

# KIC 010686930

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R <sub>★</sub> (R <sub>☉</sub> )	T <sub>★</sub> (K)	R <sub>p</sub> (R <sub>⊕</sub> )	S <sub>p</sub> (S <sub>⊕</sub> )
010686930-01	OBS	7364.01	2.618429	134.044973	38.6	3.376	8.5	8.2	3.29	5088	2.48	4043.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010686930-01	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.

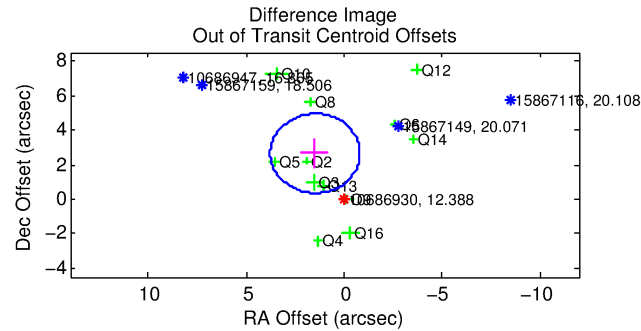
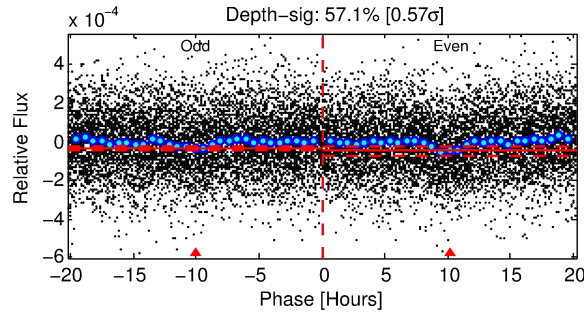
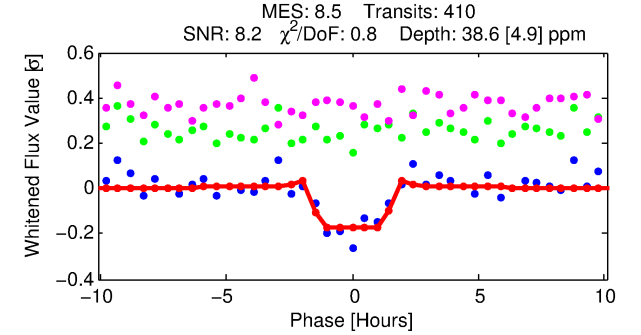
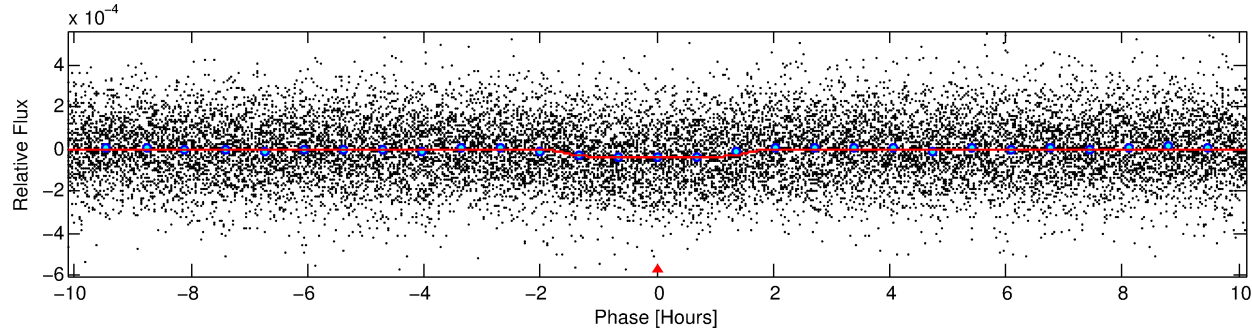
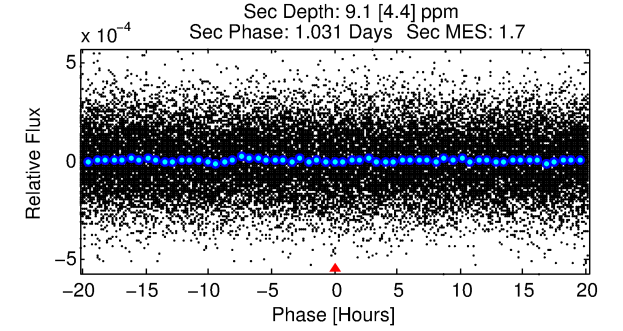
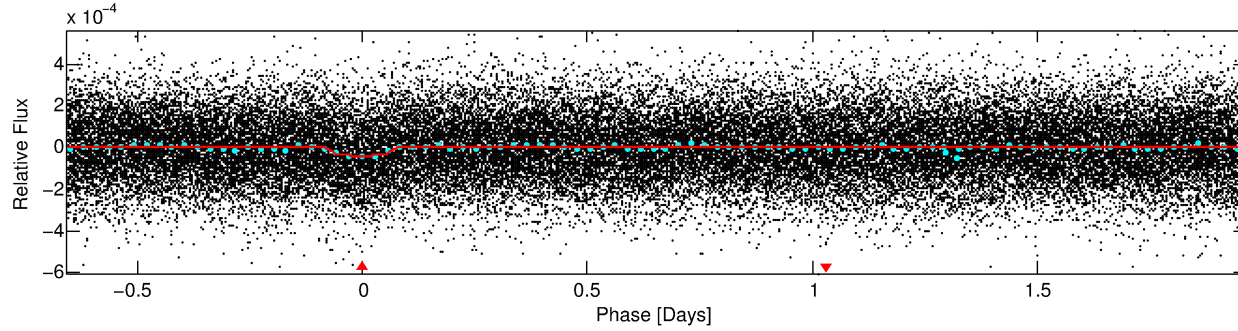
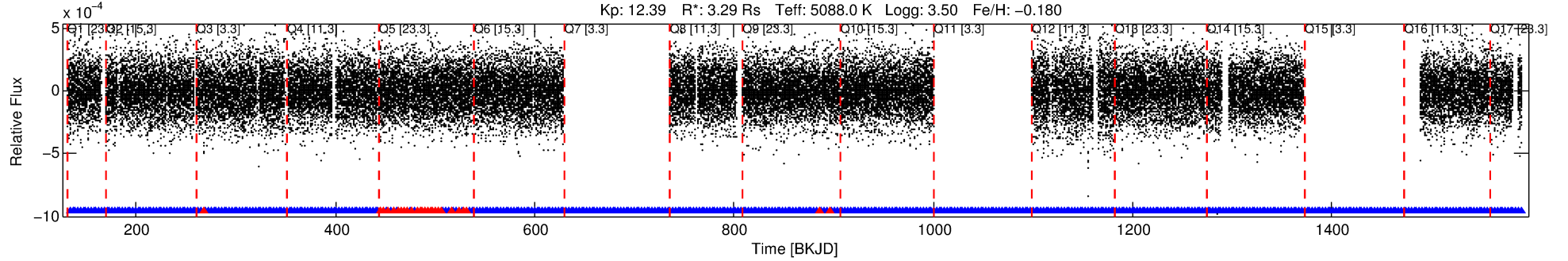
## Ephemeris Match Information For 010686930-01

TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist (″)	ΔRow	ΔCol	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	σ <sub>P</sub>	σ <sub>T</sub>
010686930-01	10686930	7363.01	10686876	1:1	61.3	-15	-4	11.73	12.39	5940.80	Direct-PRF	0	0.37	0.03

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's. σ<sub>P</sub> and σ<sub>T</sub> are the significance of the match in period and epoch. For a match to be considered significant σ<sub>P</sub> < 5.0 and σ<sub>T</sub> < 5.0. Matches which have σ<sub>P</sub> and σ<sub>T</sub> very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 10686930 Candidate: 1 of 1 Period: 2.618 d  
KOI: K07364.01 Corr: 0.950



## DV Fit Results:

Period = 2.61843 [0.00002] d  
Epoch = 134.0450 [0.0040] BKJD  
Rp/R\* = 0.0069 [0.0033]  
a/R\* = 2.83 [4.99]  
b = 0.90 [0.43]  
Seff = 4043.49 [1271.64]  
Teq = 2033 [160] K  
Rp = 2.48 [1.29] Re  
a = 0.0401 [0.0078] AU  
Ag = 1.31 [1.46] [0.21σ]  
Teffp = 3364 [904] K [1.45σ]

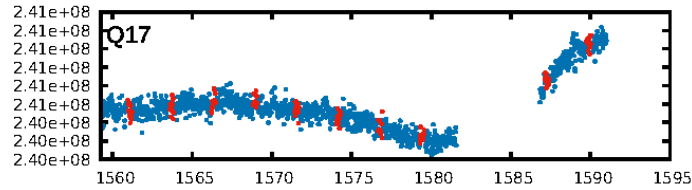
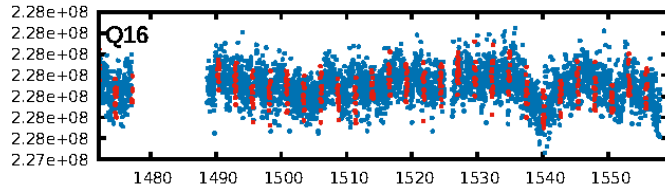
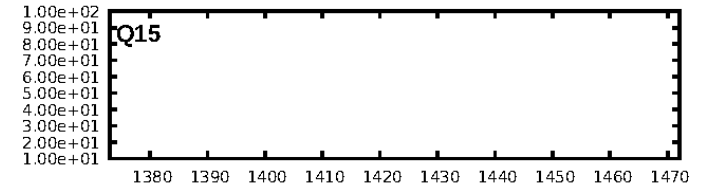
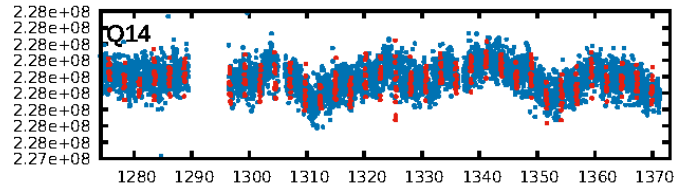
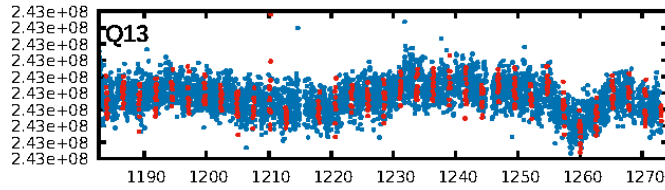
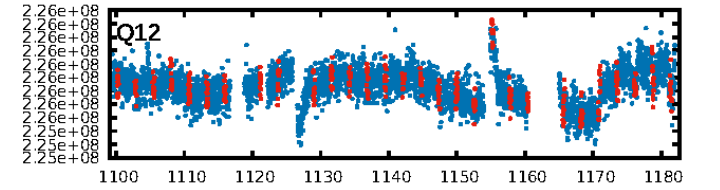
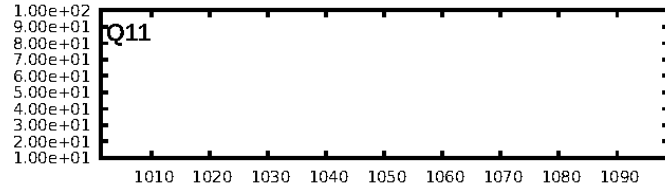
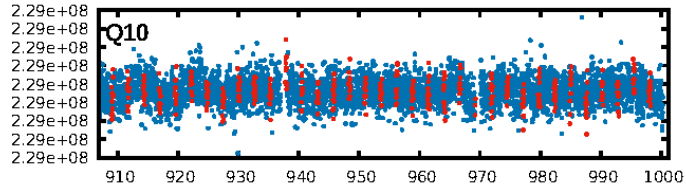
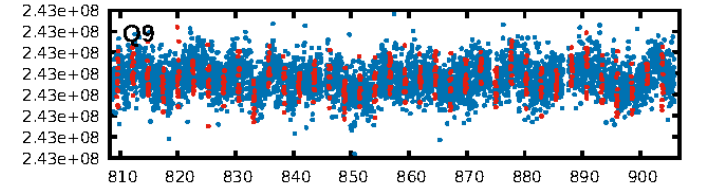
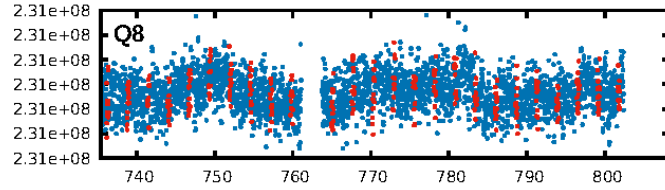
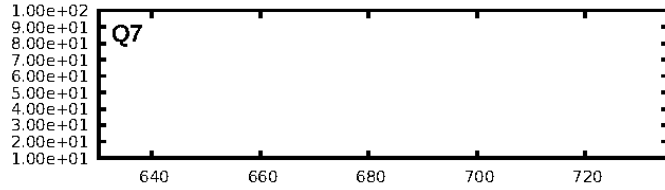
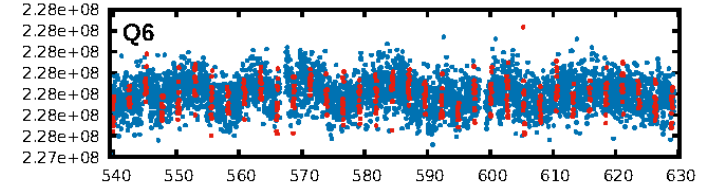
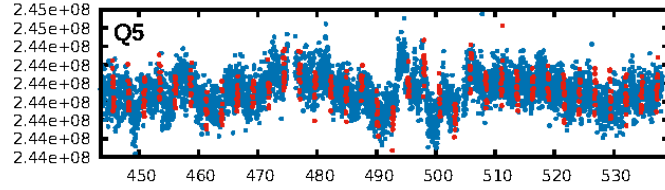
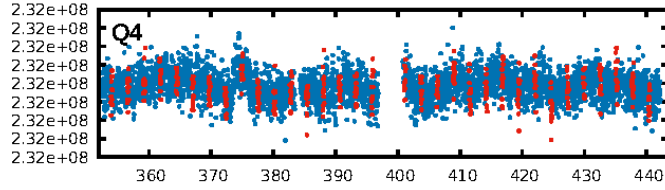
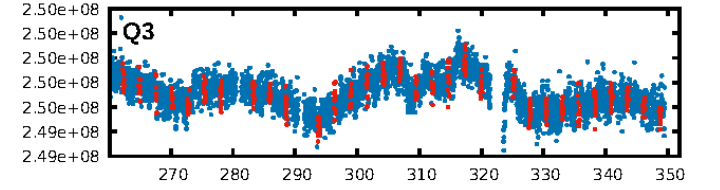
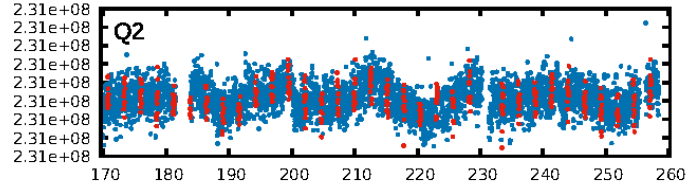
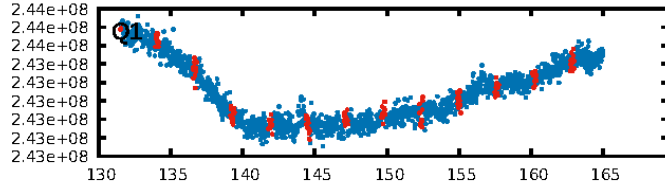
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.06e-16  
RollingBand-fgt: 0.93 [362/388]  
**GhostDiagnostic-chr: 0.2315**  
Centroid-sig: 7.8%  
Centroid-so: 0.925 arcsec [1.02σ]  
**OotOffset-rm: 3.043 arcsec [3.98σ]**  
**KicOffset-rm: 3.000 arcsec [3.71σ]**  
OotOffset-st: 4/1/4/3 [12]  
KicOffset-st: 4/1/4/3 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 1.00 [14/14]

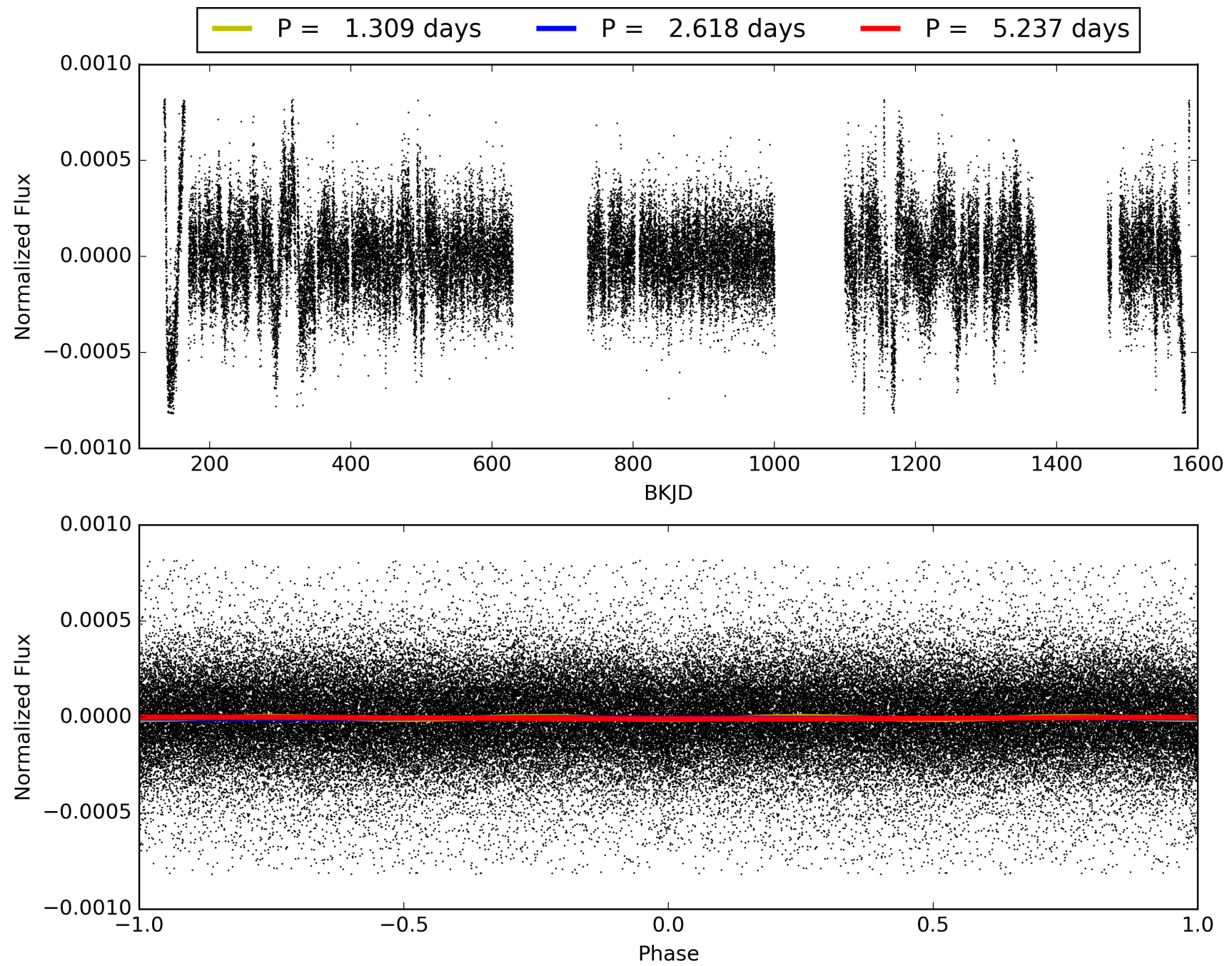
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:16:11 Z

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

# TCE 010686930-01, PDC Light Curves



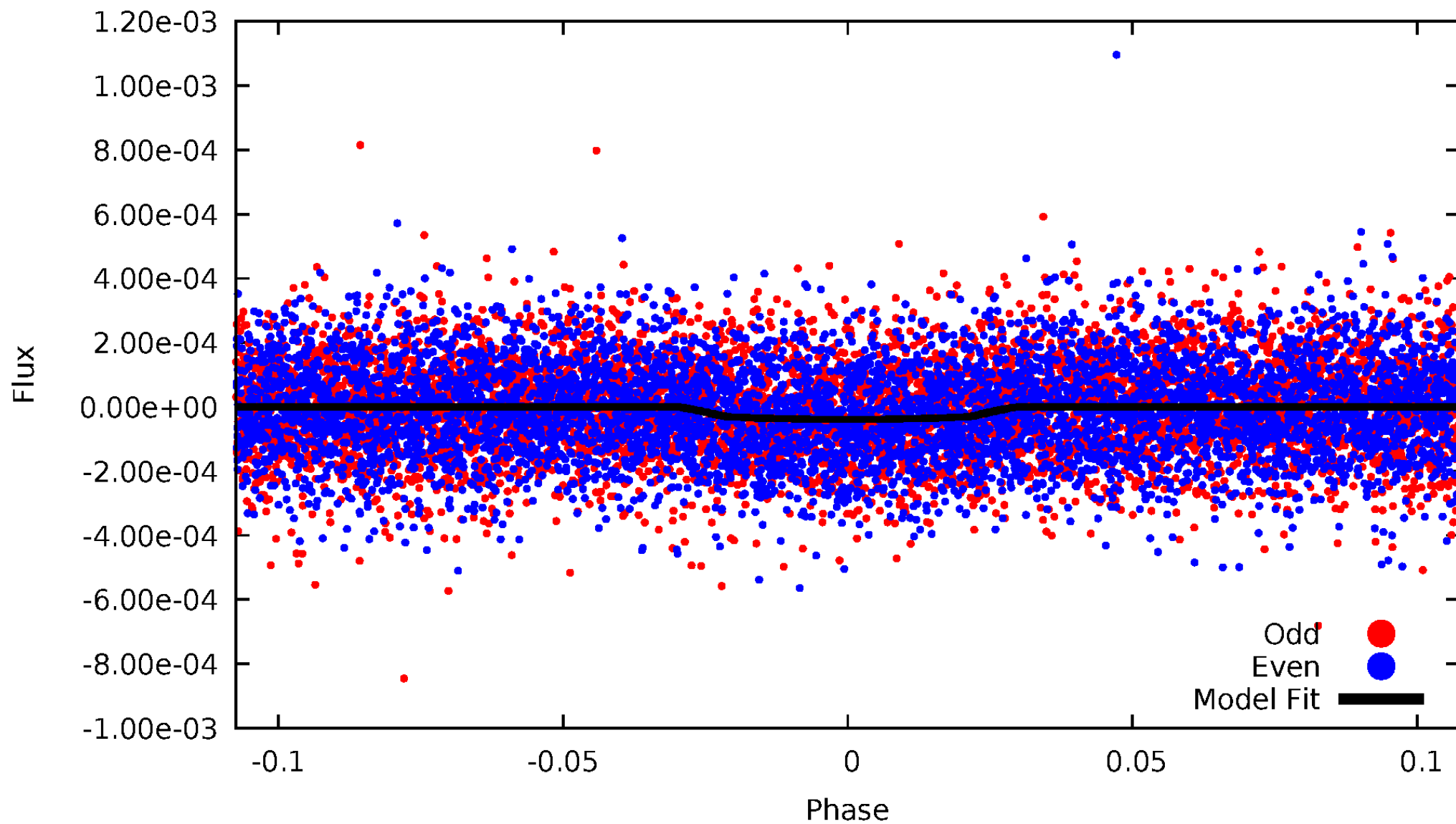
TCE 010686930-01





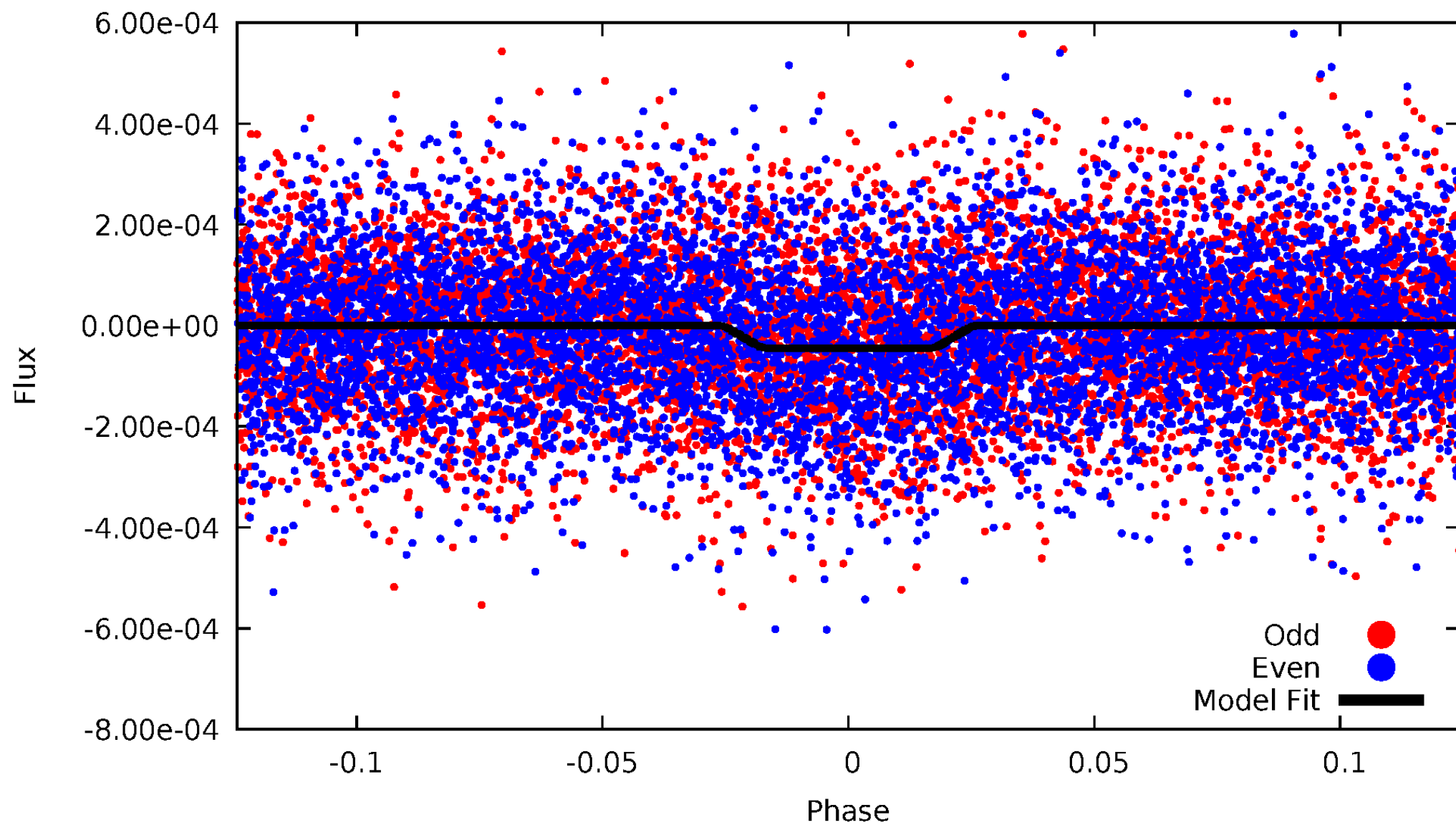
# DV Odd/Even

TCE 010686930-01



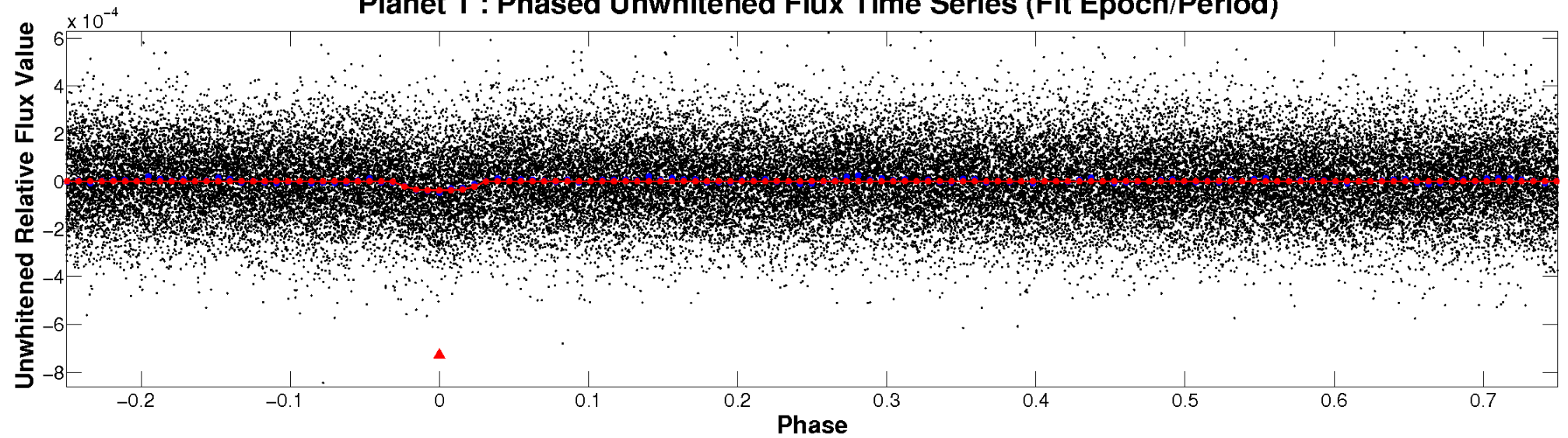
# ALT Odd/Even

TCE 010686930-01

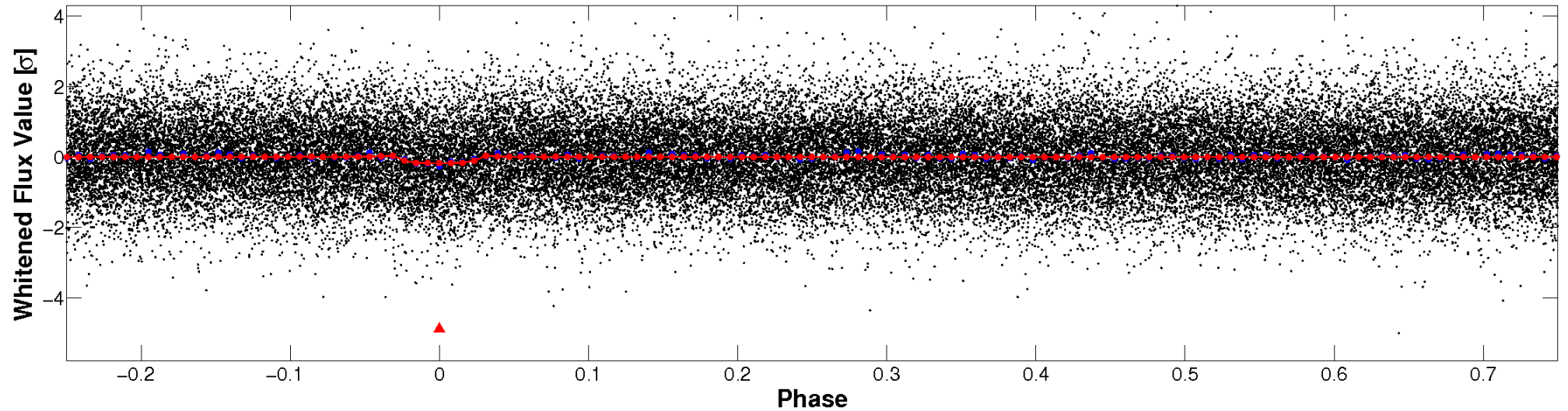


# Non-Whitened Vs. Whitened Light Curve

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

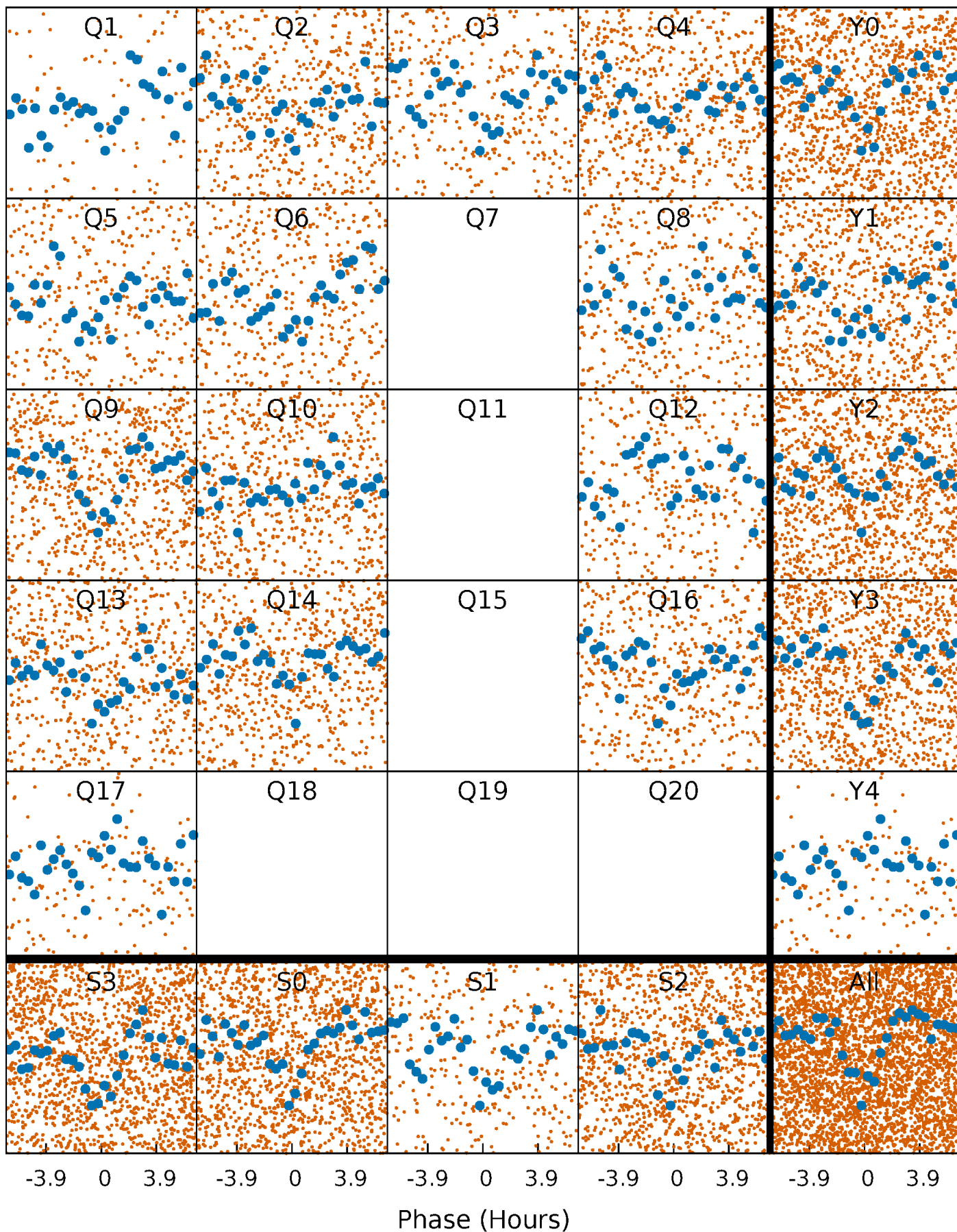


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

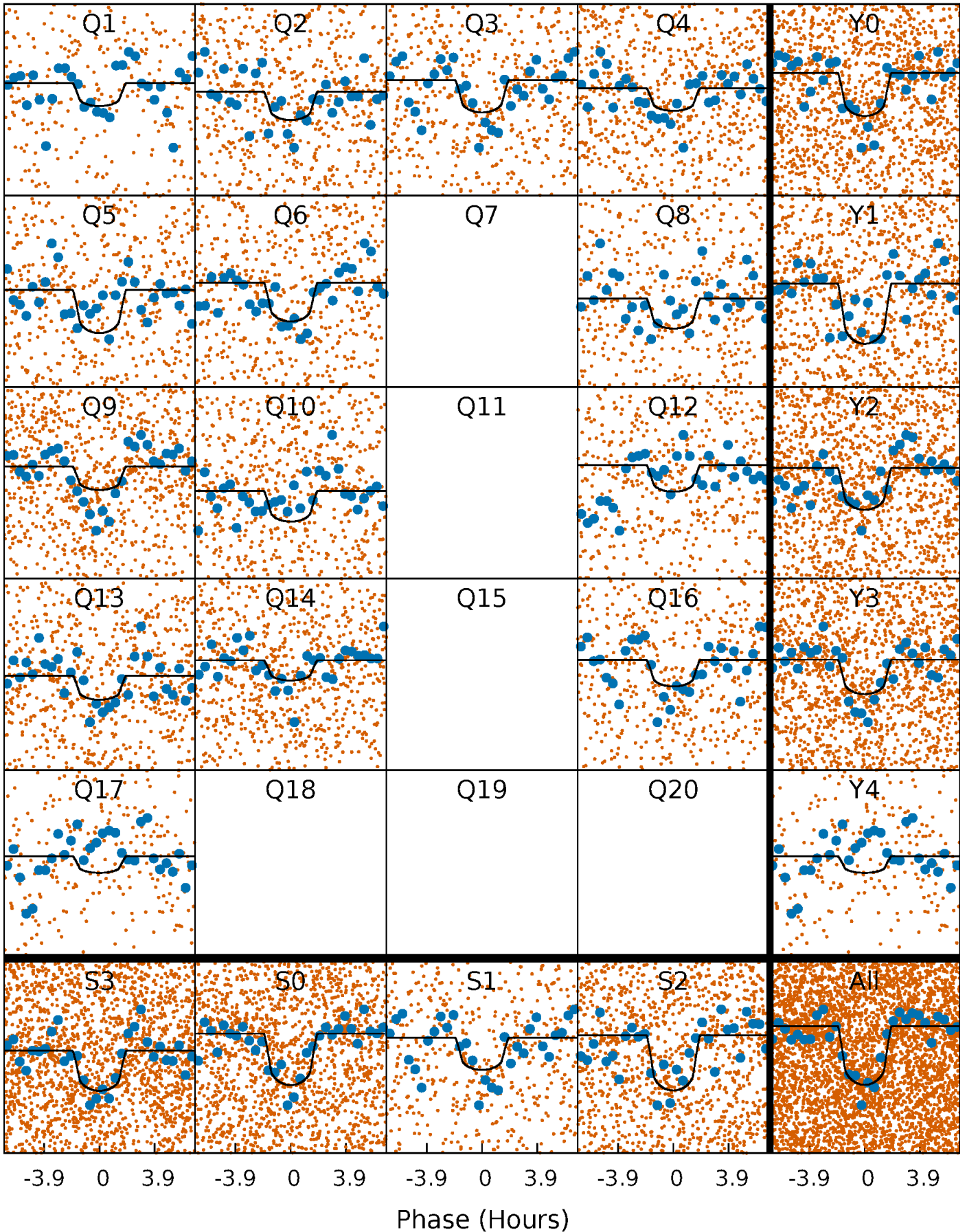
TCE 010686930-01 P= 2.618429 Days  $T_0=134.044973$  (BKJD)





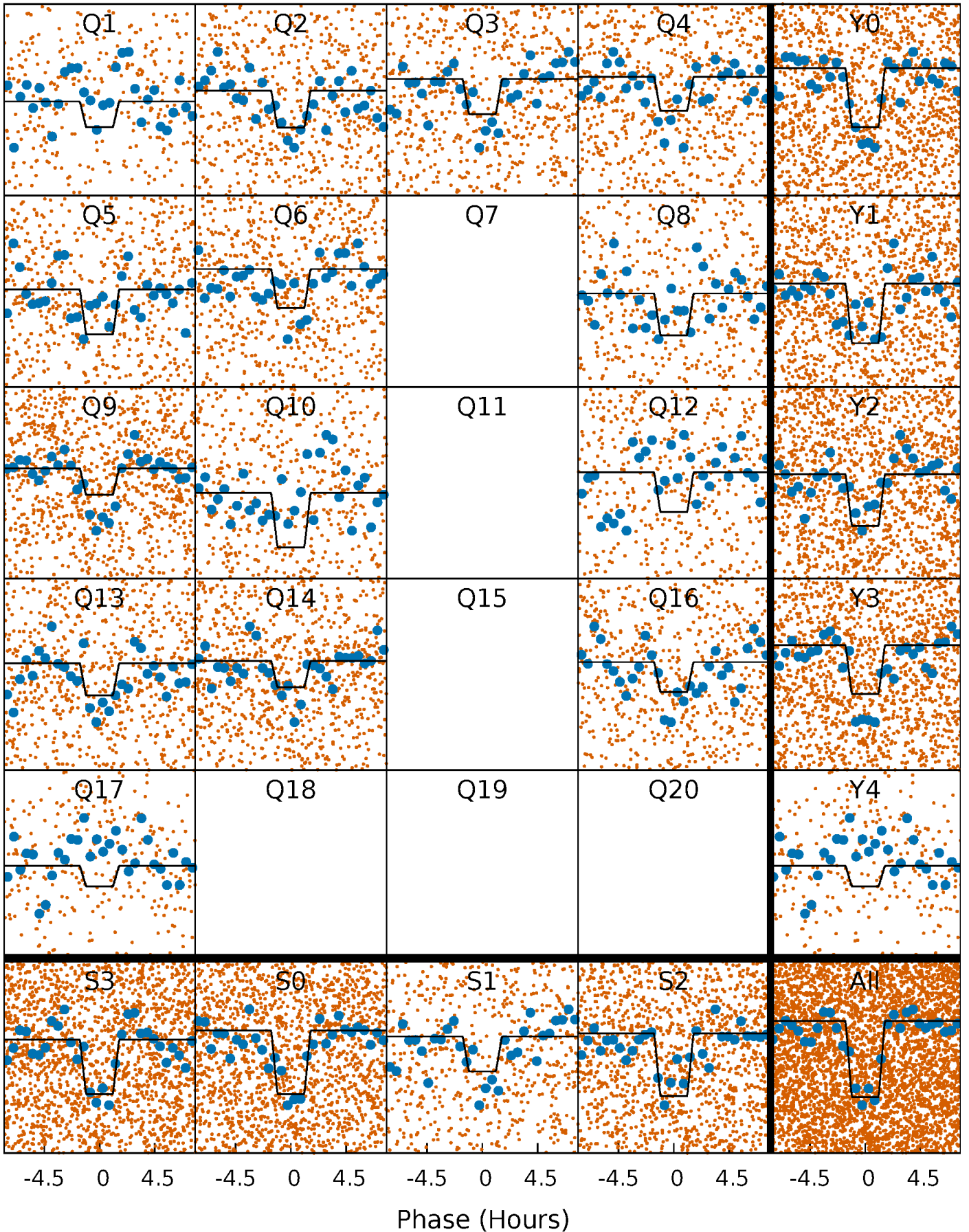
# DV Quarter-Phased Transit Curves

TCE 010686930-01 P= 2.618429 Days  $T_0=134.044973$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

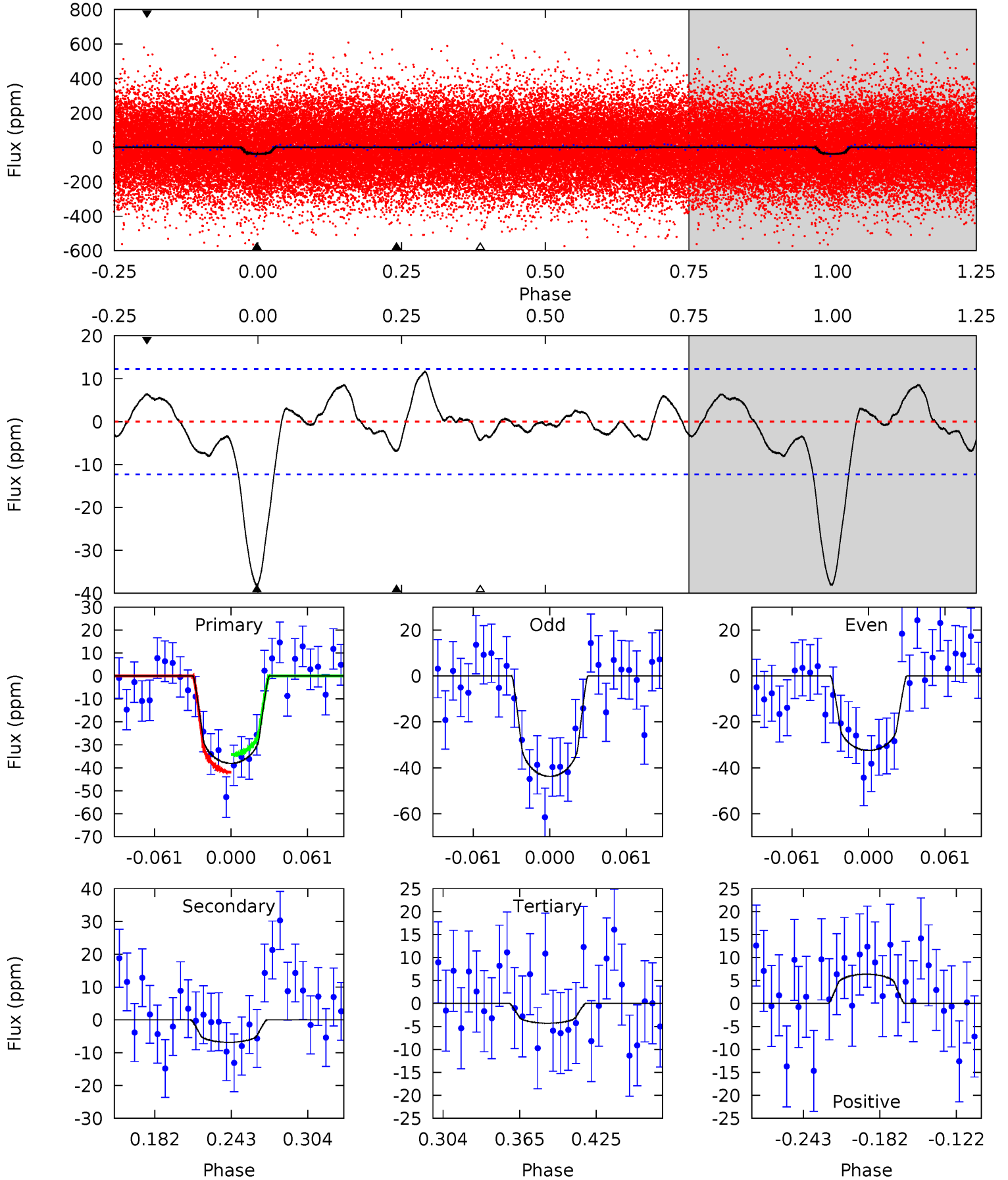
TCE 010686930-01 P= 2.618404 Days  $T_0=134.045806$  (BKJD)



# DV Model-Shift Uniqueness Test

010686930-01, P = 2.618429 Days, E = 131.426544 Days

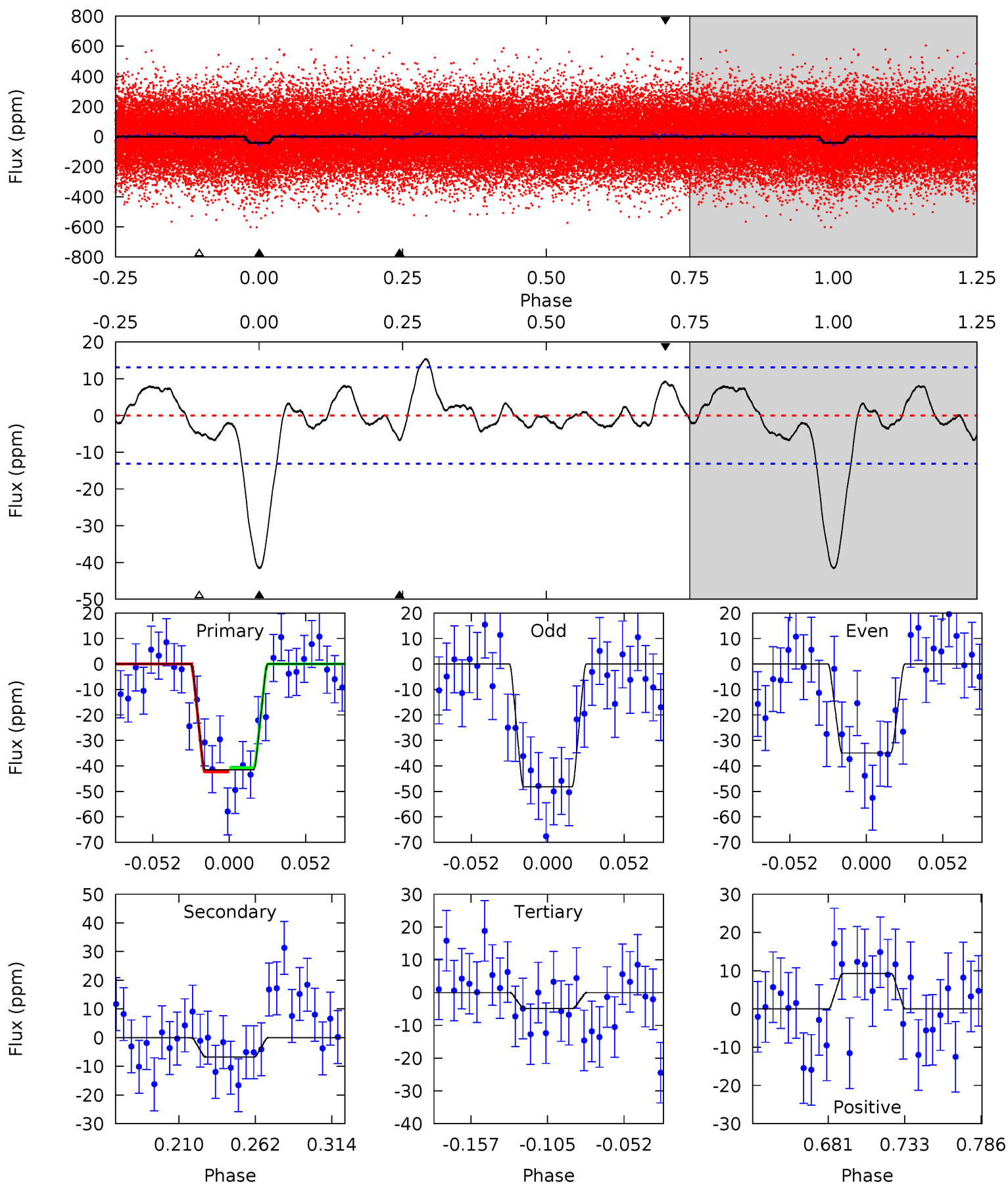
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	2.60	1.64	2.42	4.67	1.88	1.34	12.8	12.0	0.96	0.18	2.15	0.94	0.23	1.47



# Alt Model-Shift Uniqueness Test

010686930-01, P = 2.618404 Days, E = 131.427402 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
14.9	2.42	1.75	3.32	4.70	1.94	1.42	13.2	11.6	0.67	-0.91	2.38	0.86	0.27	0.30





### Stellar Parameters For KIC 010686930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5088^{+114}_{-127}$	$3.502^{+0.170}_{-0.170}$	$-0.180^{+0.250}_{-0.250}$	$3.293^{+0.713}_{-0.713}$	$1.257^{+0.154}_{-0.287}$	$0.050^{+0.043}_{-0.021}$
	+2%/-2%	+5%/-5%	+139%/-139%	+22%/-22%	+12%/-23%	+86%/-43%
Source	PHO1	FLK73	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 010686930-01 / KOI 7364.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-7 \pm 3$	$2.48^{+1.25}_{-1.12}$	$2840^{+177}_{-179}$	$3272^{+1000}_{-878}$	$0.895^{+2.196}_{-0.544}$
Alt.	$-7 \pm 3$	$2.46^{+1.26}_{-1.13}$	$2863^{+184}_{-175}$	$3316^{+1058}_{-972}$	$0.948^{+2.587}_{-0.604}$

$T_{max}$  = 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

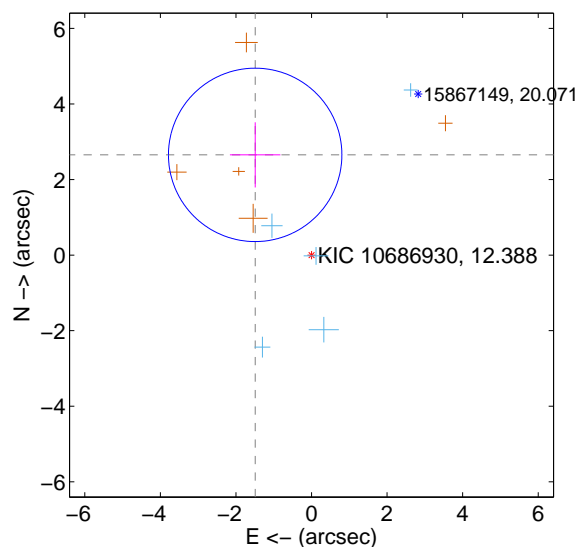
Supplemental centroid analysis for 010686930-01. Kepler magnitude: 12.39. Transit SNR 8.25

There are 5 quarters with good PRF difference image offsets

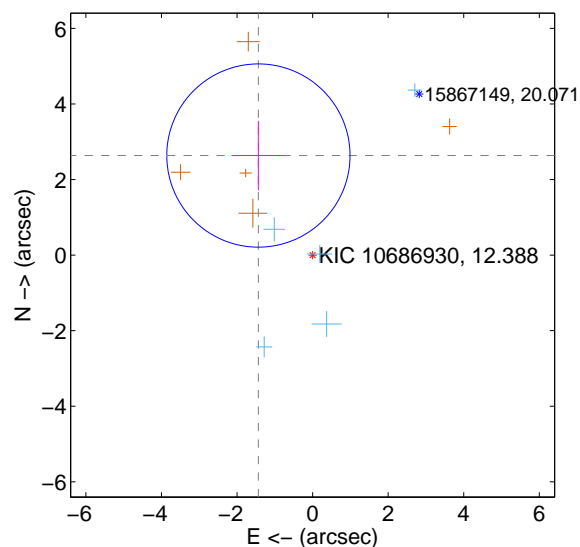
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.043 \pm 0.765$	$3.98$	$1.491 \pm 0.668$	$2.652 \pm 0.864$
PRF-fit source offset from KIC position	$3.000 \pm 0.808$	$3.71$	$1.434 \pm 0.708$	$2.635 \pm 0.919$
photometric centroid source offset	$0.92 \pm 0.91$	1.02	$0.80 \pm 0.96$	$-0.46 \pm 0.72$

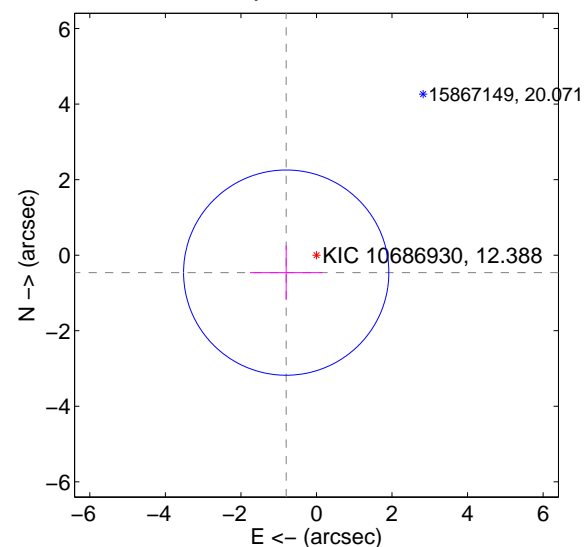
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

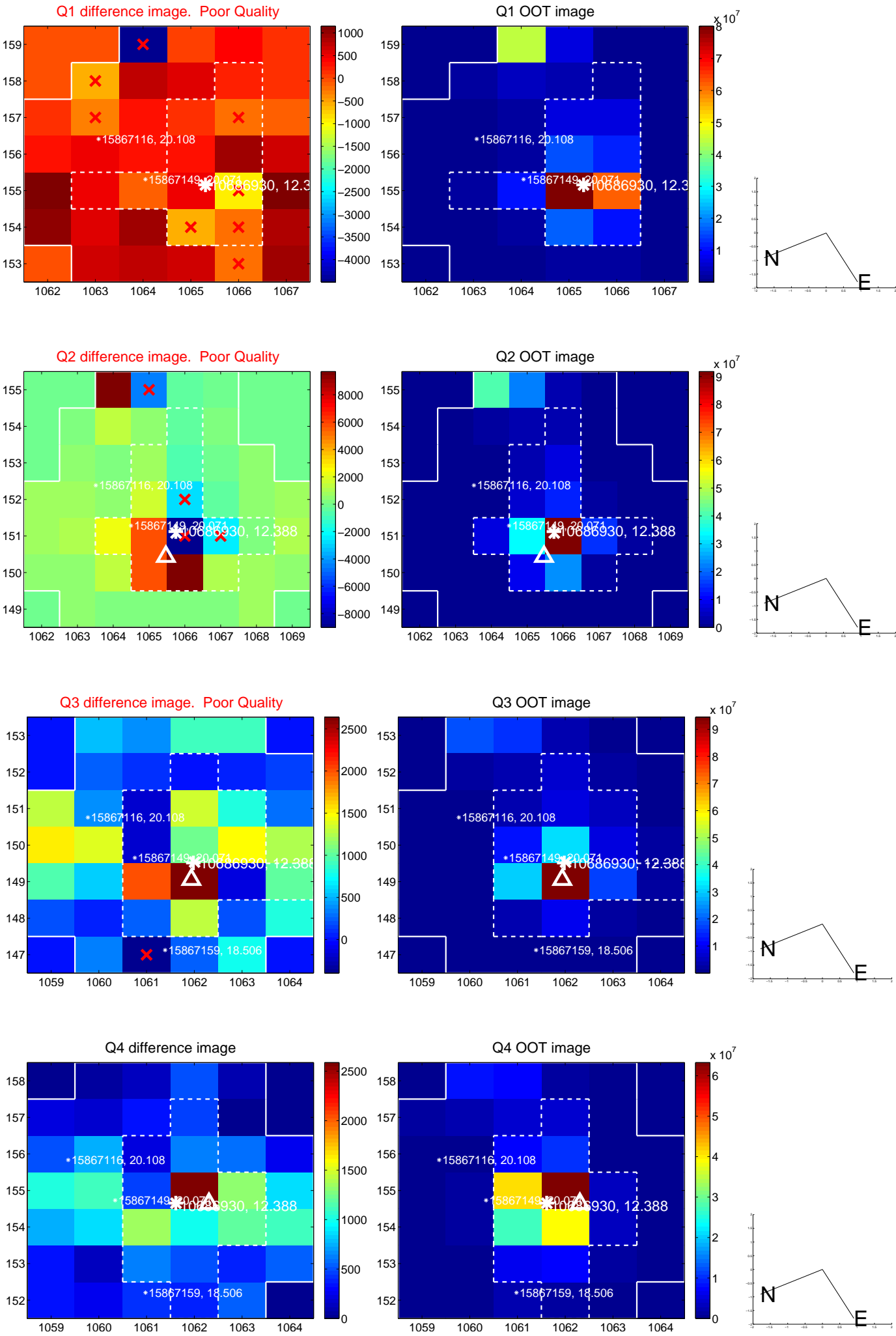


offset from photometric centroids

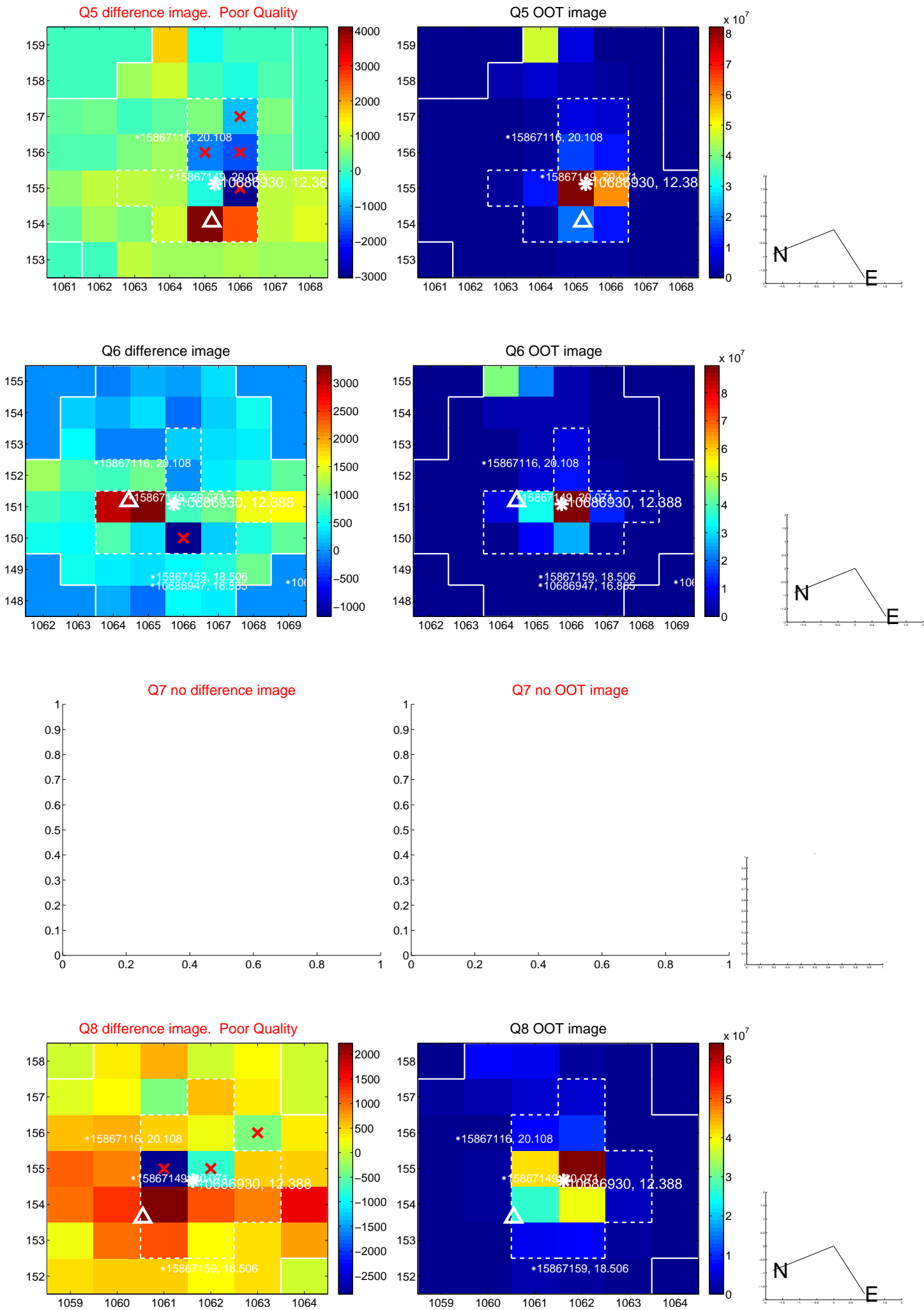


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

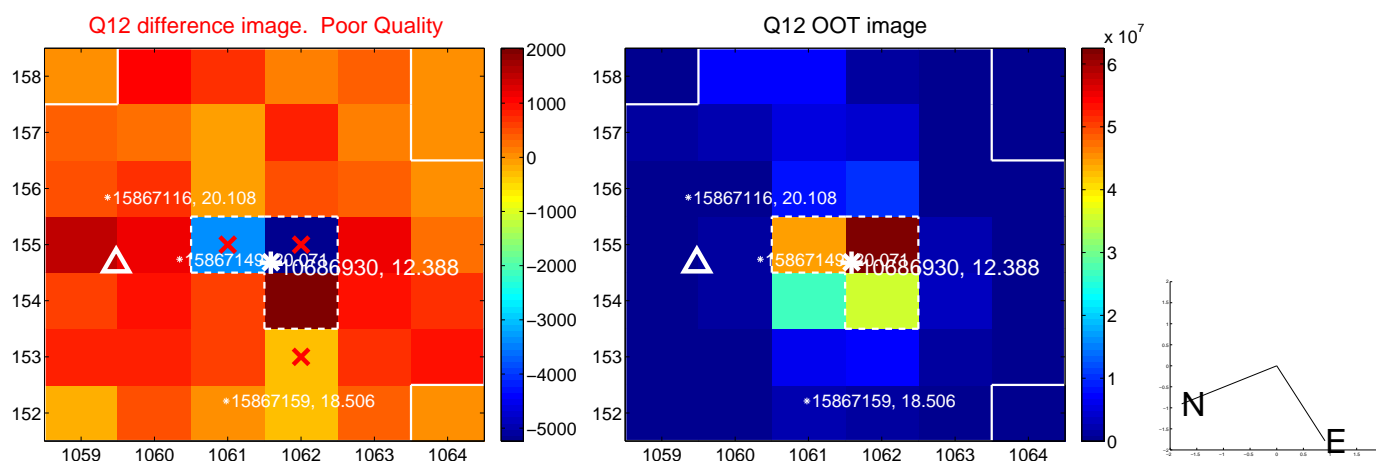
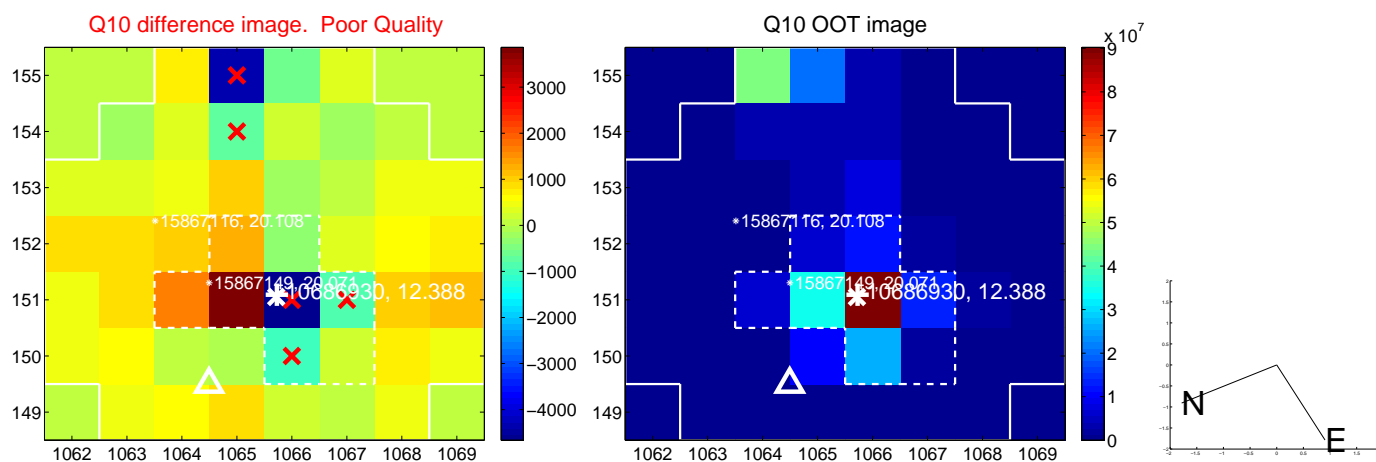
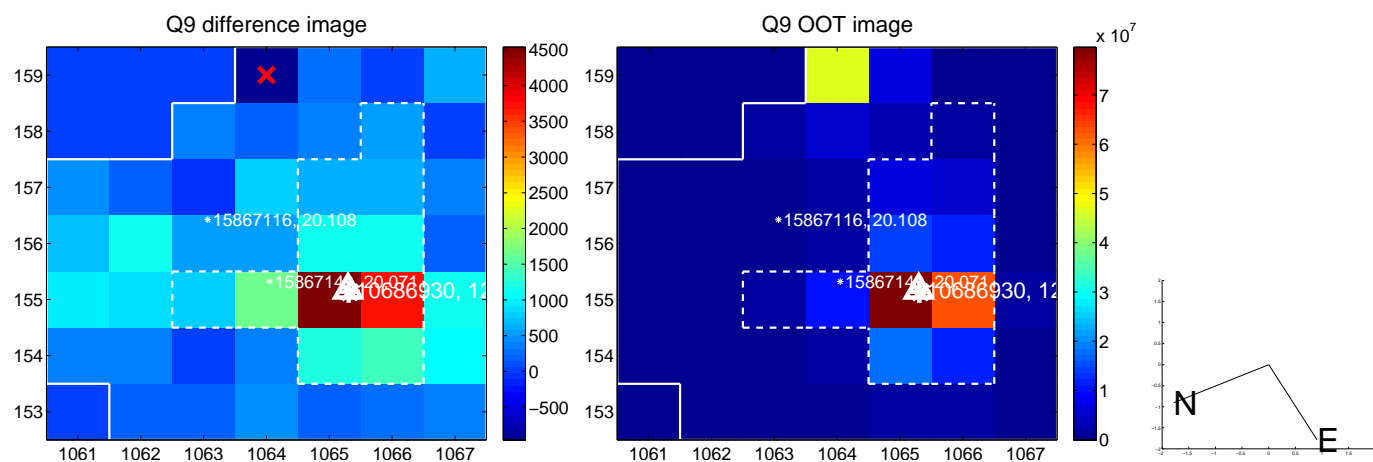


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

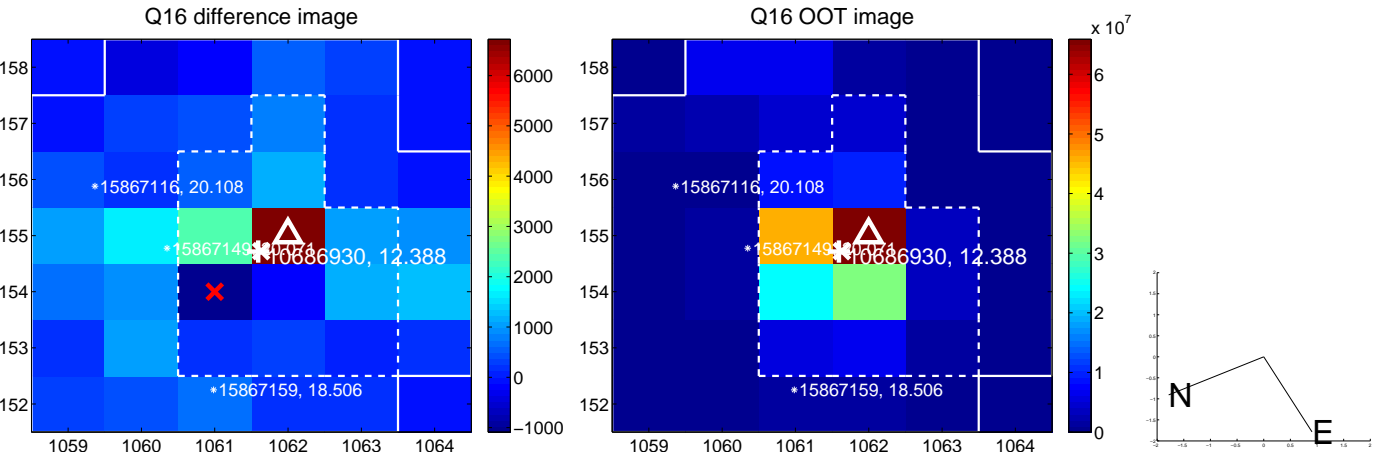
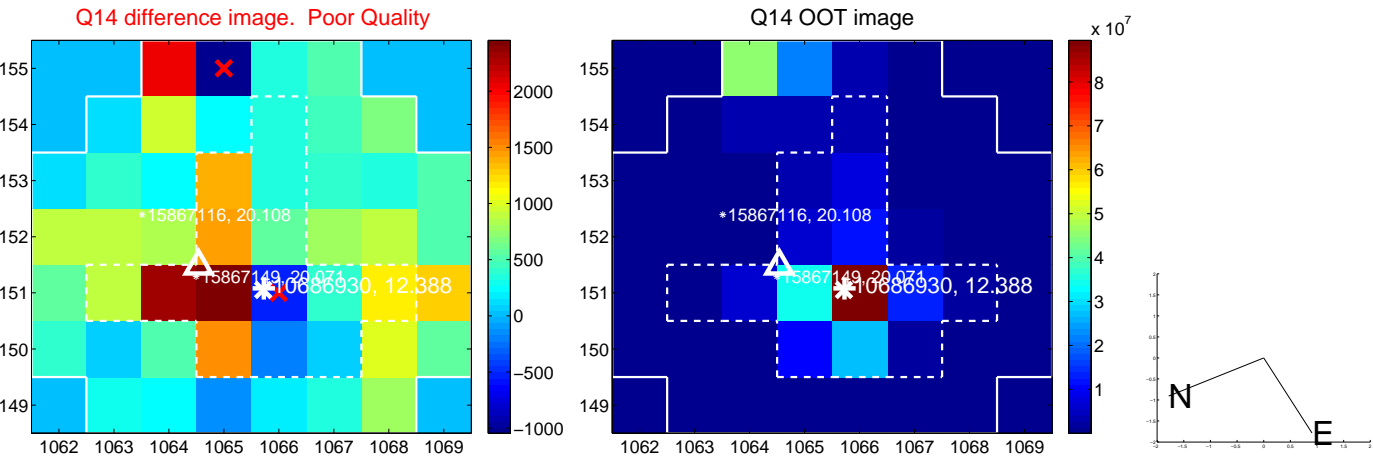
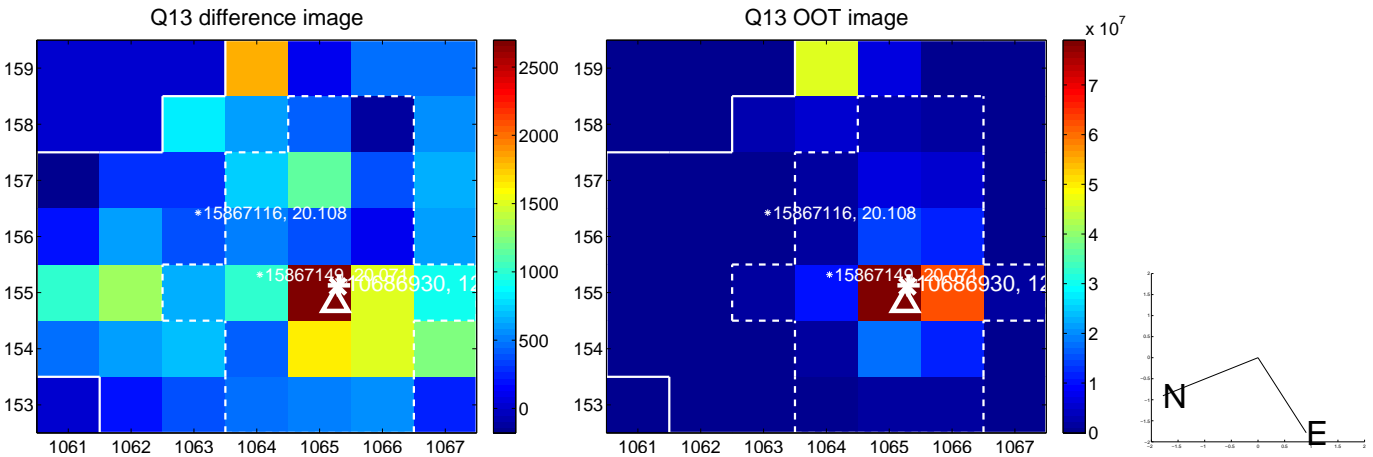




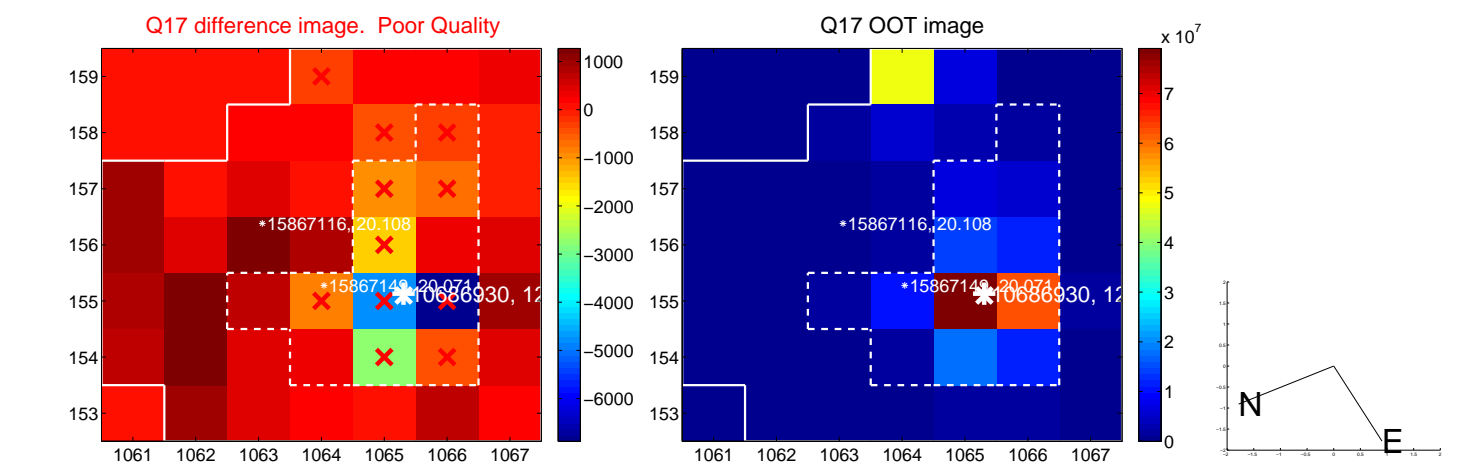
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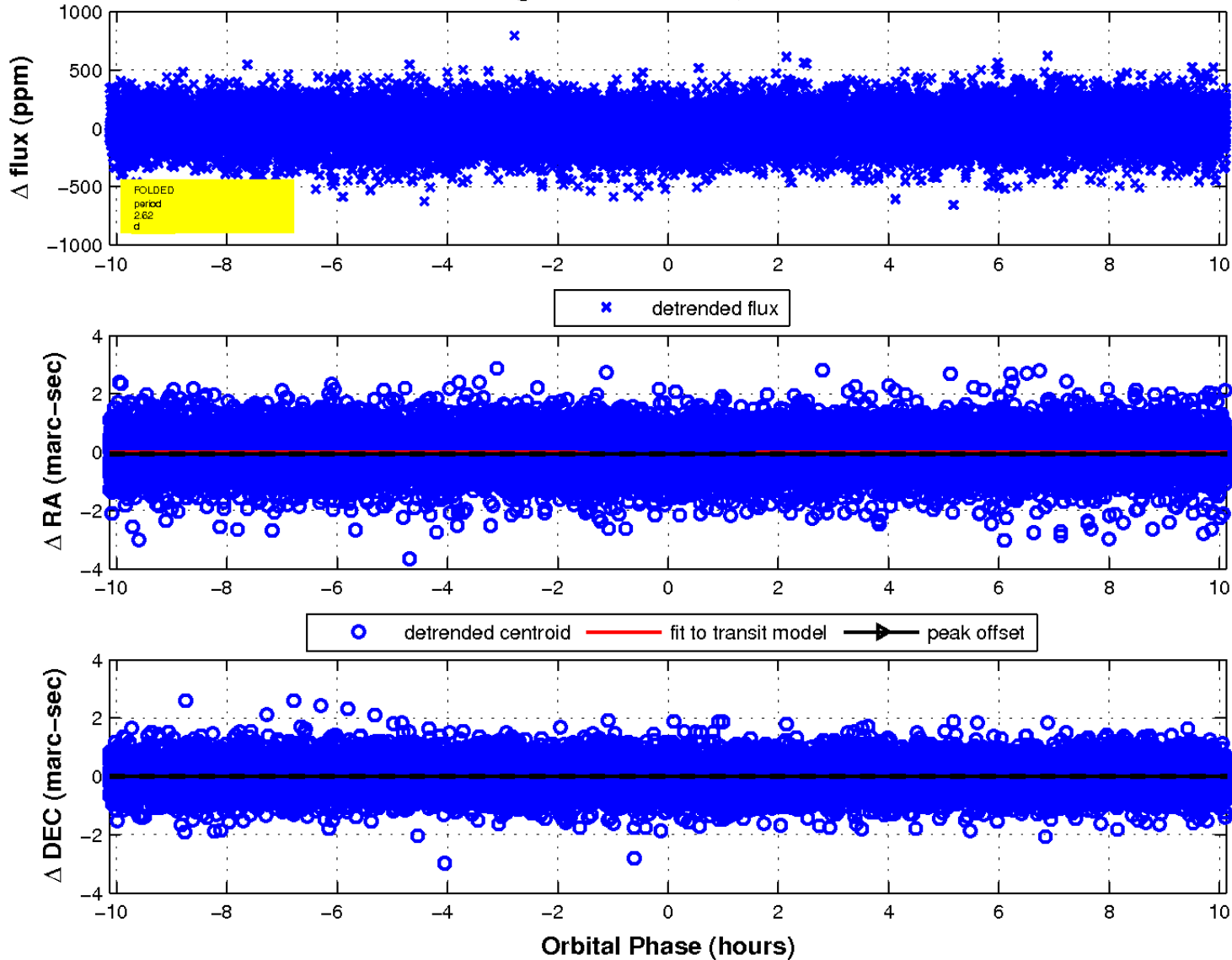
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

