

# KIC 007970427

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007970427-01	OBS	No	368.826252	233.375423	684.4	18.960	8.0	7.6	0.62	5330	2.14	0.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007970427-01	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST—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.

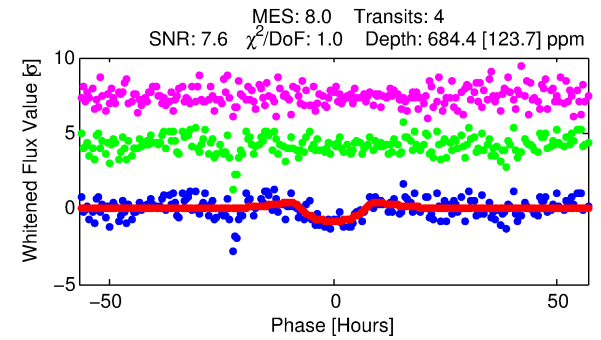
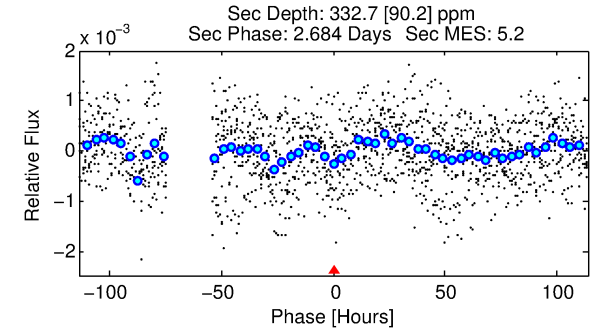
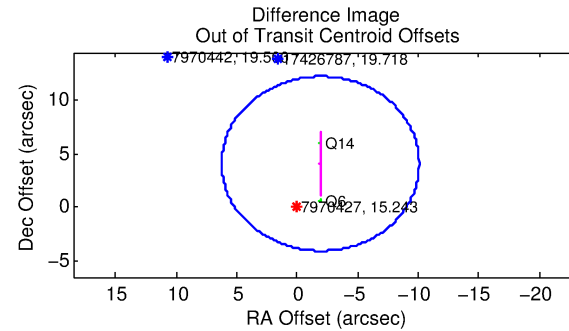
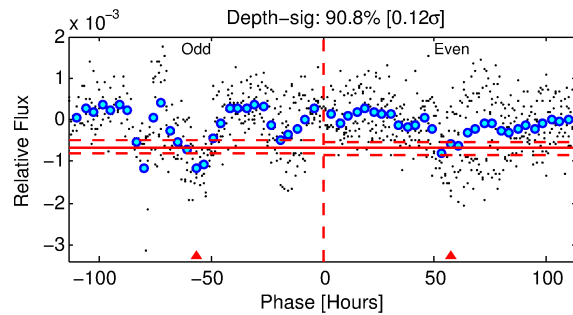
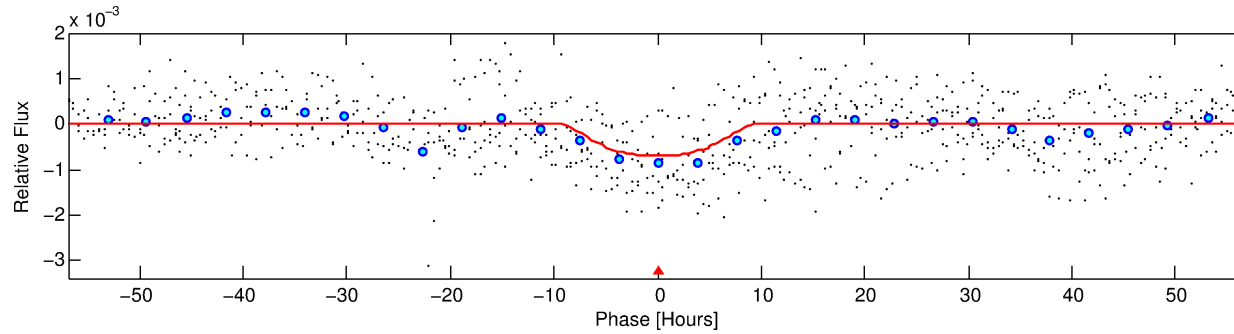
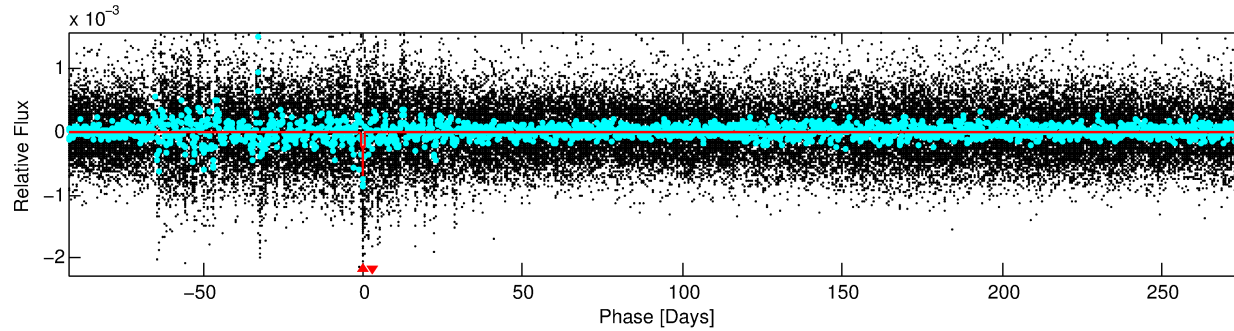
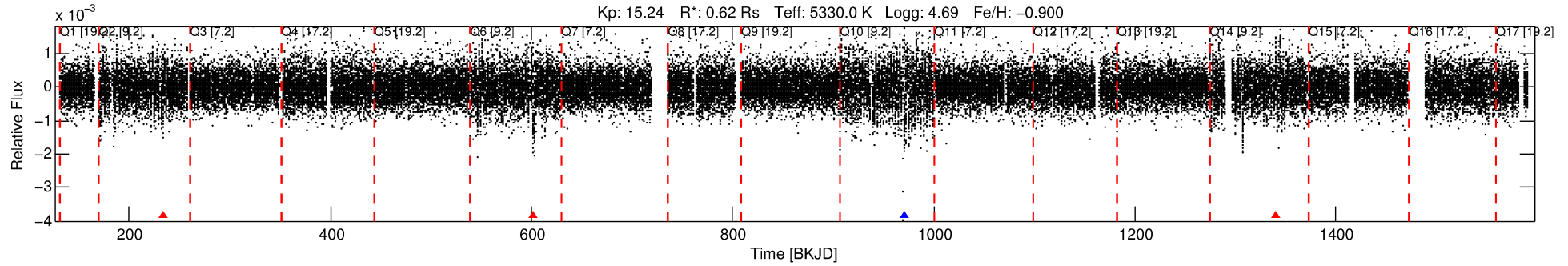
## Ephemeris Match Information For 007970427-01

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	$\sigma_P$	$\sigma_T$
007970427-01	7970427	007901074-01	7901074	1:1	557.6	140	4	15.59	15.24	2.18	Col-Anomaly	1	2.96	2.03

**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: 7970427 Candidate: 1 of 1 Period: 368.826 d



## DV Fit Results:

Period = 368.82625 [0.01956] d  
Epoch = 233.3754 [0.0378] BKJD  
Rp/R\* = 0.0317 [0.0038]  
a/R\* = 53.98 [9.68]  
b = 0.97 [0.02]  
Seff = 0.35 [0.06]  
Teq = 196 [9] K  
Rp = 2.14 [0.36] Re  
a = 0.8900 [0.0868] AU  
Ag = 31615.84 [12313.46] [2.57 $\sigma$ ]  
Teffp = 4043 [386] K [9.95 $\sigma$ ]

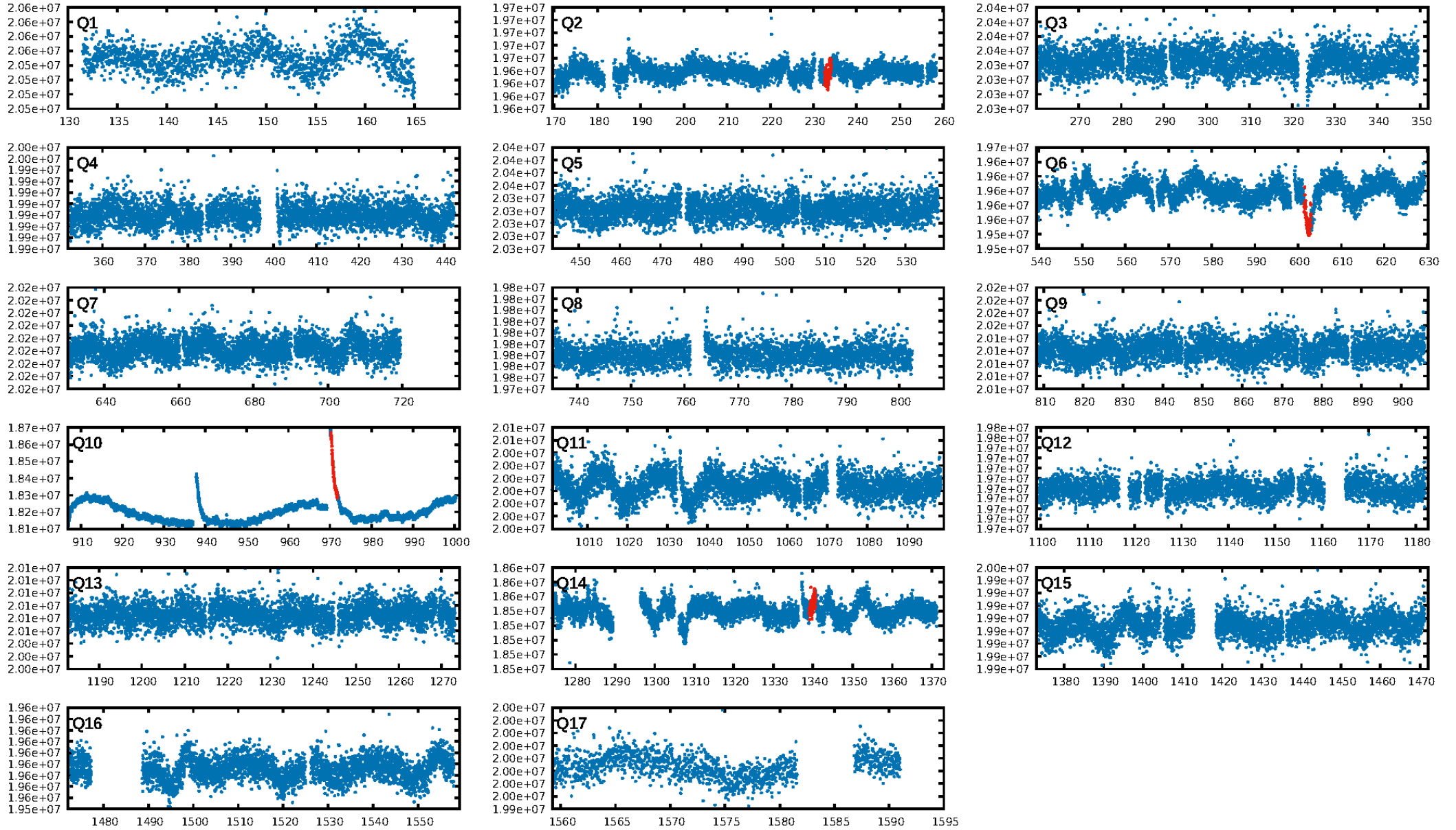
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 40.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.49e-12  
RollingBand-fgt: 0.25 [1/4]  
GhostDiagnostic-chr: 0.1747  
Centroid-sig: 0.0%  
Centroid-so: 3.634 arcsec [2.39 $\sigma$ ]  
OotOffset-rm: 4.519 arcsec [1.66 $\sigma$ ]  
KicOffset-rm: 4.503 arcsec [1.67 $\sigma$ ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

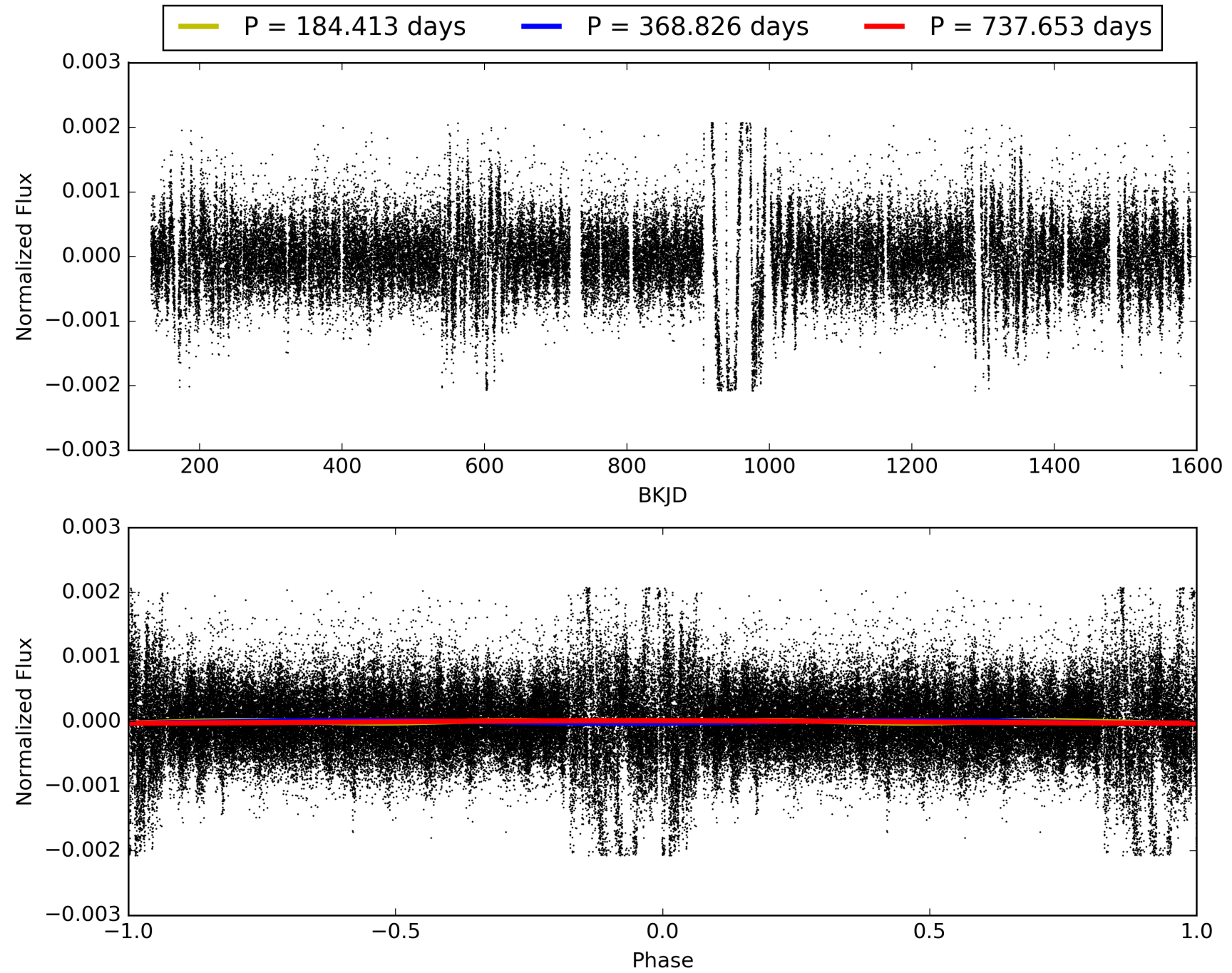
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:17:10 Z

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

# TCE 007970427-01, PDC Light Curves

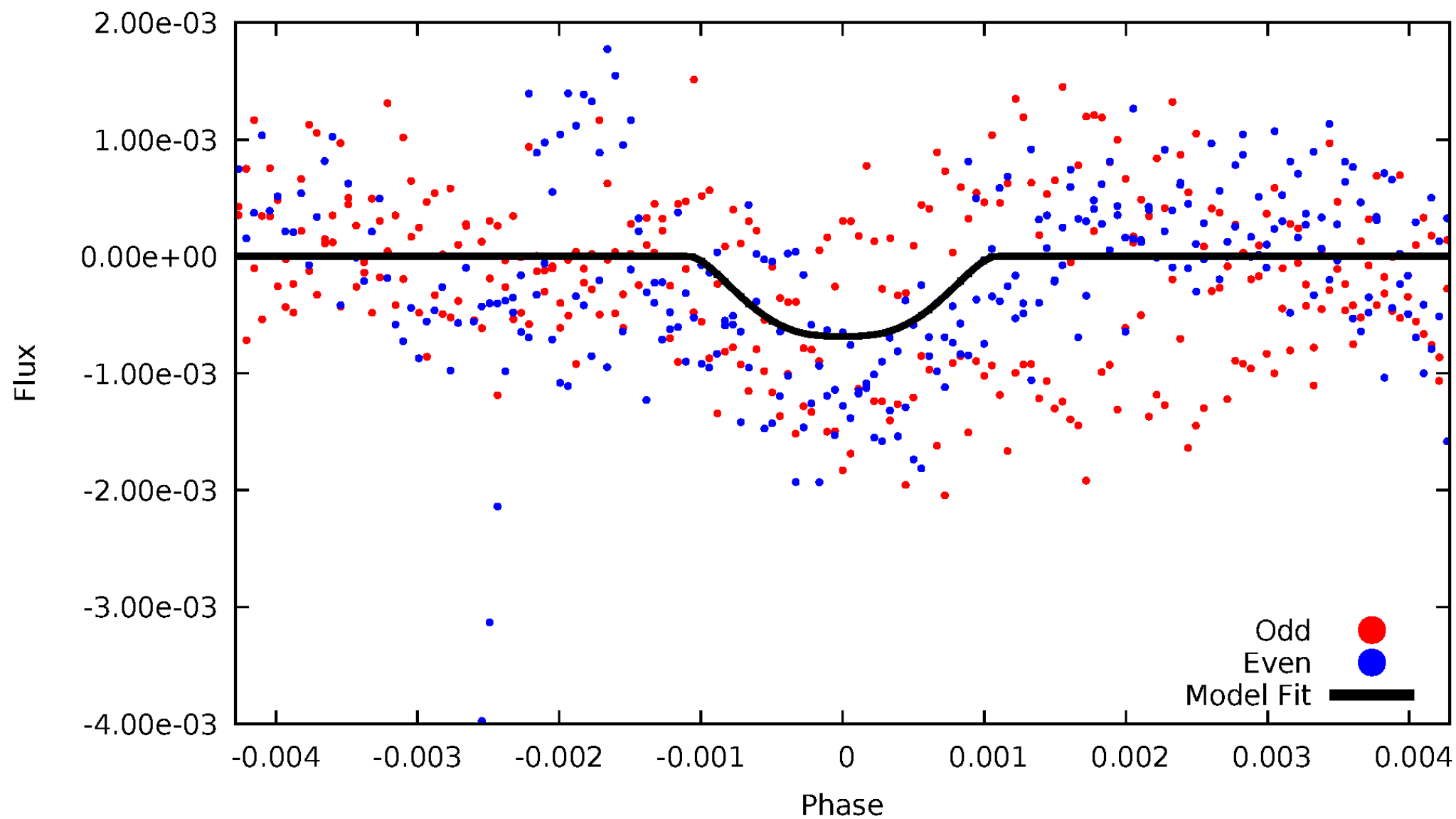


TCE 007970427-01



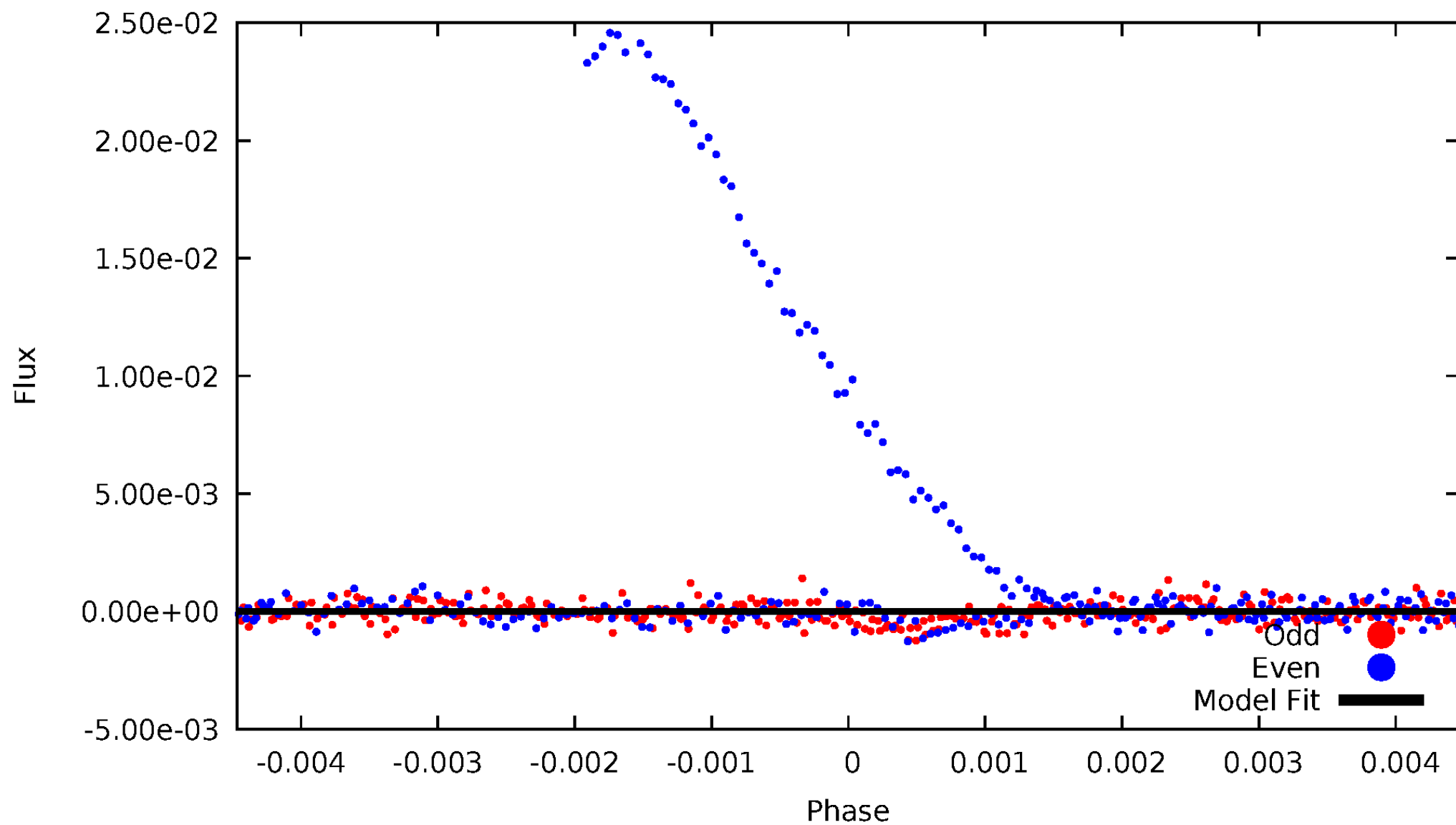
# DV Odd/Even

TCE 007970427-01



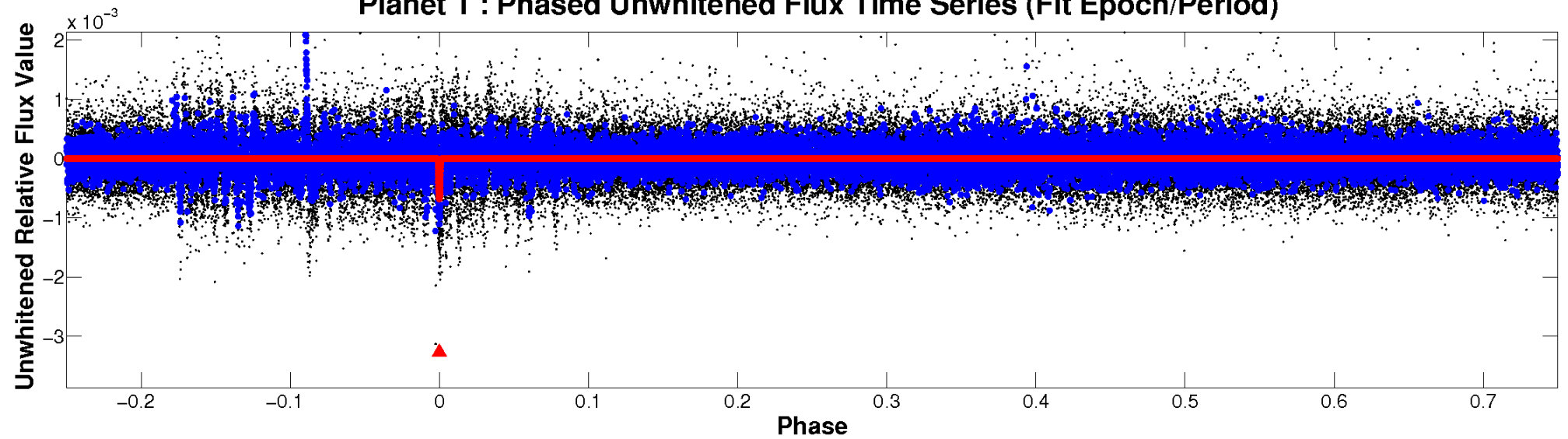
# ALT Odd/Even

TCE 007970427-01

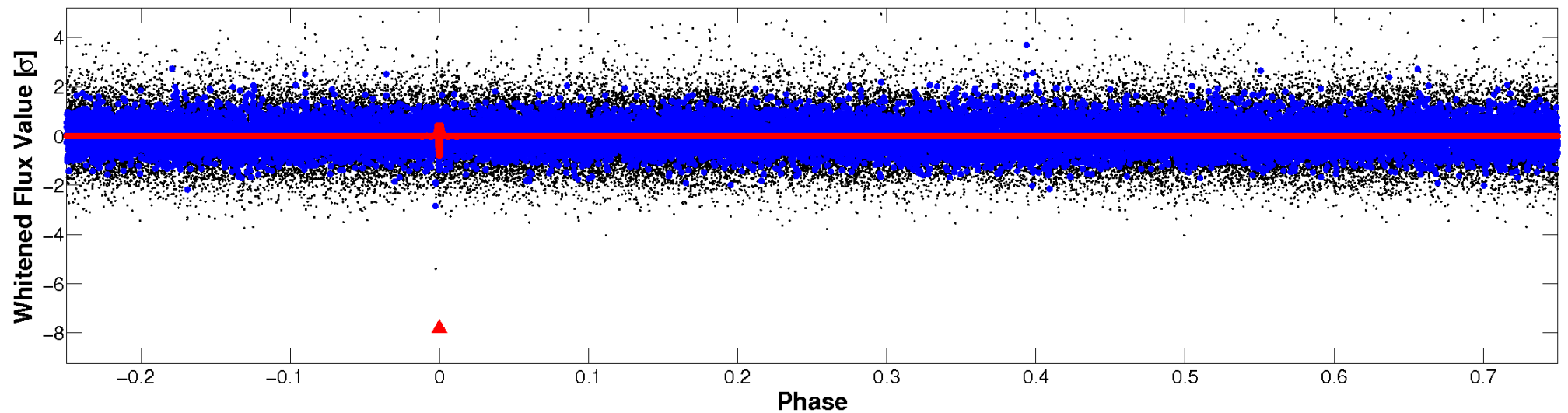


# Non-Whitened Vs. Whitened Light Curve

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



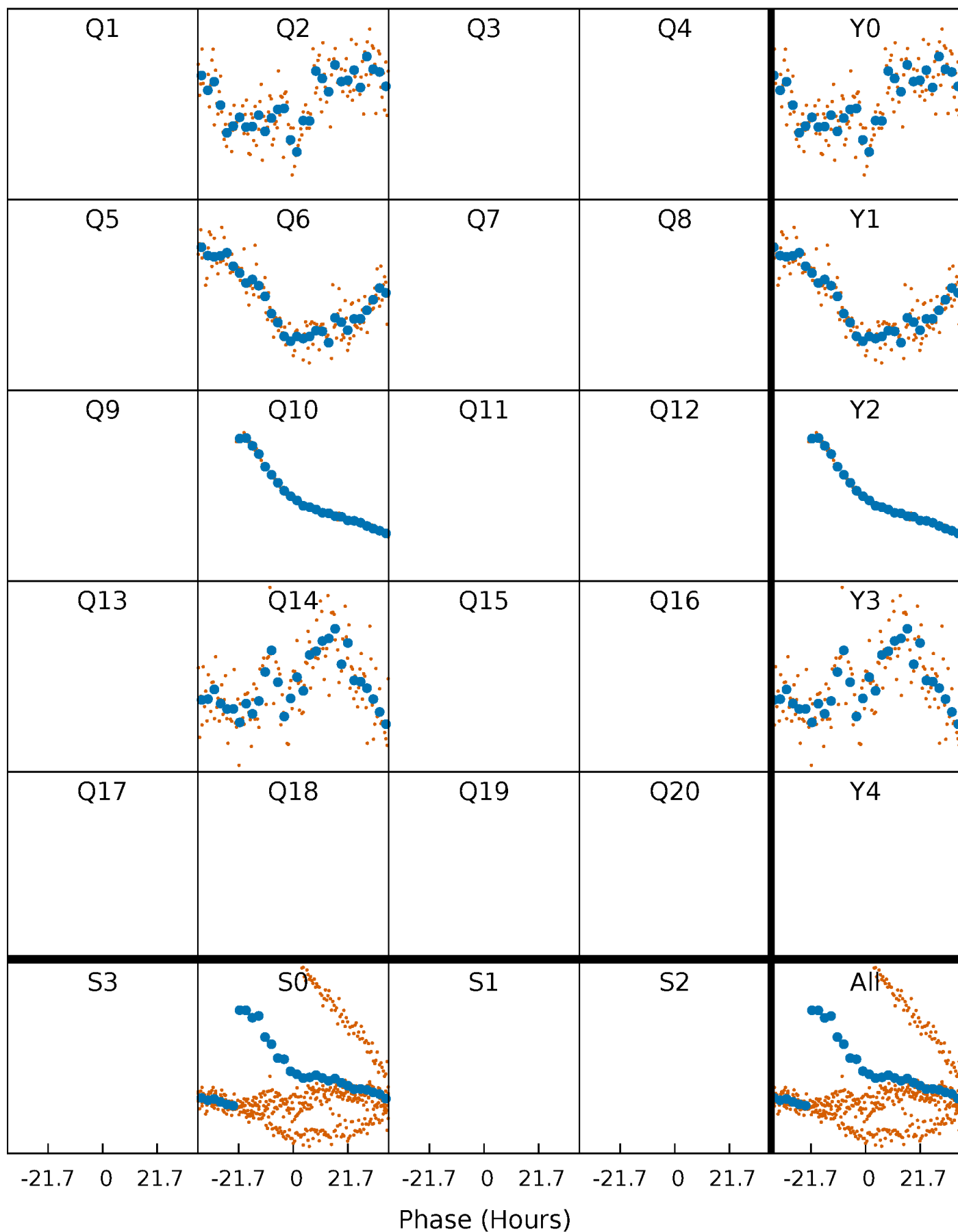
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

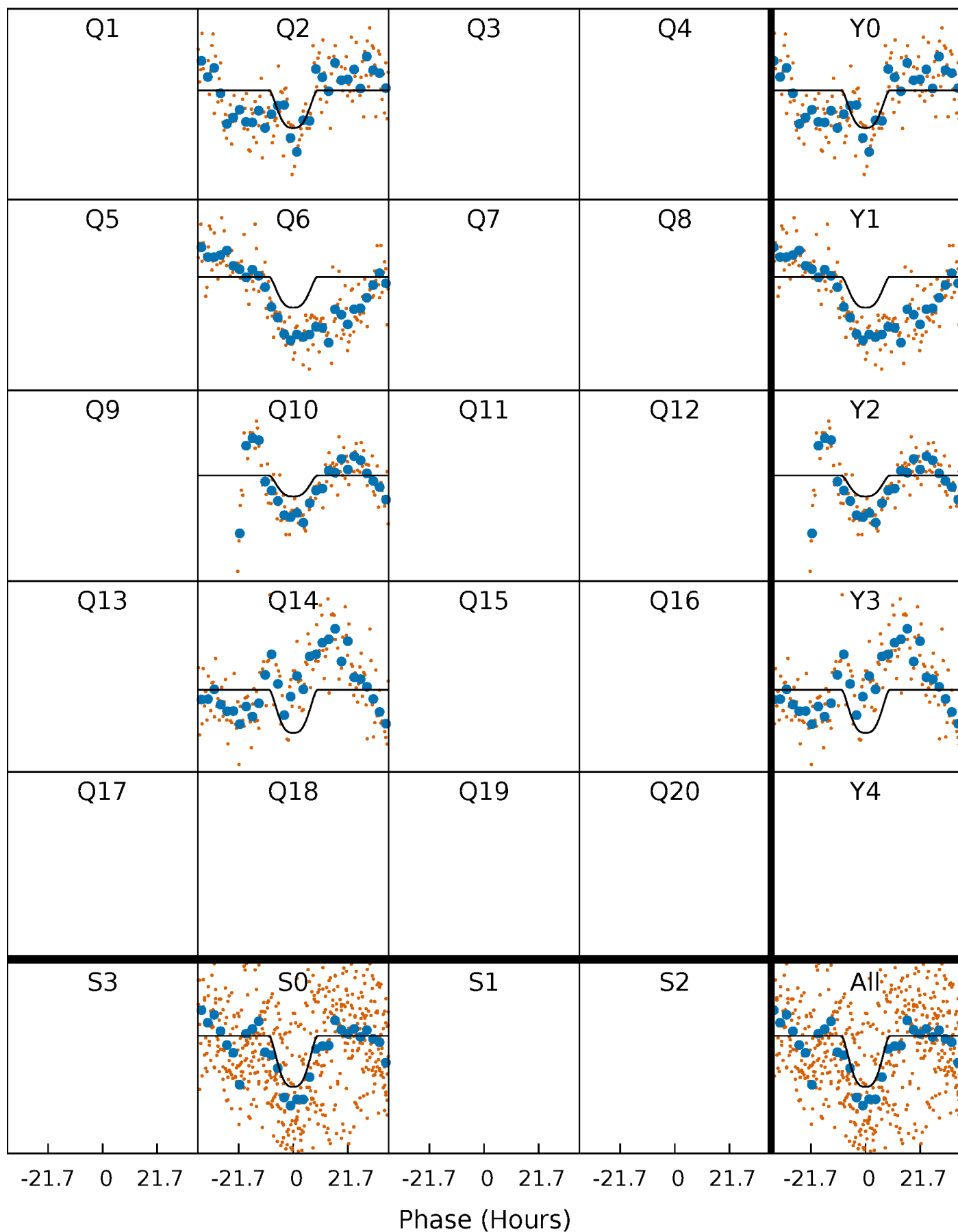
TCE 007970427-01 P=368.826252 Days  $T_0=233.375423$  (BKJD)





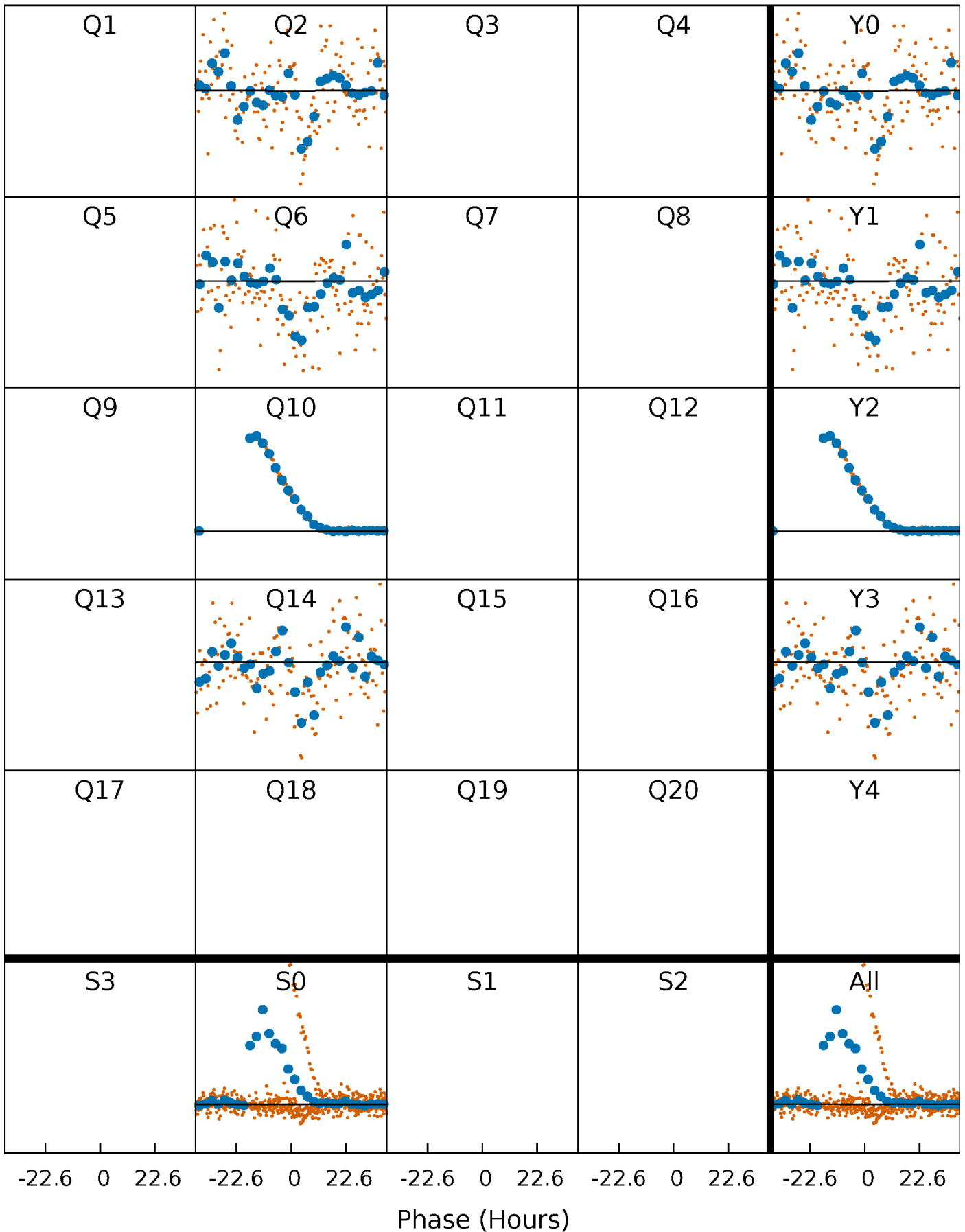
# DV Quarter-Phased Transit Curves

TCE 007970427-01 P=368.826252 Days  $T_0=233.375423$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

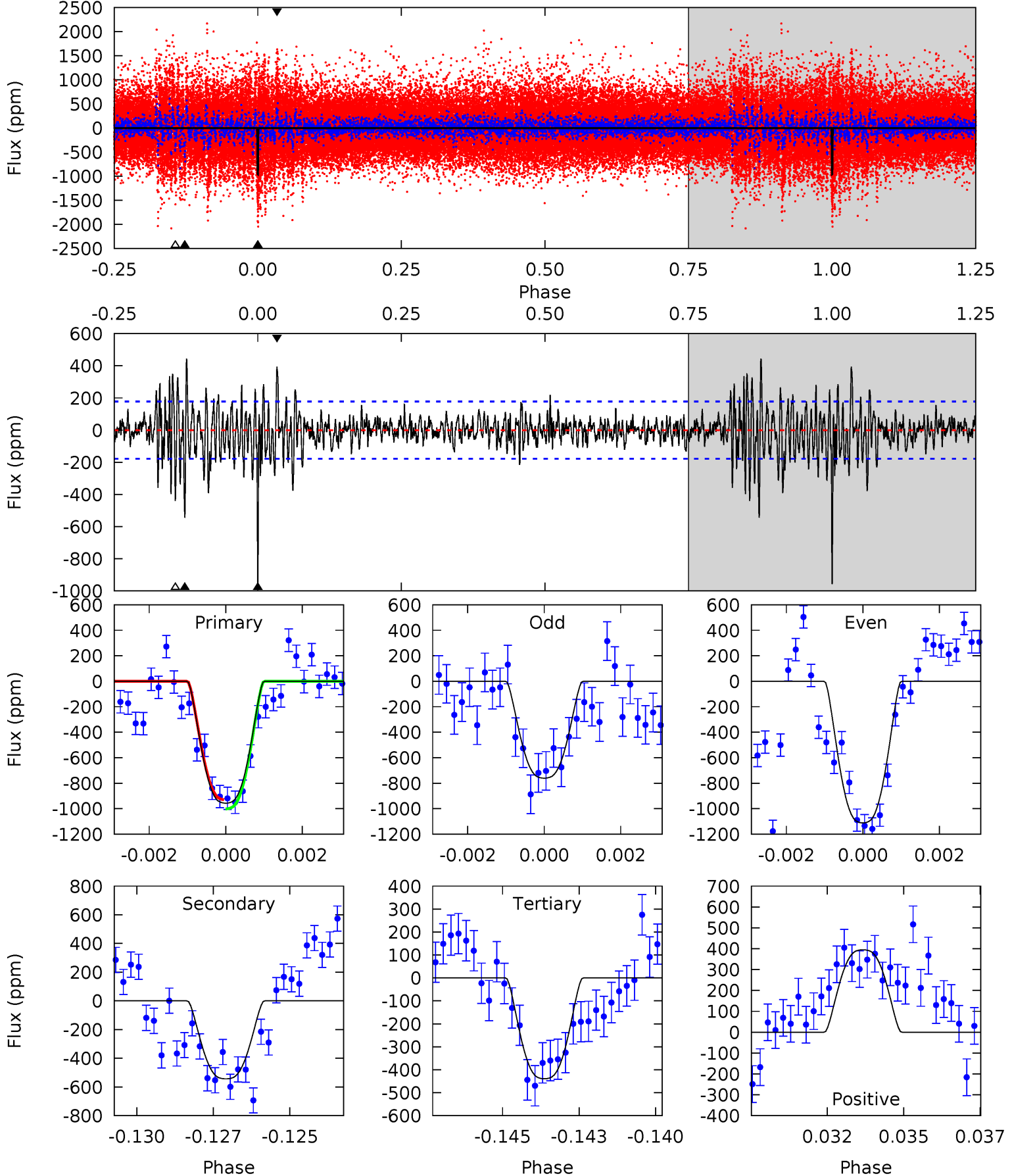
TCE 007970427-01 P=368.798513 Days  $T_0=233.195532$  (BKJD)



# DV Model-Shift Uniqueness Test

007970427-01, P = 368.826252 Days, E = 233.375423 Days

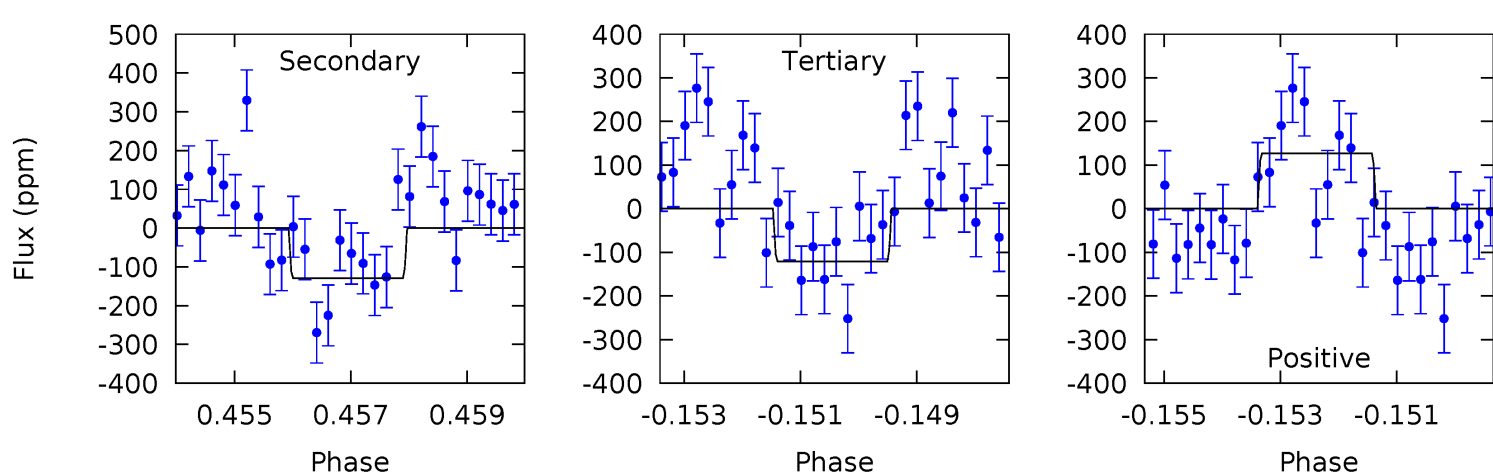
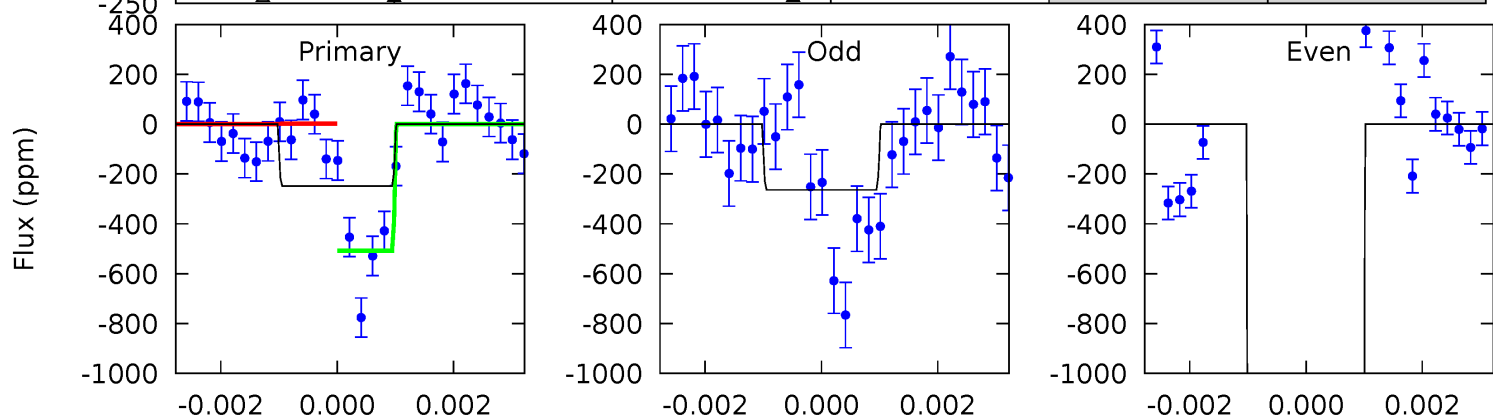
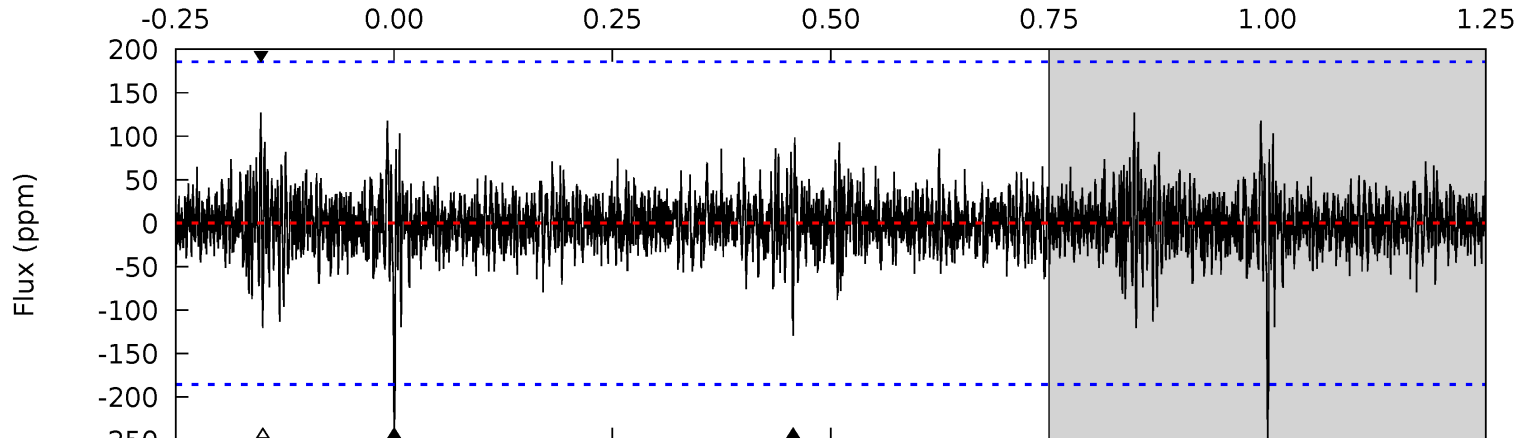
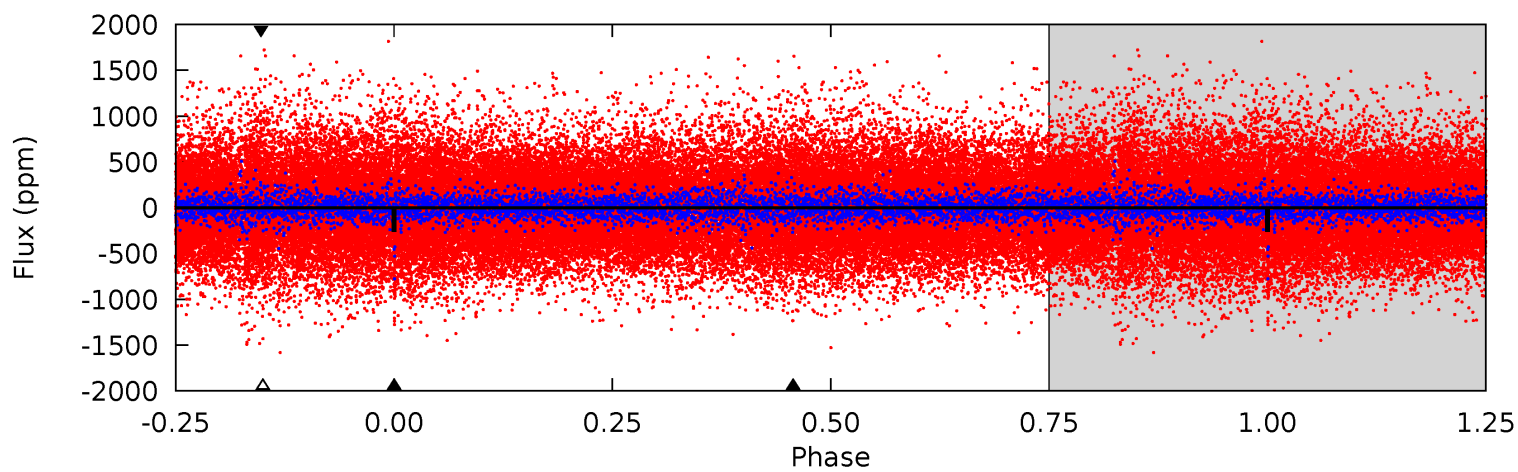
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.6	16.2	13.1	11.8	5.31	3.07	2.79	15.4	16.8	3.11	4.44	5.01	0.84	0.32	1.06



# Alt Model-Shift Uniqueness Test

007970427-01, P = 368.798513 Days, E = 233.195532 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
7.11	3.70	3.45	3.64	5.31	3.05	0.72	3.66	3.47	0.25	0.06	71.8	-10.3	0.34	7.27



### Stellar Parameters For KIC 007970427

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5330^{+144}_{-160}$	$4.694^{+0.023}_{-0.077}$	$-0.900^{+0.300}_{-0.300}$	$0.619^{+0.072}_{-0.031}$	$0.696^{+0.049}_{-0.054}$	$4.133^{+0.397}_{-0.993}$
	+3%/-3%	+0%/-2%	+33%/-33%	+12%/-5%	+7%/-8%	+10%/-24%
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 007970427-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-544 \pm 34$	$2.20^{+0.29}_{-0.30}$	$276^{+10}_{-9}$	$4670^{+302}_{-254}$	$48715^{+15574}_{-11098}$
Alt.	$-130 \pm 35$	$0.22^{+0.21}_{-0.15}$	$276^{+9}_{-9}$	$11051^{+24293}_{-4041}$	$1078611^{+9193769}_{-799003}$

$T_{\text{max}}$  = 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  $A_{\text{obs}} \gg 1.0$

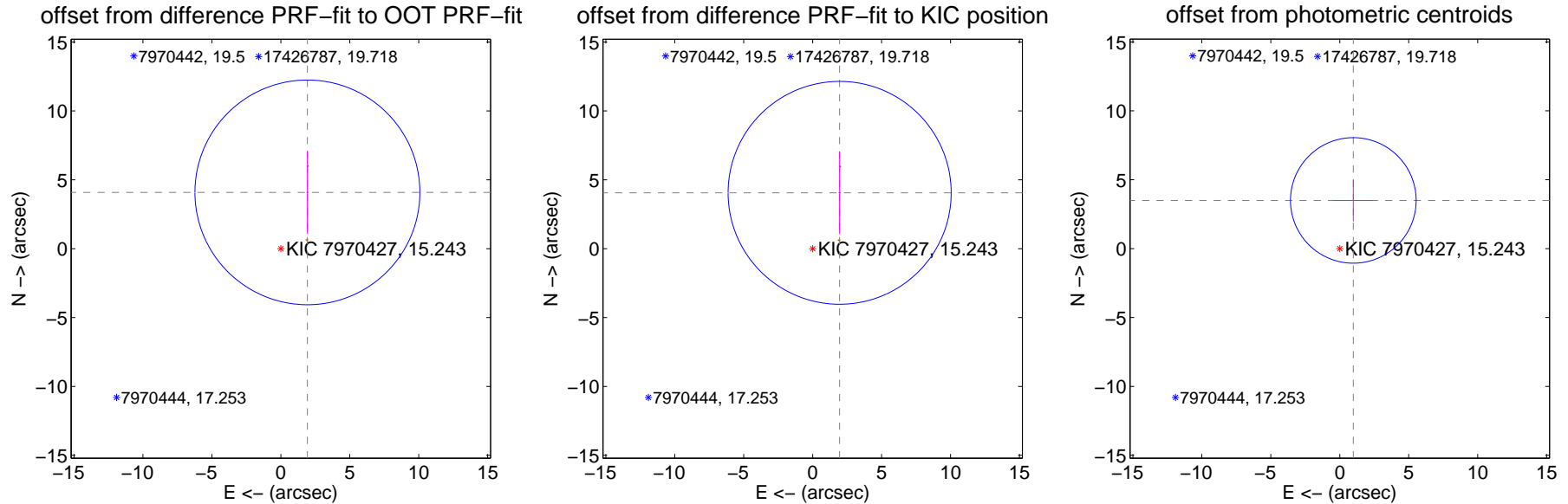
## DV Centroid Data

Supplemental centroid analysis for 007970427-01. Kepler magnitude: 15.24. Transit SNR 7.63

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.519 \pm 2.719$	1.66	$-1.927 \pm 0.076$	$4.088 \pm 3.006$
PRF-fit source offset from KIC position	$4.503 \pm 2.697$	1.67	$-1.958 \pm 0.080$	$4.055 \pm 2.994$
photometric centroid source offset	$3.63 \pm 1.52$	2.39	$-0.98 \pm 1.46$	$3.50 \pm 1.52$



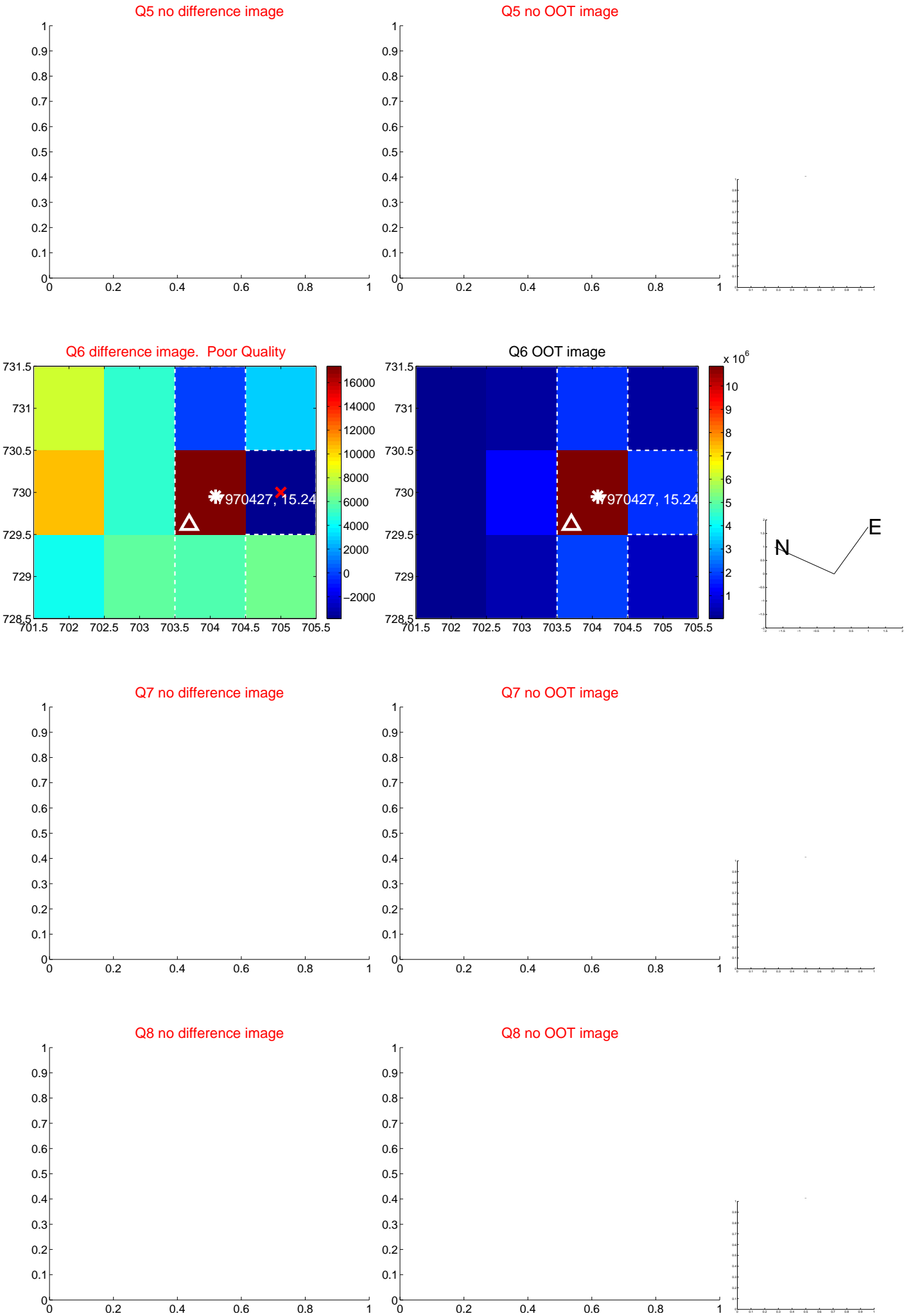
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





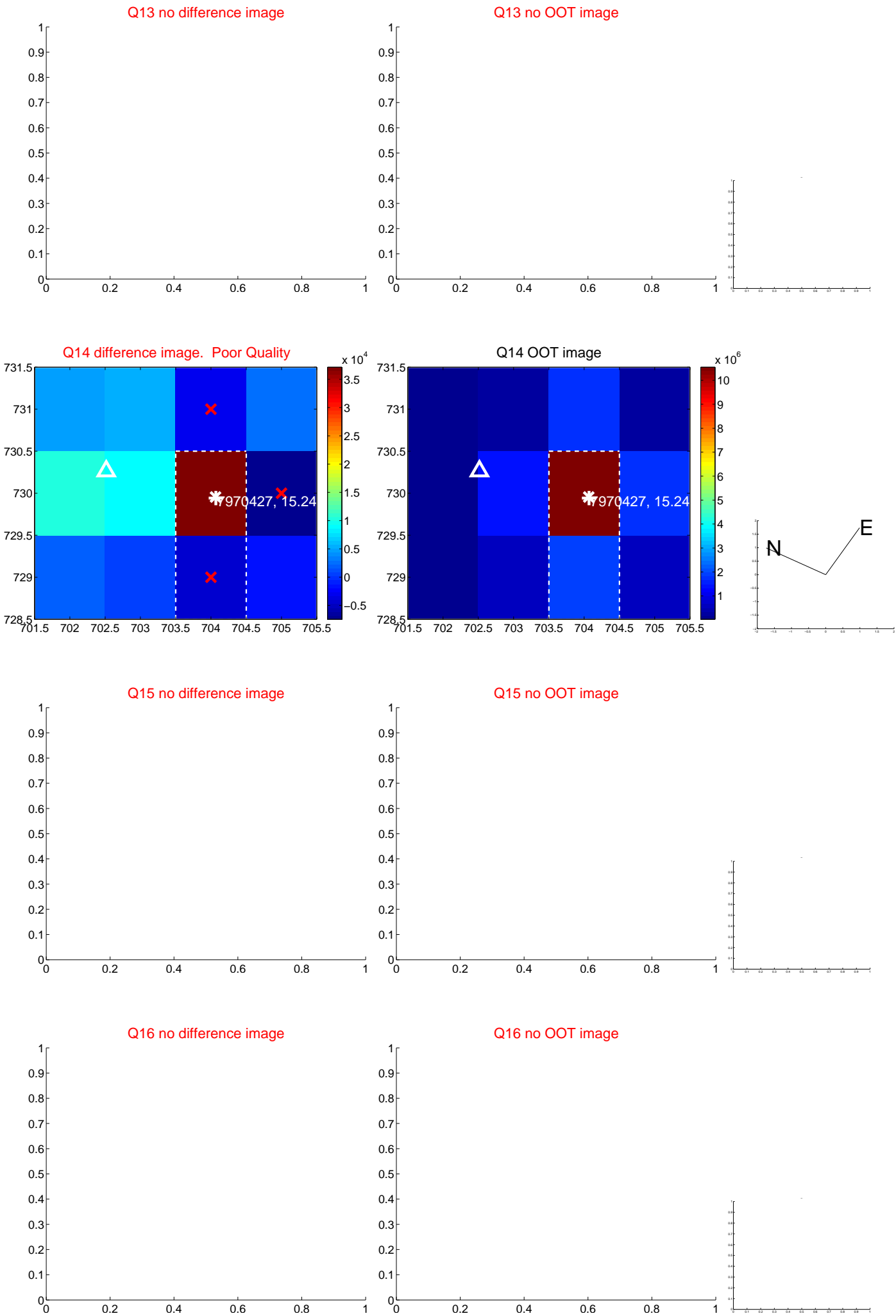
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



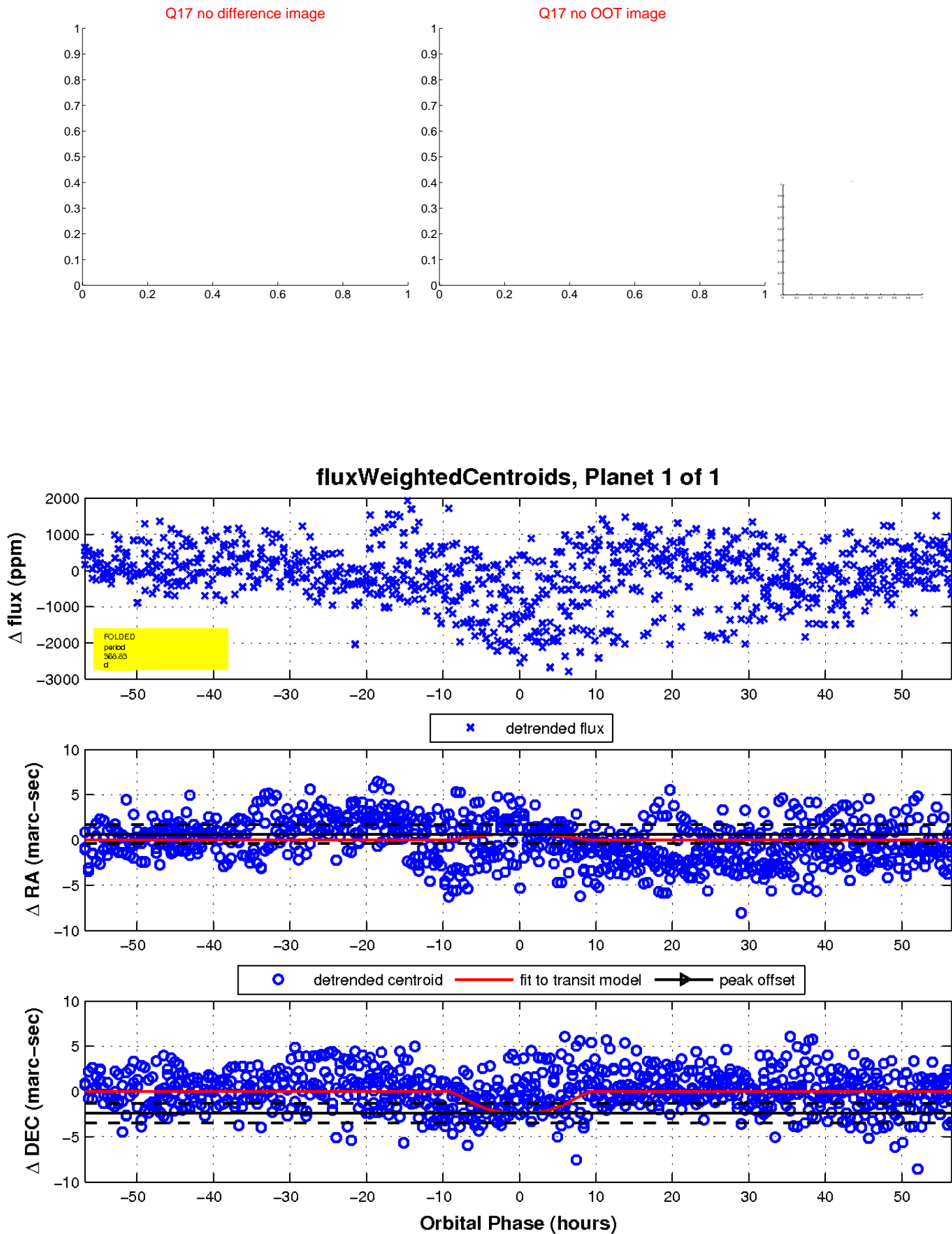
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

