

# KIC 009304821

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009304821-01	OBS	No	1.270948	132.727276	96.6	9.906	8.2	8.9	0.94	5942	0.92	1827.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009304821-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET

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

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

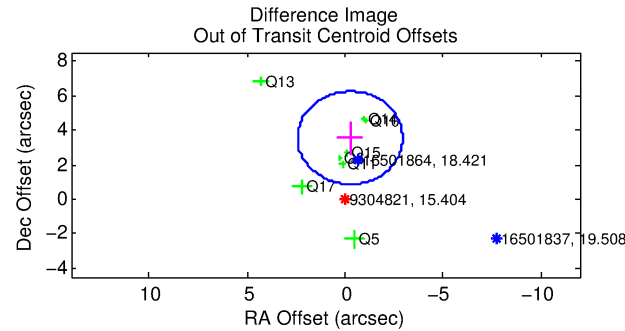
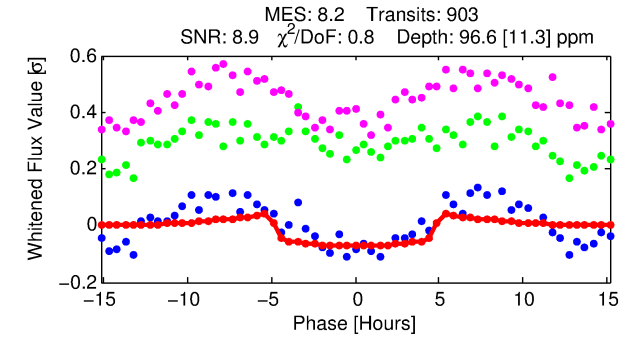
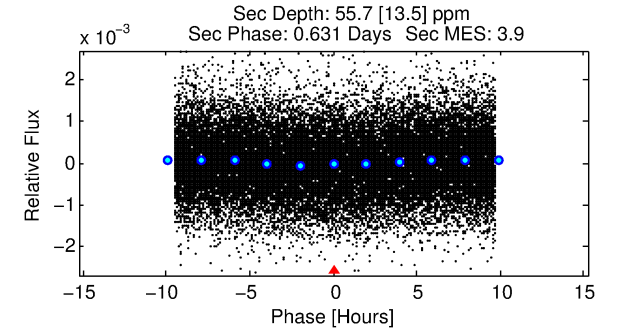
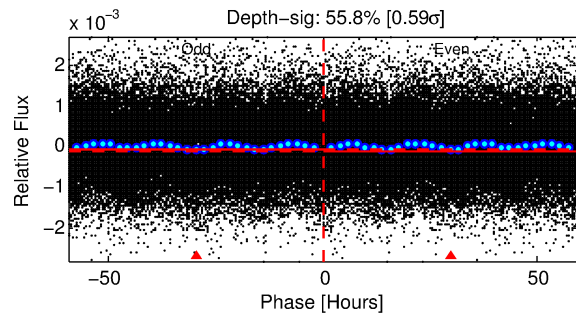
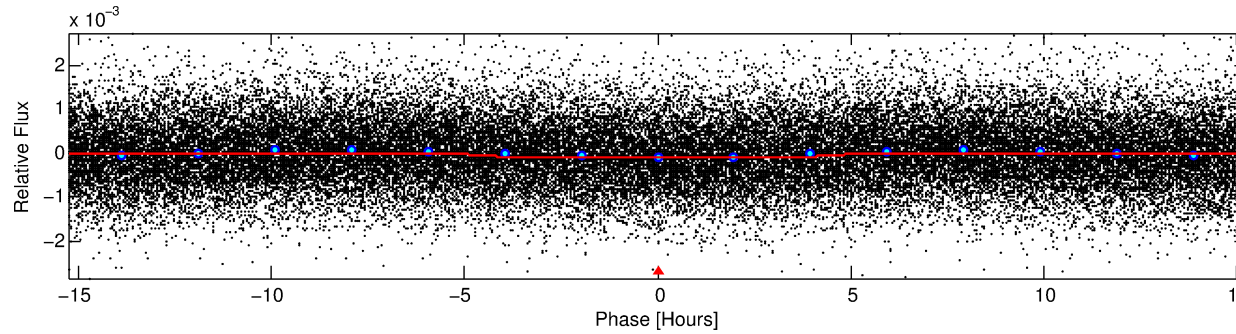
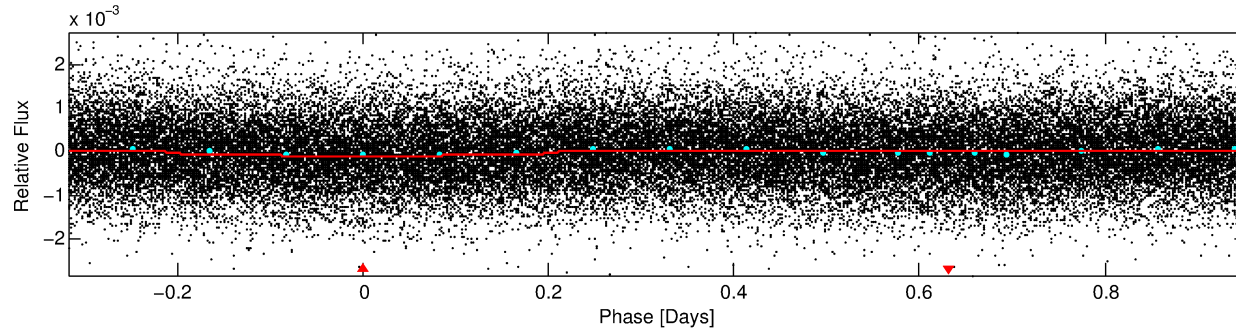
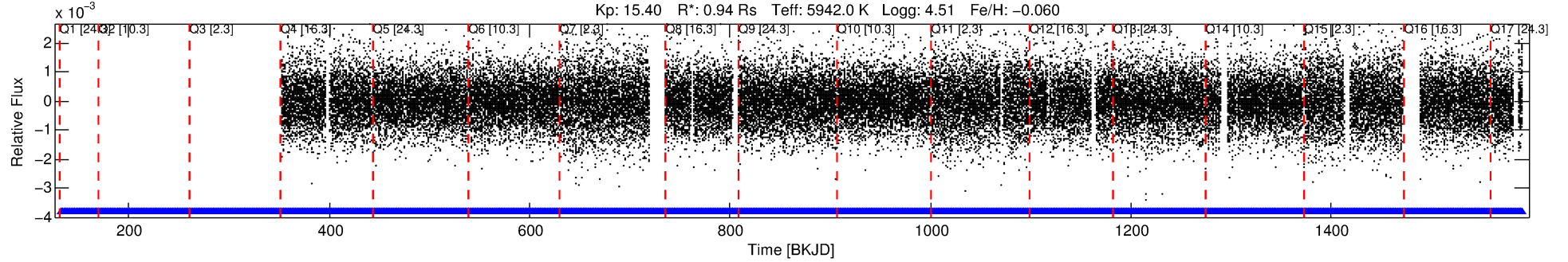
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009304821-01

No Significant Match Found

# DV One-Page Summary

KIC: 9304821 Candidate: 1 of 1 Period: 1.271 d



## DV Fit Results:

Period = 1.27095 [0.00002] d  
Epoch = 132.7273 [0.0066] BKJD  
Rp/R\* = 0.0089 [0.0107]  
a/R\* = 1.18 [1.87]  
b = 0.00 [1535.71]  
Seff = 1827.78 [699.43]  
Teq = 1667 [160] K  
Rp = 0.92 [1.12] Re  
a = 0.0232 [0.0056] AU  
Ag = 19.63 [47.63] [0.39 $\sigma$ ]  
Teffp = 5426 [3263] K [1.15 $\sigma$ ]

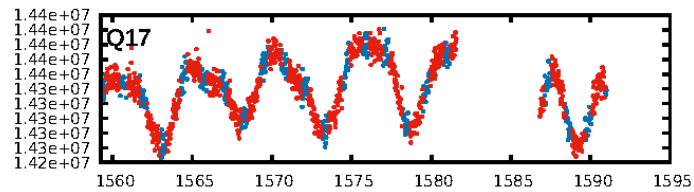
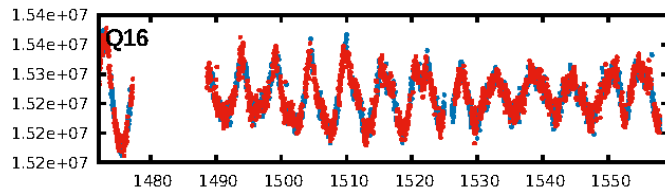
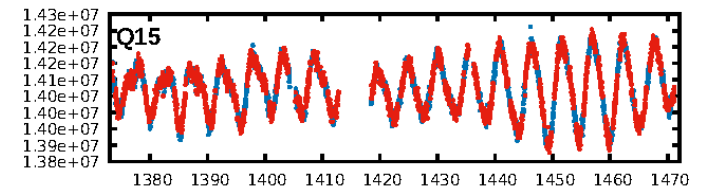
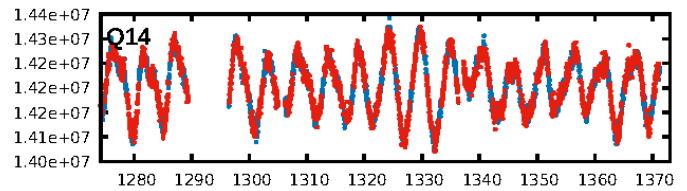
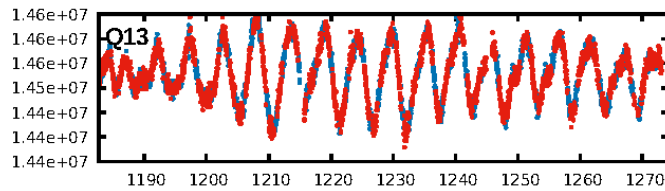
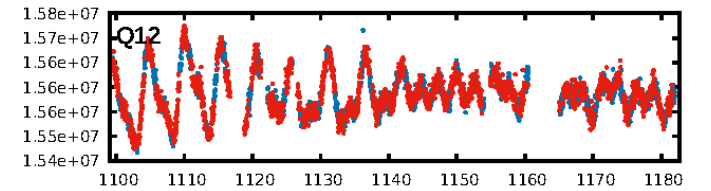
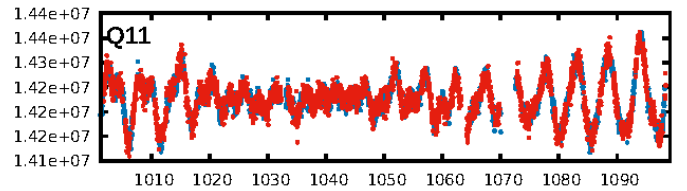
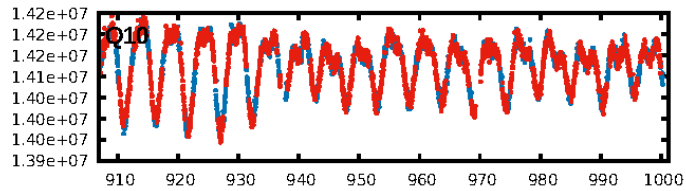
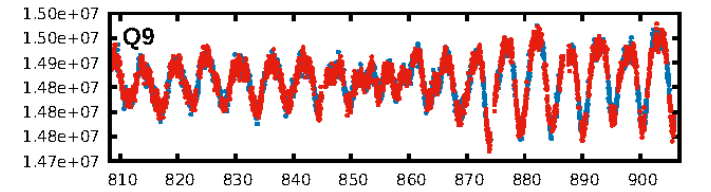
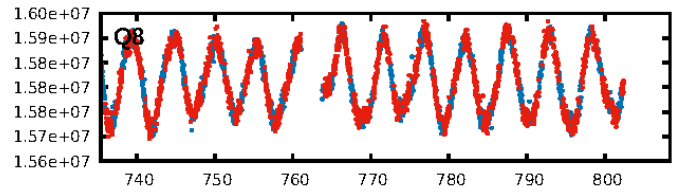
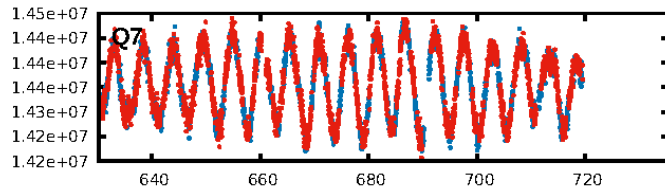
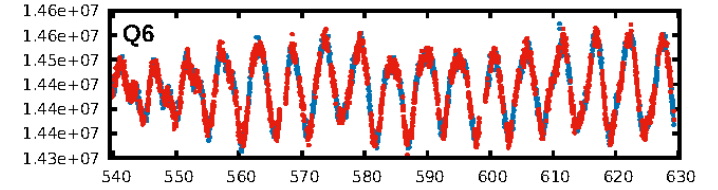
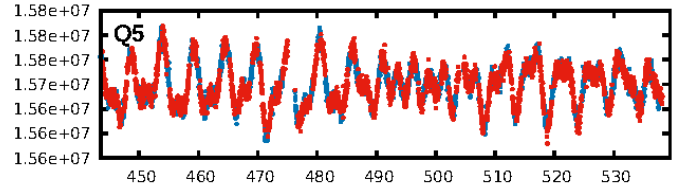
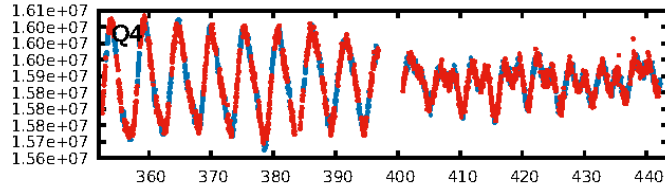
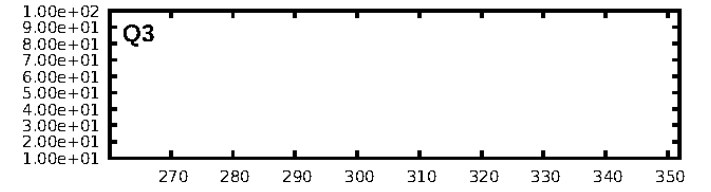
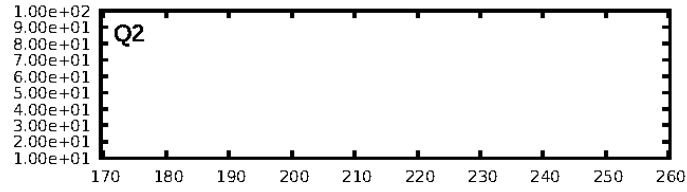
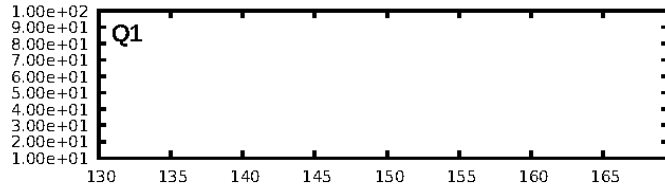
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.63e-01  
RollingBand-fgt: 1.00 [881/881]  
GhostDiagnostic-chr: -0.6392  
Centroid-sig: 0.0%  
Centroid-so: 8.681 arcsec [5.57 $\sigma$ ]  
OotOffset-rm: 3.562 arcsec [3.98 $\sigma$ ]  
KicOffset-rm: 6.068 arcsec [5.40 $\sigma$ ]  
OotOffset-st: 3/2/0/3 [8]  
KicOffset-st: 3/2/0/3 [8]  
DiffImageQuality-fgm: 0.38 [3/8]  
DiffImageOverlap-fno: 1.00 [14/14]

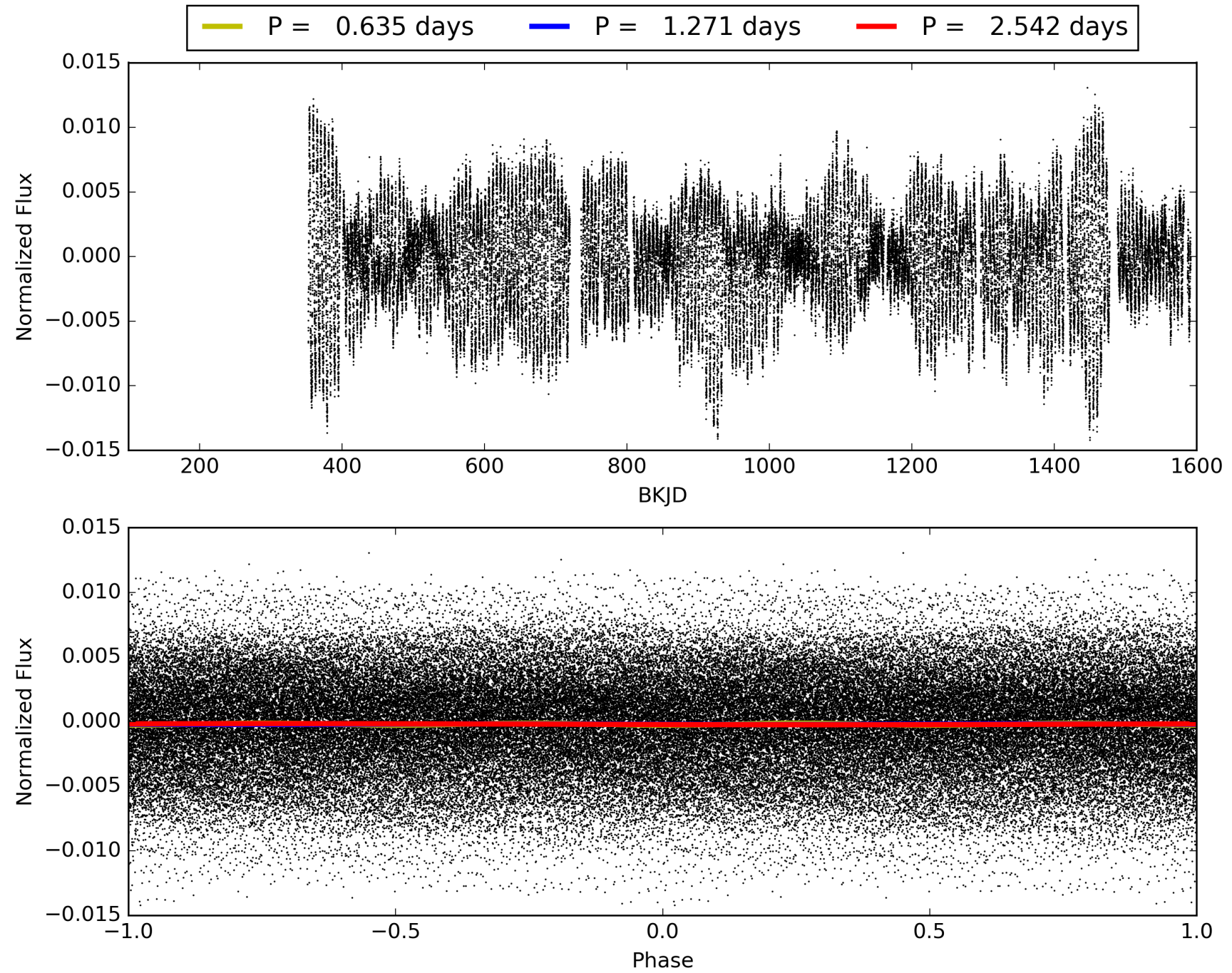
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:08:30 Z

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

# TCE 009304821-01, PDC Light Curves

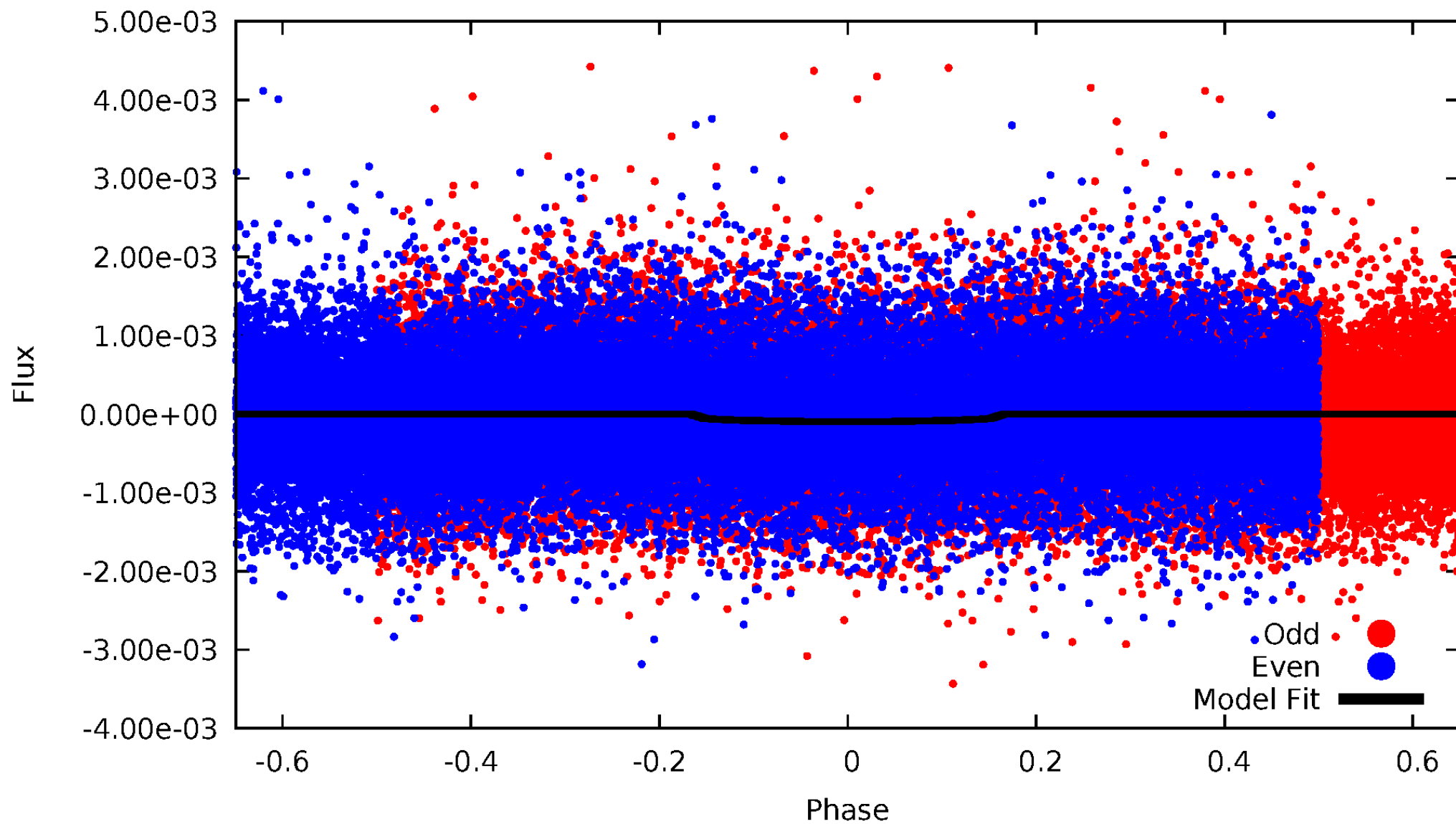


TCE 009304821-01



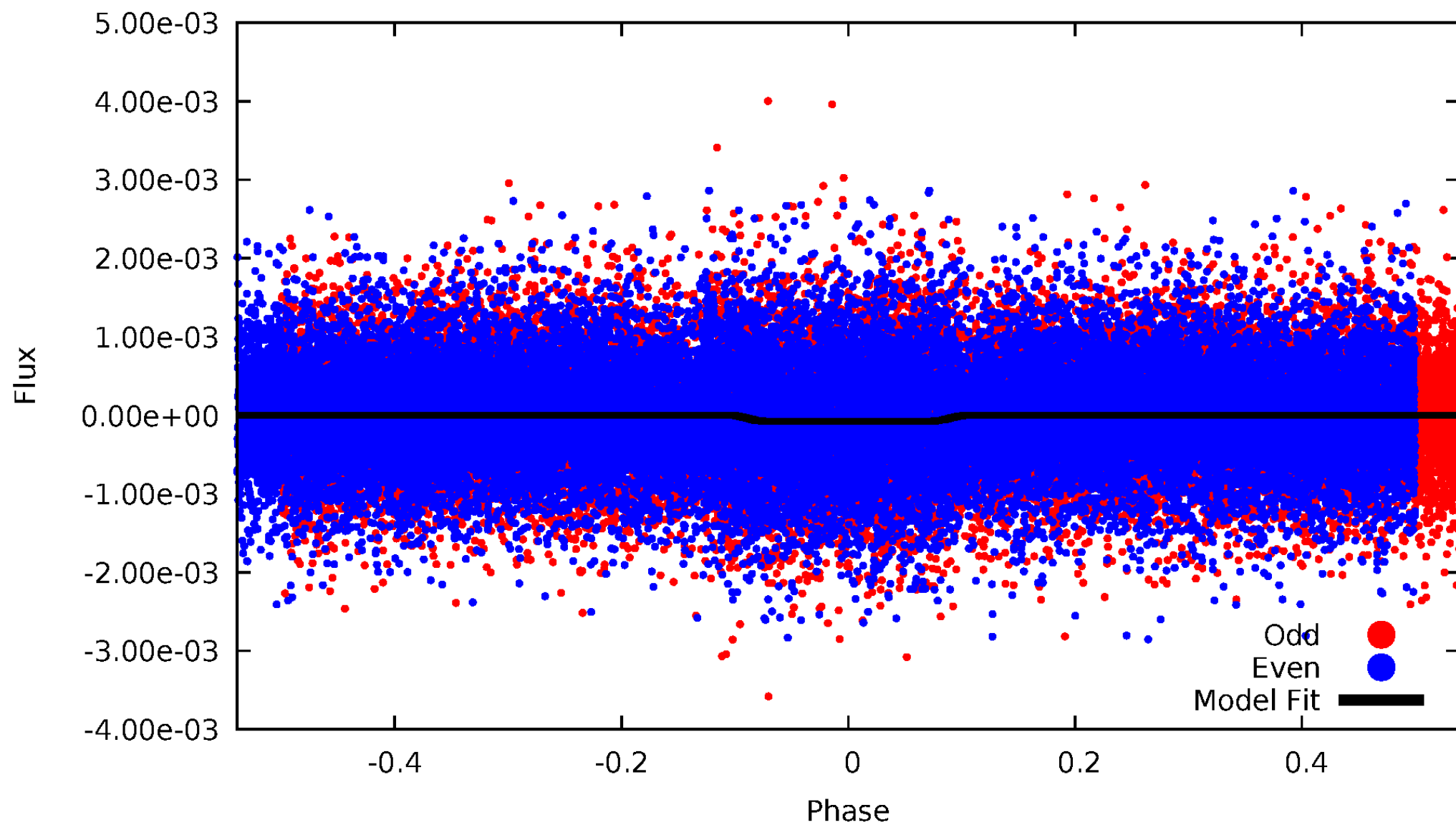
# DV Odd/Even

TCE 009304821-01



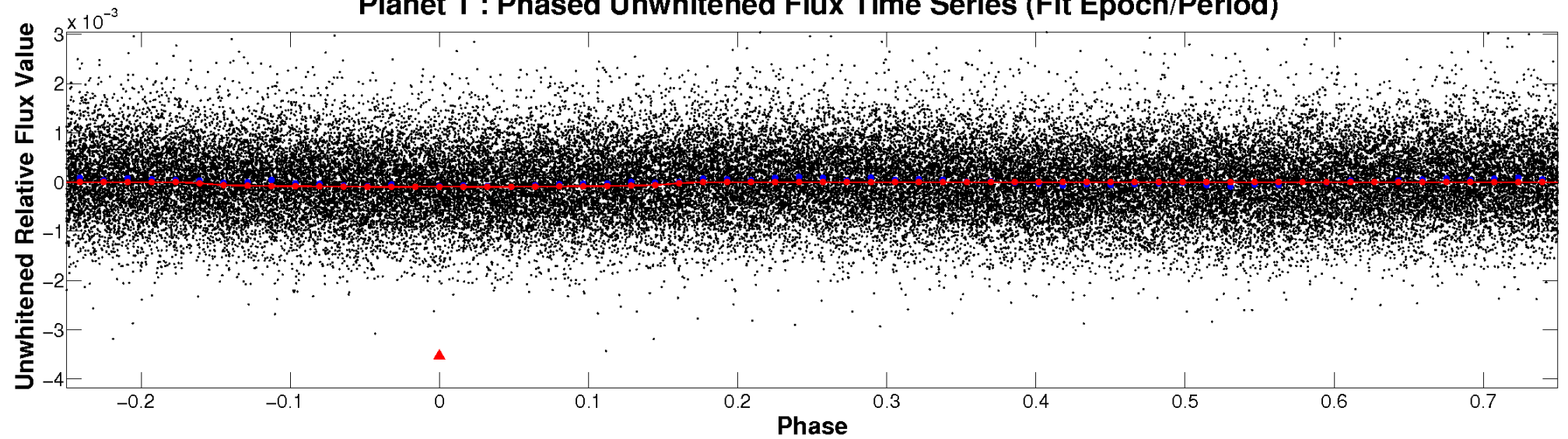
# ALT Odd/Even

TCE 009304821-01

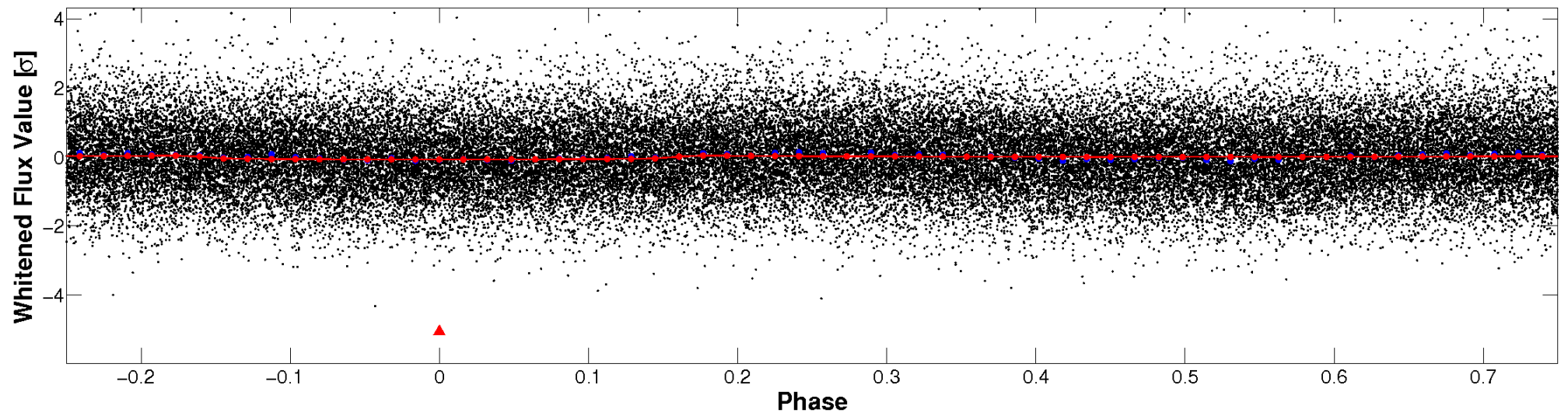


# Non-Whitened Vs. Whitened Light Curve

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

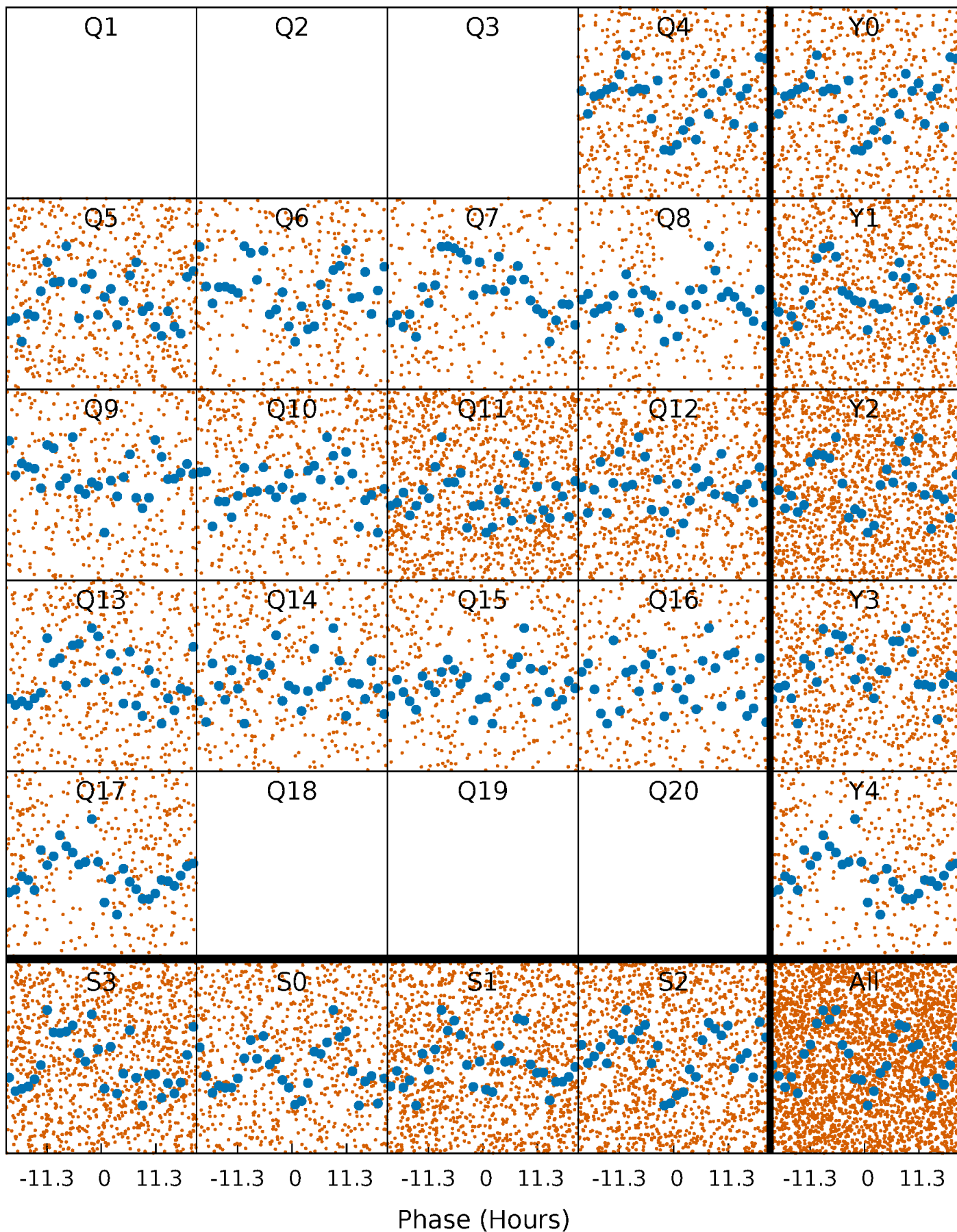


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



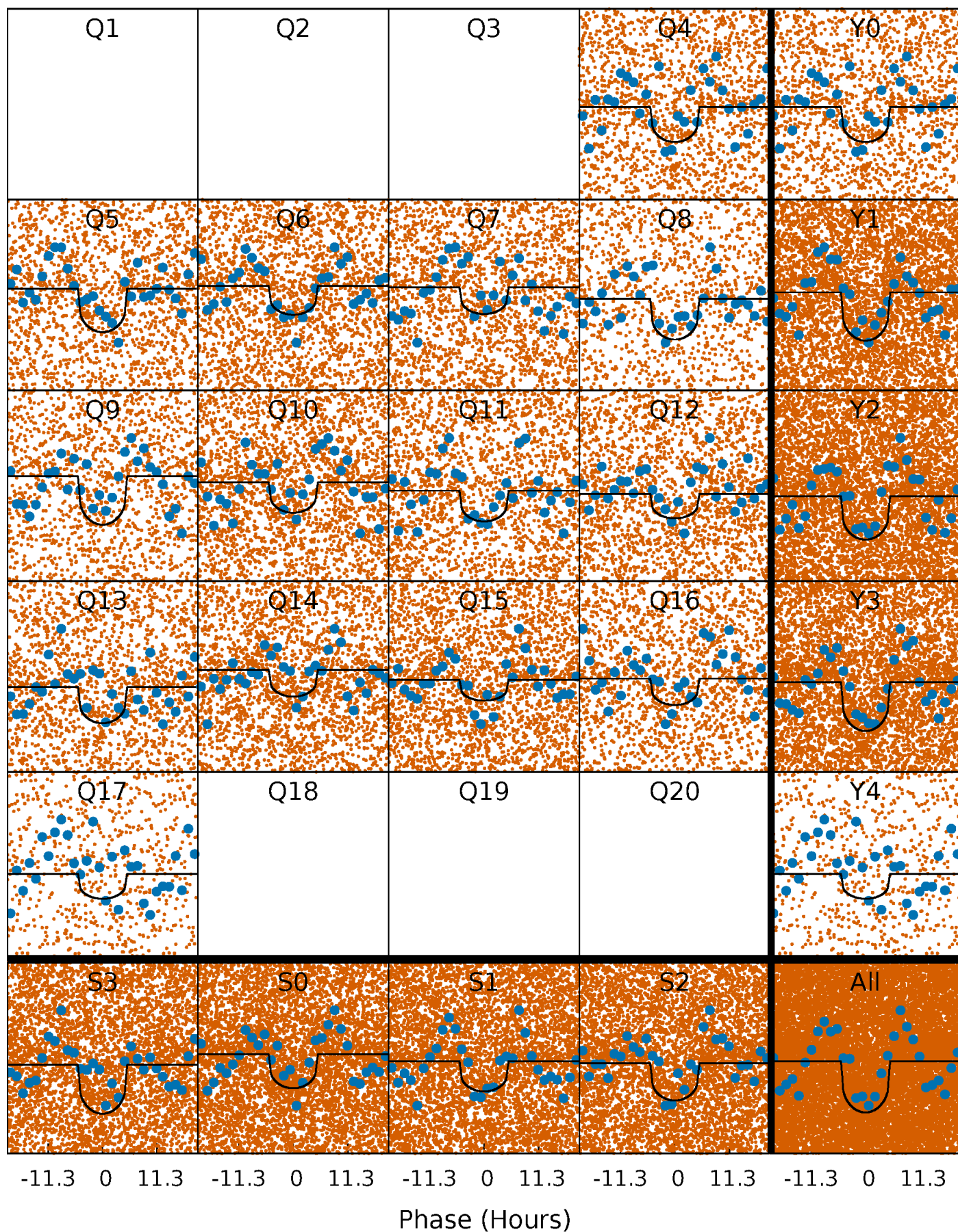
# PDC Quarter-Phased Transit Curves

TCE 009304821-01 P= 1.270948 Days  $T_0=132.727276$  (BKJD)



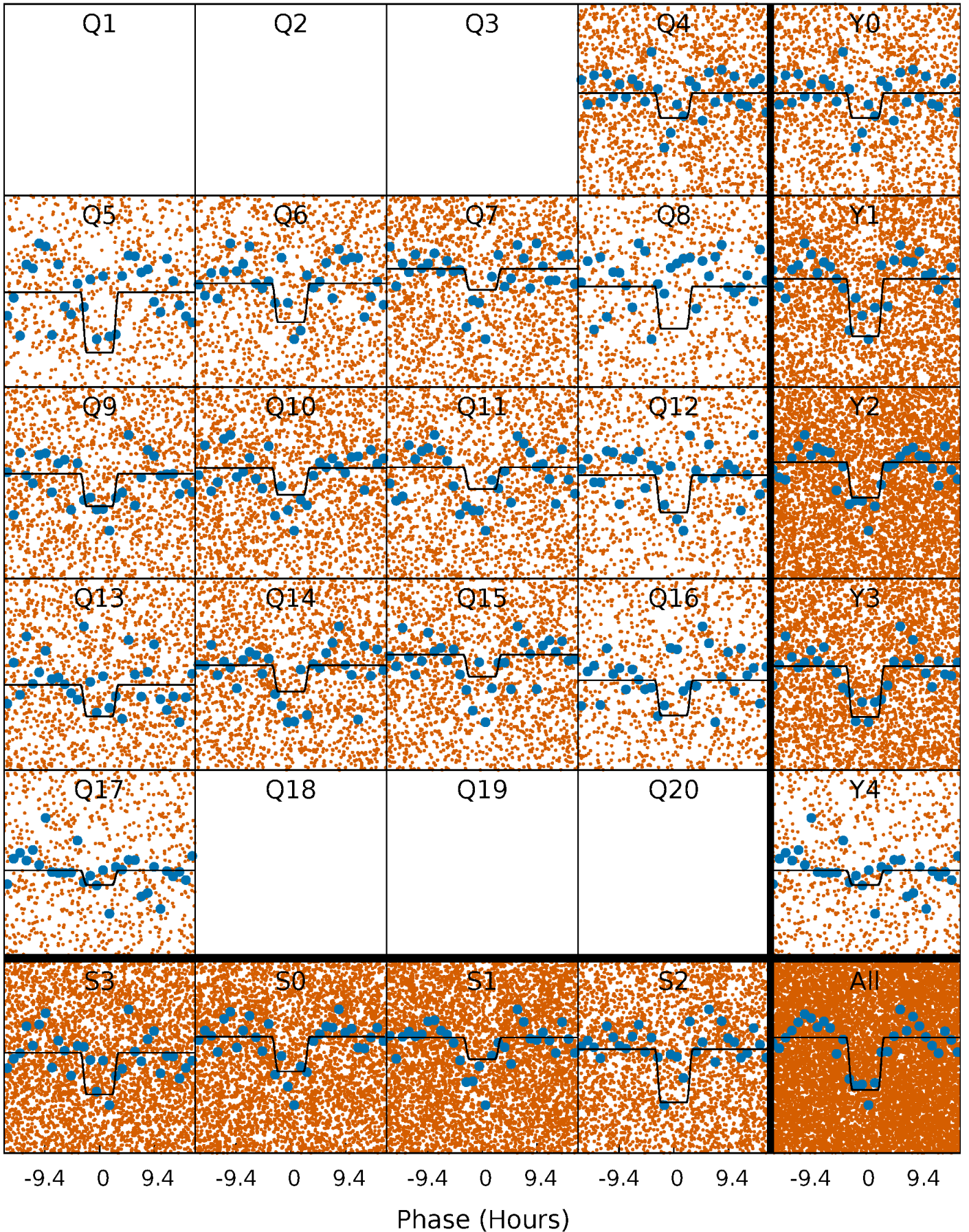
# DV Quarter-Phased Transit Curves

TCE 009304821-01 P= 1.270948 Days  $T_0=132.727276$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

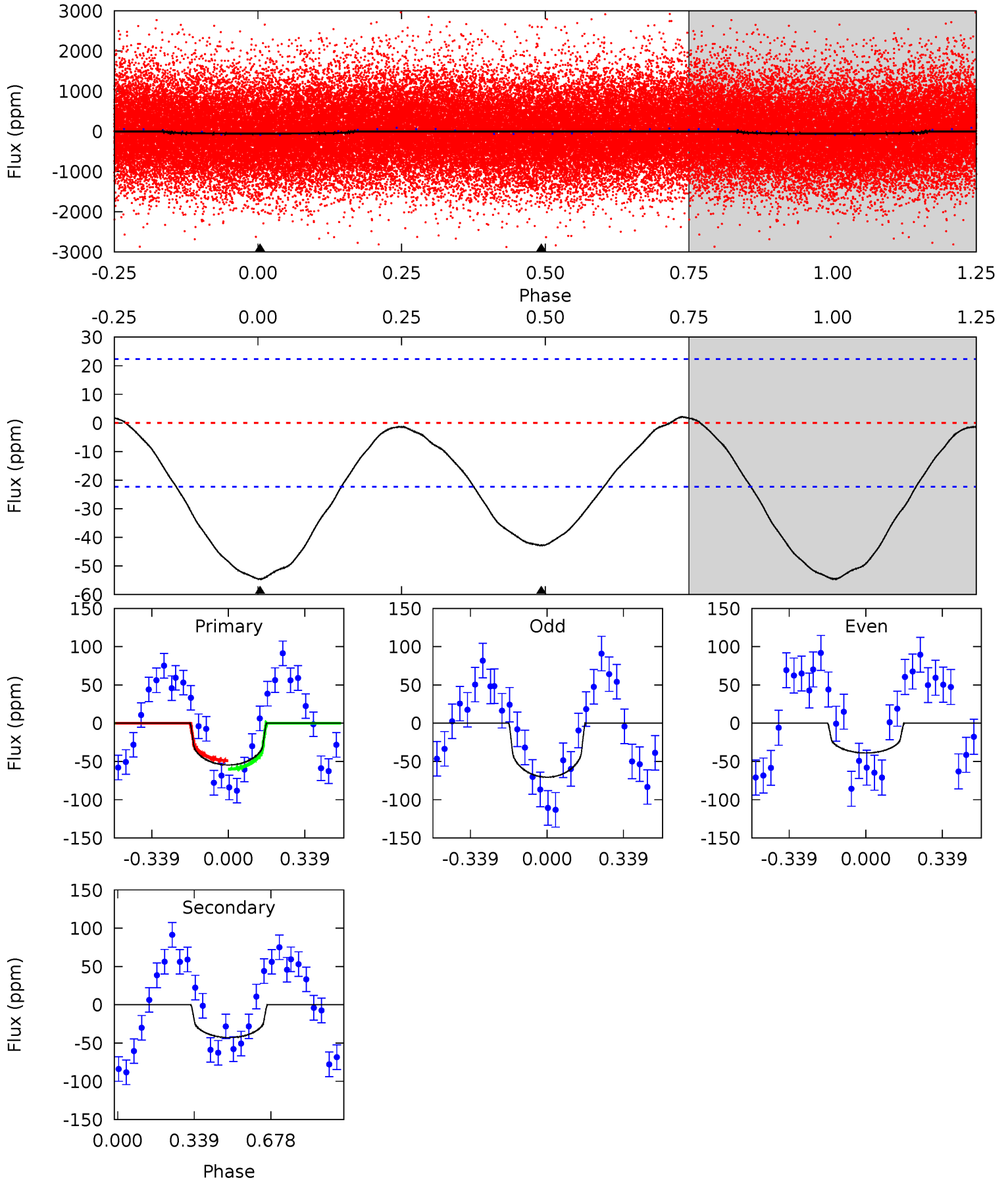
TCE 009304821-01 P= 1.271012 Days  $T_0=132.717116$  (BKJD)



# DV Model-Shift Uniqueness Test

009304821-01, P = 1.270948 Days, E = 132.727276 Days

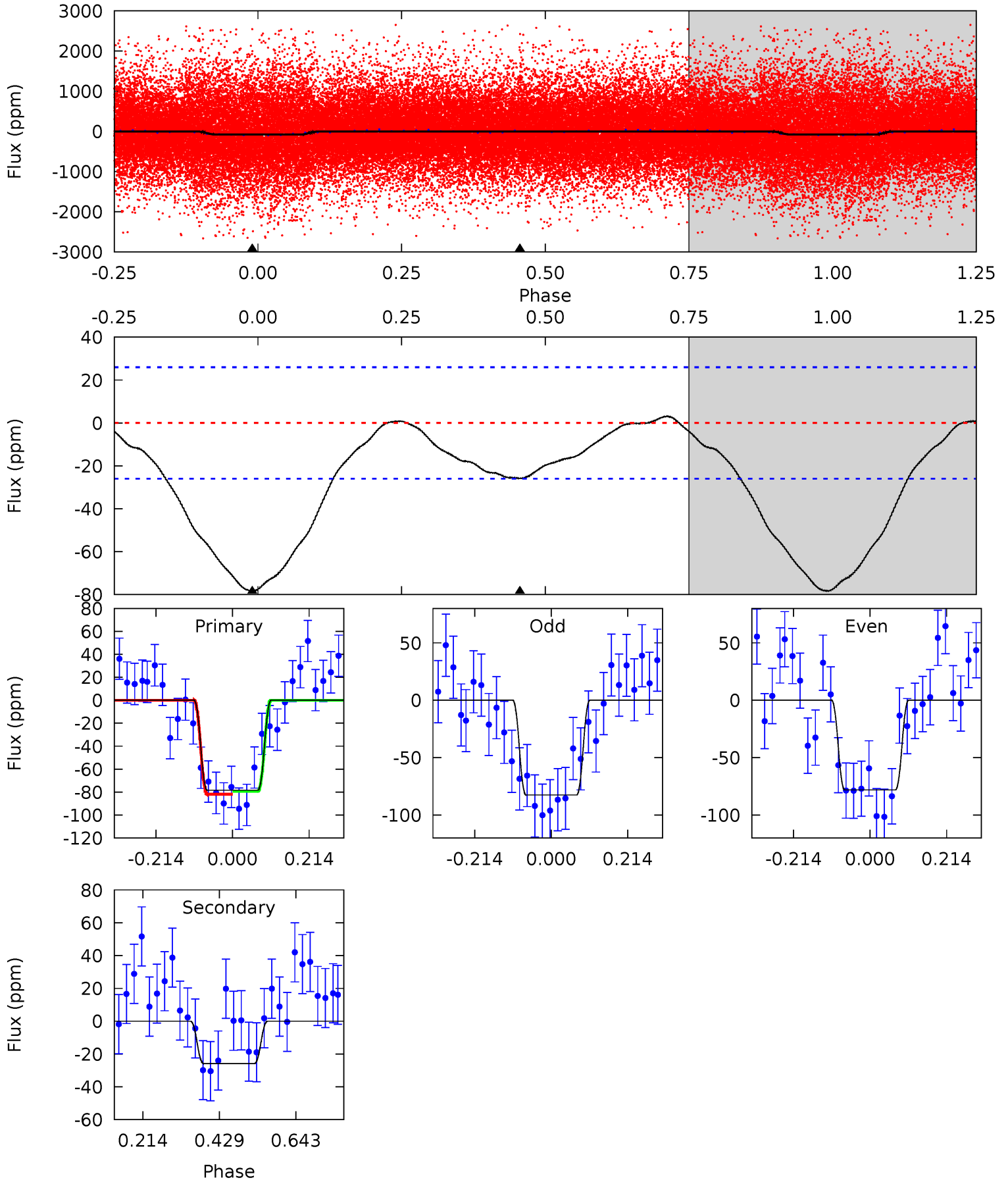
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	8.26	0	0	4.30	0.96	0.30	10.5	10.5	8.26	8.26	3.05	0.89	0.04	1.08



# Alt Model-Shift Uniqueness Test

009304821-01, P = 1.271012 Days, E = 132.717116 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
13.3	4.38	0	0	4.40	1.24	0.59	13.3	13.3	4.38	4.38	0.37	1.05	0.04	0.22



### Stellar Parameters For KIC 009304821

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5942^{+187}_{-228}$	$4.506^{+0.048}_{-0.192}$	$-0.060^{+0.250}_{-0.300}$	$0.938^{+0.267}_{-0.089}$	$1.028^{+0.119}_{-0.146}$	$1.756^{+0.457}_{-0.879}$
	+3%/-4%	+1%/-4%	+417%/-500%	+28%/-9%	+12%/-14%	+26%/-50%
Source	KIC0	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 009304821-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-43 \pm 5$	$1.28^{+1.00}_{-0.78}$	$2375^{+154}_{-131}$	$4508^{+2647}_{-910}$	$7.669^{+42.177}_{-5.273}$
Alt.	$-26 \pm 6$	$1.24^{+1.04}_{-0.78}$	$2379^{+163}_{-117}$	$4080^{+2522}_{-810}$	$4.582^{+30.999}_{-3.243}$

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

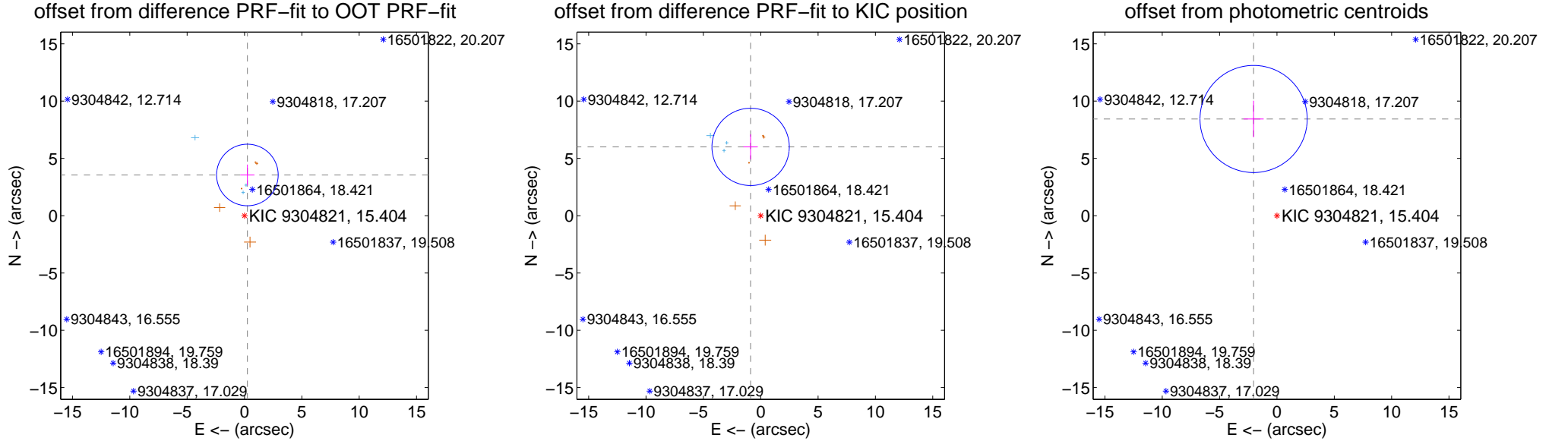
## DV Centroid Data

Supplemental centroid analysis for 009304821-01. Kepler magnitude: 15.40. Transit SNR 8.94

There are 3 quarters with good PRF difference image offsets

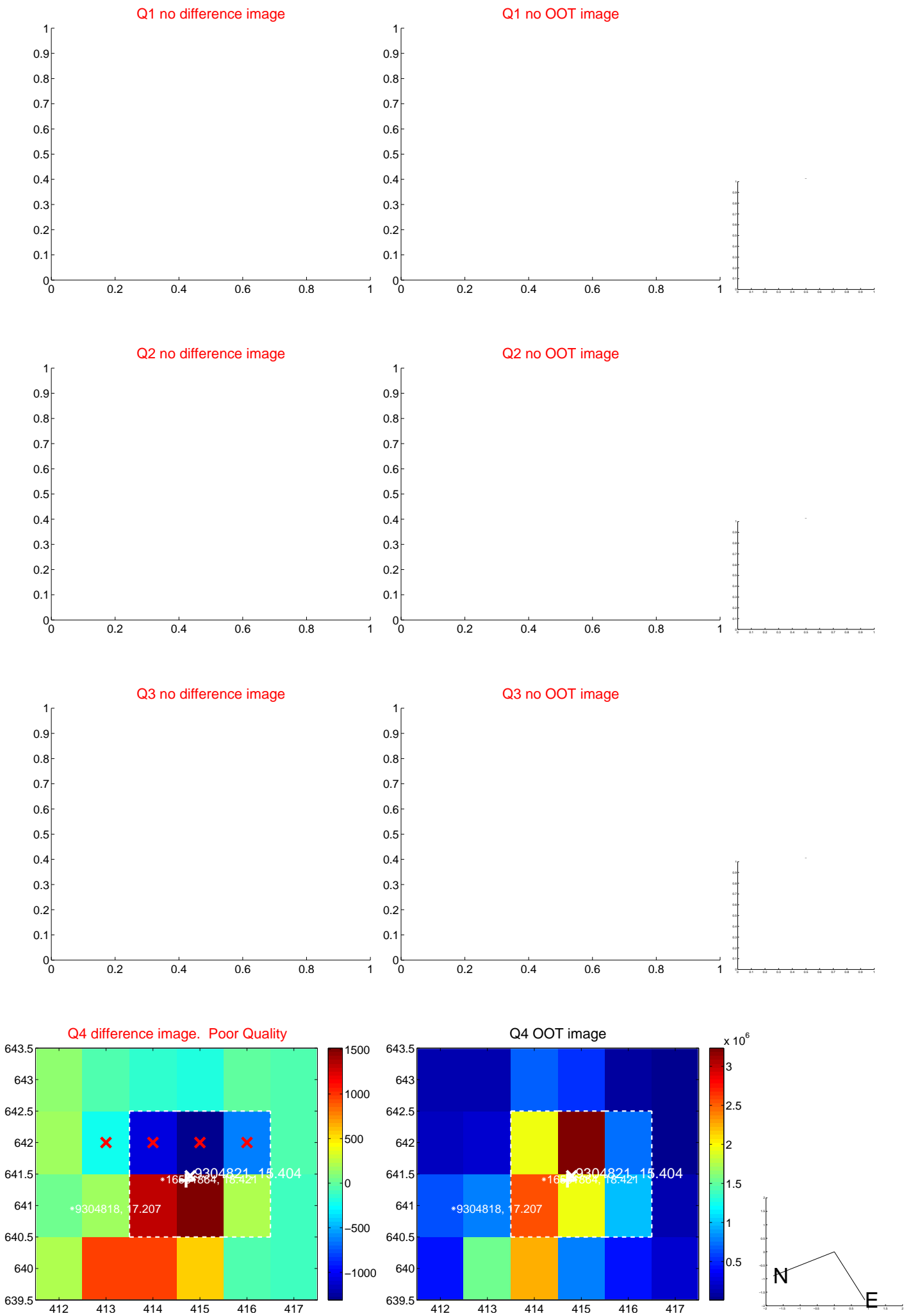
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.562 \pm 0.895$	3.98	$-0.252 \pm 0.615$	$3.553 \pm 0.914$
PRF-fit source offset from KIC position	$6.068 \pm 1.124$	5.40	$0.881 \pm 0.627$	$6.004 \pm 1.093$
photometric centroid source offset	$8.68 \pm 1.56$	5.57	$2.03 \pm 0.88$	$8.44 \pm 1.59$

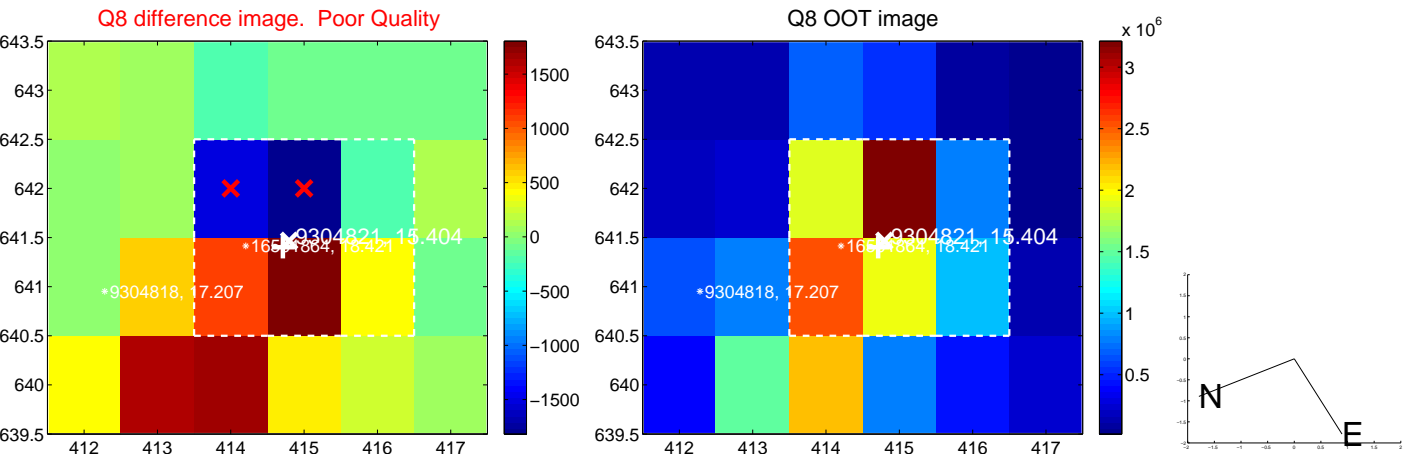
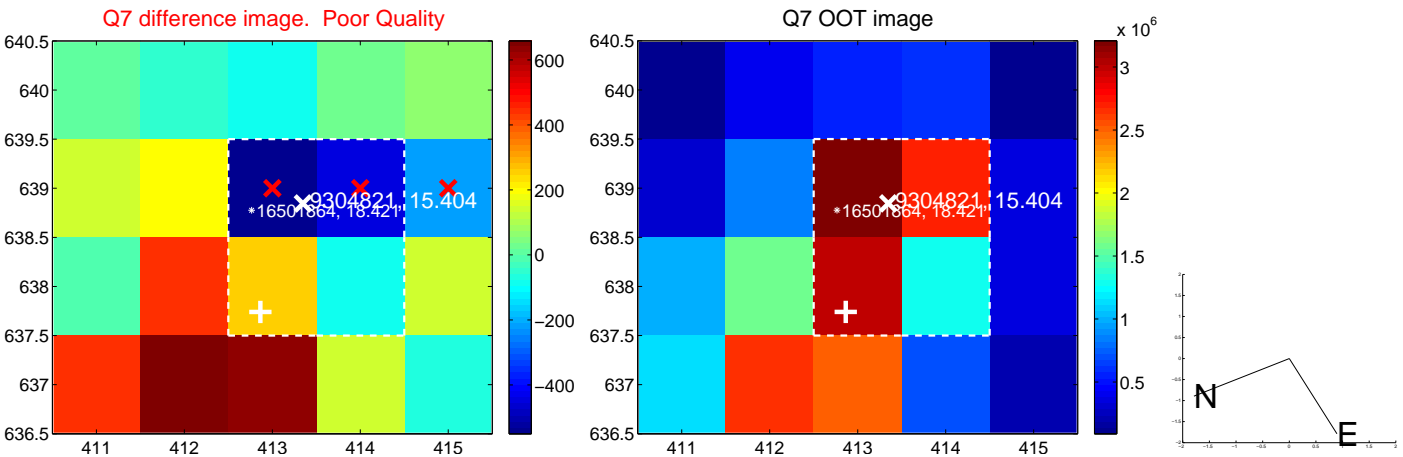
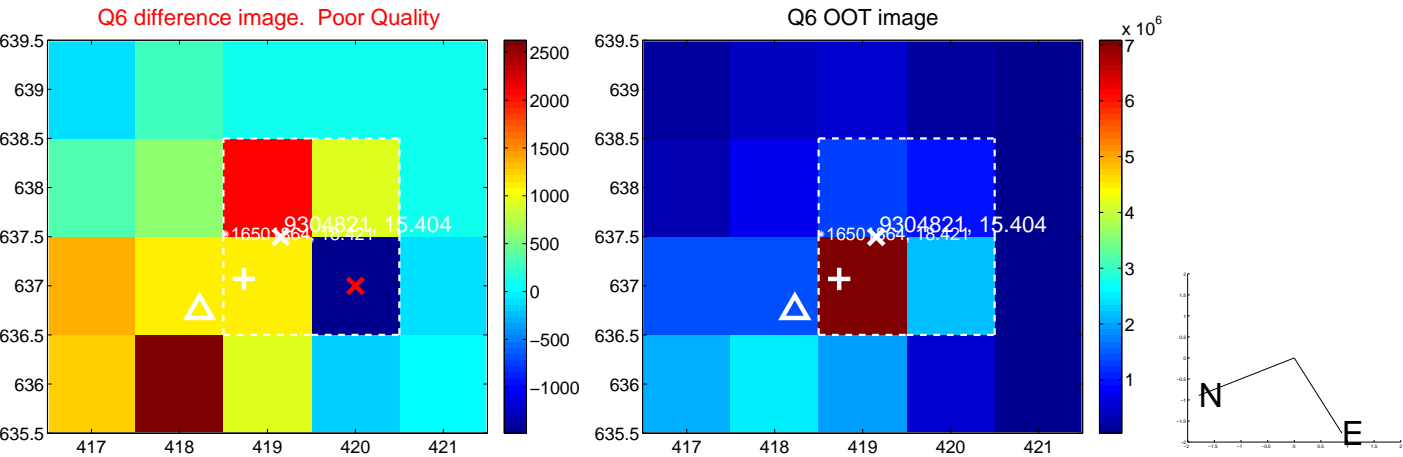
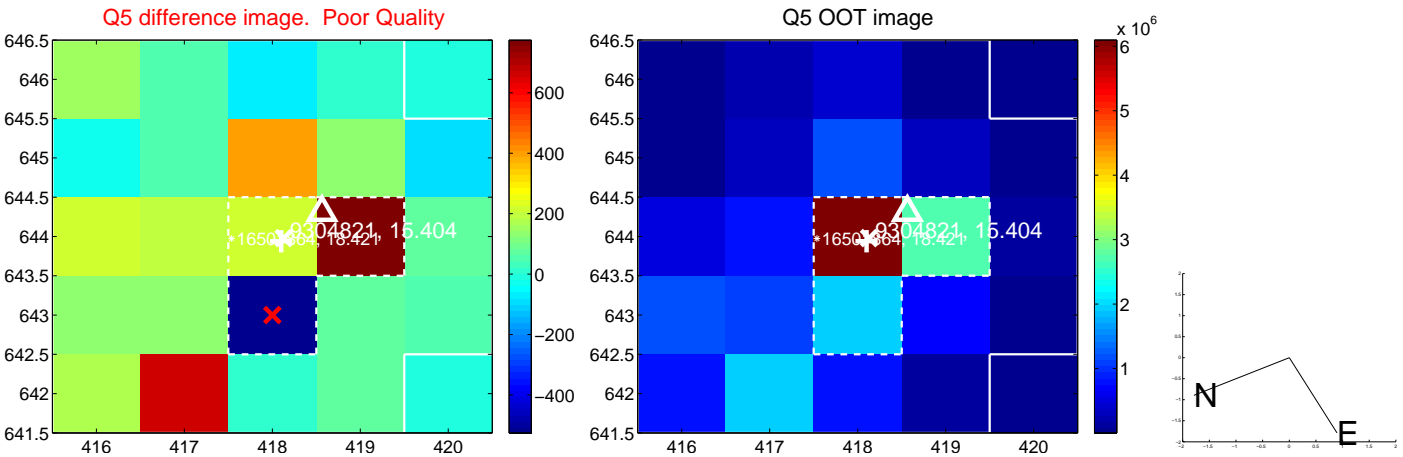


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

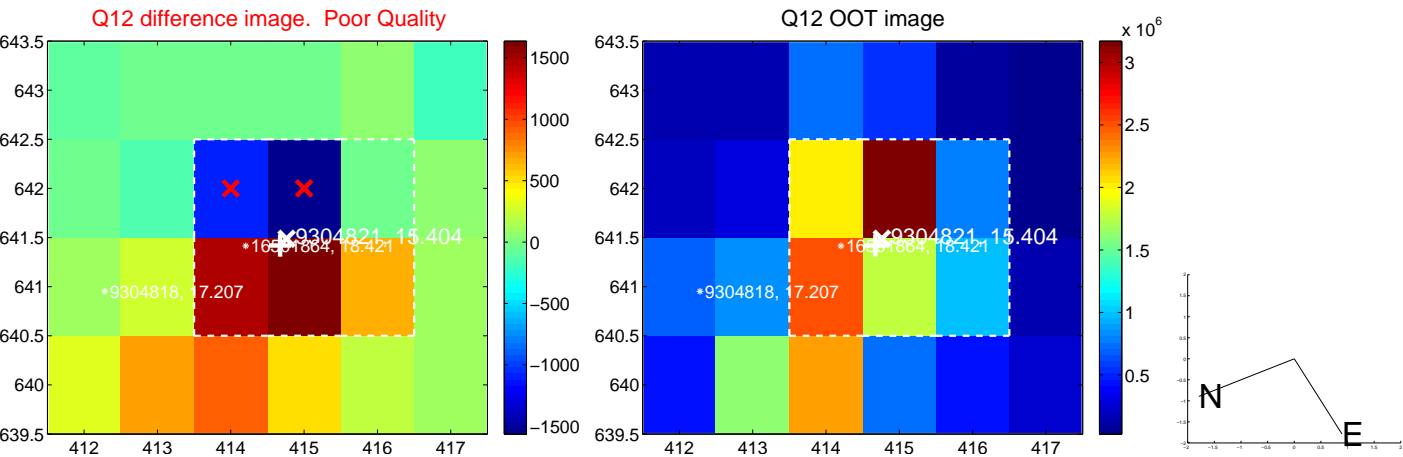
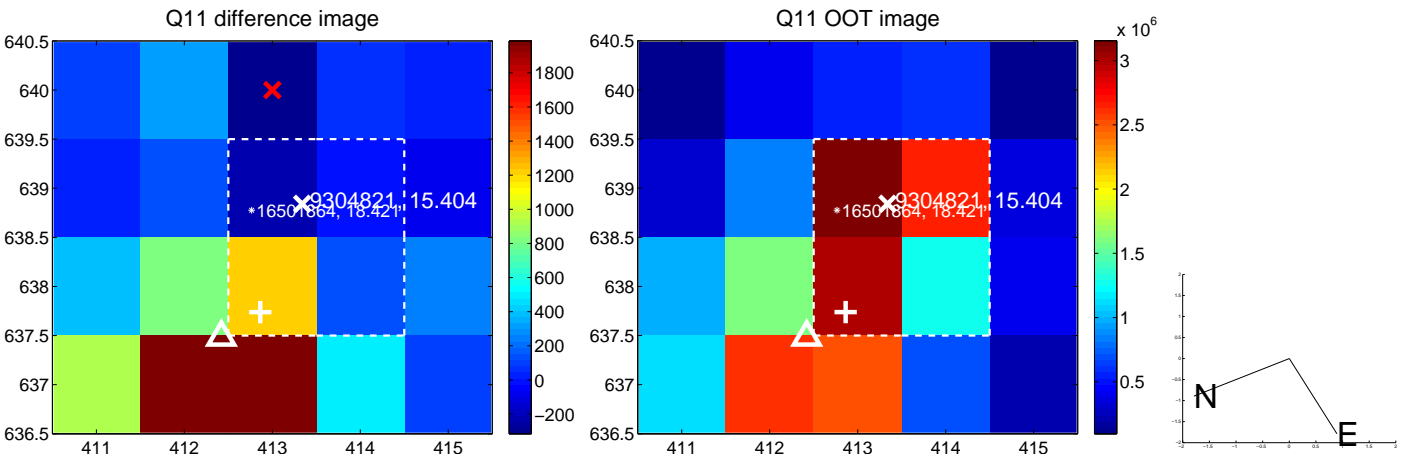
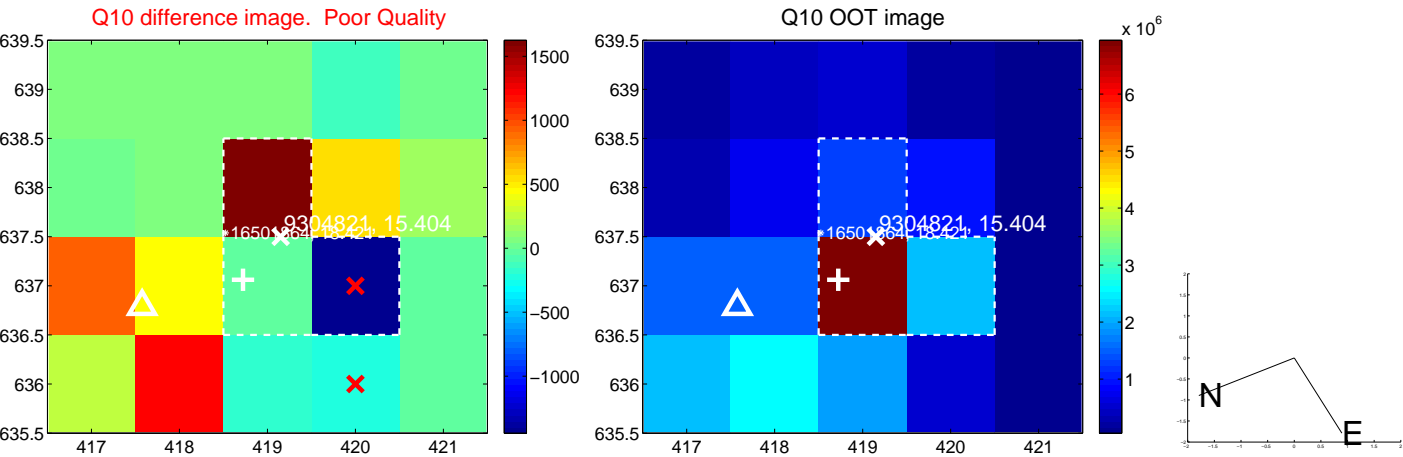
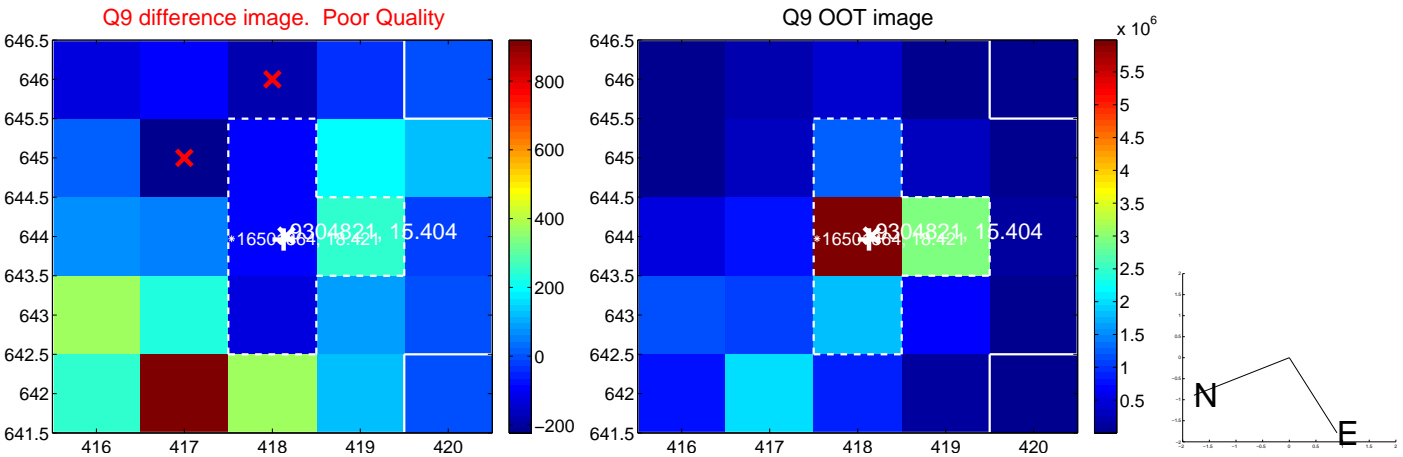
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



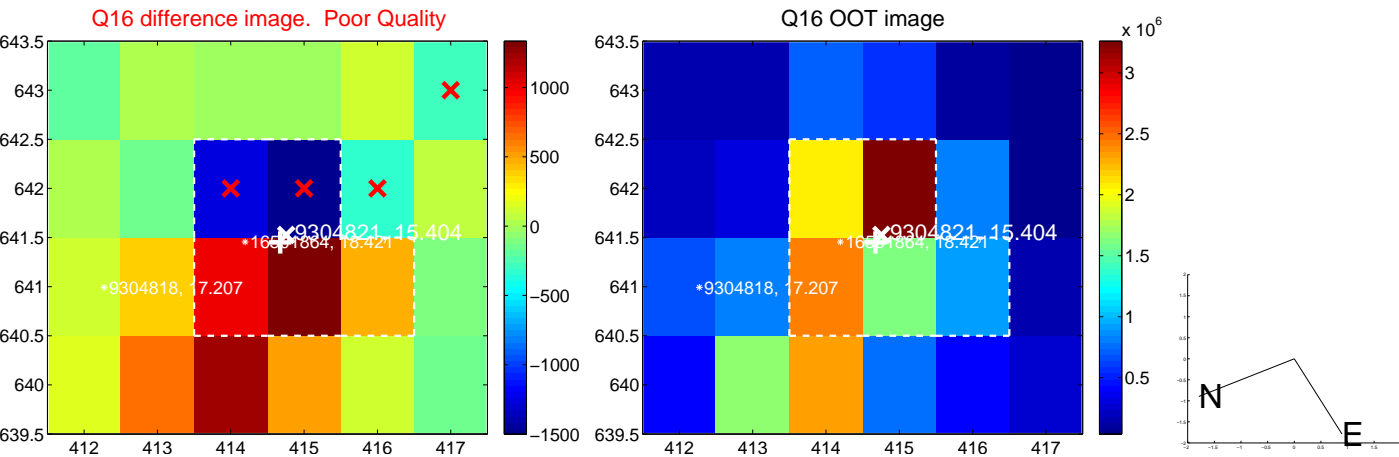
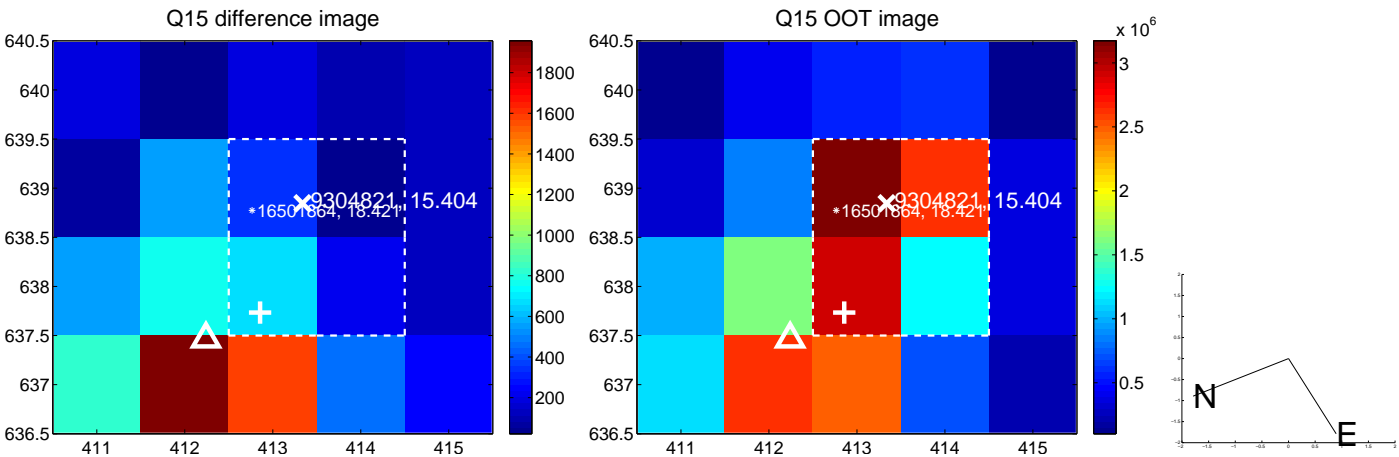
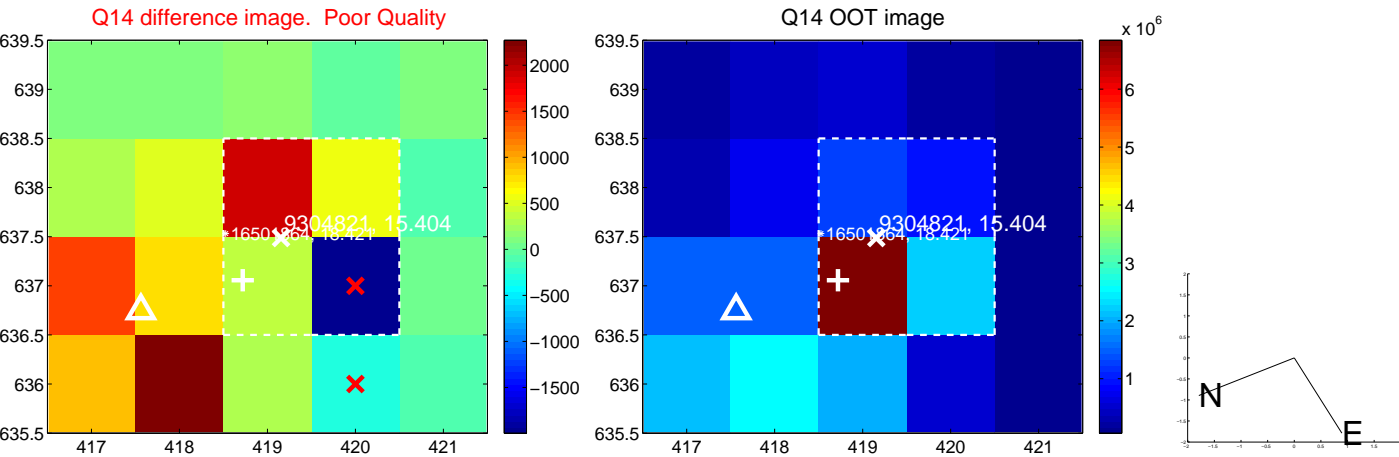
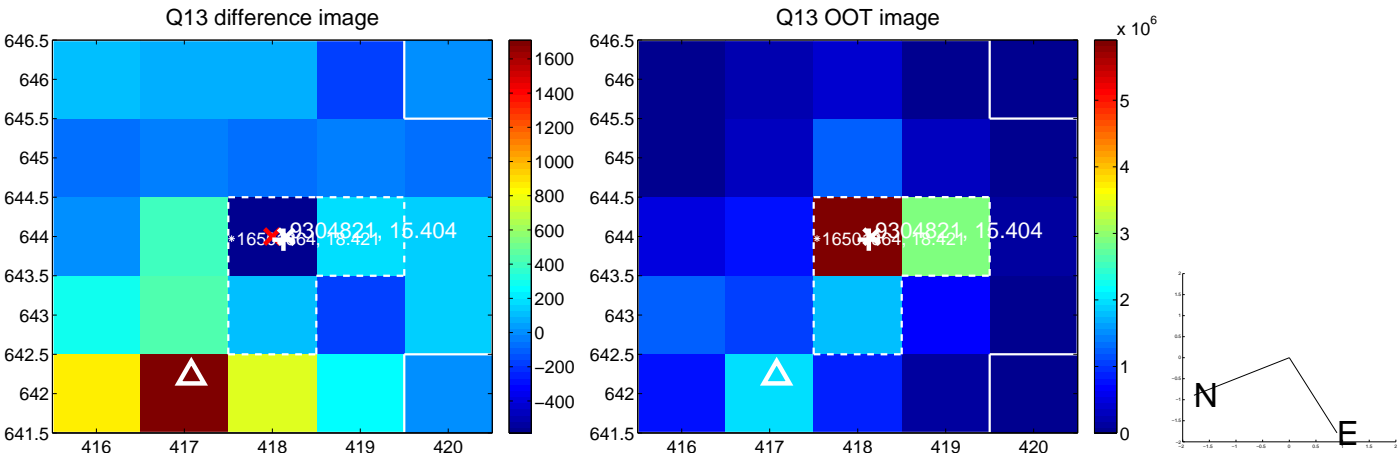
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



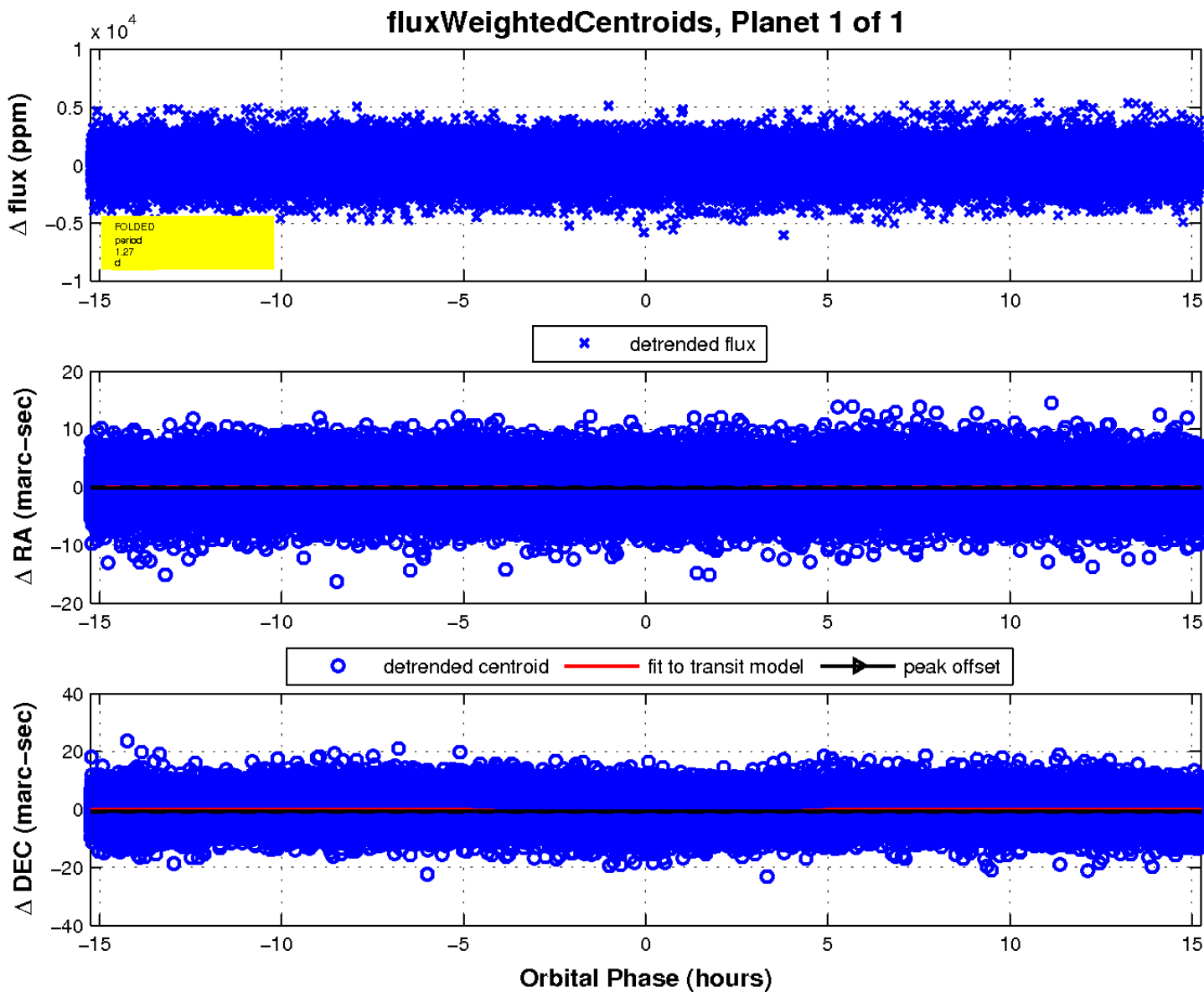
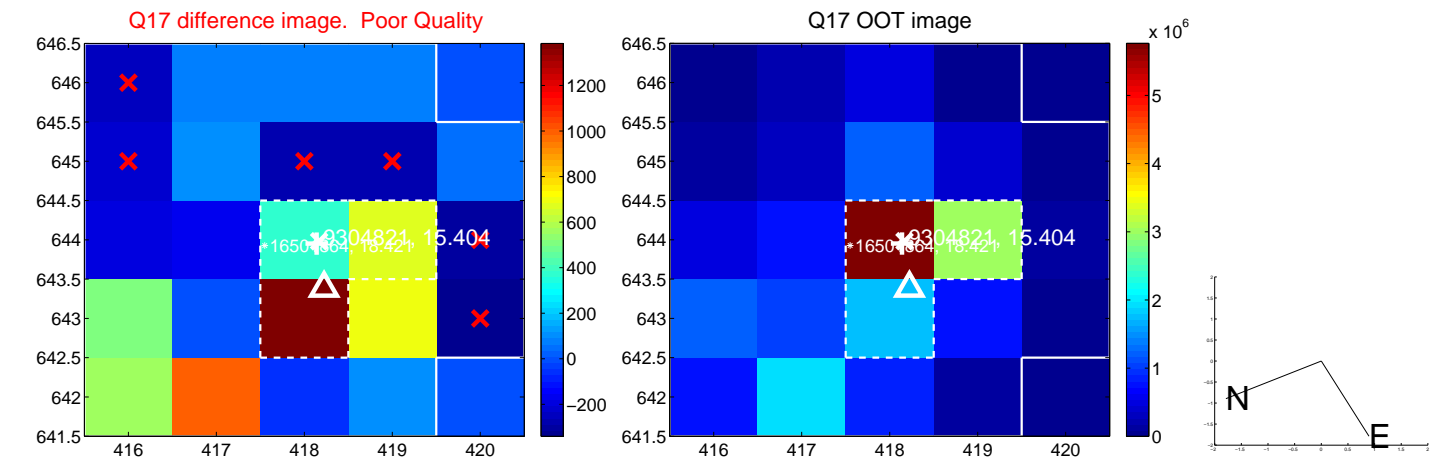
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

