

# KIC 004172746

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004172746-01	OBS	2531.01	17.699776	140.950261	846.6	3.506	16.6	18.8	0.74	4807	3.19	17.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004172746-01	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.

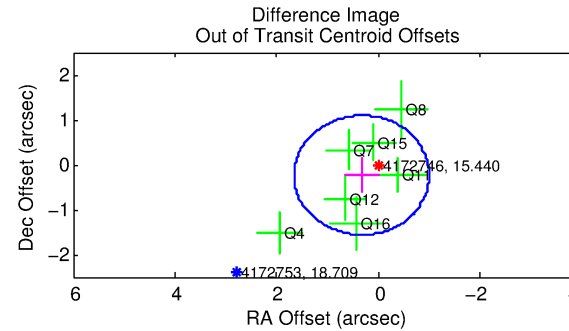
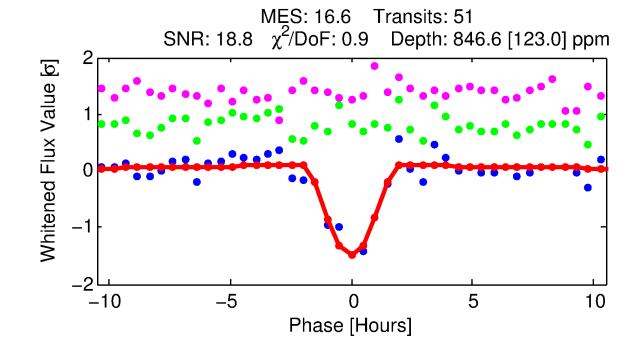
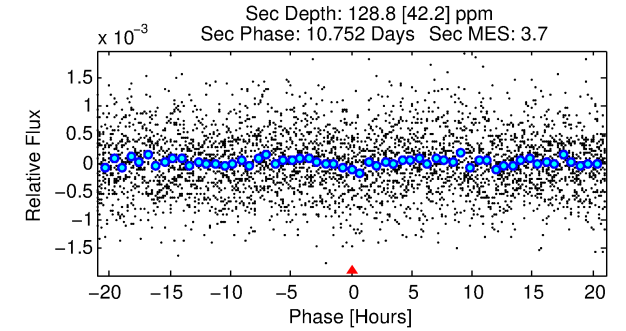
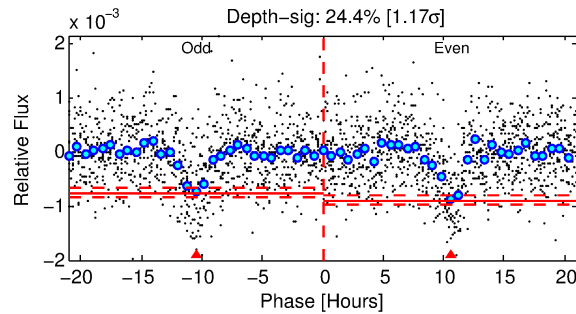
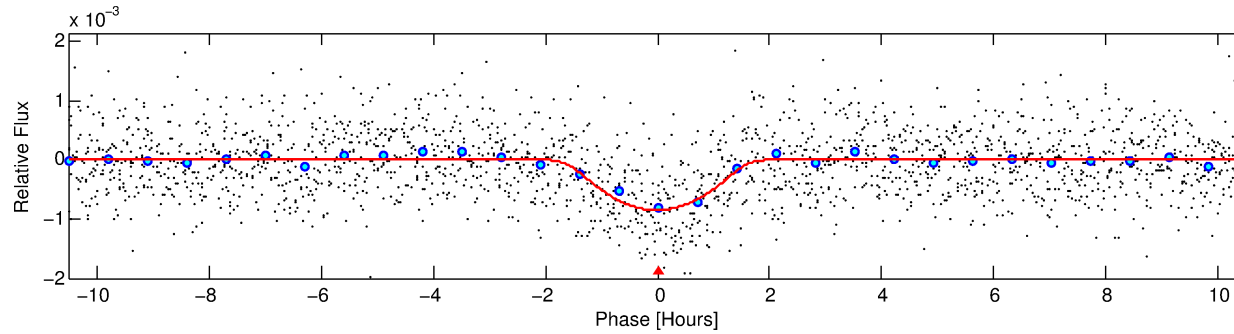
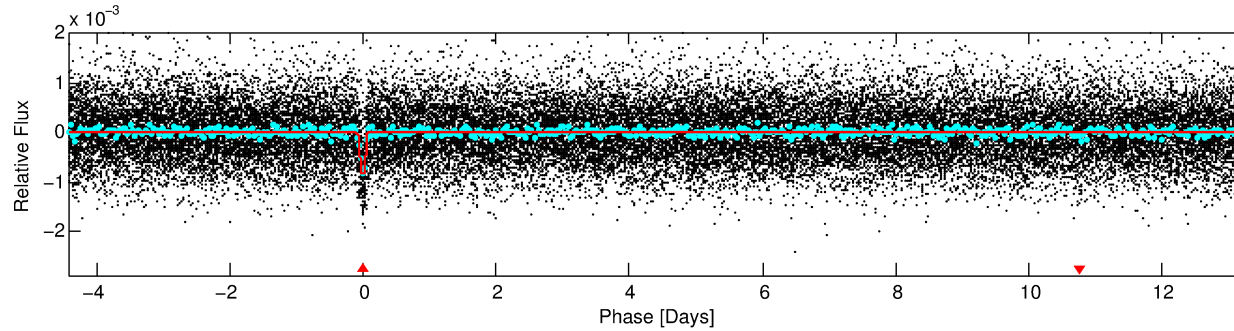
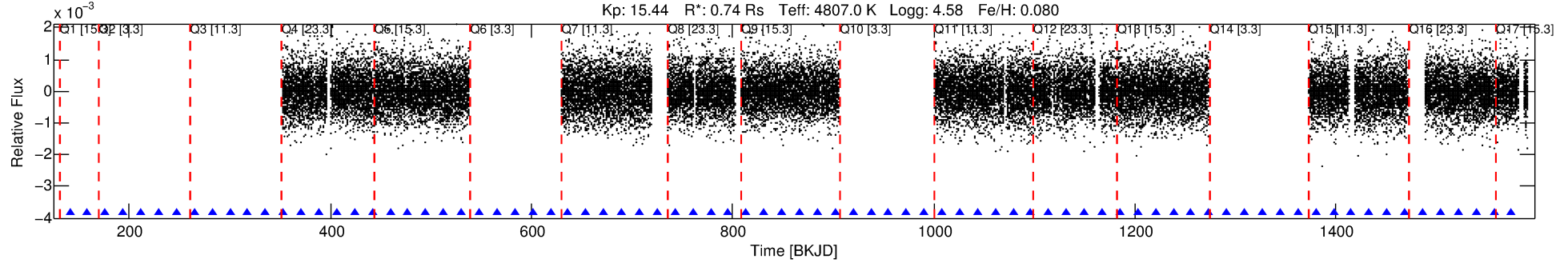
## Ephemeris Match Information For 004172746-01

No Significant Match Found

# DV One-Page Summary

KIC: 4172746 Candidate: 1 of 1 Period: 17.700 d  
KOI: K02531.01 Corr: 0.871

Kp: 15.44 R\*: 0.74 Rs Teff: 4807.0 K Logg: 4.58 Fe/H: 0.080



## DV Fit Results:

Period = 17.69978 [0.00010] d  
Epoch = 140.9503 [0.0052] BKJD  
Rp/R\* = 0.0394 [0.0165]  
a/R\* = 14.30 [3.47]  
b = 0.97 [0.04]  
Seff = 17.76 [2.99]  
Teq = 523 [22] K  
Rp = 3.19 [1.36] Re  
a = 0.1218 [0.0079] AU  
Ag = 103.22 [93.12] [1.10σ]  
Teffp = 2580 [586] K [3.50σ]

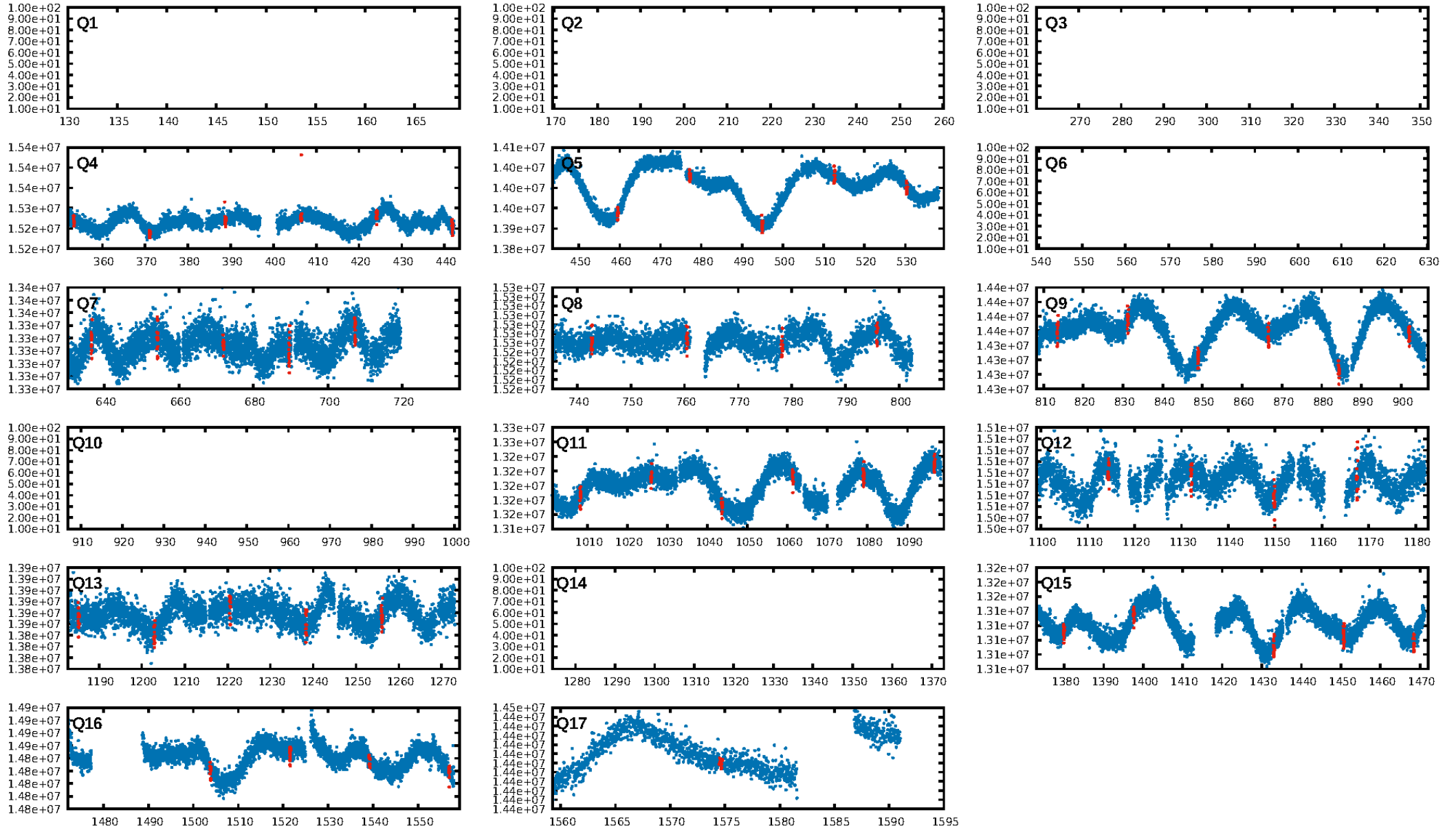
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.73e-60  
RollingBand-fgt: 1.00 [50/50]  
GhostDiagnostic-chr: 2.706  
Centroid-sig: 5.1%  
Centroid-so: 2.003 arcsec [3.43σ]  
OotOffset-rm: 0.406 arcsec [0.92σ]  
KicOffset-rm: 0.329 arcsec [0.98σ]  
OotOffset-st: 0/3/4/0 [7]  
KicOffset-st: 0/3/4/4 [11]  
DiffImageQuality-fgm: 0.82 [9/11]  
DiffImageOverlap-fno: 1.00 [11/11]

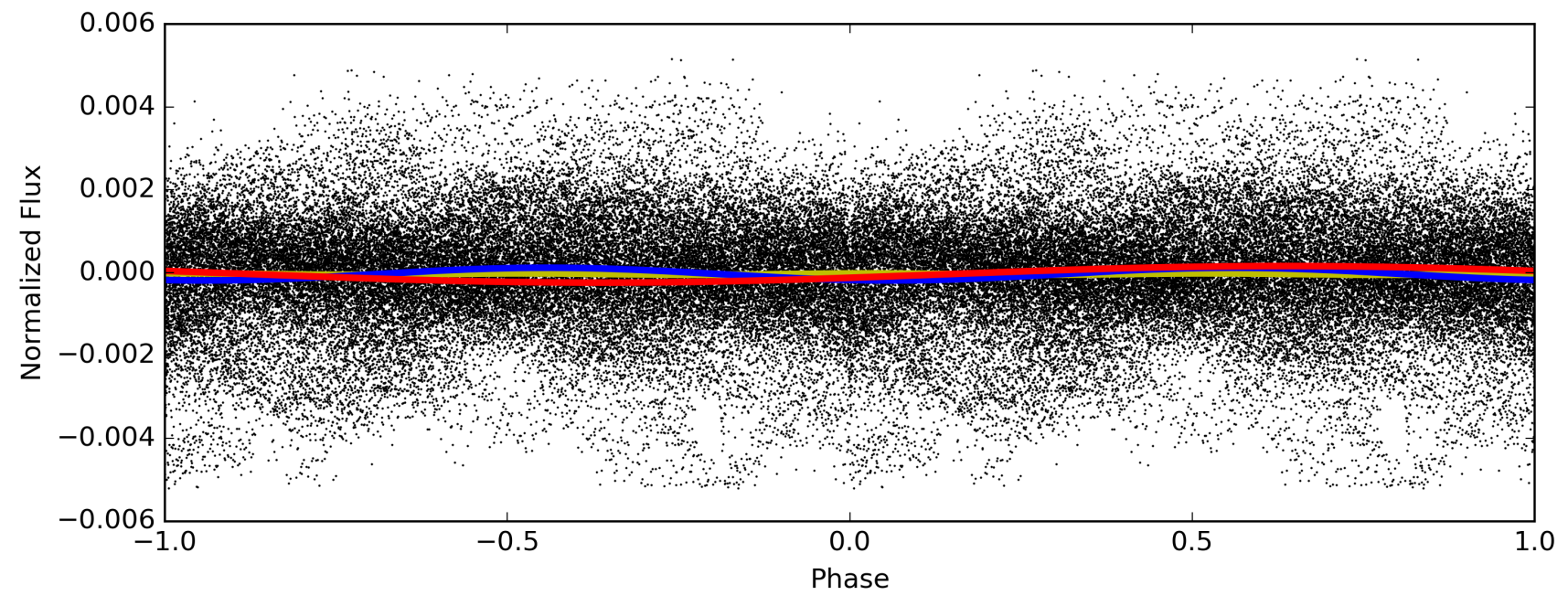
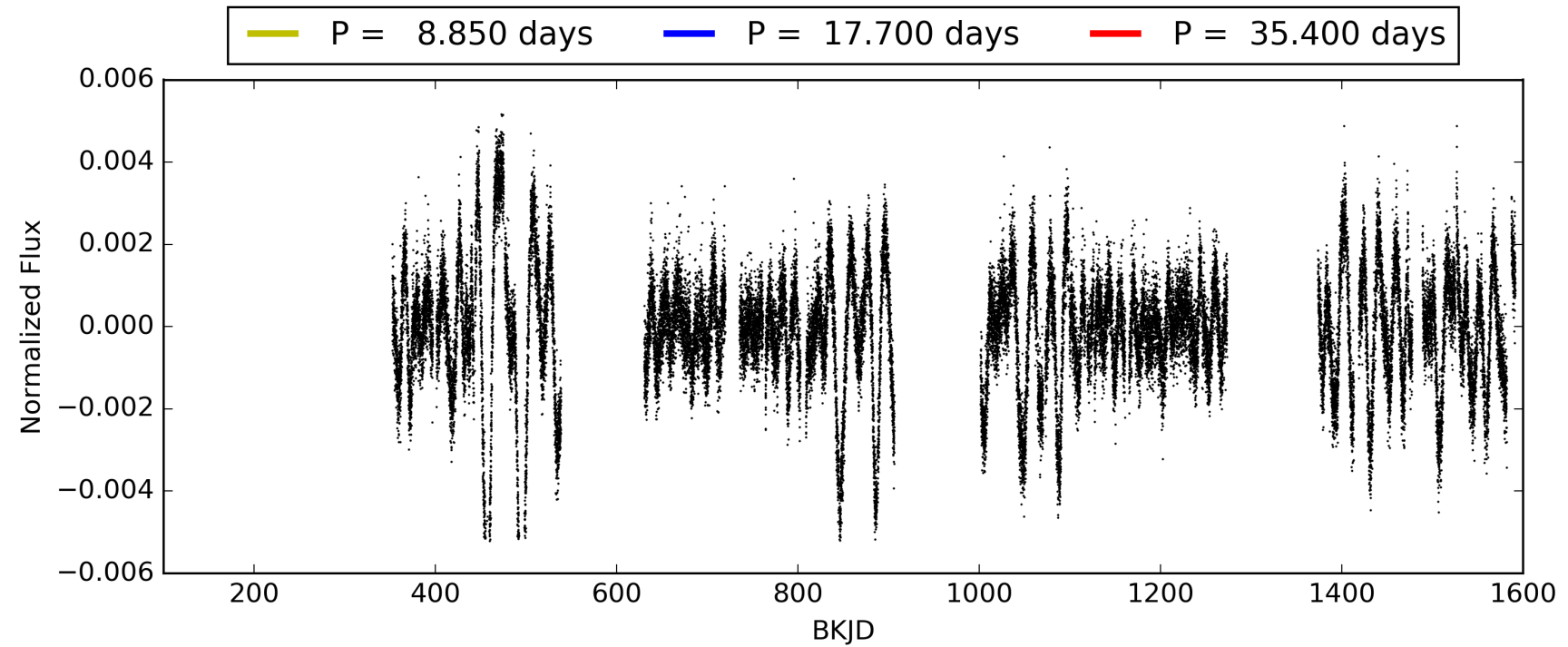
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 19:51:40 Z

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

# TCE 004172746-01, PDC Light Curves

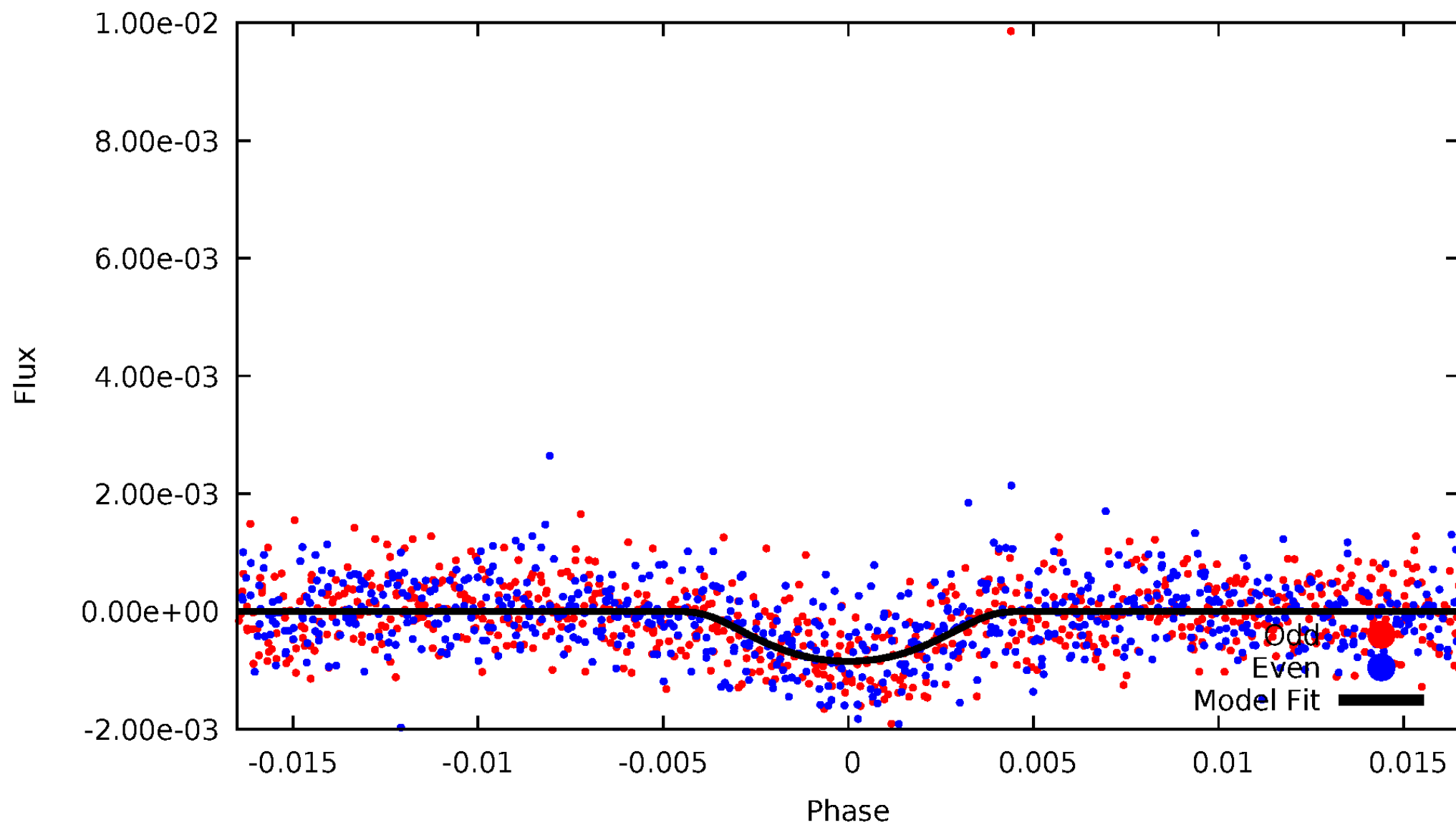


TCE 004172746-01



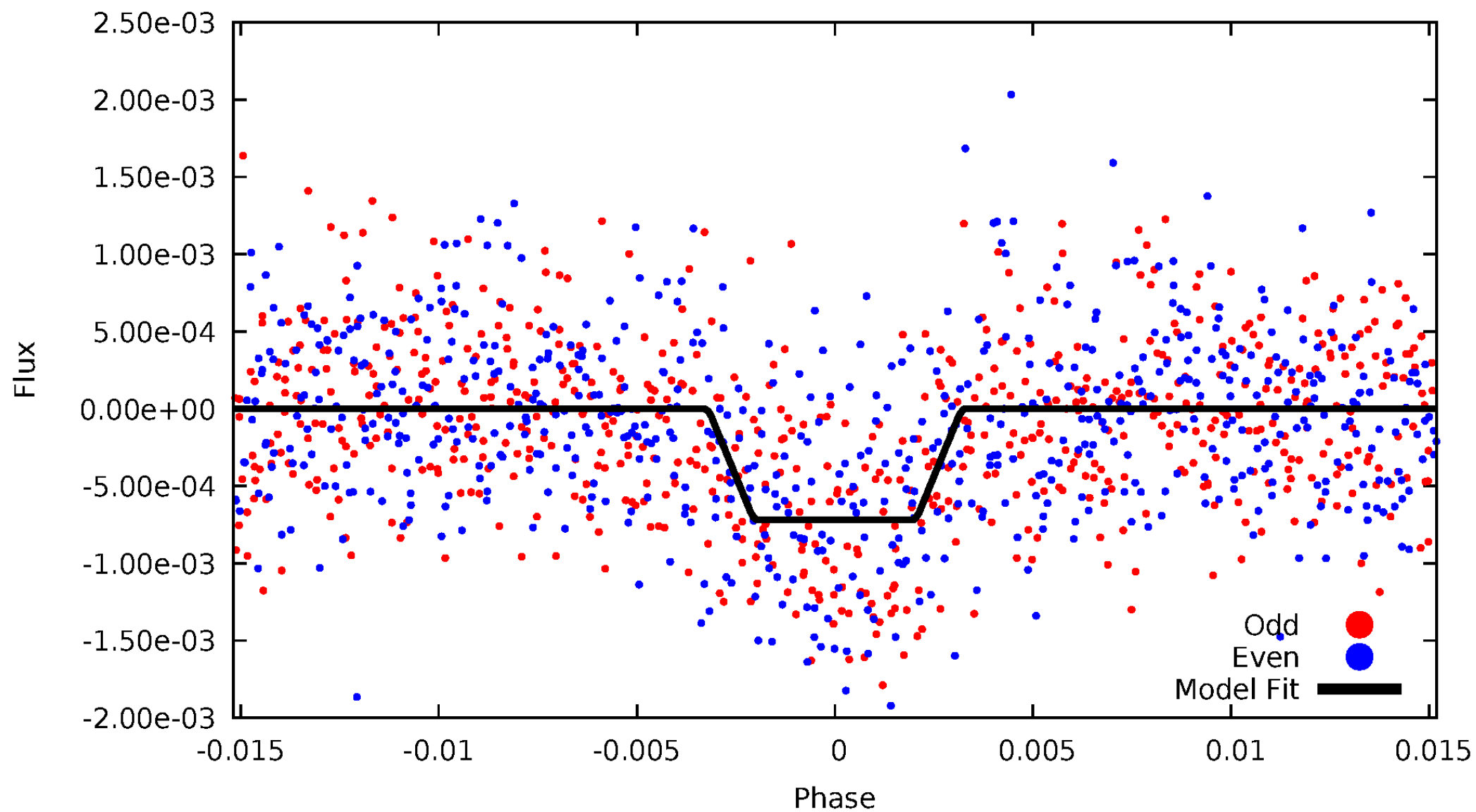
# DV Odd/Even

TCE 004172746-01



# ALT Odd/Even

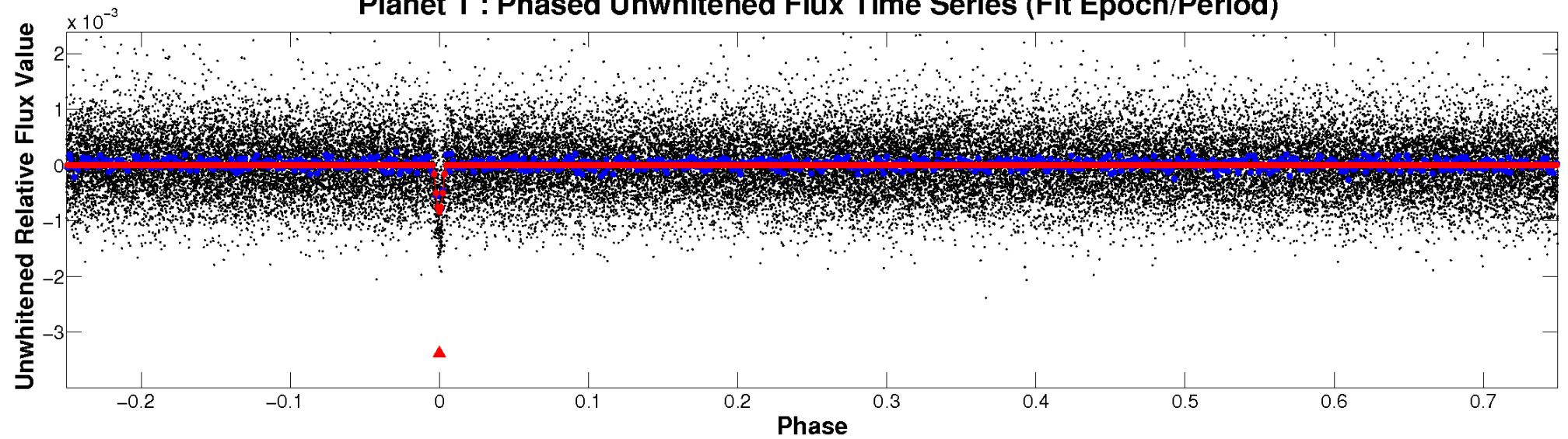
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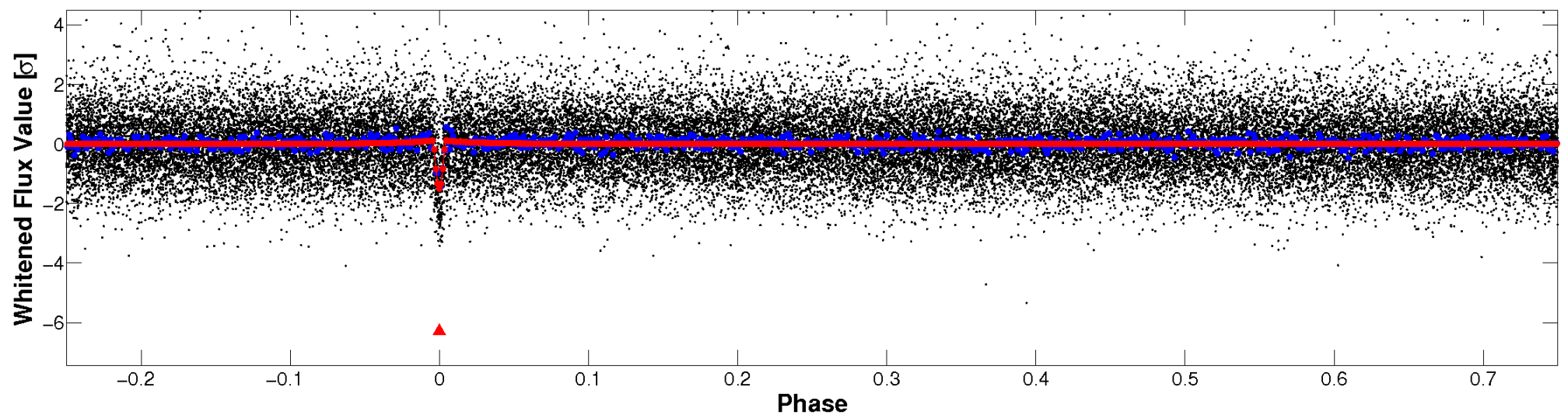


# Non-Whitened Vs. Whitened Light Curve

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

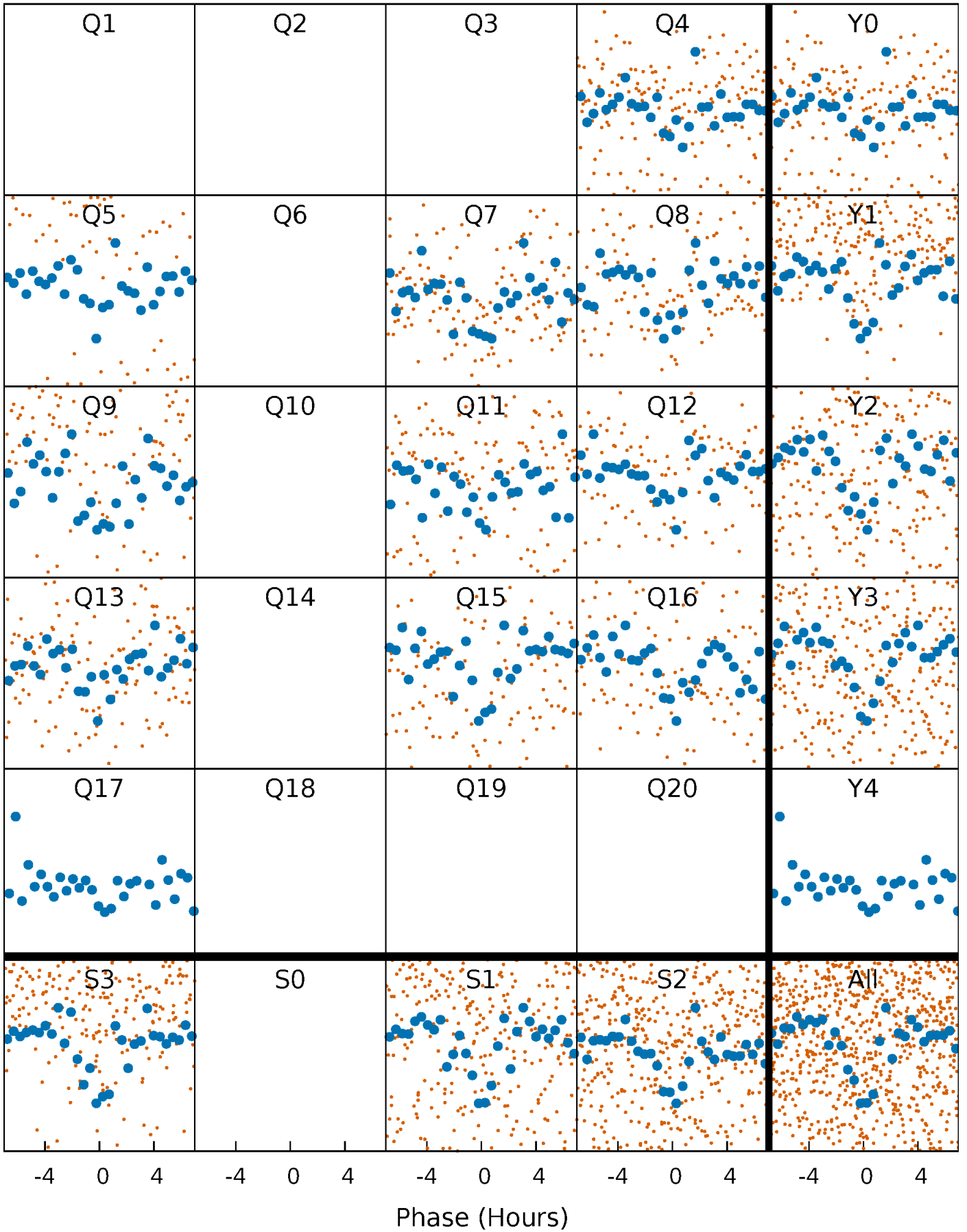


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

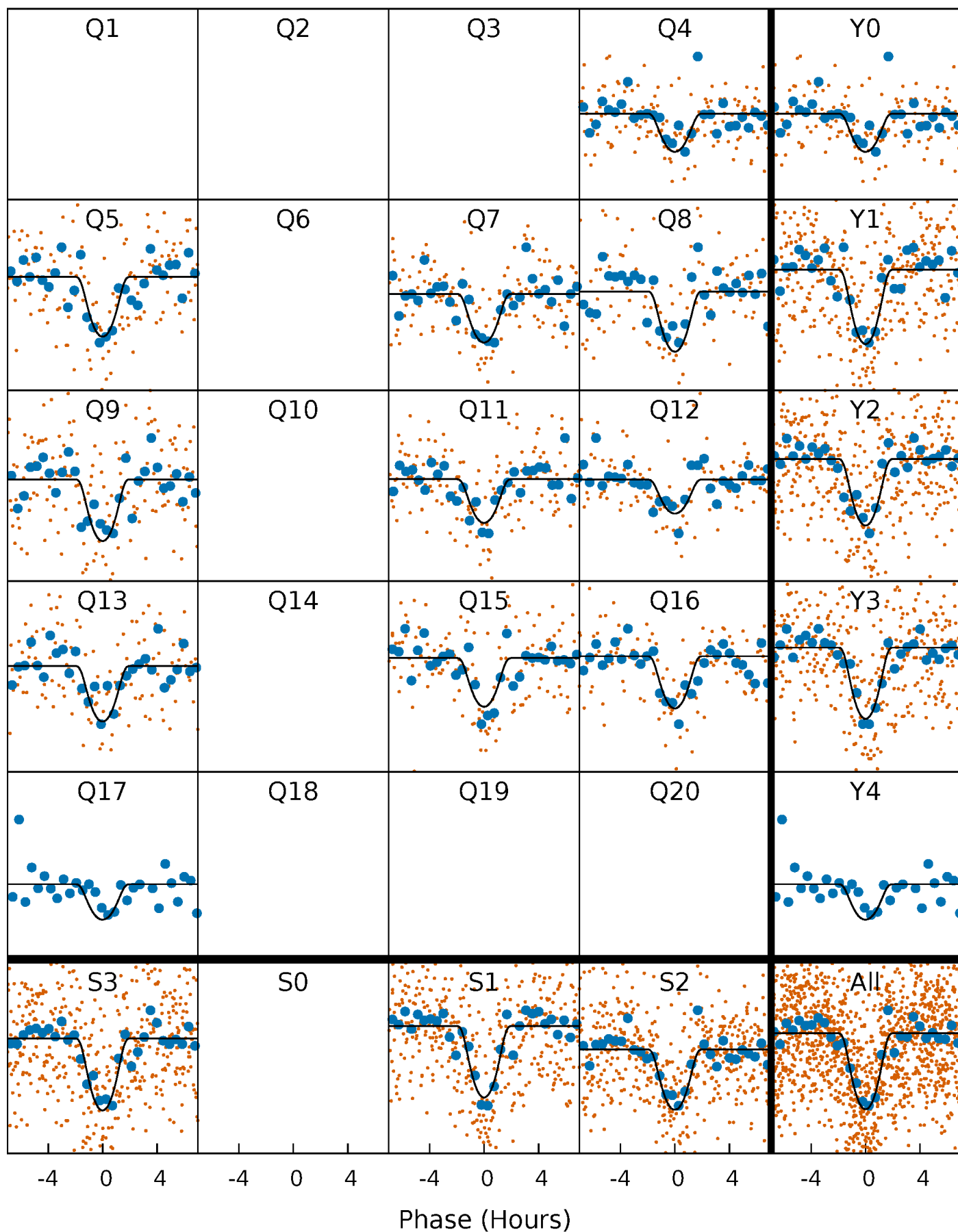
TCE 004172746-01 P= 17.699776 Days  $T_0=140.950261$  (BKJD)





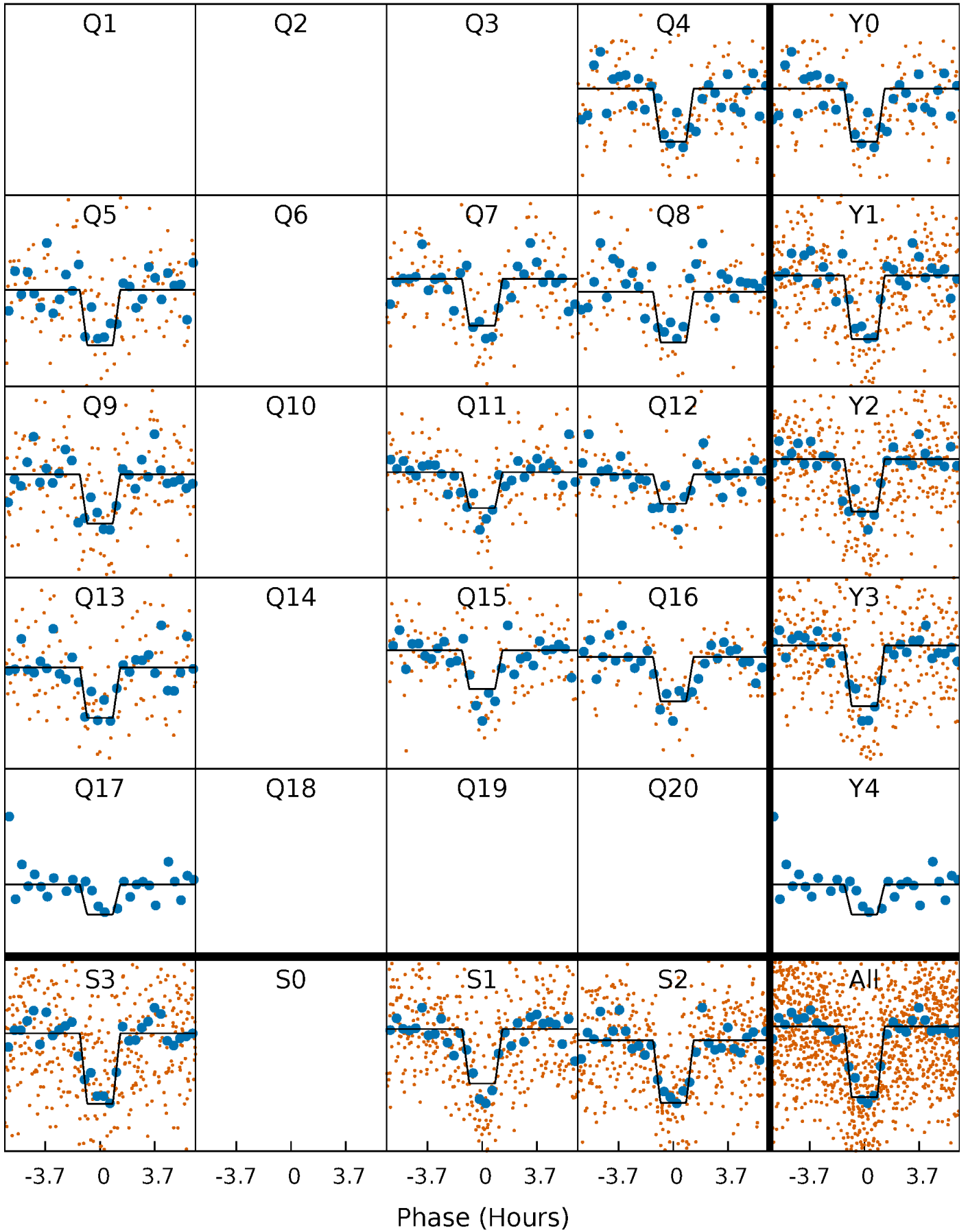
# DV Quarter-Phased Transit Curves

TCE 004172746-01 P= 17.699776 Days  $T_0=140.950261$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

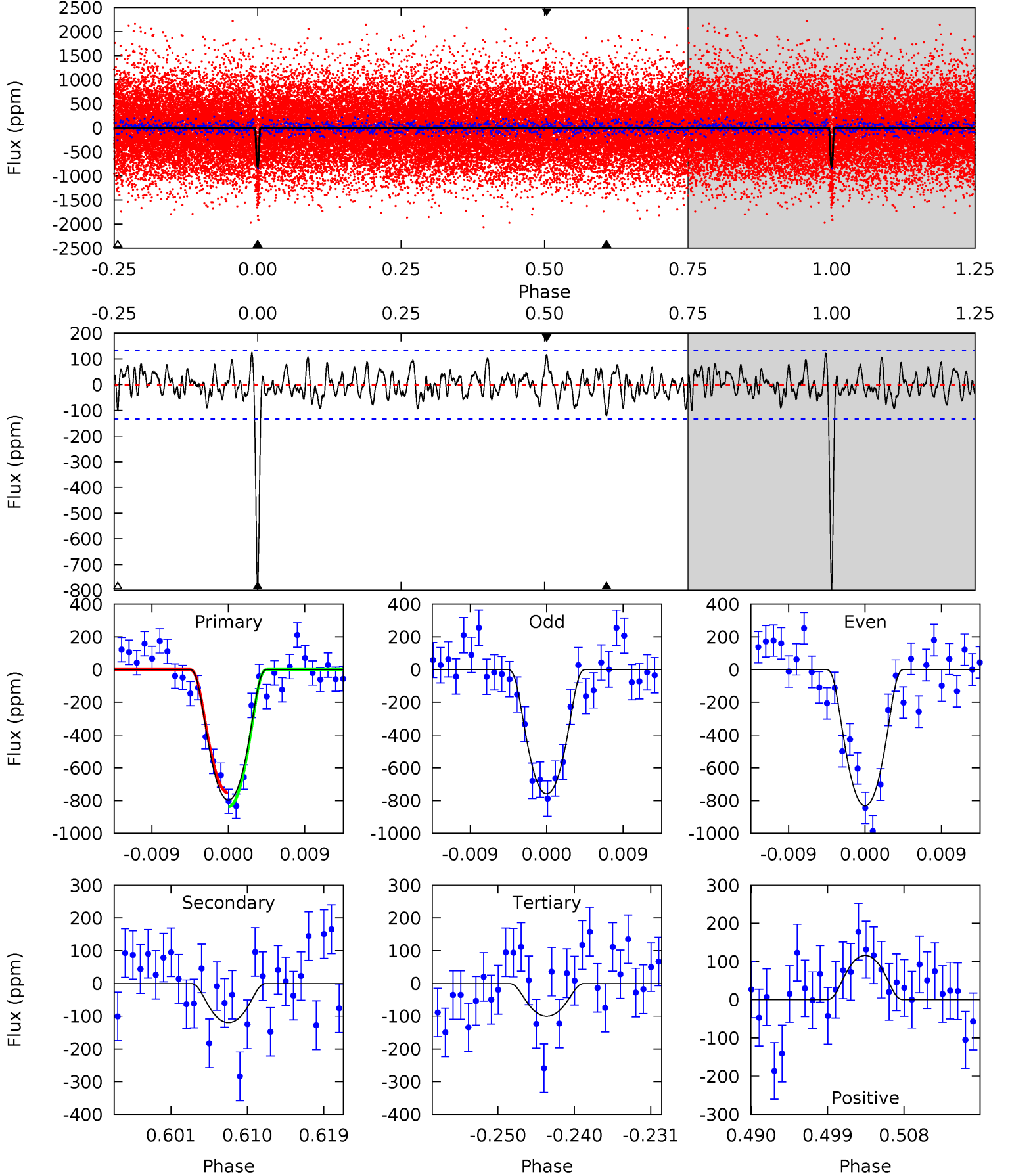
TCE 004172746-01 P= 17.699798 Days  $T_0=140.948201$  (BKJD)



# DV Model-Shift Uniqueness Test

004172746-01, P = 17.699776 Days, E = 140.950261 Days

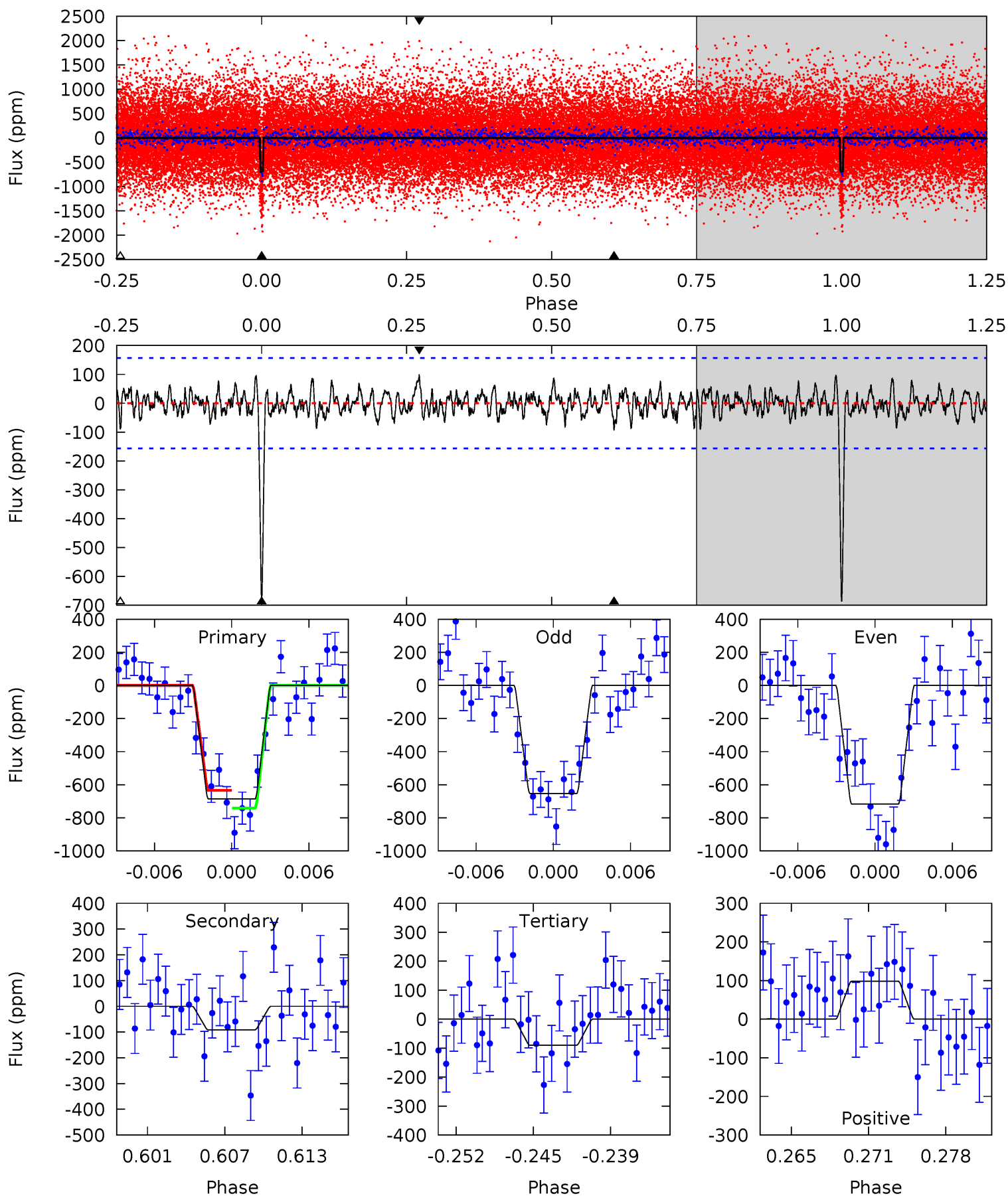
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.1	4.52	3.78	4.37	5.04	2.60	1.54	26.3	25.7	0.74	0.15	1.39	0.98	0.13	1.60



# Alt Model-Shift Uniqueness Test

004172746-01, P = 17.699798 Days, E = 140.948201 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
22.4	2.99	2.93	3.21	5.11	2.72	1.04	19.5	19.2	0.06	-0.22	1.04	0.97	0.13	1.76



### Stellar Parameters For KIC 004172746

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4807^{+172}_{-172}$	$4.583^{+0.041}_{-0.045}$	$0.080^{+0.250}_{-0.300}$	$0.742^{+0.061}_{-0.061}$	$0.769^{+0.061}_{-0.068}$	$2.653^{+0.557}_{-0.422}$
	+4%/-4%	+1%/-1%	+312%/-375%	+8%/-8%	+8%/-9%	+21%/-16%
Source	KIC0	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 004172746-01 / KOI 2531.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-120 \pm 27$	$3.26^{+1.39}_{-1.34}$	$732^{+29}_{-30}$	$3087^{+566}_{-315}$	$91^{+180}_{-48}$
Alt.	$-92 \pm 31$	$2.29^{+1.29}_{-1.20}$	$732^{+31}_{-31}$	$3257^{+957}_{-428}$	$138^{+459}_{-88}$

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

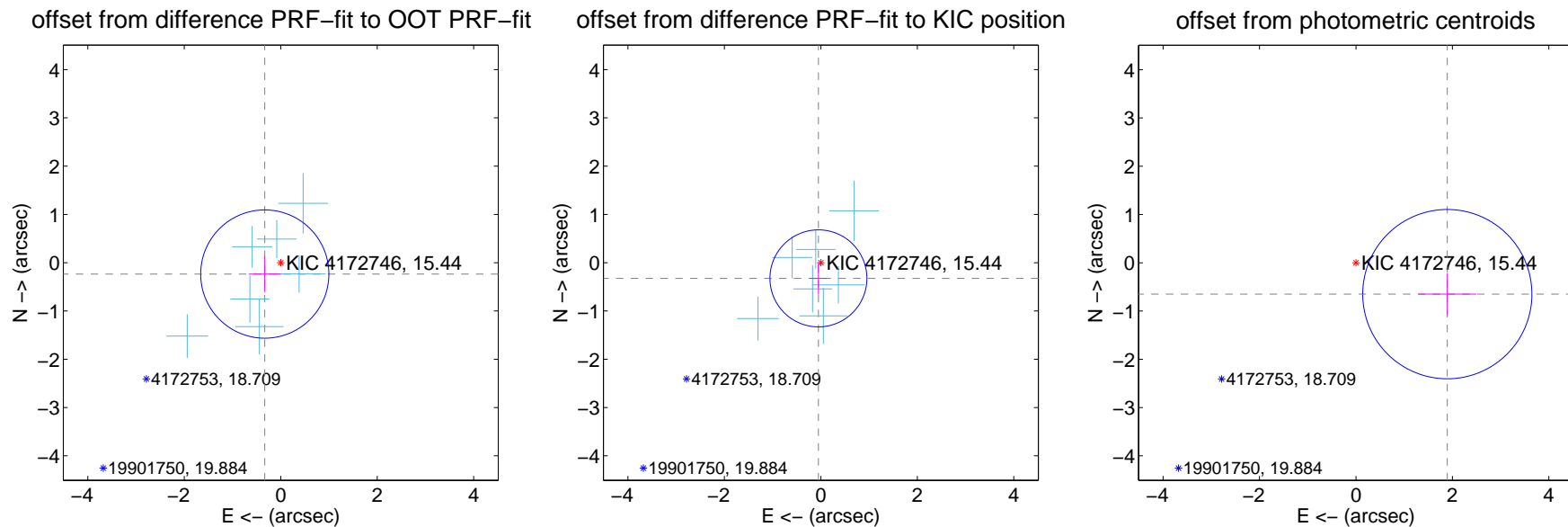
## DV Centroid Data

Supplemental centroid analysis for 004172746-01. Kepler magnitude: 15.44. Transit SNR 18.81

There are 9 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.54 arcsec

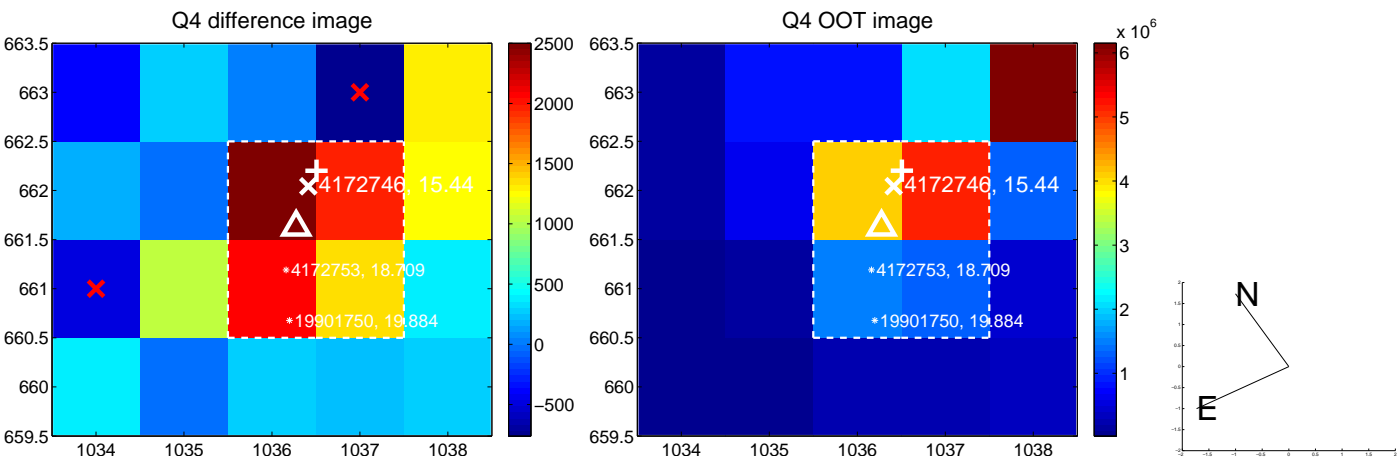
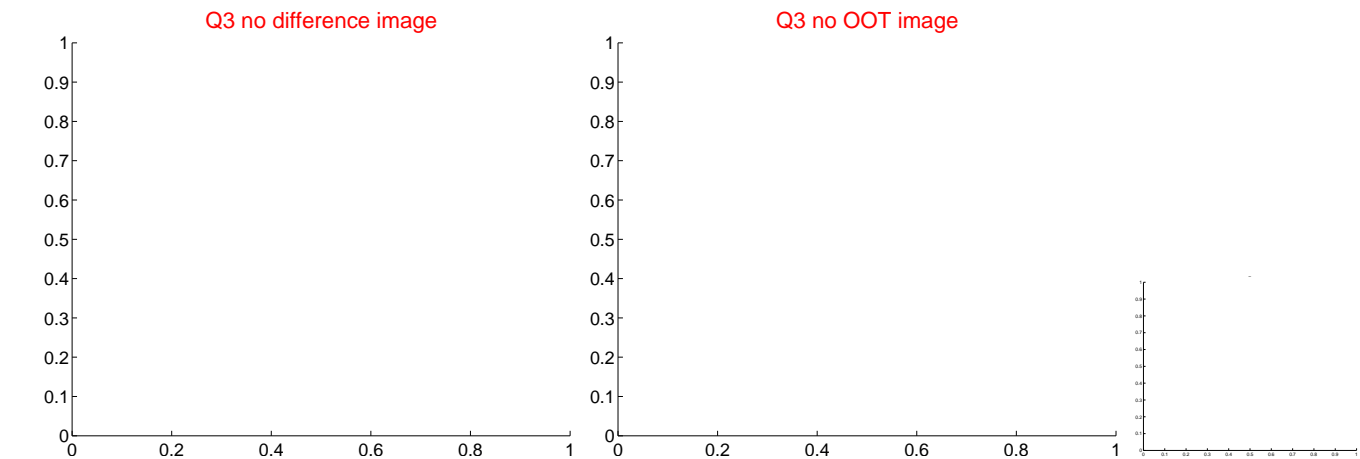
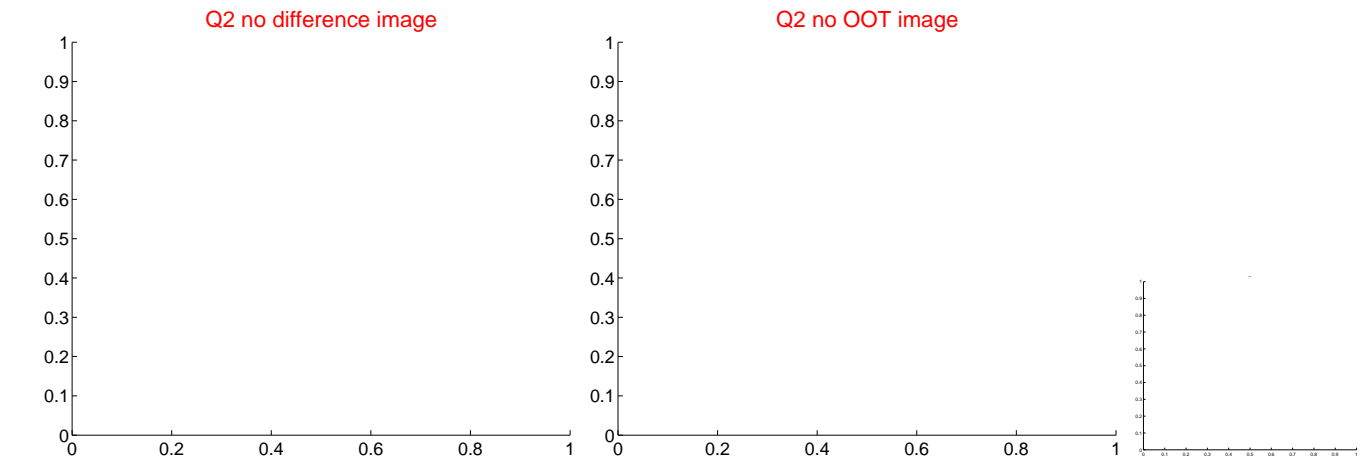
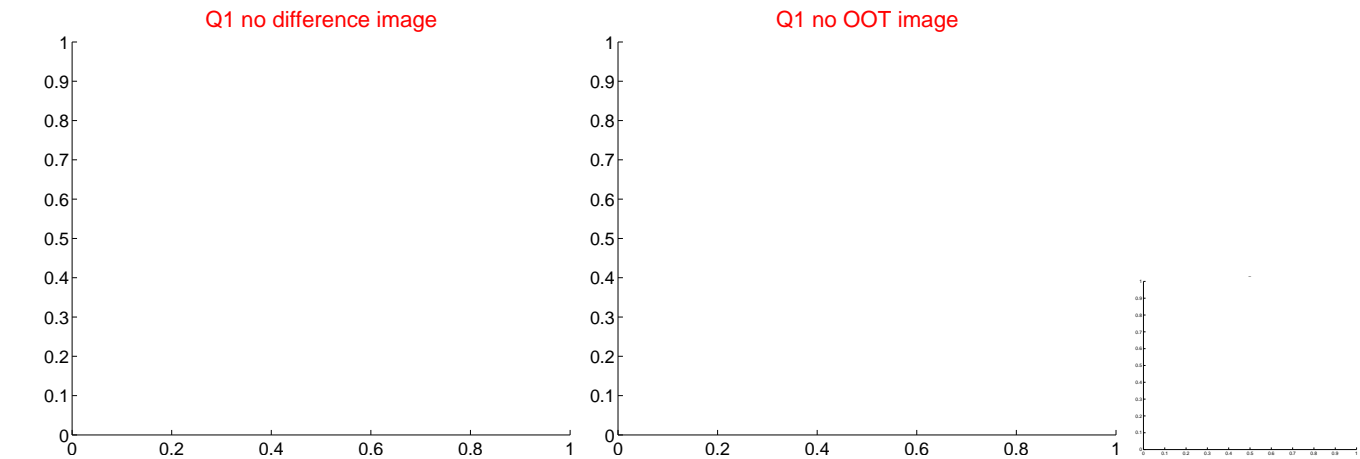
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.406 \pm 0.443$	0.92	$0.331 \pm 0.333$	$-0.235 \pm 0.372$
PRF-fit source offset from KIC position	$0.329 \pm 0.335$	0.98	$0.051 \pm 0.170$	$-0.325 \pm 0.335$
photometric centroid source offset	$2.00 \pm 0.58$	<b>3.43</b>	$-1.89 \pm 0.60$	$-0.65 \pm 0.43$



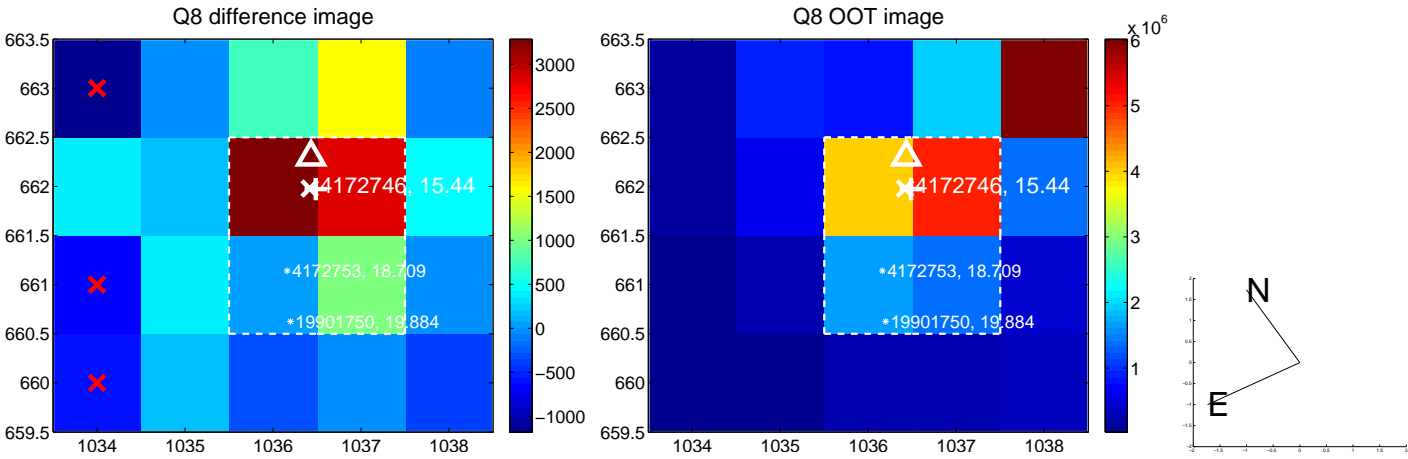
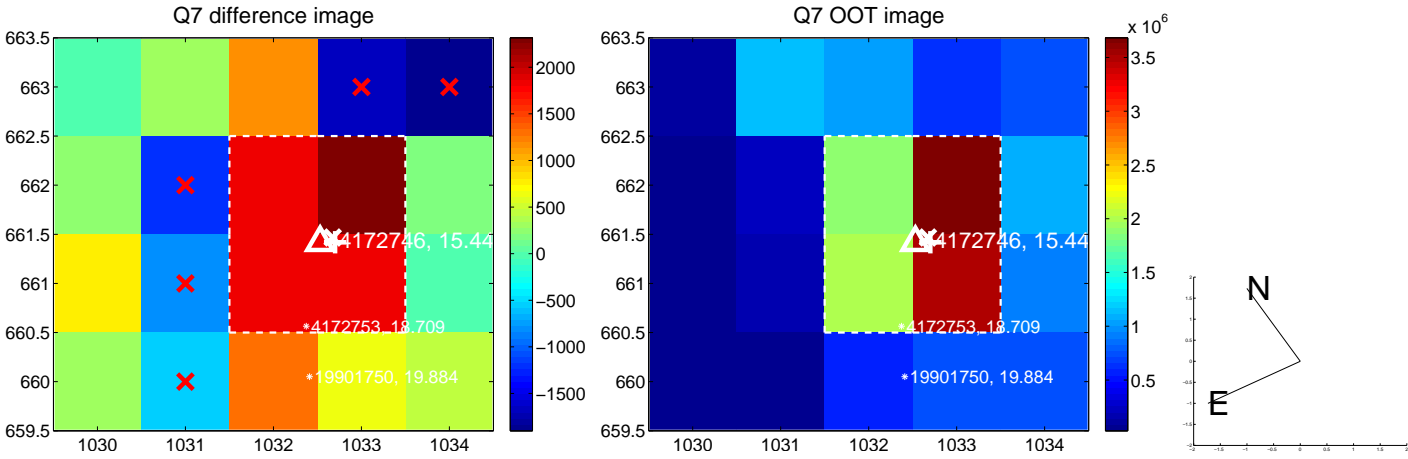
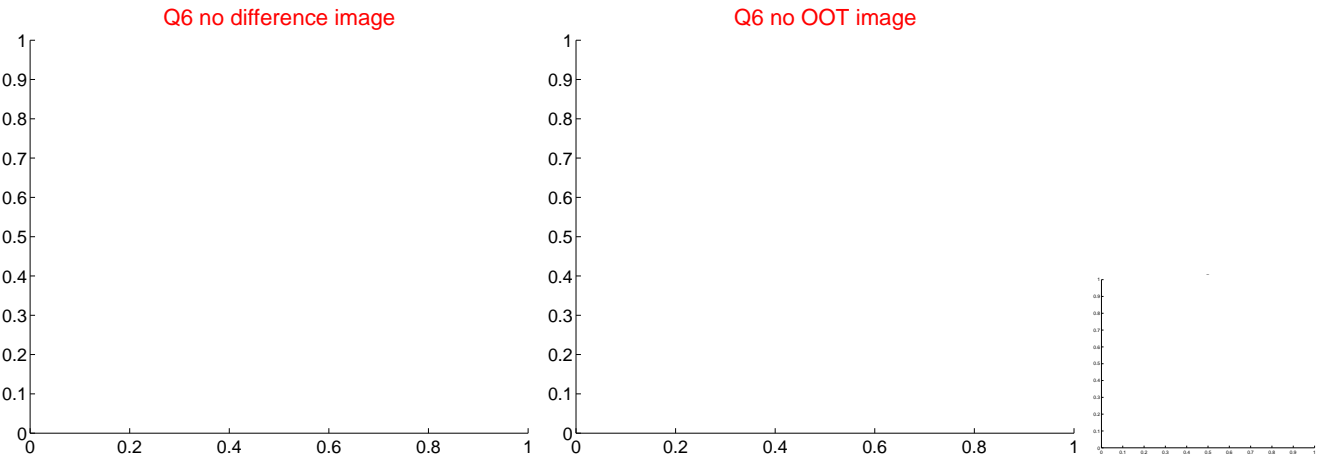
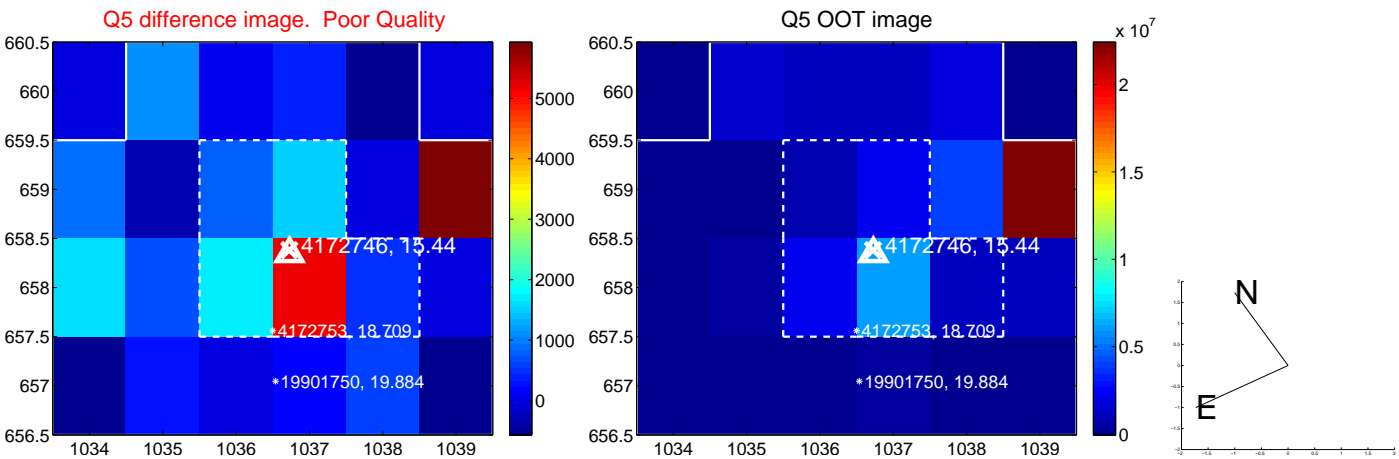
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



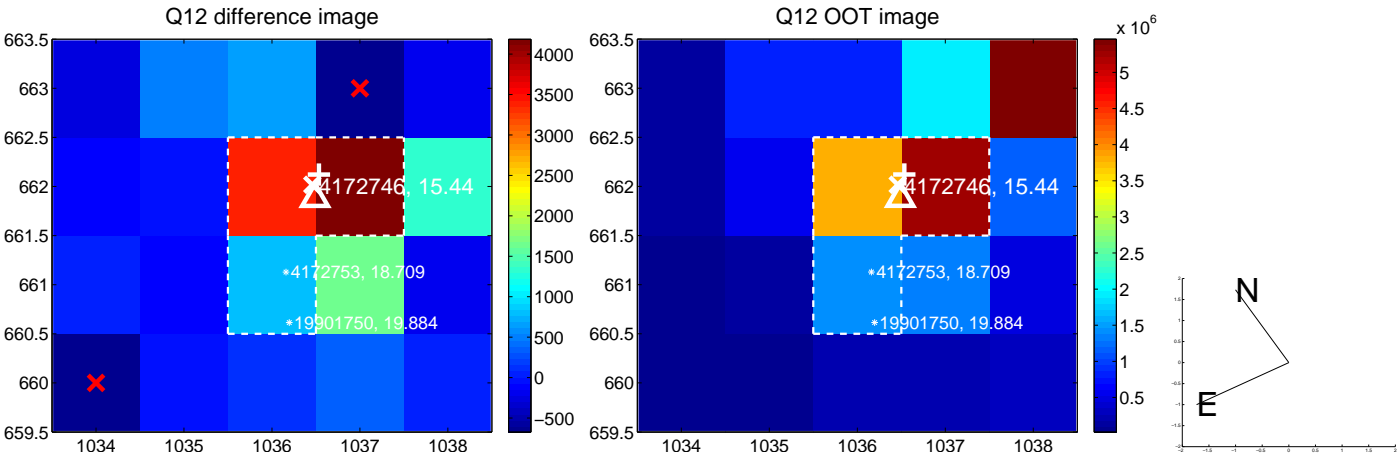
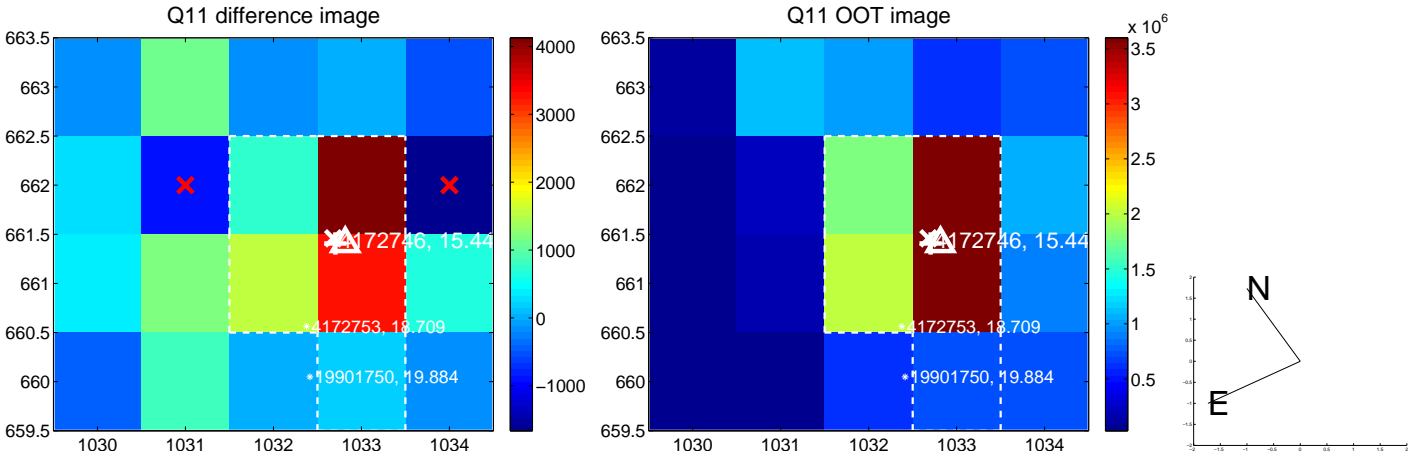
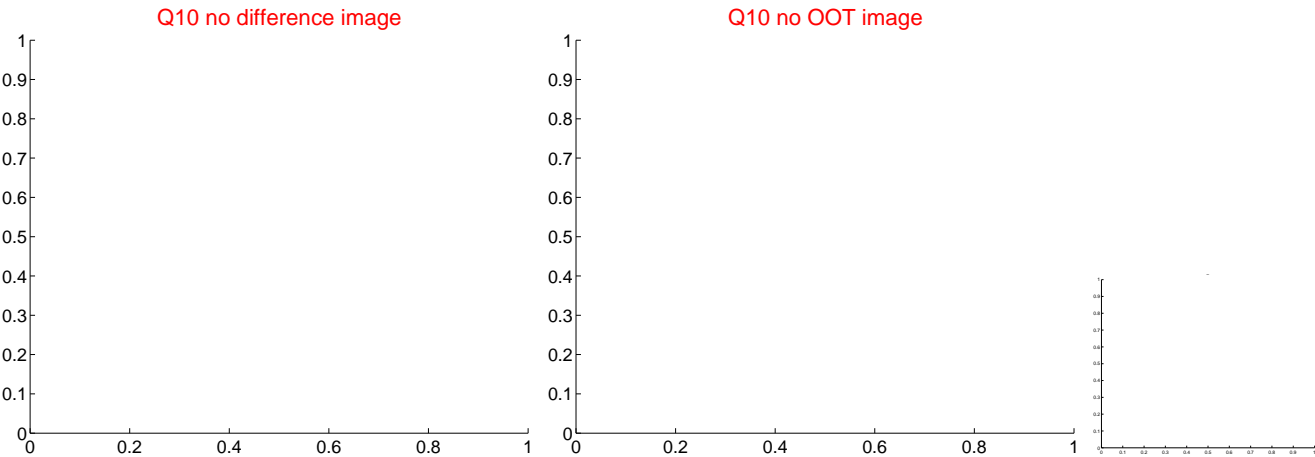
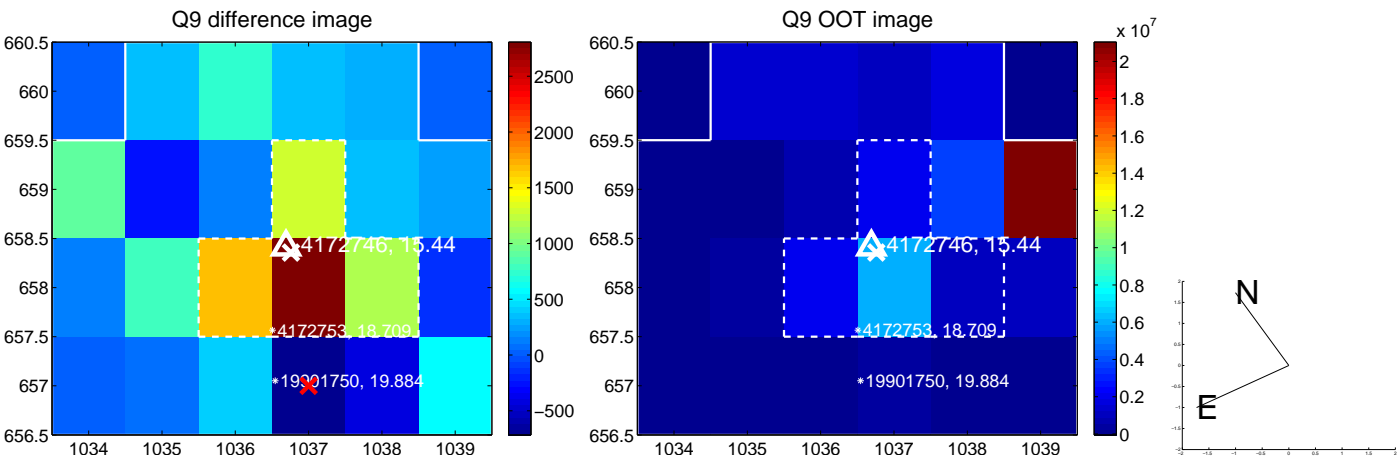
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



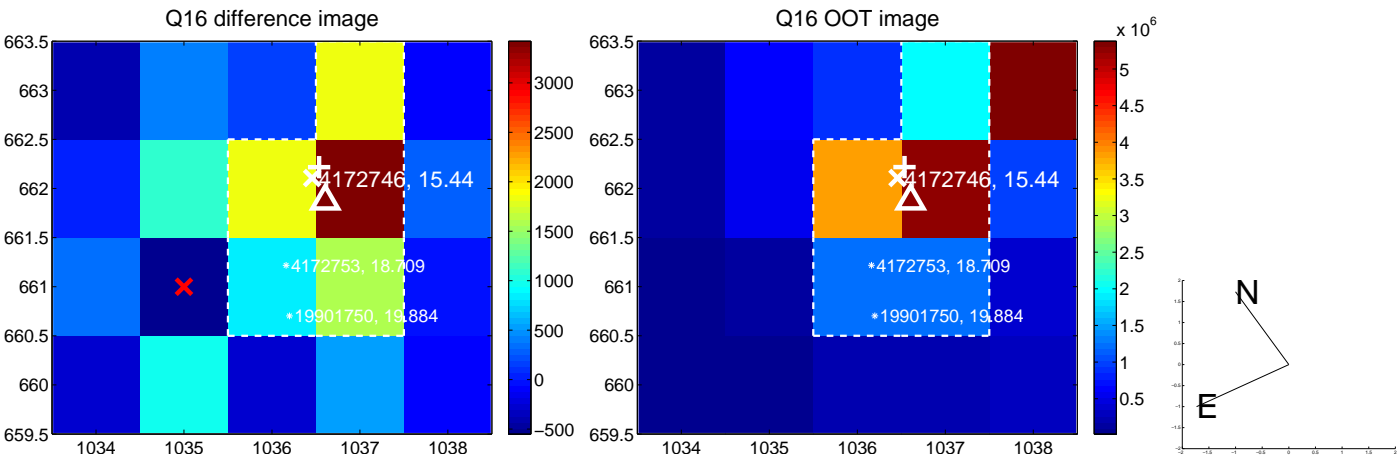
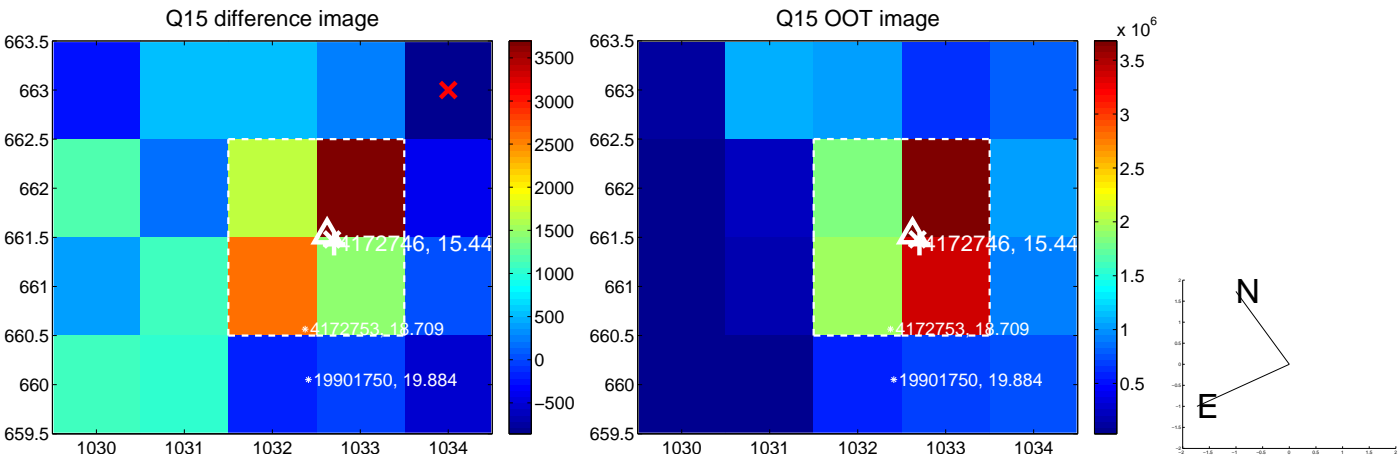
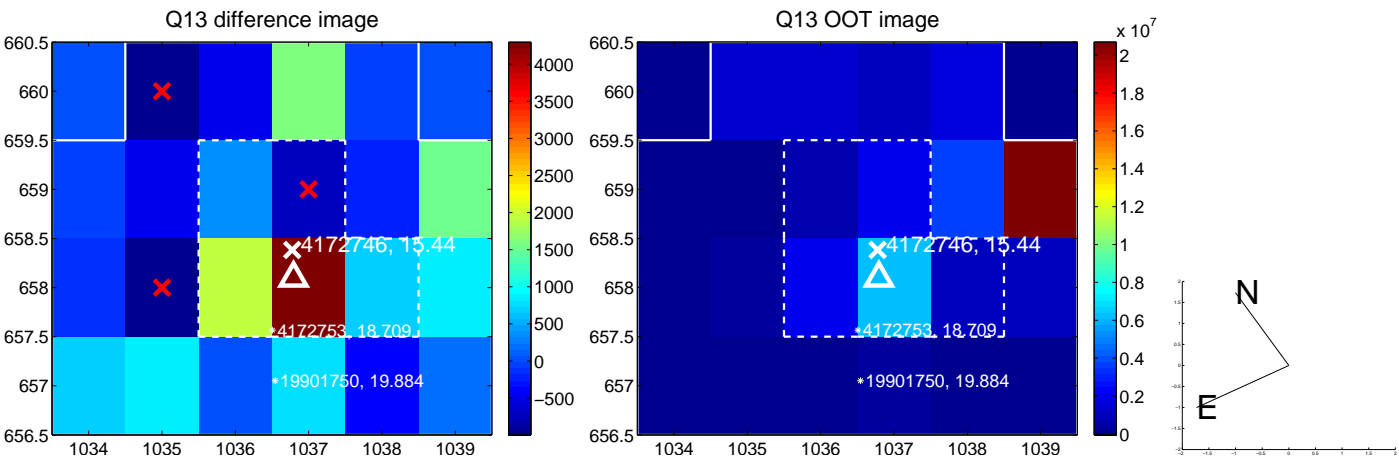
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



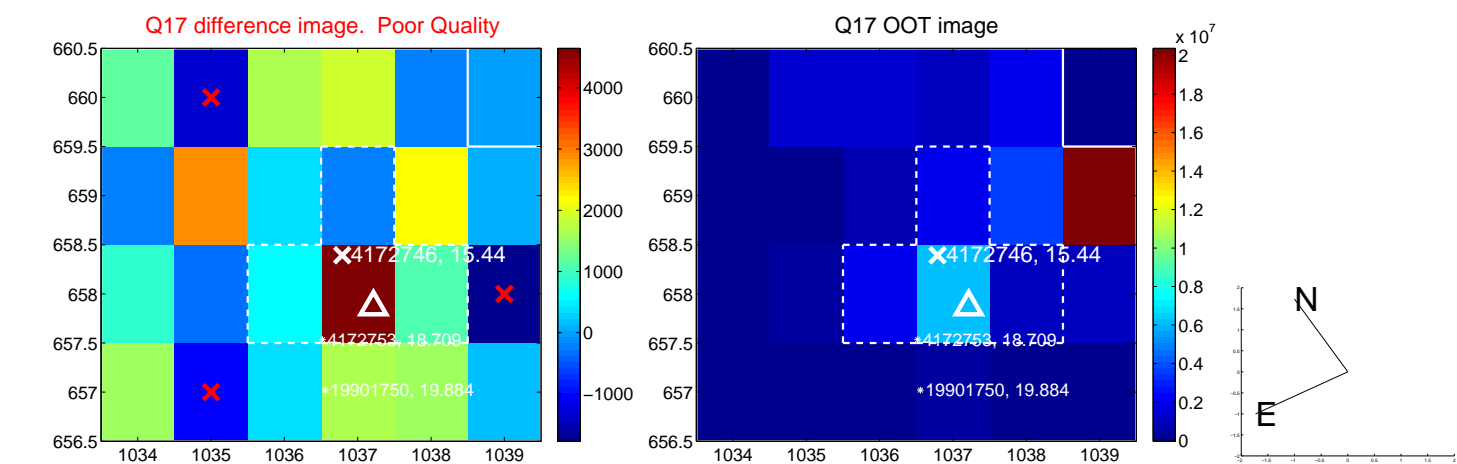
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



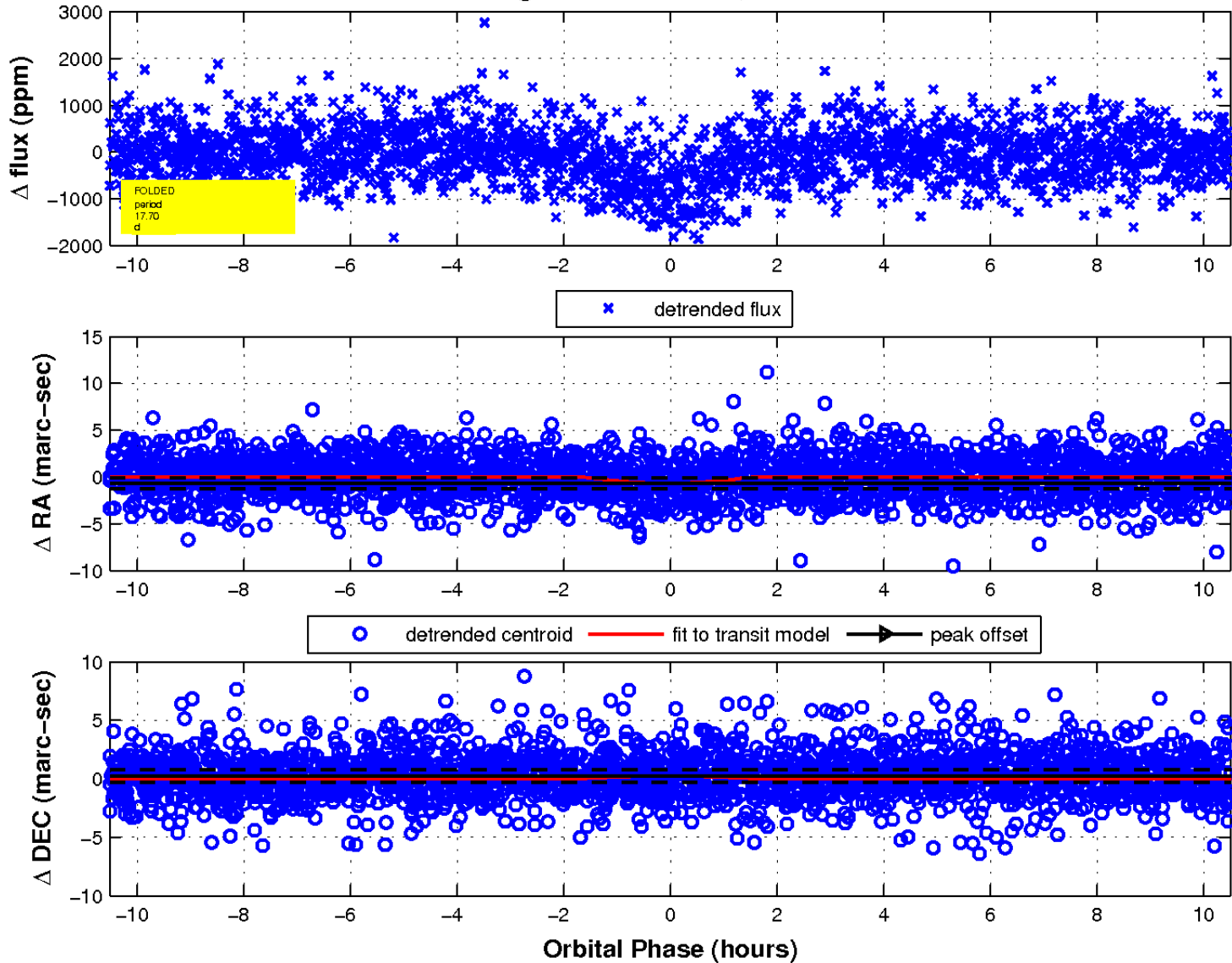
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

