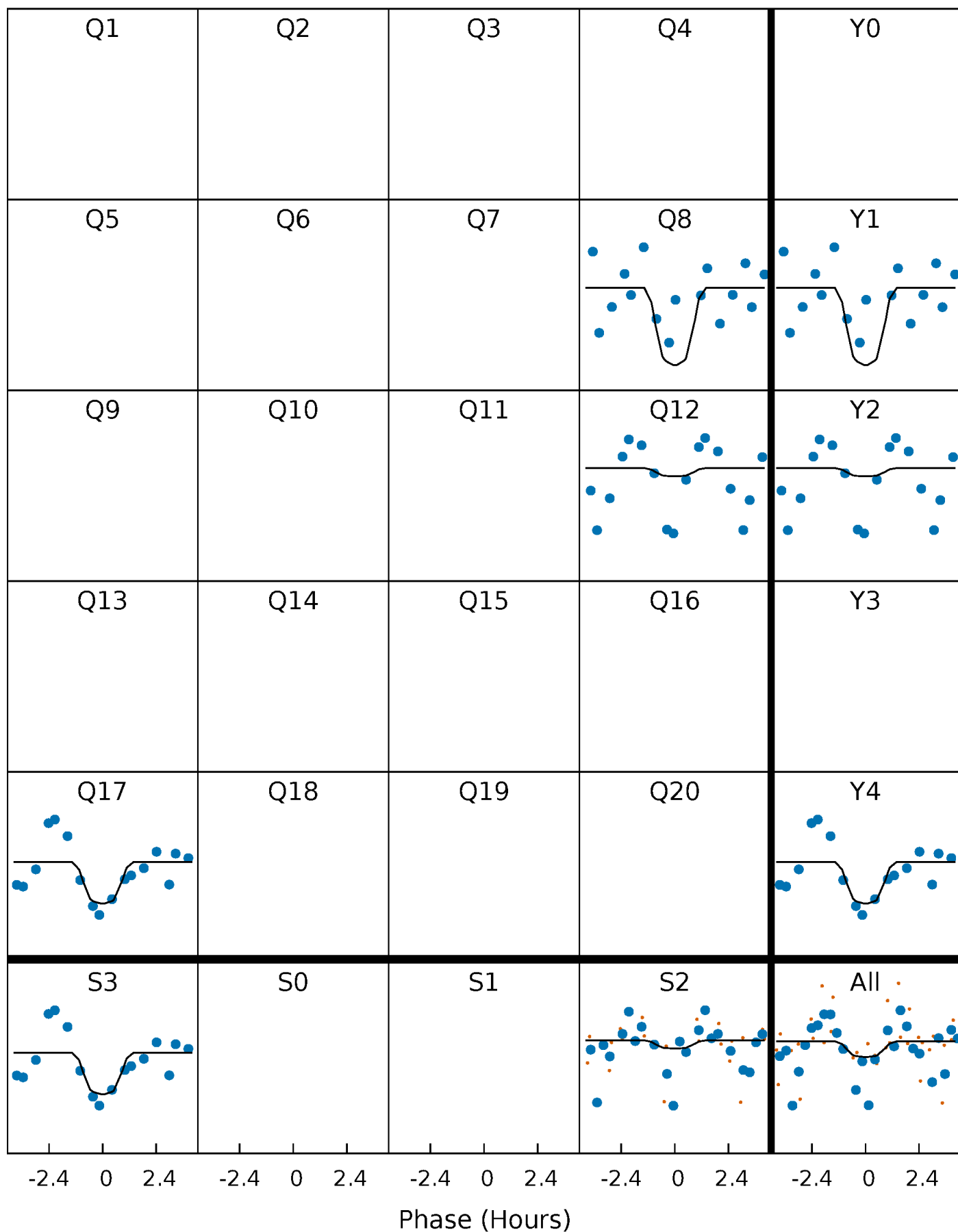
TCE 009388304-01 P=403.056850 Days  $T_0=352.102334$  (BKJD)





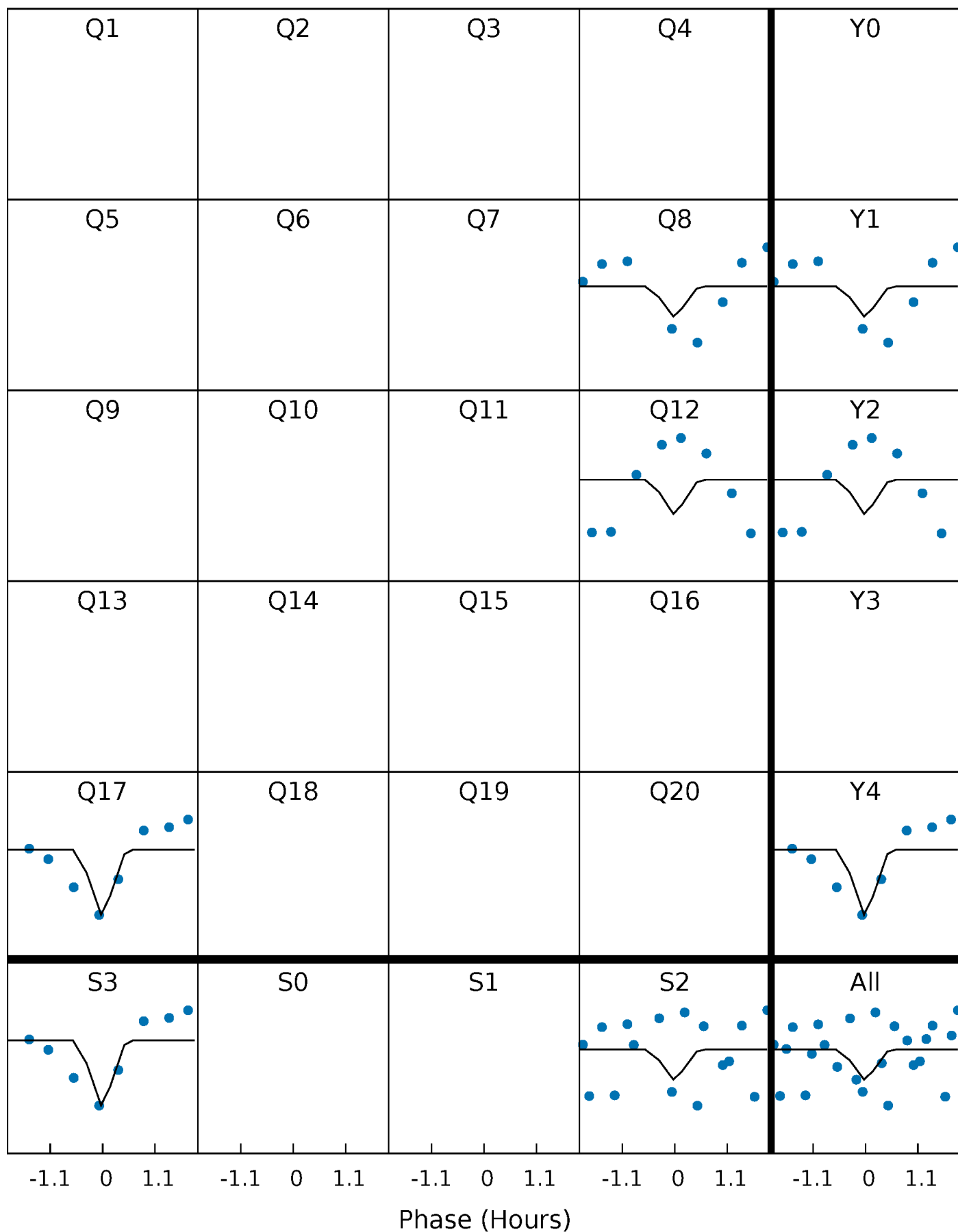
# DV Quarter-Phased Transit Curves

TCE 009388304-01     $P=403.056850$  Days     $T_0=352.102334$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

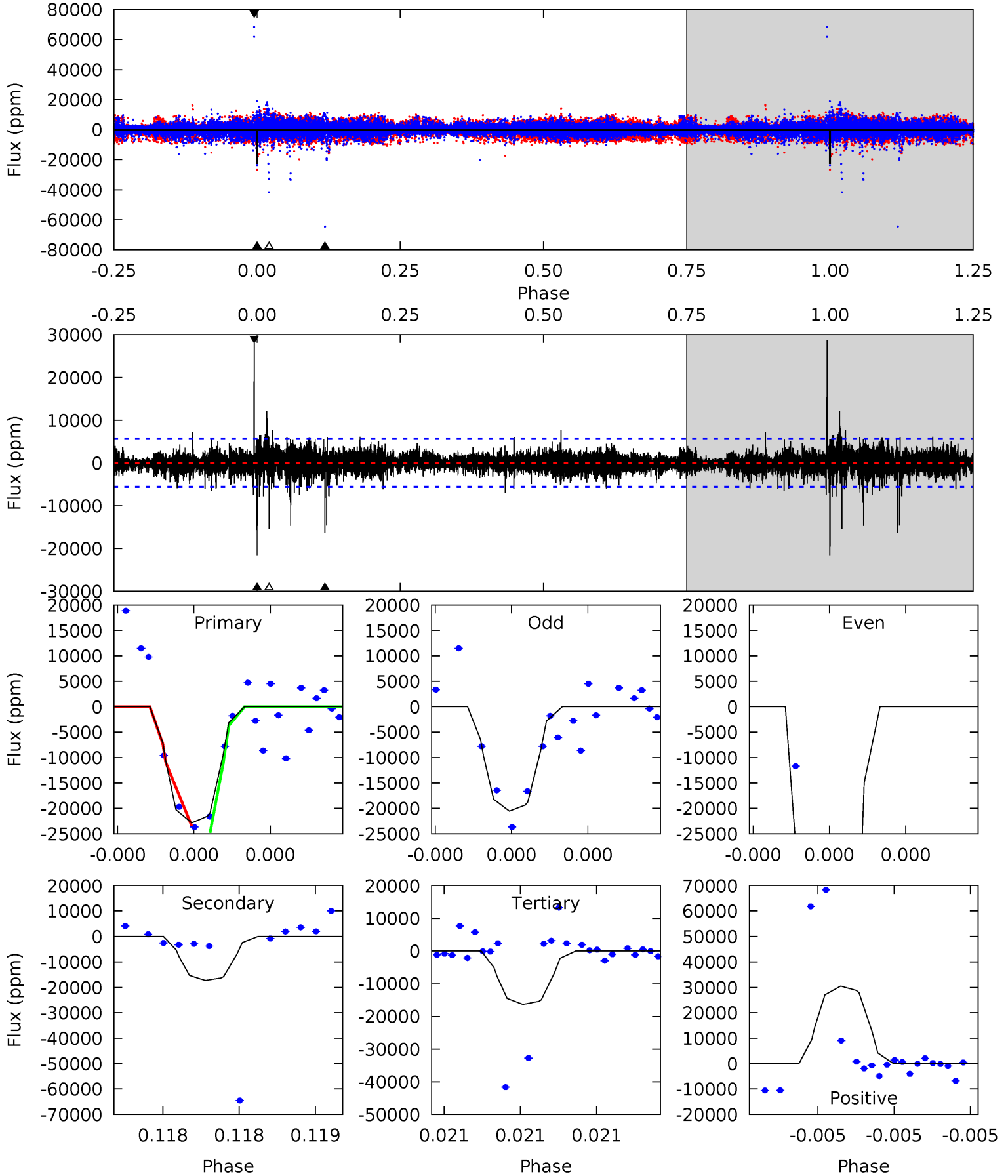
TCE 009388304-01 P=403.065593 Days  $T_0=352.140068$  (BKJD)



# DV Model-Shift Uniqueness Test

009388304-01, P = 403.056850 Days, E = 352.102334 Days

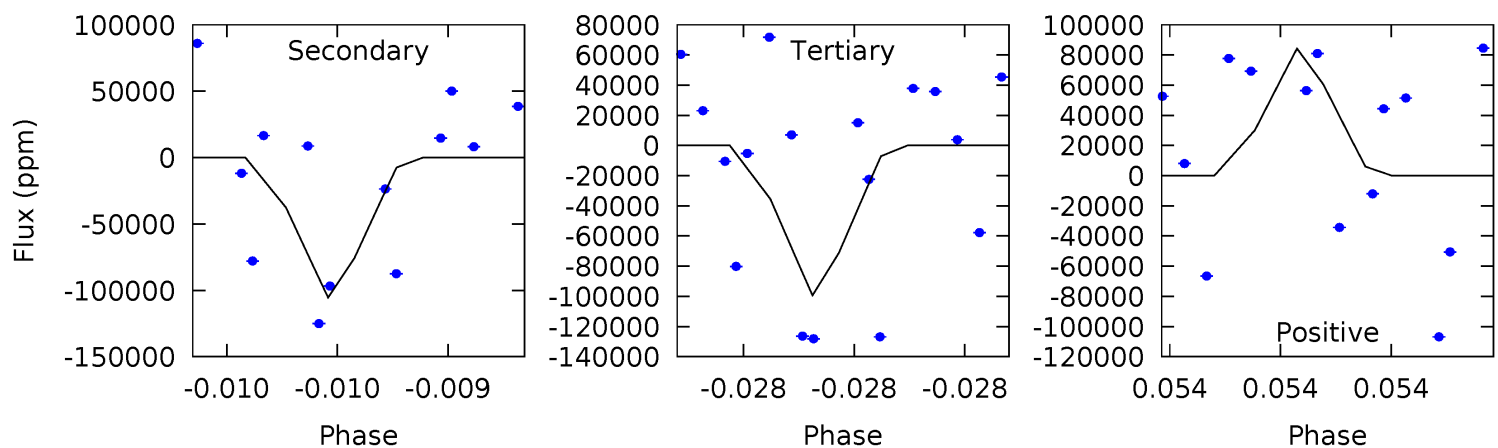
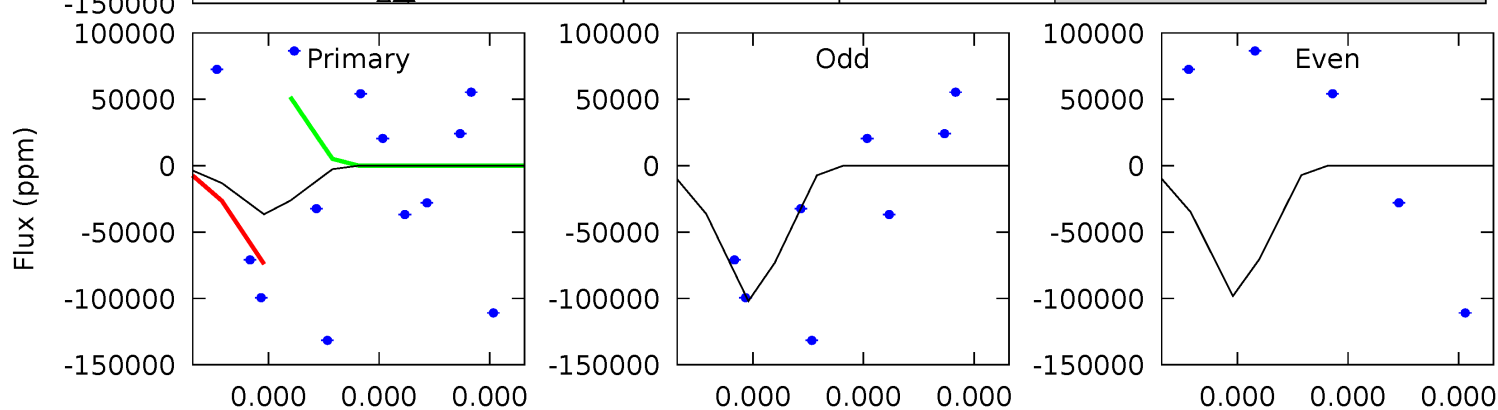
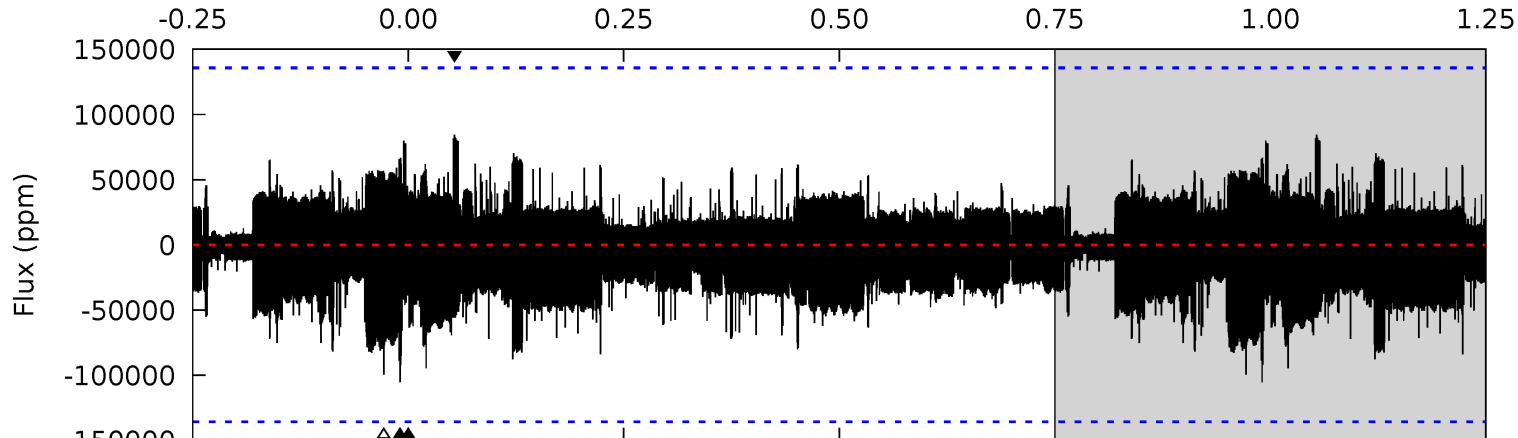
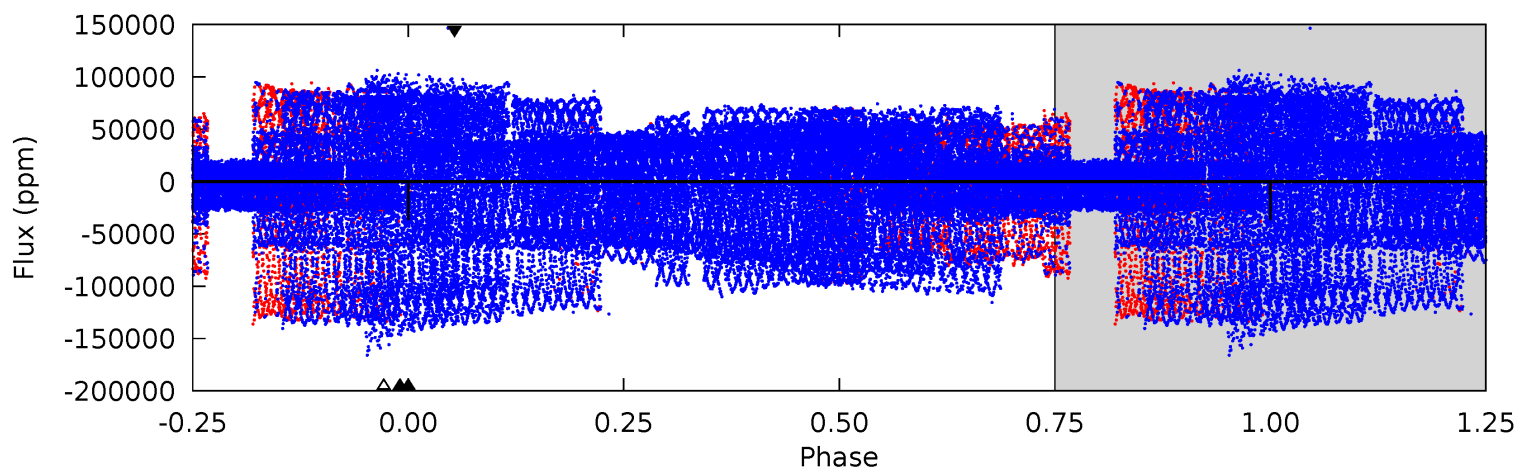
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.8	16.5	15.6	29.2	5.70	3.67	1.42	6.21	-7.32	0.90	-12.6	25.4	2.07	0.57	0.58



# Alt Model-Shift Uniqueness Test

009388304-01, P = 403.065593 Days, E = 352.140068 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
1.59	4.57	4.30	3.65	5.88	3.94	0.88	-2.72	-2.06	0.26	0.91	0.07	0.23	0.44	0.48



### Stellar Parameters For KIC 009388304

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5398^{+160}_{-160}$	$4.580^{+0.030}_{-0.120}$	$-0.040^{+0.300}_{-0.300}$	$0.805^{+0.136}_{-0.073}$	$0.902^{+0.063}_{-0.108}$	$2.441^{+0.458}_{-0.853}$
	+3%/-3%	+1%/-3%	+750%/-750%	+17%/-9%	+7%/-12%	+19%/-35%
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 009388304-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16297 \pm 986$	$53.58^{+52.79}_{-36.59}$	$300^{+14}_{-12}$	$3122^{+1485}_{-524}$	$3335^{+30544}_{-2488}$
Alt.	$-105405 \pm 23088$	$59.62^{+58.13}_{-40.76}$	$299^{+14}_{-12}$	$4181^{+2695}_{-865}$	$18865^{+175511}_{-14195}$

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

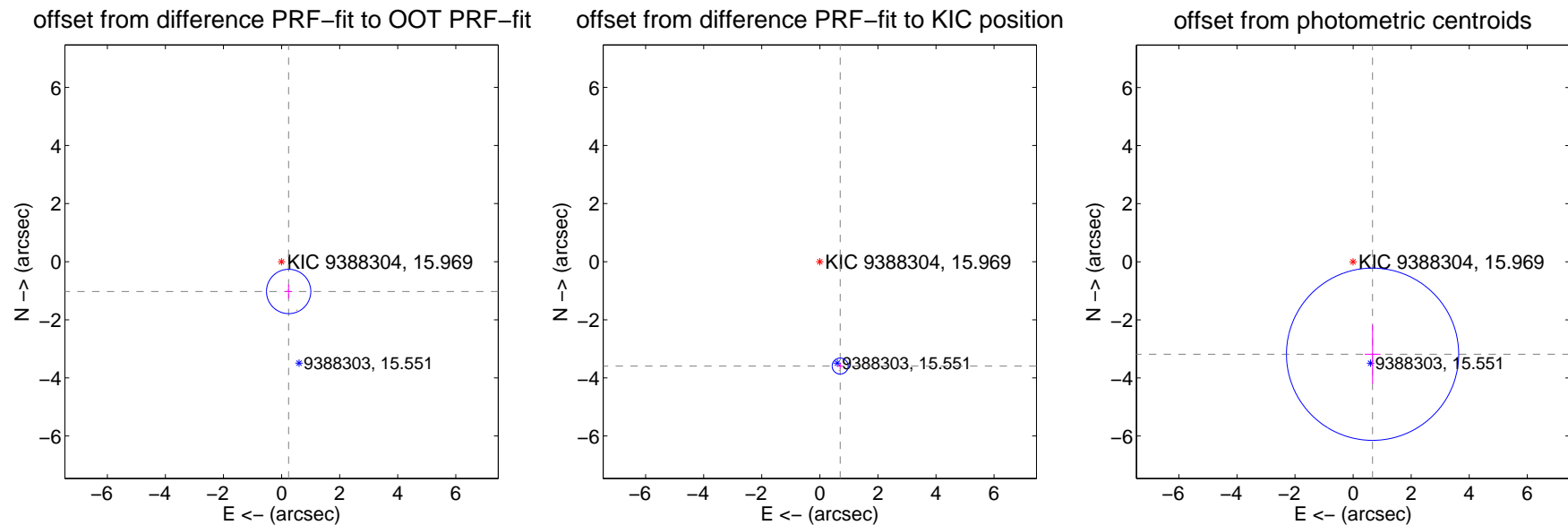
## DV Centroid Data

Supplemental centroid analysis for 009388304-01. Kepler magnitude: 15.97. Transit SNR 15.85

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.92 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.053 \pm 0.254$	4.14	$-0.244 \pm 0.121$	$-1.025 \pm 0.238$
PRF-fit source offset from KIC position	$3.661 \pm 0.092$	39.88	$-0.700 \pm 0.072$	$-3.594 \pm 0.092$
photometric centroid source offset	$3.25 \pm 0.99$	3.29	$-0.67 \pm 0.27$	$-3.18 \pm 1.01$



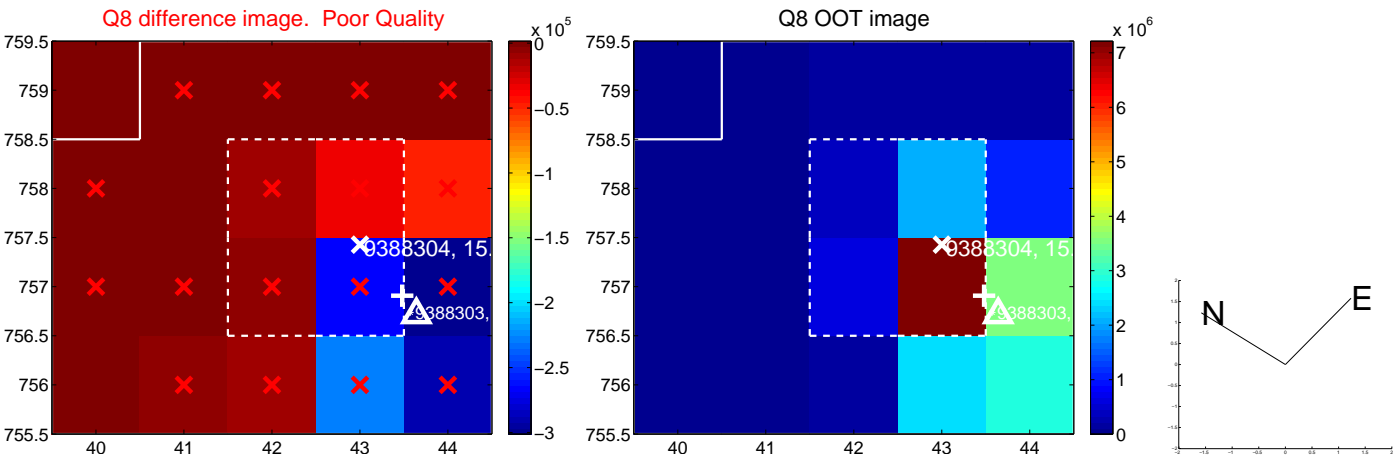
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

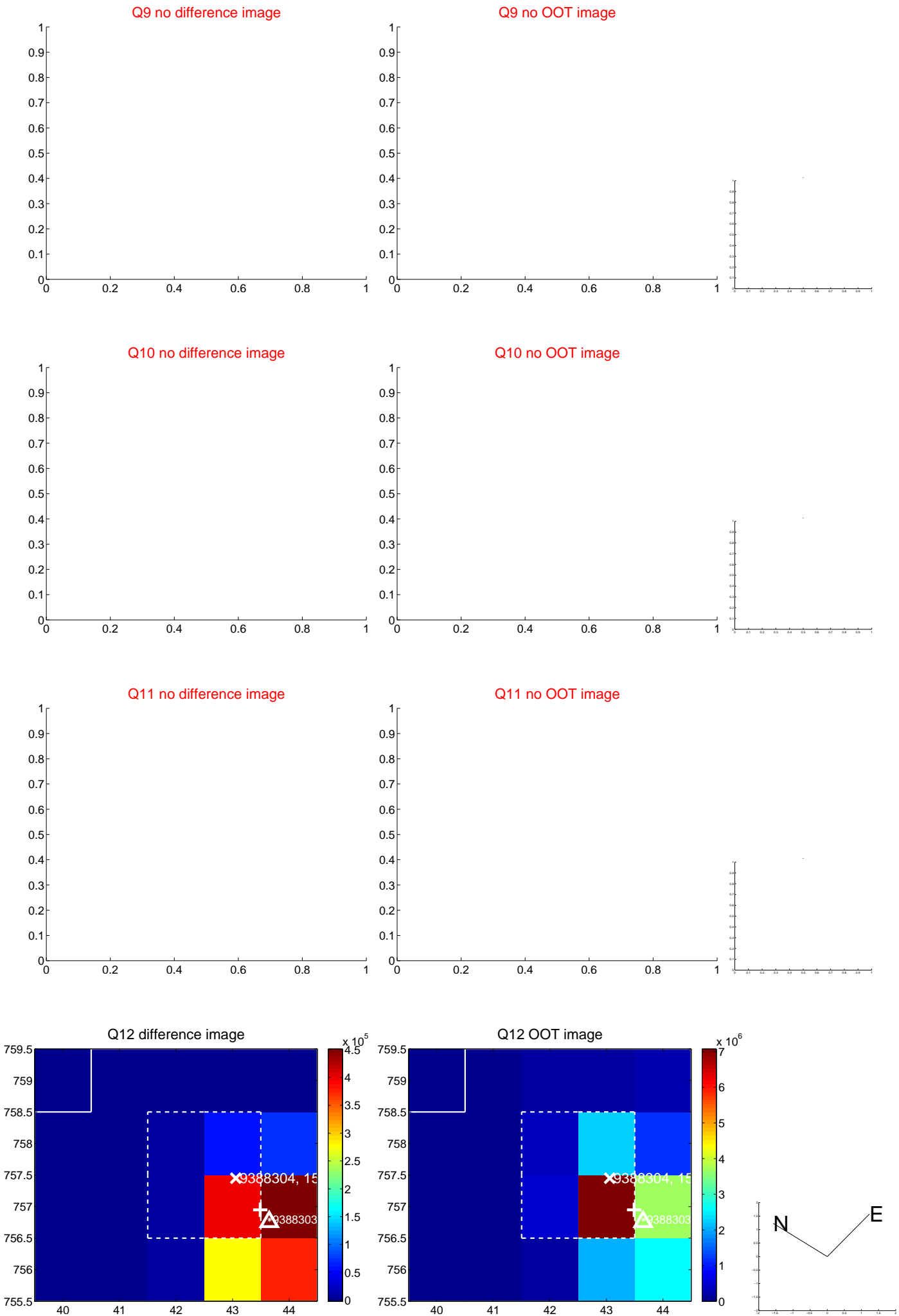




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



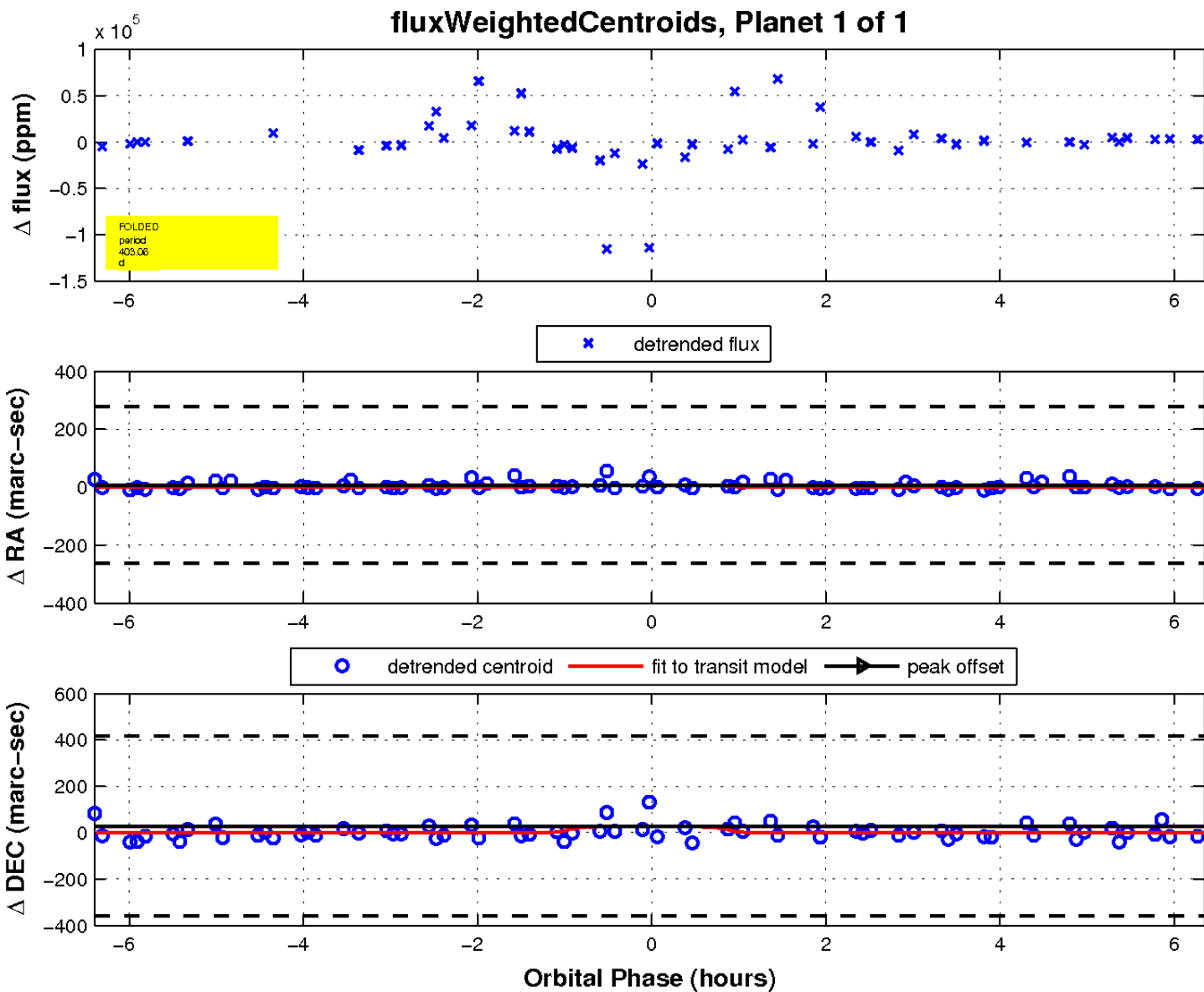
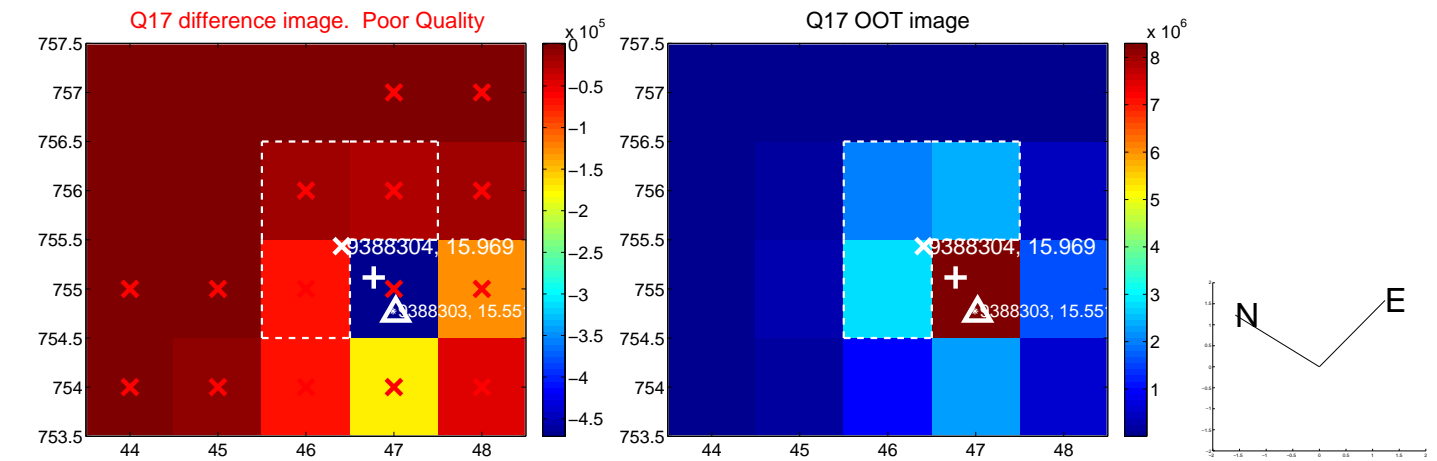
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

