

# KIC 002162635

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002162635-01	OBS	No	293.804799	176.090485	1596.1	25.121	44.9	26.3	2.28	5009	18.22	3.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002162635-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_UNRESOLVED_OFFSET—HALO_GHOST

**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 002162635-01

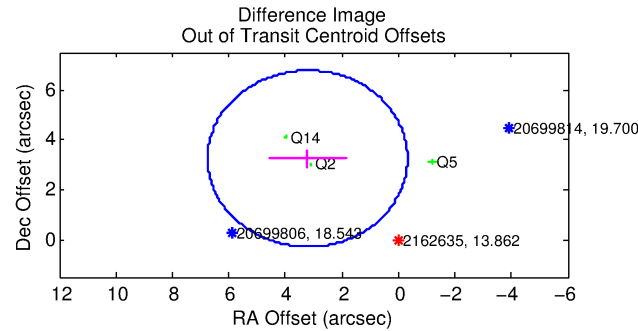
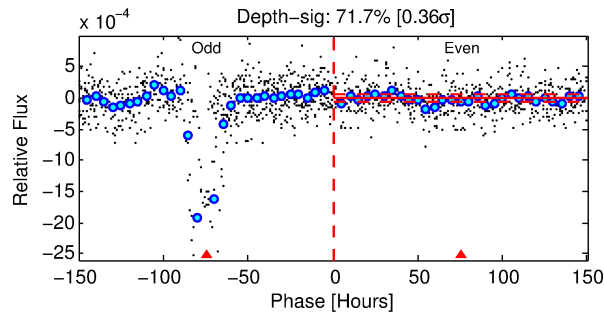
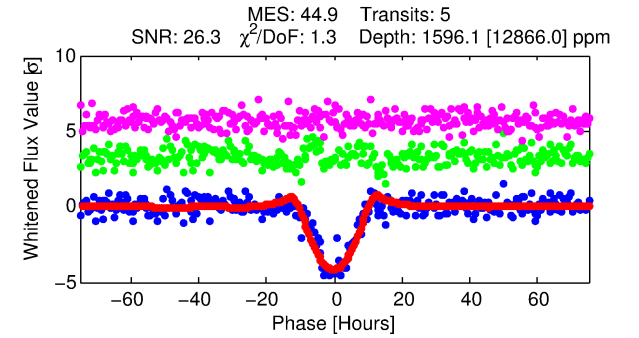
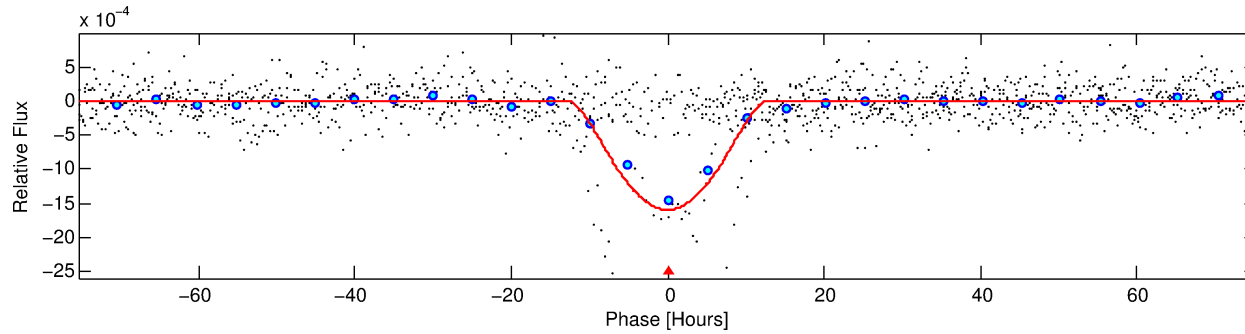
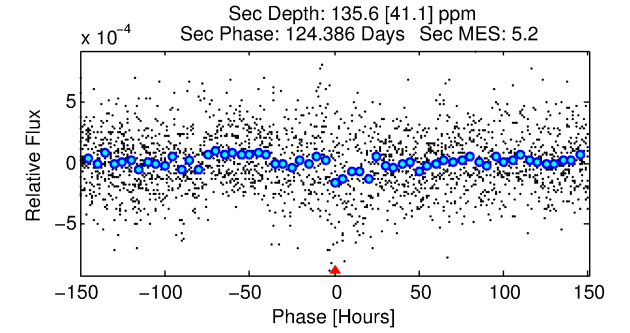
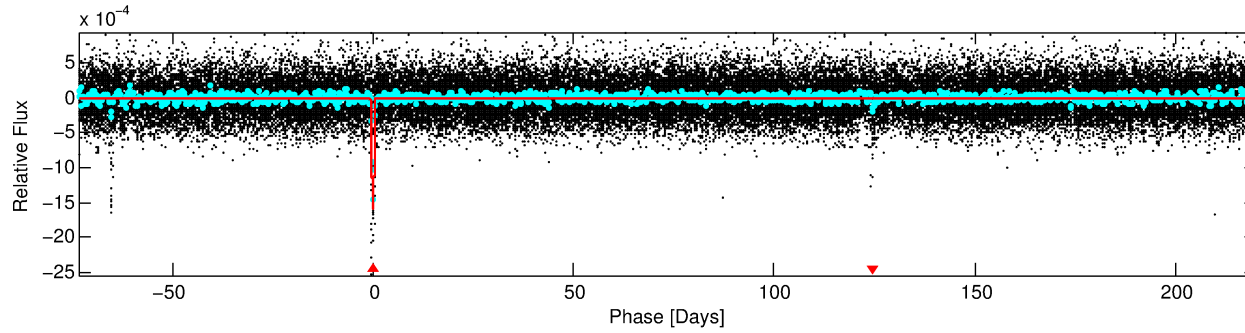
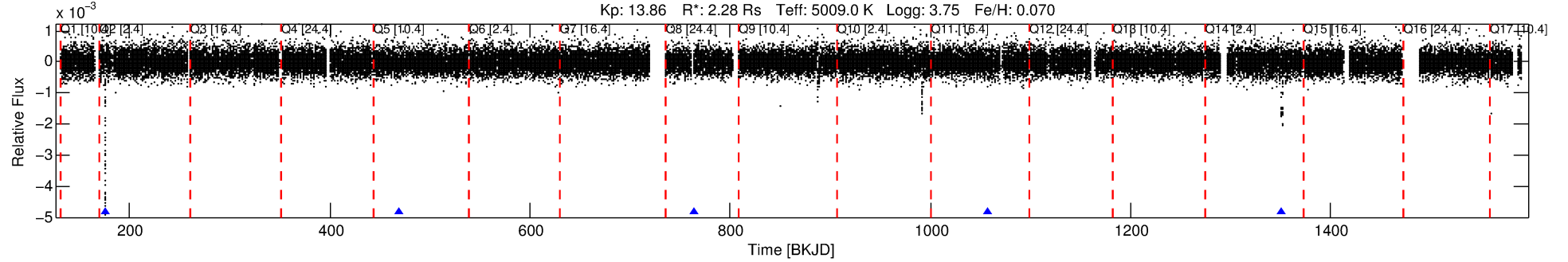
No Significant Match Found

# DV One-Page Summary

KIC: 2162635 Candidate: 1 of 1 Period: 293.805 d

KOI: K01032 Corr: No Ephemeris Match

Kp: 13.86 R\*: 2.28 Rs Teff: 5009.0 K Logg: 3.75 Fe/H: 0.070



## DV Fit Results:

Period = 293.80480 [0.00569] d  
Epoch = 176.0905 [0.0147] BKJD  
Rp/R\* = 0.0731 [0.0789]  
a/R\* = 34.80 [7.99]  
b = 1.00 [0.27]  
Seff = 3.73 [1.00]  
Teq = 354 [24] K  
Rp = 18.22 [20.06] Re  
a = 0.8880 [0.1619] AU  
Ag = 177.23 [388.80] [0.45σ]  
Teffp = 1999 [1089] K [1.51σ]

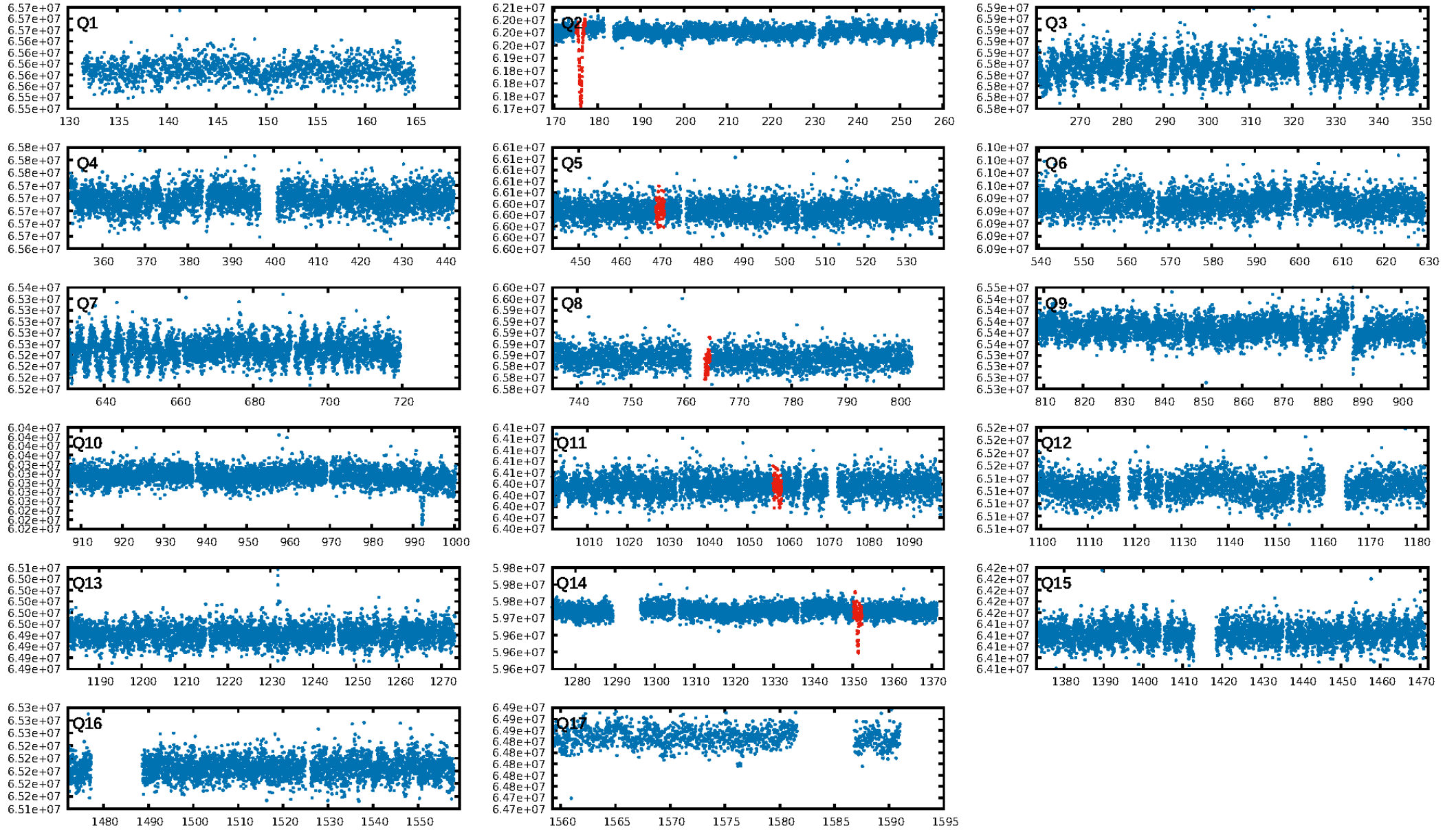
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 98.8%  
Bootstrap-pfa: 1.42e-265  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.1314  
Centroid-sig: 0.0%  
Centroid-so: 4.509 arcsec [13.21σ]  
OotOffset-rm: 4.564 arcsec [3.87σ]  
KicOffset-rm: 4.464 arcsec [3.96σ]  
OotOffset-st: 2/0/0/1 [3]  
KicOffset-st: 2/0/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [4/4]

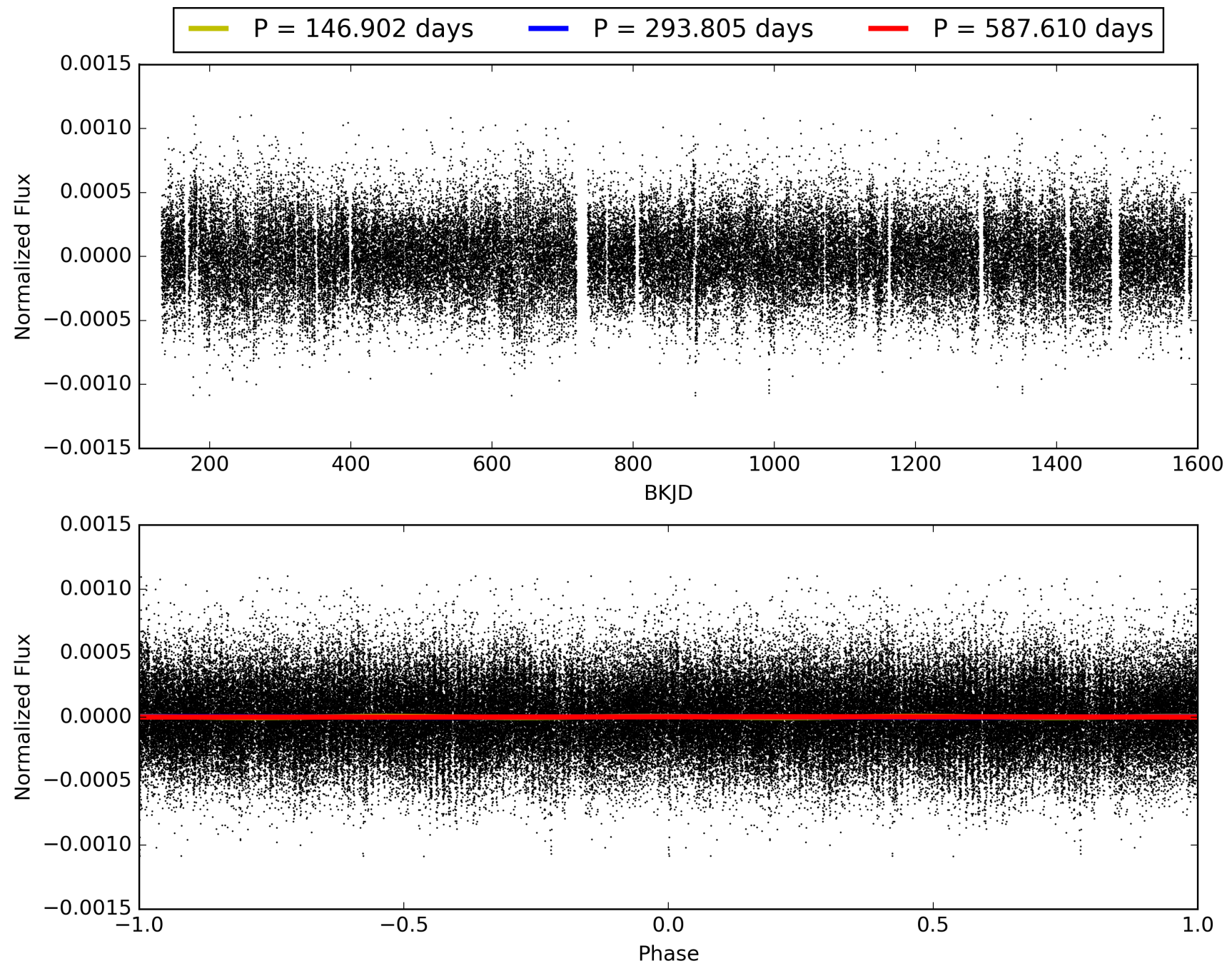
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:25:46 Z

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

# TCE 002162635-01, PDC Light Curves

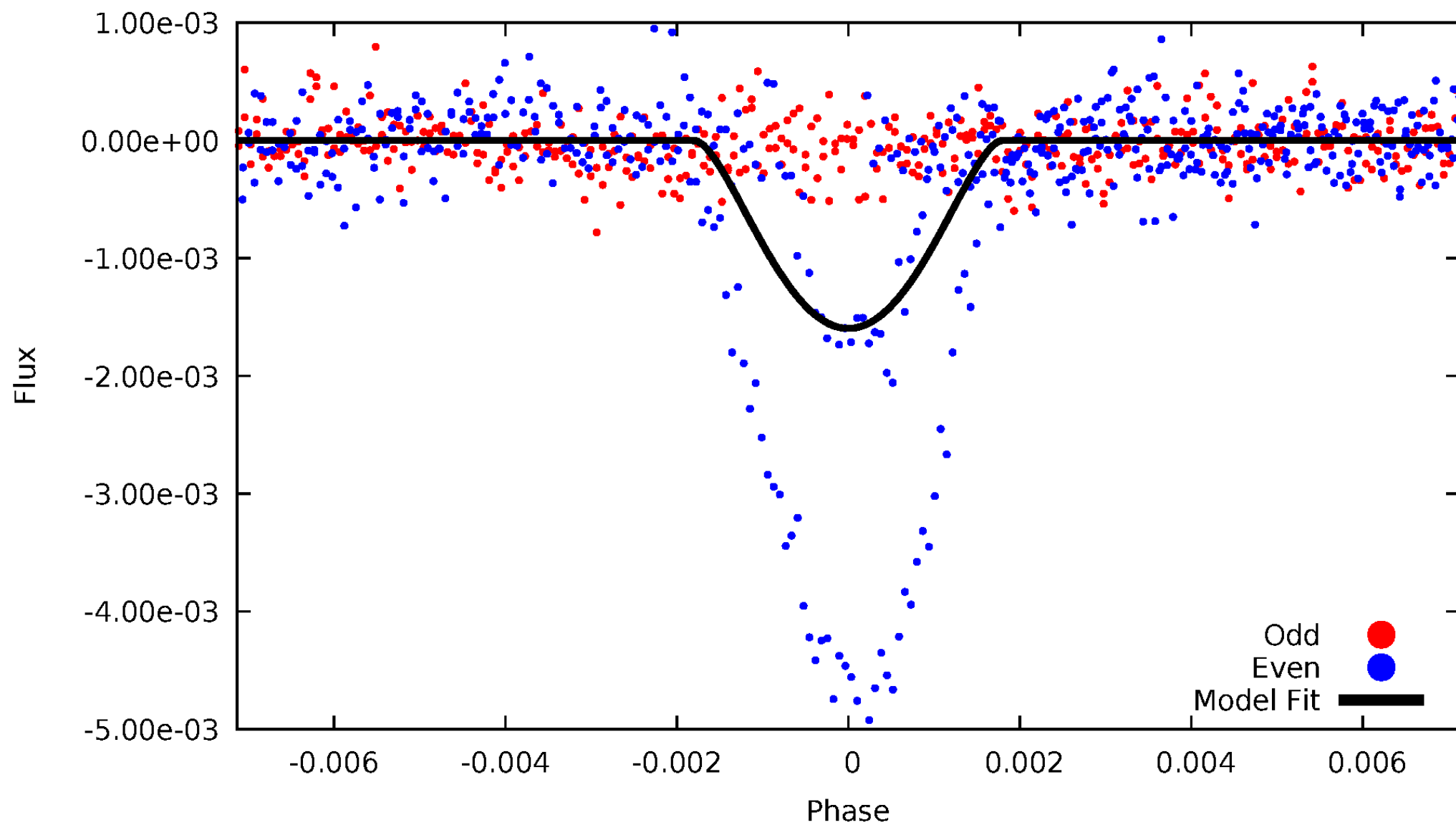


TCE 002162635-01



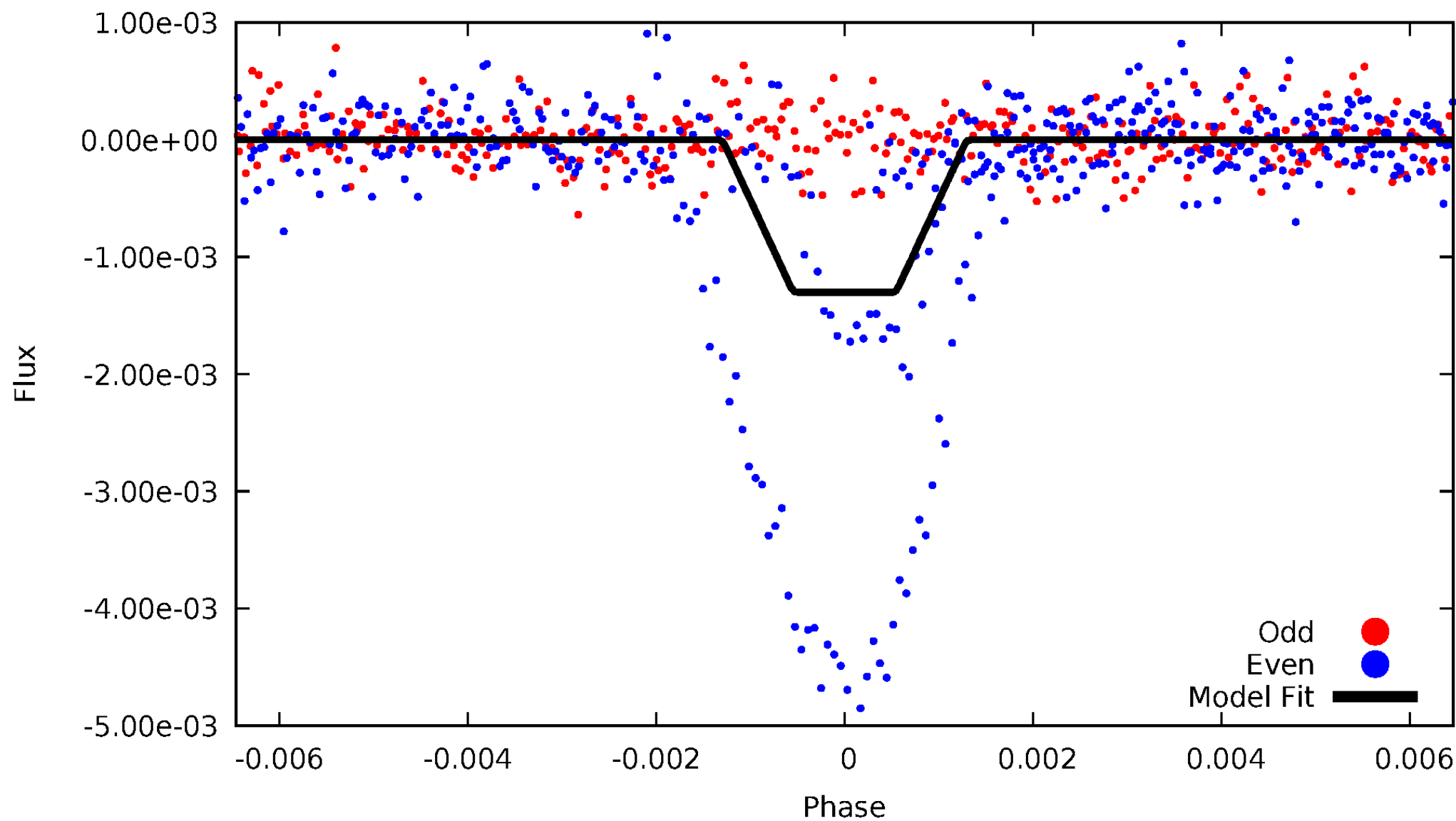
# DV Odd/Even

TCE 002162635-01



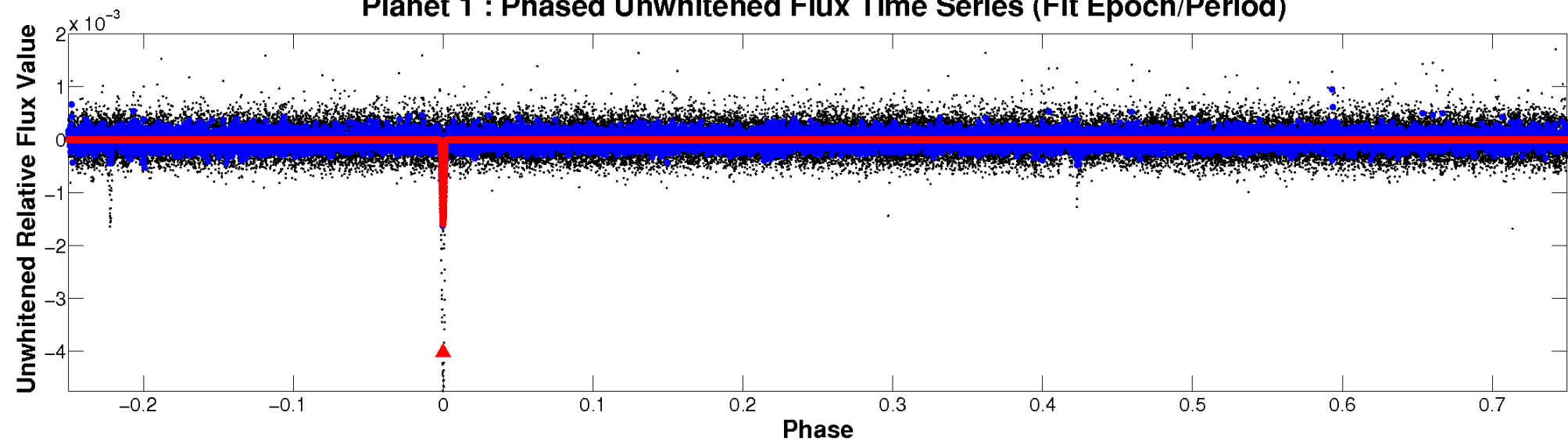
# ALT Odd/Even

TCE 002162635-01

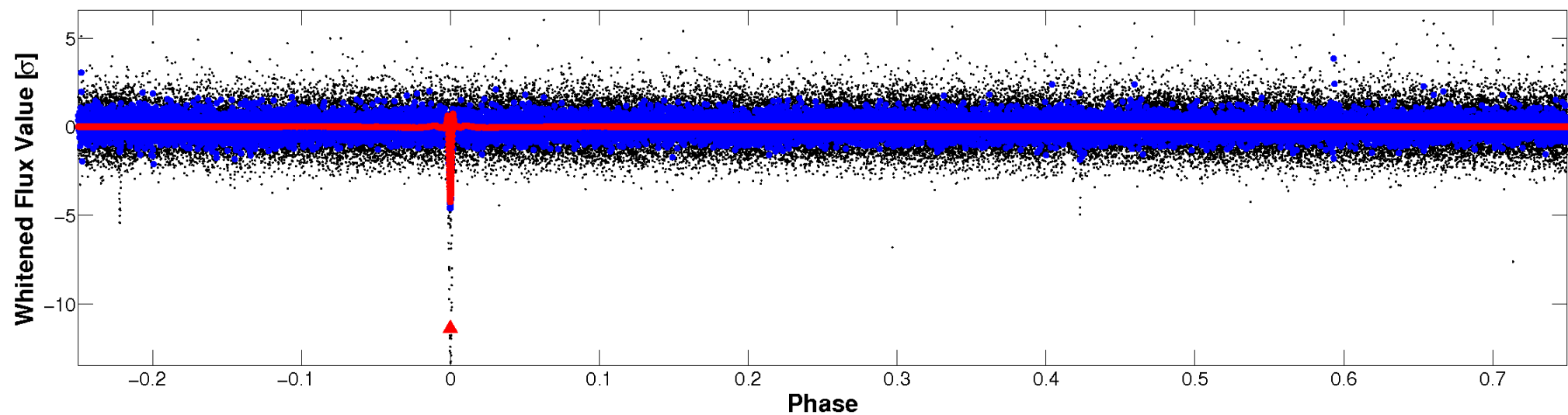


# Non-Whitened Vs. Whitened Light Curve

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



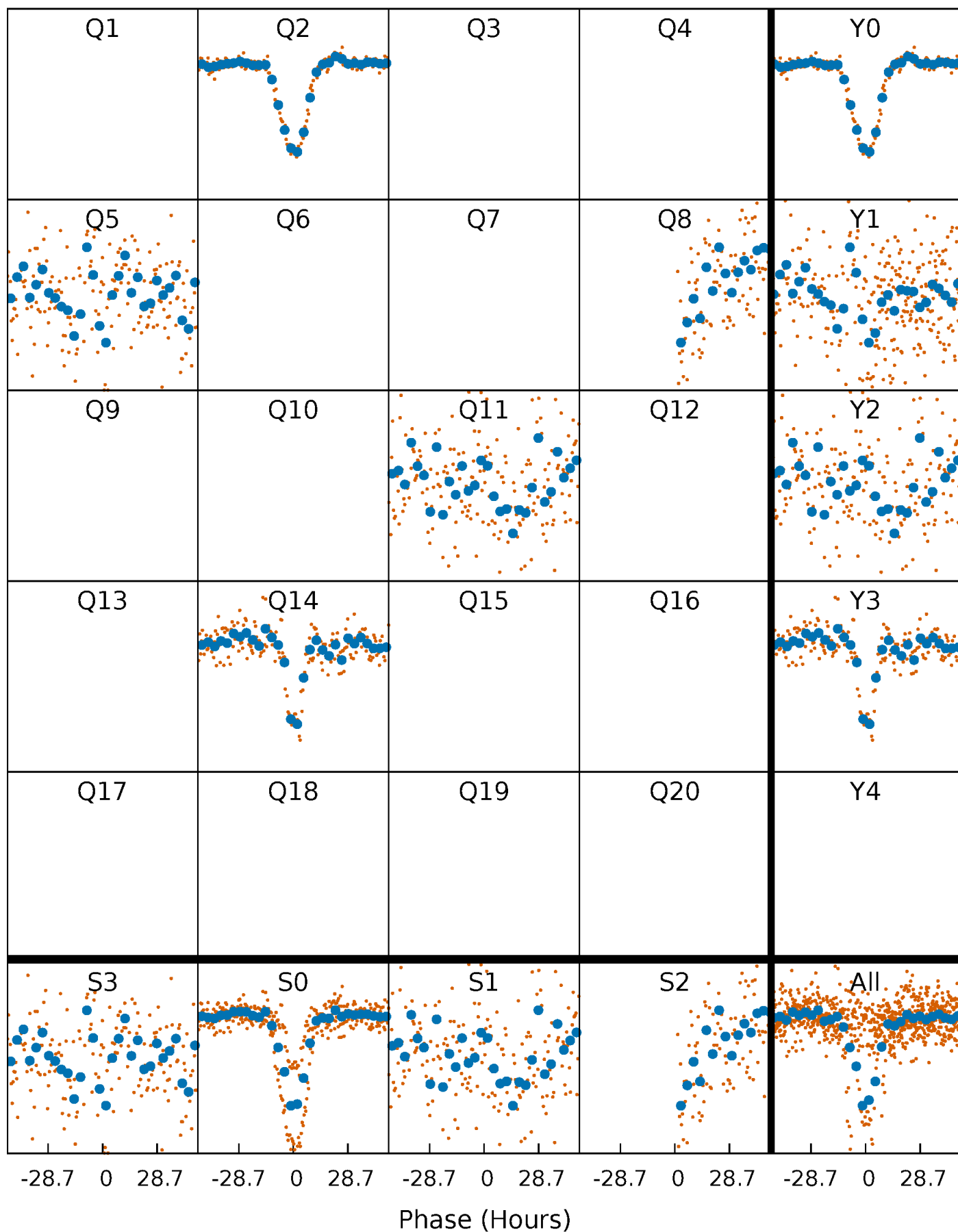
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

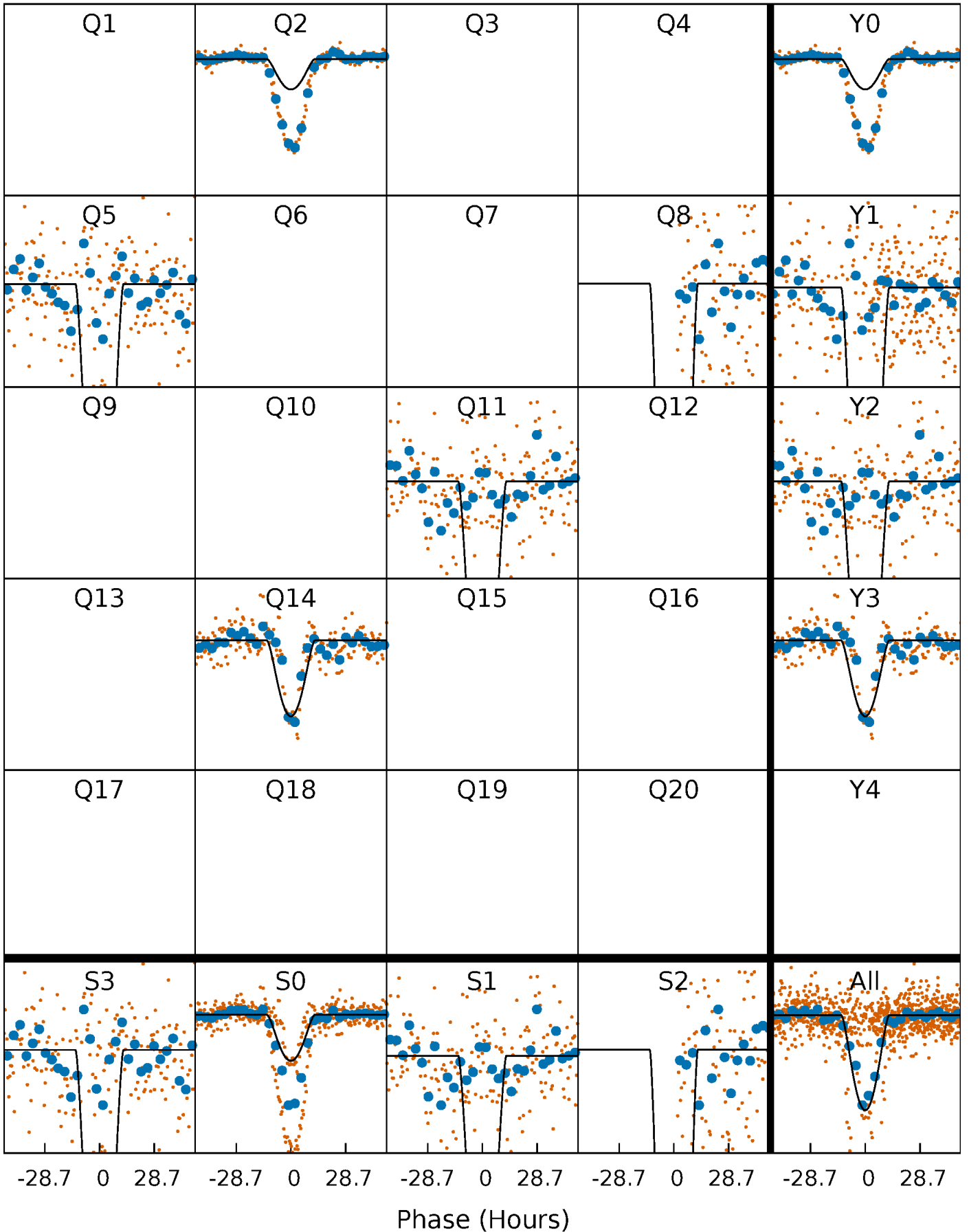
TCE 002162635-01 P=293.804799 Days  $T_0=176.090485$  (BKJD)





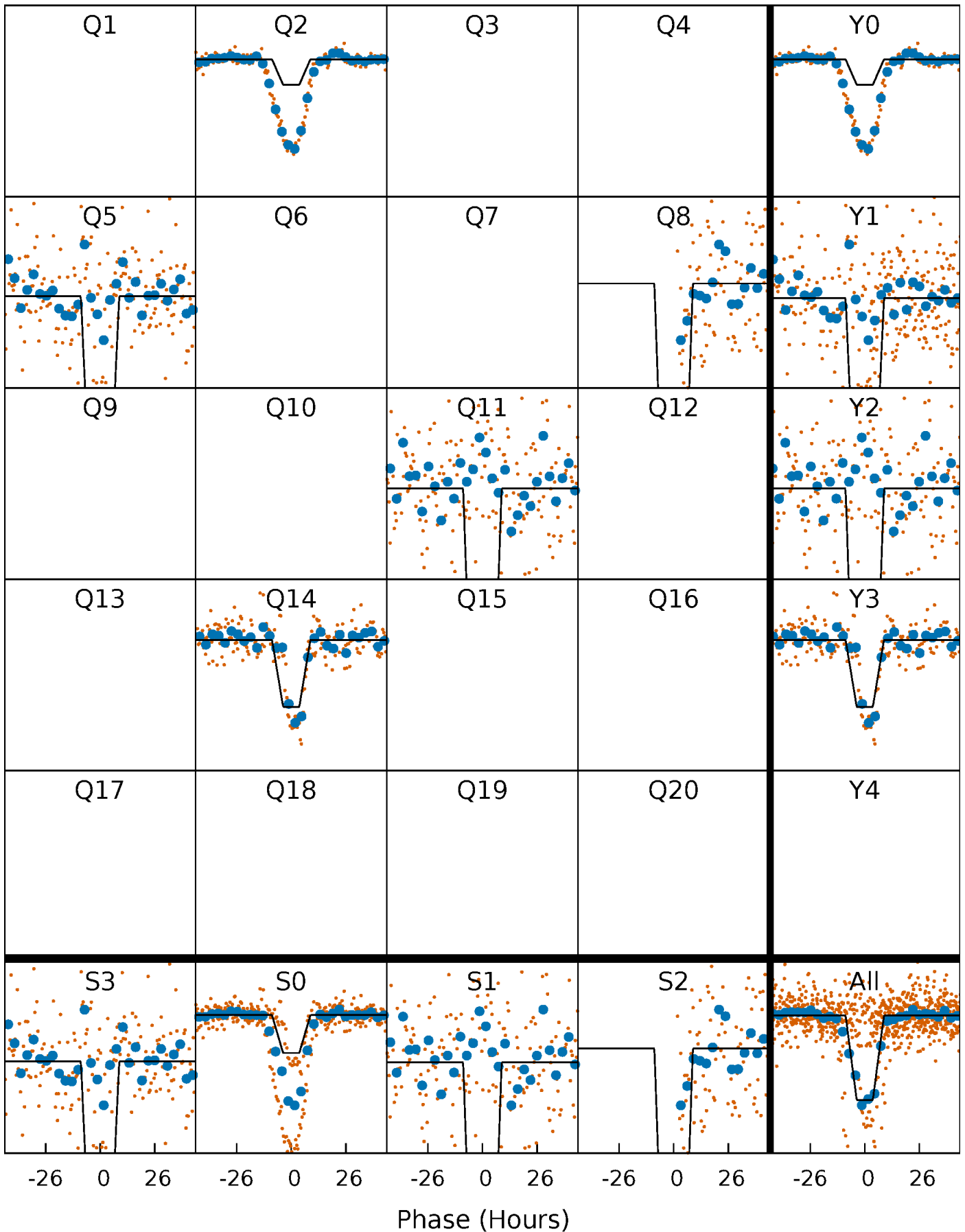
# DV Quarter-Phased Transit Curves

TCE 002162635-01 P=293.804799 Days  $T_0=176.090485$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

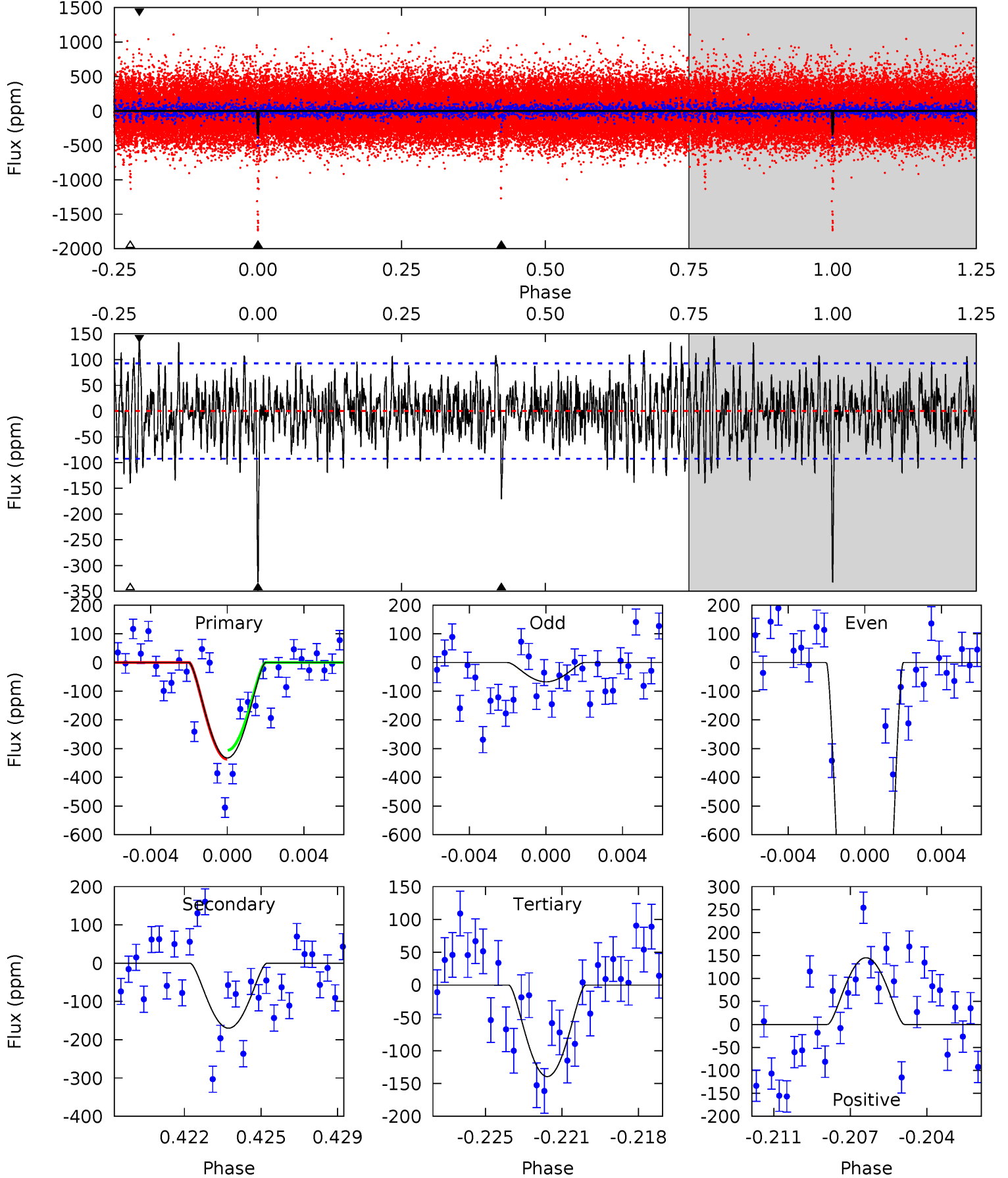
TCE 002162635-01 P=293.786915 Days  $T_0=176.112509$  (BKJD)



# DV Model-Shift Uniqueness Test

002162635-01, P = 293.804799 Days, E = 176.090485 Days

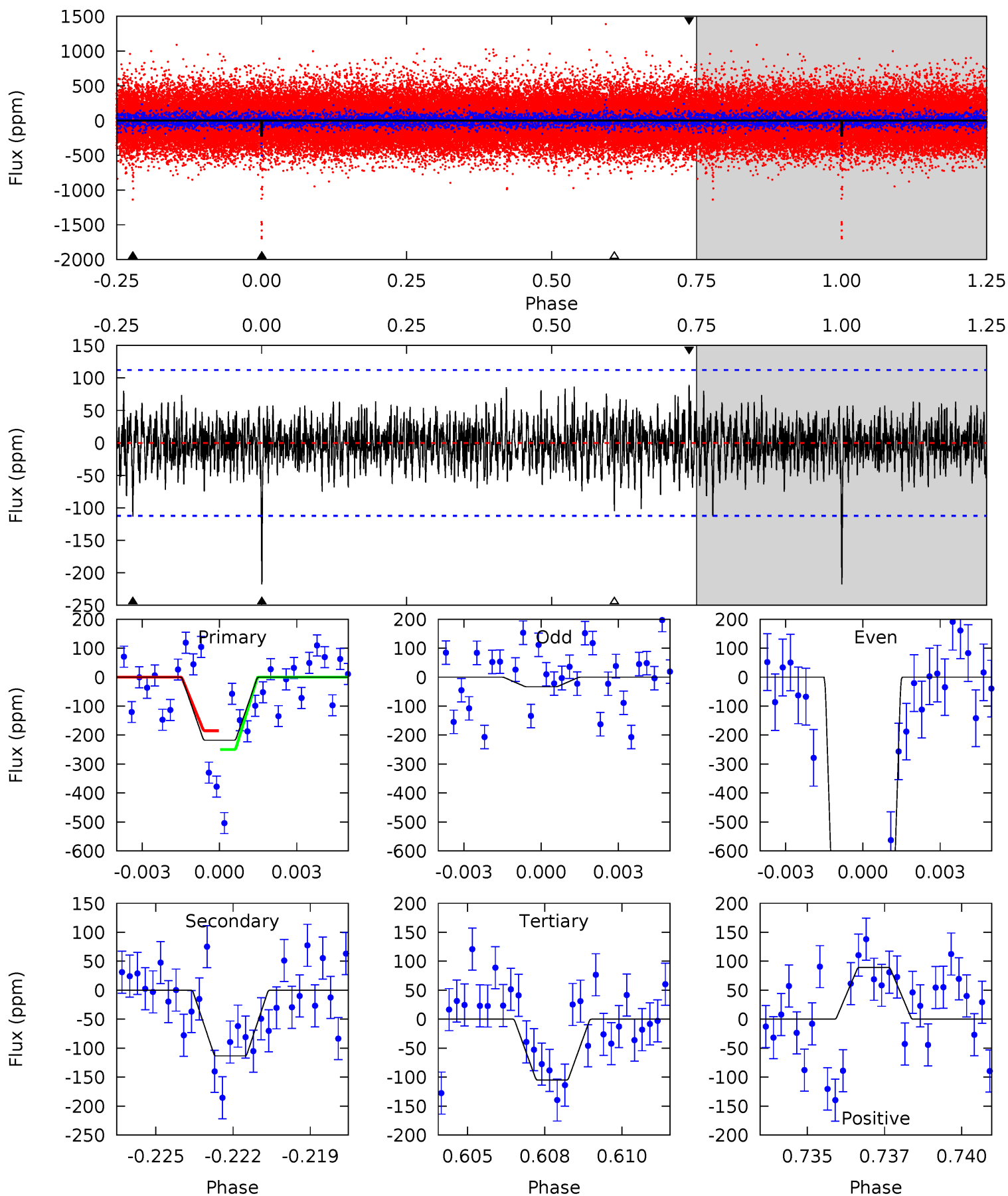
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.7	9.57	7.86	8.18	5.22	2.91	2.46	10.9	10.5	1.71	1.39	64.6	13.4	0.30	0.85



# Alt Model-Shift Uniqueness Test

002162635-01, P = 293.786915 Days, E = 176.112509 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
10.2	5.33	4.93	4.20	5.28	3.01	1.30	5.31	6.04	0.40	1.13	59.4	4.98	0.29	1.53



### Stellar Parameters For KIC 002162635

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5009^{+80}_{-90}$	$3.755^{+0.092}_{-0.138}$	$0.070^{+0.150}_{-0.150}$	$2.283^{+0.508}_{-0.296}$	$1.083^{+0.169}_{-0.113}$	$0.128^{+0.053}_{-0.052}$
	+2%/-2%	+2%/-4%	+214%/-214%	+22%/-13%	+16%/-10%	+42%/-41%
Source	SPE18	SPE18	SPE18	DSEP		

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

### Secondary Eclipse Parameters for KIC 002162635-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-170 \pm 18$	$22.76^{+18.02}_{-13.89}$	$497^{+26}_{-20}$	$2673^{+818}_{-356}$	$141^{+780}_{-96}$
Alt.	$-113 \pm 21$	$16.81^{+15.77}_{-11.72}$	$496^{+25}_{-20}$	$2738^{+1189}_{-418}$	$172^{+1698}_{-127}$

$T_{max}$  = 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

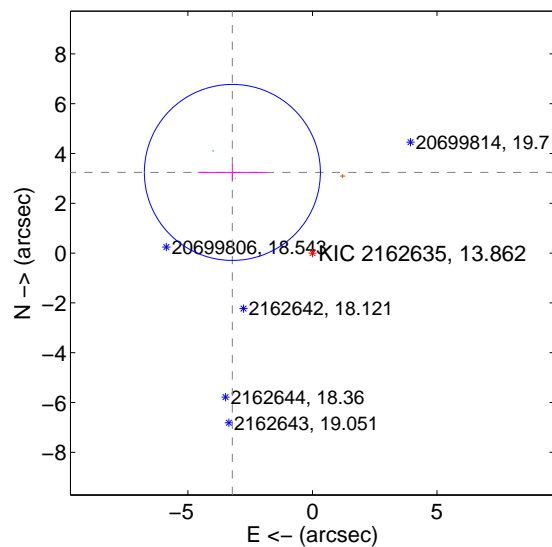
Supplemental centroid analysis for 002162635-01. Kepler magnitude: 13.86. Transit SNR 26.31

There are 2 quarters with good PRF difference image offsets

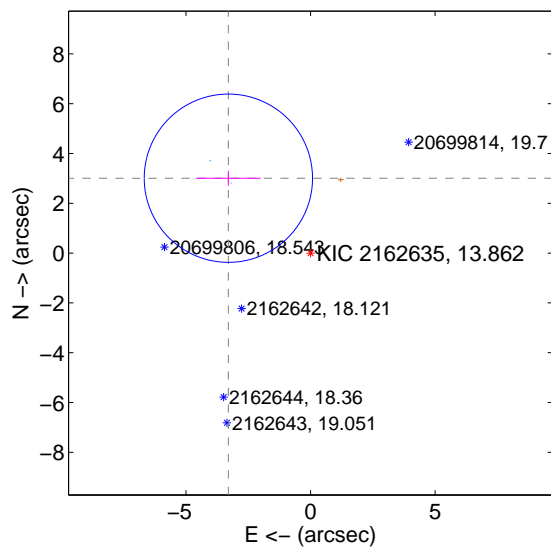
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	4.564 $\pm$ 1.178	3.87	3.215 $\pm$ 1.373	3.240 $\pm$ 0.327
PRF-fit source offset from KIC position	4.464 $\pm$ 1.126	3.96	3.299 $\pm$ 1.302	3.008 $\pm$ 0.301
photometric centroid source offset	4.51 $\pm$ 0.34	13.21	4.43 $\pm$ 0.34	-0.87 $\pm$ 0.36

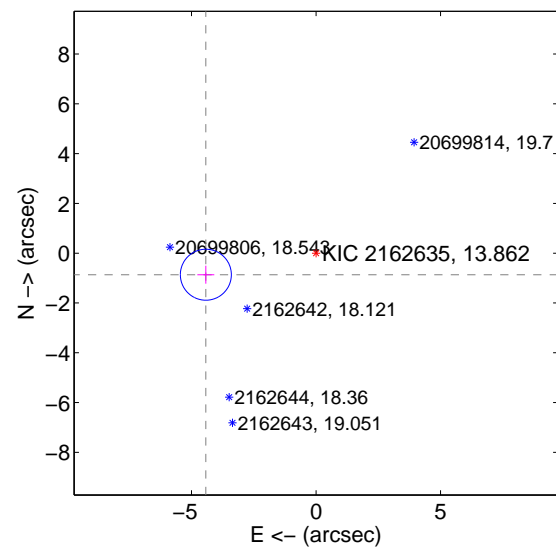
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

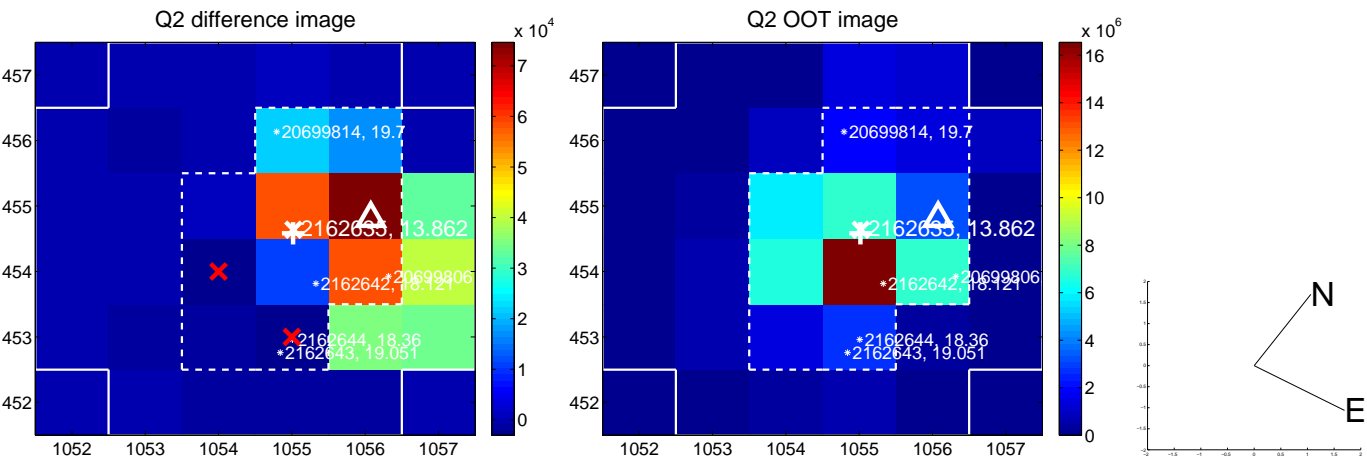


offset from photometric centroids



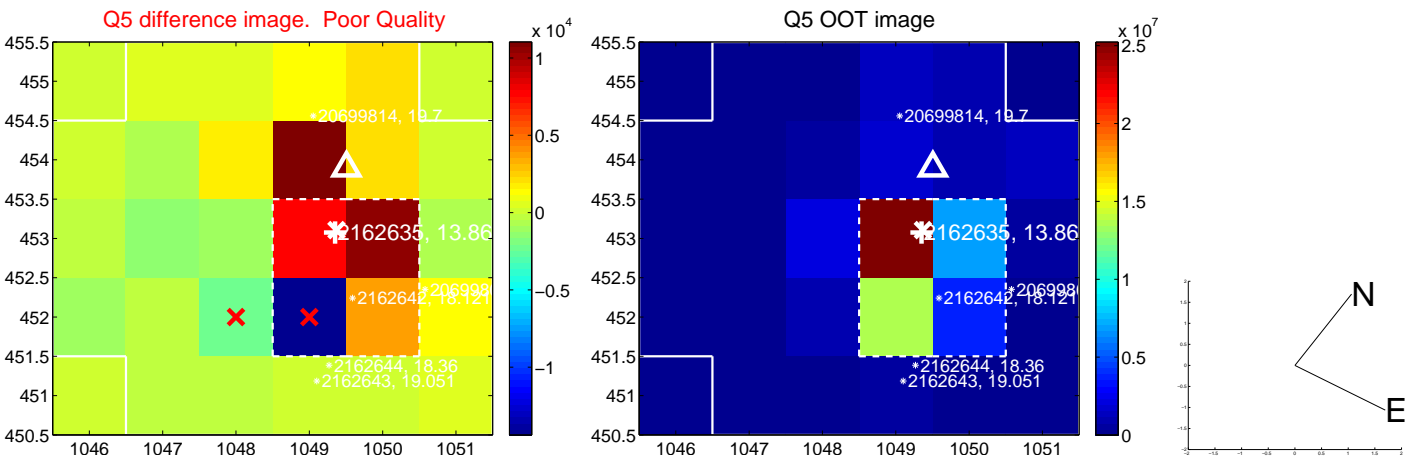
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



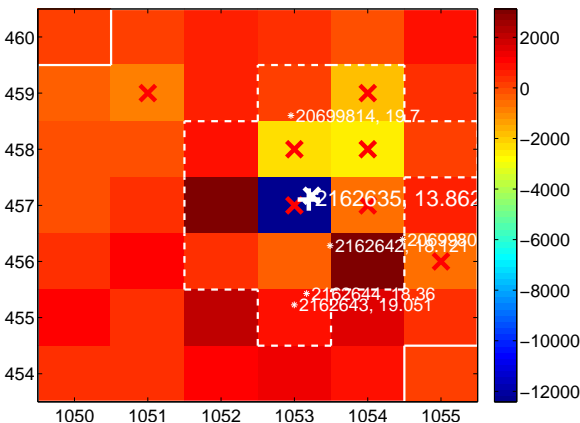
Q10 no difference image



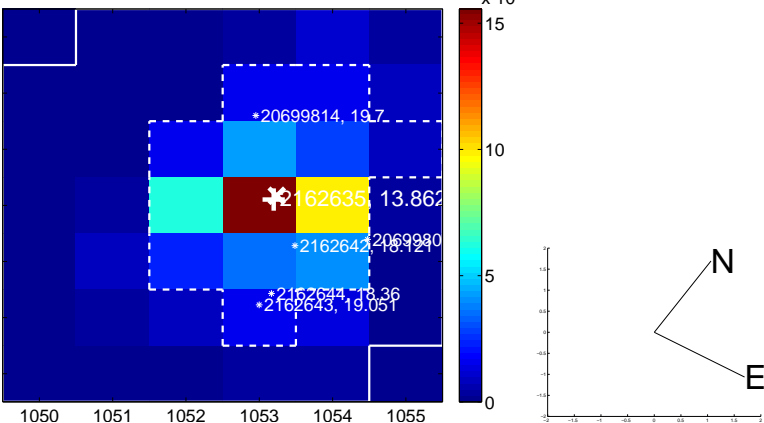
Q10 no OOT image



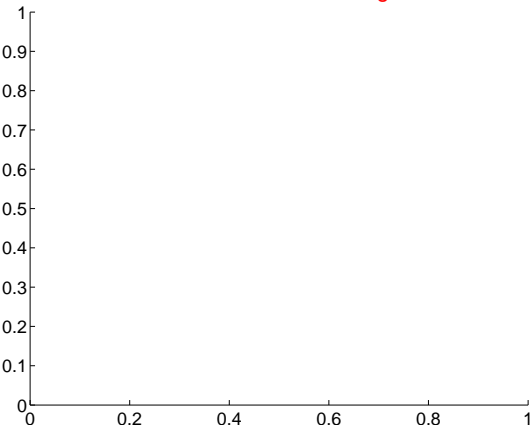
Q11 difference image. Poor Quality



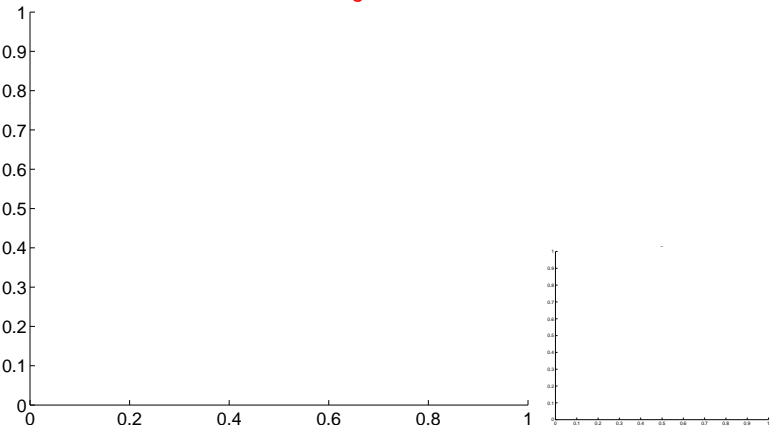
Q11 OOT image



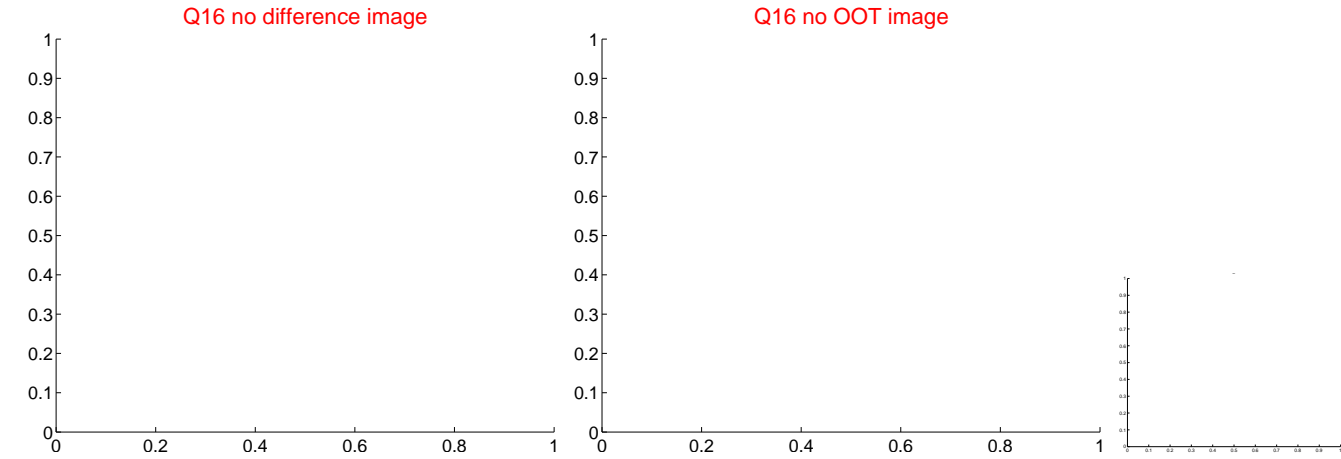
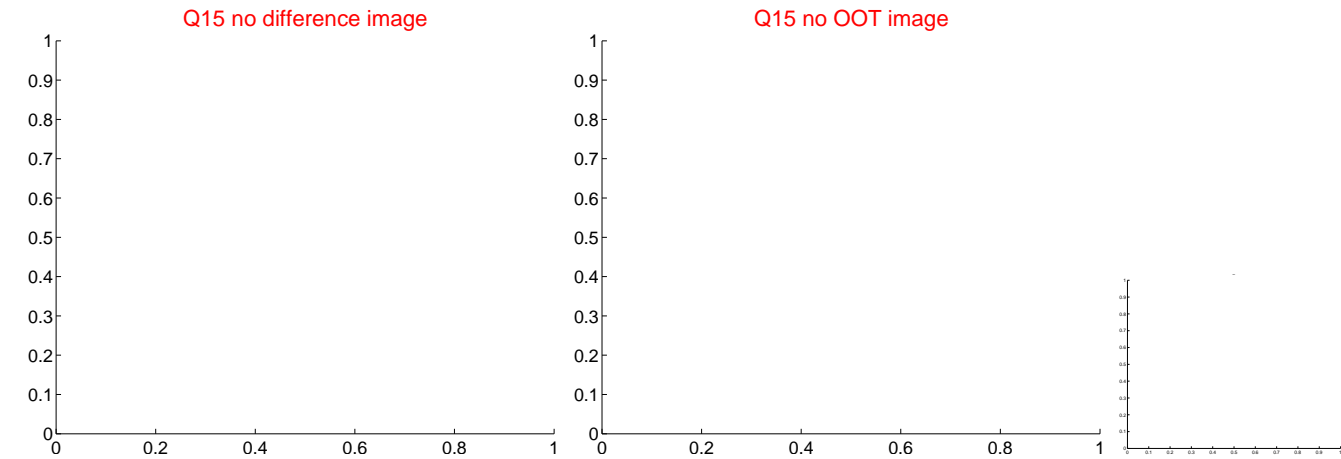
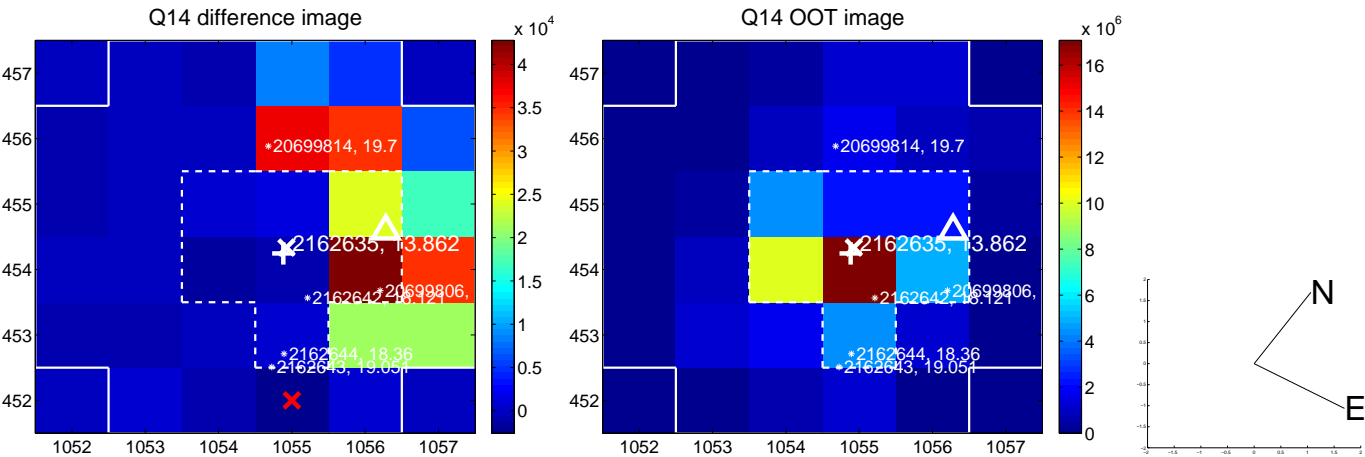
Q12 no difference image



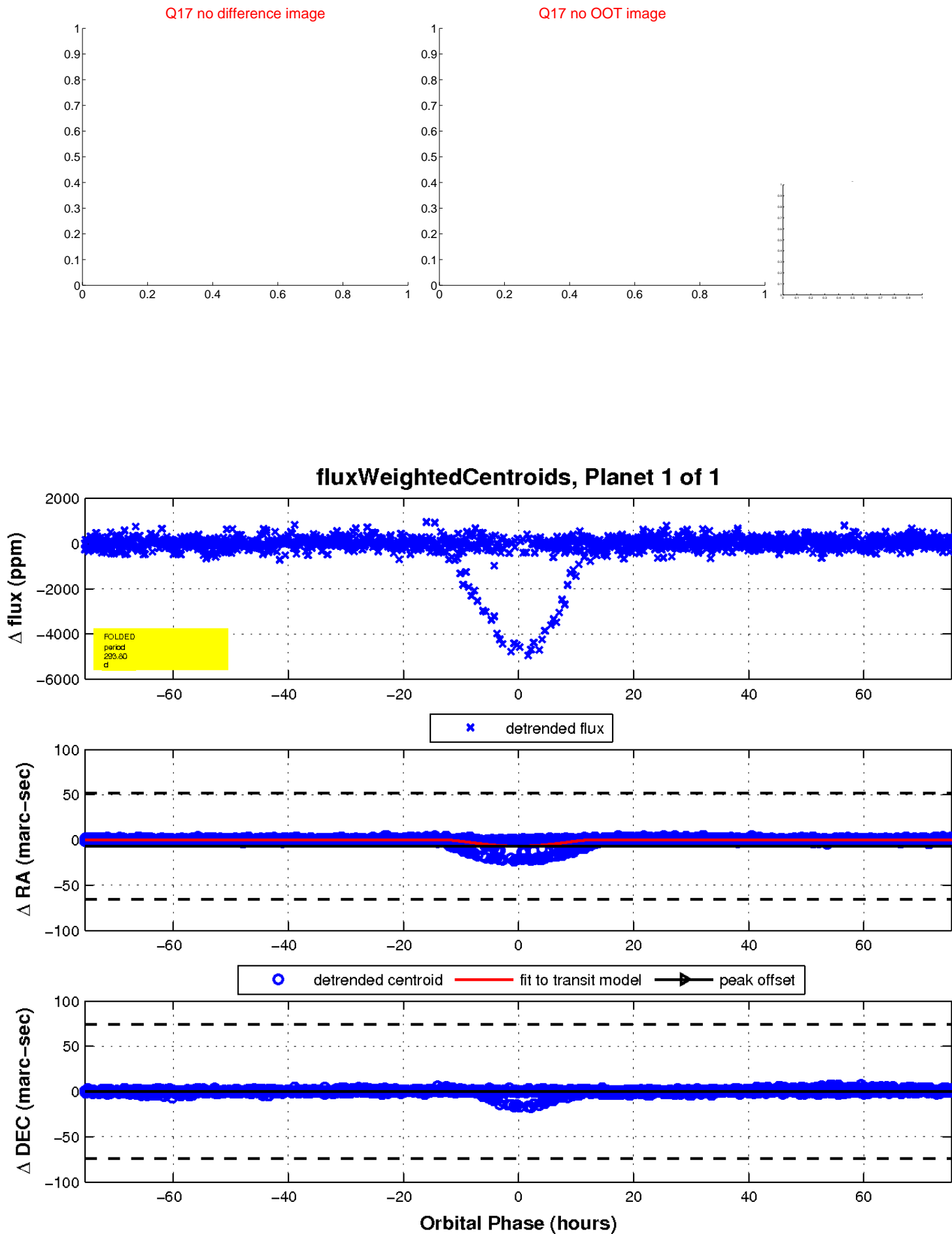
Q12 no OOT image



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.



UKIRT Image

Declination

