

# KIC 012403968

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012403968-01	OBS	7531.01	1.179502	132.423244	182.1	0.939	7.9	9.4	0.68	5414	1.10	901.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012403968-01	OBS	FP	0.00	1	0	0	0	MOD_NONUNIQ_ALT—CENT_FEW_MEAS

**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.

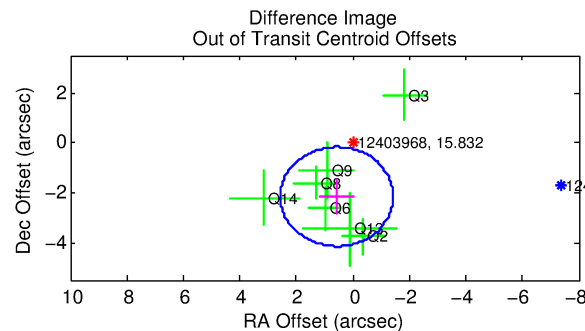
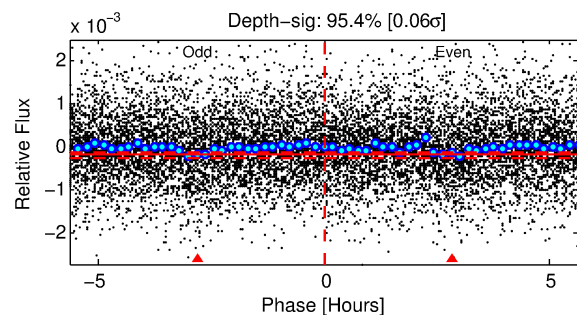
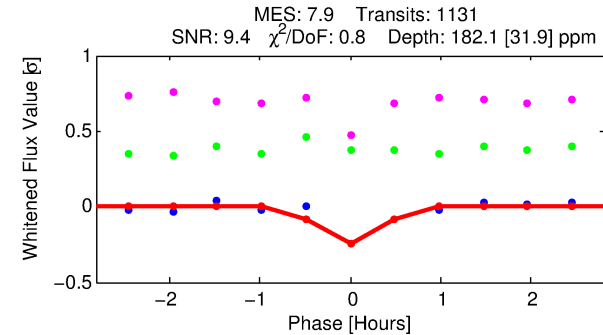
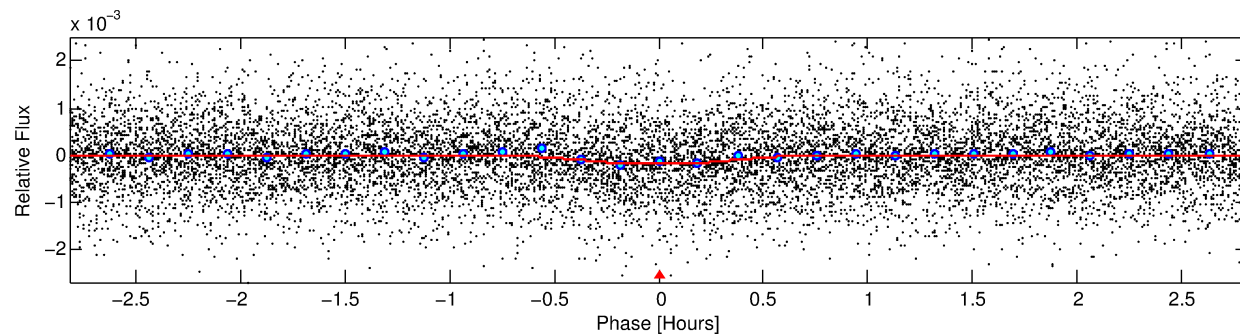
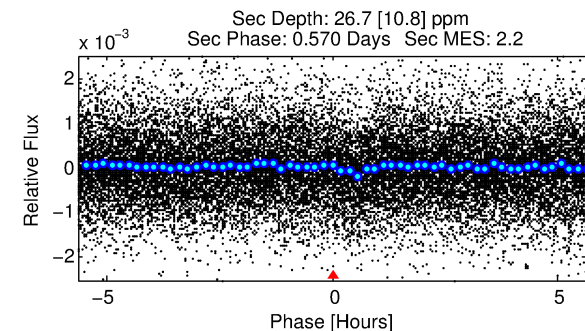
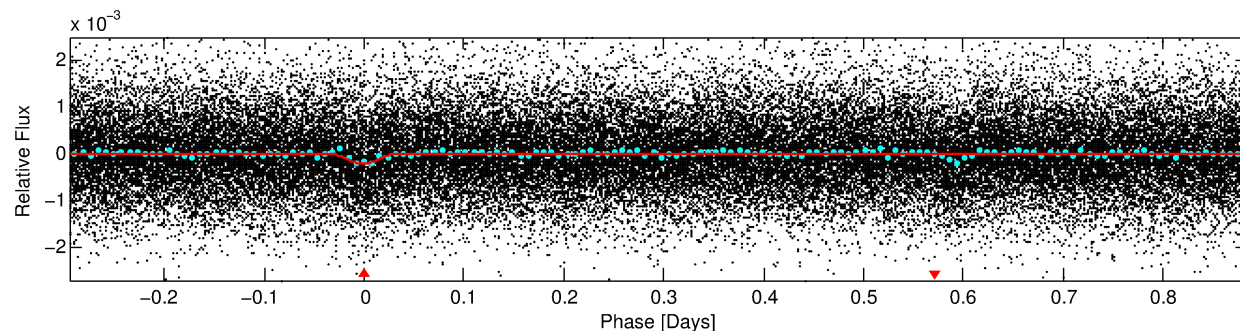
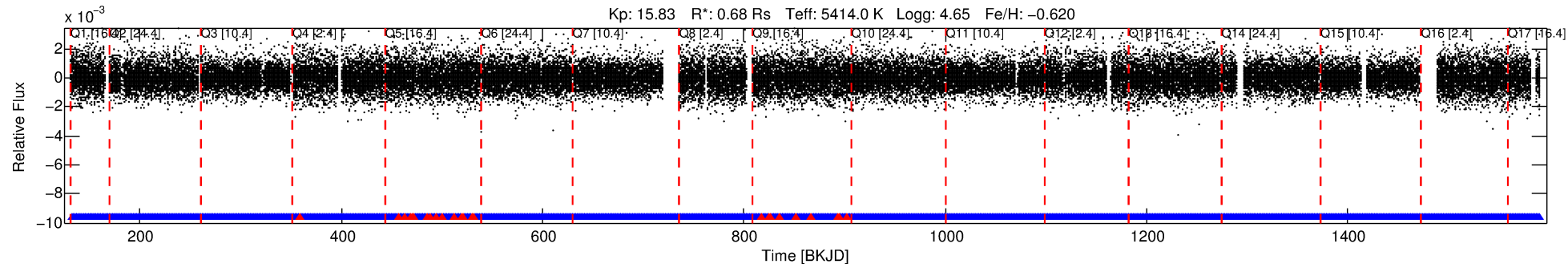
## Ephemeris Match Information For 012403968-01

No Significant Match Found

# DV One-Page Summary

KIC: 12403968 Candidate: 1 of 1 Period: 1.180 d  
KOI: K07531 Corr: No Ephemeris Match

Kp: 15.83 R\*: 0.68 Rs Teff: 5414.0 K Logg: 4.65 Fe/H: -0.620



## DV Fit Results:

Period = 1.17950 [0.00001] d  
Epoch = 132.4232 [0.0018] BKJD  
Rp/R\* = 0.0148 [0.0156]  
a/R\* = 4.68 [21.81]  
b = 0.90 [1.11]  
Seff = 901.27 [196.42]  
Teq = 1397 [76] K  
Rp = 1.10 [1.17] Re  
a = 0.0198 [0.0026] AU  
Ag = 4.81 [10.37] [0.37σ]  
Teffp = 3198 [1721] K [1.05σ]

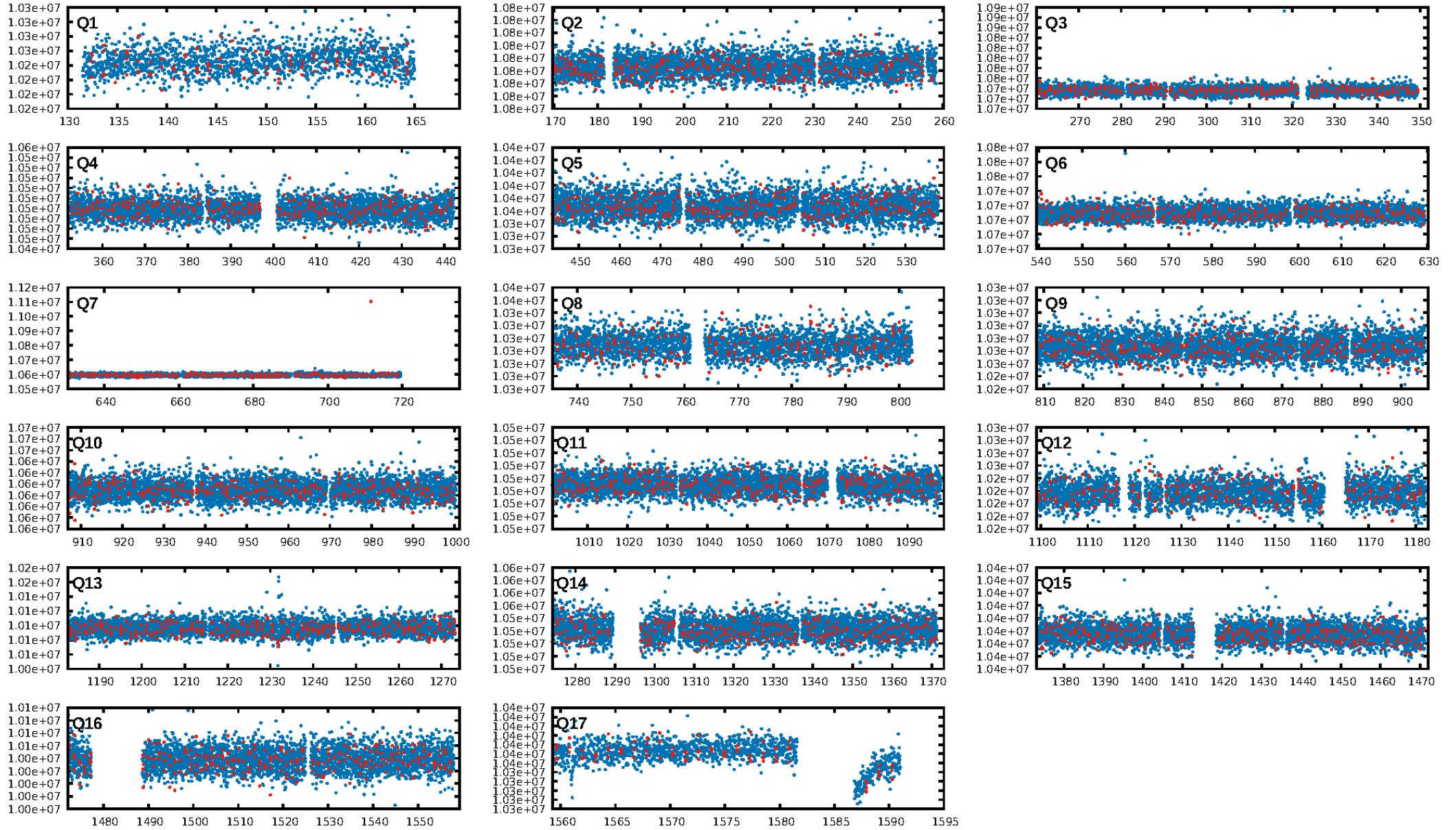
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.22e-15  
RollingBand-fgt: 0.98 [1055/1081]  
GhostDiagnostic-chr: 0.5303  
Centroid-sig: 0.0%  
Centroid-so: 3.764 arcsec [2.56σ]  
OotOffset-rm: 2.237 arcsec [3.37σ]  
KicOffset-rm: 2.132 arcsec [3.13σ]  
OotOffset-st: 3/1/1/2 [7]  
KicOffset-st: 3/1/1/2 [7]  
DiffImageQuality-fgm: 0.43 [3/7]  
DiffImageOverlap-fno: 1.00 [17/17]

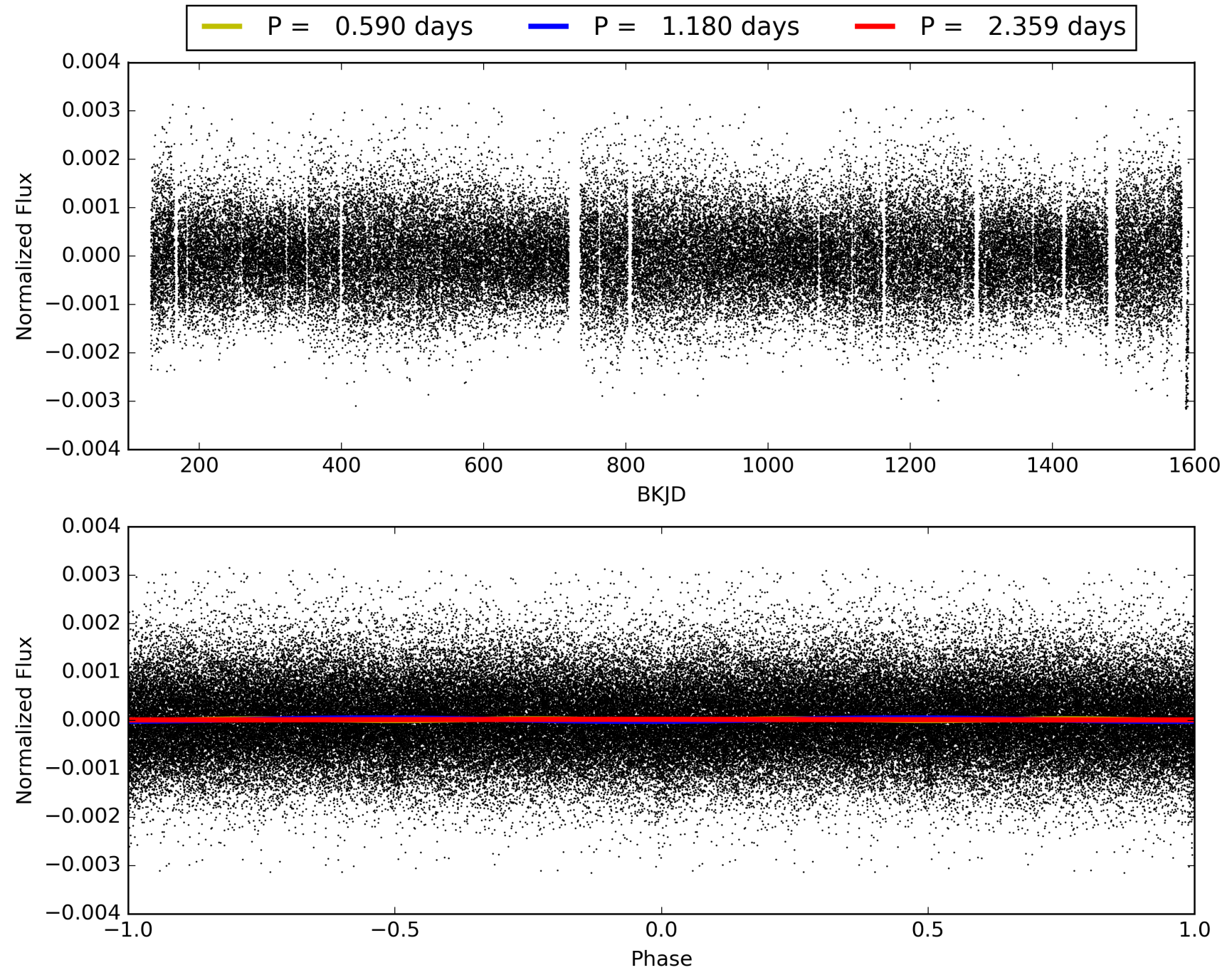
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:11:52 Z

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

# TCE 012403968-01, PDC Light Curves

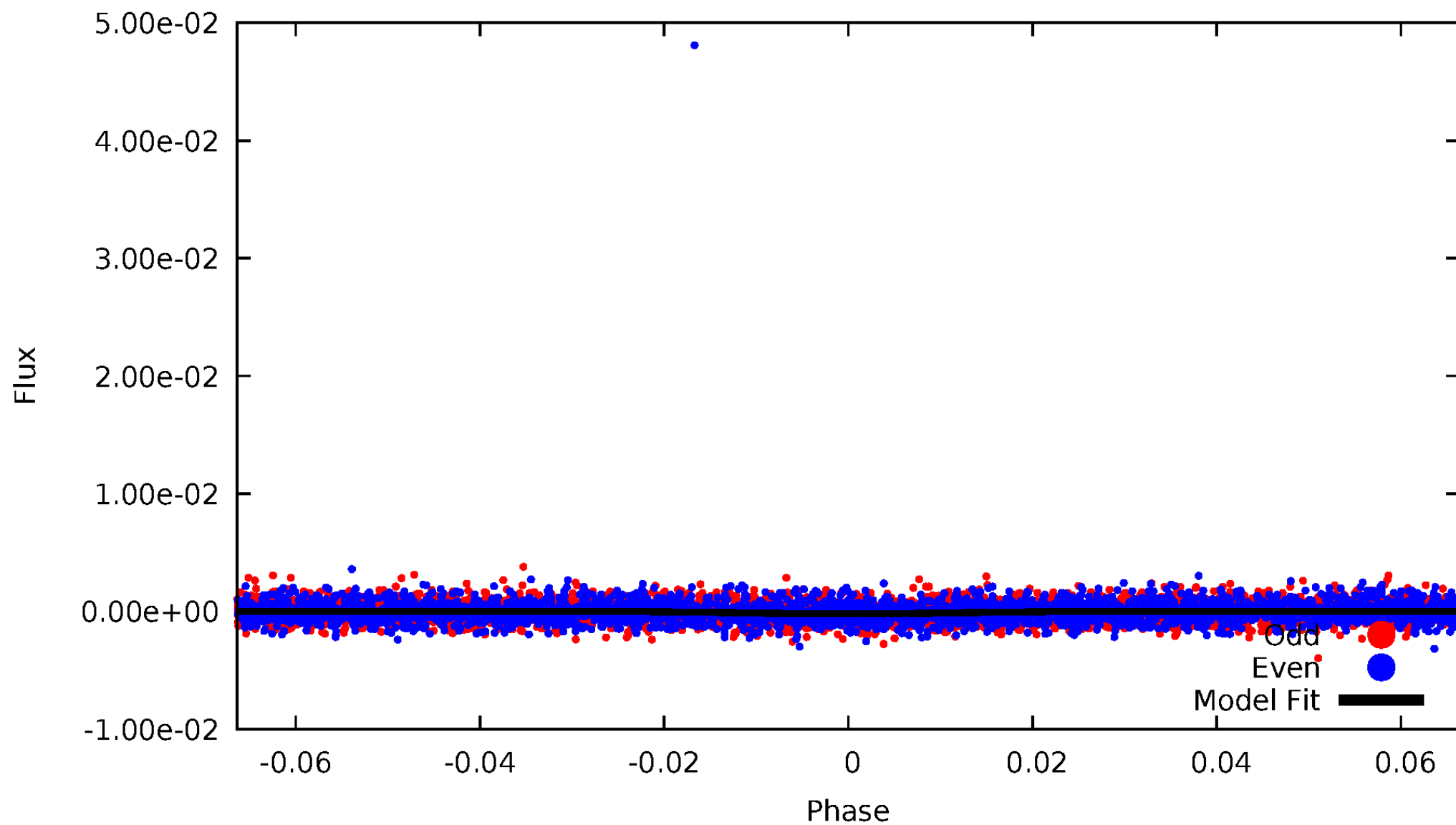


# TCE 012403968-01



# DV Odd/Even

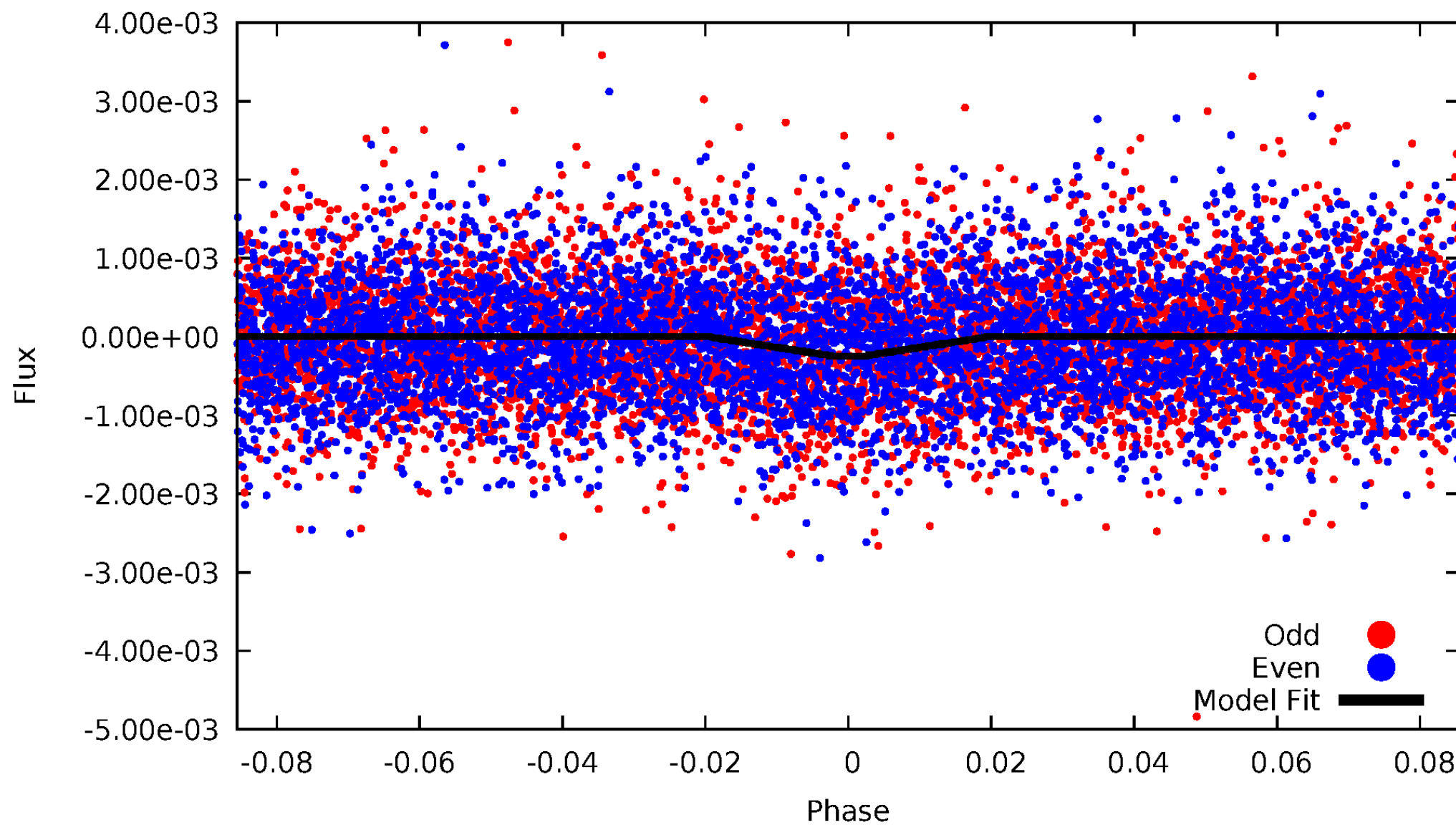
TCE 012403968-01





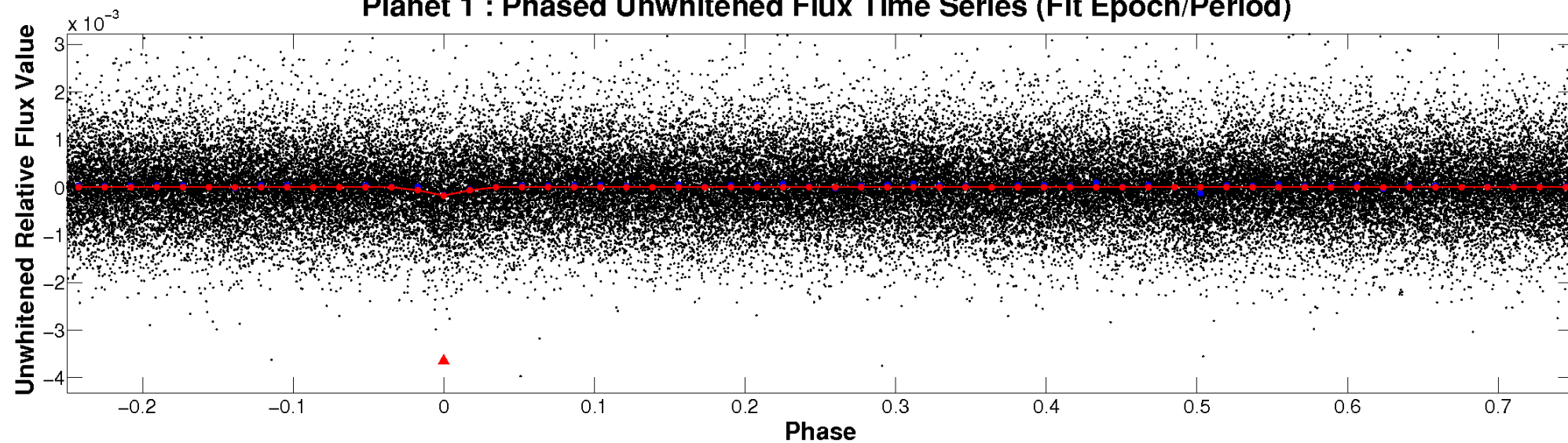
# ALT Odd/Even

TCE 012403968-01

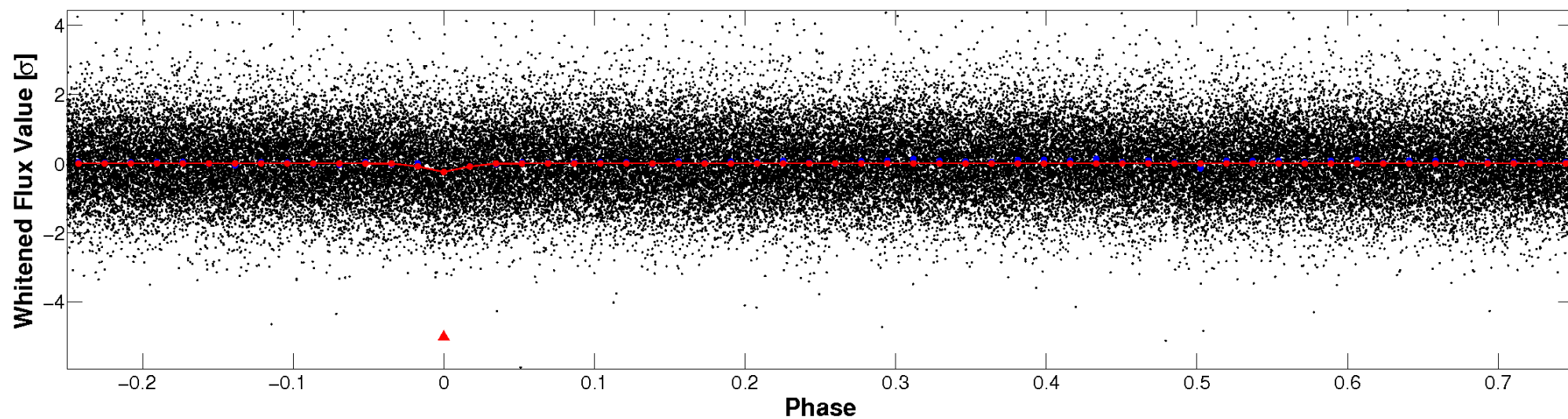


# Non-Whitened Vs. Whitened Light Curve

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

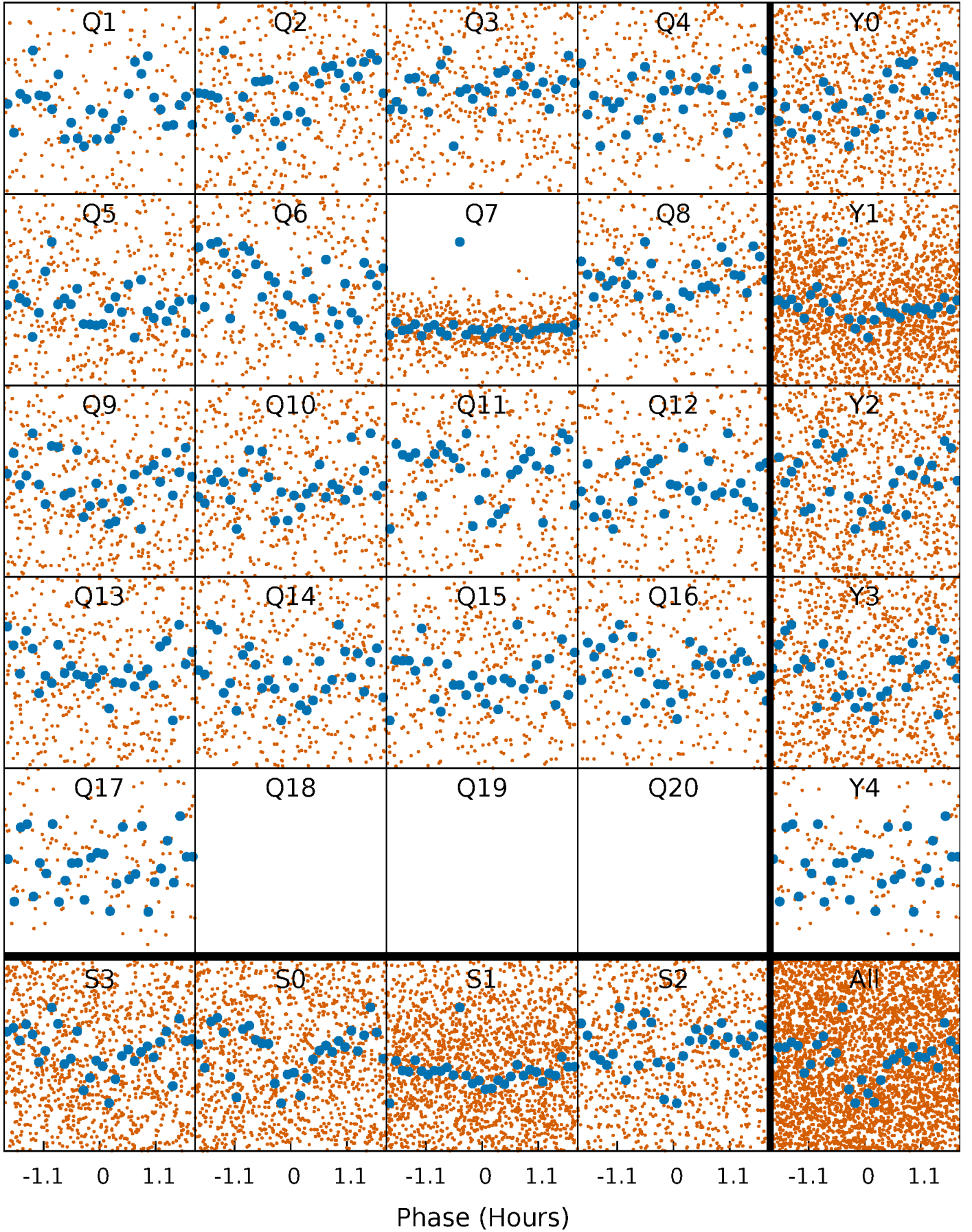


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

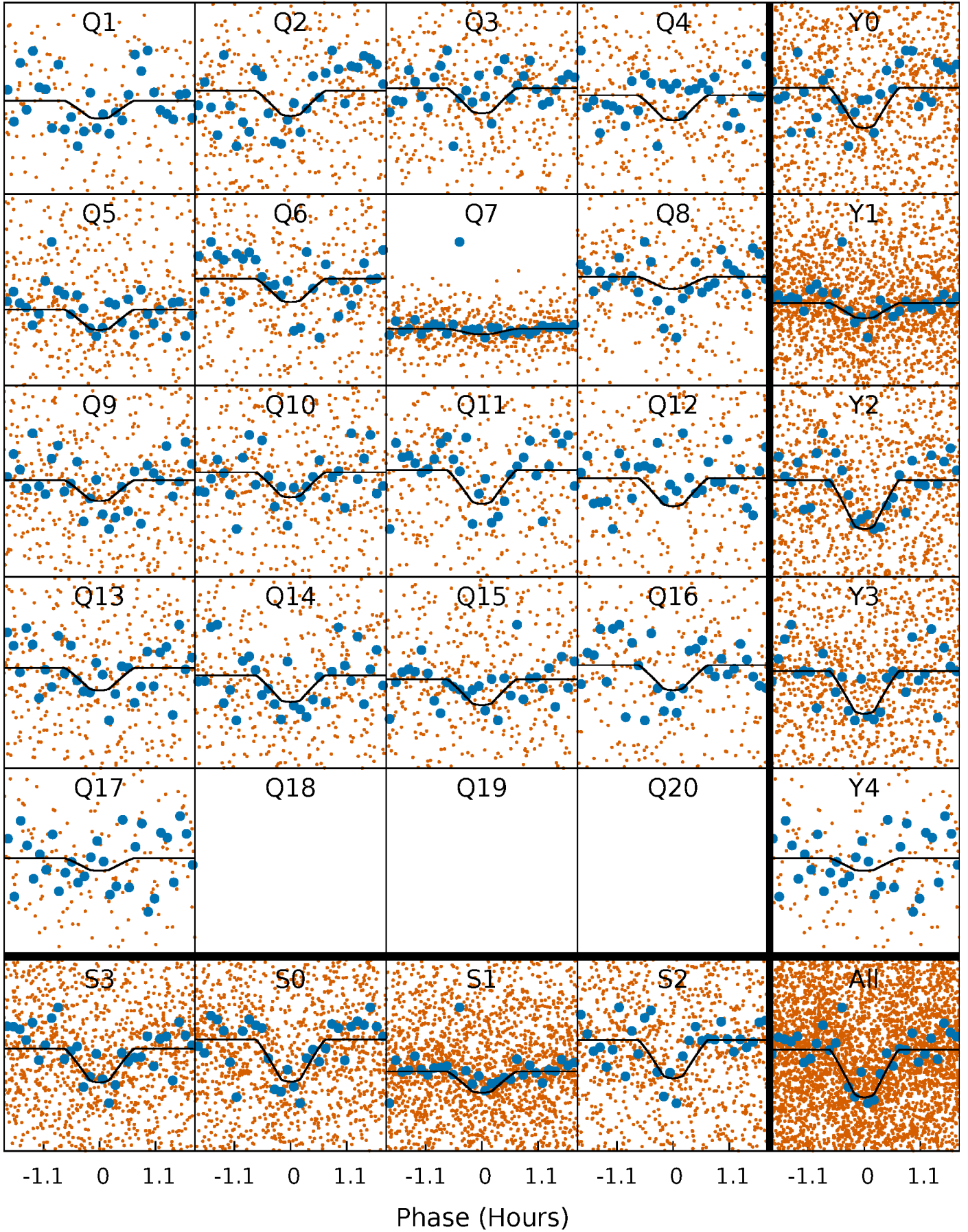
TCE 012403968-01   P= 1.179502 Days    $T_0=132.423244$  (BKJD)





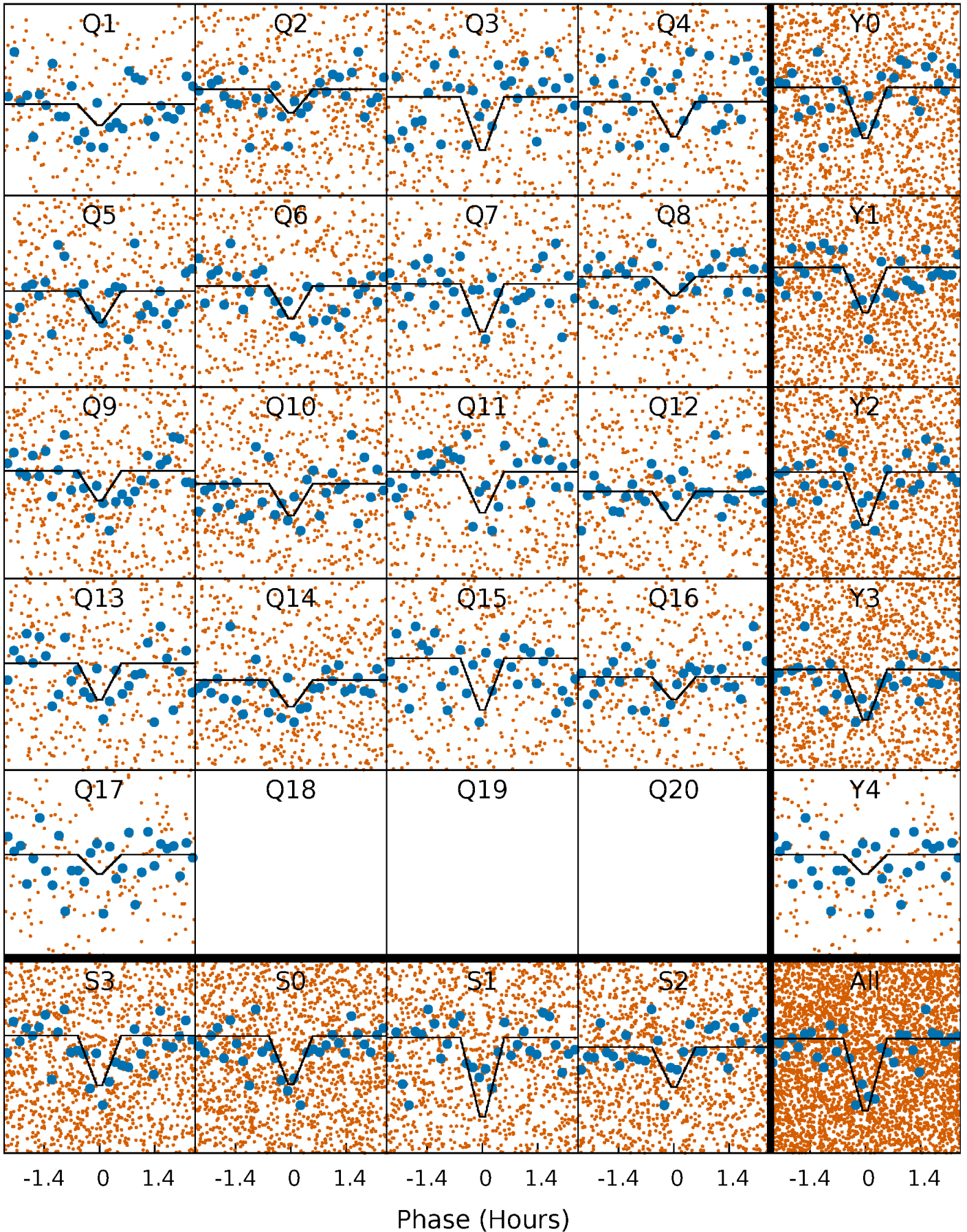
# DV Quarter-Phased Transit Curves

TCE 012403968-01   P= 1.179502 Days    $T_0=132.423244$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

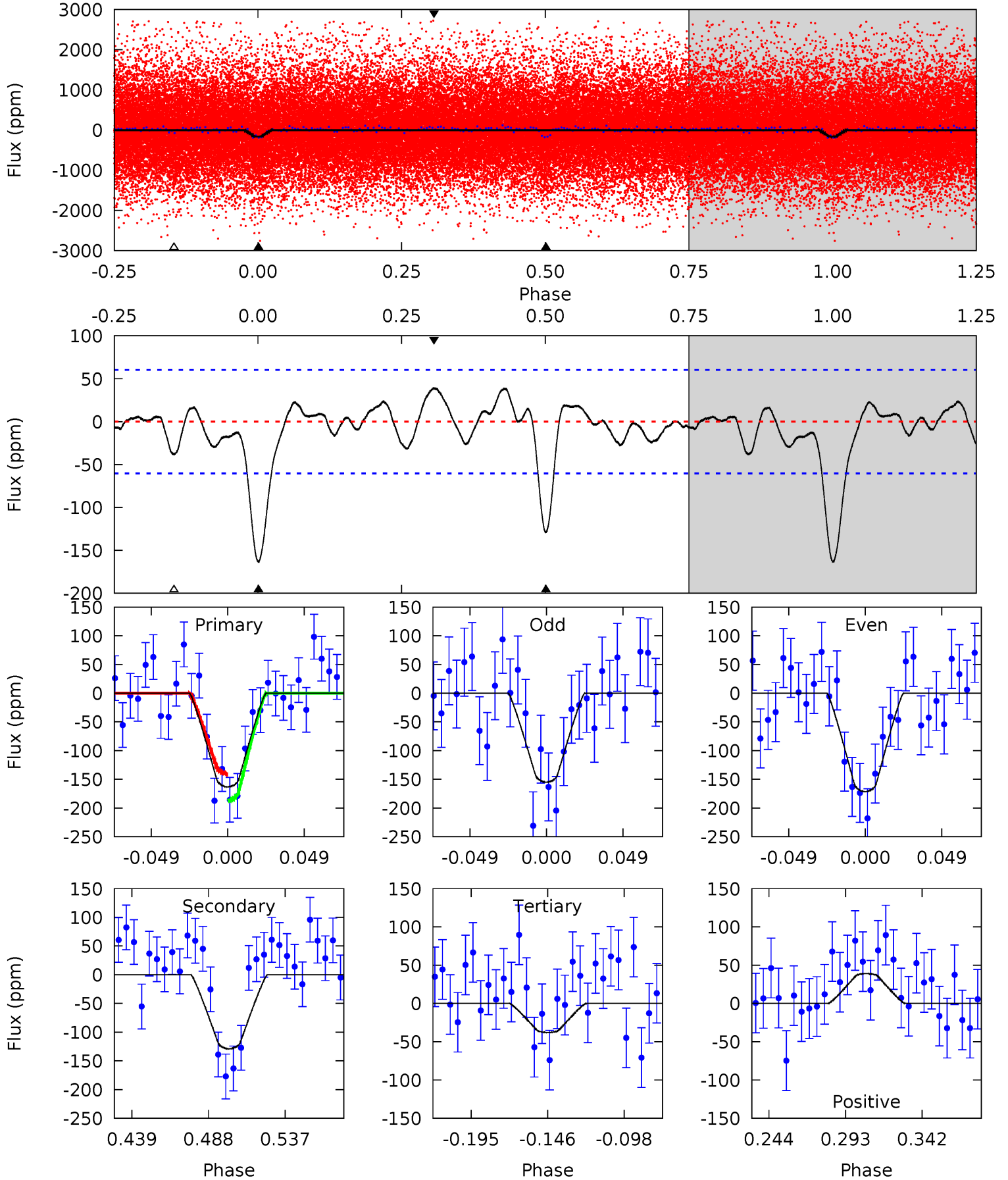
TCE 012403968-01 P= 1.179508 Days  $T_0=132.420256$  (BKJD)



# DV Model-Shift Uniqueness Test

012403968-01, P = 1.179502 Days, E = 131.243742 Days

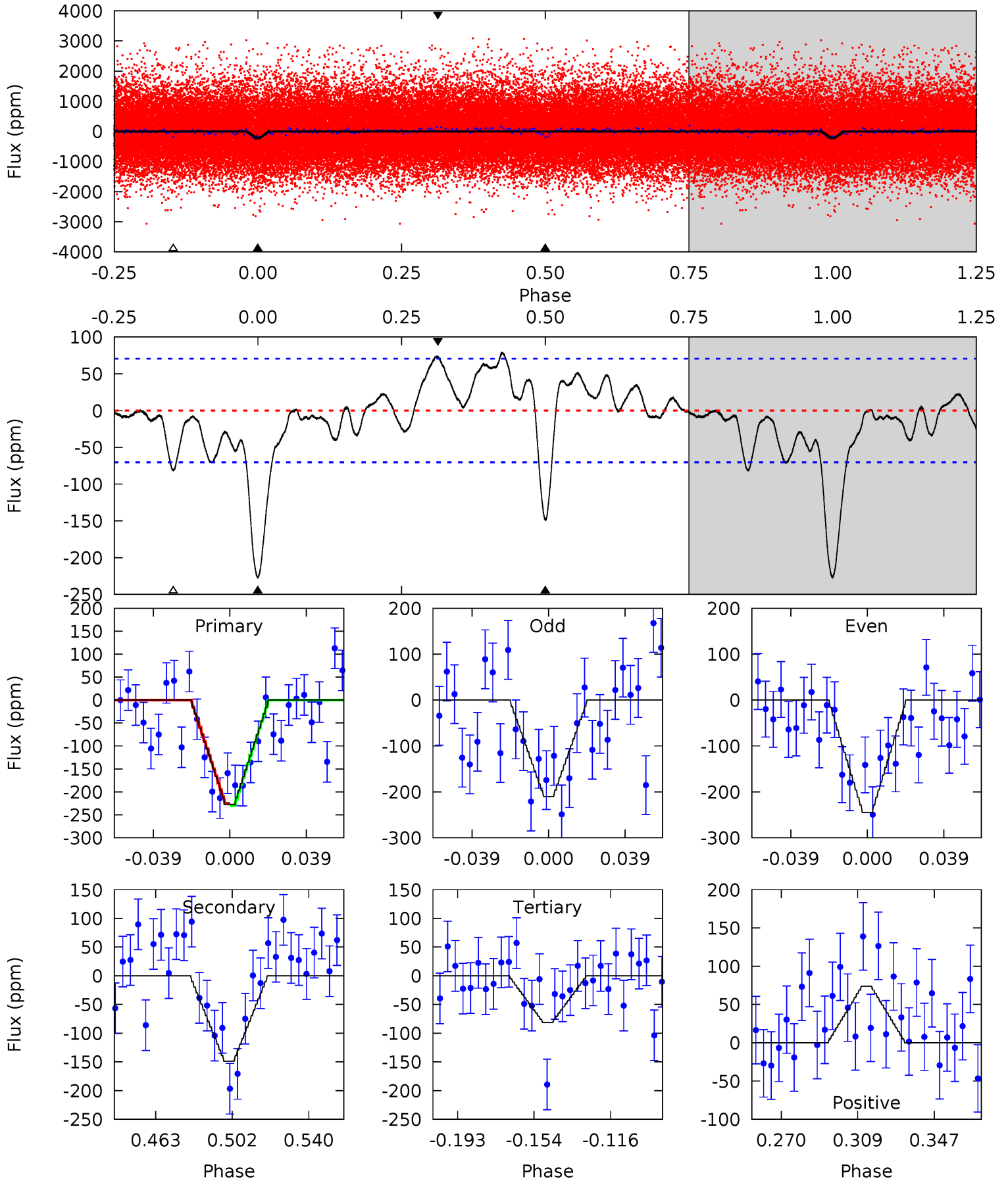
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	10.1	2.96	3.05	4.71	1.97	1.32	9.80	9.71	7.11	7.02	0.65	0.89	0.19	1.81



# Alt Model-Shift Uniqueness Test

012403968-01, P = 1.179508 Days, E = 131.240748 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
15.3	10.1	5.49	4.99	4.76	2.07	2.24	9.85	10.3	4.56	5.06	1.17	1.22	0.26	0.18





### Stellar Parameters For KIC 012403968

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5414^{+163}_{-163}$	$4.648^{+0.030}_{-0.096}$	$-0.620^{+0.350}_{-0.300}$	$0.678^{+0.108}_{-0.046}$	$0.759^{+0.074}_{-0.074}$	$3.433^{+0.464}_{-1.086}$
	+3%/-3%	+1%/-2%	+56%/-48%	+16%/-7%	+10%/-10%	+14%/-32%
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 012403968-01 / KOI 7531.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-129 \pm 13$	$1.31^{+1.17}_{-0.79}$	$1978^{+83}_{-73}$	$4517^{+2420}_{-956}$	$16^{+81}_{-12}$
Alt.	$-149 \pm 15$	$1.45^{+1.12}_{-0.89}$	$1972^{+87}_{-72}$	$4463^{+2351}_{-847}$	$15^{+90}_{-10}$

$T_{max}$  = 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

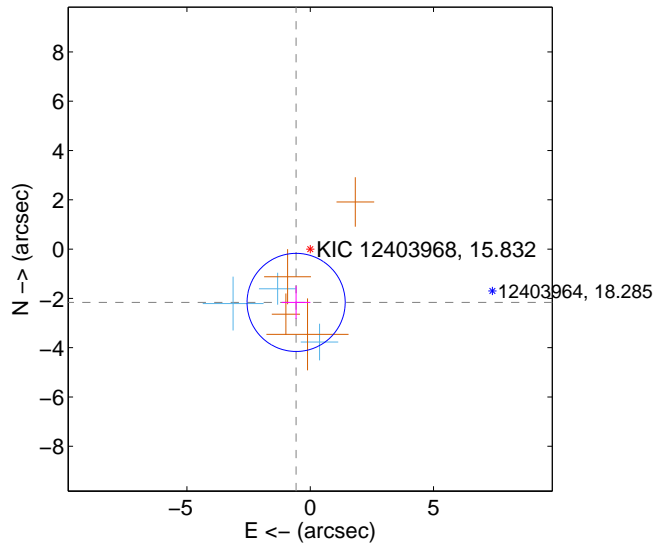
Supplemental centroid analysis for 012403968-01. Kepler magnitude: 15.83. Transit SNR 9.38

There are 3 quarters with good PRF difference image offsets

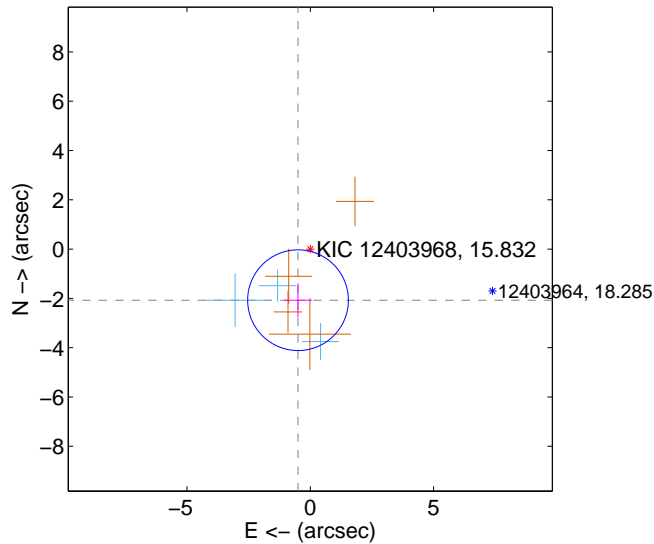
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.237 \pm 0.663$	$3.37$	$0.572 \pm 0.581$	$-2.163 \pm 0.669$
PRF-fit source offset from KIC position	$2.132 \pm 0.681$	$3.13$	$0.497 \pm 0.565$	$-2.073 \pm 0.687$
photometric centroid source offset	$3.76 \pm 1.47$	$2.56$	$-1.41 \pm 1.55$	$-3.49 \pm 1.46$

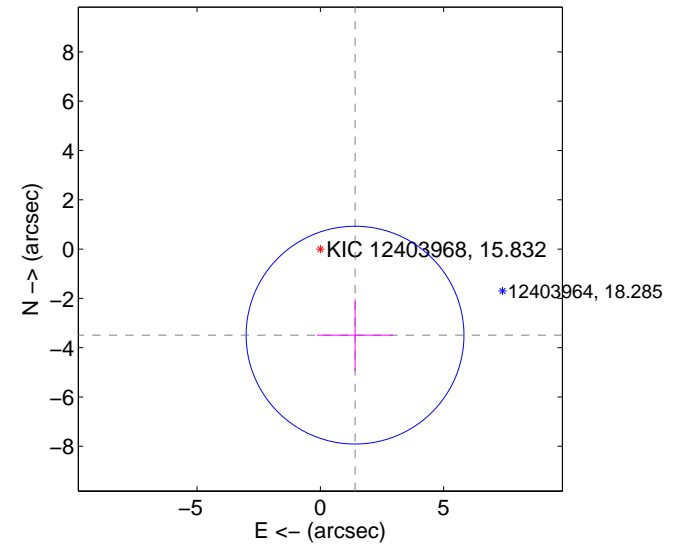
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

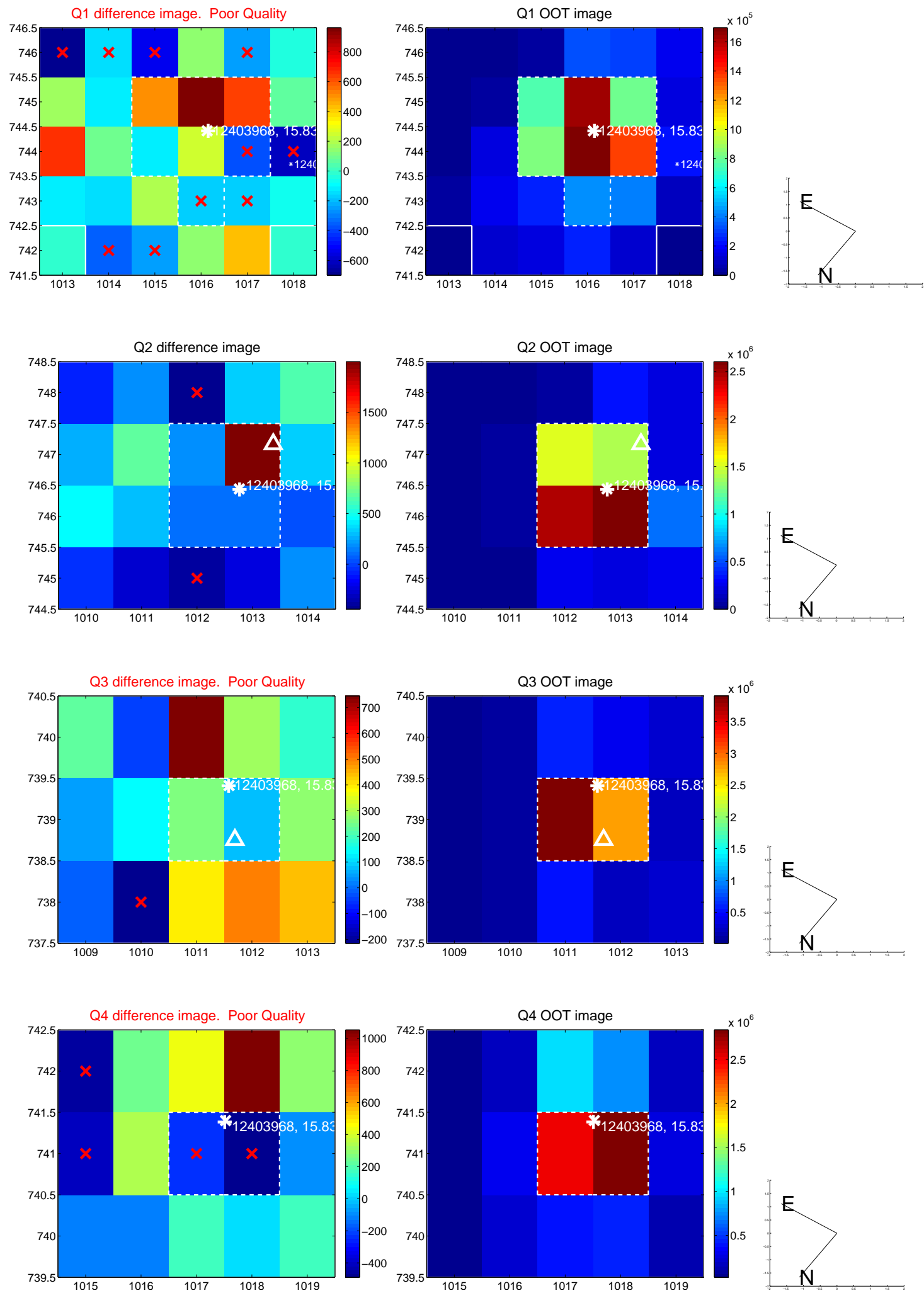


offset from photometric centroids

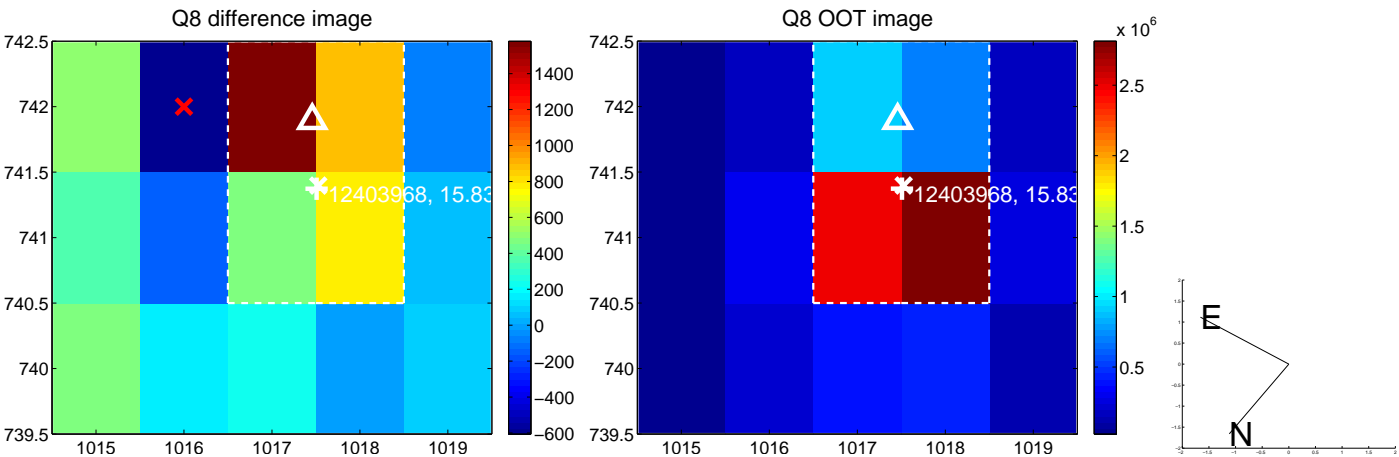
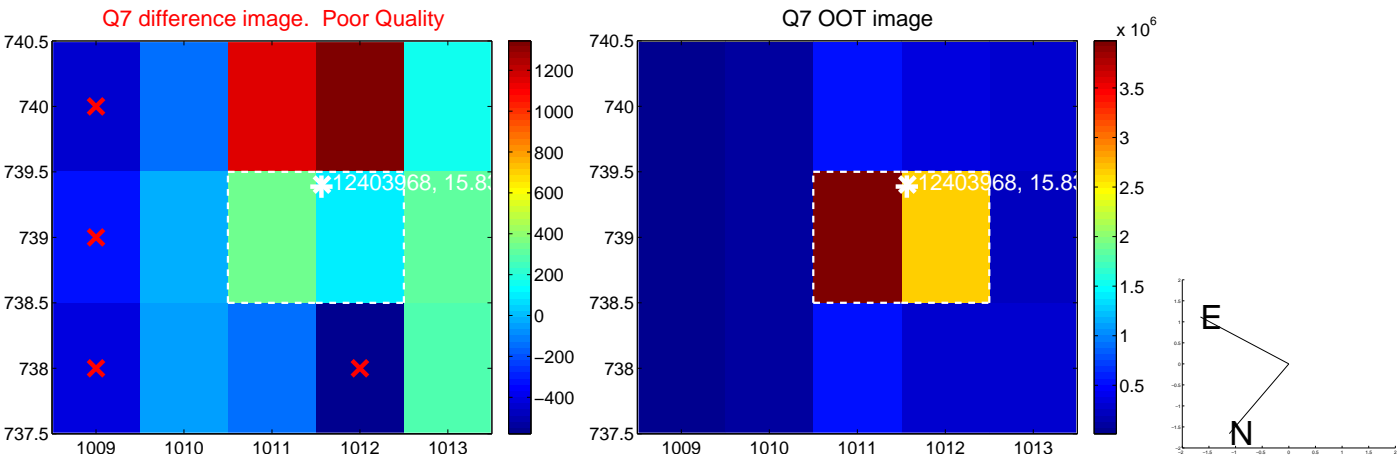
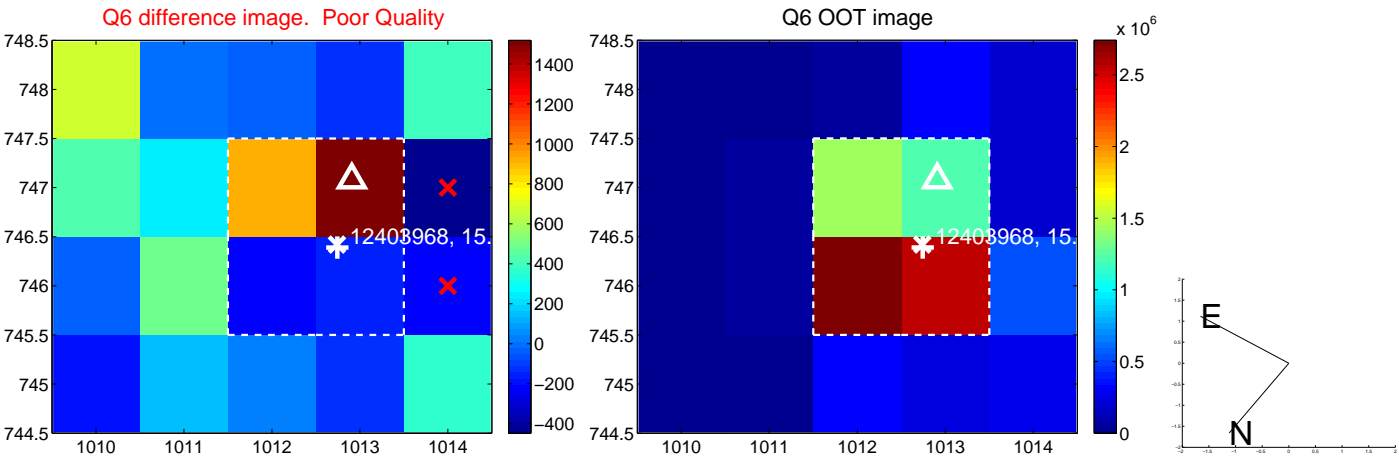
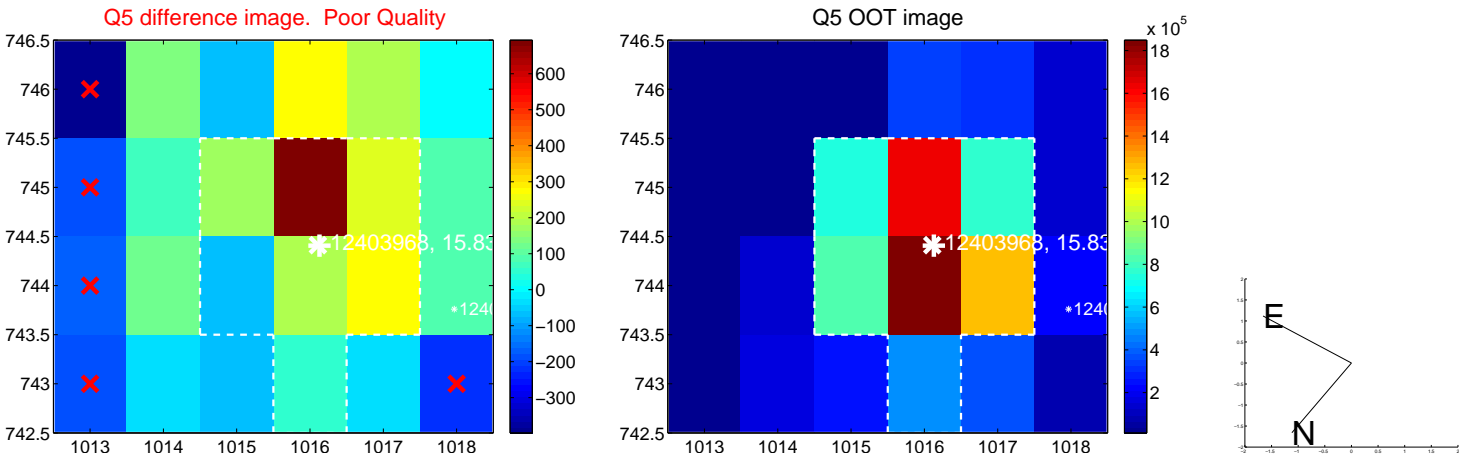


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

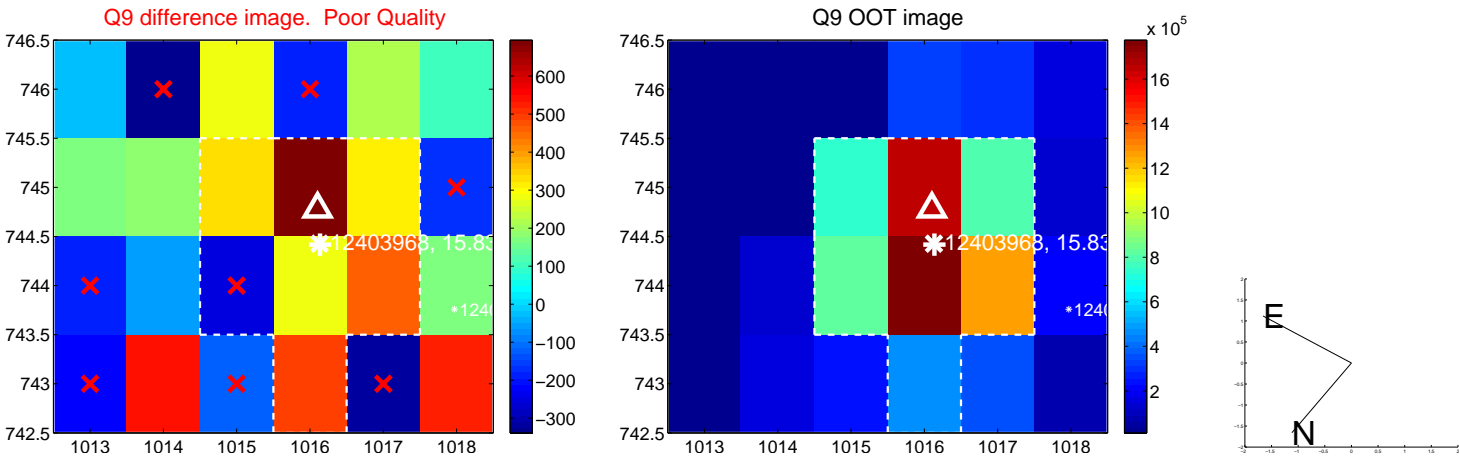


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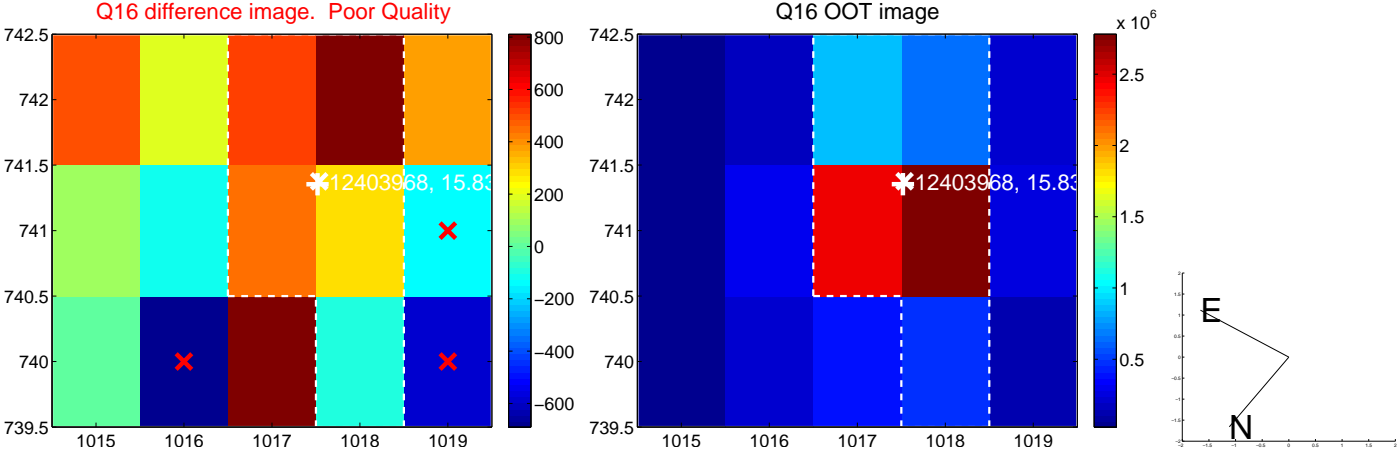
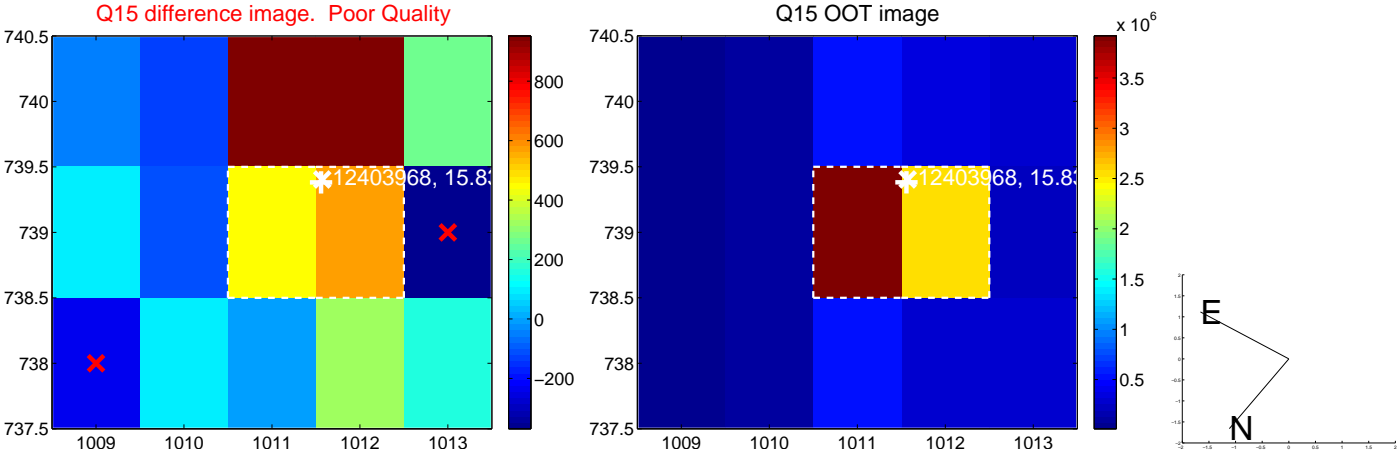
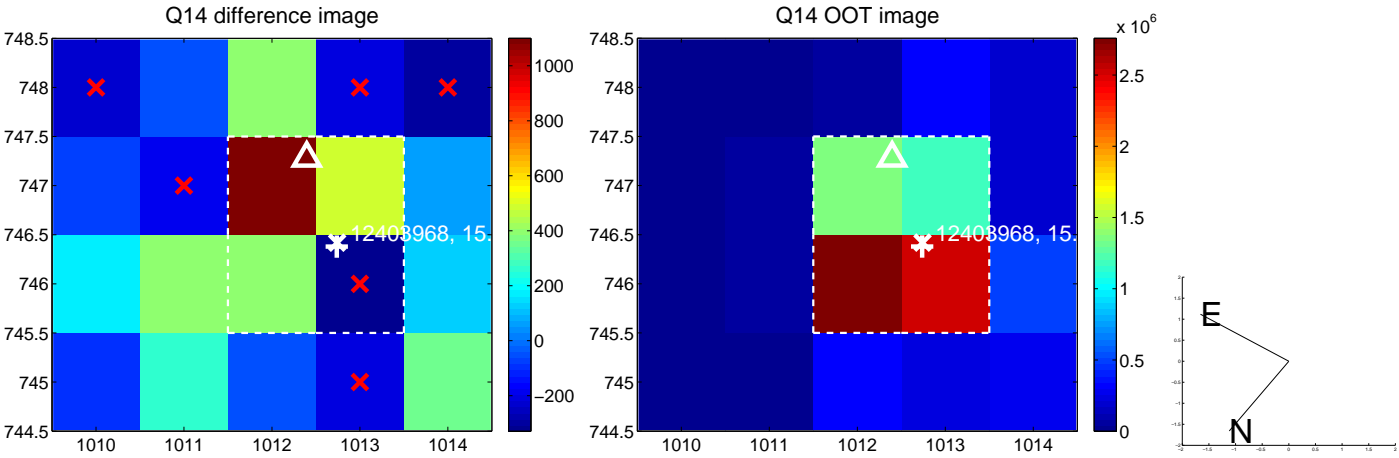
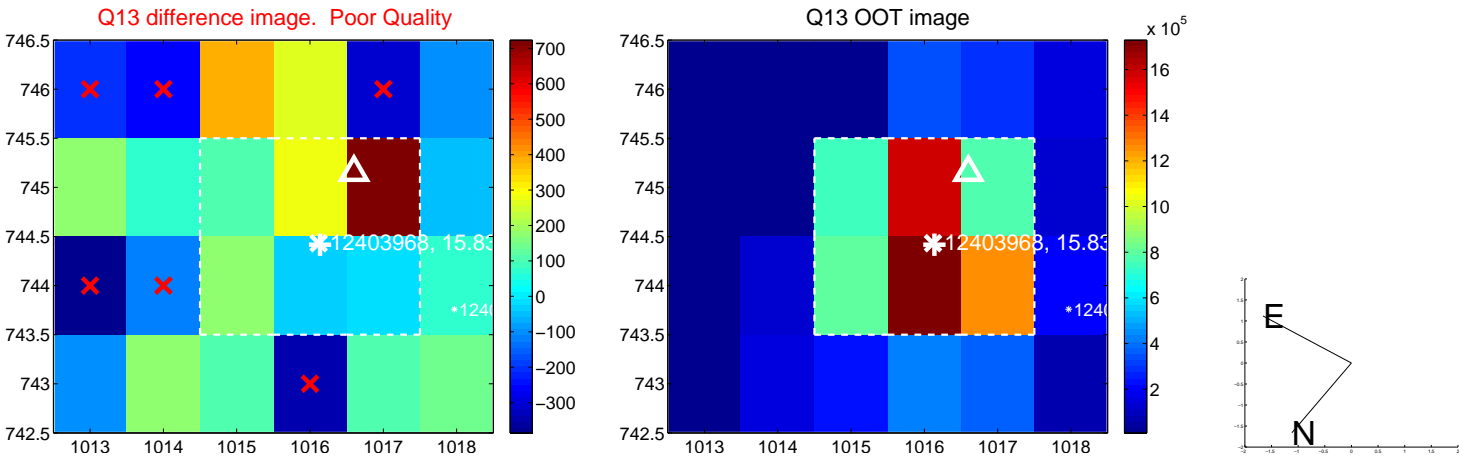




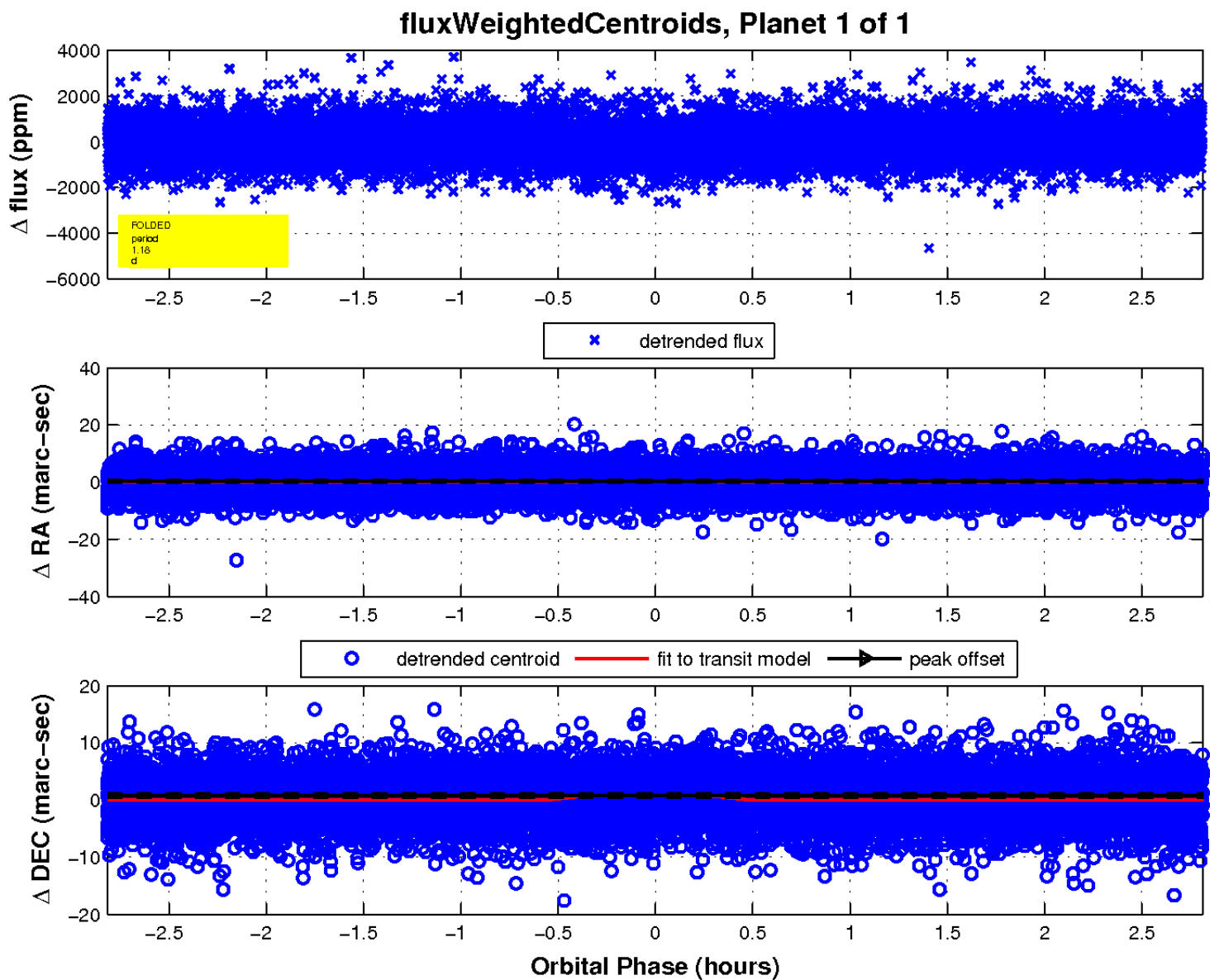
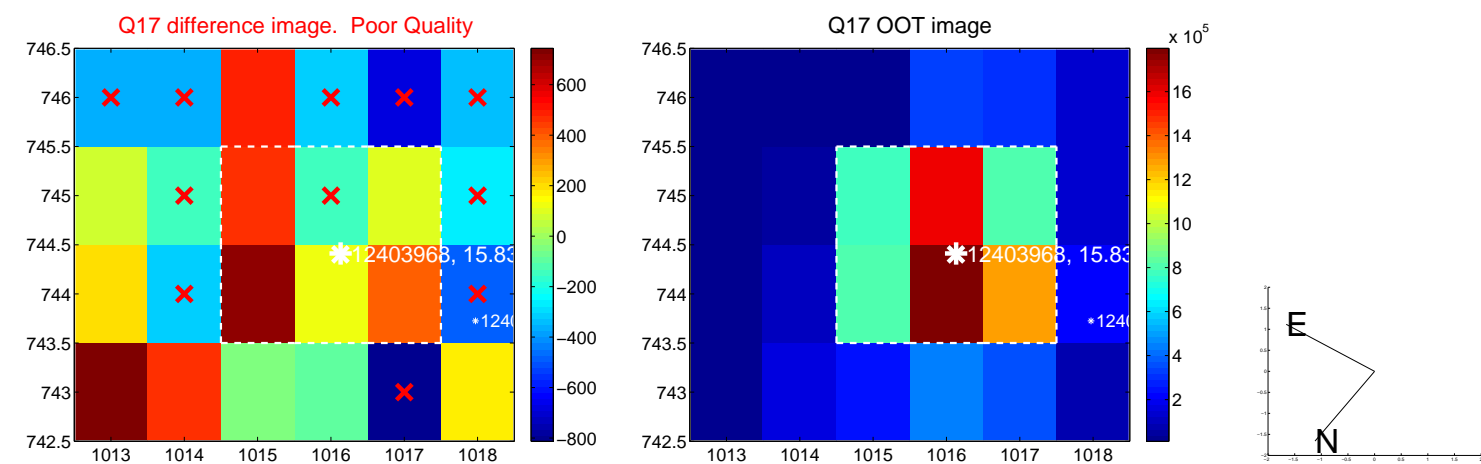
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

