

# KIC 012459808

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012459808-01	OBS	8081.01	0.502443	131.936600	10.6	1.935	7.7	9.2	1.20	6306	0.46	12682.09

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012459808-01	OBS	FP	0.00	0	0	0	1	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.

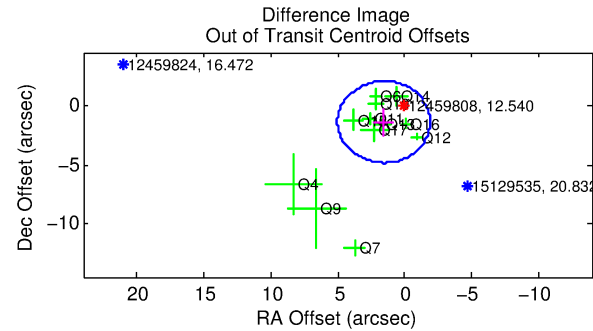
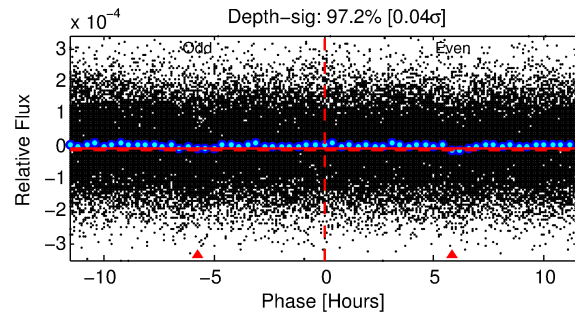
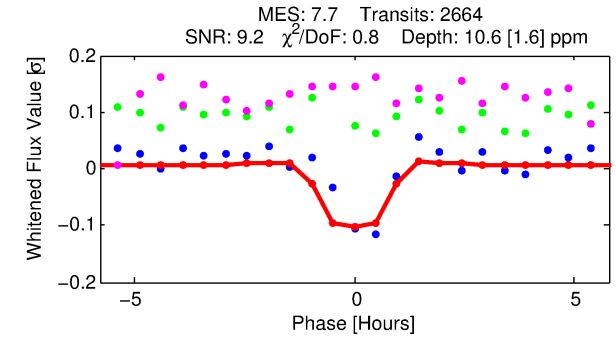
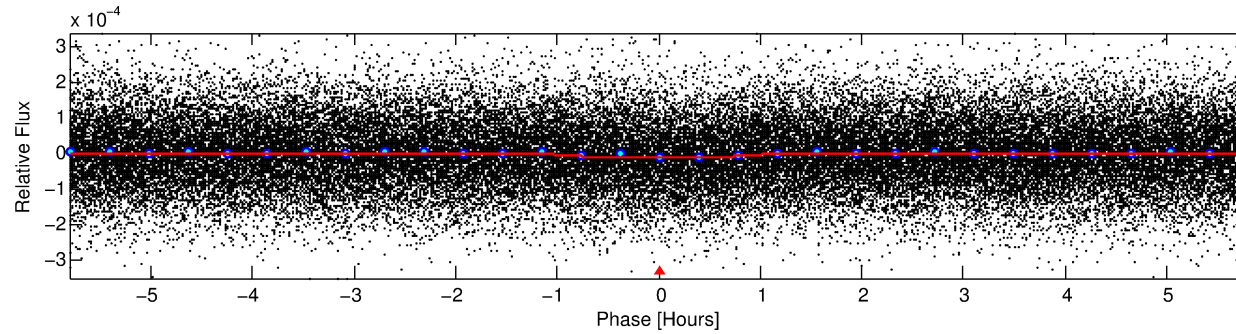
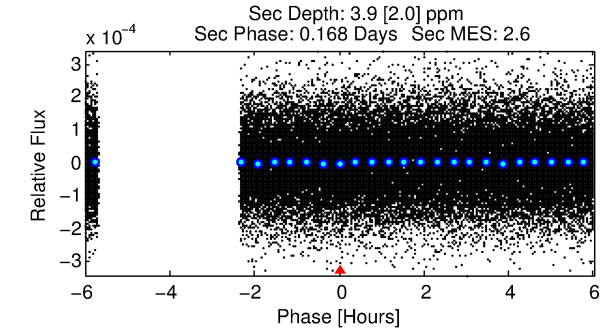
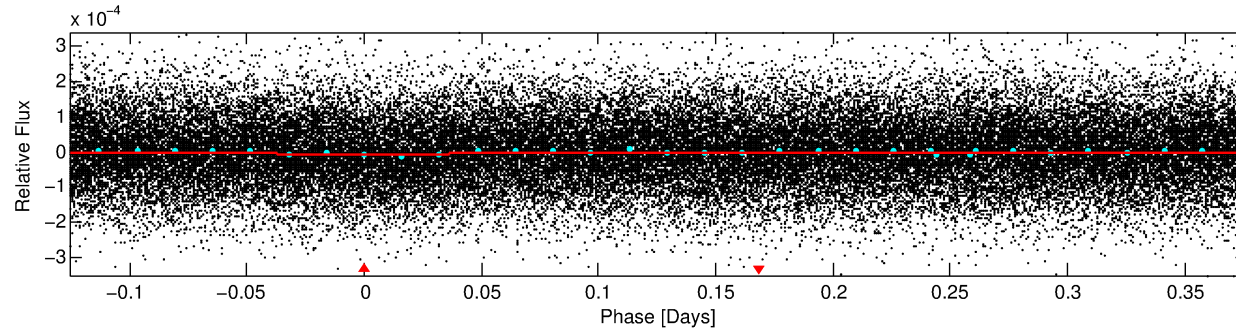
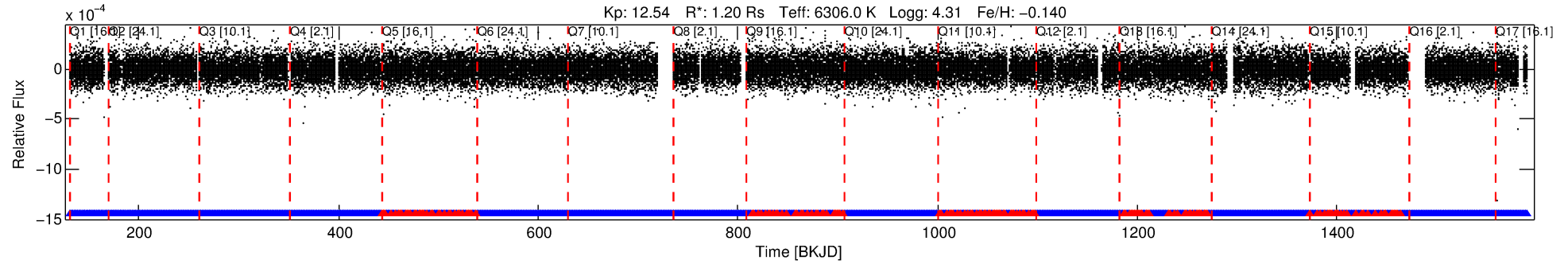
## Ephemeris Match Information For 012459808-01

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	$\sigma_P$	$\sigma_T$
012459808-01	12459808	7525.01	12356746	1:1	749.3	188	0	13.53	12.54	3422.40	Col-Anomaly	0	2.77	1.35

**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: 12459808 Candidate: 1 of 1 Period: 0.502 d



## DV Fit Results:

Period = 0.50244 [0.00001] d  
Epoch = 131.9366 [0.0027] BKJD  
Rp/R\* = 0.0035 [0.0008]  
a/R\* = 1.28 [0.60]  
b = 0.90 [0.25]  
Seff = 12682.09 [5018.70]  
Teq = 2706 [268] K  
Rp = 0.46 [0.18] Re  
a = 0.0127 [0.0033] AU  
Ag = 1.65 [1.27] [0.51σ]  
Teffp = 4743 [827] K [2.34σ]

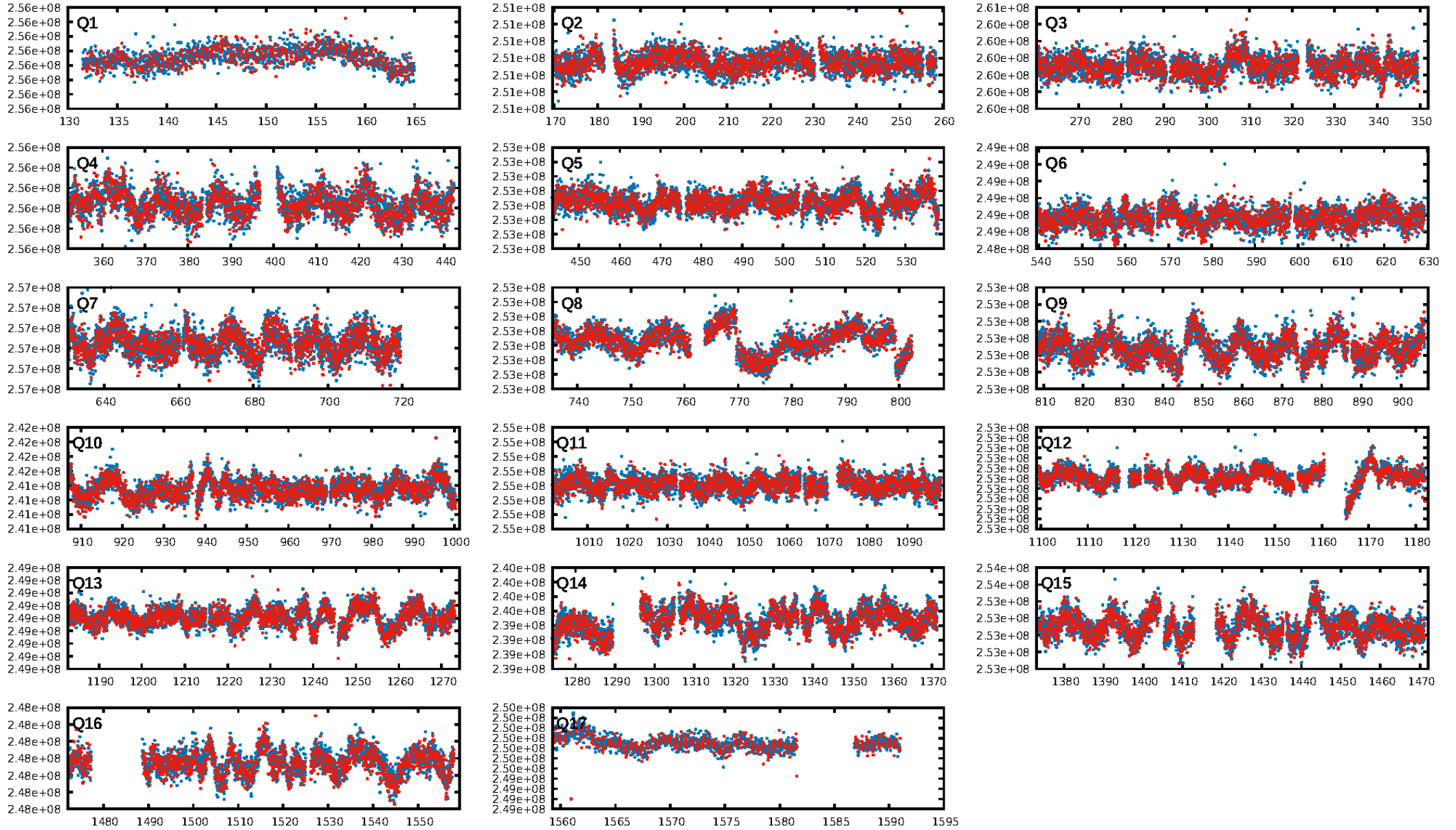
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.67e-13  
RollingBand-fgt: 0.92 [2351/2544]  
GhostDiagnostic-chr: 1.452  
Centroid-sig: 0.6%  
Centroid-so: 3.165 arcsec [2.50σ]  
OotOffset-rm: 2.093 arcsec [1.82σ]  
KicOffset-rm: 2.045 arcsec [1.71σ]  
OotOffset-st: 3/3/3/3 [12]  
KicOffset-st: 3/3/3/3 [12]  
DiffImageQuality-fgm: 0.33 [4/12]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:45:41 Z

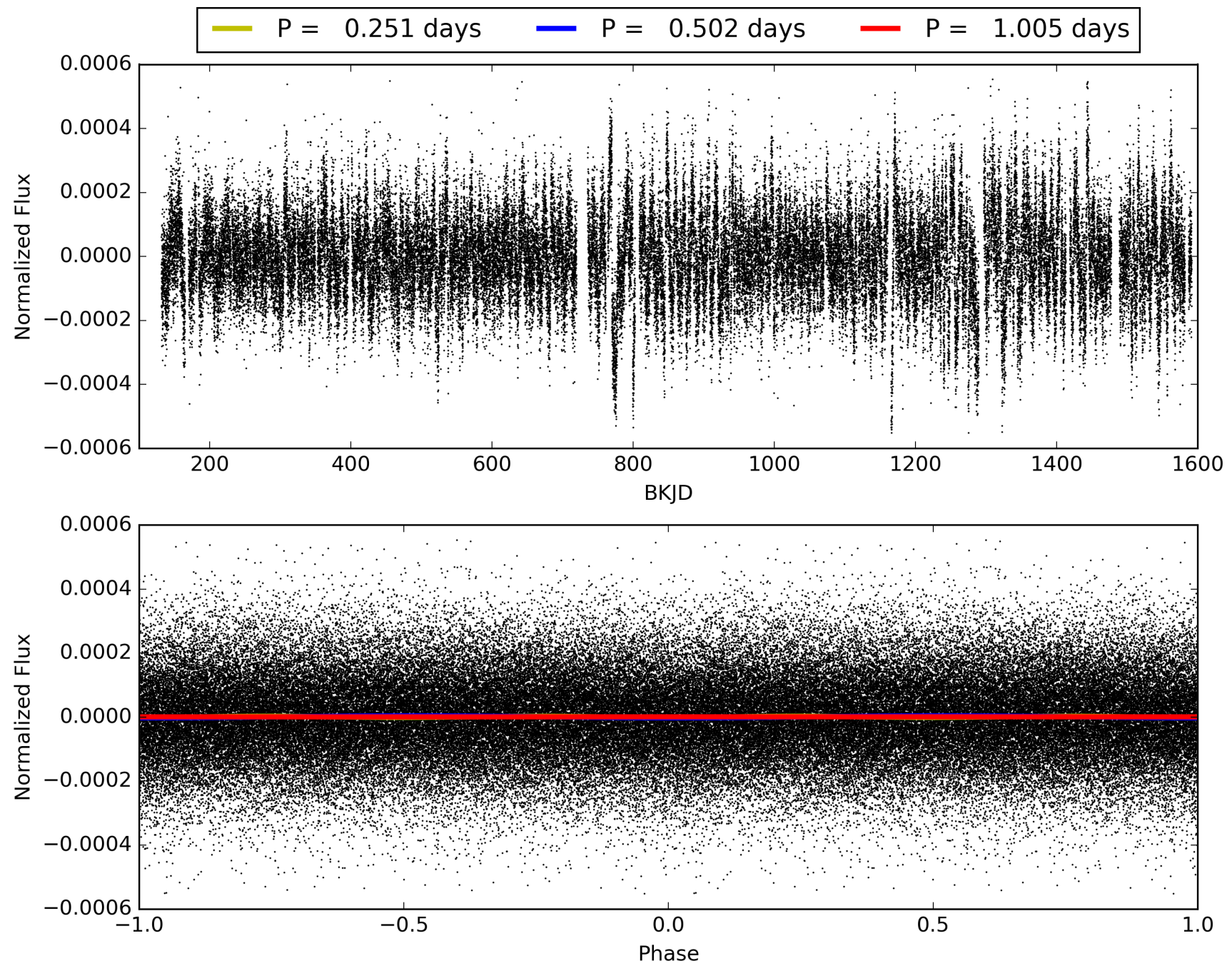
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012459808-01, PDC Light Curves



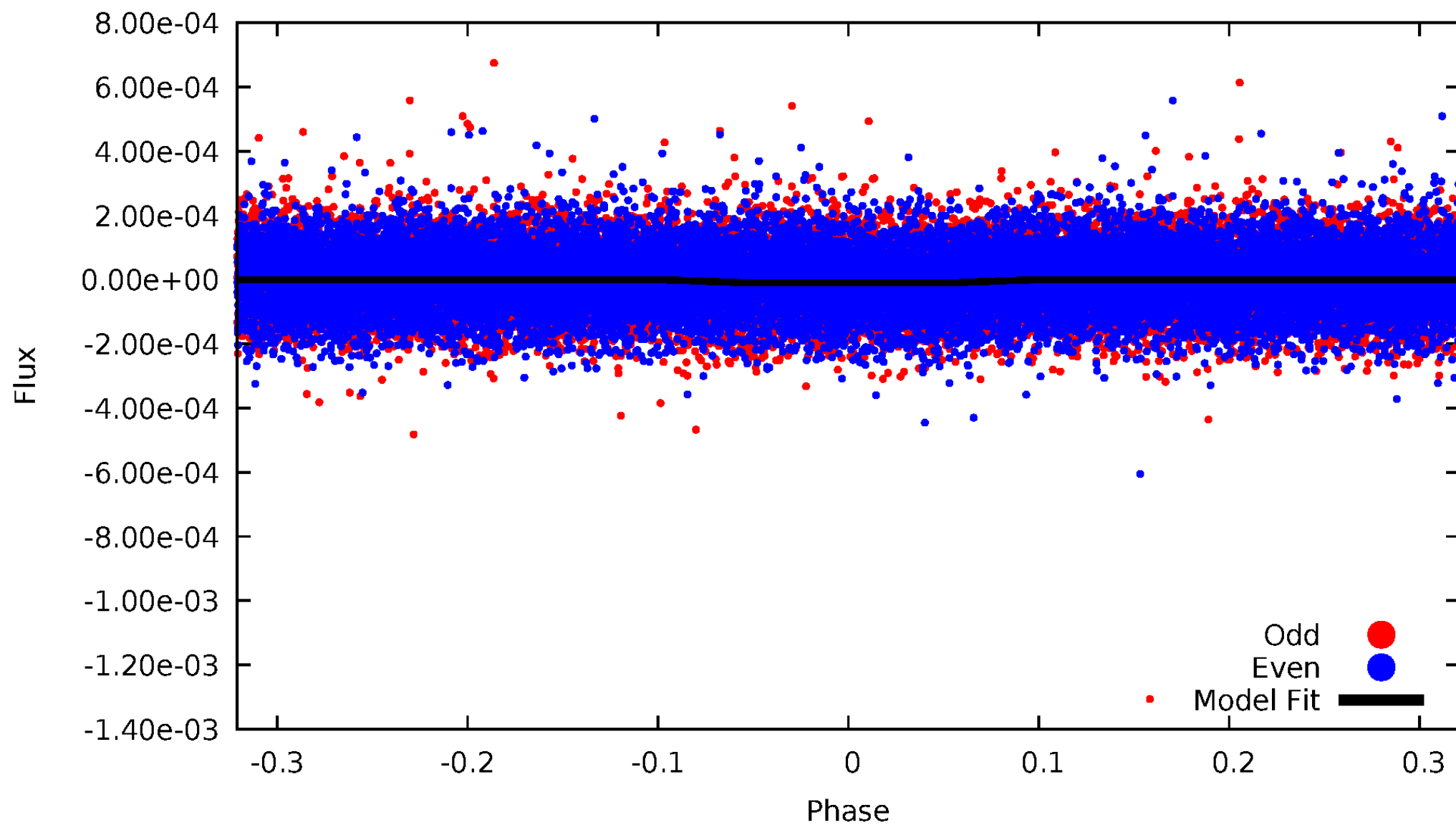


TCE 012459808-01



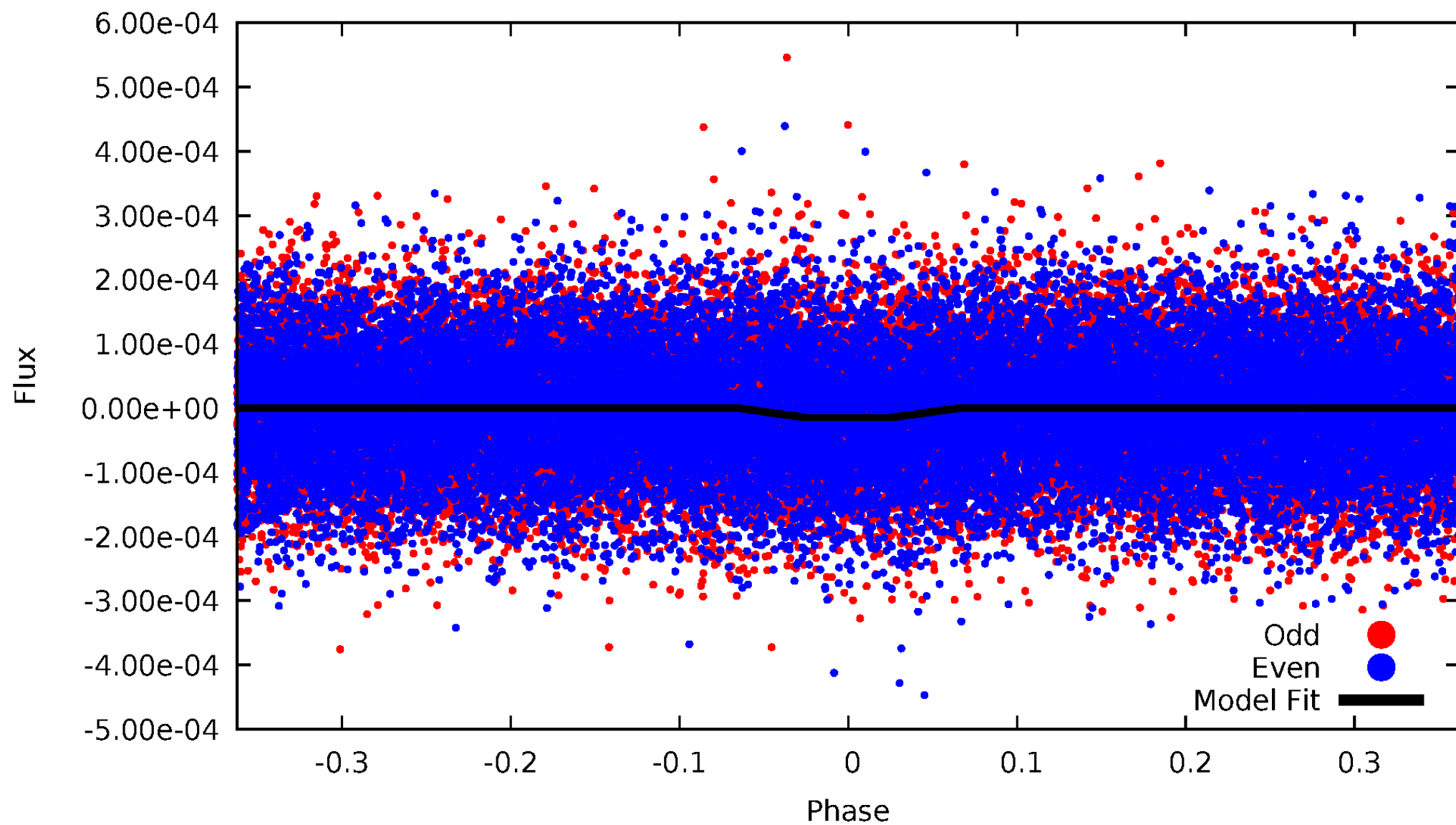
# DV Odd/Even

TCE 012459808-01

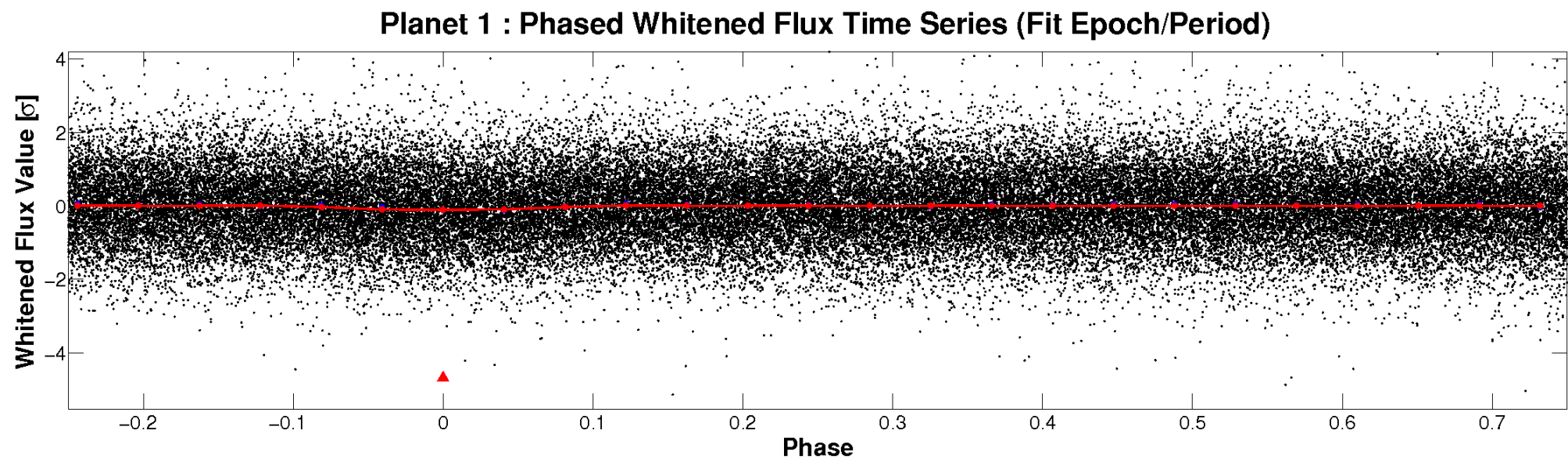
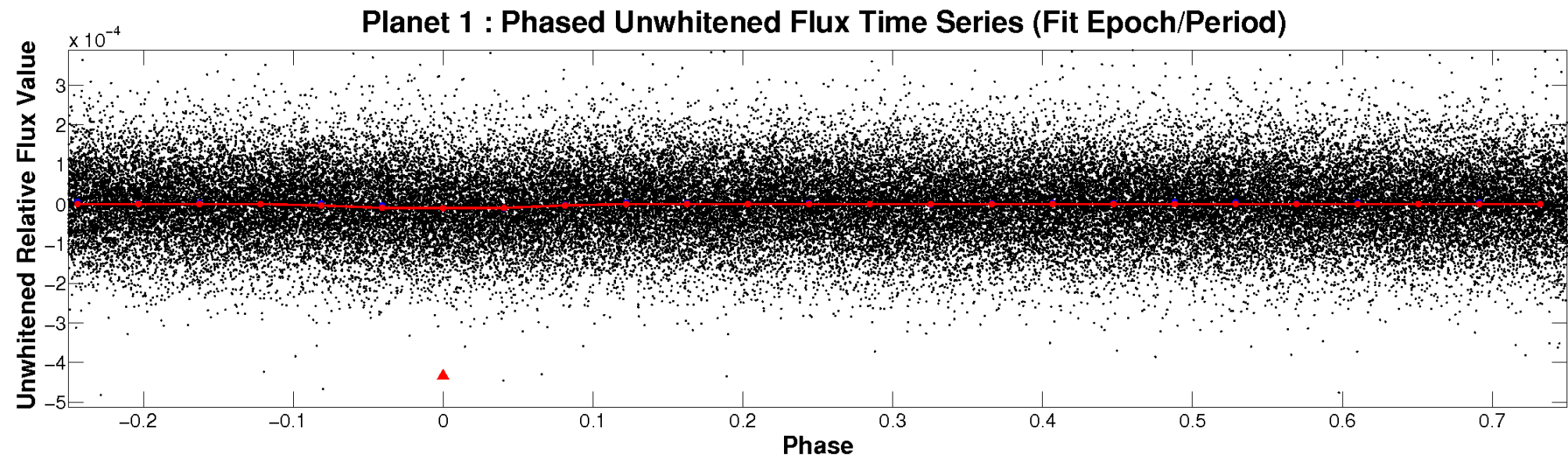


# ALT Odd/Even

TCE 012459808-01



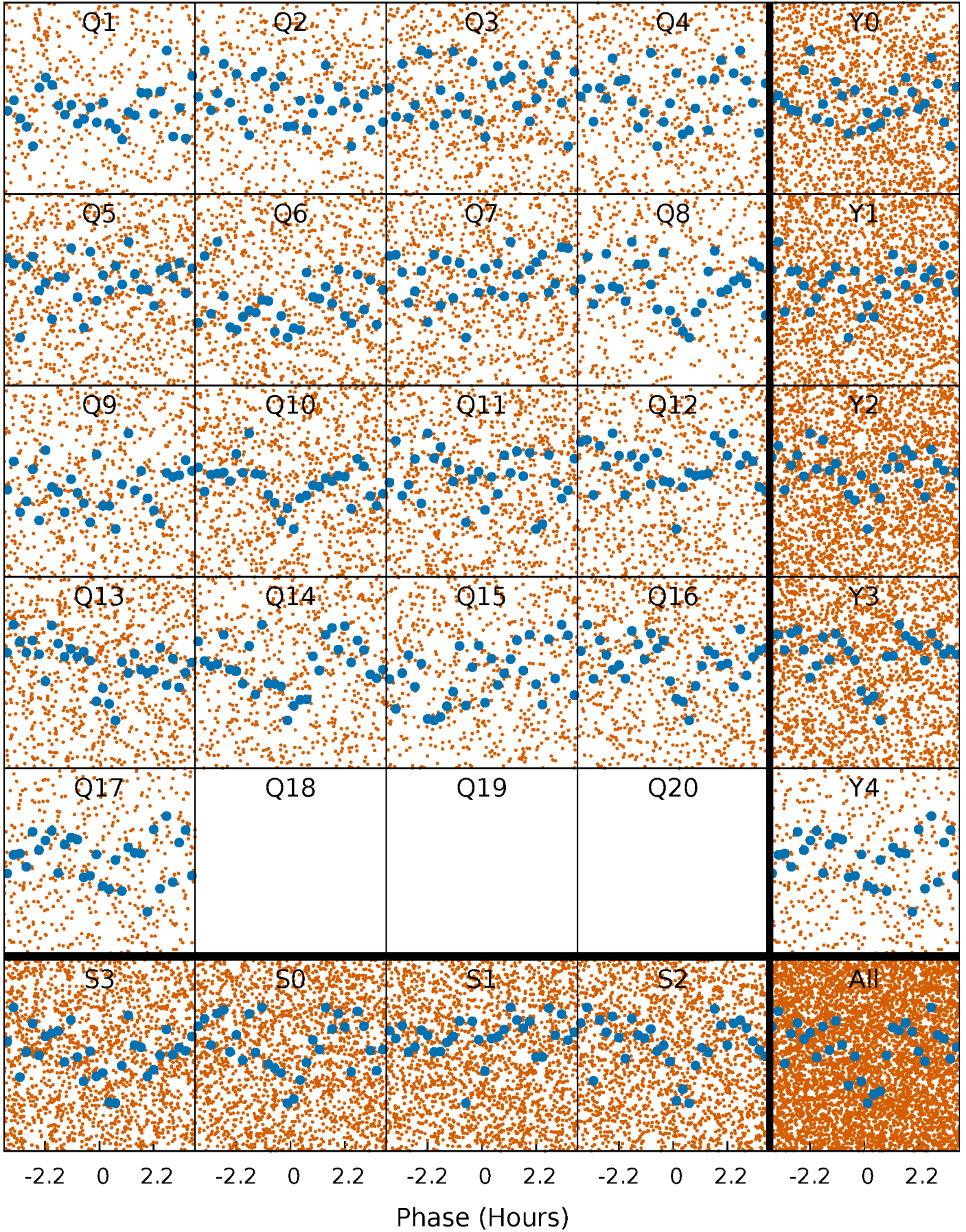
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

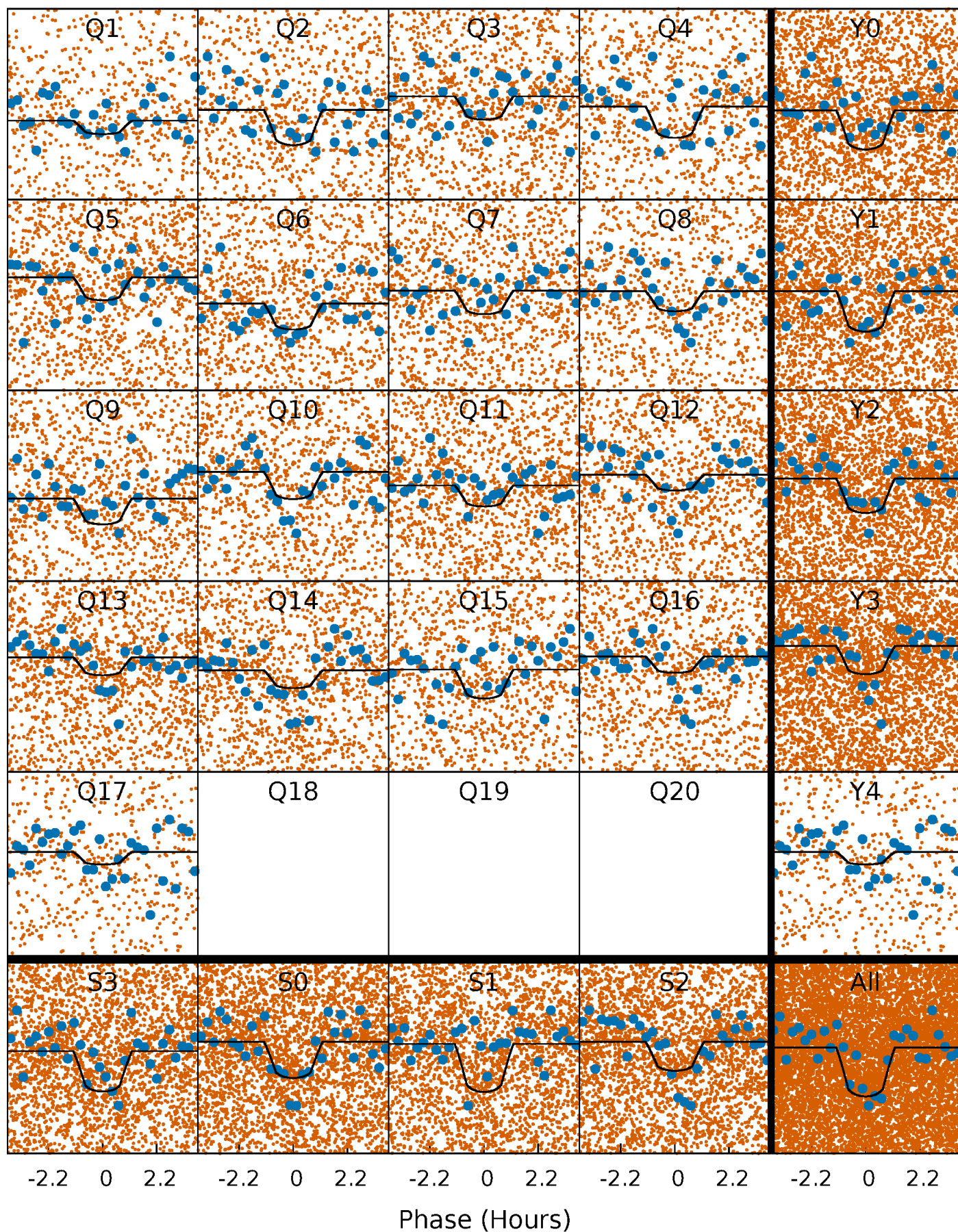
TCE 012459808-01 P= 0.502443 Days  $T_0=131.936600$  (BKJD)





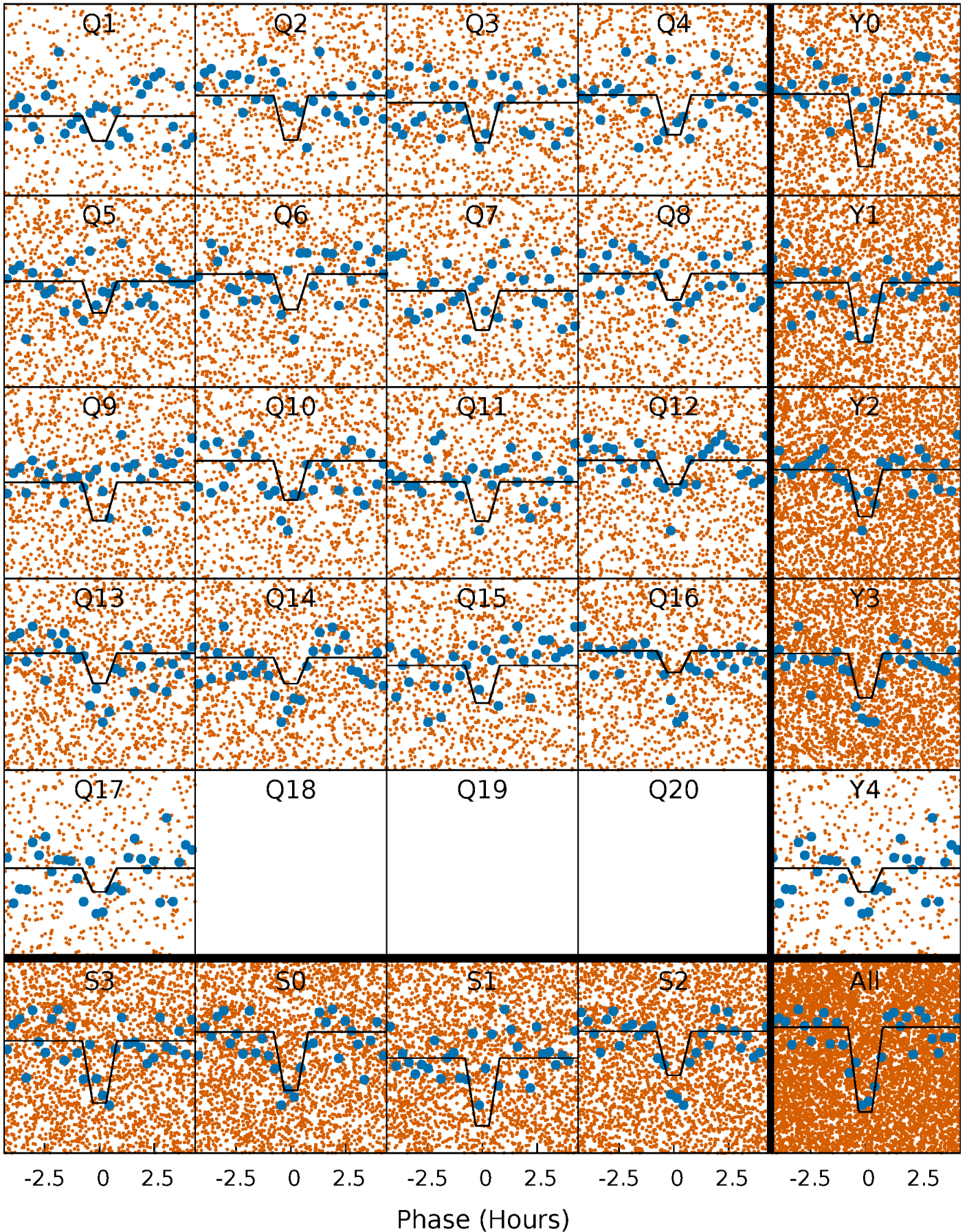
# DV Quarter-Phased Transit Curves

TCE 012459808-01   P= 0.502443 Days    $T_0=131.936600$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 012459808-01 P= 0.502446 Days  $T_0=131.939178$  (BKJD)

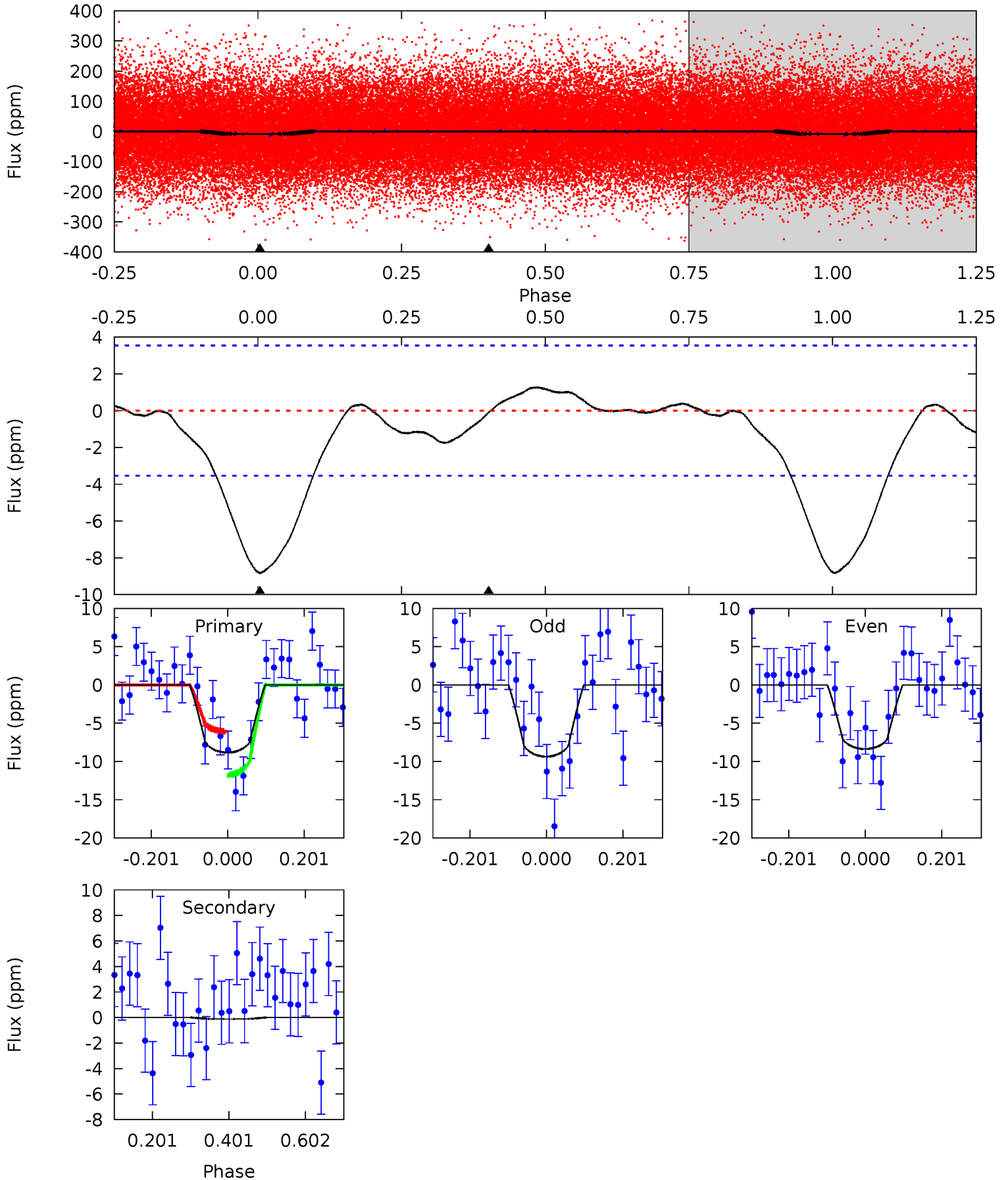




# DV Model-Shift Uniqueness Test

012459808-01, P = 0.502443 Days, E = 131.434157 Days

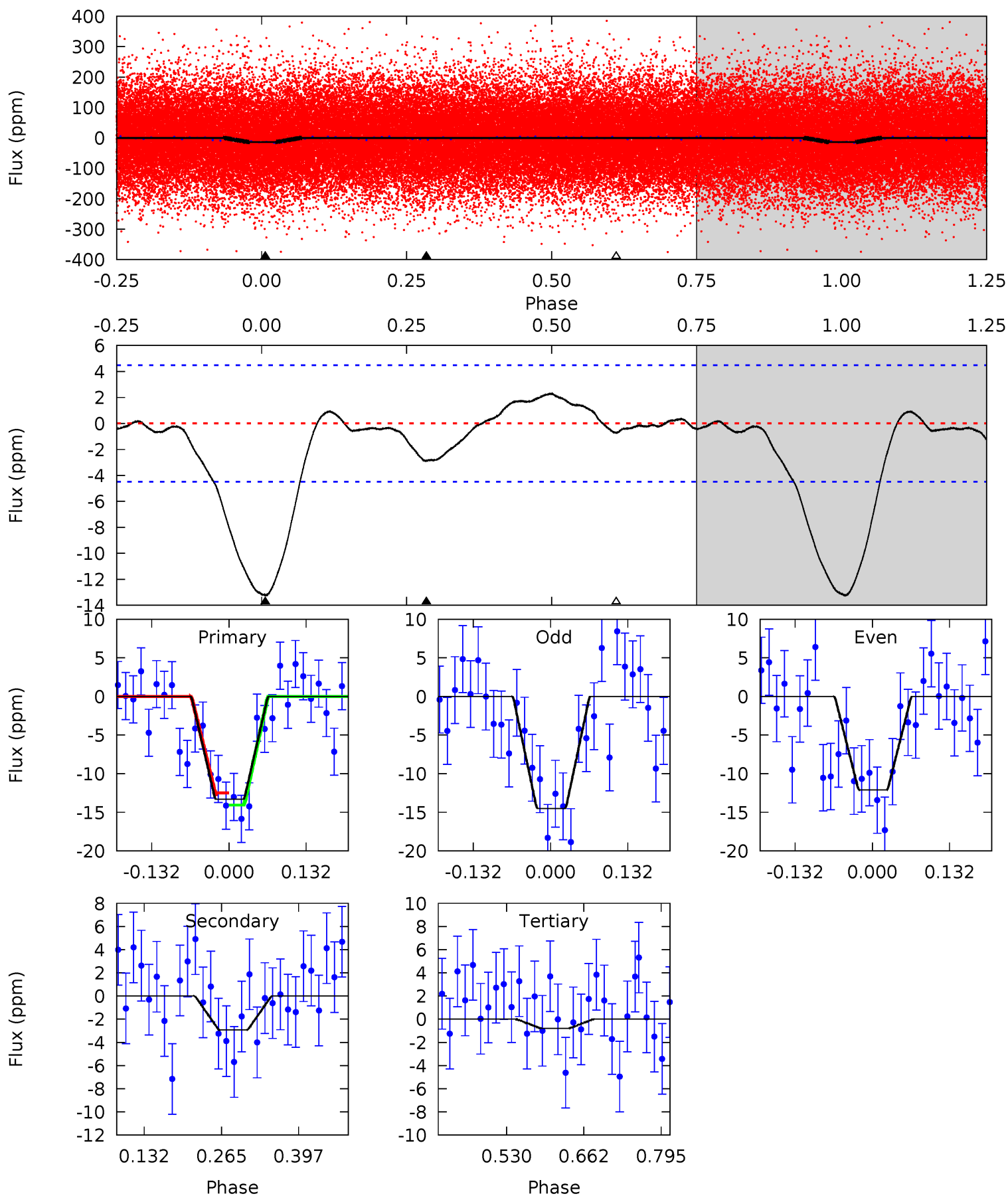
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	0.15	0	0	4.42	1.28	0.21	11.0	11.0	0.15	0.15	0.62	1.02	0.13	3.55



# Alt Model-Shift Uniqueness Test

012459808-01, P = 0.502446 Days, E = 131.436732 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
13.4	2.93	0.79	0	4.51	1.50	0.95	12.6	13.4	2.14	2.93	1.20	1.21	0.15	0.79





### Stellar Parameters For KIC 012459808

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6306^{+177}_{-243}$	$4.311^{+0.128}_{-0.192}$	$-0.140^{+0.250}_{-0.300}$	$1.197^{+0.385}_{-0.207}$	$1.064^{+0.181}_{-0.131}$	$0.875^{+0.524}_{-0.442}$
	+3%/-4%	+3%/-4%	+179%/-214%	+32%/-17%	+17%/-12%	+60%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 012459808-01 / KOI 8081.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-0 \pm 1$	$0.46^{+0.13}_{-0.12}$	$3788^{+267}_{-230}$	$-3497^{+6563}_{-521}$	$0.039^{+0.367}_{-0.322}$
Alt.	$-3 \pm 1$	$0.52^{+0.14}_{-0.13}$	$3799^{+299}_{-242}$	$4011^{+625}_{-619}$	$0.913^{+0.748}_{-0.420}$

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

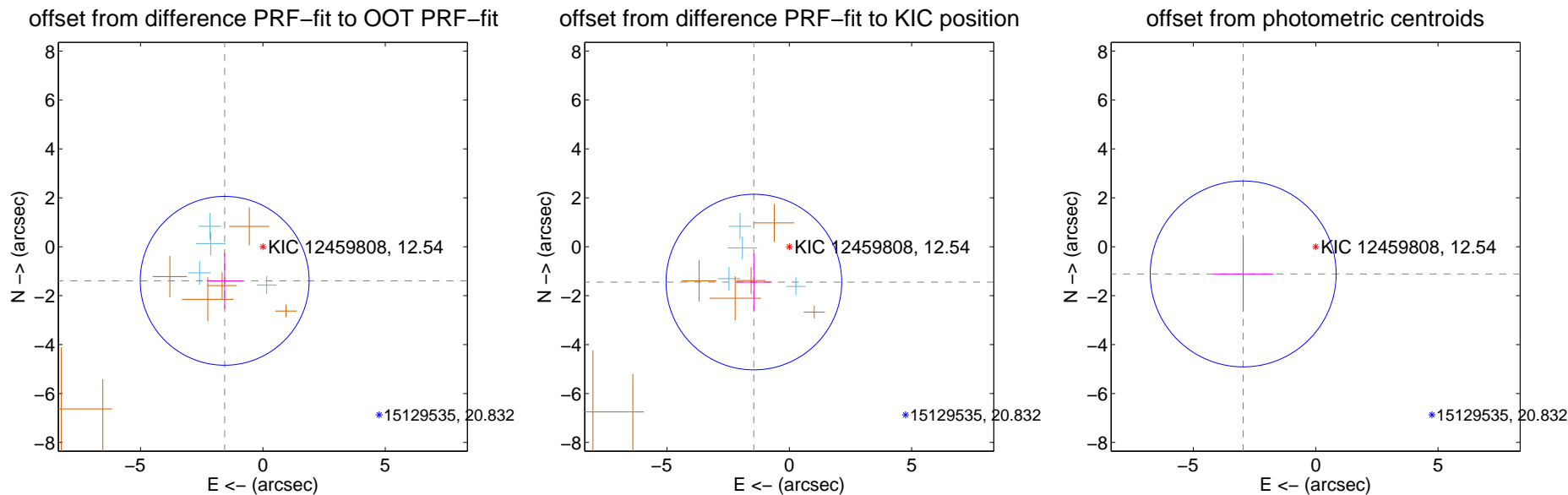
## DV Centroid Data

Supplemental centroid analysis for 012459808-01. Kepler magnitude: 12.54. Transit SNR 9.18

There are 4 quarters with good PRF difference image offsets

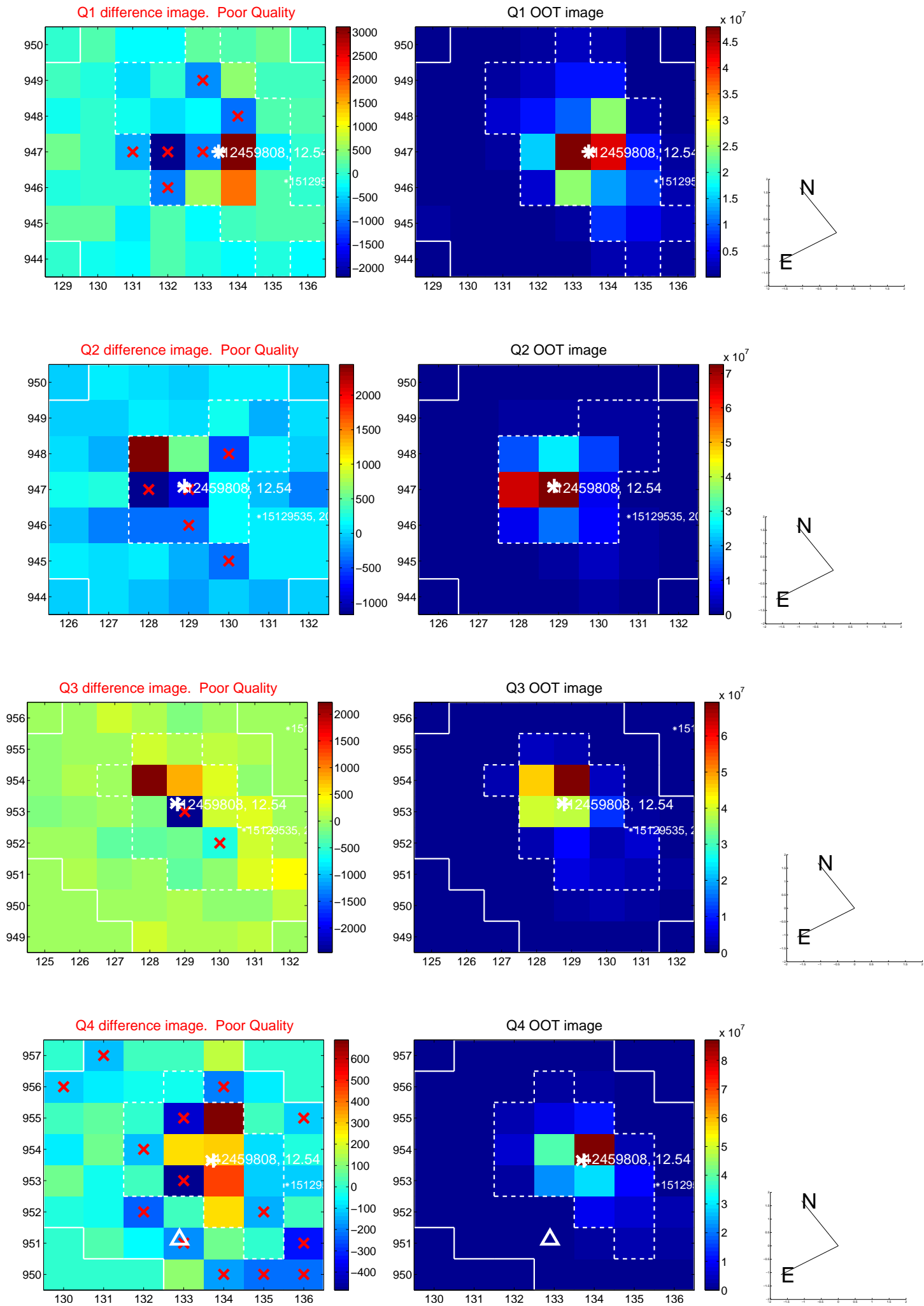
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.093 \pm 1.151$	1.82	$1.563 \pm 0.728$	$-1.393 \pm 1.132$
PRF-fit source offset from KIC position	$2.045 \pm 1.197$	1.71	$1.448 \pm 0.732$	$-1.444 \pm 1.157$
photometric centroid source offset	$3.16 \pm 1.27$	2.50	$2.96 \pm 1.23$	$-1.11 \pm 1.49$

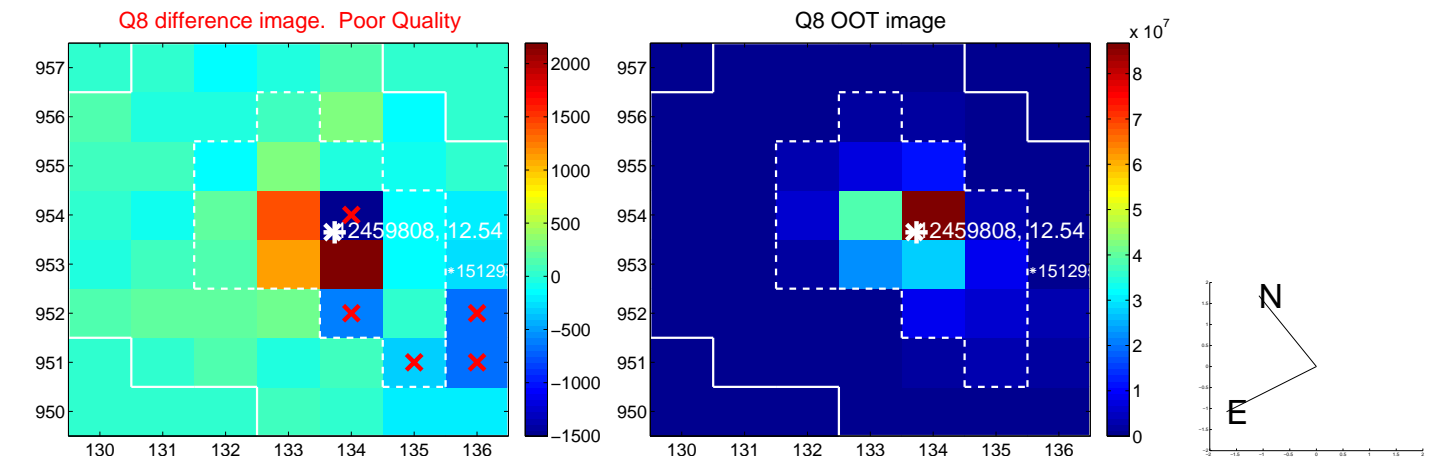
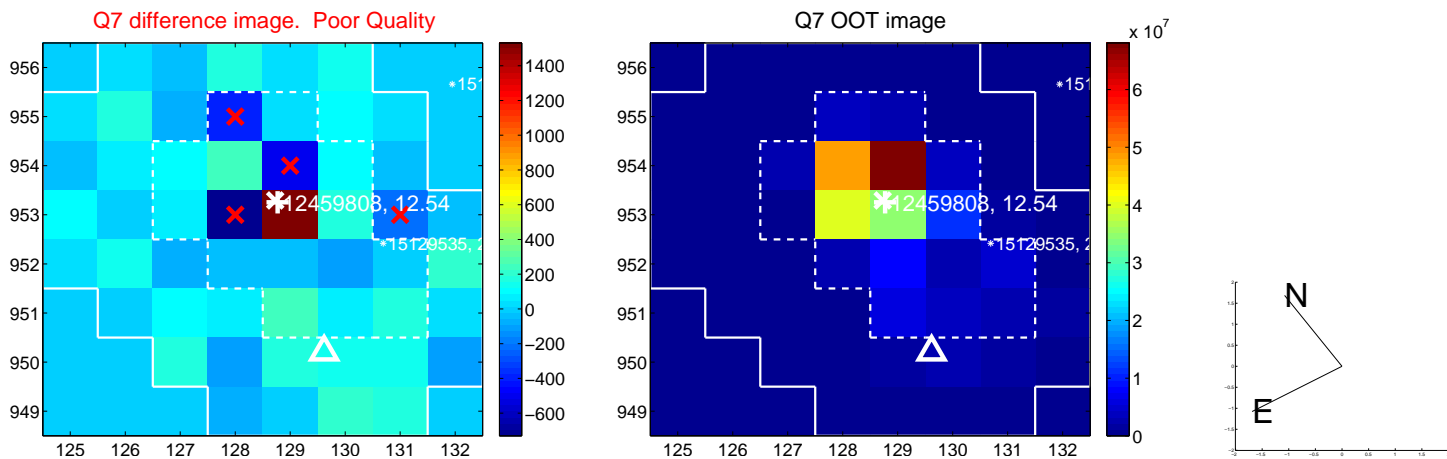
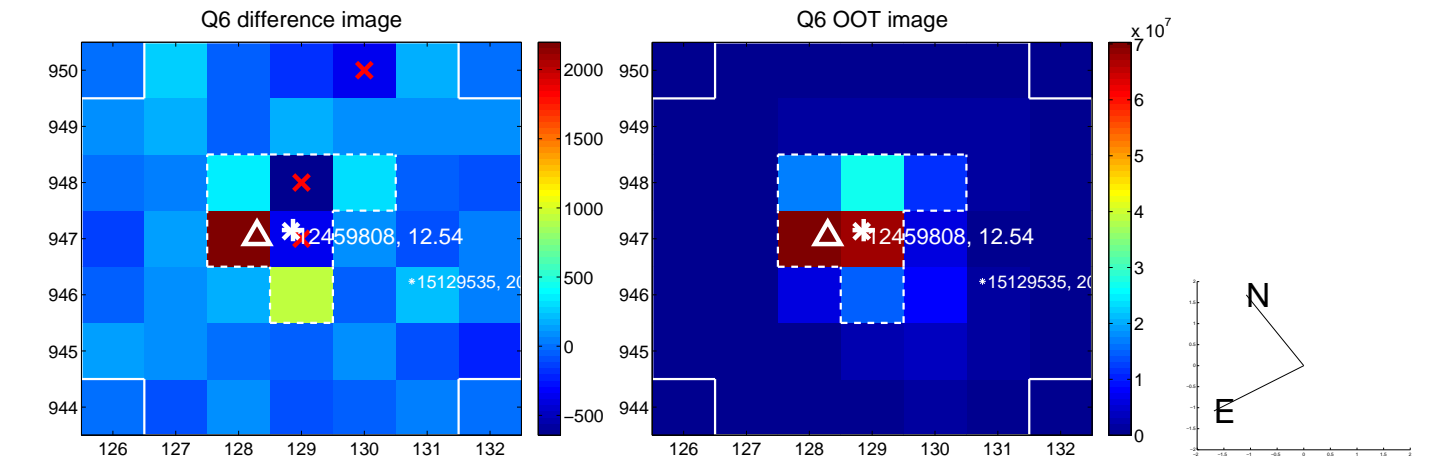
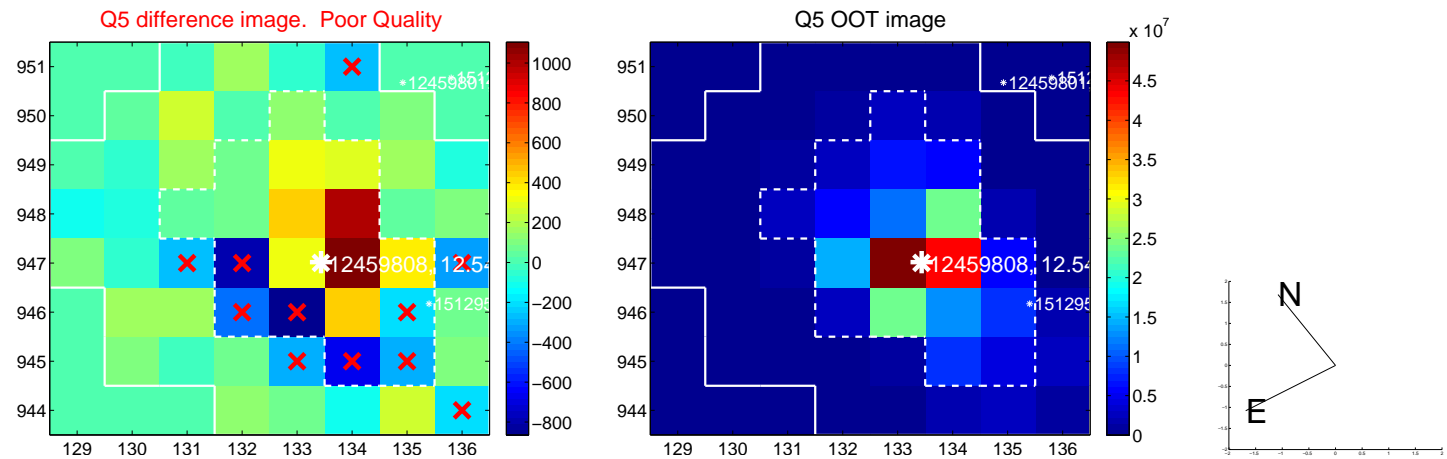


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

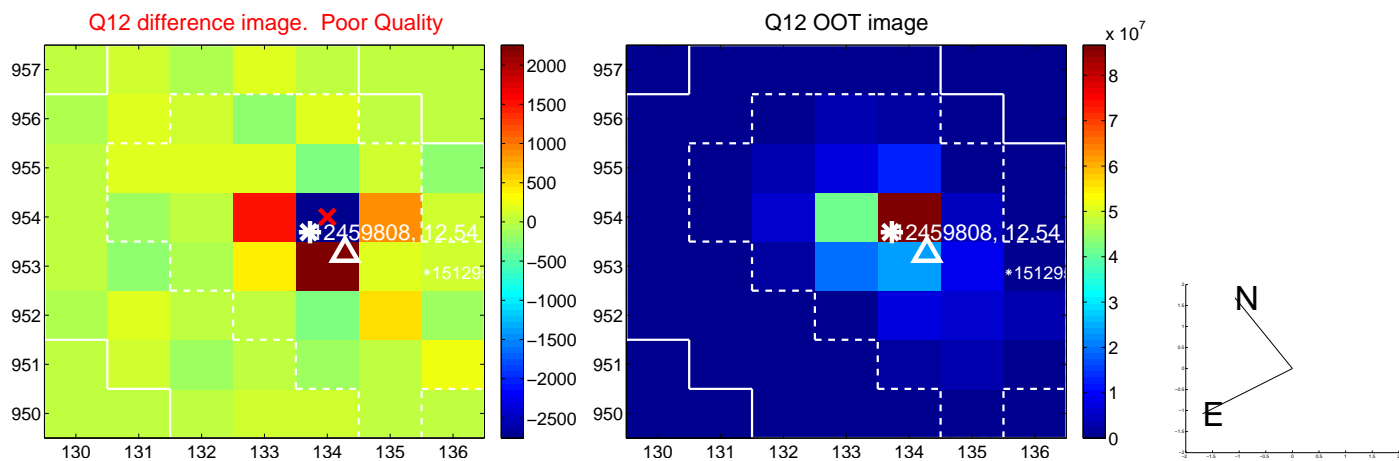
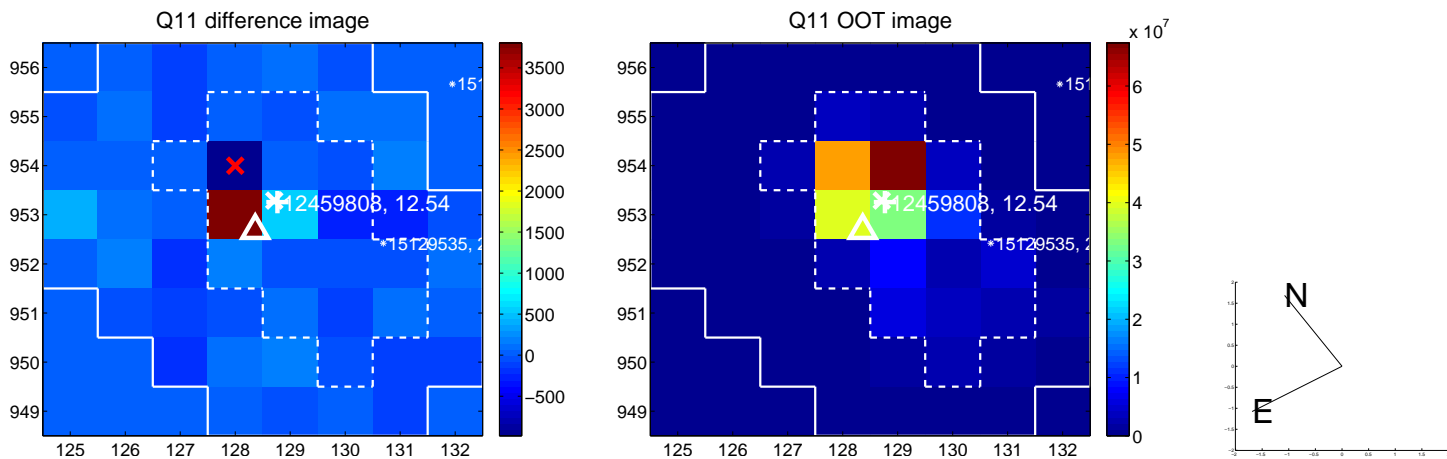
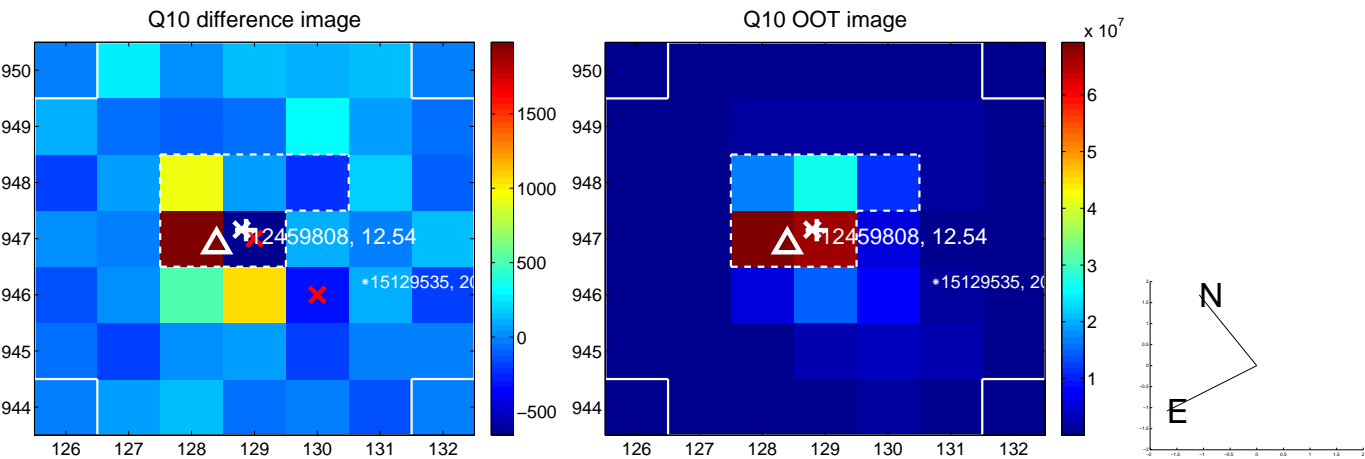
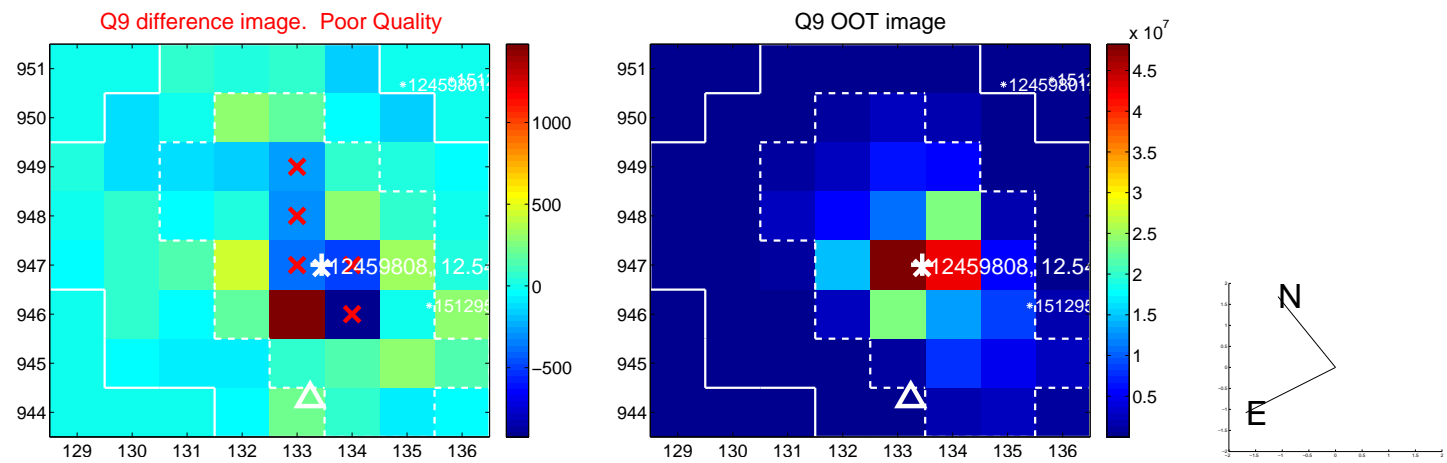


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

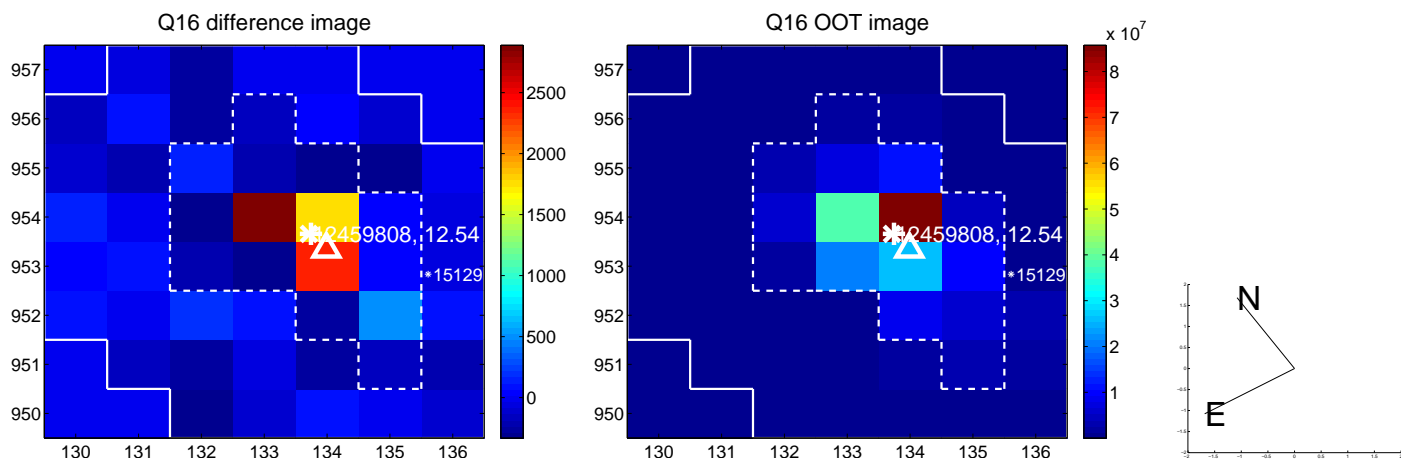
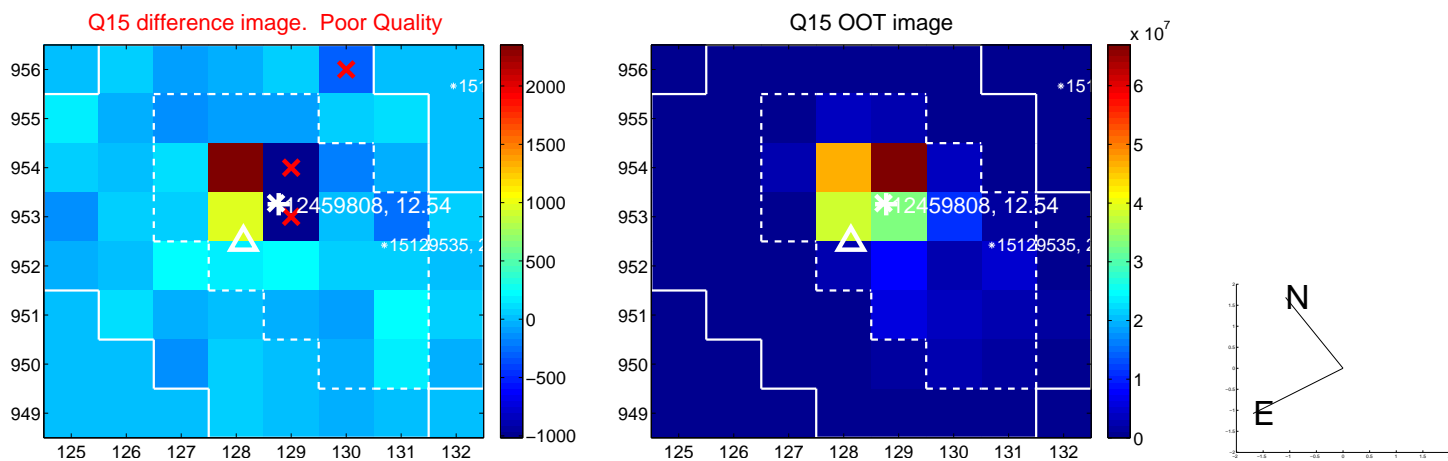
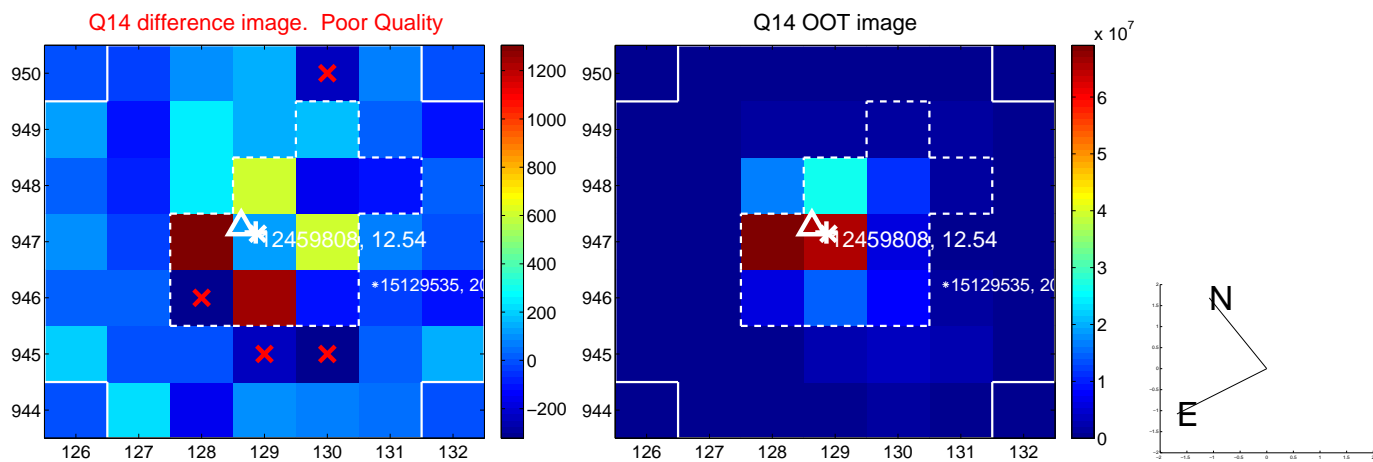
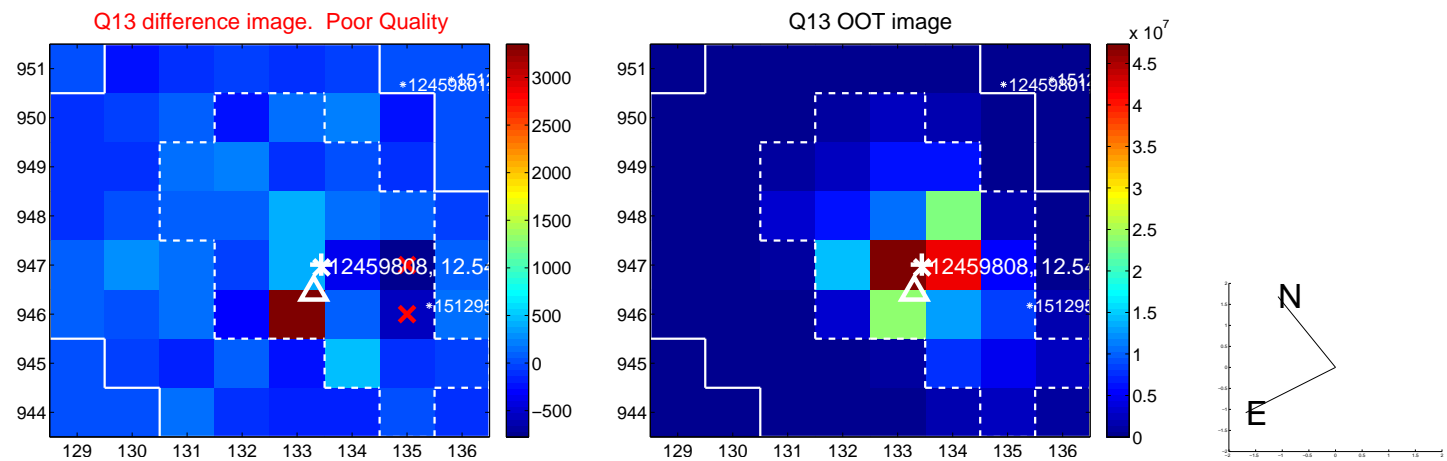




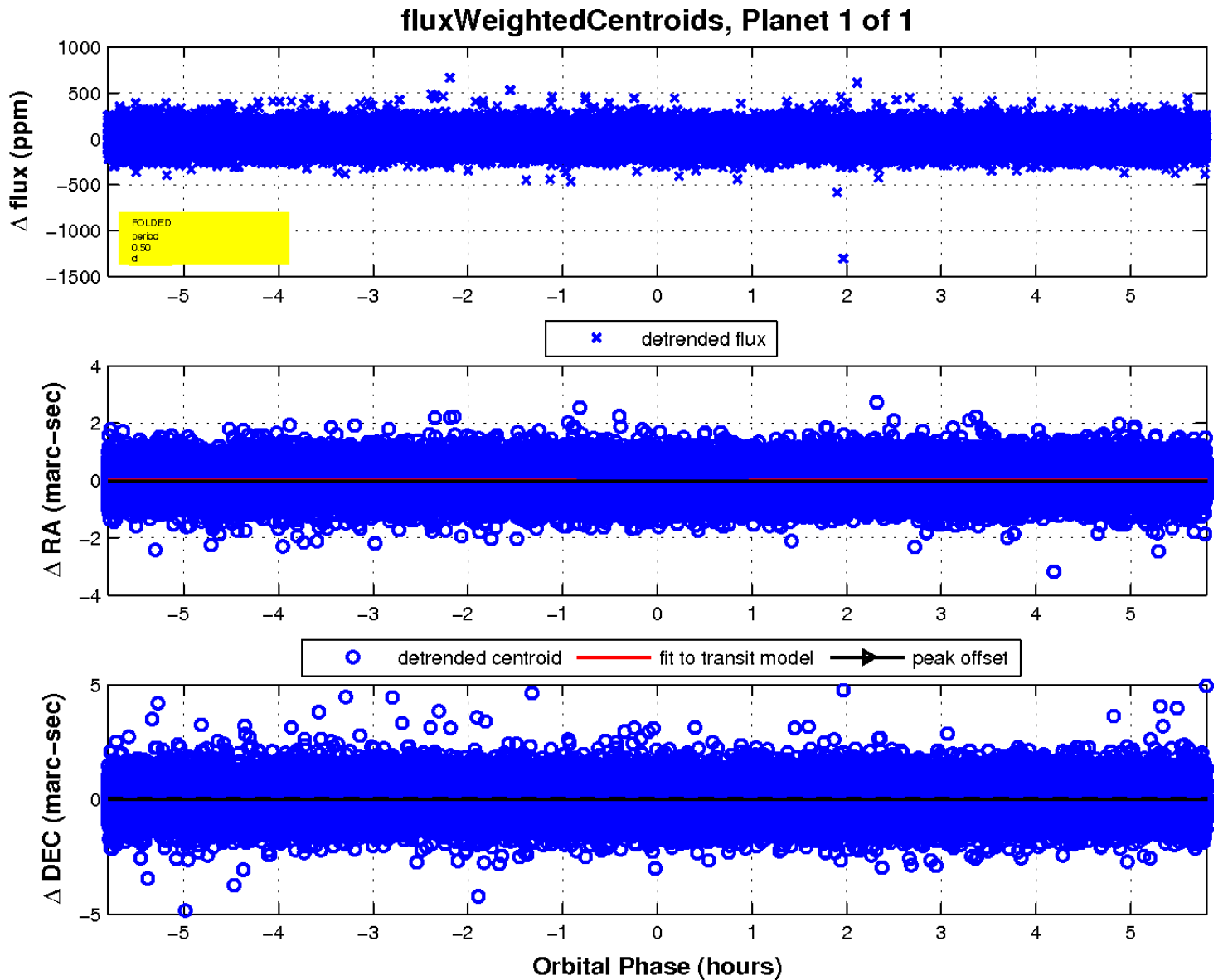
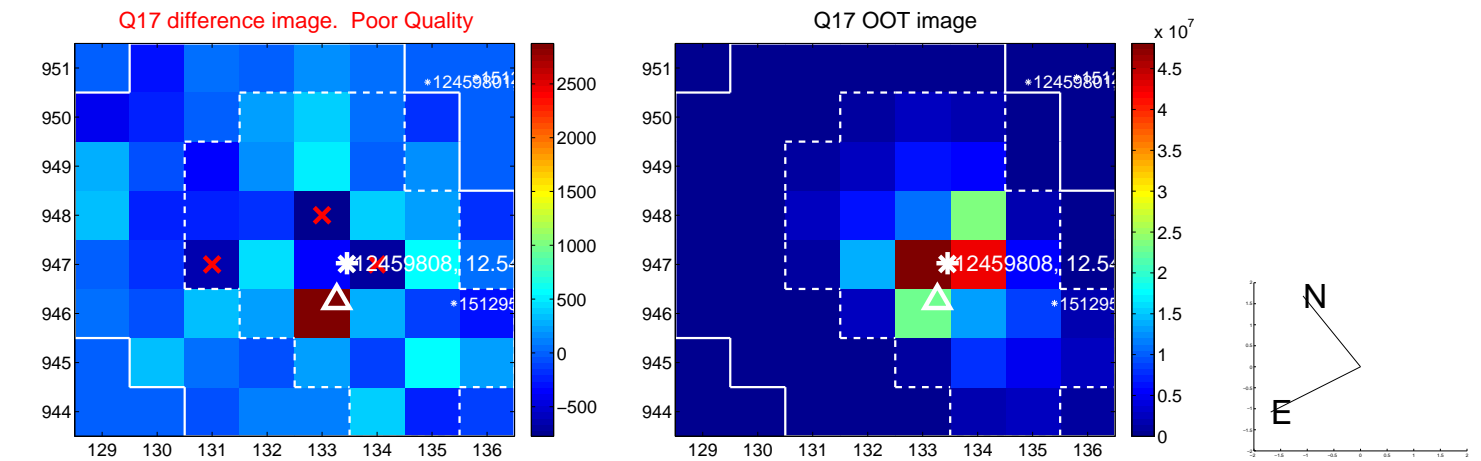
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

