

# KIC 004078955

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004078955-01	OBS	No	499.898948	387.778519	963.7	16.646	7.9	7.6	0.93	5706	3.27	0.52

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004078955-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—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.

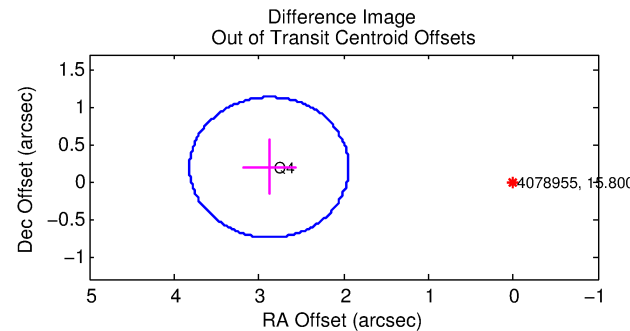
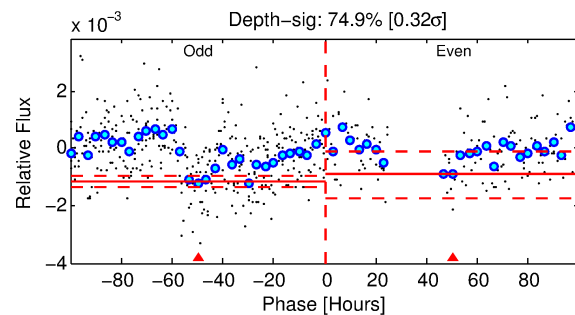
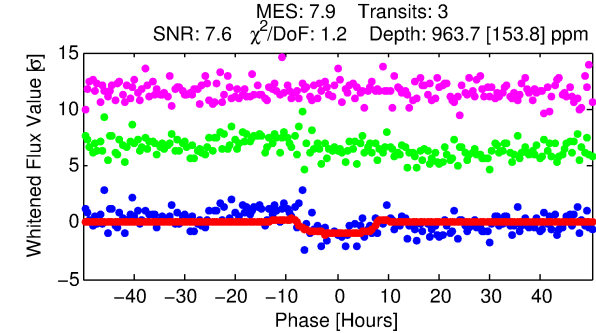
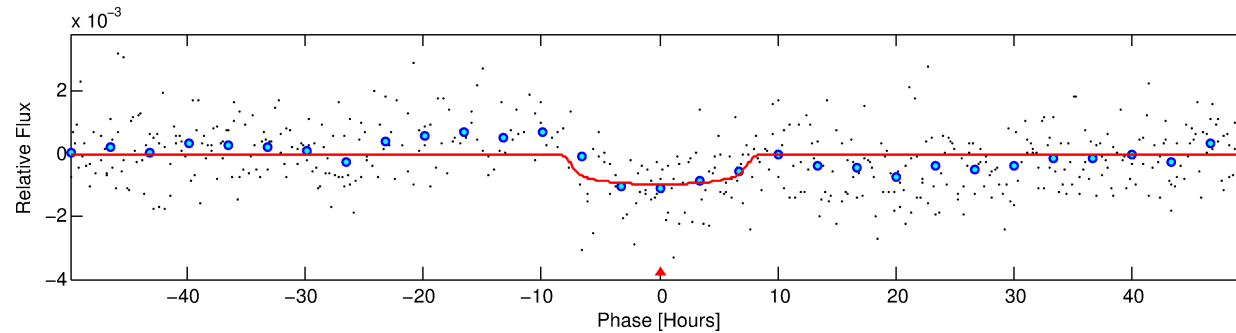
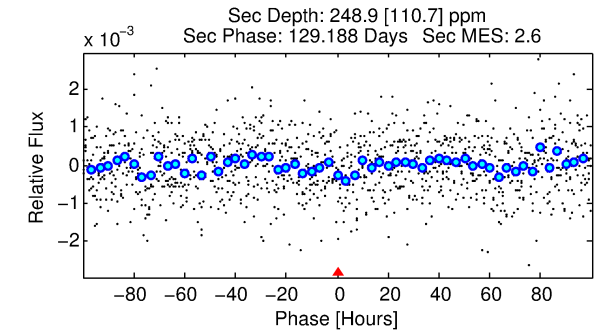
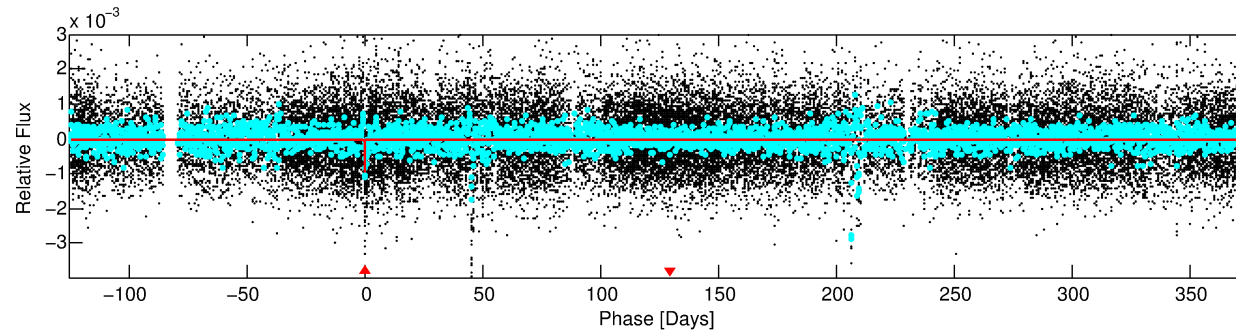
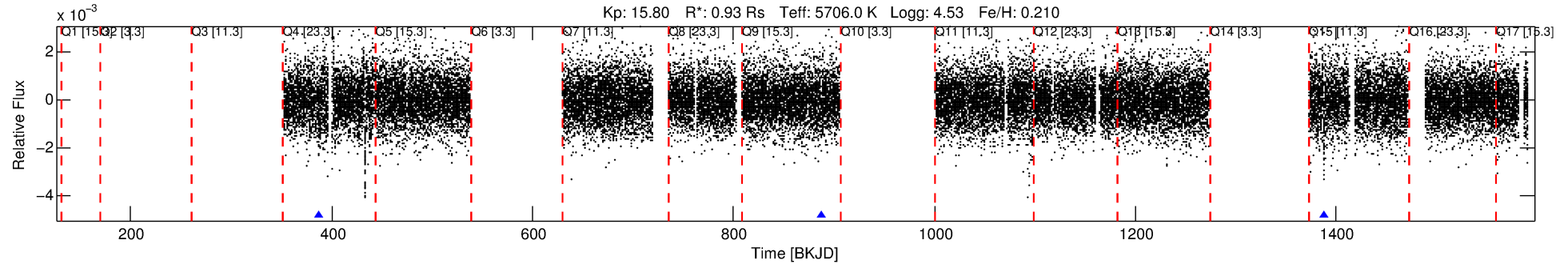
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004078955-01

No Significant Match Found

# DV One-Page Summary

KIC: 4078955 Candidate: 1 of 1 Period: 499.899 d



## DV Fit Results:

Period = 499.89895 [0.02932] d  
Epoch = 387.7785 [0.0397] BKJD  
Rp/R\* = 0.0323 [0.0077]  
a/R\* = 138.17 [128.87]  
b = 0.84 [0.34]  
Seff = 0.52 [0.19]  
Teq = 216 [20] K  
Rp = 3.27 [1.17] Re  
a = 1.2523 [0.2885] AU  
Ag = 20102.62 [14822.37] [1.36σ]  
Teffp = 3985 [665] K [5.67σ]

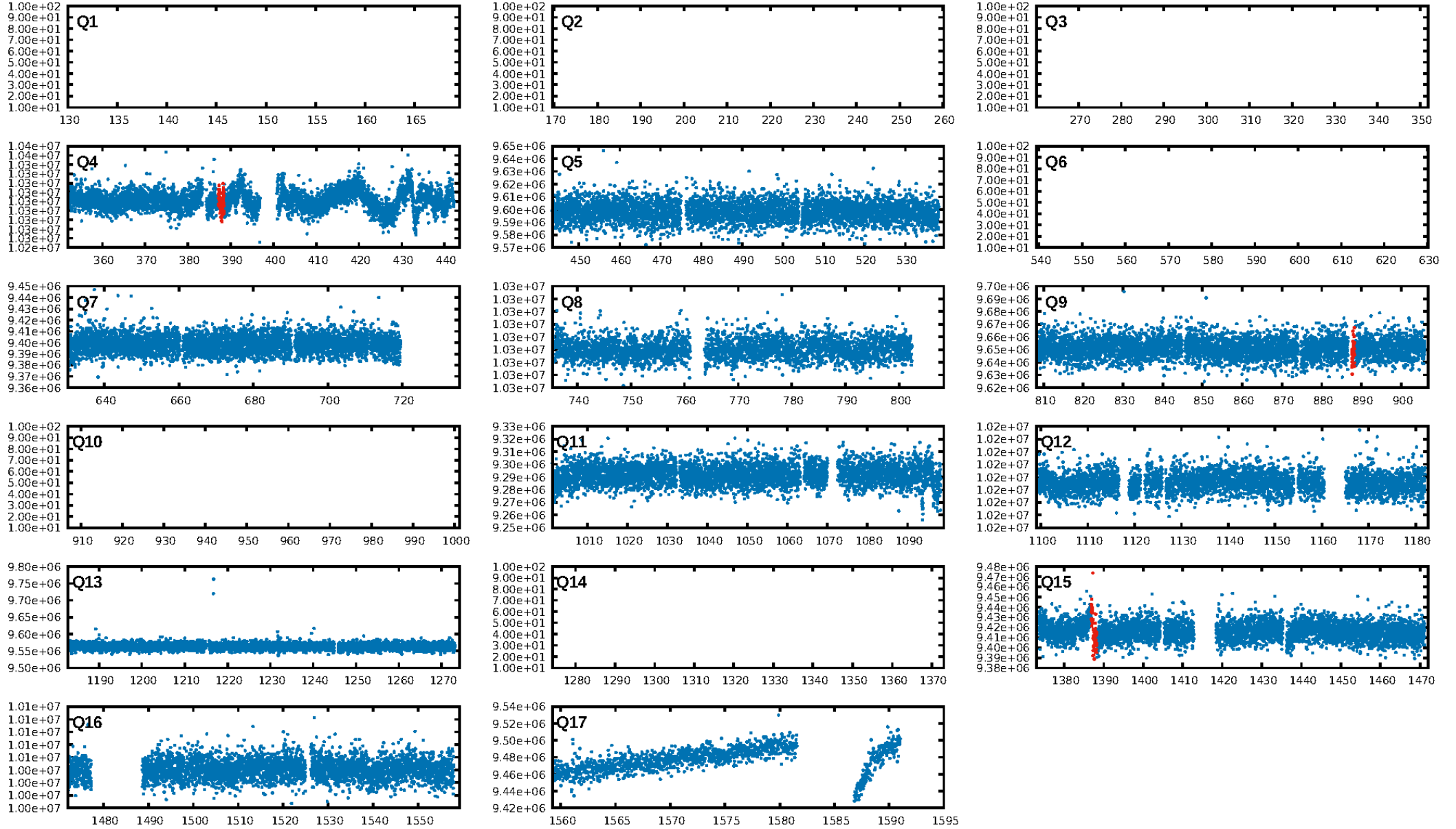
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 36.9%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 6.54e-10**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -0.286**  
Centroid-sig: 19.9%  
Centroid-so: 2.728 arcsec [2.16σ]  
**OotOffset-rm: 2.883 arcsec [9.22σ]**  
**KicOffset-rm: 2.586 arcsec [8.26σ]**  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

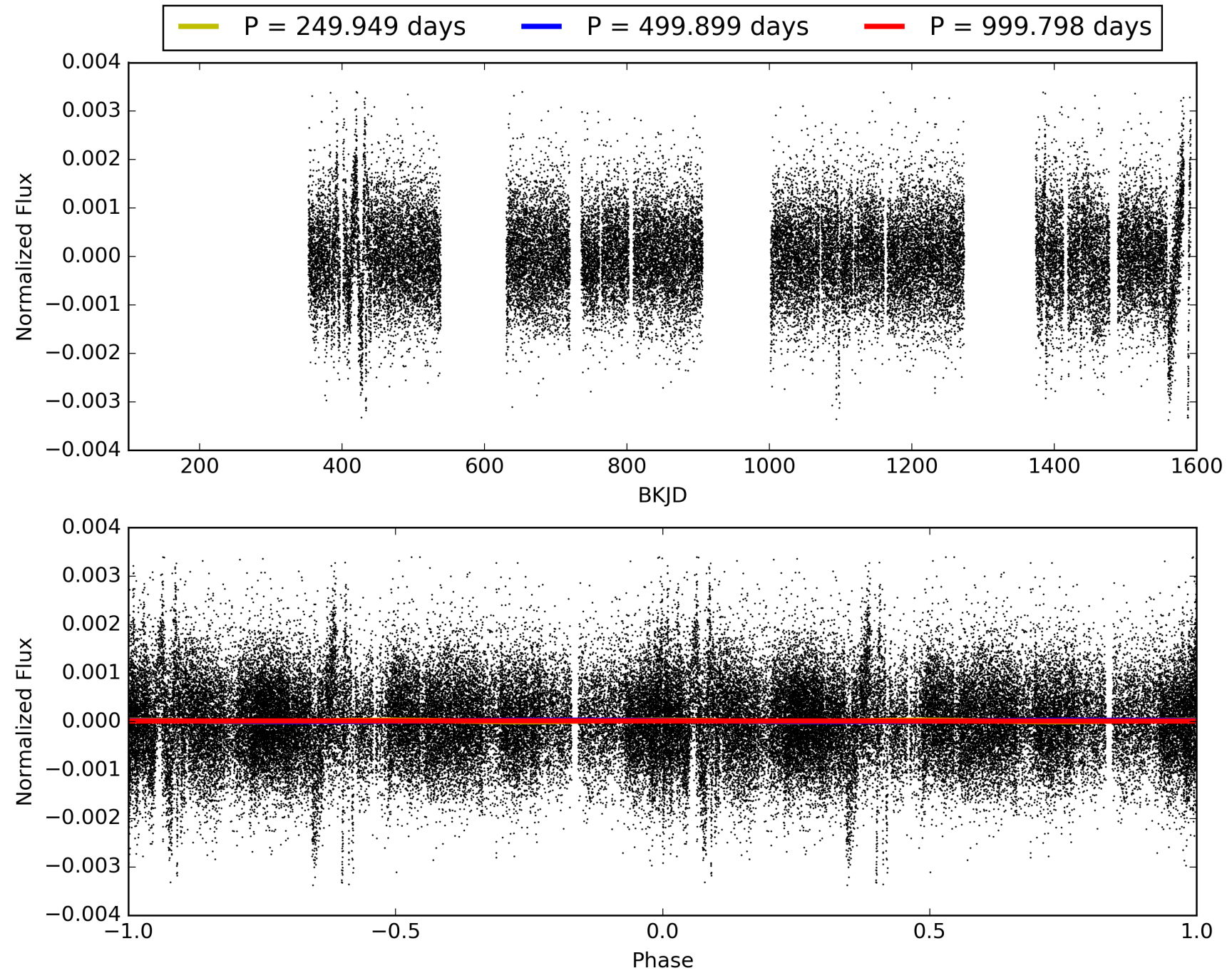
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:58:51 Z

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

# TCE 004078955-01, PDC Light Curves

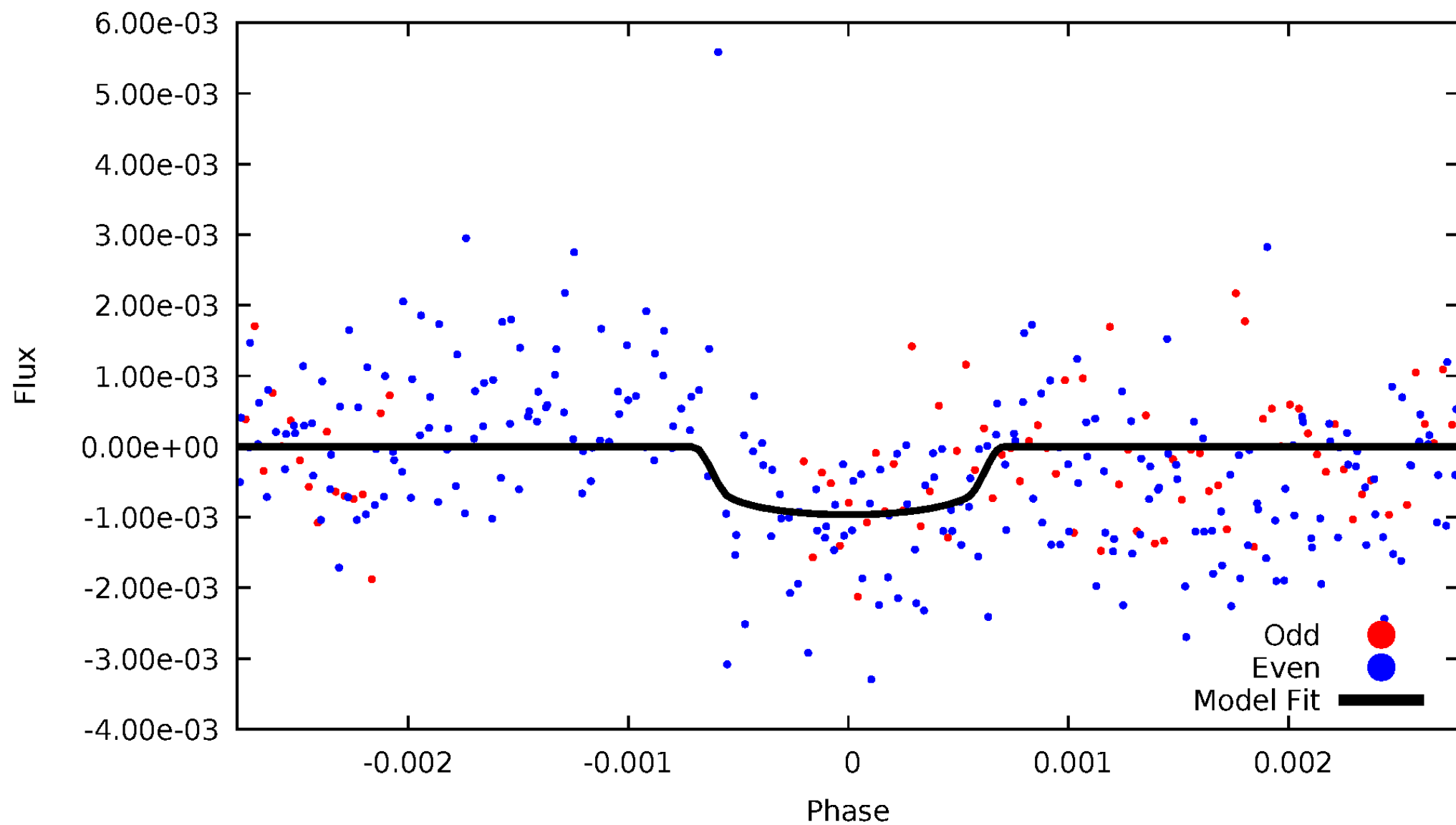


TCE 004078955-01



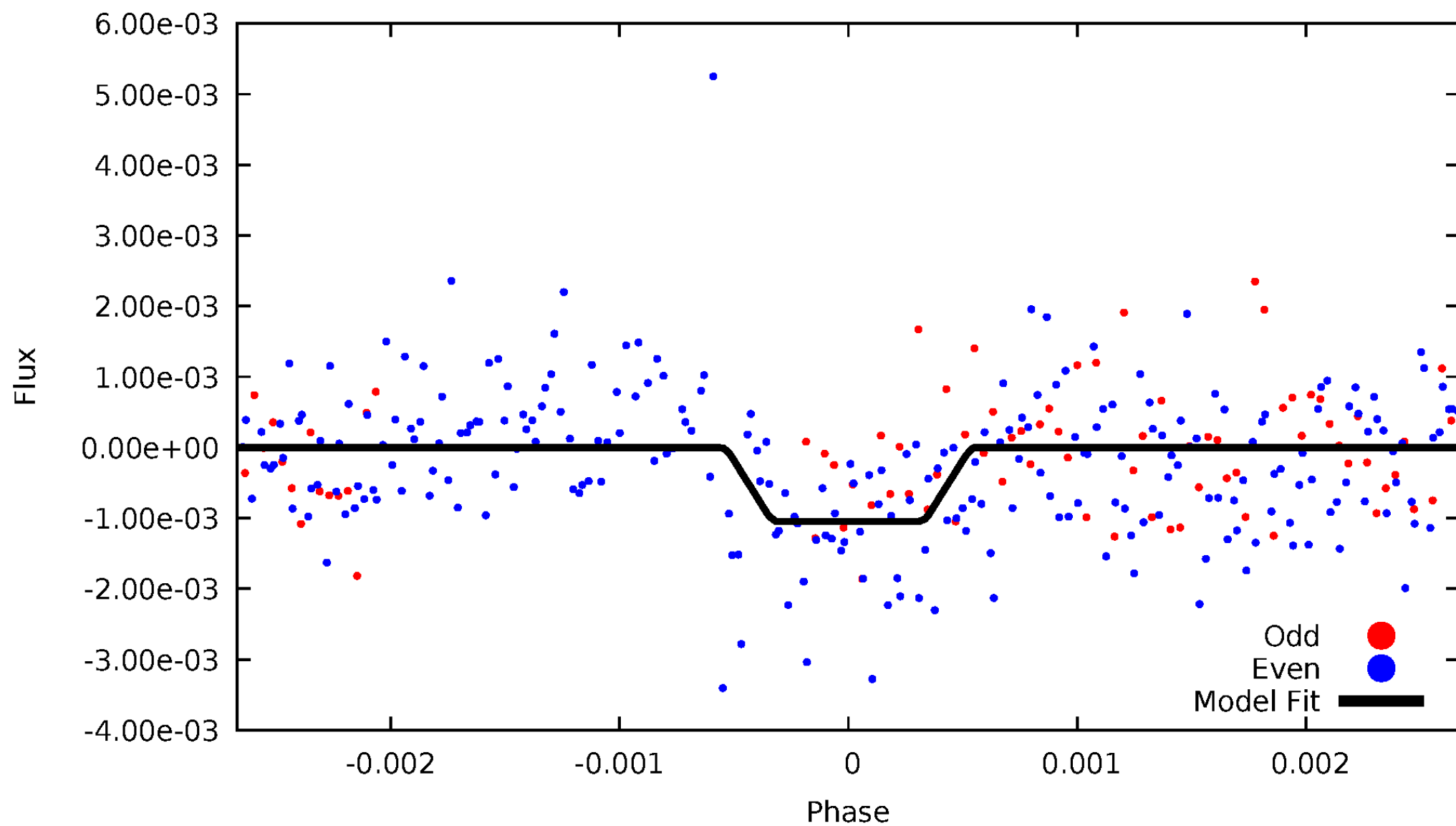
# DV Odd/Even

TCE 004078955-01



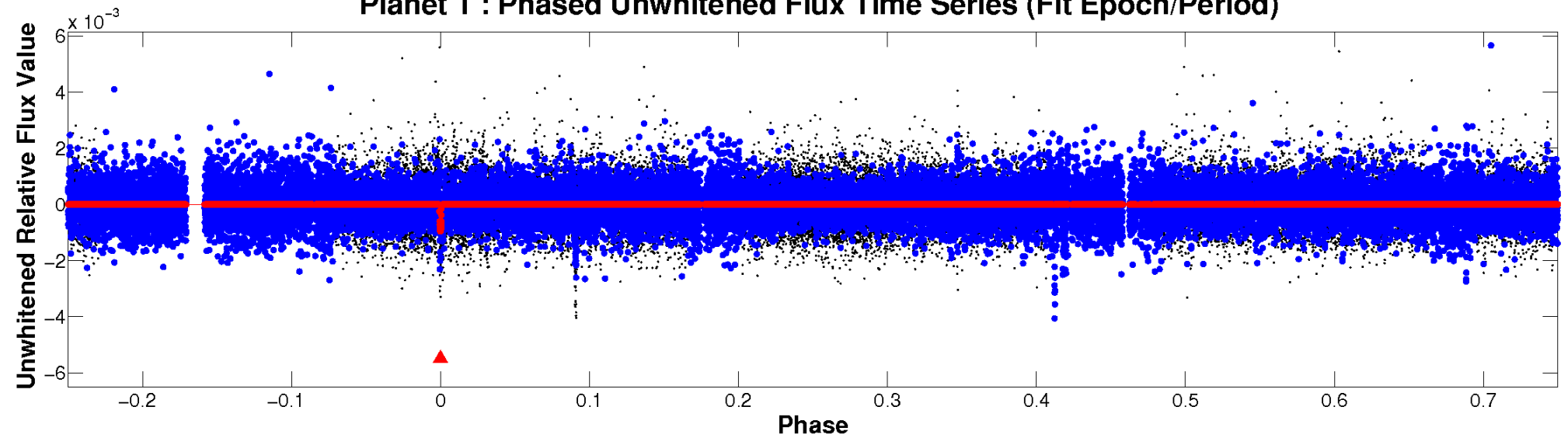
# ALT Odd/Even

TCE 004078955-01

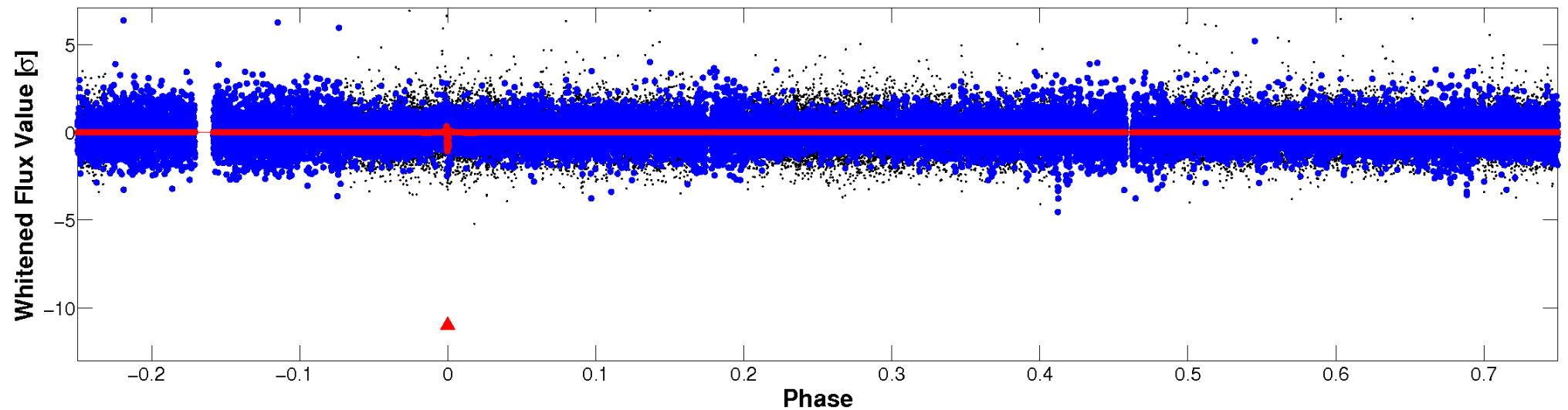


# Non-Whitened Vs. Whitened Light Curve

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

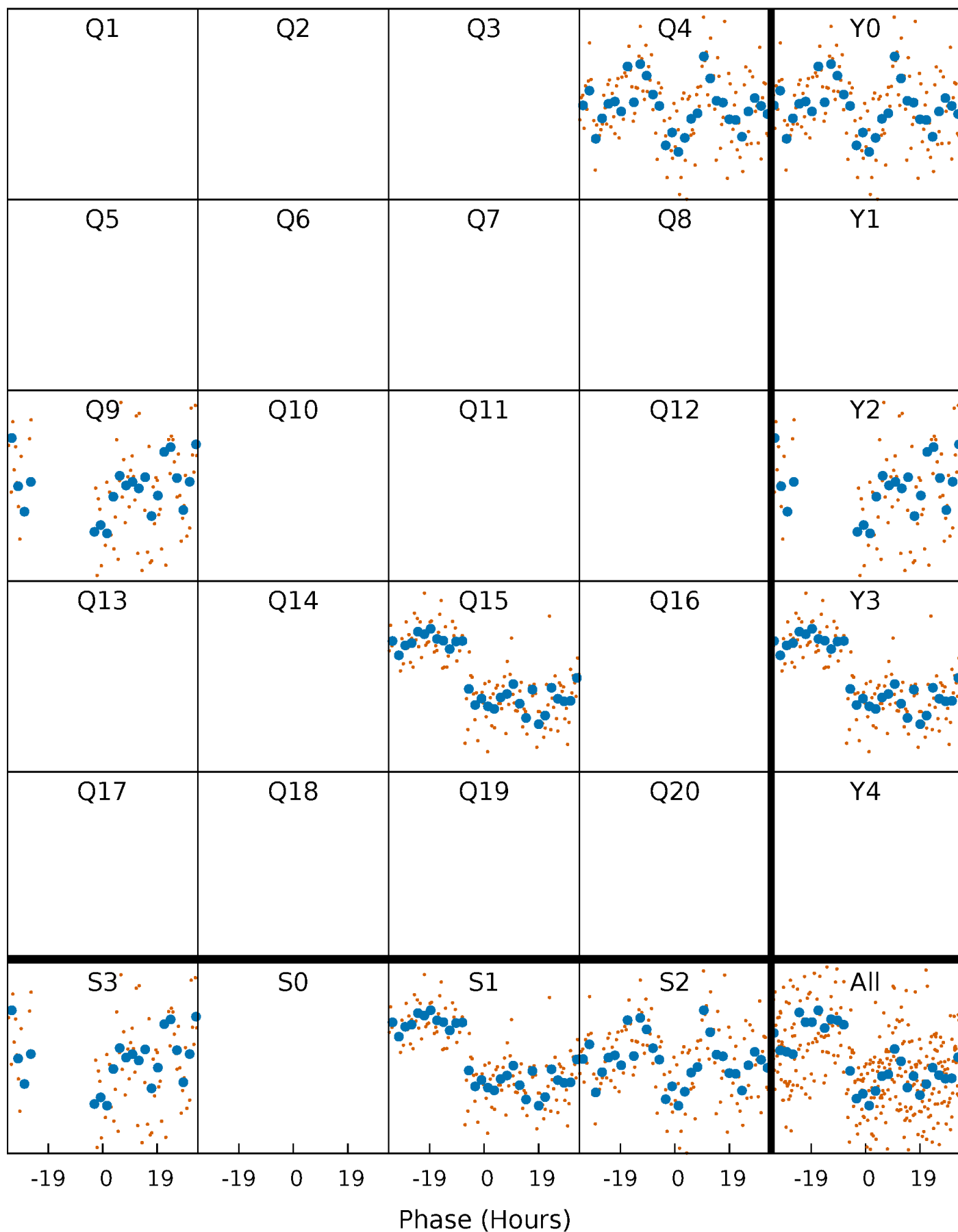


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

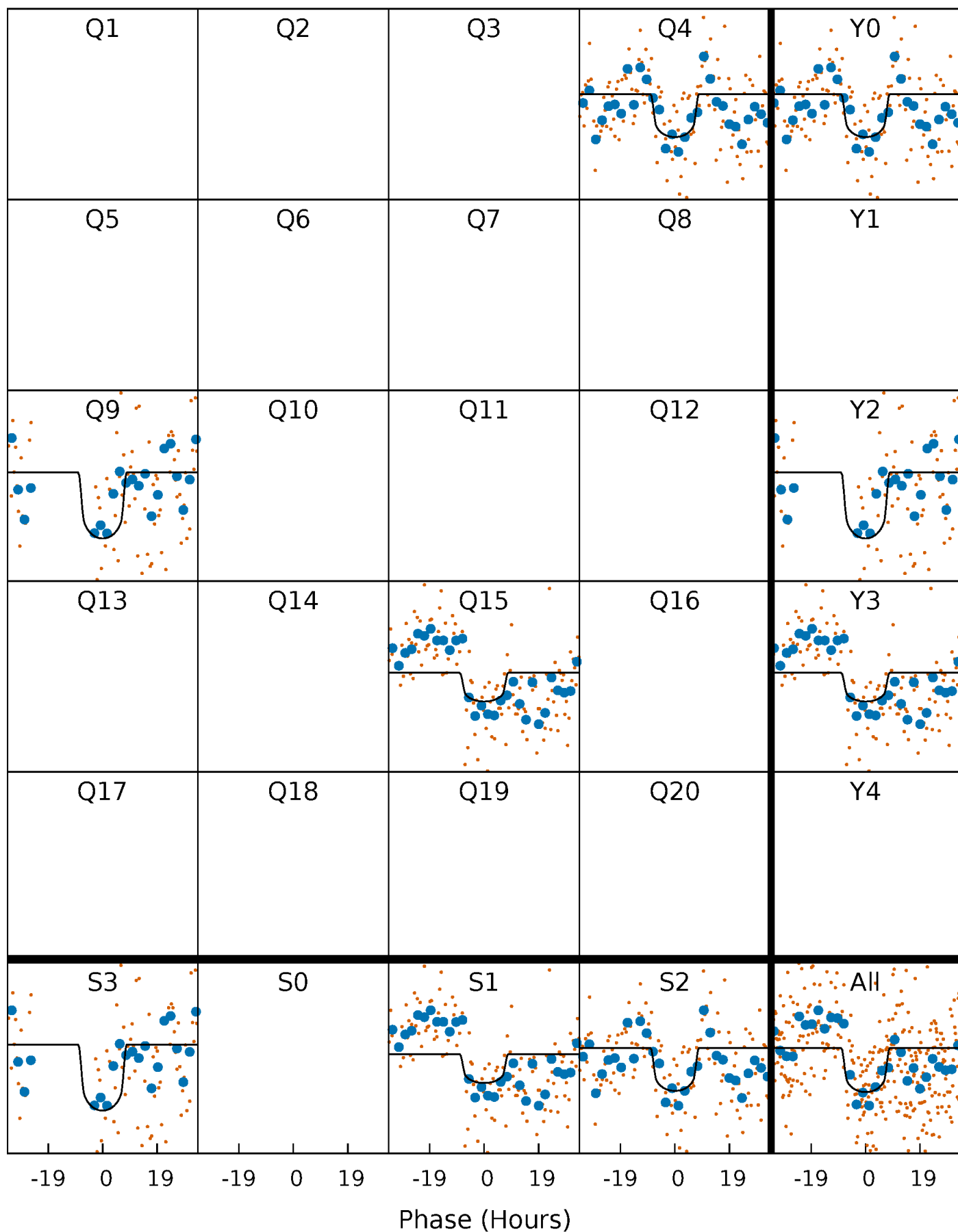
TCE 004078955-01 P=499.898948 Days  $T_0=387.778519$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 004078955-01 P=499.898948 Days  $T_0=387.778519$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

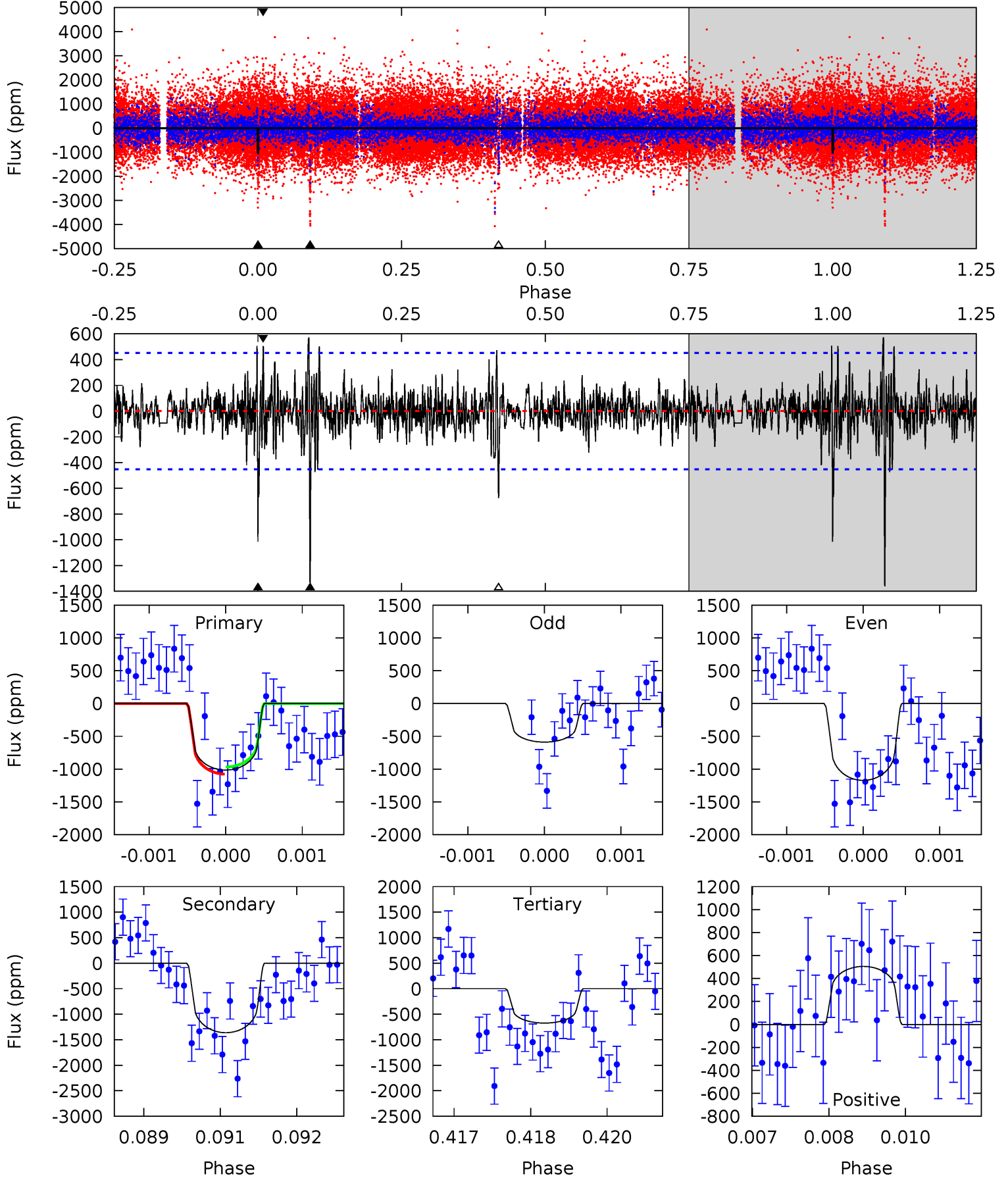
TCE 004078955-01 P=499.907045 Days  $T_0=387.761829$  (BKJD)



# DV Model-Shift Uniqueness Test

004078955-01, P = 499.898948 Days, E = 387.778519 Days

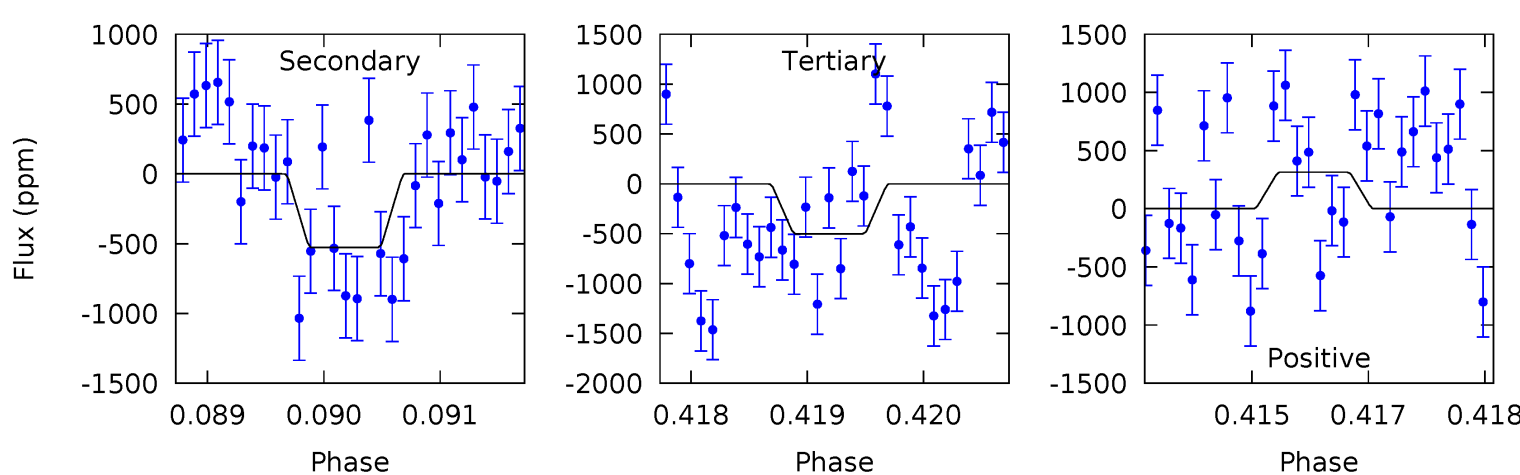
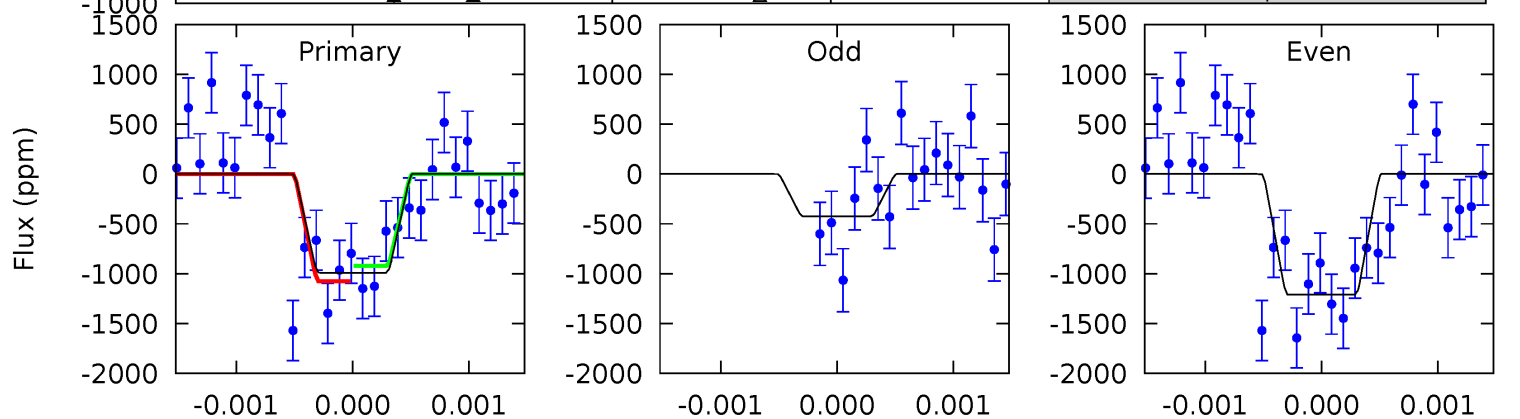
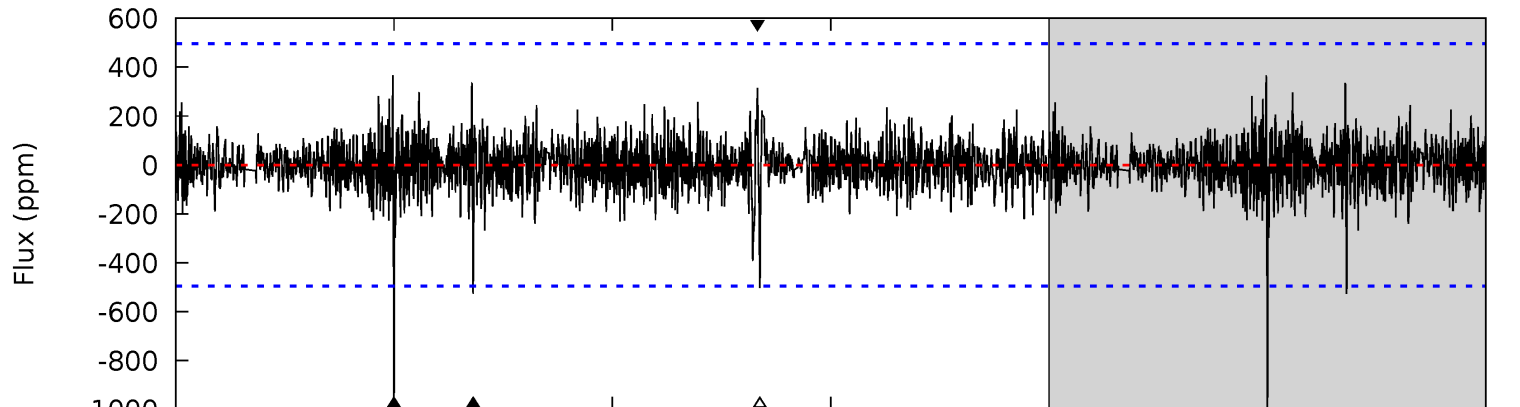
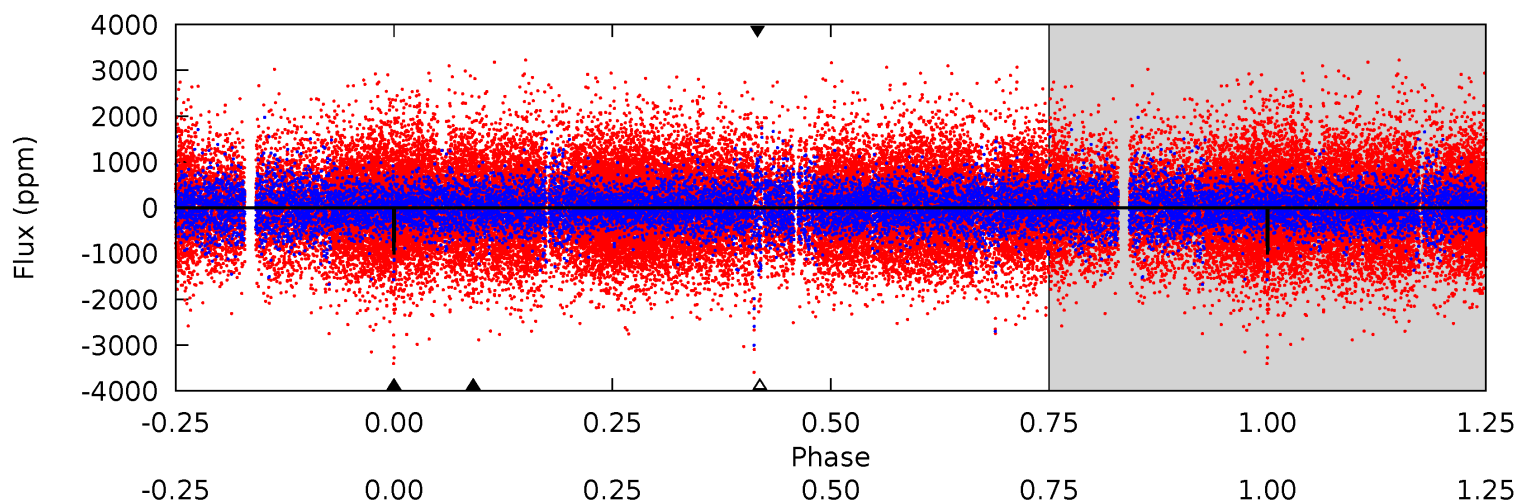
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	16.3	8.04	6.03	5.39	3.20	1.44	4.06	6.08	8.21	10.2	3.12	0.94	0.30	0.64



# Alt Model-Shift Uniqueness Test

004078955-01, P = 499.907045 Days, E = 387.761829 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
10.9	5.78	5.51	3.45	5.44	3.27	0.88	5.37	7.42	0.27	2.33	3.88	0.95	0.27	0.84



### Stellar Parameters For KIC 004078955

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5706^{+180}_{-200}$	$4.525^{+0.036}_{-0.192}$	$0.210^{+0.200}_{-0.300}$	$0.926^{+0.246}_{-0.088}$	$1.048^{+0.100}_{-0.133}$	$1.856^{+0.357}_{-0.940}$
	+3%/-4%	+1%/-4%	+95%/-143%	+27%/-10%	+10%/-13%	+19%/-51%
Source	KIC0	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 004078955-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1362 \pm 84$	$3.32^{+1.03}_{-0.79}$	$310^{+21}_{-15}$	$6178^{+941}_{-686}$	$103927^{+71814}_{-42481}$
Alt.	$-527 \pm 91$	$3.48^{+0.85}_{-0.84}$	$311^{+19}_{-15}$	$4884^{+631}_{-440}$	$36688^{+29227}_{-13636}$

$T_{max}$  = 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

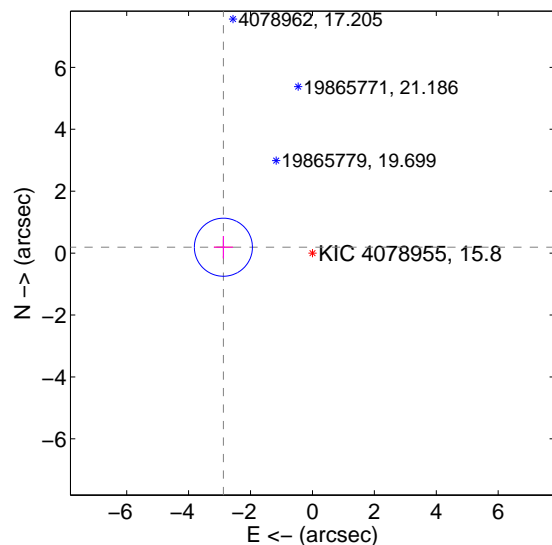
Supplemental centroid analysis for 004078955-01. Kepler magnitude: 15.80. Transit SNR 7.58

There are 0 quarters with good PRF difference image offsets

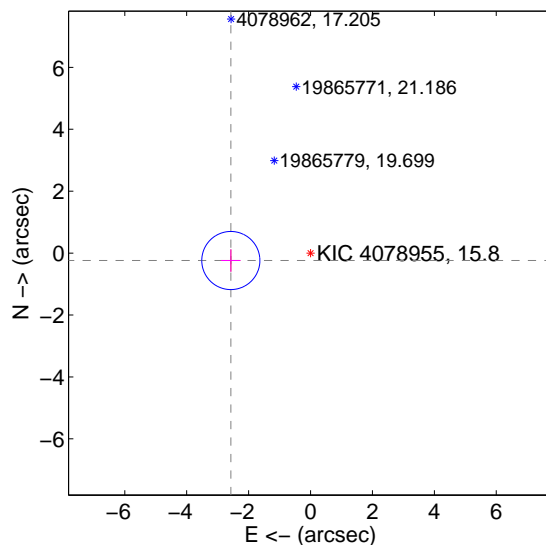
The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.883 \pm 0.313$	9.22	$2.877 \pm 0.312$	$0.190 \pm 0.364$
PRF-fit source offset from KIC position	$2.586 \pm 0.313$	8.26	$2.575 \pm 0.312$	$-0.240 \pm 0.364$
photometric centroid source offset	$2.73 \pm 1.26$	2.16	$0.05 \pm 1.12$	$-2.73 \pm 1.26$

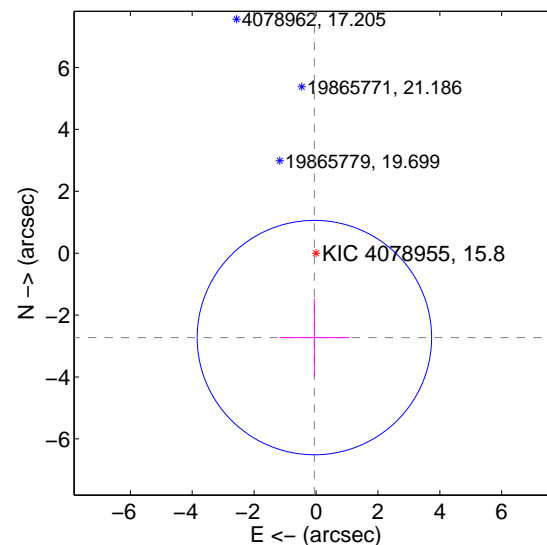
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

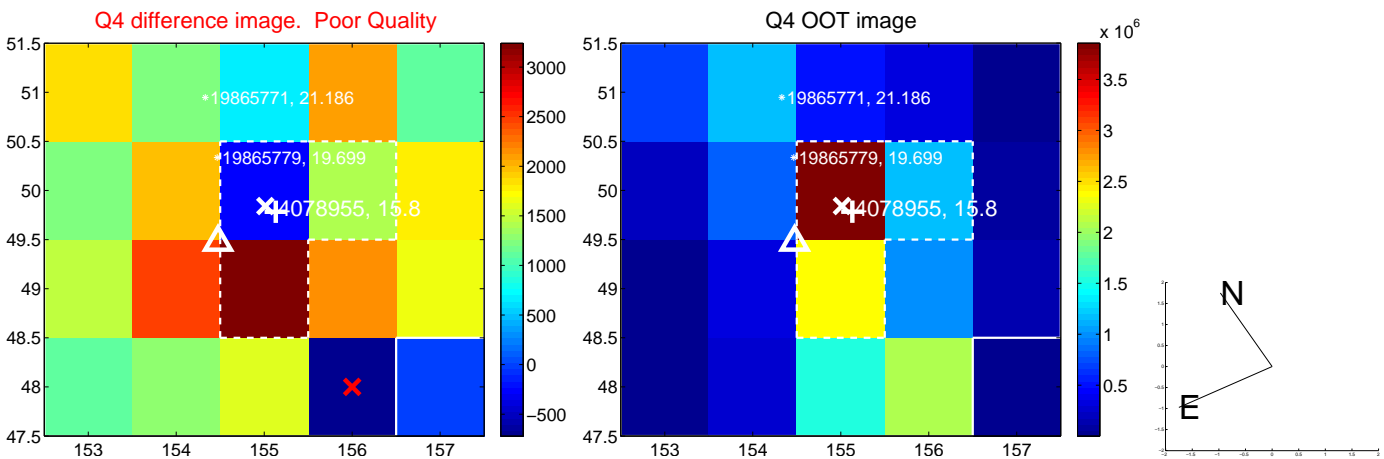
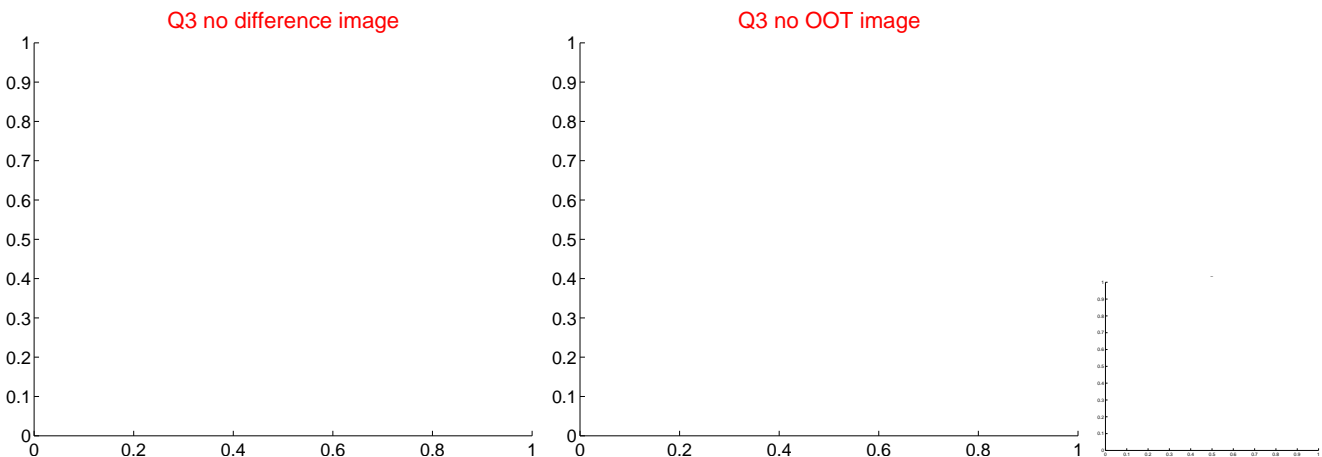
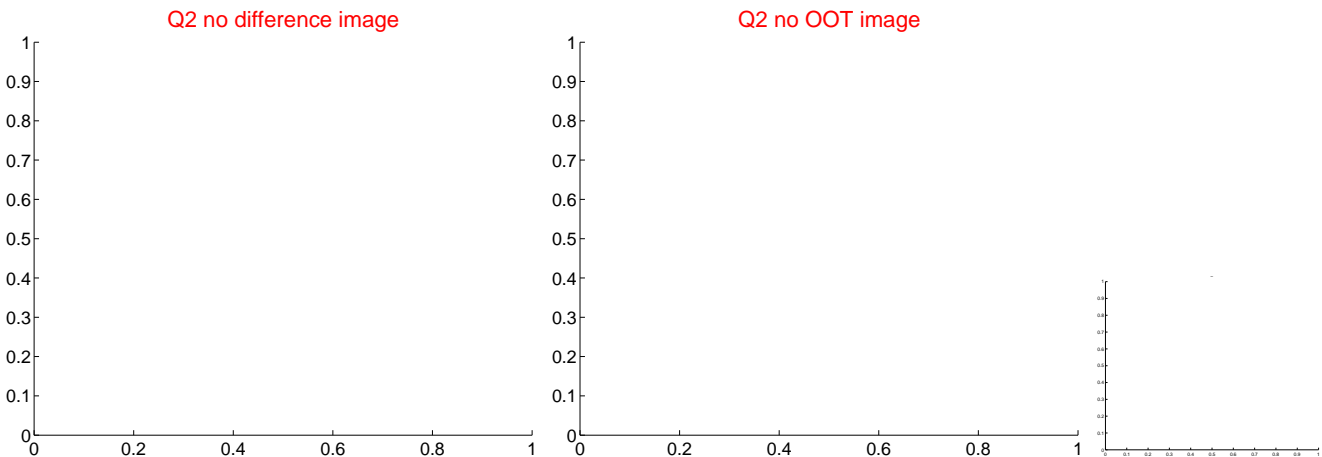


offset from photometric centroids



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





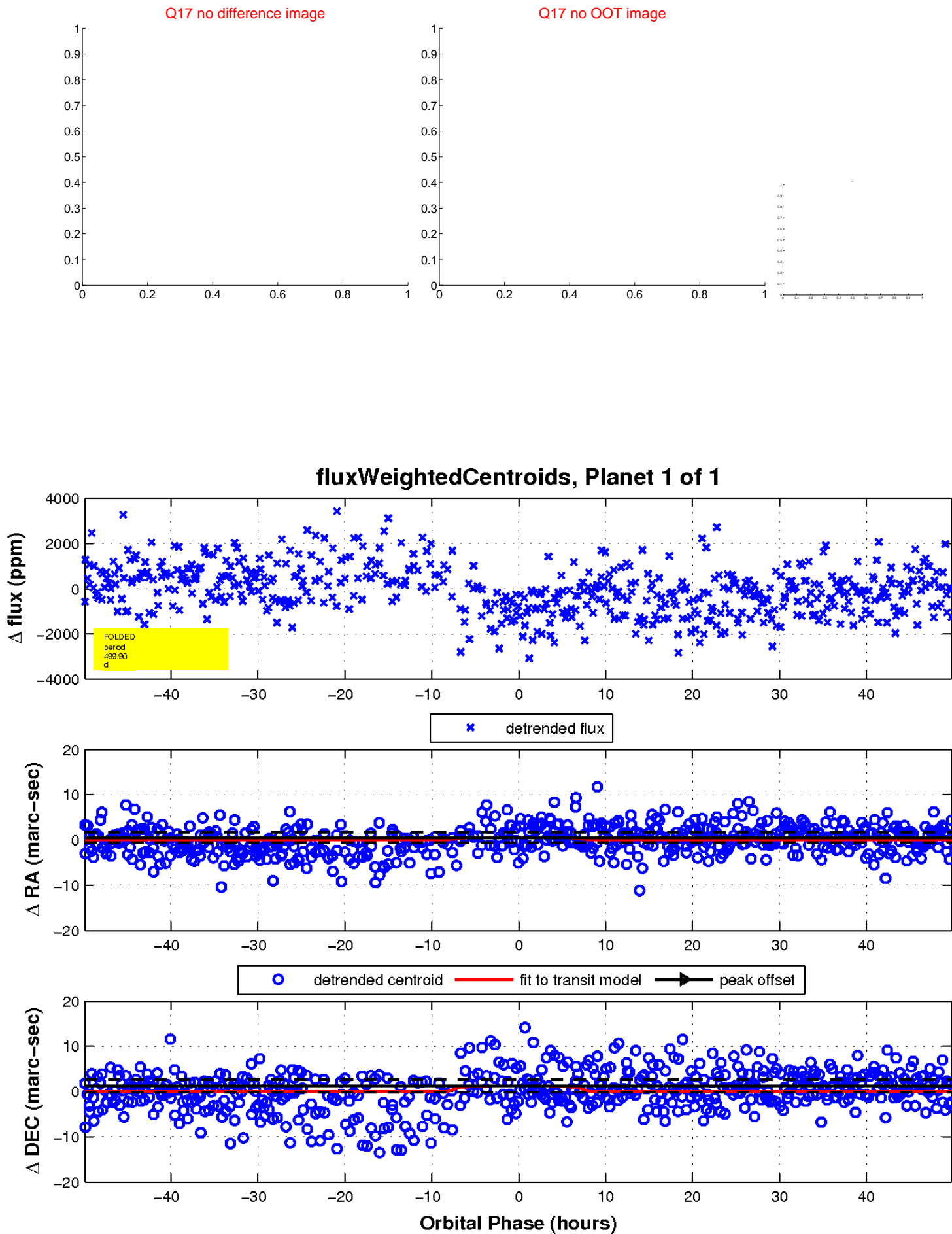
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

