

# KIC 009704050

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009704050-01	OBS	No	366.921331	182.042185	17.3	1.650	24.9	1.6	43.79	4020	20.77	315.72

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009704050-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

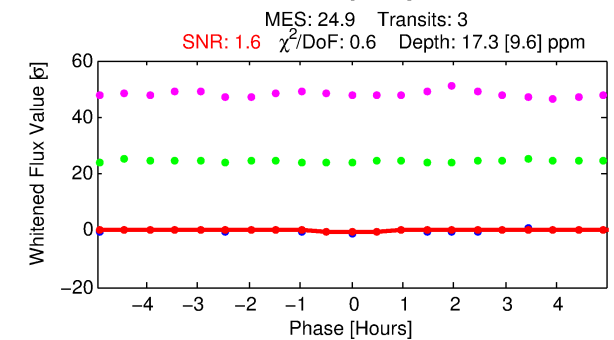
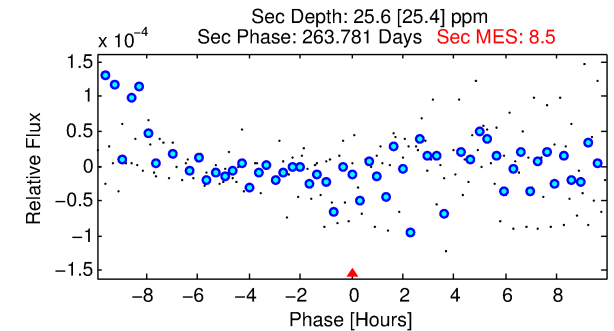
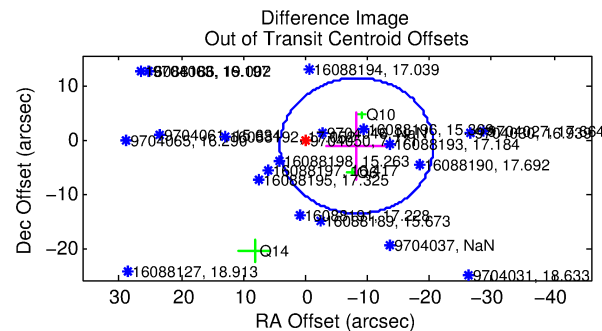
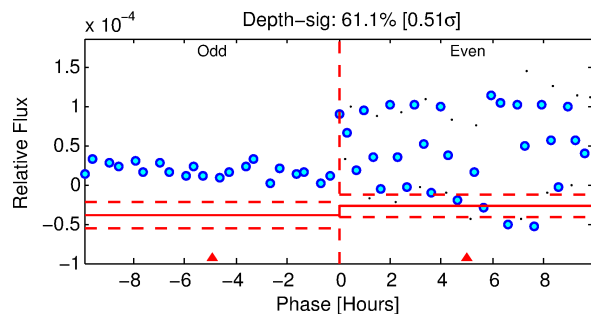
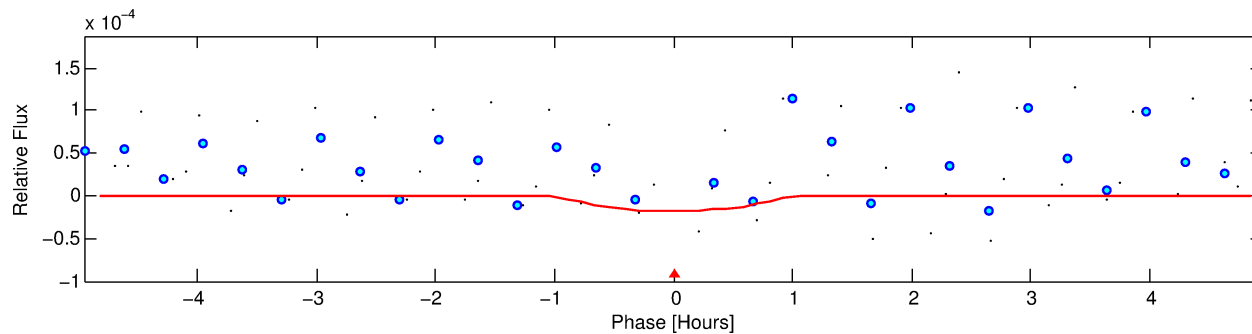
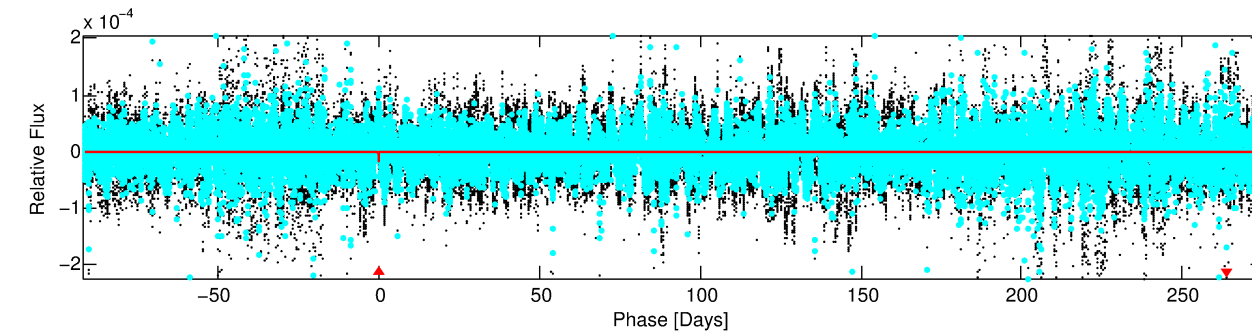
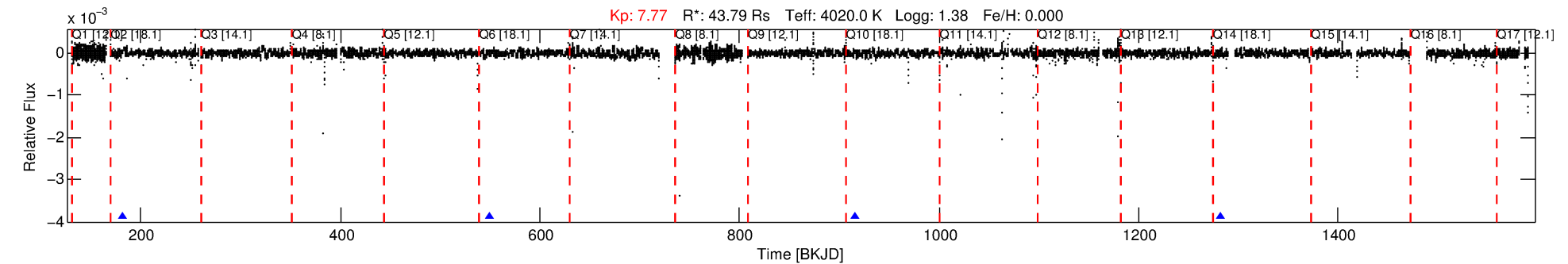
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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 009704050-01

No Significant Match Found

KIC: 9704050    Candidate: 1 of 1    Period: 366.921 d



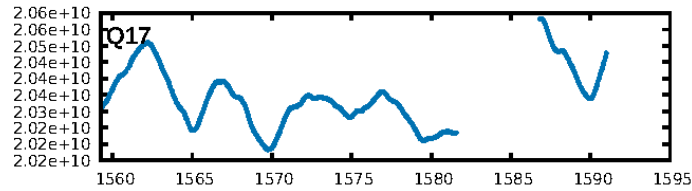
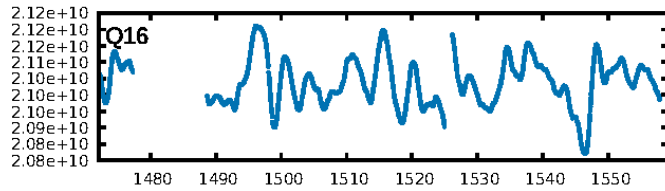
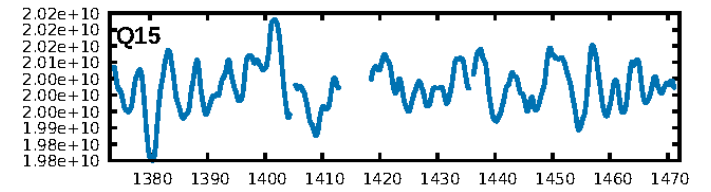
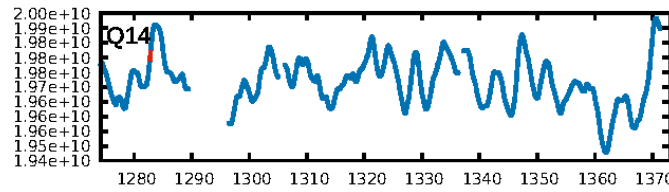
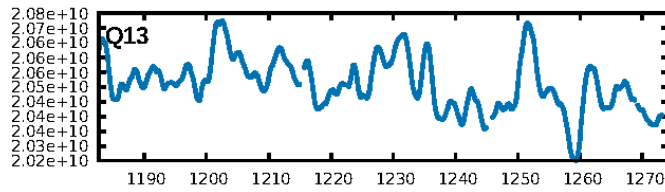
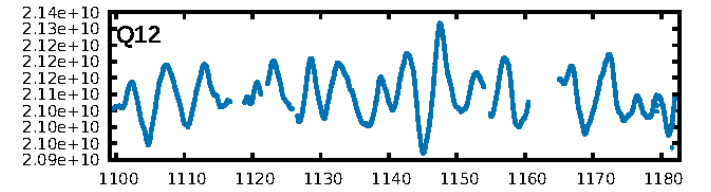
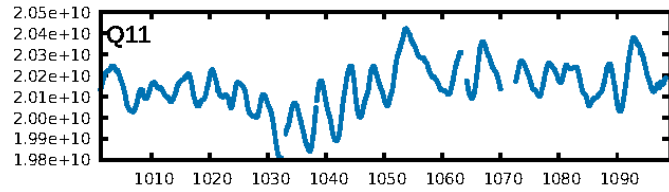
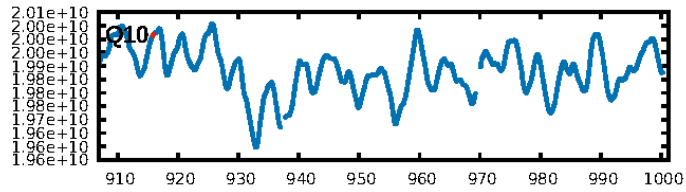
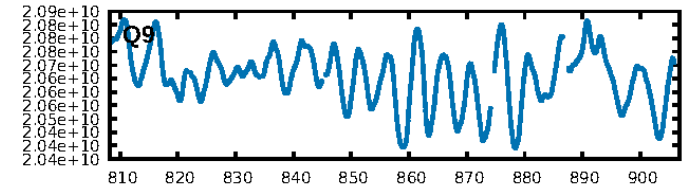
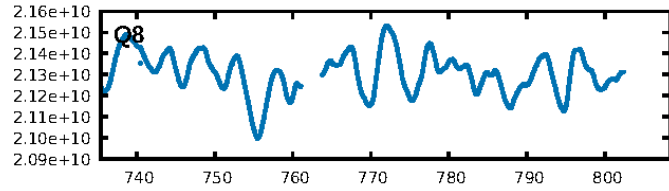
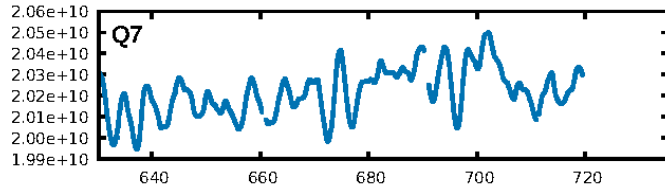
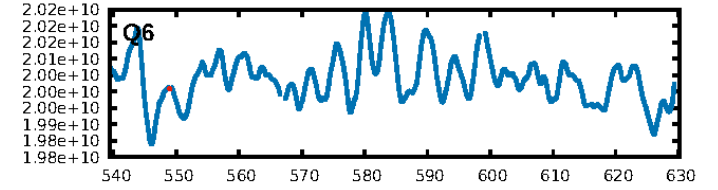
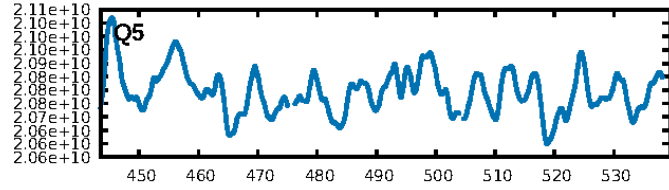
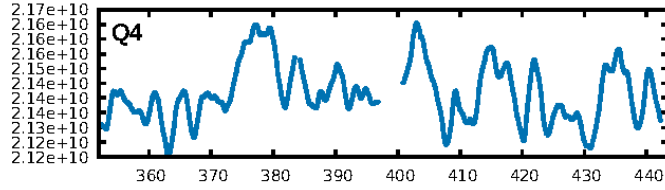
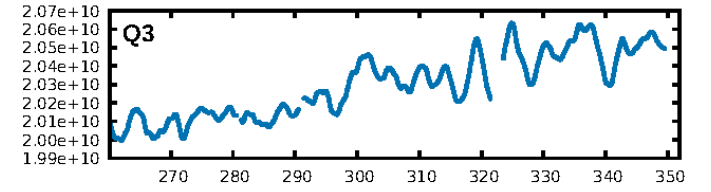
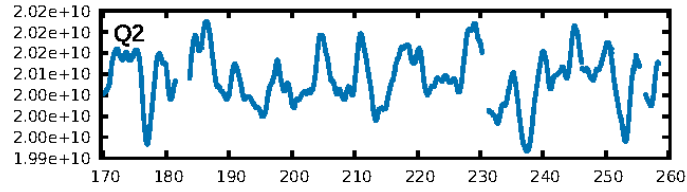
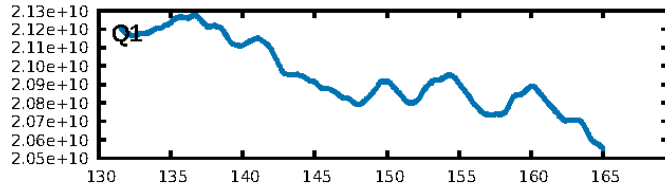
DV Fit Results:

Period = 366.92133 [0.00736] d  
Epoch = 182.0422 [0.0138] BKJD  
Rp/R\* = 0.0043 [0.0119]  
a/R\* = 1034.30 [8251.47]  
b = 0.80 [3.72]  
  
Seff = 315.72 [156.63]  
Teq = 1075 [133] K  
**Rp = 20.77 [57.51] Re**  
a = 1.1922 [0.3756] AU  
  
Ag = 46.48 [260.56] [0.17σ]  
Teffp = 4339 [6058] K [0.54σ]

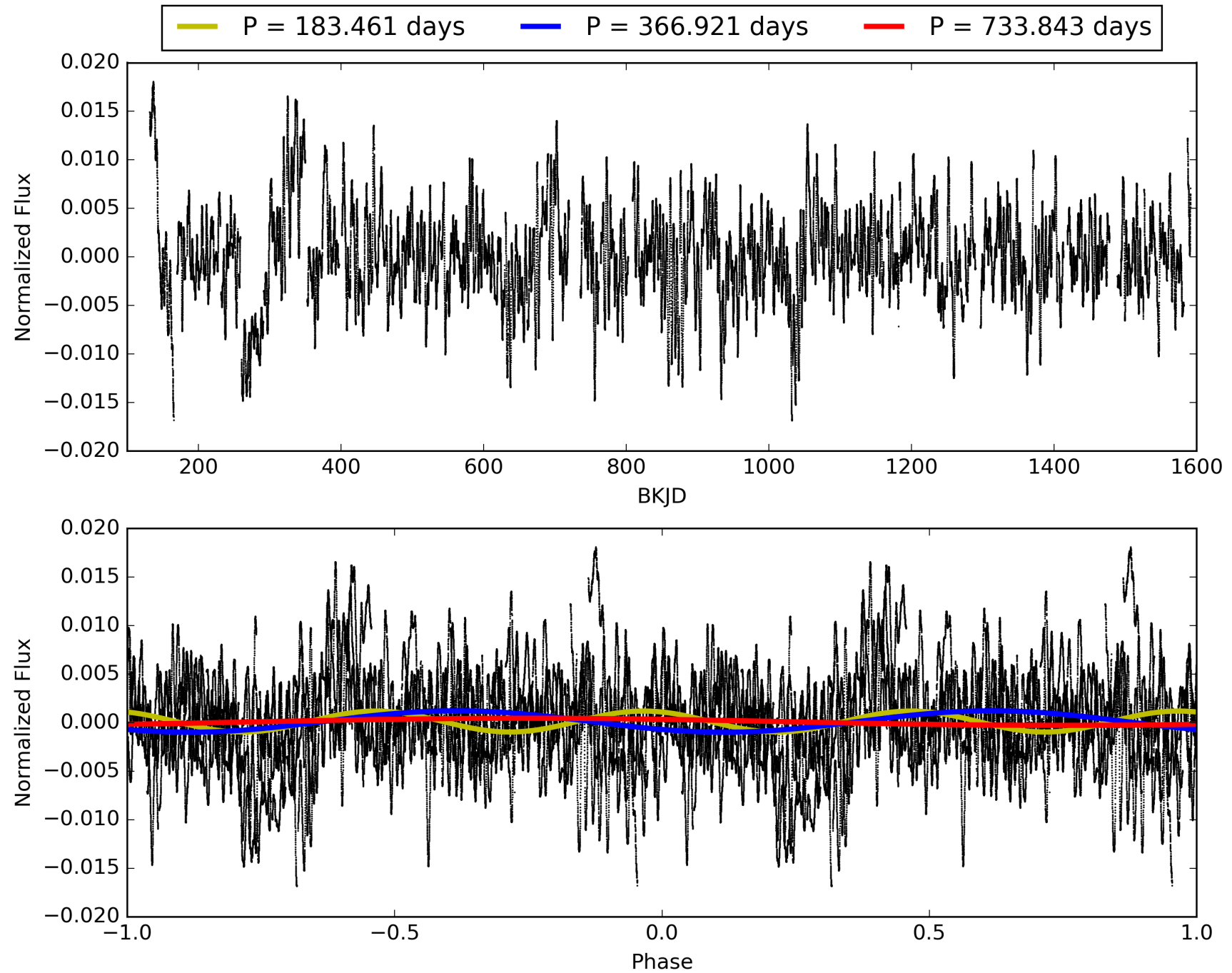
DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 69.1%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 4.53e-08**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: N/A  
  
Centroid-sig: 7.2%  
**Centroid-so: 92.155 arcsec [3.21σ]**  
OotOffset-rm: 8.302 arcsec [2.01σ]  
KicOffset-rm: 10.842 arcsec [2.55σ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 009704050-01, PDC Light Curves

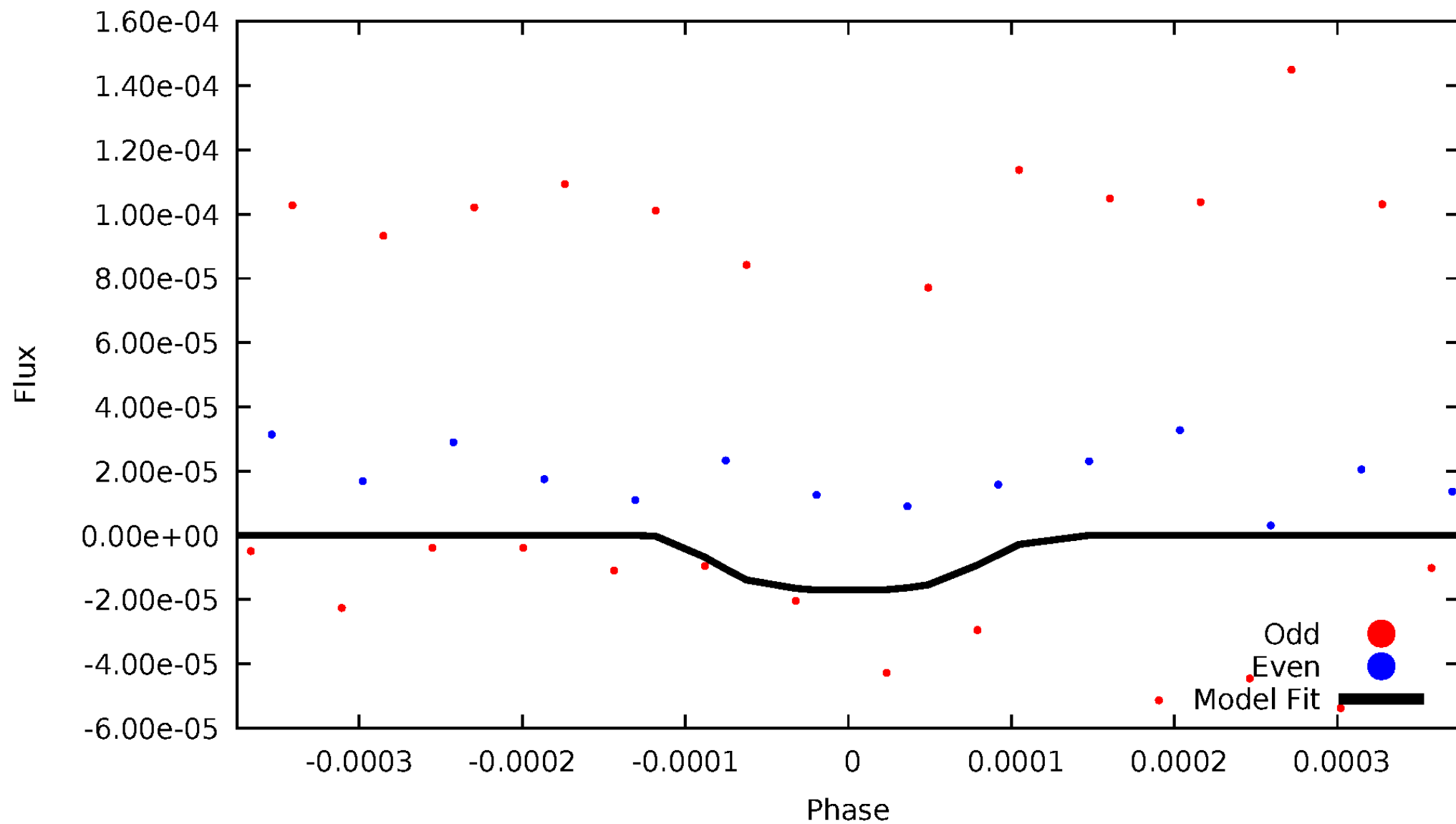


TCE 009704050-01



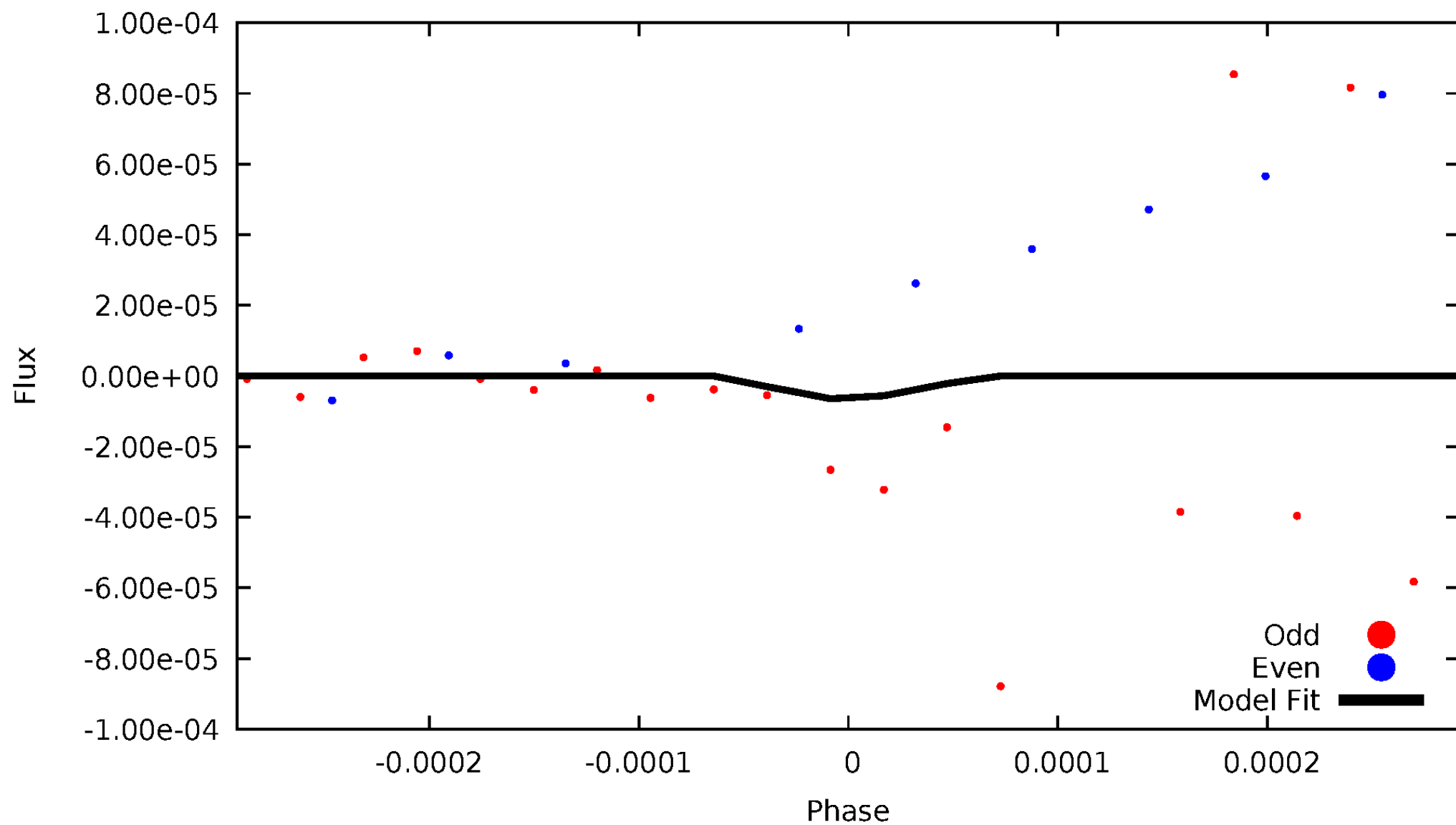
# DV Odd/Even

TCE 009704050-01



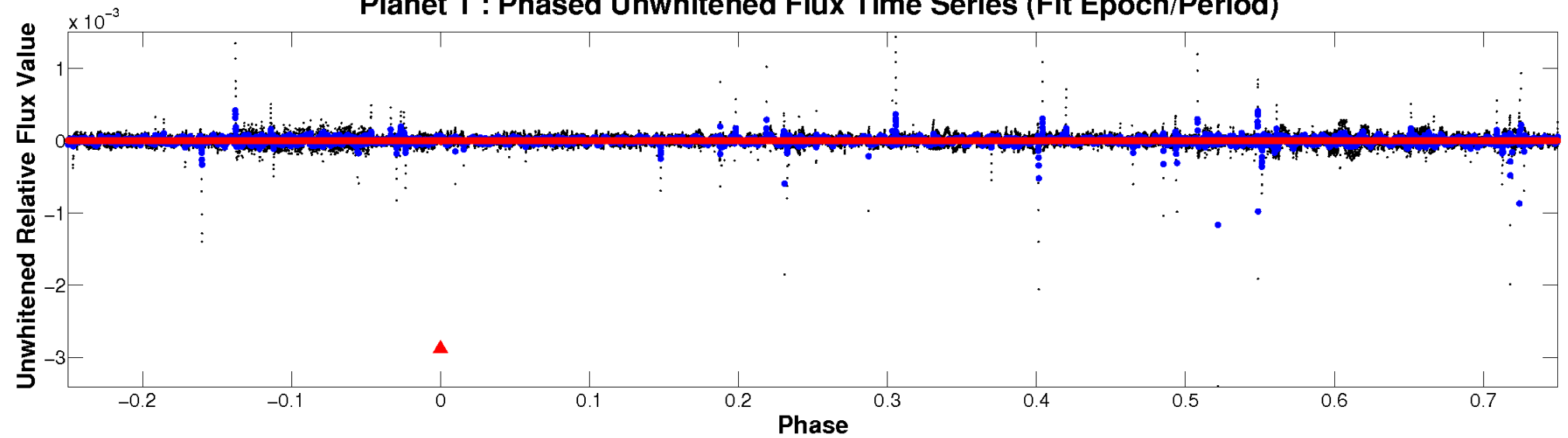
# ALT Odd/Even

TCE 009704050-01

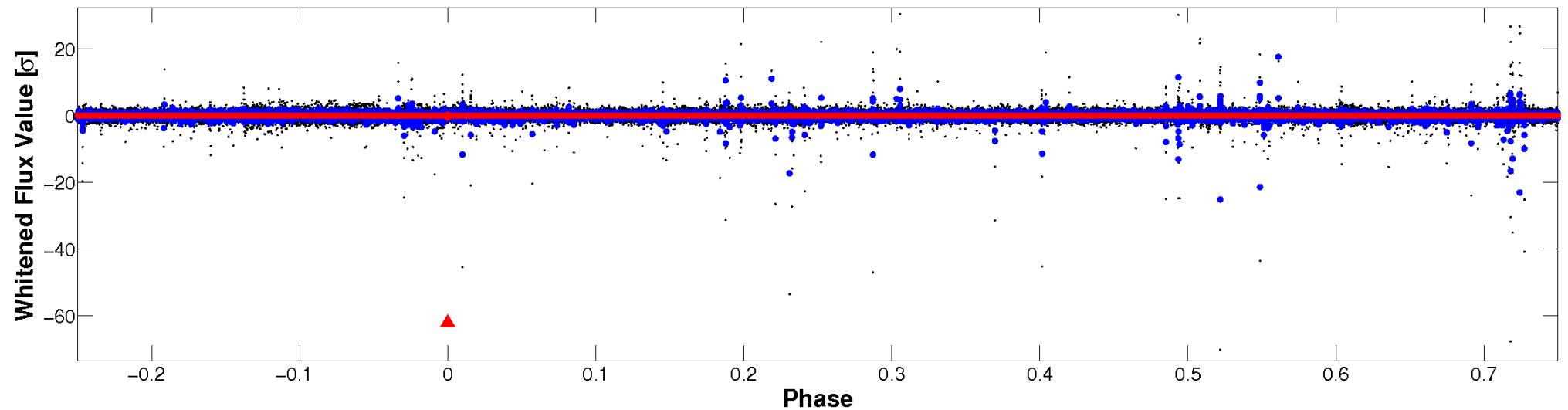


# Non-Whitened Vs. Whitened Light Curve

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

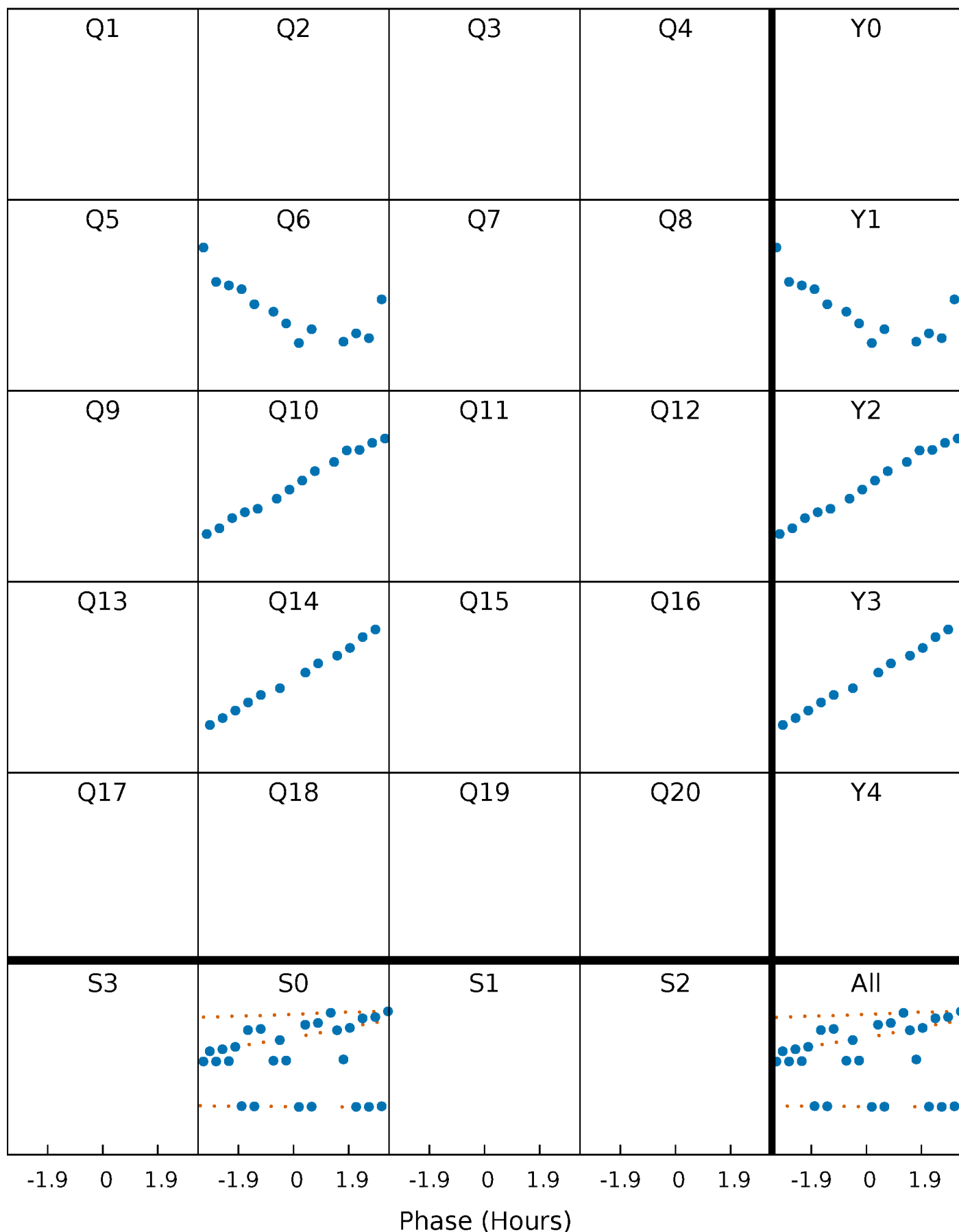


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

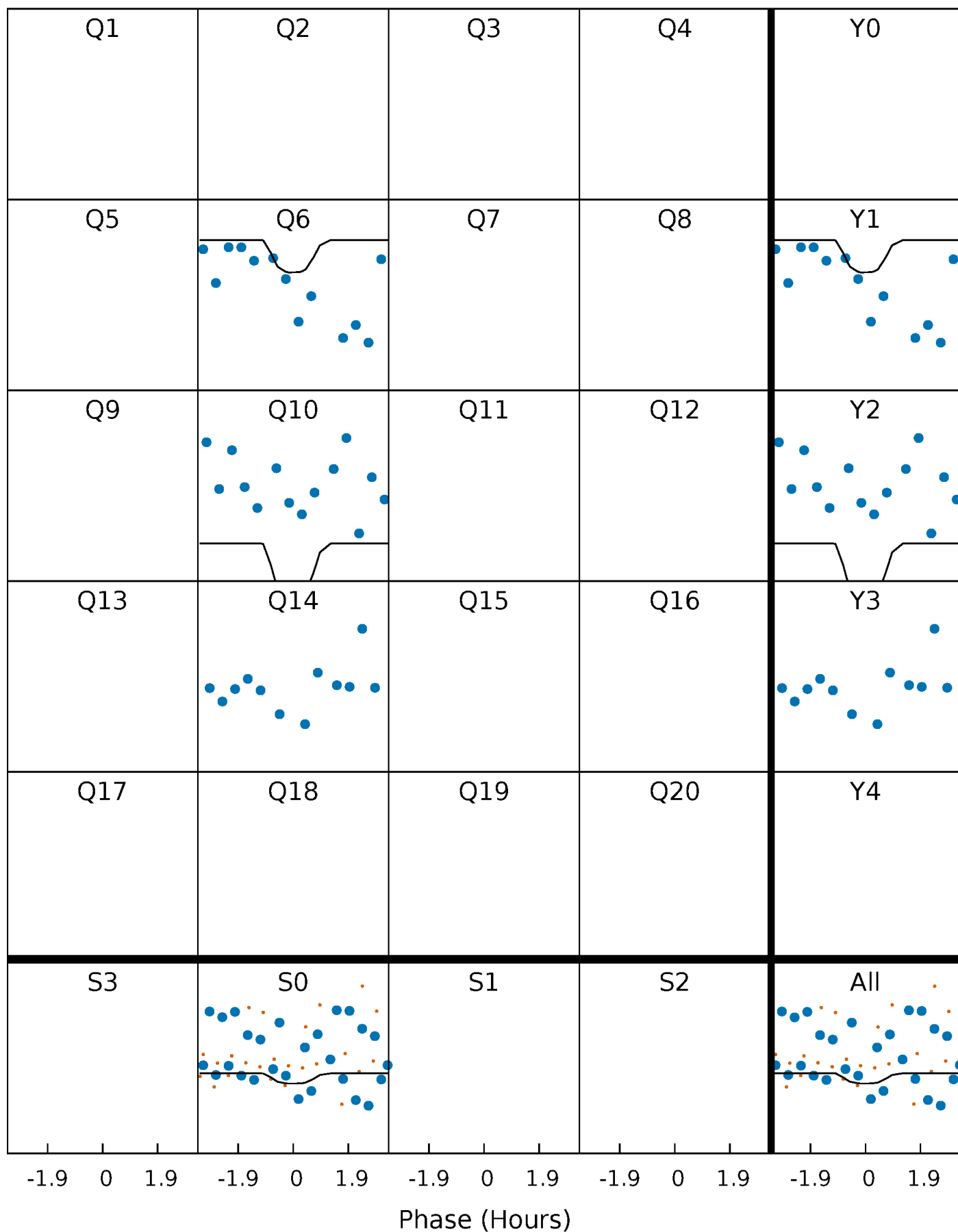
TCE 009704050-01 P=366.921331 Days  $T_0=182.042185$  (BKJD)





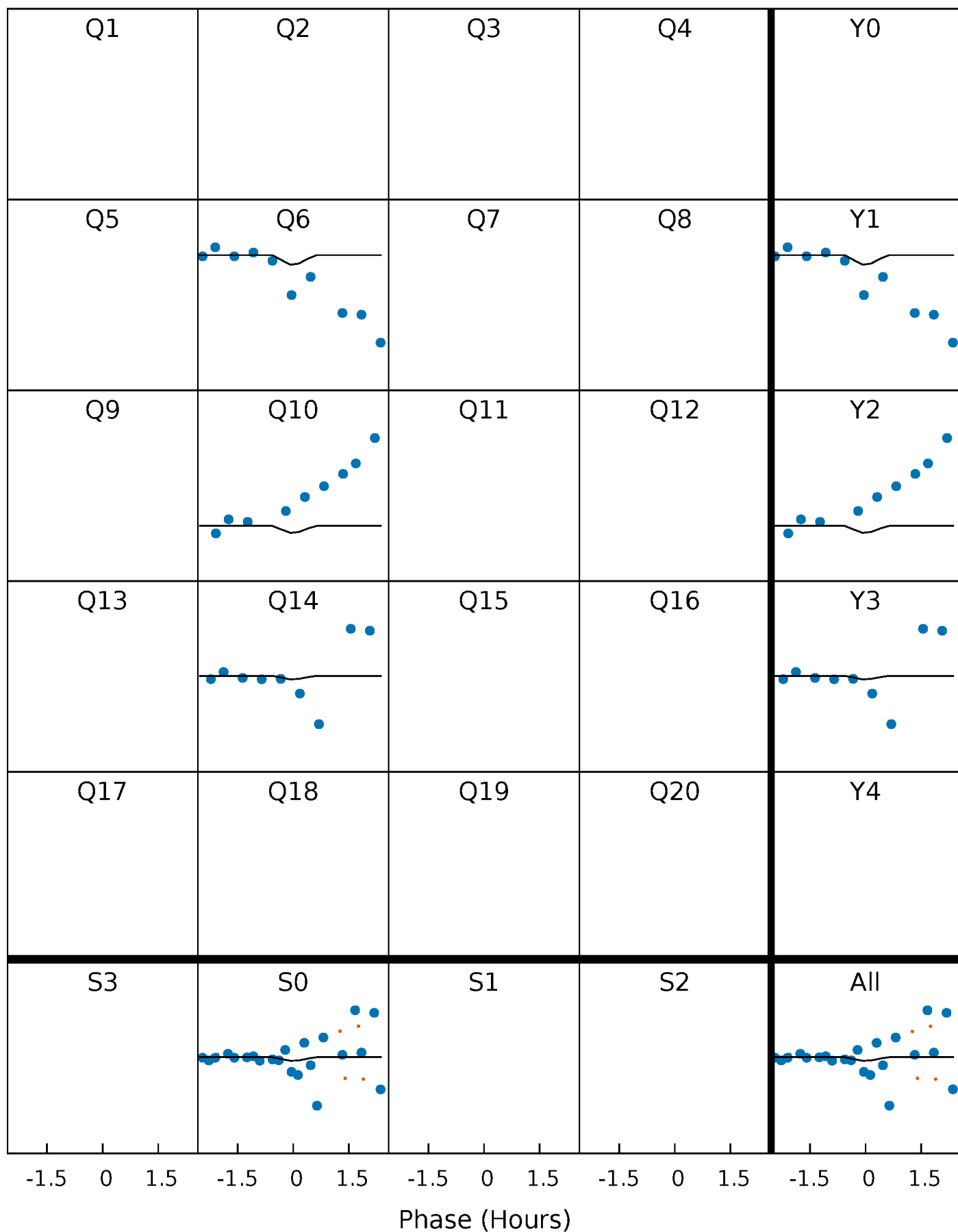
# DV Quarter-Phased Transit Curves

TCE 009704050-01 P=366.921331 Days  $T_0=182.042185$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

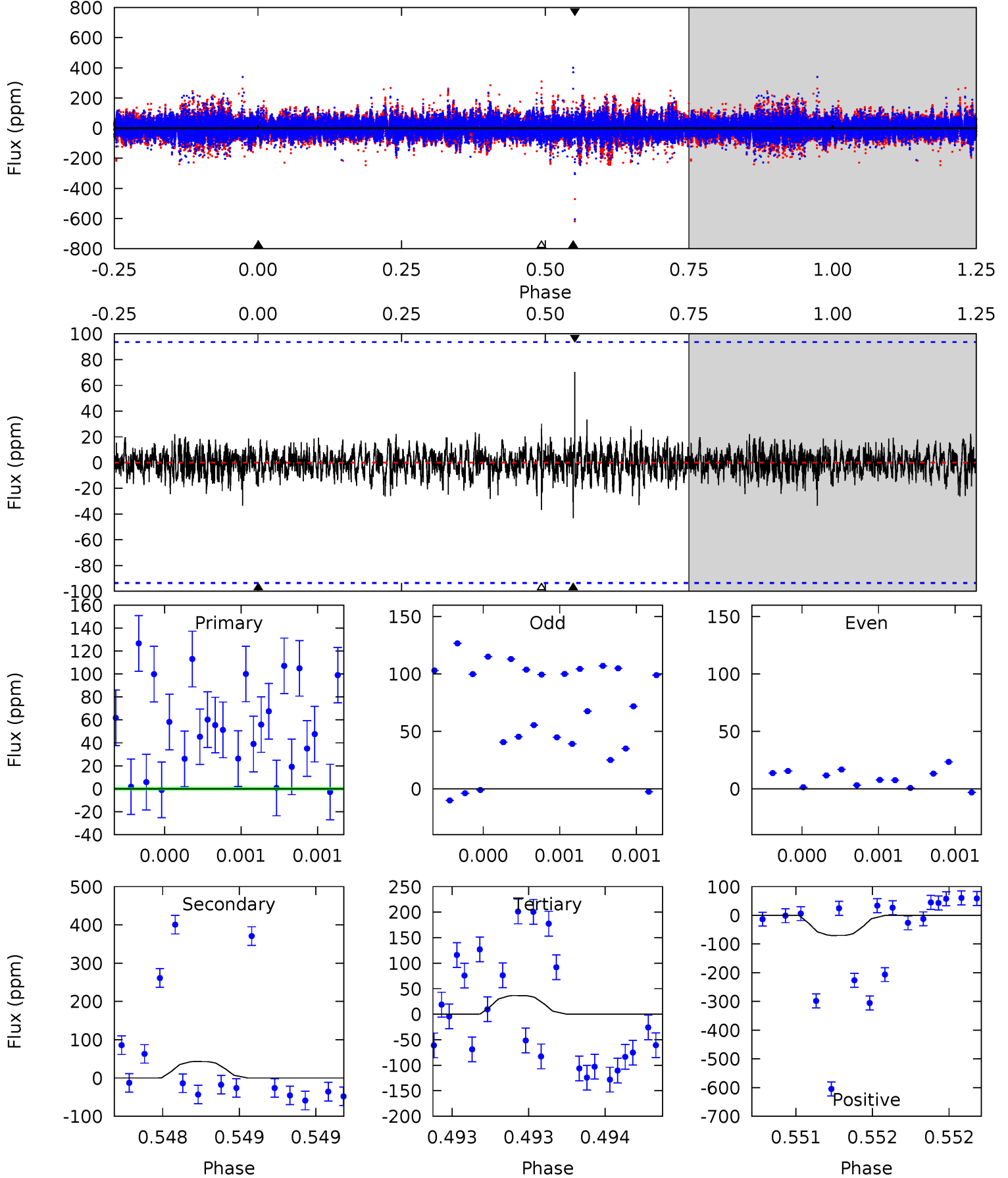
TCE 009704050-01 P=366.890687 Days  $T_0=182.084572$  (BKJD)



# DV Model-Shift Uniqueness Test

009704050-01, P = 366.921331 Days, E = 182.042185 Days

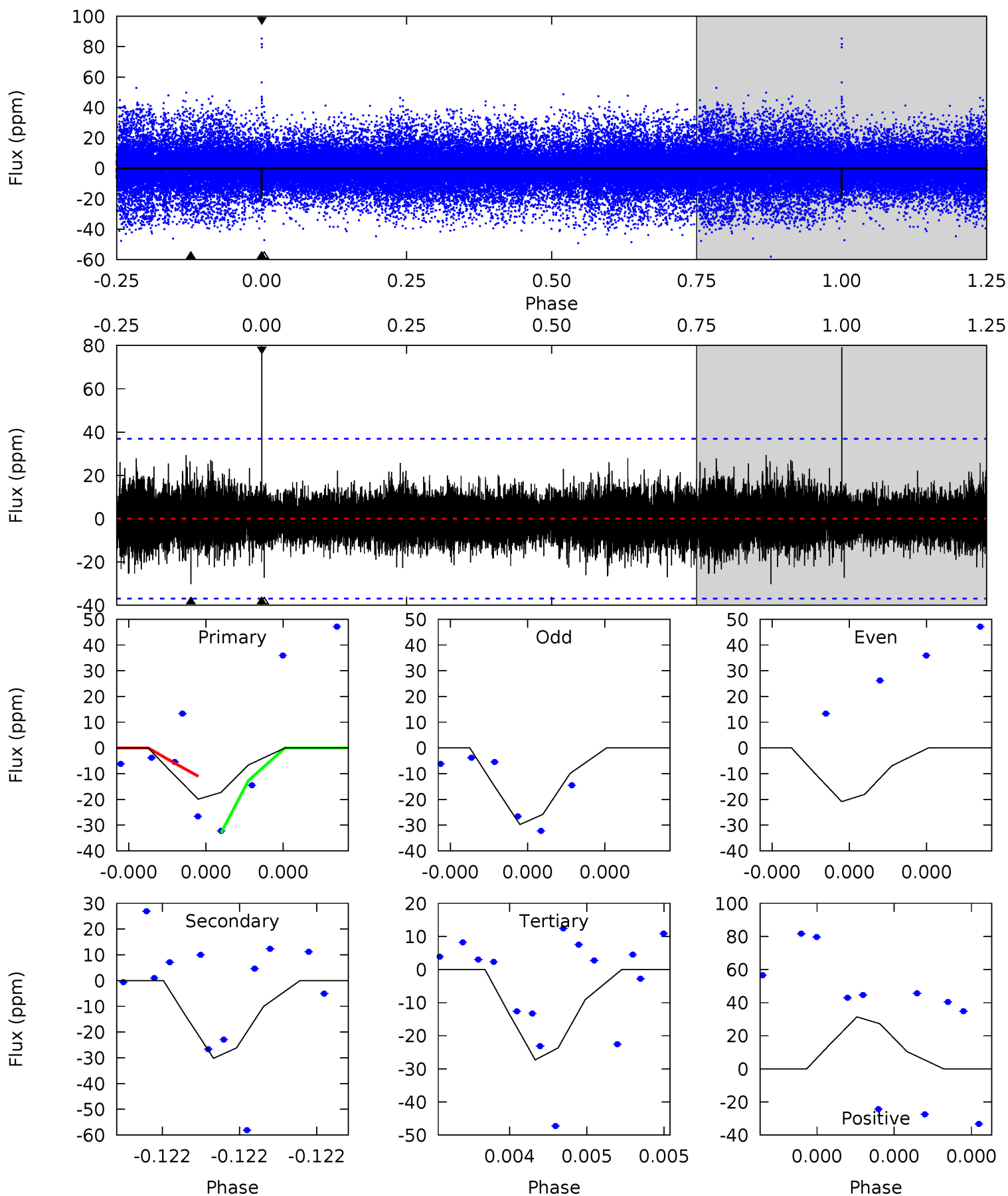
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.13	2.63	2.23	4.29	5.70	3.68	0.47	-1.10	-3.15	0.40	-1.66	0.07	1.72	0.62	0.28



# Alt Model-Shift Uniqueness Test

009704050-01, P = 366.890687 Days, E = 182.084572 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
3.17	4.81	4.35	5.00	5.87	3.93	0.93	-1.18	-1.83	0.46	-0.20	0.82	0.37	0.72	1.70



### Stellar Parameters For KIC 009704050

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4020^{+80}_{-72}$	$1.380^{+0.282}_{-0.188}$	$0.000^{+0.250}_{-0.250}$	$43.793^{+8.770}_{-15.035}$	$1.677^{+0.140}_{-0.561}$	$0.000^{+0.000}_{-0.000}$
	+2%/-2%	+20%/-14%	+inf%/-inf%	+20%/-34%	+8%/-33%	+192%/-43%
Source	SPE14	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 009704050-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-43 \pm 16$	$44.88^{+48.94}_{-29.57}$	$1514^{+106}_{-134}$	$3453^{+1826}_{-664}$	$14^{+120}_{-11}$
Alt.	$-30 \pm 6$	$40.31^{+43.87}_{-27.59}$	$1501^{+108}_{-133}$	$3392^{+1905}_{-676}$	$13^{+127}_{-10}$

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

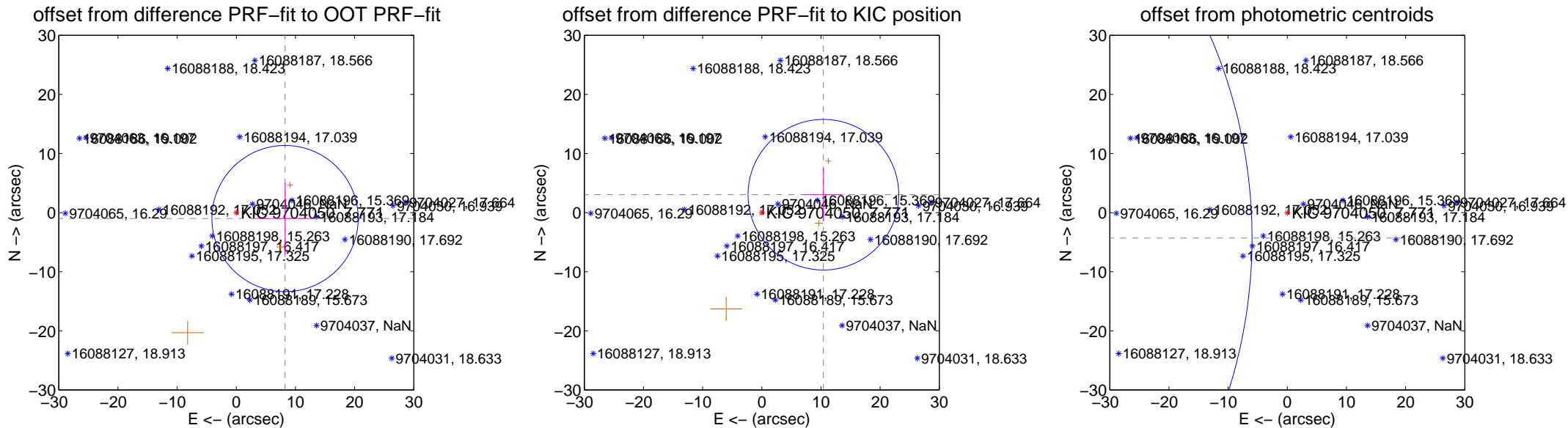
## DV Centroid Data

Supplemental centroid analysis for 009704050-01. **Kepler magnitude: 7.77.** Transit SNR 1.65

There are 0 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 4.58 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.302 \pm 4.121$	2.01	$-8.241 \pm 4.882$	$-1.005 \pm 6.091$
PRF-fit source offset from KIC position	$10.842 \pm 4.245$	2.55	$-10.411 \pm 3.255$	$3.026 \pm 4.500$
photometric centroid source offset	$92.16 \pm 28.70$	3.21	$92.06 \pm 28.69$	$-4.31 \pm 31.69$



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

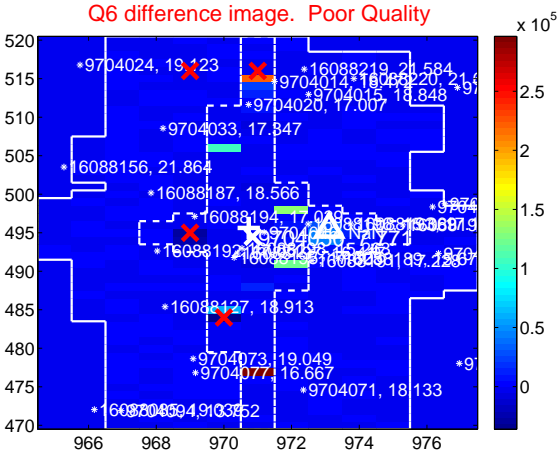
Q5 no difference image



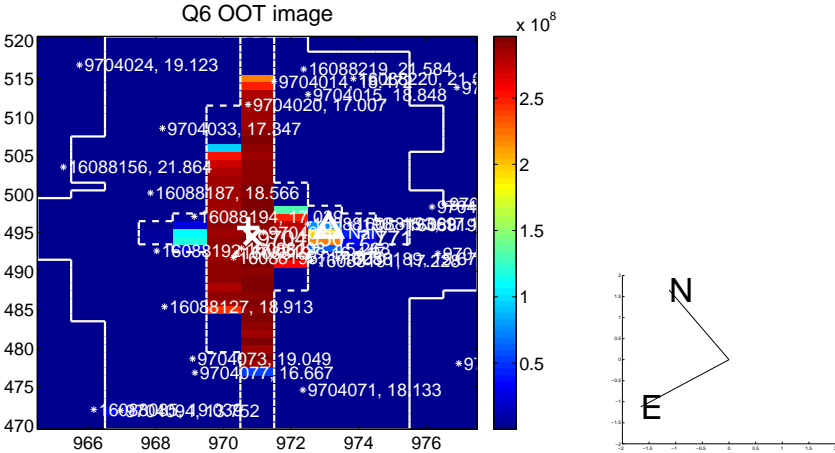
Q5 no OOT image



Q6 difference image. Poor Quality



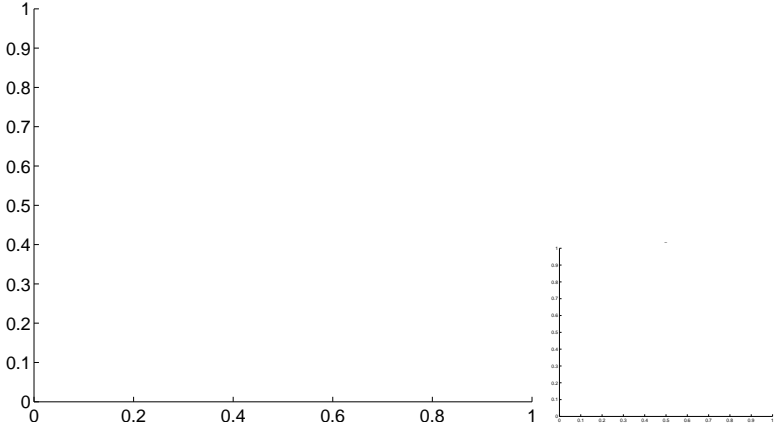
Q6 OOT image



Q7 no difference image



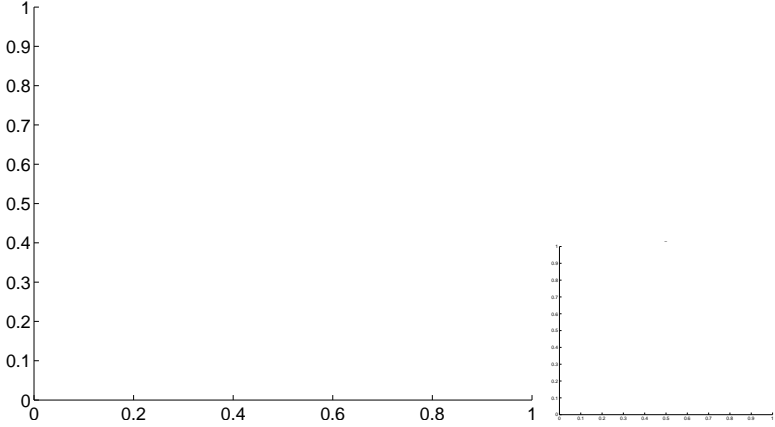
Q7 no OOT image



Q8 no difference image



Q8 no OOT image





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

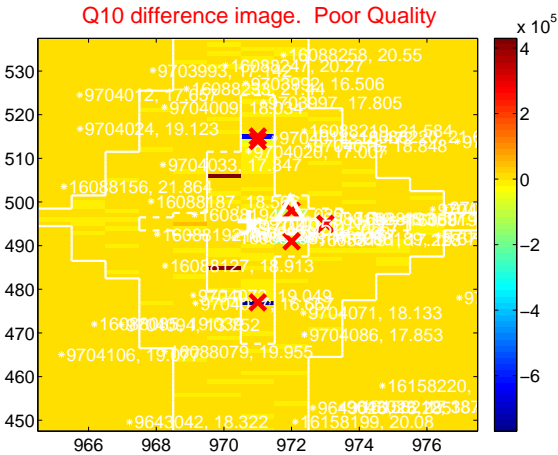
Q9 no difference image



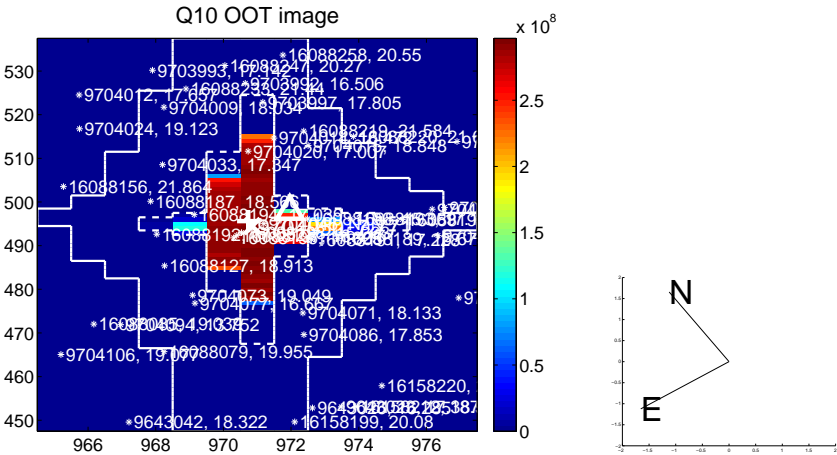
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



Q12 no OOT image

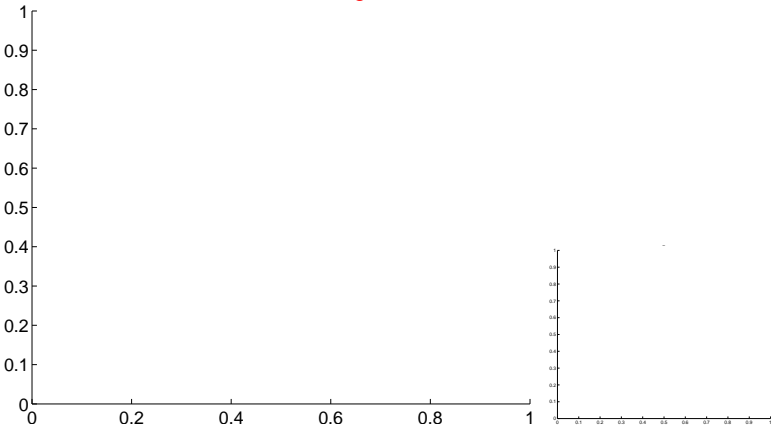


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

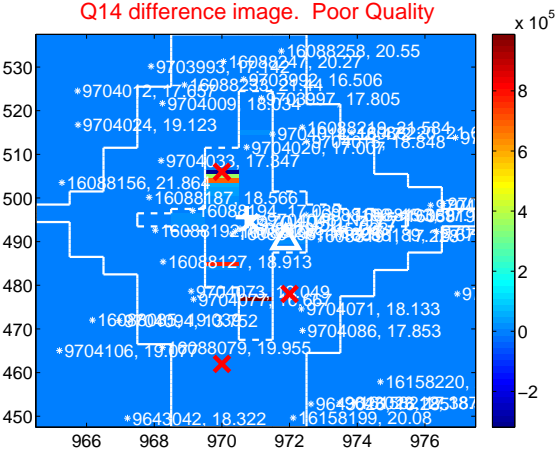
Q13 no difference image



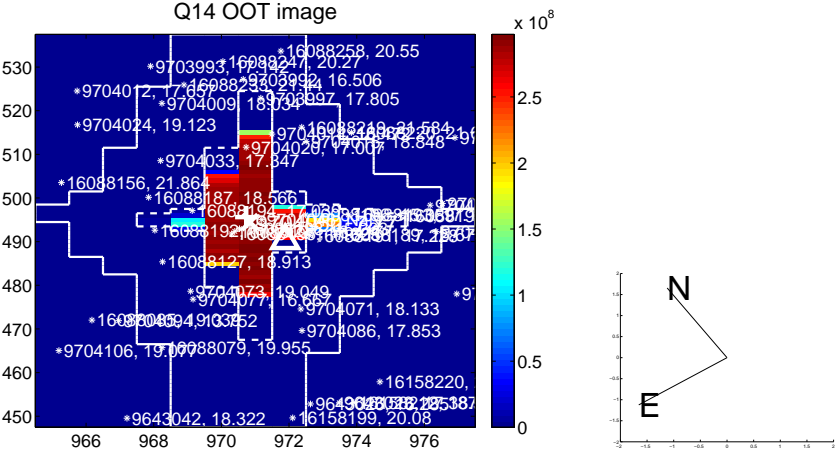
Q13 no OOT image



Q14 difference image. Poor Quality



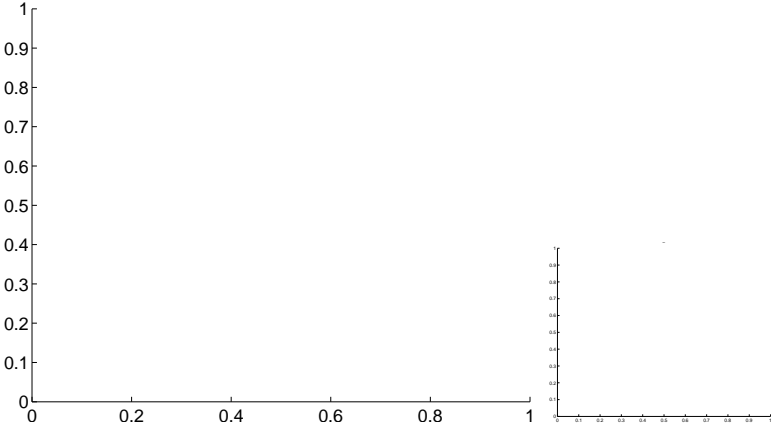
Q14 OOT image



Q15 no difference image



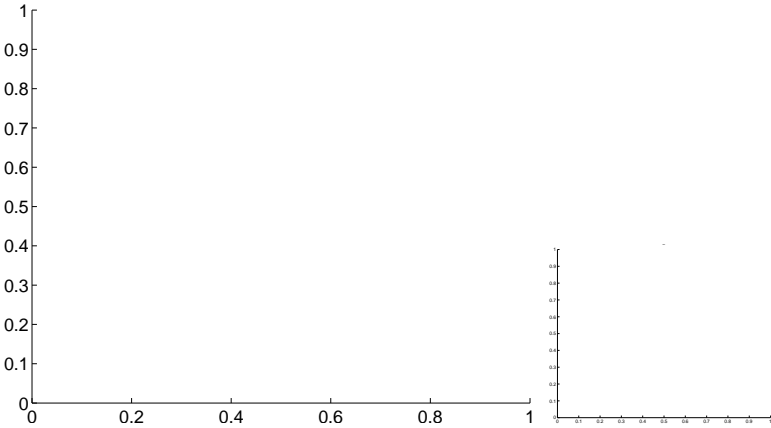
Q15 no OOT image



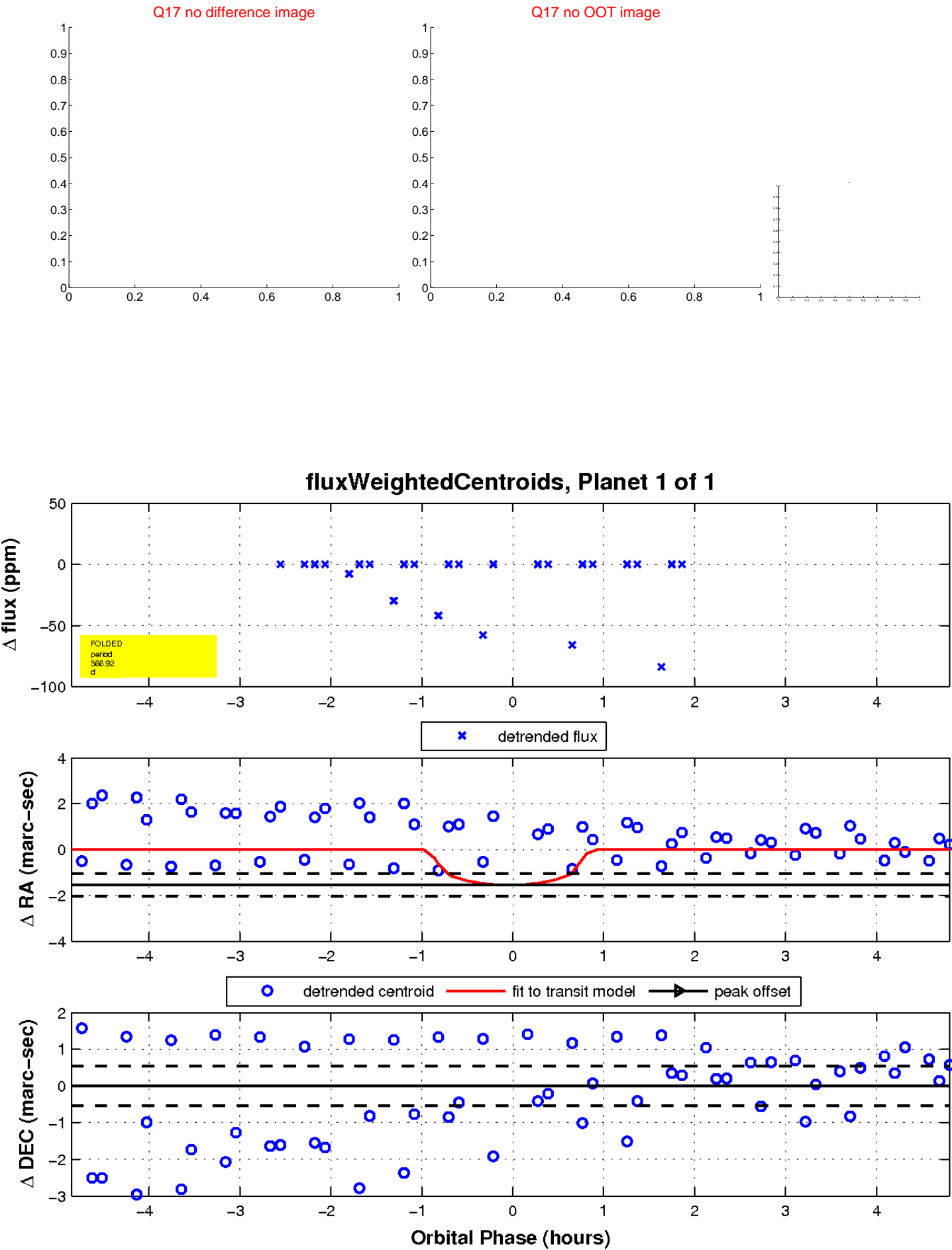
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

