

# KIC 010670412

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010670412-01	OBS	No	1.378343	131.877007	13.6	10.850	10.5	7.6	2.22	6504	0.88	9955.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010670412-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED

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

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

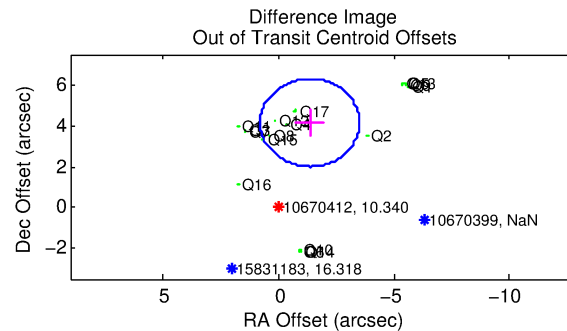
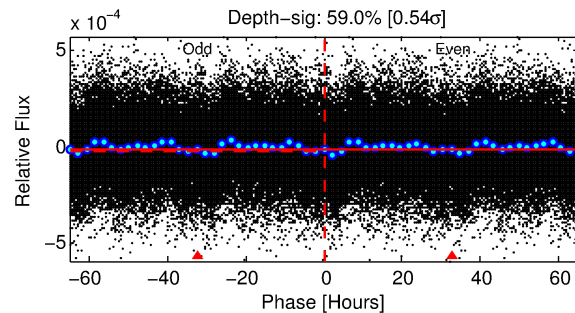
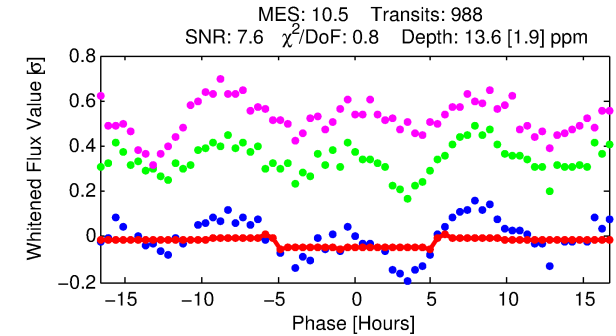
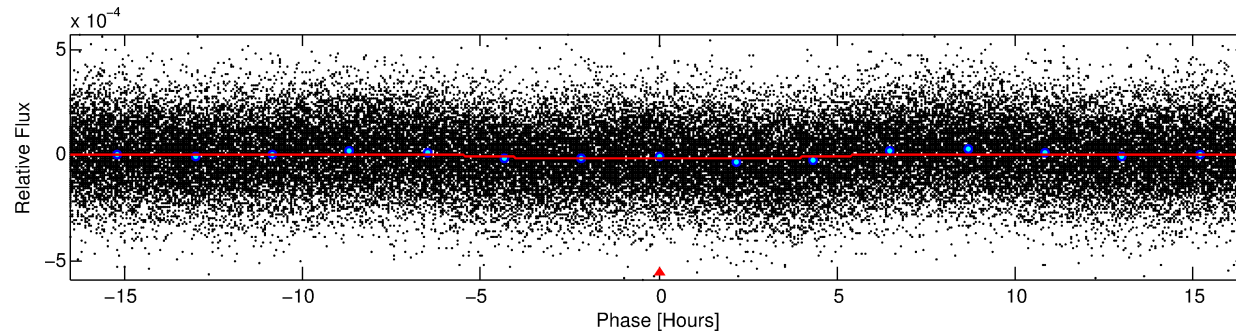
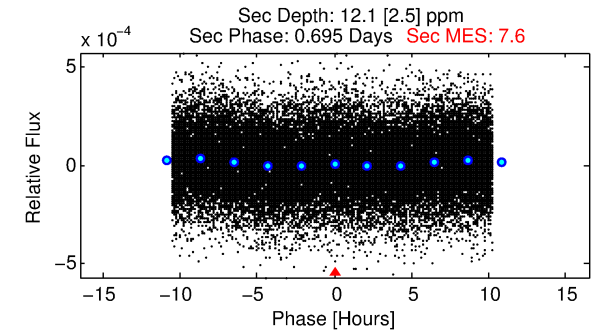
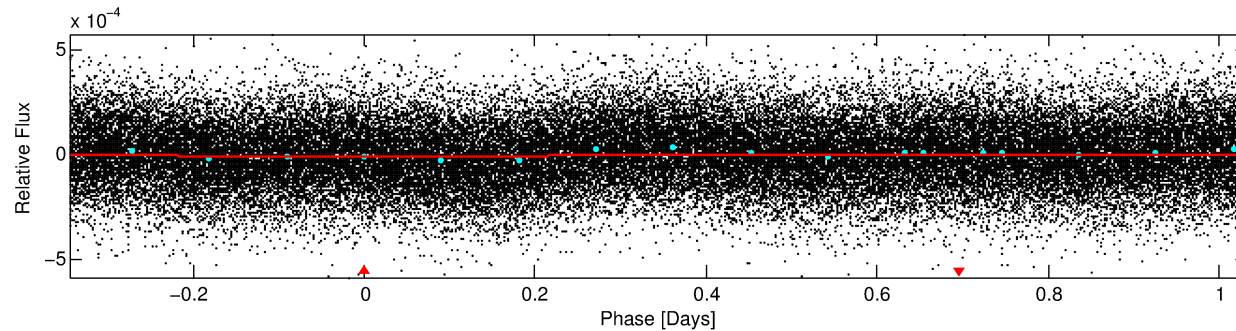
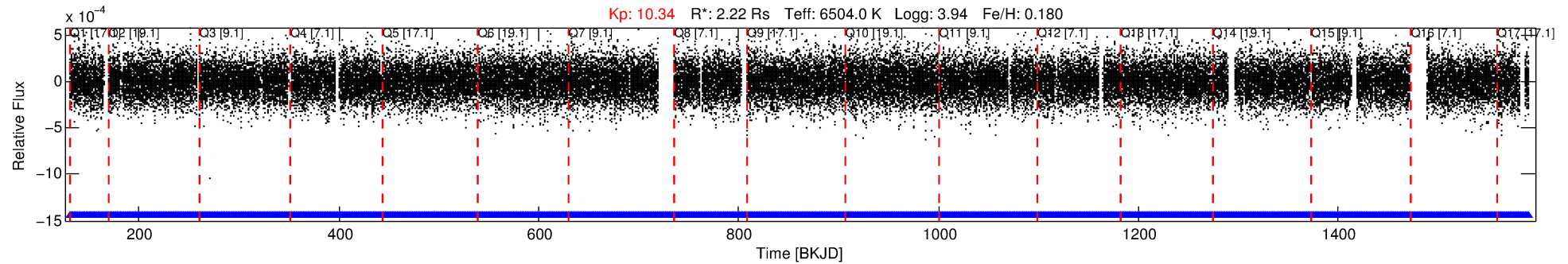
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010670412-01

No Significant Match Found

# DV One-Page Summary

KIC: 10670412 Candidate: 1 of 1 Period: 1.378 d



## DV Fit Results:

Period = 1.37834 [0.00003] d  
Epoch = 131.8770 [0.0069] BKJD  
Rp/R\* = 0.0036 [0.0026]  
a/R\* = 1.09 [0.65]  
b = 0.72 [2.57]  
Seff = 9955.02 [5656.76]  
Teq = 2547 [362] K  
Rp = 0.88 [0.72] Re  
a = 0.0282 [0.0100] AU  
Ag = 6.79 [10.41] [0.56σ]  
Teffp = 6357 [2289] K [1.64σ]

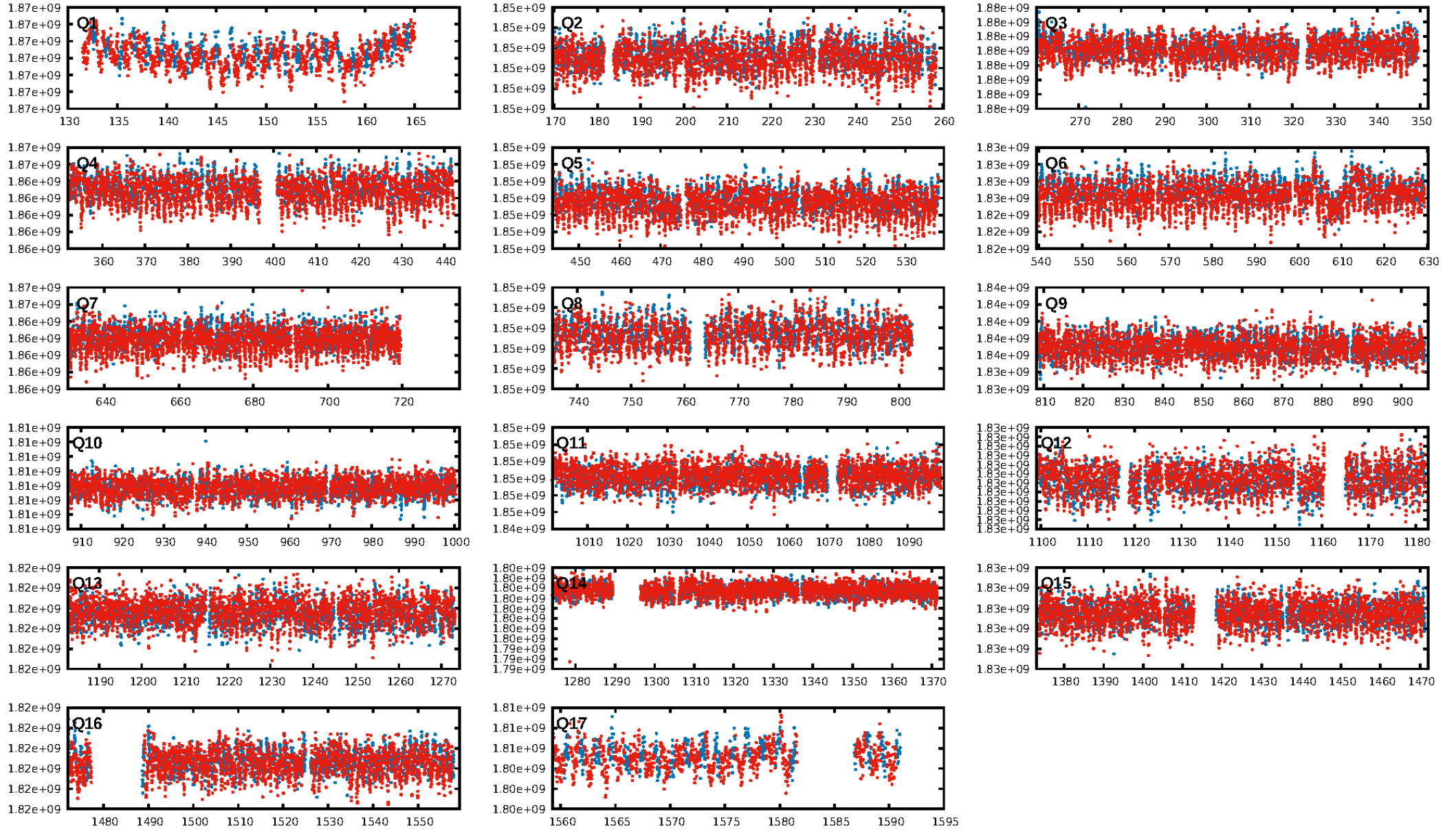
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [944/944]  
GhostDiagnostic-chr: 0.5985  
Centroid-sig: 0.0%  
Centroid-so: 2.590 arcsec [2.95σ]  
OotOffset-rm: 4.364 arcsec [6.09σ]  
KicOffset-rm: 3.033 arcsec [4.15σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.18 [3/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:22:02 Z

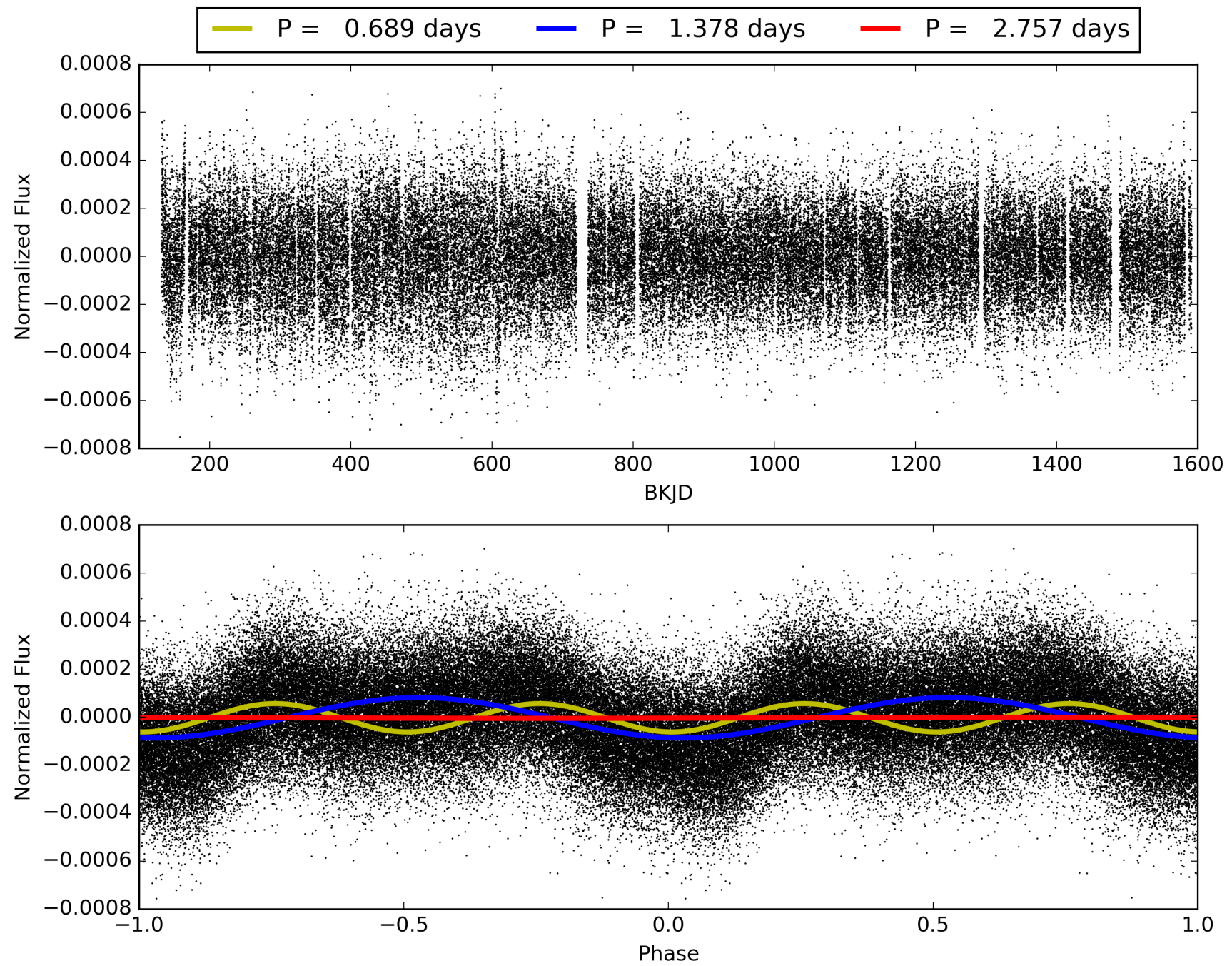
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010670412-01, PDC Light Curves



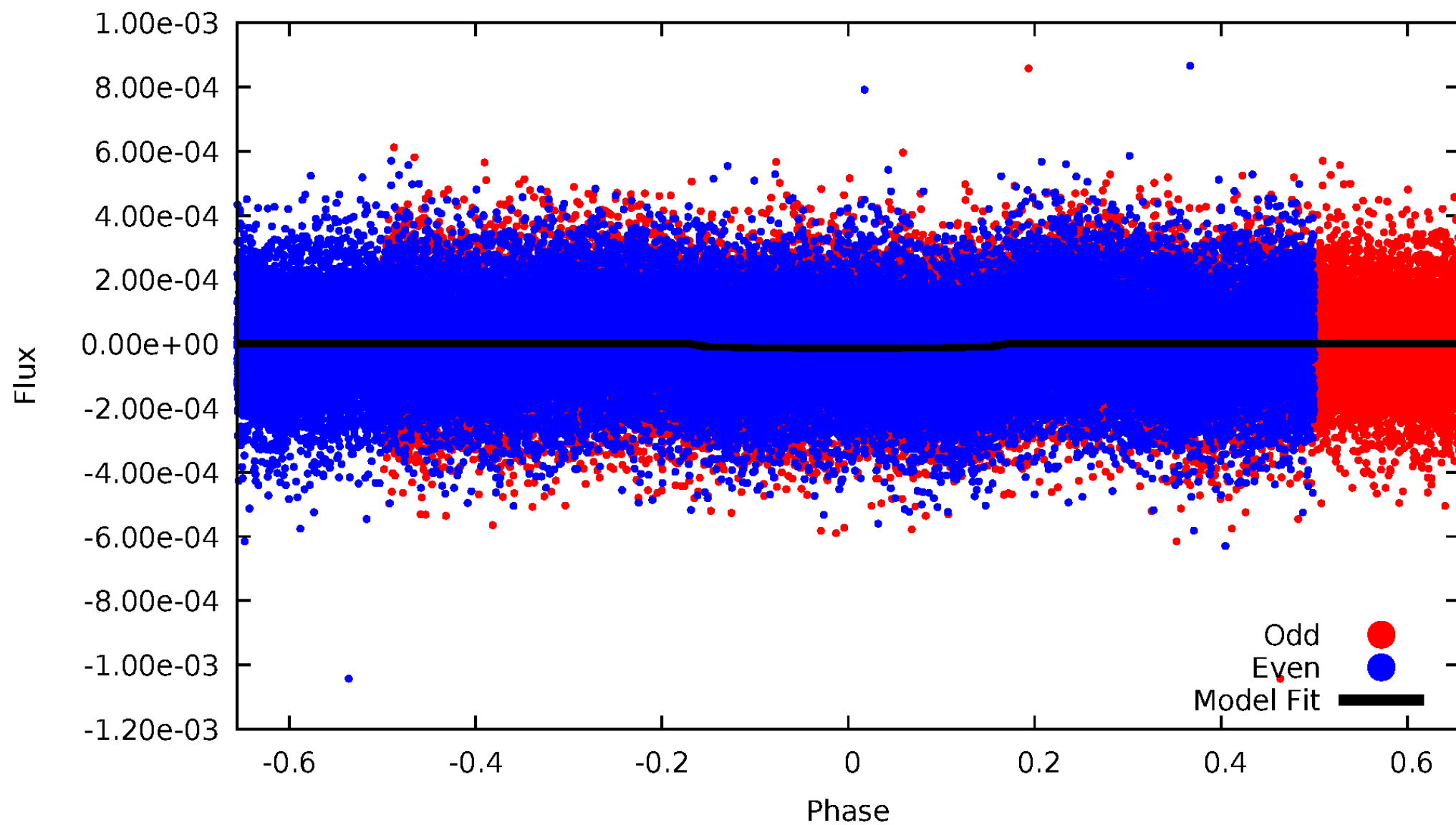


TCE 010670412-01



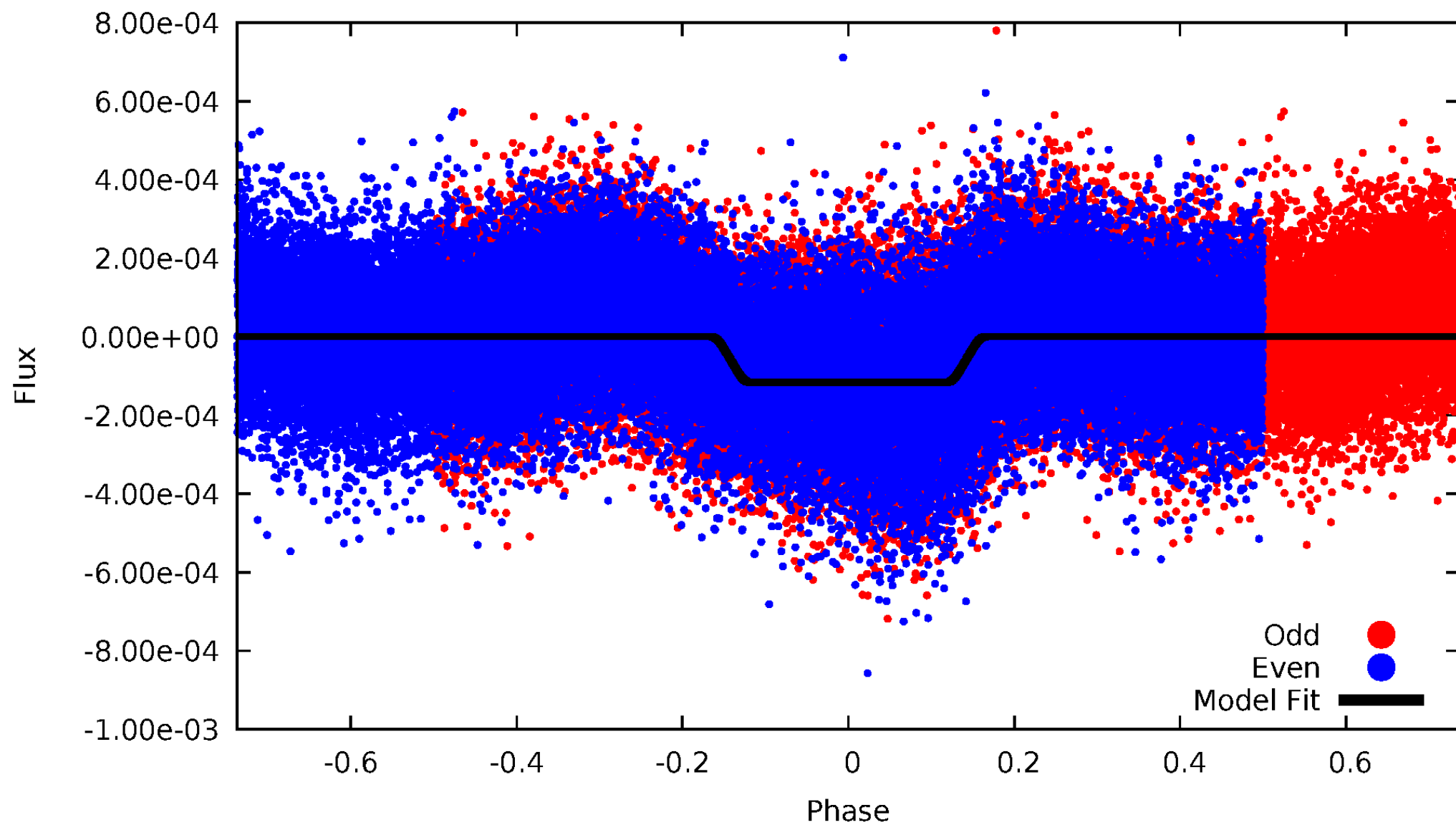
# DV Odd/Even

TCE 010670412-01



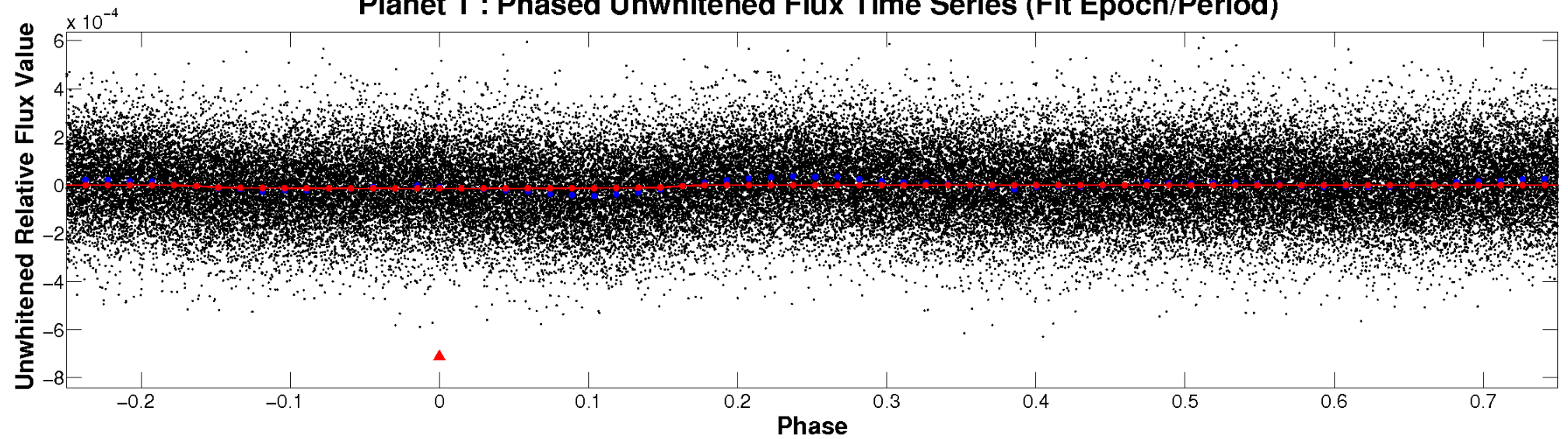
# ALT Odd/Even

TCE 010670412-01

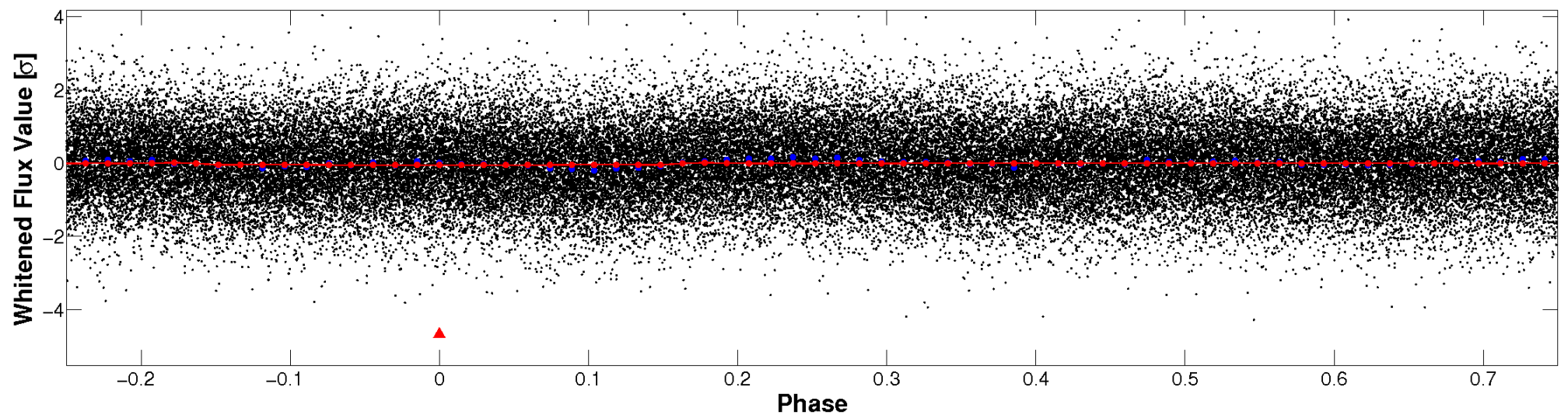


# Non-Whitened Vs. Whitened Light Curve

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



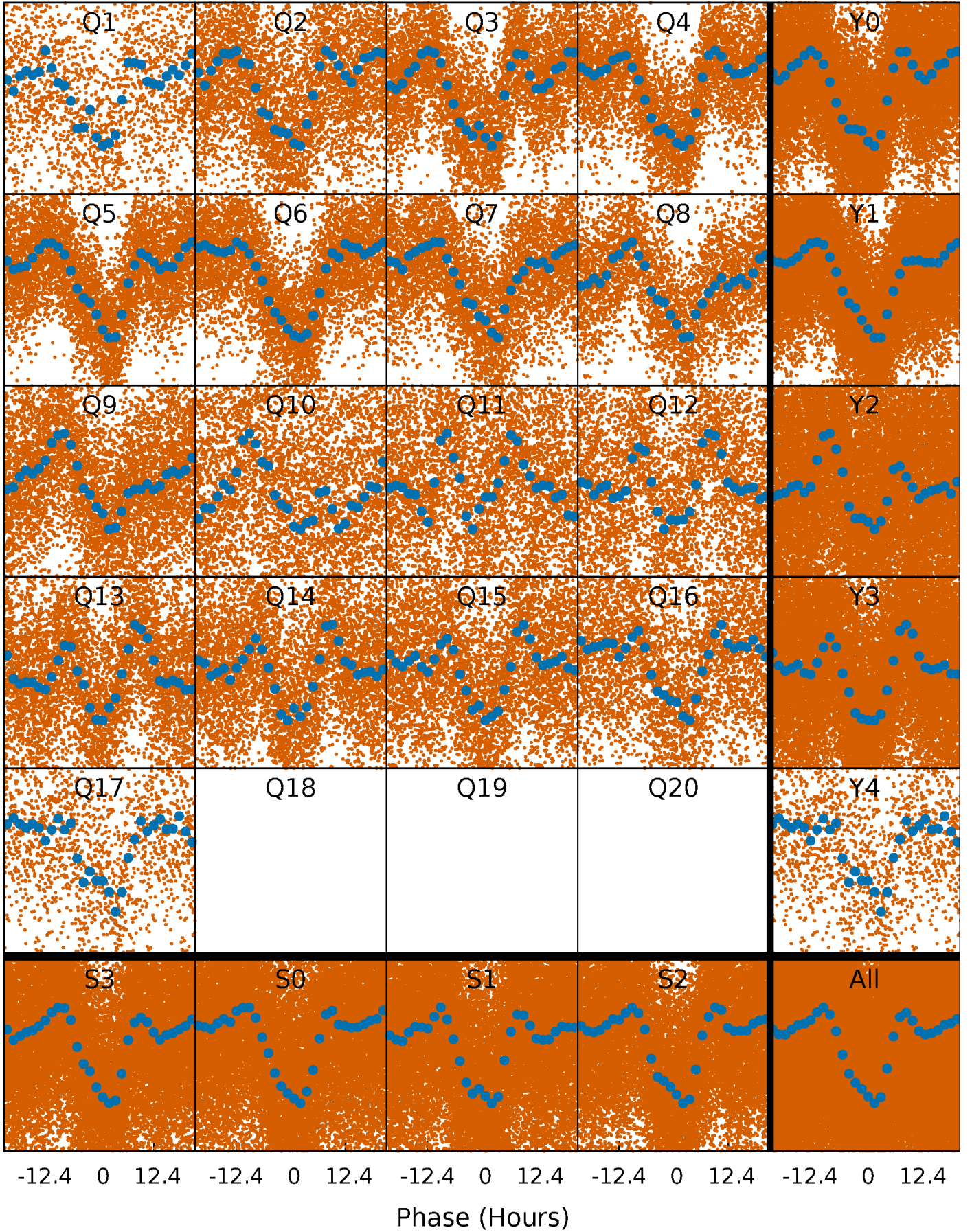
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

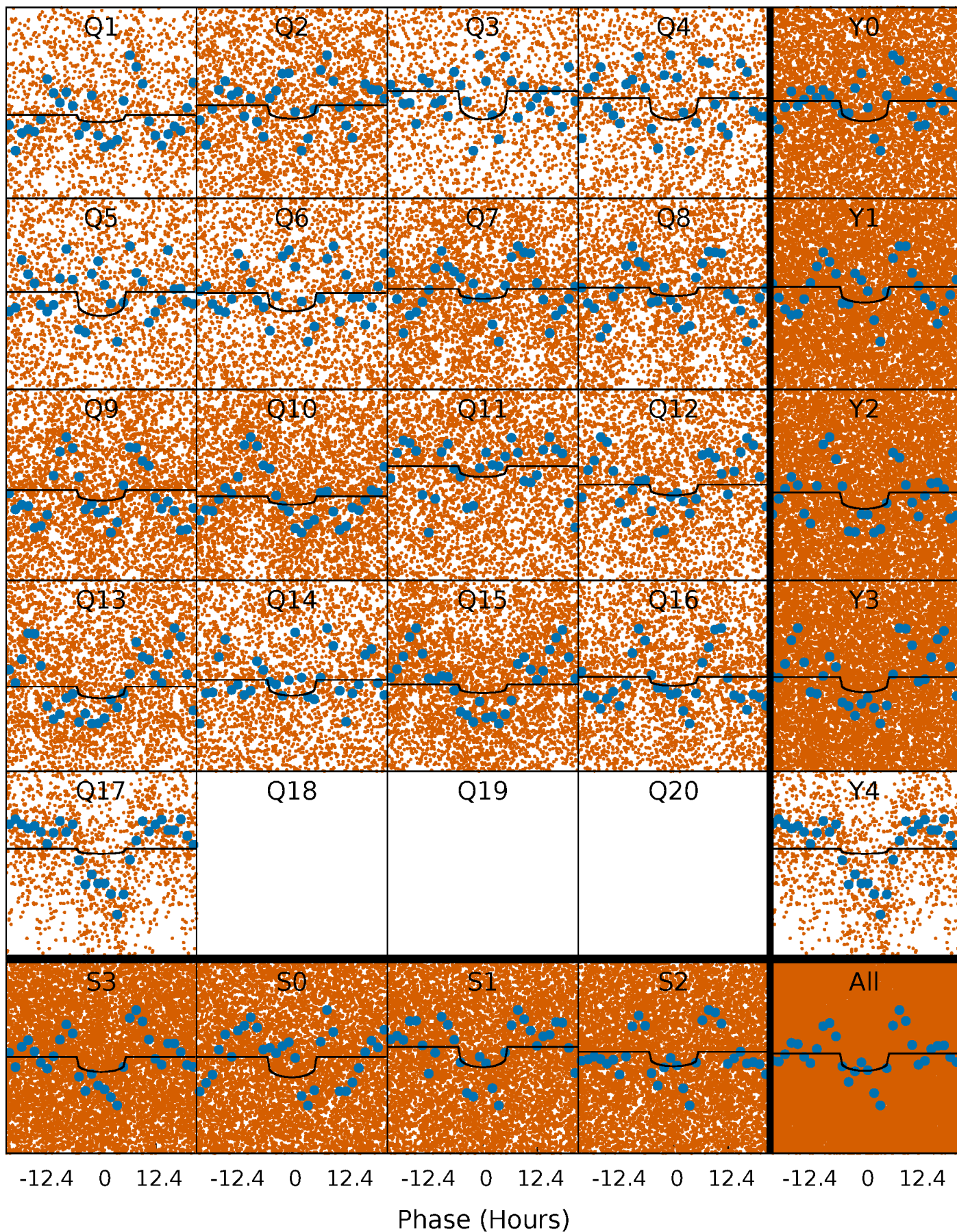
TCE 010670412-01   P= 1.378343 Days    $T_0=131.877007$  (BKJD)





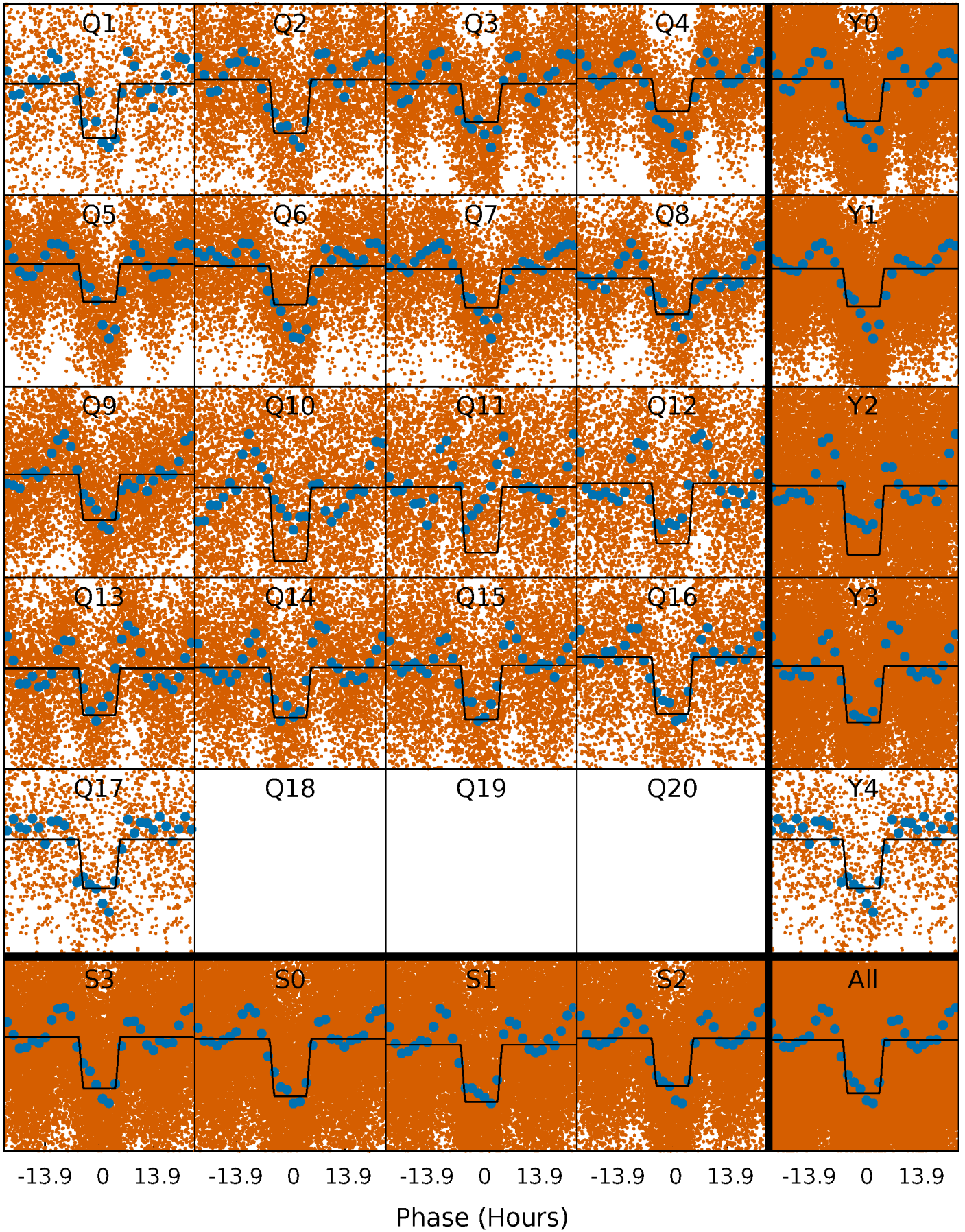
# DV Quarter-Phased Transit Curves

TCE 010670412-01 P= 1.378343 Days  $T_0=131.877007$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010670412-01 P= 1.378425 Days  $T_0=131.863980$  (BKJD)

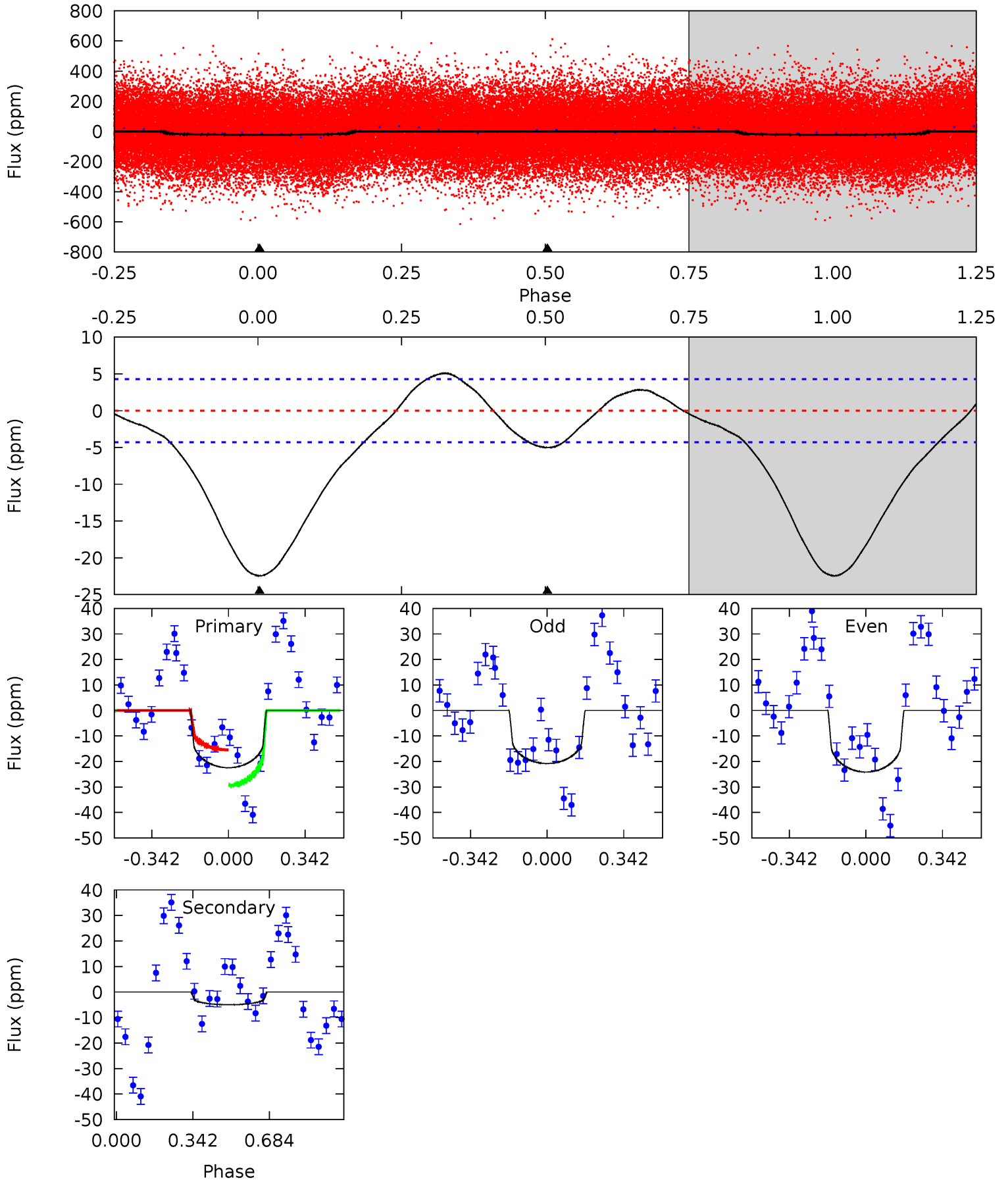




# DV Model-Shift Uniqueness Test

010670412-01, P = 1.378343 Days, E = 130.498664 Days

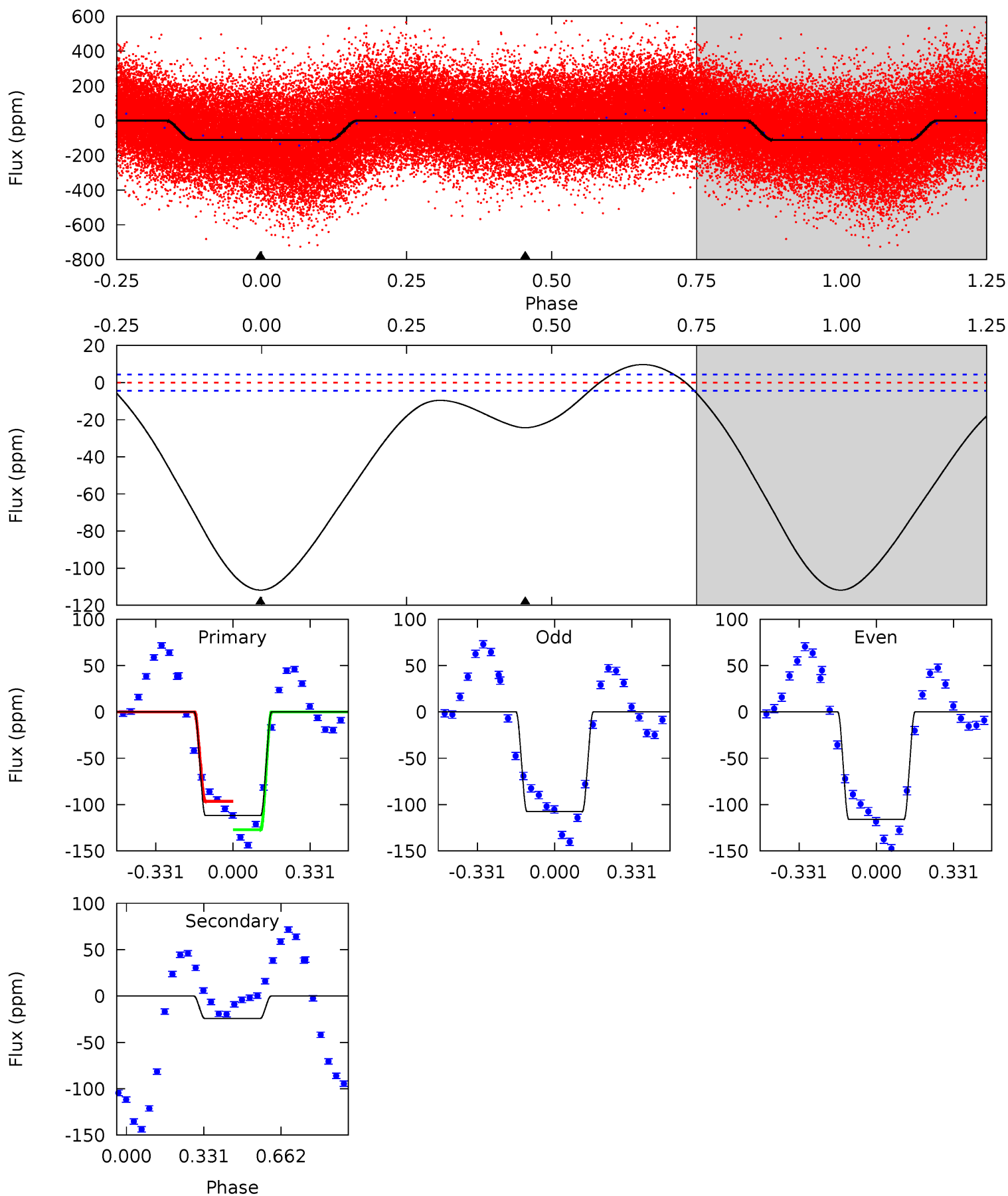
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.5	5.02	0	0	4.30	0.95	1.40	22.5	22.5	5.02	5.02	1.68	1.08	0.19	6.99



# Alt Model-Shift Uniqueness Test

010670412-01, P = 1.378425 Days, E = 130.485555 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
110.4	24.0	0	0	4.31	0.97	9.78	110.4	110.4	24.0	24.0	4.13	1.02	0.08	15.7





### Stellar Parameters For KIC 010670412

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6504^{+182}_{-251}$	$3.941^{+0.312}_{-0.168}$	$0.180^{+0.200}_{-0.350}$	$2.220^{+0.586}_{-0.879}$	$1.570^{+0.192}_{-0.356}$	$0.202^{+0.478}_{-0.098}$
	+3%/-4%	+8%/-4%	+111%/-194%	+26%/-40%	+12%/-23%	+237%/-49%
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 010670412-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-5 \pm 1$	$0.90^{+0.61}_{-0.49}$	$3546^{+282}_{-362}$	$4830^{+2478}_{-957}$	$2.660^{+10.270}_{-1.733}$
Alt.	$-24 \pm 1$	$2.52^{+0.82}_{-0.78}$	$3514^{+279}_{-335}$	$4373^{+590}_{-432}$	$1.657^{+1.693}_{-0.716}$

$T_{\text{max}}$  = 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

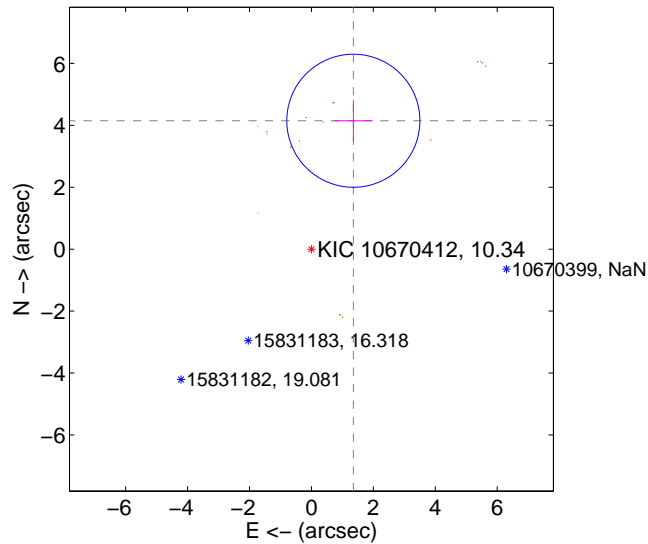
Supplemental centroid analysis for 010670412-01. **Kepler magnitude: 10.34.** Transit SNR 7.58

**There are 3 quarters with good PRF difference image offsets**

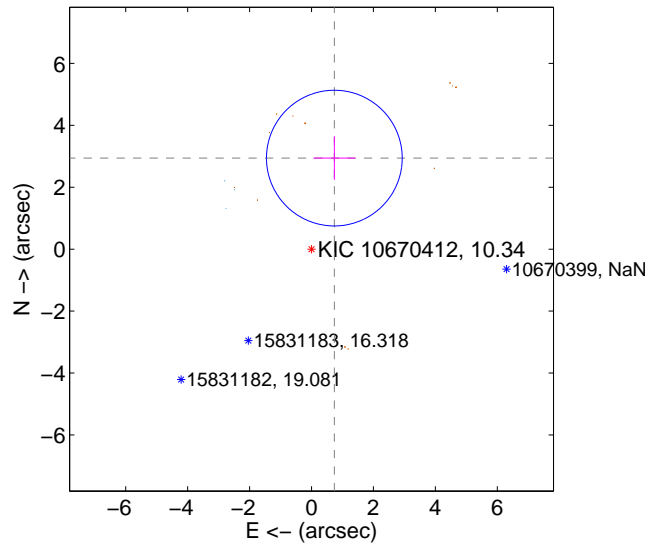
The direct PRF centroid is offset from the target star catalog position by about 1.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.364 \pm 0.716</math></b>	<b>6.09</b>	$-1.355 \pm 0.621$	$4.149 \pm 0.664$
PRF-fit source offset from KIC position	<b><math>3.033 \pm 0.731</math></b>	<b>4.15</b>	$-0.738 \pm 0.679$	$2.942 \pm 0.704$
photometric centroid source offset	$2.59 \pm 0.88$	2.95	$0.11 \pm 0.61$	$2.59 \pm 0.88$

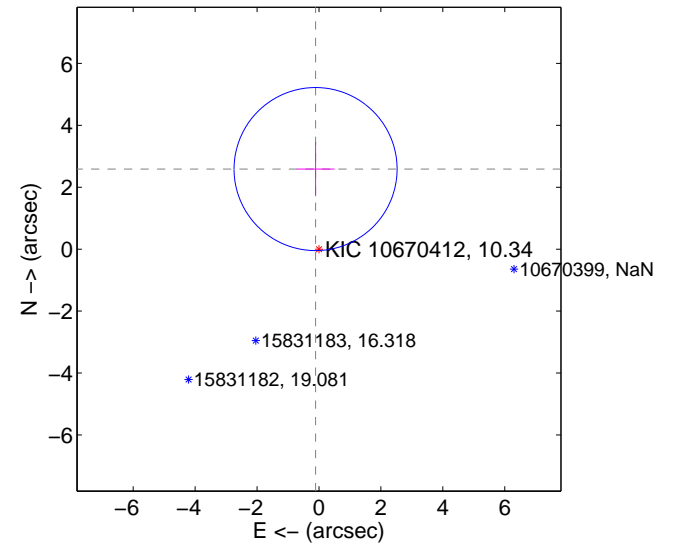
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

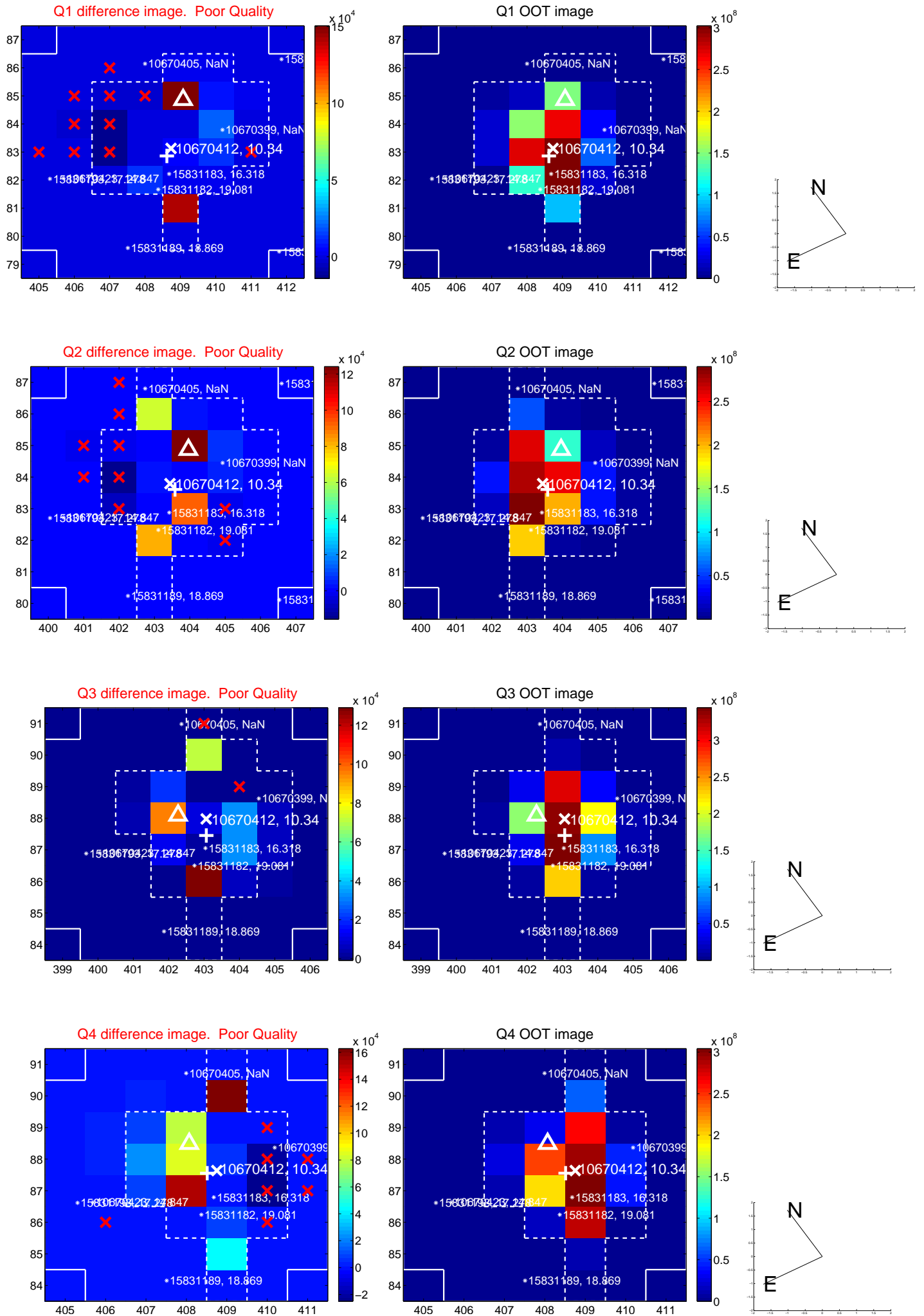


offset from photometric centroids

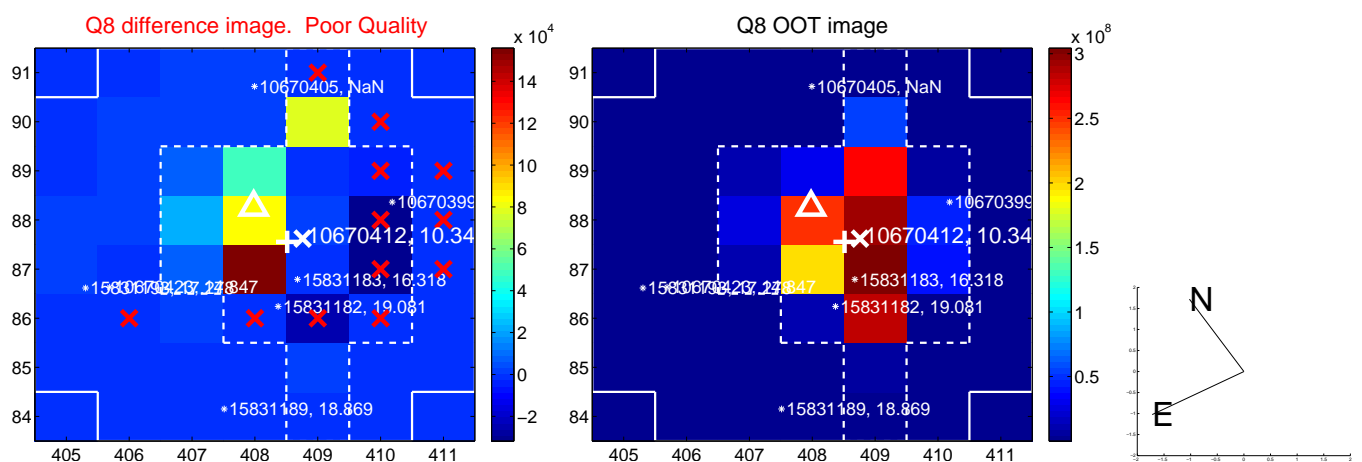
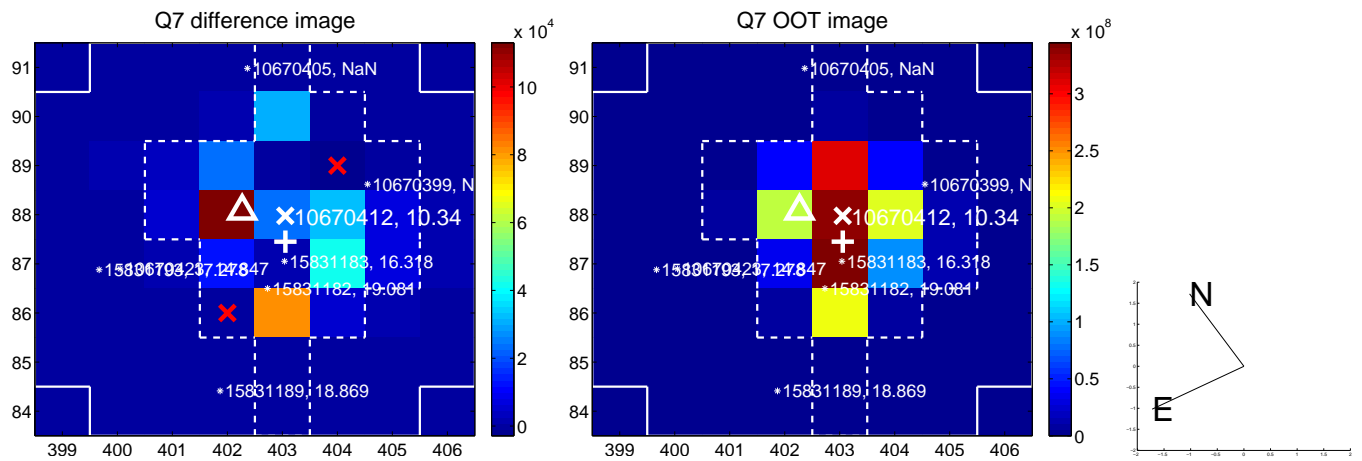
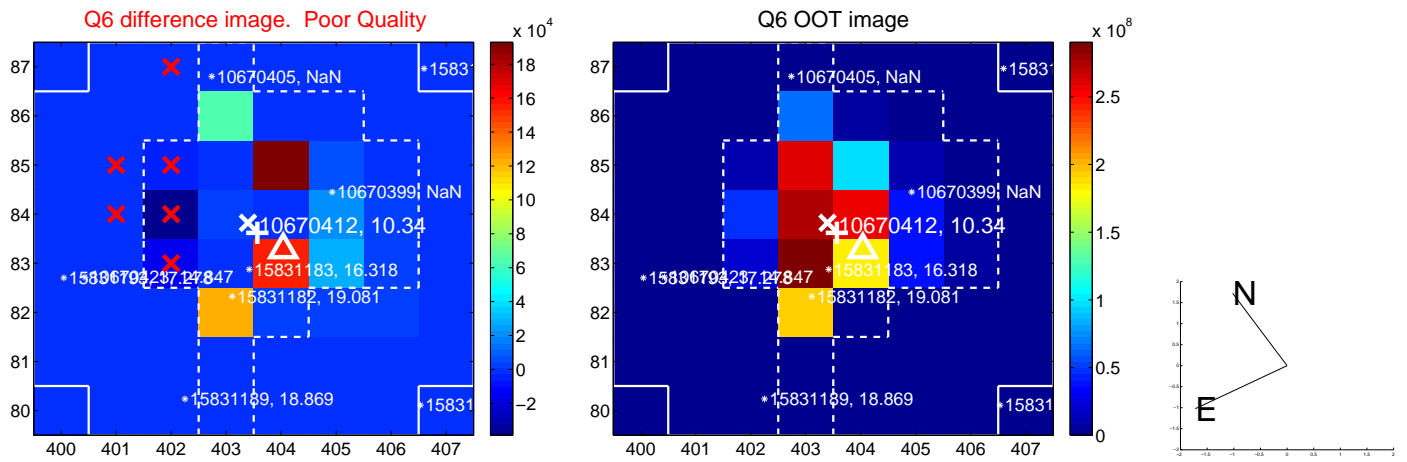
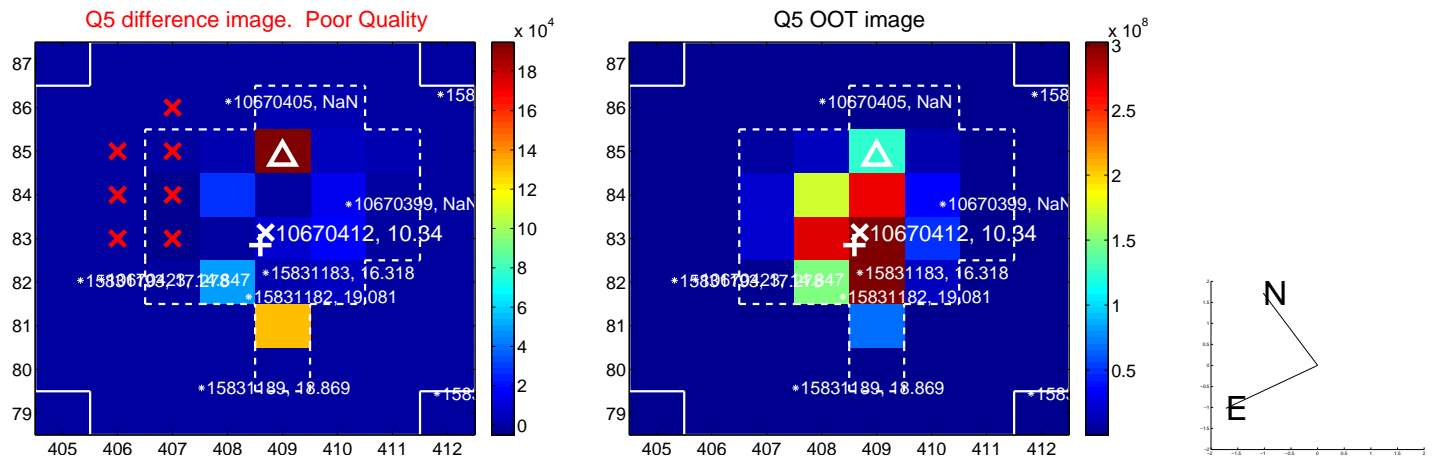


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

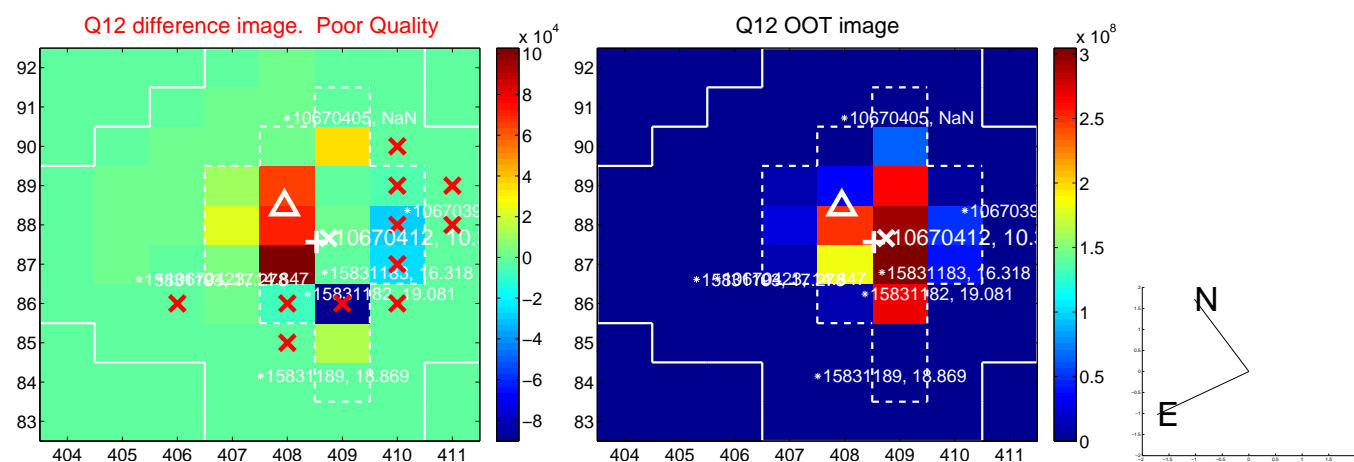
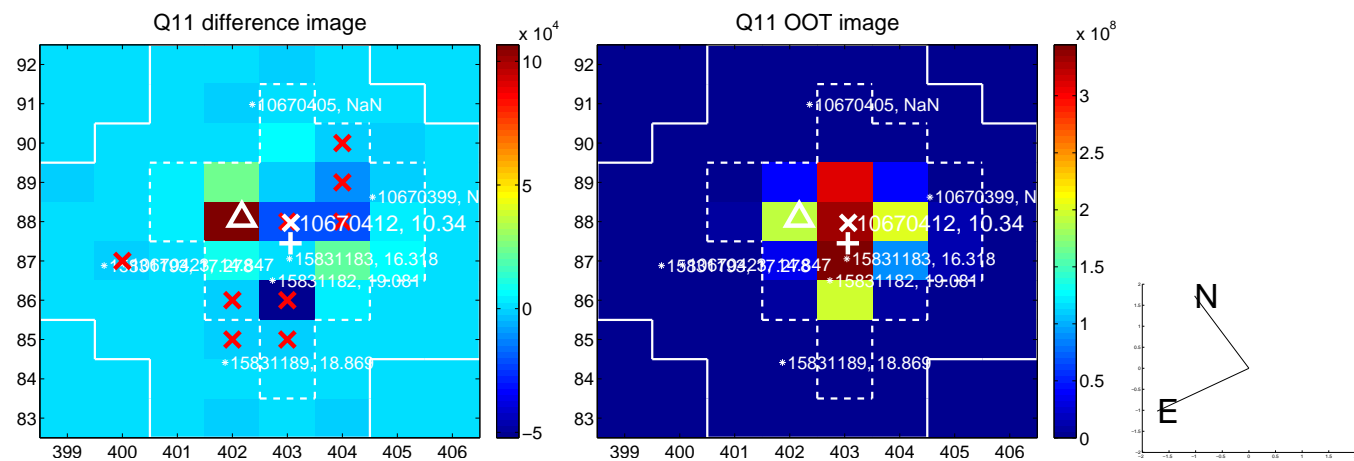
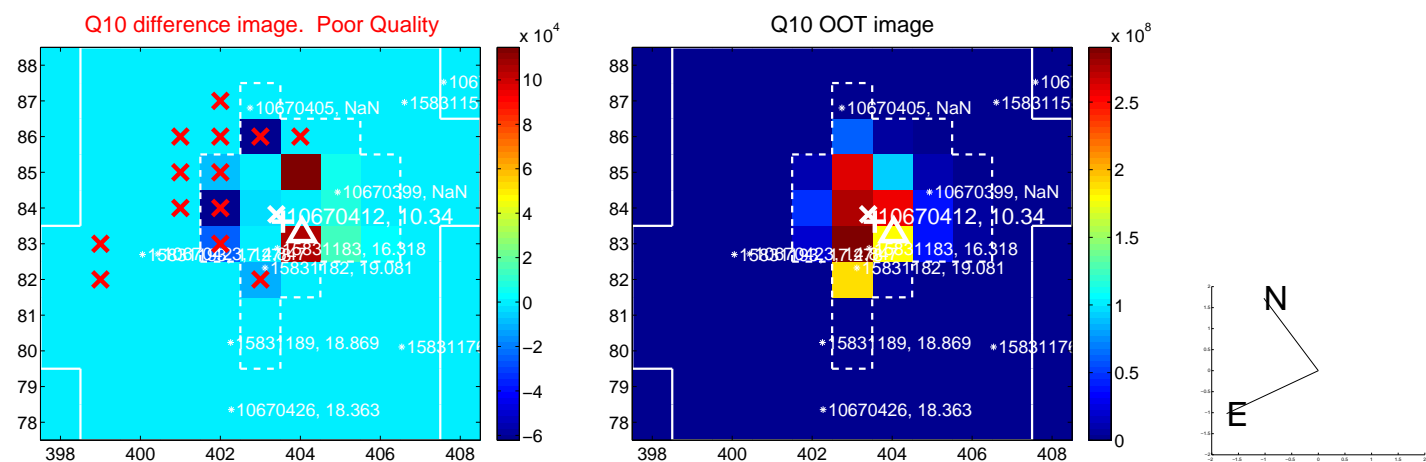
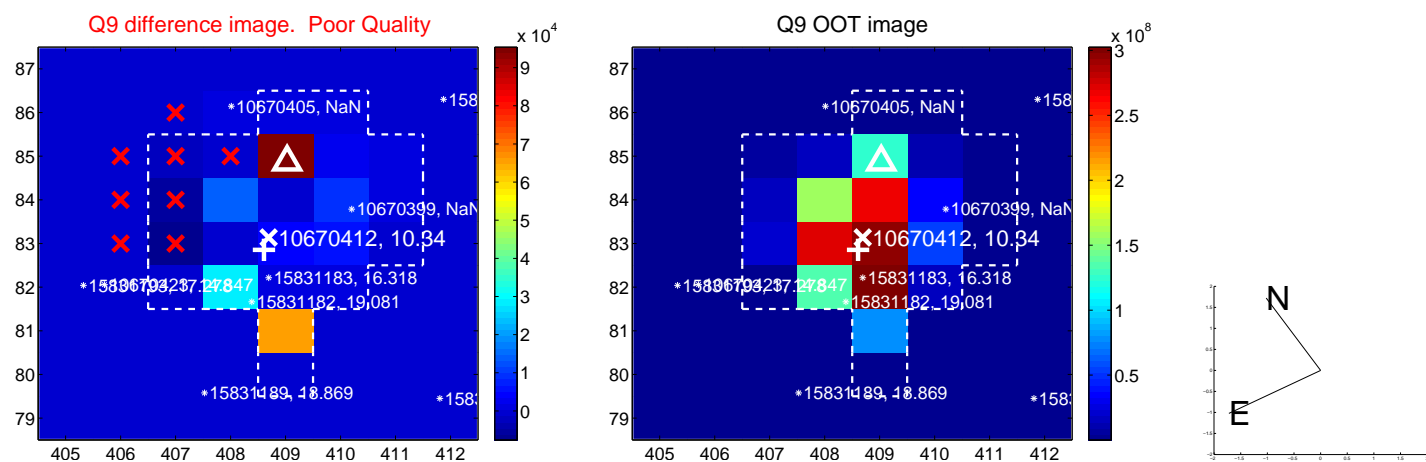


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.

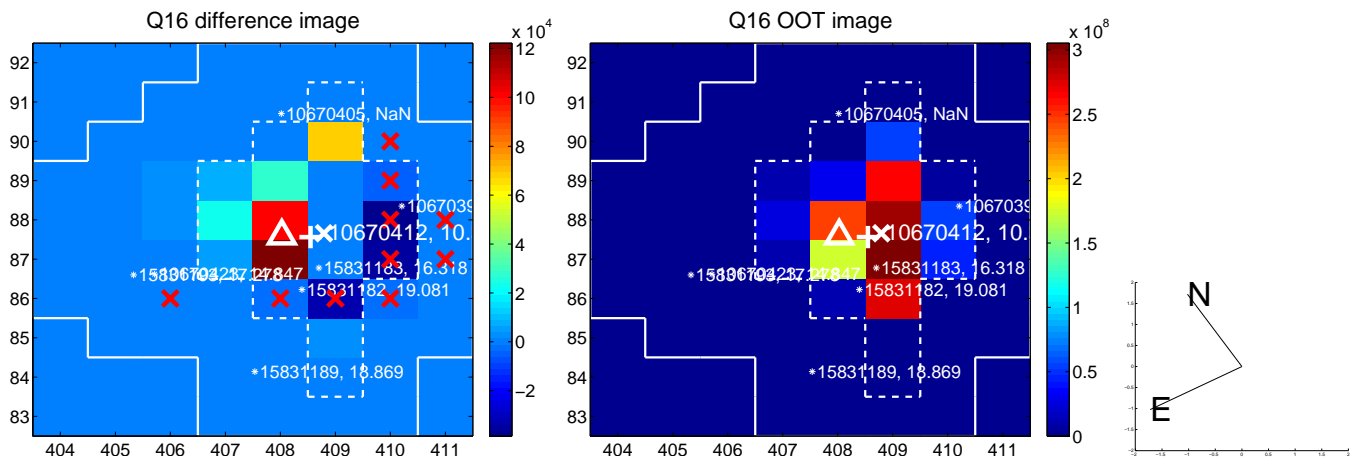
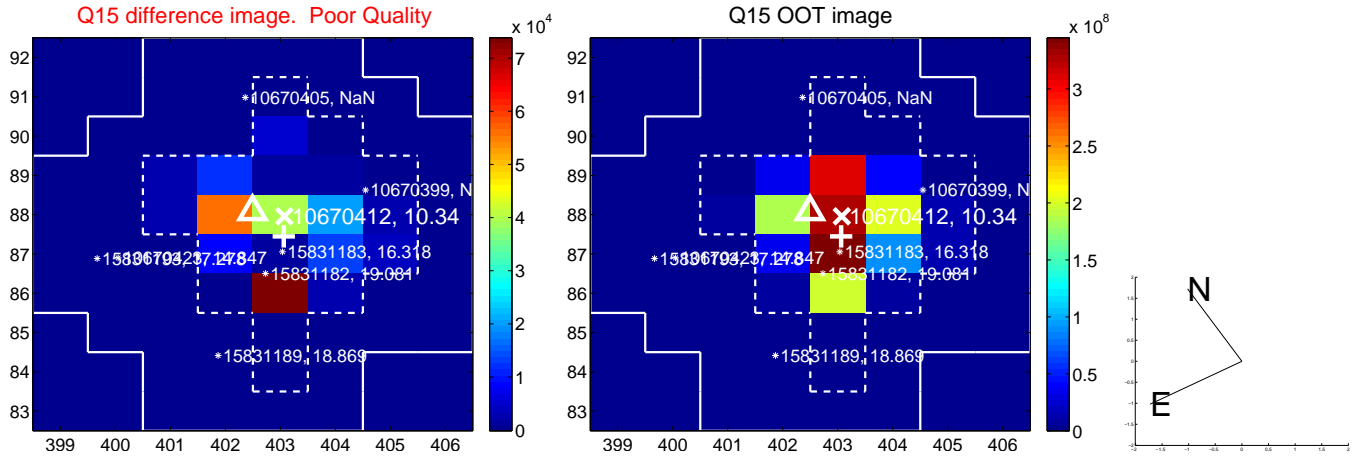
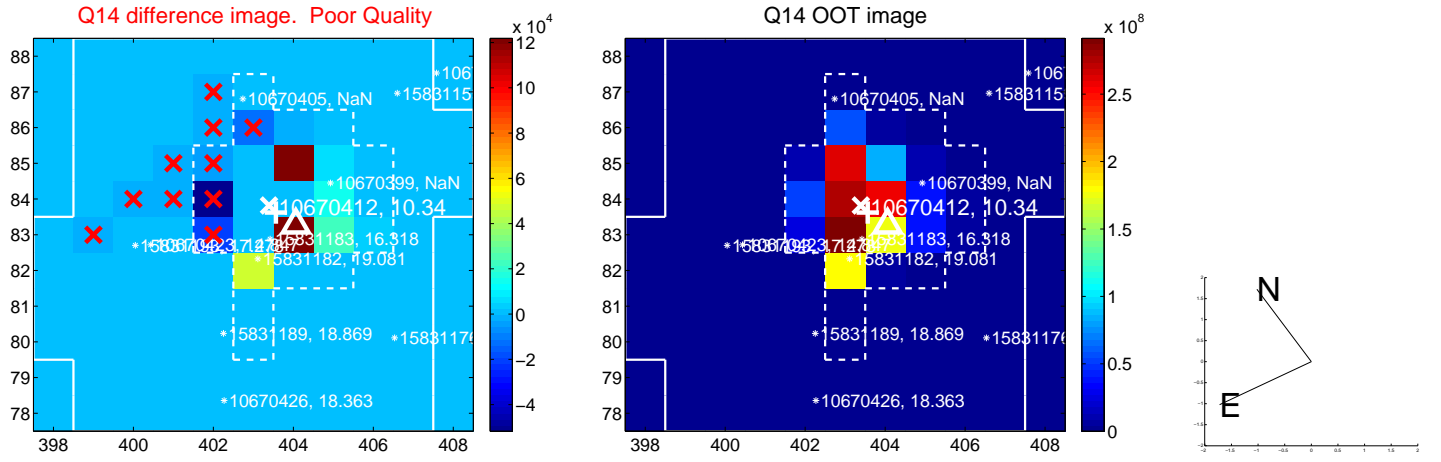
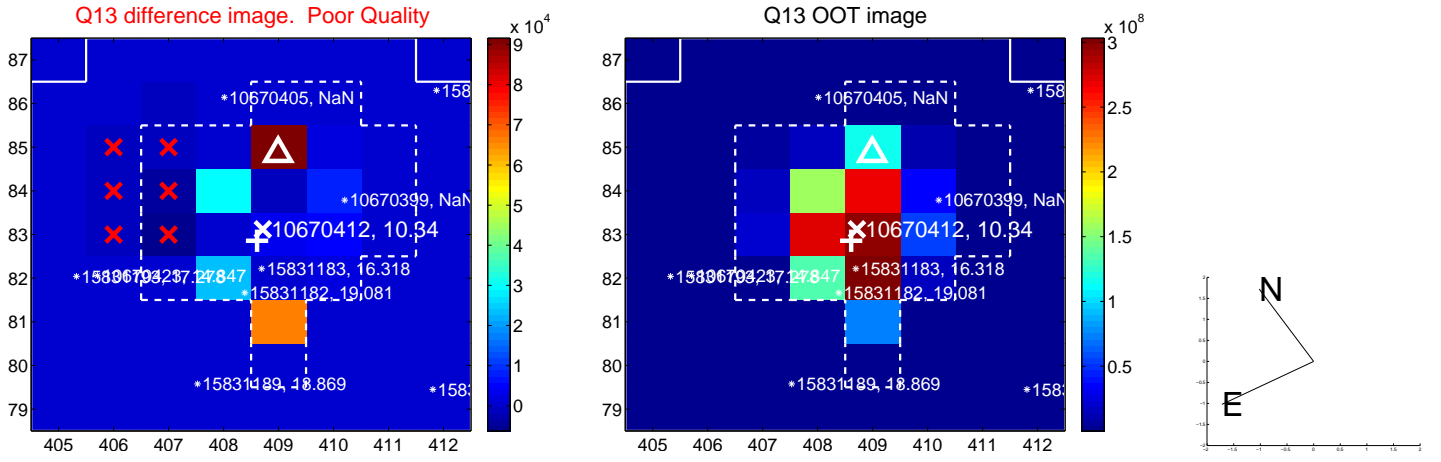




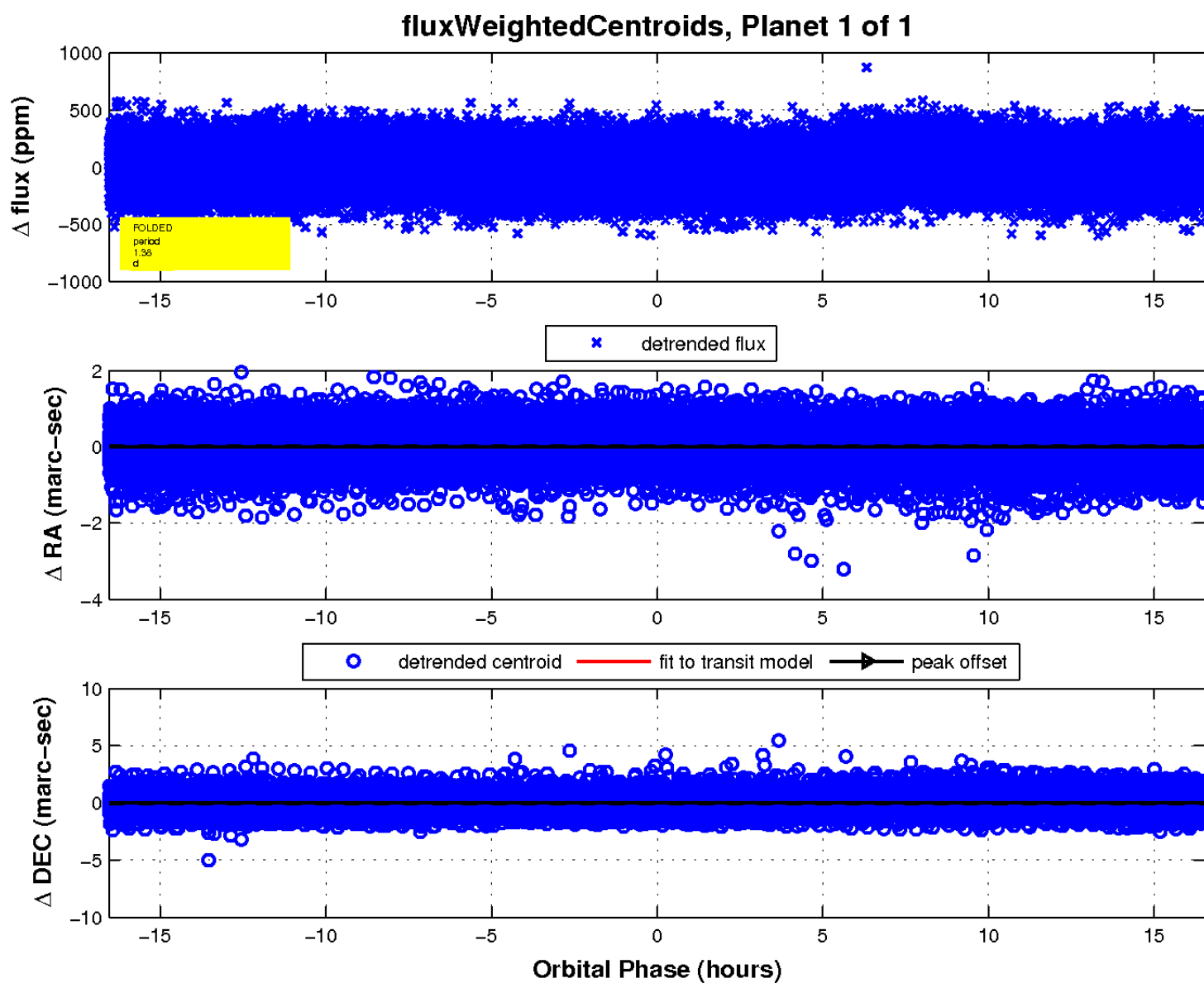
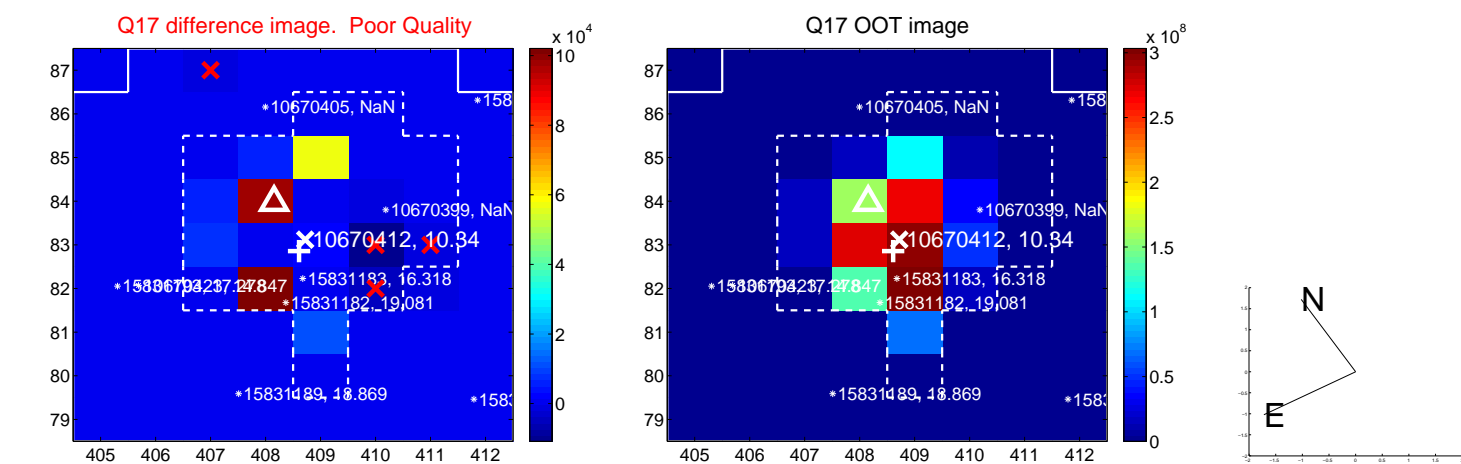
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

