

# KIC 009993683

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009993683-01	OBS	5748.01	29.937683	145.104303	183.6	5.210	9.4	9.6	0.87	5115	1.37	14.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009993683-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT

**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.

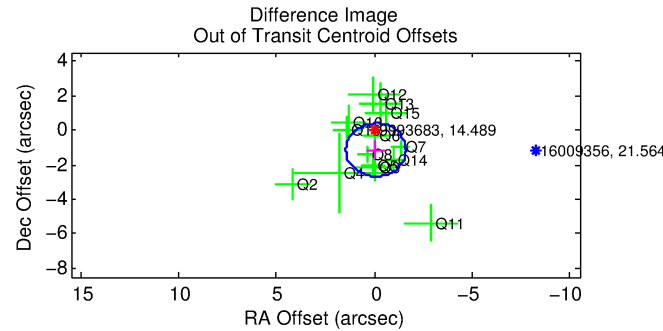
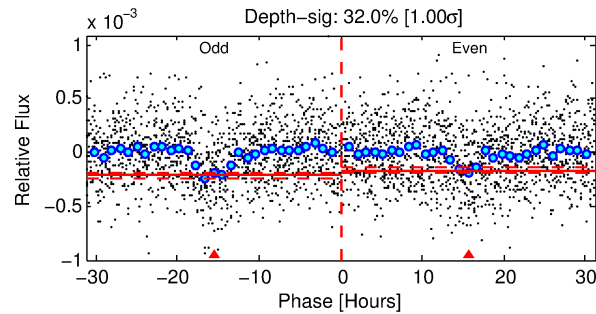
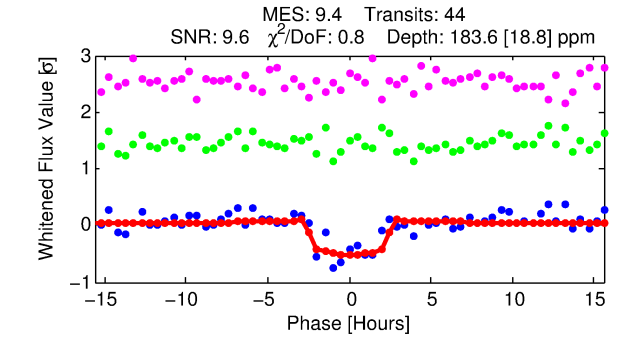
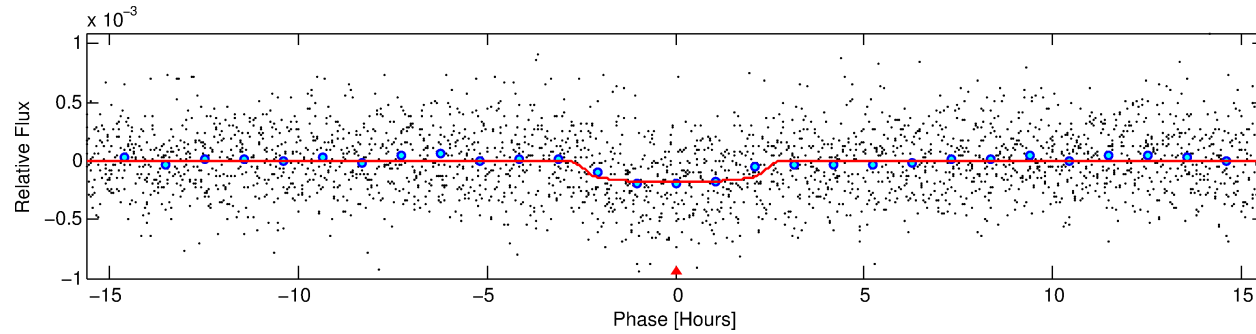
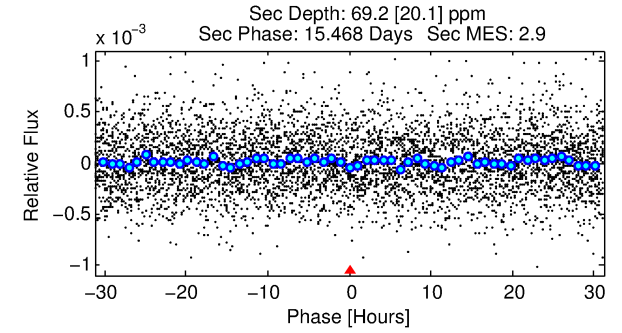
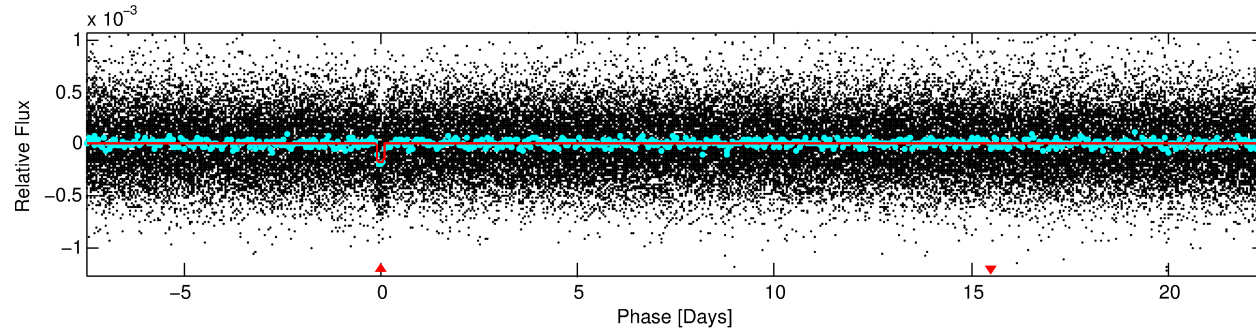
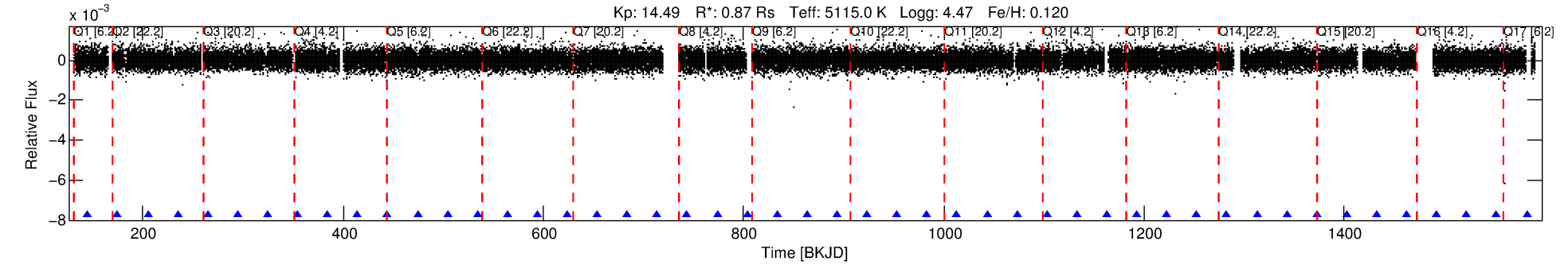
## Ephemeris Match Information For 009993683-01

No Significant Match Found

# DV One-Page Summary

KIC: 9993683 Candidate: 1 of 1 Period: 29.938 d

KOI: K05748.01 Corr: 0.905



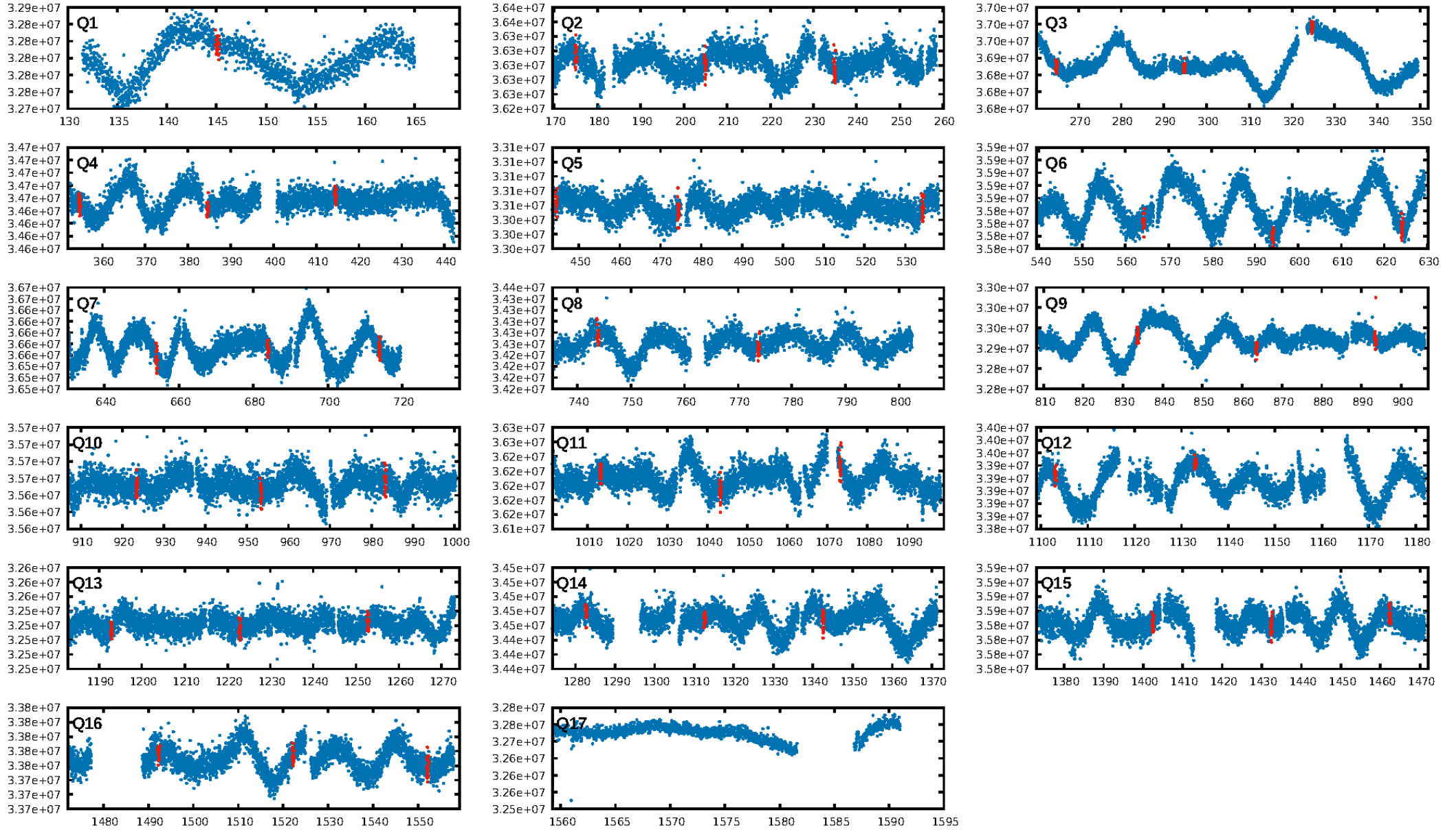
## DV Fit Results:

Period = 29.93768 [0.00035] d  
Epoch = 145.1043 [0.0097] BKJD  
Rp/R\* = 0.0145 [0.0081]  
a/R\* = 23.67 [51.37]  
b = 0.86 [0.67]  
Seff = 14.89 [2.44]  
Teq = 501 [20] K  
Rp = 1.37 [0.77] Re  
a = 0.1757 [0.0158] AU  
Ag = 626.45 [727.57] [0.86σ]  
Teffp = 3875 [1117] K [3.02σ]

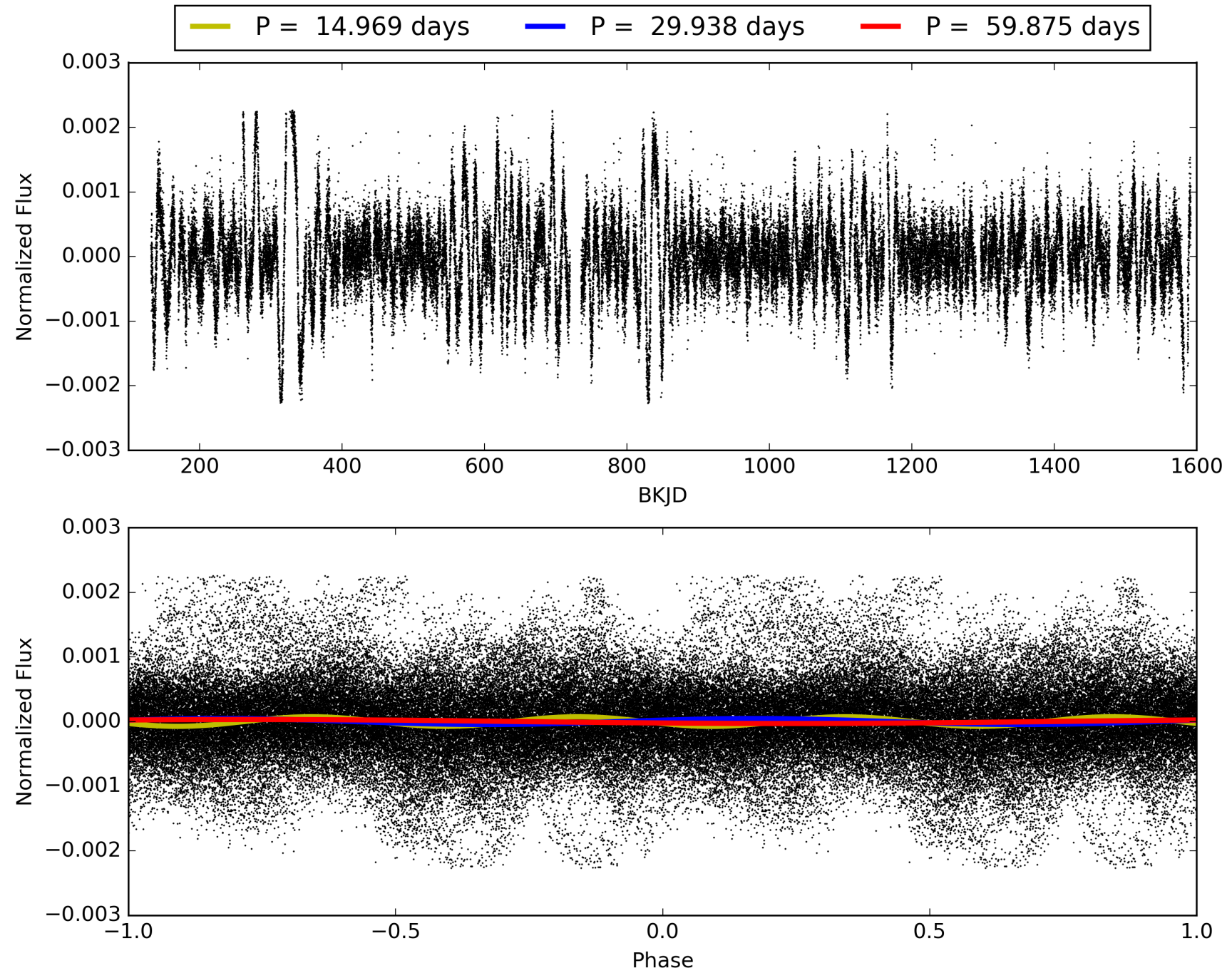
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.37e-20  
RollingBand-fgt: 1.00 [43/43]  
**GhostDiagnostic-chr: 0.8205**  
Centroid-sig: 7.4%  
Centroid-so: 1.620 arcsec [1.29σ]  
OotOffset-rm: 1.144 arcsec [2.24σ]  
KicOffset-rm: 1.140 arcsec [2.23σ]  
OotOffset-st: 4/4/4/2 [14]  
KicOffset-st: 4/4/4/2 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 1.00 [16/16]

# TCE 009993683-01, PDC Light Curves

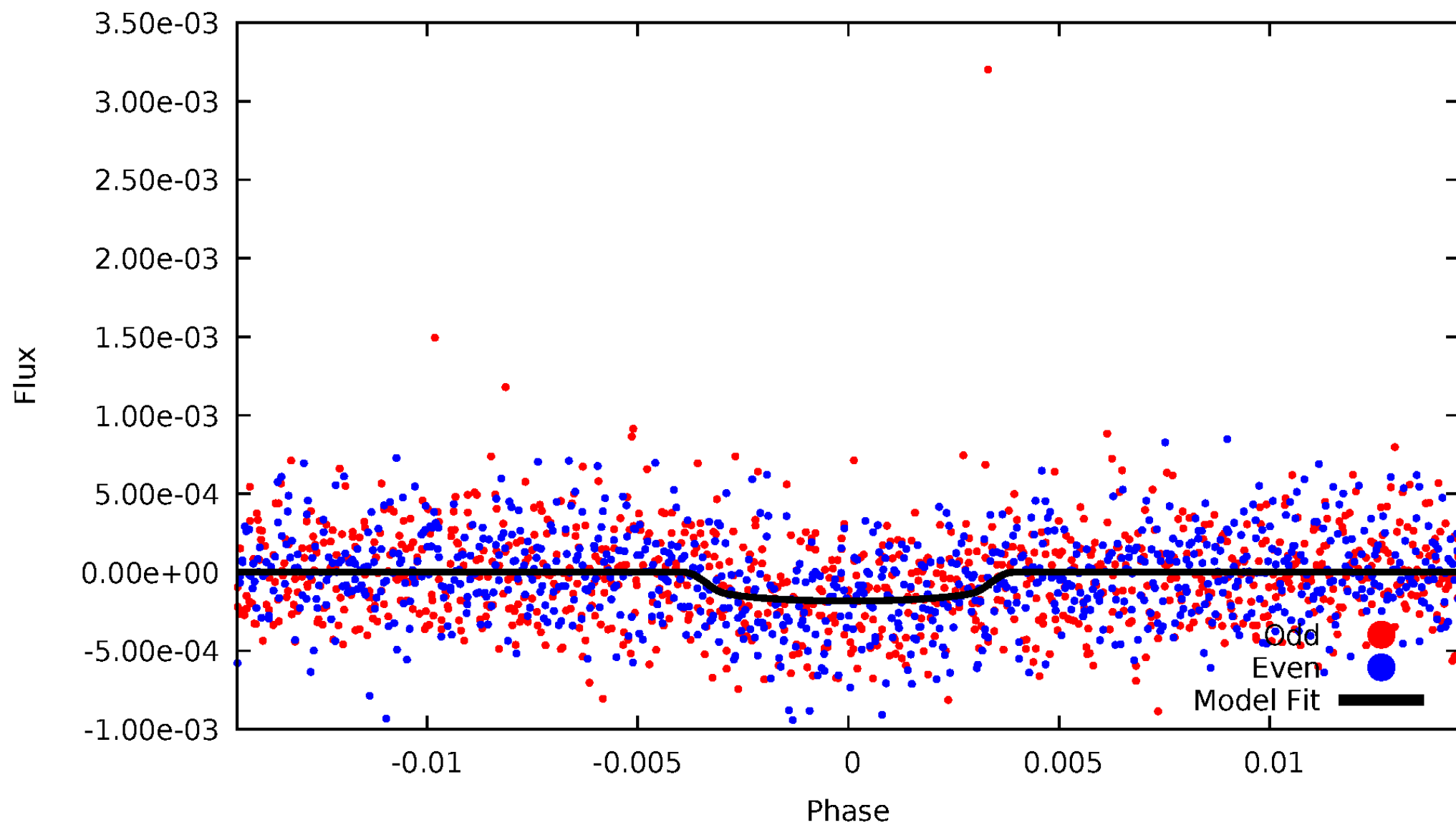


TCE 009993683-01



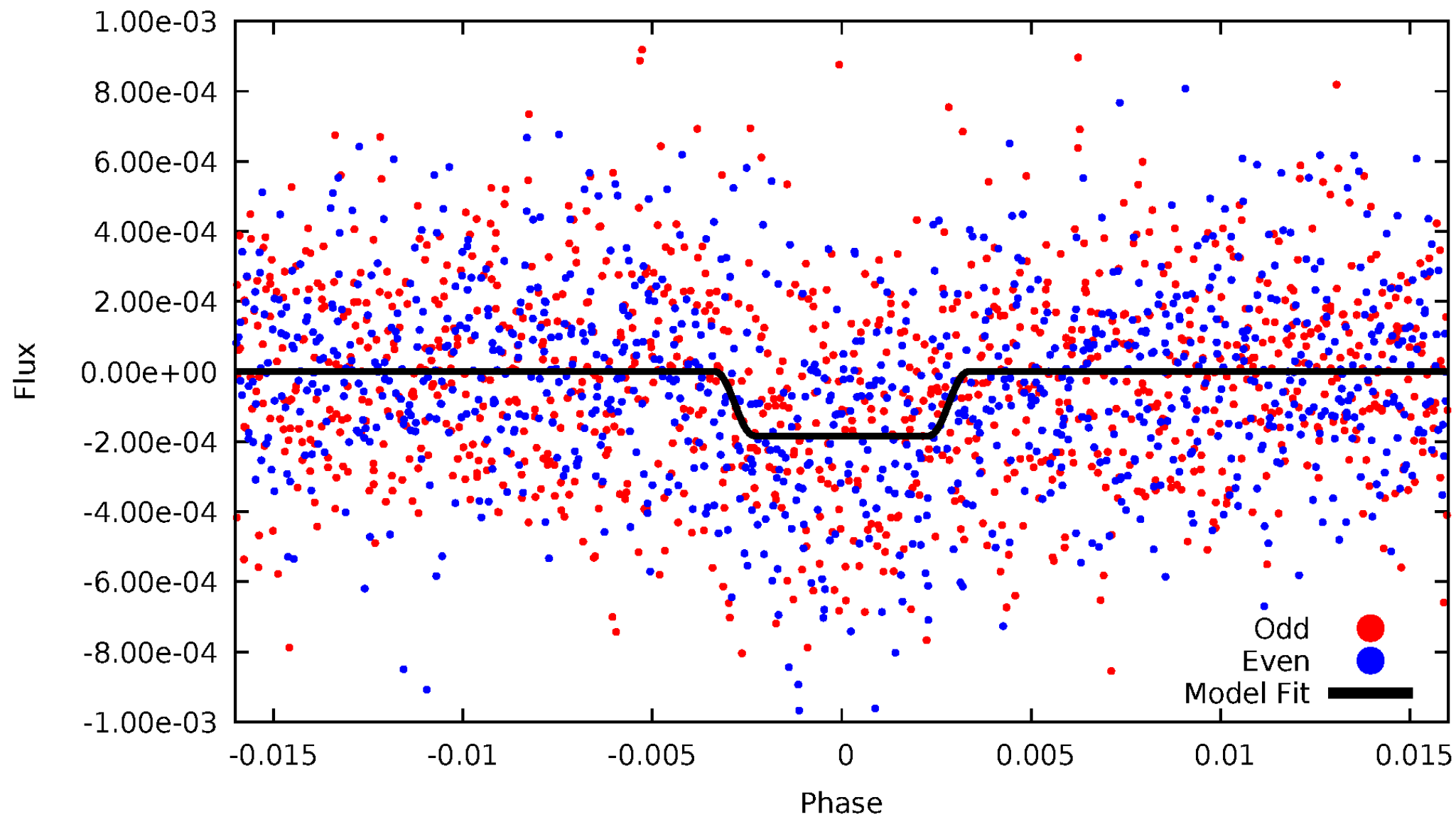
# DV Odd/Even

TCE 009993683-01



# ALT Odd/Even

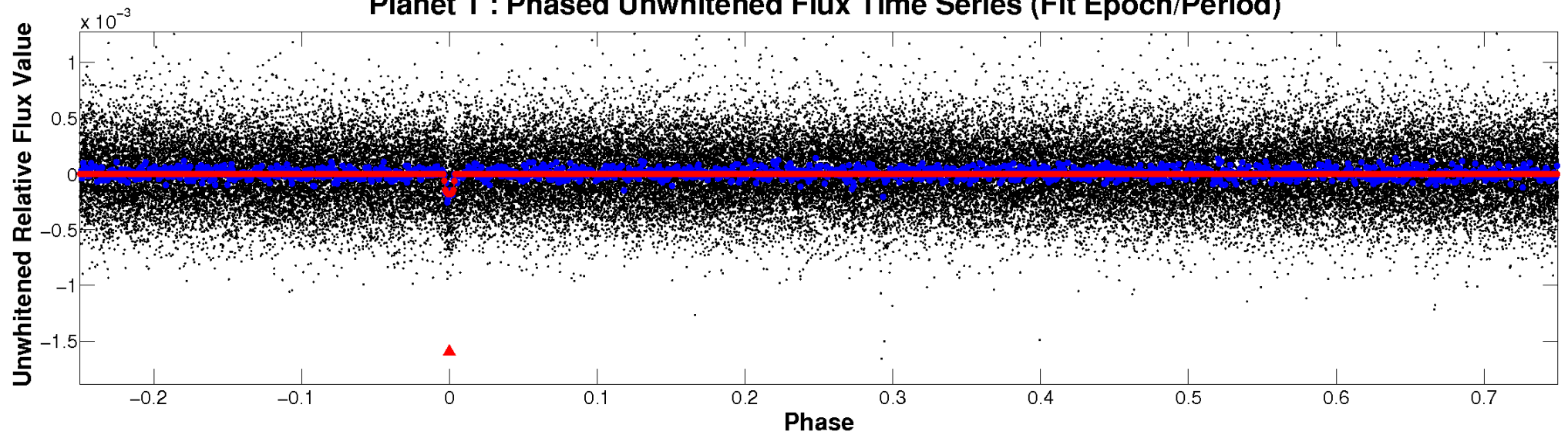
TCE 009993683-01



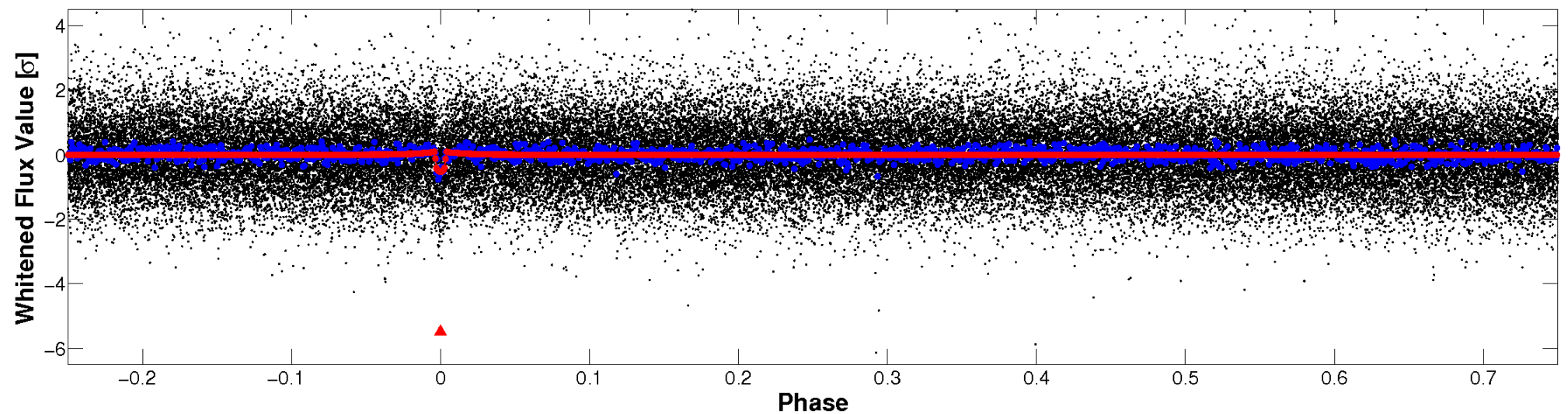


# Non-Whitened Vs. Whitened Light Curve

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

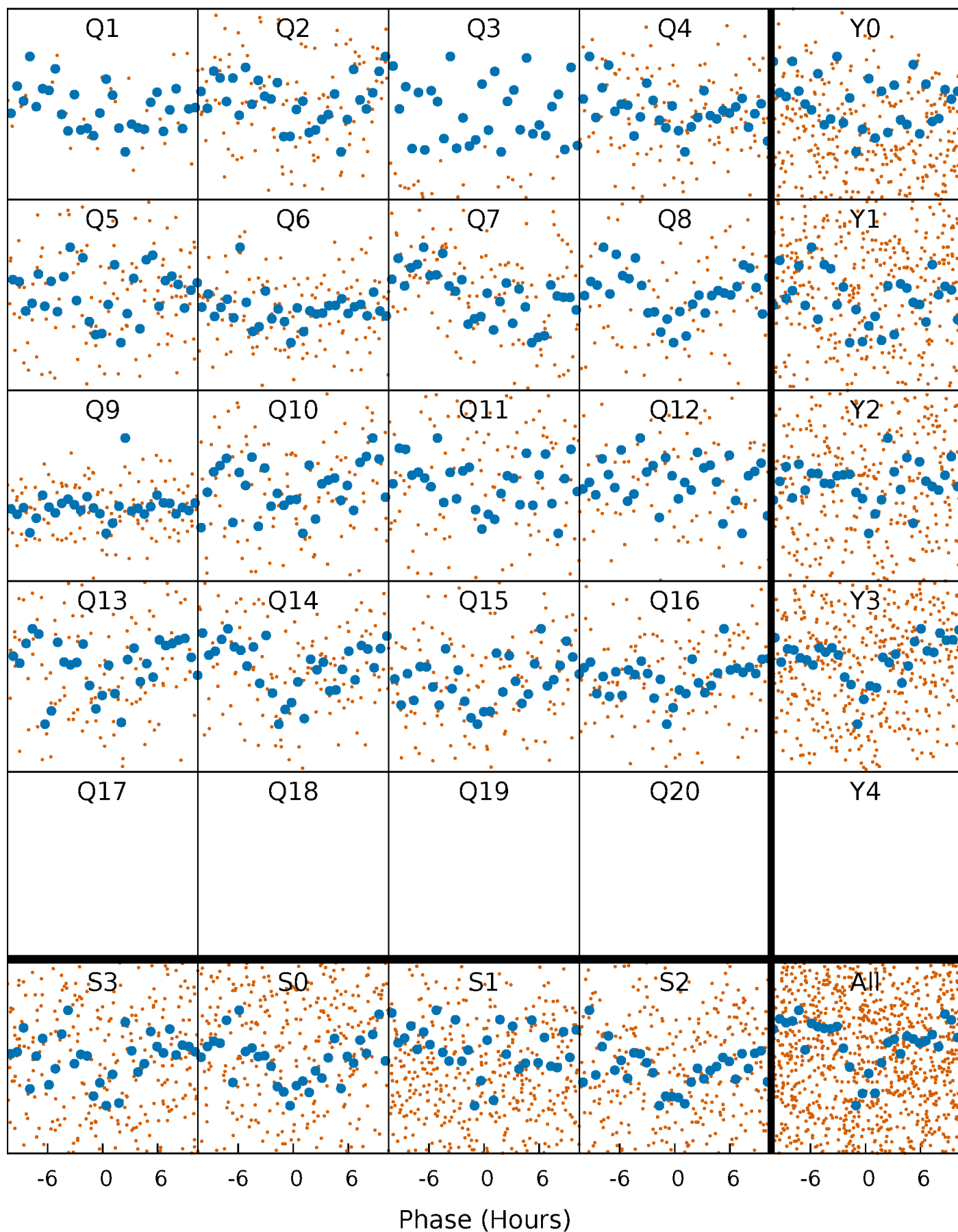


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

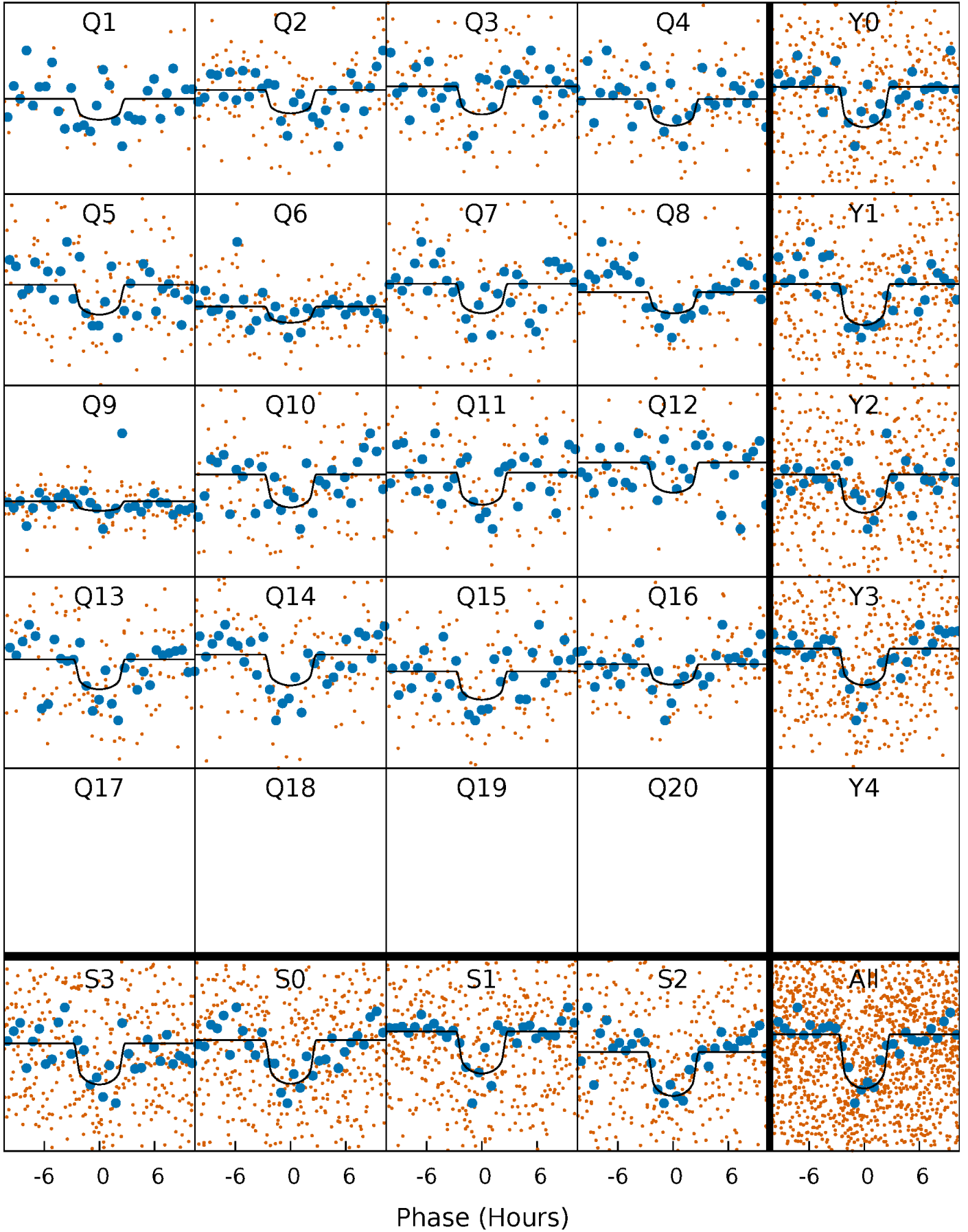
TCE 009993683-01 P= 29.937683 Days  $T_0=145.104303$  (BKJD)





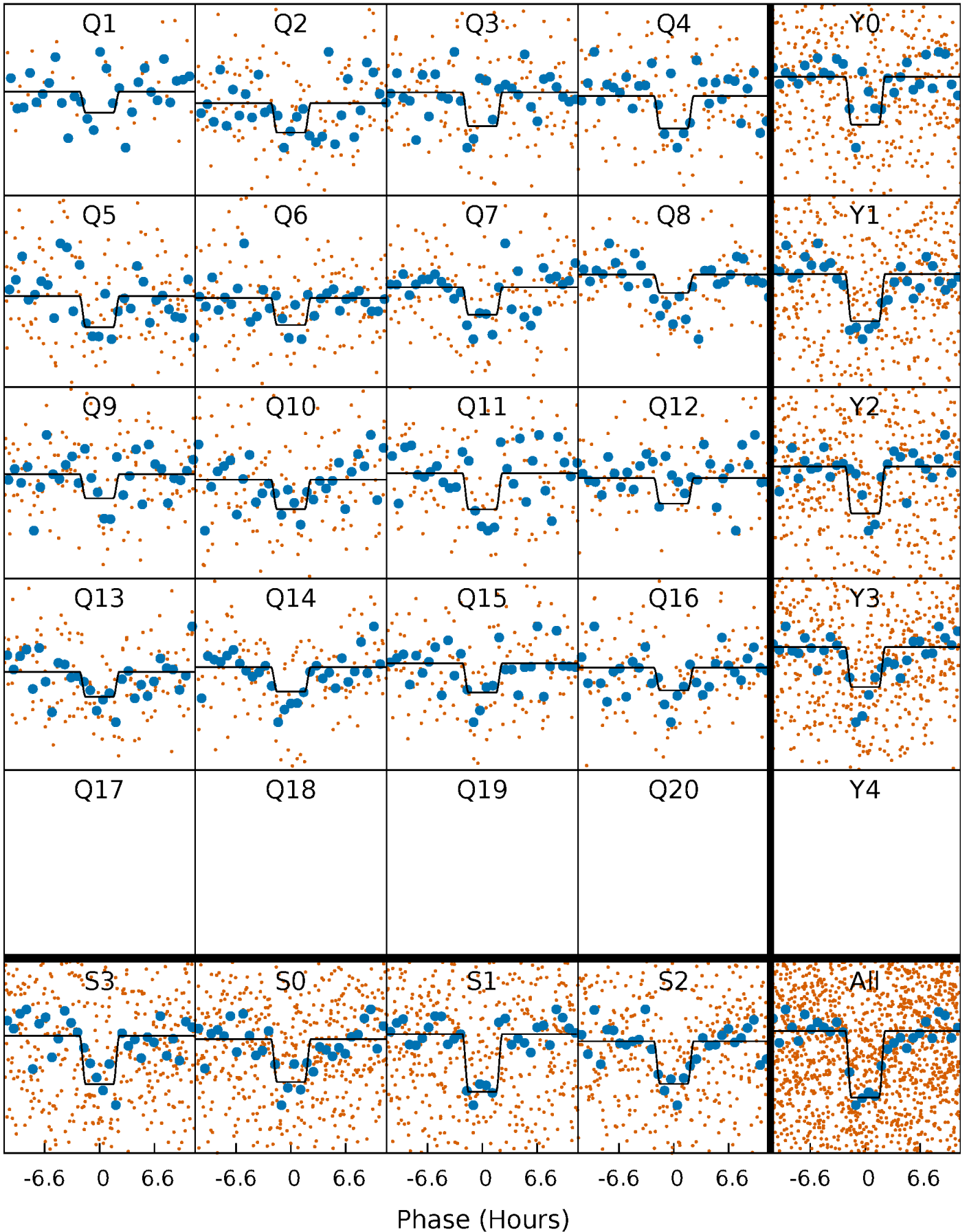
# DV Quarter-Phased Transit Curves

TCE 009993683-01 P= 29.937683 Days  $T_0=145.104303$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

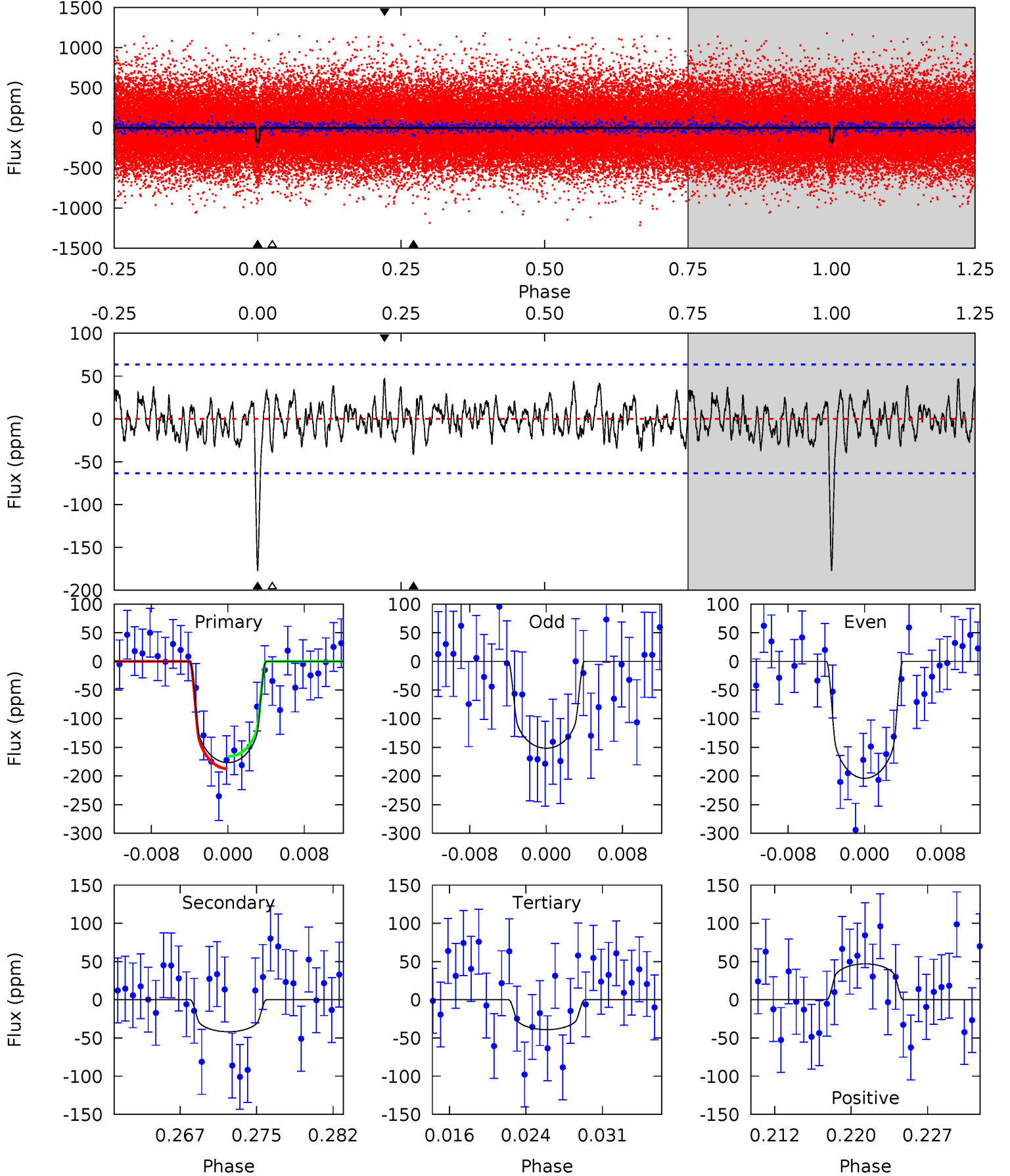
TCE 009993683-01 P= 29.937353 Days  $T_0=145.111766$  (BKJD)



# DV Model-Shift Uniqueness Test

009993683-01, P = 29.937683 Days, E = 115.166620 Days

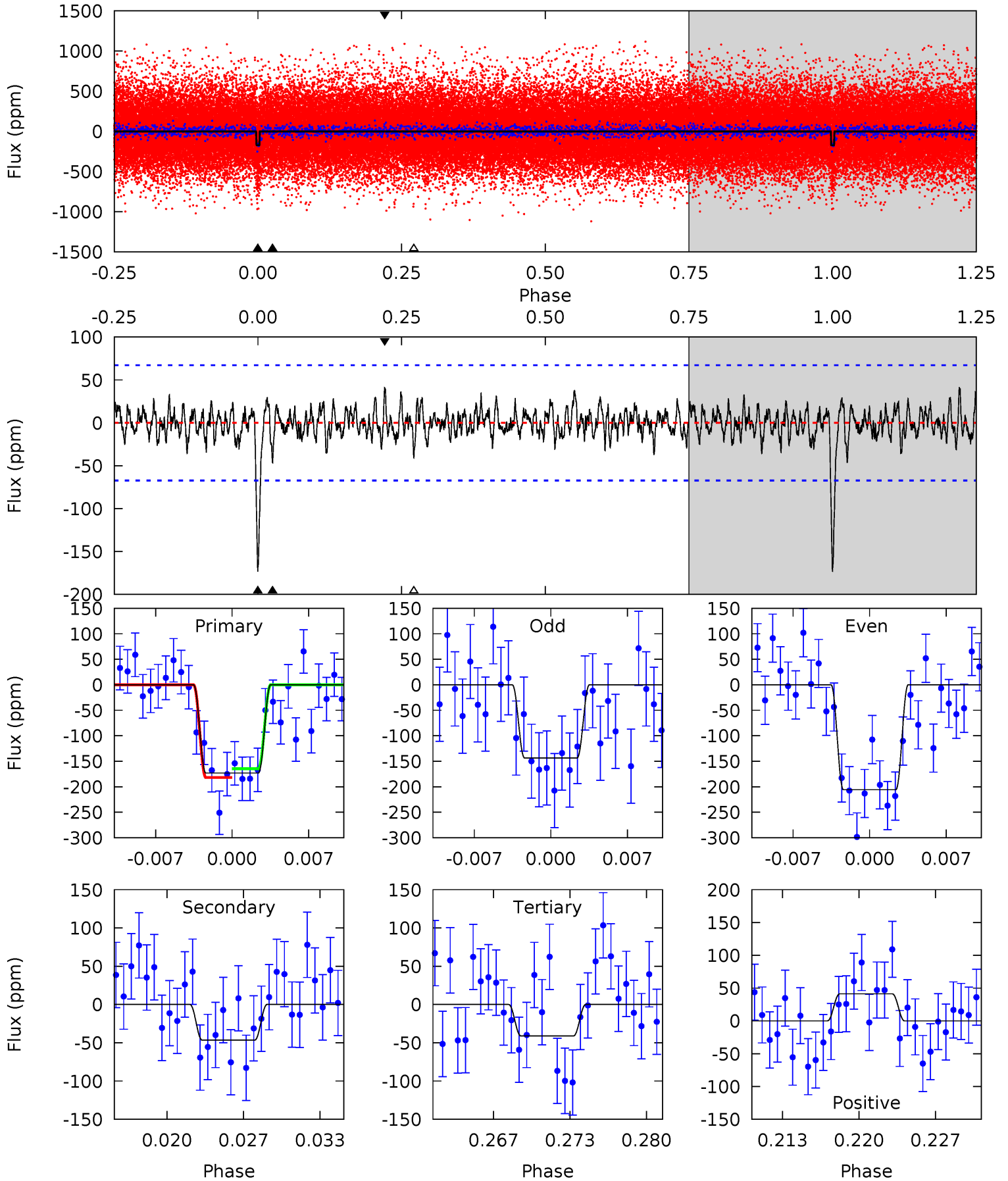
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	3.34	3.13	3.76	5.07	2.66	1.25	11.0	10.4	0.22	-0.41	2.10	1.00	0.21	0.85



# Alt Model-Shift Uniqueness Test

009993683-01, P = 29.937353 Days, E = 115.174413 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
13.2	3.54	3.13	3.13	5.10	2.71	0.99	10.0	10.0	0.41	0.41	2.37	1.02	0.19	0.65



### Stellar Parameters For KIC 009993683

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5115^{+84}_{-76}$	$4.470^{+0.090}_{-0.030}$	$0.120^{+0.150}_{-0.150}$	$0.866^{+0.044}_{-0.075}$	$0.808^{+0.060}_{-0.030}$	$1.749^{+0.600}_{-0.195}$
	+2%/-1%	+2%/-1%	+125%/-125%	+5%/-9%	+7%/-4%	+34%/-11%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009993683-01 / KOI 5748.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-42 \pm 13$	$1.38^{+0.70}_{-0.71}$	$695^{+16}_{-18}$	$3747^{+1061}_{-498}$	$386^{+1148}_{-232}$
Alt.	$-47 \pm 13$	$1.29^{+0.73}_{-0.68}$	$696^{+16}_{-20}$	$3893^{+1258}_{-561}$	$485^{+1517}_{-303}$

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

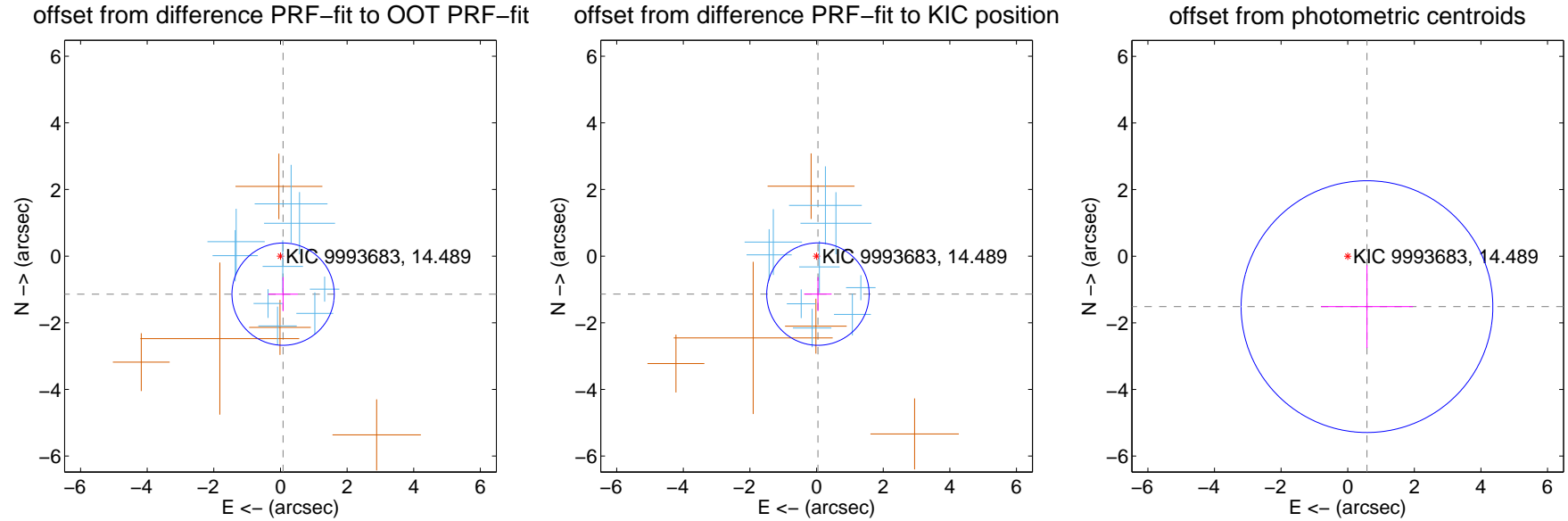
## DV Centroid Data

Supplemental centroid analysis for 009993683-01. Kepler magnitude: 14.49. Transit SNR 9.58

There are 9 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

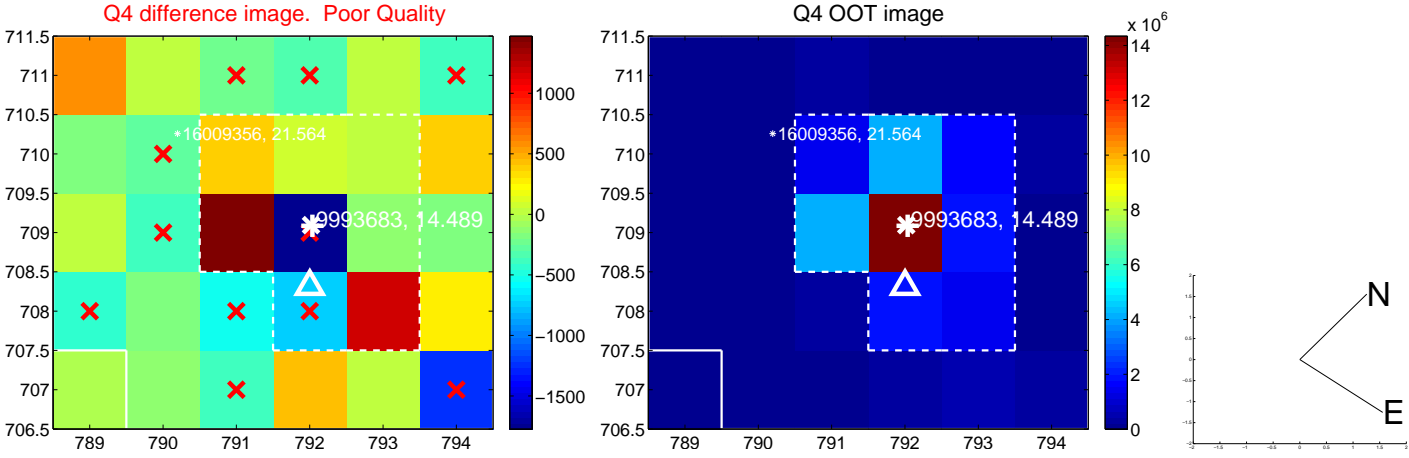
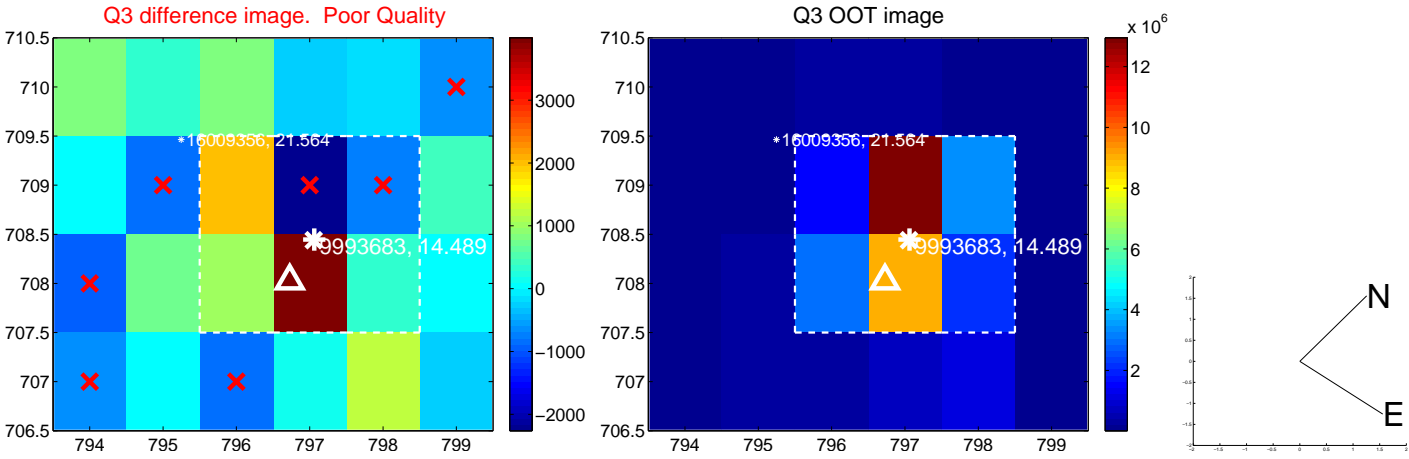
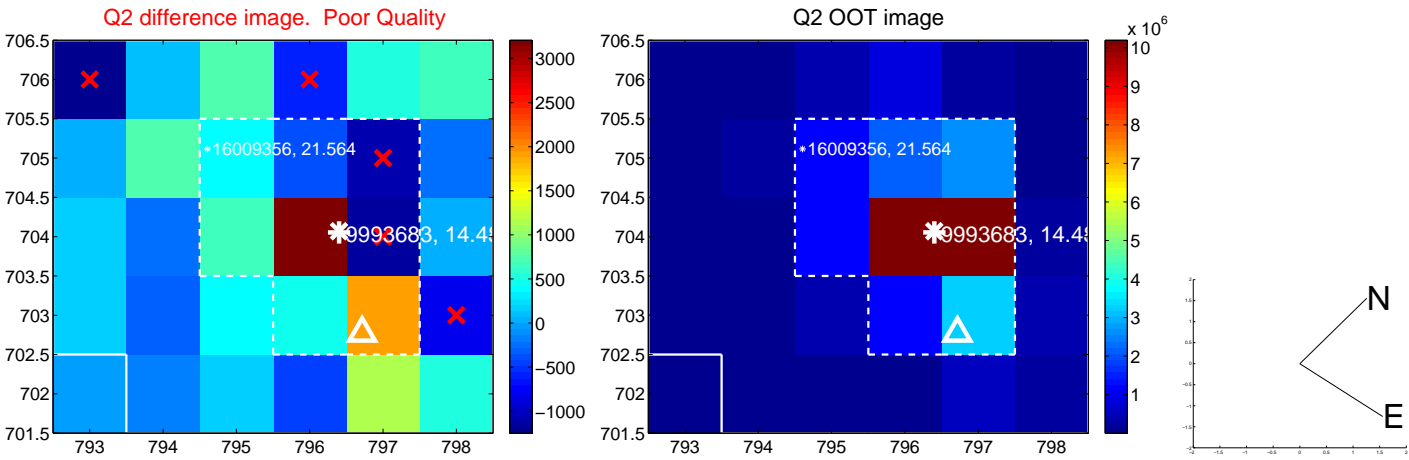
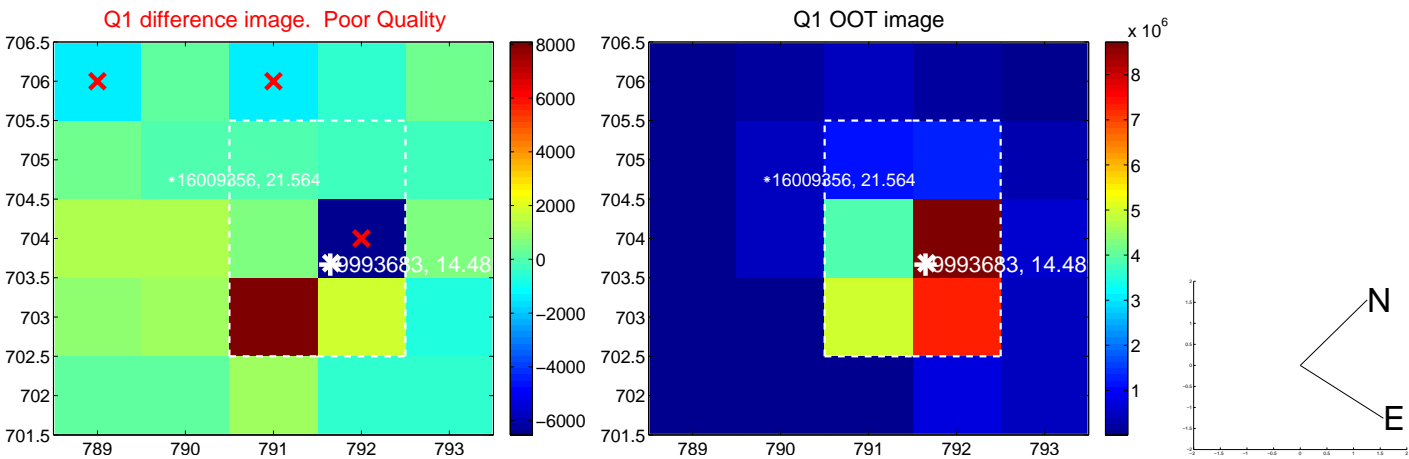
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.144 \pm 0.512$	2.24	$-0.079 \pm 0.443$	$-1.141 \pm 0.511$
PRF-fit source offset from KIC position	$1.140 \pm 0.512$	2.23	$-0.041 \pm 0.413$	$-1.140 \pm 0.510$
photometric centroid source offset	$1.62 \pm 1.26$	1.29	$-0.58 \pm 1.38$	$-1.51 \pm 1.24$



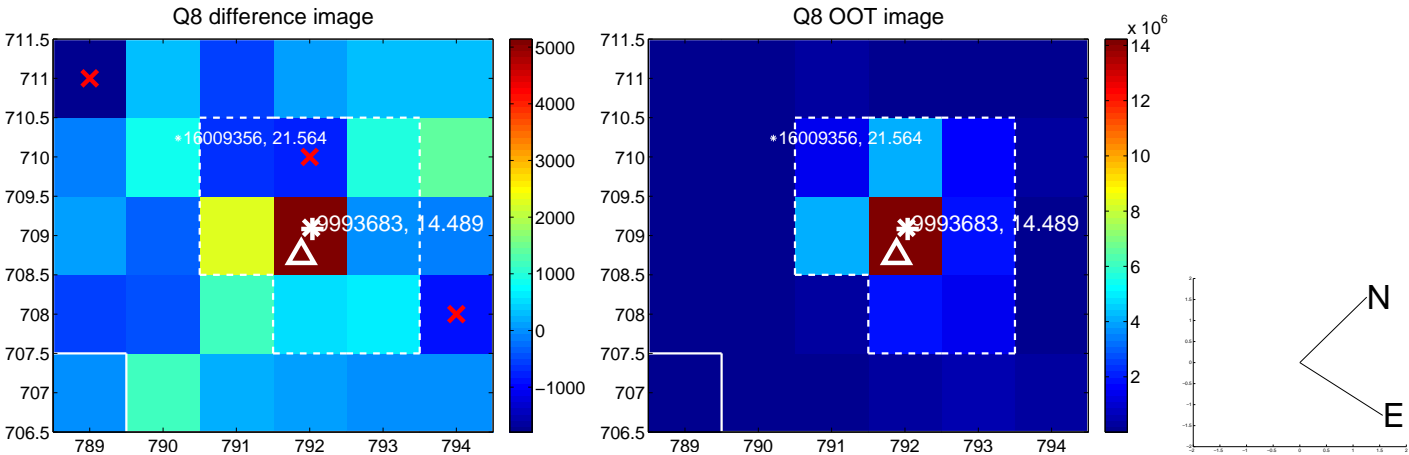
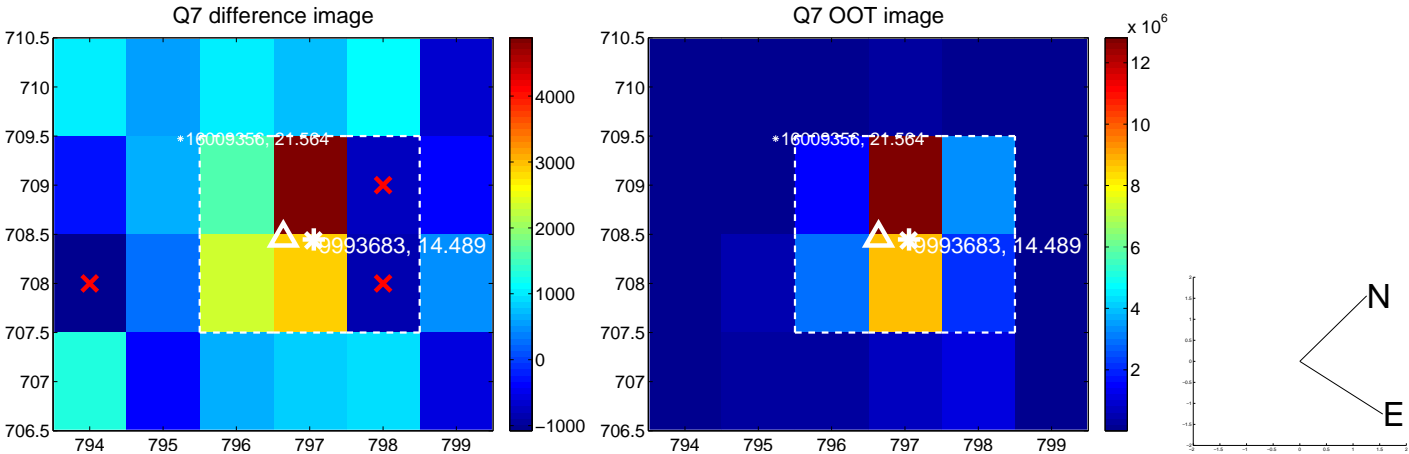
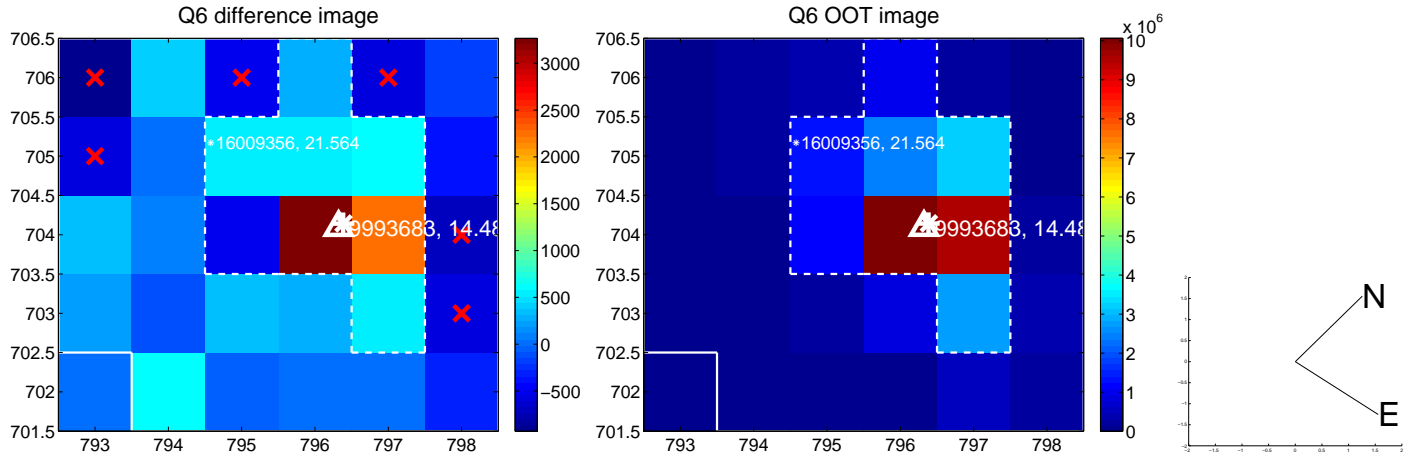
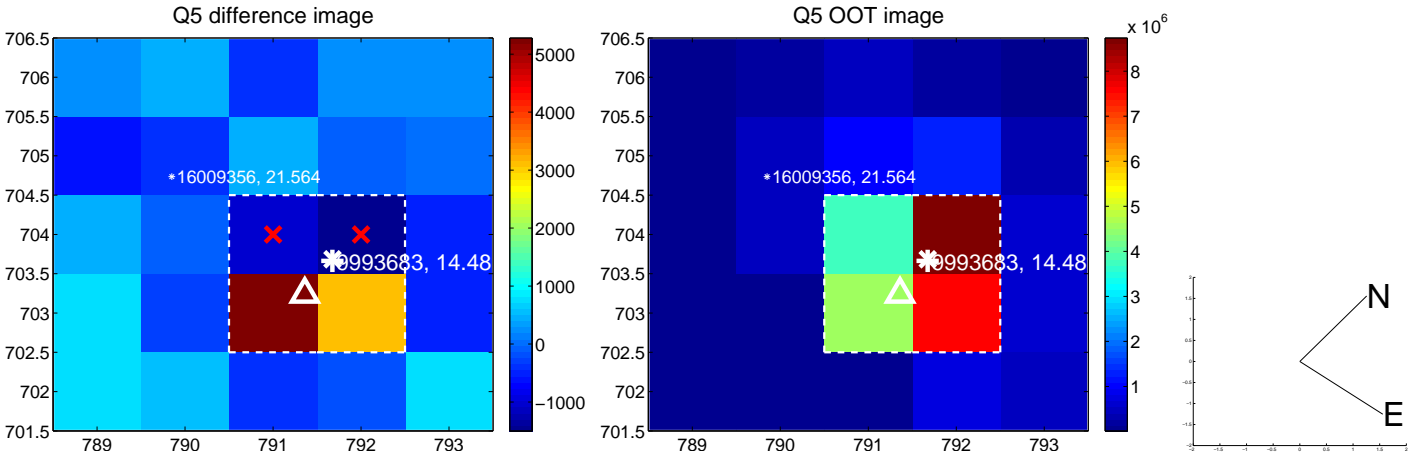
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



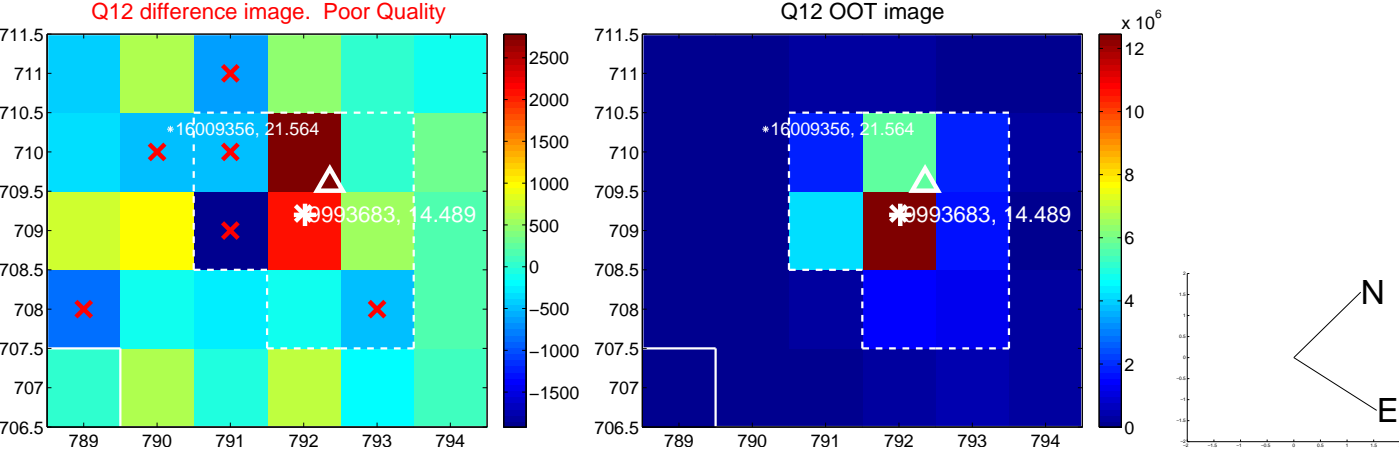
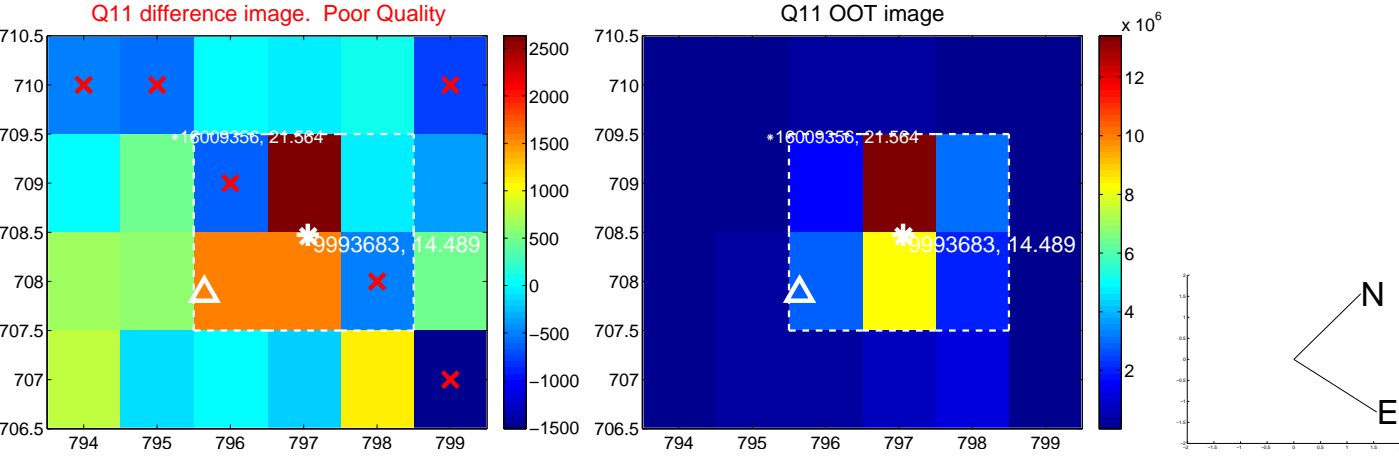
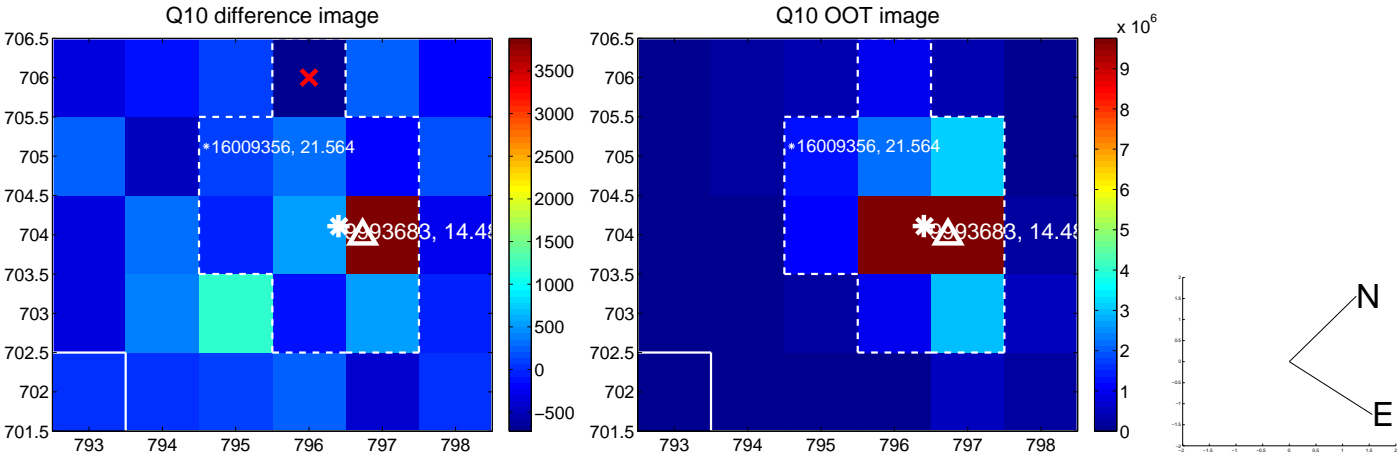
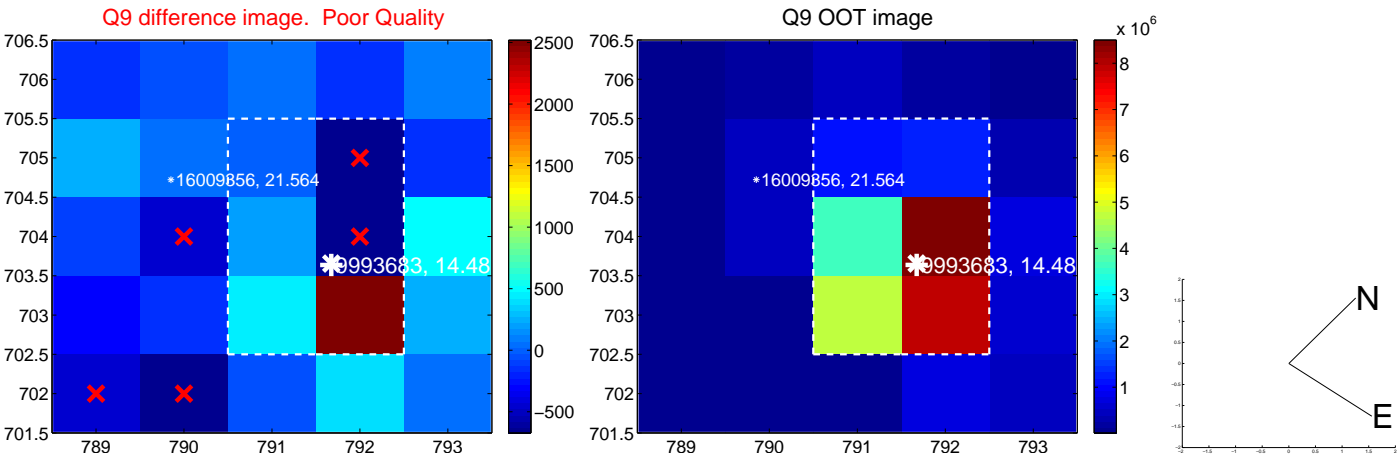
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



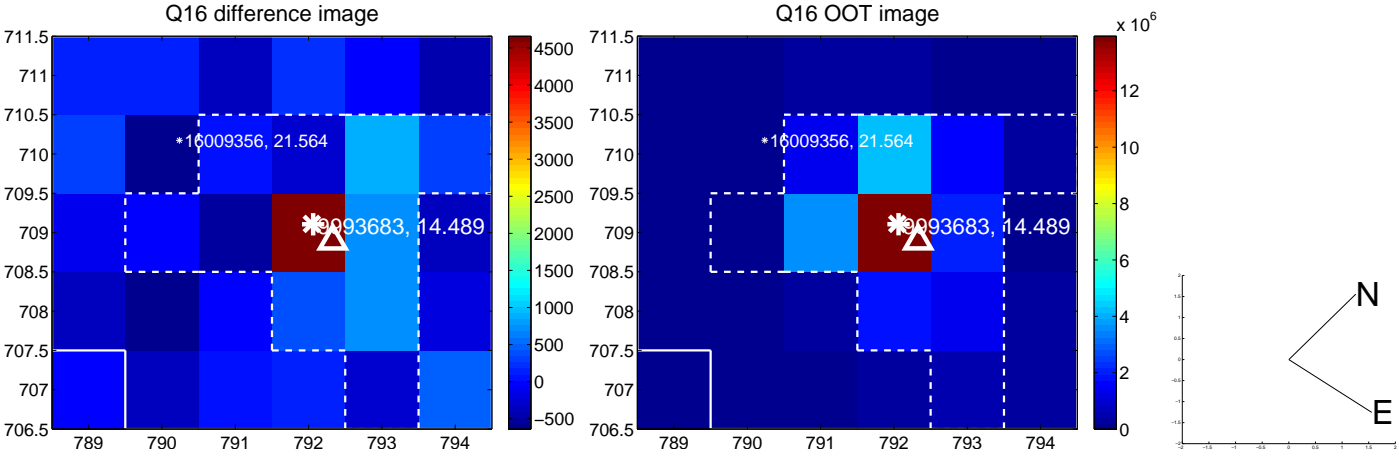
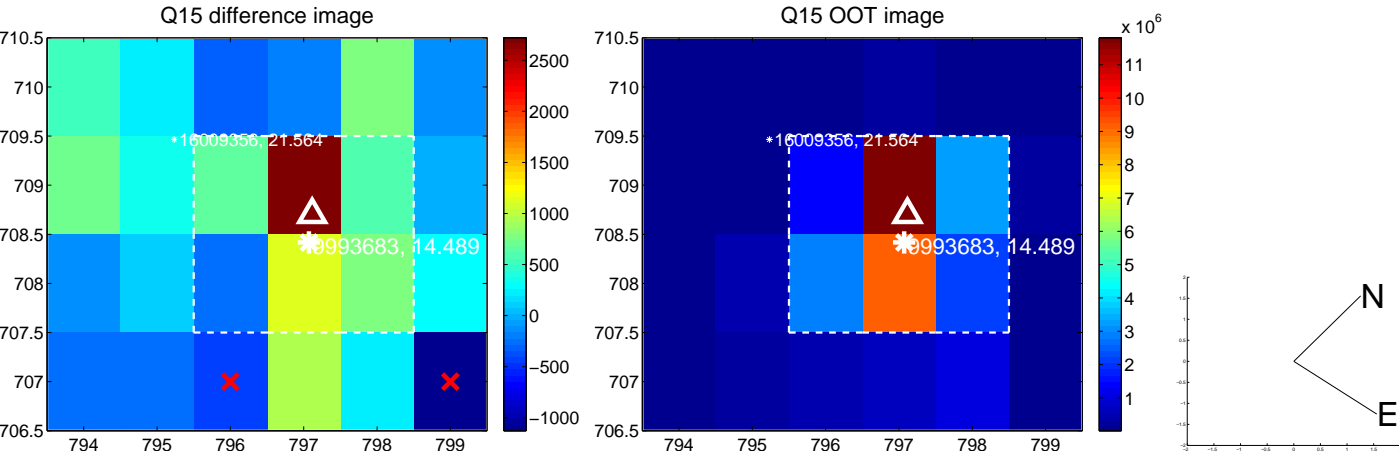
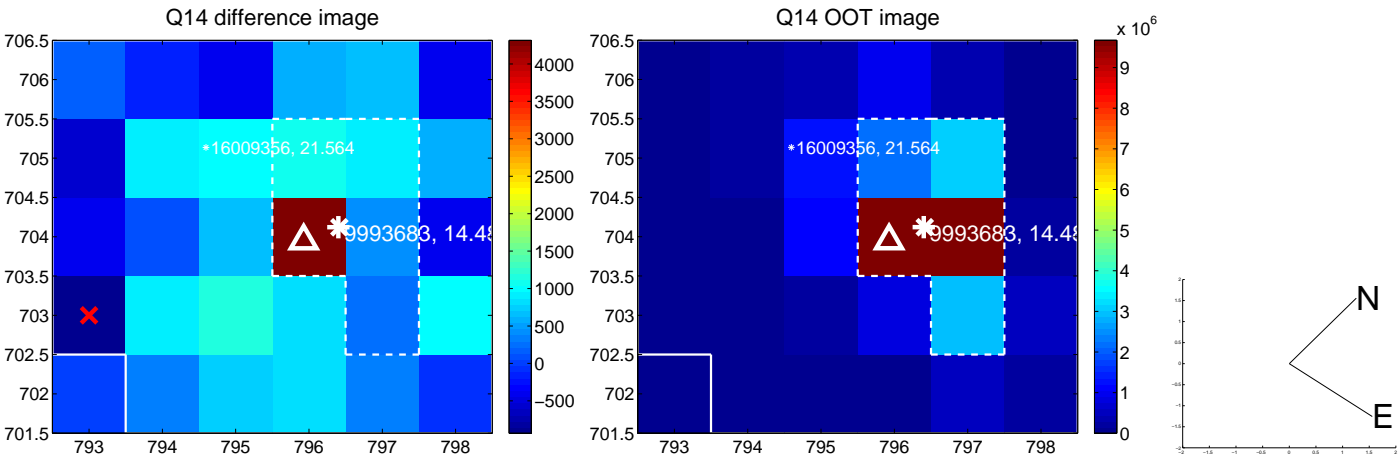
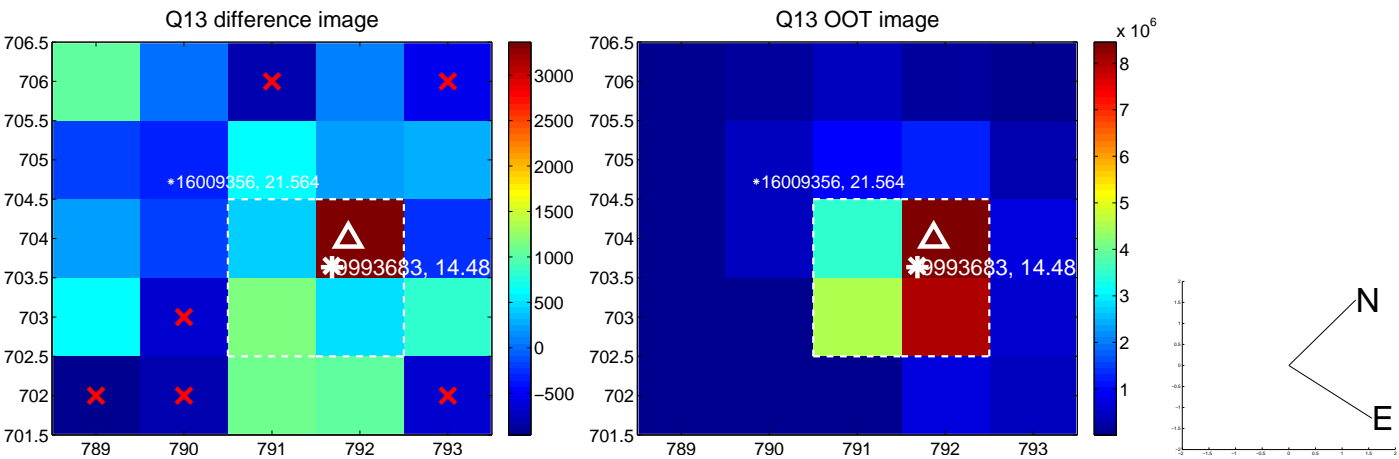
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



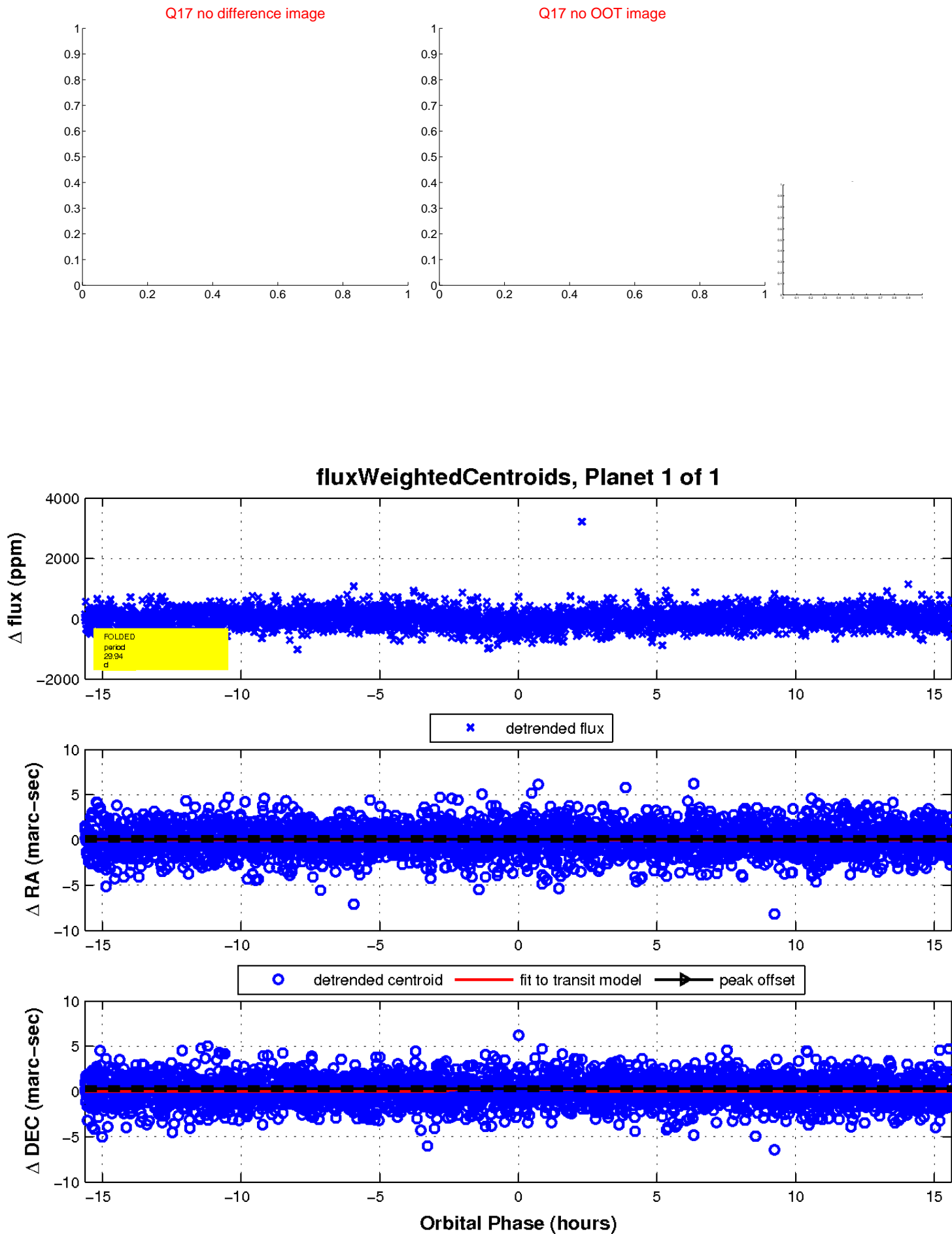
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



# UKIRT Image

Declination

