

# KIC 009345819

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009345819-01	OBS	4615.01	1.045908	131.976491	71.4	4.483	10.8	11.1	1.08	6249	0.93	3581.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009345819-01	OBS	FP	0.00	1	0	0	1	LPP_DV—EPHEM_MATCH

**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 009345819-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009345819-01	9345819	009345838-pri	9345838	1:1	66.8	-12	11	12.38	15.81	3328.20	Direct-PRF	0	3.01	1.03

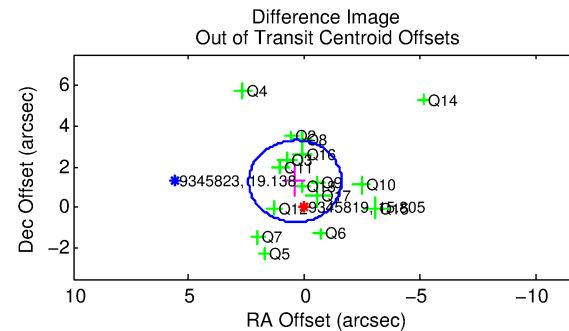
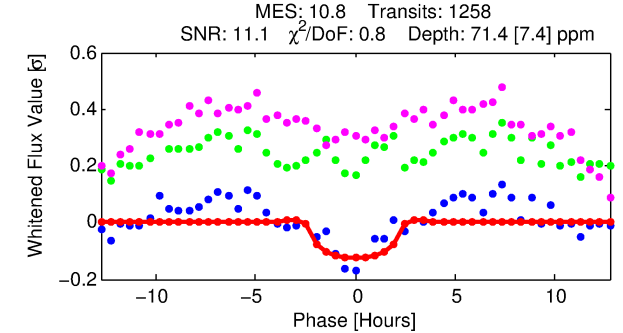
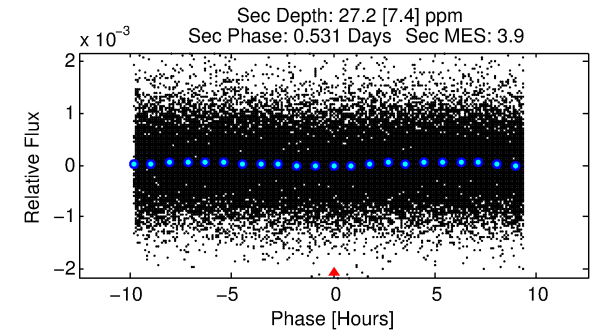
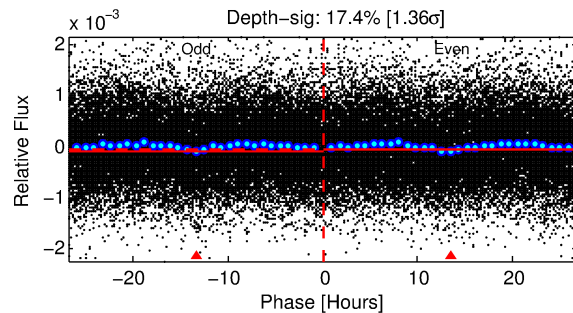
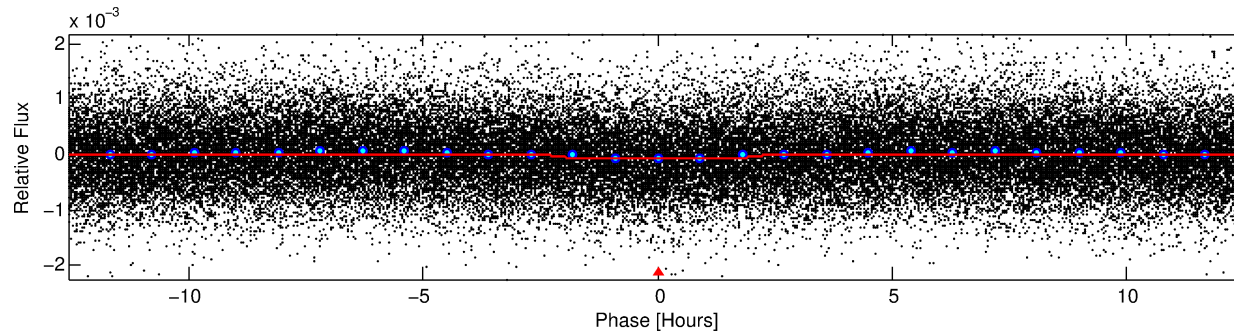
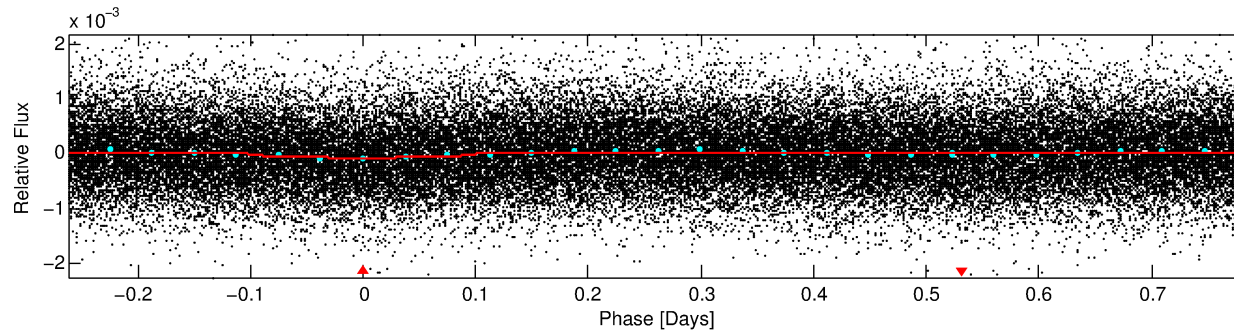
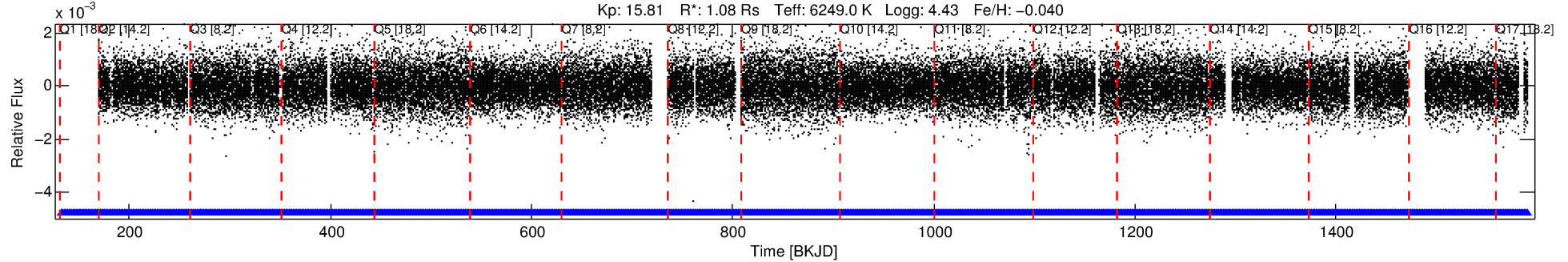
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 9345819 Candidate: 1 of 1 Period: 1.046 d

KOI: K04615.01 Corr: 0.937

Kp: 15.81 R\*: 1.08 Rs Teff: 6249.0 K Logg: 4.43 Fe/H: -0.040



## DV Fit Results:

Period = 1.04591 [0.00001] d  
Epoch = 131.9765 [0.0049] BKJD  
Rp/R\* = 0.0079 [0.0071]  
a/R\* = 1.77 [5.42]  
b = 0.43 [8.70]  
Seff = 3581.13 [1524.31]  
Teq = 1973 [210] K  
Rp = 0.93 [0.89] Re  
a = 0.0210 [0.0058] AU  
Ag = 7.68 [14.34] [0.47σ]  
Teffp = 5078 [2323] K [1.33σ]

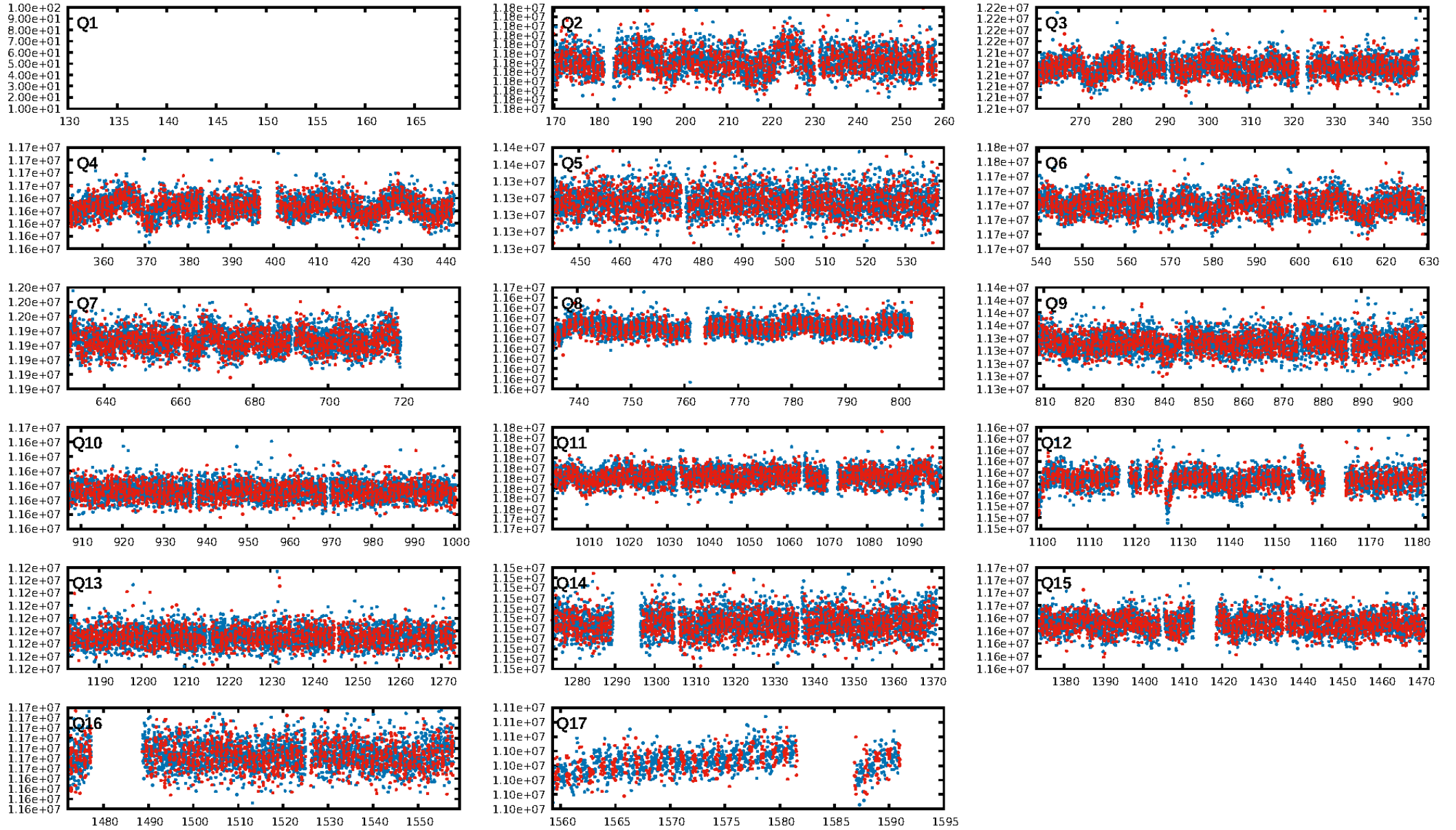
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.75e-23  
RollingBand-fgt: 1.00 [1231/1231]  
**GhostDiagnostic-chr: 0.3219**  
Centroid-sig: 95.2%  
Centroid-so: 0.228 arcsec [0.20σ]  
OotOffset-rm: 1.344 arcsec [2.01σ]  
KicOffset-rm: 1.334 arcsec [2.02σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.06 [1/16]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:19:38 Z

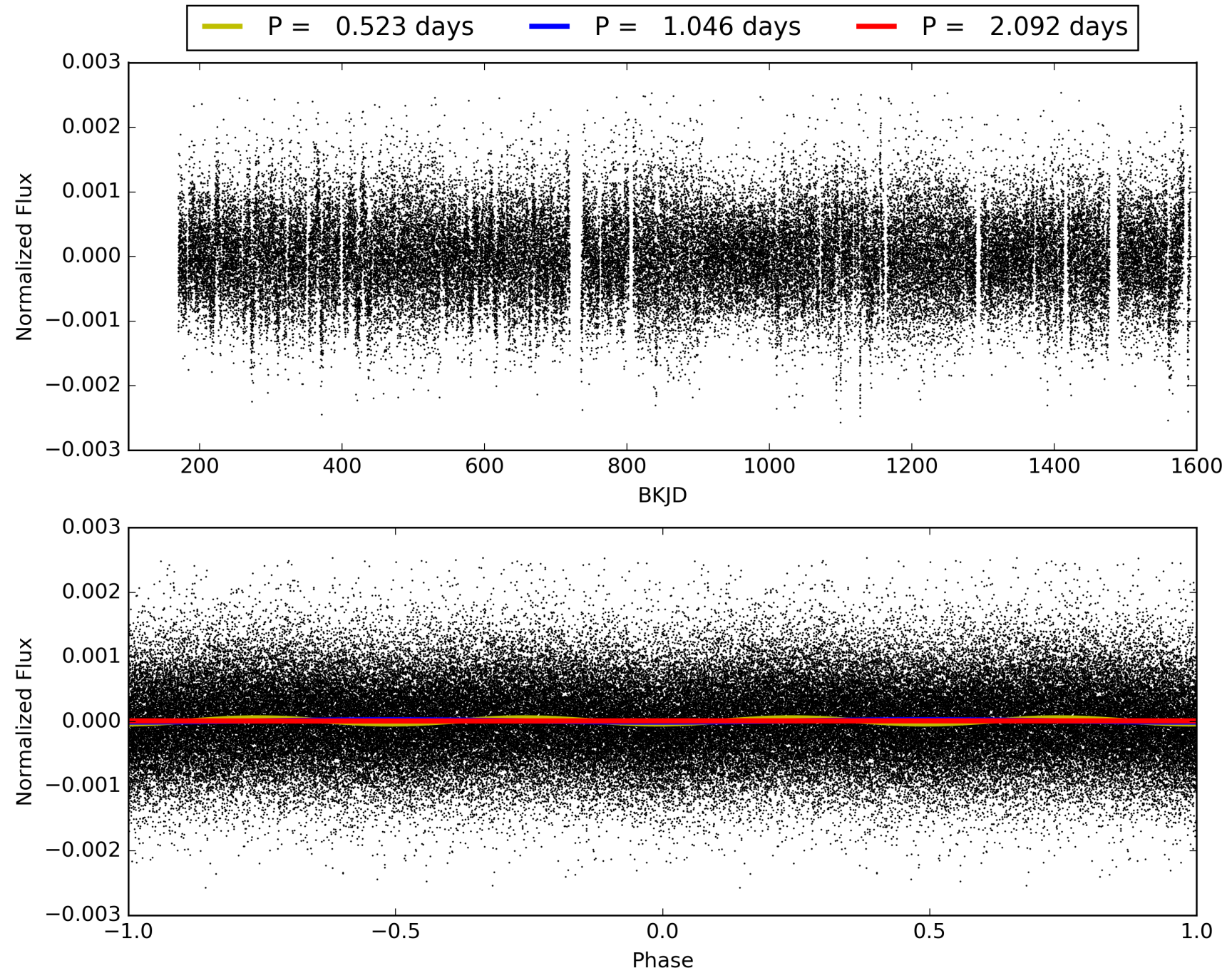
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009345819-01, PDC Light Curves



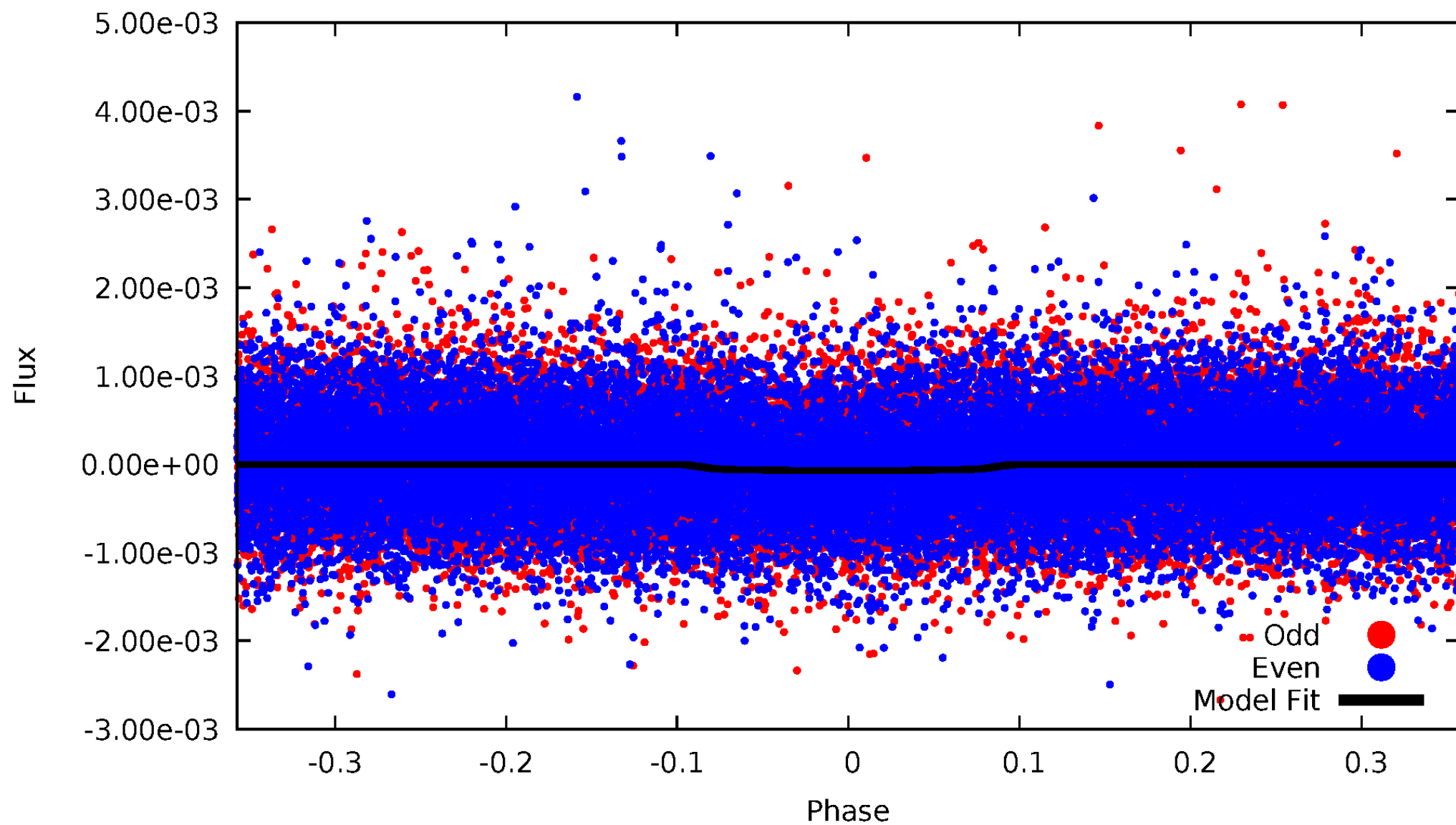


TCE 009345819-01



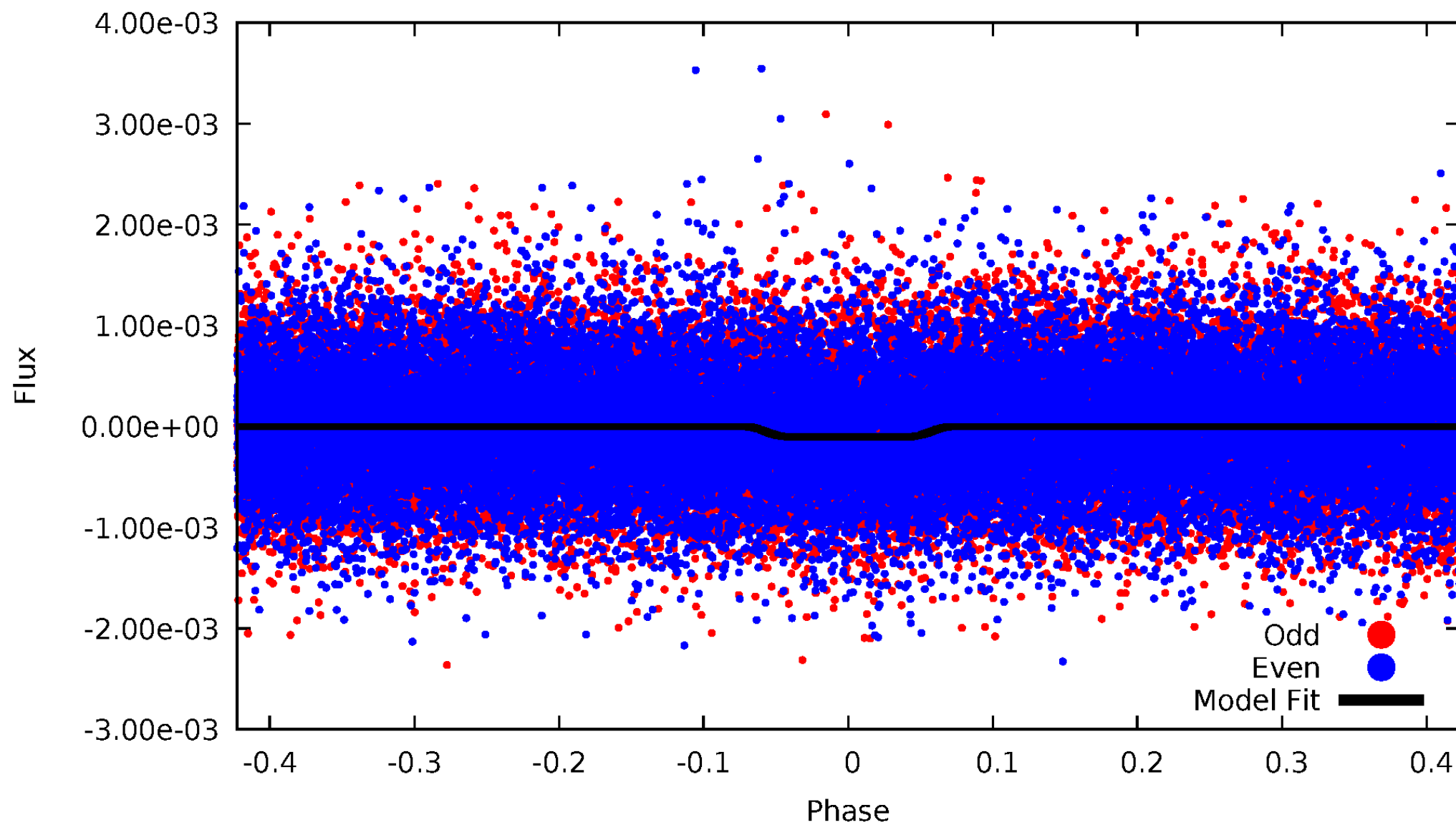
# DV Odd/Even

TCE 009345819-01



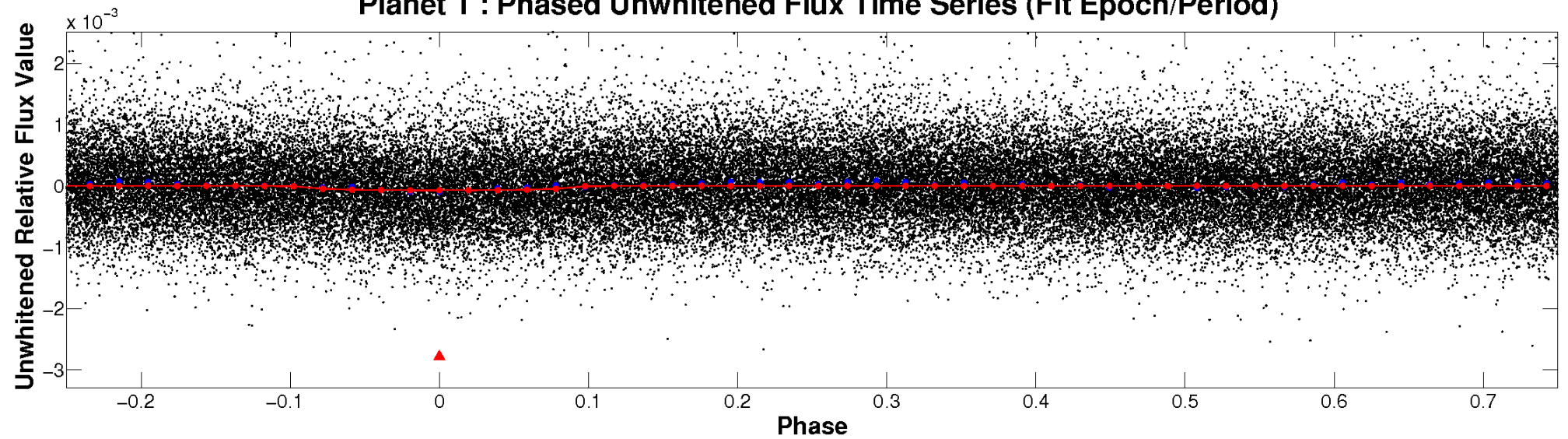
# ALT Odd/Even

TCE 009345819-01

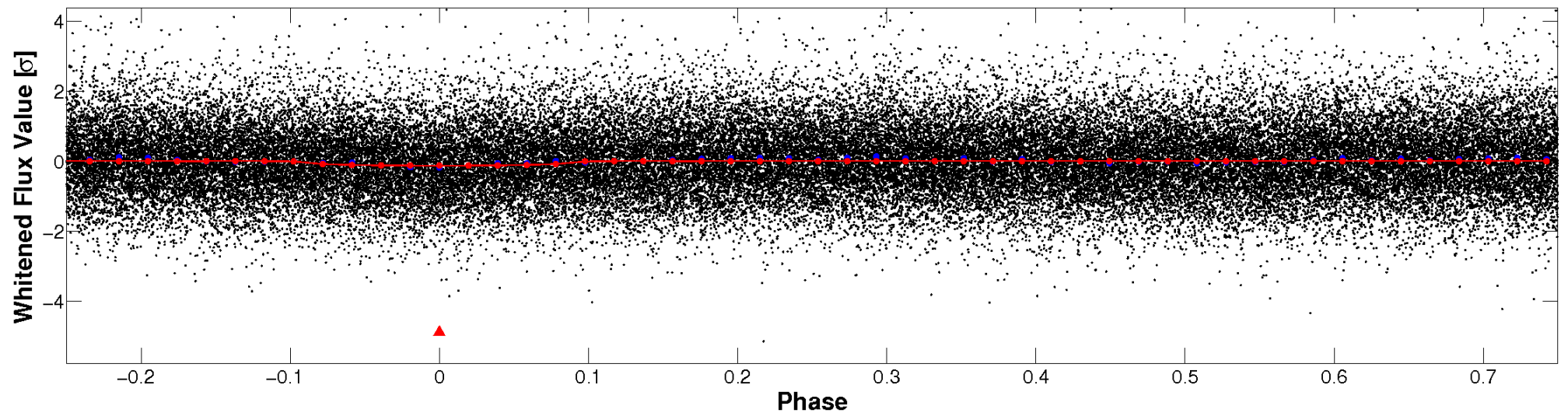


# Non-Whitened Vs. Whitened Light Curve

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



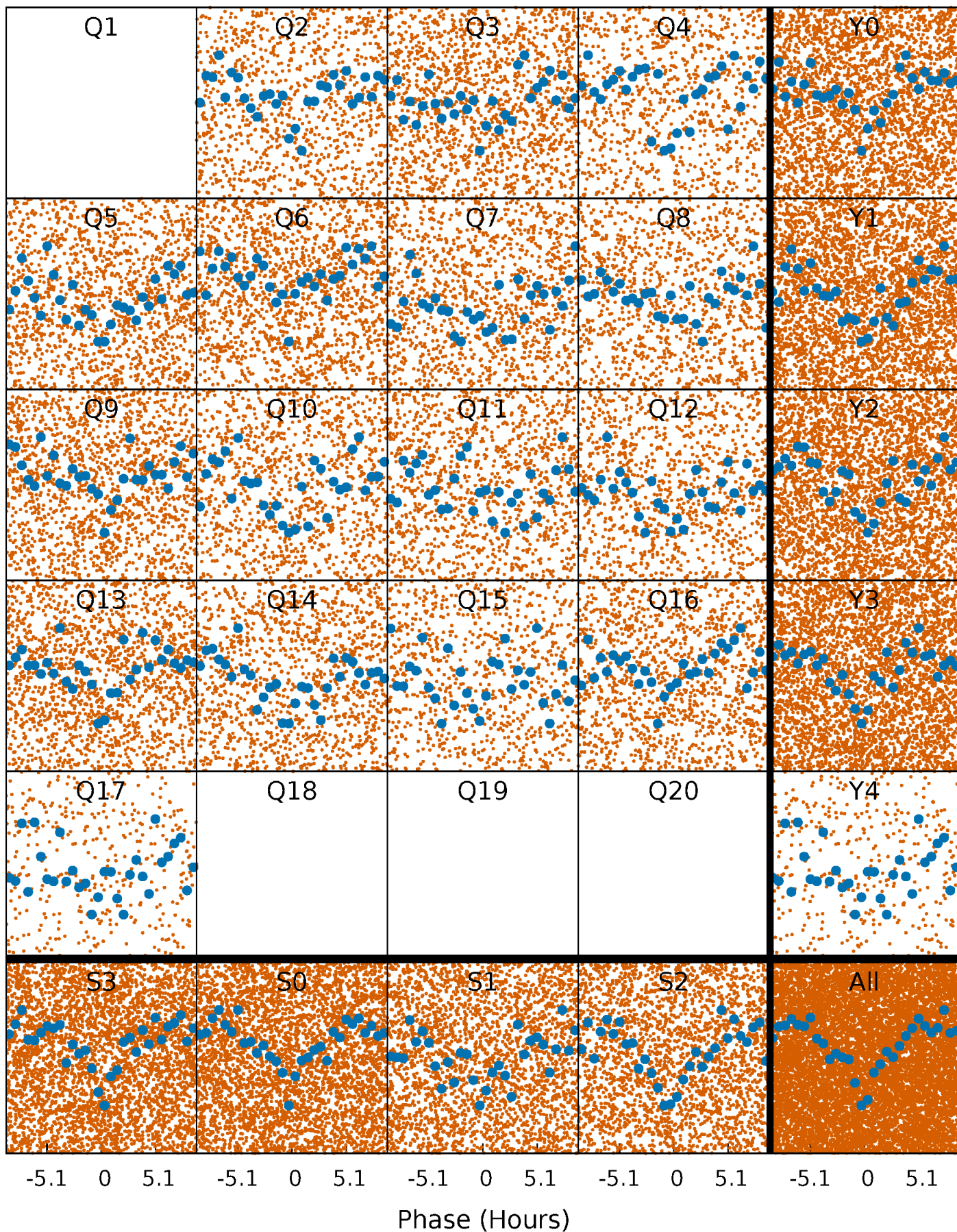
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

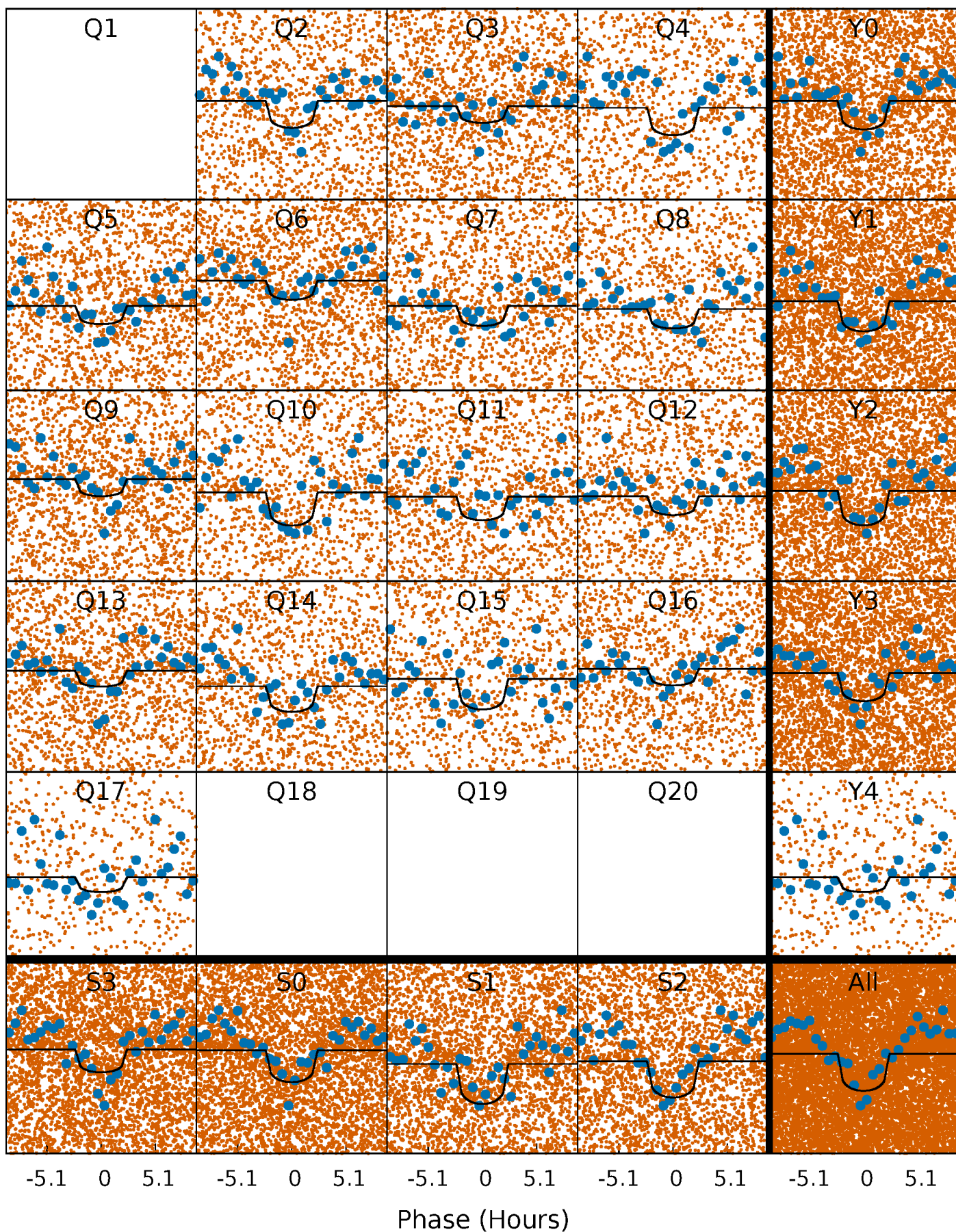
TCE 009345819-01 P= 1.045908 Days  $T_0=131.976491$  (BKJD)





# DV Quarter-Phased Transit Curves

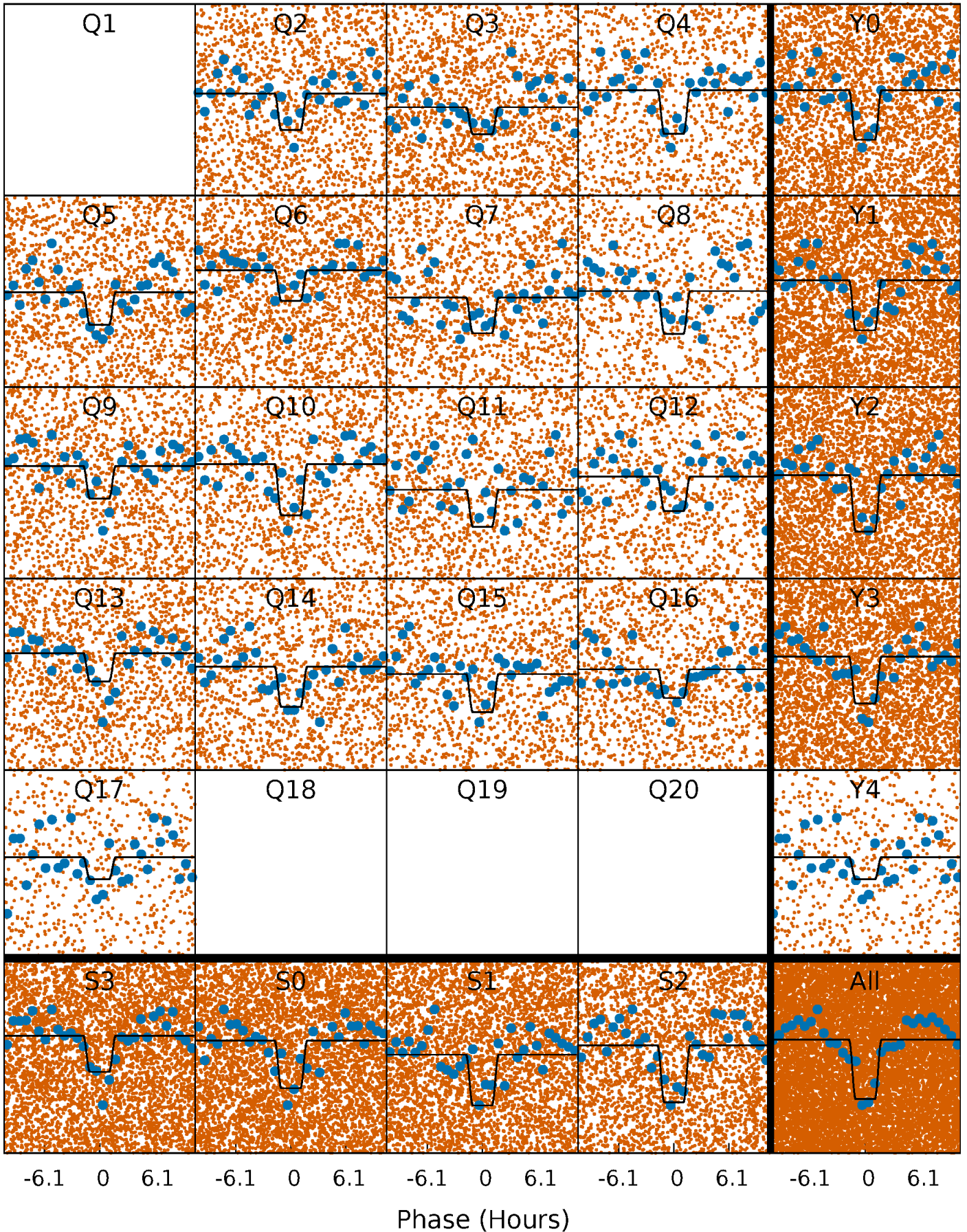
TCE 009345819-01 P= 1.045908 Days  $T_0=131.976491$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

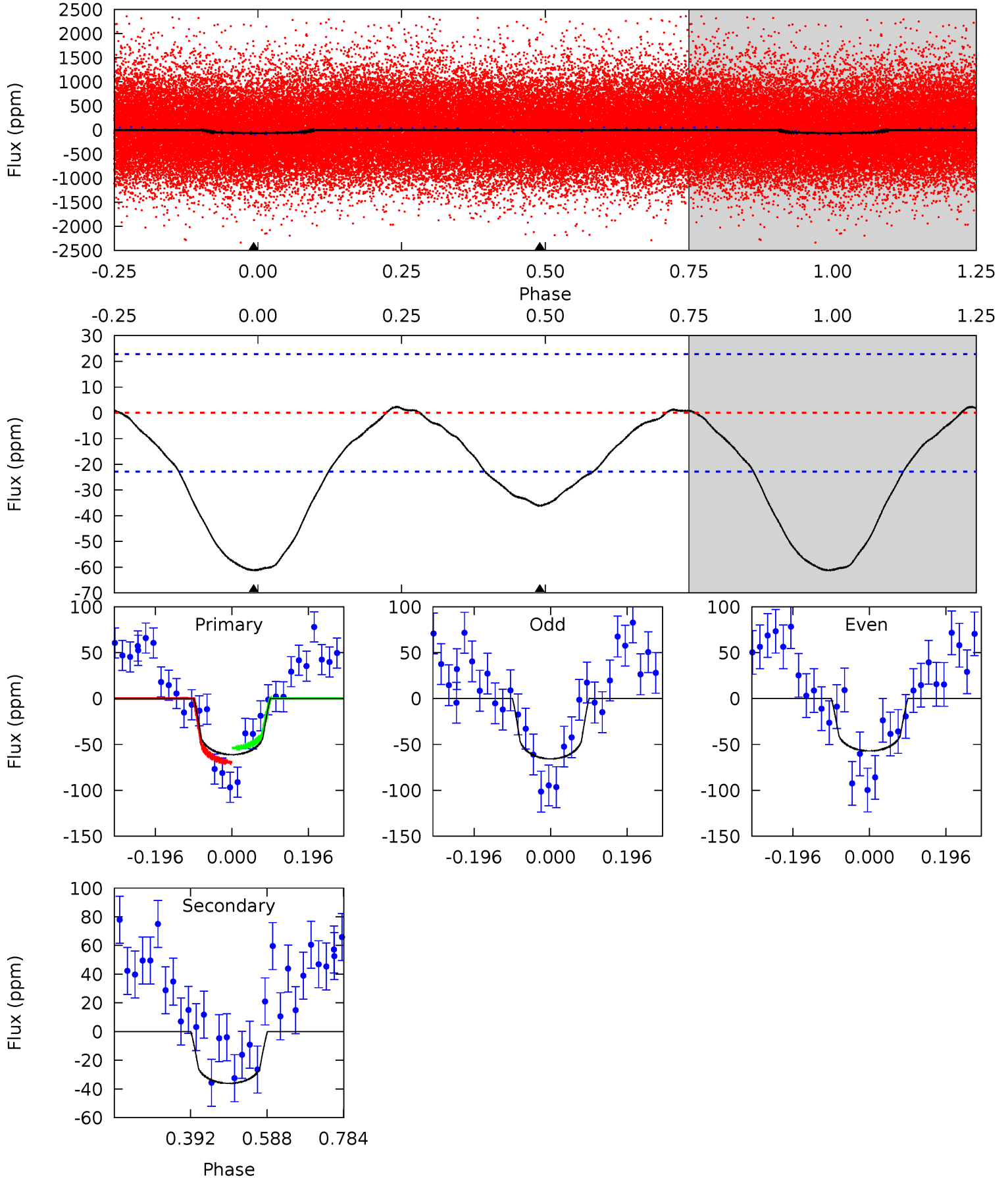
TCE 009345819-01 P= 1.045873 Days  $T_0=131.991719$  (BKJD)



# DV Model-Shift Uniqueness Test

009345819-01, P = 1.045908 Days, E = 131.976491 Days

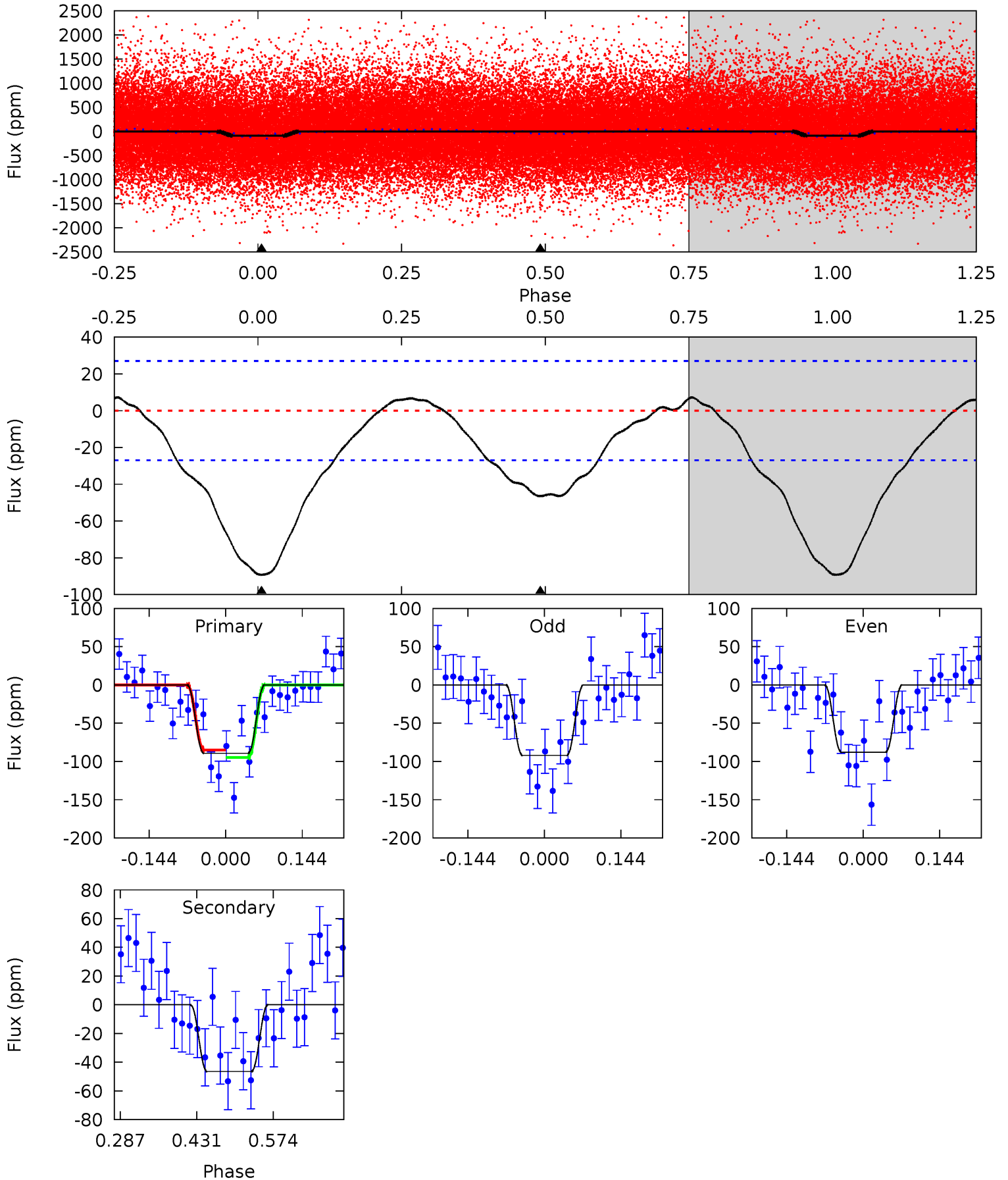
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	6.99	0	0	4.42	1.29	0.46	11.8	11.8	6.99	6.99	0.83	0.95	0.04	1.49



# Alt Model-Shift Uniqueness Test

009345819-01, P = 1.045873 Days, E = 131.991719 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
14.8	7.73	0	0	4.49	1.46	1.32	14.8	14.8	7.73	7.73	0.36	1.04	0.08	0.80





### Stellar Parameters For KIC 009345819

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6249^{+196}_{-239}$	$4.428^{+0.054}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.076^{+0.353}_{-0.118}$	$1.130^{+0.157}_{-0.157}$	$1.279^{+0.375}_{-0.693}$
	+3%/-4%	+1%/-5%	+625%/-750%	+33%/-11%	+14%/-14%	+29%/-54%
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 009345819-01 / KOI 4615.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-36 \pm 5$	$1.11^{+0.86}_{-0.66}$	$2816^{+214}_{-145}$	$5047^{+3184}_{-1041}$	$6.790^{+34.760}_{-4.505}$
Alt.	$-46 \pm 6$	$1.28^{+0.93}_{-0.76}$	$2822^{+222}_{-146}$	$5078^{+3091}_{-1026}$	$6.712^{+34.555}_{-4.407}$

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

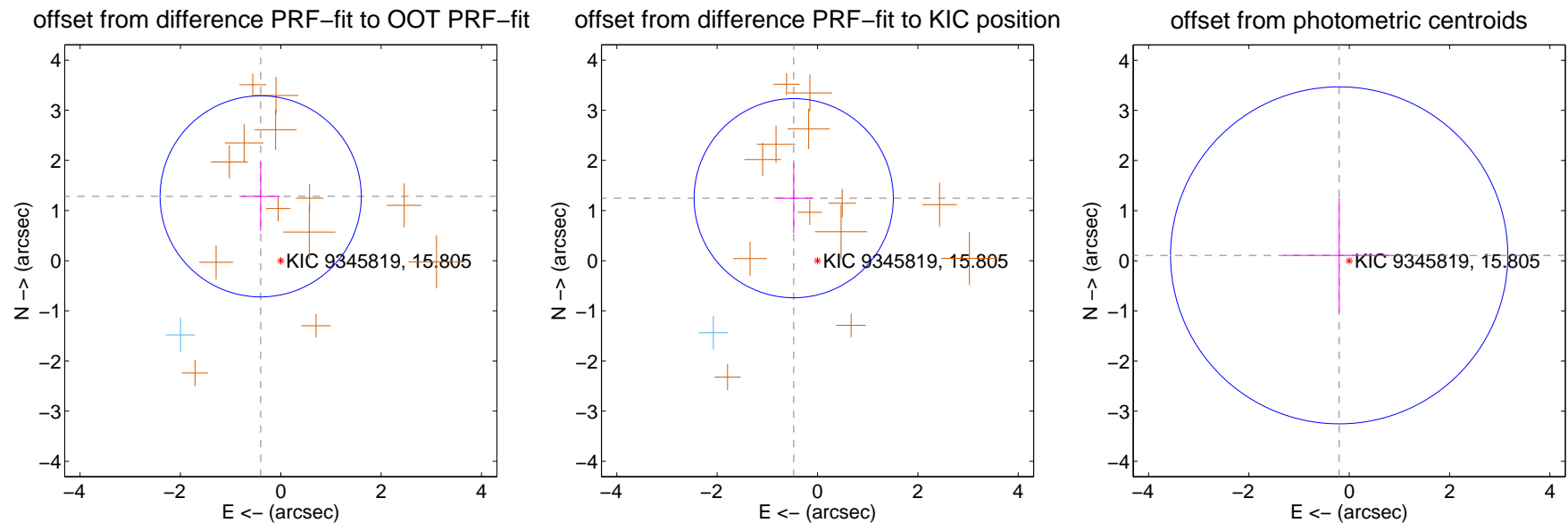
## DV Centroid Data

Supplemental centroid analysis for 009345819-01. Kepler magnitude: 15.80. Transit SNR 11.15

There are 1 quarters with good PRF difference image offsets

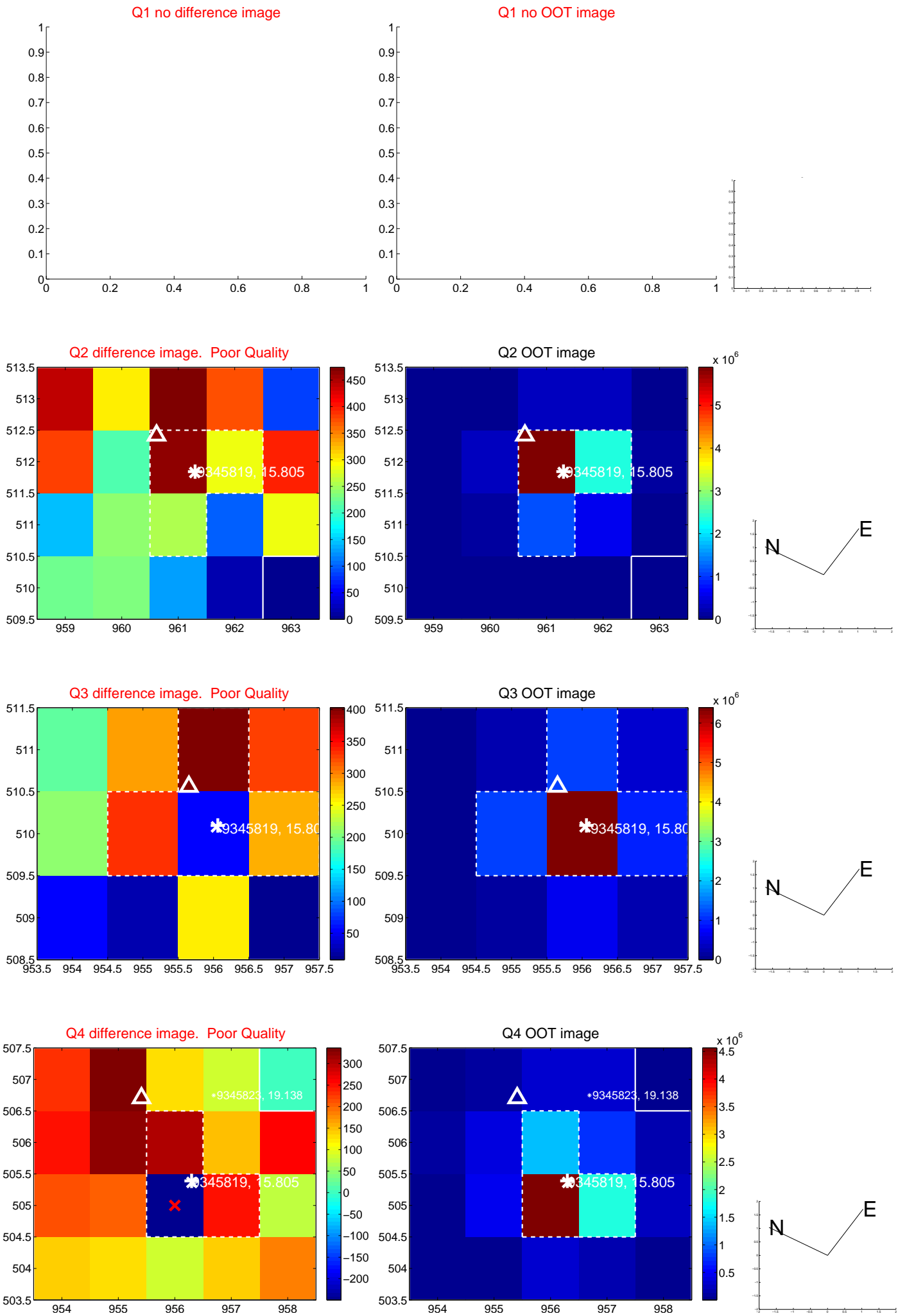
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.344 \pm 0.668$	2.01	$0.401 \pm 0.386$	$1.283 \pm 0.690$
PRF-fit source offset from KIC position	$1.334 \pm 0.662$	2.02	$0.474 \pm 0.388$	$1.247 \pm 0.692$
photometric centroid source offset	$0.23 \pm 1.12$	0.20	$0.20 \pm 1.11$	$0.11 \pm 1.14$

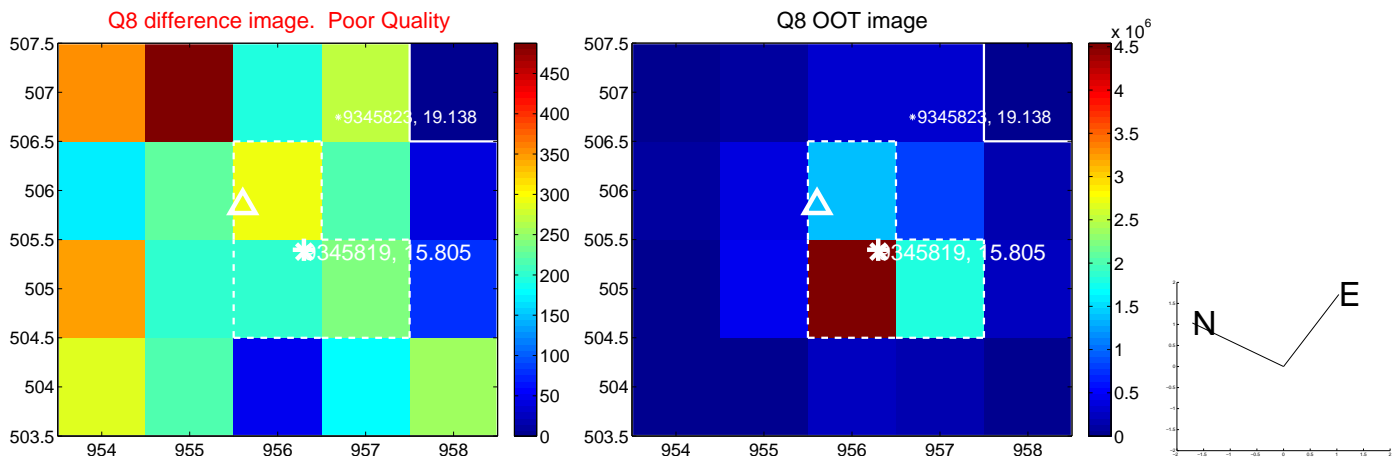
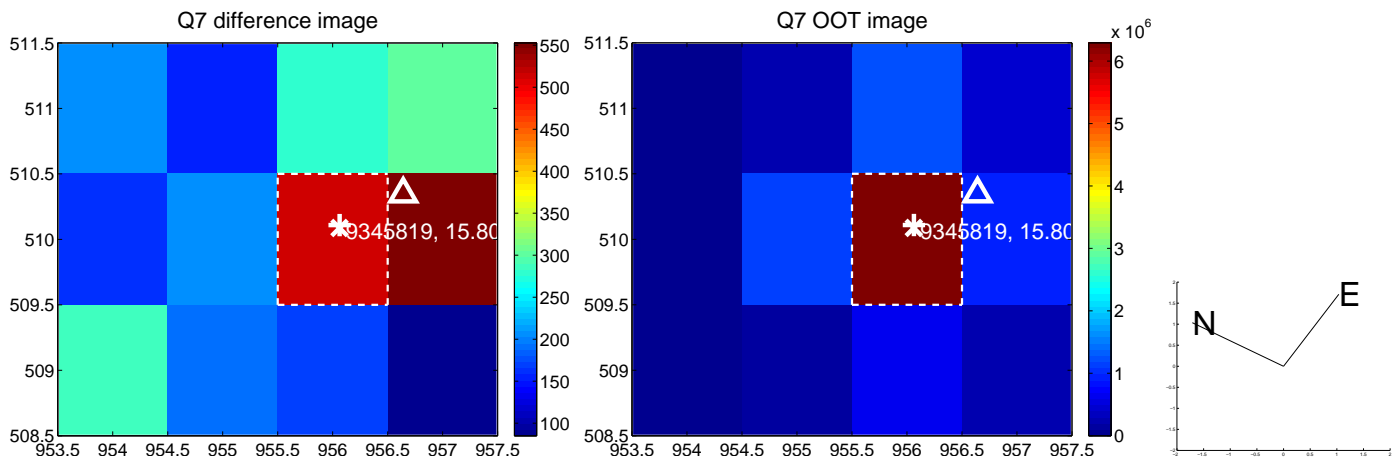
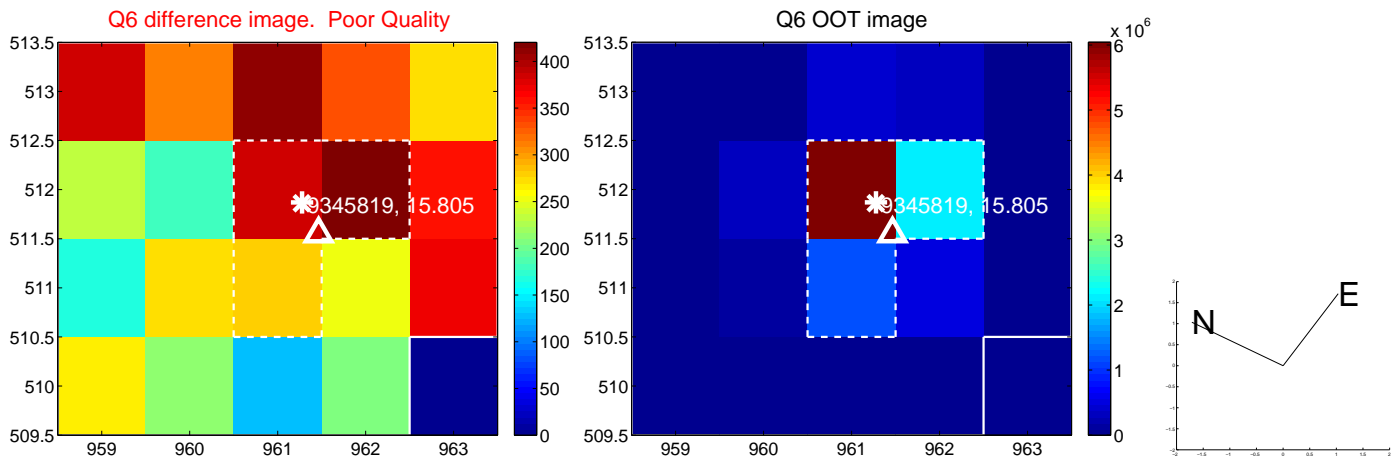
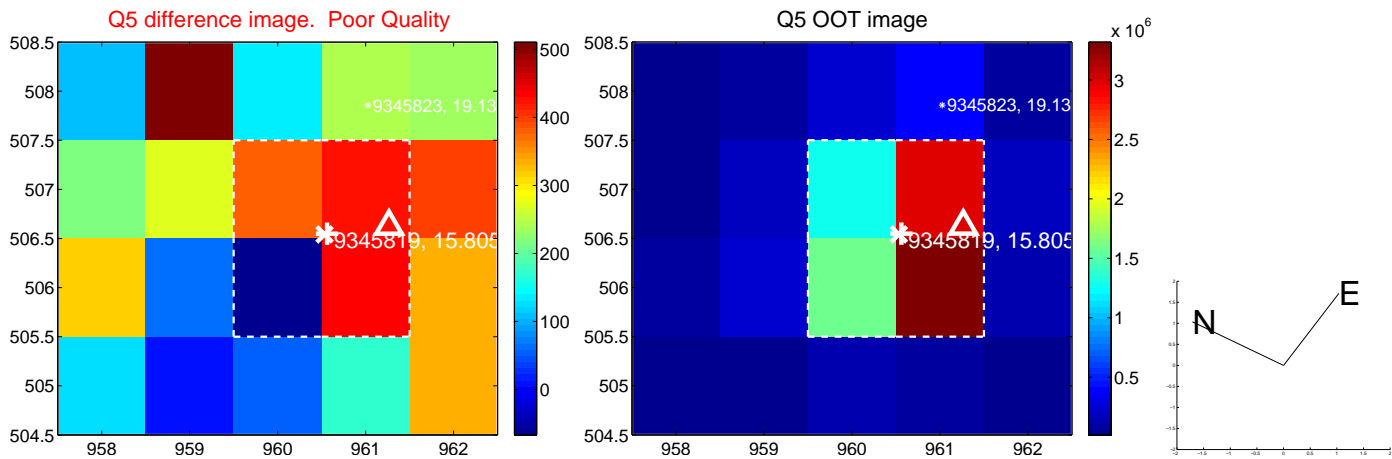


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

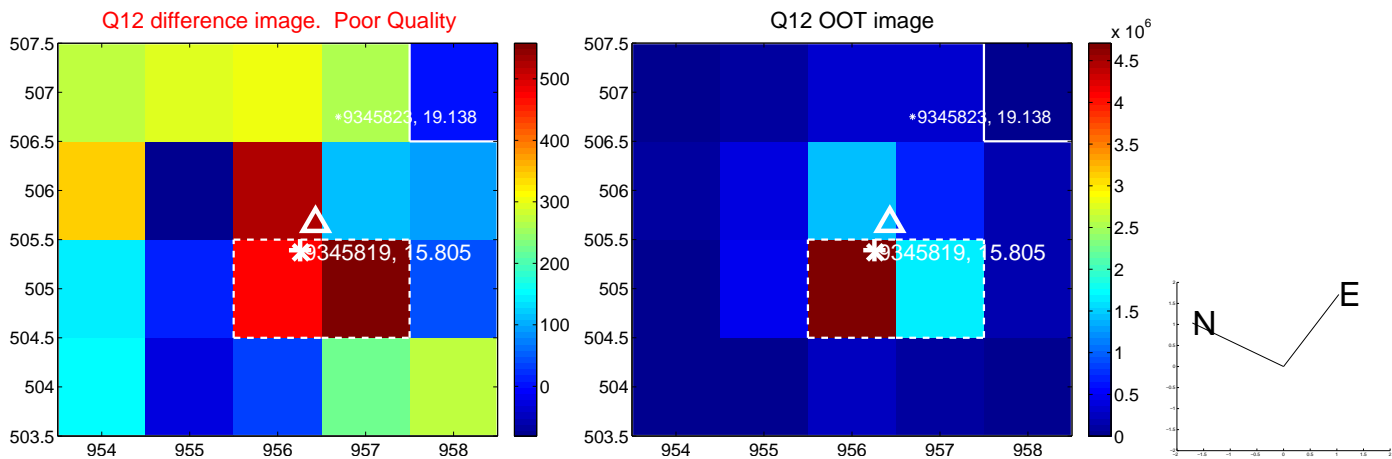
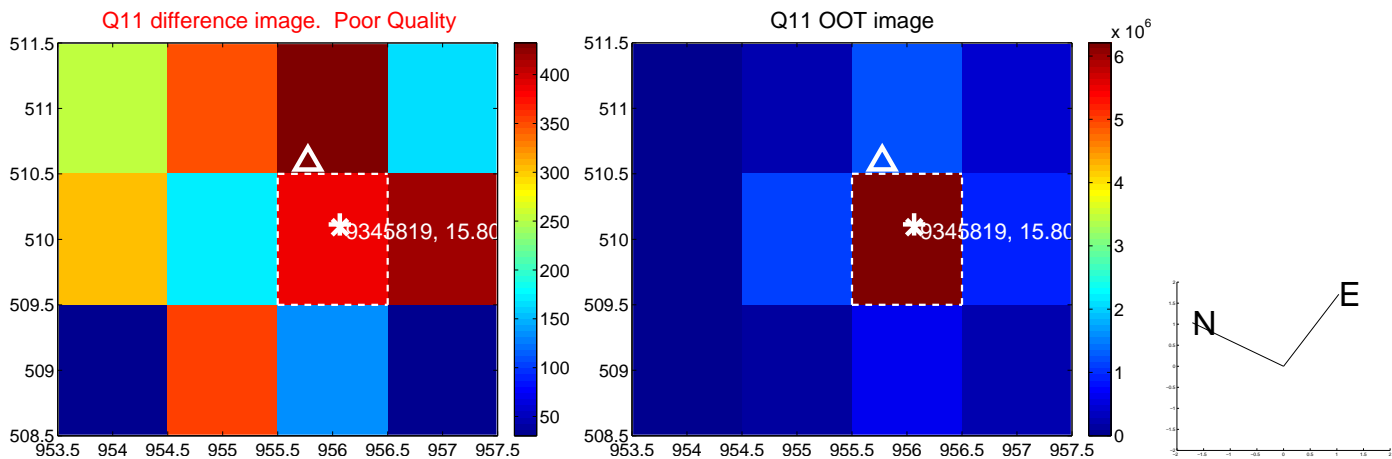
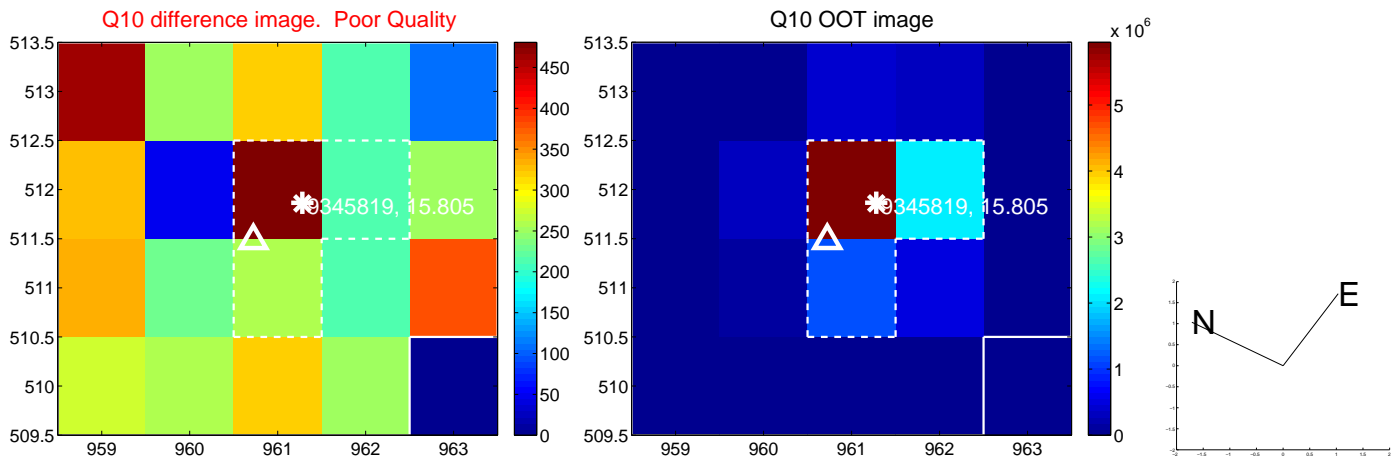
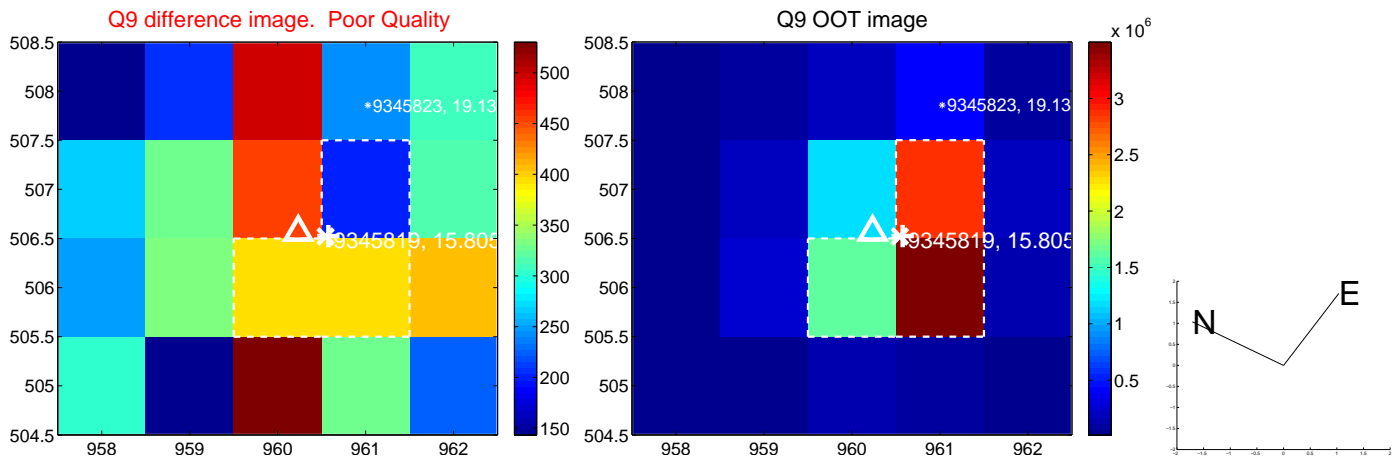


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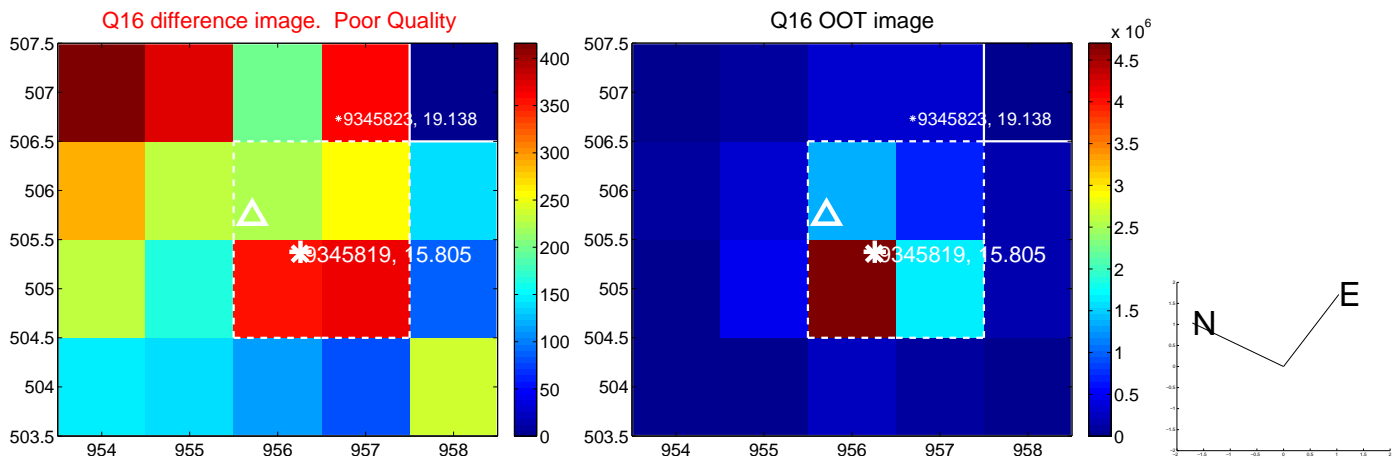
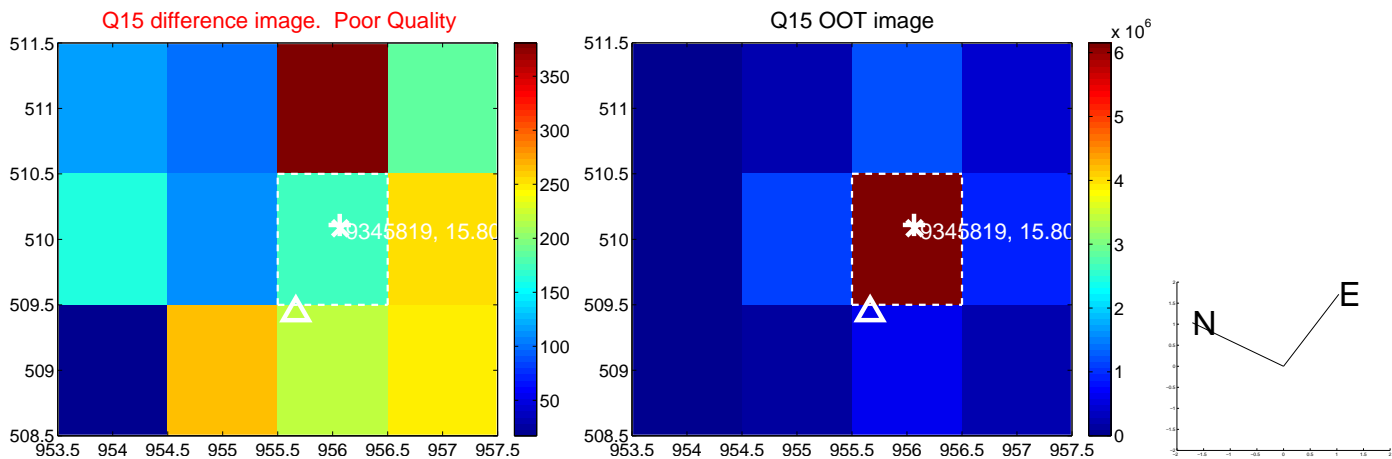
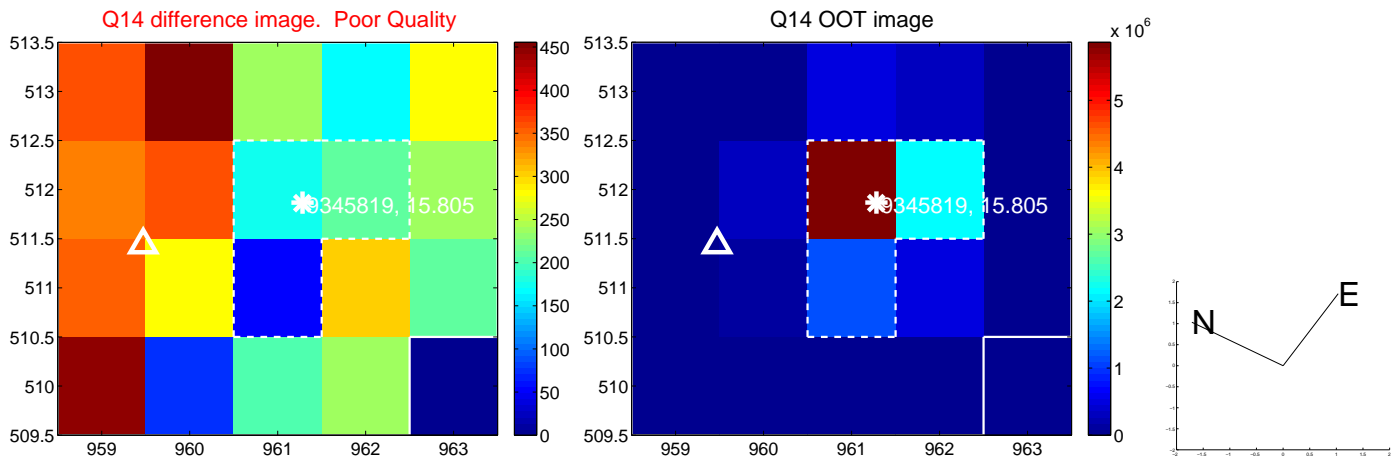
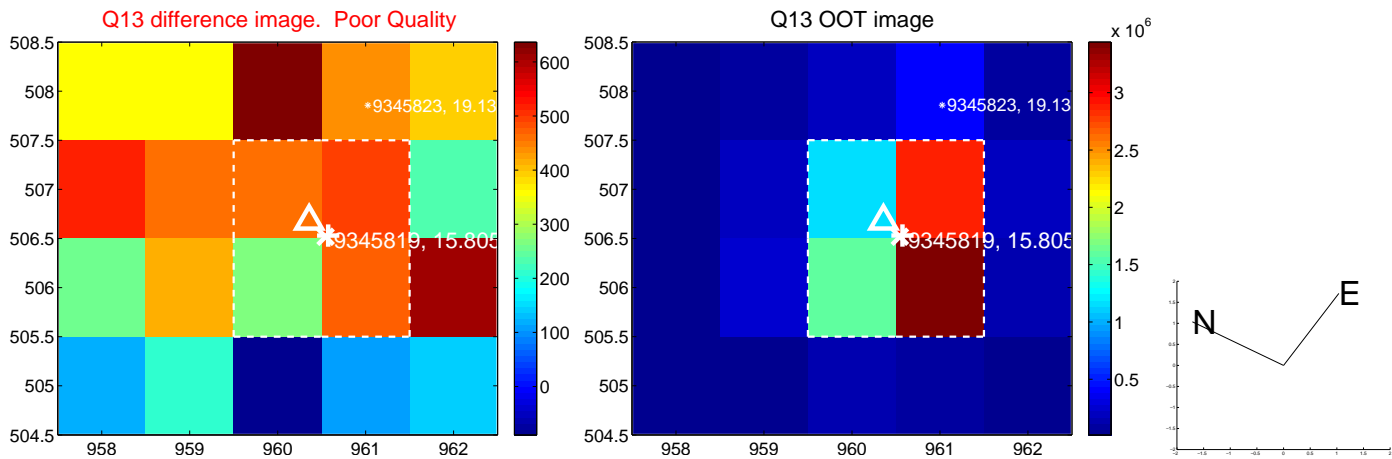




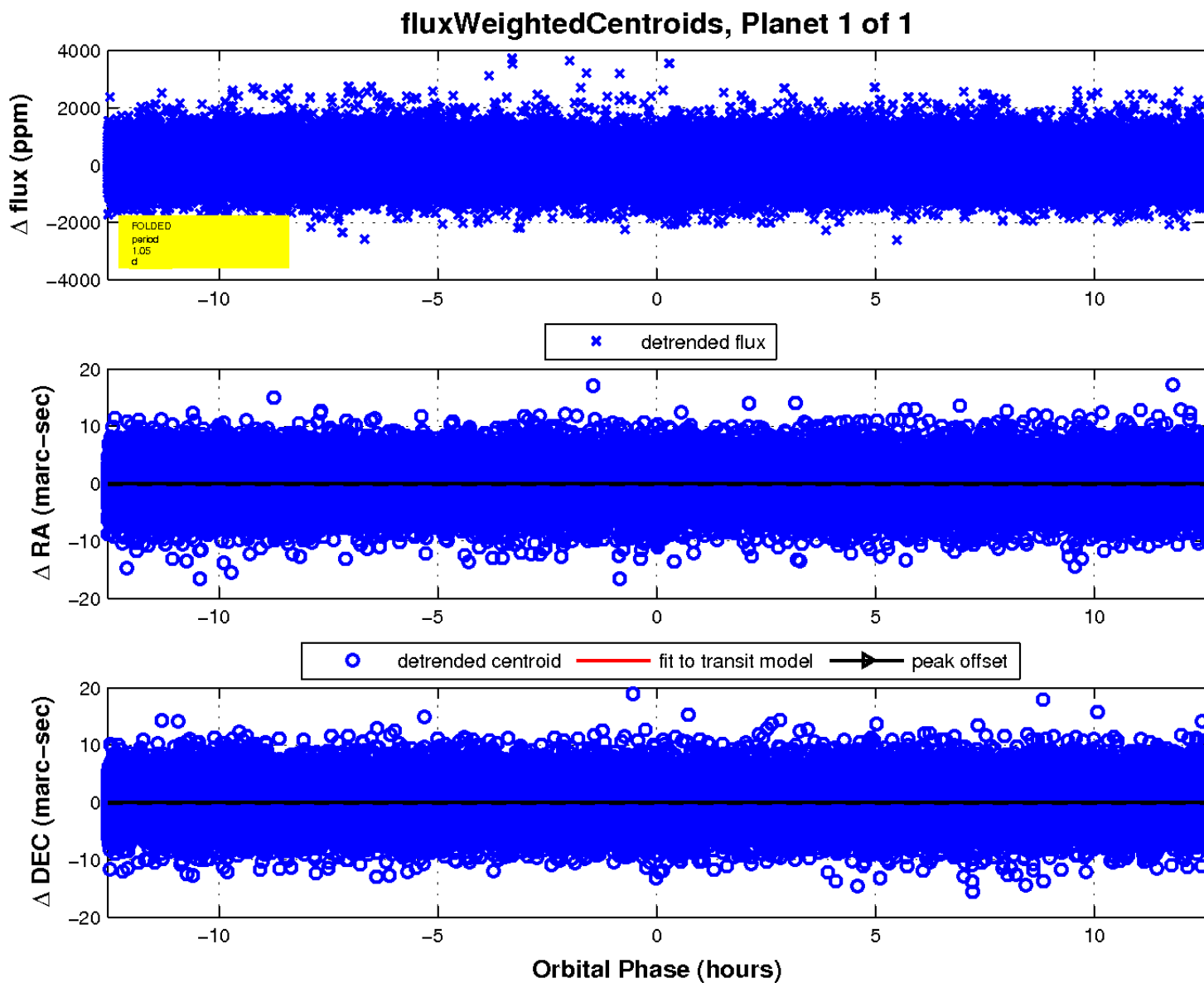
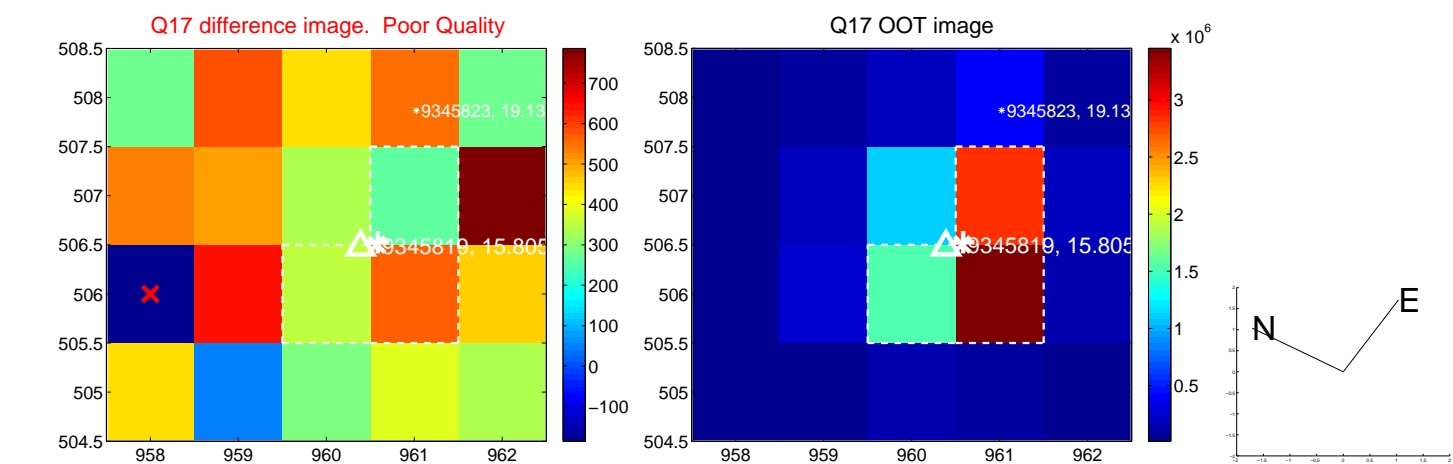
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

