

# KIC 012012872

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012012872-01	OBS	8233.01	14.395115	141.000404	98.2	4.827	7.2	7.8	0.78	5715	0.92	48.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012012872-01	OBS	FP	0.01	0	0	1	0	CENT_RESOLVED_OFFSET

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

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

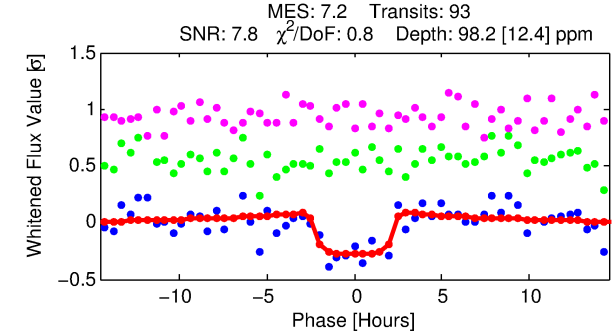
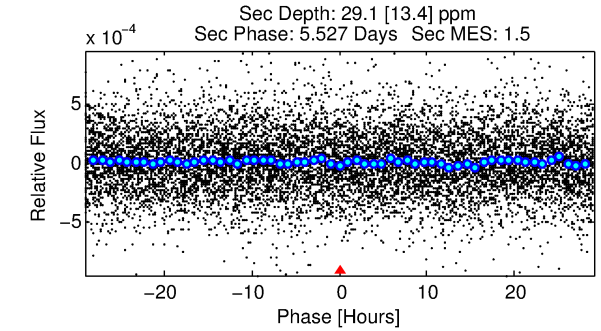
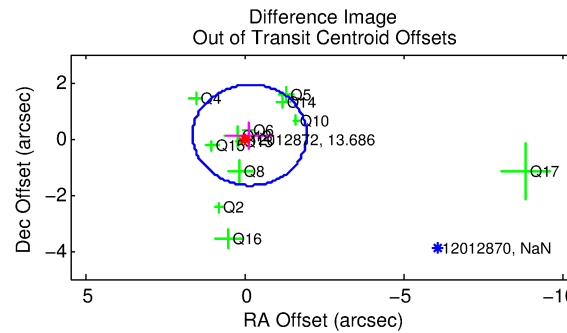
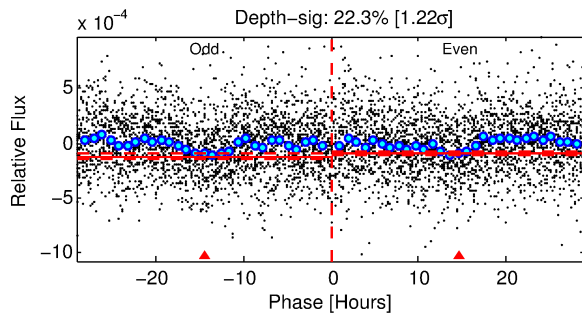
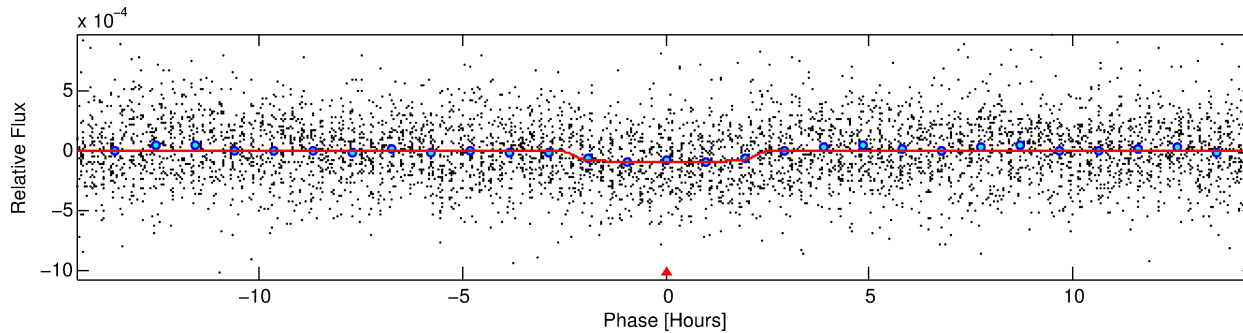
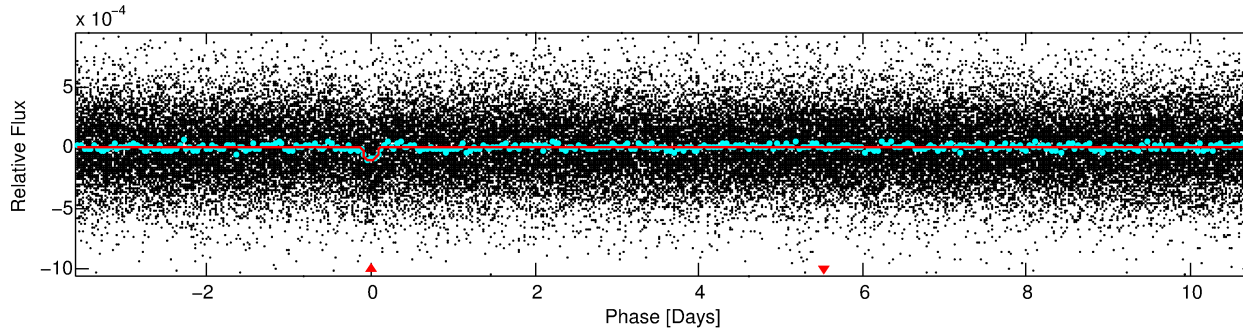
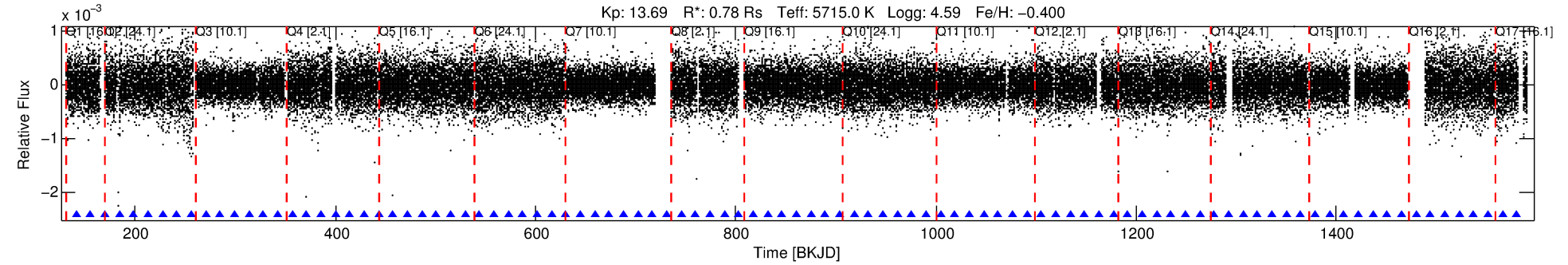
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012012872-01

No Significant Match Found

# DV One-Page Summary

KIC: 12012872 Candidate: 1 of 1 Period: 14.395 d



## DV Fit Results:

Period = 14.39511 [0.00018] d  
Epoch = 141.0004 [0.0099] BKJD  
Rp/R\* = 0.0108 [0.0046]  
a/R\* = 10.24 [21.41]  
b = 0.91 [0.42]  
Seff = 48.17 [15.67]  
Teq = 672 [55] K  
Rp = 0.92 [0.45] Re  
a = 0.1101 [0.0232] AU  
Ag = 227.79 [230.64] [0.98 $\sigma$ ]  
Teffp = 4035 [979] K [3.43 $\sigma$ ]

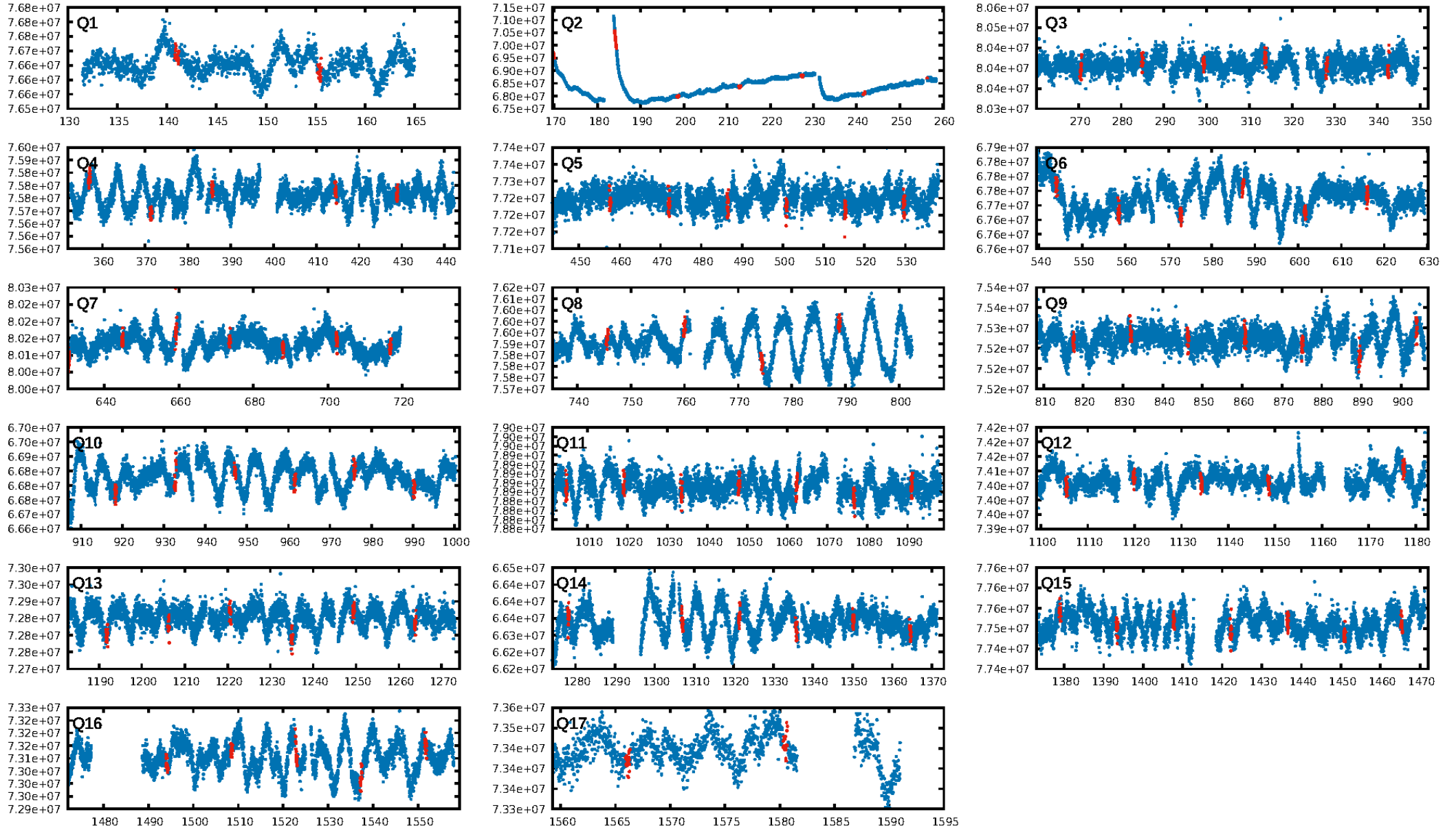
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 96.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.93e-13  
RollingBand-fgt: 1.00 [89/89]  
GhostDiagnostic-chr: 1.181  
Centroid-sig: 0.0%  
Centroid-so: 1.480 arcsec [2.09 $\sigma$ ]  
OotOffset-rm: 0.189 arcsec [0.32 $\sigma$ ]  
KicOffset-rm: 7.188 arcsec [9.87 $\sigma$ ]  
OotOffset-st: 4/1/4/3 [12]  
KicOffset-st: 4/1/4/4 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 1.00 [17/17]

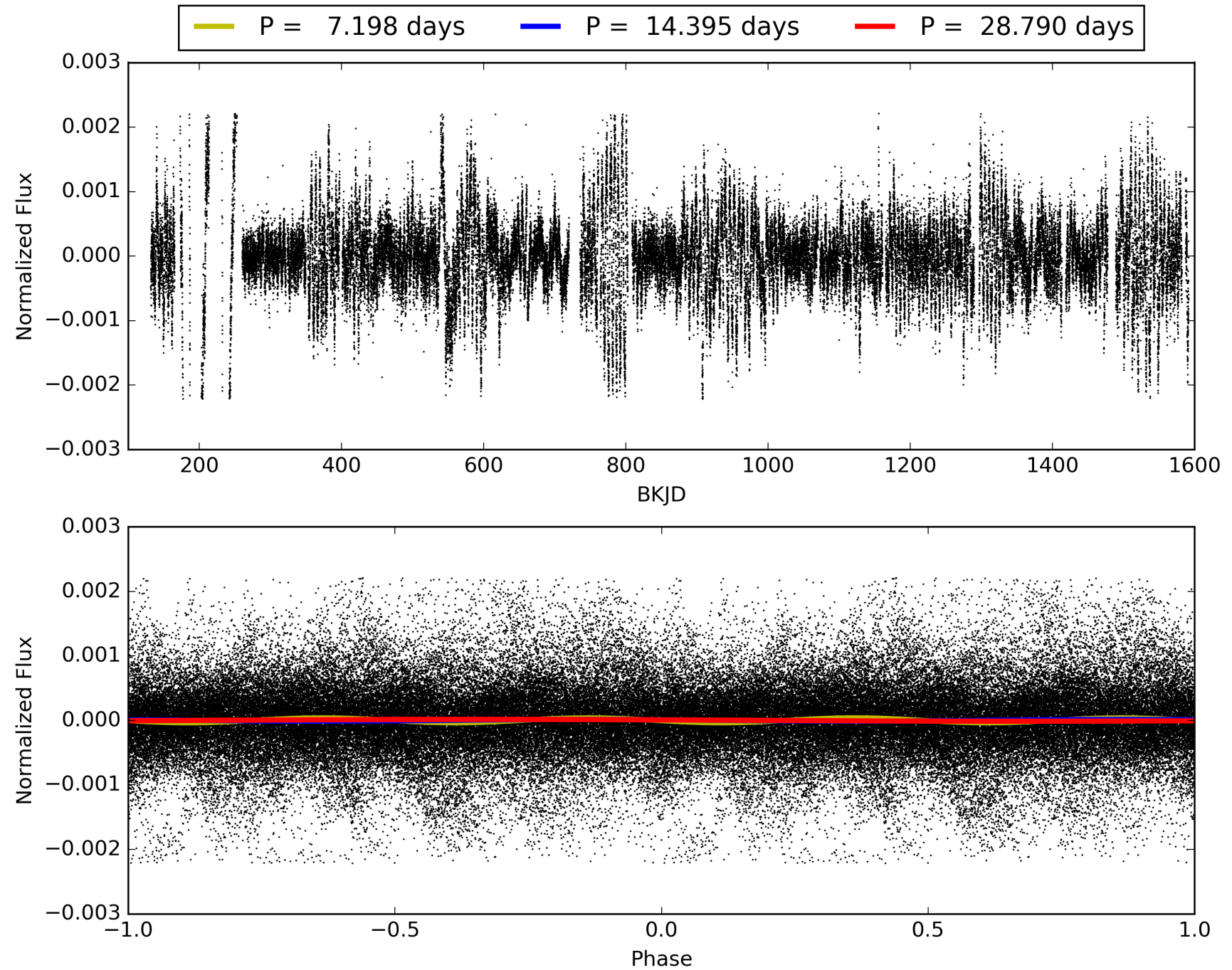
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:29:06 Z

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

# TCE 012012872-01, PDC Light Curves

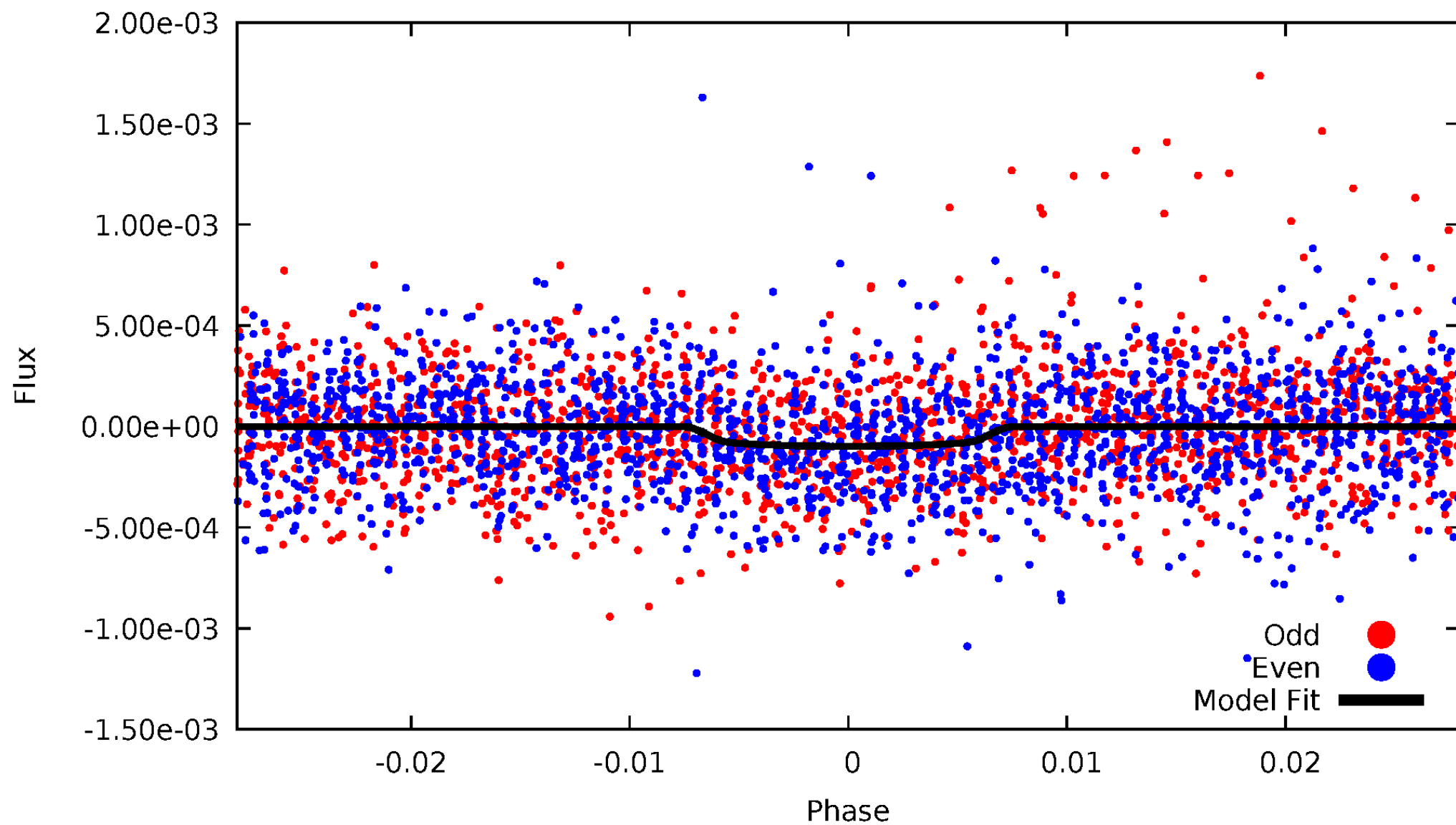


# TCE 012012872-01



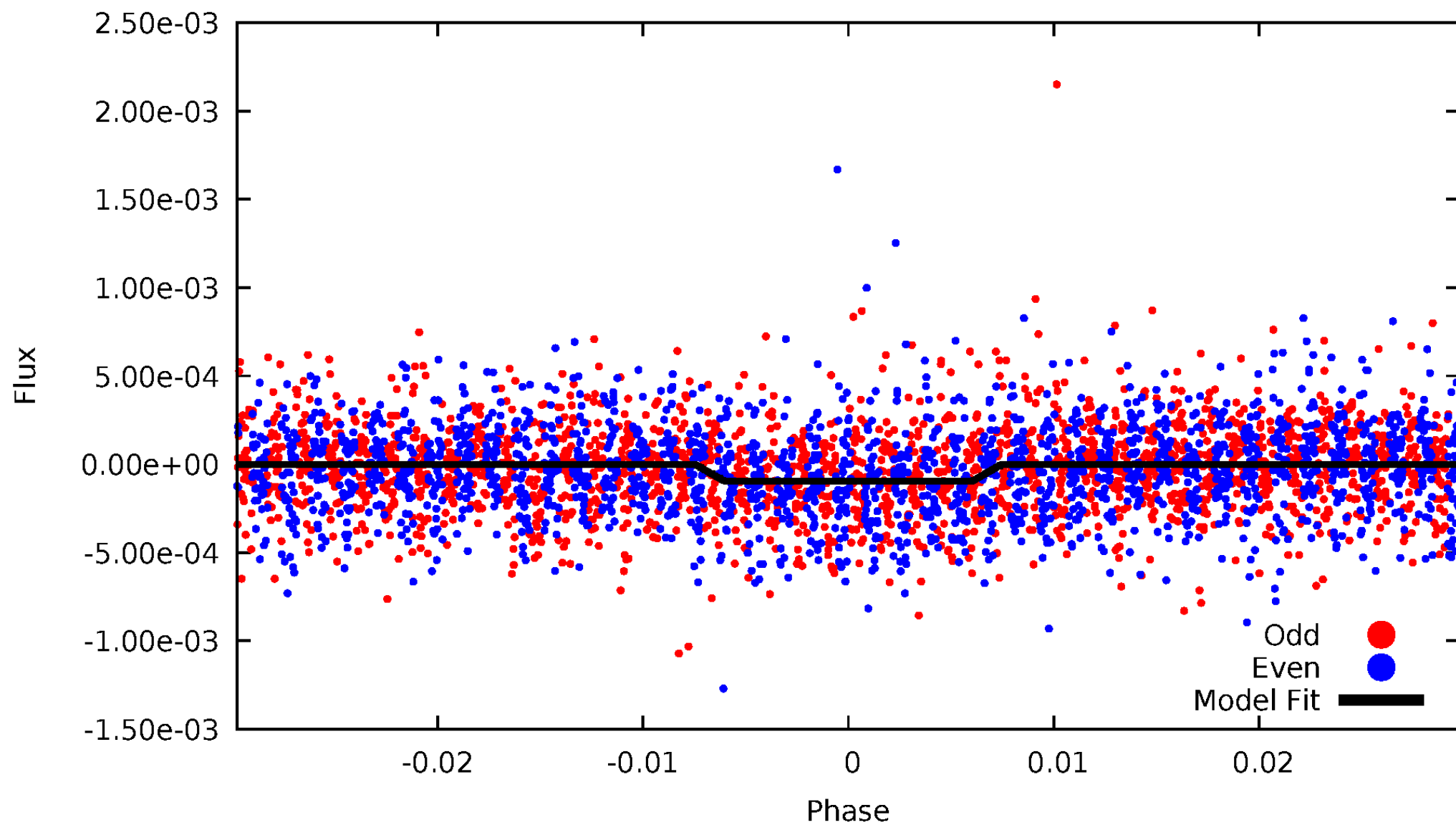
# DV Odd/Even

TCE 012012872-01



# ALT Odd/Even

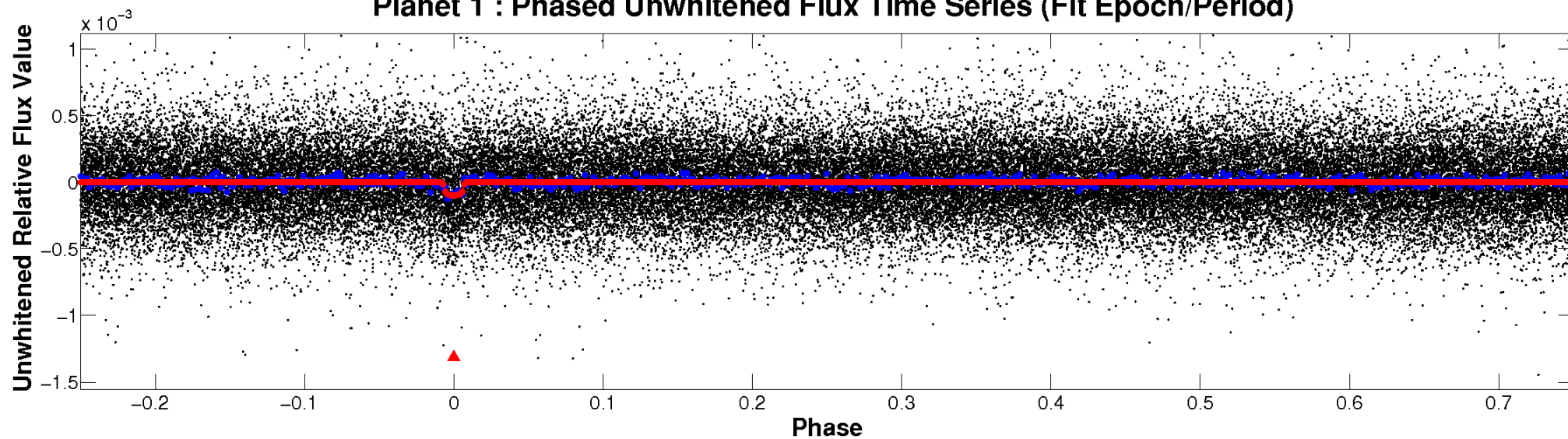
TCE 012012872-01



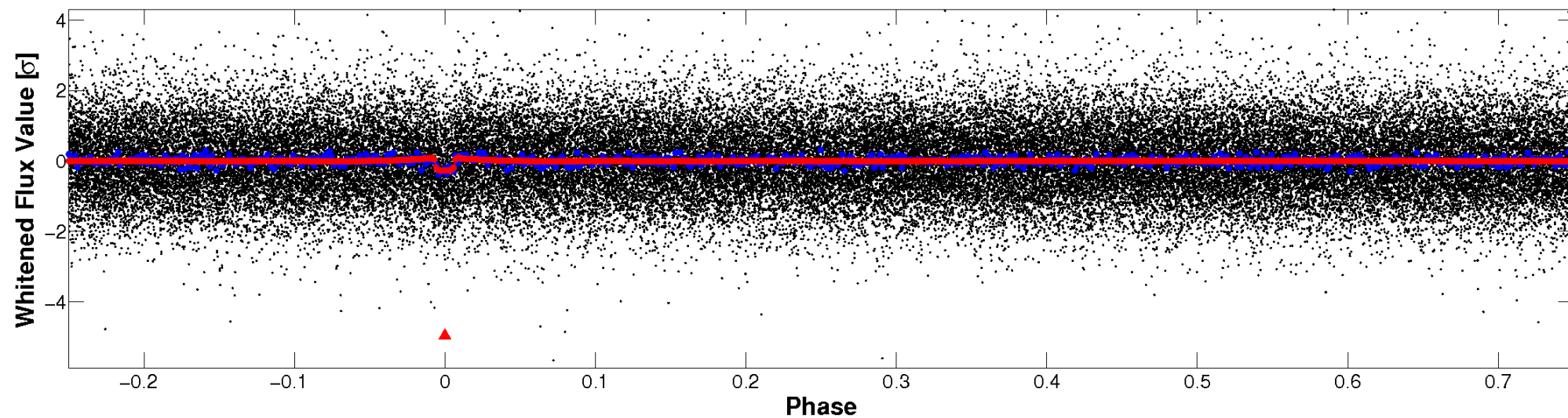


# Non-Whitened Vs. Whitened Light Curve

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

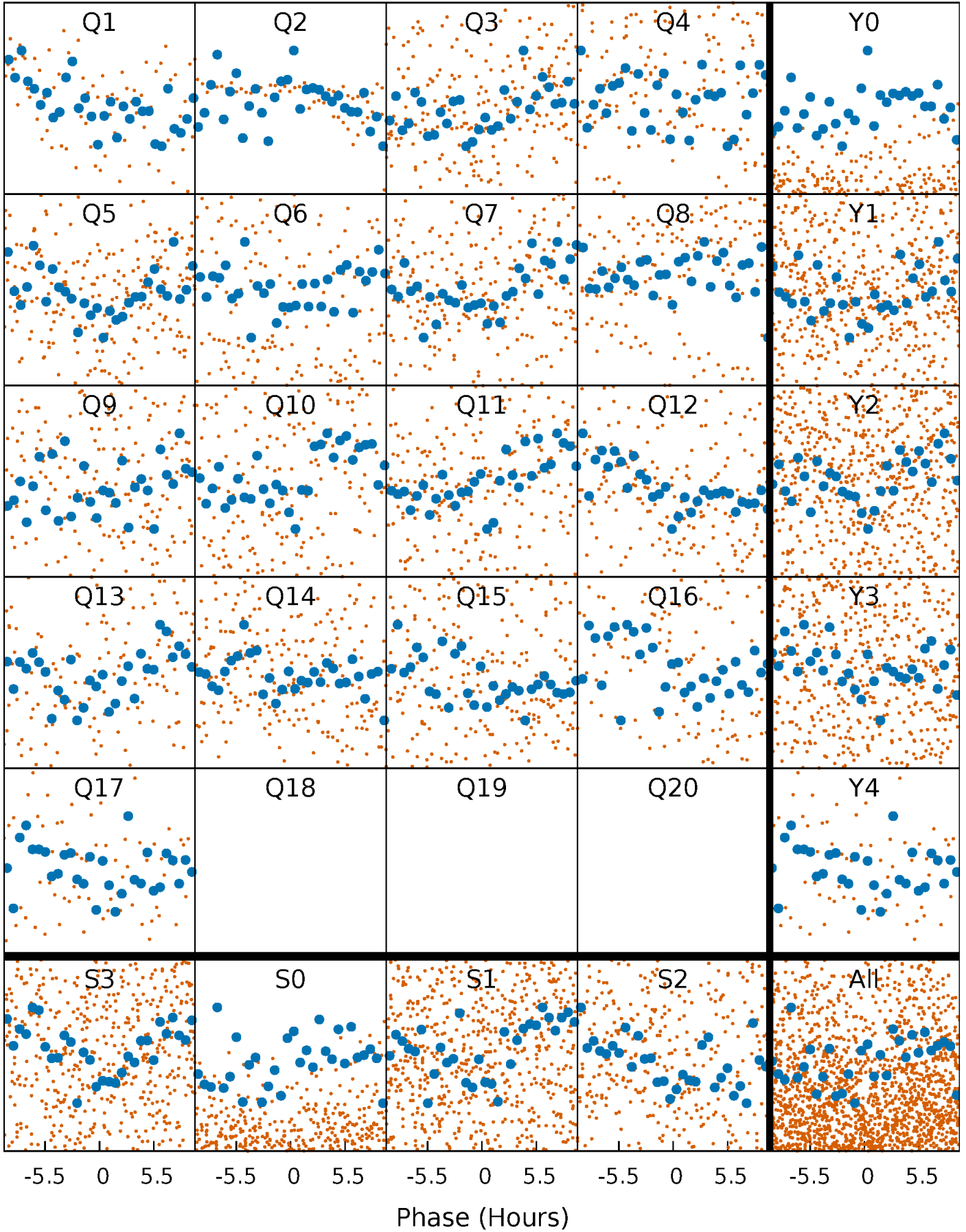


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

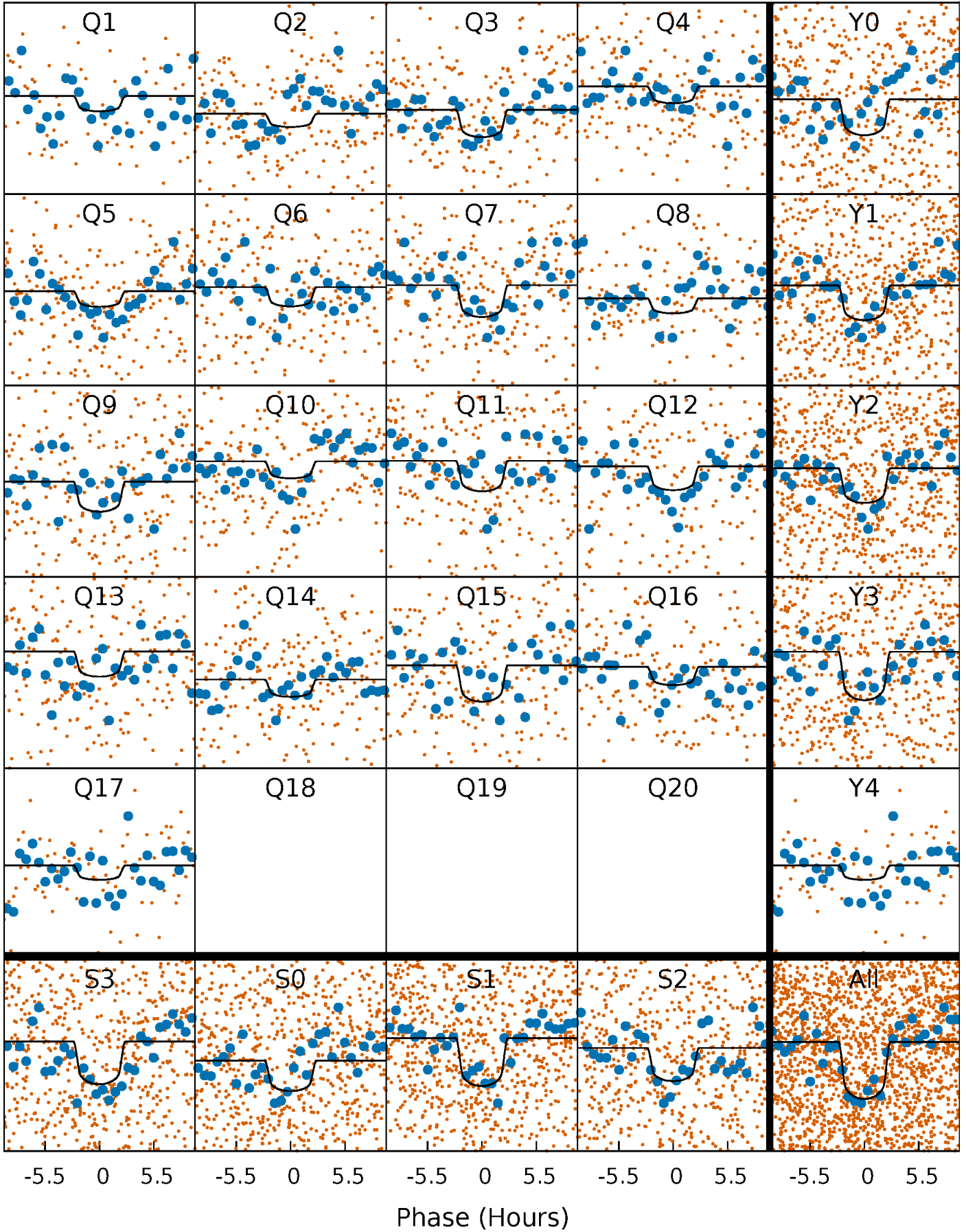
TCE 012012872-01 P= 14.395115 Days  $T_0=141.000404$  (BKJD)





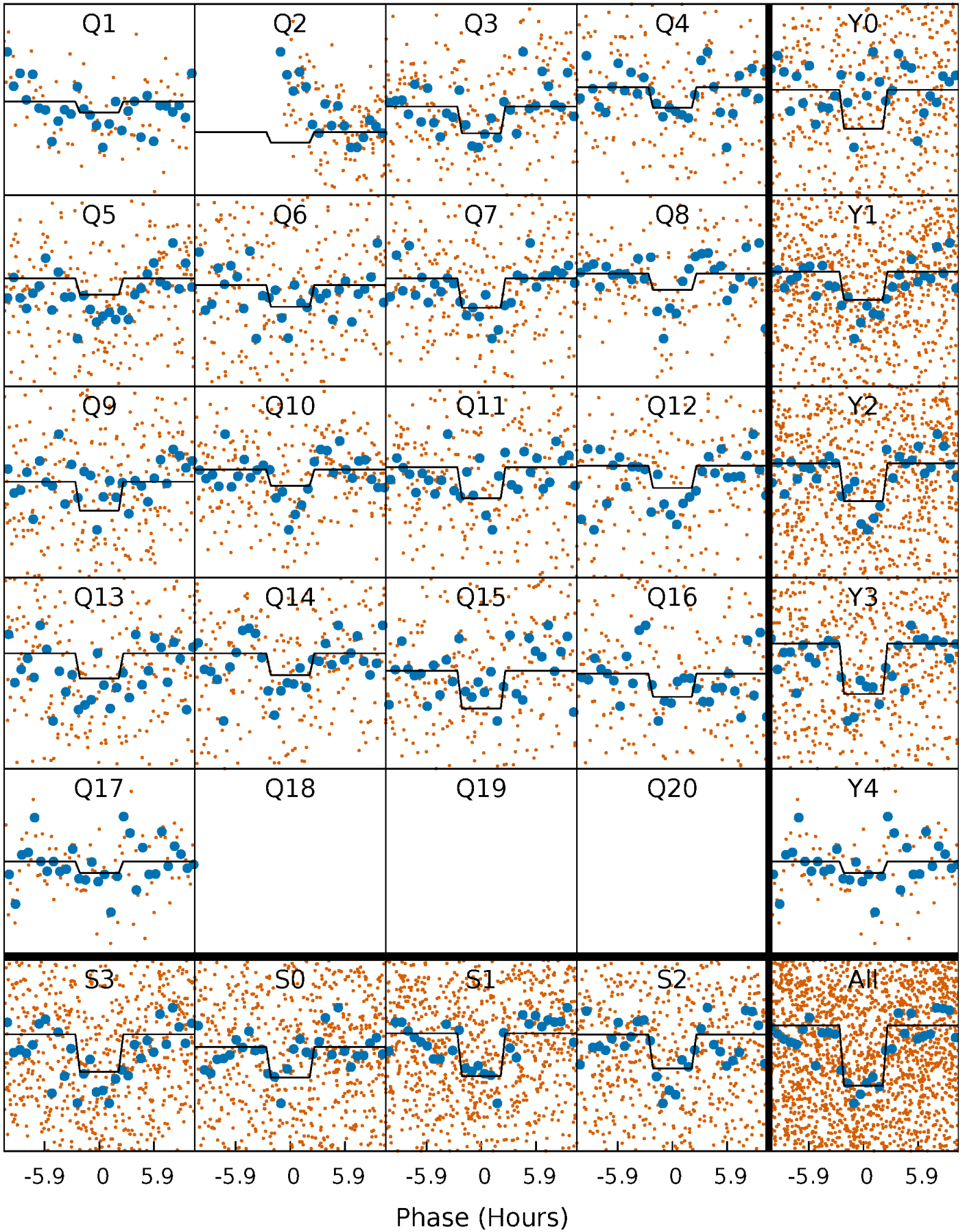
# DV Quarter-Phased Transit Curves

TCE 012012872-01 P= 14.395115 Days  $T_0=141.000404$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

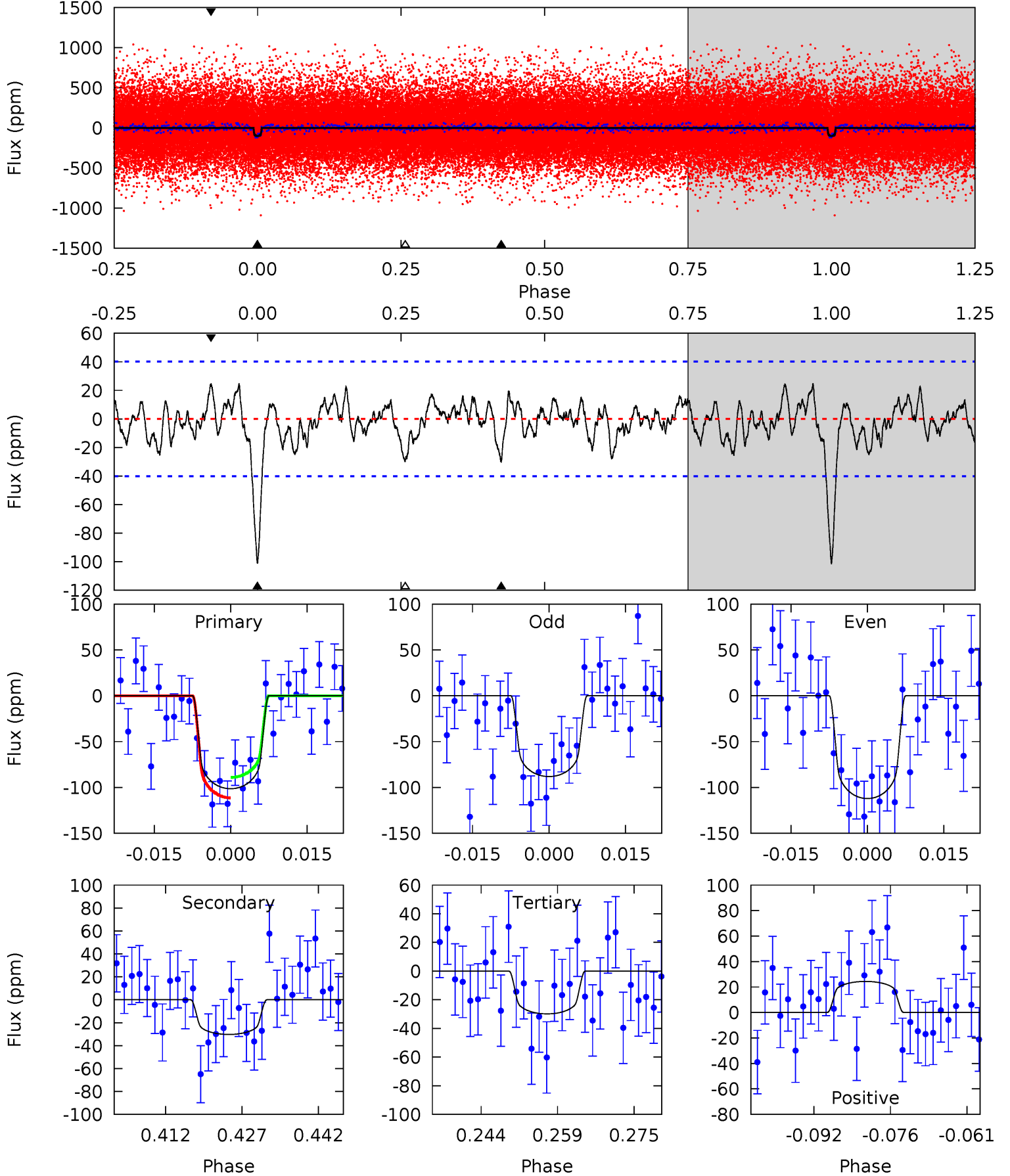
TCE 012012872-01 P= 14.395364 Days  $T_0=140.981706$  (BKJD)



# DV Model-Shift Uniqueness Test

012012872-01, P = 14.395115 Days, E = 126.605289 Days

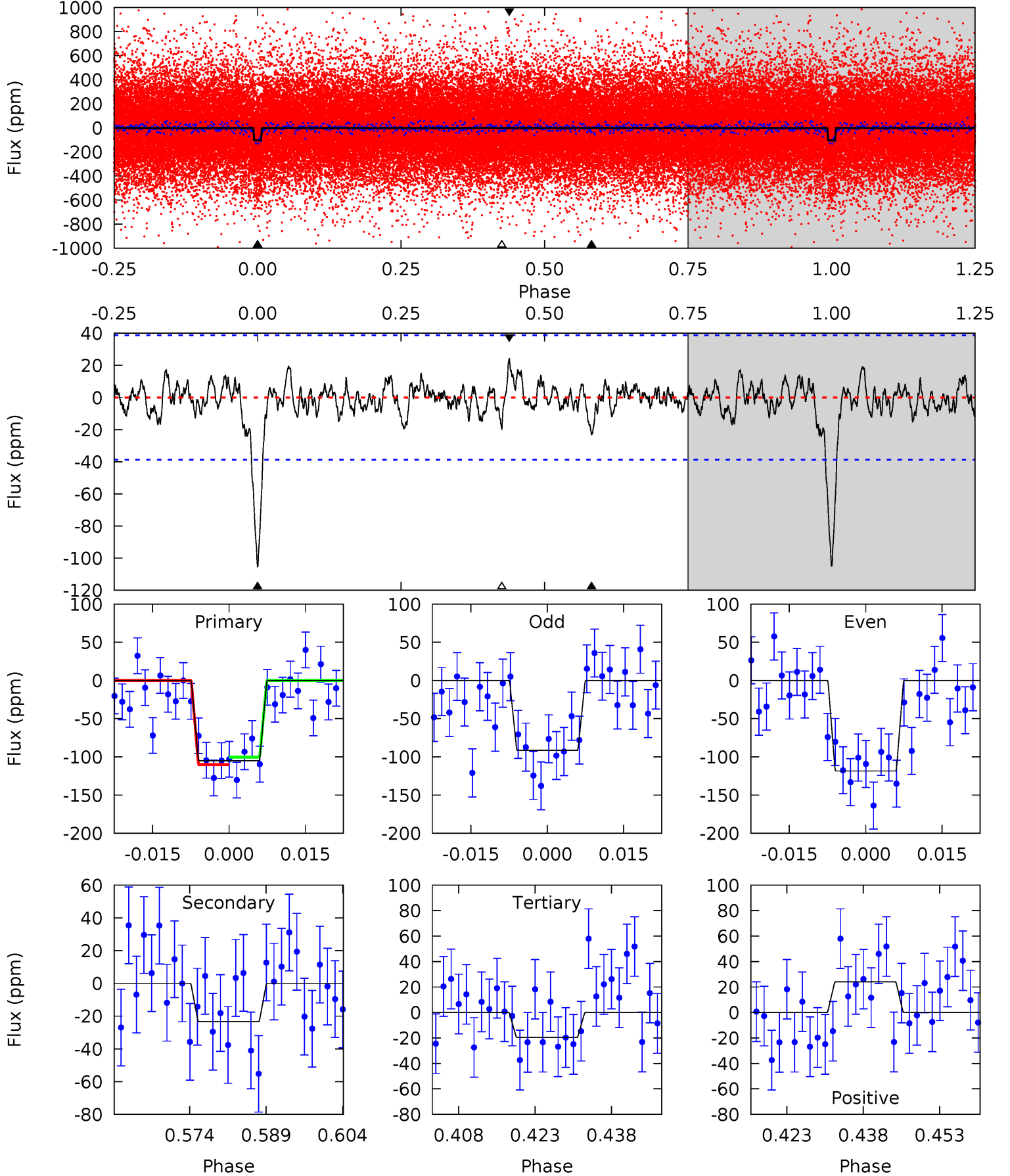
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	3.73	3.68	3.00	4.94	2.43	1.24	8.81	9.48	0.05	0.73	1.48	0.91	0.20	1.38



# Alt Model-Shift Uniqueness Test

012012872-01,  $P = 14.395364$  Days,  $E = 126.586342$  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	2.98	2.50	3.07	4.95	2.43	0.94	10.9	10.4	0.48	-0.09	1.72	0.86	0.19	0.62



### Stellar Parameters For KIC 012012872

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5715^{+154}_{-154}$	$4.586^{+0.042}_{-0.168}$	$-0.400^{+0.300}_{-0.300}$	$0.782^{+0.195}_{-0.065}$	$0.872^{+0.088}_{-0.098}$	$2.571^{+0.416}_{-1.153}$
	+3%/-3%	+1%/-4%	+75%/-75%	+25%/-8%	+10%/-11%	+16%/-45%
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 012012872-01 / KOI 8233.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-30 \pm 8$	$1.00^{+0.41}_{-0.41}$	$958^{+56}_{-40}$	$4238^{+1056}_{-503}$	$197^{+396}_{-103}$
Alt.	$-23 \pm 8$	$0.90^{+0.44}_{-0.42}$	$955^{+62}_{-39}$	$4209^{+1271}_{-584}$	$194^{+512}_{-113}$

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



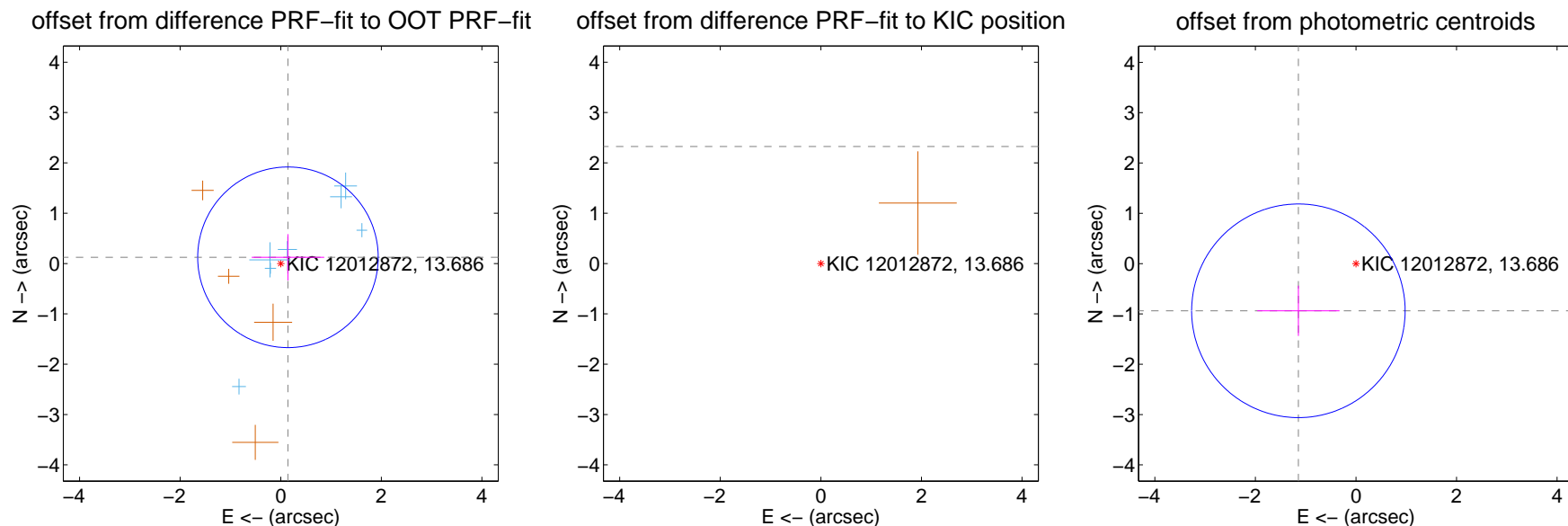
## DV Centroid Data

Supplemental centroid analysis for 012012872-01. Kepler magnitude: 13.69. Transit SNR 7.81

There are 8 quarters with good PRF difference image offsets

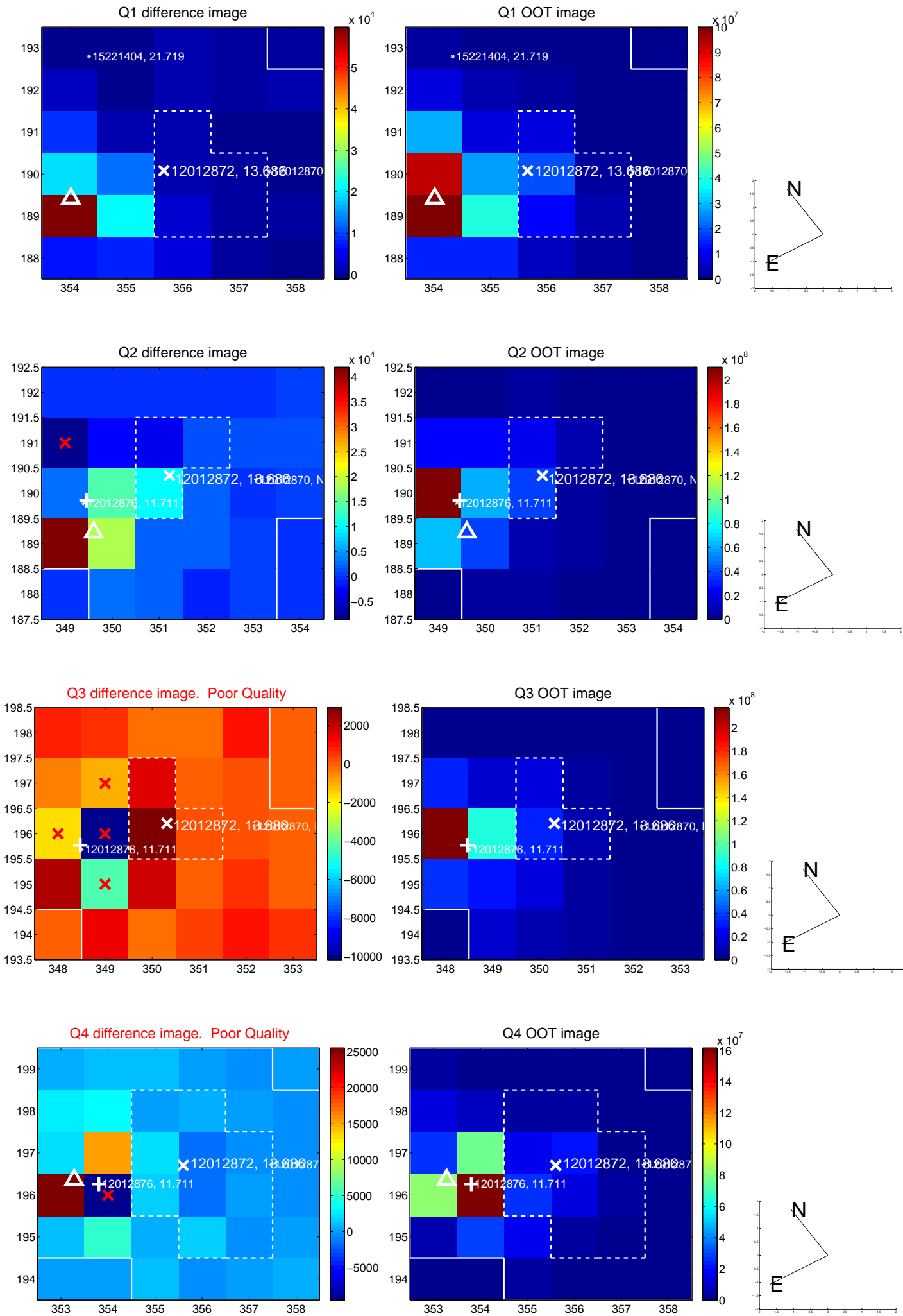
The OOT PRF centroid is offset from the target star catalog position by about 7.30 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.189 \pm 0.598$	0.32	$-0.143 \pm 0.722$	$0.124 \pm 0.461$
PRF-fit source offset from KIC position	<b><math>7.188 \pm 0.728</math></b>	<b>9.87</b>	$6.801 \pm 0.747$	$2.325 \pm 0.371$
photometric centroid source offset	$1.48 \pm 0.71$	2.09	$1.14 \pm 0.82$	$-0.94 \pm 0.50$

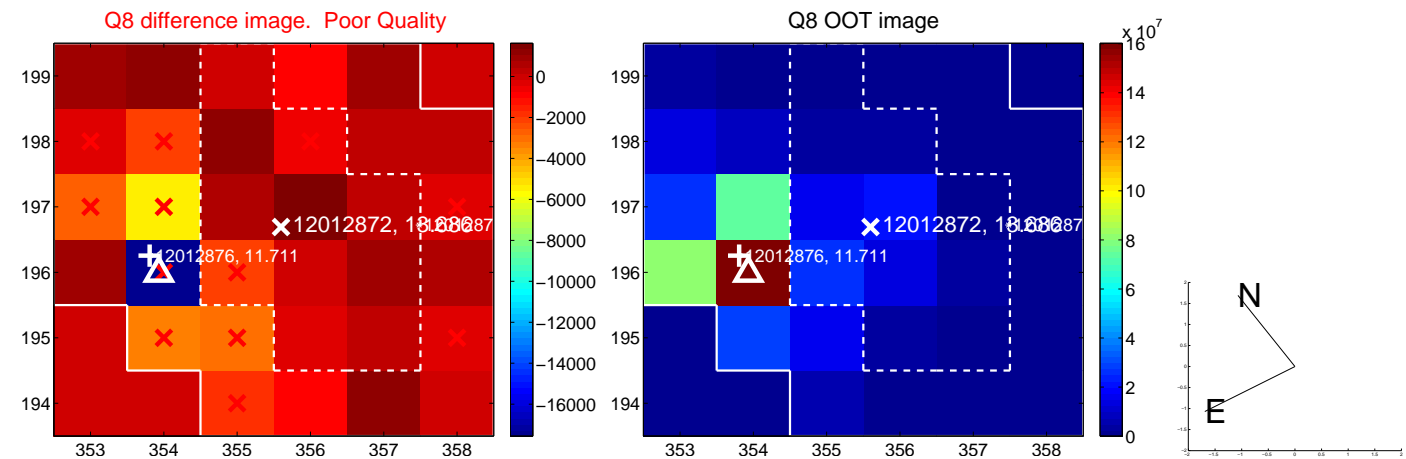
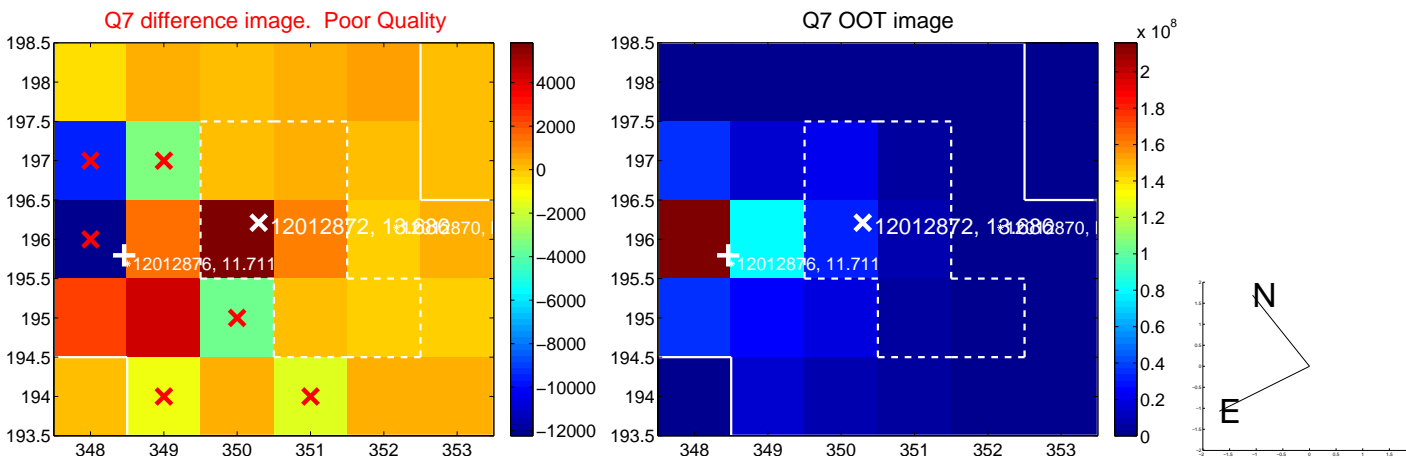
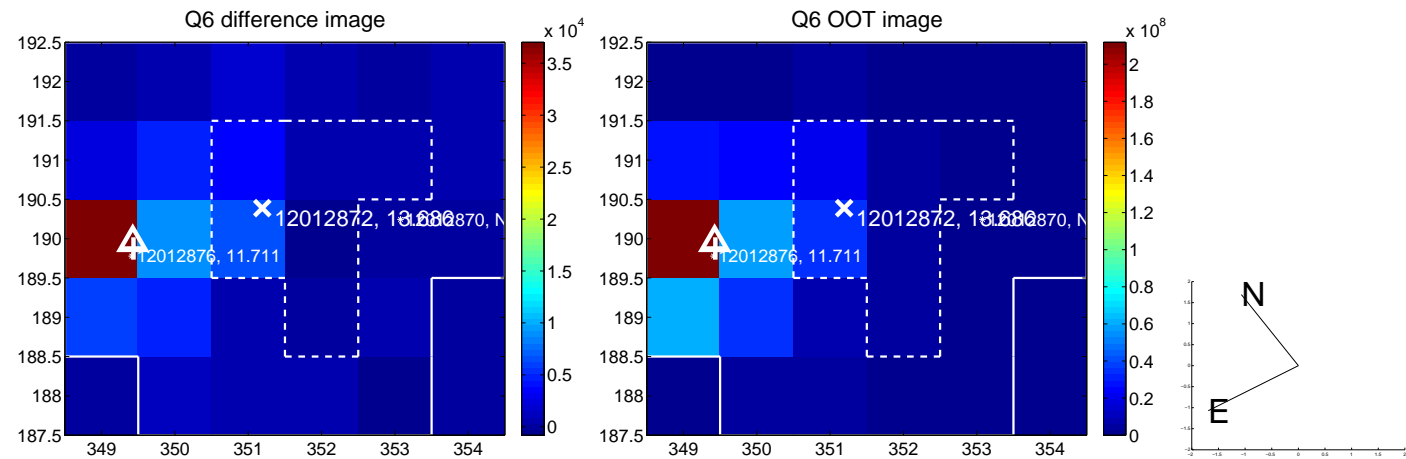
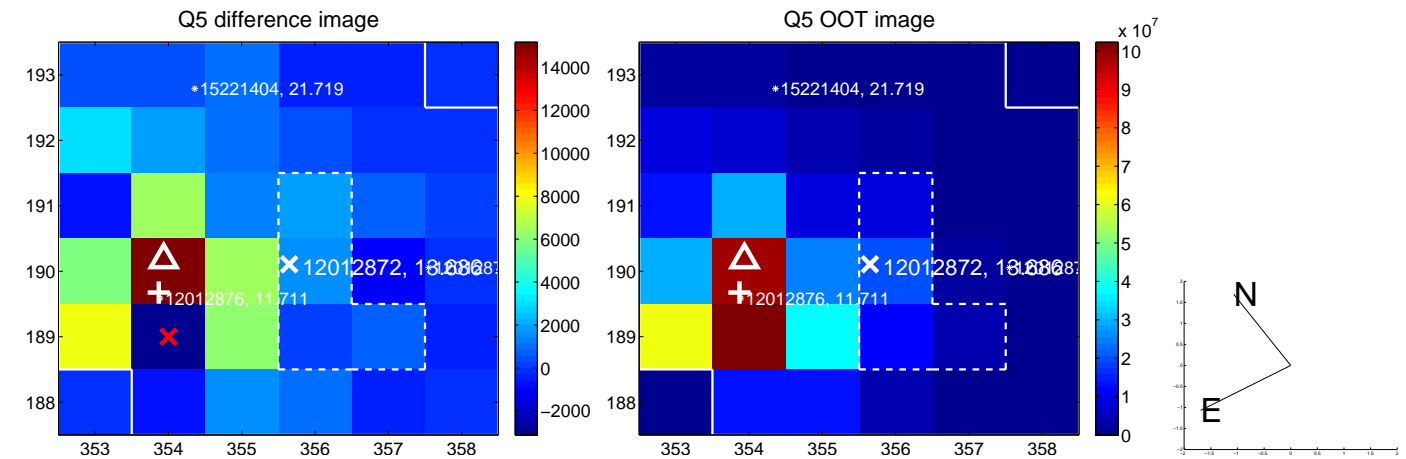


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

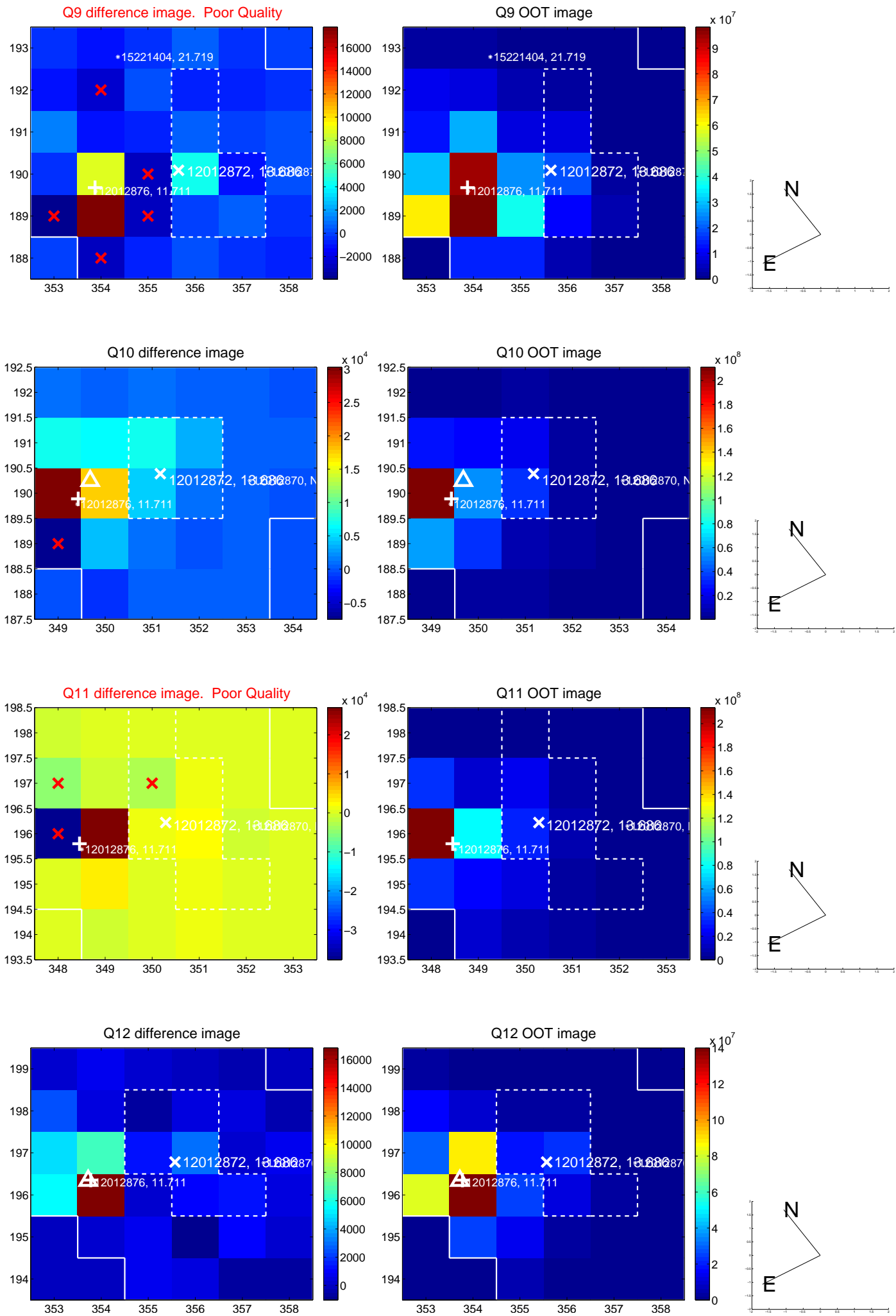
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



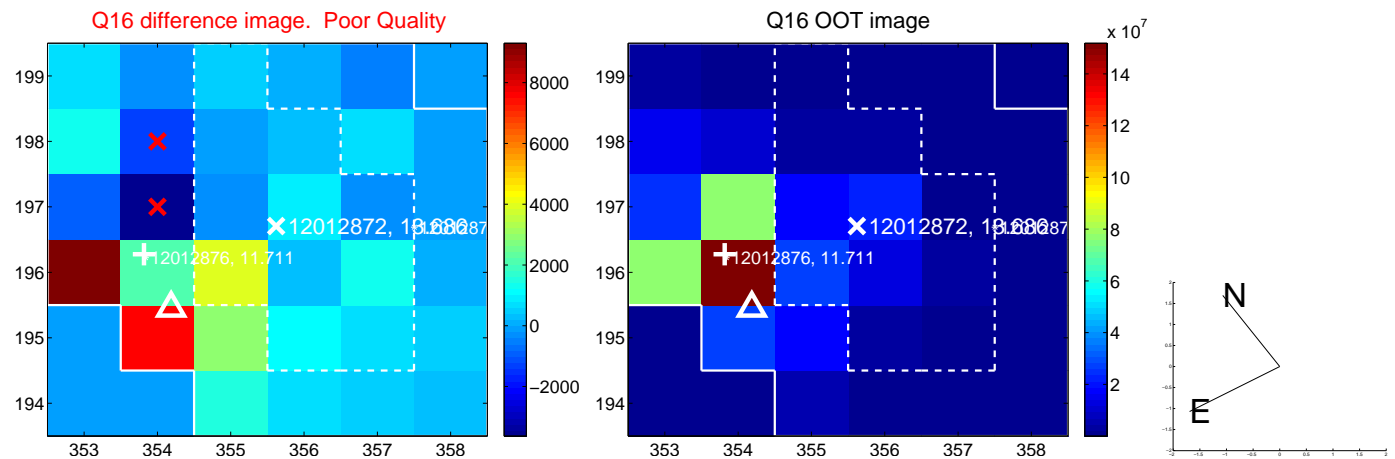
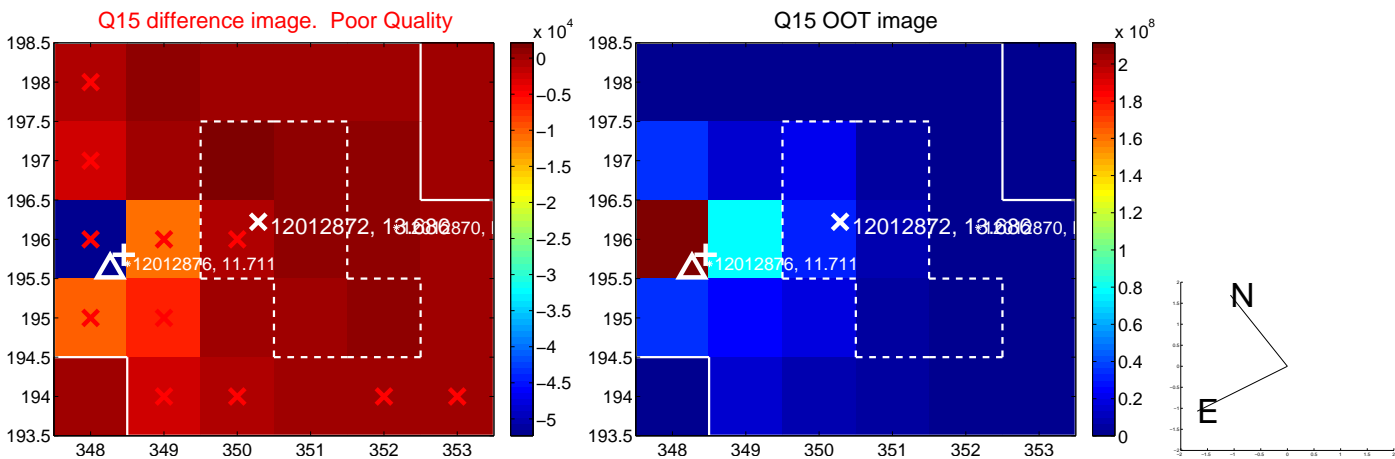
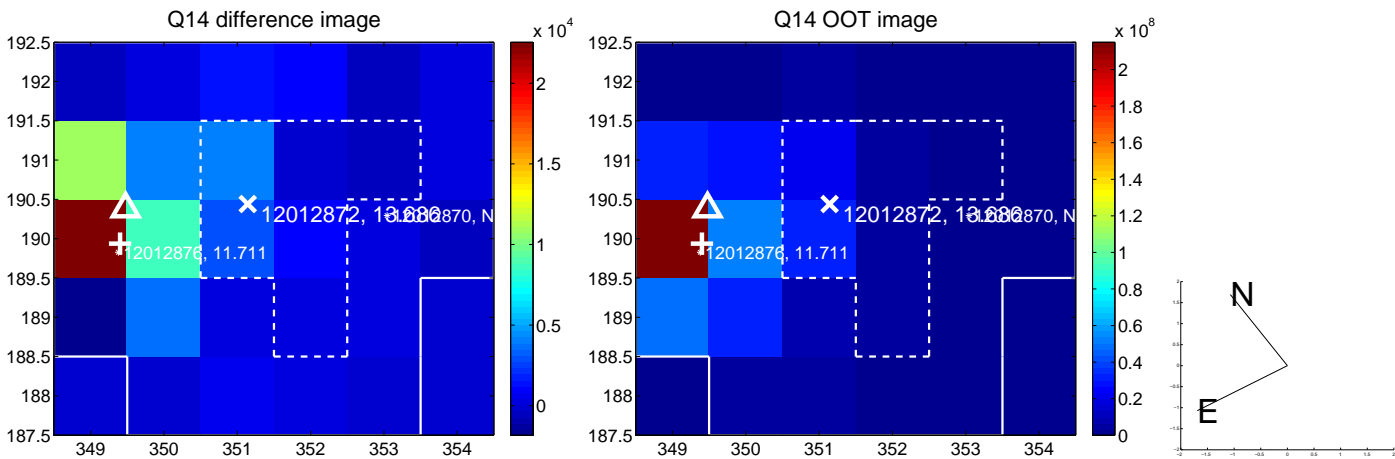
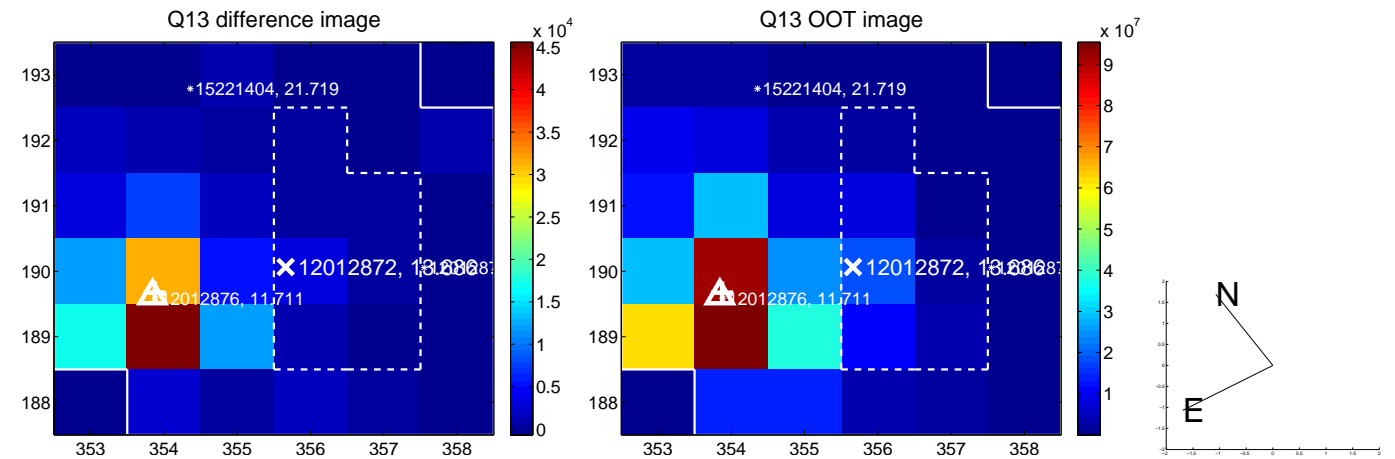
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

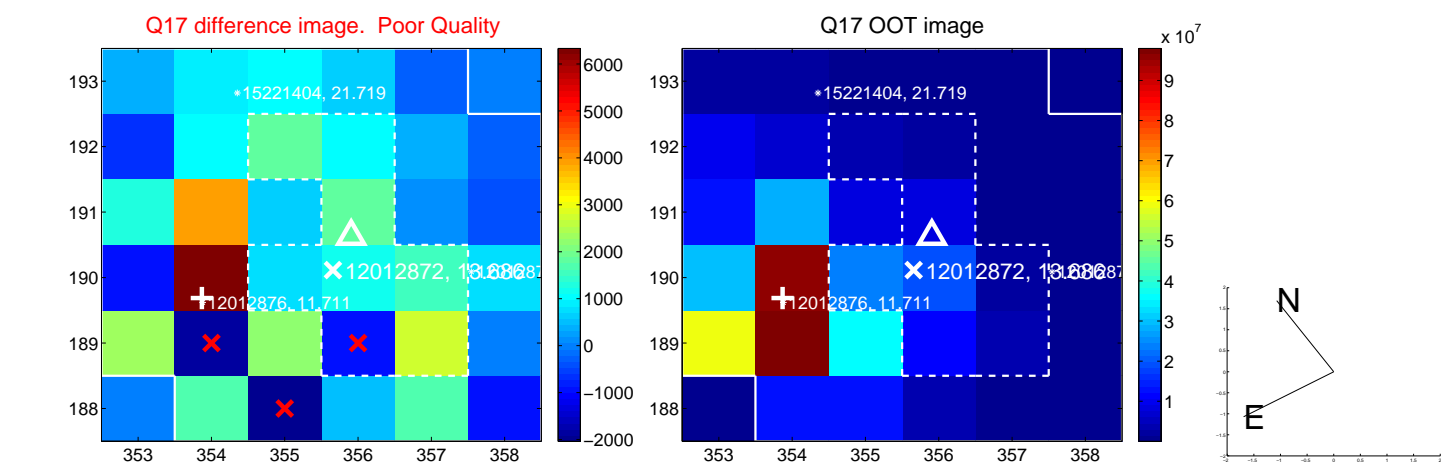


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

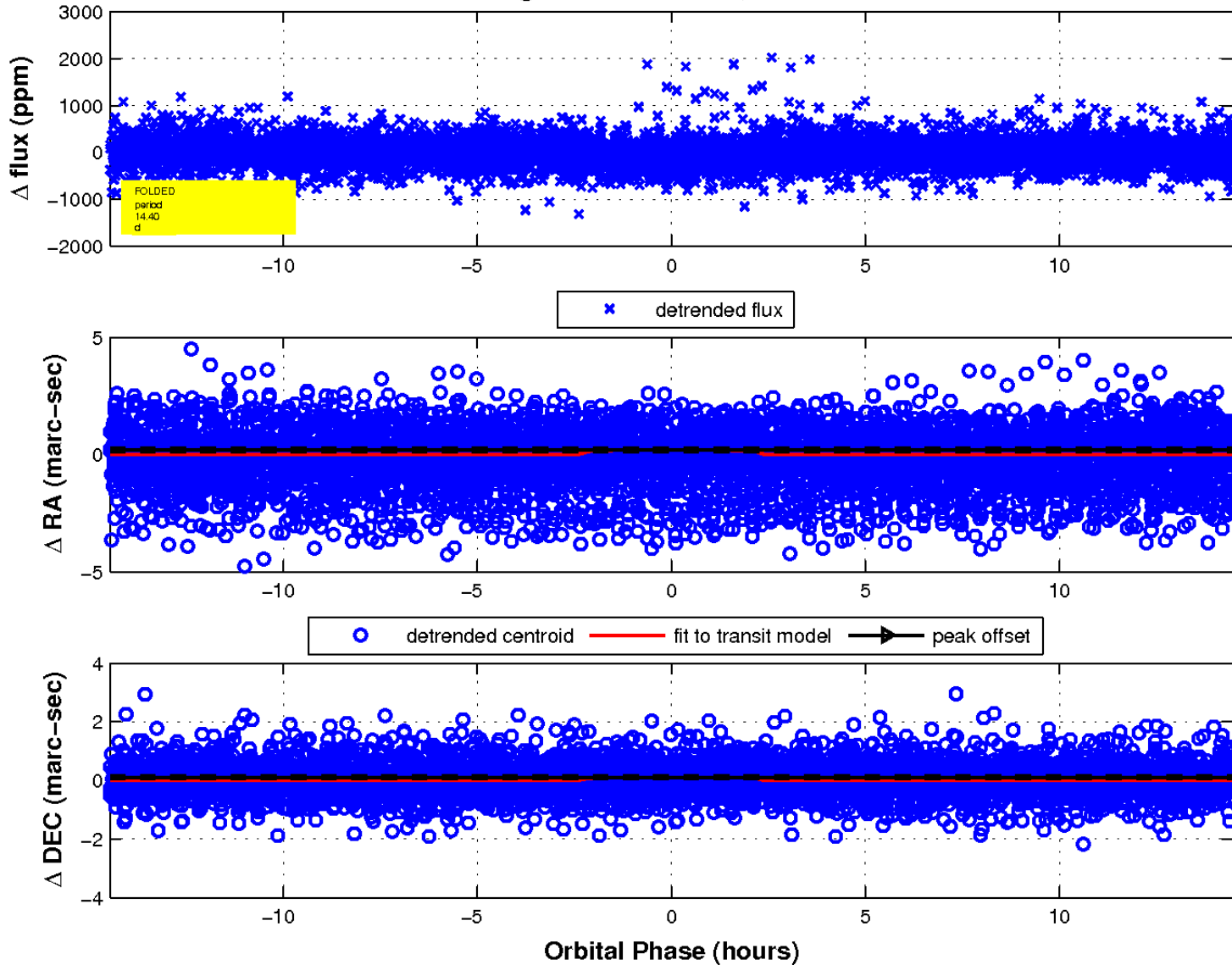




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

