

# KIC 009329223

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009329223-01	OBS	No	410.648894	510.966375	301.5	4.984	7.4	7.6	1.13	6201	2.18	1.43

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009329223-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—MOD_NONUNIQ_ALT

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

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

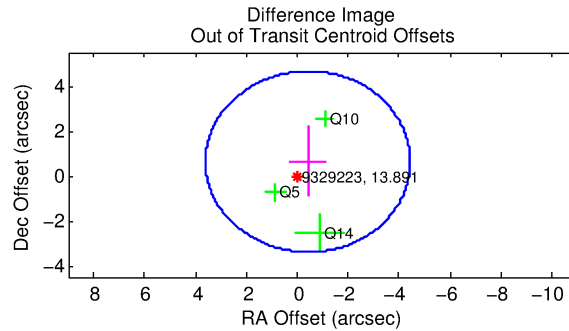
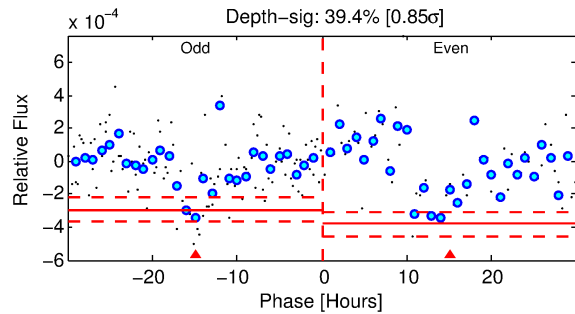
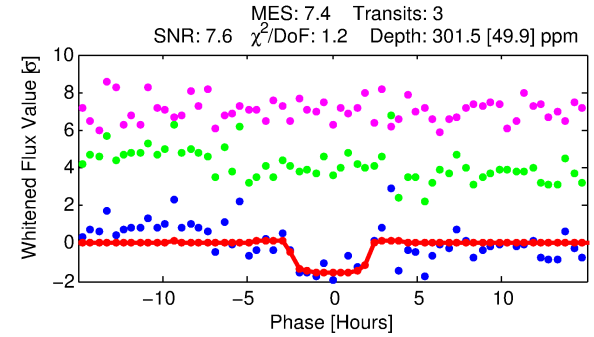
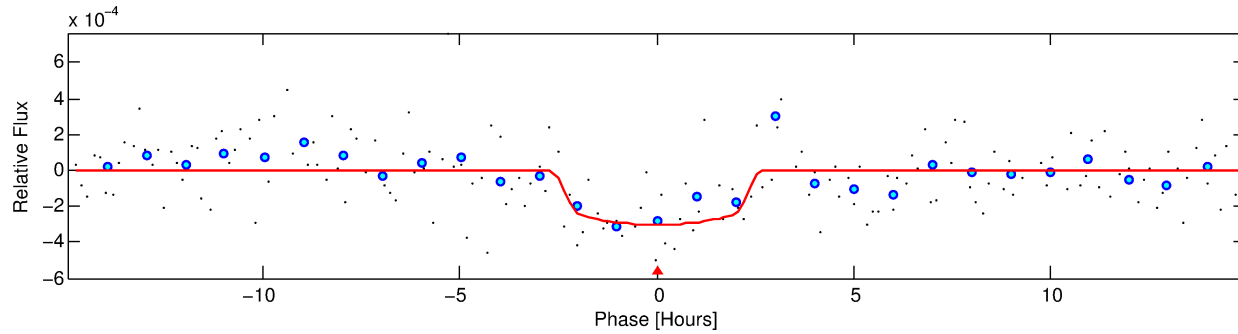
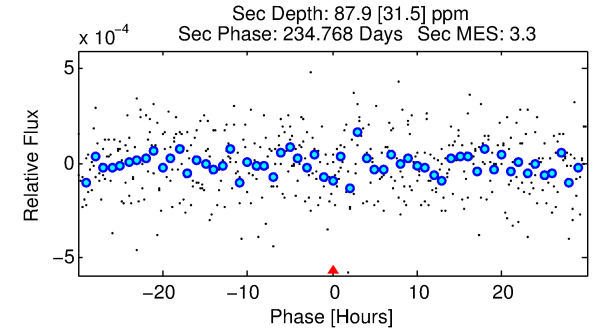
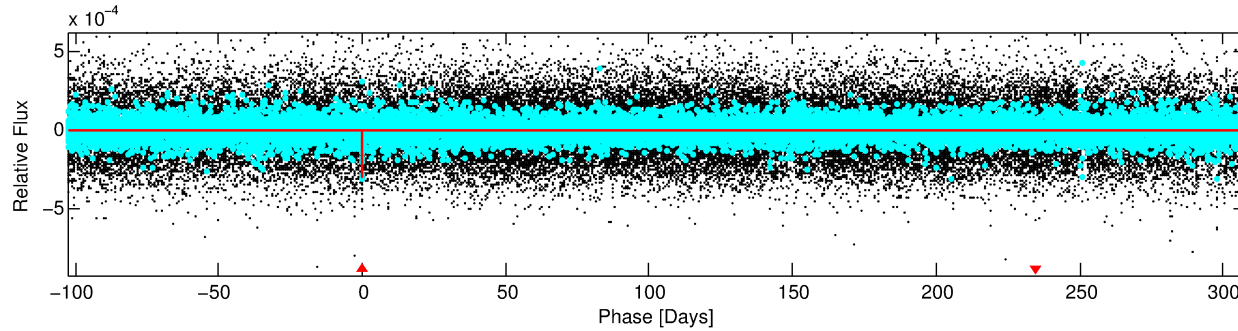
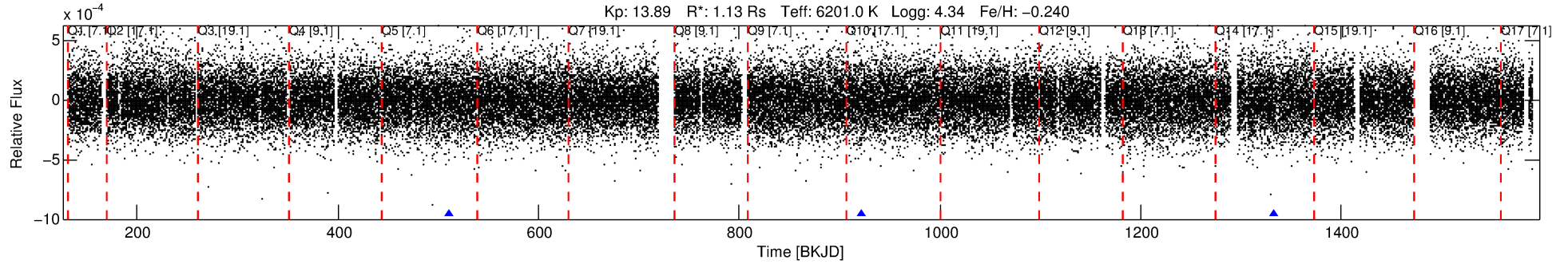
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009329223-01

No Significant Match Found

# DV One-Page Summary

KIC: 9329223 Candidate: 1 of 1 Period: 410.649 d



## DV Fit Results:

Period = 410.64889 [0.00936] d  
Epoch = 510.9664 [0.0116] BKJD  
Rp/R\* = 0.0177 [0.0148]  
a/R\* = 382.32 [1666.77]  
b = 0.82 [1.80]  
Seff = 1.43 [0.56]  
Teq = 279 [27] K  
Rp = 2.18 [1.95] Re  
a = 1.0824 [0.2797] AU  
Ag = 11939.88 [20909.45] [0.57 $\sigma$ ]  
Teffp = 4510 [1936] K [2.19 $\sigma$ ]

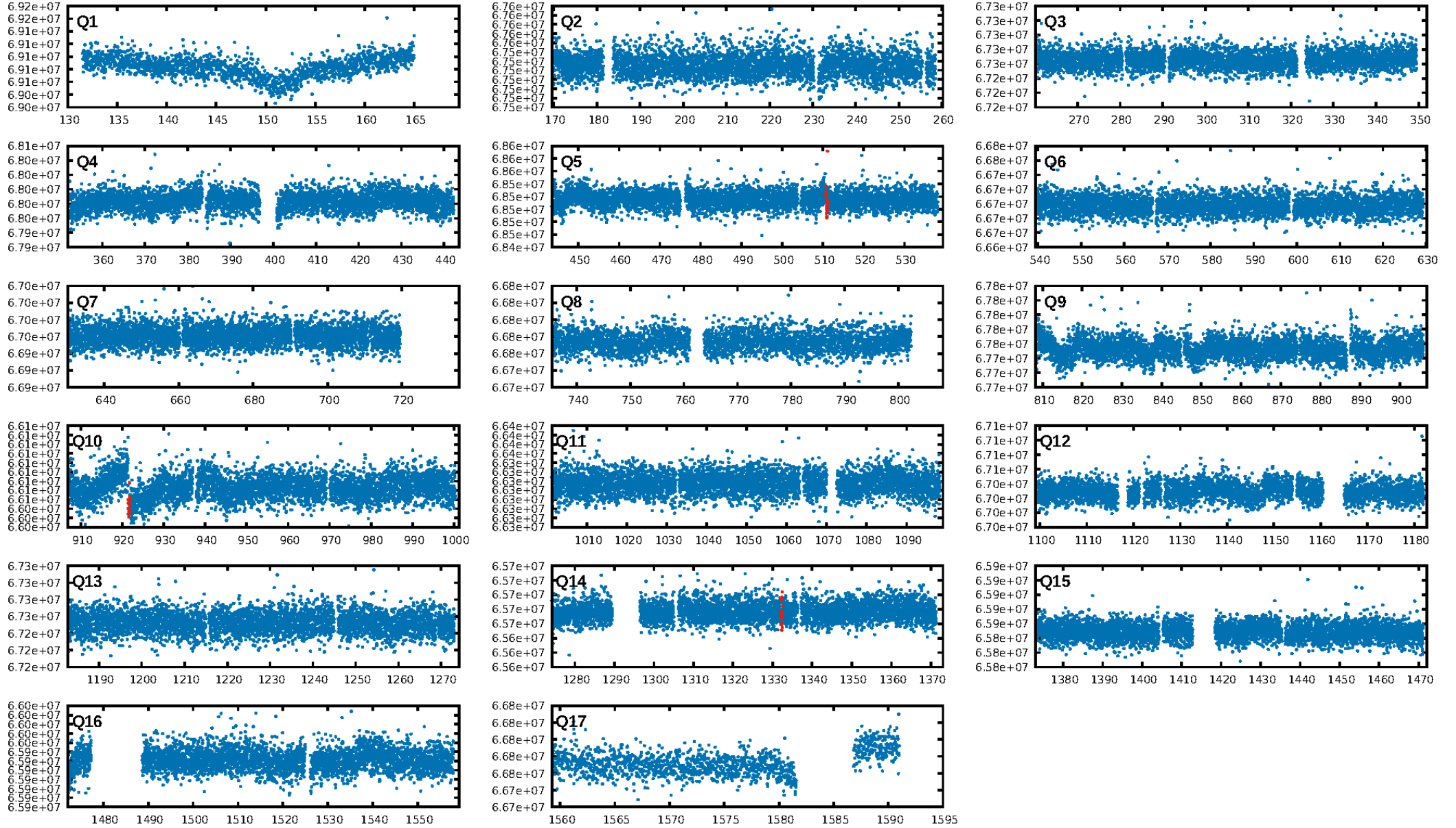
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 13.0%  
ModelChiSquareGof-sig: 97.2%  
Bootstrap-pfa: 1.24e-13  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -4.527  
Centroid-sig: 33.3%  
Centroid-so: 1.959 arcsec [0.97 $\sigma$ ]  
OotOffset-rm: 0.758 arcsec [0.56 $\sigma$ ]  
OotOffset-st: 2/0/0/1 [3]  
KicOffset-rm: 0.742 arcsec [0.55 $\sigma$ ]  
KicOffset-st: 2/0/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

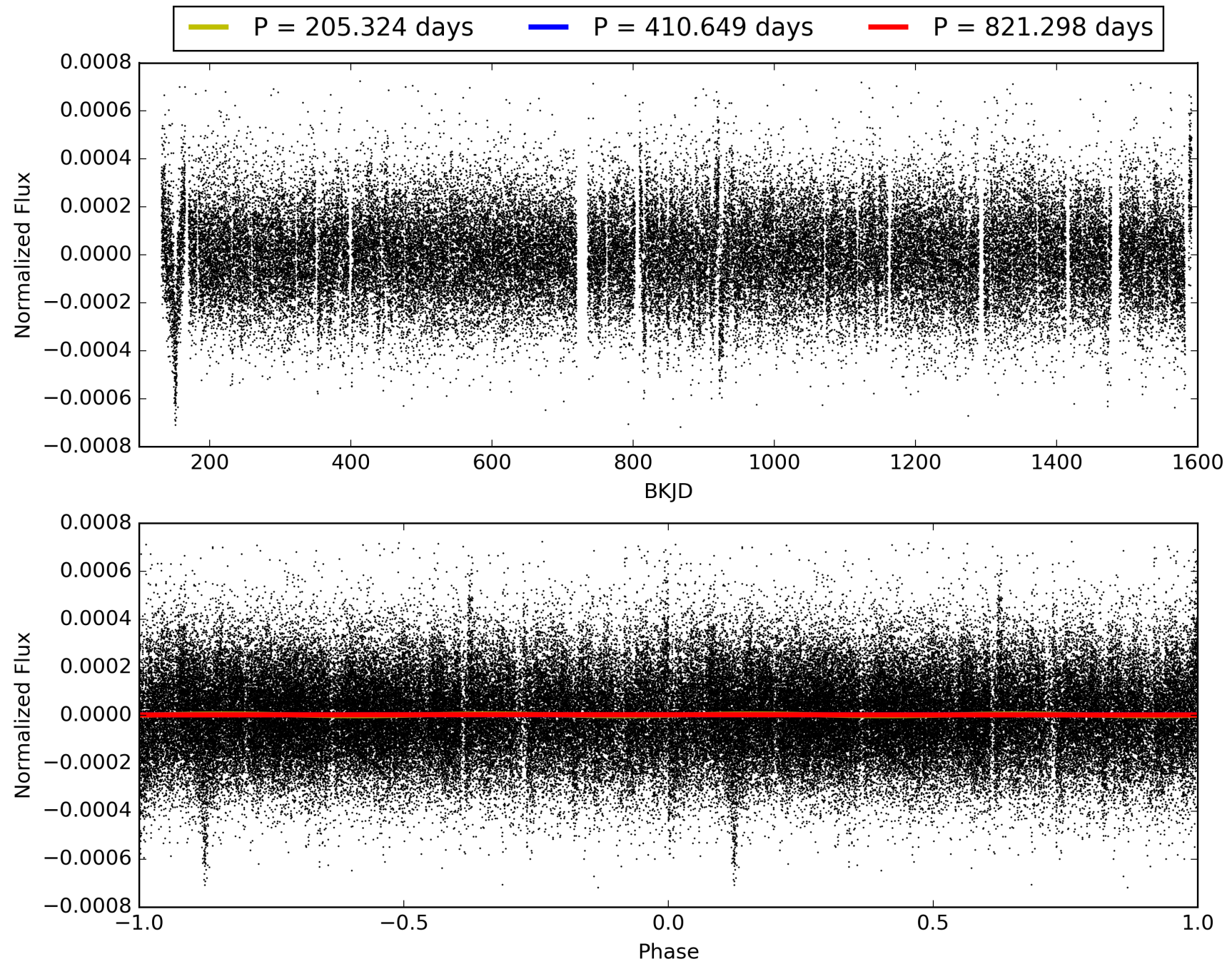
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:09:20 Z

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

# TCE 009329223-01, PDC Light Curves

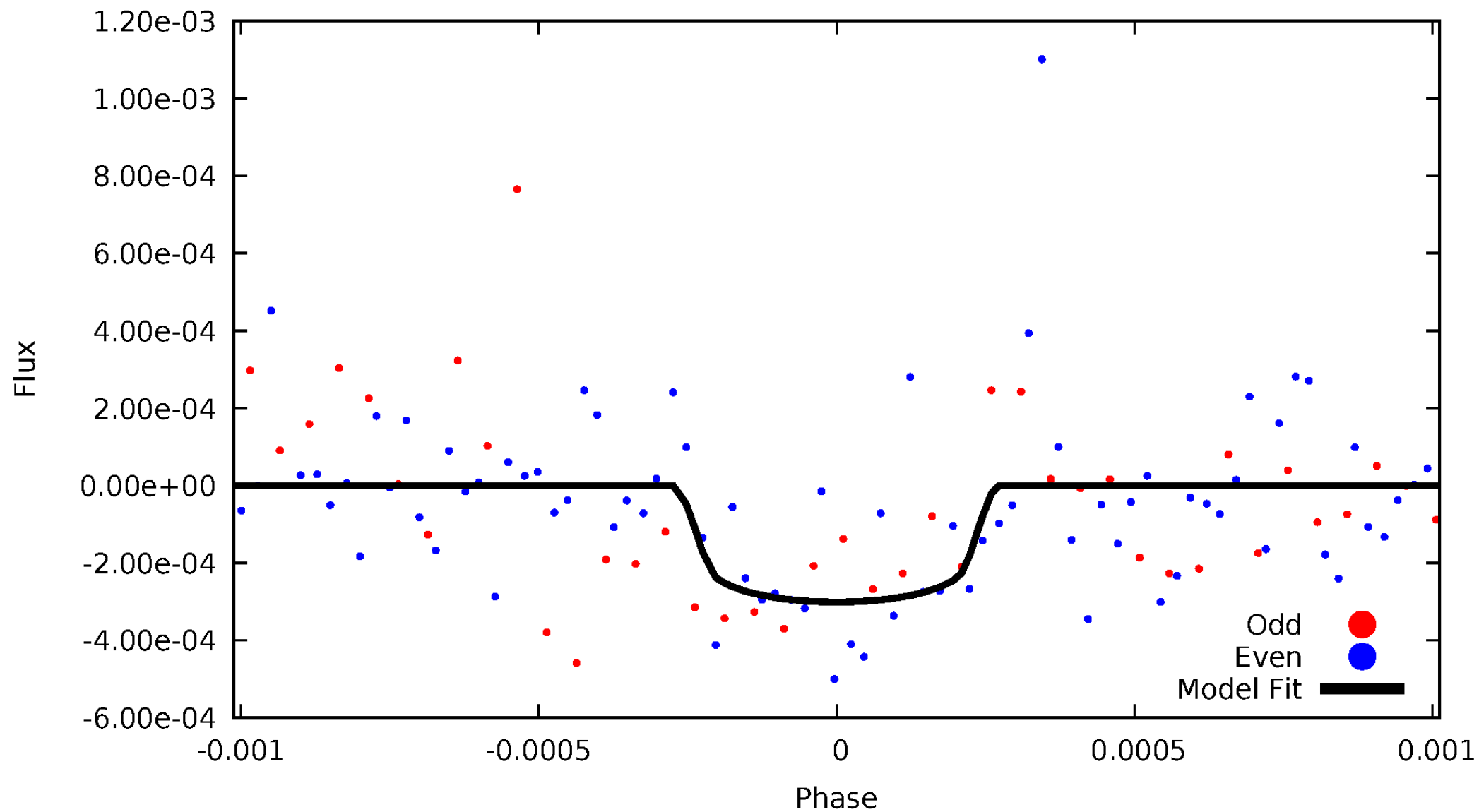


TCE 009329223-01



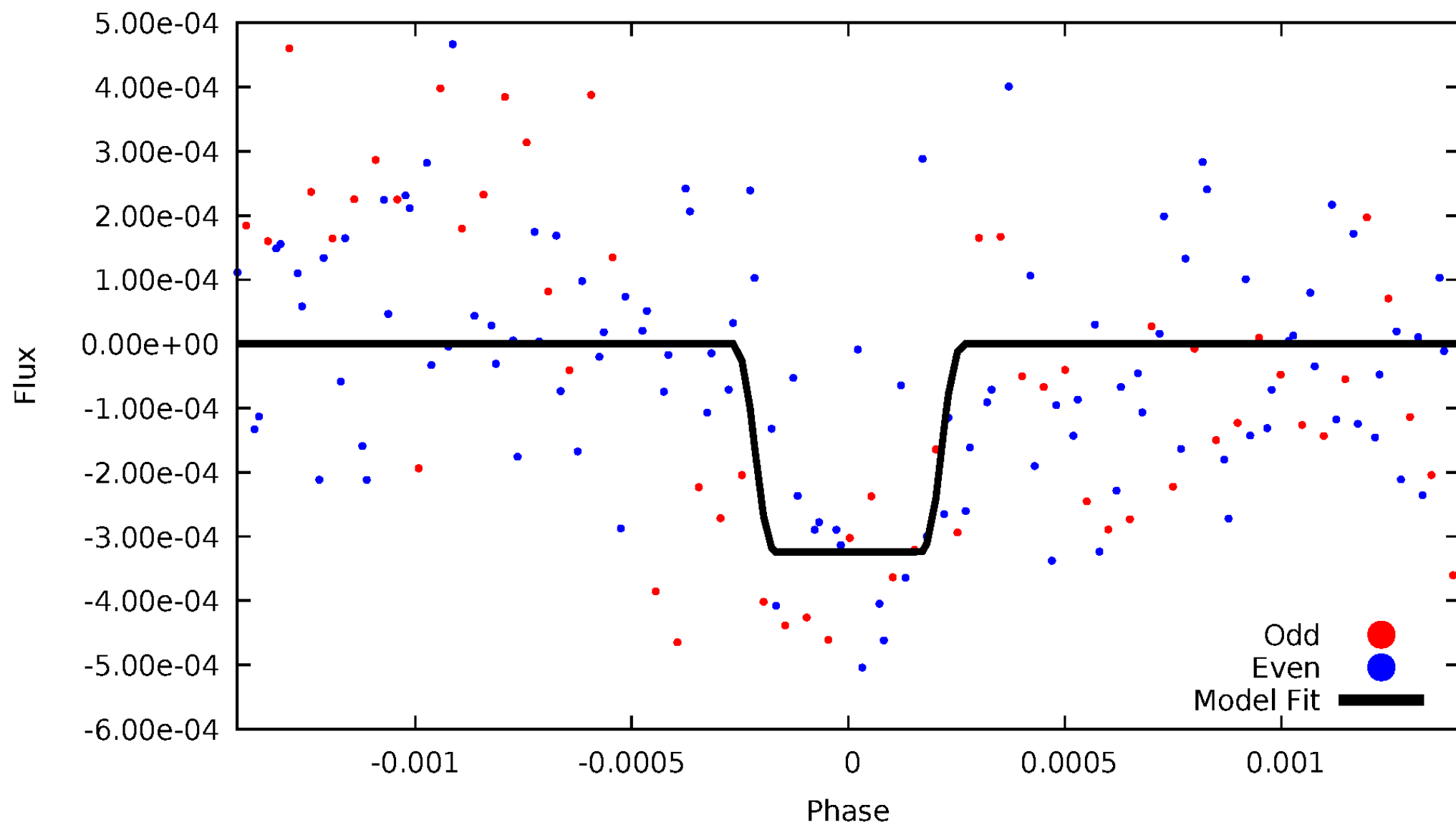
# DV Odd/Even

TCE 009329223-01



# ALT Odd/Even

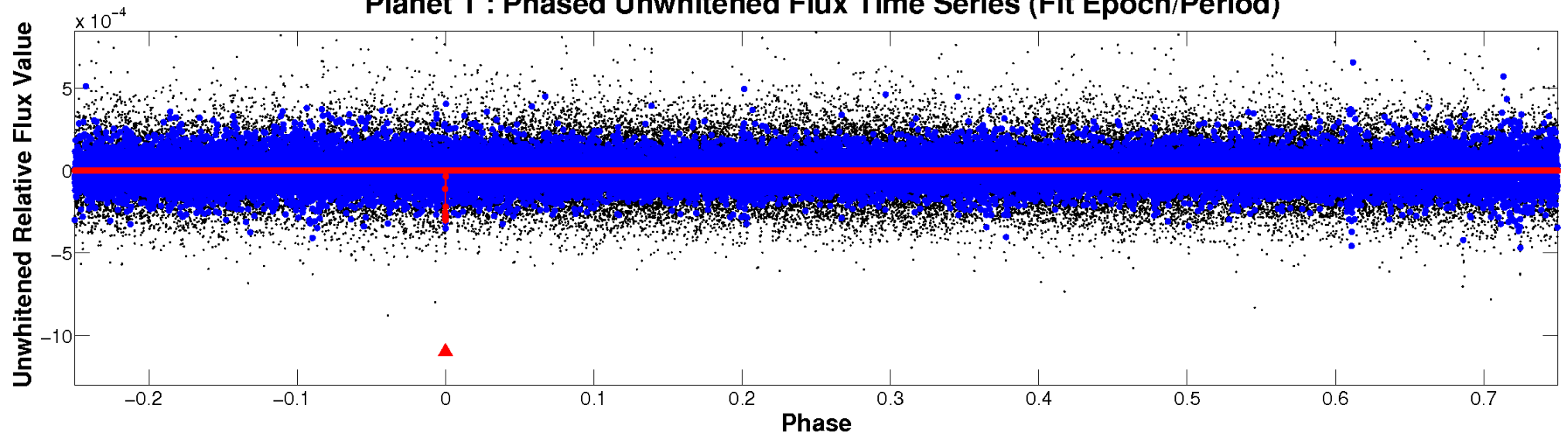
TCE 009329223-01



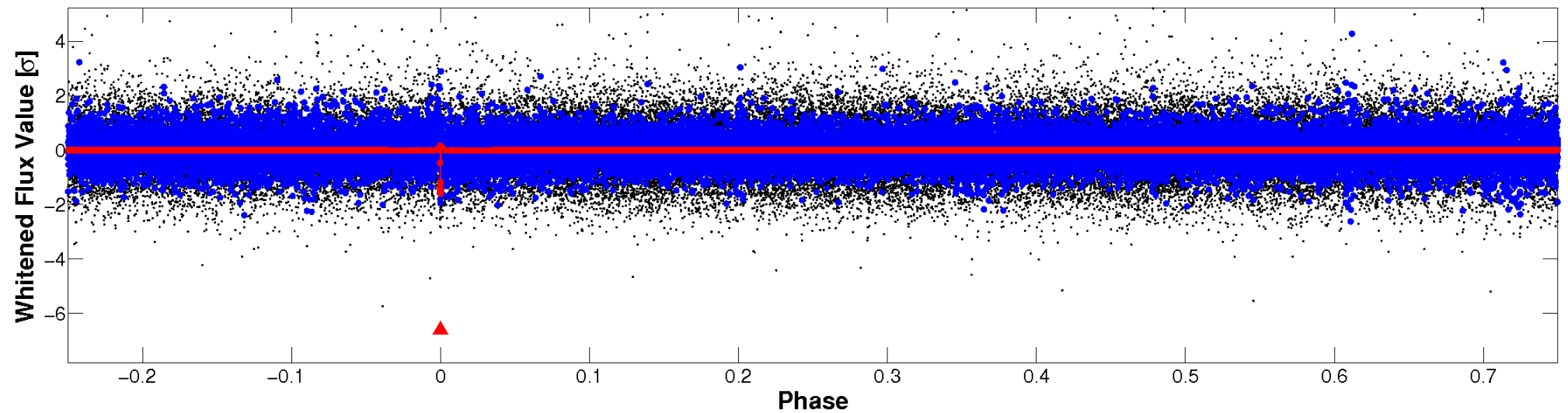


# Non-Whitened Vs. Whitened Light Curve

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

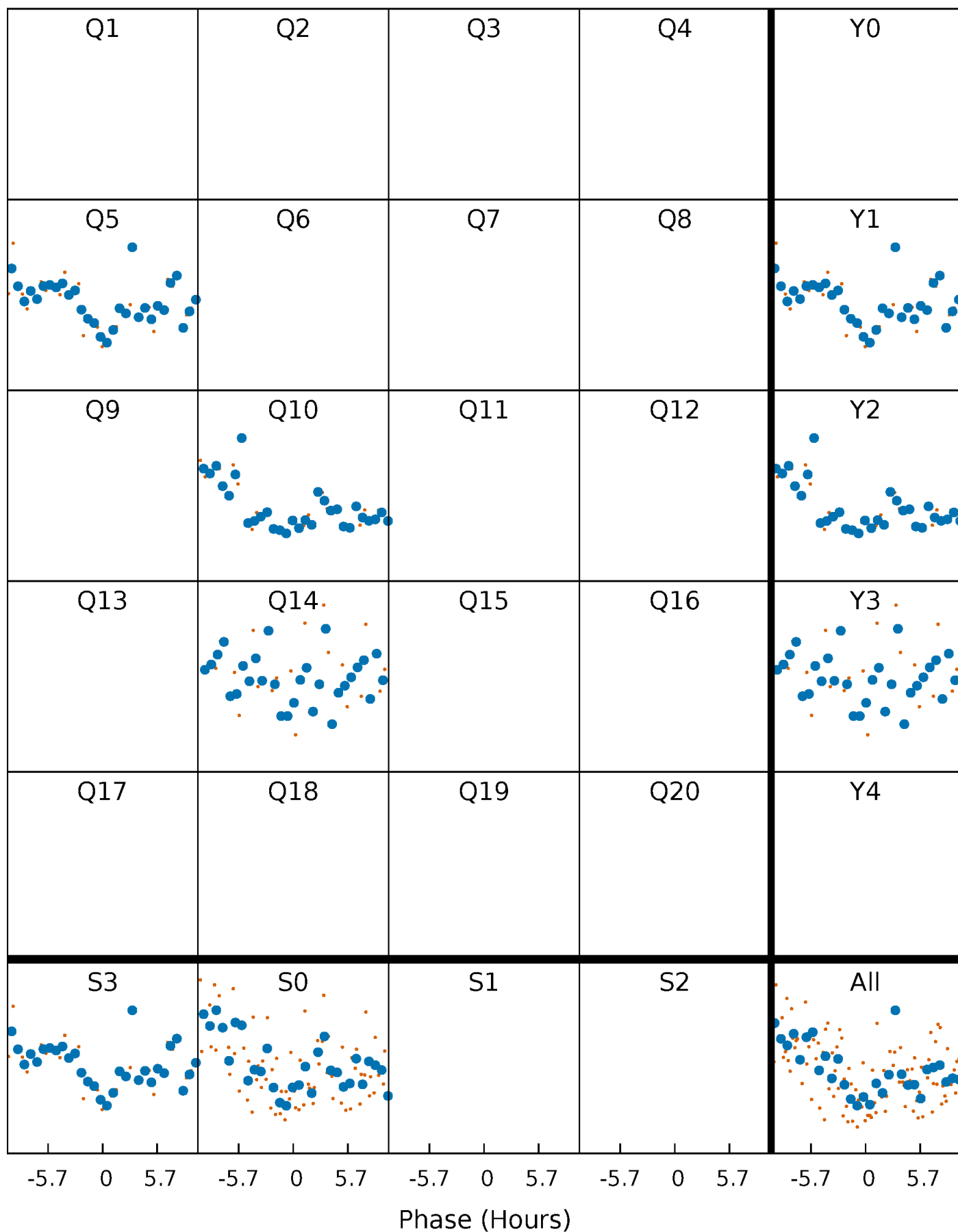


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

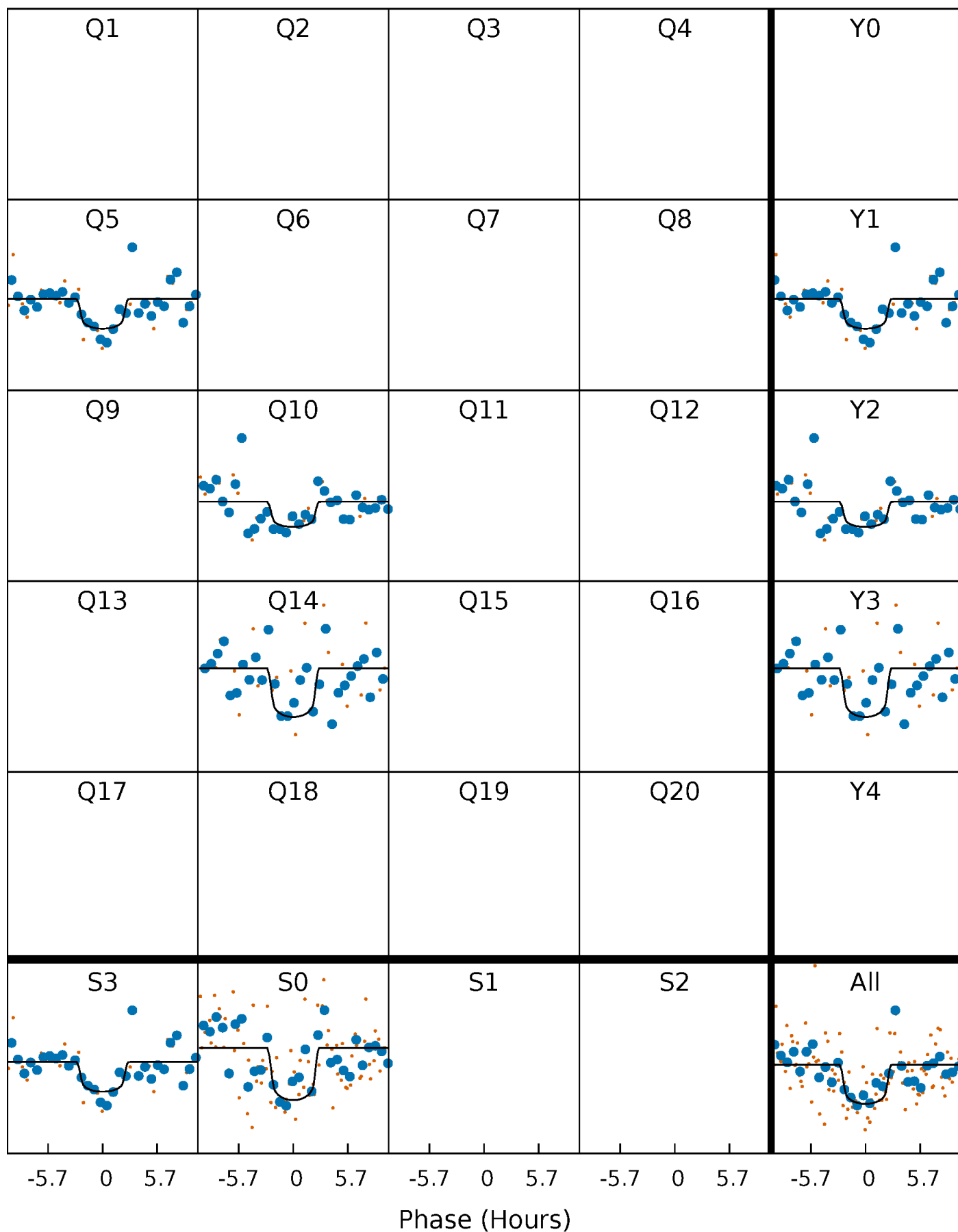
TCE 009329223-01 P=410.648894 Days  $T_0=510.966375$  (BKJD)





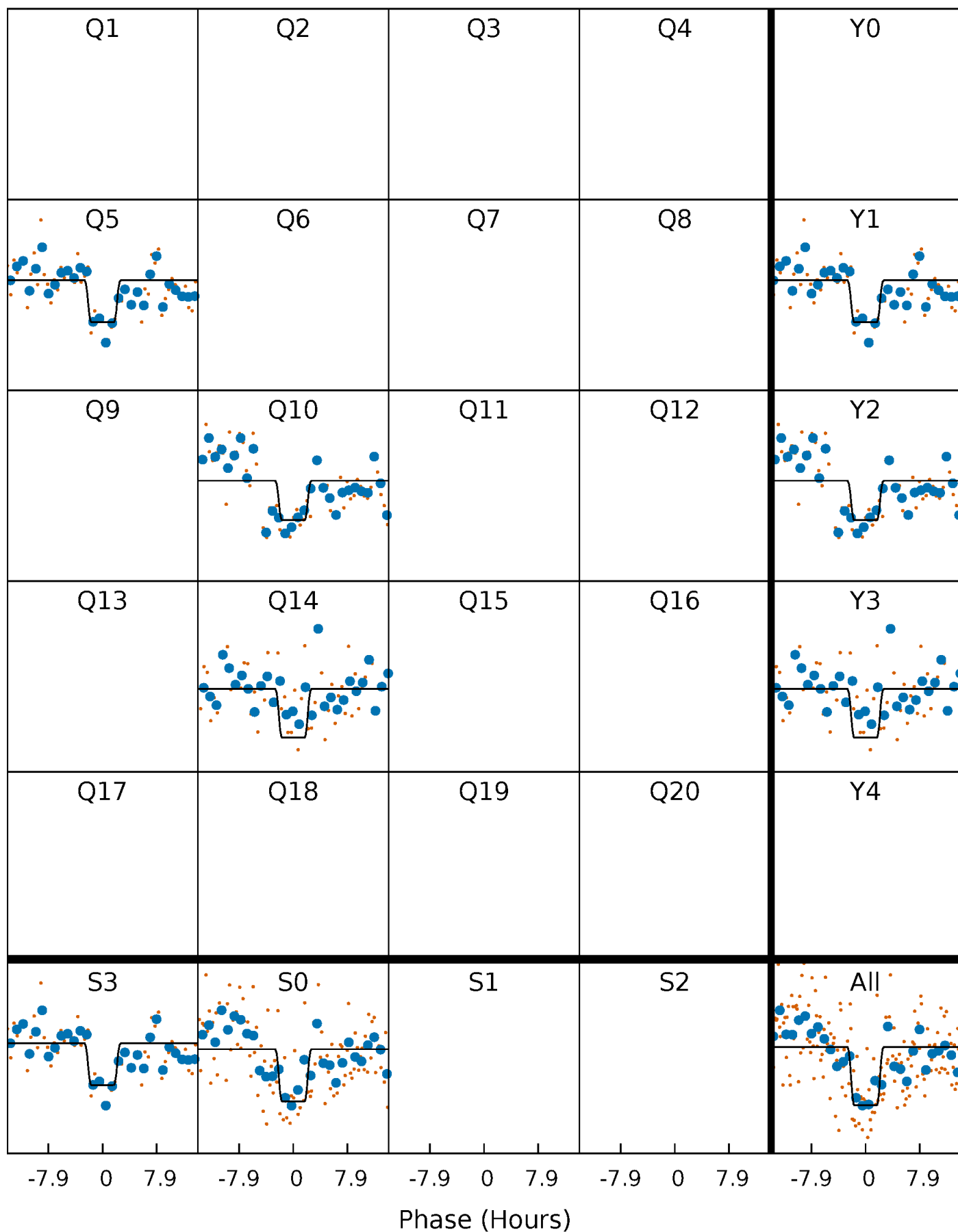
# DV Quarter-Phased Transit Curves

TCE 009329223-01 P=410.648894 Days  $T_0=510.966375$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

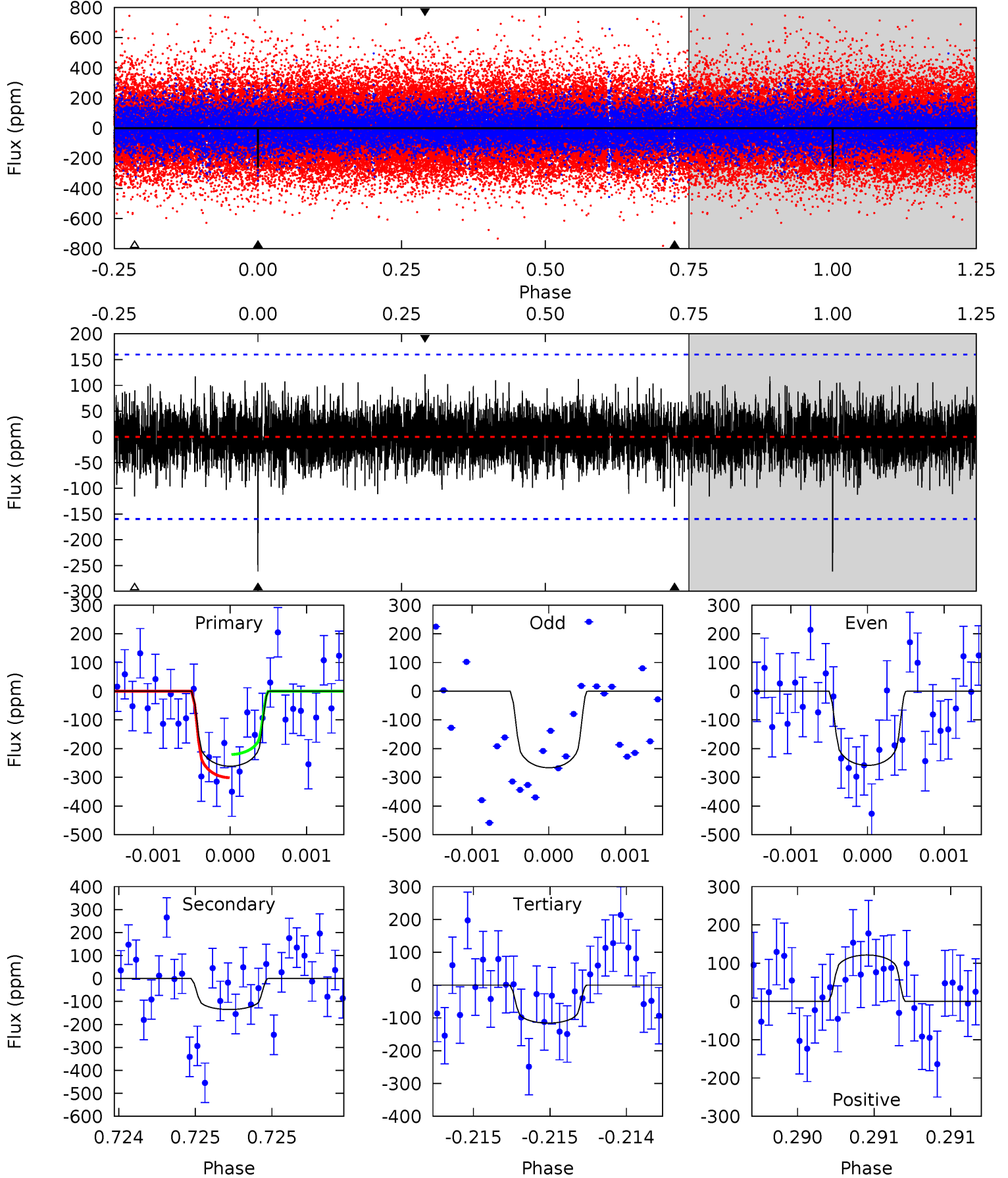
TCE 009329223-01 P=410.646444 Days  $T_0=510.951600$  (BKJD)



# DV Model-Shift Uniqueness Test

009329223-01,  $P = 410.648894$  Days,  $E = 100.317481$  Days

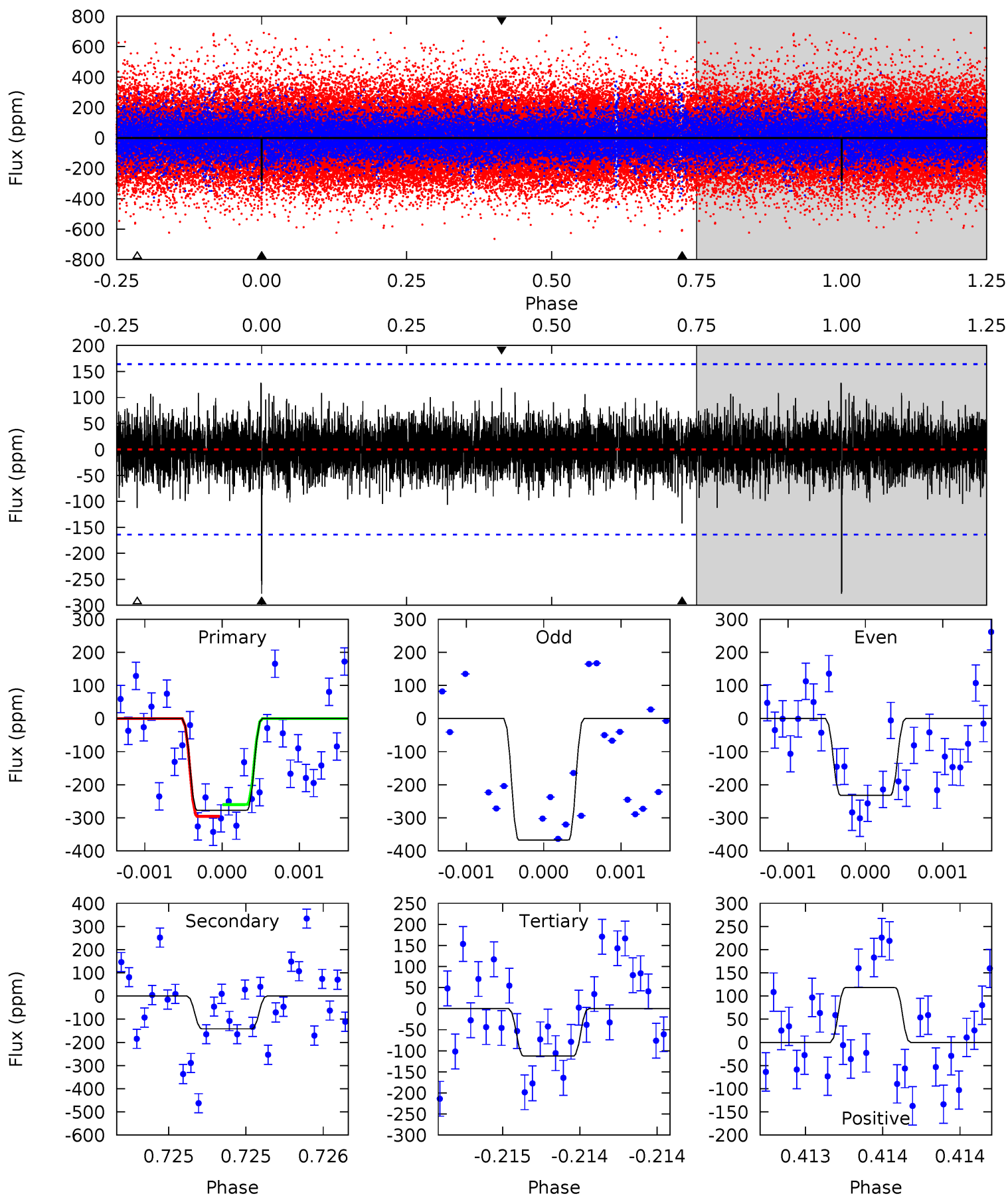
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.09	4.70	4.03	4.22	5.56	3.46	1.13	5.06	4.87	0.67	0.48	0.14	0.98	0.32	1.41



# Alt Model-Shift Uniqueness Test

009329223-01, P = 410.646444 Days, E = 100.305156 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
9.42	4.82	3.82	4.02	5.57	3.47	1.03	5.60	5.40	1.00	0.80	2.17	0.81	0.32	0.60



### Stellar Parameters For KIC 009329223

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6201^{+169}_{-206}$	$4.336^{+0.116}_{-0.198}$	$-0.240^{+0.300}_{-0.300}$	$1.126^{+0.353}_{-0.190}$	$0.998^{+0.160}_{-0.107}$	$0.986^{+0.611}_{-0.510}$
	+3%/-3%	+3%/-5%	+125%/-125%	+31%/-17%	+16%/-11%	+62%/-52%
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 009329223-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-135 \pm 29$	$2.48^{+1.78}_{-1.41}$	$393^{+31}_{-23}$	$4855^{+2563}_{-921}$	$14051^{+61378}_{-9695}$
Alt.	$-142 \pm 29$	$2.48^{+1.90}_{-1.47}$	$395^{+29}_{-23}$	$4910^{+2746}_{-917}$	$14477^{+73245}_{-9906}$

$T_{\text{max}}$  = 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

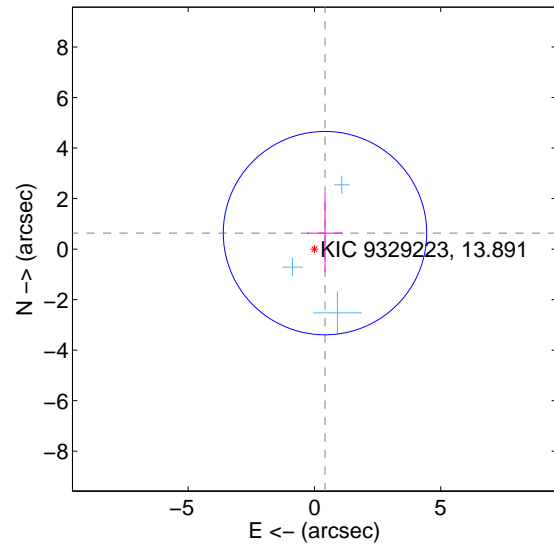
Supplemental centroid analysis for 009329223-01. Kepler magnitude: 13.89. Transit SNR 7.58

There are 3 quarters with good PRF difference image offsets

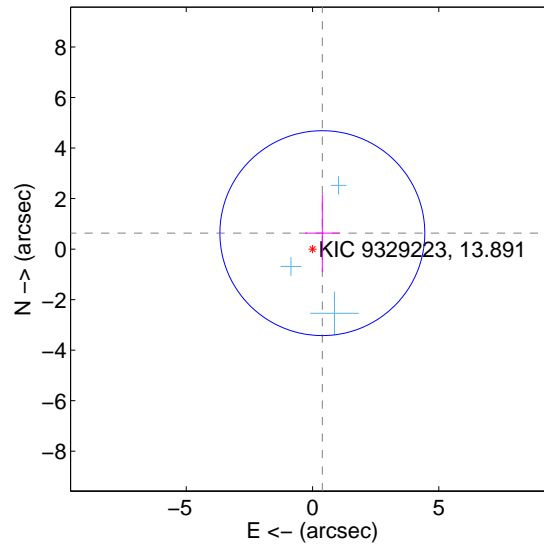
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.758 \pm 1.342$	0.56	$-0.418 \pm 0.707$	$0.633 \pm 1.539$
PRF-fit source offset from KIC position	$0.742 \pm 1.352$	0.55	$-0.389 \pm 0.685$	$0.632 \pm 1.531$
photometric centroid source offset	$1.96 \pm 2.01$	0.97	$-1.40 \pm 1.93$	$1.37 \pm 2.09$

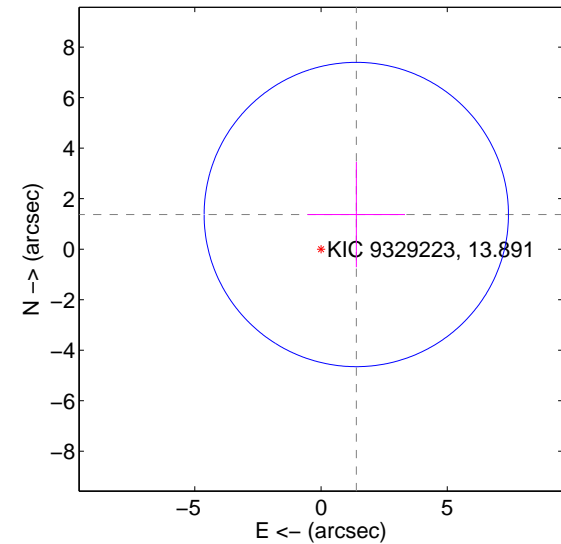
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



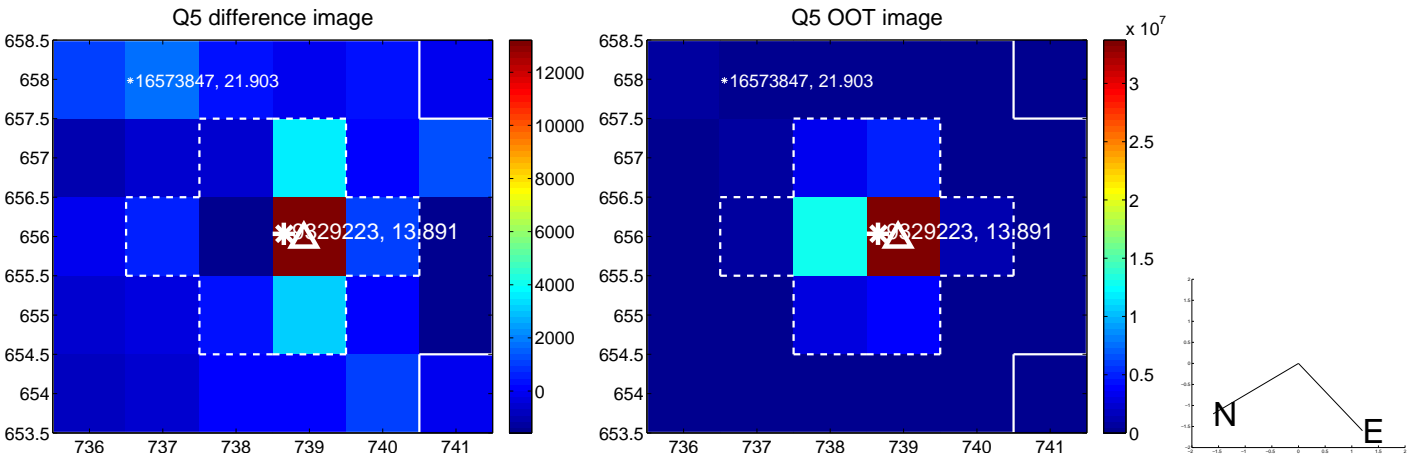
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

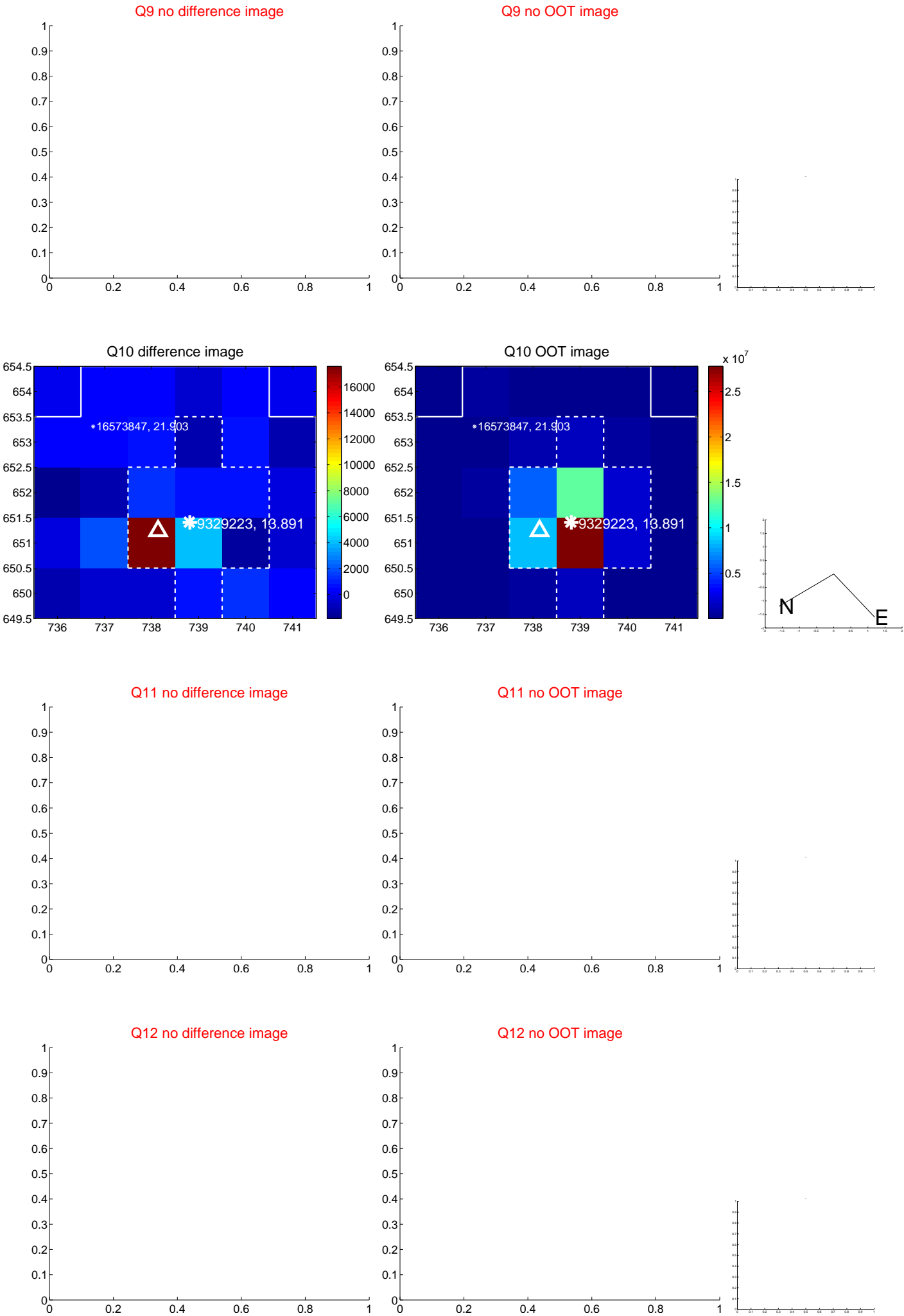




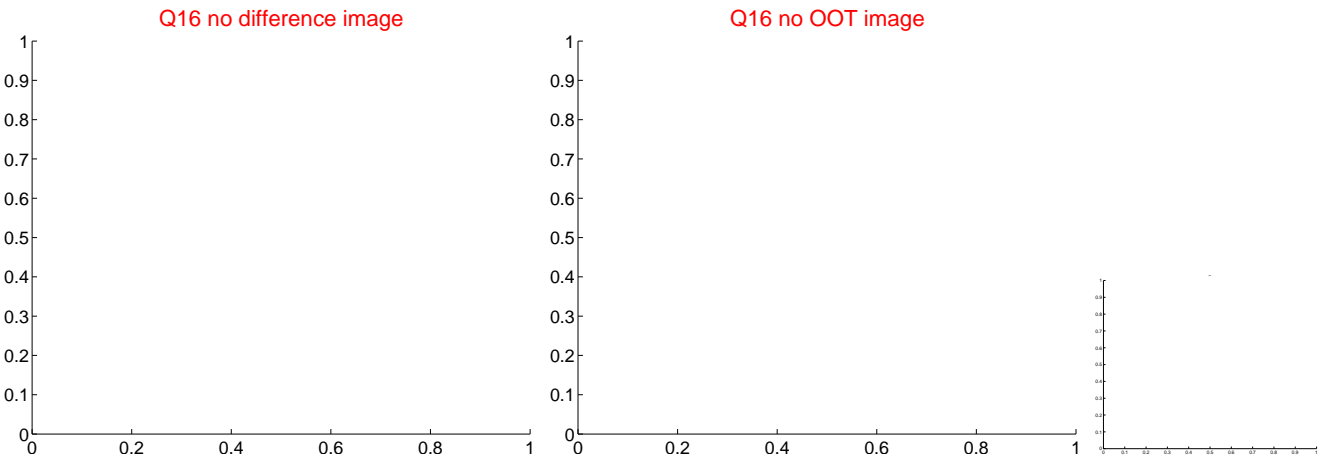
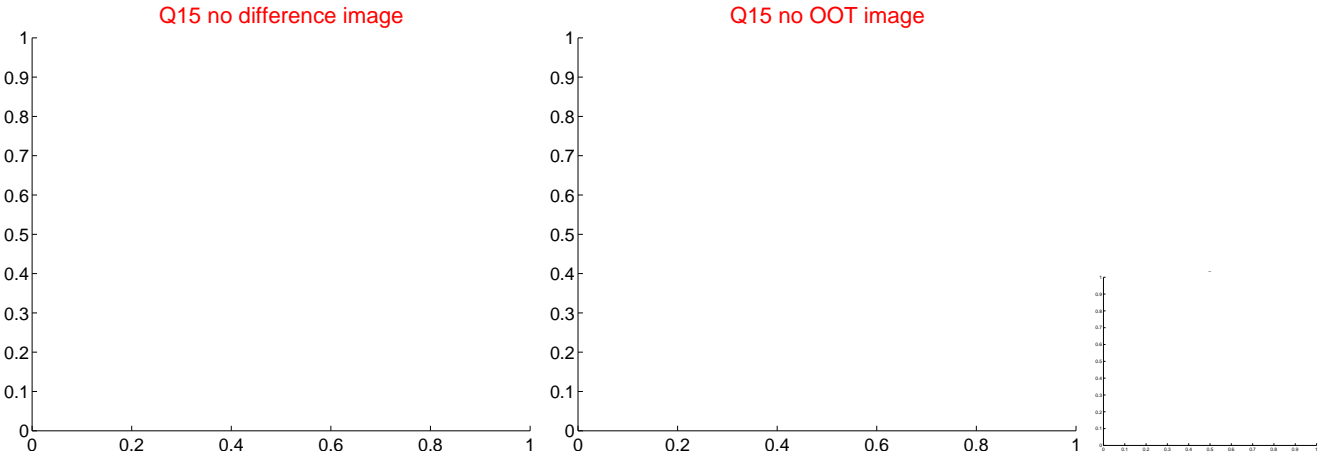
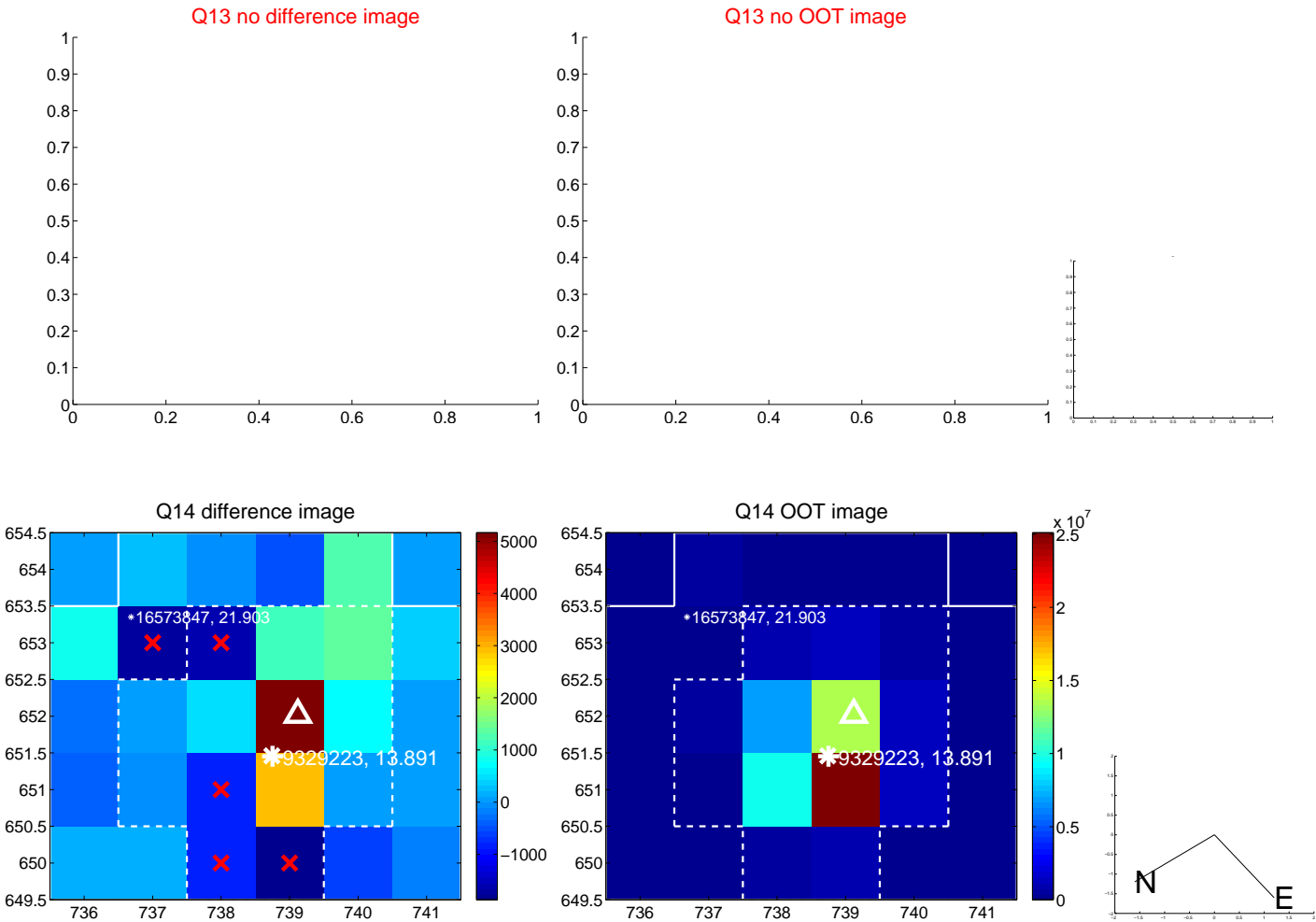
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



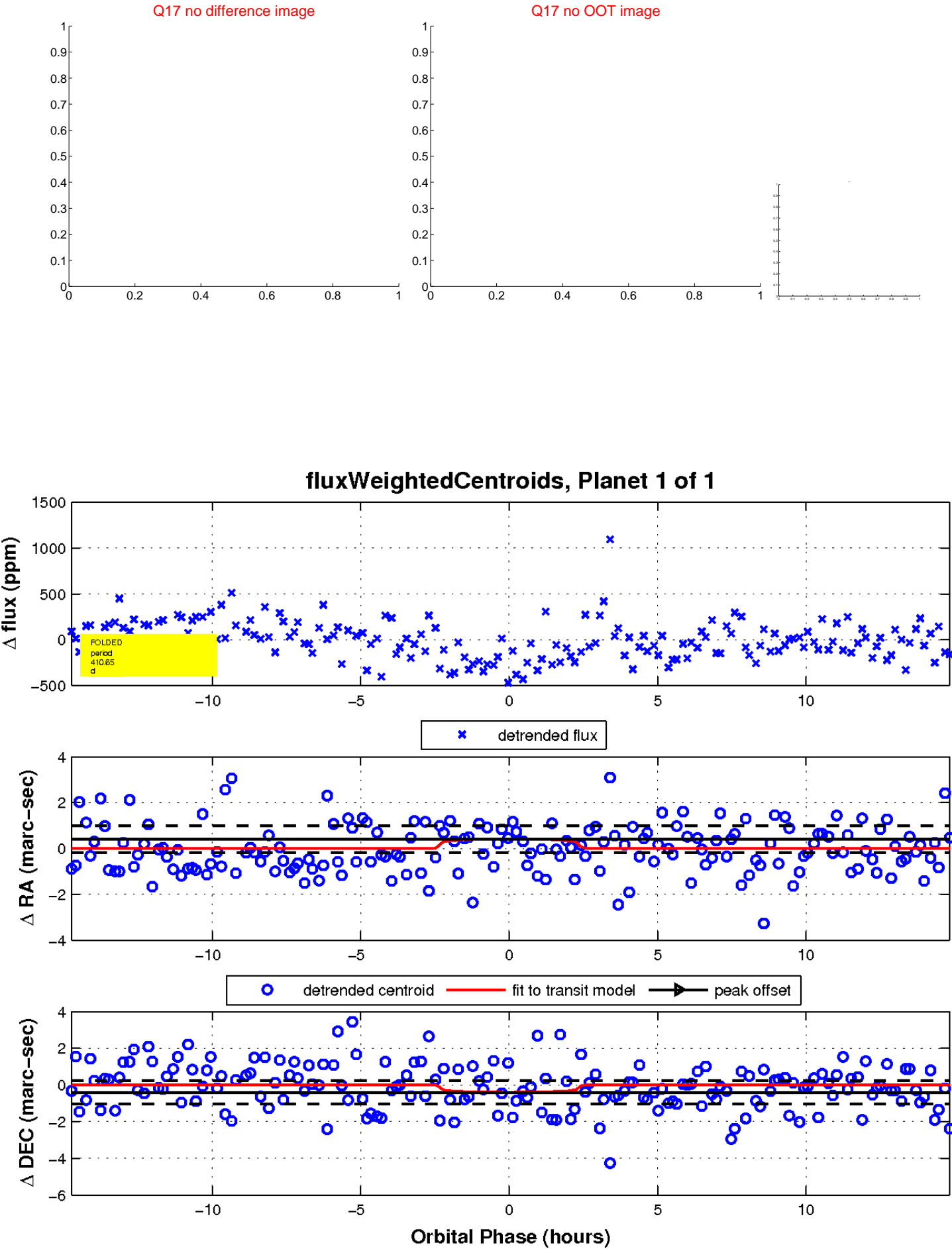
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

