

# KIC 009967646

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009967646-01	OBS	No	151.690028	221.305715	1059.1	3.423	7.2	7.9	15.15	5072	53.71	233.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009967646-01	OBS	FP	0.02	1	0	0	0	INDIV_TRANS_CHASES—MOD_NONUNIQ_ALT—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.

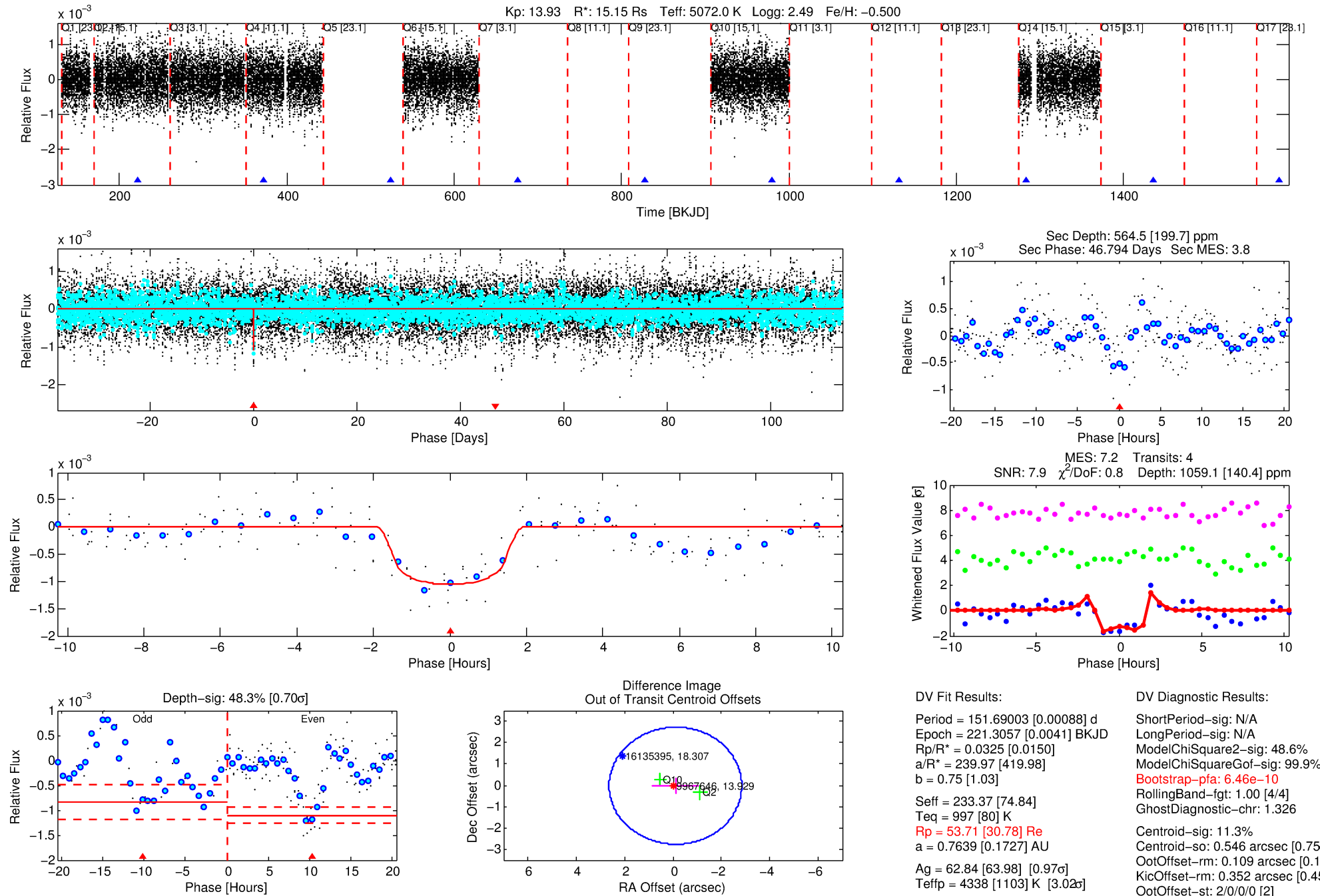
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009967646-01

No Significant Match Found

# DV One-Page Summary

KIC: 9967646 Candidate: 1 of 1 Period: 151.690 d



## DV Fit Results:

Period = 151.69003 [0.00088] d  
Epoch = 221.3057 [0.0041] BKJD  
Rp/R\* = 0.0325 [0.0150]  
a/R\* = 239.97 [419.98]  
b = 0.75 [1.03]  
Seff = 233.37 [74.84]  
Teff = 997 [80] K  
Rp = 53.71 [30.78] Re  
a = 0.7639 [0.1727] AU  
Ag = 62.84 [63.98] [0.97 $\sigma$ ]  
Teffp = 4338 [1103] K [3.02 $\sigma$ ]

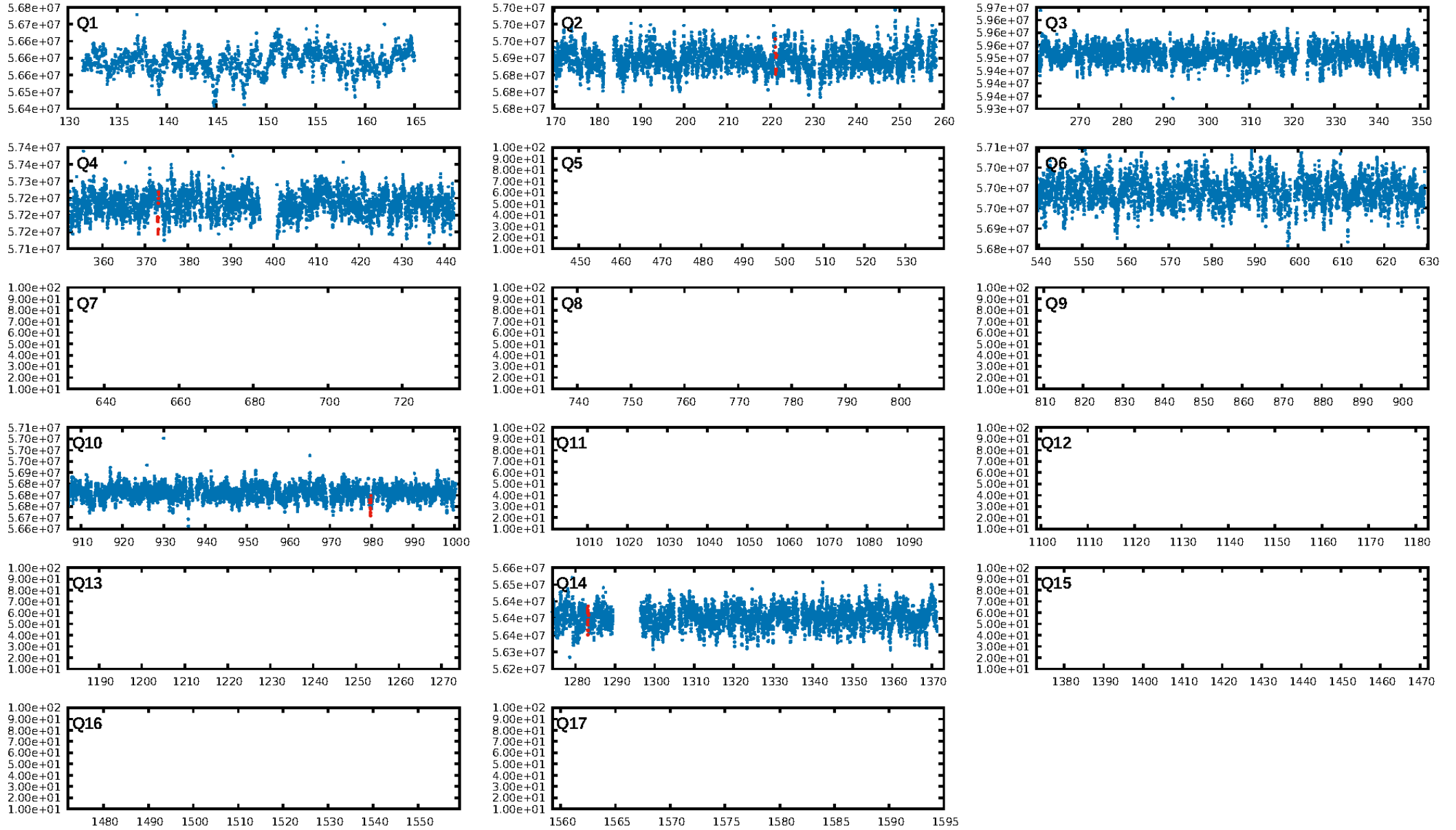
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 48.6%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 6.46e-10  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.326  
Centroid-sig: 11.3%  
Centroid-so: 0.546 arcsec [0.75 $\sigma$ ]  
OotOffset-rm: 0.109 arcsec [0.12 $\sigma$ ]  
KicOffset-rm: 0.352 arcsec [0.45 $\sigma$ ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

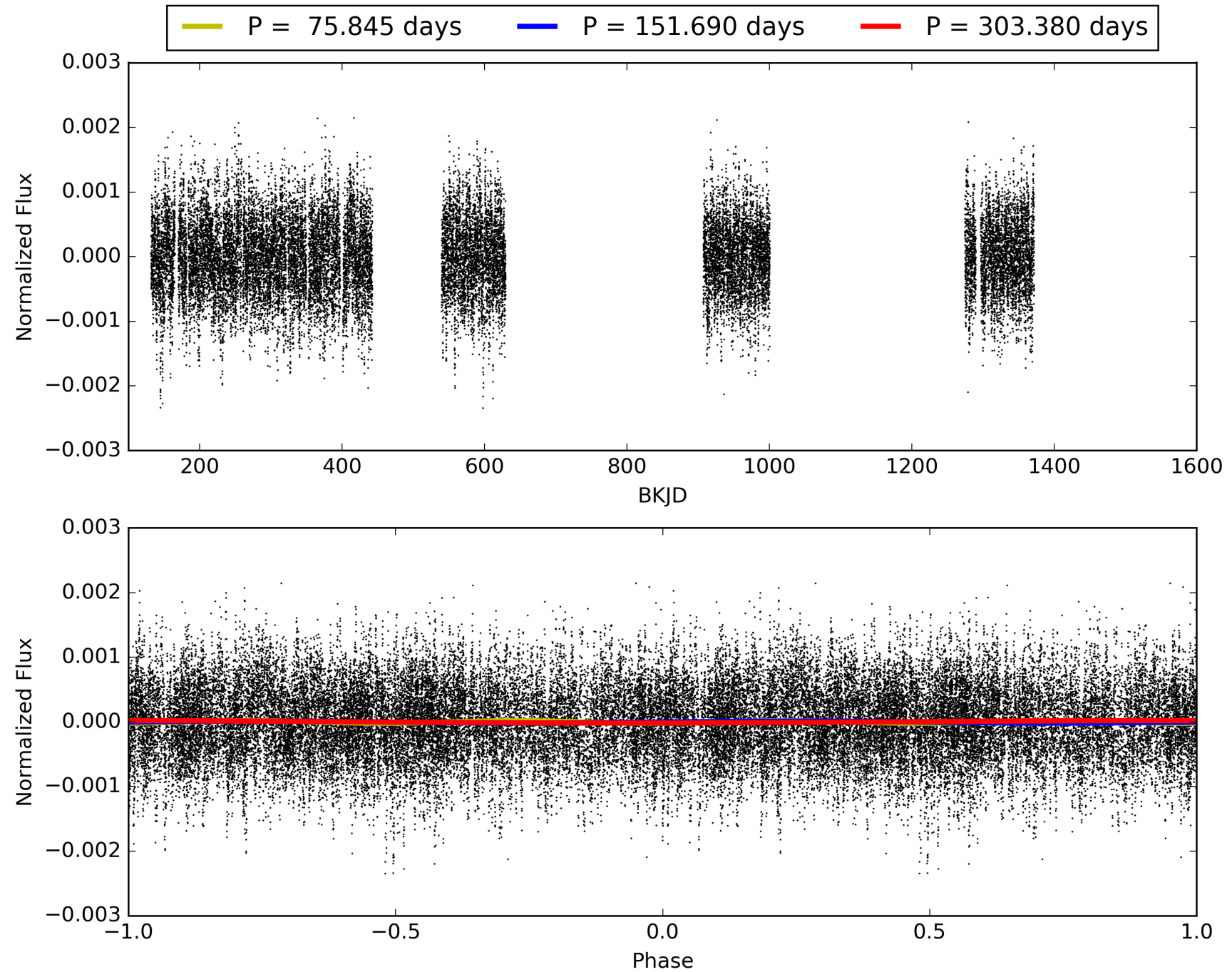
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:34:31 Z

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

# TCE 009967646-01, PDC Light Curves

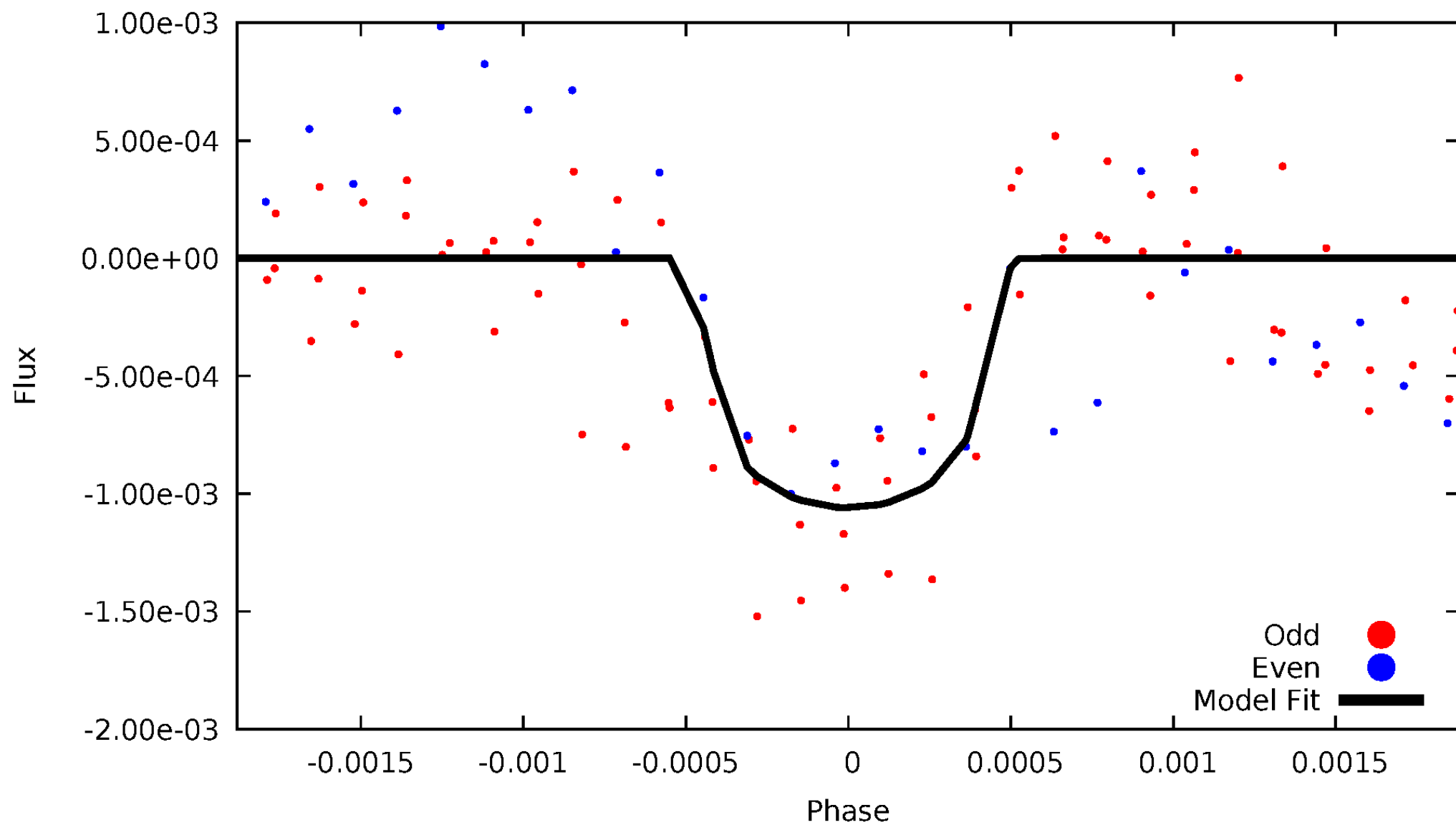


TCE 009967646-01



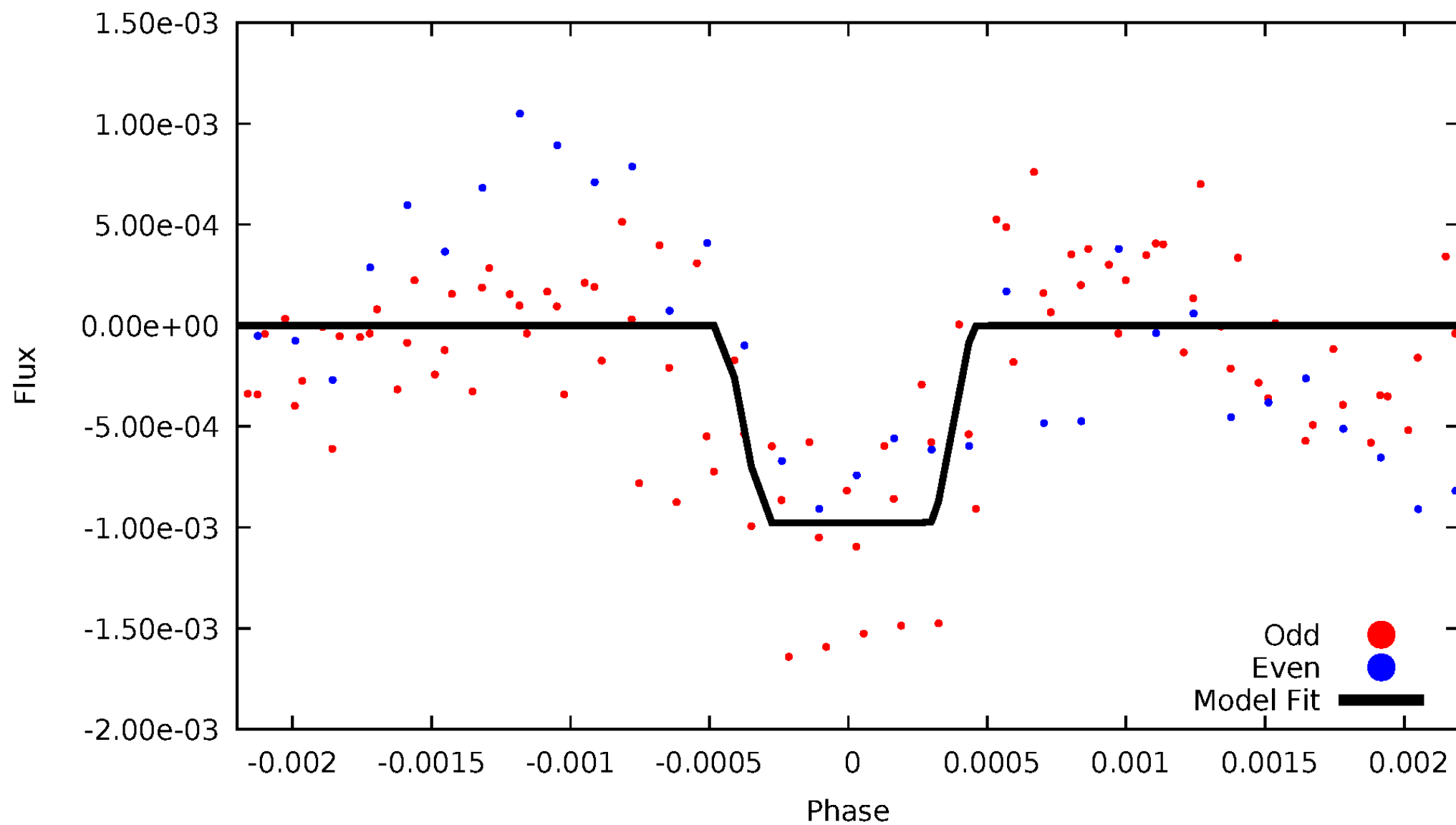
# DV Odd/Even

TCE 009967646-01

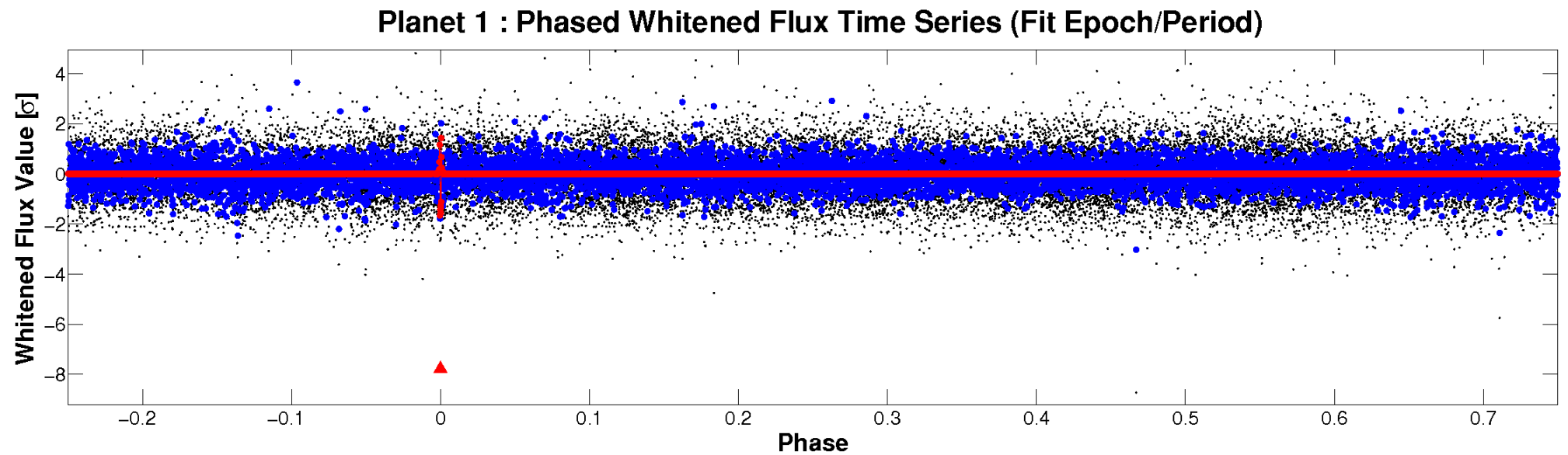
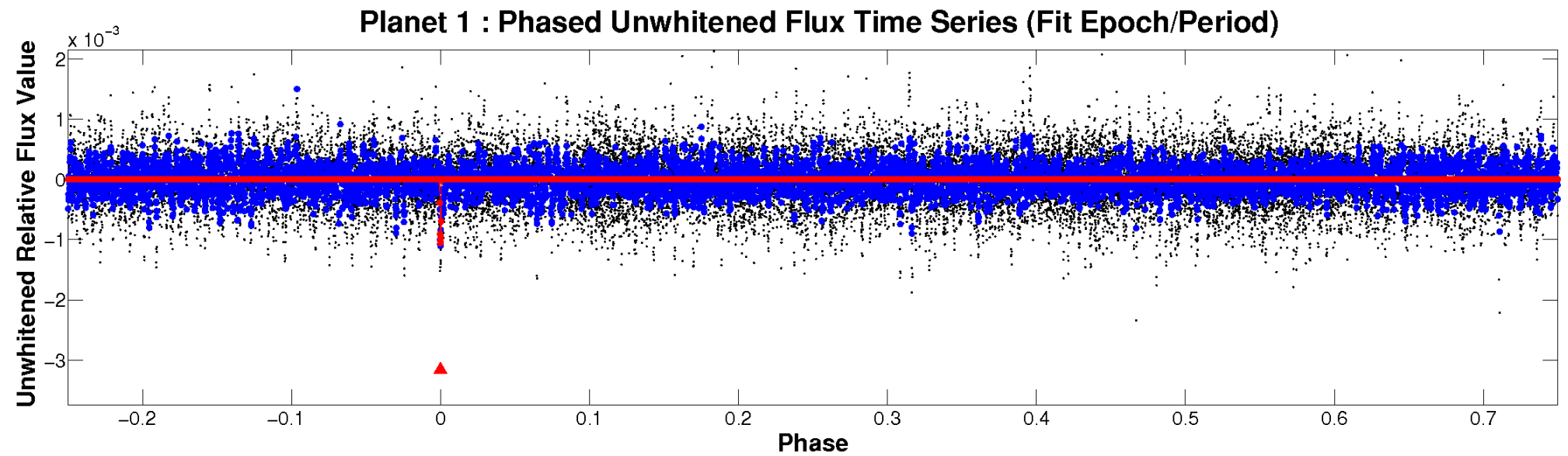


# ALT Odd/Even

TCE 009967646-01

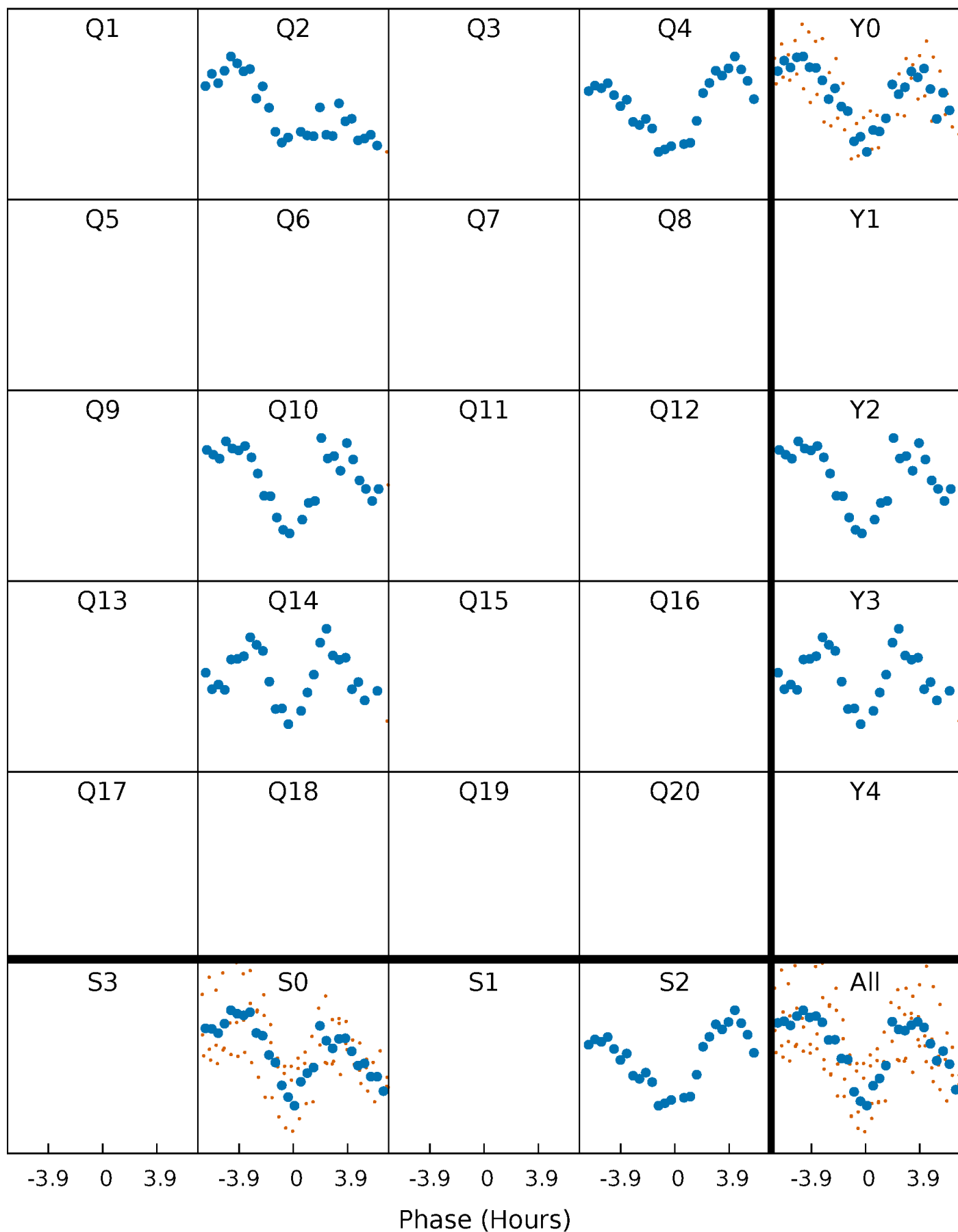


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

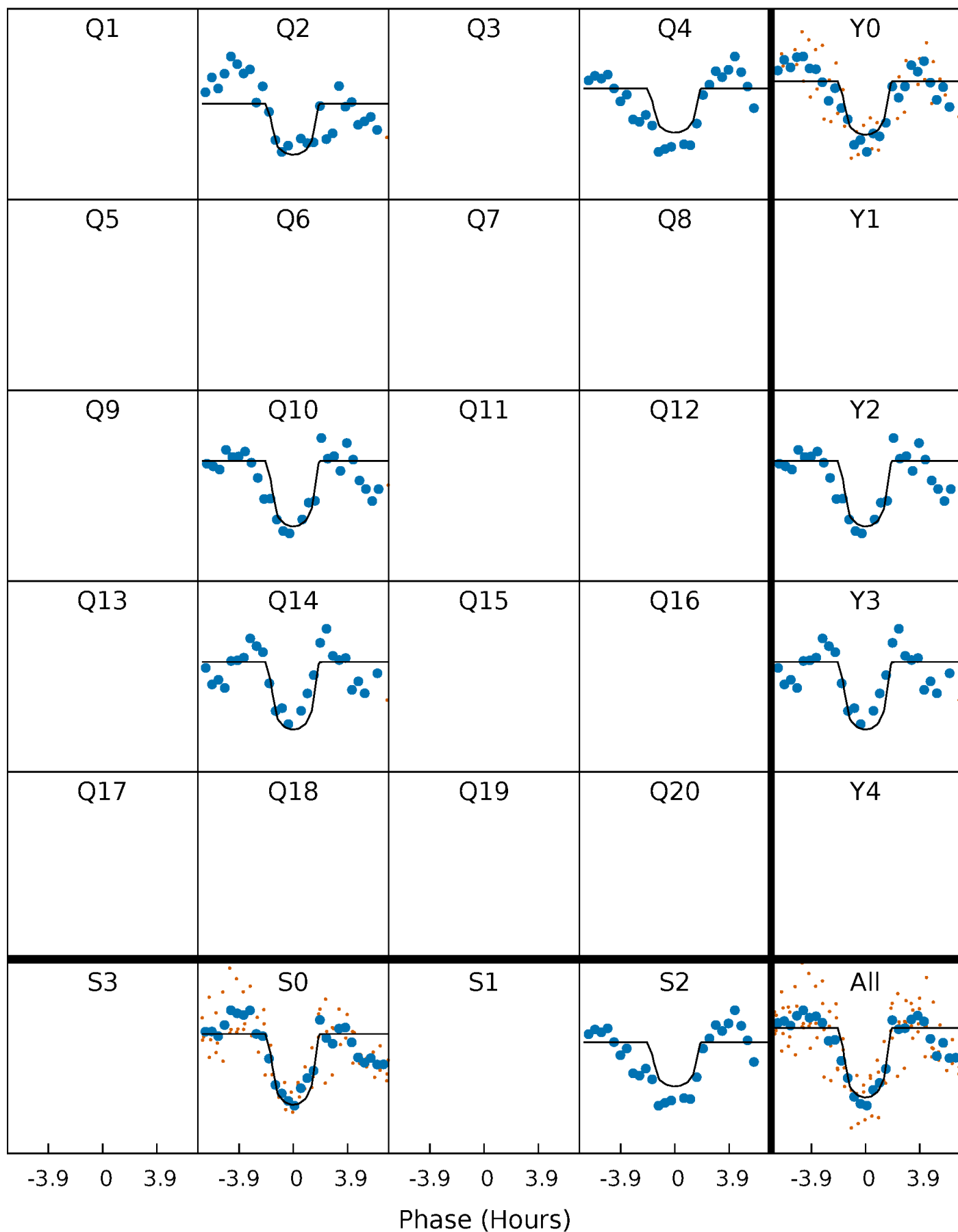
TCE 009967646-01 P=151.690028 Days  $T_0=221.305715$  (BKJD)





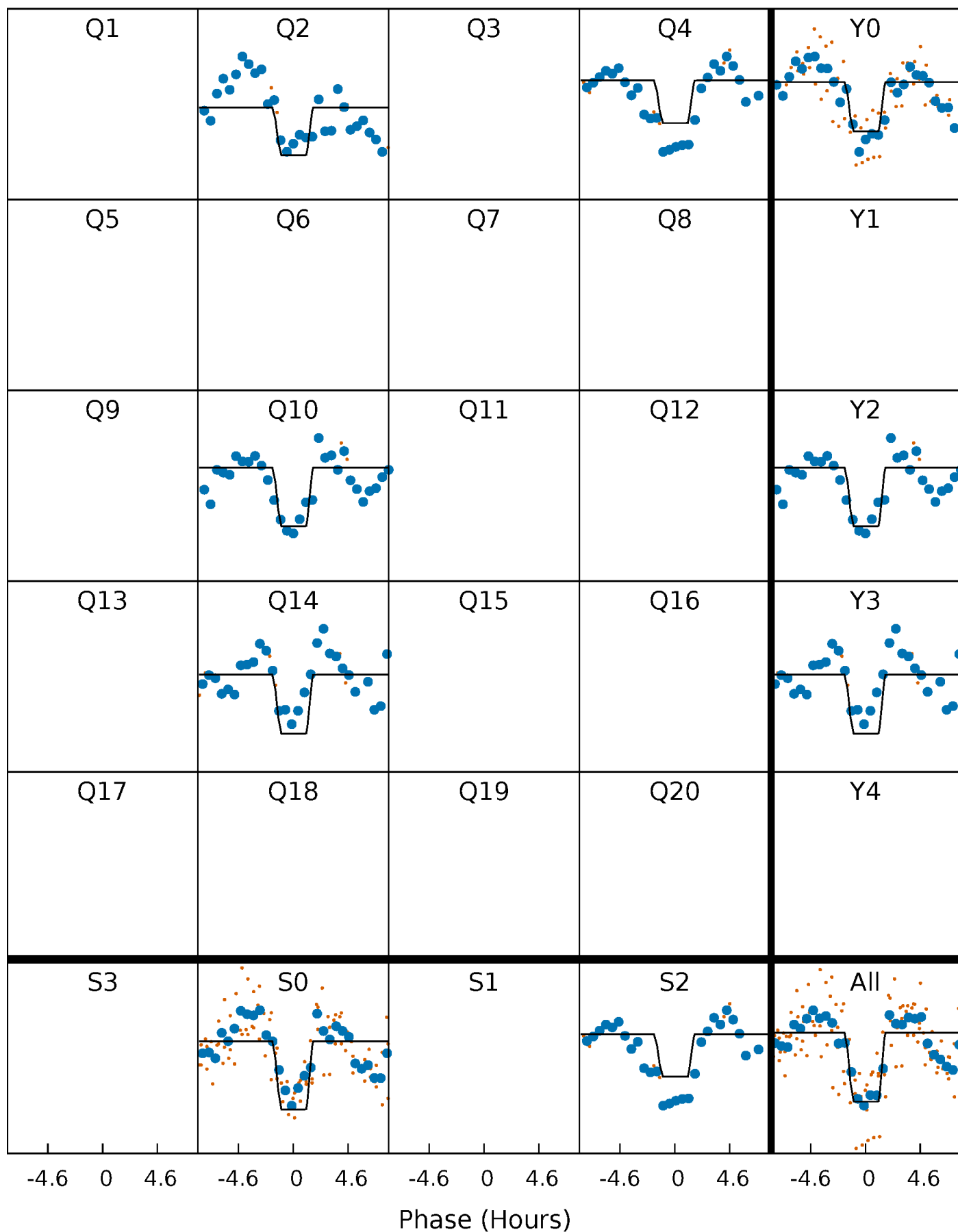
# DV Quarter-Phased Transit Curves

TCE 009967646-01 P=151.690028 Days  $T_0=221.305715$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

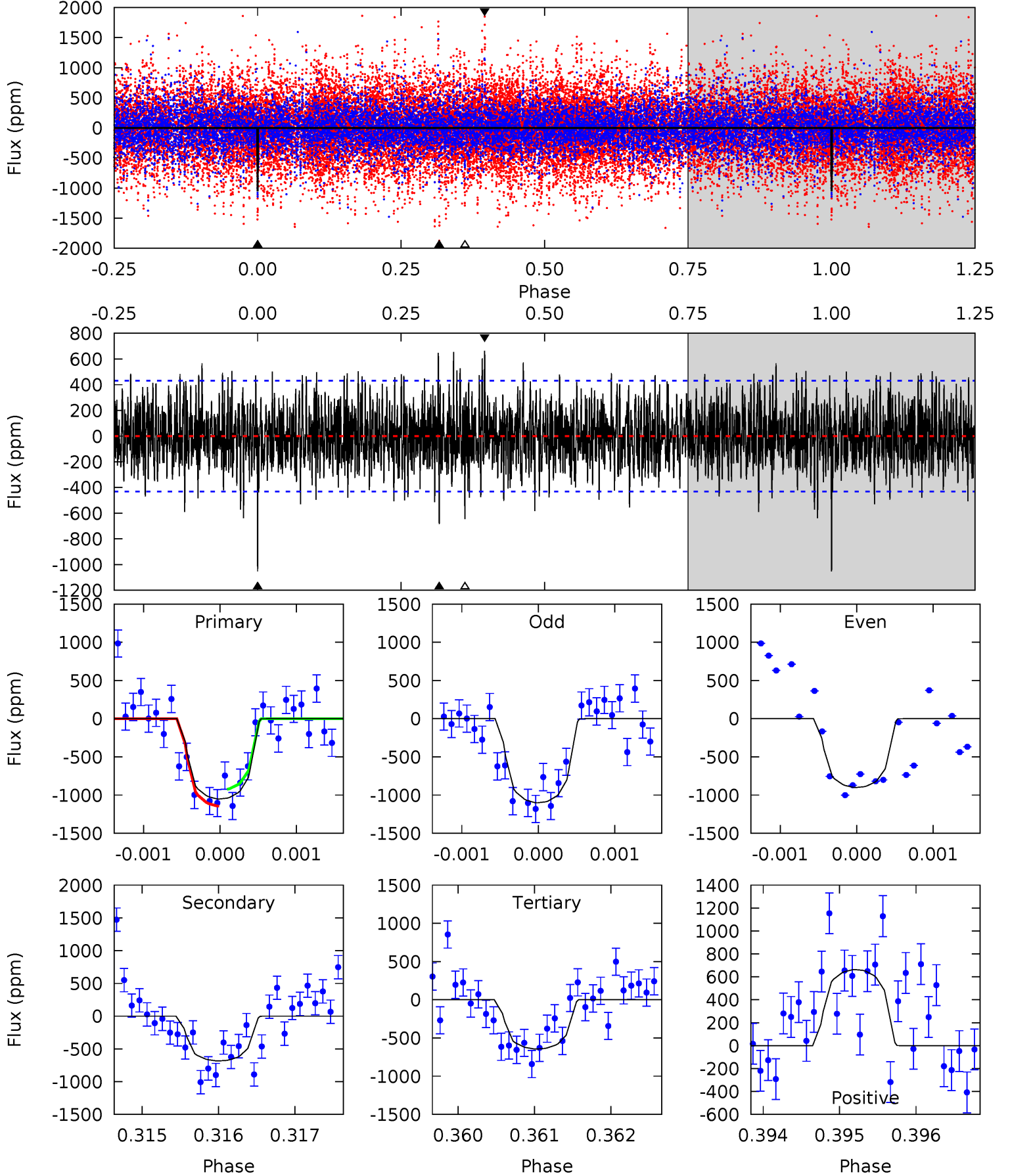
TCE 009967646-01 P=151.690914 Days  $T_0=221.294772$  (BKJD)



# DV Model-Shift Uniqueness Test

009967646-01, P = 151.690028 Days, E = 69.615687 Days

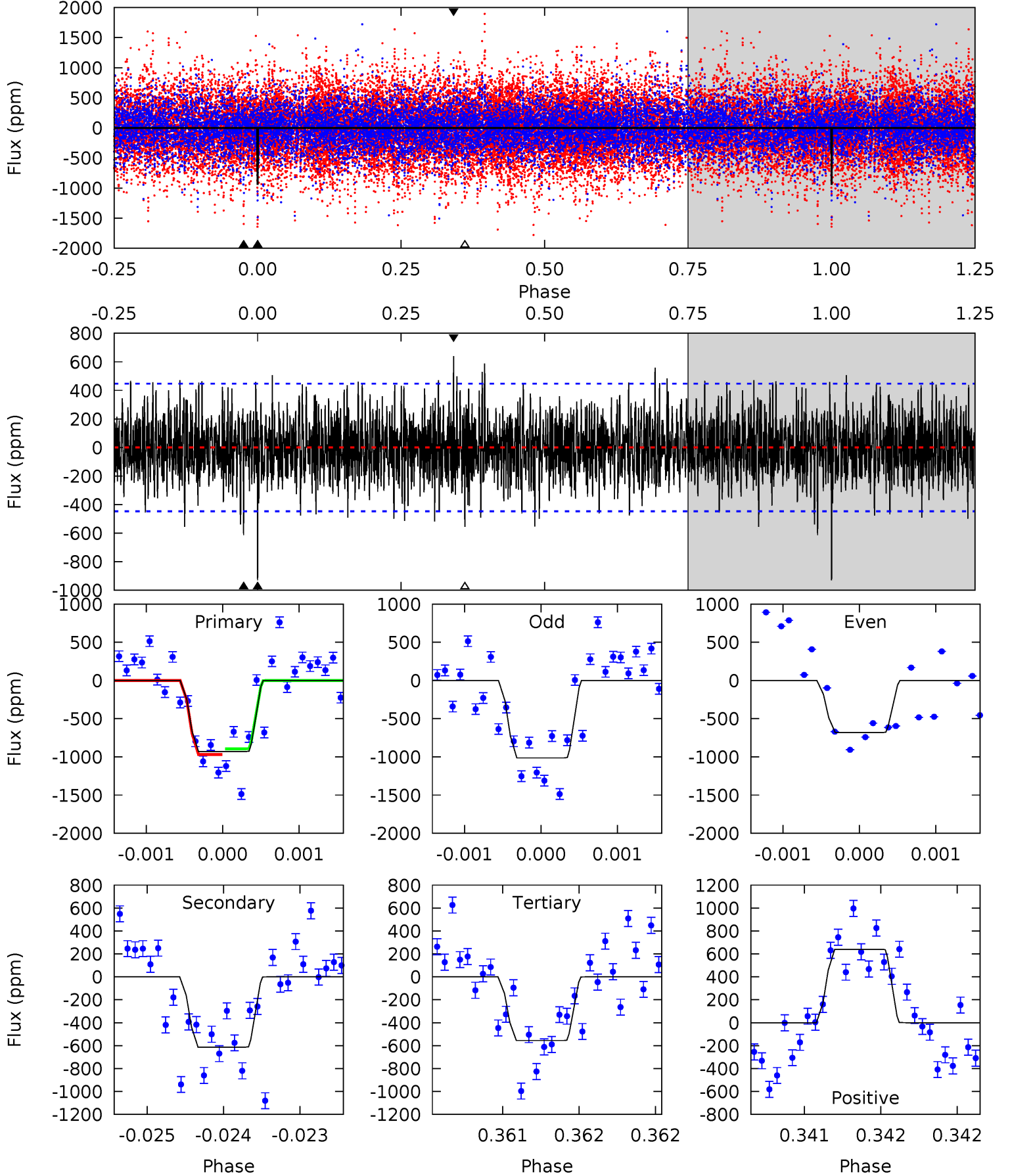
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.3	8.65	8.16	8.40	5.46	3.30	2.37	5.16	4.91	0.49	0.25	1.06	1.08	0.39	1.39



# Alt Model-Shift Uniqueness Test

009967646-01, P = 151.690914 Days, E = 69.603858 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
11.4	7.52	6.81	7.85	5.48	3.33	2.08	4.59	3.56	0.71	-0.33	1.79	1.17	0.41	0.45



### Stellar Parameters For KIC 009967646

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5072^{+71}_{-284}$	$2.489^{+0.030}_{-0.027}$	$-0.500^{+0.250}_{-0.250}$	$15.155^{+1.704}_{-5.112}$	$2.583^{+0.616}_{-1.437}$	$0.001^{+0.001}_{-0.000}$
	+1%/-6%	+1%/-1%	+50%/-50%	+11%/-34%	+24%/-56%	+54%/-13%
Source	PHO1	AST9	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 009967646-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-684 \pm 79$	$54.98^{+25.91}_{-23.94}$	$1387^{+43}_{-77}$	$4522^{+1205}_{-569}$	$72^{+156}_{-36}$
Alt.	$-613 \pm 82$	$53.30^{+26.79}_{-25.12}$	$1383^{+43}_{-79}$	$4504^{+1367}_{-634}$	$72^{+177}_{-40}$

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

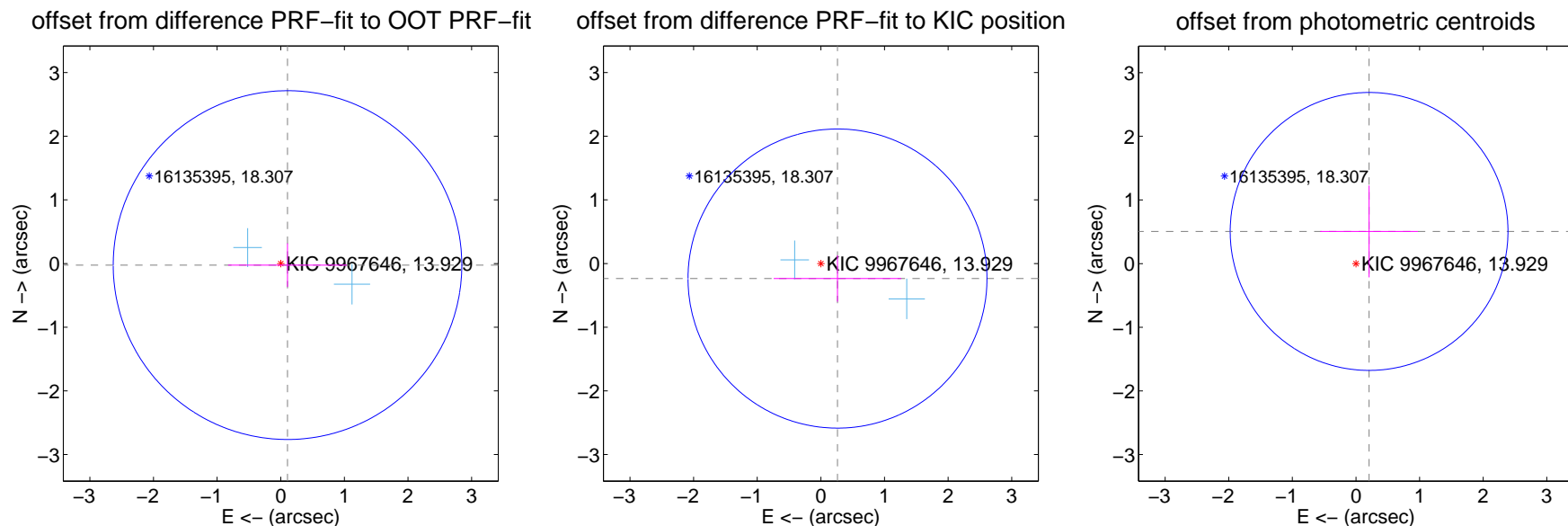
## DV Centroid Data

Supplemental centroid analysis for 009967646-01. Kepler magnitude: 13.93. Transit SNR 7.92

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.109 \pm 0.913$	0.12	$-0.106 \pm 0.934$	$-0.024 \pm 0.343$
PRF-fit source offset from KIC position	$0.352 \pm 0.783$	0.45	$-0.261 \pm 1.002$	$-0.236 \pm 0.364$
photometric centroid source offset	$0.55 \pm 0.73$	0.75	$-0.21 \pm 0.77$	$0.51 \pm 0.72$



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.

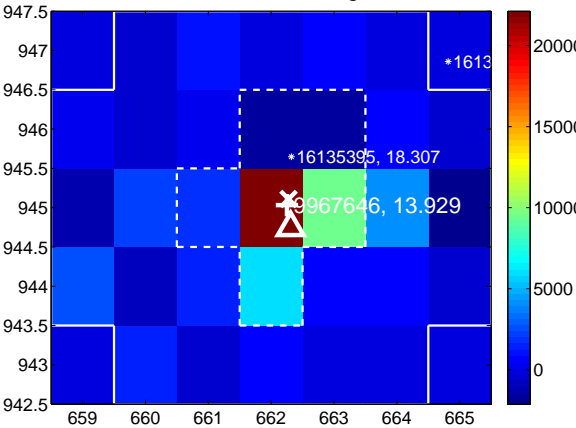
Q1 no difference image



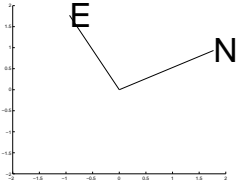
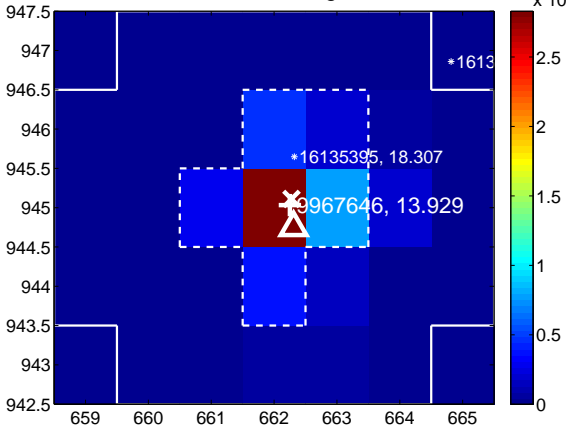
Q1 no OOT image



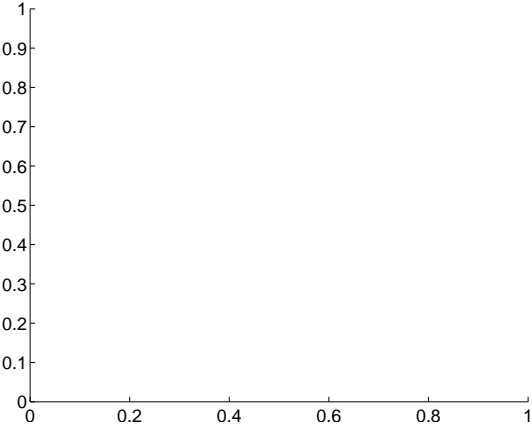
Q2 difference image



Q2 OOT image



Q3 no difference image



Q3 no OOT image



Q4 no difference image



Q4 no OOT image

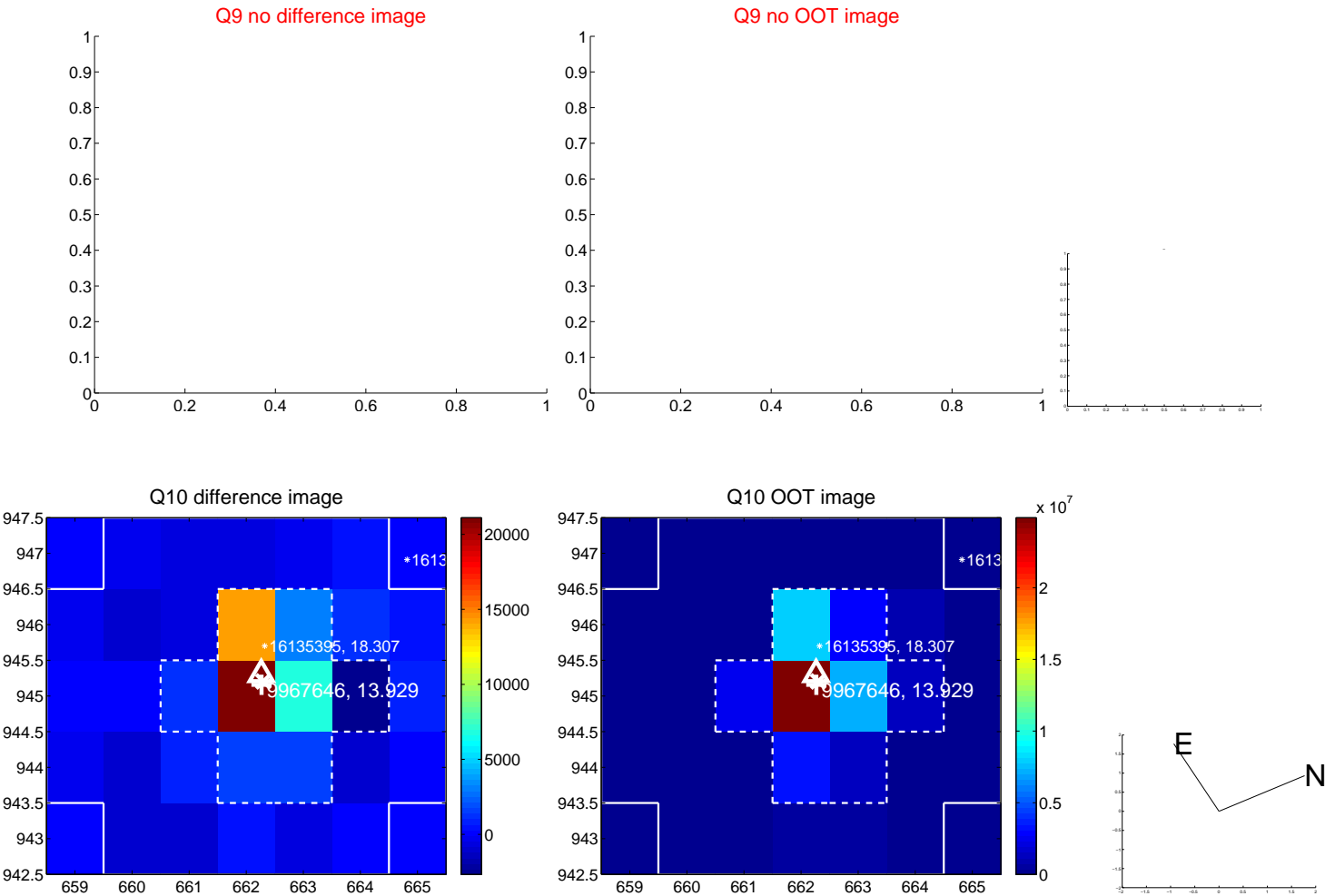


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





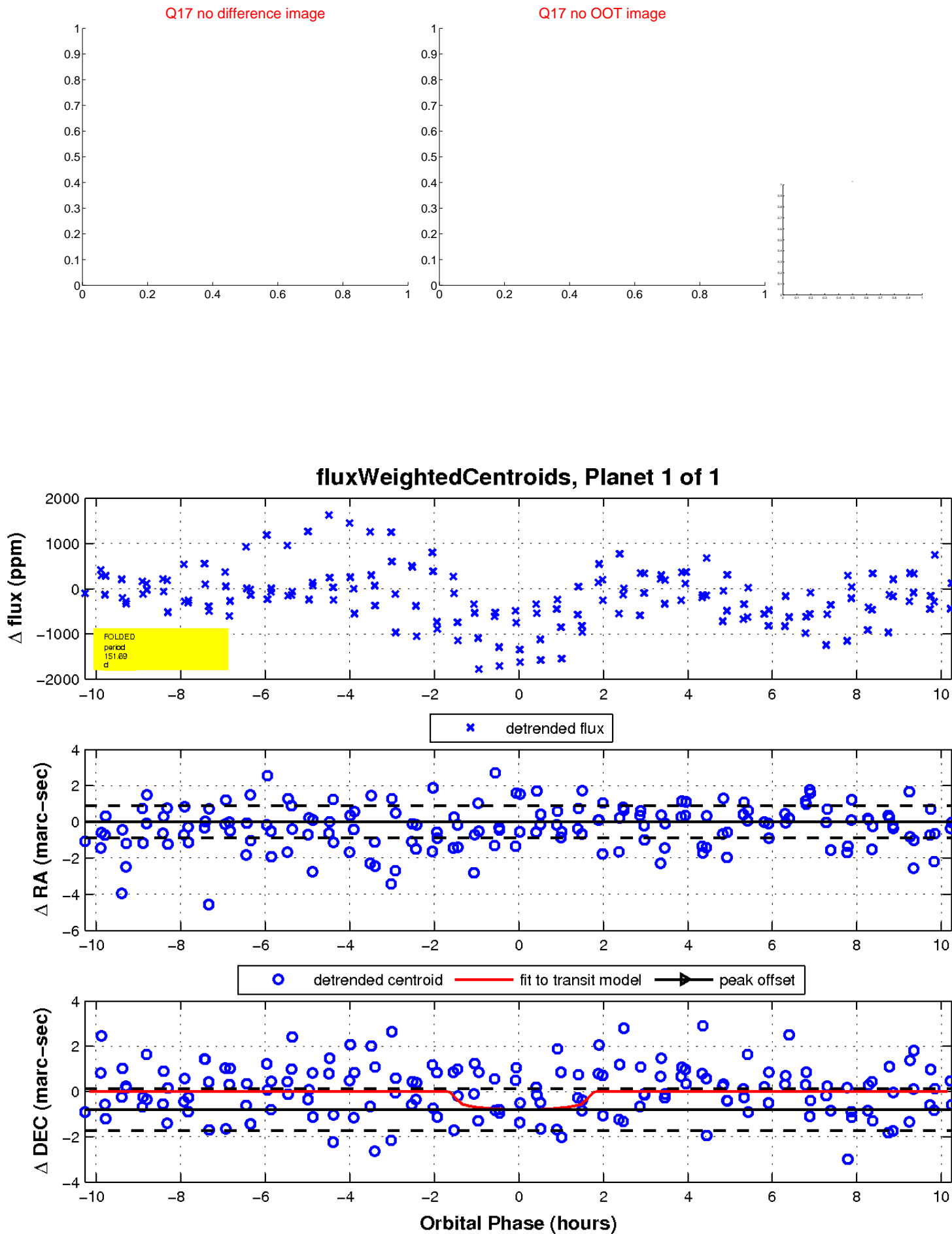
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

