

# KIC 012645181

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012645181-01	OBS	No	545.402983	141.078205	323.7	7.509	7.8	7.5	1.14	6418	2.25	1.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012645181-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—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.

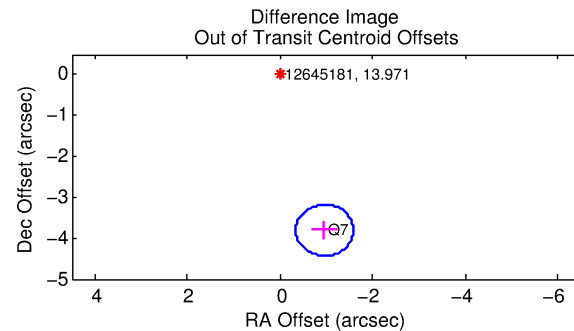
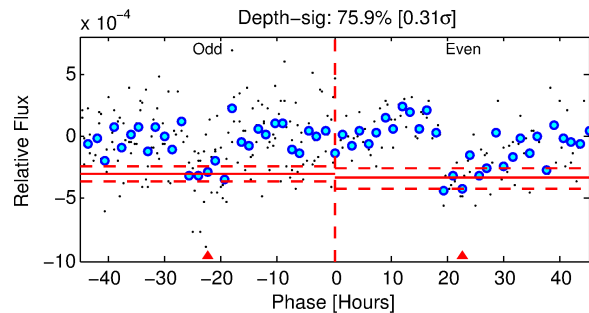
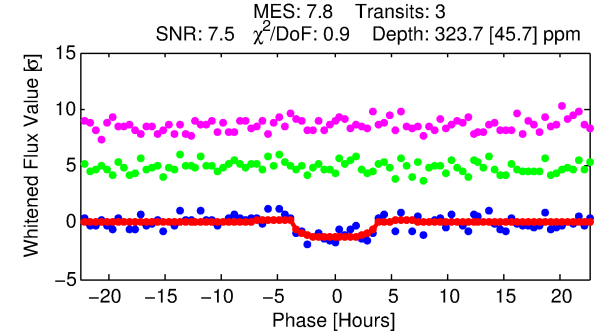
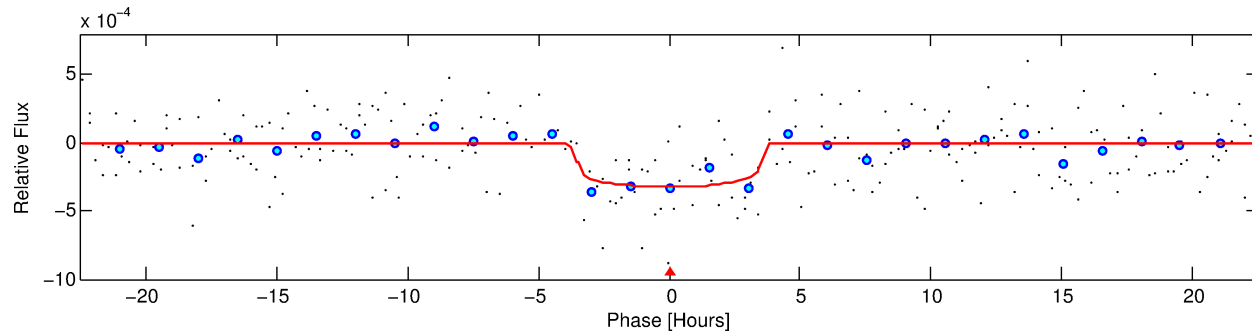
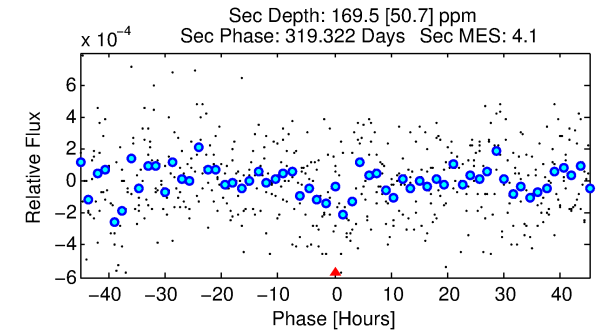
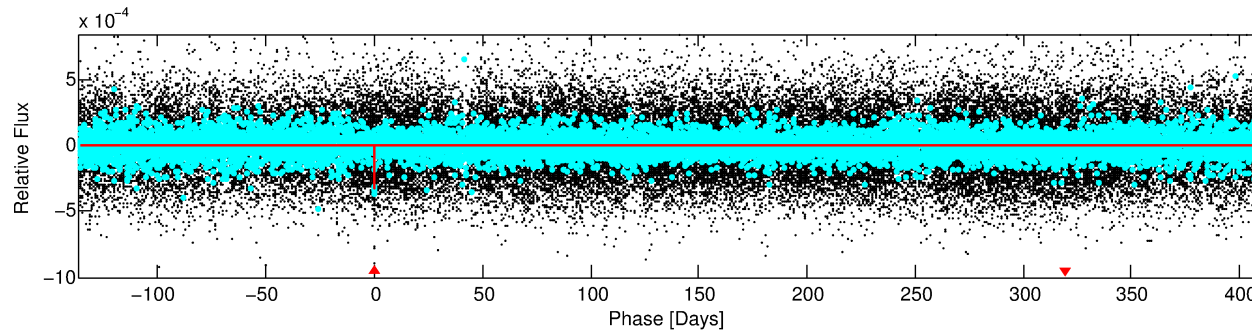
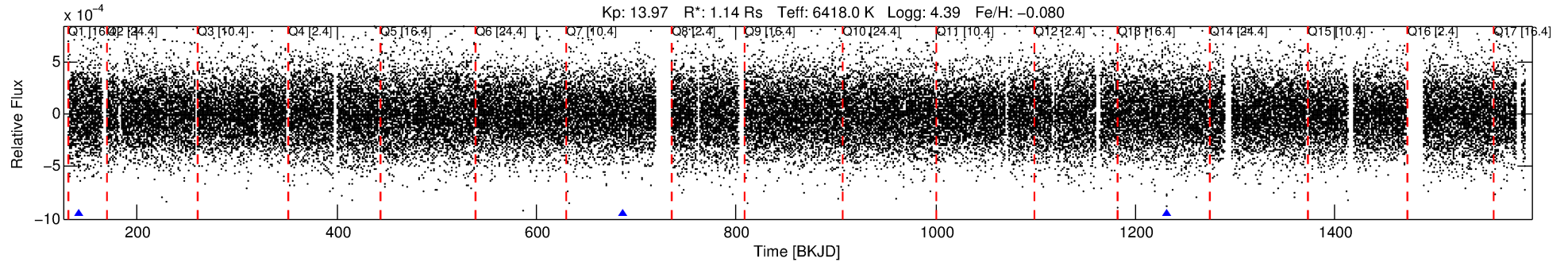
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012645181-01

No Significant Match Found

# DV One-Page Summary

KIC: 12645181 Candidate: 1 of 1 Period: 545.403 d



## DV Fit Results:

Period = 545.40298 [0.01693] d  
Epoch = 141.0782 [0.0156] BKJD  
Rp/R\* = 0.0181 [0.0106]  
a/R\* = 357.53 [1112.31]  
b = 0.79 [1.51]  
Seff = 1.04 [0.43]  
Teq = 257 [27] K  
Rp = 2.25 [1.52] Re  
a = 1.3778 [0.3844] AU  
Ag = 34835.47 [44059.25] [0.79σ]  
Teffp = 5438 [1642] K [3.16σ]

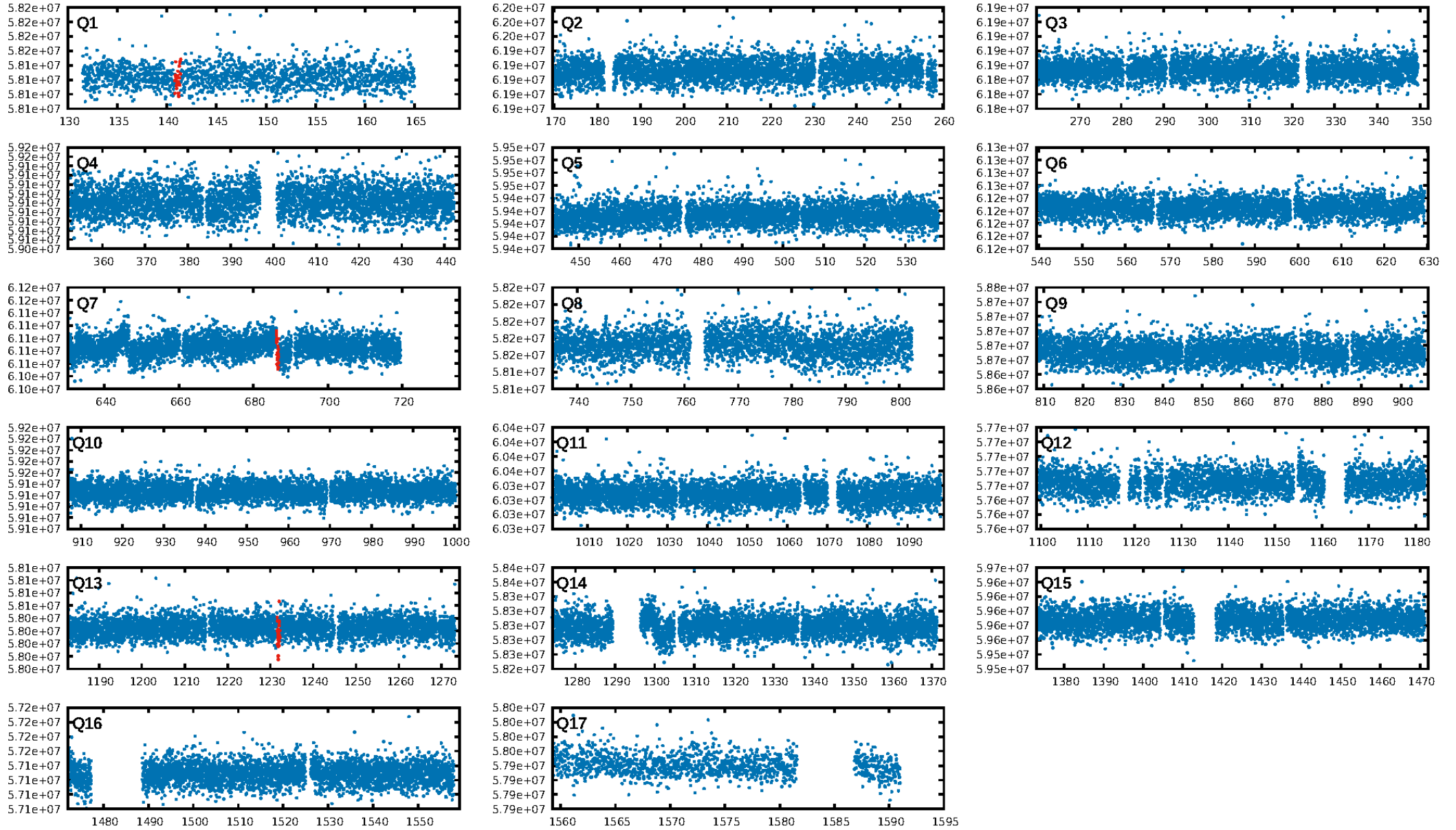
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 13.2%  
ModelChiSquareGof-sig: 99.0%  
Bootstrap-pfa: 4.69e-15  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 16.49  
Centroid-sig: 0.5%  
Centroid-so: 2.222 arcsec [1.25σ]  
OotOffset-rm: 3.925 arcsec [18.91σ]  
KicOffset-rm: 3.969 arcsec [19.09σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

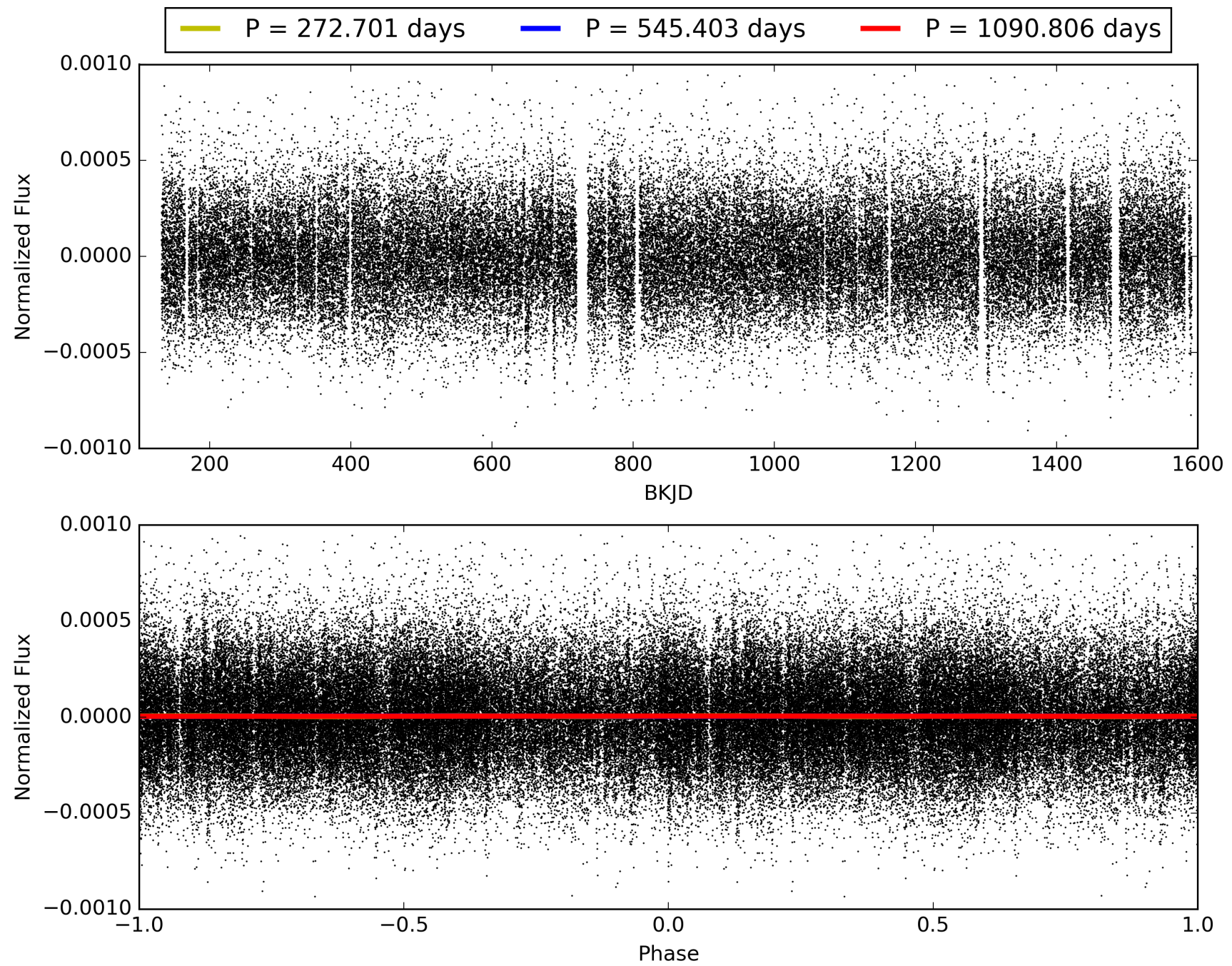
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 19:45:06 Z

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

# TCE 012645181-01, PDC Light Curves

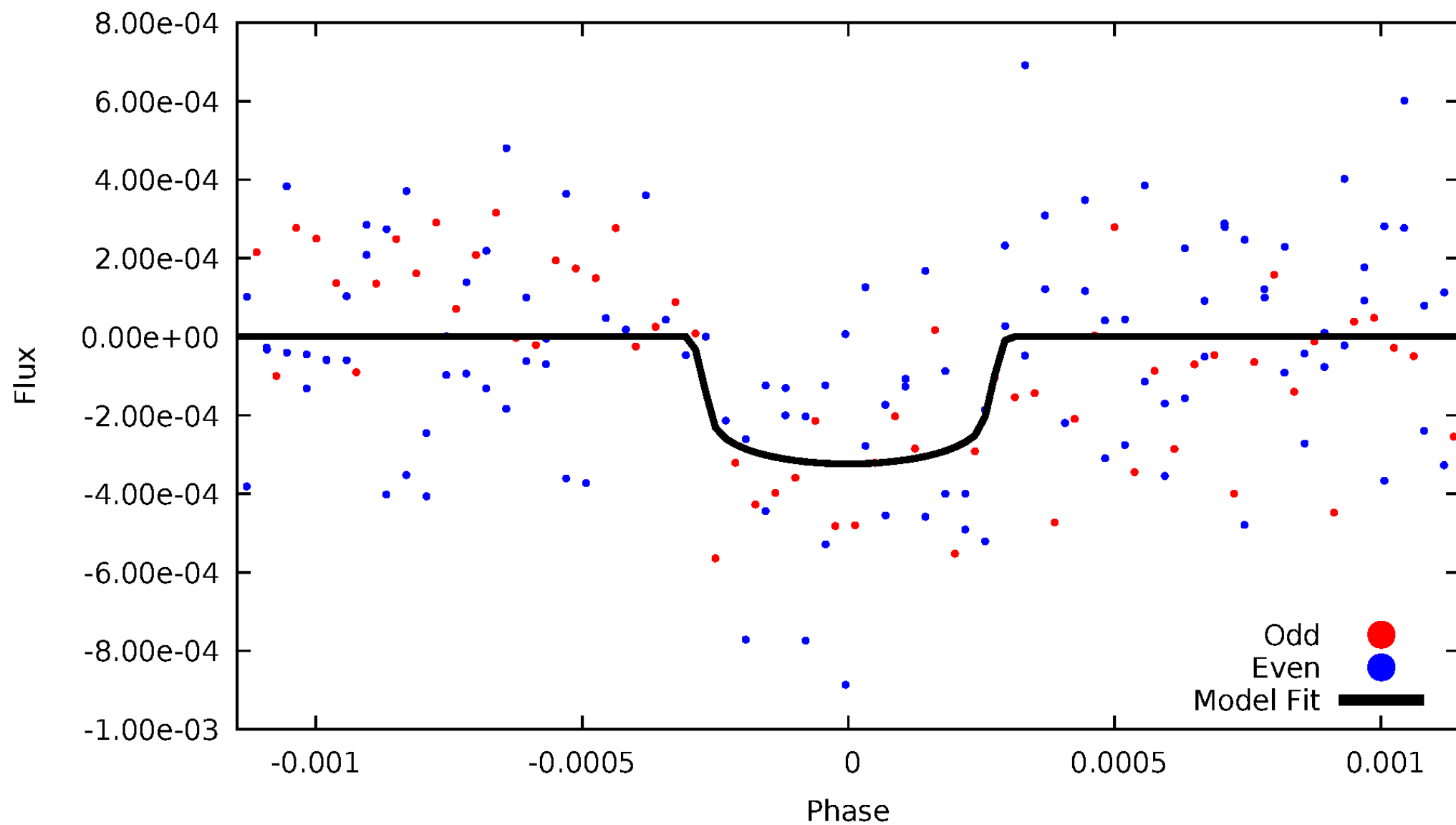


TCE 012645181-01



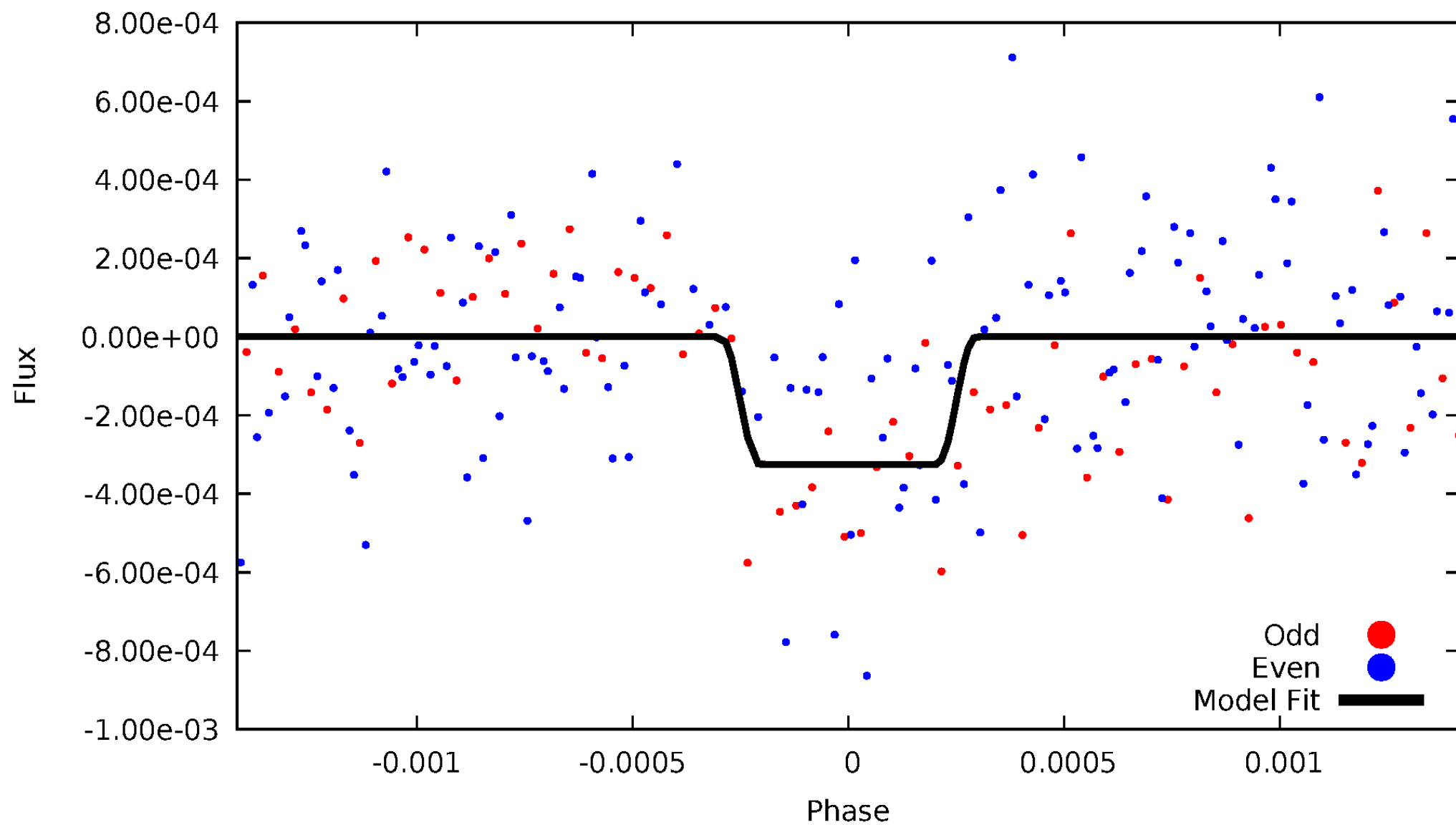
# DV Odd/Even

TCE 012645181-01



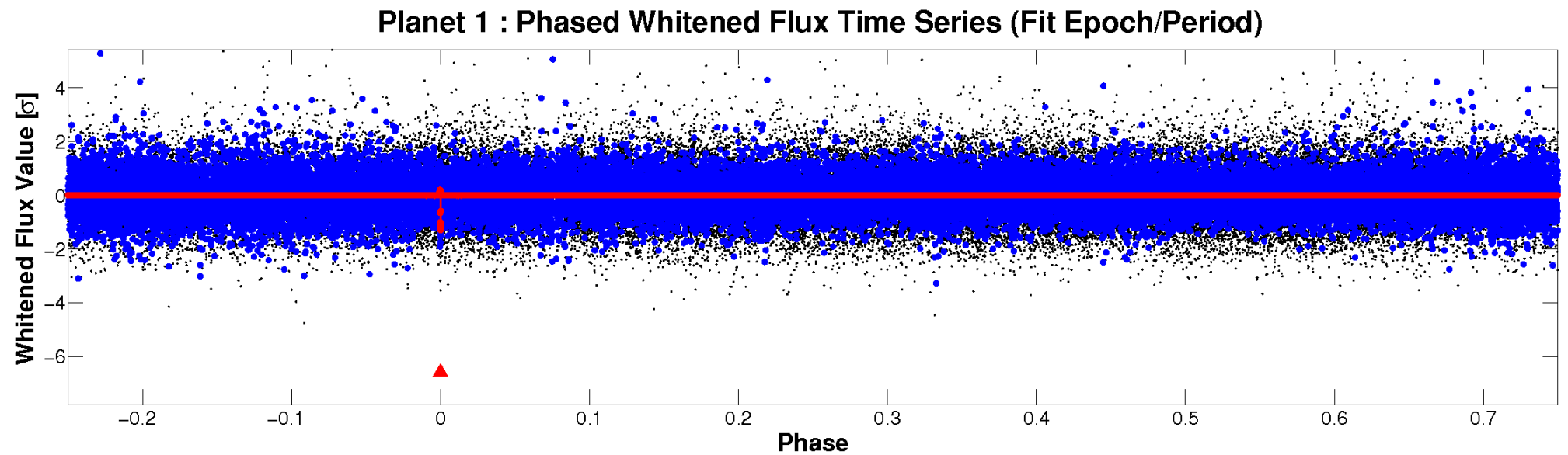
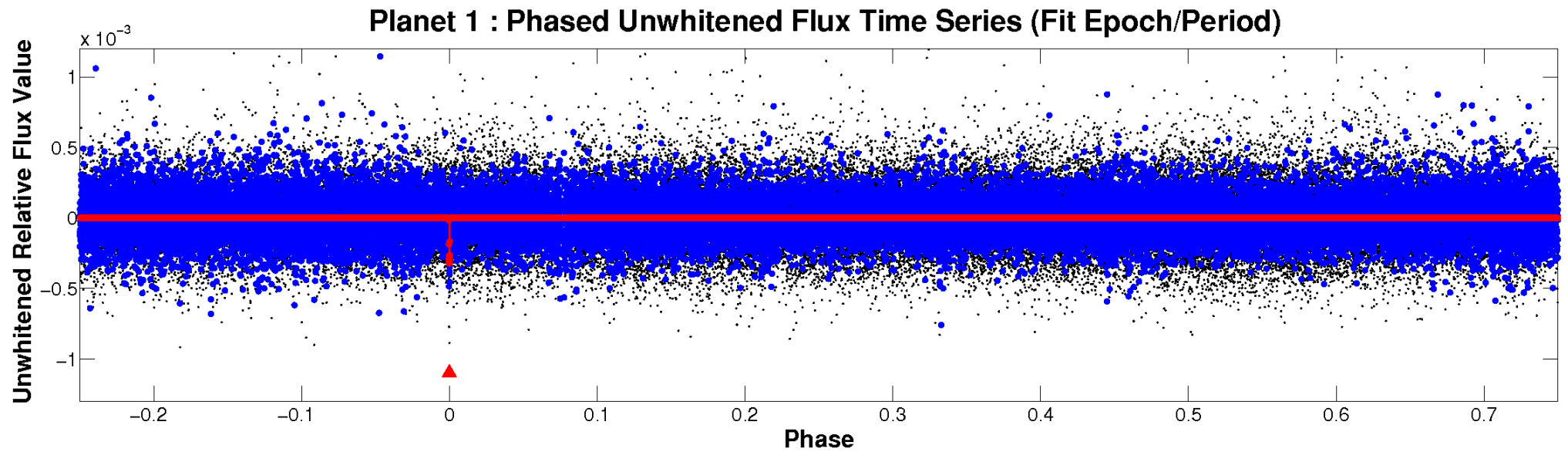
# ALT Odd/Even

TCE 012645181-01



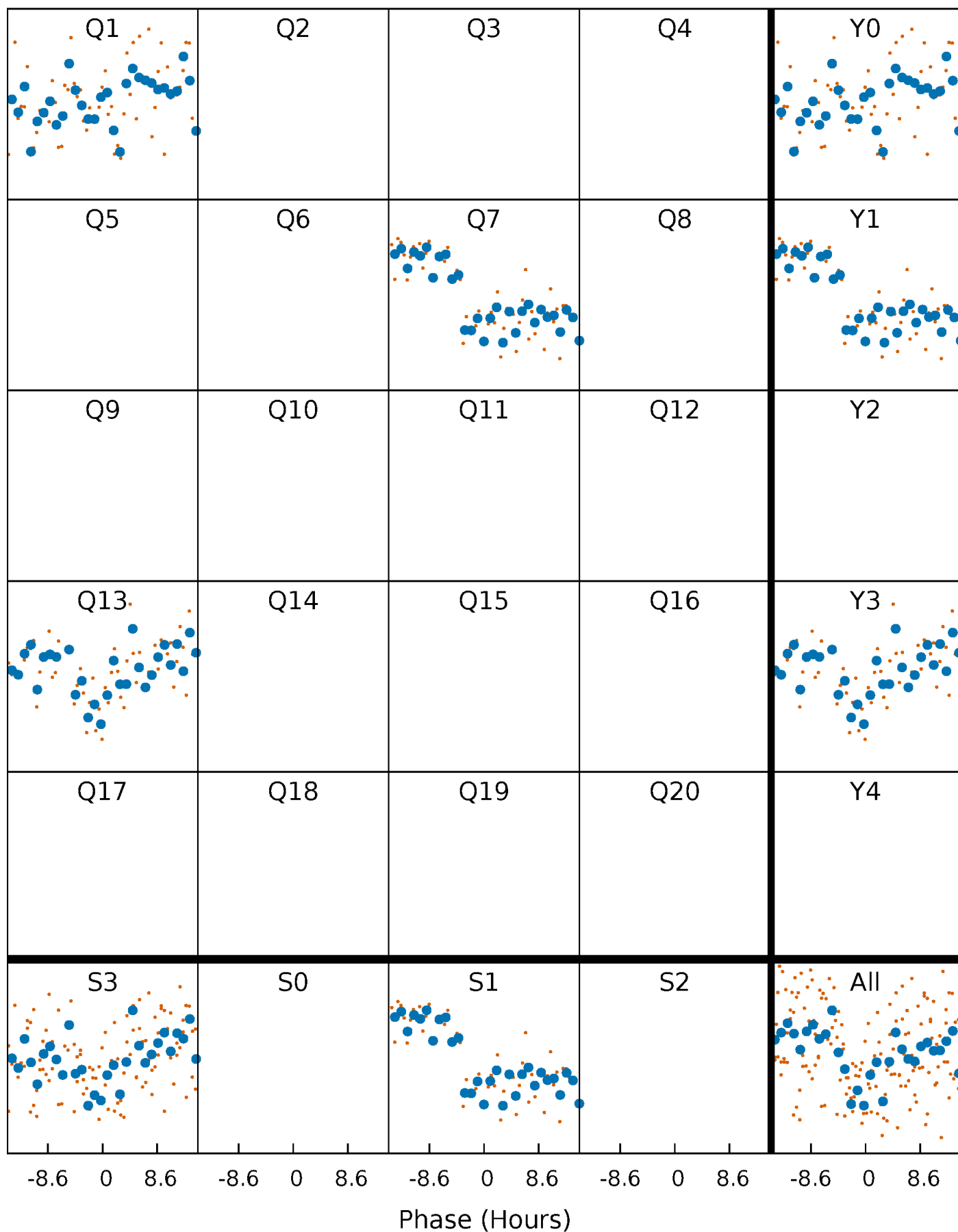


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

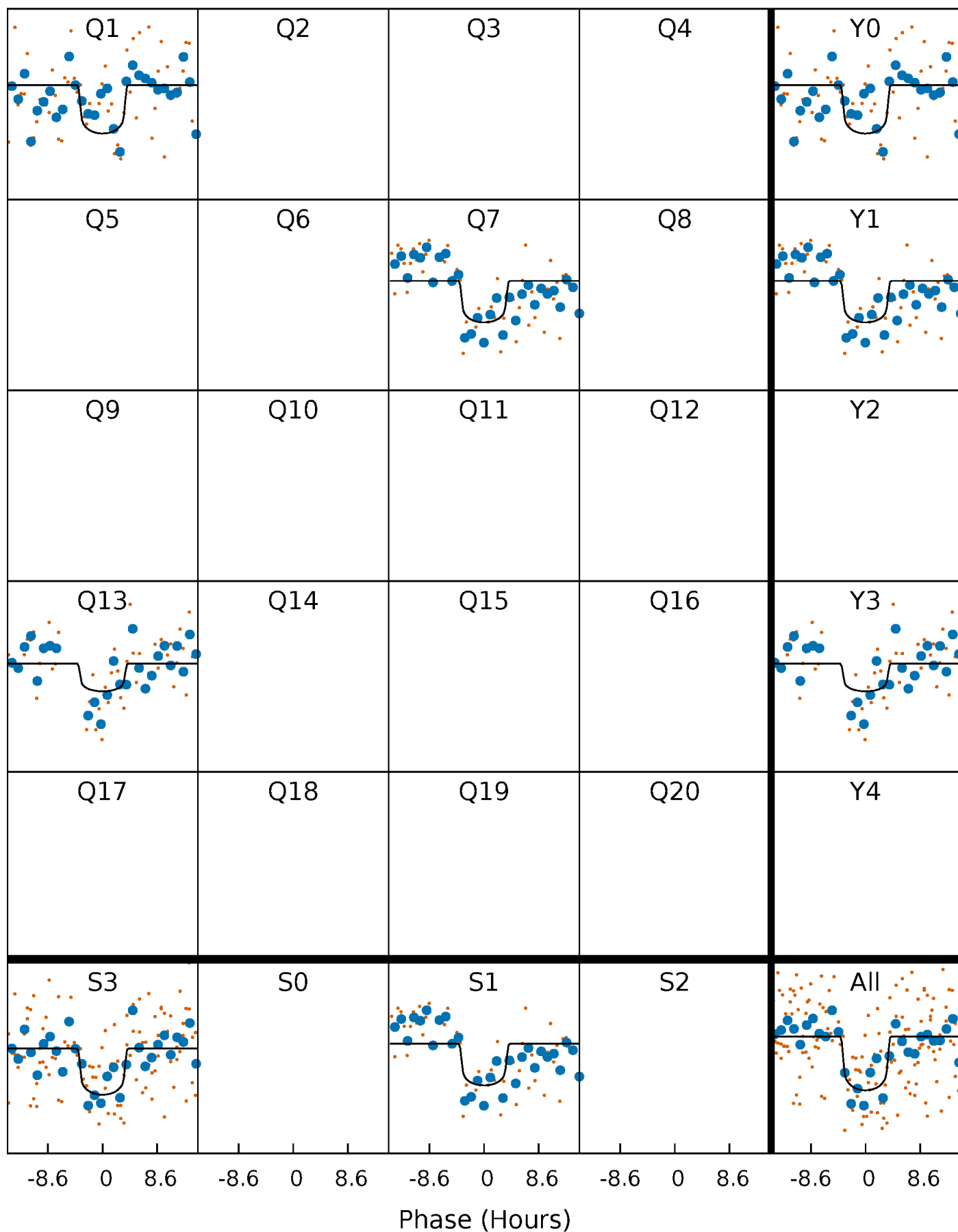
TCE 012645181-01 P=545.402983 Days  $T_0=141.078205$  (BKJD)





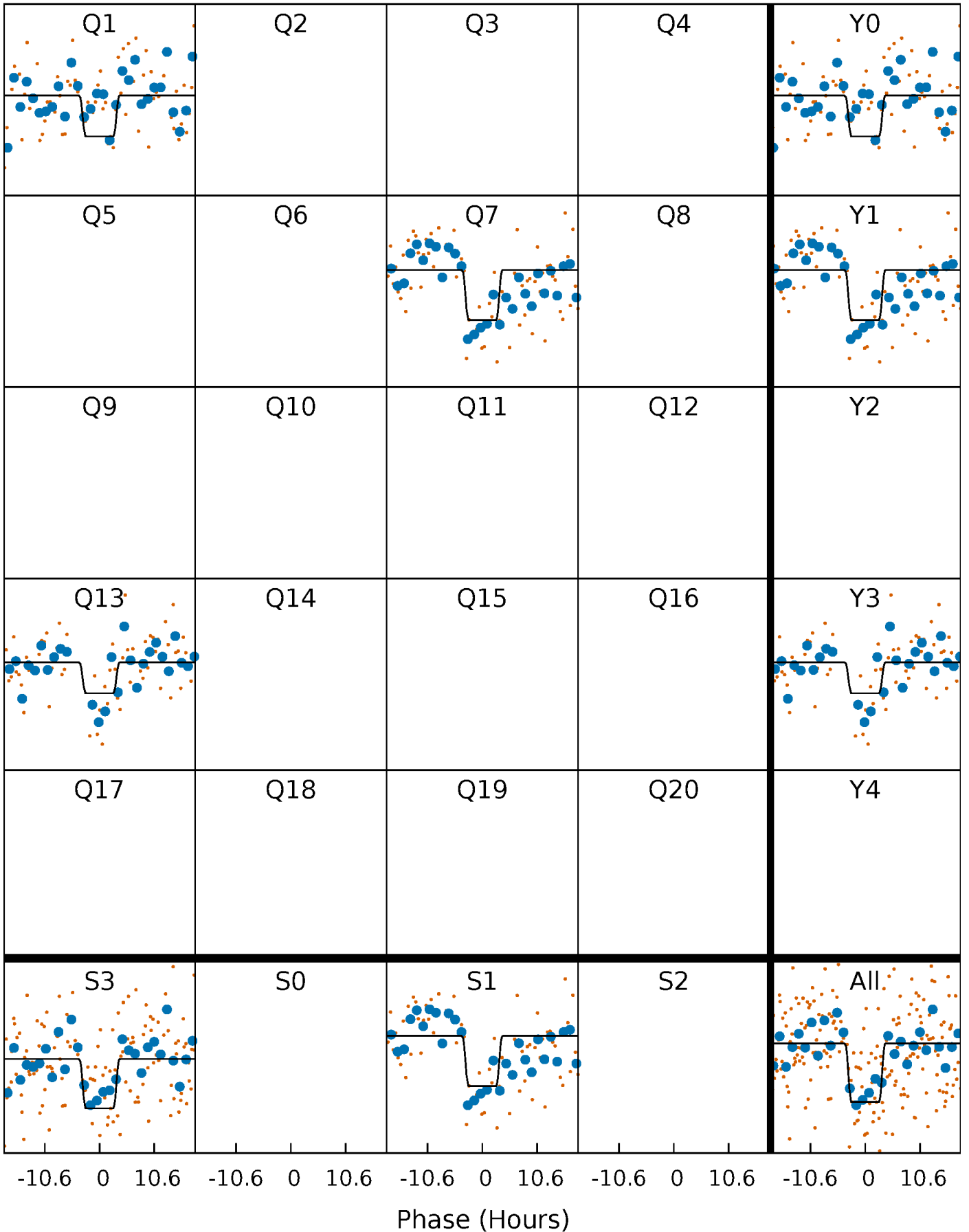
# DV Quarter-Phased Transit Curves

TCE 012645181-01 P=545.402983 Days  $T_0=141.078205$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

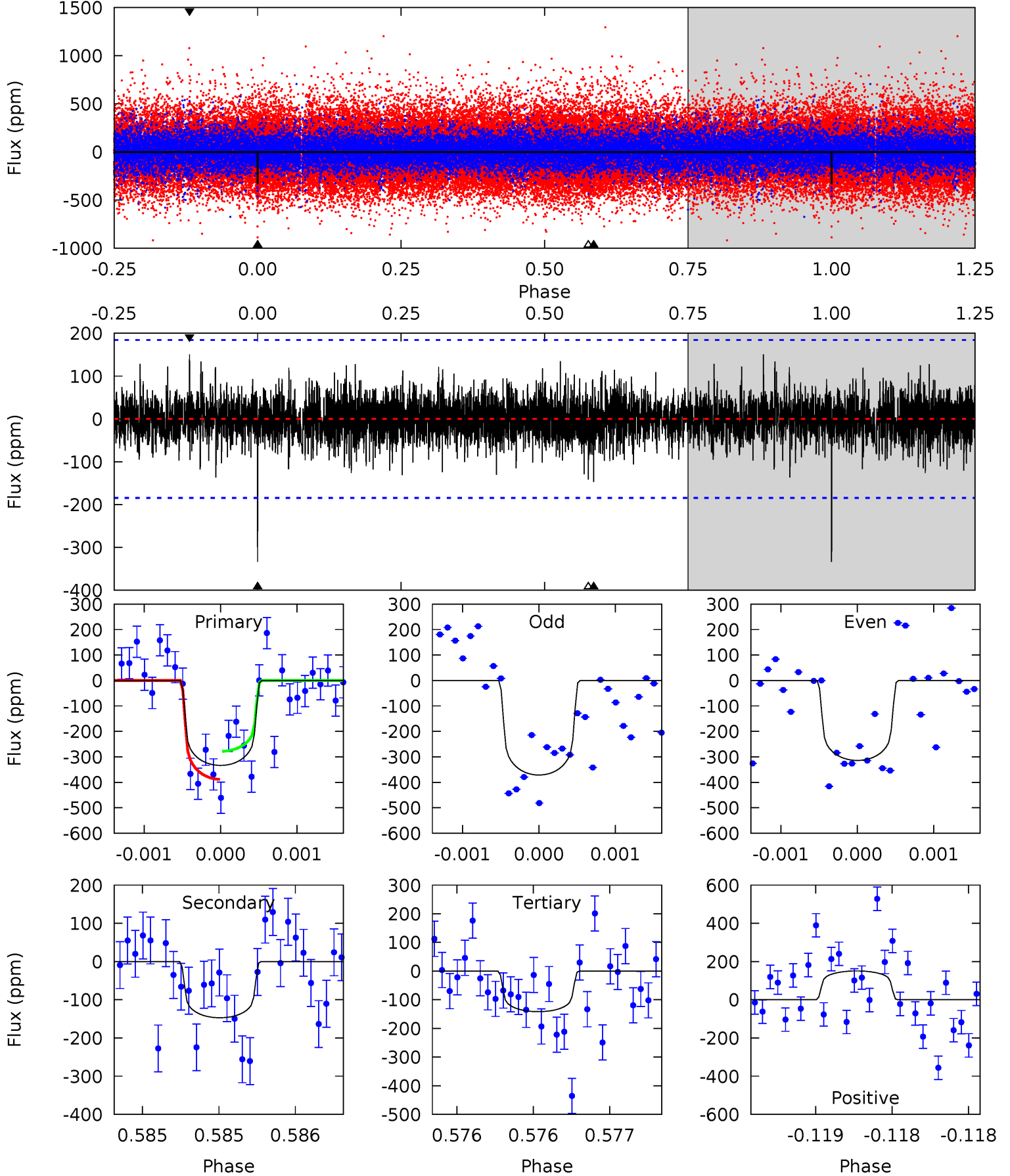
TCE 012645181-01 P=545.385339 Days  $T_0=141.087155$  (BKJD)



# DV Model-Shift Uniqueness Test

012645181-01, P = 545.402983 Days, E = 141.078205 Days

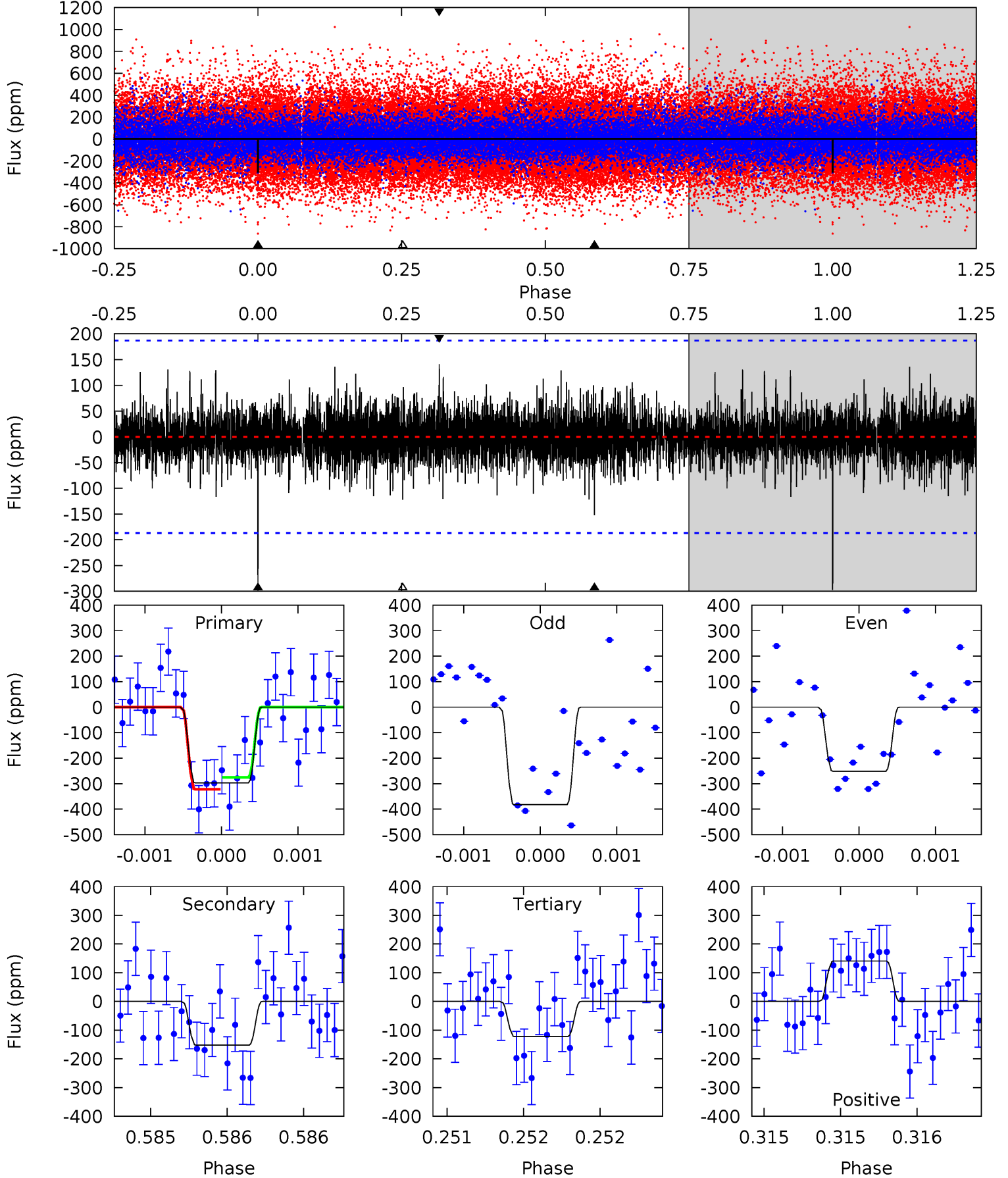
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	4.43	4.26	4.54	5.55	3.44	1.09	5.78	5.50	0.17	-0.11	0.81	0.90	0.31	1.65



# Alt Model-Shift Uniqueness Test

012645181-01, P = 545.385339 Days, E = 141.087155 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
8.83	4.51	3.63	4.18	5.55	3.44	0.98	5.20	4.65	0.88	0.33	1.86	0.79	0.32	0.69



### Stellar Parameters For KIC 012645181

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6418^{+160}_{-192}$	$4.394^{+0.056}_{-0.210}$	$-0.080^{+0.250}_{-0.300}$	$1.139^{+0.389}_{-0.130}$	$1.172^{+0.172}_{-0.157}$	$1.117^{+0.326}_{-0.596}$
	+2%/-3%	+1%/-5%	+312%/-375%	+34%/-11%	+15%/-13%	+29%/-53%
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 012645181-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-147 \pm 33$	$2.41^{+1.38}_{-1.24}$	$368^{+28}_{-18}$	$5208^{+2331}_{-876}$	$25481^{+79816}_{-16110}$
Alt.	$-152 \pm 34$	$2.34^{+1.34}_{-1.23}$	$368^{+27}_{-19}$	$5379^{+2622}_{-984}$	$28866^{+96398}_{-17719}$

$T_{max}$  = 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

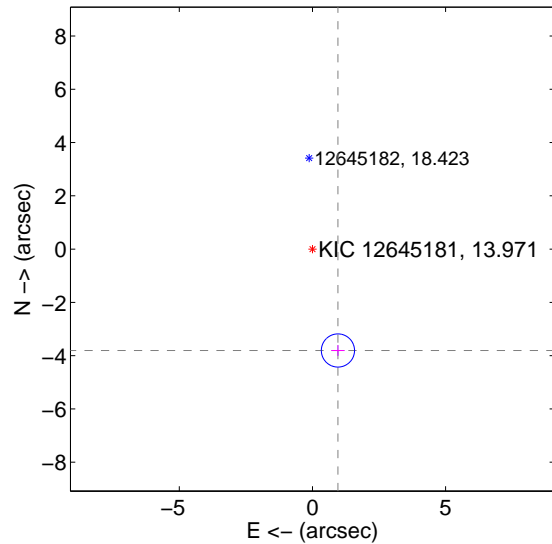
Supplemental centroid analysis for 012645181-01. Kepler magnitude: 13.97. Transit SNR 7.46

There are 1 quarters with good PRF difference image offsets

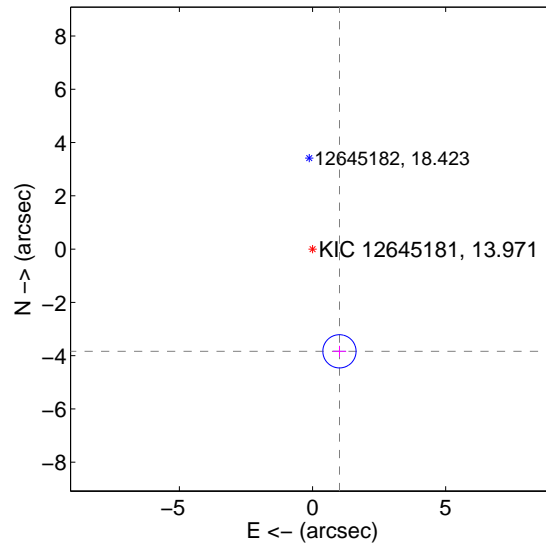
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.925 \pm 0.208$	18.91	$-0.957 \pm 0.250$	$-3.807 \pm 0.205$
PRF-fit source offset from KIC position	$3.969 \pm 0.208$	19.09	$-1.011 \pm 0.250$	$-3.838 \pm 0.205$
photometric centroid source offset	$2.22 \pm 1.78$	1.25	$-0.13 \pm 1.70$	$-2.22 \pm 1.78$

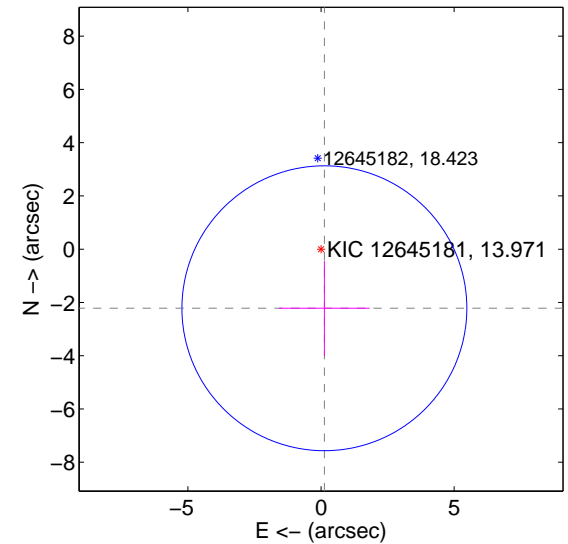
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



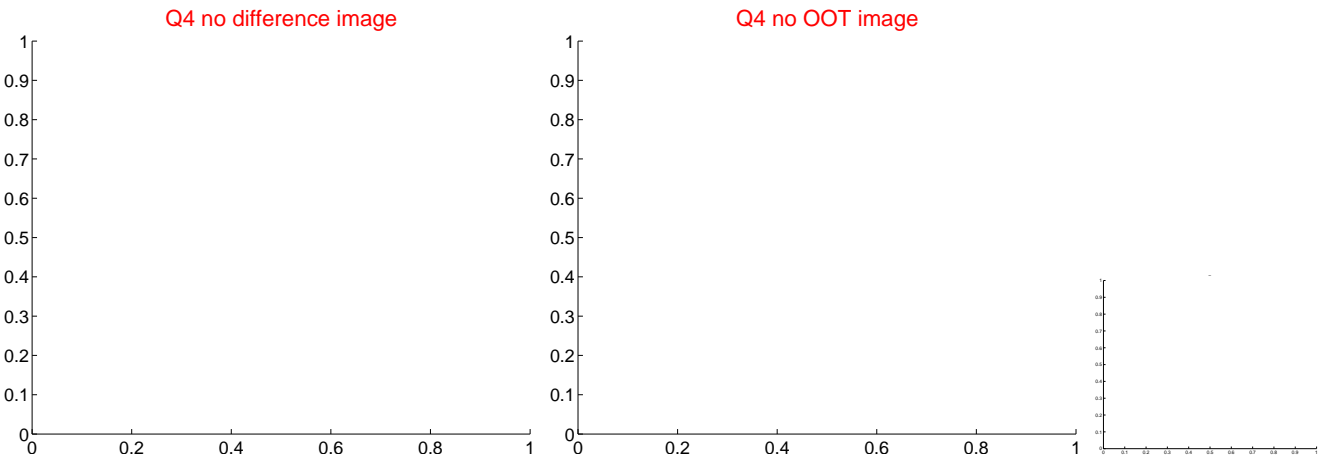
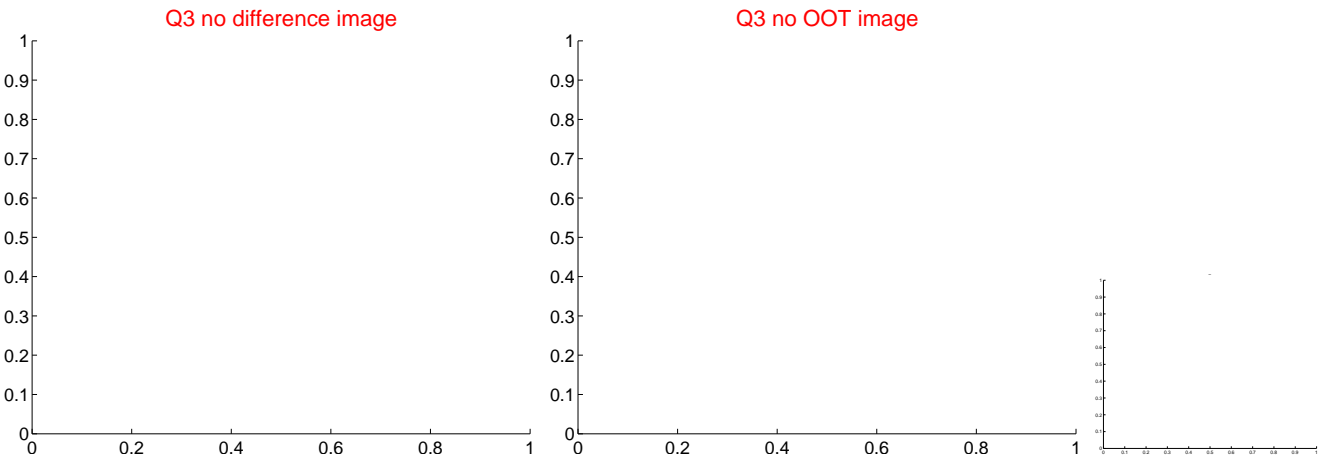
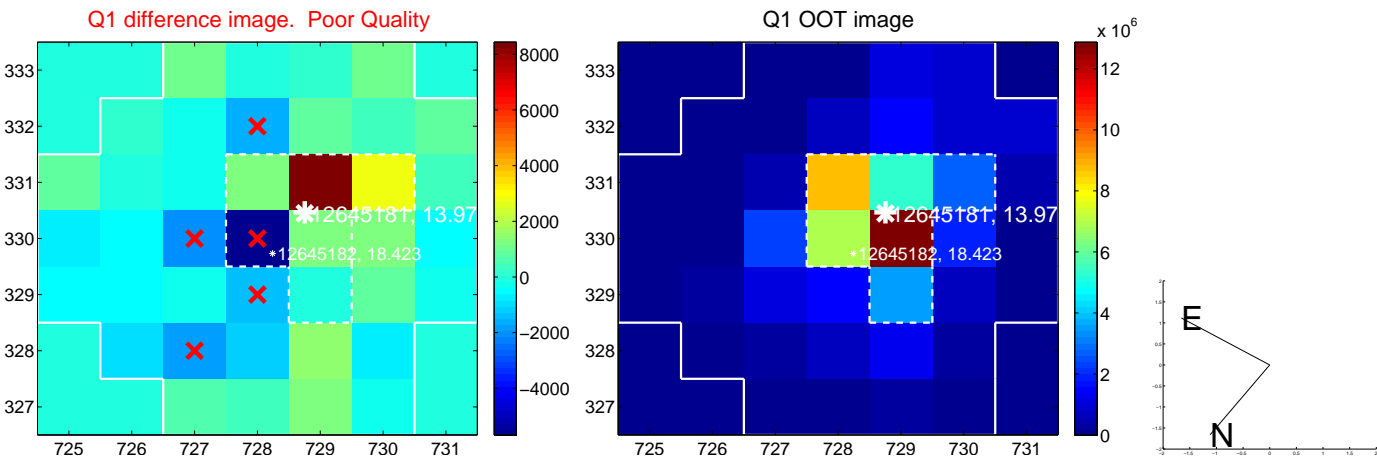
offset from photometric centroids



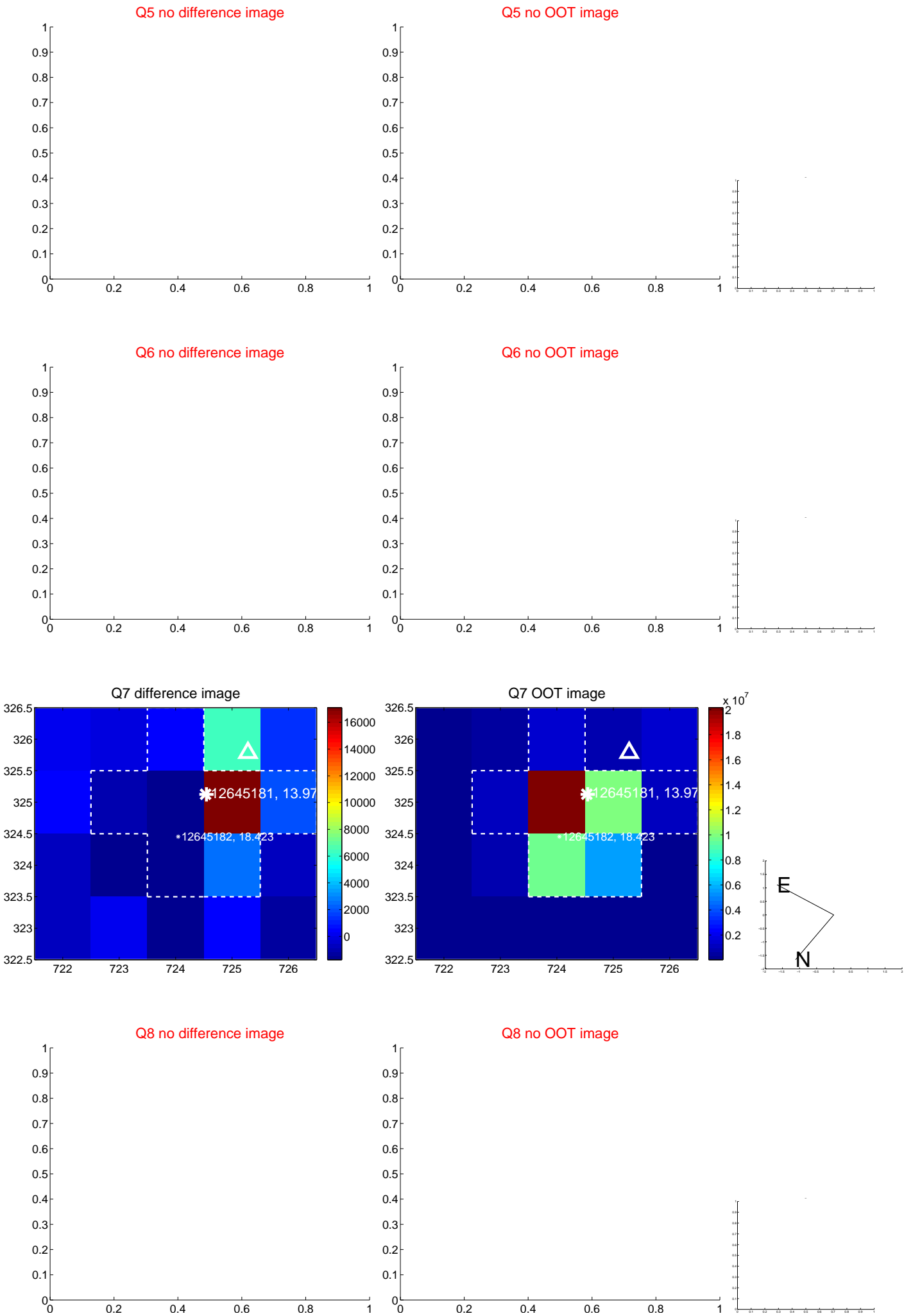
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



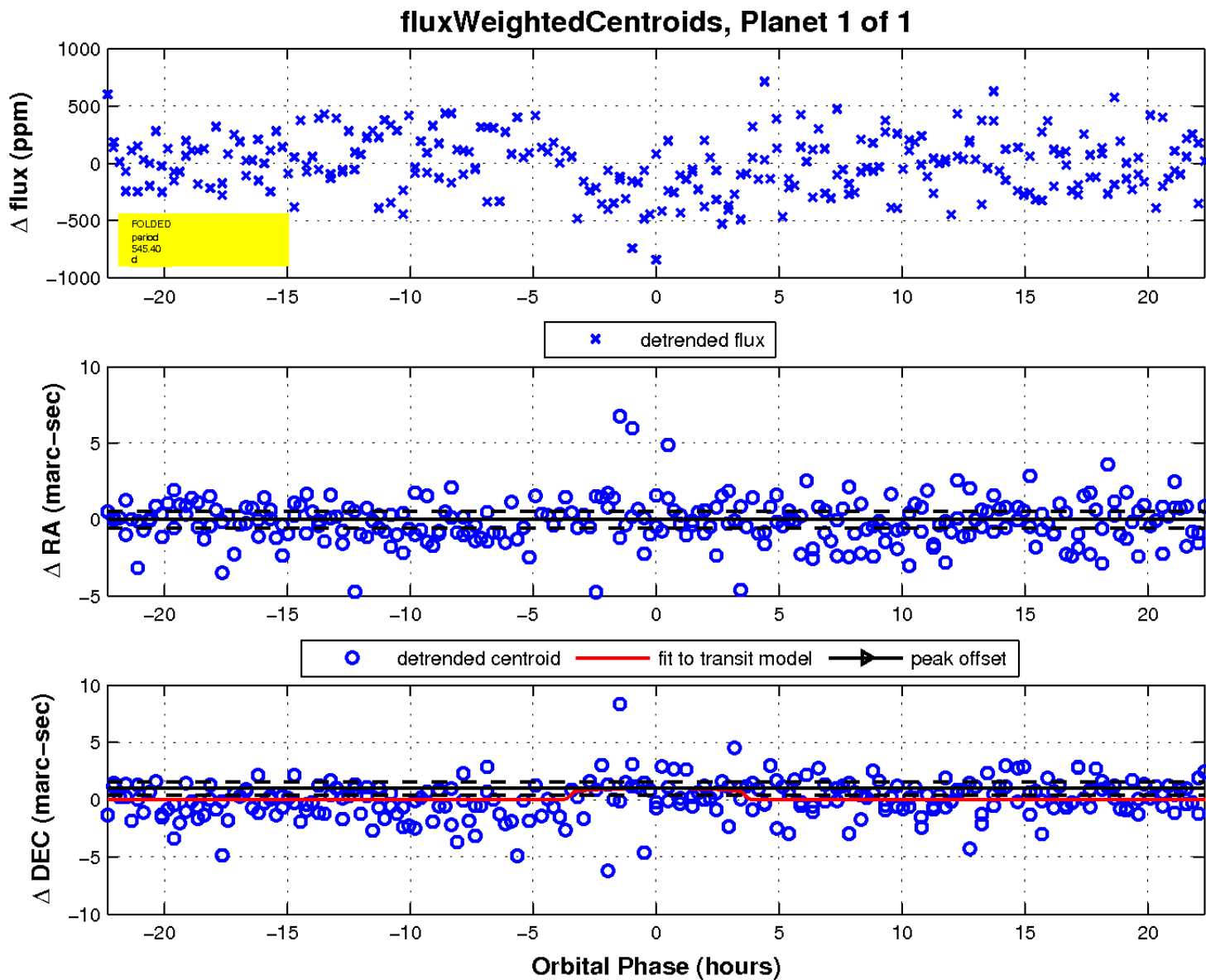
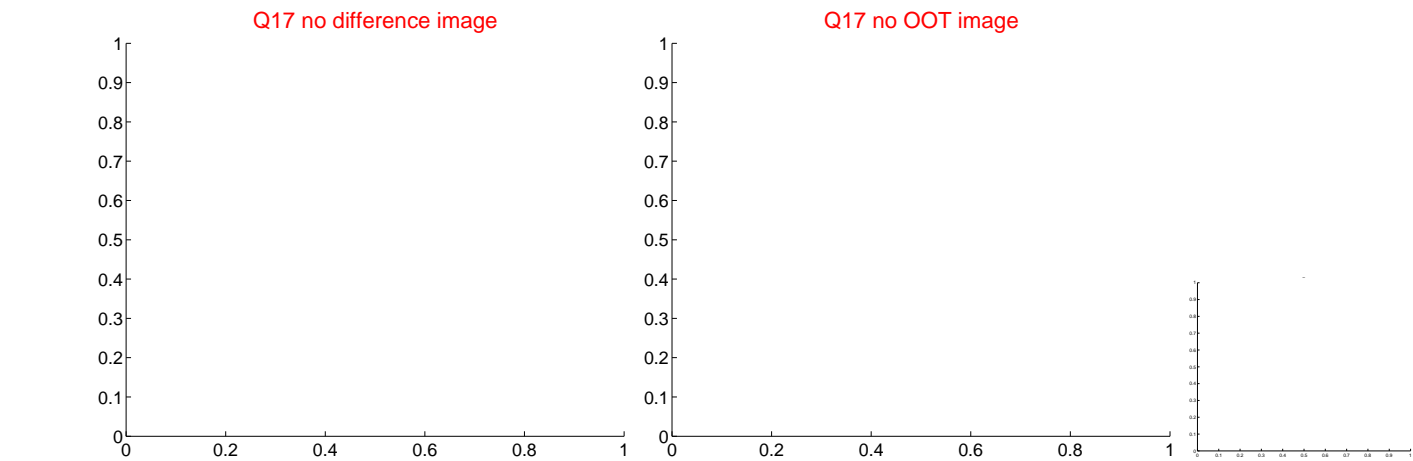
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

