

# KIC 004172013

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004172013-01	OBS	2386.01	16.270850	145.090040	496.6	5.412	14.7	17.6	1.24	6117	5.43	110.93

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004172013-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

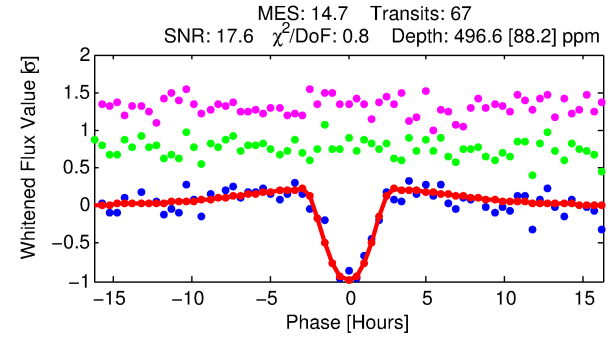
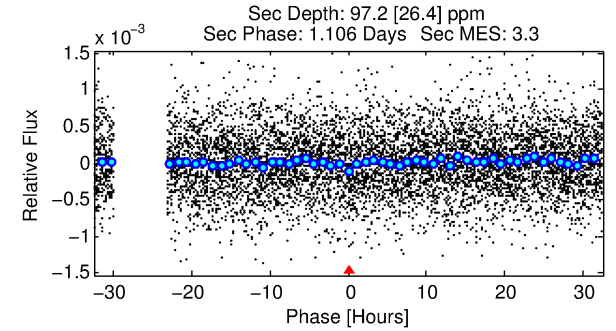
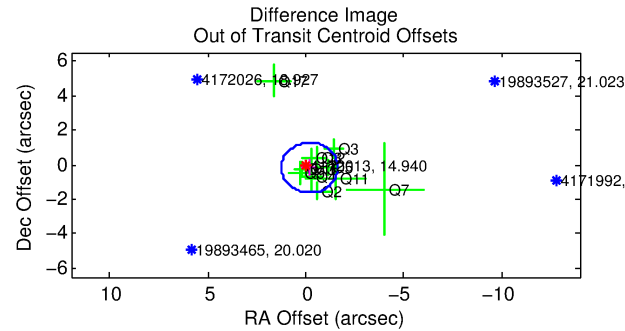
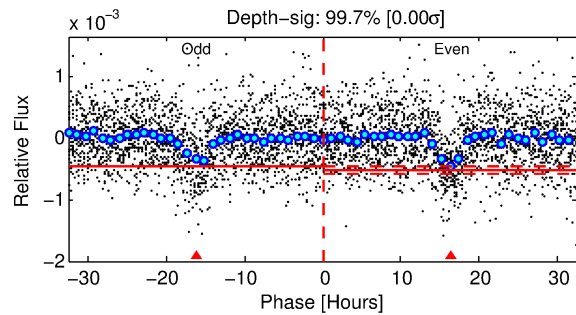
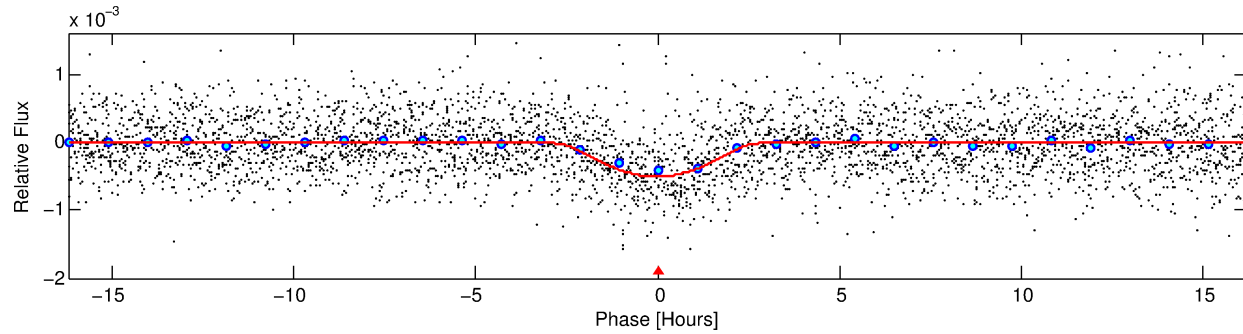
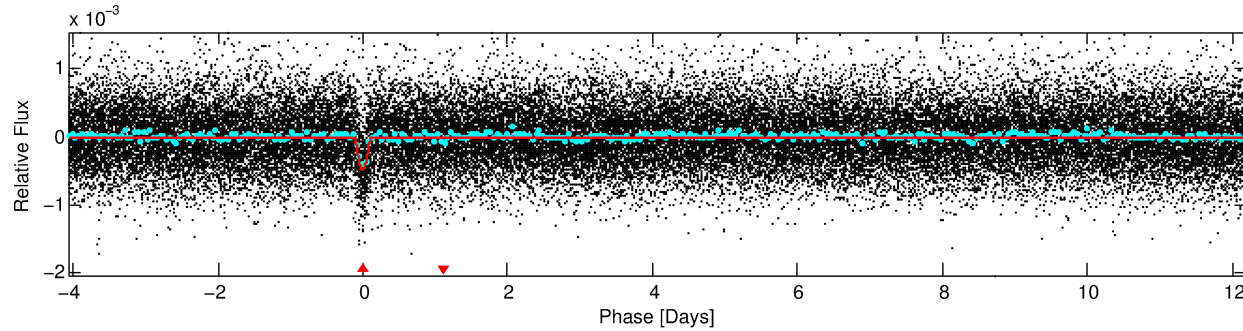
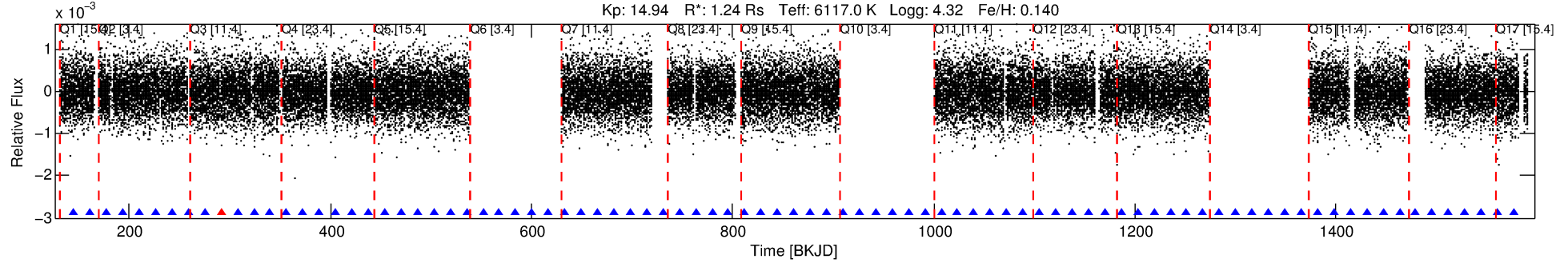
## Ephemeris Match Information For 004172013-01

No Significant Match Found

# DV One-Page Summary

KIC: 4172013 Candidate: 1 of 1 Period: 16.271 d  
KOI: K02386.01 Corr: 0.990

Kp: 14.94 R\*: 1.24 Rs Teff: 6117.0 K Logg: 4.32 Fe/H: 0.140



## DV Fit Results:

Period = 16.27085 [0.00012] d  
Epoch = 145.0900 [0.0057] BKJD  
Rp/R\* = 0.0400 [0.0741]  
a/R\* = 6.67 [3.06]  
b = 1.00 [0.11]  
Seff = 110.93 [25.43]  
Teq = 828 [47] K  
Rp = 5.43 [10.09] Re  
a = 0.1323 [0.0194] AU  
Ag = 31.74 [118.04] [0.26σ]  
Teffp = 3037 [2819] K [0.78σ]

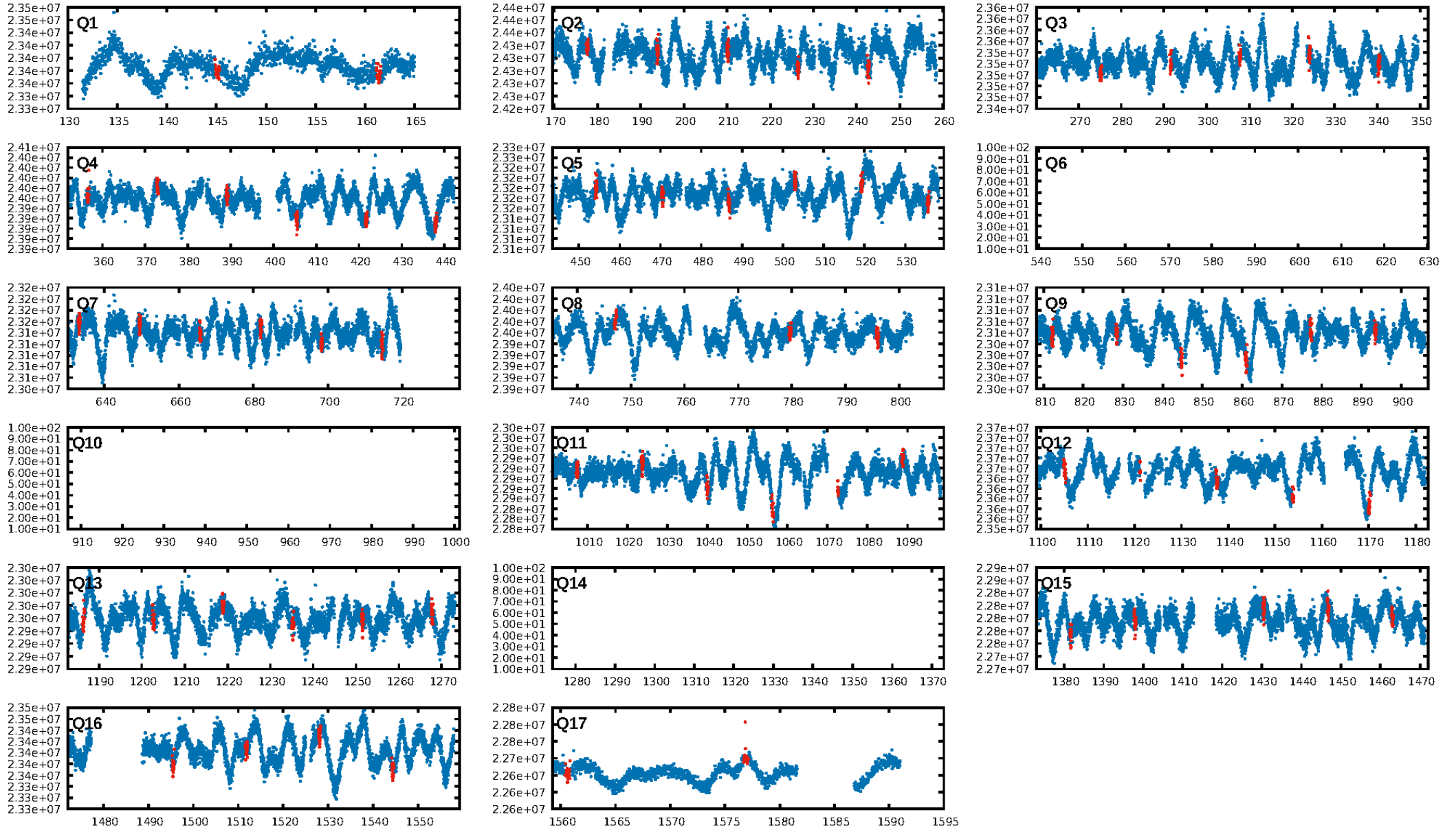
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.82e-49  
RollingBand-fgt: 0.98 [62/63]  
GhostDiagnostic-chr: 3.578  
Centroid-sig: 4.4%  
Centroid-so: 1.164 arcsec [1.71σ]  
OotOffset-rm: 0.248 arcsec [0.52σ]  
KicOffset-rm: 0.273 arcsec [0.55σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 0.77 [10/13]  
DiffImageOverlap-fno: 1.00 [14/14]

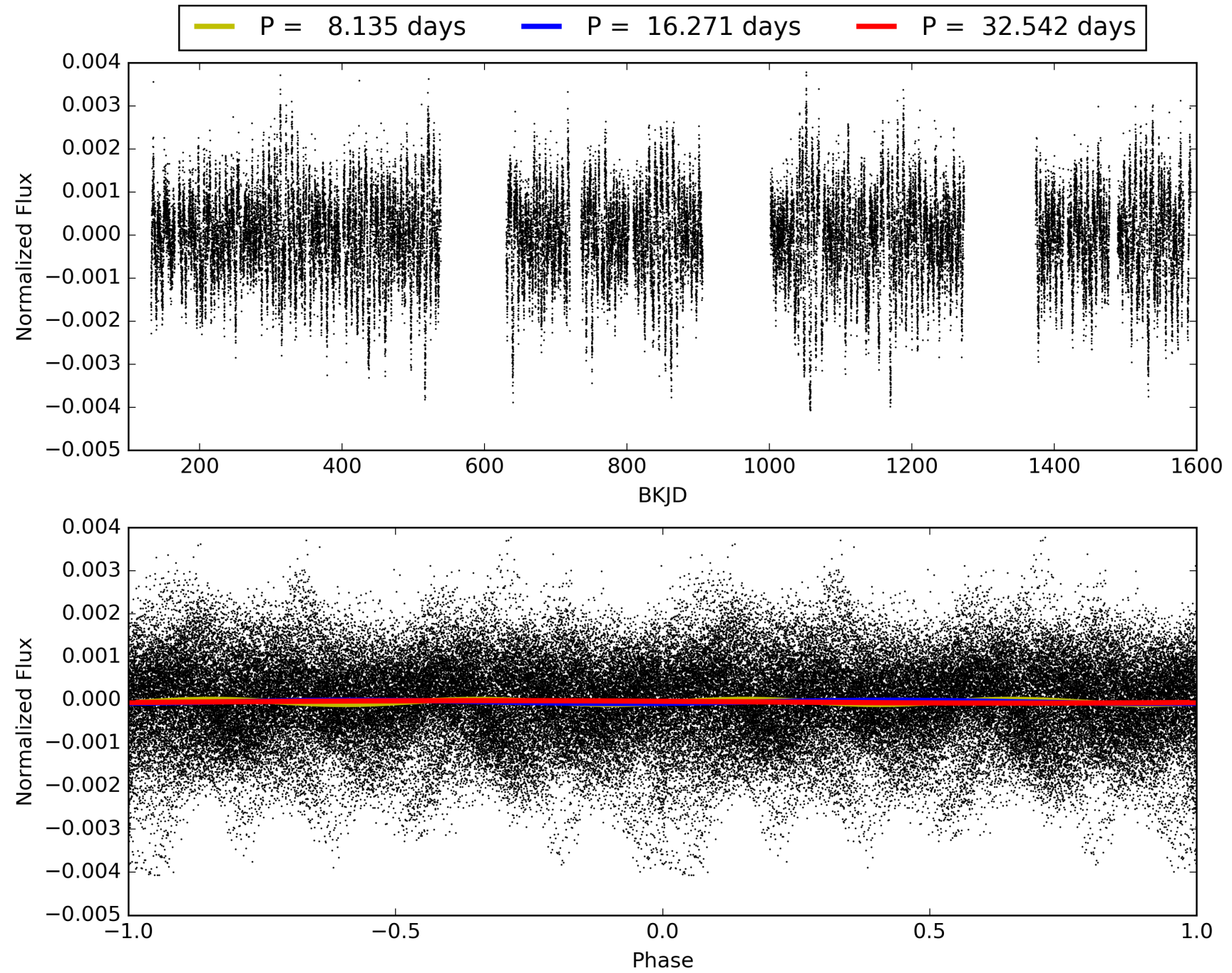
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:18:58 Z

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

# TCE 004172013-01, PDC Light Curves

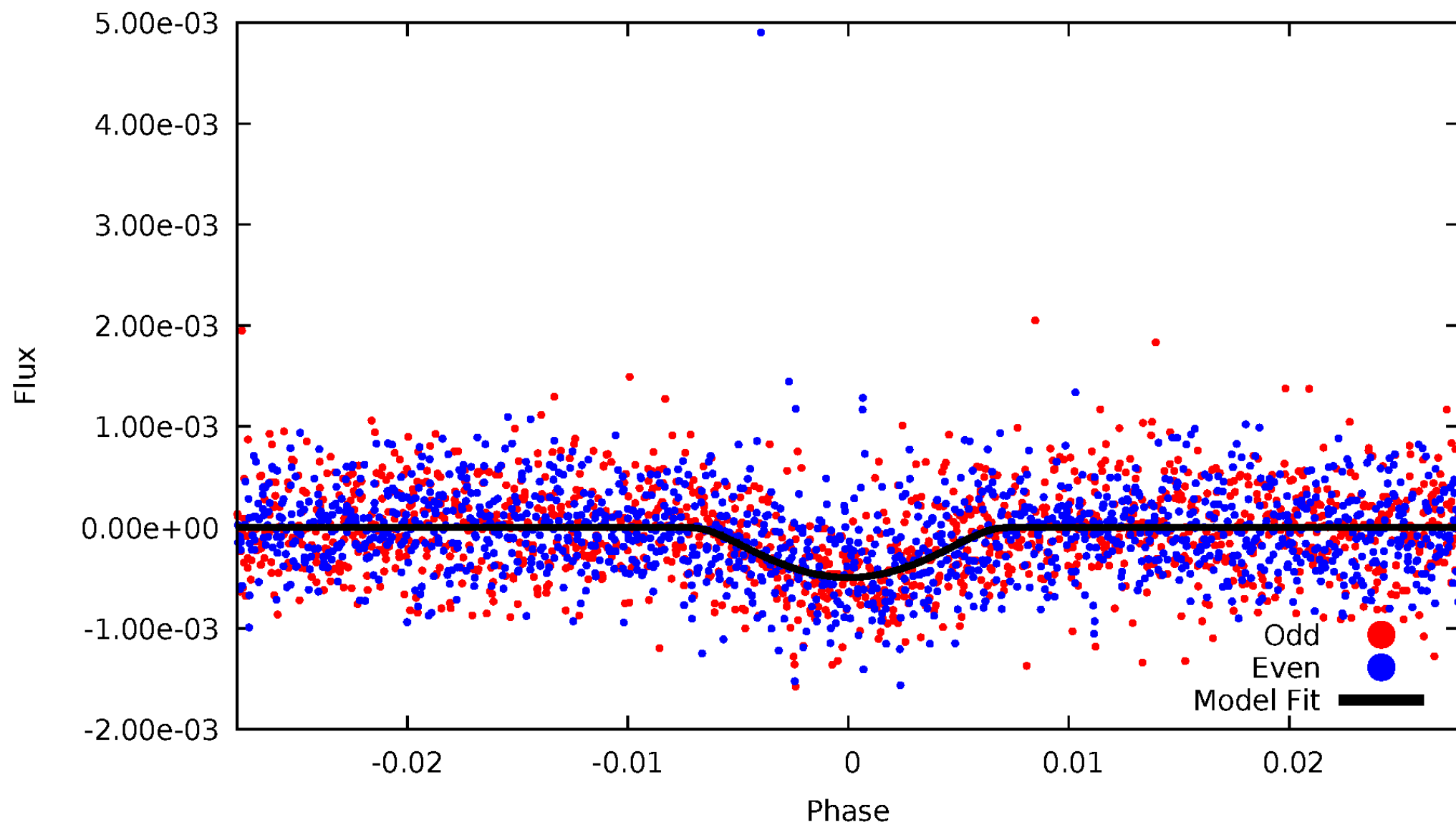


TCE 004172013-01



# DV Odd/Even

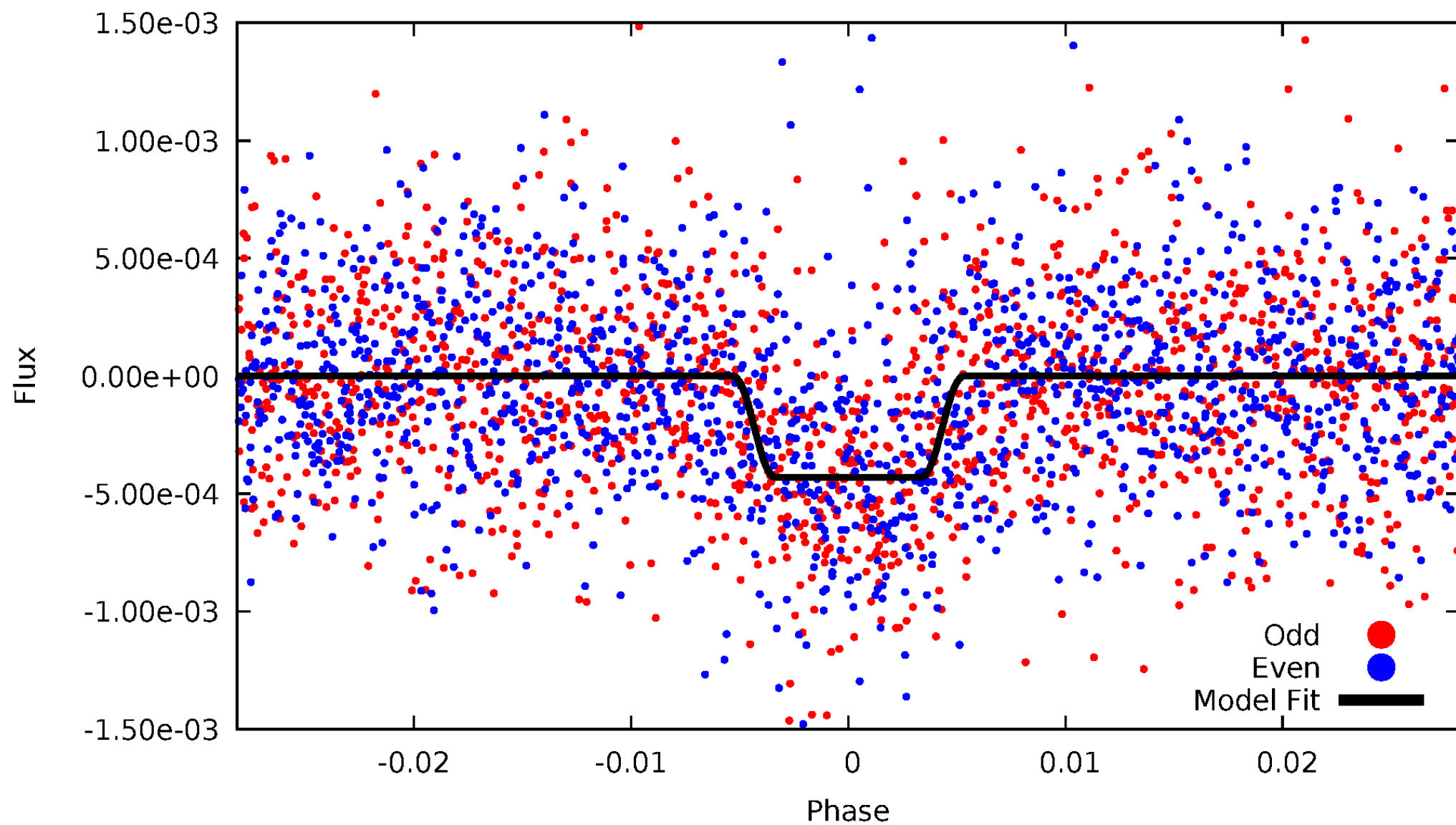
TCE 004172013-01





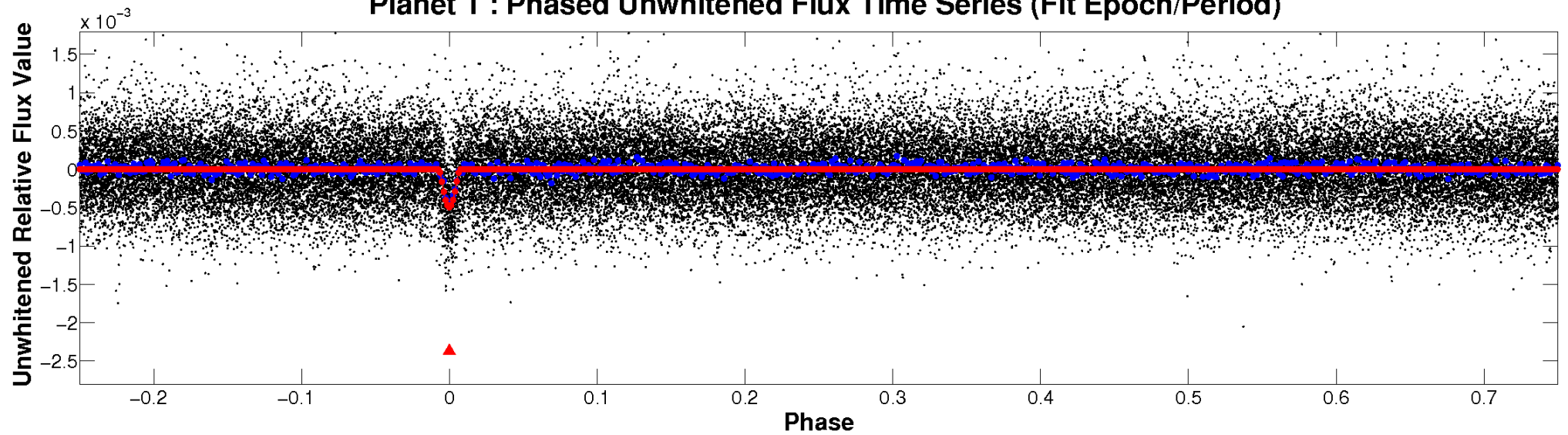
# ALT Odd/Even

TCE 004172013-01

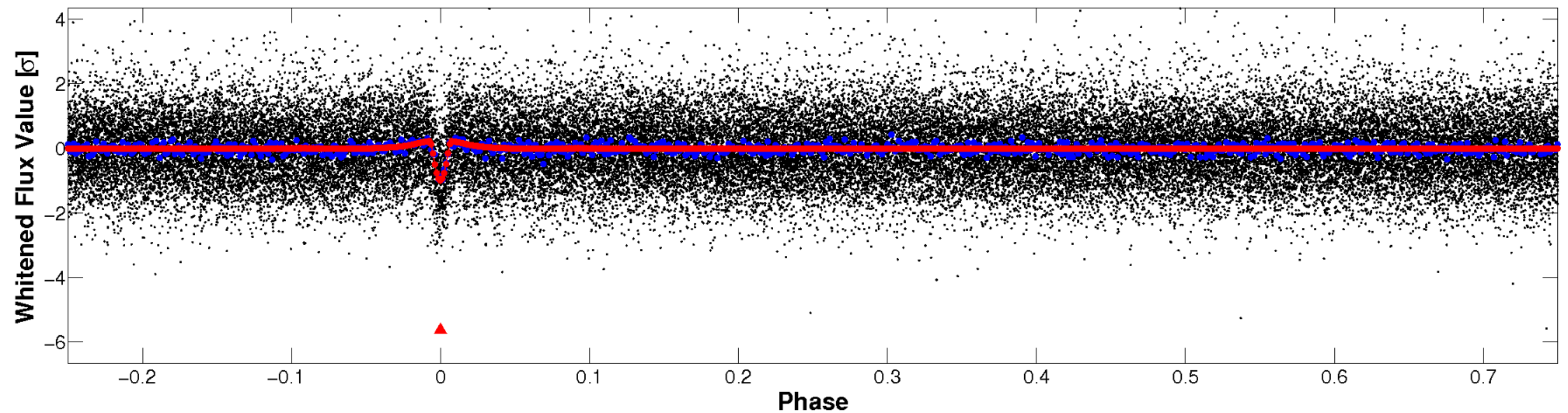


# Non-Whitened Vs. Whitened Light Curve

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

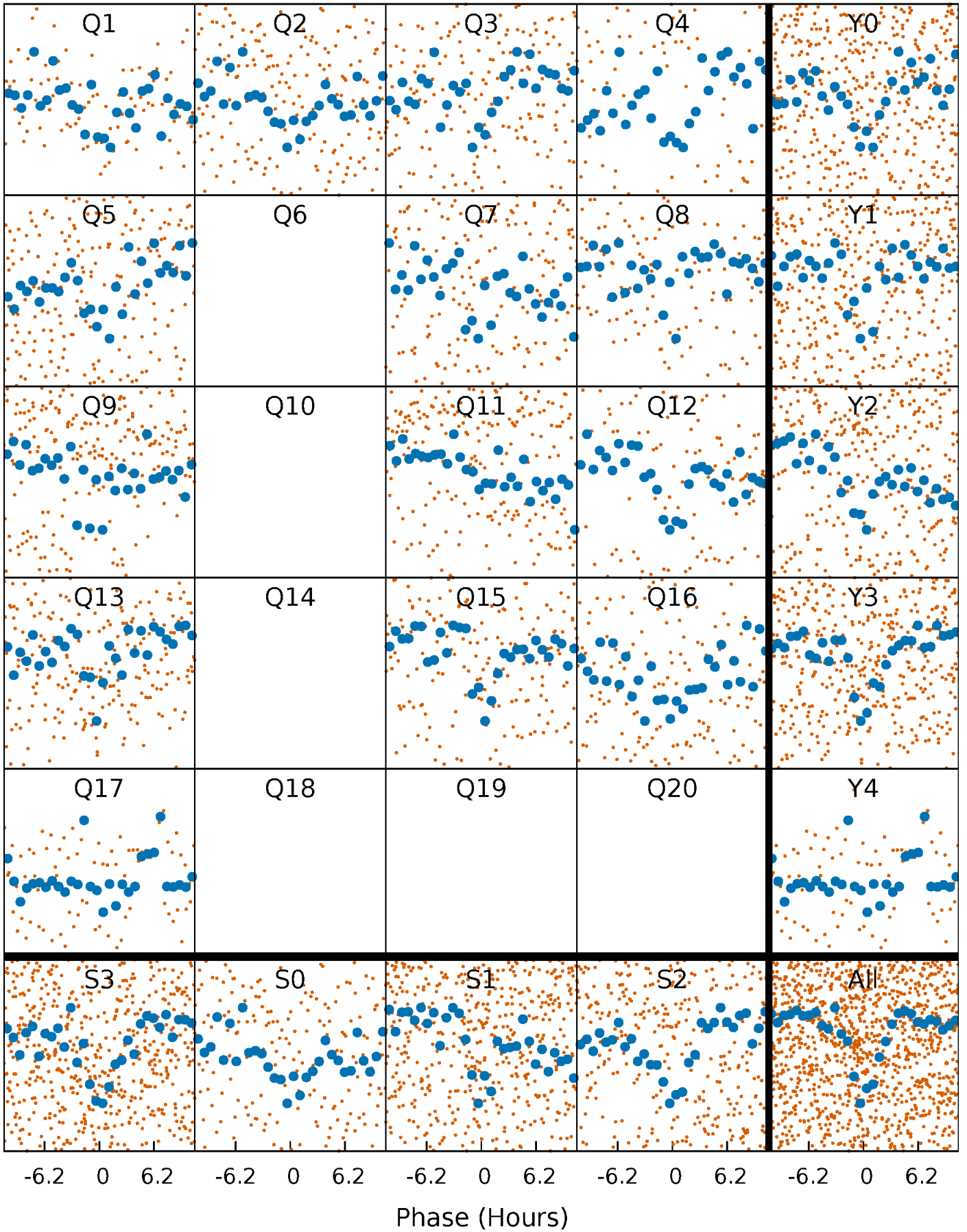


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

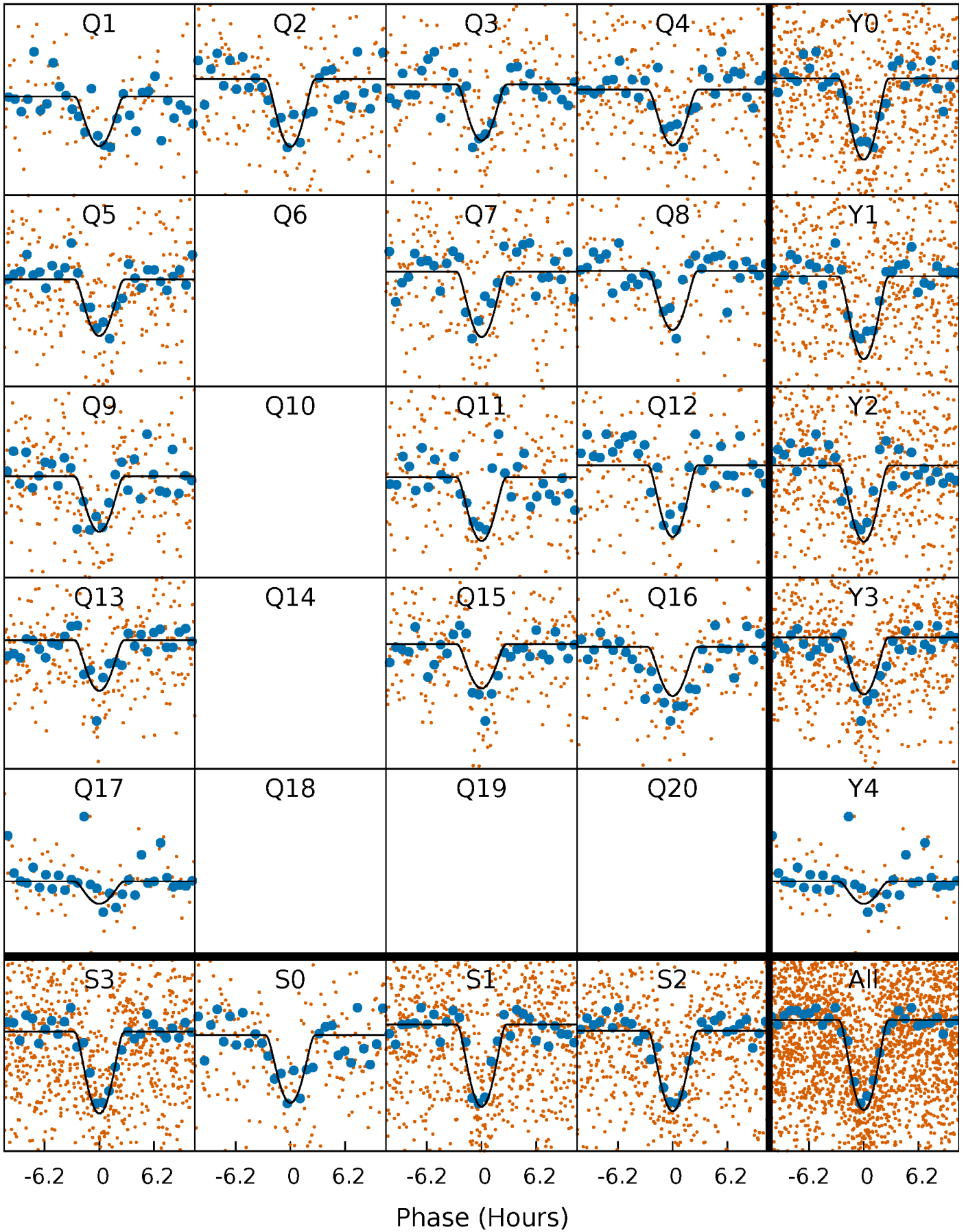
TCE 004172013-01 P= 16.270850 Days  $T_0=145.090040$  (BKJD)





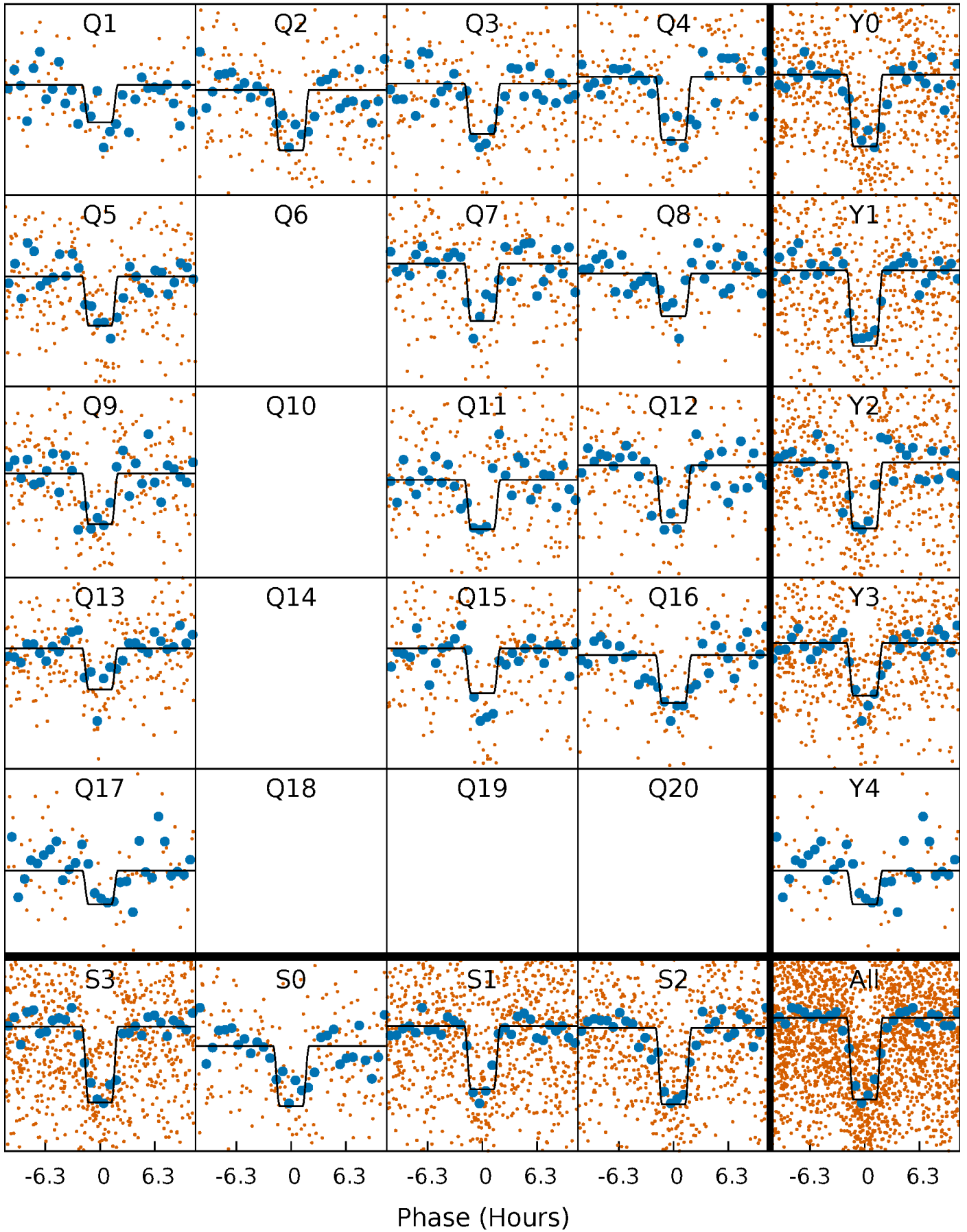
# DV Quarter-Phased Transit Curves

TCE 004172013-01 P= 16.270850 Days  $T_0=145.090040$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

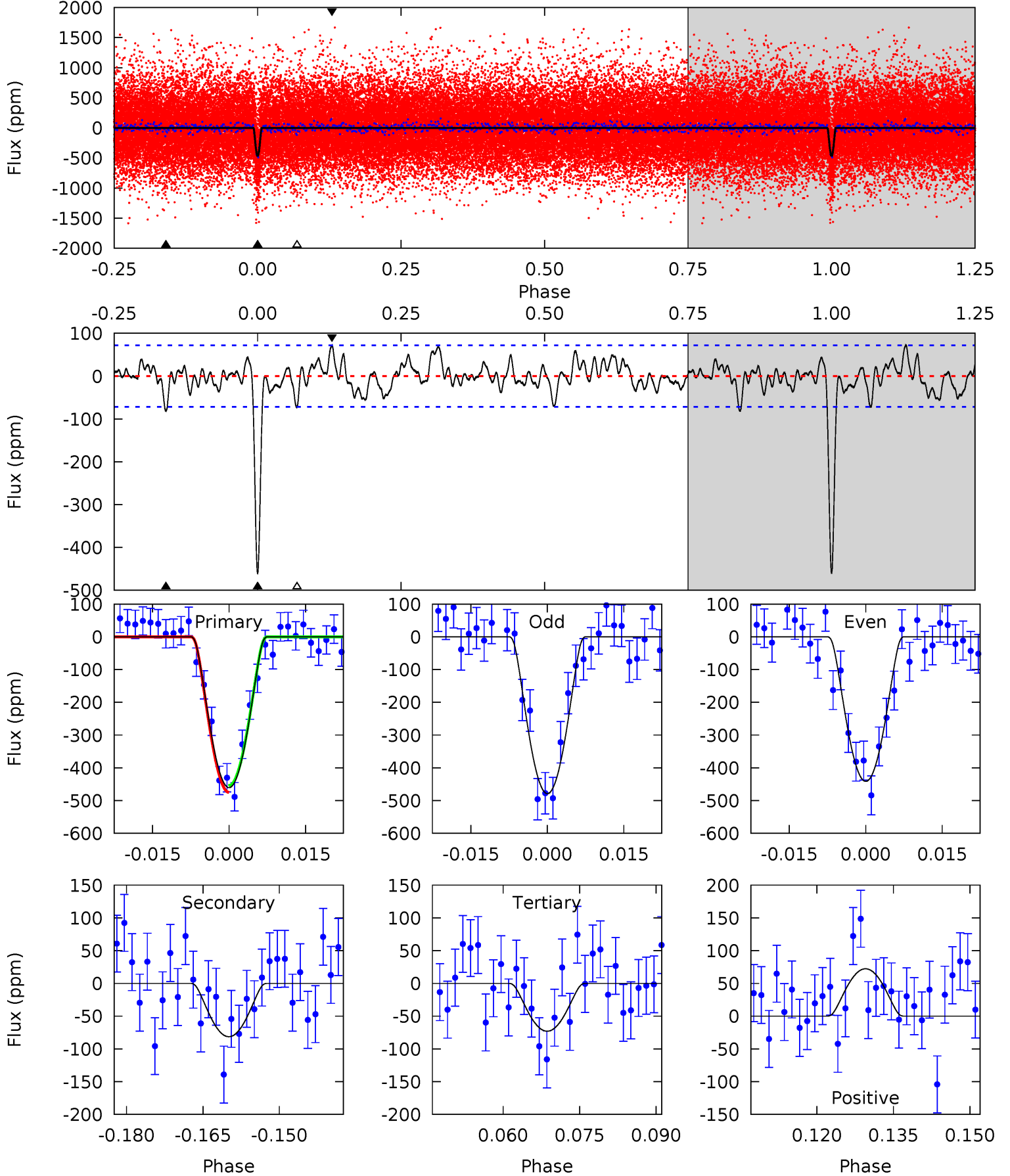
TCE 004172013-01 P= 16.270998 Days  $T_0=145.082604$  (BKJD)



# DV Model-Shift Uniqueness Test

004172013-01,  $P = 16.270850$  Days,  $E = 128.819190$  Days

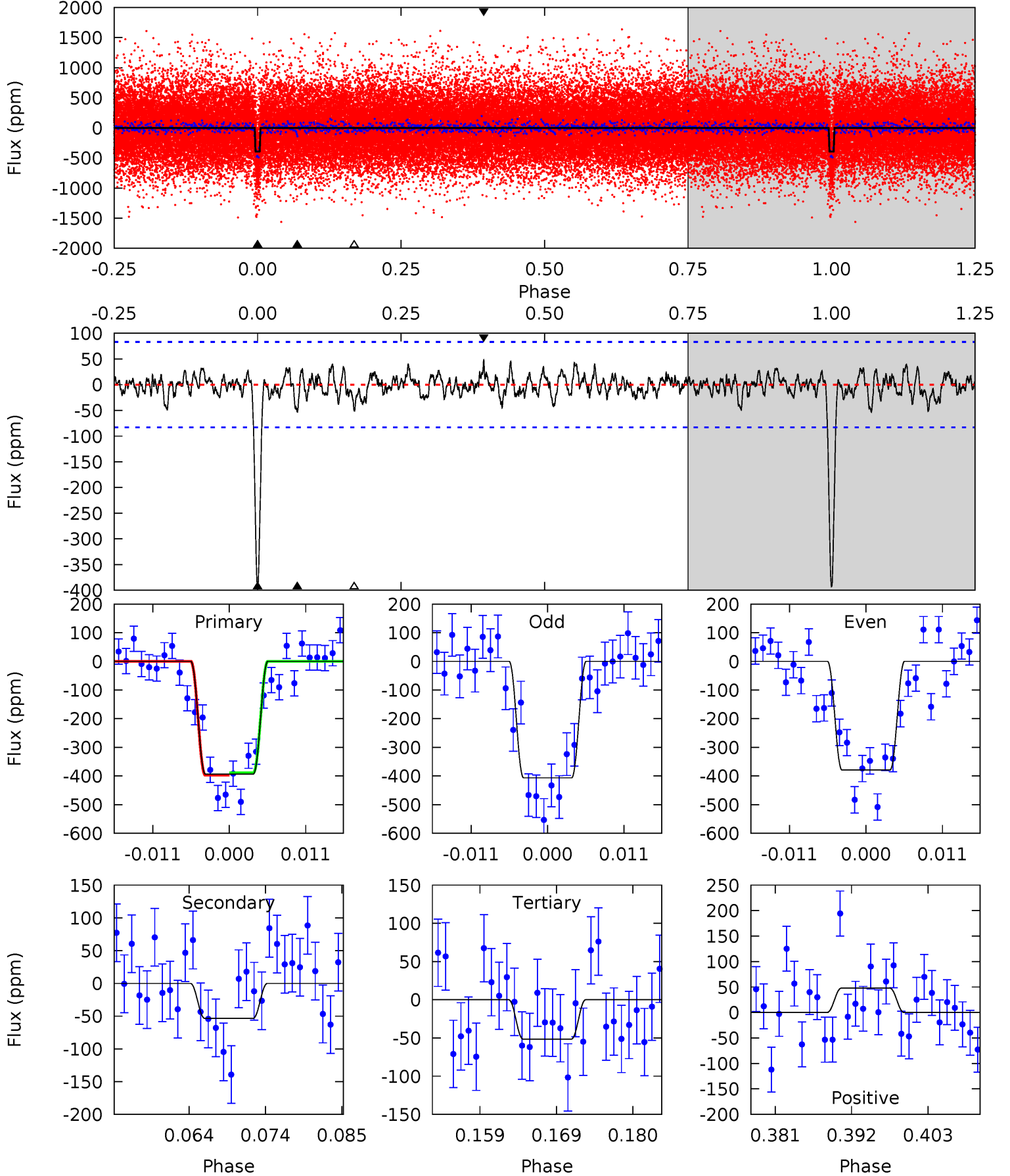
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.8	5.61	5.03	4.99	4.95	2.43	1.74	26.7	26.8	0.58	0.63	1.29	0.99	0.14	0.72



# Alt Model-Shift Uniqueness Test

004172013-01, P = 16.270998 Days, E = 128.811606 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
23.7	3.23	3.11	2.90	5.02	2.56	0.98	20.6	20.8	0.12	0.33	0.82	1.01	0.11	0.25



### Stellar Parameters For KIC 004172013

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6117^{+79}_{-85}$	$4.315^{+0.084}_{-0.126}$	$0.140^{+0.150}_{-0.150}$	$1.244^{+0.205}_{-0.136}$	$1.170^{+0.081}_{-0.089}$	$0.855^{+0.298}_{-0.310}$
	+1%/-1%	+2%/-3%	+107%/-107%	+16%/-11%	+7%/-8%	+35%/-36%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 004172013-01 / KOI 2386.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-81 \pm 14$	$9.32^{+8.58}_{-6.30}$	$1161^{+56}_{-43}$	$2913^{+1375}_{-470}$	$9.287^{+88.273}_{-6.750}$
Alt.	$-53 \pm 17$	$8.15^{+8.05}_{-5.43}$	$1160^{+50}_{-43}$	$2846^{+1133}_{-505}$	$7.507^{+54.078}_{-5.742}$

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



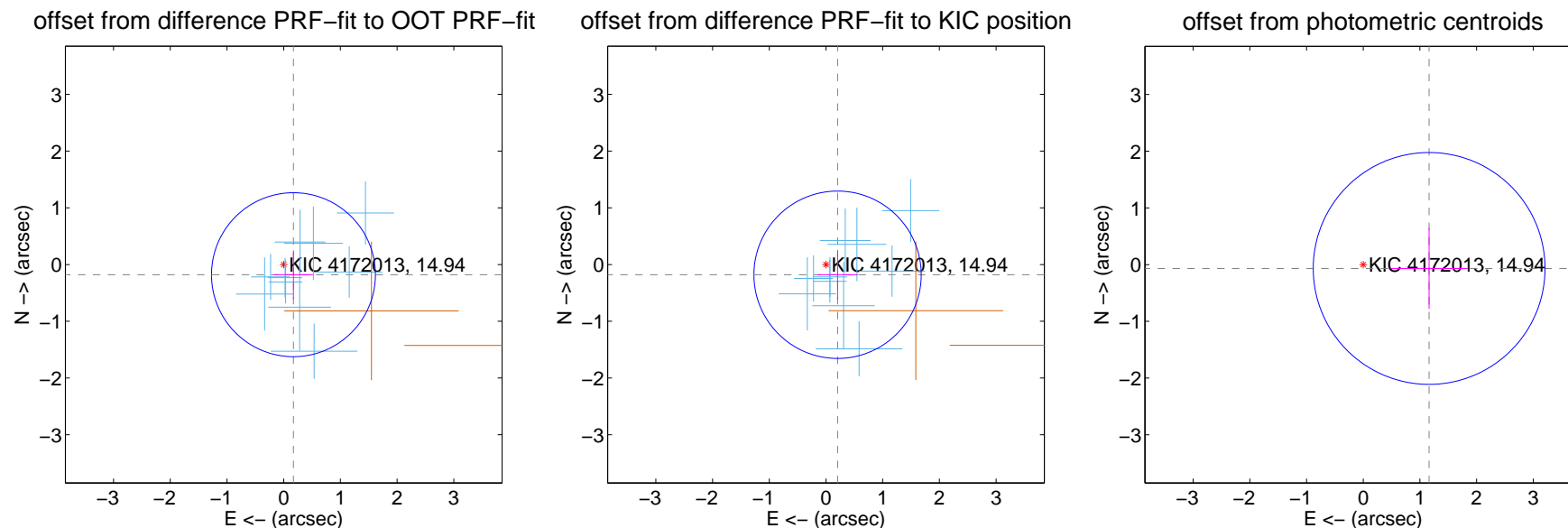
## DV Centroid Data

Supplemental centroid analysis for 004172013-01. Kepler magnitude: 14.94. Transit SNR 17.62

There are 10 quarters with good PRF difference image offsets

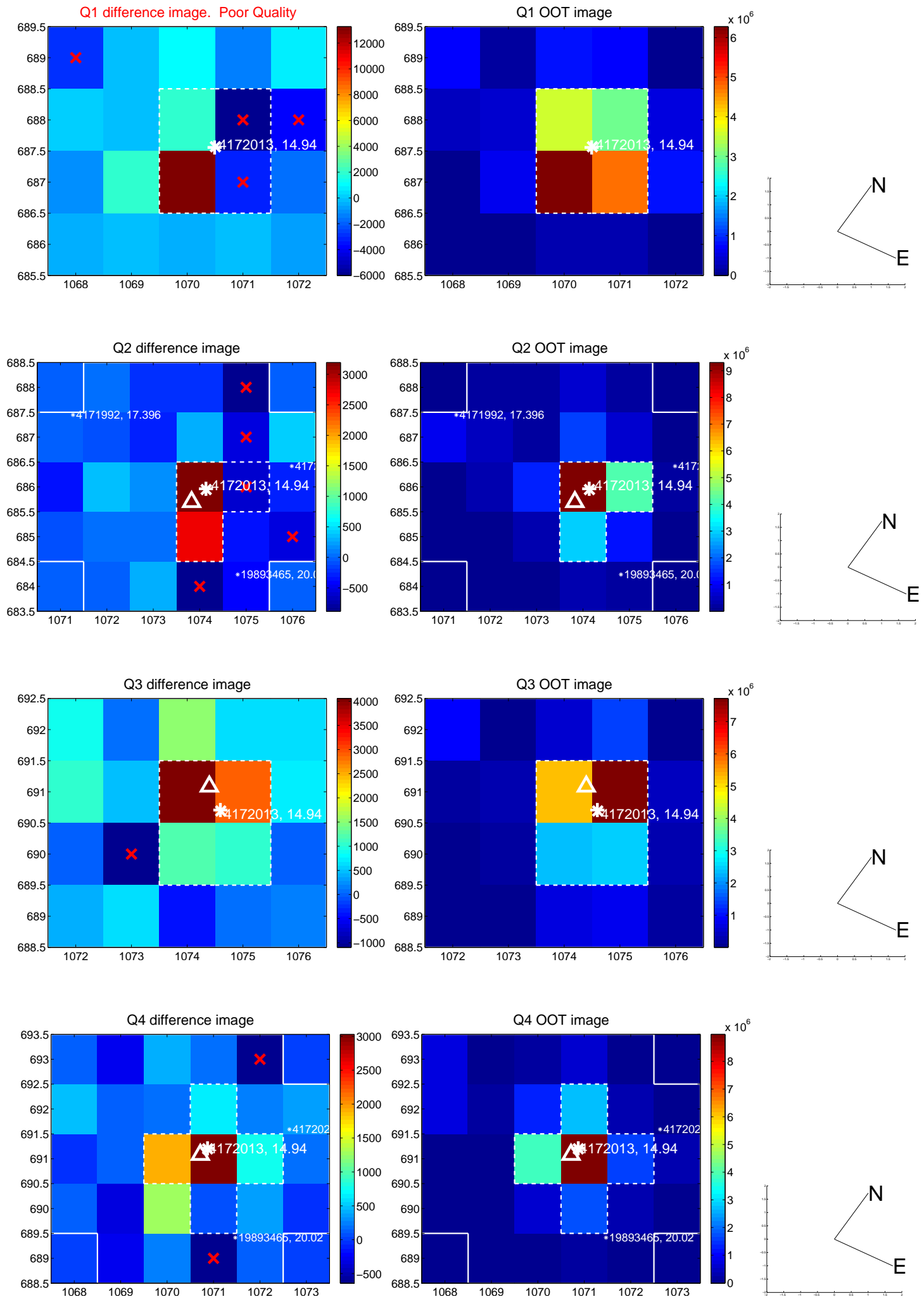
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.248 \pm 0.482$	0.52	$-0.172 \pm 0.344$	$-0.179 \pm 0.428$
PRF-fit source offset from KIC position	$0.273 \pm 0.492$	0.55	$-0.205 \pm 0.357$	$-0.180 \pm 0.438$
photometric centroid source offset	$1.16 \pm 0.68$	1.71	$-1.16 \pm 0.68$	$-0.07 \pm 0.72$

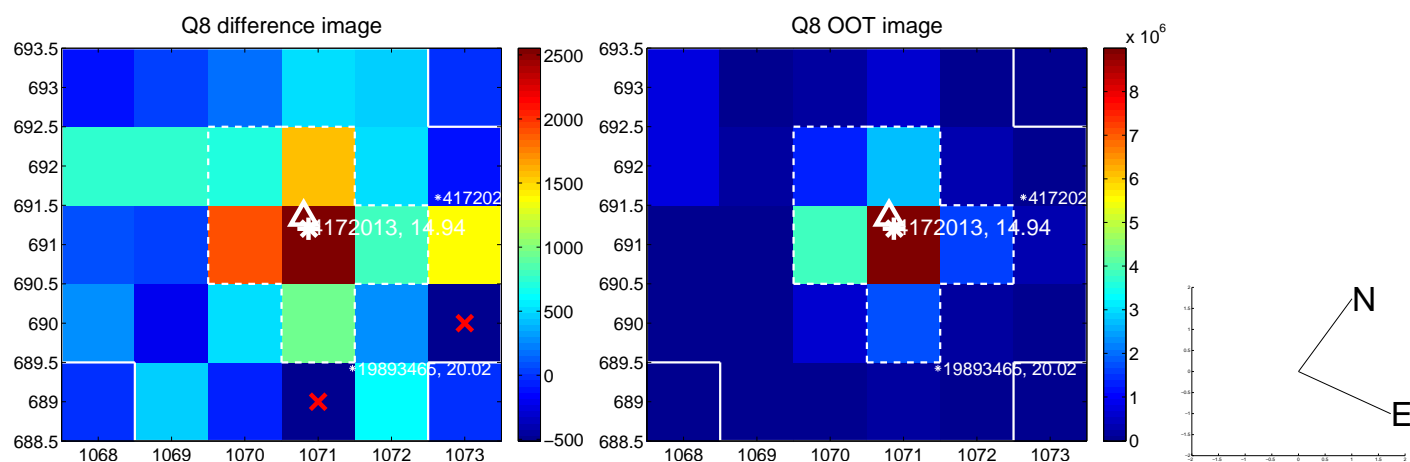
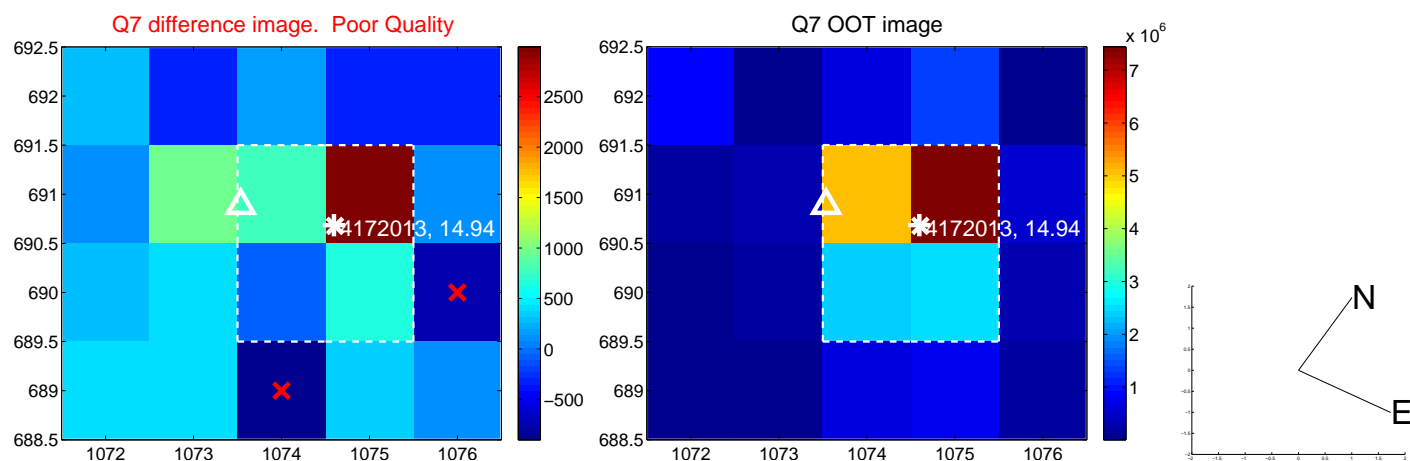
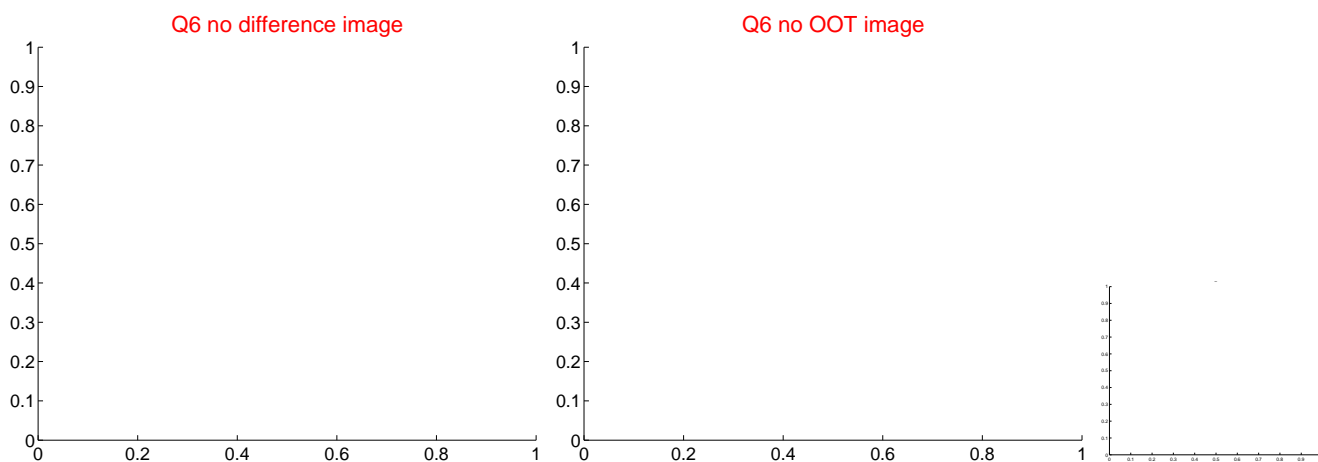
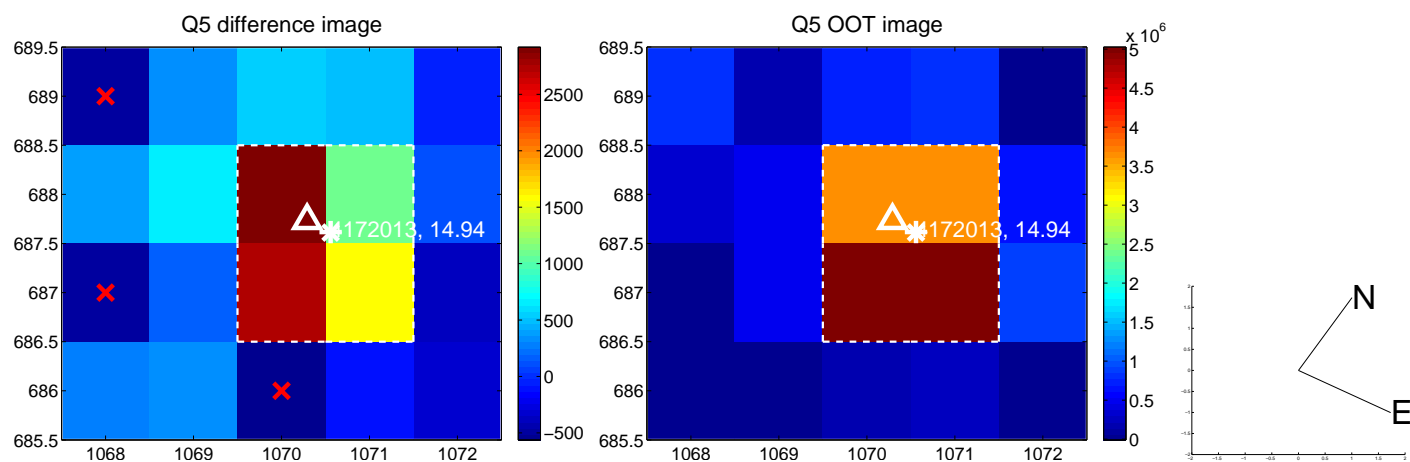


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

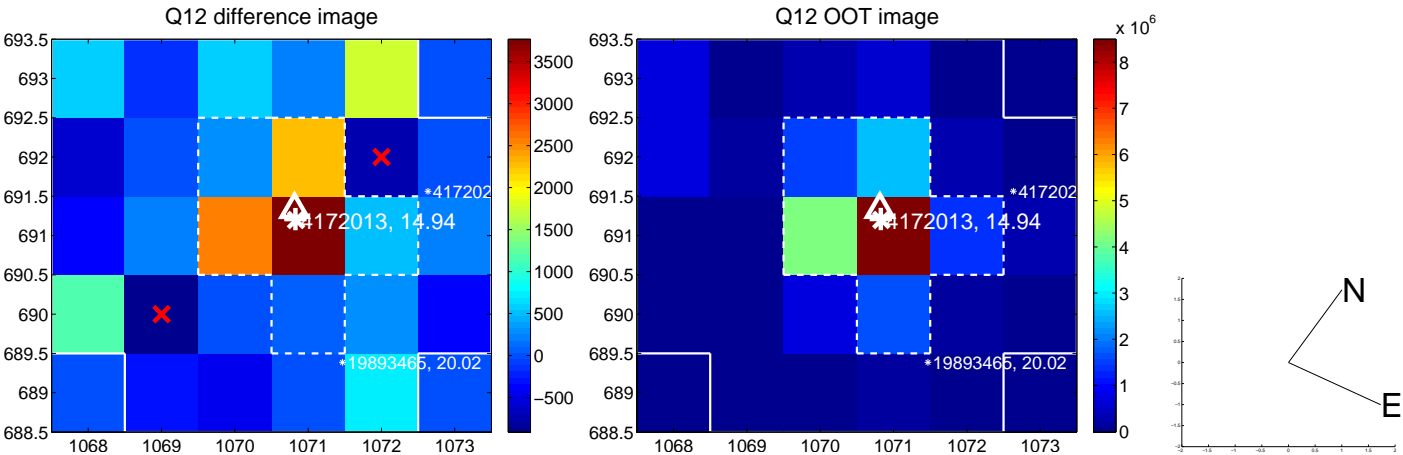
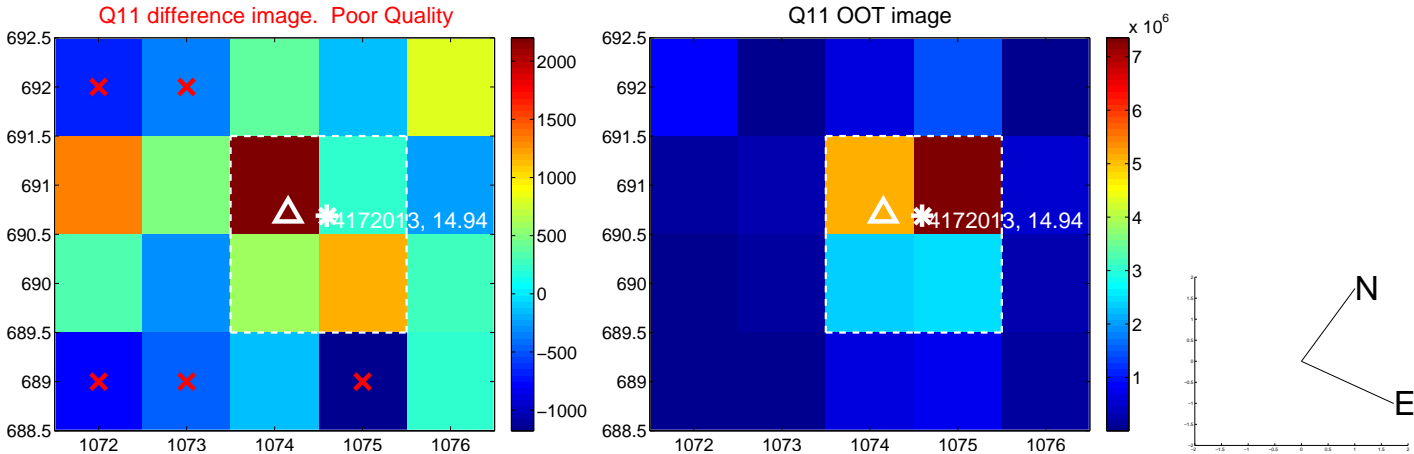
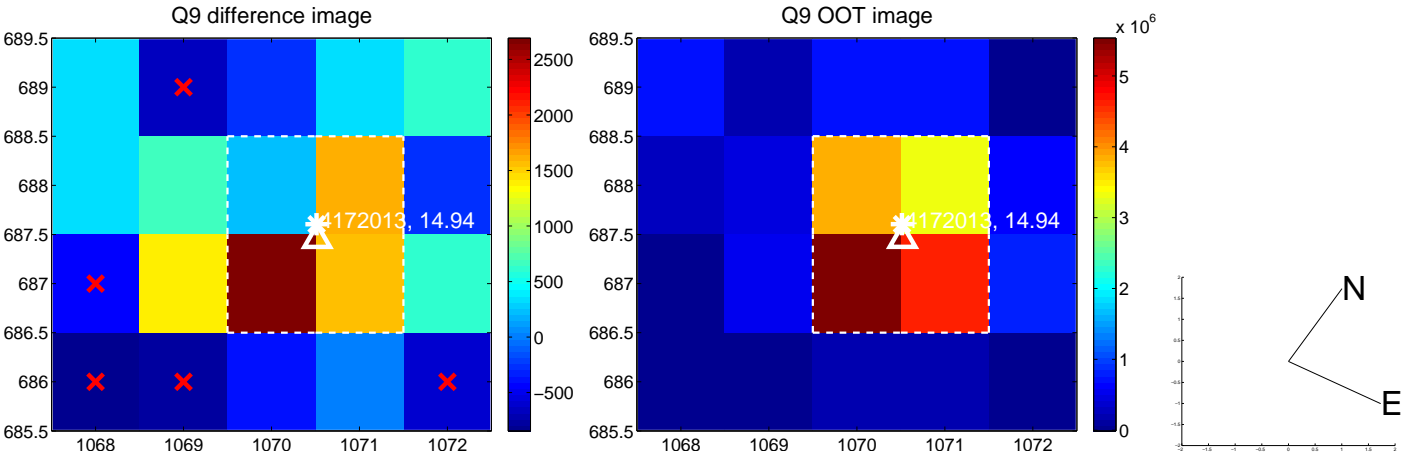
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



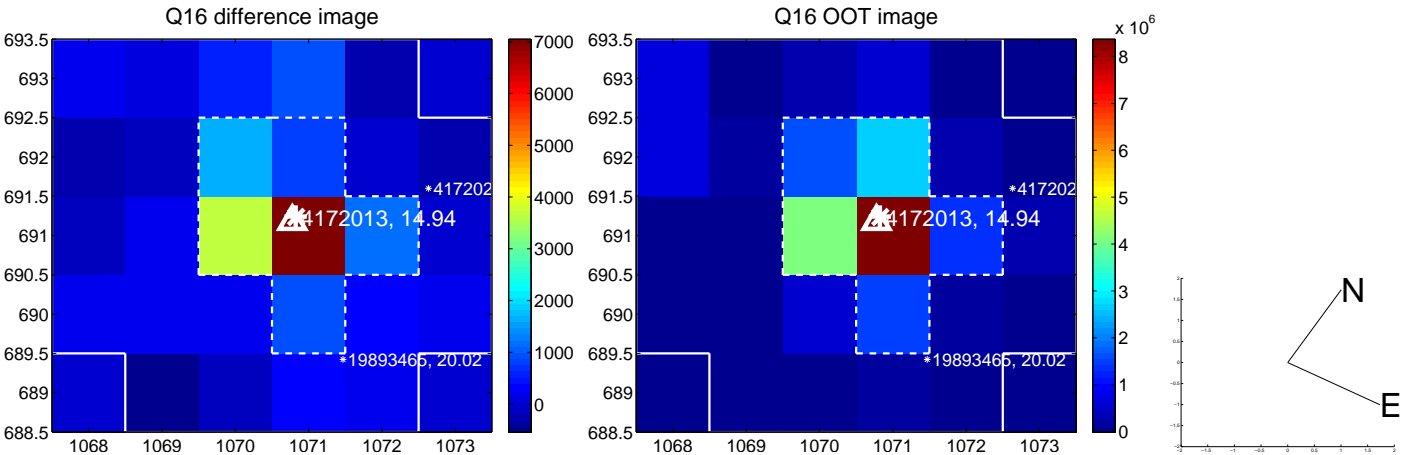
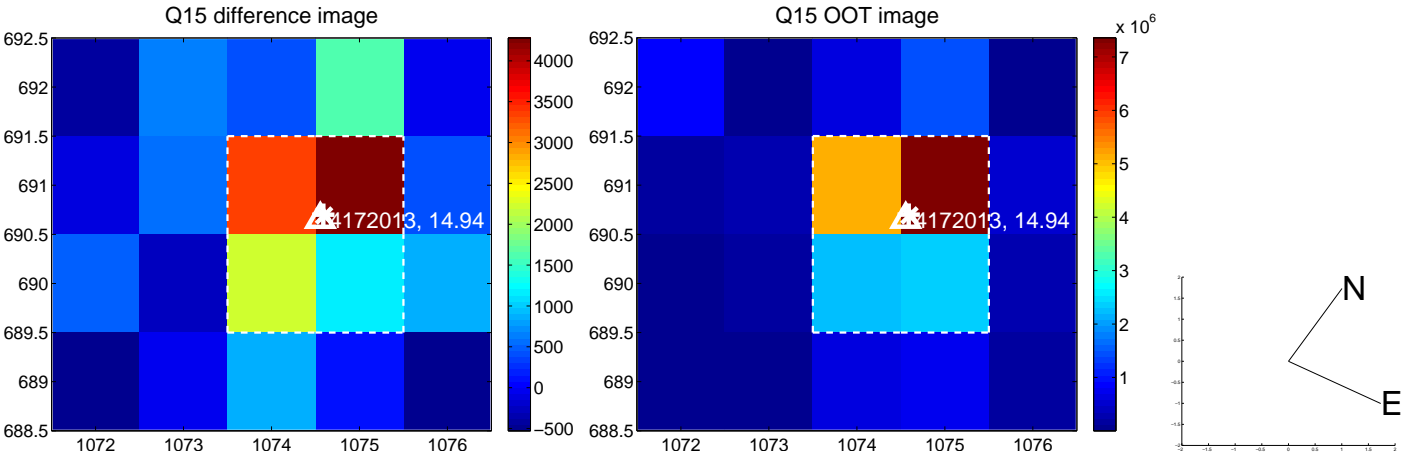
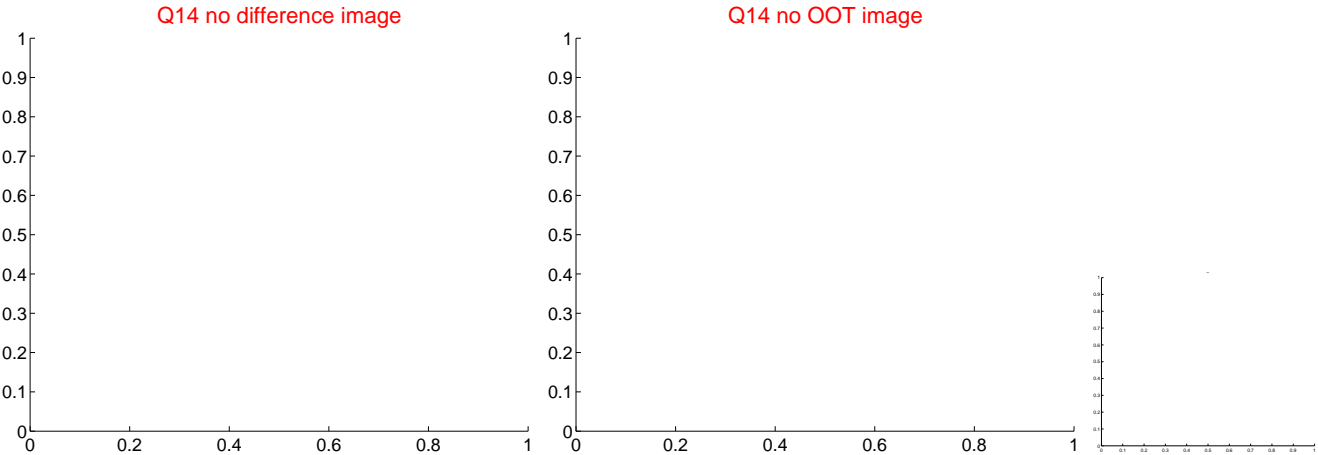
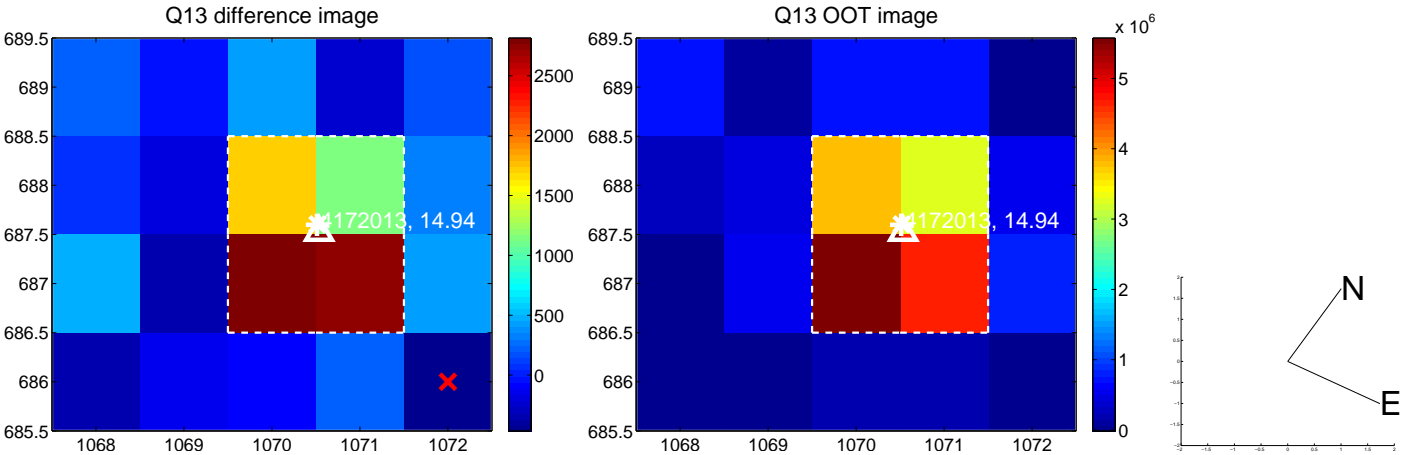
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

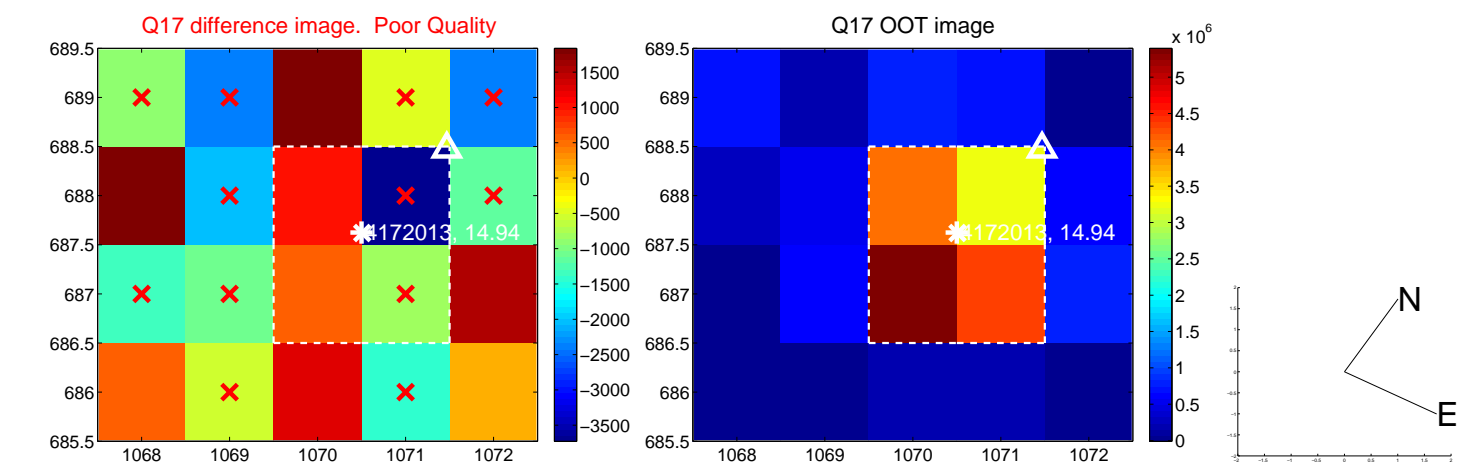


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

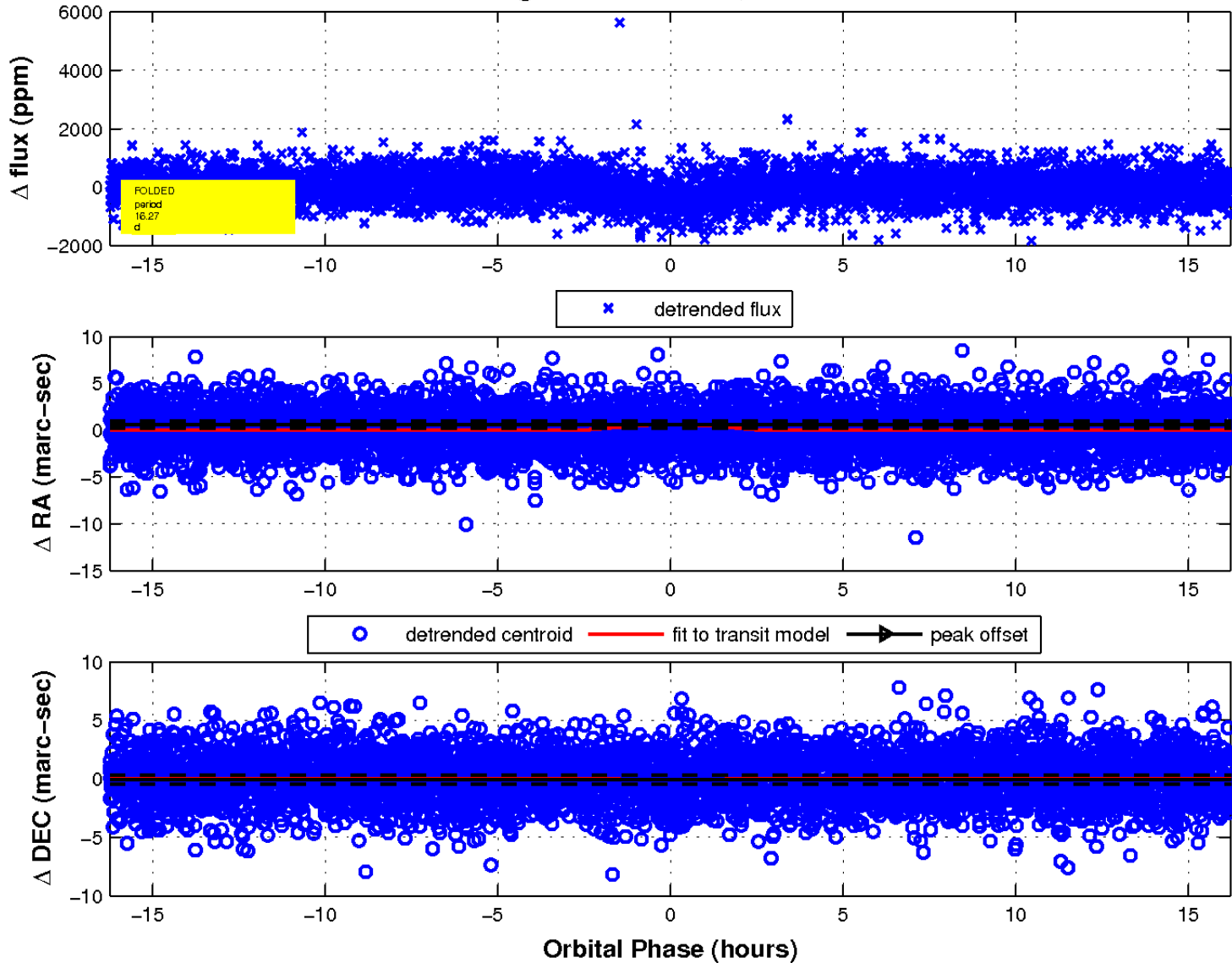




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

