

# KIC 010593626

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010593626-01	OBS	0087.01	289.866445	133.691114	519.3	7.282	35.6	36.7	0.89	5516	2.27	1.03

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010593626-01	OBS	PC	0.88	0	0	0	0	CENT_KIC_POS

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

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

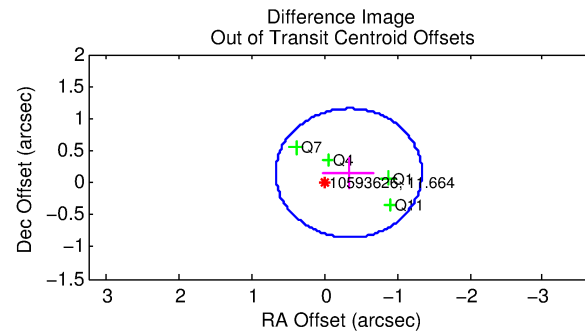
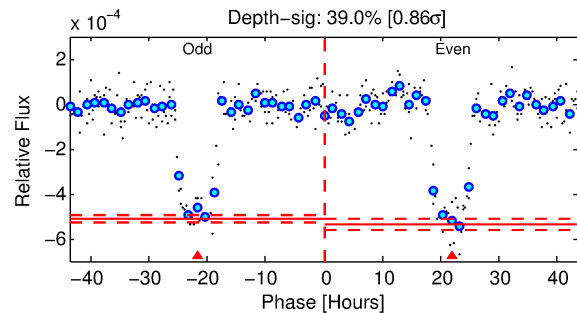
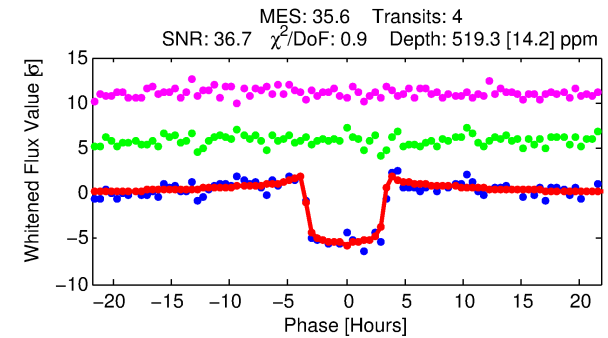
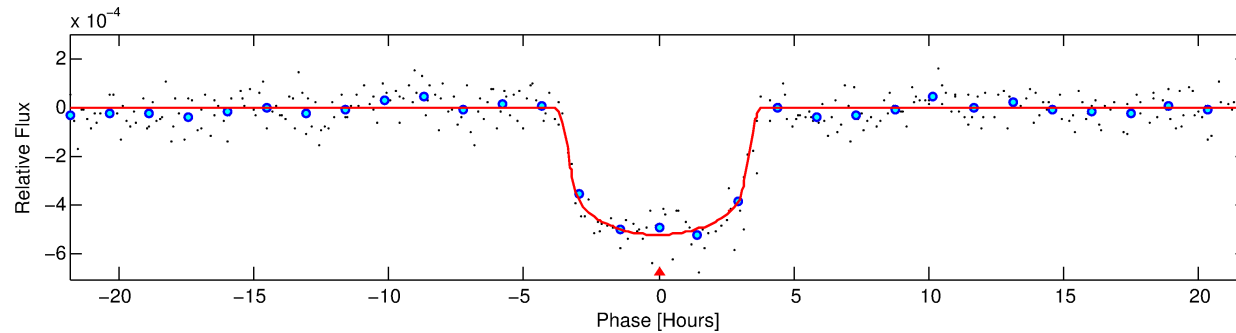
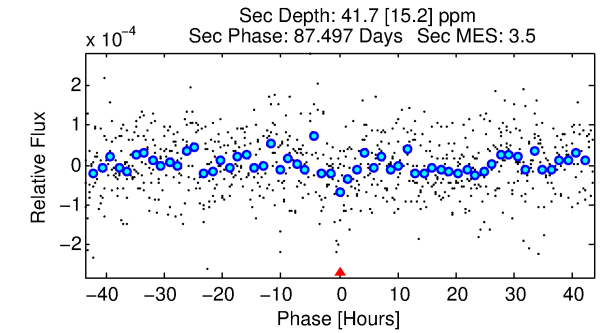
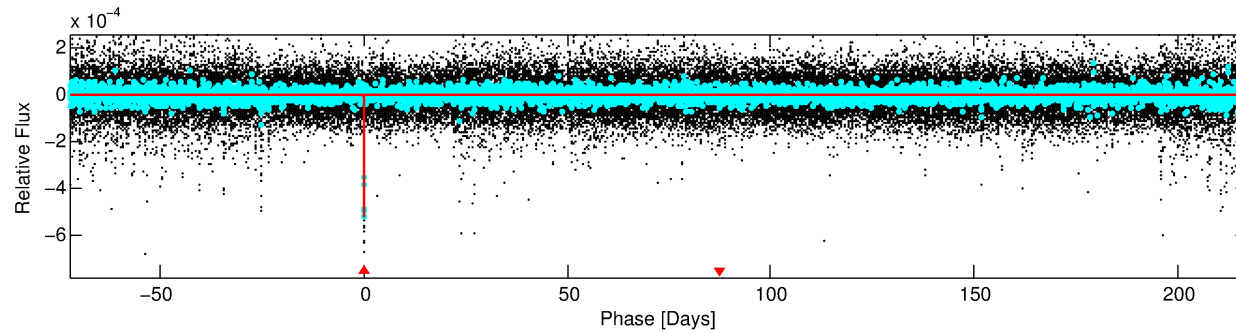
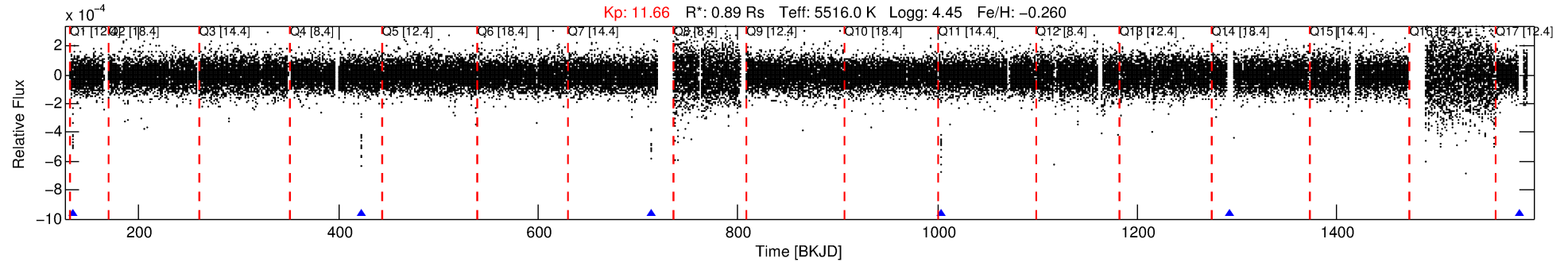
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010593626-01

No Significant Match Found

# DV One-Page Summary

KIC: 10593626 Candidate: 1 of 1 Period: 289.866 d  
KOI: K00087.01 Name: Kepler-22b Corr: 0.980



## DV Fit Results:

Period = 289.86645 [0.00125] d  
Epoch = 133.6911 [0.0024] BKJD  
 $R_p/R^* = 0.0235$  [0.0015]  
 $a/R^* = 184.01$  [48.84]  
 $b = 0.83$  [0.10]  
 $\text{Seff} = 1.03$  [0.19]  
 $T_{\text{eq}} = 257$  [12] K  
 $R_p = 2.28$  [0.27]  $R_e$   
 $a = 0.7958$  [0.0829] AU  
 $A_g = 2805.38$  [1184.98] [2.37 $\sigma$ ]  
 $T_{\text{eff}} = 2889$  [282] K [9.34 $\sigma$ ]

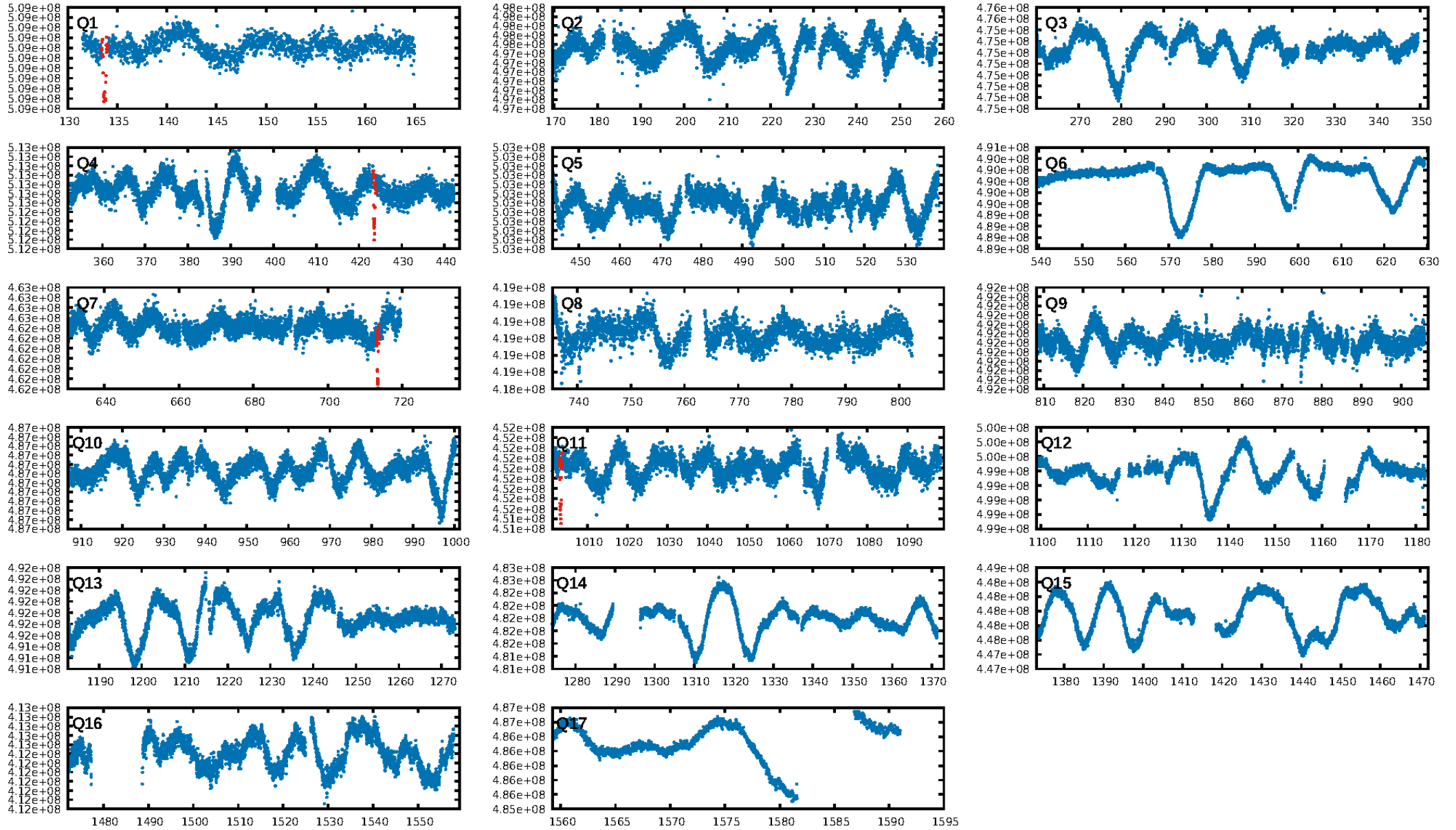
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 61.7%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 1.14e-171  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 6.834  
Centroid-sig: 5.6%  
Centroid-so: 0.689 arcsec [3.23 $\sigma$ ]  
OotOffset-rm: 0.367 arcsec [1.09 $\sigma$ ]  
KicOffset-rm: 1.052 arcsec [2.98 $\sigma$ ]  
OotOffset-st: 0/2/1/1 [4]  
KicOffset-st: 0/2/1/1 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [4/4]

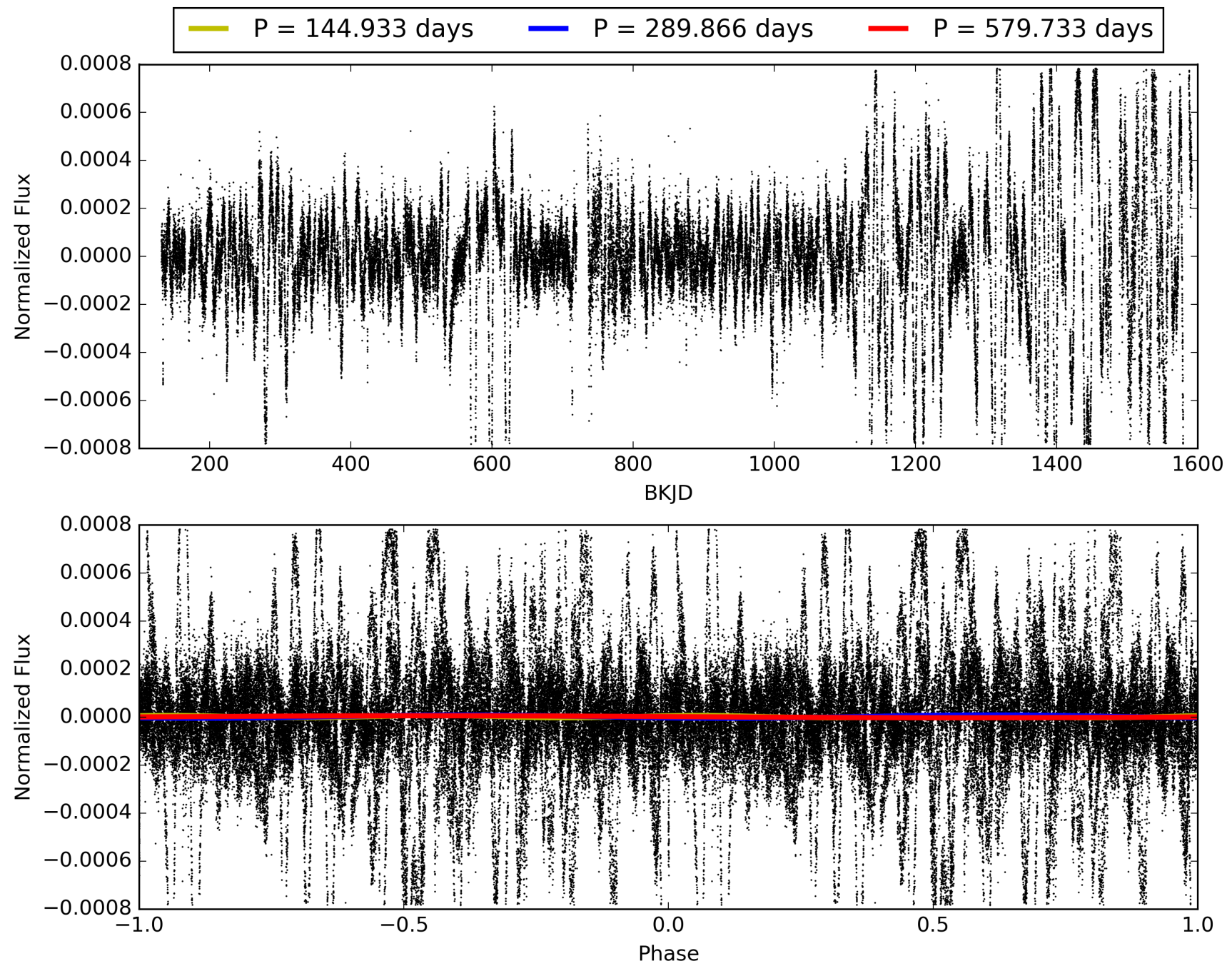
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:30:26 Z

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

# TCE 010593626-01, PDC Light Curves

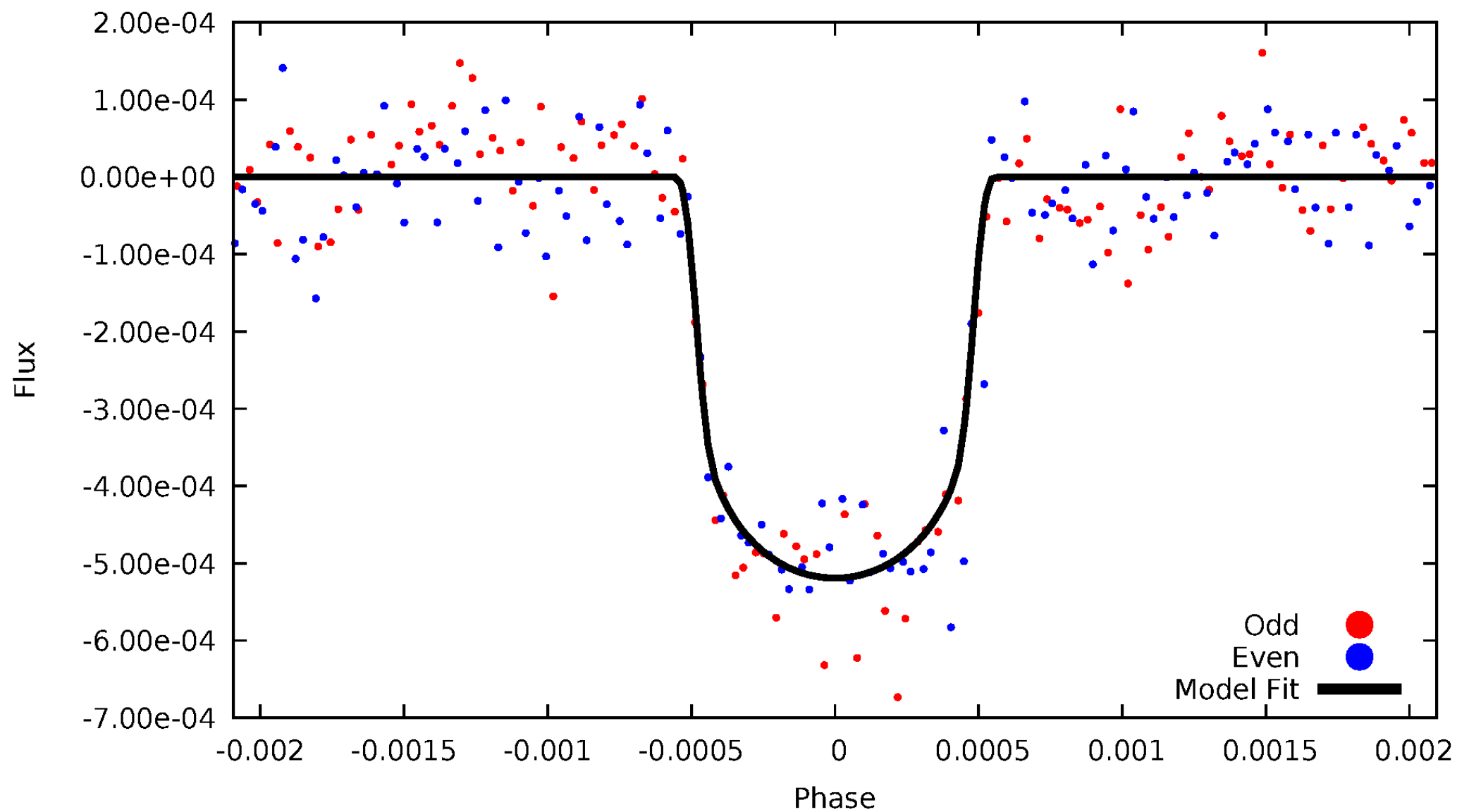


# TCE 010593626-01



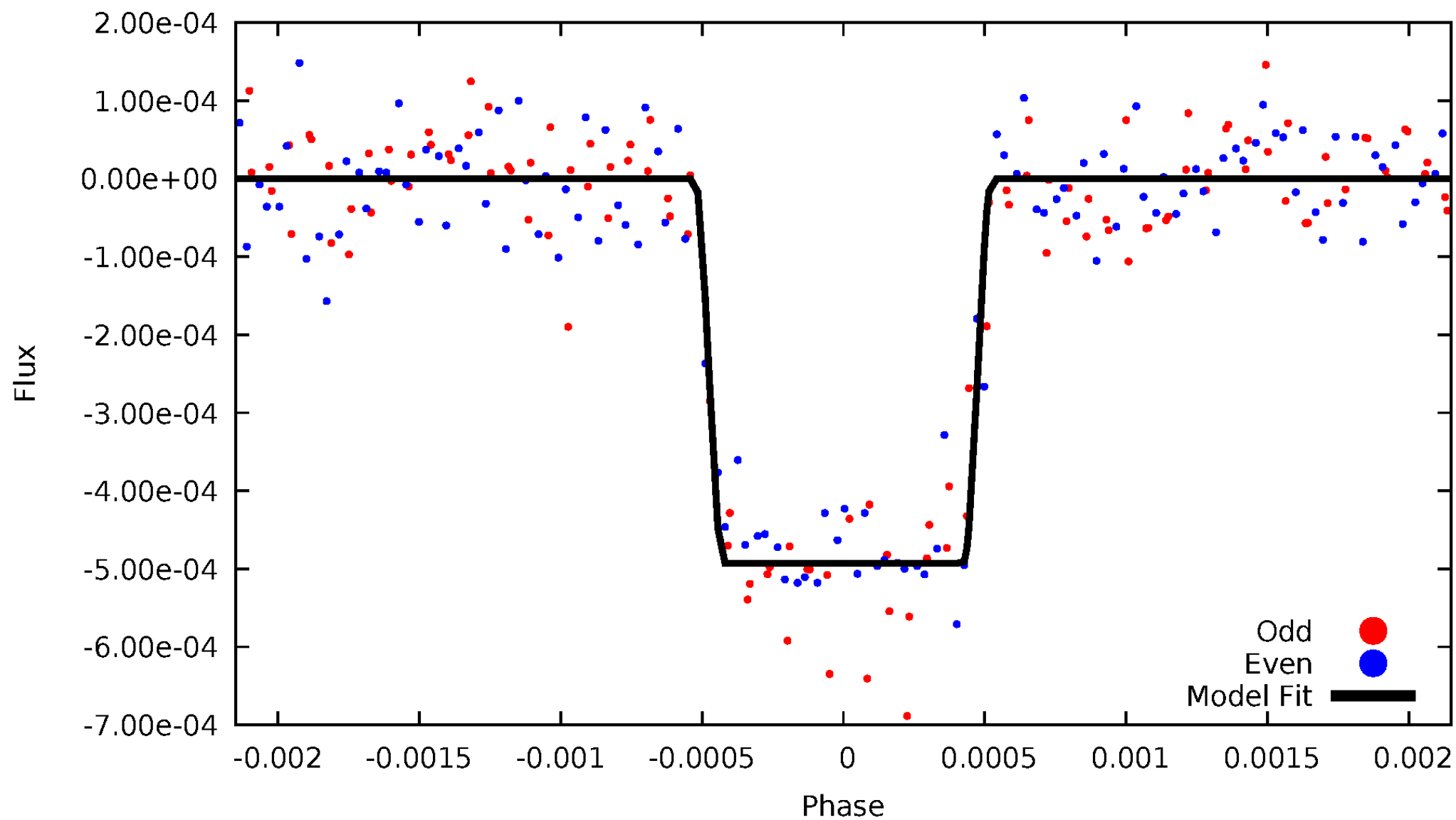
# DV Odd/Even

TCE 010593626-01

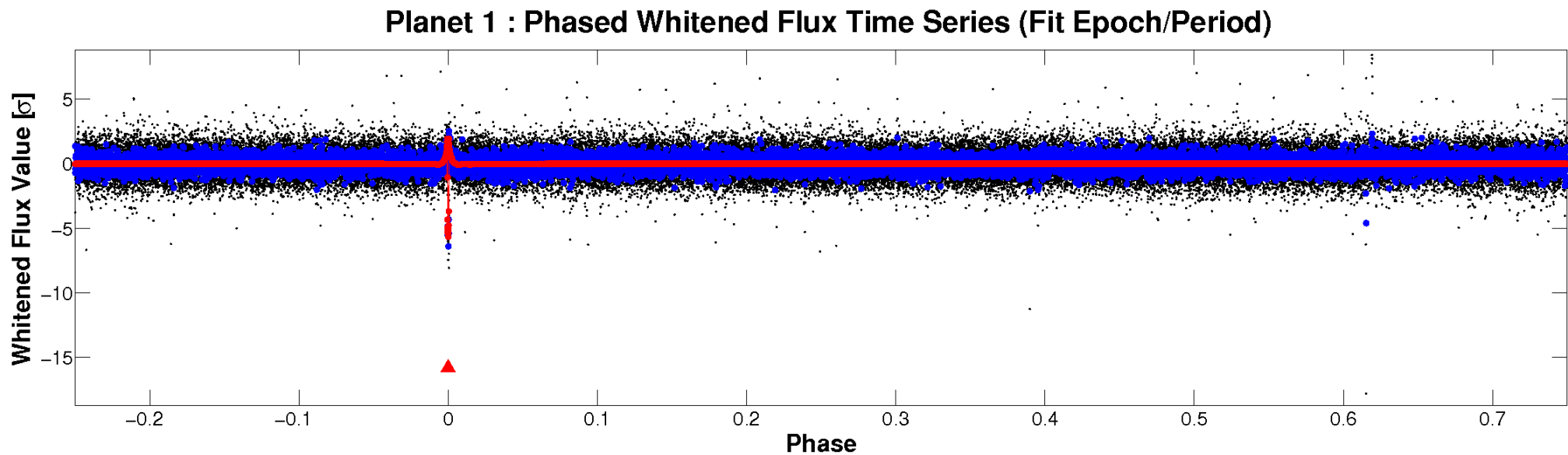
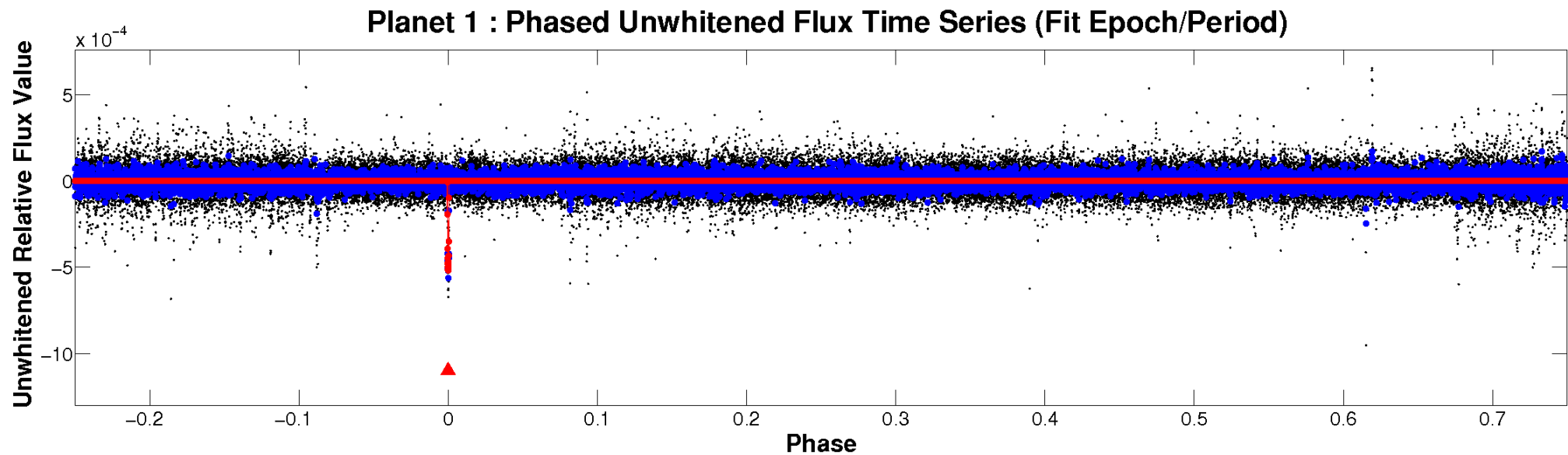


# ALT Odd/Even

TCE 010593626-01

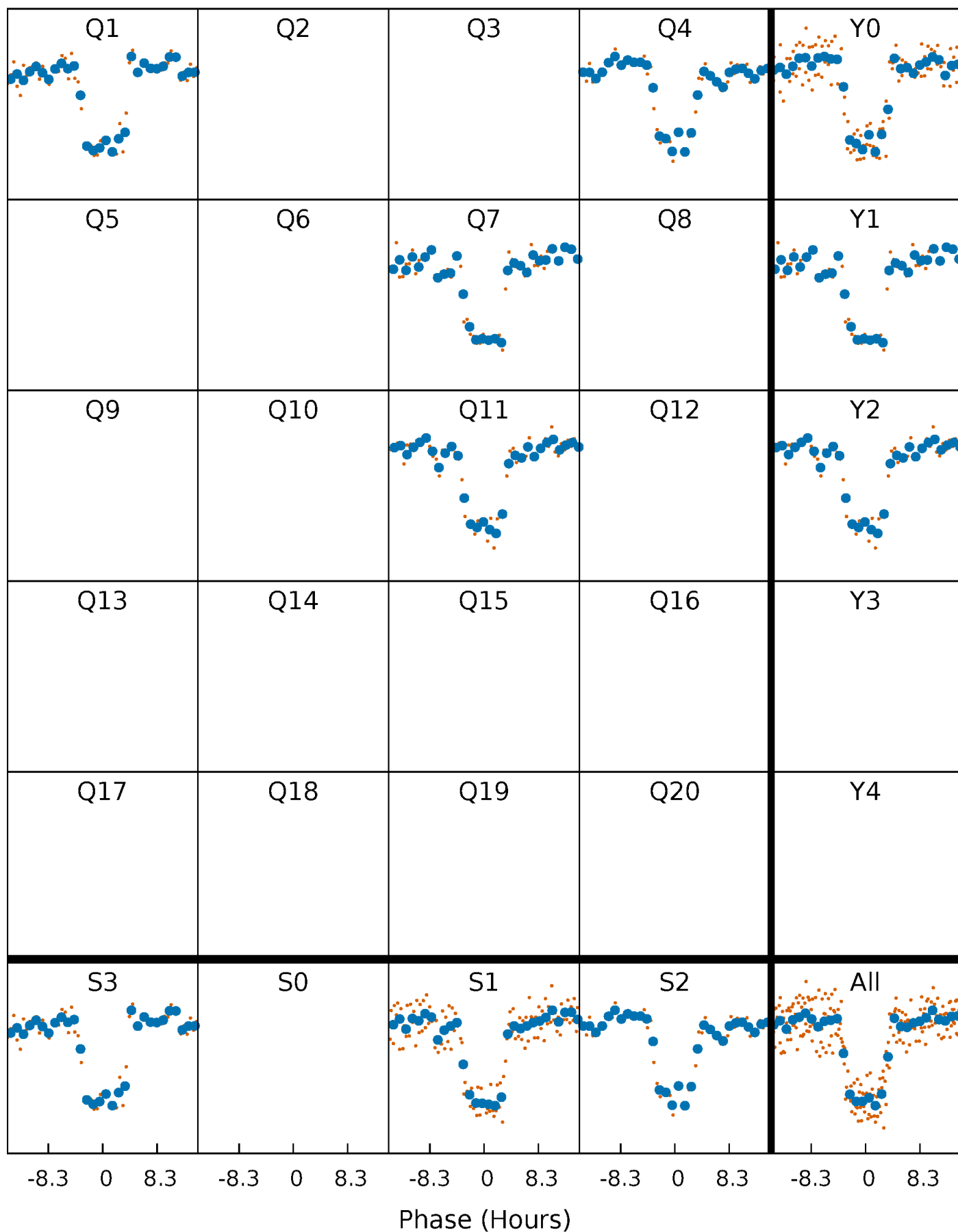


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

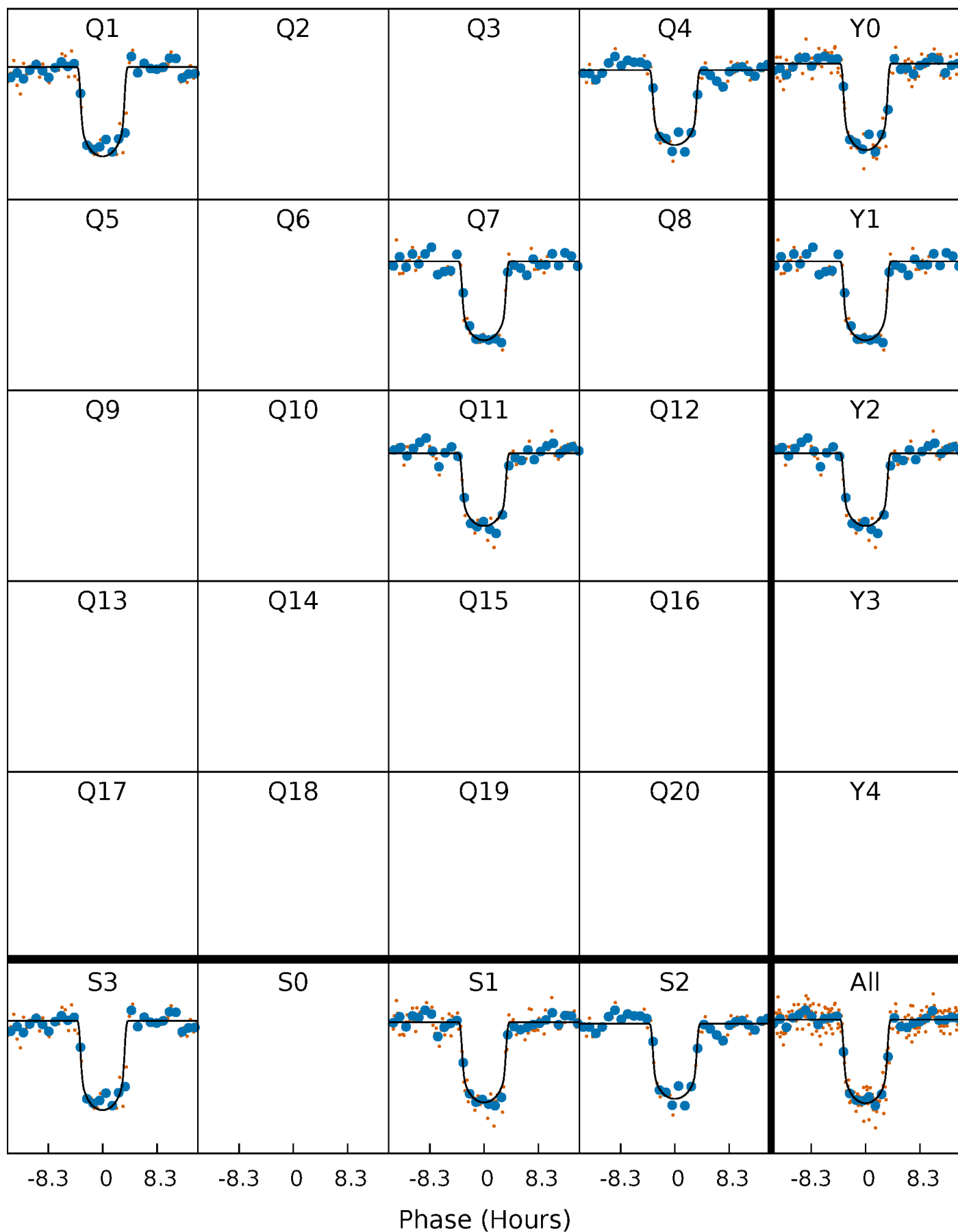
TCE 010593626-01 P=289.866445 Days  $T_0=133.691114$  (BKJD)





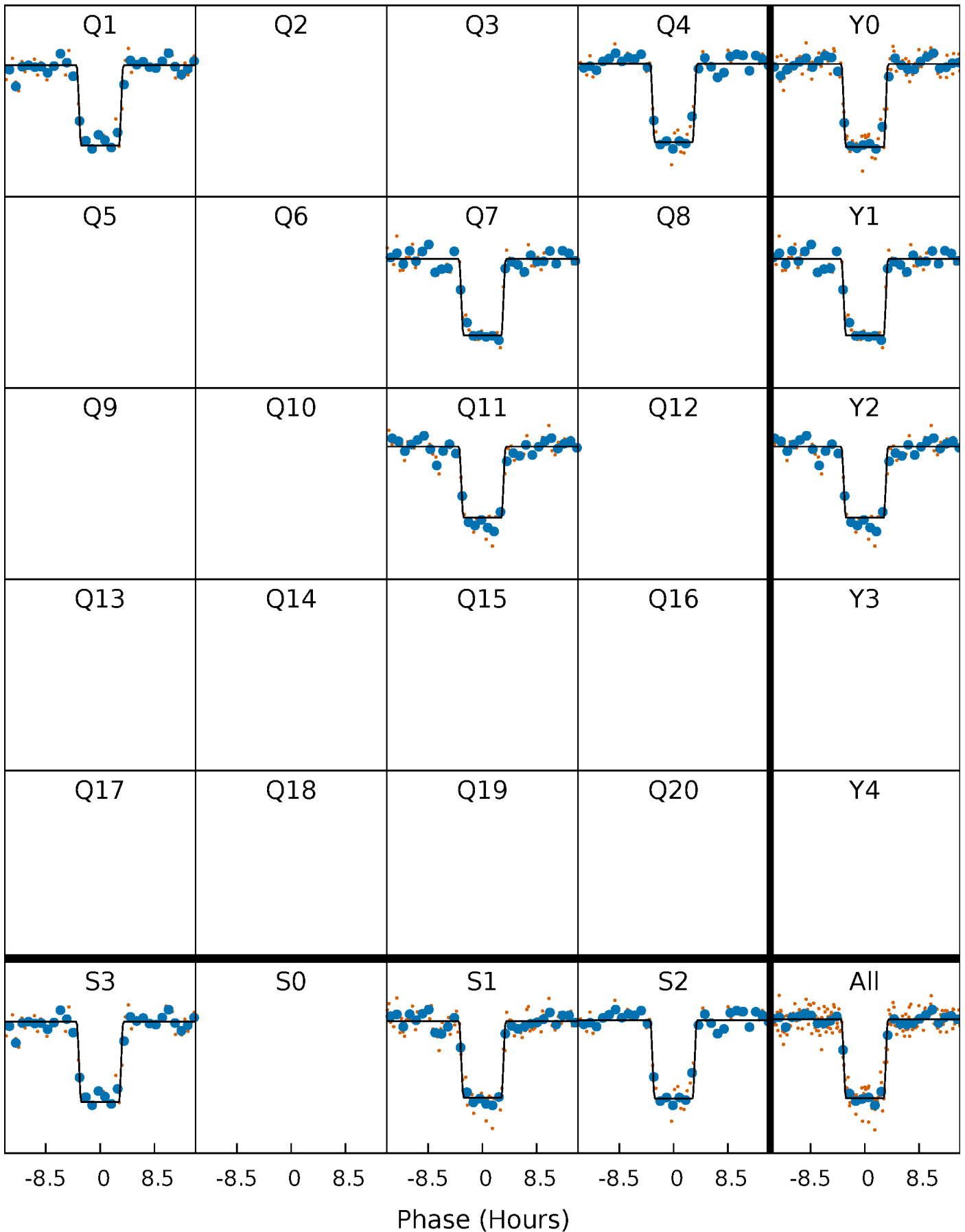
# DV Quarter-Phased Transit Curves

TCE 010593626-01 P=289.866445 Days  $T_0=133.691114$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

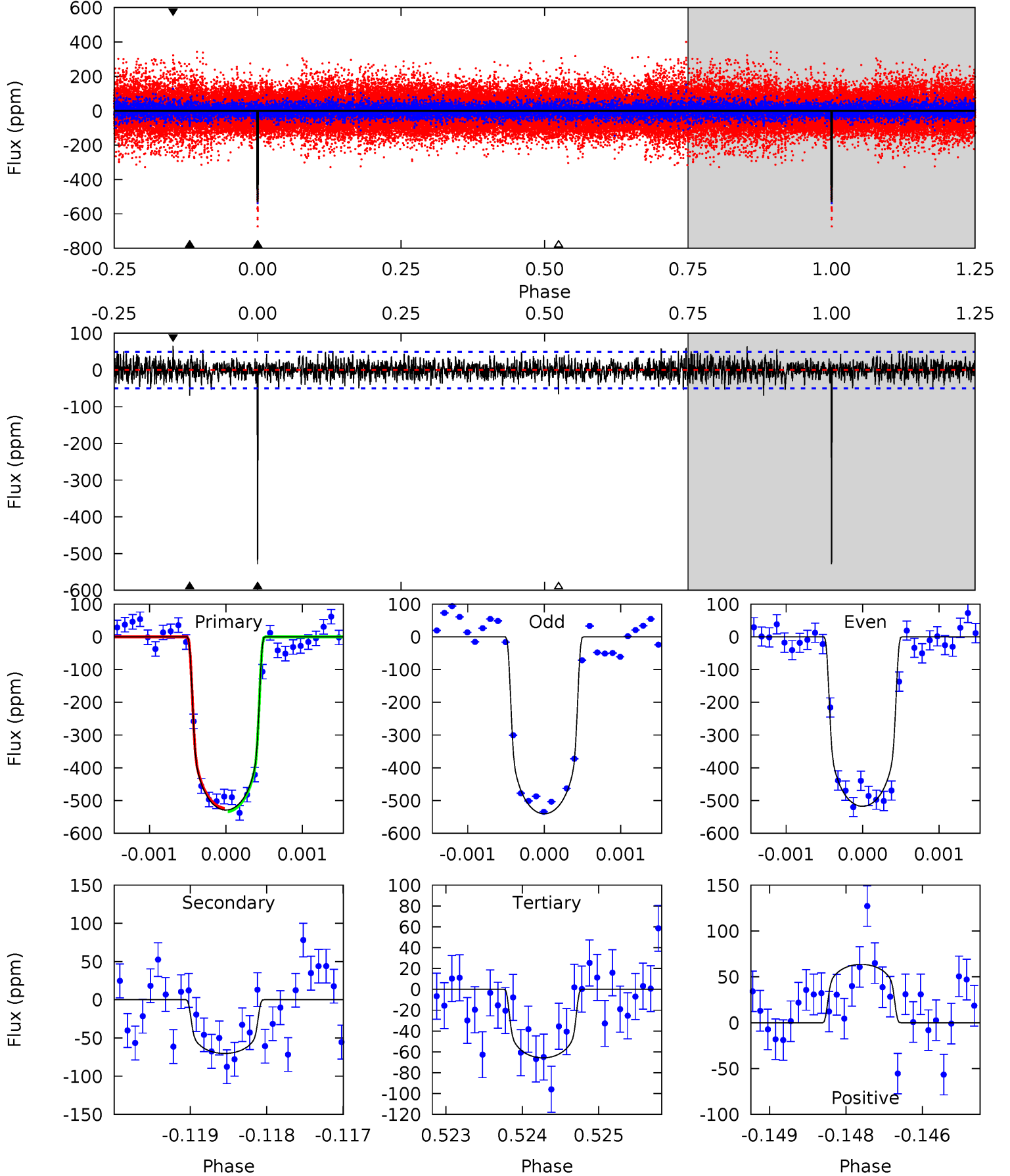
TCE 010593626-01 P=289.863671 Days  $T_0=133.697353$  (BKJD)



# DV Model-Shift Uniqueness Test

010593626-01, P = 289.866445 Days, E = 133.691114 Days

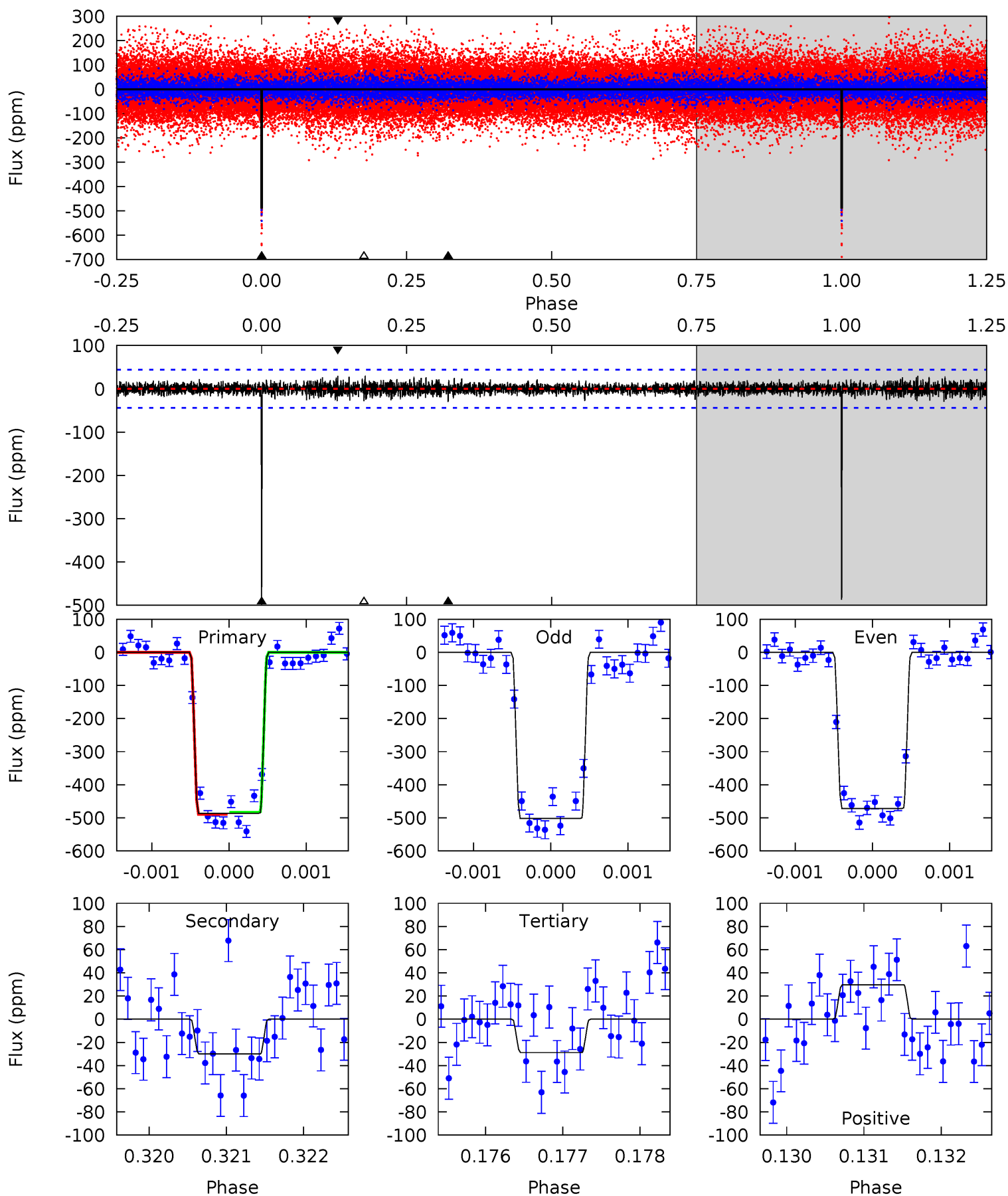
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.9	7.70	7.20	6.96	5.43	3.26	1.77	50.7	51.0	0.50	0.74	1.25	1.00	0.11	0.59



# Alt Model-Shift Uniqueness Test

010593626-01, P = 289.863671 Days, E = 133.697353 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
60.2	3.71	3.56	3.68	5.44	3.27	0.90	56.6	56.5	0.15	0.03	1.87	1.02	0.06	0.39



### Stellar Parameters For KIC 010593626

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5516^{+82}_{-74}$	$4.446^{+0.104}_{-0.064}$	$-0.260^{+0.150}_{-0.150}$	$0.886^{+0.080}_{-0.089}$	$0.799^{+0.066}_{-0.035}$	$1.619^{+0.671}_{-0.335}$
	+1%/-1%	+2%/-1%	+58%/-58%	+9%/-10%	+8%/-4%	+41%/-21%
Source	SPE89	SPE89	SPE89	DSEP		

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

### Secondary Eclipse Parameters for KIC 010593626-01 / KOI 0087.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-70 \pm 9$	$2.25^{+0.20}_{-0.20}$	$357^{+11}_{-12}$	$3702^{+111}_{-124}$	$4835^{+1231}_{-904}$
Alt.	$-30 \pm 8$	$2.13^{+0.21}_{-0.19}$	$357^{+11}_{-12}$	$3277^{+159}_{-156}$	$2258^{+839}_{-664}$

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

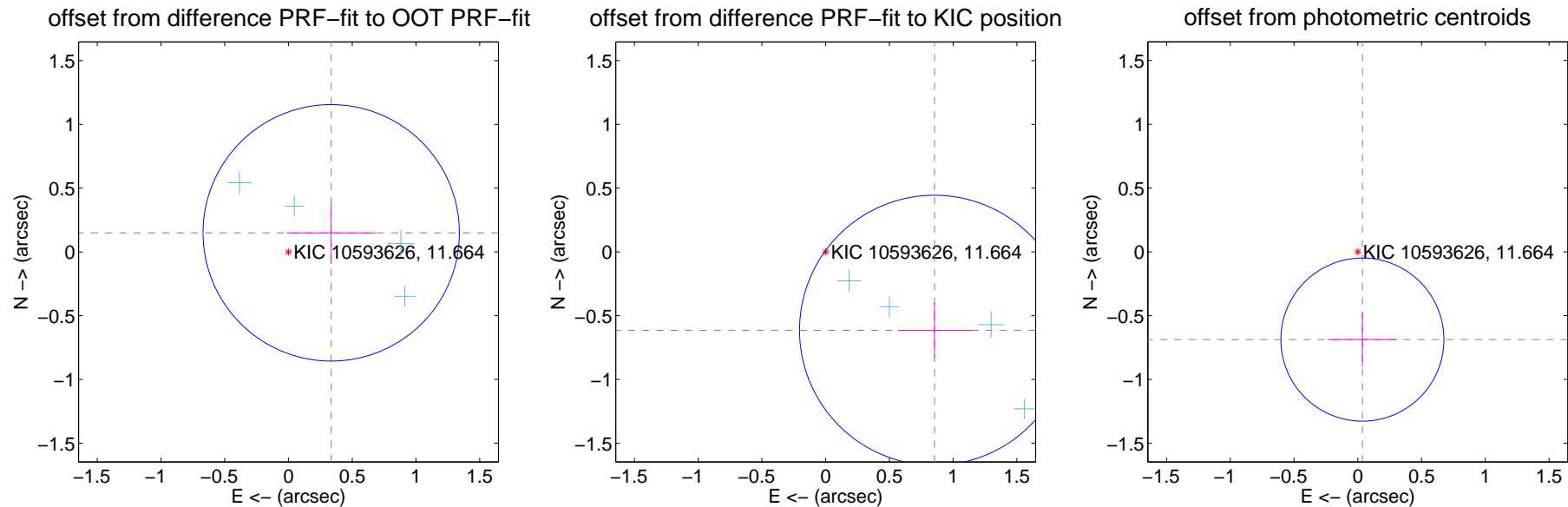
## DV Centroid Data

Supplemental centroid analysis for 010593626-01. **Kepler magnitude: 11.66.** Transit SNR 36.67

There are 4 quarters with good PRF difference image offsets

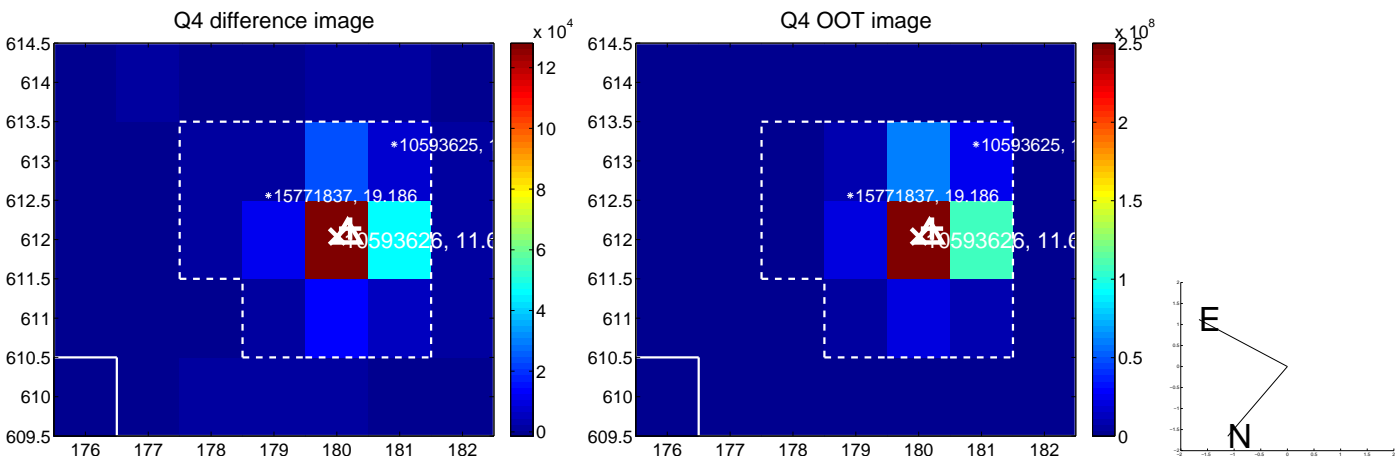
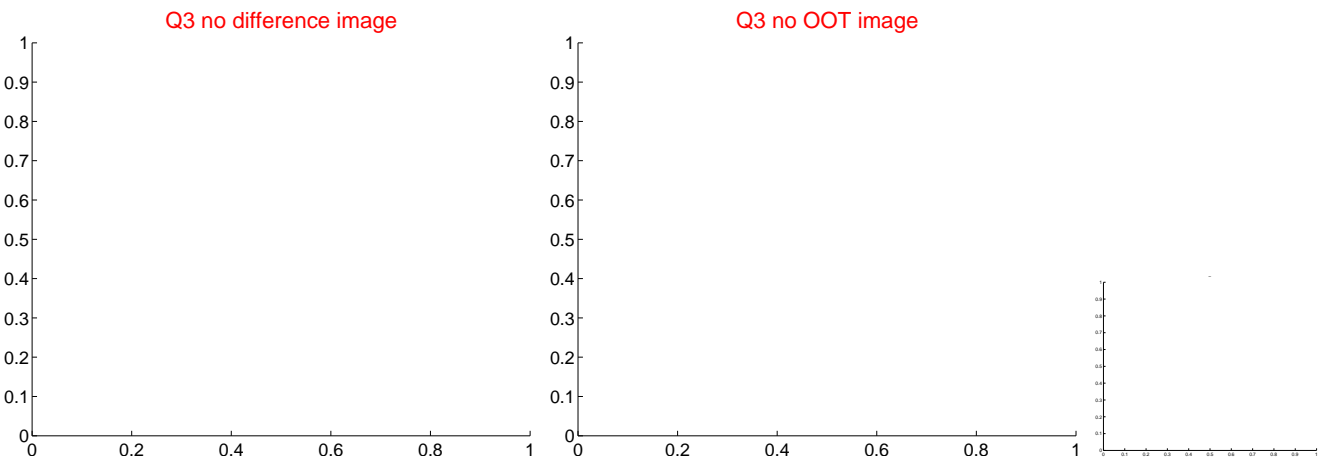
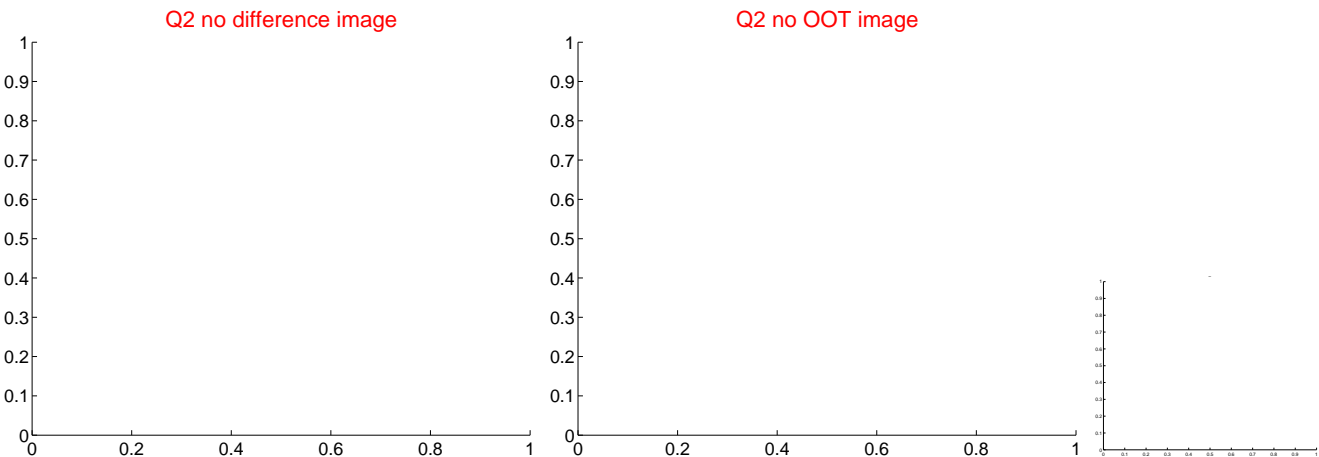
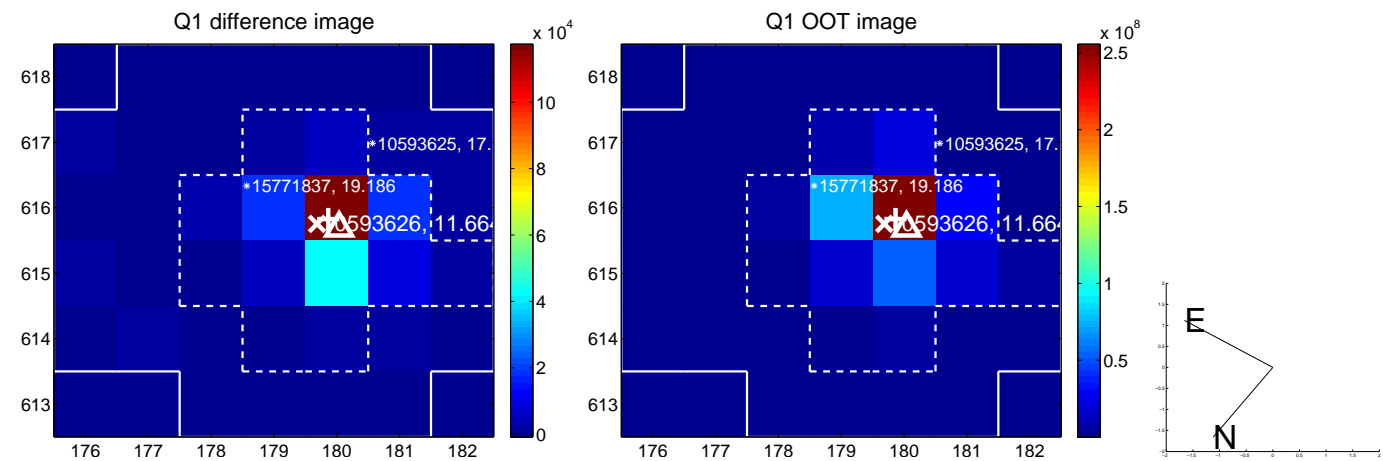
The direct PRF centroid is offset from the target star catalog position by about 1.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.367 \pm 0.335$	1.09	$-0.335 \pm 0.351$	$0.150 \pm 0.242$
PRF-fit source offset from KIC position	$1.052 \pm 0.353$	2.98	$-0.854 \pm 0.290$	$-0.614 \pm 0.217$
photometric centroid source offset	<b><math>0.69 \pm 0.21</math></b>	<b>3.23</b>	$-0.04 \pm 0.27$	$-0.69 \pm 0.21$

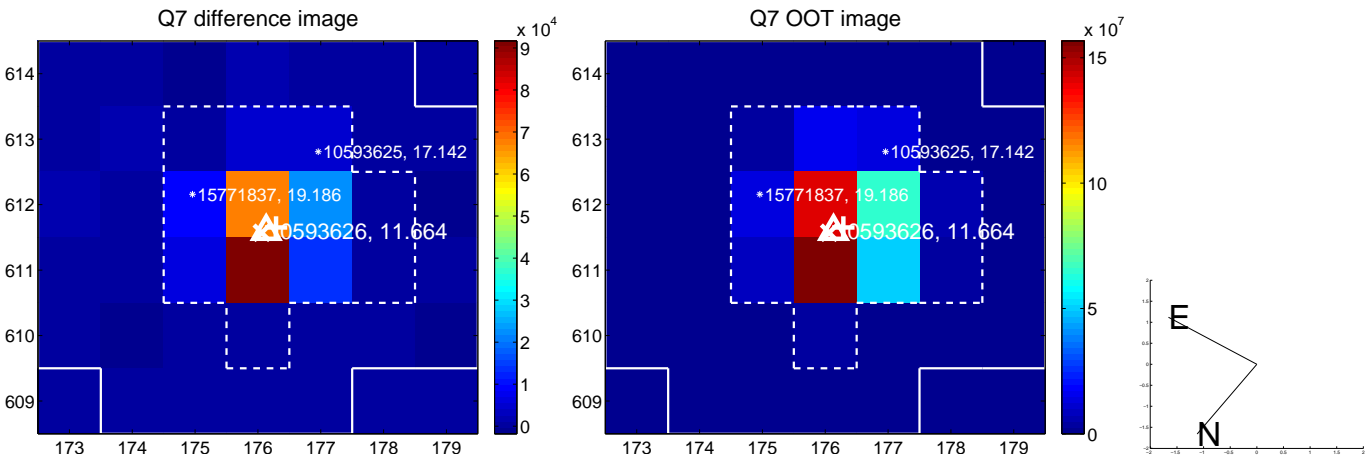


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

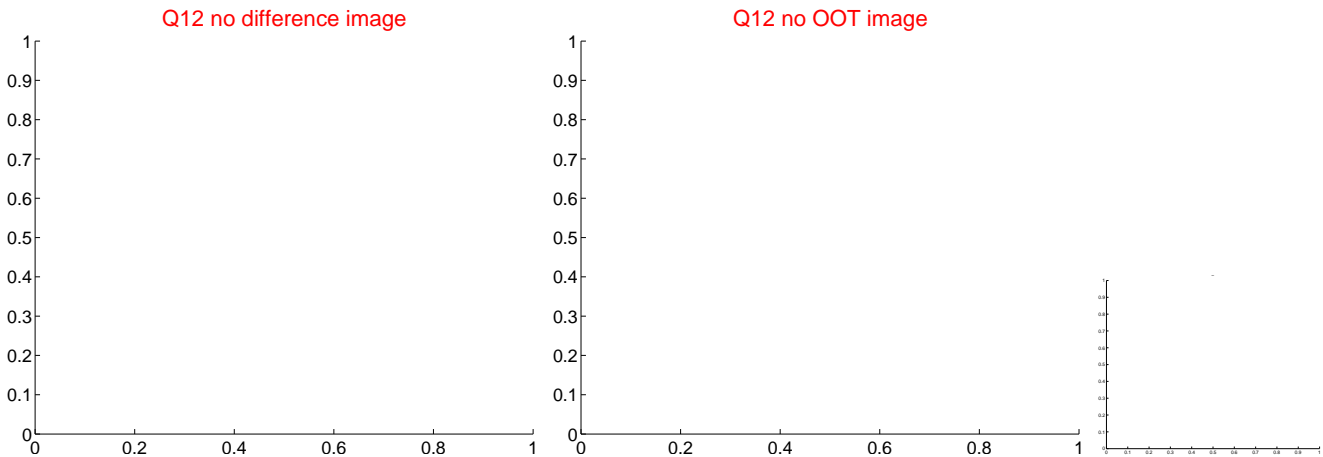
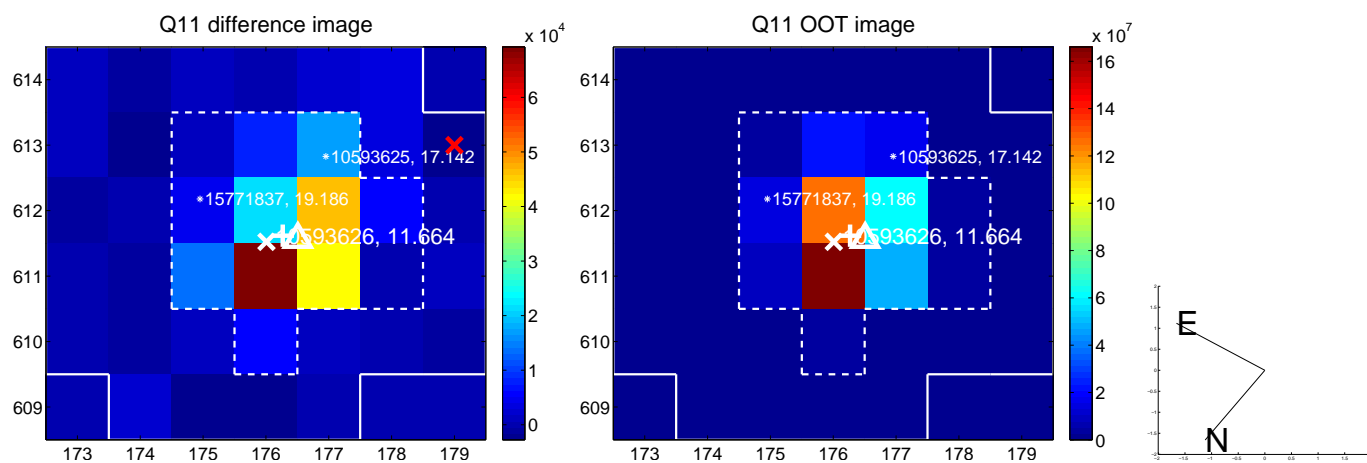
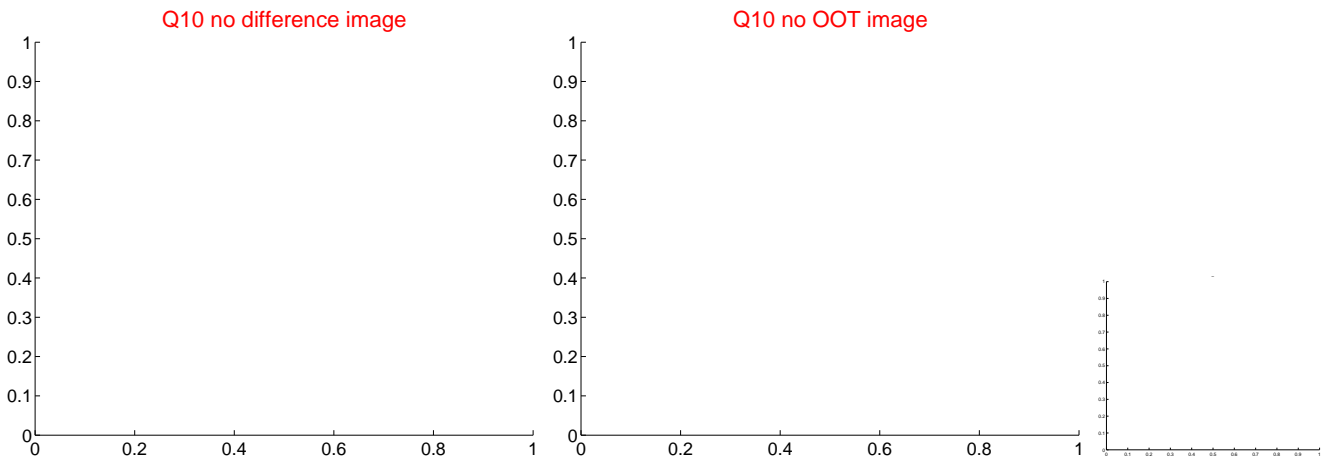


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





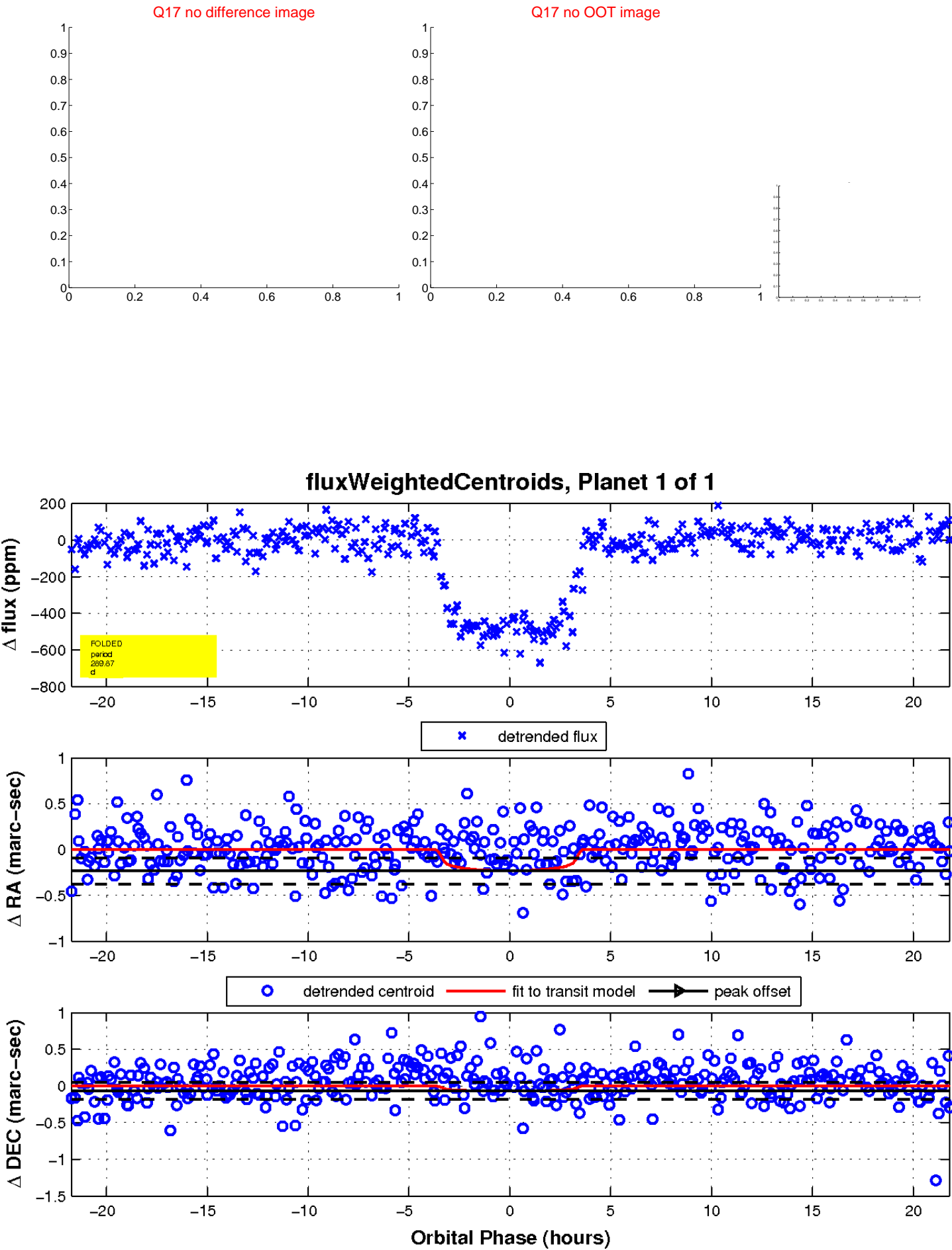
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

