

# KIC 002422539

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002422539-01	OBS	No	118.253558	223.682642	838.2	18.432	10.2	14.0	32.97	4056	205.36	1293.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002422539-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV

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

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

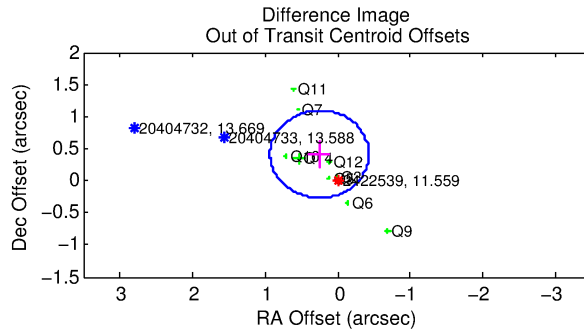
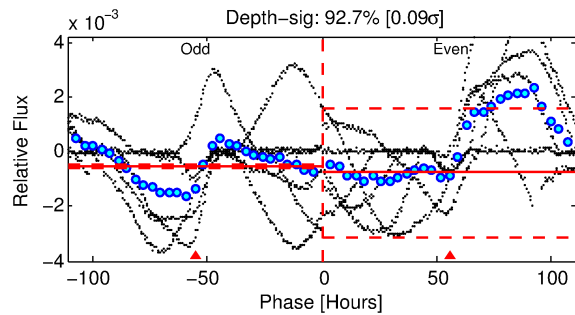
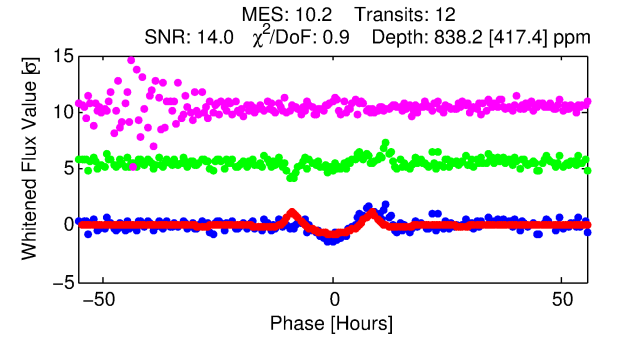
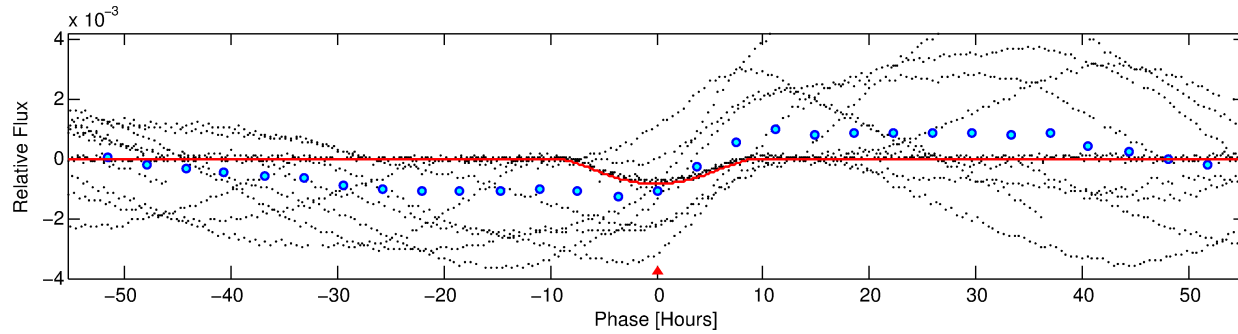
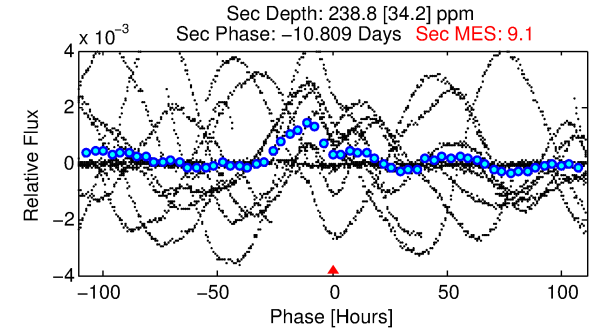
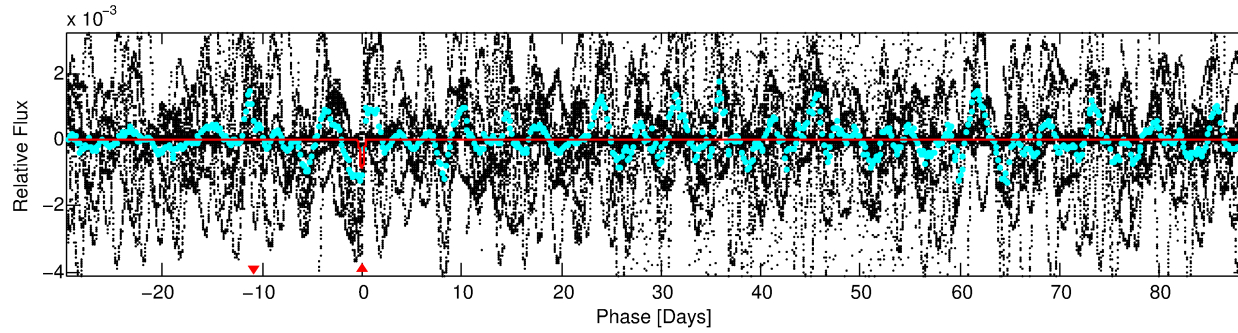
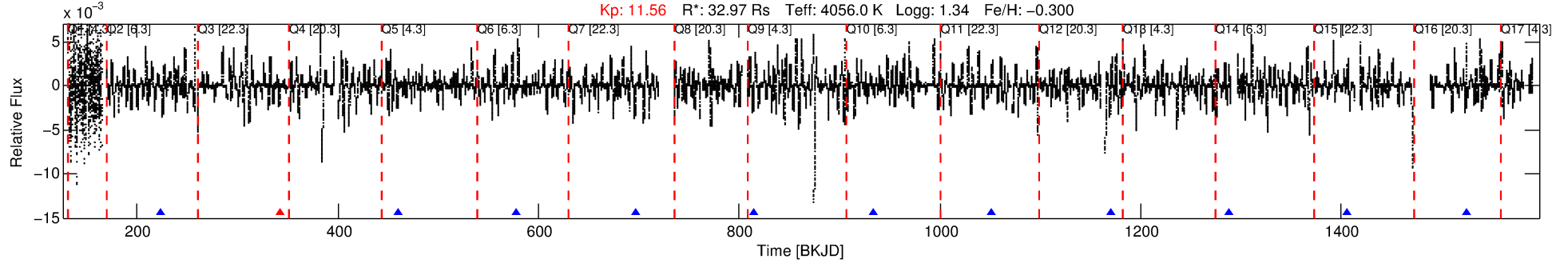
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002422539-01

No Significant Match Found

# DV One-Page Summary

KIC: 2422539 Candidate: 1 of 1 Period: 118.254 d



## DV Fit Results:

Period = 118.25356 [0.00174] d  
Epoch = 223.6826 [0.0114] BKJD  
Rp/R\* = 0.0571 [0.0256]  
a/R\* = 16.83 [1.54]  
b = 1.00 [0.05]  
Seff = 1293.02 [364.11]  
Teq = 1529 [108] K  
Rp = 205.36 [109.07] Re  
a = 0.4515 [0.0964] AU  
Ag = 0.64 [0.60] [-0.61σ]  
Teffp = 2110 [480] K [1.18σ]

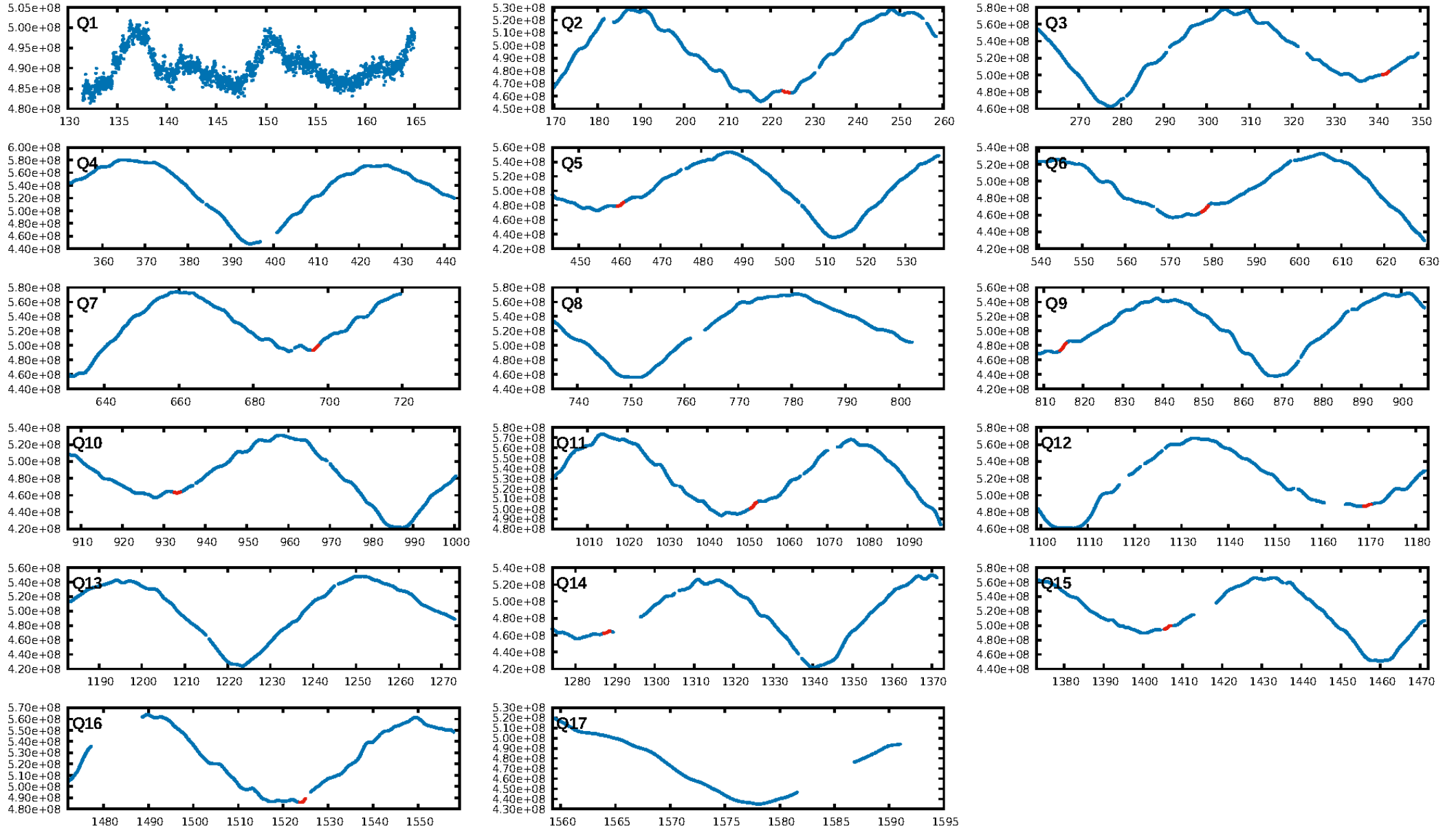
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 90.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.86e-03  
RollingBand-fgt: 0.92 [11/12]  
GhostDiagnostic-chr: 1.486  
Centroid-sig: 13.9%  
Centroid-so: 0.111 arcsec [0.49σ]  
OotOffset-rm: 0.483 arcsec [2.13σ]  
OotOffset-st: 3/3/1/2 [9]  
KicOffset-rm: 0.360 arcsec [1.60σ]  
KicOffset-st: 3/3/1/2 [9]  
DiffImageQuality-fgm: 1.00 [9/9]  
DiffImageOverlap-fno: 1.00 [9/9]

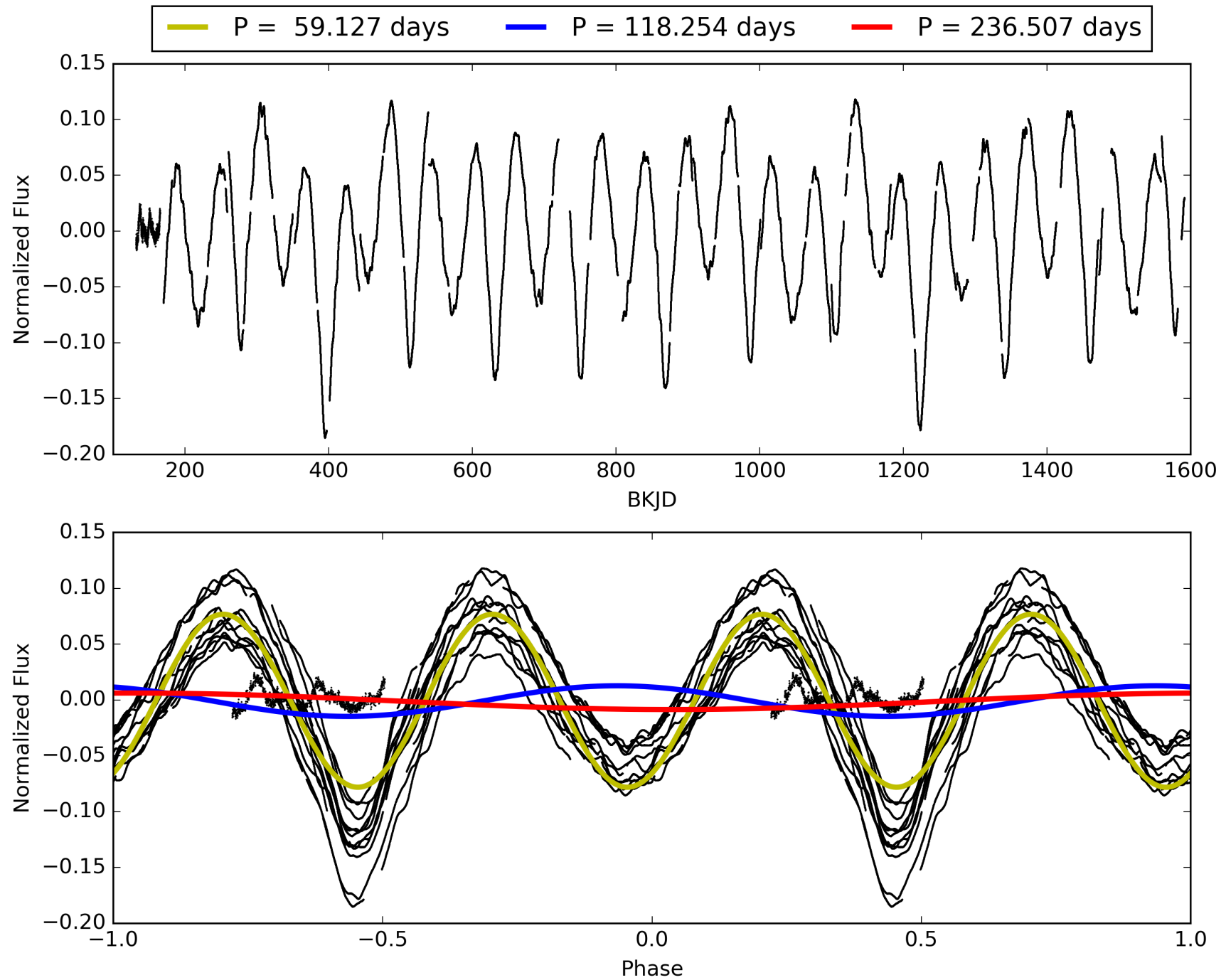
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:54:47 Z

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

# TCE 002422539-01, PDC Light Curves

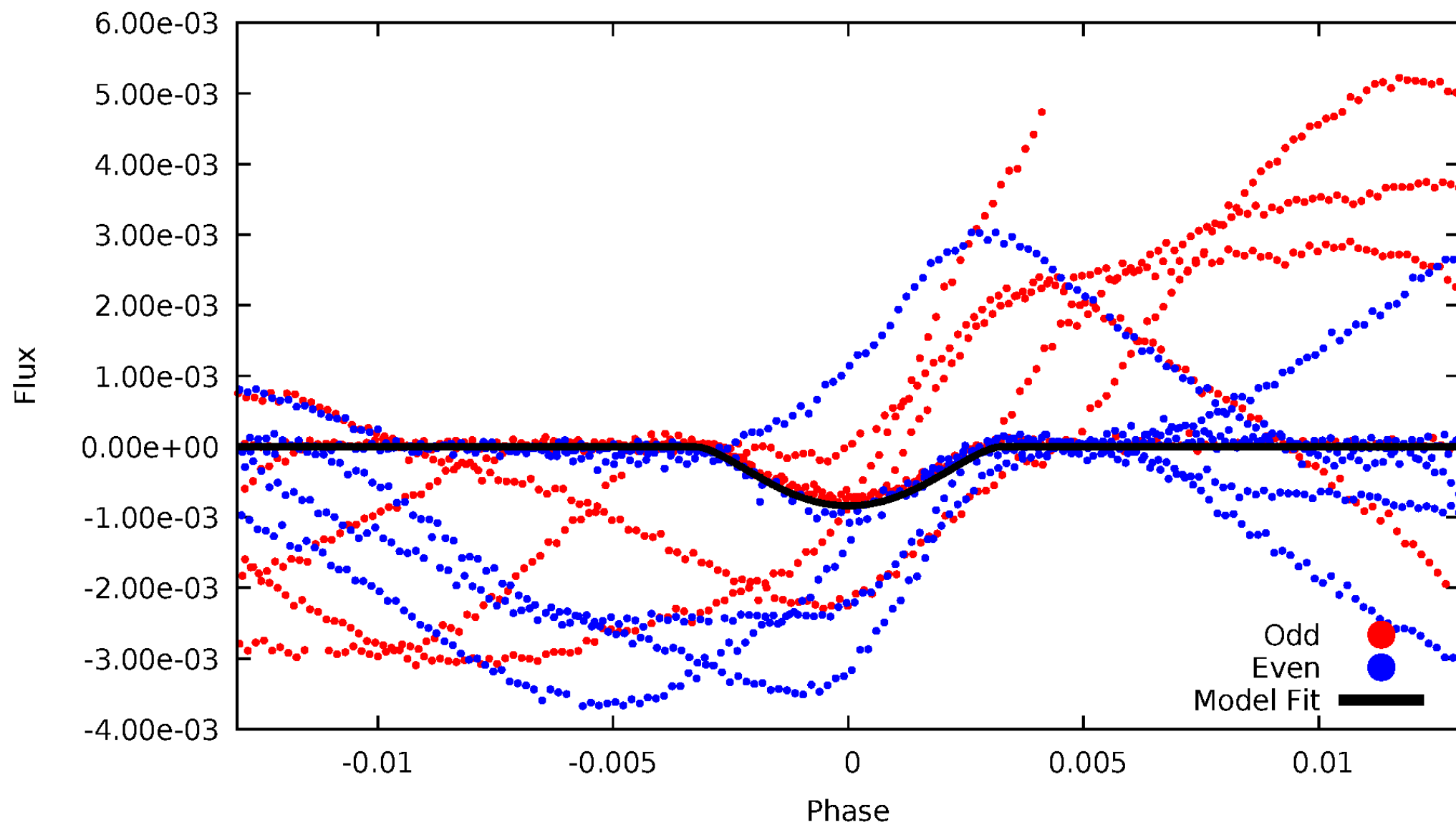


TCE 002422539-01



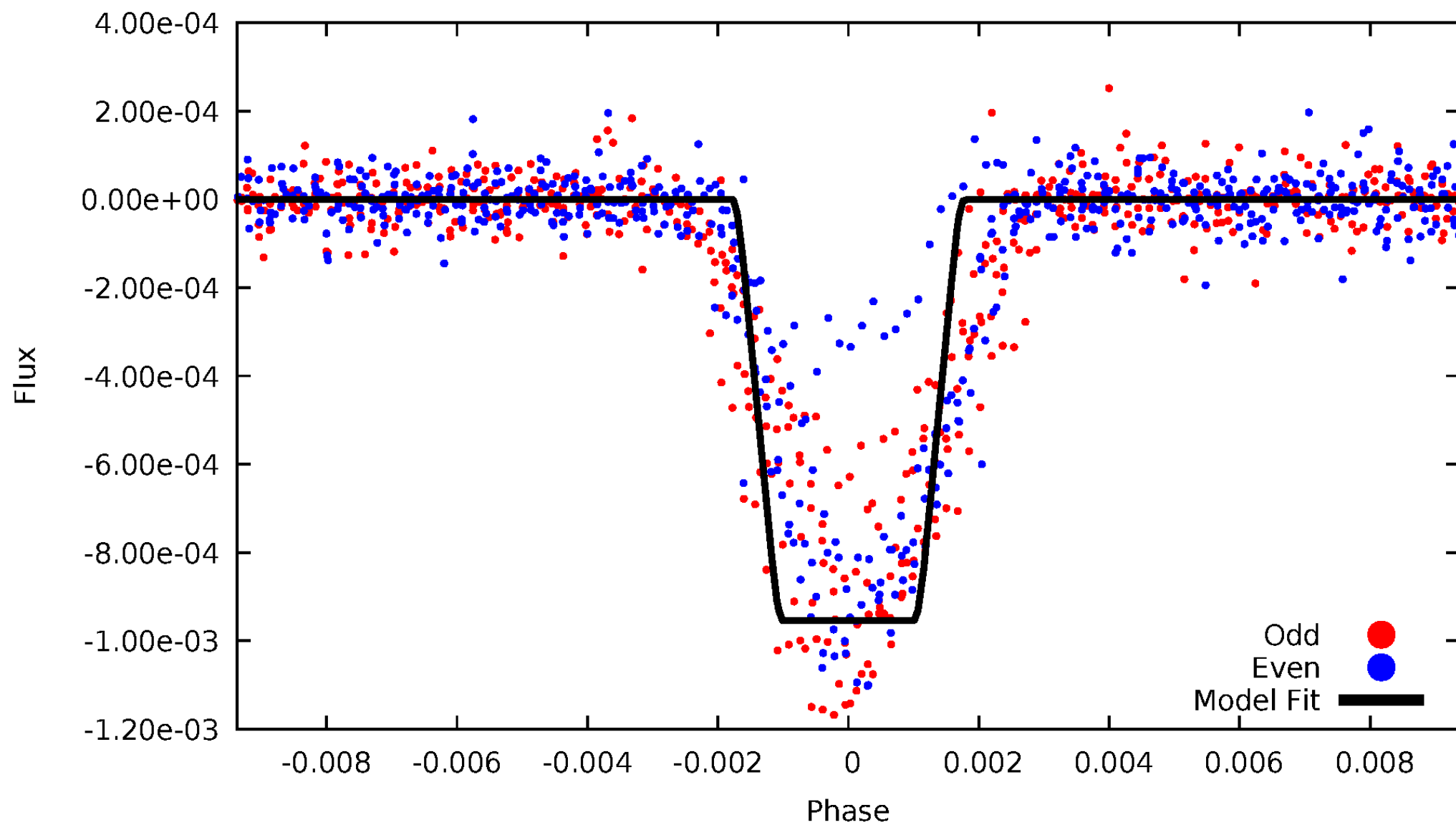
# DV Odd/Even

TCE 002422539-01



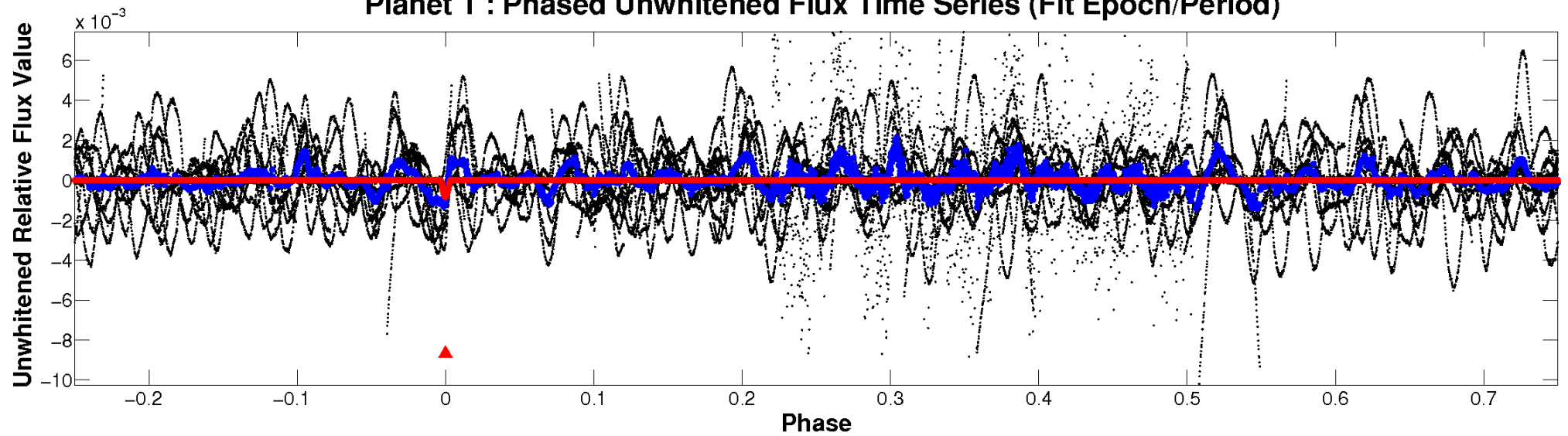
# ALT Odd/Even

TCE 002422539-01

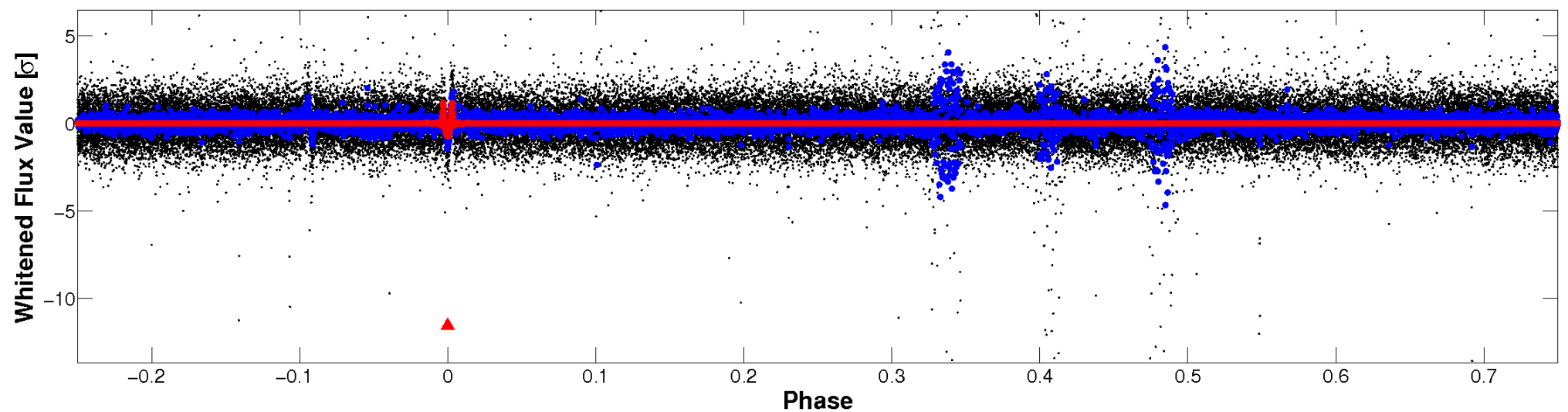


# Non-Whitened Vs. Whitened Light Curve

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

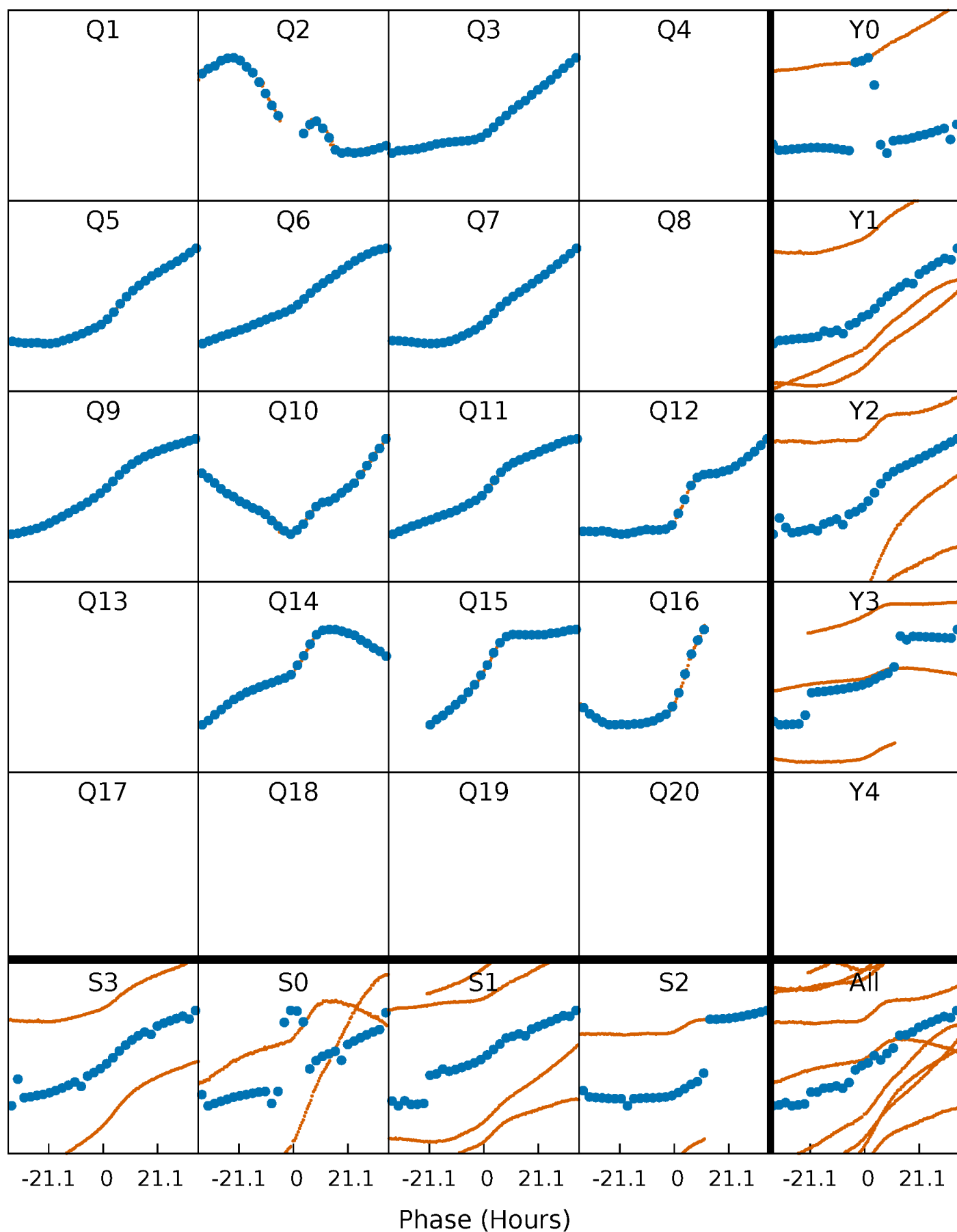


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

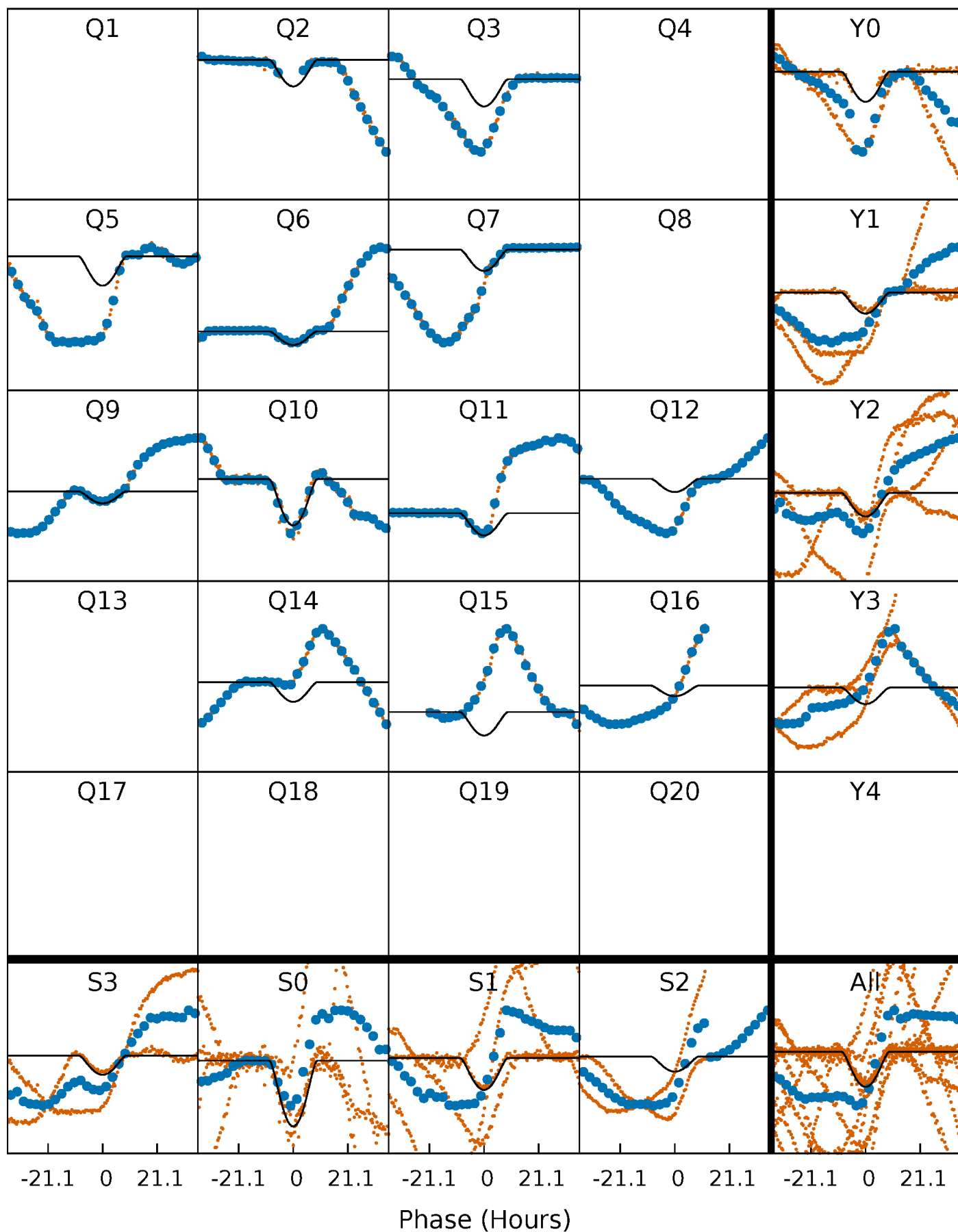
TCE 002422539-01 P=118.253558 Days  $T_0=223.682642$  (BKJD)





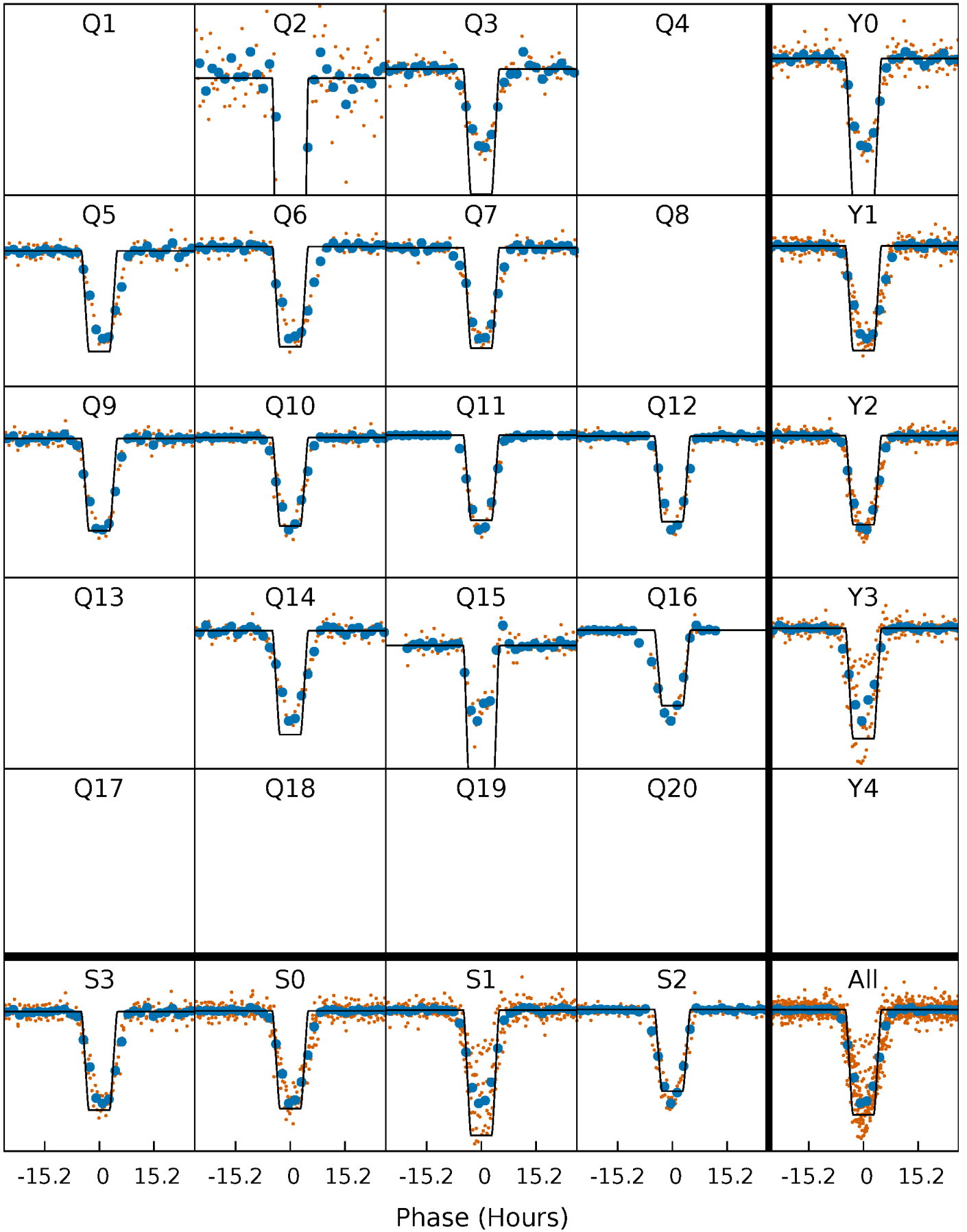
# DV Quarter-Phased Transit Curves

TCE 002422539-01 P=118.253558 Days  $T_0=223.682642$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

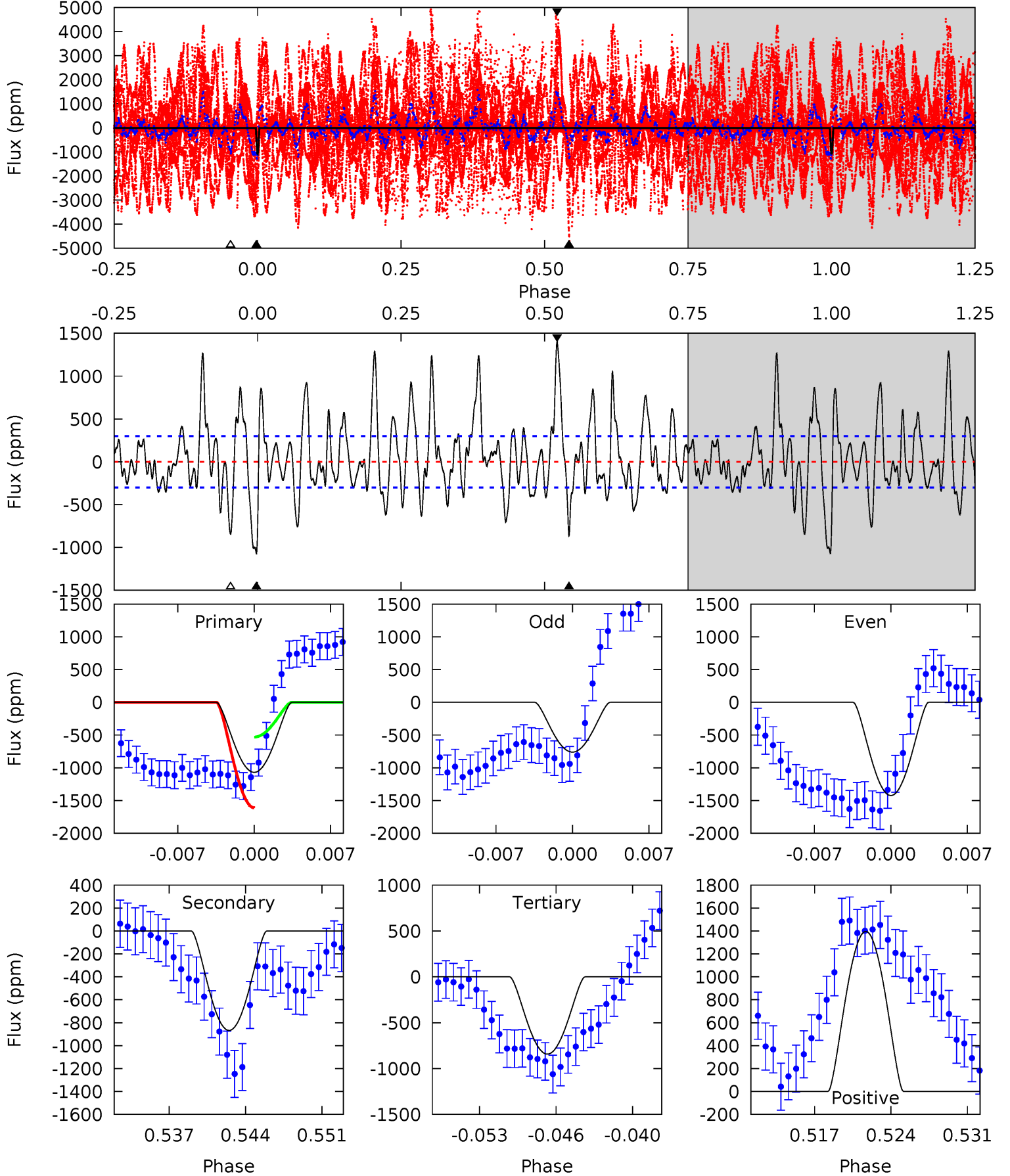
TCE 002422539-01 P=118.256116 Days  $T_0=223.635317$  (BKJD)



# DV Model-Shift Uniqueness Test

002422539-01, P = 118.253558 Days, E = 105.429084 Days

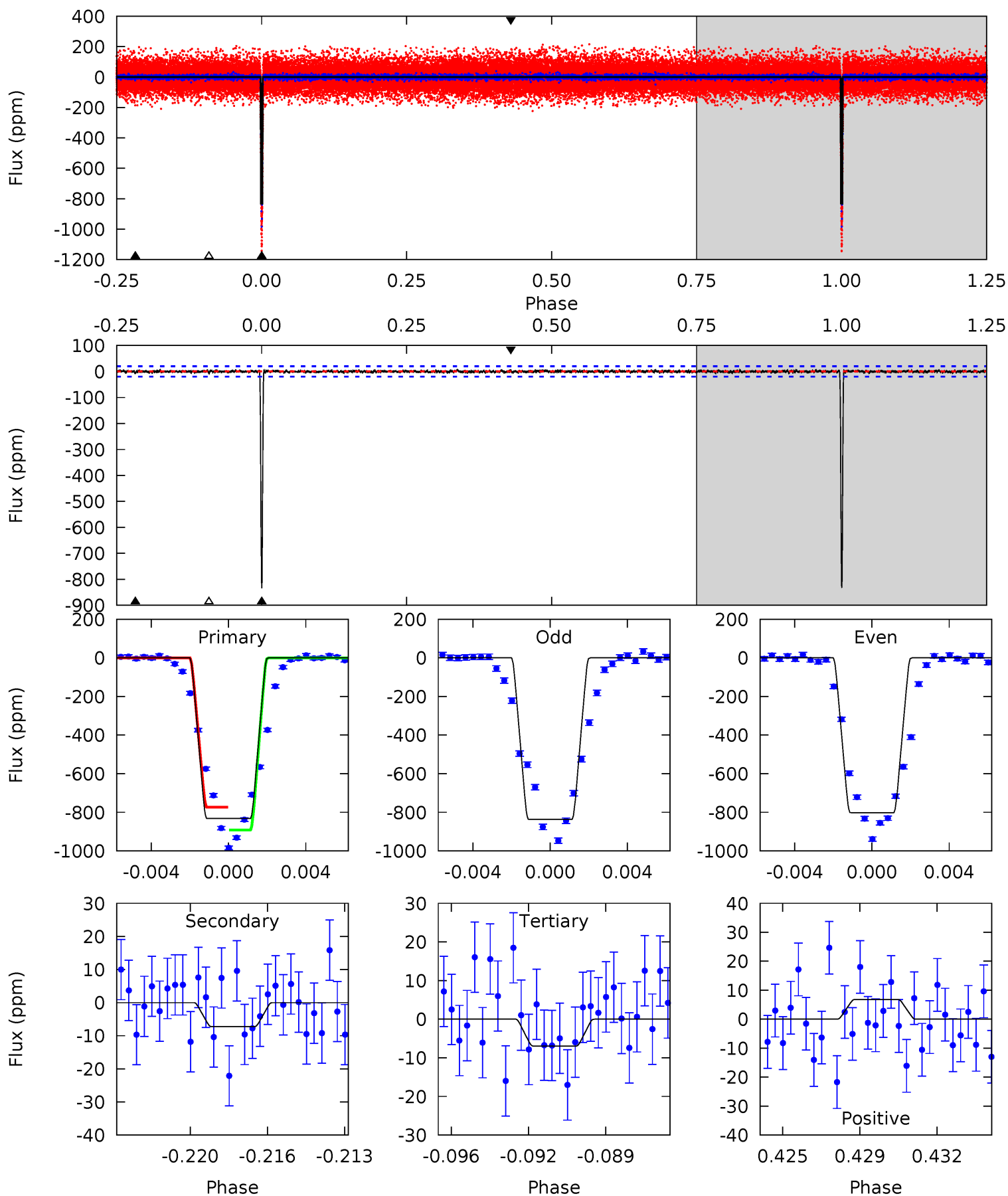
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	14.8	14.4	23.8	5.10	2.71	6.66	3.87	-5.57	0.44	-9.01	5.60	1.50	0.57	9.34



# Alt Model-Shift Uniqueness Test

002422539-01, P = 118.256116 Days, E = 105.379201 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
217.5	1.89	1.82	1.78	5.22	2.92	0.52	215.7	215.7	0.08	0.11	4.49	0.92	0.01	15.2



### Stellar Parameters For KIC 002422539

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4056^{+73}_{-54}$	$1.345^{+0.115}_{-0.127}$	$-0.300^{+0.100}_{-0.150}$	$32.969^{+9.397}_{-3.132}$	$0.877^{+0.354}_{-0.019}$	$0.000^{+0.000}_{-0.000}$
	+2%/-1%	+9%/-9%	+33%/-50%	+29%/-9%	+40%/-2%	+40%/-39%
Source	SPE74	SPE74	SPE74	DSEP		

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

### Secondary Eclipse Parameters for KIC 002422539-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-868 \pm 59$	$210.77^{+100.57}_{-93.22}$	$2134^{+118}_{-81}$	$3193^{+738}_{-389}$	$2.302^{+5.142}_{-1.249}$
Alt.	$-7 \pm 4$	$127.66^{+93.69}_{-76.00}$	$2136^{+134}_{-80}$	$-2408^{+4361}_{-100}$	$0.051^{+0.284}_{-0.039}$

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

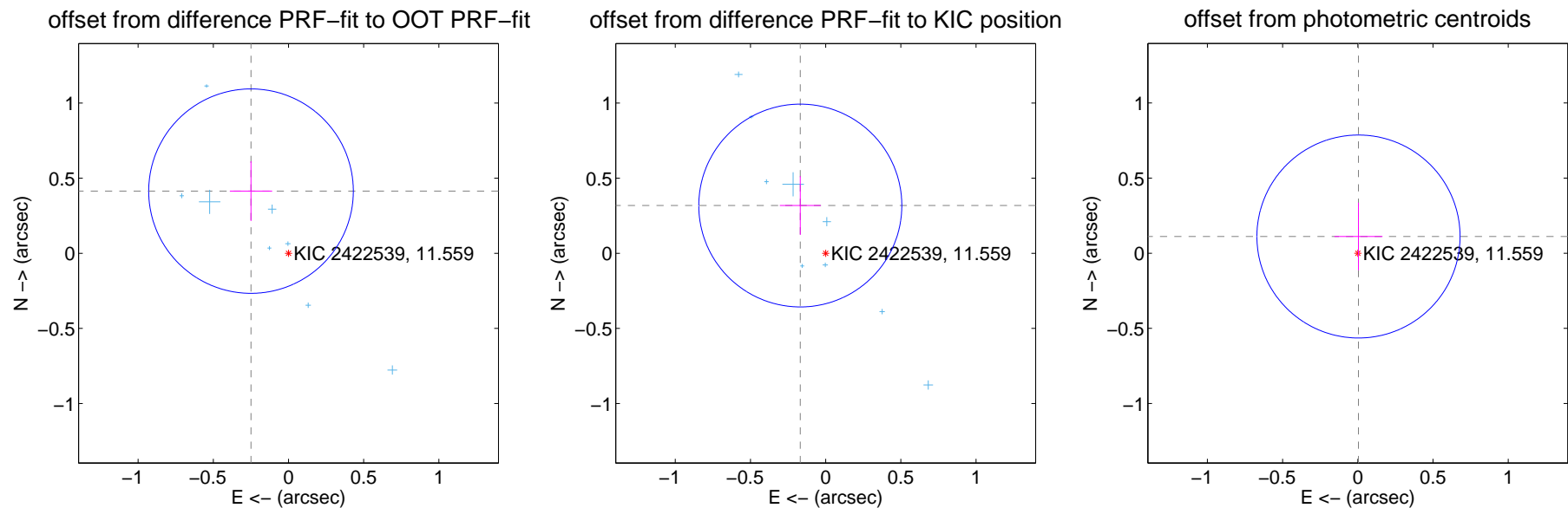
## DV Centroid Data

Supplemental centroid analysis for 002422539-01. **Kepler magnitude: 11.56.** Transit SNR 13.96

There are 9 quarters with good PRF difference image offsets

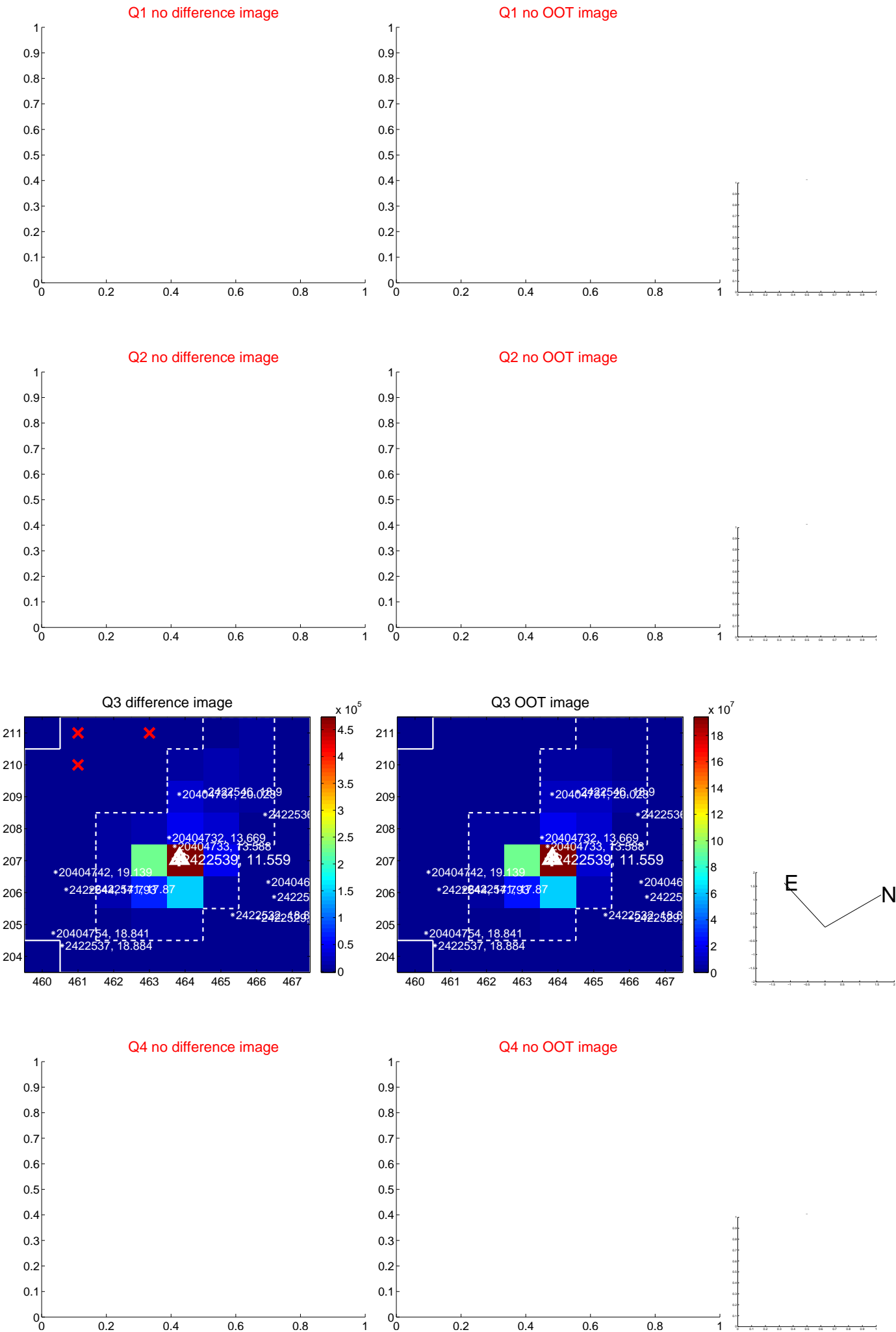
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.483 \pm 0.227$	2.13	$0.249 \pm 0.141$	$0.414 \pm 0.199$
PRF-fit source offset from KIC position	$0.360 \pm 0.225$	1.60	$0.169 \pm 0.136$	$0.318 \pm 0.195$
photometric centroid source offset	$0.11 \pm 0.23$	0.49	$-0.00 \pm 0.16$	$0.11 \pm 0.23$

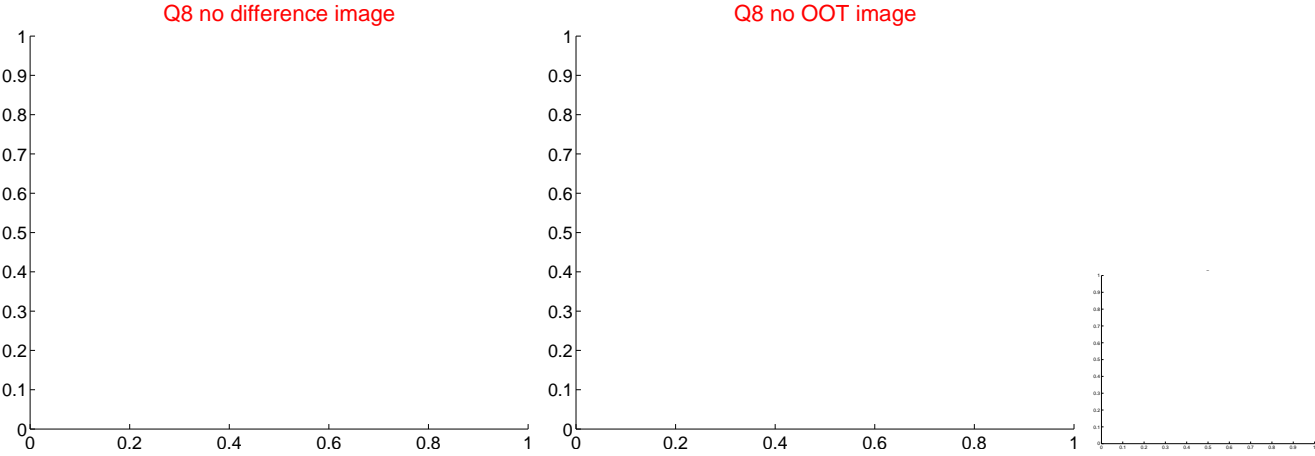
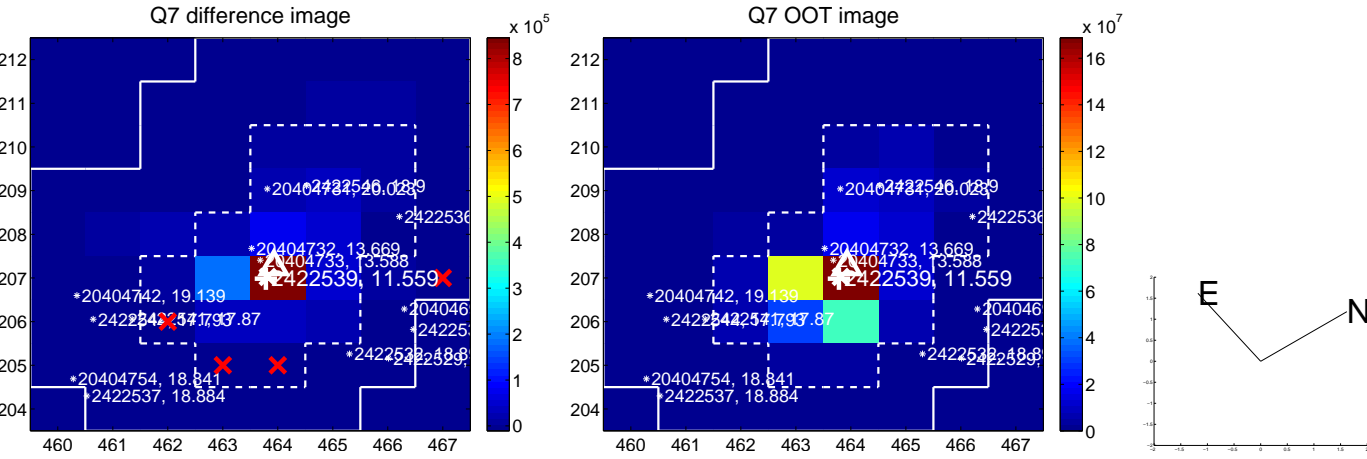
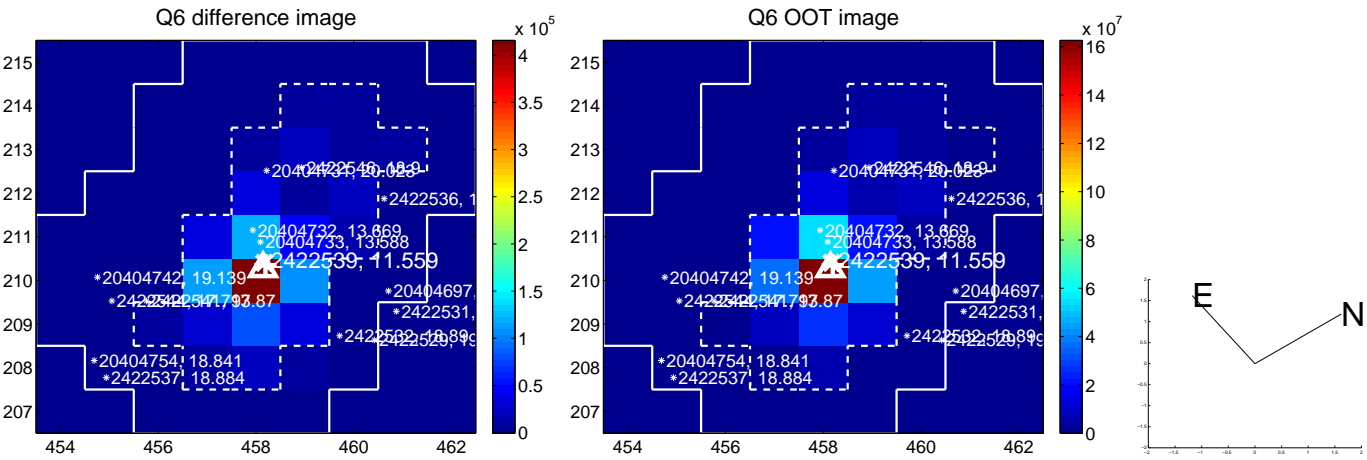
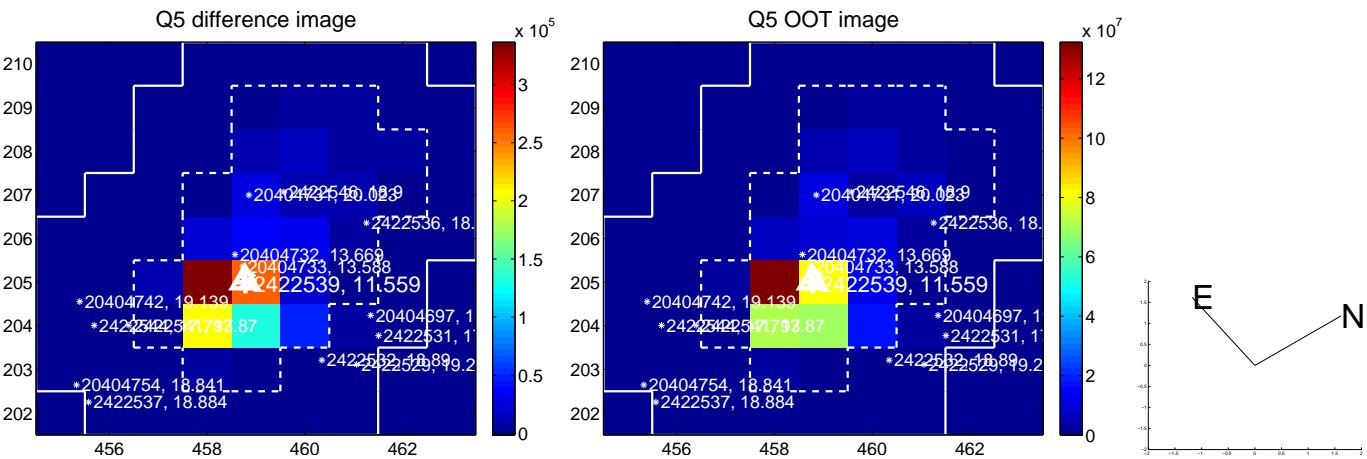


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

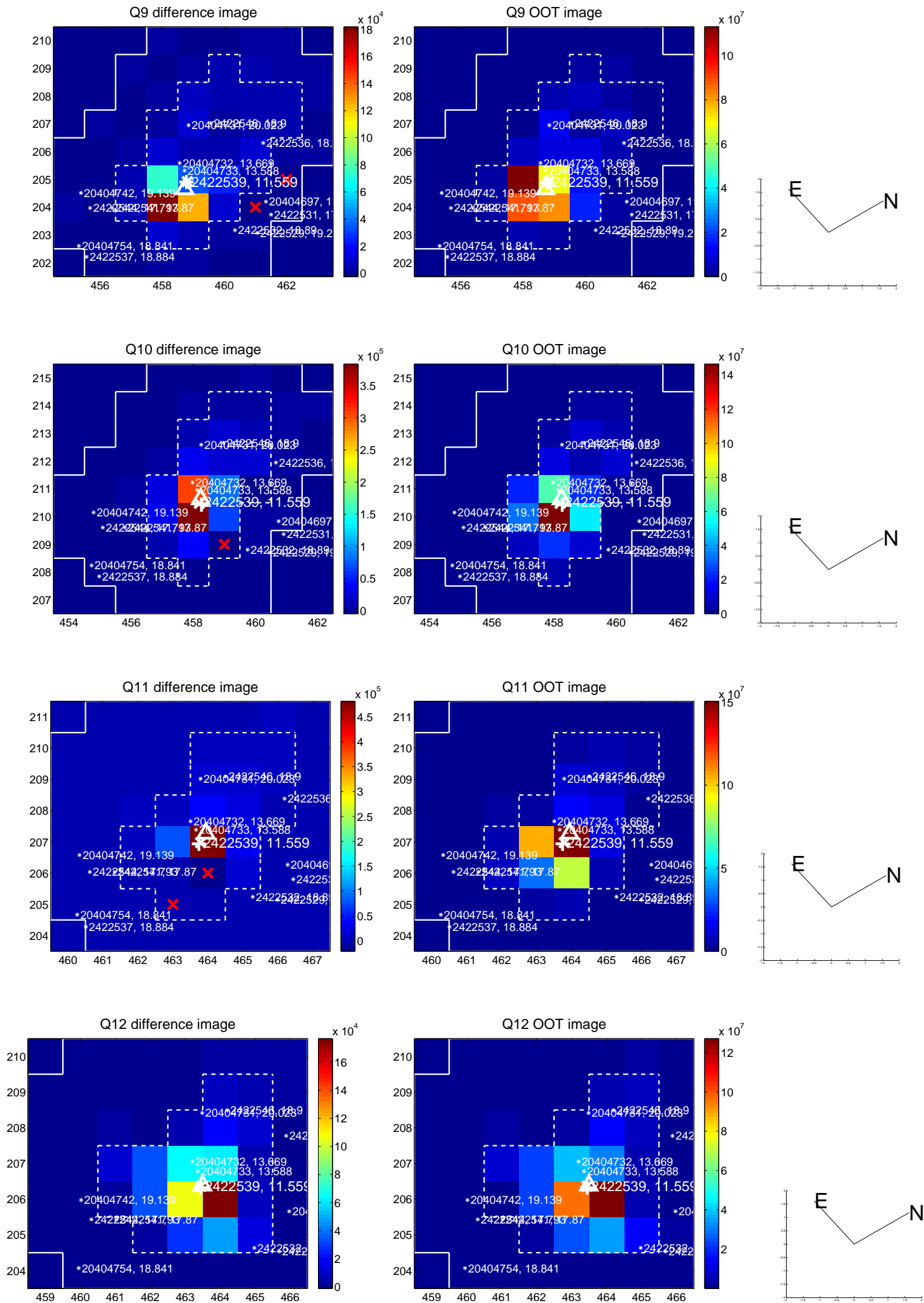


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

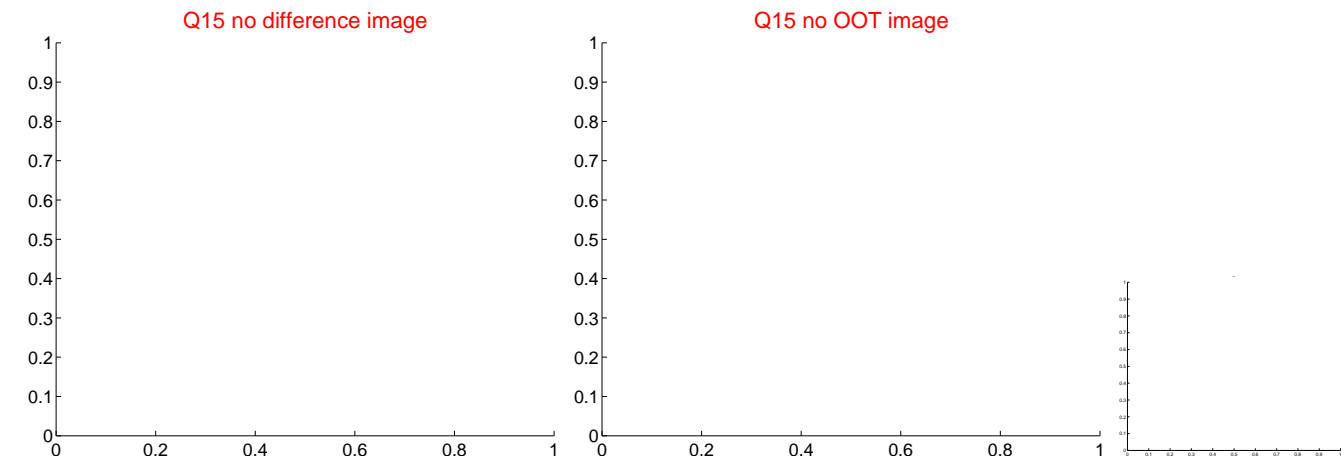
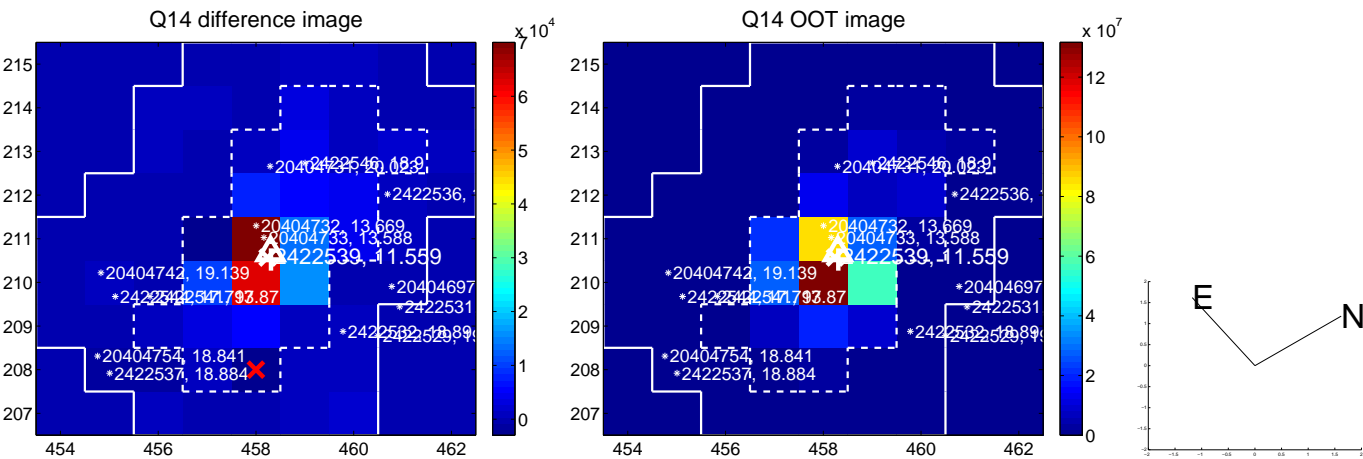




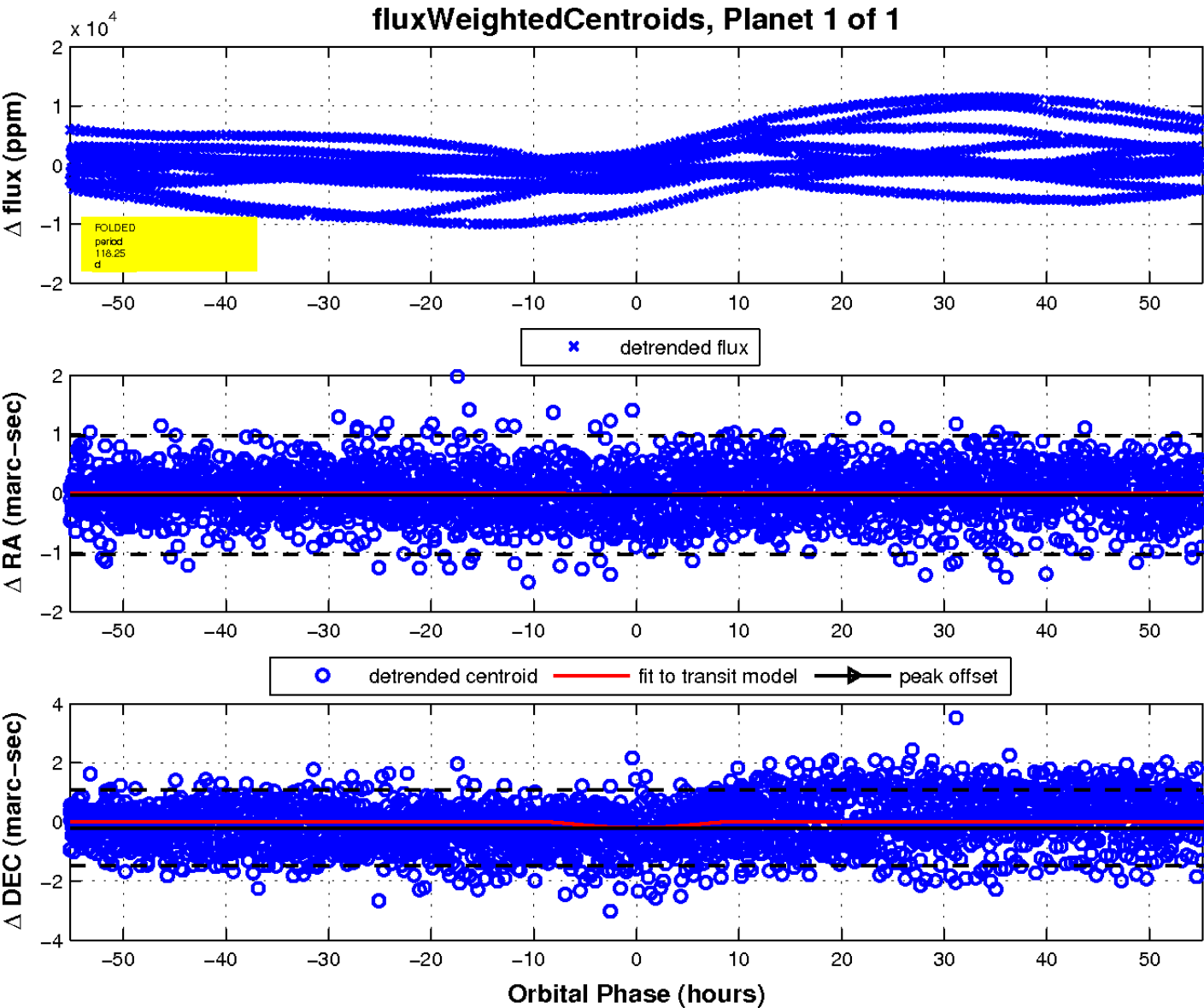
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

