

# KIC 009959765

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R <sub>★</sub> (R <sub>☉</sub> )	T <sub>★</sub> (K)	R <sub>p</sub> (R <sub>⊕</sub> )	S <sub>p</sub> (S <sub>⊕</sub> )
009959765-01	OBS	7981.01	1.332464	132.117477	22.4	4.138	8.4	8.1	1.16	6600	0.63	3736.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009959765-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—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.

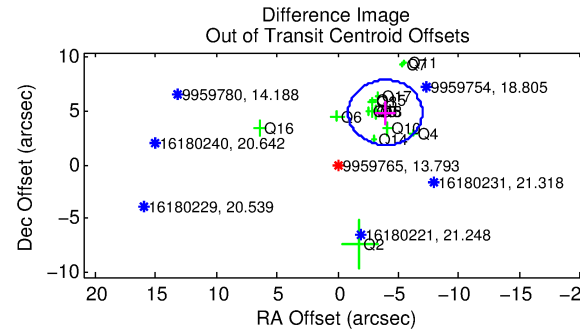
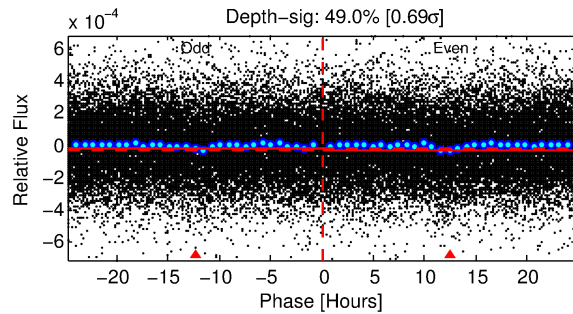
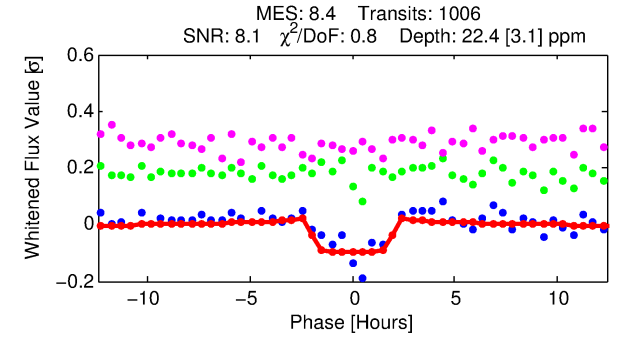
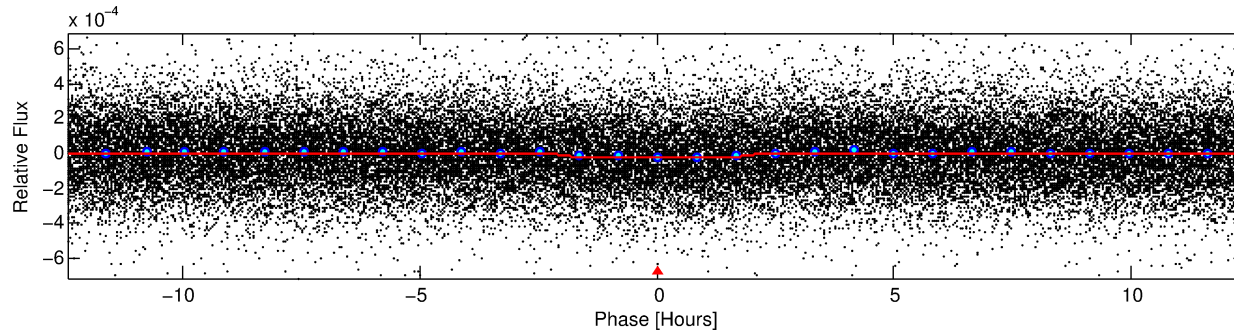
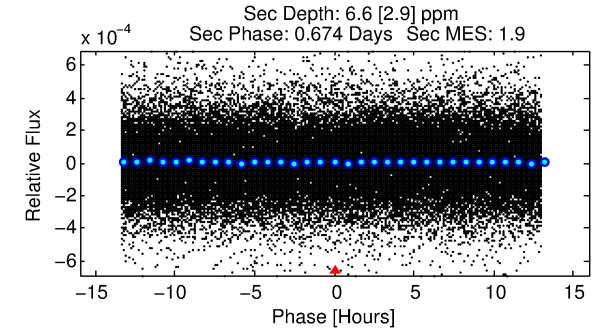
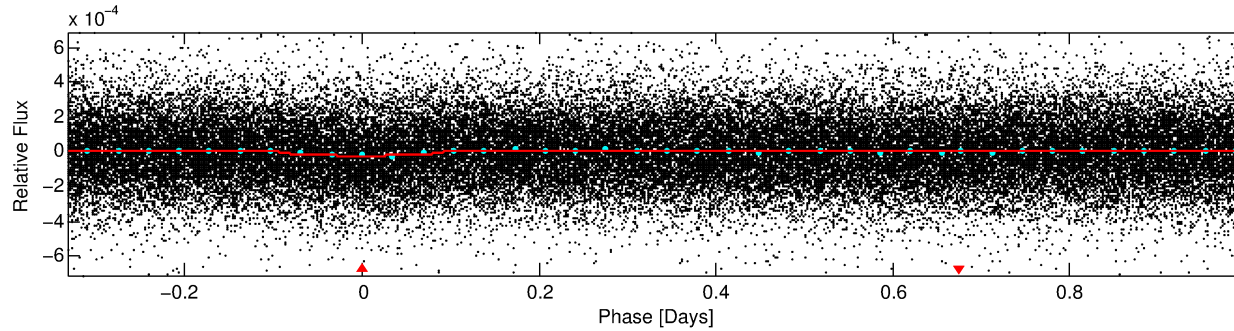
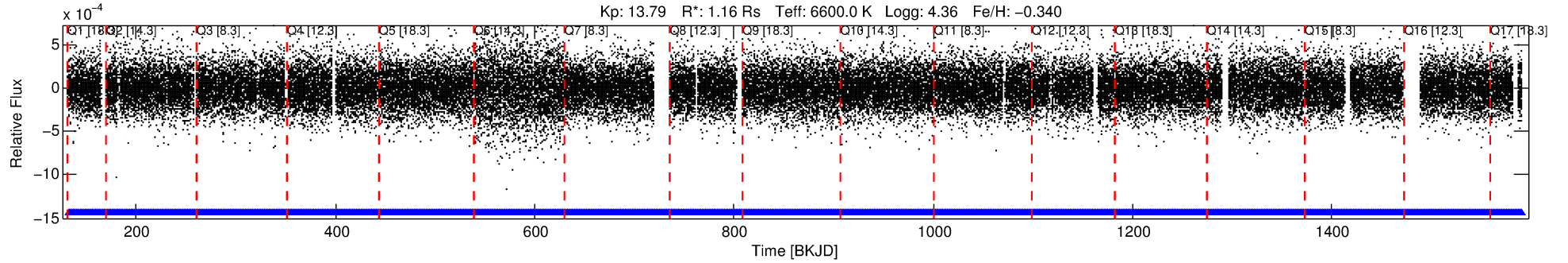
## Ephemeris Match Information For 009959765-01

TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist (″)	ΔRow	ΔCol	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	σ <sub>P</sub>	σ <sub>T</sub>
009959765-01	9959765	009838414-01	9838414	1:1	1402.7	-352	1	17.51	13.79	39.77	Col-Anomaly	1	0.98	2.02

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's. σ<sub>P</sub> and σ<sub>T</sub> are the significance of the match in period and epoch. For a match to be considered significant σ<sub>P</sub> < 5.0 and σ<sub>T</sub> < 5.0. Matches which have σ<sub>P</sub> and σ<sub>T</sub> very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 9959765 Candidate: 1 of 1 Period: 1.332 d



## DV Fit Results:

Period = 1.33246 [0.00002] d  
Epoch = 132.1175 [0.0052] BKJD  
Rp/R\* = 0.0050 [0.0022]  
a/R\* = 1.51 [2.15]  
b = 0.88 [0.65]  
Seff = 3736.10 [1437.38]  
Teq = 1994 [192] K  
Rp = 0.63 [0.34] Re  
a = 0.0247 [0.0062] AU  
Ag = 5.60 [5.84] [0.79σ]  
Teffp = 4742 [1169] K [2.32σ]

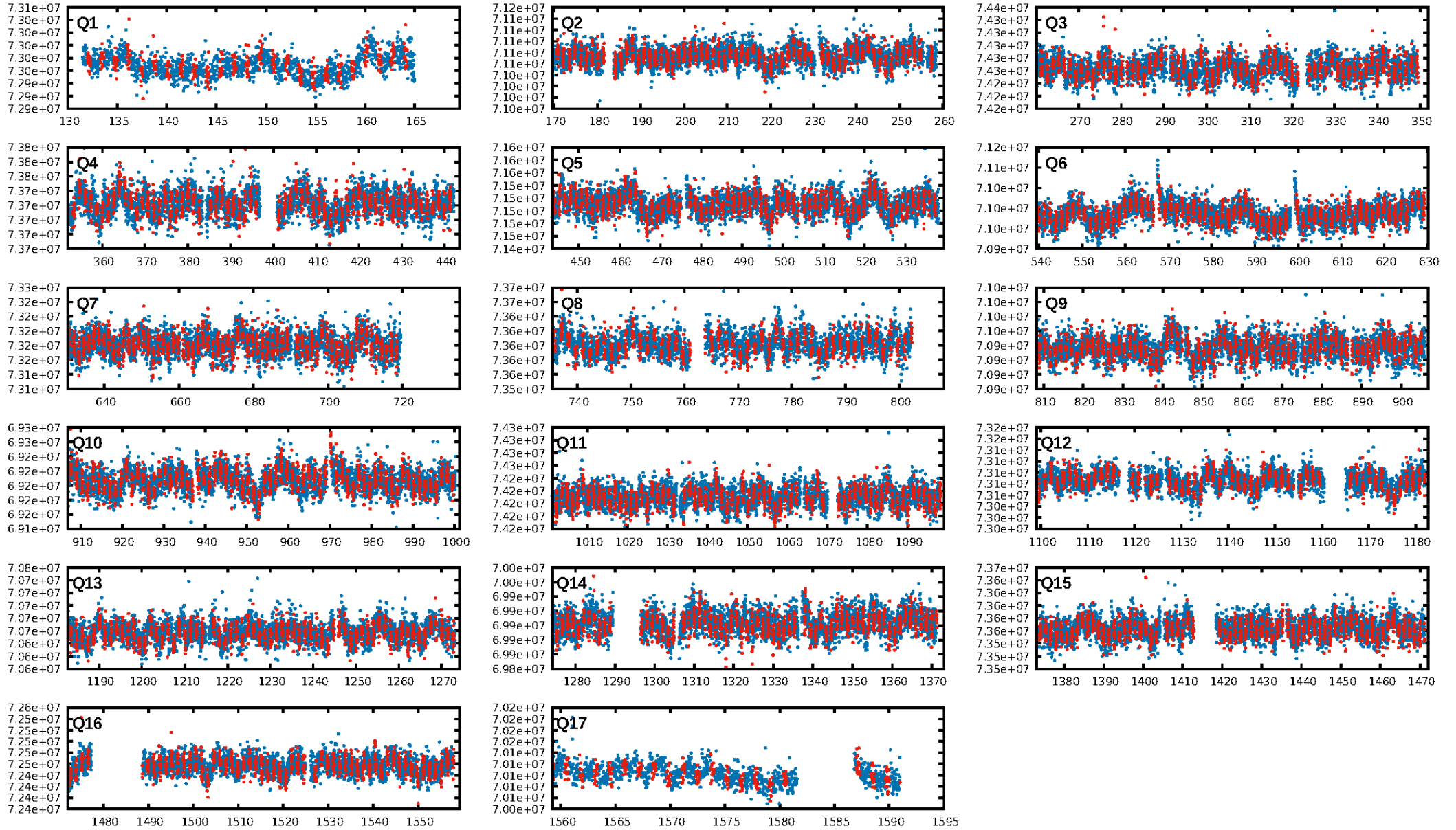
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.29e-14  
RollingBand-fgt: 1.00 [961/961]  
GhostDiagnostic-chr: -0.02778  
Centroid-sig: 0.0%  
Centroid-so: 4.771 arcsec [4.49σ]  
OotOffset-rm: 6.262 arcsec [6.16σ]  
KicOffset-rm: 6.162 arcsec [6.06σ]  
OotOffset-st: 4/4/2/4 [14]  
KicOffset-st: 4/4/2/4 [14]  
DiffImageQuality-fgm: 0.00 [0/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:08:52 Z

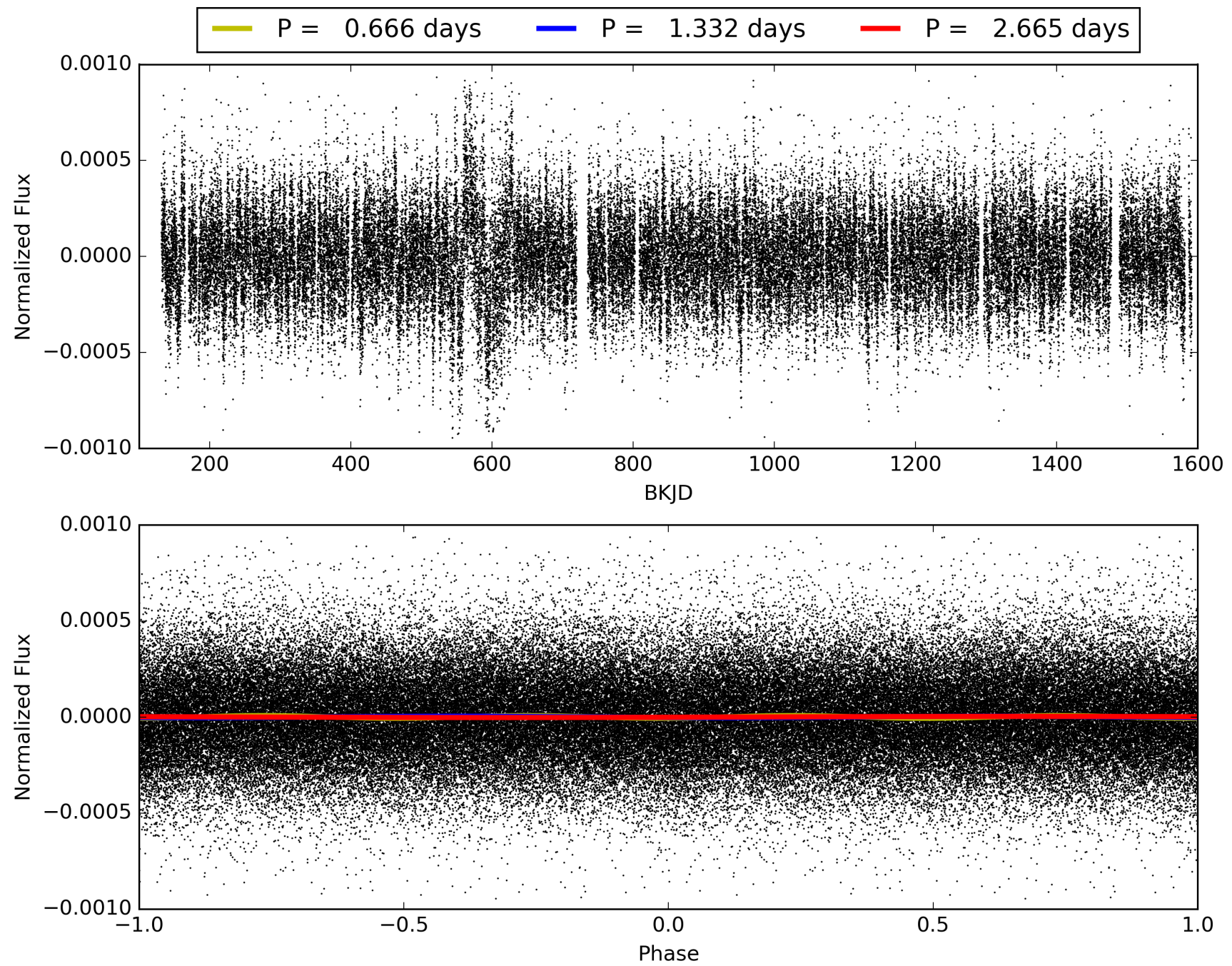
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009959765-01, PDC Light Curves



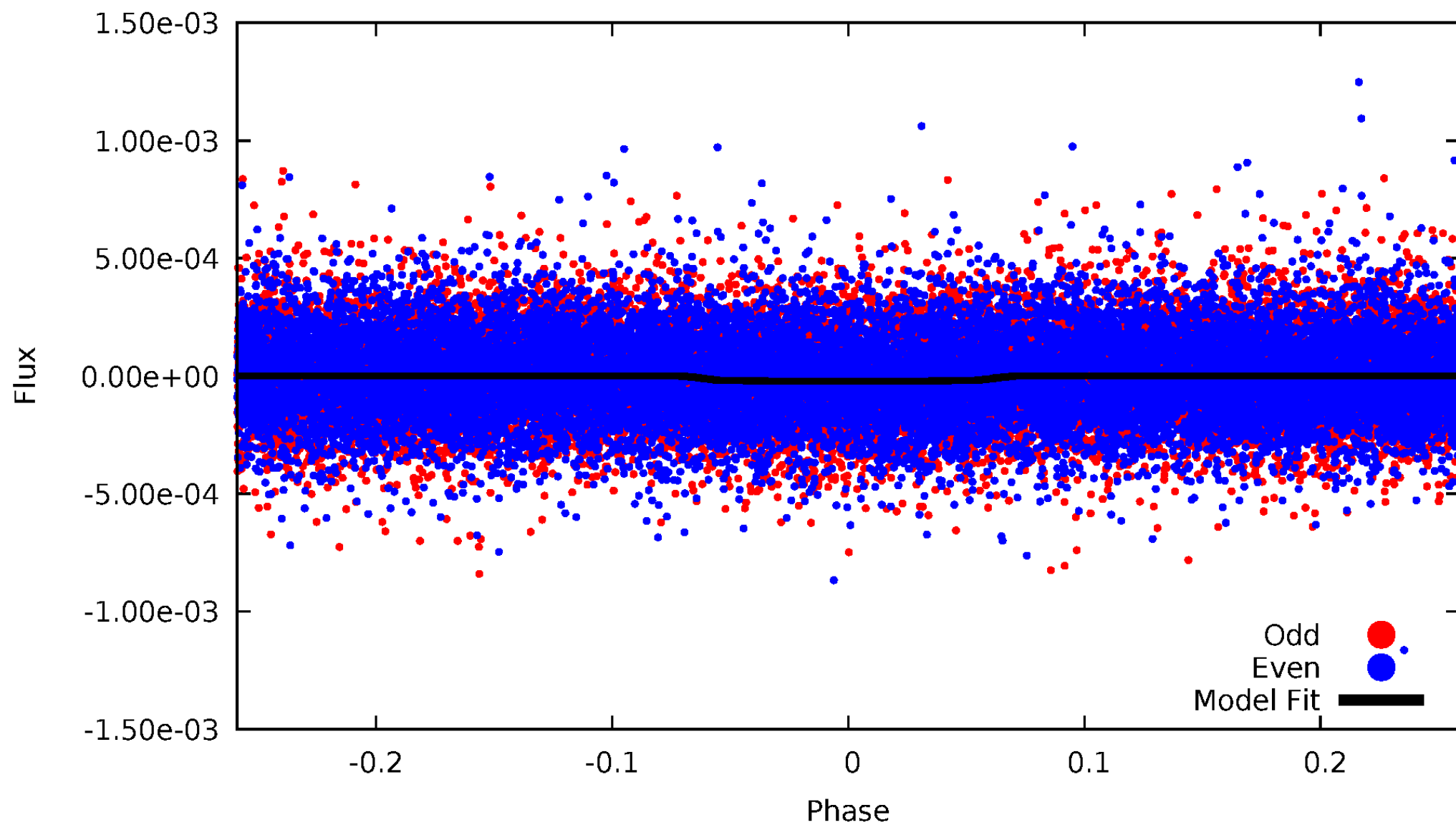


TCE 009959765-01



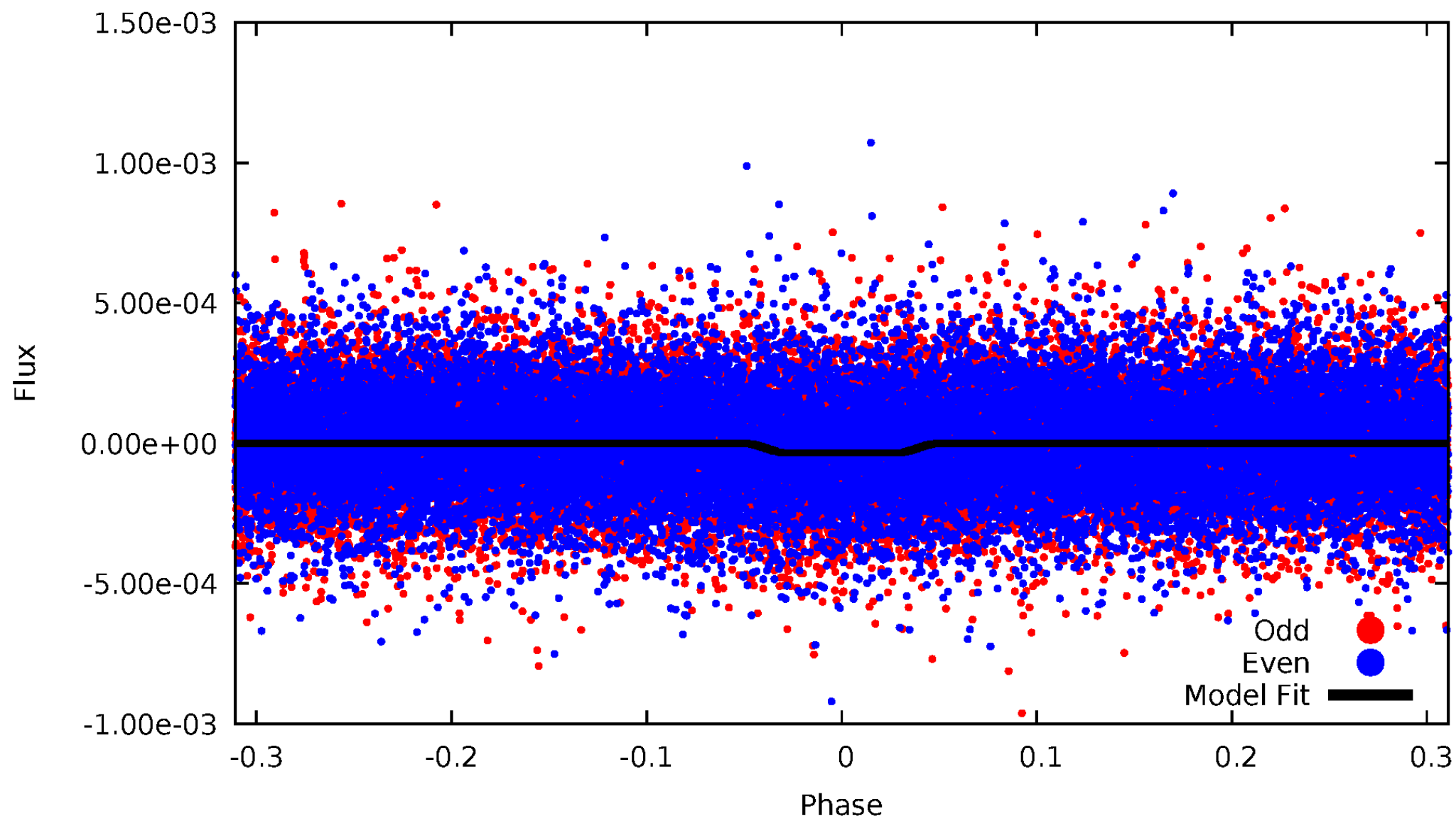
# DV Odd/Even

TCE 009959765-01



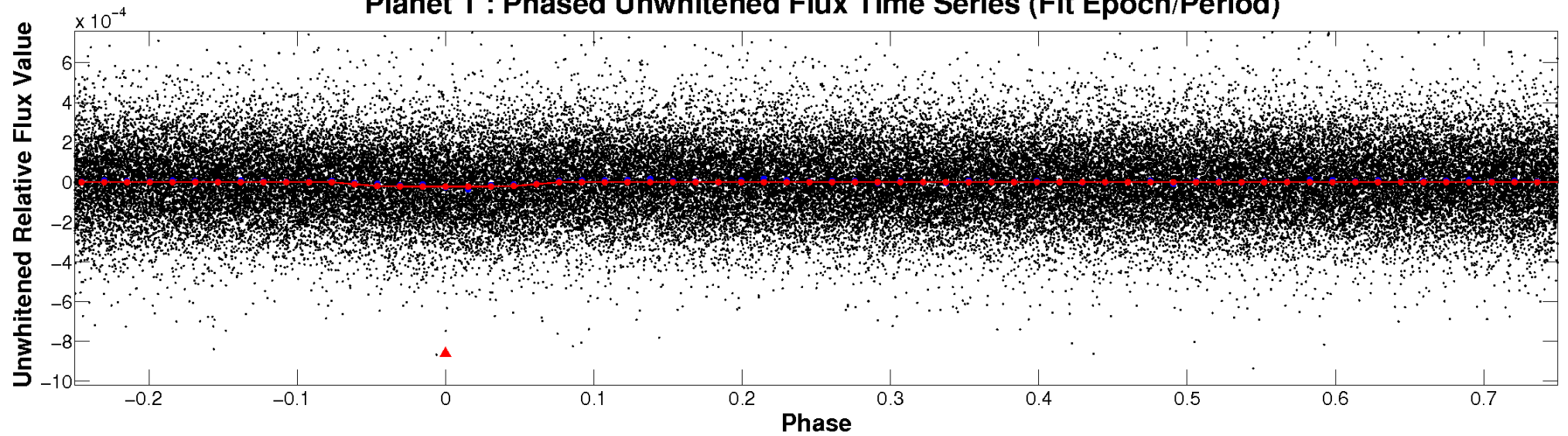
# ALT Odd/Even

TCE 009959765-01

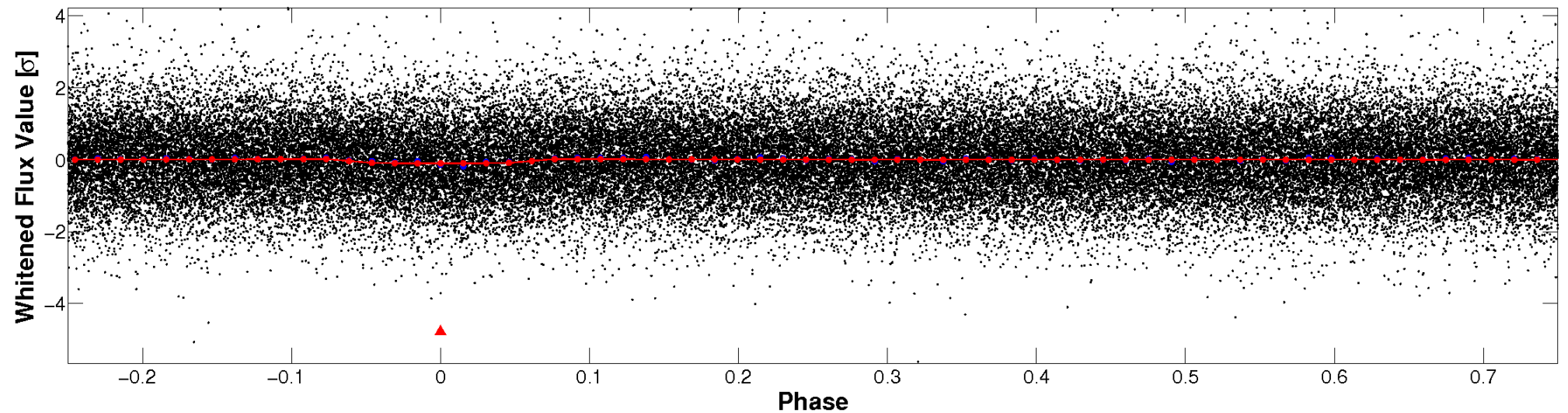


# Non-Whitened Vs. Whitened Light Curve

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



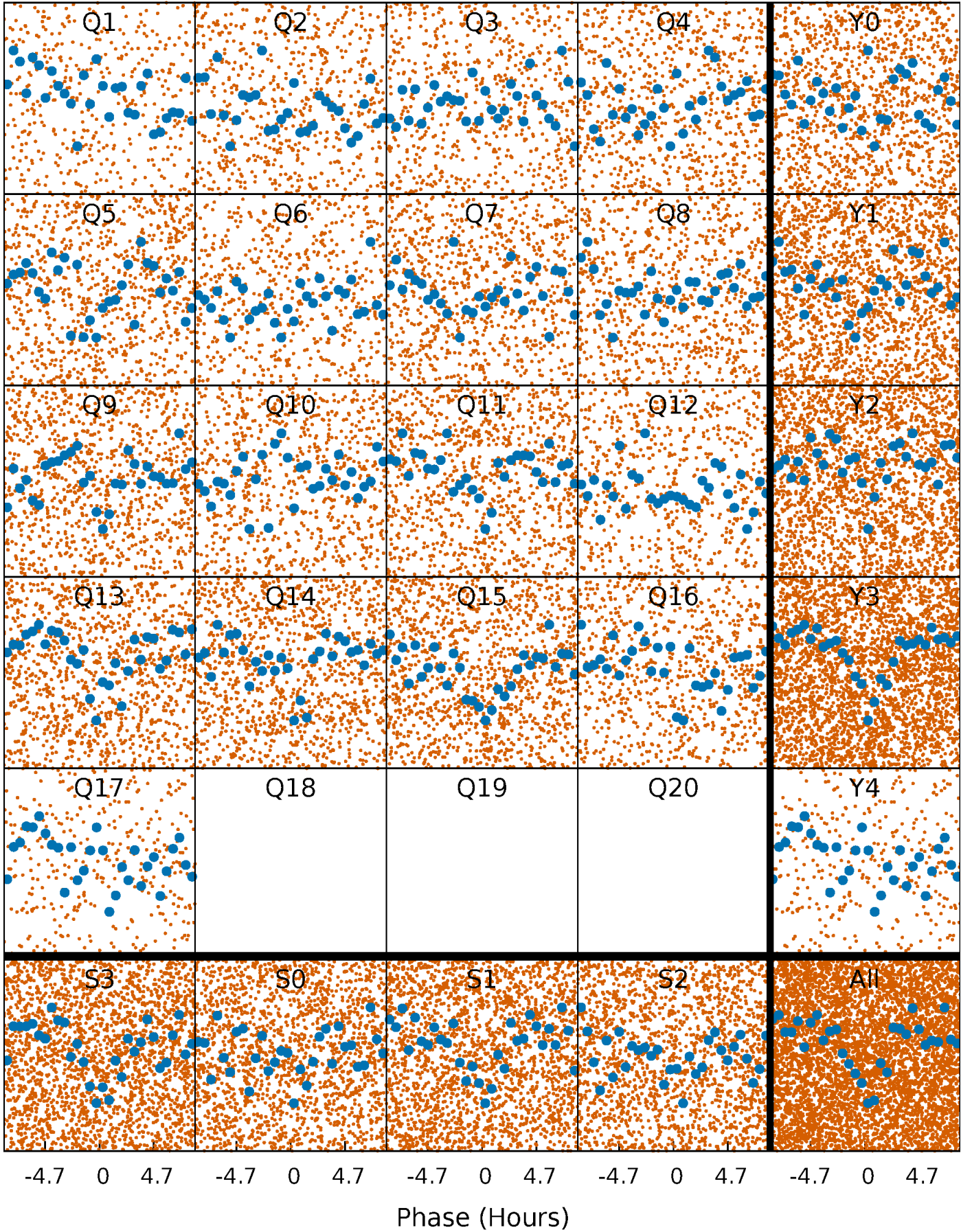
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

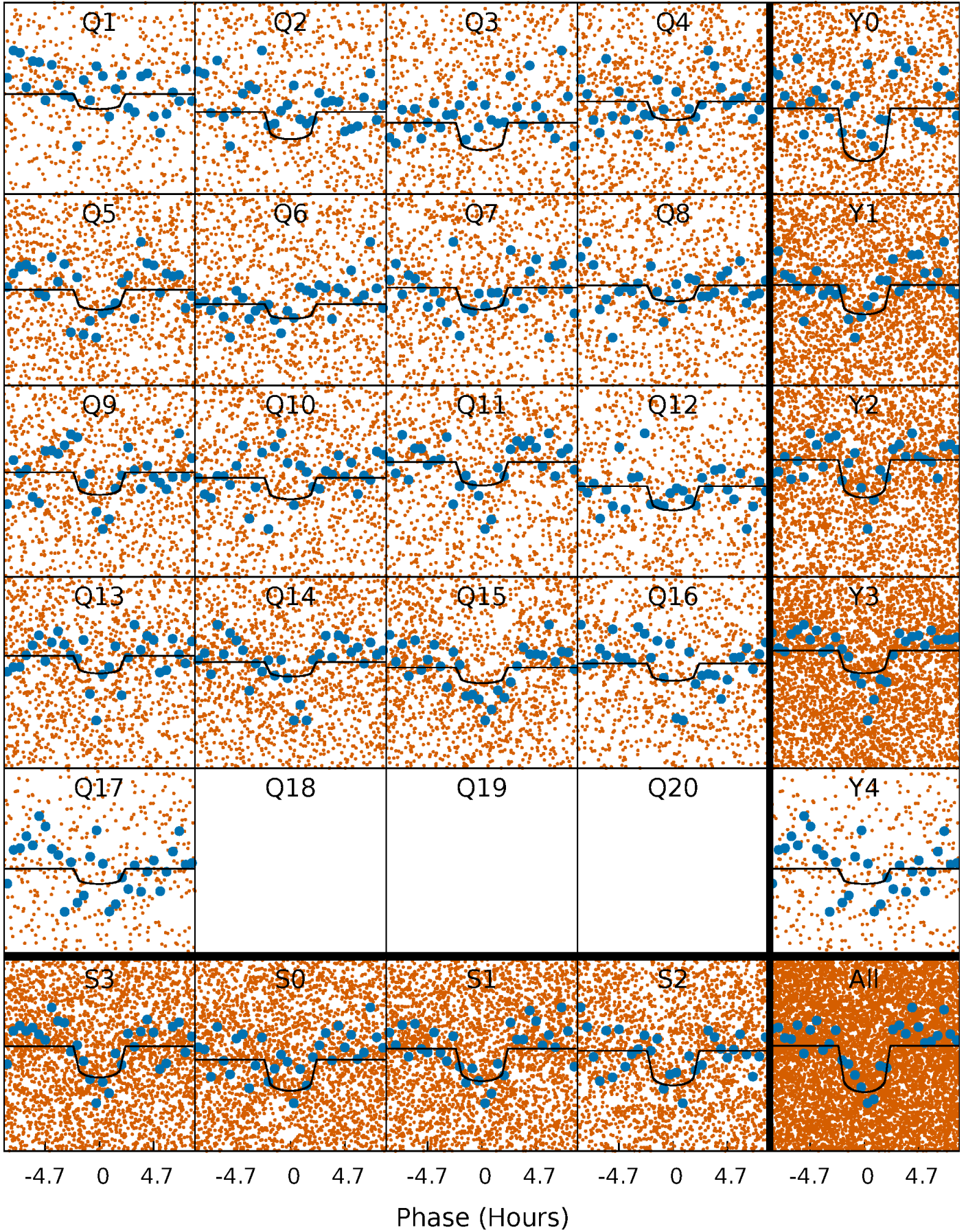
TCE 009959765-01 P= 1.332464 Days  $T_0=132.117477$  (BKJD)





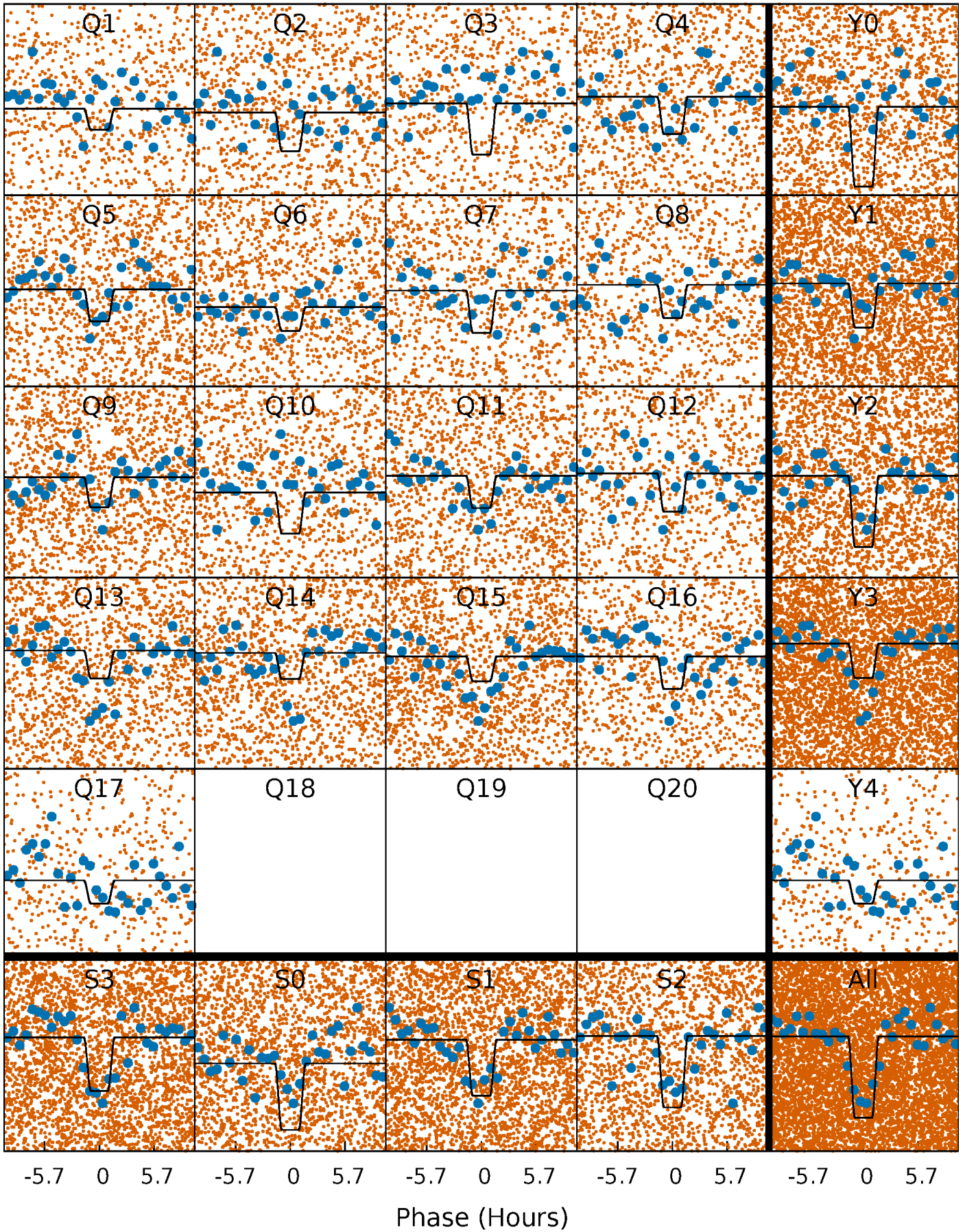
# DV Quarter-Phased Transit Curves

TCE 009959765-01 P= 1.332464 Days  $T_0=132.117477$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009959765-01 P= 1.332500 Days  $T_0=132.104609$  (BKJD)

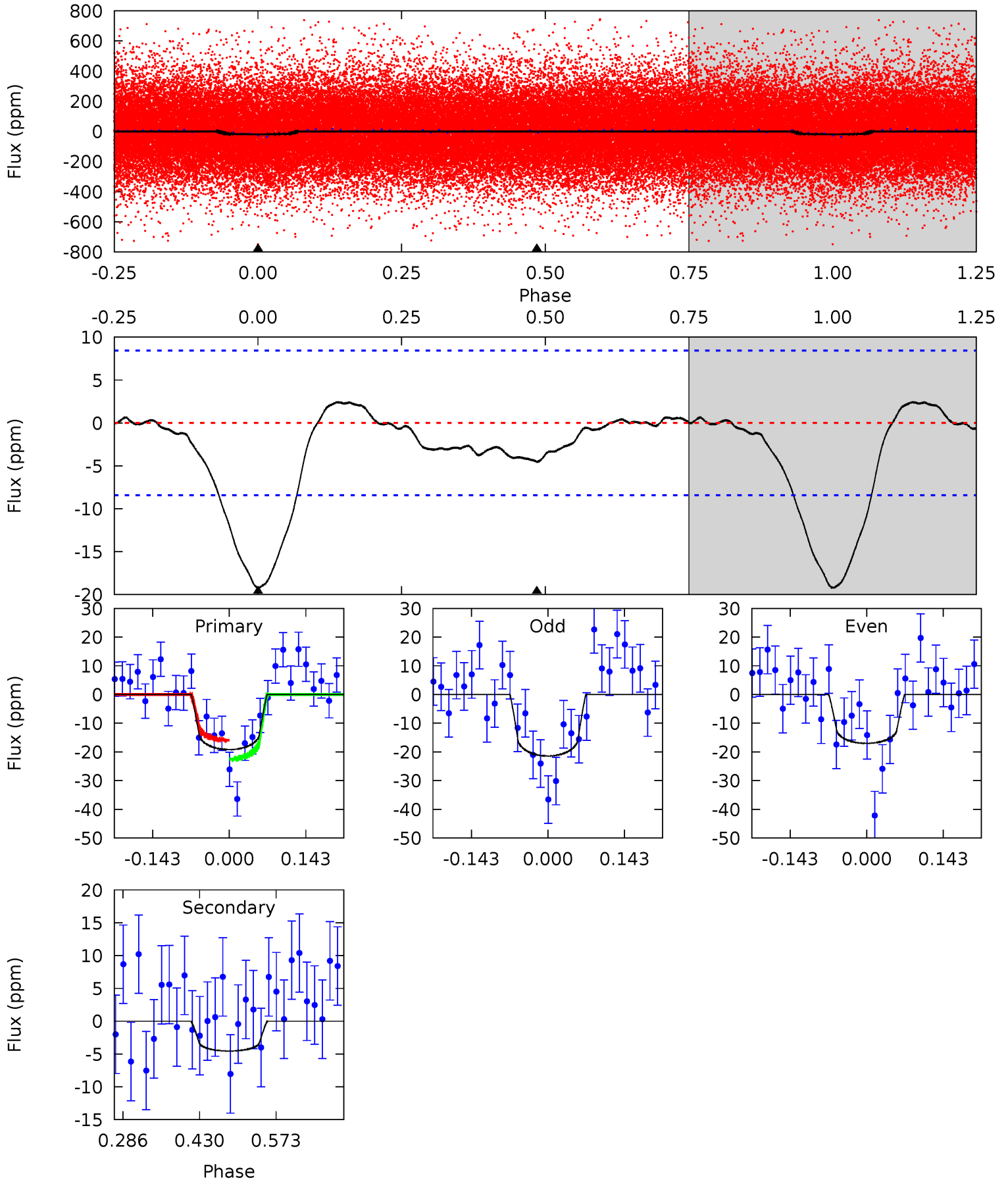




# DV Model-Shift Uniqueness Test

009959765-01, P = 1.332464 Days, E = 130.785013 Days

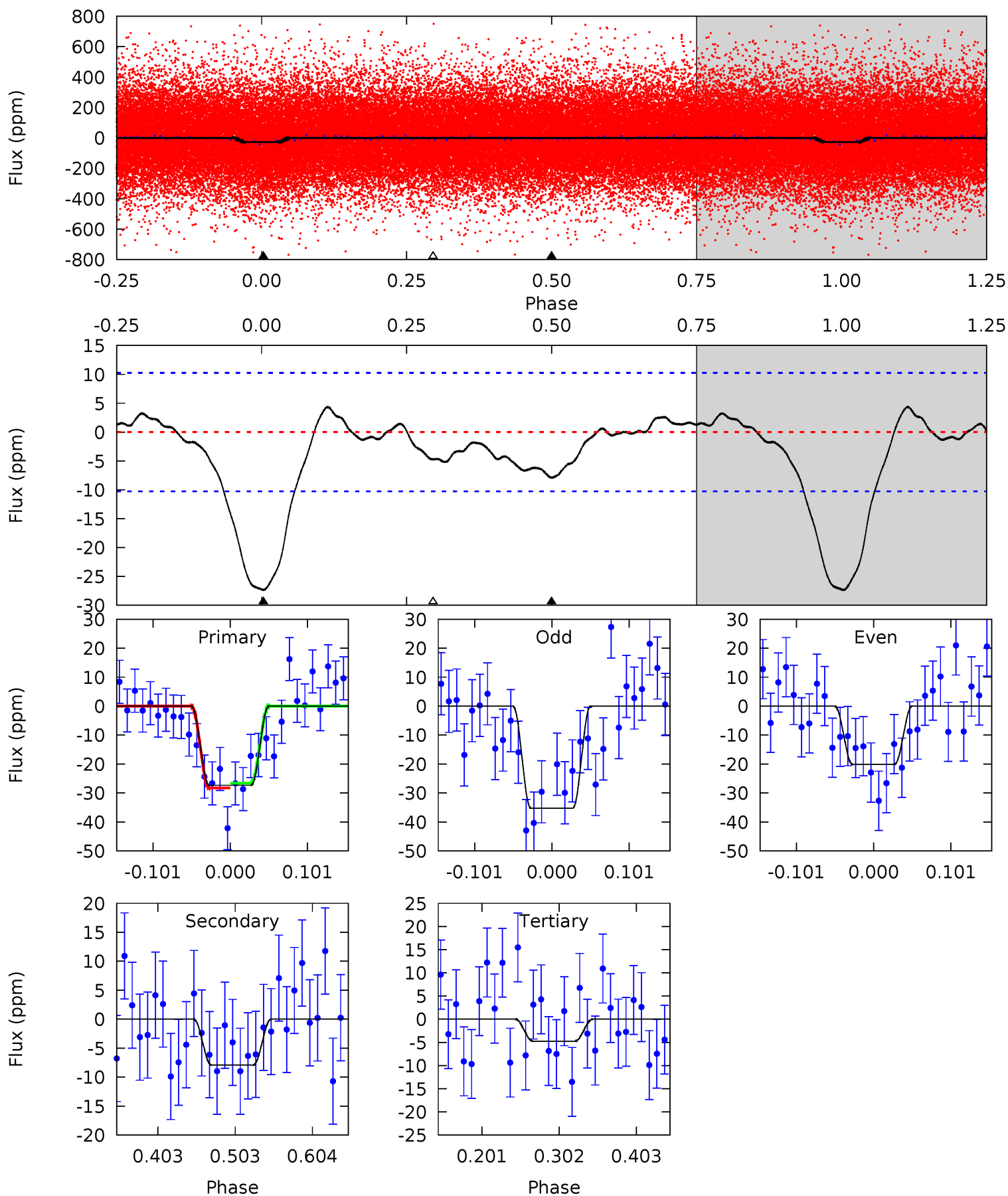
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	2.42	0	0	4.49	1.46	0.74	10.2	10.2	2.42	2.42	1.17	1.05	0.11	1.76



# Alt Model-Shift Uniqueness Test

009959765-01, P = 1.332500 Days, E = 130.772109 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
12.2	3.52	2.11	0	4.56	1.64	1.02	10.1	12.2	1.41	3.52	3.37	0.95	0.14	0.37





### Stellar Parameters For KIC 009959765

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6600^{+165}_{-214}$	$4.364^{+0.084}_{-0.196}$	$-0.340^{+0.250}_{-0.300}$	$1.157^{+0.350}_{-0.150}$	$1.133^{+0.165}_{-0.150}$	$1.030^{+0.379}_{-0.536}$
	+2%/-3%	+2%/-4%	+74%/-88%	+30%/-13%	+15%/-13%	+37%/-52%
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 009959765-01 / KOI 7981.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-5 \pm 2$	$0.65^{+0.31}_{-0.26}$	$2823^{+212}_{-152}$	$4383^{+1185}_{-745}$	$3.488^{+7.293}_{-2.115}$
Alt.	$-8 \pm 2$	$0.76^{+0.30}_{-0.27}$	$2817^{+195}_{-141}$	$4616^{+1123}_{-626}$	$4.382^{+7.399}_{-2.263}$

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

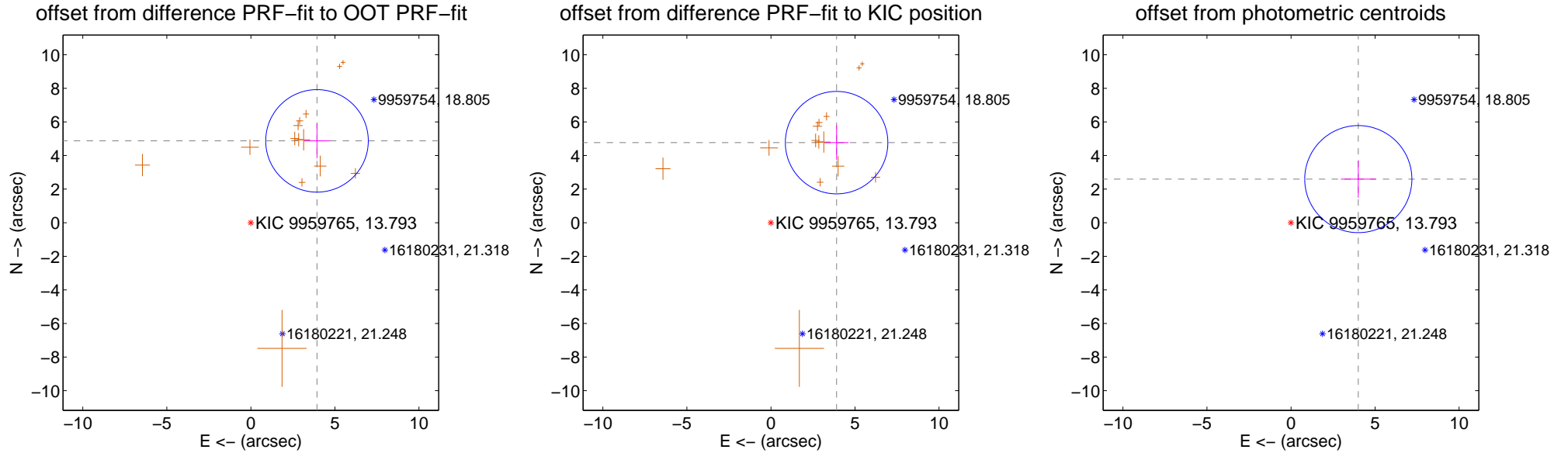
## DV Centroid Data

Supplemental centroid analysis for 009959765-01. Kepler magnitude: 13.79. Transit SNR 8.11

There are 0 quarters with good PRF difference image offsets

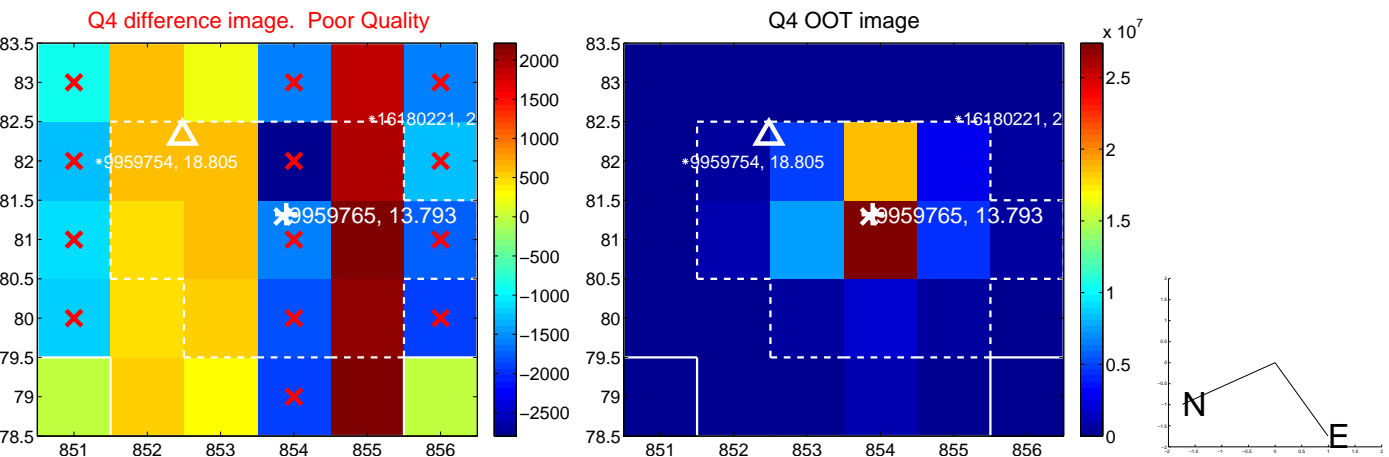
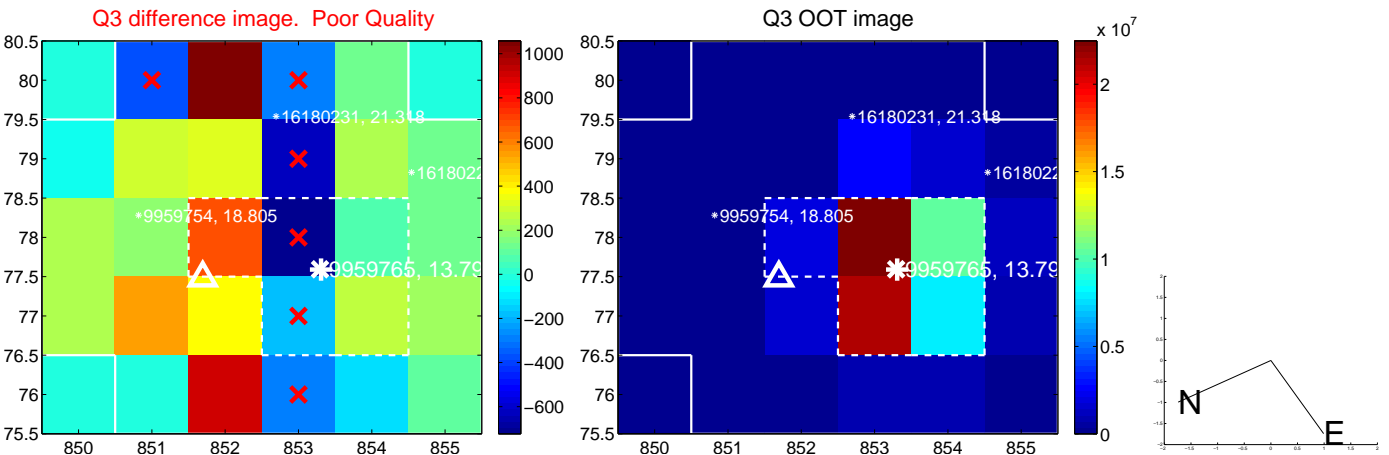
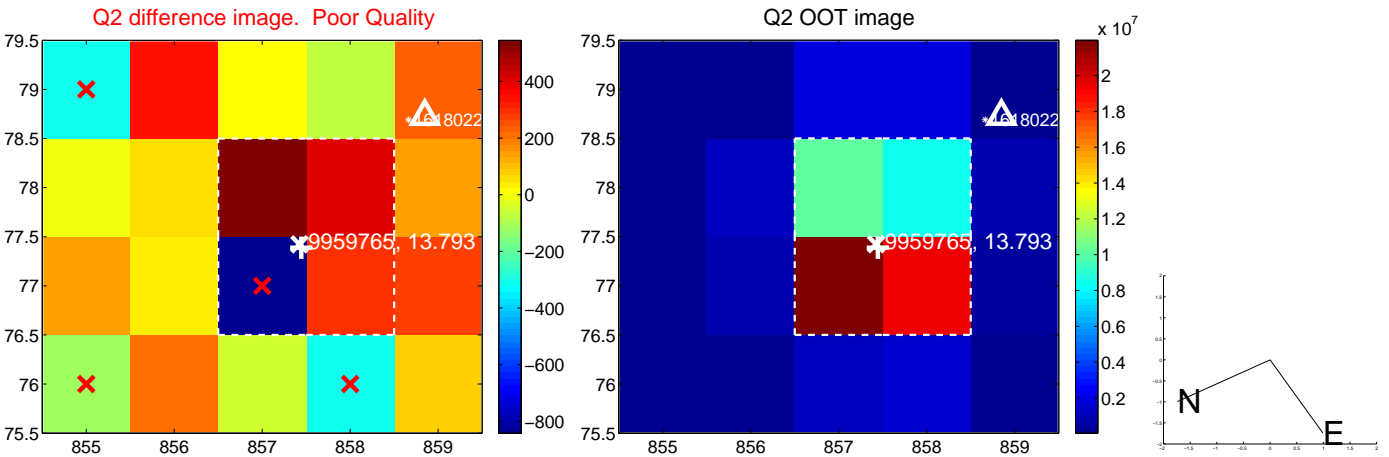
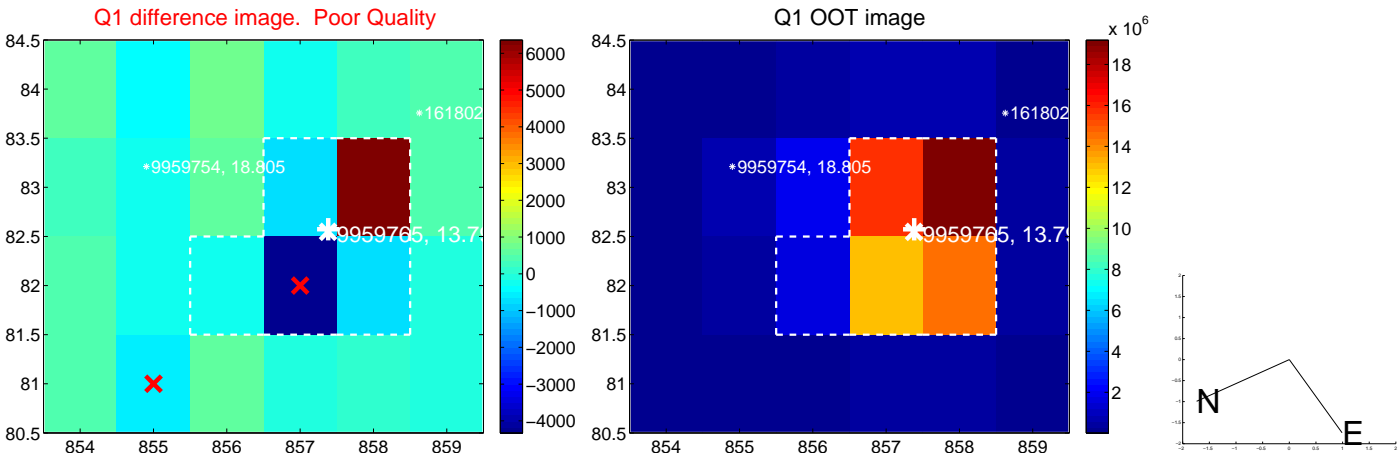
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.262 \pm 1.017$	6.16	$-3.934 \pm 0.770$	$4.871 \pm 1.032$
PRF-fit source offset from KIC position	$6.162 \pm 1.016$	6.06	$-3.905 \pm 0.711$	$4.766 \pm 1.028$
photometric centroid source offset	$4.77 \pm 1.06$	4.49	$-4.00 \pm 1.04$	$2.60 \pm 1.11$



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.

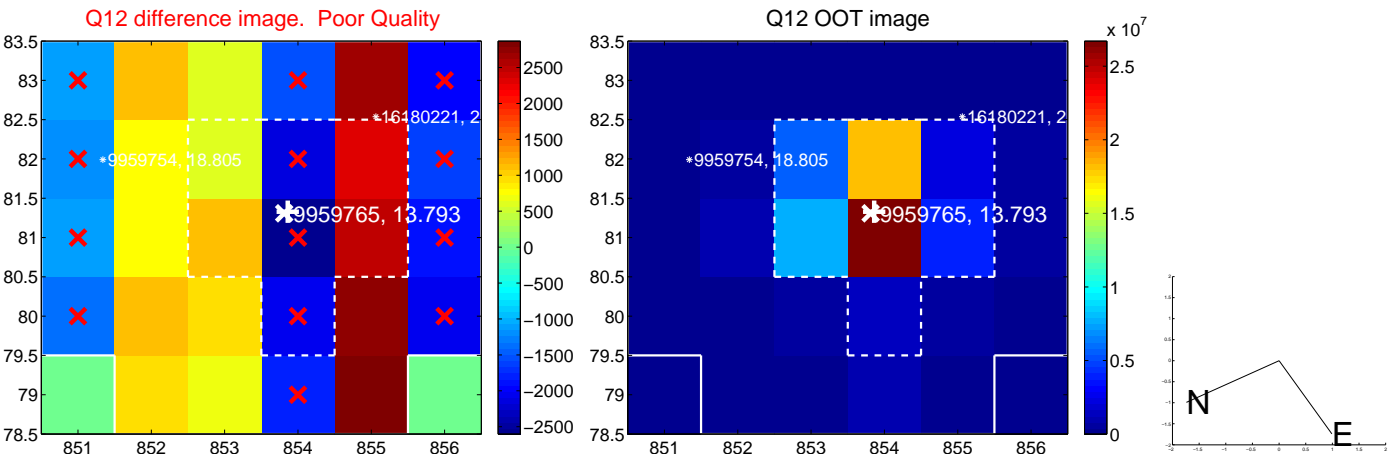
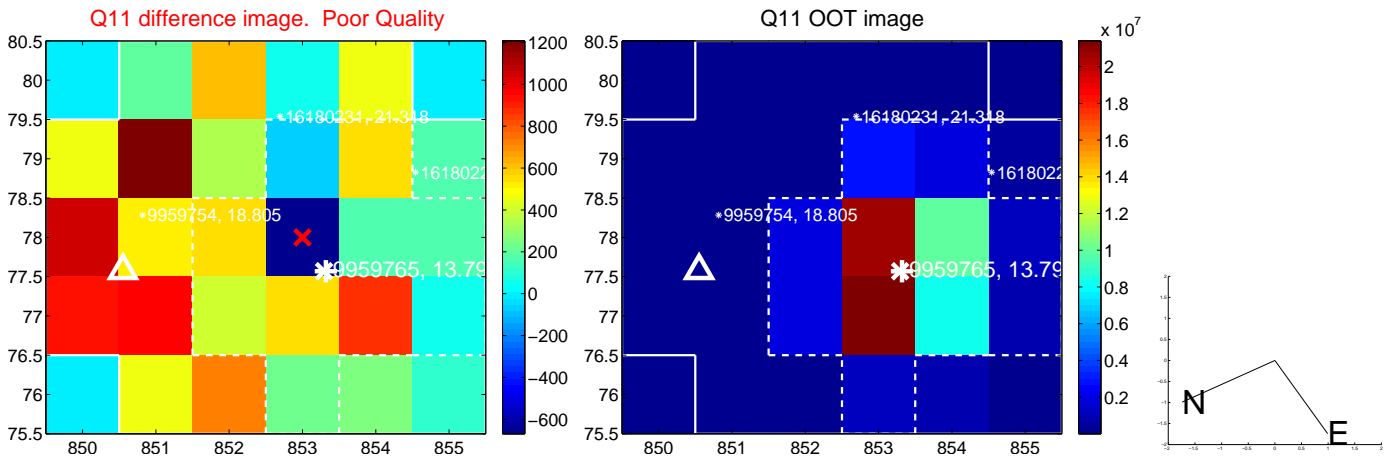
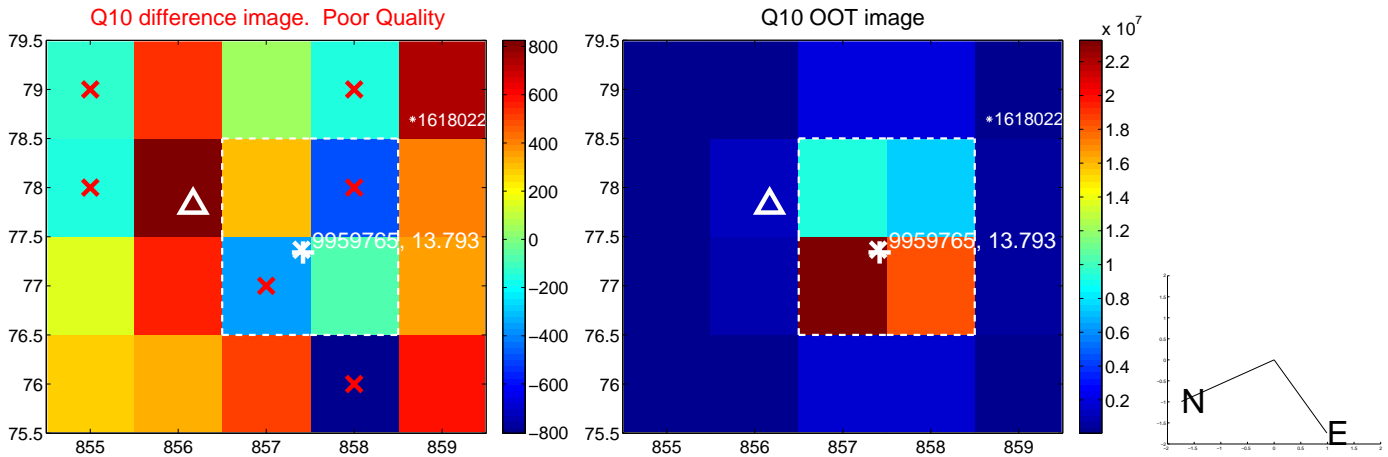
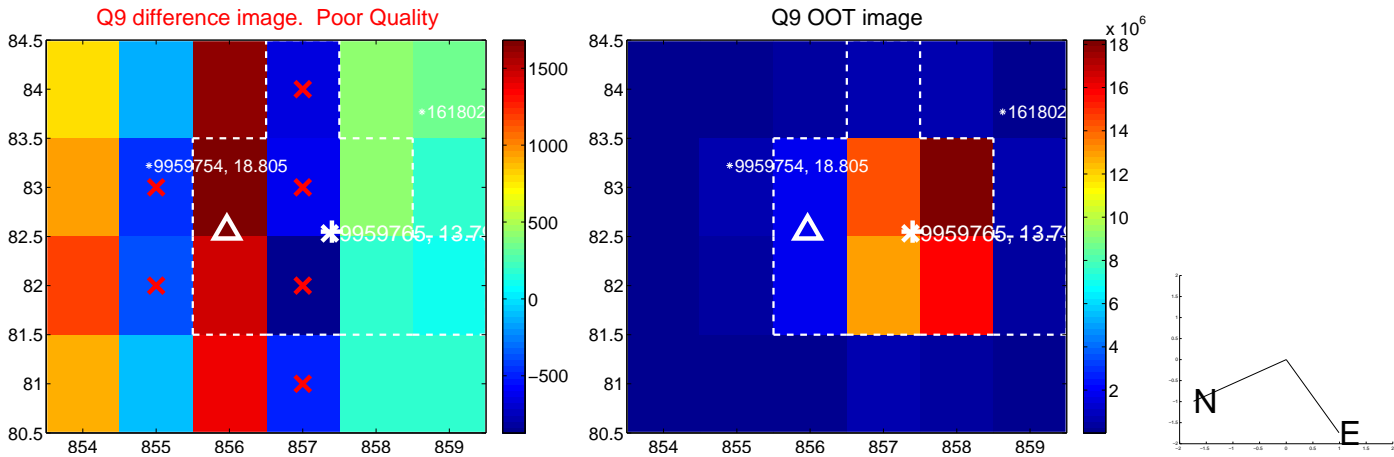
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



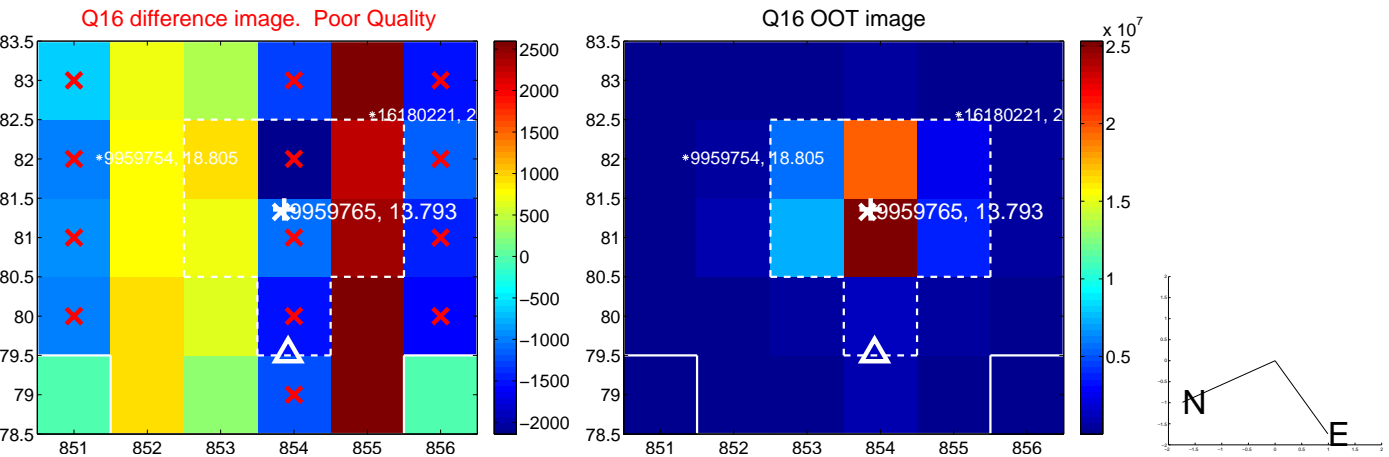
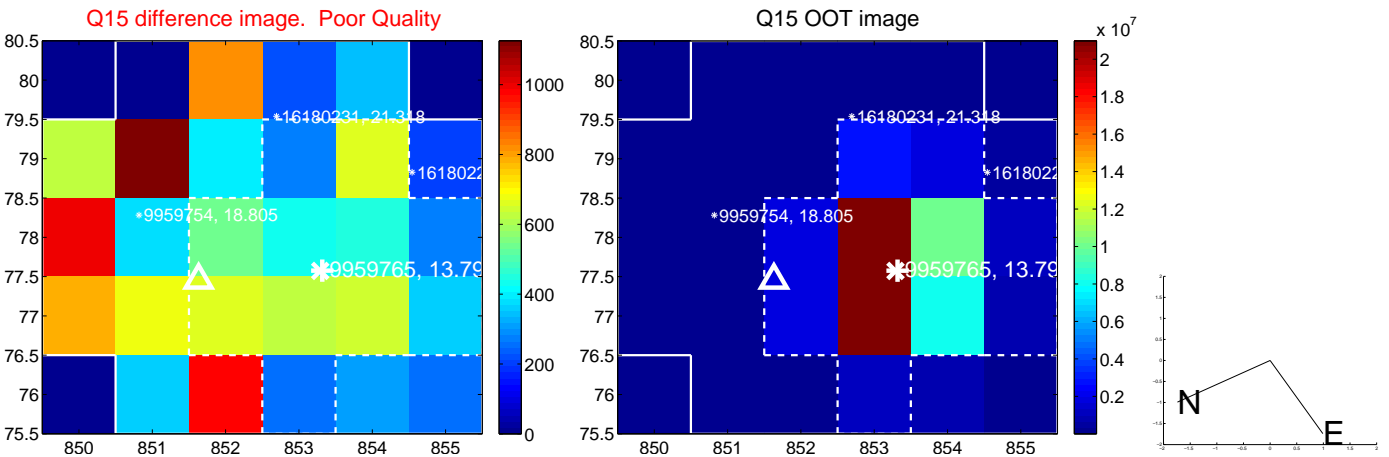
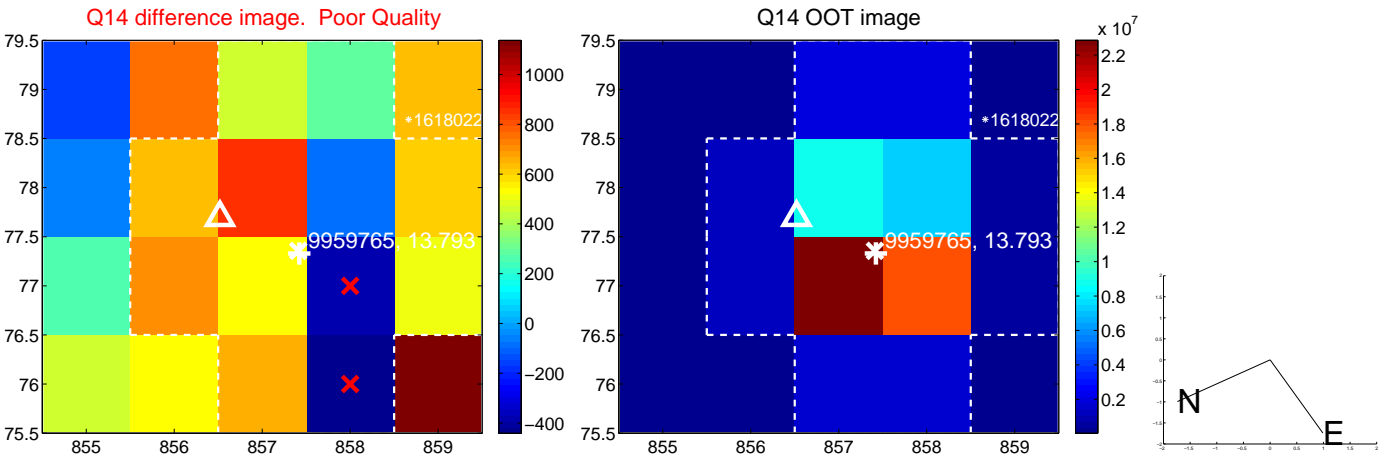
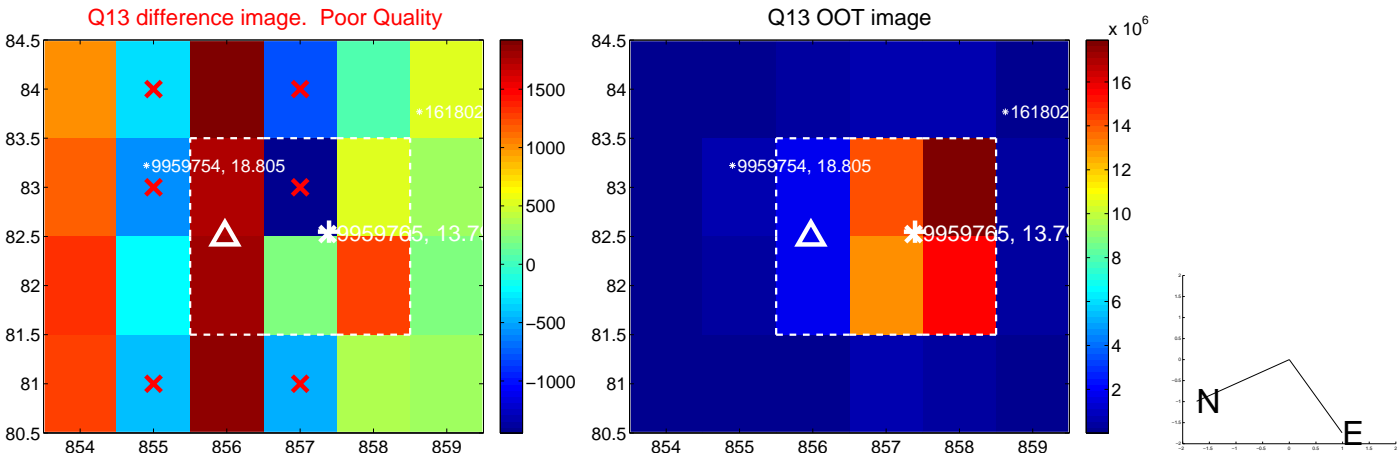




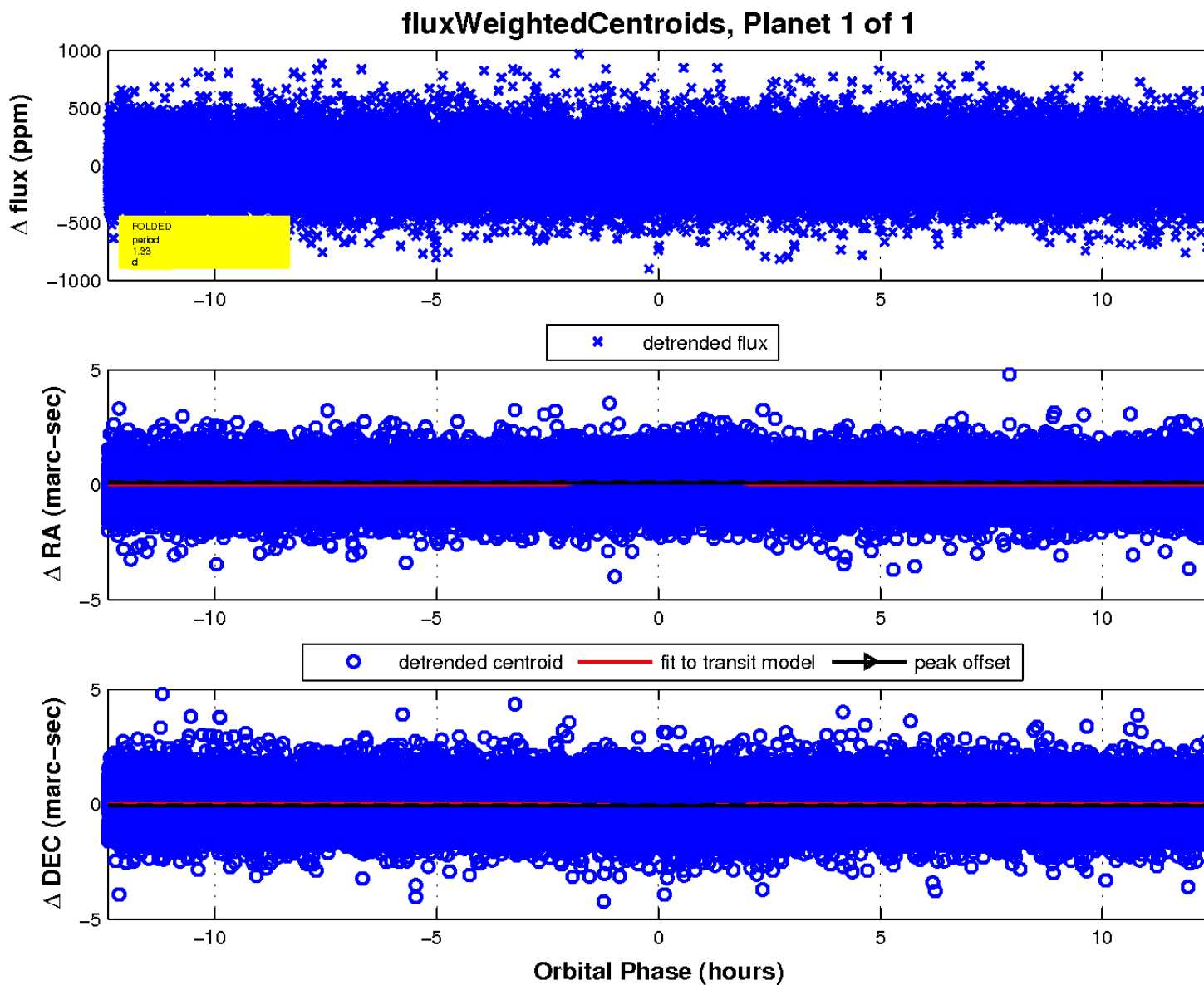
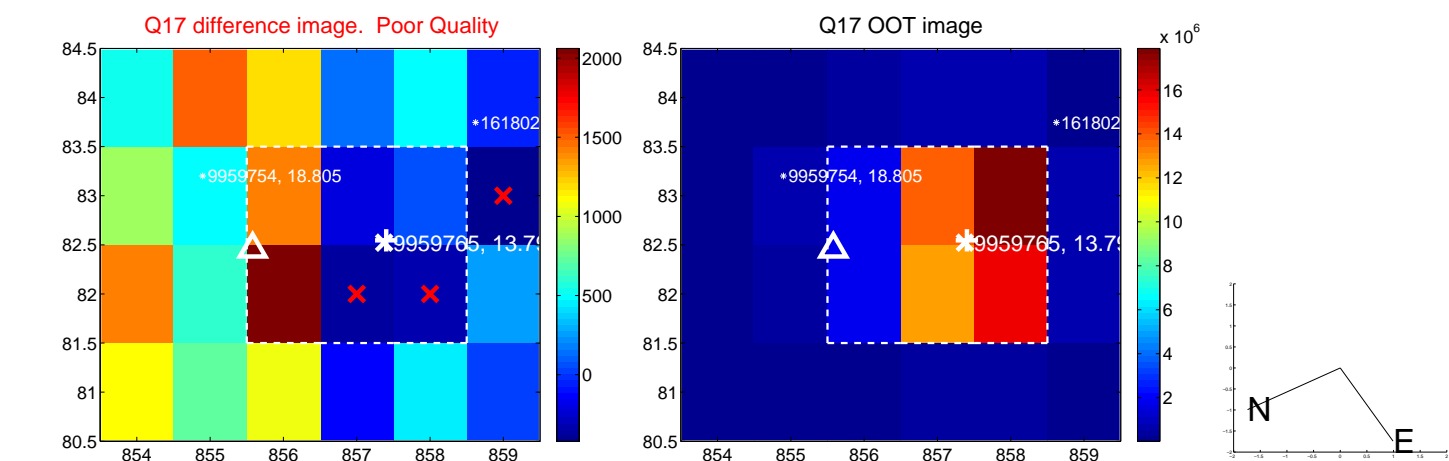
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

