

# KIC 004248120

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004248120-01	OBS	2216.01	23.340416	136.204591	624.6	2.215	16.0	17.2	0.89	5530	2.80	30.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004248120-01	OBS	PC	1.00	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.

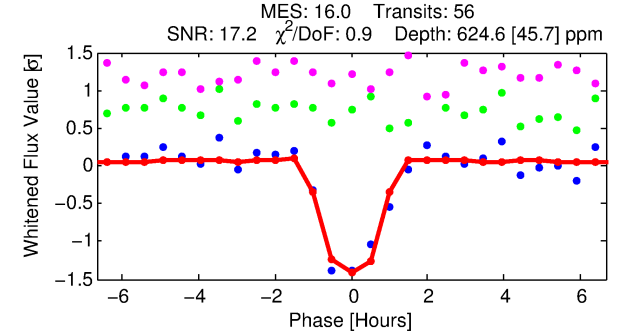
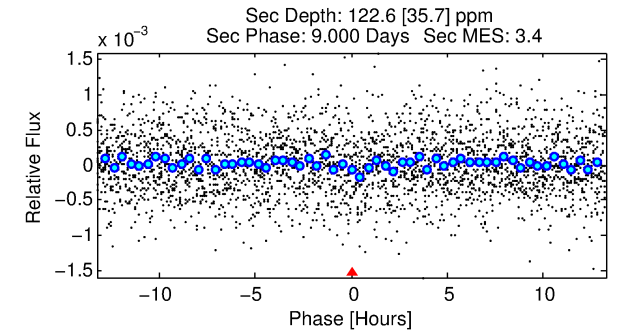
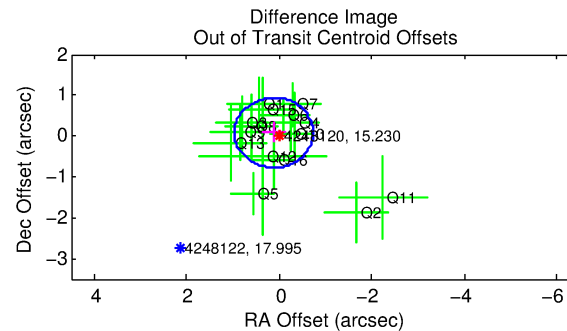
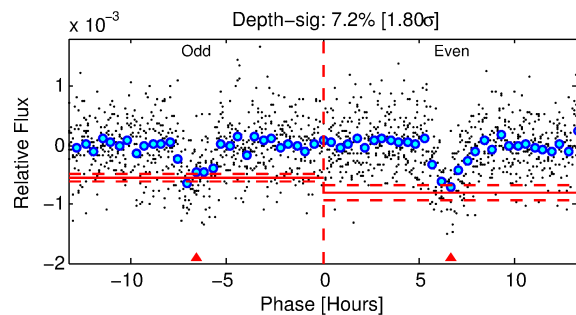
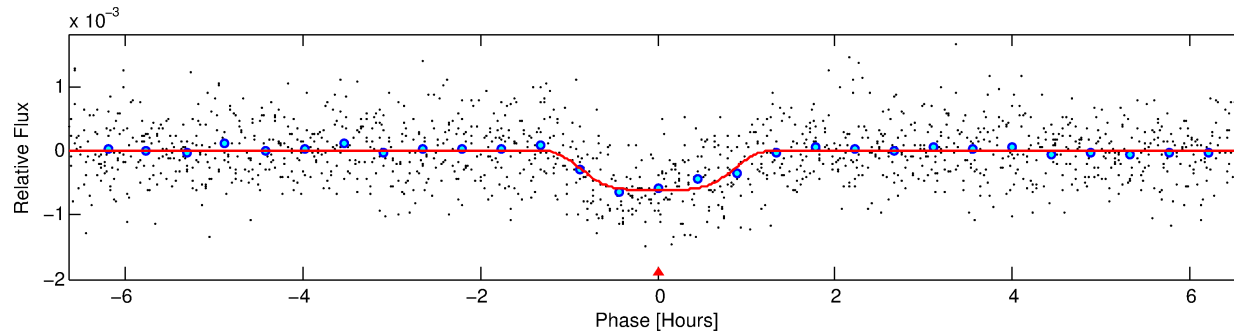
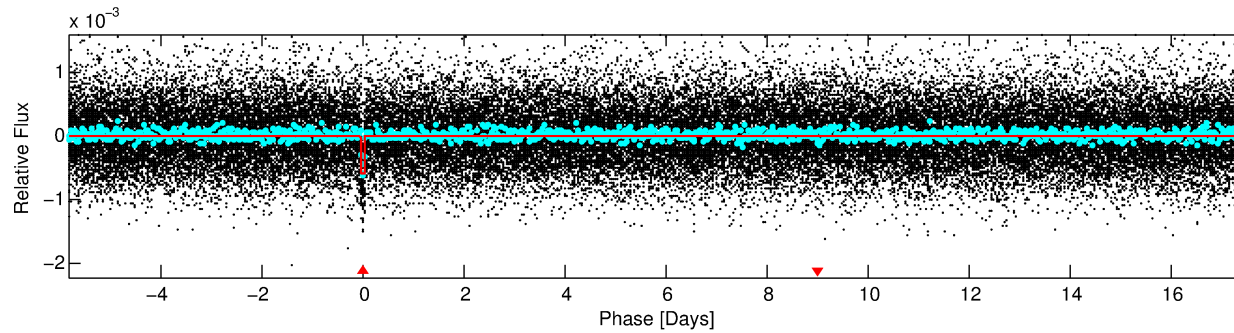
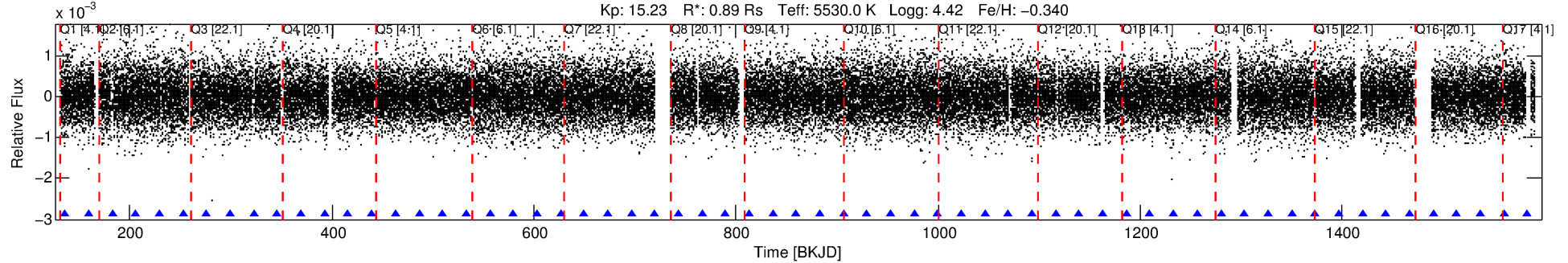
## Ephemeris Match Information For 004248120-01

No Significant Match Found

# DV One-Page Summary

KIC: 4248120 Candidate: 1 of 1 Period: 23.340 d  
KOI: K02216.01 Corr: 0.977

Kp: 15.23 R\*: 0.89 Rs Teff: 5530.0 K Logg: 4.42 Fe/H: -0.340



## DV Fit Results:

Period = 23.34042 [0.00009] d  
Epoch = 136.2046 [0.0033] BKJD  
Rp/R\* = 0.0288 [0.0033]  
a/R\* = 33.70 [15.21]  
b = 0.94 [0.06]  
Seff = 30.99 [10.87]  
Teq = 602 [53] K  
Rp = 2.80 [0.75] Re  
a = 0.1467 [0.0318] AU  
Ag = 185.03 [91.46] [2.01σ]  
Teffp = 3431 [332] K [8.41σ]

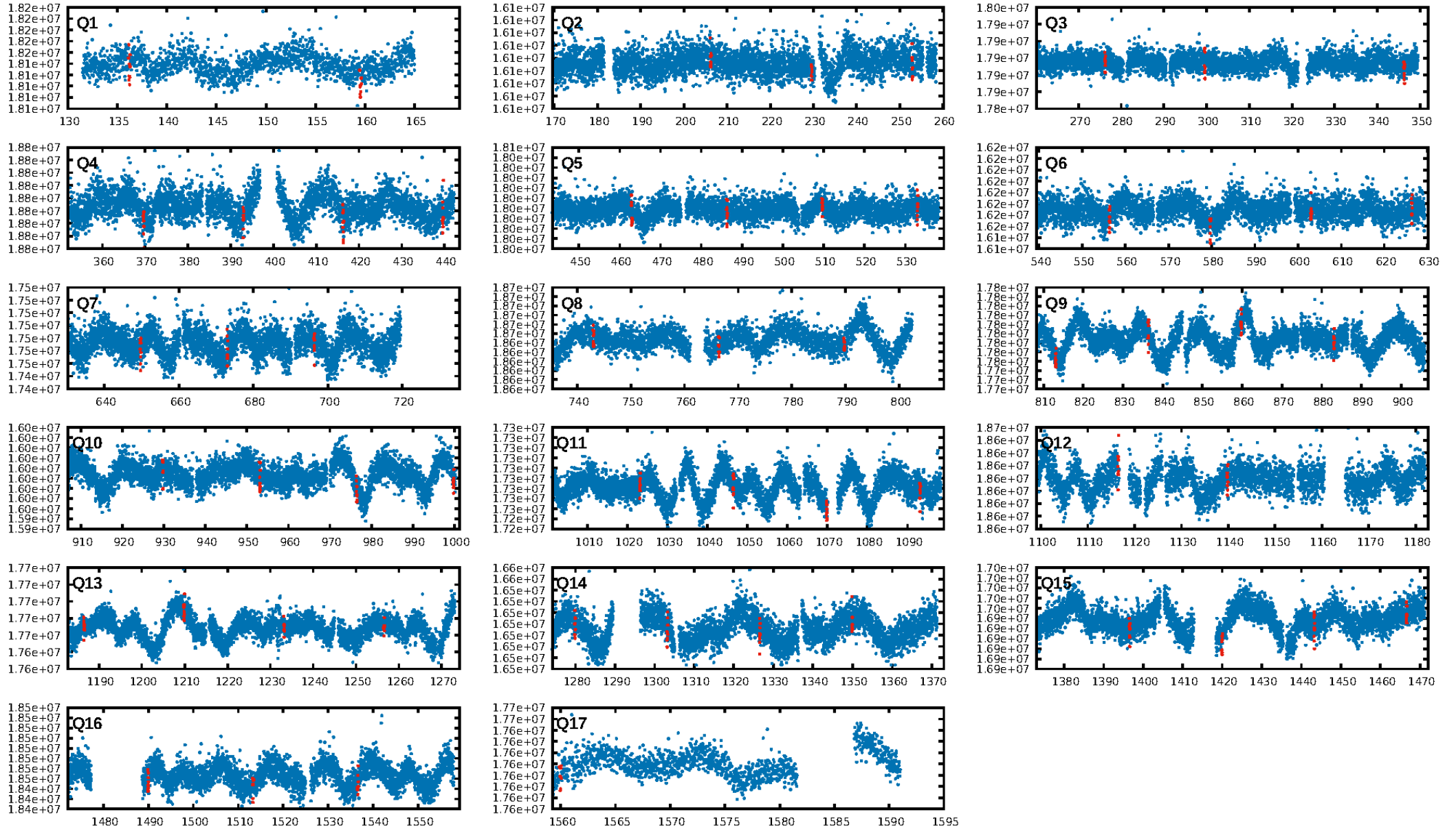
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 93.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.71e-56  
RollingBand-fgt: 1.00 [53/53]  
GhostDiagnostic-chr: -25.39  
Centroid-sig: 7.6%  
Centroid-so: 1.117 arcsec [1.42σ]  
OotOffset-rm: 0.147 arcsec [0.52σ]  
KicOffset-rm: 0.229 arcsec [0.95σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.87 [13/15]  
DiffImageOverlap-fno: 1.00 [16/16]

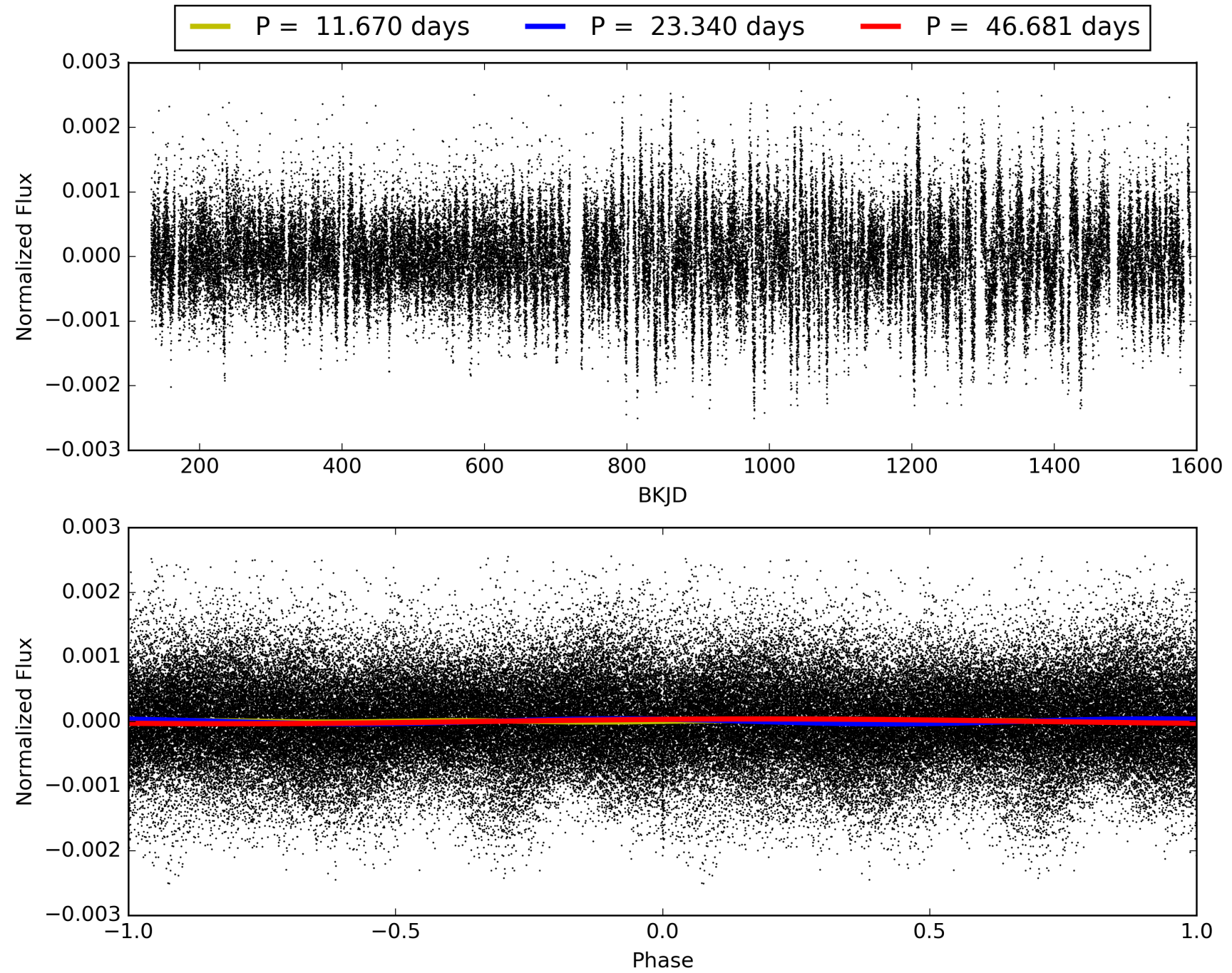
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:24:06 Z

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

# TCE 004248120-01, PDC Light Curves

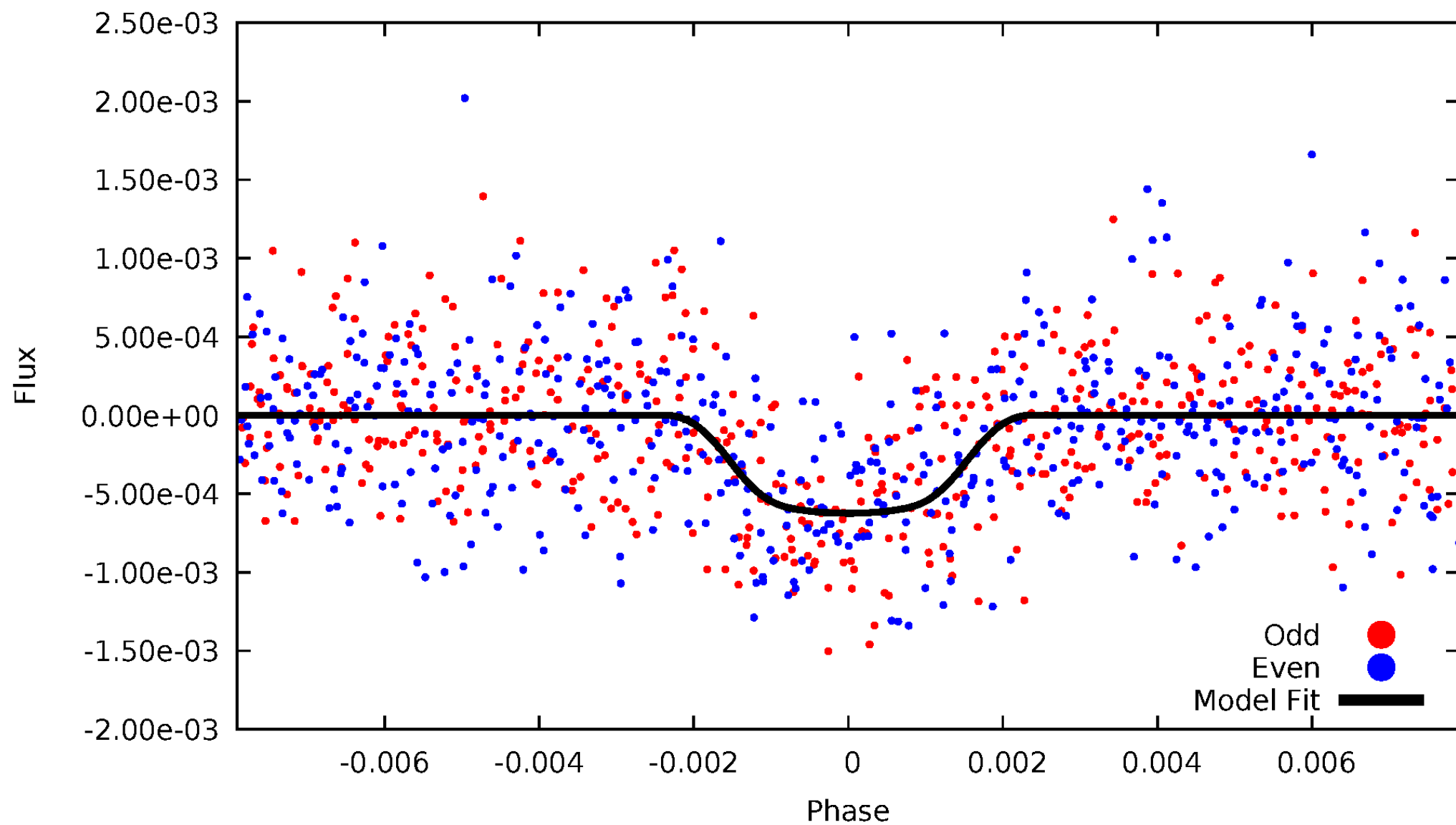


TCE 004248120-01



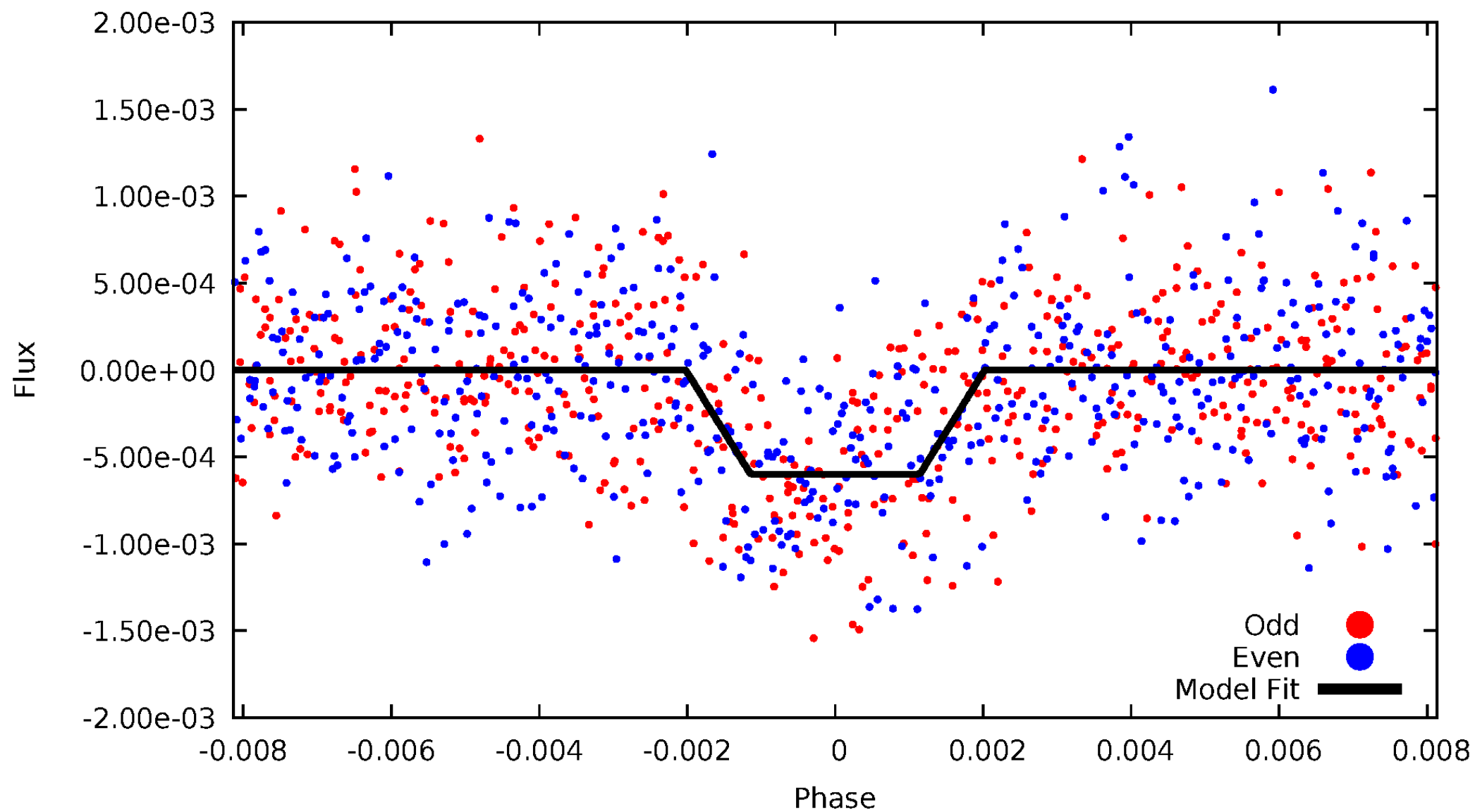
# DV Odd/Even

TCE 004248120-01



# ALT Odd/Even

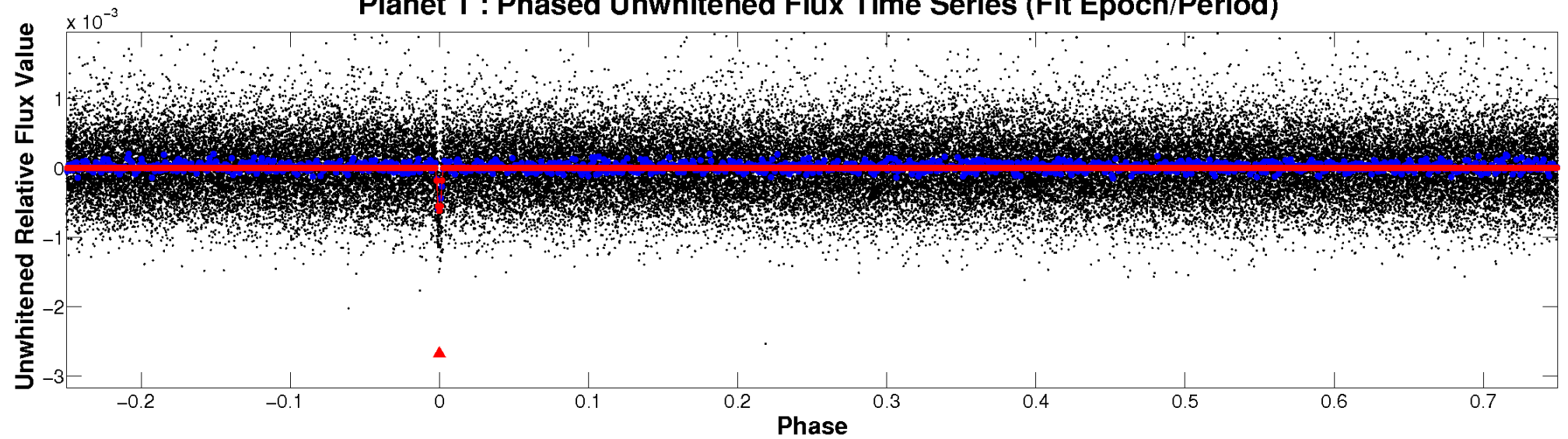
TCE 004248120-01



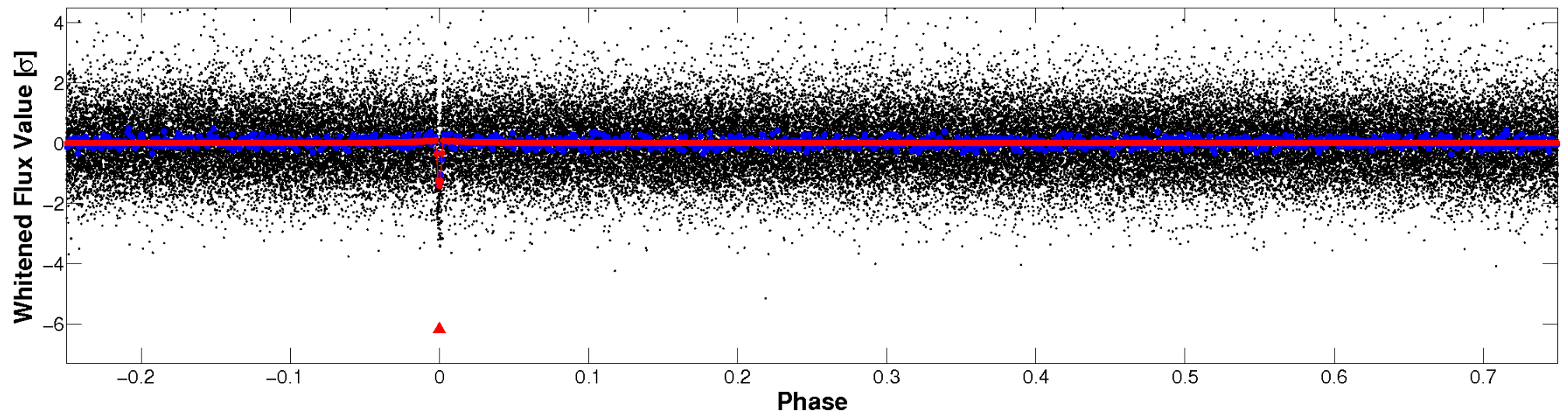


# Non-Whitened Vs. Whitened Light Curve

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

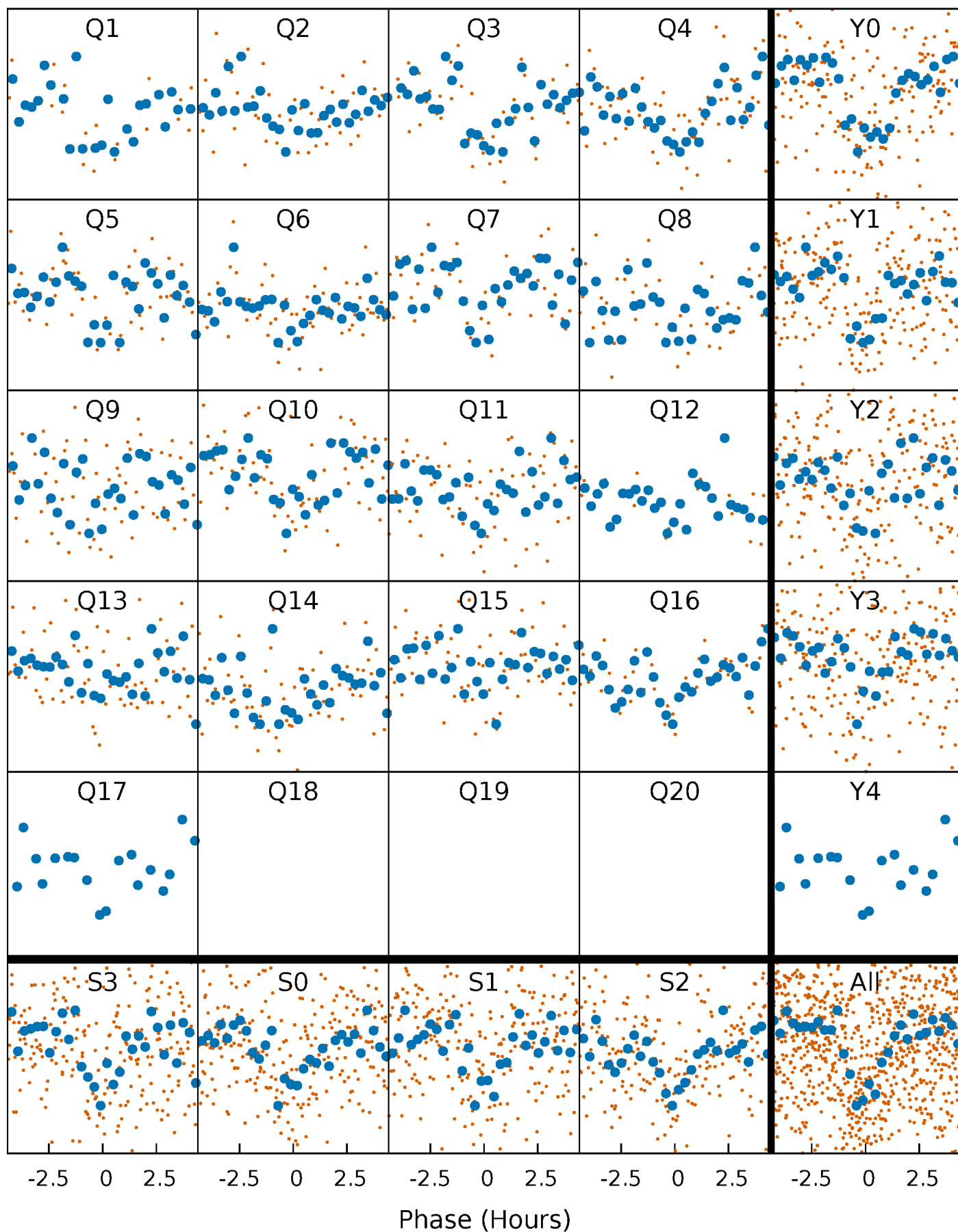


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

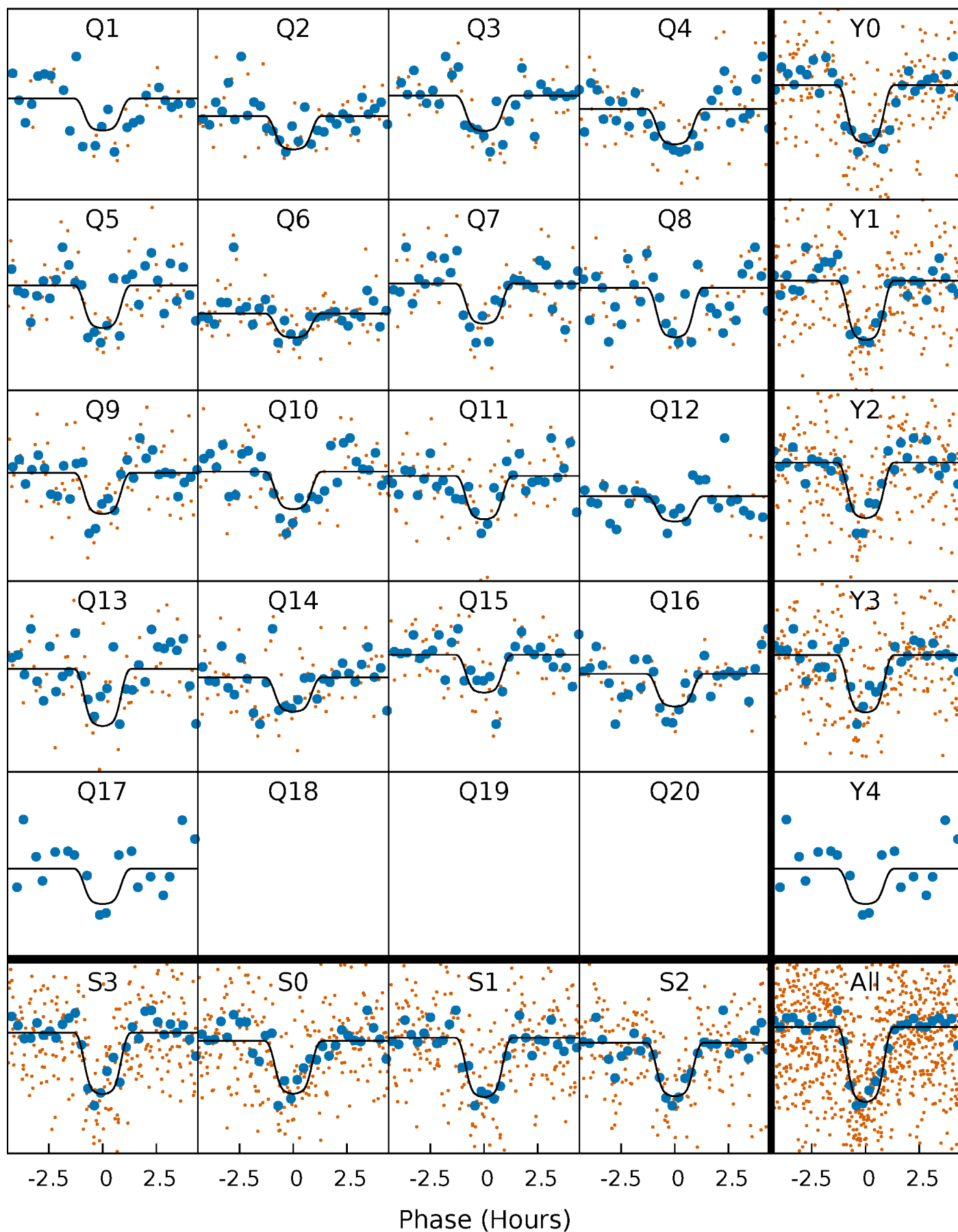
TCE 004248120-01 P= 23.340416 Days  $T_0=136.204591$  (BKJD)





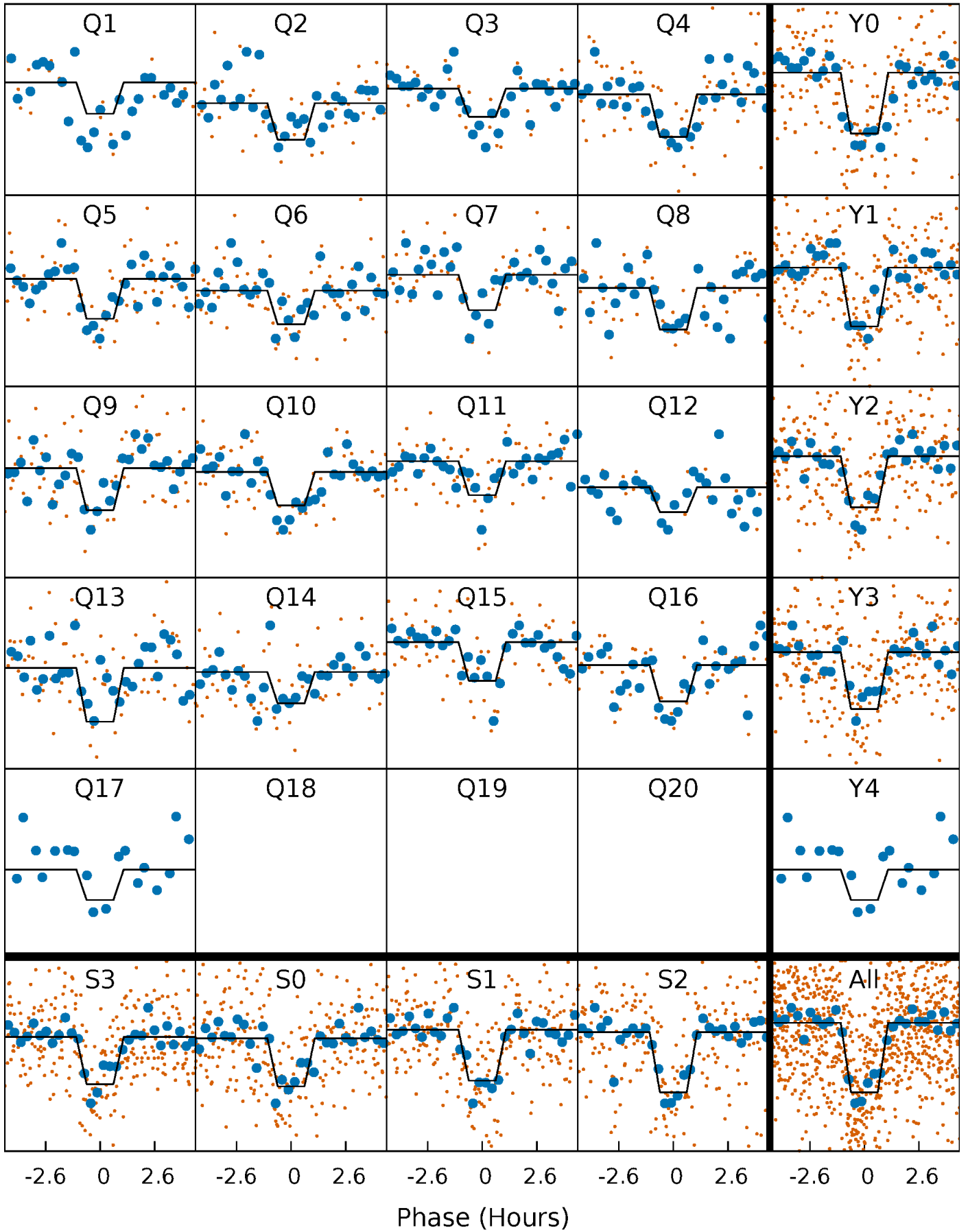
# DV Quarter-Phased Transit Curves

TCE 004248120-01 P= 23.340416 Days  $T_0=136.204591$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

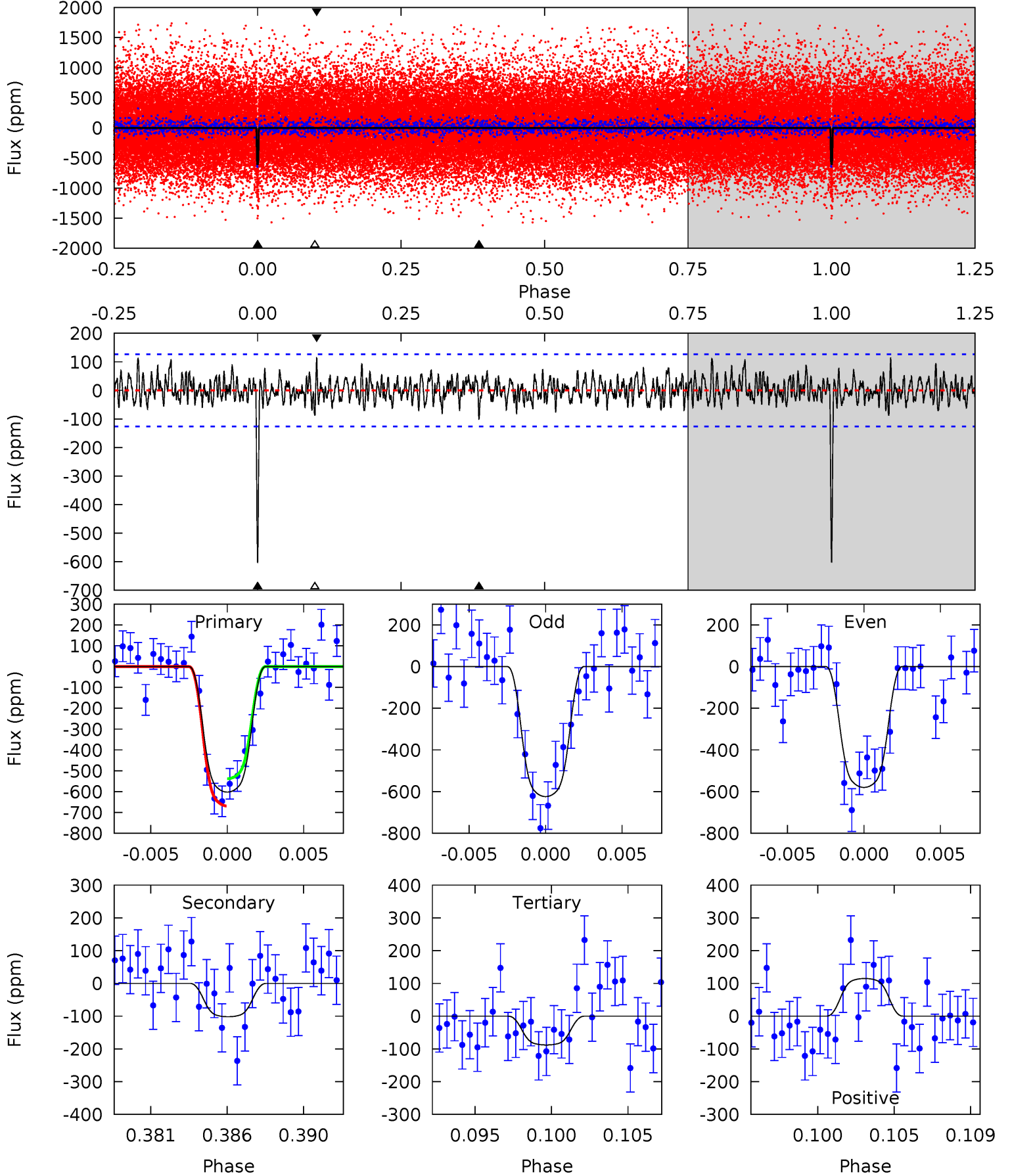
TCE 004248120-01 P= 23.340369 Days  $T_0=136.207274$  (BKJD)



# DV Model-Shift Uniqueness Test

004248120-01, P = 23.340416 Days, E = 112.864175 Days

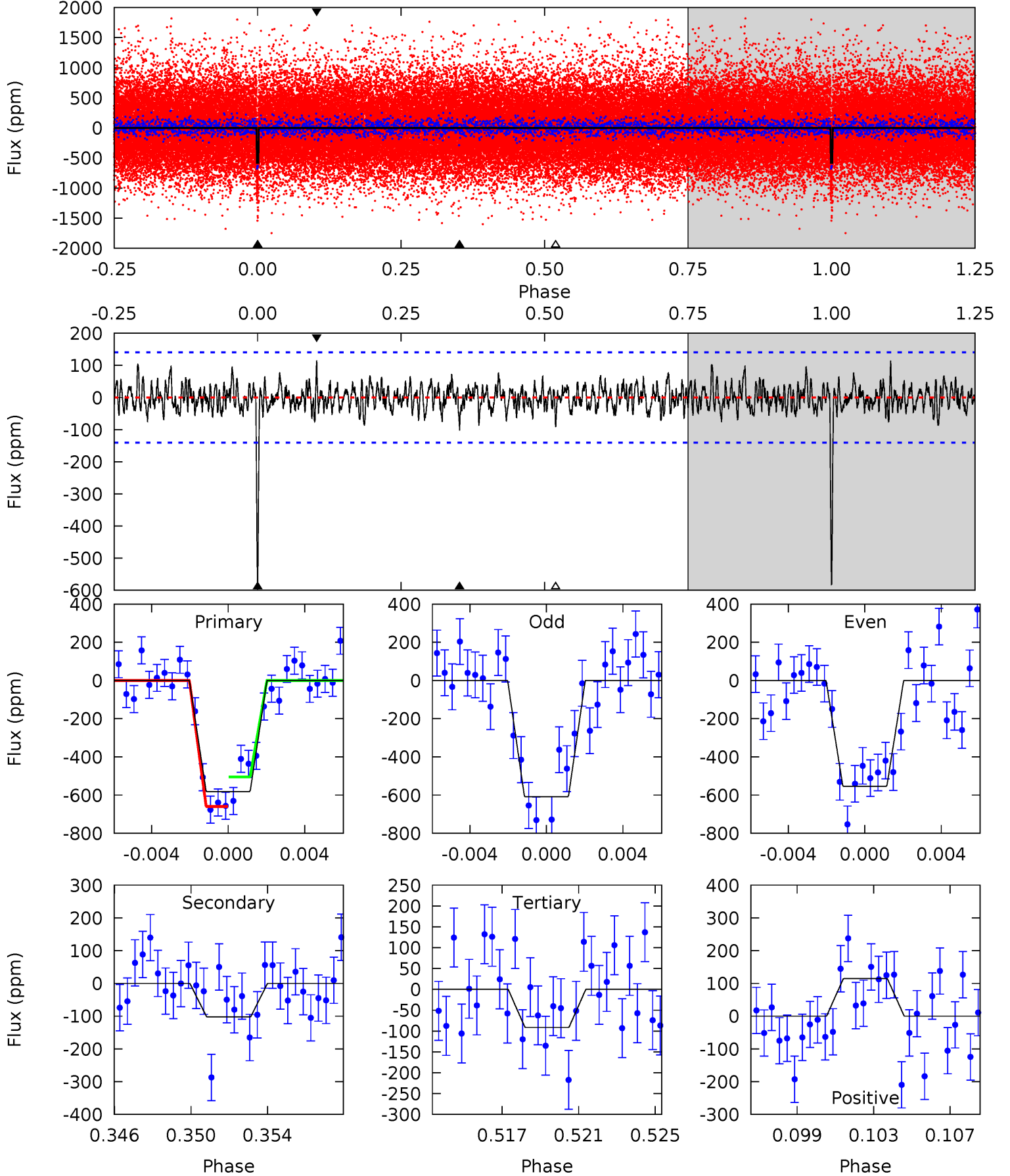
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.6	4.16	3.59	4.68	5.17	2.82	1.34	21.0	19.9	0.56	-0.53	0.90	0.99	0.16	2.67



# Alt Model-Shift Uniqueness Test

004248120-01,  $P = 23.340369$  Days,  $E = 112.866905$  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
21.5	3.78	3.37	4.23	5.20	2.88	1.16	18.1	17.3	0.41	-0.45	1.00	1.06	0.16	2.85



### Stellar Parameters For KIC 004248120

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5530^{+165}_{-165}$	$4.425^{+0.153}_{-0.187}$	$-0.340^{+0.350}_{-0.300}$	$0.892^{+0.217}_{-0.145}$	$0.773^{+0.123}_{-0.057}$	$1.532^{+1.034}_{-0.715}$
	+3%/-3%	+3%/-4%	+103%/-88%	+24%/-16%	+16%/-7%	+67%/-47%
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 004248120-01 / KOI 2216.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-102 \pm 25$	$2.85^{+0.50}_{-0.47}$	$844^{+60}_{-52}$	$3705^{+218}_{-244}$	$154^{+78}_{-56}$
Alt.	$-102 \pm 27$	$2.41^{+0.49}_{-0.43}$	$843^{+61}_{-52}$	$3873^{+306}_{-241}$	$207^{+112}_{-78}$

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

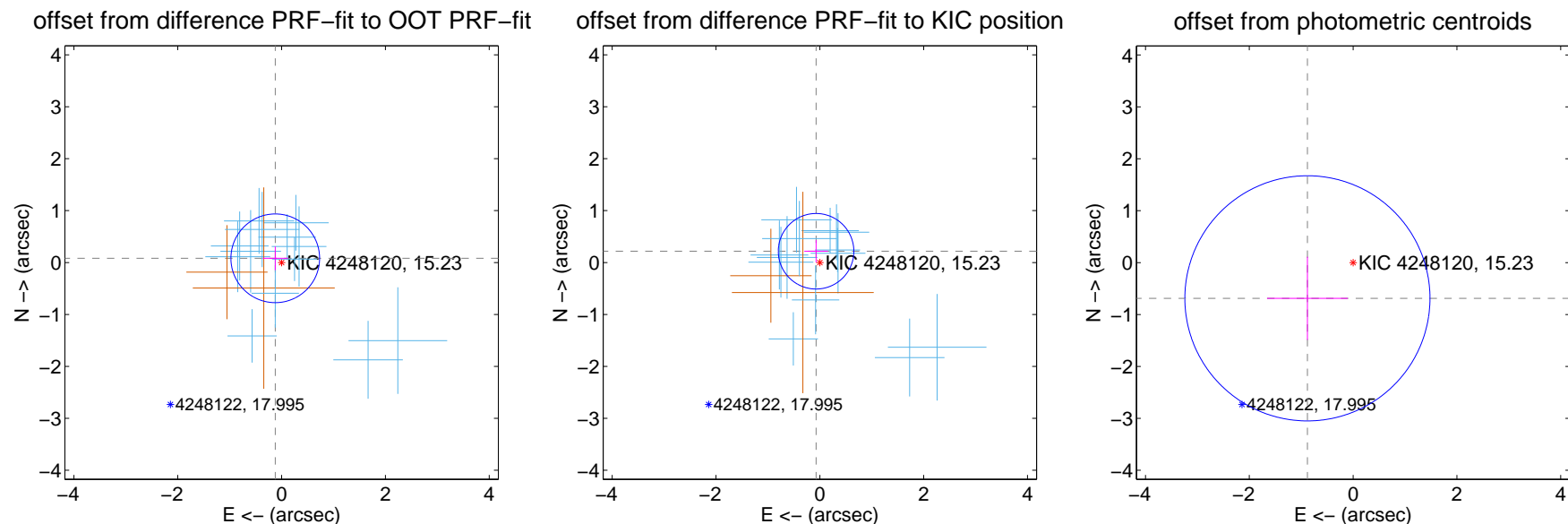
## DV Centroid Data

Supplemental centroid analysis for 004248120-01. Kepler magnitude: 15.23. Transit SNR 17.25

There are 13 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

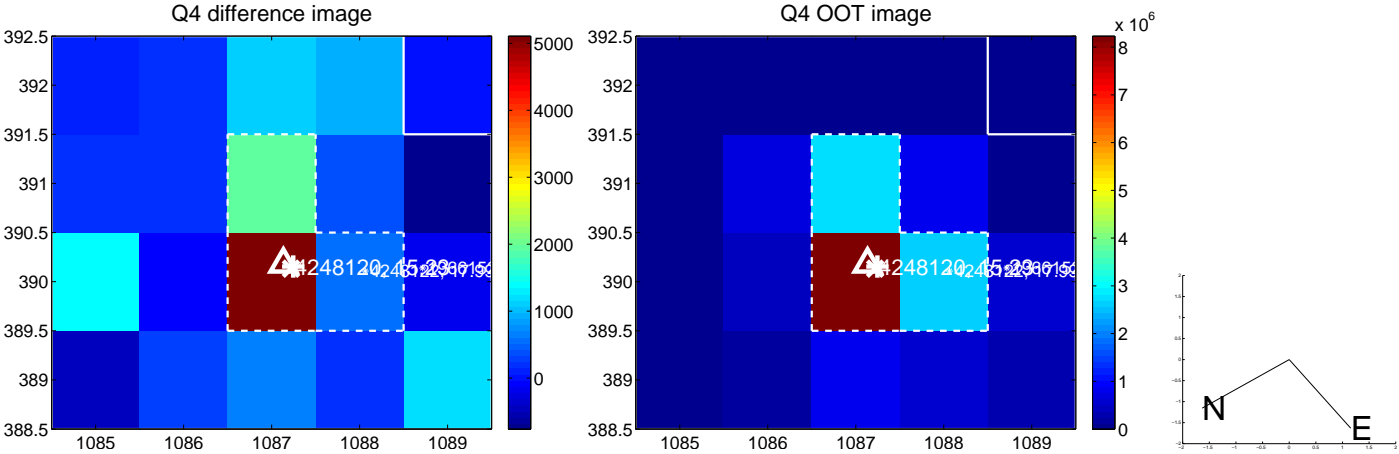
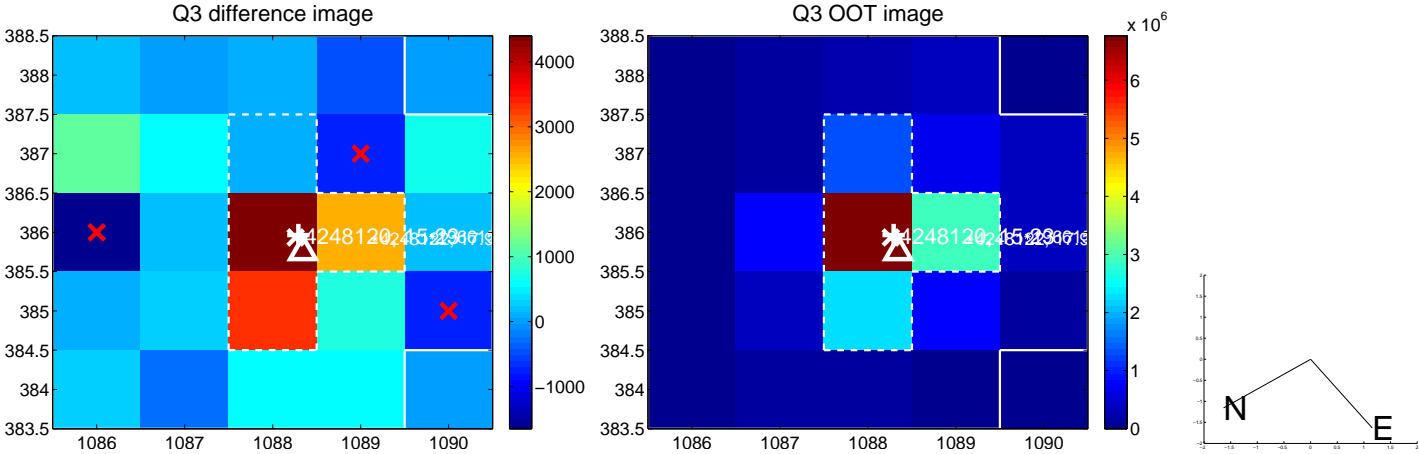
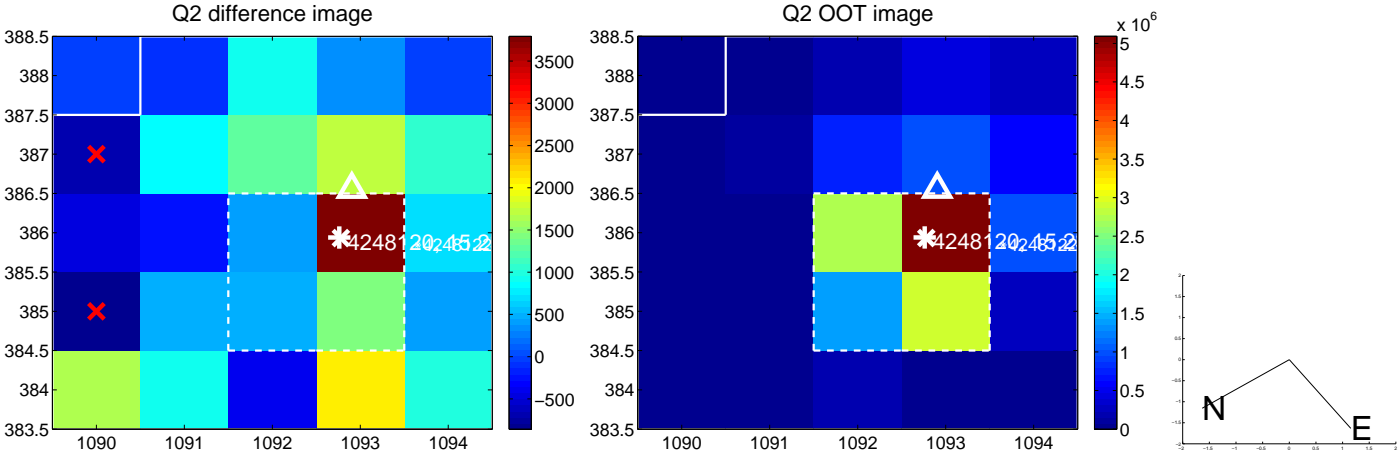
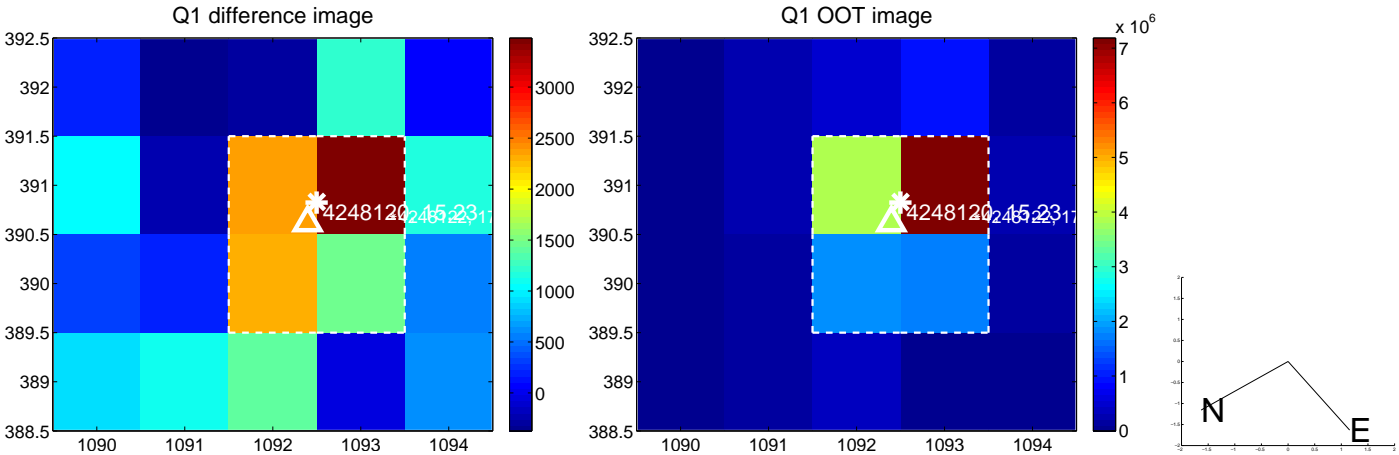
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.147 \pm 0.285$	0.52	$0.122 \pm 0.244$	$0.082 \pm 0.229$
PRF-fit source offset from KIC position	$0.229 \pm 0.242$	0.95	$0.073 \pm 0.226$	$0.217 \pm 0.214$
photometric centroid source offset	$1.12 \pm 0.79$	1.42	$0.88 \pm 0.78$	$-0.69 \pm 0.80$



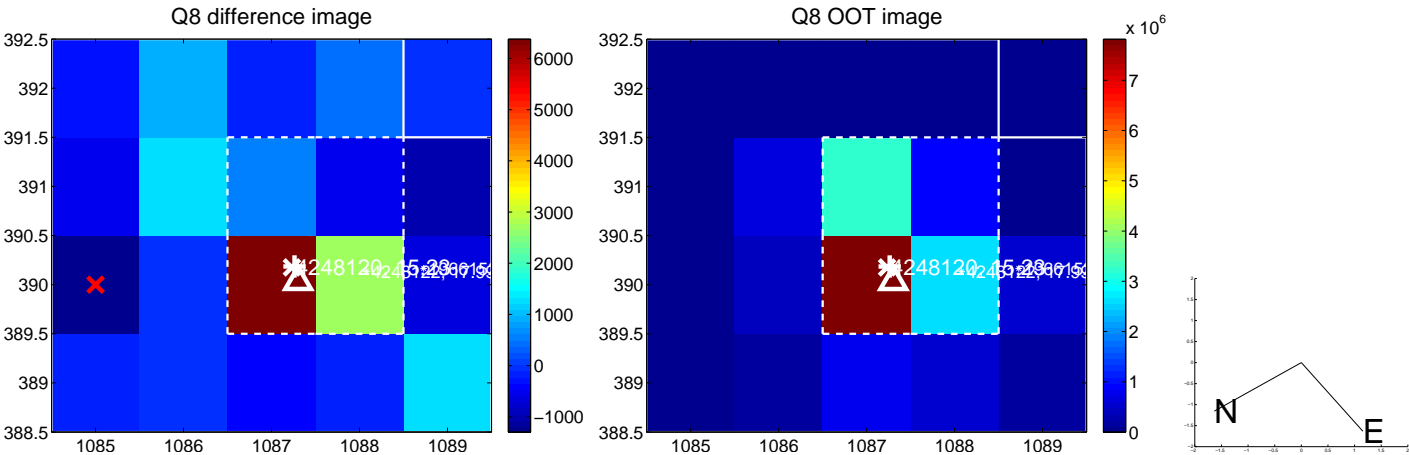
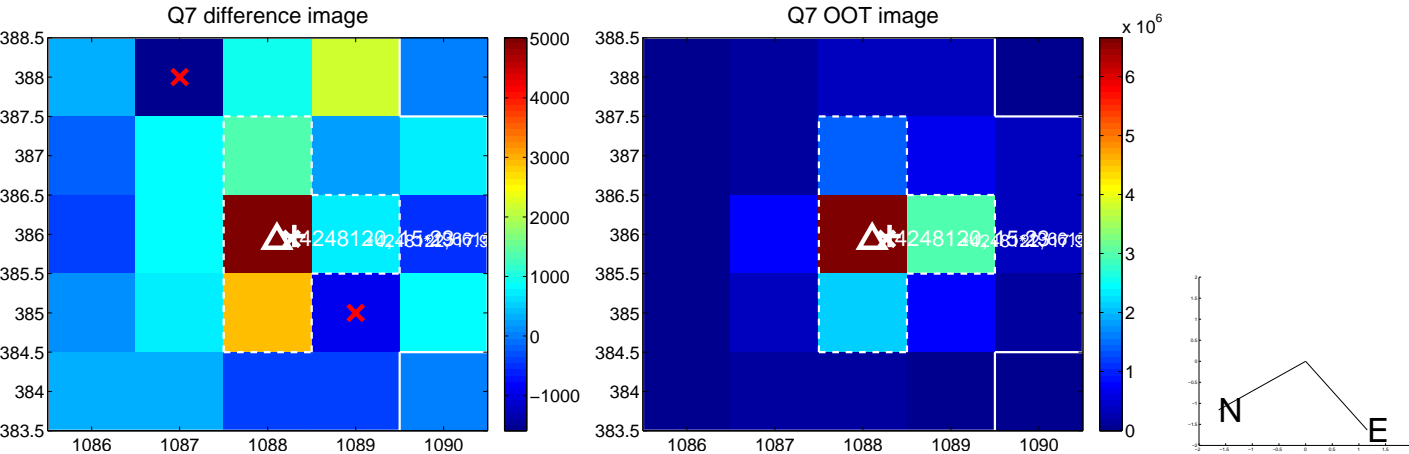
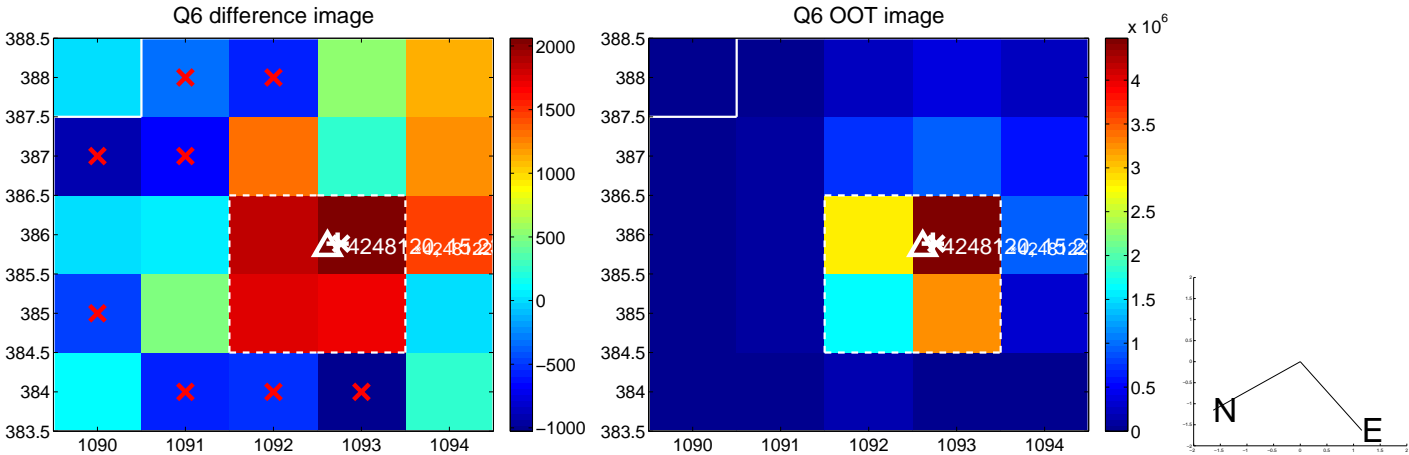
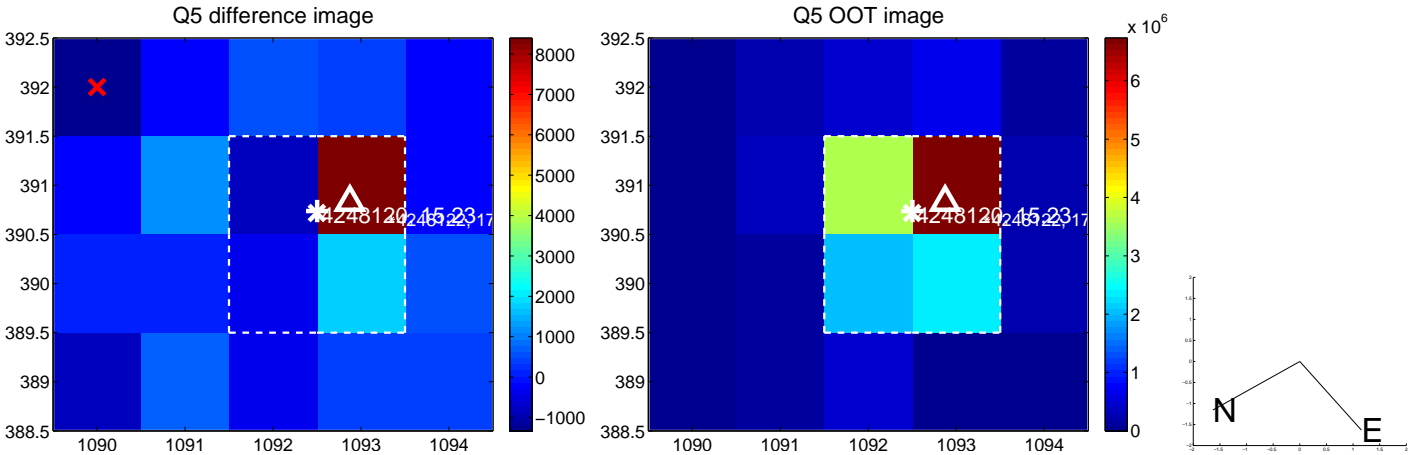
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



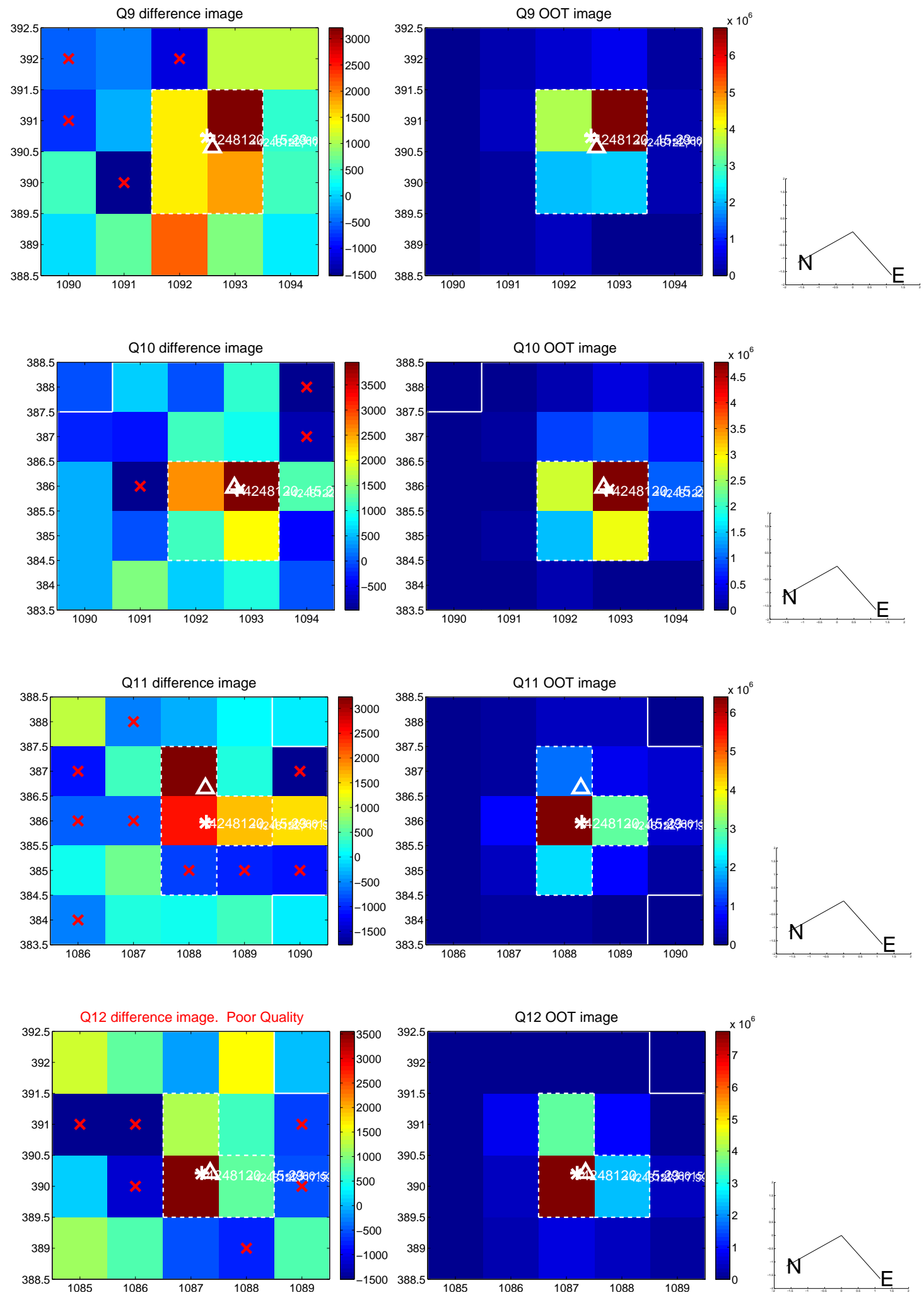
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



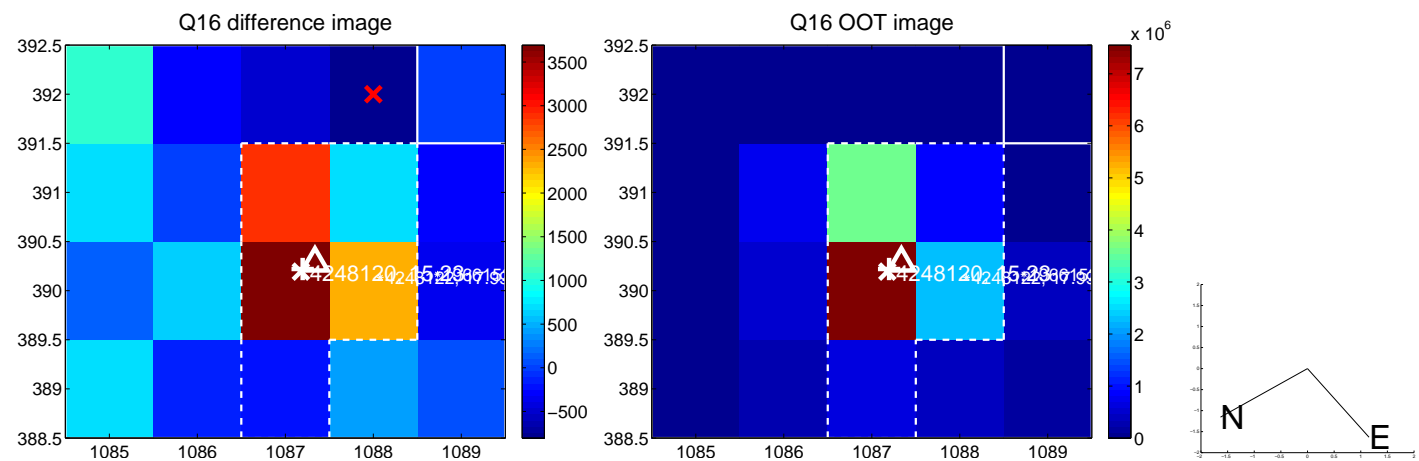
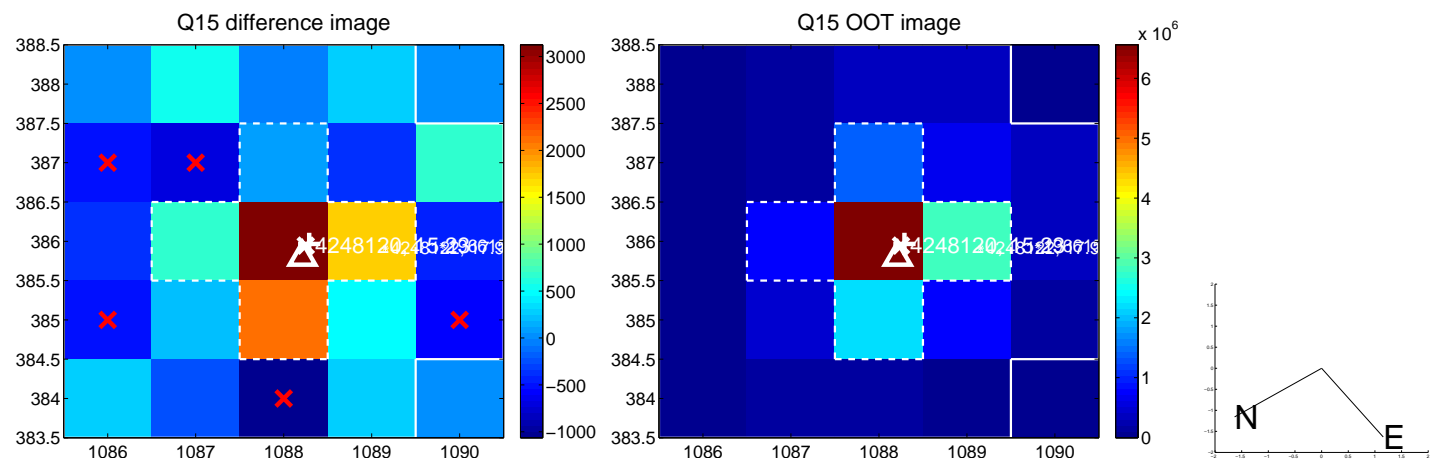
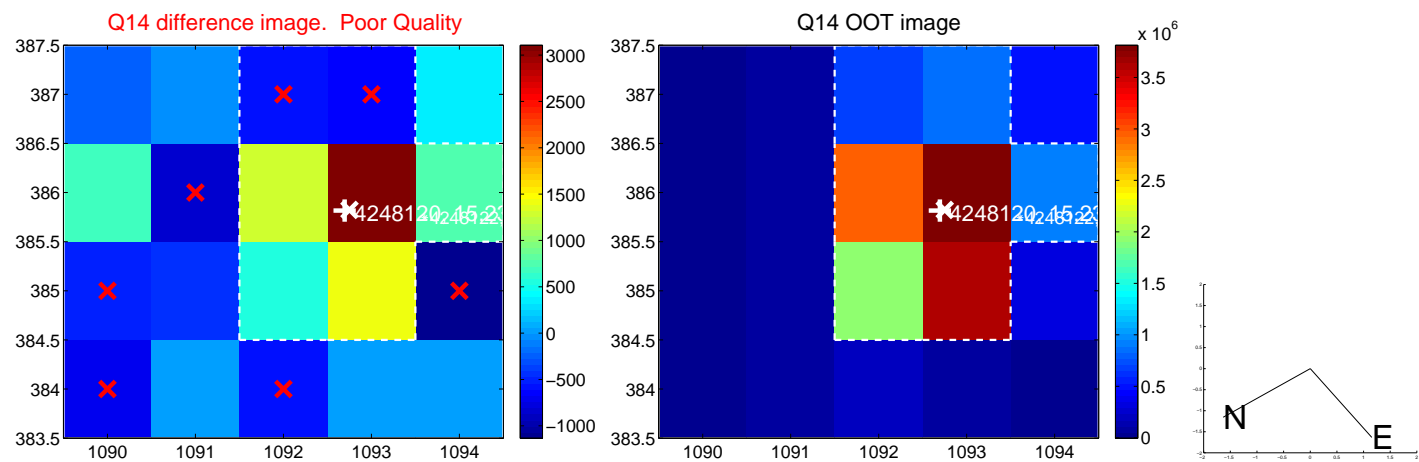
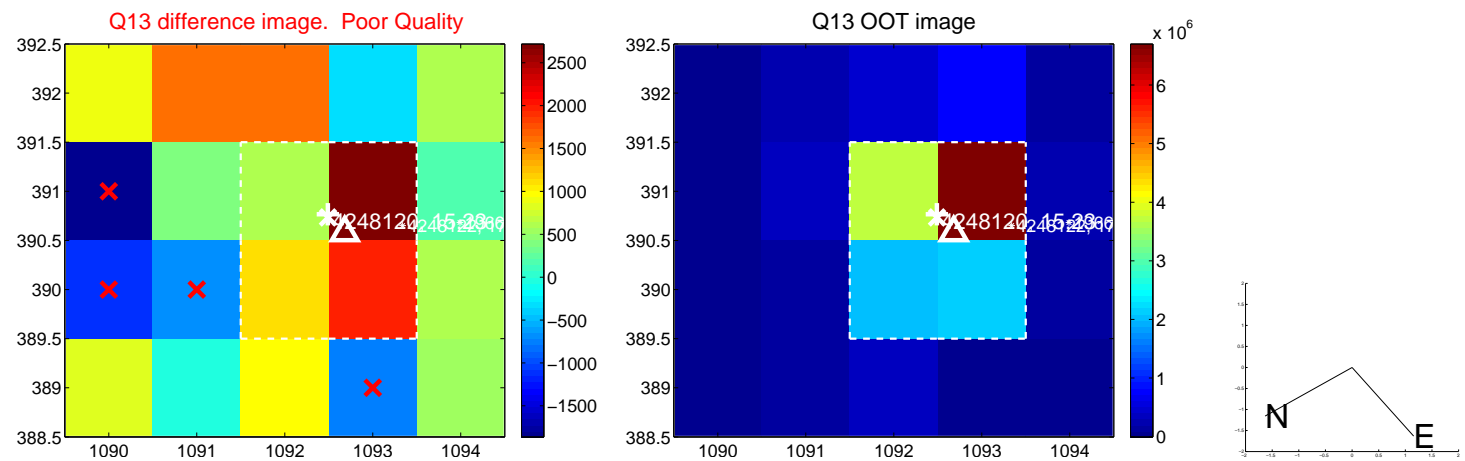
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



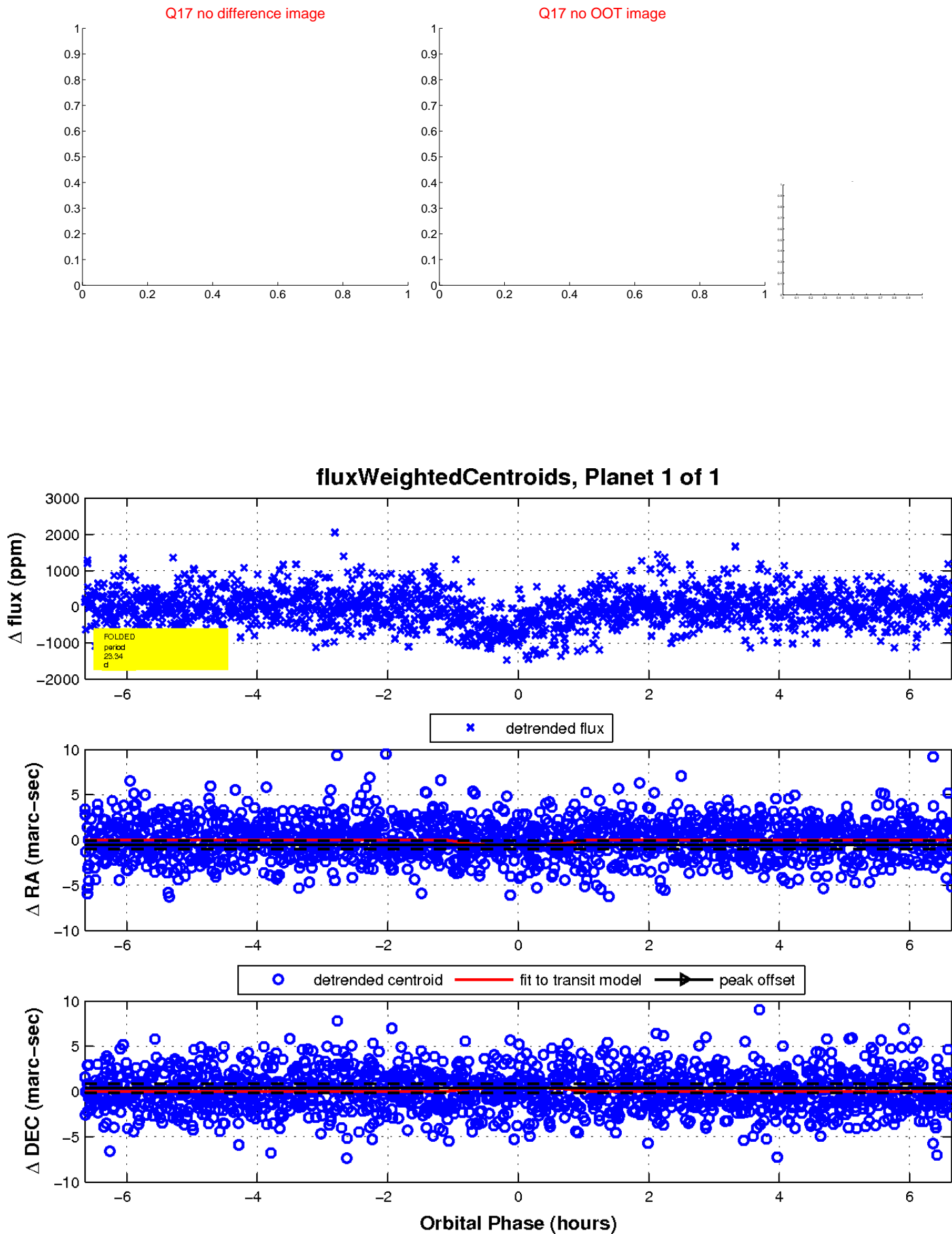
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

