

# KIC 009021075

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009021075-01	OBS	4733.01	7.281097	132.761408	324.3	2.590	10.6	10.7	0.79	5008	1.73	72.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009021075-01	OBS	PC	0.94	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.

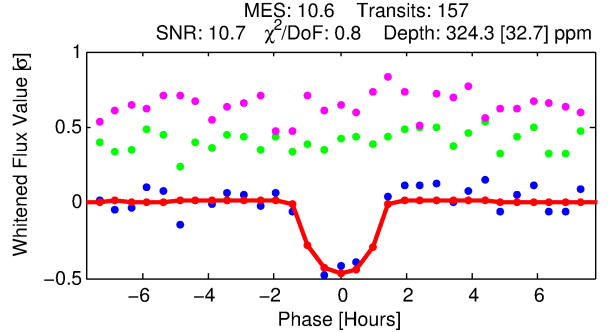
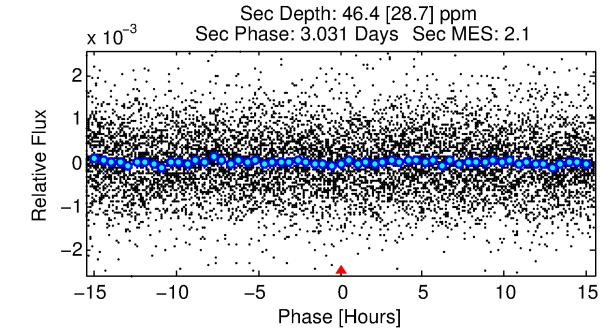
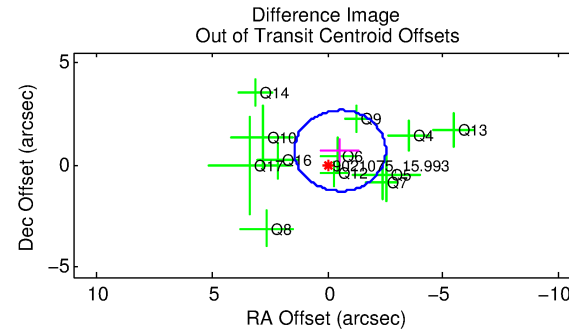
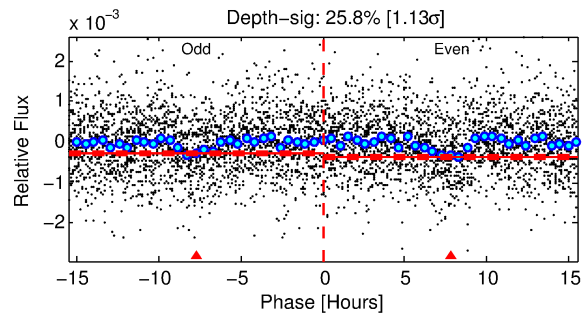
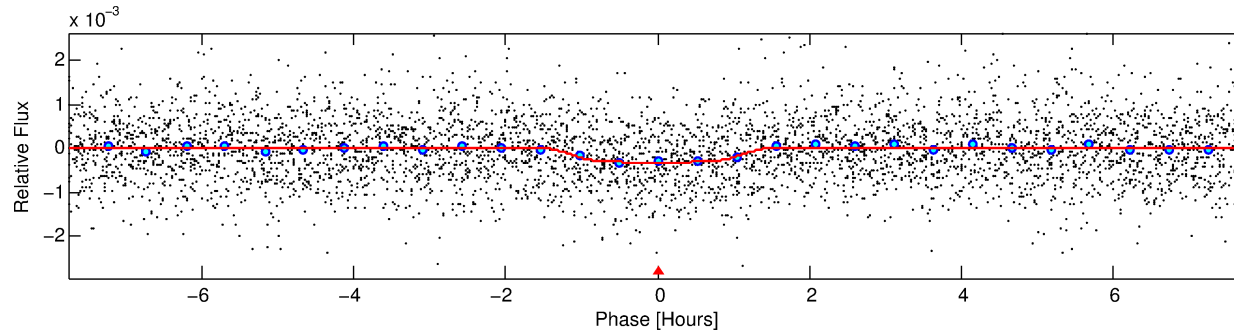
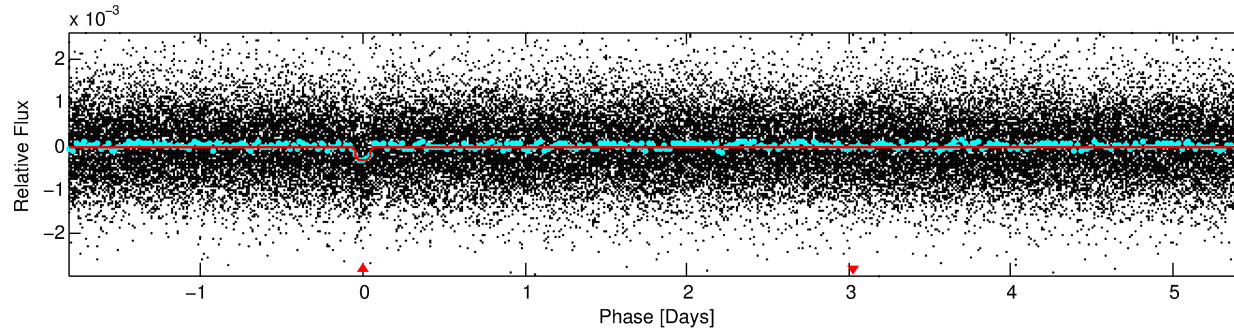
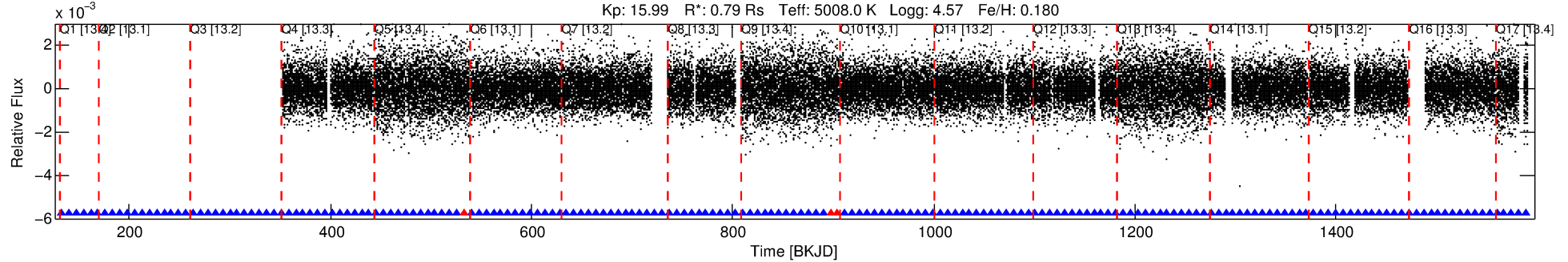
## Ephemeris Match Information For 009021075-01

No Significant Match Found

# DV One-Page Summary

KIC: 9021075 Candidate: 1 of 1 Period: 7.281 d  
KOI: K04733.01 Corr: 0.939

Kp: 15.99 R\*: 0.79 Rs Teff: 5008.0 K Logg: 4.57 Fe/H: 0.180



## DV Fit Results:

Period = 7.28110 [0.00005] d  
Epoch = 132.7614 [0.0062] BKJD  
Rp/R\* = 0.0201 [0.0126]  
a/R\* = 10.37 [25.05]  
b = 0.90 [0.53]  
Seff = 72.38 [14.22]  
Teq = 744 [37] K  
Rp = 1.73 [1.09] Re  
a = 0.0695 [0.0060] AU  
Ag = 41.13 [57.46] [0.70σ]  
Teffp = 2912 [1019] K [2.13σ]

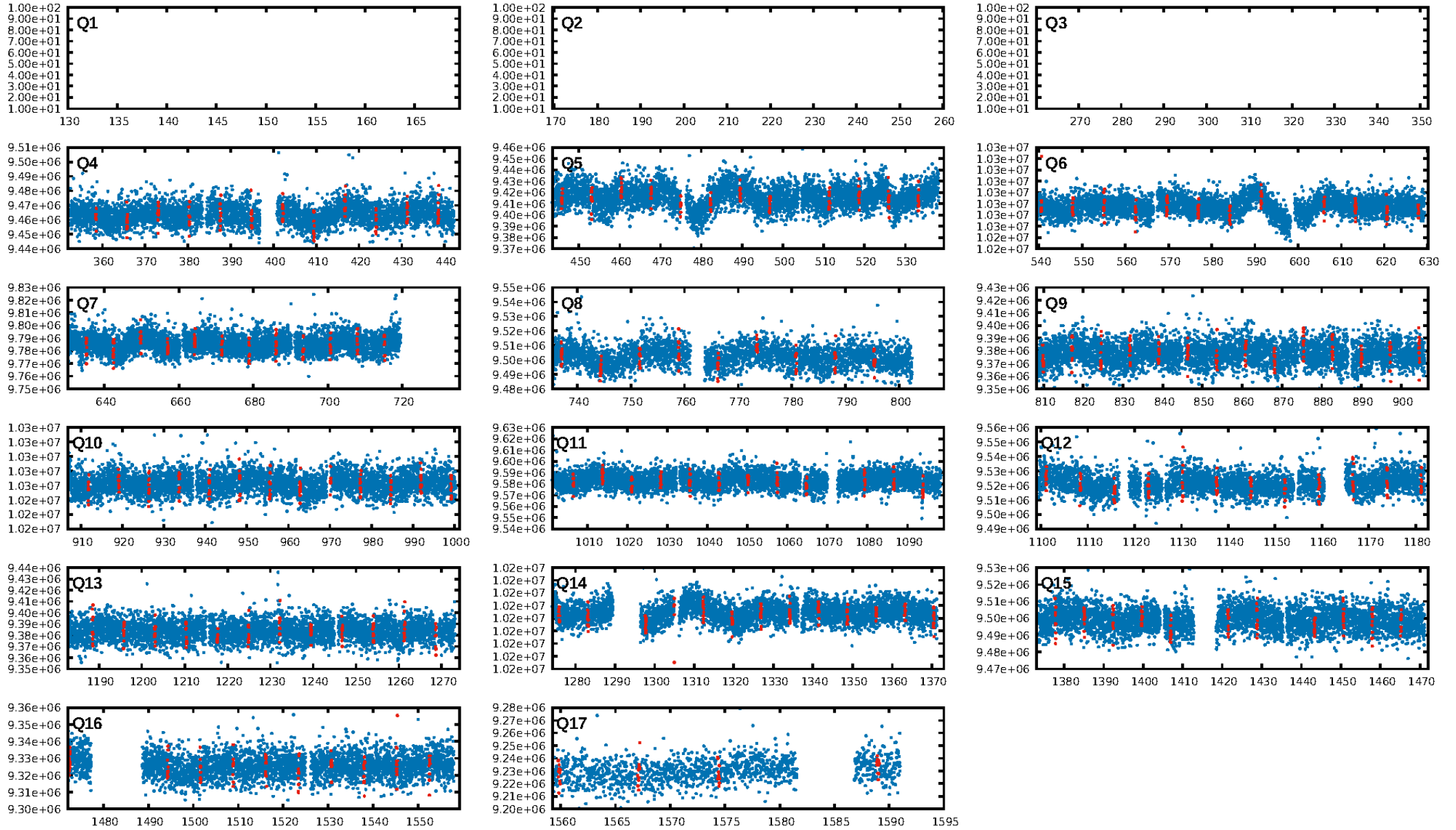
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.42e-26  
RollingBand-fgt: 0.98 [150/153]  
GhostDiagnostic-chr: 1.836  
Centroid-sig: 3.8%  
Centroid-so: 1.800 arcsec [1.30σ]  
OotOffset-rm: 0.870 arcsec [1.32σ]  
KicOffset-rm: 0.889 arcsec [1.20σ]  
OotOffset-st: 3/1/4/4 [12]  
KicOffset-st: 3/1/4/4 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 1.00 [14/14]

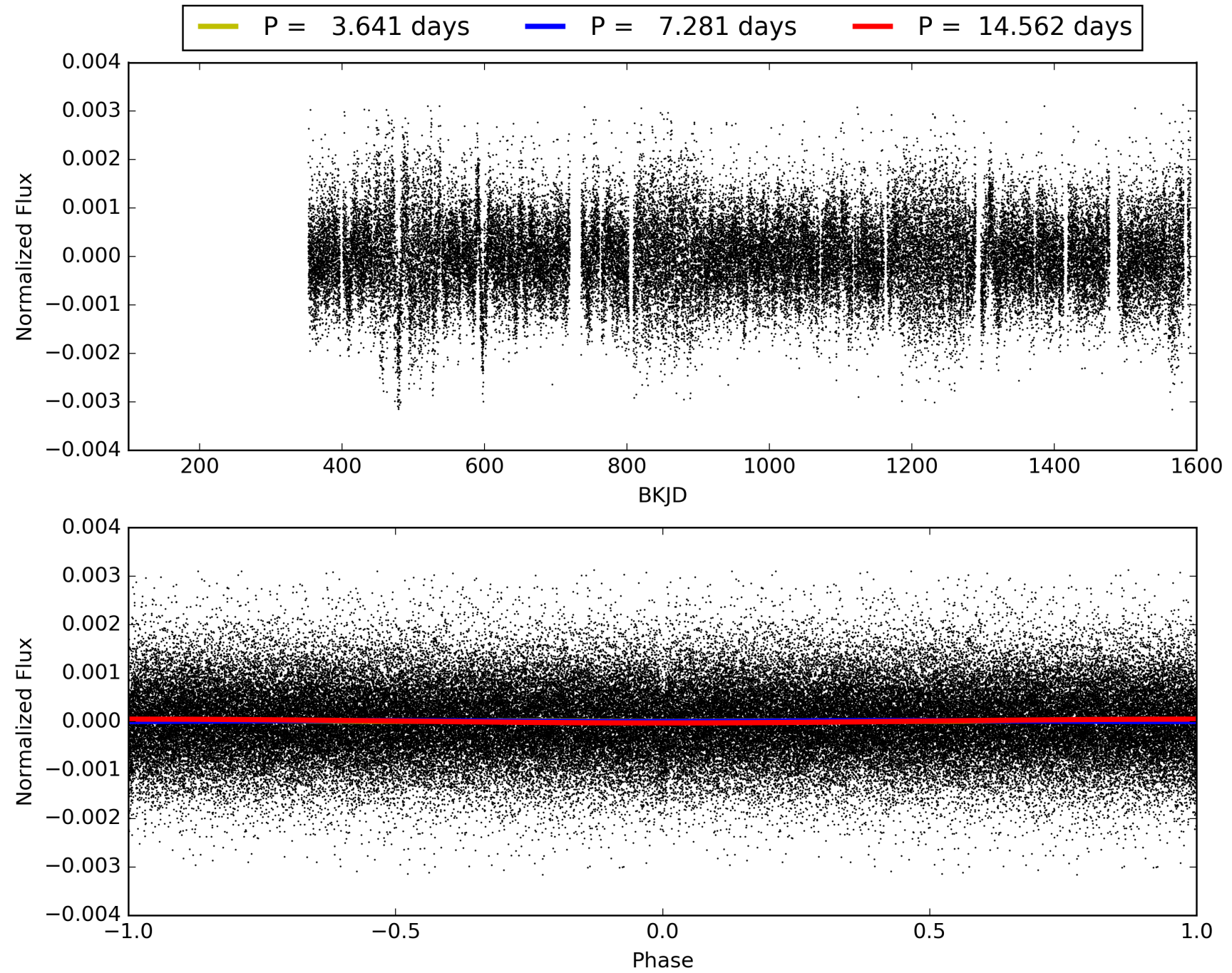
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:45:06 Z

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

# TCE 009021075-01, PDC Light Curves

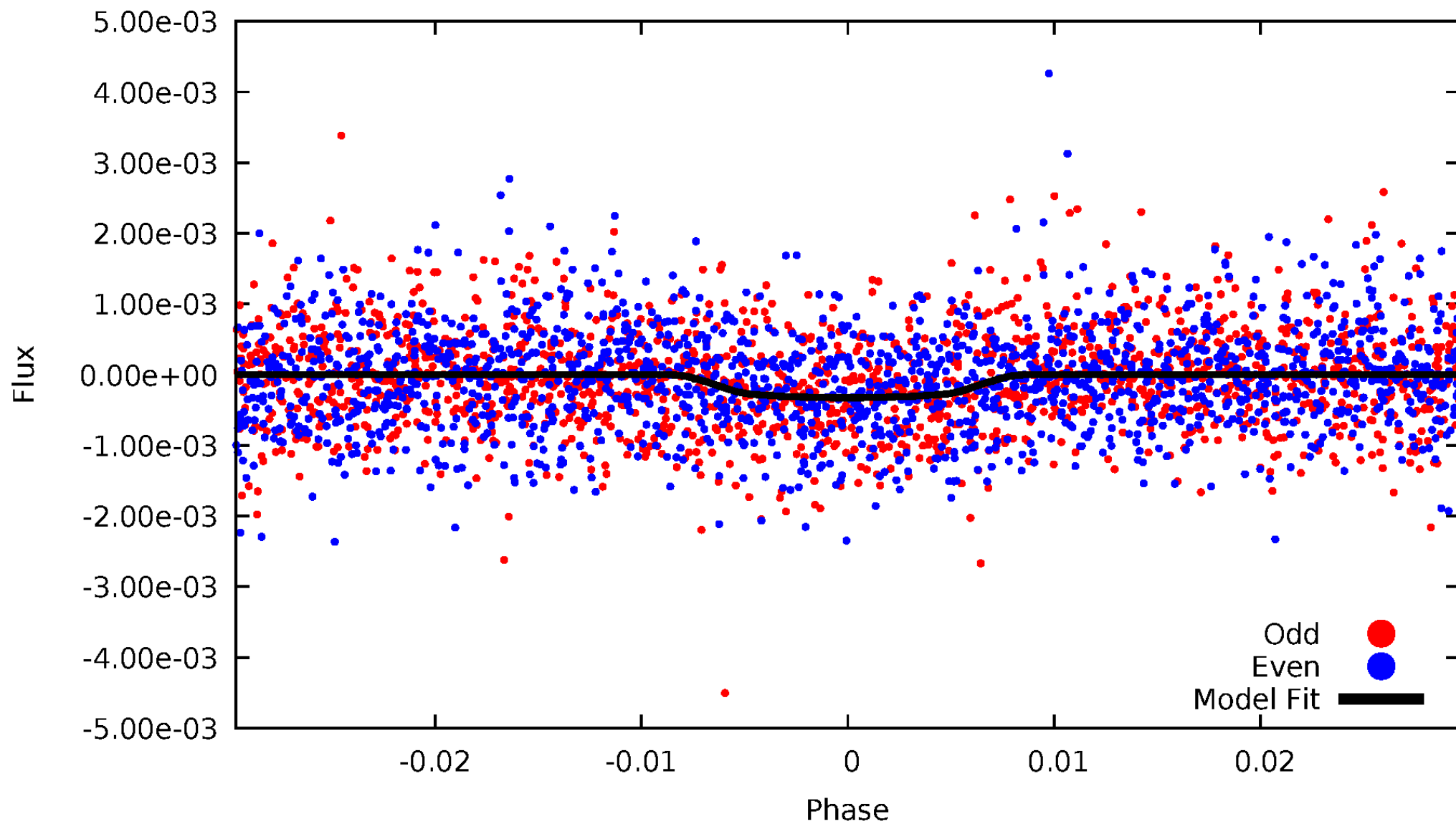


TCE 009021075-01



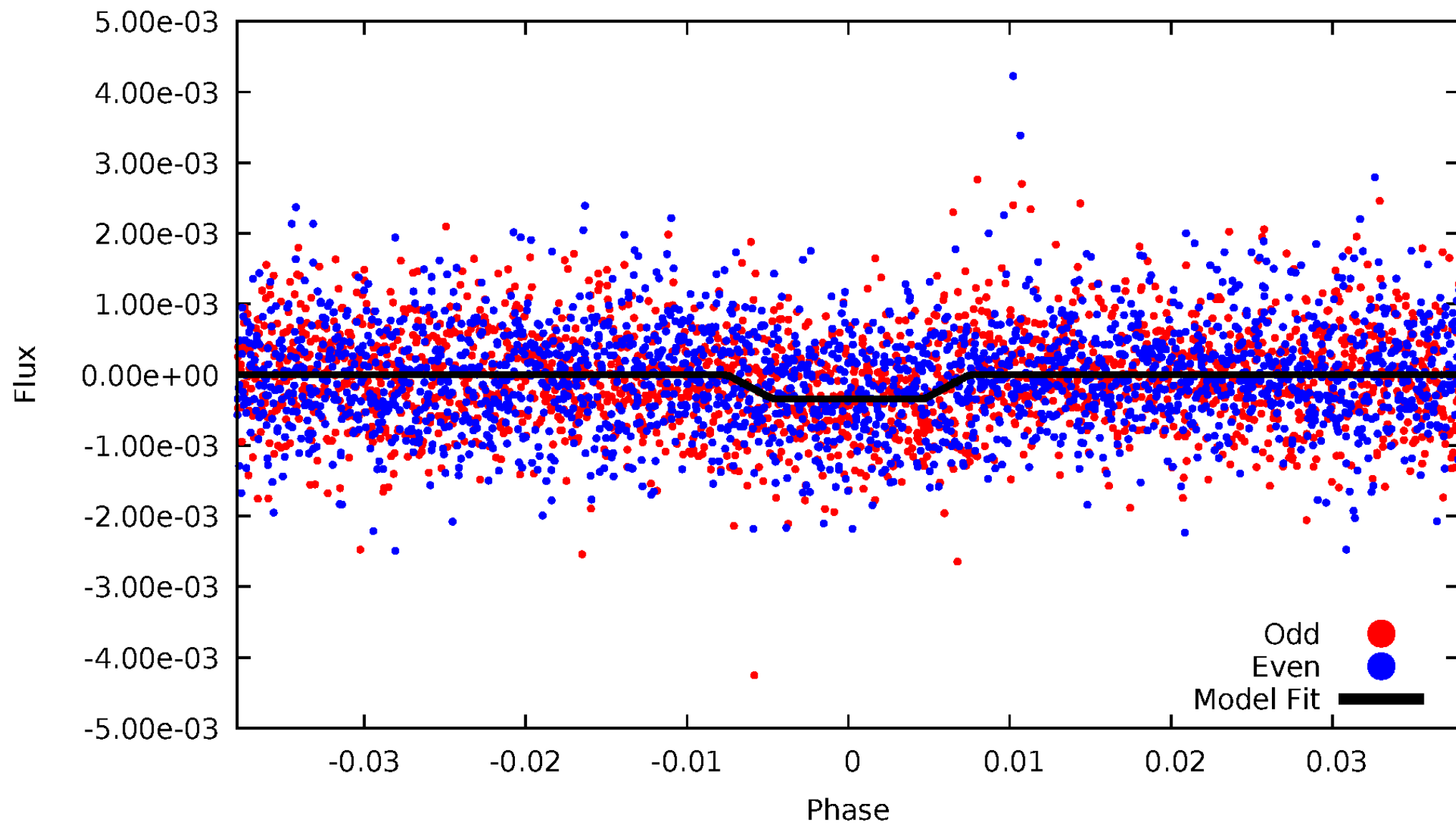
# DV Odd/Even

TCE 009021075-01



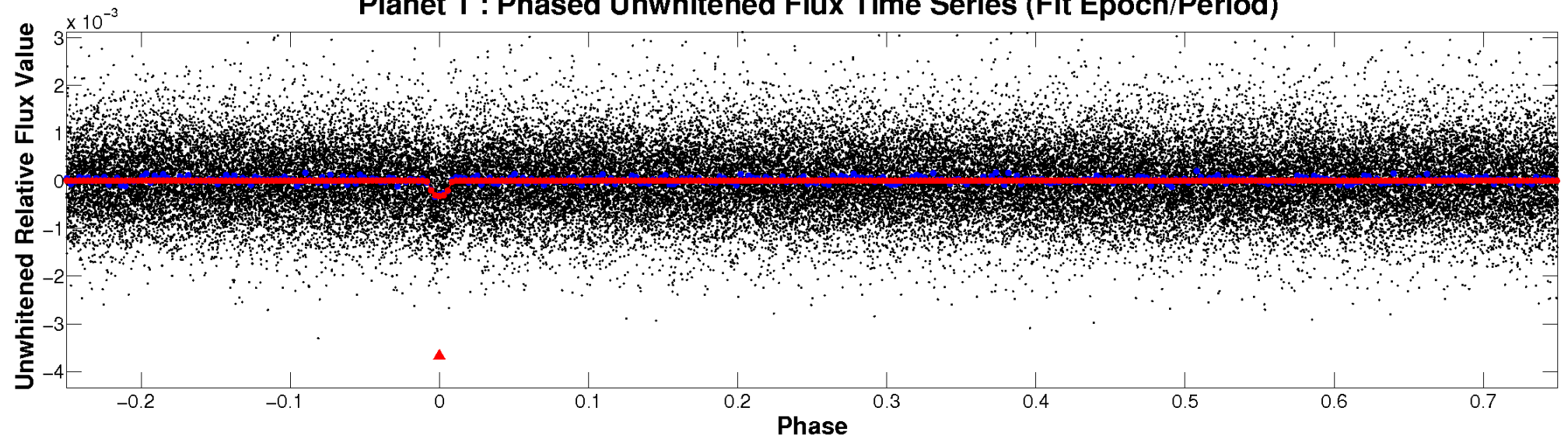
# ALT Odd/Even

TCE 009021075-01

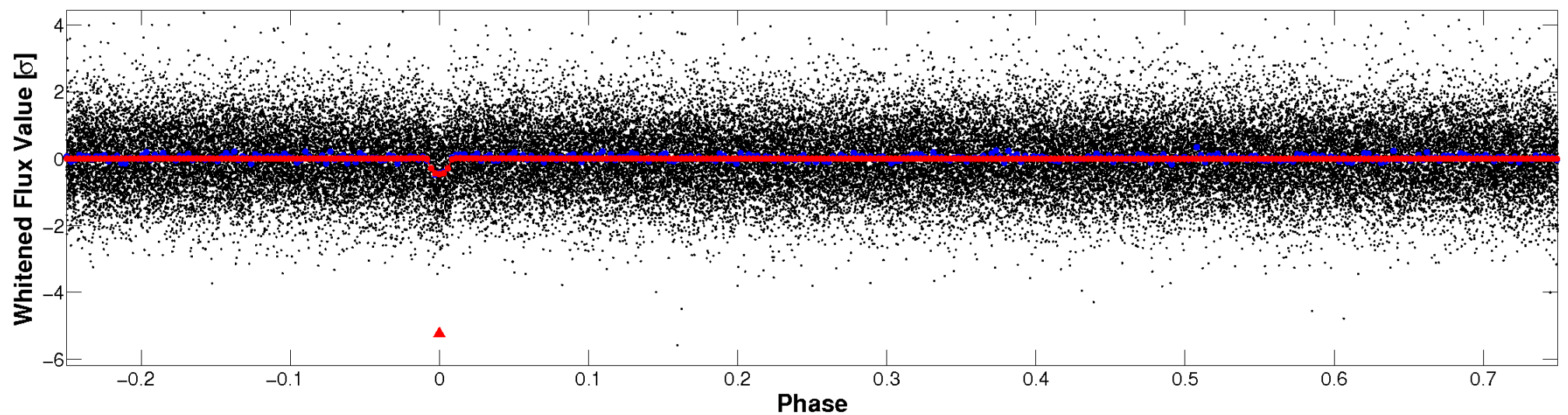


# Non-Whitened Vs. Whitened Light Curve

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

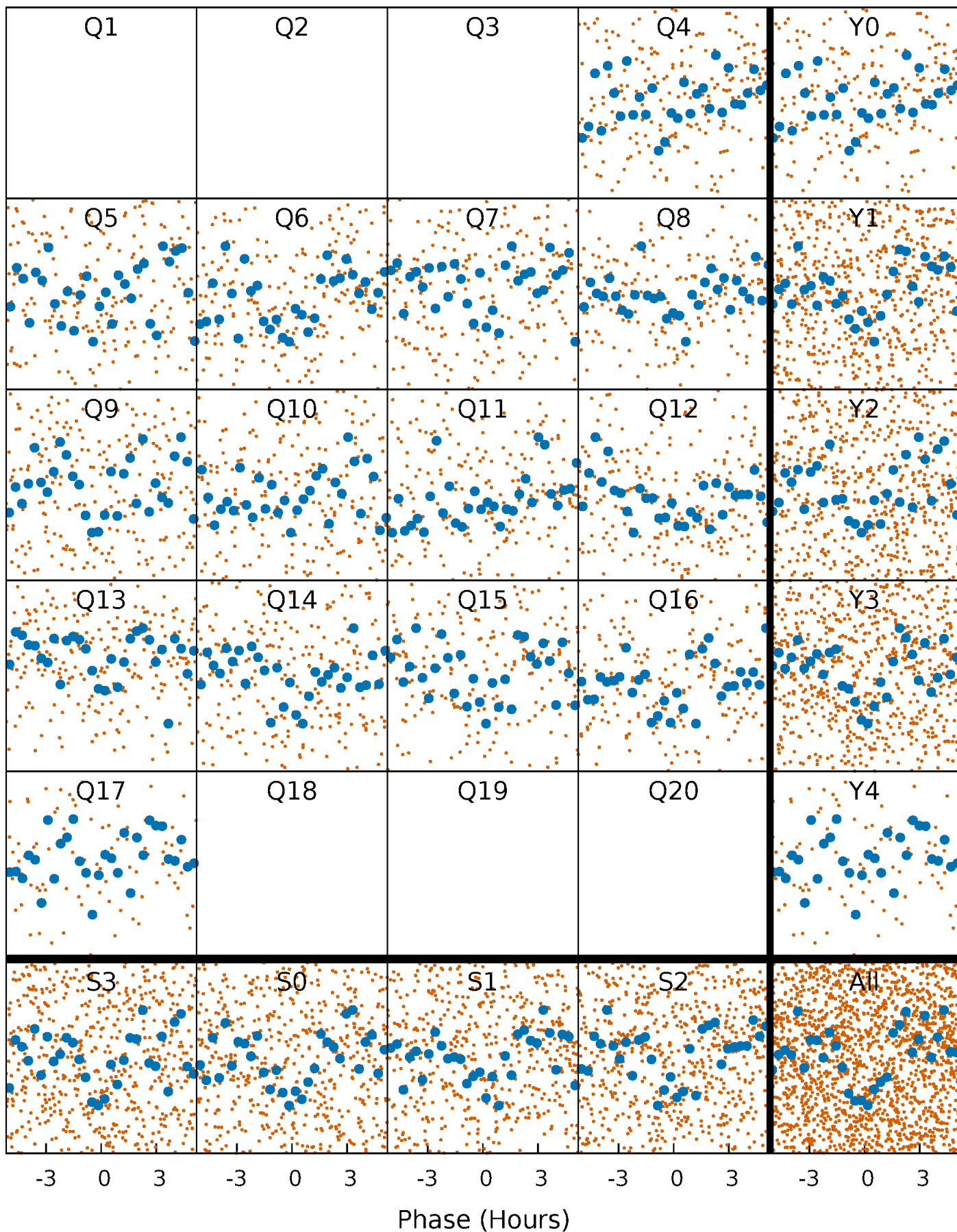


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



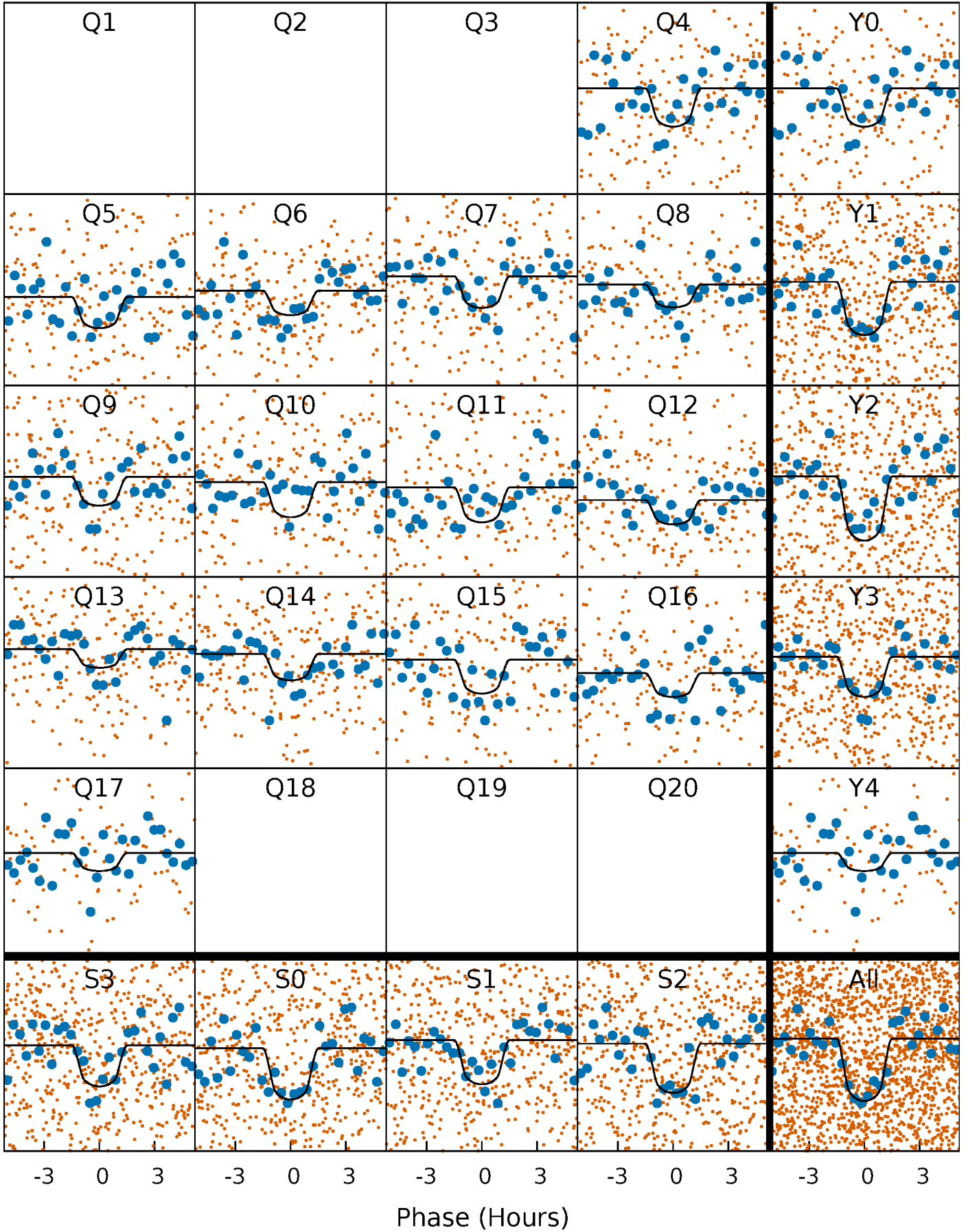
# PDC Quarter-Phased Transit Curves

TCE 009021075-01 P= 7.281097 Days  $T_0=132.761408$  (BKJD)



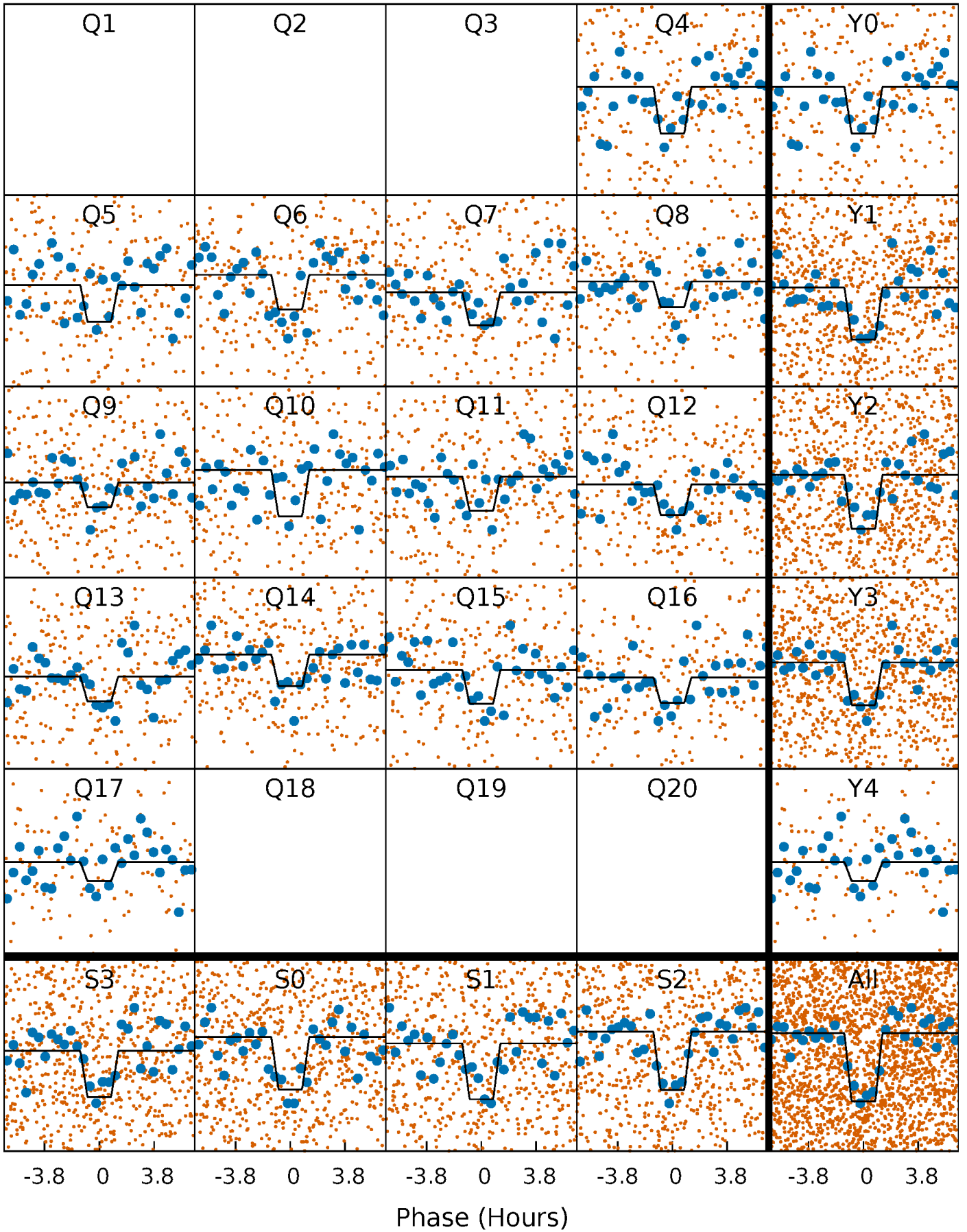
# DV Quarter-Phased Transit Curves

TCE 009021075-01   P= 7.281097 Days    $T_0=132.761408$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

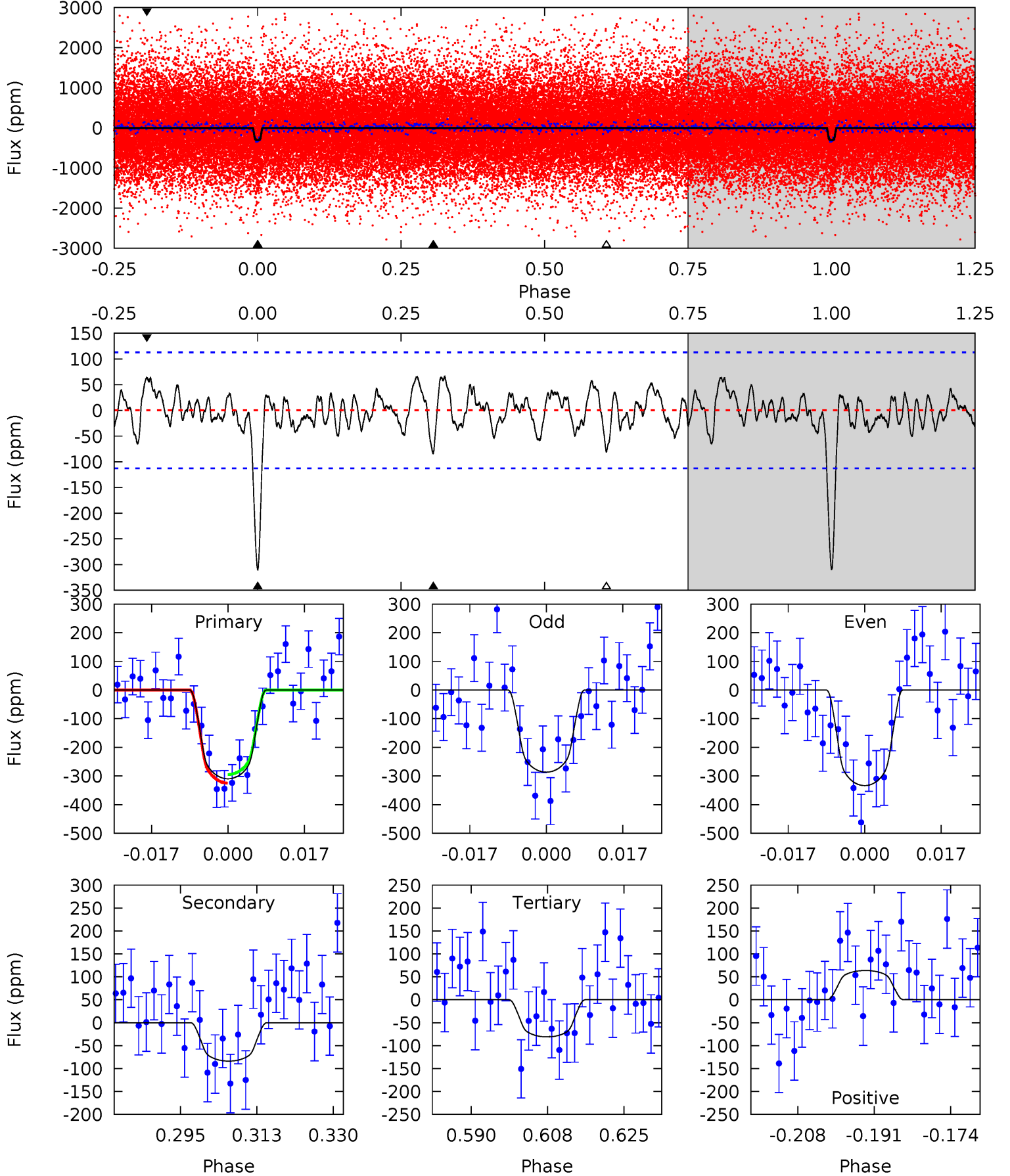
TCE 009021075-01 P= 7.281122 Days  $T_0=132.756557$  (BKJD)



# DV Model-Shift Uniqueness Test

009021075-01, P = 7.281097 Days, E = 132.761408 Days

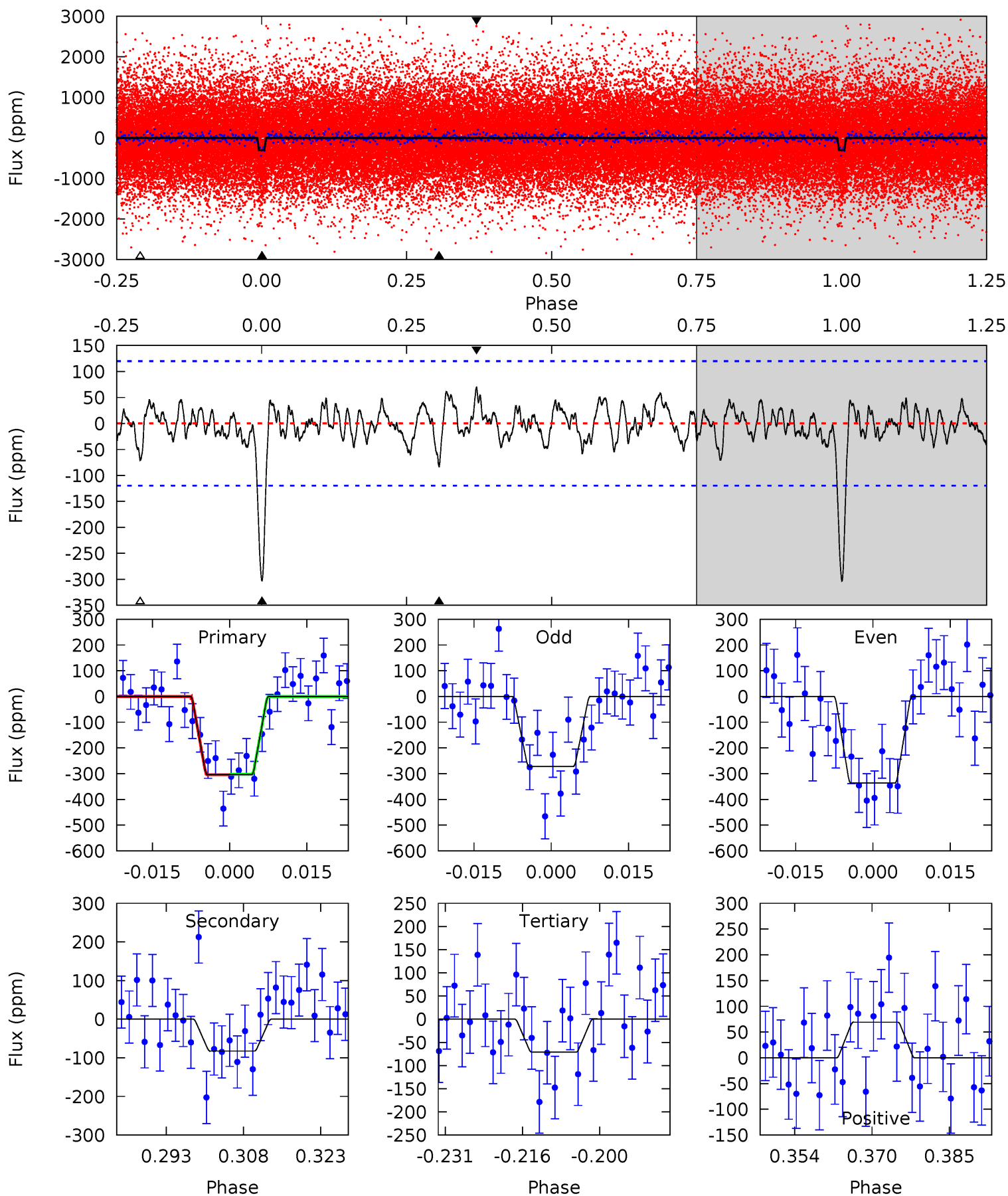
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	3.65	3.53	2.78	4.92	2.38	1.24	9.97	10.7	0.12	0.87	1.03	1.02	0.18	0.65



# Alt Model-Shift Uniqueness Test

009021075-01, P = 7.281122 Days, E = 132.756557 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	3.40	2.93	2.85	4.94	2.42	1.06	9.59	9.67	0.47	0.55	1.34	1.06	0.19	0.04



### Stellar Parameters For KIC 009021075

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5008^{+192}_{-174}$	$4.572^{+0.033}_{-0.066}$	$0.180^{+0.200}_{-0.300}$	$0.788^{+0.082}_{-0.067}$	$0.844^{+0.055}_{-0.080}$	$2.431^{+0.437}_{-0.533}$
	+4%/-3%	+1%/-1%	+111%/-167%	+10%/-9%	+7%/-9%	+18%/-22%
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 009021075-01 / KOI 4733.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-84 \pm 23$	$1.81^{+1.05}_{-0.93}$	$1050^{+45}_{-44}$	$3673^{+1192}_{-530}$	$67^{+238}_{-41}$
Alt.	$-82 \pm 24$	$1.68^{+1.08}_{-0.89}$	$1048^{+44}_{-41}$	$3751^{+1222}_{-590}$	$77^{+251}_{-50}$

$T_{\text{max}}$  = 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

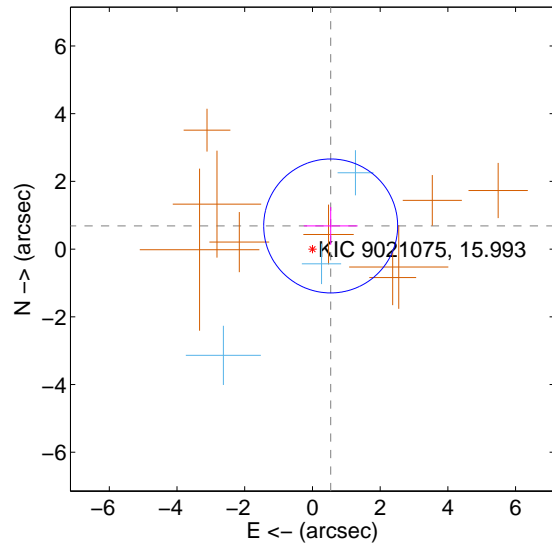
Supplemental centroid analysis for 009021075-01. Kepler magnitude: 15.99. Transit SNR 10.72

There are 3 quarters with good PRF difference image offsets

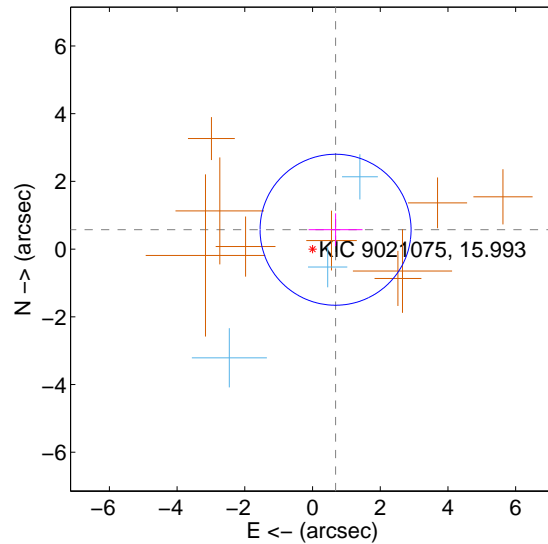
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.870 \pm 0.659$	1.32	$-0.539 \pm 0.796$	$0.683 \pm 0.558$
PRF-fit source offset from KIC position	$0.889 \pm 0.743$	1.20	$-0.681 \pm 0.796$	$0.572 \pm 0.485$
photometric centroid source offset	$1.80 \pm 1.39$	1.30	$-0.49 \pm 1.33$	$1.73 \pm 1.39$

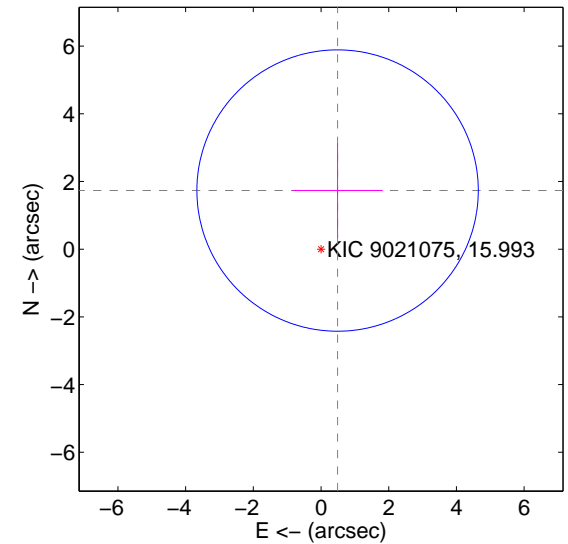
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

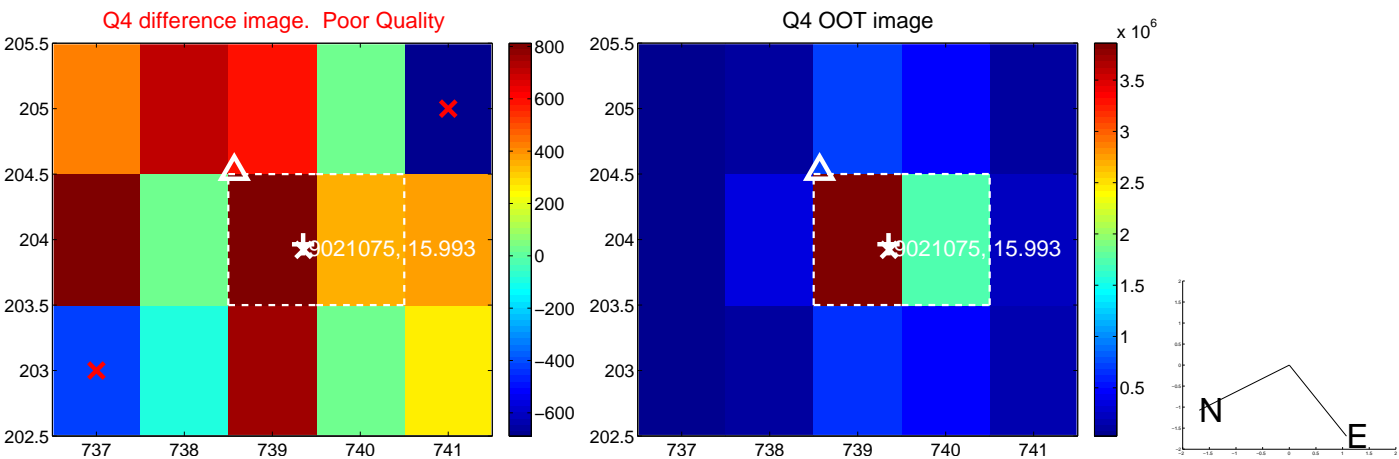
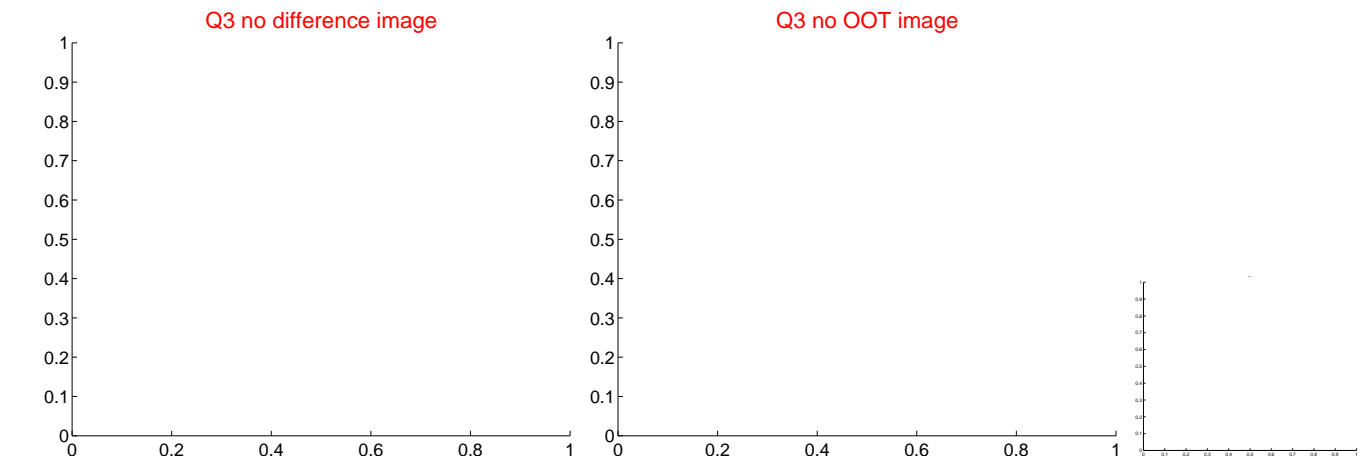
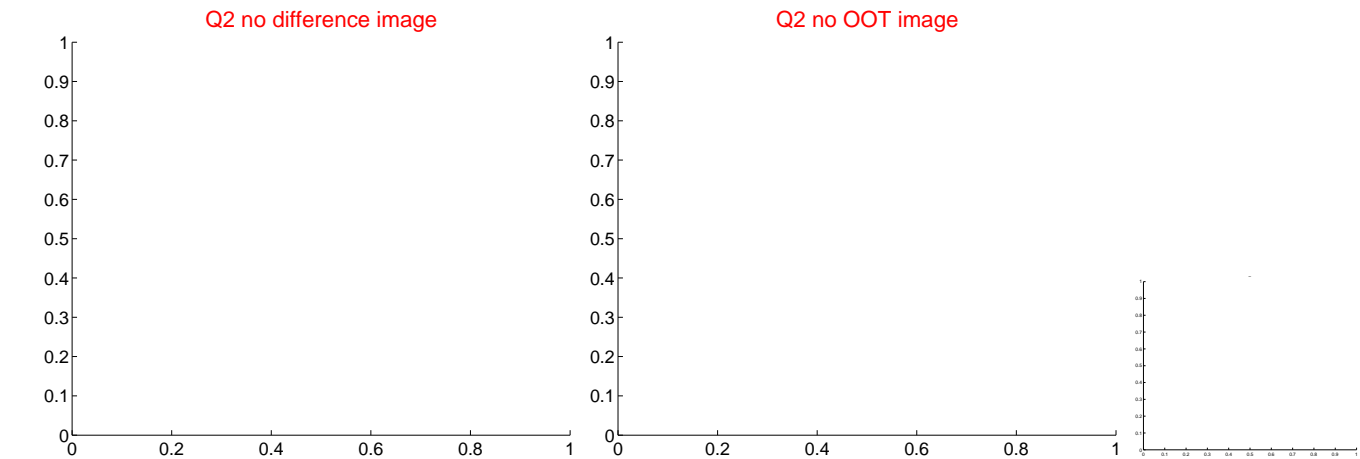
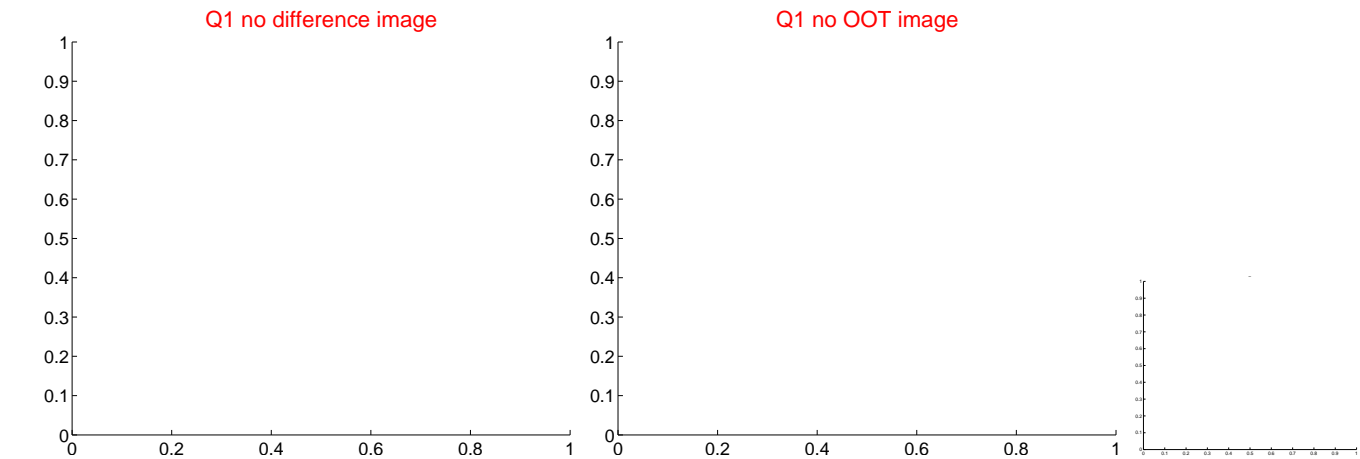


offset from photometric centroids

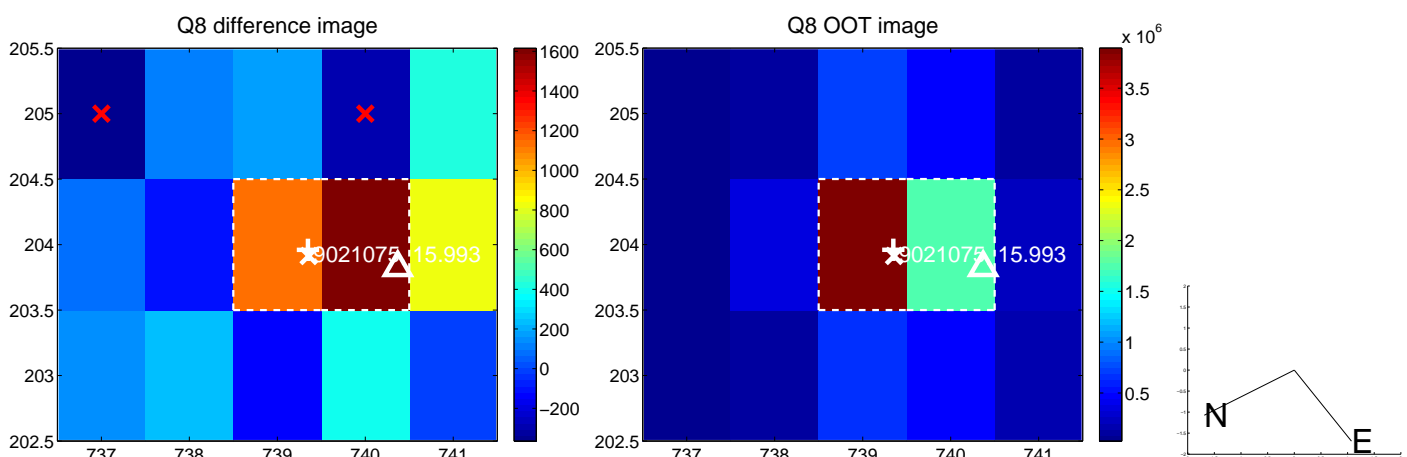
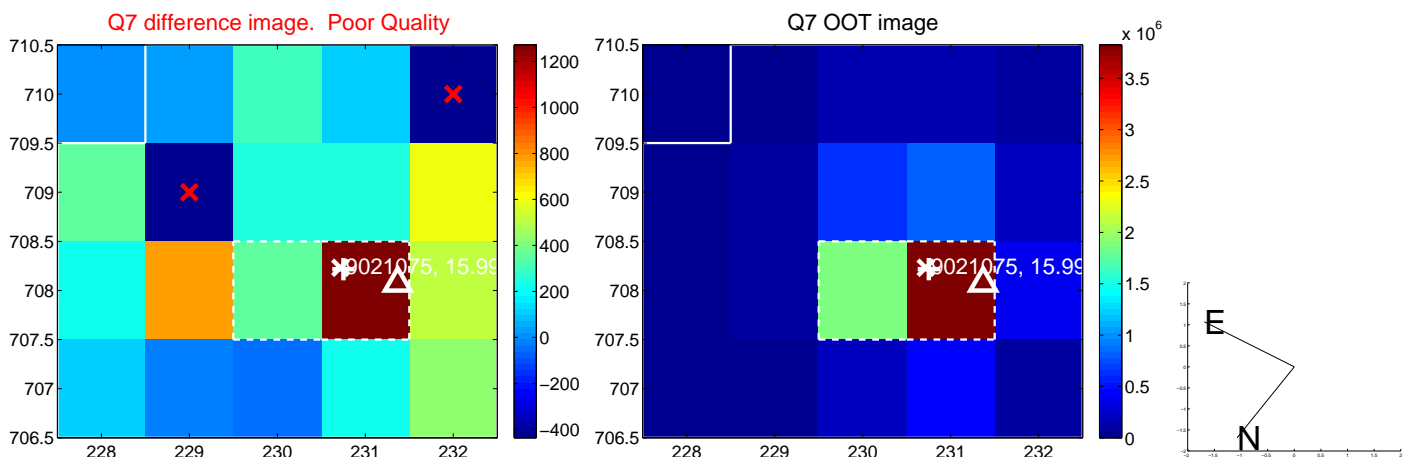
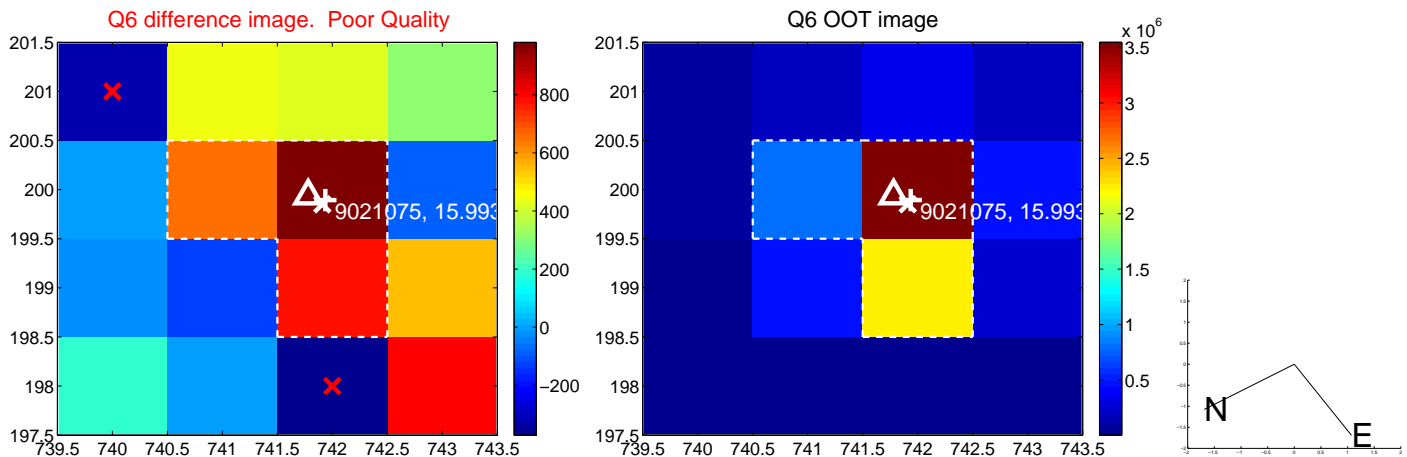
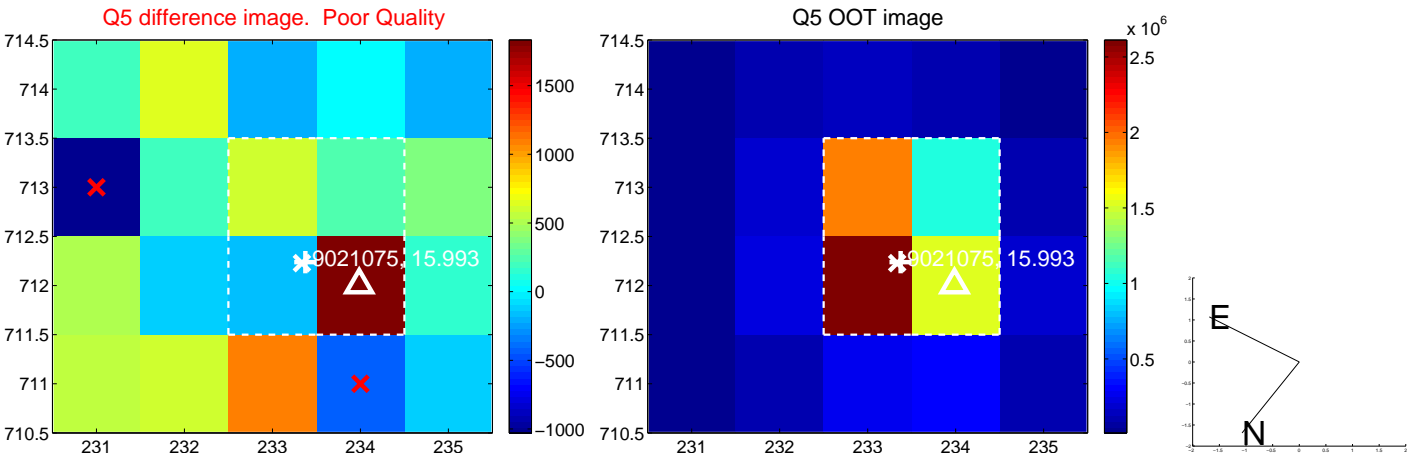


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

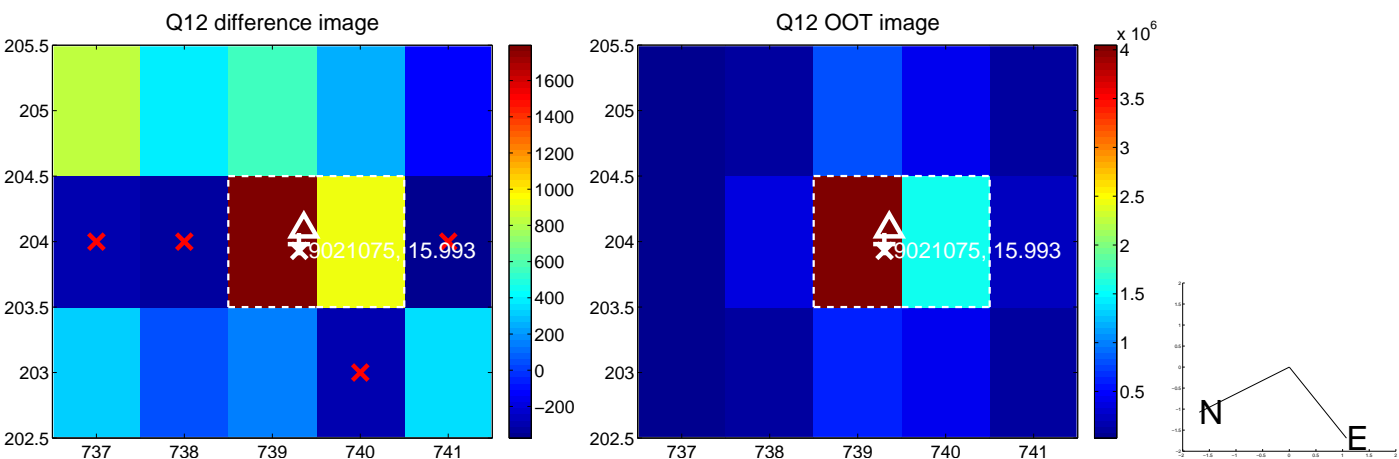
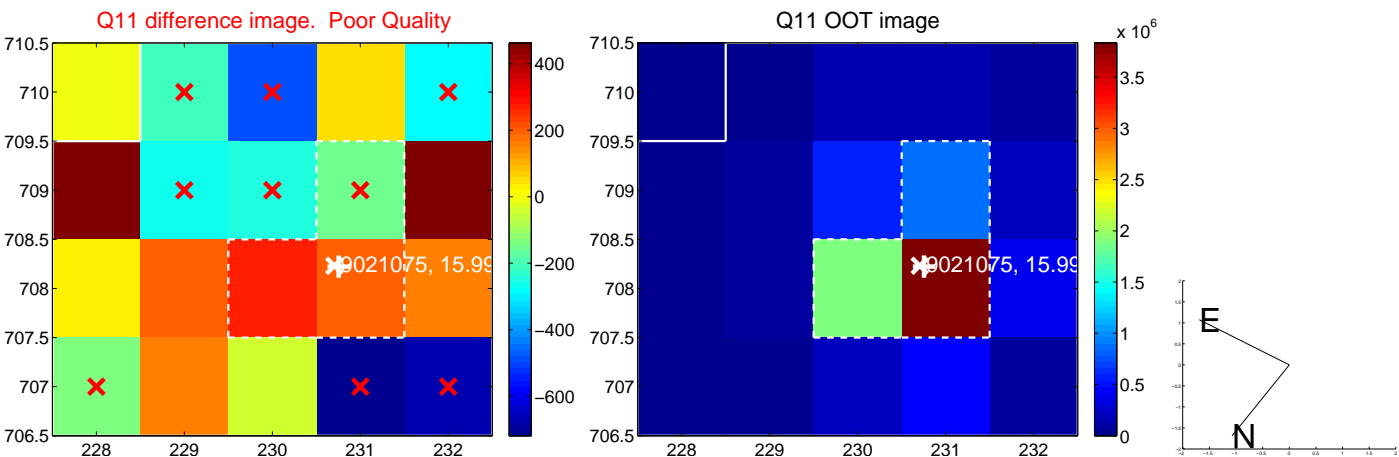
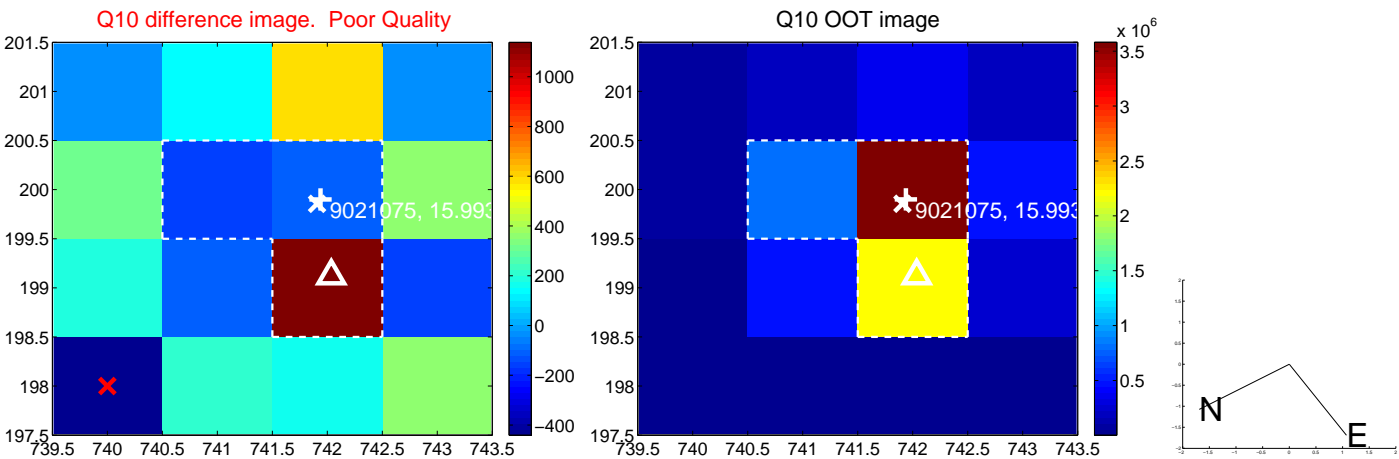
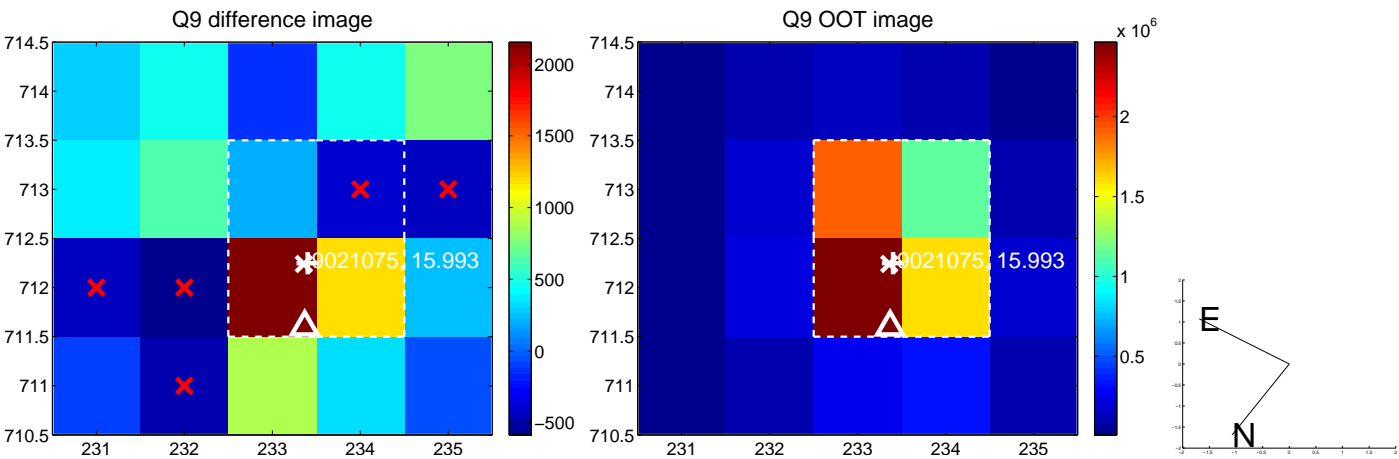
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



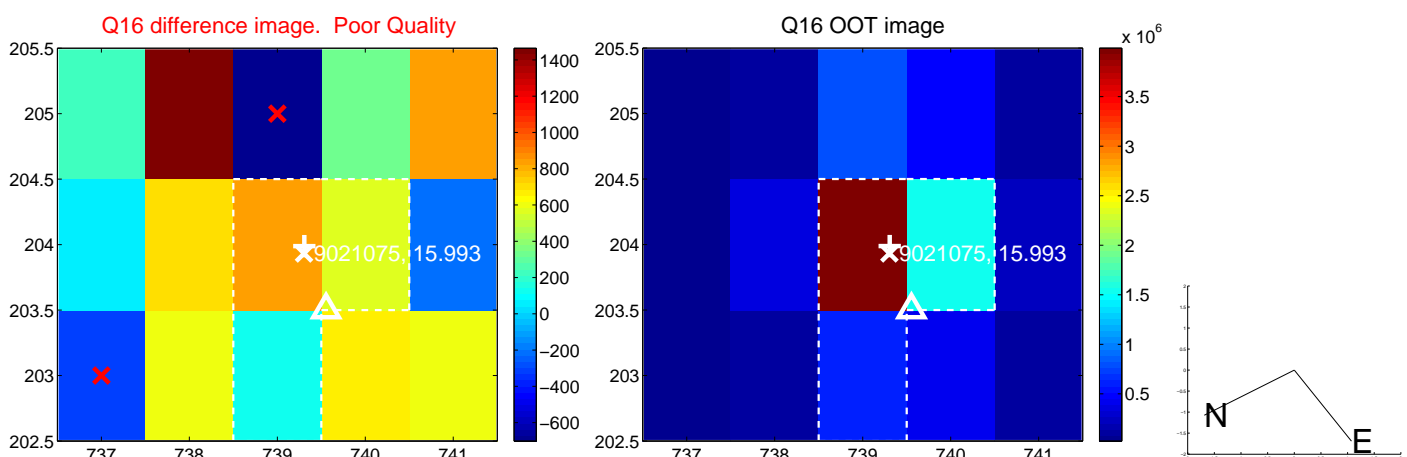
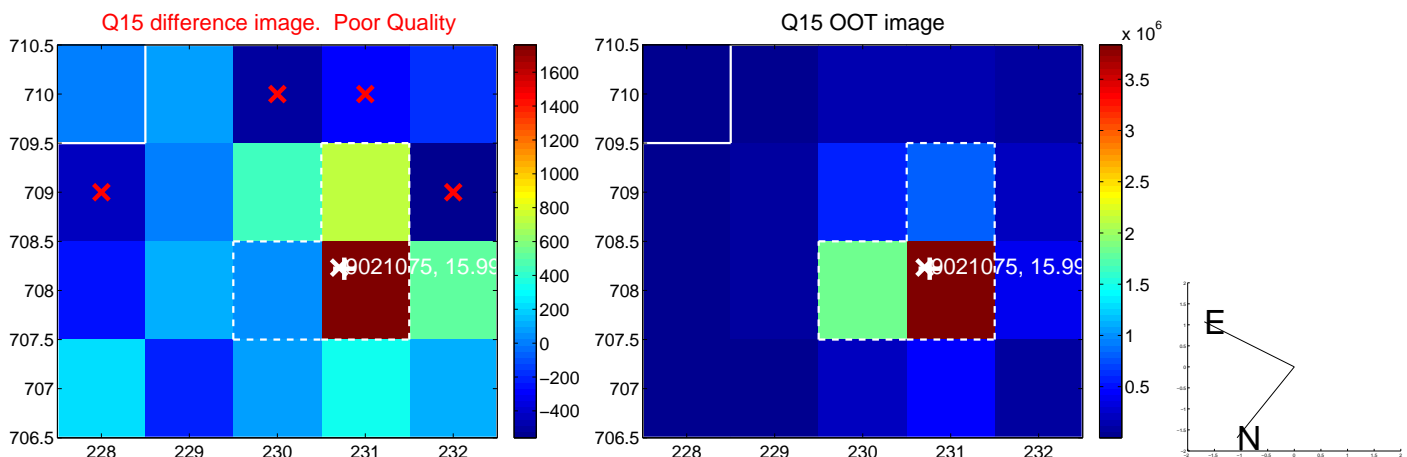
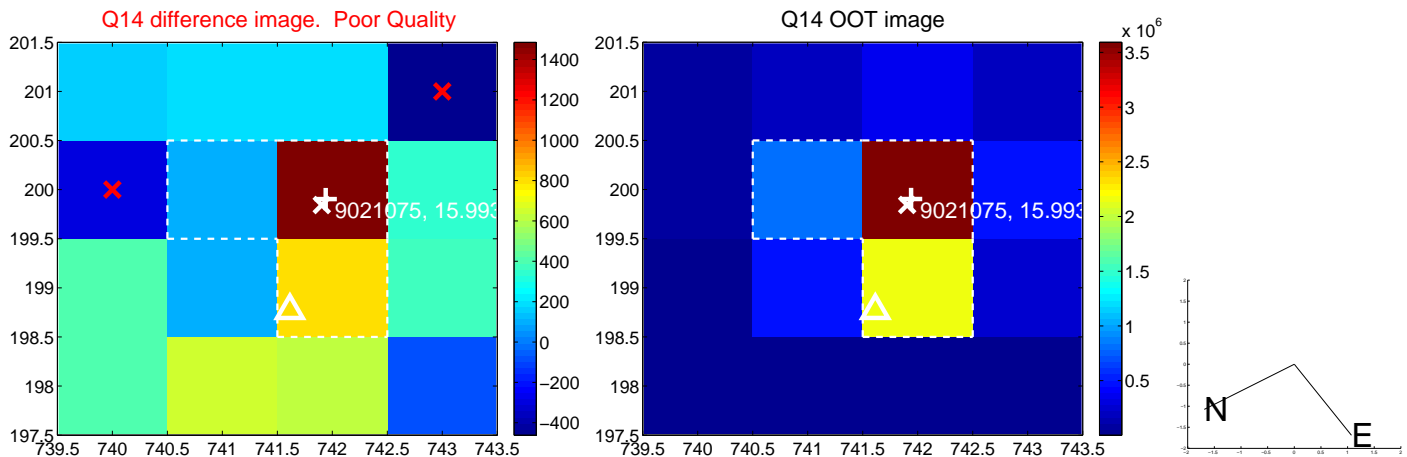
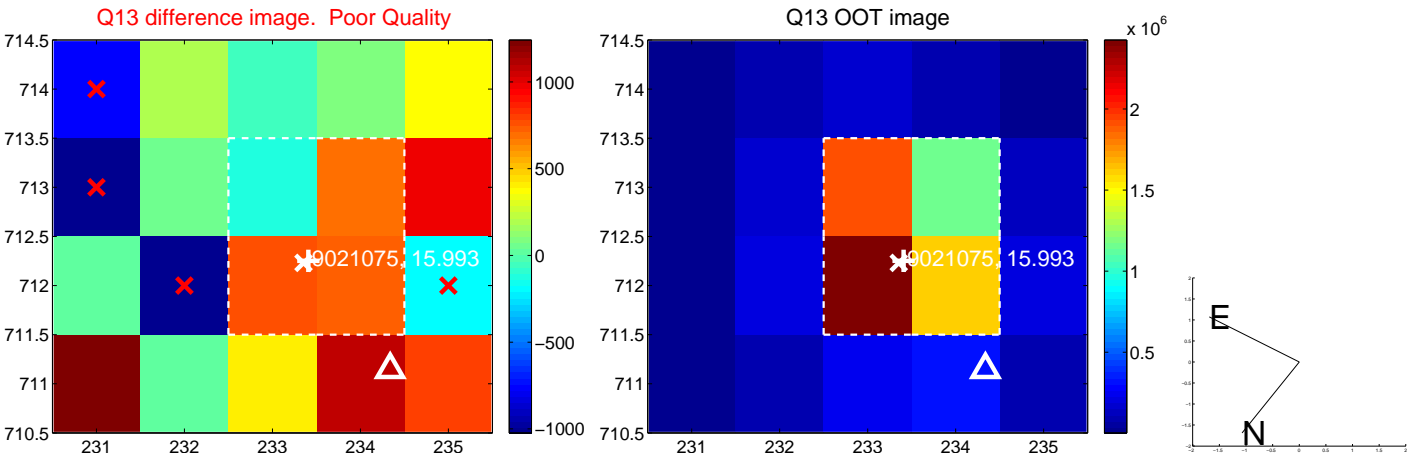
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



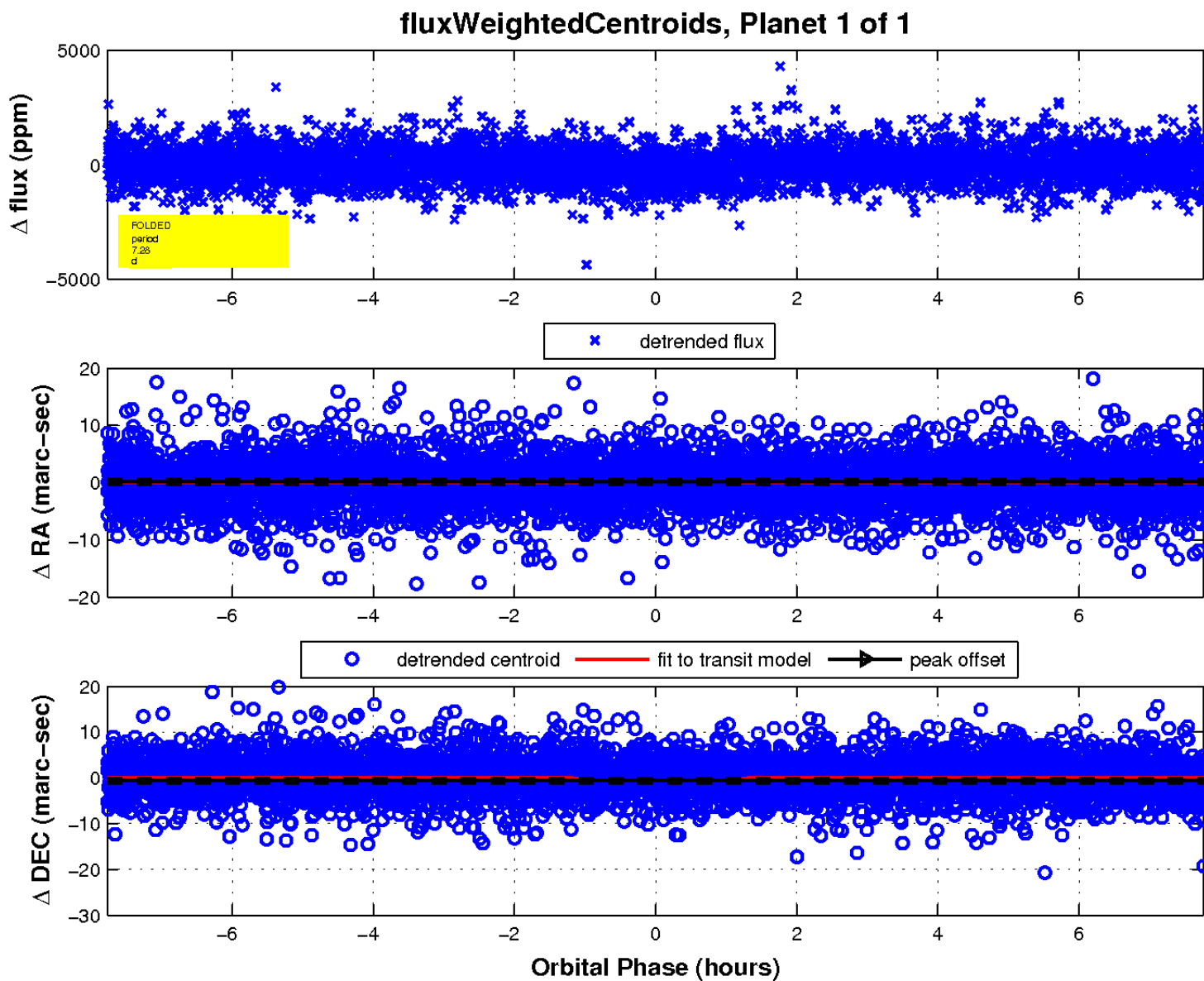
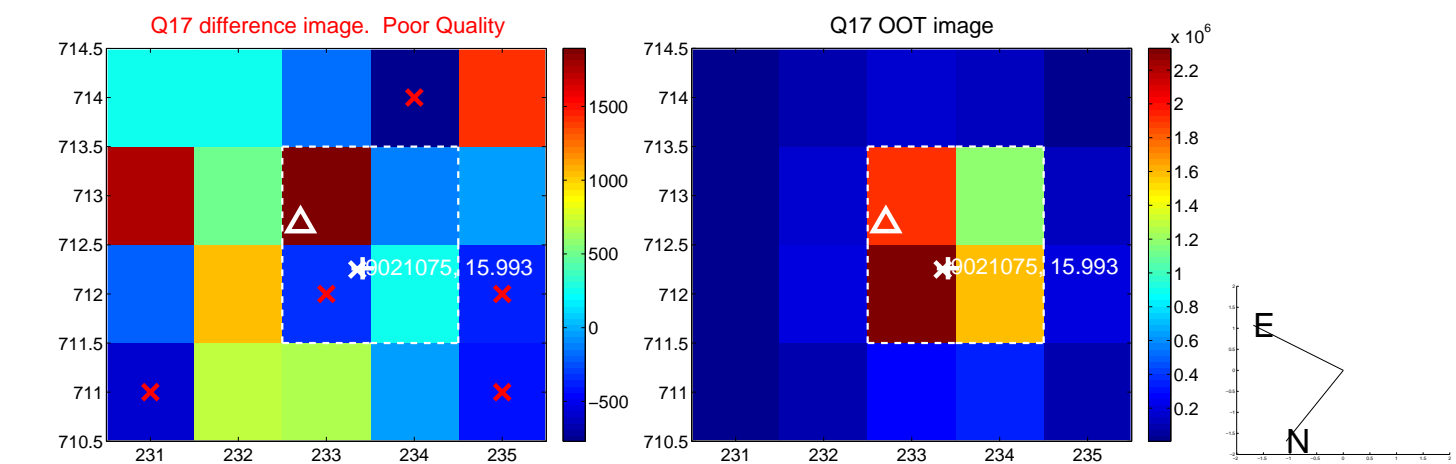
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

