

# KIC 009970525

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009970525-01	OBS	No	373.759366	139.722766	351.8	7.537	17.3	12.1	3.05	6487	6.09	10.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970525-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

**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 009970525-01

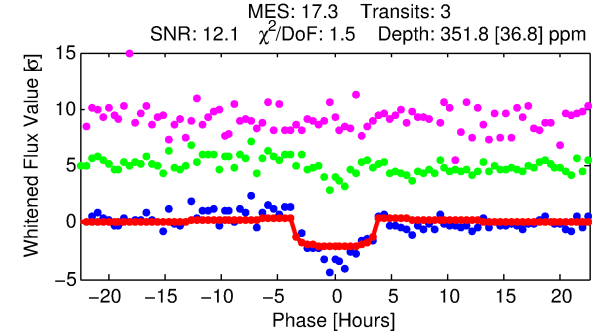
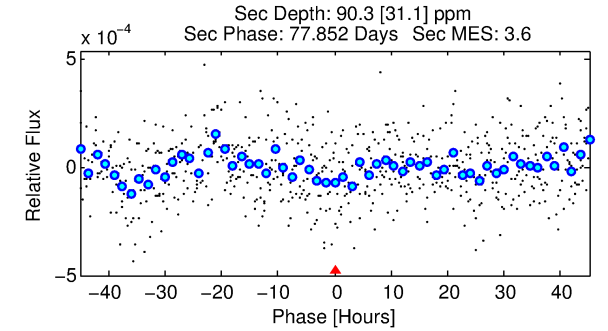
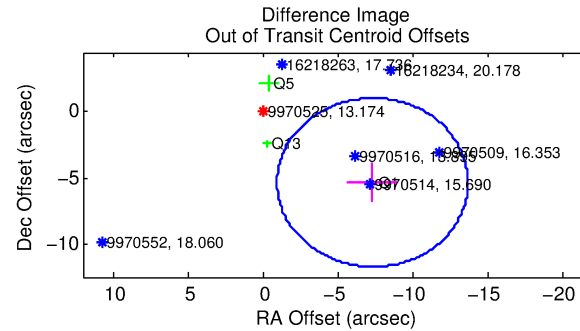
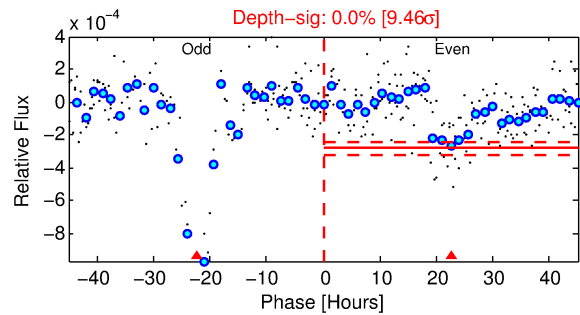
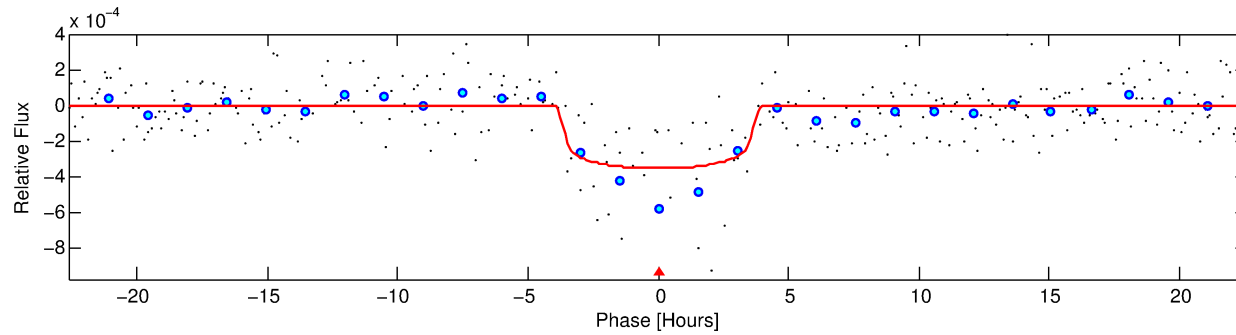
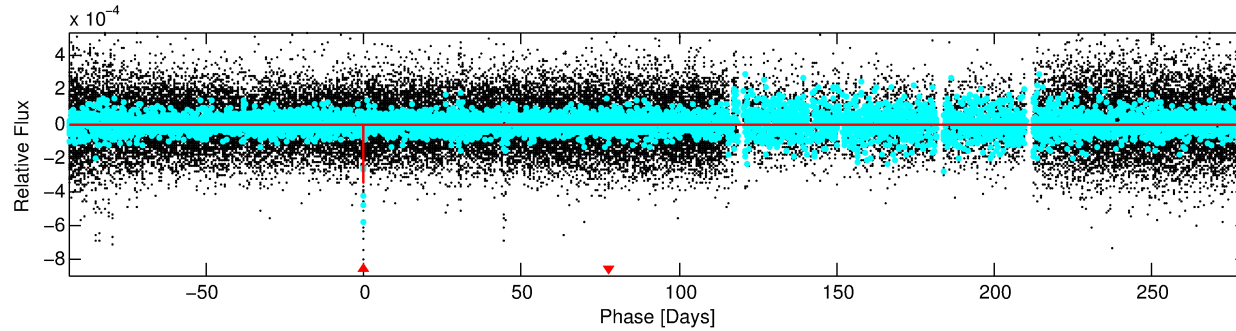
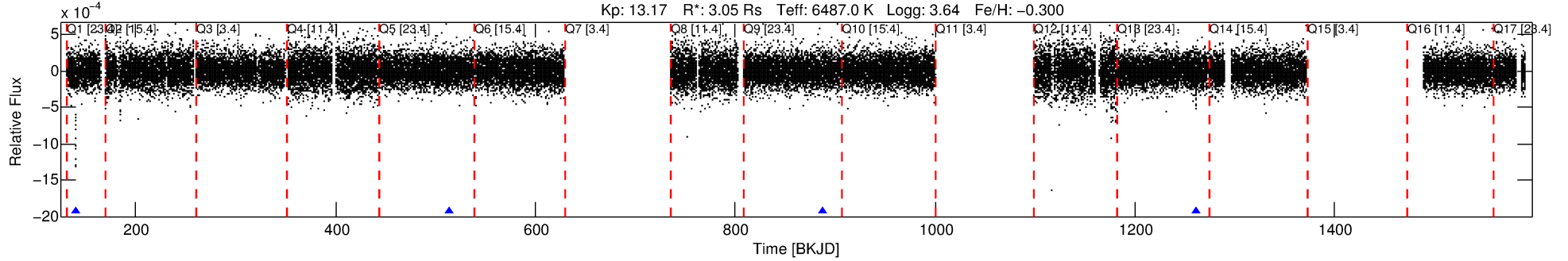
No Significant Match Found

# DV One-Page Summary

KIC: 9970525 Candidate: 1 of 1 Period: 373.759 d

KOI: K00154 Corr: No Ephemeris Match

Kp: 13.17 R\*: 3.05 Rs Teff: 6487.0 K Logg: 3.64 Fe/H: -0.300



## DV Fit Results:

Period = 373.75937 [0.00493] d  
Epoch = 139.7228 [0.0093] BKJD  
Rp/R\* = 0.0183 [0.0075]  
a/R\* = 291.25 [642.08]  
b = 0.67 [1.84]  
Seff = 10.97 [5.95]  
Teq = 464 [63] K  
Rp = 6.09 [3.34] Re  
a = 1.1615 [0.3935] AU  
Ag = 1808.63 [1875.00] [0.96σ]  
Teffp = 4679 [1049] K [4.01σ]

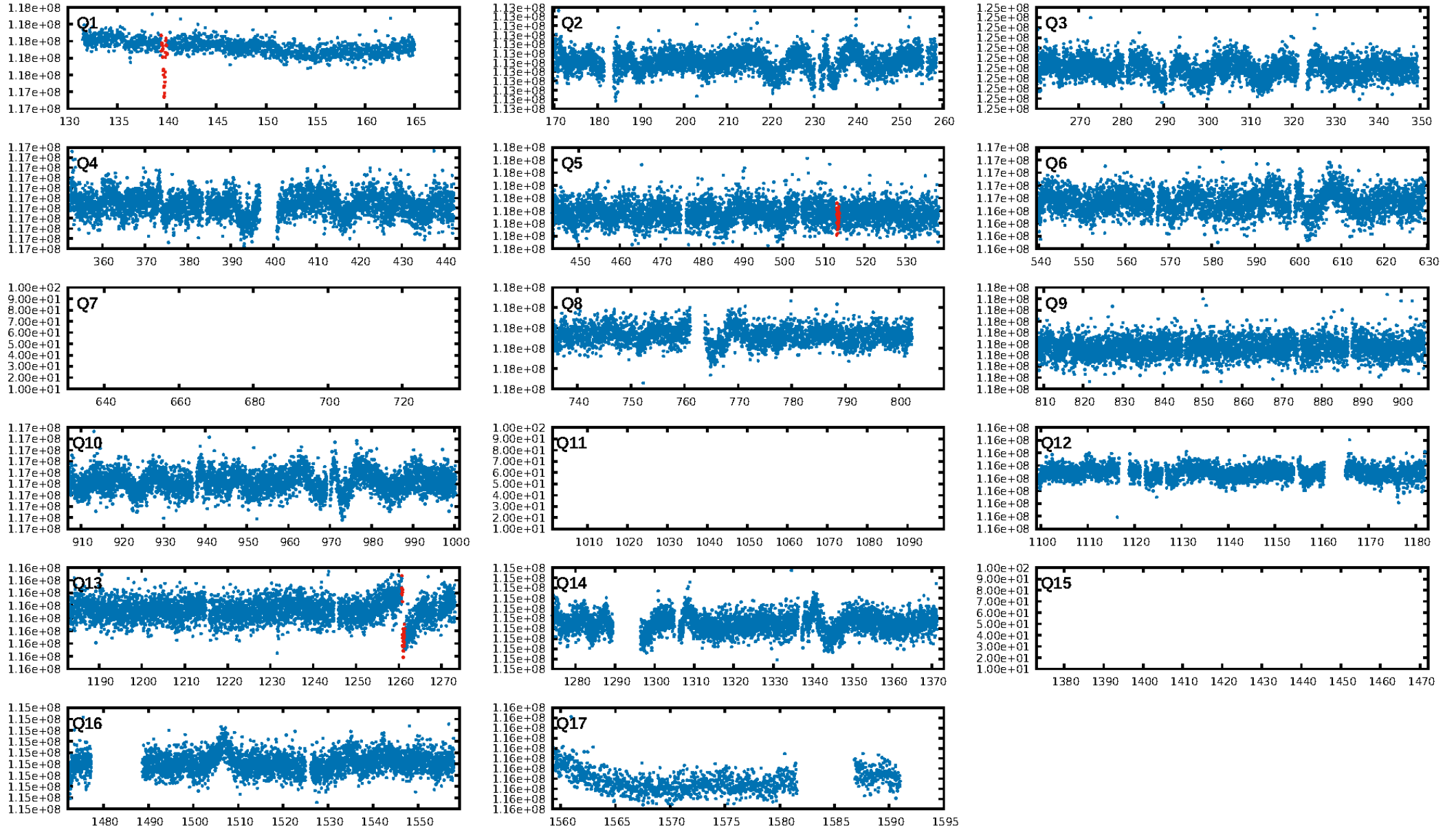
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 12.5%  
Bootstrap-pfa: 2.71e-41  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -0.1932  
Centroid-sig: 0.0%  
Centroid-so: 42.247 arcsec [46.78σ]  
OotOffset-rm: 9.091 arcsec [4.27σ]  
KicOffset-rm: 9.053 arcsec [7.66σ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

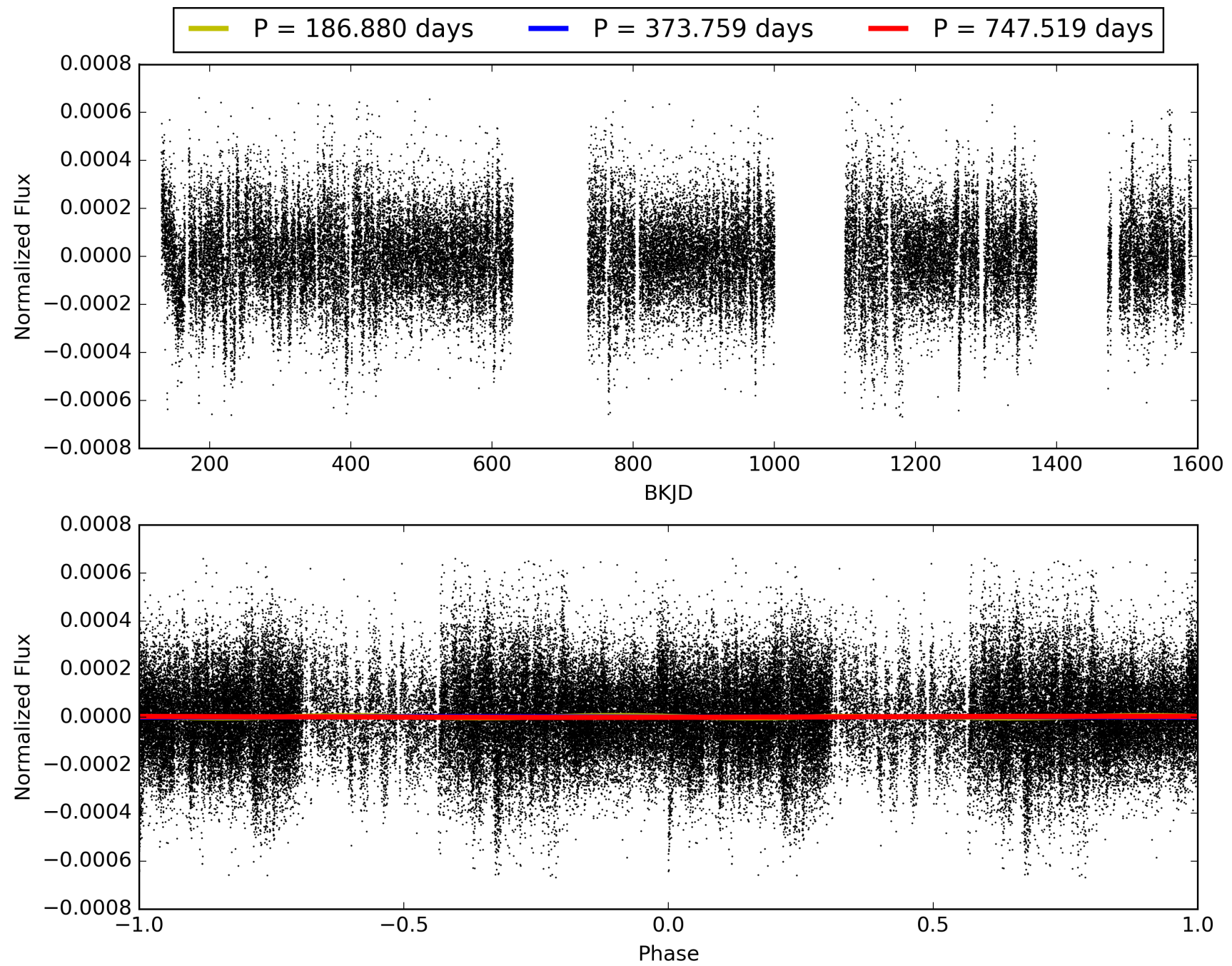
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:42:02 Z

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

# TCE 009970525-01, PDC Light Curves

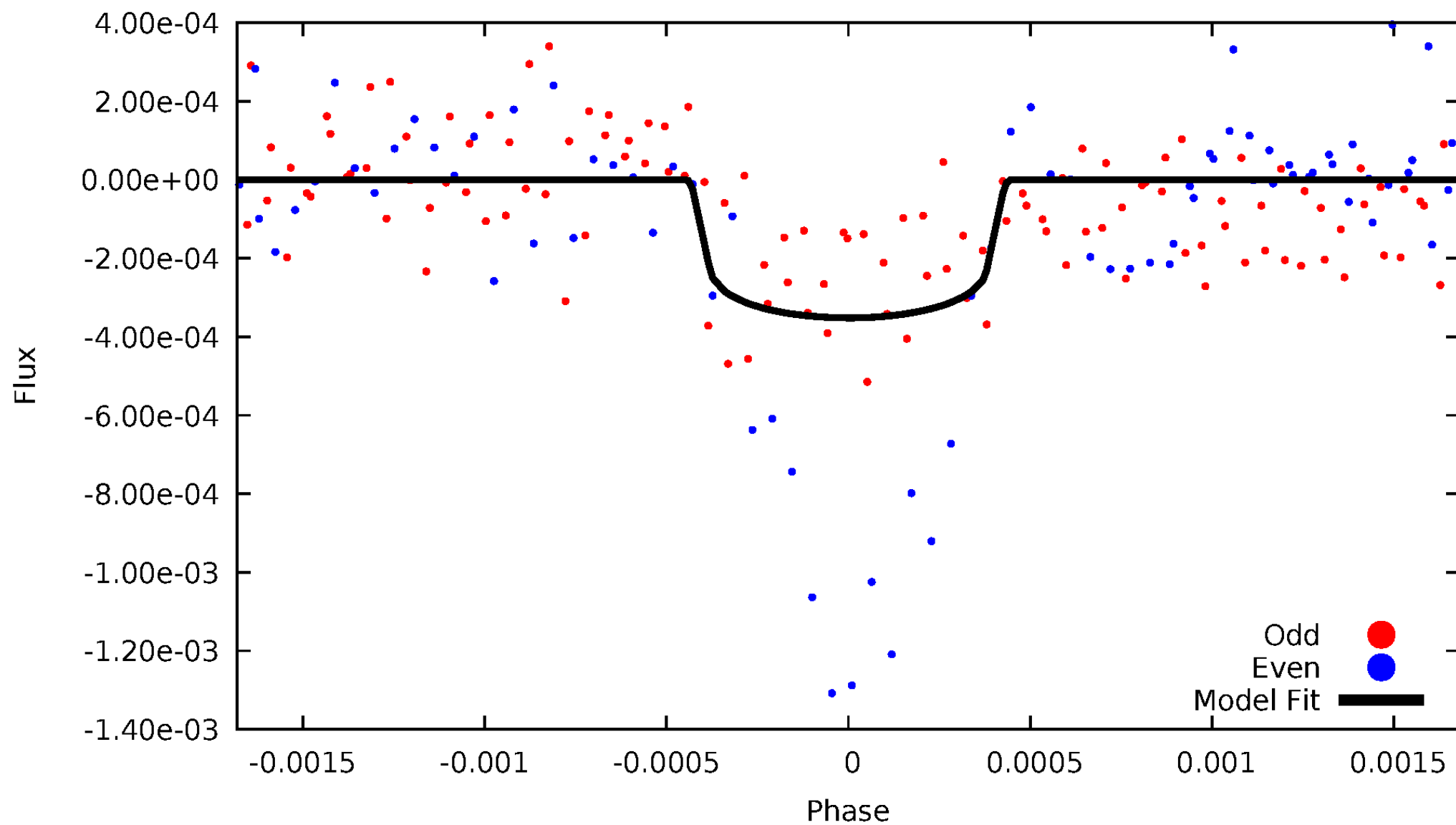


TCE 009970525-01



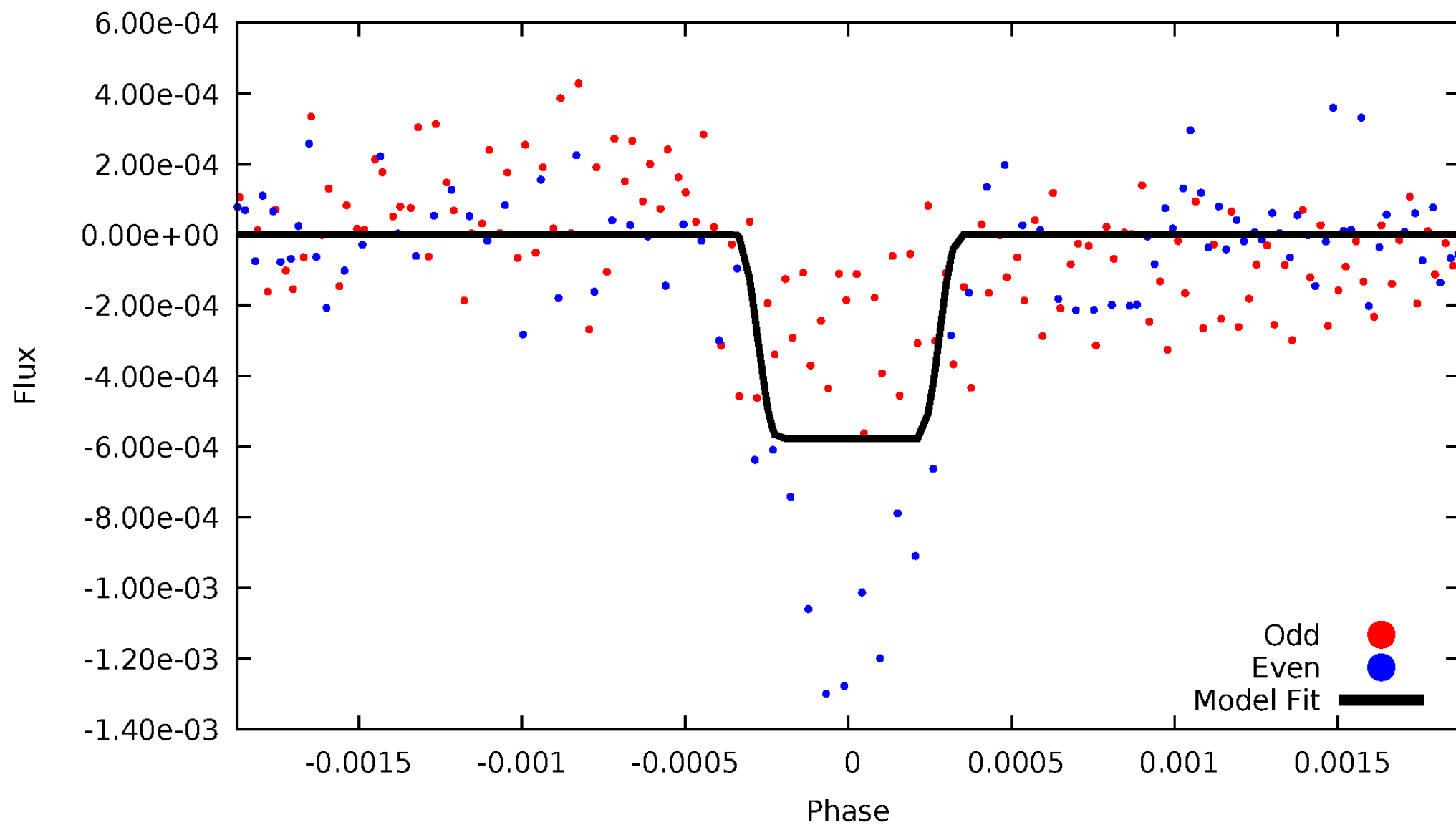
# DV Odd/Even

TCE 009970525-01



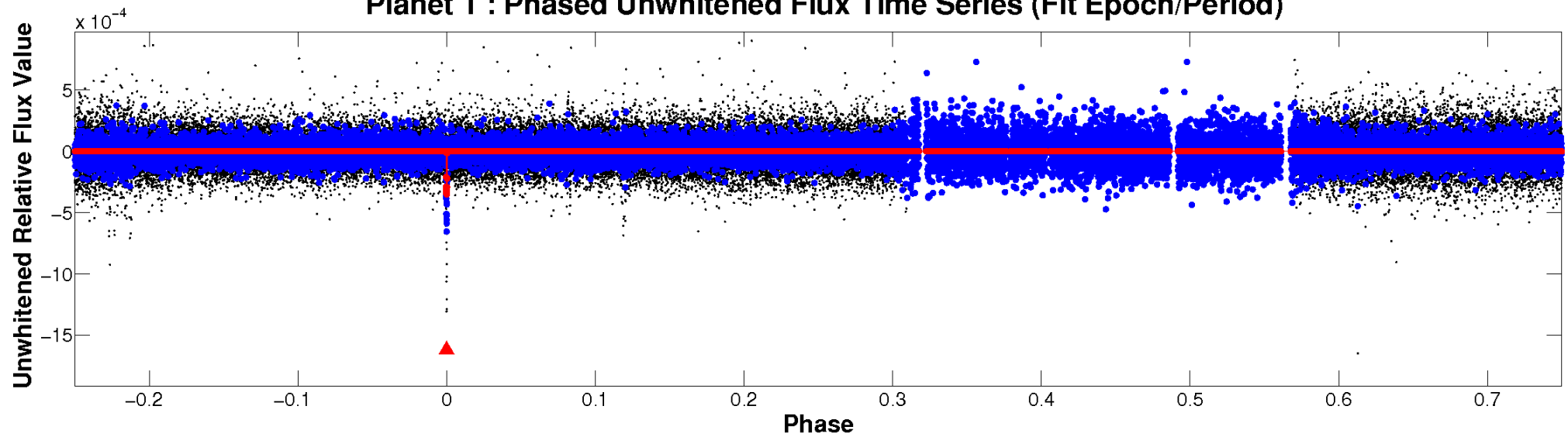
# ALT Odd/Even

TCE 009970525-01

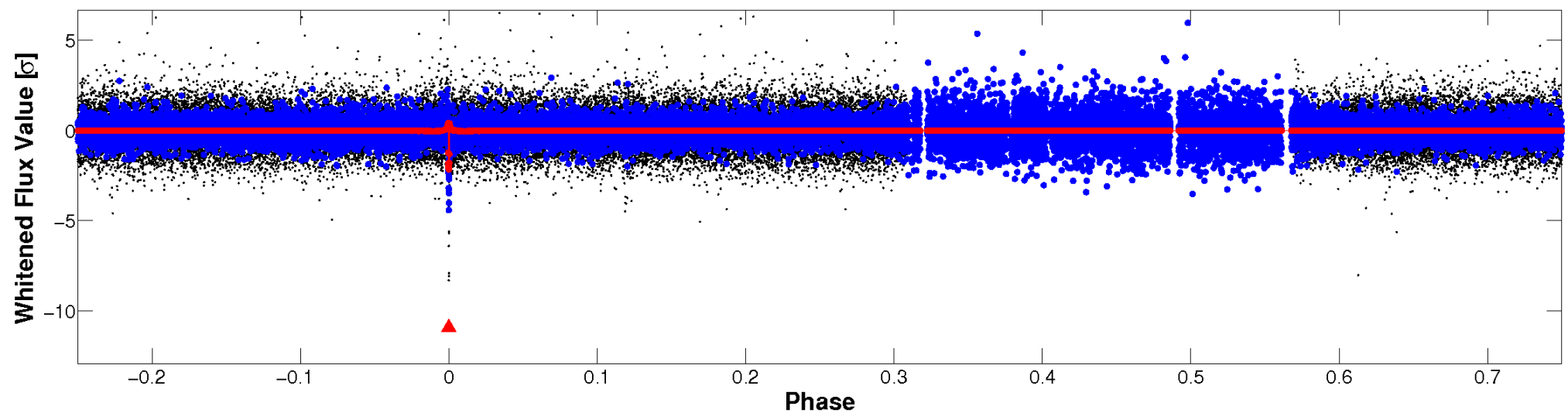


# Non-Whitened Vs. Whitened Light Curve

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

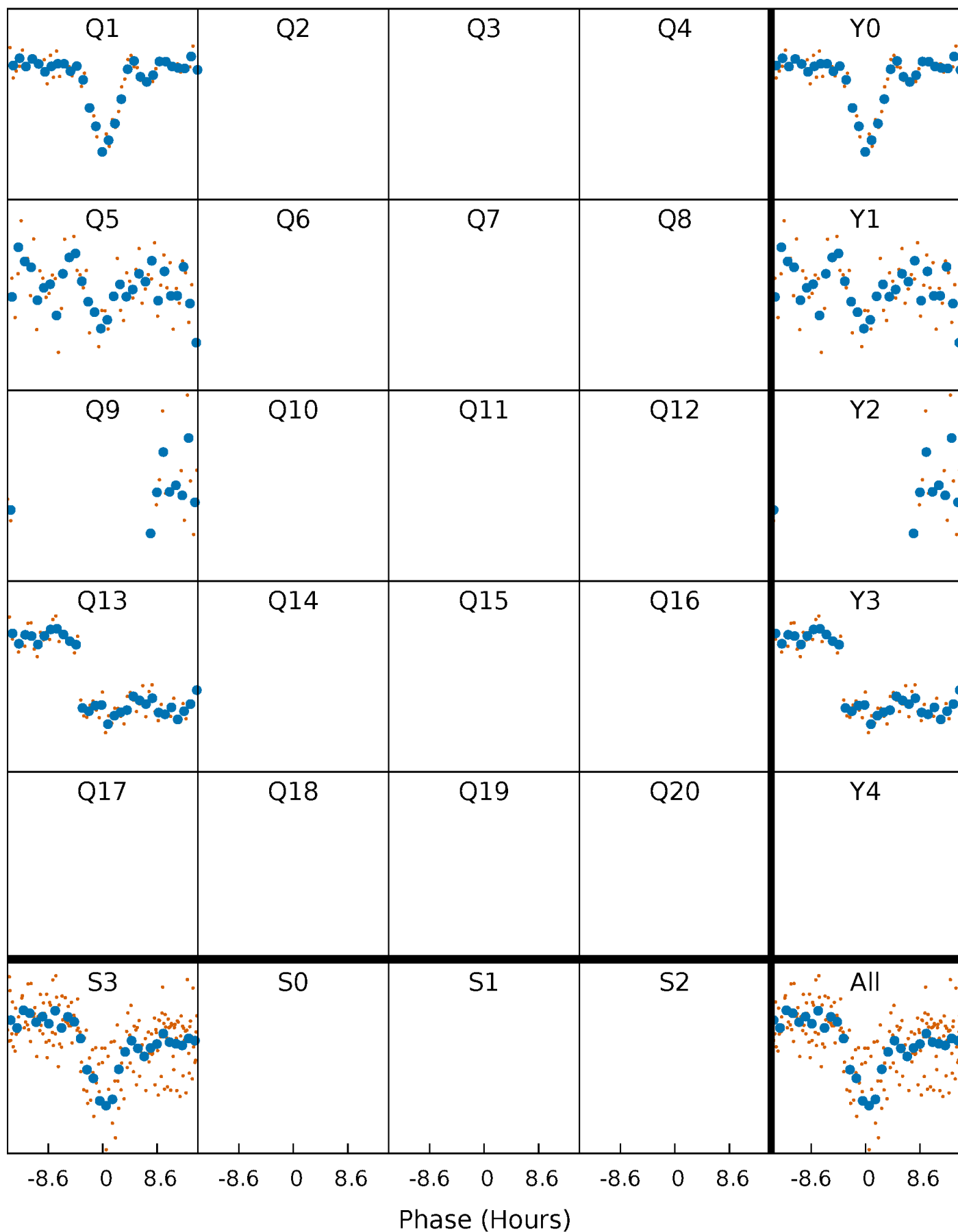


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

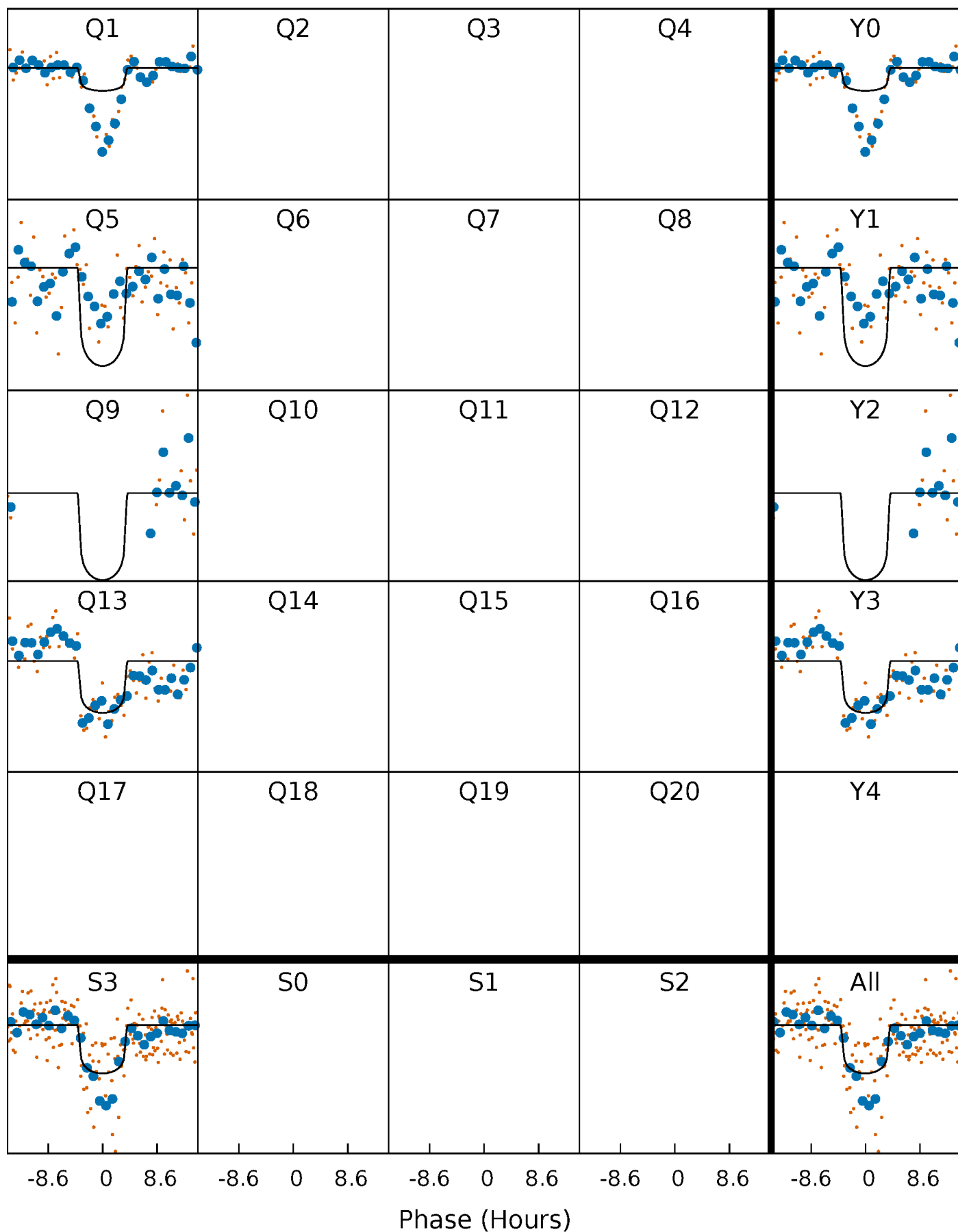
TCE 009970525-01 P=373.759366 Days  $T_0=139.722766$  (BKJD)





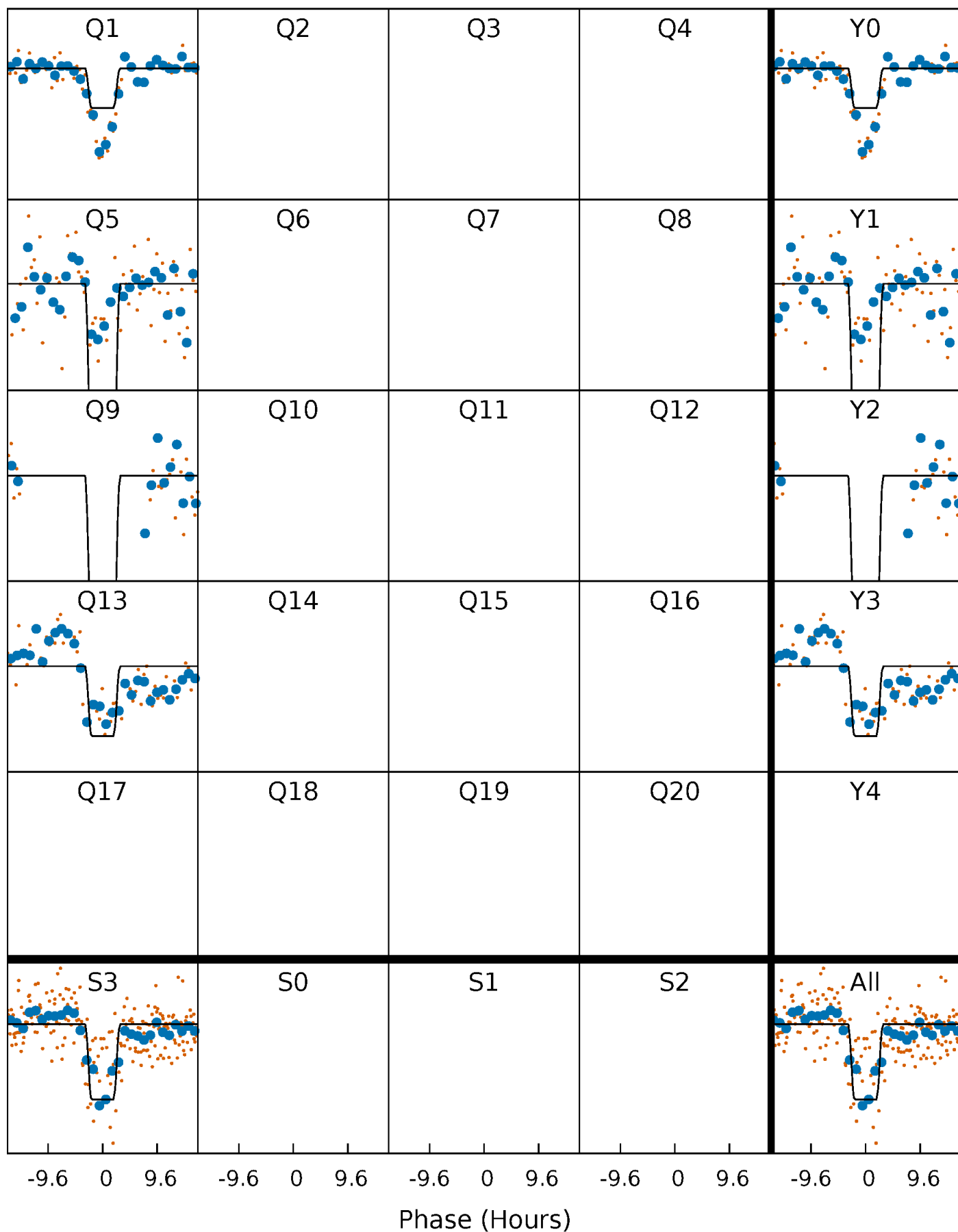
# DV Quarter-Phased Transit Curves

TCE 009970525-01 P=373.759366 Days  $T_0=139.722766$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

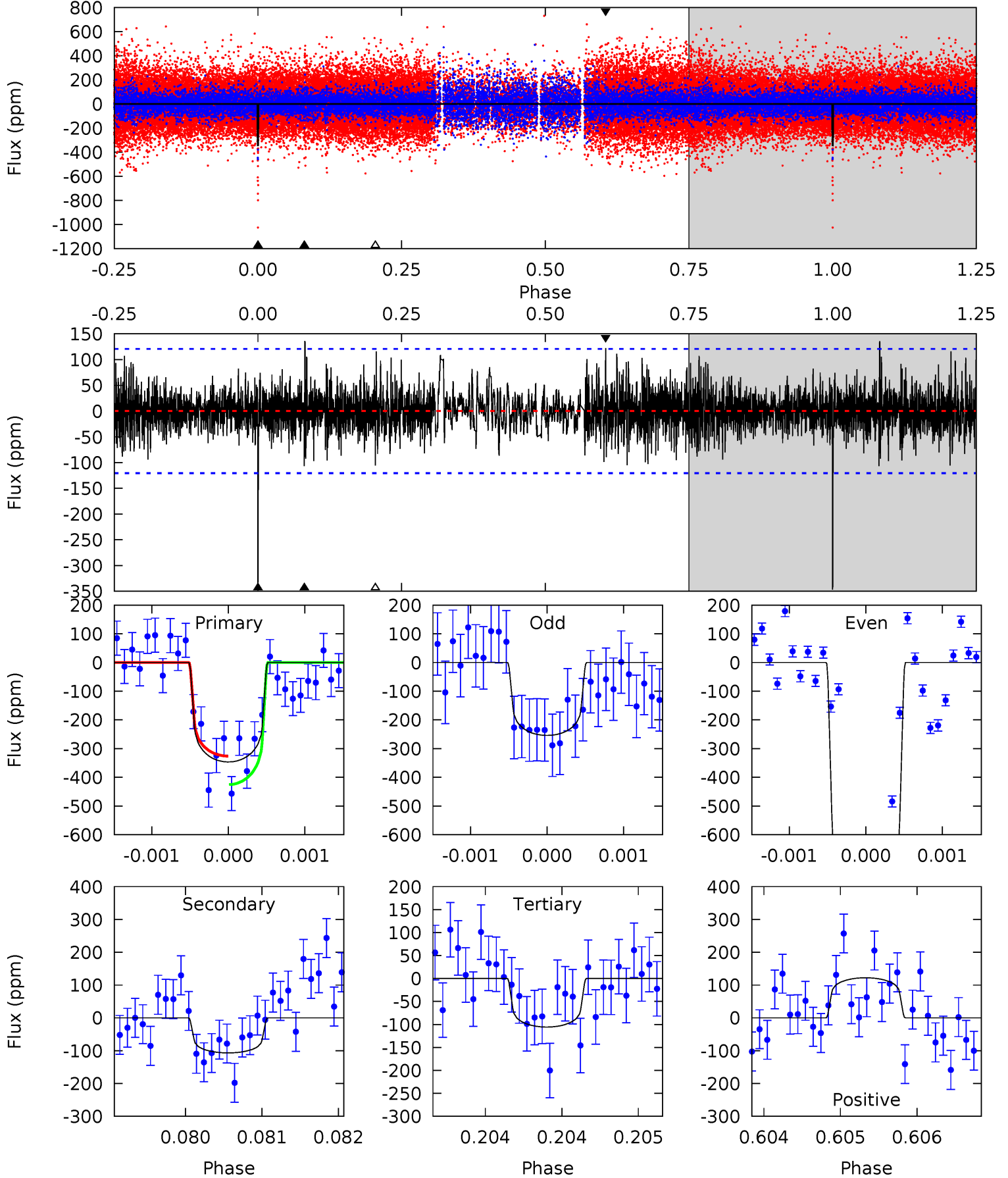
TCE 009970525-01 P=373.757057 Days  $T_0=139.731207$  (BKJD)



# DV Model-Shift Uniqueness Test

009970525-01, P = 373.759366 Days, E = 139.722766 Days

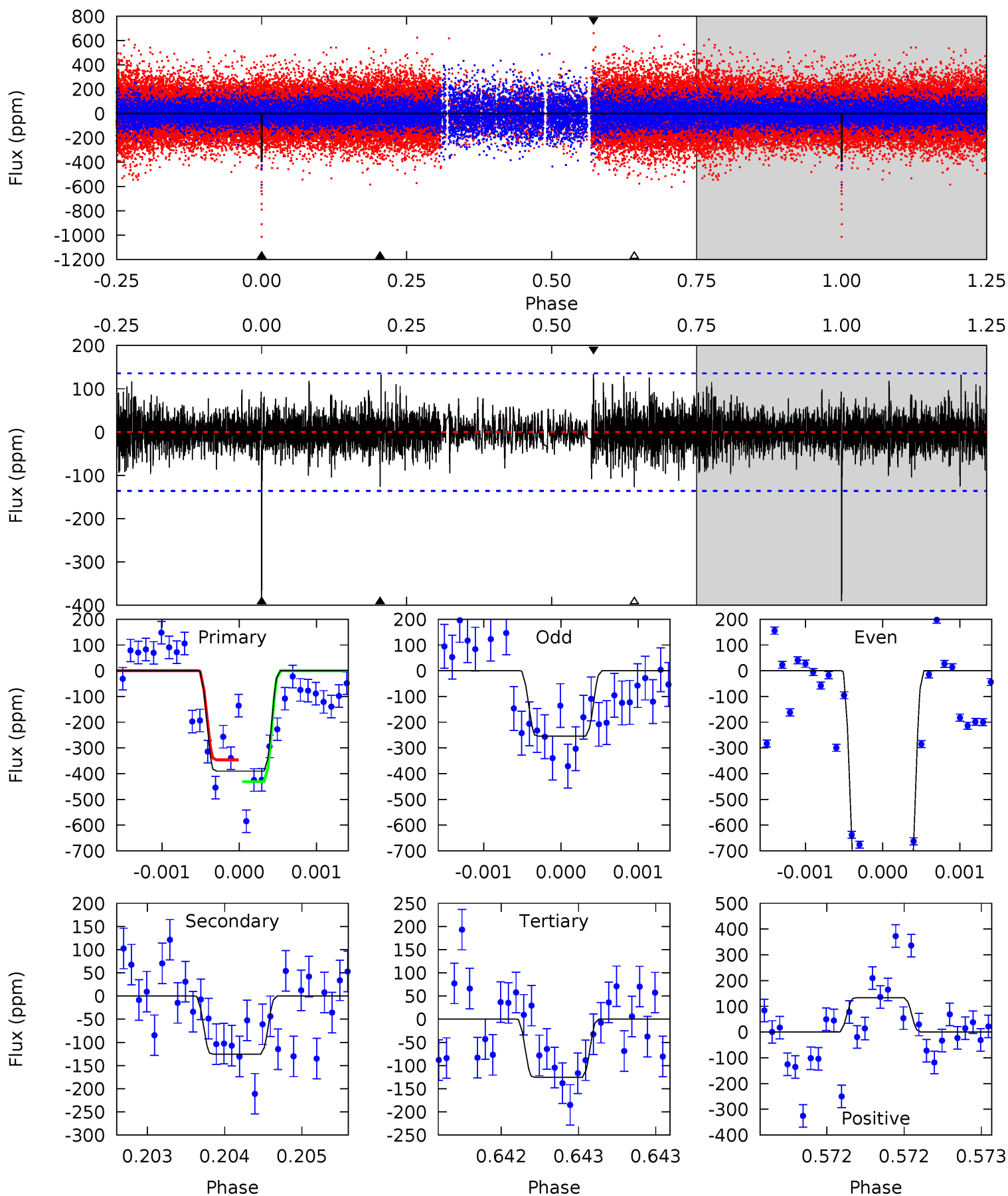
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.7	4.85	4.80	5.54	5.48	3.33	1.37	10.9	10.2	0.05	-0.70	13.7	1.22	0.28	2.28



# Alt Model-Shift Uniqueness Test

009970525-01, P = 373.757057 Days, E = 139.731207 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
15.9	5.12	5.10	5.44	5.52	3.40	1.23	10.8	10.4	0.01	-0.32	15.4	1.28	0.26	1.74



### Stellar Parameters For KIC 009970525

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6487^{+177}_{-177}$	$3.643^{+0.308}_{-0.082}$	$-0.300^{+0.350}_{-0.250}$	$3.054^{+0.477}_{-1.112}$	$1.496^{+0.256}_{-0.313}$	$0.074^{+0.173}_{-0.019}$
	+3%/-3%	+8%/-2%	+117%/-83%	+16%/-36%	+17%/-21%	+234%/-26%
Source	PHO1	FLK73	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 009970525-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-107 \pm 22$	$5.73^{+2.66}_{-2.36}$	$635^{+36}_{-56}$	$4919^{+1402}_{-644}$	$2520^{+4553}_{-1403}$
Alt.	$-126 \pm 25$	$7.60^{+2.80}_{-2.61}$	$635^{+35}_{-52}$	$4582^{+731}_{-502}$	$1643^{+2082}_{-805}$

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

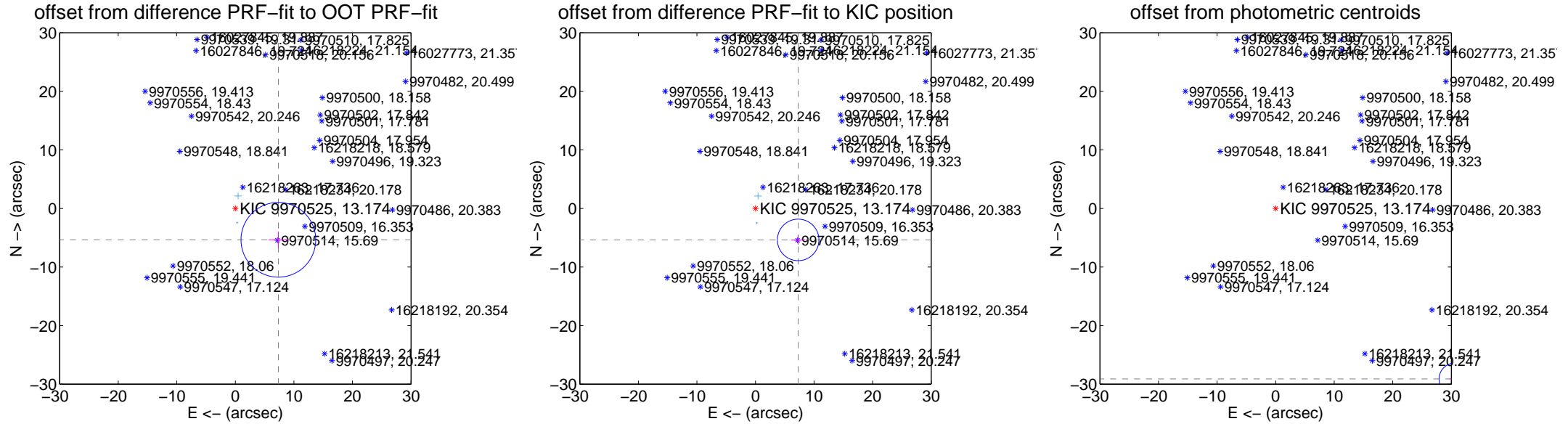
## DV Centroid Data

Supplemental centroid analysis for 009970525-01. Kepler magnitude: 13.17. Transit SNR 12.15

There are 3 quarters with good PRF difference image offsets

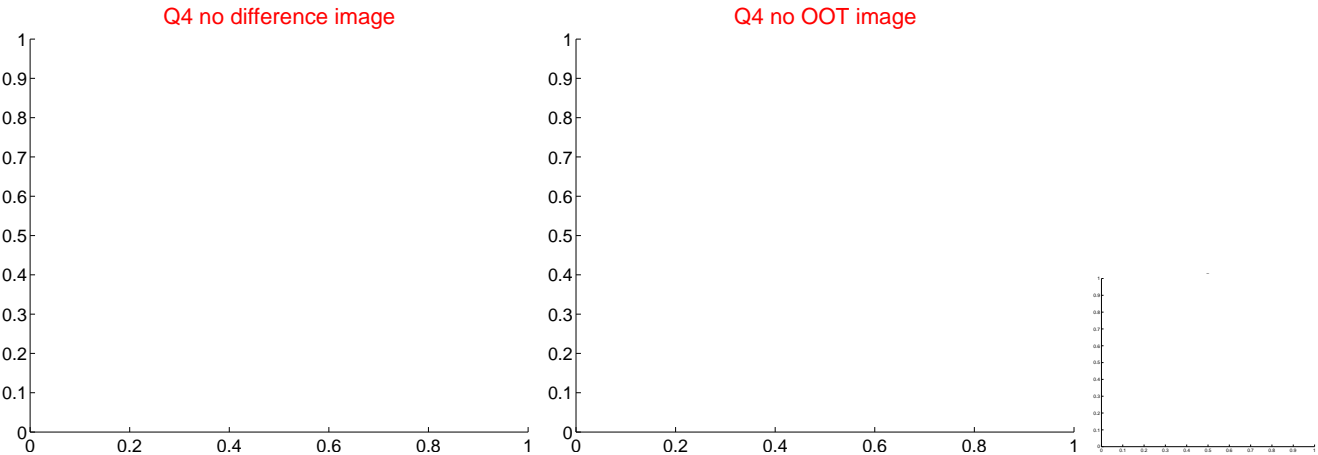
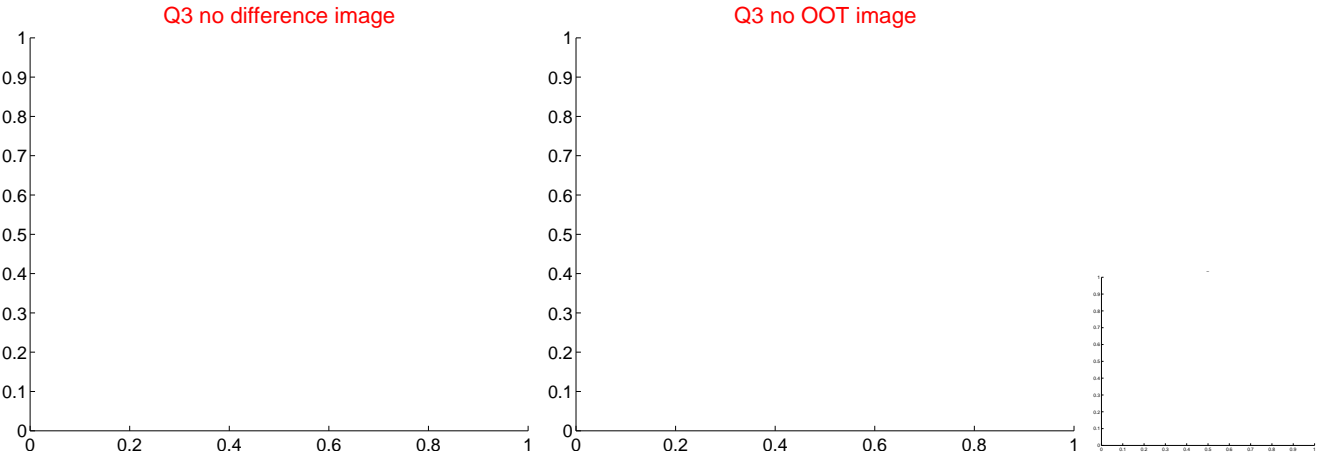
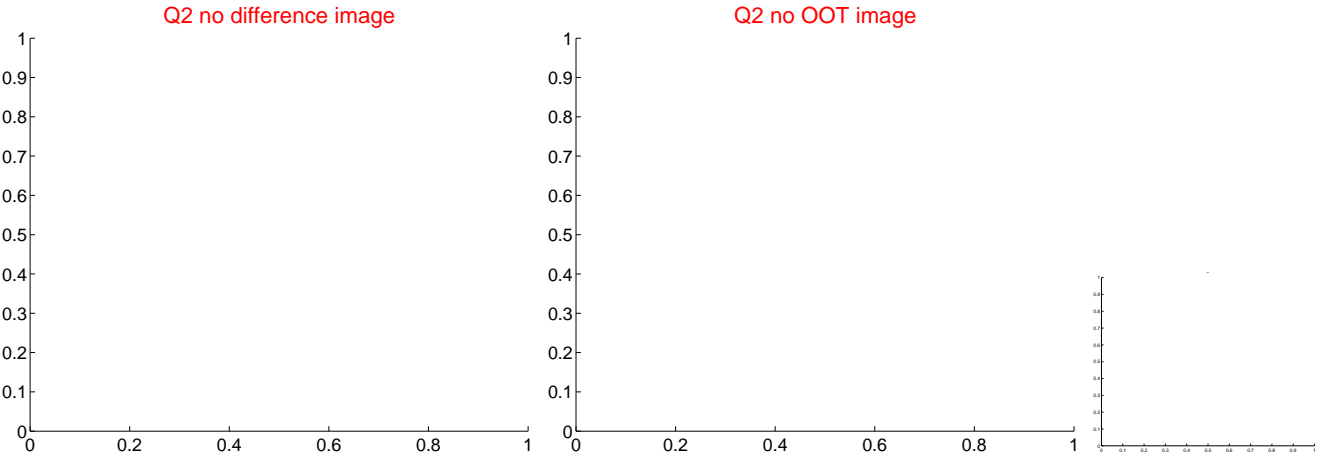
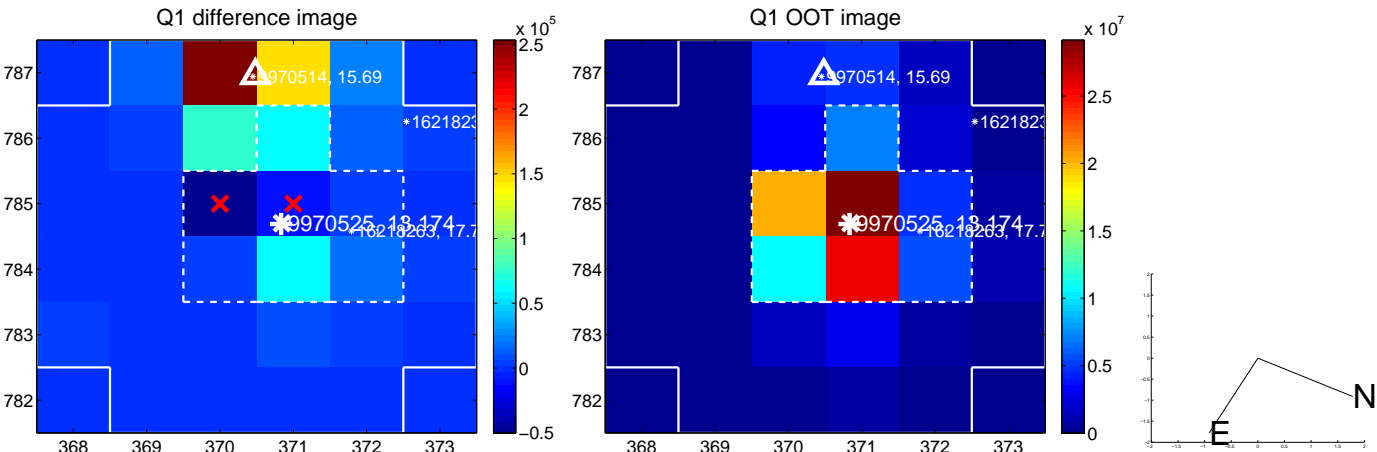
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$9.091 \pm 2.127$	4.27	$-7.348 \pm 1.647$	$-5.352 \pm 1.413$
PRF-fit source offset from KIC position	$9.053 \pm 1.181$	7.66	$-7.287 \pm 1.198$	$-5.372 \pm 0.802$
photometric centroid source offset	$42.25 \pm 0.90$	46.78	$-30.62 \pm 0.94$	$-29.12 \pm 0.86$

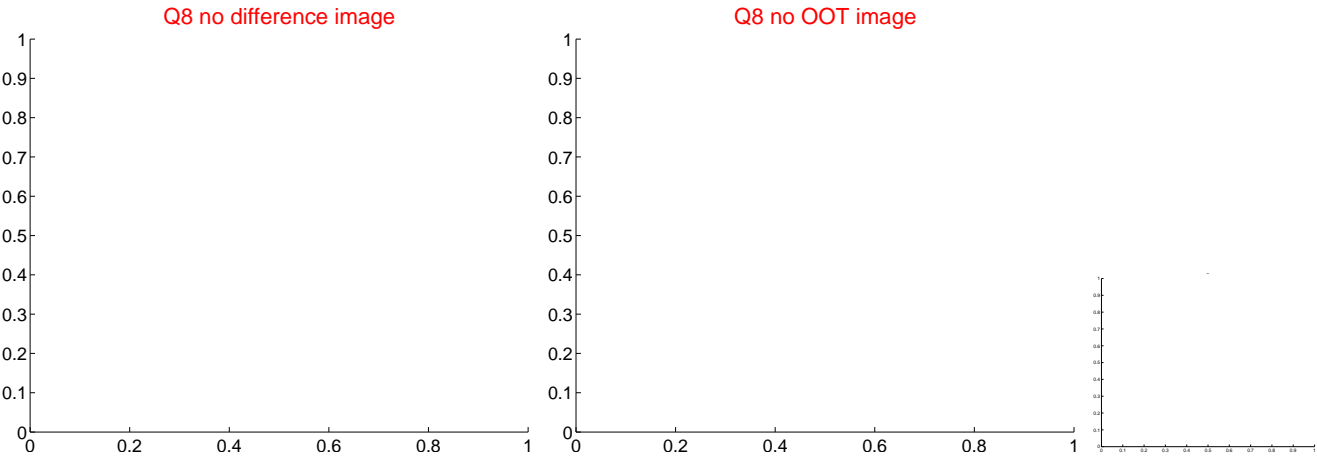
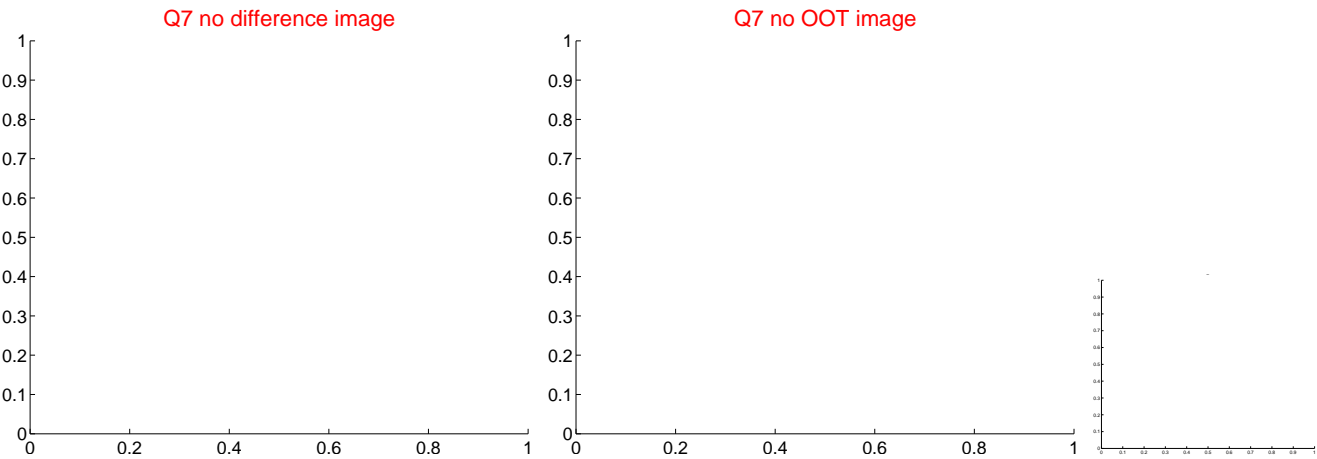
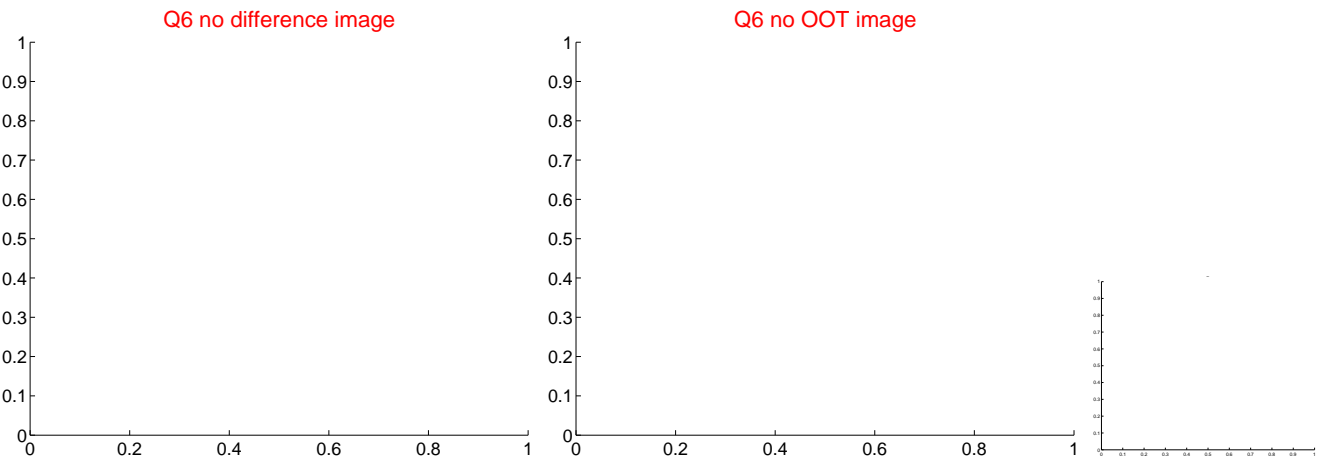
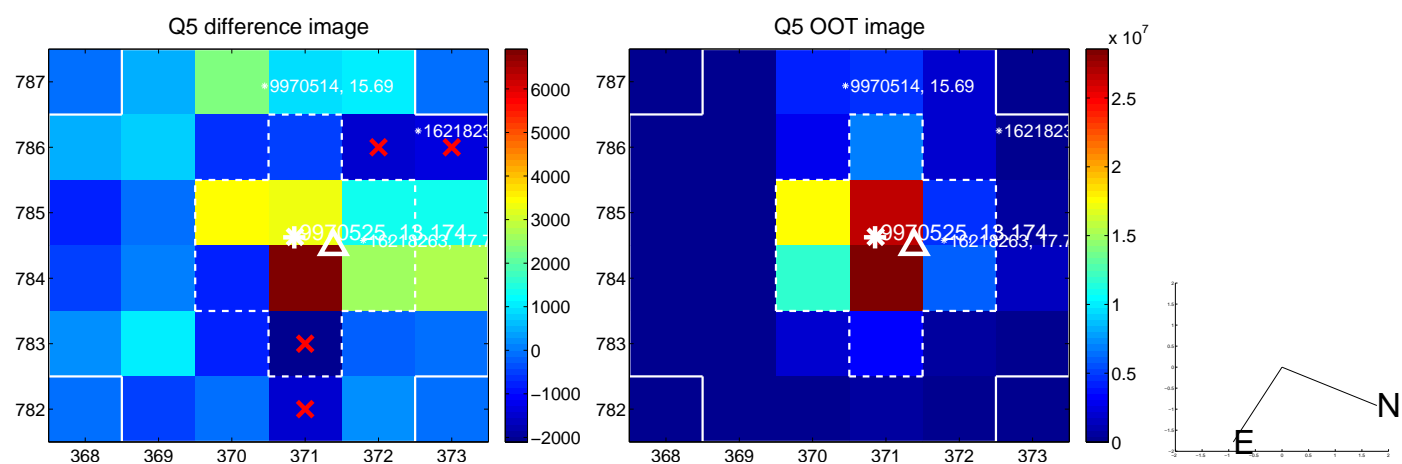


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

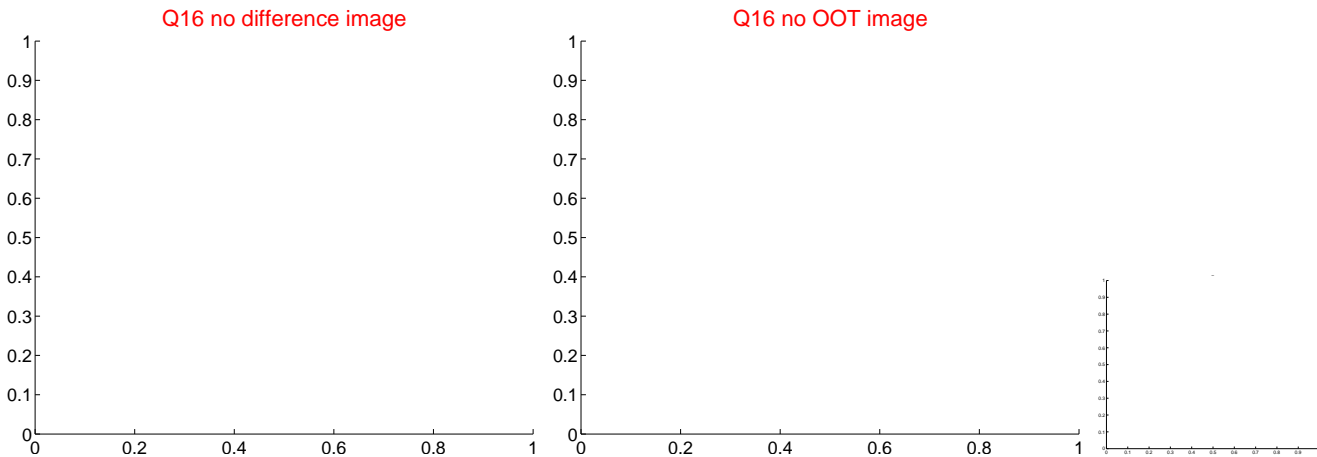
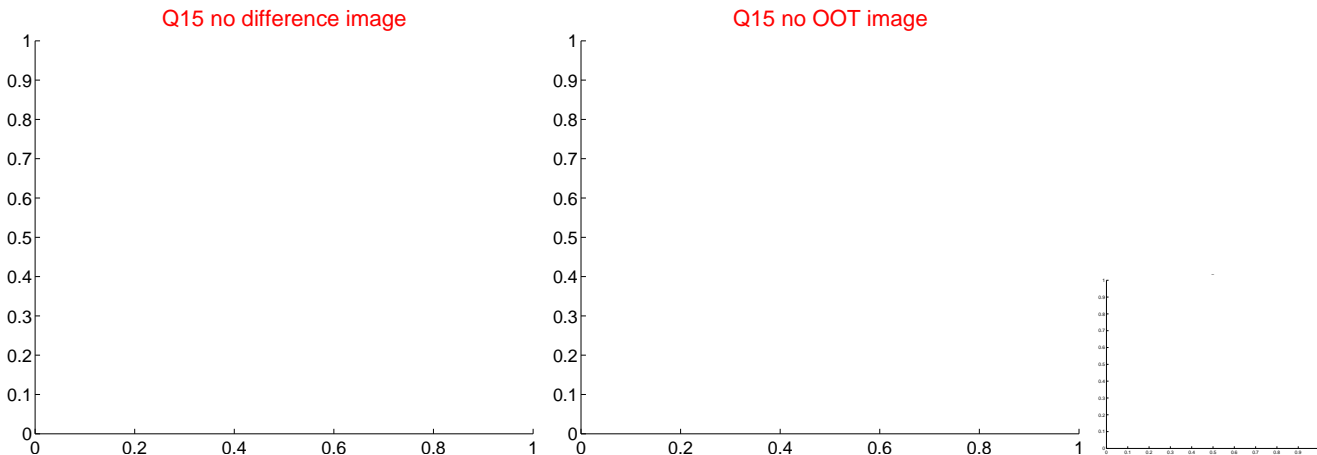
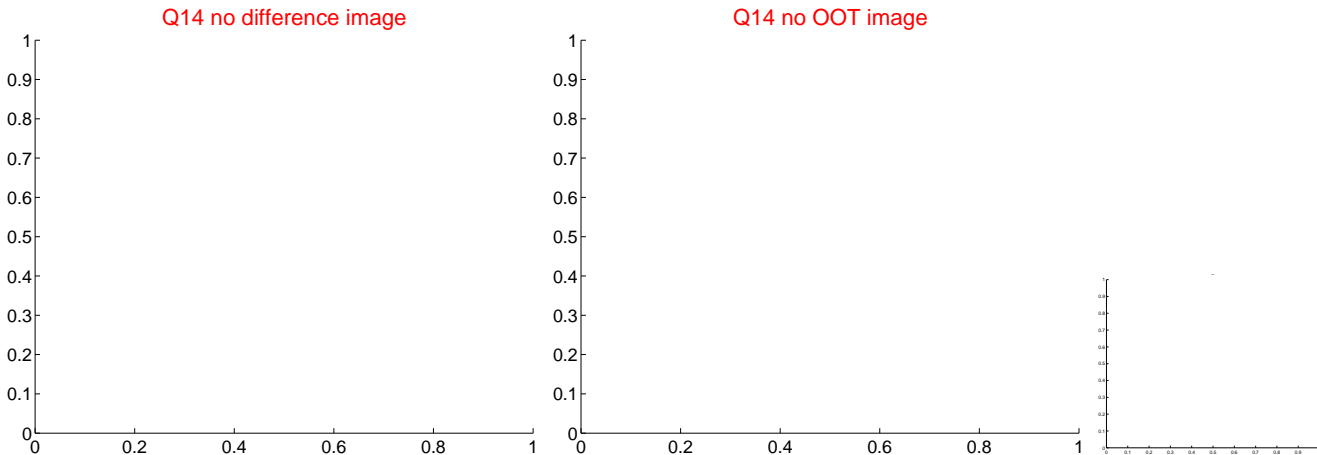
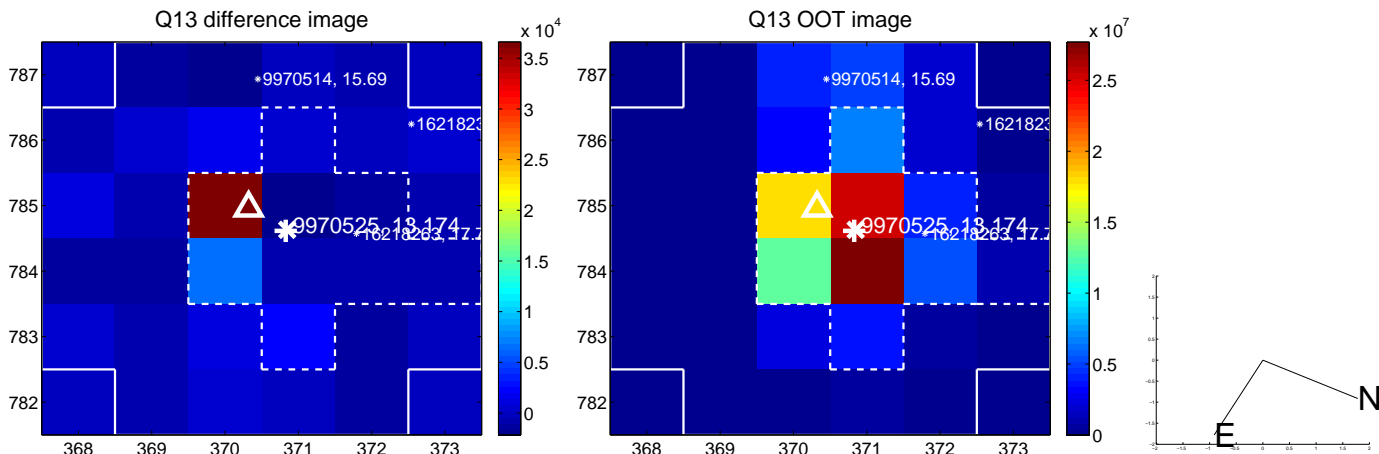




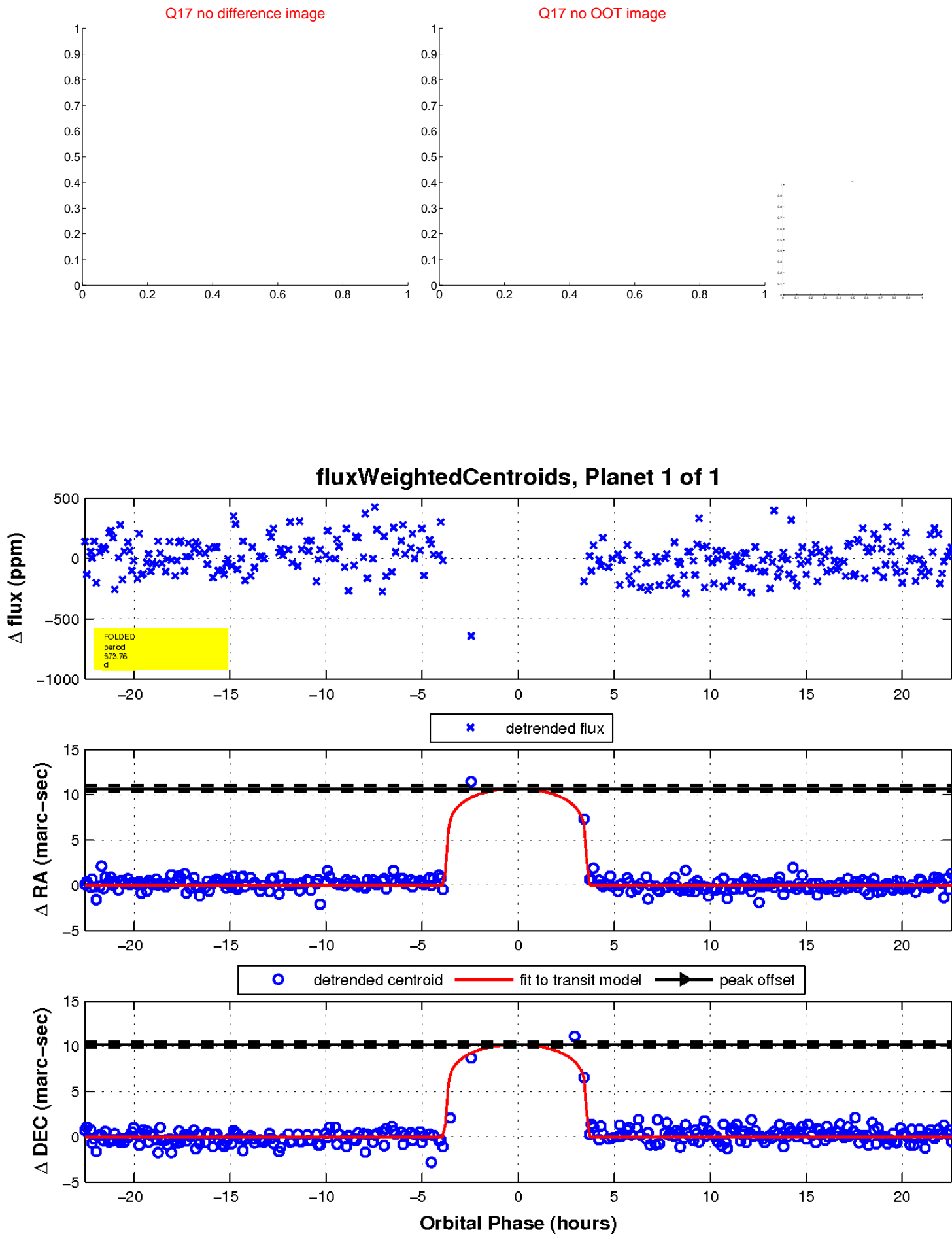
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

