

# KIC 008022520

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008022520-01	OBS	8272.01	432.397865	361.399612	167.5	20.235	7.6	7.6	1.01	6263	1.45	1.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022520-01	OBS	PC	0.12	0	0	0	0	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.

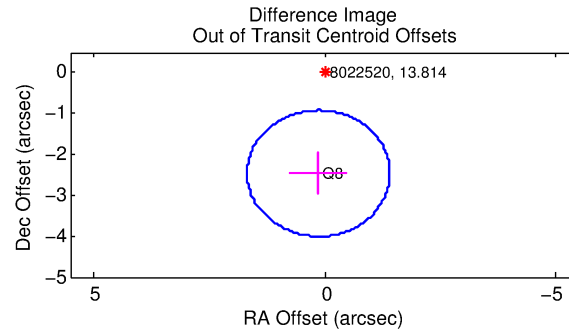
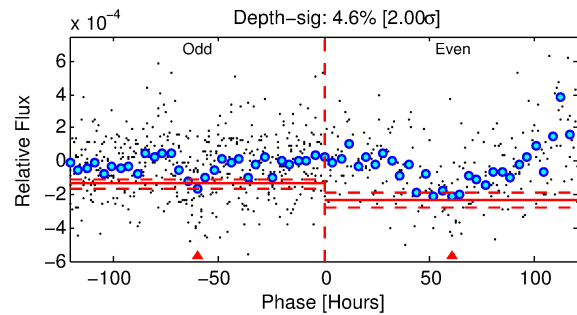
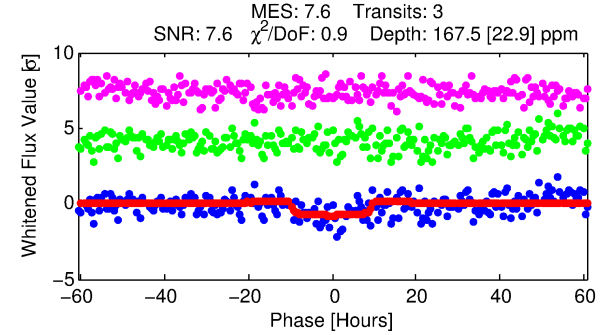
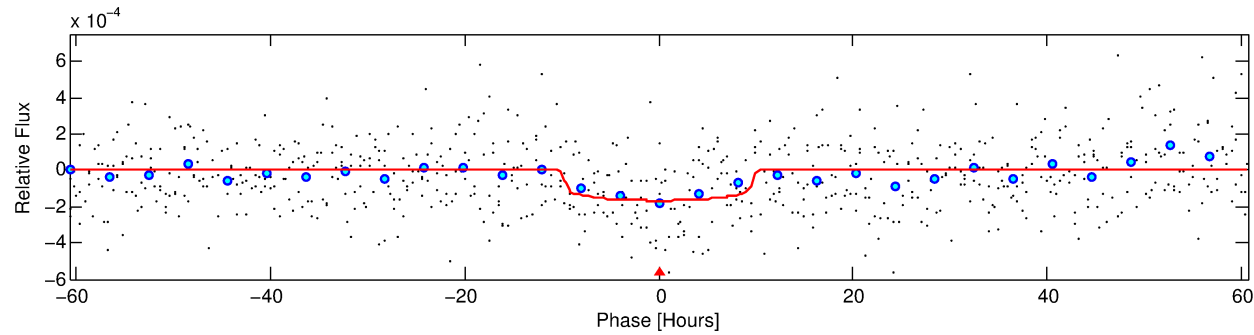
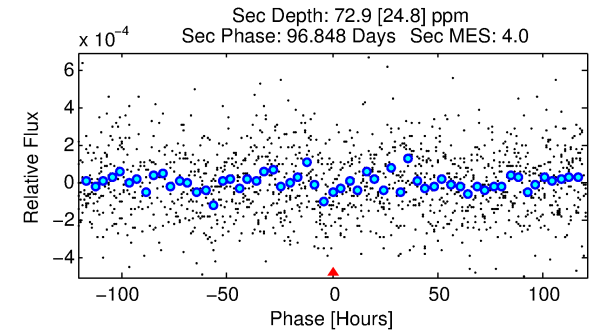
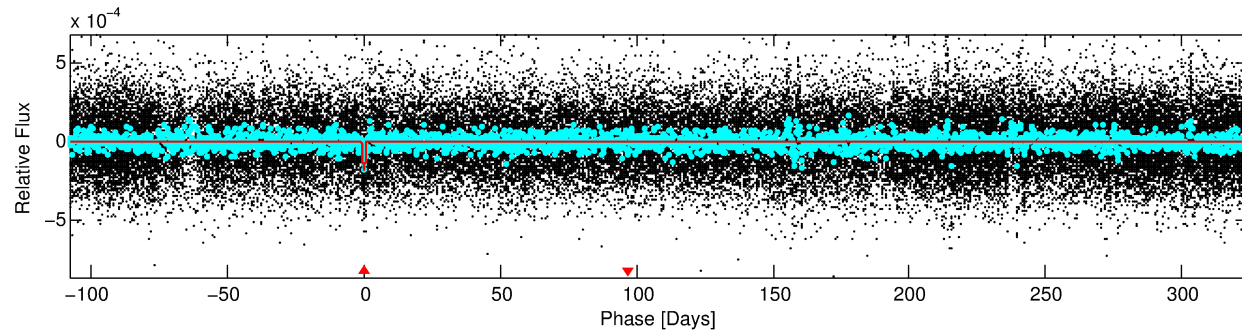
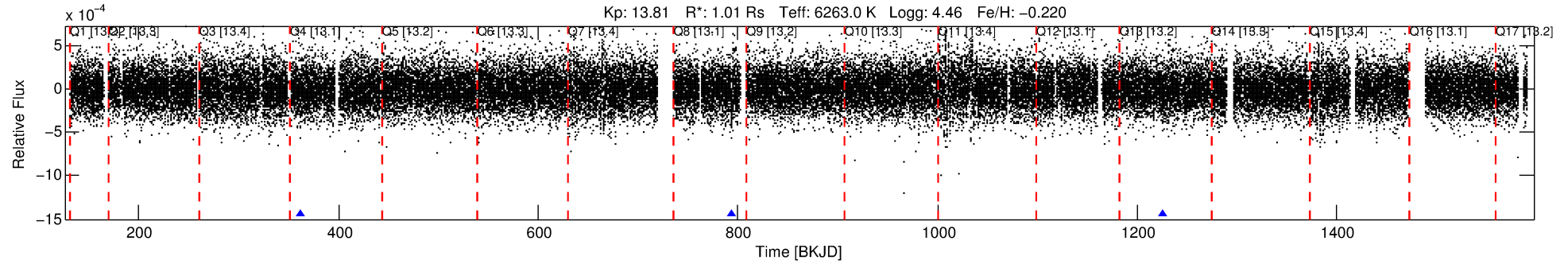
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008022520-01

No Significant Match Found

# DV One-Page Summary

KIC: 8022520 Candidate: 1 of 1 Period: 432.398 d



## DV Fit Results:

Period = 432.39786 [0.02193] d  
Epoch = 361.3996 [0.0285] BKJD  
Rp/R\* = 0.0132 [0.0032]  
a/R\* = 98.89 [124.08]  
b = 0.81 [0.53]  
Seff = 1.07 [0.45]  
Teq = 259 [27] K  
Rp = 1.45 [0.60] Re  
a = 1.1452 [0.3167] AU  
Ag = 24993.84 [17936.55] [1.39σ]  
Teffp = 5042 [767] K [6.23σ]

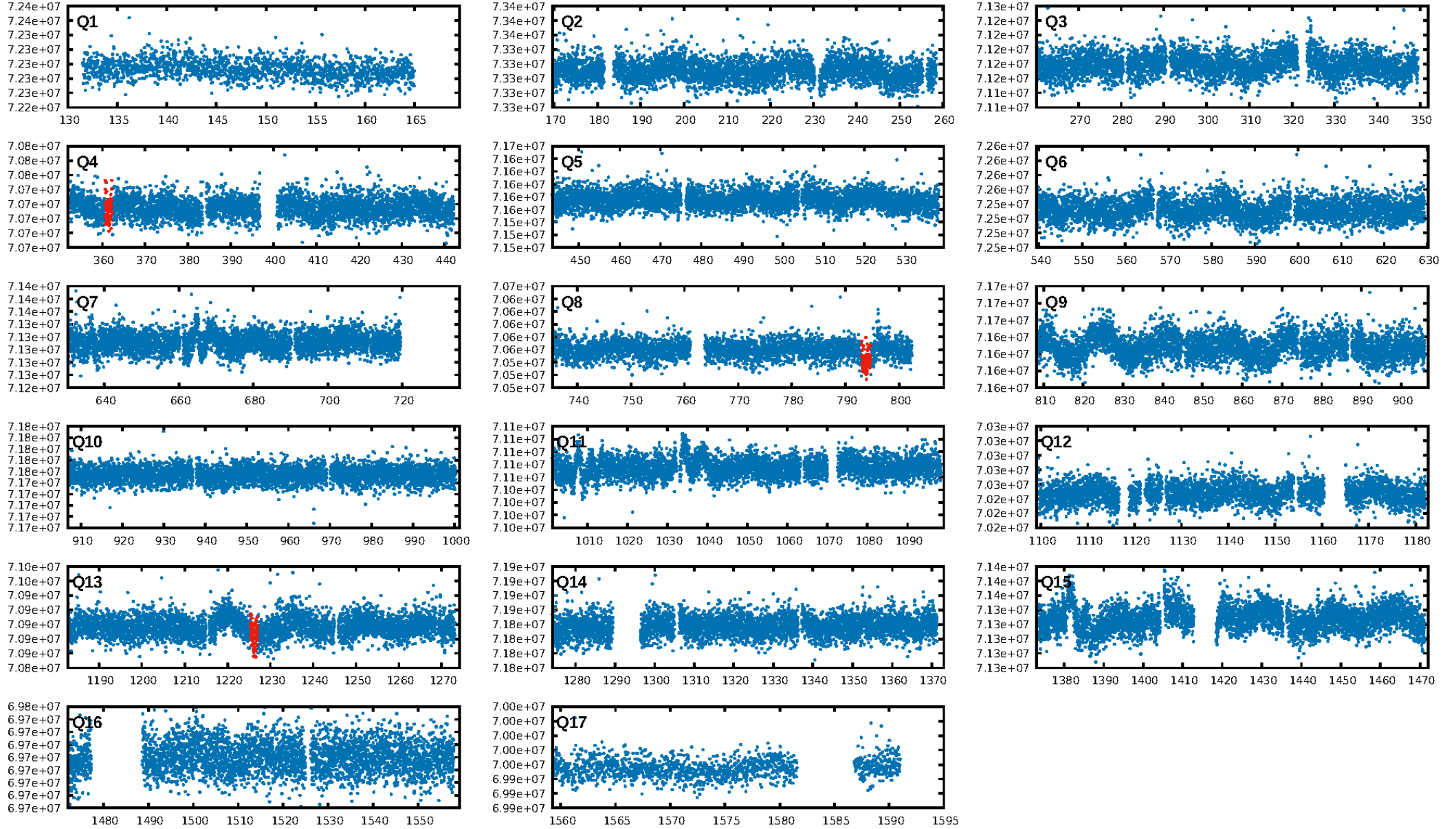
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 5.4%  
ModelChiSquareGof-sig: 99.6%  
Bootstrap-pfa: 1.02e-09  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.306  
Centroid-sig: 27.3%  
Centroid-so: 1.714 arcsec [0.94σ]  
OotOffset-rm: 2.468 arcsec [4.80σ]  
KicOffset-rm: 2.443 arcsec [4.75σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

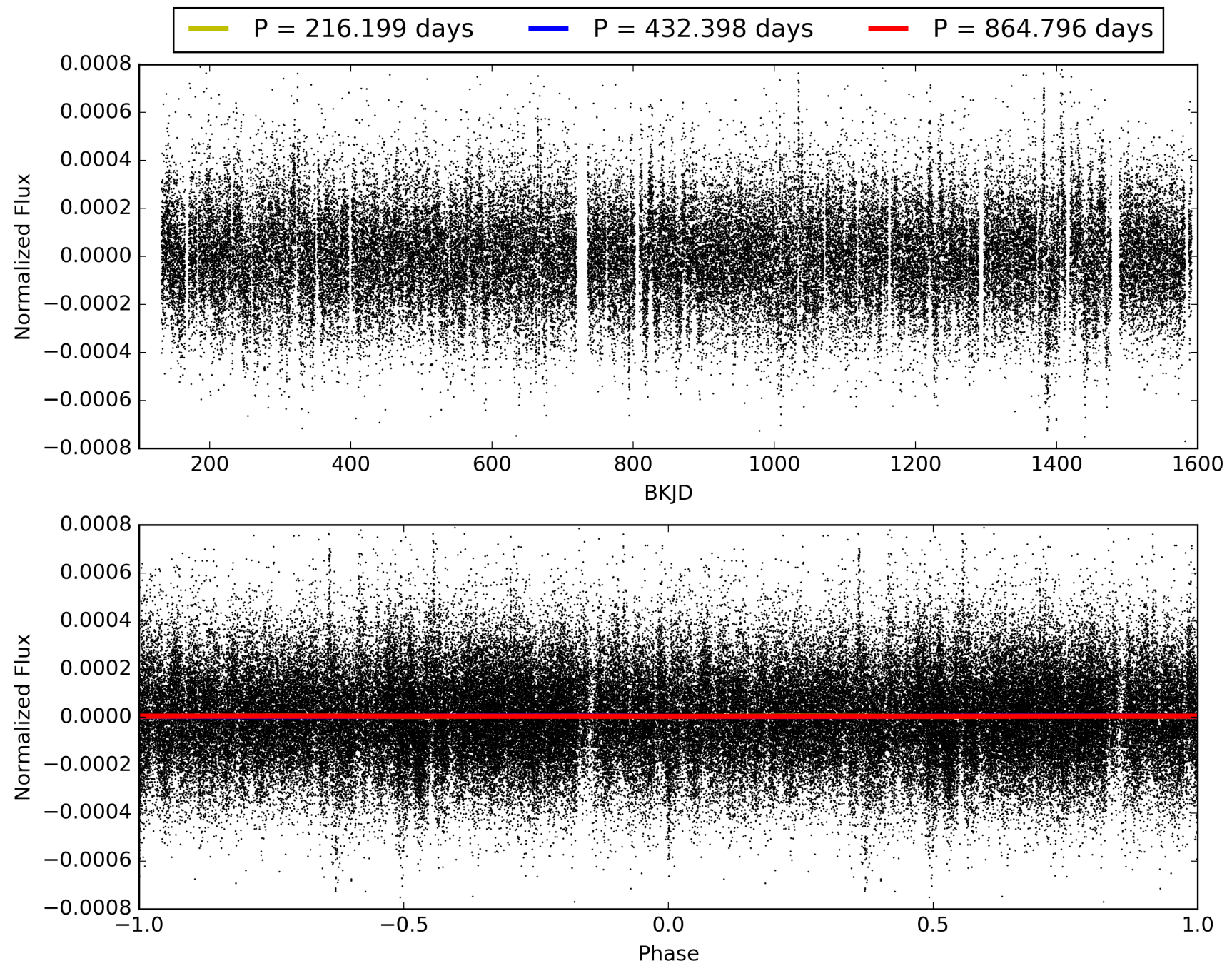
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:46:12 Z

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

# TCE 008022520-01, PDC Light Curves

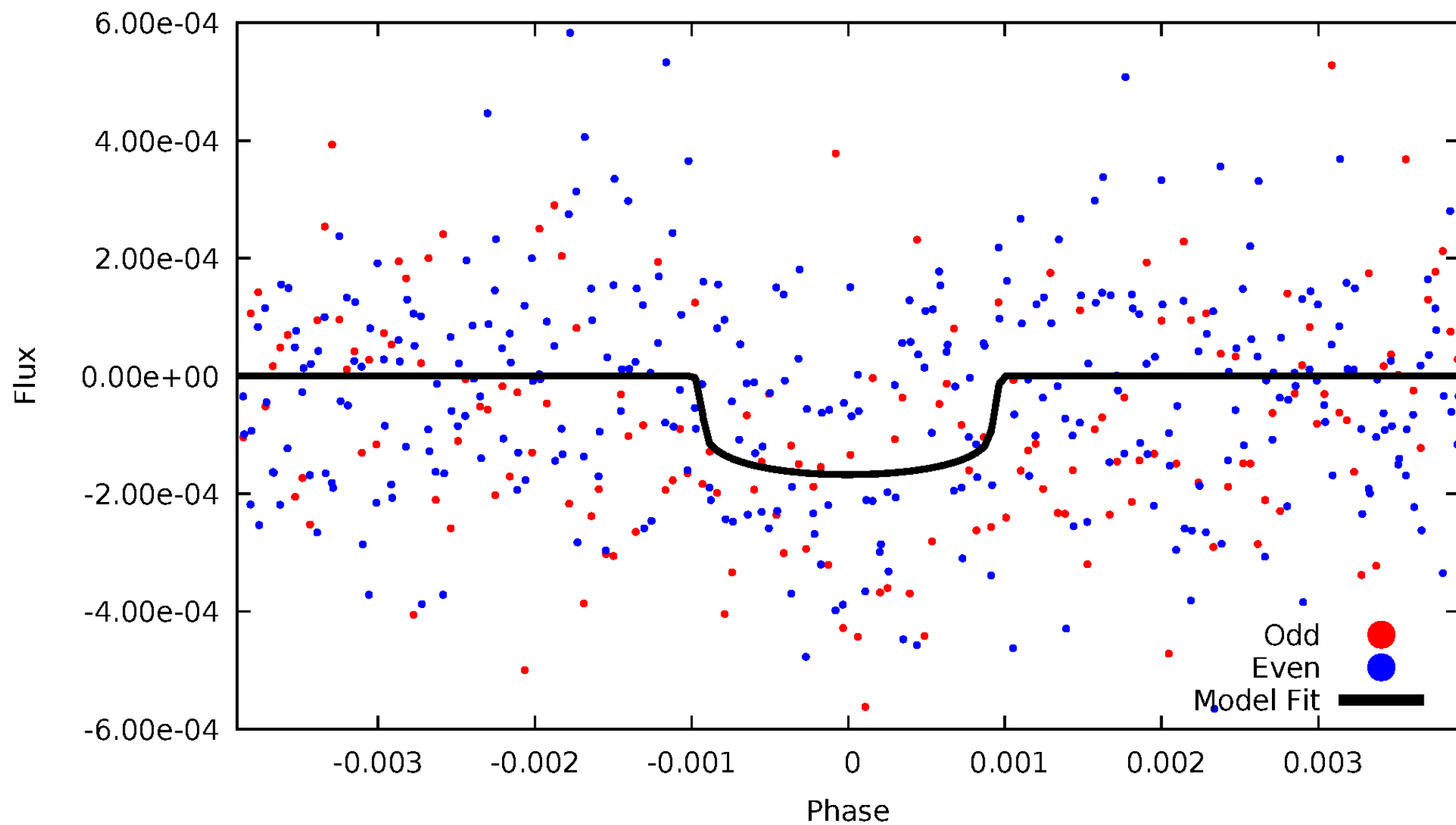


TCE 008022520-01



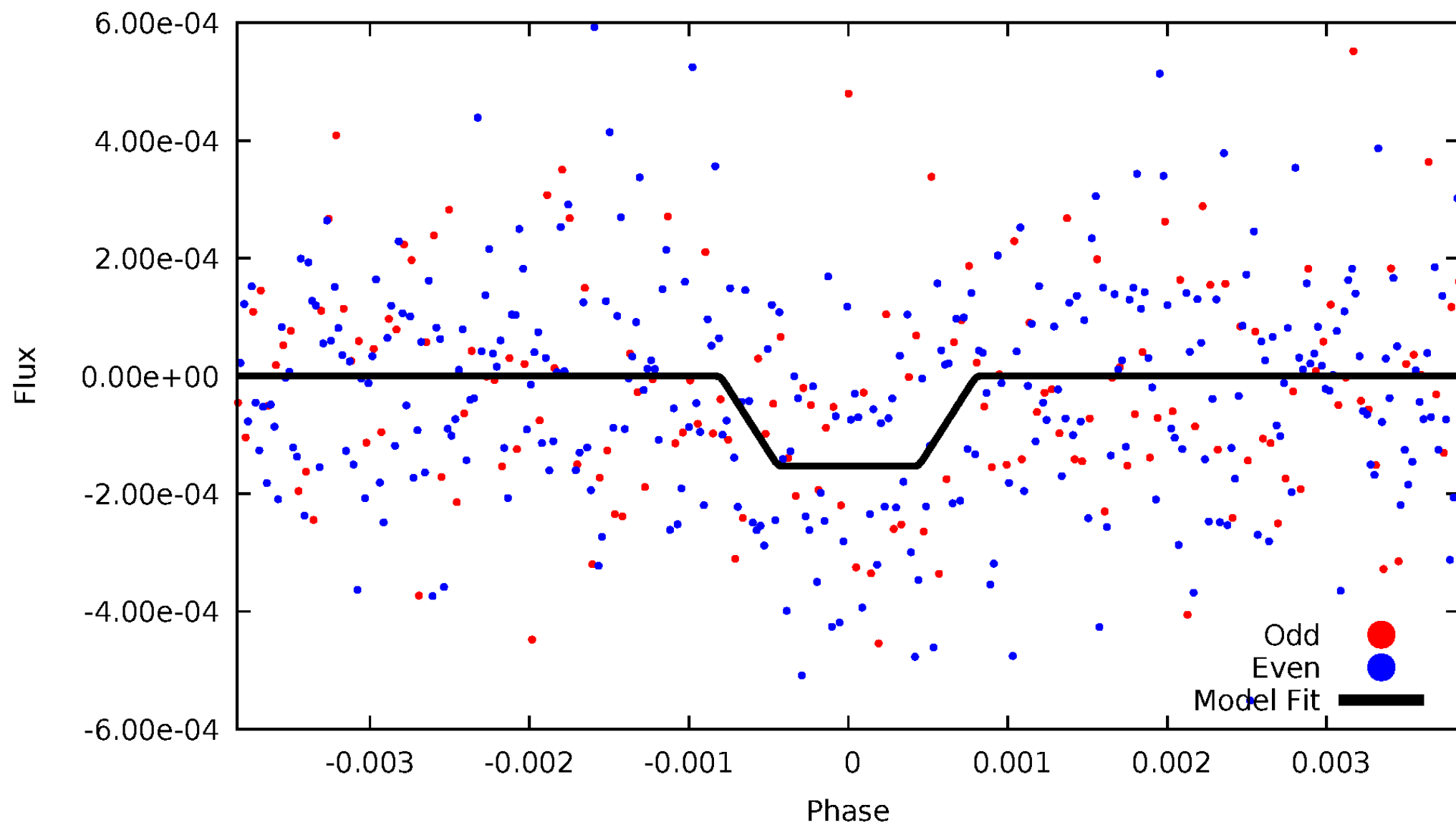
# DV Odd/Even

TCE 008022520-01



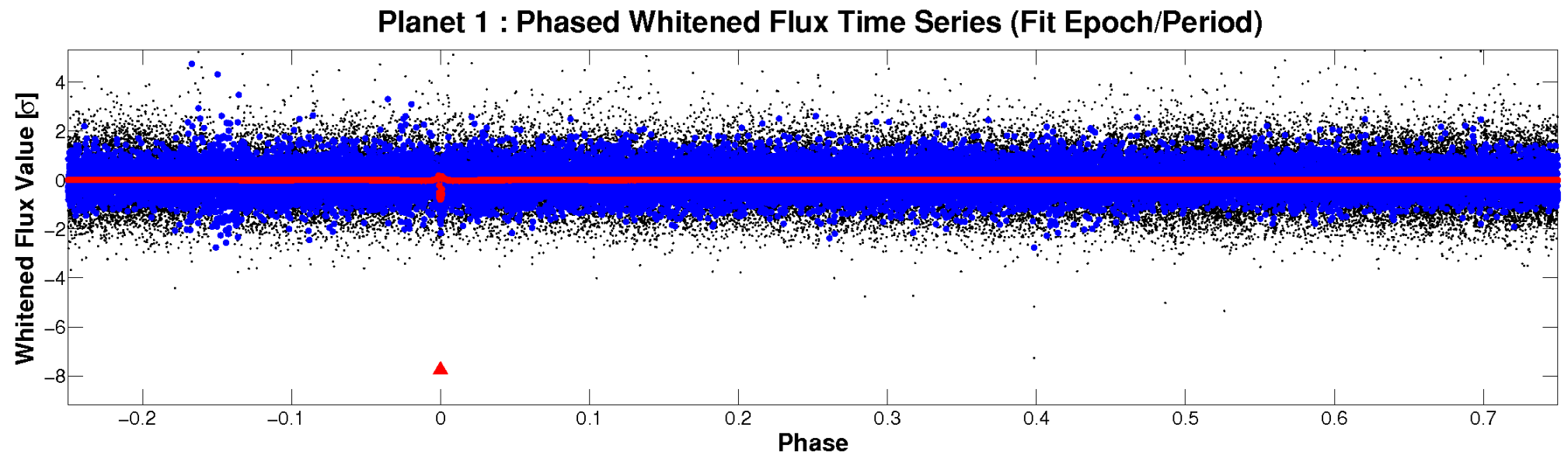
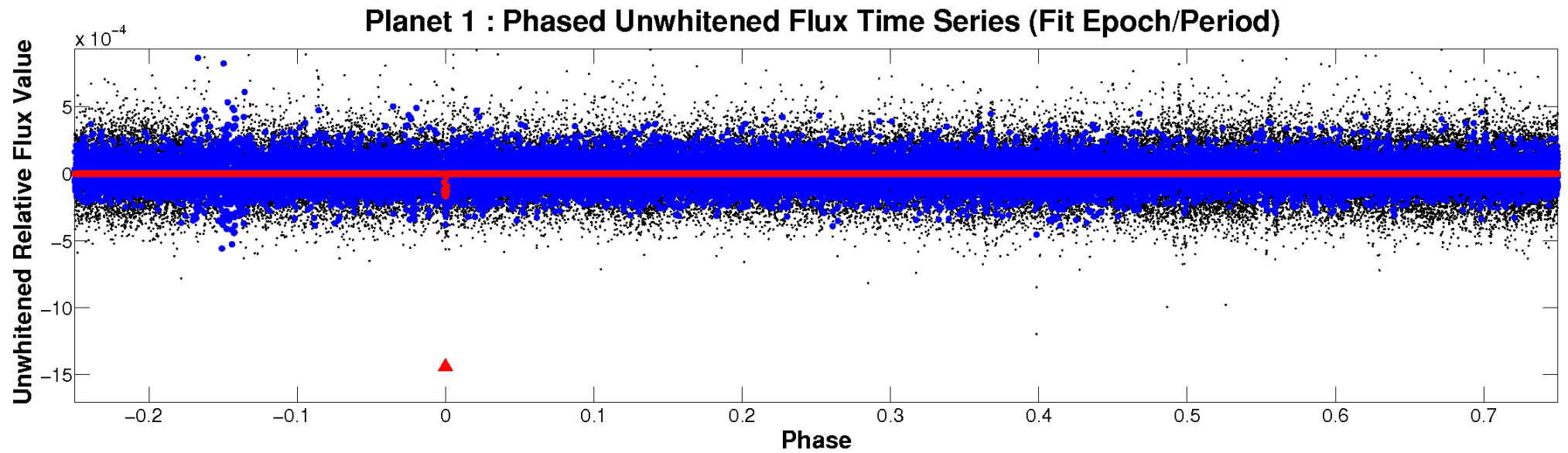
# ALT Odd/Even

TCE 008022520-01





# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

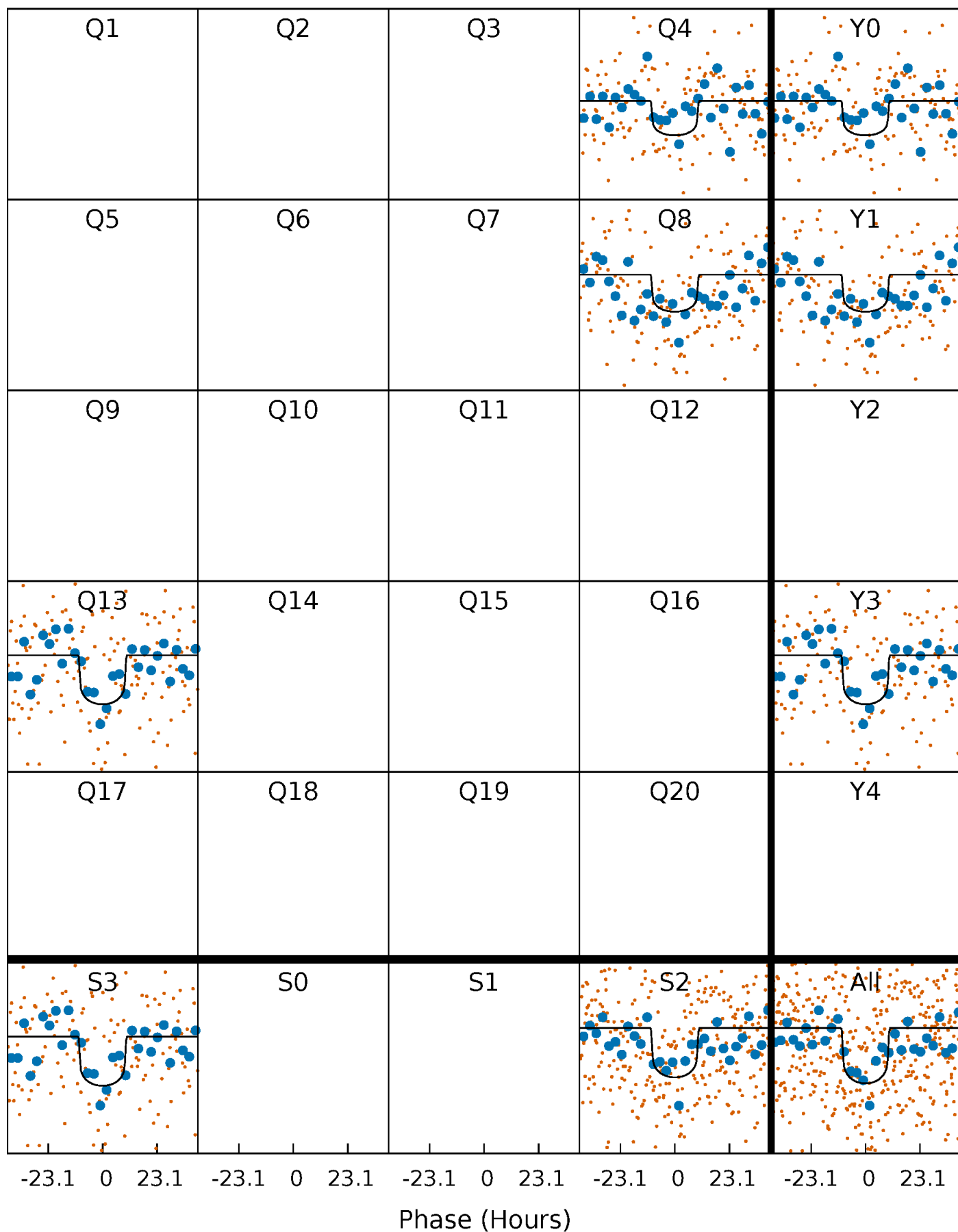
TCE 008022520-01 P=432.397865 Days  $T_0=361.399612$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 008022520-01 P=432.397865 Days  $T_0=361.399612$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

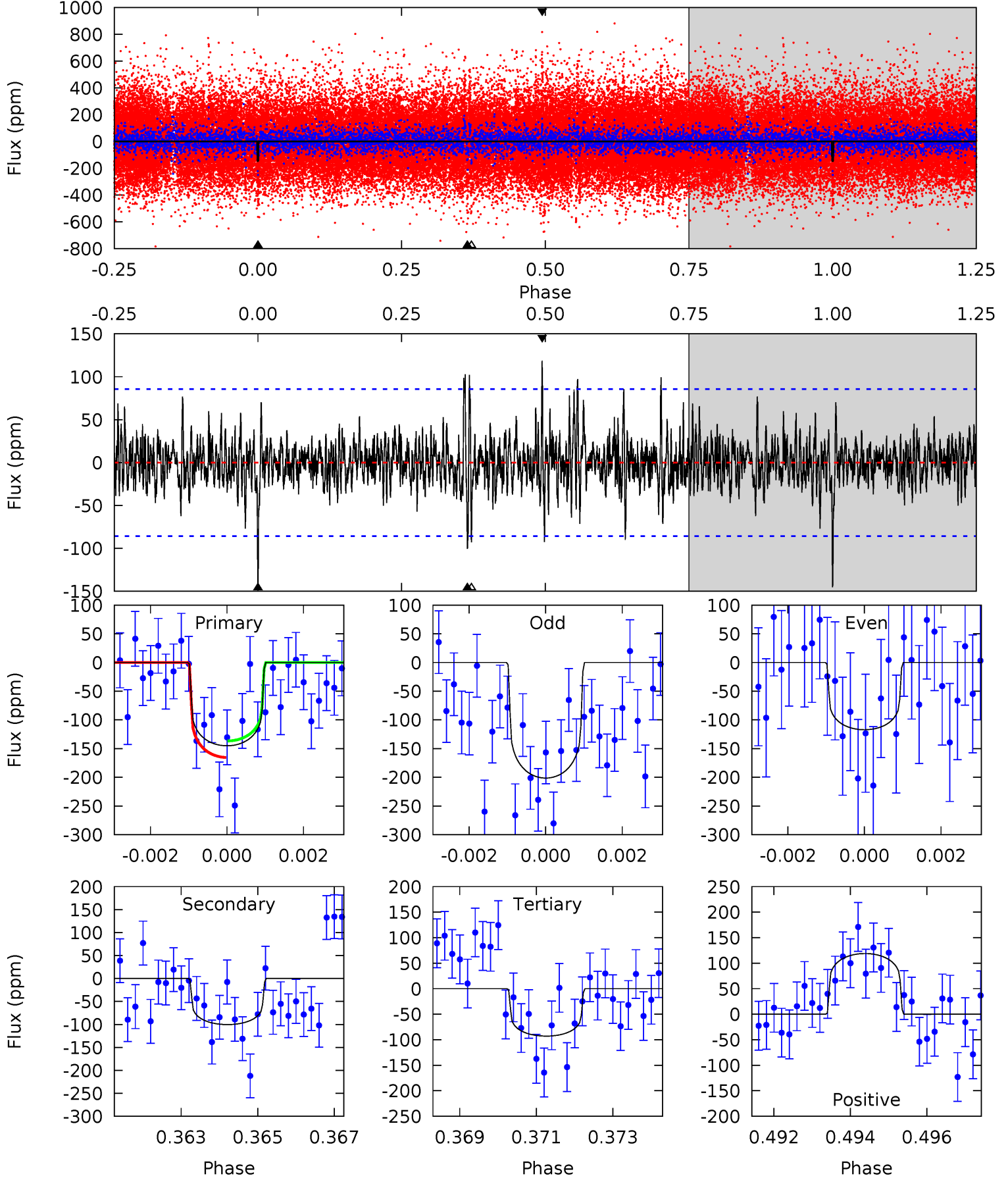
TCE 008022520-01 P=432.442242 Days  $T_0=361.319723$  (BKJD)



# DV Model-Shift Uniqueness Test

008022520-01, P = 432.397865 Days, E = 361.399612 Days

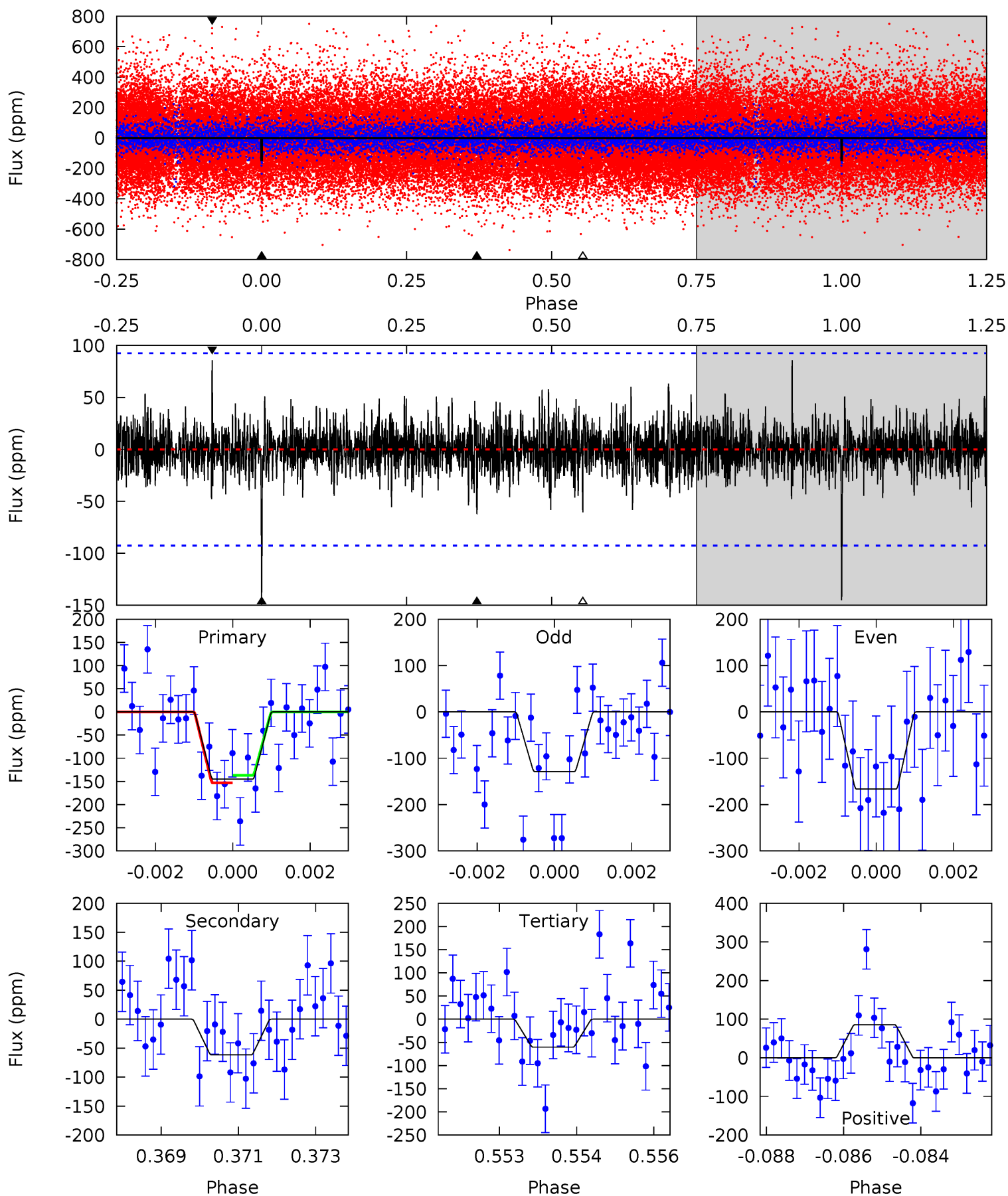
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.02	6.24	5.78	7.39	5.33	3.09	1.50	3.24	1.63	0.46	-1.15	2.46	1.09	0.45	0.89



# Alt Model-Shift Uniqueness Test

008022520-01, P = 432.442242 Days, E = 361.319723 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
8.40	3.57	3.49	4.97	5.36	3.15	0.98	4.91	3.44	0.08	-1.39	1.02	1.01	0.37	0.48



### Stellar Parameters For KIC 008022520

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6263^{+169}_{-188}$	$4.460^{+0.054}_{-0.216}$	$-0.220^{+0.250}_{-0.300}$	$1.009^{+0.335}_{-0.112}$	$1.068^{+0.144}_{-0.144}$	$1.462^{+0.417}_{-0.770}$
	+3%/-3%	+1%/-5%	+114%/-136%	+33%/-11%	+13%/-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 008022520-01 / KOI 8272.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-100 \pm 16$	$1.53^{+0.43}_{-0.39}$	$370^{+28}_{-18}$	$5468^{+834}_{-564}$	$30824^{+23776}_{-12963}$
Alt.	$-62 \pm 17$	$1.43^{+0.42}_{-0.40}$	$371^{+29}_{-19}$	$5095^{+758}_{-585}$	$21259^{+19910}_{-9709}$

$T_{\text{max}}$  = 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

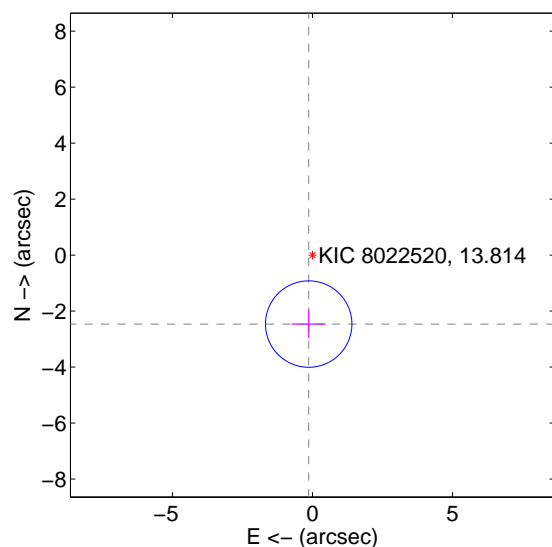
Supplemental centroid analysis for 008022520-01. Kepler magnitude: 13.81. Transit SNR 7.58

There are 1 quarters with good PRF difference image offsets

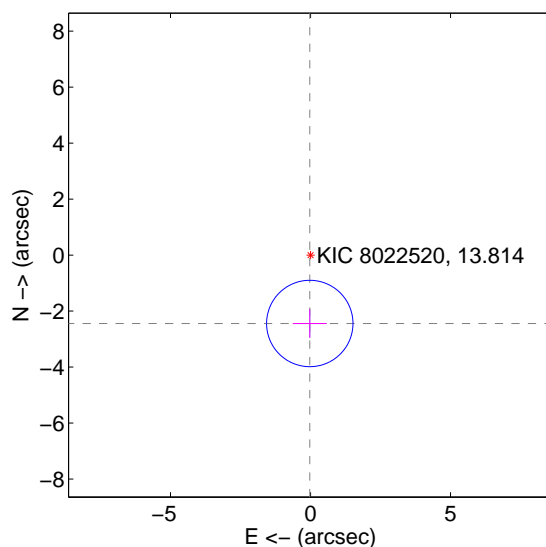
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.468 \pm 0.515$	4.80	$0.134 \pm 0.605$	$-2.464 \pm 0.514$
PRF-fit source offset from KIC position	$2.443 \pm 0.514$	4.75	$0.027 \pm 0.605$	$-2.443 \pm 0.514$
photometric centroid source offset	$1.71 \pm 1.83$	0.94	$1.35 \pm 1.92$	$1.05 \pm 1.67$

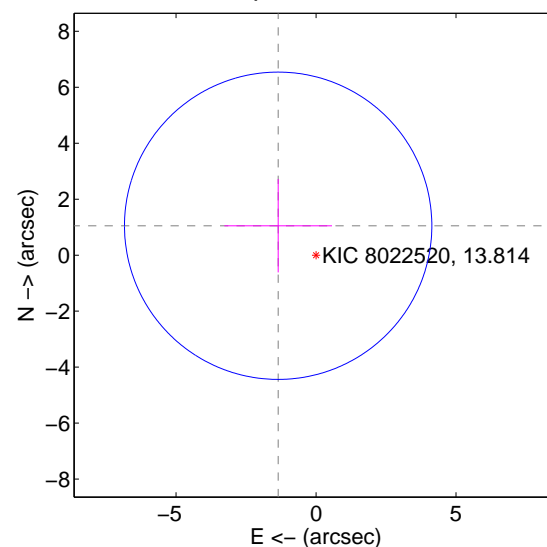
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



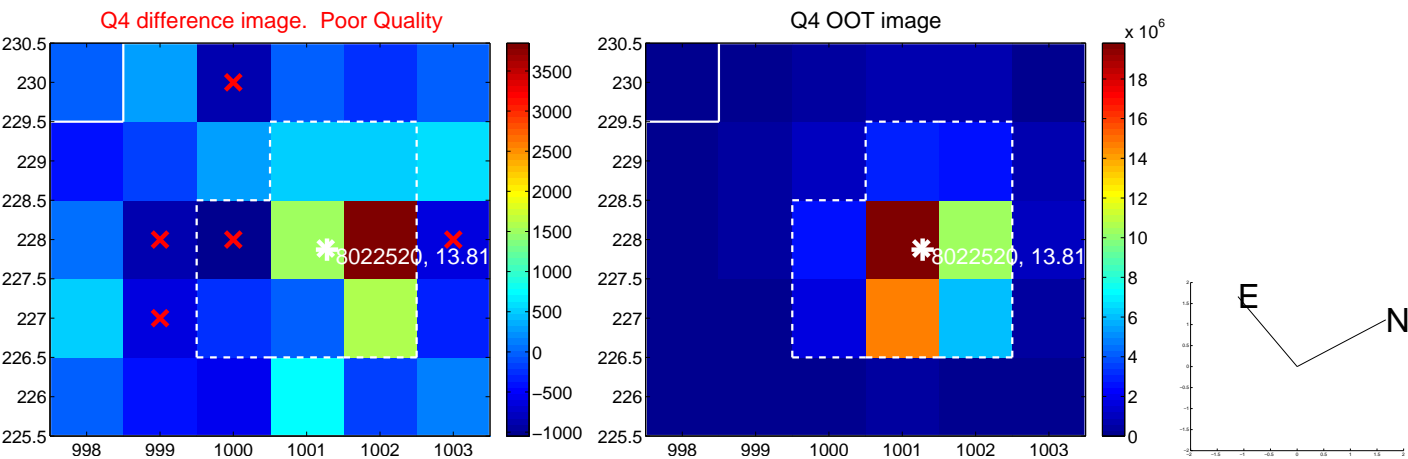
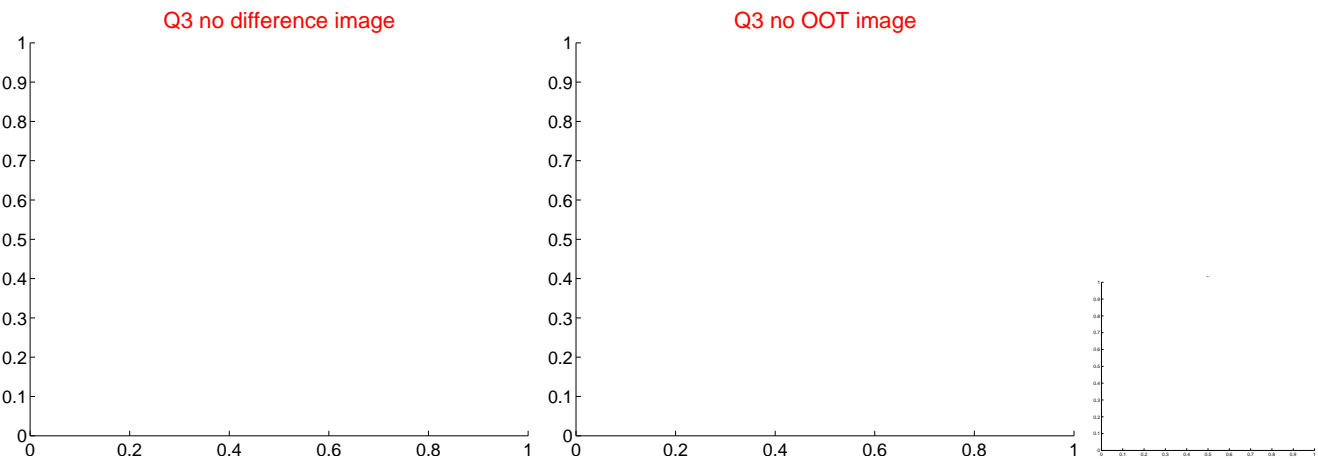
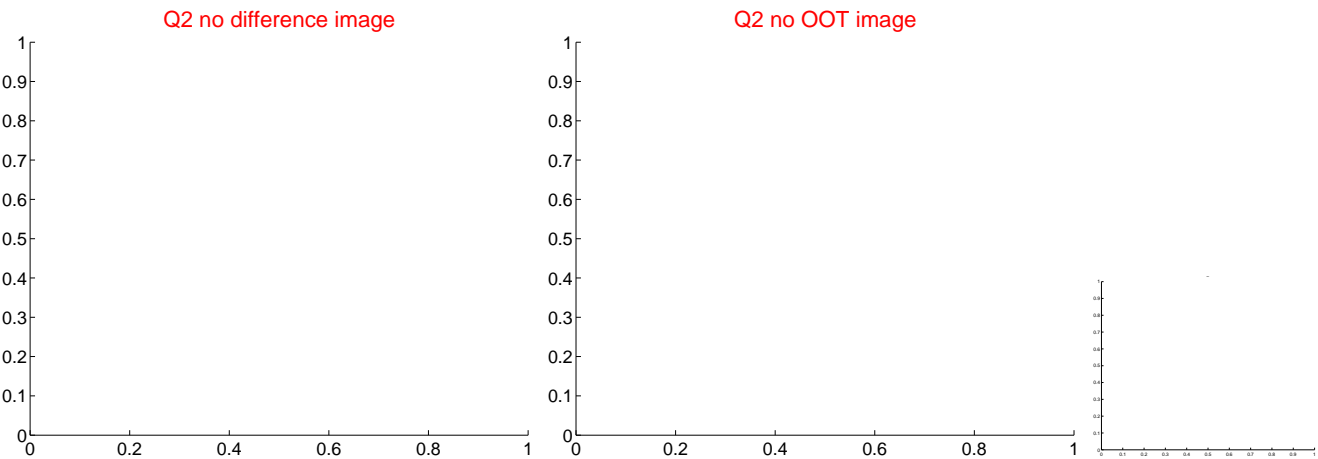
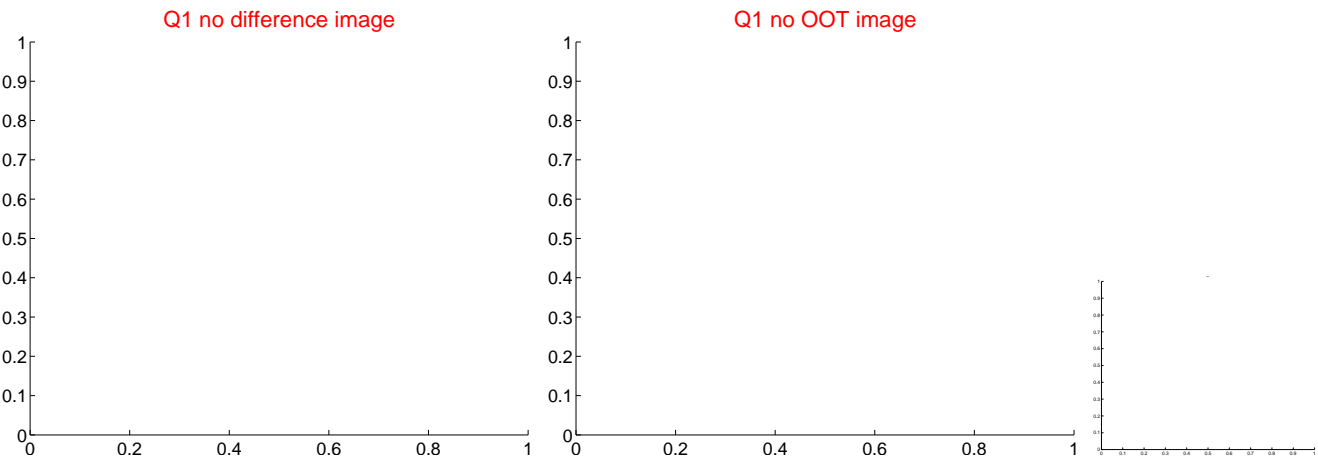
offset from photometric centroids



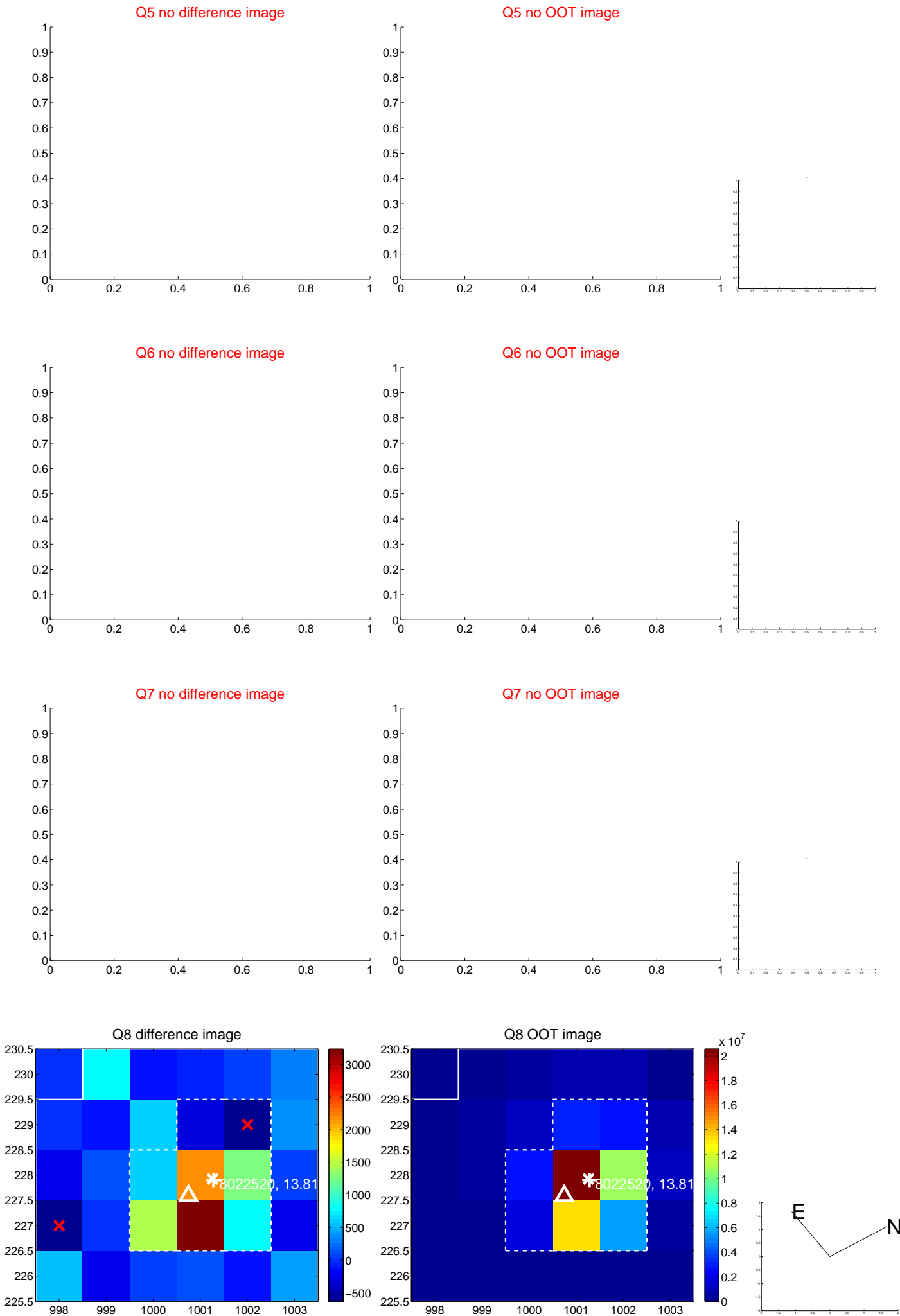
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



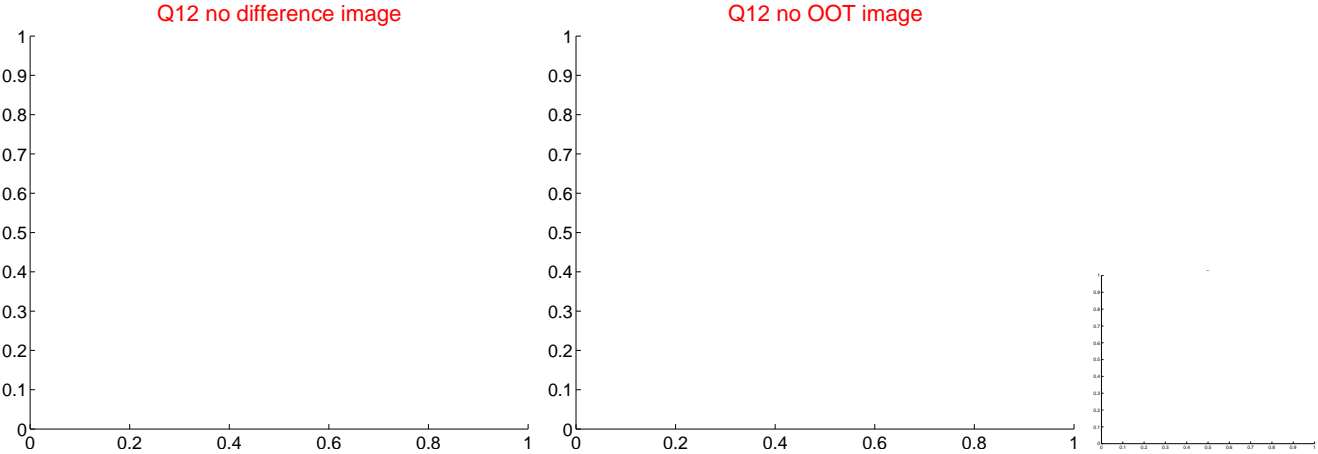
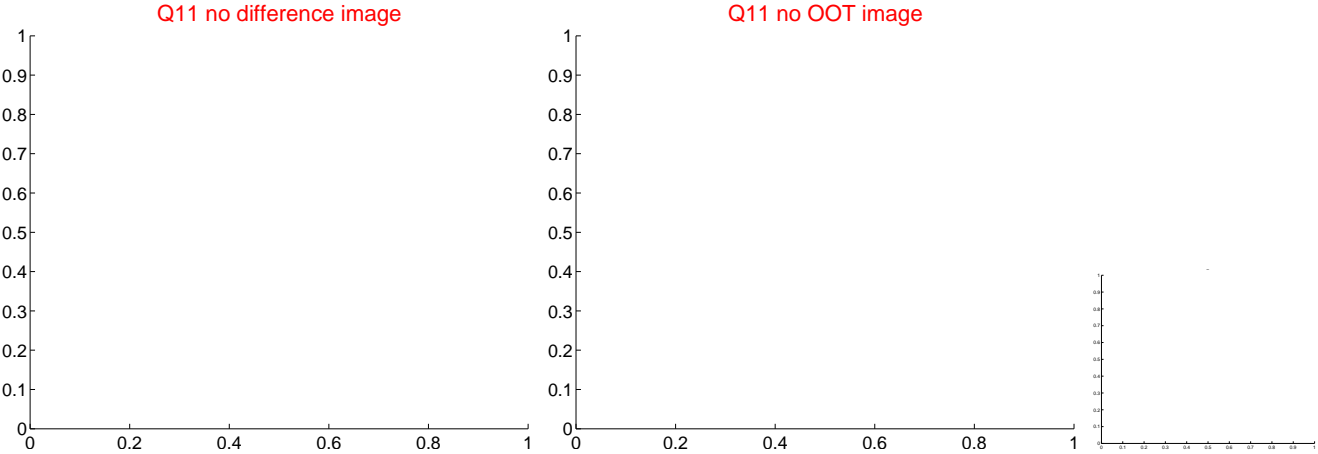
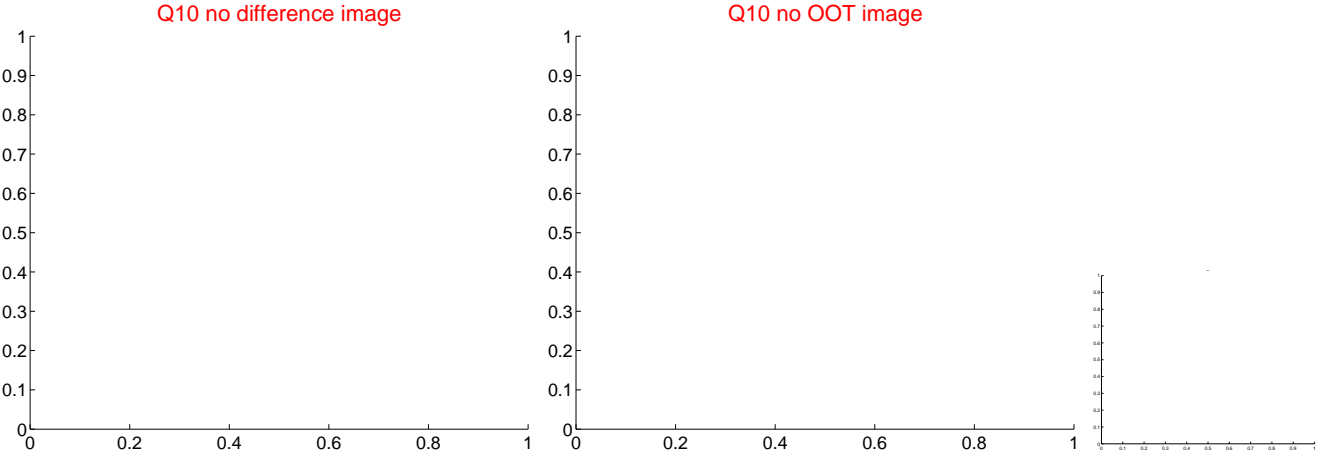
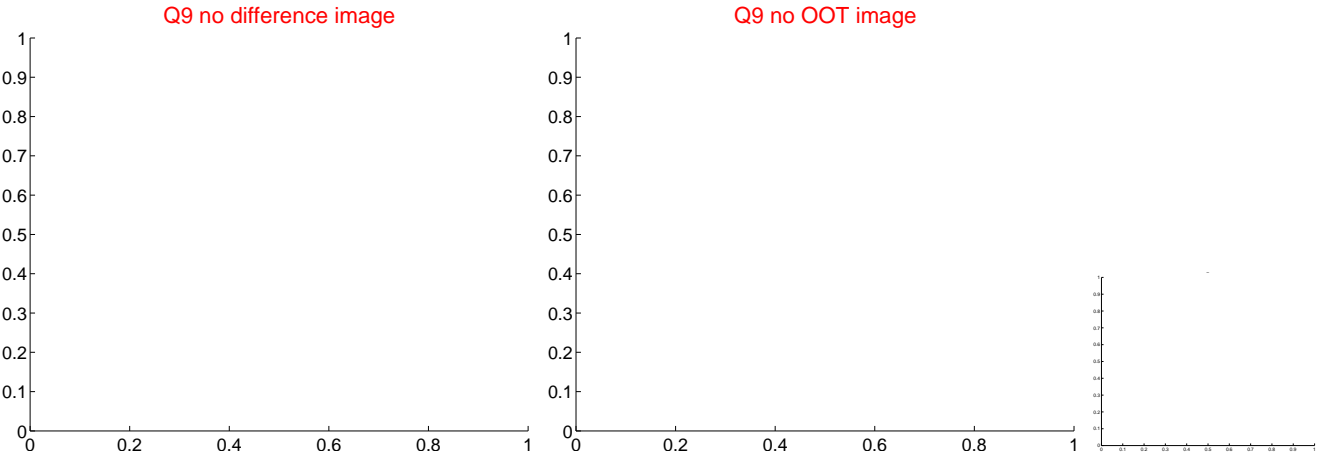
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



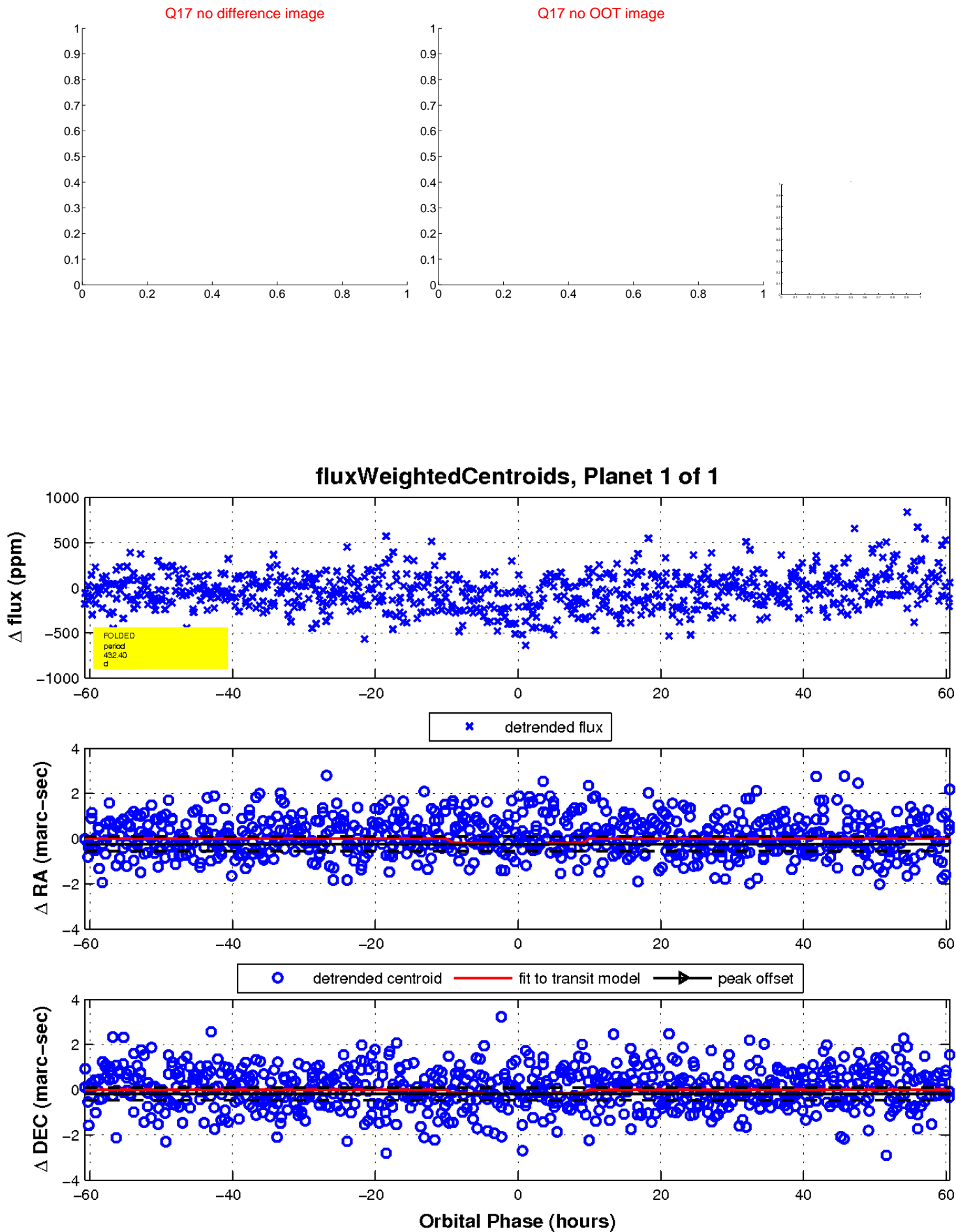
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

