

# KIC 008740609

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008740609-01	OBS	No	528.088493	412.075191	279.7	17.038	7.7	7.1	0.90	5853	1.66	0.52

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008740609-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—INCONSISTENT_TRANS—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.

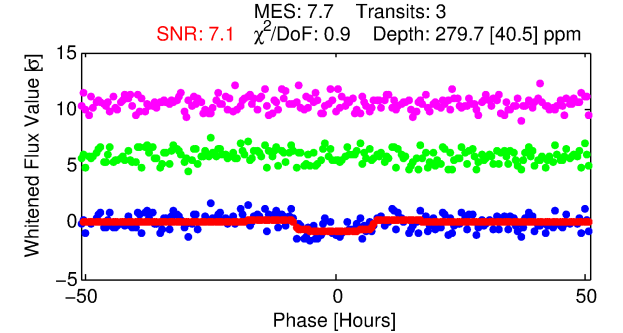
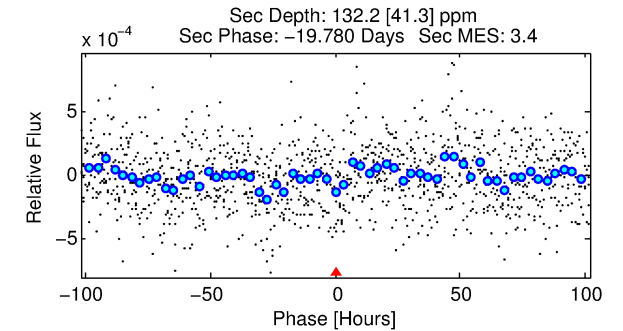
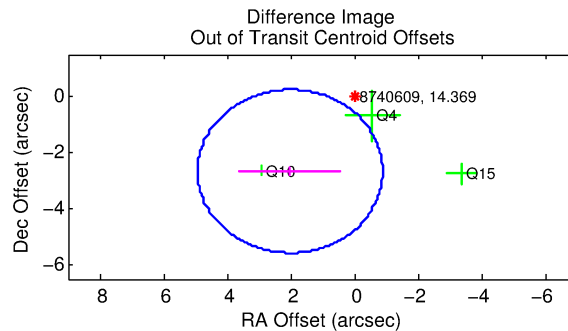
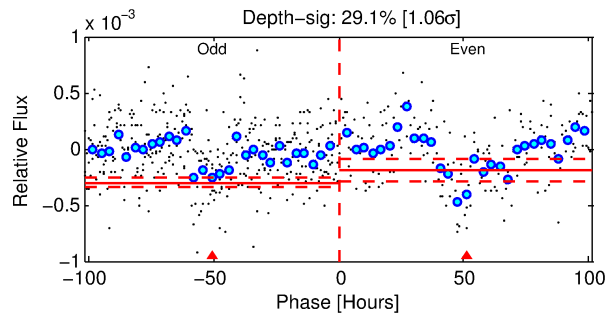
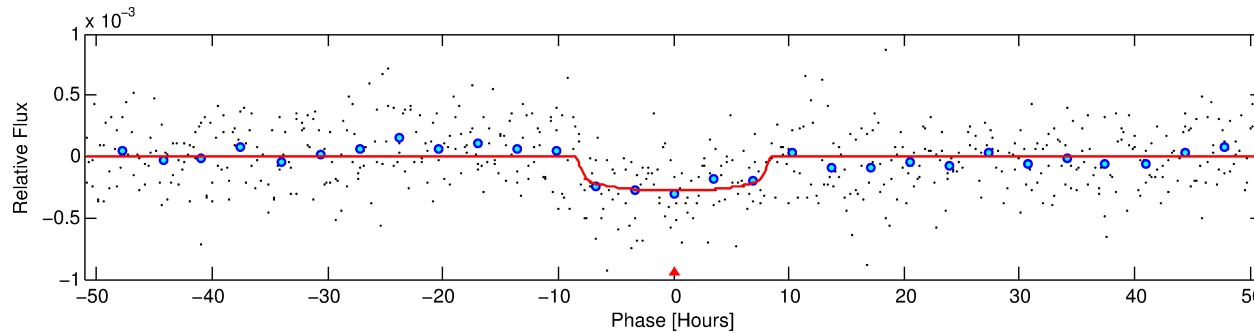
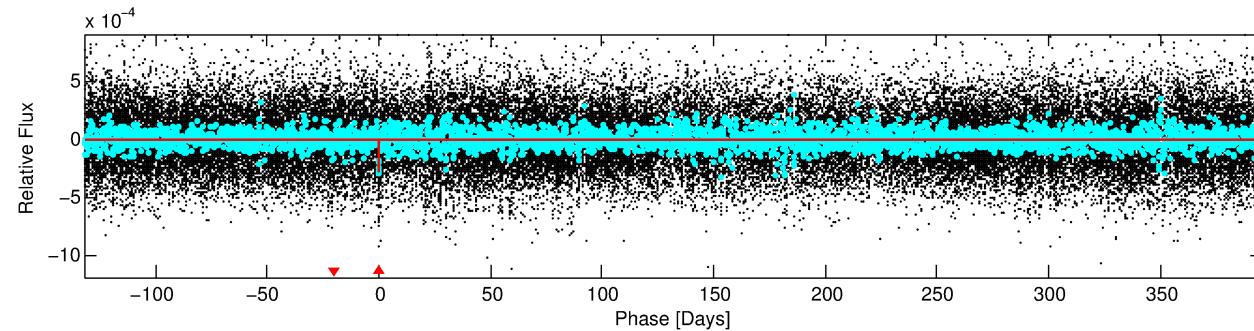
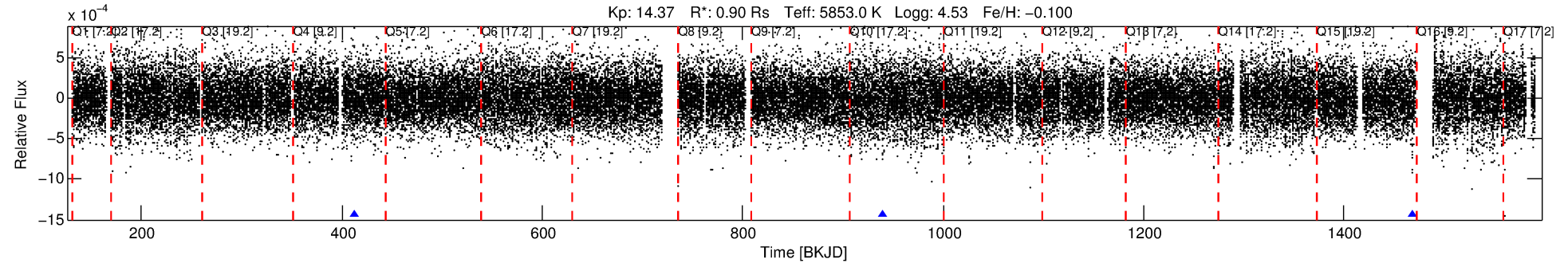
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008740609-01

No Significant Match Found

# DV One-Page Summary

KIC: 8740609 Candidate: 1 of 1 Period: 528.088 d



## DV Fit Results:

Period = 528.08849 [0.01820] d  
Epoch = 412.0752 [0.0225] BKJD  
Rp/R\* = 0.0170 [0.0052]  
a/R\* = 147.70 [204.02]  
b = 0.80 [0.61]  
Seff = 0.52 [0.19]  
Teq = 216 [20] K  
Rp = 1.66 [0.70] Re  
a = 1.2737 [0.3115] AU  
Ag = 42715.66 [33001.08] [1.29 $\sigma$ ]  
Teffp = 4811 [839] K [5.48 $\sigma$ ]

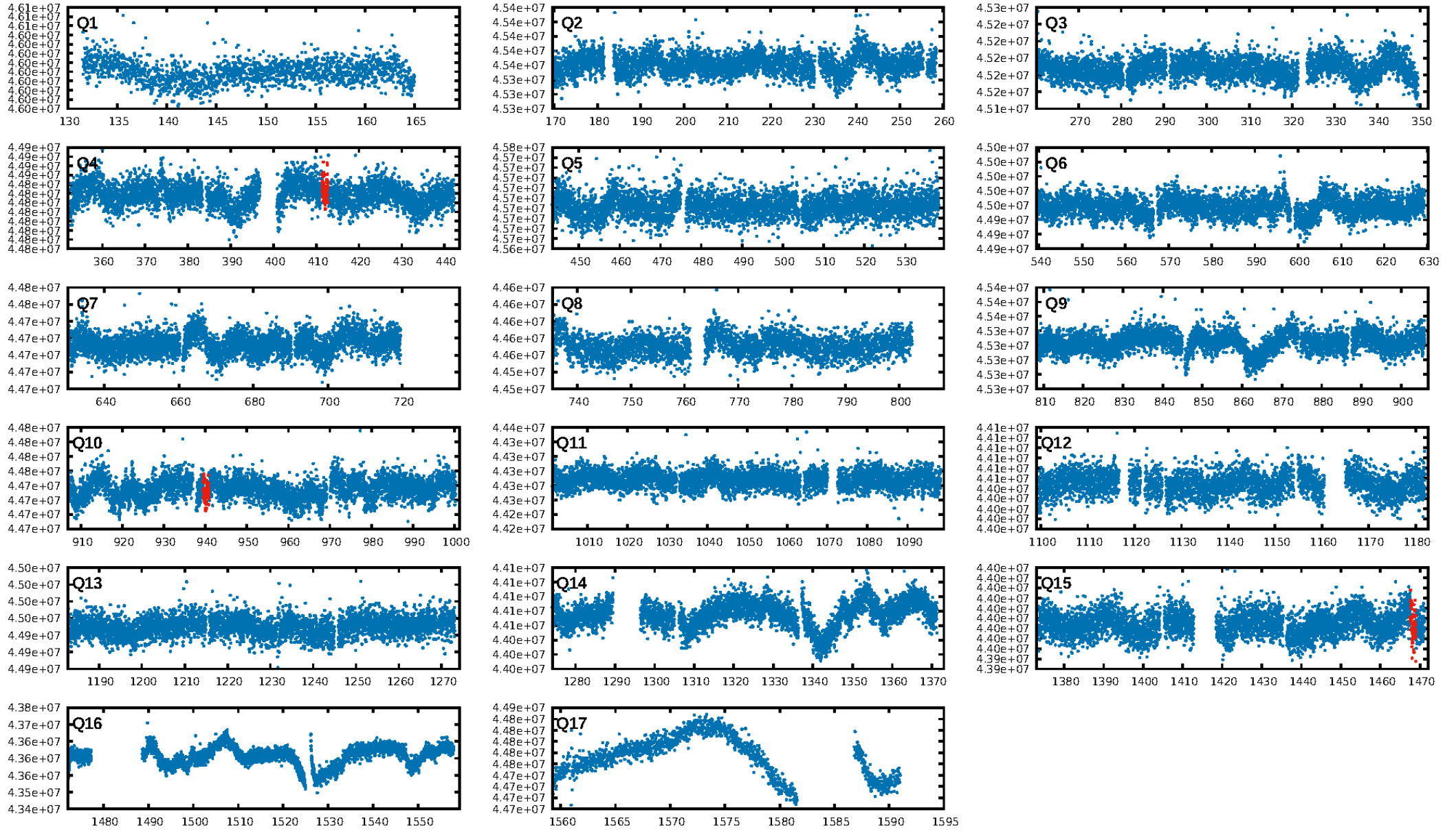
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 51.7%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.39e-11**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -4.515  
Centroid-sig: 3.4%  
Centroid-so: 3.969 arcsec [1.93 $\sigma$ ]  
**OutOffset-rm: 3.343 arcsec [3.45 $\sigma$ ]**  
KicOffset-rm: 3.461 arcsec [2.93 $\sigma$ ]  
OutOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

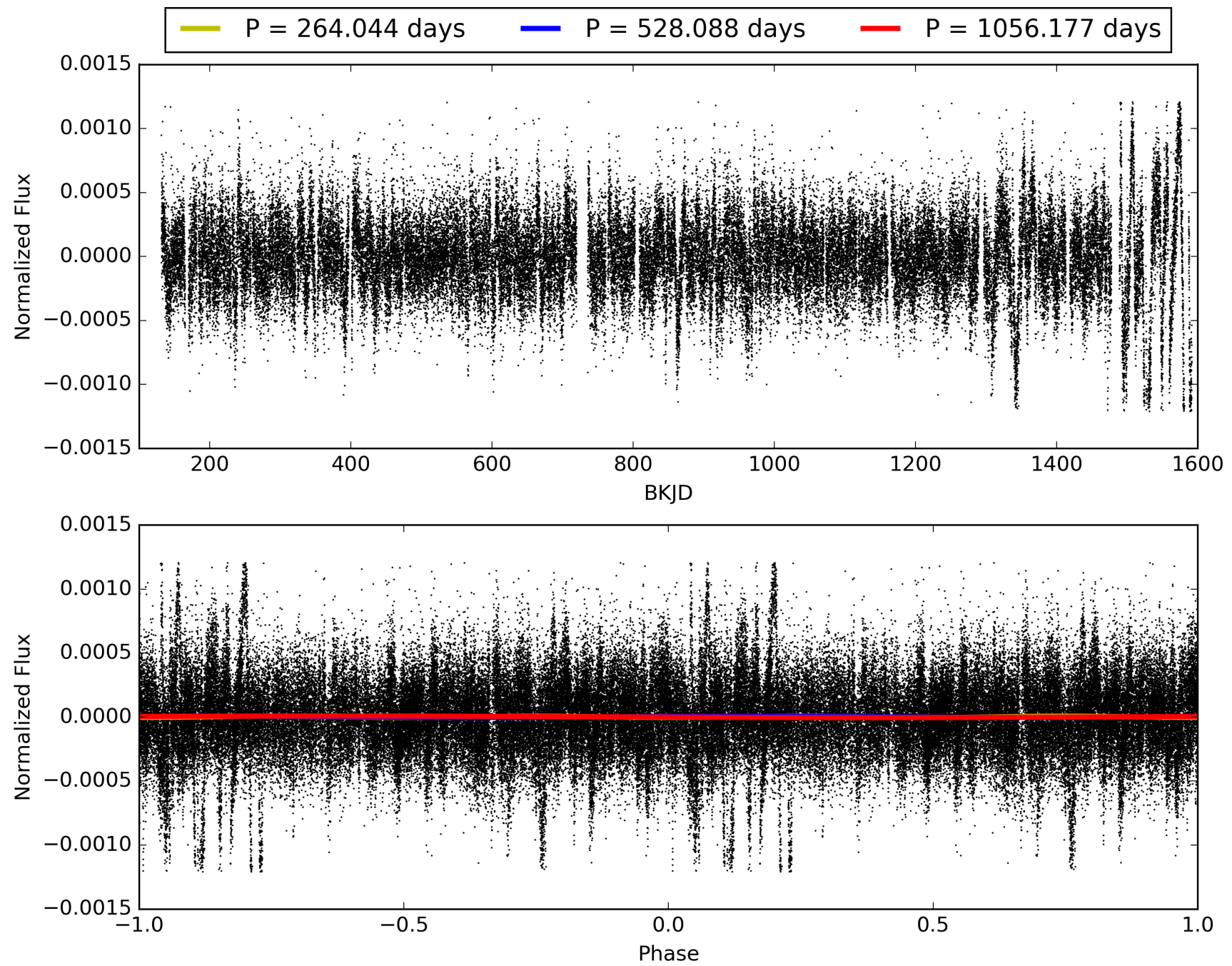
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:22:32 Z

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

# TCE 008740609-01, PDC Light Curves

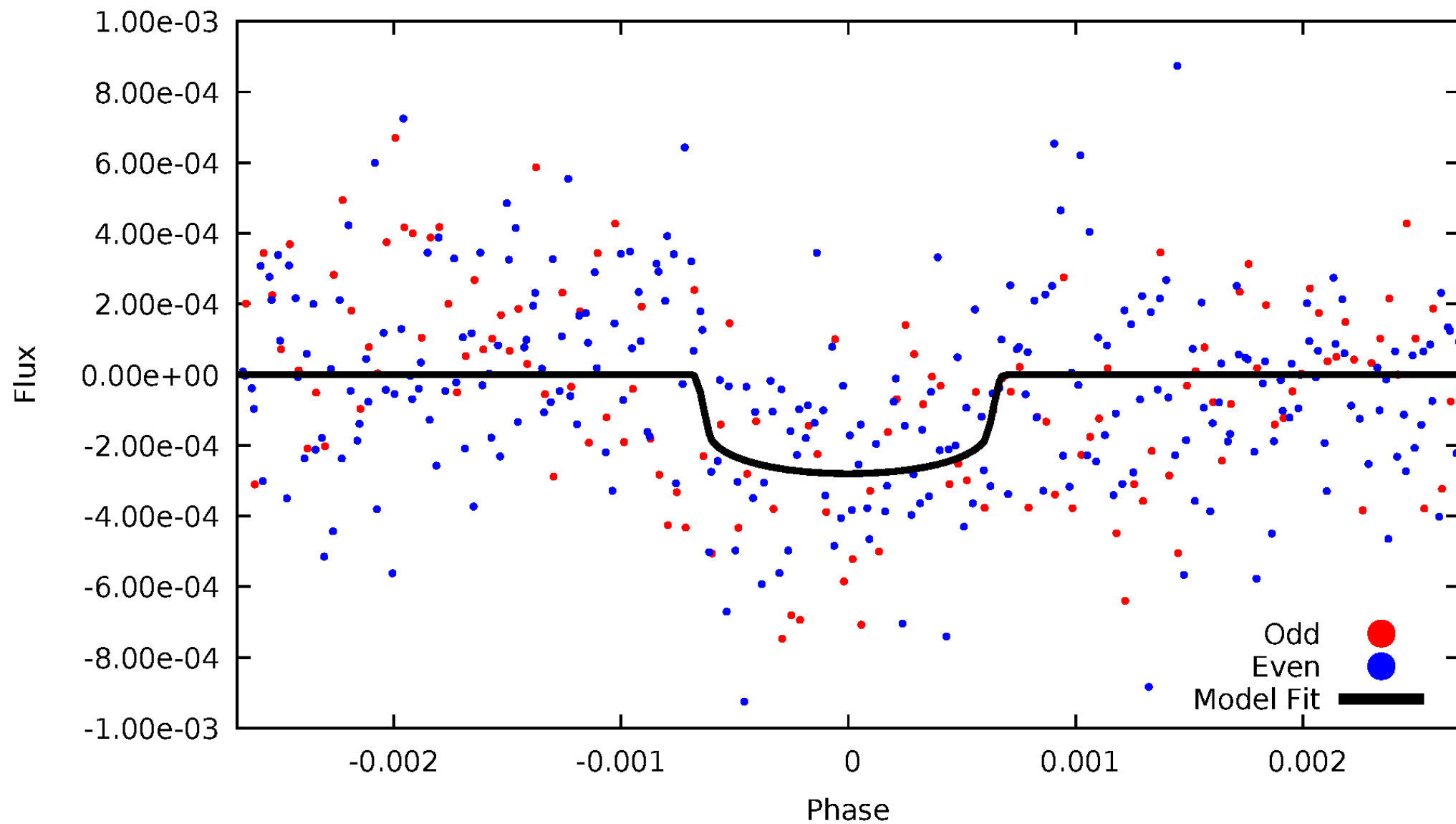


TCE 008740609-01



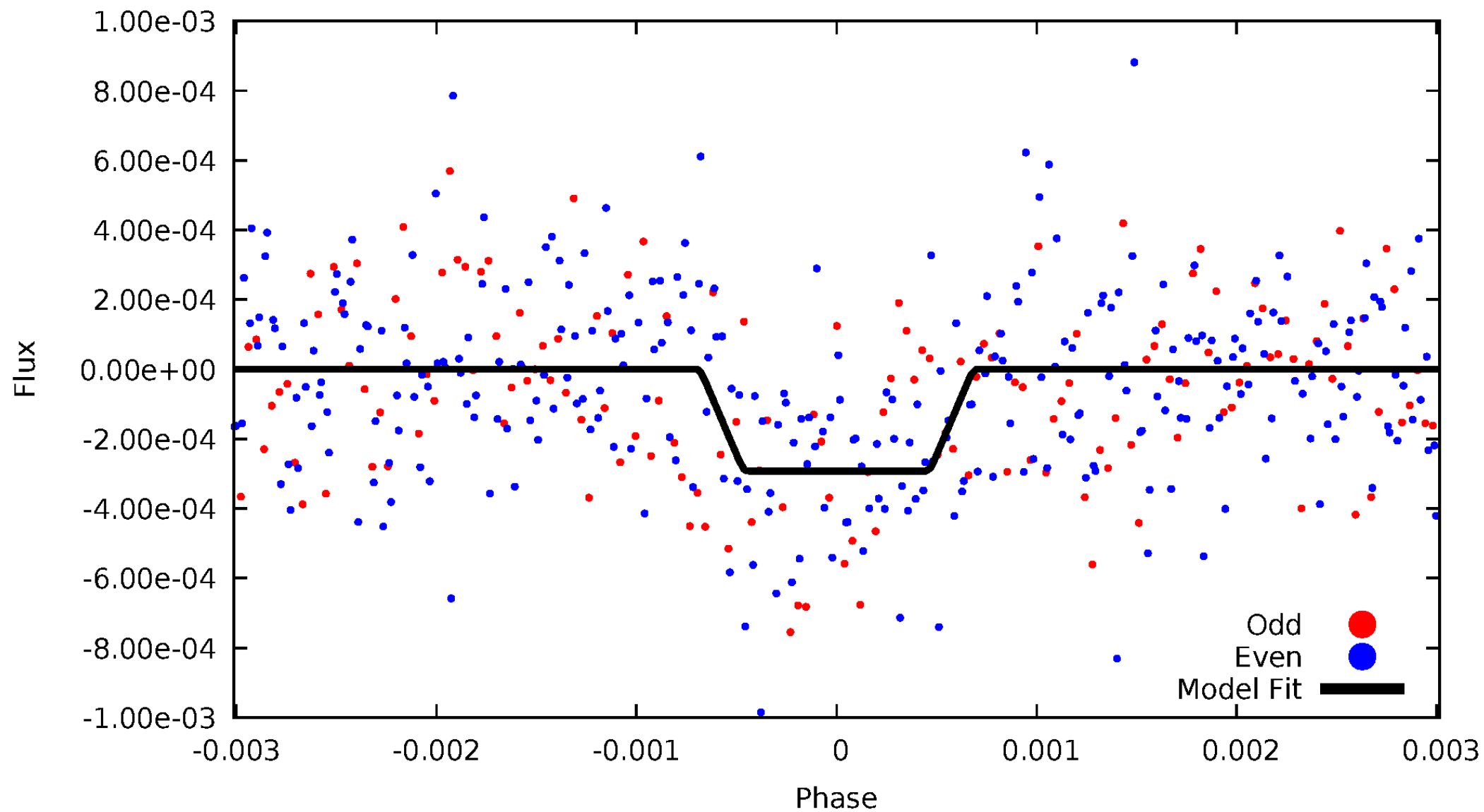
# DV Odd/Even

TCE 008740609-01



# ALT Odd/Even

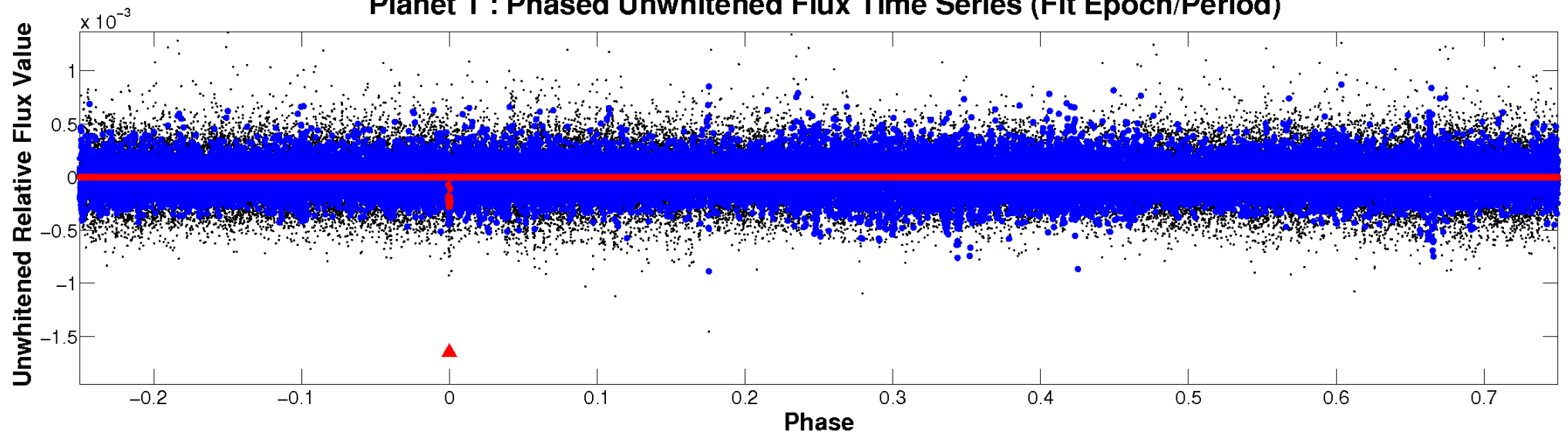
TCE 008740609-01



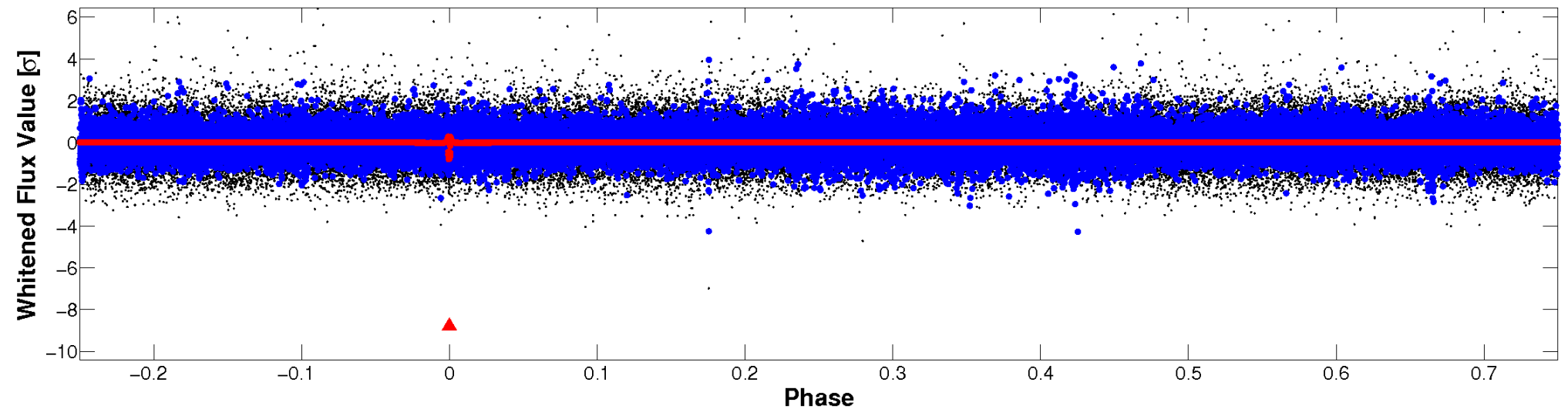


# Non-Whitened Vs. Whitened Light Curve

**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

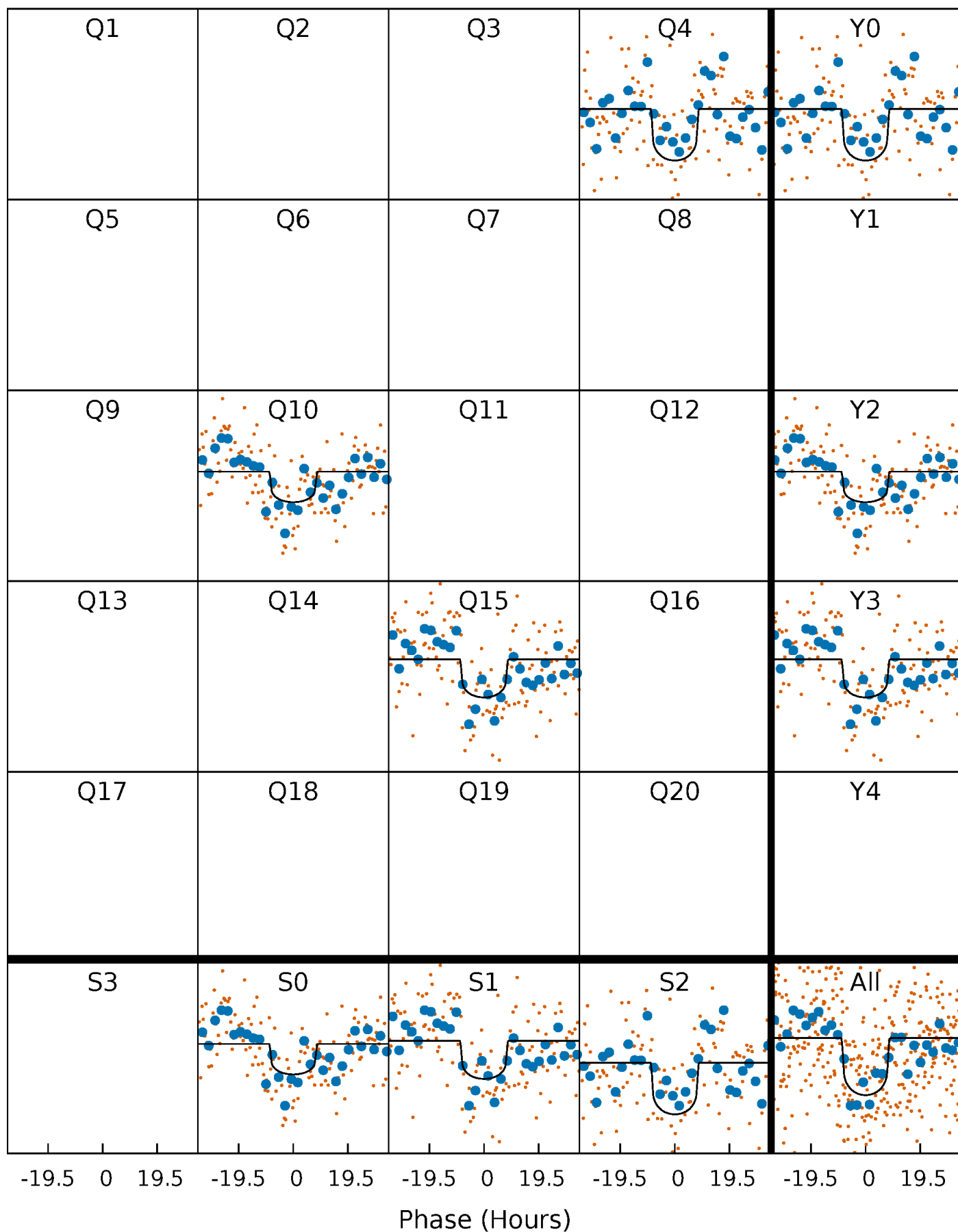
TCE 008740609-01 P=528.088494 Days  $T_0=412.075191$  (BKJD)





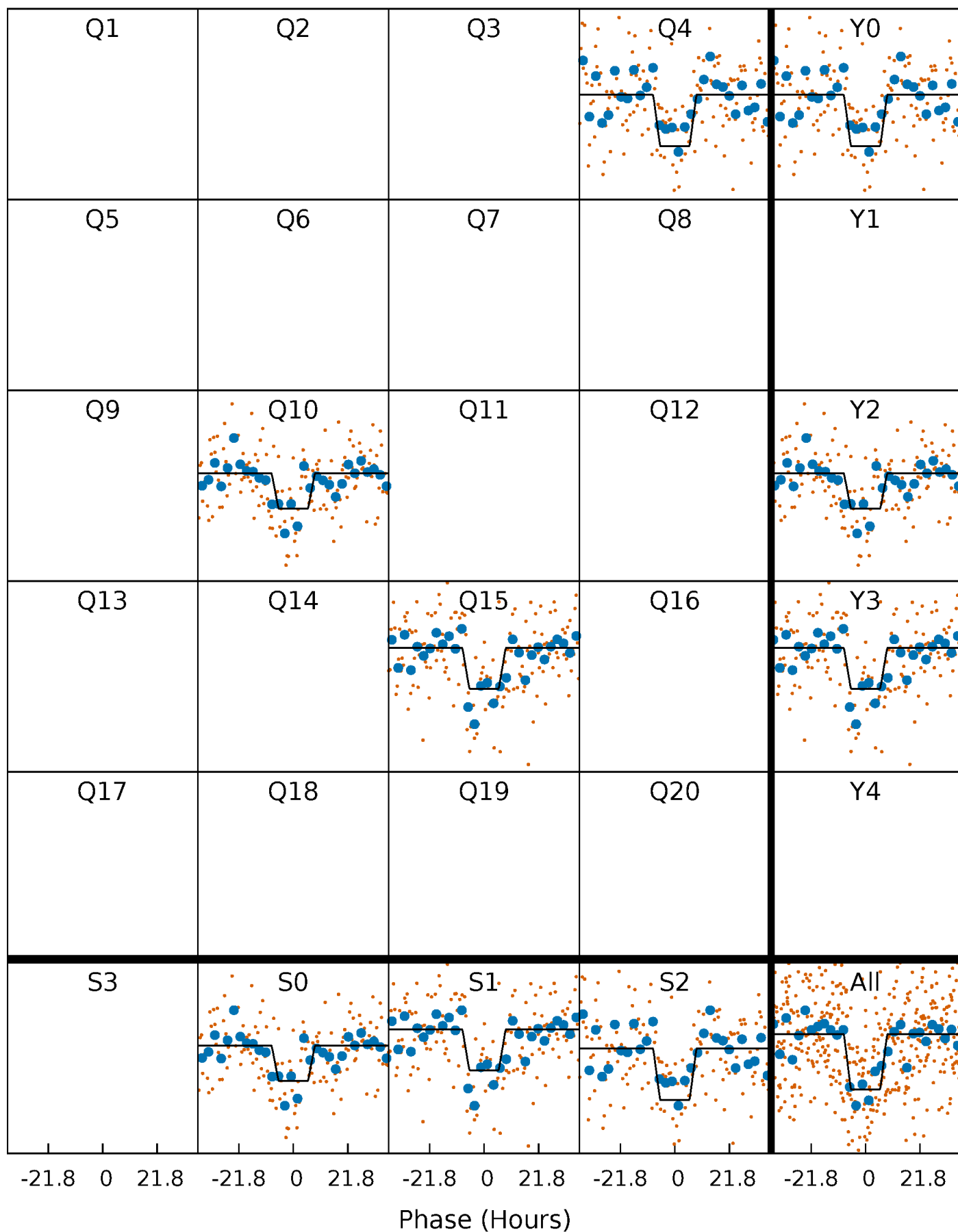
# DV Quarter-Phased Transit Curves

TCE 008740609-01 P=528.088494 Days  $T_0=412.075191$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

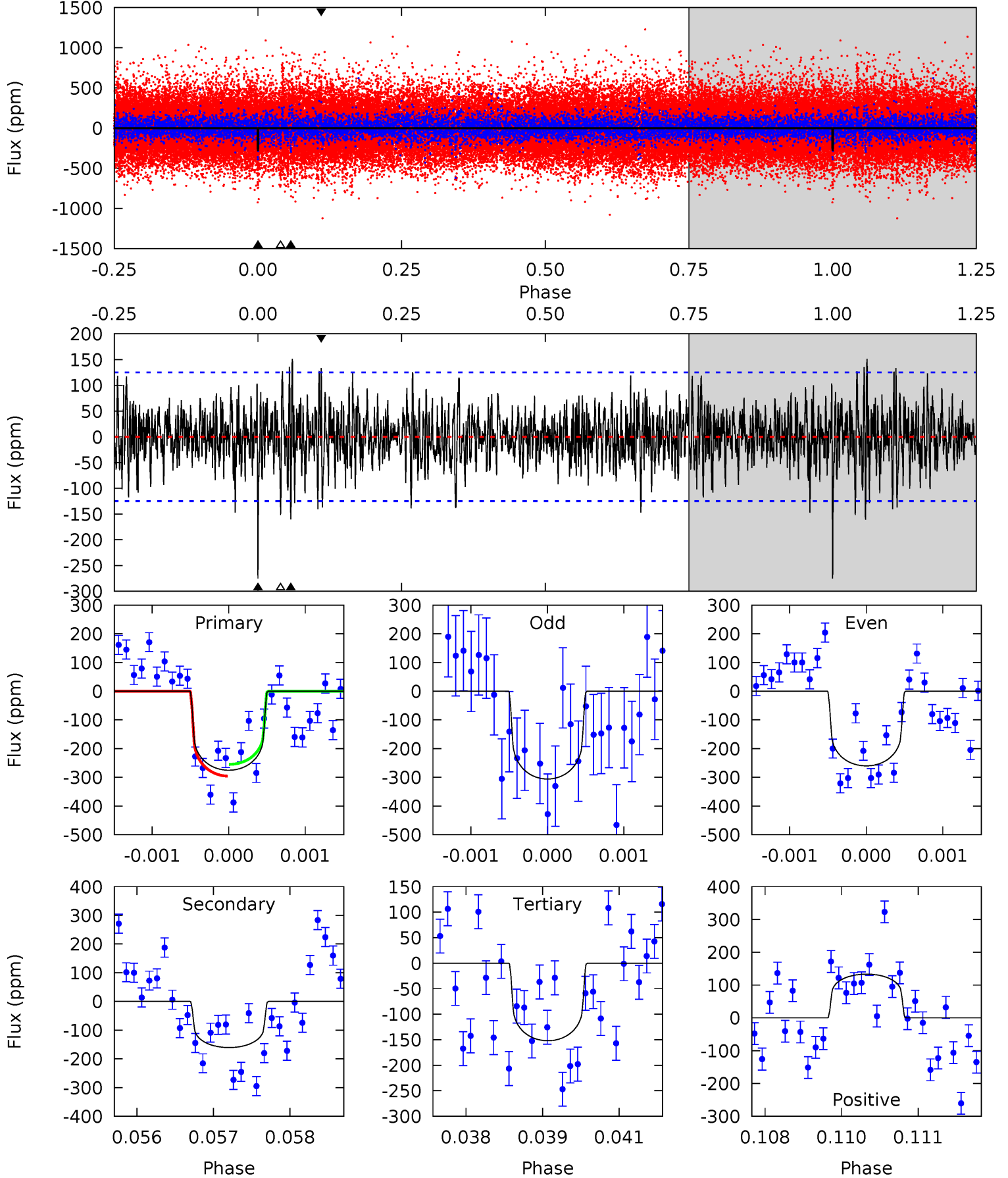
TCE 008740609-01 P=528.078113 Days  $T_0=412.054221$  (BKJD)



# DV Model-Shift Uniqueness Test

008740609-01,  $P = 528.088494$  Days,  $E = 412.075191$  Days

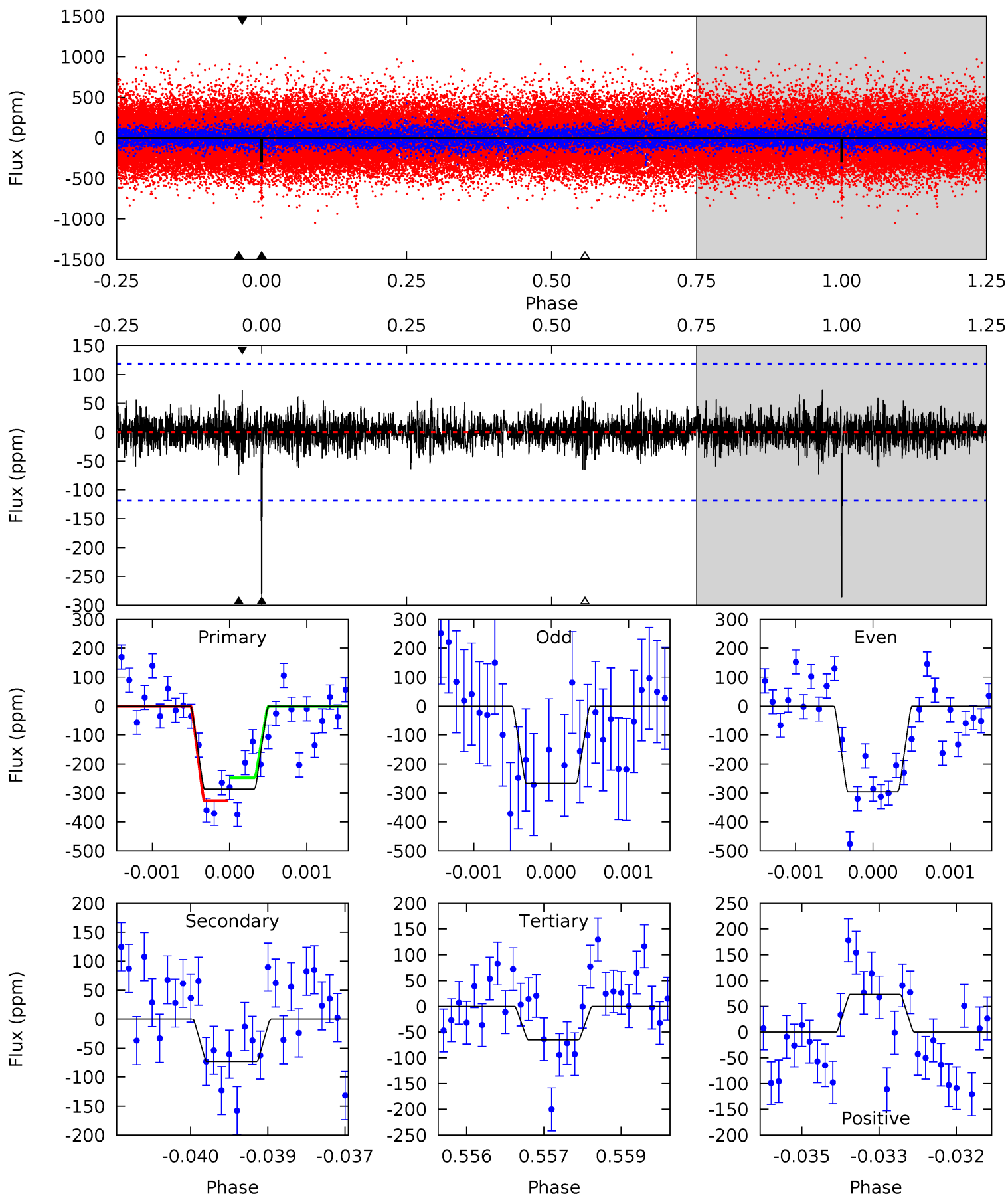
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	6.93	6.56	5.75	5.40	3.20	1.77	5.33	6.13	0.37	1.18	0.93	0.90	0.35	0.88



# Alt Model-Shift Uniqueness Test

008740609-01, P = 528.078113 Days, E = 412.054221 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
13.0	3.32	2.95	3.32	5.39	3.20	0.82	10.0	9.67	0.37	0.00	0.62	1.07	0.20	1.81



### Stellar Parameters For KIC 008740609

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5853^{+140}_{-175}$	$4.529^{+0.036}_{-0.192}$	$-0.100^{+0.250}_{-0.300}$	$0.895^{+0.262}_{-0.082}$	$0.990^{+0.104}_{-0.127}$	$1.941^{+0.466}_{-0.960}$
	+2%/-3%	+1%/-4%	+250%/-300%	+29%/-9%	+11%/-13%	+24%/-49%
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 008740609-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-161 \pm 23$	$1.76^{+0.57}_{-0.54}$	$309^{+18}_{-13}$	$5097^{+900}_{-588}$	$45327^{+49868}_{-20052}$
Alt.	$-73 \pm 22$	$1.74^{+0.57}_{-0.53}$	$310^{+20}_{-13}$	$4344^{+731}_{-480}$	$20390^{+23006}_{-9801}$

$T_{\text{max}}$  = 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

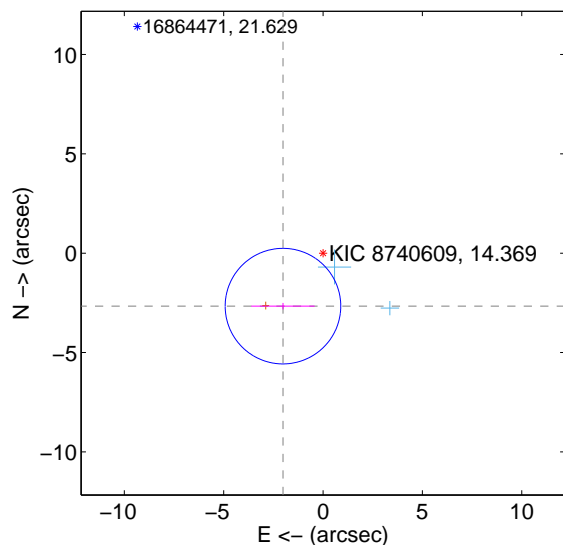
Supplemental centroid analysis for 008740609-01. Kepler magnitude: 14.37. Transit SNR 7.07

There are 2 quarters with good PRF difference image offsets

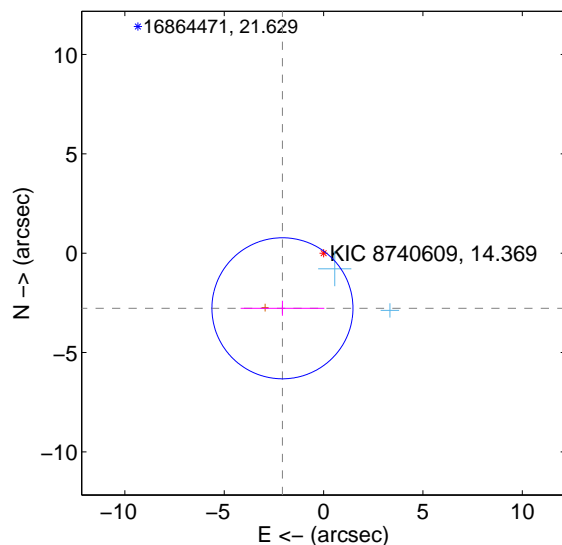
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.343 \pm 0.969$	3.45	$2.017 \pm 1.592$	$-2.666 \pm 0.162$
PRF-fit source offset from KIC position	$3.461 \pm 1.183$	2.93	$2.070 \pm 2.106$	$-2.774 \pm 0.378$
photometric centroid source offset	$3.97 \pm 2.06$	1.93	$-3.91 \pm 2.05$	$0.70 \pm 2.20$

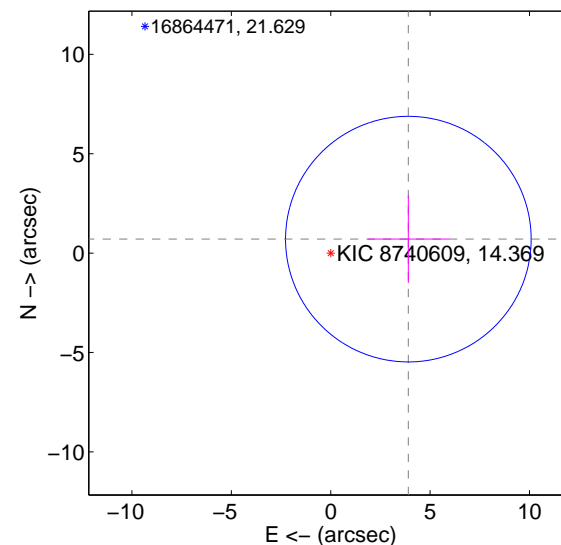
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

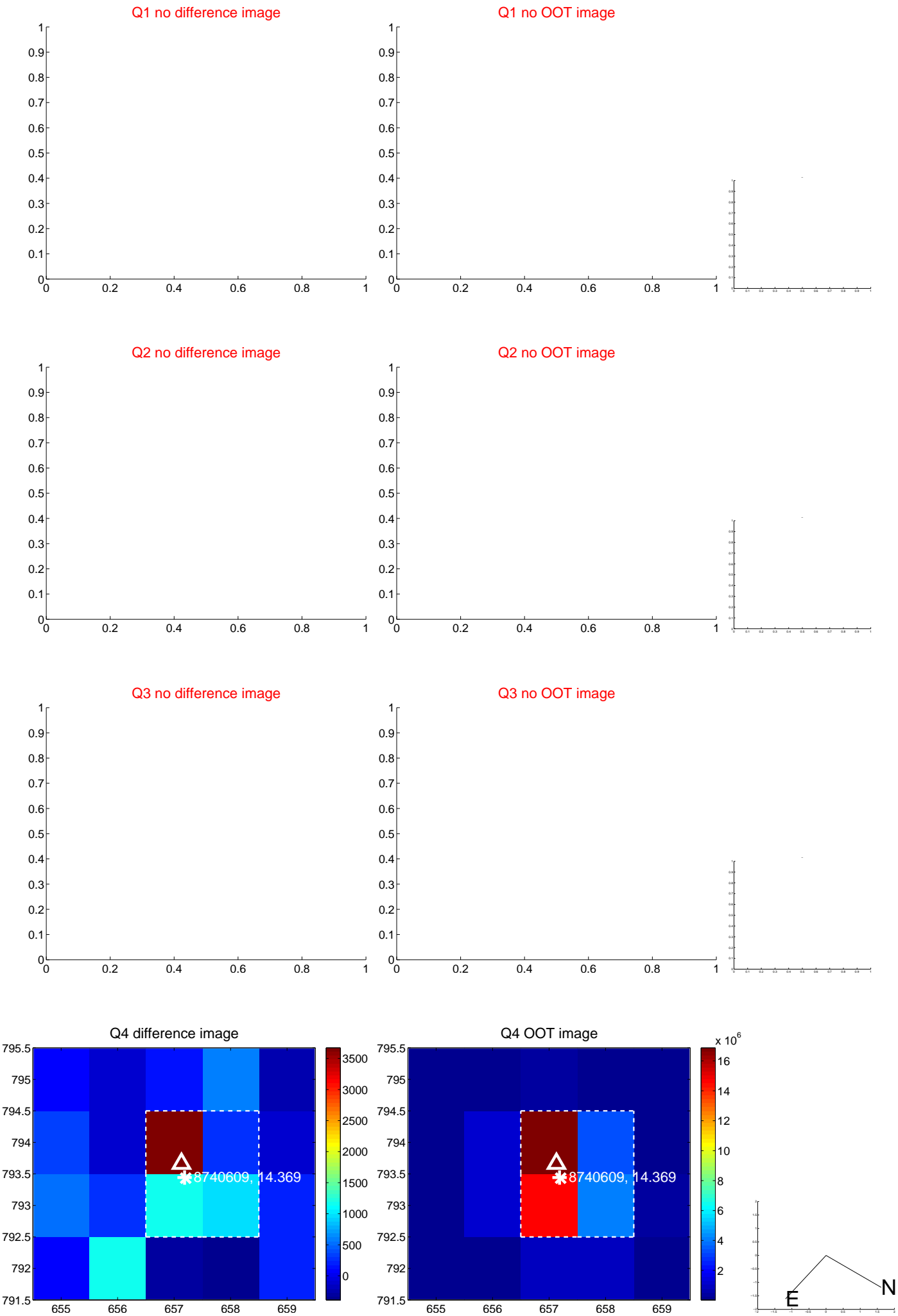


offset from photometric centroids



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.

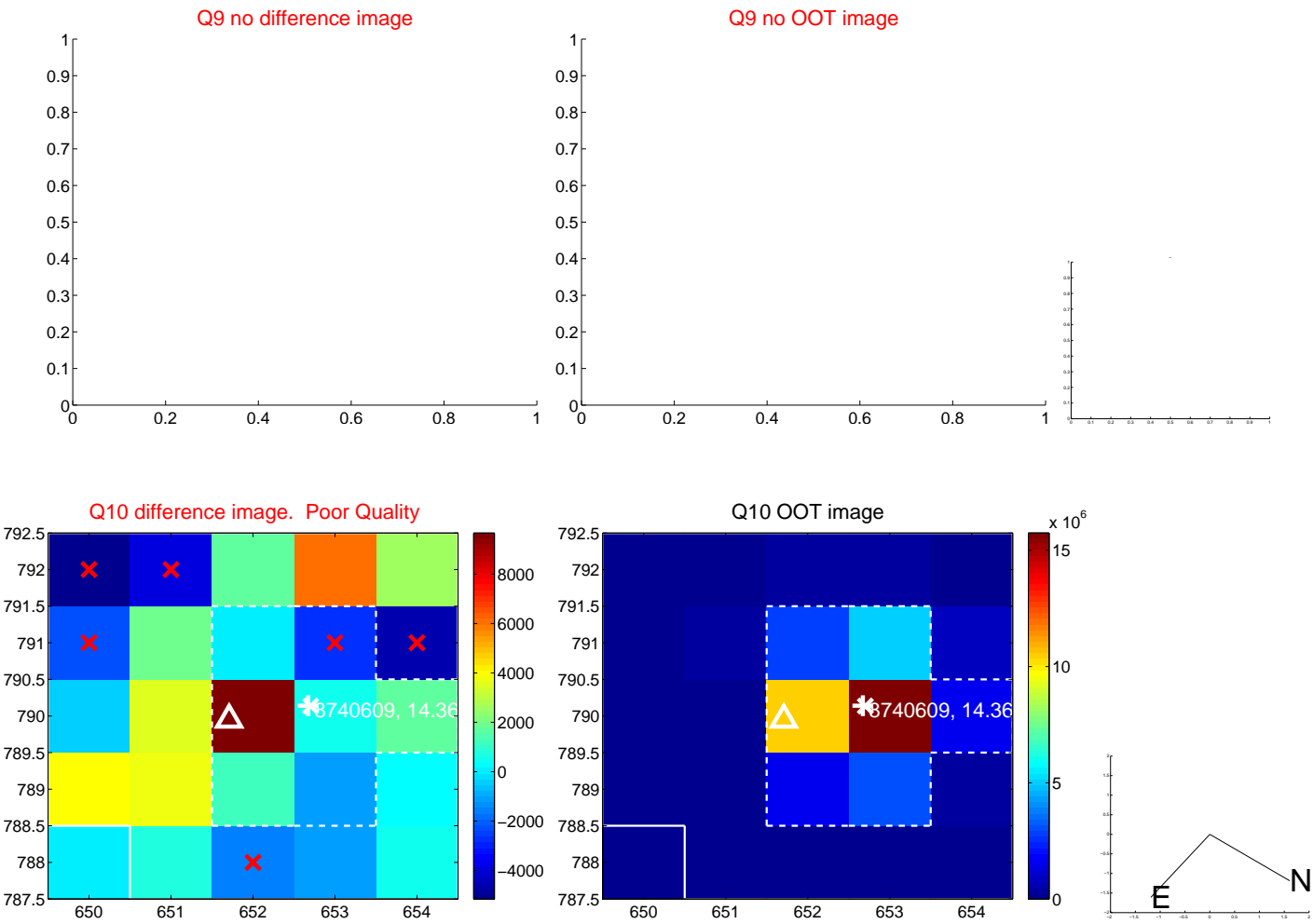




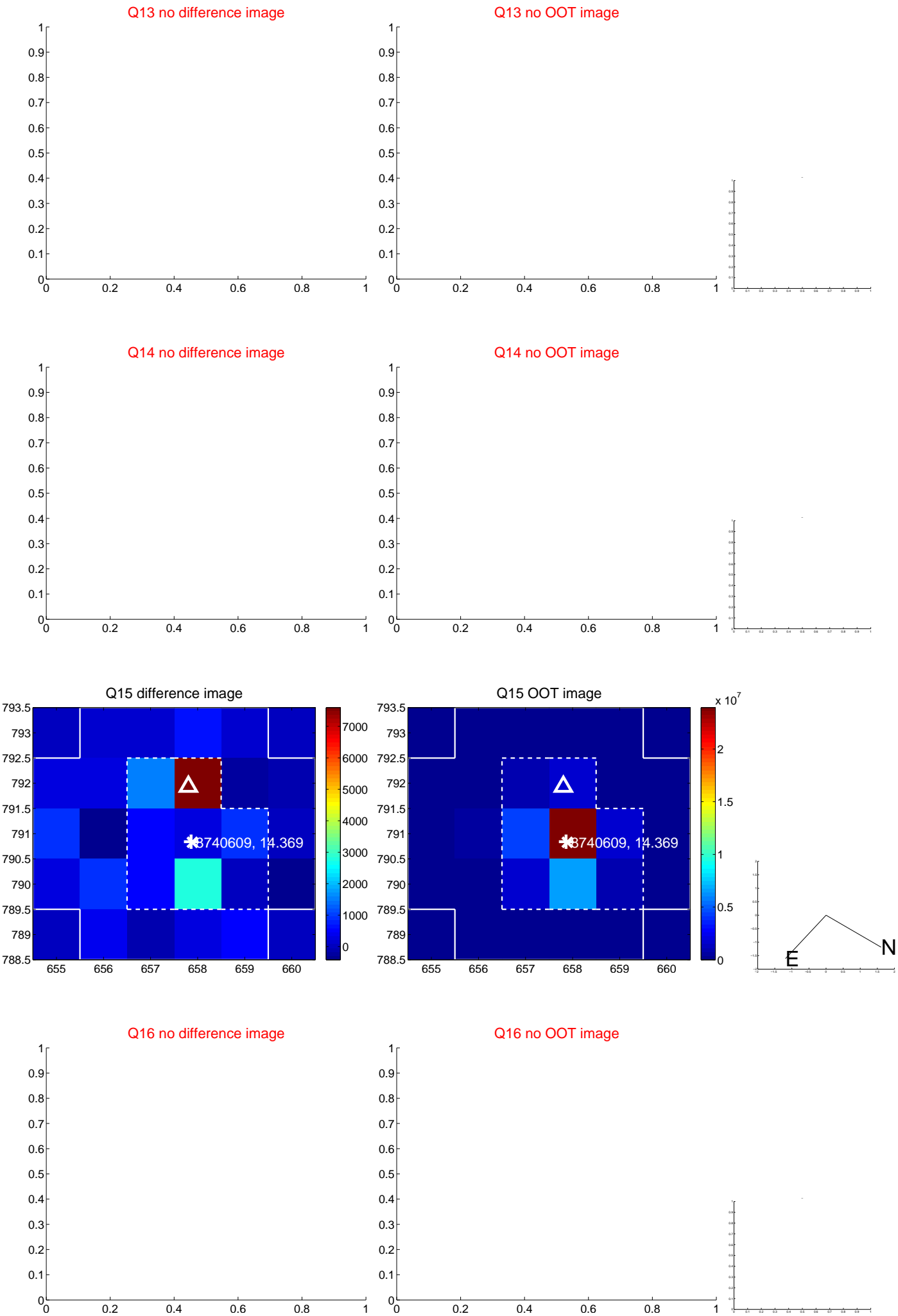
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



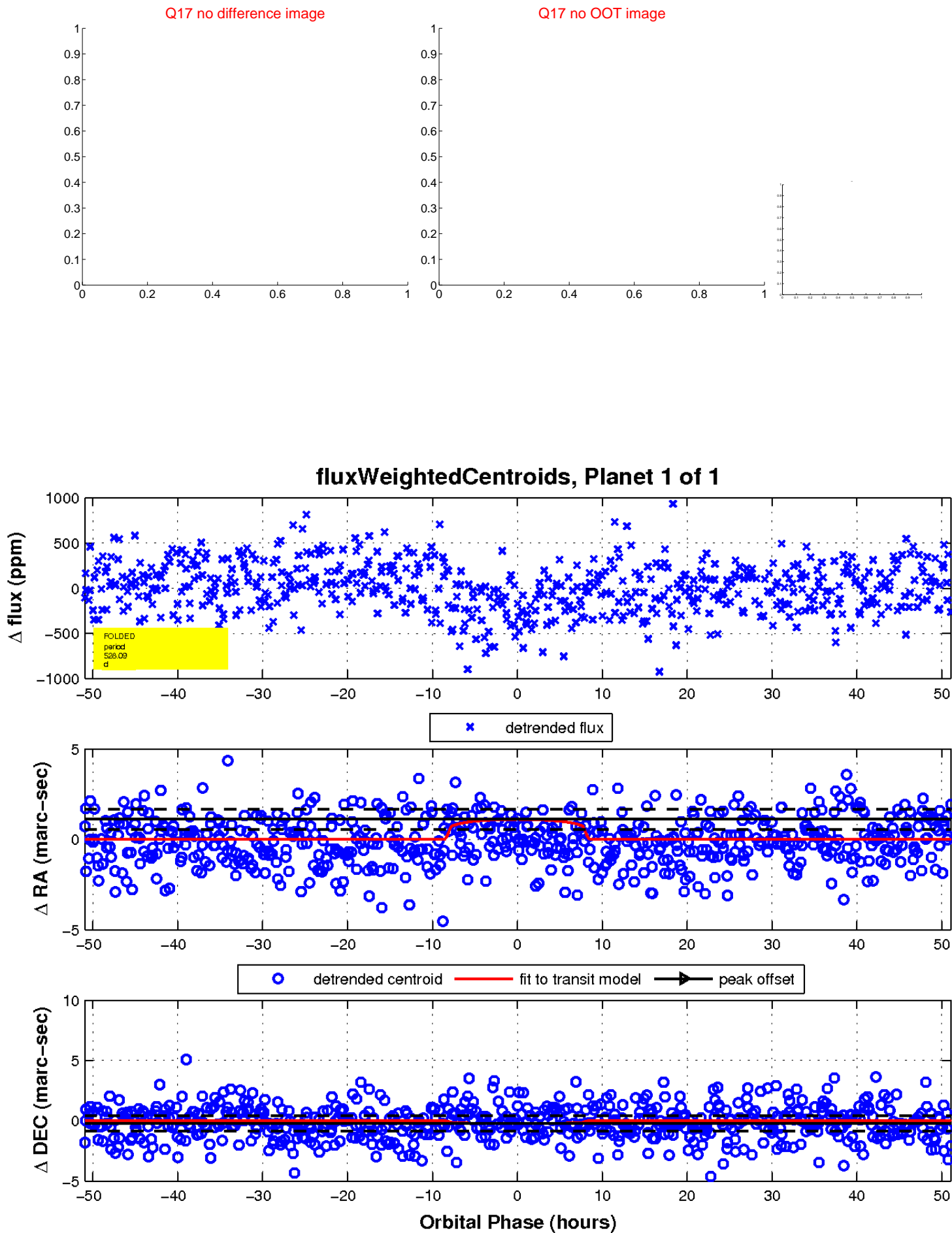
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

