

# KIC 012107008

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012107008-01	OBS	4297.01	5.937184	135.949587	113.0	3.708	14.5	15.5	0.80	5428	1.03	149.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012107008-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—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.

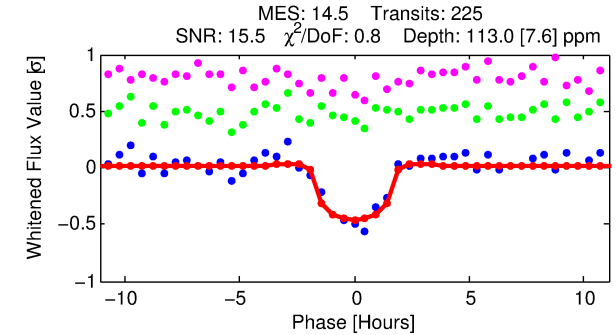
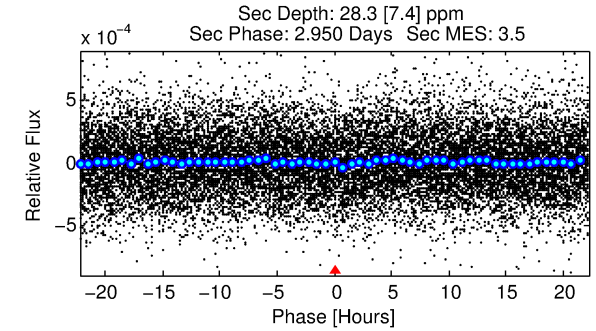
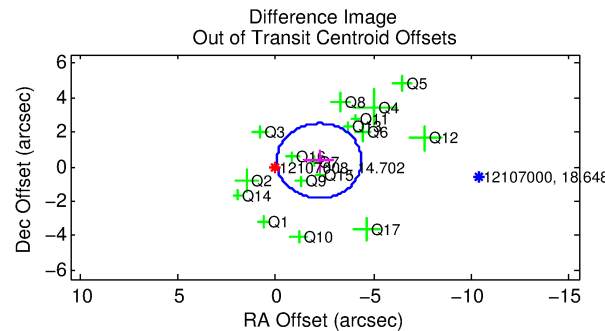
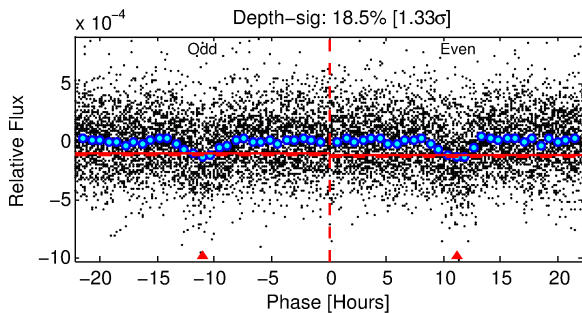
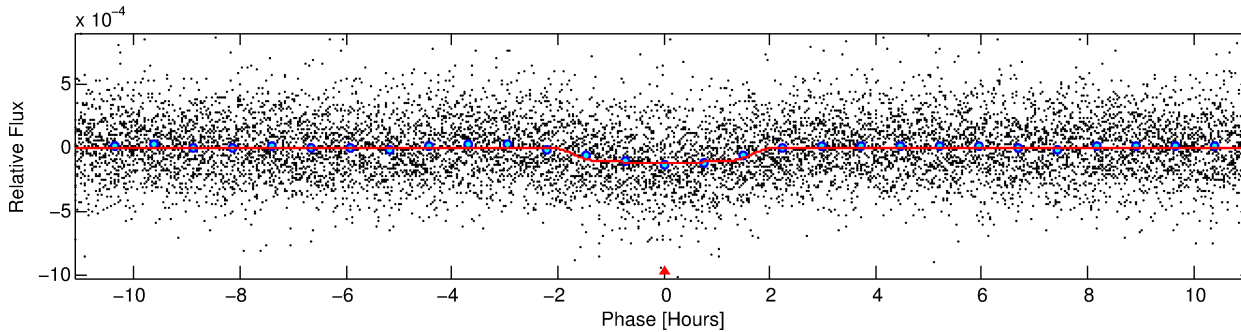
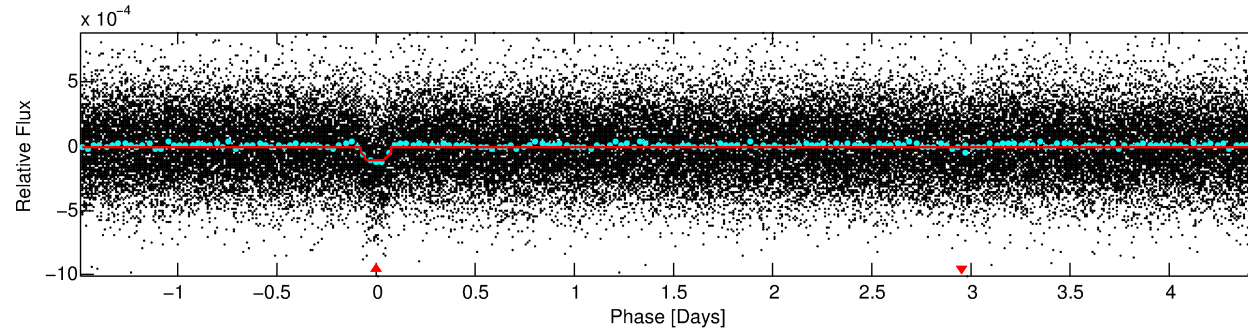
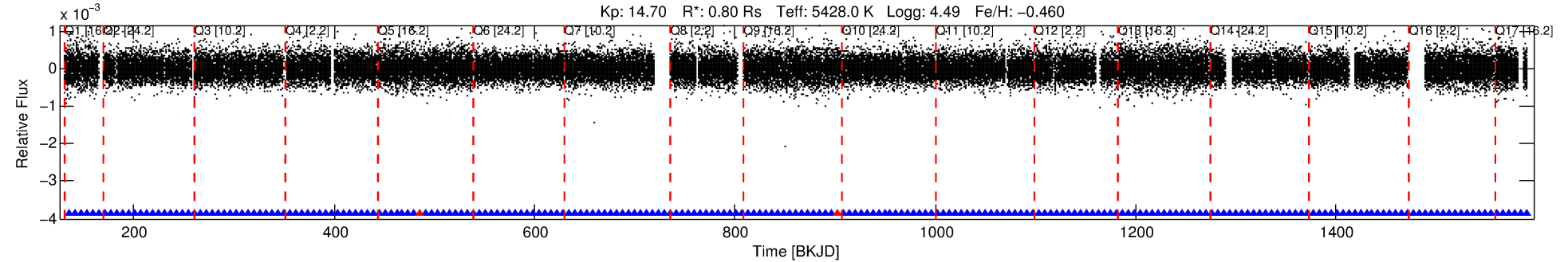
## Ephemeris Match Information For 012107008-01

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	$\sigma_P$	$\sigma_T$
012107008-01	12107008	359.01	12106929	1:1	96.7	-21	12	13.80	14.70	4.00	Direct-PRF	1	0.15	0.12

**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: 12107008 Candidate: 1 of 1 Period: 5.937 d  
KOI: K04297.01 Corr: 0.955



## DV Fit Results:

Period = 5.93718 [0.00003] d  
Epoch = 135.9496 [0.0041] BKJD  
Rp/R\* = 0.0118 [0.0038]  
a/R\* = 5.37 [7.94]  
b = 0.91 [0.28]  
Seff = 149.18 [34.97]  
Teq = 891 [52] K  
Rp = 1.03 [0.36] Re  
a = 0.0577 [0.0076] AU  
Ag = 48.83 [35.42] [1.35 $\sigma$ ]  
Teffp = 3642 [644] K [4.26 $\sigma$ ]

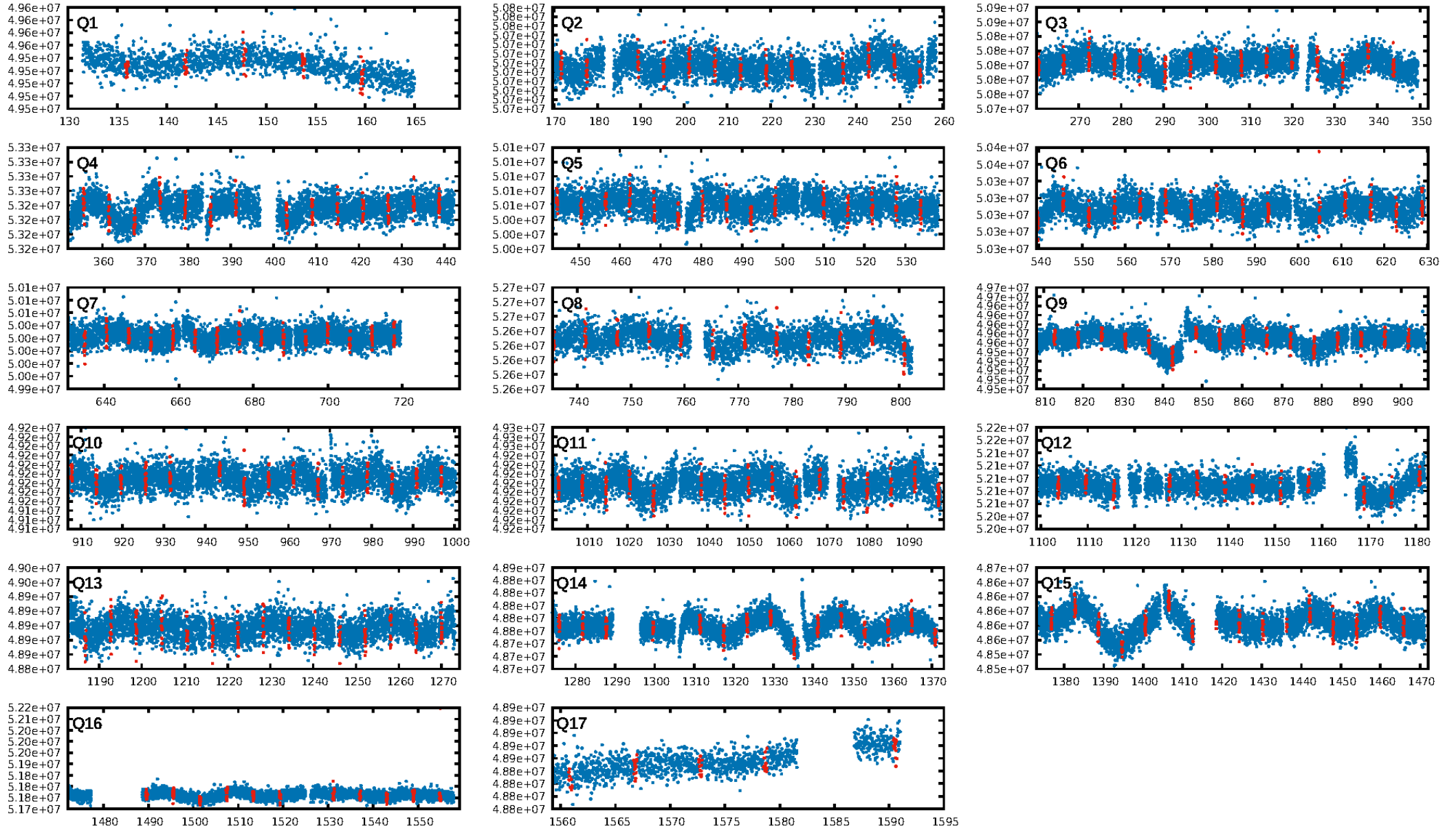
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.93e-46  
RollingBand-fgt: 0.99 [213/215]  
**GhostDiagnostic-chr: 0.1332**  
Centroid-sig: 57.4%  
Centroid-so: 0.440 arcsec [0.51 $\sigma$ ]  
**OotOffset-rm: 2.242 arcsec [3.10 $\sigma$ ]**  
**KicOffset-rm: 2.386 arcsec [3.39 $\sigma$ ]**  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.00 [0/17]  
DiffImageOverlap-fno: 1.00 [17/17]

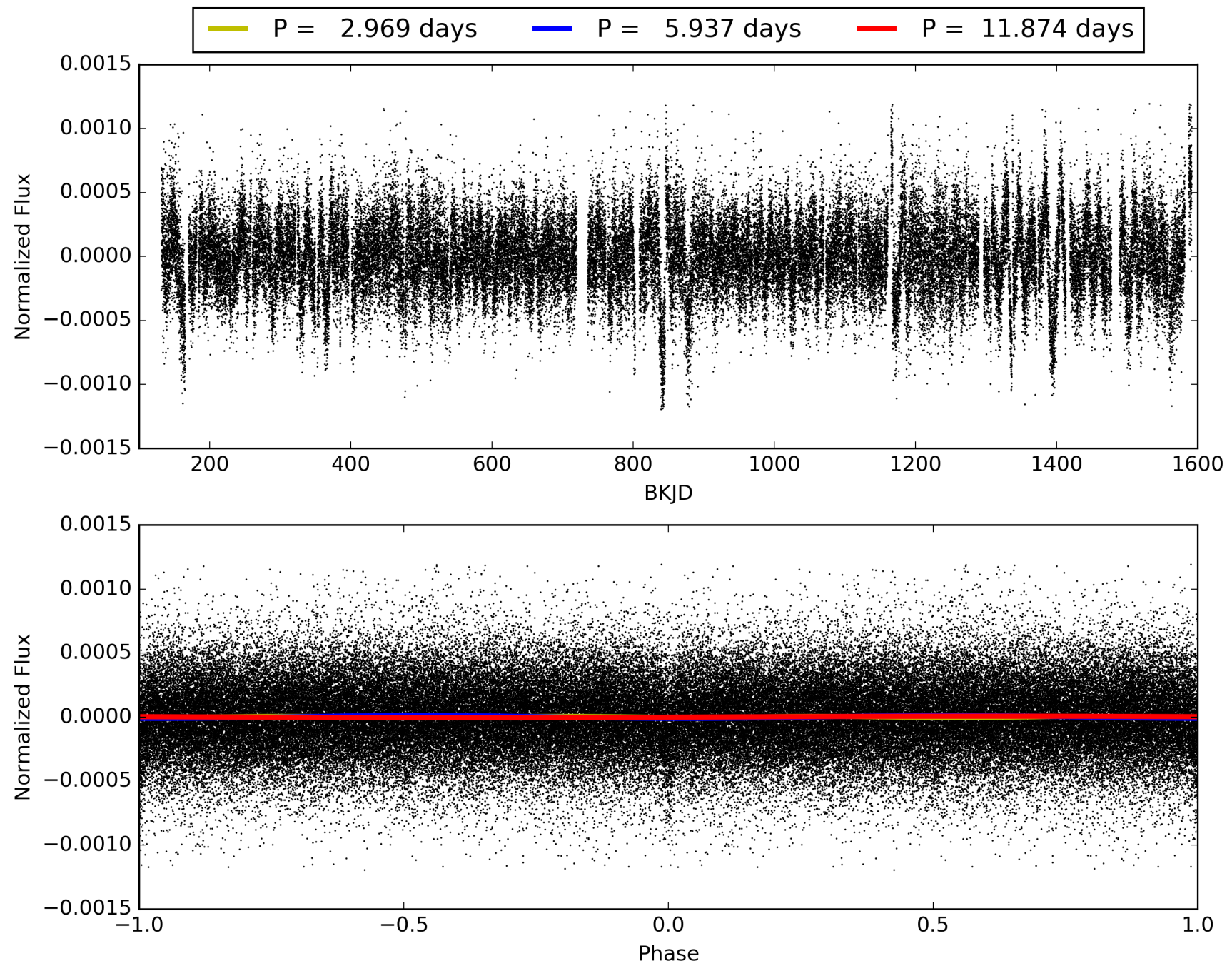
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 22:15:38 Z

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

# TCE 012107008-01, PDC Light Curves

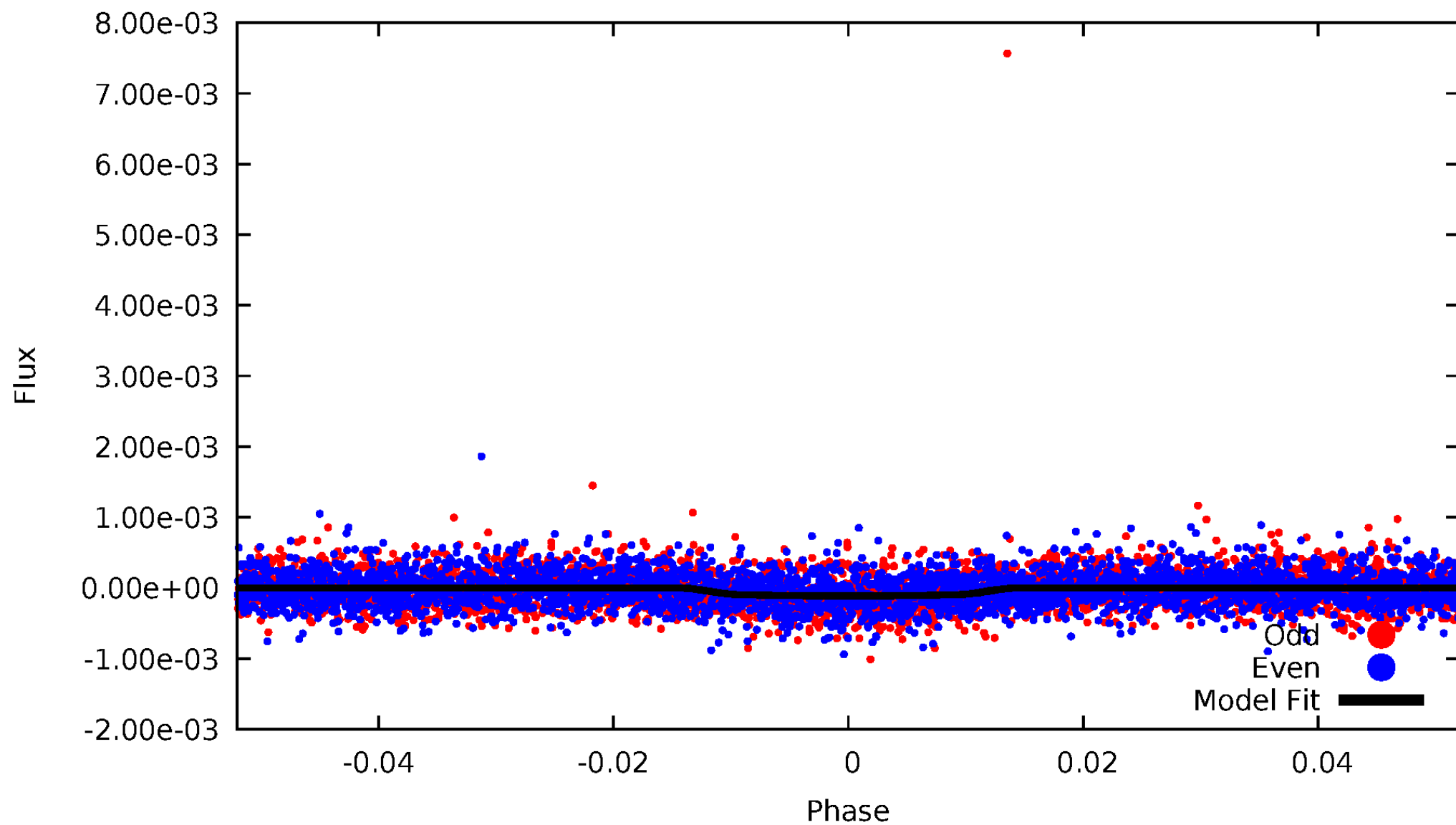


# TCE 012107008-01



# DV Odd/Even

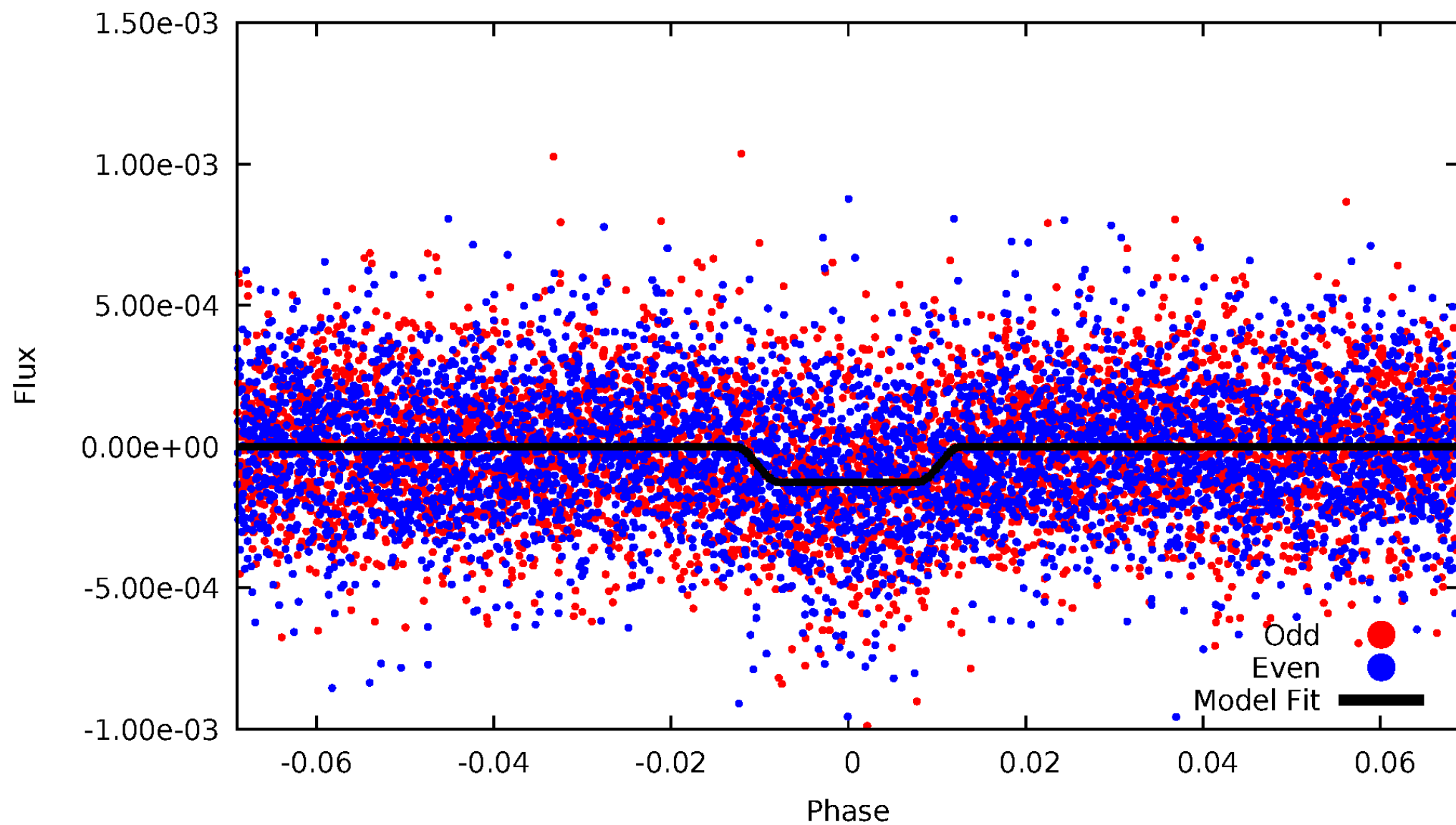
TCE 012107008-01



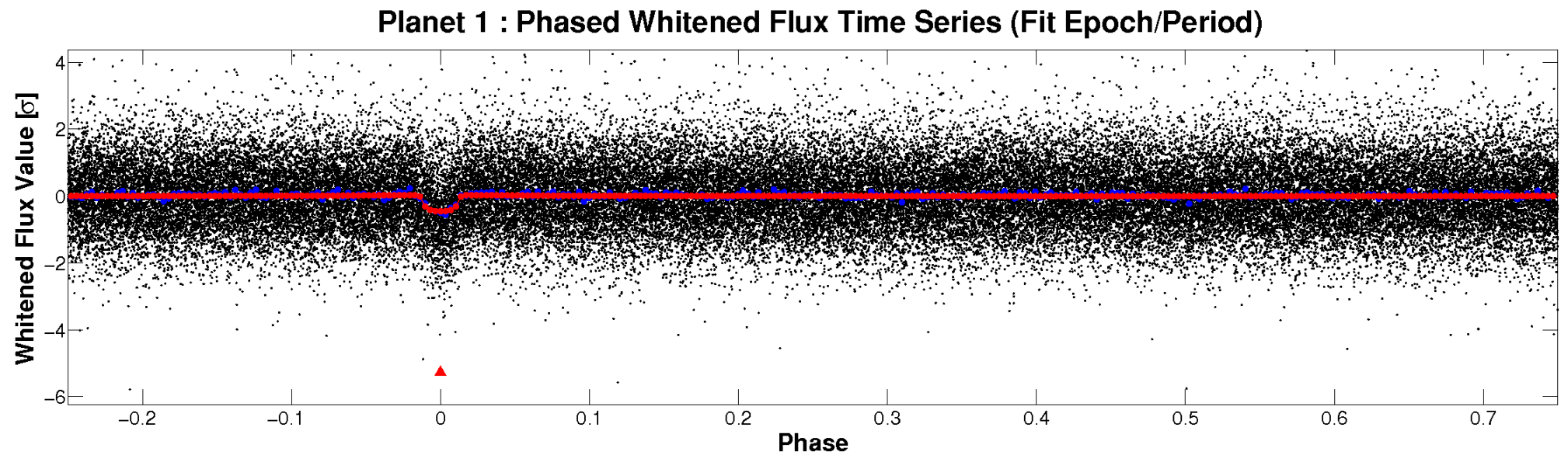
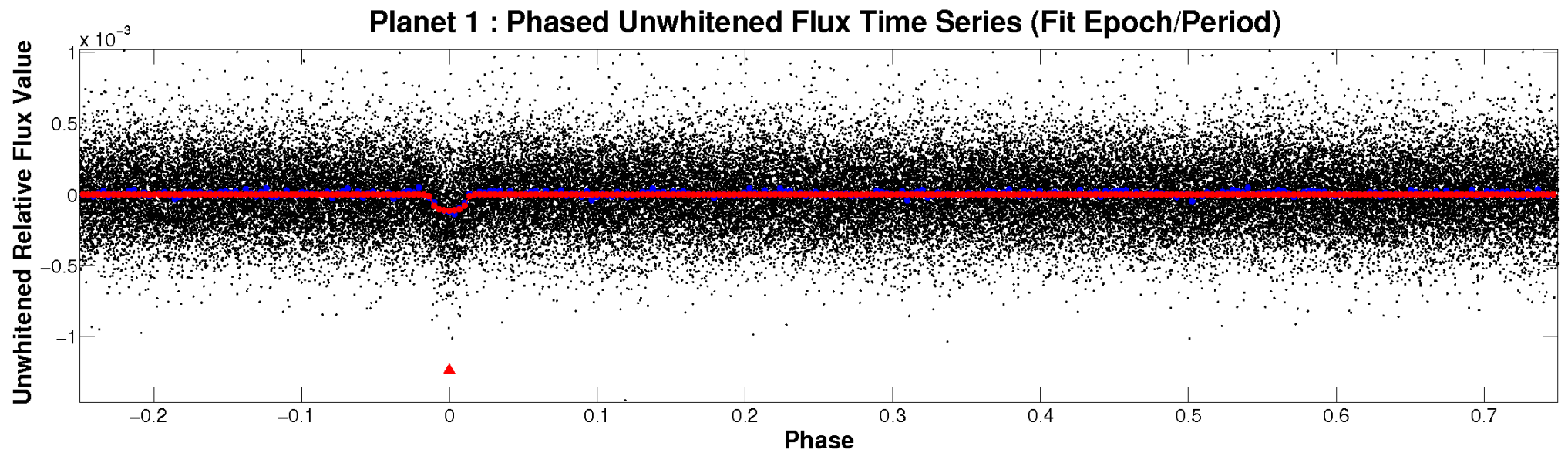


# ALT Odd/Even

TCE 012107008-01

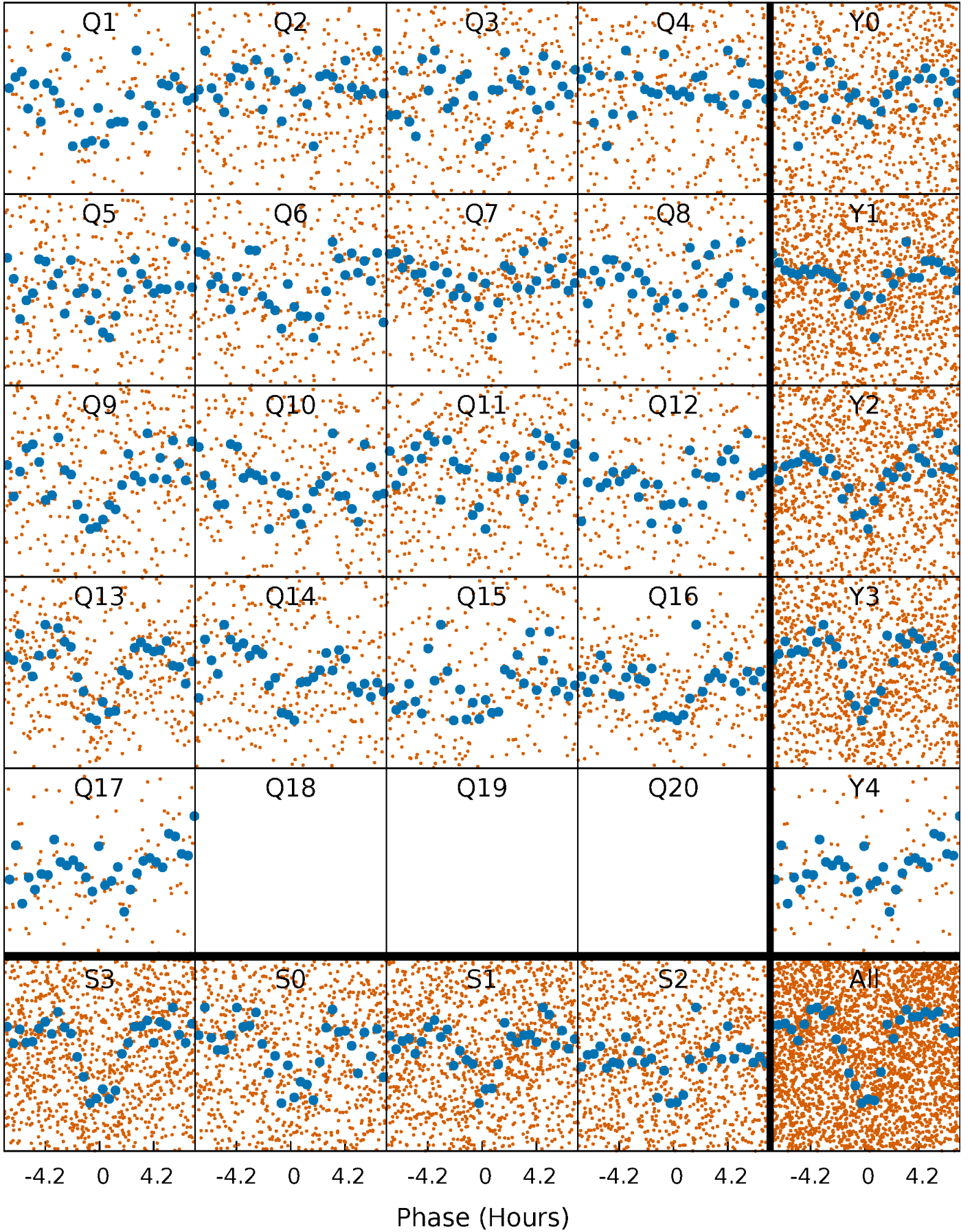


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

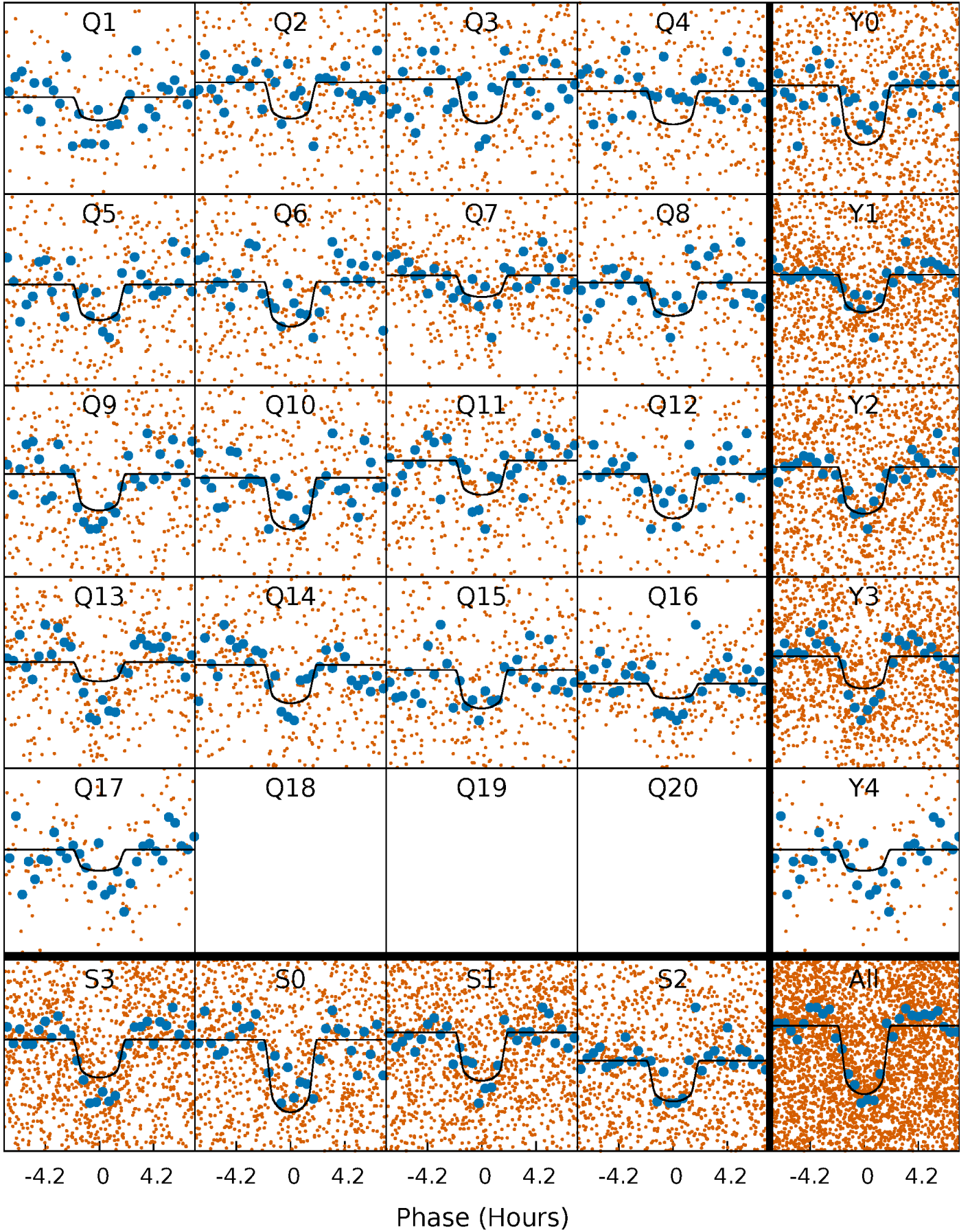
TCE 012107008-01 P= 5.937184 Days  $T_0=135.949587$  (BKJD)





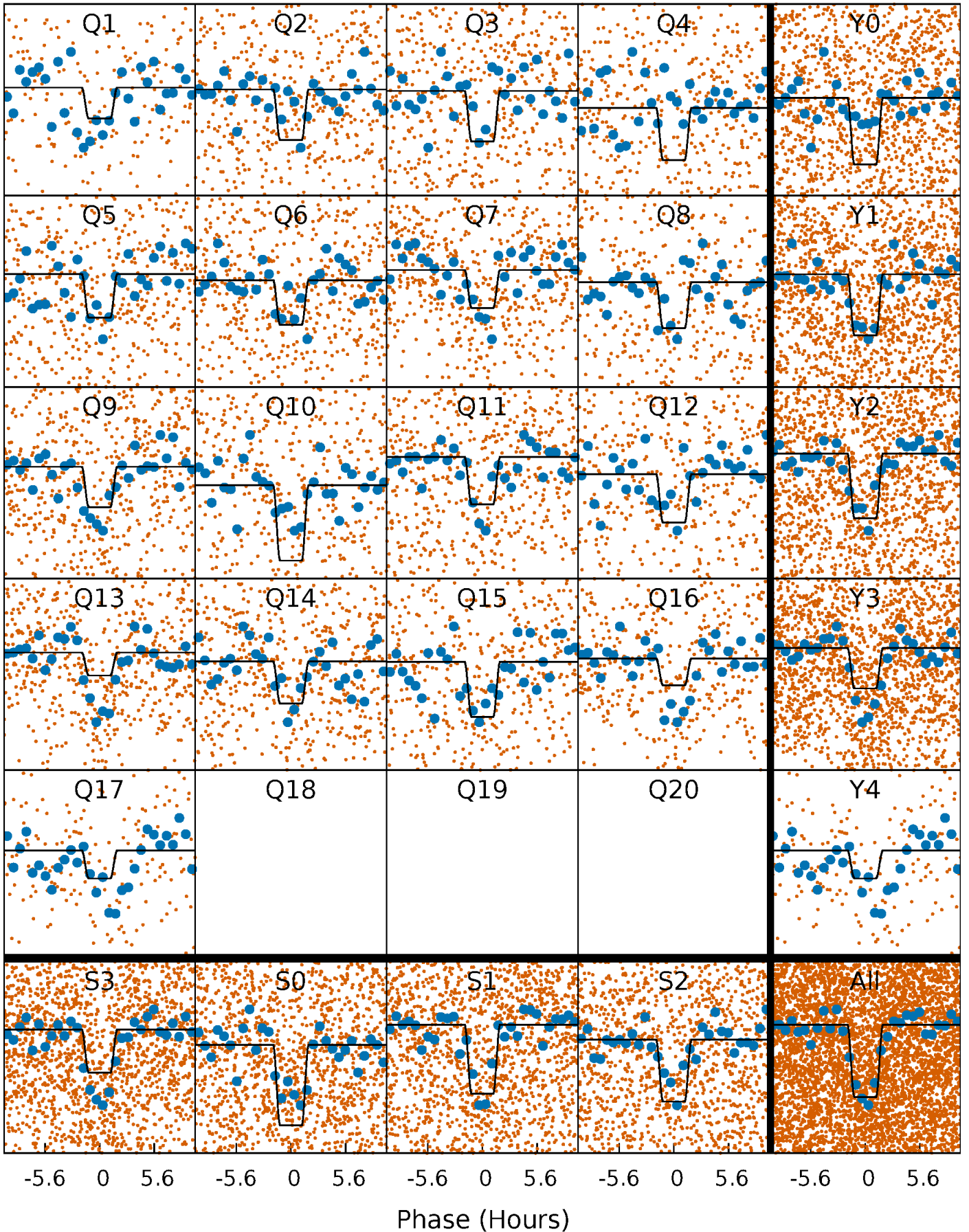
# DV Quarter-Phased Transit Curves

TCE 012107008-01 P= 5.937184 Days  $T_0=135.949587$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

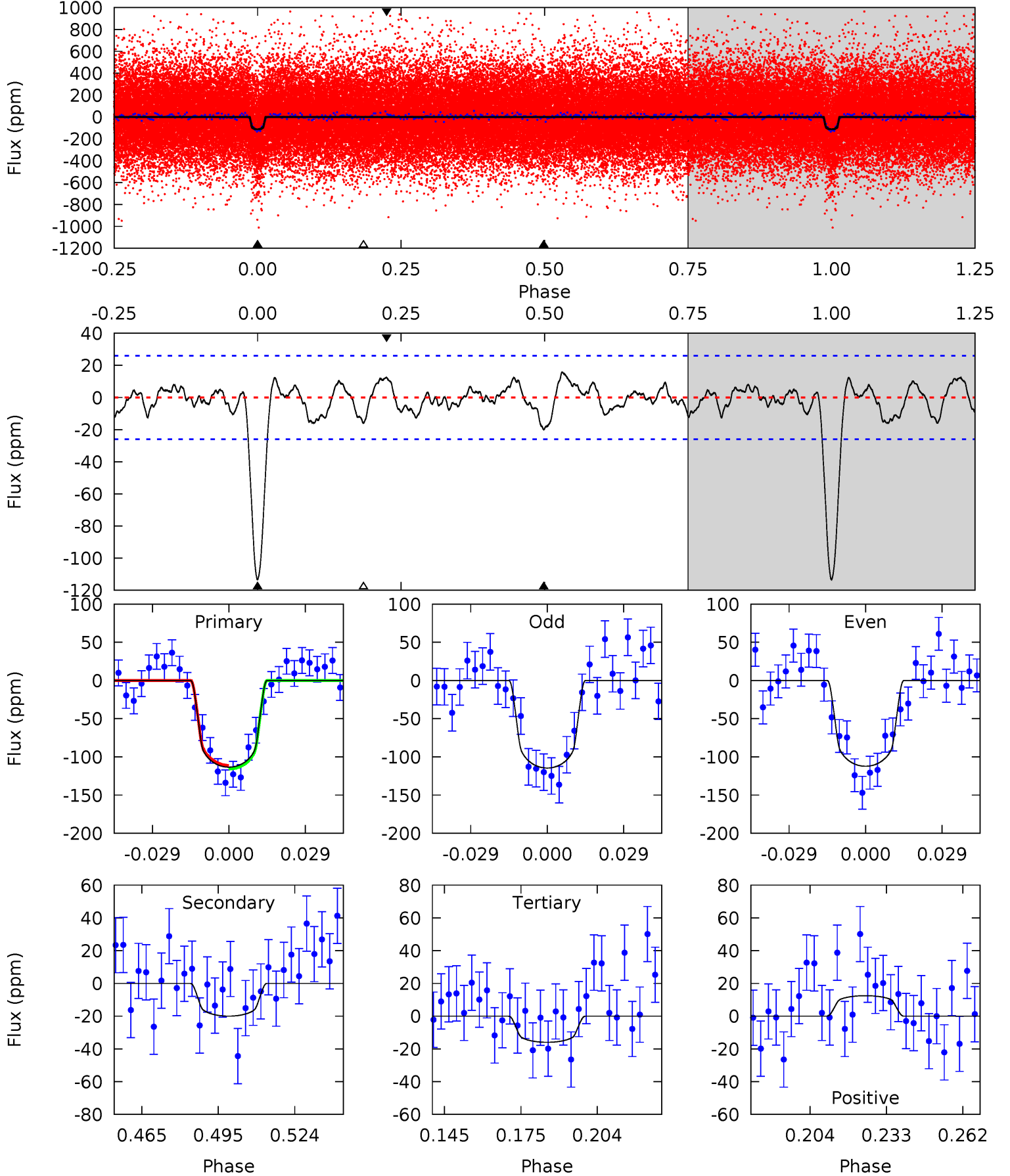
TCE 012107008-01 P= 5.937089 Days  $T_0=135.965040$  (BKJD)



# DV Model-Shift Uniqueness Test

012107008-01, P = 5.937184 Days, E = 130.012403 Days

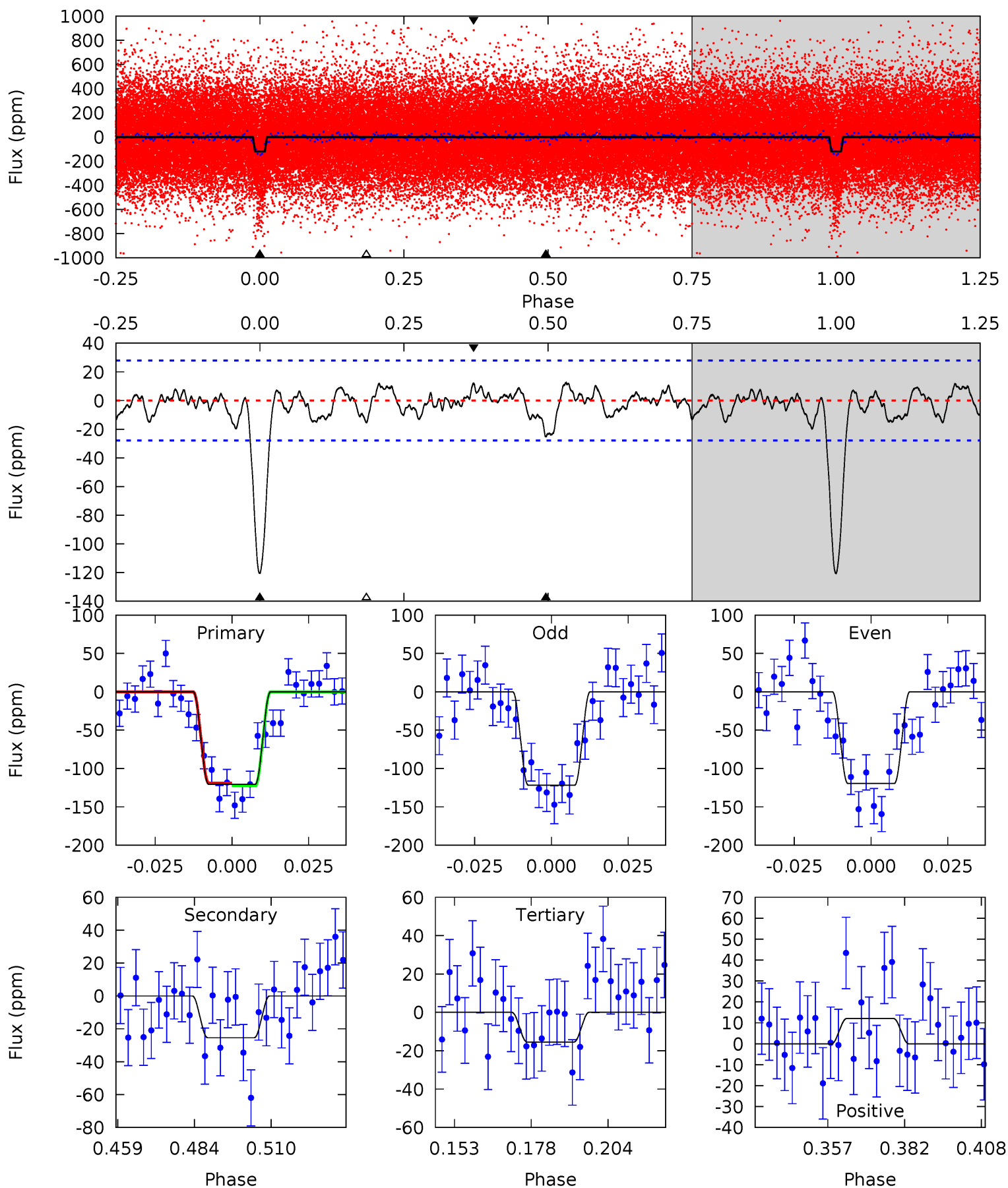
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.0	3.71	2.96	2.31	4.82	2.18	1.22	18.1	18.7	0.75	1.39	0.21	1.13	0.12	0.44



# Alt Model-Shift Uniqueness Test

012107008-01, P = 5.937089 Days, E = 130.027951 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
21.0	4.42	2.69	2.10	4.84	2.23	1.13	18.3	18.9	1.73	2.32	0.19	1.04	0.09	0.32





### Stellar Parameters For KIC 012107008

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5428^{+162}_{-162}$	$4.494^{+0.115}_{-0.104}$	$-0.460^{+0.350}_{-0.300}$	$0.799^{+0.117}_{-0.107}$	$0.727^{+0.105}_{-0.045}$	$2.008^{+0.934}_{-0.585}$
	+3%/-3%	+3%/-2%	+76%/-65%	+15%/-13%	+14%/-6%	+47%/-29%
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 012107008-01 / KOI 4297.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-20 \pm 5$	$1.04^{+0.36}_{-0.33}$	$1244^{+58}_{-59}$	$3700^{+570}_{-372}$	$34^{+42}_{-17}$
Alt.	$-25 \pm 6$	$0.98^{+0.34}_{-0.35}$	$1242^{+64}_{-60}$	$3939^{+704}_{-397}$	$49^{+68}_{-24}$

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

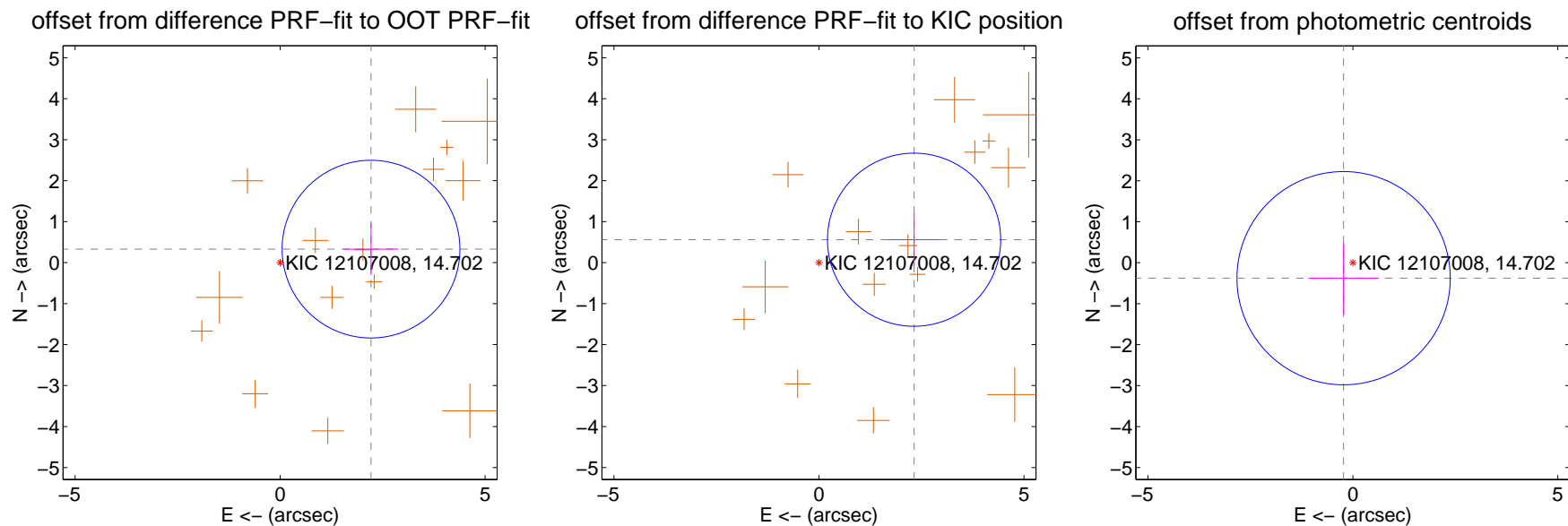
## DV Centroid Data

Supplemental centroid analysis for 012107008-01. Kepler magnitude: 14.70. Transit SNR 15.51

There are 0 quarters with good PRF difference image offsets

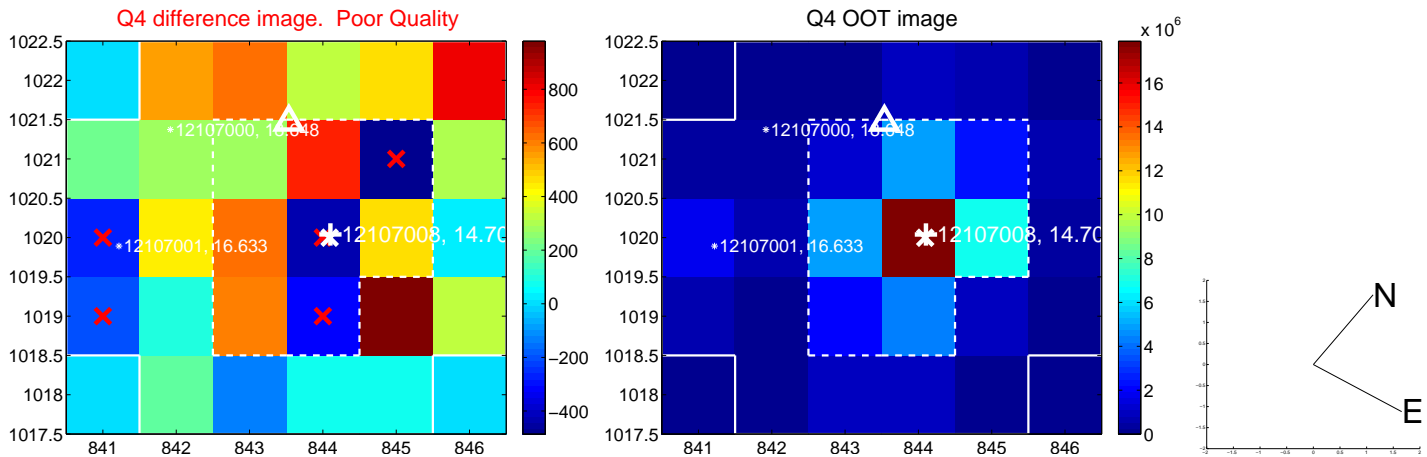
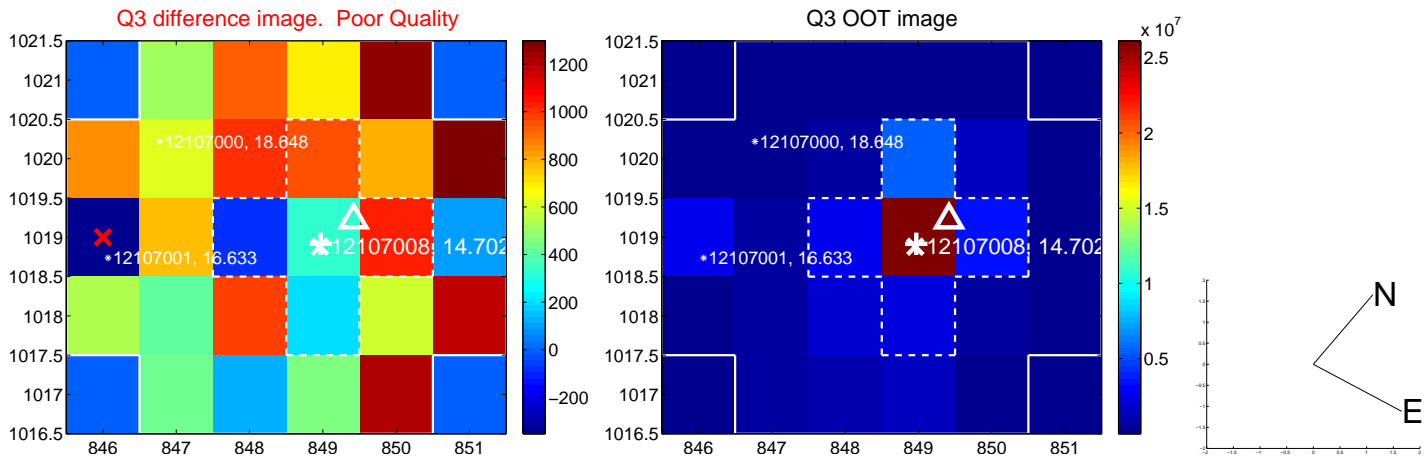
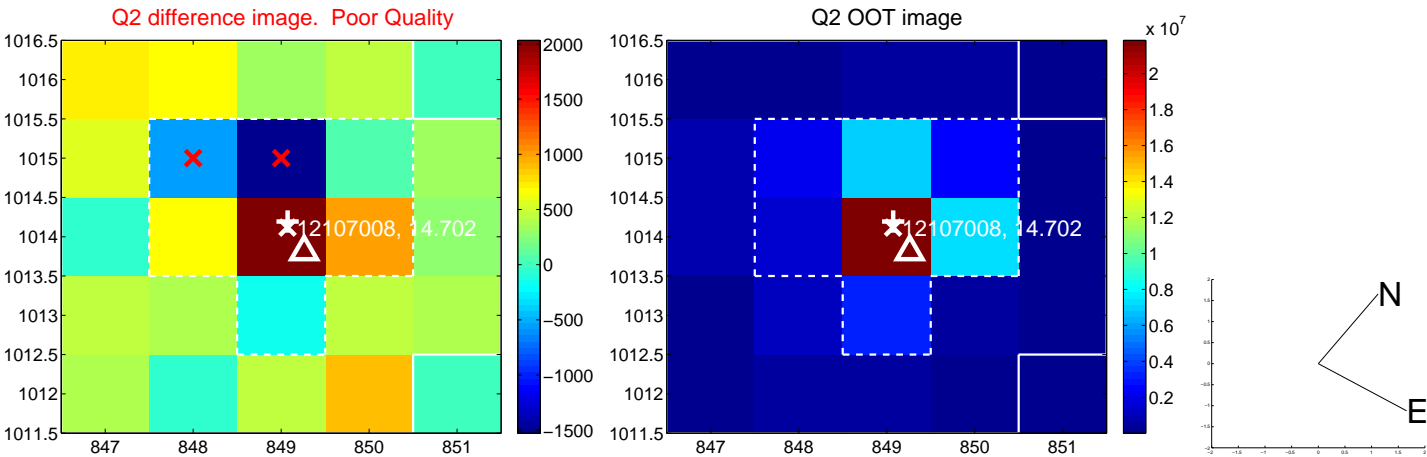
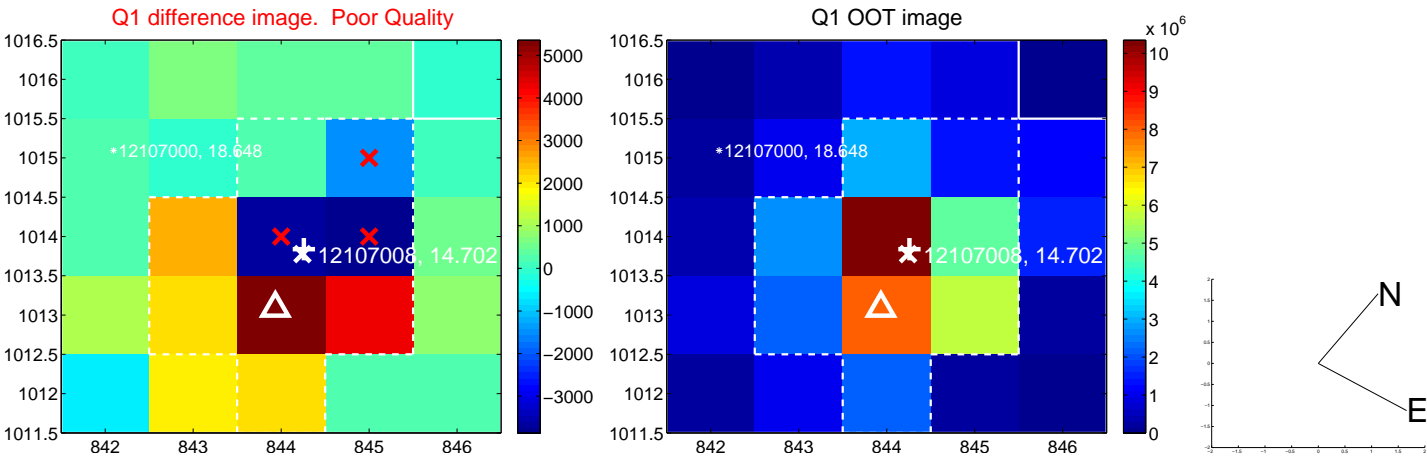
The direct PRF centroid is offset from the target star catalog position by about 0.42 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.242 \pm 0.723$	3.10	$-2.217 \pm 0.674$	$0.330 \pm 0.632$
PRF-fit source offset from KIC position	$2.386 \pm 0.704$	3.39	$-2.319 \pm 0.636$	$0.560 \pm 0.644$
photometric centroid source offset	$0.44 \pm 0.87$	0.51	$0.23 \pm 0.86$	$-0.38 \pm 0.87$

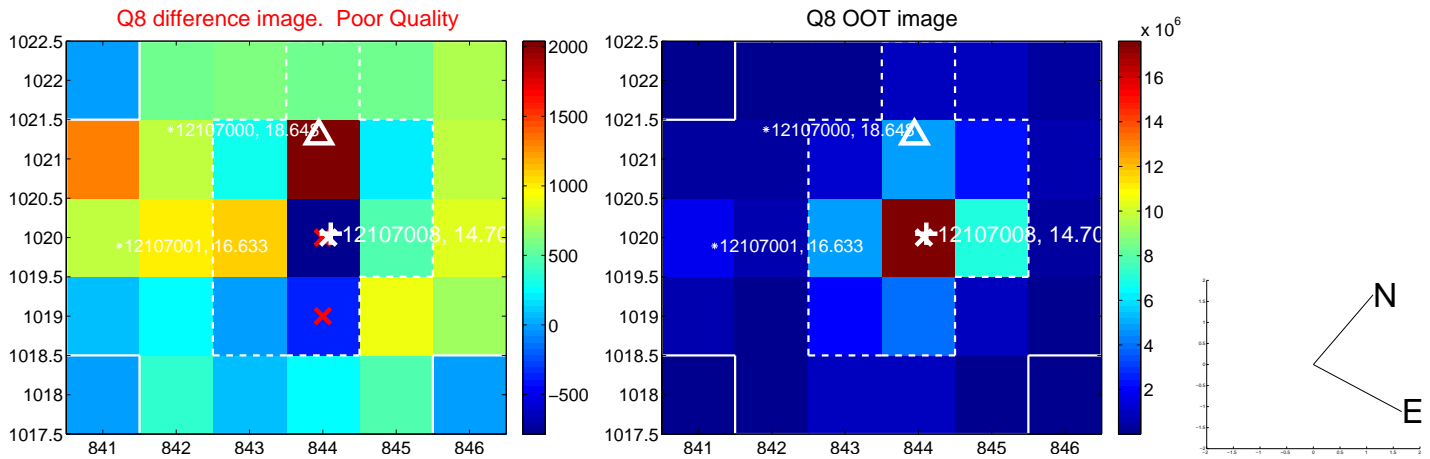
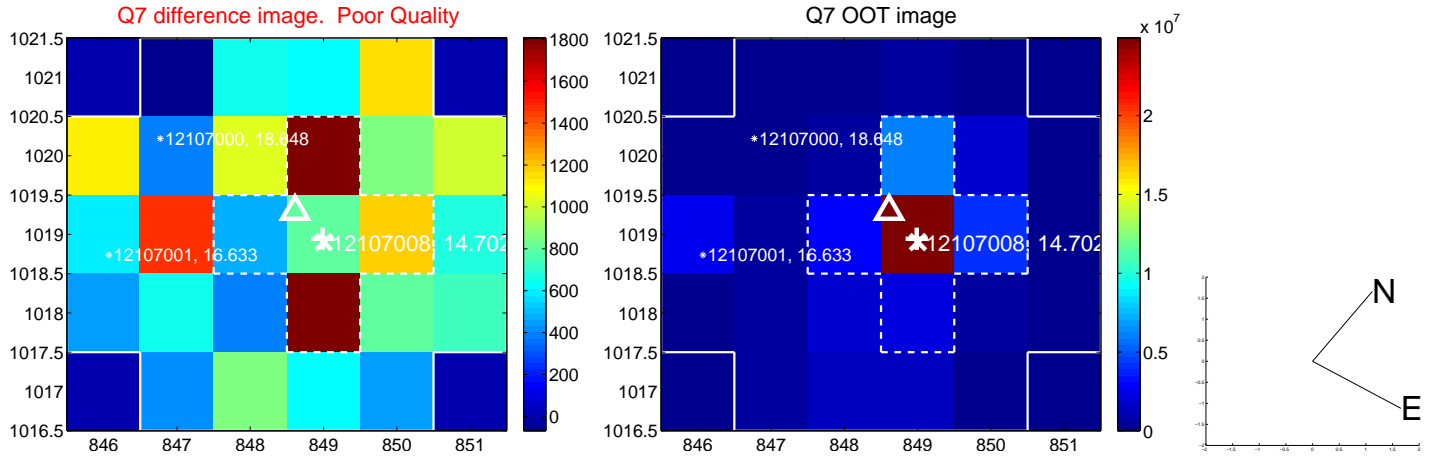
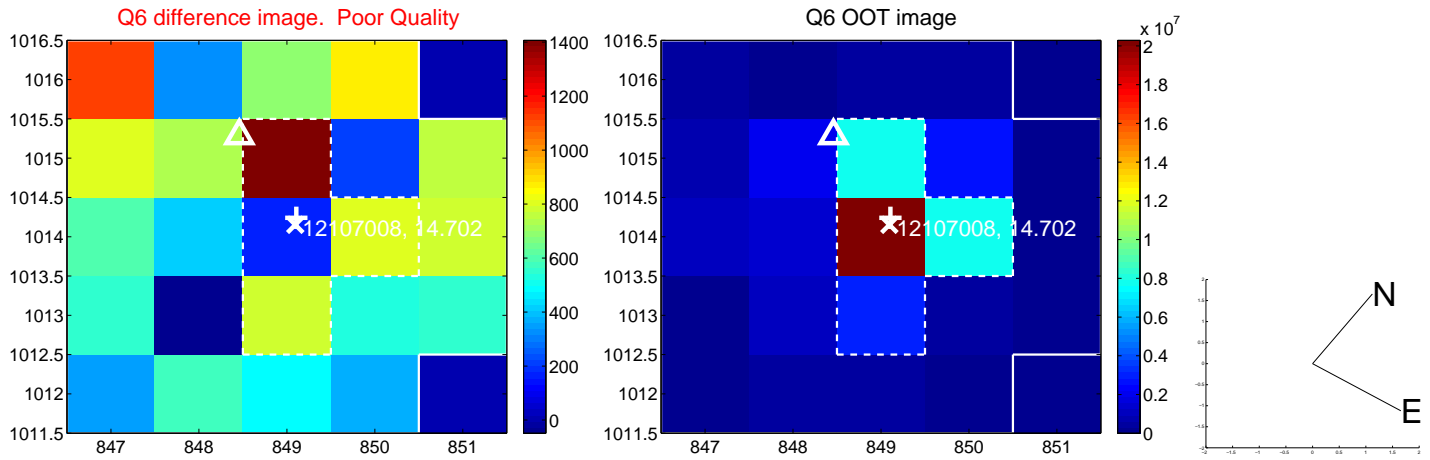
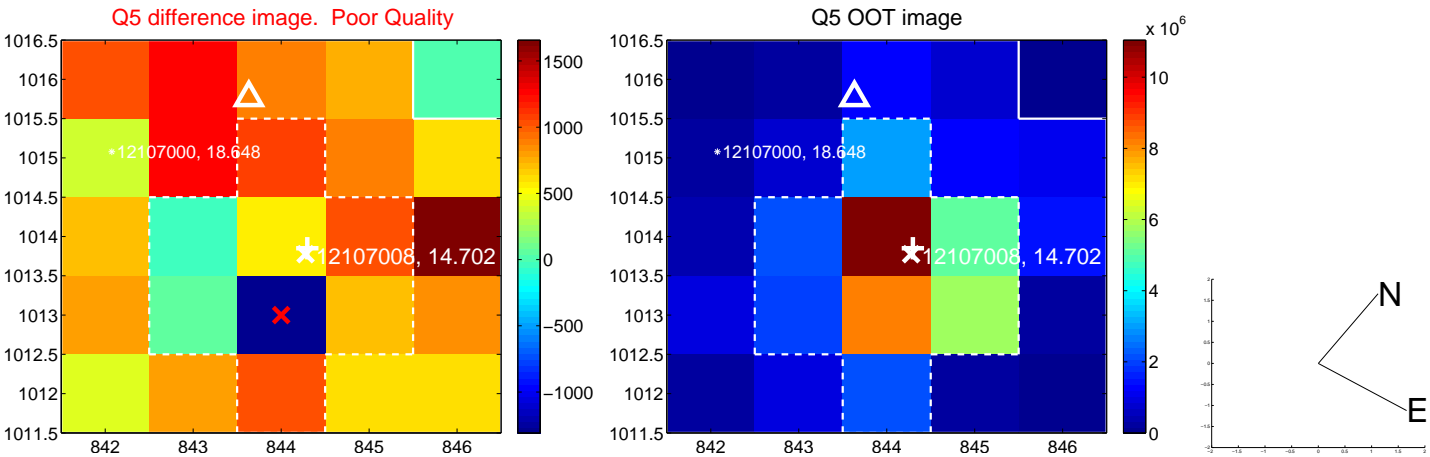


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

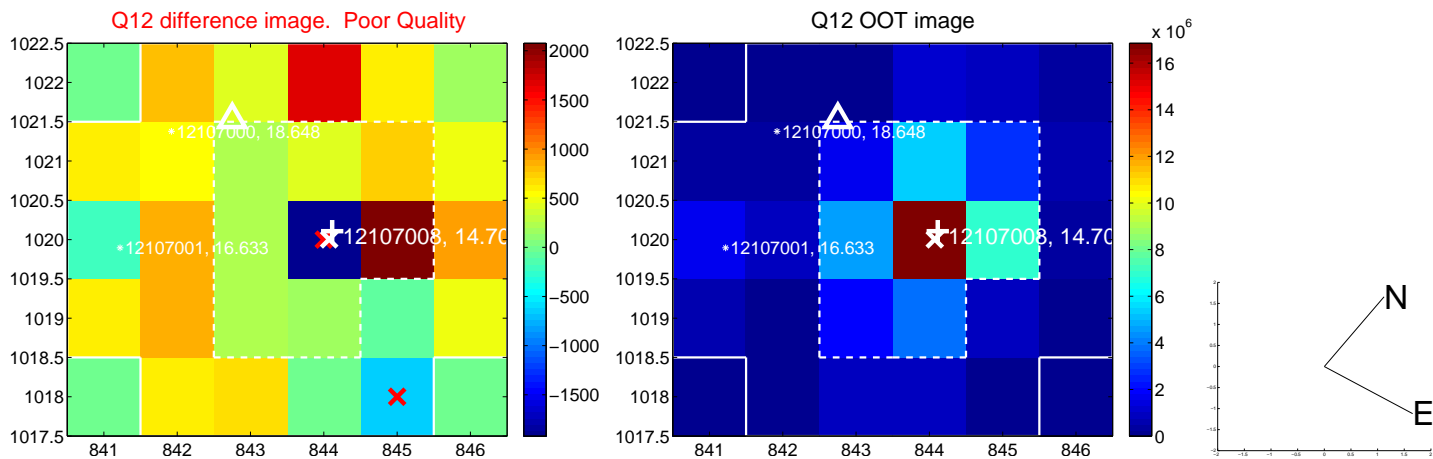
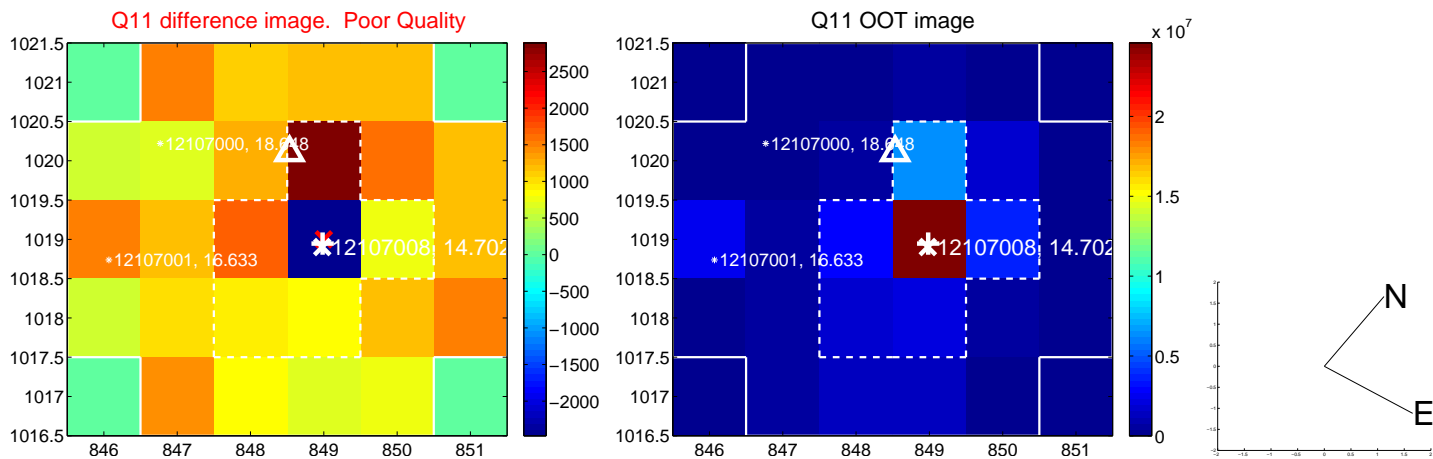
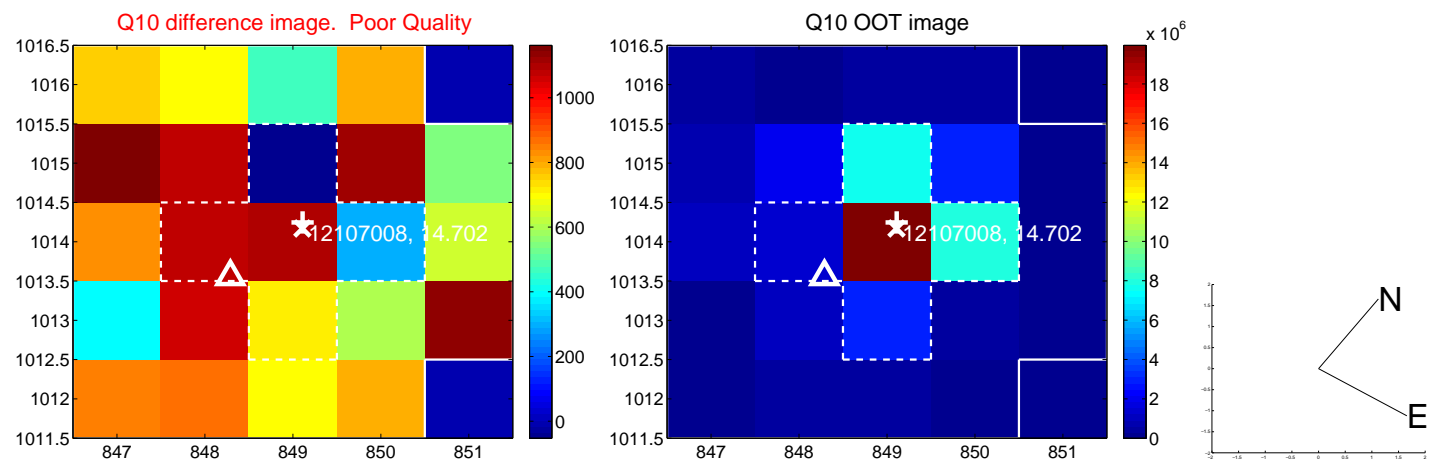
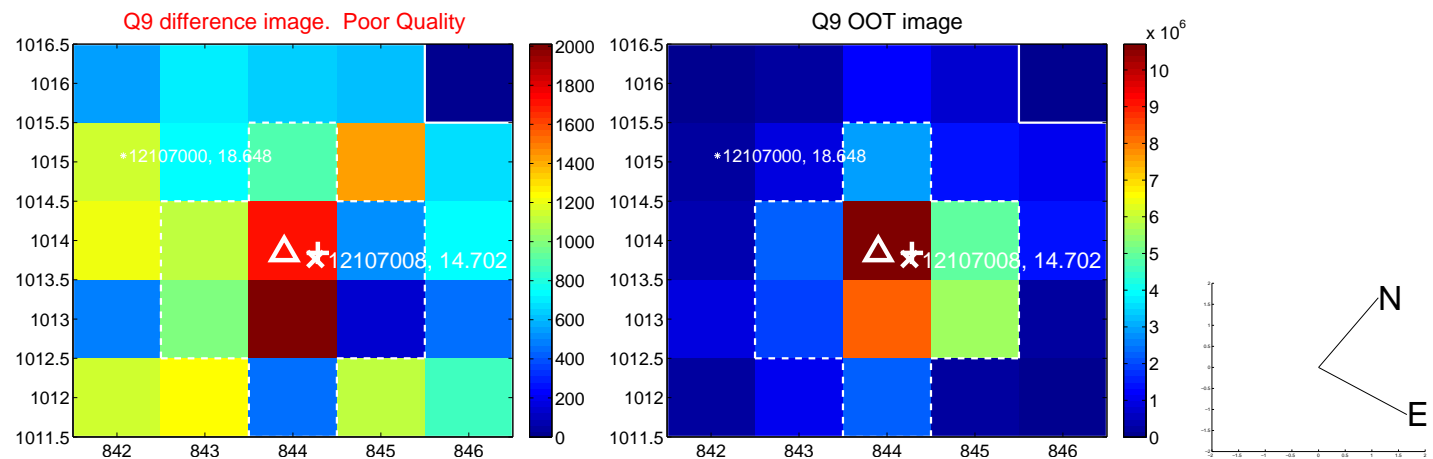


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

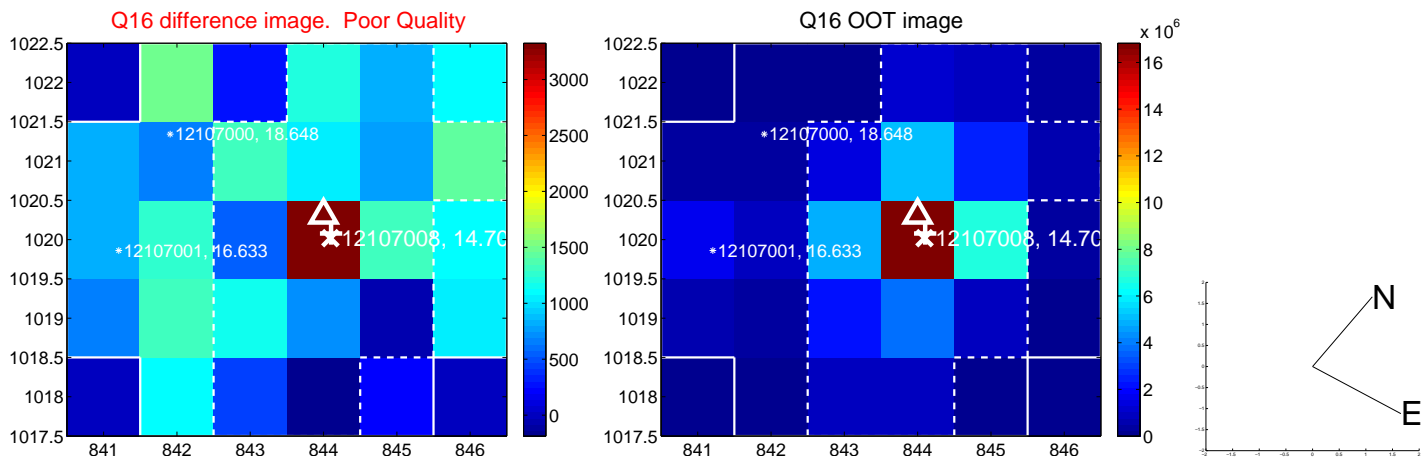
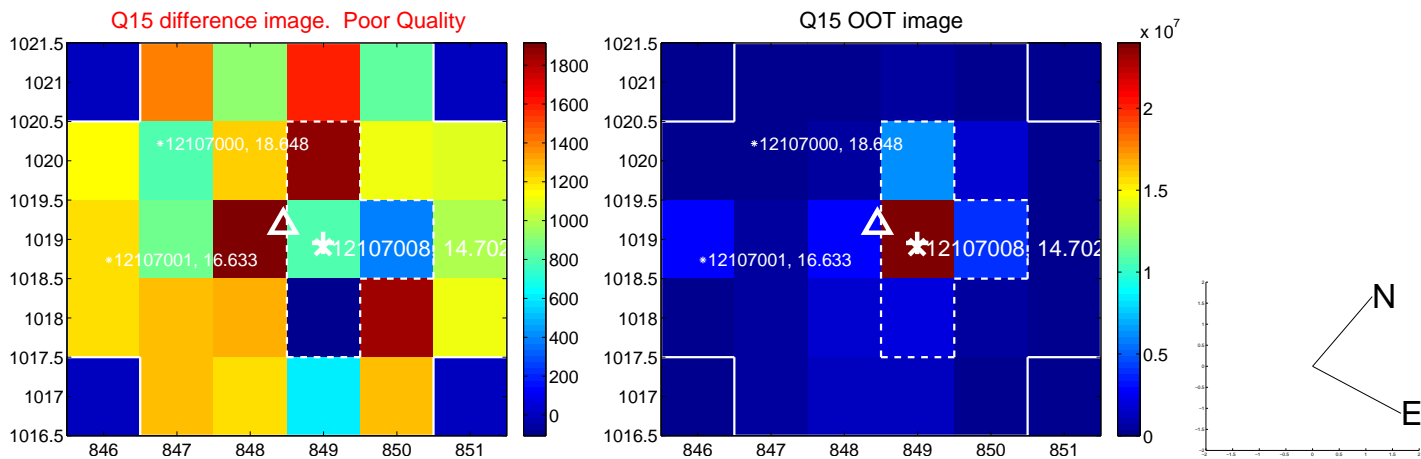
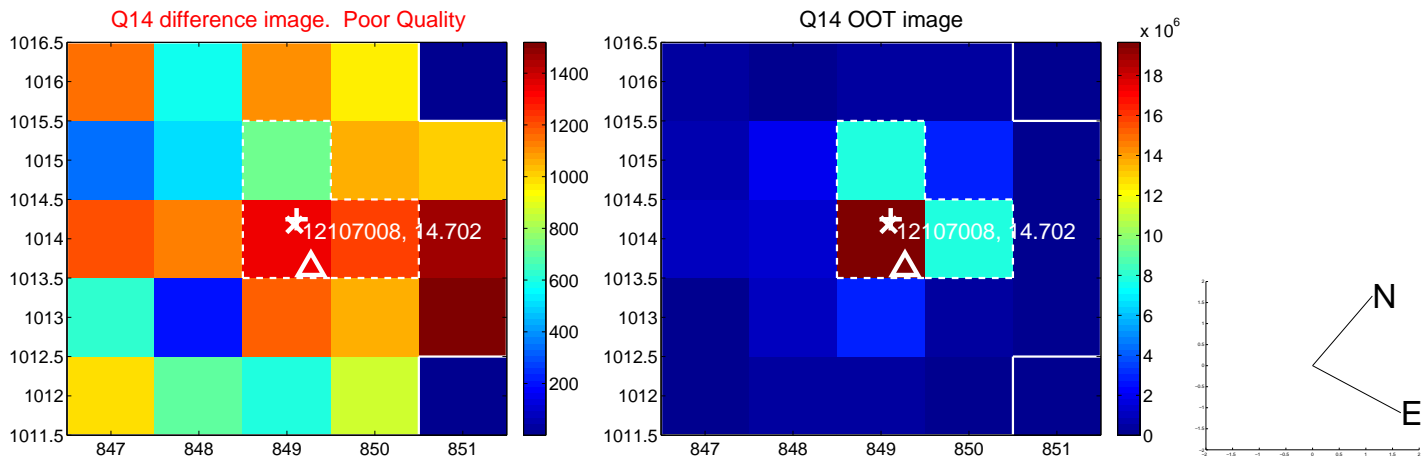
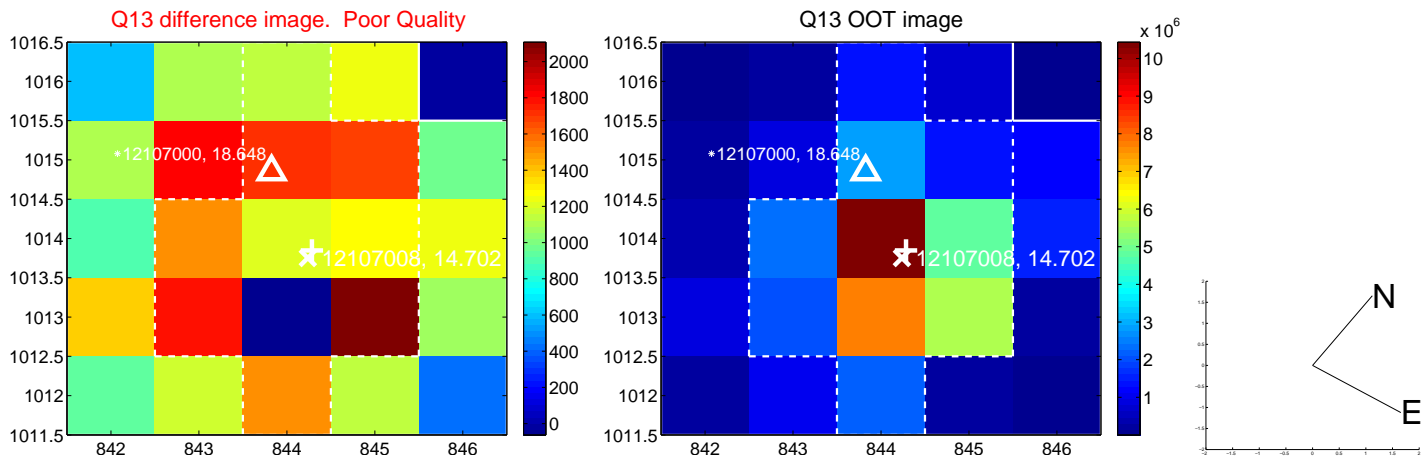




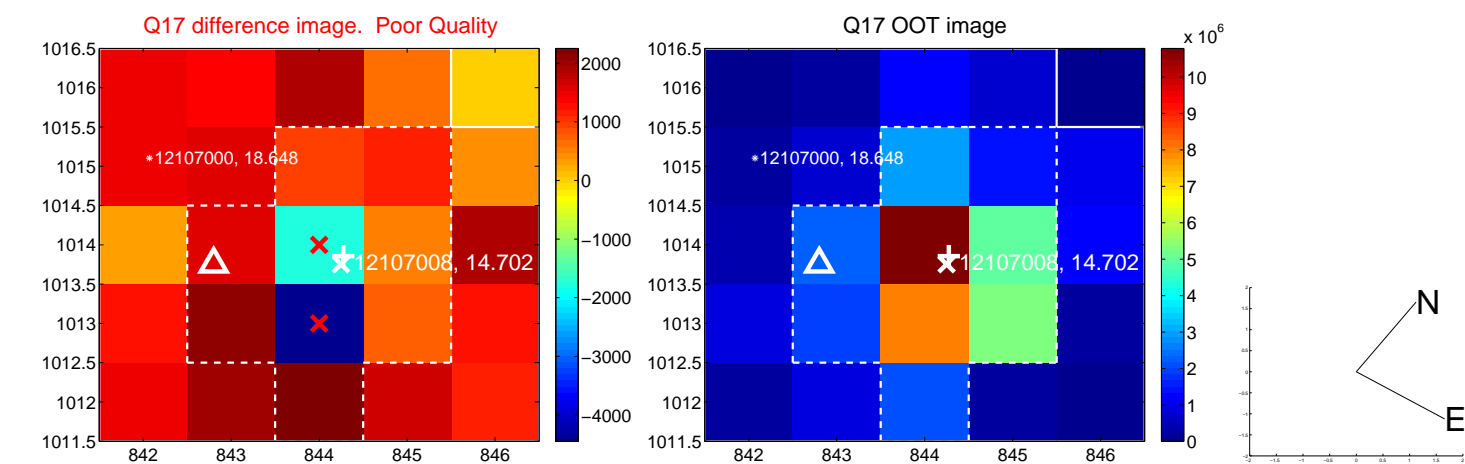
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



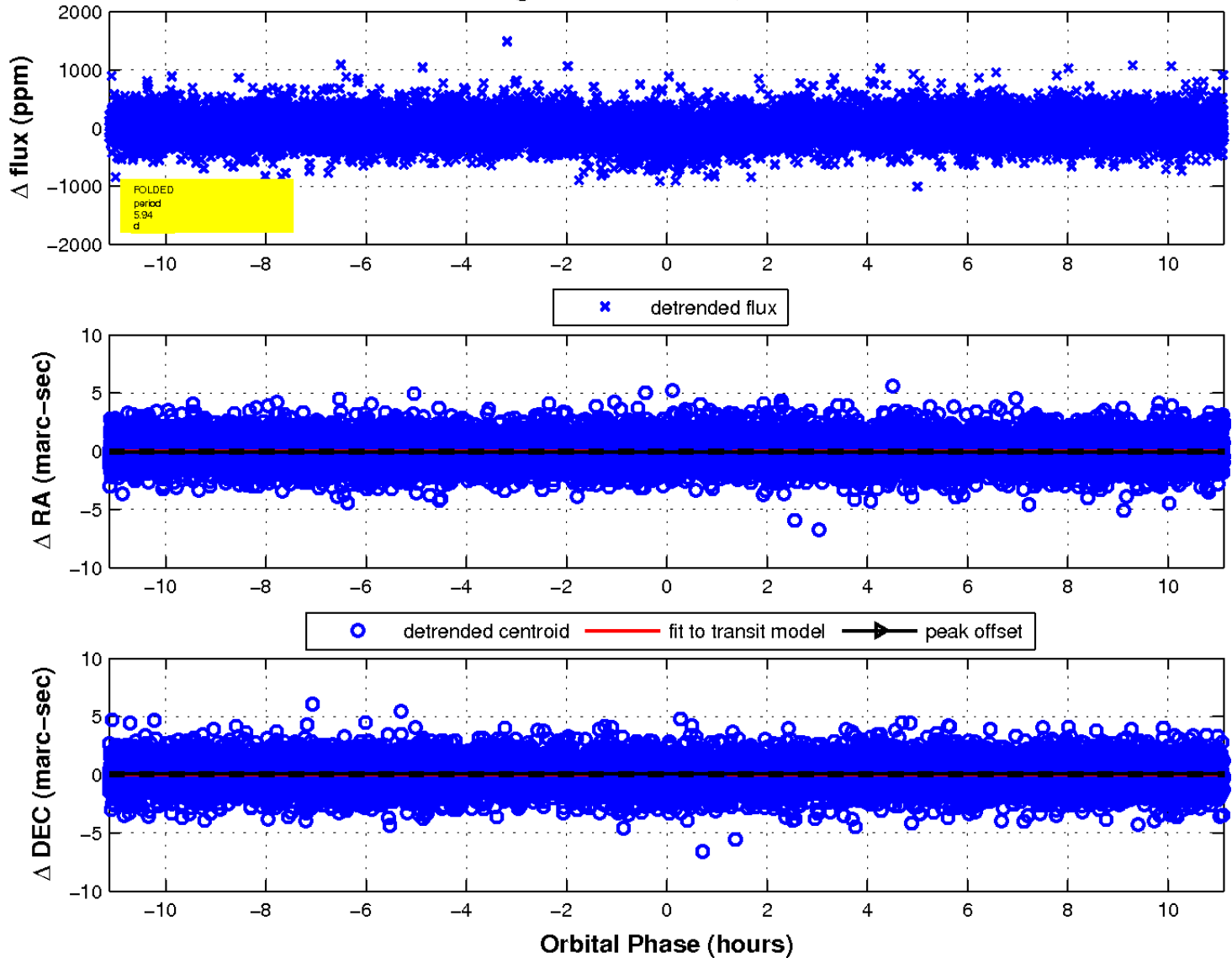
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

