

# KIC 010120548

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010120548-01	OBS	4451.01	8.830393	134.796792	312.1	3.441	10.1	11.0	0.71	5051	1.46	49.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010120548-01	OBS	PC	0.85	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.

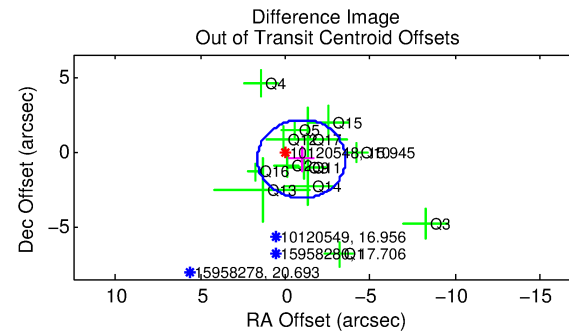
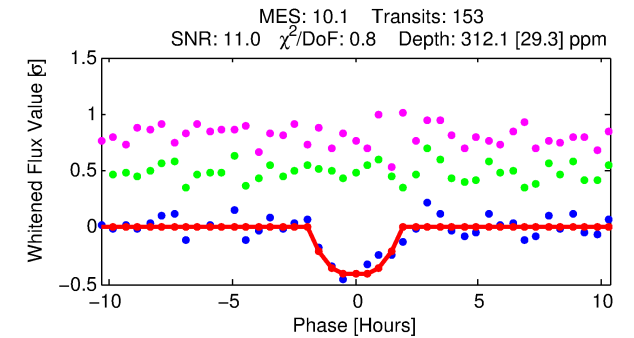
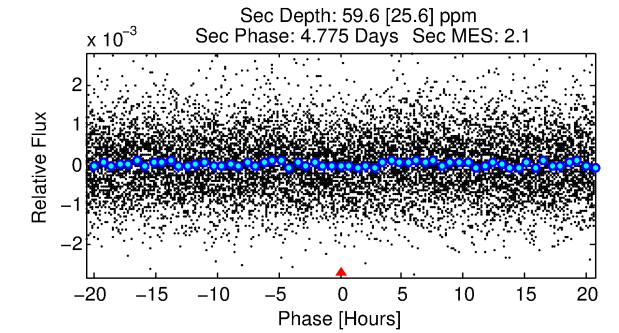
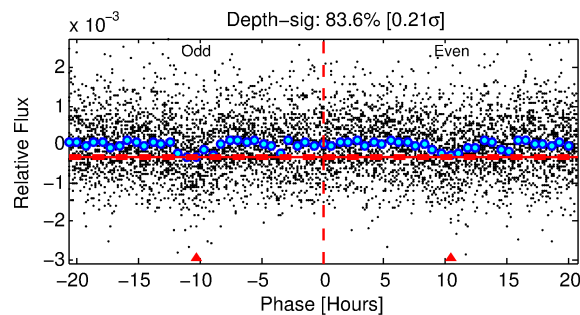
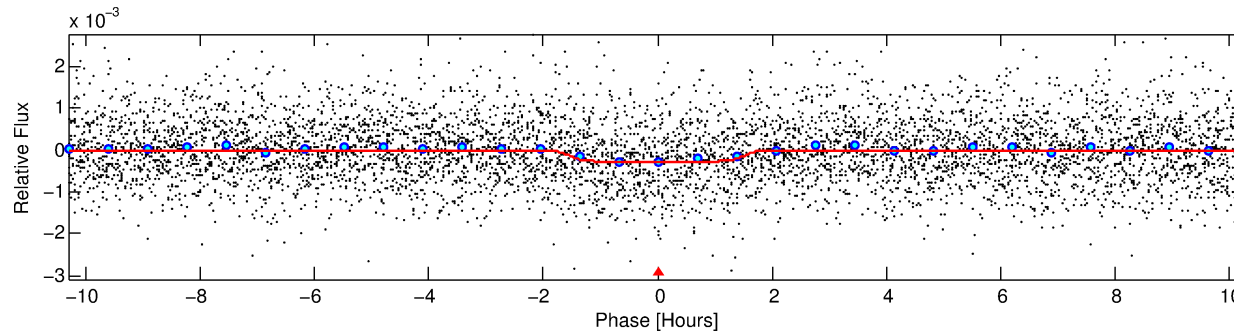
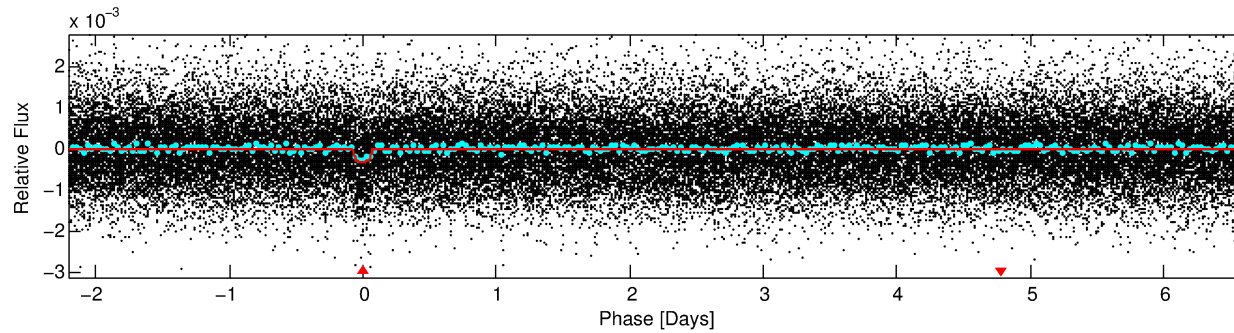
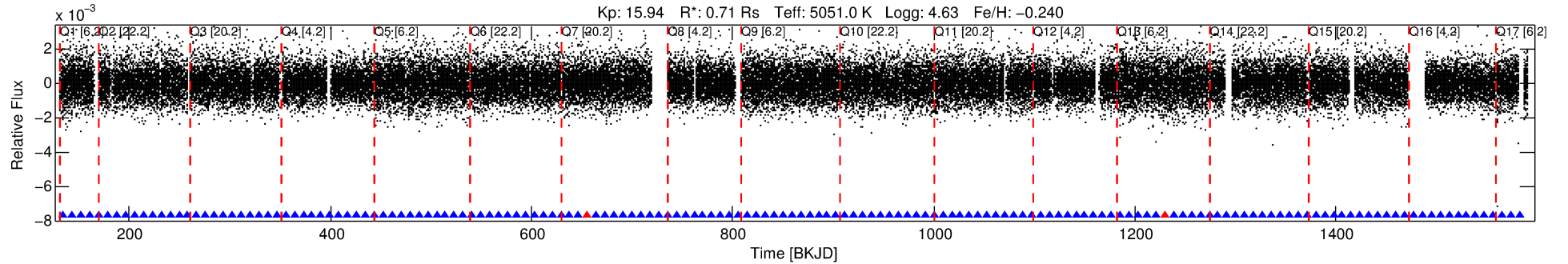
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010120548-01

No Significant Match Found

# DV One-Page Summary

KIC: 10120548 Candidate: 1 of 1 Period: 8.830 d  
KOI: K04451.01 Corr: 0.937



## DV Fit Results:

Period = 8.83039 [0.00008] d  
Epoch = 134.7968 [0.0068] BKJD  
Rp/R\* = 0.0189 [0.0139]  
a/R\* = 10.75 [30.56]  
b = 0.86 [0.89]  
Seff = 49.39 [8.90]  
Teq = 676 [30] K  
Rp = 1.45 [1.08] Re  
a = 0.0767 [0.0075] AU  
Ag = 91.22 [140.06] [0.64 $\sigma$ ]  
Teffp = 3230 [1239] K [2.06 $\sigma$ ]

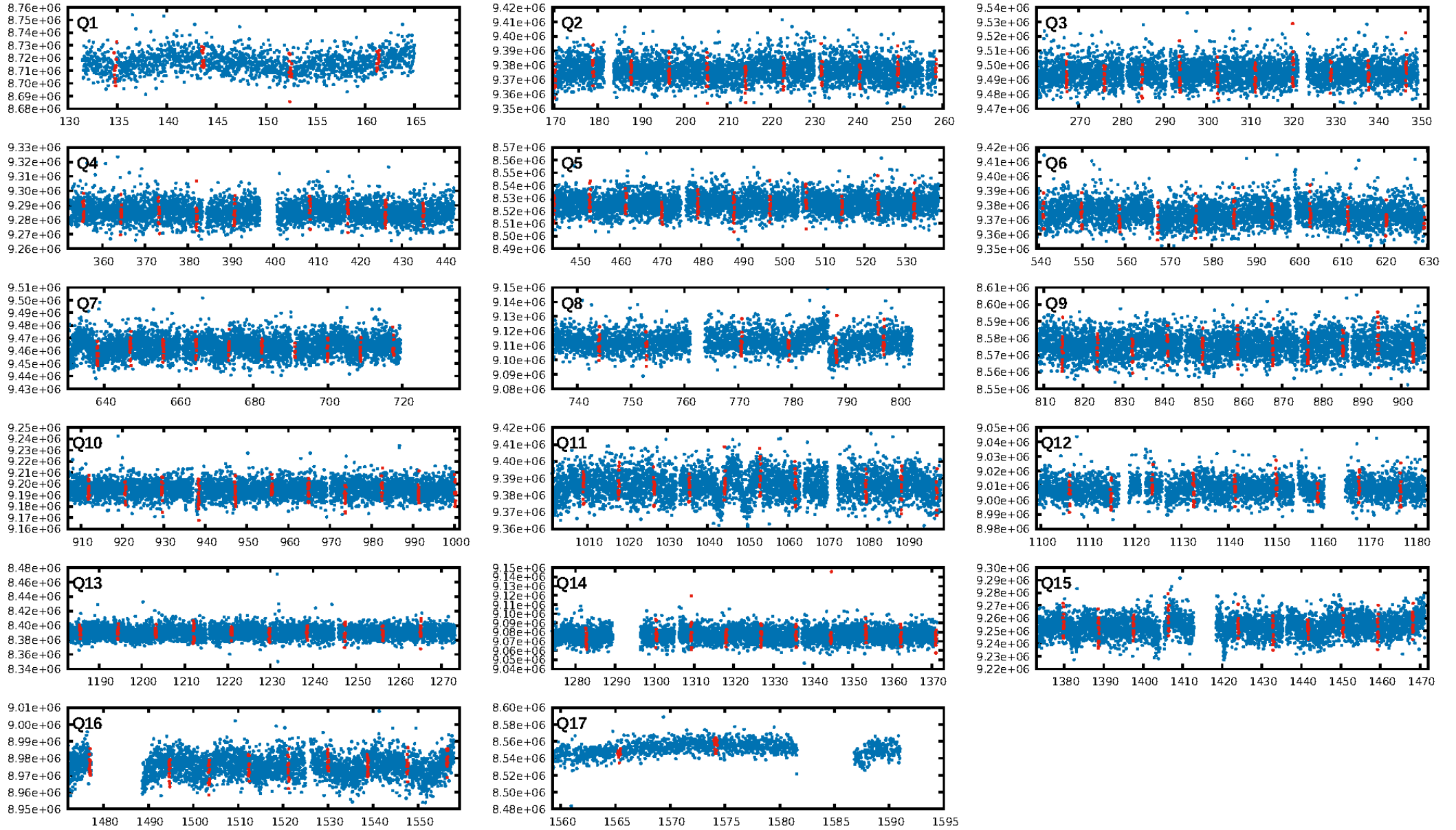
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.22e-24  
RollingBand-fgt: 0.99 [145/147]  
GhostDiagnostic-chr: 1.597  
Centroid-sig: 23.3%  
Centroid-so: 1.309 arcsec [1.02 $\sigma$ ]  
OotOffset-rm: 1.078 arcsec [1.24 $\sigma$ ]  
KicOffset-rm: 1.333 arcsec [1.48 $\sigma$ ]  
OotOffset-st: 3/3/3/5 [14]  
KicOffset-st: 3/3/3/5 [14]  
DiffImageQuality-fgm: 0.29 [4/14]  
DiffImageOverlap-fno: 1.00 [17/17]

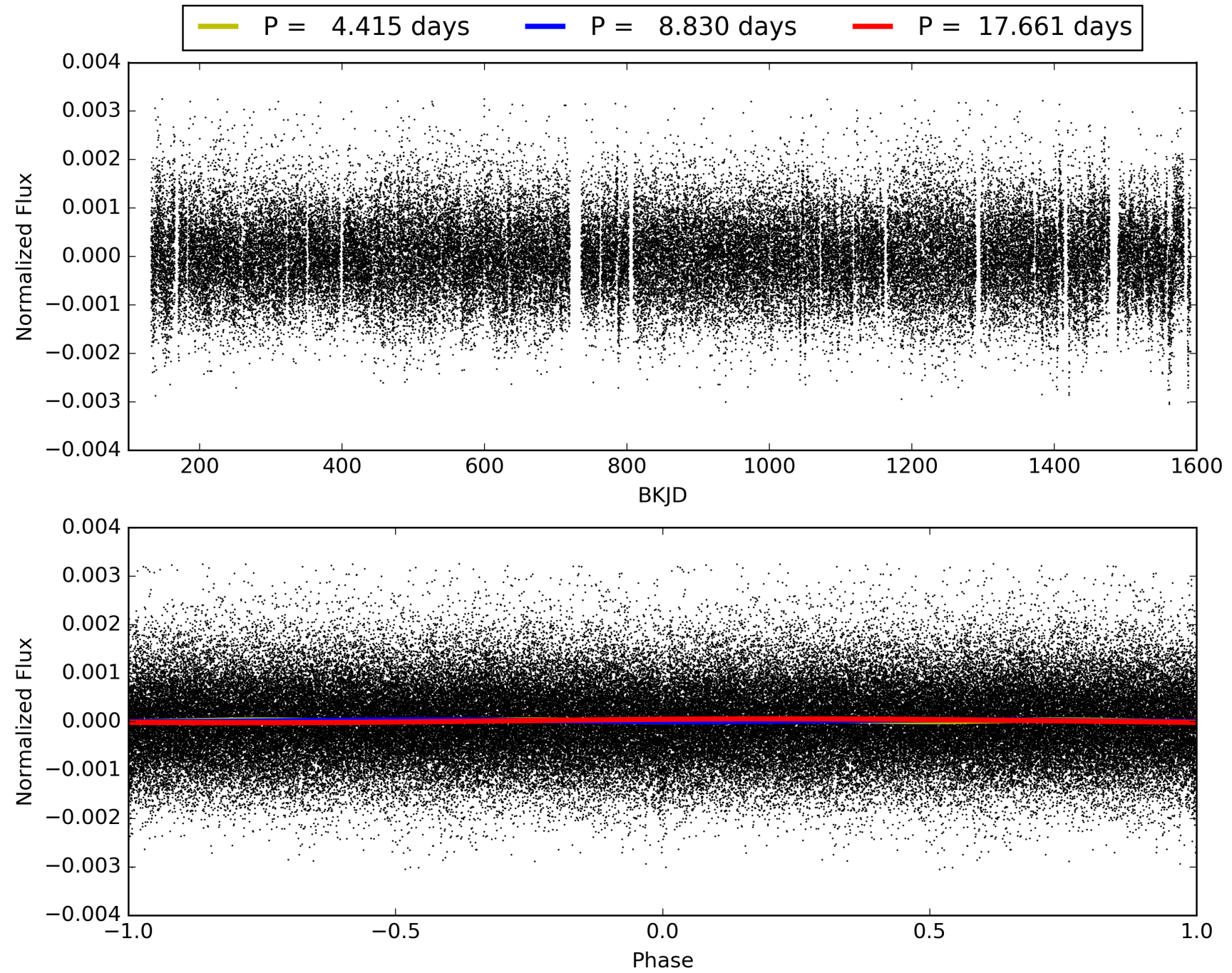
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:52:08 Z

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

# TCE 010120548-01, PDC Light Curves

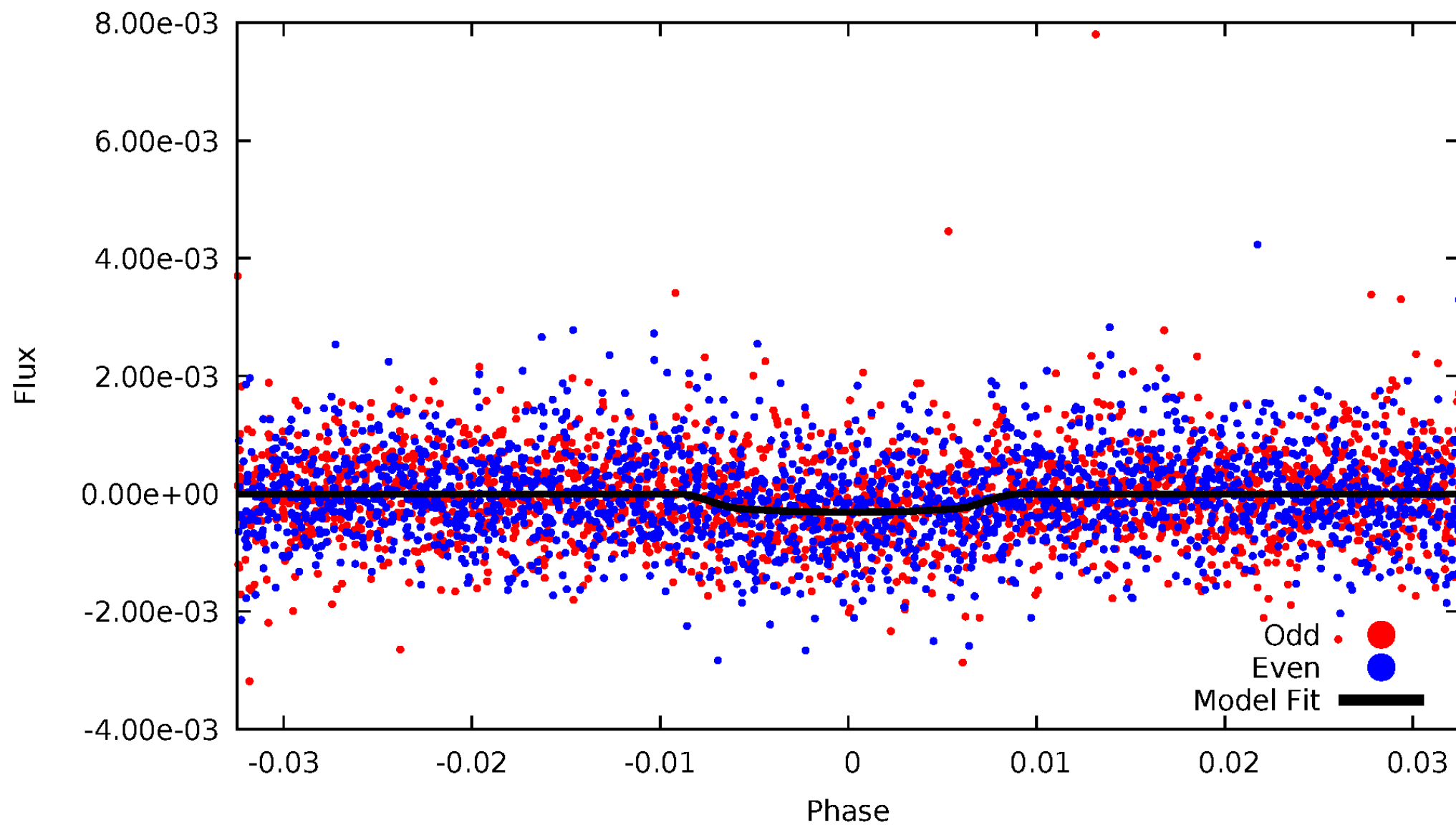


TCE 010120548-01



# DV Odd/Even

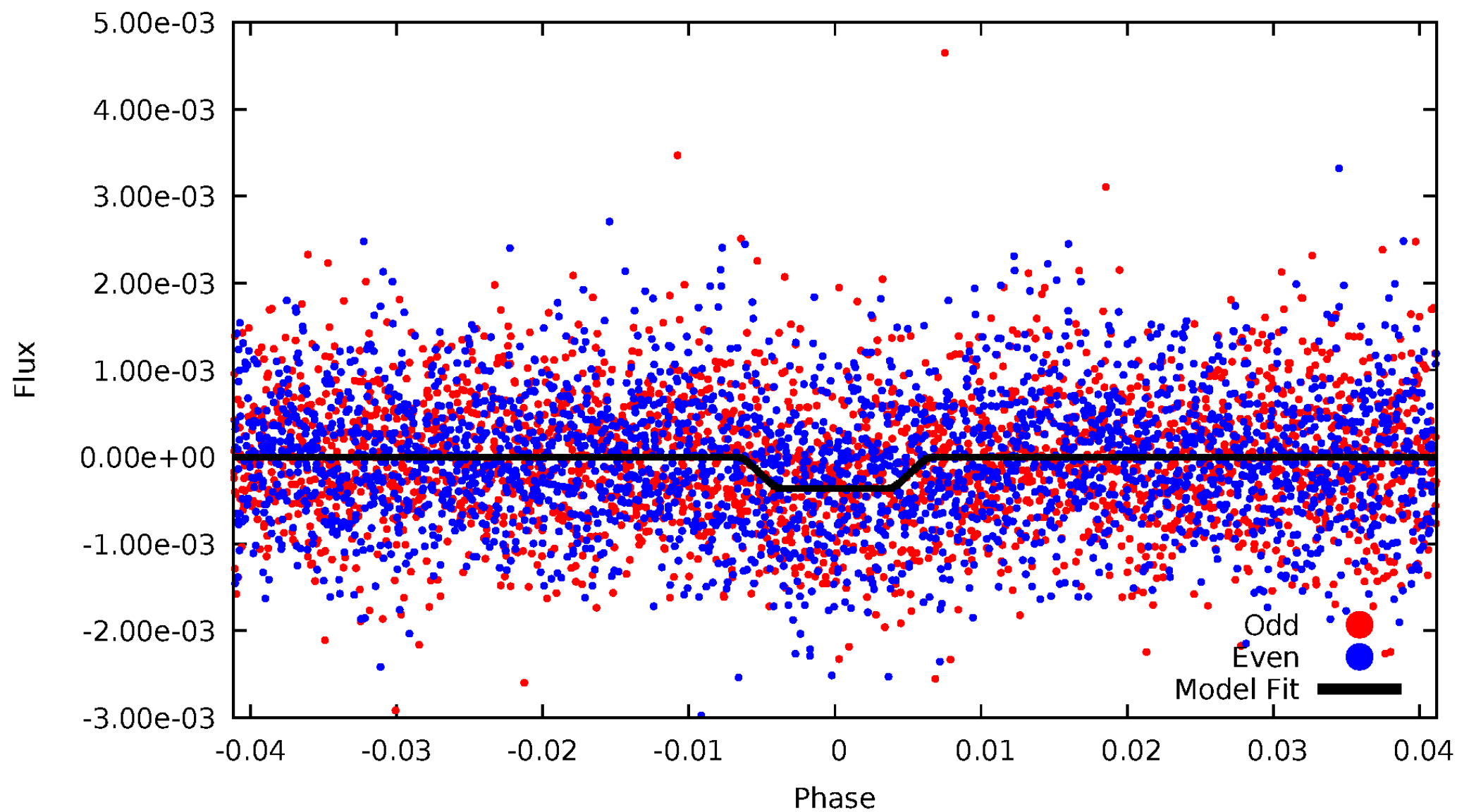
TCE 010120548-01





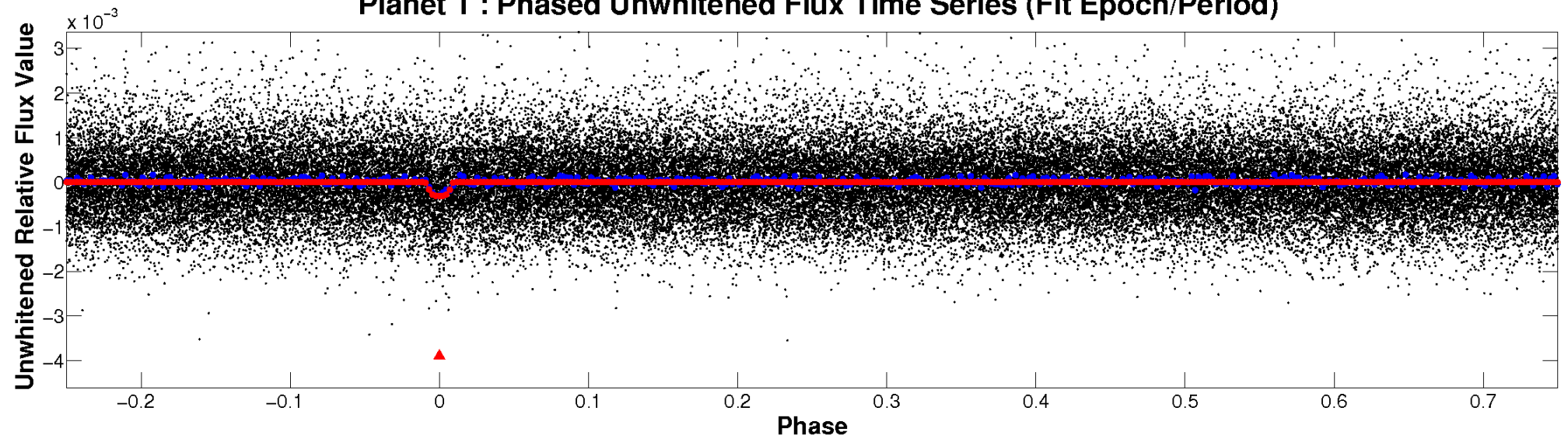
# ALT Odd/Even

TCE 010120548-01

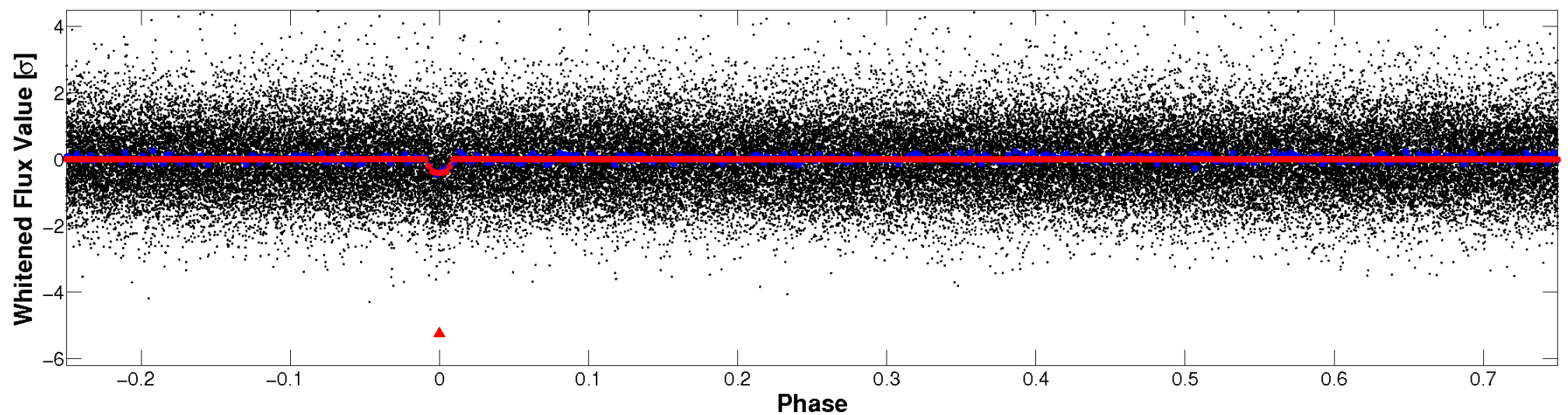


# Non-Whitened Vs. Whitened Light Curve

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

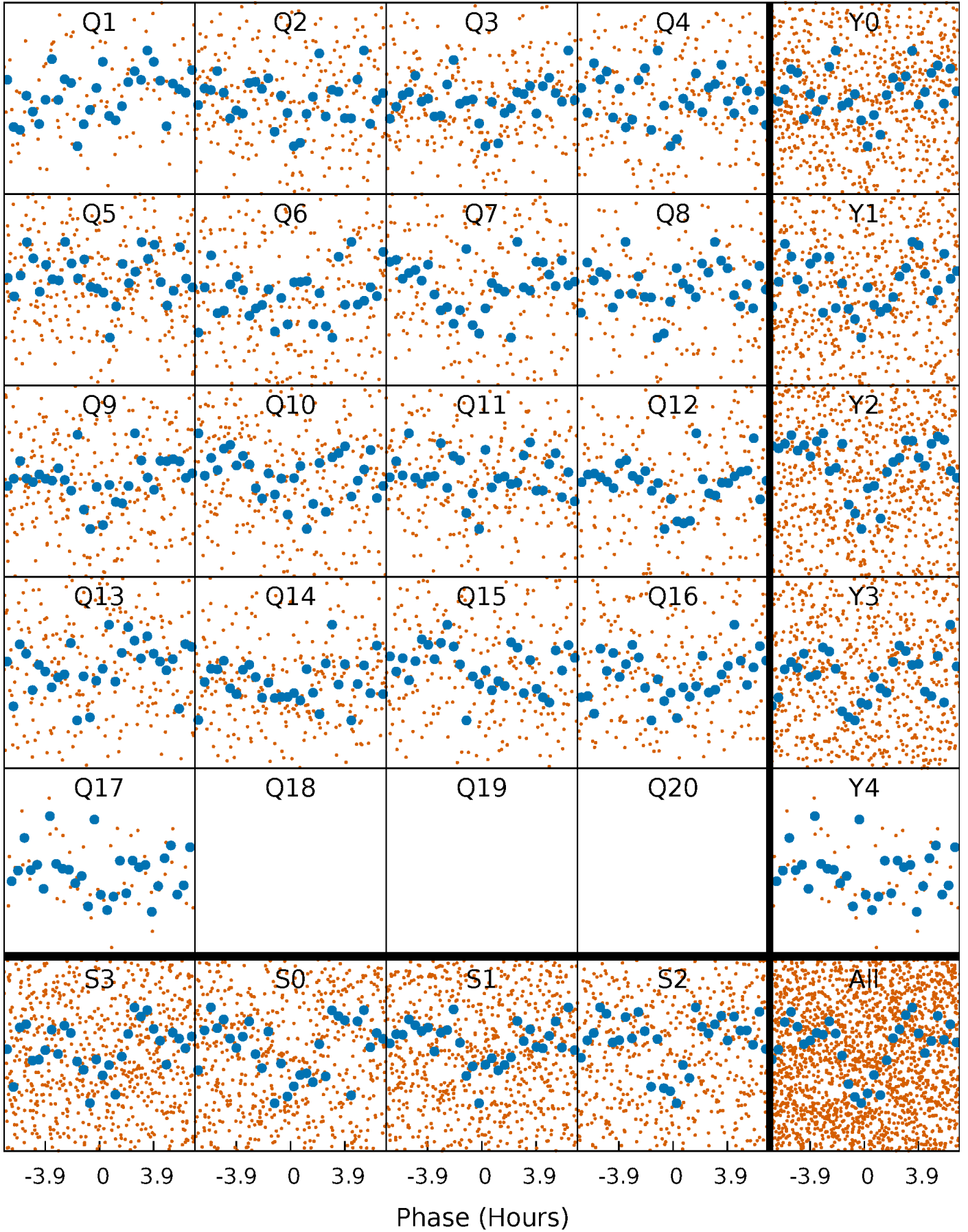


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

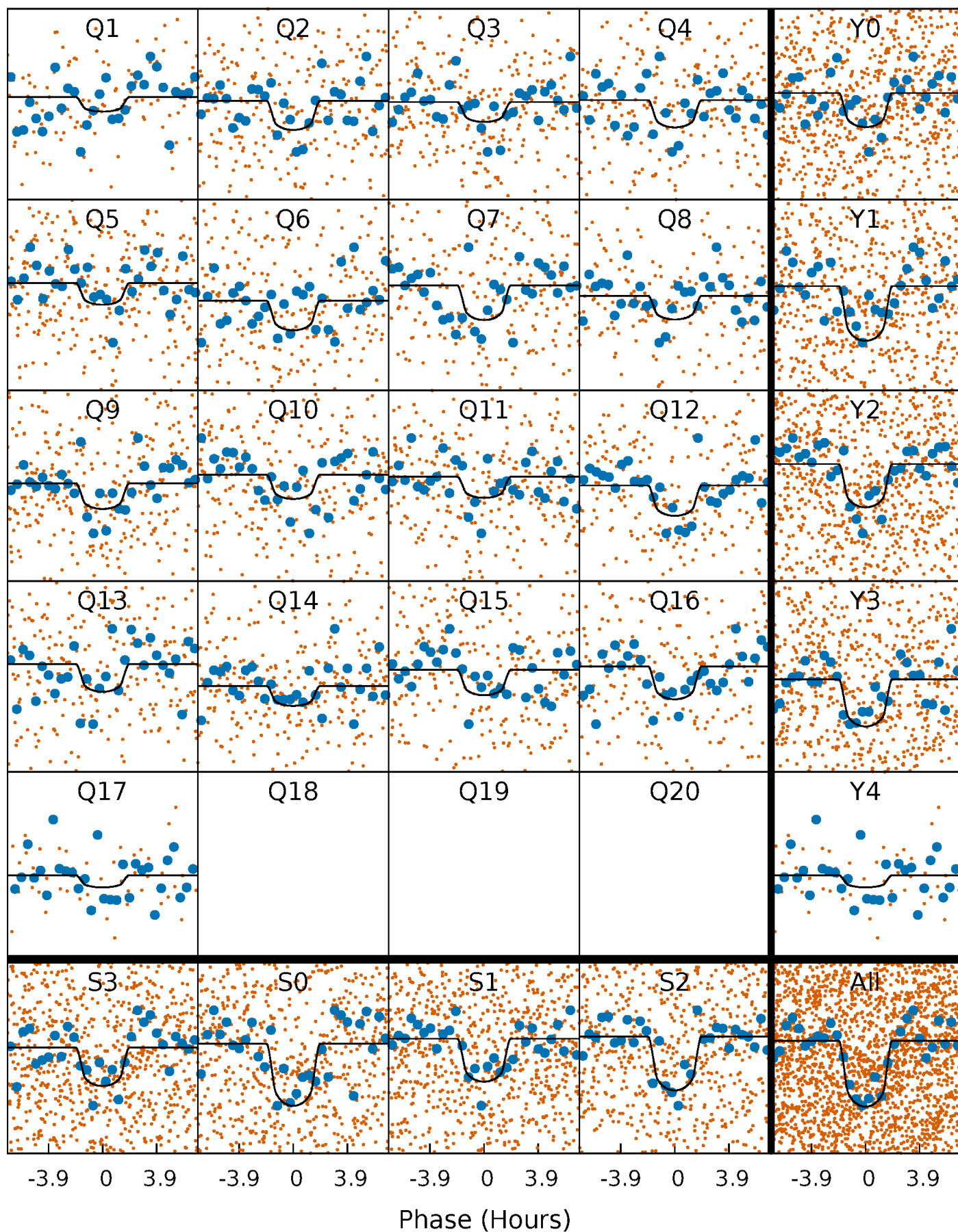
TCE 010120548-01   P= 8.830393 Days    $T_0=134.796792$  (BKJD)





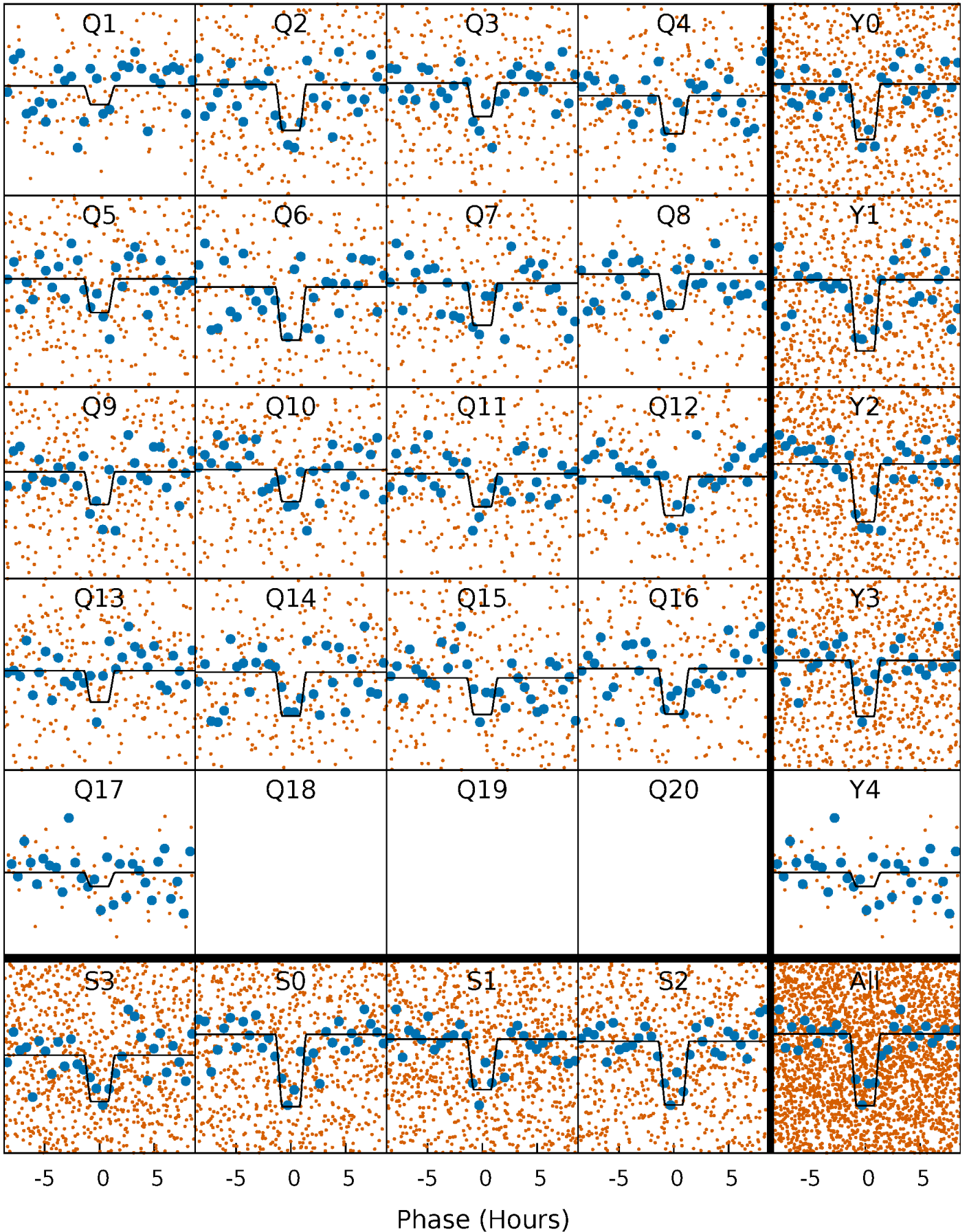
# DV Quarter-Phased Transit Curves

TCE 010120548-01 P= 8.830393 Days  $T_0=134.796792$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

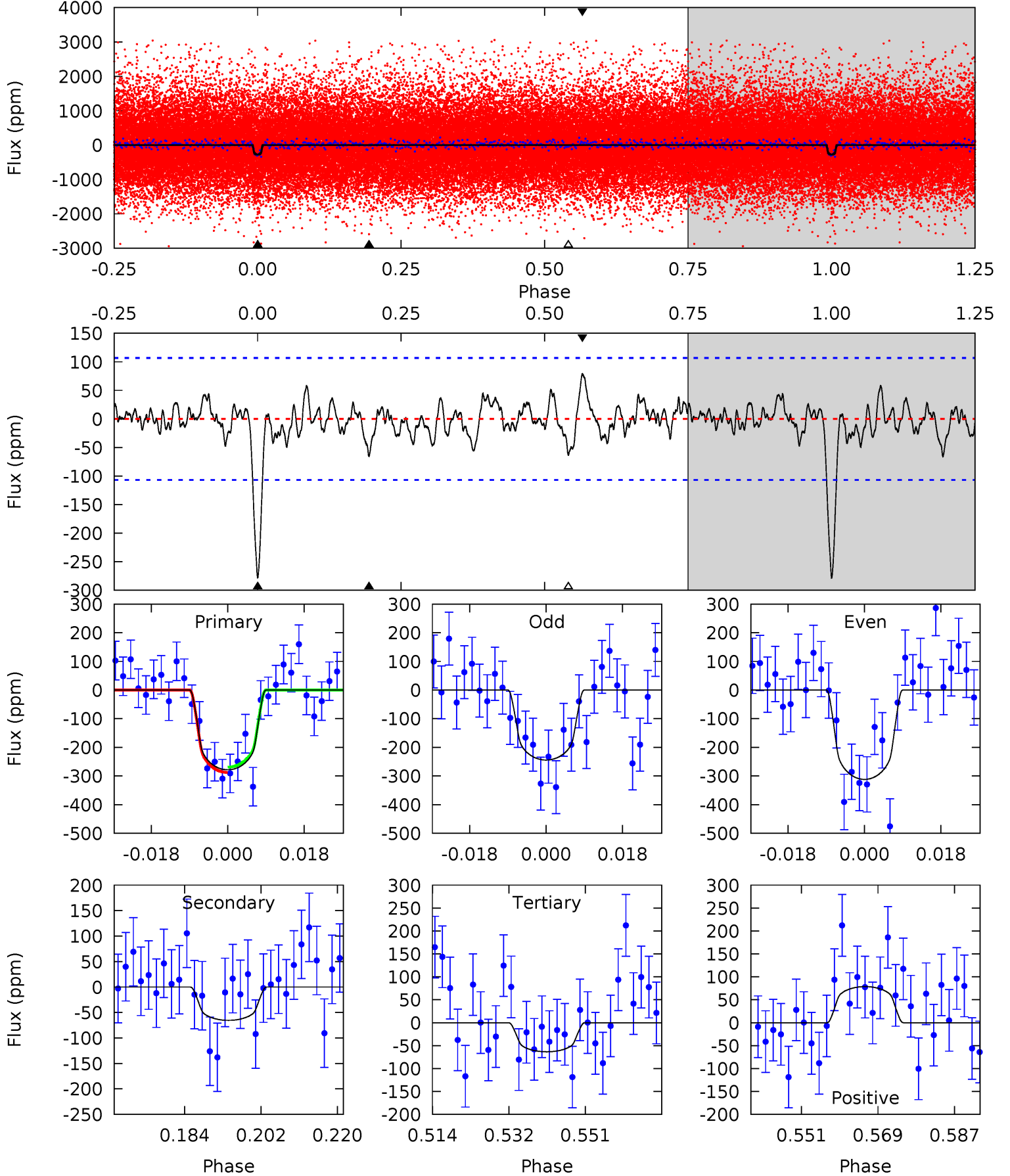
TCE 010120548-01   P= 8.830094 Days    $T_0=134.816961$  (BKJD)



# DV Model-Shift Uniqueness Test

010120548-01, P = 8.830393 Days, E = 125.966399 Days

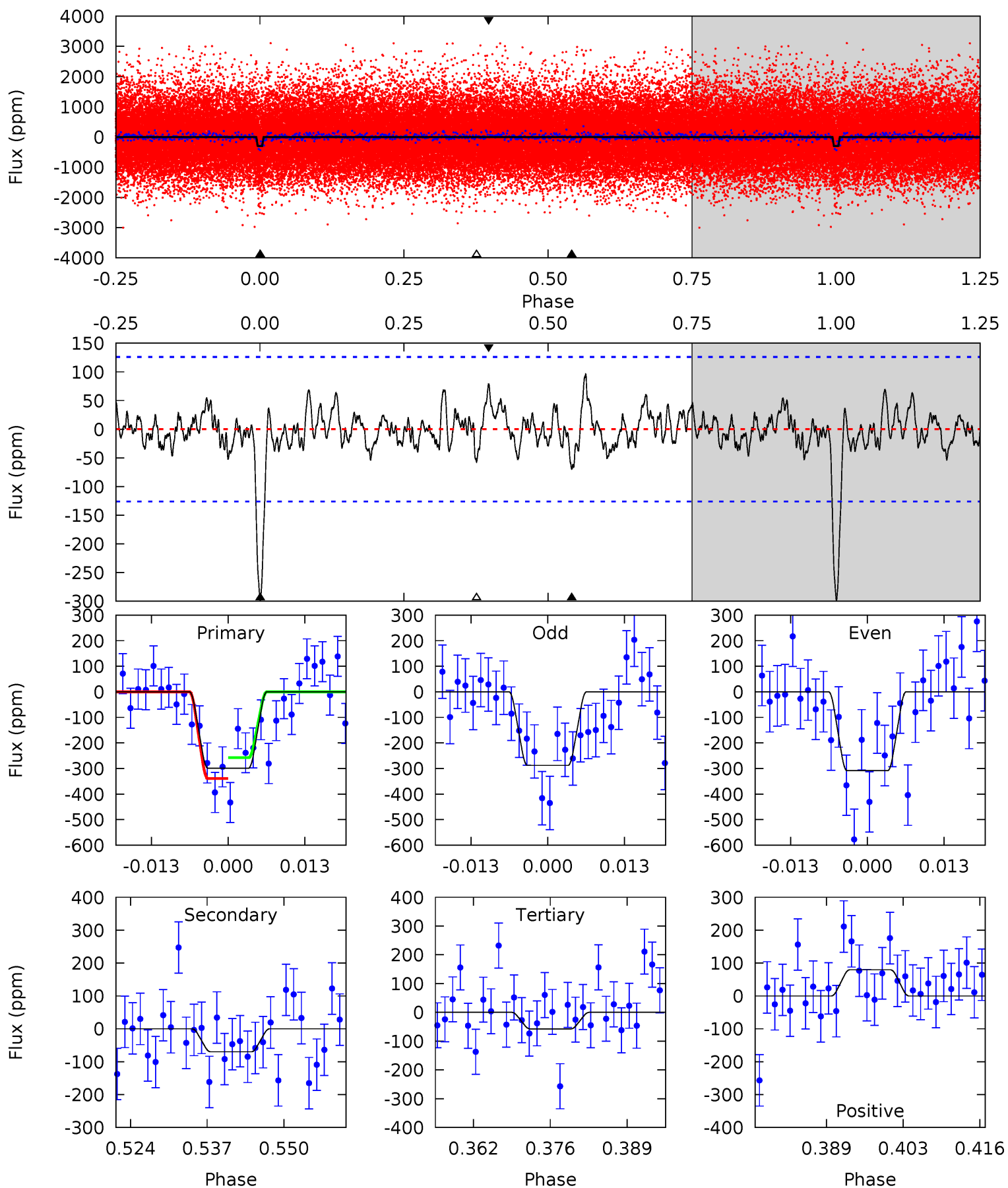
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	3.01	2.92	3.62	4.91	2.36	1.06	9.88	9.18	0.09	-0.61	1.55	1.09	0.22	0.43



# Alt Model-Shift Uniqueness Test

010120548-01, P = 8.830094 Days, E = 125.986867 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
11.8	2.76	2.26	3.14	4.97	2.47	1.03	9.51	8.64	0.50	-0.38	0.41	0.88	0.24	1.60



### Stellar Parameters For KIC 010120548

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5051^{+151}_{-136}$	$4.628^{+0.035}_{-0.070}$	$-0.240^{+0.300}_{-0.300}$	$0.706^{+0.086}_{-0.058}$	$0.786^{+0.063}_{-0.095}$	$3.145^{+0.519}_{-0.777}$
	+3%/-3%	+1%/-2%	+125%/-125%	+12%/-8%	+8%/-12%	+17%/-25%
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 010120548-01 / KOI 4451.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-65 \pm 22$	$1.63^{+0.98}_{-0.97}$	$952^{+35}_{-32}$	$3573^{+1340}_{-549}$	$78^{+400}_{-51}$
Alt.	$-70 \pm 25$	$1.61^{+1.05}_{-0.89}$	$953^{+37}_{-33}$	$3575^{+1207}_{-528}$	$81^{+329}_{-53}$

$T_{\text{max}}$  = 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

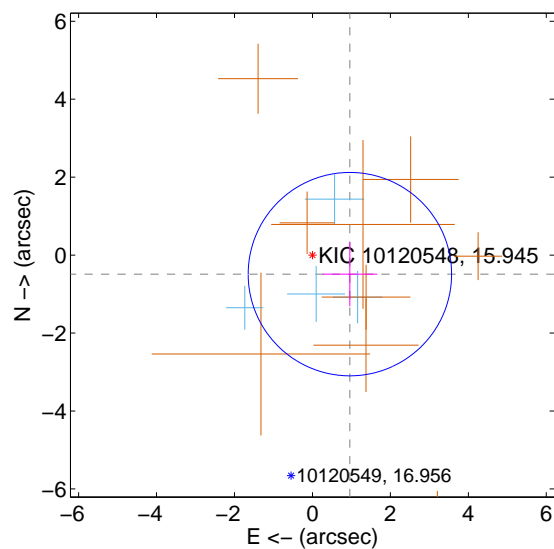
Supplemental centroid analysis for 010120548-01. Kepler magnitude: 15.95. Transit SNR 10.98

There are 4 quarters with good PRF difference image offsets

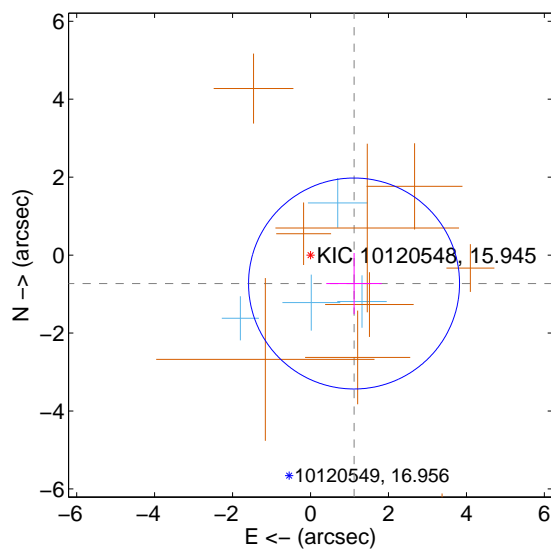
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.078 \pm 0.870$	1.24	$-0.960 \pm 0.704$	$-0.489 \pm 0.822$
PRF-fit source offset from KIC position	$1.333 \pm 0.902$	1.48	$-1.117 \pm 0.711$	$-0.729 \pm 0.785$
photometric centroid source offset	$1.31 \pm 1.29$	1.02	$-1.23 \pm 1.29$	$0.44 \pm 1.25$

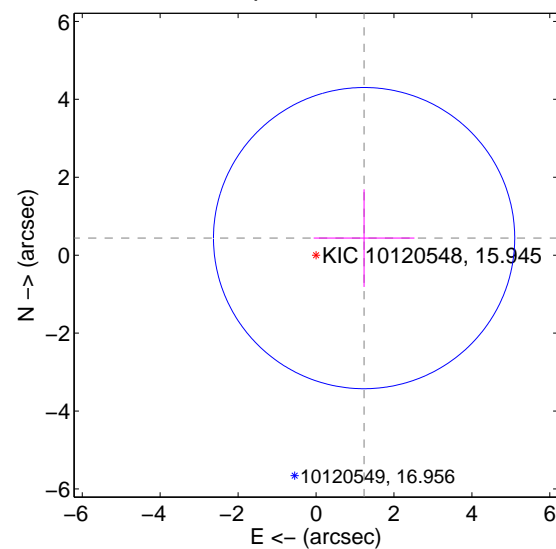
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

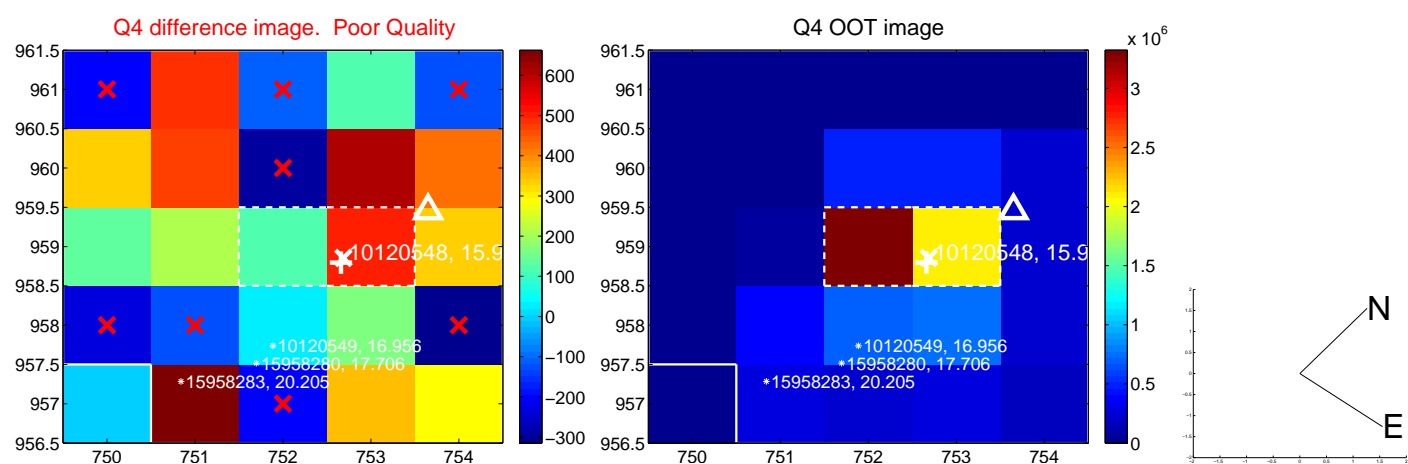
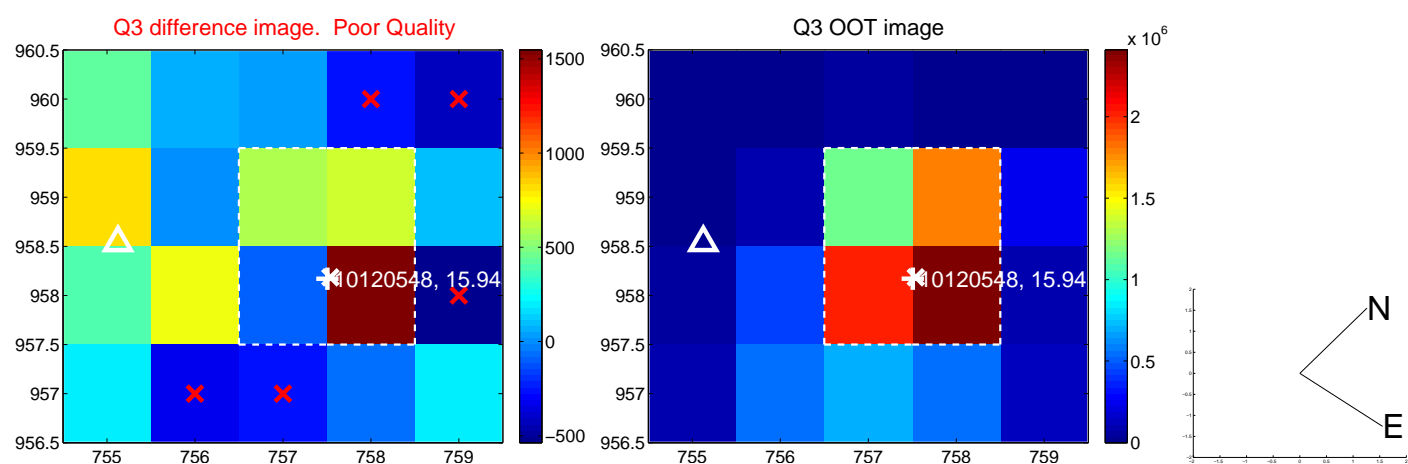
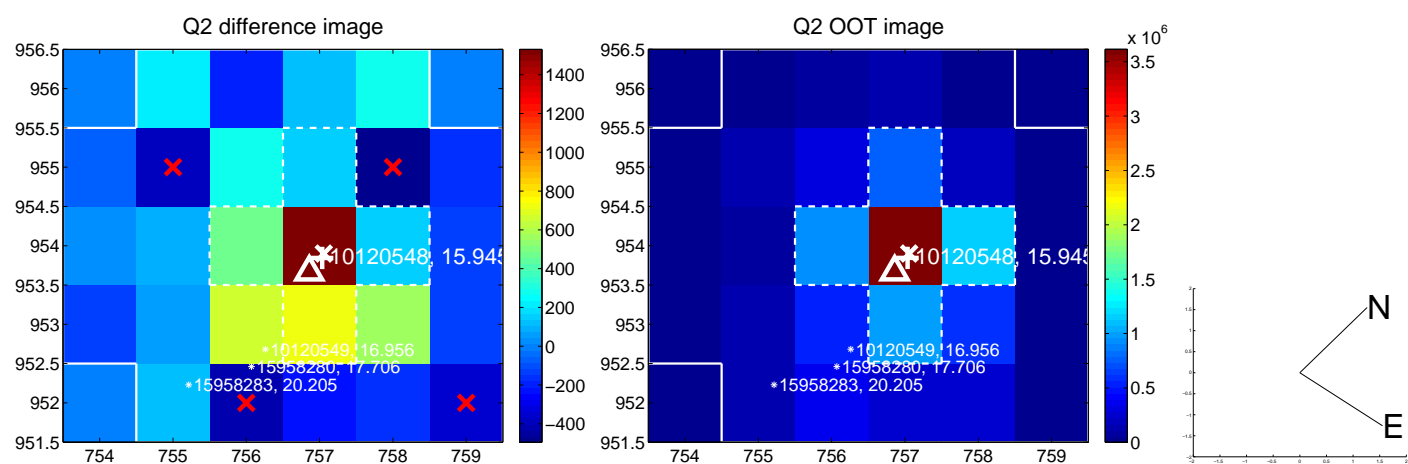
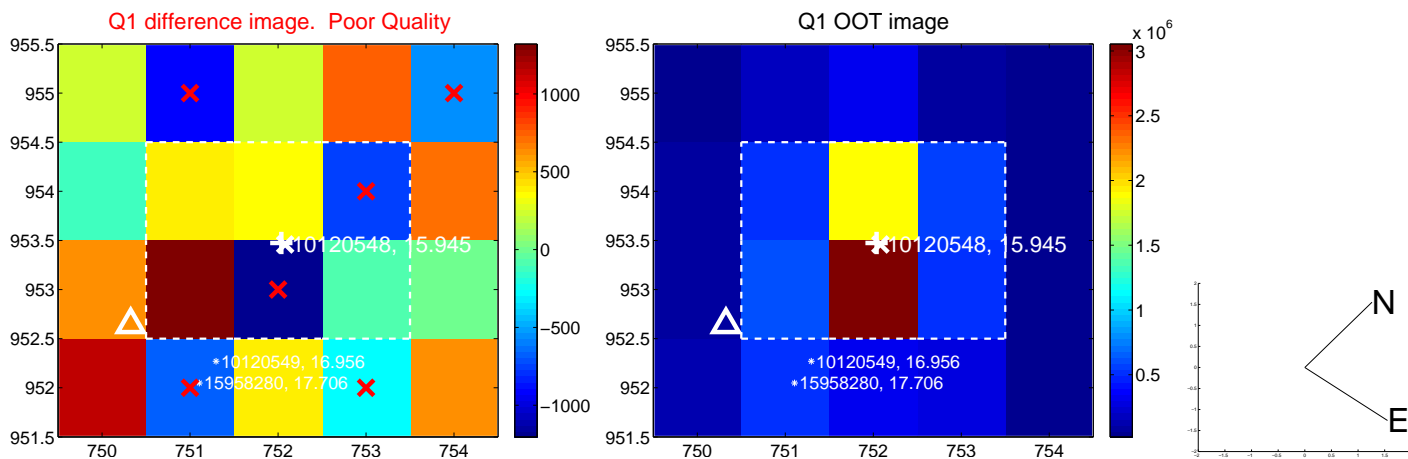


offset from photometric centroids

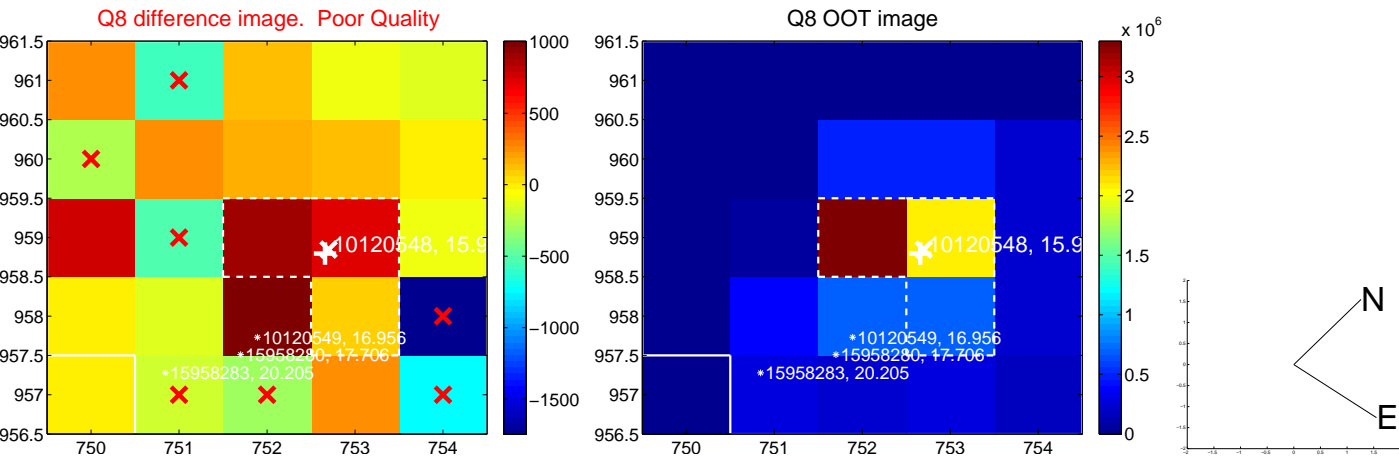
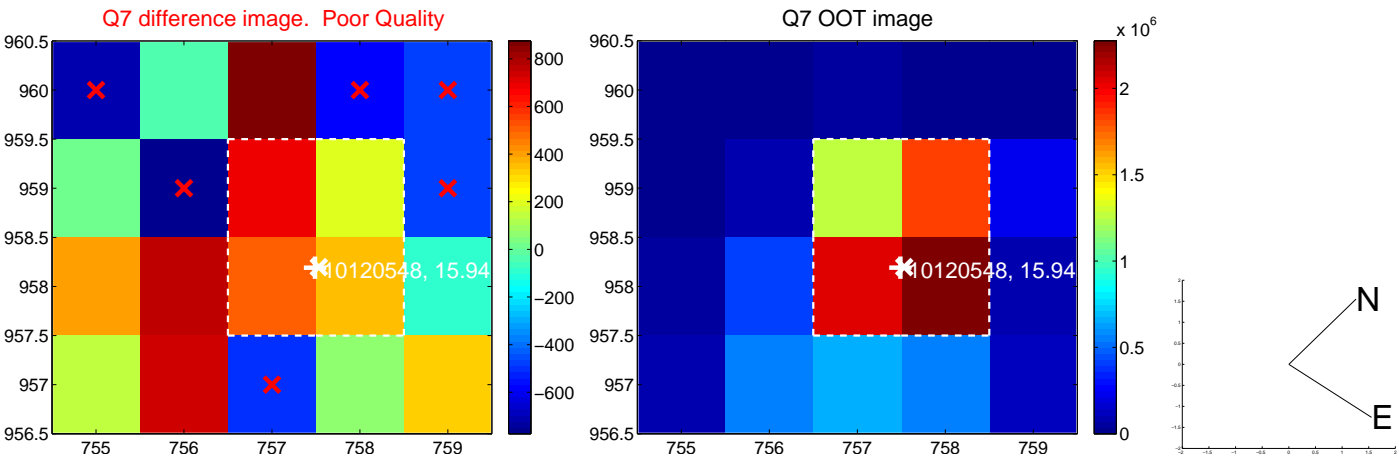
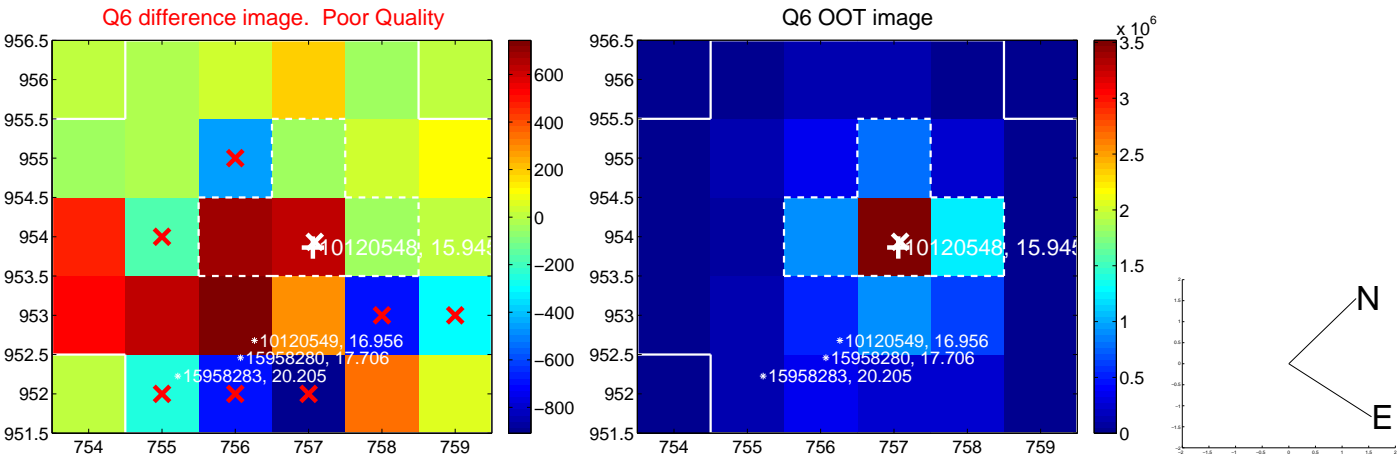
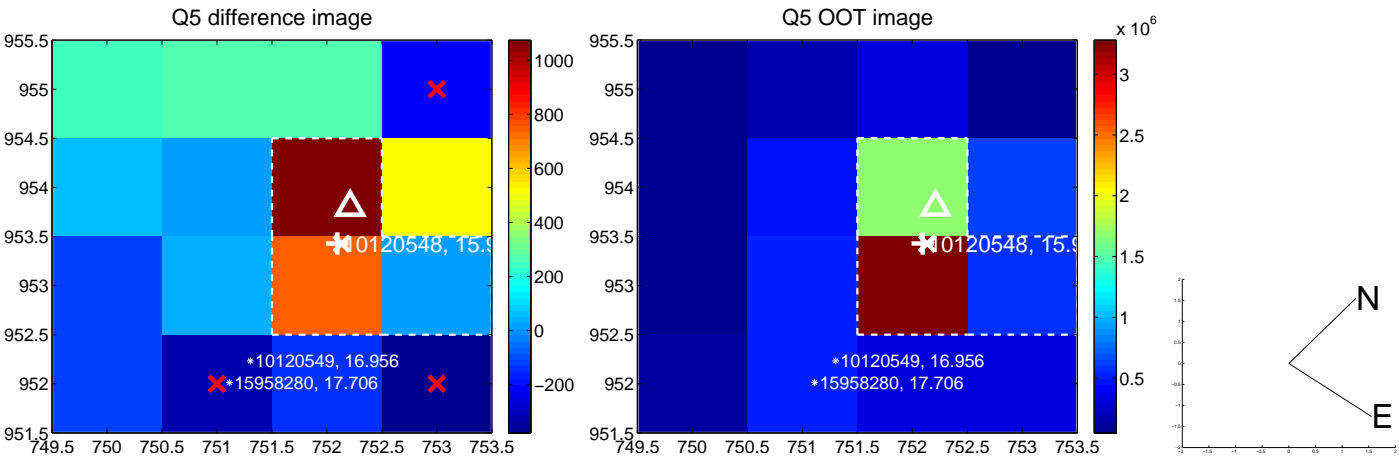


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

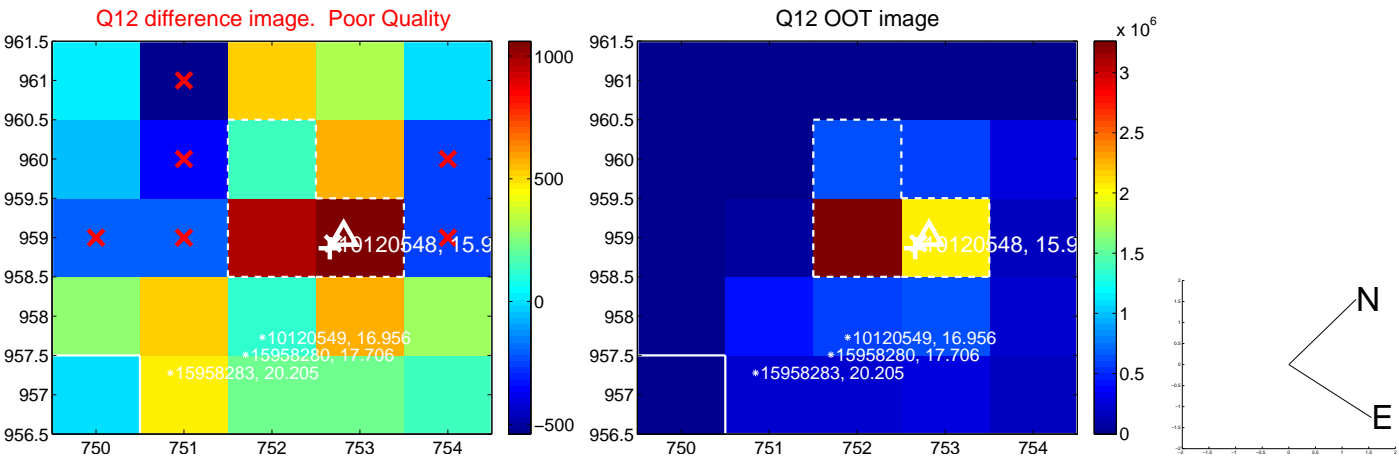
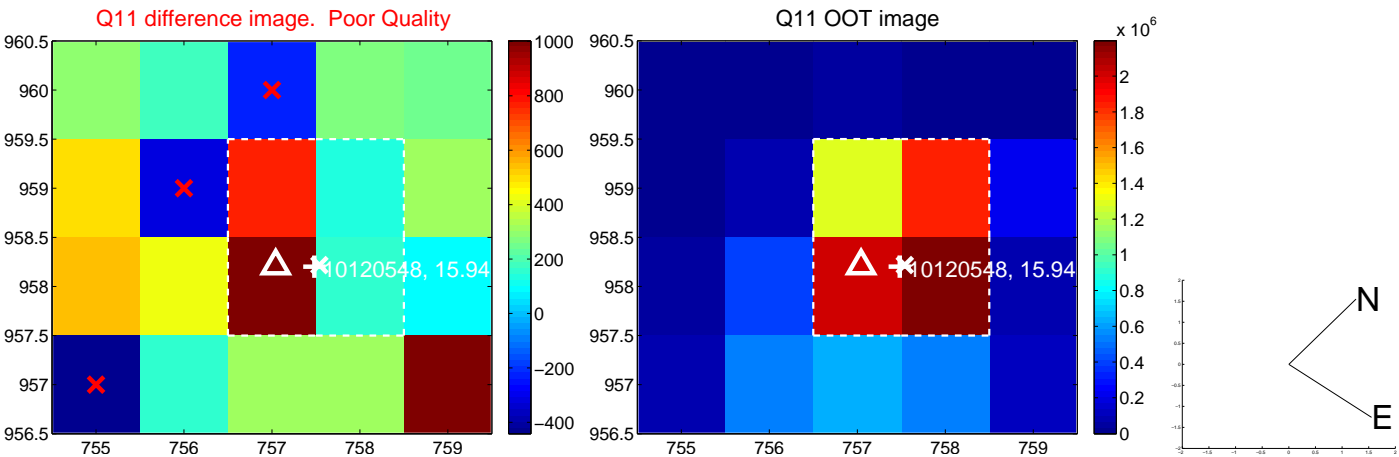
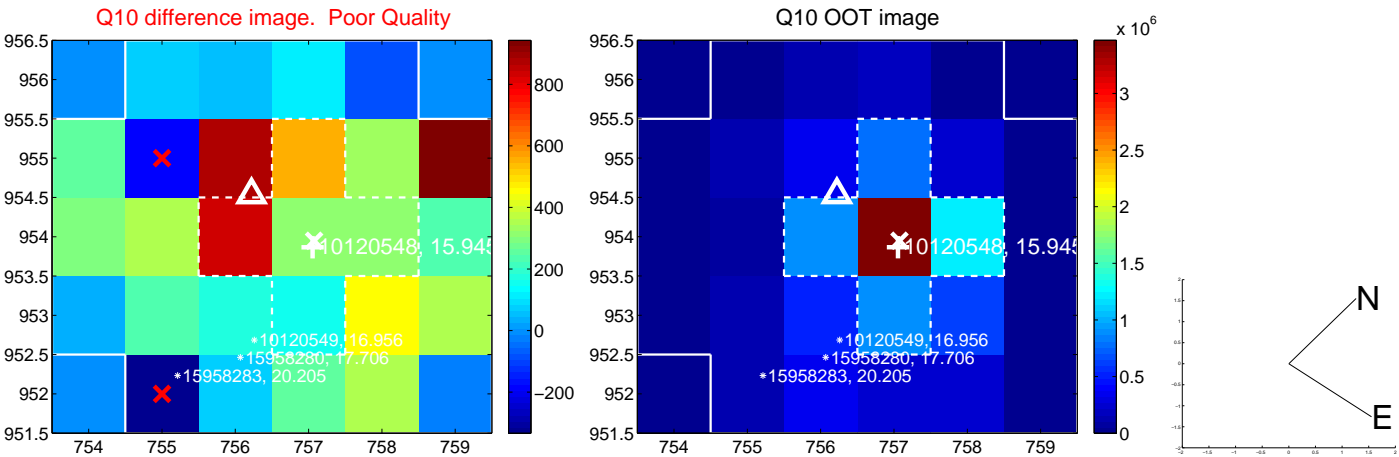
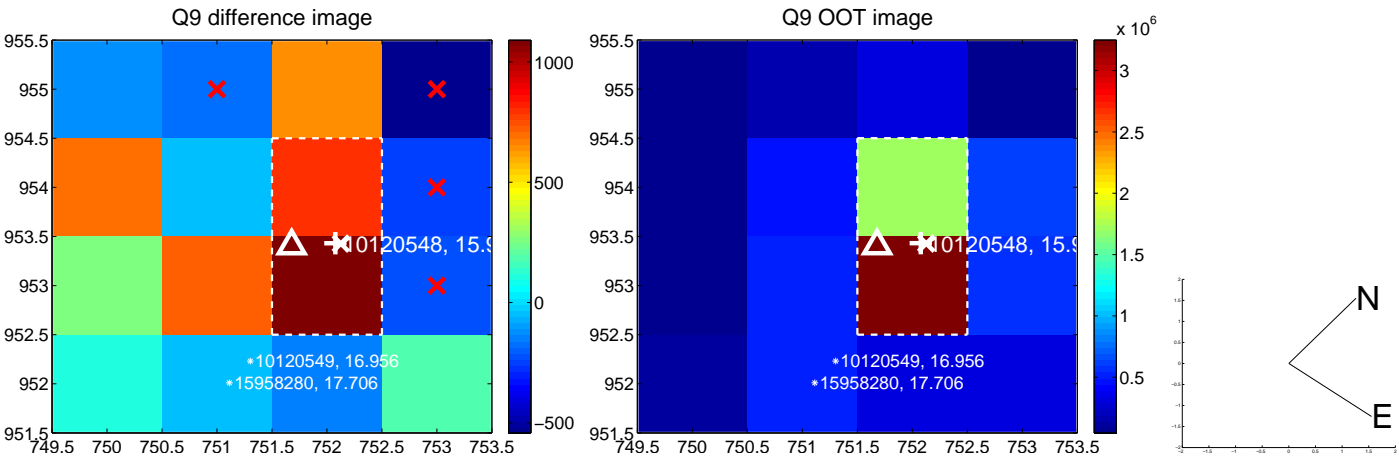
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



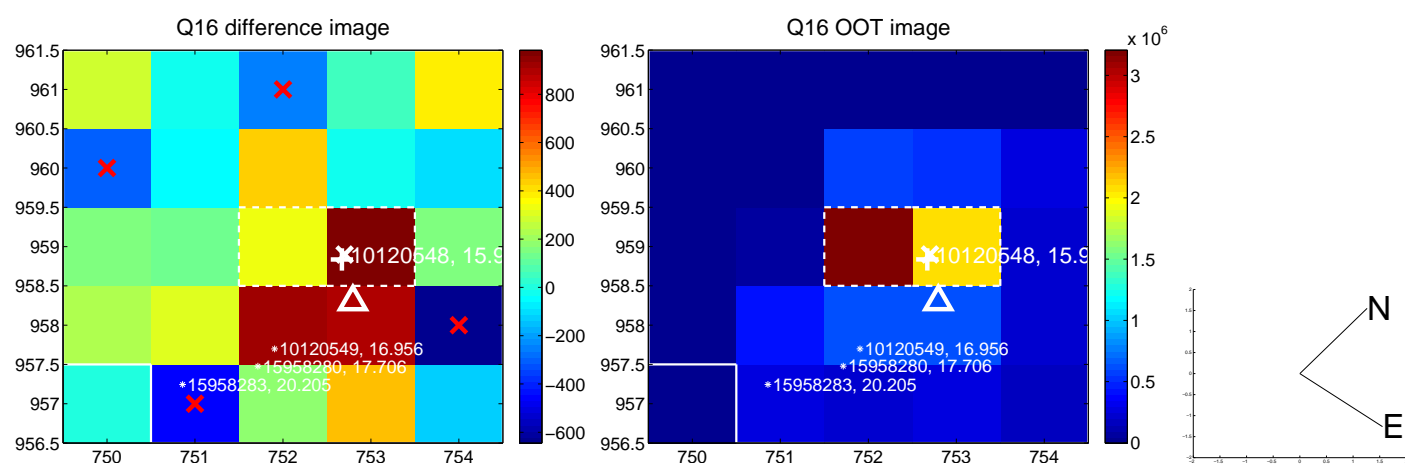
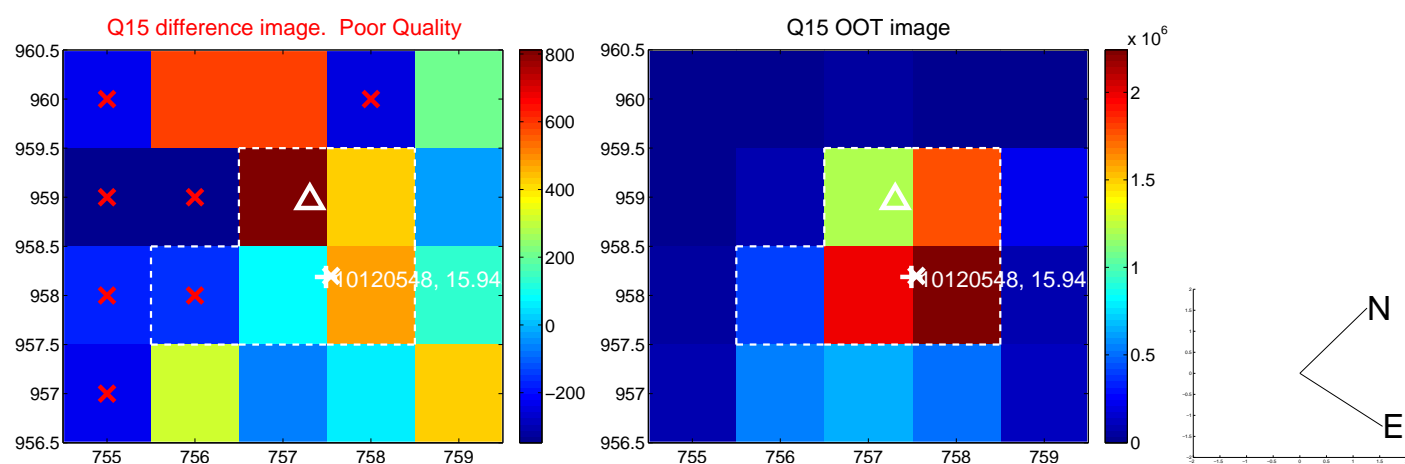
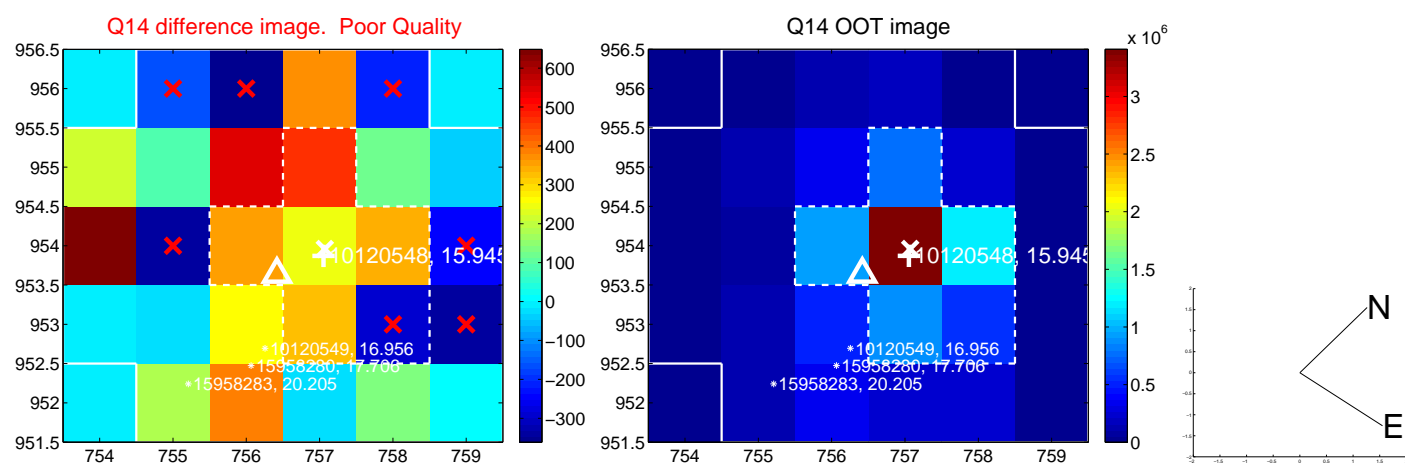
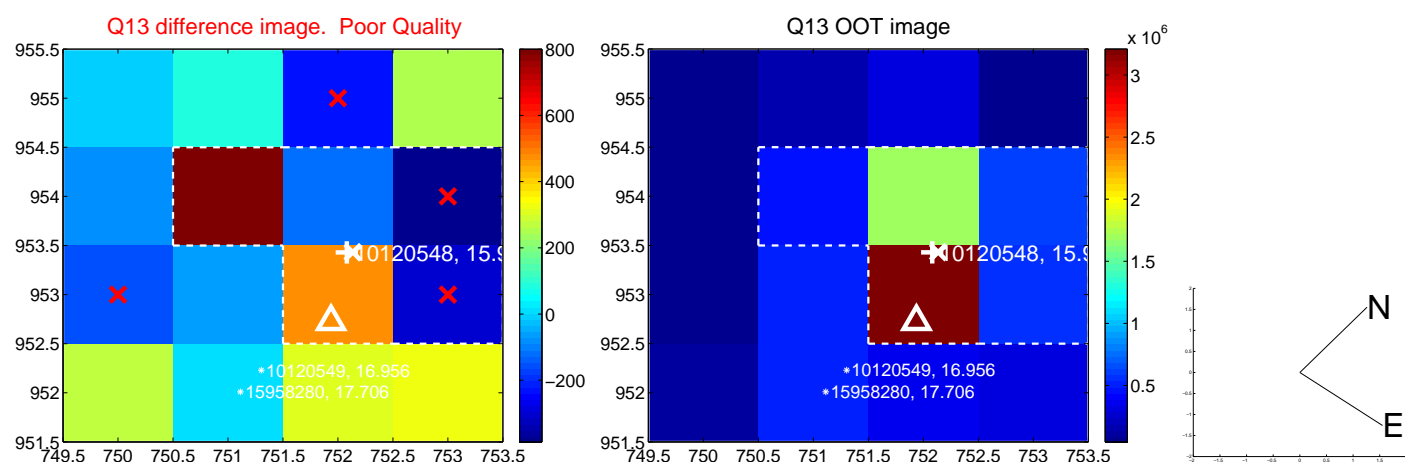
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

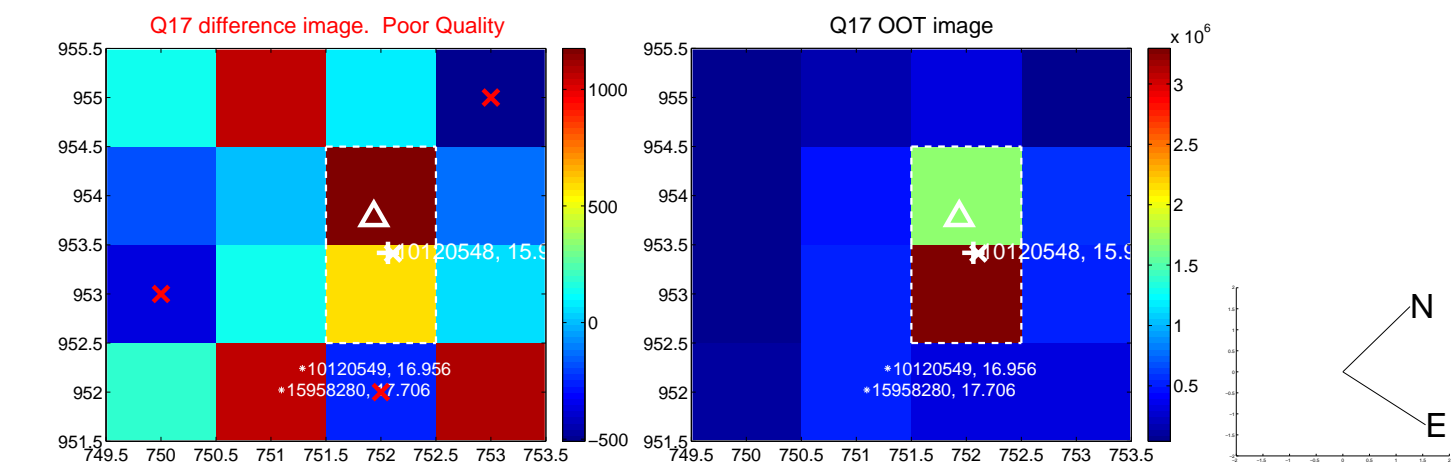


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

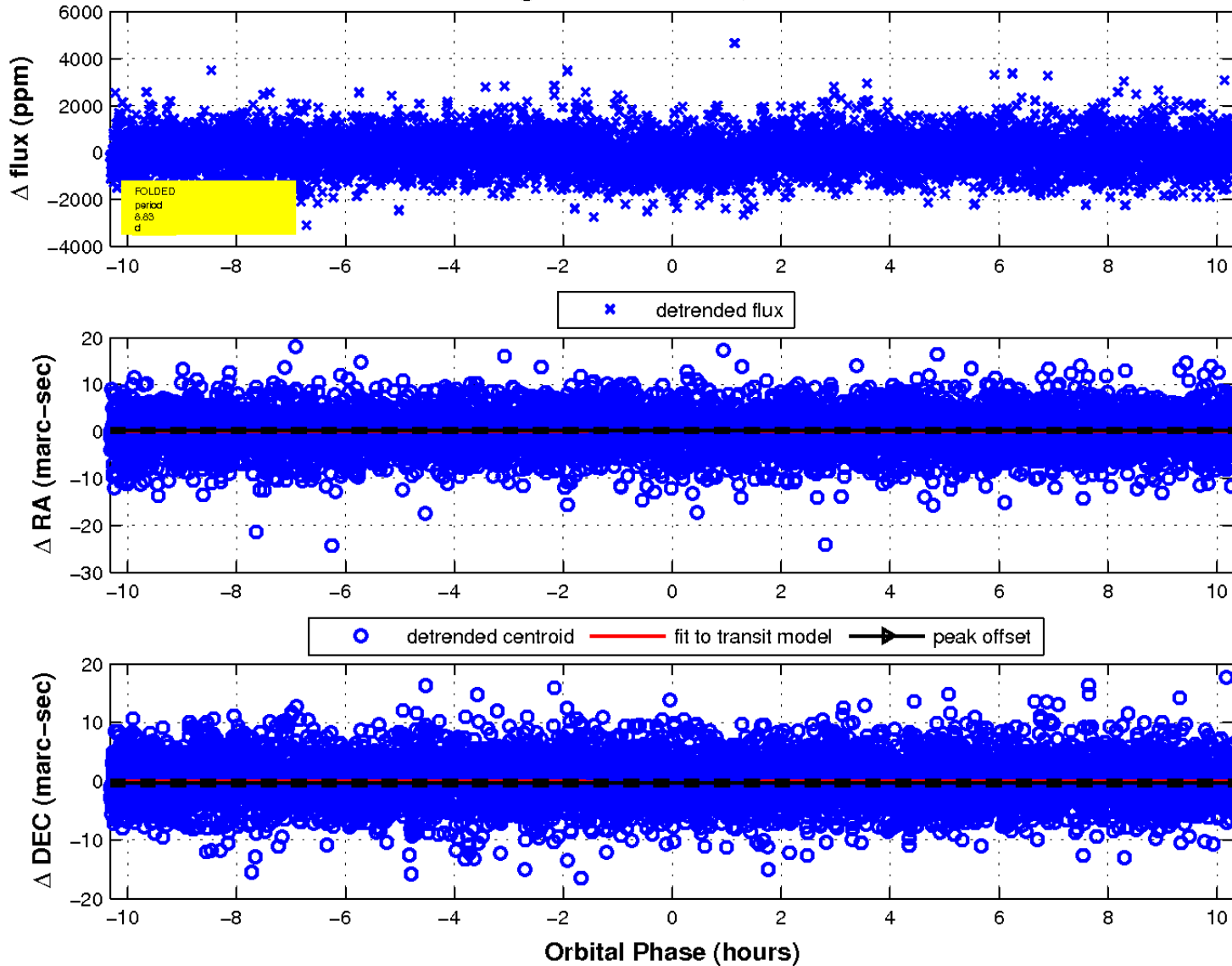




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

