

# KIC 002423938

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002423938-01	OBS	No	581.349388	407.888954	491.6	3.734	7.2	7.3	0.82	4898	2.04	0.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002423938-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

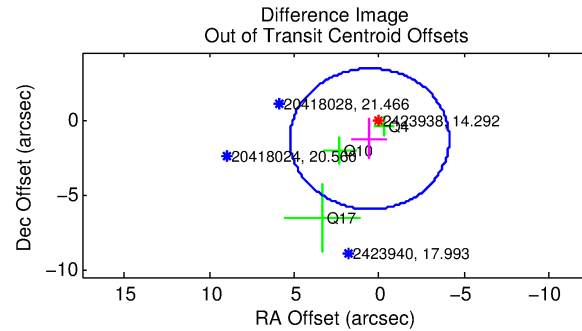
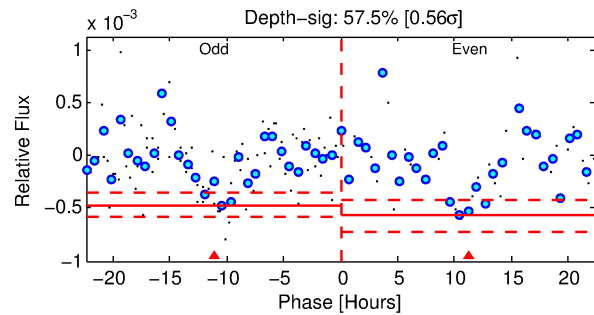
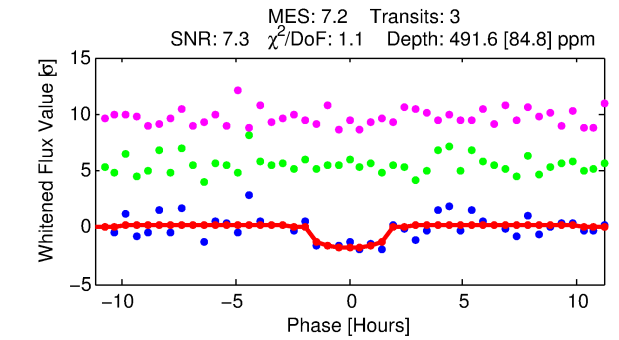
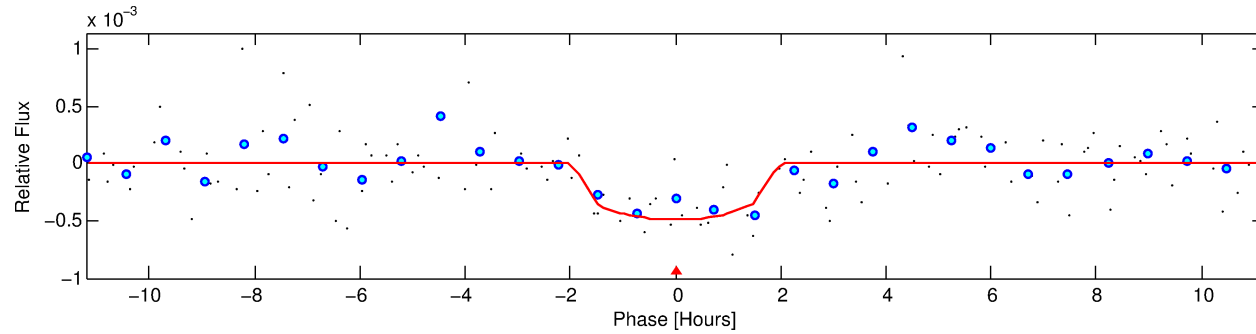
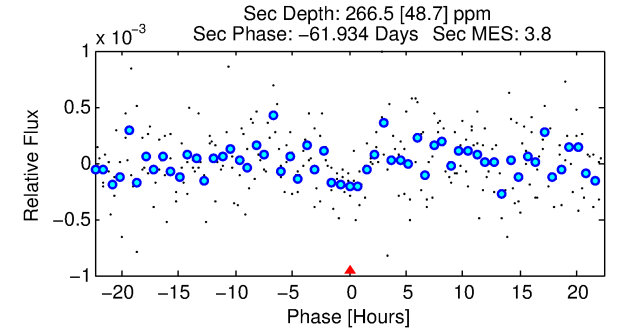
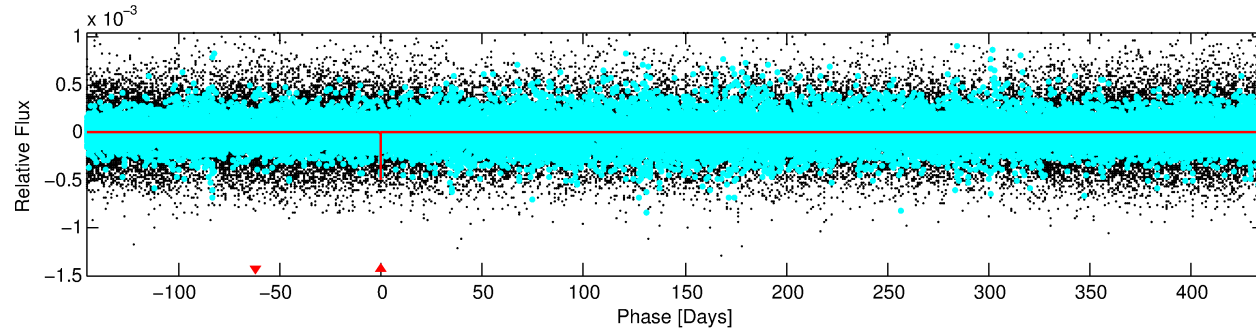
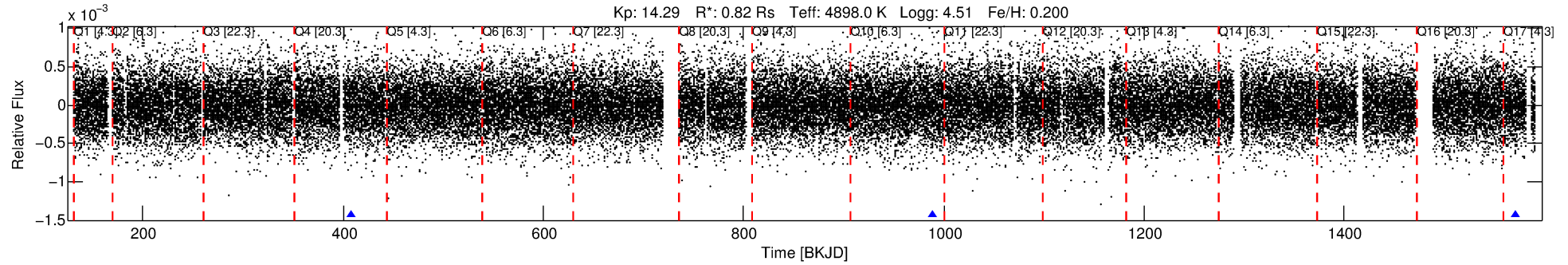
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002423938-01

No Significant Match Found

# DV One-Page Summary

KIC: 2423938 Candidate: 1 of 1 Period: 581.349 d



## DV Fit Results:

Period = 581.34939 [0.00958] d  
Epoch = 407.8890 [0.0098] BKJD  
Rp/R\* = 0.0229 [0.0288]  
a/R\* = 747.33 [3322.03]  
b = 0.81 [1.95]  
Seff = 0.22 [0.04]  
Teff = 174 [8] K  
Rp = 2.04 [2.57] Re  
a = 1.2583 [0.1114] AU  
Ag = 55715.83 [140467.63] [0.40 $\sigma$ ]  
Teffp = 4133 [2604] K [1.52 $\sigma$ ]

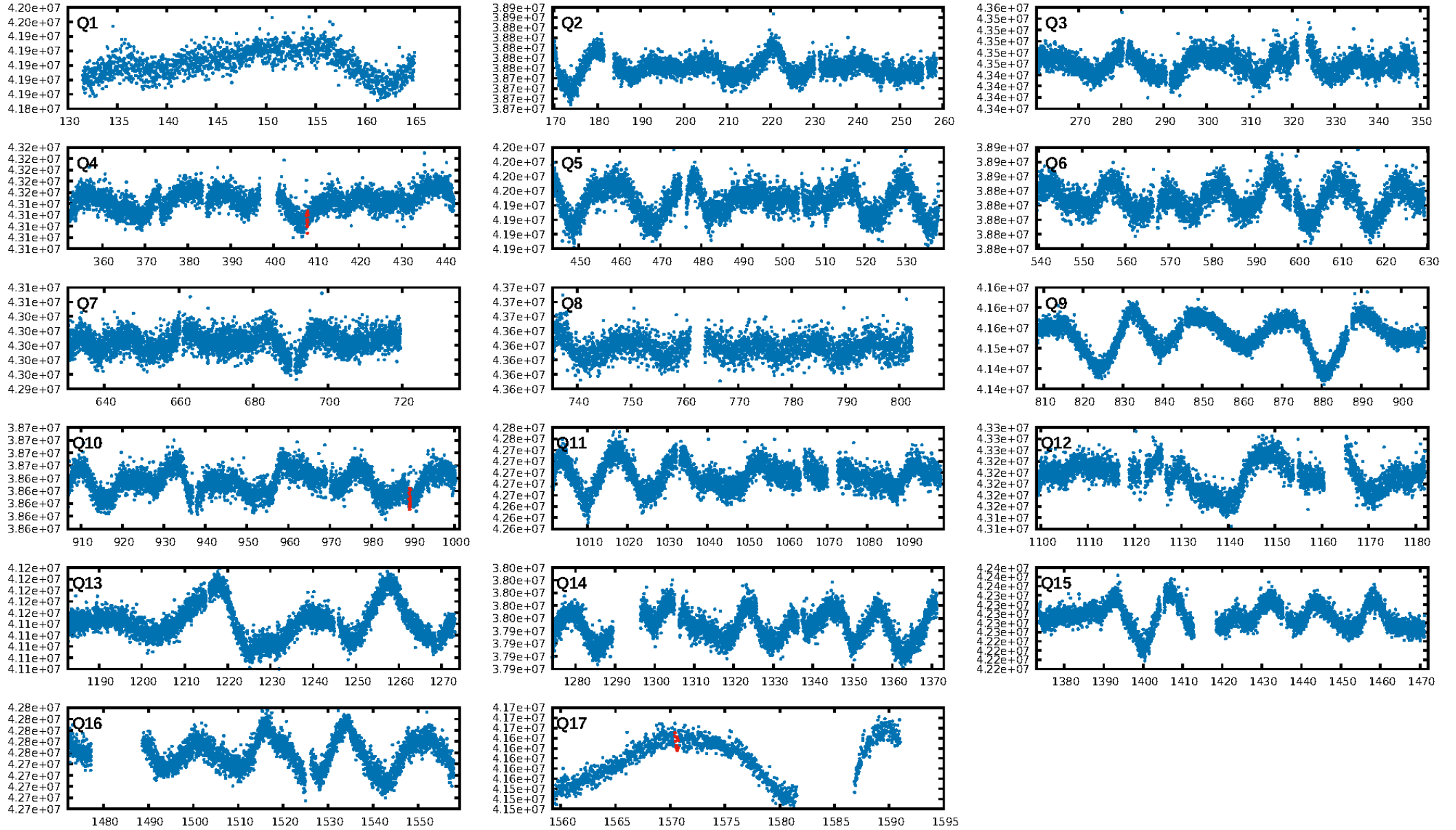
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 62.6%  
ModelChiSquareGof-sig: 98.3%  
**Bootstrap-pfa: 5.11e-12**  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 20.26  
Centroid-sig: 53.3%  
Centroid-so: 1.992 arcsec [1.14 $\sigma$ ]  
OotOffset-rm: 1.390 arcsec [0.89 $\sigma$ ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-rm: 1.413 arcsec [1.11 $\sigma$ ]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

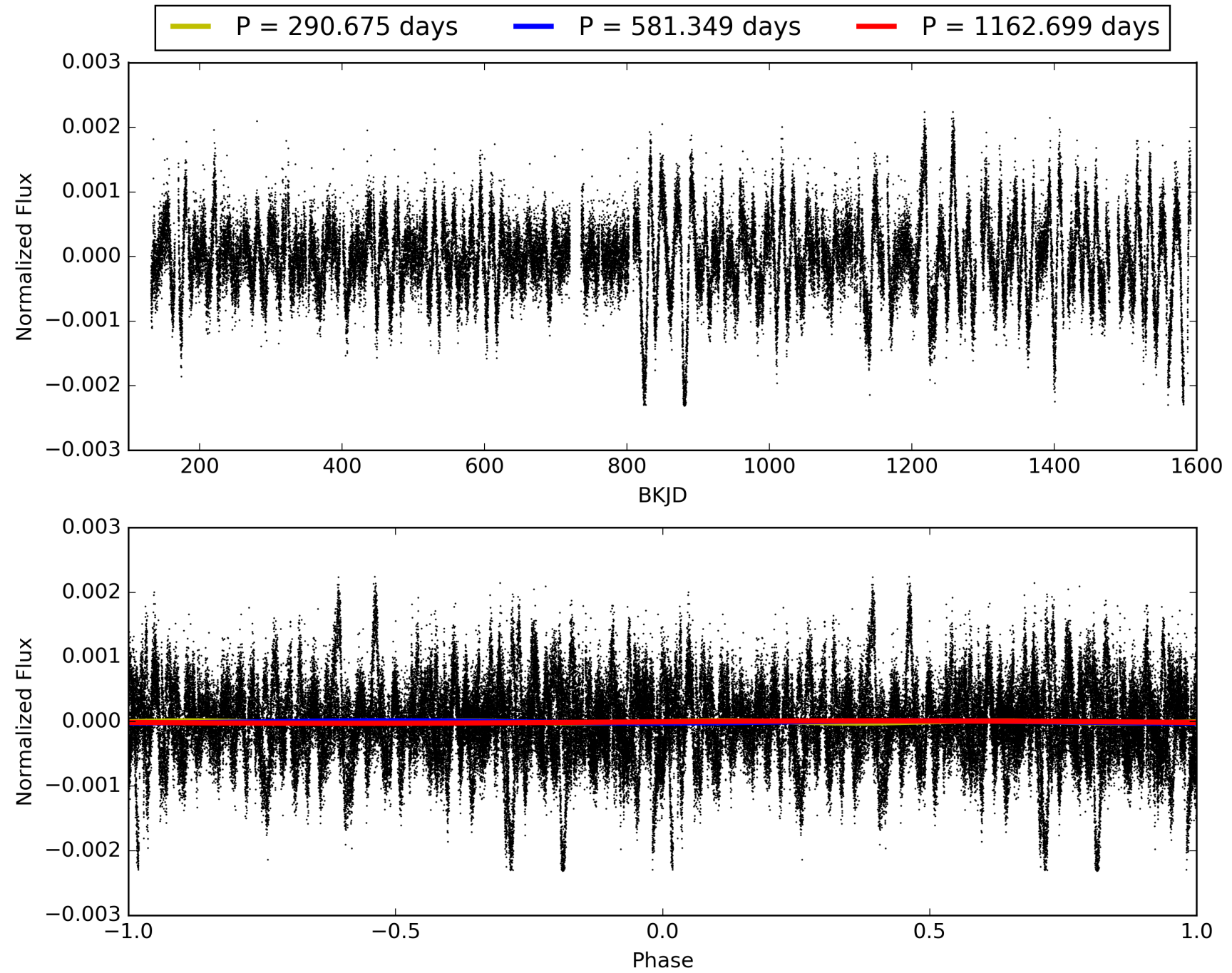
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:51:13 Z

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

# TCE 002423938-01, PDC Light Curves

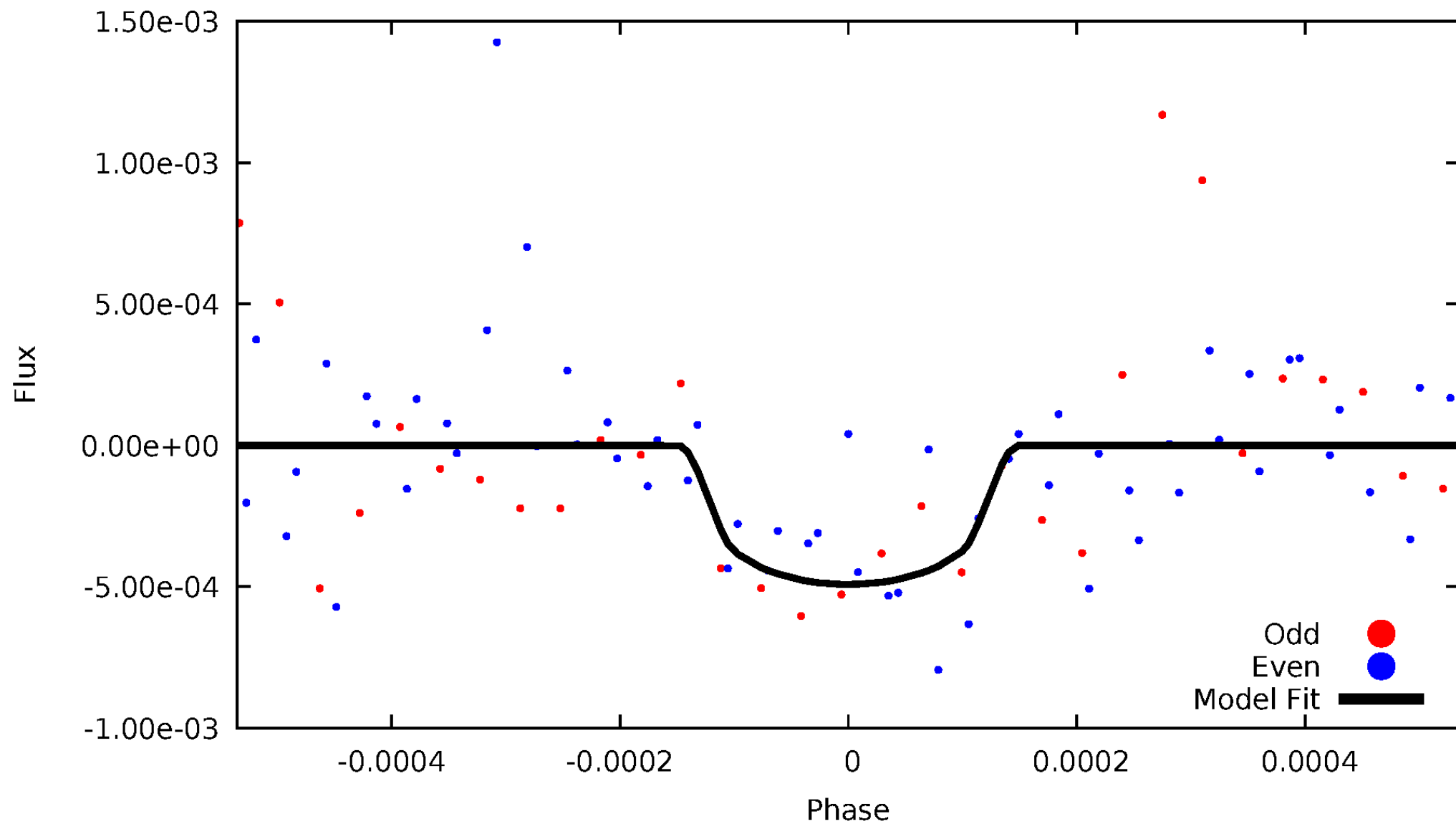


TCE 002423938-01



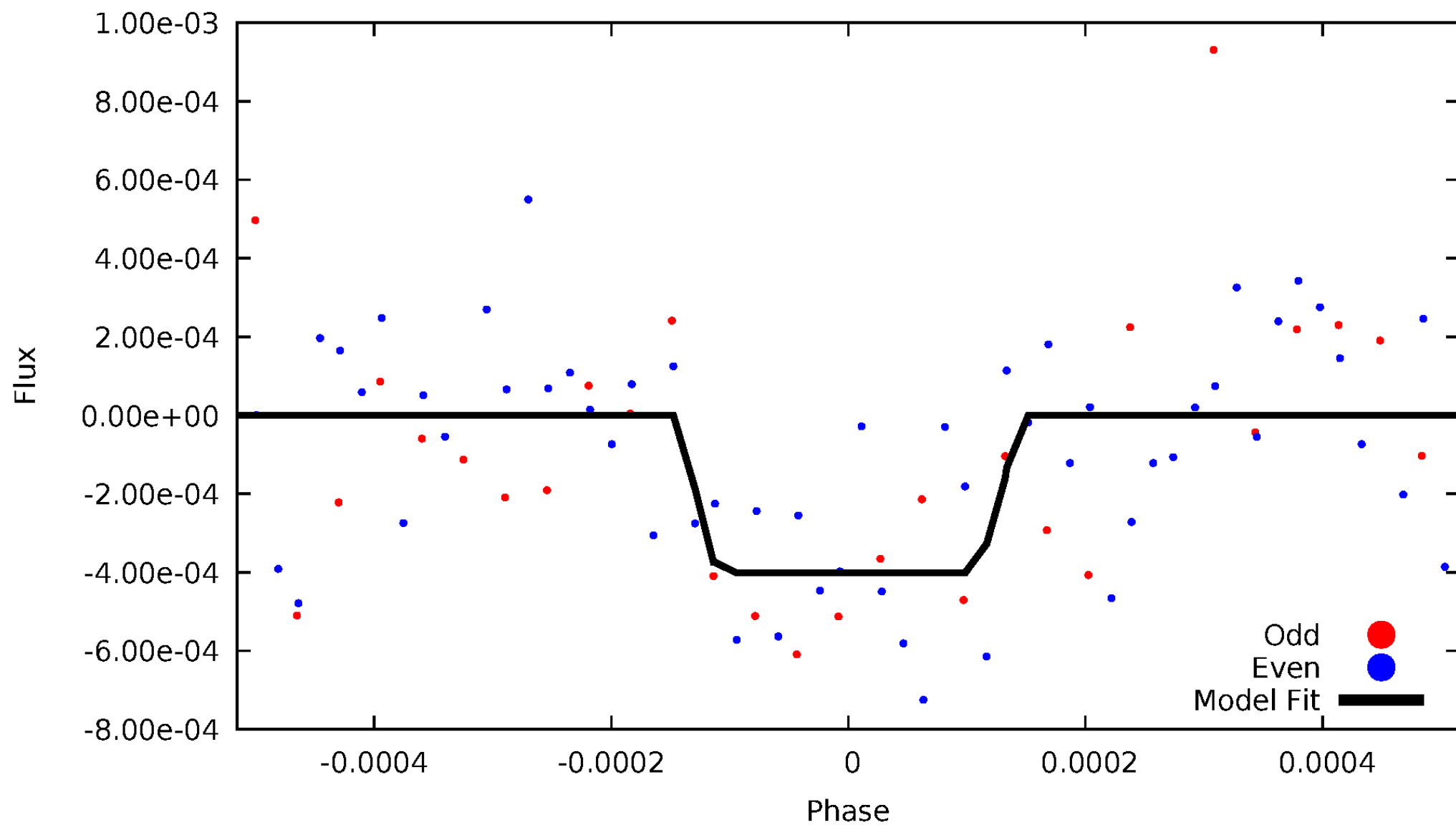
# DV Odd/Even

TCE 002423938-01

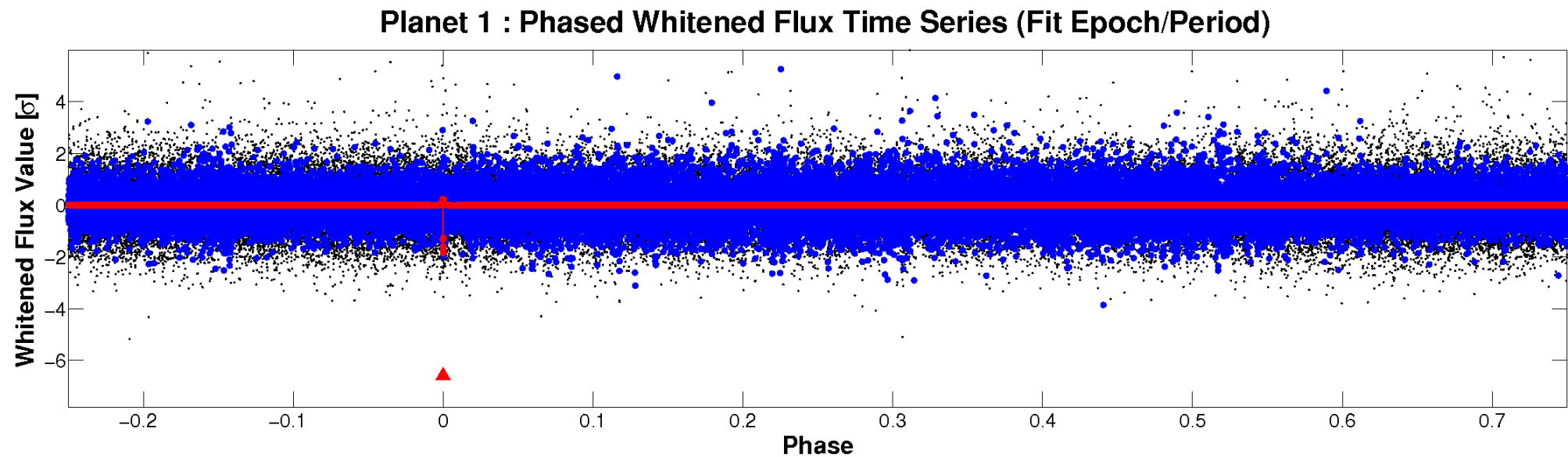
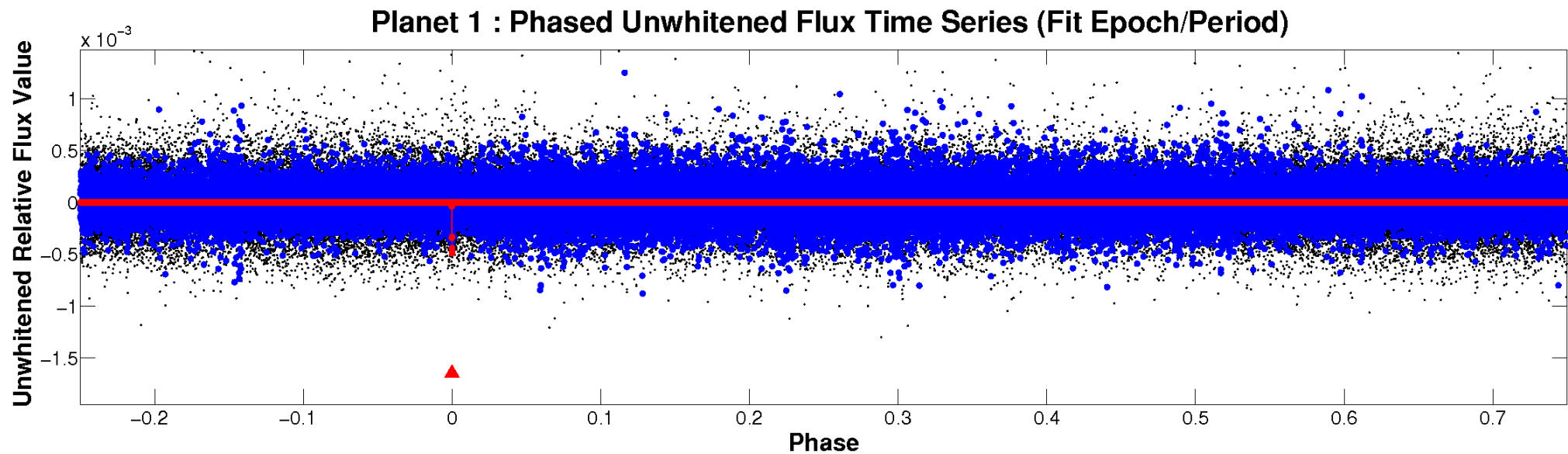


# ALT Odd/Even

TCE 002423938-01

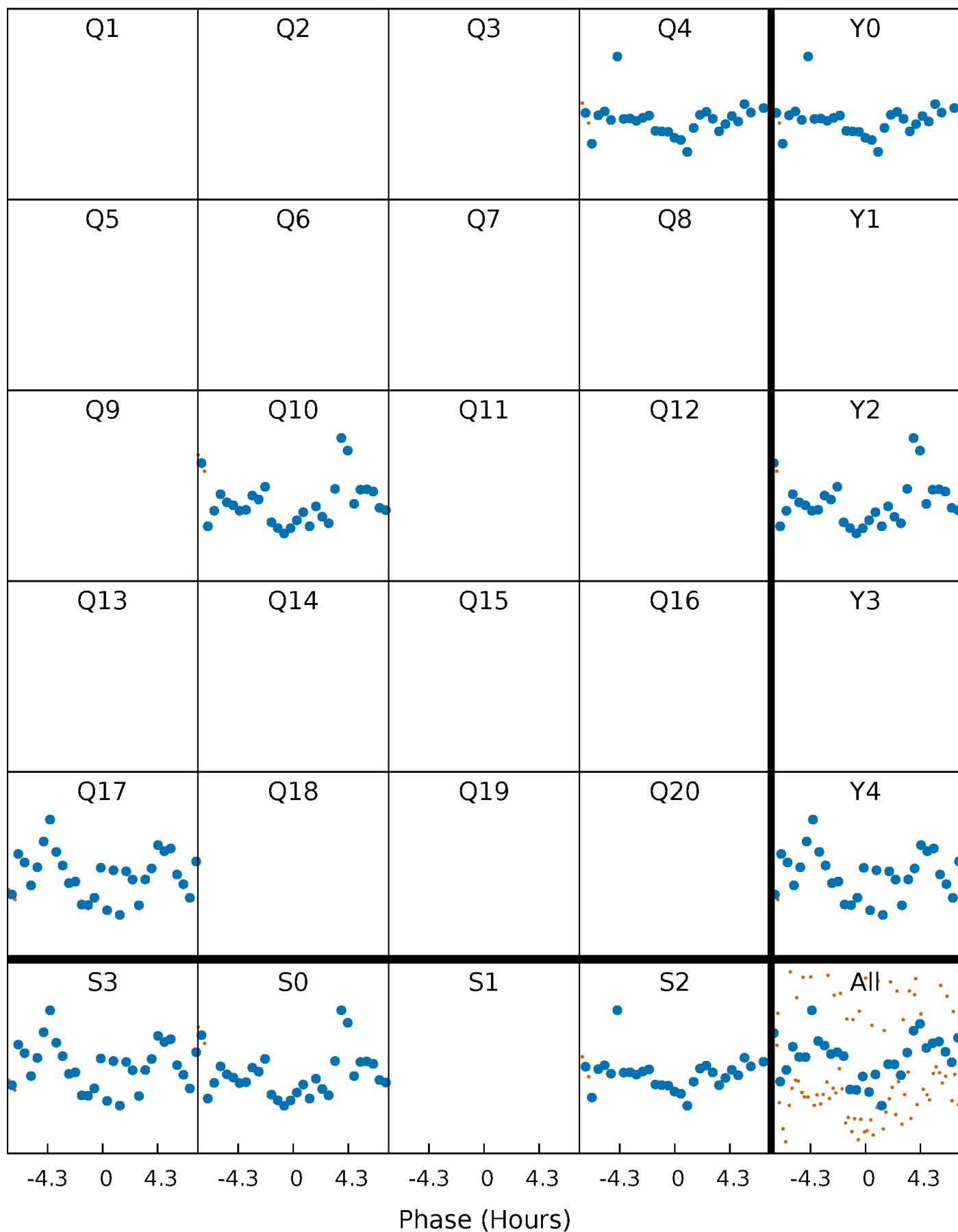


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

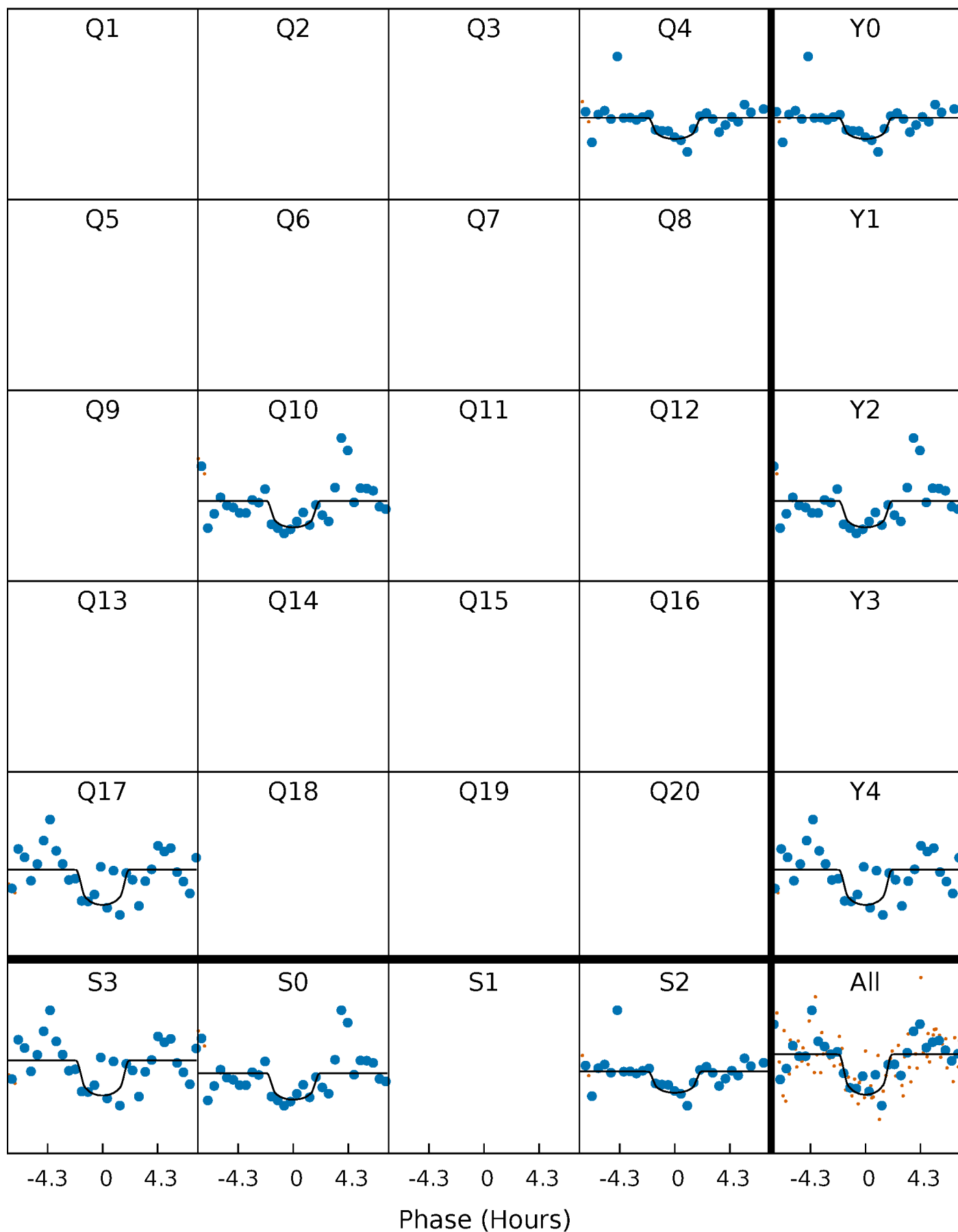
TCE 002423938-01 P=581.349389 Days  $T_0=407.888954$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 002423938-01 P=581.349389 Days  $T_0=407.888954$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

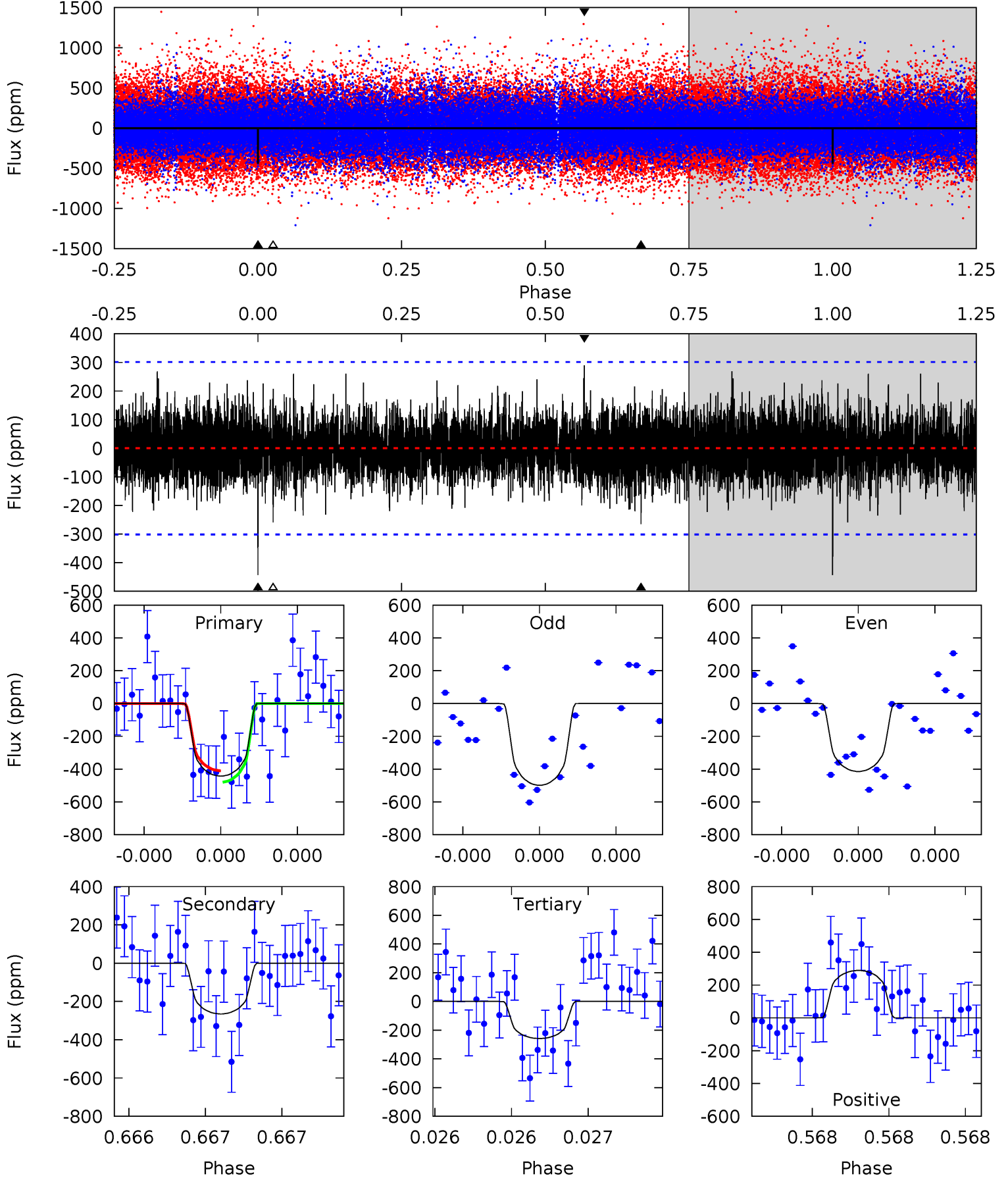
TCE 002423938-01 P=581.341593 Days  $T_0=407.897999$  (BKJD)



# DV Model-Shift Uniqueness Test

002423938-01, P = 581.349389 Days, E = 407.888954 Days

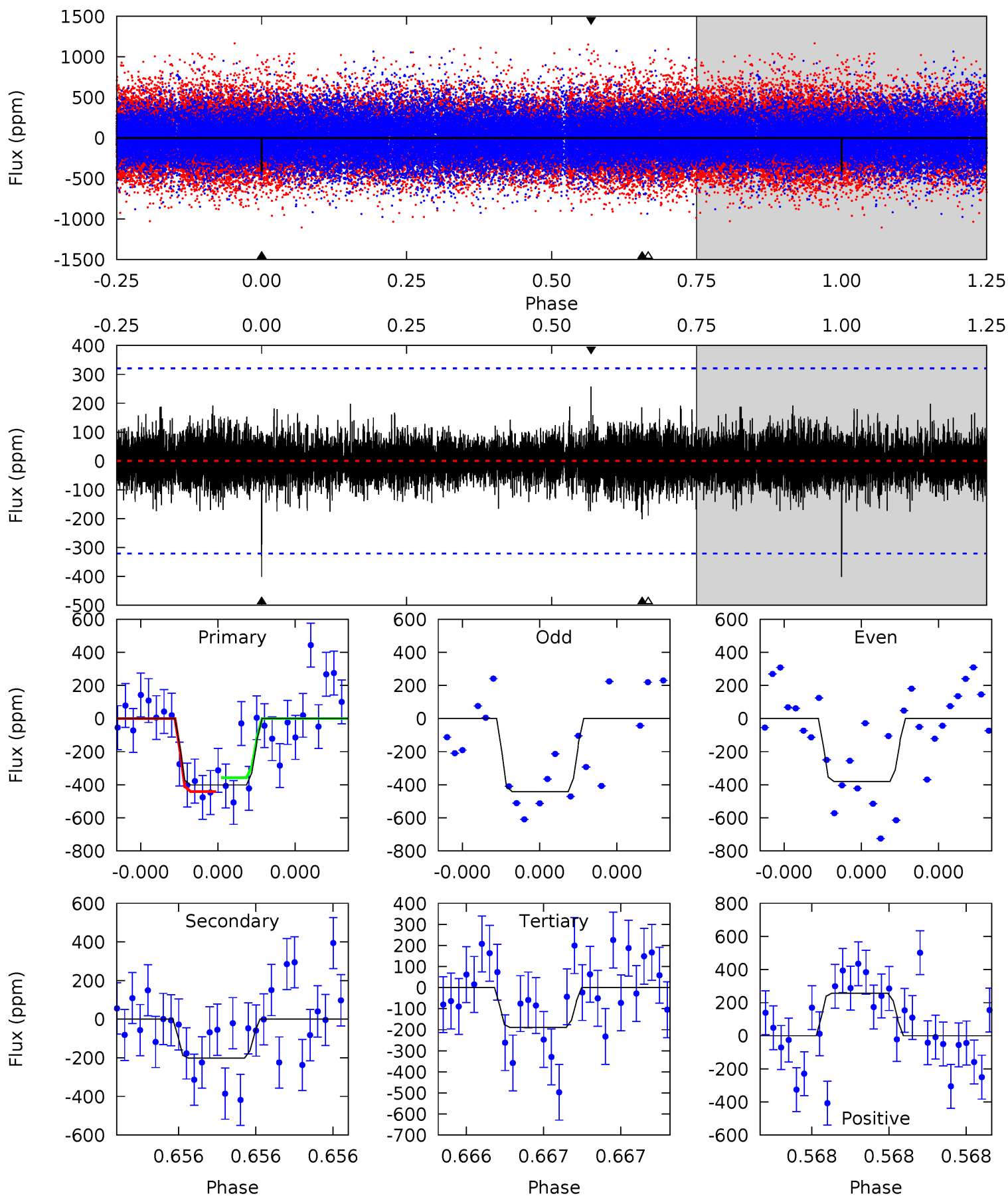
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.31	4.98	4.84	5.42	5.65	3.60	1.24	3.46	2.88	0.13	-0.45	0.73	0.94	0.39	0.66



# Alt Model-Shift Uniqueness Test

002423938-01, P = 581.341593 Days, E = 407.897999 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
7.11	3.57	3.36	4.56	5.68	3.65	0.87	3.75	2.55	0.22	-0.99	0.51	0.97	0.39	0.74



### Stellar Parameters For KIC 002423938

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4898^{+145}_{-130}$	$4.510^{+0.080}_{-0.072}$	$0.200^{+0.200}_{-0.250}$	$0.816^{+0.062}_{-0.078}$	$0.786^{+0.067}_{-0.054}$	$2.035^{+0.647}_{-0.448}$
	+3%/-3%	+2%/-2%	+100%/-125%	+8%/-10%	+9%/-7%	+32%/-22%
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 002423938-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-265 \pm 53$	$2.84^{+2.34}_{-1.84}$	$243^{+9}_{-9}$	$3798^{+2008}_{-663}$	$28961^{+197112}_{-20672}$
Alt.	$-202 \pm 56$	$2.55^{+2.34}_{-1.68}$	$243^{+9}_{-10}$	$3727^{+2034}_{-677}$	$25413^{+206692}_{-18271}$

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

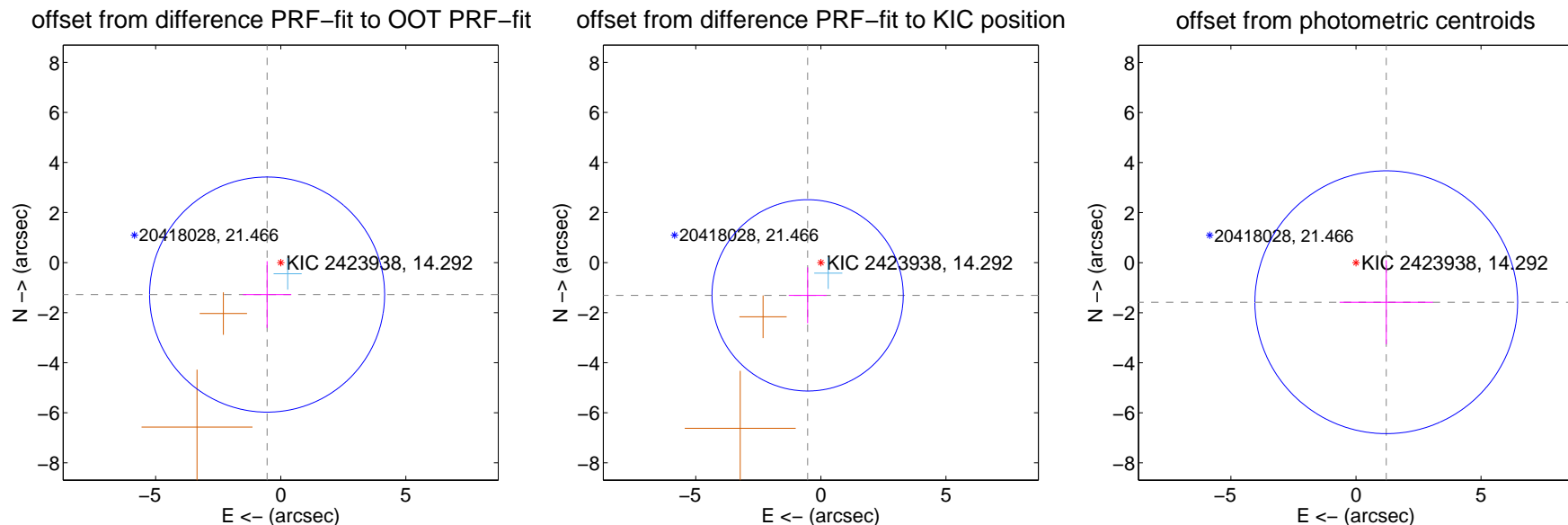
## DV Centroid Data

Supplemental centroid analysis for 002423938-01. Kepler magnitude: 14.29. Transit SNR 7.32

There are 1 quarters with good PRF difference image offsets

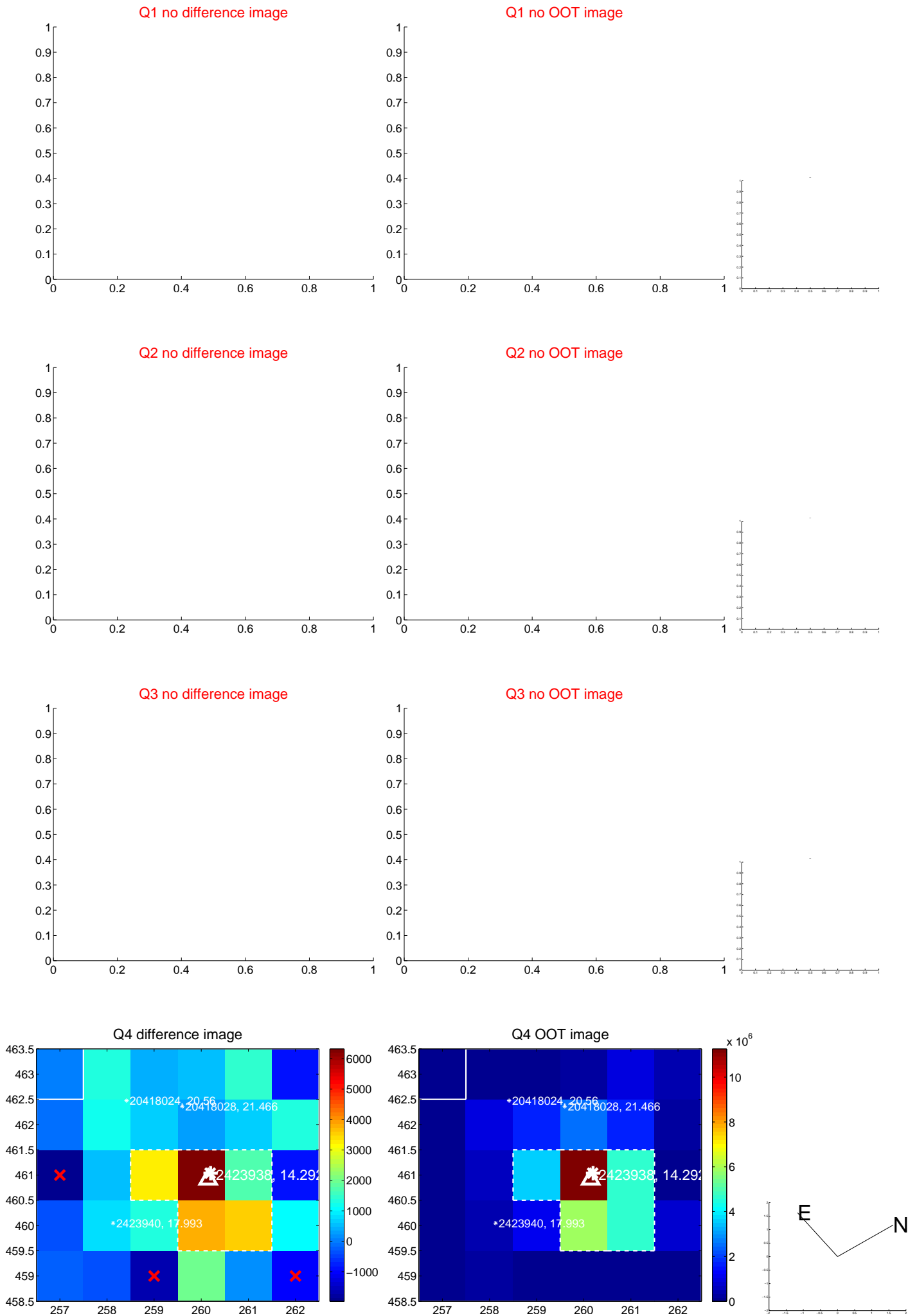
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.390 \pm 1.566$	0.89	$0.546 \pm 0.968$	$-1.278 \pm 1.332$
PRF-fit source offset from KIC position	$1.413 \pm 1.274$	1.11	$0.530 \pm 0.757$	$-1.309 \pm 1.117$
photometric centroid source offset	$1.99 \pm 1.75$	1.14	$-1.21 \pm 1.87$	$-1.58 \pm 1.68$



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.

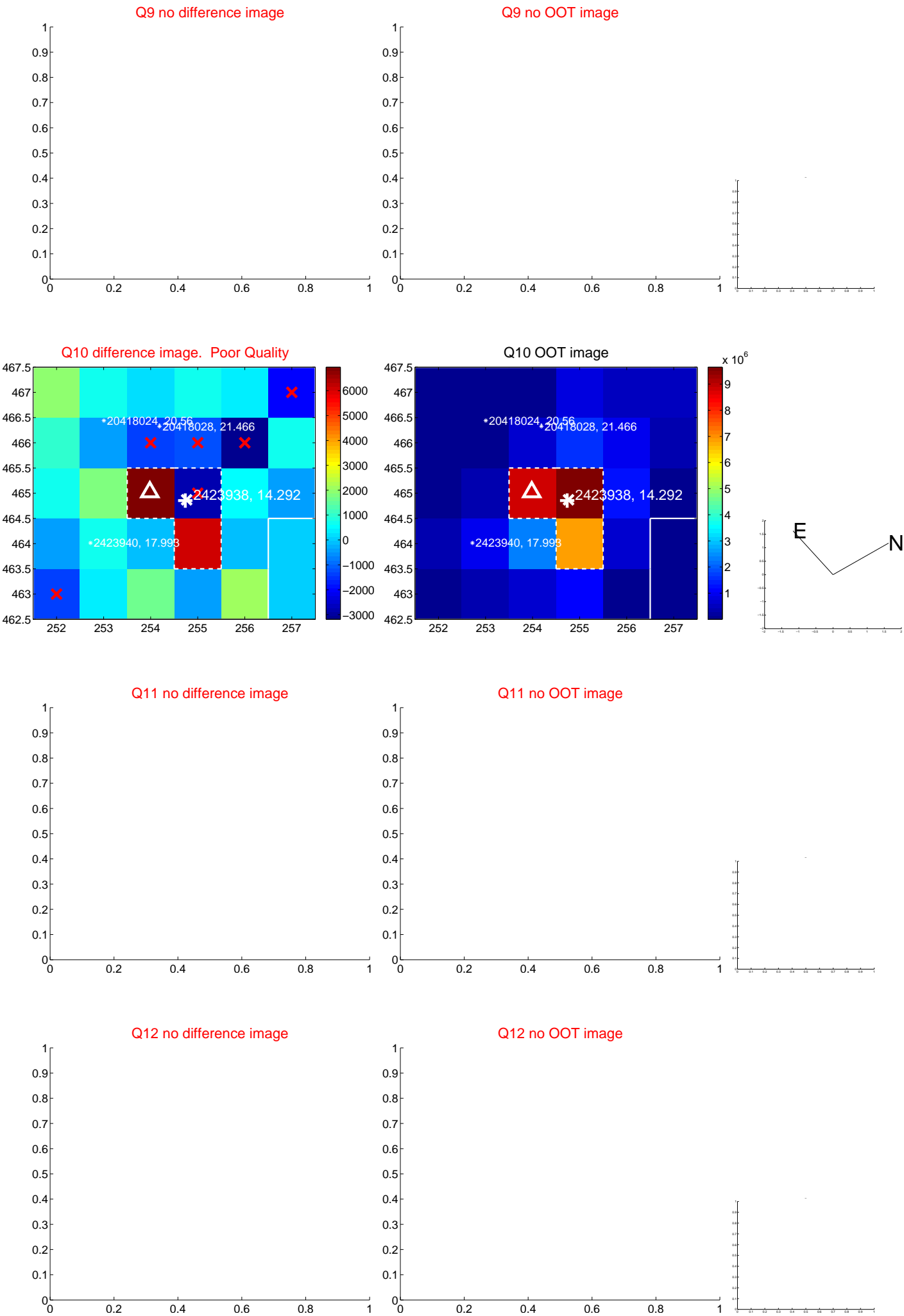


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





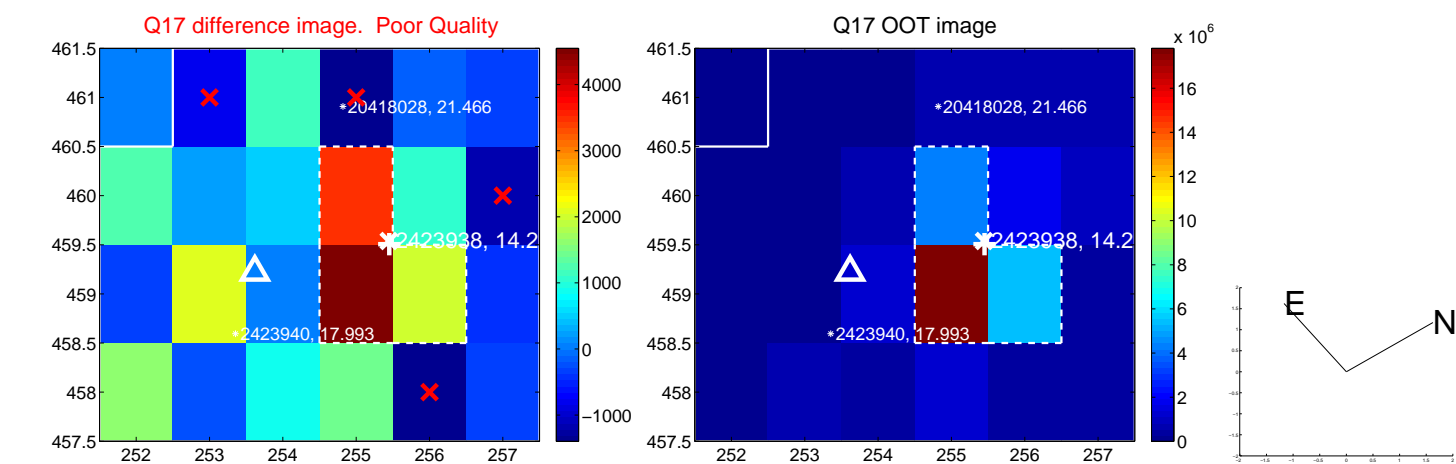
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



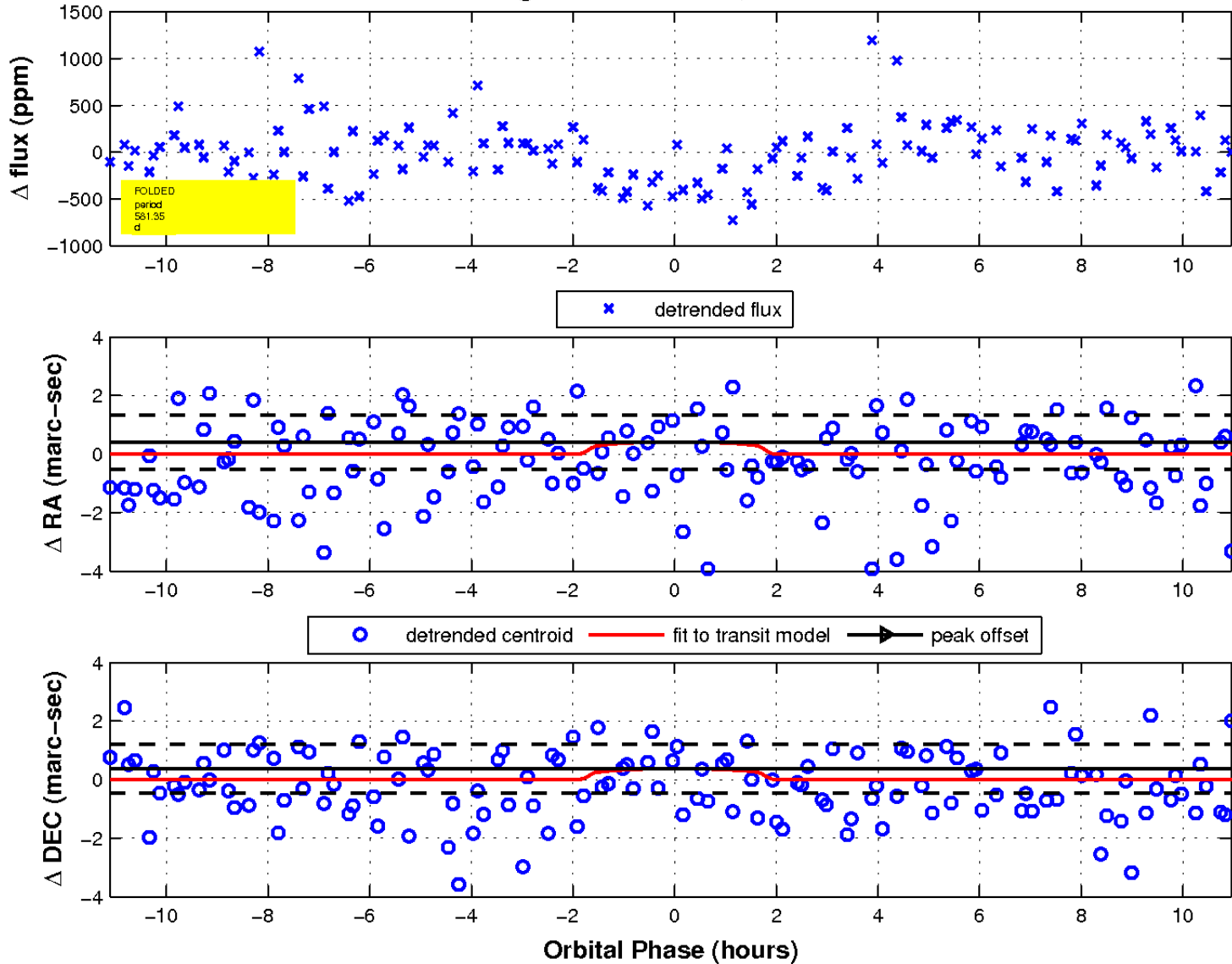
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



### fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

