

# KIC 009419020

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009419020-01	OBS	4808.01	2.401689	131.799282	197.6	1.454	9.5	10.3	0.40	3606	0.67	35.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009419020-01	OBS	PC	0.17	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 009419020-01

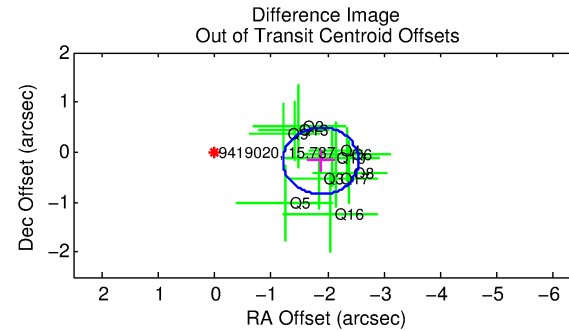
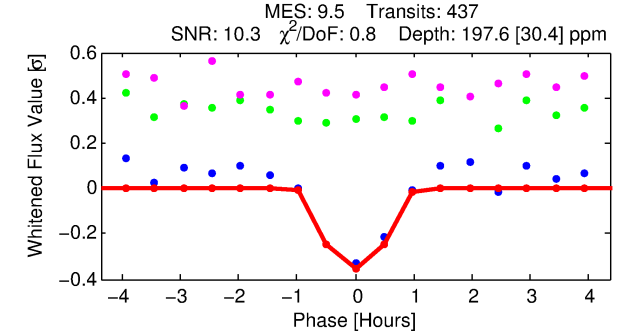
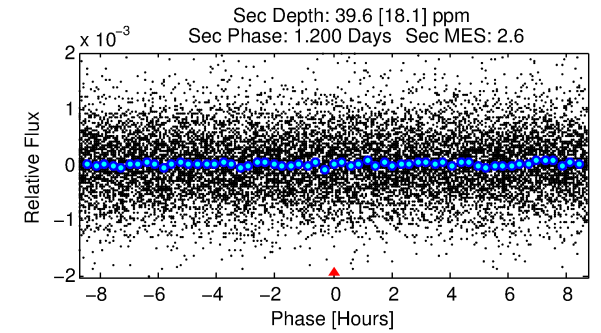
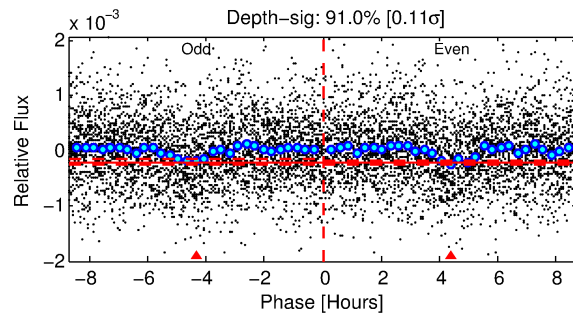
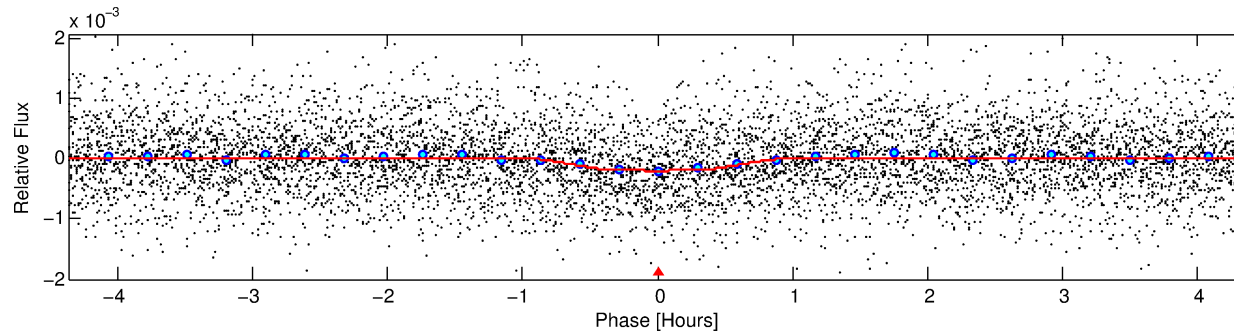
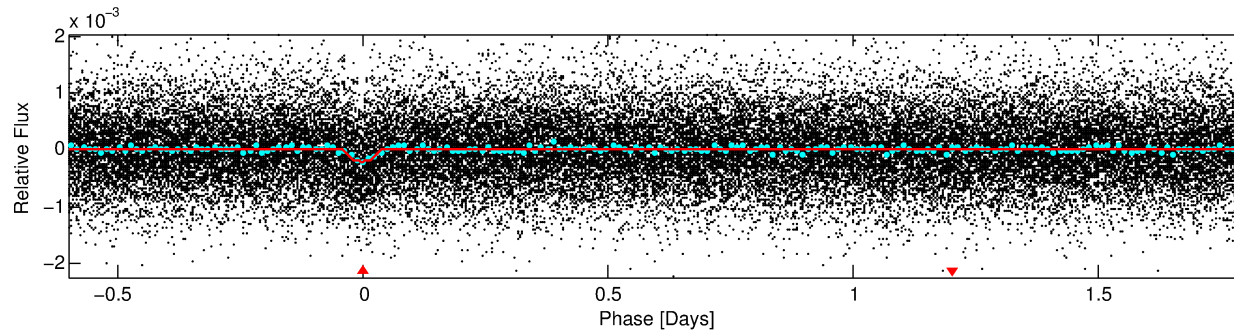
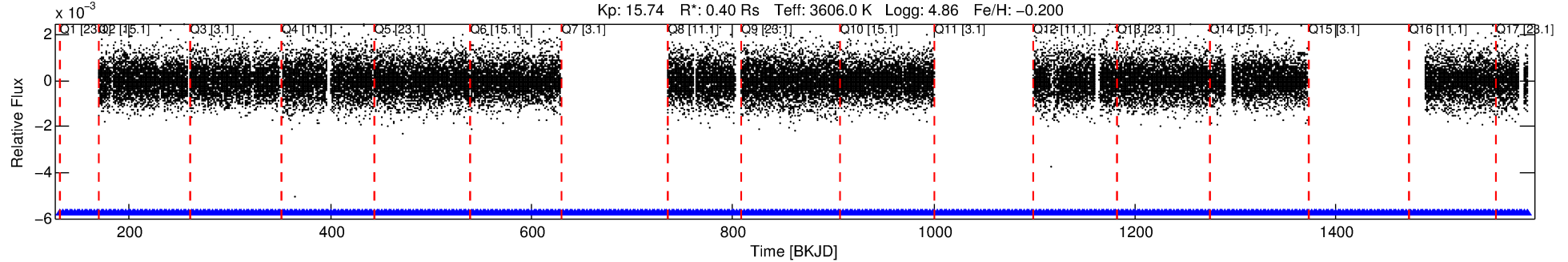
No Significant Match Found

# DV One-Page Summary

KIC: 9419020 Candidate: 1 of 1 Period: 2.402 d

KOI: K04808.01 Corr: 0.866

Kp: 15.74 R\*: 0.40 Rs Teff: 3606.0 K Logg: 4.86 Fe/H: -0.200



## DV Fit Results:

Period = 2.40169 [0.00001] d  
Epoch = 131.7993 [0.0025] BKJD  
Rp/R\* = 0.0154 [0.0138]  
a/R\* = 5.86 [23.43]  
b = 0.91 [0.82]  
Seff = 35.13 [6.26]  
Teq = 621 [28] K  
Rp = 0.67 [0.61] Re  
a = 0.0262 [0.0031] AU  
Ag = 33.20 [61.47] [0.52σ]  
Teffp = 2304 [1064] K [1.58σ]

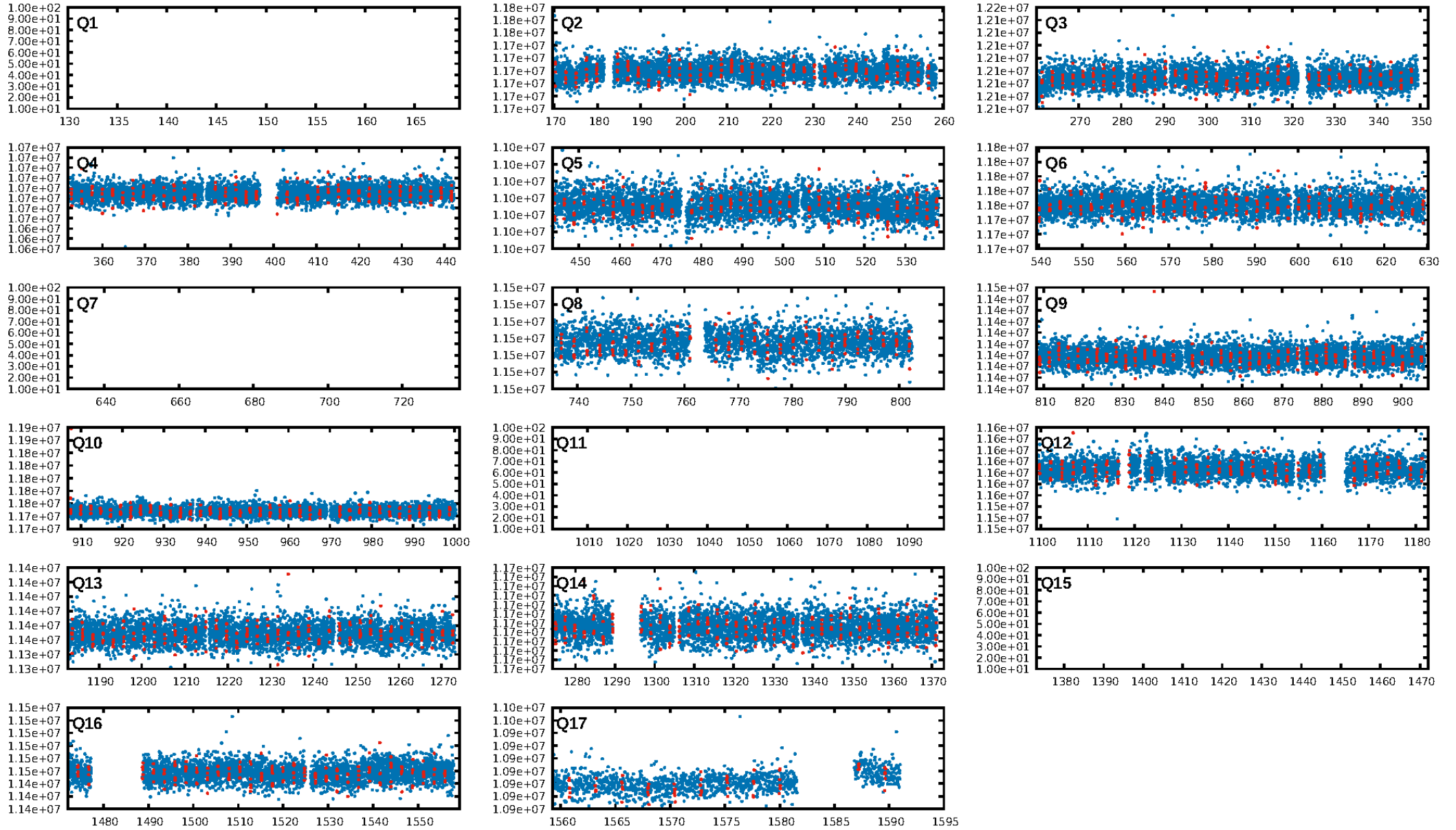
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.94e-21  
RollingBand-fgt: 1.00 [426/426]  
GhostDiagnostic-chr: 10.34  
Centroid-sig: 2.1%  
Centroid-so: 2.842 arcsec [2.21σ]  
OotOffset-rm: 1.889 arcsec [8.47σ]  
KicOffset-rm: 1.577 arcsec [7.06σ]  
OotOffset-st: 3/1/3/4 [11]  
KicOffset-st: 3/1/3/4 [11]  
DiffImageQuality-fgm: 0.55 [6/11]  
DiffImageOverlap-fno: 1.00 [13/13]

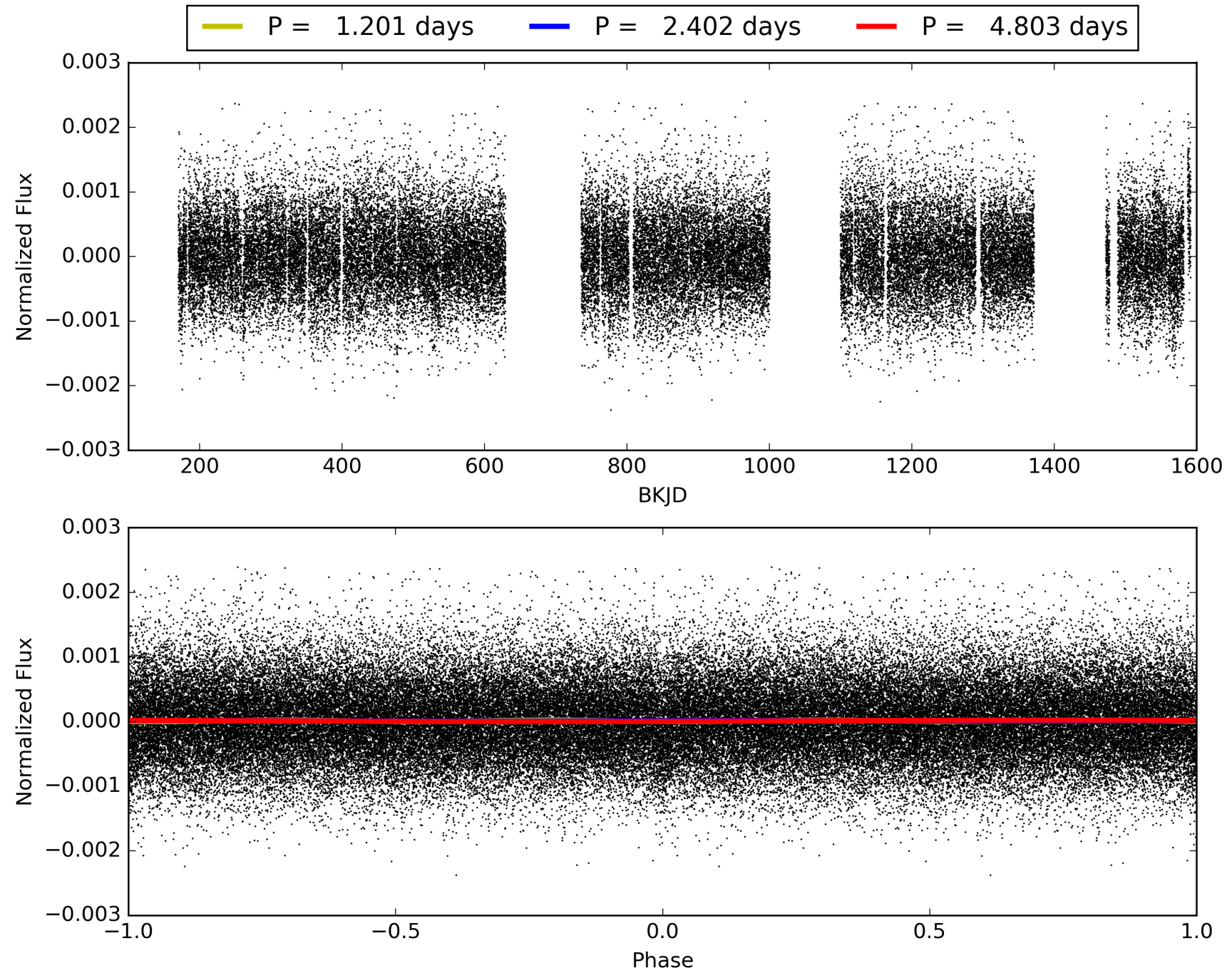
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:26:43 Z

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

# TCE 009419020-01, PDC Light Curves

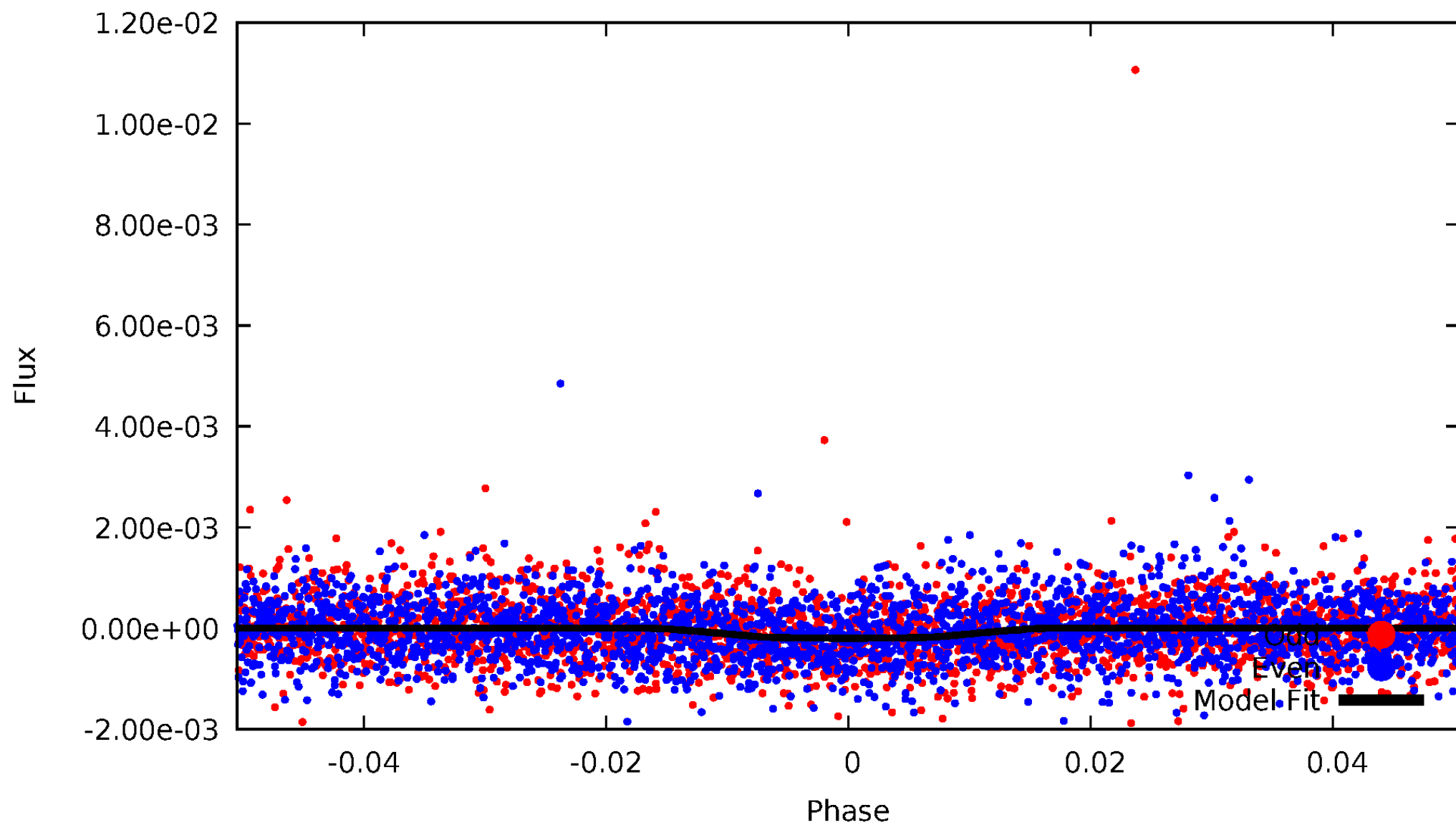


TCE 009419020-01



# DV Odd/Even

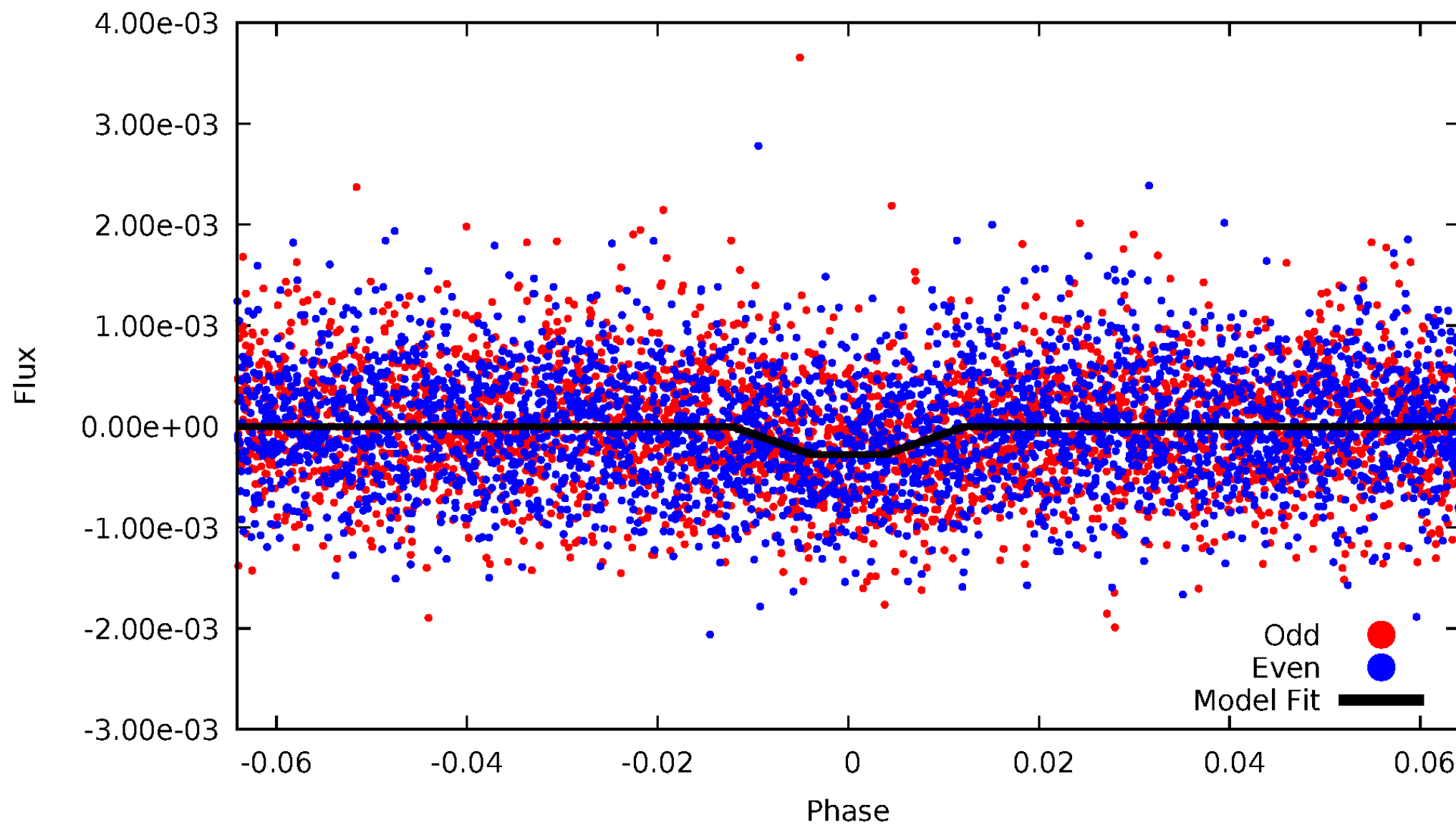
TCE 009419020-01





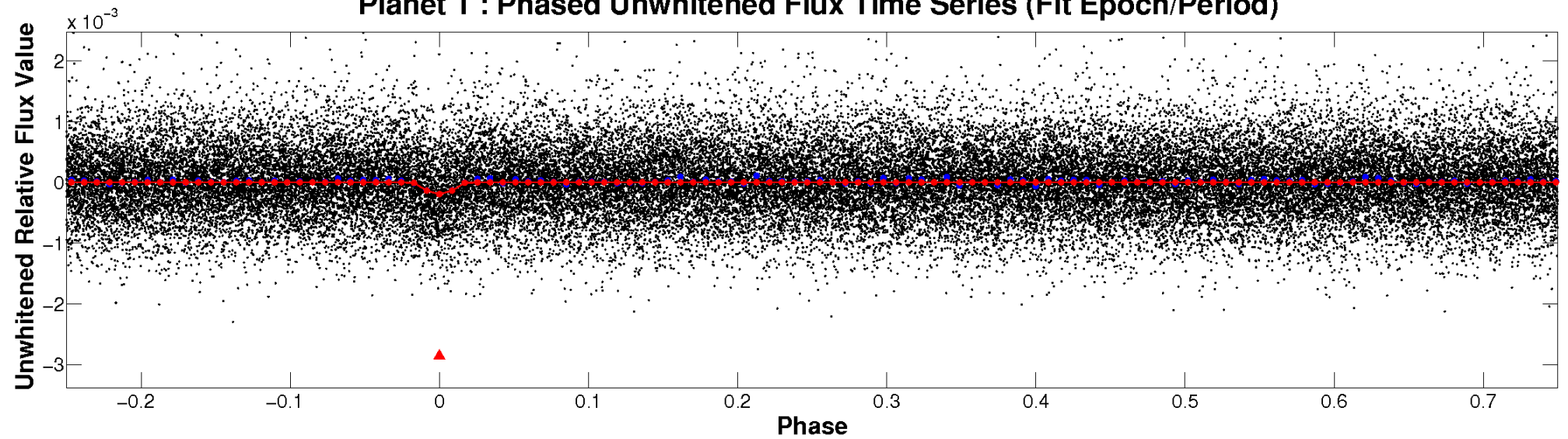
# ALT Odd/Even

TCE 009419020-01

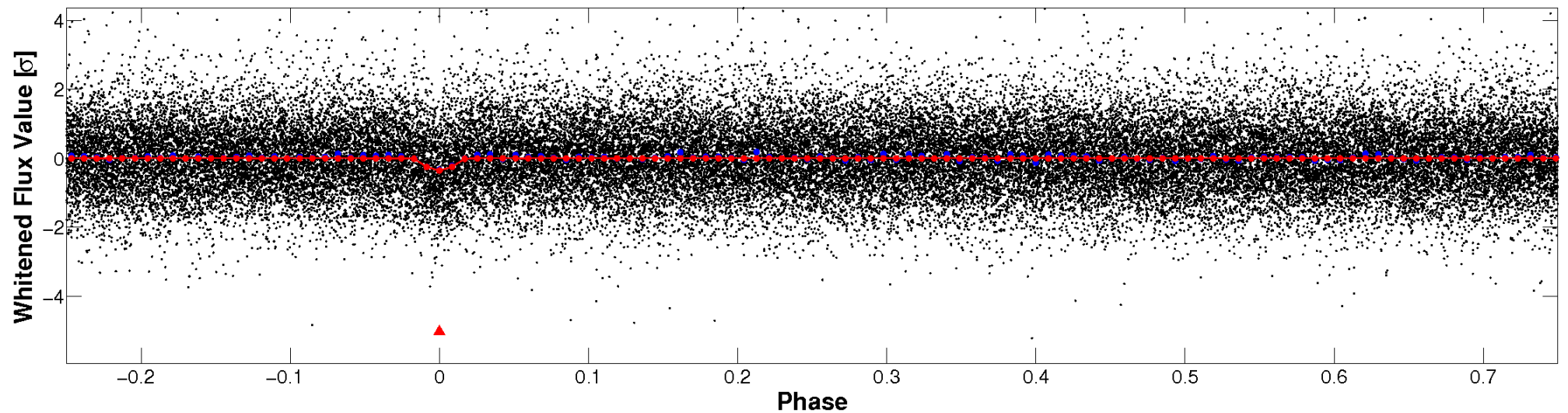


# Non-Whitened Vs. Whitened Light Curve

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

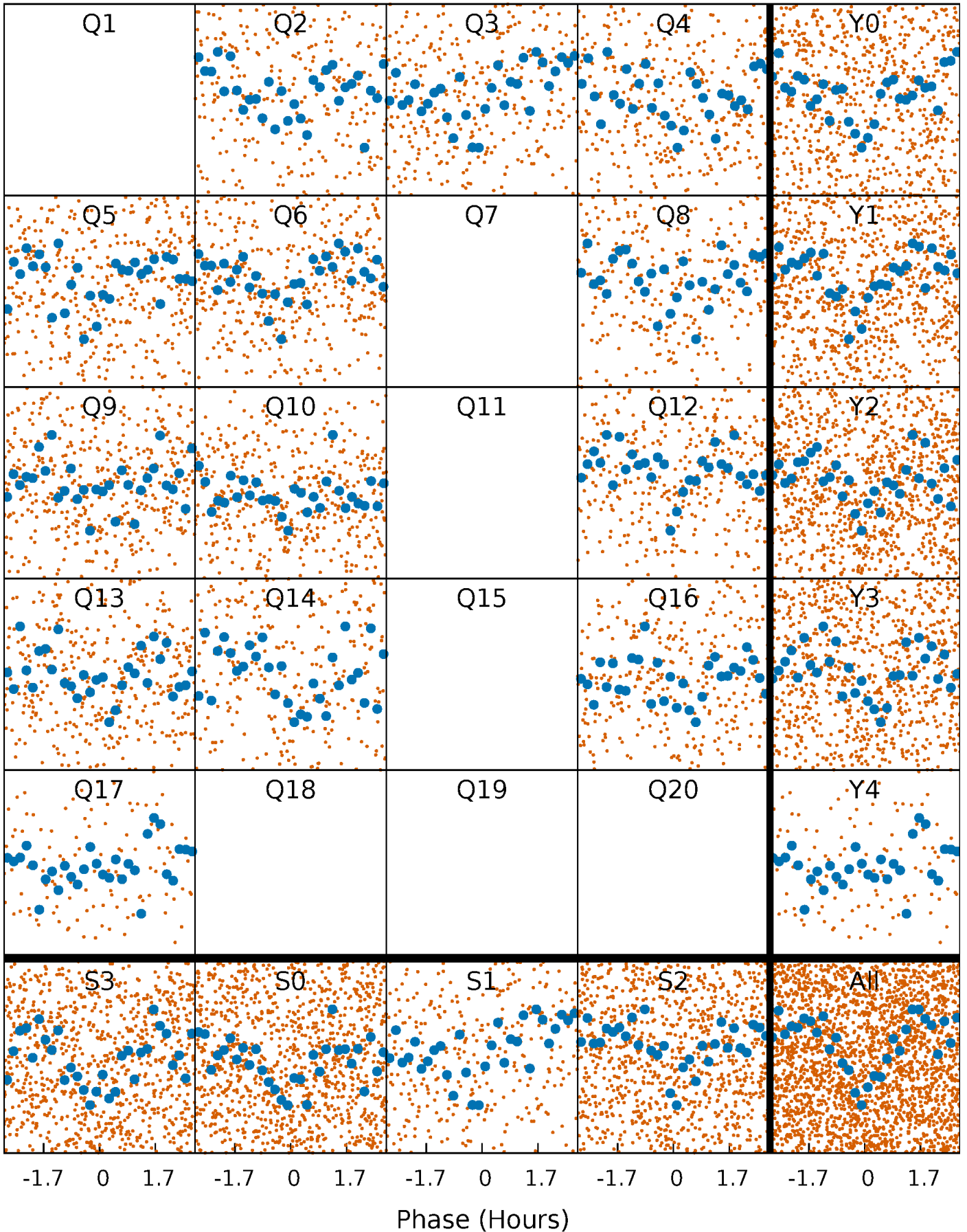


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

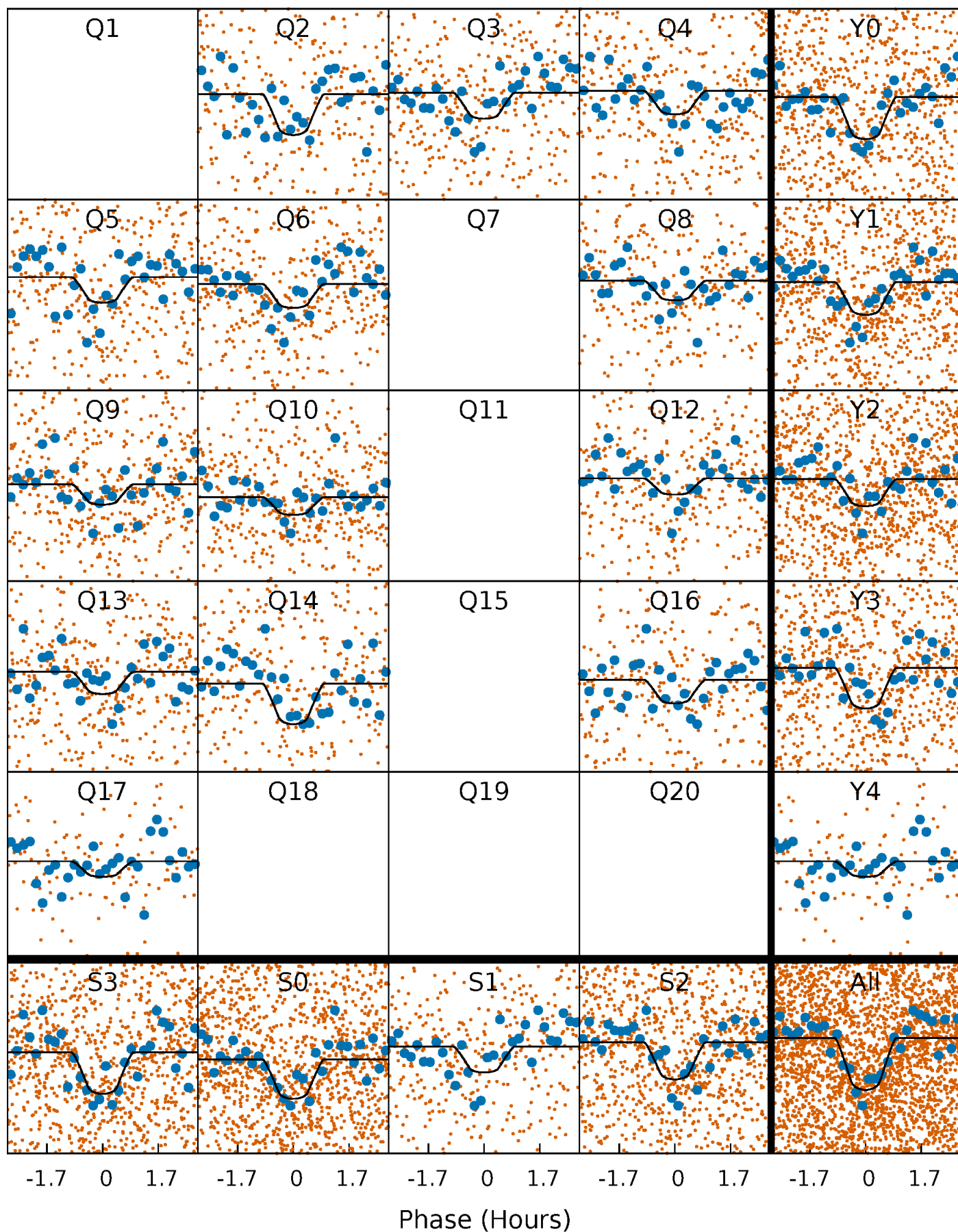
TCE 009419020-01 P= 2.401689 Days  $T_0=131.799283$  (BKJD)





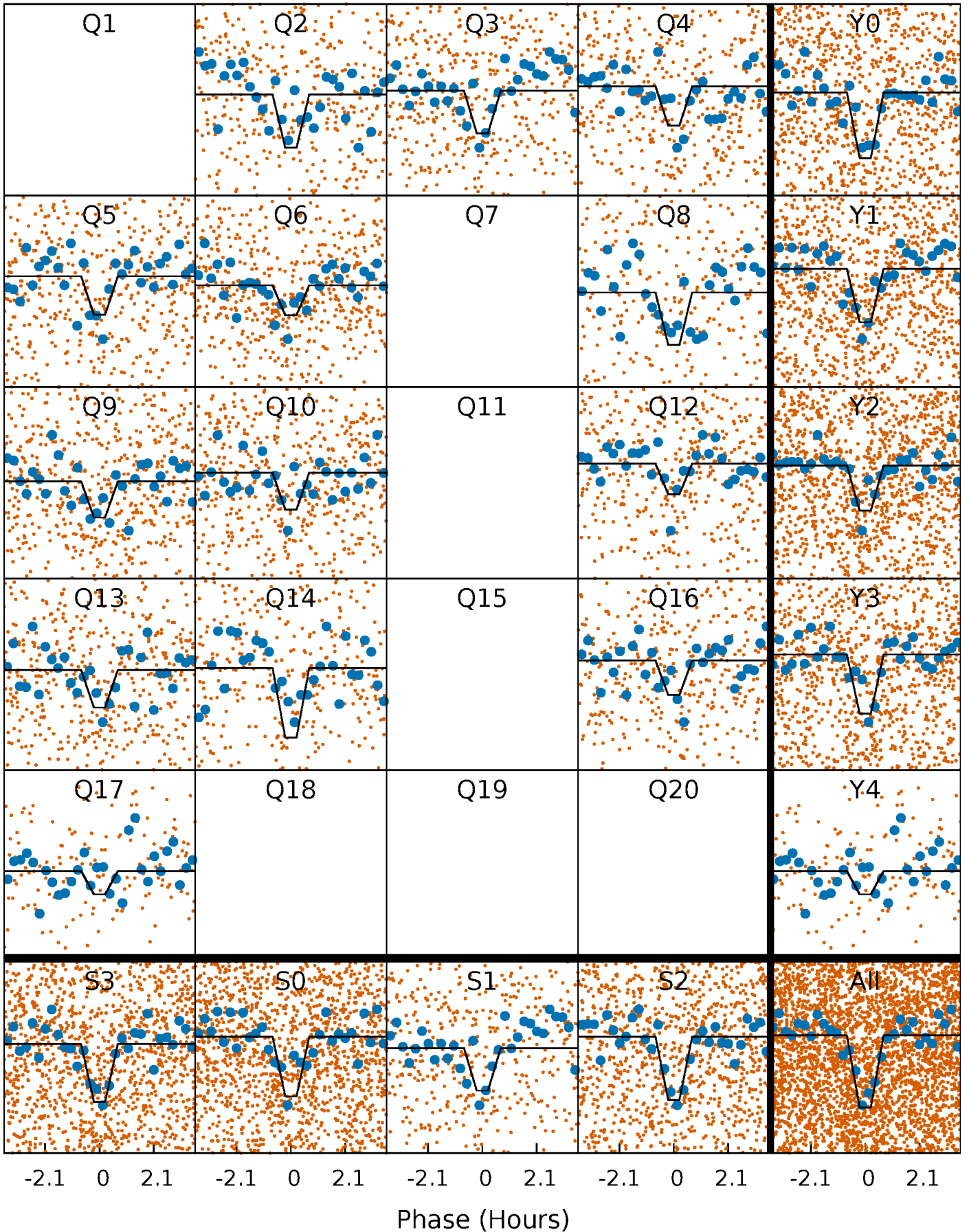
# DV Quarter-Phased Transit Curves

TCE 009419020-01   P= 2.401689 Days    $T_0=131.799283$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

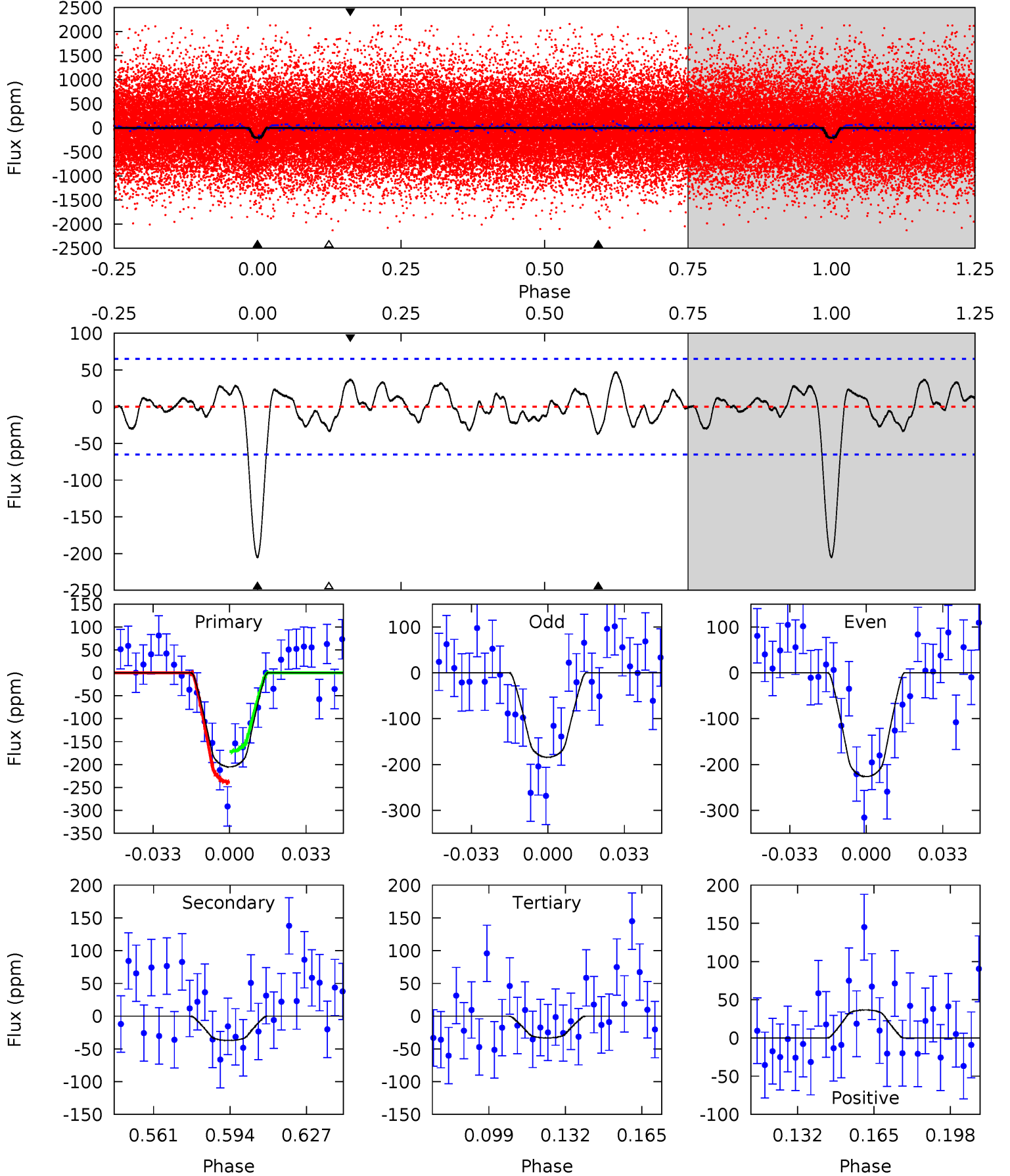
TCE 009419020-01 P= 2.401740 Days  $T_0=131.783290$  (BKJD)



# DV Model-Shift Uniqueness Test

009419020-01, P = 2.401689 Days, E = 131.799283 Days

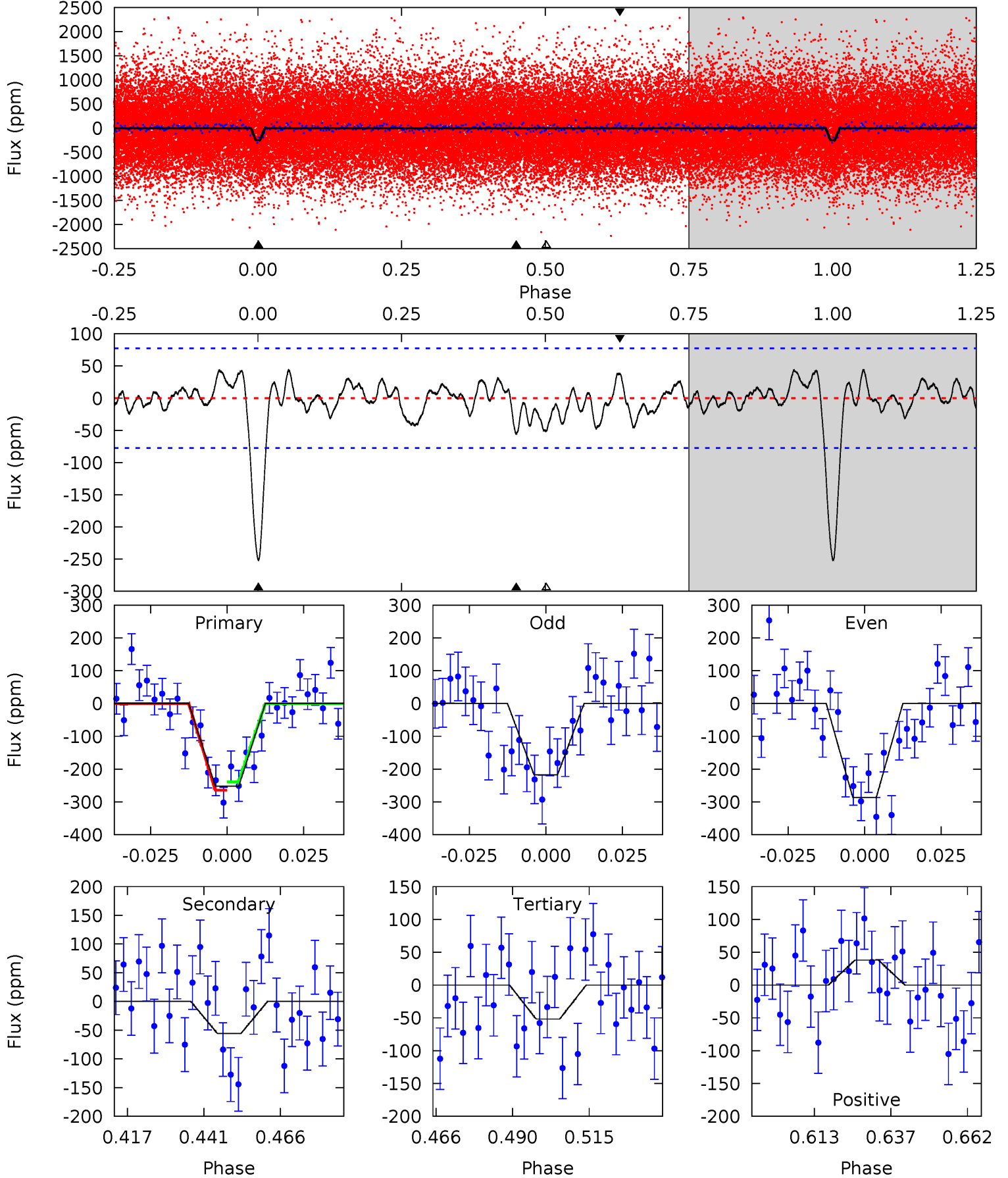
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.1	2.73	2.45	2.70	4.79	2.13	1.22	12.6	12.4	0.28	0.03	1.55	0.87	0.19	2.48



# Alt Model-Shift Uniqueness Test

009419020-01, P = 2.401740 Days, E = 131.783290 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
15.8	3.50	3.25	2.38	4.85	2.25	1.27	12.5	13.4	0.25	1.12	2.17	0.97	0.15	0.79



### Stellar Parameters For KIC 009419020

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3606^{+81}_{-90}$	$4.855^{+0.065}_{-0.052}$	$-0.200^{+0.200}_{-0.200}$	$0.399^{+0.053}_{-0.065}$	$0.415^{+0.050}_{-0.069}$	$9.236^{+3.484}_{-2.135}$
	+2%/-2%	+1%/-1%	+100%/-100%	+13%/-16%	+12%/-17%	+38%/-23%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009419020-01 / KOI 4808.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-37 \pm 14$	$0.79^{+0.52}_{-0.46}$	$866^{+29}_{-29}$	$2611^{+715}_{-326}$	$21^{+98}_{-14}$
Alt.	$-56 \pm 16$	$0.81^{+0.56}_{-0.48}$	$866^{+29}_{-33}$	$2720^{+802}_{-348}$	$30^{+142}_{-21}$

$T_{\text{max}}$  = 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

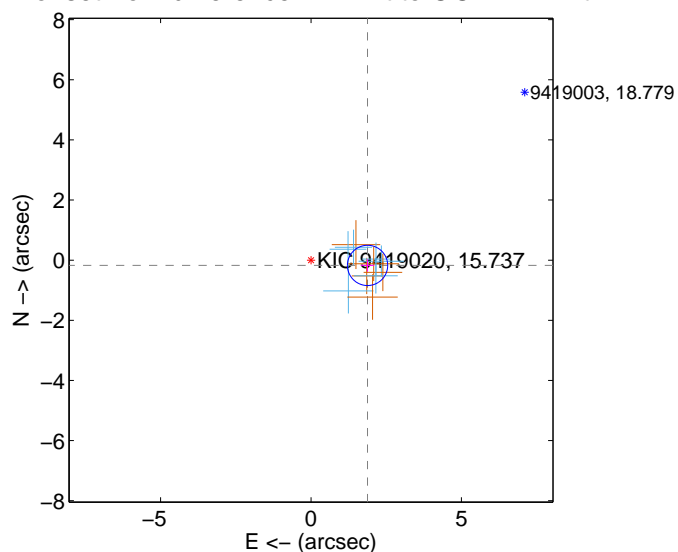
Supplemental centroid analysis for 009419020-01. Kepler magnitude: 15.74. Transit SNR 10.32

There are 6 quarters with good PRF difference image offsets

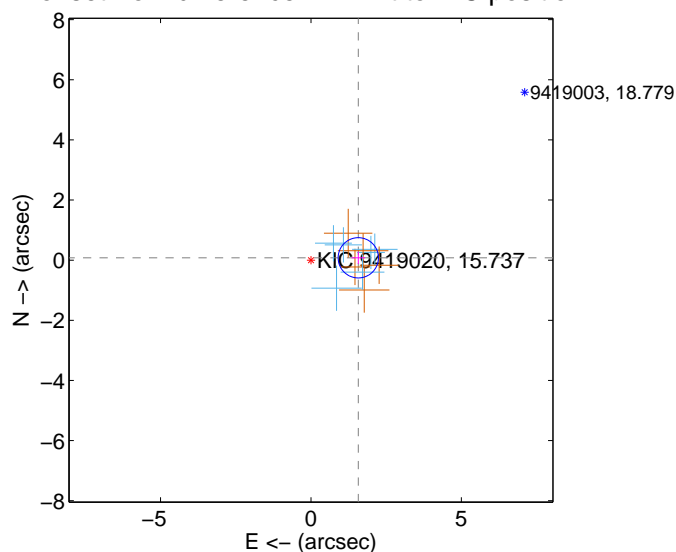
The direct PRF centroid is offset from the target star catalog position by about 0.46 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.889 \pm 0.223$	8.47	$-1.880 \pm 0.223$	$-0.175 \pm 0.204$
PRF-fit source offset from KIC position	$1.577 \pm 0.223$	7.06	$-1.575 \pm 0.223$	$0.079 \pm 0.204$
photometric centroid source offset	$2.84 \pm 1.29$	2.21	$-2.60 \pm 1.25$	$1.16 \pm 1.46$

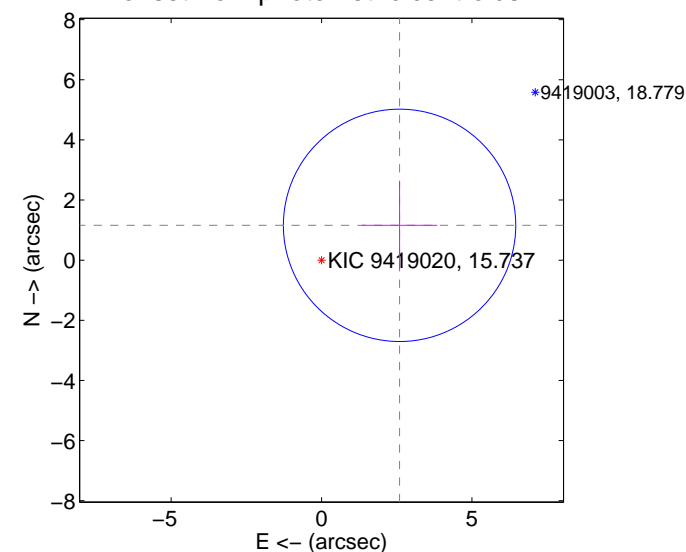
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

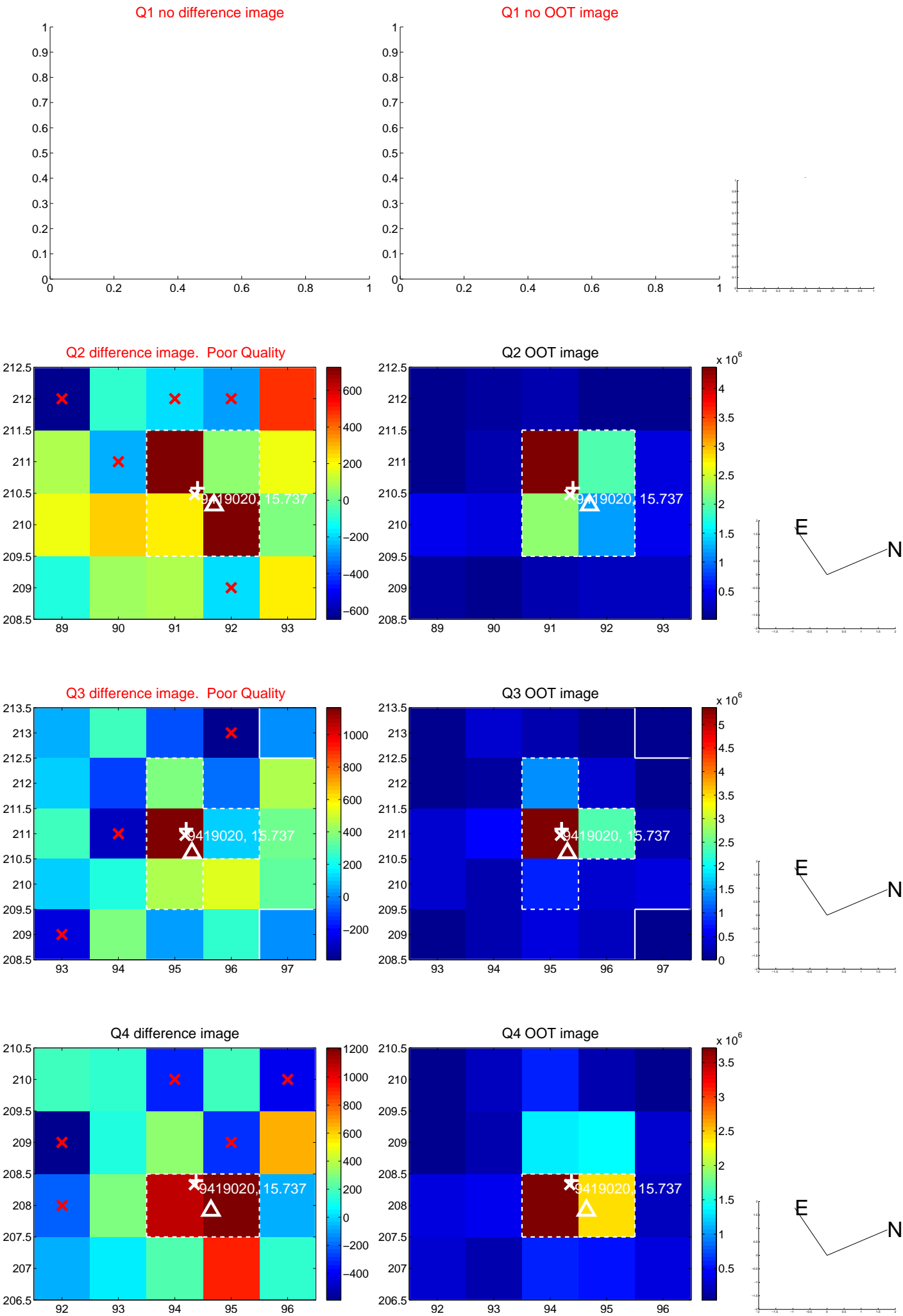


offset from photometric centroids

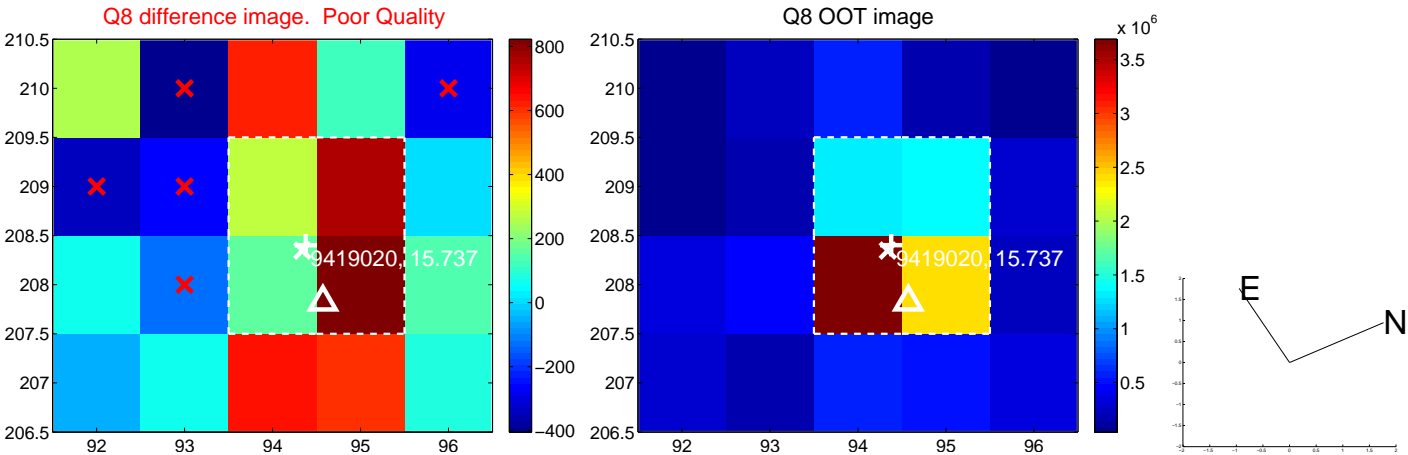
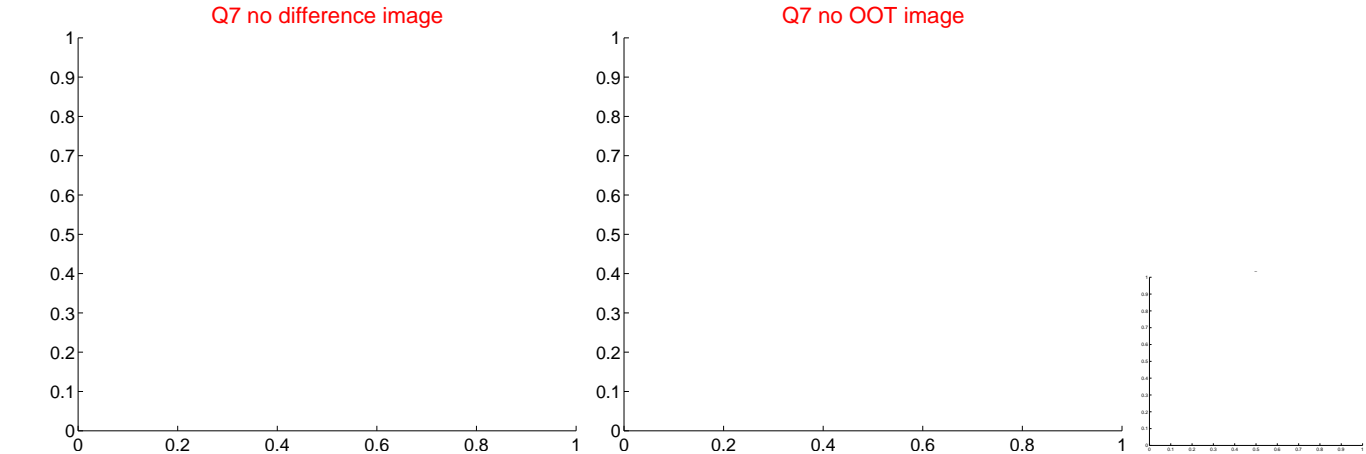
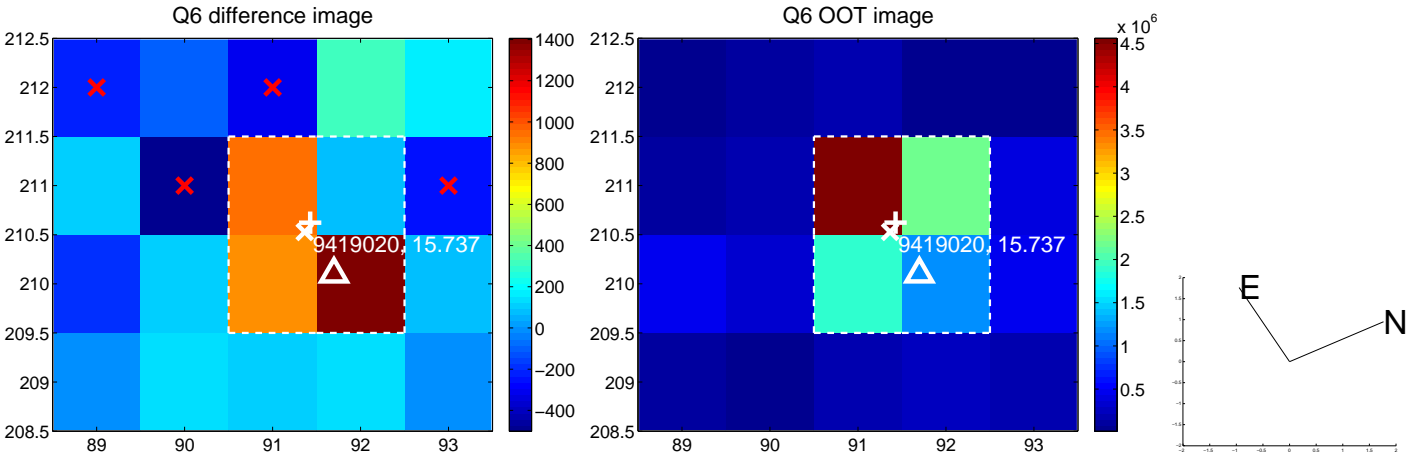
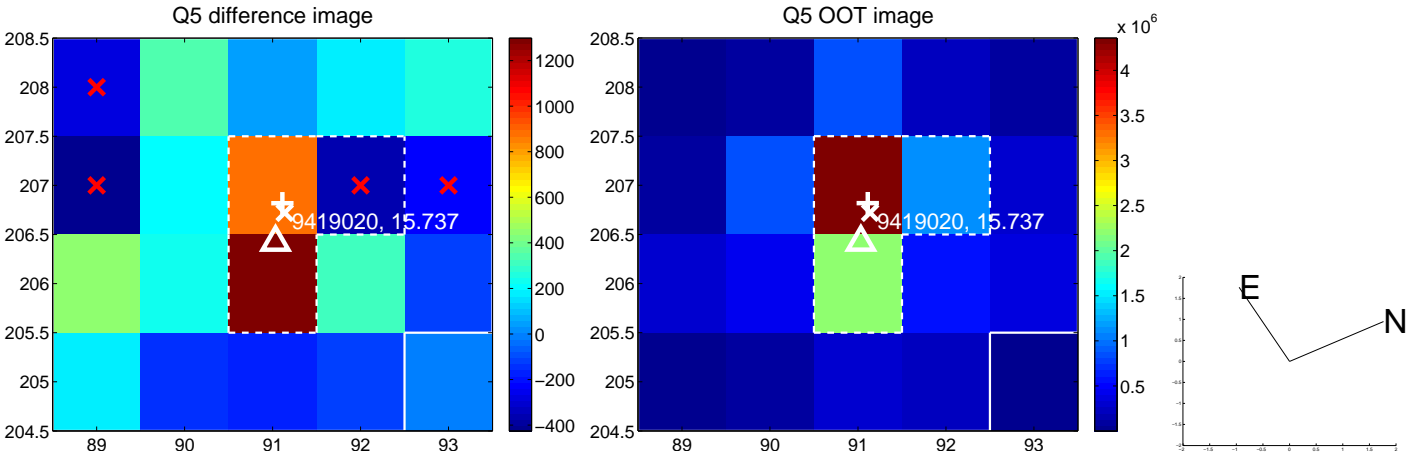


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

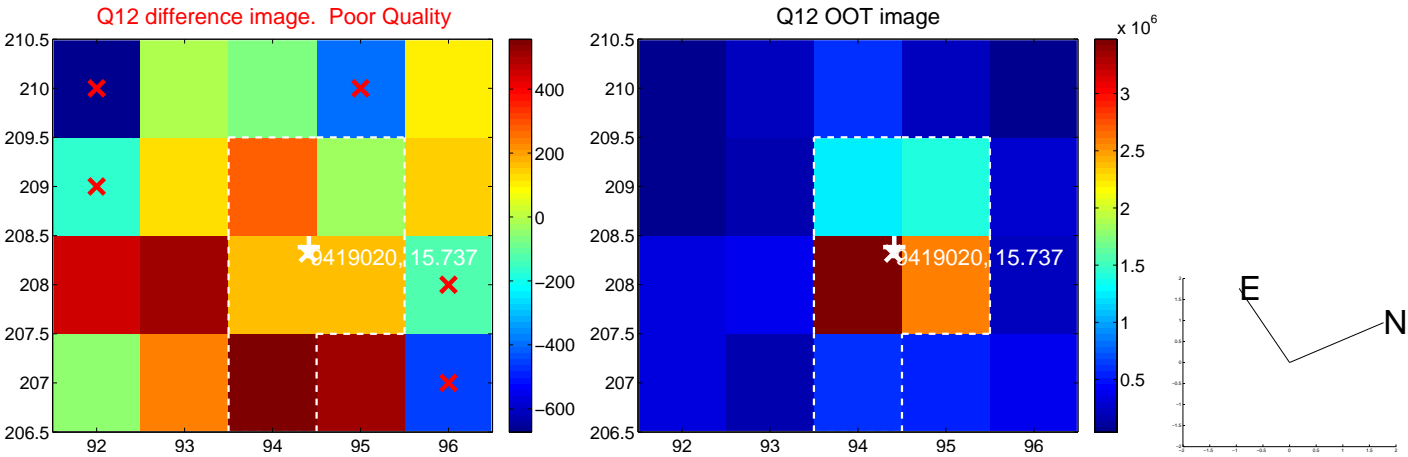
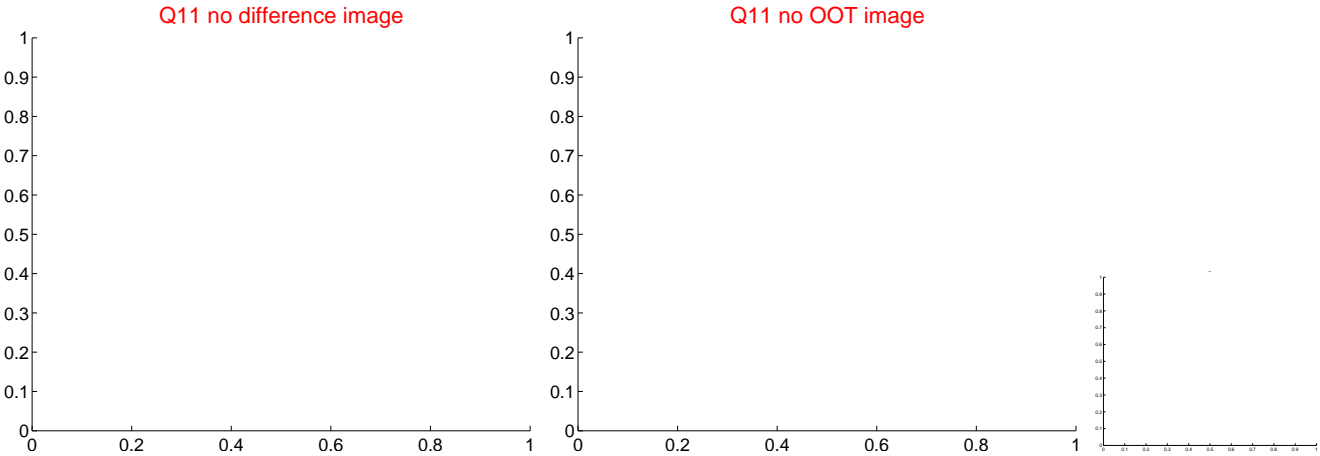
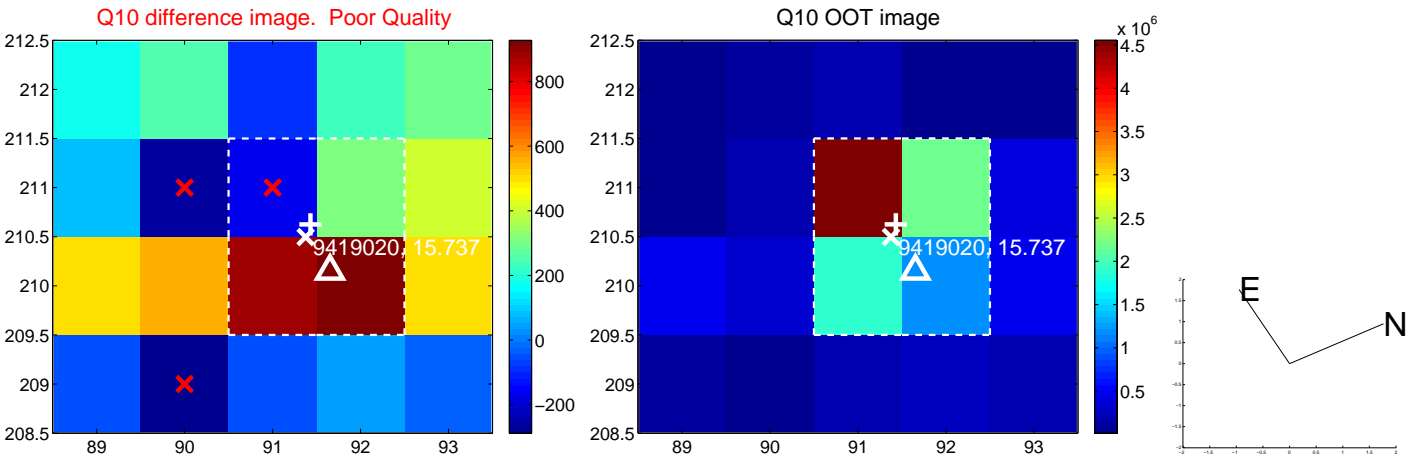
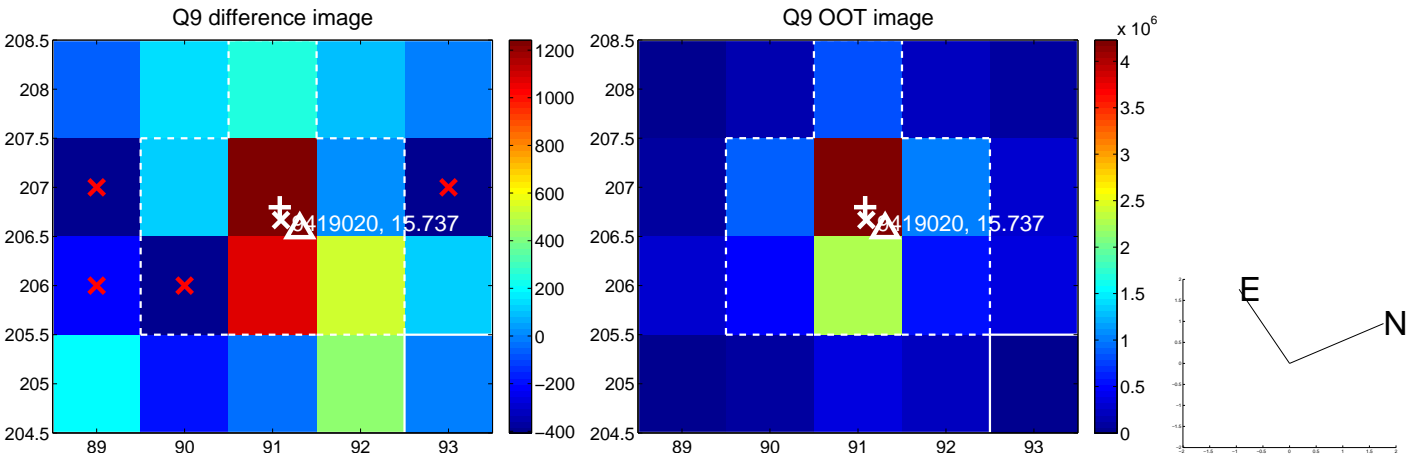
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



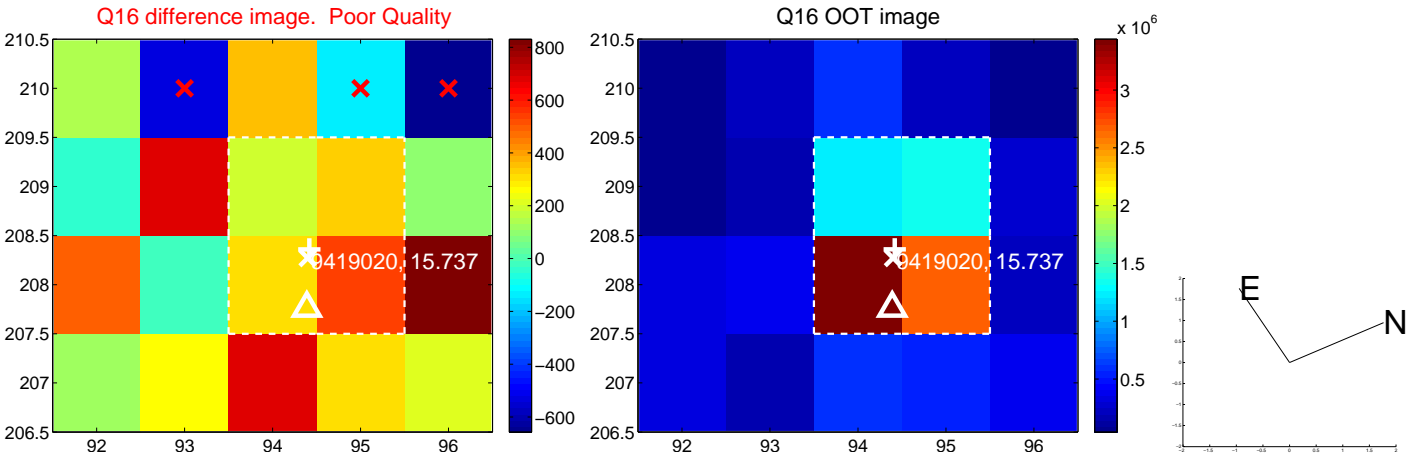
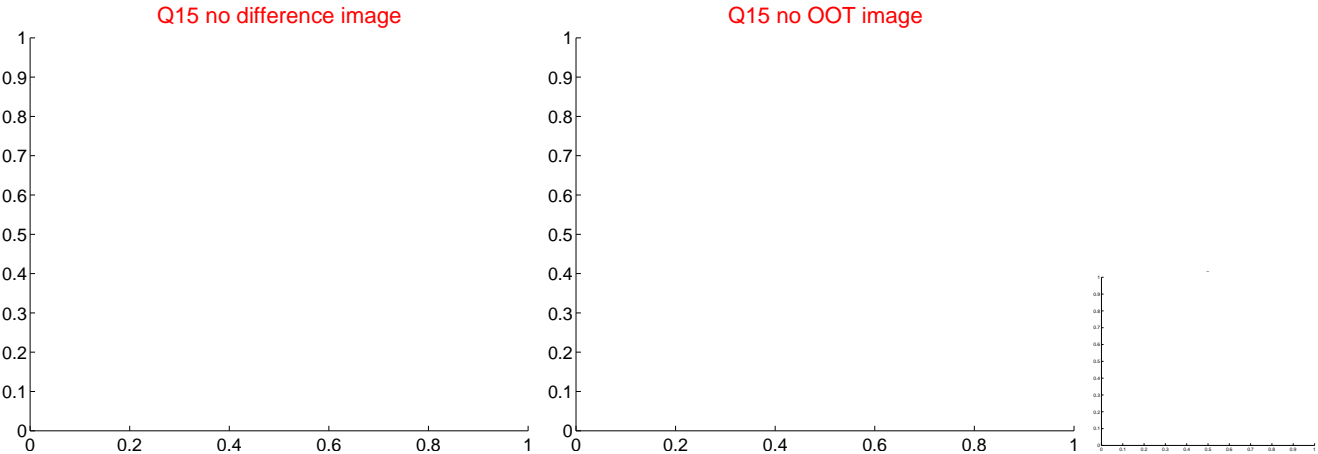
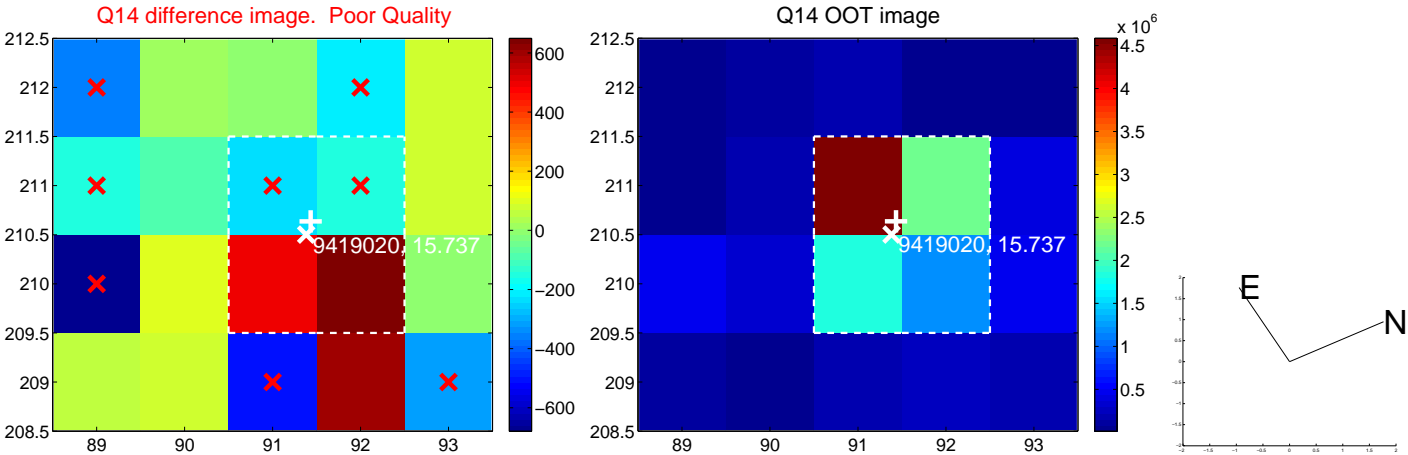
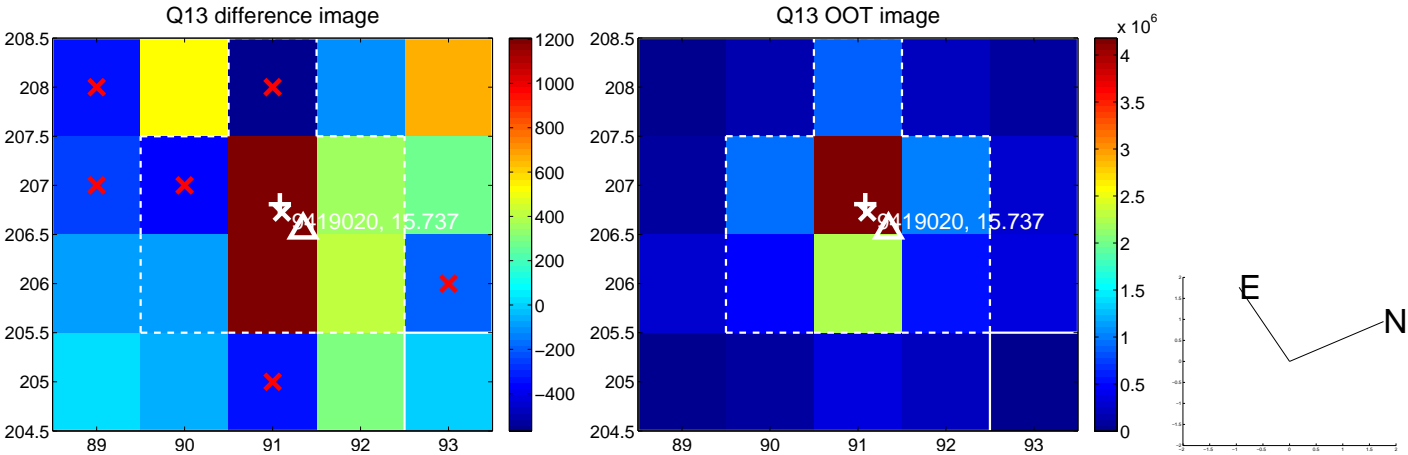
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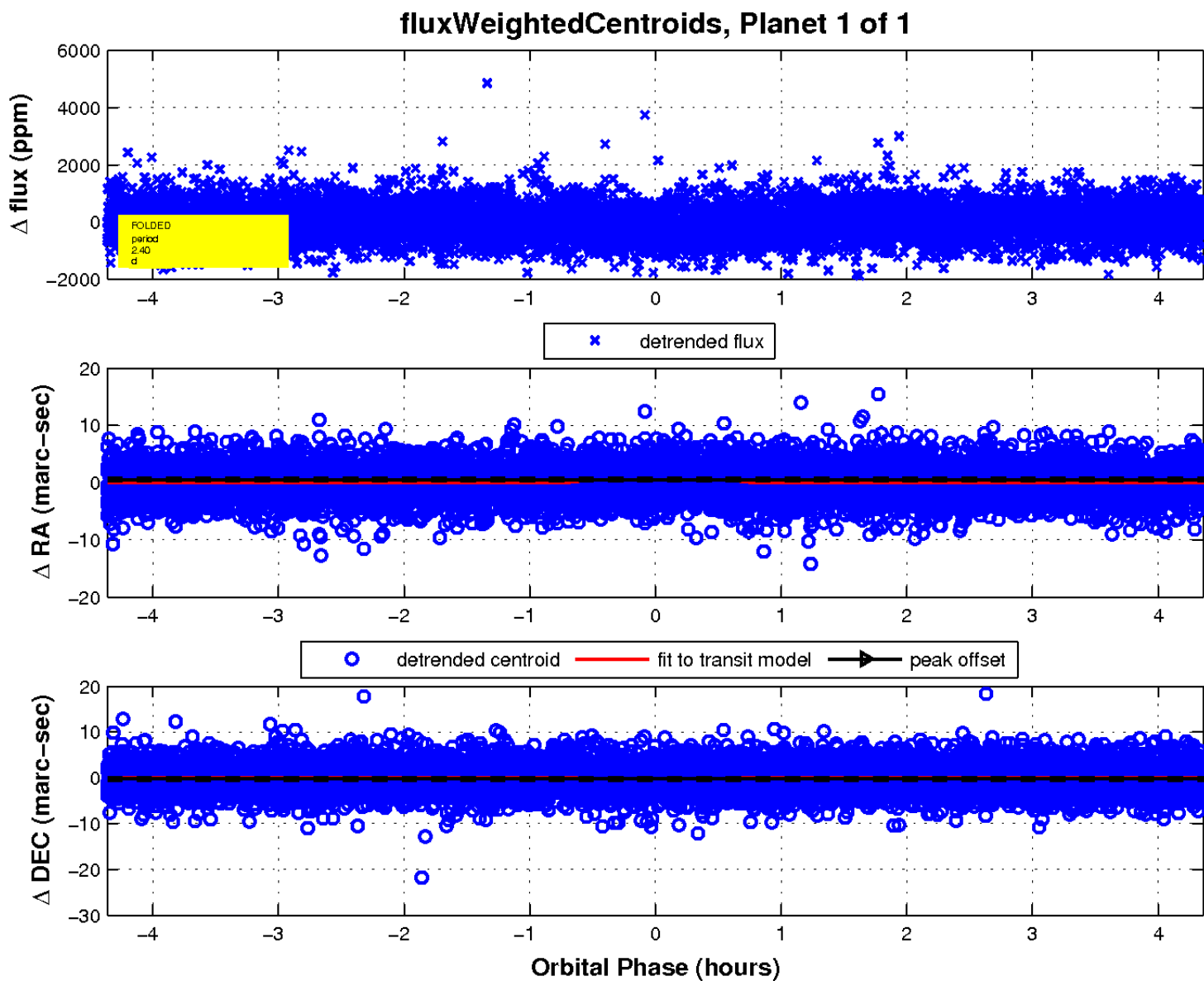
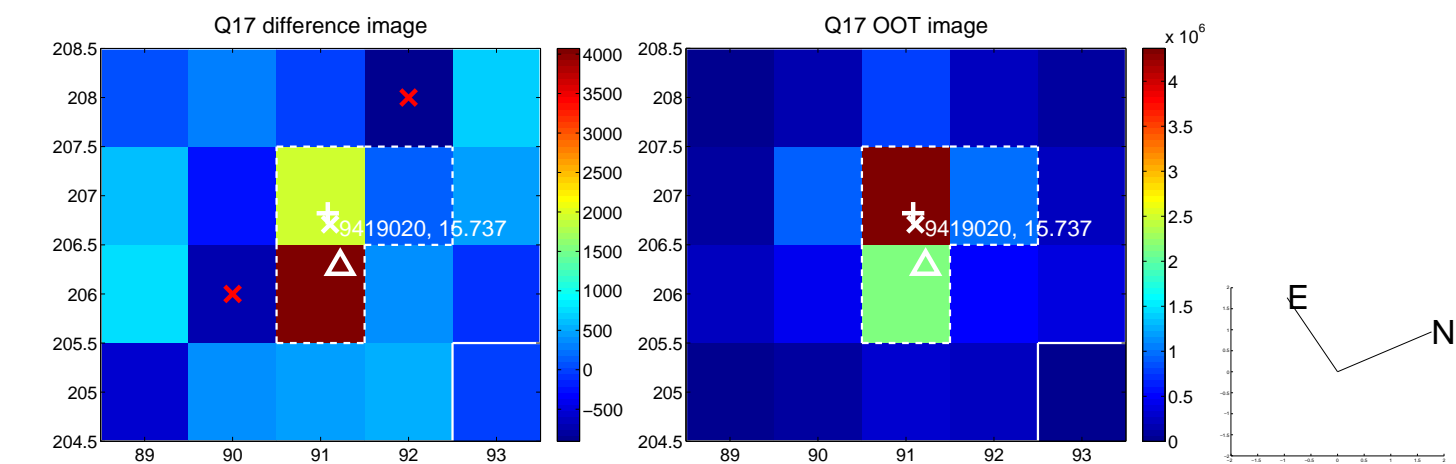


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

