

# KIC 010904004

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010904004-01	OBS	2957.01	4.644820	133.690281	108.6	2.442	9.9	11.1	0.77	4786	0.98	113.72

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010904004-01	OBS	PC	0.91	0	0	0	0	CENT_KIC_POS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

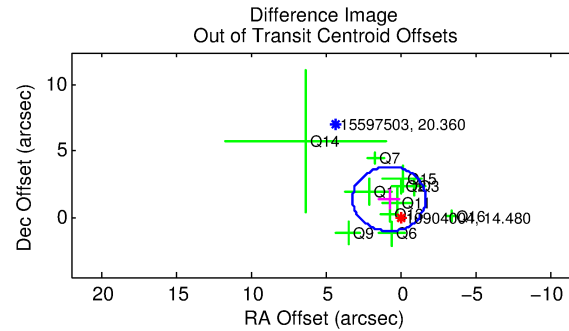
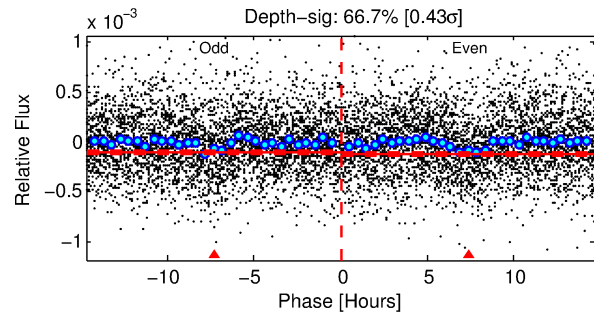
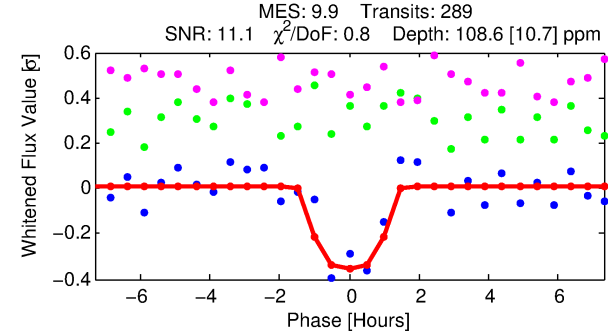
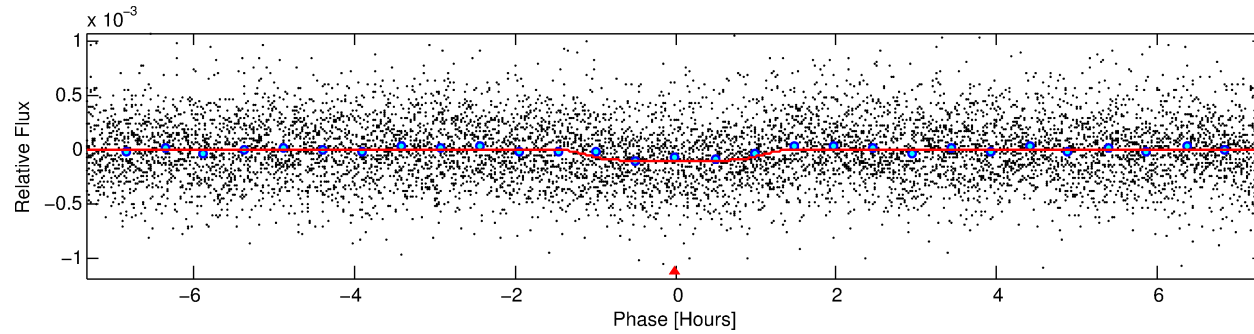
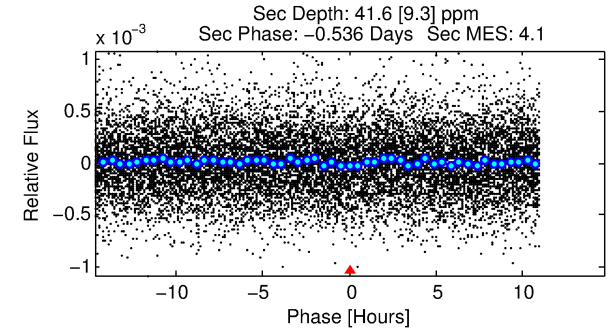
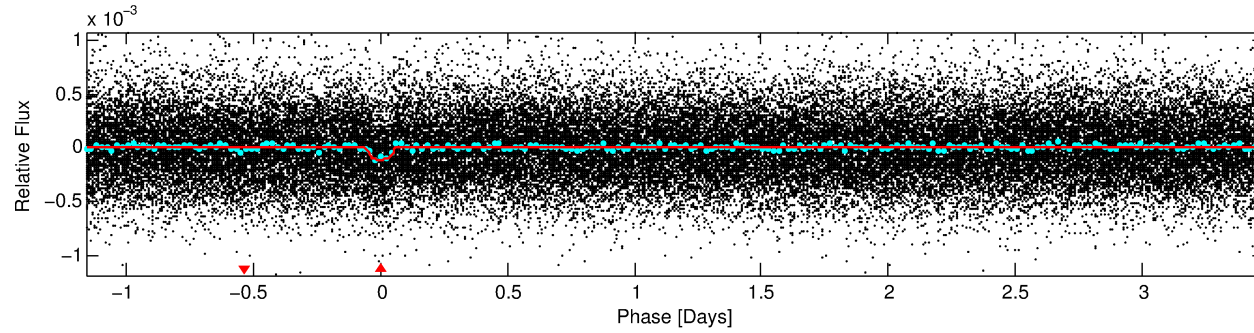
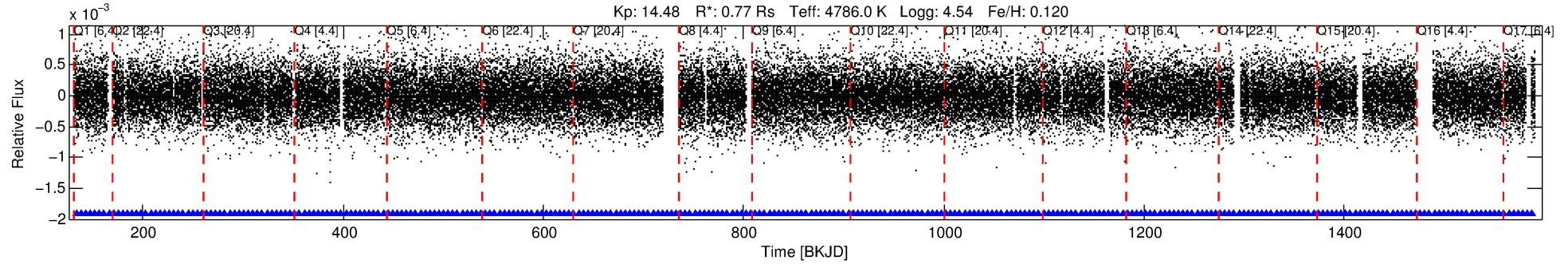
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010904004-01

No Significant Match Found

# DV One-Page Summary

KIC: 10904004 Candidate: 1 of 1 Period: 4.645 d  
KOI: K02957.01 Corr: 0.929



## DV Fit Results:

Period = 4.64482 [0.00003] d  
Epoch = 133.6903 [0.0041] BKJD  
Rp/R\* = 0.0117 [0.0091]  
a/R\* = 6.86 [19.99]  
b = 0.90 [0.67]  
Seff = 113.72 [12.97]  
Teff = 833 [24] K  
Rp = 0.98 [0.76] Re  
a = 0.0495 [0.0028] AU  
Ag = 58.16 [91.27] [0.63 $\sigma$ ]  
Teffp = 3555 [1394] K [1.95 $\sigma$ ]

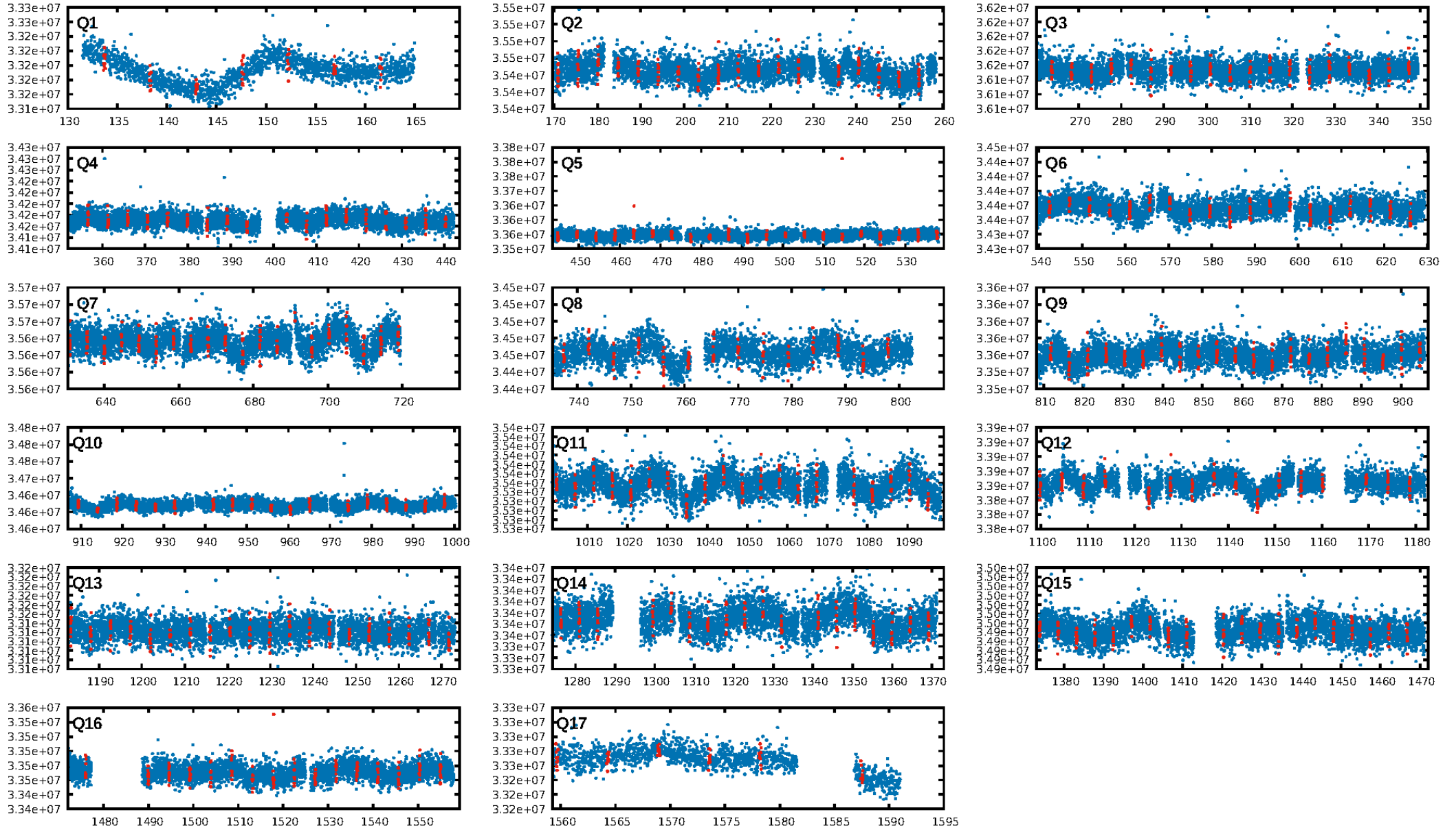
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.23e-23  
RollingBand-fgt: 1.00 [276/276]  
GhostDiagnostic-chr: 4.405  
Centroid-sig: 0.6%  
Centroid-so: 1.751 arcsec [1.41 $\sigma$ ]  
OotOffset-rm: 1.594 arcsec [1.96 $\sigma$ ]  
OotOffset-st: 3/4/1/3 [11]  
KicOffset-rm: 2.047 arcsec [2.37 $\sigma$ ]  
KicOffset-st: 3/4/1/3 [11]  
DiffImageQuality-fgm: 0.36 [4/11]  
DiffImageOverlap-fno: 1.00 [17/17]

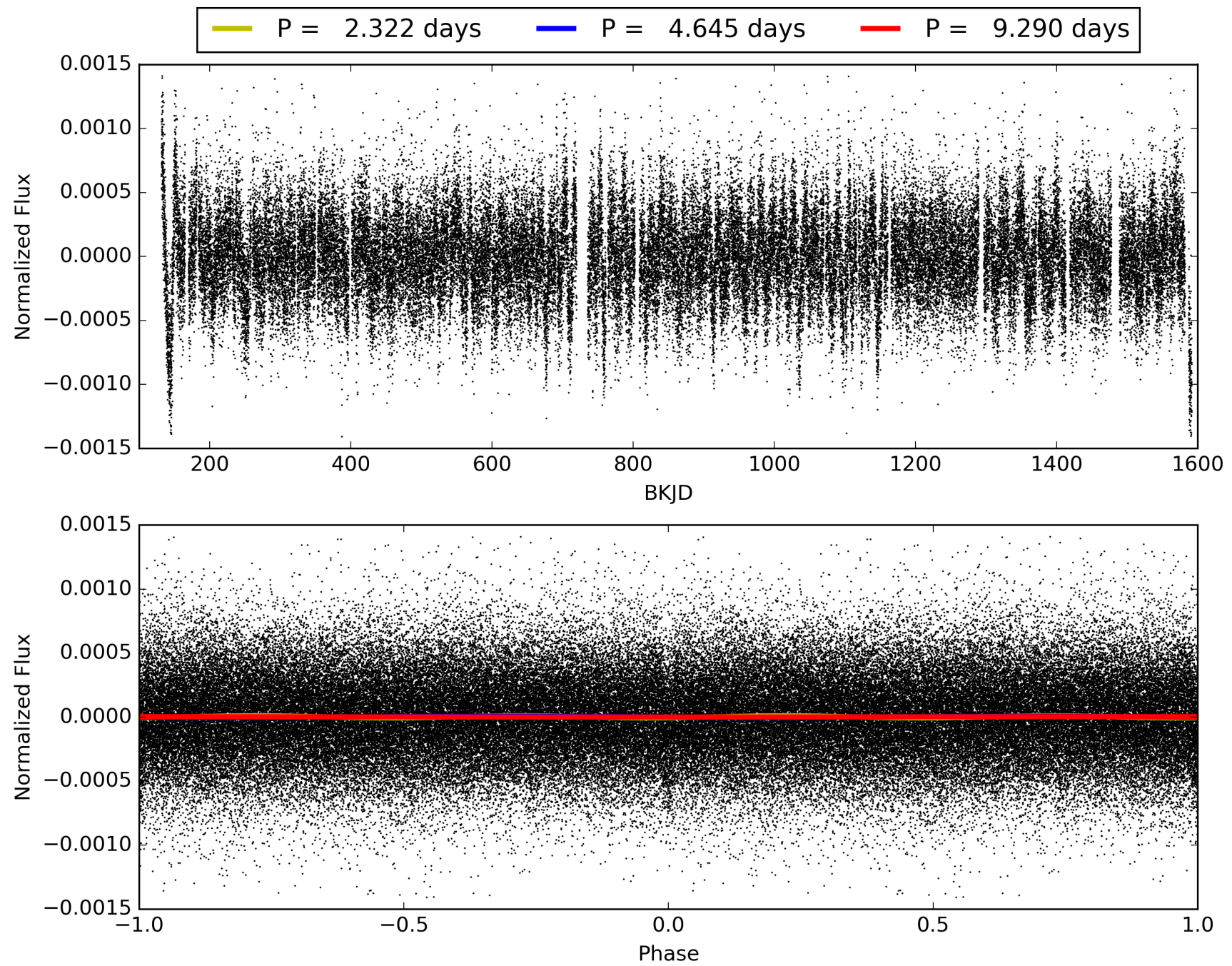
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:40:50 Z

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

# TCE 010904004-01, PDC Light Curves



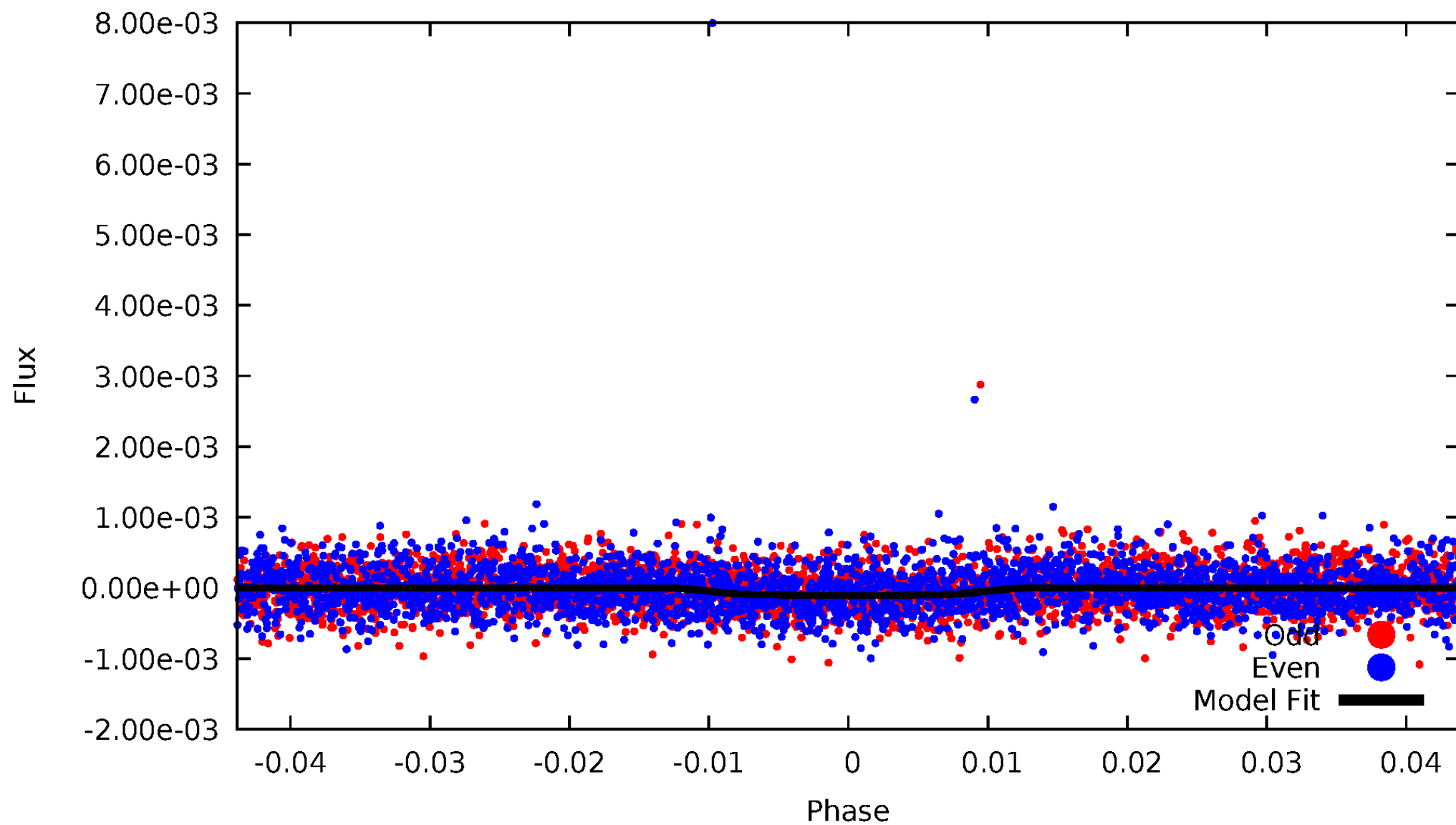
TCE 010904004-01





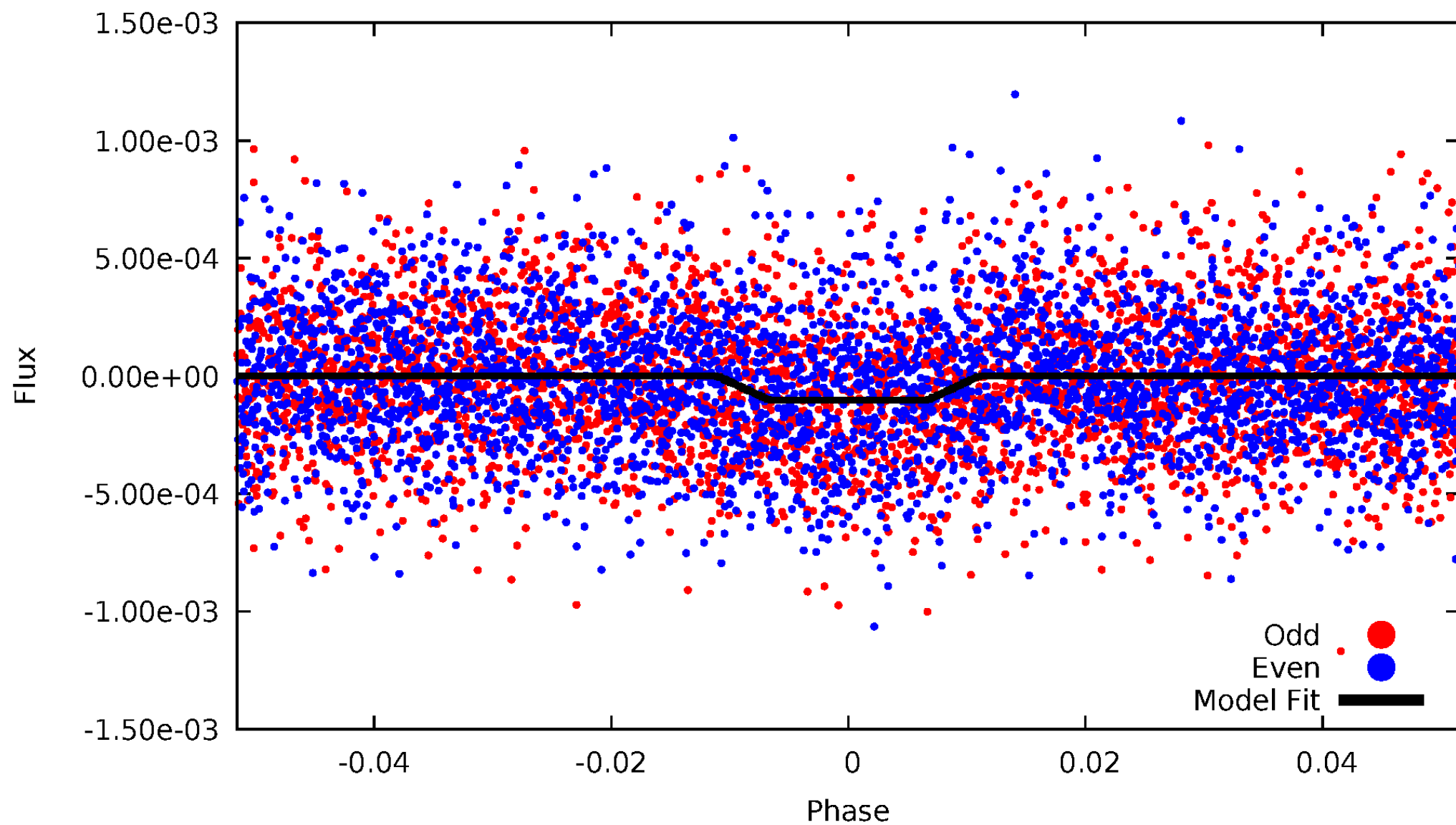
# DV Odd/Even

TCE 010904004-01



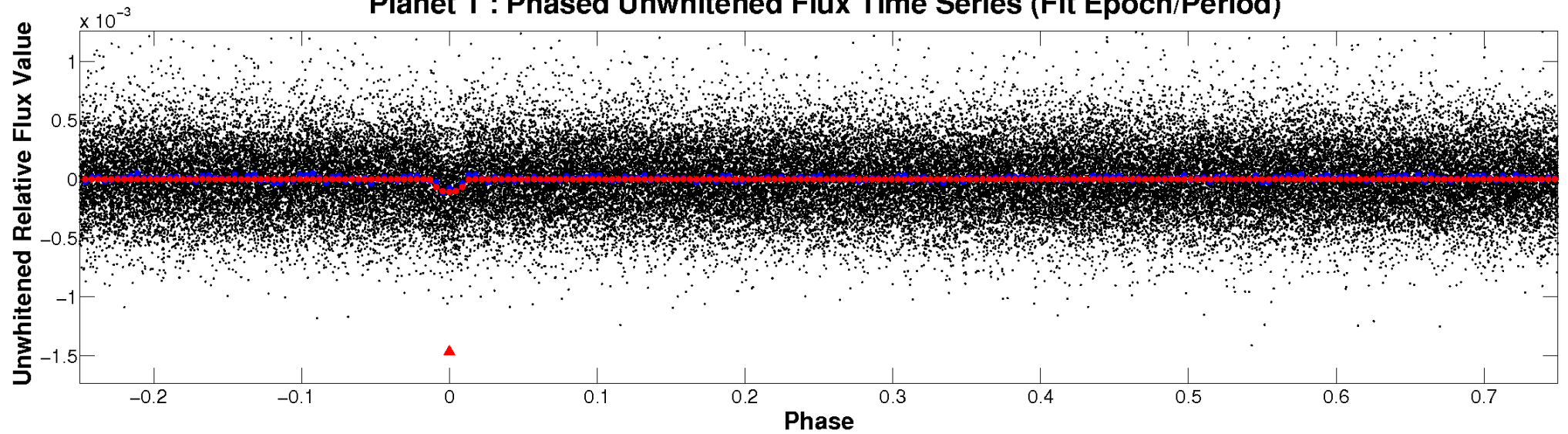
# ALT Odd/Even

TCE 010904004-01

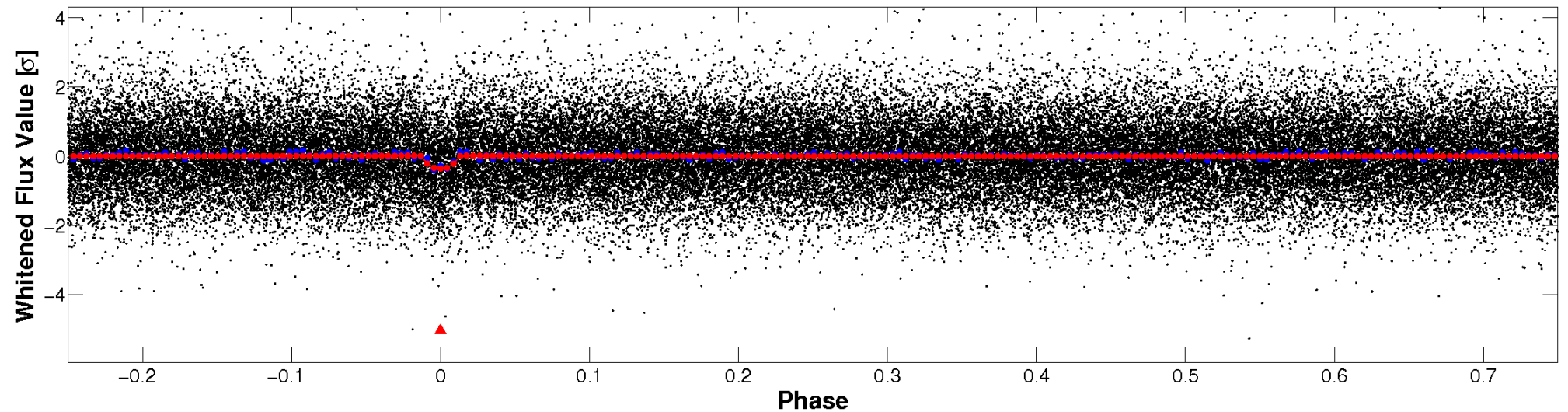


# Non-Whitened Vs. Whitened Light Curve

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

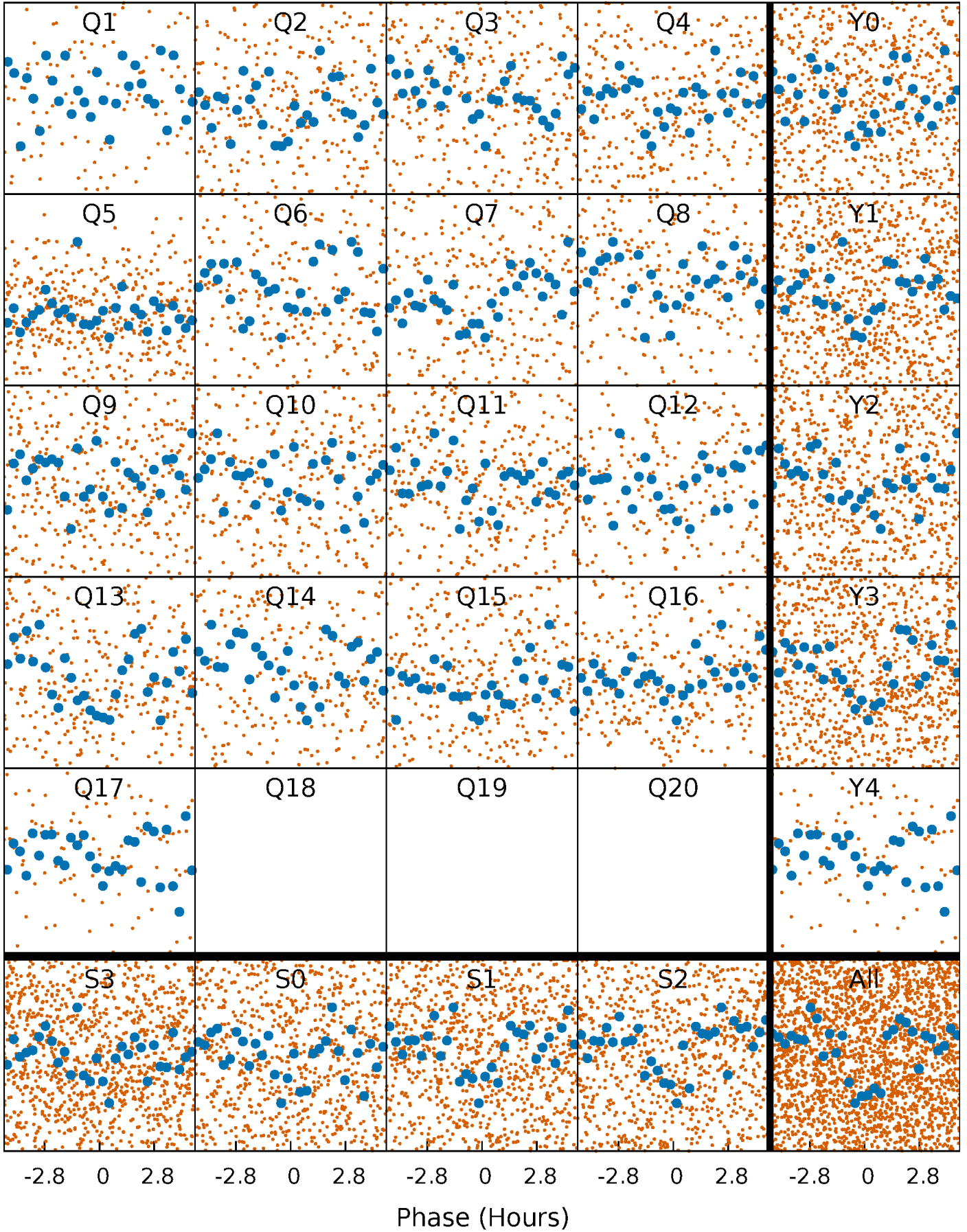


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

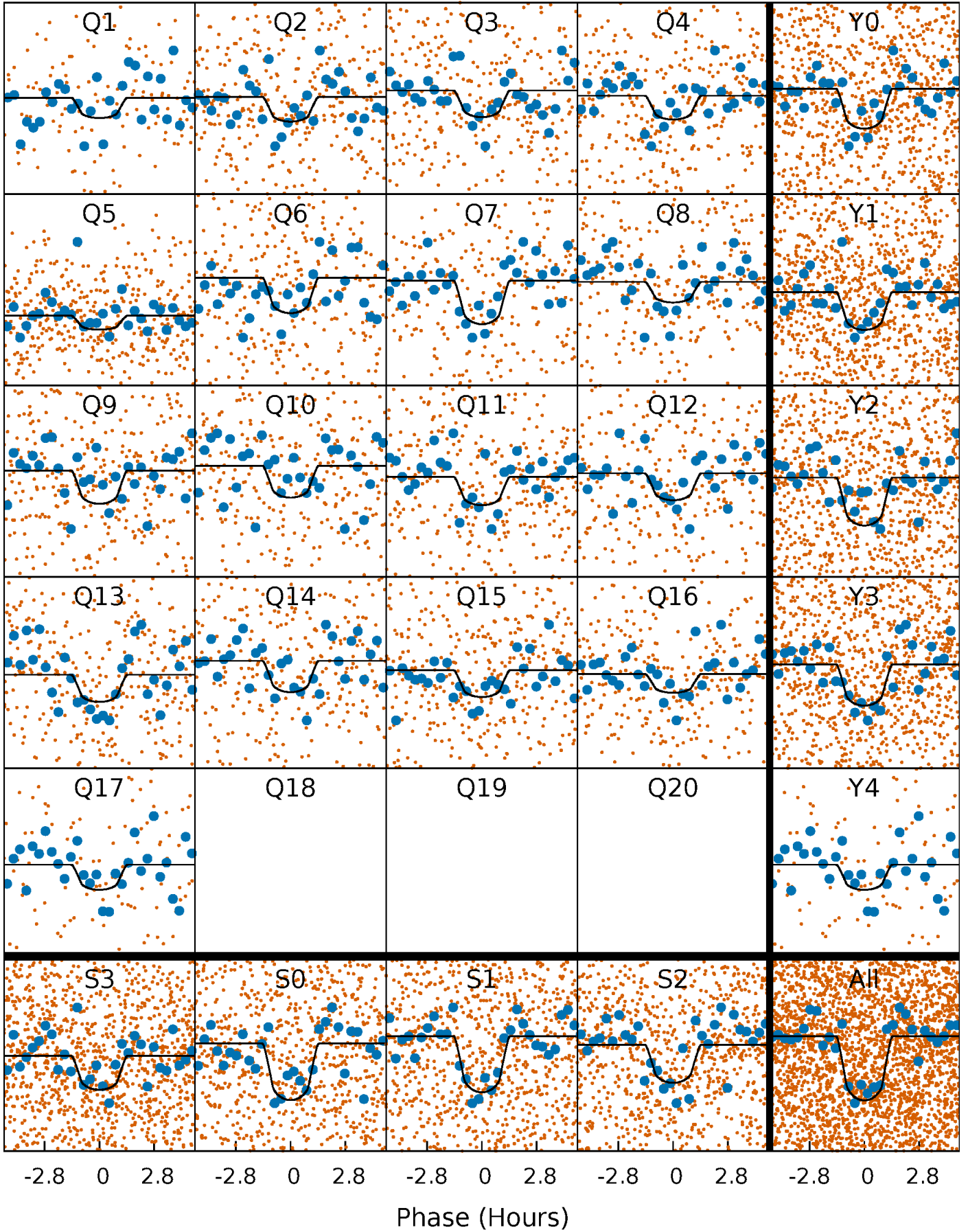
TCE 010904004-01 P= 4.644820 Days  $T_0=133.690281$  (BKJD)





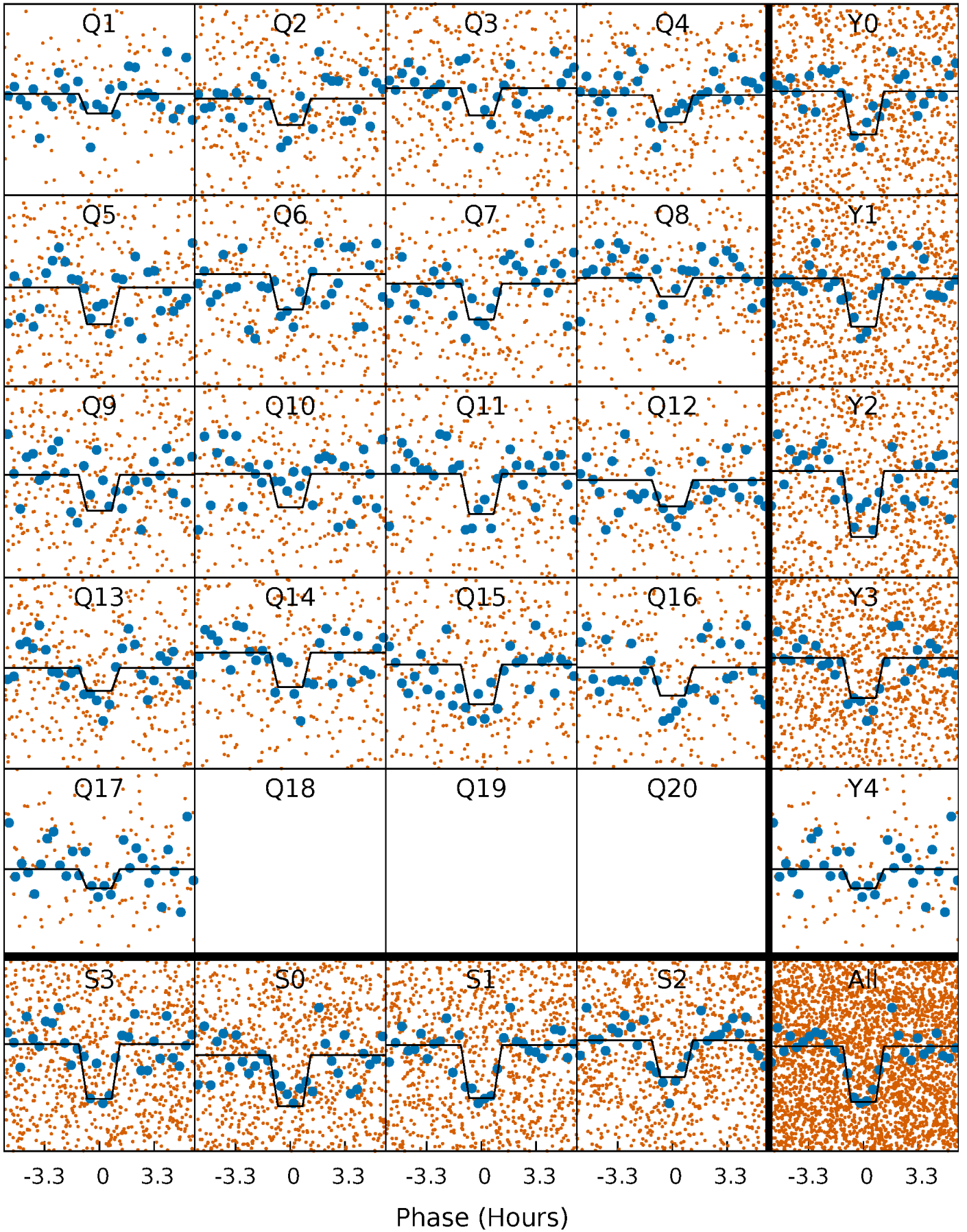
# DV Quarter-Phased Transit Curves

TCE 010904004-01 P= 4.644820 Days  $T_0=133.690281$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

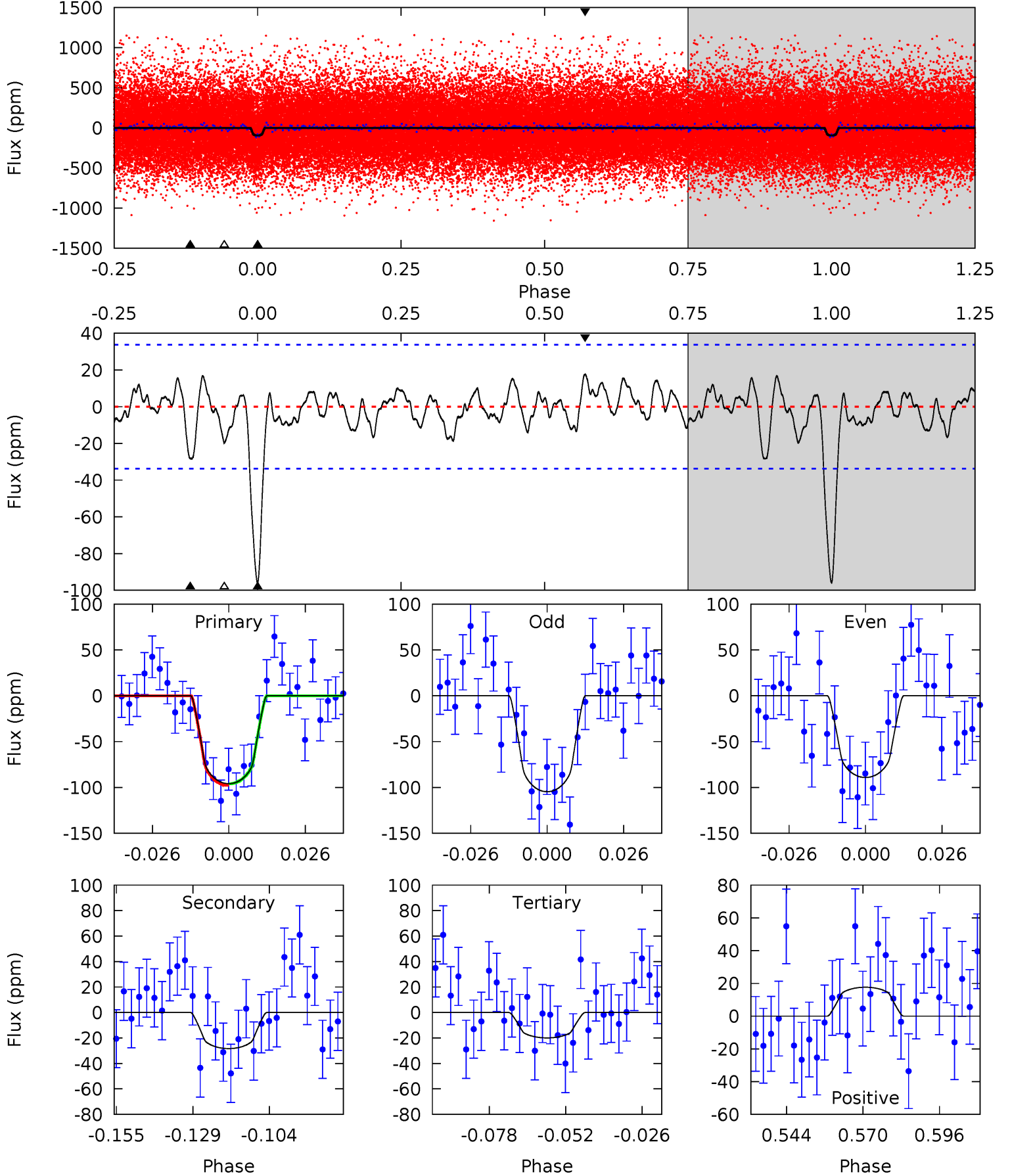
TCE 010904004-01 P= 4.644888 Days  $T_0=133.678480$  (BKJD)



# DV Model-Shift Uniqueness Test

010904004-01, P = 4.644820 Days, E = 129.045461 Days

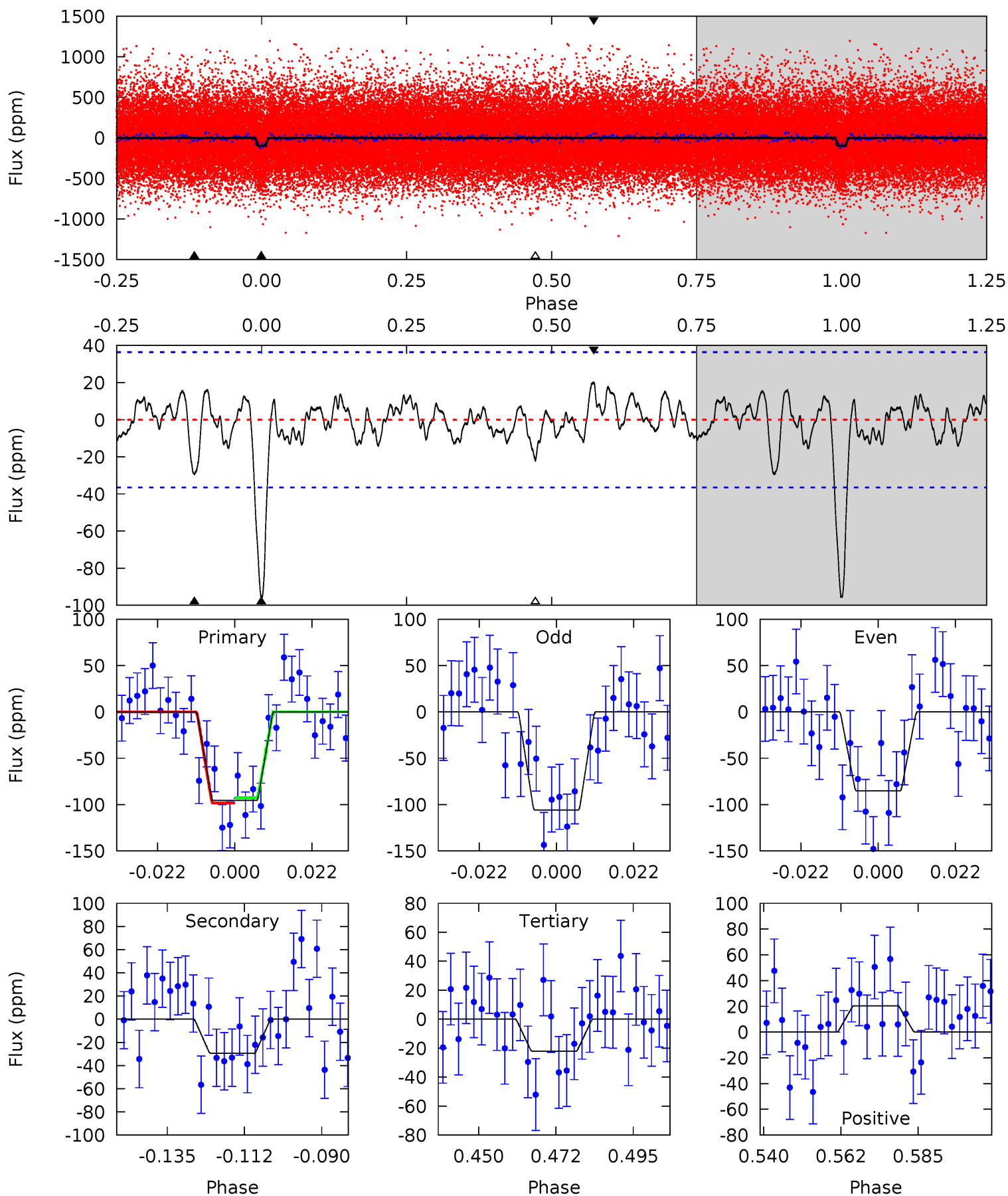
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.7	4.06	2.86	2.53	4.84	2.23	1.09	10.9	11.2	1.21	1.53	1.12	1.02	0.16	0.12



# Alt Model-Shift Uniqueness Test

010904004-01, P = 4.644888 Days, E = 129.033592 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
12.7	3.92	2.95	2.72	4.87	2.28	1.04	9.79	10.0	0.98	1.20	1.38	0.95	0.18	0.39





### Stellar Parameters For KIC 010904004

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4786^{+76}_{-85}$	$4.540^{+0.052}_{-0.017}$	$0.120^{+0.150}_{-0.150}$	$0.770^{+0.027}_{-0.046}$	$0.751^{+0.045}_{-0.026}$	$2.313^{+0.451}_{-0.170}$
	+2%/-2%	+1%/-0%	+125%/-125%	+4%/-6%	+6%/-3%	+19%/-7%
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 010904004-01 / KOI 2957.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-28 \pm 7$	$1.11^{+0.70}_{-0.63}$	$1157^{+22}_{-26}$	$3457^{+1193}_{-497}$	$32^{+142}_{-21}$
Alt.	$-29 \pm 7$	$1.00^{+0.67}_{-0.60}$	$1158^{+23}_{-27}$	$3568^{+1440}_{-541}$	$39^{+207}_{-26}$

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

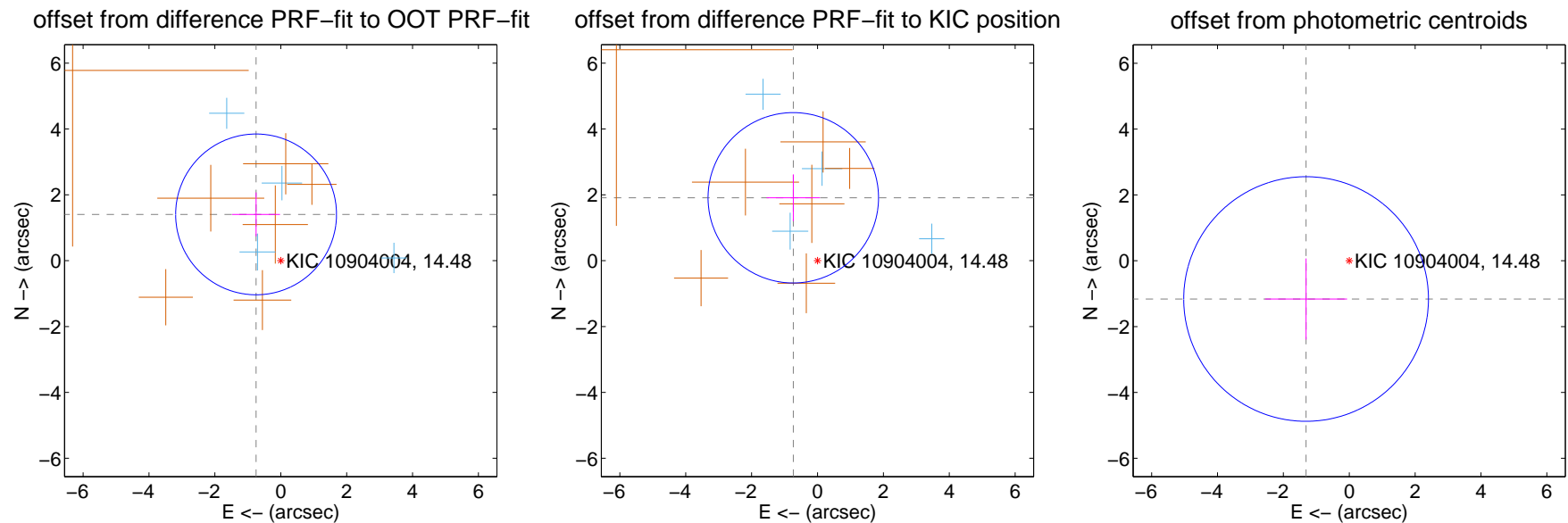
## DV Centroid Data

Supplemental centroid analysis for 010904004-01. Kepler magnitude: 14.48. Transit SNR 11.06

There are 4 quarters with good PRF difference image offsets

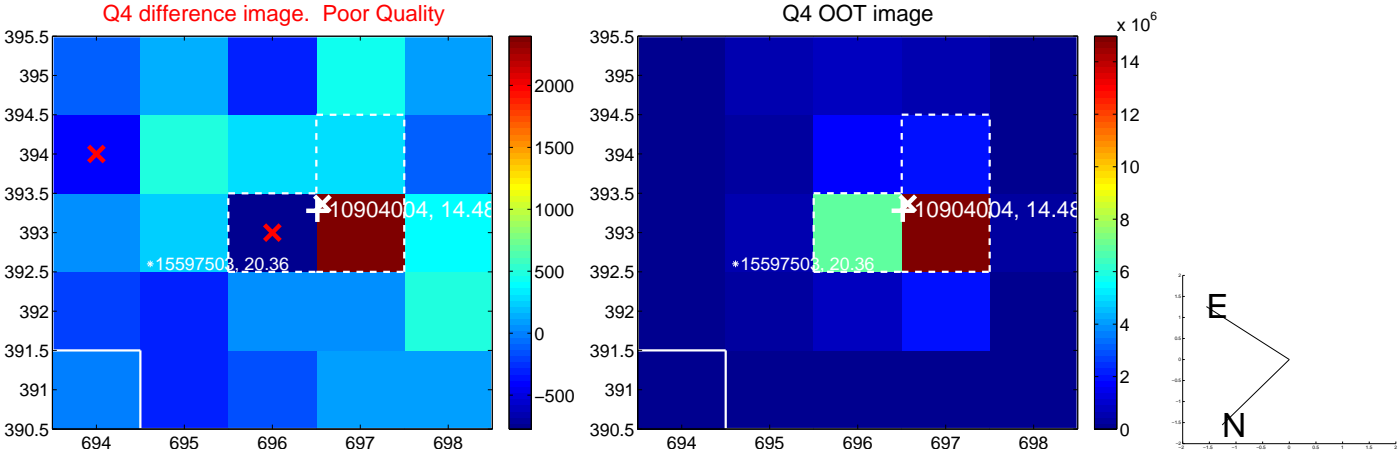
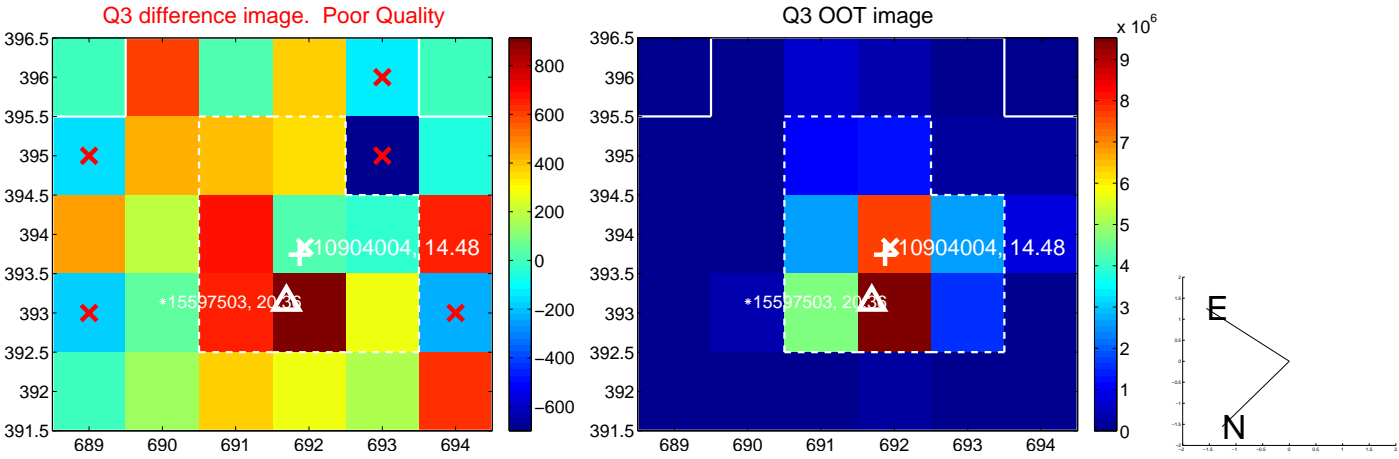
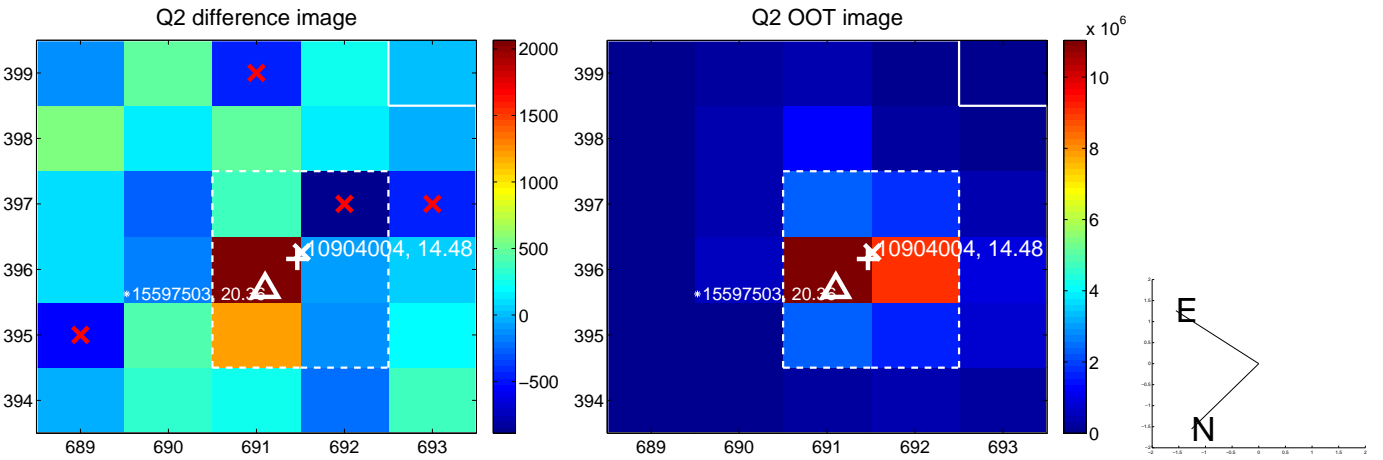
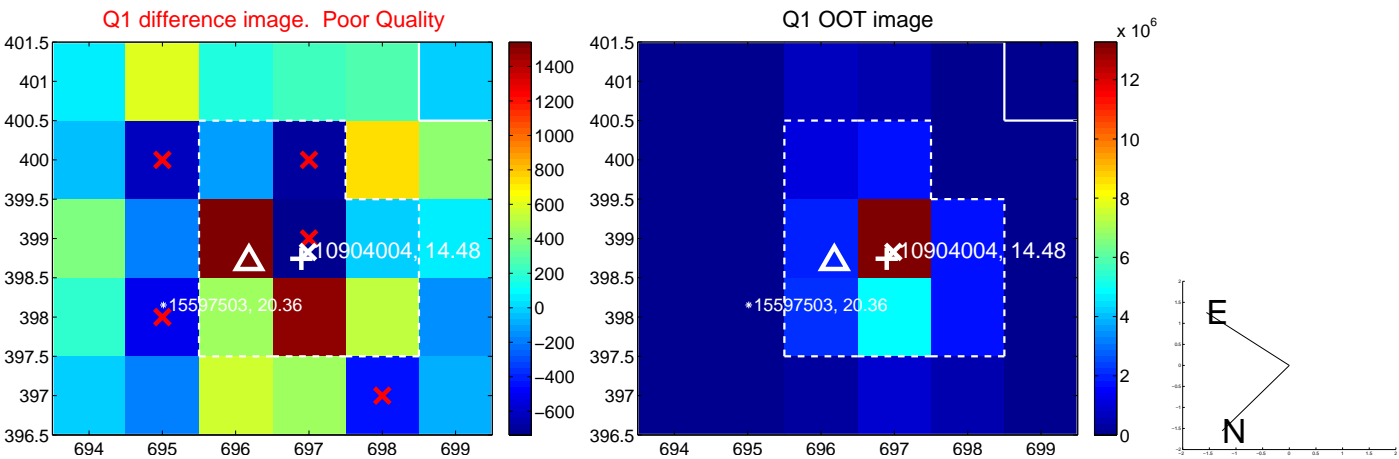
The direct PRF centroid is offset from the target star catalog position by about 0.58 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.594 \pm 0.814$	1.96	$0.750 \pm 0.726$	$1.406 \pm 0.666$
PRF-fit source offset from KIC position	$2.047 \pm 0.863$	2.37	$0.735 \pm 0.809$	$1.911 \pm 0.710$
photometric centroid source offset	$1.75 \pm 1.24$	1.41	$1.31 \pm 1.24$	$-1.16 \pm 1.23$

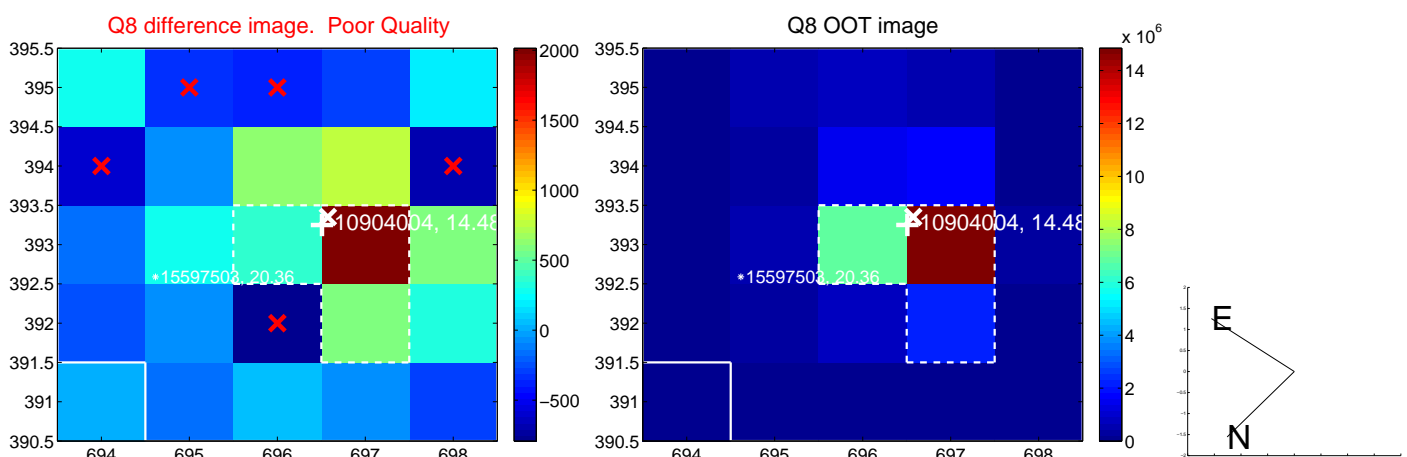
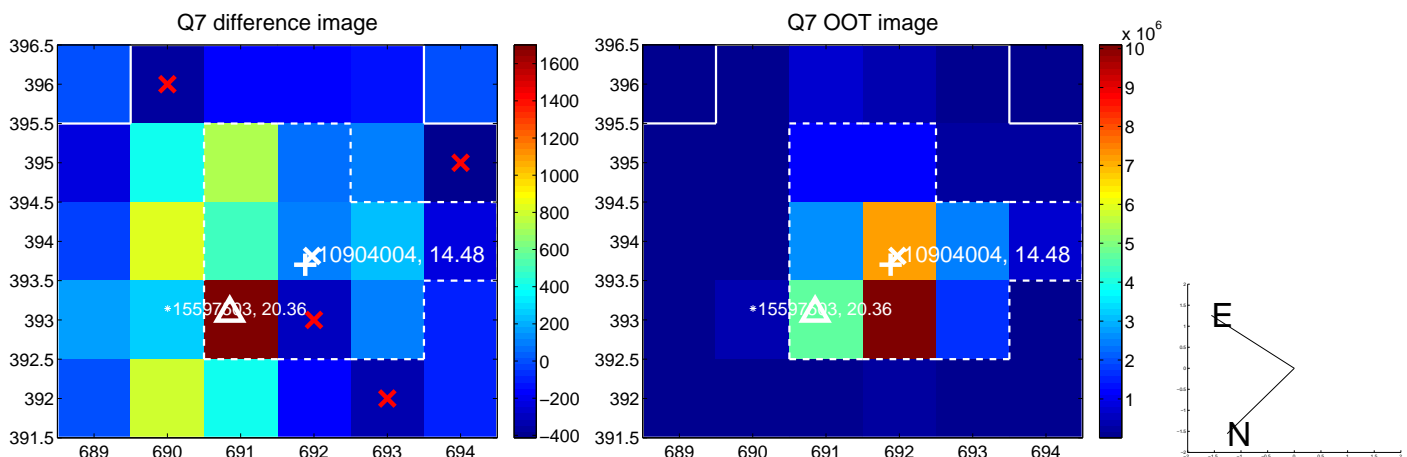
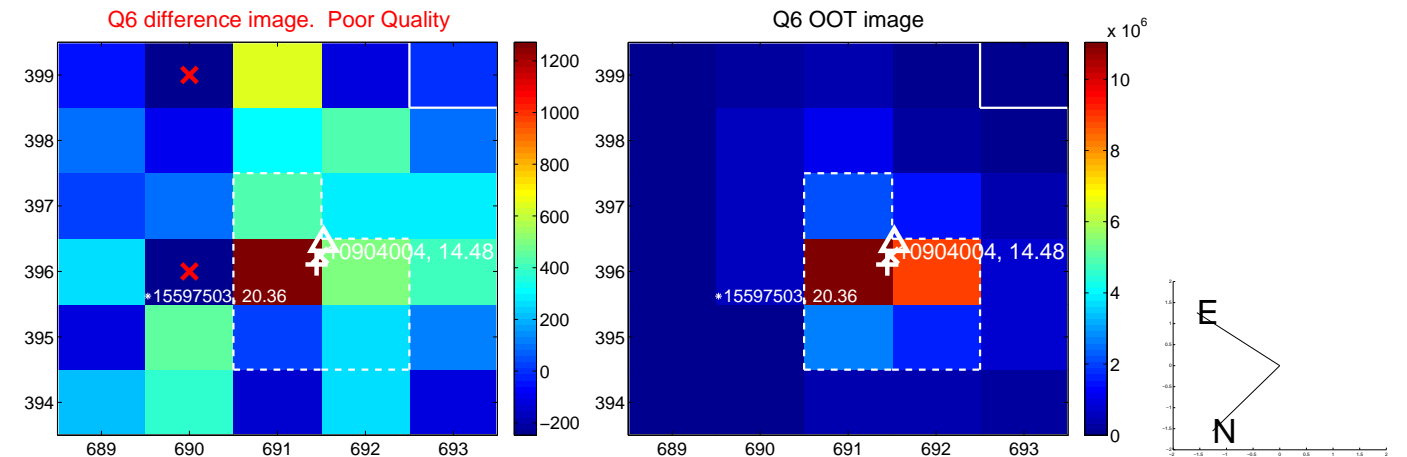
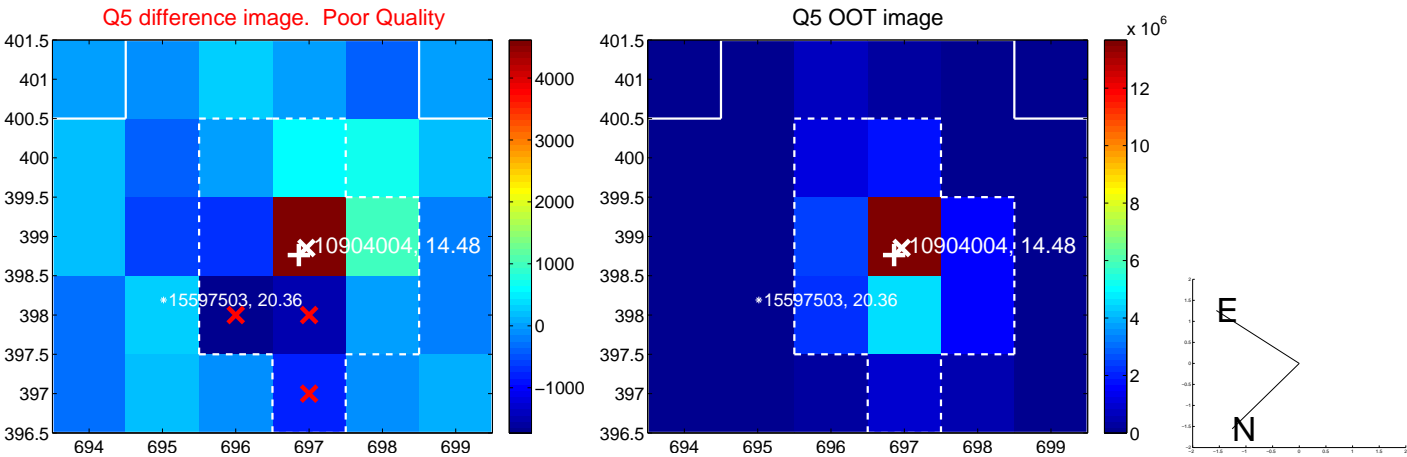


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

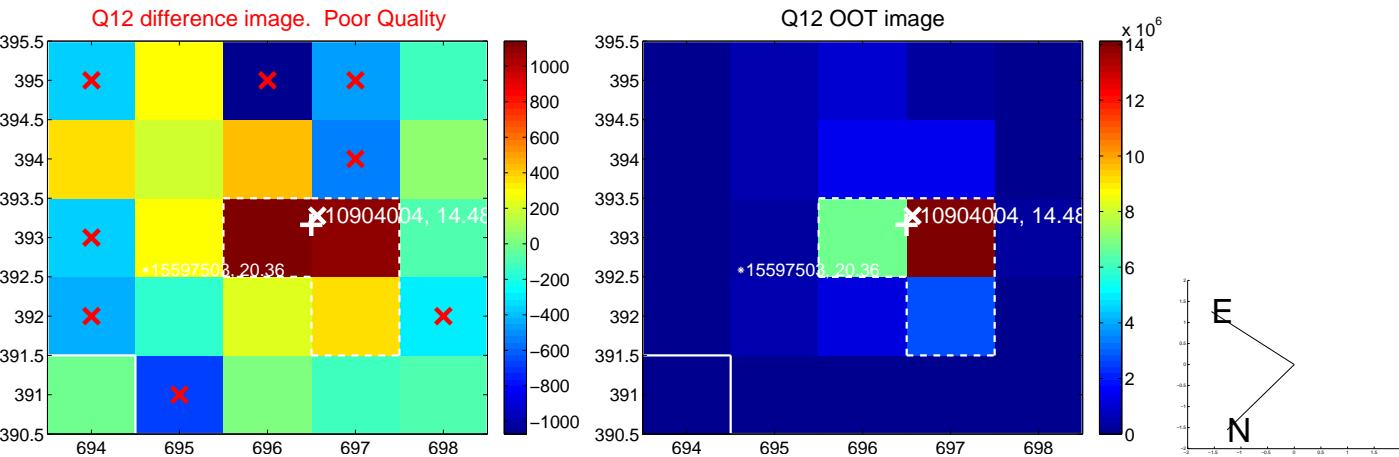
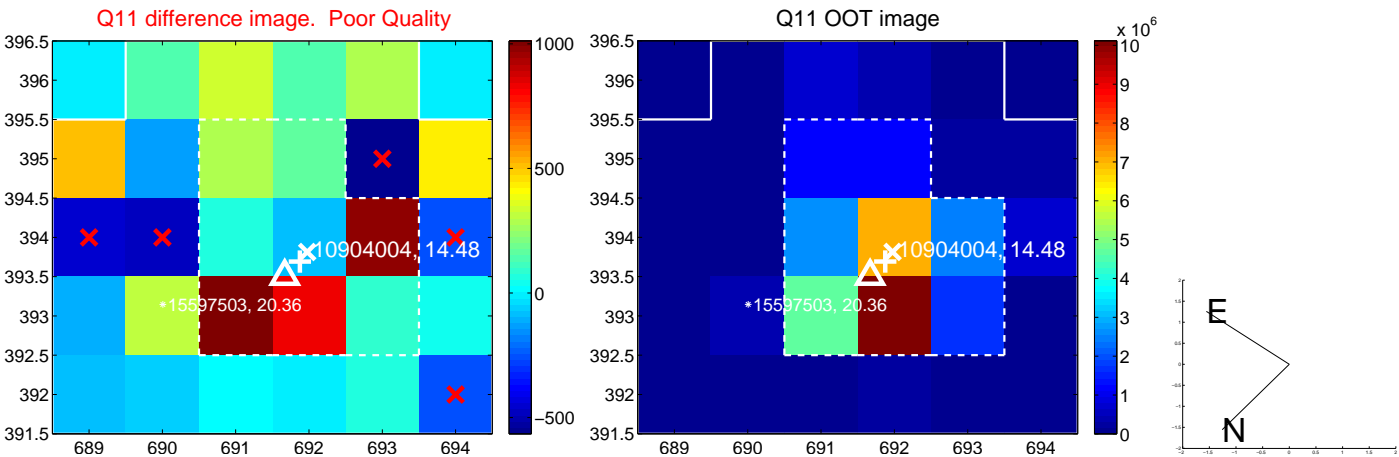
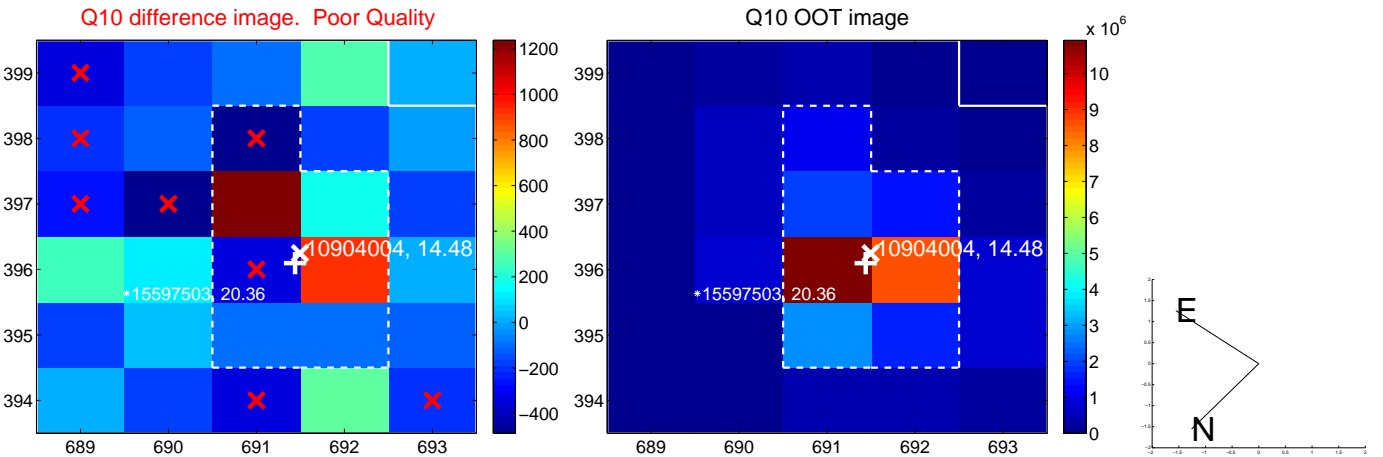
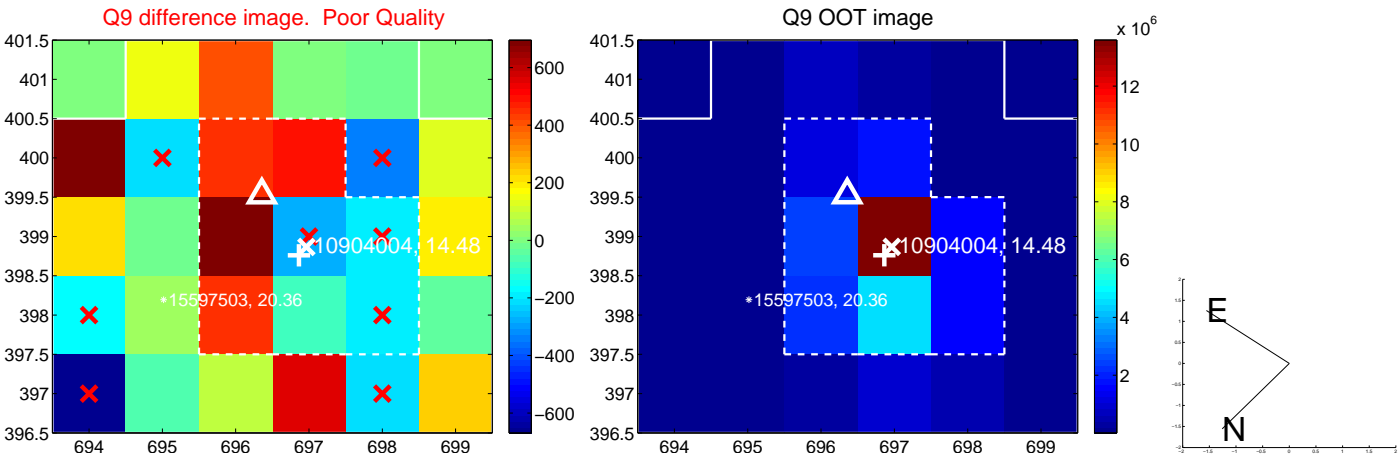


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

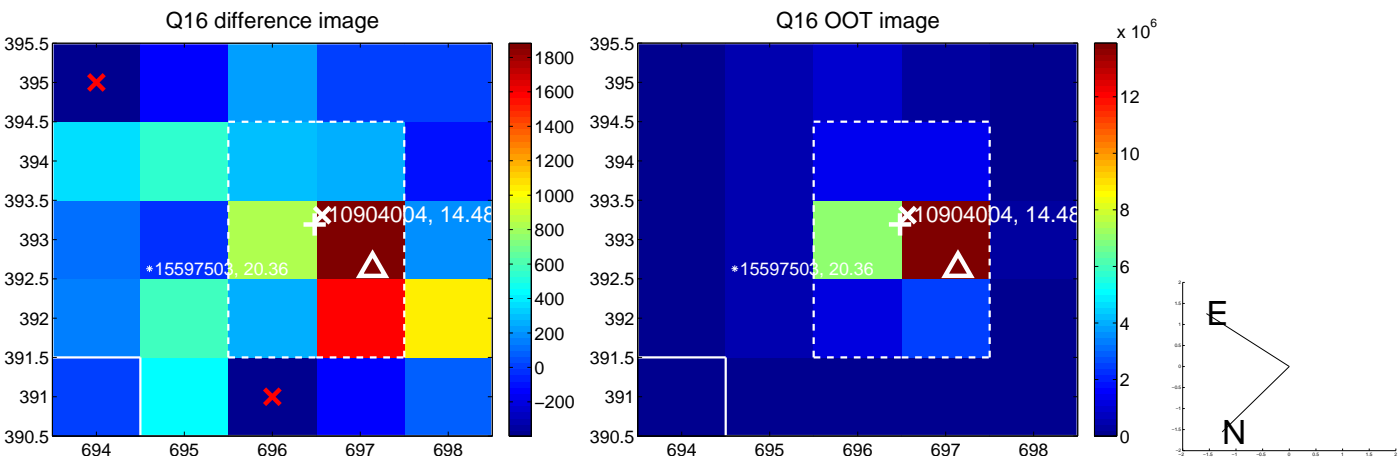
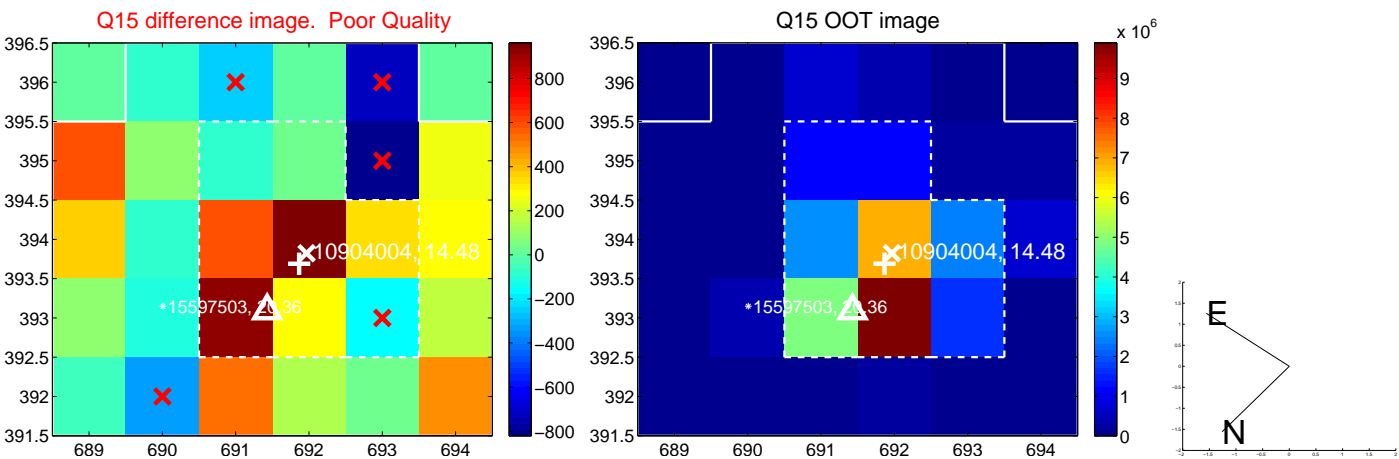
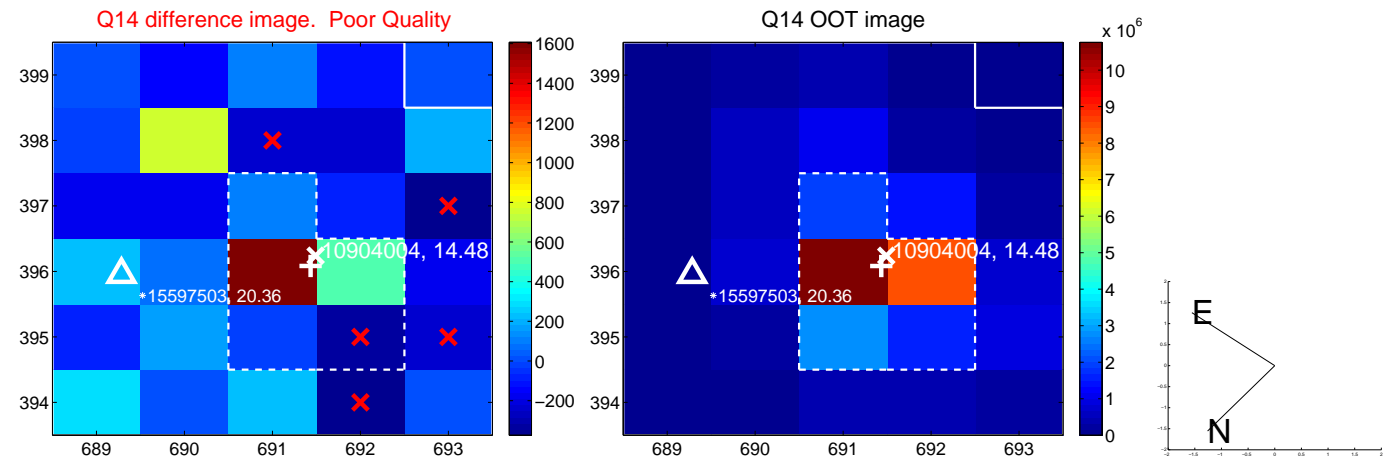
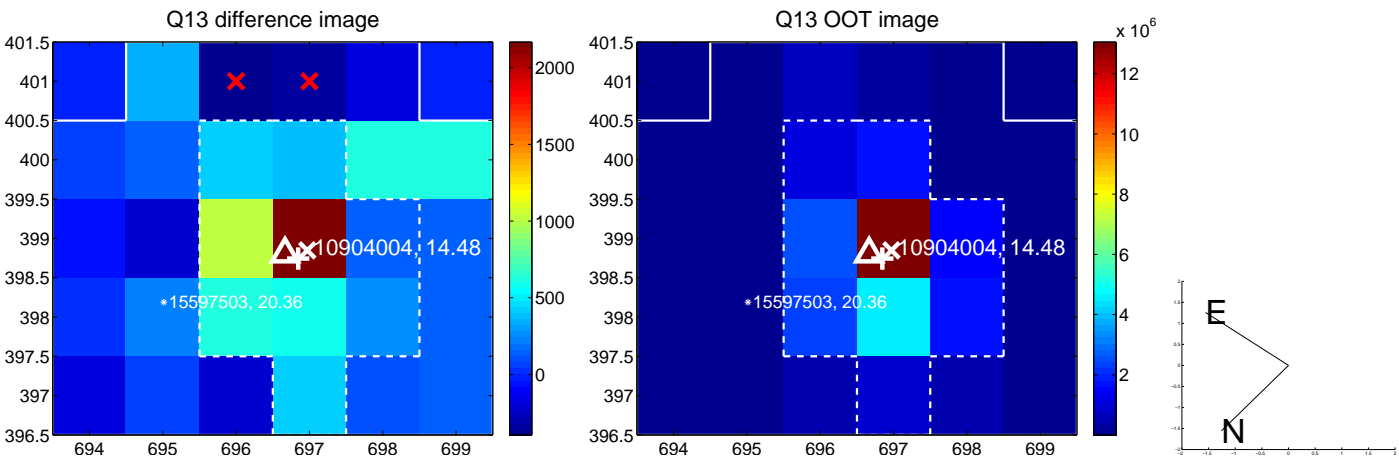




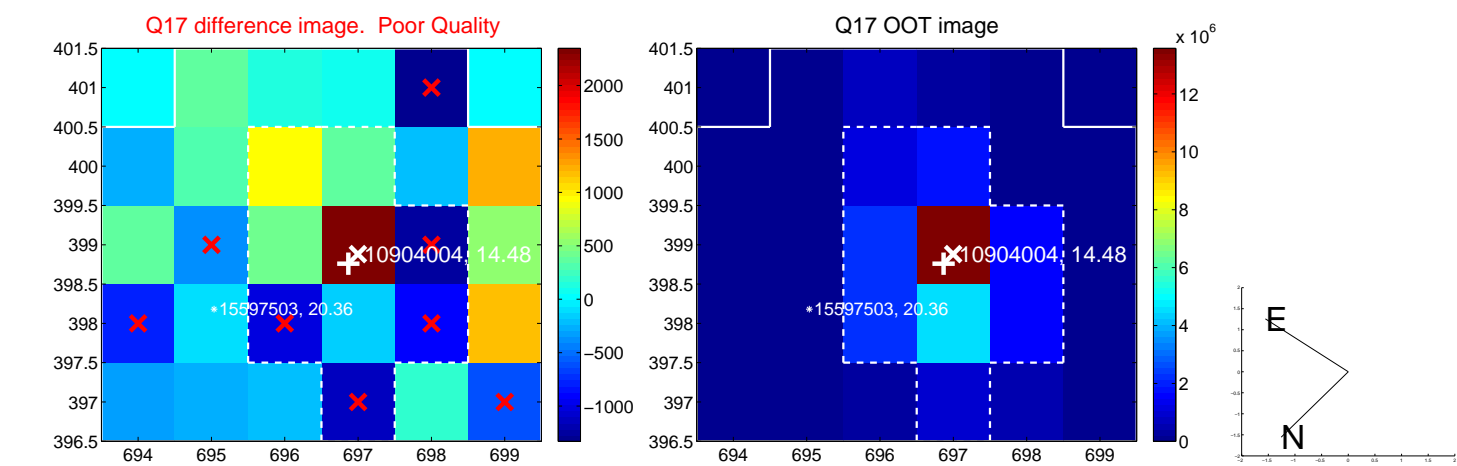
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



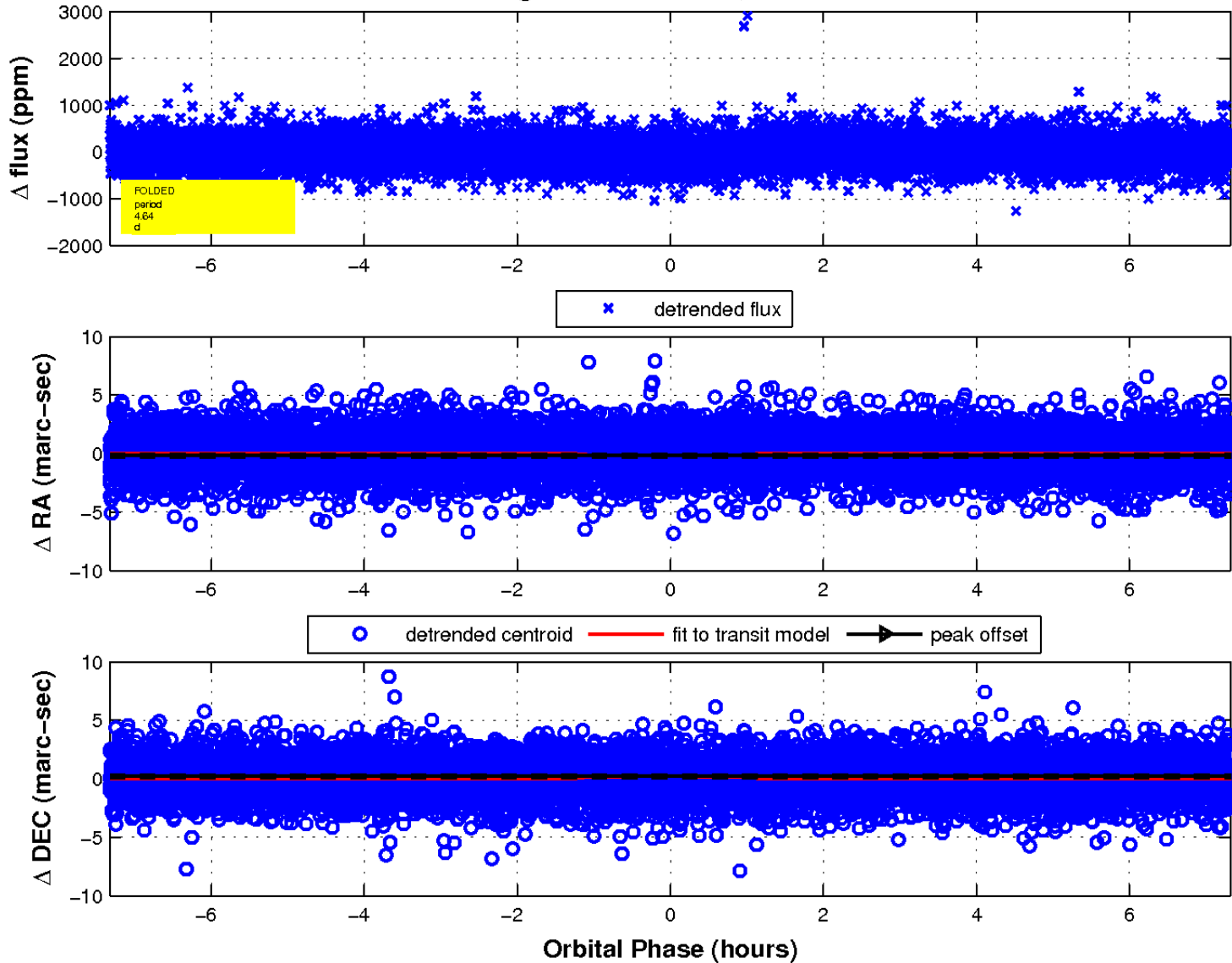
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

