

# KIC 009521317

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009521317-01	OBS	7940.01	188.881022	280.069663	330.1	1.581	8.7	9.9	1.00	6077	2.17	2.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009521317-01	OBS	PC	0.90	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.

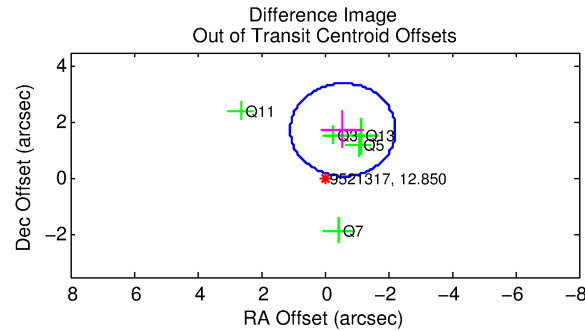
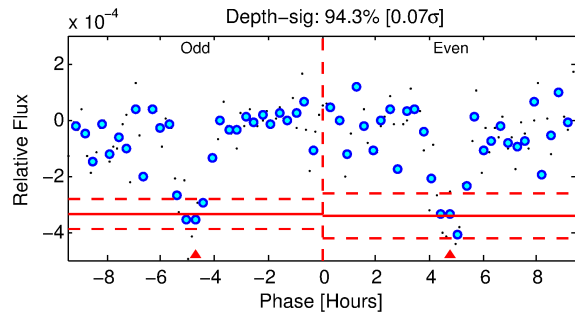
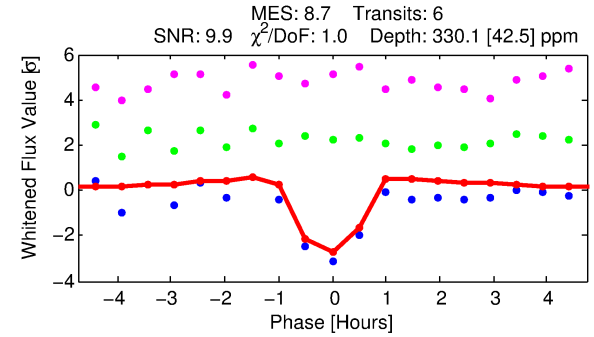
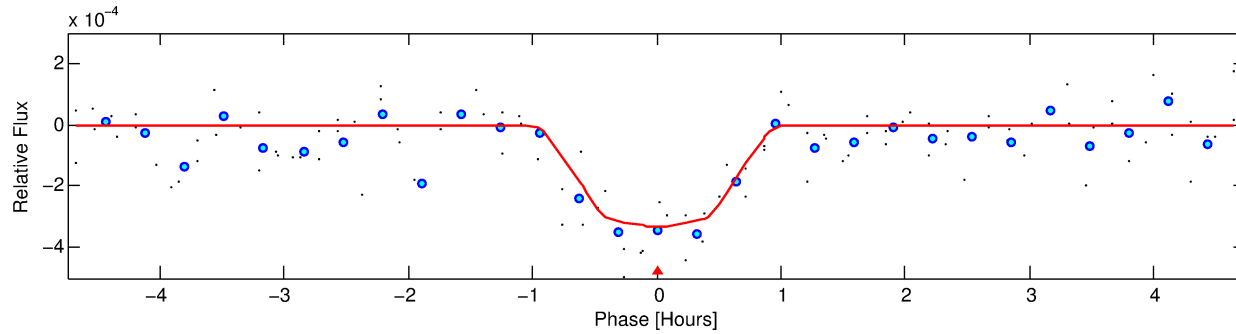
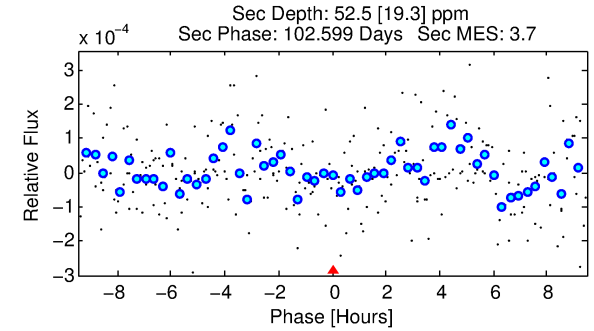
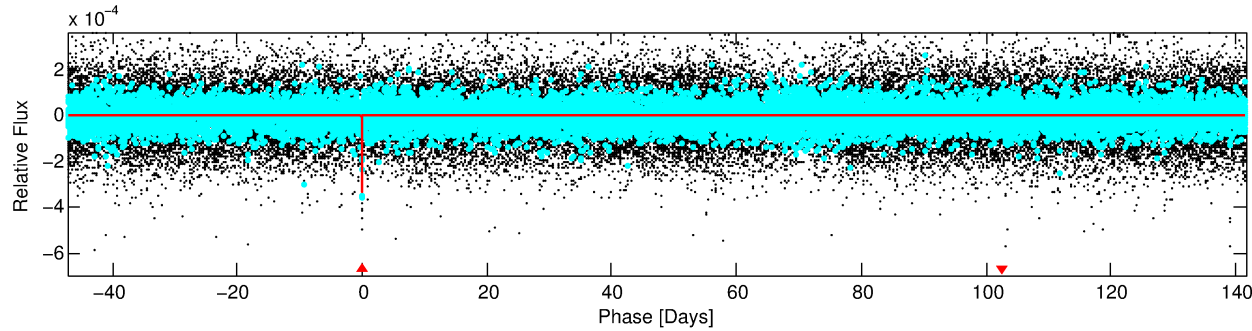
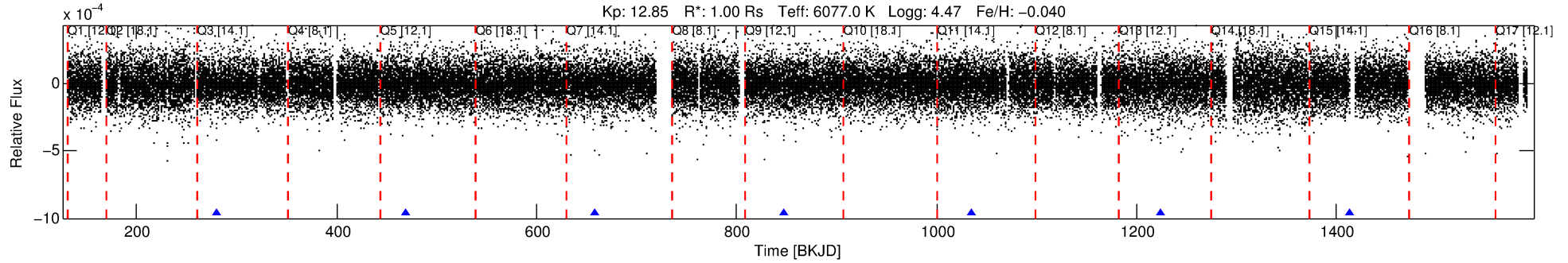
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009521317-01

No Significant Match Found

# DV One-Page Summary

KIC: 9521317 Candidate: 1 of 1 Period: 188.881 d



## DV Fit Results:

Period = 188.88102 [0.00129] d  
Epoch = 280.0697 [0.0040] BKJD  
Rp/R\* = 0.0200 [0.0120]  
a/R\* = 415.00 [1277.89]  
b = 0.91 [0.57]  
Seff = 2.80 [0.87]  
Teq = 330 [26] K  
Rp = 2.18 [1.40] Re  
a = 0.6605 [0.1254] AU  
Ag = 2664.59 [3443.02] [0.77σ]  
Teffp = 3663 [1161] K [2.87σ]

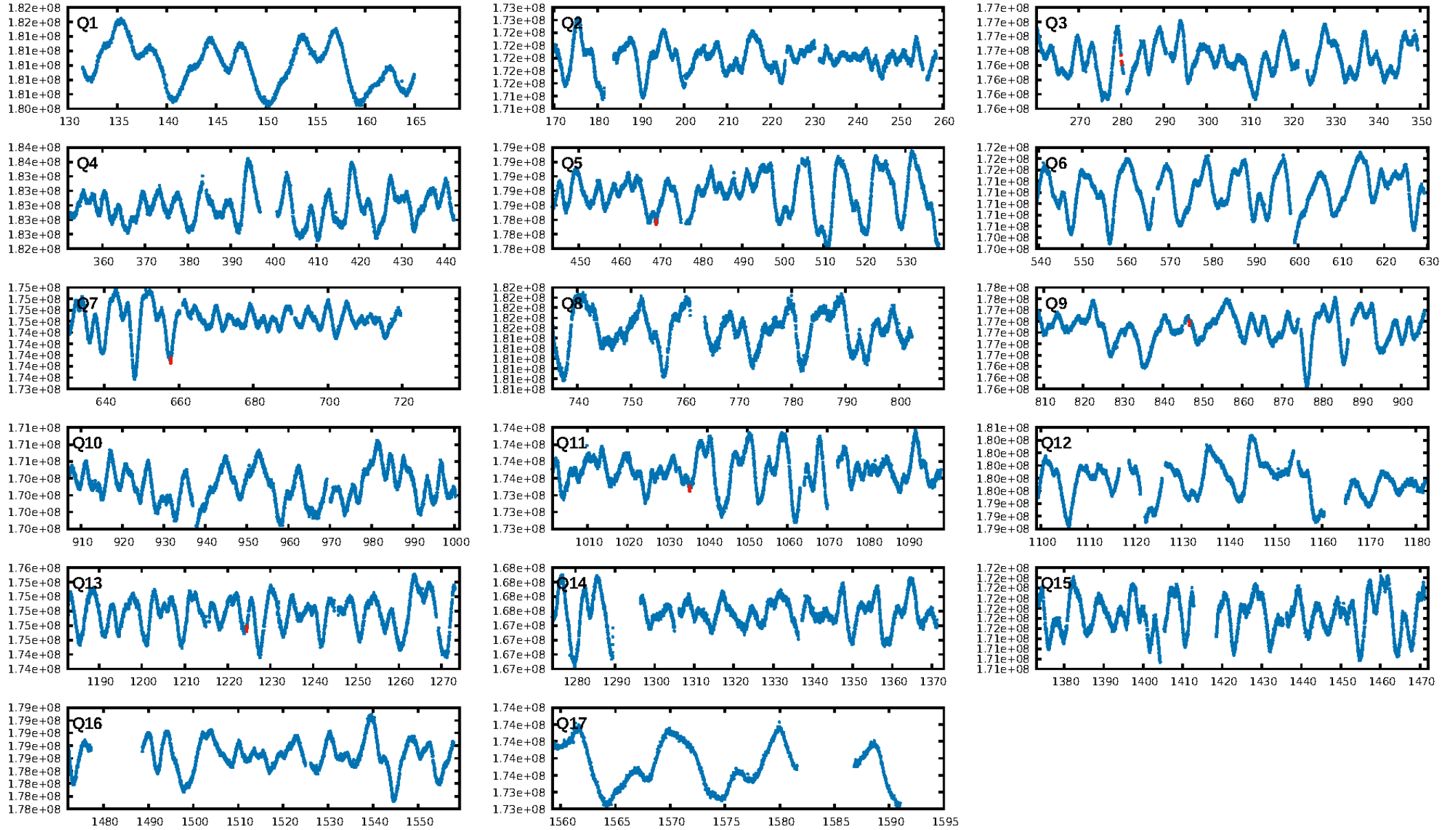
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 48.8%  
ModelChiSquareGof-sig: 93.8%  
Bootstrap-pfa: 6.33e-14  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 1.42  
Centroid-sig: 19.8%  
Centroid-so: 1.063 arcsec [0.96σ]  
OotOffset-rm: 1.833 arcsec [3.32σ]  
KicOffset-rm: 1.758 arcsec [3.33σ]  
OotOffset-st: 0/3/0/2 [5]  
KicOffset-st: 0/3/0/2 [5]  
DiffImageQuality-fgm: 1.00 [5/5]  
DiffImageOverlap-fno: 1.00 [5/5]

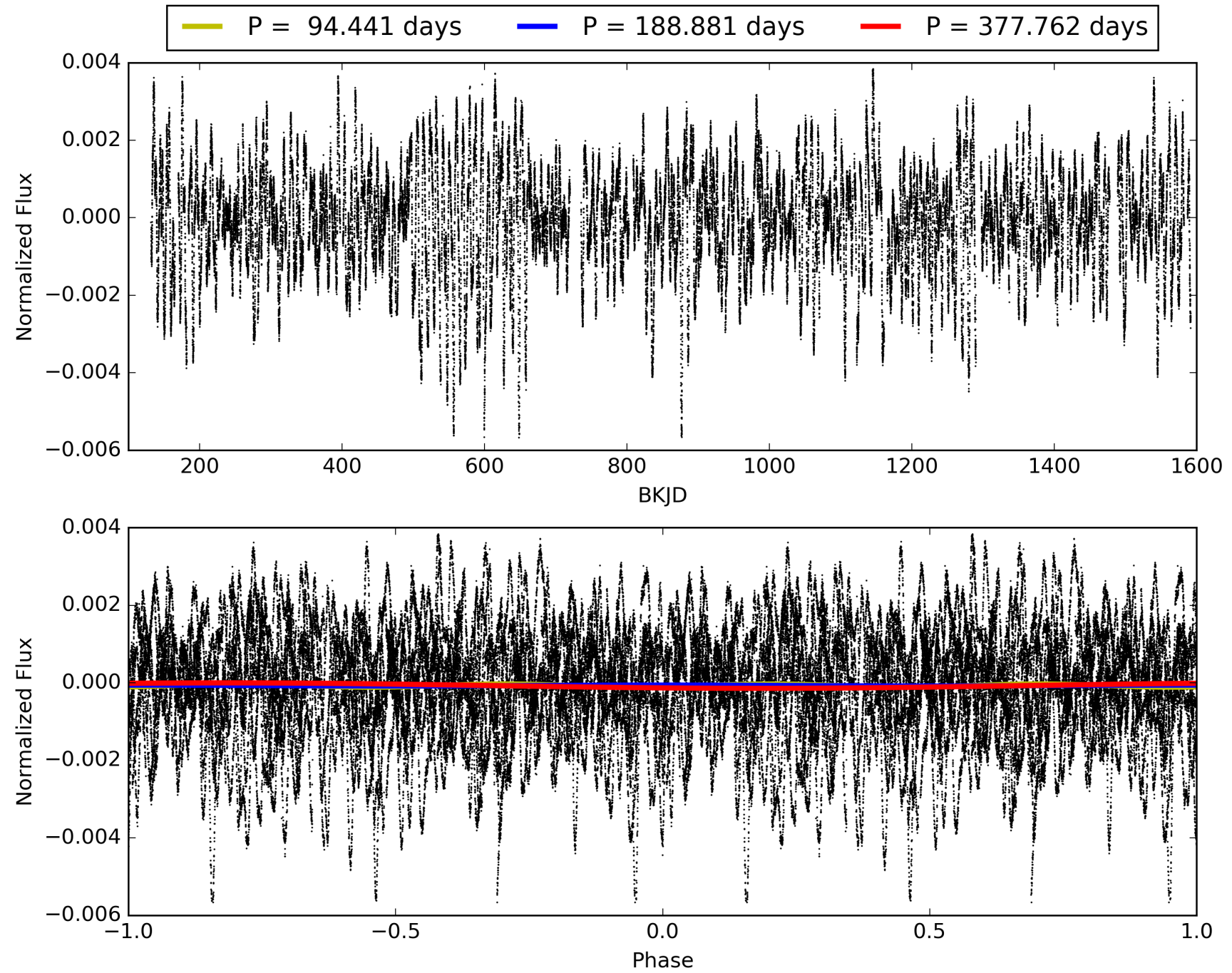
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:38:04 Z

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

# TCE 009521317-01, PDC Light Curves

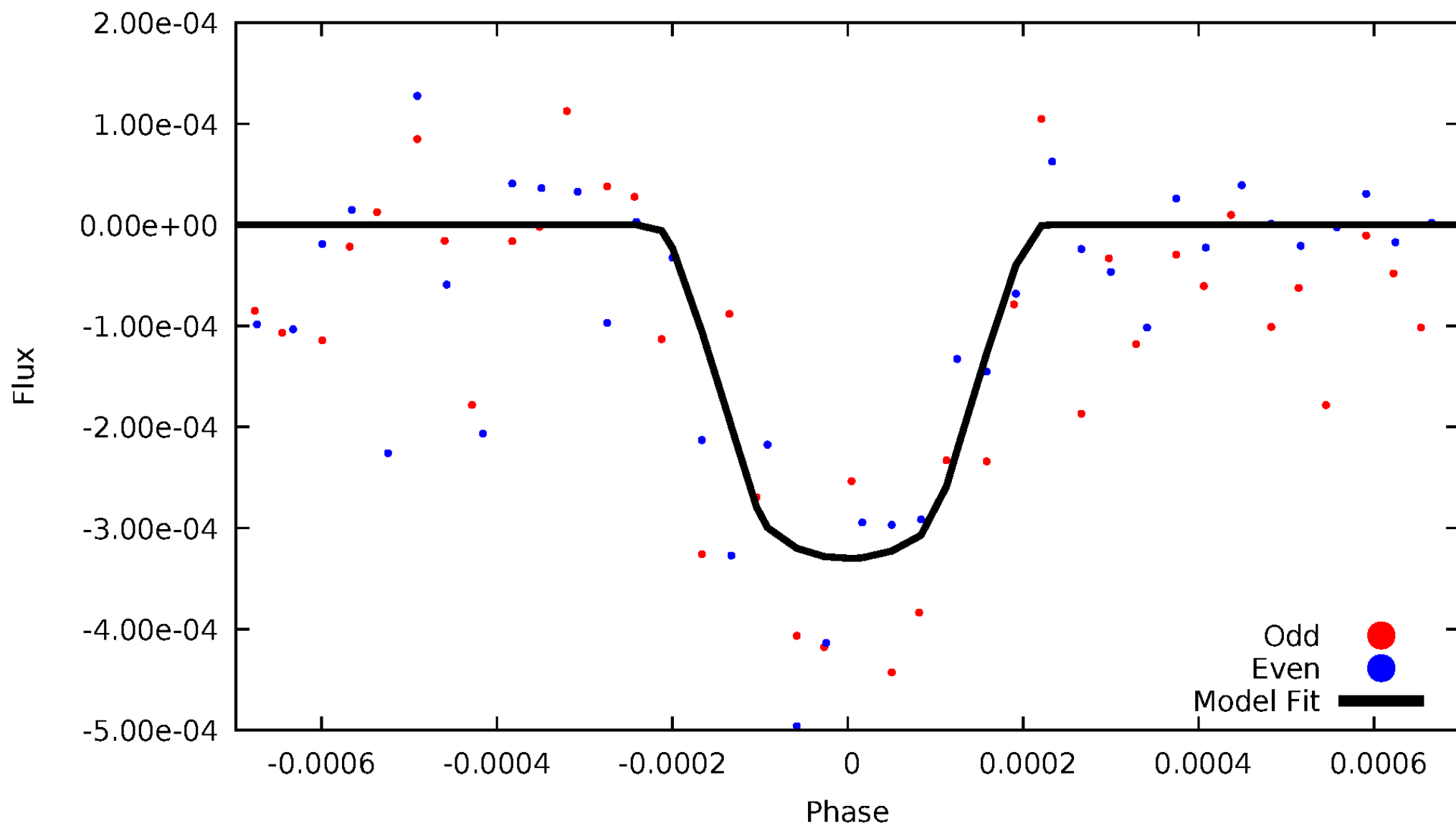


TCE 009521317-01



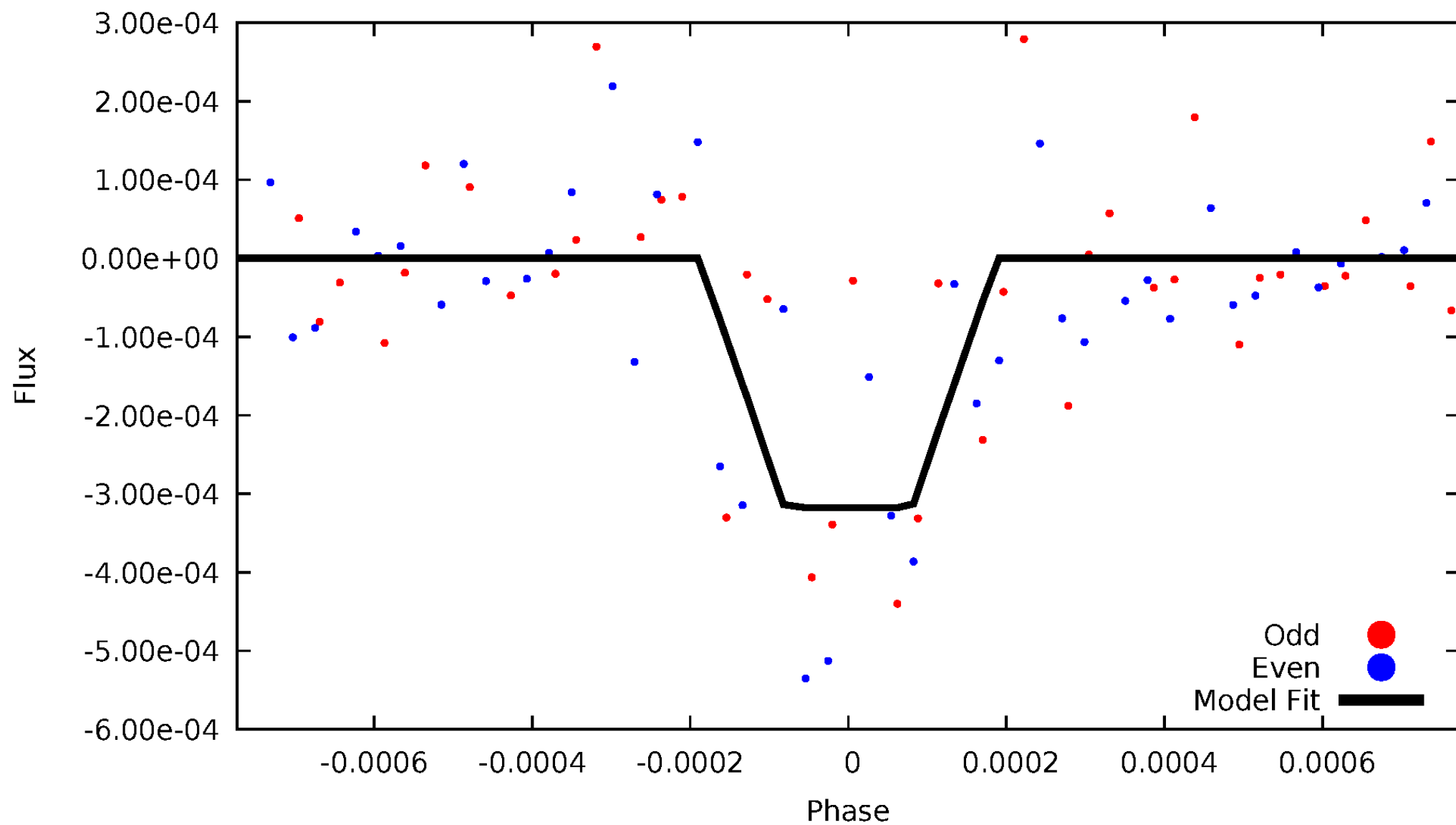
# DV Odd/Even

TCE 009521317-01

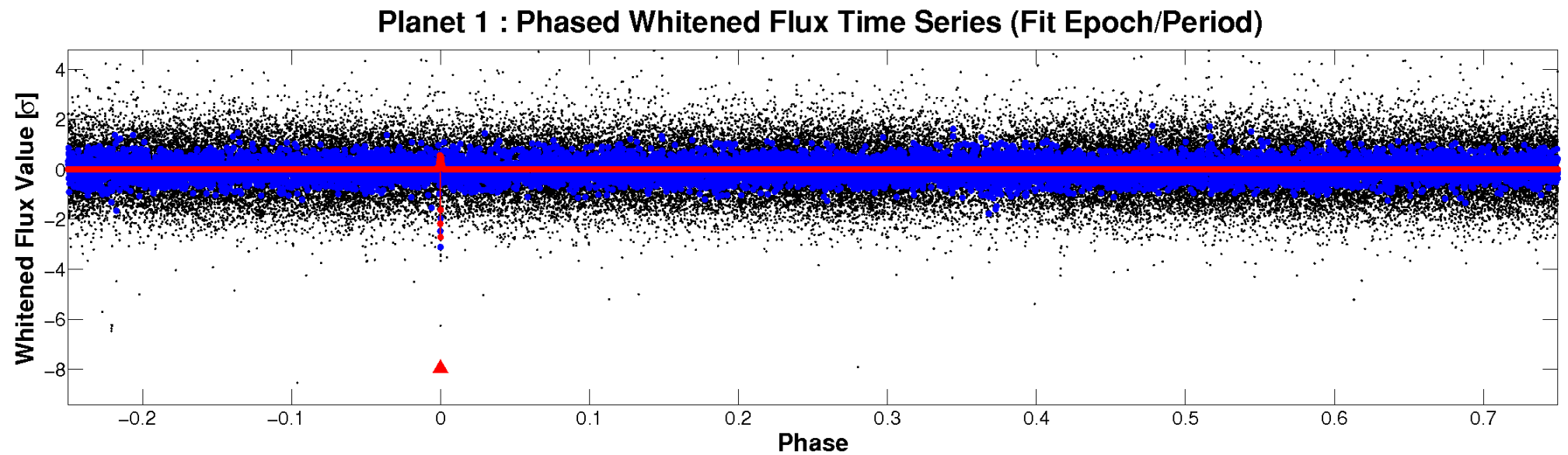
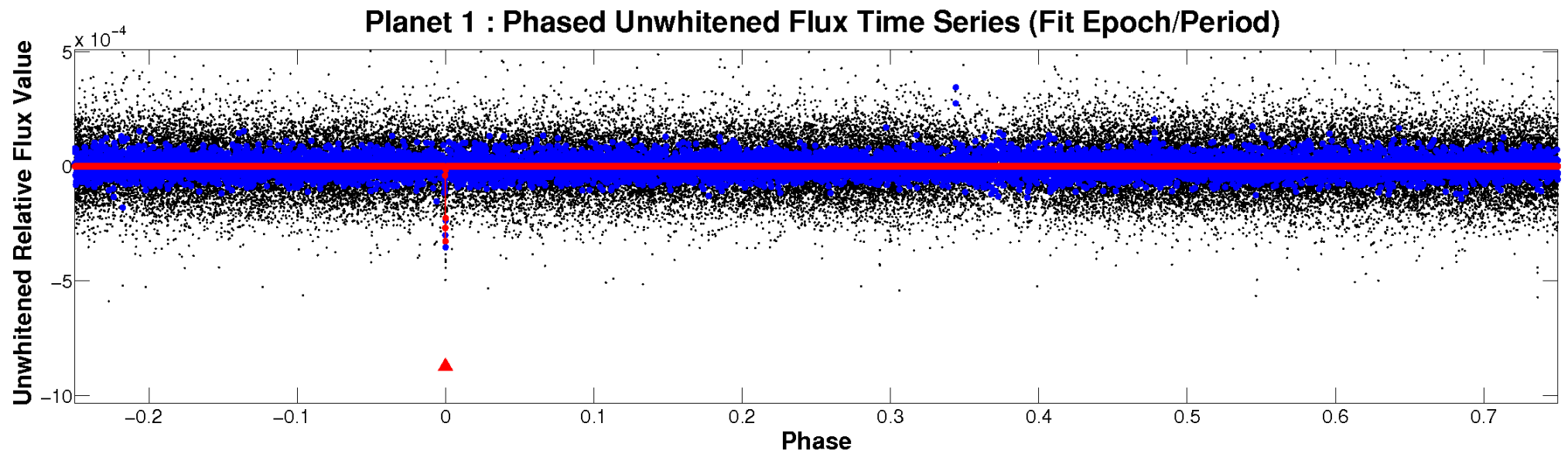


# ALT Odd/Even

TCE 009521317-01

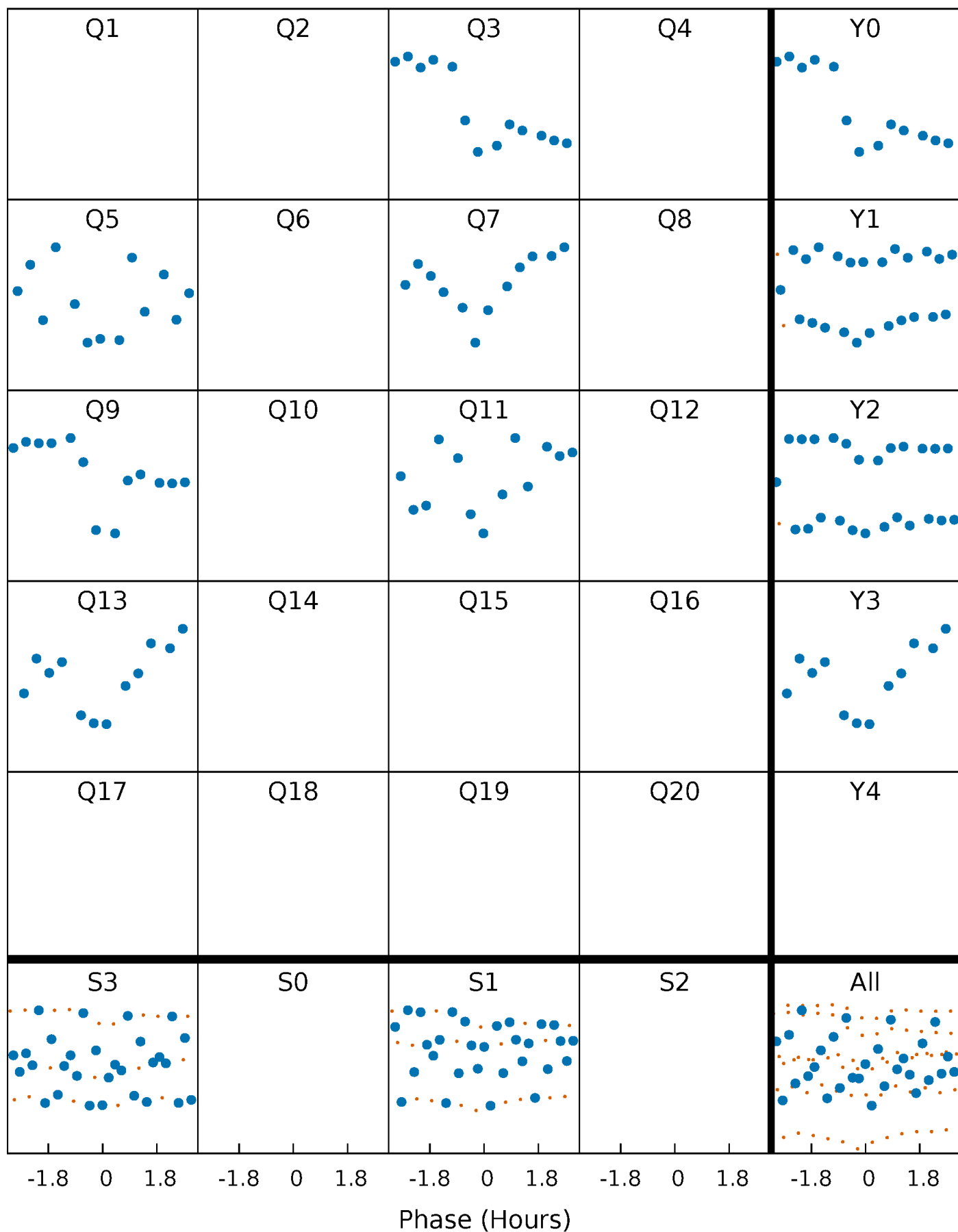


# Non-Whitened Vs. Whitened Light Curve



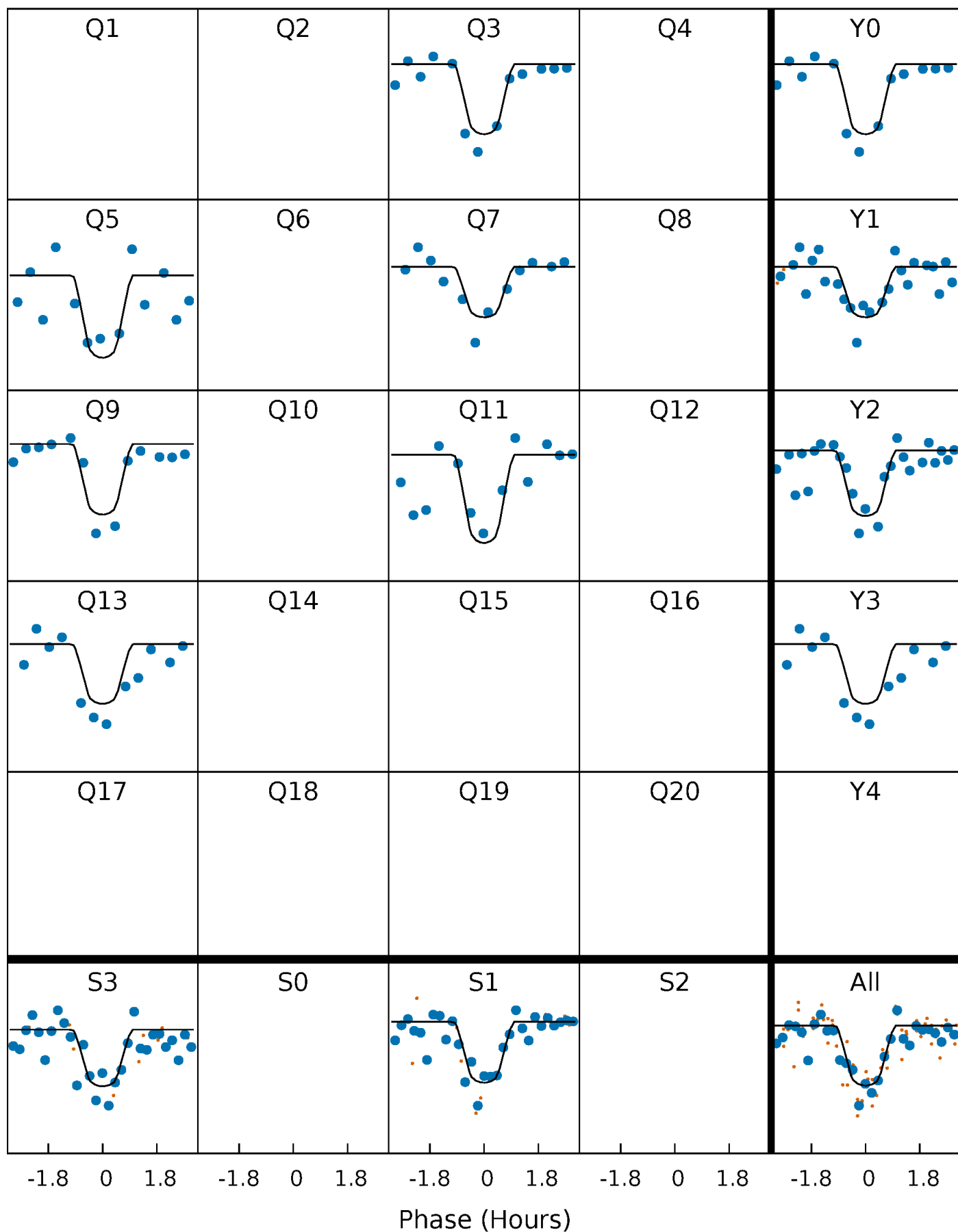
# PDC Quarter-Phased Transit Curves

TCE 009521317-01 P=188.881022 Days  $T_0=280.069663$  (BKJD)



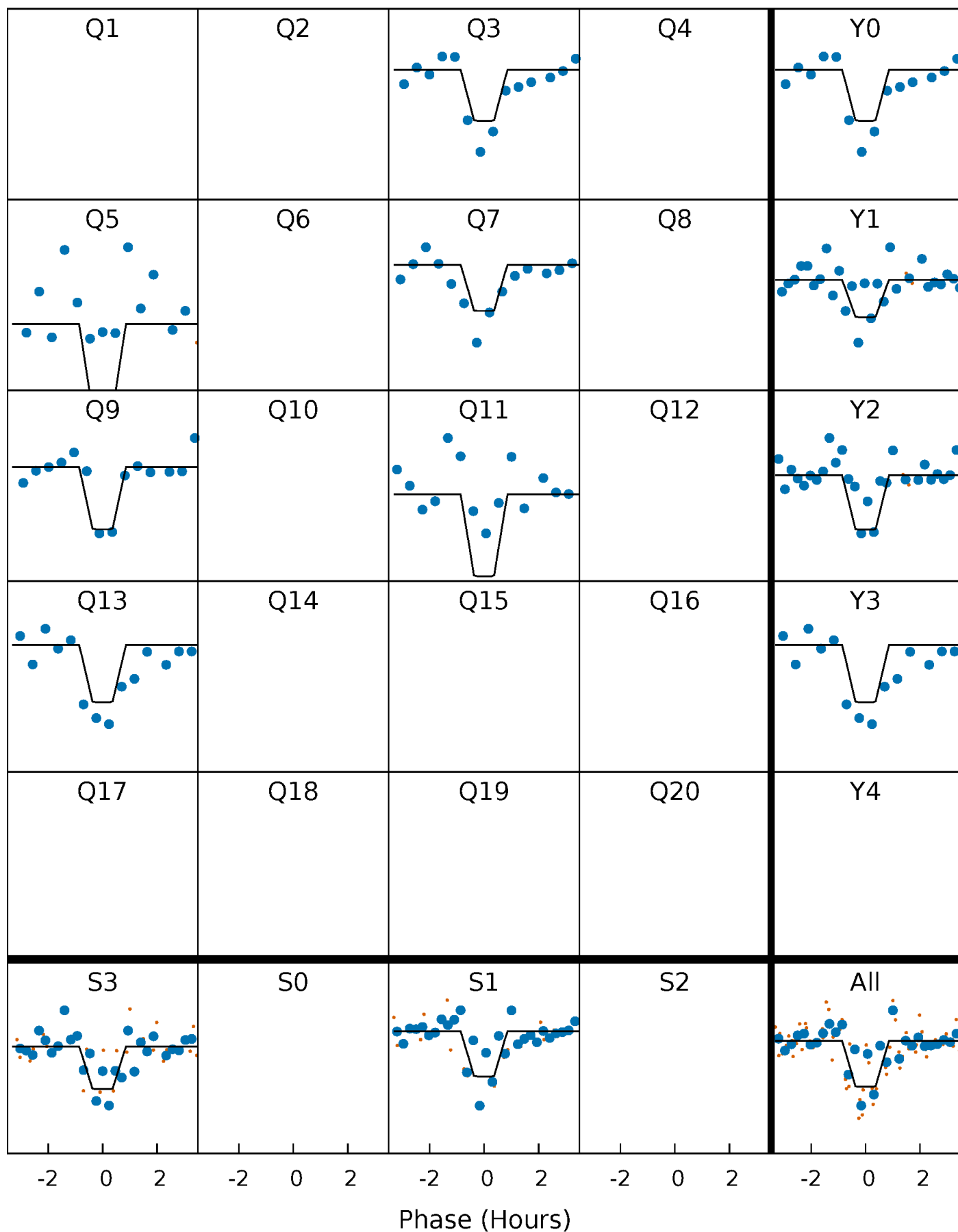
# DV Quarter-Phased Transit Curves

TCE 009521317-01 P=188.881022 Days  $T_0=280.069663$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

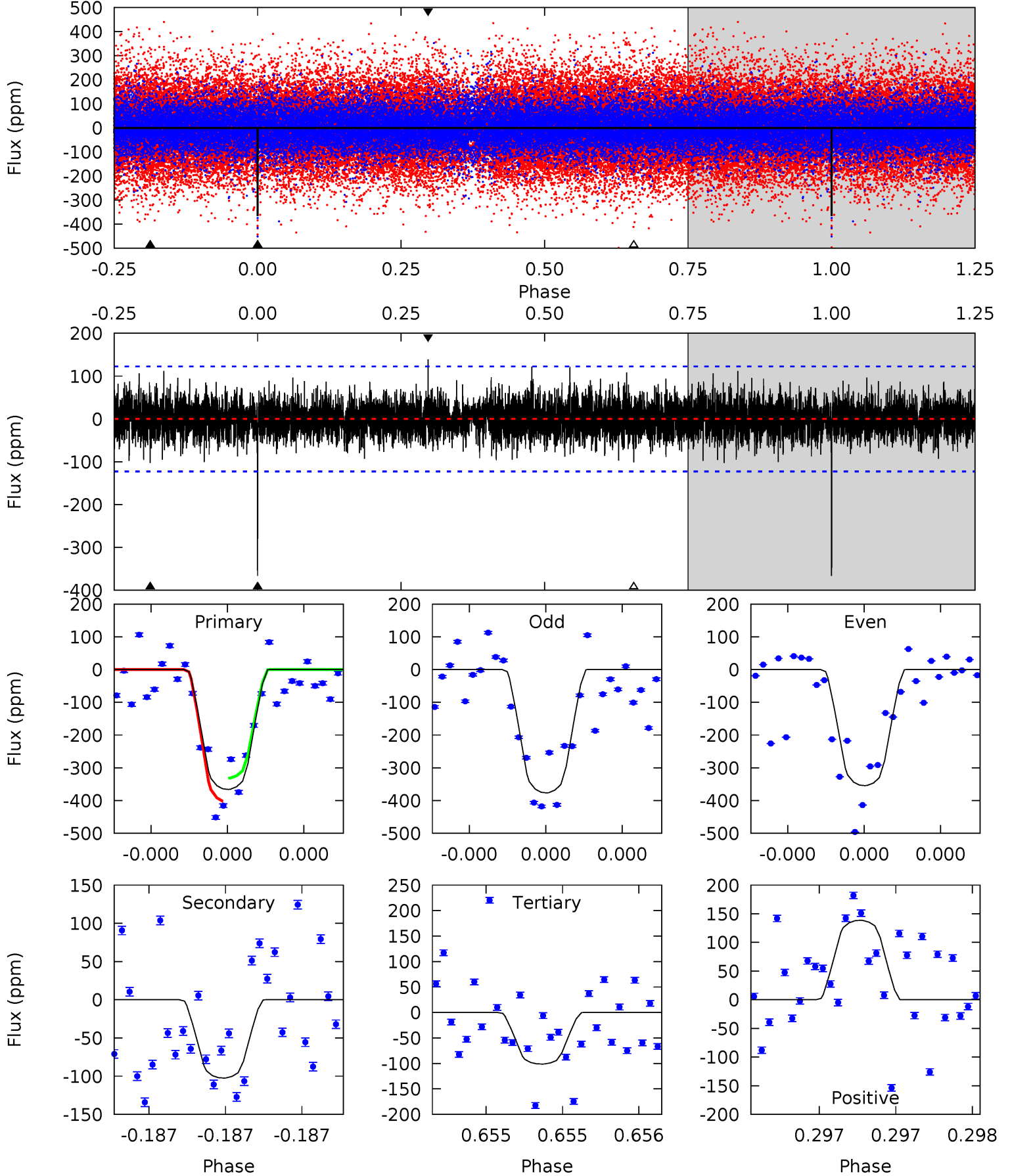
TCE 009521317-01 P=188.880530 Days  $T_0=280.069878$  (BKJD)



# DV Model-Shift Uniqueness Test

009521317-01,  $P = 188.881022$  Days,  $E = 91.188641$  Days

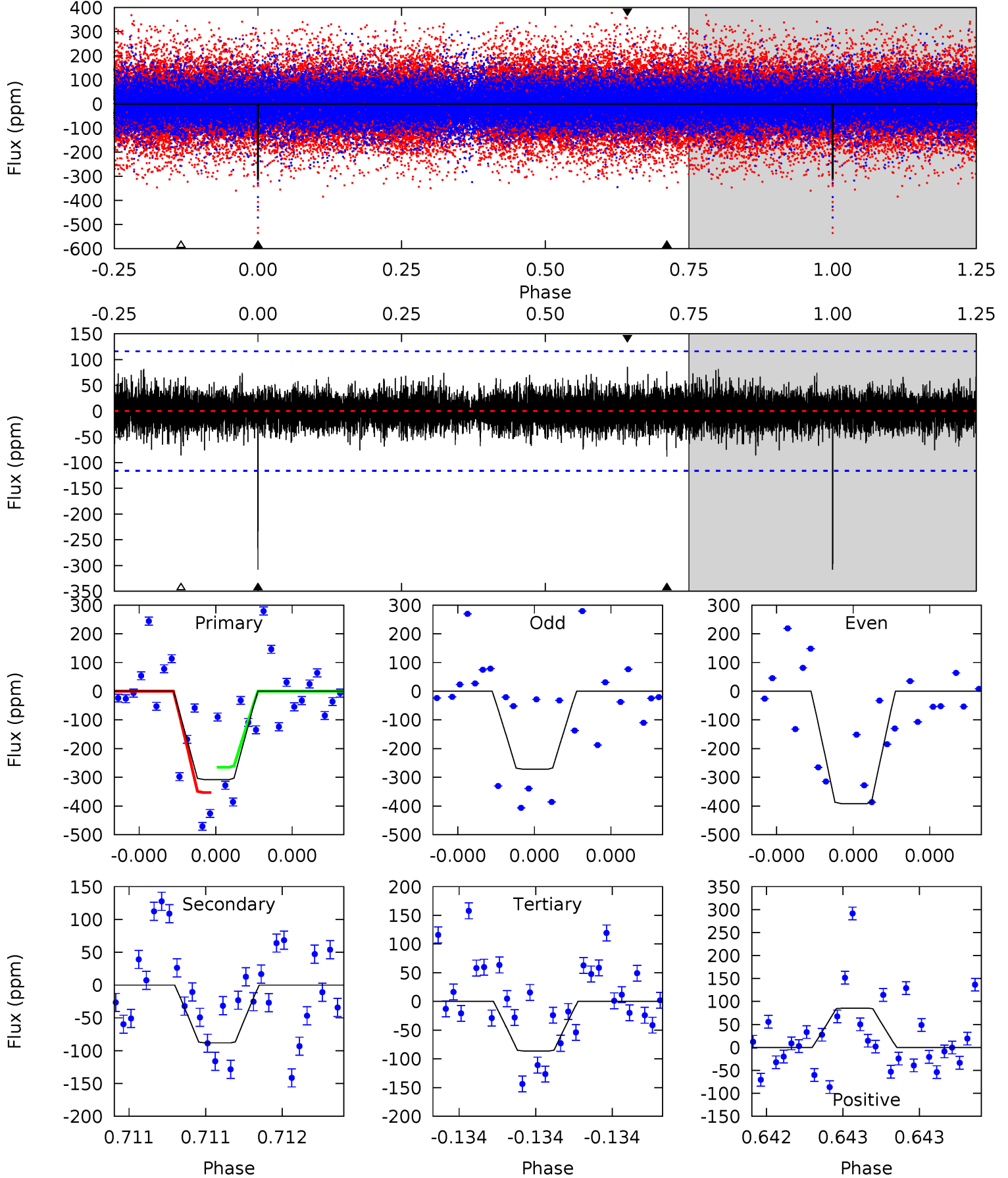
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.7	4.69	4.63	6.34	5.60	3.53	1.34	12.1	10.4	0.06	-1.66	0.51	0.95	0.27	1.61



# Alt Model-Shift Uniqueness Test

009521317-01, P = 188.880530 Days, E = 91.189348 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
15.0	4.28	4.19	4.15	5.64	3.58	1.02	10.8	10.8	0.09	0.12	2.84	0.81	0.22	2.15



### Stellar Parameters For KIC 009521317

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6077^{+163}_{-199}$	$4.471^{+0.052}_{-0.157}$	$-0.040^{+0.250}_{-0.300}$	$0.999^{+0.220}_{-0.102}$	$1.077^{+0.110}_{-0.147}$	$1.519^{+0.390}_{-0.661}$
	+3%/-3%	+1%/-4%	+625%/-750%	+22%/-10%	+10%/-14%	+26%/-44%
Source	PHO1	FLK73	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 009521317-01 / KOI 7940.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-102 \pm 22$	$2.34^{+1.29}_{-1.24}$	$468^{+26}_{-21}$	$4406^{+1608}_{-648}$	$4326^{+14329}_{-2629}$
Alt.	$-88 \pm 21$	$2.18^{+1.27}_{-1.29}$	$468^{+27}_{-22}$	$4427^{+2196}_{-712}$	$4322^{+21883}_{-2768}$

$T_{\text{max}}$  = 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

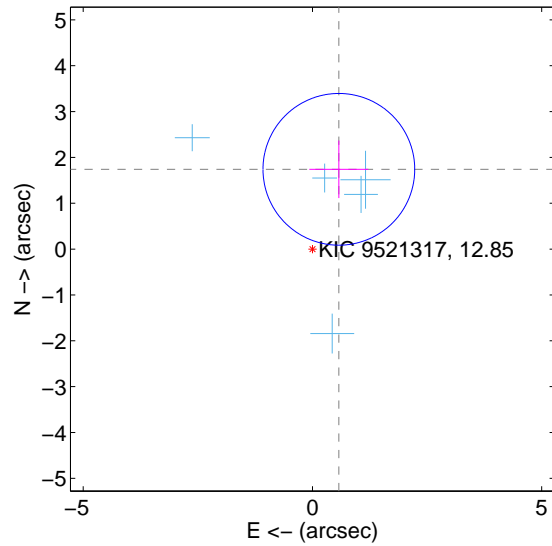
Supplemental centroid analysis for 009521317-01. Kepler magnitude: 12.85. Transit SNR 9.92

There are 5 quarters with good PRF difference image offsets

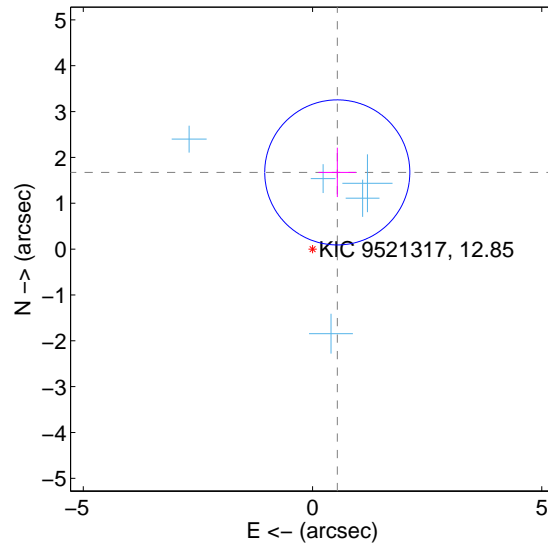
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.833 \pm 0.551$	3.32	$-0.576 \pm 0.644$	$1.740 \pm 0.628$
PRF-fit source offset from KIC position	$1.758 \pm 0.527$	3.33	$-0.540 \pm 0.408$	$1.673 \pm 0.538$
photometric centroid source offset	$1.06 \pm 1.11$	0.96	$-0.89 \pm 1.18$	$0.58 \pm 0.92$

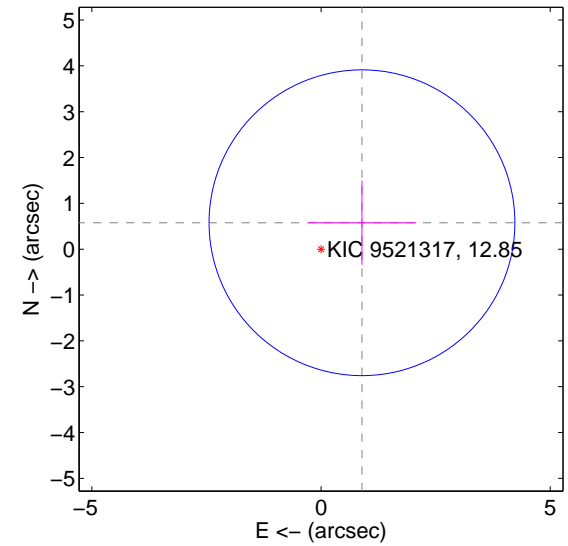
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

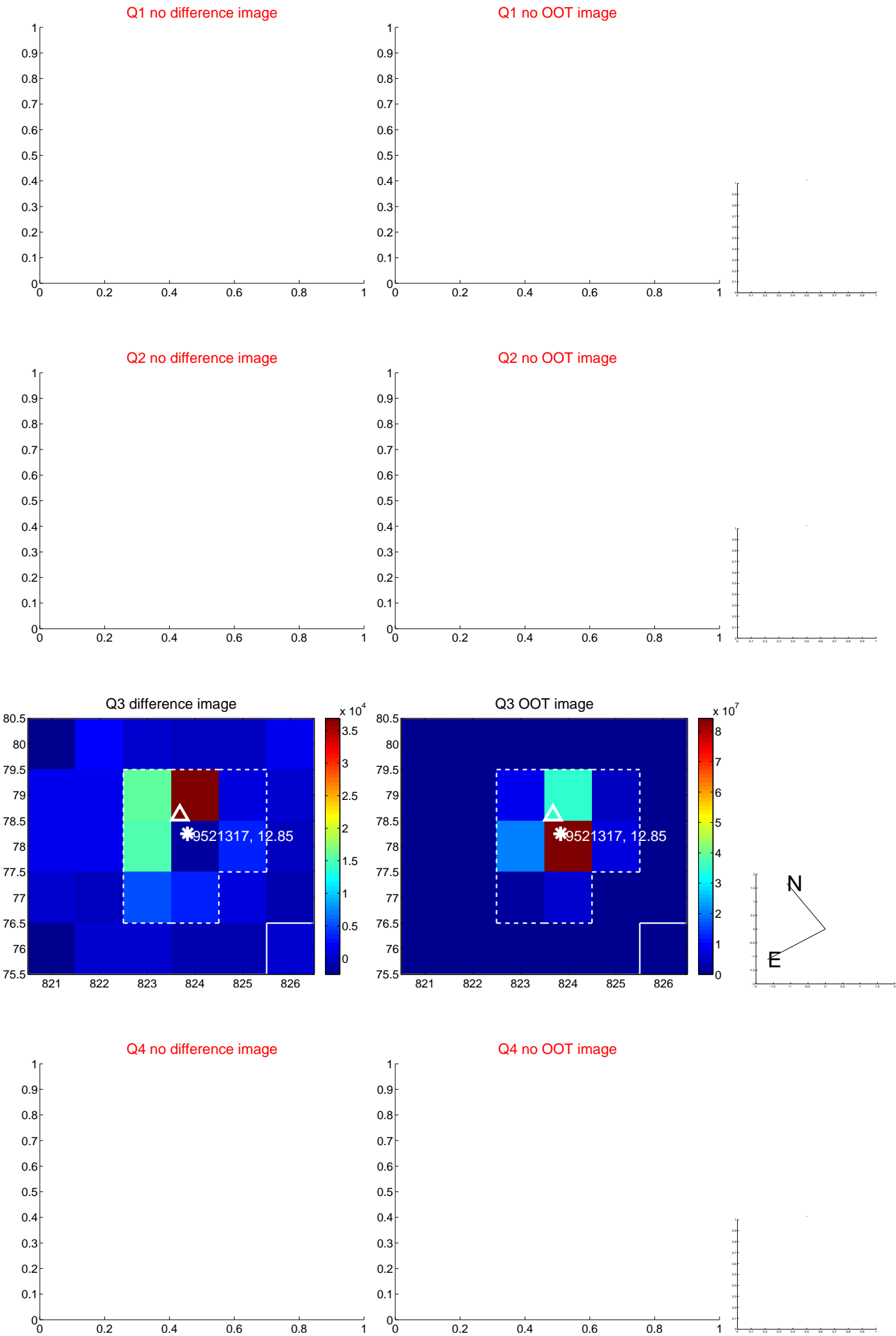


offset from photometric centroids

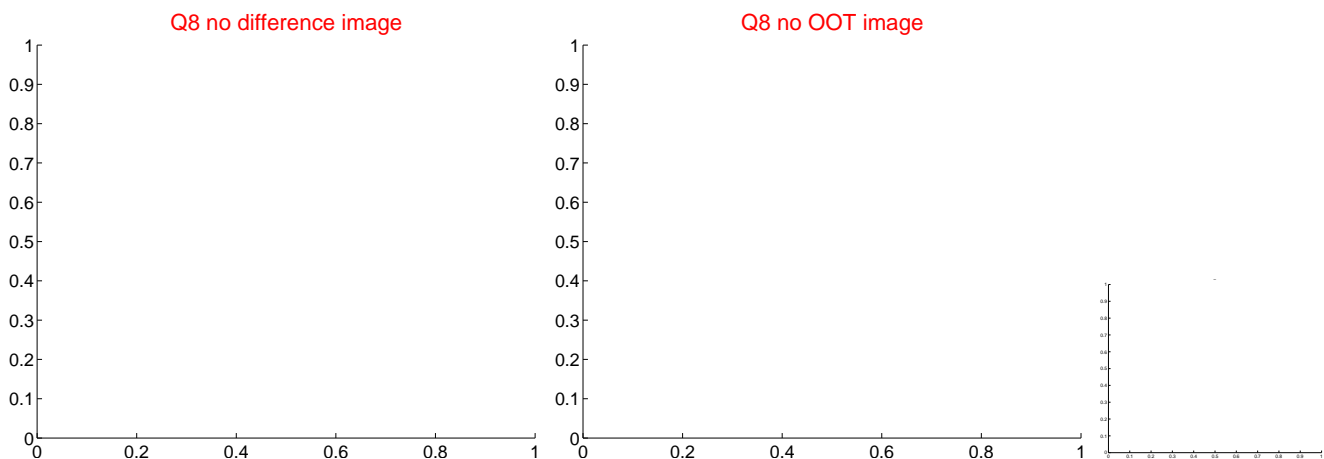
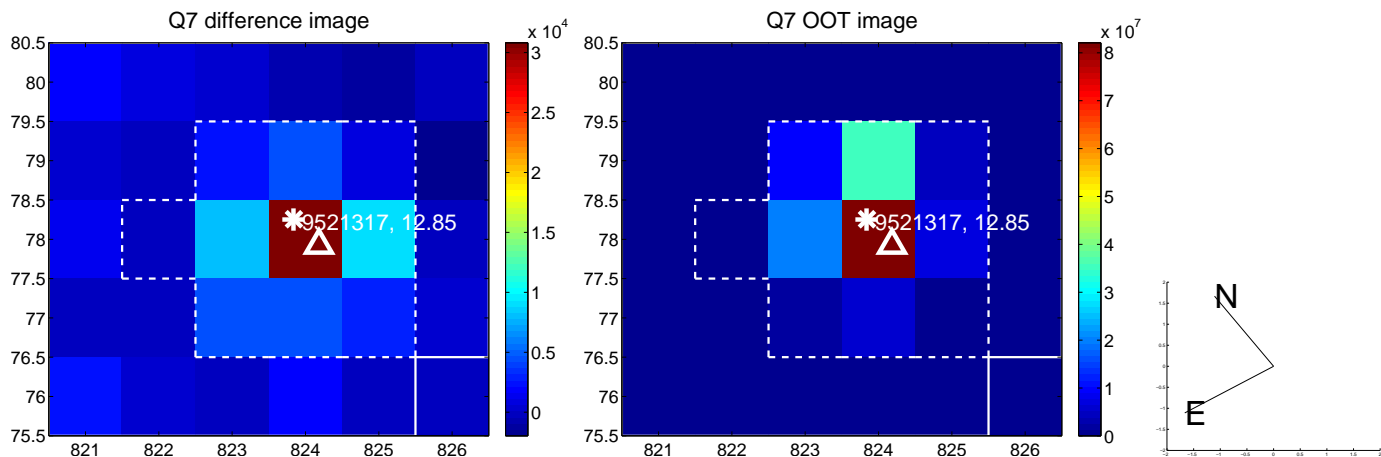
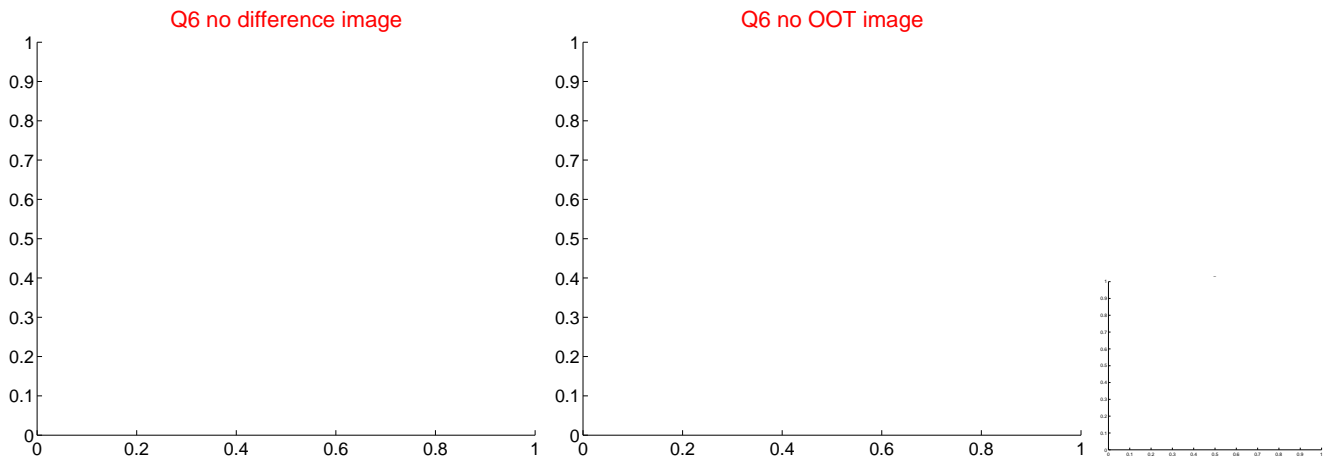
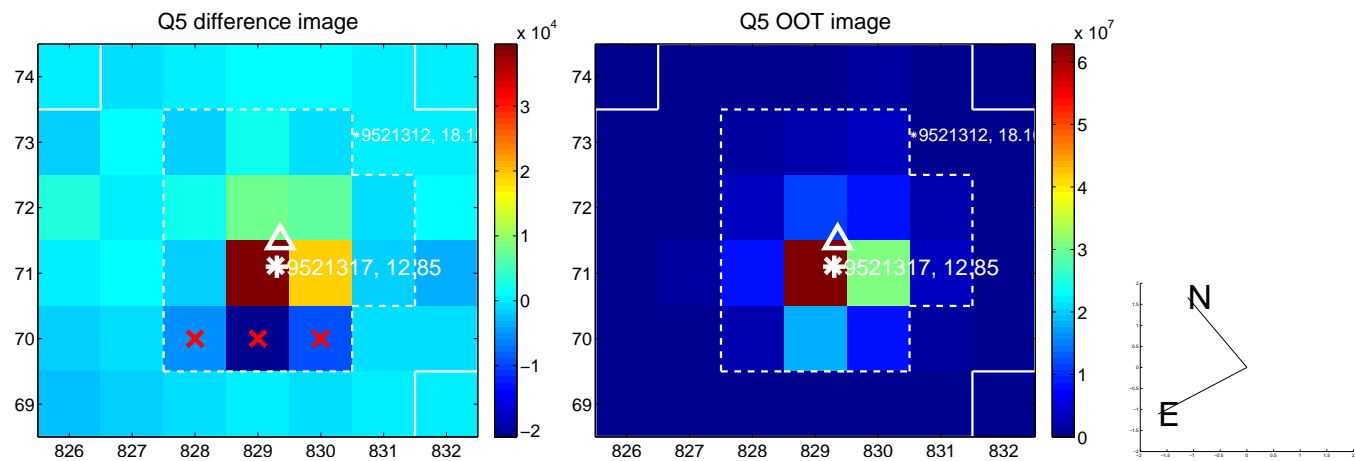


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

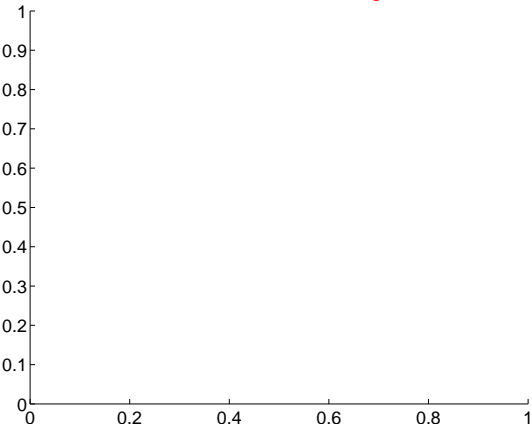


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

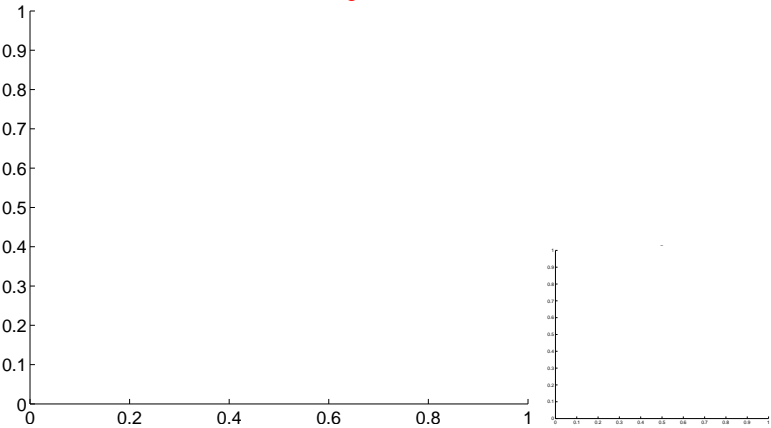


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

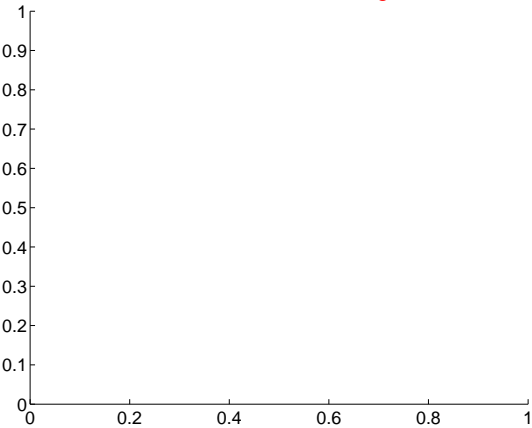
Q9 no difference image



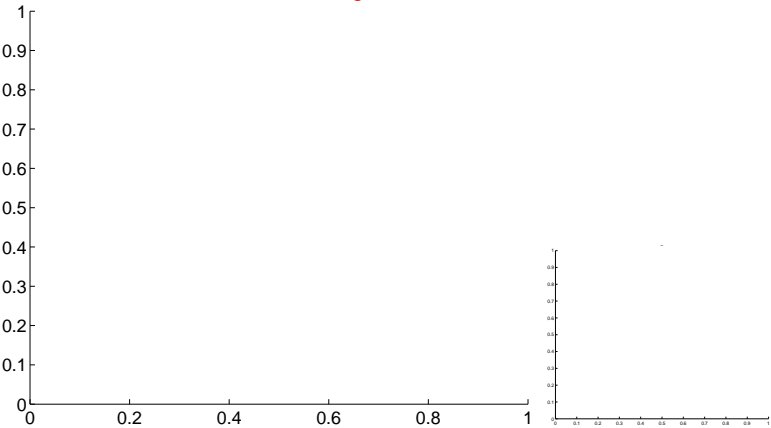
Q9 no OOT image



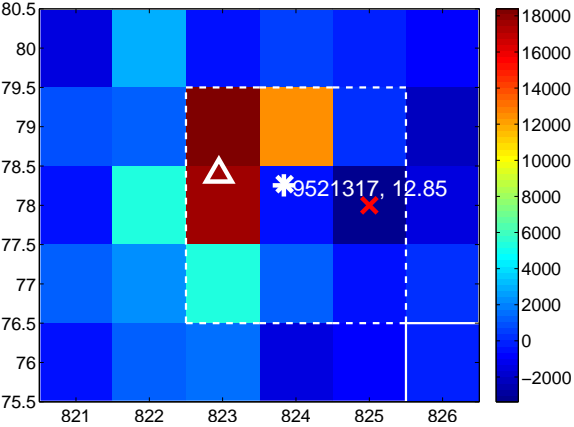
Q10 no difference image



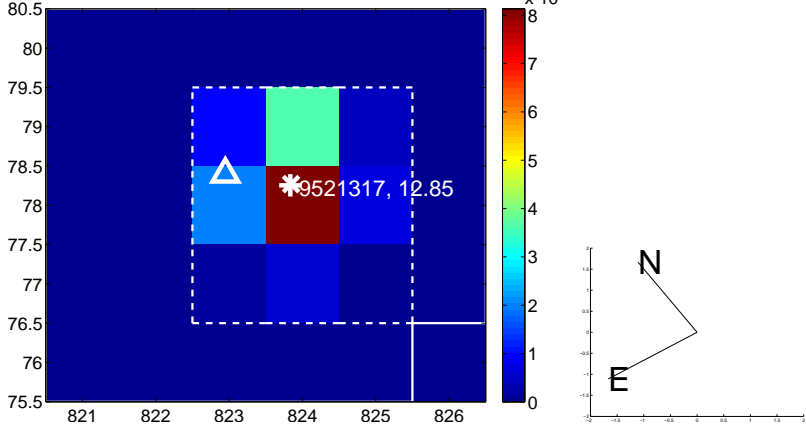
Q10 no OOT image



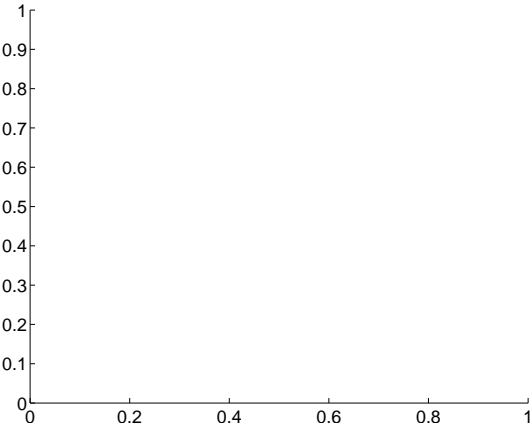
Q11 difference image



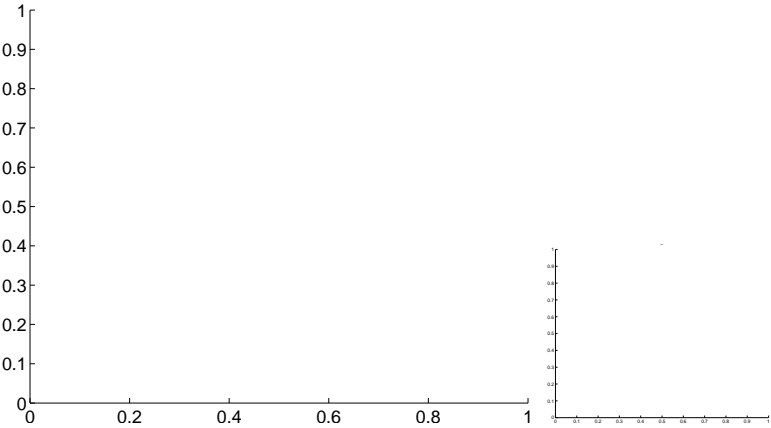
Q11 OOT image



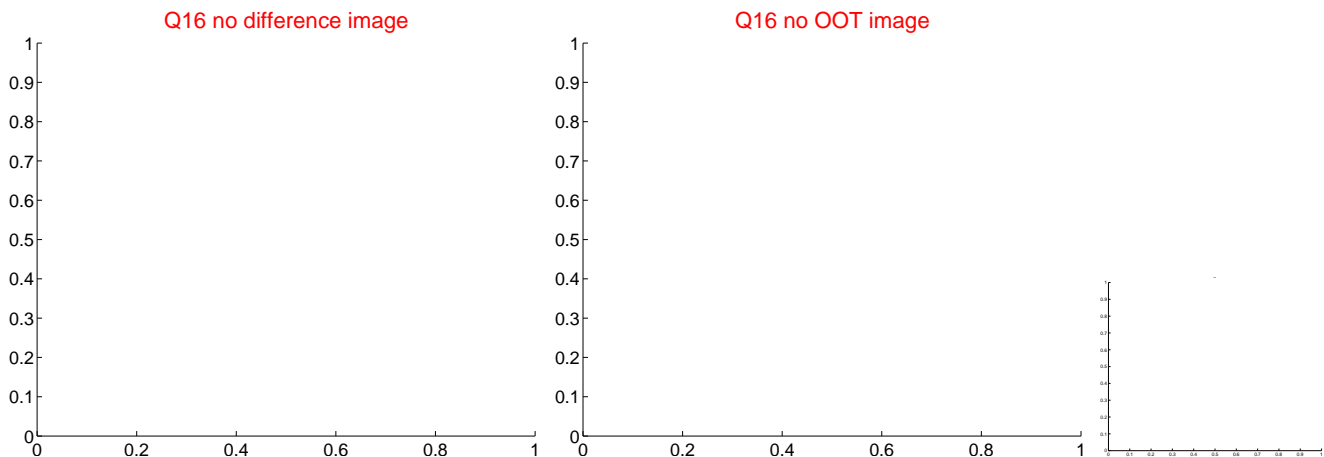
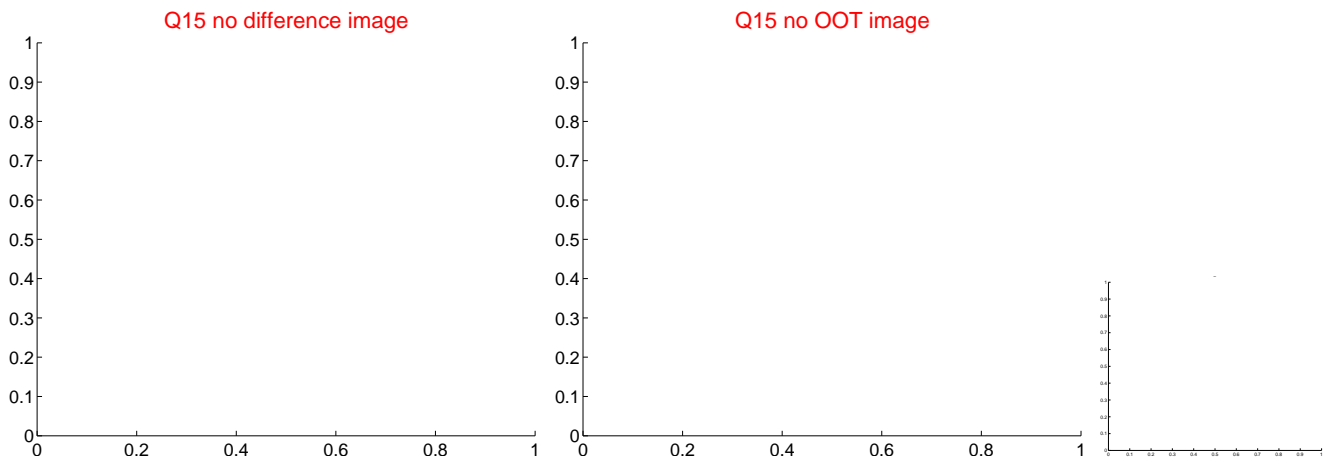
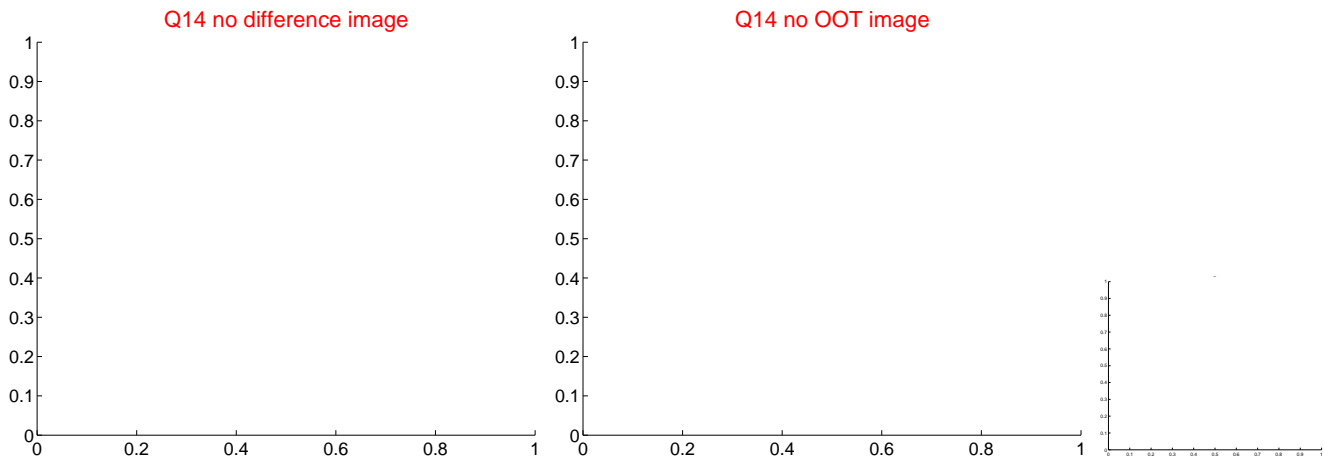
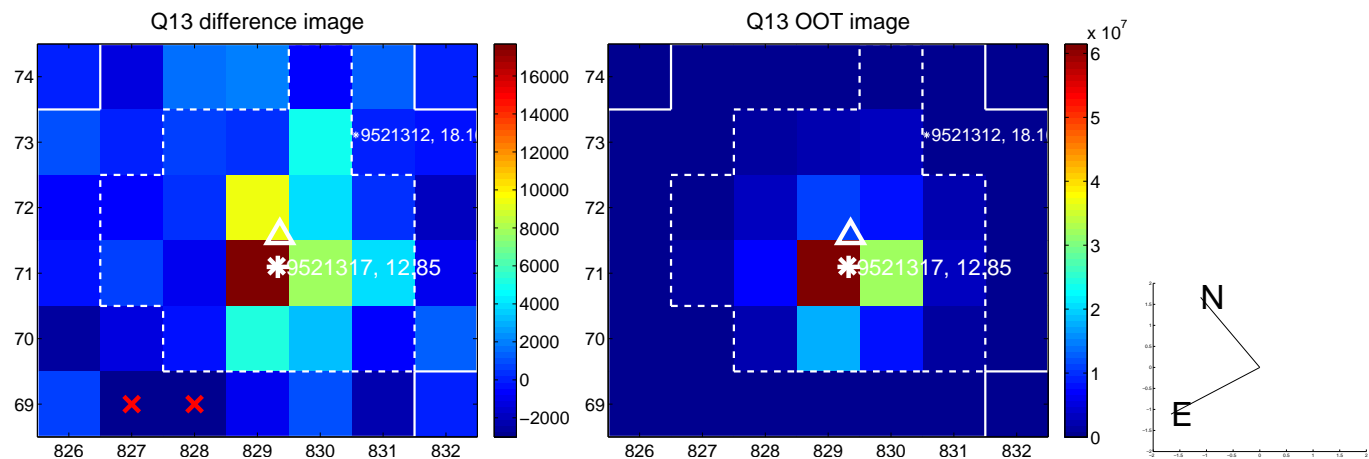
Q12 no difference image



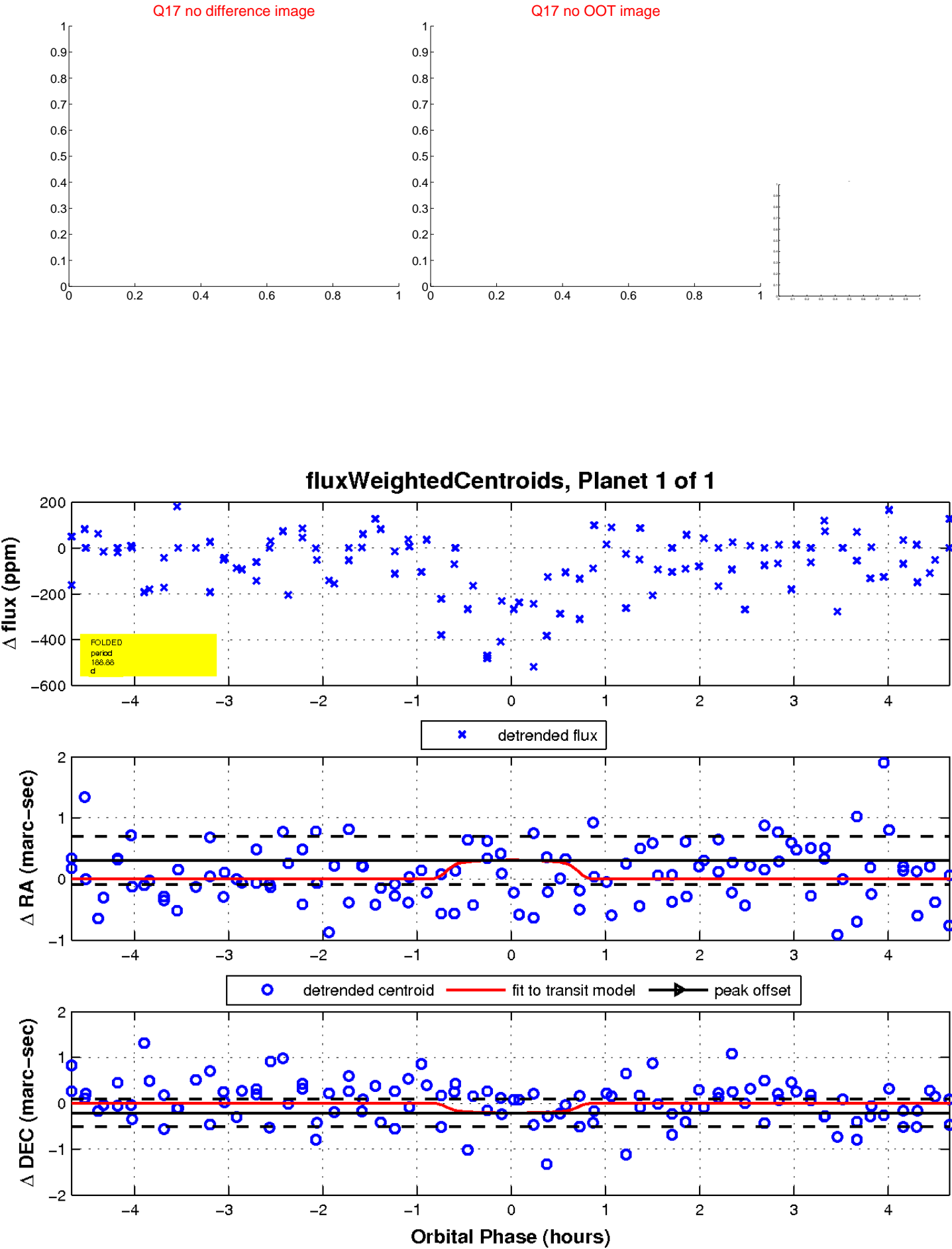
Q12 no OOT image



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

Declination

