

# KIC 008022815

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008022815-01	OBS	No	374.275709	264.082565	320.6	37.758	7.8	10.9	1.08	6220	2.36	1.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022815-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS—EPHEM_MATCH

**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.

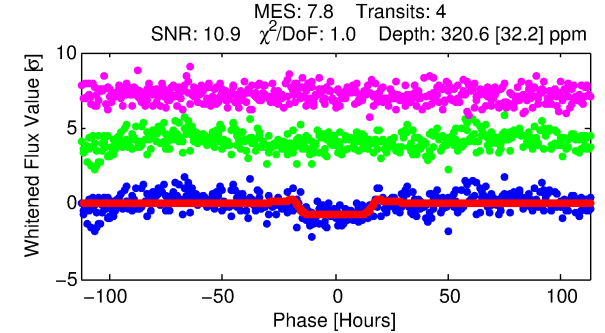
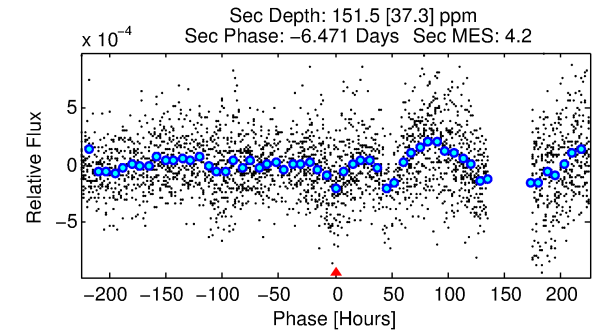
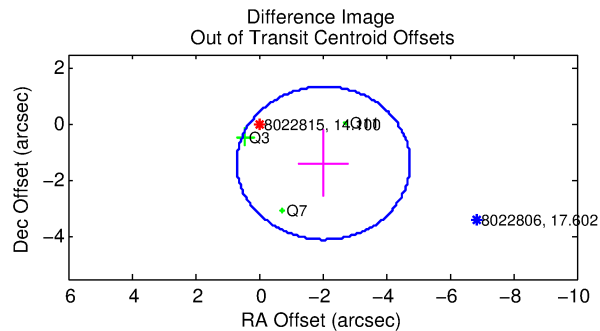
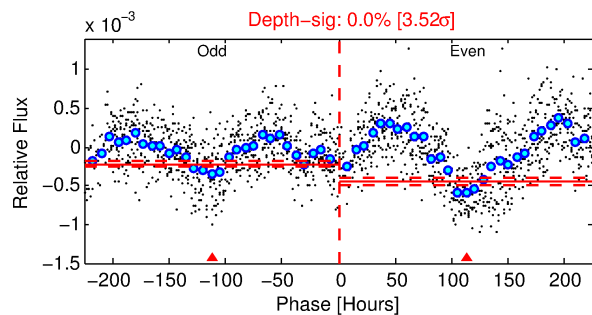
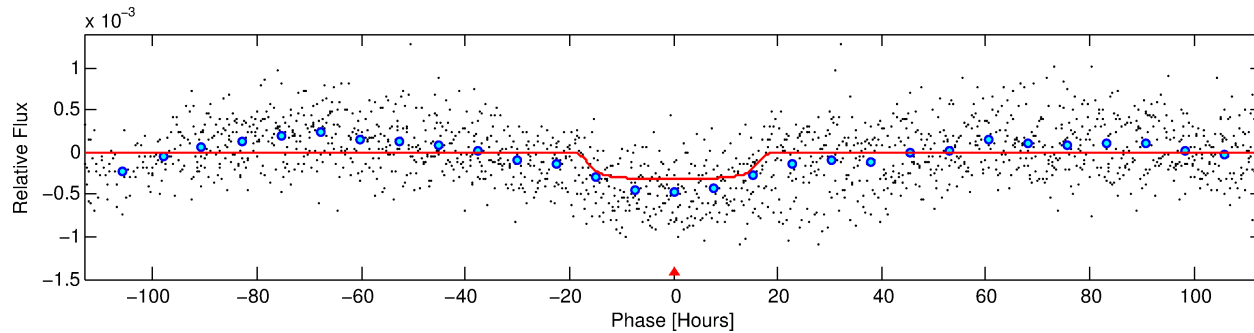
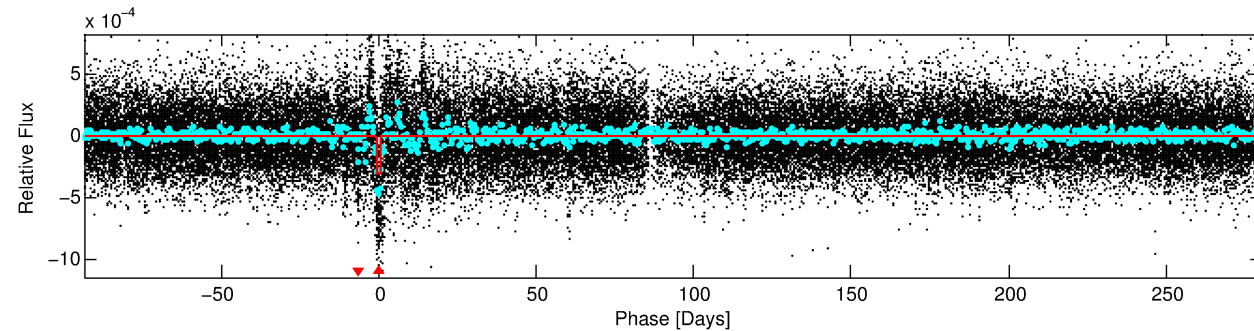
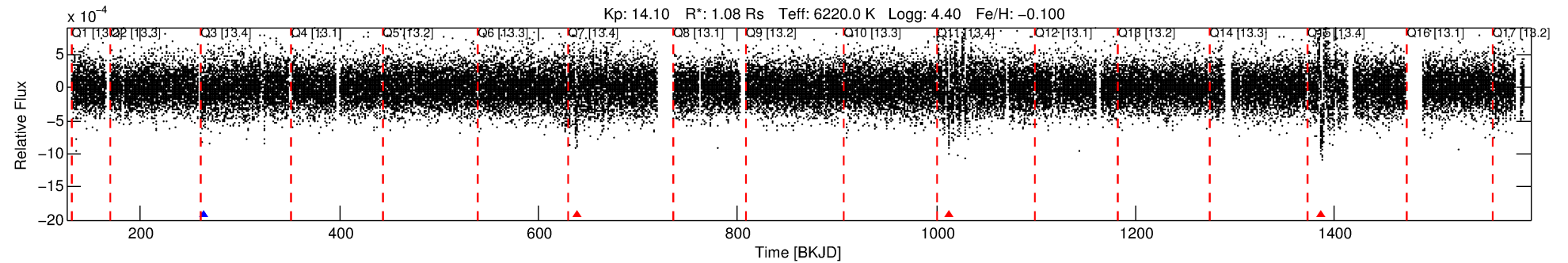
## Ephemeris Match Information For 008022815-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $\mu$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008022815-01	8022815	008092488-01	8092488	1:1	970.8	-244	-3	15.08	14.10	2.40	Col-Anomaly	1	1.37	3.59

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8022815 Candidate: 1 of 1 Period: 374.276 d



## DV Fit Results:

Period = 374.27571 [0.02335] d  
Epoch = 264.0826 [0.0398] BKJD  
Rp/R\* = 0.0200 [0.0015]  
a/R\* = 31.11 [7.86]  
b = 0.93 [0.04]  
Seff = 1.46 [0.61]  
Teff = 280 [29] K  
Rp = 2.36 [0.82] Re  
a = 1.0397 [0.2913] AU  
Ag = 16192.74 [7992.54] [2.03 $\sigma$ ]  
Teffp = 4884 [381] K [12.04 $\sigma$ ]

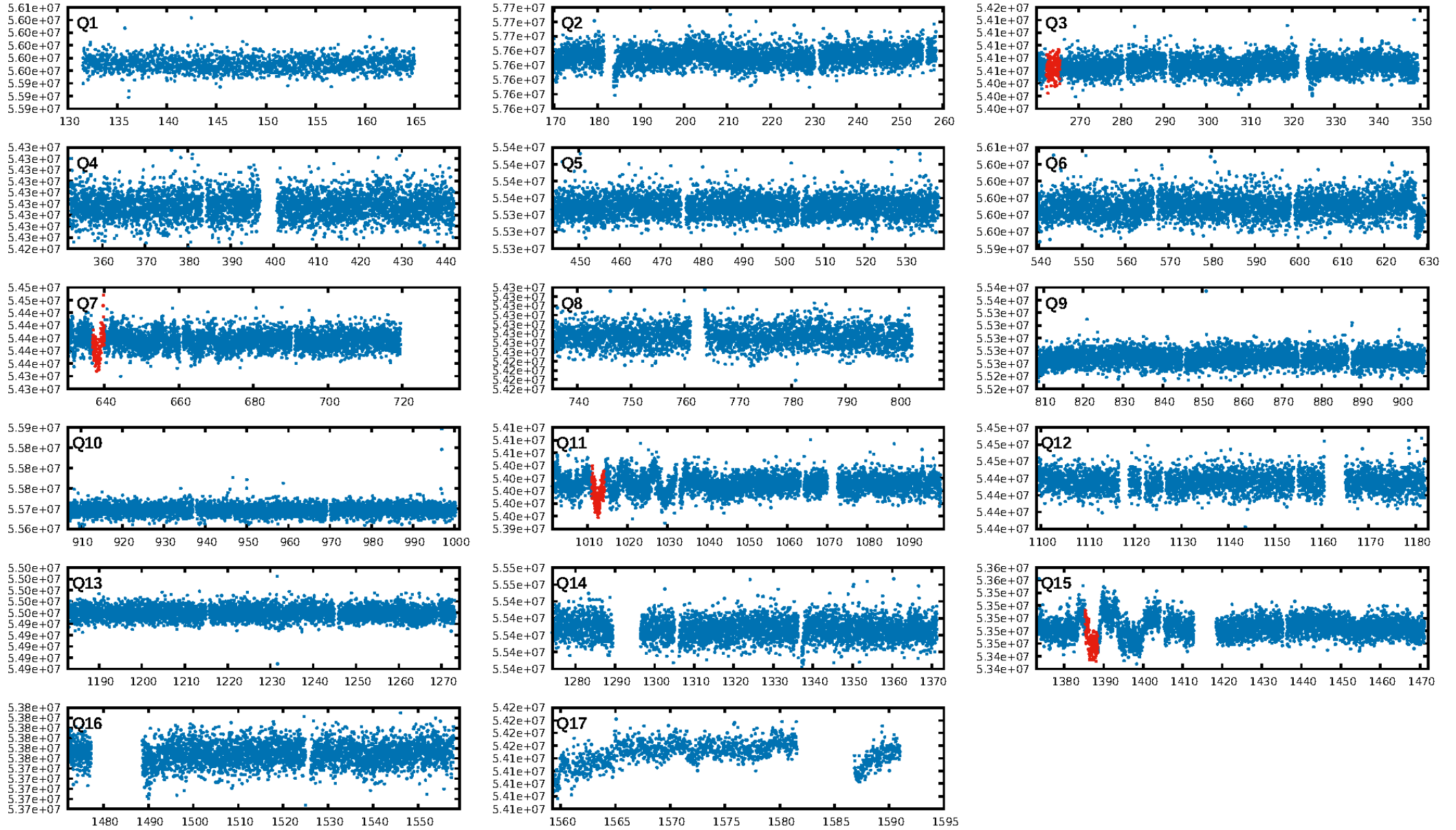
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.83e-10  
RollingBand-fgt: 0.25 [1/4]  
GhostDiagnostic-chr: -6.501  
Centroid-sig: 0.3%  
Centroid-so: 3.970 arcsec [2.15 $\sigma$ ]  
OotOffset-rm: 2.455 arcsec [2.70 $\sigma$ ]  
KicOffset-rm: 2.515 arcsec [2.74 $\sigma$ ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

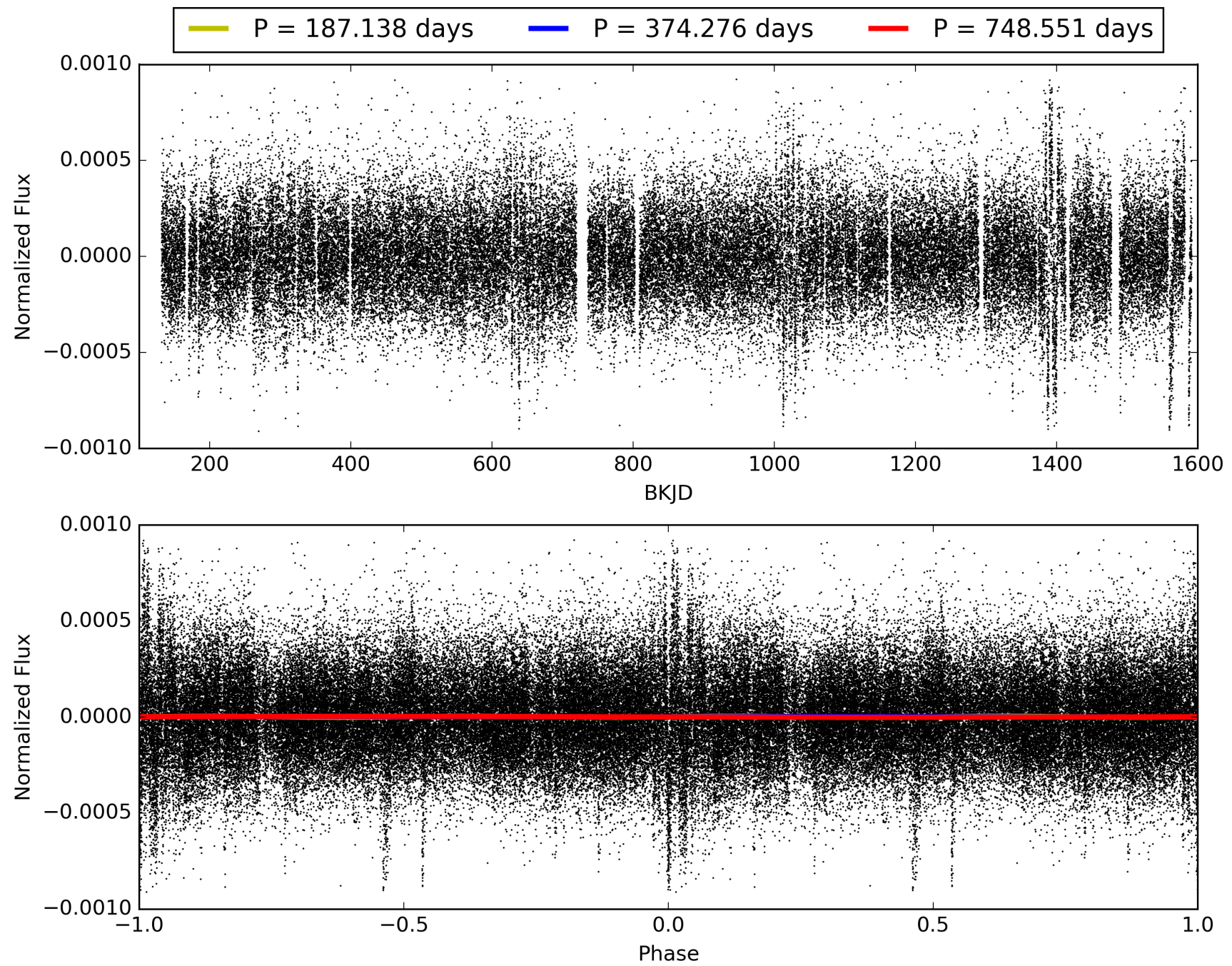
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:49:33 Z

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

# TCE 008022815-01, PDC Light Curves

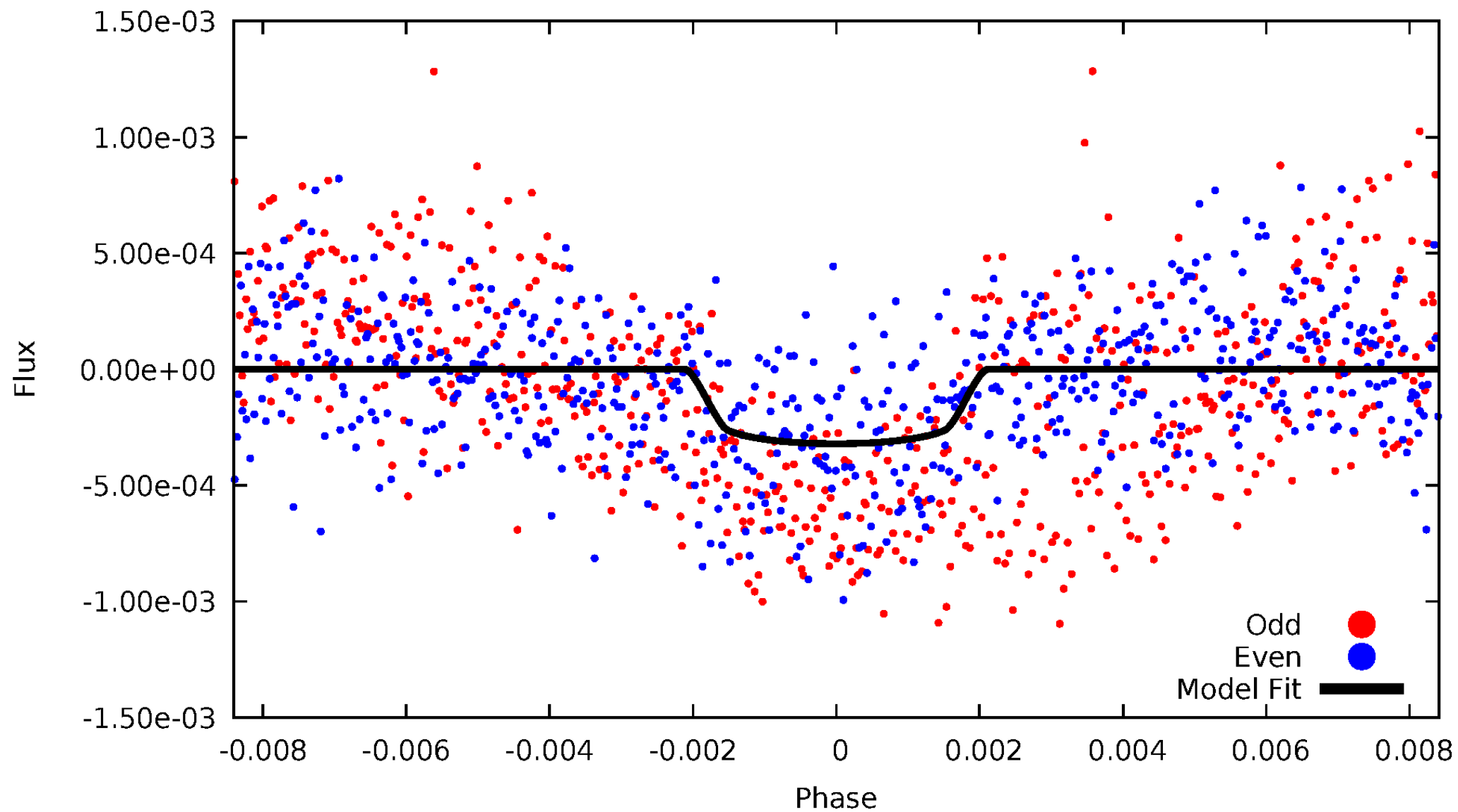


TCE 008022815-01



# DV Odd/Even

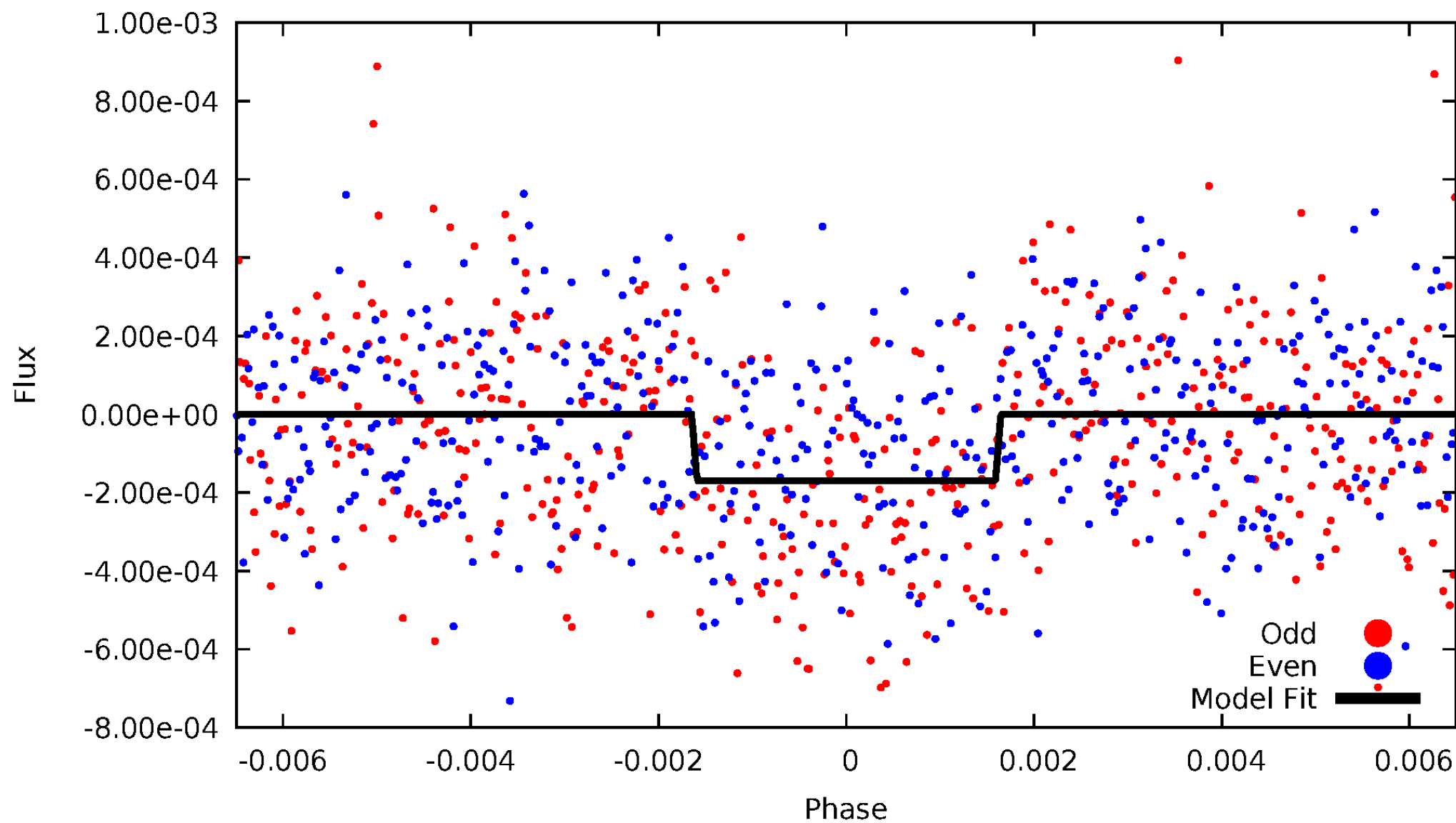
TCE 008022815-01





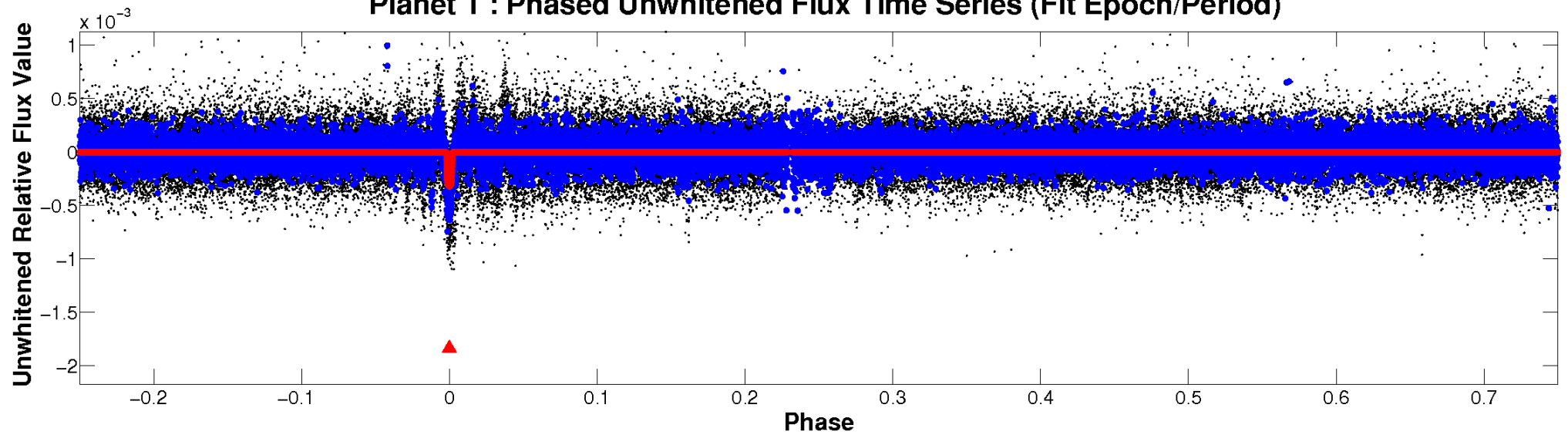
# ALT Odd/Even

TCE 008022815-01

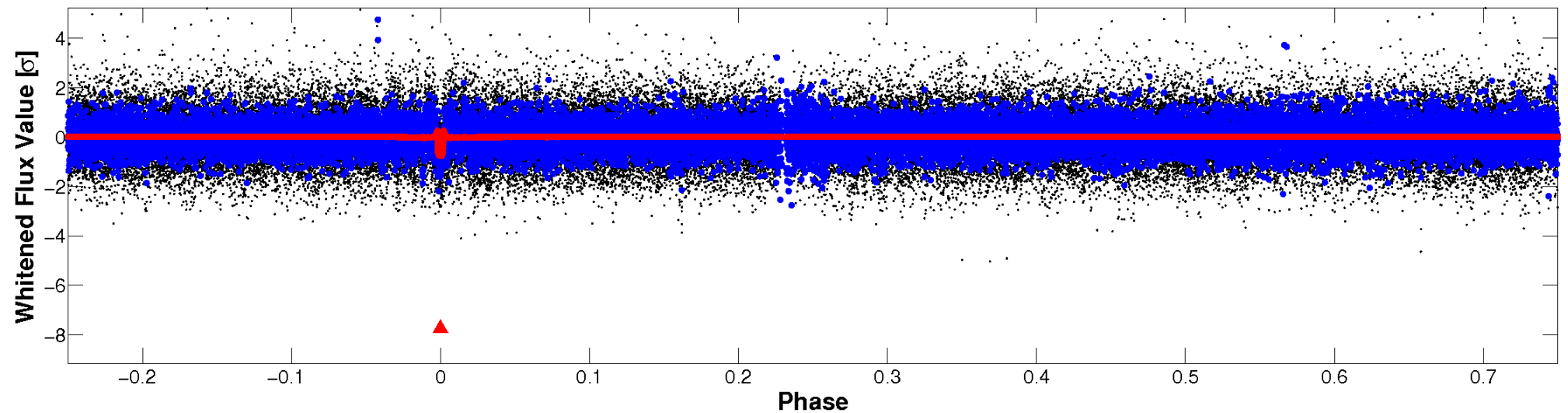


# Non-Whitened Vs. Whitened Light Curve

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

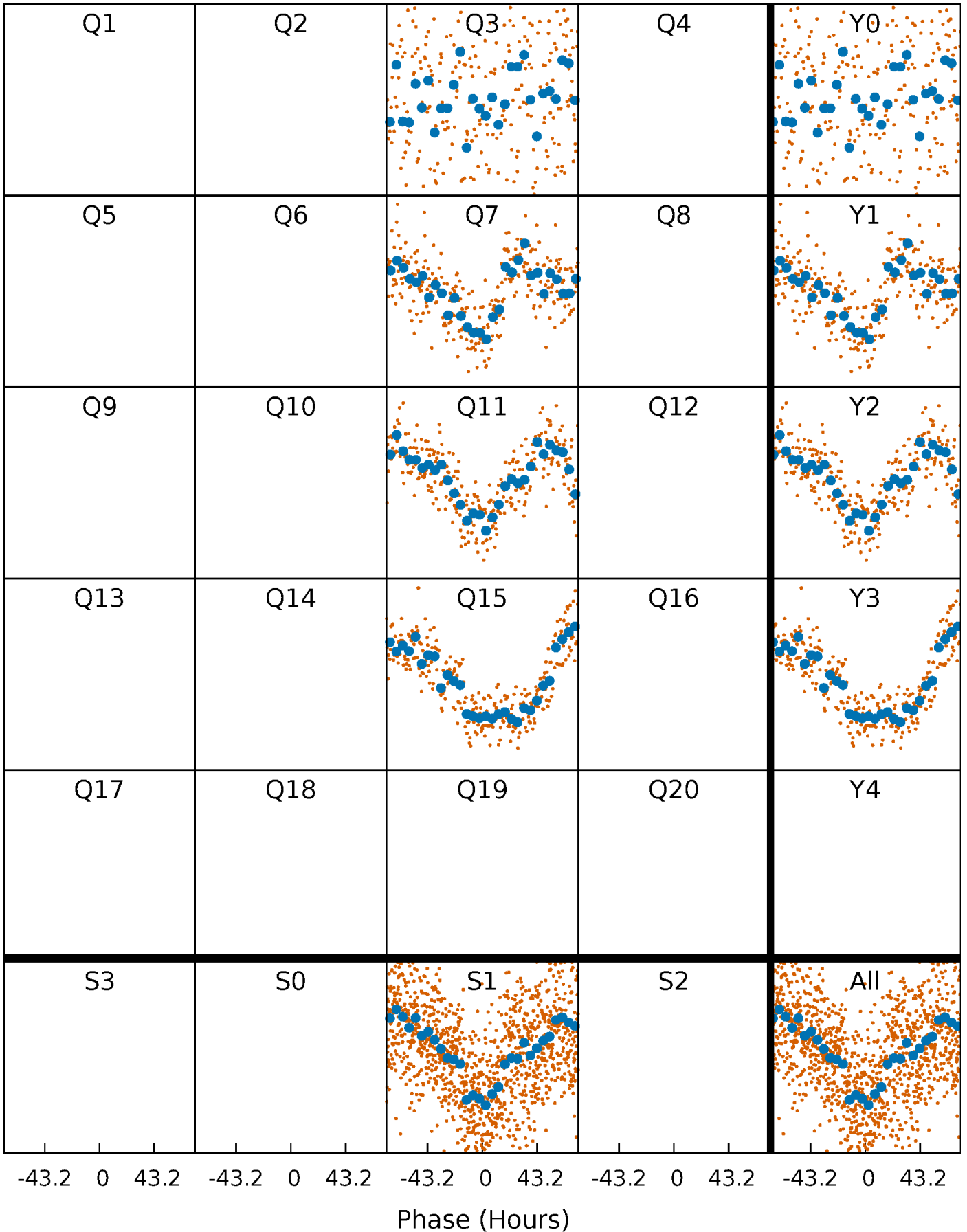


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

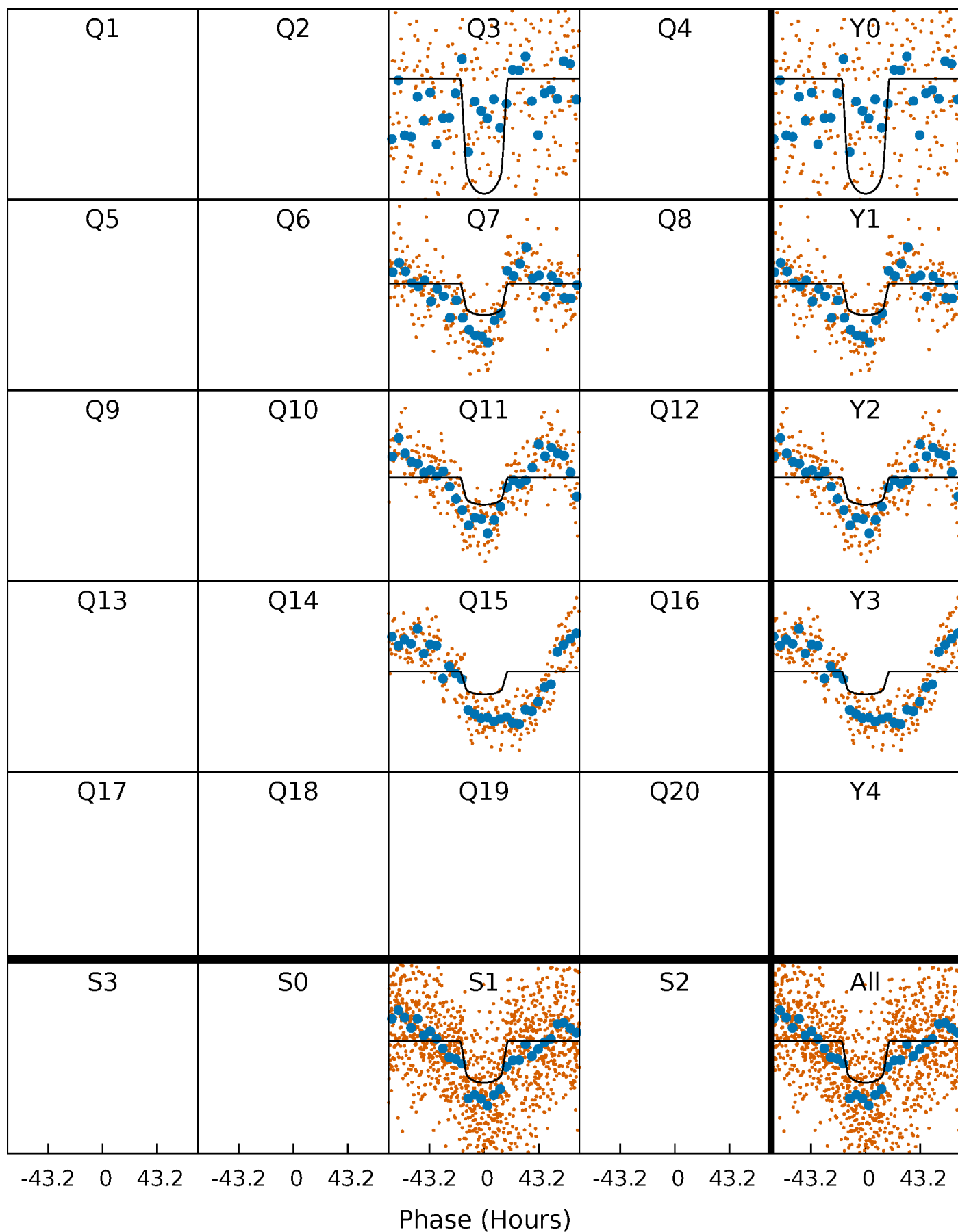
TCE 008022815-01 P=374.275709 Days  $T_0=264.082565$  (BKJD)





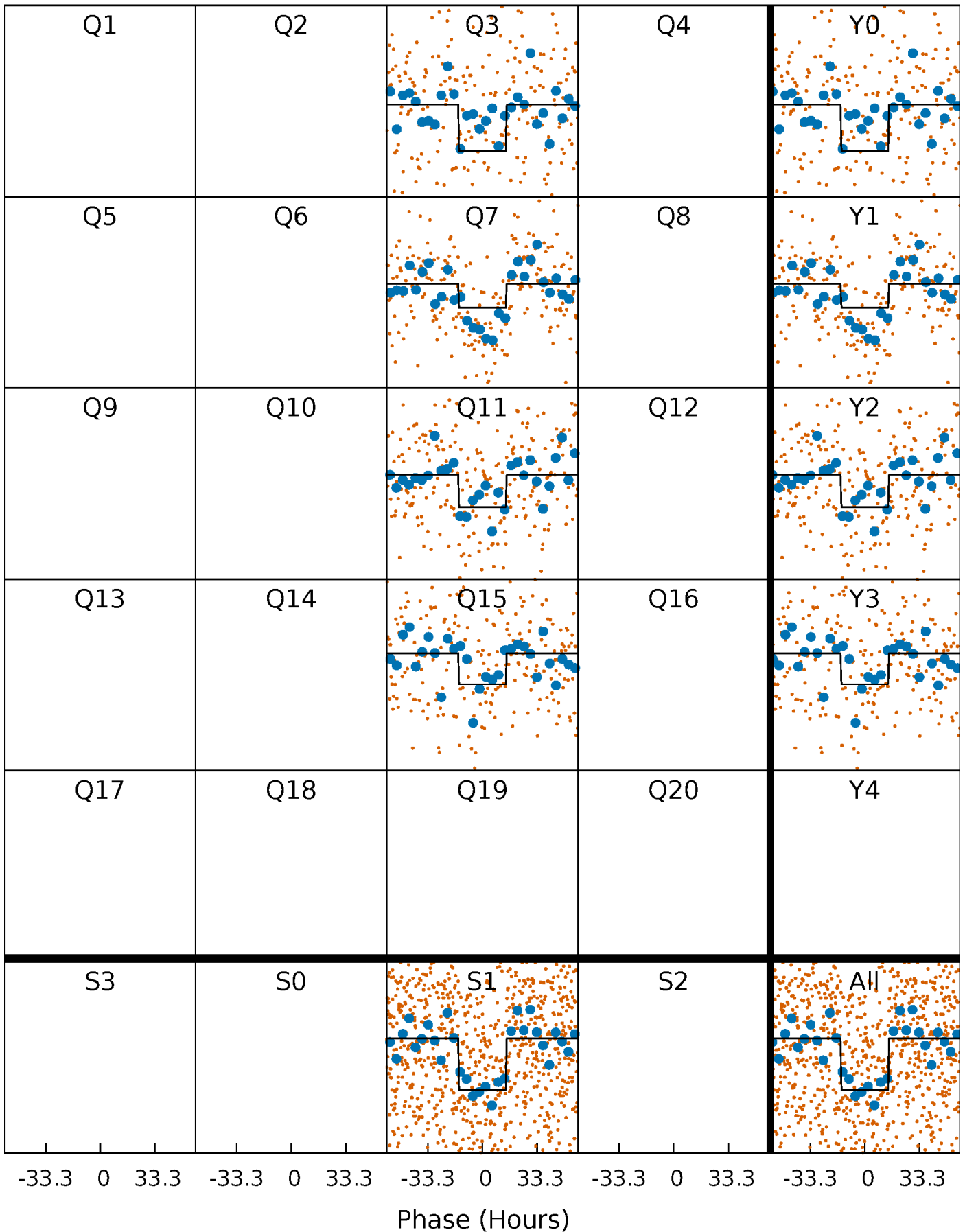
# DV Quarter-Phased Transit Curves

TCE 008022815-01 P=374.275709 Days  $T_0=264.082565$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

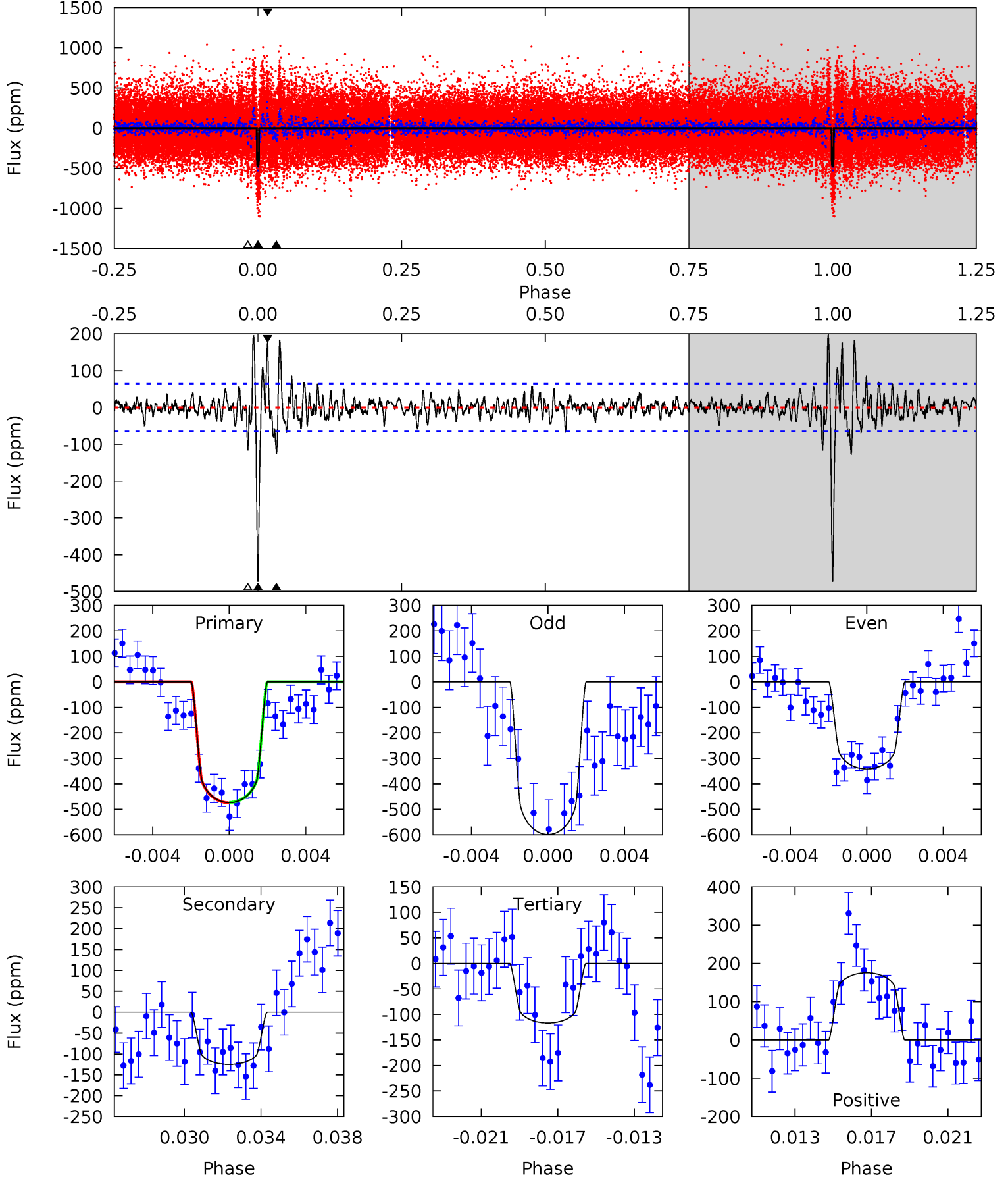
TCE 008022815-01 P=374.172540 Days  $T_0=264.160383$  (BKJD)



# DV Model-Shift Uniqueness Test

008022815-01, P = 374.275709 Days, E = 264.082565 Days

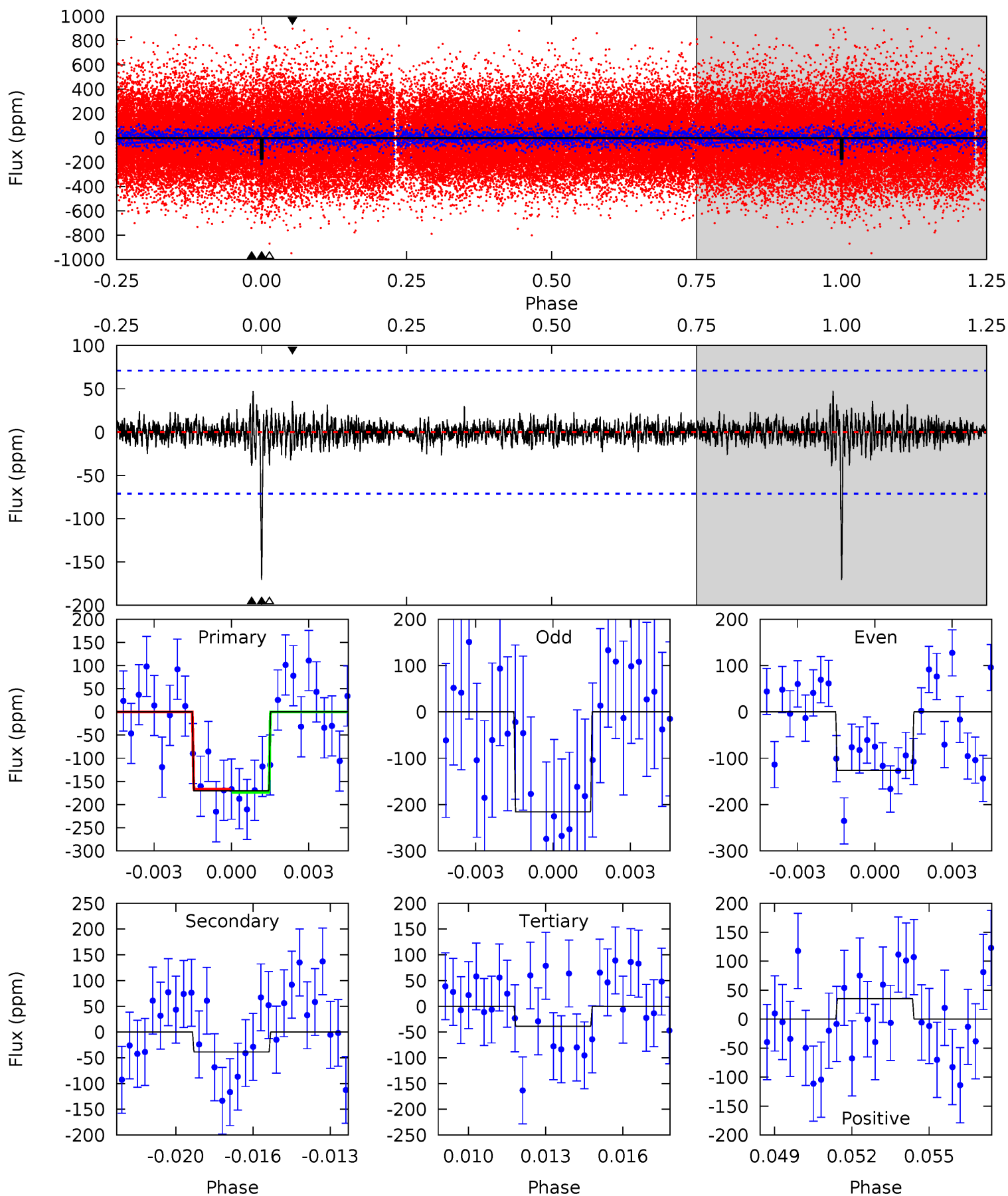
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.5	10.2	9.48	14.3	5.19	2.86	2.31	29.0	24.2	0.68	-4.11	10.5	0.87	0.29	0.07



# Alt Model-Shift Uniqueness Test

008022815-01, P = 374.172540 Days, E = 264.160383 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
12.6	2.85	2.85	2.63	5.24	2.94	0.61	9.74	9.95	0.01	0.22	3.31	1.10	0.22	0.26



### Stellar Parameters For KIC 008022815

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6220^{+172}_{-194}$	$4.398^{+0.072}_{-0.217}$	$-0.100^{+0.250}_{-0.300}$	$1.083^{+0.366}_{-0.147}$	$1.064^{+0.169}_{-0.127}$	$1.180^{+0.449}_{-0.658}$
	+3%/-3%	+2%/-5%	+250%/-300%	+34%/-14%	+16%/-12%	+38%/-56%
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 008022815-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-125 \pm 12$	$2.42^{+0.46}_{-0.26}$	$397^{+30}_{-20}$	$4773^{+199}_{-199}$	$12398^{+3455}_{-3371}$
Alt.	$-39 \pm 14$	$1.60^{+0.33}_{-0.24}$	$398^{+32}_{-20}$	$4469^{+368}_{-410}$	$8560^{+4900}_{-3605}$

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

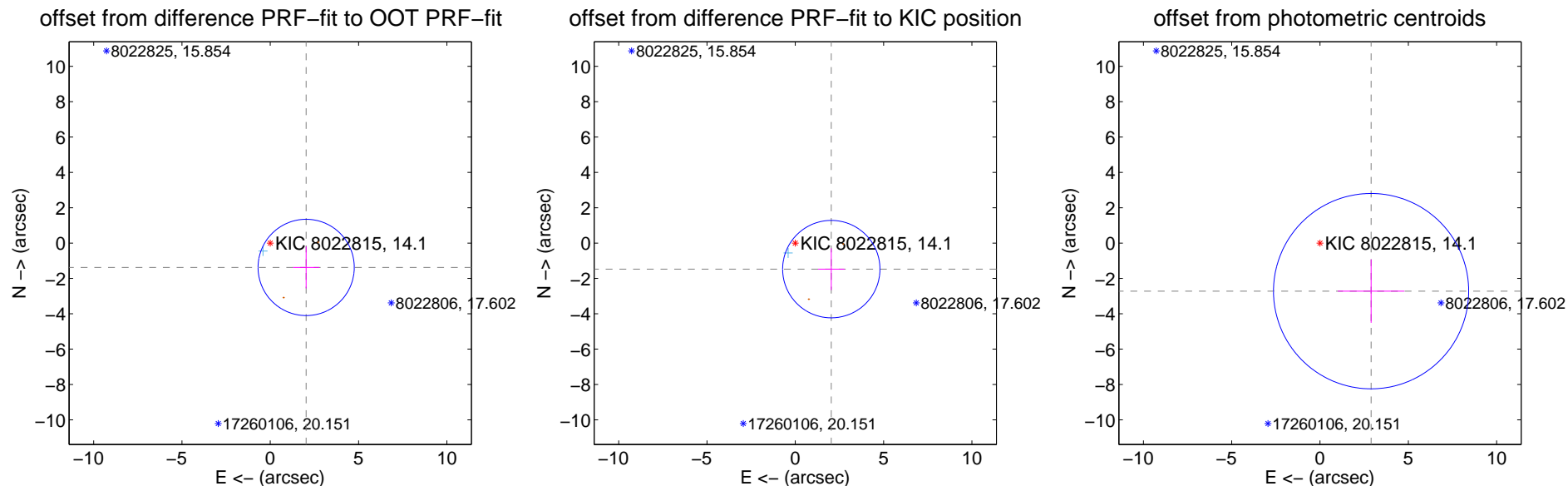
## DV Centroid Data

Supplemental centroid analysis for 008022815-01. Kepler magnitude: 14.10. Transit SNR 10.90

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

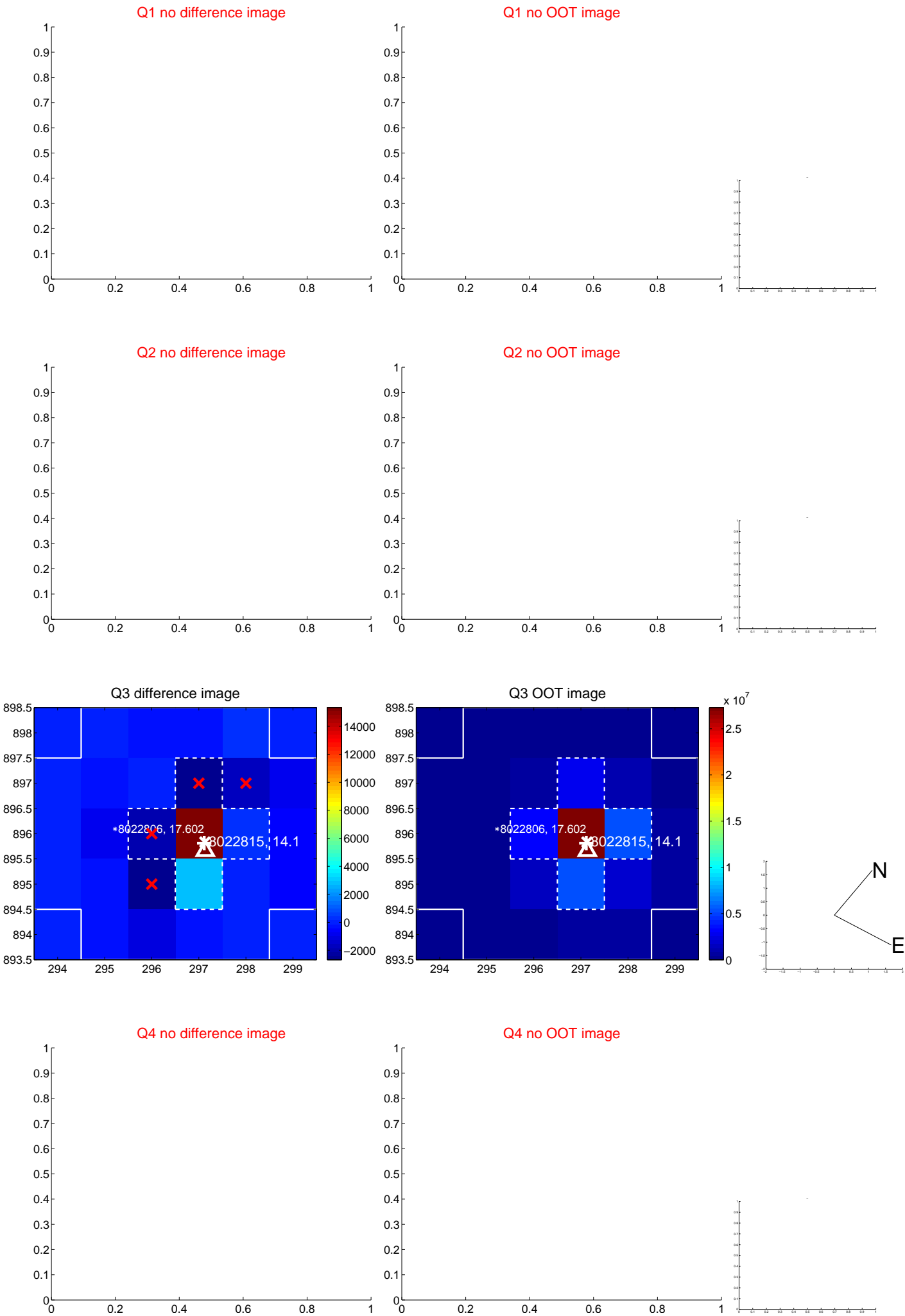
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.455 \pm 0.908$	2.70	$-2.032 \pm 0.747$	$-1.377 \pm 1.185$
PRF-fit source offset from KIC position	$2.515 \pm 0.919$	2.74	$-2.038 \pm 0.746$	$-1.473 \pm 1.181$
photometric centroid source offset	$3.97 \pm 1.84$	2.15	$-2.89 \pm 1.89$	$-2.72 \pm 1.79$



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.

Q5 no difference image



Q5 no OOT image



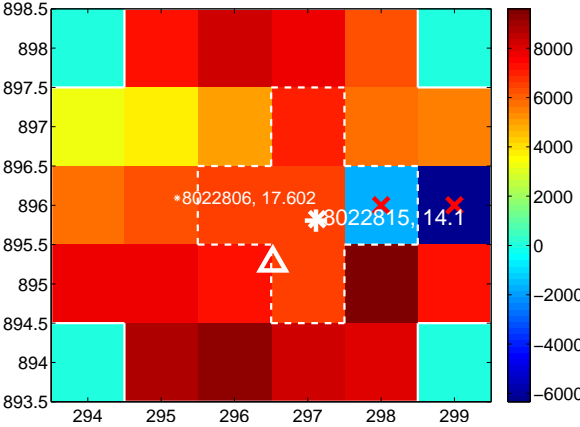
Q6 no difference image



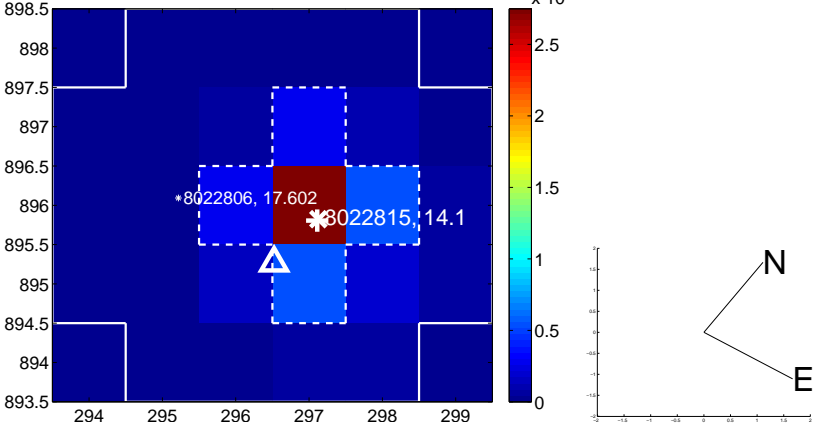
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 OOT image



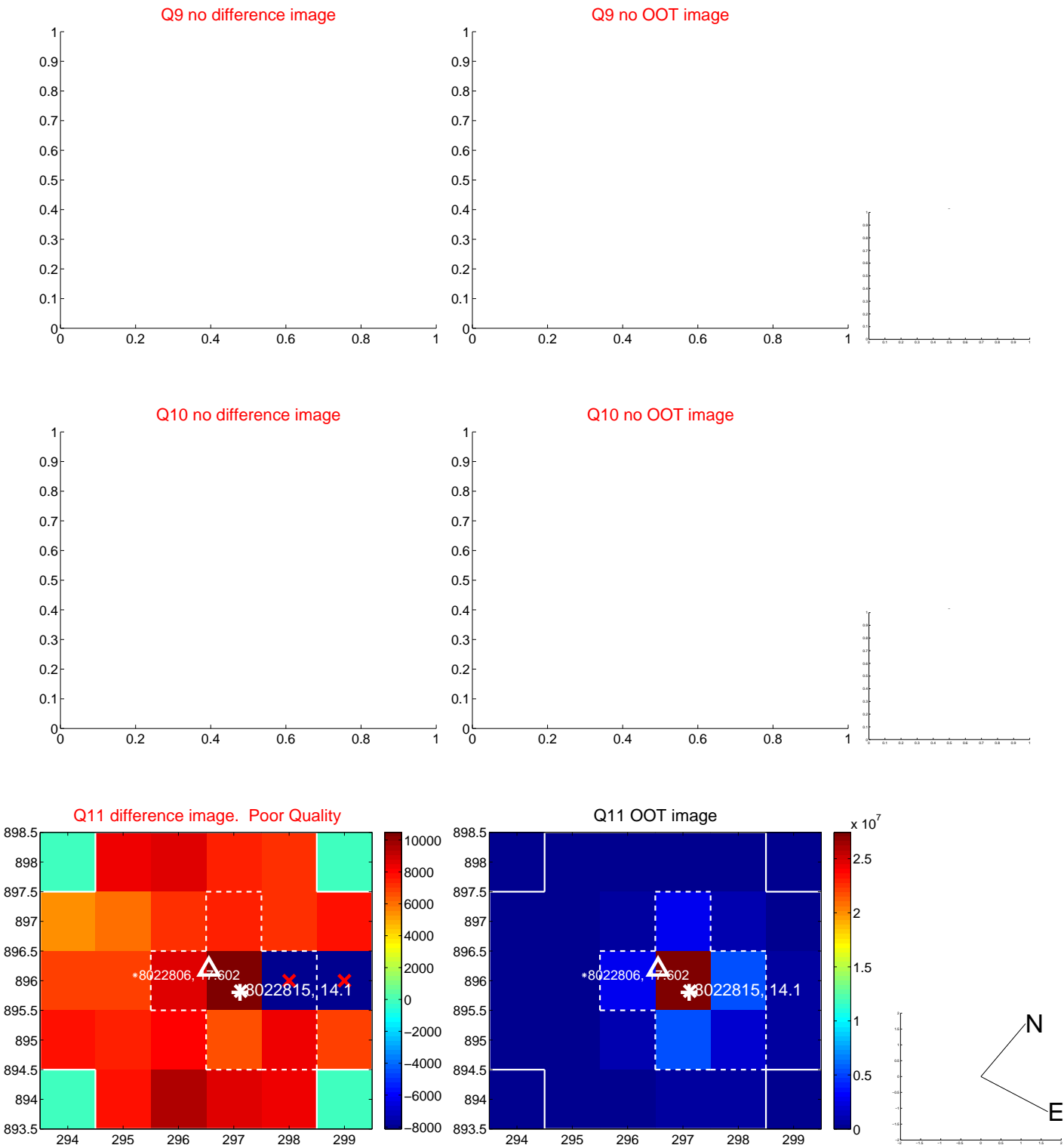
Q8 no difference image



Q8 no OOT image



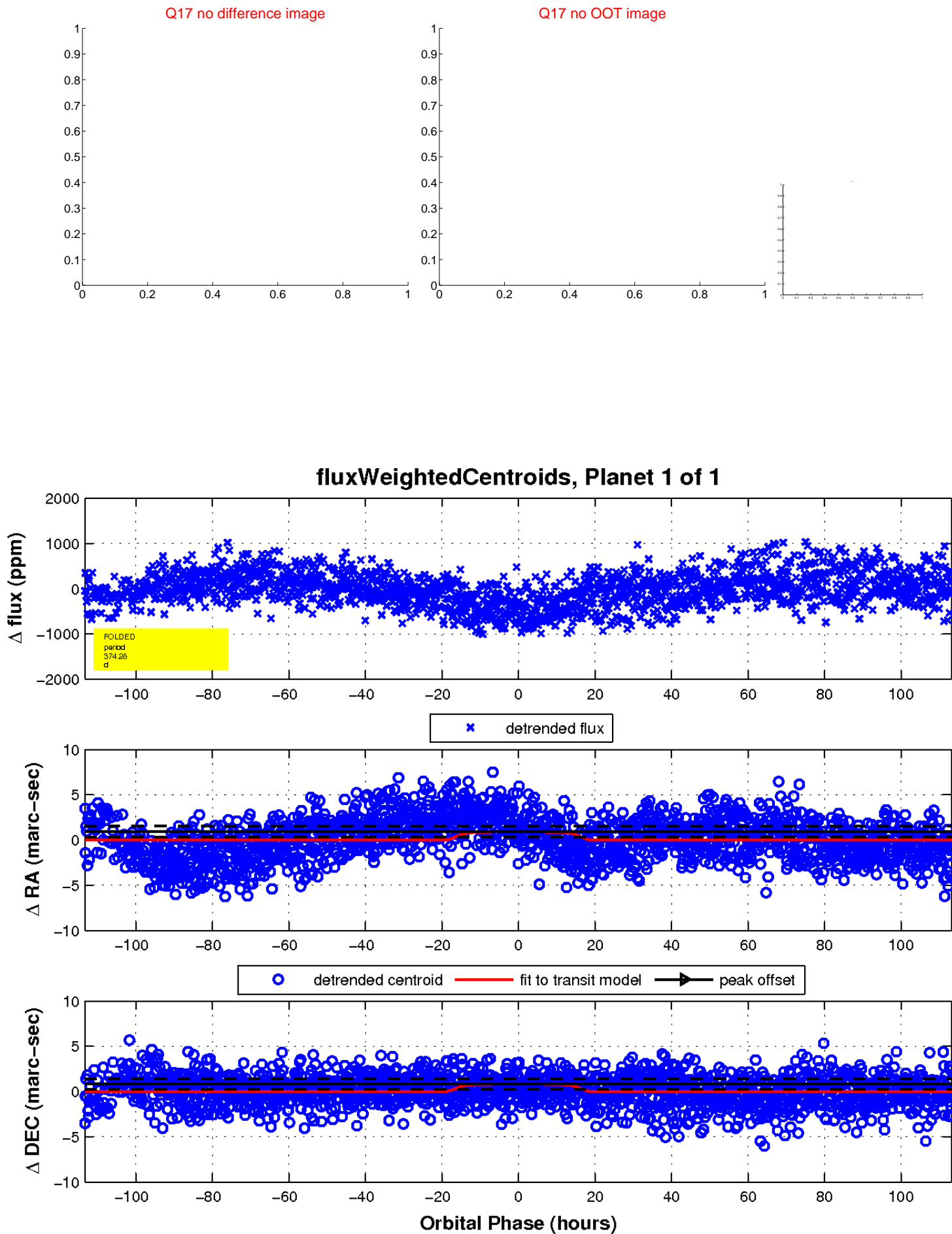
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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.



UKIRT Image

Declination

