

# KIC 008621528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008621528-01	OBS	No	375.035661	138.013249	2990.6	62.874	10.3	20.1	0.82	5395	8.57	0.52

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008621528-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_CHASES_MARSHALL_SKYE—CENT_FEW_DIFFS—EPHEM_MATCH

**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.

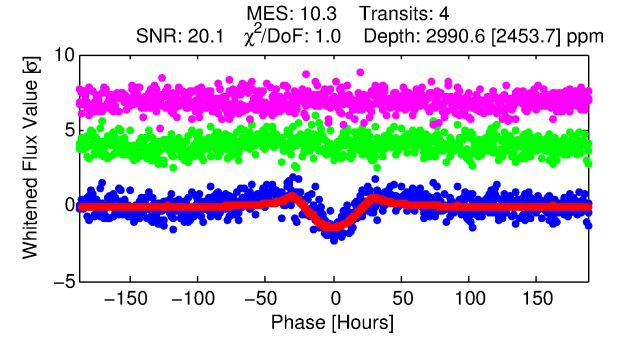
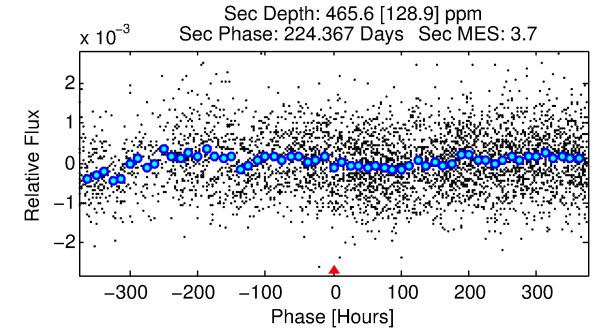
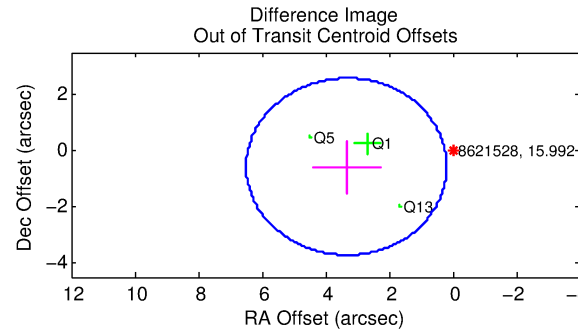
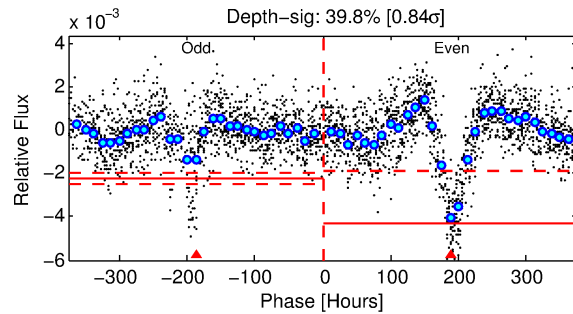
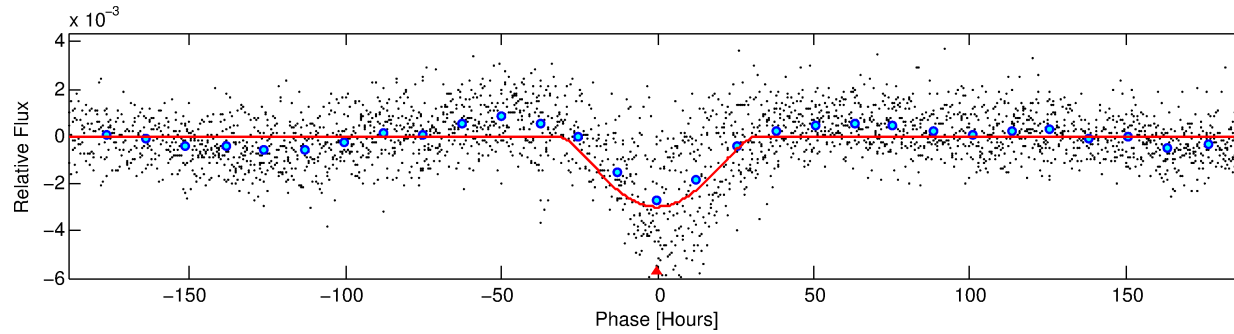
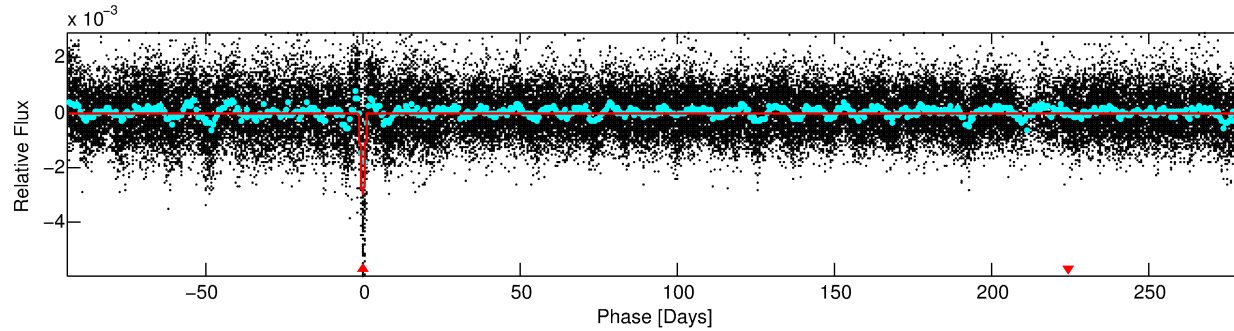
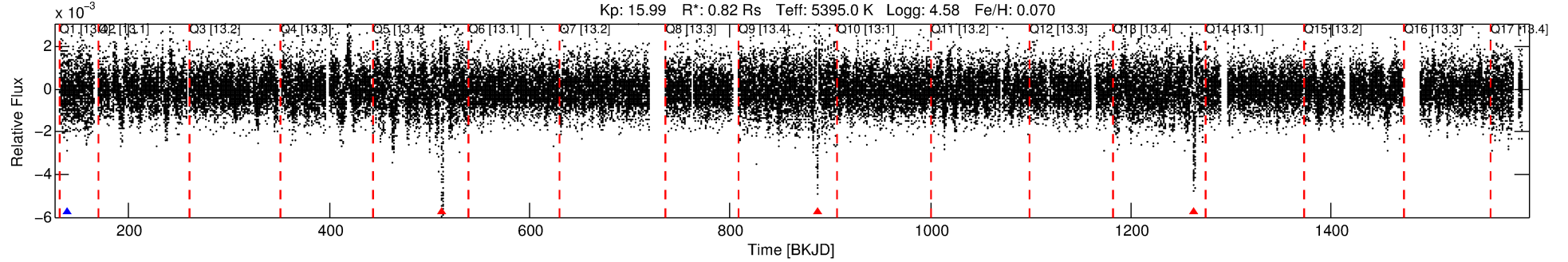
## Ephemeris Match Information For 008621528-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $\prime$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008621528-01	8621528	008751641-01	8751641	1:1	1526.7	384	-4	14.09	16.00	0.08	Col-Anomaly	1	2.02	0.97

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8621528 Candidate: 1 of 1 Period: 375.036 d



## DV Fit Results:

Period = 375.03566 [0.02557] d  
Epoch = 138.0132 [0.0542] BKJD  
Rp/R\* = 0.0960 [0.1236]  
a/R\* = 20.47 [5.14]  
b = 1.00 [0.12]  
Seff = 0.52 [0.15]  
Teq = 216 [15] K  
Rp = 8.57 [11.17] Re  
a = 0.9922 [0.1752] AU  
Ag = 3432.66 [8931.69] [0.38 $\sigma$ ]  
Teffp = 2558 [1657] K [1.41 $\sigma$ ]

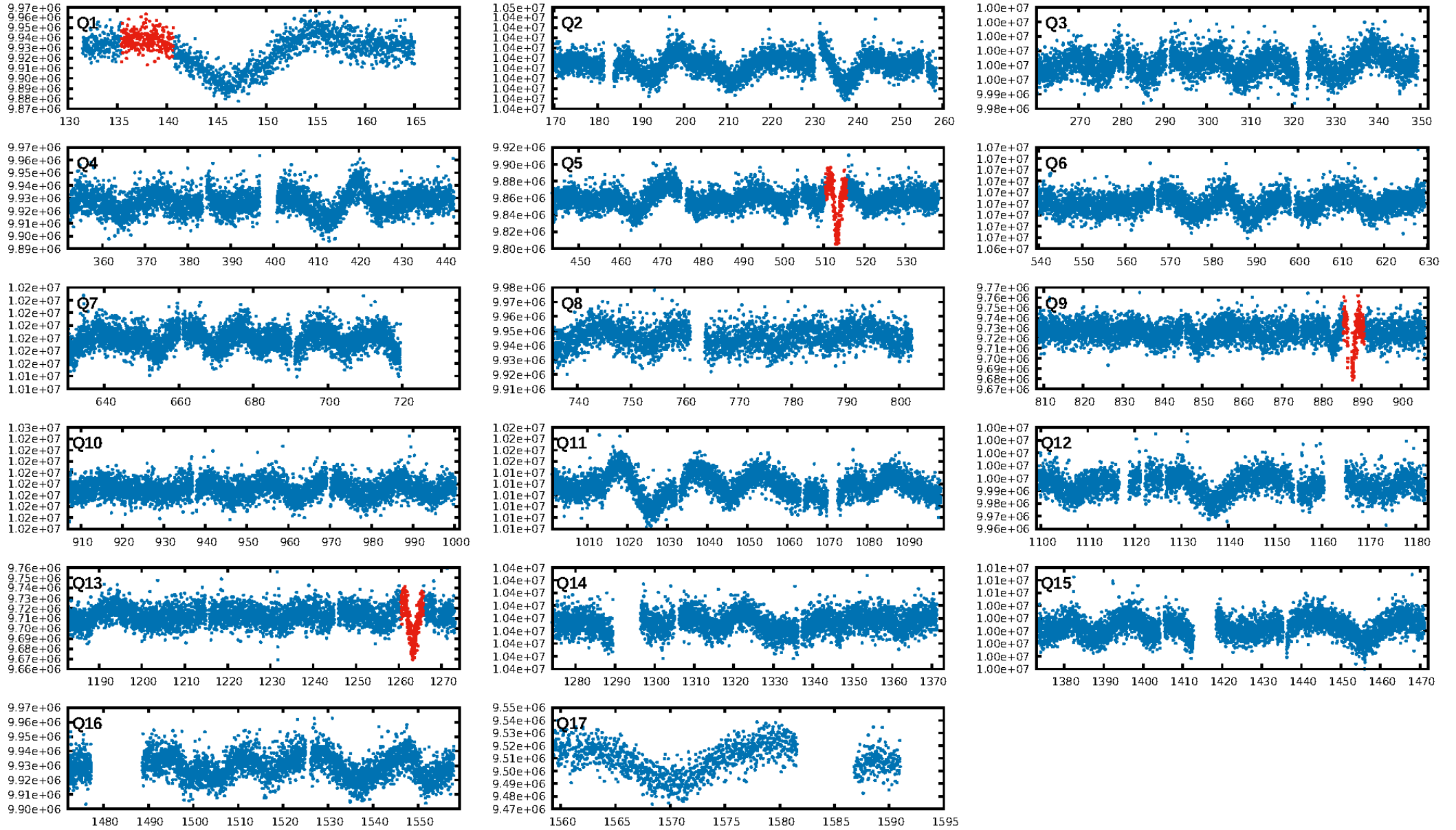
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.49e-29  
RollingBand-fgt: 0.00 [0/3]  
GhostDiagnostic-chr: 0.5985  
Centroid-sig: 22.0%  
Centroid-so: 0.541 arcsec [1.04 $\sigma$ ]  
OotOffset-rm: 3.388 arcsec [3.23 $\sigma$ ]  
KicOffset-rm: 3.355 arcsec [3.23 $\sigma$ ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 1.00 [3/3]

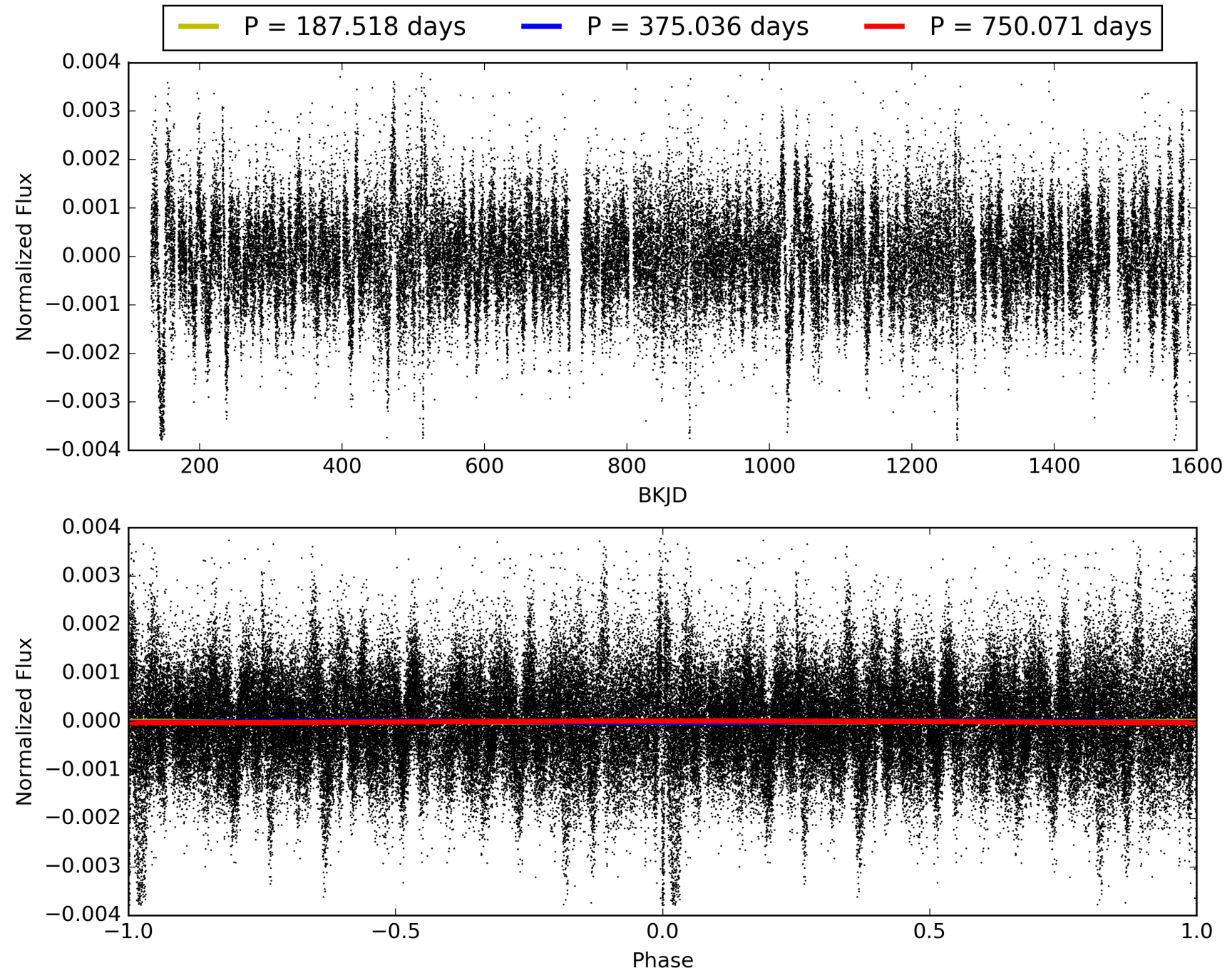
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:21:06 Z

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

# TCE 008621528-01, PDC Light Curves

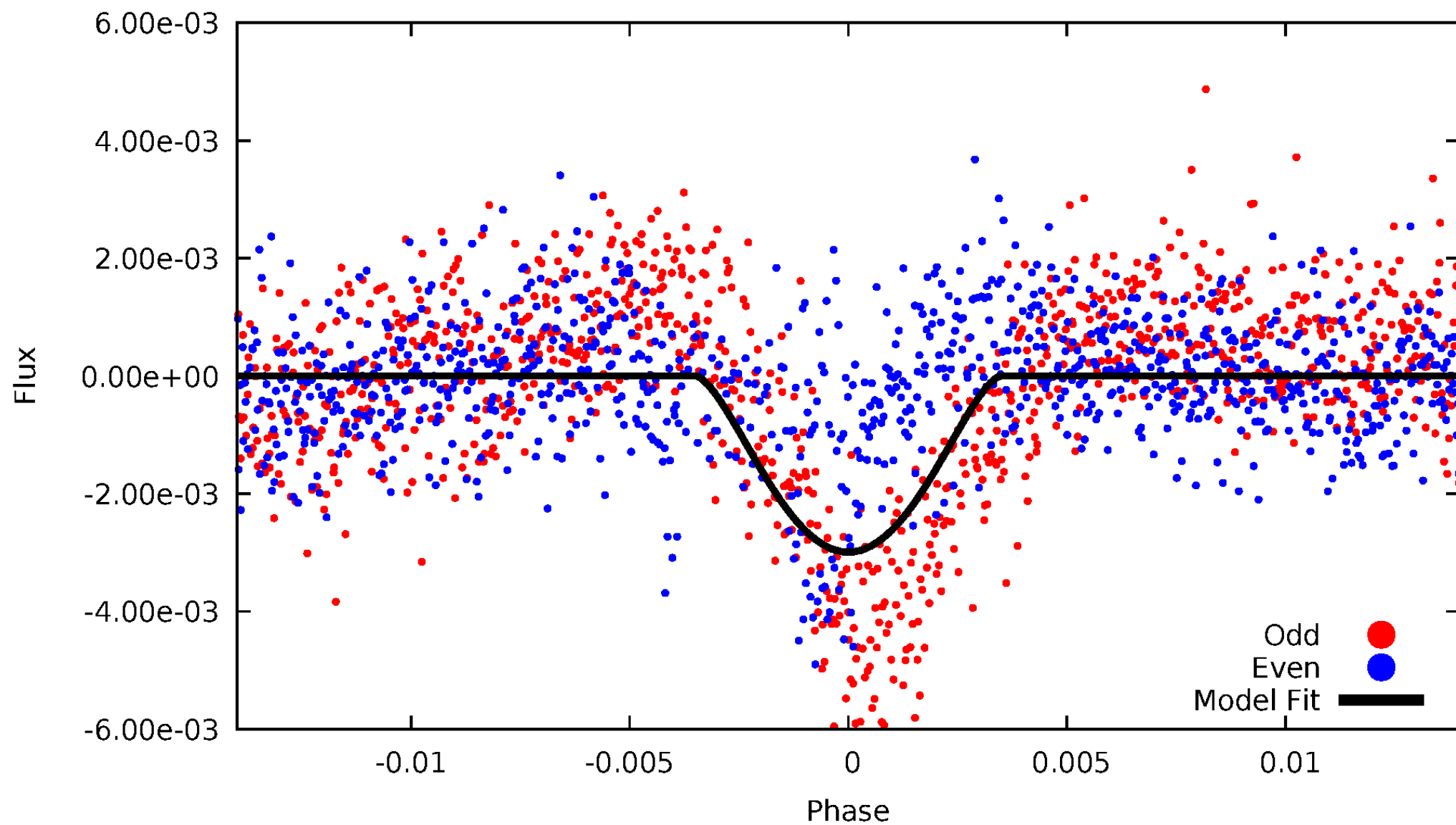


TCE 008621528-01



# DV Odd/Even

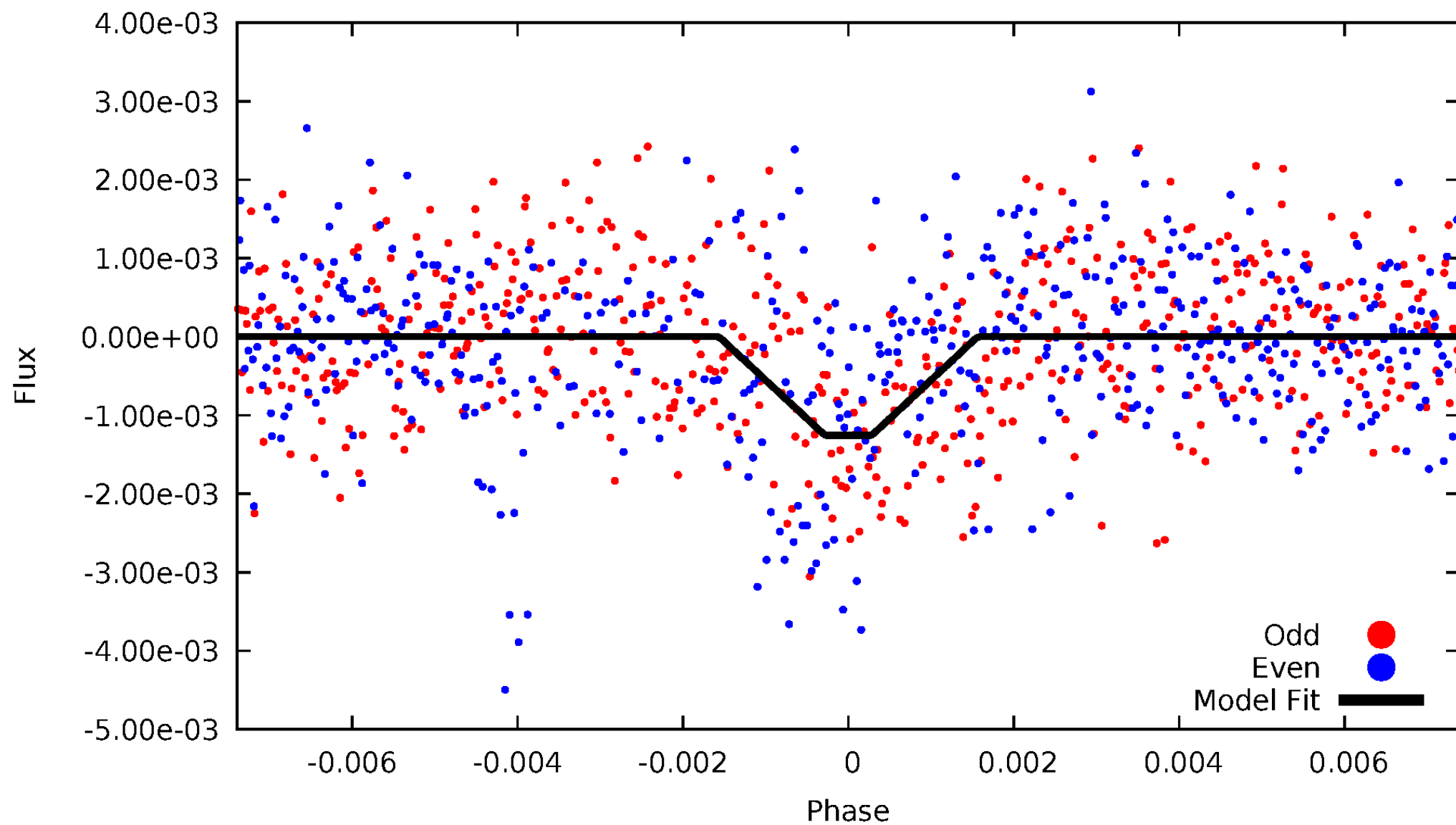
TCE 008621528-01





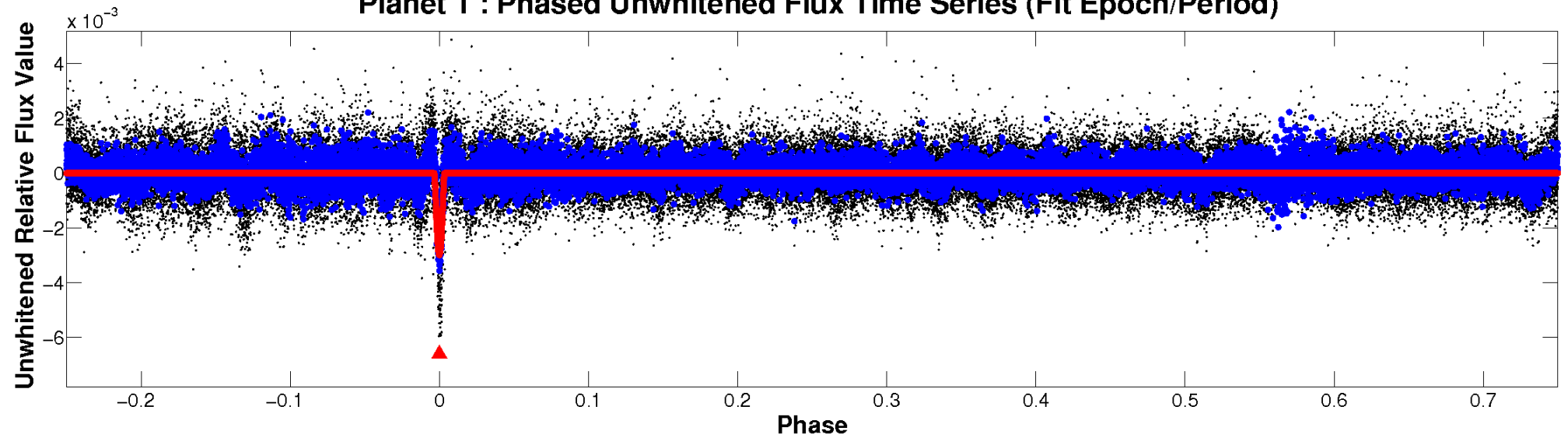
# ALT Odd/Even

TCE 008621528-01

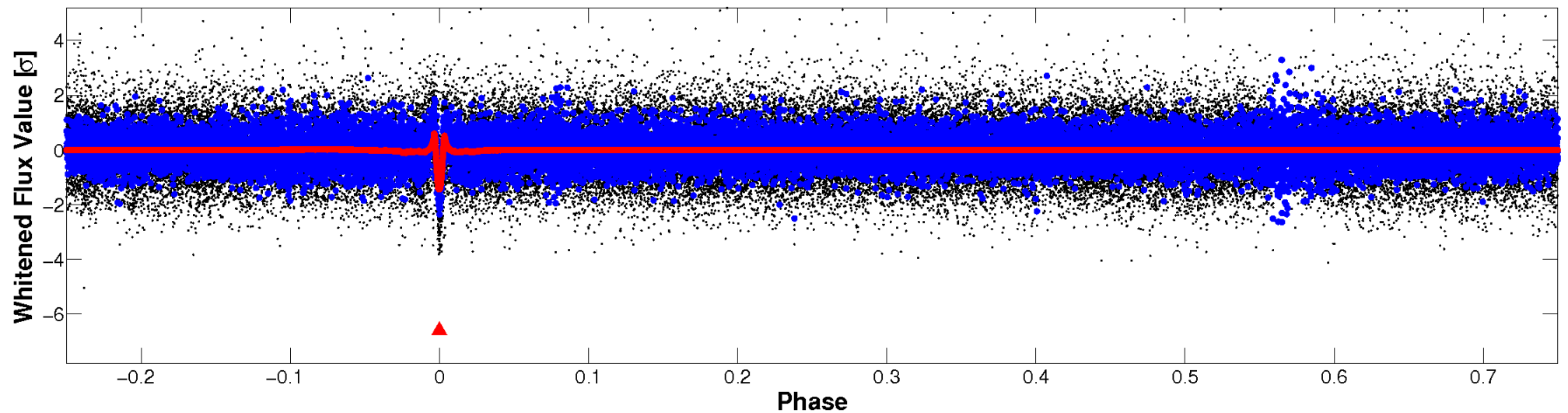


# Non-Whitened Vs. Whitened Light Curve

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

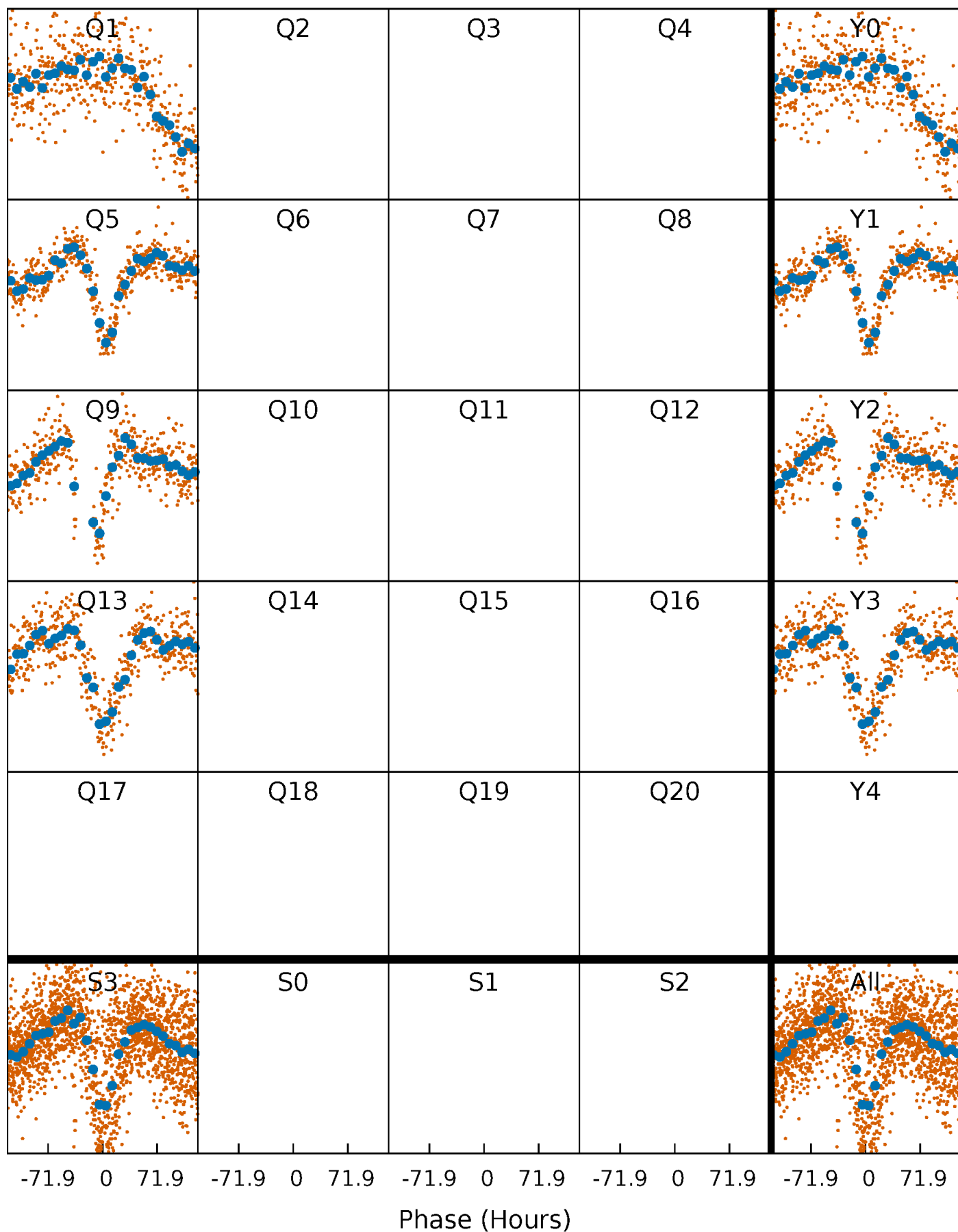


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

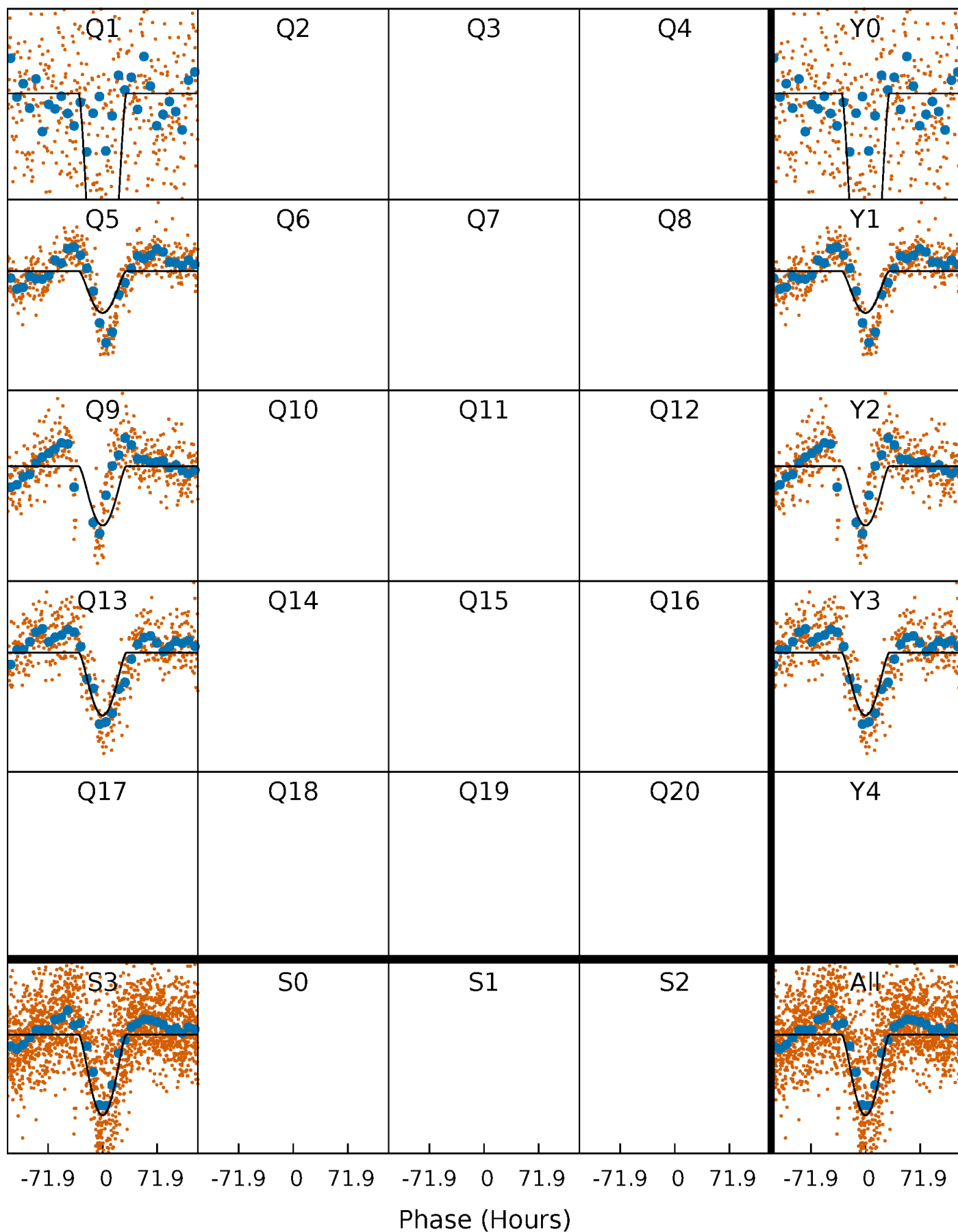
TCE 008621528-01   P=375.035661 Days    $T_0=138.013249$  (BKJD)





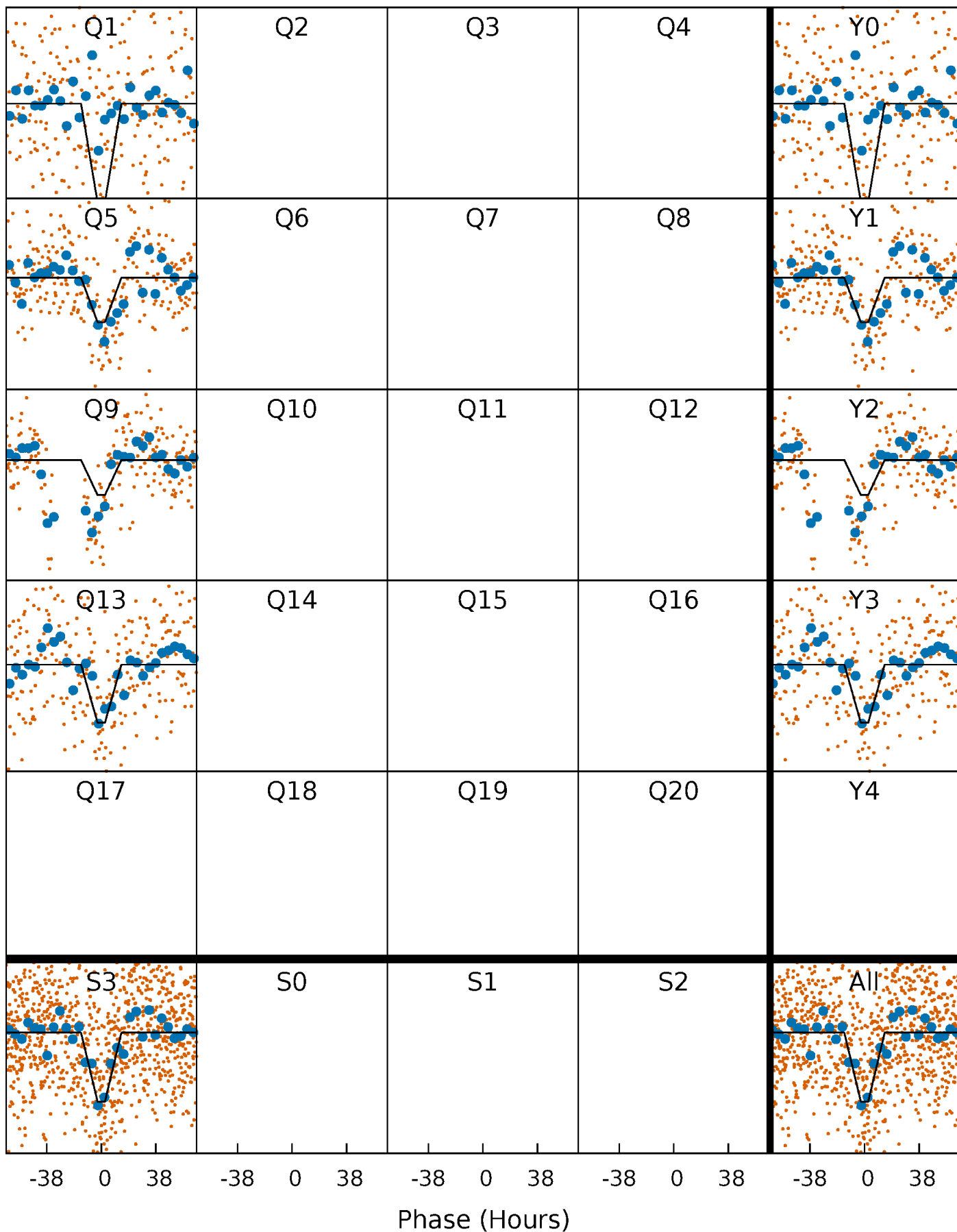
# DV Quarter-Phased Transit Curves

TCE 008621528-01 P=375.035661 Days  $T_0=138.013249$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

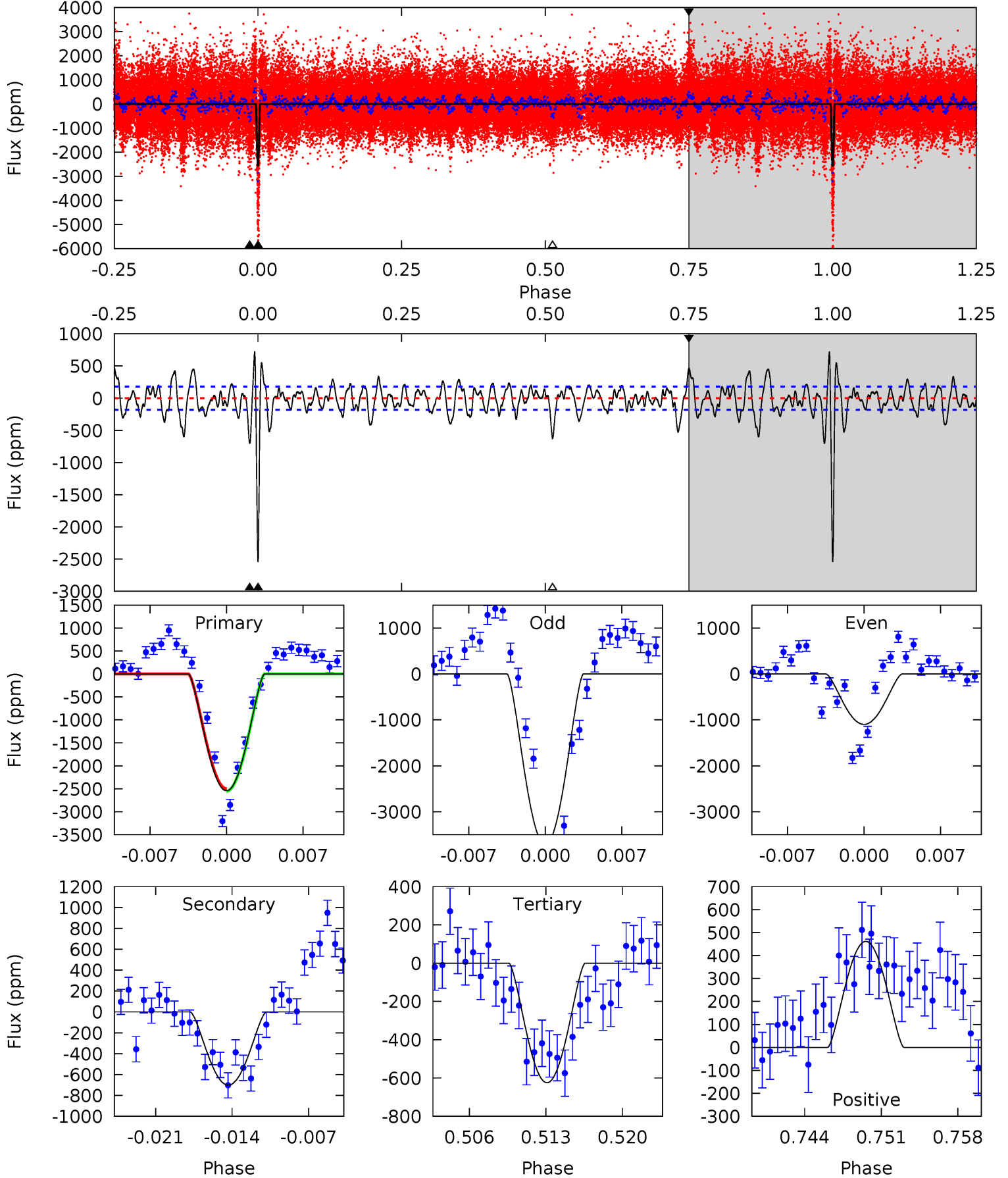
TCE 008621528-01 P=374.969448 Days  $T_0=138.131057$  (BKJD)



# DV Model-Shift Uniqueness Test

008621528-01, P = 375.035661 Days, E = 138.013249 Days

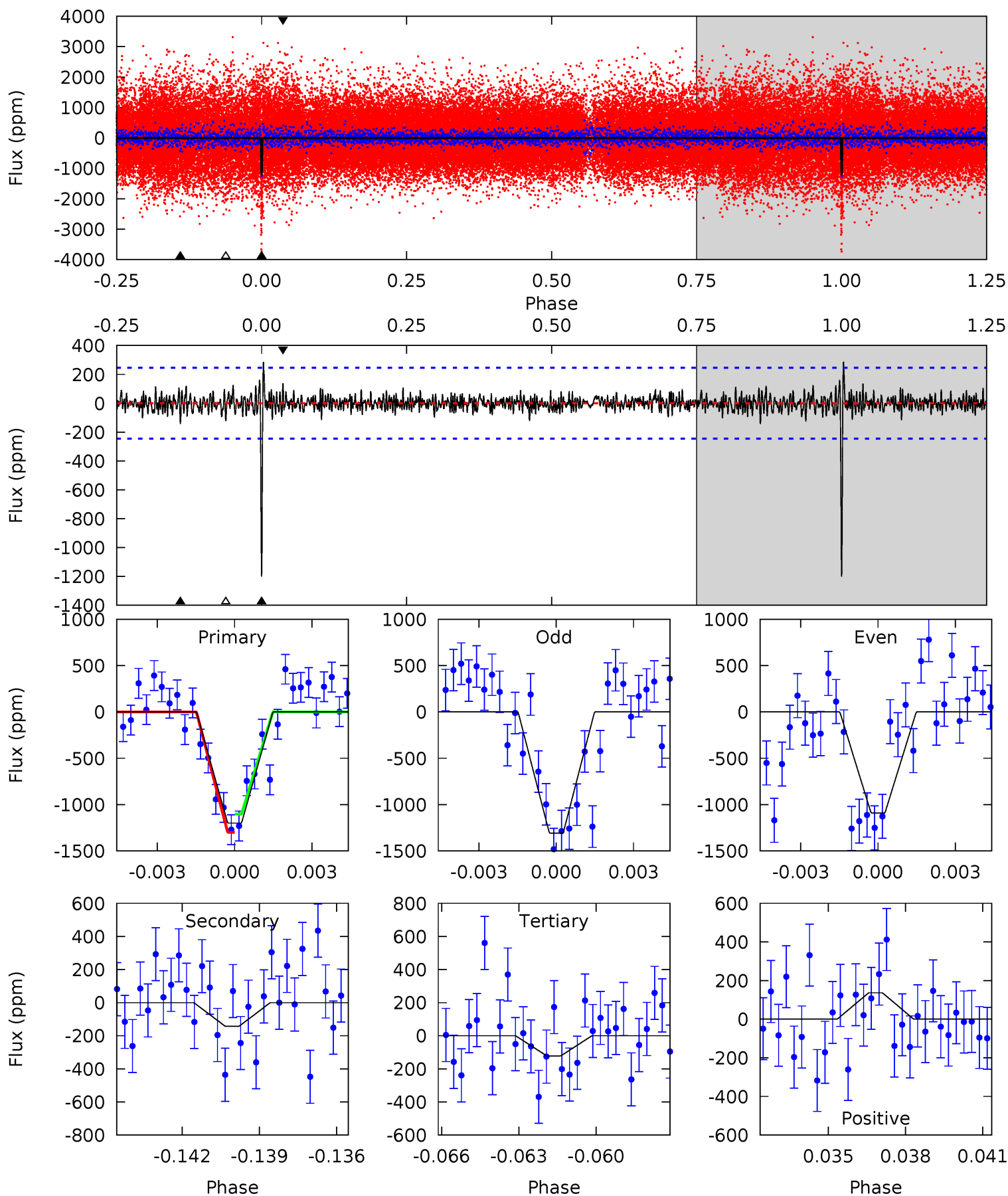
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
71.5	19.7	17.6	13.0	5.09	2.70	5.02	54.0	58.5	2.16	6.74	37.3	0.91	0.22	0.79



# Alt Model-Shift Uniqueness Test

008621528-01, P = 374.969448 Days, E = 138.131057 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
25.6	3.05	2.60	2.91	5.24	2.95	0.82	23.0	22.7	0.44	0.14	2.30	0.91	0.19	2.10



### Stellar Parameters For KIC 008621528

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5395^{+160}_{-160}$	$4.579^{+0.025}_{-0.144}$	$0.070^{+0.250}_{-0.300}$	$0.818^{+0.169}_{-0.056}$	$0.925^{+0.063}_{-0.099}$	$2.379^{+0.412}_{-0.949}$
	+3%/-3%	+1%/-3%	+357%/-429%	+21%/-7%	+7%/-11%	+17%/-40%
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 008621528-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-701 \pm 36$	$11.79^{+10.46}_{-7.84}$	$308^{+16}_{-13}$	$3076^{+1298}_{-477}$	$2673^{+20566}_{-1922}$
Alt.	$-143 \pm 47$	$8.85^{+9.73}_{-5.79}$	$308^{+17}_{-12}$	$2655^{+937}_{-416}$	$900^{+6706}_{-690}$

$T_{max}$  = 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

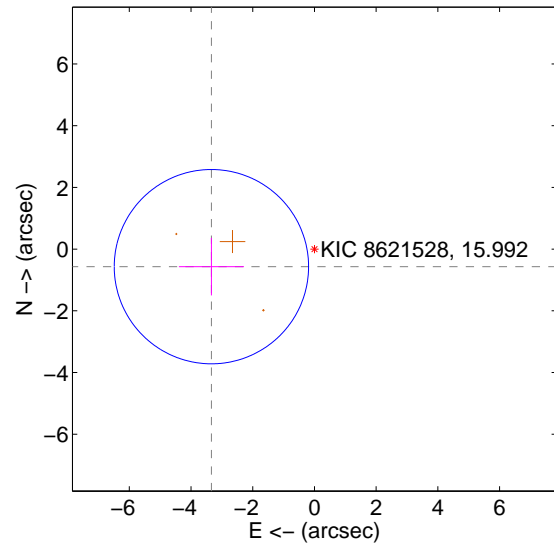
Supplemental centroid analysis for 008621528-01. Kepler magnitude: 15.99. Transit SNR 20.06

There are 0 quarters with good PRF difference image offsets

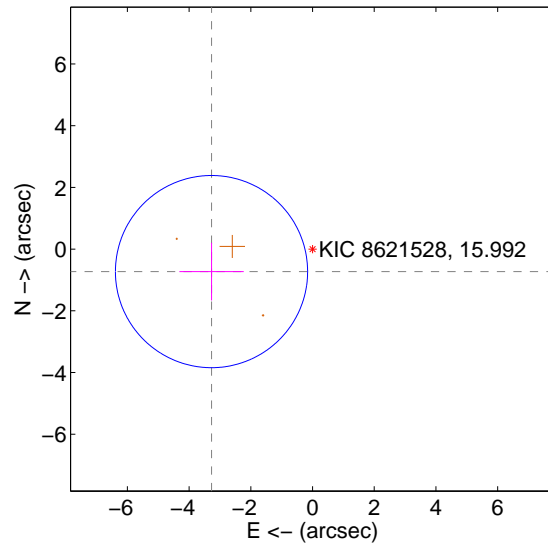
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.388 \pm 1.050$	3.23	$3.340 \pm 1.053$	$-0.569 \pm 0.932$
PRF-fit source offset from KIC position	$3.355 \pm 1.038$	3.23	$3.275 \pm 1.043$	$-0.729 \pm 0.936$
photometric centroid source offset	$0.54 \pm 0.52$	1.04	$-0.01 \pm 0.49$	$-0.54 \pm 0.52$

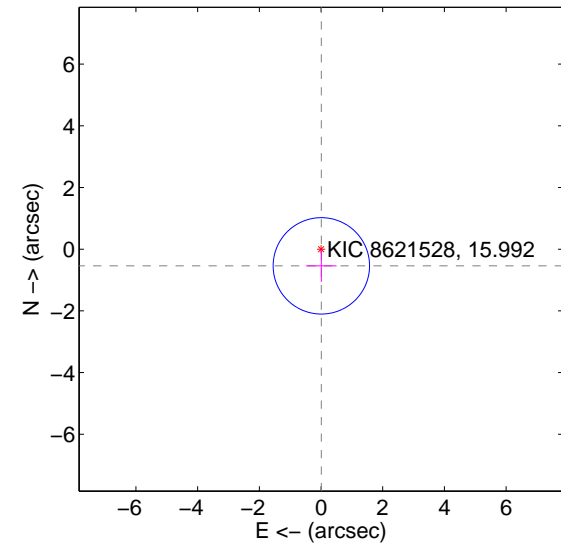
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



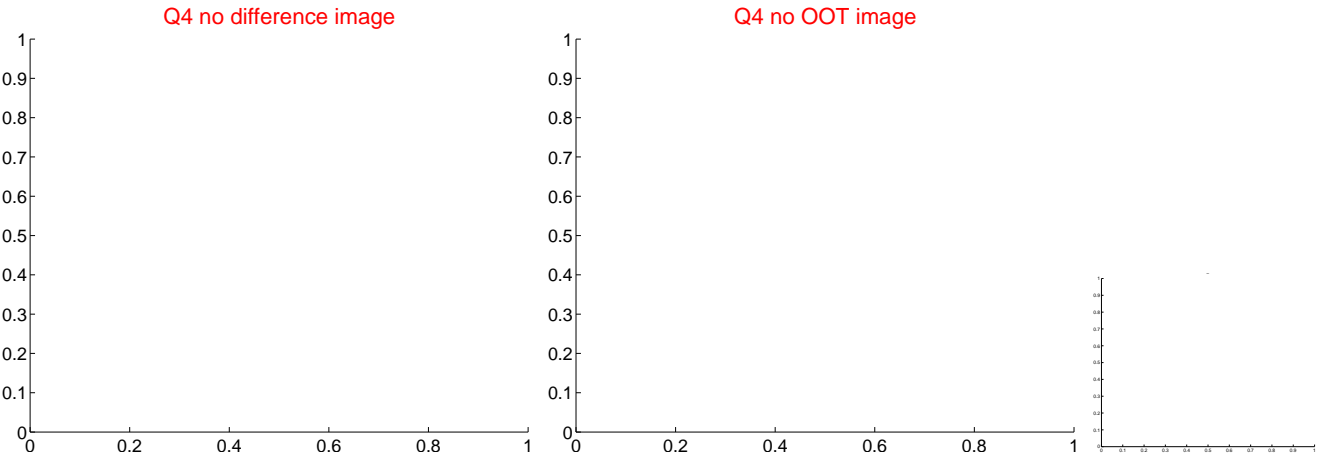
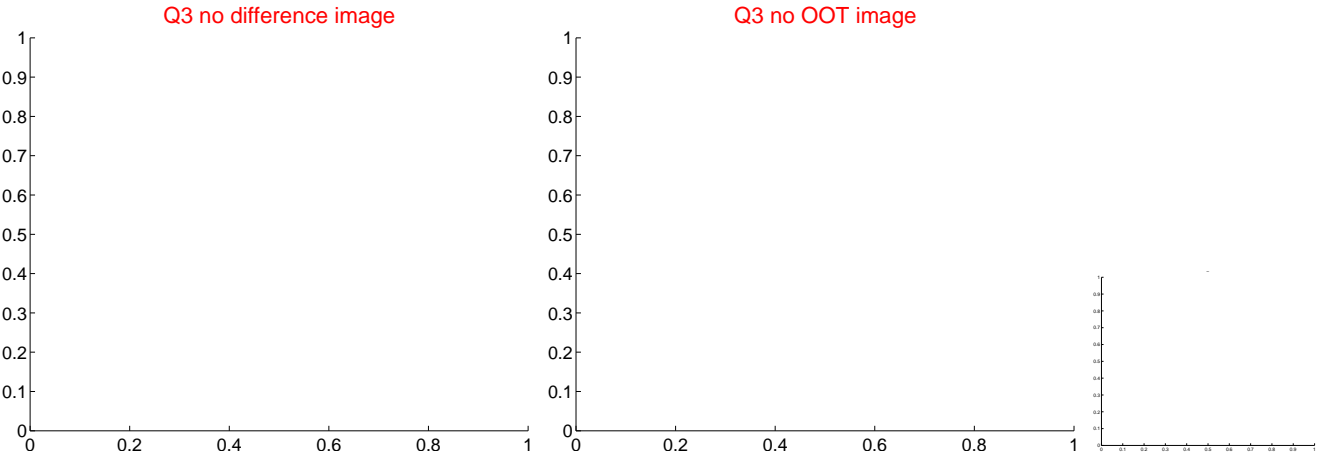
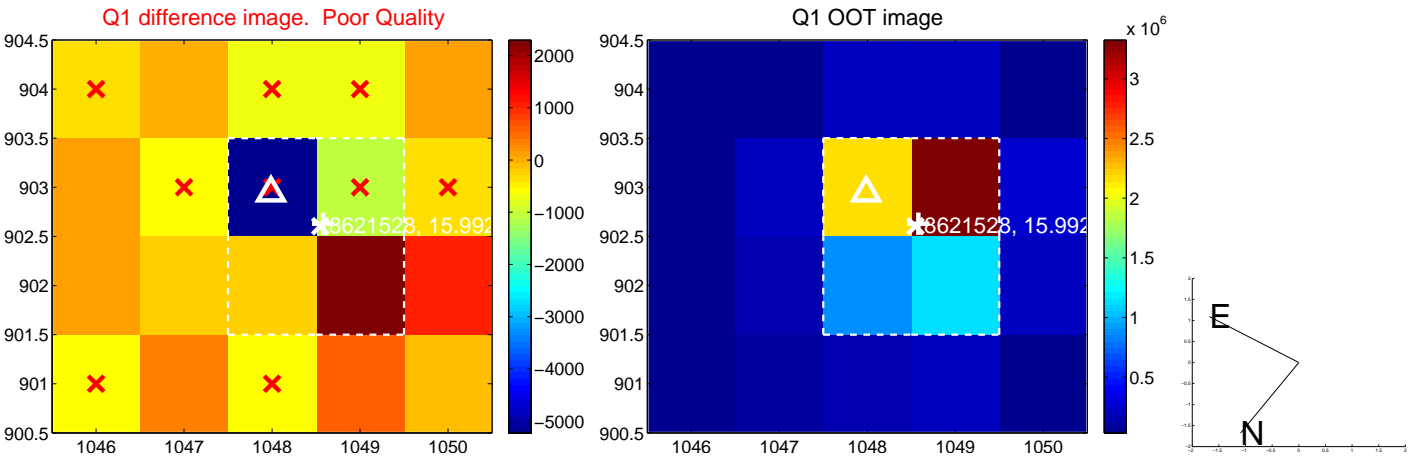
offset from photometric centroids



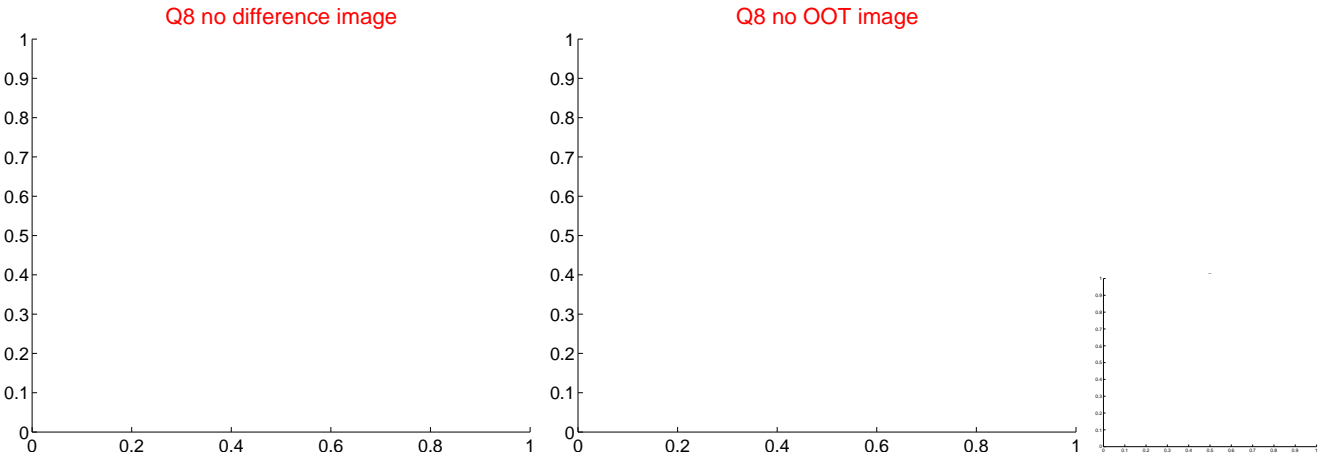
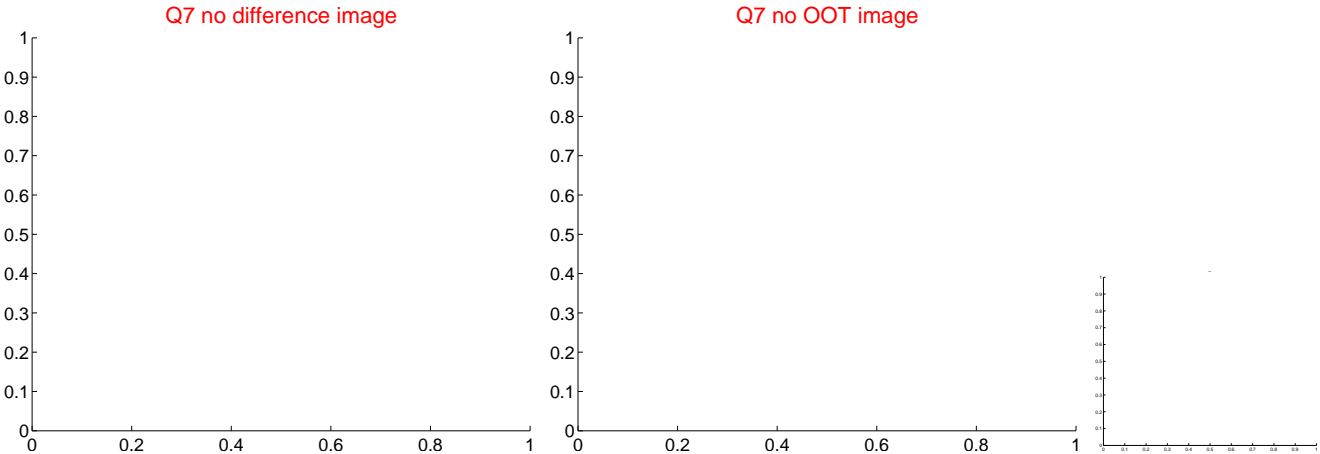
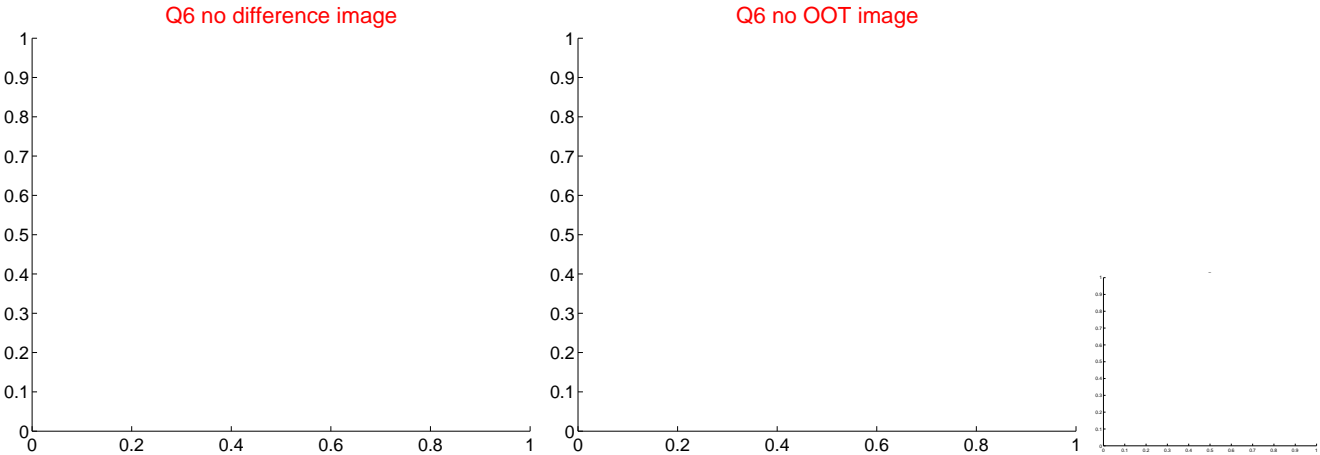
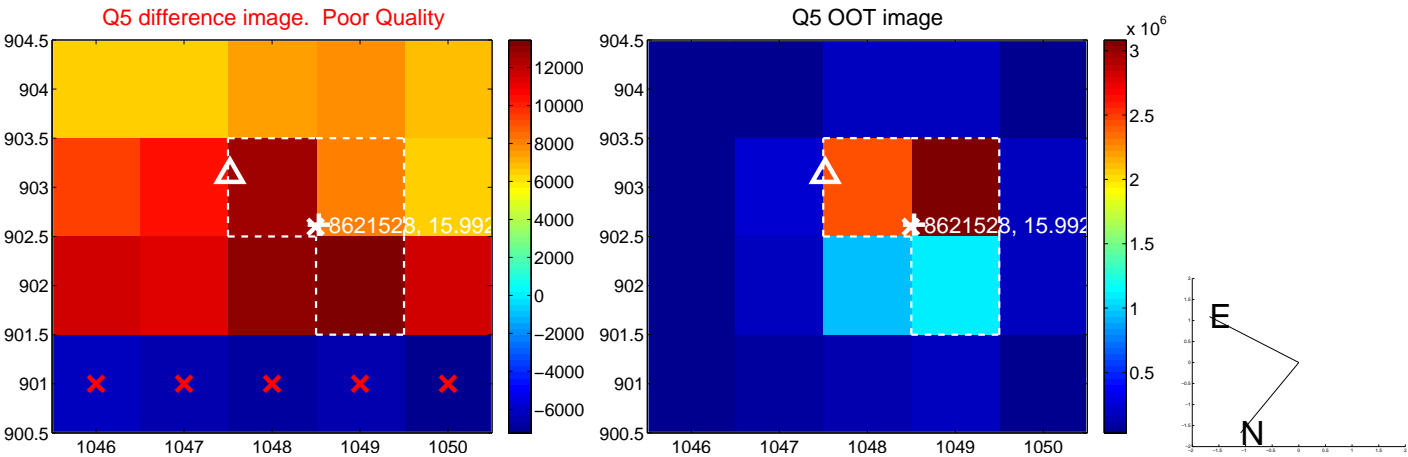
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



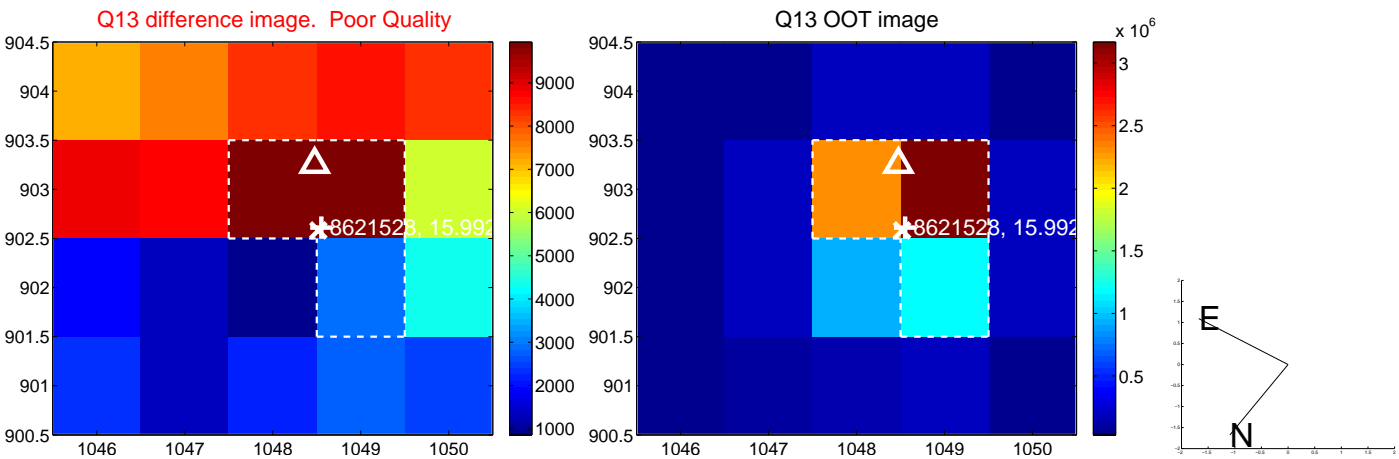
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



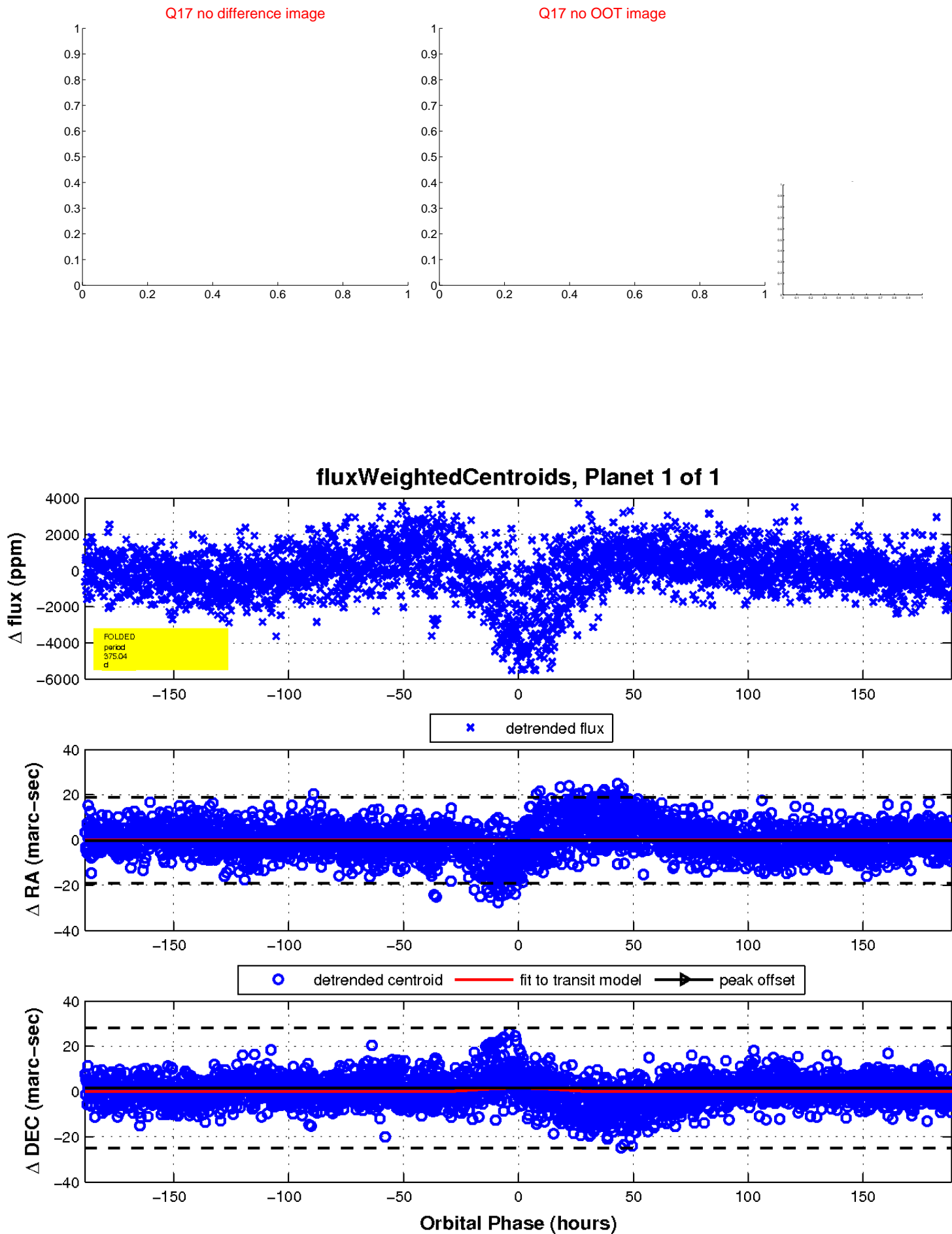
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

