

# KIC 012024018

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012024018-01	OBS	No	2.269772	133.148811	20.8	6.787	9.1	8.7	2.59	6637	1.34	7572.31

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012024018-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

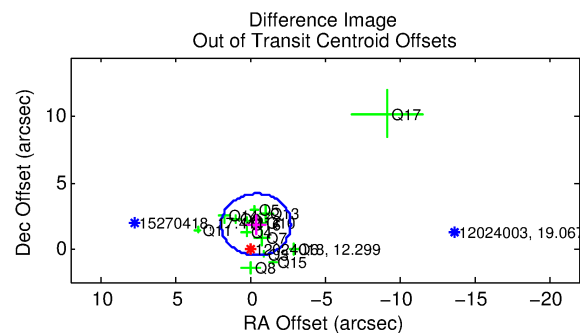
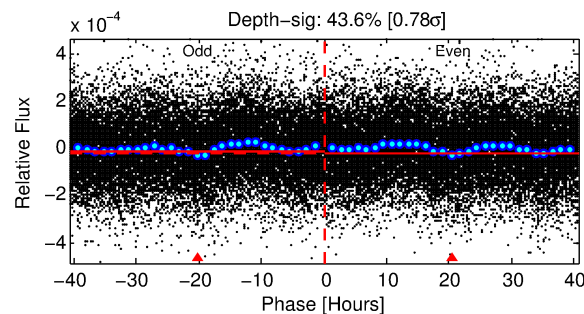
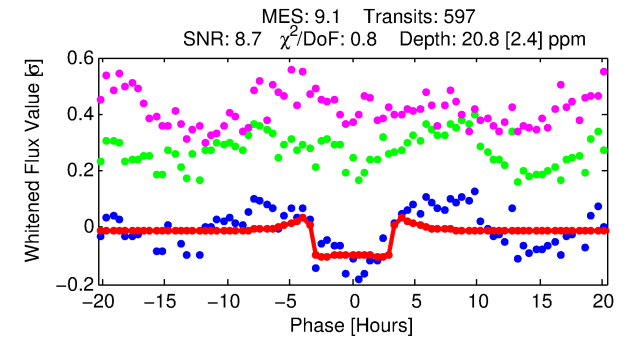
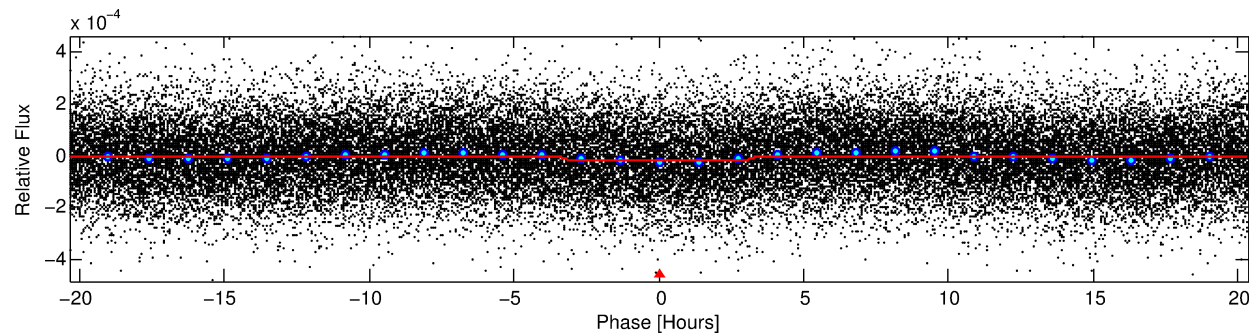
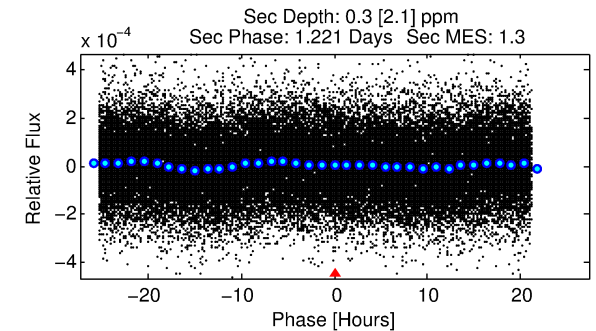
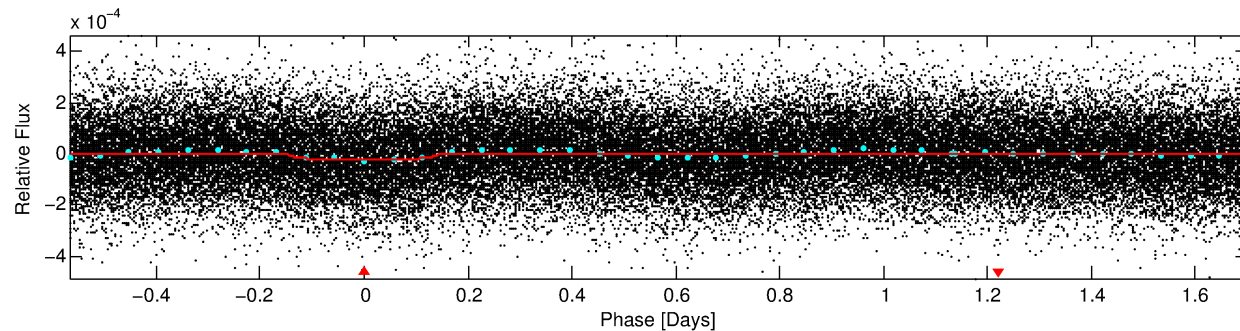
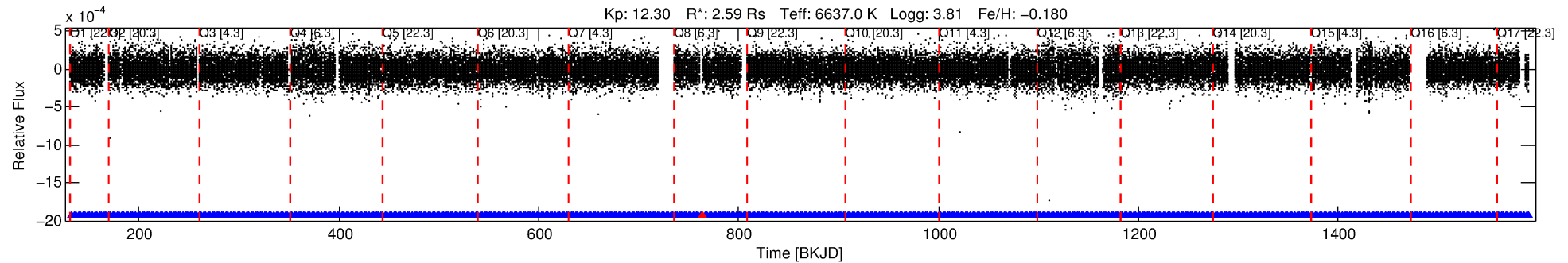
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012024018-01

No Significant Match Found

# DV One-Page Summary

KIC: 12024018 Candidate: 1 of 1 Period: 2.270 d



## DV Fit Results:

Period = 2.26977 [0.00002] d  
Epoch = 133.1488 [0.0049] BKJD  
Rp/R\* = 0.0047 [0.0010]  
a/R\* = 1.63 [1.19]  
b = 0.85 [0.38]  
Seff = 7572.31 [3899.48]  
Teq = 2379 [306] K  
Rp = 1.34 [0.54] Re  
a = 0.0393 [0.0126] AU  
Ag = 0.12 [1.01] [-0.88σ]  
Teffp = 2158 [4576] K [-0.05σ]

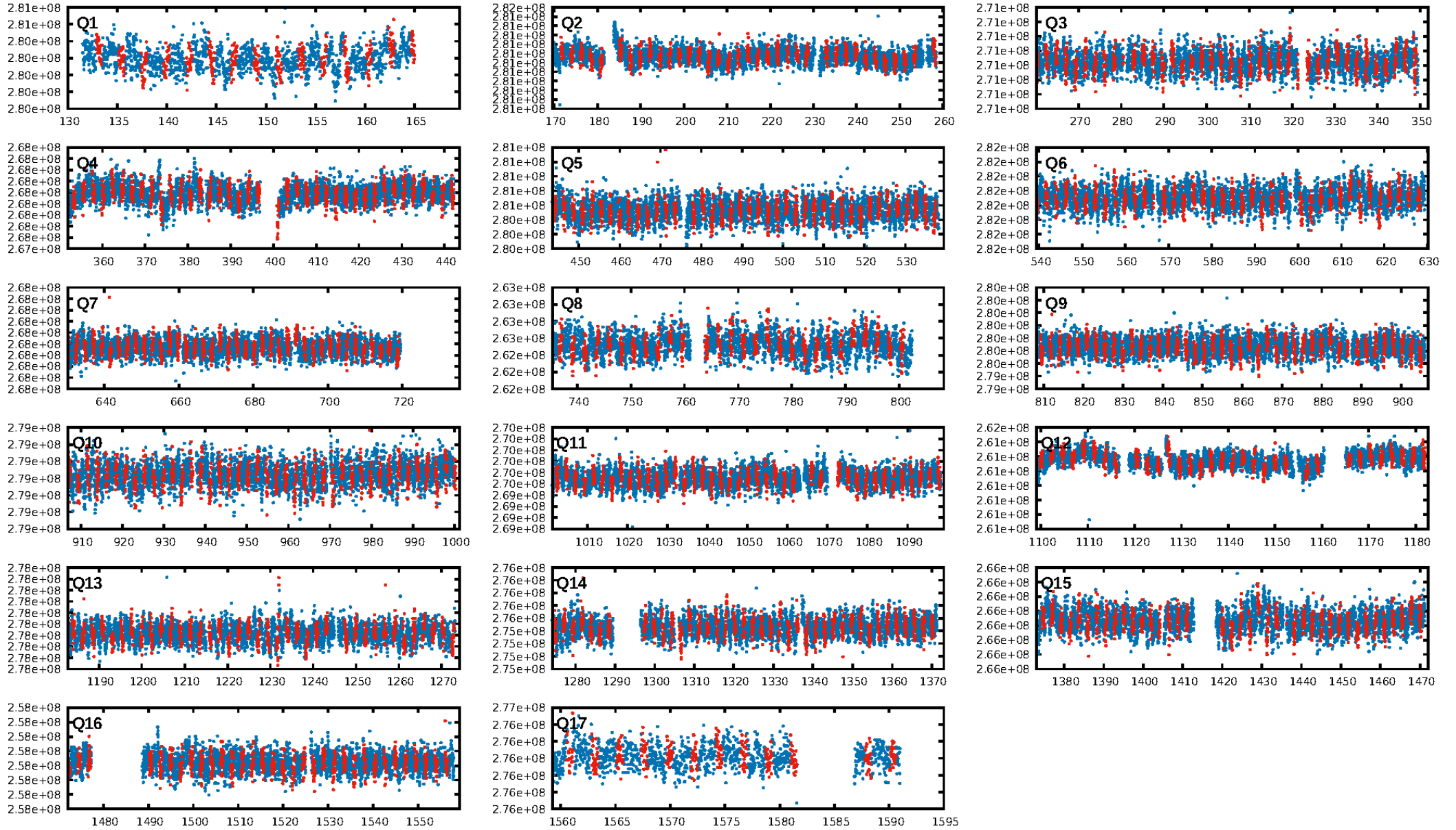
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.25e-14  
RollingBand-fgt: 1.00 [569/570]  
GhostDiagnostic-chr: 23.84  
Centroid-sig: 0.4%  
Centroid-so: 1.135 arcsec [1.43σ]  
OotOffset-rm: 1.881 arcsec [2.41σ]  
KicOffset-rm: 1.706 arcsec [2.31σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.80 [12/15]  
DiffImageOverlap-fno: 1.00 [17/17]

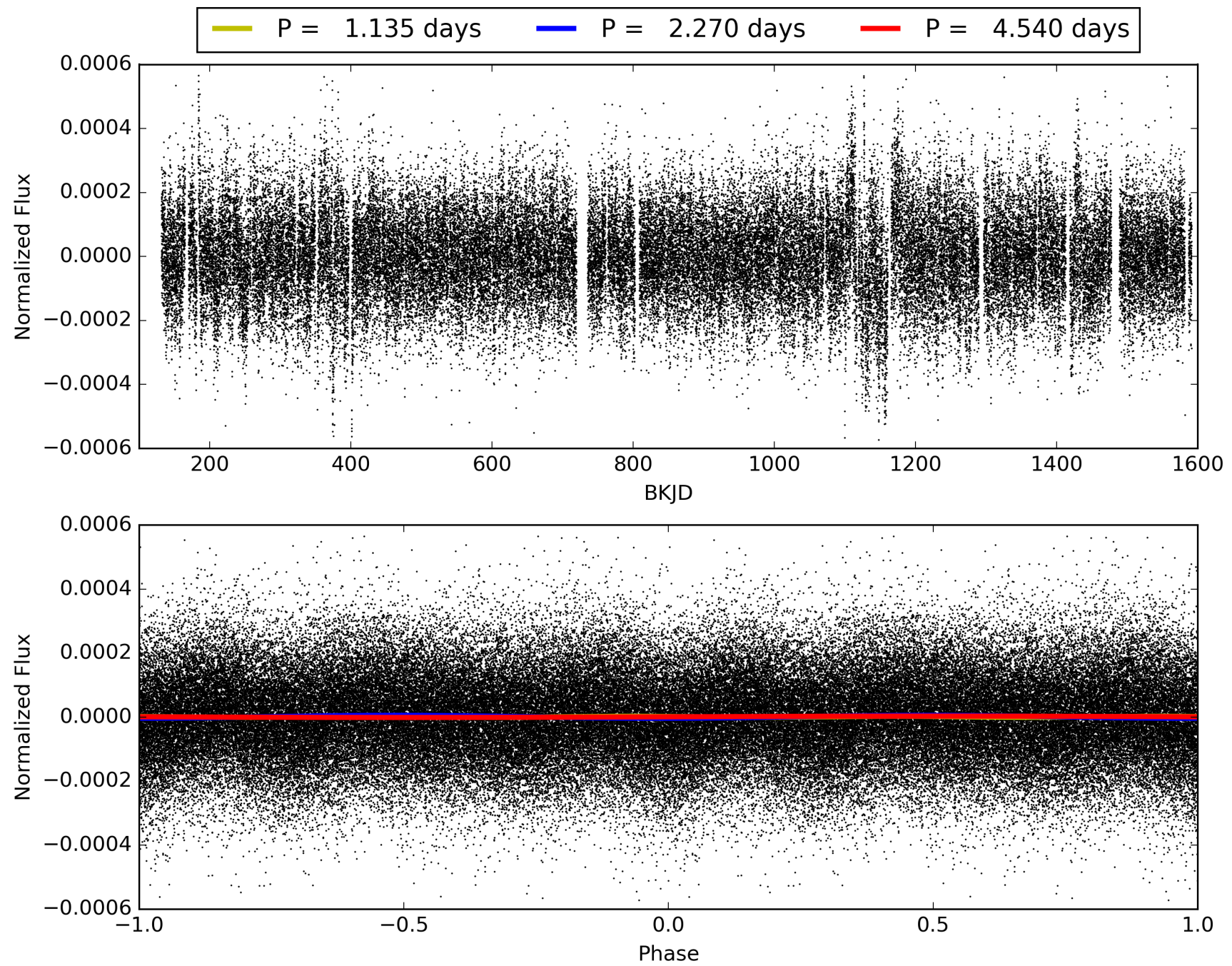
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 22:23:24 Z

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

# TCE 012024018-01, PDC Light Curves



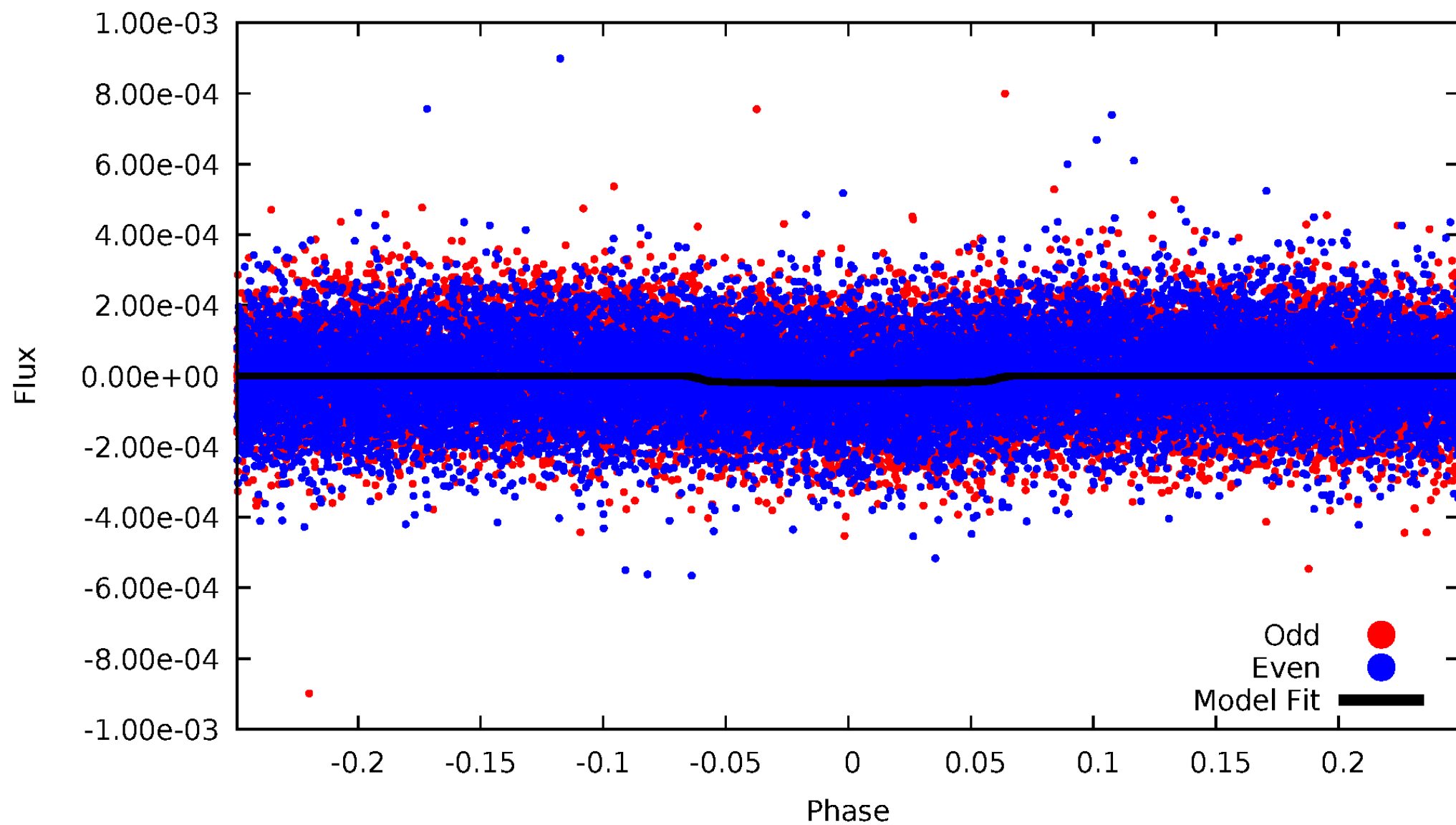
TCE 012024018-01





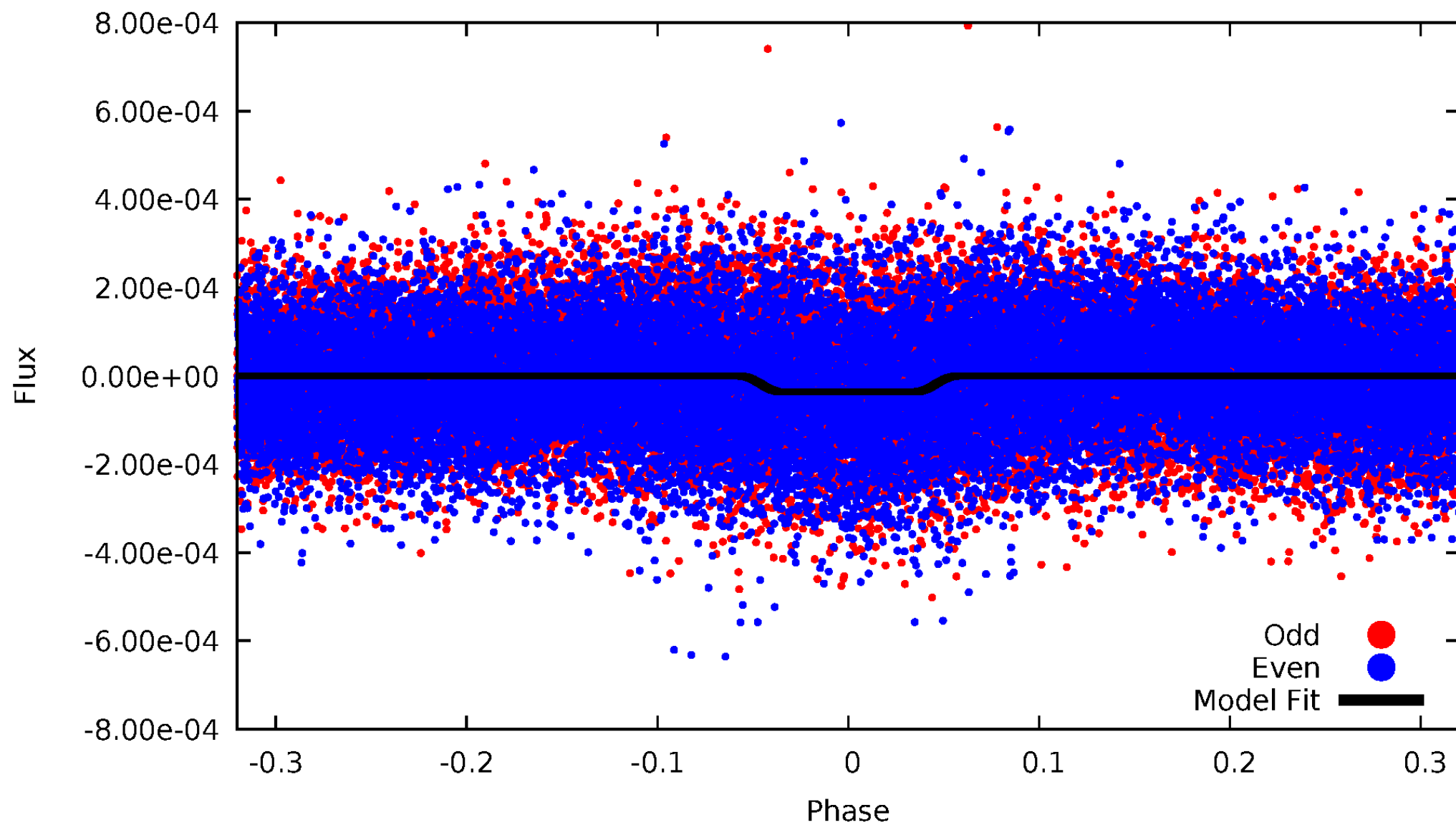
# DV Odd/Even

TCE 012024018-01



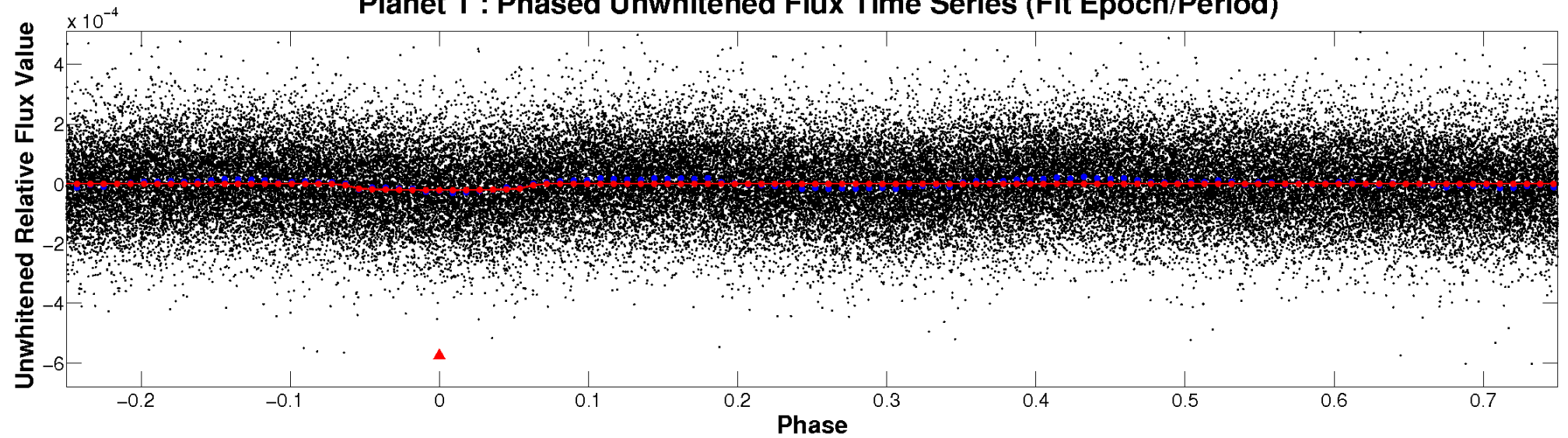
# ALT Odd/Even

TCE 012024018-01

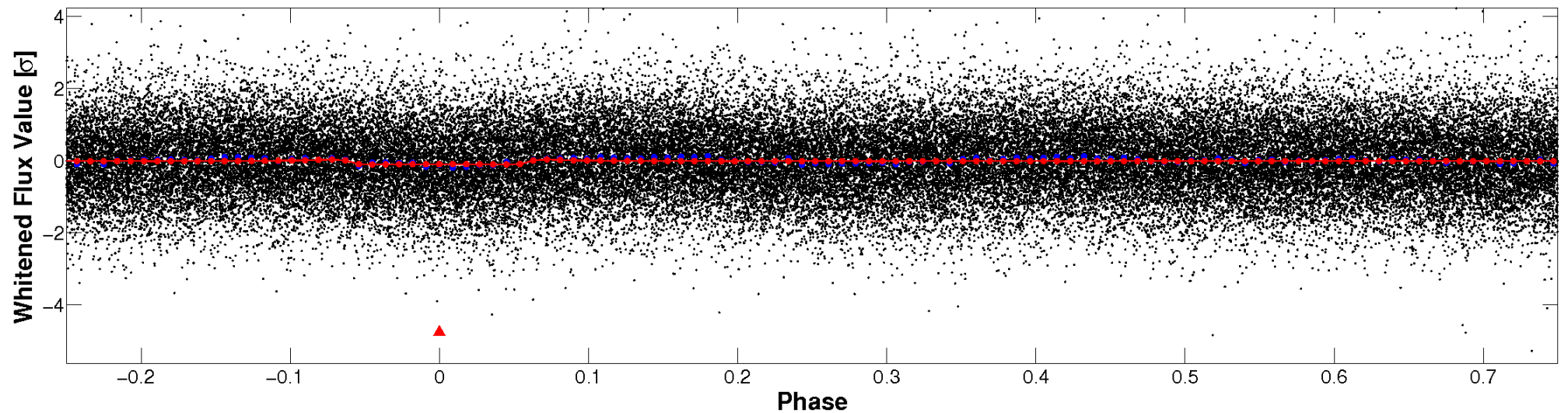


# Non-Whitened Vs. Whitened Light Curve

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

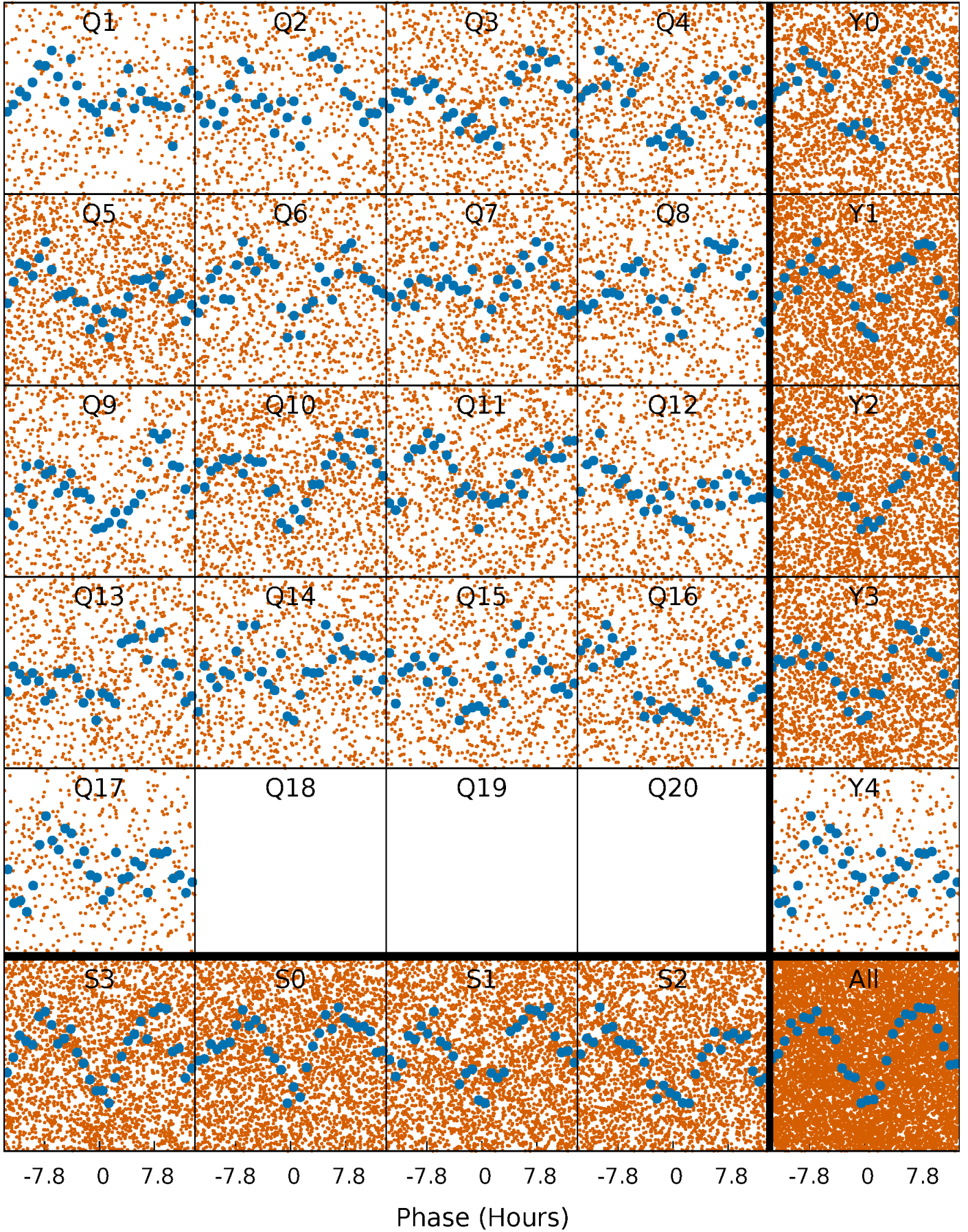


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

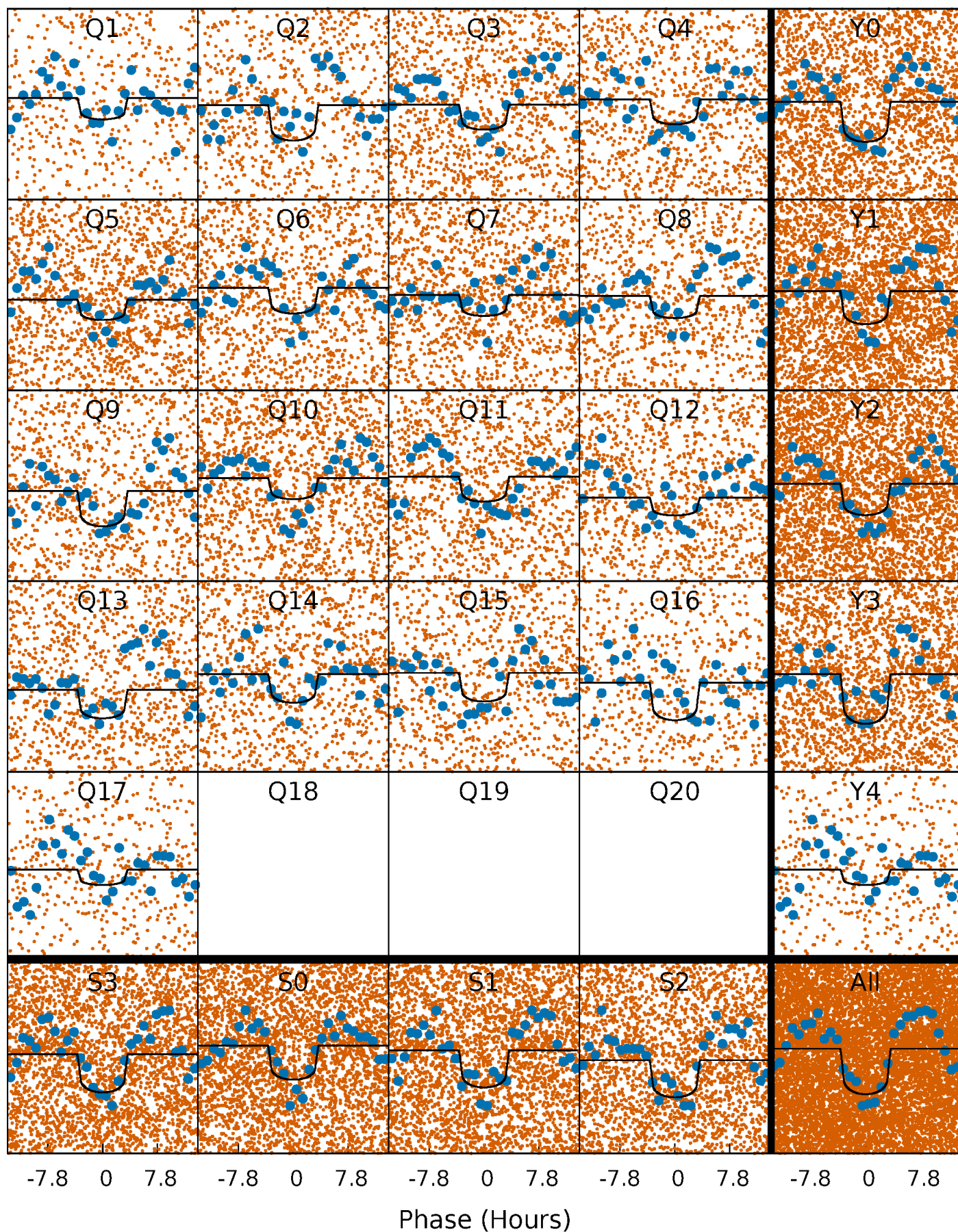
TCE 012024018-01 P= 2.269772 Days  $T_0=133.148811$  (BKJD)





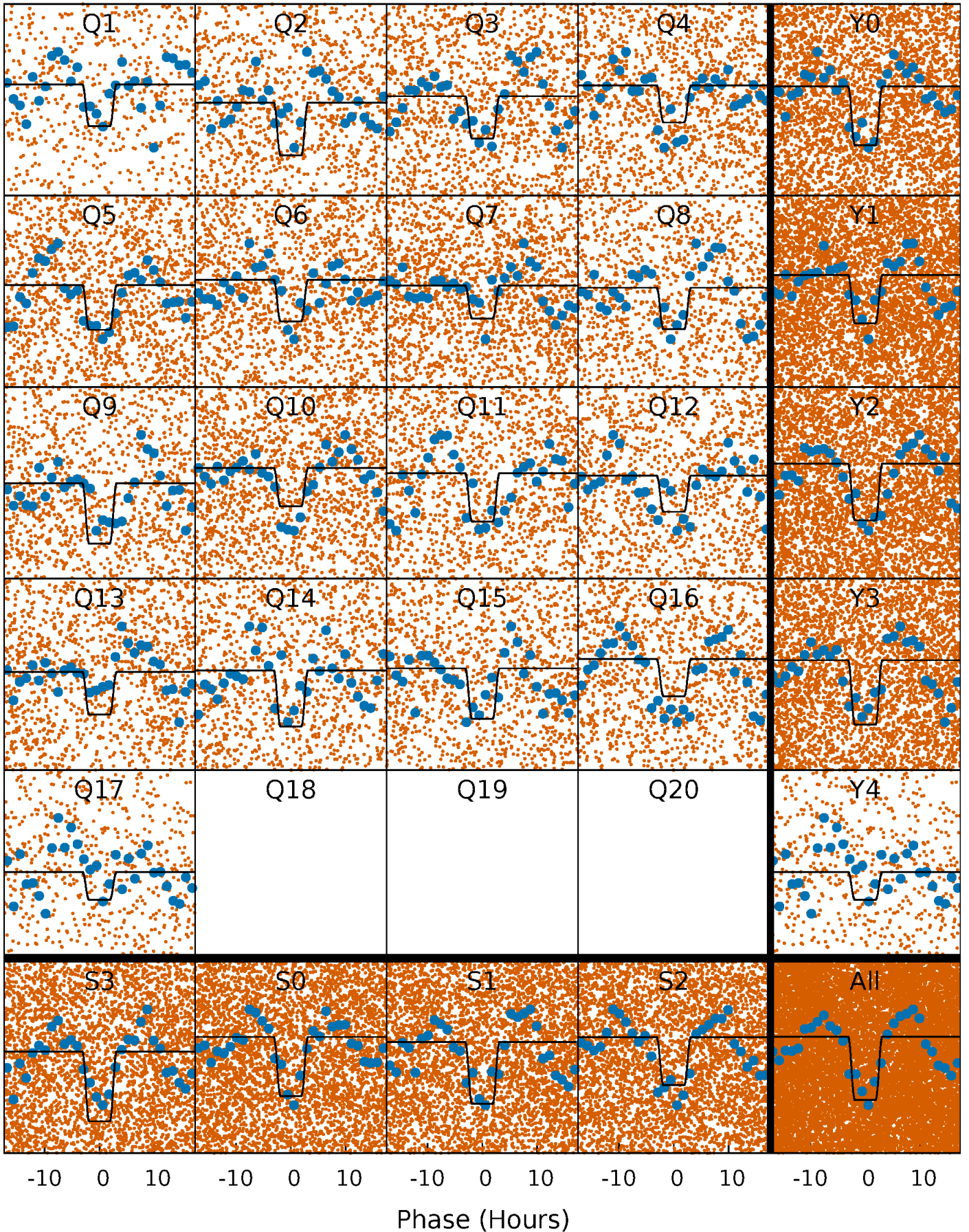
# DV Quarter-Phased Transit Curves

TCE 012024018-01 P= 2.269772 Days  $T_0=133.148811$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 012024018-01 P= 2.269749 Days  $T_0=133.163375$  (BKJD)

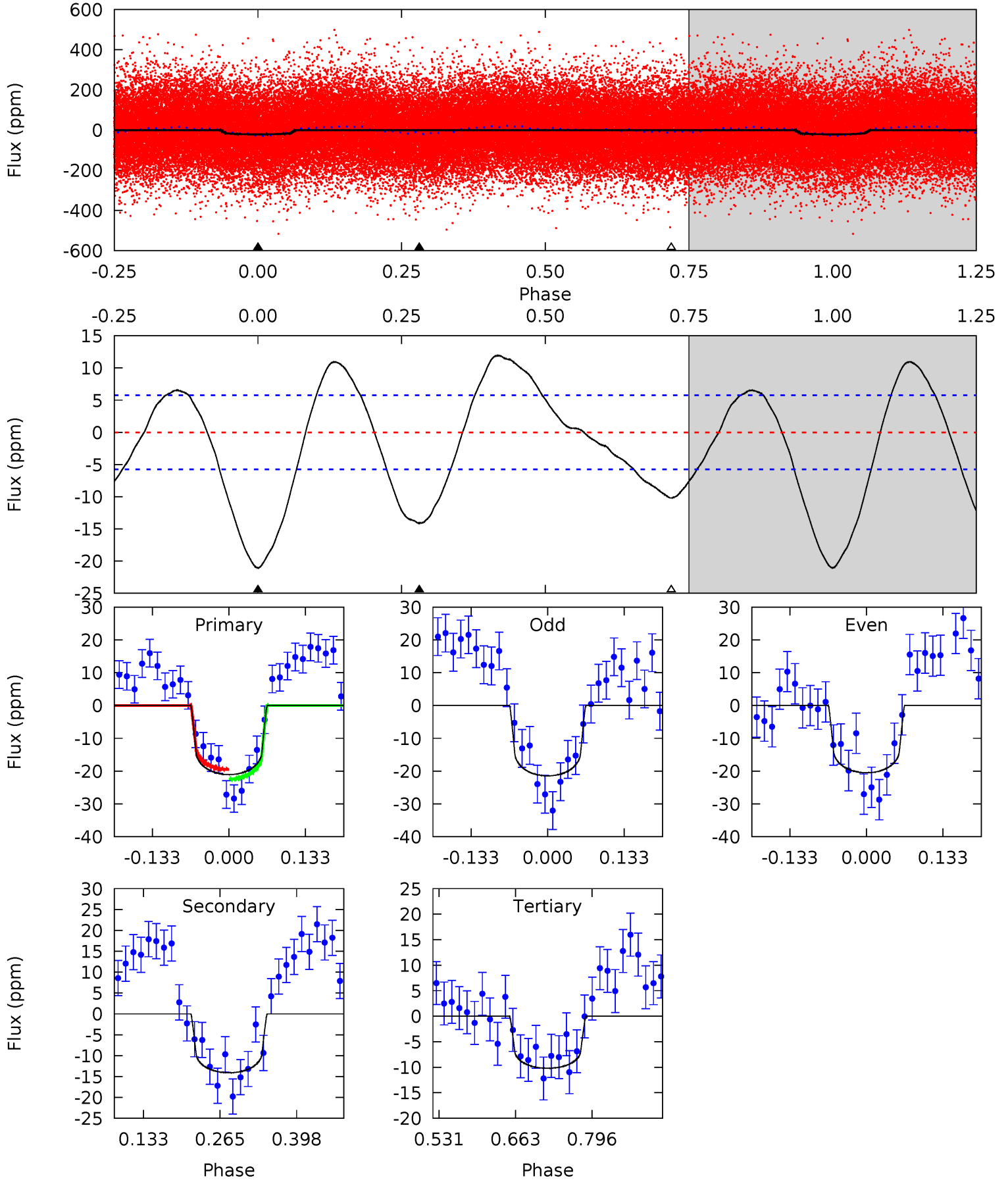




# DV Model-Shift Uniqueness Test

012024018-01, P = 2.269772 Days, E = 130.879039 Days

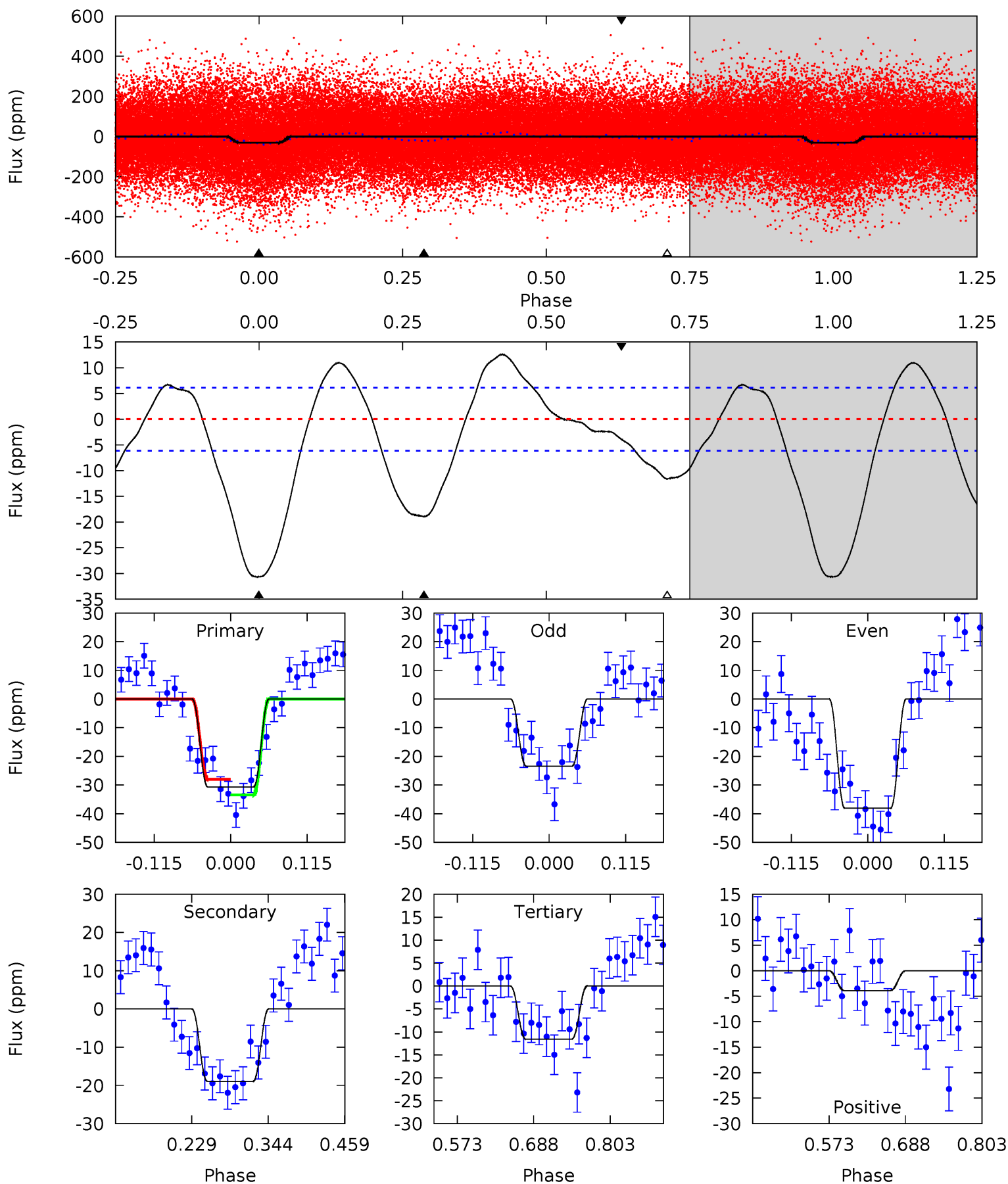
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.5	11.0	7.97	0	4.51	1.50	5.25	8.49	16.5	3.05	11.0	0.37	0.99	0.36	1.15



# Alt Model-Shift Uniqueness Test

012024018-01, P = 2.269749 Days, E = 130.893626 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
22.7	14.0	8.59	-2.89	4.54	1.58	5.34	14.1	25.6	5.42	16.9	5.44	1.07	0.29	2.02





### Stellar Parameters For KIC 012024018

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6637^{+159}_{-179}$	$3.806^{+0.292}_{-0.097}$	$-0.180^{+0.300}_{-0.250}$	$2.592^{+0.480}_{-0.892}$	$1.565^{+0.186}_{-0.346}$	$0.127^{+0.264}_{-0.040}$
	+2%/-3%	+8%/-3%	+167%/-139%	+19%/-34%	+12%/-22%	+209%/-31%
Source	PHO1	FLK73	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 012024018-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-14 \pm 1$	$1.24^{+0.36}_{-0.32}$	$3257^{+186}_{-294}$	$5861^{+749}_{-564}$	$7.710^{+6.273}_{-3.041}$
Alt.	$-19 \pm 1$	$1.60^{+0.38}_{-0.37}$	$3271^{+184}_{-303}$	$5575^{+607}_{-414}$	$6.181^{+4.109}_{-2.037}$

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

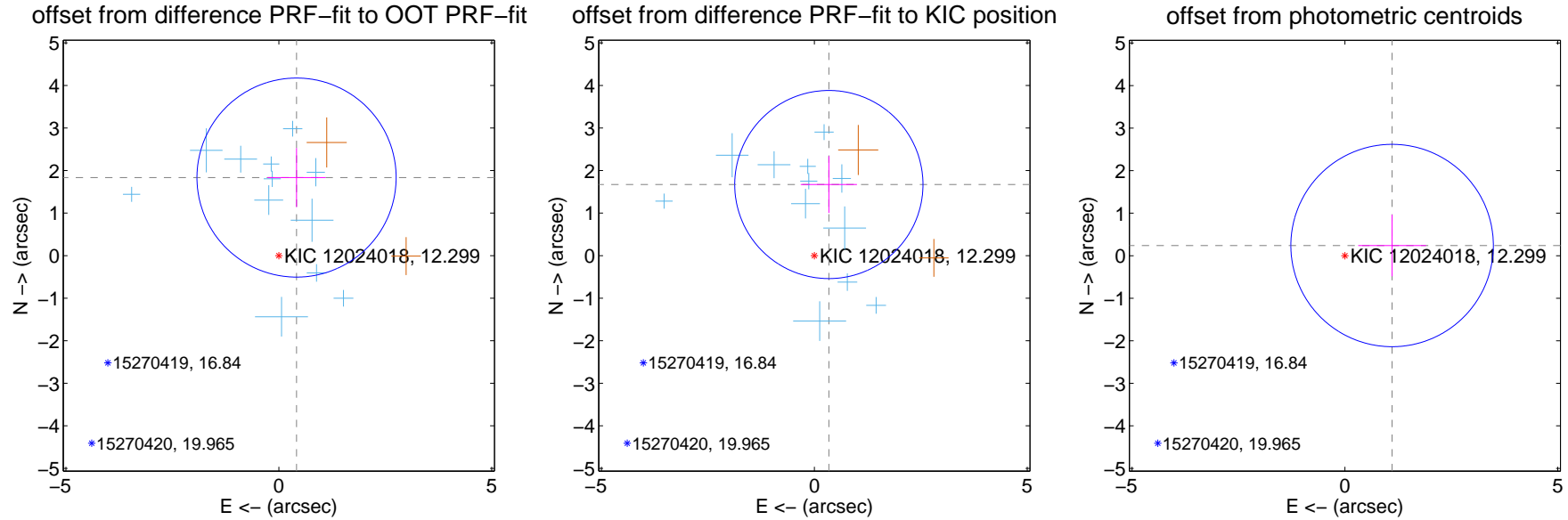
## DV Centroid Data

Supplemental centroid analysis for 012024018-01. Kepler magnitude: 12.30. Transit SNR 8.72

There are 12 quarters with good PRF difference image offsets

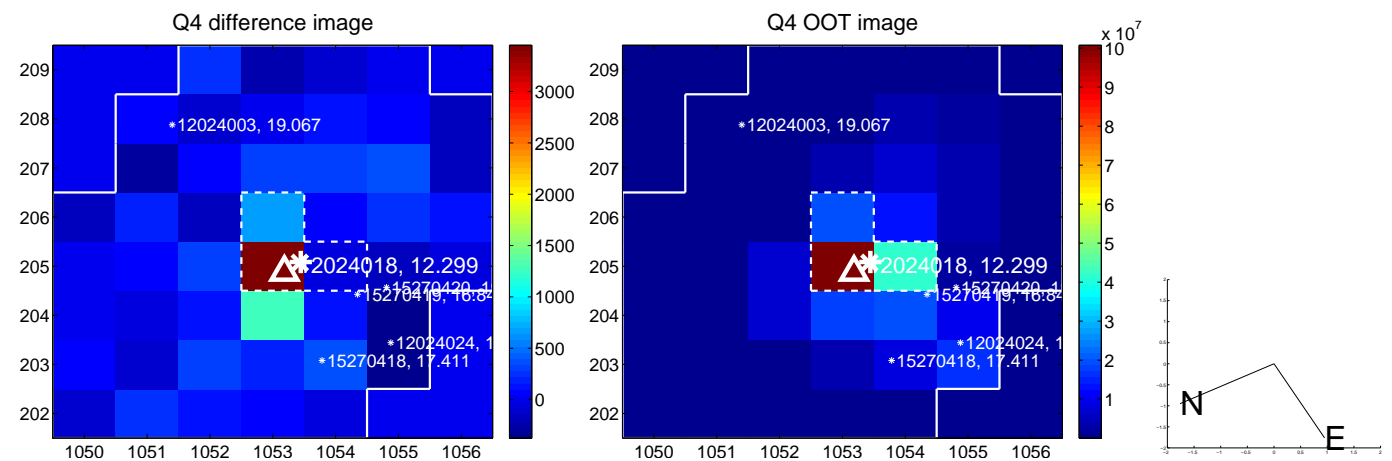
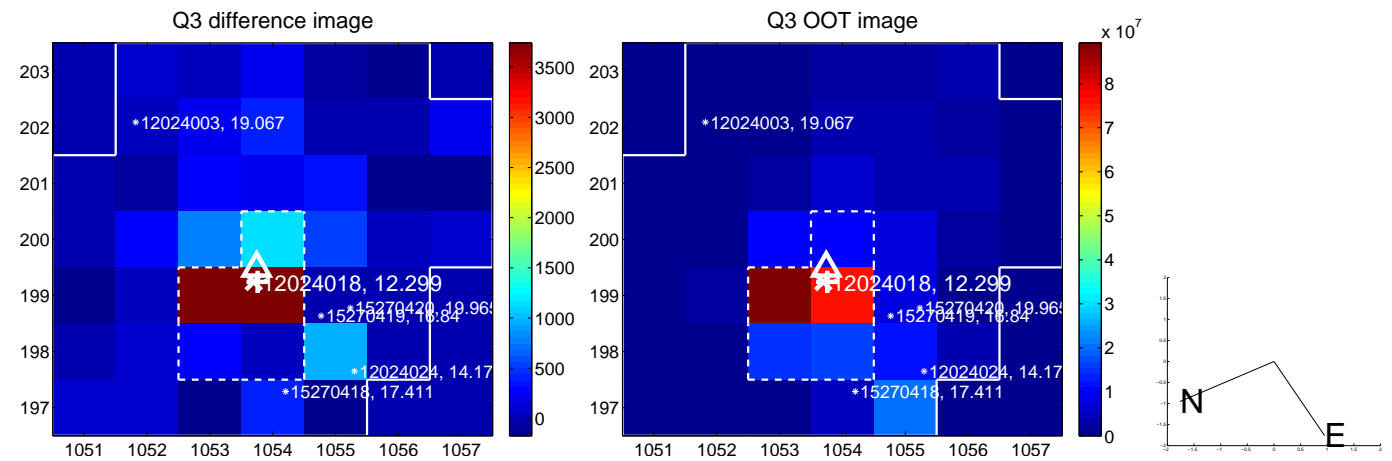
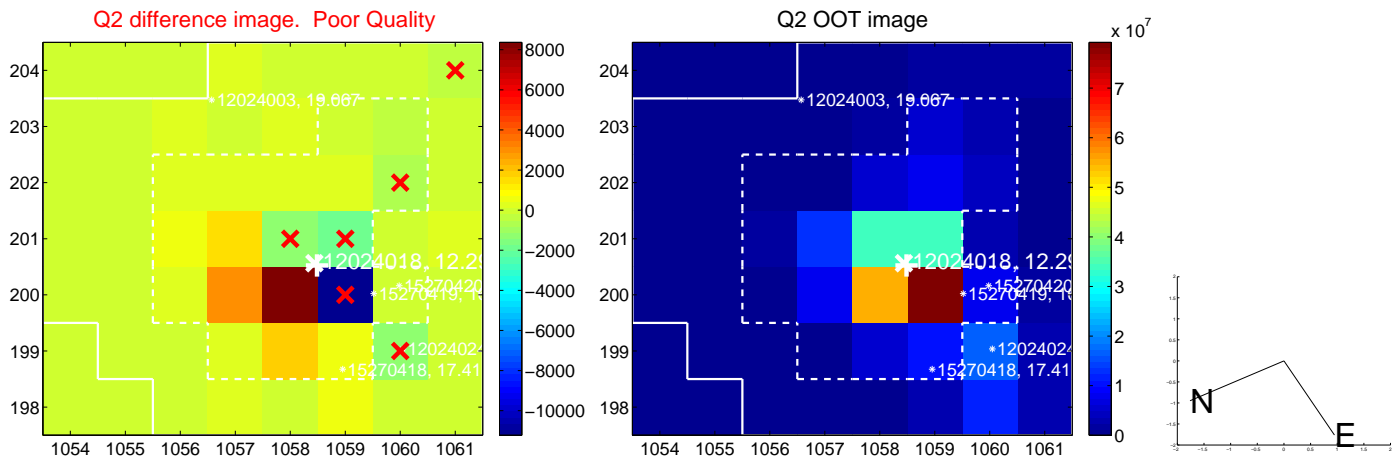
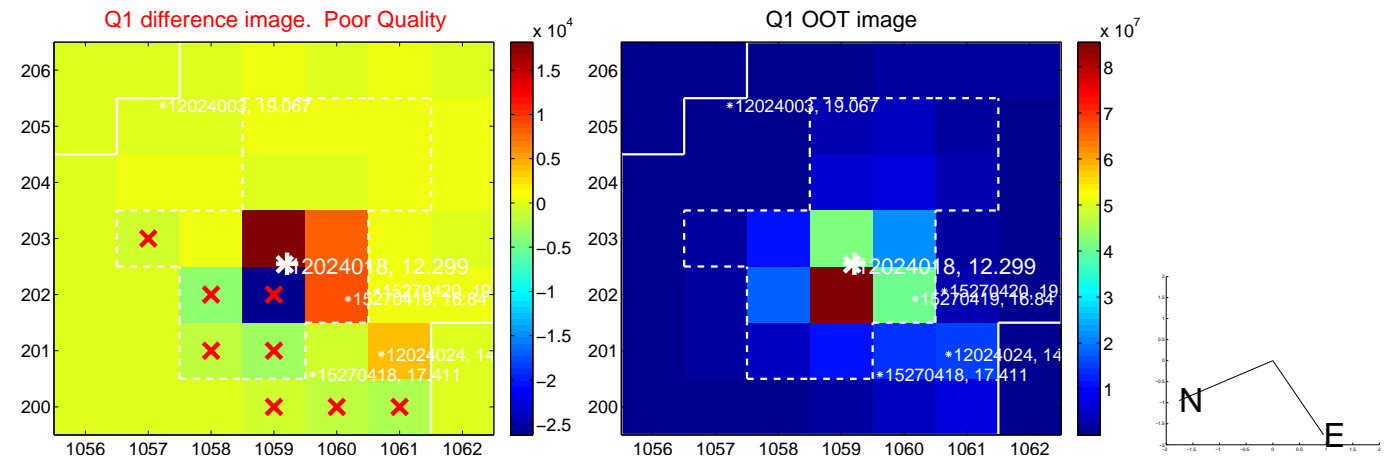
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.881 \pm 0.780$	2.41	$-0.416 \pm 0.682$	$1.835 \pm 0.692$
PRF-fit source offset from KIC position	$1.706 \pm 0.737$	2.31	$-0.341 \pm 0.660$	$1.671 \pm 0.667$
photometric centroid source offset	$1.14 \pm 0.79$	1.43	$-1.11 \pm 0.80$	$0.24 \pm 0.72$

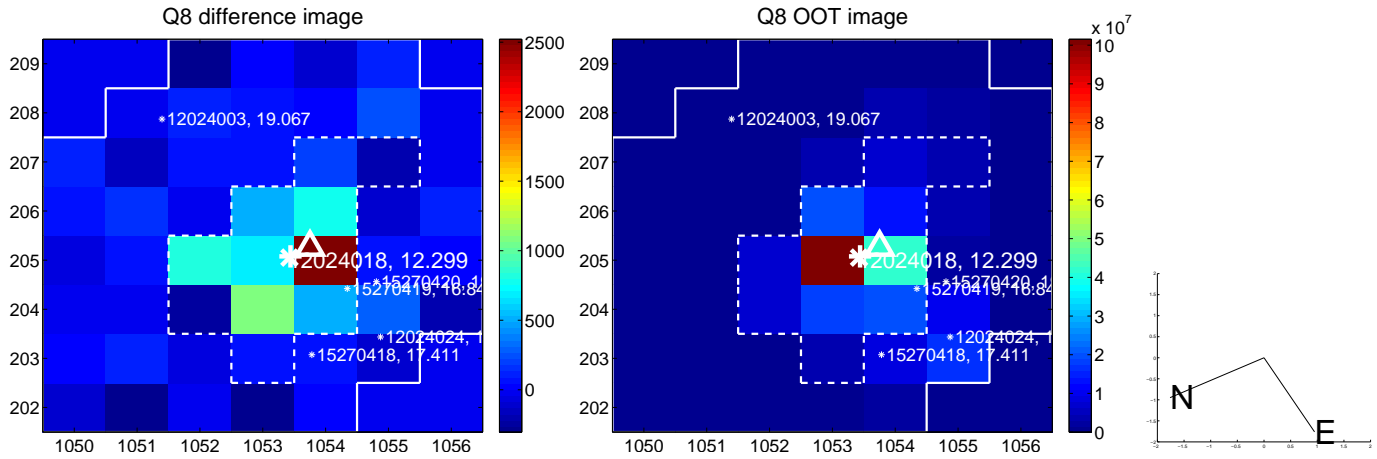
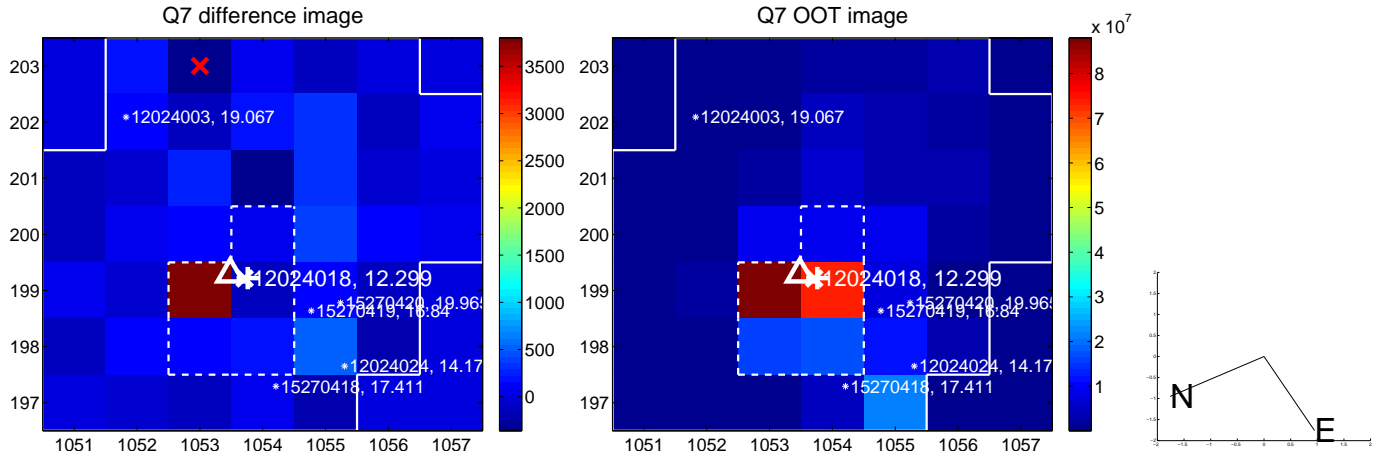
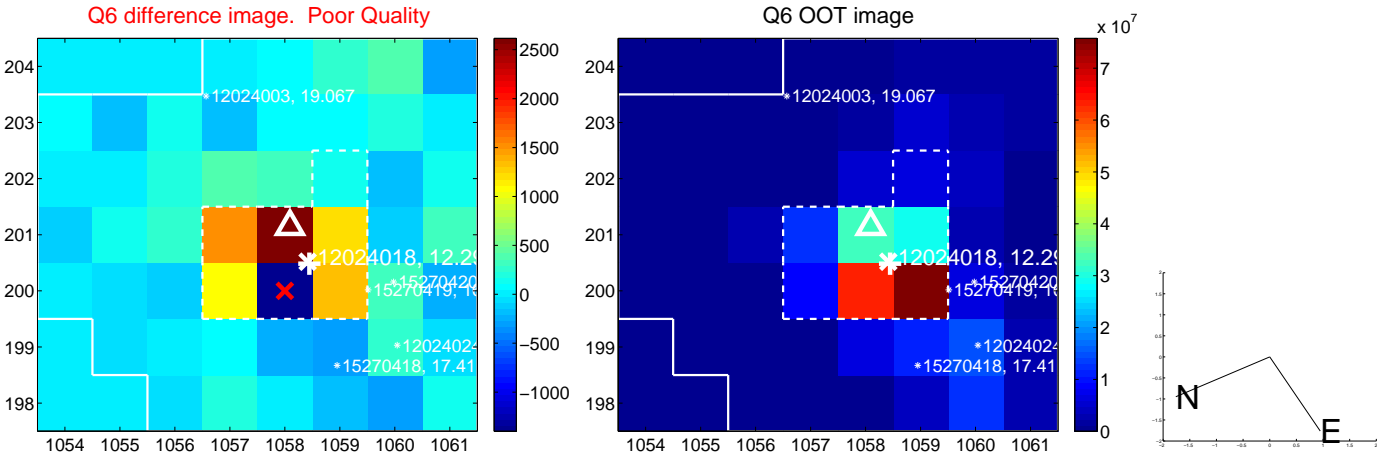
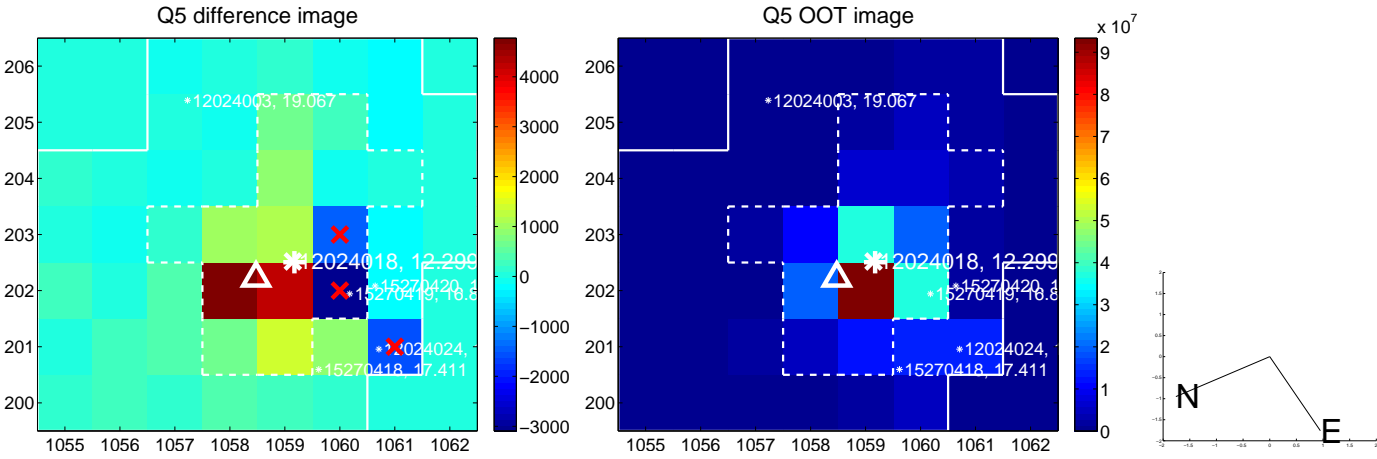


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

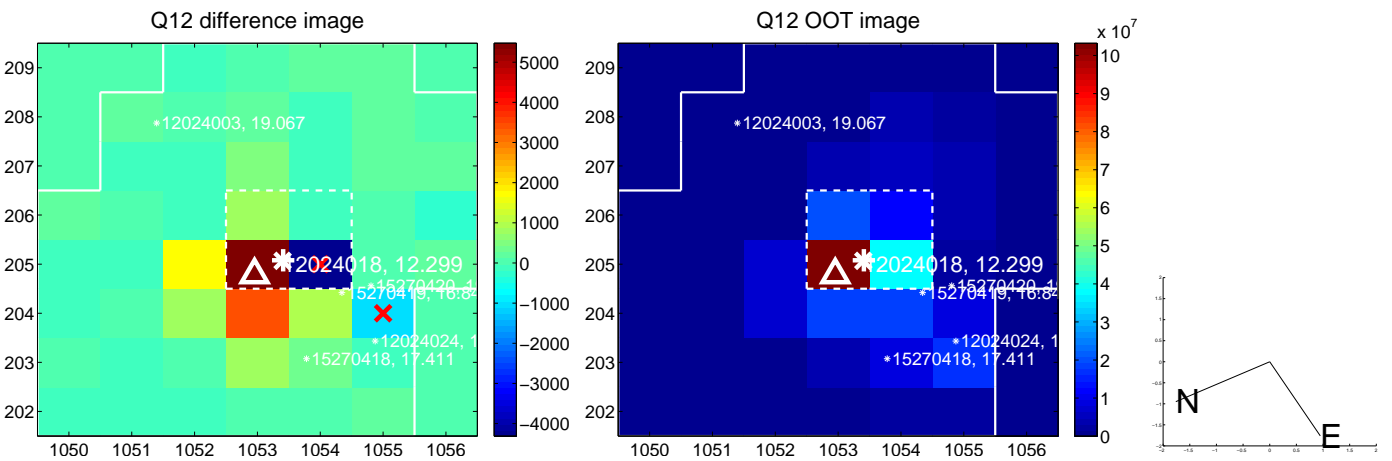
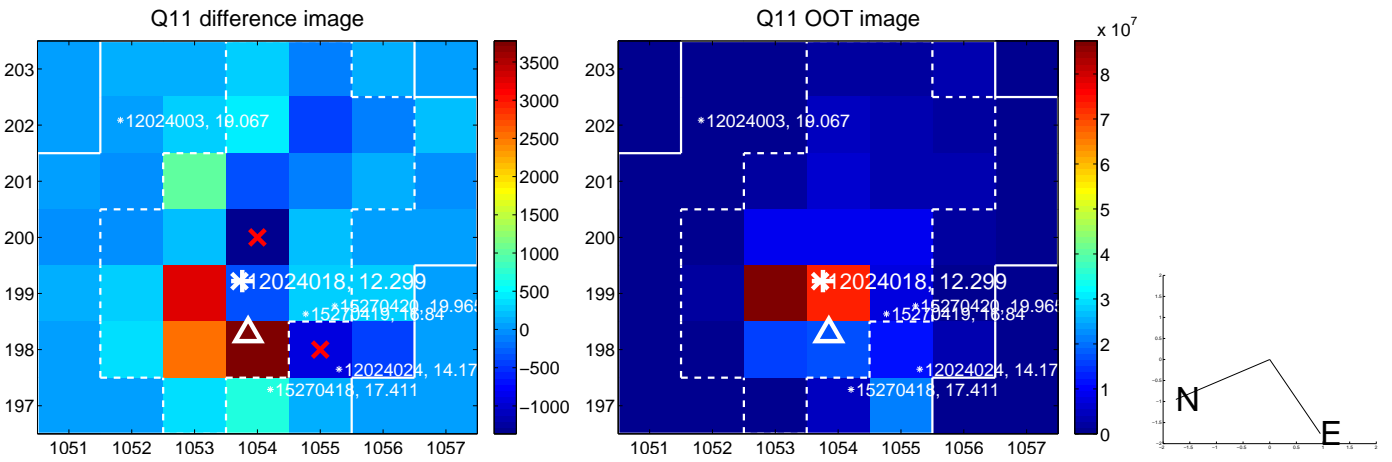
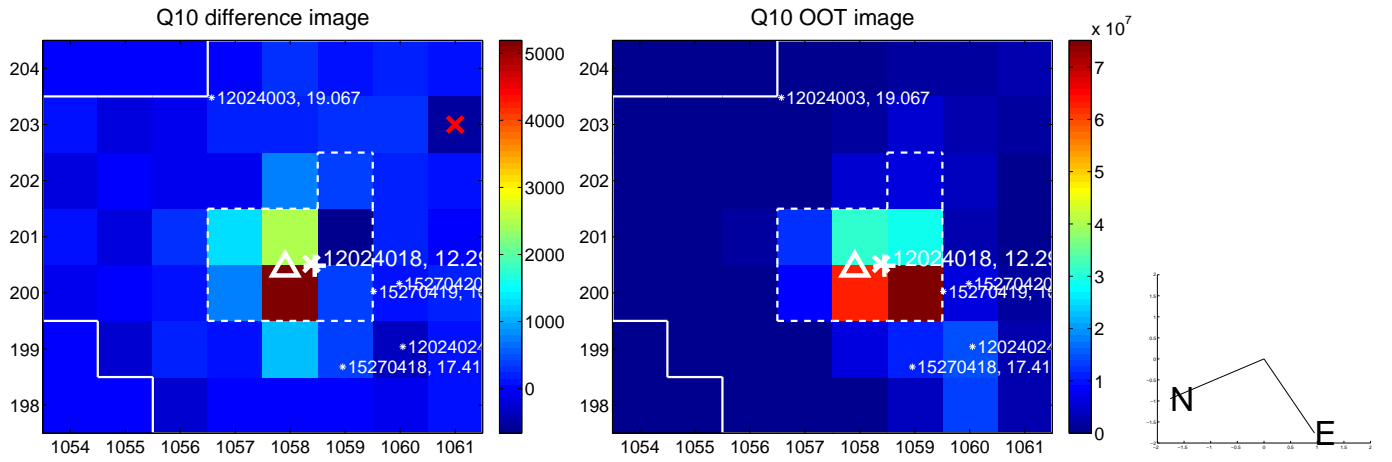
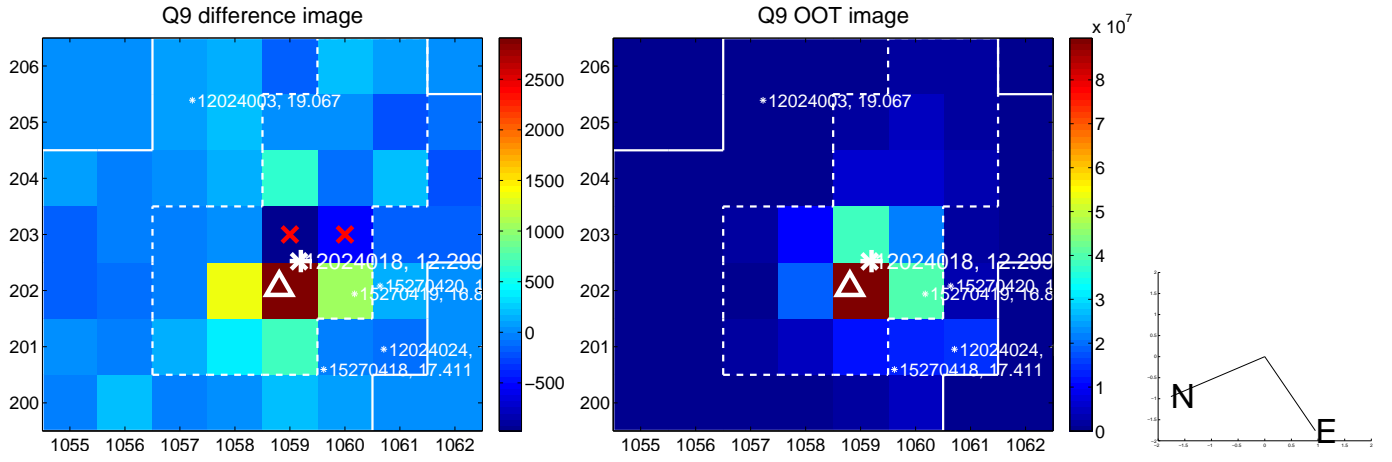


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

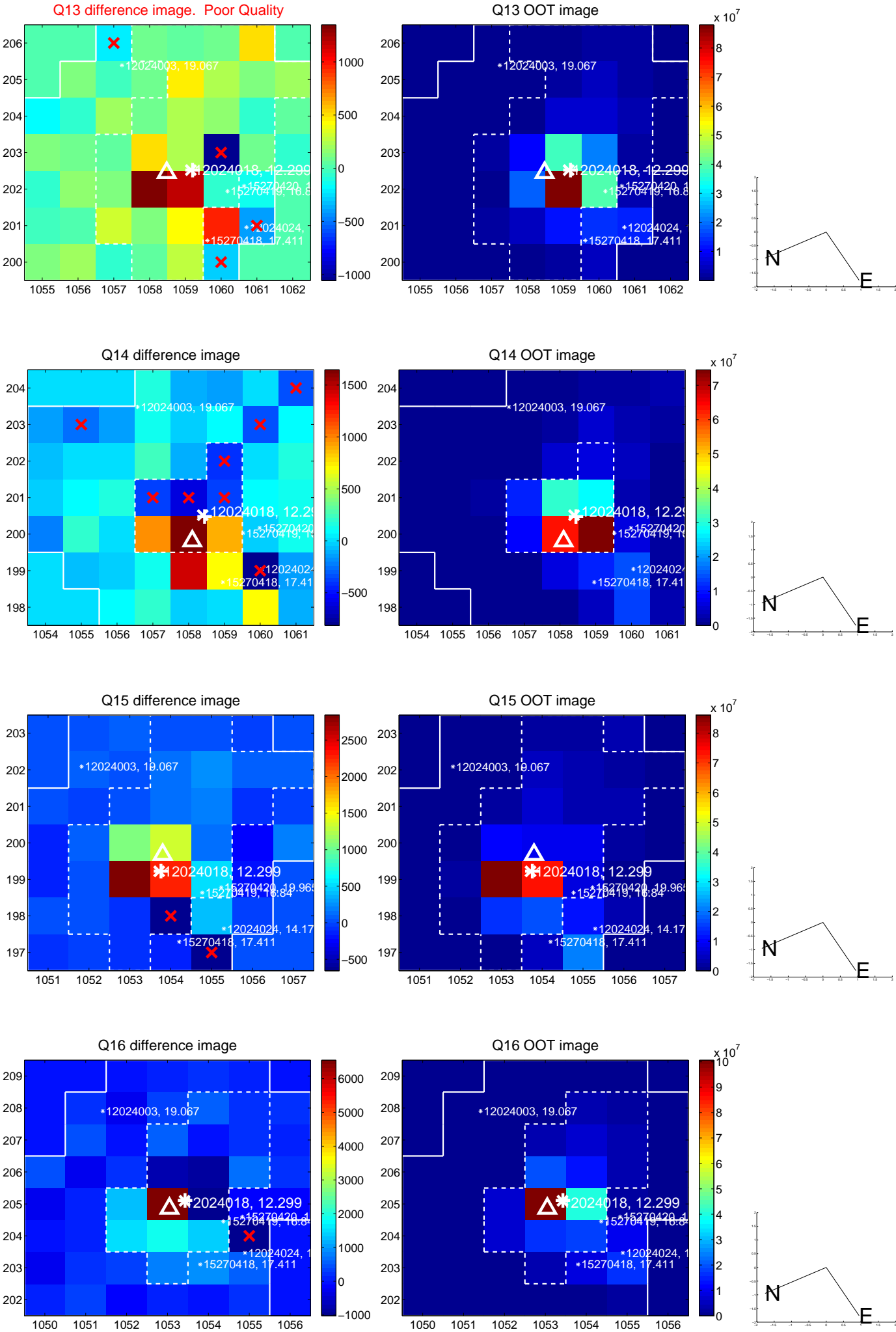




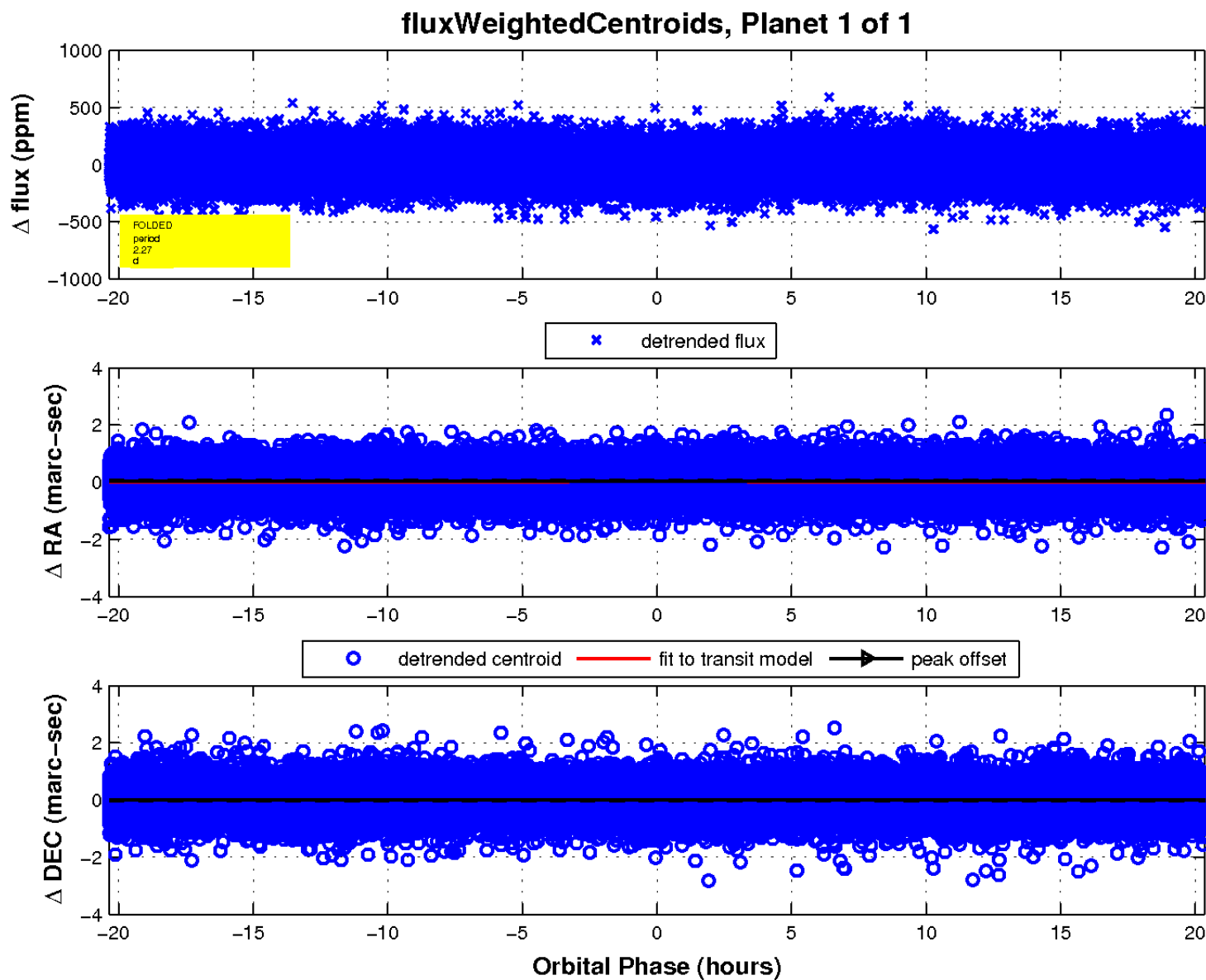
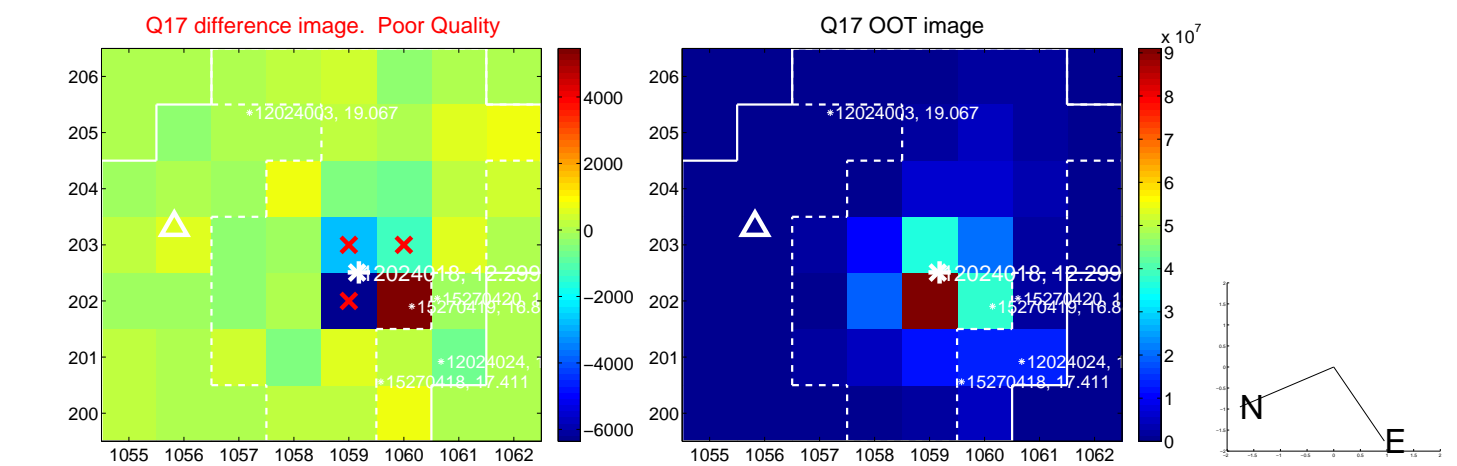
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

