

# KIC 012401863

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012401863-01	OBS	2331.01	2.832656	131.823629	107.4	2.358	23.1	25.1	1.27	5865	1.55	1055.28

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012401863-01	OBS	PC	0.99	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.

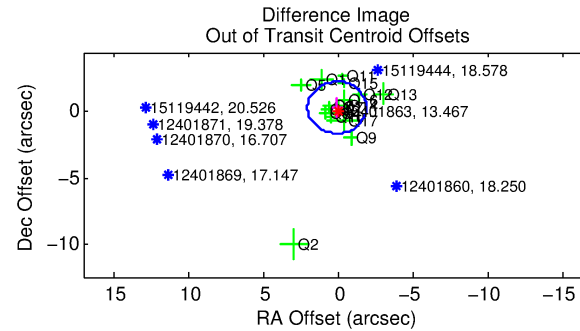
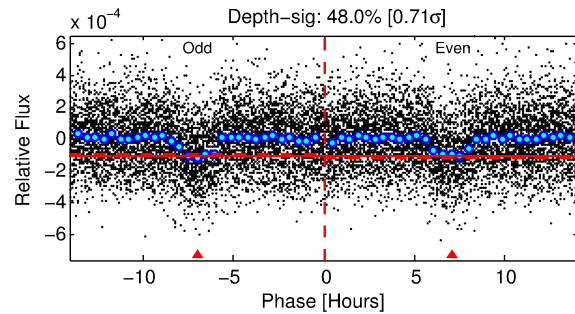
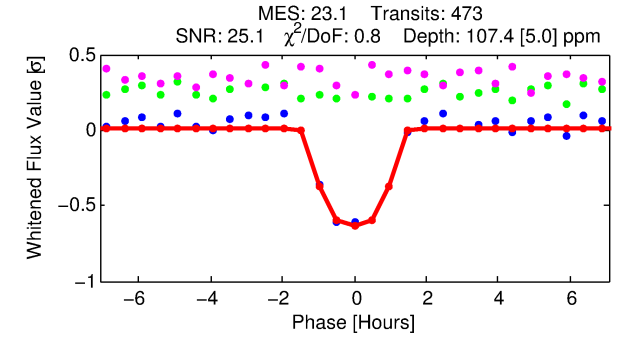
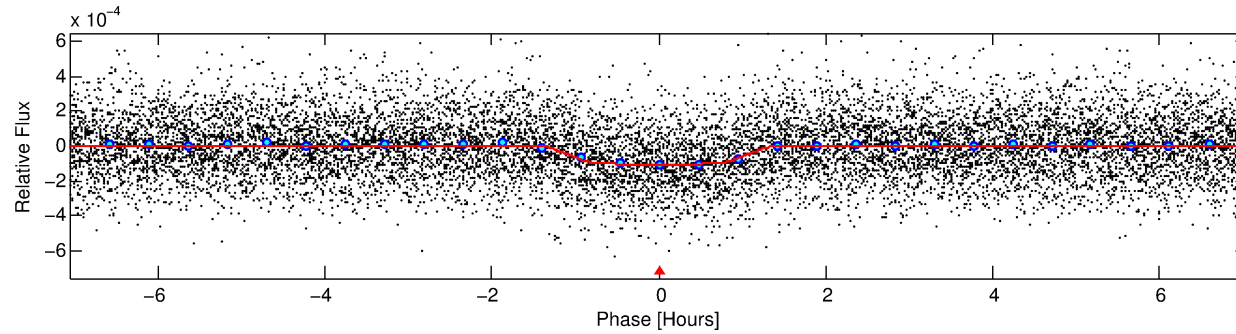
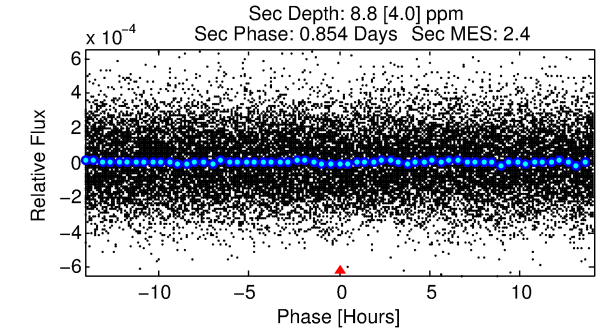
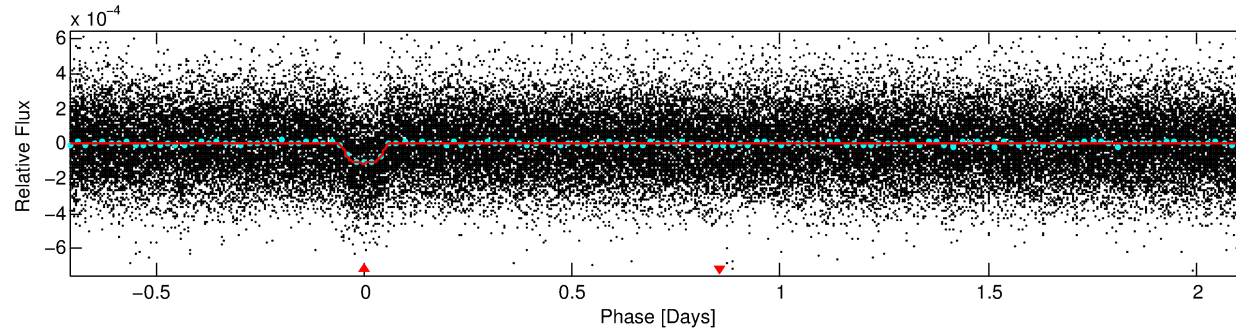
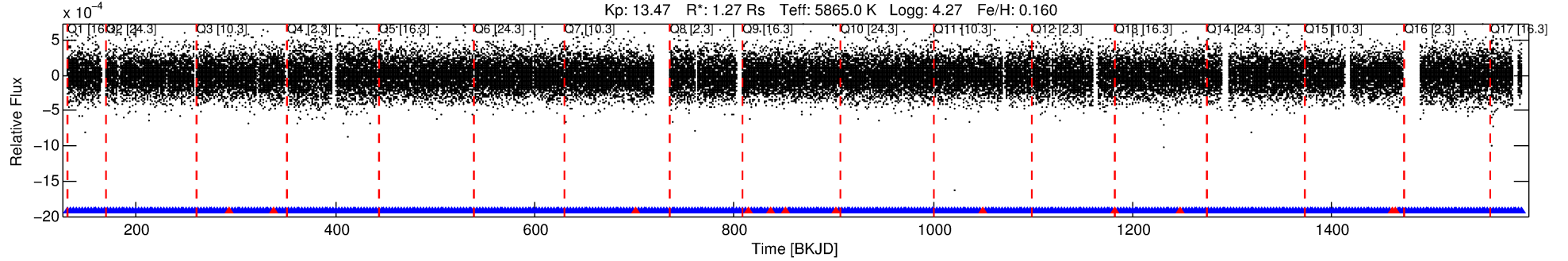
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012401863-01

No Significant Match Found

# DV One-Page Summary

KIC: 12401863 Candidate: 1 of 1 Period: 2.833 d  
KOI: K02331.01 Corr: 0.984



## DV Fit Results:

Period = 2.83266 [0.00001] d  
Epoch = 131.8236 [0.0016] BKJD  
Rp/R\* = 0.0112 [0.0037]  
a/R\* = 4.57 [6.91]  
b = 0.89 [0.39]  
Seff = 1055.28 [256.75]  
Teq = 1453 [88] K  
Rp = 1.55 [0.57] Re  
a = 0.0403 [0.0060] AU  
Ag = 3.28 [2.75] [0.83σ]  
Teffp = 3025 [611] K [2.55σ]

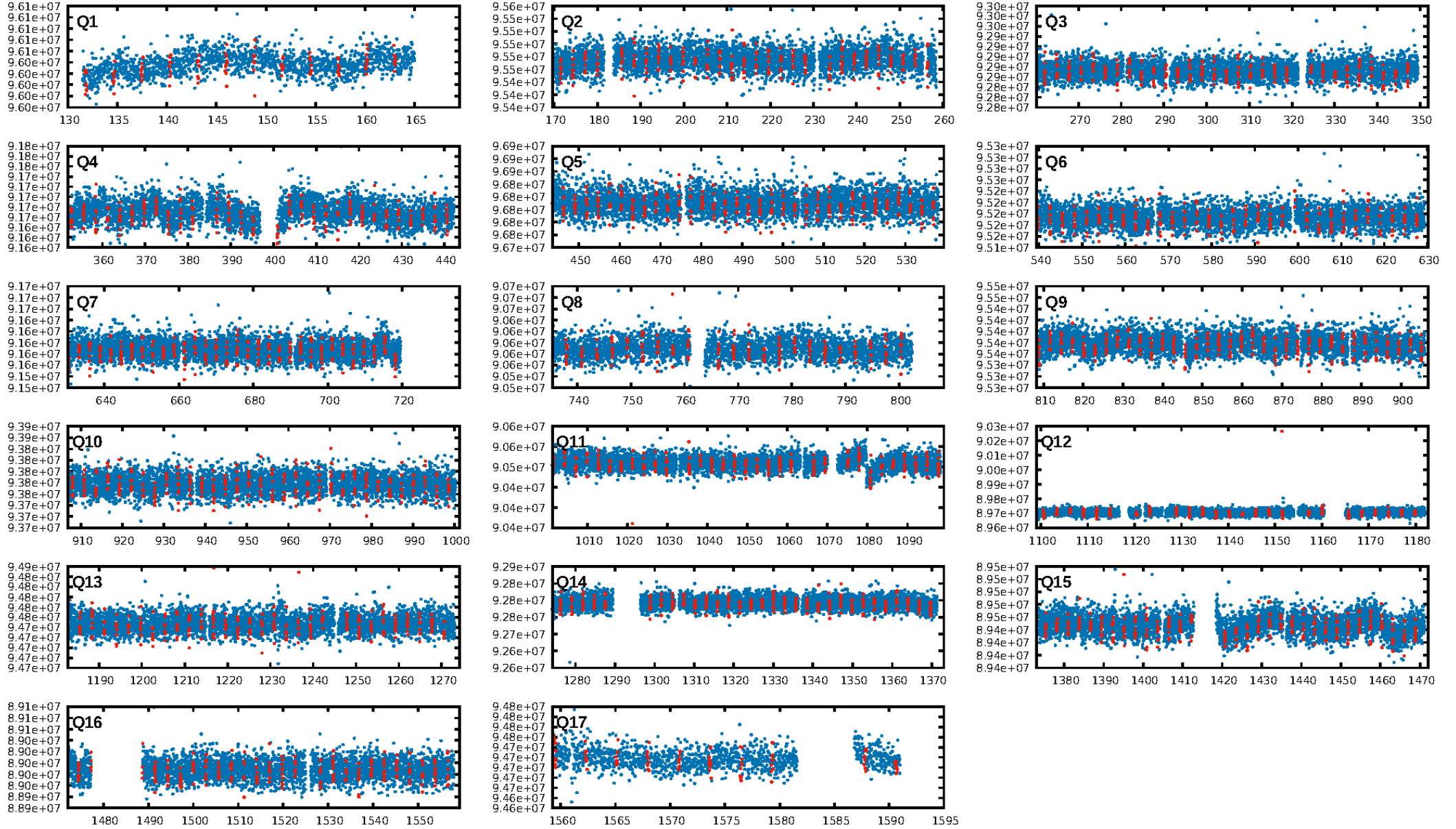
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.41e-114  
RollingBand-fgt: 0.97 [439/451]  
GhostDiagnostic-chr: 2.618  
Centroid-sig: 3.1%  
Centroid-so: 1.318 arcsec [2.34σ]  
OotOffset-rm: 0.327 arcsec [0.50σ]  
KicOffset-rm: 0.443 arcsec [0.67σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.76 [13/17]  
DiffImageOverlap-fno: 1.00 [17/17]

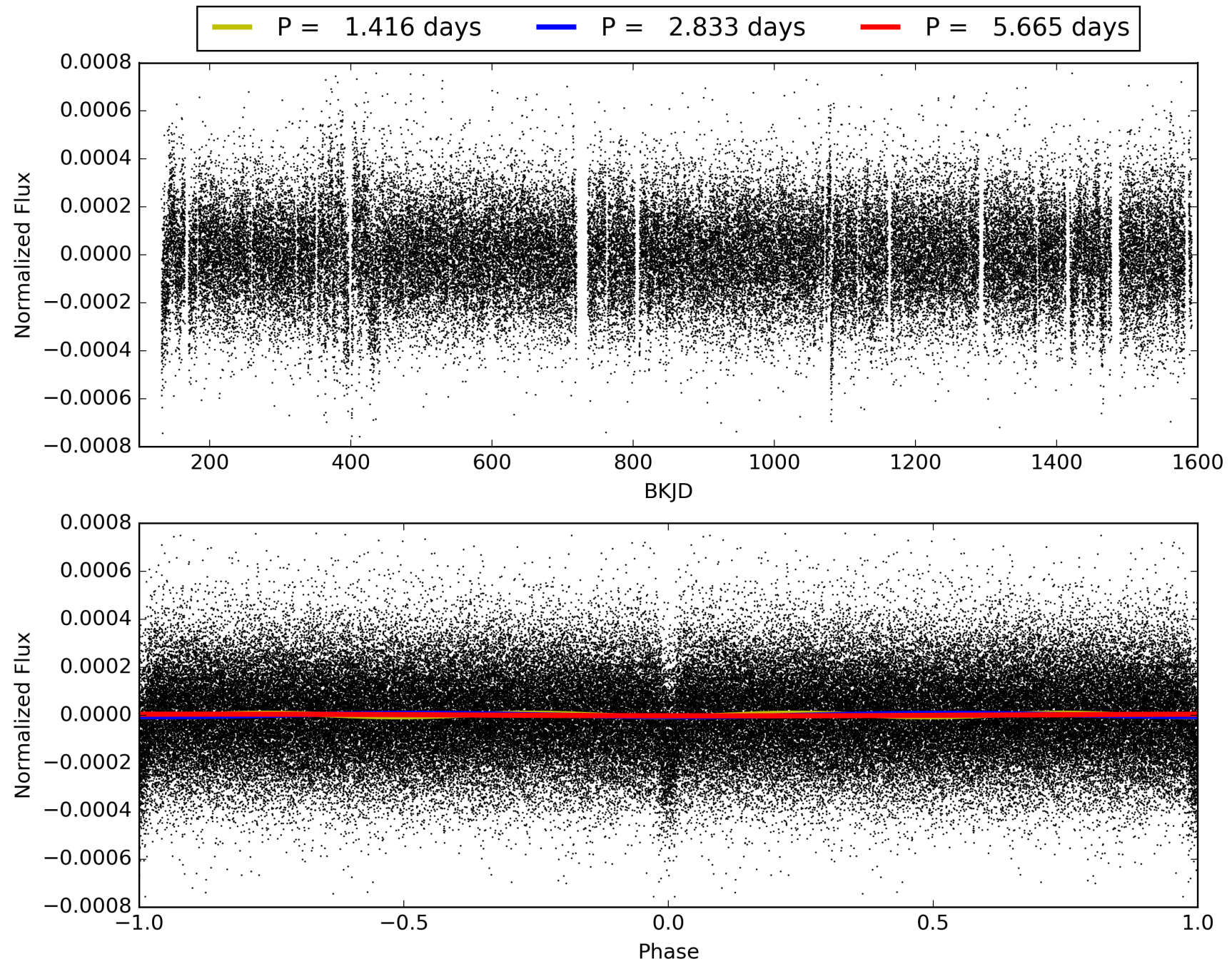
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:55:27 Z

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

# TCE 012401863-01, PDC Light Curves



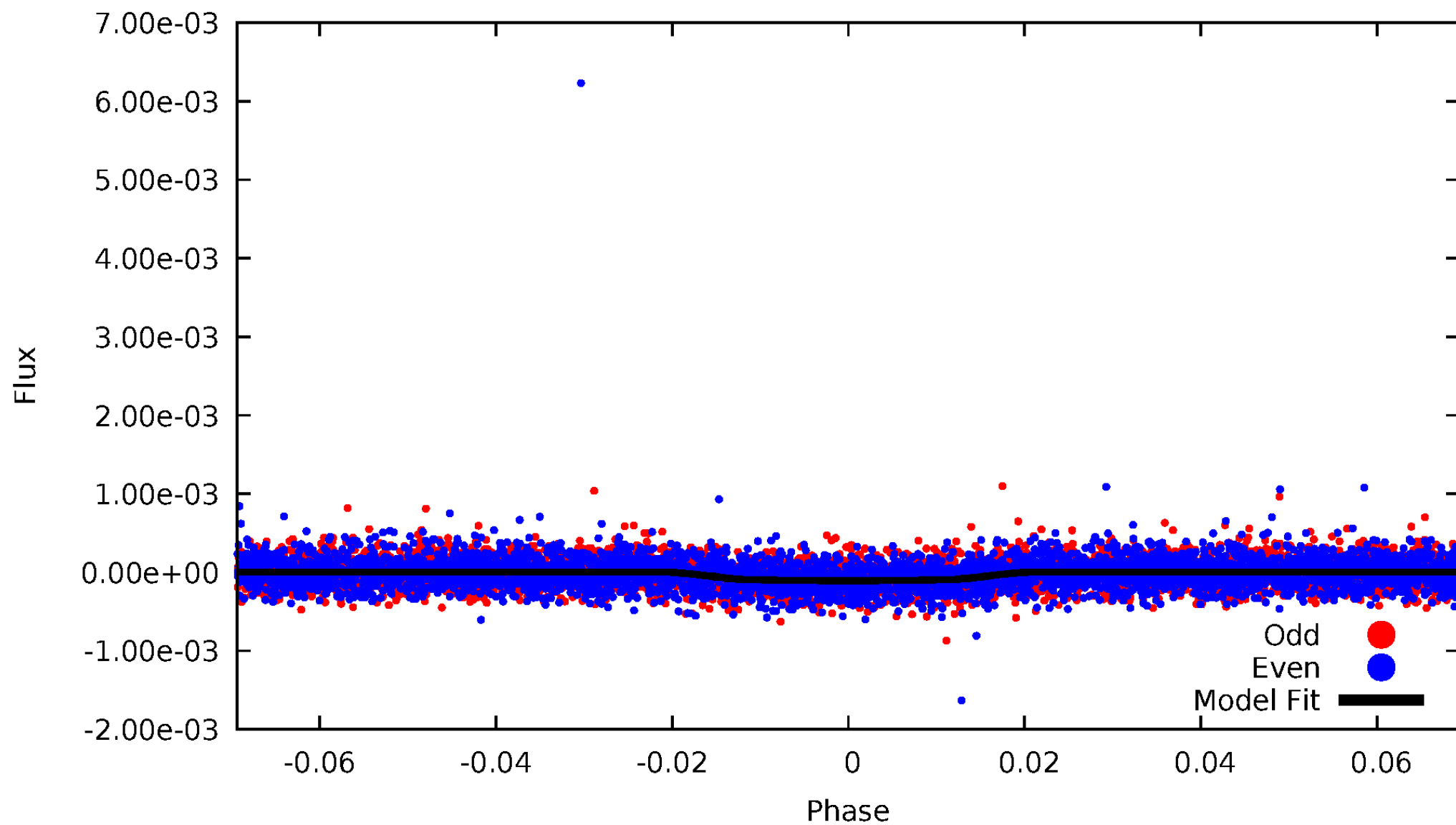
TCE 012401863-01





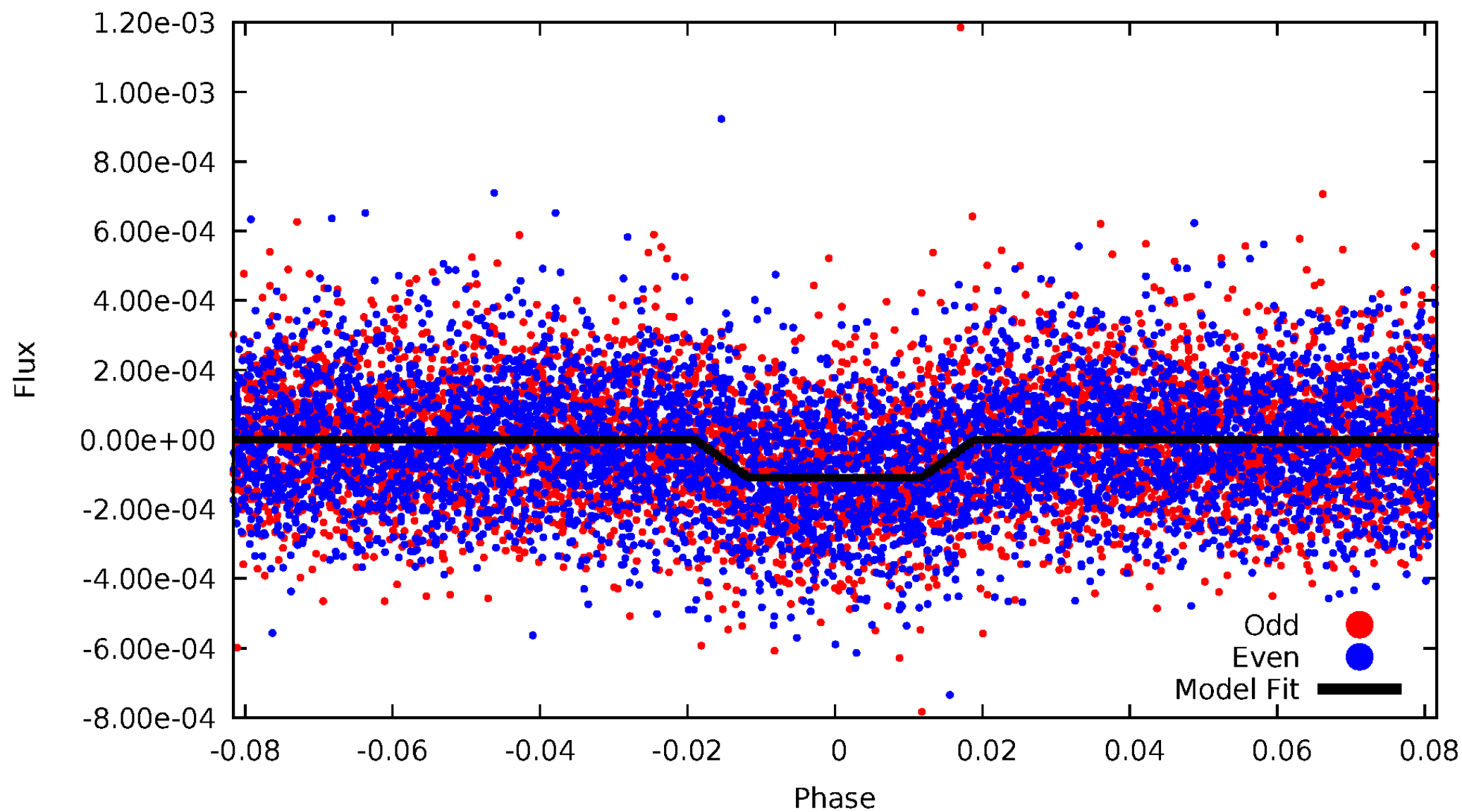
# DV Odd/Even

TCE 012401863-01



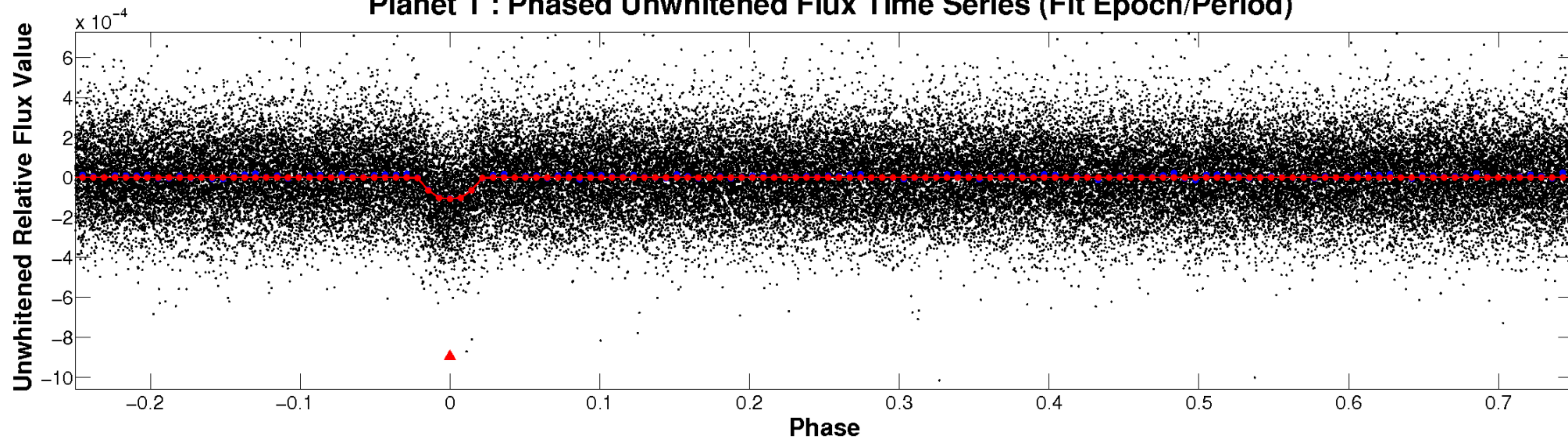
# ALT Odd/Even

TCE 012401863-01

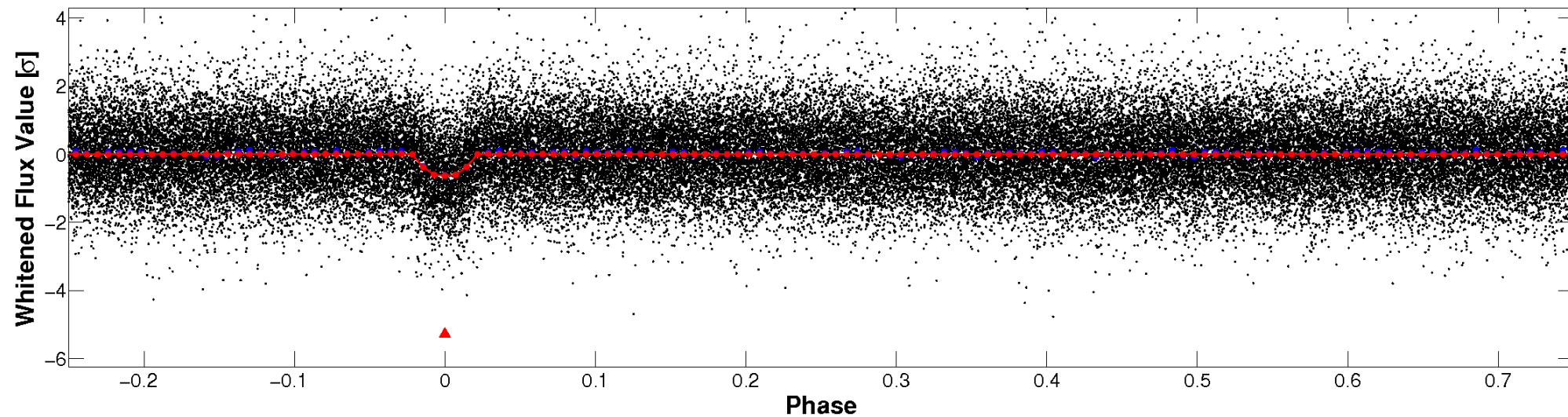


# Non-Whitened Vs. Whitened Light Curve

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

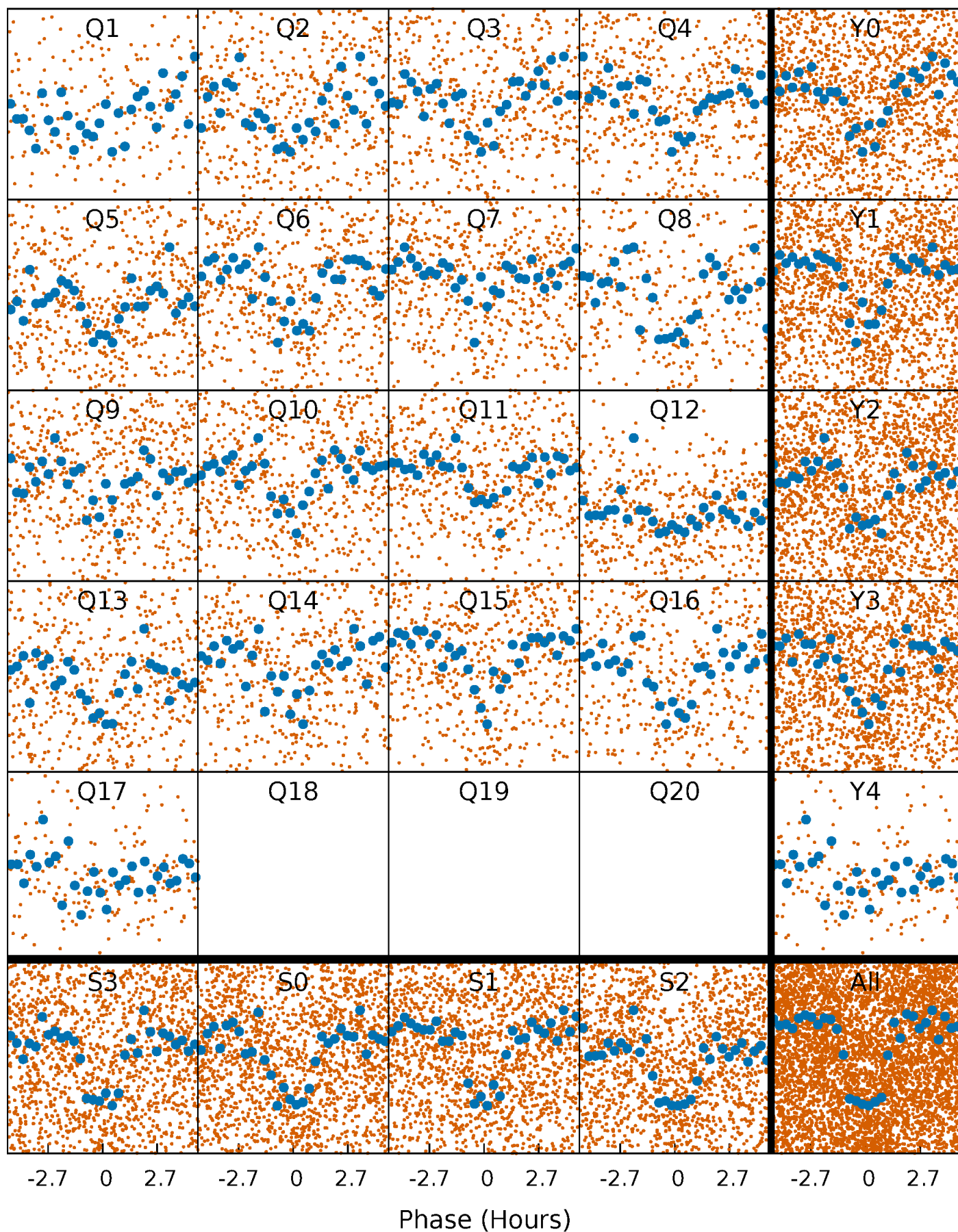


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

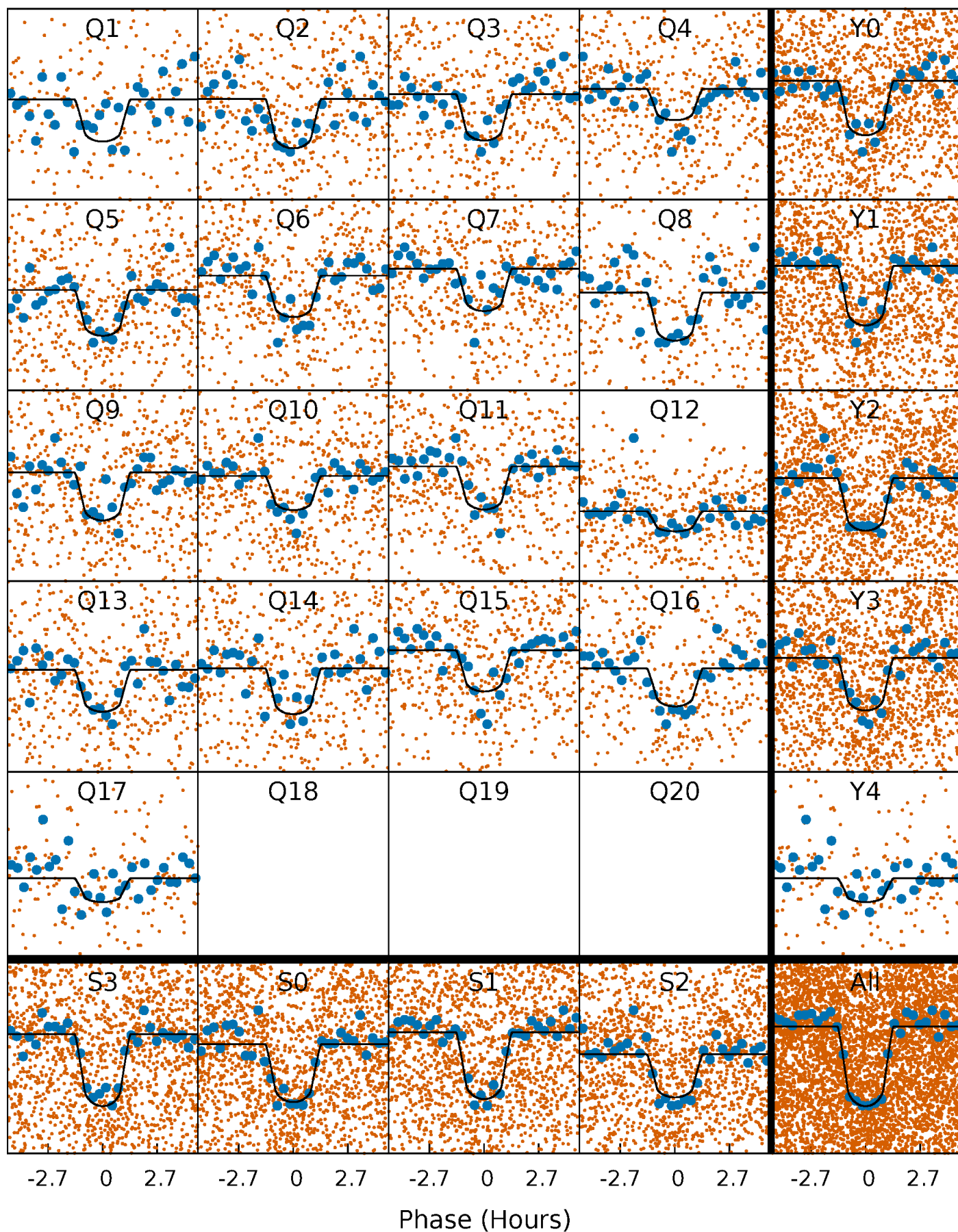
TCE 012401863-01 P= 2.832656 Days  $T_0=131.823629$  (BKJD)





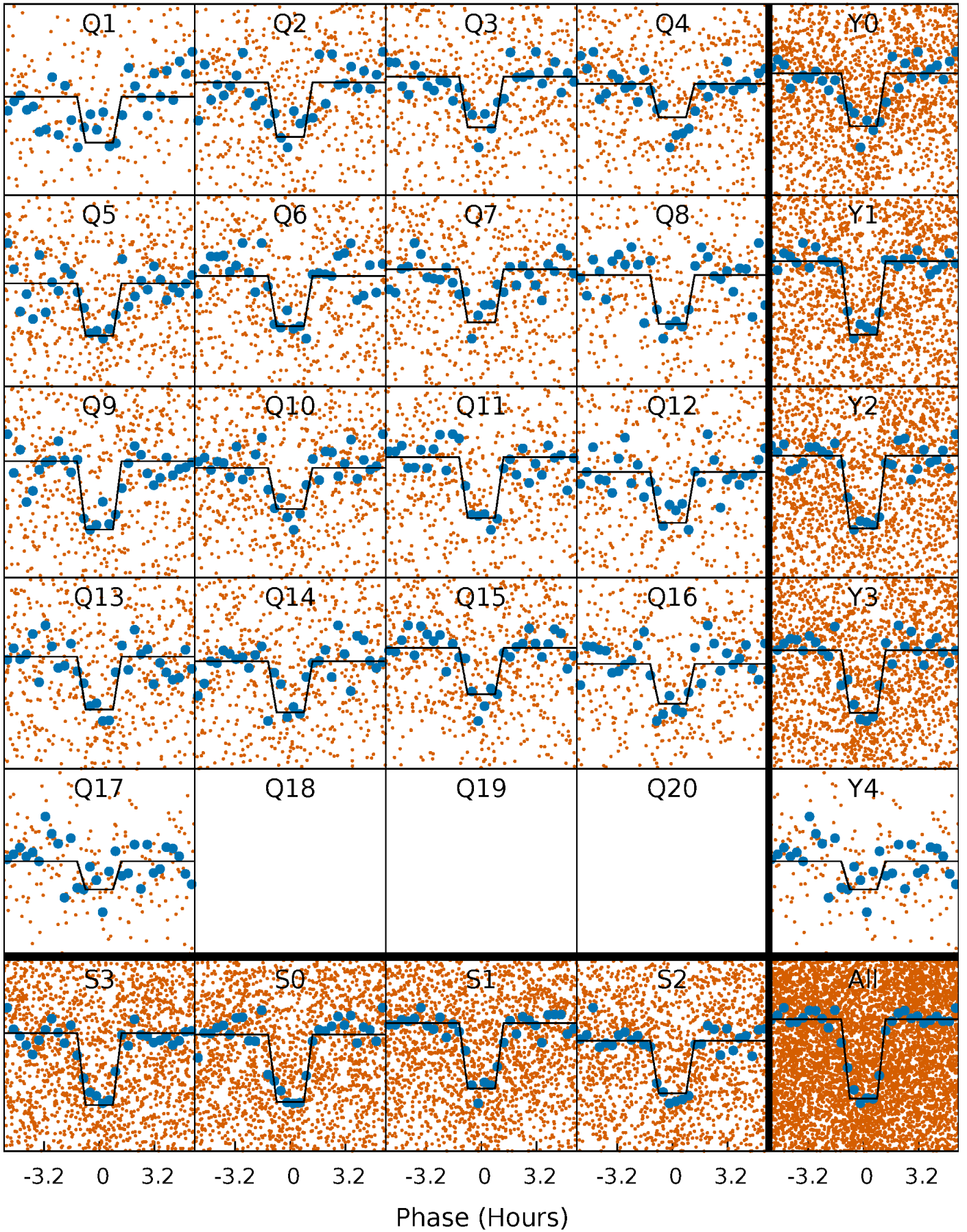
# DV Quarter-Phased Transit Curves

TCE 012401863-01   P= 2.832656 Days    $T_0=131.823629$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

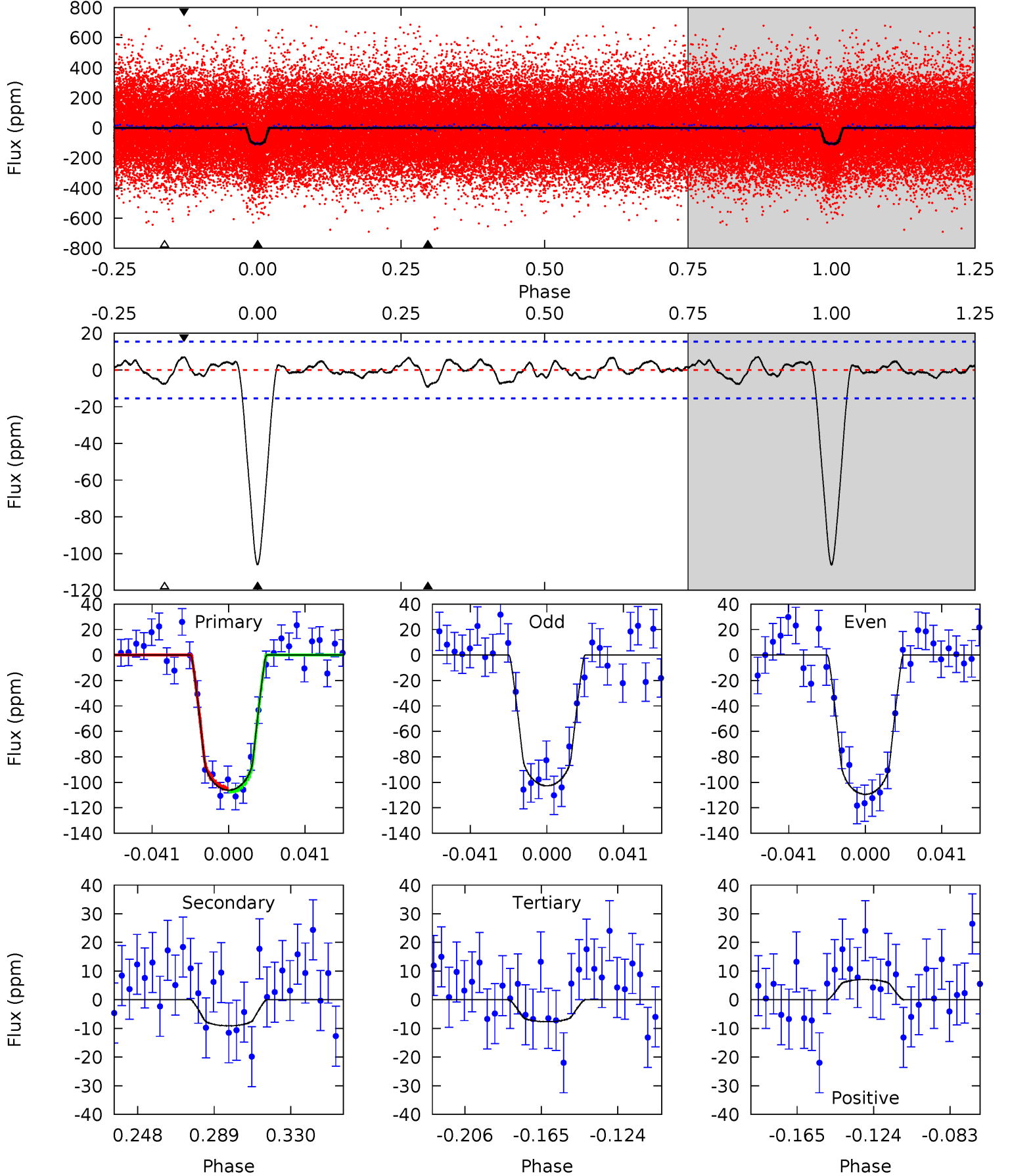
TCE 012401863-01 P= 2.832668 Days  $T_0=131.820624$  (BKJD)



# DV Model-Shift Uniqueness Test

012401863-01, P = 2.832656 Days, E = 128.990973 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
32.6	2.79	2.35	2.17	4.75	2.04	0.99	30.2	30.4	0.44	0.63	1.04	1.05	0.06	0.40

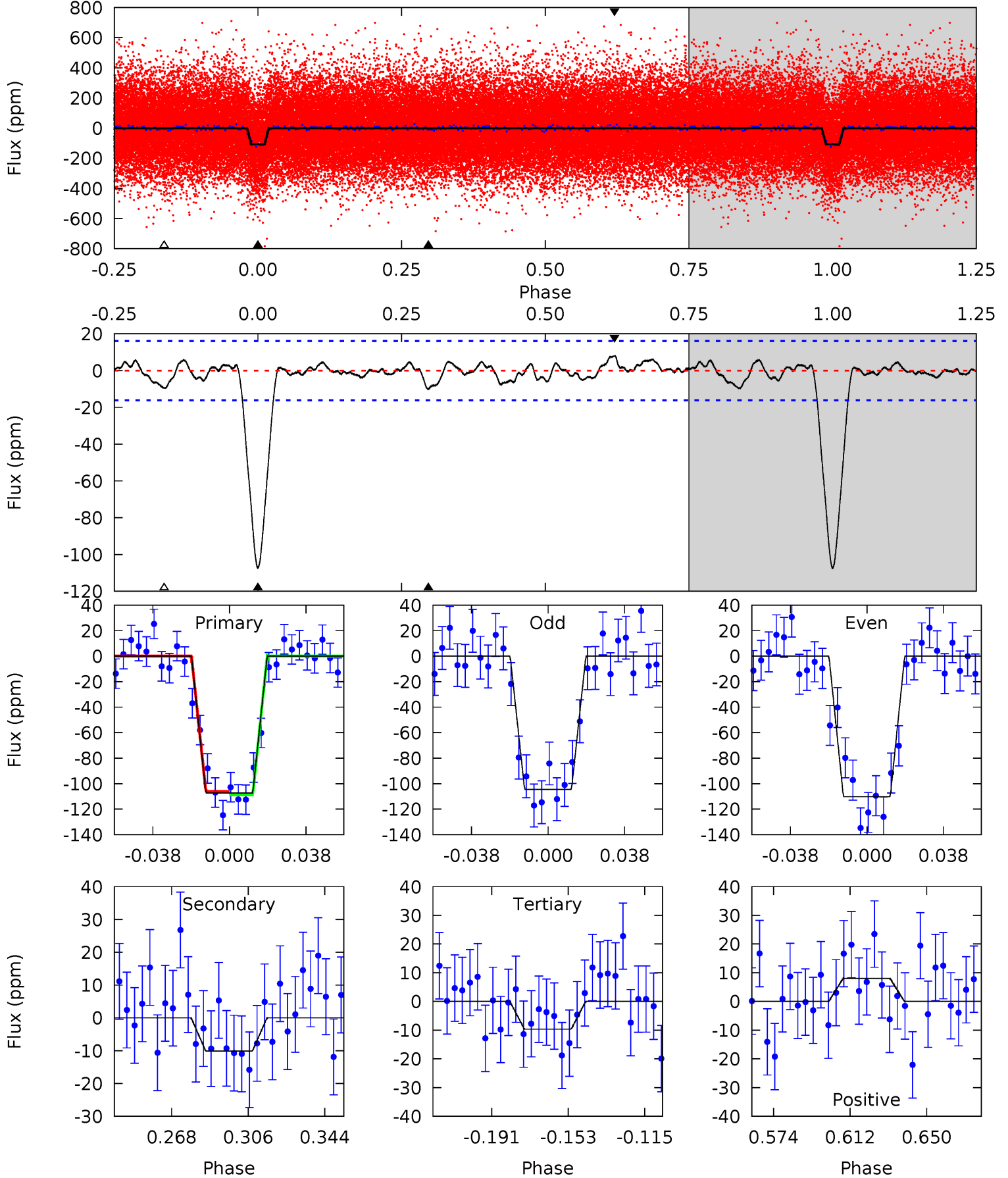




# Alt Model-Shift Uniqueness Test

012401863-01, P = 2.832668 Days, E = 128.987956 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	2.98	2.85	2.38	4.76	2.07	0.99	28.9	29.4	0.13	0.61	0.85	1.00	0.07	0.38





### Stellar Parameters For KIC 012401863

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5865^{+105}_{-117}$	$4.266^{+0.132}_{-0.120}$	$0.160^{+0.150}_{-0.150}$	$1.272^{+0.207}_{-0.207}$	$1.088^{+0.080}_{-0.089}$	$0.745^{+0.469}_{-0.244}$
	+2%/-2%	+3%/-3%	+94%/-94%	+16%/-16%	+7%/-8%	+63%/-33%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 012401863-01 / KOI 2331.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-9\pm3$	$1.54^{+0.56}_{-0.54}$	$2029^{+97}_{-92}$	$3488^{+554}_{-434}$	$3.464^{+4.750}_{-1.871}$
Alt.	$-10\pm3$	$1.45^{+0.59}_{-0.52}$	$2031^{+99}_{-101}$	$3585^{+615}_{-414}$	$4.064^{+6.230}_{-2.093}$

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

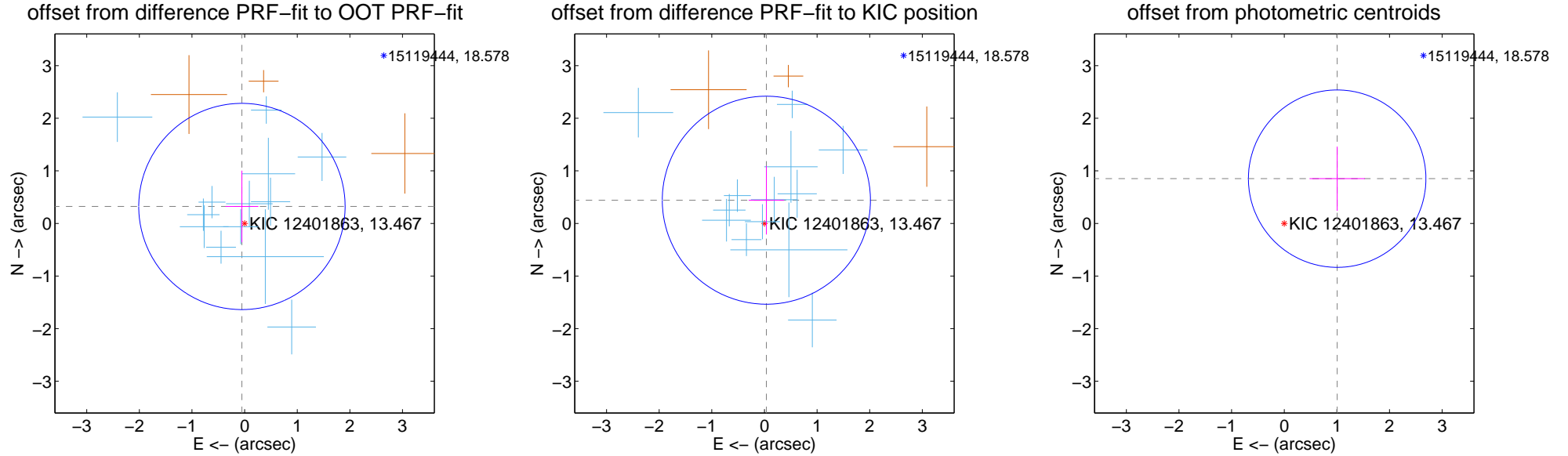
## DV Centroid Data

Supplemental centroid analysis for 012401863-01. Kepler magnitude: 13.47. Transit SNR 25.10

There are 13 quarters with good PRF difference image offsets

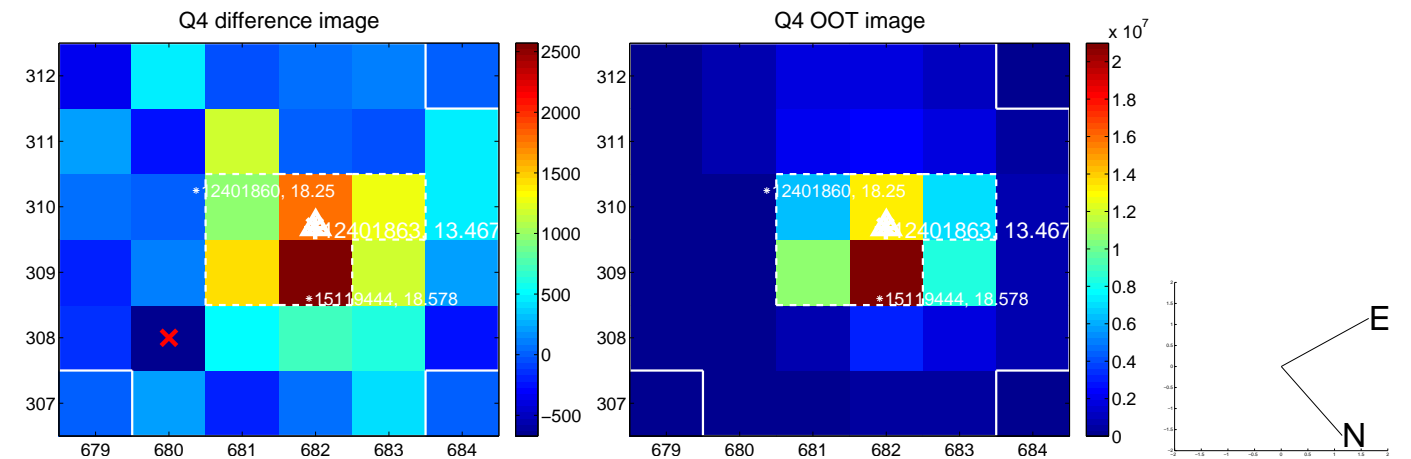
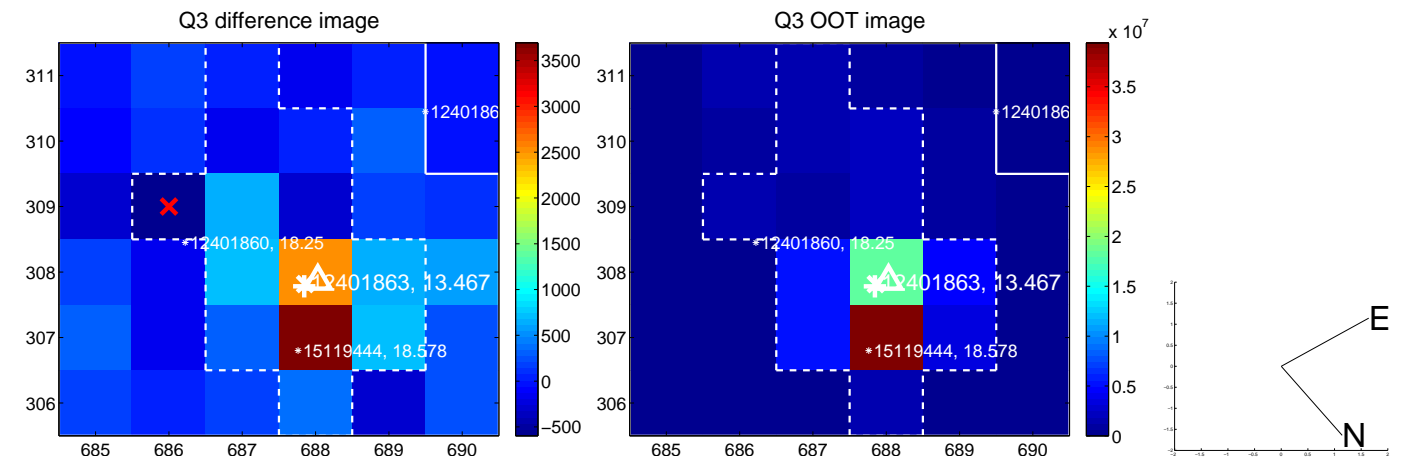
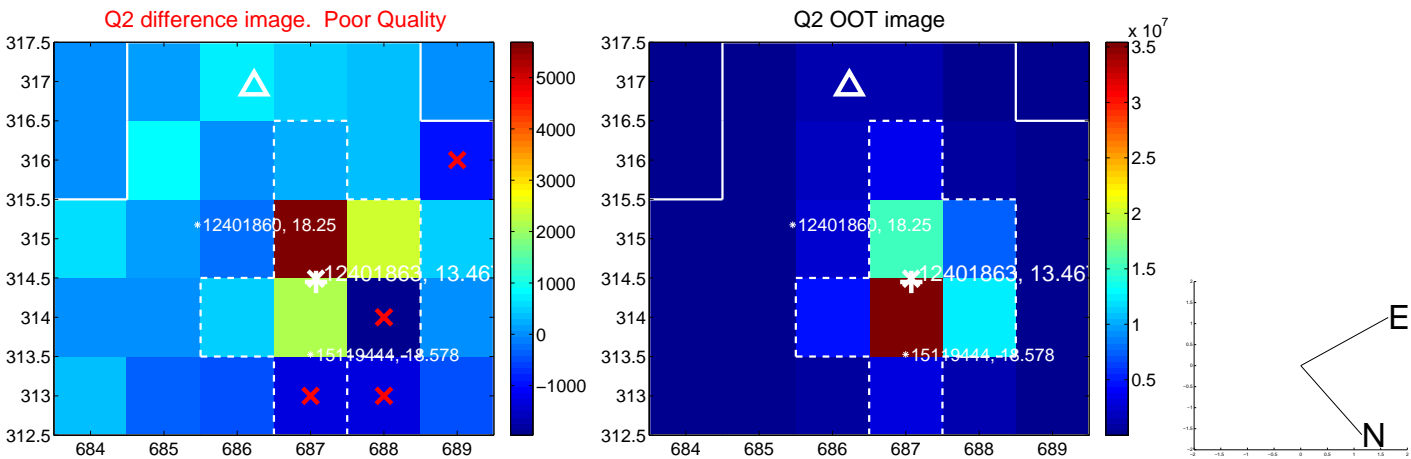
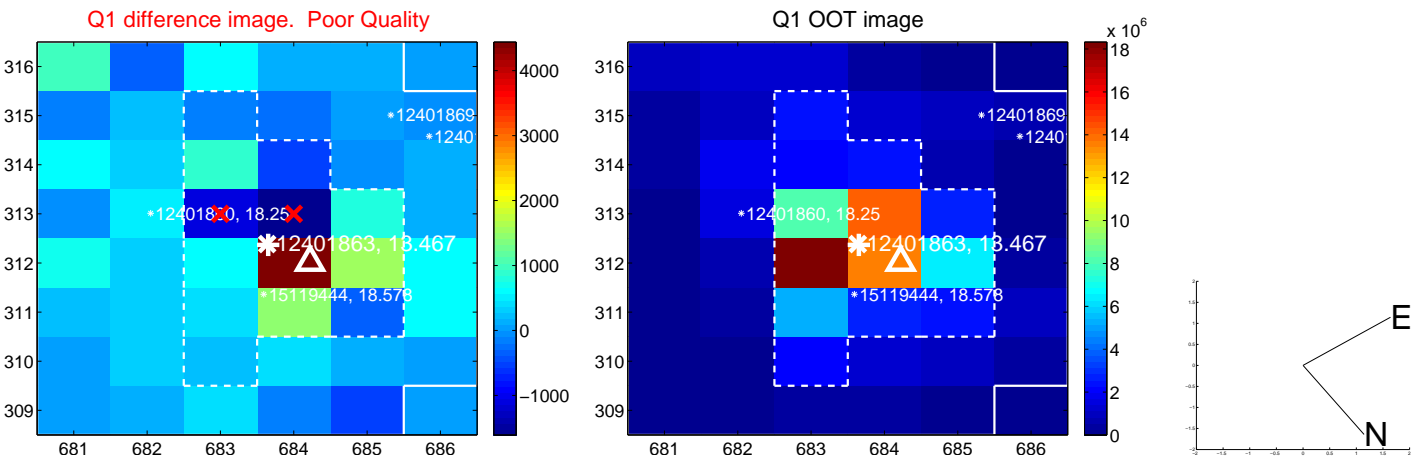
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.327 \pm 0.654$	0.50	$0.051 \pm 0.313$	$0.323 \pm 0.681$
PRF-fit source offset from KIC position	$0.443 \pm 0.659$	0.67	$-0.036 \pm 0.336$	$0.442 \pm 0.652$
photometric centroid source offset	$1.32 \pm 0.56$	2.34	$-1.01 \pm 0.53$	$0.85 \pm 0.61$

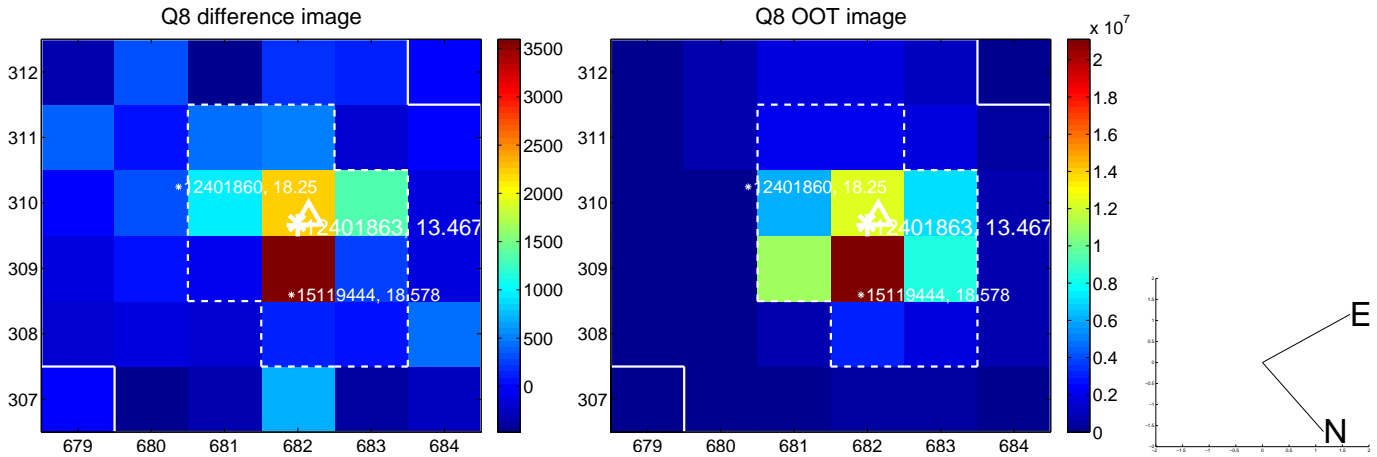
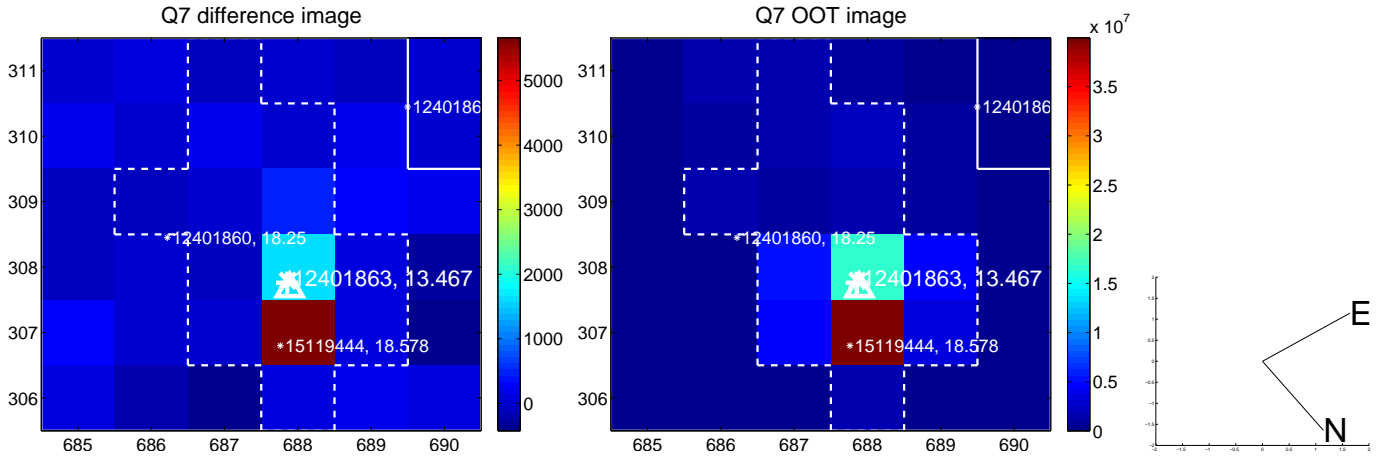
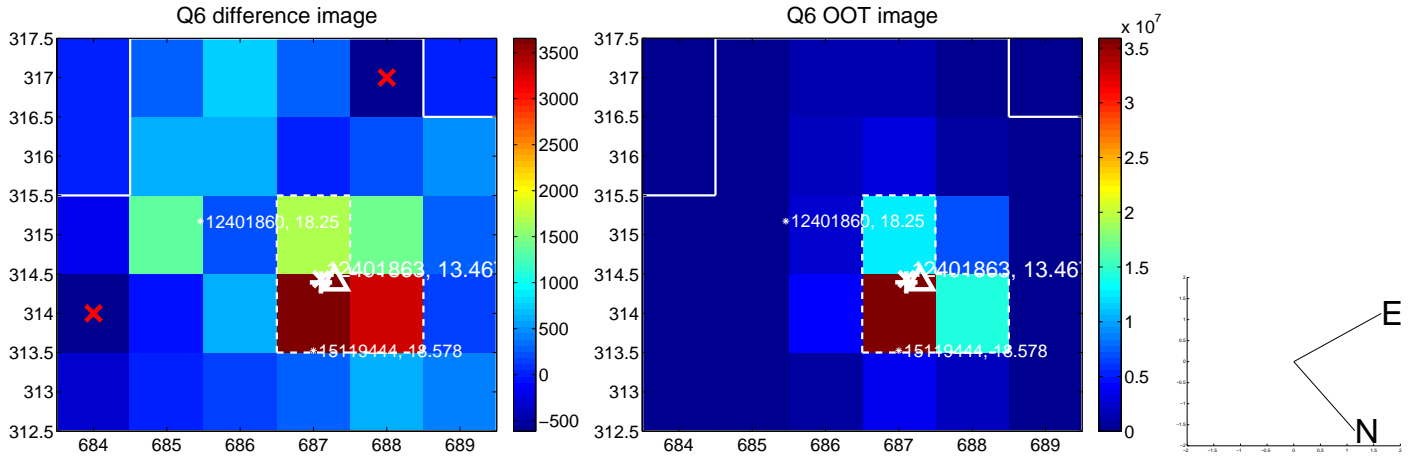
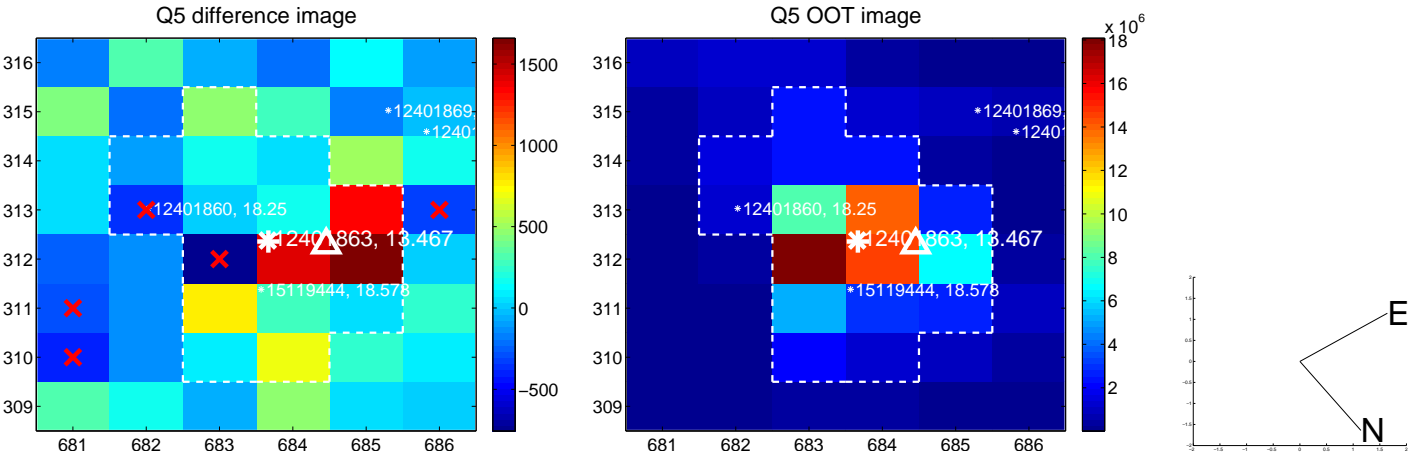


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



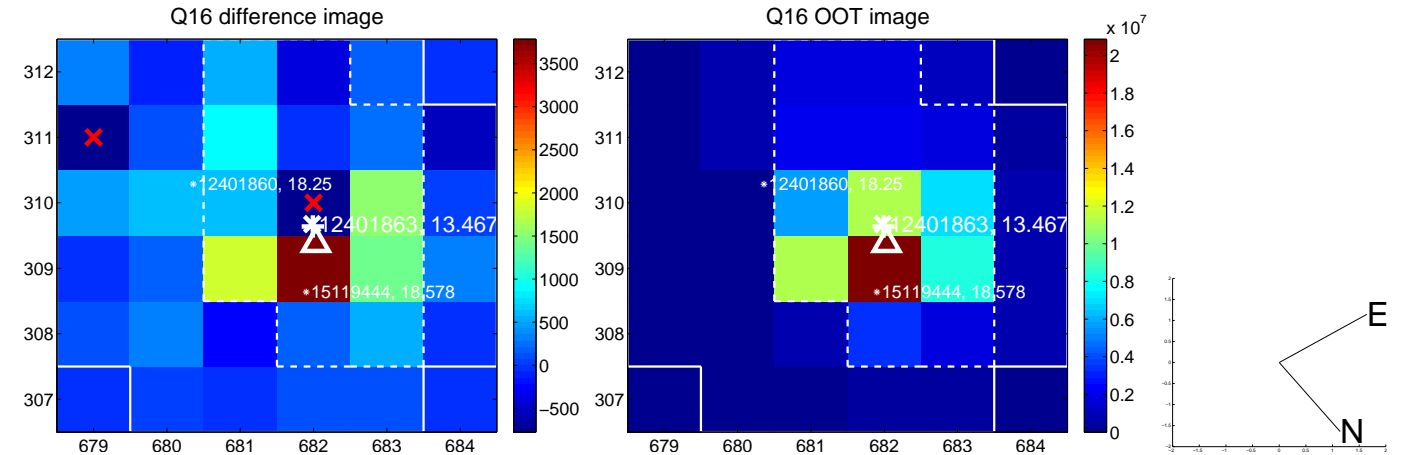
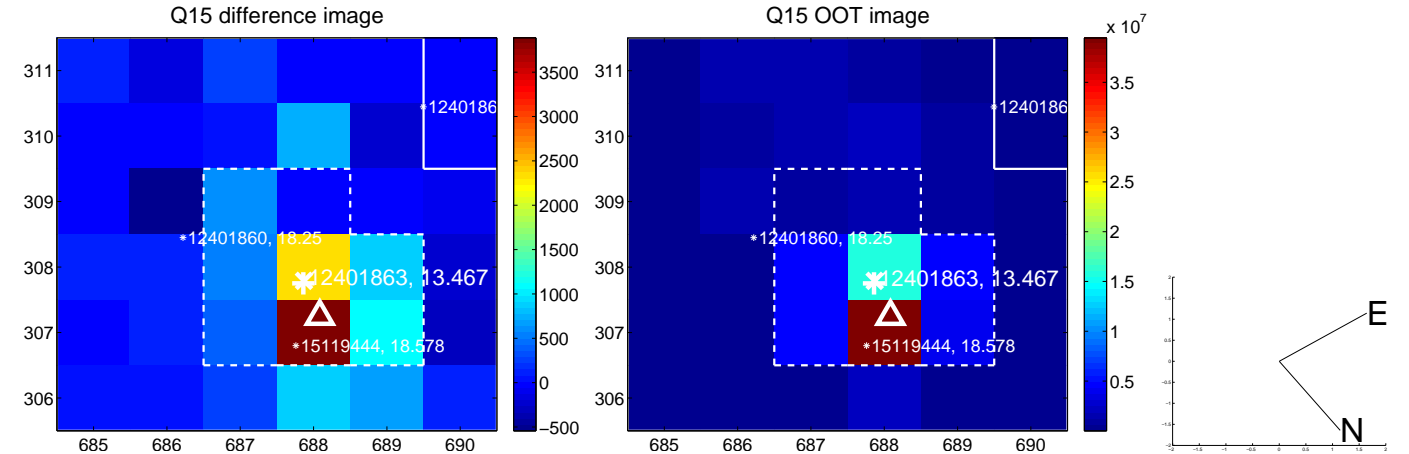
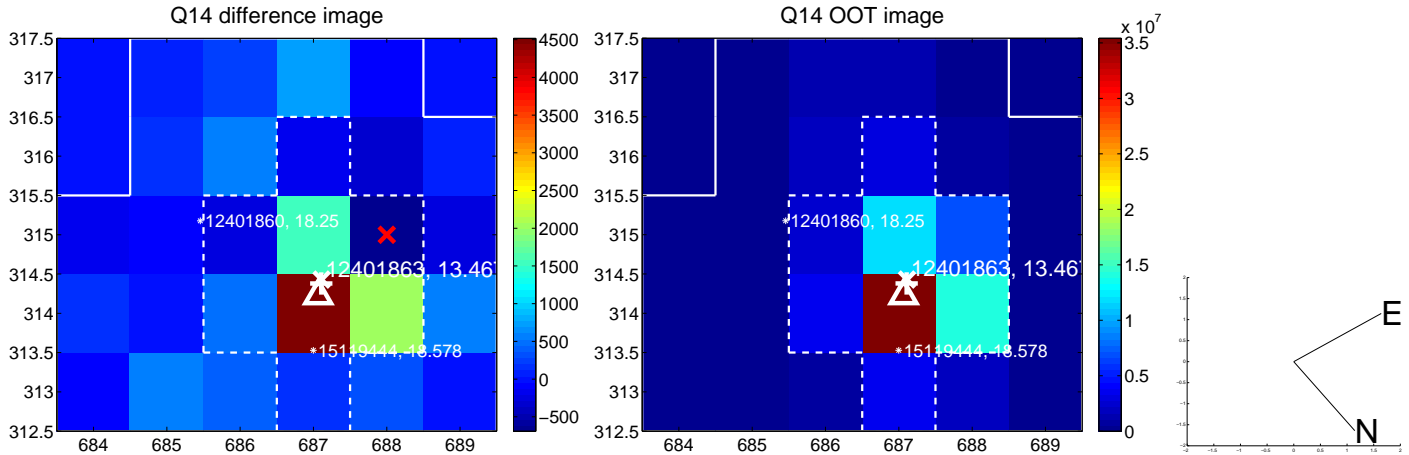
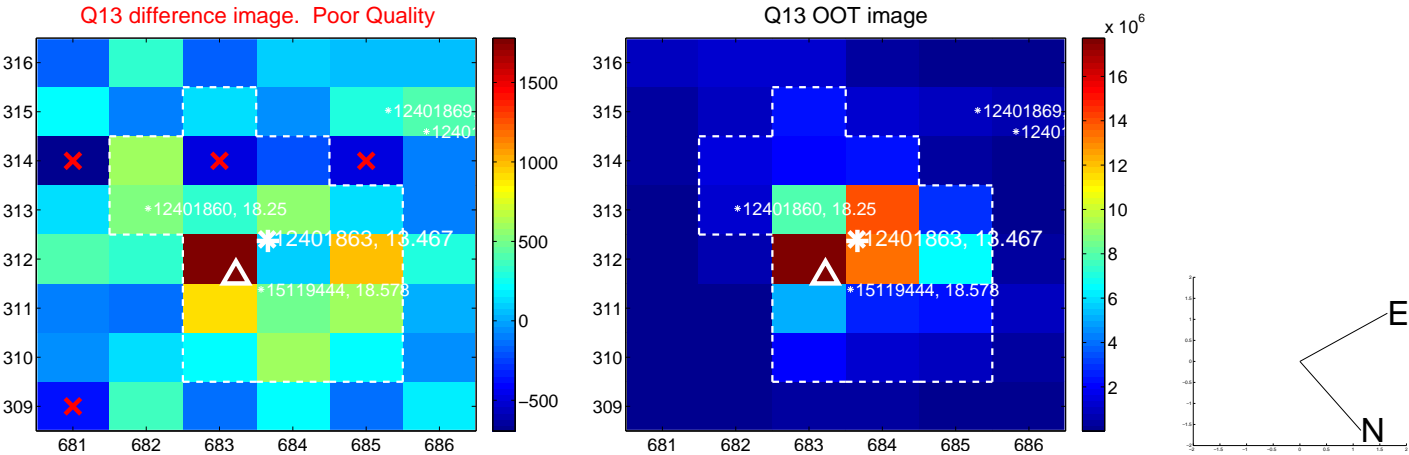
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



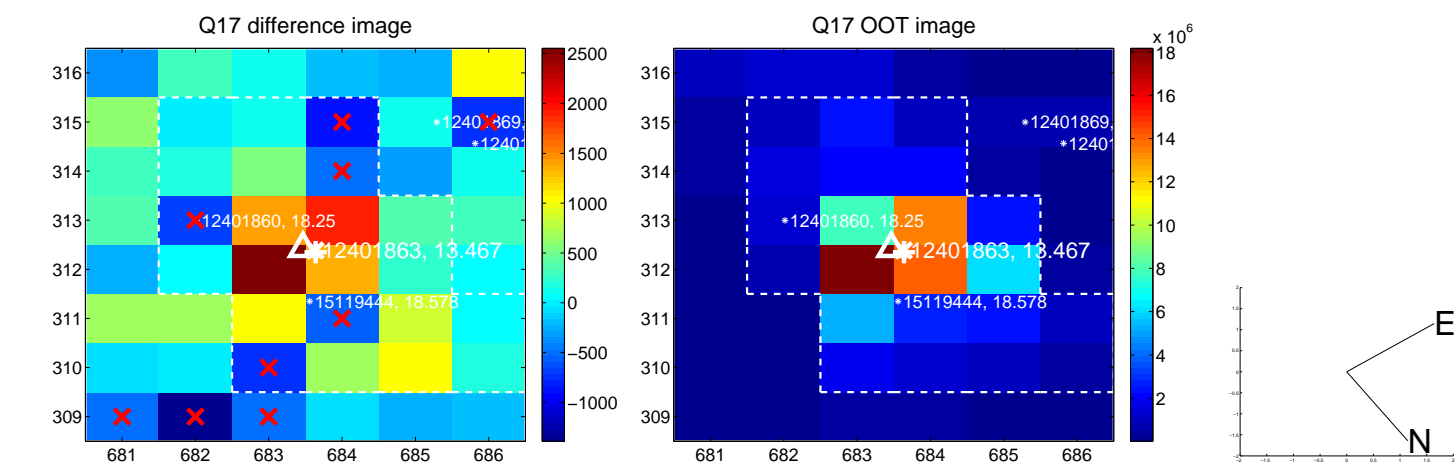




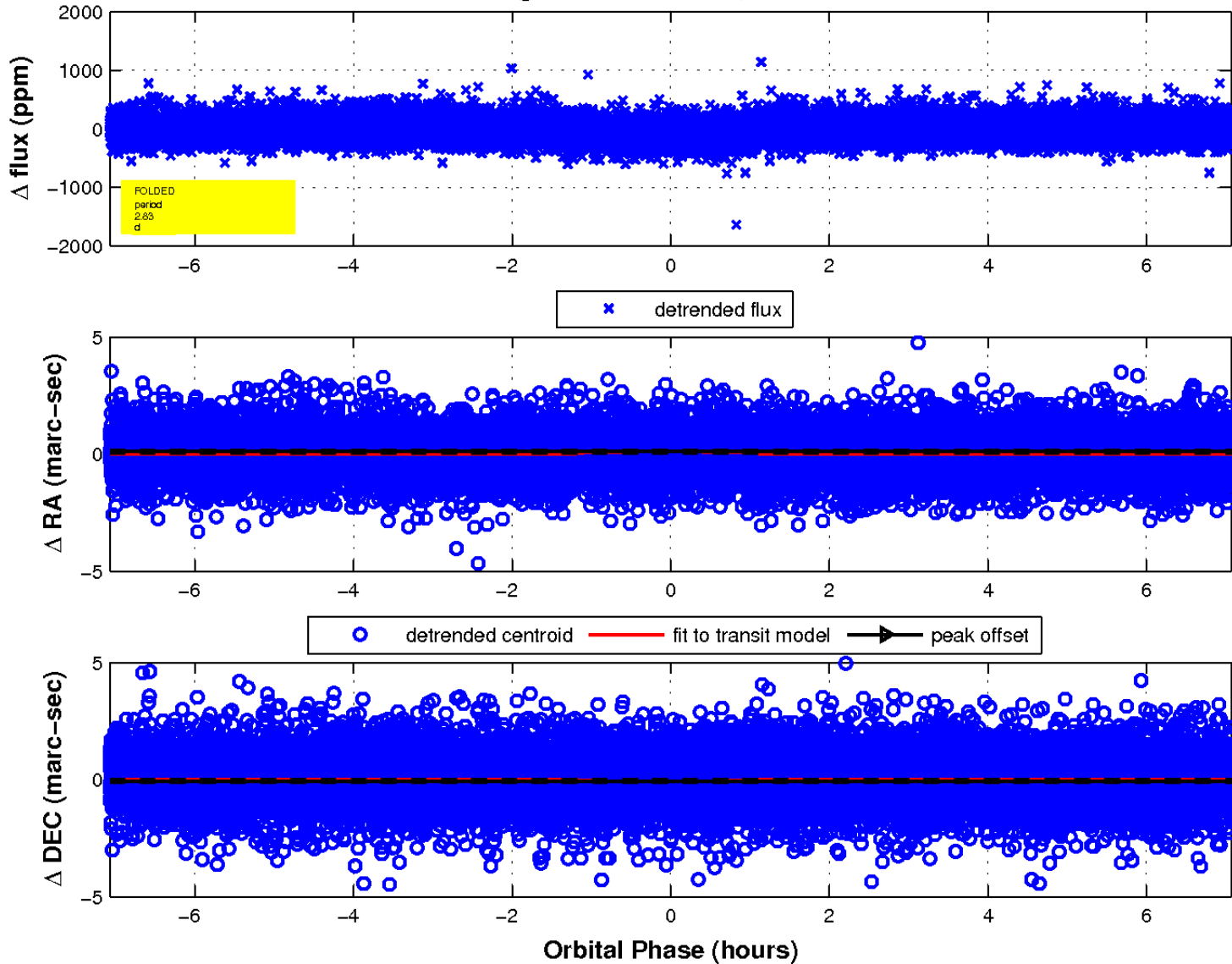
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

